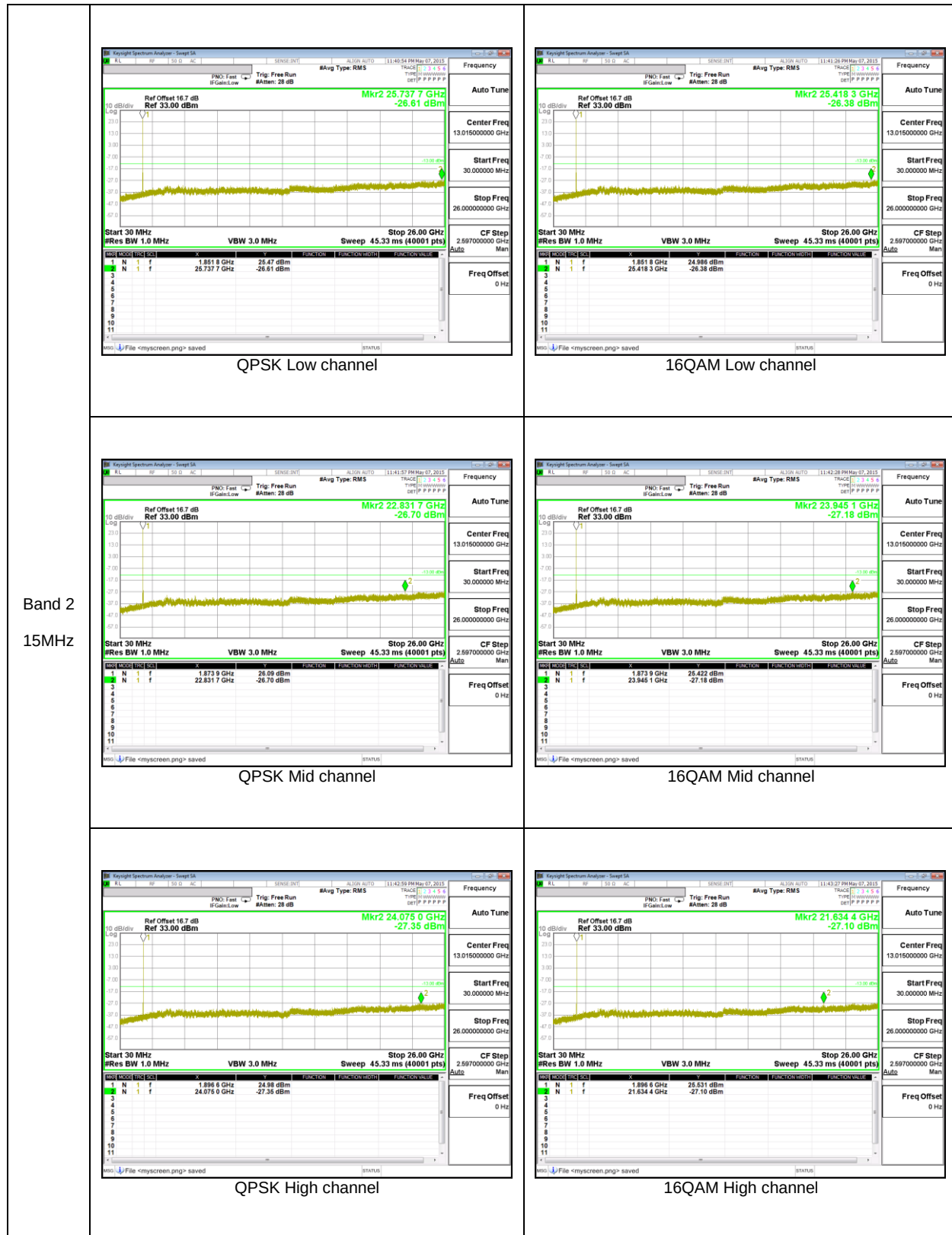
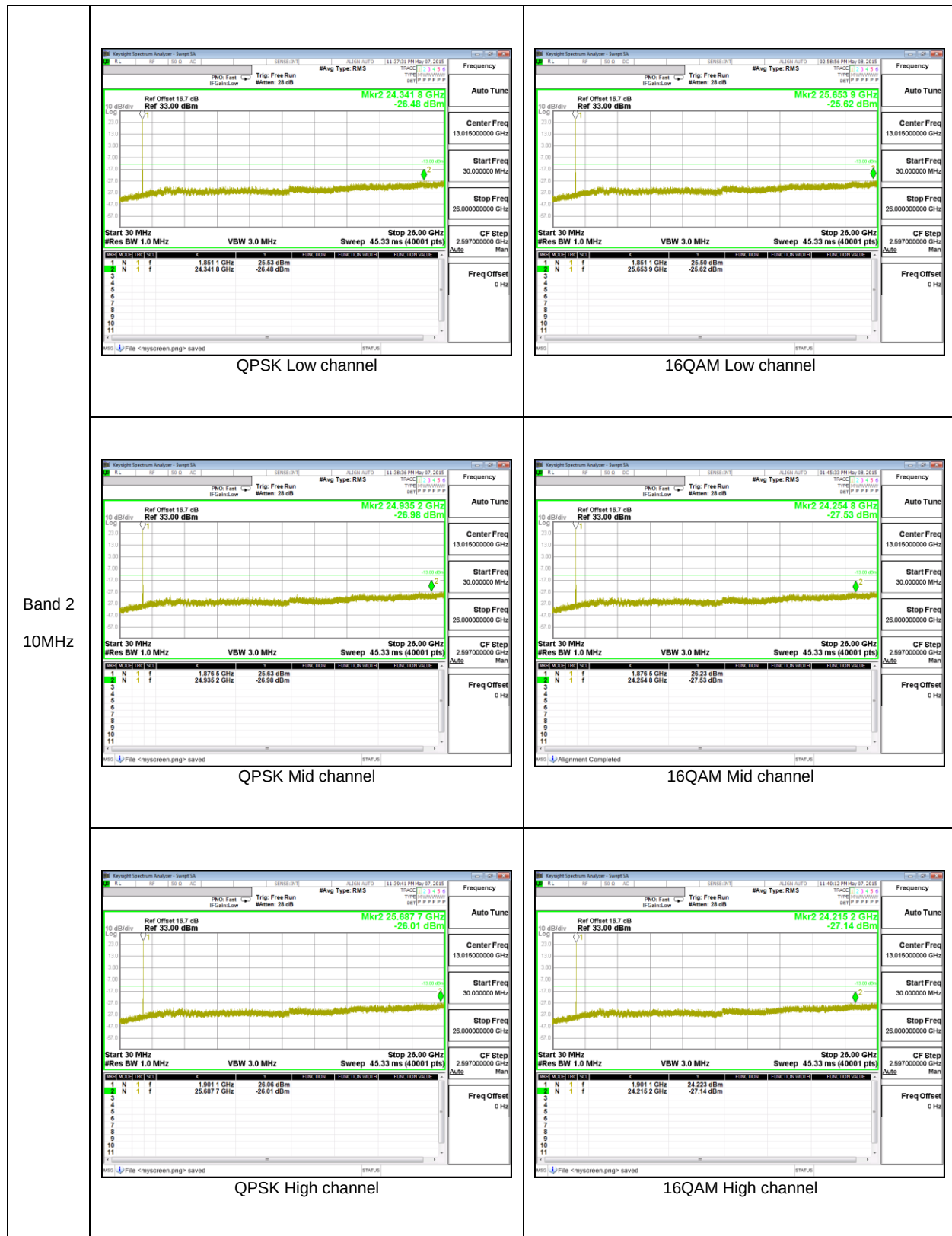
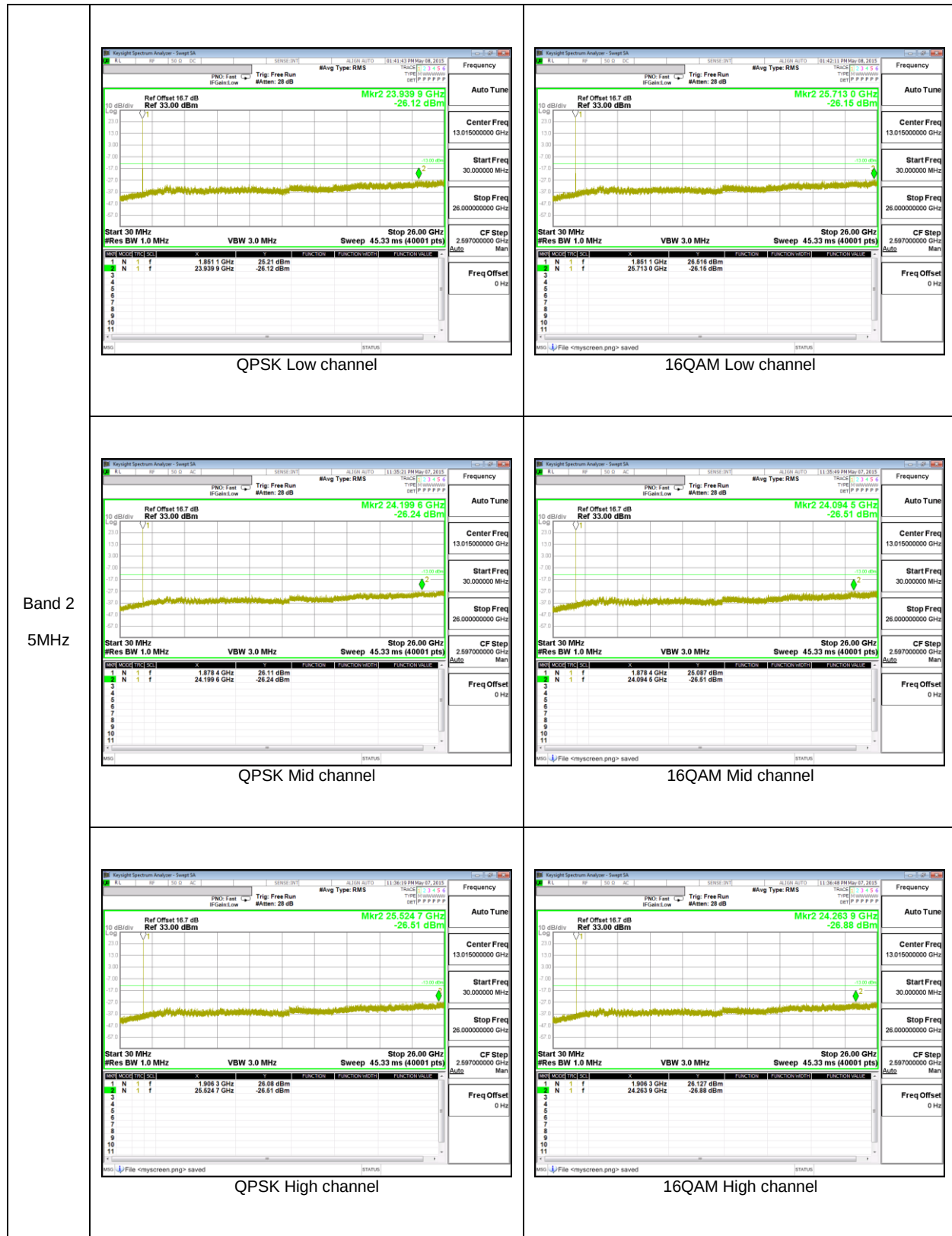


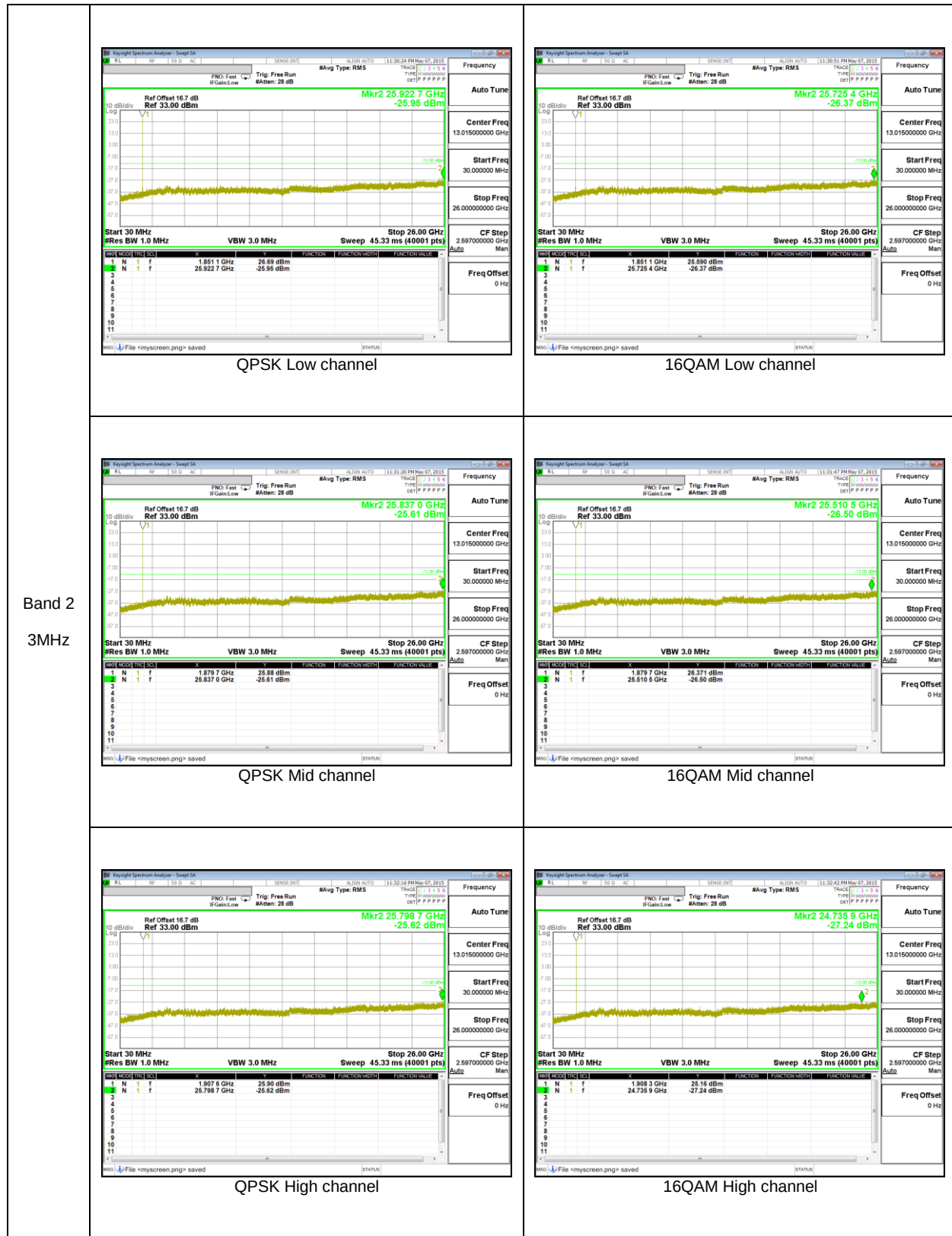
**LTE Band 2**













## **10.1. FREQUENCY STABILITY**

### **RULE PART(S)**

FCC: §2.1055, §22.355, §24.235, §27.54

### **LIMITS**

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

§27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### **TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

### **RESULTS**

See the following pages.

### 10.1.1. FREQUENCY STABILITY RESULTS

#### LTE Band 17, Channel 23790, Frequency 710.0 MHz

| Reference Frequency: LTE Band 17 Mid Channel 710.0 MHz @ 20°C |                                 |                                               |             |             |
|---------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +/- 2.5 ppm = 1775.000 Hz                              |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                         | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                               |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| 3.80                                                          | 50                              | 710.00001158                                  | 0.002       | 2.5         |
| 3.80                                                          | 40                              | 710.00000914                                  | 0.005       | 2.5         |
| 3.80                                                          | 30                              | 709.99999248                                  | 0.029       | 2.5         |
| <b>3.80</b>                                                   | <b>20</b>                       | 710.00001286                                  | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                          | 10                              | 710.00001793                                  | -0.007      | 2.5         |
| 3.80                                                          | 0                               | 710.00001236                                  | 0.001       | 2.5         |
| 3.80                                                          | -10                             | 709.99999005                                  | 0.032       | 2.5         |
| 3.80                                                          | -20                             | 709.99998768                                  | 0.035       | 2.5         |
| 3.80                                                          | -30                             | 710.00000664                                  | 0.009       | 2.5         |

| Reference Frequency: LTE Band 17 Mid Channel 710.0 MHz @ 20°C |                                 |                                               |             |             |
|---------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +/- 2.5 ppm = 1775.000 Hz                              |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                         | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                               |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| <b>3.80</b>                                                   | <b>20</b>                       | <b>710.00001286</b>                           | <b>0</b>    | <b>2.5</b>  |
| 4.20                                                          | 20                              | 710.00001730                                  | -0.006      | 2.5         |
| 3.40                                                          | 20                              | 709.99998756                                  | 0.036       | 2.5         |

**LTE Band 5, Channel 20524, Frequency 836.5 MHz**

**WCDMA Band 5, Channel 4183, Frequency 836.6 MHz**

**GSM 850, Channel 190, Frequency 836.6 MHz**

| Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20°C |                                 |                                               |             |             |
|--------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +/- 2.5 ppm = 2091.250 Hz                             |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                        | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                              |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| 3.80                                                         | 50                              | 836.50000780                                  | 0.005       | 2.5         |
| 3.80                                                         | 40                              | 836.50000964                                  | 0.003       | 2.5         |
| 3.80                                                         | 30                              | 836.50001014                                  | 0.002       | 2.5         |
| <b>3.80</b>                                                  | <b>20</b>                       | 836.50001193                                  | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                         | 10                              | 836.50001325                                  | -0.002      | 2.5         |
| 3.80                                                         | 0                               | 836.50001601                                  | -0.005      | 2.5         |
| 3.80                                                         | -10                             | 836.50001271                                  | -0.001      | 2.5         |
| 3.80                                                         | -20                             | 836.50001384                                  | -0.002      | 2.5         |
| 3.80                                                         | -30                             | 836.50001857                                  | -0.008      | 2.5         |

| Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20°C |                                 |                                               |             |             |
|--------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +/- 2.5 ppm = 2091.250 Hz                             |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                        | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                              |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| <b>3.80</b>                                                  | <b>20</b>                       | <b>836.50001193</b>                           | <b>0</b>    | <b>2.5</b>  |
| 4.20                                                         | 20                              | 836.50001813                                  | -0.007      | 2.5         |
| 3.40                                                         | 20                              | 836.50001946                                  | -0.009      | 2.5         |

**LTE Band 4, Channel 20174, Frequency 1732.5 MHz**

| Reference Frequency: LTE Band 4 Mid Channel 1732.5 MHz @ 20°C |                                 |                                               |             |             |
|---------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +/- 2.5 ppm = 4331.250 Hz                              |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                         | Environment<br>Temperature [*C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                               |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| 3.80                                                          | 50                              | 1732.49998465                                 | 0.000       | 2.5         |
| 3.80                                                          | 40                              | 1732.50001784                                 | -0.019      | 2.5         |
| 3.80                                                          | 30                              | 1732.50002010                                 | -0.021      | 2.5         |
| <b>3.80</b>                                                   | <b>20</b>                       | 1732.49998406                                 | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                          | 10                              | 1732.49998378                                 | 0.000       | 2.5         |
| 3.80                                                          | 0                               | 1732.49998027                                 | 0.002       | 2.5         |
| 3.80                                                          | -10                             | 1732.49998745                                 | -0.002      | 2.5         |
| 3.80                                                          | -20                             | 1732.49998459                                 | 0.000       | 2.5         |
| 3.80                                                          | -30                             | 1732.49998796                                 | -0.002      | 2.5         |

| Reference Frequency: LTE Band 4 Mid Channel 1732.5 MHz @ 20°C |                                 |                                               |             |             |
|---------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +/- 2.5 ppm = 4331.250 Hz                              |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                         | Environment<br>Temperature [*C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                               |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| <b>3.80</b>                                                   | <b>20</b>                       | <b>1732.49998406</b>                          | <b>0</b>    | <b>2.5</b>  |
| 4.20                                                          | 20                              | 1732.49997712                                 | 0.004       | 2.5         |
| 3.40                                                          | 20                              | 1732.49996739                                 | 0.010       | 2.5         |

**LTE Band 2, Channel 18900, Frequency 1880.0 MHz**

**WCDMA Band 2, Channel 9400, Frequency 1880.0 MHz**

**GSM 1900, Channel 661, Frequency 1880.0 MHz**

| Reference Frequency: LTE Band 2 Mid Channel 1880.0 MHz @ 20°C |                                 |                                               |             |             |
|---------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +/- 2.5 ppm = 4700.000 Hz                              |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                         | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                               |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| 3.80                                                          | 50                              | 1880.00002440                                 | -0.001      | 2.5         |
| 3.80                                                          | 40                              | 1879.99998007                                 | 0.023       | 2.5         |
| 3.80                                                          | 30                              | 1879.99998125                                 | 0.022       | 2.5         |
| <b>3.80</b>                                                   | <b>20</b>                       | 1880.00002315                                 | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                          | 10                              | 1880.00001521                                 | 0.004       | 2.5         |
| 3.80                                                          | 0                               | 1880.00001558                                 | 0.004       | 2.5         |
| 3.80                                                          | -10                             | 1879.99997719                                 | 0.024       | 2.5         |
| 3.80                                                          | -20                             | 1880.00001817                                 | 0.003       | 2.5         |
| 3.80                                                          | -30                             | 1879.99998783                                 | 0.019       | 2.5         |

| Reference Frequency: LTE Band 2 Mid Channel 1880.0 MHz @ 20°C |                                 |                                               |             |             |
|---------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +/- 2.5 ppm = 4700.000 Hz                              |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                         | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                               |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| <b>3.80</b>                                                   | <b>20</b>                       | <b>1880.00002315</b>                          | <b>0</b>    | <b>2.5</b>  |
| 4.20                                                          | 20                              | 1880.00001884                                 | 0.002       | 2.5         |
| 3.40                                                          | 20                              | 1880.00002170                                 | 0.001       | 2.5         |

## 11. RADIATED TEST RESULTS

### 11.1. RADIATED POWER (ERP & EIRP)

#### RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50

#### LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

27.50(c) - (10) Portable stations (hand-held devices) are limited to 3 watts ERP; (LTE B17)

27.50(d) - (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.(Band 4)

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

#### TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17; MXA setting reference to 971168 D01 v02r02

For peak power measurement with a MXA:

a) Set the RBW  $\geq$  OBW; b) Set VBW  $\geq 3 \times$  RBW; c) Set span  $\geq 2 \times$  RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points  $\geq$  span/RBW; g) Trace mode = max hold;

For average power measurement with a MXA:

a) Set span to at least 1.5 times the OBW; b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz; c) Set VBW  $\geq 3 \times$  RBW; d) Set number of points in sweep  $\geq 2 \times$  span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle  $\geq 98$ ; h) Use trigger to capture bursts If burst duty cycle  $< 98$ ; i) Trace average at least 100 traces in power averaging (i.e., RMS) mode. j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function.

#### TEST RESULTS

### 11.1.1. ERP/EIRP Results

#### GSM

| Band    | Mode  | Channel | f [MHz] | ERP / EIRP |        |
|---------|-------|---------|---------|------------|--------|
|         |       |         |         | [dBm]      | [mW]   |
| GSM850  | GPRS  | 512     | 824.2   | 28.61      | 725.3  |
|         |       | 661     | 836.6   | 29.63      | 917.3  |
|         |       | 810     | 848.8   | 28.68      | 737.4  |
|         | EGPRS | 512     | 824.2   | 23.82      | 240.7  |
|         |       | 661     | 836.6   | 23.58      | 227.8  |
|         |       | 810     | 848.8   | 22.43      | 174.9  |
| GSM1900 | GPRS  | 512     | 1850.2  | 31.95      | 1566.0 |
|         |       | 661     | 1880.0  | 31.95      | 1566.8 |
|         |       | 810     | 1909.8  | 31.82      | 1521.6 |
|         | EGPRS | 512     | 1850.2  | 29.82      | 959.0  |
|         |       | 661     | 1880.0  | 29.87      | 970.5  |
|         |       | 810     | 1909.8  | 29.63      | 919.0  |

#### WCDMA

| Band   | Mode  | Channel | f [MHz] | ERP / EIRP |       |
|--------|-------|---------|---------|------------|-------|
|        |       |         |         | [dBm]      | [mW]  |
| Band 5 | REL99 | 4132    | 826.4   | 17.99      | 62.9  |
|        |       | 4183    | 836.6   | 18.54      | 71.4  |
|        |       | 4233    | 846.6   | 17.93      | 62.0  |
|        | HSDPA | 4132    | 826.4   | 18.39      | 68.9  |
|        |       | 4183    | 836.6   | 18.99      | 79.2  |
|        |       | 4233    | 846.6   | 18.51      | 70.9  |
| Band 2 | REL99 | 9262    | 1852.4  | 23.55      | 226.4 |
|        |       | 9400    | 1880.0  | 23.77      | 238.2 |
|        |       | 9538    | 1907.6  | 23.61      | 229.8 |
|        | HSDPA | 9262    | 1852.4  | 22.44      | 175.3 |
|        |       | 9400    | 1880.0  | 23.09      | 203.7 |
|        |       | 9538    | 1907.6  | 21.90      | 155.0 |

**LTE Band 17**

| Band    | BW [MHz] | Mode  | RB/RB Size | f [MHz] | ERP / EIRP |      |
|---------|----------|-------|------------|---------|------------|------|
|         |          |       | Full RB    |         | [dBm]      | [mW] |
| Band 17 | 10       | QPSK  | 50/0       | 709.0   | 11.51      | 14.2 |
|         |          |       | 50/0       | 710.0   | 11.19      | 13.2 |
|         |          |       | 50/0       | 711.0   | 12.00      | 15.8 |
|         |          | 16QAM | 50/0       | 709.0   | 10.89      | 12.3 |
|         |          |       | 50/0       | 710.0   | 11.12      | 12.9 |
|         |          |       | 50/0       | 711.0   | 10.19      | 10.4 |
|         | 5        | QPSK  | 25/0       | 706.5   | 10.47      | 11.1 |
|         |          |       | 25/0       | 710.0   | 11.63      | 14.6 |
|         |          |       | 25/0       | 713.5   | 10.11      | 10.3 |
|         |          | 16QAM | 25/0       | 706.5   | 10.07      | 10.2 |
|         |          |       | 25/0       | 710.0   | 8.11       | 6.5  |
|         |          |       | 25/0       | 713.5   | 11.18      | 13.1 |

**LTE Band 5**

| Band   | BW [MHz] | Mode  | RB/RB Size | f [MHz] | ERP / EIRP |      |
|--------|----------|-------|------------|---------|------------|------|
|        |          |       | Full RB    |         | [dBm]      | [mW] |
| Band 5 | 10       | QPSK  | 50/0       | 1860.0  | 15.81      | 38.1 |
|        |          |       | 50/0       | 1880.0  | 15.64      | 36.6 |
|        |          |       | 50/0       | 1900.0  | 16.02      | 40.0 |
|        |          | 16QAM | 50/0       | 1860.0  | 14.07      | 25.5 |
|        |          |       | 50/0       | 1880.0  | 14.51      | 28.3 |
|        |          |       | 50/0       | 1900.0  | 14.92      | 31.1 |
|        | 5        | QPSK  | 25/0       | 1852.5  | 14.20      | 26.3 |
|        |          |       | 25/0       | 1880.0  | 15.82      | 38.2 |
|        |          |       | 25/0       | 1907.5  | 15.28      | 33.8 |
|        |          | 16QAM | 25/0       | 1852.5  | 14.93      | 31.1 |
|        |          |       | 25/0       | 1880.0  | 16.06      | 40.3 |
|        |          |       | 25/0       | 1907.5  | 15.30      | 33.8 |
|        | 3        | QPSK  | 15/0       | 1815.5  | 11.89      | 15.4 |
|        |          |       | 15/0       | 1880.0  | 13.15      | 20.6 |
|        |          |       | 15/0       | 1908.5  | 12.21      | 16.6 |
|        |          | 16QAM | 15/0       | 1815.5  | 10.64      | 11.6 |
|        |          |       | 15/0       | 1880.0  | 12.24      | 16.7 |
|        |          |       | 15/0       | 1908.5  | 11.77      | 15.0 |
|        | 1.4      | QPSK  | 6/0        | 1850.7  | 12.26      | 16.8 |
|        |          |       | 6/0        | 1880.0  | 13.73      | 23.6 |
|        |          |       | 6/0        | 1909.3  | 12.40      | 17.4 |
|        |          | 16QAM | 6/0        | 1850.7  | 11.13      | 13.0 |
|        |          |       | 6/0        | 1880.0  | 11.36      | 13.7 |
|        |          |       | 6/0        | 1909.3  | 11.77      | 15.0 |

**LTE Band 4**

| Band   | BW [MHz] | Mode  | RB/RB Size | f [MHz] | ERP / EIRP |       |
|--------|----------|-------|------------|---------|------------|-------|
|        |          |       | Full RB    |         | [dBm]      | [mW]  |
| Band 4 | 20       | QPSK  | 100/0      | 1720.0  | 22.18      | 165.2 |
|        |          |       | 100/0      | 1732.5  | 22.05      | 160.3 |
|        |          |       | 100/0      | 1745.0  | 23.17      | 207.5 |
|        |          | 16QAM | 100/0      | 1720.0  | 20.92      | 123.6 |
|        |          |       | 100/0      | 1732.5  | 21.82      | 152.1 |
|        |          |       | 100/0      | 1745.0  | 21.20      | 131.8 |
|        | 15       | QPSK  | 75/0       | 1717.5  | 22.87      | 193.6 |
|        |          |       | 75/0       | 1732.5  | 22.58      | 181.1 |
|        |          |       | 75/0       | 1747.5  | 23.42      | 219.8 |
|        |          | 16QAM | 75/0       | 1717.5  | 21.65      | 146.2 |
|        |          |       | 75/0       | 1732.5  | 21.86      | 153.5 |
|        |          |       | 75/0       | 1747.5  | 22.56      | 180.3 |
|        | 10       | QPSK  | 50/0       | 1715.0  | 22.73      | 187.5 |
|        |          |       | 50/0       | 1732.5  | 23.21      | 209.4 |
|        |          |       | 50/0       | 1750.0  | 23.30      | 213.8 |
|        |          | 16QAM | 50/0       | 1715.0  | 21.34      | 136.1 |
|        |          |       | 50/0       | 1732.5  | 22.13      | 163.3 |
|        |          |       | 50/0       | 1750.0  | 22.00      | 158.5 |
|        | 5        | QPSK  | 25/0       | 1712.5  | 21.91      | 155.2 |
|        |          |       | 25/0       | 1732.5  | 22.01      | 158.9 |
|        |          |       | 25/0       | 1752.5  | 22.72      | 187.1 |
|        |          | 16QAM | 25/0       | 1712.5  | 21.27      | 134.0 |
|        |          |       | 25/0       | 1732.5  | 21.57      | 143.5 |
|        |          |       | 25/0       | 1752.5  | 22.47      | 176.6 |
|        | 3        | QPSK  | 15/0       | 1711.5  | 22.80      | 190.5 |
|        |          |       | 15/0       | 1732.5  | 21.97      | 157.4 |
|        |          |       | 15/0       | 1753.5  | 22.60      | 182.0 |
|        |          | 16QAM | 15/0       | 1711.5  | 20.77      | 119.4 |
|        |          |       | 15/0       | 1732.5  | 20.74      | 118.6 |
|        |          |       | 15/0       | 1753.5  | 21.61      | 144.9 |
|        | 1.4      | QPSK  | 6/0        | 1710.7  | 20.85      | 121.6 |
|        |          |       | 6/0        | 1732.5  | 20.62      | 115.3 |
|        |          |       | 6/0        | 1754.3  | 21.20      | 131.8 |
|        |          | 16QAM | 6/0        | 1710.7  | 19.48      | 88.7  |
|        |          |       | 6/0        | 1732.5  | 19.47      | 88.5  |
|        |          |       | 6/0        | 1754.3  | 19.13      | 81.8  |

**LTE Band 2**

| Band   | BW [MHz] | Mode  | RB/RB Size | f [MHz] | ERP / EIRP |       |
|--------|----------|-------|------------|---------|------------|-------|
|        |          |       | Full RB    |         | [dBm]      | [mW]  |
| Band 2 | 20       | QPSK  | 100/0      | 1860.0  | 22.59      | 181.5 |
|        |          |       | 100/0      | 1880.0  | 22.35      | 171.8 |
|        |          |       | 100/0      | 1900.0  | 21.55      | 143.0 |
|        |          | 16QAM | 100/0      | 1860.0  | 21.18      | 131.2 |
|        |          |       | 100/0      | 1880.0  | 21.17      | 130.9 |
|        |          |       | 100/0      | 1900.0  | 20.42      | 110.2 |
|        | 15       | QPSK  | 75/0       | 1857.5  | 23.34      | 215.7 |
|        |          |       | 75/0       | 1880.0  | 21.65      | 146.2 |
|        |          |       | 75/0       | 1902.5  | 20.32      | 107.7 |
|        |          | 16QAM | 75/0       | 1857.5  | 22.12      | 162.9 |
|        |          |       | 75/0       | 1880.0  | 20.86      | 121.9 |
|        |          |       | 75/0       | 1902.5  | 19.46      | 88.4  |
|        | 10       | QPSK  | 50/0       | 1955.0  | 22.87      | 193.6 |
|        |          |       | 50/0       | 1880.0  | 22.07      | 161.1 |
|        |          |       | 50/0       | 1905.0  | 21.06      | 127.7 |
|        |          | 16QAM | 50/0       | 1955.0  | 21.44      | 139.3 |
|        |          |       | 50/0       | 1880.0  | 20.90      | 123.0 |
|        |          |       | 50/0       | 1905.0  | 19.58      | 90.8  |
|        | 5        | QPSK  | 25/0       | 1852.5  | 22.22      | 166.6 |
|        |          |       | 25/0       | 1880.0  | 20.58      | 114.3 |
|        |          |       | 25/0       | 1907.5  | 21.19      | 131.6 |
|        |          | 16QAM | 25/0       | 1852.5  | 21.10      | 128.8 |
|        |          |       | 25/0       | 1880.0  | 18.57      | 71.9  |
|        |          |       | 25/0       | 1907.5  | 19.17      | 82.7  |
|        | 3        | QPSK  | 15/0       | 1815.5  | 20.97      | 125.0 |
|        |          |       | 15/0       | 1880.0  | 20.63      | 115.6 |
|        |          |       | 15/0       | 1908.5  | 20.40      | 109.7 |
|        |          | 16QAM | 15/0       | 1815.5  | 18.81      | 76.0  |
|        |          |       | 15/0       | 1880.0  | 19.08      | 80.9  |
|        |          |       | 15/0       | 1908.5  | 19.29      | 85.0  |
|        | 1.4      | QPSK  | 6/0        | 1850.7  | 22.07      | 161.0 |
|        |          |       | 6/0        | 1880.0  | 19.58      | 90.8  |
|        |          |       | 6/0        | 1909.3  | 20.17      | 104.1 |
|        |          | 16QAM | 6/0        | 1850.7  | 18.30      | 67.6  |
|        |          |       | 6/0        | 1880.0  | 18.13      | 65.0  |
|        |          |       | 6/0        | 1909.3  | 18.81      | 76.1  |

## 11.1.2. ERP/EIRP DATA

### GSM 850

| GSM<br><br>GSM850<br>GPRS  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Y Position<br/>Mode: GPRS 850 MHz</div> <div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div> <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>824.20</td><td>31.23</td><td>V</td><td>1.1</td><td>-1.6</td><td>28.61</td><td>38.5</td><td>-9.8</td><td></td></tr><tr><td>824.20</td><td>20.55</td><td>H</td><td>1.1</td><td>-1.6</td><td>17.93</td><td>38.5</td><td>-20.5</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>836.60</td><td>32.12</td><td>V</td><td>1.1</td><td>-1.4</td><td>29.63</td><td>38.5</td><td>-8.8</td><td></td></tr><tr><td>836.60</td><td>24.59</td><td>H</td><td>1.1</td><td>-1.4</td><td>22.10</td><td>38.5</td><td>-16.4</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>848.80</td><td>31.04</td><td>V</td><td>1.1</td><td>-1.3</td><td>28.68</td><td>38.5</td><td>-9.8</td><td></td></tr><tr><td>848.80</td><td>24.55</td><td>H</td><td>1.1</td><td>-1.3</td><td>22.19</td><td>38.5</td><td>-16.3</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div>    |                  |                 |                 |                    |           |             |             |       | f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 824.20 | 31.23 | V | 1.1 | -1.6 | 28.61 | 38.5 | -9.8  |  | 824.20 | 20.55 | H | 1.1 | -1.6 | 17.93 | 38.5 | -20.5 |  | Mid Ch |  |  |  |  |  |  |  |  | 836.60 | 32.12 | V | 1.1 | -1.4 | 29.63 | 38.5 | -8.8  |  | 836.60 | 24.59 | H | 1.1 | -1.4 | 22.10 | 38.5 | -16.4 |  | High Ch |  |  |  |  |  |  |  |  | 848.80 | 31.04 | V | 1.1 | -1.3 | 28.68 | 38.5 | -9.8  |  | 848.80 | 24.55 | H | 1.1 | -1.3 | 22.19 | 38.5 | -16.3 |  |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|-----------------|--------------------|-----------|-------------|-------------|-------|-------|------------------|-----------------|-----------------|--------------------|-----------|-------------|-------------|-------|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|-------|------|-------|--|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|-------|------|-------|--|---------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|-------|------|-------|--|
|                            | f MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 824.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 31.23            | V               | 1.1             | -1.6               | 28.61     | 38.5        | -9.8        |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 824.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20.55            | H               | 1.1             | -1.6               | 17.93     | 38.5        | -20.5       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 836.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 32.12            | V               | 1.1             | -1.4               | 29.63     | 38.5        | -8.8        |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 836.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 24.59            | H               | 1.1             | -1.4               | 22.10     | 38.5        | -16.4       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 848.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 31.04            | V               | 1.1             | -1.3               | 28.68     | 38.5        | -9.8        |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 848.80                     | 24.55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                | 1.1             | -1.3            | 22.19              | 38.5      | -16.3       |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| GSM<br><br>GSM850<br>EGPRS | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Y Position<br/>Mode: GPRS 850 MHz</div> <div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div> <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>824.20</td><td>26.44</td><td>V</td><td>1.1</td><td>-1.6</td><td>23.82</td><td>38.5</td><td>-14.6</td><td></td></tr><tr><td>824.20</td><td>17.92</td><td>H</td><td>1.1</td><td>-1.6</td><td>15.30</td><td>38.5</td><td>-23.2</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>836.60</td><td>26.07</td><td>V</td><td>1.1</td><td>-1.4</td><td>23.58</td><td>38.5</td><td>-14.9</td><td></td></tr><tr><td>836.60</td><td>19.26</td><td>H</td><td>1.1</td><td>-1.4</td><td>16.77</td><td>38.5</td><td>-21.7</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>848.80</td><td>24.79</td><td>V</td><td>1.1</td><td>-1.3</td><td>22.43</td><td>38.5</td><td>-16.0</td><td></td></tr><tr><td>848.80</td><td>19.44</td><td>H</td><td>1.1</td><td>-1.3</td><td>17.08</td><td>38.5</td><td>-21.4</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div> |                  |                 |                 |                    |           |             |             |       | f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 824.20 | 26.44 | V | 1.1 | -1.6 | 23.82 | 38.5 | -14.6 |  | 824.20 | 17.92 | H | 1.1 | -1.6 | 15.30 | 38.5 | -23.2 |  | Mid Ch |  |  |  |  |  |  |  |  | 836.60 | 26.07 | V | 1.1 | -1.4 | 23.58 | 38.5 | -14.9 |  | 836.60 | 19.26 | H | 1.1 | -1.4 | 16.77 | 38.5 | -21.7 |  | High Ch |  |  |  |  |  |  |  |  | 848.80 | 24.79 | V | 1.1 | -1.3 | 22.43 | 38.5 | -16.0 |  | 848.80 | 19.44 | H | 1.1 | -1.3 | 17.08 | 38.5 | -21.4 |  |
|                            | f MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 824.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 26.44            | V               | 1.1             | -1.6               | 23.82     | 38.5        | -14.6       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 824.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 17.92            | H               | 1.1             | -1.6               | 15.30     | 38.5        | -23.2       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 836.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 26.07            | V               | 1.1             | -1.4               | 23.58     | 38.5        | -14.9       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 836.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 19.26            | H               | 1.1             | -1.4               | 16.77     | 38.5        | -21.7       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
|                            | 848.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 24.79            | V               | 1.1             | -1.3               | 22.43     | 38.5        | -16.0       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 848.80                     | 19.44                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                | 1.1             | -1.3            | 17.08              | 38.5      | -21.4       |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |

**GSM 1900**

| GSM<br><br>GSM1900<br>GPRS  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Z Position<br/>Mode: GPRS 1900MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>GHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Delta<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1850.20</td><td>20.4</td><td>V</td><td>1.60</td><td>9.12</td><td>27.93</td><td>33.0</td><td>-5.1</td></tr><tr><td>1850.20</td><td>24.4</td><td>H</td><td>1.60</td><td>9.12</td><td>31.95</td><td>33.0</td><td>-1.1</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>18.3</td><td>V</td><td>1.62</td><td>8.98</td><td>25.68</td><td>33.0</td><td>-7.3</td></tr><tr><td>1880.00</td><td>24.6</td><td>H</td><td>1.62</td><td>8.98</td><td>31.95</td><td>33.0</td><td>-1.1</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1909.80</td><td>17.5</td><td>V</td><td>1.63</td><td>8.83</td><td>24.73</td><td>33.0</td><td>-8.3</td></tr><tr><td>1909.80</td><td>24.6</td><td>H</td><td>1.63</td><td>8.83</td><td>31.82</td><td>33.0</td><td>-1.2</td></tr></table> <div>Rev. 3.17.11</div>  |                     |                    |                    |                       |               |                |               |       | f<br>GHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1850.20 | 20.4 | V | 1.60 | 9.12 | 27.93 | 33.0 | -5.1 | 1850.20 | 24.4 | H | 1.60 | 9.12 | 31.95 | 33.0 | -1.1 | Mid Ch |  |  |  |  |  |  |  | 1880.00 | 18.3 | V | 1.62 | 8.98 | 25.68 | 33.0 | -7.3 | 1880.00 | 24.6 | H | 1.62 | 8.98 | 31.95 | 33.0 | -1.1 | High Ch |  |  |  |  |  |  |  | 1909.80 | 17.5 | V | 1.63 | 8.83 | 24.73 | 33.0 | -8.3 | 1909.80 | 24.6 | H | 1.63 | 8.83 | 31.82 | 33.0 | -1.2 |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|---------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|---------------|-------|--------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|---------|------|---|------|------|-------|------|------|--------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|---------|------|---|------|------|-------|------|------|---------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|---------|------|---|------|------|-------|------|------|
|                             | f<br>GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                    |                    |                       |               |                |               |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1850.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 20.4                | V                  | 1.60               | 9.12                  | 27.93         | 33.0           | -5.1          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1850.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 24.4                | H                  | 1.60               | 9.12                  | 31.95         | 33.0           | -1.1          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                    |                    |                       |               |                |               |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 18.3                | V                  | 1.62               | 8.98                  | 25.68         | 33.0           | -7.3          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 24.6                | H                  | 1.62               | 8.98                  | 31.95         | 33.0           | -1.1          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                    |                    |                       |               |                |               |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1909.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 17.5                | V                  | 1.63               | 8.83                  | 24.73         | 33.0           | -8.3          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
| 1909.80                     | 24.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 1.63               | 8.83               | 31.82                 | 33.0          | -1.2           |               |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
| GSM<br><br>GSM1900<br>EGPRS | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Z Position<br/>Mode: EGPRS 1900MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>GHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Delta<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1850.20</td><td>18.8</td><td>V</td><td>1.60</td><td>9.12</td><td>26.32</td><td>33.0</td><td>-6.7</td></tr><tr><td>1850.20</td><td>22.3</td><td>H</td><td>1.60</td><td>9.12</td><td>29.82</td><td>33.0</td><td>-3.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>18.7</td><td>V</td><td>1.62</td><td>8.98</td><td>26.04</td><td>33.0</td><td>-7.0</td></tr><tr><td>1880.00</td><td>22.5</td><td>H</td><td>1.62</td><td>8.98</td><td>29.87</td><td>33.0</td><td>-3.1</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1909.80</td><td>18.5</td><td>V</td><td>1.63</td><td>8.83</td><td>25.70</td><td>33.0</td><td>-7.3</td></tr><tr><td>1909.80</td><td>22.4</td><td>H</td><td>1.63</td><td>8.83</td><td>29.63</td><td>33.0</td><td>-3.4</td></tr></table> <div>Rev. 3.17.11</div> |                     |                    |                    |                       |               |                |               |       | f<br>GHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1850.20 | 18.8 | V | 1.60 | 9.12 | 26.32 | 33.0 | -6.7 | 1850.20 | 22.3 | H | 1.60 | 9.12 | 29.82 | 33.0 | -3.2 | Mid Ch |  |  |  |  |  |  |  | 1880.00 | 18.7 | V | 1.62 | 8.98 | 26.04 | 33.0 | -7.0 | 1880.00 | 22.5 | H | 1.62 | 8.98 | 29.87 | 33.0 | -3.1 | High Ch |  |  |  |  |  |  |  | 1909.80 | 18.5 | V | 1.63 | 8.83 | 25.70 | 33.0 | -7.3 | 1909.80 | 22.4 | H | 1.63 | 8.83 | 29.63 | 33.0 | -3.4 |
|                             | f<br>GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                    |                    |                       |               |                |               |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1850.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 18.8                | V                  | 1.60               | 9.12                  | 26.32         | 33.0           | -6.7          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1850.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 22.3                | H                  | 1.60               | 9.12                  | 29.82         | 33.0           | -3.2          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                    |                    |                       |               |                |               |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 18.7                | V                  | 1.62               | 8.98                  | 26.04         | 33.0           | -7.0          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 22.5                | H                  | 1.62               | 8.98                  | 29.87         | 33.0           | -3.1          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                    |                    |                       |               |                |               |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
|                             | 1909.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 18.5                | V                  | 1.63               | 8.83                  | 25.70         | 33.0           | -7.3          |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |
| 1909.80                     | 22.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 1.63               | 8.83               | 29.63                 | 33.0          | -3.4           |               |       |          |                     |                    |                    |                       |               |                |               |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |         |      |   |      |      |       |      |      |

**WCDMA Band 5**

| WCDMA<br>Band 5<br>REL99 | <p align="center"><b>High Frequency Substitution Measurement</b><br/><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b></p> <p> <b>Company:</b> Samsung<br/> <b>Project #:</b> 15K20515<br/> <b>Date:</b> 04-23-15<br/> <b>Test Engineer:</b> Steven.Kim<br/> <b>Configuration:</b> EUT ONLY, Y Position<br/> <b>Mode:</b> Rel 99_850 MHz </p> <p><u><b>Test Equipment:</b></u><br/> Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/> Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse. </p> <table> <tr> <th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBd)</th><th>ERP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr> <tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>826.40</td><td>20.60</td><td>V</td><td>1.1</td><td>-1.5</td><td>17.99</td><td>38.5</td><td>-20.5</td><td></td></tr> <tr><td>826.40</td><td>13.75</td><td>H</td><td>1.1</td><td>-1.5</td><td>11.14</td><td>38.5</td><td>-27.3</td><td></td></tr> <tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>836.60</td><td>21.03</td><td>V</td><td>1.1</td><td>-1.4</td><td>18.54</td><td>38.5</td><td>-19.9</td><td></td></tr> <tr><td>836.60</td><td>14.86</td><td>H</td><td>1.1</td><td>-1.4</td><td>12.37</td><td>38.5</td><td>-26.1</td><td></td></tr> <tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>846.60</td><td>20.31</td><td>V</td><td>1.1</td><td>-1.3</td><td>17.93</td><td>38.5</td><td>-20.5</td><td></td></tr> <tr><td>846.60</td><td>15.22</td><td>H</td><td>1.1</td><td>-1.3</td><td>12.84</td><td>38.5</td><td>-25.6</td><td></td></tr> </table> <p>Rev. 3.17.11</p> |                    |                    |                       |              |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 826.40 | 20.60 | V | 1.1 | -1.5 | 17.99 | 38.5 | -20.5 |  | 826.40 | 13.75 | H | 1.1 | -1.5 | 11.14 | 38.5 | -27.3 |  | Mid Ch |  |  |  |  |  |  |  |  | 836.60 | 21.03 | V | 1.1 | -1.4 | 18.54 | 38.5 | -19.9 |  | 836.60 | 14.86 | H | 1.1 | -1.4 | 12.37 | 38.5 | -26.1 |  | High Ch |  |  |  |  |  |  |  |  | 846.60 | 20.31 | V | 1.1 | -1.3 | 17.93 | 38.5 | -20.5 |  | 846.60 | 15.22 | H | 1.1 | -1.3 | 12.84 | 38.5 | -25.6 |  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|-----------------------|--------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|--------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|-------|------|-------|--|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|-------|------|-------|--|---------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|-------|------|-------|--|
| f<br>MHz                 | SG reading<br>(dBm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| Low Ch                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 826.40                   | 20.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | V                  | 1.1                | -1.5                  | 17.99        | 38.5           | -20.5          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 826.40                   | 13.75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H                  | 1.1                | -1.5                  | 11.14        | 38.5           | -27.3          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| Mid Ch                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 836.60                   | 21.03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | V                  | 1.1                | -1.4                  | 18.54        | 38.5           | -19.9          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 836.60                   | 14.86                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H                  | 1.1                | -1.4                  | 12.37        | 38.5           | -26.1          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| High Ch                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 846.60                   | 20.31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | V                  | 1.1                | -1.3                  | 17.93        | 38.5           | -20.5          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 846.60                   | 15.22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H                  | 1.1                | -1.3                  | 12.84        | 38.5           | -25.6          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| WCDMA<br>Band 5<br>HSDPA | <p align="center"><b>High Frequency Substitution Measurement</b><br/><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b></p> <p> <b>Company:</b> Samsung<br/> <b>Project #:</b> 15K20515<br/> <b>Date:</b> 04-23-15<br/> <b>Test Engineer:</b> Steven.Kim<br/> <b>Configuration:</b> EUT ONLY, Y Position<br/> <b>Mode:</b> HSDPA_850 MHz </p> <p><u><b>Test Equipment:</b></u><br/> Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/> Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse. </p> <table> <tr> <th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBd)</th><th>ERP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr> <tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>826.40</td><td>21.00</td><td>V</td><td>1.1</td><td>-1.5</td><td>18.39</td><td>38.5</td><td>-20.1</td><td></td></tr> <tr><td>826.40</td><td>15.24</td><td>H</td><td>1.1</td><td>-1.5</td><td>12.63</td><td>38.5</td><td>-25.8</td><td></td></tr> <tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>836.60</td><td>21.48</td><td>V</td><td>1.1</td><td>-1.4</td><td>18.99</td><td>38.5</td><td>-19.5</td><td></td></tr> <tr><td>836.60</td><td>15.08</td><td>H</td><td>1.1</td><td>-1.4</td><td>12.59</td><td>38.5</td><td>-25.9</td><td></td></tr> <tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>846.60</td><td>20.89</td><td>V</td><td>1.1</td><td>-1.3</td><td>18.51</td><td>38.5</td><td>-19.9</td><td></td></tr> <tr><td>846.60</td><td>16.31</td><td>H</td><td>1.1</td><td>-1.3</td><td>13.93</td><td>38.5</td><td>-24.5</td><td></td></tr> </table> <p>Rev. 3.17.11</p>  |                    |                    |                       |              |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 826.40 | 21.00 | V | 1.1 | -1.5 | 18.39 | 38.5 | -20.1 |  | 826.40 | 15.24 | H | 1.1 | -1.5 | 12.63 | 38.5 | -25.8 |  | Mid Ch |  |  |  |  |  |  |  |  | 836.60 | 21.48 | V | 1.1 | -1.4 | 18.99 | 38.5 | -19.5 |  | 836.60 | 15.08 | H | 1.1 | -1.4 | 12.59 | 38.5 | -25.9 |  | High Ch |  |  |  |  |  |  |  |  | 846.60 | 20.89 | V | 1.1 | -1.3 | 18.51 | 38.5 | -19.9 |  | 846.60 | 16.31 | H | 1.1 | -1.3 | 13.93 | 38.5 | -24.5 |  |
| f<br>MHz                 | SG reading<br>(dBm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| Low Ch                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 826.40                   | 21.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | V                  | 1.1                | -1.5                  | 18.39        | 38.5           | -20.1          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 826.40                   | 15.24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H                  | 1.1                | -1.5                  | 12.63        | 38.5           | -25.8          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| Mid Ch                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 836.60                   | 21.48                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | V                  | 1.1                | -1.4                  | 18.99        | 38.5           | -19.5          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 836.60                   | 15.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H                  | 1.1                | -1.4                  | 12.59        | 38.5           | -25.9          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| High Ch                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 846.60                   | 20.89                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | V                  | 1.1                | -1.3                  | 18.51        | 38.5           | -19.9          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |
| 846.60                   | 16.31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H                  | 1.1                | -1.3                  | 13.93        | 38.5           | -24.5          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |

**WCDMA Band 2**

| WCDMA<br><br>Band 2<br>REL99 | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Z Position<br/>Mode: REL99_1900 MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1852.40</td><td>13.46</td><td>V</td><td>1.60</td><td>9.12</td><td>20.98</td><td>33.0</td><td>-12.0</td><td></td></tr><tr><td>1852.40</td><td>16.03</td><td>H</td><td>1.60</td><td>9.12</td><td>23.55</td><td>33.0</td><td>-9.5</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>12.11</td><td>V</td><td>1.62</td><td>8.98</td><td>19.47</td><td>33.0</td><td>-13.5</td><td></td></tr><tr><td>1880.00</td><td>16.41</td><td>H</td><td>1.62</td><td>8.98</td><td>23.77</td><td>33.0</td><td>-9.2</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1907.60</td><td>11.05</td><td>V</td><td>1.63</td><td>8.83</td><td>18.25</td><td>33.0</td><td>-14.7</td><td></td></tr><tr><td>1907.60</td><td>16.41</td><td>H</td><td>1.63</td><td>8.83</td><td>23.61</td><td>33.0</td><td>-9.4</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>   |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1852.40 | 13.46 | V | 1.60 | 9.12 | 20.98 | 33.0 | -12.0 |  | 1852.40 | 16.03 | H | 1.60 | 9.12 | 23.55 | 33.0 | -9.5  |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 12.11 | V | 1.62 | 8.98 | 19.47 | 33.0 | -13.5 |  | 1880.00 | 16.41 | H | 1.62 | 8.98 | 23.77 | 33.0 | -9.2 |  | High Ch |  |  |  |  |  |  |  |  | 1907.60 | 11.05 | V | 1.63 | 8.83 | 18.25 | 33.0 | -14.7 |  | 1907.60 | 16.41 | H | 1.63 | 8.83 | 23.61 | 33.0 | -9.4  |  |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|---------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|
|                              | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1852.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13.46               | V                  | 1.60               | 9.12                  | 20.98         | 33.0           | -12.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1852.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 16.03               | H                  | 1.60               | 9.12                  | 23.55         | 33.0           | -9.5           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 12.11               | V                  | 1.62               | 8.98                  | 19.47         | 33.0           | -13.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 16.41               | H                  | 1.62               | 8.98                  | 23.77         | 33.0           | -9.2           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1907.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11.05               | V                  | 1.63               | 8.83                  | 18.25         | 33.0           | -14.7          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1907.60                      | 16.41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | H                   | 1.63               | 8.83               | 23.61                 | 33.0          | -9.4           |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| WCDMA<br><br>Band 2<br>HSDPA | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Z Position<br/>Mode: HSDPA_1900 MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1852.40</td><td>13.37</td><td>V</td><td>1.60</td><td>9.12</td><td>20.89</td><td>33.0</td><td>-12.1</td><td></td></tr><tr><td>1852.40</td><td>14.92</td><td>H</td><td>1.60</td><td>9.12</td><td>22.44</td><td>33.0</td><td>-10.6</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>13.26</td><td>V</td><td>1.62</td><td>8.98</td><td>20.62</td><td>33.0</td><td>-12.4</td><td></td></tr><tr><td>1880.00</td><td>15.73</td><td>H</td><td>1.62</td><td>8.98</td><td>23.09</td><td>33.0</td><td>-9.9</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1907.60</td><td>10.37</td><td>V</td><td>1.63</td><td>8.83</td><td>17.57</td><td>33.0</td><td>-15.4</td><td></td></tr><tr><td>1907.60</td><td>14.70</td><td>H</td><td>1.63</td><td>8.83</td><td>21.90</td><td>33.0</td><td>-11.1</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1852.40 | 13.37 | V | 1.60 | 9.12 | 20.89 | 33.0 | -12.1 |  | 1852.40 | 14.92 | H | 1.60 | 9.12 | 22.44 | 33.0 | -10.6 |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 13.26 | V | 1.62 | 8.98 | 20.62 | 33.0 | -12.4 |  | 1880.00 | 15.73 | H | 1.62 | 8.98 | 23.09 | 33.0 | -9.9 |  | High Ch |  |  |  |  |  |  |  |  | 1907.60 | 10.37 | V | 1.63 | 8.83 | 17.57 | 33.0 | -15.4 |  | 1907.60 | 14.70 | H | 1.63 | 8.83 | 21.90 | 33.0 | -11.1 |  |
|                              | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1852.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13.37               | V                  | 1.60               | 9.12                  | 20.89         | 33.0           | -12.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1852.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 14.92               | H                  | 1.60               | 9.12                  | 22.44         | 33.0           | -10.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13.26               | V                  | 1.62               | 8.98                  | 20.62         | 33.0           | -12.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 15.73               | H                  | 1.62               | 8.98                  | 23.09         | 33.0           | -9.9           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                              | 1907.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10.37               | V                  | 1.63               | 8.83                  | 17.57         | 33.0           | -15.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1907.60                      | 14.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | H                   | 1.63               | 8.83               | 21.90                 | 33.0          | -11.1          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |

**LTE Band 17**

| LTE<br>Band 17<br><br>10MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 17, QPSK, 10MHz</div> <div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBd)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>709.00</td><td>14.11</td><td>V</td><td>1.0</td><td>-1.6</td><td>11.51</td><td>34.8</td><td>-23.3</td><td></td></tr><tr><td>709.00</td><td>11.48</td><td>H</td><td>1.0</td><td>-1.6</td><td>8.88</td><td>34.8</td><td>-25.9</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>710.00</td><td>13.79</td><td>V</td><td>1.0</td><td>-1.6</td><td>11.19</td><td>34.8</td><td>-23.6</td><td></td></tr><tr><td>710.00</td><td>12.19</td><td>H</td><td>1.0</td><td>-1.6</td><td>9.59</td><td>34.8</td><td>-25.2</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>711.00</td><td>14.60</td><td>V</td><td>1.0</td><td>-1.6</td><td>12.00</td><td>34.8</td><td>-22.8</td><td></td></tr><tr><td>711.00</td><td>12.35</td><td>H</td><td>1.0</td><td>-1.6</td><td>9.75</td><td>34.8</td><td>-25.0</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 709.00 | 14.11 | V | 1.0 | -1.6 | 11.51 | 34.8 | -23.3 |  | 709.00 | 11.48 | H | 1.0 | -1.6 | 8.88 | 34.8 | -25.9 |  | Mid Ch |  |  |  |  |  |  |  |  | 710.00 | 13.79 | V | 1.0 | -1.6 | 11.19 | 34.8 | -23.6 |  | 710.00 | 12.19 | H | 1.0 | -1.6 | 9.59 | 34.8 | -25.2 |  | High Ch |  |  |  |  |  |  |  |  | 711.00 | 14.60 | V | 1.0 | -1.6 | 12.00 | 34.8 | -22.8 |  | 711.00 | 12.35 | H | 1.0 | -1.6 | 9.75 | 34.8 | -25.0 |  |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|------|------|-------|--|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|------|------|-------|--|---------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|------|------|-------|--|
|                                          | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 709.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.11               | V                  | 1.0                | -1.6                  | 11.51         | 34.8           | -23.3          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 709.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11.48               | H                  | 1.0                | -1.6                  | 8.88          | 34.8           | -25.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 710.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 13.79               | V                  | 1.0                | -1.6                  | 11.19         | 34.8           | -23.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 710.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12.19               | H                  | 1.0                | -1.6                  | 9.59          | 34.8           | -25.2          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 711.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.60               | V                  | 1.0                | -1.6                  | 12.00         | 34.8           | -22.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| 711.00                                   | 12.35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H                   | 1.0                | -1.6               | 9.75                  | 34.8          | -25.0          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| LTE<br>Band 17<br><br>10MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 17 16QAM, 10MHz</div> <div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBd)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>709.00</td><td>13.49</td><td>V</td><td>1.0</td><td>-1.6</td><td>10.89</td><td>34.8</td><td>-23.9</td><td></td></tr><tr><td>709.00</td><td>10.37</td><td>H</td><td>1.0</td><td>-1.6</td><td>7.77</td><td>34.8</td><td>-27.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>710.00</td><td>13.72</td><td>V</td><td>1.0</td><td>-1.6</td><td>11.12</td><td>34.8</td><td>-23.7</td><td></td></tr><tr><td>710.00</td><td>10.61</td><td>H</td><td>1.0</td><td>-1.6</td><td>8.01</td><td>34.8</td><td>-26.8</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>711.00</td><td>12.79</td><td>V</td><td>1.0</td><td>-1.6</td><td>10.19</td><td>34.8</td><td>-24.6</td><td></td></tr><tr><td>711.00</td><td>10.38</td><td>H</td><td>1.0</td><td>-1.6</td><td>7.78</td><td>34.8</td><td>-27.0</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 709.00 | 13.49 | V | 1.0 | -1.6 | 10.89 | 34.8 | -23.9 |  | 709.00 | 10.37 | H | 1.0 | -1.6 | 7.77 | 34.8 | -27.0 |  | Mid Ch |  |  |  |  |  |  |  |  | 710.00 | 13.72 | V | 1.0 | -1.6 | 11.12 | 34.8 | -23.7 |  | 710.00 | 10.61 | H | 1.0 | -1.6 | 8.01 | 34.8 | -26.8 |  | High Ch |  |  |  |  |  |  |  |  | 711.00 | 12.79 | V | 1.0 | -1.6 | 10.19 | 34.8 | -24.6 |  | 711.00 | 10.38 | H | 1.0 | -1.6 | 7.78 | 34.8 | -27.0 |  |
|                                          | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 709.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 13.49               | V                  | 1.0                | -1.6                  | 10.89         | 34.8           | -23.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 709.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10.37               | H                  | 1.0                | -1.6                  | 7.77          | 34.8           | -27.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 710.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 13.72               | V                  | 1.0                | -1.6                  | 11.12         | 34.8           | -23.7          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 710.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10.61               | H                  | 1.0                | -1.6                  | 8.01          | 34.8           | -26.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                          | 711.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12.79               | V                  | 1.0                | -1.6                  | 10.19         | 34.8           | -24.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| 711.00                                   | 10.38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H                   | 1.0                | -1.6               | 7.78                  | 34.8          | -27.0          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |

| LTE<br>Band 17<br><br>5MHz<br><br>QPSK  | <div><div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div><div><div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 17, QPSK , 5MHz</div><div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div></div><table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBd)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>706.50</td><td>13.07</td><td>V</td><td>1.0</td><td>-1.6</td><td>10.47</td><td>34.8</td><td>-24.3</td></tr><tr><td>706.50</td><td>11.80</td><td>H</td><td>1.0</td><td>-1.6</td><td>9.20</td><td>34.8</td><td>-25.6</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>710.00</td><td>14.23</td><td>V</td><td>1.0</td><td>-1.6</td><td>11.63</td><td>34.8</td><td>-23.1</td></tr><tr><td>710.00</td><td>11.38</td><td>H</td><td>1.0</td><td>-1.6</td><td>8.78</td><td>34.8</td><td>-26.0</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>713.50</td><td>12.00</td><td>V</td><td>1.0</td><td>-1.6</td><td>9.40</td><td>34.8</td><td>-25.4</td></tr><tr><td>713.50</td><td>12.71</td><td>H</td><td>1.0</td><td>-1.6</td><td>10.11</td><td>34.8</td><td>-24.7</td></tr></table><div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div></div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 706.50 | 13.07 | V | 1.0 | -1.6 | 10.47 | 34.8 | -24.3 | 706.50 | 11.80 | H | 1.0 | -1.6 | 9.20 | 34.8 | -25.6 | Mid Ch |  |  |  |  |  |  |  | 710.00 | 14.23 | V | 1.0 | -1.6 | 11.63 | 34.8 | -23.1 | 710.00 | 11.38 | H | 1.0 | -1.6 | 8.78 | 34.8 | -26.0 | High Ch |  |  |  |  |  |  |  | 713.50 | 12.00 | V | 1.0 | -1.6 | 9.40  | 34.8 | -25.4 | 713.50 | 12.71 | H | 1.0 | -1.6 | 10.11 | 34.8 | -24.7 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--------|-------|---|-----|------|------|------|-------|--------|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--------|-------|---|-----|------|------|------|-------|---------|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--------|-------|---|-----|------|-------|------|-------|
|                                         | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 706.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13.07               | V                  | 1.0                | -1.6                  | 10.47         | 34.8           | -24.3          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 706.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11.80               | H                  | 1.0                | -1.6                  | 9.20          | 34.8           | -25.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 710.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 14.23               | V                  | 1.0                | -1.6                  | 11.63         | 34.8           | -23.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 710.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11.38               | H                  | 1.0                | -1.6                  | 8.78          | 34.8           | -26.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 713.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 12.00               | V                  | 1.0                | -1.6                  | 9.40          | 34.8           | -25.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
| 713.50                                  | 12.71                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | H                   | 1.0                | -1.6               | 10.11                 | 34.8          | -24.7          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
| LTE<br>Band 17<br><br>5MHz<br><br>16QAM | <div><div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div><div><div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 17 16QAM, 5MHz</div><div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div></div><table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBd)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>706.50</td><td>12.67</td><td>V</td><td>1.0</td><td>-1.6</td><td>10.07</td><td>34.8</td><td>-24.7</td></tr><tr><td>706.50</td><td>10.84</td><td>H</td><td>1.0</td><td>-1.6</td><td>8.24</td><td>34.8</td><td>-26.5</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>710.00</td><td>10.71</td><td>V</td><td>1.0</td><td>-1.6</td><td>8.11</td><td>34.8</td><td>-26.7</td></tr><tr><td>710.00</td><td>10.34</td><td>H</td><td>1.0</td><td>-1.6</td><td>7.74</td><td>34.8</td><td>-27.0</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>713.50</td><td>13.78</td><td>V</td><td>1.0</td><td>-1.6</td><td>11.18</td><td>34.8</td><td>-23.6</td></tr><tr><td>713.50</td><td>10.91</td><td>H</td><td>1.0</td><td>-1.6</td><td>8.31</td><td>34.8</td><td>-26.5</td></tr></table><div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div></div>   |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 706.50 | 12.67 | V | 1.0 | -1.6 | 10.07 | 34.8 | -24.7 | 706.50 | 10.84 | H | 1.0 | -1.6 | 8.24 | 34.8 | -26.5 | Mid Ch |  |  |  |  |  |  |  | 710.00 | 10.71 | V | 1.0 | -1.6 | 8.11  | 34.8 | -26.7 | 710.00 | 10.34 | H | 1.0 | -1.6 | 7.74 | 34.8 | -27.0 | High Ch |  |  |  |  |  |  |  | 713.50 | 13.78 | V | 1.0 | -1.6 | 11.18 | 34.8 | -23.6 | 713.50 | 10.91 | H | 1.0 | -1.6 | 8.31  | 34.8 | -26.5 |
|                                         | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 706.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 12.67               | V                  | 1.0                | -1.6                  | 10.07         | 34.8           | -24.7          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 706.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10.84               | H                  | 1.0                | -1.6                  | 8.24          | 34.8           | -26.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 710.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10.71               | V                  | 1.0                | -1.6                  | 8.11          | 34.8           | -26.7          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 710.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10.34               | H                  | 1.0                | -1.6                  | 7.74          | 34.8           | -27.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
|                                         | 713.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13.78               | V                  | 1.0                | -1.6                  | 11.18         | 34.8           | -23.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |
| 713.50                                  | 10.91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | H                   | 1.0                | -1.6               | 8.31                  | 34.8          | -26.5          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |        |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |      |      |       |         |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |        |       |   |     |      |       |      |       |

**LTE Band 5**

| LTE<br><br>Band 5<br><br>10MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Y Position<br/>Mode: TX, LTE BAND 5, 10MHz BW,QPSK</div> <div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBd)</th><th>ERP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>829.00</td><td>18.39</td><td>V</td><td>1.1</td><td>-1.5</td><td>15.81</td><td>38.5</td><td>-22.6</td><td></td></tr><tr><td>829.00</td><td>12.83</td><td>H</td><td>1.1</td><td>-1.5</td><td>10.25</td><td>38.5</td><td>-28.2</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>836.50</td><td>18.13</td><td>V</td><td>1.1</td><td>-1.4</td><td>15.64</td><td>38.5</td><td>-22.8</td><td></td></tr><tr><td>836.50</td><td>12.99</td><td>H</td><td>1.1</td><td>-1.4</td><td>10.50</td><td>38.5</td><td>-28.0</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>844.00</td><td>18.41</td><td>V</td><td>1.1</td><td>-1.3</td><td>16.02</td><td>38.5</td><td>-22.4</td><td></td></tr><tr><td>844.00</td><td>12.04</td><td>H</td><td>1.1</td><td>-1.3</td><td>9.62</td><td>38.5</td><td>-28.8</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div> |                     |                    |                    |                       |              |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 829.00 | 18.39 | V | 1.1 | -1.5 | 15.81 | 38.5 | -22.6 |  | 829.00 | 12.83 | H | 1.1 | -1.5 | 10.25 | 38.5 | -28.2 |  | Mid Ch |  |  |  |  |  |  |  |  | 836.50 | 18.13 | V | 1.1 | -1.4 | 15.64 | 38.5 | -22.8 |  | 836.50 | 12.99 | H | 1.1 | -1.4 | 10.50 | 38.5 | -28.0 |  | High Ch |  |  |  |  |  |  |  |  | 844.00 | 18.41 | V | 1.1 | -1.3 | 16.02 | 38.5 | -22.4 |  | 844.00 | 12.04 | H | 1.1 | -1.3 | 9.62 | 38.5 | -28.8 |  |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|--------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|--------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|-------|------|-------|--|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|-------|------|-------|--|---------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|------|------|-------|--|
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 829.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 18.39               | V                  | 1.1                | -1.5                  | 15.81        | 38.5           | -22.6          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 829.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 12.83               | H                  | 1.1                | -1.5                  | 10.25        | 38.5           | -28.2          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 836.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 18.13               | V                  | 1.1                | -1.4                  | 15.64        | 38.5           | -22.8          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 836.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 12.99               | H                  | 1.1                | -1.4                  | 10.50        | 38.5           | -28.0          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 844.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 18.41               | V                  | 1.1                | -1.3                  | 16.02        | 38.5           | -22.4          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| 844.00                                      | 12.04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                   | 1.1                | -1.3               | 9.62                  | 38.5         | -28.8          |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| LTE<br><br>Band 5<br><br>10MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Y Position<br/>Mode: LTE5 10MHz FUND 16QAM</div> <div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBd)</th><th>ERP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>829.00</td><td>16.65</td><td>V</td><td>1.1</td><td>-1.5</td><td>14.07</td><td>38.5</td><td>-24.4</td><td></td></tr><tr><td>829.00</td><td>11.49</td><td>H</td><td>1.1</td><td>-1.5</td><td>8.91</td><td>38.5</td><td>-29.5</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>836.50</td><td>17.02</td><td>V</td><td>1.1</td><td>-1.4</td><td>14.51</td><td>38.5</td><td>-23.9</td><td></td></tr><tr><td>836.50</td><td>11.78</td><td>H</td><td>1.1</td><td>-1.4</td><td>9.27</td><td>38.5</td><td>-29.2</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>844.00</td><td>17.34</td><td>V</td><td>1.1</td><td>-1.3</td><td>14.92</td><td>38.5</td><td>-23.5</td><td></td></tr><tr><td>844.00</td><td>10.68</td><td>H</td><td>1.1</td><td>-1.3</td><td>8.26</td><td>38.5</td><td>-30.2</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div>           |                     |                    |                    |                       |              |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 829.00 | 16.65 | V | 1.1 | -1.5 | 14.07 | 38.5 | -24.4 |  | 829.00 | 11.49 | H | 1.1 | -1.5 | 8.91  | 38.5 | -29.5 |  | Mid Ch |  |  |  |  |  |  |  |  | 836.50 | 17.02 | V | 1.1 | -1.4 | 14.51 | 38.5 | -23.9 |  | 836.50 | 11.78 | H | 1.1 | -1.4 | 9.27  | 38.5 | -29.2 |  | High Ch |  |  |  |  |  |  |  |  | 844.00 | 17.34 | V | 1.1 | -1.3 | 14.92 | 38.5 | -23.5 |  | 844.00 | 10.68 | H | 1.1 | -1.3 | 8.26 | 38.5 | -30.2 |  |
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 829.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 16.65               | V                  | 1.1                | -1.5                  | 14.07        | 38.5           | -24.4          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 829.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 11.49               | H                  | 1.1                | -1.5                  | 8.91         | 38.5           | -29.5          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 836.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 17.02               | V                  | 1.1                | -1.4                  | 14.51        | 38.5           | -23.9          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 836.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 11.78               | H                  | 1.1                | -1.4                  | 9.27         | 38.5           | -29.2          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |              |                |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                             | 844.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 17.34               | V                  | 1.1                | -1.3                  | 14.92        | 38.5           | -23.5          |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| 844.00                                      | 10.68                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                   | 1.1                | -1.3               | 8.26                  | 38.5         | -30.2          |                |       |          |                     |                    |                    |                       |              |                |                |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |       |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |

| LTE<br><br>Band 5<br><br>5MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Y Position<br/>Mode: LTE5 5MHz FUND QPSK</div> <div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div> <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>826.50</td><td>16.80</td><td>V</td><td>1.1</td><td>-1.5</td><td>14.20</td><td>38.5</td><td>-24.3</td><td></td></tr><tr><td>826.50</td><td>12.08</td><td>H</td><td>1.1</td><td>-1.5</td><td>9.48</td><td>38.5</td><td>-29.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>836.50</td><td>18.31</td><td>V</td><td>1.1</td><td>-1.4</td><td>15.82</td><td>38.5</td><td>-22.6</td><td></td></tr><tr><td>836.50</td><td>11.60</td><td>H</td><td>1.1</td><td>-1.4</td><td>9.11</td><td>38.5</td><td>-29.3</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>846.50</td><td>18.16</td><td>V</td><td>1.6</td><td>-1.3</td><td>15.28</td><td>38.5</td><td>-23.2</td><td></td></tr><tr><td>846.50</td><td>11.48</td><td>H</td><td>1.6</td><td>-1.3</td><td>8.60</td><td>38.5</td><td>-29.8</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div>  |                  |                 |                 |                    |           |             |             |       | f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 826.50 | 16.80 | V | 1.1 | -1.5 | 14.20 | 38.5 | -24.3 |  | 826.50 | 12.08 | H | 1.1 | -1.5 | 9.48 | 38.5 | -29.0 |  | Mid Ch |  |  |  |  |  |  |  |  | 836.50 | 18.31 | V | 1.1 | -1.4 | 15.82 | 38.5 | -22.6 |  | 836.50 | 11.60 | H | 1.1 | -1.4 | 9.11 | 38.5 | -29.3 |  | High Ch |  |  |  |  |  |  |  |  | 846.50 | 18.16 | V | 1.6 | -1.3 | 15.28 | 38.5 | -23.2 |  | 846.50 | 11.48 | H | 1.6 | -1.3 | 8.60 | 38.5 | -29.8 |  |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|-----------------|--------------------|-----------|-------------|-------------|-------|-------|------------------|-----------------|-----------------|--------------------|-----------|-------------|-------------|-------|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|------|------|-------|--|--------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|------|------|-------|--|---------|--|--|--|--|--|--|--|--|--------|-------|---|-----|------|-------|------|-------|--|--------|-------|---|-----|------|------|------|-------|--|
|                                            | f MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 826.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 16.80            | V               | 1.1             | -1.5               | 14.20     | 38.5        | -24.3       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 826.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 12.08            | H               | 1.1             | -1.5               | 9.48      | 38.5        | -29.0       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 836.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 18.31            | V               | 1.1             | -1.4               | 15.82     | 38.5        | -22.6       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 836.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11.60            | H               | 1.1             | -1.4               | 9.11      | 38.5        | -29.3       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 846.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 18.16            | V               | 1.6             | -1.3               | 15.28     | 38.5        | -23.2       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| 846.50                                     | 11.48                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | H                | 1.6             | -1.3            | 8.60               | 38.5      | -29.8       |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| LTE<br><br>Band 5<br><br>5MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT ONLY, Y Position<br/>Mode: LTE5 5MHz FUND 16QAM</div> <div>Test Equipment:<br/>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br/>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.</div> <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>826.50</td><td>17.53</td><td>V</td><td>1.1</td><td>-1.5</td><td>14.93</td><td>38.5</td><td>-23.5</td><td></td></tr><tr><td>826.50</td><td>11.35</td><td>H</td><td>1.1</td><td>-1.5</td><td>8.75</td><td>38.5</td><td>-29.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>836.50</td><td>18.55</td><td>V</td><td>1.1</td><td>-1.4</td><td>16.06</td><td>38.5</td><td>-22.4</td><td></td></tr><tr><td>836.50</td><td>12.25</td><td>H</td><td>1.1</td><td>-1.4</td><td>9.76</td><td>38.5</td><td>-28.7</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>846.50</td><td>17.68</td><td>V</td><td>1.1</td><td>-1.3</td><td>15.30</td><td>38.5</td><td>-23.2</td><td></td></tr><tr><td>846.50</td><td>11.33</td><td>H</td><td>1.1</td><td>-1.3</td><td>8.95</td><td>38.5</td><td>-29.5</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm</div> |                  |                 |                 |                    |           |             |             |       | f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 826.50 | 17.53 | V | 1.1 | -1.5 | 14.93 | 38.5 | -23.5 |  | 826.50 | 11.35 | H | 1.1 | -1.5 | 8.75 | 38.5 | -29.7 |  | Mid Ch |  |  |  |  |  |  |  |  | 836.50 | 18.55 | V | 1.1 | -1.4 | 16.06 | 38.5 | -22.4 |  | 836.50 | 12.25 | H | 1.1 | -1.4 | 9.76 | 38.5 | -28.7 |  | High Ch |  |  |  |  |  |  |  |  | 846.50 | 17.68 | V | 1.1 | -1.3 | 15.30 | 38.5 | -23.2 |  | 846.50 | 11.33 | H | 1.1 | -1.3 | 8.95 | 38.5 | -29.5 |  |
|                                            | f MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 826.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 17.53            | V               | 1.1             | -1.5               | 14.93     | 38.5        | -23.5       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 826.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11.35            | H               | 1.1             | -1.5               | 8.75      | 38.5        | -29.7       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 836.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 18.55            | V               | 1.1             | -1.4               | 16.06     | 38.5        | -22.4       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 836.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 12.25            | H               | 1.1             | -1.4               | 9.76      | 38.5        | -28.7       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                 |                 |                    |           |             |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
|                                            | 846.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 17.68            | V               | 1.1             | -1.3               | 15.30     | 38.5        | -23.2       |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |
| 846.50                                     | 11.33                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | H                | 1.1             | -1.3            | 8.95               | 38.5      | -29.5       |             |       |       |                  |                 |                 |                    |           |             |             |       |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |        |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |         |  |  |  |  |  |  |  |  |        |       |   |     |      |       |      |       |  |        |       |   |     |      |      |      |       |  |

|                                                                                        |                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|-------------------|---------------------|--------------|--------------|---------------|--------------|
| LTE<br>Band 5<br>3MHz<br>QPSK                                                          | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b>                                                                                                    |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>Company:</b> Samsung<br><b>Project #:</b> 15K20515<br><b>Date:</b> 04-23-15<br><b>Test Engineer:</b> Steven.Kim<br><b>Configuration:</b> EUT ONLY, Y Position<br><b>Mode:</b> LTE5 3MHz FUND QPSK  |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>Test Equipment:</b><br>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.                        |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>f</b>                                                                                                                                                                                              | <b>SG reading</b> | <b>Ant. Pol.</b> | <b>Cable Loss</b> | <b>Antenna Gain</b> | <b>ERP</b>   | <b>Limit</b> | <b>Margin</b> | <b>Notes</b> |
|                                                                                        | <b>MHz</b>                                                                                                                                                                                            | <b>(dBm)</b>      | <b>(H/V)</b>     | <b>(dB)</b>       | <b>(dBd)</b>        | <b>(dBm)</b> | <b>(dBm)</b> | <b>(dB)</b>   |              |
|                                                                                        | Low Ch                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 825.50                                                                                                                                                                                                | 14.49             | V                | 1.1               | -1.5                | 11.89        | 38.5         | -26.6         |              |
|                                                                                        | 825.50                                                                                                                                                                                                | 8.64              | H                | 1.1               | -1.5                | 6.04         | 38.5         | -32.4         |              |
|                                                                                        | Mid Ch                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 836.50                                                                                                                                                                                                | 15.64             | V                | 1.1               | -1.4                | 13.15        | 38.5         | -25.3         |              |
|                                                                                        | 836.50                                                                                                                                                                                                | 9.20              | H                | 1.1               | -1.4                | 6.71         | 38.5         | -31.7         |              |
|                                                                                        | High Ch                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 847.50                                                                                                                                                                                                | 15.09             | V                | 1.6               | -1.3                | 12.21        | 38.5         | -26.2         |              |
|                                                                                        | 847.50                                                                                                                                                                                                | 8.02              | H                | 1.6               | -1.3                | 5.14         | 38.5         | -33.3         |              |
| Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm |                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
| LTE<br>Band 5<br>3MHz<br>16QAM                                                         | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b>                                                                                                    |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>Company:</b> Samsung<br><b>Project #:</b> 15K20515<br><b>Date:</b> 04-23-15<br><b>Test Engineer:</b> Steven.Kim<br><b>Configuration:</b> EUT ONLY, Y Position<br><b>Mode:</b> LTE5 3MHz FUND 16QAM |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>Test Equipment:</b><br>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.                        |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>f</b>                                                                                                                                                                                              | <b>SG reading</b> | <b>Ant. Pol.</b> | <b>Cable Loss</b> | <b>Antenna Gain</b> | <b>ERP</b>   | <b>Limit</b> | <b>Margin</b> | <b>Notes</b> |
|                                                                                        | <b>MHz</b>                                                                                                                                                                                            | <b>(dBm)</b>      | <b>(H/V)</b>     | <b>(dB)</b>       | <b>(dBd)</b>        | <b>(dBm)</b> | <b>(dBm)</b> | <b>(dB)</b>   |              |
|                                                                                        | Low Ch                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 825.50                                                                                                                                                                                                | 13.24             | V                | 1.1               | -1.5                | 10.64        | 38.5         | -27.8         |              |
|                                                                                        | 825.50                                                                                                                                                                                                | 7.83              | H                | 1.1               | -1.5                | 5.23         | 38.5         | -33.2         |              |
|                                                                                        | Mid Ch                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 836.50                                                                                                                                                                                                | 14.73             | V                | 1.1               | -1.4                | 12.24        | 38.5         | -26.2         |              |
|                                                                                        | 836.50                                                                                                                                                                                                | 7.79              | H                | 1.1               | -1.4                | 5.30         | 38.5         | -33.2         |              |
|                                                                                        | High Ch                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 847.50                                                                                                                                                                                                | 14.15             | V                | 1.1               | -1.3                | 11.77        | 38.5         | -26.7         |              |
|                                                                                        | 847.50                                                                                                                                                                                                | 7.69              | H                | 1.1               | -1.3                | 5.31         | 38.5         | -33.1         |              |
| Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm |                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |

|                                                                                        |                                                                                                                                                                                                         |                   |                  |                   |                     |              |              |               |              |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|-------------------|---------------------|--------------|--------------|---------------|--------------|
| LTE<br>Band 5<br>1.4MHz<br>QPSK                                                        | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b>                                                                                                      |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>Company:</b> Samsung<br><b>Project #:</b> 15K20515<br><b>Date:</b> 04-23-15<br><b>Test Engineer:</b> Steven.Kim<br><b>Configuration:</b> EUT ONLY, Y Position<br><b>Mode:</b> LTE5 1.4MHz FUND QPSK  |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>Test Equipment:</b><br>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.                          |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>f</b>                                                                                                                                                                                                | <b>SG reading</b> | <b>Ant. Pol.</b> | <b>Cable Loss</b> | <b>Antenna Gain</b> | <b>ERP</b>   | <b>Limit</b> | <b>Margin</b> | <b>Notes</b> |
|                                                                                        | <b>MHz</b>                                                                                                                                                                                              | <b>(dBm)</b>      | <b>(H/V)</b>     | <b>(dB)</b>       | <b>(dBd)</b>        | <b>(dBm)</b> | <b>(dBm)</b> | <b>(dB)</b>   |              |
|                                                                                        | Low Ch                                                                                                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 824.70                                                                                                                                                                                                  | 14.86             | V                | 1.1               | -1.5                | 12.26        | 38.5         | -26.2         |              |
|                                                                                        | 824.70                                                                                                                                                                                                  | 8.51              | H                | 1.1               | -1.5                | 5.91         | 38.5         | -32.5         |              |
|                                                                                        | Mid Ch                                                                                                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 836.50                                                                                                                                                                                                  | 16.22             | V                | 1.1               | -1.4                | 13.73        | 38.5         | -24.7         |              |
|                                                                                        | 836.50                                                                                                                                                                                                  | 8.22              | H                | 1.1               | -1.4                | 5.73         | 38.5         | -32.7         |              |
|                                                                                        | High Ch                                                                                                                                                                                                 |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 844.30                                                                                                                                                                                                  | 15.28             | V                | 1.6               | -1.3                | 12.40        | 38.5         | -26.0         |              |
|                                                                                        | 844.30                                                                                                                                                                                                  | 8.18              | H                | 1.6               | -1.3                | 5.30         | 38.5         | -33.1         |              |
| Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm |                                                                                                                                                                                                         |                   |                  |                   |                     |              |              |               |              |
| LTE<br>Band 5<br>1.4MHz<br>16QAM                                                       | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b>                                                                                                      |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>Company:</b> Samsung<br><b>Project #:</b> 15K20515<br><b>Date:</b> 04-23-15<br><b>Test Engineer:</b> Steven.Kim<br><b>Configuration:</b> EUT ONLY, Y Position<br><b>Mode:</b> LTE5 1.4MHz FUND 16QAM |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>Test Equipment:</b><br>Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br>Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.                          |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | <b>f</b>                                                                                                                                                                                                | <b>SG reading</b> | <b>Ant. Pol.</b> | <b>Cable Loss</b> | <b>Antenna Gain</b> | <b>ERP</b>   | <b>Limit</b> | <b>Margin</b> | <b>Notes</b> |
|                                                                                        | <b>MHz</b>                                                                                                                                                                                              | <b>(dBm)</b>      | <b>(H/V)</b>     | <b>(dB)</b>       | <b>(dBd)</b>        | <b>(dBm)</b> | <b>(dBm)</b> | <b>(dB)</b>   |              |
|                                                                                        | Low Ch                                                                                                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 824.70                                                                                                                                                                                                  | 13.73             | V                | 1.1               | -1.5                | 11.13        | 38.5         | -27.3         |              |
|                                                                                        | 824.70                                                                                                                                                                                                  | 7.75              | H                | 1.1               | -1.5                | 5.15         | 38.5         | -33.3         |              |
|                                                                                        | Mid Ch                                                                                                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 836.50                                                                                                                                                                                                  | 13.85             | V                | 1.1               | -1.4                | 11.36        | 38.5         | -27.1         |              |
|                                                                                        | 836.50                                                                                                                                                                                                  | 8.08              | H                | 1.1               | -1.4                | 5.59         | 38.5         | -32.9         |              |
|                                                                                        | High Ch                                                                                                                                                                                                 |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 844.30                                                                                                                                                                                                  | 14.15             | V                | 1.1               | -1.3                | 11.77        | 38.5         | -26.7         |              |
|                                                                                        | 844.30                                                                                                                                                                                                  | 7.58              | H                | 1.1               | -1.3                | 5.20         | 38.5         | -33.3         |              |
| Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm |                                                                                                                                                                                                         |                   |                  |                   |                     |              |              |               |              |

**LTE Band 4**

| LTE<br><br>Band 4<br><br>20MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4, QPSK, 20MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1720.00</td><td>10.36</td><td>V</td><td>1.54</td><td>9.12</td><td>17.94</td><td>30.0</td><td>-12.1</td><td></td></tr><tr><td>1720.00</td><td>14.60</td><td>H</td><td>1.54</td><td>9.12</td><td>22.18</td><td>30.0</td><td>-7.8</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1732.50</td><td>11.23</td><td>V</td><td>1.55</td><td>9.42</td><td>19.10</td><td>30.0</td><td>-10.9</td><td></td></tr><tr><td>1732.50</td><td>14.18</td><td>H</td><td>1.55</td><td>9.42</td><td>22.05</td><td>30.0</td><td>-8.0</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1745.00</td><td>9.72</td><td>V</td><td>1.56</td><td>9.61</td><td>17.77</td><td>30.0</td><td>-12.2</td><td></td></tr><tr><td>1745.00</td><td>15.12</td><td>H</td><td>1.56</td><td>9.61</td><td>23.17</td><td>30.0</td><td>-6.8</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1720.00 | 10.36 | V | 1.54 | 9.12 | 17.94 | 30.0 | -12.1 |  | 1720.00 | 14.60 | H | 1.54 | 9.12 | 22.18 | 30.0 | -7.8 |  | Mid Ch |  |  |  |  |  |  |  |  | 1732.50 | 11.23 | V | 1.55 | 9.42 | 19.10 | 30.0 | -10.9 |  | 1732.50 | 14.18 | H | 1.55 | 9.42 | 22.05 | 30.0 | -8.0 |  | High Ch |  |  |  |  |  |  |  |  | 1745.00 | 9.72 | V | 1.56 | 9.61 | 17.77 | 30.0 | -12.2 |  | 1745.00 | 15.12 | H | 1.56 | 9.61 | 23.17 | 30.0 | -6.8 |  |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|---------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1720.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10.36               | V                  | 1.54               | 9.12                  | 17.94         | 30.0           | -12.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1720.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 14.60               | H                  | 1.54               | 9.12                  | 22.18         | 30.0           | -7.8           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 11.23               | V                  | 1.55               | 9.42                  | 19.10         | 30.0           | -10.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 14.18               | H                  | 1.55               | 9.42                  | 22.05         | 30.0           | -8.0           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1745.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.72                | V                  | 1.56               | 9.61                  | 17.77         | 30.0           | -12.2          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| 1745.00                                     | 15.12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H                   | 1.56               | 9.61               | 23.17                 | 30.0          | -6.8           |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| LTE<br><br>Band 4<br><br>20MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4, 16QAM, 20MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1720.00</td><td>9.33</td><td>V</td><td>1.54</td><td>9.12</td><td>16.91</td><td>30.0</td><td>-13.1</td><td></td></tr><tr><td>1720.00</td><td>13.34</td><td>H</td><td>1.54</td><td>9.12</td><td>20.92</td><td>30.0</td><td>-9.1</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1732.50</td><td>10.11</td><td>V</td><td>1.55</td><td>9.42</td><td>17.98</td><td>30.0</td><td>-12.0</td><td></td></tr><tr><td>1732.50</td><td>13.95</td><td>H</td><td>1.55</td><td>9.42</td><td>21.82</td><td>30.0</td><td>-8.2</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1745.00</td><td>8.64</td><td>V</td><td>1.56</td><td>9.61</td><td>16.69</td><td>30.0</td><td>-13.3</td><td></td></tr><tr><td>1745.00</td><td>13.15</td><td>H</td><td>1.56</td><td>9.61</td><td>21.20</td><td>30.0</td><td>-8.8</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1720.00 | 9.33  | V | 1.54 | 9.12 | 16.91 | 30.0 | -13.1 |  | 1720.00 | 13.34 | H | 1.54 | 9.12 | 20.92 | 30.0 | -9.1 |  | Mid Ch |  |  |  |  |  |  |  |  | 1732.50 | 10.11 | V | 1.55 | 9.42 | 17.98 | 30.0 | -12.0 |  | 1732.50 | 13.95 | H | 1.55 | 9.42 | 21.82 | 30.0 | -8.2 |  | High Ch |  |  |  |  |  |  |  |  | 1745.00 | 8.64 | V | 1.56 | 9.61 | 16.69 | 30.0 | -13.3 |  | 1745.00 | 13.15 | H | 1.56 | 9.61 | 21.20 | 30.0 | -8.8 |  |
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1720.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.33                | V                  | 1.54               | 9.12                  | 16.91         | 30.0           | -13.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1720.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.34               | H                  | 1.54               | 9.12                  | 20.92         | 30.0           | -9.1           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10.11               | V                  | 1.55               | 9.42                  | 17.98         | 30.0           | -12.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.95               | H                  | 1.55               | 9.42                  | 21.82         | 30.0           | -8.2           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1745.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 8.64                | V                  | 1.56               | 9.61                  | 16.69         | 30.0           | -13.3          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| 1745.00                                     | 13.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H                   | 1.56               | 9.61               | 21.20                 | 30.0          | -8.8           |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |

| LTE<br><br>Band 4<br><br>15MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4, QPSK, 15MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1717.50</td><td>10.74</td><td>V</td><td>1.54</td><td>9.12</td><td>18.32</td><td>30.0</td><td>-11.7</td><td></td></tr><tr><td>1717.50</td><td>15.29</td><td>H</td><td>1.54</td><td>9.12</td><td>22.87</td><td>30.0</td><td>-7.1</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1732.50</td><td>11.23</td><td>V</td><td>1.55</td><td>9.42</td><td>19.10</td><td>30.0</td><td>-10.9</td><td></td></tr><tr><td>1732.50</td><td>14.71</td><td>H</td><td>1.55</td><td>9.42</td><td>22.58</td><td>30.0</td><td>-7.4</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1747.50</td><td>10.99</td><td>V</td><td>1.56</td><td>9.61</td><td>19.04</td><td>30.0</td><td>-11.0</td><td></td></tr><tr><td>1747.50</td><td>15.37</td><td>H</td><td>1.56</td><td>9.61</td><td>23.42</td><td>30.0</td><td>-6.6</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>  |                  |                 |                 |                    |            |             |             |       | f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1717.50 | 10.74 | V | 1.54 | 9.12 | 18.32 | 30.0 | -11.7 |  | 1717.50 | 15.29 | H | 1.54 | 9.12 | 22.87 | 30.0 | -7.1 |  | Mid Ch |  |  |  |  |  |  |  |  | 1732.50 | 11.23 | V | 1.55 | 9.42 | 19.10 | 30.0 | -10.9 |  | 1732.50 | 14.71 | H | 1.55 | 9.42 | 22.58 | 30.0 | -7.4 |  | High Ch |  |  |  |  |  |  |  |  | 1747.50 | 10.99 | V | 1.56 | 9.61 | 19.04 | 30.0 | -11.0 |  | 1747.50 | 15.37 | H | 1.56 | 9.61 | 23.42 | 30.0 | -6.6 |  |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|-----------------|--------------------|------------|-------------|-------------|-------|-------|------------------|-----------------|-----------------|--------------------|------------|-------------|-------------|-------|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|---------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|
|                                             | f MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1717.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10.74            | V               | 1.54            | 9.12               | 18.32      | 30.0        | -11.7       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1717.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15.29            | H               | 1.54            | 9.12               | 22.87      | 30.0        | -7.1        |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 11.23            | V               | 1.55            | 9.42               | 19.10      | 30.0        | -10.9       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 14.71            | H               | 1.55            | 9.42               | 22.58      | 30.0        | -7.4        |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1747.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10.99            | V               | 1.56            | 9.61               | 19.04      | 30.0        | -11.0       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| 1747.50                                     | 15.37                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                | 1.56            | 9.61            | 23.42              | 30.0       | -6.6        |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| LTE<br><br>Band 4<br><br>15MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4, 16QAM, 15MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1717.50</td><td>10.87</td><td>V</td><td>1.54</td><td>9.12</td><td>18.45</td><td>30.0</td><td>-11.6</td><td></td></tr><tr><td>1717.50</td><td>14.07</td><td>H</td><td>1.54</td><td>9.12</td><td>21.65</td><td>30.0</td><td>-8.4</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1732.50</td><td>11.12</td><td>V</td><td>1.55</td><td>9.42</td><td>18.99</td><td>30.0</td><td>-11.0</td><td></td></tr><tr><td>1732.50</td><td>13.99</td><td>H</td><td>1.55</td><td>9.42</td><td>21.86</td><td>30.0</td><td>-8.1</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1747.50</td><td>10.35</td><td>V</td><td>1.56</td><td>9.61</td><td>18.40</td><td>30.0</td><td>-11.6</td><td></td></tr><tr><td>1747.50</td><td>14.51</td><td>H</td><td>1.56</td><td>9.61</td><td>22.56</td><td>30.0</td><td>-7.4</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                  |                 |                 |                    |            |             |             |       | f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1717.50 | 10.87 | V | 1.54 | 9.12 | 18.45 | 30.0 | -11.6 |  | 1717.50 | 14.07 | H | 1.54 | 9.12 | 21.65 | 30.0 | -8.4 |  | Mid Ch |  |  |  |  |  |  |  |  | 1732.50 | 11.12 | V | 1.55 | 9.42 | 18.99 | 30.0 | -11.0 |  | 1732.50 | 13.99 | H | 1.55 | 9.42 | 21.86 | 30.0 | -8.1 |  | High Ch |  |  |  |  |  |  |  |  | 1747.50 | 10.35 | V | 1.56 | 9.61 | 18.40 | 30.0 | -11.6 |  | 1747.50 | 14.51 | H | 1.56 | 9.61 | 22.56 | 30.0 | -7.4 |  |
|                                             | f MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1717.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10.87            | V               | 1.54            | 9.12               | 18.45      | 30.0        | -11.6       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1717.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 14.07            | H               | 1.54            | 9.12               | 21.65      | 30.0        | -8.4        |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 11.12            | V               | 1.55            | 9.42               | 18.99      | 30.0        | -11.0       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 13.99            | H               | 1.55            | 9.42               | 21.86      | 30.0        | -8.1        |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1747.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10.35            | V               | 1.56            | 9.61               | 18.40      | 30.0        | -11.6       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| 1747.50                                     | 14.51                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                | 1.56            | 9.61            | 22.56              | 30.0       | -7.4        |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |

| LTE<br><br>Band 4<br><br>10MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4, QPSK, 10MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1715.00</td><td>10.31</td><td>V</td><td>1.54</td><td>9.12</td><td>17.89</td><td>30.0</td><td>-12.1</td><td></td></tr><tr><td>1715.00</td><td>15.15</td><td>H</td><td>1.54</td><td>9.12</td><td>22.73</td><td>30.0</td><td>-7.3</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1732.50</td><td>10.65</td><td>V</td><td>1.55</td><td>9.42</td><td>18.52</td><td>30.0</td><td>-11.5</td><td></td></tr><tr><td>1732.50</td><td>15.34</td><td>H</td><td>1.55</td><td>9.42</td><td>23.21</td><td>30.0</td><td>-6.8</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1750.00</td><td>9.45</td><td>V</td><td>1.56</td><td>9.61</td><td>17.50</td><td>30.0</td><td>-12.5</td><td></td></tr><tr><td>1750.00</td><td>15.25</td><td>H</td><td>1.56</td><td>9.61</td><td>23.30</td><td>30.0</td><td>-6.7</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                  |                 |                 |                    |            |             |             |       | f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1715.00 | 10.31 | V | 1.54 | 9.12 | 17.89 | 30.0 | -12.1 |  | 1715.00 | 15.15 | H | 1.54 | 9.12 | 22.73 | 30.0 | -7.3 |  | Mid Ch |  |  |  |  |  |  |  |  | 1732.50 | 10.65 | V | 1.55 | 9.42 | 18.52 | 30.0 | -11.5 |  | 1732.50 | 15.34 | H | 1.55 | 9.42 | 23.21 | 30.0 | -6.8 |  | High Ch |  |  |  |  |  |  |  |  | 1750.00 | 9.45 | V | 1.56 | 9.61 | 17.50 | 30.0 | -12.5 |  | 1750.00 | 15.25 | H | 1.56 | 9.61 | 23.30 | 30.0 | -6.7 |  |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|-----------------|--------------------|------------|-------------|-------------|-------|-------|------------------|-----------------|-----------------|--------------------|------------|-------------|-------------|-------|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|---------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|------|--|
|                                             | f MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1715.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10.31            | V               | 1.54            | 9.12               | 17.89      | 30.0        | -12.1       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1715.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 15.15            | H               | 1.54            | 9.12               | 22.73      | 30.0        | -7.3        |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10.65            | V               | 1.55            | 9.42               | 18.52      | 30.0        | -11.5       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 15.34            | H               | 1.55            | 9.42               | 23.21      | 30.0        | -6.8        |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1750.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.45             | V               | 1.56            | 9.61               | 17.50      | 30.0        | -12.5       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| 1750.00                                     | 15.25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H                | 1.56            | 9.61            | 23.30              | 30.0       | -6.7        |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| LTE<br><br>Band 4<br><br>10MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4 16QAM, 10MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1715.00</td><td>9.34</td><td>V</td><td>1.54</td><td>9.12</td><td>16.92</td><td>30.0</td><td>-13.1</td><td></td></tr><tr><td>1715.00</td><td>13.76</td><td>H</td><td>1.54</td><td>9.12</td><td>21.34</td><td>30.0</td><td>-8.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1732.50</td><td>9.01</td><td>V</td><td>1.55</td><td>9.42</td><td>16.88</td><td>30.0</td><td>-13.1</td><td></td></tr><tr><td>1732.50</td><td>14.26</td><td>H</td><td>1.55</td><td>9.42</td><td>22.13</td><td>30.0</td><td>-7.9</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1750.00</td><td>8.38</td><td>V</td><td>1.56</td><td>9.61</td><td>16.43</td><td>30.0</td><td>-13.6</td><td></td></tr><tr><td>1750.00</td><td>13.95</td><td>H</td><td>1.56</td><td>9.61</td><td>22.00</td><td>30.0</td><td>-8.0</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>   |                  |                 |                 |                    |            |             |             |       | f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1715.00 | 9.34  | V | 1.54 | 9.12 | 16.92 | 30.0 | -13.1 |  | 1715.00 | 13.76 | H | 1.54 | 9.12 | 21.34 | 30.0 | -8.7 |  | Mid Ch |  |  |  |  |  |  |  |  | 1732.50 | 9.01  | V | 1.55 | 9.42 | 16.88 | 30.0 | -13.1 |  | 1732.50 | 14.26 | H | 1.55 | 9.42 | 22.13 | 30.0 | -7.9 |  | High Ch |  |  |  |  |  |  |  |  | 1750.00 | 8.38 | V | 1.56 | 9.61 | 16.43 | 30.0 | -13.6 |  | 1750.00 | 13.95 | H | 1.56 | 9.61 | 22.00 | 30.0 | -8.0 |  |
|                                             | f MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1715.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.34             | V               | 1.54            | 9.12               | 16.92      | 30.0        | -13.1       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1715.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.76            | H               | 1.54            | 9.12               | 21.34      | 30.0        | -8.7        |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.01             | V               | 1.55            | 9.42               | 16.88      | 30.0        | -13.1       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 14.26            | H               | 1.55            | 9.42               | 22.13      | 30.0        | -7.9        |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                 |                 |                    |            |             |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
|                                             | 1750.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 8.38             | V               | 1.56            | 9.61               | 16.43      | 30.0        | -13.6       |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |
| 1750.00                                     | 13.95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H                | 1.56            | 9.61            | 22.00              | 30.0       | -8.0        |             |       |       |                  |                 |                 |                    |            |             |             |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |      |  |

| LTE<br><br>Band 4<br><br>5MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4, QPSK , 5MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1712.50</td><td>10.53</td><td>V</td><td>1.54</td><td>9.12</td><td>18.11</td><td>30.0</td><td>-11.9</td></tr><tr><td>1712.50</td><td>14.33</td><td>H</td><td>1.54</td><td>9.12</td><td>21.91</td><td>30.0</td><td>-8.1</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1732.50</td><td>10.05</td><td>V</td><td>1.55</td><td>9.42</td><td>17.92</td><td>30.0</td><td>-12.1</td></tr><tr><td>1732.50</td><td>14.14</td><td>H</td><td>1.55</td><td>9.42</td><td>22.01</td><td>30.0</td><td>-8.0</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1752.50</td><td>10.46</td><td>V</td><td>1.56</td><td>9.61</td><td>18.51</td><td>30.0</td><td>-11.5</td></tr><tr><td>1752.50</td><td>14.67</td><td>H</td><td>1.56</td><td>9.61</td><td>22.72</td><td>30.0</td><td>-7.3</td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1712.50 | 10.53 | V | 1.54 | 9.12 | 18.11 | 30.0 | -11.9 | 1712.50 | 14.33 | H | 1.54 | 9.12 | 21.91 | 30.0 | -8.1 | Mid Ch |  |  |  |  |  |  |  | 1732.50 | 10.05 | V | 1.55 | 9.42 | 17.92 | 30.0 | -12.1 | 1732.50 | 14.14 | H | 1.55 | 9.42 | 22.01 | 30.0 | -8.0 | High Ch |  |  |  |  |  |  |  | 1752.50 | 10.46 | V | 1.56 | 9.61 | 18.51 | 30.0 | -11.5 | 1752.50 | 14.67 | H | 1.56 | 9.61 | 22.72 | 30.0 | -7.3 |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|------|--------|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|------|---------|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|------|
|                                            | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1712.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 10.53               | V                  | 1.54               | 9.12                  | 18.11         | 30.0           | -11.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1712.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 14.33               | H                  | 1.54               | 9.12                  | 21.91         | 30.0           | -8.1           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 10.05               | V                  | 1.55               | 9.42                  | 17.92         | 30.0           | -12.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 14.14               | H                  | 1.55               | 9.42                  | 22.01         | 30.0           | -8.0           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1752.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 10.46               | V                  | 1.56               | 9.61                  | 18.51         | 30.0           | -11.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
| 1752.50                                    | 14.67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | H                   | 1.56               | 9.61               | 22.72                 | 30.0          | -7.3           |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
| LTE<br><br>Band 4<br><br>5MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4 16QAM, 5MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1712.50</td><td>9.64</td><td>V</td><td>1.54</td><td>9.12</td><td>17.22</td><td>30.0</td><td>-12.8</td></tr><tr><td>1712.50</td><td>13.69</td><td>H</td><td>1.54</td><td>9.12</td><td>21.27</td><td>30.0</td><td>-8.7</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1732.50</td><td>9.99</td><td>V</td><td>1.55</td><td>9.42</td><td>17.86</td><td>30.0</td><td>-12.1</td></tr><tr><td>1732.50</td><td>13.70</td><td>H</td><td>1.55</td><td>9.42</td><td>21.57</td><td>30.0</td><td>-8.4</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1752.50</td><td>9.34</td><td>V</td><td>1.56</td><td>9.61</td><td>17.39</td><td>30.0</td><td>-12.6</td></tr><tr><td>1752.50</td><td>14.42</td><td>H</td><td>1.56</td><td>9.61</td><td>22.47</td><td>30.0</td><td>-7.5</td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>     |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1712.50 | 9.64  | V | 1.54 | 9.12 | 17.22 | 30.0 | -12.8 | 1712.50 | 13.69 | H | 1.54 | 9.12 | 21.27 | 30.0 | -8.7 | Mid Ch |  |  |  |  |  |  |  | 1732.50 | 9.99  | V | 1.55 | 9.42 | 17.86 | 30.0 | -12.1 | 1732.50 | 13.70 | H | 1.55 | 9.42 | 21.57 | 30.0 | -8.4 | High Ch |  |  |  |  |  |  |  | 1752.50 | 9.34  | V | 1.56 | 9.61 | 17.39 | 30.0 | -12.6 | 1752.50 | 14.42 | H | 1.56 | 9.61 | 22.47 | 30.0 | -7.5 |
|                                            | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1712.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9.64                | V                  | 1.54               | 9.12                  | 17.22         | 30.0           | -12.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1712.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 13.69               | H                  | 1.54               | 9.12                  | 21.27         | 30.0           | -8.7           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9.99                | V                  | 1.55               | 9.42                  | 17.86         | 30.0           | -12.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 13.70               | H                  | 1.55               | 9.42                  | 21.57         | 30.0           | -8.4           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1752.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9.34                | V                  | 1.56               | 9.61                  | 17.39         | 30.0           | -12.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
| 1752.50                                    | 14.42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | H                   | 1.56               | 9.61               | 22.47                 | 30.0          | -7.5           |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |

| LTE<br><br>Band 4<br><br>3MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: <br/>Date: 2015.04.20<br/>Test Engineer: <br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4, QPSK , 3MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1711.50</td><td>7.47</td><td>V</td><td>1.54</td><td>9.12</td><td>15.05</td><td>30.0</td><td>-15.0</td></tr><tr><td>1711.50</td><td>15.22</td><td>H</td><td>1.54</td><td>9.12</td><td>22.80</td><td>30.0</td><td>-7.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1732.50</td><td>11.59</td><td>V</td><td>1.55</td><td>9.42</td><td>19.46</td><td>30.0</td><td>-10.5</td></tr><tr><td>1732.50</td><td>14.10</td><td>H</td><td>1.55</td><td>9.42</td><td>21.97</td><td>30.0</td><td>-8.0</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1753.50</td><td>10.74</td><td>V</td><td>1.56</td><td>9.61</td><td>18.79</td><td>30.0</td><td>-11.2</td></tr><tr><td>1753.50</td><td>14.55</td><td>H</td><td>1.56</td><td>9.61</td><td>22.60</td><td>30.0</td><td>-7.4</td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>              |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1711.50 | 7.47 | V | 1.54 | 9.12 | 15.05 | 30.0 | -15.0 | 1711.50 | 15.22 | H | 1.54 | 9.12 | 22.80 | 30.0 | -7.2 | Mid Ch |  |  |  |  |  |  |  | 1732.50 | 11.59 | V | 1.55 | 9.42 | 19.46 | 30.0 | -10.5 | 1732.50 | 14.10 | H | 1.55 | 9.42 | 21.97 | 30.0 | -8.0 | High Ch |  |  |  |  |  |  |  | 1753.50 | 10.74 | V | 1.56 | 9.61 | 18.79 | 30.0 | -11.2 | 1753.50 | 14.55 | H | 1.56 | 9.61 | 22.60 | 30.0 | -7.4 |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|------|--------|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|------|---------|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|------|
|                                            | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1711.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7.47                | V                  | 1.54               | 9.12                  | 15.05         | 30.0           | -15.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1711.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 15.22               | H                  | 1.54               | 9.12                  | 22.80         | 30.0           | -7.2           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 11.59               | V                  | 1.55               | 9.42                  | 19.46         | 30.0           | -10.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 14.10               | H                  | 1.55               | 9.42                  | 21.97         | 30.0           | -8.0           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1753.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10.74               | V                  | 1.56               | 9.61                  | 18.79         | 30.0           | -11.2          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
| 1753.50                                    | 14.55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H                   | 1.56               | 9.61               | 22.60                 | 30.0          | -7.4           |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
| LTE<br><br>Band 4<br><br>3MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 4 16QAM, 3MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1711.50</td><td>9.68</td><td>V</td><td>1.54</td><td>9.12</td><td>17.26</td><td>30.0</td><td>-12.7</td></tr><tr><td>1711.50</td><td>13.19</td><td>H</td><td>1.54</td><td>9.12</td><td>20.77</td><td>30.0</td><td>-9.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1732.50</td><td>9.38</td><td>V</td><td>1.55</td><td>9.42</td><td>17.25</td><td>30.0</td><td>-12.8</td></tr><tr><td>1732.50</td><td>12.87</td><td>H</td><td>1.55</td><td>9.42</td><td>20.74</td><td>30.0</td><td>-9.3</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1753.50</td><td>9.56</td><td>V</td><td>1.56</td><td>9.61</td><td>17.61</td><td>30.0</td><td>-12.4</td></tr><tr><td>1753.50</td><td>13.56</td><td>H</td><td>1.56</td><td>9.61</td><td>21.61</td><td>30.0</td><td>-8.4</td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1711.50 | 9.68 | V | 1.54 | 9.12 | 17.26 | 30.0 | -12.7 | 1711.50 | 13.19 | H | 1.54 | 9.12 | 20.77 | 30.0 | -9.2 | Mid Ch |  |  |  |  |  |  |  | 1732.50 | 9.38  | V | 1.55 | 9.42 | 17.25 | 30.0 | -12.8 | 1732.50 | 12.87 | H | 1.55 | 9.42 | 20.74 | 30.0 | -9.3 | High Ch |  |  |  |  |  |  |  | 1753.50 | 9.56  | V | 1.56 | 9.61 | 17.61 | 30.0 | -12.4 | 1753.50 | 13.56 | H | 1.56 | 9.61 | 21.61 | 30.0 | -8.4 |
|                                            | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1711.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.68                | V                  | 1.54               | 9.12                  | 17.26         | 30.0           | -12.7          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1711.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.19               | H                  | 1.54               | 9.12                  | 20.77         | 30.0           | -9.2           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.38                | V                  | 1.55               | 9.42                  | 17.25         | 30.0           | -12.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1732.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 12.87               | H                  | 1.55               | 9.42                  | 20.74         | 30.0           | -9.3           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
|                                            | 1753.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.56                | V                  | 1.56               | 9.61                  | 17.61         | 30.0           | -12.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |
| 1753.50                                    | 13.56                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H                   | 1.56               | 9.61               | 21.61                 | 30.0          | -8.4           |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |      |        |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |         |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |         |       |   |      |      |       |      |      |

LTE  
Band 4  
1.4MHz  
QPSK

High Frequency Substitution Measurement  
UL Korea, Ltd. Suwon Laboratory Chamber 1

Company: Samsung  
Project #: 15K20515  
Date: 04-20-15  
Test Engineer: Steven.Kim  
Configuration: EUT / Z-Position  
Mode: LTE Band 4 QPSK, 1.4MHz

Test Equipment:

Receiving: 3117, and Chamber 1 SMA Cables  
Substitution: 3115 Substitution, 3m SMA Cable Warehouse

| f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |
|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|
| Low Ch   |                     |                    |                    |                       |               |                |                |       |
| 1710.70  | 8.24                | V                  | 1.54               | 9.12                  | 15.82         | 30.0           | -14.2          |       |
| 1710.70  | 13.27               | H                  | 1.54               | 9.12                  | 20.85         | 30.0           | -9.2           |       |
| Mid Ch   |                     |                    |                    |                       |               |                |                |       |
| 1732.50  | 8.82                | V                  | 1.55               | 9.42                  | 16.69         | 30.0           | -13.3          |       |
| 1732.50  | 12.75               | H                  | 1.55               | 9.42                  | 20.62         | 30.0           | -9.4           |       |
| High Ch  |                     |                    |                    |                       |               |                |                |       |
| 1754.30  | 7.83                | V                  | 1.56               | 9.61                  | 15.88         | 30.0           | -14.1          |       |
| 1754.30  | 13.15               | H                  | 1.56               | 9.61                  | 21.20         | 30.0           | -8.8           |       |

Rev. 3.17.11

Note: For Band 4 EIRP limit is 30dBm

LTE  
Band 4  
1.4MHz  
16QAM

High Frequency Substitution Measurement  
UL Korea, Ltd. Suwon Laboratory Chamber 1

Company: Samsung  
Project #: 15K20515  
Date: 04-20-15  
Test Engineer: Steven.Kim  
Configuration: EUT / Z-Position  
Mode: LTE Band 4 16QAM, 1.4MHz

Test Equipment:

Receiving: 3117, and Chamber 1 SMA Cables  
Substitution: 3115 Substitution, 3m SMA Cable Warehouse

| f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |
|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|
| Low Ch   |                     |                    |                    |                       |               |                |                |       |
| 1710.70  | 8.75                | V                  | 1.54               | 9.12                  | 16.33         | 30.0           | -13.7          |       |
| 1710.70  | 11.90               | H                  | 1.54               | 9.12                  | 19.48         | 30.0           | -10.5          |       |
| Mid Ch   |                     |                    |                    |                       |               |                |                |       |
| 1732.50  | 7.13                | V                  | 1.55               | 9.42                  | 15.00         | 30.0           | -15.0          |       |
| 1732.50  | 11.60               | H                  | 1.55               | 9.42                  | 19.47         | 30.0           | -10.5          |       |
| High Ch  |                     |                    |                    |                       |               |                |                |       |
| 1754.30  | 6.97                | V                  | 1.56               | 9.61                  | 15.02         | 30.0           | -15.0          |       |
| 1754.30  | 11.08               | H                  | 1.56               | 9.61                  | 19.13         | 30.0           | -10.9          |       |

Rev. 3.17.11

Note: For Band 4 EIRP limit is 30dBm

**LTE Band 2**

| LTE<br><br>Band 2<br><br>20MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 QPSK, 20MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1860.00</td><td>10.82</td><td>V</td><td>1.60</td><td>9.12</td><td>18.34</td><td>33.0</td><td>-14.7</td><td></td></tr><tr><td>1860.00</td><td>15.07</td><td>H</td><td>1.60</td><td>9.12</td><td>22.59</td><td>33.0</td><td>-10.4</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>6.15</td><td>V</td><td>1.62</td><td>8.98</td><td>13.51</td><td>33.0</td><td>-19.5</td><td></td></tr><tr><td>1880.00</td><td>14.99</td><td>H</td><td>1.62</td><td>8.98</td><td>22.35</td><td>33.0</td><td>-10.7</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1900.00</td><td>9.61</td><td>V</td><td>1.63</td><td>8.83</td><td>16.81</td><td>33.0</td><td>-16.2</td><td></td></tr><tr><td>1900.00</td><td>14.35</td><td>H</td><td>1.63</td><td>8.83</td><td>21.55</td><td>33.0</td><td>-11.4</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>  |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1860.00 | 10.82 | V | 1.60 | 9.12 | 18.34 | 33.0 | -14.7 |  | 1860.00 | 15.07 | H | 1.60 | 9.12 | 22.59 | 33.0 | -10.4 |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 6.15 | V | 1.62 | 8.98 | 13.51 | 33.0 | -19.5 |  | 1880.00 | 14.99 | H | 1.62 | 8.98 | 22.35 | 33.0 | -10.7 |  | High Ch |  |  |  |  |  |  |  |  | 1900.00 | 9.61 | V | 1.63 | 8.83 | 16.81 | 33.0 | -16.2 |  | 1900.00 | 14.35 | H | 1.63 | 8.83 | 21.55 | 33.0 | -11.4 |  |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|---------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1860.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10.82               | V                  | 1.60               | 9.12                  | 18.34         | 33.0           | -14.7          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1860.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15.07               | H                  | 1.60               | 9.12                  | 22.59         | 33.0           | -10.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6.15                | V                  | 1.62               | 8.98                  | 13.51         | 33.0           | -19.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 14.99               | H                  | 1.62               | 8.98                  | 22.35         | 33.0           | -10.7          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1900.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 9.61                | V                  | 1.63               | 8.83                  | 16.81         | 33.0           | -16.2          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1900.00                                     | 14.35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                   | 1.63               | 8.83               | 21.55                 | 33.0          | -11.4          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| LTE<br><br>Band 2<br><br>20MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 16QAM, 20MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1860.00</td><td>10.90</td><td>V</td><td>1.60</td><td>9.12</td><td>18.42</td><td>33.0</td><td>-14.6</td><td></td></tr><tr><td>1860.00</td><td>13.66</td><td>H</td><td>1.60</td><td>9.12</td><td>21.18</td><td>33.0</td><td>-11.8</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>8.15</td><td>V</td><td>1.62</td><td>8.98</td><td>15.51</td><td>33.0</td><td>-17.5</td><td></td></tr><tr><td>1880.00</td><td>13.81</td><td>H</td><td>1.62</td><td>8.98</td><td>21.17</td><td>33.0</td><td>-11.8</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1900.00</td><td>8.72</td><td>V</td><td>1.63</td><td>8.83</td><td>15.92</td><td>33.0</td><td>-17.1</td><td></td></tr><tr><td>1900.00</td><td>13.22</td><td>H</td><td>1.63</td><td>8.83</td><td>20.42</td><td>33.0</td><td>-12.6</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1860.00 | 10.90 | V | 1.60 | 9.12 | 18.42 | 33.0 | -14.6 |  | 1860.00 | 13.66 | H | 1.60 | 9.12 | 21.18 | 33.0 | -11.8 |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 8.15 | V | 1.62 | 8.98 | 15.51 | 33.0 | -17.5 |  | 1880.00 | 13.81 | H | 1.62 | 8.98 | 21.17 | 33.0 | -11.8 |  | High Ch |  |  |  |  |  |  |  |  | 1900.00 | 8.72 | V | 1.63 | 8.83 | 15.92 | 33.0 | -17.1 |  | 1900.00 | 13.22 | H | 1.63 | 8.83 | 20.42 | 33.0 | -12.6 |  |
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1860.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10.90               | V                  | 1.60               | 9.12                  | 18.42         | 33.0           | -14.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1860.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 13.66               | H                  | 1.60               | 9.12                  | 21.18         | 33.0           | -11.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8.15                | V                  | 1.62               | 8.98                  | 15.51         | 33.0           | -17.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 13.81               | H                  | 1.62               | 8.98                  | 21.17         | 33.0           | -11.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1900.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8.72                | V                  | 1.63               | 8.83                  | 15.92         | 33.0           | -17.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1900.00                                     | 13.22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                   | 1.63               | 8.83               | 20.42                 | 33.0          | -12.6          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |

| LTE<br><br>Band 2<br><br>15MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 QPSK, 15MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1857.50</td><td>12.17</td><td>V</td><td>1.60</td><td>9.12</td><td>19.69</td><td>33.0</td><td>-13.3</td><td></td></tr><tr><td>1857.50</td><td>15.82</td><td>H</td><td>1.60</td><td>9.12</td><td>23.34</td><td>33.0</td><td>-9.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>9.77</td><td>V</td><td>1.62</td><td>8.98</td><td>17.13</td><td>33.0</td><td>-15.9</td><td></td></tr><tr><td>1880.00</td><td>14.29</td><td>H</td><td>1.62</td><td>8.98</td><td>21.65</td><td>33.0</td><td>-11.4</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1902.50</td><td>7.91</td><td>V</td><td>1.63</td><td>8.83</td><td>15.11</td><td>33.0</td><td>-17.9</td><td></td></tr><tr><td>1902.50</td><td>13.12</td><td>H</td><td>1.63</td><td>8.83</td><td>20.32</td><td>33.0</td><td>-12.7</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>   |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1857.50 | 12.17 | V | 1.60 | 9.12 | 19.69 | 33.0 | -13.3 |  | 1857.50 | 15.82 | H | 1.60 | 9.12 | 23.34 | 33.0 | -9.7  |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 9.77 | V | 1.62 | 8.98 | 17.13 | 33.0 | -15.9 |  | 1880.00 | 14.29 | H | 1.62 | 8.98 | 21.65 | 33.0 | -11.4 |  | High Ch |  |  |  |  |  |  |  |  | 1902.50 | 7.91 | V | 1.63 | 8.83 | 15.11 | 33.0 | -17.9 |  | 1902.50 | 13.12 | H | 1.63 | 8.83 | 20.32 | 33.0 | -12.7 |  |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|---------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1857.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 12.17               | V                  | 1.60               | 9.12                  | 19.69         | 33.0           | -13.3          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1857.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15.82               | H                  | 1.60               | 9.12                  | 23.34         | 33.0           | -9.7           |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 9.77                | V                  | 1.62               | 8.98                  | 17.13         | 33.0           | -15.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 14.29               | H                  | 1.62               | 8.98                  | 21.65         | 33.0           | -11.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1902.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7.91                | V                  | 1.63               | 8.83                  | 15.11         | 33.0           | -17.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1902.50                                     | 13.12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                   | 1.63               | 8.83               | 20.32                 | 33.0          | -12.7          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| LTE<br><br>Band 2<br><br>15MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-23-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 16QAM, 15MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1857.50</td><td>11.02</td><td>V</td><td>1.60</td><td>9.12</td><td>18.54</td><td>33.0</td><td>-14.5</td><td></td></tr><tr><td>1857.50</td><td>14.60</td><td>H</td><td>1.60</td><td>9.12</td><td>22.12</td><td>33.0</td><td>-10.9</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>6.73</td><td>V</td><td>1.62</td><td>8.98</td><td>14.09</td><td>33.0</td><td>-18.9</td><td></td></tr><tr><td>1880.00</td><td>13.50</td><td>H</td><td>1.62</td><td>8.98</td><td>20.86</td><td>33.0</td><td>-12.1</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1902.50</td><td>7.80</td><td>V</td><td>1.63</td><td>8.83</td><td>15.00</td><td>33.0</td><td>-18.0</td><td></td></tr><tr><td>1902.50</td><td>12.26</td><td>H</td><td>1.63</td><td>8.83</td><td>19.46</td><td>33.0</td><td>-13.5</td><td></td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1857.50 | 11.02 | V | 1.60 | 9.12 | 18.54 | 33.0 | -14.5 |  | 1857.50 | 14.60 | H | 1.60 | 9.12 | 22.12 | 33.0 | -10.9 |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 6.73 | V | 1.62 | 8.98 | 14.09 | 33.0 | -18.9 |  | 1880.00 | 13.50 | H | 1.62 | 8.98 | 20.86 | 33.0 | -12.1 |  | High Ch |  |  |  |  |  |  |  |  | 1902.50 | 7.80 | V | 1.63 | 8.83 | 15.00 | 33.0 | -18.0 |  | 1902.50 | 12.26 | H | 1.63 | 8.83 | 19.46 | 33.0 | -13.5 |  |
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1857.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 11.02               | V                  | 1.60               | 9.12                  | 18.54         | 33.0           | -14.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1857.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 14.60               | H                  | 1.60               | 9.12                  | 22.12         | 33.0           | -10.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6.73                | V                  | 1.62               | 8.98                  | 14.09         | 33.0           | -18.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 13.50               | H                  | 1.62               | 8.98                  | 20.86         | 33.0           | -12.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                             | 1902.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7.80                | V                  | 1.63               | 8.83                  | 15.00         | 33.0           | -18.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1902.50                                     | 12.26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H                   | 1.63               | 8.83               | 19.46                 | 33.0          | -13.5          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |

| LTE<br><br>Band 2<br><br>10MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 QPSK, 10MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1855.00</td><td>7.55</td><td>V</td><td>1.60</td><td>9.12</td><td>15.07</td><td>33.0</td><td>-17.9</td></tr><tr><td>1855.00</td><td>15.35</td><td>H</td><td>1.60</td><td>9.12</td><td>22.87</td><td>33.0</td><td>-10.1</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>6.87</td><td>V</td><td>1.62</td><td>8.98</td><td>14.23</td><td>33.0</td><td>-18.8</td></tr><tr><td>1880.00</td><td>14.71</td><td>H</td><td>1.62</td><td>8.98</td><td>22.07</td><td>33.0</td><td>-10.9</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1905.00</td><td>9.02</td><td>V</td><td>1.63</td><td>8.83</td><td>16.22</td><td>33.0</td><td>-16.8</td></tr><tr><td>1905.00</td><td>13.86</td><td>H</td><td>1.63</td><td>8.83</td><td>21.06</td><td>33.0</td><td>-11.9</td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>  |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1855.00 | 7.55 | V | 1.60 | 9.12 | 15.07 | 33.0 | -17.9 | 1855.00 | 15.35 | H | 1.60 | 9.12 | 22.87 | 33.0 | -10.1 | Mid Ch |  |  |  |  |  |  |  | 1880.00 | 6.87 | V | 1.62 | 8.98 | 14.23 | 33.0 | -18.8 | 1880.00 | 14.71 | H | 1.62 | 8.98 | 22.07 | 33.0 | -10.9 | High Ch |  |  |  |  |  |  |  | 1905.00 | 9.02 | V | 1.63 | 8.83 | 16.22 | 33.0 | -16.8 | 1905.00 | 13.86 | H | 1.63 | 8.83 | 21.06 | 33.0 | -11.9 |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|-------|--------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|-------|---------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|-------|
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1855.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 7.55                | V                  | 1.60               | 9.12                  | 15.07         | 33.0           | -17.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1855.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 15.35               | H                  | 1.60               | 9.12                  | 22.87         | 33.0           | -10.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6.87                | V                  | 1.62               | 8.98                  | 14.23         | 33.0           | -18.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 14.71               | H                  | 1.62               | 8.98                  | 22.07         | 33.0           | -10.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1905.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9.02                | V                  | 1.63               | 8.83                  | 16.22         | 33.0           | -16.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
| 1905.00                                     | 13.86                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | H                   | 1.63               | 8.83               | 21.06                 | 33.0          | -11.9          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
| LTE<br><br>Band 2<br><br>10MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 16QAM, 10MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1855.00</td><td>9.03</td><td>V</td><td>1.60</td><td>9.12</td><td>16.55</td><td>33.0</td><td>-16.5</td></tr><tr><td>1855.00</td><td>13.92</td><td>H</td><td>1.60</td><td>9.12</td><td>21.44</td><td>33.0</td><td>-11.6</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>5.30</td><td>V</td><td>1.62</td><td>8.98</td><td>12.66</td><td>33.0</td><td>-20.3</td></tr><tr><td>1880.00</td><td>13.54</td><td>H</td><td>1.62</td><td>8.98</td><td>20.90</td><td>33.0</td><td>-12.1</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1905.00</td><td>7.87</td><td>V</td><td>1.63</td><td>8.83</td><td>15.07</td><td>33.0</td><td>-17.9</td></tr><tr><td>1905.00</td><td>12.38</td><td>H</td><td>1.63</td><td>8.83</td><td>19.58</td><td>33.0</td><td>-13.4</td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1855.00 | 9.03 | V | 1.60 | 9.12 | 16.55 | 33.0 | -16.5 | 1855.00 | 13.92 | H | 1.60 | 9.12 | 21.44 | 33.0 | -11.6 | Mid Ch |  |  |  |  |  |  |  | 1880.00 | 5.30 | V | 1.62 | 8.98 | 12.66 | 33.0 | -20.3 | 1880.00 | 13.54 | H | 1.62 | 8.98 | 20.90 | 33.0 | -12.1 | High Ch |  |  |  |  |  |  |  | 1905.00 | 7.87 | V | 1.63 | 8.83 | 15.07 | 33.0 | -17.9 | 1905.00 | 12.38 | H | 1.63 | 8.83 | 19.58 | 33.0 | -13.4 |
|                                             | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1855.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9.03                | V                  | 1.60               | 9.12                  | 16.55         | 33.0           | -16.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1855.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 13.92               | H                  | 1.60               | 9.12                  | 21.44         | 33.0           | -11.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 5.30                | V                  | 1.62               | 8.98                  | 12.66         | 33.0           | -20.3          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 13.54               | H                  | 1.62               | 8.98                  | 20.90         | 33.0           | -12.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                             | 1905.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 7.87                | V                  | 1.63               | 8.83                  | 15.07         | 33.0           | -17.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
| 1905.00                                     | 12.38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | H                   | 1.63               | 8.83               | 19.58                 | 33.0          | -13.4          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |

| LTE<br><br>Band 2<br><br>5MHz<br><br>QPSK            | <div><div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div><div><div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 QPSK, 5MHz</div><div><div>Test Equipment:</div><div>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div></div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|---------|--|--|--|--|--|--|--|--|---------|-------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|
|                                                      | <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1852.50</td><td>10.38</td><td>V</td><td>1.60</td><td>9.12</td><td>17.90</td><td>33.0</td><td>-15.1</td><td></td></tr><tr><td>1852.50</td><td>14.70</td><td>H</td><td>1.60</td><td>9.12</td><td>22.22</td><td>33.0</td><td>-10.8</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>9.88</td><td>V</td><td>1.62</td><td>8.98</td><td>17.24</td><td>33.0</td><td>-15.8</td><td></td></tr><tr><td>1880.00</td><td>13.22</td><td>H</td><td>1.62</td><td>8.98</td><td>20.58</td><td>33.0</td><td>-12.4</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1907.50</td><td>10.43</td><td>V</td><td>1.63</td><td>8.83</td><td>17.63</td><td>33.0</td><td>-15.4</td><td></td></tr><tr><td>1907.50</td><td>13.99</td><td>H</td><td>1.63</td><td>8.83</td><td>21.19</td><td>33.0</td><td>-11.8</td><td></td></tr></table> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1852.50 | 10.38 | V | 1.60 | 9.12 | 17.90 | 33.0 | -15.1 |  | 1852.50 | 14.70 | H | 1.60 | 9.12 | 22.22 | 33.0 | -10.8 |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 9.88 | V | 1.62 | 8.98 | 17.24 | 33.0 | -15.8 |  | 1880.00 | 13.22 | H | 1.62 | 8.98 | 20.58 | 33.0 | -12.4 |  | High Ch |  |  |  |  |  |  |  |  | 1907.50 | 10.43 | V | 1.63 | 8.83 | 17.63 | 33.0 | -15.4 |  | 1907.50 | 13.99 | H | 1.63 | 8.83 | 21.19 | 33.0 | -11.8 |  |
|                                                      | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | 1852.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 10.38               | V                  | 1.60               | 9.12                  | 17.90         | 33.0           | -15.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | 1852.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 14.70               | H                  | 1.60               | 9.12                  | 22.22         | 33.0           | -10.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 9.88                | V                  | 1.62               | 8.98                  | 17.24         | 33.0           | -15.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 13.22               | H                  | 1.62               | 8.98                  | 20.58         | 33.0           | -12.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1907.50                                              | 10.43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | V                   | 1.63               | 8.83               | 17.63                 | 33.0          | -15.4          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1907.50                                              | 13.99                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | H                   | 1.63               | 8.83               | 21.19                 | 33.0          | -11.8          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| Rev. 3.17.11<br>Note: For Band 4 EIRP limit is 30dBm |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |       |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |

| LTE<br><br>Band 2<br><br>5MHz<br><br>16QAM           | <div><div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div><div><div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 16QAM, 5MHz</div><div><div>Test Equipment:</div><div>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div></div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|---------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|--|---------|-------|---|------|------|-------|------|-------|--|
|                                                      | <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1852.50</td><td>9.99</td><td>V</td><td>1.60</td><td>9.12</td><td>17.51</td><td>33.0</td><td>-15.5</td><td></td></tr><tr><td>1852.50</td><td>13.58</td><td>H</td><td>1.60</td><td>9.12</td><td>21.10</td><td>33.0</td><td>-11.9</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>8.56</td><td>V</td><td>1.62</td><td>8.98</td><td>15.92</td><td>33.0</td><td>-17.1</td><td></td></tr><tr><td>1880.00</td><td>11.21</td><td>H</td><td>1.62</td><td>8.98</td><td>18.57</td><td>33.0</td><td>-14.4</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1907.50</td><td>4.72</td><td>V</td><td>1.63</td><td>8.83</td><td>11.92</td><td>33.0</td><td>-21.1</td><td></td></tr><tr><td>1907.50</td><td>11.97</td><td>H</td><td>1.63</td><td>8.83</td><td>19.17</td><td>33.0</td><td>-13.8</td><td></td></tr></table> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1852.50 | 9.99 | V | 1.60 | 9.12 | 17.51 | 33.0 | -15.5 |  | 1852.50 | 13.58 | H | 1.60 | 9.12 | 21.10 | 33.0 | -11.9 |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 8.56 | V | 1.62 | 8.98 | 15.92 | 33.0 | -17.1 |  | 1880.00 | 11.21 | H | 1.62 | 8.98 | 18.57 | 33.0 | -14.4 |  | High Ch |  |  |  |  |  |  |  |  | 1907.50 | 4.72 | V | 1.63 | 8.83 | 11.92 | 33.0 | -21.1 |  | 1907.50 | 11.97 | H | 1.63 | 8.83 | 19.17 | 33.0 | -13.8 |  |
|                                                      | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | 1852.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 9.99                | V                  | 1.60               | 9.12                  | 17.51         | 33.0           | -15.5          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | 1852.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 13.58               | H                  | 1.60               | 9.12                  | 21.10         | 33.0           | -11.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 8.56                | V                  | 1.62               | 8.98                  | 15.92         | 33.0           | -17.1          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11.21               | H                  | 1.62               | 8.98                  | 18.57         | 33.0           | -14.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1907.50                                              | 4.72                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | V                   | 1.63               | 8.83               | 11.92                 | 33.0          | -21.1          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| 1907.50                                              | 11.97                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | H                   | 1.63               | 8.83               | 19.17                 | 33.0          | -13.8          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
| Rev. 3.17.11<br>Note: For Band 4 EIRP limit is 30dBm |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |
|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |  |         |       |   |      |      |       |      |       |  |

| LTE<br><br>Band 2<br><br>3MHz<br><br>QPSK  | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 QPSK, 3MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1851.50</td><td>9.71</td><td>V</td><td>1.60</td><td>9.12</td><td>17.23</td><td>33.0</td><td>-15.8</td></tr><tr><td>1851.50</td><td>13.45</td><td>H</td><td>1.60</td><td>9.12</td><td>20.97</td><td>33.0</td><td>-12.0</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>6.65</td><td>V</td><td>1.62</td><td>8.98</td><td>14.01</td><td>33.0</td><td>-19.0</td></tr><tr><td>1880.00</td><td>13.27</td><td>H</td><td>1.62</td><td>8.98</td><td>20.63</td><td>33.0</td><td>-12.4</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1908.50</td><td>6.99</td><td>V</td><td>1.63</td><td>8.83</td><td>14.19</td><td>33.0</td><td>-18.8</td></tr><tr><td>1908.50</td><td>13.20</td><td>H</td><td>1.63</td><td>8.83</td><td>20.40</td><td>33.0</td><td>-12.6</td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div>  |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1851.50 | 9.71 | V | 1.60 | 9.12 | 17.23 | 33.0 | -15.8 | 1851.50 | 13.45 | H | 1.60 | 9.12 | 20.97 | 33.0 | -12.0 | Mid Ch |  |  |  |  |  |  |  | 1880.00 | 6.65 | V | 1.62 | 8.98 | 14.01 | 33.0 | -19.0 | 1880.00 | 13.27 | H | 1.62 | 8.98 | 20.63 | 33.0 | -12.4 | High Ch |  |  |  |  |  |  |  | 1908.50 | 6.99 | V | 1.63 | 8.83 | 14.19 | 33.0 | -18.8 | 1908.50 | 13.20 | H | 1.63 | 8.83 | 20.40 | 33.0 | -12.6 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|----------|---------------------|--------------------|--------------------|-----------------------|---------------|----------------|----------------|-------|--------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|-------|--------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|-------|---------|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|-------|---------|-------|---|------|------|-------|------|-------|
|                                            | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1851.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 9.71                | V                  | 1.60               | 9.12                  | 17.23         | 33.0           | -15.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1851.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 13.45               | H                  | 1.60               | 9.12                  | 20.97         | 33.0           | -12.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6.65                | V                  | 1.62               | 8.98                  | 14.01         | 33.0           | -19.0          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 13.27               | H                  | 1.62               | 8.98                  | 20.63         | 33.0           | -12.4          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1908.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6.99                | V                  | 1.63               | 8.83                  | 14.19         | 33.0           | -18.8          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
| 1908.50                                    | 13.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | H                   | 1.63               | 8.83               | 20.40                 | 33.0          | -12.6          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
| LTE<br><br>Band 2<br><br>3MHz<br><br>16QAM | <div>High Frequency Substitution Measurement<br/>UL Korea, Ltd. Suwon Laboratory Chamber 1</div> <div>Company: Samsung<br/>Project #: 15K20515<br/>Date: 04-20-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / Z-Position<br/>Mode: LTE Band 2 16QAM, 3MHz</div> <div>Test Equipment:<br/>Receiving: 3117, and Chamber 1 SMA Cables<br/>Substitution: 3115 Substitution, 3m SMA Cable Warehouse</div> <table><tr><th>f<br/>MHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Cable Loss<br/>(dB)</th><th>Antenna Gain<br/>(dBi)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Margin<br/>(dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1851.50</td><td>9.88</td><td>V</td><td>1.60</td><td>9.12</td><td>17.40</td><td>33.0</td><td>-15.6</td></tr><tr><td>1851.50</td><td>11.29</td><td>H</td><td>1.60</td><td>9.12</td><td>18.81</td><td>33.0</td><td>-14.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>7.76</td><td>V</td><td>1.62</td><td>8.98</td><td>15.12</td><td>33.0</td><td>-17.9</td></tr><tr><td>1880.00</td><td>11.72</td><td>H</td><td>1.62</td><td>8.98</td><td>19.08</td><td>33.0</td><td>-13.9</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1908.50</td><td>5.19</td><td>V</td><td>1.63</td><td>8.83</td><td>12.39</td><td>33.0</td><td>-20.6</td></tr><tr><td>1908.50</td><td>12.09</td><td>H</td><td>1.63</td><td>8.83</td><td>19.29</td><td>33.0</td><td>-13.7</td></tr></table> <div>Rev. 3.17.11<br/>Note: For Band 4 EIRP limit is 30dBm</div> |                     |                    |                    |                       |               |                |                |       | f<br>MHz | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes | Low Ch |  |  |  |  |  |  |  | 1851.50 | 9.88 | V | 1.60 | 9.12 | 17.40 | 33.0 | -15.6 | 1851.50 | 11.29 | H | 1.60 | 9.12 | 18.81 | 33.0 | -14.2 | Mid Ch |  |  |  |  |  |  |  | 1880.00 | 7.76 | V | 1.62 | 8.98 | 15.12 | 33.0 | -17.9 | 1880.00 | 11.72 | H | 1.62 | 8.98 | 19.08 | 33.0 | -13.9 | High Ch |  |  |  |  |  |  |  | 1908.50 | 5.19 | V | 1.63 | 8.83 | 12.39 | 33.0 | -20.6 | 1908.50 | 12.09 | H | 1.63 | 8.83 | 19.29 | 33.0 | -13.7 |
|                                            | f<br>MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Cable Loss<br>(dB) | Antenna Gain<br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1851.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 9.88                | V                  | 1.60               | 9.12                  | 17.40         | 33.0           | -15.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1851.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 11.29               | H                  | 1.60               | 9.12                  | 18.81         | 33.0           | -14.2          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7.76                | V                  | 1.62               | 8.98                  | 15.12         | 33.0           | -17.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 11.72               | H                  | 1.62               | 8.98                  | 19.08         | 33.0           | -13.9          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                    |                    |                       |               |                |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
|                                            | 1908.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5.19                | V                  | 1.63               | 8.83                  | 12.39         | 33.0           | -20.6          |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |
| 1908.50                                    | 12.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | H                   | 1.63               | 8.83               | 19.29                 | 33.0          | -13.7          |                |       |          |                     |                    |                    |                       |               |                |                |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |        |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |         |  |  |  |  |  |  |  |         |      |   |      |      |       |      |       |         |       |   |      |      |       |      |       |

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|-------------------|---------------------|--------------|--------------|---------------|--------------|
| LTE<br>Band 2<br>1.4MHz<br>QPSK                      | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b><br><br><b>Company:</b> Samsung<br><b>Project #:</b> 15K20515<br><b>Date:</b> 04-20-15<br><b>Test Engineer:</b> Steven.Kim<br><b>Configuration:</b> EUT / Z-Position<br><b>Mode:</b> LTE Band 2 QPSK, 1.4MHz<br><br><b>Test Equipment:</b><br>Receiving: 3117, and Chamber 1 SMA Cables<br>Substitution: 3115 Substitution, 3m SMA Cable Warehouse  |                   |                  |                   |                     |              |              |               |              |
|                                                      | <b>f</b>                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>SG reading</b> | <b>Ant. Pol.</b> | <b>Cable Loss</b> | <b>Antenna Gain</b> | <b>EIRP</b>  | <b>Limit</b> | <b>Margin</b> | <b>Notes</b> |
|                                                      | <b>MHz</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>(dBm)</b>      | <b>(H/V)</b>     | <b>(dB)</b>       | <b>(dBi)</b>        | <b>(dBm)</b> | <b>(dBm)</b> | <b>(dB)</b>   |              |
|                                                      | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                      | 1850.70                                                                                                                                                                                                                                                                                                                                                                                                                                               | 9.32              | V                | 1.60              | 9.12                | 16.84        | 33.0         | -16.2         |              |
|                                                      | 1850.70                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.55             | H                | 1.60              | 9.12                | 22.07        | 33.0         | -10.9         |              |
|                                                      | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                      | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                               | 8.57              | V                | 1.62              | 8.98                | 15.93        | 33.0         | -17.1         |              |
|                                                      | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12.22             | H                | 1.62              | 8.98                | 19.58        | 33.0         | -13.4         |              |
|                                                      | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                                      | 1909.30                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.53              | V                | 1.63              | 8.83                | 10.73        | 33.0         | -22.3         |              |
|                                                      | 1909.30                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12.97             | H                | 1.63              | 8.83                | 20.17        | 33.0         | -12.8         |              |
| Rev. 3.17.11<br>Note: For Band 4 EIRP limit is 30dBm |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
| LTE<br>Band 2<br>1.4MHz<br>16QAM                     | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b><br><br><b>Company:</b> Samsung<br><b>Project #:</b> 15K20515<br><b>Date:</b> 04-18-15<br><b>Test Engineer:</b> Steven.Kim<br><b>Configuration:</b> EUT / Z-Position<br><b>Mode:</b> LTE Band 2 16QAM, 1.4MHz<br><br><b>Test Equipment:</b><br>Receiving: 3117, and Chamber 1 SMA Cables<br>Substitution: 3115 Substitution, 3m SMA Cable Warehouse |                   |                  |                   |                     |              |              |               |              |
|                                                      | <b>f</b>                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>SG reading</b> | <b>Ant. Pol.</b> | <b>Cable Loss</b> | <b>Antenna Gain</b> | <b>EIRP</b>  | <b>Limit</b> | <b>Margin</b> | <b>Notes</b> |
|                                                      | <b>MHz</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>(dBm)</b>      | <b>(H/V)</b>     | <b>(dB)</b>       | <b>(dBi)</b>        | <b>(dBm)</b> | <b>(dBm)</b> | <b>(dB)</b>   |              |
|                                                      | Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                      | 1850.70                                                                                                                                                                                                                                                                                                                                                                                                                                               | 7.74              | V                | 1.60              | 9.12                | 15.26        | 33.0         | -17.7         |              |
|                                                      | 1850.70                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10.78             | H                | 1.60              | 9.12                | 18.30        | 33.0         | -14.7         |              |
|                                                      | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                      | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.10              | V                | 1.62              | 8.98                | 10.46        | 33.0         | -22.5         |              |
|                                                      | 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10.77             | H                | 1.62              | 8.98                | 18.13        | 33.0         | -14.9         |              |
|                                                      | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                                      | 1909.30                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.62              | V                | 1.63              | 8.83                | 10.82        | 33.0         | -22.2         |              |
|                                                      | 1909.30                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11.61             | H                | 1.63              | 8.83                | 18.81        | 33.0         | -14.2         |              |
| Rev. 3.17.11<br>Note: For Band 4 EIRP limit is 30dBm |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |

## **11.2. FIELD STRENGTH OF SPURIOUS RADIATION**

### **RULE PART(S)**

FCC: §2.1053, §22.917, §24.238, §27.53

### **LIMIT**

Part 22.917(a) & Part 24.238(a) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

Part 27.53(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

### **TEST PROCEDURE**

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

### **RESULTS**

## 11.2.1. SPURIOUS RADIATION PLOTS

### GSM 850

|                                                                      |                                                                                      | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                    |                 |                |                |               |                |               |       |  |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|--|
| GSM<br><br>GSM850<br>GPRS                                            | Company:                                                                             | Samsung                                                                              |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Project #:                                                                           | 15K20515                                                                             |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Date:                                                                                | 04-24-15                                                                             |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Test Engineer:                                                                       | Steven.Kim                                                                           |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Configuration:                                                                       | EUT / AC Adapter / Earphone, Y Position                                              |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Mode:                                                                                | GPRS 850 MHz                                                                         |                    |                 |                |                |               |                |               |       |  |
|                                                                      | <div>Chamber</div> <div>Chamber 1</div>                                              |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | <div>Pre-amplifier</div> <div>AFS42</div>                                            |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | <div>Filter</div> <div>Filter 1</div>                                                |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | <div>Limit</div> <div>Part 22</div>                                                  |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | f<br>GHz                                                                             | SG reading<br>(dBm)                                                                  | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
|                                                                      | Low Ch, 824.2MHz                                                                     |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | 1.6484                                                                               | 12.9                                                                                 | V                  | 3.0             | 40.2           | 1.0            | -26.3         | -13.0          | -13.3         |       |  |
|                                                                      | 2.4726                                                                               | 0.8                                                                                  | V                  | 3.0             | 40.1           | 1.0            | -38.3         | -13.0          | -25.3         |       |  |
|                                                                      | 3.2968                                                                               | -21.9                                                                                | V                  | 3.0             | 39.6           | 1.0            | -60.5         | -13.0          | -47.5         |       |  |
|                                                                      | 1.6484                                                                               | 7.0                                                                                  | H                  | 3.0             | 40.2           | 1.0            | -32.2         | -13.0          | -19.2         |       |  |
|                                                                      | 2.4726                                                                               | 1.3                                                                                  | H                  | 3.0             | 40.1           | 1.0            | -37.8         | -13.0          | -24.8         |       |  |
|                                                                      | 3.2968                                                                               | -21.5                                                                                | H                  | 3.0             | 39.6           | 1.0            | -60.1         | -13.0          | -47.1         |       |  |
|                                                                      | Mid Ch, 836.6MHz                                                                     |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | 1.6730                                                                               | 15.3                                                                                 | V                  | 3.0             | 40.2           | 1.0            | -23.8         | -13.0          | -10.8         |       |  |
|                                                                      | 2.5098                                                                               | 0.5                                                                                  | V                  | 3.0             | 40.1           | 1.0            | -38.6         | -13.0          | -25.6         |       |  |
|                                                                      | 3.3464                                                                               | -19.0                                                                                | V                  | 3.0             | 39.6           | 1.0            | -57.6         | -13.0          | -44.6         |       |  |
|                                                                      | 1.6730                                                                               | 9.6                                                                                  | H                  | 3.0             | 40.2           | 1.0            | -29.6         | -13.0          | -16.6         |       |  |
|                                                                      | 2.5098                                                                               | 2.6                                                                                  | H                  | 3.0             | 40.1           | 1.0            | -36.5         | -13.0          | -23.5         |       |  |
|                                                                      | 3.3464                                                                               | -20.5                                                                                | H                  | 3.0             | 39.6           | 1.0            | -59.1         | -13.0          | -46.1         |       |  |
|                                                                      | High Ch, 848.8MHz                                                                    |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | 1.6976                                                                               | 12.3                                                                                 | V                  | 3.0             | 40.2           | 1.0            | -26.9         | -13.0          | -13.9         |       |  |
|                                                                      | 2.5466                                                                               | -2.7                                                                                 | V                  | 3.0             | 40.1           | 1.0            | -41.8         | -13.0          | -28.8         |       |  |
|                                                                      | 3.3952                                                                               | -18.7                                                                                | V                  | 3.0             | 39.5           | 1.0            | -57.2         | -13.0          | -44.2         |       |  |
|                                                                      | 1.6976                                                                               | 6.4                                                                                  | H                  | 3.0             | 40.2           | 1.0            | -32.8         | -13.0          | -19.8         |       |  |
|                                                                      | 2.5466                                                                               | 2.5                                                                                  | H                  | 3.0             | 40.1           | 1.0            | -36.6         | -13.0          | -23.6         |       |  |
|                                                                      | 3.3952                                                                               | -17.0                                                                                | H                  | 3.0             | 39.5           | 1.0            | -55.5         | -13.0          | -42.5         |       |  |
| Rev. 03.03.09                                                        |                                                                                      |                                                                                      |                    |                 |                |                |               |                |               |       |  |
| Note: No other emissions were detected above the system noise floor. |                                                                                      |                                                                                      |                    |                 |                |                |               |                |               |       |  |
| GSM<br><br>GSM850<br>EGPRS                                           | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Company:                                                                             | Samsung                                                                              |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Project #:                                                                           | 15K20515                                                                             |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Date:                                                                                | 04-24-15                                                                             |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Test Engineer:                                                                       | Steven.Kim                                                                           |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Configuration:                                                                       | EUT / AC Adapter / Earphone, Y Position                                              |                    |                 |                |                |               |                |               |       |  |
|                                                                      | Mode:                                                                                | EGPRS 850 MHz                                                                        |                    |                 |                |                |               |                |               |       |  |
|                                                                      | <div>Chamber</div> <div>Chamber 1</div>                                              |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | <div>Pre-amplifier</div> <div>AFS42</div>                                            |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | <div>Filter</div> <div>Filter 1</div>                                                |                                                                                      |                    |                 |                |                |               |                |               |       |  |
| <div>Limit</div> <div>Part 22</div>                                  |                                                                                      |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | f<br>GHz                                                                             | SG reading<br>(dBm)                                                                  | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
|                                                                      | Low Ch, 824.2MHz                                                                     |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | 1.6484                                                                               |                                                                                      | V                  | 3.0             | 40.2           | 1.0            | -39.2         | -13.0          | -26.2         |       |  |
|                                                                      | 2.4726                                                                               |                                                                                      | V                  | 3.0             | 40.1           | 1.0            | -39.1         | -13.0          | -26.1         |       |  |
|                                                                      | 3.2968                                                                               |                                                                                      | V                  | 3.0             | 39.6           | 1.0            | -38.6         | -13.0          | -25.6         |       |  |
|                                                                      | 1.6484                                                                               |                                                                                      | H                  | 3.0             | 40.2           | 1.0            | -39.2         | -13.0          | -26.2         |       |  |
|                                                                      | 2.4726                                                                               |                                                                                      | H                  | 3.0             | 40.1           | 1.0            | -39.1         | -13.0          | -26.1         |       |  |
|                                                                      | 3.2968                                                                               |                                                                                      | H                  | 3.0             | 39.6           | 1.0            | -38.6         | -13.0          | -25.6         |       |  |
|                                                                      | Mid Ch, 836.6MHz                                                                     |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | 1.6730                                                                               | 1.5                                                                                  | V                  | 3.0             | 40.2           | 1.0            | -37.7         | -13.0          | -24.7         |       |  |
|                                                                      | 2.5098                                                                               | -13.3                                                                                | V                  | 3.0             | 40.1           | 1.0            | -52.4         | -13.0          | -39.4         |       |  |
|                                                                      | 3.3464                                                                               | -22.1                                                                                | V                  | 3.0             | 39.6           | 1.0            | -60.7         | -13.0          | -47.7         |       |  |
|                                                                      | 1.6730                                                                               | -6.8                                                                                 | H                  | 3.0             | 40.2           | 1.0            | -46.0         | -13.0          | -33.0         |       |  |
|                                                                      | 2.5098                                                                               | -12.3                                                                                | H                  | 3.0             | 40.1           | 1.0            | -51.4         | -13.0          | -38.4         |       |  |
|                                                                      | 3.3464                                                                               | -21.7                                                                                | H                  | 3.0             | 39.6           | 1.0            | -60.3         | -13.0          | -47.3         |       |  |
|                                                                      | High Ch, 848.8MHz                                                                    |                                                                                      |                    |                 |                |                |               |                |               |       |  |
|                                                                      | 1.6976                                                                               | 2.1                                                                                  | V                  | 3.0             | 40.2           | 1.0            | -37.1         | -13.0          | -24.1         |       |  |
|                                                                      | 2.5466                                                                               | -11.9                                                                                | V                  | 3.0             | 40.1           | 1.0            | -50.9         | -13.0          | -37.9         |       |  |
|                                                                      | 3.3952                                                                               | -21.4                                                                                | V                  | 3.0             | 39.5           | 1.0            | -59.9         | -13.0          | -46.9         |       |  |
|                                                                      | 1.6976                                                                               | -1.5                                                                                 | H                  | 3.0             | 40.2           | 1.0            | -40.7         | -13.0          | -27.7         |       |  |
|                                                                      | 2.5466                                                                               | -15.1                                                                                | H                  | 3.0             | 40.1           | 1.0            | -54.1         | -13.0          | -41.1         |       |  |
|                                                                      | 3.3952                                                                               | -19.8                                                                                | H                  | 3.0             | 39.5           | 1.0            | -58.3         | -13.0          | -45.3         |       |  |
| Rev. 03.03.09                                                        |                                                                                      |                                                                                      |                    |                 |                |                |               |                |               |       |  |
| Note: No other emissions were detected above the system noise floor. |                                                                                      |                                                                                      |                    |                 |                |                |               |                |               |       |  |

**GSM 1900**

|                        |                                                                                                                                                                                                                                                                                                                                                            |                     |                    |                 |                |                |               |                |               |       |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| GSM<br>GSM1900<br>GPRS | <p align="center"><b>UL Korea, Ltd Suwon Laboratory</b><br/><b>Above 1GHz High Frequency Substitution Measurement</b></p> <p> <b>Company:</b> Samsung<br/> <b>Project #:</b> 15K20515<br/> <b>Date:</b> 04-24-15<br/> <b>Test Engineer:</b> Steven.Kim<br/> <b>Configuration:</b> EUT / AC Adapter / Earphone, Z Position<br/> <b>Mode:</b> GPRS 1900 </p> |                     |                    |                 |                |                |               |                |               |       |
|                        | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>Part 24</div> </div>                                                                                                                                            |                     |                    |                 |                |                |               |                |               |       |
|                        | f<br>GHz                                                                                                                                                                                                                                                                                                                                                   | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                        | <b>Low Ch, 1850.2MHz</b>                                                                                                                                                                                                                                                                                                                                   |                     |                    |                 |                |                |               |                |               |       |
|                        | 3.7004                                                                                                                                                                                                                                                                                                                                                     | -19.3               | V                  | 3.0             | 39.2           | 1.0            | -57.5         | -13.0          | -44.5         |       |
|                        | 5.5506                                                                                                                                                                                                                                                                                                                                                     | -0.4                | V                  | 3.0             | 40.0           | 1.0            | -39.4         | -13.0          | -26.4         |       |
|                        | 7.4008                                                                                                                                                                                                                                                                                                                                                     | 3.7                 | V                  | 3.0             | 39.2           | 1.0            | -34.5         | -13.0          | -21.5         |       |
|                        | 3.7000                                                                                                                                                                                                                                                                                                                                                     | -19.5               | H                  | 3.0             | 39.2           | 1.0            | -57.6         | -13.0          | -44.6         |       |
|                        | 5.5506                                                                                                                                                                                                                                                                                                                                                     | 2.2                 | H                  | 3.0             | 40.0           | 1.0            | -36.8         | -13.0          | -23.8         |       |
|                        | 7.4008                                                                                                                                                                                                                                                                                                                                                     | -1.5                | H                  | 3.0             | 39.2           | 1.0            | -39.7         | -13.0          | -26.7         |       |
|                        | <b>Mid Ch, 1880.0MHz</b>                                                                                                                                                                                                                                                                                                                                   |                     |                    |                 |                |                |               |                |               |       |
|                        | 3.7600                                                                                                                                                                                                                                                                                                                                                     | -11.7               | V                  | 3.0             | 39.1           | 1.0            | -49.8         | -13.0          | -36.8         |       |
|                        | 5.6400                                                                                                                                                                                                                                                                                                                                                     | 1.0                 | V                  | 3.0             | 39.9           | 1.0            | -37.9         | -13.0          | -24.9         |       |
|                        | 7.5200                                                                                                                                                                                                                                                                                                                                                     | 1.0                 | V                  | 3.0             | 39.1           | 1.0            | -37.1         | -13.0          | -24.1         |       |
|                        | 3.7600                                                                                                                                                                                                                                                                                                                                                     | -15.2               | H                  | 3.0             | 39.1           | 1.0            | -53.3         | -13.0          | -40.3         |       |
|                        | 5.6400                                                                                                                                                                                                                                                                                                                                                     | 3.1                 | H                  | 3.0             | 39.9           | 1.0            | -35.8         | -13.0          | -22.8         |       |
|                        | 7.5200                                                                                                                                                                                                                                                                                                                                                     | -2.8                | H                  | 3.0             | 39.1           | 1.0            | -41.0         | -13.0          | -28.0         |       |
|                        | <b>High Ch, 1909.8 MHz</b>                                                                                                                                                                                                                                                                                                                                 |                     |                    |                 |                |                |               |                |               |       |
|                        | 3.8196                                                                                                                                                                                                                                                                                                                                                     | -7.0                | V                  | 3.0             | 39.0           | 1.0            | -45.1         | -13.0          | -32.1         |       |
|                        | 5.7294                                                                                                                                                                                                                                                                                                                                                     | -9.0                | V                  | 3.0             | 39.9           | 1.0            | -47.9         | -13.0          | -34.9         |       |
|                        | 7.6392                                                                                                                                                                                                                                                                                                                                                     | -0.5                | V                  | 3.0             | 39.1           | 1.0            | -38.6         | -13.0          | -25.6         |       |
|                        | 3.8196                                                                                                                                                                                                                                                                                                                                                     | -9.3                | H                  | 3.0             | 39.0           | 1.0            | -47.4         | -13.0          | -34.4         |       |
|                        | 5.7294                                                                                                                                                                                                                                                                                                                                                     | -3.5                | H                  | 3.0             | 39.9           | 1.0            | -42.4         | -13.0          | -29.4         |       |
|                        | 7.6392                                                                                                                                                                                                                                                                                                                                                     | -3.8                | H                  | 3.0             | 39.1           | 1.0            | -41.9         | -13.0          | -28.9         |       |
|                        | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                                                                      |                     |                    |                 |                |                |               |                |               |       |

|                         |                                                                                                                                                                                                                                                                                                                                                                 |                     |                    |                 |                |                |               |                |               |       |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| GSM<br>GSM1900<br>EGPRS | <p align="center"><b>UL Korea, Ltd Suwon Laboratory</b><br/><b>Above 1GHz High Frequency Substitution Measurement</b></p> <p> <b>Company:</b> Samsung<br/> <b>Project #:</b> 15K20515<br/> <b>Date:</b> 04-24-15<br/> <b>Test Engineer:</b> Steven.Kim<br/> <b>Configuration:</b> EUT / AC Adapter / Earphone, Z Position<br/> <b>Mode:</b> EGPRS 1900 MHz </p> |                     |                    |                 |                |                |               |                |               |       |
|                         | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>Part 24</div> </div>                                                                                                                                                 |                     |                    |                 |                |                |               |                |               |       |
|                         | f<br>GHz                                                                                                                                                                                                                                                                                                                                                        | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                         | <b>Low Ch, 1850.2MHz</b>                                                                                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |               |                |               |       |
|                         | 3.7004                                                                                                                                                                                                                                                                                                                                                          | -13.8               | V                  | 3.0             | 39.2           | 1.0            | -52.0         | -13.0          | -39.0         |       |
|                         | 5.5506                                                                                                                                                                                                                                                                                                                                                          | -12.4               | V                  | 3.0             | 40.0           | 1.0            | -51.4         | -13.0          | -38.4         |       |
|                         | 7.4008                                                                                                                                                                                                                                                                                                                                                          | 0.4                 | V                  | 3.0             | 39.2           | 1.0            | -37.8         | -13.0          | -24.8         |       |
|                         | 3.7000                                                                                                                                                                                                                                                                                                                                                          | -15.2               | H                  | 3.0             | 39.2           | 1.0            | -53.4         | -13.0          | -40.4         |       |
|                         | 5.5500                                                                                                                                                                                                                                                                                                                                                          | -9.7                | H                  | 3.0             | 40.0           | 1.0            | -48.6         | -13.0          | -35.6         |       |
|                         | 7.4000                                                                                                                                                                                                                                                                                                                                                          | -2.9                | H                  | 3.0             | 39.2           | 1.0            | -41.1         | -13.0          | -28.1         |       |
|                         | <b>Mid Ch, 1880.0MHz</b>                                                                                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |               |                |               |       |
|                         | 3.7600                                                                                                                                                                                                                                                                                                                                                          | -11.2               | V                  | 3.0             | 39.1           | 1.0            | -49.3         | -13.0          | -36.3         |       |
|                         | 5.6400                                                                                                                                                                                                                                                                                                                                                          | -14.4               | V                  | 3.0             | 39.9           | 1.0            | -53.3         | -13.0          | -40.3         |       |
|                         | 7.5200                                                                                                                                                                                                                                                                                                                                                          | -1.3                | V                  | 3.0             | 39.1           | 1.0            | -39.5         | -13.0          | -26.5         |       |
|                         | 3.7600                                                                                                                                                                                                                                                                                                                                                          | -13.1               | H                  | 3.0             | 39.1           | 1.0            | -51.2         | -13.0          | -38.2         |       |
|                         | 5.6400                                                                                                                                                                                                                                                                                                                                                          | -7.4                | H                  | 3.0             | 39.9           | 1.0            | -46.4         | -13.0          | -33.4         |       |
|                         | 7.5200                                                                                                                                                                                                                                                                                                                                                          | -6.8                | H                  | 3.0             | 39.1           | 1.0            | -45.0         | -13.0          | -32.0         |       |
|                         | <b>High Ch, 1909.8 MHz</b>                                                                                                                                                                                                                                                                                                                                      |                     |                    |                 |                |                |               |                |               |       |
|                         | 3.8196                                                                                                                                                                                                                                                                                                                                                          | -7.2                | V                  | 3.0             | 39.0           | 1.0            | -45.2         | -13.0          | -32.2         |       |
|                         | 5.7294                                                                                                                                                                                                                                                                                                                                                          | -12.4               | V                  | 3.0             | 39.9           | 1.0            | -51.2         | -13.0          | -38.2         |       |
|                         | 7.6392                                                                                                                                                                                                                                                                                                                                                          | -3.5                | V                  | 3.0             | 39.1           | 1.0            | -41.6         | -13.0          | -28.6         |       |
|                         | 3.8196                                                                                                                                                                                                                                                                                                                                                          | -10.4               | H                  | 3.0             | 39.0           | 1.0            | -48.4         | -13.0          | -35.4         |       |
|                         | 5.7294                                                                                                                                                                                                                                                                                                                                                          | -10.5               | H                  | 3.0             | 39.9           | 1.0            | -49.4         | -13.0          | -36.4         |       |
|                         | 7.6392                                                                                                                                                                                                                                                                                                                                                          | -8.4                | H                  | 3.0             | 39.1           | 1.0            | -46.5         | -13.0          | -33.5         |       |
|                         | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                                                                           |                     |                    |                 |                |                |               |                |               |       |

**WCDMA Band 5**

|                          |  | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement  |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
|--------------------------|--|---------------------------------------------------------------------------------------|---------------------|---------------------|-----------------|----------------|----------------|---------------------------|----------------|---------------------------------------------------------|-------|------------------------|
|                          |  | Company: Samsung                                                                      |                     | Project #: 15K20515 |                 | Date: 05-01-15 |                | Test Engineer: Steven Kim |                | Configuration: EUT / AC Adapter / Earphone / Y Position |       | Mode: Tx, REL99,850MHz |
| WCDMA<br>Band 5<br>REL99 |  | Chamber                                                                               |                     | Pre-amplifier       |                 | Filter         |                | Limit                     |                |                                                         |       |                        |
|                          |  | Chamber 1                                                                             |                     | AFS42               |                 | Filter 1       |                | Part 24                   |                |                                                         |       |                        |
|                          |  | f<br>GHz                                                                              | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)  | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm)             | Limit<br>(dBm) | Delta<br>(dB)                                           | Notes |                        |
|                          |  | Low Ch, 826.40MHz                                                                     |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
|                          |  | 1.6520                                                                                | -19.8               | V                   | 3.0             | 40.2           | 1.0            | -59.0                     | -13.0          | -46.0                                                   |       |                        |
|                          |  | 2.4790                                                                                | -9.8                | V                   | 3.0             | 40.1           | 1.0            | -48.8                     | -13.0          | -35.8                                                   |       |                        |
|                          |  | 3.3056                                                                                | -23.0               | V                   | 3.0             | 39.6           | 1.0            | -61.6                     | -13.0          | -48.6                                                   |       |                        |
|                          |  | 1.6520                                                                                | -20.3               | H                   | 3.0             | 40.2           | 1.0            | -59.5                     | -13.0          | -46.5                                                   |       |                        |
|                          |  | 2.4790                                                                                | -5.9                | H                   | 3.0             | 40.1           | 1.0            | -45.0                     | -13.0          | -32.0                                                   |       |                        |
|                          |  | 3.3056                                                                                | -23.0               | H                   | 3.0             | 39.6           | 1.0            | -61.6                     | -13.0          | -48.6                                                   |       |                        |
|                          |  | Mid Ch, 836.6MHz                                                                      |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
|                          |  | 1.6732                                                                                | -22.1               | V                   | 3.0             | 40.2           | 1.0            | -61.3                     | -13.0          | -48.3                                                   |       |                        |
|                          |  | 2.5098                                                                                | -12.2               | V                   | 3.0             | 40.1           | 1.0            | -51.3                     | -13.0          | -38.3                                                   |       |                        |
|                          |  | 3.3464                                                                                | -22.1               | V                   | 3.0             | 39.6           | 1.0            | -60.6                     | -13.0          | -47.6                                                   |       |                        |
|                          |  | 1.6732                                                                                | -20.3               | H                   | 3.0             | 40.2           | 1.0            | -59.5                     | -13.0          | -46.5                                                   |       |                        |
|                          |  | 2.5098                                                                                | -7.9                | H                   | 3.0             | 40.1           | 1.0            | -46.9                     | -13.0          | -33.9                                                   |       |                        |
|                          |  | 3.3464                                                                                | -22.3               | H                   | 3.0             | 39.6           | 1.0            | -60.8                     | -13.0          | -47.8                                                   |       |                        |
|                          |  | High Ch, 846.6MHz                                                                     |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
|                          |  | 1.6932                                                                                | -21.2               | V                   | 3.0             | 40.2           | 1.0            | -60.3                     | -13.0          | -47.3                                                   |       |                        |
|                          |  | 2.5390                                                                                | -6.4                | V                   | 3.0             | 40.1           | 1.0            | -45.5                     | -13.0          | -32.5                                                   |       |                        |
|                          |  | 3.3860                                                                                | -21.1               | V                   | 3.0             | 39.5           | 1.0            | -59.6                     | -13.0          | -46.6                                                   |       |                        |
|                          |  | 1.6932                                                                                | -20.4               | H                   | 3.0             | 40.2           | 1.0            | -59.5                     | -13.0          | -46.5                                                   |       |                        |
|                          |  | 2.5390                                                                                | -8.5                | H                   | 3.0             | 40.1           | 1.0            | -47.6                     | -13.0          | -34.6                                                   |       |                        |
|                          |  | 3.3860                                                                                | -21.1               | H                   | 3.0             | 39.5           | 1.0            | -59.6                     | -13.0          | -46.6                                                   |       |                        |
|                          |  | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
| WCDMA<br>Band 5<br>HSDPA |  | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement  |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
|                          |  | Company: Samsung                                                                      |                     | Project #: 15K20515 |                 | Date: 05-01-15 |                | Test Engineer: Steven Kim |                | Configuration: EUT / AC Adapter / Earphone / Y Position |       | Mode: Tx, HSDPA,850MHz |
|                          |  | Chamber                                                                               |                     | Pre-amplifier       |                 | Filter         |                | Limit                     |                |                                                         |       |                        |
|                          |  | Chamber 1                                                                             |                     | AFS42               |                 | Filter 1       |                | Part 24                   |                |                                                         |       |                        |
|                          |  | f<br>GHz                                                                              | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)  | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm)             | Limit<br>(dBm) | Delta<br>(dB)                                           | Notes |                        |
|                          |  | Low Ch, 826.40MHz                                                                     |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
|                          |  | 1.6520                                                                                | -19.4               | V                   | 3.0             | 40.2           | 1.0            | -58.5                     | -13.0          | -45.5                                                   |       |                        |
|                          |  | 2.4790                                                                                | -8.8                | V                   | 3.0             | 40.1           | 1.0            | -47.9                     | -13.0          | -34.9                                                   |       |                        |
|                          |  | 3.3056                                                                                | -23.0               | V                   | 3.0             | 39.6           | 1.0            | -61.6                     | -13.0          | -48.6                                                   |       |                        |
|                          |  | 1.6520                                                                                | -19.7               | H                   | 3.0             | 40.2           | 1.0            | -58.9                     | -13.0          | -45.9                                                   |       |                        |
|                          |  | 2.4790                                                                                | -4.7                | H                   | 3.0             | 40.1           | 1.0            | -43.8                     | -13.0          | -30.8                                                   |       |                        |
|                          |  | 3.3056                                                                                | -23.2               | H                   | 3.0             | 39.6           | 1.0            | -61.8                     | -13.0          | -48.8                                                   |       |                        |
|                          |  | Mid Ch, 836.6MHz                                                                      |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
|                          |  | 1.6732                                                                                | -21.8               | V                   | 3.0             | 40.2           | 1.0            | -61.0                     | -13.0          | -48.0                                                   |       |                        |
|                          |  | 2.5098                                                                                | -11.9               | V                   | 3.0             | 40.1           | 1.0            | -50.9                     | -13.0          | -37.9                                                   |       |                        |
|                          |  | 3.3464                                                                                | -22.1               | V                   | 3.0             | 39.6           | 1.0            | -60.6                     | -13.0          | -47.6                                                   |       |                        |
|                          |  | 1.6732                                                                                | -19.7               | H                   | 3.0             | 40.2           | 1.0            | -58.9                     | -13.0          | -45.9                                                   |       |                        |
|                          |  | 2.5098                                                                                | -7.6                | H                   | 3.0             | 40.1           | 1.0            | -46.7                     | -13.0          | -33.7                                                   |       |                        |
|                          |  | 3.3464                                                                                | -22.2               | H                   | 3.0             | 39.6           | 1.0            | -60.8                     | -13.0          | -47.8                                                   |       |                        |
|                          |  | High Ch, 846.6MHz                                                                     |                     |                     |                 |                |                |                           |                |                                                         |       |                        |
|                          |  | 1.6932                                                                                | -20.2               | V                   | 3.0             | 40.2           | 1.0            | -59.4                     | -13.0          | -46.4                                                   |       |                        |
|                          |  | 2.5390                                                                                | -5.9                | V                   | 3.0             | 40.1           | 1.0            | -44.9                     | -13.0          | -31.9                                                   |       |                        |
|                          |  | 3.3860                                                                                | -20.9               | V                   | 3.0             | 39.5           | 1.0            | -59.4                     | -13.0          | -46.4                                                   |       |                        |
|                          |  | 1.6932                                                                                | -19.2               | H                   | 3.0             | 40.2           | 1.0            | -58.4                     | -13.0          | -45.4                                                   |       |                        |
|                          |  | 2.5390                                                                                | -8.5                | H                   | 3.0             | 40.1           | 1.0            | -47.6                     | -13.0          | -34.6                                                   |       |                        |
|                          |  | 3.3860                                                                                | -21.2               | H                   | 3.0             | 39.5           | 1.0            | -59.8                     | -13.0          | -46.8                                                   |       |                        |
|                          |  | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                     |                     |                 |                |                |                           |                |                                                         |       |                        |

# WCDMA Band 2

WCDMA

Band 2

REL99

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

15K20515

04-23-15

Steven.Kim

EUT / AC Adapter / Earphone / Z Position

Tx, REL99,1900MHz

Chamber

Chamber 1

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 24

| f<br>GHz                                                                              | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|---------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| Low Ch, 1852.4MHz                                                                     |                     |                    |                 |                |                |               |                |               |       |
| 3.7050                                                                                | -9.6                | V                  | 3.0             | 39.2           | 1.0            | -47.8         | -13.0          | -34.8         |       |
| 5.5570                                                                                | -12.7               | V                  | 3.0             | 40.0           | 1.0            | -51.7         | -13.0          | -38.7         |       |
| 7.4090                                                                                | -10.5               | V                  | 3.0             | 39.2           | 1.0            | -48.7         | -13.0          | -35.7         |       |
| 3.7050                                                                                | -10.5               | H                  | 3.0             | 39.2           | 1.0            | -48.7         | -13.0          | -35.7         |       |
| 5.5570                                                                                | -13.7               | H                  | 3.0             | 40.0           | 1.0            | -52.6         | -13.0          | -39.6         |       |
| 7.4090                                                                                | -10.7               | H                  | 3.0             | 39.2           | 1.0            | -48.8         | -13.0          | -35.8         |       |
| Mid Ch, 1880MHz                                                                       |                     |                    |                 |                |                |               |                |               |       |
| 3.7600                                                                                | -17.2               | V                  | 3.0             | 39.1           | 1.0            | -55.3         | -13.0          | -42.3         |       |
| 5.6400                                                                                | -13.9               | V                  | 3.0             | 39.9           | 1.0            | -52.8         | -13.0          | -39.8         |       |
| 7.5200                                                                                | -10.7               | V                  | 3.0             | 39.1           | 1.0            | -48.8         | -13.0          | -35.8         |       |
| 3.7600                                                                                | -18.0               | H                  | 3.0             | 39.1           | 1.0            | -56.1         | -13.0          | -43.1         |       |
| 5.6400                                                                                | -13.8               | H                  | 3.0             | 39.9           | 1.0            | -52.8         | -13.0          | -39.8         |       |
| 7.5200                                                                                | -10.4               | H                  | 3.0             | 39.1           | 1.0            | -48.5         | -13.0          | -35.5         |       |
| High Ch, 1907.6MHz                                                                    |                     |                    |                 |                |                |               |                |               |       |
| 3.8150                                                                                | -15.7               | V                  | 3.0             | 39.0           | 1.0            | -53.8         | -13.0          | -40.8         |       |
| 5.7230                                                                                | -13.3               | V                  | 3.0             | 39.9           | 1.0            | -52.2         | -13.0          | -39.2         |       |
| 7.6300                                                                                | -10.4               | V                  | 3.0             | 39.1           | 1.0            | -48.5         | -13.0          | -35.5         |       |
| 3.8150                                                                                | -15.8               | H                  | 3.0             | 39.0           | 1.0            | -53.9         | -13.0          | -40.9         |       |
| 5.7230                                                                                | -13.3               | H                  | 3.0             | 39.9           | 1.0            | -52.2         | -13.0          | -39.2         |       |
| 7.6300                                                                                | -10.0               | H                  | 3.0             | 39.1           | 1.0            | -48.2         | -13.0          | -35.2         |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                     |                    |                 |                |                |               |                |               |       |

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

15K20515

04-23-15

Steven.Kim

EUT / AC Adapter / Earphone / Z Position

Tx, HSDPA,1900MHz

Chamber

Chamber 1

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 24

| f<br>GHz                                                                              | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|---------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| Low Ch, 1852.4MHz                                                                     |                     |                    |                 |                |                |               |                |               |       |
| 3.7050                                                                                | -10.0               | V                  | 3.0             | 39.2           | 1.0            | -48.2         | -13.0          | -35.2         |       |
| 5.5570                                                                                | -13.6               | V                  | 3.0             | 40.0           | 1.0            | -52.6         | -13.0          | -39.6         |       |
| 7.4090                                                                                | -10.7               | V                  | 3.0             | 39.2           | 1.0            | -48.9         | -13.0          | -35.9         |       |
| 3.7050                                                                                | -11.4               | H                  | 3.0             | 39.2           | 1.0            | -49.6         | -13.0          | -36.6         |       |
| 5.5570                                                                                | -13.6               | H                  | 3.0             | 40.0           | 1.0            | -52.6         | -13.0          | -39.6         |       |
| 7.4090                                                                                | -10.6               | H                  | 3.0             | 39.2           | 1.0            | -48.7         | -13.0          | -35.7         |       |
| Mid Ch, 1880MHz                                                                       |                     |                    |                 |                |                |               |                |               |       |
| 3.7600                                                                                | -17.0               | V                  | 3.0             | 39.1           | 1.0            | -55.0         | -13.0          | -42.0         |       |
| 5.6400                                                                                | -13.8               | V                  | 3.0             | 39.9           | 1.0            | -52.8         | -13.0          | -39.8         |       |
| 7.5200                                                                                | -10.6               | V                  | 3.0             | 39.1           | 1.0            | -48.8         | -13.0          | -35.8         |       |
| 3.7600                                                                                | -17.5               | H                  | 3.0             | 39.1           | 1.0            | -55.6         | -13.0          | -42.6         |       |
| 5.6400                                                                                | -13.8               | H                  | 3.0             | 39.9           | 1.0            | -52.7         | -13.0          | -39.7         |       |
| 7.5200                                                                                | -10.3               | H                  | 3.0             | 39.1           | 1.0            | -48.4         | -13.0          | -35.4         |       |
| High Ch, 1907.6MHz                                                                    |                     |                    |                 |                |                |               |                |               |       |
| 3.8150                                                                                | -15.8               | V                  | 3.0             | 39.0           | 1.0            | -53.8         | -13.0          | -40.8         |       |
| 5.7230                                                                                | -13.3               | V                  | 3.0             | 39.9           | 1.0            | -52.2         | -13.0          | -39.2         |       |
| 7.6300                                                                                | -10.3               | V                  | 3.0             | 39.1           | 1.0            | -48.4         | -13.0          | -35.4         |       |
| 3.8150                                                                                | -16.3               | H                  | 3.0             | 39.0           | 1.0            | -54.3         | -13.0          | -41.3         |       |
| 5.7230                                                                                | -13.3               | H                  | 3.0             | 39.9           | 1.0            | -52.2         | -13.0          | -39.2         |       |
| 7.6300                                                                                | -10.0               | H                  | 3.0             | 39.1           | 1.0            | -48.1         | -13.0          | -35.1         |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                     |                    |                 |                |                |               |                |               |       |

**LTE Band 17**

|                                  |                                                                                                                                                                                                                                                                                                       |                     |                    |                 |                |                |              |                |               |       |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| LTE<br>Band 17<br>10MHz<br>QPSK  | <p>UL Korea, Ltd Suwon Laboratory<br/>Above 1GHz High Frequency Substitution Measurement</p> <p>Company: Samsung<br/>Project #: 15K20515<br/>Date: 05-03-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / AC Adapter / Ear Phone / Y-Position<br/>Mode: TX, LTE BAND 17, 10MHz BW, QPSK</p>  |                     |                    |                 |                |                |              |                |               |       |
|                                  | <p>Chamber Pre-amplifier Filter Limit</p> <p>Chamber 1 AFS42 Filter 1 FCC Part 27</p>                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
|                                  | f<br>GHz                                                                                                                                                                                                                                                                                              | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                  | Low Channel (709MHz)                                                                                                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |
|                                  | 1.4180                                                                                                                                                                                                                                                                                                | -25.2               | V                  | 3.0             | 40.2           | 1.0            | -64.4        | -13.0          | -51.4         |       |
|                                  | 2.1270                                                                                                                                                                                                                                                                                                | -20.4               | V                  | 3.0             | 40.1           | 1.0            | -59.6        | -13.0          | -46.6         |       |
|                                  | 2.8360                                                                                                                                                                                                                                                                                                | -31.0               | V                  | 3.0             | 40.0           | 1.0            | -70.0        | -13.0          | -57.0         |       |
|                                  | 1.4180                                                                                                                                                                                                                                                                                                | -22.5               | H                  | 3.0             | 40.2           | 1.0            | -61.6        | -13.0          | -48.6         |       |
|                                  | 2.1270                                                                                                                                                                                                                                                                                                | -18.2               | H                  | 3.0             | 40.1           | 1.0            | -57.3        | -13.0          | -44.3         |       |
|                                  | 2.8360                                                                                                                                                                                                                                                                                                | -31.4               | H                  | 3.0             | 40.0           | 1.0            | -70.3        | -13.0          | -57.3         |       |
|                                  | Mid Channel (710MHz)                                                                                                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |
|                                  | 1.4200                                                                                                                                                                                                                                                                                                | -22.5               | V                  | 3.0             | 40.2           | 1.0            | -61.7        | -13.0          | -48.7         |       |
|                                  | 2.1300                                                                                                                                                                                                                                                                                                | 12.6                | V                  | 3.0             | 40.1           | 1.0            | -26.5        | -13.0          | -13.5         |       |
|                                  | 2.8400                                                                                                                                                                                                                                                                                                | -31.1               | V                  | 3.0             | 40.0           | 1.0            | -70.1        | -13.0          | -57.1         |       |
|                                  | 1.4200                                                                                                                                                                                                                                                                                                | -24.4               | H                  | 3.0             | 40.2           | 1.0            | -63.6        | -13.0          | -50.6         |       |
|                                  | 2.1300                                                                                                                                                                                                                                                                                                | -25.5               | H                  | 3.0             | 40.1           | 1.0            | -64.6        | -13.0          | -51.6         |       |
|                                  | 2.8400                                                                                                                                                                                                                                                                                                | -31.7               | H                  | 3.0             | 40.0           | 1.0            | -70.7        | -13.0          | -57.7         |       |
|                                  | High Channel (711MHz)                                                                                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
|                                  | 1.4220                                                                                                                                                                                                                                                                                                | -21.0               | V                  | 3.0             | 40.2           | 1.0            | -60.2        | -13.0          | -47.2         |       |
|                                  | 2.1330                                                                                                                                                                                                                                                                                                | -17.9               | V                  | 3.0             | 40.1           | 1.0            | -57.0        | -13.0          | -44.0         |       |
|                                  | 2.8440                                                                                                                                                                                                                                                                                                | -31.1               | V                  | 3.0             | 40.0           | 1.0            | -70.1        | -13.0          | -57.1         |       |
|                                  | 1.4220                                                                                                                                                                                                                                                                                                | -22.3               | H                  | 3.0             | 40.2           | 1.0            | -61.5        | -13.0          | -48.5         |       |
|                                  | 2.1330                                                                                                                                                                                                                                                                                                | -21.3               | H                  | 3.0             | 40.1           | 1.0            | -60.4        | -13.0          | -47.4         |       |
|                                  | 2.8440                                                                                                                                                                                                                                                                                                | -31.7               | H                  | 3.0             | 40.0           | 1.0            | -70.7        | -13.0          | -57.7         |       |
|                                  | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
| LTE<br>Band 17<br>10MHz<br>16QAM | <p>UL Korea, Ltd Suwon Laboratory<br/>Above 1GHz High Frequency Substitution Measurement</p> <p>Company: Samsung<br/>Project #: 15K20515<br/>Date: 05-03-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / AC Adapter / Ear Phone / Y-Position<br/>Mode: TX, LTE BAND 17, 10MHz BW, 16QAM</p> |                     |                    |                 |                |                |              |                |               |       |
|                                  | <p>Chamber Pre-amplifier Filter Limit</p> <p>Chamber 1 AFS42 Filter 1 FCC Part 27</p>                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
|                                  | f<br>GHz                                                                                                                                                                                                                                                                                              | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                  | Low Channel (709MHz)                                                                                                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |
|                                  | 1.4180                                                                                                                                                                                                                                                                                                | -27.7               | V                  | 3.0             | 40.2           | 1.0            | -66.9        | -13.0          | -53.9         |       |
|                                  | 2.1270                                                                                                                                                                                                                                                                                                | -21.4               | V                  | 3.0             | 40.1           | 1.0            | -60.6        | -13.0          | -47.6         |       |
|                                  | 2.8360                                                                                                                                                                                                                                                                                                | -30.9               | V                  | 3.0             | 40.0           | 1.0            | -69.9        | -13.0          | -56.9         |       |
|                                  | 1.4180                                                                                                                                                                                                                                                                                                | -23.9               | H                  | 3.0             | 40.2           | 1.0            | -63.1        | -13.0          | -50.1         |       |
|                                  | 2.1270                                                                                                                                                                                                                                                                                                | -18.9               | H                  | 3.0             | 40.1           | 1.0            | -58.1        | -13.0          | -45.1         |       |
|                                  | 2.8360                                                                                                                                                                                                                                                                                                | -31.4               | H                  | 3.0             | 40.0           | 1.0            | -70.3        | -13.0          | -57.3         |       |
|                                  | Mid Channel (710MHz)                                                                                                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |
|                                  | 1.4200                                                                                                                                                                                                                                                                                                | -23.1               | V                  | 3.0             | 40.2           | 1.0            | -62.3        | -13.0          | -49.3         |       |
|                                  | 2.1300                                                                                                                                                                                                                                                                                                | -19.0               | V                  | 3.0             | 40.1           | 1.0            | -58.2        | -13.0          | -45.2         |       |
|                                  | 2.8400                                                                                                                                                                                                                                                                                                | -31.2               | V                  | 3.0             | 40.0           | 1.0            | -70.2        | -13.0          | -57.2         |       |
|                                  | 1.4200                                                                                                                                                                                                                                                                                                | -25.9               | H                  | 3.0             | 40.2           | 1.0            | -65.1        | -13.0          | -52.1         |       |
|                                  | 2.1300                                                                                                                                                                                                                                                                                                | -26.0               | H                  | 3.0             | 40.1           | 1.0            | -65.1        | -13.0          | -52.1         |       |
|                                  | 2.8400                                                                                                                                                                                                                                                                                                | -31.5               | H                  | 3.0             | 40.0           | 1.0            | -70.5        | -13.0          | -57.5         |       |
|                                  | High Channel (711MHz)                                                                                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
|                                  | 1.4220                                                                                                                                                                                                                                                                                                | -22.4               | V                  | 3.0             | 40.2           | 1.0            | -61.6        | -13.0          | -48.6         |       |
|                                  | 2.1330                                                                                                                                                                                                                                                                                                | -18.6               | V                  | 3.0             | 40.1           | 1.0            | -57.8        | -13.0          | -44.8         |       |
|                                  | 2.8440                                                                                                                                                                                                                                                                                                | -31.3               | V                  | 3.0             | 40.0           | 1.0            | -70.3        | -13.0          | -57.3         |       |
|                                  | 1.4220                                                                                                                                                                                                                                                                                                | -23.8               | H                  | 3.0             | 40.2           | 1.0            | -63.0        | -13.0          | -50.0         |       |
|                                  | 2.1330                                                                                                                                                                                                                                                                                                | -22.3               | H                  | 3.0             | 40.1           | 1.0            | -61.4        | -13.0          | -48.4         |       |
|                                  | 2.8440                                                                                                                                                                                                                                                                                                | -31.6               | H                  | 3.0             | 40.0           | 1.0            | -70.6        | -13.0          | -57.6         |       |
|                                  | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |

|                                 |                                                                                                                                                                                             |                     |                        |                 |                    |                |                      |                |               |       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------|-----------------|--------------------|----------------|----------------------|----------------|---------------|-------|
| LTE<br>Band 17<br>5MHz<br>QPSK  | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement                                                                                                        |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Y-Position<br>Mode: TX, LTE BAND 17, 5MHz BW, QPSK  |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | Chamber<br>Chamber 1                                                                                                                                                                        |                     | Pre-amplifier<br>AFS42 |                 | Filter<br>Filter 1 |                | Limit<br>FCC Part 27 |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                    | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB)     | Filter<br>(dB) | ERP<br>(dBm)         | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | Low Channel (706.5MHz)                                                                                                                                                                      |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | 1.4130                                                                                                                                                                                      | -17.8               | V                      | 3.0             | 40.2               | 1.0            | -57.0                | -13.0          | -44.0         |       |
|                                 | 2.1195                                                                                                                                                                                      | -13.6               | V                      | 3.0             | 40.1               | 1.0            | -52.8                | -13.0          | -39.8         |       |
|                                 | 2.8260                                                                                                                                                                                      | -30.7               | V                      | 3.0             | 40.0               | 1.0            | -69.6                | -13.0          | -56.6         |       |
|                                 | 1.4130                                                                                                                                                                                      | -25.1               | H                      | 3.0             | 40.2               | 1.0            | -64.3                | -13.0          | -51.3         |       |
|                                 | 2.1195                                                                                                                                                                                      | -24.2               | H                      | 3.0             | 40.1               | 1.0            | -63.4                | -13.0          | -50.4         |       |
|                                 | 2.8260                                                                                                                                                                                      | -31.1               | H                      | 3.0             | 40.0               | 1.0            | -70.1                | -13.0          | -57.1         |       |
|                                 | Mid Channel (710MHz)                                                                                                                                                                        |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | 1.4200                                                                                                                                                                                      | -21.0               | V                      | 3.0             | 40.2               | 1.0            | -60.2                | -13.0          | -47.2         |       |
|                                 | 2.1300                                                                                                                                                                                      | -13.4               | V                      | 3.0             | 40.1               | 1.0            | -52.6                | -13.0          | -39.6         |       |
|                                 | 2.8400                                                                                                                                                                                      | -30.7               | V                      | 3.0             | 40.0               | 1.0            | -69.6                | -13.0          | -56.6         |       |
|                                 | 1.4200                                                                                                                                                                                      | -25.4               | H                      | 3.0             | 40.2               | 1.0            | -64.6                | -13.0          | -51.6         |       |
|                                 | 2.1300                                                                                                                                                                                      | -23.2               | H                      | 3.0             | 40.1               | 1.0            | -62.3                | -13.0          | -49.3         |       |
|                                 | 2.8400                                                                                                                                                                                      | -31.2               | H                      | 3.0             | 40.0               | 1.0            | -70.2                | -13.0          | -57.2         |       |
|                                 | High Channel (713.5MHz)                                                                                                                                                                     |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | 1.4270                                                                                                                                                                                      | -17.8               | V                      | 3.0             | 40.2               | 1.0            | -57.0                | -13.0          | -44.0         |       |
|                                 | 2.1405                                                                                                                                                                                      | -15.4               | V                      | 3.0             | 40.1               | 1.0            | -54.6                | -13.0          | -41.6         |       |
|                                 | 2.8540                                                                                                                                                                                      | -30.9               | V                      | 3.0             | 40.0               | 1.0            | -69.9                | -13.0          | -56.9         |       |
|                                 | 1.4270                                                                                                                                                                                      | -25.4               | H                      | 3.0             | 40.2               | 1.0            | -64.6                | -13.0          | -51.6         |       |
|                                 | 2.1405                                                                                                                                                                                      | -22.3               | H                      | 3.0             | 40.1               | 1.0            | -61.4                | -13.0          | -48.4         |       |
|                                 | 2.8540                                                                                                                                                                                      | -31.2               | H                      | 3.0             | 40.0               | 1.0            | -70.2                | -13.0          | -57.2         |       |
|                                 | Rev. 03.03.09                                                                                                                                                                               |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | Note: No other emissions were detected above the system noise floor.                                                                                                                        |                     |                        |                 |                    |                |                      |                |               |       |
| LTE<br>Band 17<br>5MHz<br>16QAM | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement                                                                                                        |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Y-Position<br>Mode: TX, LTE BAND 17, 5MHz BW, 16QAM |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | Chamber<br>Chamber 1                                                                                                                                                                        |                     | Pre-amplifier<br>AFS42 |                 | Filter<br>Filter 1 |                | Limit<br>FCC Part 27 |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                    | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB)     | Filter<br>(dB) | ERP<br>(dBm)         | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | Low Channel (706.5MHz)                                                                                                                                                                      |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | 1.4130                                                                                                                                                                                      | -20.4               | V                      | 3.0             | 40.2               | 1.0            | -59.6                | -13.0          | -46.6         |       |
|                                 | 2.1195                                                                                                                                                                                      | -15.0               | V                      | 3.0             | 40.1               | 1.0            | -54.2                | -13.0          | -41.2         |       |
|                                 | 2.8260                                                                                                                                                                                      | -30.6               | V                      | 3.0             | 40.0               | 1.0            | -69.6                | -13.0          | -56.6         |       |
|                                 | 1.4130                                                                                                                                                                                      | -26.4               | H                      | 3.0             | 40.2               | 1.0            | -65.6                | -13.0          | -52.6         |       |
|                                 | 2.1195                                                                                                                                                                                      | -25.4               | H                      | 3.0             | 40.1               | 1.0            | -64.5                | -13.0          | -51.5         |       |
|                                 | 2.8260                                                                                                                                                                                      | -31.0               | H                      | 3.0             | 40.0               | 1.0            | -70.0                | -13.0          | -57.0         |       |
|                                 | Mid Channel (710MHz)                                                                                                                                                                        |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | 1.4200                                                                                                                                                                                      | -22.4               | V                      | 3.0             | 40.2               | 1.0            | -61.6                | -13.0          | -48.6         |       |
|                                 | 2.1300                                                                                                                                                                                      | -16.1               | V                      | 3.0             | 40.1               | 1.0            | -55.2                | -13.0          | -42.2         |       |
|                                 | 2.8400                                                                                                                                                                                      | -30.9               | V                      | 3.0             | 40.0               | 1.0            | -69.9                | -13.0          | -56.9         |       |
|                                 | 1.4200                                                                                                                                                                                      | -26.2               | H                      | 3.0             | 40.2               | 1.0            | -65.4                | -13.0          | -52.4         |       |
|                                 | 2.1300                                                                                                                                                                                      | -24.2               | H                      | 3.0             | 40.1               | 1.0            | -63.4                | -13.0          | -50.4         |       |
|                                 | 2.8400                                                                                                                                                                                      | -31.4               | H                      | 3.0             | 40.0               | 1.0            | -70.4                | -13.0          | -57.4         |       |
|                                 | High Channel (713.5MHz)                                                                                                                                                                     |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | 1.4270                                                                                                                                                                                      | -19.0               | V                      | 3.0             | 40.2               | 1.0            | -58.2                | -13.0          | -45.2         |       |
|                                 | 2.1405                                                                                                                                                                                      | -17.3               | V                      | 3.0             | 40.1               | 1.0            | -56.4                | -13.0          | -43.4         |       |
|                                 | 2.8540                                                                                                                                                                                      | -30.9               | V                      | 3.0             | 40.0               | 1.0            | -69.9                | -13.0          | -56.9         |       |
|                                 | 1.4270                                                                                                                                                                                      | -26.3               | H                      | 3.0             | 40.2               | 1.0            | -65.5                | -13.0          | -52.5         |       |
|                                 | 2.1405                                                                                                                                                                                      | -23.5               | H                      | 3.0             | 40.1               | 1.0            | -62.6                | -13.0          | -49.6         |       |
|                                 | 2.8540                                                                                                                                                                                      | -31.3               | H                      | 3.0             | 40.0               | 1.0            | -70.3                | -13.0          | -57.3         |       |
|                                 | Rev. 03.03.09                                                                                                                                                                               |                     |                        |                 |                    |                |                      |                |               |       |
|                                 | Note: No other emissions were detected above the system noise floor.                                                                                                                        |                     |                        |                 |                    |                |                      |                |               |       |

**LTE Band 5**

| UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement  |                                                                                      |                     |                                       |                 |                |                |               |                |               |       |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|---------------------------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| LTE<br>Band 5<br>10MHz<br>QPSK                                                        | Company: Samsung                                                                     |                     | Project #: 15K20515                   |                 |                |                |               |                |               |       |
|                                                                                       | Date: 05-04-15                                                                       |                     | Test Engineer: Steven Kim             |                 |                |                |               |                |               |       |
|                                                                                       | Configuration: EUT / AC Adapter / Earphone / Y Position                              |                     | Mode: TX, LTE BAND 5, 10MHz BW, QPSK  |                 |                |                |               |                |               |       |
|                                                                                       | Chamber                                                                              |                     | Pre-amplifier                         |                 | Filter         |                | Limit         |                |               |       |
|                                                                                       | Chamber 1                                                                            |                     | AFS42                                 |                 | Filter 1       |                | Part 24       |                |               |       |
|                                                                                       | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)                    | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                                       | Low Channel (829MHz)                                                                 |                     |                                       |                 |                |                |               |                |               |       |
|                                                                                       | 1.6580                                                                               | -13.4               | V                                     | 3.0             | 40.2           | 1.0            | -52.6         | -13.0          | -39.6         |       |
|                                                                                       | 2.4870                                                                               | -13.7               | V                                     | 3.0             | 40.1           | 1.0            | -52.8         | -13.0          | -39.8         |       |
|                                                                                       | 3.3160                                                                               | -29.9               | V                                     | 3.0             | 39.6           | 1.0            | -68.5         | -13.0          | -55.5         |       |
| Mid Channel (836.5MHz)                                                                |                                                                                      |                     |                                       |                 |                |                |               |                |               |       |
| 1.6580                                                                                | -17.7                                                                                | H                   | 3.0                                   | 40.2            | 1.0            | -56.9          | -13.0         | -43.9          |               |       |
| 2.4870                                                                                | -12.4                                                                                | H                   | 3.0                                   | 40.1            | 1.0            | -51.5          | -13.0         | -38.5          |               |       |
| 3.3160                                                                                | -29.8                                                                                | H                   | 3.0                                   | 39.6            | 1.0            | -68.4          | -13.0         | -55.4          |               |       |
| High Channel (844MHz)                                                                 |                                                                                      |                     |                                       |                 |                |                |               |                |               |       |
| 1.6730                                                                                | -18.8                                                                                | V                   | 3.0                                   | 40.2            | 1.0            | -58.0          | -13.0         | -45.0          |               |       |
| 2.5090                                                                                | -11.4                                                                                | V                   | 3.0                                   | 40.1            | 1.0            | -50.4          | -13.0         | -37.4          |               |       |
| 3.3460                                                                                | -29.1                                                                                | V                   | 3.0                                   | 39.6            | 1.0            | -67.6          | -13.0         | -54.6          |               |       |
| 1.6730                                                                                | -19.0                                                                                | H                   | 3.0                                   | 40.2            | 1.0            | -58.1          | -13.0         | -45.1          |               |       |
| 2.5090                                                                                | -12.4                                                                                | H                   | 3.0                                   | 40.1            | 1.0            | -51.5          | -13.0         | -38.5          |               |       |
| 3.3460                                                                                | -29.5                                                                                | H                   | 3.0                                   | 39.6            | 1.0            | -68.1          | -13.0         | -55.1          |               |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                                       |                 |                |                |               |                |               |       |
| LTE<br>Band 5<br>10MHz<br>16QAM                                                       | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                                       |                 |                |                |               |                |               |       |
|                                                                                       | Company: Samsung                                                                     |                     | Project #: 15K20515                   |                 |                |                |               |                |               |       |
|                                                                                       | Date: 05-04-15                                                                       |                     | Test Engineer: Steven Kim             |                 |                |                |               |                |               |       |
|                                                                                       | Configuration: EUT / AC Adapter / Earphone / Y Position                              |                     | Mode: TX, LTE BAND 5, 10MHz BW, 16QAM |                 |                |                |               |                |               |       |
|                                                                                       | Chamber                                                                              |                     | Pre-amplifier                         |                 | Filter         |                | Limit         |                |               |       |
|                                                                                       | Chamber 1                                                                            |                     | AFS42                                 |                 | Filter 1       |                | Part 24       |                |               |       |
|                                                                                       | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)                    | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                                       | Low Channel (829MHz)                                                                 |                     |                                       |                 |                |                |               |                |               |       |
|                                                                                       | 1.6580                                                                               | -14.8               | V                                     | 3.0             | 40.2           | 1.0            | -54.0         | -13.0          | -41.0         |       |
|                                                                                       | 2.4870                                                                               | -14.6               | V                                     | 3.0             | 40.1           | 1.0            | -53.7         | -13.0          | -40.7         |       |
| 3.3160                                                                                | -29.3                                                                                | V                   | 3.0                                   | 39.6            | 1.0            | -67.9          | -13.0         | -54.9          |               |       |
| Mid Channel (836.5MHz)                                                                |                                                                                      |                     |                                       |                 |                |                |               |                |               |       |
| 1.6580                                                                                | -17.5                                                                                | H                   | 3.0                                   | 40.2            | 1.0            | -56.6          | -13.0         | -43.6          |               |       |
| 2.4870                                                                                | -14.7                                                                                | H                   | 3.0                                   | 40.1            | 1.0            | -53.8          | -13.0         | -40.8          |               |       |
| 3.3160                                                                                | -29.7                                                                                | H                   | 3.0                                   | 39.6            | 1.0            | -68.3          | -13.0         | -55.3          |               |       |
| High Channel (844MHz)                                                                 |                                                                                      |                     |                                       |                 |                |                |               |                |               |       |
| 1.6730                                                                                | -19.2                                                                                | V                   | 3.0                                   | 40.2            | 1.0            | -58.4          | -13.0         | -45.4          |               |       |
| 2.5090                                                                                | -11.6                                                                                | V                   | 3.0                                   | 40.1            | 1.0            | -50.7          | -13.0         | -37.7          |               |       |
| 3.3460                                                                                | -29.0                                                                                | V                   | 3.0                                   | 39.6            | 1.0            | -67.5          | -13.0         | -54.5          |               |       |
| 1.6730                                                                                | -22.4                                                                                | H                   | 3.0                                   | 40.2            | 1.0            | -61.6          | -13.0         | -48.6          |               |       |
| 2.5090                                                                                | -14.1                                                                                | H                   | 3.0                                   | 40.1            | 1.0            | -53.1          | -13.0         | -40.1          |               |       |
| 3.3460                                                                                | -29.0                                                                                | H                   | 3.0                                   | 39.6            | 1.0            | -67.5          | -13.0         | -54.5          |               |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                                       |                 |                |                |               |                |               |       |

|                                                                                       |                                                                                      |                     |                    |                 |                |                |               |                |               |       |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| LTE<br><br>Band 5<br><br>5MHz<br><br>QPSK                                             | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Company: Samsung                                                                     |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Project #: 15K20515                                                                  |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Date: 05-04-15                                                                       |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Test Engineer: Steven Kim                                                            |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Configuration: EUT / AC Adapter / Earphone / Y Position                              |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Mode: TX, LTE BAND 5, 5MHz BW,QPSK                                                   |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Chamber                                                                              |                     | Pre-amplifier      |                 | Filter         |                | Limit         |                |               |       |
|                                                                                       | Chamber 1                                                                            |                     | AFS42              |                 | Filter 1       |                | Part 24       |                |               |       |
|                                                                                       | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                                       | Low Channel (826.5MHz)                                                               |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | 1.6530                                                                               | -14.4               | V                  | 3.0             | 40.2           | 1.0            | -53.6         | -13.0          | -40.6         |       |
|                                                                                       | 2.4790                                                                               | -14.8               | V                  | 3.0             | 40.1           | 1.0            | -53.9         | -13.0          | -40.9         |       |
|                                                                                       | 3.3060                                                                               | -29.4               | V                  | 3.0             | 39.6           | 1.0            | -68.0         | -13.0          | -55.0         |       |
|                                                                                       | 1.6530                                                                               | -21.8               | H                  | 3.0             | 40.2           | 1.0            | -61.0         | -13.0          | -48.0         |       |
|                                                                                       | 2.4790                                                                               | -15.1               | H                  | 3.0             | 40.1           | 1.0            | -54.2         | -13.0          | -41.2         |       |
|                                                                                       | 3.3060                                                                               | -29.9               | H                  | 3.0             | 39.6           | 1.0            | -68.5         | -13.0          | -55.5         |       |
|                                                                                       | Mid Channel (836.5MHz)                                                               |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | 1.6730                                                                               | -18.7               | V                  | 3.0             | 40.2           | 1.0            | -57.9         | -13.0          | -44.9         |       |
|                                                                                       | 2.5090                                                                               | -9.2                | V                  | 3.0             | 40.1           | 1.0            | -48.2         | -13.0          | -35.2         |       |
|                                                                                       | 3.3460                                                                               | -29.0               | V                  | 3.0             | 39.6           | 1.0            | -67.5         | -13.0          | -54.5         |       |
|                                                                                       | 1.6730                                                                               | -21.3               | H                  | 3.0             | 40.2           | 1.0            | -60.5         | -13.0          | -47.5         |       |
|                                                                                       | 2.5090                                                                               | -12.8               | H                  | 3.0             | 40.1           | 1.0            | -51.9         | -13.0          | -38.9         |       |
|                                                                                       | 3.3460                                                                               | -29.0               | H                  | 3.0             | 39.6           | 1.0            | -67.5         | -13.0          | -54.5         |       |
|                                                                                       | High Channel (846.5MHz)                                                              |                     |                    |                 |                |                |               |                |               |       |
| 1.6930                                                                                | -2.2                                                                                 | V                   | 3.0                | 40.2            | 1.0            | -41.4          | -13.0         | -28.4          |               |       |
| 2.5390                                                                                | -7.1                                                                                 | V                   | 3.0                | 40.1            | 1.0            | -46.2          | -13.0         | -33.2          |               |       |
| 3.3860                                                                                | -28.2                                                                                | V                   | 3.0                | 39.5            | 1.0            | -66.7          | -13.0         | -53.7          |               |       |
| 1.6930                                                                                | -8.7                                                                                 | H                   | 3.0                | 40.2            | 1.0            | -47.9          | -13.0         | -34.9          |               |       |
| 2.5390                                                                                | -10.6                                                                                | H                   | 3.0                | 40.1            | 1.0            | -49.7          | -13.0         | -36.7          |               |       |
| 3.3860                                                                                | -28.6                                                                                | H                   | 3.0                | 39.5            | 1.0            | -67.1          | -13.0         | -54.1          |               |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                    |                 |                |                |               |                |               |       |

|                                                                                       |                                                                                      |                     |                    |                 |                |                |               |                |               |       |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| LTE<br><br>Band 5<br><br>5MHz<br><br>16QAM                                            | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Company: Samsung                                                                     |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Project #: 15K20515                                                                  |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Date: 05-04-15                                                                       |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Test Engineer: Steven Kim                                                            |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Configuration: EUT / AC Adapter / Earphone / Y Position                              |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Mode: TX, LTE BAND 5, 5MHz BW,16QAM                                                  |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | Chamber                                                                              |                     | Pre-amplifier      |                 | Filter         |                | Limit         |                |               |       |
|                                                                                       | Chamber 1                                                                            |                     | AFS42              |                 | Filter 1       |                | Part 24       |                |               |       |
|                                                                                       | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                                       | Low Channel (826.5MHz)                                                               |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | 1.6530                                                                               | -16.2               | V                  | 3.0             | 40.2           | 1.0            | -55.4         | -13.0          | -42.4         |       |
|                                                                                       | 2.4790                                                                               | -16.0               | V                  | 3.0             | 40.1           | 1.0            | -55.1         | -13.0          | -42.1         |       |
|                                                                                       | 3.3060                                                                               | -29.8               | V                  | 3.0             | 39.6           | 1.0            | -68.4         | -13.0          | -55.4         |       |
|                                                                                       | 1.6530                                                                               | -19.4               | H                  | 3.0             | 40.2           | 1.0            | -58.5         | -13.0          | -45.5         |       |
|                                                                                       | 2.4790                                                                               | -15.4               | H                  | 3.0             | 40.1           | 1.0            | -54.5         | -13.0          | -41.5         |       |
|                                                                                       | 3.3060                                                                               | -29.9               | H                  | 3.0             | 39.6           | 1.0            | -68.5         | -13.0          | -55.5         |       |
|                                                                                       | Mid Channel (836.5MHz)                                                               |                     |                    |                 |                |                |               |                |               |       |
|                                                                                       | 1.6730                                                                               | -17.8               | V                  | 3.0             | 40.2           | 1.0            | -57.0         | -13.0          | -44.0         |       |
|                                                                                       | 2.5090                                                                               | -10.7               | V                  | 3.0             | 40.1           | 1.0            | -49.8         | -13.0          | -36.8         |       |
|                                                                                       | 3.3460                                                                               | -28.9               | V                  | 3.0             | 39.6           | 1.0            | -67.5         | -13.0          | -54.5         |       |
|                                                                                       | 1.6730                                                                               | -21.9               | H                  | 3.0             | 40.2           | 1.0            | -61.1         | -13.0          | -48.1         |       |
|                                                                                       | 2.5090                                                                               | -11.6               | H                  | 3.0             | 40.1           | 1.0            | -50.7         | -13.0          | -37.7         |       |
|                                                                                       | 3.3460                                                                               | -28.9               | H                  | 3.0             | 39.6           | 1.0            | -67.4         | -13.0          | -54.4         |       |
|                                                                                       | High Channel (846.5MHz)                                                              |                     |                    |                 |                |                |               |                |               |       |
| 1.6930                                                                                | -3.1                                                                                 | V                   | 3.0                | 40.2            | 1.0            | -42.3          | -13.0         | -29.3          |               |       |
| 2.5390                                                                                | -9.5                                                                                 | V                   | 3.0                | 40.1            | 1.0            | -48.6          | -13.0         | -35.6          |               |       |
| 3.3860                                                                                | -28.2                                                                                | V                   | 3.0                | 39.5            | 1.0            | -66.7          | -13.0         | -53.7          |               |       |
| 1.6930                                                                                | -9.2                                                                                 | H                   | 3.0                | 40.2            | 1.0            | -48.4          | -13.0         | -35.4          |               |       |
| 2.5390                                                                                | -12.9                                                                                | H                   | 3.0                | 40.1            | 1.0            | -51.9          | -13.0         | -38.9          |               |       |
| 3.3860                                                                                | -28.4                                                                                | H                   | 3.0                | 39.5            | 1.0            | -66.9          | -13.0         | -53.9          |               |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                    |                 |                |                |               |                |               |       |

|                                                                      |                                                                                      |                     |                    |                 |                |                |               |                |               |       |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| LTE<br><br>Band 5<br><br>3MHz<br><br>QPSK                            | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Company: Samsung                                                                     |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Project #: 15K20515                                                                  |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Date: 05-04-15                                                                       |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Test Engineer: Steven Kim                                                            |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Configuration: EUT / AC Adapter / Earphone / Y Position                              |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Mode: TX, LTE BAND 5, 3MHz BW,QPSK                                                   |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Chamber                                                                              |                     | Pre-amplifier      |                 | Filter         |                | Limit         |                |               |       |
|                                                                      | Chamber 1                                                                            |                     | AFS42              |                 | Filter 1       |                | Part 24       |                |               |       |
|                                                                      | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                      | Low Channel (825.5MHz)                                                               |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | 1.6510                                                                               | -16.2               | V                  | 3.0             | 40.2           | 1.0            | -55.4         | -13.0          | -42.4         |       |
|                                                                      | 2.4675                                                                               | -15.6               | V                  | 3.0             | 40.1           | 1.0            | -54.7         | -13.0          | -41.7         |       |
|                                                                      | 3.3020                                                                               | -29.2               | V                  | 3.0             | 39.6           | 1.0            | -67.8         | -13.0          | -54.8         |       |
|                                                                      | 1.6510                                                                               | -23.7               | H                  | 3.0             | 40.2           | 1.0            | -62.9         | -13.0          | -49.9         |       |
|                                                                      | 2.4675                                                                               | -13.7               | H                  | 3.0             | 40.1           | 1.0            | -52.7         | -13.0          | -39.7         |       |
|                                                                      | 3.3020                                                                               | -29.9               | H                  | 3.0             | 39.6           | 1.0            | -68.5         | -13.0          | -55.5         |       |
|                                                                      | Mid Channel (836.5MHz)                                                               |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | 1.6730                                                                               | -19.0               | V                  | 3.0             | 40.2           | 1.0            | -58.2         | -13.0          | -45.2         |       |
|                                                                      | 2.5090                                                                               | -9.1                | V                  | 3.0             | 40.1           | 1.0            | -48.2         | -13.0          | -35.2         |       |
|                                                                      | 3.3460                                                                               | -28.9               | V                  | 3.0             | 39.6           | 1.0            | -67.5         | -13.0          | -54.5         |       |
|                                                                      | 1.6730                                                                               | -22.6               | H                  | 3.0             | 40.2           | 1.0            | -61.8         | -13.0          | -48.8         |       |
|                                                                      | 2.5090                                                                               | -12.0               | H                  | 3.0             | 40.1           | 1.0            | -51.1         | -13.0          | -38.1         |       |
|                                                                      | 3.3460                                                                               | -29.0               | H                  | 3.0             | 39.6           | 1.0            | -67.6         | -13.0          | -54.6         |       |
| High Channel (847.5MHz)                                              |                                                                                      |                     |                    |                 |                |                |               |                |               |       |
| 1.6950                                                               | -4.7                                                                                 | V                   | 3.0                | 40.2            | 1.0            | -43.8          | -13.0         | -30.8          |               |       |
| 2.5425                                                               | -6.3                                                                                 | V                   | 3.0                | 40.1            | 1.0            | -45.3          | -13.0         | -32.3          |               |       |
| 3.3900                                                               | -27.7                                                                                | V                   | 3.0                | 39.5            | 1.0            | -66.2          | -13.0         | -53.2          |               |       |
| 1.6950                                                               | -12.0                                                                                | H                   | 3.0                | 40.2            | 1.0            | -51.2          | -13.0         | -38.2          |               |       |
| 2.5425                                                               | -7.5                                                                                 | H                   | 3.0                | 40.1            | 1.0            | -46.6          | -13.0         | -33.6          |               |       |
| 3.3900                                                               | -27.9                                                                                | H                   | 3.0                | 39.5            | 1.0            | -66.4          | -13.0         | -53.4          |               |       |
| Rev. 03.03.09                                                        |                                                                                      |                     |                    |                 |                |                |               |                |               |       |
| Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                    |                 |                |                |               |                |               |       |

|                                                                      |                                                                                      |                     |                    |                 |                |                |               |                |               |       |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|
| LTE<br><br>Band 5<br><br>3MHz<br><br>16QAM                           | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Company: Samsung                                                                     |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Project #: 15K20515                                                                  |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Date: 05-04-15                                                                       |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Test Engineer: Steven Kim                                                            |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Configuration: EUT / AC Adapter / Earphone / Y Position                              |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Mode: TX, LTE BAND 5, 3MHz BW,16QAM                                                  |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | Chamber                                                                              |                     | Pre-amplifier      |                 | Filter         |                | Limit         |                |               |       |
|                                                                      | Chamber 1                                                                            |                     | AFS42              |                 | Filter 1       |                | Part 24       |                |               |       |
|                                                                      | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | EIRP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                      | Low Channel (825.5MHz)                                                               |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | 1.6510                                                                               | -19.2               | V                  | 3.0             | 40.2           | 1.0            | -58.3         | -13.0          | -45.3         |       |
|                                                                      | 2.4675                                                                               | -17.9               | V                  | 3.0             | 40.1           | 1.0            | -57.0         | -13.0          | -44.0         |       |
|                                                                      | 3.3020                                                                               | -29.7               | V                  | 3.0             | 39.6           | 1.0            | -68.4         | -13.0          | -55.4         |       |
|                                                                      | 1.6510                                                                               | -24.2               | H                  | 3.0             | 40.2           | 1.0            | -63.4         | -13.0          | -50.4         |       |
|                                                                      | 2.4675                                                                               | -16.1               | H                  | 3.0             | 40.1           | 1.0            | -55.2         | -13.0          | -42.2         |       |
|                                                                      | 3.3020                                                                               | -30.0               | H                  | 3.0             | 39.6           | 1.0            | -68.6         | -13.0          | -55.6         |       |
|                                                                      | Mid Channel (836.5MHz)                                                               |                     |                    |                 |                |                |               |                |               |       |
|                                                                      | 1.6730                                                                               | -22.2               | V                  | 3.0             | 40.2           | 1.0            | -61.4         | -13.0          | -48.4         |       |
|                                                                      | 2.5090                                                                               | -10.9               | V                  | 3.0             | 40.1           | 1.0            | -50.0         | -13.0          | -37.0         |       |
|                                                                      | 3.3460                                                                               | -28.9               | V                  | 3.0             | 39.6           | 1.0            | -67.5         | -13.0          | -54.5         |       |
|                                                                      | 1.6730                                                                               | -22.0               | H                  | 3.0             | 40.2           | 1.0            | -61.1         | -13.0          | -48.1         |       |
|                                                                      | 2.5090                                                                               | -14.2               | H                  | 3.0             | 40.1           | 1.0            | -53.3         | -13.0          | -40.3         |       |
|                                                                      | 3.3460                                                                               | -28.8               | H                  | 3.0             | 39.6           | 1.0            | -67.3         | -13.0          | -54.3         |       |
| High Channel (847.5MHz)                                              |                                                                                      |                     |                    |                 |                |                |               |                |               |       |
| 1.6950                                                               | -4.6                                                                                 | V                   | 3.0                | 40.2            | 1.0            | -43.8          | -13.0         | -30.8          |               |       |
| 2.5425                                                               | -9.1                                                                                 | V                   | 3.0                | 40.1            | 1.0            | -48.2          | -13.0         | -35.2          |               |       |
| 3.3900                                                               | -27.9                                                                                | V                   | 3.0                | 39.5            | 1.0            | -66.4          | -13.0         | -53.4          |               |       |
| 1.6950                                                               | -12.0                                                                                | H                   | 3.0                | 40.2            | 1.0            | -51.1          | -13.0         | -38.1          |               |       |
| 2.5425                                                               | -10.7                                                                                | H                   | 3.0                | 40.1            | 1.0            | -49.8          | -13.0         | -36.8          |               |       |
| 3.3900                                                               | -28.0                                                                                | H                   | 3.0                | 39.5            | 1.0            | -66.5          | -13.0         | -53.5          |               |       |
| Rev. 03.03.09                                                        |                                                                                      |                     |                    |                 |                |                |               |                |               |       |
| Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                    |                 |                |                |               |                |               |       |

|                                                                                       |                                                                                      |                     |                        |                 |                    |                |                  |                |               |       |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|------------------------|-----------------|--------------------|----------------|------------------|----------------|---------------|-------|
| LTE<br><br>Band 5<br><br>1.4MHz<br><br>QPSK                                           | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Company: Samsung                                                                     |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Project #: 15K20515                                                                  |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Date: 05-04-15                                                                       |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Test Engineer: Steven.Kim                                                            |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Configuration: EUT / AC Adapter / Earphone, X Position                               |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Mode: TX, LTE BAND 5, 1.4MHz BW,QPSK                                                 |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Chamber<br>Chamber 1                                                                 |                     | Pre-amplifier<br>AFS42 |                 | Filter<br>Filter 1 |                | Limit<br>Part 24 |                |               |       |
|                                                                                       | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB)     | Filter<br>(dB) | EIRP<br>(dBm)    | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                                       | Low Channel (824.7MHz)                                                               |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | 1.6494                                                                               | -20.5               | V                      | 3.0             | 40.2               | 1.0            | -59.7            | -13.0          | -46.7         |       |
|                                                                                       | 2.4741                                                                               | -17.2               | V                      | 3.0             | 40.1               | 1.0            | -56.3            | -13.0          | -43.3         |       |
|                                                                                       | 3.2988                                                                               | -30.0               | V                      | 3.0             | 39.6               | 1.0            | -68.6            | -13.0          | -55.6         |       |
|                                                                                       | 1.6494                                                                               | -23.3               | H                      | 3.0             | 40.2               | 1.0            | -62.5            | -13.0          | -49.5         |       |
|                                                                                       | 2.4741                                                                               | -16.9               | H                      | 3.0             | 40.1               | 1.0            | -56.0            | -13.0          | -43.0         |       |
|                                                                                       | 3.2988                                                                               | -30.4               | H                      | 3.0             | 39.6               | 1.0            | -69.0            | -13.0          | -56.0         |       |
|                                                                                       | Mid Channel (836.5MHz)                                                               |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | 1.6730                                                                               | 117.4               | V                      | 3.0             | 40.2               | 1.0            | 78.2             | -13.0          | 91.2          |       |
|                                                                                       | 2.5090                                                                               | -11.9               | V                      | 3.0             | 40.1               | 1.0            | -51.0            | -13.0          | -38.0         |       |
|                                                                                       | 3.3460                                                                               | -29.3               | V                      | 3.0             | 39.6               | 1.0            | -67.8            | -13.0          | -54.8         |       |
|                                                                                       | 1.6730                                                                               | -20.0               | H                      | 3.0             | 40.2               | 1.0            | -59.1            | -13.0          | -46.1         |       |
|                                                                                       | 2.5090                                                                               | -13.3               | H                      | 3.0             | 40.1               | 1.0            | -52.3            | -13.0          | -39.3         |       |
|                                                                                       | 3.3460                                                                               | -29.6               | H                      | 3.0             | 39.6               | 1.0            | -68.1            | -13.0          | -55.1         |       |
|                                                                                       | High Channel (844.3MHz)                                                              |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | 1.6886                                                                               | -6.2                | V                      | 3.0             | 40.2               | 1.0            | -45.4            | -13.0          | -32.4         |       |
| 2.5329                                                                                | -9.9                                                                                 | V                   | 3.0                    | 40.1            | 1.0                | -48.9          | -13.0            | -35.9          |               |       |
| 3.3772                                                                                | -29.4                                                                                | V                   | 3.0                    | 39.5            | 1.0                | -67.9          | -13.0            | -54.9          |               |       |
| 1.6886                                                                                | -12.0                                                                                | H                   | 3.0                    | 40.2            | 1.0                | -51.2          | -13.0            | -38.2          |               |       |
| 2.5329                                                                                | -8.9                                                                                 | H                   | 3.0                    | 40.1            | 1.0                | -48.0          | -13.0            | -35.0          |               |       |
| 3.3772                                                                                | -29.7                                                                                | H                   | 3.0                    | 39.5            | 1.0                | -68.2          | -13.0            | -55.2          |               |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                        |                 |                    |                |                  |                |               |       |

|                                                                                       |                                                                                      |                     |                        |                 |                    |                |                  |                |               |       |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|------------------------|-----------------|--------------------|----------------|------------------|----------------|---------------|-------|
| LTE<br><br>Band 5<br><br>1.4MHz<br><br>16QAM                                          | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Company: Samsung                                                                     |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Project #: 15K20515                                                                  |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Date: 05-04-15                                                                       |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Test Engineer: Steven.Kim                                                            |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Configuration: EUT / AC Adapter / Earphone, Y Position                               |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Mode: TX, LTE BAND 5, 1.4MHz BW,16QAM                                                |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | Chamber<br>Chamber 1                                                                 |                     | Pre-amplifier<br>AFS42 |                 | Filter<br>Filter 1 |                | Limit<br>Part 24 |                |               |       |
|                                                                                       | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB)     | Filter<br>(dB) | EIRP<br>(dBm)    | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                                       | Low Channel (824.7MHz)                                                               |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | 1.6494                                                                               | -33.6               | V                      | 3.0             | 40.2               | 1.0            | -72.8            | -13.0          | -59.8         |       |
|                                                                                       | 2.4741                                                                               | -26.6               | V                      | 3.0             | 40.1               | 1.0            | -65.7            | -13.0          | -52.7         |       |
|                                                                                       | 3.2988                                                                               | -37.1               | V                      | 3.0             | 39.6               | 1.0            | -75.7            | -13.0          | -62.7         |       |
|                                                                                       | 1.6494                                                                               | -34.5               | H                      | 3.0             | 40.2               | 1.0            | -73.7            | -13.0          | -60.7         |       |
|                                                                                       | 2.4741                                                                               | -23.4               | H                      | 3.0             | 40.1               | 1.0            | -62.5            | -13.0          | -49.5         |       |
|                                                                                       | 3.2988                                                                               | -37.3               | H                      | 3.0             | 39.6               | 1.0            | -75.9            | -13.0          | -62.9         |       |
|                                                                                       | Mid Channel (836.5MHz)                                                               |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | 1.6730                                                                               | -32.0               | V                      | 3.0             | 40.2               | 1.0            | -71.2            | -13.0          | -58.2         |       |
|                                                                                       | 2.5090                                                                               | -23.7               | V                      | 3.0             | 40.1               | 1.0            | -62.8            | -13.0          | -49.8         |       |
|                                                                                       | 3.3460                                                                               | -36.3               | V                      | 3.0             | 39.6               | 1.0            | -74.8            | -13.0          | -61.8         |       |
|                                                                                       | 1.6730                                                                               | -35.9               | H                      | 3.0             | 40.2               | 1.0            | -75.0            | -13.0          | -62.0         |       |
|                                                                                       | 2.5090                                                                               | -28.4               | H                      | 3.0             | 40.1               | 1.0            | -67.5            | -13.0          | -54.5         |       |
|                                                                                       | 3.3460                                                                               | -36.5               | H                      | 3.0             | 39.6               | 1.0            | -75.0            | -13.0          | -62.0         |       |
|                                                                                       | High Channel (844.3MHz)                                                              |                     |                        |                 |                    |                |                  |                |               |       |
|                                                                                       | 1.6886                                                                               | -18.6               | V                      | 3.0             | 40.2               | 1.0            | -57.8            | -13.0          | -44.8         |       |
| 2.5329                                                                                | -18.6                                                                                | V                   | 3.0                    | 40.1            | 1.0                | -57.6          | -13.0            | -44.6          |               |       |
| 3.3772                                                                                | -36.9                                                                                | V                   | 3.0                    | 39.5            | 1.0                | -75.4          | -13.0            | -62.4          |               |       |
| 1.6886                                                                                | -25.5                                                                                | H                   | 3.0                    | 40.2            | 1.0                | -64.7          | -13.0            | -51.7          |               |       |
| 2.5329                                                                                | -27.3                                                                                | H                   | 3.0                    | 40.1            | 1.0                | -66.3          | -13.0            | -53.3          |               |       |
| 3.3772                                                                                | -36.7                                                                                | H                   | 3.0                    | 39.5            | 1.0                | -75.2          | -13.0            | -62.2          |               |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                        |                 |                    |                |                  |                |               |       |

**LTE Band 4**

|                                 |                                                                                                                                                                                                                                                                                                      |                     |                    |                 |                |                |              |                |               |       |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| LTE<br>Band 4<br>20MHz<br>QPSK  | <p>UL Korea, Ltd Suwon Laboratory<br/>Above 1GHz High Frequency Substitution Measurement</p> <p>Company: Samsung<br/>Project #: 15K20515<br/>Date: 05-03-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br/>Mode: TX, LTE BAND 4, 20MHz BW, QPSK</p>  |                     |                    |                 |                |                |              |                |               |       |
|                                 | <p>Chamber Pre-amplifier Filter Limit</p> <p>Chamber 1 AFS42 Filter 1 FCC Part 27</p>                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                                                                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | <b>Low Channel (1720MHz)</b>                                                                                                                                                                                                                                                                         |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4400                                                                                                                                                                                                                                                                                               | -19.9               | V                  | 3.0             | 39.5           | 1.0            | -58.4        | -13.0          | -45.4         |       |
|                                 | 5.1600                                                                                                                                                                                                                                                                                               | -15.3               | V                  | 3.0             | 40.1           | 1.0            | -54.4        | -13.0          | -41.4         |       |
|                                 | 6.8800                                                                                                                                                                                                                                                                                               | -13.8               | V                  | 3.0             | 39.4           | 1.0            | -52.2        | -13.0          | -39.2         |       |
|                                 | 3.4400                                                                                                                                                                                                                                                                                               | -19.0               | H                  | 3.0             | 39.5           | 1.0            | -57.5        | -13.0          | -44.5         |       |
|                                 | 5.1600                                                                                                                                                                                                                                                                                               | -10.3               | H                  | 3.0             | 40.1           | 1.0            | -49.4        | -13.0          | -36.4         |       |
|                                 | 6.8800                                                                                                                                                                                                                                                                                               | -7.1                | H                  | 3.0             | 39.4           | 1.0            | -45.5        | -13.0          | -32.5         |       |
|                                 | <b>Mid Channel (1732.5MHz)</b>                                                                                                                                                                                                                                                                       |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                               | -20.5               | V                  | 3.0             | 39.4           | 1.0            | -59.0        | -13.0          | -46.0         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                               | -9.9                | V                  | 3.0             | 40.1           | 1.0            | -49.0        | -13.0          | -36.0         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                               | -16.8               | V                  | 3.0             | 39.4           | 1.0            | -55.2        | -13.0          | -42.2         |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                               | -19.6               | H                  | 3.0             | 39.4           | 1.0            | -58.0        | -13.0          | -45.0         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                               | -9.1                | H                  | 3.0             | 40.1           | 1.0            | -48.2        | -13.0          | -35.2         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                               | -14.0               | H                  | 3.0             | 39.4           | 1.0            | -52.4        | -13.0          | -39.4         |       |
|                                 | <b>High Channel (1745MHz)</b>                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4900                                                                                                                                                                                                                                                                                               | -22.3               | V                  | 3.0             | 39.4           | 1.0            | -60.7        | -13.0          | -47.7         |       |
|                                 | 5.2350                                                                                                                                                                                                                                                                                               | -17.5               | V                  | 3.0             | 40.1           | 1.0            | -56.6        | -13.0          | -43.6         |       |
|                                 | 6.9800                                                                                                                                                                                                                                                                                               | -11.6               | V                  | 3.0             | 39.3           | 1.0            | -50.0        | -13.0          | -37.0         |       |
|                                 | 3.4900                                                                                                                                                                                                                                                                                               | -19.5               | H                  | 3.0             | 39.4           | 1.0            | -57.9        | -13.0          | -44.9         |       |
|                                 | 5.2350                                                                                                                                                                                                                                                                                               | -10.2               | H                  | 3.0             | 40.1           | 1.0            | -49.3        | -13.0          | -36.3         |       |
|                                 | 6.9800                                                                                                                                                                                                                                                                                               | -13.3               | H                  | 3.0             | 39.3           | 1.0            | -51.6        | -13.0          | -38.6         |       |
|                                 | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
| LTE<br>Band 4<br>20MHz<br>16QAM | <p>UL Korea, Ltd Suwon Laboratory<br/>Above 1GHz High Frequency Substitution Measurement</p> <p>Company: Samsung<br/>Project #: 15K20515<br/>Date: 05-03-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br/>Mode: TX, LTE BAND 4, 20MHz BW, 16QAM</p> |                     |                    |                 |                |                |              |                |               |       |
|                                 | <p>Chamber Pre-amplifier Filter Limit</p> <p>Chamber 1 AFS42 Filter 1 FCC Part 27</p>                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                                                                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | <b>Low Channel (1720MHz)</b>                                                                                                                                                                                                                                                                         |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4400                                                                                                                                                                                                                                                                                               | -21.7               | V                  | 3.0             | 39.5           | 1.0            | -60.1        | -13.0          | -47.1         |       |
|                                 | 5.1600                                                                                                                                                                                                                                                                                               | -16.6               | V                  | 3.0             | 40.1           | 1.0            | -55.7        | -13.0          | -42.7         |       |
|                                 | 6.8800                                                                                                                                                                                                                                                                                               | -15.0               | V                  | 3.0             | 39.4           | 1.0            | -53.4        | -13.0          | -40.4         |       |
|                                 | 3.4400                                                                                                                                                                                                                                                                                               | -20.6               | H                  | 3.0             | 39.5           | 1.0            | -59.1        | -13.0          | -46.1         |       |
|                                 | 5.1600                                                                                                                                                                                                                                                                                               | -11.7               | H                  | 3.0             | 40.1           | 1.0            | -50.7        | -13.0          | -37.7         |       |
|                                 | 6.8800                                                                                                                                                                                                                                                                                               | -17.3               | H                  | 3.0             | 39.4           | 1.0            | -55.7        | -13.0          | -42.7         |       |
|                                 | <b>Mid Channel (1732.5MHz)</b>                                                                                                                                                                                                                                                                       |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                               | -22.3               | V                  | 3.0             | 39.4           | 1.0            | -60.7        | -13.0          | -47.7         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                               | -11.4               | V                  | 3.0             | 40.1           | 1.0            | -50.5        | -13.0          | -37.5         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                               | -17.3               | V                  | 3.0             | 39.4           | 1.0            | -55.6        | -13.0          | -42.6         |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                               | -20.6               | H                  | 3.0             | 39.4           | 1.0            | -59.0        | -13.0          | -46.0         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                               | -10.3               | H                  | 3.0             | 40.1           | 1.0            | -49.4        | -13.0          | -36.4         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                               | -15.8               | H                  | 3.0             | 39.4           | 1.0            | -54.1        | -13.0          | -41.1         |       |
|                                 | <b>High Channel (1745MHz)</b>                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4900                                                                                                                                                                                                                                                                                               | -22.4               | V                  | 3.0             | 39.4           | 1.0            | -60.8        | -13.0          | -47.8         |       |
|                                 | 5.2350                                                                                                                                                                                                                                                                                               | -18.5               | V                  | 3.0             | 40.1           | 1.0            | -57.6        | -13.0          | -44.6         |       |
|                                 | 6.9800                                                                                                                                                                                                                                                                                               | -12.9               | V                  | 3.0             | 39.3           | 1.0            | -51.3        | -13.0          | -38.3         |       |
|                                 | 3.4900                                                                                                                                                                                                                                                                                               | -21.0               | H                  | 3.0             | 39.4           | 1.0            | -59.4        | -13.0          | -46.4         |       |
|                                 | 5.2350                                                                                                                                                                                                                                                                                               | -10.8               | H                  | 3.0             | 40.1           | 1.0            | -49.9        | -13.0          | -36.9         |       |
|                                 | 6.9800                                                                                                                                                                                                                                                                                               | -14.5               | H                  | 3.0             | 39.3           | 1.0            | -52.9        | -13.0          | -39.9         |       |
|                                 | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |

|                                 |                                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |              |                |               |       |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| LTE<br>Band 4<br>15MHz<br>QPSK  | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 15MHz BW,QPSK  |                     |                    |                 |                |                |              |                |               |       |
|                                 | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>FCC Part 27</div> </div>                                                                    |                     |                    |                 |                |                |              |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                                                                                                               | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | Low Channel (1717.5MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4350                                                                                                                                                                                                                                                                                 | -21.7               | V                  | 3.0             | 39.5           | 1.0            | -60.2        | -13.0          | -47.2         |       |
|                                 | 5.1525                                                                                                                                                                                                                                                                                 | -16.3               | V                  | 3.0             | 40.1           | 1.0            | -55.4        | -13.0          | -42.4         |       |
|                                 | 6.8700                                                                                                                                                                                                                                                                                 | -15.0               | V                  | 3.0             | 39.4           | 1.0            | -53.4        | -13.0          | -40.4         |       |
|                                 | 3.4350                                                                                                                                                                                                                                                                                 | -20.2               | H                  | 3.0             | 39.5           | 1.0            | -58.6        | -13.0          | -45.6         |       |
|                                 | 5.1525                                                                                                                                                                                                                                                                                 | -12.4               | H                  | 3.0             | 40.1           | 1.0            | -51.4        | -13.0          | -38.4         |       |
|                                 | 6.8700                                                                                                                                                                                                                                                                                 | -16.9               | H                  | 3.0             | 39.4           | 1.0            | -55.3        | -13.0          | -42.3         |       |
|                                 | Mid Channel (1732.5MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                 | -22.2               | V                  | 3.0             | 39.4           | 1.0            | -60.7        | -13.0          | -47.7         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                 | -10.2               | V                  | 3.0             | 40.1           | 1.0            | -49.3        | -13.0          | -36.3         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                 | -17.0               | V                  | 3.0             | 39.4           | 1.0            | -55.4        | -13.0          | -42.4         |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                 | -19.0               | H                  | 3.0             | 39.4           | 1.0            | -57.4        | -13.0          | -44.4         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                 | -10.3               | H                  | 3.0             | 40.1           | 1.0            | -49.4        | -13.0          | -36.4         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                 | -16.2               | H                  | 3.0             | 39.4           | 1.0            | -54.5        | -13.0          | -41.5         |       |
|                                 | High Channel (1747.5MHz)                                                                                                                                                                                                                                                               |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4950                                                                                                                                                                                                                                                                                 | -20.4               | V                  | 3.0             | 39.4           | 1.0            | -58.8        | -13.0          | -45.8         |       |
|                                 | 5.2425                                                                                                                                                                                                                                                                                 | -15.8               | V                  | 3.0             | 40.1           | 1.0            | -54.9        | -13.0          | -41.9         |       |
|                                 | 6.9900                                                                                                                                                                                                                                                                                 | -13.3               | V                  | 3.0             | 39.3           | 1.0            | -51.7        | -13.0          | -38.7         |       |
|                                 | 3.4950                                                                                                                                                                                                                                                                                 | -20.5               | H                  | 3.0             | 39.4           | 1.0            | -58.9        | -13.0          | -45.9         |       |
|                                 | 5.2425                                                                                                                                                                                                                                                                                 | -18.1               | H                  | 3.0             | 40.1           | 1.0            | -57.2        | -13.0          | -44.2         |       |
|                                 | 6.9900                                                                                                                                                                                                                                                                                 | -13.2               | H                  | 3.0             | 39.3           | 1.0            | -51.6        | -13.0          | -38.6         |       |
|                                 | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |
| LTE<br>Band 4<br>15MHz<br>16QAM | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 15MHz BW,16QAM |                     |                    |                 |                |                |              |                |               |       |
|                                 | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>FCC Part 27</div> </div>                                                                    |                     |                    |                 |                |                |              |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                                                                                                               | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | Low Channel (1717.5MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4350                                                                                                                                                                                                                                                                                 | -22.1               | V                  | 3.0             | 39.5           | 1.0            | -60.5        | -13.0          | -47.5         |       |
|                                 | 5.1525                                                                                                                                                                                                                                                                                 | -17.2               | V                  | 3.0             | 40.1           | 1.0            | -56.3        | -13.0          | -43.3         |       |
|                                 | 6.8700                                                                                                                                                                                                                                                                                 | -15.7               | V                  | 3.0             | 39.4           | 1.0            | -54.1        | -13.0          | -41.1         |       |
|                                 | 3.4350                                                                                                                                                                                                                                                                                 | -21.7               | H                  | 3.0             | 39.5           | 1.0            | -60.1        | -13.0          | -47.1         |       |
|                                 | 5.1525                                                                                                                                                                                                                                                                                 | -13.1               | H                  | 3.0             | 40.1           | 1.0            | -52.2        | -13.0          | -39.2         |       |
|                                 | 6.8700                                                                                                                                                                                                                                                                                 | -17.4               | H                  | 3.0             | 39.4           | 1.0            | -55.8        | -13.0          | -42.8         |       |
|                                 | Mid Channel (1732.5MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                 | -22.9               | V                  | 3.0             | 39.4           | 1.0            | -61.3        | -13.0          | -48.3         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                 | -11.6               | V                  | 3.0             | 40.1           | 1.0            | -50.7        | -13.0          | -37.7         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                 | -17.3               | V                  | 3.0             | 39.4           | 1.0            | -55.6        | -13.0          | -42.6         |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                 | -20.1               | H                  | 3.0             | 39.4           | 1.0            | -58.5        | -13.0          | -45.5         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                 | -11.0               | H                  | 3.0             | 40.1           | 1.0            | -50.2        | -13.0          | -37.2         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                 | -17.0               | H                  | 3.0             | 39.4           | 1.0            | -55.4        | -13.0          | -42.4         |       |
|                                 | High Channel (1747.5MHz)                                                                                                                                                                                                                                                               |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4950                                                                                                                                                                                                                                                                                 | -21.5               | V                  | 3.0             | 39.4           | 1.0            | -59.9        | -13.0          | -46.9         |       |
|                                 | 5.2425                                                                                                                                                                                                                                                                                 | -16.7               | V                  | 3.0             | 40.1           | 1.0            | -55.8        | -13.0          | -42.8         |       |
|                                 | 6.9900                                                                                                                                                                                                                                                                                 | -14.3               | V                  | 3.0             | 39.3           | 1.0            | -52.6        | -13.0          | -39.6         |       |
|                                 | 3.4950                                                                                                                                                                                                                                                                                 | -21.8               | H                  | 3.0             | 39.4           | 1.0            | -60.2        | -13.0          | -47.2         |       |
|                                 | 5.2425                                                                                                                                                                                                                                                                                 | -19.3               | H                  | 3.0             | 40.1           | 1.0            | -58.4        | -13.0          | -45.4         |       |
|                                 | 6.9900                                                                                                                                                                                                                                                                                 | -14.4               | H                  | 3.0             | 39.3           | 1.0            | -52.7        | -13.0          | -39.7         |       |
|                                 | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |

|                                 |                                                                                                                                                                                                                                                                                         |                     |                    |                 |                |                |              |                |               |       |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| LTE<br>Band 4<br>10MHz<br>QPSK  | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 10MHz BW, QPSK  |                     |                    |                 |                |                |              |                |               |       |
|                                 | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>FCC Part 27</div> </div>                                                                     |                     |                    |                 |                |                |              |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                                                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | Low Channel (1715MHz)                                                                                                                                                                                                                                                                   |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4300                                                                                                                                                                                                                                                                                  | -22.0               | V                  | 3.0             | 39.5           | 1.0            | -60.5        | -13.0          | -47.5         |       |
|                                 | 5.1450                                                                                                                                                                                                                                                                                  | -15.6               | V                  | 3.0             | 40.1           | 1.0            | -54.6        | -13.0          | -41.6         |       |
|                                 | 6.8600                                                                                                                                                                                                                                                                                  | -16.3               | V                  | 3.0             | 39.4           | 1.0            | -54.7        | -13.0          | -41.7         |       |
|                                 | 3.4300                                                                                                                                                                                                                                                                                  | -21.5               | H                  | 3.0             | 39.5           | 1.0            | -59.9        | -13.0          | -46.9         |       |
|                                 | 5.1450                                                                                                                                                                                                                                                                                  | -15.5               | H                  | 3.0             | 40.1           | 1.0            | -54.5        | -13.0          | -41.5         |       |
|                                 | 6.8600                                                                                                                                                                                                                                                                                  | -16.4               | H                  | 3.0             | 39.4           | 1.0            | -54.8        | -13.0          | -41.8         |       |
|                                 | Mid Channel (1732.5MHz)                                                                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                  | -21.7               | V                  | 3.0             | 39.4           | 1.0            | -60.1        | -13.0          | -47.1         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                  | -11.3               | V                  | 3.0             | 40.1           | 1.0            | -50.4        | -13.0          | -37.4         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                  | -15.5               | V                  | 3.0             | 39.4           | 1.0            | -53.9        | -13.0          | -40.9         |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                  | -22.0               | H                  | 3.0             | 39.4           | 1.0            | -60.4        | -13.0          | -47.4         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                  | -14.4               | H                  | 3.0             | 40.1           | 1.0            | -53.5        | -13.0          | -40.5         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                  | -14.2               | H                  | 3.0             | 39.4           | 1.0            | -52.6        | -13.0          | -39.6         |       |
|                                 | High Channel (1750MHz)                                                                                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.5000                                                                                                                                                                                                                                                                                  | -20.3               | V                  | 3.0             | 39.4           | 1.0            | -58.7        | -13.0          | -45.7         |       |
|                                 | 5.2500                                                                                                                                                                                                                                                                                  | -14.3               | V                  | 3.0             | 40.1           | 1.0            | -53.4        | -13.0          | -40.4         |       |
|                                 | 7.0000                                                                                                                                                                                                                                                                                  | -15.4               | V                  | 3.0             | 39.3           | 1.0            | -53.7        | -13.0          | -40.7         |       |
|                                 | 3.5000                                                                                                                                                                                                                                                                                  | -20.9               | H                  | 3.0             | 39.4           | 1.0            | -59.3        | -13.0          | -46.3         |       |
|                                 | 5.2500                                                                                                                                                                                                                                                                                  | -17.9               | H                  | 3.0             | 40.1           | 1.0            | -57.0        | -13.0          | -44.0         |       |
|                                 | 7.0000                                                                                                                                                                                                                                                                                  | -14.6               | H                  | 3.0             | 39.3           | 1.0            | -52.9        | -13.0          | -39.9         |       |
|                                 | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                   |                     |                    |                 |                |                |              |                |               |       |
| LTE<br>Band 4<br>10MHz<br>16QAM | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 10MHz BW, 16QAM |                     |                    |                 |                |                |              |                |               |       |
|                                 | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>FCC Part 27</div> </div>                                                                     |                     |                    |                 |                |                |              |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                                                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | Low Channel (1715MHz)                                                                                                                                                                                                                                                                   |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4300                                                                                                                                                                                                                                                                                  | -23.3               | V                  | 3.0             | 39.5           | 1.0            | -61.8        | -13.0          | -48.8         |       |
|                                 | 5.1450                                                                                                                                                                                                                                                                                  | -16.1               | V                  | 3.0             | 40.1           | 1.0            | -55.2        | -13.0          | -42.2         |       |
|                                 | 6.8600                                                                                                                                                                                                                                                                                  | -17.4               | V                  | 3.0             | 39.4           | 1.0            | -55.8        | -13.0          | -42.8         |       |
|                                 | 3.4300                                                                                                                                                                                                                                                                                  | -22.2               | H                  | 3.0             | 39.5           | 1.0            | -60.6        | -13.0          | -47.6         |       |
|                                 | 5.1450                                                                                                                                                                                                                                                                                  | -16.7               | H                  | 3.0             | 40.1           | 1.0            | -55.8        | -13.0          | -42.8         |       |
|                                 | 6.8600                                                                                                                                                                                                                                                                                  | -17.5               | H                  | 3.0             | 39.4           | 1.0            | -55.9        | -13.0          | -42.9         |       |
|                                 | Mid Channel (1732.5MHz)                                                                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                  | -22.8               | V                  | 3.0             | 39.4           | 1.0            | -61.2        | -13.0          | -48.2         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                  | -12.6               | V                  | 3.0             | 40.1           | 1.0            | -51.8        | -13.0          | -38.8         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                  | -16.5               | V                  | 3.0             | 39.4           | 1.0            | -54.9        | -13.0          | -41.9         |       |
|                                 | 3.4650                                                                                                                                                                                                                                                                                  | -22.8               | H                  | 3.0             | 39.4           | 1.0            | -61.2        | -13.0          | -48.2         |       |
|                                 | 5.1975                                                                                                                                                                                                                                                                                  | -15.8               | H                  | 3.0             | 40.1           | 1.0            | -54.9        | -13.0          | -41.9         |       |
|                                 | 6.9300                                                                                                                                                                                                                                                                                  | -15.5               | H                  | 3.0             | 39.4           | 1.0            | -53.9        | -13.0          | -40.9         |       |
|                                 | High Channel (1750MHz)                                                                                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.5000                                                                                                                                                                                                                                                                                  | -21.6               | V                  | 3.0             | 39.4           | 1.0            | -60.0        | -13.0          | -47.0         |       |
|                                 | 5.2500                                                                                                                                                                                                                                                                                  | -14.7               | V                  | 3.0             | 40.1           | 1.0            | -53.8        | -13.0          | -40.8         |       |
|                                 | 7.0000                                                                                                                                                                                                                                                                                  | -16.1               | V                  | 3.0             | 39.3           | 1.0            | -54.4        | -13.0          | -41.4         |       |
|                                 | 3.5000                                                                                                                                                                                                                                                                                  | -21.5               | H                  | 3.0             | 39.4           | 1.0            | -59.9        | -13.0          | -46.9         |       |
|                                 | 5.2500                                                                                                                                                                                                                                                                                  | -18.9               | H                  | 3.0             | 40.1           | 1.0            | -58.0        | -13.0          | -45.0         |       |
|                                 | 7.0000                                                                                                                                                                                                                                                                                  | -15.5               | H                  | 3.0             | 39.3           | 1.0            | -53.8        | -13.0          | -40.8         |       |
|                                 | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                   |                     |                    |                 |                |                |              |                |               |       |

|                                |                                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |              |                |               |       |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| LTE<br>Band 4<br>5MHz<br>QPSK  | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 5MHz BW, QPSK  |                     |                    |                 |                |                |              |                |               |       |
|                                | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>FCC Part 27</div> </div>                                                                    |                     |                    |                 |                |                |              |                |               |       |
|                                | f<br>GHz                                                                                                                                                                                                                                                                               | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                | Low Channel (1712.5MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.4250                                                                                                                                                                                                                                                                                 | -22.1               | V                  | 3.0             | 39.5           | 1.0            | -60.5        | -13.0          | -47.5         |       |
|                                | 5.1375                                                                                                                                                                                                                                                                                 | -16.3               | V                  | 3.0             | 40.1           | 1.0            | -55.4        | -13.0          | -42.4         |       |
|                                | 6.5800                                                                                                                                                                                                                                                                                 | -17.7               | V                  | 3.0             | 39.5           | 1.0            | -56.2        | -13.0          | -43.2         |       |
|                                | 3.4250                                                                                                                                                                                                                                                                                 | -22.4               | H                  | 3.0             | 39.5           | 1.0            | -60.8        | -13.0          | -47.8         |       |
|                                | 5.1375                                                                                                                                                                                                                                                                                 | -18.3               | H                  | 3.0             | 40.1           | 1.0            | -57.3        | -13.0          | -44.3         |       |
|                                | 6.5800                                                                                                                                                                                                                                                                                 | -17.2               | H                  | 3.0             | 39.5           | 1.0            | -55.7        | -13.0          | -42.7         |       |
|                                | Mid Channel (1732.5MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.4650                                                                                                                                                                                                                                                                                 | -21.9               | V                  | 3.0             | 39.4           | 1.0            | -60.3        | -13.0          | -47.3         |       |
|                                | 5.1975                                                                                                                                                                                                                                                                                 | -11.2               | V                  | 3.0             | 40.1           | 1.0            | -50.3        | -13.0          | -37.3         |       |
|                                | 6.9300                                                                                                                                                                                                                                                                                 | -15.7               | V                  | 3.0             | 39.4           | 1.0            | -54.1        | -13.0          | -41.1         |       |
|                                | 3.4650                                                                                                                                                                                                                                                                                 | -19.2               | H                  | 3.0             | 39.4           | 1.0            | -57.6        | -13.0          | -44.6         |       |
|                                | 5.1975                                                                                                                                                                                                                                                                                 | -17.5               | H                  | 3.0             | 40.1           | 1.0            | -56.7        | -13.0          | -43.7         |       |
|                                | 6.9300                                                                                                                                                                                                                                                                                 | -16.2               | H                  | 3.0             | 39.4           | 1.0            | -54.5        | -13.0          | -41.5         |       |
|                                | High Channel (1752.5MHz)                                                                                                                                                                                                                                                               |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.5050                                                                                                                                                                                                                                                                                 | -21.3               | V                  | 3.0             | 39.4           | 1.0            | -59.7        | -13.0          | -46.7         |       |
|                                | 5.2575                                                                                                                                                                                                                                                                                 | -13.2               | V                  | 3.0             | 40.1           | 1.0            | -52.3        | -13.0          | -39.3         |       |
|                                | 7.0100                                                                                                                                                                                                                                                                                 | -14.2               | V                  | 3.0             | 39.3           | 1.0            | -52.5        | -13.0          | -39.5         |       |
|                                | 3.5050                                                                                                                                                                                                                                                                                 | -19.9               | H                  | 3.0             | 39.4           | 1.0            | -58.2        | -13.0          | -45.2         |       |
|                                | 5.2575                                                                                                                                                                                                                                                                                 | -13.0               | H                  | 3.0             | 40.1           | 1.0            | -52.1        | -13.0          | -39.1         |       |
|                                | 7.0100                                                                                                                                                                                                                                                                                 | -13.1               | H                  | 3.0             | 39.3           | 1.0            | -51.4        | -13.0          | -38.4         |       |
|                                | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |
| LTE<br>Band 4<br>5MHz<br>16QAM | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 7, 5MHz BW, 16QAM |                     |                    |                 |                |                |              |                |               |       |
|                                | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>FCC Part 27</div> </div>                                                                    |                     |                    |                 |                |                |              |                |               |       |
|                                | f<br>GHz                                                                                                                                                                                                                                                                               | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                | Low Channel (1712.5MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.4250                                                                                                                                                                                                                                                                                 | -23.6               | V                  | 3.0             | 39.5           | 1.0            | -62.0        | -13.0          | -49.0         |       |
|                                | 5.1375                                                                                                                                                                                                                                                                                 | -17.3               | V                  | 3.0             | 40.1           | 1.0            | -56.3        | -13.0          | -43.3         |       |
|                                | 6.5800                                                                                                                                                                                                                                                                                 | -18.9               | V                  | 3.0             | 39.5           | 1.0            | -57.4        | -13.0          | -44.4         |       |
|                                | 3.4250                                                                                                                                                                                                                                                                                 | -24.0               | H                  | 3.0             | 39.5           | 1.0            | -62.4        | -13.0          | -49.4         |       |
|                                | 5.1375                                                                                                                                                                                                                                                                                 | -19.8               | H                  | 3.0             | 40.1           | 1.0            | -58.9        | -13.0          | -45.9         |       |
|                                | 6.5800                                                                                                                                                                                                                                                                                 | -18.7               | H                  | 3.0             | 39.5           | 1.0            | -57.2        | -13.0          | -44.2         |       |
|                                | Mid Channel (1732.5MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.4650                                                                                                                                                                                                                                                                                 | -23.1               | V                  | 3.0             | 39.4           | 1.0            | -61.5        | -13.0          | -48.5         |       |
|                                | 5.1975                                                                                                                                                                                                                                                                                 | -11.9               | V                  | 3.0             | 40.1           | 1.0            | -51.1        | -13.0          | -38.1         |       |
|                                | 6.9300                                                                                                                                                                                                                                                                                 | -17.0               | V                  | 3.0             | 39.4           | 1.0            | -55.4        | -13.0          | -42.4         |       |
|                                | 3.4650                                                                                                                                                                                                                                                                                 | -20.3               | H                  | 3.0             | 39.4           | 1.0            | -58.7        | -13.0          | -45.7         |       |
|                                | 5.1975                                                                                                                                                                                                                                                                                 | -18.8               | H                  | 3.0             | 40.1           | 1.0            | -58.0        | -13.0          | -45.0         |       |
|                                | 6.9300                                                                                                                                                                                                                                                                                 | -17.0               | H                  | 3.0             | 39.4           | 1.0            | -55.4        | -13.0          | -42.4         |       |
|                                | High Channel (1752.5MHz)                                                                                                                                                                                                                                                               |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.5050                                                                                                                                                                                                                                                                                 | -22.3               | V                  | 3.0             | 39.4           | 1.0            | -60.7        | -13.0          | -47.7         |       |
|                                | 5.2575                                                                                                                                                                                                                                                                                 | -13.9               | V                  | 3.0             | 40.1           | 1.0            | -53.0        | -13.0          | -40.0         |       |
|                                | 7.0100                                                                                                                                                                                                                                                                                 | -15.0               | V                  | 3.0             | 39.3           | 1.0            | -53.4        | -13.0          | -40.4         |       |
|                                | 3.5050                                                                                                                                                                                                                                                                                 | -20.7               | H                  | 3.0             | 39.4           | 1.0            | -59.1        | -13.0          | -46.1         |       |
|                                | 5.2575                                                                                                                                                                                                                                                                                 | -13.9               | H                  | 3.0             | 40.1           | 1.0            | -53.0        | -13.0          | -40.0         |       |
|                                | 7.0100                                                                                                                                                                                                                                                                                 | -14.1               | H                  | 3.0             | 39.3           | 1.0            | -52.4        | -13.0          | -39.4         |       |
|                                | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                  |                     |                    |                 |                |                |              |                |               |       |

|                                |                                                                                                                                                                                                                                                                                       |                     |                    |                 |                |                |              |                |               |       |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| LTE<br>Band 4<br>3MHz<br>QPSK  | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 3MHz BW,QPSK  |                     |                    |                 |                |                |              |                |               |       |
|                                | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>FCC Part 27</div> </div>                                                                   |                     |                    |                 |                |                |              |                |               |       |
|                                | f<br>GHz                                                                                                                                                                                                                                                                              | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                | Low Channel (1711.5MHz)                                                                                                                                                                                                                                                               |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.4230                                                                                                                                                                                                                                                                                | -22.1               | V                  | 3.0             | 39.5           | 1.0            | -60.6        | -13.0          | -47.6         |       |
|                                | 5.1345                                                                                                                                                                                                                                                                                | -16.0               | V                  | 3.0             | 40.0           | 1.0            | -55.1        | -13.0          | -42.1         |       |
|                                | 6.8460                                                                                                                                                                                                                                                                                | -16.7               | V                  | 3.0             | 39.4           | 1.0            | -55.1        | -13.0          | -42.1         |       |
|                                | 3.4230                                                                                                                                                                                                                                                                                | -23.3               | H                  | 3.0             | 39.5           | 1.0            | -61.8        | -13.0          | -48.8         |       |
|                                | 5.1345                                                                                                                                                                                                                                                                                | -14.2               | H                  | 3.0             | 40.0           | 1.0            | -53.3        | -13.0          | -40.3         |       |
|                                | 6.8460                                                                                                                                                                                                                                                                                | -16.7               | H                  | 3.0             | 39.4           | 1.0            | -55.1        | -13.0          | -42.1         |       |
|                                | Mid Channel (1732.5MHz)                                                                                                                                                                                                                                                               |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.4650                                                                                                                                                                                                                                                                                | -21.9               | V                  | 3.0             | 39.4           | 1.0            | -60.3        | -13.0          | -47.3         |       |
|                                | 5.1975                                                                                                                                                                                                                                                                                | -9.9                | V                  | 3.0             | 40.1           | 1.0            | -49.0        | -13.0          | -36.0         |       |
|                                | 6.9300                                                                                                                                                                                                                                                                                | -16.5               | V                  | 3.0             | 39.4           | 1.0            | -54.8        | -13.0          | -41.8         |       |
|                                | 3.4650                                                                                                                                                                                                                                                                                | -22.0               | H                  | 3.0             | 39.4           | 1.0            | -60.4        | -13.0          | -47.4         |       |
|                                | 5.1975                                                                                                                                                                                                                                                                                | -12.1               | H                  | 3.0             | 40.1           | 1.0            | -51.2        | -13.0          | -38.2         |       |
|                                | 6.9300                                                                                                                                                                                                                                                                                | -16.6               | H                  | 3.0             | 39.4           | 1.0            | -55.0        | -13.0          | -42.0         |       |
|                                | High Channel (1753.5MHz)                                                                                                                                                                                                                                                              |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.5070                                                                                                                                                                                                                                                                                | -21.5               | V                  | 3.0             | 39.4           | 1.0            | -59.9        | -13.0          | -46.9         |       |
|                                | 5.2605                                                                                                                                                                                                                                                                                | -11.7               | V                  | 3.0             | 40.1           | 1.0            | -50.8        | -13.0          | -37.8         |       |
|                                | 7.0140                                                                                                                                                                                                                                                                                | -14.3               | V                  | 3.0             | 39.3           | 1.0            | -52.6        | -13.0          | -39.6         |       |
|                                | 3.5070                                                                                                                                                                                                                                                                                | -21.6               | H                  | 3.0             | 39.4           | 1.0            | -60.0        | -13.0          | -47.0         |       |
|                                | 5.2605                                                                                                                                                                                                                                                                                | -13.9               | H                  | 3.0             | 40.1           | 1.0            | -53.0        | -13.0          | -40.0         |       |
|                                | 7.0140                                                                                                                                                                                                                                                                                | -13.7               | H                  | 3.0             | 39.3           | 1.0            | -52.0        | -13.0          | -39.0         |       |
|                                | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
| LTE<br>Band 4<br>3MHz<br>16QAM | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 3MHz BW,16QAM |                     |                    |                 |                |                |              |                |               |       |
|                                | <div> <div>Chamber</div> <div>Chamber 1</div> </div> <div> <div>Pre-amplifier</div> <div>AFS42</div> </div> <div> <div>Filter</div> <div>Filter 1</div> </div> <div> <div>Limit</div> <div>FCC Part 27</div> </div>                                                                   |                     |                    |                 |                |                |              |                |               |       |
|                                | f<br>GHz                                                                                                                                                                                                                                                                              | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                | Low Channel (1711.5MHz)                                                                                                                                                                                                                                                               |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.4230                                                                                                                                                                                                                                                                                | -23.1               | V                  | 3.0             | 39.5           | 1.0            | -61.6        | -13.0          | -48.6         |       |
|                                | 5.1345                                                                                                                                                                                                                                                                                | -17.6               | V                  | 3.0             | 40.0           | 1.0            | -56.6        | -13.0          | -43.6         |       |
|                                | 6.8460                                                                                                                                                                                                                                                                                | -18.2               | V                  | 3.0             | 39.4           | 1.0            | -56.6        | -13.0          | -43.6         |       |
|                                | 3.4230                                                                                                                                                                                                                                                                                | -24.4               | H                  | 3.0             | 39.5           | 1.0            | -62.9        | -13.0          | -49.9         |       |
|                                | 5.1345                                                                                                                                                                                                                                                                                | -15.8               | H                  | 3.0             | 40.0           | 1.0            | -54.8        | -13.0          | -41.8         |       |
|                                | 6.8460                                                                                                                                                                                                                                                                                | -18.1               | H                  | 3.0             | 39.4           | 1.0            | -56.5        | -13.0          | -43.5         |       |
|                                | Mid Channel (1732.5MHz)                                                                                                                                                                                                                                                               |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.4650                                                                                                                                                                                                                                                                                | -23.5               | V                  | 3.0             | 39.4           | 1.0            | -61.9        | -13.0          | -48.9         |       |
|                                | 5.1975                                                                                                                                                                                                                                                                                | -11.2               | V                  | 3.0             | 40.1           | 1.0            | -50.3        | -13.0          | -37.3         |       |
|                                | 6.9300                                                                                                                                                                                                                                                                                | -17.3               | V                  | 3.0             | 39.4           | 1.0            | -55.7        | -13.0          | -42.7         |       |
|                                | 3.4650                                                                                                                                                                                                                                                                                | -23.1               | H                  | 3.0             | 39.4           | 1.0            | -61.5        | -13.0          | -48.5         |       |
|                                | 5.1975                                                                                                                                                                                                                                                                                | -13.0               | H                  | 3.0             | 40.1           | 1.0            | -52.1        | -13.0          | -39.1         |       |
|                                | 6.9300                                                                                                                                                                                                                                                                                | -17.2               | H                  | 3.0             | 39.4           | 1.0            | -55.6        | -13.0          | -42.6         |       |
|                                | High Channel (1752.5MHz)                                                                                                                                                                                                                                                              |                     |                    |                 |                |                |              |                |               |       |
|                                | 3.5070                                                                                                                                                                                                                                                                                | -22.6               | V                  | 3.0             | 39.4           | 1.0            | -61.0        | -13.0          | -48.0         |       |
|                                | 5.2605                                                                                                                                                                                                                                                                                | -13.0               | V                  | 3.0             | 40.1           | 1.0            | -52.1        | -13.0          | -39.1         |       |
|                                | 7.0140                                                                                                                                                                                                                                                                                | -15.7               | V                  | 3.0             | 39.3           | 1.0            | -54.0        | -13.0          | -41.0         |       |
|                                | 3.5070                                                                                                                                                                                                                                                                                | -22.3               | H                  | 3.0             | 39.4           | 1.0            | -60.7        | -13.0          | -47.7         |       |
|                                | 5.2605                                                                                                                                                                                                                                                                                | -15.5               | H                  | 3.0             | 40.1           | 1.0            | -54.6        | -13.0          | -41.6         |       |
|                                | 7.0140                                                                                                                                                                                                                                                                                | -14.9               | H                  | 3.0             | 39.3           | 1.0            | -53.2        | -13.0          | -40.2         |       |
|                                | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |

| UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement  |                                                                                                                                                                                              |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|-------|
| LTE<br>Band 4<br>1.4MHz<br>QPSK                                                       | Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 1.4MHz BW, QPSK  |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
|                                                                                       | <div style="border: 1px solid black; padding: 2px; text-align: center;">Chamber</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">Chamber 1</div>                |                     | <div style="border: 1px solid black; padding: 2px; text-align: center;">Pre-amplifier</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">AFS42</div> |                 | <div style="border: 1px solid black; padding: 2px; text-align: center;">Filter</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">Filter 1</div> |                | <div style="border: 1px solid black; padding: 2px; text-align: center;">Limit</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">FCC Part 27</div> |                |               |       |
|                                                                                       | f<br>GHz                                                                                                                                                                                     | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)                                                                                                                                                              | Distance<br>(m) | Preamp<br>(dB)                                                                                                                                                              | Filter<br>(dB) | ERP<br>(dBm)                                                                                                                                                                  | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                                       | Low Channel (1710.7MHz)                                                                                                                                                                      |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
|                                                                                       | 3.4214                                                                                                                                                                                       | -23.4               | V                                                                                                                                                                               | 3.0             | 39.5                                                                                                                                                                        | 1.0            | -61.9                                                                                                                                                                         | -13.0          | -48.9         |       |
|                                                                                       | 5.1321                                                                                                                                                                                       | -15.0               | V                                                                                                                                                                               | 3.0             | 40.0                                                                                                                                                                        | 1.0            | -54.1                                                                                                                                                                         | -13.0          | -41.1         |       |
|                                                                                       | 6.8428                                                                                                                                                                                       | -16.8               | V                                                                                                                                                                               | 3.0             | 39.4                                                                                                                                                                        | 1.0            | -55.2                                                                                                                                                                         | -13.0          | -42.2         |       |
|                                                                                       | 3.4214                                                                                                                                                                                       | -23.2               | H                                                                                                                                                                               | 3.0             | 39.5                                                                                                                                                                        | 1.0            | -61.7                                                                                                                                                                         | -13.0          | -48.7         |       |
|                                                                                       | 5.1321                                                                                                                                                                                       | -16.3               | H                                                                                                                                                                               | 3.0             | 40.0                                                                                                                                                                        | 1.0            | -55.3                                                                                                                                                                         | -13.0          | -42.3         |       |
|                                                                                       | 6.8428                                                                                                                                                                                       | -16.6               | H                                                                                                                                                                               | 3.0             | 39.4                                                                                                                                                                        | 1.0            | -55.0                                                                                                                                                                         | -13.0          | -42.0         |       |
| Mid Channel (1732.5MHz)                                                               |                                                                                                                                                                                              |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
| 3.4650                                                                                | -22.2                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -60.6          | -13.0                                                                                                                                                                         | -47.6          |               |       |
| 5.1975                                                                                | -10.0                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 40.1            | 1.0                                                                                                                                                                         | -49.1          | -13.0                                                                                                                                                                         | -36.1          |               |       |
| 6.9300                                                                                | -14.6                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -53.0          | -13.0                                                                                                                                                                         | -40.0          |               |       |
| 3.4650                                                                                | -19.3                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -57.7          | -13.0                                                                                                                                                                         | -44.7          |               |       |
| 5.1975                                                                                | -13.0                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 40.1            | 1.0                                                                                                                                                                         | -52.1          | -13.0                                                                                                                                                                         | -39.1          |               |       |
| 6.9300                                                                                | -6.3                                                                                                                                                                                         | H                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -44.6          | -13.0                                                                                                                                                                         | -31.6          |               |       |
| High Channel (1754.3MHz)                                                              |                                                                                                                                                                                              |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
| 3.5086                                                                                | -21.4                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -59.7          | -13.0                                                                                                                                                                         | -46.7          |               |       |
| 5.2629                                                                                | -12.0                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 40.1            | 1.0                                                                                                                                                                         | -51.1          | -13.0                                                                                                                                                                         | -38.1          |               |       |
| 7.0172                                                                                | -14.0                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 39.3            | 1.0                                                                                                                                                                         | -52.4          | -13.0                                                                                                                                                                         | -39.4          |               |       |
| 3.5086                                                                                | -19.6                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -57.9          | -13.0                                                                                                                                                                         | -44.9          |               |       |
| 5.2629                                                                                | -11.5                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 40.1            | 1.0                                                                                                                                                                         | -50.6          | -13.0                                                                                                                                                                         | -37.6          |               |       |
| 7.0172                                                                                | -13.1                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 39.3            | 1.0                                                                                                                                                                         | -51.4          | -13.0                                                                                                                                                                         | -38.4          |               |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                                                                                                                              |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
| LTE<br>Band 4<br>1.4MHz<br>16QAM                                                      | Company: Samsung<br>Project #: 15K20515<br>Date: 05-03-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 4, 1.4MHz BW, 16QAM |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
|                                                                                       | <div style="border: 1px solid black; padding: 2px; text-align: center;">Chamber</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">Chamber 1</div>                |                     | <div style="border: 1px solid black; padding: 2px; text-align: center;">Pre-amplifier</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">AFS42</div> |                 | <div style="border: 1px solid black; padding: 2px; text-align: center;">Filter</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">Filter 1</div> |                | <div style="border: 1px solid black; padding: 2px; text-align: center;">Limit</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">FCC Part 27</div> |                |               |       |
|                                                                                       | f<br>GHz                                                                                                                                                                                     | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)                                                                                                                                                              | Distance<br>(m) | Preamp<br>(dB)                                                                                                                                                              | Filter<br>(dB) | ERP<br>(dBm)                                                                                                                                                                  | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                                       | Low Channel (1710.7MHz)                                                                                                                                                                      |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
|                                                                                       | 3.4214                                                                                                                                                                                       | -24.6               | V                                                                                                                                                                               | 3.0             | 39.5                                                                                                                                                                        | 1.0            | -63.1                                                                                                                                                                         | -13.0          | -50.1         |       |
|                                                                                       | 5.1321                                                                                                                                                                                       | -16.6               | V                                                                                                                                                                               | 3.0             | 40.0                                                                                                                                                                        | 1.0            | -55.7                                                                                                                                                                         | -13.0          | -42.7         |       |
|                                                                                       | 6.8428                                                                                                                                                                                       | -17.8               | V                                                                                                                                                                               | 3.0             | 39.4                                                                                                                                                                        | 1.0            | -56.2                                                                                                                                                                         | -13.0          | -43.2         |       |
|                                                                                       | 3.4214                                                                                                                                                                                       | -24.8               | H                                                                                                                                                                               | 3.0             | 39.5                                                                                                                                                                        | 1.0            | -63.3                                                                                                                                                                         | -13.0          | -50.3         |       |
|                                                                                       | 5.1321                                                                                                                                                                                       | -17.2               | H                                                                                                                                                                               | 3.0             | 40.0                                                                                                                                                                        | 1.0            | -56.2                                                                                                                                                                         | -13.0          | -43.2         |       |
|                                                                                       | 6.8428                                                                                                                                                                                       | -17.4               | H                                                                                                                                                                               | 3.0             | 39.4                                                                                                                                                                        | 1.0            | -55.8                                                                                                                                                                         | -13.0          | -42.8         |       |
| Mid Channel (1732.5MHz)                                                               |                                                                                                                                                                                              |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
| 3.4650                                                                                | -22.7                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -61.1          | -13.0                                                                                                                                                                         | -48.1          |               |       |
| 5.1975                                                                                | -11.2                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 40.1            | 1.0                                                                                                                                                                         | -50.3          | -13.0                                                                                                                                                                         | -37.3          |               |       |
| 6.9300                                                                                | -15.9                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -54.3          | -13.0                                                                                                                                                                         | -41.3          |               |       |
| 3.4650                                                                                | -20.1                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -58.5          | -13.0                                                                                                                                                                         | -45.5          |               |       |
| 5.1975                                                                                | -14.7                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 40.1            | 1.0                                                                                                                                                                         | -53.8          | -13.0                                                                                                                                                                         | -40.8          |               |       |
| 6.9300                                                                                | -17.3                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -55.7          | -13.0                                                                                                                                                                         | -42.7          |               |       |
| High Channel (1754.3MHz)                                                              |                                                                                                                                                                                              |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |
| 3.5086                                                                                | -22.3                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -60.6          | -13.0                                                                                                                                                                         | -47.6          |               |       |
| 5.2629                                                                                | -13.5                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 40.1            | 1.0                                                                                                                                                                         | -52.6          | -13.0                                                                                                                                                                         | -39.6          |               |       |
| 7.0172                                                                                | -15.2                                                                                                                                                                                        | V                   | 3.0                                                                                                                                                                             | 39.3            | 1.0                                                                                                                                                                         | -53.6          | -13.0                                                                                                                                                                         | -40.6          |               |       |
| 3.5086                                                                                | -20.4                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 39.4            | 1.0                                                                                                                                                                         | -58.8          | -13.0                                                                                                                                                                         | -45.8          |               |       |
| 5.2629                                                                                | -12.5                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 40.1            | 1.0                                                                                                                                                                         | -51.6          | -13.0                                                                                                                                                                         | -38.6          |               |       |
| 7.0172                                                                                | -14.4                                                                                                                                                                                        | H                   | 3.0                                                                                                                                                                             | 39.3            | 1.0                                                                                                                                                                         | -52.8          | -13.0                                                                                                                                                                         | -39.8          |               |       |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                                                                                                                              |                     |                                                                                                                                                                                 |                 |                                                                                                                                                                             |                |                                                                                                                                                                               |                |               |       |

**LTE Band 2**

|                                 |                                                                                                                                                                                                                                                                                                      |                     |                    |                 |                |                |              |                |               |       |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| LTE<br>Band 2<br>20MHz<br>QPSK  | <p>UL Korea, Ltd Suwon Laboratory<br/>Above 1GHz High Frequency Substitution Measurement</p> <p>Company: Samsung<br/>Project #: 15K20515<br/>Date: 05-01-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br/>Mode: TX, LTE BAND 2, 20MHz BW, QPSK</p>  |                     |                    |                 |                |                |              |                |               |       |
|                                 | <p>Chamber Pre-amplifier Filter Limit</p> <p>Chamber 1 AFS42 Filter 1 FCC Part 27</p>                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                                                                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | <b>Low Channel (1860MHz)</b>                                                                                                                                                                                                                                                                         |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.7200                                                                                                                                                                                                                                                                                               | -9.7                | V                  | 3.0             | 39.1           | 1.0            | -47.8        | -13.0          | -34.8         |       |
|                                 | 5.5800                                                                                                                                                                                                                                                                                               | -10.9               | V                  | 3.0             | 40.0           | 1.0            | -49.9        | -13.0          | -36.9         |       |
|                                 | 7.4400                                                                                                                                                                                                                                                                                               | -17.7               | V                  | 3.0             | 39.2           | 1.0            | -55.9        | -13.0          | -42.9         |       |
|                                 | 3.7200                                                                                                                                                                                                                                                                                               | -12.6               | H                  | 3.0             | 39.1           | 1.0            | -50.8        | -13.0          | -37.8         |       |
|                                 | 5.5800                                                                                                                                                                                                                                                                                               | -11.7               | H                  | 3.0             | 40.0           | 1.0            | -50.7        | -13.0          | -37.7         |       |
|                                 | 7.4400                                                                                                                                                                                                                                                                                               | -16.6               | H                  | 3.0             | 39.2           | 1.0            | -54.7        | -13.0          | -41.7         |       |
|                                 | <b>Mid Channel (1880MHz)</b>                                                                                                                                                                                                                                                                         |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.7600                                                                                                                                                                                                                                                                                               | -22.2               | V                  | 3.0             | 39.1           | 1.0            | -60.2        | -13.0          | -47.2         |       |
|                                 | 5.6400                                                                                                                                                                                                                                                                                               | -10.9               | V                  | 3.0             | 39.9           | 1.0            | -49.8        | -13.0          | -36.8         |       |
|                                 | 7.5200                                                                                                                                                                                                                                                                                               | -16.8               | V                  | 3.0             | 39.1           | 1.0            | -54.9        | -13.0          | -41.9         |       |
|                                 | 3.7600                                                                                                                                                                                                                                                                                               | -21.0               | H                  | 3.0             | 39.1           | 1.0            | -59.1        | -13.0          | -46.1         |       |
|                                 | 5.6400                                                                                                                                                                                                                                                                                               | -12.6               | H                  | 3.0             | 39.9           | 1.0            | -51.5        | -13.0          | -38.5         |       |
|                                 | 7.5200                                                                                                                                                                                                                                                                                               | -16.2               | H                  | 3.0             | 39.1           | 1.0            | -54.4        | -13.0          | -41.4         |       |
|                                 | <b>High Channel (1900MHz)</b>                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.8000                                                                                                                                                                                                                                                                                               | -16.5               | V                  | 3.0             | 39.1           | 1.0            | -54.5        | -13.0          | -41.5         |       |
|                                 | 5.7000                                                                                                                                                                                                                                                                                               | -13.6               | V                  | 3.0             | 39.9           | 1.0            | -52.5        | -13.0          | -39.5         |       |
|                                 | 7.6000                                                                                                                                                                                                                                                                                               | -16.6               | V                  | 3.0             | 39.1           | 1.0            | -54.7        | -13.0          | -41.7         |       |
|                                 | 3.8000                                                                                                                                                                                                                                                                                               | -16.2               | H                  | 3.0             | 39.1           | 1.0            | -54.3        | -13.0          | -41.3         |       |
|                                 | 5.7000                                                                                                                                                                                                                                                                                               | -14.6               | H                  | 3.0             | 39.9           | 1.0            | -53.5        | -13.0          | -40.5         |       |
|                                 | 7.6000                                                                                                                                                                                                                                                                                               | -16.2               | H                  | 3.0             | 39.1           | 1.0            | -54.3        | -13.0          | -41.3         |       |
|                                 | Rev. 03.03.09                                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |              |                |               |       |
|                                 | Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
| LTE<br>Band 2<br>20MHz<br>16QAM | <p>UL Korea, Ltd Suwon Laboratory<br/>Above 1GHz High Frequency Substitution Measurement</p> <p>Company: Samsung<br/>Project #: 15K20515<br/>Date: 05-01-15<br/>Test Engineer: Steven.Kim<br/>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br/>Mode: TX, LTE BAND 2, 20MHz BW, 16QAM</p> |                     |                    |                 |                |                |              |                |               |       |
|                                 | <p>Chamber Pre-amplifier Filter Limit</p> <p>Chamber 1 AFS42 Filter 1 FCC Part 27</p>                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                 | f<br>GHz                                                                                                                                                                                                                                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                 | <b>Low Channel (1860MHz)</b>                                                                                                                                                                                                                                                                         |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.7200                                                                                                                                                                                                                                                                                               | -10.8               | V                  | 3.0             | 39.1           | 1.0            | -48.9        | -13.0          | -35.9         |       |
|                                 | 5.5800                                                                                                                                                                                                                                                                                               | -13.0               | V                  | 3.0             | 40.0           | 1.0            | -51.9        | -13.0          | -38.9         |       |
|                                 | 7.4400                                                                                                                                                                                                                                                                                               | -17.5               | V                  | 3.0             | 39.2           | 1.0            | -55.6        | -13.0          | -42.6         |       |
|                                 | 3.7200                                                                                                                                                                                                                                                                                               | -13.6               | H                  | 3.0             | 39.1           | 1.0            | -51.8        | -13.0          | -38.8         |       |
|                                 | 5.5800                                                                                                                                                                                                                                                                                               | -14.0               | H                  | 3.0             | 40.0           | 1.0            | -53.0        | -13.0          | -40.0         |       |
|                                 | 7.4400                                                                                                                                                                                                                                                                                               | -16.7               | H                  | 3.0             | 39.2           | 1.0            | -54.9        | -13.0          | -41.9         |       |
|                                 | <b>Mid Channel (1880MHz)</b>                                                                                                                                                                                                                                                                         |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.7600                                                                                                                                                                                                                                                                                               | -23.6               | V                  | 3.0             | 39.1           | 1.0            | -61.7        | -13.0          | -48.7         |       |
|                                 | 5.6400                                                                                                                                                                                                                                                                                               | -11.6               | V                  | 3.0             | 39.9           | 1.0            | -50.5        | -13.0          | -37.5         |       |
|                                 | 7.5200                                                                                                                                                                                                                                                                                               | -17.2               | V                  | 3.0             | 39.1           | 1.0            | -55.3        | -13.0          | -42.3         |       |
|                                 | 3.7600                                                                                                                                                                                                                                                                                               | -22.7               | H                  | 3.0             | 39.1           | 1.0            | -60.8        | -13.0          | -47.8         |       |
|                                 | 5.6400                                                                                                                                                                                                                                                                                               | -15.2               | H                  | 3.0             | 39.9           | 1.0            | -54.1        | -13.0          | -41.1         |       |
|                                 | 7.5200                                                                                                                                                                                                                                                                                               | -16.4               | H                  | 3.0             | 39.1           | 1.0            | -54.5        | -13.0          | -41.5         |       |
|                                 | <b>High Channel (1900MHz)</b>                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |              |                |               |       |
|                                 | 3.8000                                                                                                                                                                                                                                                                                               | -17.8               | V                  | 3.0             | 39.1           | 1.0            | -55.8        | -13.0          | -42.8         |       |
|                                 | 5.7000                                                                                                                                                                                                                                                                                               | -14.7               | V                  | 3.0             | 39.9           | 1.0            | -53.6        | -13.0          | -40.6         |       |
|                                 | 7.6000                                                                                                                                                                                                                                                                                               | -16.7               | V                  | 3.0             | 39.1           | 1.0            | -54.8        | -13.0          | -41.8         |       |
|                                 | 3.8000                                                                                                                                                                                                                                                                                               | -16.5               | H                  | 3.0             | 39.1           | 1.0            | -54.6        | -13.0          | -41.6         |       |
|                                 | 5.7000                                                                                                                                                                                                                                                                                               | -15.5               | H                  | 3.0             | 39.9           | 1.0            | -54.4        | -13.0          | -41.4         |       |
|                                 | 7.6000                                                                                                                                                                                                                                                                                               | -16.0               | H                  | 3.0             | 39.1           | 1.0            | -54.1        | -13.0          | -41.1         |       |
|                                 | Rev. 03.03.09                                                                                                                                                                                                                                                                                        |                     |                    |                 |                |                |              |                |               |       |
|                                 | Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |

|                                                                      |                                                                                      |                     |                        |                 |                    |                |                      |                |               |       |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|------------------------|-----------------|--------------------|----------------|----------------------|----------------|---------------|-------|
| LTE<br>Band 2<br>15MHz<br>QPSK                                       | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Company: Samsung                                                                     |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Project #: 15K20515                                                                  |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Date: 05-01-15                                                                       |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Test Engineer: Steven.Kim                                                            |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Configuration: EUT / AC Adapter / Ear Phone / Z-Position                             |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Mode: TX, LTE BAND 2, 15MHz BW, QPSK                                                 |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Chamber<br>Chamber 1                                                                 |                     | Pre-amplifier<br>AFS42 |                 | Filter<br>Filter 1 |                | Limit<br>FCC Part 27 |                |               |       |
|                                                                      | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB)     | Filter<br>(dB) | ERP<br>(dBm)         | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                      | Low Channel (1857.5MHz)                                                              |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | 3.7150                                                                               | -10.0               | V                      | 3.0             | 39.1               | 1.0            | -48.2                | -13.0          | -35.2         |       |
|                                                                      | 5.5725                                                                               | -11.7               | V                      | 3.0             | 40.0               | 1.0            | -50.6                | -13.0          | -37.6         |       |
|                                                                      | 7.4300                                                                               | -17.2               | V                      | 3.0             | 39.2               | 1.0            | -55.4                | -13.0          | -42.4         |       |
|                                                                      | 3.7150                                                                               | -12.4               | H                      | 3.0             | 39.1               | 1.0            | -50.6                | -13.0          | -37.6         |       |
|                                                                      | 5.5725                                                                               | -12.1               | H                      | 3.0             | 40.0               | 1.0            | -51.0                | -13.0          | -38.0         |       |
|                                                                      | 7.4300                                                                               | -16.8               | H                      | 3.0             | 39.2               | 1.0            | -55.0                | -13.0          | -42.0         |       |
|                                                                      | Mid Channel (1880MHz)                                                                |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | 3.7600                                                                               | -21.0               | V                      | 3.0             | 39.1               | 1.0            | -59.0                | -13.0          | -46.0         |       |
|                                                                      | 5.6400                                                                               | -10.8               | V                      | 3.0             | 39.9               | 1.0            | -49.7                | -13.0          | -36.7         |       |
|                                                                      | 7.5200                                                                               | -15.4               | V                      | 3.0             | 39.1               | 1.0            | -53.6                | -13.0          | -40.6         |       |
|                                                                      | 3.7600                                                                               | -21.6               | H                      | 3.0             | 39.1               | 1.0            | -59.7                | -13.0          | -46.7         |       |
|                                                                      | 5.6400                                                                               | -13.7               | H                      | 3.0             | 39.9               | 1.0            | -52.6                | -13.0          | -39.6         |       |
|                                                                      | 7.5200                                                                               | -16.0               | H                      | 3.0             | 39.1               | 1.0            | -54.2                | -13.0          | -41.2         |       |
|                                                                      | High Channel (1902.5MHz)                                                             |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | 3.8050                                                                               | -17.9               | V                      | 3.0             | 39.0               | 1.0            | -56.0                | -13.0          | -43.0         |       |
|                                                                      | 5.7075                                                                               | -10.0               | V                      | 3.0             | 39.9               | 1.0            | -48.9                | -13.0          | -35.9         |       |
|                                                                      | 7.6100                                                                               | -15.8               | V                      | 3.0             | 39.1               | 1.0            | -53.9                | -13.0          | -40.9         |       |
|                                                                      | 3.8050                                                                               | -15.7               | H                      | 3.0             | 39.0               | 1.0            | -53.8                | -13.0          | -40.8         |       |
|                                                                      | 5.7075                                                                               | -14.5               | H                      | 3.0             | 39.9               | 1.0            | -53.4                | -13.0          | -40.4         |       |
|                                                                      | 7.6100                                                                               | -15.6               | H                      | 3.0             | 39.1               | 1.0            | -53.7                | -13.0          | -40.7         |       |
| Rev. 03.03.09                                                        |                                                                                      |                     |                        |                 |                    |                |                      |                |               |       |
| Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                        |                 |                    |                |                      |                |               |       |
| LTE<br>Band 2<br>15MHz<br>16QAM                                      | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Company: Samsung                                                                     |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Project #: 15K20515                                                                  |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Date: 05-01-15                                                                       |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Test Engineer: Steven.Kim                                                            |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Configuration: EUT / AC Adapter / Ear Phone / Z-Position                             |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Mode: TX, LTE BAND 2, 15MHz BW, 16QAM                                                |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | Chamber<br>Chamber 1                                                                 |                     | Pre-amplifier<br>AFS42 |                 | Filter<br>Filter 1 |                | Limit<br>FCC Part 27 |                |               |       |
|                                                                      | f<br>GHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB)     | Filter<br>(dB) | ERP<br>(dBm)         | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                                                      | Low Channel (1857.5MHz)                                                              |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | 3.7150                                                                               | -10.3               | V                      | 3.0             | 39.1               | 1.0            | -48.5                | -13.0          | -35.5         |       |
|                                                                      | 5.5725                                                                               | -12.6               | V                      | 3.0             | 40.0               | 1.0            | -51.5                | -13.0          | -38.5         |       |
|                                                                      | 7.4300                                                                               | -17.2               | V                      | 3.0             | 39.2               | 1.0            | -55.4                | -13.0          | -42.4         |       |
|                                                                      | 3.7150                                                                               | -13.3               | H                      | 3.0             | 39.1               | 1.0            | -51.4                | -13.0          | -38.4         |       |
|                                                                      | 5.5725                                                                               | -12.9               | H                      | 3.0             | 40.0               | 1.0            | -51.9                | -13.0          | -38.9         |       |
|                                                                      | 7.4300                                                                               | -16.5               | H                      | 3.0             | 39.2               | 1.0            | -54.7                | -13.0          | -41.7         |       |
|                                                                      | Mid Channel (1880MHz)                                                                |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | 3.7600                                                                               | -22.5               | V                      | 3.0             | 39.1               | 1.0            | -60.6                | -13.0          | -47.6         |       |
|                                                                      | 5.6400                                                                               | -12.1               | V                      | 3.0             | 39.9               | 1.0            | -51.0                | -13.0          | -38.0         |       |
|                                                                      | 7.5200                                                                               | -16.9               | V                      | 3.0             | 39.1               | 1.0            | -55.1                | -13.0          | -42.1         |       |
|                                                                      | 3.7600                                                                               | -22.3               | H                      | 3.0             | 39.1               | 1.0            | -60.4                | -13.0          | -47.4         |       |
|                                                                      | 5.6400                                                                               | -15.0               | H                      | 3.0             | 39.9               | 1.0            | -53.9                | -13.0          | -40.9         |       |
|                                                                      | 7.5200                                                                               | -16.3               | H                      | 3.0             | 39.1               | 1.0            | -54.4                | -13.0          | -41.4         |       |
|                                                                      | High Channel (1902.5MHz)                                                             |                     |                        |                 |                    |                |                      |                |               |       |
|                                                                      | 3.8050                                                                               | -18.7               | V                      | 3.0             | 39.0               | 1.0            | -56.7                | -13.0          | -43.7         |       |
|                                                                      | 5.7075                                                                               | -11.3               | V                      | 3.0             | 39.9               | 1.0            | -50.2                | -13.0          | -37.2         |       |
|                                                                      | 7.6100                                                                               | -16.6               | V                      | 3.0             | 39.1               | 1.0            | -54.7                | -13.0          | -41.7         |       |
|                                                                      | 3.8050                                                                               | -16.5               | H                      | 3.0             | 39.0               | 1.0            | -54.5                | -13.0          | -41.5         |       |
|                                                                      | 5.7075                                                                               | -15.5               | H                      | 3.0             | 39.9               | 1.0            | -54.4                | -13.0          | -41.4         |       |
|                                                                      | 7.6100                                                                               | -15.6               | H                      | 3.0             | 39.1               | 1.0            | -53.8                | -13.0          | -40.8         |       |
| Rev. 03.03.09                                                        |                                                                                      |                     |                        |                 |                    |                |                      |                |               |       |
| Note: No other emissions were detected above the system noise floor. |                                                                                      |                     |                        |                 |                    |                |                      |                |               |       |

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|                                  |                                                                                                                                                                                                                                                                                         |                     |                    |                 |                |                |              |                |               |       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| LTE<br>Band 2<br>1.4MHz<br>QPSK  | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-02-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 2, 1.4MHz BW,QPSK  |                     |                    |                 |                |                |              |                |               |       |
|                                  | Chamber                                                                                                                                                                                                                                                                                 |                     | Pre-amplifier      |                 | Filter         |                | Limit        |                |               |       |
|                                  | Chamber 1                                                                                                                                                                                                                                                                               |                     | AFS42              |                 | Filter 1       |                | FCC Part 27  |                |               |       |
|                                  | f<br>GHz                                                                                                                                                                                                                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                  | Low Channel (1850.7MHz)                                                                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
|                                  | 3.7014                                                                                                                                                                                                                                                                                  | -8.0                | V                  | 3.0             | 39.2           | 1.0            | -46.2        | -13.0          | -33.2         |       |
|                                  | 5.5071                                                                                                                                                                                                                                                                                  | -18.2               | V                  | 3.0             | 40.0           | 1.0            | -57.2        | -13.0          | -44.2         |       |
|                                  | 7.3578                                                                                                                                                                                                                                                                                  | -15.4               | V                  | 3.0             | 39.2           | 1.0            | -53.6        | -13.0          | -40.6         |       |
|                                  | 3.7014                                                                                                                                                                                                                                                                                  | -12.8               | H                  | 3.0             | 39.2           | 1.0            | -51.0        | -13.0          | -38.0         |       |
|                                  | 5.5071                                                                                                                                                                                                                                                                                  | -18.2               | H                  | 3.0             | 40.0           | 1.0            | -57.2        | -13.0          | -44.2         |       |
|                                  | 7.3578                                                                                                                                                                                                                                                                                  | -16.3               | H                  | 3.0             | 39.2           | 1.0            | -54.5        | -13.0          | -41.5         |       |
|                                  | Mid Channel (1880MHz)                                                                                                                                                                                                                                                                   |                     |                    |                 |                |                |              |                |               |       |
|                                  | 3.7600                                                                                                                                                                                                                                                                                  | -21.7               | V                  | 3.0             | 39.1           | 1.0            | -59.8        | -13.0          | -46.8         |       |
|                                  | 5.6400                                                                                                                                                                                                                                                                                  | -14.8               | V                  | 3.0             | 39.9           | 1.0            | -53.7        | -13.0          | -40.7         |       |
|                                  | 7.5200                                                                                                                                                                                                                                                                                  | -15.1               | V                  | 3.0             | 39.1           | 1.0            | -53.2        | -13.0          | -40.2         |       |
|                                  | 3.7600                                                                                                                                                                                                                                                                                  | -21.4               | H                  | 3.0             | 39.1           | 1.0            | -59.5        | -13.0          | -46.5         |       |
|                                  | 5.6400                                                                                                                                                                                                                                                                                  | -14.4               | H                  | 3.0             | 39.9           | 1.0            | -53.3        | -13.0          | -40.3         |       |
|                                  | 7.5200                                                                                                                                                                                                                                                                                  | -16.0               | H                  | 3.0             | 39.1           | 1.0            | -54.2        | -13.0          | -41.2         |       |
|                                  | High Channel (1909.3MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                  | 3.8186                                                                                                                                                                                                                                                                                  | -19.1               | V                  | 3.0             | 39.0           | 1.0            | -57.1        | -13.0          | -44.1         |       |
|                                  | 5.7279                                                                                                                                                                                                                                                                                  | -13.3               | V                  | 3.0             | 39.9           | 1.0            | -52.2        | -13.0          | -39.2         |       |
|                                  | 7.6732                                                                                                                                                                                                                                                                                  | -16.1               | V                  | 3.0             | 39.1           | 1.0            | -54.2        | -13.0          | -41.2         |       |
|                                  | 3.8186                                                                                                                                                                                                                                                                                  | -19.6               | H                  | 3.0             | 39.0           | 1.0            | -57.6        | -13.0          | -44.6         |       |
|                                  | 5.7279                                                                                                                                                                                                                                                                                  | -15.2               | H                  | 3.0             | 39.9           | 1.0            | -54.1        | -13.0          | -41.1         |       |
|                                  | 7.6732                                                                                                                                                                                                                                                                                  | -16.6               | H                  | 3.0             | 39.1           | 1.0            | -54.7        | -13.0          | -41.7         |       |
|                                  | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                   |                     |                    |                 |                |                |              |                |               |       |
| LTE<br>Band 2<br>1.4MHz<br>16QAM | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement<br><br>Company: Samsung<br>Project #: 15K20515<br>Date: 05-02-15<br>Test Engineer: Steven.Kim<br>Configuration: EUT / AC Adapter / Ear Phone / Z-Position<br>Mode: TX, LTE BAND 2, 1.4MHz BW,16QAM |                     |                    |                 |                |                |              |                |               |       |
|                                  | Chamber                                                                                                                                                                                                                                                                                 |                     | Pre-amplifier      |                 | Filter         |                | Limit        |                |               |       |
|                                  | Chamber 1                                                                                                                                                                                                                                                                               |                     | AFS42              |                 | Filter 1       |                | FCC Part 27  |                |               |       |
|                                  | f<br>GHz                                                                                                                                                                                                                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|                                  | Low Channel (1850.7MHz)                                                                                                                                                                                                                                                                 |                     |                    |                 |                |                |              |                |               |       |
|                                  | 3.7014                                                                                                                                                                                                                                                                                  | -9.8                | V                  | 3.0             | 39.2           | 1.0            | -47.9        | -13.0          | -34.9         |       |
|                                  | 5.5071                                                                                                                                                                                                                                                                                  | -19.1               | V                  | 3.0             | 40.0           | 1.0            | -58.1        | -13.0          | -45.1         |       |
|                                  | 7.3578                                                                                                                                                                                                                                                                                  | -16.9               | V                  | 3.0             | 39.2           | 1.0            | -55.2        | -13.0          | -42.2         |       |
|                                  | 3.7014                                                                                                                                                                                                                                                                                  | -14.0               | H                  | 3.0             | 39.2           | 1.0            | -52.2        | -13.0          | -39.2         |       |
|                                  | 5.5071                                                                                                                                                                                                                                                                                  | -18.9               | H                  | 3.0             | 40.0           | 1.0            | -57.9        | -13.0          | -44.9         |       |
|                                  | 7.3578                                                                                                                                                                                                                                                                                  | -16.1               | H                  | 3.0             | 39.2           | 1.0            | -54.3        | -13.0          | -41.3         |       |
|                                  | Mid Channel (1880MHz)                                                                                                                                                                                                                                                                   |                     |                    |                 |                |                |              |                |               |       |
|                                  | 3.7600                                                                                                                                                                                                                                                                                  | -22.5               | V                  | 3.0             | 39.1           | 1.0            | -60.6        | -13.0          | -47.6         |       |
|                                  | 5.6400                                                                                                                                                                                                                                                                                  | -15.4               | V                  | 3.0             | 39.9           | 1.0            | -54.3        | -13.0          | -41.3         |       |
|                                  | 7.5200                                                                                                                                                                                                                                                                                  | -16.7               | V                  | 3.0             | 39.1           | 1.0            | -54.8        | -13.0          | -41.8         |       |
|                                  | 3.7600                                                                                                                                                                                                                                                                                  | -21.8               | H                  | 3.0             | 39.1           | 1.0            | -59.9        | -13.0          | -46.9         |       |
|                                  | 5.6400                                                                                                                                                                                                                                                                                  | -15.6               | H                  | 3.0             | 39.9           | 1.0            | -54.5        | -13.0          | -41.5         |       |
|                                  | 7.5200                                                                                                                                                                                                                                                                                  | -15.7               | H                  | 3.0             | 39.1           | 1.0            | -53.8        | -13.0          | -40.8         |       |
|                                  | High Channel (1909.3MHz)                                                                                                                                                                                                                                                                |                     |                    |                 |                |                |              |                |               |       |
|                                  | 3.8186                                                                                                                                                                                                                                                                                  | -19.5               | V                  | 3.0             | 39.0           | 1.0            | -57.5        | -13.0          | -44.5         |       |
|                                  | 5.7279                                                                                                                                                                                                                                                                                  | -14.3               | V                  | 3.0             | 39.9           | 1.0            | -53.1        | -13.0          | -40.1         |       |
|                                  | 7.6732                                                                                                                                                                                                                                                                                  | -16.7               | V                  | 3.0             | 39.1           | 1.0            | -54.8        | -13.0          | -41.8         |       |
|                                  | 3.8186                                                                                                                                                                                                                                                                                  | -20.7               | H                  | 3.0             | 39.0           | 1.0            | -58.7        | -13.0          | -45.7         |       |
|                                  | 5.7279                                                                                                                                                                                                                                                                                  | -16.7               | H                  | 3.0             | 39.9           | 1.0            | -55.6        | -13.0          | -42.6         |       |
|                                  | 7.6732                                                                                                                                                                                                                                                                                  | -16.5               | H                  | 3.0             | 39.1           | 1.0            | -54.6        | -13.0          | -41.6         |       |
|                                  | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                   |                     |                    |                 |                |                |              |                |               |       |