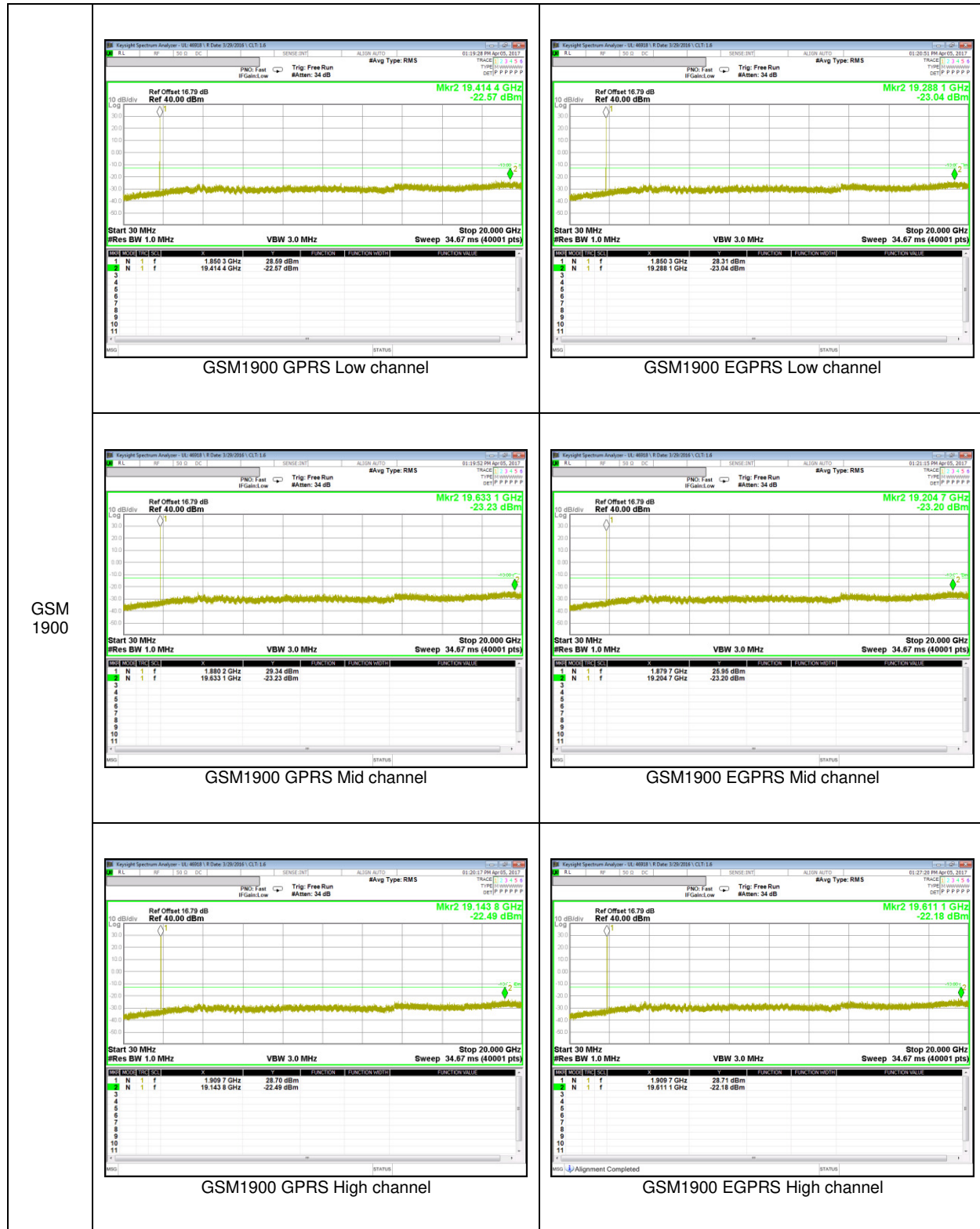
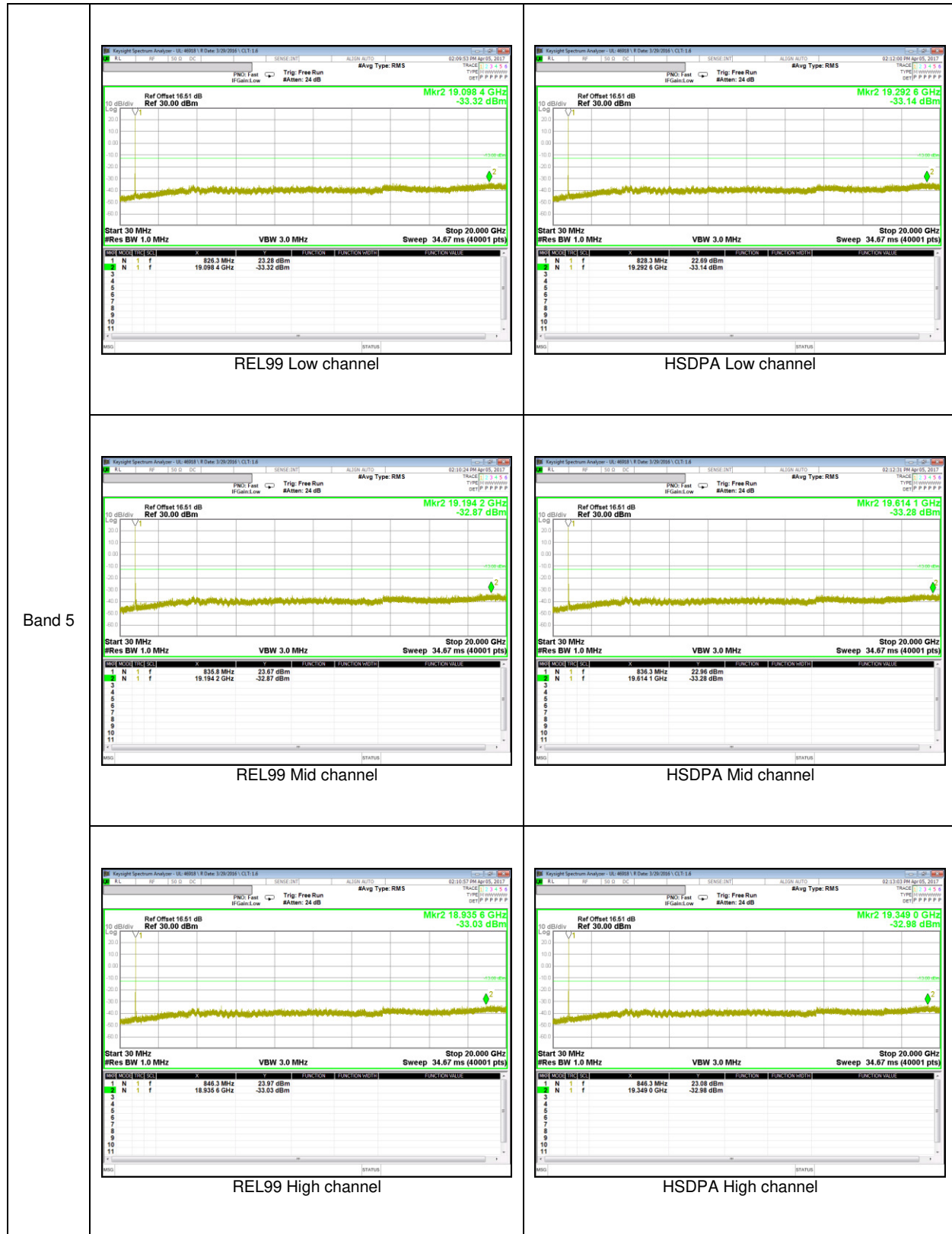


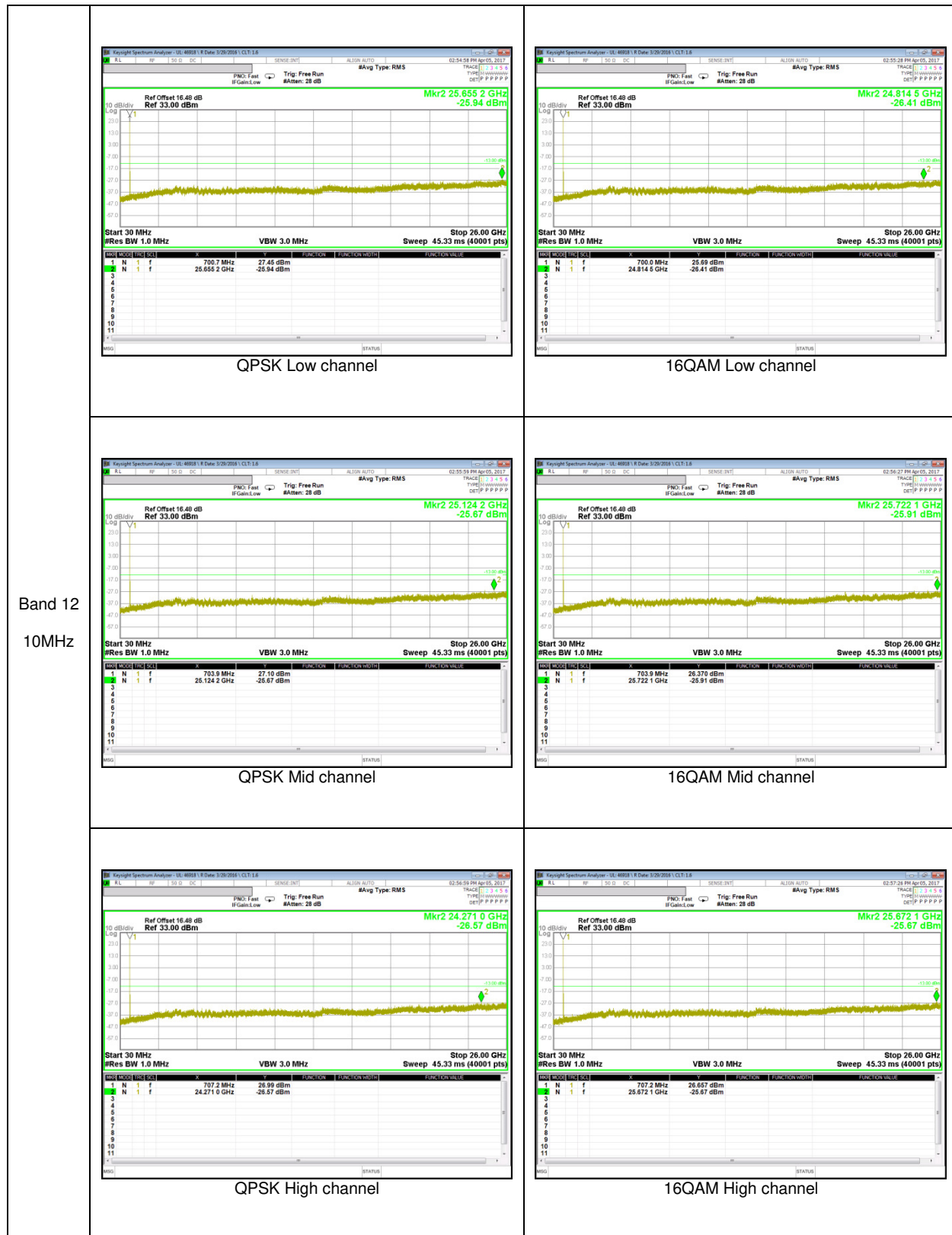
**GSM 1900**

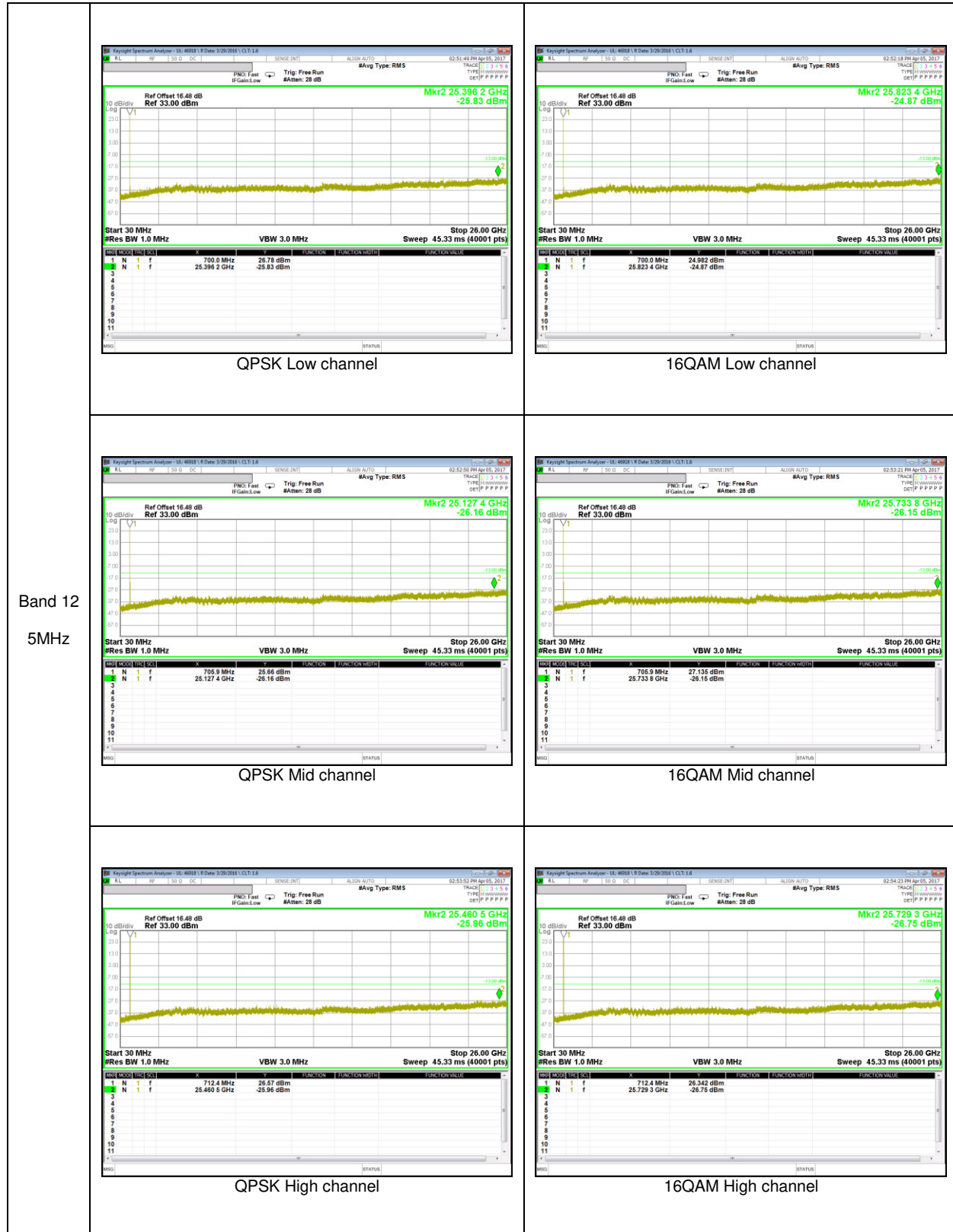


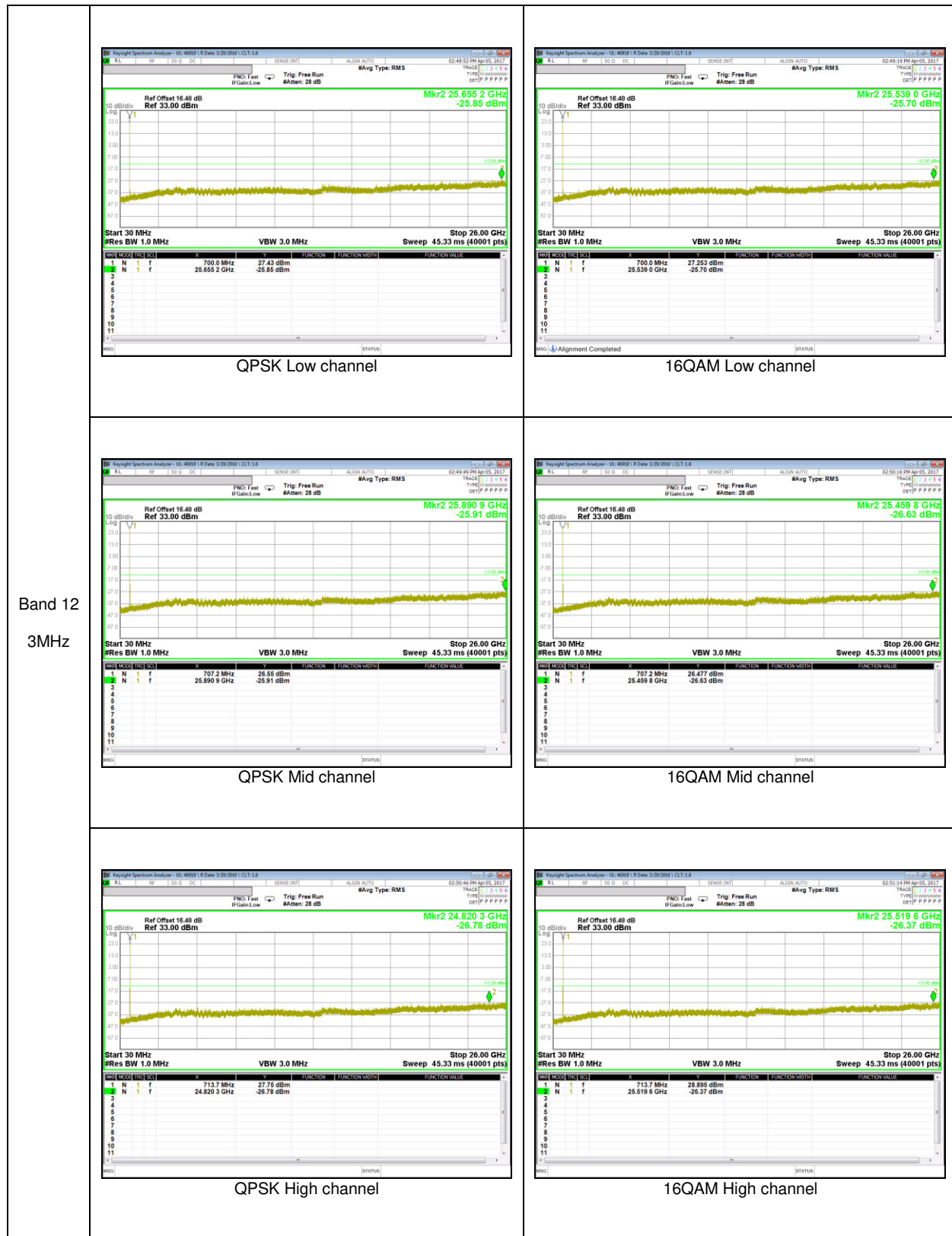
**WCDMA Band 5**

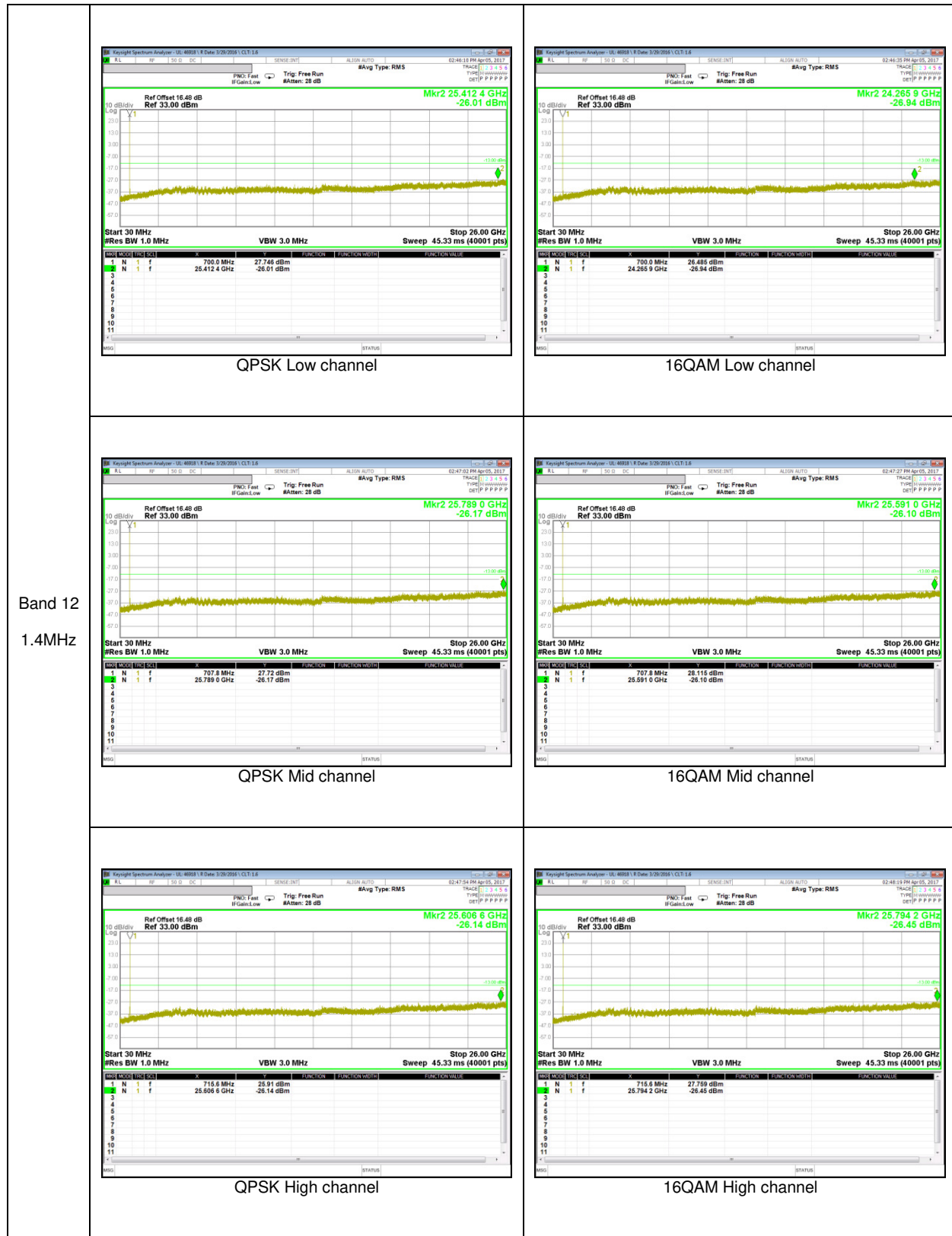


**LTE Band 12**









## **9.4. FREQUENCY STABILITY**

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

FCC: §2.1055, §22.355, §24.235 and §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.

### 9.4.1. FREQUENCY STABILITY RESULTS

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

| Reference Frequency: GSM850 Mid Channel 836.6 MHz @ 20°C<br>Limit: $\pm 2.5$ ppm = 2091.500 Hz |                                 |                                               |             |             |
|------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                          | Environment<br>Temperature (*C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.85                                                                                           | 50                              | 836.59997417                                  | -0.010      | 2.5         |
| 3.85                                                                                           | 40                              | 836.59997378                                  | -0.009      | 2.5         |
| 3.85                                                                                           | 30                              | 836.59996430                                  | 0.002       | 2.5         |
| <b>3.85</b>                                                                                    | <b>20</b>                       | <b>836.59996598</b>                           | <b>0</b>    | <b>2.5</b>  |
| 3.85                                                                                           | 10                              | 836.59996261                                  | 0.004       | 2.5         |
| 3.85                                                                                           | 0                               | 836.59996739                                  | -0.002      | 2.5         |
| 3.85                                                                                           | -10                             | 836.59996319                                  | 0.003       | 2.5         |
| 3.85                                                                                           | -20                             | 836.59997194                                  | -0.007      | 2.5         |
| 3.85                                                                                           | -30                             | 836.59997411                                  | -0.010      | 2.5         |

| Reference Frequency: GSM850 Mid Channel 836.6 MHz @ 20°C<br>Limit: $\pm 2.5$ ppm = 2091.500 Hz |                                 |                                               |             |             |
|------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>[Vdc]                                                                          | Environment<br>Temperature (*C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| <b>3.85</b>                                                                                    | <b>20</b>                       | <b>836.59996598</b>                           | <b>0</b>    | <b>2.5</b>  |
| 4.35                                                                                           | 20                              | 836.59996952                                  | -0.004      | 2.5         |
| 3.40                                                                                           | 20                              | 836.59996691                                  | -0.001      | 2.5         |

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

| Reference Frequency: WCDMA Band 5 Mid Channel 836.6 MHz @ 20°C |                                 |                                               |             |             |
|----------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +- 2.5 ppm = 2091.500 Hz                                |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                          | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| 3.85                                                           | 50                              | 836.59999523                                  | 0.003       | 2.5         |
| 3.85                                                           | 40                              | 836.59999547                                  | 0.002       | 2.5         |
| 3.85                                                           | 30                              | 836.59999715                                  | 0.000       | 2.5         |
| <b>3.85</b>                                                    | <b>20</b>                       | 836.59999740                                  | <b>0</b>    | <b>2.5</b>  |
| 3.85                                                           | 10                              | 836.59999722                                  | 0.000       | 2.5         |
| 3.85                                                           | 0                               | 836.59999692                                  | 0.001       | 2.5         |
| 3.85                                                           | -10                             | 836.59999645                                  | 0.001       | 2.5         |
| 3.85                                                           | -20                             | 836.59999655                                  | 0.001       | 2.5         |
| 3.85                                                           | -30                             | 836.59999638                                  | 0.001       | 2.5         |

| Reference Frequency: WCDMA Band 5 Mid Channel 836.6 MHz @ 20°C |                                 |                                               |             |             |
|----------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +- 2.5 ppm = 2091.500 Hz                                |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                          | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| <b>3.85</b>                                                    | <b>20</b>                       | <b>836.59999740</b>                           | <b>0</b>    | <b>2.5</b>  |
| 4.35                                                           | 20                              | 836.59999726                                  | 0.000       | 2.5         |
| 3.40                                                           | 20                              | 836.59999667                                  | 0.001       | 2.5         |

### LTE Band 17

Due to frequency range and same output power setting, test was carried in LTE Band 12 to cover both LTE Band 12 and LTE Band 17.

### LTE Band 12, Channel 23095, Frequency 707.5 MHz

| Reference Frequency: LTE Band 12 Mid Channel 707.5 MHz @ 20°C |                                 |                                               |             |             |
|---------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +- 2.5 ppm = 1768.750 Hz                               |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                         | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                               |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| 3.85                                                          | 50                              | 707.49999575                                  | -0.001      | 2.5         |
| 3.85                                                          | 40                              | 707.49999644                                  | -0.002      | 2.5         |
| 3.85                                                          | 30                              | 707.49999489                                  | 0.000       | 2.5         |
| <b>3.85</b>                                                   | <b>20</b>                       | 707.49999516                                  | <b>0</b>    | <b>2.5</b>  |
| 3.85                                                          | 10                              | 707.49999599                                  | -0.001      | 2.5         |
| 3.85                                                          | 0                               | 707.49999681                                  | -0.002      | 2.5         |
| 3.85                                                          | -10                             | 707.49999694                                  | -0.003      | 2.5         |
| 3.85                                                          | -20                             | 707.49999562                                  | -0.001      | 2.5         |
| 3.85                                                          | -30                             | 707.49999601                                  | -0.001      | 2.5         |

| Reference Frequency: LTE Band 12 Mid Channel 707.5 MHz @ 20°C |                                 |                                               |             |             |
|---------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: +- 2.5 ppm = 1768.750 Hz                               |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                         | Environment<br>Temperature [°C] | Frequency Deviation Measured with Time Elapse |             |             |
|                                                               |                                 | [MHz]                                         | Delta [ppm] | Limit [ppm] |
| <b>3.85</b>                                                   | <b>20</b>                       | <b>707.49999516</b>                           | <b>0</b>    | <b>2.5</b>  |
| 4.35                                                          | 20                              | 707.49999615                                  | -0.001      | 2.5         |
| 3.40                                                          | 20                              | 707.49999510                                  | 0.000       | 2.5         |

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

| Reference Frequency: GSM1900 Mid Channel 1880 MHz @ 20°C |                                 |                                               |             |             |
|----------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: $\pm 2.5$ ppm = 4700.000 Hz                       |                                 |                                               |             |             |
| Power Supply<br>(Vdc)                                    | Environment<br>Temperature (*C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                          |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.85                                                     | 50                              | 1879.99996291                                 | 0.003       | 2.5         |
| 3.85                                                     | 40                              | 1879.99995655                                 | 0.006       | 2.5         |
| 3.85                                                     | 30                              | 1879.99996694                                 | 0.000       | 2.5         |
| <b>3.85</b>                                              | <b>20</b>                       | <b>1879.99996775</b>                          | <b>0</b>    | <b>2.5</b>  |
| 3.85                                                     | 10                              | 1879.99996610                                 | 0.001       | 2.5         |
| 3.85                                                     | 0                               | 1879.99996474                                 | 0.002       | 2.5         |
| 3.85                                                     | -10                             | 1879.99996378                                 | 0.002       | 2.5         |
| 3.85                                                     | -20                             | 1879.99996523                                 | 0.001       | 2.5         |
| 3.85                                                     | -30                             | 1879.99995764                                 | 0.005       | 2.5         |

| Reference Frequency: GSM1900 Mid Channel 1880 MHz @ 20°C |                                 |                                               |             |             |
|----------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: $\pm 2.5$ ppm = 4700.000 Hz                       |                                 |                                               |             |             |
| Power Supply<br>[Vdc]                                    | Environment<br>Temperature (*C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                          |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| <b>3.85</b>                                              | <b>20</b>                       | <b>1879.99996775</b>                          | <b>0</b>    | <b>2.5</b>  |
| 4.35                                                     | 20                              | 1879.99996442                                 | 0.002       | 2.5         |
| 3.40                                                     | 20                              | 1879.99996599                                 | 0.001       | 2.5         |

## 10. RADIATED TEST RESULTS

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

#### RULE PART(S)

FCC: §2.1046, §22.913, §24.232 and §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) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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 603D Clause 2.2.17; ESU40 setting reference to 971168 D01 v02r02

For peak power measurement with a ESU40:

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 ESU40:

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

### 10.1.1. ERP/EIRP Results

#### GSM

| Band    | Mode  | Channel | f [MHz] | ERP / EIRP |         |
|---------|-------|---------|---------|------------|---------|
|         |       |         |         | [dBm]      | [mW]    |
| GSM850  | GPRS  | 512     | 824.2   | 27.94      | 622.30  |
|         |       | 661     | 836.6   | 26.87      | 486.41  |
|         |       | 810     | 848.8   | 26.37      | 433.51  |
|         | EGPRS | 512     | 824.2   | 23.01      | 199.99  |
|         |       | 661     | 836.6   | 21.13      | 129.72  |
|         |       | 810     | 848.8   | 21.41      | 138.36  |
| GSM1900 | GPRS  | 512     | 1850.2  | 30.31      | 1073.99 |
|         |       | 661     | 1880.0  | 30.39      | 1093.96 |
|         |       | 810     | 1909.8  | 29.30      | 851.14  |
|         | EGPRS | 512     | 1850.2  | 28.20      | 660.69  |
|         |       | 661     | 1880.0  | 28.06      | 639.73  |
|         |       | 810     | 1909.8  | 27.28      | 534.56  |

#### WCDMA

| Band   | Mode  | Channel | f [MHz] | ERP / EIRP |       |
|--------|-------|---------|---------|------------|-------|
|        |       |         |         | [dBm]      | [mW]  |
| Band 5 | REL99 | 4132    | 826.4   | 18.42      | 69.50 |
|        |       | 4183    | 836.6   | 17.78      | 59.98 |
|        |       | 4233    | 846.6   | 17.62      | 57.81 |
|        | HSDPA | 4132    | 826.4   | 18.58      | 72.11 |
|        |       | 4183    | 836.6   | 17.61      | 57.68 |
|        |       | 4233    | 846.6   | 17.58      | 57.28 |

**LTE Band 12**

| Band    | BW [MHz] | Mode  | RB/RB Size | f [MHz] | ERP / EIRP |       |
|---------|----------|-------|------------|---------|------------|-------|
|         |          |       | Full RB    |         | [dBm]      | [mW]  |
| Band 12 | 10       | QPSK  | 50/0       | 704.0   | 16.02      | 39.99 |
|         |          |       | 50/0       | 707.5   | 16.12      | 40.93 |
|         |          |       | 50/0       | 711.0   | 15.90      | 38.90 |
|         |          | 16QAM | 50/0       | 704.0   | 14.93      | 31.12 |
|         |          |       | 50/0       | 707.5   | 14.88      | 30.76 |
|         |          |       | 50/0       | 711.0   | 14.77      | 29.99 |
|         | 5        | QPSK  | 25/0       | 701.5   | 14.94      | 31.19 |
|         |          |       | 25/0       | 707.5   | 15.51      | 35.56 |
|         |          |       | 25/0       | 713.5   | 15.02      | 31.77 |
|         |          | 16QAM | 25/0       | 701.5   | 13.77      | 23.82 |
|         |          |       | 25/0       | 707.5   | 14.43      | 27.73 |
|         |          |       | 25/0       | 713.5   | 14.35      | 27.23 |
|         | 3        | QPSK  | 15/0       | 700.5   | 15.43      | 34.91 |
|         |          |       | 15/0       | 707.5   | 15.73      | 37.41 |
|         |          |       | 15/0       | 714.5   | 15.24      | 33.42 |
|         |          | 16QAM | 15/0       | 700.5   | 14.23      | 26.49 |
|         |          |       | 15/0       | 707.5   | 14.57      | 28.64 |
|         |          |       | 15/0       | 714.5   | 14.52      | 28.31 |
|         | 1.4      | QPSK  | 6/0        | 699.7   | 12.84      | 19.23 |
|         |          |       | 6/0        | 707.5   | 13.20      | 20.89 |
|         |          |       | 6/0        | 715.3   | 13.08      | 20.32 |
|         |          | 16QAM | 6/0        | 699.7   | 11.71      | 14.83 |
|         |          |       | 6/0        | 707.5   | 12.17      | 16.48 |
|         |          |       | 6/0        | 715.3   | 12.50      | 17.78 |

## 10.1.2. ERP/EIRP DATA

### GSM 850

|                        |                                                                                                                                                                                              |                   |                  |                   |                     |              |              |               |              |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|-------------------|---------------------|--------------|--------------|---------------|--------------|
| GSM<br>GSM850<br>GPRS  | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b>                                                                                           |                   |                  |                   |                     |              |              |               |              |
|                        | <b>Company:</b> Samsung<br><b>Project #:</b> 4787892815<br><b>Date:</b> 03-23-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> GPRS 850 MHz  |                   |                  |                   |                     |              |              |               |              |
|                        | <b>Test Equipment:</b><br><b>Receiving:</b> VULB9163-845, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br><b>Substitution:</b> 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                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
|                        | 824.20                                                                                                                                                                                       | 21.45             | V                | 1.1               | -1.6                | 18.83        | 38.5         | -19.6         |              |
|                        | 824.20                                                                                                                                                                                       | 30.56             | H                | 1.1               | -1.6                | 27.94        | 38.5         | -10.5         |              |
|                        | Mid Ch                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
|                        | 836.60                                                                                                                                                                                       | 21.38             | V                | 1.1               | -1.4                | 18.89        | 38.5         | -19.6         |              |
|                        | 836.60                                                                                                                                                                                       | 29.36             | H                | 1.1               | -1.4                | 26.87        | 38.5         | -11.6         |              |
|                        | High Ch                                                                                                                                                                                      |                   |                  |                   |                     |              |              |               |              |
|                        | 848.80                                                                                                                                                                                       | 20.54             | V                | 1.1               | -1.3                | 18.18        | 38.5         | -20.3         |              |
|                        | 848.80                                                                                                                                                                                       | 28.73             | H                | 1.1               | -1.3                | 26.37        | 38.5         | -12.1         |              |
|                        | Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm                                                                                                       |                   |                  |                   |                     |              |              |               |              |
| GSM<br>GSM850<br>EGPRS | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b>                                                                                           |                   |                  |                   |                     |              |              |               |              |
|                        | <b>Company:</b> Samsung<br><b>Project #:</b> 4787892815<br><b>Date:</b> 03-23-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> EGPRS 850 MHz |                   |                  |                   |                     |              |              |               |              |
|                        | <b>Test Equipment:</b><br><b>Receiving:</b> VULB9163-845, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br><b>Substitution:</b> 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                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
|                        | 824.20                                                                                                                                                                                       | 16.44             | V                | 1.1               | -1.6                | 13.82        | 38.5         | -24.6         |              |
|                        | 824.20                                                                                                                                                                                       | 25.63             | H                | 1.1               | -1.6                | 23.01        | 38.5         | -15.4         |              |
|                        | Mid Ch                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
|                        | 836.60                                                                                                                                                                                       | 16.32             | V                | 1.1               | -1.4                | 13.83        | 38.5         | -24.6         |              |
|                        | 836.60                                                                                                                                                                                       | 23.62             | H                | 1.1               | -1.4                | 21.13        | 38.5         | -17.3         |              |
|                        | High Ch                                                                                                                                                                                      |                   |                  |                   |                     |              |              |               |              |
|                        | 848.80                                                                                                                                                                                       | 15.78             | V                | 1.1               | -1.3                | 13.42        | 38.5         | -25.0         |              |
|                        | 848.80                                                                                                                                                                                       | 23.77             | H                | 1.1               | -1.3                | 21.41        | 38.5         | -17.0         |              |
|                        | Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm                                                                                                       |                   |                  |                   |                     |              |              |               |              |

**GSM 1900**

| GSM<br><br>GSM1900<br>GPRS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | High Frequency Substitution Measurement<br>UL Korea, Ltd. Suwon Laboratory Chamber 1 |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------|----------------------|--------------------|------------|-------------|------------|-------|-------|------------------|-----------------|-----------------|--------------------|------------|-------------|------------|-------|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|--|---------|------|---|------|------|-------|------|------|--|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|--|---------|------|---|------|------|-------|------|------|--|---------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|--|---------|------|---|------|------|-------|------|------|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Company:                                                                             |                 | Samsung              |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Project #:                                                                           |                 | 4787892815           |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Date:                                                                                |                 | 03-23-17             |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Test Engineer:                                                                       |                 | YH Lim               |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Configuration:                                                                       |                 | EUT ONLY, X Position |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Mode:                                                                                |                 | GPRS 1900MHz         |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Test Equipment:                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Receiving: 3117[00168717] and Chamber 1 SMA Cables                                   |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse                    |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| <table><tr><th>f GHz</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>Delta (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>1850.20</td><td>20.8</td><td>V</td><td>1.60</td><td>8.80</td><td>28.04</td><td>33.0</td><td>-5.0</td><td></td></tr><tr><td>1850.20</td><td>23.1</td><td>H</td><td>1.60</td><td>8.80</td><td>30.31</td><td>33.0</td><td>-2.7</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>1880.00</td><td>20.8</td><td>V</td><td>1.62</td><td>8.62</td><td>27.75</td><td>33.0</td><td>-5.2</td><td></td></tr><tr><td>1880.00</td><td>23.4</td><td>H</td><td>1.62</td><td>8.62</td><td>30.39</td><td>33.0</td><td>-2.6</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>1909.80</td><td>20.4</td><td>V</td><td>1.63</td><td>8.44</td><td>27.18</td><td>33.0</td><td>-5.8</td><td></td></tr><tr><td>1909.80</td><td>22.5</td><td>H</td><td>1.63</td><td>8.44</td><td>29.30</td><td>33.0</td><td>-3.7</td><td></td></tr></table> |                                                                                      |                 |                      |                    |            |             |            |       | f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1850.20 | 20.8 | V | 1.60 | 8.80 | 28.04 | 33.0 | -5.0 |  | 1850.20 | 23.1 | H | 1.60 | 8.80 | 30.31 | 33.0 | -2.7 |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 20.8 | V | 1.62 | 8.62 | 27.75 | 33.0 | -5.2 |  | 1880.00 | 23.4 | H | 1.62 | 8.62 | 30.39 | 33.0 | -2.6 |  | High Ch |  |  |  |  |  |  |  |  | 1909.80 | 20.4 | V | 1.63 | 8.44 | 27.18 | 33.0 | -5.8 |  | 1909.80 | 22.5 | H | 1.63 | 8.44 | 29.30 | 33.0 | -3.7 |  |
| f GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SG reading (dBm)                                                                     | Ant. Pol. (H/V) | Cable Loss (dB)      | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1850.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20.8                                                                                 | V               | 1.60                 | 8.80               | 28.04      | 33.0        | -5.0       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1850.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 23.1                                                                                 | H               | 1.60                 | 8.80               | 30.31      | 33.0        | -2.7       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20.8                                                                                 | V               | 1.62                 | 8.62               | 27.75      | 33.0        | -5.2       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 23.4                                                                                 | H               | 1.62                 | 8.62               | 30.39      | 33.0        | -2.6       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1909.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20.4                                                                                 | V               | 1.63                 | 8.44               | 27.18      | 33.0        | -5.8       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1909.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 22.5                                                                                 | H               | 1.63                 | 8.44               | 29.30      | 33.0        | -3.7       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| Rev. 3.17.11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |

| GSM<br><br>GSM1900<br>EGPRS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | High Frequency Substitution Measurement<br>UL Korea, Ltd. Suwon Laboratory Chamber 1 |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------|----------------------|--------------------|------------|-------------|------------|-------|-------|------------------|-----------------|-----------------|--------------------|------------|-------------|------------|-------|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|--|---------|------|---|------|------|-------|------|------|--|--------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|--|---------|------|---|------|------|-------|------|------|--|---------|--|--|--|--|--|--|--|--|---------|------|---|------|------|-------|------|------|--|---------|------|---|------|------|-------|------|------|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Company:                                                                             |                 | Samsung              |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Project #:                                                                           |                 | 4787892815           |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Date:                                                                                |                 | 03-23-17             |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Test Engineer:                                                                       |                 | YH Lim               |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Configuration:                                                                       |                 | EUT ONLY, X Position |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Mode:                                                                                |                 | EGPRS 1900MHz        |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Test Equipment:                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Receiving: 3117[00168717] and Chamber 1 SMA Cables                                   |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse                    |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| <table><tr><th>f GHz</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>Delta (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>1850.20</td><td>19.3</td><td>V</td><td>1.60</td><td>8.80</td><td>26.50</td><td>33.0</td><td>-6.5</td><td></td></tr><tr><td>1850.20</td><td>21.0</td><td>H</td><td>1.60</td><td>8.80</td><td>28.20</td><td>33.0</td><td>-4.8</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>1880.00</td><td>18.5</td><td>V</td><td>1.62</td><td>8.62</td><td>25.51</td><td>33.0</td><td>-7.5</td><td></td></tr><tr><td>1880.00</td><td>21.1</td><td>H</td><td>1.62</td><td>8.62</td><td>28.06</td><td>33.0</td><td>-4.9</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>1909.80</td><td>19.4</td><td>V</td><td>1.63</td><td>8.44</td><td>26.19</td><td>33.0</td><td>-6.8</td><td></td></tr><tr><td>1909.80</td><td>20.5</td><td>H</td><td>1.63</td><td>8.44</td><td>27.28</td><td>33.0</td><td>-5.7</td><td></td></tr></table> |                                                                                      |                 |                      |                    |            |             |            |       | f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes | Low Ch |  |  |  |  |  |  |  |  | 1850.20 | 19.3 | V | 1.60 | 8.80 | 26.50 | 33.0 | -6.5 |  | 1850.20 | 21.0 | H | 1.60 | 8.80 | 28.20 | 33.0 | -4.8 |  | Mid Ch |  |  |  |  |  |  |  |  | 1880.00 | 18.5 | V | 1.62 | 8.62 | 25.51 | 33.0 | -7.5 |  | 1880.00 | 21.1 | H | 1.62 | 8.62 | 28.06 | 33.0 | -4.9 |  | High Ch |  |  |  |  |  |  |  |  | 1909.80 | 19.4 | V | 1.63 | 8.44 | 26.19 | 33.0 | -6.8 |  | 1909.80 | 20.5 | H | 1.63 | 8.44 | 27.28 | 33.0 | -5.7 |  |
| f GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SG reading (dBm)                                                                     | Ant. Pol. (H/V) | Cable Loss (dB)      | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| Low Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1850.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 19.3                                                                                 | V               | 1.60                 | 8.80               | 26.50      | 33.0        | -6.5       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1850.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 21.0                                                                                 | H               | 1.60                 | 8.80               | 28.20      | 33.0        | -4.8       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 18.5                                                                                 | V               | 1.62                 | 8.62               | 25.51      | 33.0        | -7.5       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1880.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 21.1                                                                                 | H               | 1.62                 | 8.62               | 28.06      | 33.0        | -4.9       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1909.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 19.4                                                                                 | V               | 1.63                 | 8.44               | 26.19      | 33.0        | -6.8       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| 1909.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20.5                                                                                 | H               | 1.63                 | 8.44               | 27.28      | 33.0        | -5.7       |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |
| Rev. 3.17.11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                      |                 |                      |                    |            |             |            |       |       |                  |                 |                 |                    |            |             |            |       |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |        |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |         |  |  |  |  |  |  |  |  |         |      |   |      |      |       |      |      |  |         |      |   |      |      |       |      |      |  |

**WCDMA Band 5**

|                          |  |                                                                                                                                                                                               |                   |                  |                   |                     |              |              |              |
|--------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|-------------------|---------------------|--------------|--------------|--------------|
| WCDMA<br>Band 5<br>REL99 |  | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b>                                                                                            |                   |                  |                   |                     |              |              |              |
|                          |  | <b>Company:</b> Samsung<br><b>Project #:</b> 4787892815<br><b>Date:</b> 03-23-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> Rel 99_850 MHz |                   |                  |                   |                     |              |              |              |
|                          |  | <b>Test Equipment:</b><br>Receiving: VULB9163-845, 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>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                                                                                                                                                                                        |                   |                  |                   |                     |              |              |              |
|                          |  | 826.40                                                                                                                                                                                        | 12.48             | V                | 1.1               | -1.5                | 9.87         | 38.5         | -28.6        |
|                          |  | 826.40                                                                                                                                                                                        | 21.03             | H                | 1.1               | -1.5                | 18.42        | 38.5         | -20.0        |
|                          |  | Mid Ch                                                                                                                                                                                        |                   |                  |                   |                     |              |              |              |
|                          |  | 836.60                                                                                                                                                                                        | 11.65             | V                | 1.1               | -1.4                | 9.16         | 38.5         | -29.3        |
|                          |  | 836.60                                                                                                                                                                                        | 20.27             | H                | 1.1               | -1.4                | 17.78        | 38.5         | -20.7        |
|                          |  | High Ch                                                                                                                                                                                       |                   |                  |                   |                     |              |              |              |
|                          |  | 846.60                                                                                                                                                                                        | 11.92             | V                | 1.1               | -1.3                | 9.54         | 38.5         | -28.9        |
|                          |  | 846.60                                                                                                                                                                                        | 20.00             | H                | 1.1               | -1.3                | 17.62        | 38.5         | -20.8        |
|                          |  | Rev. 3.17.11                                                                                                                                                                                  |                   |                  |                   |                     |              |              |              |
| WCDMA<br>Band 5<br>HSDPA |  | <b>High Frequency Substitution Measurement</b><br><b>UL Korea, Ltd. Suwon Laboratory Chamber 1</b>                                                                                            |                   |                  |                   |                     |              |              |              |
|                          |  | <b>Company:</b> Samsung<br><b>Project #:</b> 4787892815<br><b>Date:</b> 03-23-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> HSDPA_850 MHz  |                   |                  |                   |                     |              |              |              |
|                          |  | <b>Test Equipment:</b><br>Receiving: VULB9163-749, 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>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                                                                                                                                                                                        |                   |                  |                   |                     |              |              |              |
|                          |  | 826.40                                                                                                                                                                                        | 12.83             | V                | 1.1               | -1.5                | 10.22        | 38.5         | -28.2        |
|                          |  | 826.40                                                                                                                                                                                        | 21.19             | H                | 1.1               | -1.5                | 18.58        | 38.5         | -19.9        |
|                          |  | Mid Ch                                                                                                                                                                                        |                   |                  |                   |                     |              |              |              |
|                          |  | 836.60                                                                                                                                                                                        | 11.24             | V                | 1.1               | -1.4                | 8.75         | 38.5         | -29.7        |
|                          |  | 836.60                                                                                                                                                                                        | 20.10             | H                | 1.1               | -1.4                | 17.61        | 38.5         | -20.8        |
|                          |  | High Ch                                                                                                                                                                                       |                   |                  |                   |                     |              |              |              |
|                          |  | 846.60                                                                                                                                                                                        | 11.43             | V                | 1.1               | -1.3                | 9.05         | 38.5         | -29.4        |
|                          |  | 846.60                                                                                                                                                                                        | 19.96             | H                | 1.1               | -1.3                | 17.58        | 38.5         | -20.9        |
|                          |  | Rev. 3.17.11                                                                                                                                                                                  |                   |                  |                   |                     |              |              |              |

**LTE Band 12**

|                                  |                                                                                                                                                                                                         |                   |                  |                   |                     |              |              |               |              |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|-------------------|---------------------|--------------|--------------|---------------|--------------|
| LTE<br>Band 12<br>10MHz<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> 4787892815<br><b>Date:</b> 03-24-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> TX, LTE12, 10MHz BW,QPSK |                   |                  |                   |                     |              |              |               |              |
|                                  | <b>Test Equipment:</b><br>Receiving: VULB9163-845, 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                                                                                                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
|                                  | 704.00                                                                                                                                                                                                  | 9.05              | V                | 1.1               | -1.5                | 6.47         | 34.8         | -28.3         |              |
|                                  | 704.00                                                                                                                                                                                                  | 18.60             | H                | 1.1               | -1.5                | 16.02        | 34.8         | -18.8         |              |
|                                  | Mid Ch                                                                                                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
|                                  | 707.50                                                                                                                                                                                                  | 8.98              | V                | 1.1               | -1.4                | 6.49         | 34.8         | -28.3         |              |
|                                  | 707.50                                                                                                                                                                                                  | 18.61             | H                | 1.1               | -1.4                | 16.12        | 34.8         | -18.7         |              |
|                                  | High Ch                                                                                                                                                                                                 |                   |                  |                   |                     |              |              |               |              |
|                                  | 711.00                                                                                                                                                                                                  | 8.83              | V                | 1.1               | -1.3                | 6.44         | 34.8         | -28.3         |              |
|                                  | 711.00                                                                                                                                                                                                  | 18.32             | H                | 1.1               | -1.3                | 15.90        | 34.8         | -18.9         |              |
|                                  | Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
| LTE<br>Band 12<br>10MHz<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> 4787892815<br><b>Date:</b> 03-24-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> LTE12 10MHz FUND 16QAM   |                   |                  |                   |                     |              |              |               |              |
|                                  | <b>Test Equipment:</b><br>Receiving: VULB9163-845, 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                                                                                                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
|                                  | 704.00                                                                                                                                                                                                  | 8.17              | V                | 1.1               | -1.5                | 5.59         | 34.8         | -29.2         |              |
|                                  | 704.00                                                                                                                                                                                                  | 17.51             | H                | 1.1               | -1.5                | 14.93        | 34.8         | -19.8         |              |
|                                  | Mid Ch                                                                                                                                                                                                  |                   |                  |                   |                     |              |              |               |              |
|                                  | 707.50                                                                                                                                                                                                  | 7.89              | V                | 1.1               | -1.4                | 5.38         | 34.8         | -29.4         |              |
|                                  | 707.50                                                                                                                                                                                                  | 17.39             | H                | 1.1               | -1.4                | 14.88        | 34.8         | -19.9         |              |
|                                  | High Ch                                                                                                                                                                                                 |                   |                  |                   |                     |              |              |               |              |
|                                  | 711.00                                                                                                                                                                                                  | 7.77              | V                | 1.1               | -1.3                | 5.35         | 34.8         | -29.4         |              |
|                                  | 711.00                                                                                                                                                                                                  | 17.19             | H                | 1.1               | -1.3                | 14.77        | 34.8         | -20.0         |              |
|                                  | Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm                                                                                                                  |                   |                  |                   |                     |              |              |               |              |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                  |                   |                     |              |              |               |              |
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| LTE<br>Band 12<br>5MHz<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> 4787892815<br><b>Date:</b> 03-24-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> LTE12 5MHz FUND QPSK<br><br><b>Test Equipment:</b><br><b>Receiving:</b> VULB9163-845, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br><b>Substitution:</b> 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 701.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8.84              | V                | 1.1               | -1.5                | 6.24         | 34.8         | -28.5         |              |
|                                                                                        | 701.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 17.54             | H                | 1.1               | -1.5                | 14.94        | 34.8         | -19.8         |              |
|                                                                                        | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 707.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8.57              | V                | 1.1               | -1.4                | 6.08         | 34.8         | -28.7         |              |
|                                                                                        | 707.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 18.00             | H                | 1.1               | -1.4                | 15.51        | 34.8         | -19.3         |              |
|                                                                                        | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 713.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8.46              | V                | 1.6               | -1.3                | 5.58         | 34.8         | -29.2         |              |
|                                                                                        | 713.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 17.90             | H                | 1.6               | -1.3                | 15.02        | 34.8         | -19.7         |              |
| Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                  |                   |                     |              |              |               |              |
| LTE<br>Band 12<br>5MHz<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> 4787892815<br><b>Date:</b> 03-24-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> LTE12 5MHz FUND 16QAM<br><br><b>Test Equipment:</b><br><b>Receiving:</b> VULB9163-845, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br><b>Substitution:</b> 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 701.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7.71              | V                | 1.1               | -1.5                | 5.11         | 34.8         | -29.7         |              |
|                                                                                        | 701.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 16.37             | H                | 1.1               | -1.5                | 13.77        | 34.8         | -21.0         |              |
|                                                                                        | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 707.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7.48              | V                | 1.1               | -1.4                | 4.99         | 34.8         | -29.8         |              |
|                                                                                        | 707.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 16.92             | H                | 1.1               | -1.4                | 14.43        | 34.8         | -20.3         |              |
|                                                                                        | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 713.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7.48              | V                | 1.1               | -1.3                | 5.10         | 34.8         | -29.7         |              |
|                                                                                        | 713.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 16.73             | H                | 1.1               | -1.3                | 14.35        | 34.8         | -20.4         |              |
| Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                  |                   |                     |              |              |               |              |

|                                 |                                                                                                                                                                                                      |                   |                  |                   |                     |              |              |               |              |
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| LTE<br>Band 12<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> 4787892815<br><b>Date:</b> 03-24-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> LTE12 3MHz FUND QPSK  |                   |                  |                   |                     |              |              |               |              |
|                                 | <b>Test Equipment:</b><br>Receiving: VULB9163-845, 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                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                 | 700.50                                                                                                                                                                                               | 8.77              | V                | 1.1               | -1.5                | 6.17         | 34.8         | -28.6         |              |
|                                 | 700.50                                                                                                                                                                                               | 18.03             | H                | 1.1               | -1.5                | 15.43        | 34.8         | -19.3         |              |
|                                 | Mid Ch                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                 | 707.50                                                                                                                                                                                               | 9.02              | V                | 1.1               | -1.4                | 6.53         | 34.8         | -28.2         |              |
|                                 | 707.50                                                                                                                                                                                               | 18.22             | H                | 1.1               | -1.4                | 15.73        | 34.8         | -19.0         |              |
|                                 | High Ch                                                                                                                                                                                              |                   |                  |                   |                     |              |              |               |              |
|                                 | 714.50                                                                                                                                                                                               | 8.90              | V                | 1.6               | -1.3                | 6.02         | 34.8         | -28.7         |              |
|                                 | 714.50                                                                                                                                                                                               | 18.12             | H                | 1.6               | -1.3                | 15.24        | 34.8         | -19.5         |              |
|                                 | Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm                                                                                                               |                   |                  |                   |                     |              |              |               |              |
| LTE<br>Band 12<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> 4787892815<br><b>Date:</b> 03-24-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> LTE12 3MHz FUND 16QAM |                   |                  |                   |                     |              |              |               |              |
|                                 | <b>Test Equipment:</b><br>Receiving: VULB9163-845, 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                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                 | 700.50                                                                                                                                                                                               | 7.56              | V                | 1.1               | -1.5                | 4.96         | 34.8         | -29.8         |              |
|                                 | 700.50                                                                                                                                                                                               | 16.83             | H                | 1.1               | -1.5                | 14.23        | 34.8         | -20.5         |              |
|                                 | Mid Ch                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                 | 707.50                                                                                                                                                                                               | 7.82              | V                | 1.1               | -1.4                | 5.33         | 34.8         | -29.4         |              |
|                                 | 707.50                                                                                                                                                                                               | 17.06             | H                | 1.1               | -1.4                | 14.57        | 34.8         | -20.2         |              |
|                                 | High Ch                                                                                                                                                                                              |                   |                  |                   |                     |              |              |               |              |
|                                 | 714.50                                                                                                                                                                                               | 7.76              | V                | 1.1               | -1.3                | 5.38         | 34.8         | -29.4         |              |
|                                 | 714.50                                                                                                                                                                                               | 16.90             | H                | 1.1               | -1.3                | 14.52        | 34.8         | -20.3         |              |
|                                 | Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm                                                                                                               |                   |                  |                   |                     |              |              |               |              |

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
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| LTE<br>Band 12<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> 4787892815<br><b>Date:</b> 03-24-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> LTE 12 1.4MHz FUND QPSK<br><br><b>Test Equipment:</b><br><b>Receiving:</b> VULB9163-845, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br><b>Substitution:</b> 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 699.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6.55              | V                | 1.1               | -1.5                | 3.95         | 34.8         | -30.8         |              |
|                                                                                        | 699.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 15.44             | H                | 1.1               | -1.5                | 12.84        | 34.8         | -21.9         |              |
|                                                                                        | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 707.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6.11              | V                | 1.1               | -1.4                | 3.62         | 34.8         | -31.2         |              |
|                                                                                        | 707.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 15.69             | H                | 1.1               | -1.4                | 13.20        | 34.8         | -21.6         |              |
|                                                                                        | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 715.30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5.78              | V                | 1.6               | -1.3                | 2.90         | 34.8         | -31.9         |              |
|                                                                                        | 715.30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 15.96             | H                | 1.6               | -1.3                | 13.08        | 34.8         | -21.7         |              |
| Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |
| LTE<br>Band 12<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> 4787892815<br><b>Date:</b> 03-24-17<br><b>Test Engineer:</b> YH Lim<br><b>Configuration:</b> EUT ONLY, X Position<br><b>Mode:</b> LTE 12 1.4MHz FUND 16QAM<br><br><b>Test Equipment:</b><br><b>Receiving:</b> VULB9163-845, and 3m Chamber N-type Cable (Setup this one for testing EUT)<br><b>Substitution:</b> 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 699.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5.46              | V                | 1.1               | -1.5                | 2.86         | 34.8         | -31.9         |              |
|                                                                                        | 699.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 14.31             | H                | 1.1               | -1.5                | 11.71        | 34.8         | -23.1         |              |
|                                                                                        | Mid Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 707.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4.91              | V                | 1.1               | -1.4                | 2.42         | 34.8         | -32.4         |              |
|                                                                                        | 707.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 14.66             | H                | 1.1               | -1.4                | 12.17        | 34.8         | -22.6         |              |
|                                                                                        | High Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                  |                   |                     |              |              |               |              |
|                                                                                        | 715.30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4.59              | V                | 1.1               | -1.3                | 2.21         | 34.8         | -32.6         |              |
|                                                                                        | 715.30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 14.88             | H                | 1.1               | -1.3                | 12.50        | 34.8         | -22.3         |              |
| Rev. 3.17.11<br>Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                  |                   |                     |              |              |               |              |

## 10.2. FIELD STRENGTH OF SPURIOUS RADIATION

### RULE PART(S)

FCC: §2.1053, §22.917, §24.238 and §27. 53

### LIMIT

Part 22.917(a) & Part 24.238(a) & Part 27.53(g) - 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.

### TEST PROCEDURE

ANSI / TIA / EIA 603D Clause 2.2.12; ESU40 setting reference to 971168 D01 v02r02

For peak power measurement with a ESU40:

- a) Set the RBW = 100 KHz for emission below 1GHz and 1MHz for emissions above 1GHz
- b) Set VBW  $\geq 3 \times$  RBW;
- c) Set span  $\geq 1.5$  times the OBW;
- d) Sweep time = auto couple;
- e) Detector = peak (RMS for average measurement);
- f) Ensure that the number of measurement points  $\geq$  span/RBW;
- g) Trace mode = max hold;

### RESULTS

## 10.2.1. SPURIOUS RADIATION PLOTS

### GSM 850

GSM

GSM850

GPRS

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787892815

Date: 03-24-17

Test Engineer: YH Lim

Configuration: EUT / AC Adapter / Earphone, XPosition

Mode: GPRS 850 MHz

Chamber

Chamber 1

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 22

| f GHz             | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|-------------------|------------------|-----------------|--------------|-------------|-------------|------------|-------------|------------|-------|
| Low Ch, 824.2MHz  |                  |                 |              |             |             |            |             |            |       |
| 1.6484            | 5.5              | V               | 3.0          | 44.2        | 1.0         | -37.7      | -13.0       | -24.7      |       |
| 2.4726            | -1.7             | V               | 3.0          | 44.8        | 1.0         | -45.5      | -13.0       | -32.5      |       |
| 3.2968            | -7.8             | V               | 3.0          | 44.8        | 1.0         | -51.6      | -13.0       | -38.6      |       |
| 1.6484            | 8.4              | H               | 3.0          | 44.2        | 1.0         | -34.8      | -13.0       | -21.8      |       |
| 2.4726            | -0.9             | H               | 3.0          | 44.8        | 1.0         | -44.7      | -13.0       | -31.7      |       |
| 3.2968            | -7.2             | H               | 3.0          | 44.8        | 1.0         | -51.0      | -13.0       | -38.0      |       |
| Mid Ch, 836.6MHz  |                  |                 |              |             |             |            |             |            |       |
| 1.6730            | 7.3              | V               | 3.0          | 44.2        | 1.0         | -35.9      | -13.0       | -22.9      |       |
| 2.5098            | -1.1             | V               | 3.0          | 44.8        | 1.0         | -44.9      | -13.0       | -31.9      |       |
| 3.3464            | -7.5             | V               | 3.0          | 44.7        | 1.0         | -51.2      | -13.0       | -38.2      |       |
| 1.6730            | 7.7              | H               | 3.0          | 44.2        | 1.0         | -35.6      | -13.0       | -22.6      |       |
| 2.5098            | 2.4              | H               | 3.0          | 44.8        | 1.0         | -41.4      | -13.0       | -28.4      |       |
| 3.3464            | -7.4             | H               | 3.0          | 44.7        | 1.0         | -51.2      | -13.0       | -38.2      |       |
| High Ch, 848.8MHz |                  |                 |              |             |             |            |             |            |       |
| 1.6976            | 5.8              | V               | 3.0          | 44.2        | 1.0         | -37.4      | -13.0       | -24.4      |       |
| 2.5466            | -2.0             | V               | 3.0          | 44.8        | 1.0         | -45.8      | -13.0       | -32.8      |       |
| 3.3952            | -7.8             | V               | 3.0          | 44.6        | 1.0         | -51.4      | -13.0       | -38.4      |       |
| 1.6976            | 5.5              | H               | 3.0          | 44.2        | 1.0         | -37.7      | -13.0       | -24.7      |       |
| 2.5466            | 3.7              | H               | 3.0          | 44.8        | 1.0         | -40.2      | -13.0       | -27.2      |       |
| 3.3952            | -7.0             | H               | 3.0          | 44.6        | 1.0         | -50.6      | -13.0       | -37.6      |       |

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

GSM

GSM850

EGPRS

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787892815

Date: 03-24-17

Test Engineer: YH Lim

Configuration: EUT / AC Adapter / Earphone, XPosition

Mode: EGPRS 850 MHz

Chamber

Chamber 1

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 22

| f GHz             | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|-------------------|------------------|-----------------|--------------|-------------|-------------|------------|-------------|------------|-------|
| Low Ch, 824.2MHz  |                  |                 |              |             |             |            |             |            |       |
| 1.6484            | -1.8             | V               | 3.0          | 44.2        | 1.0         | -45.0      | -13.0       | -32.0      |       |
| 2.4726            | -7.4             | V               | 3.0          | 44.8        | 1.0         | -51.2      | -13.0       | -38.2      |       |
| 3.2968            | -8.3             | V               | 3.0          | 44.8        | 1.0         | -52.1      | -13.0       | -39.1      |       |
| 1.6484            | 3.3              | H               | 3.0          | 44.2        | 1.0         | -39.9      | -13.0       | -26.9      |       |
| 2.4726            | -8.1             | H               | 3.0          | 44.8        | 1.0         | -51.9      | -13.0       | -38.9      |       |
| 3.2968            | -7.9             | H               | 3.0          | 44.8        | 1.0         | -51.7      | -13.0       | -38.7      |       |
| Mid Ch, 836.6MHz  |                  |                 |              |             |             |            |             |            |       |
| 1.6730            | 1.0              | V               | 3.0          | 44.2        | 1.0         | -42.2      | -13.0       | -29.2      |       |
| 2.5098            | -7.3             | V               | 3.0          | 44.8        | 1.0         | -51.1      | -13.0       | -38.1      |       |
| 3.3464            | -7.9             | V               | 3.0          | 44.7        | 1.0         | -51.6      | -13.0       | -38.6      |       |
| 1.6730            | 2.5              | H               | 3.0          | 44.2        | 1.0         | -40.7      | -13.0       | -27.7      |       |
| 2.5098            | -8.9             | H               | 3.0          | 44.8        | 1.0         | -52.7      | -13.0       | -39.7      |       |
| 3.3464            | -7.8             | H               | 3.0          | 44.7        | 1.0         | -51.5      | -13.0       | -38.5      |       |
| High Ch, 848.8MHz |                  |                 |              |             |             |            |             |            |       |
| 1.6976            | -0.7             | V               | 3.0          | 44.2        | 1.0         | -44.0      | -13.0       | -31.0      |       |
| 2.5466            | -7.5             | V               | 3.0          | 44.8        | 1.0         | -51.3      | -13.0       | -38.3      |       |
| 3.3952            | -8.2             | V               | 3.0          | 44.6        | 1.0         | -51.8      | -13.0       | -38.8      |       |
| 1.6976            | -1.4             | H               | 3.0          | 44.2        | 1.0         | -44.7      | -13.0       | -31.7      |       |
| 2.5466            | -6.7             | H               | 3.0          | 44.8        | 1.0         | -50.5      | -13.0       | -37.5      |       |
| 3.3952            | -8.3             | H               | 3.0          | 44.6        | 1.0         | -51.9      | -13.0       | -38.9      |       |

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

**GSM 1900**

| GSM<br><br>GSM1900<br>GPRS                                                            | <div>UL Korea, Ltd Suwon Laboratory<br/>Above 1GHz High Frequency Substitution Measurement</div> <div>Company: Samsung<br/>Project #: 4787892815<br/>Date: 03-24-17<br/>Test Engineer: YH Lim<br/>Configuration: EUT / AC Adapter / Earphone, X Position<br/>Mode: GPRS 1900</div> <div><div>Chamber</div><div>Pre-amplifier</div><div>Filter</div><div>Limit</div></div> <div><div>Chamber 1</div><div>AFS42</div><div>Filter 1</div><div>Part 24</div></div> <table><thead><tr><th>f<br/>GHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Distance<br/>(m)</th><th>Preamp<br/>(dB)</th><th>Filter<br/>(dB)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Delta<br/>(dB)</th><th>Notes</th></tr></thead><tbody><tr><td colspan="10">Low Ch, 1850.2MHz</td></tr><tr><td>3.7004</td><td>-7.4</td><td>V</td><td>3.0</td><td>44.1</td><td>1.0</td><td>-50.6</td><td>-13.0</td><td>-37.6</td><td></td></tr><tr><td>5.5506</td><td>-5.0</td><td>V</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-48.3</td><td>-13.0</td><td>-35.3</td><td></td></tr><tr><td>7.4008</td><td>-5.5</td><td>V</td><td>3.0</td><td>43.8</td><td>1.0</td><td>-48.3</td><td>-13.0</td><td>-35.3</td><td></td></tr><tr><td>3.7000</td><td>-6.7</td><td>H</td><td>3.0</td><td>44.1</td><td>1.0</td><td>-49.8</td><td>-13.0</td><td>-36.8</td><td></td></tr><tr><td>5.5506</td><td>-6.6</td><td>H</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-50.0</td><td>-13.0</td><td>-37.0</td><td></td></tr><tr><td>7.4008</td><td>-5.0</td><td>H</td><td>3.0</td><td>43.8</td><td>1.0</td><td>-47.9</td><td>-13.0</td><td>-34.9</td><td></td></tr><tr><td colspan="10">Mid Ch, 1880.0MHz</td></tr><tr><td>3.7600</td><td>-7.4</td><td>V</td><td>3.0</td><td>44.0</td><td>1.0</td><td>-50.4</td><td>-13.0</td><td>-37.4</td><td></td></tr><tr><td>5.6400</td><td>-4.8</td><td>V</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-48.1</td><td>-13.0</td><td>-35.1</td><td></td></tr><tr><td>7.5200</td><td>-4.9</td><td>V</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-47.8</td><td>-13.0</td><td>-34.8</td><td></td></tr><tr><td>3.7600</td><td>-6.6</td><td>H</td><td>3.0</td><td>44.0</td><td>1.0</td><td>-49.6</td><td>-13.0</td><td>-36.6</td><td></td></tr><tr><td>5.6400</td><td>-6.2</td><td>H</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-49.5</td><td>-13.0</td><td>-36.5</td><td></td></tr><tr><td>7.5200</td><td>-5.1</td><td>H</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-47.9</td><td>-13.0</td><td>-34.9</td><td></td></tr><tr><td colspan="10">High Ch, 1909.8 MHz</td></tr><tr><td>3.8196</td><td>-7.2</td><td>V</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-50.1</td><td>-13.0</td><td>-37.1</td><td></td></tr><tr><td>5.7294</td><td>-6.0</td><td>V</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-49.4</td><td>-13.0</td><td>-36.4</td><td></td></tr><tr><td>7.6392</td><td>-4.7</td><td>V</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-47.6</td><td>-13.0</td><td>-34.6</td><td></td></tr><tr><td>3.8196</td><td>-7.6</td><td>H</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-50.5</td><td>-13.0</td><td>-37.5</td><td></td></tr><tr><td>5.7294</td><td>-6.8</td><td>H</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-50.1</td><td>-13.0</td><td>-37.1</td><td></td></tr><tr><td>7.6392</td><td>-5.2</td><td>H</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-48.0</td><td>-13.0</td><td>-35.0</td><td></td></tr><tr><td colspan="10">Rev. 03.03.09<br/>Note: No other emissions were detected above the system noise floor.</td></tr></tbody></table>      |                     |                    |                 |                |                |                |                |               |       | 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, 1850.2MHz |  |  |  |  |  |  |  |  |  | 3.7004 | -7.4 | V | 3.0 | 44.1 | 1.0 | -50.6 | -13.0 | -37.6 |  | 5.5506 | -5.0 | V | 3.0 | 44.3 | 1.0 | -48.3 | -13.0 | -35.3 |  | 7.4008 | -5.5 | V | 3.0 | 43.8 | 1.0 | -48.3 | -13.0 | -35.3 |  | 3.7000 | -6.7 | H | 3.0 | 44.1 | 1.0 | -49.8 | -13.0 | -36.8 |  | 5.5506 | -6.6 | H | 3.0 | 44.3 | 1.0 | -50.0 | -13.0 | -37.0 |  | 7.4008 | -5.0 | H | 3.0 | 43.8 | 1.0 | -47.9 | -13.0 | -34.9 |  | Mid Ch, 1880.0MHz |  |  |  |  |  |  |  |  |  | 3.7600 | -7.4 | V | 3.0 | 44.0 | 1.0 | -50.4 | -13.0 | -37.4 |  | 5.6400 | -4.8 | V | 3.0 | 44.3 | 1.0 | -48.1 | -13.0 | -35.1 |  | 7.5200 | -4.9 | V | 3.0 | 43.9 | 1.0 | -47.8 | -13.0 | -34.8 |  | 3.7600 | -6.6 | H | 3.0 | 44.0 | 1.0 | -49.6 | -13.0 | -36.6 |  | 5.6400 | -6.2 | H | 3.0 | 44.3 | 1.0 | -49.5 | -13.0 | -36.5 |  | 7.5200 | -5.1 | H | 3.0 | 43.9 | 1.0 | -47.9 | -13.0 | -34.9 |  | High Ch, 1909.8 MHz |  |  |  |  |  |  |  |  |  | 3.8196 | -7.2 | V | 3.0 | 43.9 | 1.0 | -50.1 | -13.0 | -37.1 |  | 5.7294 | -6.0 | V | 3.0 | 44.3 | 1.0 | -49.4 | -13.0 | -36.4 |  | 7.6392 | -4.7 | V | 3.0 | 43.9 | 1.0 | -47.6 | -13.0 | -34.6 |  | 3.8196 | -7.6 | H | 3.0 | 43.9 | 1.0 | -50.5 | -13.0 | -37.5 |  | 5.7294 | -6.8 | H | 3.0 | 44.3 | 1.0 | -50.1 | -13.0 | -37.1 |  | 7.6392 | -5.2 | H | 3.0 | 43.9 | 1.0 | -48.0 | -13.0 | -35.0 |  | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |  |  |  |  |  |  |  |  |  |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|----------------|----------------|---------------|-------|----------|---------------------|--------------------|-----------------|----------------|----------------|---------------|----------------|---------------|-------|-------------------|--|--|--|--|--|--|--|--|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|-------------------|--|--|--|--|--|--|--|--|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|---------------------|--|--|--|--|--|--|--|--|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|--------|------|---|-----|------|-----|-------|-------|-------|--|---------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
|                                                                                       | 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, 1850.2MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |                 |                |                |                |                |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
|                                                                                       | 3.7004                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -7.4                | V                  | 3.0             | 44.1           | 1.0            | -50.6          | -13.0          | -37.6         |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|                                                                                       | 5.5506                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -5.0                | V                  | 3.0             | 44.3           | 1.0            | -48.3          | -13.0          | -35.3         |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|                                                                                       | 7.4008                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -5.5                | V                  | 3.0             | 43.8           | 1.0            | -48.3          | -13.0          | -35.3         |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|                                                                                       | 3.7000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -6.7                | H                  | 3.0             | 44.1           | 1.0            | -49.8          | -13.0          | -36.8         |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|                                                                                       | 5.5506                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -6.6                | H                  | 3.0             | 44.3           | 1.0            | -50.0          | -13.0          | -37.0         |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|                                                                                       | 7.4008                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -5.0                | H                  | 3.0             | 43.8           | 1.0            | -47.9          | -13.0          | -34.9         |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|                                                                                       | Mid Ch, 1880.0MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| 3.7600                                                                                | -7.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 44.0            | 1.0            | -50.4          | -13.0          | -37.4          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 5.6400                                                                                | -4.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 44.3            | 1.0            | -48.1          | -13.0          | -35.1          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 7.5200                                                                                | -4.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 43.9            | 1.0            | -47.8          | -13.0          | -34.8          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 3.7600                                                                                | -6.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 44.0            | 1.0            | -49.6          | -13.0          | -36.6          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 5.6400                                                                                | -6.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 44.3            | 1.0            | -49.5          | -13.0          | -36.5          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 7.5200                                                                                | -5.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 43.9            | 1.0            | -47.9          | -13.0          | -34.9          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| High Ch, 1909.8 MHz                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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|     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 3.8196                                                                                | -7.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 43.9            | 1.0            | -50.1          | -13.0          | -37.1          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      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| 5.7294                                                                                | -6.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 44.3            | 1.0            | -49.4          | -13.0          | -36.4          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 7.6392                                                                                | -4.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 43.9            | 1.0            | -47.6          | -13.0          | -34.6          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      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| 3.8196                                                                                | -7.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 43.9            | 1.0            | -50.5          | -13.0          | -37.5          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 5.7294                                                                                | -6.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 44.3            | 1.0            | -50.1          | -13.0          | -37.1          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 7.6392                                                                                | -5.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 43.9            | 1.0            | -48.0          | -13.0          | -35.0          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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|     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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|     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| GSM<br><br>GSM1900<br>EGPRS                                                           | <div>UL Korea, Ltd Suwon Laboratory<br/>Above 1GHz High Frequency Substitution Measurement</div> <div>Company: Samsung<br/>Project #: 4787892815<br/>Date: 03-24-17<br/>Test Engineer: YH Lim<br/>Configuration: EUT / AC Adapter / Earphone, X Position<br/>Mode: EGPRS 1900 MHz</div> <div><div>Chamber</div><div>Pre-amplifier</div><div>Filter</div><div>Limit</div></div> <div><div>Chamber 1</div><div>AFS42</div><div>Filter 1</div><div>Part 24</div></div> <table><thead><tr><th>f<br/>GHz</th><th>SG reading<br/>(dBm)</th><th>Ant. Pol.<br/>(H/V)</th><th>Distance<br/>(m)</th><th>Preamp<br/>(dB)</th><th>Filter<br/>(dB)</th><th>EIRP<br/>(dBm)</th><th>Limit<br/>(dBm)</th><th>Delta<br/>(dB)</th><th>Notes</th></tr></thead><tbody><tr><td colspan="10">Low Ch, 1850.2MHz</td></tr><tr><td>3.7004</td><td>-8.9</td><td>V</td><td>3.0</td><td>44.1</td><td>1.0</td><td>-52.0</td><td>-13.0</td><td>-39.0</td><td></td></tr><tr><td>5.5506</td><td>-6.8</td><td>V</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-50.1</td><td>-13.0</td><td>-37.1</td><td></td></tr><tr><td>7.4008</td><td>-5.9</td><td>V</td><td>3.0</td><td>43.8</td><td>1.0</td><td>-48.8</td><td>-13.0</td><td>-35.8</td><td></td></tr><tr><td>3.7000</td><td>-8.7</td><td>H</td><td>3.0</td><td>44.1</td><td>1.0</td><td>-51.8</td><td>-13.0</td><td>-38.8</td><td></td></tr><tr><td>5.5500</td><td>-8.1</td><td>H</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-51.4</td><td>-13.0</td><td>-38.4</td><td></td></tr><tr><td>7.4000</td><td>-4.8</td><td>H</td><td>3.0</td><td>43.8</td><td>1.0</td><td>-47.6</td><td>-13.0</td><td>-34.6</td><td></td></tr><tr><td colspan="10">Mid Ch, 1880.0MHz</td></tr><tr><td>3.7600</td><td>-8.4</td><td>V</td><td>3.0</td><td>44.0</td><td>1.0</td><td>-51.5</td><td>-13.0</td><td>-38.5</td><td></td></tr><tr><td>5.6400</td><td>-5.9</td><td>V</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-49.2</td><td>-13.0</td><td>-36.2</td><td></td></tr><tr><td>7.5200</td><td>-5.5</td><td>V</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-48.4</td><td>-13.0</td><td>-35.4</td><td></td></tr><tr><td>3.7600</td><td>-8.4</td><td>H</td><td>3.0</td><td>44.0</td><td>1.0</td><td>-51.4</td><td>-13.0</td><td>-38.4</td><td></td></tr><tr><td>5.6400</td><td>-7.1</td><td>H</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-50.4</td><td>-13.0</td><td>-37.4</td><td></td></tr><tr><td>7.5200</td><td>-5.1</td><td>H</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-48.0</td><td>-13.0</td><td>-35.0</td><td></td></tr><tr><td colspan="10">High Ch, 1909.8 MHz</td></tr><tr><td>3.8196</td><td>-8.5</td><td>V</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-51.4</td><td>-13.0</td><td>-38.4</td><td></td></tr><tr><td>5.7294</td><td>-5.8</td><td>V</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-49.2</td><td>-13.0</td><td>-36.2</td><td></td></tr><tr><td>7.6392</td><td>-5.3</td><td>V</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-48.2</td><td>-13.0</td><td>-35.2</td><td></td></tr><tr><td>3.8196</td><td>-8.3</td><td>H</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-51.3</td><td>-13.0</td><td>-38.3</td><td></td></tr><tr><td>5.7294</td><td>-7.1</td><td>H</td><td>3.0</td><td>44.3</td><td>1.0</td><td>-50.4</td><td>-13.0</td><td>-37.4</td><td></td></tr><tr><td>7.6392</td><td>-5.0</td><td>H</td><td>3.0</td><td>43.9</td><td>1.0</td><td>-47.9</td><td>-13.0</td><td>-34.9</td><td></td></tr><tr><td colspan="10">Rev. 03.03.09<br/>Note: No other emissions were detected above the system noise floor.</td></tr></tbody></table> |                     |                    |                 |                |                |                |                |               |       | 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, 1850.2MHz |  |  |  |  |  |  |  |  |  | 3.7004 | -8.9 | V | 3.0 | 44.1 | 1.0 | -52.0 | -13.0 | -39.0 |  | 5.5506 | -6.8 | V | 3.0 | 44.3 | 1.0 | -50.1 | -13.0 | -37.1 |  | 7.4008 | -5.9 | V | 3.0 | 43.8 | 1.0 | -48.8 | -13.0 | -35.8 |  | 3.7000 | -8.7 | H | 3.0 | 44.1 | 1.0 | -51.8 | -13.0 | -38.8 |  | 5.5500 | -8.1 | H | 3.0 | 44.3 | 1.0 | -51.4 | -13.0 | -38.4 |  | 7.4000 | -4.8 | H | 3.0 | 43.8 | 1.0 | -47.6 | -13.0 | -34.6 |  | Mid Ch, 1880.0MHz |  |  |  |  |  |  |  |  |  | 3.7600 | -8.4 | V | 3.0 | 44.0 | 1.0 | -51.5 | -13.0 | -38.5 |  | 5.6400 | -5.9 | V | 3.0 | 44.3 | 1.0 | -49.2 | -13.0 | -36.2 |  | 7.5200 | -5.5 | V | 3.0 | 43.9 | 1.0 | -48.4 | -13.0 | -35.4 |  | 3.7600 | -8.4 | H | 3.0 | 44.0 | 1.0 | -51.4 | -13.0 | -38.4 |  | 5.6400 | -7.1 | H | 3.0 | 44.3 | 1.0 | -50.4 | -13.0 | -37.4 |  | 7.5200 | -5.1 | H | 3.0 | 43.9 | 1.0 | -48.0 | -13.0 | -35.0 |  | High Ch, 1909.8 MHz |  |  |  |  |  |  |  |  |  | 3.8196 | -8.5 | V | 3.0 | 43.9 | 1.0 | -51.4 | -13.0 | -38.4 |  | 5.7294 | -5.8 | V | 3.0 | 44.3 | 1.0 | -49.2 | -13.0 | -36.2 |  | 7.6392 | -5.3 | V | 3.0 | 43.9 | 1.0 | -48.2 | -13.0 | -35.2 |  | 3.8196 | -8.3 | H | 3.0 | 43.9 | 1.0 | -51.3 | -13.0 | -38.3 |  | 5.7294 | -7.1 | H | 3.0 | 44.3 | 1.0 | -50.4 | -13.0 | -37.4 |  | 7.6392 | -5.0 | H | 3.0 | 43.9 | 1.0 | -47.9 | -13.0 | -34.9 |  | Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |  |  |  |  |  |  |  |  |  |
| 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, 1850.2MHz                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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  |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 3.7004                                                                                | -8.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 44.1            | 1.0            | -52.0          | -13.0          | -39.0          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 5.5506                                                                                | -6.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 44.3            | 1.0            | -50.1          | -13.0          | -37.1          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 7.4008                                                                                | -5.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 43.8            | 1.0            | -48.8          | -13.0          | -35.8          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 3.7000                                                                                | -8.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 44.1            | 1.0            | -51.8          | -13.0          | -38.8          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      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| 5.5500                                                                                | -8.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 44.3            | 1.0            | -51.4          | -13.0          | -38.4          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      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| 7.4000                                                                                | -4.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 43.8            | 1.0            | -47.6          | -13.0          | -34.6          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| Mid Ch, 1880.0MHz                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 3.7600                                                                                | -8.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| 5.6400                                                                                | -5.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 44.3            | 1.0            | -49.2          | -13.0          | -36.2          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 7.5200                                                                                | -5.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| 3.7600                                                                                | -8.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 44.0            | 1.0            | -51.4          | -13.0          | -38.4          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 5.6400                                                                                | -7.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 44.3            | 1.0            | -50.4          | -13.0          | -37.4          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 7.5200                                                                                | -5.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 43.9            | 1.0            | -48.0          | -13.0          | -35.0          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| High Ch, 1909.8 MHz                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 3.8196                                                                                | -8.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 43.9            | 1.0            | -51.4          | -13.0          | -38.4          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 5.7294                                                                                | -5.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 44.3            | 1.0            | -49.2          | -13.0          | -36.2          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 7.6392                                                                                | -5.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V                   | 3.0                | 43.9            | 1.0            | -48.2          | -13.0          | -35.2          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |     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| 3.8196                                                                                | -8.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 43.9            | 1.0            | -51.3          | -13.0          | -38.3          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 5.7294                                                                                | -7.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 44.3            | 1.0            | -50.4          | -13.0          | -37.4          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| 7.6392                                                                                | -5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | H                   | 3.0                | 43.9            | 1.0            | -47.9          | -13.0          | -34.9          |               |       |          |                     |                    |                 |                |                |               |                |               |       |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                   |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                     |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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|     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                                                                                       |  |  |  |  |  |  |  |  |  |

# WCDMA Band 5

WCDMA  
Band 5  
REL99

UL Korea, Ltd Suwon Laboratory  
Above 1GHz High Frequency Substitution Measurement

Company: Samsung  
Project #: 4787892815  
Date: 03-24-17  
Test Engineer: YH Lim  
Configuration: EUT / AC Adapter / Earphone, X Position  
Mode: Tx, REL99,850MHz

Chamber

Pre-amplifier

Filter

Limit

Chamber 1

AFS42

Filter 1

Part 22

| 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            | -1.5                | V                  | 3.0             | 44.2           | 1.0            | -44.7         | -13.0          | -31.7         |       |
| 2.4790            | -4.2                | V                  | 3.0             | 44.8           | 1.0            | -48.0         | -13.0          | -35.0         |       |
| 3.3056            | -7.3                | V                  | 3.0             | 44.8           | 1.0            | -51.1         | -13.0          | -38.1         |       |
| 1.6520            | -2.5                | H                  | 3.0             | 44.2           | 1.0            | -45.7         | -13.0          | -32.7         |       |
| 2.4790            | -4.9                | H                  | 3.0             | 44.8           | 1.0            | -48.6         | -13.0          | -35.6         |       |
| 3.3056            | -7.3                | H                  | 3.0             | 44.8           | 1.0            | -51.1         | -13.0          | -38.1         |       |
| Mid Ch, 836.6MHz  |                     |                    |                 |                |                |               |                |               |       |
| 1.6732            | -4.7                | V                  | 3.0             | 44.2           | 1.0            | -47.9         | -13.0          | -34.9         |       |
| 2.5098            | -3.7                | V                  | 3.0             | 44.8           | 1.0            | -47.5         | -13.0          | -34.5         |       |
| 3.3464            | -7.2                | V                  | 3.0             | 44.7           | 1.0            | -51.0         | -13.0          | -38.0         |       |
| 1.6732            | -3.7                | H                  | 3.0             | 44.2           | 1.0            | -47.0         | -13.0          | -34.0         |       |
| 2.5098            | -3.4                | H                  | 3.0             | 44.8           | 1.0            | -47.2         | -13.0          | -34.2         |       |
| 3.3464            | -6.8                | H                  | 3.0             | 44.7           | 1.0            | -50.6         | -13.0          | -37.6         |       |
| High Ch, 846.6MHz |                     |                    |                 |                |                |               |                |               |       |
| 1.6932            | -3.4                | V                  | 3.0             | 44.2           | 1.0            | -46.7         | -13.0          | -33.7         |       |
| 2.5390            | -2.2                | V                  | 3.0             | 44.8           | 1.0            | -46.0         | -13.0          | -33.0         |       |
| 3.3860            | -7.6                | V                  | 3.0             | 44.7           | 1.0            | -51.2         | -13.0          | -38.2         |       |
| 1.6932            | -3.0                | H                  | 3.0             | 44.2           | 1.0            | -46.3         | -13.0          | -33.3         |       |
| 2.5390            | -4.2                | H                  | 3.0             | 44.8           | 1.0            | -48.0         | -13.0          | -35.0         |       |
| 3.3860            | -7.6                | H                  | 3.0             | 44.7           | 1.0            | -51.3         | -13.0          | -38.3         |       |

Rev. 03.03.09  
Note: No other emissions were detected above the system noise floor.

WCDMA  
Band 5  
HSDPA

UL Korea, Ltd Suwon Laboratory  
Above 1GHz High Frequency Substitution Measurement

Company: Samsung  
Project #: 4787892815  
Date: 03-24-17  
Test Engineer: YH Lim  
Configuration: EUT / AC Adapter / Earphone, X Position  
Mode: Tx, HSDPA,850MHz

Chamber

Pre-amplifier

Filter

Limit

Chamber 1

AFS42

Filter 1

Part 22

| 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            | -2.4                | V                  | 3.0             | 44.2           | 1.0            | -45.6         | -13.0          | -32.6         |       |
| 2.4790            | -4.8                | V                  | 3.0             | 44.8           | 1.0            | -48.6         | -13.0          | -35.6         |       |
| 3.3056            | -7.5                | V                  | 3.0             | 44.8           | 1.0            | -51.3         | -13.0          | -38.3         |       |
| 1.6520            | -2.6                | H                  | 3.0             | 44.2           | 1.0            | -45.9         | -13.0          | -32.9         |       |
| 2.4790            | -5.7                | H                  | 3.0             | 44.8           | 1.0            | -49.4         | -13.0          | -36.4         |       |
| 3.3056            | -7.5                | H                  | 3.0             | 44.8           | 1.0            | -51.3         | -13.0          | -38.3         |       |
| Mid Ch, 836.6MHz  |                     |                    |                 |                |                |               |                |               |       |
| 1.6732            | -4.5                | V                  | 3.0             | 44.2           | 1.0            | -47.7         | -13.0          | -34.7         |       |
| 2.5098            | -3.0                | V                  | 3.0             | 44.8           | 1.0            | -46.8         | -13.0          | -33.8         |       |
| 3.3464            | -7.4                | V                  | 3.0             | 44.7           | 1.0            | -51.1         | -13.0          | -38.1         |       |
| 1.6732            | -3.9                | H                  | 3.0             | 44.2           | 1.0            | -47.2         | -13.0          | -34.2         |       |
| 2.5098            | -4.3                | H                  | 3.0             | 44.8           | 1.0            | -48.1         | -13.0          | -35.1         |       |
| 3.3464            | -7.2                | H                  | 3.0             | 44.7           | 1.0            | -50.9         | -13.0          | -37.9         |       |
| High Ch, 846.6MHz |                     |                    |                 |                |                |               |                |               |       |
| 1.6932            | -3.8                | V                  | 3.0             | 44.2           | 1.0            | -47.1         | -13.0          | -34.1         |       |
| 2.5390            | -2.6                | V                  | 3.0             | 44.8           | 1.0            | -46.4         | -13.0          | -33.4         |       |
| 3.3860            | -7.5                | V                  | 3.0             | 44.7           | 1.0            | -51.2         | -13.0          | -38.2         |       |
| 1.6932            | -3.7                | H                  | 3.0             | 44.2           | 1.0            | -46.9         | -13.0          | -33.9         |       |
| 2.5390            | -4.7                | H                  | 3.0             | 44.8           | 1.0            | -48.6         | -13.0          | -35.6         |       |
| 3.3860            | -7.1                | H                  | 3.0             | 44.7           | 1.0            | -50.8         | -13.0          | -37.8         |       |

Rev. 03.03.09  
Note: No other emissions were detected above the system noise floor.

**LTE Band 12**

| LTE<br>Band 12<br>10MHz<br>QPSK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Company: Samsung                                                                     |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
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| <table><tr><th>f GHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Distance (m)</th><th>Preamp (dB)</th><th>Filter (dB)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="10">Low Channel (704MHz)</td></tr><tr><td>1.4080</td><td>12.8</td><td>V</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-30.4</td><td>-13.0</td><td>-17.4</td><td></td></tr><tr><td>2.1120</td><td>-1.0</td><td>V</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-44.4</td><td>-13.0</td><td>-31.4</td><td></td></tr><tr><td>2.8160</td><td>-5.5</td><td>V</td><td>3.0</td><td>45.1</td><td>1.0</td><td>-49.6</td><td>-13.0</td><td>-36.6</td><td></td></tr><tr><td>1.4080</td><td>12.5</td><td>H</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-30.8</td><td>-13.0</td><td>-17.8</td><td></td></tr><tr><td>2.1120</td><td>-2.7</td><td>H</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-46.1</td><td>-13.0</td><td>-33.1</td><td></td></tr><tr><td>2.8160</td><td>-2.4</td><td>H</td><td>3.0</td><td>45.1</td><td>1.0</td><td>-46.6</td><td>-13.0</td><td>-33.6</td><td></td></tr><tr><td colspan="10">Mid Channel (707.5MHz)</td></tr><tr><td>1.4150</td><td>13.3</td><td>V</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-29.9</td><td>-13.0</td><td>-16.9</td><td></td></tr><tr><td>2.1225</td><td>-2.3</td><td>V</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-45.7</td><td>-13.0</td><td>-32.7</td><td></td></tr><tr><td>2.8300</td><td>-5.1</td><td>V</td><td>3.0</td><td>45.1</td><td>1.0</td><td>-49.2</td><td>-13.0</td><td>-36.2</td><td></td></tr><tr><td>1.4150</td><td>13.8</td><td>H</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-29.4</td><td>-13.0</td><td>-16.4</td><td></td></tr><tr><td>2.1225</td><td>-3.2</td><td>H</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-46.6</td><td>-13.0</td><td>-33.6</td><td></td></tr><tr><td>2.8300</td><td>-4.0</td><td>H</td><td>3.0</td><td>45.1</td><td>1.0</td><td>-48.2</td><td>-13.0</td><td>-35.2</td><td></td></tr><tr><td colspan="10">High Channel (711MHz)</td></tr><tr><td>1.4220</td><td>12.0</td><td>V</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-31.2</td><td>-13.0</td><td>-18.2</td><td></td></tr><tr><td>2.1330</td><td>-2.6</td><td>V</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-46.0</td><td>-13.0</td><td>-33.0</td><td></td></tr><tr><td>2.8440</td><td>-5.9</td><td>V</td><td>3.0</td><td>45.2</td><td>1.0</td><td>-50.0</td><td>-13.0</td><td>-37.0</td><td></td></tr><tr><td>1.4220</td><td>12.9</td><td>H</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-30.4</td><td>-13.0</td><td>-17.4</td><td></td></tr><tr><td>2.1330</td><td>-2.0</td><td>H</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-45.4</td><td>-13.0</td><td>-32.4</td><td></td></tr><tr><td>2.8440</td><td>-5.2</td><td>H</td><td>3.0</td><td>45.2</td><td>1.0</td><td>-49.4</td><td>-13.0</td><td>-36.4</td><td></td></tr></table> |                                                                                      |                 |               |             |             |            |             |            |       | f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes | Low Channel (704MHz) |  |  |  |  |  |  |  |  |  | 1.4080 | 12.8 | V | 3.0 | 44.2 | 1.0 | -30.4 | -13.0 | -17.4 |  | 2.1120 | -1.0 | V | 3.0 | 44.4 | 1.0 | -44.4 | -13.0 | -31.4 |  | 2.8160 | -5.5 | V | 3.0 | 45.1 | 1.0 | -49.6 | -13.0 | -36.6 |  | 1.4080 | 12.5 | H | 3.0 | 44.2 | 1.0 | -30.8 | -13.0 | -17.8 |  | 2.1120 | -2.7 | H | 3.0 | 44.4 | 1.0 | -46.1 | -13.0 | -33.1 |  | 2.8160 | -2.4 | H | 3.0 | 45.1 | 1.0 | -46.6 | -13.0 | -33.6 |  | Mid Channel (707.5MHz) |  |  |  |  |  |  |  |  |  | 1.4150 | 13.3 | V | 3.0 | 44.2 | 1.0 | -29.9 | -13.0 | -16.9 |  | 2.1225 | -2.3 | V | 3.0 | 44.4 | 1.0 | -45.7 | -13.0 | -32.7 |  | 2.8300 | -5.1 | V | 3.0 | 45.1 | 1.0 | -49.2 | -13.0 | -36.2 |  | 1.4150 | 13.8 | H | 3.0 | 44.2 | 1.0 | -29.4 | -13.0 | -16.4 |  | 2.1225 | -3.2 | H | 3.0 | 44.4 | 1.0 | -46.6 | -13.0 | -33.6 |  | 2.8300 | -4.0 | H | 3.0 | 45.1 | 1.0 | -48.2 | -13.0 | -35.2 |  | High Channel (711MHz) |  |  |  |  |  |  |  |  |  | 1.4220 | 12.0 | V | 3.0 | 44.2 | 1.0 | -31.2 | -13.0 | -18.2 |  | 2.1330 | -2.6 | V | 3.0 | 44.4 | 1.0 | -46.0 | -13.0 | -33.0 |  | 2.8440 | -5.9 | V | 3.0 | 45.2 | 1.0 | -50.0 | -13.0 | -37.0 |  | 1.4220 | 12.9 | H | 3.0 | 44.2 | 1.0 | -30.4 | -13.0 | -17.4 |  | 2.1330 | -2.0 | H | 3.0 | 44.4 | 1.0 | -45.4 | -13.0 | -32.4 |  | 2.8440 | -5.2 | H | 3.0 | 45.2 | 1.0 | -49.4 | -13.0 | -36.4 |  |
| f GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SG reading (dBm)                                                                     | Ant. Pol. (H/V) | Distance (m)  | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| Low Channel (704MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                      |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4080                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12.8                                                                                 | V               | 3.0           | 44.2        | 1.0         | -30.4      | -13.0       | -17.4      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -1.0                                                                                 | V               | 3.0           | 44.4        | 1.0         | -44.4      | -13.0       | -31.4      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -5.5                                                                                 | V               | 3.0           | 45.1        | 1.0         | -49.6      | -13.0       | -36.6      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4080                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12.5                                                                                 | H               | 3.0           | 44.2        | 1.0         | -30.8      | -13.0       | -17.8      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.7                                                                                 | H               | 3.0           | 44.4        | 1.0         | -46.1      | -13.0       | -33.1      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.4                                                                                 | H               | 3.0           | 45.1        | 1.0         | -46.6      | -13.0       | -33.6      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| Mid Channel (707.5MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                      |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.3                                                                                 | V               | 3.0           | 44.2        | 1.0         | -29.9      | -13.0       | -16.9      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.3                                                                                 | V               | 3.0           | 44.4        | 1.0         | -45.7      | -13.0       | -32.7      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -5.1                                                                                 | V               | 3.0           | 45.1        | 1.0         | -49.2      | -13.0       | -36.2      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.8                                                                                 | H               | 3.0           | 44.2        | 1.0         | -29.4      | -13.0       | -16.4      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -3.2                                                                                 | H               | 3.0           | 44.4        | 1.0         | -46.6      | -13.0       | -33.6      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -4.0                                                                                 | H               | 3.0           | 45.1        | 1.0         | -48.2      | -13.0       | -35.2      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| High Channel (711MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12.0                                                                                 | V               | 3.0           | 44.2        | 1.0         | -31.2      | -13.0       | -18.2      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1330                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.6                                                                                 | V               | 3.0           | 44.4        | 1.0         | -46.0      | -13.0       | -33.0      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8440                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -5.9                                                                                 | V               | 3.0           | 45.2        | 1.0         | -50.0      | -13.0       | -37.0      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12.9                                                                                 | H               | 3.0           | 44.2        | 1.0         | -30.4      | -13.0       | -17.4      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1330                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.0                                                                                 | H               | 3.0           | 44.4        | 1.0         | -45.4      | -13.0       | -32.4      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8440                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -5.2                                                                                 | H               | 3.0           | 45.2        | 1.0         | -49.4      | -13.0       | -36.4      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |

| LTE<br>Band 12<br>10MHz<br>16QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | UL Korea, Ltd Suwon Laboratory<br>Above 1GHz High Frequency Substitution Measurement |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
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| <table><tr><th>f GHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Distance (m)</th><th>Preamp (dB)</th><th>Filter (dB)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="10">Low Channel (704MHz)</td></tr><tr><td>1.4080</td><td>12.9</td><td>V</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-30.3</td><td>-13.0</td><td>-17.3</td><td></td></tr><tr><td>2.1120</td><td>-1.5</td><td>V</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-44.9</td><td>-13.0</td><td>-31.9</td><td></td></tr><tr><td>2.8160</td><td>-4.9</td><td>V</td><td>3.0</td><td>45.1</td><td>1.0</td><td>-49.0</td><td>-13.0</td><td>-36.0</td><td></td></tr><tr><td>1.4080</td><td>12.5</td><td>H</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-30.7</td><td>-13.0</td><td>-17.7</td><td></td></tr><tr><td>2.1120</td><td>-2.7</td><td>H</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-46.0</td><td>-13.0</td><td>-33.0</td><td></td></tr><tr><td>2.8160</td><td>-2.4</td><td>H</td><td>3.0</td><td>45.1</td><td>1.0</td><td>-46.5</td><td>-13.0</td><td>-33.5</td><td></td></tr><tr><td colspan="10">Mid Channel (707.5MHz)</td></tr><tr><td>1.4150</td><td>13.2</td><td>V</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-30.0</td><td>-13.0</td><td>-17.0</td><td></td></tr><tr><td>2.1225</td><td>-2.0</td><td>V</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-45.4</td><td>-13.0</td><td>-32.4</td><td></td></tr><tr><td>2.8300</td><td>-5.6</td><td>V</td><td>3.0</td><td>45.1</td><td>1.0</td><td>-49.8</td><td>-13.0</td><td>-36.8</td><td></td></tr><tr><td>1.4150</td><td>13.8</td><td>H</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-29.5</td><td>-13.0</td><td>-16.5</td><td></td></tr><tr><td>2.1225</td><td>-3.0</td><td>H</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-46.4</td><td>-13.0</td><td>-33.4</td><td></td></tr><tr><td>2.8300</td><td>-4.9</td><td>H</td><td>3.0</td><td>45.1</td><td>1.0</td><td>-49.0</td><td>-13.0</td><td>-36.0</td><td></td></tr><tr><td colspan="10">High Channel (711MHz)</td></tr><tr><td>1.4220</td><td>12.0</td><td>V</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-31.2</td><td>-13.0</td><td>-18.2</td><td></td></tr><tr><td>2.1330</td><td>-2.7</td><td>V</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-46.1</td><td>-13.0</td><td>-33.1</td><td></td></tr><tr><td>2.8440</td><td>-6.1</td><td>V</td><td>3.0</td><td>45.2</td><td>1.0</td><td>-50.2</td><td>-13.0</td><td>-37.2</td><td></td></tr><tr><td>1.4220</td><td>12.8</td><td>H</td><td>3.0</td><td>44.2</td><td>1.0</td><td>-30.5</td><td>-13.0</td><td>-17.5</td><td></td></tr><tr><td>2.1330</td><td>-2.9</td><td>H</td><td>3.0</td><td>44.4</td><td>1.0</td><td>-46.3</td><td>-13.0</td><td>-33.3</td><td></td></tr><tr><td>2.8440</td><td>-5.3</td><td>H</td><td>3.0</td><td>45.2</td><td>1.0</td><td>-49.5</td><td>-13.0</td><td>-36.5</td><td></td></tr></table> |                                                                                      |                 |               |             |             |            |             |            |       | f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes | Low Channel (704MHz) |  |  |  |  |  |  |  |  |  | 1.4080 | 12.9 | V | 3.0 | 44.2 | 1.0 | -30.3 | -13.0 | -17.3 |  | 2.1120 | -1.5 | V | 3.0 | 44.4 | 1.0 | -44.9 | -13.0 | -31.9 |  | 2.8160 | -4.9 | V | 3.0 | 45.1 | 1.0 | -49.0 | -13.0 | -36.0 |  | 1.4080 | 12.5 | H | 3.0 | 44.2 | 1.0 | -30.7 | -13.0 | -17.7 |  | 2.1120 | -2.7 | H | 3.0 | 44.4 | 1.0 | -46.0 | -13.0 | -33.0 |  | 2.8160 | -2.4 | H | 3.0 | 45.1 | 1.0 | -46.5 | -13.0 | -33.5 |  | Mid Channel (707.5MHz) |  |  |  |  |  |  |  |  |  | 1.4150 | 13.2 | V | 3.0 | 44.2 | 1.0 | -30.0 | -13.0 | -17.0 |  | 2.1225 | -2.0 | V | 3.0 | 44.4 | 1.0 | -45.4 | -13.0 | -32.4 |  | 2.8300 | -5.6 | V | 3.0 | 45.1 | 1.0 | -49.8 | -13.0 | -36.8 |  | 1.4150 | 13.8 | H | 3.0 | 44.2 | 1.0 | -29.5 | -13.0 | -16.5 |  | 2.1225 | -3.0 | H | 3.0 | 44.4 | 1.0 | -46.4 | -13.0 | -33.4 |  | 2.8300 | -4.9 | H | 3.0 | 45.1 | 1.0 | -49.0 | -13.0 | -36.0 |  | High Channel (711MHz) |  |  |  |  |  |  |  |  |  | 1.4220 | 12.0 | V | 3.0 | 44.2 | 1.0 | -31.2 | -13.0 | -18.2 |  | 2.1330 | -2.7 | V | 3.0 | 44.4 | 1.0 | -46.1 | -13.0 | -33.1 |  | 2.8440 | -6.1 | V | 3.0 | 45.2 | 1.0 | -50.2 | -13.0 | -37.2 |  | 1.4220 | 12.8 | H | 3.0 | 44.2 | 1.0 | -30.5 | -13.0 | -17.5 |  | 2.1330 | -2.9 | H | 3.0 | 44.4 | 1.0 | -46.3 | -13.0 | -33.3 |  | 2.8440 | -5.3 | H | 3.0 | 45.2 | 1.0 | -49.5 | -13.0 | -36.5 |  |
| f GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SG reading (dBm)                                                                     | Ant. Pol. (H/V) | Distance (m)  | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| Low Channel (704MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                      |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4080                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12.9                                                                                 | V               | 3.0           | 44.2        | 1.0         | -30.3      | -13.0       | -17.3      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -1.5                                                                                 | V               | 3.0           | 44.4        | 1.0         | -44.9      | -13.0       | -31.9      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -4.9                                                                                 | V               | 3.0           | 45.1        | 1.0         | -49.0      | -13.0       | -36.0      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4080                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12.5                                                                                 | H               | 3.0           | 44.2        | 1.0         | -30.7      | -13.0       | -17.7      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.7                                                                                 | H               | 3.0           | 44.4        | 1.0         | -46.0      | -13.0       | -33.0      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.4                                                                                 | H               | 3.0           | 45.1        | 1.0         | -46.5      | -13.0       | -33.5      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| Mid Channel (707.5MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                      |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.2                                                                                 | V               | 3.0           | 44.2        | 1.0         | -30.0      | -13.0       | -17.0      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.0                                                                                 | V               | 3.0           | 44.4        | 1.0         | -45.4      | -13.0       | -32.4      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -5.6                                                                                 | V               | 3.0           | 45.1        | 1.0         | -49.8      | -13.0       | -36.8      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.8                                                                                 | H               | 3.0           | 44.2        | 1.0         | -29.5      | -13.0       | -16.5      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -3.0                                                                                 | H               | 3.0           | 44.4        | 1.0         | -46.4      | -13.0       | -33.4      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -4.9                                                                                 | H               | 3.0           | 45.1        | 1.0         | -49.0      | -13.0       | -36.0      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| High Channel (711MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12.0                                                                                 | V               | 3.0           | 44.2        | 1.0         | -31.2      | -13.0       | -18.2      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1330                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.7                                                                                 | V               | 3.0           | 44.4        | 1.0         | -46.1      | -13.0       | -33.1      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8440                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -6.1                                                                                 | V               | 3.0           | 45.2        | 1.0         | -50.2      | -13.0       | -37.2      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 1.4220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12.8                                                                                 | H               | 3.0           | 44.2        | 1.0         | -30.5      | -13.0       | -17.5      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.1330                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -2.9                                                                                 | H               | 3.0           | 44.4        | 1.0         | -46.3      | -13.0       | -33.3      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| 2.8440                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -5.3                                                                                 | H               | 3.0           | 45.2        | 1.0         | -49.5      | -13.0       | -36.5      |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |
| Rev. 03.03.09<br>Note: No other emissions were detected above the system noise floor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |                 |               |             |             |            |             |            |       |       |                  |                 |              |             |             |            |             |            |       |                      |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                        |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |                       |  |  |  |  |  |  |  |  |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |        |      |   |     |      |     |       |       |       |  |

LTE  
Band 12  
5MHz  
QPSK

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787892815

Date: 03-27-17

Test Engineer: JH Park

Configuration: EUT / AC Adapter / Earphone, X Position

Mode: TX, LTE BAND 12, 5MHz BW, QPSK

Chamber

Chamber 1

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 27

| f GHz                   | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|-------------------------|------------------|-----------------|--------------|-------------|-------------|------------|-------------|------------|-------|
| Low Channel (701.5MHz)  |                  |                 |              |             |             |            |             |            |       |
| 1.4030                  | 13.0             | V               | 3.0          | 44.2        | 1.0         | -30.2      | -13.0       | -17.2      |       |
| 2.1045                  | -2.4             | V               | 3.0          | 44.4        | 1.0         | -45.8      | -13.0       | -32.8      |       |
| 2.8060                  | -4.2             | V               | 3.0          | 45.1        | 1.0         | -48.3      | -13.0       | -35.3      |       |
| 1.4030                  | 14.0             | H               | 3.0          | 44.2        | 1.0         | -29.2      | -13.0       | -16.2      |       |
| 2.1045                  | -2.4             | H               | 3.0          | 44.4        | 1.0         | -45.8      | -13.0       | -32.8      |       |
| 2.8060                  | -4.1             | H               | 3.0          | 45.1        | 1.0         | -48.2      | -13.0       | -35.2      |       |
| Mid Channel (707.5MHz)  |                  |                 |              |             |             |            |             |            |       |
| 1.4150                  | 13.0             | V               | 3.0          | 44.2        | 1.0         | -30.2      | -13.0       | -17.2      |       |
| 2.1225                  | -2.0             | V               | 3.0          | 44.4        | 1.0         | -45.4      | -13.0       | -32.4      |       |
| 2.8300                  | -6.0             | V               | 3.0          | 45.1        | 1.0         | -50.2      | -13.0       | -37.2      |       |
| 1.4150                  | 13.6             | H               | 3.0          | 44.2        | 1.0         | -29.7      | -13.0       | -16.7      |       |
| 2.1225                  | -2.9             | H               | 3.0          | 44.4        | 1.0         | -46.2      | -13.0       | -33.2      |       |
| 2.8300                  | -6.1             | H               | 3.0          | 45.1        | 1.0         | -50.3      | -13.0       | -37.3      |       |
| High Channel (713.5MHz) |                  |                 |              |             |             |            |             |            |       |
| 1.4270                  | 11.5             | V               | 3.0          | 44.2        | 1.0         | -31.7      | -13.0       | -18.7      |       |
| 2.1405                  | -3.1             | V               | 3.0          | 44.4        | 1.0         | -46.5      | -13.0       | -33.5      |       |
| 2.8540                  | -4.5             | V               | 3.0          | 45.2        | 1.0         | -48.7      | -13.0       | -35.7      |       |
| 1.4270                  | 12.4             | H               | 3.0          | 44.2        | 1.0         | -30.8      | -13.0       | -17.8      |       |
| 2.1405                  | -3.9             | H               | 3.0          | 44.4        | 1.0         | -47.3      | -13.0       | -34.3      |       |
| 2.8540                  | -4.2             | H               | 3.0          | 45.2        | 1.0         | -48.3      | -13.0       | -35.3      |       |

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

LTE  
Band 12  
5MHz  
16QAM

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787892815

Date: 03-27-17

Test Engineer: JH Park

Configuration: EUT / AC Adapter / Earphone, X Position

Mode: TX, LTE BAND 12, 5MHz BW, 16QAM

Chamber

Chamber 1

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 27

| f GHz                   | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|-------------------------|------------------|-----------------|--------------|-------------|-------------|------------|-------------|------------|-------|
| Low Channel (701.5MHz)  |                  |                 |              |             |             |            |             |            |       |
| 1.4030                  | 13.0             | V               | 3.0          | 44.2        | 1.0         | -30.3      | -13.0       | -17.3      |       |
| 2.1045                  | -2.4             | V               | 3.0          | 44.4        | 1.0         | -45.7      | -13.0       | -32.7      |       |
| 2.8060                  | -5.1             | V               | 3.0          | 45.1        | 1.0         | -49.3      | -13.0       | -36.3      |       |
| 1.4030                  | 14.1             | H               | 3.0          | 44.2        | 1.0         | -29.1      | -13.0       | -16.1      |       |
| 2.1045                  | -2.3             | H               | 3.0          | 44.4        | 1.0         | -45.7      | -13.0       | -32.7      |       |
| 2.8060                  | -4.3             | H               | 3.0          | 45.1        | 1.0         | -48.4      | -13.0       | -35.4      |       |
| Mid Channel (707.5MHz)  |                  |                 |              |             |             |            |             |            |       |
| 1.4150                  | 13.0             | V               | 3.0          | 44.2        | 1.0         | -30.2      | -13.0       | -17.2      |       |
| 2.1225                  | -2.2             | V               | 3.0          | 44.4        | 1.0         | -45.6      | -13.0       | -32.6      |       |
| 2.8300                  | -5.8             | V               | 3.0          | 45.1        | 1.0         | -50.0      | -13.0       | -37.0      |       |
| 1.4150                  | 13.5             | H               | 3.0          | 44.2        | 1.0         | -29.7      | -13.0       | -16.7      |       |
| 2.1225                  | -2.7             | H               | 3.0          | 44.4        | 1.0         | -46.1      | -13.0       | -33.1      |       |
| 2.8300                  | -4.9             | H               | 3.0          | 45.1        | 1.0         | -49.0      | -13.0       | -36.0      |       |
| High Channel (713.5MHz) |                  |                 |              |             |             |            |             |            |       |
| 1.4270                  | 11.6             | V               | 3.0          | 44.2        | 1.0         | -31.6      | -13.0       | -18.6      |       |
| 2.1405                  | -3.5             | V               | 3.0          | 44.4        | 1.0         | -46.9      | -13.0       | -33.9      |       |
| 2.8540                  | -4.0             | V               | 3.0          | 45.2        | 1.0         | -48.1      | -13.0       | -35.1      |       |
| 1.4270                  | 12.5             | H               | 3.0          | 44.2        | 1.0         | -30.7      | -13.0       | -17.7      |       |
| 2.1405                  | -3.8             | H               | 3.0          | 44.4        | 1.0         | -47.2      | -13.0       | -34.2      |       |
| 2.8540                  | -4.3             | H               | 3.0          | 45.2        | 1.0         | -48.4      | -13.0       | -35.4      |       |

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

LTE  
Band 12  
  
3MHz  
  
QPSK

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787892815

Date: 03-27-17

Test Engineer: JH Park

Configuration: EUT / AC Adapter / Earphone, XPosition

Mode: TX, LTE BAND 12, 3MHz BW, QPSK

Chamber

Pre-amplifier

Filter

Limit

Chamber 1

AFS42

Filter 1

Part 27

| 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 (700.5MHz)  |                     |                    |                 |                |                |               |                |               |       |
| 1.4010                  | 13.1                | V                  | 3.0             | 44.2           | 1.0            | -30.1         | -13.0          | -17.1         |       |
| 2.1015                  | -3.3                | V                  | 3.0             | 44.3           | 1.0            | -46.7         | -13.0          | -33.7         |       |
| 2.8020                  | -5.2                | V                  | 3.0             | 45.1           | 1.0            | -49.3         | -13.0          | -36.3         |       |
| 1.4010                  | 13.8                | H                  | 3.0             | 44.2           | 1.0            | -29.4         | -13.0          | -16.4         |       |
| 2.1015                  | -3.4                | H                  | 3.0             | 44.3           | 1.0            | -46.7         | -13.0          | -33.7         |       |
| 2.8020                  | -2.9                | H                  | 3.0             | 45.1           | 1.0            | -47.0         | -13.0          | -34.0         |       |
| Mid Channel (707.5MHz)  |                     |                    |                 |                |                |               |                |               |       |
| 1.4150                  | 13.2                | V                  | 3.0             | 44.2           | 1.0            | -30.1         | -13.0          | -17.1         |       |
| 2.1225                  | -2.5                | V                  | 3.0             | 44.4           | 1.0            | -45.8         | -13.0          | -32.8         |       |
| 2.8300                  | -5.2                | V                  | 3.0             | 45.1           | 1.0            | -49.4         | -13.0          | -36.4         |       |
| 1.4150                  | 12.7                | H                  | 3.0             | 44.2           | 1.0            | -30.5         | -13.0          | -17.5         |       |
| 2.1225                  | -2.9                | H                  | 3.0             | 44.4           | 1.0            | -46.3         | -13.0          | -33.3         |       |
| 2.8300                  | -3.4                | H                  | 3.0             | 45.1           | 1.0            | -47.5         | -13.0          | -34.5         |       |
| High Channel (714.5MHz) |                     |                    |                 |                |                |               |                |               |       |
| 1.4290                  | 11.3                | V                  | 3.0             | 44.2           | 1.0            | -31.9         | -13.0          | -18.9         |       |
| 2.1435                  | -2.5                | V                  | 3.0             | 44.4           | 1.0            | -45.9         | -13.0          | -32.9         |       |
| 2.8580                  | -7.1                | V                  | 3.0             | 45.2           | 1.0            | -51.3         | -13.0          | -38.3         |       |
| 1.4290                  | 11.9                | H                  | 3.0             | 44.2           | 1.0            | -31.3         | -13.0          | -18.3         |       |
| 2.1435                  | -2.9                | H                  | 3.0             | 44.4           | 1.0            | -46.3         | -13.0          | -33.3         |       |
| 2.8580                  | -5.0                | H                  | 3.0             | 45.2           | 1.0            | -49.2         | -13.0          | -36.2         |       |

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

LTE  
Band 12  
  
3MHz  
  
16QAM

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787892815

Date: 03-27-17

Test Engineer: JH Park

Configuration: EUT / AC Adapter / Earphone, XPosition

Mode: TX, LTE BAND 12, 3MHz BW, 16QAM

Chamber

Pre-amplifier

Filter

Limit

Chamber 1

AFS42

Filter 1

Part 27

| 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 (700.5MHz)  |                     |                    |                 |                |                |               |                |               |       |
| 1.4010                  | 13.2                | V                  | 3.0             | 44.2           | 1.0            | -30.0         | -13.0          | -17.0         |       |
| 2.1015                  | -2.8                | V                  | 3.0             | 44.3           | 1.0            | -46.2         | -13.0          | -33.2         |       |
| 2.8020                  | -5.4                | V                  | 3.0             | 45.1           | 1.0            | -49.5         | -13.0          | -36.5         |       |
| 1.4010                  | 13.9                | H                  | 3.0             | 44.2           | 1.0            | -29.3         | -13.0          | -16.3         |       |
| 2.1015                  | -3.6                | H                  | 3.0             | 44.3           | 1.0            | -47.0         | -13.0          | -34.0         |       |
| 2.8020                  | -2.9                | H                  | 3.0             | 45.1           | 1.0            | -47.0         | -13.0          | -34.0         |       |
| Mid Channel (707.5MHz)  |                     |                    |                 |                |                |               |                |               |       |
| 1.4150                  | 13.0                | V                  | 3.0             | 44.2           | 1.0            | -30.2         | -13.0          | -17.2         |       |
| 2.1225                  | -2.0                | V                  | 3.0             | 44.4           | 1.0            | -45.4         | -13.0          | -32.4         |       |
| 2.8300                  | -4.6                | V                  | 3.0             | 45.1           | 1.0            | -48.7         | -13.0          | -35.7         |       |
| 1.4150                  | 12.6                | H                  | 3.0             | 44.2           | 1.0            | -30.6         | -13.0          | -17.6         |       |
| 2.1225                  | -3.5                | H                  | 3.0             | 44.4           | 1.0            | -46.9         | -13.0          | -33.9         |       |
| 2.8300                  | -4.3                | H                  | 3.0             | 45.1           | 1.0            | -48.5         | -13.0          | -35.5         |       |
| High Channel (714.5MHz) |                     |                    |                 |                |                |               |                |               |       |
| 1.4290                  | 11.6                | V                  | 3.0             | 44.2           | 1.0            | -31.6         | -13.0          | -18.6         |       |
| 2.1435                  | -2.1                | V                  | 3.0             | 44.4           | 1.0            | -45.5         | -13.0          | -32.5         |       |
| 2.8580                  | -6.4                | V                  | 3.0             | 45.2           | 1.0            | -50.5         | -13.0          | -37.5         |       |
| 1.4290                  | 11.8                | H                  | 3.0             | 44.2           | 1.0            | -31.4         | -13.0          | -18.4         |       |
| 2.1435                  | -3.4                | H                  | 3.0             | 44.4           | 1.0            | -46.8         | -13.0          | -33.8         |       |
| 2.8580                  | -4.6                | H                  | 3.0             | 45.2           | 1.0            | -48.8         | -13.0          | -35.8         |       |

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

LTE  
Band 12  
  
1.4MHz  
  
QPSK

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787892815

Date: 04-04-17

Test Engineer: Chan Park

Configuration: EUT / AC Adapter / Earphone, XPosition

Mode: TX, LTE BAND 12, 1.4MHz BW, QPSK

Chamber

Pre-amplifier

Filter

Limit

Chamber 1

AFS42

Filter 1

Part 27

| f GHz                   | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|-------------------------|------------------|-----------------|--------------|-------------|-------------|------------|-------------|------------|-------|
| Low Channel (699.7MHz)  |                  |                 |              |             |             |            |             |            |       |
| 1.3994                  | -0.6             | V               | 3.0          | 44.2        | 1.0         | -43.8      | -13.0       | -30.8      |       |
| 2.0991                  | -15.9            | V               | 3.0          | 44.3        | 1.0         | -59.2      | -13.0       | -46.2      |       |
| 2.7988                  | -15.6            | V               | 3.0          | 45.1        | 1.0         | -59.7      | -13.0       | -46.7      |       |
| 1.3994                  | 3.1              | H               | 3.0          | 44.2        | 1.0         | -40.1      | -13.0       | -27.1      |       |
| 2.0991                  | -12.7            | H               | 3.0          | 44.3        | 1.0         | -56.0      | -13.0       | -43.0      |       |
| 2.7988                  | -18.8            | H               | 3.0          | 45.1        | 1.0         | -62.9      | -13.0       | -49.9      |       |
| Mid Channel (707.5MHz)  |                  |                 |              |             |             |            |             |            |       |
| 1.4150                  | 0.7              | V               | 3.0          | 44.2        | 1.0         | -42.5      | -13.0       | -29.5      |       |
| 2.1225                  | -12.1            | V               | 3.0          | 44.4        | 1.0         | -55.4      | -13.0       | -42.4      |       |
| 2.8300                  | -17.9            | V               | 3.0          | 45.1        | 1.0         | -62.1      | -13.0       | -49.1      |       |
| 1.4150                  | 5.4              | H               | 3.0          | 44.2        | 1.0         | -37.8      | -13.0       | -24.8      |       |
| 2.1225                  | -14.1            | H               | 3.0          | 44.4        | 1.0         | -57.5      | -13.0       | -44.5      |       |
| 2.8300                  | -19.3            | H               | 3.0          | 45.1        | 1.0         | -63.4      | -13.0       | -50.4      |       |
| High Channel (715.3MHz) |                  |                 |              |             |             |            |             |            |       |
| 1.4306                  | -2.4             | V               | 3.0          | 44.2        | 1.0         | -45.6      | -13.0       | -32.6      |       |
| 2.1459                  | -13.2            | V               | 3.0          | 44.4        | 1.0         | -56.6      | -13.0       | -43.6      |       |
| 2.8612                  | -21.4            | V               | 3.0          | 45.2        | 1.0         | -65.5      | -13.0       | -52.5      |       |
| 1.4306                  | 2.1              | H               | 3.0          | 44.2        | 1.0         | -41.1      | -13.0       | -28.1      |       |
| 2.1459                  | -19.6            | H               | 3.0          | 44.4        | 1.0         | -63.0      | -13.0       | -50.0      |       |
| 2.8612                  | -21.3            | H               | 3.0          | 45.2        | 1.0         | -65.5      | -13.0       | -52.5      |       |

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

LTE  
Band 12  
  
1.4MHz  
  
16QAM

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787892815

Date: 04-04-17

Test Engineer: Chan Park

Configuration: EUT / AC Adapter / Earphone, XPosition

Mode: TX, LTE BAND 12, 1.4MHz BW, 16QAM

Chamber

Pre-amplifier

Filter

Limit

Chamber 1

AFS42

Filter 1

Part 27

| f GHz                   | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|-------------------------|------------------|-----------------|--------------|-------------|-------------|------------|-------------|------------|-------|
| Low Channel (699.7MHz)  |                  |                 |              |             |             |            |             |            |       |
| 1.3994                  | -0.4             | V               | 3.0          | 44.2        | 1.0         | -43.6      | -13.0       | -30.6      |       |
| 2.0991                  | -16.4            | V               | 3.0          | 44.3        | 1.0         | -59.8      | -13.0       | -46.8      |       |
| 2.7988                  | -15.3            | V               | 3.0          | 45.1        | 1.0         | -59.4      | -13.0       | -46.4      |       |
| 1.3994                  | 3.2              | H               | 3.0          | 44.2        | 1.0         | -40.0      | -13.0       | -27.0      |       |
| 2.0991                  | -12.6            | H               | 3.0          | 44.3        | 1.0         | -56.0      | -13.0       | -43.0      |       |
| 2.7988                  | -18.6            | H               | 3.0          | 45.1        | 1.0         | -62.7      | -13.0       | -49.7      |       |
| Mid Channel (707.5MHz)  |                  |                 |              |             |             |            |             |            |       |
| 1.4150                  | 0.8              | V               | 3.0          | 44.2        | 1.0         | -42.4      | -13.0       | -29.4      |       |
| 2.1225                  | -12.5            | V               | 3.0          | 44.4        | 1.0         | -55.9      | -13.0       | -42.9      |       |
| 2.8300                  | -19.0            | V               | 3.0          | 45.1        | 1.0         | -63.1      | -13.0       | -50.1      |       |
| 1.4150                  | 5.5              | H               | 3.0          | 44.2        | 1.0         | -37.8      | -13.0       | -24.8      |       |
| 2.1225                  | -14.1            | H               | 3.0          | 44.4        | 1.0         | -57.5      | -13.0       | -44.5      |       |
| 2.8300                  | -20.3            | H               | 3.0          | 45.1        | 1.0         | -64.5      | -13.0       | -51.5      |       |
| High Channel (715.3MHz) |                  |                 |              |             |             |            |             |            |       |
| 1.4306                  | -2.7             | V               | 3.0          | 44.2        | 1.0         | -45.9      | -13.0       | -32.9      |       |
| 2.1459                  | -13.1            | V               | 3.0          | 44.4        | 1.0         | -56.5      | -13.0       | -43.5      |       |
| 2.8612                  | -22.3            | V               | 3.0          | 45.2        | 1.0         | -66.5      | -13.0       | -53.5      |       |
| 1.4306                  | 1.7              | H               | 3.0          | 44.2        | 1.0         | -41.5      | -13.0       | -28.5      |       |
| 2.1459                  | -19.8            | H               | 3.0          | 44.4        | 1.0         | -63.2      | -13.0       | -50.2      |       |
| 2.8612                  | -22.0            | H               | 3.0          | 45.2        | 1.0         | -66.2      | -13.0       | -53.2      |       |

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.