**FCC CFR47 PART 22 SUBPART H**
**FCC CFR47 PART 24 SUBPART E**
**FCC CFR47 PART 27 SUBPART L**

# C2PC CERTIFICATION TEST REPORT

**FOR**

**GSM/WCDMA/LTE PHONE WITH BT & DTS WLAN b/g/n**

**MODEL NUMBER: LG-L61AL, L61AL, LGL61AL**

**FCC ID: ZNFL61AL**

**REPORT NUMBER: 16I22652-E1V2**

**ISSUE DATE: 2/8/2016**

*Prepared for*
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NVLAP LAB CODE 200065-0

# Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 1/29/2016 | Initial Issue | D. CORONIA |
| V2 | 2/8/2016 | Updated Section 7 & 8.9 | D. CORONIA |

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# 1. ATTESTATION OF TEST RESULTS

| | |
|---|---|
| **COMPANY NAME:** | LG ELECTRONICS MOBILECOMM U.S.A., INC. |
| **EUT DESCRIPTION:** | GSM/WCDMA/LTE PHONE WITH BT & DTS WLAN b/g/n |
| **MODEL:** | LGL61AL, L61AL, LG-L61AL |
| **SERIAL NUMBER:** | 601KPRW000622, 601KPVH000623 |
| **DATE TESTED:** | JANUARY 16-22, 2016 |

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| FCC PART 22H, 24E, 27L | PASS |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revision section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-D, FCC CFR 47 Part 22, FCC CFR Part 24, and FCC CFR 47 Part 27.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 47173 Benicia Street | 47266 Benicia Street |
|---|---|
| ☐ Chamber A | ☐ Chamber D |
| ☒ Chamber B | ☐ Chamber E |
| ☒ Chamber C | ☐ Chamber F |
| | ☐ Chamber G |
| | ☐ Chamber H |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

EIRP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss( between the SG and substitution antenna) + Substitution Antenna Factor (dBi)

ERP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss( between the SG and substitution antenna)

(Path loss = Signal generator output – PSA reading with substitution antenna)

## 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|---|---|
| Conducted Disturbance, 0.15 to 30 MHz | 3.52 dB |
| Radiated Disturbance, 9KHz to 30 MHz | 2.14 dB |
| Radiated Disturbance, 30 to 1000 MHz | 4.98 dB |
| Radiated Disturbance,1000 to 6000 MHz | 3.86 dB |
| Radiated Disturbance,6000 to 18000 MHz | 4.23 dB |
| Radiated Disturbance,18000 to 26000 MHz | 5.30 dB |
| Radiated Disturbance,26000 to 40000 MHz | 5.23 dB |

Uncertainty figures are valid to a confidence level of 95%.

# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

This EUT is a GSM/WCDMA/LTE PHONE WITH BT & DTS WLAN b/g/n.

## 5.2. MAXIMUM OUTPUT POWER (GSM/EGPRS)

The transmitter has a maximum peak conducted and radiated ERP / EIRP output powers as follows:

| FCC Part 22/24 | | | | | | |
|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | Modulation | Conducted | | Radiated | |
| | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| GSM850 | 824~849 | GMSK | 33.5 | 2238.72 | | |
| | 824~849 | GPRS | 33.5 | 2238.72 | 30.36 | 1086.43 |
| | 824~849 | EGPRS | 27.7 | 588.84 | 25.14 | 326.59 |
| GSM1900 | 1850~1910 | GMSK | 30.7 | 1174.90 | | |
| | 1850~1910 | GPRS | 30.7 | 1174.90 | 31.51 | 1415.79 |
| | 1850~1910 | EGPRS | 26.7 | 467.74 | 28.95 | 785.24 |

## 5.3. MAXIMUM OUTPUT POWER (WCDMA)

**The transmitter has a maximum peak conducted and radiated ERP / EIRP output powers as follows:**

| FCC Part 22/24 | | | | | | |
|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | Modulation | Conducted | | Radiated | |
| | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| Band 2 | 1850~1910 | REL99 | 23.7 | 234.42 | 24.82 | 303.39 |
| | 1850~1910 | HSDPA | 23.7 | 234.42 | 24.69 | 294.44 |
| | 1850~1910 | HSUPA | 23.7 | 234.42 | | |
| Band 5 | 824~849 | REL99 | 23.6 | 229.09 | 20.30 | 107.15 |
| | 824~849 | HSDPA | 23.6 | 229.09 | 19.89 | 97.50 |
| | 824~849 | HSUPA | 23.6 | 229.09 | | |

## 5.4. MAXIMUM OUTPUT POWER (LTE)

The transmitter has a maximum peak conducted and radiated ERP/EIRP output powers as follows:

| FCC Part 24 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE2 | 1850~1910 | 1.4MHz | QPSK | 24.1 | 257.04 | 26.26 | 422.67 |
| | | | 16QAM | 23.2 | 208.93 | 25.69 | 370.68 |
| | | 3MHz | QPSK | 24.1 | 257.04 | 26.38 | 434.51 |
| | | | 16QAM | 23.2 | 208.93 | 25.72 | 373.25 |
| | | 5MHz | QPSK | 24.2 | 263.03 | 26.32 | 428.55 |
| | | | 16QAM | 23.2 | 208.93 | 25.86 | 385.48 |
| | | 10MHz | QPSK | 24.2 | 263.03 | 26.33 | 429.54 |
| | | | 16QAM | 23.2 | 208.93 | 25.72 | 373.25 |
| | | 15MHz | QPSK | 24.2 | 263.03 | 26.36 | 432.51 |
| | | | 16QAM | 23.2 | 208.93 | 25.73 | 374.11 |
| | | 20MHz | QPSK | 24.2 | 263.03 | 26.35 | 431.52 |
| | | | 16QAM | 23.2 | 208.93 | 25.83 | 382.82 |

| FCC Part 27 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE4 | 1710~1755 | 1.4MHz | QPSK | 24.4 | 275.42 | 25.20 | 331.13 |
| | | | 16QAM | 23.4 | 218.78 | 24.55 | 285.10 |
| | | 3MHz | QPSK | 24.4 | 275.42 | 25.19 | 330.37 |
| | | | 16QAM | 23.4 | 218.78 | 24.74 | 297.85 |
| | | 5MHz | QPSK | 24.3 | 269.15 | 25.40 | 346.74 |
| | | | 16QAM | 23.4 | 218.78 | 24.65 | 291.74 |
| | | 10MHz | QPSK | 24.4 | 275.42 | 25.37 | 344.35 |
| | | | 16QAM | 23.4 | 218.78 | 24.71 | 295.80 |
| | | 15MHz | QPSK | 24.4 | 275.42 | 25.21 | 331.89 |
| | | | 16QAM | 23.4 | 218.78 | 24.28 | 267.92 |
| | | 20MHz | QPSK | 24.4 | 275.42 | 25.18 | 329.61 |
| | | | 16QAM | 23.4 | 218.78 | 24.27 | 267.30 |

| FCC Part 22 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE5 | 824~849 | 1.4MHz | QPSK | 24.2 | 263.03 | 21.82 | 152.05 |
| | | | 16QAM | 23.2 | 208.93 | 21.00 | 125.89 |
| | | 3MHz | QPSK | 24.2 | 263.03 | 21.82 | 152.05 |
| | | | 16QAM | 23.2 | 208.93 | 21.48 | 140.60 |
| | | 5MHz | QPSK | 24.2 | 263.03 | 21.65 | 146.22 |
| | | | 16QAM | 23.2 | 208.93 | 21.03 | 126.77 |
| | | 10MHz | QPSK | 24.1 | 257.04 | 22.12 | 162.93 |
| | | | 16QAM | 23.2 | 208.93 | 21.53 | 142.23 |

| FCC Part 27 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | BandWidth (MHz) | Modulation | Conducted | | Radiated | |
| | | | | AVG(dBm) | AVG(mW) | AVG(dBm) | AVG(mW) |
| LTE17 | 704~716 | 5MHz | QPSK | 24.2 | 263.03 | 18.36 | 68.55 |
| | | | 16QAM | 22.9 | 194.98 | 17.28 | 53.46 |
| | | 10MHz | QPSK | 24.0 | 251.19 | 18.30 | 67.61 |
| | | | 16QAM | 23.2 | 208.93 | 17.87 | 61.24 |

## 5.5. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna for the [List the bands supported] with a maximum peak gain as follow:

| Frequency (MHz) | Peak Gain (dBi) |
|---|---|
| LTE B2, 1850~1910MHz | 0.31 |
| LTE B4, 1710~1755MHz | -0.57 |
| LTE B17, 704~716MHz | -4.34 |
| GSM/WCDMA B5/LTE B5, 824~849MHz | -2.41 |
| GSM/WCDMA B2, 1850~1910MHz | 0.31 |

## 5.6. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| Description | Manufacturer | Model | Serial Number | FCC ID |
| AC Adapter | LG | MCS-02WRE | N/A | N/A |
| Earphone | LG | N/A | N/A | N/A |

**I/O CABLES (CONDUCTED SETUP)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | RF Out | 1 | Spectrum Analyzer | Shielded | None | NA |
| 2 | Antenna Port | 1 | EUT | Shielded | 0.1m | NA |
| 3 | RF In/Out | 1 | Communication Test Set | Shielded | 1m | NA |

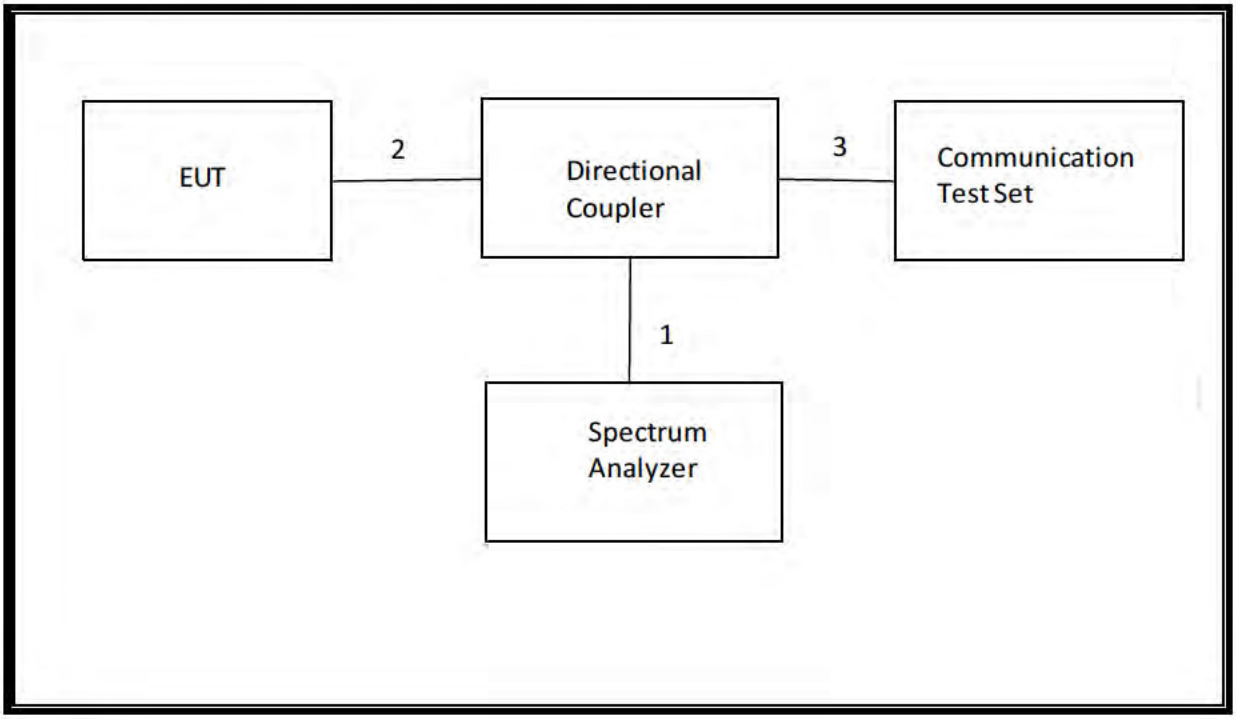
**I/O CABLES (RADIATED SETUP)**

| I/O CABLE LIST | | | | | | |
|---|---|---|---|---|---|---|
| Cable No. | Port | # of Identical Ports | Connector Type | Cable Type | Cable Length | Remarks |
| 1 | USB | 1 | AC Adapter | Un-shielded | 1.2m | No |
| 2 | Jack | 1 | Headset | Shielded | 1m | No |
| 3 | RF In/out | 1 | Communication Test Set | Un-shielded | 2m | Yes |

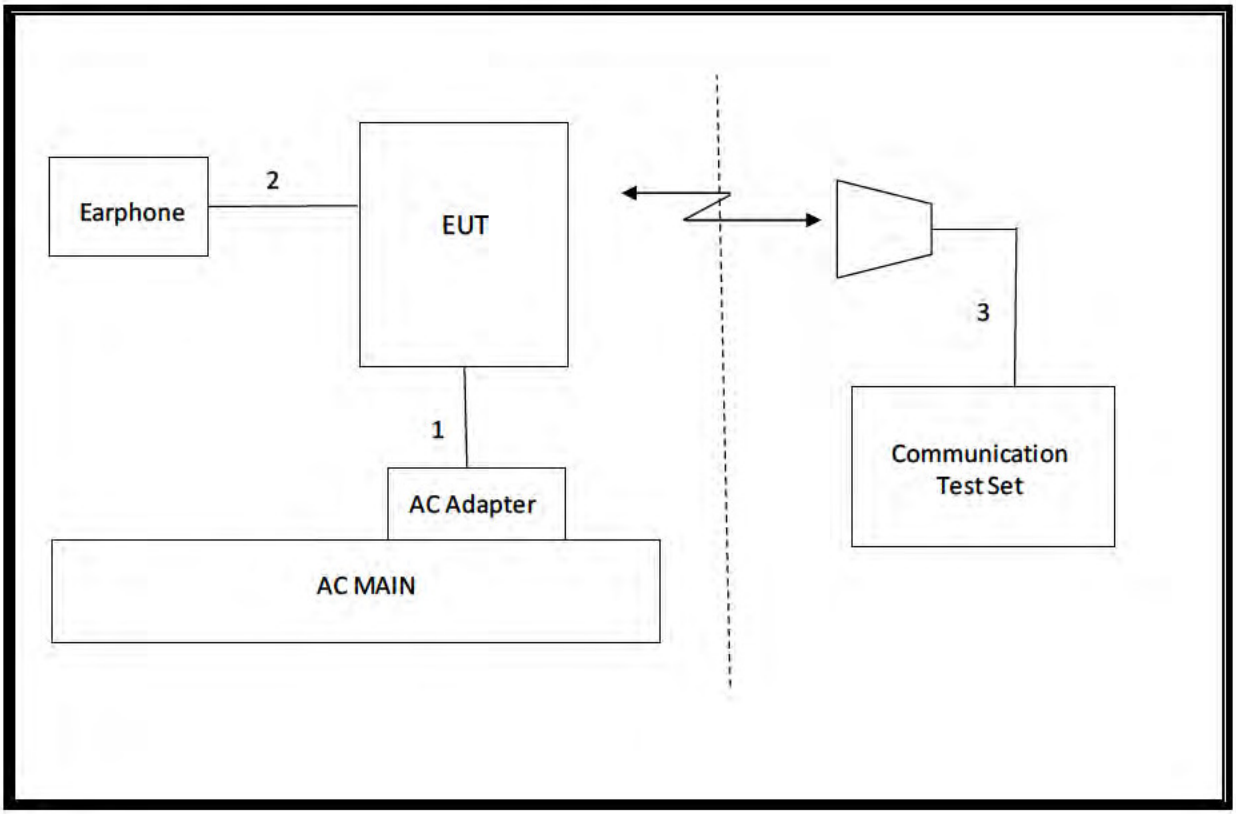
**TEST SETUP**

The EUT is continuously communicated to the call box during the tests.

**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**



**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



# 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| TEST EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| Description | Manufacturer | Model | T Number | Cal Due |
| Spectrum Analyzer, 44 GHz | Agilent / HP | E4446A | 123 | 10/22/16 |
| Antenna, Bilog, 2 GHz | Sunol Sciences | JB1 | 130 | 06/10/16 |
| Antenna, Horn, 18 GHz | EMCO | 3115 | 59 | 11/18/16 |
| Highpass Filter, 2.7 GHz | Micro-Tronics | HPM13194 | 151 | CNR |
| Highpass Filter, 1.5 GHz | Micro-Tronics | HPM13193 | 153 | CNR |
| Temperature / Humidity Chamber | Thermotron | SE 600-10-10 | 80 | 05/15/16 |
| Communications Test Set | R&S | CMW500 | 159 | 07/10/16 |
| DC power supply, 8 V @ 3 A or 15 V | Agilent / HP | E3610A | None | CNR |
| Vector signal generator, 6 GHz | Agilent / HP | E4438C | None | 06/16/16 |
| Antenna, Tuned Dipole 400~1000 | ETS | 3121C DB4 | 273 | 05/05/16 |
| Directional Coupler | RF-Lambda | RFDC5M06G15 | None | CNR |
| Antenna, Horn, 26.5 GHz | ARA | MWH-1826/B | 447 | 05/18/16 |

| Test Software List | | | |
|---|---|---|---|
| Description | Manufacturer | Model | Version |
| Radiated Software | UL | UL EMC | Ver 9.5, June 24, 2015 |
| Conducted Software | UL | UL EMC | Ver 9.5, May 26, 2015 |
| CLT Software | UL | UL RF | Ver 1.0, Feb 2, 2015 |
| Antenna Port Software | UL | UL RF | Ver 3.7, Nov 12, 2015 |

# 7. SUMMARY TABLE

| FCC Part Section | RSS Section(s) | Test Description | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|---|
| 2.1049 | N/A | Occupied Bandwidth (99%) | N/A | Conducted | Refer to Original |
| 22.917(a)<br>24.238(a)<br>27.53(g) | RSS-132(4.5.1)<br>RSS-133(6.5.1)<br>RSS-139(6.5.1) | Band Edge / Conducted Spurious Emission | -13dBm | | Refer to Original |
| 2.1046 | N/A | Conducted output power | N/A | | Pass |
| 22.355<br>24.235<br>27.54 | RSS-132(4.3)<br>RSS-133(6.3)<br>RSS-139(6.3) | Frequency Stability | 2.5PPM | | Refer to Original |
| 22.913(a)(2) | RSS-132(4.4) | Effective Radiated Power | 38 dBm | Radiated | Pass |
| 27.50(c)(10) | N/A | | 34.77 dBm | | Pass |
| 24.232(c )<br>27.50(h)(2) | RSS-133(6.4) | Equivalent Isotropic Radiated Power | 33dBm | | Pass |
| 27.50(d)(4) | RSS-139(6.4) | | 30dBm | | Pass |
| 22.917(a)<br>24.238(a)<br>27.53(g) | RSS-132(4.5.1)<br>RSS-133(6.5.1)<br>RSS-139(6.5.1) | Radiated Spurious Emission | -13dBm | | Pass |

# 8. RF POWER OUTPUT VERIFICATION

## 8.1. GSM/GPRS/EDGE

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press Connection control to choose the different menus

Press RESET > choose all to reset all settings

Connection Press Signal Off to turn off the signal and change settings

Network Support > GSM+GPRS or GSM+EGPRS

Main Service > Packet Data

Service selection > Test Mode A – Auto Slot Config. off

MS Signal Press Slot Config bottom on the right twice to select and change the number of time slots and power setting

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850/900

> 30 dBm for GPRS1800/1900

BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

BCCH Level > -85 dBm (May need to adjust if link is not stable)

BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off

P0> 4 dB

Slot Config > Unchanged (if already set under MS Signal)

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3 (Default)

Network Coding Scheme > CS4 (GPRS) and MCS5 ~ MCS9 (EGPRS)

Bit Stream > 2E9-1PSR Bit Pattern

AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input

Connection Press Signal On to turn on the signal and change settings

## 8.2. GSM OUTPUT POWER RESULT

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Burst Pwr (dBm) |
|---|---|---|---|---|---|
| GSM (Voice) | CS1 | 1 | 128 | 824.4 | 33.5 |
| | | | 190 | 836.6 | 33.5 |
| | | | 251 | 848.8 | 33.3 |
| GPRS (GMSK) | CS1 | 1 | 128 | 824.4 | 33.5 |
| | | | 190 | 836.6 | 33.5 |
| | | | 251 | 848.8 | 33.3 |
| | | 2 | 128 | 824.4 | 31.5 |
| | | | 190 | 836.6 | 31.5 |
| | | | 251 | 848.8 | 31.6 |
| EGPRS (8PSK) | MCS5 | 1 | 128 | 824.4 | 27.7 |
| | | | 190 | 836.6 | 27.7 |
| | | | 251 | 848.8 | 27.7 |
| | | 2 | 128 | 824.4 | 25.7 |
| | | | 190 | 836.6 | 25.7 |
| | | | 251 | 848.8 | 25.7 |

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Burst Pwr (dBm) |
|---|---|---|---|---|---|
| GSM (Voice) | CS1 | 1 | 512 | 1850.2 | 30.4 |
| | | | 661 | 1880.0 | 30.7 |
| | | | 810 | 1909.8 | 30.4 |
| GPRS (GMSK) | CS1 | 1 | 512 | 1850.2 | 30.4 |
| | | | 661 | 1880.0 | 30.7 |
| | | | 810 | 1909.8 | 30.4 |
| | | 2 | 512 | 1850.2 | 29.4 |
| | | | 661 | 1880.0 | 29.6 |
| | | | 810 | 1909.8 | 29.5 |
| EGPRS (8PSK) | MCS5 | 1 | 512 | 1850.2 | 26.7 |
| | | | 661 | 1880.0 | 26.7 |
| | | | 810 | 1909.8 | 26.7 |
| | | 2 | 512 | 1850.2 | 24.7 |
| | | | 661 | 1880.0 | 24.7 |
| | | | 810 | 1909.8 | 24.7 |

## 8.3. UMTS REL 99

**TEST PROCEDURE**

The following summary of these settings are illustrated below:

| | Mode | Rel99 |
|---|---|---|
| | Subtest | - |
| WCDMA General Settings | Loopback Mode | Test Mode 1 |
| | Rel99 RMC | 12.2kbps RMC |
| | HSDPA FRC | Not Applicable |
| | HSUPA Test | Not Applicable |
| | Power Control Algorithm | Algorithm2 |
| | βc | Not Applicable |
| | βd | Not Applicable |
| | βec | Not Applicable |
| | βc/βd | 8/15 |
| | βhs | Not Applicable |
| | βed | Not Applicable |

## 8.4. UMTS REL 99 OUTPUT POWER RESULT

| Band | Mode | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| W-CDMA Band II | Rel 99 (RMC, 12.2 kbps) | 9262 | 1852.4 | 0 | 23.7 |
| | | 9400 | 1880.0 | 0 | 23.7 |
| | | 9538 | 1907.6 | 0 | 23.7 |

| Band | Mode | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| W-CDMA Band V | Rel 99 (RMC, 12.2 kbps) | 4132 | 826.4 | 0 | 23.5 |
| | | 4183 | 836.6 | 0 | 23.6 |
| | | 4233 | 846.6 | 0 | 23.6 |

## 8.5. UMTS HSDPA

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

| | Mode | Rel5 HSDPA | | | |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1 | | | |
| | Power Control Algorithm | Algorithm 2 | | | |
| | βc | 2/15 | 12/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | Bd (SF) | 64 | | | |
| | βc/βd | 2/15 | 12/15 | 15/8 | 15/4 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | MPR (dB) | 0 | 0 | 0.5 | 0.5 |
| HSDPA Specific Settings | $D_{ACK}$ | 8 | | | |
| | $D_{NAK}$ | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack repetition factor | 3 | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | |
| | Ahs =βhs/βc | 30/15 | | | |

## 8.6. UMTS HSDPA OUTPUT POWER RESULT

| Band | Mode | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| W-CDMA Band II | Subtest 1 | 9262 | 1852.4 | 0 | 23.7 |
| | | 9400 | 1880.0 | 0 | 23.7 |
| | | 9538 | 1907.6 | 0 | 23.7 |
| | Subtest 2 | 9262 | 1852.4 | 0 | 23.7 |
| | | 9400 | 1880.0 | 0 | 23.7 |
| | | 9538 | 1907.6 | 0 | 23.7 |
| | Subtest 3 | 9262 | 1852.4 | 0.5 | 23.2 |
| | | 9400 | 1880.0 | 0.5 | 23.2 |
| | | 9538 | 1907.6 | 0.5 | 23.2 |
| | Subtest 4 | 9262 | 1852.4 | 0.5 | 23.2 |
| | | 9400 | 1880.0 | 0.5 | 23.2 |
| | | 9538 | 1907.6 | 0.5 | 23.2 |

| Band | Mode | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| W-CDMA Band V | Subtest 1 | 4132 | 826.4 | 0 | 23.4 |
| | | 4183 | 836.6 | 0 | 23.5 |
| | | 4233 | 846.6 | 0 | 23.6 |
| | Subtest 2 | 4132 | 826.4 | 0 | 23.5 |
| | | 4183 | 836.6 | 0 | 23.6 |
| | | 4233 | 846.6 | 0 | 23.6 |
| | Subtest 3 | 4132 | 826.4 | 0.5 | 23.1 |
| | | 4183 | 836.6 | 0.5 | 23.1 |
| | | 4233 | 846.6 | 0.5 | 23.1 |
| | Subtest 4 | 4132 | 826.4 | 0.5 | 23.1 |
| | | 4183 | 836.6 | 0.5 | 23.1 |
| | | 4233 | 846.6 | 0.5 | 23.1 |

# 8.7. UMTS HSUPA

**TEST PROCEDURE**

The following summary of these settings are illustrated below: (ETSI TS 134.121-1 Table C.11.1)

| | Mode | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA | Rel6 HSUPA |
|---|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 | 5 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | P-CPICH (dB) | -10 | | | | |
| | P-CCPCH (dB) | -12 | | | | |
| | SCH (dB) | -12 | | | | |
| | PICH(dB) | -15 | | | | |
| | DPCH (dB) | -9 | | | | |
| | HS-SCCH 1 (dB) | -8 | | | | |
| | HS-PDSCH (dB) | -3 | | | | |
| | Rel99 RMC | 12.2kbps RMC | | | | |
| | HSDPA FRC | H-Set1 | | | | |
| | HSUPA Test | HSUPA Loopback | | | | |
| | Power Control Algorithm | Algorithm2 | | | | |
| | Bc | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | Bd | 15/15 | 15/15 | 9/15 | 15/15 | 15/15 |
| | Bec | 209/225 | 12/15 | 30/15 | 2/15 | 5/15 |
| | βc/βd | 11/15 | 6/15 | 15/9 | 2/15 | 15/15 |
| | Bhs | 22/15 | 12/15 | 30/15 | 4/15 | 30/15 |
| | βed (note1) | 1309/225 | 94/75 | 47/15<br>47/15 | 56/75 | 134/15 |
| | MPR | 0 | 2 | 1 | 2 | 0 |
| HSDPA Specific Settings | DACK | 8 | | | | |
| | DNAK | 8 | | | | |
| | DCQI | 8 | | | | |
| | Ack-Nack repetition factor | 3 | | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | | |
| | Ahs = βhs/βc | 30/15 | | | | |
| HSUPA Specific Settings | D E-DPCCH | 6 | 8 | 8 | 5 | 7 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 21 |
| | Reference E-TFCIs | 5 | 5 | 2 | 5 | 5 |
| | ETFCI (from 34.121 Table C.11.1.3) | 75 | 67 | 92 | 71 | 81 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E_TFCIs | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO 23<br>E-TFCI 75<br>E-TFCI PO 26<br>E-TFCI 81<br>E-TFCI PO 27 | | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 92<br>E-TFCI PO 18 | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO 23<br>E-TFCI 75<br>E-TFCI PO 26<br>E-TFCI 81<br>E-TFCI PO 27 | |

Note1: βed cannot be set directly, it is set by Absolute Grant Value.

## 8.8. UMTS HSUPA OUTPUT POWER RESULT

| Band | Mode | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| W-CDMA Band II | Subtest 1 | 9262 | 1852.4 | 0 | 23.0 |
| | | 9400 | 1880.0 | 0 | 23.7 |
| | | 9538 | 1907.6 | 0 | 23.3 |
| | Subtest 2 | 9262 | 1852.4 | 2 | 21.7 |
| | | 9400 | 1880.0 | 2 | 21.7 |
| | | 9538 | 1907.6 | 2 | 21.7 |
| | Subtest 3 | 9262 | 1852.4 | 1 | 22.4 |
| | | 9400 | 1880.0 | 1 | 22.7 |
| | | 9538 | 1907.6 | 1 | 22.3 |
| | Subtest 4 | 9262 | 1852.4 | 2 | 21.7 |
| | | 9400 | 1880.0 | 2 | 21.7 |
| | | 9538 | 1907.6 | 2 | 21.7 |
| | Subtest 5 | 9262 | 1852.4 | 0 | 23.0 |
| | | 9400 | 1880.0 | 0 | 23.7 |
| | | 9538 | 1907.6 | 0 | 23.3 |

| Band | Mode | UL Ch No. | Freq. (MHz) | MPR | Avg Pwr (dBm) |
|---|---|---|---|---|---|
| W-CDMA Band V | Subtest 1 | 4132 | 826.4 | 0 | 23.0 |
| | | 4183 | 836.6 | 0 | 22.7 |
| | | 4233 | 846.6 | 0 | 23.1 |
| | Subtest 2 | 4132 | 826.4 | 2 | 21.4 |
| | | 4183 | 836.6 | 2 | 21.7 |
| | | 4233 | 846.6 | 2 | 21.7 |
| | Subtest 3 | 4132 | 826.4 | 1 | 22.3 |
| | | 4183 | 836.6 | 1 | 22.2 |
| | | 4233 | 846.6 | 1 | 22.2 |
| | Subtest 4 | 4132 | 826.4 | 2 | 21.4 |
| | | 4183 | 836.6 | 2 | 21.7 |
| | | 4233 | 846.6 | 2 | 21.7 |
| | Subtest 5 | 4132 | 826.4 | 0 | 23.5 |
| | | 4183 | 836.6 | 0 | 23.5 |
| | | 4233 | 846.6 | 0 | 23.6 |

## 8.9. LTE OUTPUT POWER RESULT

**LTE Band 2**

| Band | BW (MHz) | Mode | RB Alloca ion | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 18607 | 18900 | 19193 |
| | | | | | | 1850.7 MHz | 1880 MHz | 1909.3 MHz |
| LTE Band 2 | 1.4 | QPSK | 1 | 0 | 0 | 23.9 | 23.8 | 23.8 |
| | | | 1 | 2 | 0 | 23.9 | 23.8 | 23.9 |
| | | | 1 | 5 | 0 | 23.8 | 23.8 | 24.1 |
| | | | 3 | 0 | 0 | 24.0 | 23.9 | 23.9 |
| | | | 3 | 1 | 0 | 24.1 | 24.1 | 23.9 |
| | | | 3 | 2 | 0 | 24.1 | 24.1 | 23.9 |
| | | | 6 | 0 | 1 | 23.2 | 23.0 | 23.0 |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 2 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 5 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 3 | 0 | 1 | 22.8 | 23.0 | 22.9 |
| | | | 3 | 1 | 1 | 23.1 | 23.0 | 22.9 |
| | | | 3 | 2 | 1 | 23.0 | 22.8 | 23.1 |
| | | | 6 | 0 | 2 | 22.2 | 21.9 | 21.9 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 18615 | 18900 | 19185 |
| | | | | | | 1851.5 MHz | 1880 MHz | 1908.5 MHz |
| LTE Band 2 | 3 | QPSK | 1 | 0 | 0 | 24.0 | 24.1 | 23.9 |
| | | | 1 | 7 | 0 | 24.0 | 24.1 | 23.7 |
| | | | 1 | 14 | 0 | 24.0 | 24.1 | 24.0 |
| | | | 6 | 0 | 1 | 23.1 | 23.0 | 23.1 |
| | | | 6 | 3 | 1 | 23.0 | 23.0 | 23.0 |
| | | | 6 | 5 | 1 | 23.0 | 23.1 | 23.0 |
| | | | 15 | 0 | 1 | 23.1 | 23.0 | 23.1 |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 7 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 14 | 1 | 23.1 | 23.2 | 23.2 |
| | | | 6 | 0 | 2 | 22.1 | 22.2 | 22.0 |
| | | | 6 | 3 | 2 | 22.2 | 22.2 | 22.0 |
| | | | 6 | 5 | 2 | 22.2 | 22.1 | 22.0 |
| | | | 15 | 0 | 2 | 22.0 | 22.1 | 22.1 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 18625 | 18900 | 19175 |
| | | | | | | 1852.5 MHz | 1880 MHz | 1907.5 MHz |
| LTE Band 2 | 5 | QPSK | 1 | 0 | 0 | 24.1 | 23.9 | 23.8 |
| | | | 1 | 12 | 0 | 24.0 | 24.1 | 24.2 |
| | | | 1 | 24 | 0 | 24.1 | 24.0 | 24.0 |
| | | | 12 | 0 | 1 | 23.1 | 23.1 | 23.1 |
| | | | 12 | 6 | 1 | 23.1 | 23.1 | 23.1 |
| | | | 12 | 11 | 1 | 23.1 | 23.1 | 23.1 |
| | | | 25 | 0 | 1 | 23.1 | 23.1 | 23.1 |
| | | 16QAM | 1 | 0 | 1 | 23.1 | 23.2 | 23.0 |
| | | | 1 | 12 | 1 | 23.2 | 23.2 | 22.8 |
| | | | 1 | 24 | 1 | 23.2 | 23.2 | 22.9 |
| | | | 12 | 0 | 2 | 22.2 | 22.1 | 21.8 |
| | | | 12 | 6 | 2 | 22.2 | 22.0 | 22.0 |
| | | | 12 | 11 | 2 | 22.2 | 22.1 | 22.1 |
| | | | 25 | 0 | 2 | 22.2 | 22.0 | 22.0 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 18650 | 18900 | 19150 |
| | | | | | | 1855 MHz | 1880 MHz | 1905 MHz |
| LTE Band 2 | 10 | QPSK | 1 | 0 | 0 | 24.2 | 24.2 | 24.1 |
| | | | 1 | 24 | 0 | 24.1 | 24.2 | 24.0 |
| | | | 1 | 49 | 0 | 24.2 | 23.9 | 24.0 |
| | | | 25 | 0 | 1 | 23.2 | 23.2 | 23.1 |
| | | | 25 | 12 | 1 | 23.2 | 23.2 | 23.1 |
| | | | 25 | 24 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 50 | 0 | 1 | 23.1 | 23.1 | 23.1 |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 24 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 49 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 25 | 0 | 2 | 22.2 | 22.1 | 22.0 |
| | | | 25 | 12 | 2 | 22.2 | 22.1 | 22.1 |
| | | | 25 | 24 | 2 | 22.2 | 22.1 | 22.1 |
| | | | 50 | 0 | 2 | 22.1 | 22.1 | 22.0 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 18675 | 18900 | 19125 |
| | | | | | | 1857.5 MHz | 1880 MHz | 1902.5 MHz |
| LTE Band 2 | 15 | QPSK | 1 | 0 | 0 | 24.1 | 24.2 | 24.2 |
| | | | 1 | 37 | 0 | 24.2 | 24.2 | 24.0 |
| | | | 1 | 74 | 0 | 24.2 | 24.0 | 24.1 |
| | | | 36 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 36 | 18 | 1 | 23.2 | 23.2 | 23.1 |
| | | | 36 | 35 | 1 | 23.2 | 23.1 | 23.1 |
| | | | 75 | 0 | 1 | 23.2 | 23.2 | 23.1 |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 37 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 74 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 36 | 0 | 2 | 22.1 | 21.9 | 22.0 |
| | | | 36 | 18 | 2 | 22.1 | 22.0 | 21.9 |
| | | | 36 | 35 | 2 | 22.0 | 22.0 | 21.9 |
| | | | 75 | 0 | 2 | 22.2 | 22.2 | 21.9 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 18700 | 18900 | 19100 |
| | | | | | | 1860 MHz | 1880 MHz | 1900 MHz |
| LTE Band 2 | 20 | QPSK | 1 | 0 | 0 | 24.0 | 24.2 | 24.1 |
| | | | 1 | 49 | 0 | 23.9 | 24.2 | 23.9 |
| | | | 1 | 99 | 0 | 24.0 | 24.0 | 24.0 |
| | | | 50 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 50 | 25 | 1 | 23.1 | 23.2 | 23.1 |
| | | | 50 | 49 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 100 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 49 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 99 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 50 | 0 | 2 | 22.2 | 22.2 | 22.2 |
| | | | 50 | 25 | 2 | 22.2 | 22.2 | 22.1 |
| | | | 50 | 49 | 2 | 22.2 | 22.0 | 22.2 |
| | | | 100 | 0 | 2 | 22.2 | 22.2 | 22.1 |

**LTE Band 4**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 19957 | 20175 | 20393 |
| | | | | | | 1710.7 MHz | 1732.5 MHz | 1754.3 MHz |
| LTE Band 4 | 1.4 | QPSK | 1 | 0 | 0 | 23.7 | 23.8 | 24.1 |
| | | | 1 | 2 | 0 | 23.8 | 23.7 | 24.1 |
| | | | 1 | 5 | 0 | 23.8 | 23.8 | 24.1 |
| | | | 3 | 0 | 0 | 23.9 | 23.9 | 24.3 |
| | | | 3 | 1 | 0 | 23.9 | 23.9 | 24.4 |
| | | | 3 | 2 | 0 | 24.0 | 23.9 | 24.3 |
| | | | 6 | 0 | 1 | 23.3 | 23.2 | 23.4 |
| | | 16QAM | 1 | 0 | 1 | 23.4 | 23.3 | 23.4 |
| | | | 1 | 2 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 1 | 5 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 3 | 0 | 1 | 23.3 | 23.4 | 23.4 |
| | | | 3 | 1 | 1 | 23.2 | 23.4 | 23.4 |
| | | | 3 | 2 | 1 | 23.0 | 23.2 | 23.4 |
| | | | 6 | 0 | 2 | 22.1 | 22.3 | 22.4 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 19965 | 20175 | 20385 |
| | | | | | | 1711.5 MHz | 1732.5 MHz | 1753.5 MHz |
| LTE Band 4 | 3 | QPSK | 1 | 0 | 0 | 23.9 | 24.1 | 24.3 |
| | | | 1 | 7 | 0 | 24.3 | 24.1 | 24.3 |
| | | | 1 | 14 | 0 | 23.9 | 23.9 | 24.4 |
| | | | 6 | 0 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 6 | 3 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 6 | 5 | 1 | 23.3 | 23.4 | 23.4 |
| | | | 15 | 0 | 1 | 23.3 | 23.4 | 23.4 |
| | | 16QAM | 1 | 0 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 1 | 7 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 1 | 14 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 6 | 0 | 2 | 22.4 | 22.4 | 22.4 |
| | | | 6 | 3 | 2 | 22.4 | 22.4 | 22.4 |
| | | | 6 | 5 | 2 | 22.4 | 22.4 | 22.4 |
| | | | 15 | 0 | 2 | 22.3 | 22.4 | 22.4 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 19975 | 20175 | 20375 |
| | | | | | | 1712.5 MHz | 1732.5 MHz | 1752.5 MHz |
| LTE Band 4 | 5 | QPSK | 1 | 0 | 0 | 24.1 | 24.0 | 24.2 |
| | | | 1 | 12 | 0 | 24.2 | 24.3 | 24.3 |
| | | | 1 | 24 | 0 | 24.1 | 24.1 | 24.3 |
| | | | 12 | 0 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 12 | 7 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 12 | 13 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 25 | 0 | 1 | 23.3 | 23.4 | 23.4 |
| | | 16QAM | 1 | 0 | 1 | 23.4 | 23.2 | 23.4 |
| | | | 1 | 12 | 1 | 23.3 | 23.1 | 23.4 |
| | | | 1 | 24 | 1 | 23.4 | 22.9 | 23.4 |
| | | | 12 | 0 | 2 | 22.4 | 22.2 | 22.4 |
| | | | 12 | 7 | 2 | 22.3 | 22.4 | 22.4 |
| | | | 12 | 13 | 2 | 22.3 | 22.4 | 22.4 |
| | | | 25 | 0 | 2 | 22.4 | 22.4 | 22.4 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20000 | 20175 | 20350 |
| | | | | | | 1715 MHz | 1732.5 MHz | 1750 MHz |
| LTE Band 4 | 10 | QPSK | 1 | 0 | 0 | 23.9 | 24.0 | 24.2 |
| | | | 1 | 25 | 0 | 23.7 | 24.0 | 24.0 |
| | | | 1 | 49 | 0 | 23.9 | 23.9 | 24.4 |
| | | | 25 | 0 | 1 | 23.3 | 23.3 | 23.4 |
| | | | 25 | 12 | 1 | 23.2 | 23.3 | 23.4 |
| | | | 25 | 25 | 1 | 23.2 | 23.3 | 23.4 |
| | | | 50 | 0 | 1 | 23.3 | 23.4 | 23.4 |
| | | 16QAM | 1 | 0 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 1 | 25 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 1 | 49 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 25 | 0 | 2 | 22.3 | 22.4 | 22.4 |
| | | | 25 | 12 | 2 | 22.2 | 22.4 | 22.4 |
| | | | 25 | 25 | 2 | 22.1 | 22.3 | 22.4 |
| | | | 50 | 0 | 2 | 22.3 | 22.3 | 22.4 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20025 | 20175 | 20325 |
| | | | | | | 1717.5 MHz | 1732.5 MHz | 1747.5 MHz |
| LTE Band 4 | 15 | QPSK | 1 | 0 | 0 | 24.1 | 24.0 | 24.4 |
| | | | 1 | 37 | 0 | 23.8 | 23.9 | 24.4 |
| | | | 1 | 74 | 0 | 23.9 | 23.9 | 24.4 |
| | | | 36 | 0 | 1 | 23.3 | 23.3 | 23.4 |
| | | | 36 | 20 | 1 | 23.2 | 23.3 | 23.4 |
| | | | 36 | 39 | 1 | 23.2 | 23.2 | 23.4 |
| | | | 75 | 0 | 1 | 23.3 | 23.4 | 23.4 |
| | | 16QAM | 1 | 0 | 1 | 23.1 | 23.4 | 23.4 |
| | | | 1 | 37 | 1 | 23.4 | 23.4 | 23.3 |
| | | | 1 | 74 | 1 | 23.4 | 23.4 | 23.4 |
| | | | 36 | 0 | 2 | 22.4 | 22.4 | 22.4 |
| | | | 36 | 20 | 2 | 22.3 | 22.4 | 22.4 |
| | | | 36 | 39 | 2 | 22.4 | 22.4 | 22.4 |
| | | | 75 | 0 | 2 | 22.3 | 22.4 | 22.4 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20050 | 20175 | 20300 |
| | | | | | | 1720 MHz | 1732.5 MHz | 1745 MHz |
| LTE Band 4 | 20 | QPSK | 1 | 0 | 0 | | 24.40 | |
| | | | 1 | 49 | 0 | | 24.40 | |
| | | | 1 | 99 | 0 | | 24.30 | |
| | | | 50 | 0 | 1 | | 23.40 | |
| | | | 50 | 24 | 1 | | 23.40 | |
| | | | 50 | 50 | 1 | | 23.30 | |
| | | | 100 | 0 | 1 | | 23.40 | |
| | | 16QAM | 1 | 0 | 1 | | 23.40 | |
| | | | 1 | 49 | 1 | | 23.40 | |
| | | | 1 | 99 | 1 | | 23.30 | |
| | | | 50 | 0 | 2 | | 22.40 | |
| | | | 50 | 24 | 2 | | 22.40 | |
| | | | 50 | 50 | 2 | | 22.40 | |
| | | | 100 | 0 | 2 | | 22.40 | |

**LTE Band 5**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20407 | 20525 | 20643 |
| | | | | | | 824.7 MHz | 836.5 MHz | 848.3 MHz |
| LTE Band 5 | 1.4 | QPSK | 1 | 0 | 0 | 24.0 | 24.0 | 24.1 |
| | | | 1 | 3 | 0 | 24.0 | 24.0 | 24.0 |
| | | | 1 | 5 | 0 | 23.7 | 24.0 | 24.1 |
| | | | 3 | 0 | 0 | 24.1 | 24.0 | 24.2 |
| | | | 3 | 1 | 0 | 24.0 | 24.0 | 24.2 |
| | | | 3 | 3 | 0 | 23.9 | 24.1 | 24.2 |
| | | | 6 | 0 | 1 | 23.1 | 23.1 | 23.2 |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 3 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 5 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 3 | 0 | 1 | 23.2 | 23.0 | 23.2 |
| | | | 3 | 1 | 1 | 23.1 | 23.0 | 23.2 |
| | | | 3 | 3 | 1 | 22.9 | 23.1 | 23.2 |
| | | | 6 | 0 | 2 | 21.9 | 21.9 | 22.2 |
| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
| | | | | | | 20415 | 20525 | 20635 |
| | | | | | | 825.5 MHz | 836.5 MHz | 847.5 MHz |
| LTE Band 5 | 3 | QPSK | 1 | 0 | 0 | 23.9 | 24.0 | 23.8 |
| | | | 1 | 8 | 0 | 23.8 | 24.0 | 24.2 |
| | | | 1 | 14 | 0 | 23.9 | 24.1 | 24.2 |
| | | | 8 | 0 | 1 | 23.1 | 23.2 | 23.2 |
| | | | 8 | 4 | 1 | 23.0 | 23.2 | 23.2 |
| | | | 8 | 7 | 1 | 23.1 | 23.1 | 23.2 |
| | | | 15 | 0 | 1 | 23.1 | 23.2 | 23.2 |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 8 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 1 | 14 | 1 | 23.2 | 23.2 | 23.2 |
| | | | 8 | 0 | 2 | 22.2 | 22.2 | 22.2 |
| | | | 8 | 4 | 2 | 22.2 | 22.1 | 22.2 |
| | | | 8 | 7 | 2 | 22.1 | 22.0 | 22.2 |
| | | | 15 | 0 | 2 | 22.1 | 22.1 | 22.2 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20425 | 20525 | 20625 |
| | | | | | | 826.5 MHz | 836.5 MHz | 846.5 MHz |
| LTE Band 5 | 5 | QPSK | 1 | 0 | 0 | 23.9 | 23.8 | 23.8 |
| | | | 1 | 12 | 0 | 24.1 | 24.0 | 24.1 |
| | | | 1 | 24 | 0 | 23.9 | 24.1 | 24.2 |
| | | | 12 | 0 | 1 | 23.1 | 23.2 | 23.1 |
| | | | 12 | 7 | 1 | 23.2 | 23.1 | 23.2 |
| | | | 12 | 13 | 1 | 23.1 | 23.1 | 23.2 |
| | | | 25 | 0 | 1 | 23.2 | 23.2 | 23.2 |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 23.2 | 23.0 |
| | | | 1 | 12 | 1 | 23.1 | 23.2 | 23.0 |
| | | | 1 | 24 | 1 | 23.1 | 23.2 | 23.0 |
| | | | 12 | 0 | 2 | 22.1 | 22.2 | 22.2 |
| | | | 12 | 7 | 2 | 22.1 | 22.2 | 22.2 |
| | | | 12 | 13 | 2 | 22.1 | 22.1 | 22.2 |
| | | | 25 | 0 | 2 | 22.2 | 22.2 | 22.2 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 20450 | 20525 | 20600 |
| | | | | | | 829 MHz | 836.5 MHz | 844 MHz |
| LTE Band 5 | 10 | QPSK | 1 | 0 | 0 | | 24.1 | |
| | | | 1 | 25 | 0 | | 24.0 | |
| | | | 1 | 49 | 0 | | 23.9 | |
| | | | 25 | 0 | 1 | | 23.2 | |
| | | | 25 | 12 | 1 | | 23.2 | |
| | | | 25 | 25 | 1 | | 23.2 | |
| | | | 50 | 0 | 1 | | 23.2 | |
| | | 16QAM | 1 | 0 | 1 | | 23.2 | |
| | | | 1 | 25 | 1 | | 23.2 | |
| | | | 1 | 49 | 1 | | 23.2 | |
| | | | 25 | 0 | 2 | | 22.2 | |
| | | | 25 | 12 | 2 | | 22.2 | |
| | | | 25 | 25 | 2 | | 22.2 | |
| | | | 50 | 0 | 2 | | 22.2 | |

**LTE Band 17**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) 23790 710 MHz |
|---|---|---|---|---|---|---|
| LTE Band 17 | 5 | QPSK | 1 | 0 | 0 | 23.9 |
| | | | 1 | 12 | 0 | 24.2 |
| | | | 1 | 24 | 0 | 23.9 |
| | | | 12 | 0 | 1 | 22.9 |
| | | | 12 | 7 | 1 | 23.0 |
| | | | 12 | 13 | 1 | 23.0 |
| | | | 25 | 0 | 1 | 23.0 |
| | | 16QAM | 1 | 0 | 1 | 22.9 |
| | | | 1 | 12 | 1 | 22.7 |
| | | | 1 | 24 | 1 | 22.6 |
| | | | 12 | 0 | 2 | 21.7 |
| | | | 12 | 7 | 2 | 21.9 |
| | | | 12 | 13 | 2 | 22.0 |
| | | | 25 | 0 | 2 | 22.2 |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Avg Pwr (dBm) 23790 710 MHz |
|---|---|---|---|---|---|---|
| LTE Band 17 | 10 | QPSK | 1 | 0 | 0 | 24.0 |
| | | | 1 | 25 | 0 | 23.9 |
| | | | 1 | 49 | 0 | 23.8 |
| | | | 25 | 0 | 1 | 22.9 |
| | | | 25 | 12 | 1 | 22.9 |
| | | | 25 | 25 | 1 | 22.9 |
| | | | 50 | 0 | 1 | 22.9 |
| | | 16QAM | 1 | 0 | 1 | 23.1 |
| | | | 1 | 25 | 1 | 23.2 |
| | | | 1 | 49 | 1 | 23.1 |
| | | | 25 | 0 | 2 | 22.1 |
| | | | 25 | 12 | 2 | 22.1 |
| | | | 25 | 25 | 2 | 21.9 |
| | | | 50 | 0 | 2 | 21.9 |

# 9. RADIATED TEST RESULTS

## 9.1. RADIATED POWER (ERP & EIRP)

**RULE PART(S)**

FCC: §2.1046, §22.913, §24.232, §27

**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 (b) - (10) Portable stations (handheld devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP. (LTE B13)

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

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

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

**TEST PROCEDURE**

ANSI / TIA / EIA 603D Clause 2.2.17; PSA setting reference to 971168 D01 v02r02

For peak power measurement with a PSA:

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

For average power measurement with a PSA:

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 ≥ 3 x RBW; d) Set number of points in sweep ≥ 2 × span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle ≥ 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.

## 9.1.1. ERP/EIRP RESULTS AND TABLE

**GSM**

| Band | Mode | Channel | f(MHz) | ERP/EIRP | |
|---|---|---|---|---|---|
| | | | | dBm | mW |
| GSM850 | GPRS | 128 | 824.2 | 29.43 | 877.00 |
| | | 190 | 836.6 | 29.89 | 974.99 |
| | | 251 | 848.8 | 30.36 | 1086.43 |
| | EGPRS | 128 | 824.2 | 24.63 | 290.40 |
| | | 190 | 836.6 | 25.14 | 326.59 |
| | | 251 | 848.8 | 24.95 | 312.61 |
| GSM1900 | GPRS | 512 | 1850.2 | 30.52 | 1127.20 |
| | | 661 | 1880 | 31.51 | 1415.79 |
| | | 810 | 1909.8 | 30.28 | 1066.60 |
| | EGPRS | 512 | 1850.2 | 28.63 | 729.46 |
| | | 661 | 1880.0 | 28.95 | 785.24 |
| | | 810 | 1909.8 | 28.87 | 770.90 |

GSM850 GPRS

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | GPRS 850 MHz Fundamentals |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 824.20 | 22.47 | V | 0.9 | 0.0 | 21.57 | 38.5 | -16.9 | |
| 824.20 | 30.33 | H | 0.9 | 0.0 | 29.43 | 38.5 | -9.1 | |
| Mid Ch | | | | | | | | |
| 836.60 | 22.47 | V | 0.9 | 0.0 | 21.57 | 38.5 | -16.9 | |
| 836.60 | 30.79 | H | 0.9 | 0.0 | 29.89 | 38.5 | -8.6 | |
| High Ch | | | | | | | | |
| 848.80 | 22.88 | V | 0.9 | 0.0 | 21.98 | 38.5 | -16.5 | |
| 848.80 | 31.26 | H | 0.9 | 0.0 | 30.36 | 38.5 | -8.1 | |

GSM850 EGPRS

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | EGPRS 850 MHz Fundamentals |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 824.20 | 18.06 | V | 0.9 | 0.0 | 17.16 | 38.5 | -21.3 | |
| 824.20 | 25.53 | H | 0.9 | 0.0 | 24.63 | 38.5 | -13.9 | |
| Mid Ch | | | | | | | | |
| 836.60 | 18.35 | V | 0.9 | 0.0 | 17.45 | 38.5 | -21.1 | |
| 836.60 | 26.04 | H | 0.9 | 0.0 | 25.14 | 38.5 | -13.4 | |
| High Ch | | | | | | | | |
| 848.80 | 18.21 | V | 0.9 | 0.0 | 17.31 | 38.5 | -21.2 | |
| 848.80 | 25.85 | H | 0.9 | 0.0 | 24.95 | 38.5 | -13.5 | |

GSM1900 GPRS

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/16/2016 |
| **Test Engineer:** | R.Alegre |
| **Configuration:** | EUT only X postion |
| **Location:** | Chamber C |
| **Mode:** | GPRS 1900 MHz Fundamentals |

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1850.20 | 20.99 | V | 0.9 | 8.6 | 28.69 | 33.0 | -4.3 | |
| 1850.20 | 22.82 | H | 0.9 | 8.6 | 30.52 | 33.0 | -2.5 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 20.81 | V | 0.9 | 8.6 | 28.52 | 33.0 | -4.5 | |
| 1880.00 | 23.80 | H | 0.9 | 8.6 | 31.51 | 33.0 | -1.5 | |
| High Ch | | | | | | | | |
| 1909.80 | 20.35 | V | 0.9 | 8.6 | 28.07 | 33.0 | -4.9 | |
| 1909.80 | 22.56 | H | 0.9 | 8.6 | 30.28 | 33.0 | -2.7 | |

GSM1900 EGPRS

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/16/2016 |
| **Test Engineer:** | R.Alegre |
| **Configuration:** | EUT only X postion |
| **Location:** | Chamber C |
| **Mode:** | EGPRS 1900 MHz Fundamentals |

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1850.20 | 18.97 | V | 0.9 | 8.6 | 26.67 | 33.0 | -6.3 | |
| 1850.20 | 20.94 | H | 0.9 | 8.6 | 28.63 | 33.0 | -4.4 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 18.74 | V | 0.9 | 8.6 | 26.45 | 33.0 | -6.6 | |
| 1880.00 | 21.24 | H | 0.9 | 8.6 | 28.95 | 33.0 | -4.1 | |
| High Ch | | | | | | | | |
| 1909.80 | 18.84 | V | 0.9 | 8.6 | 26.56 | 33.0 | -6.4 | |
| 1909.80 | 21.15 | H | 0.9 | 8.6 | 28.87 | 33.0 | -4.1 | |

**WCDMA**

| Band | Mode | Channel | f(MHz) | ERP/EIRP | |
|---|---|---|---|---|---|
| | | | | dBm | mW |
| Band 2 | REL99 | 9262 | 1852.4 | 24.64 | 291.07 |
| | | 9400 | 1880 | 24.82 | 303.39 |
| | | 9538 | 1907.6 | 24.01 | 251.77 |
| | HSDPA | 9262 | 1852.4 | 24.60 | 288.40 |
| | | 9400 | 1880.0 | 24.69 | 294.44 |
| | | 9538 | 1907.6 | 24.00 | 251.19 |
| Band 5 | REL99 | 4132 | 826.4 | 19.54 | 89.95 |
| | | 4183 | 836.6 | 19.86 | 96.83 |
| | | 4233 | 846.6 | 20.30 | 107.15 |
| | HSDPA | 4132 | 826.4 | 19.38 | 86.70 |
| | | 4183 | 836.6 | 19.34 | 85.90 |
| | | 4233 | 846.6 | 19.89 | 97.50 |

B2 REL99

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/16/2016 |
| **Test Engineer:** | R.Alegre |
| **Configuration:** | EUT only X postion |
| **Location:** | Chamber C |
| **Mode:** | Rel99 Band 2 Fundamentals |

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1852.40 | 13.11 | V | 0.9 | 8.6 | 20.81 | 33.0 | -12.2 | |
| 1852.40 | 16.94 | H | 0.9 | 8.6 | 24.64 | 33.0 | -8.4 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 13.34 | V | 0.9 | 8.6 | 21.05 | 33.0 | -12.0 | |
| 1880.00 | 17.11 | H | 0.9 | 8.6 | 24.82 | 33.0 | -8.2 | |
| High Ch | | | | | | | | |
| 1907.60 | 12.95 | V | 0.9 | 8.6 | 20.67 | 33.0 | -12.3 | |
| 1907.60 | 16.29 | H | 0.9 | 8.6 | 24.01 | 33.0 | -9.0 | |

B2 HSDPA

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/16/2016 |
| **Test Engineer:** | R.Alegre |
| **Configuration:** | EUT only X postion |
| **Location:** | Chamber C |
| **Mode:** | HSDPA Band 2 Fundamentals |

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1852.40 | 13.18 | V | 0.9 | 8.6 | 20.88 | 33.0 | -12.1 | |
| 1852.40 | 16.98 | H | 0.9 | 8.6 | 24.68 | 33.0 | -8.4 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 13.31 | V | 0.9 | 8.6 | 21.02 | 33.0 | -12.0 | |
| 1880.00 | 16.98 | H | 0.9 | 8.6 | 24.69 | 33.0 | -8.3 | |
| High Ch | | | | | | | | |
| 1907.60 | 13.12 | V | 0.9 | 8.6 | 20.84 | 33.0 | -12.2 | |
| 1907.60 | 16.78 | H | 0.9 | 8.6 | 24.00 | 33.0 | -9.0 | |

B5 REL99

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | Rel99 Band 5 Fundamentals |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 826.40 | 12.34 | V | 0.9 | 0.0 | 11.44 | 38.5 | -27.1 | |
| 826.40 | 20.44 | H | 0.9 | 0.0 | 19.54 | 38.5 | -19.0 | |
| Mid Ch | | | | | | | | |
| 836.60 | 11.88 | V | 0.9 | 0.0 | 10.98 | 38.5 | -27.5 | |
| 836.60 | 20.76 | H | 0.9 | 0.0 | 19.86 | 38.5 | -18.6 | |
| High Ch | 0.00 | | | | | | | |
| 846.60 | 12.62 | V | 0.9 | 0.0 | 11.72 | 38.5 | -26.8 | |
| 846.60 | 21.20 | H | 0.9 | 0.0 | 20.30 | 38.5 | -18.2 | |

B5 HSDPA

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | HSDPA Band 5 Fundamentals |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 826.40 | 12.23 | V | 0.9 | 0.0 | 11.33 | 38.5 | -27.2 | |
| 826.40 | 20.28 | H | 0.9 | 0.0 | 19.38 | 38.5 | -19.1 | |
| Mid Ch | | | | | | | | |
| 836.60 | 11.73 | V | 0.9 | 0.0 | 10.83 | 38.5 | -27.7 | |
| 836.60 | 20.24 | H | 0.9 | 0.0 | 19.34 | 38.5 | -19.2 | |
| High Ch | | | | | | | | |
| 846.60 | 12.44 | V | 0.9 | 0.0 | 11.54 | 38.5 | -27.0 | |
| 846.60 | 20.79 | H | 0.9 | 0.0 | 19.89 | 38.5 | -18.6 | |

## LTE Band 2

| BW (MHz) | Mode | RB/RB Size | f(MHz) | EIRP | |
|---|---|---|---|---|---|
| | | | | dBm | mW |
| 1.4 | QPSK | 1/0 | 1850.7 | 26.18 | 414.95 |
| | | 1/0 | 1880 | 26.04 | 401.79 |
| | | 1/0 | 1909.3 | 26.26 | 422.67 |
| | 16QAM | 1/0 | 1850.7 | 25.50 | 354.81 |
| | | 1/0 | 1880 | 25.43 | 349.14 |
| | | 1/0 | 1909.3 | 25.69 | 370.68 |
| 3 | QPSK | 1/0 | 1851.5 | 26.24 | 420.73 |
| | | 1/0 | 1880 | 26.38 | 434.51 |
| | | 1/0 | 1908.5 | 26.31 | 427.56 |
| | 16QAM | 1/0 | 1851.5 | 25.47 | 352.37 |
| | | 1/0 | 1880 | 25.46 | 351.56 |
| | | 1/0 | 1908.5 | 25.72 | 373.25 |
| 5 | QPSK | 1/0 | 1852.5 | 26.27 | 423.64 |
| | | 1/0 | 1880 | 26.32 | 428.55 |
| | | 1/0 | 1907.5 | 26.28 | 424.62 |
| | 16QAM | 1/0 | 1852.5 | 25.60 | 363.08 |
| | | 1/0 | 1880 | 25.77 | 377.57 |
| | | 1/0 | 1907.5 | 25.86 | 385.48 |
| 10 | QPSK | 1/0 | 1855 | 26.18 | 414.95 |
| | | 1/0 | 1880 | 26.33 | 429.54 |
| | | 1/0 | 1905 | 26.27 | 423.64 |
| | 16QAM | 1/0 | 1855 | 25.68 | 369.83 |
| | | 1/0 | 1880 | 25.72 | 373.25 |
| | | 1/0 | 1905 | 25.60 | 363.08 |
| 15 | QPSK | 1/0 | 1857.5 | 26.30 | 426.58 |
| | | 1/0 | 1880 | 26.36 | 432.51 |
| | | 1/0 | 1902.5 | 26.33 | 429.54 |
| | 16QAM | 1/0 | 1857.5 | 25.66 | 368.13 |
| | | 1/0 | 1880 | 25.54 | 358.10 |
| | | 1/0 | 1902.5 | 25.73 | 374.11 |
| 20 | QPSK | 1/0 | 1860 | 26.34 | 430.53 |
| | | 1/0 | 1880 | 26.29 | 425.60 |
| | | 1/0 | 1900 | 26.35 | 431.52 |
| | 16QAM | 1/0 | 1860 | 25.83 | 382.82 |
| | | 1/0 | 1880 | 25.52 | 356.45 |
| | | 1/0 | 1900 | 25.69 | 370.68 |

1.4MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_QPSK Band 2 Fundamentals, 1.4MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1850.70 | 7.28 | V | 0.9 | 8.6 | 14.98 | 33.0 | -18.0 | |
| 1850.70 | 18.48 | H | 0.9 | 8.6 | 26.18 | 33.0 | -6.8 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 7.24 | V | 0.9 | 8.6 | 14.95 | 33.0 | -18.1 | |
| 1880.00 | 18.33 | H | 0.9 | 8.6 | 26.04 | 33.0 | -7.0 | |
| High Ch | | | | | | | | |
| 1909.30 | 6.79 | V | 0.9 | 8.6 | 14.51 | 33.0 | -18.5 | |
| 1909.30 | 18.54 | H | 0.9 | 8.6 | 26.26 | 33.0 | -6.7 | |

1.4MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_16QAM Band 2 Fundamentals, 1.4MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1850.70 | 6.46 | V | 0.9 | 8.6 | 14.16 | 33.0 | -18.8 | |
| 1850.70 | 17.80 | H | 0.9 | 8.6 | 25.50 | 33.0 | -7.5 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 6.51 | V | 0.9 | 8.6 | 14.22 | 33.0 | -18.8 | |
| 1880.00 | 17.72 | H | 0.9 | 8.6 | 25.43 | 33.0 | -7.6 | |
| High Ch | | | | | | | | |
| 1909.30 | 6.23 | V | 0.9 | 8.6 | 13.95 | 33.0 | -19.1 | |
| 1909.30 | 17.97 | H | 0.9 | 8.6 | 25.69 | 33.0 | -7.3 | |

3MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_QPSK Band 2 Fundamentals, 3MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1851.50 | 7.52 | V | 0.9 | 8.6 | 15.22 | 33.0 | -17.8 | |
| 1851.50 | 18.54 | H | 0.9 | 8.6 | 26.24 | 33.0 | -6.8 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 7.51 | V | 0.9 | 8.6 | 15.22 | 33.0 | -17.8 | |
| 1880.00 | 18.67 | H | 0.9 | 8.6 | 26.38 | 33.0 | -6.6 | |
| High Ch | | | | | | | | |
| 1908.50 | 6.99 | V | 0.9 | 8.6 | 14.71 | 33.0 | -18.3 | |
| 1908.50 | 18.59 | H | 0.9 | 8.6 | 26.31 | 33.0 | -6.7 | |

3MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1851.50 | 6.38 | V | 0.9 | 8.6 | 14.08 | 33.0 | -18.9 | |
| 1851.50 | 17.77 | H | 0.9 | 8.6 | 25.47 | 33.0 | -7.5 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 6.34 | V | 0.9 | 8.6 | 14.05 | 33.0 | -19.0 | |
| 1880.00 | 17.75 | H | 0.9 | 8.6 | 25.46 | 33.0 | -7.5 | |
| High Ch | | | | | | | | |
| 1908.50 | 6.35 | V | 0.9 | 8.6 | 14.07 | 33.0 | -18.9 | |
| 1908.50 | 18.00 | H | 0.9 | 8.6 | 25.72 | 33.0 | -7.3 | |

5MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1852.50 | 7.37 | V | 0.9 | 8.6 | 15.07 | 33.0 | -17.9 | |
| 1852.50 | 18.57 | H | 0.9 | 8.6 | 26.27 | 33.0 | -6.7 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 7.49 | V | 0.9 | 8.6 | 15.20 | 33.0 | -17.8 | |
| 1880.00 | 18.61 | H | 0.9 | 8.6 | 26.32 | 33.0 | -6.7 | |
| High Ch | | | | | | | | |
| 1907.50 | 7.04 | V | 0.9 | 8.6 | 14.76 | 33.0 | -18.2 | |
| 1907.50 | 18.56 | H | 0.9 | 8.6 | 26.28 | 33.0 | -6.7 | |

5MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_16QAM Band 2 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1852.50 | 6.67 | V | 0.9 | 8.6 | 14.37 | 33.0 | -18.6 | |
| 1852.50 | 17.90 | H | 0.9 | 8.6 | 25.60 | 33.0 | -7.4 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 6.41 | V | 0.9 | 8.6 | 14.12 | 33.0 | -18.9 | |
| 1880.00 | 18.06 | H | 0.9 | 8.6 | 25.77 | 33.0 | -7.2 | |
| High Ch | | | | | | | | |
| 1907.50 | 6.16 | V | 0.9 | 8.6 | 13.88 | 33.0 | -19.1 | |
| 1907.50 | 18.14 | H | 0.9 | 8.6 | 25.86 | 33.0 | -7.1 | |

10MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1855.00 | 7.30 | V | 0.9 | 8.6 | 15.00 | 33.0 | -18.0 | |
| 1855.00 | 18.48 | H | 0.9 | 8.6 | 26.18 | 33.0 | -6.8 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 7.26 | V | 0.9 | 8.6 | 14.97 | 33.0 | -18.0 | |
| 1880.00 | 18.62 | H | 0.9 | 8.6 | 26.33 | 33.0 | -6.7 | |
| High Ch | | | | | | | | |
| 1905.00 | 6.76 | V | 0.9 | 8.6 | 14.47 | 33.0 | -18.5 | |
| 1905.00 | 18.56 | H | 0.9 | 8.6 | 26.27 | 33.0 | -6.7 | |

10MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_16QAM Band 2 Fundamentals, 10MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1855.00 | 6.33 | V | 0.9 | 8.6 | 14.03 | 33.0 | -19.0 | |
| 1855.00 | 17.58 | H | 0.9 | 8.6 | 25.68 | 33.0 | -7.3 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 6.67 | V | 0.9 | 8.6 | 14.38 | 33.0 | -18.6 | |
| 1880.00 | 18.01 | H | 0.9 | 8.6 | 25.72 | 33.0 | -7.3 | |
| High Ch | | | | | | | | |
| 1905.00 | 6.40 | V | 0.9 | 8.6 | 14.11 | 33.0 | -18.9 | |
| 1905.00 | 17.89 | H | 0.9 | 8.6 | 25.60 | 33.0 | -7.4 | |

15MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1857.50 | 7.48 | V | 0.9 | 8.6 | 15.18 | 33.0 | -17.8 | |
| 1857.50 | 18.60 | H | 0.9 | 8.6 | 26.30 | 33.0 | -6.7 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 7.43 | V | 0.9 | 8.6 | 15.14 | 33.0 | -17.9 | |
| 1880.00 | 18.65 | H | 0.9 | 8.6 | 26.36 | 33.0 | -6.6 | |
| High Ch | | | | | | | | |
| 1902.50 | 6.95 | V | 0.9 | 8.6 | 14.66 | 33.0 | -18.3 | |
| 1902.50 | 18.62 | H | 0.9 | 8.6 | 26.33 | 33.0 | -6.7 | |

15MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_16QAM Band 2 Fundamentals, 15MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1857.50 | 6.67 | V | 0.9 | 8.6 | 14.37 | 33.0 | -18.6 | |
| 1857.50 | 17.96 | H | 0.9 | 8.6 | 25.66 | 33.0 | -7.3 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 6.56 | V | 0.9 | 8.6 | 14.27 | 33.0 | -18.7 | |
| 1880.00 | 17.83 | H | 0.9 | 8.6 | 25.54 | 33.0 | -7.5 | |
| High Ch | | | | | | | | |
| 1902.50 | 6.35 | V | 0.9 | 8.6 | 14.06 | 33.0 | -18.9 | |
| 1902.50 | 18.02 | H | 0.9 | 8.6 | 25.73 | 33.0 | -7.3 | |

20MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1860.00 | 7.07 | V | 0.9 | 8.6 | 14.77 | 33.0 | -18.2 | |
| 1860.00 | 18.64 | H | 0.9 | 8.6 | 26.34 | 33.0 | -6.7 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 7.33 | V | 0.9 | 8.6 | 15.04 | 33.0 | -18.0 | |
| 1880.00 | 18.58 | H | 0.9 | 8.6 | 26.29 | 33.0 | -6.7 | |
| High Ch | | | | | | | | |
| 1900.00 | 7.00 | V | 0.9 | 8.6 | 14.71 | 33.0 | -18.3 | |
| 1900.00 | 18.64 | H | 0.9 | 8.6 | 26.35 | 33.0 | -6.7 | |

20MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/16/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT only X postion
**Location:** Chamber C
**Mode:** LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1860.00 | 6.61 | V | 0.9 | 8.6 | 14.31 | 33.0 | -18.7 | |
| 1860.00 | 18.13 | H | 0.9 | 8.6 | 25.83 | 33.0 | -7.2 | |
| Mid Ch | | | | | | | | |
| 1880.00 | 6.65 | V | 0.9 | 8.6 | 14.36 | 33.0 | -18.6 | |
| 1880.00 | 17.81 | H | 0.9 | 8.6 | 25.52 | 33.0 | -7.5 | |
| High Ch | | | | | | | | |
| 1900.00 | 6.26 | V | 0.9 | 8.6 | 13.97 | 33.0 | -19.0 | |
| 1900.00 | 17.98 | H | 0.9 | 8.6 | 25.69 | 33.0 | -7.3 | |

## LTE Band 4

| BW (MHz) | Mode | RB/RB Size | f(MHz) | EIRP | |
|---|---|---|---|---|---|
| | | | | dBm | mW |
| 1.4 | QPSK | 1/0 | 1710.7 | 25.08 | 322.11 |
| | | 1/0 | 1732.5 | 25.20 | 331.13 |
| | | 1/0 | 1754.3 | 24.79 | 301.30 |
| | 16QAM | 1/0 | 1710.7 | 24.43 | 277.33 |
| | | 1/0 | 1732.5 | 24.55 | 285.10 |
| | | 1/0 | 1754.3 | 24.31 | 269.77 |
| 3 | QPSK | 1/0 | 1711.5 | 25.07 | 321.37 |
| | | 1/0 | 1732.5 | 25.19 | 330.37 |
| | | 1/0 | 1753.5 | 25.12 | 325.09 |
| | 16QAM | 1/0 | 1711.5 | 24.16 | 260.62 |
| | | 1/0 | 1732.5 | 24.74 | 297.85 |
| | | 1/0 | 1753.5 | 24.48 | 280.54 |
| 5 | QPSK | 1/0 | 1712.5 | 24.95 | 312.61 |
| | | 1/0 | 1732.5 | 25.40 | 346.74 |
| | | 1/0 | 1752.5 | 25.36 | 343.56 |
| | 16QAM | 1/0 | 1712.5 | 24.09 | 256.45 |
| | | 1/0 | 1732.5 | 24.65 | 291.74 |
| | | 1/0 | 1752.5 | 24.45 | 278.61 |
| 10 | QPSK | 1/0 | 1715 | 24.48 | 280.54 |
| | | 1/0 | 1732.5 | 25.37 | 344.35 |
| | | 1/0 | 1750 | 25.11 | 324.34 |
| | 16QAM | 1/0 | 1715 | 23.57 | 227.51 |
| | | 1/0 | 1732.5 | 24.71 | 295.80 |
| | | 1/0 | 1750 | 24.32 | 270.40 |
| 15 | QPSK | 1/0 | 1717.5 | 24.34 | 271.64 |
| | | 1/0 | 1732.5 | 25.21 | 331.89 |
| | | 1/0 | 1747.5 | 25.17 | 328.85 |
| | 16QAM | 1/0 | 1717.5 | 23.88 | 244.34 |
| | | 1/0 | 1732.5 | 24.28 | 267.92 |
| | | 1/0 | 1747.5 | 24.20 | 263.03 |
| 20 | QPSK | 1/0 | 1720 | 24.33 | 271.02 |
| | | 1/0 | 1732.5 | 24.91 | 309.74 |
| | | 1/0 | 1745 | 25.18 | 329.61 |
| | 16QAM | 1/0 | 1720 | 23.52 | 224.91 |
| | | 1/0 | 1732.5 | 23.84 | 242.10 |
| | | 1/0 | 1745 | 24.27 | 267.30 |

1.4MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 4 Fundamentals, 1.4MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1710.70 | 15.06 | V | 0.9 | 8.7 | 22.91 | 30.0 | -7.1 | |
| 1710.70 | 17.24 | H | 0.9 | 8.7 | 25.08 | 30.0 | -4.9 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 14.45 | V | 0.9 | 8.7 | 22.26 | 30.0 | -7.7 | |
| 1732.50 | 17.39 | H | 0.9 | 8.7 | 25.20 | 30.0 | -4.8 | |
| High Ch | | | | | | | | |
| 1754.30 | 15.00 | V | 0.9 | 8.7 | 22.77 | 30.0 | -7.2 | |
| 1754.30 | 17.02 | H | 0.9 | 8.7 | 24.79 | 30.0 | -5.2 | |

1.4MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 4 Fundamentals, 1.4MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1710.70 | 13.68 | V | 0.9 | 8.7 | 21.45 | 30.0 | -8.6 | |
| 1710.70 | 16.59 | H | 0.9 | 8.7 | 24.43 | 30.0 | -5.6 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 14.00 | V | 0.9 | 8.7 | 21.81 | 30.0 | -8.2 | |
| 1732.50 | 16.74 | H | 0.9 | 8.7 | 24.55 | 30.0 | -5.5 | |
| High Ch | | | | | | | | |
| 1754.30 | 14.28 | V | 0.9 | 8.7 | 22.05 | 30.0 | -7.9 | |
| 1754.30 | 16.54 | H | 0.9 | 8.7 | 24.31 | 30.0 | -5.7 | |

3MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 4 Fundamentals, 3MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1711.50 | 14.85 | V | 0.9 | 8.7 | 22.70 | 30.0 | -7.3 | |
| 1711.50 | 17.23 | H | 0.9 | 8.7 | 25.07 | 30.0 | -4.9 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 13.93 | V | 0.9 | 8.7 | 21.74 | 30.0 | -8.3 | |
| 1732.50 | 17.38 | H | 0.9 | 8.7 | 25.19 | 30.0 | -4.8 | |
| High Ch | | | | | | | | |
| 1753.50 | 14.87 | V | 0.9 | 8.7 | 22.64 | 30.0 | -7.4 | |
| 1753.50 | 17.35 | H | 0.9 | 8.7 | 25.12 | 30.0 | -4.9 | |

3MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 4 Fundamentals, 3MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1711.50 | 13.75 | V | 0.9 | 8.7 | 21.60 | 30.0 | -8.4 | |
| 1711.50 | 16.32 | H | 0.9 | 8.7 | 24.16 | 30.0 | -5.8 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 13.15 | V | 0.9 | 8.7 | 20.96 | 30.0 | -9.0 | |
| 1732.50 | 16.93 | H | 0.9 | 8.7 | 24.74 | 30.0 | -5.3 | |
| High Ch | | | | | | | | |
| 1753.50 | 14.19 | V | 0.9 | 8.7 | 21.96 | 30.0 | -8.0 | |
| 1753.50 | 16.71 | H | 0.9 | 8.7 | 24.48 | 30.0 | -5.5 | |

5MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 4 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1712.50 | 14.35 | V | 0.9 | 8.7 | 22.19 | 30.0 | -7.8 | |
| 1712.50 | 17.11 | H | 0.9 | 8.7 | 24.95 | 30.0 | -5.0 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 15.36 | V | 0.9 | 8.7 | 23.17 | 30.0 | -6.8 | |
| 1732.50 | 17.59 | H | 0.9 | 8.7 | 25.40 | 30.0 | -4.6 | |
| High Ch | | | | | | | | |
| 1752.50 | 14.82 | V | 0.9 | 8.7 | 22.59 | 30.0 | -7.4 | |
| 1752.50 | 17.59 | H | 0.9 | 8.7 | 25.36 | 30.0 | -4.6 | |

5MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 4 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1712.50 | 13.68 | V | 0.9 | 8.7 | 21.52 | 30.0 | -8.5 | |
| 1712.50 | 16.25 | H | 0.9 | 8.7 | 24.09 | 30.0 | -5.9 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 14.47 | V | 0.9 | 8.7 | 22.28 | 30.0 | -7.7 | |
| 1732.50 | 16.84 | H | 0.9 | 8.7 | 24.65 | 30.0 | -5.4 | |
| High Ch | | | | | | | | |
| 1752.50 | 13.71 | V | 0.9 | 8.7 | 21.48 | 30.0 | -8.5 | |
| 1752.50 | 16.68 | H | 0.9 | 8.7 | 24.45 | 30.0 | -5.6 | |

10MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 4 Fundamentals, 10MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1715.00 | 14.22 | V | 0.9 | 8.7 | 22.06 | 30.0 | -7.9 | |
| 1715.00 | 16.64 | H | 0.9 | 8.7 | 24.48 | 30.0 | -5.5 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 14.93 | V | 0.9 | 8.7 | 22.74 | 30.0 | -7.3 | |
| 1732.50 | 17.56 | H | 0.9 | 8.7 | 25.37 | 30.0 | -4.6 | |
| High Ch | | | | | | | | |
| 1750.00 | 14.20 | V | 0.9 | 8.7 | 21.98 | 30.0 | -8.0 | |
| 1750.00 | 17.33 | H | 0.9 | 8.7 | 25.11 | 30.0 | -4.9 | |

10MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 4 Fundamentals, 10MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1715.00 | 13.34 | V | 0.9 | 8.7 | 21.18 | 30.0 | -8.8 | |
| 1715.00 | 15.73 | H | 0.9 | 8.7 | 23.57 | 30.0 | -6.4 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 13.82 | V | 0.9 | 8.7 | 21.63 | 30.0 | -8.4 | |
| 1732.50 | 16.90 | H | 0.9 | 8.7 | 24.71 | 30.0 | -5.3 | |
| High Ch | | | | | | | | |
| 1750.00 | 13.43 | V | 0.9 | 8.7 | 21.21 | 30.0 | -8.8 | |
| 1750.00 | 16.54 | H | 0.9 | 8.7 | 24.32 | 30.0 | -5.7 | |

15MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 4 Fundamentals, 15MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1717.50 | 14.39 | V | 0.9 | 8.7 | 22.23 | 30.0 | -7.8 | |
| 1717.50 | 16.50 | H | 0.9 | 8.7 | 24.34 | 30.0 | -5.7 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 15.40 | V | 0.9 | 8.7 | 23.21 | 30.0 | -6.8 | |
| 1732.50 | 17.40 | H | 0.9 | 8.7 | 25.21 | 30.0 | -4.8 | |
| High Ch | | | | | | | | |
| 1747.50 | 14.72 | V | 0.9 | 8.7 | 22.50 | 30.0 | -7.5 | |
| 1747.50 | 17.39 | H | 0.9 | 8.7 | 25.17 | 30.0 | -4.8 | |

15MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 4 Fundamentals, 15MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1717.50 | 13.52 | V | 0.9 | 8.7 | 21.36 | 30.0 | -8.6 | |
| 1717.50 | 16.04 | H | 0.9 | 8.7 | 23.88 | 30.0 | -6.1 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 14.51 | V | 0.9 | 8.7 | 22.32 | 30.0 | -7.7 | |
| 1732.50 | 16.47 | H | 0.9 | 8.7 | 24.28 | 30.0 | -5.7 | |
| High Ch | | | | | | | | |
| 1747.50 | 13.98 | V | 0.9 | 8.7 | 21.76 | 30.0 | -8.2 | |
| 1747.50 | 16.42 | H | 0.9 | 8.7 | 24.20 | 30.0 | -5.8 | |

20MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 4 Fundamentals, 20MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1720.00 | 14.18 | V | 0.9 | 8.7 | 22.01 | 30.0 | -8.0 | |
| 1720.00 | 16.50 | H | 0.9 | 8.7 | 24.33 | 30.0 | -5.7 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 15.18 | V | 0.9 | 8.7 | 22.99 | 30.0 | -7.0 | |
| 1732.50 | 17.10 | H | 0.9 | 8.7 | 24.91 | 30.0 | -5.1 | |
| High Ch | | | | | | | | |
| 1745.00 | 14.62 | V | 0.9 | 8.7 | 22.41 | 30.0 | -7.6 | |
| 1745.00 | 17.39 | H | 0.9 | 8.7 | 25.18 | 30.0 | -4.8 | |

20MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 4 Fundamentals, 20MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T119, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft SMA CableWarehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 1720.00 | 13.25 | V | 0.9 | 8.7 | 21.08 | 30.0 | -8.9 | |
| 1720.00 | 15.69 | H | 0.9 | 8.7 | 23.52 | 30.0 | -6.5 | |
| Mid Ch | | | | | | | | |
| 1732.50 | 13.98 | V | 0.9 | 8.7 | 21.79 | 30.0 | -8.2 | |
| 1732.50 | 16.03 | H | 0.9 | 8.7 | 23.84 | 30.0 | -6.2 | |
| High Ch | | | | | | | | |
| 1745.00 | 13.77 | V | 0.9 | 8.7 | 21.56 | 30.0 | -8.4 | |
| 1745.00 | 16.48 | H | 0.9 | 8.7 | 24.27 | 30.0 | -5.7 | |

**LTE Band 5**

| BW (MHz) | Mode | RB/RB Size | f(MHz) | ERP | |
|---|---|---|---|---|---|
| | | | | dBm | mW |
| 1.4 | QPSK | 1/0 | 824.7 | 20.92 | 123.59 |
| | | 1/0 | 836.5 | 21.13 | 129.72 |
| | | 1/0 | 848.3 | 21.82 | 152.05 |
| | 16QAM | 1/0 | 824.7 | 20.32 | 107.65 |
| | | 1/0 | 836.5 | 20.81 | 120.50 |
| | | 1/0 | 848.3 | 21.00 | 125.89 |
| 3 | QPSK | 1/0 | 825.5 | 20.97 | 125.03 |
| | | 1/0 | 836.5 | 21.43 | 139.00 |
| | | 1/0 | 847.5 | 21.82 | 152.05 |
| | 16QAM | 1/0 | 825.5 | 20.39 | 109.40 |
| | | 1/0 | 836.5 | 20.80 | 120.23 |
| | | 1/0 | 847.5 | 21.48 | 140.60 |
| 5 | QPSK | 1/0 | 826.5 | 21.10 | 128.82 |
| | | 1/0 | 836.5 | 21.53 | 142.23 |
| | | 1/0 | 846.5 | 21.65 | 146.22 |
| | 16QAM | 1/0 | 826.5 | 20.14 | 103.28 |
| | | 1/0 | 836.5 | 20.59 | 114.55 |
| | | 1/0 | 846.5 | 21.03 | 126.77 |
| 10 | QPSK | 1/0 | 829 | 21.72 | 148.59 |
| | | 1/0 | 836.5 | 21.99 | 158.12 |
| | | 1/0 | 844 | 22.12 | 162.93 |
| | 16QAM | 1/0 | 829 | 20.96 | 124.74 |
| | | 1/0 | 836.5 | 21.53 | 142.23 |
| | | 1/0 | 844 | 21.48 | 140.60 |

1.4MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/19/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 824.70 | 14.51 | V | 0.9 | 0.0 | 13.61 | 38.5 | -24.9 | |
| 824.70 | 21.82 | H | 0.9 | 0.0 | 20.92 | 38.5 | -17.6 | |
| Mid Ch | | | | | | | | |
| 836.50 | 14.22 | V | 0.9 | 0.0 | 13.32 | 38.5 | -25.2 | |
| 836.50 | 22.03 | H | 0.9 | 0.0 | 21.13 | 38.5 | -17.4 | |
| High Ch | | | | | | | | |
| 848.30 | 15.31 | V | 0.9 | 0.0 | 14.41 | 38.5 | -24.1 | |
| 848.30 | 22.72 | H | 0.9 | 0.0 | 21.82 | 38.5 | -16.7 | |

1.4MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/19/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 824.70 | 13.32 | V | 0.9 | 0.0 | 12.42 | 38.5 | -26.1 | |
| 824.70 | 21.22 | H | 0.9 | 0.0 | 20.32 | 38.5 | -18.2 | |
| Mid Ch | | | | | | | | |
| 836.50 | 13.58 | V | 0.9 | 0.0 | 12.68 | 38.5 | -25.8 | |
| 836.50 | 21.71 | H | 0.9 | 0.0 | 20.81 | 38.5 | -17.7 | |
| High Ch | | | | | | | | |
| 848.30 | 14.41 | V | 0.9 | 0.0 | 13.51 | 38.5 | -25.0 | |
| 848.30 | 21.90 | H | 0.9 | 0.0 | 21.00 | 38.5 | -17.5 | |

3MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/19/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 825.50 | 14.64 | V | 0.9 | 0.0 | 13.74 | 38.5 | -24.8 | |
| 825.50 | 21.87 | H | 0.9 | 0.0 | 20.97 | 38.5 | -17.5 | |
| Mid Ch | | | | | | | | |
| 836.50 | 14.45 | V | 0.9 | 0.0 | 13.55 | 38.5 | -25.0 | |
| 836.50 | 22.33 | H | 0.9 | 0.0 | 21.43 | 38.5 | -17.1 | |
| High Ch | | | | | | | | |
| 847.50 | 15.00 | V | 0.9 | 0.0 | 14.10 | 38.5 | -24.4 | |
| 847.50 | 22.72 | H | 0.9 | 0.0 | 21.82 | 38.5 | -16.7 | |

3MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/19/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 825.50 | 13.83 | V | 0.9 | 0.0 | 12.93 | 38.5 | -25.6 | |
| 825.50 | 21.29 | H | 0.9 | 0.0 | 20.39 | 38.5 | -18.1 | |
| Mid Ch | | | | | | | | |
| 836.50 | 13.85 | V | 0.9 | 0.0 | 12.95 | 38.5 | -25.6 | |
| 836.50 | 21.70 | H | 0.9 | 0.0 | 20.80 | 38.5 | -17.7 | |
| High Ch | | | | | | | | |
| 847.50 | 14.47 | V | 0.9 | 0.0 | 13.57 | 38.5 | -24.9 | |
| 847.50 | 22.38 | H | 0.9 | 0.0 | 21.48 | 38.5 | -17.0 | |

5MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/19/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 826.50 | 14.49 | V | 0.9 | 0.0 | 13.59 | 38.5 | -24.9 | |
| 826.50 | 22.00 | H | 0.9 | 0.0 | 21.10 | 38.5 | -17.4 | |
| Mid Ch | | | | | | | | |
| 836.50 | 14.19 | V | 0.9 | 0.0 | 13.29 | 38.5 | -25.2 | |
| 836.50 | 22.43 | H | 0.9 | 0.0 | 21.53 | 38.5 | -17.0 | |
| High Ch | | | | | | | | |
| 846.50 | 15.03 | V | 0.9 | 0.0 | 14.13 | 38.5 | -24.4 | |
| 846.50 | 22.55 | H | 0.9 | 0.0 | 21.65 | 38.5 | -16.9 | |

5MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/19/2016
**Test Engineer:** A. Escamilla
**Configuration:** X-pos EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 826.50 | 13.83 | V | 0.9 | 0.0 | 12.93 | 38.5 | -25.6 | |
| 826.50 | 21.04 | H | 0.9 | 0.0 | 20.14 | 38.5 | -18.4 | |
| Mid Ch | | | | | | | | |
| 836.50 | 13.64 | V | 0.9 | 0.0 | 12.74 | 38.5 | -25.8 | |
| 836.50 | 21.49 | H | 0.9 | 0.0 | 20.59 | 38.5 | -17.9 | |
| High Ch | | | | | | | | |
| 846.50 | 14.16 | V | 0.9 | 0.0 | 13.26 | 38.5 | -25.2 | |
| 846.50 | 21.93 | H | 0.9 | 0.0 | 21.03 | 38.5 | -17.5 | |

10MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 829.00 | 14.41 | V | 0.9 | 0.0 | 13.51 | 38.5 | -25.0 | |
| 829.00 | 22.62 | H | 0.9 | 0.0 | 21.72 | 38.5 | -16.8 | |
| Mid Ch | | | | | | | | |
| 836.50 | 14.68 | V | 0.9 | 0.0 | 13.78 | 38.5 | -24.7 | |
| 836.50 | 22.89 | H | 0.9 | 0.0 | 21.99 | 38.5 | -16.5 | |
| High Ch | | | | | | | | |
| 844.00 | 15.08 | V | 0.9 | 0.0 | 14.18 | 38.5 | -24.3 | |
| 844.00 | 23.02 | H | 0.9 | 0.0 | 22.12 | 38.5 | -16.4 | |

10MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 829.00 | 13.61 | V | 0.9 | 0.0 | 12.71 | 38.5 | -25.8 | |
| 829.00 | 21.86 | H | 0.9 | 0.0 | 20.96 | 38.5 | -17.5 | |
| Mid Ch | | | | | | | | |
| 836.50 | 13.94 | V | 0.9 | 0.0 | 13.04 | 38.5 | -25.5 | |
| 836.50 | 22.43 | H | 0.9 | 0.0 | 21.53 | 38.5 | -17.0 | |
| High Ch | | | | | | | | |
| 844.00 | 14.33 | V | 0.9 | 0.0 | 13.43 | 38.5 | -25.1 | |
| 844.00 | 22.38 | H | 0.9 | 0.0 | 21.48 | 38.5 | -17.0 | |

**LTE Band 17**

| BW (MHz) | Mode | RB/RB Size | f(MHz) | ERP | |
|---|---|---|---|---|---|
| | | | | dBm | mW |
| 5 | QPSK | 1/0 | 701.5 | 17.63 | 57.94 |
| | | 1/0 | 707.5 | 18.10 | 64.57 |
| | | 1/0 | 713.5 | 18.36 | 68.55 |
| | 16QAM | 1/0 | 701.5 | 17.19 | 52.36 |
| | | 1/0 | 707.5 | 17.06 | 50.82 |
| | | 1/0 | 713.5 | 17.28 | 53.46 |
| 10 | QPSK | 1/0 | 704 | 18.10 | 64.57 |
| | | 1/0 | 707.5 | 18.22 | 66.37 |
| | | 1/0 | 711 | 18.30 | 67.61 |
| | 16QAM | 1/0 | 704 | 17.44 | 55.46 |
| | | 1/0 | 707.5 | 17.87 | 61.24 |
| | | 1/0 | 711 | 17.70 | 58.88 |

5MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | LTE_QPSK Band 17 Fundamentals, 5MHz Bandwidth |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 706.50 | 8.78 | V | 0.9 | 0.0 | 7.88 | 34.8 | -26.9 | |
| 706.50 | 18.53 | H | 0.9 | 0.0 | 17.63 | 34.8 | -17.1 | |
| Mid Ch | | | | | | | | |
| 710.00 | 8.89 | V | 0.9 | 0.0 | 7.99 | 34.8 | -26.8 | |
| 710.00 | 19.00 | H | 0.9 | 0.0 | 18.10 | 34.8 | -16.7 | |
| High Ch | | | | | | | | |
| 713.50 | 9.18 | V | 0.9 | 0.0 | 8.28 | 34.8 | -26.5 | |
| 713.50 | 19.26 | H | 0.9 | 0.0 | 18.36 | 34.8 | -16.4 | |

5MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | LTE_16QAM Band 17 Fundamentals, 5MHz Bandwidth |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 706.50 | 7.87 | V | 0.9 | 0.0 | 6.97 | 34.8 | -27.8 | |
| 706.50 | 18.09 | H | 0.9 | 0.0 | 17.19 | 34.8 | -17.6 | |
| Mid Ch | | | | | | | | |
| 710.00 | 7.62 | V | 0.9 | 0.0 | 6.72 | 34.8 | -28.1 | |
| 710.00 | 17.96 | H | 0.9 | 0.0 | 17.06 | 34.8 | -17.7 | |
| High Ch | | | | | | | | |
| 713.50 | 7.86 | V | 0.9 | 0.0 | 6.96 | 34.8 | -27.8 | |
| 713.50 | 18.16 | H | 0.9 | 0.0 | 17.26 | 34.8 | -17.5 | |

10MHz QPSK

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | LTE_QPSK Band 17 Fundamentals, 10MHz Bandwidth |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 709.00 | 8.98 | V | 0.9 | 0.0 | 8.08 | 34.8 | -26.7 | |
| 709.00 | 19.00 | H | 0.9 | 0.0 | 18.10 | 34.8 | -16.7 | |
| Mid Ch | | | | | | | | |
| 710.00 | 9.54 | V | 0.9 | 0.0 | 8.64 | 34.8 | -26.1 | |
| 710.00 | 19.12 | H | 0.9 | 0.0 | 18.22 | 34.8 | -16.6 | |
| High Ch | | | | | | | | |
| 711.00 | 9.43 | V | 0.9 | 0.0 | 8.53 | 34.8 | -26.2 | |
| 711.00 | 19.20 | H | 0.9 | 0.0 | 18.30 | 34.8 | -16.5 | |

10MHz 16QAM

**High Frequency Substitution Measurement**
**UL Verification Services, Inc.**

| | |
|---|---|
| **Company:** | LG Electronics |
| **Project #:** | 16I22652 |
| **Date:** | 1/19/2016 |
| **Test Engineer:** | A. Escamilla |
| **Configuration:** | X-pos EUT Only |
| **Location:** | Chamber C |
| **Mode:** | LTE_16QAM Band 17 Fundamentals, 10MHz Bandwidth |

**Test Equipment:**
**Receiving: Hybrid T185, and Chamber C SMA Cables**
**Substitution: Dipole T416, 6ft N-type Cable Warehouse**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 709.00 | 8.06 | V | 0.9 | 0.0 | 7.16 | 34.8 | -27.6 | |
| 709.00 | 18.34 | H | 0.9 | 0.0 | 17.44 | 34.8 | -17.3 | |
| Mid Ch | | | | | | | | |
| 710.00 | 8.35 | V | 0.9 | 0.0 | 7.45 | 34.8 | -27.3 | |
| 710.00 | 18.77 | H | 0.9 | 0.0 | 17.87 | 34.8 | -16.9 | |
| High Ch | | | | | | | | |
| 711.00 | 8.46 | V | 0.9 | 0.0 | 7.56 | 34.8 | -27.2 | |
| 711.00 | 18.60 | H | 0.9 | 0.0 | 17.70 | 34.8 | -17.1 | |

# 9.2. FIELD STRENGTH OF SPURIOUS RADIATION

**RULE PART(S)**

FCC: §2.1053, §22.917, §24.238

**LIMIT**

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**

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

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

## 9.2.1. SPURIOUS EMISSION TEST DATA

**GSM**

GSM850 GPRS

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: GPRS 850 MHz Harmonics

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 824.2 | | | | | | | | | |
| 1648.40 | -6.0 | V | 3.0 | 36.4 | 1.0 | -41.3 | -13.0 | -28.3 | |
| 2472.60 | -21.3 | V | 3.0 | 35.0 | 1.0 | -55.3 | -13.0 | -42.3 | |
| 3296.80 | -23.4 | V | 3.0 | 34.3 | 1.0 | -56.6 | -13.0 | -43.6 | |
| 1648.40 | -14.4 | H | 3.0 | 36.4 | 1.0 | -49.8 | -13.0 | -36.8 | |
| 2472.60 | -23.1 | H | 3.0 | 35.0 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 3296.80 | -24.2 | H | 3.0 | 34.3 | 1.0 | -57.5 | -13.0 | -44.5 | |
| Mid Ch, 836.6 | | | | | | | | | |
| 1673.20 | -7.4 | V | 3.0 | 36.3 | 1.0 | -42.8 | -13.0 | -29.8 | |
| 2509.80 | -19.9 | V | 3.0 | 34.9 | 1.0 | -53.9 | -13.0 | -40.9 | |
| 3346.40 | -23.3 | V | 3.0 | 34.2 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 1673.20 | -12.9 | H | 3.0 | 36.3 | 1.0 | -48.2 | -13.0 | -35.2 | |
| 2509.80 | -22.9 | H | 3.0 | 34.9 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 3346.40 | -24.0 | H | 3.0 | 34.2 | 1.0 | -57.3 | -13.0 | -44.3 | |
| High Ch, 848.8 | | | | | | | | | |
| 1697.60 | -8.3 | V | 3.0 | 36.3 | 1.0 | -43.6 | -13.0 | -30.6 | |
| 2546.40 | -21.9 | V | 3.0 | 34.9 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 3395.20 | -23.0 | V | 3.0 | 34.2 | 1.0 | -56.2 | -13.0 | -43.2 | |
| 1697.60 | -16.3 | H | 3.0 | 36.3 | 1.0 | -51.6 | -13.0 | -38.6 | |
| 2546.40 | -21.9 | H | 3.0 | 34.9 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 3395.20 | -23.5 | H | 3.0 | 34.2 | 1.0 | -56.7 | -13.0 | -43.7 | |

GSM850 EGPRS

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: EGPRS 850 MHz Harmonics

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 824.2 | | | | | | | | | |
| 1648.40 | -8.4 | V | 3.0 | 36.4 | 1.0 | -43.7 | -13.0 | -30.7 | |
| 2472.60 | -20.9 | V | 3.0 | 35.0 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 3296.80 | -23.4 | V | 3.0 | 34.3 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 1648.40 | -13.2 | H | 3.0 | 36.4 | 1.0 | -48.6 | -13.0 | -35.6 | |
| 2472.60 | -23.2 | H | 3.0 | 35.0 | 1.0 | -57.2 | -13.0 | -44.2 | |
| 3296.80 | -23.7 | H | 3.0 | 34.3 | 1.0 | -57.0 | -13.0 | -44.0 | |
| Mid Ch, 836.6 | | | | | | | | | |
| 1673.20 | -7.8 | V | 3.0 | 36.3 | 1.0 | -43.1 | -13.0 | -30.1 | |
| 2509.80 | -20.0 | V | 3.0 | 34.9 | 1.0 | -54.0 | -13.0 | -41.0 | |
| 3346.40 | -23.3 | V | 3.0 | 34.2 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 1673.20 | -15.4 | H | 3.0 | 36.3 | 1.0 | -50.7 | -13.0 | -37.7 | |
| 2509.80 | -23.8 | H | 3.0 | 34.9 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 3346.40 | -23.9 | H | 3.0 | 34.2 | 1.0 | -57.1 | -13.0 | -44.1 | |
| High Ch, 848.8 | | | | | | | | | |
| 1697.60 | -10.1 | V | 3.0 | 36.3 | 1.0 | -45.4 | -13.0 | -32.4 | |
| 2546.40 | -22.3 | V | 3.0 | 34.9 | 1.0 | -56.2 | -13.0 | -43.2 | |
| 3395.20 | -23.0 | V | 3.0 | 34.2 | 1.0 | -56.2 | -13.0 | -43.2 | |
| 1697.60 | -15.3 | H | 3.0 | 36.3 | 1.0 | -50.6 | -13.0 | -37.6 | |
| 2546.40 | -24.0 | H | 3.0 | 34.9 | 1.0 | -57.9 | -13.0 | -44.9 | |
| 3395.20 | -24.0 | H | 3.0 | 34.2 | 1.0 | -57.2 | -13.0 | -44.2 | |

GSM1900 GPRS

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: GPRS 1900 MHz Harmonics

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1850.2 | | | | | | | | | |
| 3700.40 | -14.3 | V | 3.0 | 33.9 | 1.0 | -47.1 | -13.0 | -34.1 | |
| 5550.60 | -12.8 | V | 3.0 | 33.1 | 1.0 | -45.0 | -13.0 | -32.0 | |
| 7400.80 | -17.5 | V | 3.0 | 32.9 | 1.0 | -49.4 | -13.0 | -36.4 | |
| 3700.40 | -15.5 | H | 3.0 | 33.9 | 1.0 | -48.3 | -13.0 | -35.3 | |
| 5550.60 | -11.5 | H | 3.0 | 33.1 | 1.0 | -43.6 | -13.0 | -30.6 | |
| 7400.80 | -16.1 | H | 3.0 | 32.9 | 1.0 | -48.0 | -13.0 | -35.0 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -14.3 | V | 3.0 | 33.8 | 1.0 | -47.1 | -13.0 | -34.1 | |
| 5640.00 | -13.2 | V | 3.0 | 33.1 | 1.0 | -45.3 | -13.0 | -32.3 | |
| 7520.00 | -16.1 | V | 3.0 | 32.8 | 1.0 | -47.9 | -13.0 | -34.9 | |
| 3760.00 | -14.6 | H | 3.0 | 33.8 | 1.0 | -47.4 | -13.0 | -34.4 | |
| 5640.00 | -18.6 | H | 3.0 | 33.1 | 1.0 | -50.7 | -13.0 | -37.7 | |
| 7520.00 | -16.5 | H | 3.0 | 32.8 | 1.0 | -48.3 | -13.0 | -35.3 | |
| High Ch, 1909.8 | | | | | | | | | |
| 3819.60 | -13.8 | V | 3.0 | 33.7 | 1.0 | -46.5 | -13.0 | -33.5 | |
| 5729.40 | -15.6 | V | 3.0 | 33.1 | 1.0 | -47.7 | -13.0 | -34.7 | |
| 7639.20 | -17.2 | V | 3.0 | 32.8 | 1.0 | -49.0 | -13.0 | -36.0 | |
| 3819.60 | -15.5 | H | 3.0 | 33.7 | 1.0 | -48.3 | -13.0 | -35.3 | |
| 5729.40 | -13.7 | H | 3.0 | 33.1 | 1.0 | -45.8 | -13.0 | -32.8 | |
| 7639.20 | -16.1 | H | 3.0 | 32.8 | 1.0 | -48.0 | -13.0 | -35.0 | |

GSM1900 EGPRS

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos EUT + AC Adapter + Headset
Location: Chamber C
Mode: EGPRS 1900 MHz Harmonics

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1850.2 | | | | | | | | | |
| 3700.40 | -15.0 | V | 3.0 | 33.9 | 1.0 | -47.9 | -13.0 | -34.9 | |
| 5550.60 | -15.5 | V | 3.0 | 33.1 | 1.0 | -47.6 | -13.0 | -34.6 | |
| 7400.80 | -13.1 | V | 3.0 | 32.9 | 1.0 | -44.9 | -13.0 | -31.9 | |
| 3700.40 | -18.3 | H | 3.0 | 33.9 | 1.0 | -51.2 | -13.0 | -38.2 | |
| 5550.60 | -13.1 | H | 3.0 | 33.1 | 1.0 | -45.2 | -13.0 | -32.2 | |
| 7400.80 | -17.4 | H | 3.0 | 32.9 | 1.0 | -49.2 | -13.0 | -36.2 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -16.3 | V | 3.0 | 33.8 | 1.0 | -49.1 | -13.0 | -36.1 | |
| 5640.00 | -7.8 | V | 3.0 | 33.1 | 1.0 | -39.9 | -13.0 | -26.9 | |
| 7520.00 | -11.9 | V | 3.0 | 32.8 | 1.0 | -43.8 | -13.0 | -30.8 | |
| 3760.00 | -17.7 | H | 3.0 | 33.8 | 1.0 | -50.5 | -13.0 | -37.5 | |
| 5640.00 | -18.1 | H | 3.0 | 33.1 | 1.0 | -50.2 | -13.0 | -37.2 | |
| 7520.00 | -17.6 | H | 3.0 | 32.8 | 1.0 | -49.4 | -13.0 | -36.4 | |
| High Ch, 1909.8 | | | | | | | | | |
| 3819.60 | -15.4 | V | 3.0 | 33.7 | 1.0 | -48.1 | -13.0 | -35.1 | |
| 5729.40 | -14.7 | V | 3.0 | 33.1 | 1.0 | -46.8 | -13.0 | -33.8 | |
| 7639.20 | -15.2 | V | 3.0 | 32.8 | 1.0 | -47.1 | -13.0 | -34.1 | |
| 3819.60 | -16.8 | H | 3.0 | 33.7 | 1.0 | -49.6 | -13.0 | -36.6 | |
| 5729.40 | -15.0 | H | 3.0 | 33.1 | 1.0 | -47.0 | -13.0 | -34.0 | |
| 7639.20 | -16.5 | H | 3.0 | 32.8 | 1.0 | -48.4 | -13.0 | -35.4 | |

## WCDMA

B2 REL99

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: Rel99 Band 2 Harmonics

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1852.4 | | | | | | | | | |
| 3704.80 | -14.8 | V | 3.0 | 33.9 | 1.0 | -47.6 | -13.0 | -34.6 | |
| 5557.20 | -18.3 | V | 3.0 | 33.1 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 7409.60 | -17.7 | V | 3.0 | 32.9 | 1.0 | -49.5 | -13.0 | -36.5 | |
| 3704.80 | -15.7 | H | 3.0 | 33.9 | 1.0 | -48.6 | -13.0 | -35.6 | |
| 5557.20 | -15.5 | H | 3.0 | 33.1 | 1.0 | -47.6 | -13.0 | -34.6 | |
| 7409.60 | -17.4 | H | 3.0 | 32.9 | 1.0 | -49.3 | -13.0 | -36.3 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -15.2 | V | 3.0 | 33.8 | 1.0 | -48.0 | -13.0 | -35.0 | |
| 5640.00 | -17.2 | V | 3.0 | 33.1 | 1.0 | -49.3 | -13.0 | -36.3 | |
| 7520.00 | -15.3 | V | 3.0 | 32.8 | 1.0 | -47.2 | -13.0 | -34.2 | |
| 3760.00 | -15.6 | H | 3.0 | 33.8 | 1.0 | -48.4 | -13.0 | -35.4 | |
| 5640.00 | -14.4 | H | 3.0 | 33.1 | 1.0 | -46.5 | -13.0 | -33.5 | |
| 7520.00 | -16.6 | H | 3.0 | 32.8 | 1.0 | -48.4 | -13.0 | -35.4 | |
| High Ch, 1907.6 | | | | | | | | | |
| 3815.20 | -13.6 | V | 3.0 | 33.7 | 1.0 | -46.3 | -13.0 | -33.3 | |
| 5722.80 | -14.0 | V | 3.0 | 33.1 | 1.0 | -46.1 | -13.0 | -33.1 | |
| 7630.40 | -15.5 | V | 3.0 | 32.8 | 1.0 | -47.3 | -13.0 | -34.3 | |
| 3815.20 | -13.9 | H | 3.0 | 33.7 | 1.0 | -46.7 | -13.0 | -33.7 | |
| 5722.80 | -13.8 | H | 3.0 | 33.1 | 1.0 | -45.9 | -13.0 | -32.9 | |
| 7630.40 | -15.4 | H | 3.0 | 32.8 | 1.0 | -47.2 | -13.0 | -34.2 | |

B2 HSDPA

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos EUT + AC Adapter + Headset
Location: Chamber C
Mode: HSDPA Band 2 Harmonics

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1852.4 | | | | | | | | | |
| 3704.80 | -15.0 | V | 3.0 | 33.9 | 1.0 | -47.9 | -13.0 | -34.9 | |
| 5557.20 | -18.8 | V | 3.0 | 33.1 | 1.0 | -50.9 | -13.0 | -37.9 | |
| 7409.60 | -15.5 | V | 3.0 | 32.9 | 1.0 | -47.3 | -13.0 | -34.3 | |
| 3704.80 | -14.3 | H | 3.0 | 33.9 | 1.0 | -47.2 | -13.0 | -34.2 | |
| 5557.20 | -15.2 | H | 3.0 | 33.1 | 1.0 | -47.3 | -13.0 | -34.3 | |
| 7409.60 | -17.5 | H | 3.0 | 32.9 | 1.0 | -49.3 | -13.0 | -36.3 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -13.2 | V | 3.0 | 33.8 | 1.0 | -46.0 | -13.0 | -33.0 | |
| 5640.00 | -18.6 | V | 3.0 | 33.1 | 1.0 | -50.7 | -13.0 | -37.7 | |
| 7520.00 | -16.6 | V | 3.0 | 32.8 | 1.0 | -48.4 | -13.0 | -35.4 | |
| 3760.00 | -12.7 | H | 3.0 | 33.8 | 1.0 | -45.5 | -13.0 | -32.5 | |
| 5640.00 | -12.2 | H | 3.0 | 33.1 | 1.0 | -44.3 | -13.0 | -31.3 | |
| 7520.00 | -17.5 | H | 3.0 | 32.8 | 1.0 | -49.4 | -13.0 | -36.4 | |
| High Ch, 1907.6 | | | | | | | | | |
| 3815.20 | -12.2 | V | 3.0 | 33.7 | 1.0 | -45.0 | -13.0 | -32.0 | |
| 5722.80 | -14.0 | V | 3.0 | 33.1 | 1.0 | -46.1 | -13.0 | -33.1 | |
| 7630.40 | -15.5 | V | 3.0 | 32.8 | 1.0 | -47.3 | -13.0 | -34.3 | |
| 3815.20 | -12.9 | H | 3.0 | 33.7 | 1.0 | -45.7 | -13.0 | -32.7 | |
| 5722.80 | -14.3 | H | 3.0 | 33.1 | 1.0 | -46.4 | -13.0 | -33.4 | |
| 7630.40 | -14.4 | H | 3.0 | 32.8 | 1.0 | -46.3 | -13.0 | -33.3 | |

B5 REL99

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: Rel99 Band 5 Harmonics

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 826.4 | | | | | | | | | |
| 1652.80 | -22.6 | V | 3.0 | 36.4 | 1.0 | -57.9 | -13.0 | -44.9 | |
| 2479.20 | -22.8 | V | 3.0 | 35.0 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 3305.60 | -21.9 | V | 3.0 | 34.3 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 1652.80 | -26.3 | H | 3.0 | 36.4 | 1.0 | -61.7 | -13.0 | -48.7 | |
| 2479.20 | -24.6 | H | 3.0 | 35.0 | 1.0 | -58.6 | -13.0 | -45.6 | |
| 3305.60 | -22.4 | H | 3.0 | 34.3 | 1.0 | -55.7 | -13.0 | -42.7 | |
| Mid Ch, 836.6 | | | | | | | | | |
| 1673.20 | -23.1 | V | 3.0 | 36.3 | 1.0 | -58.5 | -13.0 | -45.5 | |
| 2509.80 | -24.0 | V | 3.0 | 34.9 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 3346.40 | -21.4 | V | 3.0 | 34.2 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 1673.20 | -26.0 | H | 3.0 | 36.3 | 1.0 | -61.3 | -13.0 | -48.3 | |
| 2509.80 | -24.4 | H | 3.0 | 34.9 | 1.0 | -58.4 | -13.0 | -45.4 | |
| 3346.40 | -22.4 | H | 3.0 | 34.2 | 1.0 | -55.6 | -13.0 | -42.6 | |
| High Ch, 846.6 | | | | | | | | | |
| 1693.20 | -23.5 | V | 3.0 | 36.3 | 1.0 | -58.8 | -13.0 | -45.8 | |
| 2539.80 | -23.8 | V | 3.0 | 34.9 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 3386.40 | -22.2 | V | 3.0 | 34.2 | 1.0 | -55.3 | -13.0 | -42.3 | |
| 1693.20 | -25.9 | H | 3.0 | 36.3 | 1.0 | -61.2 | -13.0 | -48.2 | |
| 2539.80 | -24.2 | H | 3.0 | 34.9 | 1.0 | -58.1 | -13.0 | -45.1 | |
| 3386.40 | -19.6 | H | 3.0 | 34.2 | 1.0 | -52.8 | -13.0 | -39.8 | |

B5 HSDPA

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos EUT + AC Adapter + Headset
Location: Chamber C
Mode: HSDPA Band 5 Harmonics

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 826.4 | | | | | | | | | |
| 1652.80 | -24.4 | V | 3.0 | 36.4 | 1.0 | -59.8 | -13.0 | -46.8 | |
| 2479.20 | -23.5 | V | 3.0 | 35.0 | 1.0 | -57.4 | -13.0 | -44.4 | |
| 3305.60 | -21.2 | V | 3.0 | 34.3 | 1.0 | -54.5 | -13.0 | -41.5 | |
| 1652.80 | -23.5 | H | 3.0 | 36.4 | 1.0 | -58.9 | -13.0 | -45.9 | |
| 2479.20 | -23.6 | H | 3.0 | 35.0 | 1.0 | -57.6 | -13.0 | -44.6 | |
| 3305.60 | -21.7 | H | 3.0 | 34.3 | 1.0 | -55.0 | -13.0 | -42.0 | |
| Mid Ch, 836.6 | | | | | | | | | |
| 1673.20 | -25.9 | V | 3.0 | 36.3 | 1.0 | -61.2 | -13.0 | -48.2 | |
| 2509.80 | -23.5 | V | 3.0 | 34.9 | 1.0 | -57.5 | -13.0 | -44.5 | |
| 3346.40 | -21.9 | V | 3.0 | 34.2 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 1673.20 | -24.1 | H | 3.0 | 36.3 | 1.0 | -59.4 | -13.0 | -46.4 | |
| 2509.80 | -24.5 | H | 3.0 | 34.9 | 1.0 | -58.4 | -13.0 | -45.4 | |
| 3346.40 | -21.1 | H | 3.0 | 34.2 | 1.0 | -54.3 | -13.0 | -41.3 | |
| High Ch, 846.6 | | | | | | | | | |
| 1693.20 | -25.3 | V | 3.0 | 36.3 | 1.0 | -60.6 | -13.0 | -47.6 | |
| 2539.80 | -24.2 | V | 3.0 | 34.9 | 1.0 | -58.1 | -13.0 | -45.1 | |
| 3386.40 | -21.6 | V | 3.0 | 34.2 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 1693.20 | -22.5 | H | 3.0 | 36.3 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 2539.80 | -23.9 | H | 3.0 | 34.9 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 3386.40 | -19.7 | H | 3.0 | 34.2 | 1.0 | -52.9 | -13.0 | -39.9 | |

## LTE Band 2

### 1.4MHz QPSK

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** R.Z
**Configuration:** EUT w/AC+HS X postion
**Location:** Chamber B
**Mode:** LTE_QPSK Band 2 Harmonics, 1.4MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1850.7 | | | | | | | | | |
| 3701.40 | -14.5 | V | 3.0 | 38.4 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 5552.10 | -7.8 | V | 3.0 | 38.8 | 1.0 | -45.6 | -13.0 | -32.6 | |
| 7402.80 | -7.2 | V | 3.0 | 38.3 | 1.0 | -44.5 | -13.0 | -31.5 | |
| 3701.40 | -14.7 | H | 3.0 | 38.4 | 1.0 | -52.1 | -13.0 | -39.1 | |
| 5552.10 | -8.9 | H | 3.0 | 38.8 | 1.0 | -46.7 | -13.0 | -33.7 | |
| 7402.80 | -8.2 | H | 3.0 | 38.3 | 1.0 | -45.4 | -13.0 | -32.4 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -14.4 | V | 3.0 | 38.4 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 5640.00 | -10.4 | V | 3.0 | 38.7 | 1.0 | -48.2 | -13.0 | -35.2 | |
| 7520.00 | -9.3 | V | 3.0 | 38.2 | 1.0 | -46.5 | -13.0 | -33.5 | |
| 3760.00 | -10.6 | H | 3.0 | 38.4 | 1.0 | -48.0 | -13.0 | -35.0 | |
| 5640.00 | -10.7 | H | 3.0 | 38.7 | 1.0 | -48.5 | -13.0 | -35.5 | |
| 7520.00 | -10.4 | H | 3.0 | 38.2 | 1.0 | -47.6 | -13.0 | -34.6 | |
| High Ch, 1909.3 | | | | | | | | | |
| 3818.60 | -11.2 | V | 3.0 | 38.4 | 1.0 | -48.6 | -13.0 | -35.6 | |
| 5727.90 | -4.4 | V | 3.0 | 38.7 | 1.0 | -42.1 | -13.0 | -29.1 | |
| 7637.20 | -3.7 | V | 3.0 | 38.1 | 1.0 | -40.8 | -13.0 | -27.8 | |
| 3818.60 | -9.7 | H | 3.0 | 38.4 | 1.0 | -47.1 | -13.0 | -34.1 | |
| 5727.90 | -6.1 | H | 3.0 | 38.7 | 1.0 | -43.8 | -13.0 | -30.8 | |
| 7637.20 | -6.9 | H | 3.0 | 38.1 | 1.0 | -44.0 | -13.0 | -31.0 | |

### 1.4MHz 16QAM

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** R.Z
**Configuration:** EUT w/AC+HS X postion
**Location:** Chamber B
**Mode:** LTE_16QAM Band 2 Harmonics, 1.4MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1850.7 | | | | | | | | | |
| 3701.40 | -14.8 | V | 3.0 | 38.4 | 1.0 | -52.3 | -13.0 | -39.3 | |
| 5552.10 | -8.2 | V | 3.0 | 38.8 | 1.0 | -46.0 | -13.0 | -33.0 | |
| 7402.80 | -8.1 | V | 3.0 | 38.3 | 1.0 | -45.3 | -13.0 | -32.3 | |
| 3701.40 | -15.8 | H | 3.0 | 38.4 | 1.0 | -53.2 | -13.0 | -40.2 | |
| 5552.10 | -10.4 | H | 3.0 | 38.8 | 1.0 | -48.1 | -13.0 | -35.1 | |
| 7402.80 | -8.7 | H | 3.0 | 38.3 | 1.0 | -46.0 | -13.0 | -33.0 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -15.2 | V | 3.0 | 38.4 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 5640.00 | -10.3 | V | 3.0 | 38.7 | 1.0 | -48.0 | -13.0 | -35.0 | |
| 7520.00 | -9.0 | V | 3.0 | 38.2 | 1.0 | -46.2 | -13.0 | -33.2 | |
| 3760.00 | -11.6 | H | 3.0 | 38.4 | 1.0 | -49.1 | -13.0 | -36.1 | |
| 5640.00 | -11.3 | H | 3.0 | 38.7 | 1.0 | -49.0 | -13.0 | -36.0 | |
| 7520.00 | -11.2 | H | 3.0 | 38.2 | 1.0 | -48.4 | -13.0 | -35.4 | |
| High Ch, 1909.3 | | | | | | | | | |
| 3818.60 | -10.9 | V | 3.0 | 38.4 | 1.0 | -48.3 | -13.0 | -35.3 | |
| 5727.90 | -3.4 | V | 3.0 | 38.7 | 1.0 | -41.1 | -13.0 | -28.1 | |
| 7637.20 | -2.5 | V | 3.0 | 38.1 | 1.0 | -39.6 | -13.0 | -26.6 | |
| 3818.60 | -10.9 | H | 3.0 | 38.4 | 1.0 | -48.3 | -13.0 | -35.3 | |
| 5727.90 | -6.7 | H | 3.0 | 38.7 | 1.0 | -44.4 | -13.0 | -31.4 | |
| 7637.20 | -2.4 | H | 3.0 | 38.1 | 1.0 | -39.6 | -13.0 | -26.6 | |

### 3MHz QPSK

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** R.Z
**Configuration:** EUT w/AC+HS X postion
**Location:** Chamber B
**Mode:** LTE_QPSK Band 2 Harmonics, 3MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1851.5 | | | | | | | | | |
| 3703.00 | -15.1 | V | 3.0 | 38.4 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 5554.50 | -11.4 | V | 3.0 | 38.8 | 1.0 | -49.2 | -13.0 | -36.2 | |
| 7406.00 | -13.3 | V | 3.0 | 38.3 | 1.0 | -50.6 | -13.0 | -37.6 | |
| 3703.00 | -14.5 | H | 3.0 | 38.4 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 5554.50 | -11.7 | H | 3.0 | 38.8 | 1.0 | -49.4 | -13.0 | -36.4 | |
| 7406.00 | -14.9 | H | 3.0 | 38.3 | 1.0 | -52.2 | -13.0 | -39.2 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -14.5 | V | 3.0 | 38.4 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 5640.00 | -9.6 | V | 3.0 | 38.7 | 1.0 | -47.3 | -13.0 | -34.3 | |
| 7520.00 | -9.7 | V | 3.0 | 38.2 | 1.0 | -46.9 | -13.0 | -33.9 | |
| 3760.00 | -12.8 | H | 3.0 | 38.4 | 1.0 | -50.2 | -13.0 | -37.2 | |
| 5640.00 | -12.4 | H | 3.0 | 38.7 | 1.0 | -50.1 | -13.0 | -37.1 | |
| 7520.00 | -11.8 | H | 3.0 | 38.2 | 1.0 | -48.9 | -13.0 | -35.9 | |
| High Ch, 1908.5 | | | | | | | | | |
| 3817.00 | -13.0 | V | 3.0 | 38.4 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 5725.50 | -6.2 | V | 3.0 | 38.7 | 1.0 | -43.9 | -13.0 | -30.9 | |
| 7634.00 | -8.0 | V | 3.0 | 38.1 | 1.0 | -45.2 | -13.0 | -32.2 | |
| 3817.00 | -13.0 | H | 3.0 | 38.4 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 5725.50 | -11.2 | H | 3.0 | 38.7 | 1.0 | -48.9 | -13.0 | -35.9 | |
| 7634.00 | -10.4 | H | 3.0 | 38.1 | 1.0 | -47.5 | -13.0 | -34.5 | |

### 3MHz 16QAM

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** R.Z
**Configuration:** EUT w/AC+HS X postion
**Location:** Chamber B
**Mode:** LTE_16QAM Band 2 Harmonics, 3MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1851.5 | | | | | | | | | |
| 3703.00 | -15.5 | V | 3.0 | 38.4 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 5554.50 | -12.5 | V | 3.0 | 38.8 | 1.0 | -50.3 | -13.0 | -37.3 | |
| 7406.00 | -14.0 | V | 3.0 | 38.3 | 1.0 | -51.2 | -13.0 | -38.2 | |
| 3703.00 | -15.1 | H | 3.0 | 38.4 | 1.0 | -52.5 | -13.0 | -39.5 | |
| 5554.50 | -12.9 | H | 3.0 | 38.8 | 1.0 | -50.6 | -13.0 | -37.6 | |
| 7406.00 | -15.2 | H | 3.0 | 38.3 | 1.0 | -52.4 | -13.0 | -39.4 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -14.2 | V | 3.0 | 38.4 | 1.0 | -51.6 | -13.0 | -38.6 | |
| 5640.00 | -10.2 | V | 3.0 | 38.7 | 1.0 | -48.0 | -13.0 | -35.0 | |
| 7520.00 | -9.9 | V | 3.0 | 38.2 | 1.0 | -47.1 | -13.0 | -34.1 | |
| 3760.00 | -13.7 | H | 3.0 | 38.4 | 1.0 | -51.2 | -13.0 | -38.2 | |
| 5640.00 | -13.2 | H | 3.0 | 38.7 | 1.0 | -50.9 | -13.0 | -37.9 | |
| 7520.00 | -10.4 | H | 3.0 | 38.2 | 1.0 | -47.6 | -13.0 | -34.6 | |
| High Ch, 1908.5 | | | | | | | | | |
| 3817.00 | -14.0 | V | 3.0 | 38.4 | 1.0 | -51.4 | -13.0 | -38.4 | |
| 5725.50 | -7.1 | V | 3.0 | 38.7 | 1.0 | -44.8 | -13.0 | -31.8 | |
| 7634.00 | -9.6 | V | 3.0 | 38.1 | 1.0 | -46.7 | -13.0 | -33.7 | |
| 3817.00 | -13.7 | H | 3.0 | 38.4 | 1.0 | -51.1 | -13.0 | -38.1 | |
| 5725.50 | -11.7 | H | 3.0 | 38.7 | 1.0 | -49.5 | -13.0 | -36.5 | |
| 7634.00 | -11.1 | H | 3.0 | 38.1 | 1.0 | -48.3 | -13.0 | -35.3 | |

### 5MHz QPSK

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** R.Z
**Configuration:** EUT w/AC+HS X postion
**Location:** Chamber B
**Mode:** LTE_QPSK Band 2 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1852.5 | | | | | | | | | |
| 3705.00 | -15.9 | V | 3.0 | 38.4 | 1.0 | -53.3 | -13.0 | -40.3 | |
| 5557.50 | -10.7 | V | 3.0 | 38.8 | 1.0 | -48.5 | -13.0 | -35.5 | |
| 7410.00 | -13.3 | V | 3.0 | 38.3 | 1.0 | -50.5 | -13.0 | -37.5 | |
| 3705.00 | -14.8 | H | 3.0 | 38.4 | 1.0 | -52.2 | -13.0 | -39.2 | |
| 5557.50 | -13.5 | H | 3.0 | 38.8 | 1.0 | -51.2 | -13.0 | -38.2 | |
| 7410.00 | -15.9 | H | 3.0 | 38.3 | 1.0 | -53.1 | -13.0 | -40.1 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -14.5 | V | 3.0 | 38.4 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 5640.00 | -12.1 | V | 3.0 | 38.7 | 1.0 | -49.8 | -13.0 | -36.8 | |
| 7520.00 | -11.3 | V | 3.0 | 38.2 | 1.0 | -48.5 | -13.0 | -35.5 | |
| 3760.00 | -14.0 | H | 3.0 | 38.4 | 1.0 | -51.4 | -13.0 | -38.4 | |
| 5640.00 | -13.7 | H | 3.0 | 38.7 | 1.0 | -51.4 | -13.0 | -38.4 | |
| 7520.00 | -12.7 | H | 3.0 | 38.2 | 1.0 | -49.9 | -13.0 | -36.9 | |
| High Ch, 1907.5 | | | | | | | | | |
| 3815.00 | -13.0 | V | 3.0 | 38.4 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 5722.50 | -9.7 | V | 3.0 | 38.7 | 1.0 | -47.5 | -13.0 | -34.5 | |
| 7630.00 | -8.8 | V | 3.0 | 38.1 | 1.0 | -45.9 | -13.0 | -32.9 | |
| 3815.00 | -13.4 | H | 3.0 | 38.4 | 1.0 | -50.8 | -13.0 | -37.8 | |
| 5722.50 | -11.6 | H | 3.0 | 38.7 | 1.0 | -49.3 | -13.0 | -36.3 | |
| 7630.00 | -11.9 | H | 3.0 | 38.1 | 1.0 | -49.1 | -13.0 | -36.1 | |

### 5MHz 16QAM

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/20/2016
**Test Engineer:** R.Z
**Configuration:** EUT w/AC+HS X postion
**Location:** Chamber B
**Mode:** LTE_16QAM Band 2 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1852.5 | | | | | | | | | |
| 3705.00 | -16.7 | V | 3.0 | 38.4 | 1.0 | -54.2 | -13.0 | -41.2 | |
| 5557.50 | -12.0 | V | 3.0 | 38.8 | 1.0 | -49.8 | -13.0 | -36.8 | |
| 7410.00 | -13.9 | V | 3.0 | 38.3 | 1.0 | -51.2 | -13.0 | -38.2 | |
| 3705.00 | -16.2 | H | 3.0 | 38.4 | 1.0 | -53.6 | -13.0 | -40.6 | |
| 5557.50 | -14.0 | H | 3.0 | 38.8 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 7410.00 | -15.7 | H | 3.0 | 38.3 | 1.0 | -53.0 | -13.0 | -40.0 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -14.9 | V | 3.0 | 38.4 | 1.0 | -52.3 | -13.0 | -39.3 | |
| 5640.00 | -11.2 | V | 3.0 | 38.7 | 1.0 | -48.9 | -13.0 | -35.9 | |
| 7520.00 | -11.0 | V | 3.0 | 38.2 | 1.0 | -48.2 | -13.0 | -35.2 | |
| 3760.00 | -14.2 | H | 3.0 | 38.4 | 1.0 | -51.6 | -13.0 | -38.6 | |
| 5640.00 | -14.2 | H | 3.0 | 38.7 | 1.0 | -52.0 | -13.0 | -39.0 | |
| 7520.00 | -13.2 | H | 3.0 | 38.2 | 1.0 | -50.4 | -13.0 | -37.4 | |
| High Ch, 1907.5 | | | | | | | | | |
| 3815.00 | -13.6 | V | 3.0 | 38.4 | 1.0 | -51.0 | -13.0 | -38.0 | |
| 5722.50 | -9.9 | V | 3.0 | 38.7 | 1.0 | -47.6 | -13.0 | -34.6 | |
| 7630.00 | -9.0 | V | 3.0 | 38.1 | 1.0 | -46.1 | -13.0 | -33.1 | |
| 3815.00 | -13.3 | H | 3.0 | 38.4 | 1.0 | -50.7 | -13.0 | -37.7 | |
| 5722.50 | -12.2 | H | 3.0 | 38.7 | 1.0 | -50.0 | -13.0 | -37.0 | |
| 7630.00 | -12.5 | H | 3.0 | 38.1 | 1.0 | -49.6 | -13.0 | -36.6 | |

10MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/20/2016
Test Engineer: R.Z
Configuration: EUT w/AC+HS X postion
Location: Chamber B
Mode: LTE_QPSK Band 2 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1855 | | | | | | | | | |
| 3710.00 | -16.5 | V | 3.0 | 38.4 | 1.0 | -54.0 | -13.0 | -41.0 | |
| 5565.00 | -14.7 | V | 3.0 | 38.8 | 1.0 | -52.5 | -13.0 | -39.5 | |
| 7420.00 | -13.4 | V | 3.0 | 38.3 | 1.0 | -50.7 | -13.0 | -37.7 | |
| 3710.00 | -15.5 | H | 3.0 | 38.4 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 5565.00 | -15.2 | H | 3.0 | 38.8 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 7420.00 | -15.2 | H | 3.0 | 38.3 | 1.0 | -52.4 | -13.0 | -39.4 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -14.8 | V | 3.0 | 38.4 | 1.0 | -52.3 | -13.0 | -39.3 | |
| 5640.00 | -12.7 | V | 3.0 | 38.7 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 7520.00 | -14.3 | V | 3.0 | 38.2 | 1.0 | -51.5 | -13.0 | -38.5 | |
| 3760.00 | -15.2 | H | 3.0 | 38.4 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 5640.00 | -15.8 | H | 3.0 | 38.7 | 1.0 | -53.5 | -13.0 | -40.5 | |
| 7520.00 | -14.6 | H | 3.0 | 38.2 | 1.0 | -51.8 | -13.0 | -38.8 | |
| High Ch, 1905 | | | | | | | | | |
| 3810.00 | -14.0 | V | 3.0 | 38.4 | 1.0 | -51.4 | -13.0 | -38.4 | |
| 5715.00 | -11.7 | V | 3.0 | 38.7 | 1.0 | -49.4 | -13.0 | -36.4 | |
| 7620.00 | -10.5 | V | 3.0 | 38.1 | 1.0 | -47.6 | -13.0 | -34.6 | |
| 3810.00 | -14.4 | H | 3.0 | 38.4 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 5715.00 | -13.5 | H | 3.0 | 38.7 | 1.0 | -51.3 | -13.0 | -38.3 | |
| 7620.00 | -12.4 | H | 3.0 | 38.1 | 1.0 | -49.6 | -13.0 | -36.6 | |

10MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/20/2016
Test Engineer: R.Z
Configuration: EUT w/AC+HS X postion
Location: Chamber B
Mode: LTE_QPSK Band 2 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1855 | | | | | | | | | |
| 3710.00 | -17.3 | V | 3.0 | 38.4 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 5565.00 | -15.2 | V | 3.0 | 38.8 | 1.0 | -53.0 | -13.0 | -40.0 | |
| 7420.00 | -12.5 | V | 3.0 | 38.3 | 1.0 | -49.7 | -13.0 | -36.7 | |
| 3710.00 | -16.2 | H | 3.0 | 38.4 | 1.0 | -53.6 | -13.0 | -40.6 | |
| 5565.00 | -15.4 | H | 3.0 | 38.8 | 1.0 | -53.1 | -13.0 | -40.1 | |
| 7420.00 | -15.5 | H | 3.0 | 38.3 | 1.0 | -52.7 | -13.0 | -39.7 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -15.1 | V | 3.0 | 38.4 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 5640.00 | -14.1 | V | 3.0 | 38.7 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 7520.00 | -11.3 | V | 3.0 | 38.2 | 1.0 | -48.5 | -13.0 | -35.5 | |
| 3760.00 | -16.3 | H | 3.0 | 38.4 | 1.0 | -53.7 | -13.0 | -40.7 | |
| 5640.00 | -15.7 | H | 3.0 | 38.7 | 1.0 | -53.5 | -13.0 | -40.5 | |
| 7520.00 | -14.7 | H | 3.0 | 38.2 | 1.0 | -51.9 | -13.0 | -38.9 | |
| High Ch, 1905 | | | | | | | | | |
| 3810.00 | -14.4 | V | 3.0 | 38.4 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 5715.00 | -12.3 | V | 3.0 | 38.7 | 1.0 | -50.0 | -13.0 | -37.0 | |
| 7620.00 | -12.0 | V | 3.0 | 38.1 | 1.0 | -49.1 | -13.0 | -36.1 | |
| 3810.00 | -15.5 | H | 3.0 | 38.4 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 5715.00 | -14.9 | H | 3.0 | 38.7 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 7620.00 | -13.7 | H | 3.0 | 38.1 | 1.0 | -50.8 | -13.0 | -37.8 | |

15MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/20/2016
Test Engineer: R.Z
Configuration: EUT w/AC+HS X postion
Location: Chamber B
Mode: LTE_QPSK Band 2 Harmonics, 15MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1857.5 | | | | | | | | | |
| 3715.00 | -17.3 | V | 3.0 | 38.4 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 5572.50 | -13.1 | V | 3.0 | 38.8 | 1.0 | -50.9 | -13.0 | -37.9 | |
| 7430.00 | -12.6 | V | 3.0 | 38.3 | 1.0 | -49.8 | -13.0 | -36.8 | |
| 3715.00 | -15.4 | H | 3.0 | 38.4 | 1.0 | -52.8 | -13.0 | -39.8 | |
| 5572.50 | -16.2 | H | 3.0 | 38.8 | 1.0 | -53.9 | -13.0 | -40.9 | |
| 7430.00 | -15.1 | H | 3.0 | 38.3 | 1.0 | -52.4 | -13.0 | -39.4 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -15.9 | V | 3.0 | 38.4 | 1.0 | -53.3 | -13.0 | -40.3 | |
| 5640.00 | -16.2 | V | 3.0 | 38.7 | 1.0 | -54.0 | -13.0 | -41.0 | |
| 7520.00 | -11.6 | V | 3.0 | 38.2 | 1.0 | -48.8 | -13.0 | -35.8 | |
| 3760.00 | -16.3 | H | 3.0 | 38.4 | 1.0 | -53.7 | -13.0 | -40.7 | |
| 5640.00 | -15.0 | H | 3.0 | 38.7 | 1.0 | -52.8 | -13.0 | -39.8 | |
| 7520.00 | -13.3 | H | 3.0 | 38.2 | 1.0 | -50.5 | -13.0 | -37.5 | |
| High Ch, 1902.5 | | | | | | | | | |
| 3805.00 | -15.5 | V | 3.0 | 38.4 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 5707.50 | -13.2 | V | 3.0 | 38.7 | 1.0 | -51.0 | -13.0 | -38.0 | |
| 7610.00 | -10.8 | V | 3.0 | 38.1 | 1.0 | -47.9 | -13.0 | -34.9 | |
| 3805.00 | -14.4 | H | 3.0 | 38.4 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 5707.50 | -14.3 | H | 3.0 | 38.7 | 1.0 | -52.0 | -13.0 | -39.0 | |
| 7610.00 | -14.0 | H | 3.0 | 38.1 | 1.0 | -51.2 | -13.0 | -38.2 | |

15MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/20/2016
Test Engineer: R.Z
Configuration: EUT w/AC+HS X postion
Location: Chamber B
Mode: LTE_16QAM Band 2 Harmonics, 15MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1857.5 | | | | | | | | | |
| 3715.00 | -17.4 | V | 3.0 | 38.4 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 5572.50 | -13.9 | V | 3.0 | 38.8 | 1.0 | -51.7 | -13.0 | -38.7 | |
| 7430.00 | -13.9 | V | 3.0 | 38.3 | 1.0 | -51.1 | -13.0 | -38.1 | |
| 3715.00 | -16.1 | H | 3.0 | 38.4 | 1.0 | -53.6 | -13.0 | -40.6 | |
| 5572.50 | -17.0 | H | 3.0 | 38.8 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 7430.00 | -15.5 | H | 3.0 | 38.3 | 1.0 | -52.8 | -13.0 | -39.8 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -15.6 | V | 3.0 | 38.4 | 1.0 | -53.0 | -13.0 | -40.0 | |
| 5640.00 | -14.1 | V | 3.0 | 38.7 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 7520.00 | -15.8 | V | 3.0 | 38.2 | 1.0 | -53.0 | -13.0 | -40.0 | |
| 3760.00 | -15.9 | H | 3.0 | 38.4 | 1.0 | -53.3 | -13.0 | -40.3 | |
| 5640.00 | -15.8 | H | 3.0 | 38.7 | 1.0 | -53.5 | -13.0 | -40.5 | |
| 7520.00 | -15.8 | H | 3.0 | 38.2 | 1.0 | -53.0 | -13.0 | -40.0 | |
| High Ch, 1902.5 | | | | | | | | | |
| 3805.00 | -15.2 | V | 3.0 | 38.4 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 5707.50 | -13.3 | V | 3.0 | 38.7 | 1.0 | -51.1 | -13.0 | -38.1 | |
| 7610.00 | -12.6 | V | 3.0 | 38.1 | 1.0 | -49.8 | -13.0 | -36.8 | |
| 3805.00 | -15.3 | H | 3.0 | 38.4 | 1.0 | -52.7 | -13.0 | -39.7 | |
| 5707.50 | -15.0 | H | 3.0 | 38.7 | 1.0 | -52.8 | -13.0 | -39.8 | |
| 7610.00 | -13.7 | H | 3.0 | 38.1 | 1.0 | -50.9 | -13.0 | -37.9 | |

20MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/20/2016
Test Engineer: R.Z
Configuration: EUT w/AC+HS X postion
Location: Chamber B
Mode: LTE_QPSK Band 2 Harmonics, 20MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1860 | | | | | | | | | |
| 3720.00 | -16.7 | V | 3.0 | 38.4 | 1.0 | -54.1 | -13.0 | -41.1 | |
| 5580.00 | -14.2 | V | 3.0 | 38.8 | 1.0 | -52.0 | -13.0 | -39.0 | |
| 7440.00 | -13.1 | V | 3.0 | 38.2 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 3720.00 | -18.3 | H | 3.0 | 38.4 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 5580.00 | -17.0 | H | 3.0 | 38.8 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 7440.00 | -15.1 | H | 3.0 | 38.2 | 1.0 | -52.4 | -13.0 | -39.4 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -18.1 | V | 3.0 | 38.4 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 5640.00 | -15.2 | V | 3.0 | 38.7 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 7520.00 | -13.2 | V | 3.0 | 38.2 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 3760.00 | -16.5 | H | 3.0 | 38.4 | 1.0 | -53.9 | -13.0 | -40.9 | |
| 5640.00 | -17.8 | H | 3.0 | 38.7 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 7520.00 | -14.6 | H | 3.0 | 38.2 | 1.0 | -51.8 | -13.0 | -38.8 | |
| High Ch, 1900 | | | | | | | | | |
| 3800.00 | -16.9 | V | 3.0 | 38.4 | 1.0 | -54.3 | -13.0 | -41.3 | |
| 5700.00 | -14.9 | V | 3.0 | 38.7 | 1.0 | -52.7 | -13.0 | -39.7 | |
| 7600.00 | -12.1 | V | 3.0 | 38.2 | 1.0 | -49.2 | -13.0 | -36.2 | |
| 3800.00 | -14.9 | H | 3.0 | 38.4 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 5700.00 | -17.1 | H | 3.0 | 38.7 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 7600.00 | -13.1 | H | 3.0 | 38.2 | 1.0 | -50.2 | -13.0 | -37.2 | |

20MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/20/2016
Test Engineer: R.Z
Configuration: EUT w/AC+HS X postion
Location: Chamber B
Mode: LTE_16QAM Band 2 Harmonics, 20MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1860 | | | | | | | | | |
| 3720.00 | -17.3 | V | 3.0 | 38.4 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 5580.00 | -14.7 | V | 3.0 | 38.8 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 7440.00 | -14.7 | V | 3.0 | 38.2 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 3720.00 | -18.7 | H | 3.0 | 38.4 | 1.0 | -56.1 | -13.0 | -43.1 | |
| 5580.00 | -17.4 | H | 3.0 | 38.8 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 7440.00 | -15.5 | H | 3.0 | 38.2 | 1.0 | -52.8 | -13.0 | -39.8 | |
| Mid Ch, 1880 | | | | | | | | | |
| 3760.00 | -18.3 | V | 3.0 | 38.4 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 5640.00 | -16.9 | V | 3.0 | 38.7 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 7520.00 | -15.3 | V | 3.0 | 38.2 | 1.0 | -52.5 | -13.0 | -39.5 | |
| 3760.00 | -17.3 | H | 3.0 | 38.4 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 5640.00 | -17.3 | H | 3.0 | 38.7 | 1.0 | -55.1 | -13.0 | -42.1 | |
| 7520.00 | -15.3 | H | 3.0 | 38.2 | 1.0 | -52.5 | -13.0 | -39.5 | |
| High Ch, 1900 | | | | | | | | | |
| 3800.00 | -18.0 | V | 3.0 | 38.4 | 1.0 | -55.4 | -13.0 | -42.4 | |
| 5700.00 | -16.0 | V | 3.0 | 38.7 | 1.0 | -53.7 | -13.0 | -40.7 | |
| 7600.00 | -12.3 | V | 3.0 | 38.2 | 1.0 | -49.5 | -13.0 | -36.5 | |
| 3800.00 | -16.5 | H | 3.0 | 38.4 | 1.0 | -53.9 | -13.0 | -40.9 | |
| 5700.00 | -17.8 | H | 3.0 | 38.7 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 7600.00 | -13.4 | H | 3.0 | 38.2 | 1.0 | -50.6 | -13.0 | -37.6 | |

## LTE Band 4

### 1.4MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R.Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_QPSK Band 4 Harmonics, 1.4MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1710.7 | | | | | | | | | |
| 3421.40 | -14.2 | V | 3.0 | 38.5 | 1.0 | -51.7 | -13.0 | -38.7 | |
| 5132.10 | -7.8 | V | 3.0 | 38.8 | 1.0 | -45.6 | -13.0 | -32.6 | |
| 6842.80 | -2.5 | V | 3.0 | 38.5 | 1.0 | -40.1 | -13.0 | -27.1 | |
| 3421.40 | -14.9 | H | 3.0 | 38.5 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 5132.10 | -10.9 | H | 3.0 | 38.8 | 1.0 | -48.7 | -13.0 | -35.7 | |
| 6842.80 | -9.5 | H | 3.0 | 38.5 | 1.0 | -47.0 | -13.0 | -34.0 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -17.7 | V | 3.0 | 38.5 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 5197.50 | -6.8 | V | 3.0 | 38.8 | 1.0 | -44.6 | -13.0 | -31.6 | |
| 6930.00 | 1.0 | V | 3.0 | 38.5 | 1.0 | -36.5 | -13.0 | -23.5 | |
| 3465.00 | -16.0 | H | 3.0 | 38.5 | 1.0 | -53.5 | -13.0 | -40.5 | |
| 5197.50 | -11.2 | H | 3.0 | 38.8 | 1.0 | -49.0 | -13.0 | -36.0 | |
| 6930.00 | -0.7 | H | 3.0 | 38.5 | 1.0 | -38.2 | -13.0 | -25.2 | |
| High Ch, 1754.3 | | | | | | | | | |
| 3508.60 | -18.1 | V | 3.0 | 38.5 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 5262.90 | -4.9 | V | 3.0 | 38.8 | 1.0 | -42.7 | -13.0 | -29.7 | |
| 7017.20 | 1.5 | V | 3.0 | 38.5 | 1.0 | -36.0 | -13.0 | -23.0 | |
| 3508.60 | -16.5 | H | 3.0 | 38.5 | 1.0 | -53.9 | -13.0 | -40.9 | |
| 5262.90 | -7.9 | H | 3.0 | 38.8 | 1.0 | -45.7 | -13.0 | -32.7 | |
| 7017.20 | -2.7 | H | 3.0 | 38.5 | 1.0 | -40.2 | -13.0 | -27.2 | |

### 1.4MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R.Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_16QAM Band 4 Harmonics, 1.4MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1710.7 | | | | | | | | | |
| 3421.40 | -15.5 | V | 3.0 | 38.5 | 1.0 | -53.0 | -13.0 | -40.0 | |
| 5132.10 | -8.2 | V | 3.0 | 38.8 | 1.0 | -46.0 | -13.0 | -33.0 | |
| 6842.80 | -2.9 | V | 3.0 | 38.5 | 1.0 | -40.5 | -13.0 | -27.5 | |
| 3421.40 | -14.0 | H | 3.0 | 38.5 | 1.0 | -51.5 | -13.0 | -38.5 | |
| 5132.10 | -11.5 | H | 3.0 | 38.8 | 1.0 | -49.3 | -13.0 | -36.3 | |
| 6842.80 | -9.3 | H | 3.0 | 38.5 | 1.0 | -46.8 | -13.0 | -33.8 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -15.4 | V | 3.0 | 38.5 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 5197.50 | -7.5 | V | 3.0 | 38.8 | 1.0 | -45.4 | -13.0 | -32.4 | |
| 6930.00 | -0.5 | V | 3.0 | 38.5 | 1.0 | -38.0 | -13.0 | -25.0 | |
| 3465.00 | -15.2 | H | 3.0 | 38.5 | 1.0 | -52.7 | -13.0 | -39.7 | |
| 5197.50 | -12.5 | H | 3.0 | 38.8 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 6930.00 | -6.7 | H | 3.0 | 38.5 | 1.0 | -44.2 | -13.0 | -31.2 | |
| High Ch, 1754.3 | | | | | | | | | |
| 3508.60 | -16.1 | V | 3.0 | 38.5 | 1.0 | -53.6 | -13.0 | -40.6 | |
| 5262.90 | -5.8 | V | 3.0 | 38.8 | 1.0 | -43.6 | -13.0 | -30.6 | |
| 7017.20 | -0.2 | V | 3.0 | 38.5 | 1.0 | -37.7 | -13.0 | -24.7 | |
| 3508.60 | -15.6 | H | 3.0 | 38.5 | 1.0 | -53.1 | -13.0 | -40.1 | |
| 5262.90 | -8.5 | H | 3.0 | 38.8 | 1.0 | -46.3 | -13.0 | -33.3 | |
| 7017.20 | -4.5 | H | 3.0 | 38.5 | 1.0 | -42.0 | -13.0 | -29.0 | |

### 3MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R.Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_QPSK Band 4 Harmonics, 3MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1711.5 | | | | | | | | | |
| 3423.00 | -15.4 | V | 3.0 | 38.5 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 5134.50 | -11.1 | V | 3.0 | 38.8 | 1.0 | -48.9 | -13.0 | -35.9 | |
| 6846.00 | -5.1 | V | 3.0 | 38.5 | 1.0 | -42.6 | -13.0 | -29.6 | |
| 3423.00 | -15.9 | H | 3.0 | 38.5 | 1.0 | -53.4 | -13.0 | -40.4 | |
| 5134.50 | -12.6 | H | 3.0 | 38.8 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 6846.00 | -10.7 | H | 3.0 | 38.5 | 1.0 | -48.2 | -13.0 | -35.2 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -18.2 | V | 3.0 | 38.5 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 5197.50 | -10.1 | V | 3.0 | 38.8 | 1.0 | -47.9 | -13.0 | -34.9 | |
| 6930.00 | -3.0 | V | 3.0 | 38.5 | 1.0 | -40.5 | -13.0 | -27.5 | |
| 3465.00 | -17.9 | H | 3.0 | 38.5 | 1.0 | -55.4 | -13.0 | -42.4 | |
| 5197.50 | -14.1 | H | 3.0 | 38.8 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 6930.00 | -6.3 | H | 3.0 | 38.5 | 1.0 | -43.8 | -13.0 | -30.8 | |
| High Ch, 1753.5 | | | | | | | | | |
| 3507.00 | -20.3 | V | 3.0 | 38.5 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 5260.50 | -8.3 | V | 3.0 | 38.8 | 1.0 | -46.2 | -13.0 | -33.2 | |
| 7014.00 | -5.2 | V | 3.0 | 38.5 | 1.0 | -42.7 | -13.0 | -29.7 | |
| 3507.00 | -18.4 | H | 3.0 | 38.5 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 5260.50 | -11.6 | H | 3.0 | 38.8 | 1.0 | -49.4 | -13.0 | -36.4 | |
| 7014.00 | -7.3 | H | 3.0 | 38.5 | 1.0 | -44.8 | -13.0 | -31.8 | |

### 3MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R.Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_16QAM Band 4 Harmonics, 3MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1711.5 | | | | | | | | | |
| 3423.00 | -17.7 | V | 3.0 | 38.5 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 5134.50 | -11.3 | V | 3.0 | 38.8 | 1.0 | -49.1 | -13.0 | -36.1 | |
| 6846.00 | -4.6 | V | 3.0 | 38.5 | 1.0 | -42.2 | -13.0 | -29.2 | |
| 3423.00 | -13.8 | H | 3.0 | 38.5 | 1.0 | -51.3 | -13.0 | -38.3 | |
| 5134.50 | -14.3 | H | 3.0 | 38.8 | 1.0 | -52.1 | -13.0 | -39.1 | |
| 6846.00 | -11.6 | H | 3.0 | 38.5 | 1.0 | -49.1 | -13.0 | -36.1 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -19.3 | V | 3.0 | 38.5 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 5197.50 | -10.1 | V | 3.0 | 38.8 | 1.0 | -47.9 | -13.0 | -34.9 | |
| 6930.00 | -4.3 | V | 3.0 | 38.5 | 1.0 | -41.8 | -13.0 | -28.8 | |
| 3465.00 | -16.7 | H | 3.0 | 38.5 | 1.0 | -54.2 | -13.0 | -41.2 | |
| 5197.50 | -14.4 | H | 3.0 | 38.8 | 1.0 | -52.2 | -13.0 | -39.2 | |
| 6930.00 | -10.7 | H | 3.0 | 38.5 | 1.0 | -48.2 | -13.0 | -35.2 | |
| High Ch, 1753.5 | | | | | | | | | |
| 3507.00 | -17.3 | V | 3.0 | 38.5 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 5260.50 | -10.1 | V | 3.0 | 38.8 | 1.0 | -47.9 | -13.0 | -34.9 | |
| 7014.00 | -5.7 | V | 3.0 | 38.5 | 1.0 | -43.2 | -13.0 | -30.2 | |
| 3507.00 | -19.8 | H | 3.0 | 38.5 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 5260.50 | -13.9 | H | 3.0 | 38.8 | 1.0 | -51.7 | -13.0 | -38.7 | |
| 7014.00 | -11.3 | H | 3.0 | 38.5 | 1.0 | -48.8 | -13.0 | -35.8 | |

### 5MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R.Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_QPSK Band 4 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1712.5 | | | | | | | | | |
| 3425.00 | -17.3 | V | 3.0 | 38.5 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 5137.50 | -12.2 | V | 3.0 | 38.8 | 1.0 | -50.0 | -13.0 | -37.0 | |
| 6850.00 | -6.0 | V | 3.0 | 38.5 | 1.0 | -43.5 | -13.0 | -30.5 | |
| 3425.00 | -18.3 | H | 3.0 | 38.5 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 5137.50 | -14.8 | H | 3.0 | 38.8 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 6850.00 | -9.1 | H | 3.0 | 38.5 | 1.0 | -46.7 | -13.0 | -33.7 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -17.3 | V | 3.0 | 38.5 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 5197.50 | -10.7 | V | 3.0 | 38.8 | 1.0 | -48.6 | -13.0 | -35.6 | |
| 6930.00 | -6.0 | V | 3.0 | 38.5 | 1.0 | -43.5 | -13.0 | -30.5 | |
| 3465.00 | -17.4 | H | 3.0 | 38.5 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 5197.50 | -13.9 | H | 3.0 | 38.8 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 6930.00 | -7.6 | H | 3.0 | 38.5 | 1.0 | -45.1 | -13.0 | -32.1 | |
| High Ch, 1752.5 | | | | | | | | | |
| 3505.00 | -19.7 | V | 3.0 | 38.5 | 1.0 | -57.2 | -13.0 | -44.2 | |
| 5257.50 | -9.0 | V | 3.0 | 38.8 | 1.0 | -46.8 | -13.0 | -33.8 | |
| 7010.00 | -5.6 | V | 3.0 | 38.5 | 1.0 | -43.1 | -13.0 | -30.1 | |
| 3505.00 | -19.3 | H | 3.0 | 38.5 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 5257.50 | -13.1 | H | 3.0 | 38.8 | 1.0 | -50.9 | -13.0 | -37.9 | |
| 7010.00 | -8.4 | H | 3.0 | 38.5 | 1.0 | -45.9 | -13.0 | -32.9 | |

### 5MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R.Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_16QAM Band 4 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1712.5 | | | | | | | | | |
| 3425.00 | -18.2 | V | 3.0 | 38.5 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 5137.50 | -14.8 | V | 3.0 | 38.8 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 6850.00 | -7.5 | V | 3.0 | 38.5 | 1.0 | -45.1 | -13.0 | -32.1 | |
| 3425.00 | -17.3 | H | 3.0 | 38.5 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 5137.50 | -16.1 | H | 3.0 | 38.8 | 1.0 | -53.9 | -13.0 | -40.9 | |
| 6850.00 | -14.0 | H | 3.0 | 38.5 | 1.0 | -51.5 | -13.0 | -38.5 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -19.5 | V | 3.0 | 38.5 | 1.0 | -57.0 | -13.0 | -44.0 | |
| 5197.50 | -9.6 | V | 3.0 | 38.8 | 1.0 | -47.5 | -13.0 | -34.5 | |
| 6930.00 | -7.2 | V | 3.0 | 38.5 | 1.0 | -44.7 | -13.0 | -31.7 | |
| 3465.00 | -17.4 | H | 3.0 | 38.5 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 5197.50 | -15.6 | H | 3.0 | 38.8 | 1.0 | -53.4 | -13.0 | -40.4 | |
| 6930.00 | -12.5 | H | 3.0 | 38.5 | 1.0 | -50.0 | -13.0 | -37.0 | |
| High Ch, 1752.5 | | | | | | | | | |
| 3505.00 | -19.6 | V | 3.0 | 38.5 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 5257.50 | -11.9 | V | 3.0 | 38.8 | 1.0 | -49.7 | -13.0 | -36.7 | |
| 7010.00 | -7.9 | V | 3.0 | 38.5 | 1.0 | -45.4 | -13.0 | -32.4 | |
| 3505.00 | -20.2 | H | 3.0 | 38.5 | 1.0 | -57.6 | -13.0 | -44.6 | |
| 5257.50 | -15.8 | H | 3.0 | 38.8 | 1.0 | -53.6 | -13.0 | -40.6 | |
| 7010.00 | -12.8 | H | 3.0 | 38.5 | 1.0 | -50.3 | -13.0 | -37.3 | |

10MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_QPSK Band 4 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1715 | | | | | | | | | |
| 3430.00 | -19.0 | V | 3.0 | 38.5 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 5145.00 | -14.3 | V | 3.0 | 38.8 | 1.0 | -52.1 | -13.0 | -39.1 | |
| 6860.00 | -8.0 | V | 3.0 | 38.5 | 1.0 | -45.5 | -13.0 | -32.5 | |
| 3430.00 | -20.7 | H | 3.0 | 38.5 | 1.0 | -58.2 | -13.0 | -45.2 | |
| 5145.00 | -17.1 | H | 3.0 | 38.8 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 6860.00 | -14.2 | H | 3.0 | 38.5 | 1.0 | -51.8 | -13.0 | -38.8 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -20.5 | V | 3.0 | 38.5 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 5197.50 | -9.4 | V | 3.0 | 38.8 | 1.0 | -47.2 | -13.0 | -34.2 | |
| 6930.00 | -7.1 | V | 3.0 | 38.5 | 1.0 | -44.6 | -13.0 | -31.6 | |
| 3465.00 | -20.5 | H | 3.0 | 38.5 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 5197.50 | -15.5 | H | 3.0 | 38.8 | 1.0 | -53.3 | -13.0 | -40.3 | |
| 6930.00 | -10.0 | H | 3.0 | 38.5 | 1.0 | -47.5 | -13.0 | -34.5 | |
| High Ch, 1750 | | | | | | | | | |
| 3500.00 | -21.2 | V | 3.0 | 38.5 | 1.0 | -58.7 | -13.0 | -45.7 | |
| 5250.00 | -12.5 | V | 3.0 | 38.8 | 1.0 | -50.3 | -13.0 | -37.3 | |
| 7000.00 | -7.9 | V | 3.0 | 38.5 | 1.0 | -45.4 | -13.0 | -32.4 | |
| 3500.00 | -21.1 | H | 3.0 | 38.5 | 1.0 | -58.6 | -13.0 | -45.6 | |
| 5250.00 | -14.5 | H | 3.0 | 38.8 | 1.0 | -52.3 | -13.0 | -39.3 | |
| 7000.00 | -10.5 | H | 3.0 | 38.5 | 1.0 | -48.0 | -13.0 | -35.0 | |

10MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_16QAM Band 4 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1715 | | | | | | | | | |
| 3430.00 | -19.3 | V | 3.0 | 38.5 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 5145.00 | -15.7 | V | 3.0 | 38.8 | 1.0 | -53.5 | -13.0 | -40.5 | |
| 6860.00 | -8.2 | V | 3.0 | 38.5 | 1.0 | -45.7 | -13.0 | -32.7 | |
| 3430.00 | -20.6 | H | 3.0 | 38.5 | 1.0 | -58.1 | -13.0 | -45.1 | |
| 5145.00 | -17.8 | H | 3.0 | 38.8 | 1.0 | -55.6 | -13.0 | -42.6 | |
| 6860.00 | -14.9 | H | 3.0 | 38.5 | 1.0 | -52.4 | -13.0 | -39.4 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -18.9 | V | 3.0 | 38.5 | 1.0 | -56.4 | -13.0 | -43.4 | |
| 5197.50 | -12.2 | V | 3.0 | 38.8 | 1.0 | -50.0 | -13.0 | -37.0 | |
| 6930.00 | -9.2 | V | 3.0 | 38.5 | 1.0 | -46.7 | -13.0 | -33.7 | |
| 3465.00 | -18.7 | H | 3.0 | 38.5 | 1.0 | -56.2 | -13.0 | -43.2 | |
| 5197.50 | -15.5 | H | 3.0 | 38.8 | 1.0 | -53.3 | -13.0 | -40.3 | |
| 6930.00 | -11.2 | H | 3.0 | 38.5 | 1.0 | -48.7 | -13.0 | -35.7 | |
| High Ch, 1750 | | | | | | | | | |
| 3500.00 | -19.9 | V | 3.0 | 38.5 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 5250.00 | -14.0 | V | 3.0 | 38.8 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 7000.00 | -8.5 | V | 3.0 | 38.5 | 1.0 | -46.0 | -13.0 | -33.0 | |
| 3500.00 | -20.4 | H | 3.0 | 38.5 | 1.0 | -57.9 | -13.0 | -44.9 | |
| 5250.00 | -15.5 | H | 3.0 | 38.8 | 1.0 | -53.3 | -13.0 | -40.3 | |
| 7000.00 | -11.1 | H | 3.0 | 38.5 | 1.0 | -48.6 | -13.0 | -35.6 | |

15MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_QPSK Band 4 Harmonics, 15MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1717.5 | | | | | | | | | |
| 3435.00 | -21.7 | V | 3.0 | 38.5 | 1.0 | -59.2 | -13.0 | -46.2 | |
| 5152.50 | -14.0 | V | 3.0 | 38.8 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 6870.00 | -11.5 | V | 3.0 | 38.5 | 1.0 | -49.1 | -13.0 | -36.1 | |
| 3435.00 | -21.4 | H | 3.0 | 38.5 | 1.0 | -58.9 | -13.0 | -45.9 | |
| 5152.50 | -15.8 | H | 3.0 | 38.8 | 1.0 | -53.6 | -13.0 | -40.6 | |
| 6870.00 | -14.6 | H | 3.0 | 38.5 | 1.0 | -52.1 | -13.0 | -39.1 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -19.8 | V | 3.0 | 38.5 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 5197.50 | -13.1 | V | 3.0 | 38.8 | 1.0 | -51.0 | -13.0 | -38.0 | |
| 6930.00 | -9.0 | V | 3.0 | 38.5 | 1.0 | -46.5 | -13.0 | -33.5 | |
| 3465.00 | -21.0 | H | 3.0 | 38.5 | 1.0 | -58.4 | -13.0 | -45.4 | |
| 5197.50 | -15.9 | H | 3.0 | 38.8 | 1.0 | -53.7 | -13.0 | -40.7 | |
| 6930.00 | -12.3 | H | 3.0 | 38.5 | 1.0 | -49.8 | -13.0 | -36.8 | |
| High Ch, 1747.5 | | | | | | | | | |
| 3495.00 | -22.0 | V | 3.0 | 38.5 | 1.0 | -59.5 | -13.0 | -46.5 | |
| 5242.50 | -13.0 | V | 3.0 | 38.8 | 1.0 | -50.8 | -13.0 | -37.8 | |
| 6990.00 | -8.3 | V | 3.0 | 38.5 | 1.0 | -45.8 | -13.0 | -32.8 | |
| 3495.00 | -19.3 | H | 3.0 | 38.5 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 5242.50 | -16.3 | H | 3.0 | 38.8 | 1.0 | -54.1 | -13.0 | -41.1 | |
| 6990.00 | -10.6 | H | 3.0 | 38.5 | 1.0 | -48.1 | -13.0 | -35.1 | |

15MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_16QAM Band 4 Harmonics, 15MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1717.5 | | | | | | | | | |
| 3435.00 | -20.2 | V | 3.0 | 38.5 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 5152.50 | -16.3 | V | 3.0 | 38.8 | 1.0 | -54.1 | -13.0 | -41.1 | |
| 6870.00 | -14.4 | V | 3.0 | 38.5 | 1.0 | -52.0 | -13.0 | -39.0 | |
| 3435.00 | -19.4 | H | 3.0 | 38.5 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 5152.50 | -17.0 | H | 3.0 | 38.8 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 6870.00 | -16.2 | H | 3.0 | 38.5 | 1.0 | -53.7 | -13.0 | -40.7 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -19.8 | V | 3.0 | 38.5 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 5197.50 | -14.4 | V | 3.0 | 38.8 | 1.0 | -52.2 | -13.0 | -39.2 | |
| 6930.00 | -11.0 | V | 3.0 | 38.5 | 1.0 | -48.6 | -13.0 | -35.6 | |
| 3465.00 | -21.9 | H | 3.0 | 38.5 | 1.0 | -59.4 | -13.0 | -46.4 | |
| 5197.50 | -18.1 | H | 3.0 | 38.8 | 1.0 | -55.9 | -13.0 | -42.9 | |
| 6930.00 | -17.2 | H | 3.0 | 38.5 | 1.0 | -54.7 | -13.0 | -41.7 | |
| High Ch, 1747.5 | | | | | | | | | |
| 3495.00 | -21.6 | V | 3.0 | 38.5 | 1.0 | -59.1 | -13.0 | -46.1 | |
| 5242.50 | -15.0 | V | 3.0 | 38.8 | 1.0 | -52.8 | -13.0 | -39.8 | |
| 6990.00 | -11.6 | V | 3.0 | 38.5 | 1.0 | -49.1 | -13.0 | -36.1 | |
| 3495.00 | -20.6 | H | 3.0 | 38.5 | 1.0 | -58.1 | -13.0 | -45.1 | |
| 5242.50 | -17.9 | H | 3.0 | 38.8 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 6990.00 | -13.6 | H | 3.0 | 38.5 | 1.0 | -51.1 | -13.0 | -38.1 | |

20MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_QPSK Band 4 Harmonics, 20MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1720 | | | | | | | | | |
| 3440.00 | -20.9 | V | 3.0 | 38.5 | 1.0 | -58.4 | -13.0 | -45.4 | |
| 5160.00 | -15.3 | V | 3.0 | 38.8 | 1.0 | -53.1 | -13.0 | -40.1 | |
| 6880.00 | -12.4 | V | 3.0 | 38.5 | 1.0 | -50.0 | -13.0 | -37.0 | |
| 3440.00 | -21.2 | H | 3.0 | 38.5 | 1.0 | -58.7 | -13.0 | -45.7 | |
| 5160.00 | -17.1 | H | 3.0 | 38.8 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 6880.00 | -16.1 | H | 3.0 | 38.5 | 1.0 | -53.6 | -13.0 | -40.6 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -22.4 | V | 3.0 | 38.5 | 1.0 | -59.9 | -13.0 | -46.9 | |
| 5197.50 | -18.9 | V | 3.0 | 38.8 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 6930.00 | -17.3 | V | 3.0 | 38.5 | 1.0 | -54.8 | -13.0 | -41.8 | |
| 3465.00 | -22.0 | H | 3.0 | 38.5 | 1.0 | -59.5 | -13.0 | -46.5 | |
| 5197.50 | -17.7 | H | 3.0 | 38.8 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 6930.00 | -17.4 | H | 3.0 | 38.5 | 1.0 | -54.9 | -13.0 | -41.9 | |
| High Ch, 1745 | | | | | | | | | |
| 3490.00 | -22.3 | V | 3.0 | 38.5 | 1.0 | -59.8 | -13.0 | -46.8 | |
| 5235.00 | -15.5 | V | 3.0 | 38.8 | 1.0 | -53.4 | -13.0 | -40.4 | |
| 6980.00 | -17.7 | V | 3.0 | 38.5 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 3490.00 | -21.8 | H | 3.0 | 38.5 | 1.0 | -59.2 | -13.0 | -46.2 | |
| 5235.00 | -18.4 | H | 3.0 | 38.8 | 1.0 | -56.2 | -13.0 | -43.2 | |
| 6980.00 | -16.2 | H | 3.0 | 38.5 | 1.0 | -53.7 | -13.0 | -40.7 | |

20MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: R Z
Configuration: X-pos EUT w/AC+HS
Location: Chamber B
Mode: LTE_16QAM Band 4 Harmonics, 20MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 1720 | | | | | | | | | |
| 3440.00 | -21.5 | V | 3.0 | 38.5 | 1.0 | -59.0 | -13.0 | -46.0 | |
| 5160.00 | -17.3 | V | 3.0 | 38.8 | 1.0 | -55.1 | -13.0 | -42.1 | |
| 6880.00 | -15.7 | V | 3.0 | 38.5 | 1.0 | -53.2 | -13.0 | -40.2 | |
| 3440.00 | -21.3 | H | 3.0 | 38.5 | 1.0 | -58.8 | -13.0 | -45.8 | |
| 5160.00 | -16.5 | H | 3.0 | 38.8 | 1.0 | -54.3 | -13.0 | -41.3 | |
| 6880.00 | -17.2 | H | 3.0 | 38.5 | 1.0 | -54.7 | -13.0 | -41.7 | |
| Mid Ch, 1732.5 | | | | | | | | | |
| 3465.00 | -22.0 | V | 3.0 | 38.5 | 1.0 | -59.5 | -13.0 | -46.5 | |
| 5197.50 | -13.9 | V | 3.0 | 38.8 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 6930.00 | -12.3 | V | 3.0 | 38.5 | 1.0 | -49.8 | -13.0 | -36.8 | |
| 3465.00 | -22.7 | H | 3.0 | 38.5 | 1.0 | -60.2 | -13.0 | -47.2 | |
| 5197.50 | -17.0 | H | 3.0 | 38.8 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 6930.00 | -13.9 | H | 3.0 | 38.5 | 1.0 | -51.4 | -13.0 | -38.4 | |
| High Ch, 1745 | | | | | | | | | |
| 3490.00 | -20.6 | V | 3.0 | 38.5 | 1.0 | -58.1 | -13.0 | -45.1 | |
| 5235.00 | -14.3 | V | 3.0 | 38.8 | 1.0 | -52.1 | -13.0 | -39.1 | |
| 6980.00 | -17.2 | V | 3.0 | 38.5 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 3490.00 | -20.7 | H | 3.0 | 38.5 | 1.0 | -58.2 | -13.0 | -45.2 | |
| 5235.00 | -17.7 | H | 3.0 | 38.8 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 6980.00 | -17.2 | H | 3.0 | 38.5 | 1.0 | -54.7 | -13.0 | -41.7 | |

## LTE Band 5

### 1.4MHz QPSK

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/23/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT + AC ADAPTER + HS
**Location:** Chamber C
**Mode:** LTE_QPSK Band 5 Harmonics, 1.4MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 824.7 | | | | | | | | | |
| 1649.40 | -21.1 | V | 3.0 | 36.4 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 2474.10 | -23.5 | V | 3.0 | 35.0 | 1.0 | -57.5 | -13.0 | -44.5 | |
| 3298.80 | -15.8 | V | 3.0 | 34.3 | 1.0 | -49.1 | -13.0 | -36.1 | |
| 1649.40 | -19.6 | H | 3.0 | 36.4 | 1.0 | -55.0 | -13.0 | -42.0 | |
| 2474.10 | -24.0 | H | 3.0 | 35.0 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 3298.80 | -17.8 | H | 3.0 | 34.3 | 1.0 | -51.1 | -13.0 | -38.1 | |
| Mid Ch, 836.5 | | | | | | | | | |
| 1673.00 | -22.9 | V | 3.0 | 36.3 | 1.0 | -58.3 | -13.0 | -45.3 | |
| 2509.50 | -12.8 | V | 3.0 | 34.9 | 1.0 | -46.7 | -13.0 | -33.7 | |
| 3346.00 | -21.1 | V | 3.0 | 34.2 | 1.0 | -54.4 | -13.0 | -41.4 | |
| 1673.00 | -24.4 | H | 3.0 | 36.3 | 1.0 | -59.8 | -13.0 | -46.8 | |
| 2509.50 | -11.4 | H | 3.0 | 34.9 | 1.0 | -45.4 | -13.0 | -32.4 | |
| 3346.00 | -18.9 | H | 3.0 | 34.2 | 1.0 | -52.1 | -13.0 | -39.1 | |
| High Ch, 848.3 | | | | | | | | | |
| 1696.60 | -20.2 | V | 3.0 | 36.3 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 2544.90 | -18.5 | V | 3.0 | 34.9 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 3393.20 | -18.2 | V | 3.0 | 34.2 | 1.0 | -51.4 | -13.0 | -38.4 | |
| 1696.60 | -21.8 | H | 3.0 | 36.3 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 2544.90 | -23.2 | H | 3.0 | 34.9 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 3393.20 | -22.2 | H | 3.0 | 34.2 | 1.0 | -55.4 | -13.0 | -42.4 | |

### 1.4MHz 16QAM

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/23/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT + AC ADAPTER + HS
**Location:** Chamber C
**Mode:** LTE_16QAM Band 5 Harmonics, 1.4MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 824.7 | | | | | | | | | |
| 1649.40 | -19.7 | V | 3.0 | 36.4 | 1.0 | -55.1 | -13.0 | -42.1 | |
| 2474.10 | -23.9 | V | 3.0 | 35.0 | 1.0 | -57.9 | -13.0 | -44.9 | |
| 3298.80 | -15.4 | V | 3.0 | 34.3 | 1.0 | -48.7 | -13.0 | -35.7 | |
| 1649.40 | -18.4 | H | 3.0 | 36.4 | 1.0 | -53.7 | -13.0 | -40.7 | |
| 2474.10 | -25.1 | H | 3.0 | 35.0 | 1.0 | -59.1 | -13.0 | -46.1 | |
| 3298.80 | -16.9 | H | 3.0 | 34.3 | 1.0 | -50.1 | -13.0 | -37.1 | |
| Mid Ch, 836.5 | | | | | | | | | |
| 1673.00 | -17.6 | V | 3.0 | 36.3 | 1.0 | -52.9 | -13.0 | -39.9 | |
| 2509.50 | -23.9 | V | 3.0 | 34.9 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 3346.00 | -22.4 | V | 3.0 | 34.2 | 1.0 | -55.6 | -13.0 | -42.6 | |
| 1673.00 | -27.0 | H | 3.0 | 36.3 | 1.0 | -62.3 | -13.0 | -49.3 | |
| 2509.50 | -24.0 | H | 3.0 | 34.9 | 1.0 | -57.9 | -13.0 | -44.9 | |
| 3346.00 | -16.0 | H | 3.0 | 34.2 | 1.0 | -49.2 | -13.0 | -36.2 | |
| High Ch, 848.3 | | | | | | | | | |
| 1696.60 | -21.1 | V | 3.0 | 36.3 | 1.0 | -56.4 | -13.0 | -43.4 | |
| 2544.90 | -18.7 | V | 3.0 | 34.9 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 3393.20 | -19.4 | V | 3.0 | 34.2 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 1696.60 | -21.9 | H | 3.0 | 36.3 | 1.0 | -57.2 | -13.0 | -44.2 | |
| 2544.90 | -23.0 | H | 3.0 | 34.9 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 3393.20 | -23.2 | H | 3.0 | 34.2 | 1.0 | -56.3 | -13.0 | -43.3 | |

### 3MHz QPSK

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/23/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT + AC ADAPTER + HS
**Location:** Chamber C
**Mode:** LTE_QPSK Band 5 Harmonics, 3MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 825.5 | | | | | | | | | |
| 1651.00 | -21.1 | V | 3.0 | 36.4 | 1.0 | -56.4 | -13.0 | -43.4 | |
| 2476.50 | -23.5 | V | 3.0 | 35.0 | 1.0 | -57.5 | -13.0 | -44.5 | |
| 3302.00 | -15.8 | V | 3.0 | 34.3 | 1.0 | -49.1 | -13.0 | -36.1 | |
| 1651.00 | -19.6 | H | 3.0 | 36.4 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 2476.50 | -24.1 | H | 3.0 | 35.0 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 3302.00 | -17.9 | H | 3.0 | 34.3 | 1.0 | -51.2 | -13.0 | -38.2 | |
| Mid Ch, 836.5 | | | | | | | | | |
| 1673.00 | -22.9 | V | 3.0 | 36.3 | 1.0 | -58.2 | -13.0 | -45.2 | |
| 2509.50 | -12.8 | V | 3.0 | 34.9 | 1.0 | -46.7 | -13.0 | -33.7 | |
| 3346.00 | -21.4 | V | 3.0 | 34.2 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 1673.00 | -24.5 | H | 3.0 | 36.3 | 1.0 | -59.8 | -13.0 | -46.8 | |
| 2509.50 | -11.5 | H | 3.0 | 34.9 | 1.0 | -45.4 | -13.0 | -32.4 | |
| 3346.00 | -19.0 | H | 3.0 | 34.2 | 1.0 | -52.2 | -13.0 | -39.2 | |
| High Ch, 847.5 | | | | | | | | | |
| 1695.00 | -20.3 | V | 3.0 | 36.3 | 1.0 | -55.6 | -13.0 | -42.6 | |
| 2542.50 | -18.5 | V | 3.0 | 34.9 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 3390.00 | -18.1 | V | 3.0 | 34.2 | 1.0 | -51.3 | -13.0 | -38.3 | |
| 1695.00 | -21.8 | H | 3.0 | 36.3 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 2542.50 | -23.4 | H | 3.0 | 34.9 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 3390.00 | -22.2 | H | 3.0 | 34.2 | 1.0 | -55.3 | -13.0 | -42.3 | |

### 3MHz 16QAM

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/23/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT + AC ADAPTER + HS
**Location:** Chamber C
**Mode:** LTE_16QAM Band 5 Harmonics, 3MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 825.5 | | | | | | | | | |
| 1651.00 | -19.8 | V | 3.0 | 36.4 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 2476.50 | -23.9 | V | 3.0 | 35.0 | 1.0 | -57.9 | -13.0 | -44.9 | |
| 3302.00 | -15.4 | V | 3.0 | 34.3 | 1.0 | -48.7 | -13.0 | -35.7 | |
| 1651.00 | -18.4 | H | 3.0 | 36.4 | 1.0 | -53.8 | -13.0 | -40.8 | |
| 2476.50 | -25.2 | H | 3.0 | 35.0 | 1.0 | -59.2 | -13.0 | -46.2 | |
| 3302.00 | -16.9 | H | 3.0 | 34.3 | 1.0 | -50.2 | -13.0 | -37.2 | |
| Mid Ch, 836.5 | | | | | | | | | |
| 1673.00 | -17.6 | V | 3.0 | 36.3 | 1.0 | -53.0 | -13.0 | -40.0 | |
| 2509.50 | -23.4 | V | 3.0 | 34.9 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 3346.00 | -22.2 | V | 3.0 | 34.2 | 1.0 | -55.4 | -13.0 | -42.4 | |
| 1673.00 | -27.4 | H | 3.0 | 36.3 | 1.0 | -62.7 | -13.0 | -49.7 | |
| 2509.50 | -24.0 | H | 3.0 | 34.9 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 3346.00 | -15.7 | H | 3.0 | 34.2 | 1.0 | -49.0 | -13.0 | -36.0 | |
| High Ch, 847.5 | | | | | | | | | |
| 1695.00 | -21.2 | V | 3.0 | 36.3 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 2542.50 | -18.4 | V | 3.0 | 34.9 | 1.0 | -52.3 | -13.0 | -39.3 | |
| 3390.00 | -19.3 | V | 3.0 | 34.2 | 1.0 | -52.5 | -13.0 | -39.5 | |
| 1695.00 | -22.1 | H | 3.0 | 36.3 | 1.0 | -57.4 | -13.0 | -44.4 | |
| 2542.50 | -23.0 | H | 3.0 | 34.9 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 3390.00 | -22.3 | H | 3.0 | 34.2 | 1.0 | -55.5 | -13.0 | -42.5 | |

### 5MHz QPSK

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/23/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT + AC ADAPTER + HS
**Location:** Chamber C
**Mode:** LTE_QPSK Band 5 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 826.5 | | | | | | | | | |
| 1653.00 | -20.7 | V | 3.0 | 36.4 | 1.0 | -56.1 | -13.0 | -43.1 | |
| 2479.50 | -23.5 | V | 3.0 | 35.0 | 1.0 | -57.4 | -13.0 | -44.4 | |
| 3306.00 | -15.6 | V | 3.0 | 34.3 | 1.0 | -48.9 | -13.0 | -35.9 | |
| 1653.00 | -19.6 | H | 3.0 | 36.4 | 1.0 | -55.0 | -13.0 | -42.0 | |
| 2479.50 | -23.8 | H | 3.0 | 35.0 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 3306.00 | -17.8 | H | 3.0 | 34.3 | 1.0 | -51.1 | -13.0 | -38.1 | |
| Mid Ch, 836.5 | | | | | | | | | |
| 1673.00 | -23.3 | V | 3.0 | 36.3 | 1.0 | -58.6 | -13.0 | -45.6 | |
| 2509.50 | -13.4 | V | 3.0 | 34.9 | 1.0 | -47.4 | -13.0 | -34.4 | |
| 3346.00 | -21.7 | V | 3.0 | 34.2 | 1.0 | -55.0 | -13.0 | -42.0 | |
| 1673.00 | -24.5 | H | 3.0 | 36.3 | 1.0 | -59.9 | -13.0 | -46.9 | |
| 2509.50 | -11.5 | H | 3.0 | 34.9 | 1.0 | -45.4 | -13.0 | -32.4 | |
| 3346.00 | -18.9 | H | 3.0 | 34.2 | 1.0 | -52.1 | -13.0 | -39.1 | |
| High Ch, 846.5 | | | | | | | | | |
| 1693.00 | -20.6 | V | 3.0 | 36.3 | 1.0 | -55.9 | -13.0 | -42.9 | |
| 2539.50 | -18.4 | V | 3.0 | 34.9 | 1.0 | -52.3 | -13.0 | -39.3 | |
| 3386.00 | -18.3 | V | 3.0 | 34.2 | 1.0 | -51.5 | -13.0 | -38.5 | |
| 1693.00 | -21.3 | H | 3.0 | 36.3 | 1.0 | -56.6 | -13.0 | -43.6 | |
| 2539.50 | -24.5 | H | 3.0 | 34.9 | 1.0 | -58.4 | -13.0 | -45.4 | |
| 3386.00 | -22.0 | H | 3.0 | 34.2 | 1.0 | -55.2 | -13.0 | -42.2 | |

### 5MHz 16QAM

**UL Verification Services, Inc.**
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG Electronics
**Project #:** 16I22652
**Date:** 1/23/2016
**Test Engineer:** R.Alegre
**Configuration:** EUT + AC ADAPTER + HS
**Location:** Chamber C
**Mode:** LTE_16QAM Band 5 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 826.5 | | | | | | | | | |
| 1653.00 | -19.5 | V | 3.0 | 36.4 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 2479.50 | -23.5 | V | 3.0 | 35.0 | 1.0 | -57.5 | -13.0 | -44.5 | |
| 3306.00 | -15.1 | V | 3.0 | 34.3 | 1.0 | -48.4 | -13.0 | -35.4 | |
| 1653.00 | -19.3 | H | 3.0 | 36.4 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 2479.50 | -25.1 | H | 3.0 | 35.0 | 1.0 | -59.1 | -13.0 | -46.1 | |
| 3306.00 | -17.4 | H | 3.0 | 34.3 | 1.0 | -50.7 | -13.0 | -37.7 | |
| Mid Ch, 836.5 | | | | | | | | | |
| 1673.00 | -17.8 | V | 3.0 | 36.3 | 1.0 | -53.1 | -13.0 | -40.1 | |
| 2509.50 | -23.9 | V | 3.0 | 34.9 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 3346.00 | -22.2 | V | 3.0 | 34.2 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 1673.00 | -27.4 | H | 3.0 | 36.3 | 1.0 | -62.7 | -13.0 | -49.7 | |
| 2509.50 | -23.9 | H | 3.0 | 34.9 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 3346.00 | -15.8 | H | 3.0 | 34.2 | 1.0 | -49.0 | -13.0 | -36.0 | |
| High Ch, 846.5 | | | | | | | | | |
| 1693.00 | -21.5 | V | 3.0 | 36.3 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 2539.50 | -18.4 | V | 3.0 | 34.9 | 1.0 | -52.3 | -13.0 | -39.3 | |
| 3386.00 | -19.4 | V | 3.0 | 34.2 | 1.0 | -52.6 | -13.0 | -39.6 | |
| 1693.00 | -22.4 | H | 3.0 | 36.3 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 2539.50 | -23.0 | H | 3.0 | 34.9 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 3386.00 | -21.9 | H | 3.0 | 34.2 | 1.0 | -55.1 | -13.0 | -42.1 | |

10MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

| | |
|---|---|
| Company: | LG Electronics |
| Project #: | 16I22652 |
| Date: | 1/23/2016 |
| Test Engineer: | R.Alegre |
| Configuration: | EUT + AC ADAPTER + HS |
| Location: | Chamber C |
| Mode: | LTE_QPSK Band 5 Harmonics, 10MHz Bandwidth |

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 829 | | | | | | | | | |
| 1658.00 | -21.4 | V | 3.0 | 36.4 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 2487.00 | -23.5 | V | 3.0 | 35.0 | 1.0 | -57.5 | -13.0 | -44.5 | |
| 3316.00 | -15.4 | V | 3.0 | 34.3 | 1.0 | -48.6 | -13.0 | -35.6 | |
| 1658.00 | -19.7 | H | 3.0 | 36.4 | 1.0 | -55.1 | -13.0 | -42.1 | |
| 2487.00 | -23.8 | H | 3.0 | 35.0 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 3316.00 | -17.8 | H | 3.0 | 34.3 | 1.0 | -51.1 | -13.0 | -38.1 | |
| Mid Ch, 836.5 | | | | | | | | | |
| 1673.00 | -24.2 | V | 3.0 | 36.3 | 1.0 | -59.5 | -13.0 | -46.5 | |
| 2509.50 | -13.8 | V | 3.0 | 34.9 | 1.0 | -47.7 | -13.0 | -34.7 | |
| 3346.00 | -22.5 | V | 3.0 | 34.2 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 1673.00 | -24.5 | H | 3.0 | 36.3 | 1.0 | -59.8 | -13.0 | -46.8 | |
| 2509.50 | -11.6 | H | 3.0 | 34.9 | 1.0 | -45.5 | -13.0 | -32.5 | |
| 3346.00 | -19.6 | H | 3.0 | 34.2 | 1.0 | -52.8 | -13.0 | -39.8 | |
| High Ch, 844 | | | | | | | | | |
| 1688.00 | -20.7 | V | 3.0 | 36.3 | 1.0 | -56.0 | -13.0 | -43.0 | |
| 2532.00 | -18.5 | V | 3.0 | 34.9 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 3376.00 | -18.7 | V | 3.0 | 34.2 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 1688.00 | -21.7 | H | 3.0 | 36.3 | 1.0 | -57.0 | -13.0 | -44.0 | |
| 2532.00 | -24.7 | H | 3.0 | 34.9 | 1.0 | -58.6 | -13.0 | -45.6 | |
| 3376.00 | -22.0 | H | 3.0 | 34.2 | 1.0 | -55.2 | -13.0 | -42.2 | |

10MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

| | |
|---|---|
| Company: | LG Electronics |
| Project #: | 16I22652 |
| Date: | 1/23/2016 |
| Test Engineer: | R.Alegre |
| Configuration: | EUT + AC ADAPTER + HS |
| Location: | Chamber C |
| Mode: | LTE_16QAM Band 5 Harmonics, 10MHz Bandwidth |

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 829 | | | | | | | | | |
| 1658.00 | -20.4 | V | 3.0 | 36.4 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 2487.00 | -23.7 | V | 3.0 | 35.0 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 3316.00 | -16.2 | V | 3.0 | 34.3 | 1.0 | -49.4 | -13.0 | -36.4 | |
| 1658.00 | -19.4 | H | 3.0 | 36.4 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 2487.00 | -25.1 | H | 3.0 | 35.0 | 1.0 | -59.0 | -13.0 | -46.0 | |
| 3316.00 | -17.6 | H | 3.0 | 34.3 | 1.0 | -50.9 | -13.0 | -37.9 | |
| Mid Ch, 836.5 | | | | | | | | | |
| 1673.00 | -18.1 | V | 3.0 | 36.3 | 1.0 | -53.4 | -13.0 | -40.4 | |
| 2509.50 | -23.9 | V | 3.0 | 34.9 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 3346.00 | -22.5 | V | 3.0 | 34.2 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 1673.00 | -27.4 | H | 3.0 | 36.3 | 1.0 | -62.8 | -13.0 | -49.8 | |
| 2509.50 | -23.9 | H | 3.0 | 34.9 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 3346.00 | -16.1 | H | 3.0 | 34.2 | 1.0 | -49.3 | -13.0 | -36.3 | |
| High Ch, 844 | | | | | | | | | |
| 1688.00 | -21.6 | V | 3.0 | 36.3 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 2532.00 | -18.5 | V | 3.0 | 34.9 | 1.0 | -52.4 | -13.0 | -39.4 | |
| 3376.00 | -19.5 | V | 3.0 | 34.2 | 1.0 | -52.7 | -13.0 | -39.7 | |
| 1688.00 | -22.4 | H | 3.0 | 36.3 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 2532.00 | -23.1 | H | 3.0 | 34.9 | 1.0 | -57.0 | -13.0 | -44.0 | |
| 3376.00 | -22.2 | H | 3.0 | 34.2 | 1.0 | -55.4 | -13.0 | -42.4 | |

## LTE Band 17

5MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: LTE_QPSK Band 17 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 706.50 | | | | | | | | | |
| 1413.00 | -20.5 | V | 3.0 | 36.5 | 1.0 | -56.0 | -13.0 | -43.0 | |
| 2119.50 | -16.3 | V | 3.0 | 35.6 | 1.0 | -50.9 | -13.0 | -37.9 | |
| 2826.00 | -21.8 | V | 3.0 | 34.7 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 1413.00 | -18.5 | H | 3.0 | 36.5 | 1.0 | -54.0 | -13.0 | -41.0 | |
| 2119.50 | -23.1 | H | 3.0 | 35.6 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 2826.00 | -23.2 | H | 3.0 | 34.7 | 1.0 | -56.9 | -13.0 | -43.9 | |
| Mid Ch, 710.00 | | | | | | | | | |
| 1420.00 | -21.2 | V | 3.0 | 36.5 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 2130.00 | -19.7 | V | 3.0 | 35.6 | 1.0 | -54.3 | -13.0 | -41.3 | |
| 2840.00 | -22.1 | V | 3.0 | 34.7 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 1420.00 | -18.9 | H | 3.0 | 36.5 | 1.0 | -54.4 | -13.0 | -41.4 | |
| 2130.00 | -22.8 | H | 3.0 | 35.6 | 1.0 | -57.4 | -13.0 | -44.4 | |
| 2840.00 | -23.5 | H | 3.0 | 34.7 | 1.0 | -57.2 | -13.0 | -44.2 | |
| High Ch, 713.50 | | | | | | | | | |
| 1427.00 | -20.1 | V | 3.0 | 36.5 | 1.0 | -55.6 | -13.0 | -42.6 | |
| 2140.50 | -22.3 | V | 3.0 | 35.6 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 2854.00 | -21.8 | V | 3.0 | 34.7 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 1427.00 | -19.4 | H | 3.0 | 36.5 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 2140.50 | -22.6 | H | 3.0 | 35.6 | 1.0 | -57.2 | -13.0 | -44.2 | |
| 2854.00 | -23.5 | H | 3.0 | 34.7 | 1.0 | -57.2 | -13.0 | -44.2 | |

5MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: LTE_16QAM Band 17 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 706.50 | | | | | | | | | |
| 1413.00 | -20.8 | V | 3.0 | 36.5 | 1.0 | -56.3 | -13.0 | -43.3 | |
| 2119.50 | -16.7 | V | 3.0 | 35.6 | 1.0 | -51.3 | -13.0 | -38.3 | |
| 2826.00 | -23.1 | V | 3.0 | 34.7 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 1413.00 | -18.5 | H | 3.0 | 36.5 | 1.0 | -54.0 | -13.0 | -41.0 | |
| 2119.50 | -23.4 | H | 3.0 | 35.6 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 2826.00 | -23.5 | H | 3.0 | 34.7 | 1.0 | -57.2 | -13.0 | -44.2 | |
| Mid Ch, 710.00 | | | | | | | | | |
| 1420.00 | -21.2 | V | 3.0 | 36.5 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 2130.00 | -21.2 | V | 3.0 | 35.6 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 2840.00 | -22.4 | V | 3.0 | 34.7 | 1.0 | -56.1 | -13.0 | -43.1 | |
| 1420.00 | -20.1 | H | 3.0 | 36.5 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 2130.00 | -23.1 | H | 3.0 | 35.6 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 2840.00 | -24.1 | H | 3.0 | 34.7 | 1.0 | -57.8 | -13.0 | -44.8 | |
| High Ch, 713.50 | | | | | | | | | |
| 1427.00 | -21.0 | V | 3.0 | 36.5 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 2140.50 | -22.5 | V | 3.0 | 35.6 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 2854.00 | -22.3 | V | 3.0 | 34.7 | 1.0 | -56.0 | -13.0 | -43.0 | |
| 1427.00 | -20.0 | H | 3.0 | 36.5 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 2140.50 | -22.7 | H | 3.0 | 35.6 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 2854.00 | -23.4 | H | 3.0 | 34.7 | 1.0 | -57.1 | -13.0 | -44.1 | |

10MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: LTE_QPSK Band 17 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 709 | | | | | | | | | |
| 1418.00 | -21.3 | V | 3.0 | 36.5 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 2127.00 | -18.8 | V | 3.0 | 35.6 | 1.0 | -53.4 | -13.0 | -40.4 | |
| 2836.00 | -21.9 | V | 3.0 | 34.7 | 1.0 | -55.6 | -13.0 | -42.6 | |
| 1418.00 | -18.4 | H | 3.0 | 36.5 | 1.0 | -53.9 | -13.0 | -40.9 | |
| 2127.00 | -23.0 | H | 3.0 | 35.6 | 1.0 | -57.6 | -13.0 | -44.6 | |
| 2836.00 | -23.0 | H | 3.0 | 34.7 | 1.0 | -56.7 | -13.0 | -43.7 | |
| Mid Ch, 710 | | | | | | | | | |
| 1420.00 | -22.1 | V | 3.0 | 36.5 | 1.0 | -57.7 | -13.0 | -44.7 | |
| 2130.00 | -22.5 | V | 3.0 | 35.6 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 2840.00 | -22.2 | V | 3.0 | 34.7 | 1.0 | -55.9 | -13.0 | -42.9 | |
| 1420.00 | -19.2 | H | 3.0 | 36.5 | 1.0 | -54.7 | -13.0 | -41.7 | |
| 2130.00 | -23.6 | H | 3.0 | 35.6 | 1.0 | -58.2 | -13.0 | -45.2 | |
| 2840.00 | -22.8 | H | 3.0 | 34.7 | 1.0 | -56.5 | -13.0 | -43.5 | |
| High Ch, 711 | | | | | | | | | |
| 1422.00 | -21.0 | V | 3.0 | 36.5 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 2133.00 | -22.4 | V | 3.0 | 35.6 | 1.0 | -57.0 | -13.0 | -44.0 | |
| 2844.00 | -22.8 | V | 3.0 | 34.7 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 1422.00 | -19.4 | H | 3.0 | 36.5 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 2133.00 | -23.0 | H | 3.0 | 35.6 | 1.0 | -57.6 | -13.0 | -44.6 | |
| 2844.00 | -22.6 | H | 3.0 | 34.7 | 1.0 | -56.3 | -13.0 | -43.3 | |

10MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG Electronics
Project #: 16I22652
Date: 1/21/2016
Test Engineer: A. Escamilla
Configuration: X-pos, EUT + AC Adapter + Headset
Location: Chamber C
Mode: LTE_16QAM Band 17 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 709 | | | | | | | | | |
| 1418.00 | -21.8 | V | 3.0 | 36.5 | 1.0 | -57.3 | -13.0 | -44.3 | |
| 2127.00 | -19.8 | V | 3.0 | 35.6 | 1.0 | -54.4 | -13.0 | -41.4 | |
| 2836.00 | -21.9 | V | 3.0 | 34.7 | 1.0 | -55.6 | -13.0 | -42.6 | |
| 1418.00 | -18.6 | H | 3.0 | 36.5 | 1.0 | -54.1 | -13.0 | -41.1 | |
| 2127.00 | -22.9 | H | 3.0 | 35.6 | 1.0 | -57.5 | -13.0 | -44.5 | |
| 2836.00 | -23.3 | H | 3.0 | 34.7 | 1.0 | -57.0 | -13.0 | -44.0 | |
| Mid Ch, 710 | | | | | | | | | |
| 1420.00 | -22.5 | V | 3.0 | 36.5 | 1.0 | -58.0 | -13.0 | -45.0 | |
| 2130.00 | -22.1 | V | 3.0 | 35.6 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 2840.00 | -23.0 | V | 3.0 | 34.7 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 1420.00 | -19.5 | H | 3.0 | 36.5 | 1.0 | -55.0 | -13.0 | -42.0 | |
| 2130.00 | -24.1 | H | 3.0 | 35.6 | 1.0 | -58.7 | -13.0 | -45.7 | |
| 2840.00 | -23.4 | H | 3.0 | 34.7 | 1.0 | -57.1 | -13.0 | -44.1 | |
| High Ch, 711 | | | | | | | | | |
| 1422.00 | -22.0 | V | 3.0 | 36.5 | 1.0 | -57.6 | -13.0 | -44.6 | |
| 2133.00 | -22.3 | V | 3.0 | 35.6 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 2844.00 | -23.0 | V | 3.0 | 34.7 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 1422.00 | -19.9 | H | 3.0 | 36.5 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 2133.00 | -22.3 | H | 3.0 | 35.6 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 2844.00 | -23.4 | H | 3.0 | 34.7 | 1.0 | -57.1 | -13.0 | -44.1 | |