# CERTIFICATION TEST REPORT

**Report Number. :** 11631998-E6V6

**Applicant :** Verifone, Inc.
1400 West Stanford Ranch Road
Rocklin, CA 95765, USA

**FCC ID :** B32V240MPLUS

**IC ID :** 787C- V240MPLUS

**EUT Description :** MOBILE POINT OF SALE TERMINAL

**Test Standard(s) :** FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E
INDUSTRY CANADA RSS-132 ISSUE 3
INDUSTRY CANADA RSS-133 ISSUE 6

**Date Of Issue:**

April 16, 2018

**Prepared by:**

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NVLAP TESTING
NVLAP LAB CODE 200065-0

# Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 09/18/17 | Initial Issue | Frank Ibrahim |
| V2 | 09/19/17 | Updated sections 5.3 & 7.1 | V. Tran |
| V3 | 10/04/17 | Updated sections 5.2, 5.3 & 7.1 | K. Kedida |
| V4 | 12/13/17 | Updated section 7.1 | Frank Ibrahim |
| V5 | 01/18/18 | Added section 7.1 (Summary Table) and changed ERP to EIRP for ISED line item and revised some sections number for ISED<br>Revised data for GSM850 for ISED | Frank Ibrahim |
| V6 | 04/16/18 | Added HSUPA | Frank Ibrahim |


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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Verifone, Inc.
1400 West Stanford Ranch Road Suite 200
Rocklin, CA 95765, USA

**EUT DESCRIPTION:** Mobile Point of Sale Terminal

**MODEL:** V240m Plus 3GBW

**SERIAL NUMBER:** 313-855-587, 313-855-666

**DATE TESTED:** May 12 to September 12, 2017

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| FCC PART 22H, 24E | PASS |
| INDUSTRY CANADA RSS-132,133 | 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 revisions 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 2, FCC KDB 971168 D01 v02r02, FCC Part 22 and Part 24, RSS-132, RSS-133, and RSS-GEN Issue 4.

# 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(IC: 2324B-1) | ☐ Chamber D(IC: 22541-1) |
| ☐ Chamber B(IC: 2324B-2) | ☐ Chamber E(IC: 22541-2) |
| ☒ Chamber C(IC: 2324B-3) | ☐ Chamber F(IC: 22541-3) |
| | ☐ Chamber G(IC: 22541-4) |
| | ☐ Chamber H(IC: 22541-5) |

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 C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, 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)




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## 4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER | UNCERTAINTY |
|---|---|
| Occupied Channel Bandwidth | ±1.1 % |
| RF output power, conducted | ±0.35 dB |
| Power Spectral Density, conducted | ±0.39 dB |
| Unwanted Emissions, conducted | ±2.9 dB |
| All emissions, radiated | ±5.36 dB |
| Temperature | ±0.9 °C |
| Humidity | ±2.26% RH |
| Supply Voltages | ±0.45 % |
| Time | ±0.2 % |

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


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# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT is the Mobile Point of Sale Terminal which contains an 11a/b/g/n/ac W-LAN + Bluetooth 4.1 combo module, and GSM/WCDMA radio module.

## 5.2. 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) |
|---|---|
| GSM850, 824~849MHz | -2.0 |
| GSM1900, 1850~1910MHz | -0.4 |
| WCDMA Band 2, 1850~1910MHz | -0.4 |
| WCDMA Band 5, 824~849 | -2.0 |



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## 5.3. MAXIMUM OUTPUT POWER

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

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

| FCC Part 22/24 | | | | | | |
|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | Modulation | Conducted (Average) | | ERP/EIRP (Average) | |
| | | | AVG(dBm) | AVG(mW) | dBm | mW |
| 850 | 824~849 | GPRS | 31.65 | 1462.18 | 27.50 | 562.34 |
| | 824~849 | EGPRS | 26.00 | 398.11 | 21.85 | 153.11 |
| 1900 | 1850~1910 | GPRS | 28.78 | 755.09 | 28.38 | 688.65 |
| | 1850~1910 | EGPRS | 24.80 | 302.00 | 24.40 | 275.42 |

| RSS 132/133 | | | | | | |
|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | Modulation | Conducted (Average) | | EIRP (Average) | |
| | | | AVG(dBm) | AVG(mW) | dBm | mW |
| 850 | 824~849 | GPRS | 31.65 | 1462.18 | 29.65 | 922.57 |
| | 824~849 | EGPRS | 26.00 | 398.11 | 24.00 | 251.19 |
| 1900 | 1850~1910 | GPRS | 28.78 | 755.09 | 28.38 | 688.65 |
| | 1850~1910 | EGPRS | 24.80 | 302.00 | 24.40 | 275.42 |


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### 5.3.2. MAXIMUM OUTPUT POWER (WCDMA)

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

| FCC Part 24 & RSS 133 | | | | | | |
|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | Modulation | Conducted (Average) | | ERP/EIRP (Average) | |
| | | | AVG(dBm) | AVG(mW) | dBm | mW |
| Band 2 | 1850~1910 | REL99 | 22.30 | 169.8 | 21.90 | 154.9 |
| | 1850~1910 | HSDPA | 22.72 | 187.1 | 22.32 | 170.6 |
| | 1850~1910 | HSUPA | 21.53 | 142.2 | 21.13 | 129.7 |

| FCC Part 22 & RSS 132 | | | | | | |
|---|---|---|---|---|---|---|
| Band | Frequency Range(MHz) | Modulation | Conducted (Average) | | ERP/EIRP (Average) | |
| | | | AVG(dBm) | AVG(mW) | dBm | mW |
| Band 5 | 824~849 | REL99 | 22.82 | 191.4 | 18.67 | 73.6 |
| | 824~849 | HSDPA | 21.46 | 140.0 | 17.31 | 53.8 |
| | 824~849 | HSUPA | 21.67 | 146.9 | 17.52 | 56.5 |



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## 5.4. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| AC Adapter | Verifone | SC1402 | 1708200053701 | NA |

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

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No** | **Port** | **# of Identical ports** | **Connector Type** | **Serial 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** | **Serial Type** | **Cable Length (m)** | **Remarks** |
| 1 | DC | 1 | Round | Un-shielded | 1.75m | No |
| 2 | 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.




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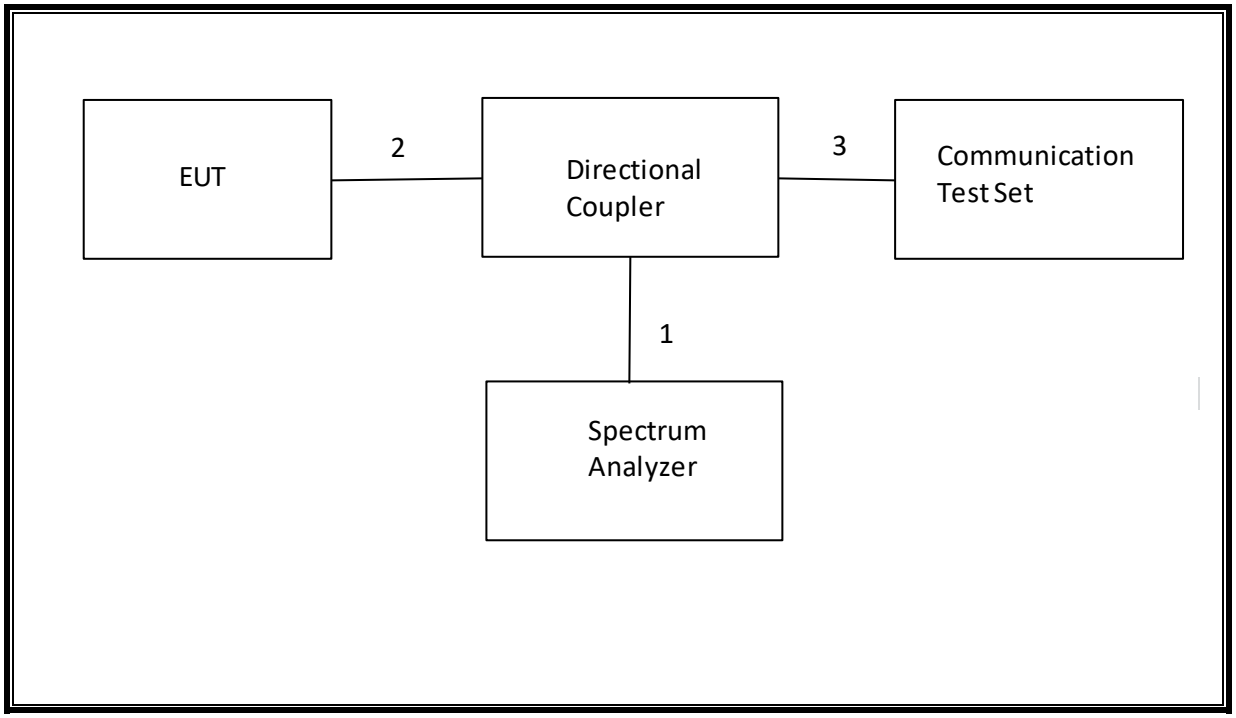
**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**





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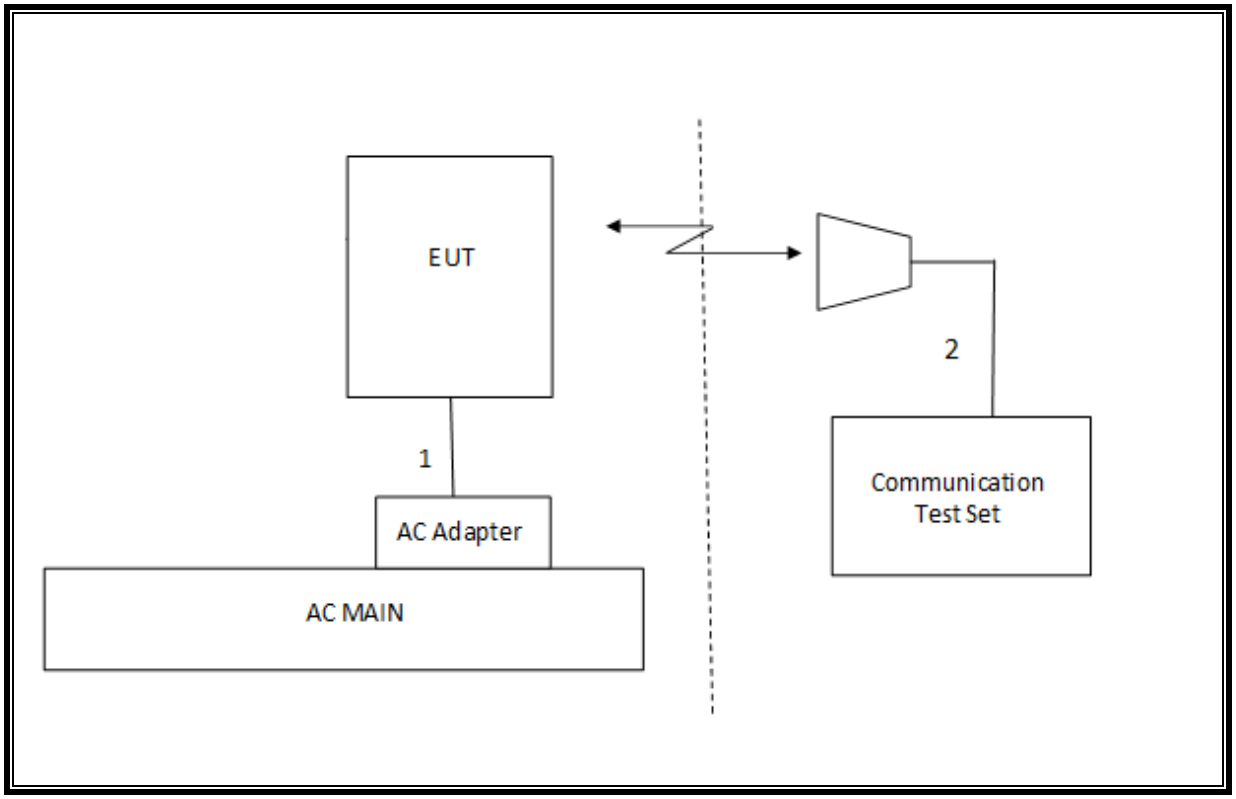
**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



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# 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 Date** | **Cal Due** |
| Amplifier, 1 to 18 GHz | Miteq | AFS43-00101800-25-S-42 | 493 | 02/15/17 | 02/15/18 |
| Amplifier, 1 to 8 GHz | Miteq | AMF-4D-01000800-30-29P | 1156 | 02/15/17 | 02/15/18 |
| Amplifier, 10KHz to 1GHz, 32dB | Keysight | 8447D | 10 | 02/15/17 | 02/15/18 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz | Sunol Sciences | JB3 | 408 | 11/10/16 | 11/10/17 |
| Horn Antenna | ETS-Lindgren | 3117 | T712 | 01/30/17 | 01/30/18 |
| Spectrum Analyzer, PXA 3Hz to 44GHz | Keysight | N9030A | 907 | 01/23/17 | 01/23/18 |
| Highpass Filter, 2.7 GHz | Micro-Circuits | H2G518G6 | T772 | 07/05/16 | 07/05/18 |
| Highpass Filter, 1 GHz | Micro-Tronics | HPM18129 | T889 | 02/21/17 | 02/21/18 |
| Highpass Filter, 4GHz | Micro-Tronics | HPM13351 | T1241 | 07/19/17 | 07/19/18 |
| Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | T956 | None | None |
| PXA, Signal Analyzer | Agilent Technologies | N9030A | T1931 | 06/06/17 | 06/06/18 |
| DC power supply, 8 V @ 3 A or 15 V @ 2 A | Agilent / HP | E3610A | None | CNR | None |
| Antenna, Tuned Dipole 400~1000 MHz | ETS | 3121C DB4 | T273 | 06/08/17 | 06/08/18 |
| Directional Coupler | Mini-Circuits | ZUDC10-183+ | T1136 | 06/18/17 | 06/18/18 |

| Test Equipment List | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **T Number** |
| 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 |


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# 7. ANTENNA PORT TEST RESULTS

## 7.1. 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 | Pass |
| 22.917(a)<br>24.238(a) | RSS-132(5.5)<br>RSS-133(6.5) | Band Edge / Conducted Spurious Emission | -13dBm | | Pass |
| 2.1046 | N/A | Conducted output power | N/A | | Pass |
| 22.355<br>24.235 | RSS-132(5.3)<br>RSS-133(6.3) | Frequency Stability | 2.5PPM | | Pass |
| 22.913(a)(2) | RSS-132<br>(5.4) | Effective Radiated Power (FCC)<br>Equivalent Isotropic Radiated Power (ISED) | 38dBm | Radiated | Pass |
| 24.232(c ) | RSS-133(6.4) | Equivalent Isotropic Radiated Power | 33dBm | | Pass |
| 22.917(a)<br>24.238(a) | RSS-132(5.5)<br>RSS-133(6.5) | Radiated Spurious Emission | -13dBm | | Pass |



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## 7.2. RF OUTPUT POWER

**TEST PROCEDURE**

**ANSI C63.26:2015/ TIA / EIA 603-D Clause 2.2.17**
**KDB 971168 Section 5.6**

**ERP/EIRP = PMeas + GT – LC**

**where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);**
**PMeas = measured transmitter output power or PSD, in dBm or dBW;**
**GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);**
**LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.**

**For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.**

**MODES TESTED**

- **GSM 850**
- **GSM 1900**
- **WCDMA Band 2**
- **WCDMA Band 5**



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### 7.2.1. GSM/GPRS/EDGE

**Using CMW500 Communication Test Set**

| | |
|---|---|
| **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**<br>**Network Support > GSM+GPRS or GSM+EGPRS**<br>**Main Service > Packet Data**<br>**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**<br>**> 33 dBm for GPRS 850/900**<br>**> 27 dBm for EGPRS 850/900**<br>**> 30 dBm for GPRS1800/1900**<br>**> 26 dBm for EGPRS1800/1900** |
| **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 >** | **CS 4 (GPRS) and MCS5-9 (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** | |




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**GSM OUTPUT POWER RESULT**

| | |
|---|---|
| Tested By | Vanessa Moestopo |
| Date | 5/12/2017 |

**GSM 850 (FCC)**

| Antenna gain (dBi) | -2.00 |
|---|---|

| Mode | Ch. | f (MHz) | Modulation | Conducted Average (dBm) | ERP Average (dBm) | ERP Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| GPRS | 128 | 824.2 | 1 Time slot | 31.65 | 27.50 | 38.5 | -11.00 |
| | 190 | 836.6 | | 31.22 | 27.07 | 38.5 | -11.43 |
| | 251 | 848.8 | | 30.40 | 26.25 | 38.5 | -12.25 |
| | 128 | 824.2 | 2 Time slot | 28.87 | 24.72 | 38.5 | -13.78 |
| | 190 | 836.6 | | 28.44 | 24.29 | 38.5 | -14.21 |
| | 251 | 848.8 | | 27.71 | 23.56 | 38.5 | -14.94 |
| | 128 | 824.2 | 3 Time slot | 27.10 | 22.95 | 38.5 | -15.55 |
| | 190 | 836.6 | | 26.67 | 22.52 | 38.5 | -15.98 |
| | 251 | 848.8 | | 25.95 | 21.80 | 38.5 | -16.70 |
| | 128 | 824.2 | 4 Time slot | 25.97 | 21.82 | 38.5 | -16.68 |
| | 190 | 836.6 | | 25.53 | 21.38 | 38.5 | -17.12 |
| | 251 | 848.8 | | 24.80 | 20.65 | 38.5 | -17.85 |
| EGPRS | 128 | 824.2 | 1 Time slot | 26.00 | 21.85 | 38.5 | -16.65 |
| | 190 | 836.6 | | 25.60 | 21.45 | 38.5 | -17.05 |
| | 251 | 848.8 | | 24.80 | 20.65 | 38.5 | -17.85 |
| | 128 | 824.2 | 2 Time slot | 23.00 | 18.85 | 38.5 | -19.65 |
| | 190 | 836.6 | | 22.60 | 18.45 | 38.5 | -20.05 |
| | 251 | 848.8 | | 21.90 | 17.75 | 38.5 | -20.75 |
| | 128 | 824.2 | 3 Time slot | 21.20 | 17.05 | 38.5 | -21.45 |
| | 190 | 836.6 | | 20.80 | 16.65 | 38.5 | -21.85 |
| | 251 | 848.8 | | 20.10 | 15.95 | 38.5 | -22.55 |
| | 128 | 824.2 | 4 Time slot | 20.10 | 15.95 | 38.5 | -22.55 |
| | 190 | 836.6 | | 19.60 | 15.45 | 38.5 | -23.05 |
| | 251 | 848.8 | | 18.90 | 14.75 | 38.5 | -23.75 |





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**GSM 850 (ISED)**

| Antenna gain (dBi) | -2.00 |
|---|---|

| Mode | Ch. | f (MHz) | Modulation | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| GPRS | 128 | 824.2 | 1 Time slot | 31.65 | 29.65 | 38.5 | -8.85 |
| | 190 | 836.6 | | 31.22 | 29.22 | 38.5 | -9.28 |
| | 251 | 848.8 | | 30.40 | 28.40 | 38.5 | -10.10 |
| | 128 | 824.2 | 2 Time slot | 28.87 | 26.87 | 38.5 | -11.63 |
| | 190 | 836.6 | | 28.44 | 26.44 | 38.5 | -12.06 |
| | 251 | 848.8 | | 27.71 | 25.71 | 38.5 | -12.79 |
| | 128 | 824.2 | 3 Time slot | 27.10 | 25.10 | 38.5 | -13.40 |
| | 190 | 836.6 | | 26.67 | 24.67 | 38.5 | -13.83 |
| | 251 | 848.8 | | 25.95 | 23.95 | 38.5 | -14.55 |
| | 128 | 824.2 | 4 Time slot | 25.97 | 23.97 | 38.5 | -14.53 |
| | 190 | 836.6 | | 25.53 | 23.53 | 38.5 | -14.97 |
| | 251 | 848.8 | | 24.80 | 22.80 | 38.5 | -15.70 |
| EGPRS | 128 | 824.2 | 1 Time slot | 26.00 | 24.00 | 38.5 | -14.50 |
| | 190 | 836.6 | | 25.60 | 23.60 | 38.5 | -14.90 |
| | 251 | 848.8 | | 24.80 | 22.80 | 38.5 | -15.70 |
| | 128 | 824.2 | 2 Time slot | 23.00 | 21.00 | 38.5 | -17.50 |
| | 190 | 836.6 | | 22.60 | 20.60 | 38.5 | -17.90 |
| | 251 | 848.8 | | 21.90 | 19.90 | 38.5 | -18.60 |
| | 128 | 824.2 | 3 Time slot | 21.20 | 19.20 | 38.5 | -19.30 |
| | 190 | 836.6 | | 20.80 | 18.80 | 38.5 | -19.70 |
| | 251 | 848.8 | | 20.10 | 18.10 | 38.5 | -20.40 |
| | 128 | 824.2 | 4 Time slot | 20.10 | 18.10 | 38.5 | -20.40 |
| | 190 | 836.6 | | 19.60 | 17.60 | 38.5 | -20.90 |
| | 251 | 848.8 | | 18.90 | 16.90 | 38.5 | -21.60 |



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**GSM 1900**

| Antenna gain (dBi) | | -0.40 | | | | | |
|---|---|---|---|---|---|---|---|
| Mode | Ch. | f (MHz) | Modulation | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Limit (dBm) | Margin (dB) |
| GPRS | 512 | 1850.2 | 1 Time slot | 28.78 | 28.38 | 33.0 | -4.62 |
| | 661 | 1880 | | 28.64 | 28.24 | 33.0 | -4.76 |
| | 810 | 1909.8 | | 28.37 | 27.97 | 33.0 | -5.03 |
| | 512 | 1850.2 | 2 Time slot | 25.93 | 25.53 | 33.0 | -7.47 |
| | 661 | 1880 | | 25.79 | 25.39 | 33.0 | -7.61 |
| | 810 | 1909.8 | | 25.51 | 25.11 | 33.0 | -7.89 |
| | 512 | 1850.2 | 3 Time slot | 24.17 | 23.77 | 33.0 | -9.23 |
| | 661 | 1880 | | 24.00 | 23.60 | 33.0 | -9.40 |
| | 810 | 1909.8 | | 23.24 | 22.84 | 33.0 | -10.16 |
| | 512 | 1850.2 | 4 Time slot | 22.97 | 22.57 | 33.0 | -10.43 |
| | 661 | 1880 | | 22.79 | 22.39 | 33.0 | -10.61 |
| | 810 | 1909.8 | | 22.53 | 22.13 | 33.0 | -10.87 |
| EGPRS | 512 | 1850.2 | 1 Time slot | 24.80 | 24.40 | 33.0 | -8.60 |
| | 661 | 1880 | | 24.60 | 24.20 | 33.0 | -8.80 |
| | 810 | 1909.8 | | 24.30 | 23.90 | 33.0 | -9.10 |
| | 512 | 1850.2 | 2 Time slot | 21.80 | 21.40 | 33.0 | -11.60 |
| | 661 | 1880 | | 21.60 | 21.20 | 33.0 | -11.80 |
| | 810 | 1909.8 | | 21.40 | 21.00 | 33.0 | -12.00 |
| | 512 | 1850.2 | 3 Time slot | 20.00 | 19.60 | 33.0 | -13.40 |
| | 661 | 1880 | | 19.80 | 19.40 | 33.0 | -13.60 |
| | 810 | 1909.8 | | 19.60 | 19.20 | 33.0 | -13.80 |
| | 512 | 1850.2 | 4 Time slot | 18.90 | 18.50 | 33.0 | -14.50 |
| | 661 | 1880 | | 18.70 | 18.30 | 33.0 | -14.70 |
| | 810 | 1909.8 | | 18.40 | 18.00 | 33.0 | -15.00 |





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### 7.2.2. UMTS REL 99

**TEST PROCEDURE**

**Release 99 Setup Procedures used to establish the test signals**

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

The following summary of these settings are illustrated below:

| Mode | Subtest | Rel99 |
|---|---|---|
| WCDMA General Settings | Loopback Mode | Test Mode 2 |
| | Rel99 RMC | 12.2kbps RMC |
| | Power Control Algorithm | Algorithm2 |
| | βc/βd | 8/15 |

**RESULTS**





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**UMTS REL 99 OUTPUT POWER RESULT**

| | |
|---|---|
| Tested By | Vanessa Moestopo |
| Date | 6/27/2017 |

| | |
|---|---|
| Antenna gain Band 5 (dBi) | -2.00 |
| Antenna gain Band 2 (dBi) | -0.40 |

**Part 22 / RSS 132 850MHz Band (5)**

| Band | UL Channel | DL Channel | Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| UMTS Rel. 99 850MHz | 4132 | 4357 | 826.4 | 22.82 | 18.67 | 38.5 | -19.8 |
| | 4183 | 4408 | 836.6 | 22.27 | 18.12 | 38.5 | -20.4 |
| | 4233 | 4458 | 846.6 | 21.75 | 17.60 | 38.5 | -20.9 |

**Part 24 / RSS 133 1900MHz Band (2)**

| Band | UL Channel | DL Channel | Frequency (MHz) | Peak Power (dBm) | EIRP Average (dBm) | EIRP Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| UMTS Rel. 99 1900MHz | 9262 | 9662 | 1852.4 | 22.30 | 21.90 | 33.0 | -11.1 |
| | 9400 | 9800 | 1880.0 | 22.10 | 21.70 | 33.0 | -11.3 |
| | 9538 | 9938 | 1907.6 | 21.23 | 20.83 | 33.0 | -12.2 |



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### 7.2.3. UMTS HSDPA and HSUPA

**HSDPA Setup Procedures used to establish the test signals**

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121.

Summary of settings are illustrated below:

| | Mode | HSDPA | HSDPA | HSDPA | HSDPA |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| W-CDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set 1 | | | |
| | Power Control Algorithm | Algorithm 2 | | | |
| | βc | 2/15 | 11/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | Bd (SF) | 64 | | | |
| | βc/βd | 2/15 | 11/15 | 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 | | | |





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## HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to Release 6 procedures in table C,11.1.3 of 3GPP TS 34.121-1 v13.

A summary of these settings are illustrated below:

| | Mode | HSPA | | | | |
|---|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 | 5 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | Rel99 RMC | 12.2 kbps RMC | | | | |
| | HSDPA FRC | H-Set 1 | | | | |
| | HSUPA Test | HSPA | | | | |
| | Power Control Algorithm | Algorithm 2 | | | | Algorithm 1 |
| | βc | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | βd | 15/15 | 15/15 | 9/15 | 15/15 | 0 |
| | βec | 209/225 | 12/15 | 30/15 | 2/15 | 5/15 |
| | βc/βd | 11/15 | 6/15 | 15/9 | 2/15 | - |
| | βhs | 22/15 | 12/15 | 30/15 | 4/15 | 5/15 |
| | βed | 1309/225 | 94/75 | 47/15 | 56/75 | 47/15 |
| | CM (dB) | 1 | 3 | 2 | 3 | 1 |
| | MPR (dB) | 0 | 2 | 1 | 2 | 0 |
| HSDPA Specific Settings | DACK | 8 | | | | 0 |
| | DNAK | 8 | | | | 0 |
| | DCQI | 8 | | | | 0 |
| | 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 | E-DPDCCH | 6 | 8 | 8 | 5 | 0 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 12 |
| | ETFCI (from 34.121 Table C.11.1.3) | 75 | 67 | 92 | 71 | 67 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E-TFCIs | 5 | 5 | 2 | 5 | 1 |
| | Reference E-TFCI | 11 | 11 | 11 | 11 | 67 |
| | Reference E-TFCI PO | 4 | 4 | 4 | 4 | 18 |
| | Reference E-TFCI | 67 | 67 | 92 | 67 | 67 |
| | Reference E-TFCI PO | 18 | 18 | 18 | 18 | 18 |
| | Reference E-TFCI | 71 | 71 | 71 | 71 | 71 |
| | Reference E-TFCI PO | 23 | 23 | 23 | 23 | 23 |
| | Reference E-TFCI | 75 | 75 | 75 | 75 | 75 |
| | Reference E-TFCI PO | 26 | 26 | 26 | 26 | 26 |
| | Reference E-TFCI | 81 | 81 | 81 | 81 | 81 |
| | Reference E-TFCI PO | 27 | 27 | 27 | 27 | 27 |
| | Maximum Channelization Codes | 2xSF2 | | | | SF4 |

## RESULTS





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## UMTS HSDPA OUTPUT POWER RESULT

| | |
|---|---|
| Antenna gain Band 5 (dBi) | -2.00 |
| Antenna gain Band 2 (dBi) | -0.40 |

**Part 22 / RSS 132 850MHz Band (5)**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| UMTS HSDPA 850MHz | 1 | 4132 | 4357 | 826.4 | 21.46 | 17.31 | 38.5 | -17.0 |
| | | 4183 | 4408 | 836.6 | 20.93 | 16.78 | 38.5 | -17.6 |
| | | 4233 | 4458 | 846.6 | 20.42 | 16.27 | 38.5 | -18.1 |
| | 2 | 4132 | 4357 | 826.4 | 21.43 | 17.28 | 38.5 | -17.1 |
| | | 4183 | 4408 | 836.6 | 20.89 | 16.74 | 38.5 | -17.6 |
| | | 4233 | 4458 | 846.6 | 20.35 | 16.20 | 38.5 | -18.2 |
| | 3 | 4132 | 4357 | 826.4 | 21.45 | 17.30 | 38.5 | -17.1 |
| | | 4183 | 4408 | 836.6 | 20.88 | 16.73 | 38.5 | -17.6 |
| | | 4233 | 4458 | 846.6 | 20.64 | 16.49 | 38.5 | -17.9 |
| | 4 | 4132 | 4357 | 826.4 | 21.45 | 17.30 | 38.5 | -17.1 |
| | | 4183 | 4408 | 836.6 | 20.90 | 16.75 | 38.5 | -17.6 |
| | | 4233 | 4458 | 846.6 | 20.36 | 16.21 | 38.5 | -18.1 |

**Part 24 / RSS 133 1900MHz Band (2)**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| UMTS HSDPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | 22.72 | 22.32 | 33.0 | -10.3 |
| | | 9400 | 9800 | 1880.0 | 22.65 | 22.25 | 33.0 | -10.4 |
| | | 9538 | 9938 | 1907.6 | 21.88 | 21.48 | 33.0 | -11.1 |
| | 2 | 9262 | 9662 | 1852.4 | 21.88 | 21.48 | 33.0 | -11.1 |
| | | 9400 | 9800 | 1880.0 | 21.72 | 21.32 | 33.0 | -11.3 |
| | | 9538 | 9938 | 1907.6 | 21.14 | 20.74 | 33.0 | -11.9 |
| | 3 | 9262 | 9662 | 1852.4 | 21.54 | 21.14 | 33.0 | -11.5 |
| | | 9400 | 9800 | 1880.0 | 21.30 | 20.90 | 33.0 | -11.7 |
| | | 9538 | 9938 | 1907.6 | 20.80 | 20.40 | 33.0 | -12.2 |
| | 4 | 9262 | 9662 | 1852.4 | 21.35 | 20.95 | 33.0 | -11.7 |
| | | 9400 | 9800 | 1880.0 | 21.10 | 20.70 | 33.0 | -11.9 |
| | | 9538 | 9938 | 1907.6 | 20.58 | 20.18 | 33.0 | -12.4 |



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## UMTS HSUPA OUTPUT POWER RESULT

| | |
|---|---|
| Antenna gain Band 5 (dBi) | -2.00 |
| Antenna gain Band 2 (dBi) | -0.40 |

**Part 22 / RSS 132 850MHz Band (5)**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| UMTS HSUPA 850MHz | 1 | 4132 | 4357 | 826.4 | 21.54 | 17.39 | 38.5 | -17.0 |
| | | 4183 | 4408 | 836.6 | 21.65 | 17.50 | 38.5 | -16.9 |
| | | 4233 | 4458 | 846.6 | 21.67 | 17.52 | 38.5 | -16.8 |
| | 2 | 4132 | 4357 | 826.4 | 19.87 | 15.72 | 38.5 | -18.6 |
| | | 4183 | 4408 | 836.6 | 20.79 | 16.64 | 38.5 | -17.7 |
| | | 4233 | 4458 | 846.6 | 20.81 | 16.66 | 38.5 | -17.7 |
| | 3 | 4132 | 4357 | 826.4 | 21.42 | 17.27 | 38.5 | -17.1 |
| | | 4183 | 4408 | 836.6 | 21.52 | 17.37 | 38.5 | -17.0 |
| | | 4233 | 4458 | 846.6 | 21.52 | 17.37 | 38.5 | -17.0 |
| | 4 | 4132 | 4357 | 826.4 | 19.87 | 15.72 | 38.5 | -18.6 |
| | | 4183 | 4408 | 836.6 | 20.79 | 16.64 | 38.5 | -17.7 |
| | | 4233 | 4458 | 846.6 | 20.81 | 16.66 | 38.5 | -17.7 |
| | 5 | 4132 | 4357 | 826.4 | 21.54 | 17.39 | 38.5 | -17.0 |
| | | 4183 | 4408 | 836.6 | 21.65 | 17.50 | 38.5 | -16.9 |
| | | 4233 | 4458 | 846.6 | 21.67 | 17.52 | 38.5 | -16.8 |

**Part 24 / RSS 133 1900MHz Band (2)**

| Band | Subtest | UL Channel | DL Channel | Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| UMTS HSUPA 1900MHz | 1 | 9262 | 9662 | 1852.4 | 21.53 | 21.13 | 33.0 | -11.5 |
| | | 9400 | 9800 | 1880.0 | 21.28 | 20.88 | 33.0 | -11.7 |
| | | 9538 | 9938 | 1907.6 | 21.00 | 20.60 | 33.0 | -12.0 |
| | 2 | 9262 | 9662 | 1852.4 | 20.68 | 20.28 | 33.0 | -12.3 |
| | | 9400 | 9800 | 1880.0 | 20.44 | 20.04 | 33.0 | -12.6 |
| | | 9538 | 9938 | 1907.6 | 19.87 | 19.47 | 33.0 | -13.1 |
| | 3 | 9262 | 9662 | 1852.4 | 21.38 | 20.98 | 33.0 | -11.6 |
| | | 9400 | 9800 | 1880.0 | 21.17 | 20.77 | 33.0 | -11.8 |
| | | 9538 | 9938 | 1907.6 | 20.56 | 20.16 | 33.0 | -12.4 |
| | 4 | 9262 | 9662 | 1852.4 | 20.68 | 20.28 | 33.0 | -12.3 |
| | | 9400 | 9800 | 1880.0 | 20.44 | 20.04 | 33.0 | -12.6 |
| | | 9538 | 9938 | 1907.6 | 19.87 | 19.47 | 33.0 | -13.1 |
| | 5 | 9262 | 9662 | 1852.4 | 21.50 | 21.10 | 33.0 | -11.5 |
| | | 9400 | 9800 | 1880.0 | 21.28 | 20.88 | 33.0 | -11.7 |
| | | 9538 | 9938 | 1907.6 | 21.00 | 20.60 | 33.0 | -12.0 |



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## 7.3. PEAK TO AVERAGE RATIO

**TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

**TEST SPEC**

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



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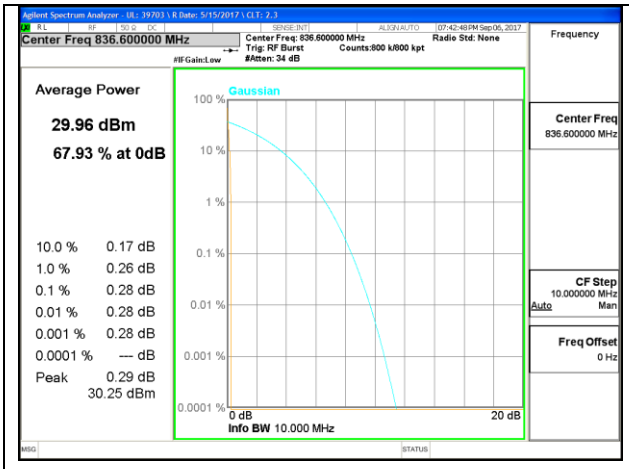
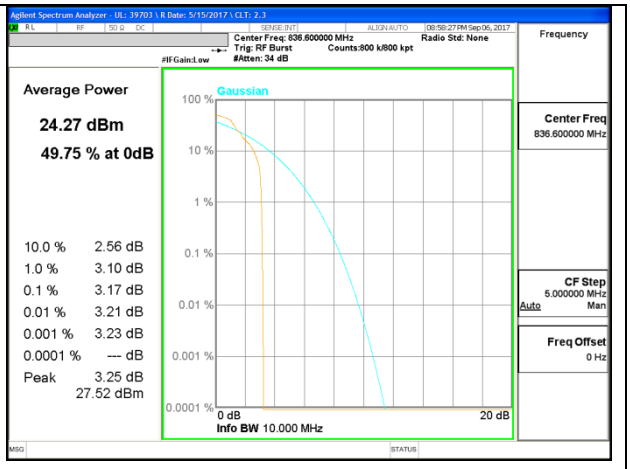
**CONDUCTED PEAK TO AVERAGE RESULT**

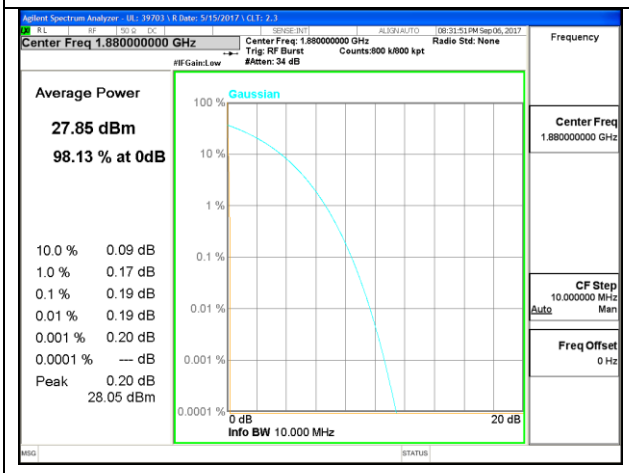
### 7.3.1. GSM



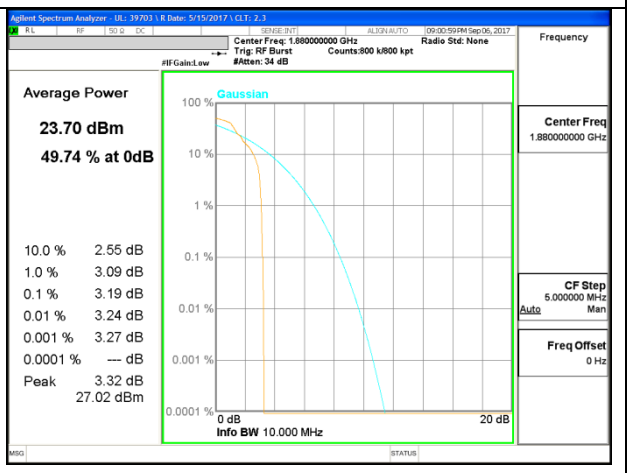

GSM850 GPRS Middle Channel




GSM850 EGPRS Middle Channel




GSM1900 GPRS Middle Channel




GSM1900 EGPRS Middle Channel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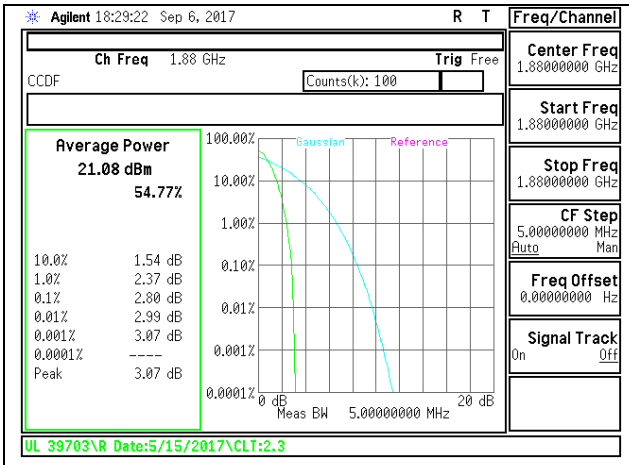
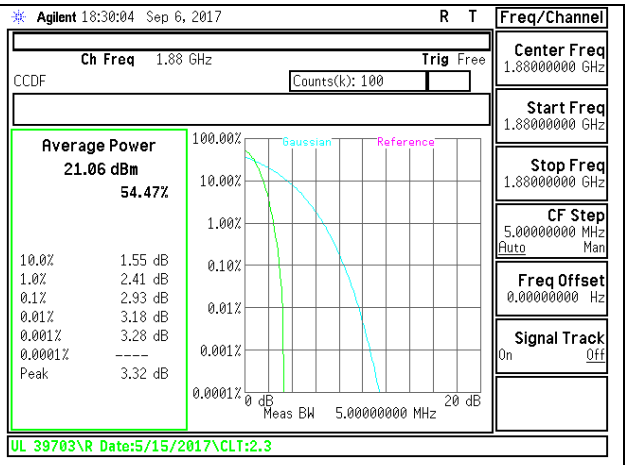
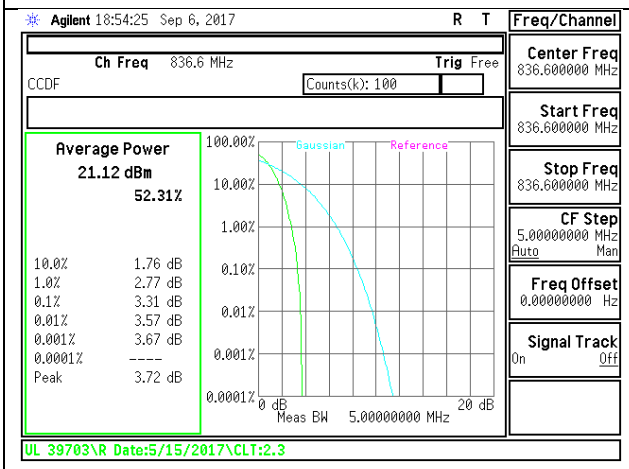
### 7.3.2. WCDMA



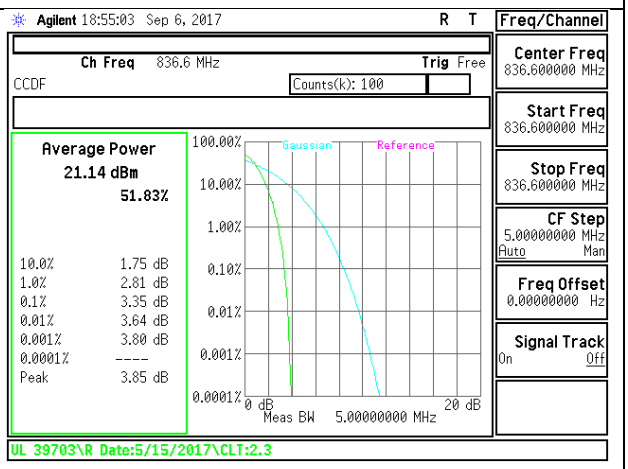

B2 REL99




B2 HSDPA




B5 REL99




B5 HSDPA



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## 8.1. OCCUPIED BANDWIDTH

**RULE PART(S)**

FCC: §2.1049
IC: RSS132; RSS133

**LIMITS**

For reporting purposes only

**TEST PROCEDURE**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v02r02)



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**OCCUPIED BANDWIDTH RESULTS AND PLOTS**

### 8.1.1. GSM

| Band | Mode | Channel | f (MHz) | 99% BW (kHz) | -26dB (kHz) |
|---|---|---|---|---|---|
| GSM 850 | GPRS | 128 | 824.2 | 244.8 | 316.2 |
| | | 190 | 836.6 | 245.1 | 310.1 |
| | | 251 | 848.8 | 238.5 | 321.5 |
| | EGPRS | 128 | 824.2 | 234.8 | 302.7 |
| | | 190 | 836.6 | 245.1 | 317.9 |
| | | 251 | 848.8 | 231.9 | 286.6 |
| GSM 1900 | GPRS | 512 | 1850.2 | 246 | 314.5 |
| | | 661 | 1880 | 245.1 | 315 |
| | | 810 | 1909.8 | 243.1 | 320.7 |
| | EGPRS | 512 | 1850.2 | 246.1 | 305.2 |
| | | 661 | 1880 | 246.9 | 317.3 |
| | | 810 | 1909.8 | 240.3 | 301.3 |



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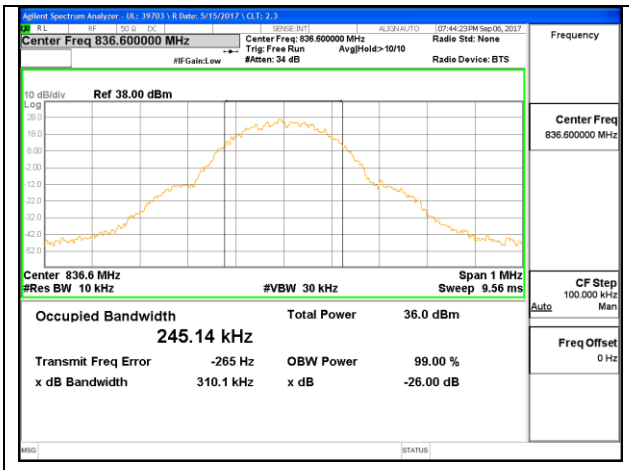
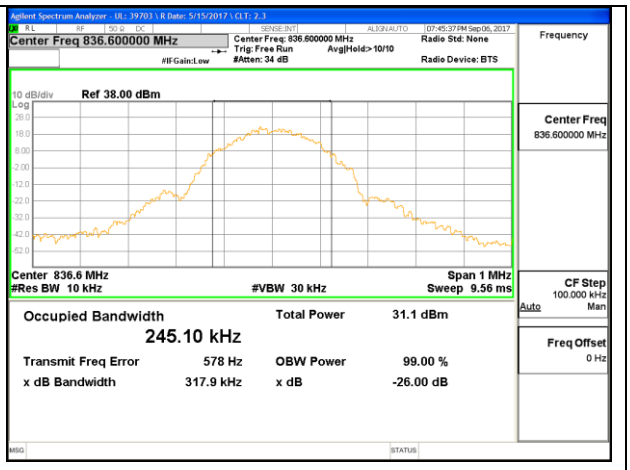
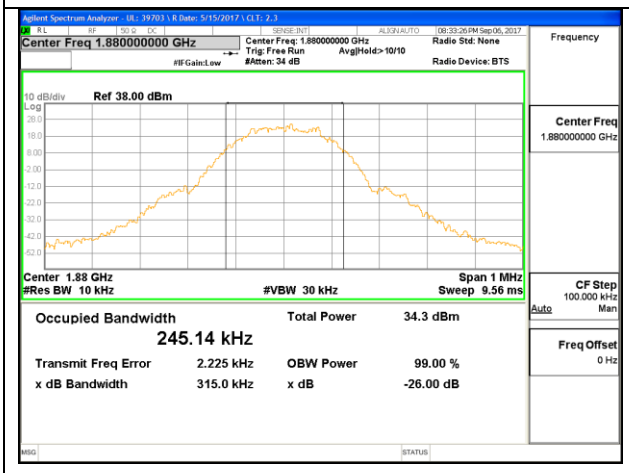


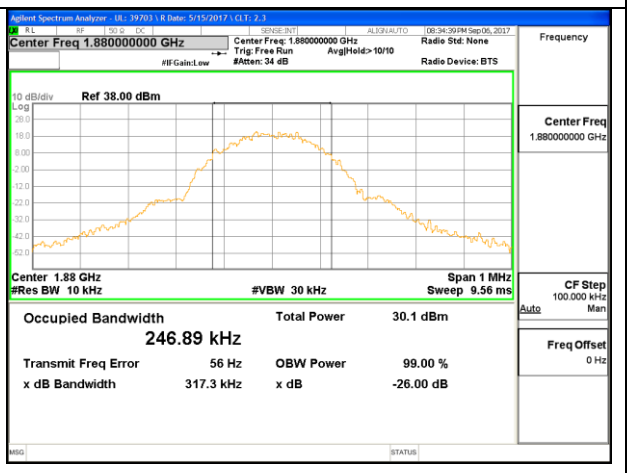

GSM850 GPRS Middle Channel




GSM850 EGPRS Middle Channel




GSM1900 GPRS Middle Channel




GSM1900 EGPRS Middle Channel



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### 8.1.2. WCDMA

| Band | Mode | Channel | f (MHz) | 99% BW (MHz) | -26dB (MHz) |
|---|---|---|---|---|---|
| Band 2 | REL99 | 9262 | 1852.4 | 4.07 | 4.64 |
| | | 9400 | 1880 | 4.07 | 4.66 |
| | | 9538 | 1907.6 | 4.07 | 4.62 |
| | HSDPA | 9262 | 1852.4 | 4.07 | 4.62 |
| | | 9400 | 1880 | 4.08 | 4.6 |
| | | 9538 | 1907.6 | 4.06 | 4.61 |
| Band 5 | REL99 | 4132 | 826.4 | 4.05 | 4.57 |
| | | 4183 | 836.6 | 4.03 | 4.58 |
| | | 4233 | 846.6 | 4.04 | 4.59 |
| | HSDPA | 4132 | 826.4 | 4.05 | 4.58 |
| | | 4183 | 836.6 | 4.04 | 4.58 |
| | | 4233 | 846.6 | 4.06 | 4.63 |


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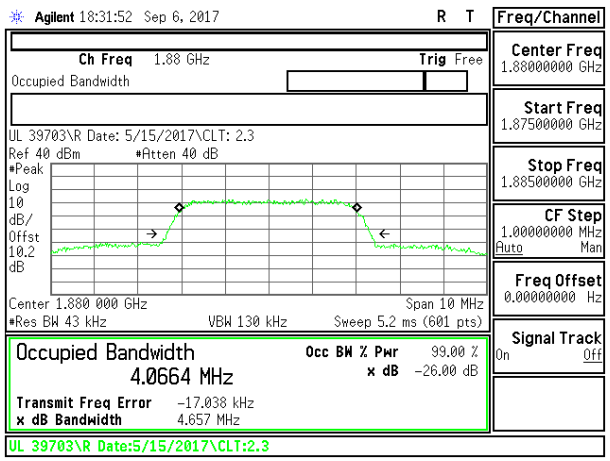
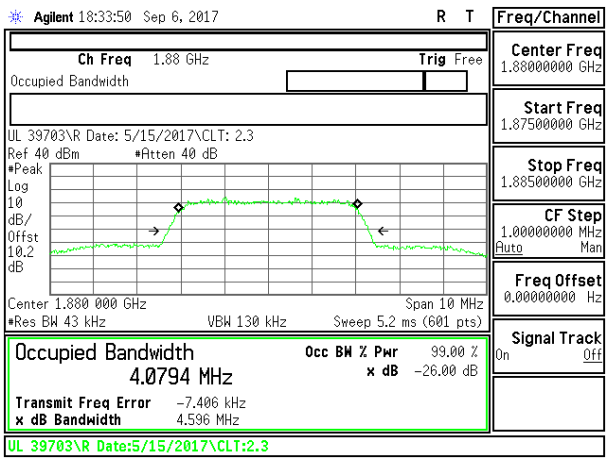
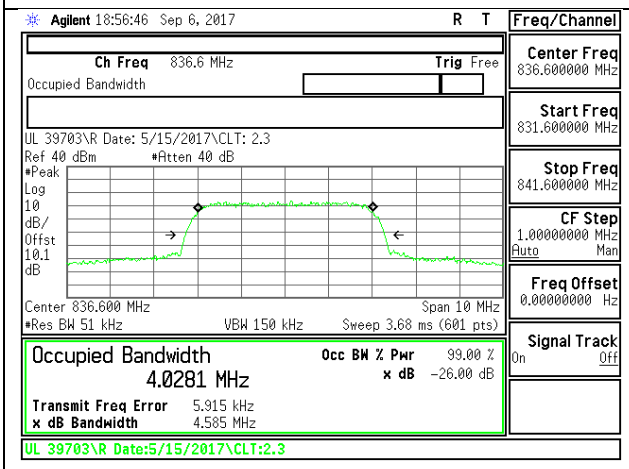


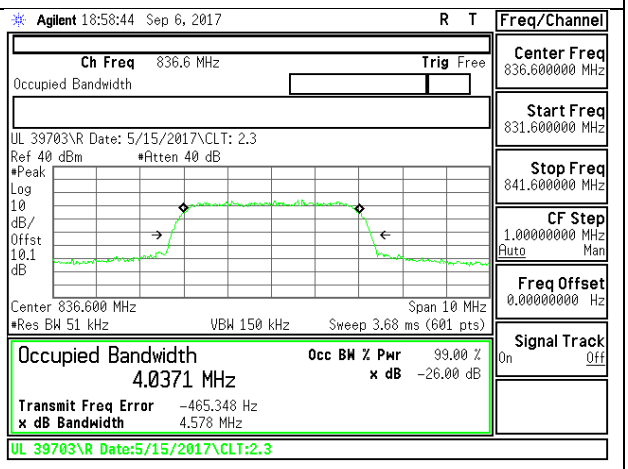

B2 REL99 Middle Channel




B2 HSDPA Middle Channel




B5 REL99 Middle Channel




B5 HSDPA Middle Channel



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## 8.2. BAND EDGE EMISSIONS

**RULE PART(S)**

FCC: §22.359, §22.917, §24.238
IC: RSS132§5.5; RSS133§6.5

**FCC LIMITS**

FCC: §22.359, §22.917, §24.238
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.

RSS132§5.5
Mobile and base station equipment shall comply with the limits in (i) and (ii) below.
In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P ( dBW) by at least 43 + 10 log10p (watts).
After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5
Equipment shall comply with the limits in (i) and (ii) below.
(i)In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).
(ii)After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

**TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v02r02
The transmitter output was connected to an Agilent 8960 or a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.
For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.




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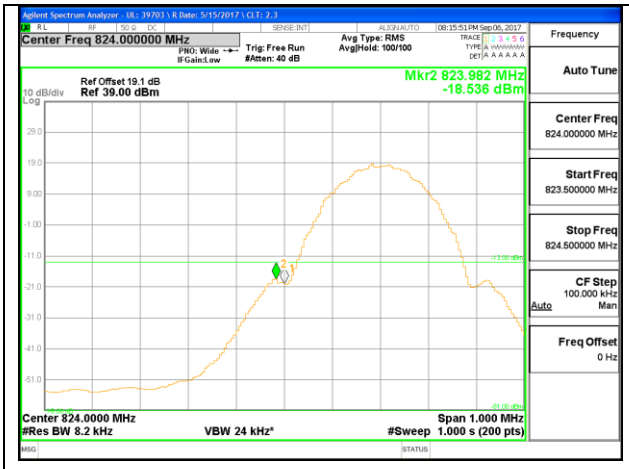
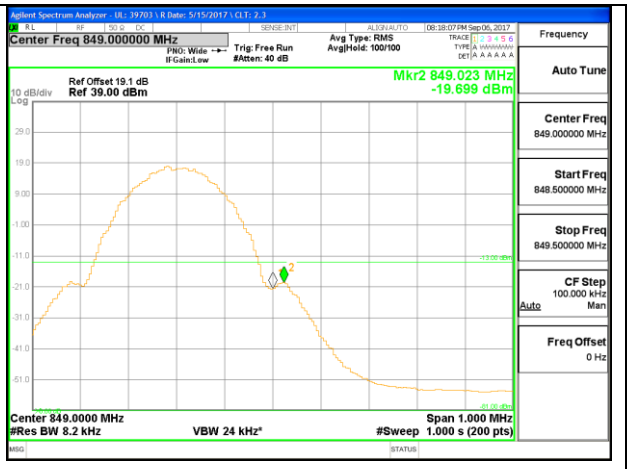
**BAND EDGE PLOTS**

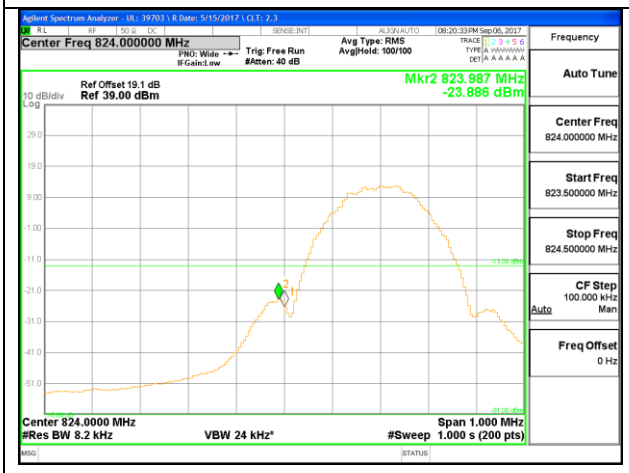
### 8.2.1. GSM



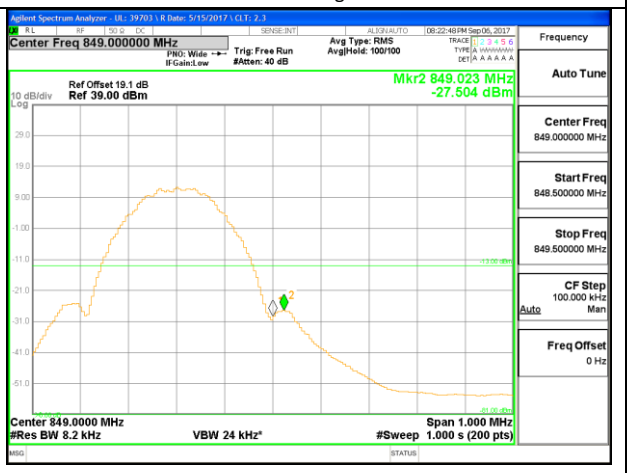

GSM850 GPRS Low Channel




GSM850 GPRS High Channel




GSM850 EGPRS Low Channel




GSM850 EGPRS High Channel



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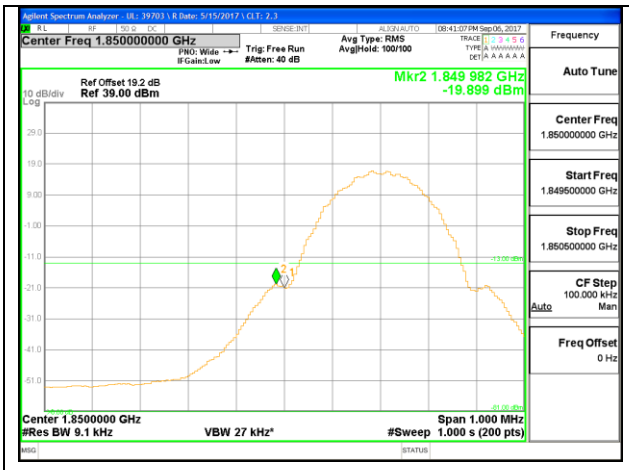
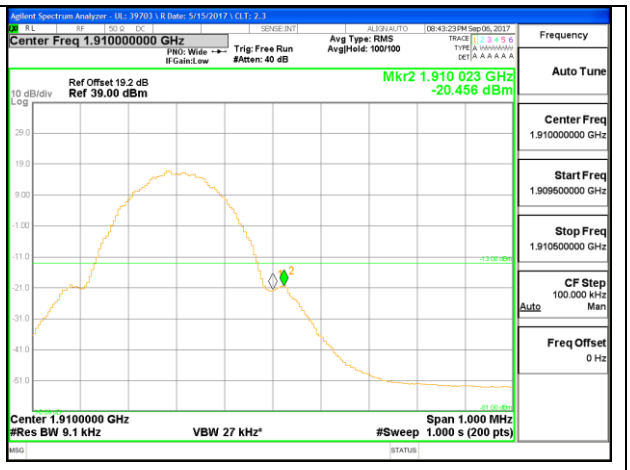
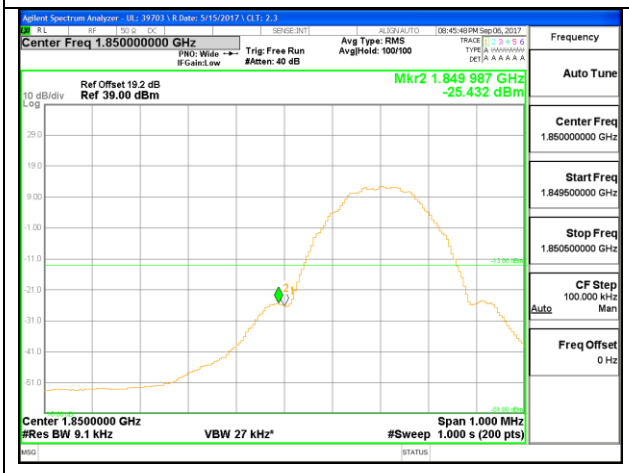


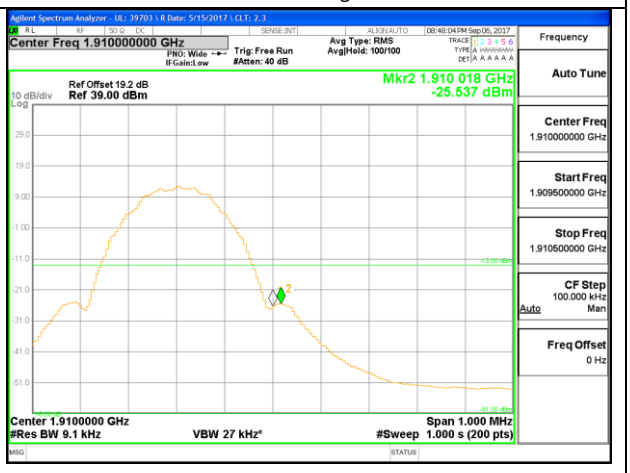

GSM1900 GPRS Low Channel




GSM1900 GPRS High Channel




GSM1900 EGPRS Low Channel




GSM1900 EGPRS High Channel



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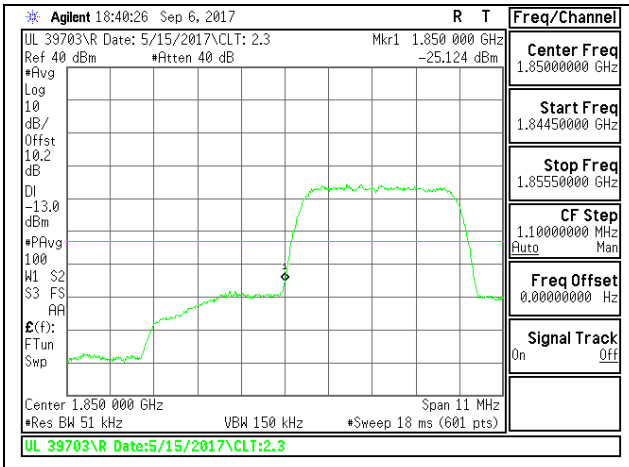
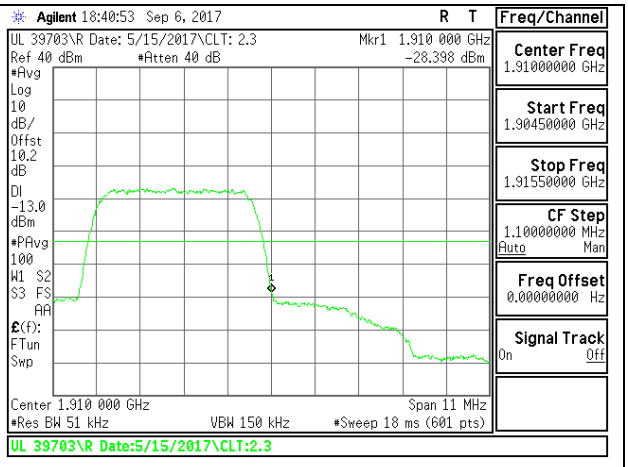
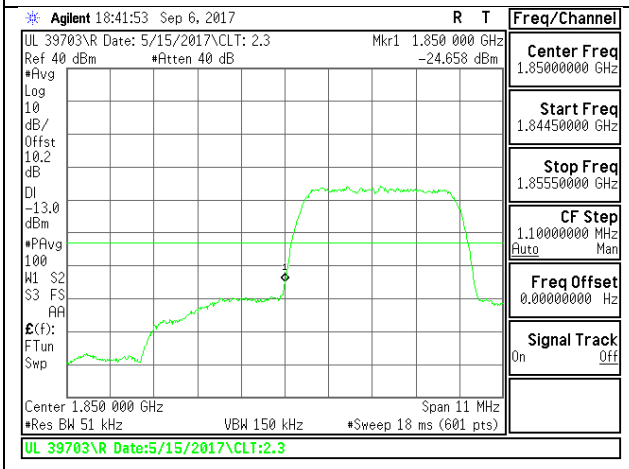
### 8.2.2. WCDMA



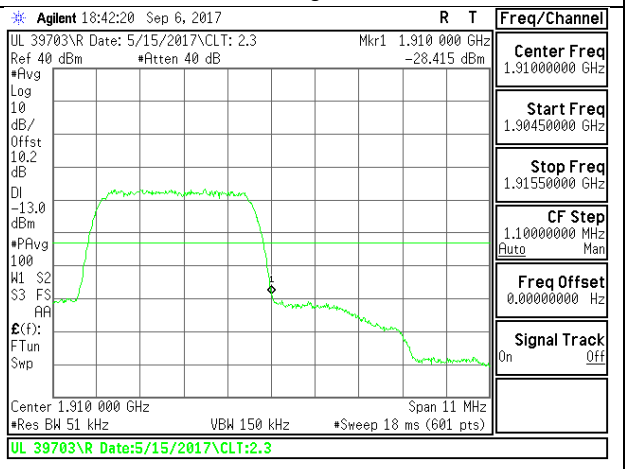

B2 REL99 Low Channel



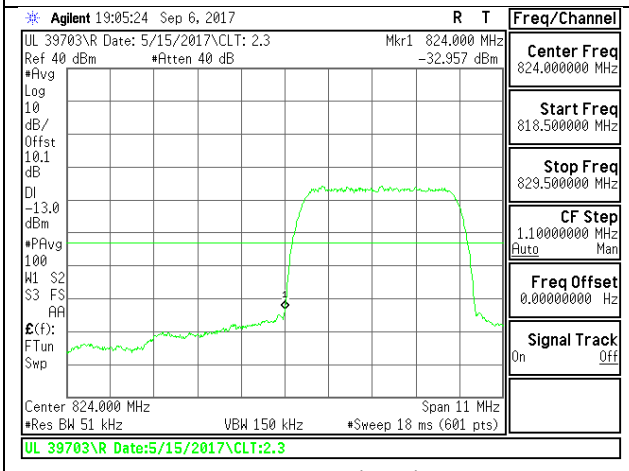

B2 REL99 High Channel



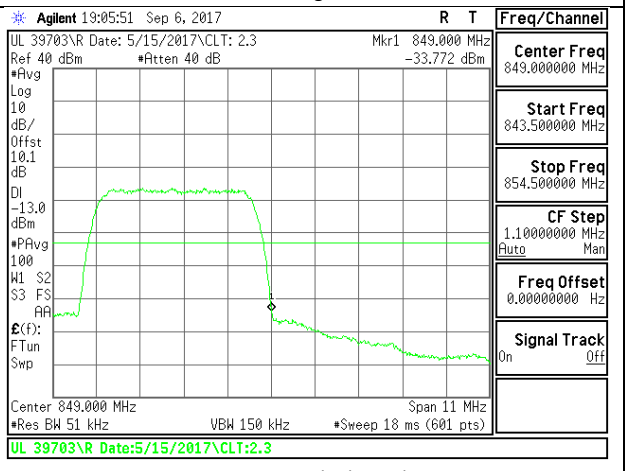

B2 HSDPA Low Channel




B2 HSDPA High Channel




B5 REL99 Low Channel




B5 REL99 High Channel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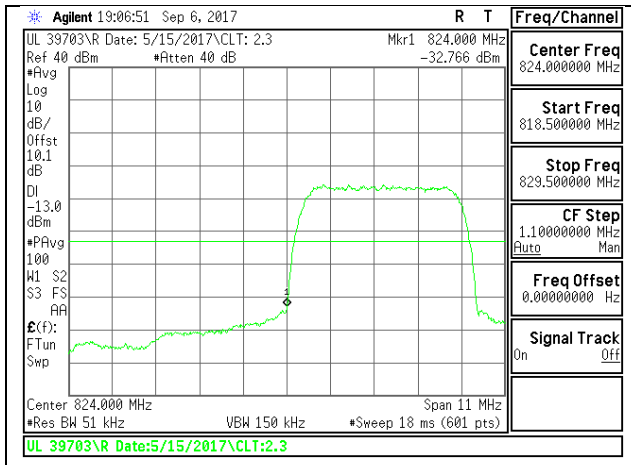
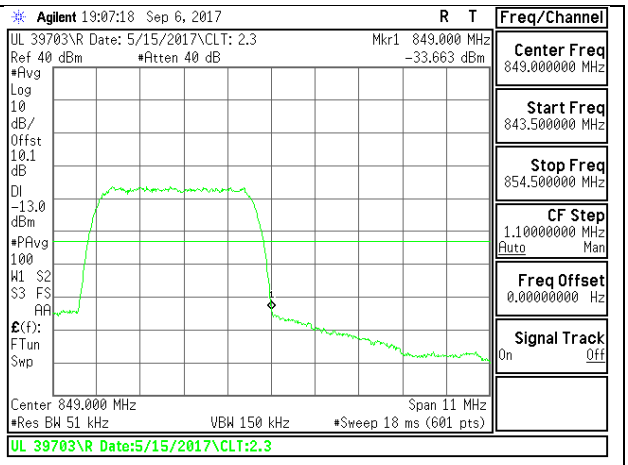



B5 HSDPA Low Channel




B5 HSDPA High Channel



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## 8.3. OUT OF BAND EMISSIONS

**RULE PART(S)**

FCC: §22.359, §22.917, §24.238
IC: RSS132§5.5; RSS133§6.5

**FCC LIMITS**

FCC: §22.359, §22.917, §24.238
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.

RSS132§5.5
Mobile and base station equipment shall comply with the limits in (i) and (ii) below.
In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P ( dBW) by at least 43 + 10 log10p (watts).
After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5
Equipment shall comply with the limits in (i) and (ii) below.
(i)In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).
(ii)After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

**TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v02r02
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in a maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.
For each out of band emissions measurement:

- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

**RESULTS**


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**OUT OF BAND EMISSIONS RESULT AND PLOTS**

### 8.3.1. GSM

| Band | Mode | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|---|---|---|---|---|---|
| GSM 850 | GPRS | 824.2 | -22.179 | -13 | -9.179 |
| | | 836.6 | -21.908 | -13 | -8.908 |
| | | 848.8 | -21.458 | -13 | -8.458 |
| | EGPRS | 824.2 | -21.998 | -13 | -8.998 |
| | | 836.6 | -21.708 | -13 | -8.708 |
| | | 848.8 | -21.664 | -13 | -8.664 |
| GSM 1900 | GPRS | 1850.2 | -21.423 | -13 | -8.423 |
| | | 1880 | -21.958 | -13 | -8.958 |
| | | 1909.8 | -21.678 | -13 | -8.678 |
| | EGPRS | 1850.2 | -21.578 | -13 | -8.578 |
| | | 1880 | -21.986 | -13 | -8.986 |
| | | 1909.8 | -21.656 | -13 | -8.656 |


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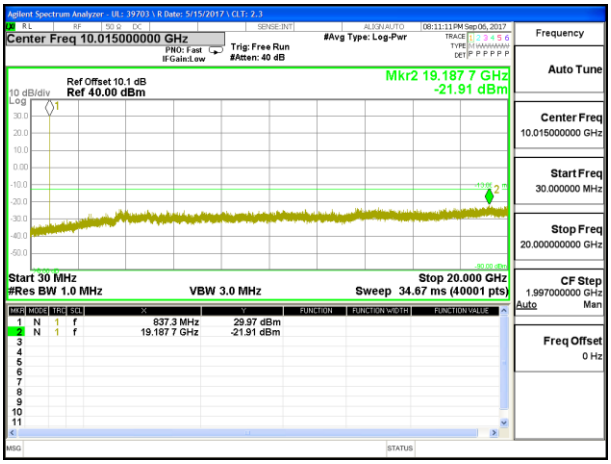
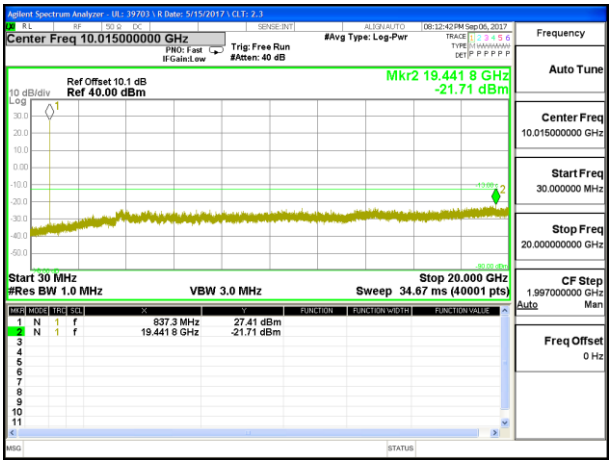
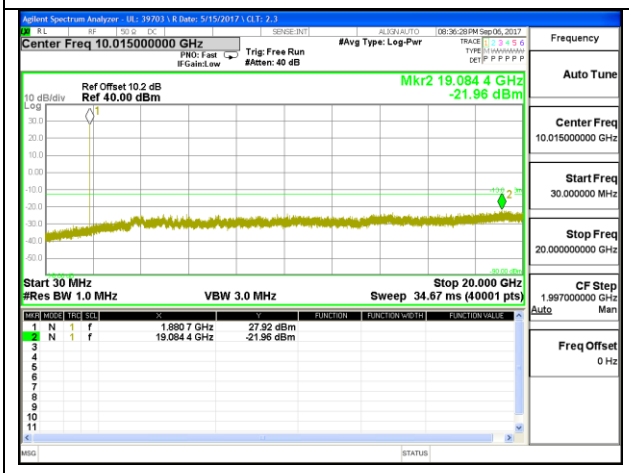


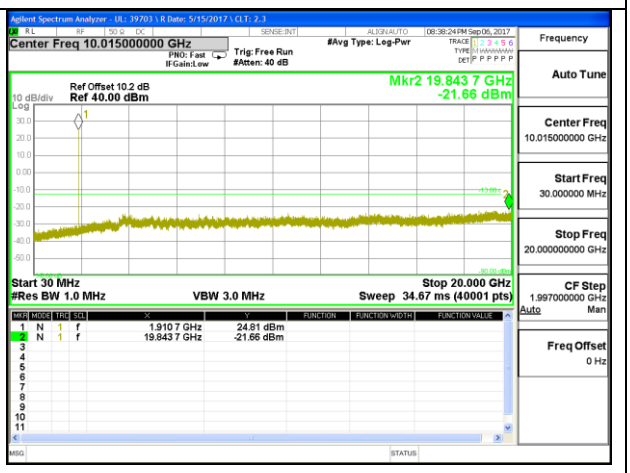

GSM850 GPRS Middle Channel




GSM850 EGPRS Middle Channel




GSM1900 GPRS Middle Channel




GSM1900 EGPRS Middle Channel



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### 8.3.2. WCDMA

| Band | Mode | f (MHz) | Spur (dBm) | 99% BW (MHz) | Delta (dB) |
|---|---|---|---|---|---|
| Band 2 | REL99 | 1852.4 | -23.74 | -13 | -10.74 |
| | | 1880 | -24.09 | -13 | -11.09 |
| | | 1907.6 | -24.15 | -13 | -11.15 |
| | HSDPA | 1852.4 | -23.98 | -13 | -10.98 |
| | | 1880 | -23.7 | -13 | -10.7 |
| | | 1907.6 | -23.24 | -13 | -10.24 |
| Band 5 | REL99 | 826.4 | -24.07 | -13 | -11.07 |
| | | 836.6 | -24 | -13 | -11 |
| | | 846.6 | -22.9 | -13 | -9.9 |
| | HSDPA | 826.4 | -24.1 | -13 | -11.1 |
| | | 836.6 | -24.1 | -13 | -11.1 |
| | | 846.6 | -24.2 | -13 | -11.2 |


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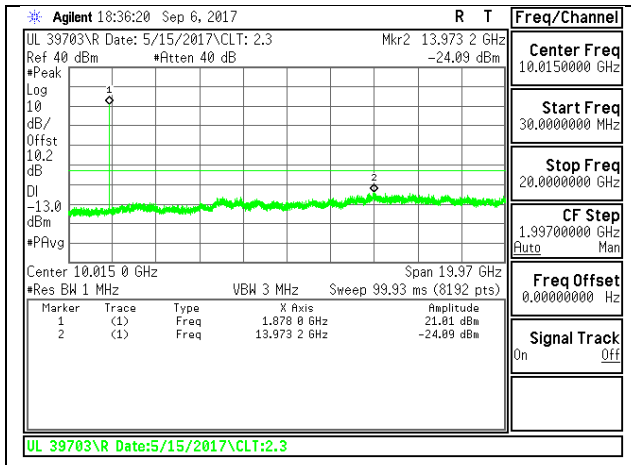
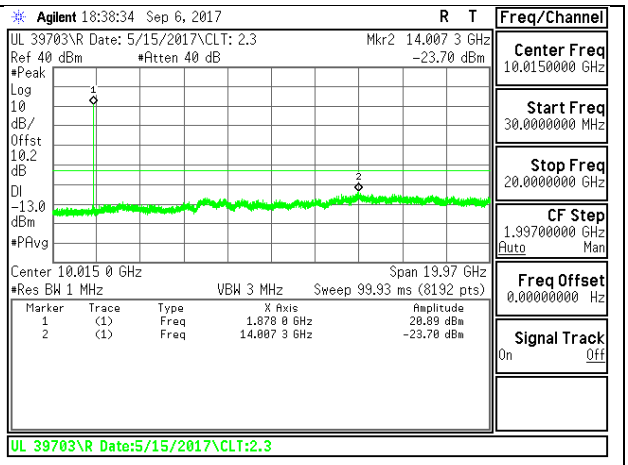
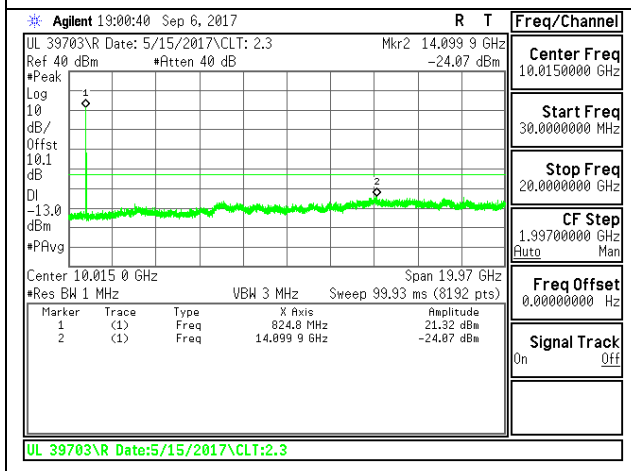


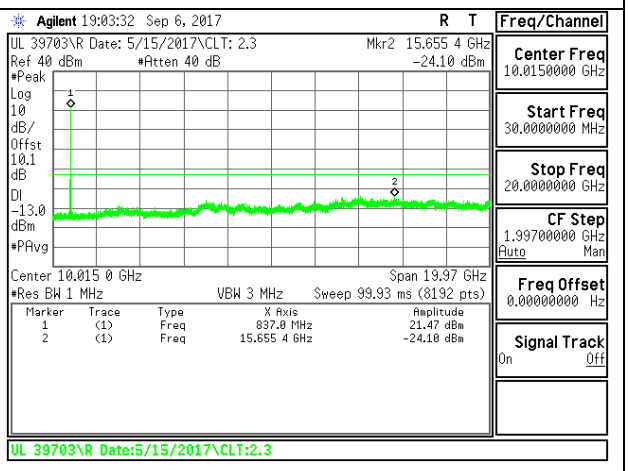

B2 REL99 Middle Channel




B2 HSDPA Middle Channel




B5 REL99 Middle Channel




B5 HSDPA Middle Channel



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## 8.4 FREQUENCY STABILITY

**RULE PART(S)**

FCC: §2.1055, §22.355, §24.235
IC: RSS132§5.3; RSS133§6.3

**FCC LIMITS**

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

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

RSS132§5.3
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 SRSP for mobile stations and±1.5 ppm for base stations.
In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS133§6.3
The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and±1.0 ppm for base stations.
In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

**TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

**Results**




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| | |
|---|---|
| Tested By | Kiya Kedida |
| Date | 9/12/17 |

**FREQUENCY STABILITY RESULTS**

## 8.4.1 GSM 850

| Reference Frequency: GSM 850 Mid Channel | | 836.6 | MHz @ 20°C | |
|---|---|---|---|---|
| Limit: to stay +- 2.5 ppm = | | 2091.500 | Hz | |
| Power Supply | Environment | Frequency Deviation Measureed with Time Elapse | | |
| (Vdc) | Temperature (°C) | (MHz) | Delta (ppm) | Limit (ppm) |
| 3.30 | 75 | 836.599982 | 0.000 | 2.5 |
| 3.30 | 60 | 836.599978 | 0.005 | 2.5 |
| 3.30 | 40 | 836.599970 | 0.014 | 2.5 |
| ***3.30*** | ***20*** | **836.599982** | **0** | ***2.5*** |
| 3.30 | 10 | 836.599976 | 0.006 | 2.5 |
| 3.30 | 0 | 836.599980 | 0.002 | 2.5 |
| 3.30 | -10 | 836.599983 | -0.001 | 2.5 |
| 3.30 | -20 | 836.599980 | 0.002 | 2.5 |

| Reference Frequency: GSM 850 Mid Channel | | 836.6 | MHz @ 20°C | |
|---|---|---|---|---|
| Limit: to stay +- 2.5 ppm = | | 2091.500 | Hz | |
| Power Supply | Environment | Frequency Deviation Measured with Time Elapse | | |
| (Vdc) | Temperature (°C) | (MHz) | Delta (ppm) | Limit (ppm) |
| ***3.30*** | ***20*** | ***836.599982*** | ***0*** | ***2.5*** |
| 4.80 | 20 | 836.599983 | *-0.001* | 2.5 |
| 3.20 | 20 | 836.599976 | *0.006* | 2.5 |

## 8.4.2 GSM 1900

| Reference Frequency: GSM 1900 Mid Channel | | 1880 | MHz @ 20°C | |
|---|---|---|---|---|
| Limit: to stay +- 2.5 ppm = | | 4700.000 | Hz | |
| Power Supply | Environment | Frequency Deviation Measureed with Time Elapse | | |
| (Vdc) | Temperature (°C) | (MHz) | Delta (ppm) | Limit (ppm) |
| 3.30 | 50 | 1880.000028 | 0.003 | 2.5 |
| 3.30 | 40 | 1880.000025 | 0.005 | 2.5 |
| 3.30 | 30 | 1880.000032 | 0.001 | 2.5 |
| ***3.30*** | ***20*** | **1880.000034** | **0** | ***2.5*** |
| 3.30 | 10 | 1880.000026 | 0.004 | 2.5 |
| 3.30 | 0 | 1880.000025 | 0.005 | 2.5 |
| 3.30 | -10 | 1880.000029 | 0.003 | 2.5 |
| 3.30 | -20 | 1880.000027 | 0.004 | 2.5 |

| Reference Frequency: GSM 1900 Mid Channel | | 1880 | MHz @ 20°C | |
|---|---|---|---|---|
| Limit: to stay +- 2.5 ppm = | | 4700.000 | Hz | |
| Power Supply | Environment | Frequency Deviation Measured with Time Elapse | | |
| (Vdc) | Temperature (°C) | (MHz) | Delta (ppm) | Limit (ppm) |
| ***3.30*** | ***20*** | ***1880.000034*** | ***0*** | ***2.5*** |
| 4.80 | 20 | 1880.000029 | *0.003* | 2.5 |
| 3.20 | 20 | 1880.000031 | *0.002* | 2.5 |



UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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# 9. RADIATED TEST RESULTS

## 9.1. FIELD STRENGTH OF SPURIOUS RADIATION

**RULE PART(S)**

FCC: §2.1053, §22.917
IC: RSS132§5.5; RSS133§6.5

**FCC LIMIT**

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

RSS132§5.5
Mobile and base station equipment shall comply with the limits in (i) and (ii) below.
In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P ( dBW) by at least 43 + 10 log10p (watts).
After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5
Equipment shall comply with the limits in (i) and (ii) below.
(i)In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).

(ii)After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

**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.




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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.



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## SPURIOUS RADIATION PLOTS

### 9.1.1. GSM

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

**Company:** VERIFONE
**Project #:** 11631998
**Date:** 9/6/2017
**Test Engineer:** GE43578
**Configuration:** EUT + AC Adapter
**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, 824.2MHz | | | | | | | | | |
| 1648.40 | -18.0 | V | 3.0 | 37.0 | 1.0 | -54.1 | -13.0 | -41.1 | |
| 2472.60 | -15.9 | V | 3.0 | 36.4 | 1.0 | -51.3 | -13.0 | -38.3 | |
| 3296.80 | -25.5 | V | 3.0 | 36.2 | 1.0 | -60.7 | -13.0 | -47.7 | |
| 1648.40 | -15.0 | H | 3.0 | 37.0 | 1.0 | -51.0 | -13.0 | -38.0 | |
| 2472.60 | -24.2 | H | 3.0 | 36.4 | 1.0 | -59.7 | -13.0 | -46.7 | |
| 3296.80 | -26.3 | H | 3.0 | 36.2 | 1.0 | -61.4 | -13.0 | -48.4 | |
| Mid Ch, 836.6MHz | | | | | | | | | |
| 1673.20 | -16.7 | V | 3.0 | 37.0 | 1.0 | -52.7 | -13.0 | -39.7 | |
| 2509.80 | -13.1 | V | 3.0 | 36.4 | 1.0 | -48.5 | -13.0 | -35.5 | |
| 3346.40 | -20.1 | V | 3.0 | 36.1 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 1673.20 | -15.9 | H | 3.0 | 37.0 | 1.0 | -51.9 | -13.0 | -38.9 | |
| 2509.80 | -18.3 | H | 3.0 | 36.4 | 1.0 | -53.7 | -13.0 | -40.7 | |
| 3346.40 | -20.2 | H | 3.0 | 36.1 | 1.0 | -55.3 | -13.0 | -42.3 | |
| High Ch, 848.8MHz | | | | | | | | | |
| 1697.60 | -11.1 | V | 3.0 | 37.0 | 1.0 | -47.1 | -13.0 | -34.1 | |
| 2546.40 | -16.3 | V | 3.0 | 36.4 | 1.0 | -51.7 | -13.0 | -38.7 | |
| 3395.20 | -18.4 | V | 3.0 | 36.1 | 1.0 | -53.5 | -13.0 | -40.5 | |
| 1697.60 | -15.6 | H | 3.0 | 37.0 | 1.0 | -51.6 | -13.0 | -38.6 | |
| 2546.40 | -18.2 | H | 3.0 | 36.4 | 1.0 | -53.6 | -13.0 | -40.6 | |
| 3395.20 | -18.0 | H | 3.0 | 36.1 | 1.0 | -53.1 | -13.0 | -40.1 | |

GSM850 GPRS

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

**Company:** VERIFONE
**Project #:** 11631998
**Date:** 9/6/2017
**Test Engineer:** GE43578
**Configuration:** EUT + AC Adapter
**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, 824.2MHz | | | | | | | | | |
| 1648.40 | -14.5 | V | 3.0 | 37.0 | 1.0 | -50.5 | -13.0 | -37.5 | |
| 2472.60 | -21.9 | V | 3.0 | 36.4 | 1.0 | -57.4 | -13.0 | -44.4 | |
| 3296.80 | -24.6 | V | 3.0 | 36.2 | 1.0 | -59.8 | -13.0 | -46.8 | |
| 1648.40 | -19.4 | H | 3.0 | 37.0 | 1.0 | -55.4 | -13.0 | -42.4 | |
| 2472.60 | -17.3 | H | 3.0 | 36.4 | 1.0 | -52.7 | -13.0 | -39.7 | |
| 3296.80 | -24.8 | H | 3.0 | 36.2 | 1.0 | -59.9 | -13.0 | -46.9 | |
| Mid Ch, 836.6MHz | | | | | | | | | |
| 1673.20 | -14.4 | V | 3.0 | 37.0 | 1.0 | -50.4 | -13.0 | -37.4 | |
| 2509.80 | -22.9 | V | 3.0 | 36.4 | 1.0 | -58.3 | -13.0 | -45.3 | |
| 3346.40 | -23.4 | V | 3.0 | 36.1 | 1.0 | -58.6 | -13.0 | -45.6 | |
| 1673.20 | -19.5 | H | 3.0 | 37.0 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 2509.80 | -13.5 | H | 3.0 | 36.4 | 1.0 | -48.9 | -13.0 | -35.9 | |
| 3346.40 | -24.6 | H | 3.0 | 36.1 | 1.0 | -59.7 | -13.0 | -46.7 | |
| High Ch, 848.8MHz | | | | | | | | | |
| 1697.60 | -13.7 | V | 3.0 | 37.0 | 1.0 | -49.7 | -13.0 | -36.7 | |
| 2546.40 | -23.9 | V | 3.0 | 36.4 | 1.0 | -59.3 | -13.0 | -46.3 | |
| 3395.20 | -21.7 | V | 3.0 | 36.1 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 1697.60 | -18.4 | H | 3.0 | 37.0 | 1.0 | -54.4 | -13.0 | -41.4 | |
| 2546.40 | -13.8 | H | 3.0 | 36.4 | 1.0 | -49.2 | -13.0 | -36.2 | |
| 3395.20 | -19.1 | H | 3.0 | 36.1 | 1.0 | -54.2 | -13.0 | -41.2 | |

GSM850 EGPRS

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

**Company:** VERIFONE
**Project #:** 11631998
**Date:** 9/6/2017
**Test Engineer:** GE43578
**Configuration:** EUT + AC Adapter
**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, 1850.2MHz | | | | | | | | | |
| 3700.40 | -24.4 | V | 3.0 | 35.9 | 1.0 | -59.3 | -13.0 | -46.3 | |
| 5550.60 | -23.3 | V | 3.0 | 35.5 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 7400.80 | -21.7 | V | 3.0 | 35.7 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 3700.40 | -25.5 | H | 3.0 | 35.9 | 1.0 | -60.4 | -13.0 | -47.4 | |
| 5550.60 | -22.6 | H | 3.0 | 35.5 | 1.0 | -57.1 | -13.0 | -44.1 | |
| 7400.80 | -21.0 | H | 3.0 | 35.7 | 1.0 | -55.8 | -13.0 | -42.8 | |
| Mid Ch, 1880MHz | | | | | | | | | |
| 3760.00 | -25.7 | V | 3.0 | 35.8 | 1.0 | -60.5 | -13.0 | -47.5 | |
| 5640.00 | -22.2 | V | 3.0 | 35.5 | 1.0 | -56.7 | -13.0 | -43.7 | |
| 7520.00 | -21.8 | V | 3.0 | 35.7 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 3760.00 | -25.7 | H | 3.0 | 35.8 | 1.0 | -60.5 | -13.0 | -47.5 | |
| 5640.00 | -22.1 | H | 3.0 | 35.5 | 1.0 | -56.6 | -13.0 | -43.6 | |
| 7520.00 | -20.2 | H | 3.0 | 35.7 | 1.0 | -54.9 | -13.0 | -41.9 | |
| High Ch, 1909.8MHz | | | | | | | | | |
| 3819.60 | -25.2 | V | 3.0 | 35.8 | 1.0 | -60.0 | -13.0 | -47.0 | |
| 5729.40 | -22.7 | V | 3.0 | 35.5 | 1.0 | -57.2 | -13.0 | -44.2 | |
| 7639.20 | -21.8 | V | 3.0 | 35.8 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 3819.60 | -25.0 | H | 3.0 | 35.8 | 1.0 | -59.8 | -13.0 | -46.8 | |
| 5729.40 | -22.7 | H | 3.0 | 35.5 | 1.0 | -57.2 | -13.0 | -44.2 | |
| 7639.20 | -20.6 | H | 3.0 | 35.8 | 1.0 | -55.3 | -13.0 | -42.3 | |

GSM1900 GPRS

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

**Company:** VERIFONE
**Project #:** 11631998
**Date:** 9/6/2017
**Test Engineer:** GE43578
**Configuration:** EUT + AC Adapter
**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, 1850.2MHz | | | | | | | | | |
| 3700.40 | -24.6 | V | 3.0 | 35.9 | 1.0 | -59.4 | -13.0 | -46.4 | |
| 5550.60 | -23.0 | V | 3.0 | 35.5 | 1.0 | -57.5 | -13.0 | -44.5 | |
| 7400.80 | -21.6 | V | 3.0 | 35.7 | 1.0 | -56.3 | -13.0 | -43.3 | |
| 3700.40 | -24.4 | H | 3.0 | 35.9 | 1.0 | -59.3 | -13.0 | -46.3 | |
| 5550.60 | -22.4 | H | 3.0 | 35.5 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 7400.80 | -20.7 | H | 3.0 | 35.7 | 1.0 | -55.5 | -13.0 | -42.5 | |
| Mid Ch, 1880MHz | | | | | | | | | |
| 3760.00 | -25.9 | V | 3.0 | 35.8 | 1.0 | -60.7 | -13.0 | -47.7 | |
| 5640.00 | -21.4 | V | 3.0 | 35.5 | 1.0 | -55.9 | -13.0 | -42.9 | |
| 7520.00 | -21.7 | V | 3.0 | 35.7 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 3760.00 | -25.3 | H | 3.0 | 35.8 | 1.0 | -60.1 | -13.0 | -47.1 | |
| 5640.00 | -20.7 | H | 3.0 | 35.5 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 7520.00 | -19.7 | H | 3.0 | 35.7 | 1.0 | -54.4 | -13.0 | -41.4 | |
| High Ch, 1909.8MHz | | | | | | | | | |
| 3819.60 | -25.4 | V | 3.0 | 35.8 | 1.0 | -60.2 | -13.0 | -47.2 | |
| 5729.40 | -22.4 | V | 3.0 | 35.5 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 7639.20 | -21.4 | V | 3.0 | 35.8 | 1.0 | -56.2 | -13.0 | -43.2 | |
| 3819.60 | -25.5 | H | 3.0 | 35.8 | 1.0 | -60.3 | -13.0 | -47.3 | |
| 5729.40 | -22.4 | H | 3.0 | 35.5 | 1.0 | -56.9 | -13.0 | -43.9 | |
| 7639.20 | -20.8 | H | 3.0 | 35.8 | 1.0 | -55.5 | -13.0 | -42.5 | |

GSM1900 EGPRS


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### 9.1.2. WCDMA

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

**Company:** VERIFONE
**Project #:** 11631998
**Date:** 9/6/2017
**Test Engineer:** GE43578
**Configuration:** EUT + AC Adapter
**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, 1852.4MHz | | | | | | | | | |
| 3704.80 | -15.4 | V | 3.0 | 35.9 | 1.0 | -50.3 | -13.0 | -37.3 | |
| 5557.20 | -21.3 | V | 3.0 | 35.5 | 1.0 | -55.7 | -13.0 | -42.7 | |
| 7409.60 | -20.5 | V | 3.0 | 35.7 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 3704.80 | -12.0 | H | 3.0 | 35.9 | 1.0 | -46.9 | -13.0 | -33.9 | |
| 5557.20 | -20.6 | H | 3.0 | 35.5 | 1.0 | -55.1 | -13.0 | -42.1 | |
| 7409.60 | -19.1 | H | 3.0 | 35.7 | 1.0 | -53.8 | -13.0 | -40.8 | |
| Mid Ch, 1880MHz | | | | | | | | | |
| 3760.00 | -21.8 | V | 3.0 | 35.8 | 1.0 | -56.6 | -13.0 | -43.6 | |
| 5640.00 | -22.7 | V | 3.0 | 35.5 | 1.0 | -57.2 | -13.0 | -44.2 | |
| 7520.00 | -21.2 | V | 3.0 | 35.7 | 1.0 | -56.0 | -13.0 | -43.0 | |
| 3760.00 | -17.9 | H | 3.0 | 35.8 | 1.0 | -52.7 | -13.0 | -39.7 | |
| 5640.00 | -21.3 | H | 3.0 | 35.5 | 1.0 | -55.8 | -13.0 | -42.8 | |
| 7520.00 | -19.6 | H | 3.0 | 35.7 | 1.0 | -54.4 | -13.0 | -41.4 | |
| High Ch, 1907.6MHz | | | | | | | | | |
| 3815.20 | -19.5 | V | 3.0 | 35.8 | 1.0 | -54.3 | -13.0 | -41.3 | |
| 5722.80 | -20.8 | V | 3.0 | 35.5 | 1.0 | -55.3 | -13.0 | -42.3 | |
| 7630.40 | -20.6 | V | 3.0 | 35.8 | 1.0 | -55.3 | -13.0 | -42.3 | |
| 3815.20 | -16.2 | H | 3.0 | 35.8 | 1.0 | -51.0 | -13.0 | -38.0 | |
| 5722.80 | -22.0 | H | 3.0 | 35.5 | 1.0 | -56.5 | -13.0 | -43.5 | |
| 7630.40 | -19.2 | H | 3.0 | 35.8 | 1.0 | -53.9 | -13.0 | -40.9 | |

B2 REL99

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

**Company:** VERIFONE
**Project #:** 11631998
**Date:** 9/6/2017
**Test Engineer:** GE43578
**Configuration:** EUT + AC Adapter
**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, 1852.4MHz | | | | | | | | | |
| 3704.80 | -15.7 | V | 3.0 | 35.9 | 1.0 | -50.6 | -13.0 | -37.6 | |
| 5557.20 | -21.5 | V | 3.0 | 35.5 | 1.0 | -56.0 | -13.0 | -43.0 | |
| 7409.60 | -20.2 | V | 3.0 | 35.7 | 1.0 | -54.9 | -13.0 | -41.9 | |
| 3704.80 | -12.7 | H | 3.0 | 35.9 | 1.0 | -47.5 | -13.0 | -34.5 | |
| 5557.20 | -20.7 | H | 3.0 | 35.5 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 7409.60 | -19.4 | H | 3.0 | 35.7 | 1.0 | -54.1 | -13.0 | -41.1 | |
| Mid Ch, 1880MHz | | | | | | | | | |
| 3760.00 | -21.3 | V | 3.0 | 35.8 | 1.0 | -56.1 | -13.0 | -43.1 | |
| 5640.00 | -23.4 | V | 3.0 | 35.5 | 1.0 | -57.8 | -13.0 | -44.8 | |
| 7520.00 | -24.1 | V | 3.0 | 35.7 | 1.0 | -58.8 | -13.0 | -45.8 | |
| 3760.00 | -18.3 | H | 3.0 | 35.8 | 1.0 | -53.1 | -13.0 | -40.1 | |
| 5640.00 | -21.8 | H | 3.0 | 35.5 | 1.0 | -56.3 | -13.0 | -43.3 | |
| 7520.00 | -19.4 | H | 3.0 | 35.7 | 1.0 | -54.2 | -13.0 | -41.2 | |
| High Ch, 1907.6MHz | | | | | | | | | |
| 3815.20 | -19.2 | V | 3.0 | 35.8 | 1.0 | -54.0 | -13.0 | -41.0 | |
| 5722.80 | -20.7 | V | 3.0 | 35.5 | 1.0 | -55.2 | -13.0 | -42.2 | |
| 7630.40 | -20.3 | V | 3.0 | 35.8 | 1.0 | -55.1 | -13.0 | -42.1 | |
| 3815.20 | -16.5 | H | 3.0 | 35.8 | 1.0 | -51.3 | -13.0 | -38.3 | |
| 5722.80 | -22.3 | H | 3.0 | 35.5 | 1.0 | -56.8 | -13.0 | -43.8 | |
| 7630.40 | -19.5 | H | 3.0 | 35.8 | 1.0 | -54.3 | -13.0 | -41.3 | |

B2 HSDPA

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

**Company:** VERIFONE
**Project #:** 11631998
**Date:** 9/6/2017
**Test Engineer:** GE43578
**Configuration:** EUT + AC Adapter
**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, 826.4MHz | | | | | | | | | |
| 1652.80 | -13.5 | V | 3.0 | 37.0 | 1.0 | -49.6 | -13.0 | -36.6 | |
| 2479.20 | -26.6 | V | 3.0 | 36.4 | 1.0 | -62.0 | -13.0 | -49.0 | |
| 3305.60 | -26.3 | V | 3.0 | 36.1 | 1.0 | -61.5 | -13.0 | -48.5 | |
| 1652.80 | -19.5 | H | 3.0 | 37.0 | 1.0 | -55.5 | -13.0 | -42.5 | |
| 2479.20 | -29.4 | H | 3.0 | 36.4 | 1.0 | -64.8 | -13.0 | -51.8 | |
| 3305.60 | -26.6 | H | 3.0 | 36.1 | 1.0 | -61.8 | -13.0 | -48.8 | |
| Mid Ch, 836.6MHz | | | | | | | | | |
| 1673.20 | -10.7 | V | 3.0 | 37.0 | 1.0 | -46.7 | -13.0 | -33.7 | |
| 2509.80 | -27.1 | V | 3.0 | 36.4 | 1.0 | -62.6 | -13.0 | -49.6 | |
| 3346.40 | -26.4 | V | 3.0 | 36.1 | 1.0 | -61.5 | -13.0 | -48.5 | |
| 1673.20 | -15.8 | H | 3.0 | 37.0 | 1.0 | -51.8 | -13.0 | -38.8 | |
| 2509.80 | -26.0 | H | 3.0 | 36.4 | 1.0 | -61.4 | -13.0 | -48.4 | |
| 3346.40 | -26.8 | H | 3.0 | 36.1 | 1.0 | -61.9 | -13.0 | -48.9 | |
| High Ch, 846.6MHz | | | | | | | | | |
| 1693.20 | -11.1 | V | 3.0 | 37.0 | 1.0 | -47.1 | -13.0 | -34.1 | |
| 2539.80 | -26.4 | V | 3.0 | 36.4 | 1.0 | -61.8 | -13.0 | -48.8 | |
| 3386.40 | -25.4 | V | 3.0 | 36.1 | 1.0 | -60.5 | -13.0 | -47.5 | |
| 1693.20 | -17.4 | H | 3.0 | 37.0 | 1.0 | -53.4 | -13.0 | -40.4 | |
| 2539.80 | -26.8 | H | 3.0 | 36.4 | 1.0 | -62.2 | -13.0 | -49.2 | |
| 3386.40 | -26.7 | H | 3.0 | 36.1 | 1.0 | -61.8 | -13.0 | -48.8 | |

B5 REL99

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

**Company:** VERIFONE
**Project #:** 11631998
**Date:** 9/6/2017
**Test Engineer:** GE43578
**Configuration:** EUT + AC Adapter
**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, 826.4MHz | | | | | | | | | |
| 1652.80 | -14.5 | V | 3.0 | 37.0 | 1.0 | -50.5 | -13.0 | -37.5 | |
| 2479.20 | -26.9 | V | 3.0 | 36.4 | 1.0 | -62.3 | -13.0 | -49.3 | |
| 3305.60 | -26.9 | V | 3.0 | 36.1 | 1.0 | -62.0 | -13.0 | -49.0 | |
| 1652.80 | -20.1 | H | 3.0 | 37.0 | 1.0 | -56.1 | -13.0 | -43.1 | |
| 2479.20 | -29.8 | H | 3.0 | 36.4 | 1.0 | -65.2 | -13.0 | -52.2 | |
| 3305.60 | -26.8 | H | 3.0 | 36.1 | 1.0 | -61.9 | -13.0 | -48.9 | |
| Mid Ch, 836.6MHz | | | | | | | | | |
| 1673.20 | -11.0 | V | 3.0 | 37.0 | 1.0 | -47.0 | -13.0 | -34.0 | |
| 2509.80 | -27.4 | V | 3.0 | 36.4 | 1.0 | -62.8 | -13.0 | -49.8 | |
| 3346.40 | -26.5 | V | 3.0 | 36.1 | 1.0 | -61.6 | -13.0 | -48.6 | |
| 1673.20 | -16.2 | H | 3.0 | 37.0 | 1.0 | -52.2 | -13.0 | -39.2 | |
| 2509.80 | -26.6 | H | 3.0 | 36.4 | 1.0 | -62.0 | -13.0 | -49.0 | |
| 3346.40 | -26.9 | H | 3.0 | 36.1 | 1.0 | -62.0 | -13.0 | -49.0 | |
| High Ch, 846.6MHz | | | | | | | | | |
| 1693.20 | -11.7 | V | 3.0 | 37.0 | 1.0 | -47.7 | -13.0 | -34.7 | |
| 2539.80 | -26.7 | V | 3.0 | 36.4 | 1.0 | -62.1 | -13.0 | -49.1 | |
| 3386.40 | -25.8 | V | 3.0 | 36.1 | 1.0 | -60.9 | -13.0 | -47.9 | |
| 1693.20 | -17.6 | H | 3.0 | 37.0 | 1.0 | -53.6 | -13.0 | -40.6 | |
| 2539.80 | -26.9 | H | 3.0 | 36.4 | 1.0 | -62.4 | -13.0 | -49.4 | |
| 3386.40 | -27.1 | H | 3.0 | 36.1 | 1.0 | -62.2 | -13.0 | -49.2 | |

B5 HSDPA



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