LTE
Band 41
5MHz
QPSK

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-20-16
**Test Engineer:** JH Park
**Configuration:** EUT / X-Position
**Mode:** LTE Band 41, QPSK , 5MHz

**Test Equipment:**
**Receiving: 3117[00168724] and Chamber 1 SMA Cables**
**Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2557.50 | 14.58 | V | 1.9 | 9.1 | 21.84 | 33.0 | -11.2 | |
| 2557.50 | 14.10 | H | 1.9 | 9.1 | 21.36 | 33.0 | -11.6 | |
| Mid Ch | | | | | | | | |
| 2605.00 | 13.89 | V | 1.9 | 10.4 | 22.38 | 33.0 | -10.6 | |
| 2605.00 | 13.83 | H | 1.9 | 10.4 | 22.32 | 33.0 | -10.7 | |
| High Ch | | | | | | | | |
| 2652.50 | 13.29 | V | 1.9 | 10.3 | 21.73 | 33.0 | -11.3 | |
| 2652.50 | 14.58 | H | 1.9 | 10.3 | 23.02 | 33.0 | -10.0 | |

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

LTE
Band 41
5MHz
16QAM

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-20-16
**Test Engineer:** JH Park
**Configuration:** EUT / X-Position
**Mode:** LTE Band 41 16QAM, 5MHz

**Test Equipment:**
**Receiving: 3117[00168724] and Chamber 1 SMA Cables**
**Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2557.50 | 14.09 | V | 1.9 | 9.1 | 21.35 | 33.0 | -11.7 | |
| 2557.50 | 13.48 | H | 1.9 | 9.1 | 20.74 | 33.0 | -12.3 | |
| Mid Ch | | | | | | | | |
| 2605.00 | 12.97 | V | 1.9 | 10.4 | 21.46 | 33.0 | -11.5 | |
| 2605.00 | 12.92 | H | 1.9 | 10.4 | 21.41 | 33.0 | -11.6 | |
| High Ch | | | | | | | | |
| 2652.50 | 12.25 | V | 1.9 | 10.3 | 20.69 | 33.0 | -12.3 | |
| 2652.50 | 13.14 | H | 1.9 | 10.3 | 21.58 | 33.0 | -11.4 | |

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm


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## LTE Band 5

LTE Band 5 10MHz QPSK

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-21-16
**Test Engineer:** YH Lim
**Configuration:** EUT ONLY, X Position
**Mode:** TX, LTE BAND 5, 10MHz BW,QPSK

**Test Equipment:**
**Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)**
**Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 829.00 | 14.23 | V | 1.1 | -1.5 | 11.65 | 38.5 | -26.8 | |
| 829.00 | 19.46 | H | 1.1 | -1.5 | 16.88 | 38.5 | -21.6 | |
| Mid Ch | | | | | | | | |
| 836.50 | 14.30 | V | 1.1 | -1.4 | 11.81 | 38.5 | -26.6 | |
| 836.50 | 19.42 | H | 1.1 | -1.4 | 16.93 | 38.5 | -21.5 | |
| High Ch | | | | | | | | |
| 844.00 | 13.81 | V | 1.1 | -1.3 | 11.42 | 38.5 | -27.0 | |
| 844.00 | 20.60 | H | 1.1 | -1.3 | 18.18 | 38.5 | -20.3 | |

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

LTE Band 5 10MHz 16QAM

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-21-16
**Test Engineer:** YH Lim
**Configuration:** EUT ONLY, X Position
**Mode:** LTE5 10MHz FUND 16QAM

**Test Equipment:**
**Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)**
**Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 829.00 | 13.30 | V | 1.1 | -1.5 | 10.72 | 38.5 | -27.7 | |
| 829.00 | 18.49 | H | 1.1 | -1.5 | 15.91 | 38.5 | -22.5 | |
| Mid Ch | | | | | | | | |
| 836.50 | 13.32 | V | 1.1 | -1.4 | 10.81 | 38.5 | -27.6 | |
| 836.50 | 18.32 | H | 1.1 | -1.4 | 15.81 | 38.5 | -22.6 | |
| High Ch | | | | | | | | |
| 844.00 | 12.53 | V | 1.1 | -1.3 | 10.11 | 38.5 | -28.3 | |
| 844.00 | 20.24 | H | 1.1 | -1.3 | 17.82 | 38.5 | -20.6 | |

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm


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LTE
Band 5
5MHz
QPSK

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-21-16
**Test Engineer:** YH Lim
**Configuration:** EUT ONLY, X Position
**Mode:** LTE5 5MHz FUND QPSK

**Test Equipment:**
**Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)**
**Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 826.50 | 15.31 | V | 1.1 | -1.5 | 12.71 | 38.5 | -25.7 | |
| 826.50 | 18.93 | H | 1.1 | -1.5 | 16.33 | 38.5 | -22.1 | |
| Mid Ch | | | | | | | | |
| 836.50 | 13.34 | V | 1.1 | -1.4 | 10.85 | 38.5 | -27.6 | |
| 836.50 | 19.10 | H | 1.1 | -1.4 | 16.61 | 38.5 | -21.8 | |
| High Ch | | | | | | | | |
| 846.50 | 12.93 | V | 1.6 | -1.3 | 10.05 | 38.5 | -28.4 | |
| 846.50 | 18.48 | H | 1.6 | -1.3 | 15.60 | 38.5 | -22.8 | |

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

LTE
Band 5
5MHz
16QAM

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-21-16
**Test Engineer:** YH Lim
**Configuration:** EUT ONLY, X Position
**Mode:** LTE5 5MHz FUND 16QAM

**Test Equipment:**
**Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)**
**Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 826.50 | 14.35 | V | 1.1 | -1.5 | 11.75 | 38.5 | -26.7 | |
| 826.50 | 17.97 | H | 1.1 | -1.5 | 15.37 | 38.5 | -23.1 | |
| Mid Ch | | | | | | | | |
| 836.50 | 12.32 | V | 1.1 | -1.4 | 9.83 | 38.5 | -28.6 | |
| 836.50 | 18.05 | H | 1.1 | -1.4 | 15.56 | 38.5 | -22.9 | |
| High Ch | | | | | | | | |
| 846.50 | 11.85 | V | 1.1 | -1.3 | 9.47 | 38.5 | -29.0 | |
| 846.50 | 17.48 | H | 1.1 | -1.3 | 15.10 | 38.5 | -23.4 | |

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm


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LTE Band 5 3MHz QPSK

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-21-16
**Test Engineer:** YH Lim
**Configuration:** EUT ONLY, X Position
**Mode:** LTE5 3MHz FUND QPSK

**Test Equipment:**
**Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)**
**Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 825.50 | 15.15 | V | 1.1 | -1.5 | 12.55 | 38.5 | -25.9 | |
| 825.50 | 21.44 | H | 1.1 | -1.5 | 18.84 | 38.5 | -19.6 | |
| Mid Ch | | | | | | | | |
| 836.50 | 13.72 | V | 1.1 | -1.4 | 11.23 | 38.5 | -27.2 | |
| 836.50 | 20.73 | H | 1.1 | -1.4 | 18.24 | 38.5 | -20.2 | |
| High Ch | | | | | | | | |
| 847.50 | 11.65 | V | 1.6 | -1.3 | 8.77 | 38.5 | -29.7 | |
| 847.50 | 20.83 | H | 1.6 | -1.3 | 17.95 | 38.5 | -20.5 | |

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

LTE Band 5 3MHz 16QAM

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-21-16
**Test Engineer:** YH Lim
**Configuration:** EUT ONLY, X Position
**Mode:** LTE5 3MHz FUND 16QAM

**Test Equipment:**
**Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)**
**Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 825.50 | 14.43 | V | 1.1 | -1.5 | 11.83 | 38.5 | -26.6 | |
| 825.50 | 20.37 | H | 1.1 | -1.5 | 17.77 | 38.5 | -20.7 | |
| Mid Ch | | | | | | | | |
| 836.50 | 12.66 | V | 1.1 | -1.4 | 10.17 | 38.5 | -28.3 | |
| 836.50 | 19.71 | H | 1.1 | -1.4 | 17.22 | 38.5 | -21.2 | |
| High Ch | | | | | | | | |
| 847.50 | 10.79 | V | 1.1 | -1.3 | 8.41 | 38.5 | -30.0 | |
| 847.50 | 19.78 | H | 1.1 | -1.3 | 17.40 | 38.5 | -21.1 | |

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm


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LTE Band 5 1.4MHz QPSK

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-21-16
**Test Engineer:** YH Lim
**Configuration:** EUT ONLY, X Position
**Mode:** LTE5 1.4MHz FUND QPSK

**Test Equipment:**
**Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)**
**Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 824.70 | 12.92 | V | 1.1 | -1.5 | 10.32 | 38.5 | -28.1 | |
| 824.70 | 18.01 | H | 1.1 | -1.5 | 15.41 | 38.5 | -23.0 | |
| Mid Ch | | | | | | | | |
| 836.50 | 12.34 | V | 1.1 | -1.4 | 9.85 | 38.5 | -28.6 | |
| 836.50 | 18.14 | H | 1.1 | -1.4 | 15.65 | 38.5 | -22.8 | |
| High Ch | | | | | | | | |
| 848.30 | 10.62 | V | 1.6 | -1.3 | 7.74 | 38.5 | -30.7 | |
| 848.30 | 17.28 | H | 1.6 | -1.3 | 14.40 | 38.5 | -24.0 | |

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

LTE Band 5 1.4MHz 16QAM

**High Frequency Substitution Measurement**
**UL Korea, Ltd. Suwon Laboratory Chamber 2**

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-21-16
**Test Engineer:** YH Lim
**Configuration:** EUT ONLY, X Position
**Mode:** LTE5 1.4MHz FUND 16QAM

**Test Equipment:**
**Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)**
**Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Margin (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 824.70 | 11.88 | V | 1.1 | -1.5 | 9.28 | 38.5 | -29.2 | |
| 824.70 | 16.69 | H | 1.1 | -1.5 | 14.09 | 38.5 | -24.4 | |
| Mid Ch | | | | | | | | |
| 836.50 | 11.32 | V | 1.1 | -1.4 | 8.83 | 38.5 | -29.6 | |
| 836.50 | 16.93 | H | 1.1 | -1.4 | 14.44 | 38.5 | -24.0 | |
| High Ch | | | | | | | | |
| 848.30 | 9.60 | V | 1.1 | -1.3 | 7.22 | 38.5 | -31.2 | |
| 848.30 | 16.24 | H | 1.1 | -1.3 | 13.86 | 38.5 | -24.6 | |

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm


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## 11.2. 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) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

Part 27: (m)(4) For mobile station, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and (55 + 10 log (P)dB) at the 5.5 MHz from the channel edges.

**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 = 100KHz for emission below 1GHz and 1MHz for emissions above 1GHz

b) Set VBW ≥ 3 × RBW;

c) Set span ≥ 1.5 times the OBW;

d) Sweep time = auto couple;

e) Detector = peak;

f) Ensure that the number of measurement points ≥ span/RBW;

g) Trace mode = max hold;

**RESULTS**


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## 11.2.1. SPURIOUS RADIATION PLOTS

**GSM 850**

GSM

GSM850
GPRS

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

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-10-16
**Test Engineer:** YH Lim
**Configuration:** EUT / AC Adapter, X Position
**Mode:** GPRS 850 MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | 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 | 39.1 | 1.0 | -39.9 | -13.0 | -26.9 | |
| 2.4726 | -2.3 | V | 3.0 | 39.5 | 1.0 | -40.8 | -13.0 | -27.8 | |
| 3.2968 | -18.3 | V | 3.0 | 40.1 | 1.0 | -57.4 | -13.0 | -44.4 | |
| 1.6484 | 0.2 | H | 3.0 | 39.1 | 1.0 | -37.9 | -13.0 | -24.9 | |
| 2.4726 | 3.6 | H | 3.0 | 39.5 | 1.0 | -35.0 | -13.0 | -22.0 | |
| 3.2968 | -18.5 | H | 3.0 | 40.1 | 1.0 | -57.6 | -13.0 | -44.6 | |
| Mid Ch, 836.6MHz | | | | | | | | | |
| 1.6730 | 0.2 | V | 3.0 | 39.1 | 1.0 | -37.9 | -13.0 | -24.9 | |
| 2.5098 | 2.7 | V | 3.0 | 39.5 | 1.0 | -35.8 | -13.0 | -22.8 | |
| 3.3464 | -17.9 | V | 3.0 | 40.1 | 1.0 | -57.0 | -13.0 | -44.0 | |
| 1.6730 | 4.1 | H | 3.0 | 39.1 | 1.0 | -34.0 | -13.0 | -21.0 | |
| 2.5098 | 7.9 | H | 3.0 | 39.5 | 1.0 | -30.7 | -13.0 | -17.7 | |
| 3.3464 | -18.2 | H | 3.0 | 40.1 | 1.0 | -57.3 | -13.0 | -44.3 | |
| High Ch, 848.8MHz | | | | | | | | | |
| 1.6976 | 5.5 | V | 3.0 | 39.1 | 1.0 | -32.6 | -13.0 | -19.6 | |
| 2.5466 | 6.8 | V | 3.0 | 39.6 | 1.0 | -31.8 | -13.0 | -18.8 | |
| 3.3952 | -17.4 | V | 3.0 | 40.2 | 1.0 | -56.6 | -13.0 | -43.6 | |
| 1.6976 | 8.3 | H | 3.0 | 39.1 | 1.0 | -29.8 | -13.0 | -16.8 | |
| 2.5466 | 12.7 | H | 3.0 | 39.6 | 1.0 | -25.8 | -13.0 | -12.8 | |
| 3.3952 | -17.8 | H | 3.0 | 40.2 | 1.0 | -57.0 | -13.0 | -44.0 | |

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 #:** 16K23557
**Date:** 06-10-16
**Test Engineer:** YH Lim
**Configuration:** EUT / AC Adapter, X Position
**Mode:** EGPRS 850 MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | 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 | -3.1 | V | 3.0 | 39.1 | 1.0 | -41.2 | -13.0 | -28.2 | |
| 2.4726 | -16.7 | V | 3.0 | 39.5 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 3.2968 | -18.4 | V | 3.0 | 40.1 | 1.0 | -57.5 | -13.0 | -44.5 | |
| 1.6484 | -1.1 | H | 3.0 | 39.1 | 1.0 | -39.2 | -13.0 | -26.2 | |
| 2.4726 | -13.3 | H | 3.0 | 39.5 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 3.2968 | -18.5 | H | 3.0 | 40.1 | 1.0 | -57.6 | -13.0 | -44.6 | |
| Mid Ch, 836.6MHz | | | | | | | | | |
| 1.6730 | -2.4 | V | 3.0 | 39.1 | 1.0 | -40.5 | -13.0 | -27.5 | |
| 2.5098 | -14.6 | V | 3.0 | 39.5 | 1.0 | -53.1 | -13.0 | -40.1 | |
| 3.3464 | -18.0 | V | 3.0 | 40.1 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 1.6730 | 1.6 | H | 3.0 | 39.1 | 1.0 | -36.5 | -13.0 | -23.5 | |
| 2.5098 | -15.7 | H | 3.0 | 39.5 | 1.0 | -54.2 | -13.0 | -41.2 | |
| 3.3464 | -18.2 | H | 3.0 | 40.1 | 1.0 | -57.3 | -13.0 | -44.3 | |
| High Ch, 848.8MHz | | | | | | | | | |
| 1.6976 | 0.8 | V | 3.0 | 39.1 | 1.0 | -37.4 | -13.0 | -24.4 | |
| 2.5466 | -13.4 | V | 3.0 | 39.6 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 3.3952 | -17.4 | V | 3.0 | 40.2 | 1.0 | -56.6 | -13.0 | -43.6 | |
| 1.6976 | 2.5 | H | 3.0 | 39.1 | 1.0 | -35.6 | -13.0 | -22.6 | |
| 2.5466 | -10.2 | H | 3.0 | 39.6 | 1.0 | -48.7 | -13.0 | -35.7 | |
| 3.3952 | -17.7 | H | 3.0 | 40.2 | 1.0 | -56.9 | -13.0 | -43.9 | |

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


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## GSM 1900

GSM

GSM1900
GPRS

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

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-16-16
**Test Engineer:** JH Park
**Configuration:** EUT / AC Adapter, X Position
**Mode:** GPRS 1900

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | Part 24 |

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1850.2MHz | | | | | | | | | |
| 3.7004 | -12.1 | V | 3.0 | 40.5 | 1.0 | -51.6 | -13.0 | -38.6 | |
| 5.5506 | -4.8 | V | 3.0 | 40.8 | 1.0 | -44.6 | -13.0 | -31.6 | |
| 7.4008 | -4.1 | V | 3.0 | 40.8 | 1.0 | -43.8 | -13.0 | -30.8 | |
| 3.7000 | -12.1 | H | 3.0 | 40.5 | 1.0 | -51.6 | -13.0 | -38.6 | |
| 5.5506 | -7.6 | H | 3.0 | 40.8 | 1.0 | -47.4 | -13.0 | -34.4 | |
| 7.4008 | -5.5 | H | 3.0 | 40.8 | 1.0 | -45.3 | -13.0 | -32.3 | |
| Mid Ch, 1880.0MHz | | | | | | | | | |
| 3.7600 | -13.2 | V | 3.0 | 40.5 | 1.0 | -52.7 | -13.0 | -39.7 | |
| 5.6400 | -6.5 | V | 3.0 | 40.8 | 1.0 | -46.3 | -13.0 | -33.3 | |
| 7.5200 | -3.9 | V | 3.0 | 40.7 | 1.0 | -43.6 | -13.0 | -30.6 | |
| 3.7600 | -14.4 | H | 3.0 | 40.5 | 1.0 | -54.0 | -13.0 | -41.0 | |
| 5.6400 | -8.7 | H | 3.0 | 40.8 | 1.0 | -48.5 | -13.0 | -35.5 | |
| 7.5200 | -4.9 | H | 3.0 | 40.7 | 1.0 | -44.6 | -13.0 | -31.6 | |
| High Ch, 1909.8 MHz | | | | | | | | | |
| 3.8196 | -13.8 | V | 3.0 | 40.6 | 1.0 | -53.4 | -13.0 | -40.4 | |
| 5.7294 | -3.3 | V | 3.0 | 40.8 | 1.0 | -43.1 | -13.0 | -30.1 | |
| 7.6392 | -3.1 | V | 3.0 | 40.7 | 1.0 | -42.7 | -13.0 | -29.7 | |
| 3.8196 | -15.8 | H | 3.0 | 40.6 | 1.0 | -55.4 | -13.0 | -42.4 | |
| 5.7294 | -7.1 | H | 3.0 | 40.8 | 1.0 | -46.9 | -13.0 | -33.9 | |
| 7.6392 | -2.8 | H | 3.0 | 40.7 | 1.0 | -42.4 | -13.0 | -29.4 | |

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

GSM

GSM1900
EGPRS

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

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-16-16
**Test Engineer:** JH Park
**Configuration:** EUT / AC Adapter, X Position
**Mode:** EGPRS 1900 MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | Part 24 |

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1850.2MHz | | | | | | | | | |
| 3.7004 | -18.3 | V | 3.0 | 40.5 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 5.5506 | -9.9 | V | 3.0 | 40.8 | 1.0 | -49.8 | -13.0 | -36.8 | |
| 7.4008 | -9.7 | V | 3.0 | 40.8 | 1.0 | -49.5 | -13.0 | -36.5 | |
| 3.7000 | -18.5 | H | 3.0 | 40.5 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 5.5500 | -11.0 | H | 3.0 | 40.8 | 1.0 | -50.8 | -13.0 | -37.8 | |
| 7.4000 | -10.6 | H | 3.0 | 40.8 | 1.0 | -50.4 | -13.0 | -37.4 | |
| Mid Ch, 1880.0MHz | | | | | | | | | |
| 3.7600 | -15.4 | V | 3.0 | 40.5 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 5.6400 | -11.8 | V | 3.0 | 40.8 | 1.0 | -51.6 | -13.0 | -38.6 | |
| 7.5200 | -8.8 | V | 3.0 | 40.7 | 1.0 | -48.6 | -13.0 | -35.6 | |
| 3.7600 | -15.9 | H | 3.0 | 40.5 | 1.0 | -55.4 | -13.0 | -42.4 | |
| 5.6400 | -12.4 | H | 3.0 | 40.8 | 1.0 | -52.2 | -13.0 | -39.2 | |
| 7.5200 | -9.0 | H | 3.0 | 40.7 | 1.0 | -48.7 | -13.0 | -35.7 | |
| High Ch, 1909.8 MHz | | | | | | | | | |
| 3.8196 | -12.8 | V | 3.0 | 40.6 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 5.7294 | -10.9 | V | 3.0 | 40.8 | 1.0 | -50.7 | -13.0 | -37.7 | |
| 7.6392 | -7.7 | V | 3.0 | 40.7 | 1.0 | -47.4 | -13.0 | -34.4 | |
| 3.8196 | -14.9 | H | 3.0 | 40.6 | 1.0 | -54.5 | -13.0 | -41.5 | |
| 5.7294 | -12.6 | H | 3.0 | 40.8 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 7.6392 | -7.7 | H | 3.0 | 40.7 | 1.0 | -47.4 | -13.0 | -34.4 | |

Rev. 03.03.09
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 #:** 16K23557
**Date:** 06-10-16
**Test Engineer:** YH Lim
**Configuration:** EUT / AC Adapter, X Position
**Mode:** Tx, REL99,850MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | 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, 826.40MHz | | | | | | | | | |
| 1.6520 | -19.7 | V | 3.0 | 39.1 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 2.4790 | -16.3 | V | 3.0 | 39.5 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 3.3056 | -16.5 | V | 3.0 | 40.1 | 1.0 | -55.6 | -13.0 | -42.6 | |
| 1.6520 | -17.1 | H | 3.0 | 39.1 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 2.4790 | -14.6 | H | 3.0 | 39.5 | 1.0 | -53.1 | -13.0 | -40.1 | |
| 3.3056 | -16.6 | H | 3.0 | 40.1 | 1.0 | -55.7 | -13.0 | -42.7 | |
| Mid Ch, 836.6MHz | | | | | | | | | |
| 1.6732 | -18.2 | V | 3.0 | 39.1 | 1.0 | -56.3 | -13.0 | -43.3 | |
| 2.5098 | -17.3 | V | 3.0 | 39.5 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 3.3464 | -16.4 | V | 3.0 | 40.1 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 1.6732 | -15.8 | H | 3.0 | 39.1 | 1.0 | -53.9 | -13.0 | -40.9 | |
| 2.5098 | -13.9 | H | 3.0 | 39.5 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 3.3464 | -16.6 | H | 3.0 | 40.1 | 1.0 | -55.7 | -13.0 | -42.7 | |
| High Ch, 846.6MHz | | | | | | | | | |
| 1.6932 | -19.1 | V | 3.0 | 39.1 | 1.0 | -57.2 | -13.0 | -44.2 | |
| 2.5390 | -16.1 | V | 3.0 | 39.6 | 1.0 | -54.6 | -13.0 | -41.6 | |
| 3.3860 | -16.0 | V | 3.0 | 40.2 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 1.6932 | -19.9 | H | 3.0 | 39.1 | 1.0 | -58.1 | -13.0 | -45.1 | |
| 2.5390 | -11.4 | H | 3.0 | 39.6 | 1.0 | -50.0 | -13.0 | -37.0 | |
| 3.3860 | -16.4 | H | 3.0 | 40.2 | 1.0 | -55.6 | -13.0 | -42.6 | |

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 #:** 16K23557
**Date:** 06-10-16
**Test Engineer:** YH Lim
**Configuration:** EUT / AC Adapter, X Position
**Mode:** Tx, HSDPA,850MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | 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, 826.40MHz | | | | | | | | | |
| 1.6520 | -19.8 | V | 3.0 | 39.1 | 1.0 | -57.9 | -13.0 | -44.9 | |
| 2.4790 | -16.5 | V | 3.0 | 39.5 | 1.0 | -55.0 | -13.0 | -42.0 | |
| 3.3056 | -16.6 | V | 3.0 | 40.1 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 1.6520 | -18.0 | H | 3.0 | 39.1 | 1.0 | -56.1 | -13.0 | -43.1 | |
| 2.4790 | -16.0 | H | 3.0 | 39.5 | 1.0 | -54.5 | -13.0 | -41.5 | |
| 3.3056 | -16.6 | H | 3.0 | 40.1 | 1.0 | -55.7 | -13.0 | -42.7 | |
| Mid Ch, 836.6MHz | | | | | | | | | |
| 1.6732 | -18.2 | V | 3.0 | 39.1 | 1.0 | -56.3 | -13.0 | -43.3 | |
| 2.5098 | -18.3 | V | 3.0 | 39.5 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 3.3464 | -16.4 | V | 3.0 | 40.1 | 1.0 | -55.6 | -13.0 | -42.6 | |
| 1.6732 | -17.7 | H | 3.0 | 39.1 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 2.5098 | -16.9 | H | 3.0 | 39.5 | 1.0 | -55.4 | -13.0 | -42.4 | |
| 3.3464 | -16.7 | H | 3.0 | 40.1 | 1.0 | -55.9 | -13.0 | -42.9 | |
| High Ch, 846.6MHz | | | | | | | | | |
| 1.6932 | -19.2 | V | 3.0 | 39.1 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 2.5390 | -16.5 | V | 3.0 | 39.6 | 1.0 | -55.0 | -13.0 | -42.0 | |
| 3.3860 | -16.1 | V | 3.0 | 40.2 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 1.6932 | -19.7 | H | 3.0 | 39.1 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 2.5390 | -16.7 | H | 3.0 | 39.6 | 1.0 | -55.3 | -13.0 | -42.3 | |
| 3.3860 | -16.5 | H | 3.0 | 40.2 | 1.0 | -55.7 | -13.0 | -42.7 | |

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


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## WCDMA Band 2

WCDMA

Band 2
REL99

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

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-13-16
**Test Engineer:** YH Lim
**Configuration:** EUT / AC Adapter, X Position
**Mode:** Tx, REL99,1900MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | Part 24 |

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1852.4MHz | | | | | | | | | |
| 3.7048 | -12.2 | V | 3.0 | 40.5 | 1.0 | -51.7 | -13.0 | -38.7 | |
| 5.5572 | -11.1 | V | 3.0 | 40.8 | 1.0 | -51.0 | -13.0 | -38.0 | |
| 7.4096 | -8.7 | V | 3.0 | 40.8 | 1.0 | -48.5 | -13.0 | -35.5 | |
| 3.7048 | -12.7 | H | 3.0 | 40.5 | 1.0 | -52.2 | -13.0 | -39.2 | |
| 5.5572 | -11.3 | H | 3.0 | 40.8 | 1.0 | -51.1 | -13.0 | -38.1 | |
| 7.4096 | -8.2 | H | 3.0 | 40.8 | 1.0 | -48.0 | -13.0 | -35.0 | |
| Mid Ch, 1880MHz | | | | | | | | | |
| 3.7600 | -11.3 | V | 3.0 | 40.5 | 1.0 | -50.8 | -13.0 | -37.8 | |
| 5.6400 | -9.0 | V | 3.0 | 40.8 | 1.0 | -48.8 | -13.0 | -35.8 | |
| 7.5200 | -8.4 | V | 3.0 | 40.7 | 1.0 | -48.2 | -13.0 | -35.2 | |
| 3.7600 | -13.3 | H | 3.0 | 40.5 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 5.6400 | -11.2 | H | 3.0 | 40.8 | 1.0 | -51.0 | -13.0 | -38.0 | |
| 7.5200 | -7.5 | H | 3.0 | 40.7 | 1.0 | -47.2 | -13.0 | -34.2 | |
| High Ch, 1907.6MHz | | | | | | | | | |
| 3.8152 | -4.6 | V | 3.0 | 40.6 | 1.0 | -44.2 | -13.0 | -31.2 | |
| 5.7228 | -7.0 | V | 3.0 | 40.8 | 1.0 | -46.8 | -13.0 | -33.8 | |
| 7.6304 | -5.8 | V | 3.0 | 40.7 | 1.0 | -45.4 | -13.0 | -32.4 | |
| 3.8152 | -9.7 | H | 3.0 | 40.6 | 1.0 | -49.3 | -13.0 | -36.3 | |
| 5.7228 | -9.4 | H | 3.0 | 40.8 | 1.0 | -49.2 | -13.0 | -36.2 | |
| 7.6304 | -4.4 | H | 3.0 | 40.7 | 1.0 | -44.1 | -13.0 | -31.1 | |

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

WCDMA

Band 2
HSDPA

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

**Company:** Samsung
**Project #:** 16K23557
**Date:** 06-13-16
**Test Engineer:** YH Lim
**Configuration:** EUT / AC Adapter, X Position
**Mode:** Tx, HSDPA,1900MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | Part 24 |

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1852.4MHz | | | | | | | | | |
| 3.7048 | -12.2 | V | 3.0 | 40.5 | 1.0 | -51.7 | -13.0 | -38.7 | |
| 5.5572 | -11.2 | V | 3.0 | 40.8 | 1.0 | -51.1 | -13.0 | -38.1 | |
| 7.4096 | -8.9 | V | 3.0 | 40.8 | 1.0 | -48.7 | -13.0 | -35.7 | |
| 3.7048 | -13.4 | H | 3.0 | 40.5 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 5.5572 | -11.7 | H | 3.0 | 40.8 | 1.0 | -51.6 | -13.0 | -38.6 | |
| 7.4096 | -9.0 | H | 3.0 | 40.8 | 1.0 | -48.8 | -13.0 | -35.8 | |
| Mid Ch, 1880MHz | | | | | | | | | |
| 3.7600 | -11.4 | V | 3.0 | 40.5 | 1.0 | -50.9 | -13.0 | -37.9 | |
| 5.6400 | -9.6 | V | 3.0 | 40.8 | 1.0 | -49.4 | -13.0 | -36.4 | |
| 7.5200 | -8.8 | V | 3.0 | 40.7 | 1.0 | -48.5 | -13.0 | -35.5 | |
| 3.7600 | -13.4 | H | 3.0 | 40.5 | 1.0 | -53.0 | -13.0 | -40.0 | |
| 5.6400 | -11.1 | H | 3.0 | 40.8 | 1.0 | -50.9 | -13.0 | -37.9 | |
| 7.5200 | -8.1 | H | 3.0 | 40.7 | 1.0 | -47.8 | -13.0 | -34.8 | |
| High Ch, 1907.6MHz | | | | | | | | | |
| 3.8152 | -5.4 | V | 3.0 | 40.6 | 1.0 | -45.0 | -13.0 | -32.0 | |
| 5.7228 | -7.6 | V | 3.0 | 40.8 | 1.0 | -47.4 | -13.0 | -34.4 | |
| 7.6304 | -6.9 | V | 3.0 | 40.7 | 1.0 | -46.5 | -13.0 | -33.5 | |
| 3.8152 | -10.1 | H | 3.0 | 40.6 | 1.0 | -49.7 | -13.0 | -36.7 | |
| 5.7228 | -8.8 | H | 3.0 | 40.8 | 1.0 | -48.6 | -13.0 | -35.6 | |
| 7.6304 | -6.2 | H | 3.0 | 40.7 | 1.0 | -45.8 | -13.0 | -32.8 | |

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


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## LTE Band 41

LTE Band 41 20MHz QPSK

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

Company: Samsung
Project #: 16K23557
Date: 06-14-16
Test Engineer: YH Lim
Configuration: EUT / AC Adapter, X Position
Mode: TX, LTE BAND 41, 20MHz BW, QPSK

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | FCC Part 27 |

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, (2565 MHz) | | | | | | | | | |
| 5.1300 | -9.9 | V | 3.0 | 40.9 | 1.0 | -49.8 | -25.0 | -24.8 | |
| 7.6950 | -11.8 | V | 3.0 | 40.6 | 1.0 | -51.4 | -25.0 | -26.4 | |
| 10.2600 | -0.2 | V | 3.0 | 39.5 | 1.0 | -38.7 | -25.0 | -13.7 | |
| 5.1300 | -12.2 | H | 3.0 | 40.9 | 1.0 | -52.1 | -25.0 | -27.1 | |
| 7.6950 | -11.5 | H | 3.0 | 40.6 | 1.0 | -51.1 | -25.0 | -26.1 | |
| 10.2600 | -7.7 | H | 3.0 | 39.5 | 1.0 | -46.2 | -25.0 | -21.2 | |
| Mid Ch, (2605 MHz) | | | | | | | | | |
| 5.2100 | -1.5 | V | 3.0 | 40.9 | 1.0 | -41.4 | -25.0 | -16.4 | |
| 7.8150 | -12.0 | V | 3.0 | 40.6 | 1.0 | -51.6 | -25.0 | -26.6 | |
| 10.4200 | 4.2 | V | 3.0 | 39.4 | 1.0 | -34.2 | -25.0 | -9.2 | |
| 5.2100 | -2.7 | H | 3.0 | 40.9 | 1.0 | -42.6 | -25.0 | -17.6 | |
| 7.8150 | -9.1 | H | 3.0 | 40.6 | 1.0 | -48.7 | -25.0 | -23.7 | |
| 10.4200 | -5.9 | H | 3.0 | 39.4 | 1.0 | -44.3 | -25.0 | -19.3 | |
| High Ch, (2645 MHz) | | | | | | | | | |
| 5.2900 | -2.9 | V | 3.0 | 40.9 | 1.0 | -42.8 | -25.0 | -17.8 | |
| 7.9350 | -12.2 | V | 3.0 | 40.5 | 1.0 | -51.7 | -25.0 | -26.7 | |
| 10.5800 | -2.5 | V | 3.0 | 39.3 | 1.0 | -40.8 | -25.0 | -15.8 | |
| 5.2900 | -5.8 | H | 3.0 | 40.9 | 1.0 | -45.7 | -25.0 | -20.7 | |
| 7.9350 | -11.5 | H | 3.0 | 40.5 | 1.0 | -51.0 | -25.0 | -26.0 | |
| 10.5800 | -10.0 | H | 3.0 | 39.3 | 1.0 | -48.2 | -25.0 | -23.2 | |

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

LTE Band 41 20MHz 16QAM

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

Company: Samsung
Project #: 16K23557
Date: 06-14-16
Test Engineer: YH Lim
Configuration: EUT / AC Adapter, X Position
Mode: TX, LTE BAND 41, 20MHz BW,16QAM

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | FCC Part 27 |

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, (2565 MHz) | | | | | | | | | |
| 5.1300 | -12.6 | V | 3.0 | 40.9 | 1.0 | -52.5 | -25.0 | -27.5 | |
| 7.6950 | -11.6 | V | 3.0 | 40.6 | 1.0 | -51.2 | -25.0 | -26.2 | |
| 10.2600 | -0.4 | V | 3.0 | 39.5 | 1.0 | -38.9 | -25.0 | -13.9 | |
| 5.1300 | -12.5 | H | 3.0 | 40.9 | 1.0 | -52.4 | -25.0 | -27.4 | |
| 7.6950 | -10.9 | H | 3.0 | 40.6 | 1.0 | -50.5 | -25.0 | -25.5 | |
| 10.2600 | -7.3 | H | 3.0 | 39.5 | 1.0 | -45.8 | -25.0 | -20.8 | |
| Mid Ch, (2605 MHz) | | | | | | | | | |
| 5.2100 | -1.9 | V | 3.0 | 40.9 | 1.0 | -41.8 | -25.0 | -16.8 | |
| 7.8150 | -13.3 | V | 3.0 | 40.6 | 1.0 | -52.9 | -25.0 | -27.9 | |
| 10.4200 | 3.2 | V | 3.0 | 39.4 | 1.0 | -35.2 | -25.0 | -10.2 | |
| 5.2100 | -2.7 | H | 3.0 | 40.9 | 1.0 | -42.5 | -25.0 | -17.5 | |
| 7.8150 | -9.2 | H | 3.0 | 40.6 | 1.0 | -48.7 | -25.0 | -23.7 | |
| 10.4200 | -5.3 | H | 3.0 | 39.4 | 1.0 | -43.7 | -25.0 | -18.7 | |
| High Ch, (2645 MHz) | | | | | | | | | |
| 5.2900 | -3.0 | V | 3.0 | 40.9 | 1.0 | -42.9 | -25.0 | -17.9 | |
| 7.9350 | -11.2 | V | 3.0 | 40.5 | 1.0 | -50.7 | -25.0 | -25.7 | |
| 10.5800 | -4.4 | V | 3.0 | 39.3 | 1.0 | -42.6 | -25.0 | -17.6 | |
| 5.2900 | -6.9 | H | 3.0 | 40.9 | 1.0 | -46.8 | -25.0 | -21.8 | |
| 7.9350 | -9.7 | H | 3.0 | 40.5 | 1.0 | -49.2 | -25.0 | -24.2 | |
| 10.5800 | -9.8 | H | 3.0 | 39.3 | 1.0 | -48.1 | -25.0 | -23.1 | |

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


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LTE

Band 41

15MHz

QPSK

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

Company: Samsung
Project #: 16K23557
Date: 06-15-16
Test Engineer: JH Park
Configuration: EUT / AC Adapter, X Position
Mode: TX, LTE BAND 41, 15MHz BW,QPSK

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | FCC Part 27 |

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, (2562.5 MHz) | | | | | | | | | |
| 5.1250 | -9.9 | V | 3.0 | 40.9 | 1.0 | -49.8 | -25.0 | -24.8 | |
| 7.6875 | -10.3 | V | 3.0 | 40.6 | 1.0 | -50.0 | -25.0 | -25.0 | |
| 10.2500 | 0.7 | V | 3.0 | 39.5 | 1.0 | -37.8 | -25.0 | -12.8 | |
| 5.1250 | -10.4 | H | 3.0 | 40.9 | 1.0 | -50.3 | -25.0 | -25.3 | |
| 7.6875 | -10.5 | H | 3.0 | 40.6 | 1.0 | -50.2 | -25.0 | -25.2 | |
| 10.2500 | -7.1 | H | 3.0 | 39.5 | 1.0 | -45.6 | -25.0 | -20.6 | |
| Mid Ch, (2605 MHz) | | | | | | | | | |
| 5.2100 | 0.7 | V | 3.0 | 40.9 | 1.0 | -39.2 | -25.0 | -14.2 | |
| 7.8150 | -10.8 | V | 3.0 | 40.6 | 1.0 | -50.4 | -25.0 | -25.4 | |
| 10.4200 | 2.5 | V | 3.0 | 39.4 | 1.0 | -35.8 | -25.0 | -10.8 | |
| 5.2100 | -4.4 | H | 3.0 | 40.9 | 1.0 | -44.3 | -25.0 | -19.3 | |
| 7.8150 | -9.7 | H | 3.0 | 40.6 | 1.0 | -49.2 | -25.0 | -24.2 | |
| 10.4200 | -2.9 | H | 3.0 | 39.4 | 1.0 | -41.3 | -25.0 | -16.3 | |
| High Ch, (2647.5 MHz) | | | | | | | | | |
| 5.2950 | -4.4 | V | 3.0 | 40.9 | 1.0 | -44.3 | -25.0 | -19.3 | |
| 7.9425 | -11.3 | V | 3.0 | 40.5 | 1.0 | -50.8 | -25.0 | -25.8 | |
| 10.5900 | -5.2 | V | 3.0 | 39.3 | 1.0 | -43.4 | -25.0 | -18.4 | |
| 5.2950 | -4.2 | H | 3.0 | 40.9 | 1.0 | -44.0 | -25.0 | -19.0 | |
| 7.9425 | -11.2 | H | 3.0 | 40.5 | 1.0 | -50.7 | -25.0 | -25.7 | |
| 10.5900 | -8.7 | H | 3.0 | 39.3 | 1.0 | -47.0 | -25.0 | -22.0 | |

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

LTE

Band 41

15MHz

16QAM

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

Company: Samsung
Project #: 16K23557
Date: 06-15-16
Test Engineer: JH Park
Configuration: EUT / AC Adapter, X Position
Mode: TX, LTE BAND 41, 15MHz BW,16QAM

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| Chamber 2 | AFS42 | Filter 1 | FCC Part 27 |

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, (2562.5 MHz) | | | | | | | | | |
| 5.1250 | -10.0 | V | 3.0 | 40.9 | 1.0 | -49.9 | -25.0 | -24.9 | |
| 7.6875 | -11.1 | V | 3.0 | 40.6 | 1.0 | -50.7 | -25.0 | -25.7 | |
| 10.2500 | 0.3 | V | 3.0 | 39.5 | 1.0 | -38.2 | -25.0 | -13.2 | |
| 5.1250 | -11.0 | H | 3.0 | 40.9 | 1.0 | -50.9 | -25.0 | -25.9 | |
| 7.6875 | -10.3 | H | 3.0 | 40.6 | 1.0 | -49.9 | -25.0 | -24.9 | |
| 10.2500 | -7.0 | H | 3.0 | 39.5 | 1.0 | -45.5 | -25.0 | -20.5 | |
| Mid Ch, (2605 MHz) | | | | | | | | | |
| 5.2100 | 1.0 | V | 3.0 | 40.9 | 1.0 | -38.9 | -25.0 | -13.9 | |
| 7.8150 | -10.4 | V | 3.0 | 40.6 | 1.0 | -49.9 | -25.0 | -24.9 | |
| 10.4200 | 2.6 | V | 3.0 | 39.4 | 1.0 | -35.8 | -25.0 | -10.8 | |
| 5.2100 | -5.1 | H | 3.0 | 40.9 | 1.0 | -45.0 | -25.0 | -20.0 | |
| 7.8150 | -9.2 | H | 3.0 | 40.6 | 1.0 | -48.7 | -25.0 | -23.7 | |
| 10.4200 | -3.2 | H | 3.0 | 39.4 | 1.0 | -41.6 | -25.0 | -16.6 | |
| High Ch, (2647.5 MHz) | | | | | | | | | |
| 5.2950 | -3.1 | V | 3.0 | 40.9 | 1.0 | -43.0 | -25.0 | -18.0 | |
| 7.9425 | -11.0 | V | 3.0 | 40.5 | 1.0 | -50.5 | -25.0 | -25.5 | |
| 10.5900 | -4.5 | V | 3.0 | 39.3 | 1.0 | -42.7 | -25.0 | -17.7 | |
| 5.2950 | -3.0 | H | 3.0 | 40.9 | 1.0 | -42.8 | -25.0 | -17.8 | |
| 7.9425 | -11.9 | H | 3.0 | 40.5 | 1.0 | -51.3 | -25.0 | -26.3 | |
| 10.5900 | -8.5 | H | 3.0 | 39.3 | 1.0 | -46.8 | -25.0 | -21.8 | |

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


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LTE Band 41 10MHz QPSK

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

Company: Samsung
Project #: 16K23557
Date: 06-15-16
Test Engineer: JH Park
Configuration: EUT / AC Adapter, X Position
Mode: TX, LTE BAND 41, 10MHz BW, QPSK

Chamber: Chamber 2 | Pre-amplifer: AFS42 | Filter: Filter 1 | Limit: FCC Part 27

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, (2560 MHz) | | | | | | | | | |
| 5.1200 | -8.9 | V | 3.0 | 40.9 | 1.0 | -48.8 | -25.0 | -23.8 | |
| 7.6800 | -10.9 | V | 3.0 | 40.6 | 1.0 | -50.5 | -25.0 | -25.5 | |
| 10.2400 | -1.8 | V | 3.0 | 39.5 | 1.0 | -40.3 | -25.0 | -15.3 | |
| 5.1200 | -6.8 | H | 3.0 | 40.9 | 1.0 | -46.7 | -25.0 | -21.7 | |
| 7.6800 | -9.1 | H | 3.0 | 40.6 | 1.0 | -48.8 | -25.0 | -23.8 | |
| 10.2400 | -6.2 | H | 3.0 | 39.5 | 1.0 | -44.7 | -25.0 | -19.7 | |
| Mid Ch, (2605 MHz) | | | | | | | | | |
| 5.2100 | -2.4 | V | 3.0 | 40.9 | 1.0 | -42.3 | -25.0 | -17.3 | |
| 7.8150 | -11.3 | V | 3.0 | 40.6 | 1.0 | -50.9 | -25.0 | -25.9 | |
| 10.4200 | 3.3 | V | 3.0 | 39.4 | 1.0 | -35.1 | -25.0 | -10.1 | |
| 5.2100 | -2.2 | H | 3.0 | 40.9 | 1.0 | -42.1 | -25.0 | -17.1 | |
| 7.8150 | -9.9 | H | 3.0 | 40.6 | 1.0 | -49.4 | -25.0 | -24.4 | |
| 10.4200 | -3.2 | H | 3.0 | 39.4 | 1.0 | -41.6 | -25.0 | -16.6 | |
| High Ch, (2650 MHz) | | | | | | | | | |
| 5.3000 | -0.9 | V | 3.0 | 40.9 | 1.0 | -40.8 | -25.0 | -15.8 | |
| 7.9500 | -12.4 | V | 3.0 | 40.5 | 1.0 | -51.9 | -25.0 | -26.9 | |
| 10.6000 | -2.7 | V | 3.0 | 39.2 | 1.0 | -40.9 | -25.0 | -15.9 | |
| 5.3000 | -3.8 | H | 3.0 | 40.9 | 1.0 | -43.6 | -25.0 | -18.6 | |
| 7.9500 | -12.1 | H | 3.0 | 40.5 | 1.0 | -51.6 | -25.0 | -26.6 | |
| 10.6000 | -8.2 | H | 3.0 | 39.2 | 1.0 | -46.4 | -25.0 | -21.4 | |

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

LTE Band 41 10MHz 16QAM

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

Company: Samsung
Project #: 16K23557
Date: 06-15-16
Test Engineer: JH Park
Configuration: EUT / AC Adapter, X Position
Mode: TX, LTE BAND 41, 10MHz BW,16QAM

Chamber: Chamber 2 | Pre-amplifer: AFS42 | Filter: Filter 1 | Limit: FCC Part 27

| f GHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, (2560 MHz) | | | | | | | | | |
| 5.1200 | -7.9 | V | 3.0 | 40.9 | 1.0 | -47.8 | -25.0 | -22.8 | |
| 7.6800 | -11.2 | V | 3.0 | 40.6 | 1.0 | -50.9 | -25.0 | -25.9 | |
| 10.2400 | -0.9 | V | 3.0 | 39.5 | 1.0 | -39.4 | -25.0 | -14.4 | |
| 5.1200 | -13.4 | H | 3.0 | 40.9 | 1.0 | -53.3 | -25.0 | -28.3 | |
| 7.6800 | -8.1 | H | 3.0 | 40.6 | 1.0 | -47.7 | -25.0 | -22.7 | |
| 10.2400 | -6.3 | H | 3.0 | 39.5 | 1.0 | -44.8 | -25.0 | -19.8 | |
| Mid Ch, (2605 MHz) | | | | | | | | | |
| 5.2100 | -1.3 | V | 3.0 | 40.9 | 1.0 | -41.2 | -25.0 | -16.2 | |
| 7.8150 | -10.7 | V | 3.0 | 40.6 | 1.0 | -50.3 | -25.0 | -25.3 | |
| 10.4200 | 3.6 | V | 3.0 | 39.4 | 1.0 | -34.8 | -25.0 | -9.8 | |
| 5.2100 | -2.0 | H | 3.0 | 40.9 | 1.0 | -41.9 | -25.0 | -16.9 | |
| 7.8150 | -9.6 | H | 3.0 | 40.6 | 1.0 | -49.1 | -25.0 | -24.1 | |
| 10.4200 | -1.5 | H | 3.0 | 39.4 | 1.0 | -39.8 | -25.0 | -14.8 | |
| High Ch, (2650 MHz) | | | | | | | | | |
| 5.3000 | -1.5 | V | 3.0 | 40.9 | 1.0 | -41.3 | -25.0 | -16.3 | |
| 7.9500 | -12.2 | V | 3.0 | 40.5 | 1.0 | -51.7 | -25.0 | -26.7 | |
| 10.6000 | -2.2 | V | 3.0 | 39.2 | 1.0 | -40.4 | -25.0 | -15.4 | |
| 5.3000 | -5.3 | H | 3.0 | 40.9 | 1.0 | -45.2 | -25.0 | -20.2 | |
| 7.9500 | -11.8 | H | 3.0 | 40.5 | 1.0 | -51.3 | -25.0 | -26.3 | |
| 10.6000 | -8.4 | H | 3.0 | 39.2 | 1.0 | -46.7 | -25.0 | -21.7 | |

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


UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
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