

PCTEST ENGINEERING LABORATORY, INC.

7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. 410.290.6652 / Fax 410.290.6654 http://www.pctestlab.com



MEASUREMENT REPORT

FCC Part 22, 24, & 27

Applicant Name:

LG Electronics MobileComm U.S.A 1000 Sylvan Avenue Englewood Cliffs, NJ 07632 United States Date of Testing: 12/27/2016-2/16/2017 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 1M1701180035-02-R3.ZNF

FCC ID:

ZNFVS988

APPLICANT:

LG ELECTRONICS MOBILECOMM U.S.A

| Application Type: | Certification |
|-------------------------|--|
| Model: | LG-VS988 |
| Additional Model(s): | LGVS988, VS988, LG-US997, LGUS997, US997, LG-VS988P, LG-VS988T, LG-VS988B, LG-VS988W, LG-VS988G |
| EUT Type: | Portable Handset |
| FCC Classification: | PCS Licensed Transmitter Held to Ear (PCE) |
| FCC Rule Part(s): | §2 §22(H) §24(E) §27(L) |
| Test Procedure(s): | ANSI/TIA-603-D-2010, KDB 971168 D01 v02r02, KDB 648474 D03 v01r04 |
| Test Device Serial No.: | identical prototype [S/N: 06277, 06921, 06913, 06905] |

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

This revised Test Report (S/N: 1M1701180035-02-R3.ZNF) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez President



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MEASUREMENT REPORT FCC Part 22, 24, & 27



| APPLICANT: | LG Electronics MobileComm U.S.A | | | |
|-------------------------|--|--|--|--|
| APPLICANT ADDRESS: | 1000 Sylvan Avenue | | | |
| | Englewood Cliffs, NJ 07632, United States | | | |
| TEST SITE: | PCTEST ENGINEERING LABORATORY, INC. | | | |
| TEST SITE ADDRESS: | 7185 Oakland Mills Road, Columbia, MD 21046 USA | | | |
| FCC RULE PART(S): | §2 §22(H) §24(E) §27(L) | | | |
| BASE MODEL: | LG-VS988 | | | |
| FCC ID: | ZNFVS988 | | | |
| FCC CLASSIFICATION: | PCS Licensed Transmitter Held to Ear (PCE) | | | |
| MODE: | GSM / GPRS / EDGE / CDMA / WCDMA | | | |
| FREQUENCY TOLERANCE: | ±0.00025 % (2.5 ppm) | | | |
| Test Device Serial No.: | 06277, 06921, 06913, □ Production ⊠ Pre-Production □ Engineering | | | |
| DATE(S) OF TEST: | 12/27/2016-2/16/2017 | | | |
| TEST REPORT S/N: | 1M1701180035-02-R3.ZNF | | | |

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

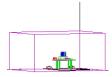


- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

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MEASUREMENT REPORT FCC Part 22, 24, & 27



| | | | ERP/ | EIRP | |
|-----------|------------------|--------------------|----------------------|------------------------|------------------------|
| Mode | FCC Rule Part | Tx Frequency (MHz) | Max. Power (W) | Max. Power (dBm) | Emission Designator |
| GPRS850 | 22H | 824.2 - 848.8 | 0.509 | 27.06 | 242KGXW |
| EDGE850 | 22H | 824.2 - 848.8 | 0.222 | 23.46 | 239KG7W |
| WCDMA850 | 22H | 826.4 - 846.6 | 0.081 | 19.10 | 4M14F9W |
| CDMA850 | 22H | 824.70 - 848.31 | 0.060 | 17.76 | 1M28F9W |
| WCDMA1700 | 27 | 1712.4 - 1752.6 | 0.175 | 22.44 | 4M14F9W |
| GPRS1900 | 24E | 1850.2 - 1909.8 | 0.721 | 28.58 | 244KGXW |
| EDGE1900 | 24E | 1850.2 - 1909.8 | 0.129 | 21.12 | 246KG7W |
| WCDMA1900 | 24E | 1852.4 - 1907.6 | 0.204 | 23.09 | 4M15F9W |
| CDMA1900 | 24E | 1851.25 - 1908.75 | 0.121 | 20.84 | 1M27F9W |

EUT Overview

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕑 LG | Approved by: Quality Manager |
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INTRODUCTION . 0

1.1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Internt'I (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2014 on January 22, 2015.

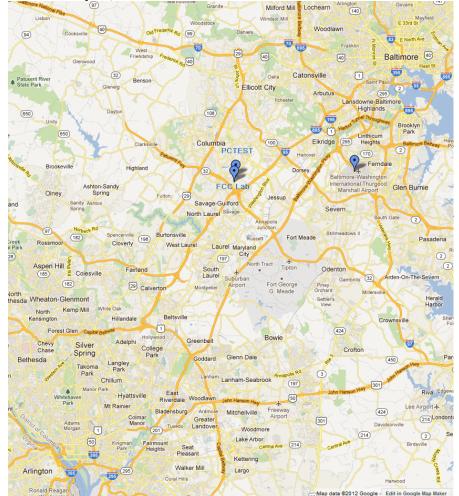


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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12/26/2016



2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFVS988**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA (BC0, BC1), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multiband LTE, 802.11b/g/n WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-D-2010 and KDB 971168 D01 v02r02. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on a certified wireless charging pad (WCP) while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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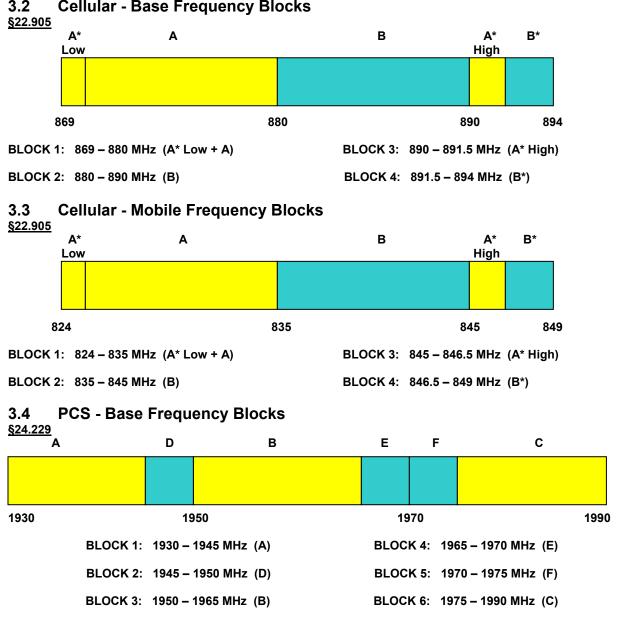


DESCRIPTION OF TESTS 3.0

3.1 Evaluation Procedure

The measurement procedures described in the "Land Mobile FM or PM - Communications Equipment -Measurements and Performance Standards" (ANSI/TIA-603-D-2010) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v02r02) were used in the measurement of the EUT.



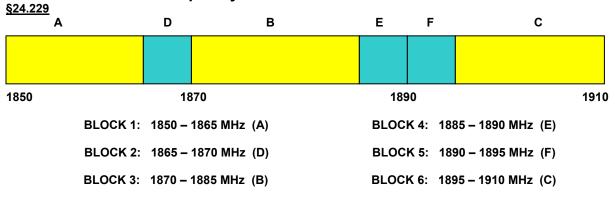


3.2 **Cellular - Base Frequency Blocks**

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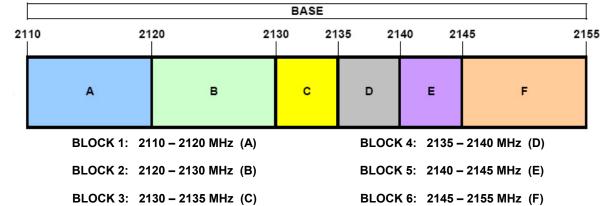


3.5 PCS - Mobile Frequency Blocks



3.6 AWS - Base Frequency Blocks

<u>§27.5(h)</u>



3.7 AWS - Mobile Frequency Blocks

<u>§27.5(h)</u>

| | MOBILE | | | | | | | |
|----|--------|-------------|-------------------|------------|-------|-----------|--------------|------|
| 17 | 10 | 17 | 720 17 | '30 17 | 35 17 | 40 17 | 45 | 1755 |
| | | A | В | с | D | E | F | |
| | | BLOCK 1: 17 | 10 – 1720 MHz (A) | | BLOCK | 4: 1735 – | 1740 MHz (D) | |
| | | BLOCK 2: 17 | 20 – 1730 MHz (B) | | BLOCK | 5: 1740 – | 1745 MHz (E) | |
| | | BLOCK 3: 17 | 30 – 1735 MHz (C) | | BLOCK | 6: 1745 – | 1755 MHz (F) | |

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3.8 Radiated Measurements

§2.1053 §22.913(a.2) §22.917(a) §24.232(c) §24.238(a) §27.50(d)(10) §27.53(h

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 72.4cm high PVC support structure is placed on top of the turntable. A 3" (~7.6cm) sheet of high density polystyrene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

Per the guidance of ANSI/TIA-603-D-2010, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

Pd [dBm] = Pg [dBm] - cable loss [dB] + antenna gain [dBd/dBi]

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_{g [dBm]}$ – cable loss [dB].

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/ITA-603-D-2010.

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4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement data shown meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2.

| Contribution | Expanded Uncertainty (±dB) |
|-------------------------------------|----------------------------|
| Conducted Bench Top Measurements | 1.13 |
| Radiated Disturbance (<1GHz) | 4.98 |
| Radiated Disturbance (>1GHz) | 5.07 |
| Radiated Disturbance (>18GHz) | 5.09 |

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5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2006.

| Manufacturer | Model | Description | Cal Date | Cal Interval | Cal Due | Serial Number |
|-----------------|--------------------|-------------------------------------|------------|--------------|------------|----------------------|
| - | LTx3 | Licensed Transmitter Cable Set | 7/12/2016 | Annual | 7/12/2017 | N/A |
| Agilent | N9030A | PXA Signal Analyzer (44GHz) | 3/1/2016 | Annual | 3/1/2017 | MY52350166 |
| Com-Power | PAM-103 | Pre-Amplifier (1-1000MHz) | 2/26/2016 | Biennial | 2/26/2018 | 441128 |
| Emco | 3115 | Horn Antenna (1-18GHz) | 3/10/2016 | Biennial | 3/10/2018 | 9704-5182 |
| Espec | ESX-2CA | Environmental Chamber | 3/4/2016 | Annual | 3/4/2017 | 17620 |
| ETS Lindgren | 3117 | 1-18 GHz DRG Horn (Medium) | 4/26/2016 | Biennial | 4/26/2018 | 125518 |
| ETS Lindgren | 3160-09 | 18-26.5 GHz Standard Gain Horn | 8/28/2016 | Biennial | 8/28/2018 | 135427 |
| ETS Lindgren | 3164-08 | Quad Ridge Horn Antenna | 4/26/2016 | Biennial | 4/26/2018 | 128338 |
| K & L | 11SH10-3075/U18000 | High Pass Filter | 7/11/2016 | Annual | 7/11/2017 | 11SH10-3075/U18000-2 |
| K & L | 13SH10-1000/U1000 | N Type High Pass Filter | 7/6/2016 | Annual | 7/6/2017 | 13SH10-1000/U1000-1 |
| Mini-Circuits | PWR-SENS-4RMS | USB Power Sensor | 3/4/2016 | Annual | 3/7/2017 | 11210140001 |
| Mini-Circuits | SSG-4000HP | USB Synthesized Signal Generator | | N/A | | 11208010032 |
| Mini-Circuits | TVA-11-422 | RF Power Amp | | N/A | | QA1303002 |
| PCTEST | - | EMC Switch System | 7/11/2016 | Annual | 7/11/2017 | NM1 |
| PCTEST | - | EMC Switch System | 7/6/2016 | Annual | 7/6/2017 | NM2 |
| Rohde & Schwarz | CMU200 | Base Station Simulator | 6/2/2016 | Annual | 6/2/2017 | 109892 |
| Rohde & Schwarz | ESU40 | EMI Test Receiver (40GHz) | 7/15/2016 | Annual | 7/15/2017 | 100348 |
| Rohde & Schwarz | TS-PR18 | 1-18 GHz Pre-Amplifier | 3/7/2016 | Annual | 3/7/2017 | 100071 |
| Rohde & Schwarz | TS-PR26 | 18-26.5 GHz Pre-Amplifier | 3/7/2016 | Annual | 3/7/2017 | 100040 |
| Schwarzbeck | UHA 9105 | Dipole Antenna (400 - 1GHz) Rx | 3/30/2016 | Biennial | 3/30/2018 | 9105-2404 |
| Schwarzbeck | VULB-9161SE | Trilog Super Broadband Test Antenna | 11/13/2015 | Biennial | 11/13/2017 | 9161-4075 |
| Sunol | JB5 | Bi-Log Antenna (30M - 5GHz) | 3/14/2016 | Biennial | 3/14/2018 | A051107 |

Table 5-1. Test Equipment

Notes:

Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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6.0 SAMPLE CALCULATIONS

GPRS Emission Designator

Emission Designator = 250KGXW

GPRS BW = 250 kHz G = Phase Modulation X = Cases not otherwise covered W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 250KG7W

EDGE BW = 250 kHz G = Phase Modulation 7 = Quantized/Digital Info W = Combination (Audio/Data)

CDMA Emission Designator

Emission Designator = 1M25F9W

CDMA BW = 1.25 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M16F9W

WCDMA BW = 4.16 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

The receive spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm – (-24.80) = 50.3 dBc.

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7.0 TEST RESULTS

7.1 Summary

| Company Name: | LG Electronics MobileComm U.S.A |
|---------------------|--|
| FCC ID: | ZNFVS988 |
| FCC Classification: | PCS Licensed Transmitter Held to Ear (PCE) |
| Mode(s): | <u>GSM / GPRS / EDGE / CDMA / WCDMA</u> |

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|--|---|--|-------------------|----------------|--------------------------|
| 2.1049 | Occupied Bandwidth | N/A | | PASS | Section 7.2 |
| 2.1051 22.917(a) 24.238(a) 27.53(h) | Conducted Band Edge / Spurious Emissions | > 43 + log ₁₀ (P[Watts]) at Band Edge and for all out-of-band emissions | | PASS | Sections 7.3, 7.4 |
| 24.232(d) | Peak-Average Ratio | < 13 dB | CONDUCTED | PASS | Section 7.5 |
| 2.1046 | Transmitter Conducted Output Power | N/A | | PASS | RF Exposure Report |
| 2.1055 22.355 24.235 27.54 | Frequency Stability | < 2.5 ppm (Part 22) Emission must remain in band (Part 24, 27) | | PASS | Section 7.8 |
| 22.913(a.2) | Effective Radiated Power | < 7 Watts max. ERP | | PASS | Section 7.6 |
| 24.232(c) | Equivalent Isotropic Radiated Power | < 2 Watts max. EIRP | | PASS | Section 7.6 |
| 27.50(d.4) | Equivalent Isotropic Radiated Power | < 1 Watts max. EIRP | RADIATED | PASS | Section 7.6 |
| 2.1053 22.917(a) 24.238(a) 27.53(h) | Radiated Spurious Emissions | > 43 + log ₁₀ (P[Watts]) for all out-of-band emissions | | PASS | Section 7.7 |

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "2G/3G Automation," Version 3.7.

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7.2 Occupied Bandwidth §2.1049

Test Overview

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

KDB 971168 D01 v02r02 - Section 4.2

Test Settings

- The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within

1 – 5% of the 99% occupied bandwidth observed in Step 7

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

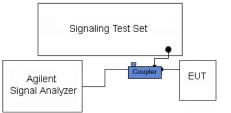


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

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| Keysight Spectrum Analyzer - Occupied E | 3W | | | | | | |
|--|--|--|------------|---|--------------------|----------|--------------------------------|
| 4 RL RF 50 Ω AC | , → Trig #IFGain:Low #Att | SENSE:INT ter Freq: 836.600000 MHz j: Free Run Avg H ten: 32 dB | ALIGN AUTO | 04:24:03 PM Radio Std: Radio Devi | | Trace/De | etector |
| 15 dB/div Ref 35.00 dB 20 20 5.00 5.00 10 | m | ······································ | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | Alien (m | Cle | ar Write |
| 25.0 | | | | • • • • • | | 4 | Average |
| 70.0 85.0 -100 | | | | | | м | ax Hold |
| Center 836.6 MHz Res BW 4.7 kHz Occupied Bandwid | | #VBW 15 kHz Total Power | 30 (| Span Sweep) dBm | 500 kHz 21.6 ms | N | lin Hol |
| | 2 42.08 kHz -531 Hz 314.6 kHz | % of OBW Po x dB | ower 99 | 0.00 % 00 dB | | D |)etecto Peaki <u>Mar</u> |
| sg | | | STATU | 5 | | | |

Plot 7-1. Occupied Bandwidth Plot (Cellular GPRS Mode – Ch. 190)



Plot 7-2. Occupied Bandwidth Plot (EDGE850 Mode - Ch. 190)

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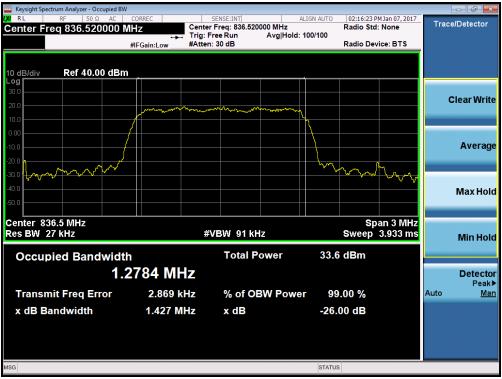




Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode – Ch. 661)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dego 16 of 107 |
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Plot 7-5. Occupied Bandwidth Plot (Cellular CDMA Mode - Ch. 384)

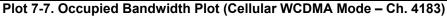


Plot 7-6. Occupied Bandwidth Plot (PCS CDMA Mode – Ch. 600)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|---------------------------------|----------------------|---|------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dego 17 of 107 | |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 17 of 107 | |
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Plot 7-8. Occupied Bandwidth Plot (AWS WCDMA Mode – Ch. 1413)

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|---------------------------------|----------------------|---|------|---------------------------------|
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Plot 7-9. Occupied Bandwidth Plot (PCS WCDMA Mode - Ch. 9400)

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|---------------------------------|--|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Daga 10 of 107 |
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7.3 Spurious and Harmonic Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(h)

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v02r02 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 10GHz for Cell, 20GHz for AWS, 20GHz for PCS (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

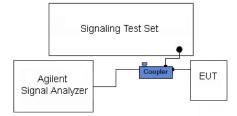


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

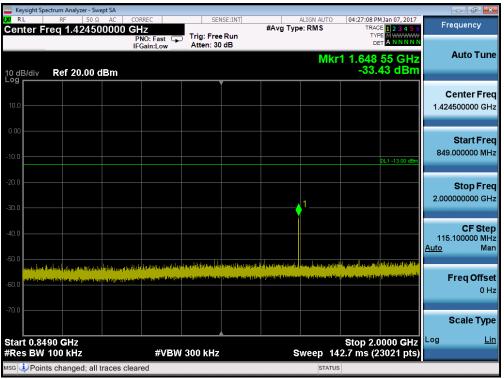
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Part 22 and 1 MHz or greater for Part 24, Part 27. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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 emission are attenuated at least 26 dB below the transmitter power.

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| | rum Analyzer - Swept SA | | | | | |
|---------------------------|--|--|---|--|---|---|
| Center Fre | RF 50 Ω AC eq 426.500000 | CORREC MHZ PNO: Fast IFGain:Low | SENSE:INT Trig: Free Run Atten: 30 dB | ALIGN AUTO #Avg Type: RMS | 04:26:56 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE M WWWW DET A N N N N N | Frequency |
| 10 dB/div | Ref 20.00 dBm | II Guilleow | | М | kr1 822.20 MHz -43.84 dBm | Auto Tune |
| 10.0 | | | | | | Center Freq 426.500000 MHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq 30.000000 MHz |
| -20.0 | | | | | | Stop Freq 823.000000 MHz |
| -40.0 | | | | | 1 | CF Step 79.300000 MHz <u>Auto</u> Man |
| والالمتحميط | szeni este zéhe beneszténi keszeketetetetetetetetetetetetetetetetetete | Model (ny Anatol South Card) Model da pisakany kéwahipada | daganetik manganikan pak lafa tanganetik yeki dagatan kanana manganikan panana k | la data ad kenangkang pangkeng kang bang bang bang bang bang bang bang b | l je spora postaj konstruktur ka | Freq Offset 0 Hz |
| -70.0 | | | | | | Scale Type |
| Start 30.0 N #Res BW 1 | | #VBW | 300 kHz | Sweep 98 | Stop 823.0 MHz .33 ms (15861 pts) | Log <u>Lin</u> |
| MSG 🔱 Points | changed; all traces | cleared | | STATUS | \$ | |

Plot 7-10. Conducted Spurious Plot (Cellular GPRS Mode – Ch. 128)



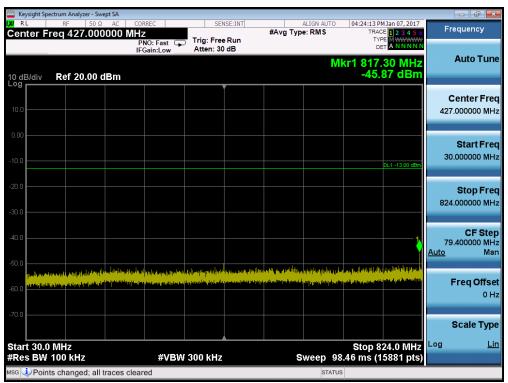
Plot 7-11. Conducted Spurious Plot (Cellular GPRS Mode – Ch. 128)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | |
|---------------------------------|--|---|------|---------------------------------|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Daga 21 of 107 | | | |
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| | t Spectrum A | | | | | | | | | | | _ | |
|--------------------|--------------------|------------------------|------------------------------|--|-------|--------------------------------------|---|--|--|---|--|----------------------|------------------------------------|
| IXI RL | RF | | 2 AC | CORREC | | SEN | ISE:INT | #Avg Typ | ALIGN AUTO | | MJan 07, 2017 E 1 2 3 4 5 6 | Fred | uency |
| Center | Freq 6 | .0000 | 00000 | GHZ PNO: Fa IFGain:Lo | | Trig: Free Atten: 20 | | #Avg Typ | e. Rivis | TY | | | |
| 10 dB/div Log | v Ref | 10.00 | dBm | | | | | | M | kr1 2.47 -22. | 3 0 GHz 59 dBm | A | uto Tune |
| 0.00 | | | | | | | | | | | | | nter Freq 00000 GHz |
| -10.0 | 1 | | | | | | | | | | DL1 -13.00 dBm | | Start Freq 00000 GHz |
| -30.0 | | | | | | | | | | | | | Stop Freq 00000 GHz |
| -50.0 | | ann a staine Seanna | ni mati na finati Na sala | and the second s | | Yeleydd o Helbor Meleydd o Helbor | anta da la contra p anta da la contra p anta da la contra p | a gapilisi matapana Ayun tahun tahun yang | a ^{lan} ayo iyo ay ^j ashira Tarang salata da biyo | un political de la la presiona de la constitución de la constitución de la constitución de la constitución de La constitución de la constitución d | national (Internet) Sector (Internet) | 800.0 <u>Auto</u> | CF Step 00000 MHz Man |
| -70.0 | | | | | | | | | | | | Fr | eq Offset 0 Hz |
| -80.0 | | | | | | | | | | | | | cale Type |
| Start 2. #Res B | 000 GH: W 1.0 M | | | # | VBW 3 | 3.0 MHz | | s | weep 1 | Stop 10 3.87 ms (1 | .000 GHz 6001 pts) | Log | Lin |
| MSG 🗼 Pe | oints char | nged; all | traces cl | eared | | | | | STATU | JS | | | |





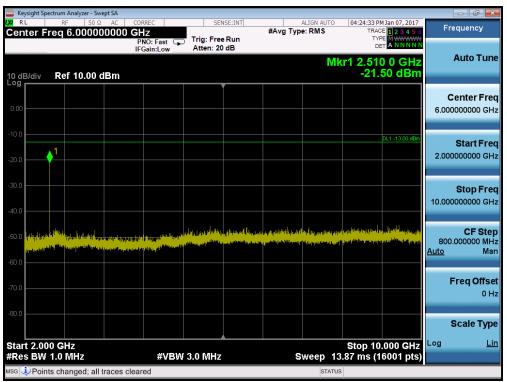
Plot 7-13. Conducted Spurious Plot (Cellular GPRS Mode – Ch. 190)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | |
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| | ctrum Analyzer - Swept SA | | | | | |
|-------------------------------|---|--|--|---|---|--|
| Center F | RF 50 Ω AC req 1.42450000 | CORREC 10 GHz PNO: Fast | Trig: Free Run | ALIGN AUTO #Avg Type: RMS | 04:24:23 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE M WWWWW | Frequency |
| 10 dB/div | Ref 20.00 dBm | IFGain:Low | Atten: 30 dB | Mkr | 1 1.673 20 GHz -32.99 dBm | Auto Tune |
| 10.0 | | | | | | Center Freq 1.424500000 GHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq 849.000000 MHz |
| -20.0 | | | | | | Stop Freq 2.000000000 GHz |
| -40.0 | | | | | | CF Step 115.100000 MHz <u>Auto</u> Man |
| -60.0 <mark>Stradbildy</mark> | leta feliz (sy klasna jejata svanske kolonika (se se s | panekan sena <mark>kulopekan panok</mark> an enamena ing panakain dinakan k | nan fa si pitan na na na na si pitan n Na na fa fa si si pitan na s | y to a stand on the providence of the p | en ffister for en fister for finnen for en state finnen fister 1935 si den tre fister och en state provinsen det for state 19 | Freq Offset 0 Hz |
| -70.0 | | | | | | Scale Type |
| Start 0.84 #Res BW | | #VBW | 300 kHz | Sweep 14 | Stop 2.0000 GHz 2.7 ms (23021 pts) | Log <u>Lin</u> |
| мsg 🔱 Point | ts changed; all traces | s cleared | | STATUS | 5 | |



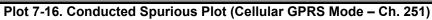


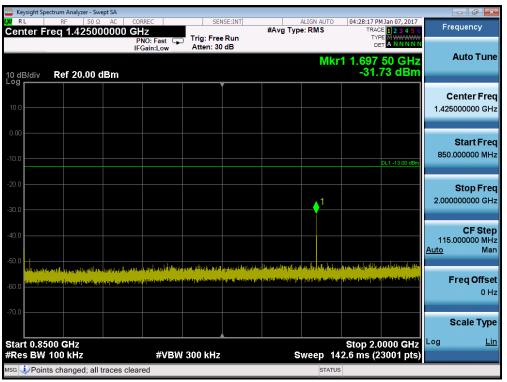
Plot 7-15. Conducted Spurious Plot (Cellular GPRS Mode – Ch. 190)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | |
|--|----------------------|---|------|---------------------------------|--|--|--|
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| | ectrum Analyzer | | | | | | | | | | |
|------------------------|--------------------|---------------|------------------------|-----------------------------------|--------------|------------------|-----------------------------|-------------------------------|-------------------------|-------------------------|--------------|
| LXI RL | | 0 Ω AC | CORREC | SE | NSE:INT | #Avg Typ | ALIGN AUTO | 04:28:07 PM Jai | 1 07, 2017 2 3 4 5 6 | Frequence | су |
| Center F | req 427.0 | 000001 | PNO: Fast | Trig: Fre | | #Avg iyi | Je. Rivija | TYPE N | 1 wwww | | |
| | | | IFGain:Low | Atten: 30 |) dB | | | 52.1 | NNNNN | 8 | T |
| | | | | | | | M | kr1 766.90 |) MHz | Auto | Tune |
| 10 dB/div Log | Ref 20.0 | 0 dBm | | | | | | -49.24 | dBm | | |
| | | | | | Ĭ | | | | | 0 amtas | . Energy |
| 10.0 | | | | | | | | | | Center 427.00000 | • |
| 10.0 | | | | | | | | | | 427.00000 | UWHZ |
| 0.00 | | | | | | | | | | | |
| 0.00 | | | | | | | | | | Start | Freq |
| -10.0 | | | | | | | | | | 30.00000 | 0 MHz |
| | | | | | | | | DL1 | -13.00 dBm | | |
| -20.0 | | | | | | | | | | 04 | |
| | | | | | | | | | | 824.00000 | Freq |
| -30.0 | | | | | | | | | | 824.00000 | UWHZ |
| | | | | | | | | | | | |
| -40.0 | | | | | | | | | | | Step |
| | | | | | | | | | 1 | 79.40000 <u>Auto</u> | 0 MHZ Man |
| -50.0 | | | | | | | | | | | |
| | | | | | | | | Applifaction for a particular | | F | |
| -60.0 (4)(4)(4) | Maniplanasi Janima | | Hills Mitcales By Jint | فللقائد المانية المراقل كرافي كري | an hi shi ka | alterior de tra- | l a allo an abhladh an an a | | | FreqC | |
| | | | | | | | | | | | 0 Hz |
| -70.0 | | | | | | | | | | | |
| | | | | | | | | | | Scale | Туре |
| Start 30.0 | 1 MHz | | | | | | | Stop 824 | 0 MHz | Log | Lin |
| #Res BW | | | #VE | SW 300 kHz | | s | weep 98 | 46 ms (158 | 81 pts) | | |
| | nts changed; | all traces of | | | | | STATUS | | / | | |
| | ne enangea, | | | | | | | | | | |







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|--|----------------------|---|------|---------------------------------|--|--|--|--|
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| 🔤 Keysight Spectrum Analyzer - | | | | | | |
|------------------------------------|--|---|--|---|--|---|
| | Ω AC CORR | | NSE:INT | ALIGN AUTO | 04:28:28 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Center Freq 6.000 | PNC | D: Fast Trig: Fre Atten: 2 | e Run | | DET A N N N N | |
| 10 dB/div Ref 10.00 | dBm | | | M | kr1 2.546 5 GHz -20.42 dBm | Auto Tune |
| 0.00 | | | | | | Center Freq 6.00000000 GHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq 2.00000000 GHz |
| -30.0 | | | | | | Stop Freq 10.000000000 GHz |
| -50.0 | an a | <mark>S personal de la constance de la desense en de la desense en de la desense en de la desense en de la desense de La seconda de la constance de la desense d</mark> | n _{an} , Privatah, an di Una Santa Katang Katang | (1979–1971) og by det for Disker og preder blege gifter for Disker og for dig stor af se besker gifter for Disker og for dig stor af se besker og stor af se besker | ng ang balan ^{kan} a sa kang sa gang sa | CF Step 800.000000 MHz <u>Auto</u> Man |
| -70.0 | | | | | | Freq Offset 0 Hz |
| -80.0 | | | | | | Scale Type |
| Start 2.000 GHz #Res BW 1.0 MHz | | #VBW 3.0 MHz | | Sweep 1 | Stop 10.000 GHz 3.87 ms (16001 pts) | Log <u>Lin</u> |
| мsg 🗼 Points changed; a | II traces cleared | d | | STATU | s | |





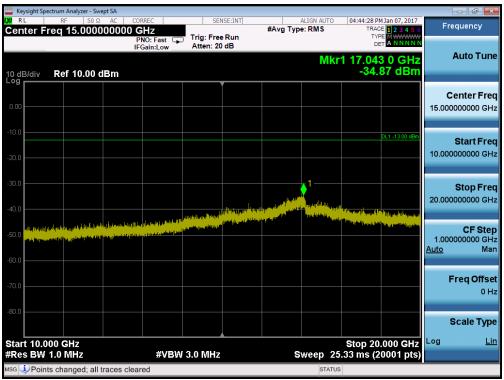
Plot 7-19. Conducted Spurious Plot (PCS GPRS Mode - Ch. 512)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | | | |
|--|----------------------|---|------|---------------------------------|--|--|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 25 of 107 | | | | | |
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| | | Analyzer - Sv | | | | | | | | | [| - |
|-------------------------|----------------------|---|---|--|---------------------------------------|------------------------|--------------------|------------------------|---------------------------|--|--------------|-------------------|
| LXI RL Center | Fred | | 2 AC | CORREC GHZ | SE | NSE:INT | #Avg Typ | ALIGN AUTO e: RMS | TRAC | M Jan 07, 2017 E <mark>1 2 3 4 5 6</mark> | | quency |
| o on no | Troq | | | PNO: Fast IFGain:Low | | | - // | | TYF | | | |
| | | | | II Gam.Low | | | | M | (r1 9.95 | 1 0 GHz | | Auto Tune |
| 10 dB/di | v Ref | f 20.00 | dBm | | | | | | -35. | 51 dBm | | |
| | | | | | | Ĭ | | | | | C | enter Freg |
| 10.0 | | | | | | | | | | | | 000000 GHz |
| | | | | | | | | | | | - | |
| 0.00 | | | | | | | | | | | | Start Freq |
| -10.0 | | | | | | | | | | | | 000000 GHz |
| -10.0 | | | | | | | | | | DL1 -13.00 dBm | | |
| -20.0 | | | | | | | | | | | | Stop Freq |
| | | | | | | | | | | | | 000000 GHz |
| -30.0 | | | | | | | | | | 1 | | |
| 40.0 | | | | | alogo and the second second | والمعادية المعطران الم | المتوقفا التفريسات | discontributional data | وأنكل برام والطأنق إرمينا | a distribution of the second | | CF Step |
| | | a na an | n, allerer fir | u. Witten and a start of the start of | the party of the second second second | i anasi dahari pi | in the state | hand foresteed a la | الحرارين بسائنات ريس | a she water a state of the stat | 809. Auto | 000000 MHz Man |
| -50.0 <mark>with</mark> | al aviabalitation of | ali ang | աները՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝ | المرينة المرينة المنا | | | | | | | Auto | Wan |
| | | | | | | | | | | | F | req Offset |
| -60.0 | | | | | | | | | | | | 0 Hz |
| 70.0 | | | | | | | | | | | | |
| -70.0 | | | | | | | | | | | S | cale Type |
| | | _ | | | | | | | | | 1.00 | Lin |
| Start 1. #Res B | | | | #V | BW 3.0 MHz | | 8 | weep 14 | Stop 10 | .000 GHz 6181 pts) | Log | Lin |
| MSG 🕕 P | | | traces cl | | | | | STATUS | | oror pts, | | |
| | | | | | | | | | | | | |





Plot 7-21. Conducted Spurious Plot (PCS GPRS Mode - Ch. 512)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 26 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 26 of 107 |
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| 🤤 Keysight Spectrur | | | | | | | | | | | × |
|-----------------------------|---------------------|------------------|------------------------------|-------------------------|--------|----------|------------|------------------------|---------------------------------------|---------------------------------|------------------------|
| | RF 50 Ω | | ORREC | SEI | SE:INT | #Avg Typ | ALIGN AUTO | | MJan 07, 2017 E 1 2 3 4 5 6 | Frequenc | v |
| Center Freq | 940.000 | | IZ PNO: Fast FGain:Low | | | #Avg Typ | | TYF DE | | Auto | |
| 10 dB/div R | ef 20.00 d | IBm | | | | | M | kr1 1.60 -37. | 3 5 GHz 96 dBm | Auto | Turie |
| 10.0 | | | | | | | | | | Center 940.000000 | |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | Start 30.000000 | |
| -20.0 | | | | | | | | | | Stop 1.85000000 | |
| -40.0 -50.0 | filijel stary kalet | andal (and a da | itel platate | iterpelastration and th | | | | | kan di kana kan | CF 182.000000 <u>Auto</u> | Step MHz Man |
| -60.0 | | | | | | | | | | Freq O | o ffset 0 Hz |
| -70.0 | | | | | | | | | | Scale | |
| Start 0.0300 #Res BW 1.0 | | | #V | BW 3.0 MHz | | | Sweep 2 | Stop 1.8 2.427 ms (| 3500 GHz 3641 pts) | Log | <u>Lin</u> |
| мsg 🗼 Points cl | hanged; all | traces cle | ared | | | | STATU | IS | | | |





Plot 7-23. Conducted Spurious Plot (PCS GPRS Mode - Ch. 661)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dego 27 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 27 of 107 |
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| | trum Analyzer - Swept S | A | | | | |
|--------------------------|--|---|---|------------------------------|--|----------------------------|
| UXI RL | RF 50 Ω A eq 15.000000 | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:38:20 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Center Pr | eq 15.000000 | PNO: Fast IFGain:Low | Trig: Free Run Atten: 20 dB | | TYPE M WWWWW DET A N N N N N | |
| | | IFGall.LOW | Autorit 20 db | Mk | 1 16.983 0 GHz | Auto Tune |
| 10 dB/div Log | Ref 10.00 dBr | n | | | -32.95 dBm | |
| | | | ľ | | | Center Freq |
| 0.00 | | | | | | 15.00000000 GHz |
| | | | | | | |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq |
| -20.0 | | | | | | 10.000000000 GHz |
| 20.0 | | | | | | |
| -30.0 | | | | ↓ ↓ ¹ | | Stop Freq |
| | | | | and separate the second | | 20.000000000 GHz |
| -40.0 | | | on departicipation of the local sector of the | | | |
| -50.0 | and a second strength of the second strength | الأولال المراجع ما المحري والمراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع الم المحمد المحدية المحرية مستعمل من معامل المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع ا | المتعالية المتعاطية أتشخطهم والالاسدار | | and the state of the second state of the secon | CF Step |
| A solution and | A DESCRIPTION OF THE PARTY OF T | and the second se | | | | 1.00000000 GHz Auto Man |
| -60.0 | | | | | | <u>Auto</u> murr |
| | | | | | | Freq Offset |
| -70.0 | | | | | | 0 Hz |
| -80.0 | | | | | | |
| | | | | | | Scale Type |
| 04-14.000 | | | | | 011- 00 000 OU | Log Lin |
| Start 10.00 #Res BW 1 | | #VBW | 3.0 MHz | Sweep 2 | Stop 20.000 GHz 5.33 ms (20001 pts) | |
| | s changed; all trac | | | STATU | | |





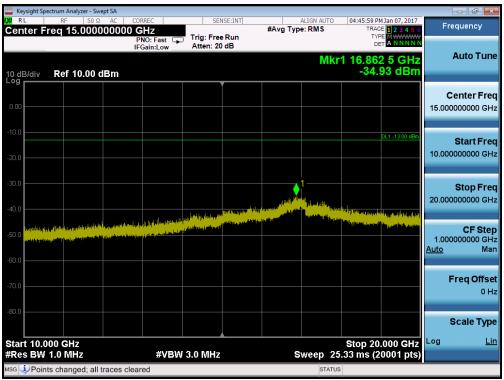
Plot 7-25. Conducted Spurious Plot (PCS GPRS Mode - Ch. 810)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | | | |
|--|----------------------|---|------|---------------------------------|--|--|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 28 of 107 | | | | | |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Fage 20 01 107 | | | | | |
| 2 2017 PCTEST Engineering Laboratory, Inc. | | | | | | | | | |



| 🔤 Keysight Sp | ectrum Analyzer - Swe | ept SA | | | | | | | | | |
|---------------------------------------|--|----------------------------------|------------------------------|---|-----------------------------|--|------------------------|---|--|-------|-----------------------------------|
| LXIRL | RF 50 Ω | | RREC | SEI | ISE:INT | #Avg Typ | ALIGN AUTO | | M Jan 07, 2017 E 1 2 3 4 5 6 | Frequ | iency |
| Center F | req 5.95750 | Р | HZ NO: Fast ⊆ Gain:Low | Trig: Free Atten: 30 | | #Avg Typ | e. Rivis | TYF | | | |
| 10 dB/div Log | Ref 20.00 d | IBm | | | | | MI | kr1 5.69 -35. | 7 5 GHz 37 dBm | AL | ito Tune |
| 10.0 | | | | | | | | | | | iter Freq 0000 GHz |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | | t art Freq 0000 GHz |
| -20.0 | | | | 1 | | | | | | | top Freq 0000 GHz |
| -40.0 -40.0 -1.00000 | and the second | a a faran ya ku a sa sa sa sa sa | | a provinju venika na ^{den} asta se na ^{nata} r | na (tanàn tinàn ang mang mi | Ung (pilotageneration Propertielle (pilotagen | the manufacture of the | la yali walio kata a kata Manifesi ili kata a kata | | | CF Step 0000 MHz Man |
| -60.0 | | | | | | | | | | Fre | e q Offset 0 Hz |
| -70.0 | | | | | | | | | | | ale Type |
| Start 1.91 #Res BW | | | #VBM | / 3.0 MHz | | 8 | ween 14 | Stop 10 | .000 GHz 6171 pts) | Log | Lin |
| · · · · · · · · · · · · · · · · · · · | ts changed; all t | races clear | | | | | STATU | | o n i pisj | | |
| | to shangou, un t | | | | | | | | | | |





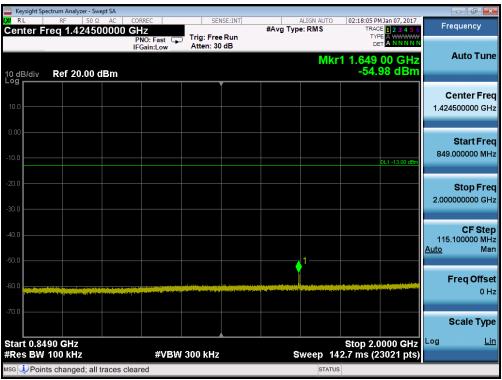
Plot 7-27. Conducted Spurious Plot (PCS GPRS Mode - Ch. 810)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 20 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 29 of 107 |
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| 🔤 Keysight Sp | ectrum Analyzer | - Swept SA | | | | | | | | | |
|-----------------------|-----------------|------------|--------------------------------|-------------------------|---------|---------|------------|---------------------|--|----------------------|------------------------------------|
| LXIRL | | 50 Ω AC | CORREC | SEI | NSE:INT | | ALIGN AUTO | | 1 Jan 07, 2017 | Fred | uency |
| Center F | req 426. | 500000 | MHZ PNO: Fast IFGain:Low | Trig: Free Atten: 30 | | #Avg Ty | pe: RMS | TYP | E 1 2 3 4 5 6 E A WWWW T A N N N N N | | |
| 10 dB/div Log | Ref 20.0 | 00 dBm | | | | | M | kr1 823. -32.: | 00 MHz 23 dBm | A | uto Tune |
| 10.0 | | | | | | | | | | | nter Freq 00000 MHz |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | | Start Freq D0000 MHz |
| -20.0 | | | | | | | | | 1 | | Stop Freq D0000 MHz |
| -40.0 | | | | | | | | | | 79.30 <u>Auto</u> | CF Step 00000 MHz Man |
| -60.0 | | | | | | | | | | Fr | eq Offset 0 Hz |
| -70.0 | | | | | | | | | | | cale Type |
| Start 30.0 #Res BW | 100 kHz | | | 3W 300 kHz | | 5 | Sweep 98 | Stop 8 .33 ms (1 | 20.0 191112 | Log | <u>Lin</u> |
| мsg 🧼 Poin | ts changed; | all traces | cleared | | | | STATUS | | | | |





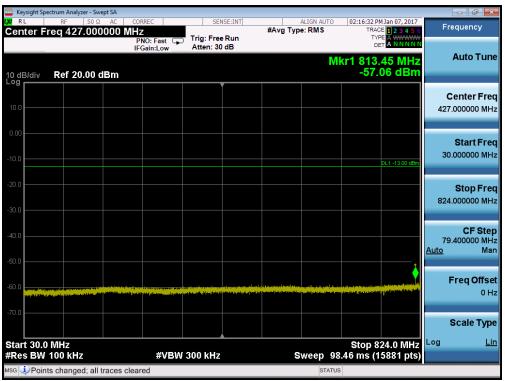
Plot 7-29. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 1013)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 30 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | raye 50 01 107 |
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| 🔤 Keysight Spectrum Analyzer - Swept SA 🚽 | | | | |
|---|--|------------|---|---------------------------|
| X RL RF 50 Ω AC Center Freq 6.000000000 | GHz | ALIGN AUTO | 02:18:16 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| | PNO: Fast Trig: Free IFGain:Low Atten: 20 | | DET A NNNN | |
| | | Mk | r1 2.474 0 GHz | Auto Tune |
| 10 dB/div Ref 10.00 dBm | | | -45.75 dBm | |
| 203 | | | | Center Freq |
| 0.00 | | | | 6.00000000 GHz |
| 49.0 | | | | |
| -10.0 | | | DL1 -13.00 dBm | Start Freq |
| -20.0 | | | | 2.000000000 GHz |
| | | | | |
| -30.0 | | | | Stop Freq |
| -40.0 | | | | 10.00000000 GHz |
| | | | | 05.04.4 |
| -50.0 | | | | CF Step 800.000000 MHz |
| -60.0 | | | | <u>Auto</u> Man |
| -00.0 | | | | |
| -70.0 | | | | Freq Offset 0 Hz |
| | | | | 0112 |
| -80.0 | | | | Scale Type |
| | | | | |
| Start 2.000 GHz #Res BW 1.0 MHz | #VBW 3.0 MHz | Sweep 13. | Stop 10.000 GHz 87 ms (16001 pts) | |
| MSG Doints changed; all traces | | STATUS | | |





Plot 7-31. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 384)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dego 21 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 31 of 107 |
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| | ectrum Analyzer - Swept SA | | | | | |
|-----------------------|---|-------------------------|--|------------------------------|---|--|
| LXI RL | RF 50 Ω AC | CORREC | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 02:16:43 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Center F | req 1.424500000 | PNO: Fast IFGain:Low | Trig: Free Run Atten: 30 dB | #Avg Type. RMS | | |
| 10 dB/div Log | Ref 20.00 dBm | | | Mkr | 1 1.673 45 GHz -53.97 dBm | Auto Tune |
| 10.0 | | | | | | Center Freq 1.424500000 GHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq 849.000000 MHz |
| -20.0 | | | | | | Stop Freq 2.000000000 GHz |
| -40.0 | | | | 1 | | CF Step 115.100000 MHz <u>Auto</u> Man |
| -60.0 | senter name prinning gant tempyonen prinnen websit generative A Radids of principal system y describes the temperature principal sectors | | n a se a s | | a tong transit la pontra a fonger se post a fond ta a ser nonga pongeng tong da ta da tra transit na seria a fond ta | Freq Offset 0 Hz |
| -70.0 | | | | | | Scale Type |
| Start 0.84 #Res BW | | #VBW | - 300 kHz | Sweep 14 | Stop 2.0000 GHz 2.7 ms (23021 pts) | Log <u>Lin</u> |
| мsg 🔱 Poin | ts changed; all traces | cleared | | STATUS | | |





Plot 7-33. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 384)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 22 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 32 of 107 |
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| 🔤 Keysight Sp | ectrum Analyzer - Sw | ept SA | | | | | | | | | |
|-----------------------|--|----------|--------------------------------|-------------|---------|---------|------------|---------------------|--|-------|-----------------------------------|
| LXI RL | RF 50 Ω | | CORREC | SEI | NSE:INT | #Avg Ty | ALIGN AUTO | | 1 Jan 07, 2017 | Frequ | Jency |
| Center F | req 427.000 | J000 N | IHZ PNO: Fast IFGain:Low | | | #Avg Ty | pe: RWS | TYP | E 1 2 3 4 5 6 E A WWWW T A N N N N N | | |
| 10 dB/div Log | Ref 20.00 (| dBm | | | | | M | kr1 809. -58. | 40 MHz 65 dBm | AL | ito Tune |
| 10.0 | | | | | | | | | | | iter Freq 0000 MHz |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | | t art Freq 0000 MHz |
| -20.0 | | | | | | | | | | | top Freq 0000 MHz |
| -40.0 | | | | | | | | | | | CF Step 0000 MHz Man |
| -60.0 | n tri Sangan kana sa | | | | | | | | | Fre | e q Offset 0 Hz |
| -70.0 | | | | | | | | | | | ale Type |
| Start 30.0 #Res BW | | | #V | 'BW 300 kHz | | | Sweep 98 | Stop 8 .46 ms (1 | 24.0 10112 | Log | <u>Lin</u> |
| мsg 🔱 Poin | its changed; all | traces o | leared | | | | STATUS | 5 | | | |



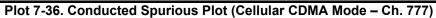


Plot 7-35. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 22 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 33 of 107 |
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| | t Spectrum Analyzer - Swept SA | | | | | - 6 - |
|--------------------------------------|--------------------------------|---------------------------|--------------------------------|------------------------------|---|--|
| Center | RF 50 Ω AC | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 02:19:39 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| | | PNO: Fast 😱 IFGain:Low | Trig: Free Run Atten: 20 dB | | TYPE A WWWWW DET A N N N N N | |
| 10 dB/di [;] Log | Ref 10.00 dBm | | | Mk | r1 2.545 5 GHz -44.56 dBm | Auto Tune |
| 0.00 | | | | | | Center Freq 6.000000000 GHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq 2.00000000 GHz |
| -30.0 | 1 | | | | | Stop Freq 10.000000000 GHz |
| -50.0 | | | | | | CF Step 800.000000 MHz <u>Auto</u> Man |
| -70.0 | | | | | | Freq Offset 0 Hz |
| -80.0 | | | | | | Scale Type |
| | 000 GHz W 1.0 MHz | #VBW | 3.0 MHz | Sweep 13 | Stop 10.000 GHz .87 ms (16001 pts) | Log <u>Lin</u> |
| MSG 🗼 P | oints changed; all traces | cleared | | STATUS | | |



| Keysight Spec | ctrum Analyzer - Swept SA | | | | | |
|----------------------|------------------------------|----------------------------|---|------------------------------|---|--|
| | RF 50 Ω AC req 937.500000 | CORREC MHZ PNO: Fast | SENSE:INT Trig: Free Run Atten: 30 dB | ALIGN AUTO #Avg Type: RMS | 02:27:32 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN | Frequency |
| 0 dB/div | Ref 20.00 dBm | | | M | r1 1.845 0 GHz -42.80 dBm | Auto Tun |
| 10.0 | | | | | | Center Fre 937.500000 MH |
| 10.0 | | | | | DL1 -13.00 dBm | Start Fre 30.000000 MH |
| 30.0 | | | | | | Stop Fre 1.845000000 GH |
| 0.0 | | | | | | CF Ste 181.50000 M⊢ <u>Auto</u> Ma |
| 0.0 | | | | | | Freq Offse 0 ⊢ |
| 70.0 | | | | | | Scale Typ |
| tart 0.030 Res BW | | #VBW | 3.0 MHz | Sweep 2 | Stop 1.8450 GHz .420 ms (3631 pts) | Log <u>L</u> |
| G 🗼 Points | s changed; all traces | cleared | | STATUS | 6 | |

Plot 7-37. Conducted Spurious Plot (PCS CDMA Mode – Ch. 25)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Daga 24 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 34 of 107 |
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| | Spectrum Analyzer - Swept SA | | | | | |
|------------------|--------------------------------|-------------------------|--|------------------------------|--|----------------------------------|
| Center | RF 50 Ω AC Freq 5.955000000 | CORREC GHZ | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 02:27:42 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Contor | | PNO: Fast IFGain:Low | Trig: Free Run Atten: 30 dB | | TYPE A WWWWW DET A NNNNN | |
| | | I Guilleow | | MI | (r1 7.405 0 GHz | Auto Tune |
| 10 dB/div Log | Ref 20.00 dBm | | | | -41.53 dBm | |
| Log | | | Ĭ | | | Center Freq |
| 10.0 | | | | | | 5.955000000 GHz |
| | | | | | | |
| 0.00 | | | | | | Start Freq |
| -10.0 | | | | | | 1.91000000 GHz |
| | | | | | DL1 -13.00 dBm | |
| -20.0 | | | | | | Stop Freq |
| | | | | | | 10.00000000 GHz |
| -30.0 | | | | | | |
| -40.0 | | | | ∳ ¹ | | CF Step |
| | | ور و معالمات . | and the second | | and the second | 809.00000 MHz <u>Auto</u> Man |
| -50.0 | | | | | | |
| -60.0 | | | | | | Freq Offset |
| -00.0 | | | | | | 0 Hz |
| -70.0 | | | | | | |
| | | | | | | Scale Type |
| Start 1.9 | 910 GHz | | | | Stop 10.000 GHz | Log <u>Lin</u> |
| #Res BV | V 1.0 MHz | #VBW | 3.0 MHz | Sweep 14 | .02 ms (16181 pts) | |
| MSG 🤳 Po | ints changed; all traces of | cleared | | STATUS | 3 | |





Plot 7-39. Conducted Spurious Plot (PCS CDMA Mode - Ch. 25)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | |
|---------------------------------|--|---|------|---------------------------------|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 35 of 107 | | |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | raye 55 01 107 | | |
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| | ctrum Analyzer - Sw | | | | | | | | | - P | × |
|--|----------------------|---------|-------------------------|--|---------|--|--|------------------------|---------------------------------|-------------------------------------|---------------------|
| Conter F | RF 50Ω eq 940.000 | | CORREC | SEI | NSE:INT | #Avg Typ | ALIGN AUTO | | M Jan 07, 2017 E 1 2 3 4 5 6 | Frequency | |
| Center P | eq 940.000 | JOOO IW | PNO: Fast IFGain:Lov | Trig: Free Atten: 30 | | | | TYI Di | | Auto T | |
| 10 dB/div Log | Ref 20.00 (| dBm | | | | | М | kr1 1.84 -48. | 7 5 GHz 36 dBm | Auto I | une |
| 10.0 | | | | | | | | | | Center F 940.000000 I | - 1 |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | Start F 30.000000 I | |
| -20.0 | | | | | | | | | | Stop F 1.850000000 | |
| -40.0 | | | | and a start of the | | producer julier risered at a state to tage | , _{and} and the second | | 1 | CF S 182.000000 I <u>Auto</u> | |
| -60.0 | | | | | | | | | | Freq Ofi | fset 0 Hz |
| -70.0 | | | | | | | | | | Scale T | |
| Start 0.03 #Res BW | | | #\ | /BW 3.0 MHz | | | Sweep : | Stop 1.8 2.427 ms (| 5500 GHZ | Log | Lin |
| MSG Deints changed; all traces cleared | | | | | | | | | | | |





Plot 7-41. Conducted Spurious Plot (PCS CDMA Mode - Ch. 600)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | |
|--|----------------------|---|----------------|---------------------------------|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 36 of 107 | | | |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | raye 30 01 107 | | | | |
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| | ctrum Analyzer - Swept SA | | | | | - 6 - |
|-----------------------|-------------------------------|------------------------------|--------------|------------------------------|---|---|
| Center F | RF 50 Ω AC req 15.00000000 | CORREC OOGHZ PNO: Fast | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 02:26:08 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N | Frequency |
| 10 dB/div | Ref 10.00 dBm | IFGain:Low | Atten: 20 dB | Mkr | 1 16.962 5 GHz -41.19 dBm | Auto Tune |
| 0.00 | | | | | | Center Freq 15.00000000 GHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq 10.000000000 GHz |
| -30.0 | | | | 1 | | Stop Freq 20.000000000 GHz |
| -50.0 | | | | | | CF Step 1.00000000 GHz <u>Auto</u> Man |
| -70.0 | | | | | | Freq Offset 0 Hz |
| -80.0 | | | | | | Scale Type |
| Start 10.0 #Res BW | 1.0 MHz | | 3.0 MHz | | .33 ms (20001 pts) | Log <u>Lin</u> |
| MSG Point | ts changed; all traces | cleared | | STATUS | | |



| | ectrum Analyzer - Swept SA | | | | | - • • • |
|---------------------|--|-------------------------|----------------------------------|--|--|---------------------------------|
| K RL | RF 50 Ω AC | CORREC | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 02:28:58 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Senter F | req 940.000000 | PNO: Fast IFGain:Low |) Trig: Free Run Atten: 30 dB | • // | TYPE A WWWWW DET A NNNNN | |
| I0 dB/div | Ref 20.00 dBm | | | Mł | r1 1.826 5 GHz -48.20 dBm | Auto Tune |
| | | | | | | Center Fred |
| 10.0 | | | | | | 940.000000 MHz |
| 0.00 | | | | | | Start Fred |
| 10.0 | | | | | DL1 -13.00 dBm | 30.000000 MH |
| 20.0 | | | | | | Stop Free |
| 30.0 | | | | | | 1.85000000 GH |
| | | | | | | CF Ste |
| 40.0 | | | | | | 182.000000 MH <u>Auto</u> Ma |
| 50.0 | and the second | | | and a subsection of the second s | i entre digter französigter i entre digter i entre | Ener Offer |
| 50.0 | | | | | | Freq Offse 0 H |
| 70.0 | | | | | | Scale Typ |
| | | | | | | |
| tart 0.03 Res BW | 00 GHz 1.0 MHz | #VBW | 3.0 MHz | Sweep 2 | Stop 1.8500 GHz .427 ms (3641 pts) | |
| sg 🕕 Poin | ts changed; all traces | s cleared | | STATUS | | |

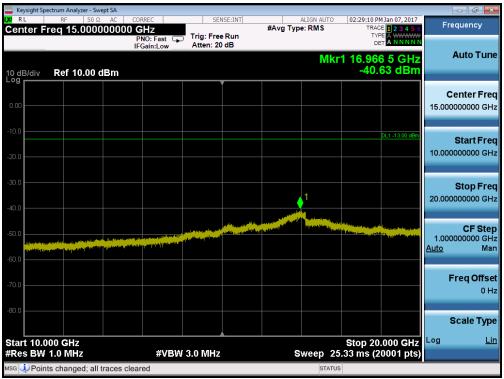
Plot 7-43. Conducted Spurious Plot (PCS CDMA Mode – Ch. 1175)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕑 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dego 27 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 37 of 107 |
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| 🔤 Keysight Spectrum Analyzer - Swept SA 🚽 | | | | |
|--|--|--------------|---|---|
| ເ₩ RL RF 50Ω AC Center Freq 5.957500000 | GHz | #Avg Type: R | N AUTO 02:29:04 PM Jan 07, 2017 MS TRACE 2 3 4 5 6 | Frequency |
| | PNO: Fast Trig: Free IFGain:Low Atten: 30 | | | Auto Tuno |
| 10 dB/div Ref 20.00 dBm | | | Mkr1 7.635 5 GHz -40.93 dBm | Auto Tune |
| 10.0 | | | | Center Freq 5.957500000 GHz |
| -10.0 | | | DL1 -13.00 dBm | Start Freq 1.915000000 GHz |
| -20.0 | | | | Stop Freq 10.000000000 GHz |
| -40.0 | | | | CF Step 808.500000 MHz <u>Auto</u> Man |
| -60.0 | | | | Freq Offset 0 Hz |
| -70.0 | | | | Scale Type |
| Start 1.915 GHz #Res BW 1.0 MHz | #VBW 3.0 MHz | Swe | Stop 10.000 GHz ep 14.01 ms (16171 pts) | Log <u>Lin</u> |
| MSG iPoints changed; all traces of | cleared | | STATUS | |



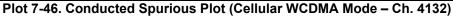


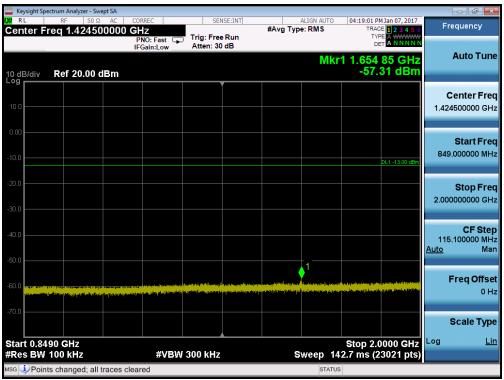
Plot 7-45. Conducted Spurious Plot (PCS CDMA Mode - Ch. 1175)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 29 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 38 of 107 |
| © 2017 PCTEST Engineering Labor | ratory, Inc. | | | V 6.1 |



| 🔤 Ke | ysight Spe | ectrum An | alyzer - Si | wept SA | | | | | | | | | | |
|----------------|----------------|-----------|-------------|---------|---------|-----------------|-----------------------|---------|---------|------------|----------------------|---|-------------------|--------------------------------------|
| LXI R | - | RF | 50 9 | | CORREC | C | SE | NSE:INT | #A T. | ALIGN AUTO | | M Jan 07, 2017 | Fr | equency |
| Cen | iter Fi | req 4 | 26.50 | 0000 | PNO: | Fast ⊊ n:Low | Trig: Fre Atten: 3 | | #Avg Iy | /pe: RMS | TY | DE 1 2 3 4 5 6 PE A WWWW ET A NNNNN | | |
| 10 di Log | B/div | Ref | 20.00 | dBm | | | | | | M | kr1 822 -32. | .80 MHz 95 dBm | | Auto Tune |
| 10.0 | | | | | | | | | | | | | | Center Freq .500000 MHz |
| 0.00 -10.0 | | | | | | | | | | | | DL1 -13.00 dBm | 30 | Start Freq .000000 MHz |
| -20.0 -30.0 | | | | | | | | | | | | 1 | 823 | Stop Freq .000000 MHz |
| -40.0 | | | | | | | | | | | | | 79 <u>Auto</u> | CF Step .300000 MHz Man |
| -60.0 | ij) () de () | | | | | | | | | | | | | F req Offset 0 Hz |
| -70.0 | | | | | | | | | | | | | | Scale Type |
| #Re | t 30.0 s BW | 100 k | | | | #VBW | 300 kHz | | | Sweep 98 | Stop 8 3.33 ms (1 | 23.0 19112 | Log | Lin |
| MSG 🤇 | Point | ts chan | ged; al | traces | cleared | | | | | STATUS | 3 | | | |



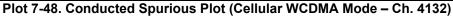


Plot 7-47. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | | |
|--|----------------------|---|------|---------------------------------|--|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 39 of 107 | | | | |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Fage 39 01 107 | | | | |
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| | ectrum Analyzer - Swe | | | | | | | | | | |
|-------------------|------------------------|--|--|------------|---------|----------|------------|-----------|---------------------------------|-------------|------------|
| Center F | RF 50 Ω req 6.00000 | | ORREC | SEI | NSE:INT | #Avg Typ | ALIGN AUTO | | M Jan 07, 2017 E 1 2 3 4 5 6 | Fred | uency |
| Centerr | req 0.00000 | | PNO: Fast 🔾 | Trig: Fre | | | | TY | | | |
| | | | FGain:Low | Atten: 20 | dB | | | | | Δ | uto Tune |
| | | | | | | | Mł | (r1 2.48) | 2 5 GHz | | |
| 10 dB/div Log | Ref 10.00 d | IBm | | | | | | -50. | 71 dBm | | |
| | | | | | Í | | | | | Co | nter Freg |
| 0.00 | | | | | | | | | | | 00000 GHz |
| 0.00 | | | | | | | | | | 0.0000 | 00000 GH2 |
| -10.0 | | | | | | | | | | | |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | 5 | Start Freq |
| -20.0 | | | | | | | | | | | 00000 GHz |
| -20.0 | | | | | | | | | | | |
| | | | | | | | | | | | |
| -30.0 | | | | | | | | | | 5 | Stop Freq |
| | | | | | | | | | | 10.0000 | 00000 GHz |
| -40.0 | | | | | | | | | | | |
| | <u>1</u> | | | | | | | | | | CF Step |
| -50.0 | | | | | | | | | | 800.0 | 00000 MHz |
| المحمد ومادته | | and the local division of the local division | and the state of the state of | | | | | | | <u>Auto</u> | Man |
| -60.0 March 10.00 | | and a design of the second | And the state of t | | | | | | | | |
| | | | | | | | | | | Fr | eq Offset |
| -70.0 | | | | | | | | | | | 0 Hz |
| | | | | | | | | | | | |
| -80.0 | | | | | | | | | | | |
| | | | | | | | | | | S | cale Type |
| Start 2.00 | | | | | | | | Stop 40 | | Log | Lin |
| #Res BW | | | #VBV | / 3.0 MHz | | | ween 13 | 510p 10 | .000 GHz 6001 pts) | | |
| | | | | -0.0-10112 | | | | | ooor pts) | | |
| MSG Poin | ts changed; all t | races clea | ared | | | | STATUS | | | | |



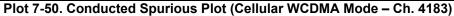


Plot 7-49. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)

| FCC ID: ZNFVS988 | <u> PCTEST</u> | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | | | |
|--|----------------------|---|------|---------------------------------|--|--|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 40 of 107 | | | | | |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Fage 40 01 107 | | | | | |
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| 🔤 Keysight Spe | ectrum Analyzer - Sv | vept SA | | | | | | | | | |
|-----------------------|---|-----------|---|---|---------|--|--|---|--|------------------|-----------------------------------|
| LXI RL | | AC | CORREC | SE | NSE:INT | | ALIGN AUTO | | 1 Jan 07, 2017 | Freque | ency |
| Center F | req 1.4245 | 00000 | CHZ PNO: Fast IFGain:Low | | | #Avg Ty | pe: RMS | TYP | E 1 2 3 4 5 6 E A WWWW T A N N N N N | | |
| 10 dB/div Log | Ref 20.00 | dBm | | | | | M | kr1 849. -55. | 85 MHz 59 dBm | Aut | to Tune |
| 10.0 | | | | | | | | | | Cent 1.424500 | e r Freq 000 GHz |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | | art Freq 000 MHz |
| -20.0 | | | | | | | | | | Sto 2.000000 | o p Freq 000 GHz |
| -40.0 | | | | | | | | | | | C F Step 000 MHz Man |
| and a little | a na sana ang ang ang ang ang ang ang ang ang | | ang | trasmusi da kana hida kata ya Manga ya kana punisi da kata ini | | n a statut na sere statu je sto Na sere statu je statut na statut na statut na statut na statut na statut na st | en al a Aright and a since agricultury and a since agricultury and a since | n (na falana) ay ganada penti Yang tanang dan tang tang tang tang ta | ngen de geben et de la 1997 en | Free | offset 0 Hz |
| -70.0 | | | | | | | | | | | Іе Туре |
| Start 0.84 #Res BW | | | #V | BW 300 kHz | | | Sweep 14 | Stop 2.0 2.7 ms (2 | 000 GHz 3021 pts) | Log | Lin |
| мsg 🤃 Point | ts changed; all | traces of | leared | | | | STATU | S | | | |



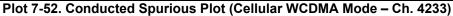


Plot 7-51. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | | |
|--|----------------------|---|------|---------------------------------|--|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Daga 11 of 107 | | | | |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 41 of 107 | | | | |
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| | ysight Spe | | | | | | | | | | | | | |
|-------------------------|----------------|-------------|-------------|-----------|----------------|--------|--|---------|----------|------------|---------------------|----------------------------------|-------------------|---------------------------------------|
| <mark>⊯</mark> R Cen | | RF req 4 | 50 27.00 | Ω AC | MHz | | | NSE:INT | #Avg Typ | ALIGN AUTO | TRAC | M Jan 07, 2017 CE 1 2 3 4 5 6 | Fr | equency |
| | | | | | PNO: IFGair | Fast 🖵 | Trig: Fre Atten: 3 | | | | DI | | | |
| 10 dE Log | 3/div | Ref | 20.00 | dBm | | | | | | M | kr1 822. -58. | .30 MHz 45 dBm | | Auto Tune |
| 10.0 | | | | | | | | | | | | | | Center Freq .000000 MHz |
| 0.00 -10.0 | | | | | | | | | | | | DL1 -13.00 dBm | 30 | Start Freq 0.000000 MHz |
| -20.0 -30.0 | | | | | | | | | | | | | 824 | Stop Freq 1.000000 MHz |
| -40.0 -50.0 | | | | | | | | | | | | | 79 <u>Auto</u> | CF Step 9.400000 MHz Man |
| -60.0 | | | | | | | an a | | | | | | | Freq Offset 0 Hz |
| -70.0 | | | | | | | | | | | | | | Scale Type |
| | t 30.0 s BW | | | | | #VBW | 300 kHz | | ş | weep 98 | Stop 8 .46 ms (1 | 24.0 MHz 5881 pts) | Log | <u>Lin</u> |
| MSG 🤇 | Point | s chai | nged; a | ll traces | cleared | | | | | STATUS | ; | | | |



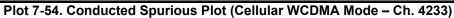


Plot 7-53. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 42 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Faye 42 01 107 |
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| 🔤 Keysight Spectrum Analyzer - Swept SA 🚽 | | | | | |
|--|----------|------------|------------------------------|---|----------------------------|
| ເ₩ RL RF 50 Ω AC Center Freq 6.000000000 | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:20:10 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWWW | Frequency |
| | | ten: 20 dB | ML | | Auto Tune |
| 10 dB/div Ref 10.00 dBm | | | | -49.85 dBm | |
| | | Ĭ | | | Center Freq |
| 0.00 | | | | | 6.000000000 GHz |
| -10.0 | | | | DL1 -13.00 dBm | Start Freq |
| -20.0 | | | | | 2.000000000 GHz |
| -30.0 | | | | | Stop Freq |
| -40.0 | | | | | 10.000000000 GHz |
| 1 | | | | | CF Step |
| -50.0 | | | | | 800.000000 MHz Auto Man |
| -60.0 | | | | | |
| -70.0 | | | | | Freq Offset 0 Hz |
| -80.0 | | | | | 0112 |
| | | | | | Scale Type |
| Start 2.000 GHz #Res BW 1.0 MHz | #VBW 3.0 | MHz | Sweep 13 | Stop 10.000 GHz 5.87 ms (16001 pts) | Log <u>Lin</u> |
| MSG Dor Horning MSG Points changed; all traces of | | | STATUS | | |



| | ctrum Analyzer - Swept SA | | | | | |
|---------------------|------------------------------|--|--------------------------------|--|---|-----------------------------|
| RL | RF 50 Ω AC req 867.500000 | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:12:43 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| | cq 007.300000 | PNO: Fast IFGain:Low | Trig: Free Run Atten: 30 dB | | TYPE A WWWW DET A NNNNN | |
| 0 dB/div | Ref 20.00 dBm | | | Mk | r1 1.705 0 GHz -35.17 dBm | Auto Tun |
| ° ^g | | | Ĭ | | | A |
| 10.0 | | | | | | Center Fre 867.500000 MH |
| 10.0 | | | | | | 867.500000 WH |
| 0.00 | | | | | | |
| | | | | | | Start Fre |
| 10.0 | | | | | DL1 -13.00 dBm | 30.000000 MH |
| | | | | | | |
| 20.0 | | | | | | Stop Fre |
| 30.0 | | | | | 1 | 1.705000000 GH |
| | | | | | | |
| 40.0 | | | | | | CF Ste 167.500000 MH |
| | | | | | | Auto Ma |
| 50.0 | | الافتار الوط ويعتر بقر الدينة المحاج والمحاج ومحاجر ومعاونة والمحاجة | | روحه شده داران وروار وسطوره المودور موسود ومرور والمواجد | น _{านสถ} าร์ แล _น กระวังนะสมุรรรม | |
| | | | | | | Freq Offse |
| 60.0 | | | | | | 0 H |
| 70.0 | | | | | | |
| AU.U | | | | | | Scale Typ |
| | | | | | | |
| tart 0.03 Res BW | | #\/B\M | 3.0 MHz | Swoon 2 | Stop 1.7050 GHz .233 ms (3351 pts) | Log <u>Li</u> |
| - | s changed; all traces | | 3.0 MHZ | Sweep 2 | | |

Plot 7-55. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1312)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dece 42 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Page 43 of 107 |
| © 2017 PCTEST Engineering Labor | ratory, Inc. | · | | V 6.1 12/26/2016 |



| | ectrum Analyzer - Swept SA | | | | | |
|-------------------|--|---|--|---|---|---------------------------|
| X/ RL Center F | RF 50 Ω AC | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:12:50 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| | | PNO: Fast IFGain:Low | Trig: Free Run Atten: 30 dB | | DET A NNNN | |
| | | | | MI | r1 9.419 0 GHz | Auto Tune |
| 10 dB/div Log | Ref 20.00 dBm | n | | | -43.48 dBm | |
| | | | | | | Center Freq |
| 10.0 | | | | | | 5.877500000 GHz |
| 0.00 | | | | | | |
| 0.00 | | | | | | Start Freq |
| -10.0 | | | | | DL1 -13.00 dBm | 1.755000000 GHz |
| | | | | | | |
| -20.0 | | | | | | Stop Freq |
| -30.0 | | | | | | 10.00000000 GHz |
| | | | | | | |
| -40.0 | | | | | ↓1 | CF Step 824.500000 MHz |
| | A State of the second | | and the second | يريا له المارية ويريد ومن ومالية المربية المارية المارية المارية المربوع المربوع المربوع المربوع المربوع المربوع ويريدوا المارية المربوع ومن المربوع المربوع المارية المربوع المربوع المربوع المربوع المربوع المربوع المربوع الم | | <u>Auto</u> Man |
| -50.0 | م متحد من التي المحد على والتي الله من . منظر في المحد التي التي التي التي التي التي التي التي | ظار الاستاني _{وري} بطعانية المستريرين والطاقين | | | | |
| -60.0 | | | | | | Freq Offset |
| | | | | | | 0 Hz |
| -70.0 | | | | | | Scale Type |
| | | | | | | |
| Start 1.75 | | <i>#</i> 1 (P) (| 0.0.001- | | Stop 10.000 GHz | Log <u>Lin</u> |
| #Res BW | | | 3.0 MHz | | .29 ms (16491 pts) | |
| Poin | its changed; all trace | es cleared | | STATUS | | |





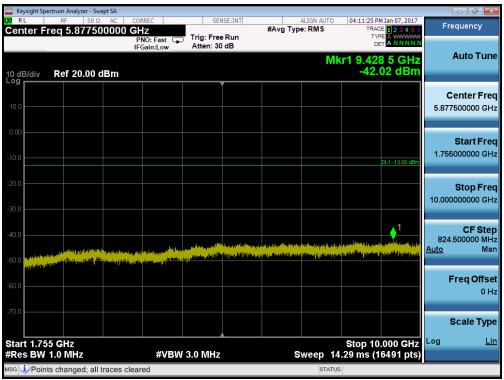
Plot 7-57. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1312)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 44 of 107 |
| 1M1701180035-02-R3.ZNF | 12/27/2016-2/16/2017 | Portable Handset | | Fage 44 01 107 |
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| | ctrum Analyzer - Swept SA | | | | | |
|-----------------------|--|----------------------------|---|--|--|--|
| Center F | RF 50 Ω AC req 870.000000 | CORREC MHZ PNO: Fast | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:11:21 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N | Frequency |
| 10 dB/div | Ref 20.00 dBm | IFGain:Low | Atten: 30 dB | M | r1 1.709 5 GHz -47.90 dBm | Auto Tune |
| 10.0 | | | Ĭ | | | Center Freq 870.000000 MHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq 30.000000 MHz |
| -20.0 | | | | | | Stop Freq 1.710000000 GHz |
| -40.0 | and the second | | an gan gan balanta ang da parta di siyakita yang tang tang ta | and principality system with the principality system with the second system of the second sys | landed a wypinangen and a sector of the sect | CF Step 168.000000 MHz <u>Auto</u> Man |
| -60.0 | | | | | | Freq Offset 0 Hz |
| -70.0 | | | | | | Scale Type |
| Start 0.03 #Res BW | 1.0 MHz | #VBW 3 | .0 MHz | Sweep 2 | Stop 1.7100 GHz .240 ms (3361 pts) | Log <u>Lin</u> |
| MSG 🌙 Point | ts changed; all traces | cleared | | STATUS | 5 | |





Plot 7-59. Conducted Spurious Plot (AWS WCDMA Mode – Ch. 1413)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
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| | ctrum Analyzer - Swept SA | | | | | |
|------------------|------------------------------|-------------|----------------|------------------------------|---|-----------------|
| Center F | RF 50 Ω AC Ceq 15.0000000 | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:11:34 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Center Pi | eq 15.000000 | PNO: Fast 😱 | Trig: Free Run | | TYPE A WWWWW | |
| | | IFGain:Low | Atten: 20 dB | | | Auto Tune |
| | | | | MKr | 1 16.972 0 GHz -41.56 dBm | Auto Funo |
| 10 dB/div Log | Ref 10.00 dBm | | | | -41.50 aBm | |
| | | | | | | Center Freq |
| 0.00 | | | | | | 15.00000000 GHz |
| | | | | | | |
| -10.0 | | | | | DL1 -13.00 dBm | |
| | | | | | | Start Freq |
| -20.0 | | | | | | 10.00000000 GHz |
| | | | | | | |
| -30.0 | | | | | | Stop Freq |
| | | | | 1 | | 20.00000000 GHz |
| -40.0 | | | | | | |
| | | | | | | CF Step |
| -50.0 | | | | | | 1.00000000 GHz |
| | | | | | | <u>Auto</u> Man |
| -60.0 | | | | | | |
| -70.0 | | | | | | Freq Offset |
| -7010 | | | | | | 0 Hz |
| -80.0 | | | | | | |
| | | | | | | Scale Type |
| | | | | | | |
| Start 10.0 | | | | | 0100 20.000 0112 | Log <u>Lin</u> |
| #Res BW | | | 3.0 MHz | Sweep 25 | .33 ms (20001 pts) | |
| мsg 🤳 Point | s changed; all traces | s cleared | | STATUS | | |





Plot 7-61. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1513)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|---------------------------------|----------------------|---|------|---------------------------------|--|
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| | ctrum Analyzer - Swept SA | | | | | |
|-----------------------|-----------------------------|---|--------------------------------|--|---|-----------------------------------|
| XI RL | RF 50 Ω A0 reg 5.8800000 | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:13:44 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Genter | eq 3.0000000 | PNO: Fast IFGain:Low | Trig: Free Run Atten: 30 dB | | TYPE A WWWWW DET A NNNNN | |
| 10 dB/div Log | Ref 20.00 dBn | n | | MI | r1 1.760 5 GHz -32.48 dBm | Auto Tune |
| 209 | | | Ĭ | | | Center Freq |
| 10.0 | | | | | | 5.880000000 GHz |
| 0.00 | | | | | | Start Freq |
| -10.0 | | | | | DL1 -13.00 dBm | 1.760000000 GHz |
| -20.0 | | | | | | Stop Freq |
| -30.0 | | | | | | 10.000000000 GHz |
| * | | | | | | CF Step |
| -40.0 | | and still provide a standard from the still being a | | n series en le faste reception de la serie de la s La serie en la serie de la s | a standard a statistica statistica statistica statistica statistica statistica statistica statistica statistica Statistica statistica statistica statistica statistica statistica statistica statistica statistica statistica st | 824.000000 MHz <u>Auto</u> Man |
| -50.0 | | | | | | Erog Offect |
| -60.0 | | | | | | Freq Offset 0 Hz |
| -70.0 | | | | | | Scale Type |
| | | | | | | |
| Start 1.76 #Res BW | | #VBW | 3.0 MHz | Sweep 14 | Stop 10.000 GHz .28 ms (16481 pts) | |
| isg 🕕 Point | ts changed; all trace | es cleared | | STATUS | 3 | |





Plot 7-63. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1513)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| | ectrum Analyzer - Swept SA | | | | | |
|------------|--|--|--------------------------------|---|---|---------------------------|
| Center E | RF 50 Ω AC req 937.500000 | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:07:54 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Genter T | 100 337.300000 | PNO: Fast | Trig: Free Run Atten: 30 dB | | DET A NNNN | |
| 10 dB/div | Ref 20.00 dBm | | | MI | r1 1.845 0 GHz -40.81 dBm | Auto Tune |
| Log | | | Ť | | | Center Freq |
| 10.0 | | | | | | 937.500000 MHz |
| | | | | | | |
| 0.00 | | | | | | Start Freq |
| -10.0 | | | | | DL1 -13.00 dBm | 30.000000 MHz |
| | | | | | DET -15.00 GBM | |
| -20.0 | | | | | | Stop Freq |
| -30.0 | | | | | | 1.845000000 GHz |
| | | | | | 1 | |
| -40.0 | | | | | | CF Step 181.500000 MHz |
| -50.0 | | | a detables on a la seta la su | الملقية فواف والانتراب الروم ومتعود والمتعود والمتعود والمتعود والمتعود والمتعود والمتعود والمتعود والمتعود وال | مىرىلىلىرى بىرى بىرى بىرى بىرى بىرى بىرى | <u>Auto</u> Man |
| | and a second | an a | | | | E 1 0 5 1 |
| -60.0 | | | | | | Freq Offset 0 Hz |
| -70.0 | | | | | | |
| -70.0 | | | | | | Scale Type |
| Start 0.03 | | | | | Stop 1.8450 GHz | Log <u>Lin</u> |
| #Res BW | | #VBW | 3.0 MHz | Sweep 2 | 2.420 ms (3631 pts) | |
| мsg 🗼 Poin | ts changed; all traces | cleared | | STATUS | 5 | |

Plot 7-64. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)



Plot 7-65. Conducted Spurious Plot (PCS WCDMA Mode - Ch. 9262)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dama 40 of 407 |
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| | ectrum Analyzer - Swept SA | | | | | |
|-----------------------|-------------------------------|-------------------------|--------------------------------|------------------------------|---|------------------------------------|
| (XIRL) | RF 50 Ω AC req 15.00000000 | | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:08:10 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 | Frequency |
| Center Pr | req 15.0000000 | PNO: Fast IFGain:Low | Trig: Free Run Atten: 20 dB | mitg type.itins | | |
| 10 dB/div Log | Ref 10.00 dBm | | | Mkr | 1 16.974 0 GHz -41.51 dBm | Auto Tune |
| 0.00 | | | | | | Center Freq 15.00000000 GHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq |
| -20.0 | | | | | | Stop Freq |
| -40.0 | | | | | | 20.00000000 GHz |
| -50.0 | | | | | | 1.000000000 GHz <u>Auto</u> Man |
| -70.0 | | | | | | Freq Offset 0 Hz |
| -80.0 | | | | | | Scale Type |
| Start 10.0 #Res BW | 1.0 MHz | | 3.0 MHz | Sweep 25 | Stop 20.000 GHz .33 ms (20001 pts) | Log <u>Lin</u> |
| мsg 🤹 Point | ts changed; all traces | cleared | | STATUS | | |





Plot 7-67. Conducted Spurious Plot (PCS WCDMA Mode - Ch. 9400)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| | ctrum Analyzer - Swept SA | | | | | |
|-----------------------|-------------------------------|------------------------------|--------------|------------------------------|---|--|
| Center Fi | RF 50 Ω AC req 5.955000000 | CORREC O GHZ PNO: Fast | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:06:10 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN | Frequency |
| 10 dB/div | Ref 20.00 dBm | IFGain:Low | Atten: 30 dB | M | r1 7.515 5 GHz -43.58 dBm | Auto Tune |
| 10.0 | | | | | | Center Freq 5.955000000 GHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq 1.910000000 GHz |
| -20.0 | | | | | | Stop Freq 10.000000000 GHz |
| -40.0 | and the second second | | | 1 | | CF Step 809.000000 MHz <u>Auto</u> Man |
| -60.0 | | | | | | Freq Offset 0 Hz |
| -70.0 | | | | | | Scale Type |
| Start 1.91 #Res BW | | #VBW | 3.0 MHz | Sweep 14 | Stop 10.000 GHz .02 ms (16181 pts) | Log <u>Lin</u> |
| usg 🔱 Point | s changed; all traces | cleared | | STATUS | | |





Plot 7-69. Conducted Spurious Plot (PCS WCDMA Mode - Ch. 9400)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| | ectrum Analyzer - Sw | | | | | | | | | | |
|-----------------------|----------------------|------------|---------------------------------|-------------------------|--------------------|---|-----------------------|---|---|-----------------------|--------------------------------|
| LXI RL | RF 50 Ω | | CORREC | SEN | ISE:INT | #Avg Ty | ALIGN AUTO | | M Jan 07, 2017 | Fred | uency |
| Center F | req 940.000 | | PNO: Fast (IFGain:Low | Trig: Free Atten: 30 | | #Avg iy | | TYF DE | CE 1 2 3 4 5 6 PE A WWWWW A N N N N N | | uto Tune |
| 10 dB/div Log | Ref 20.00 c | iBm | | | | | Mk | (r1 1.76 -48. | 4 5 GHz 29 dBm | A | |
| 10.0 | | | | | | | | | | | n ter Freq 00000 MHz |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | | tart Freq 00000 MHz |
| -20.0 | | | | | | | | | | | top Freq 00000 GHz |
| -40.0 | | | utifierd in some troff-symbolic | | وروبوا معافير بدوا | Name of the state | andlegenbergebartunes | and the standard and the s | 1 | 182.00 <u>Auto</u> | CF Step 00000 MHz Man |
| -60.0 | | | | | | | | | | Fr | e q Offset 0 Hz |
| -70.0 | | | | | | | | | | | ale Type |
| Start 0.03 #Res BW | | | #VB | W 3.0 MHz | | | Sweep 2 | | 3500 GHz 3641 pts) | Log | Lin |
| мsg 횢 Poin | ts changed; all | traces cle | eared | | | | STATUS | 5 | | | |





Plot 7-71. Conducted Spurious Plot (PCS WCDMA Mode - Ch. 9538)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| | ctrum Analyzer - Swept SA | | | | | |
|-----------------------|---------------------------|---------------------------|--------------------------------|------------------------------|--|-----------------------------|
| Center Fi | RF 50 Ω AC | 000 GHz | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 04:09:23 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW | Frequency |
| | | PNO: Fast 😱 IFGain:Low | Trig: Free Run Atten: 20 dB | | DETANNNN | A |
| 10 dB/div Log | Ref 10.00 dBm | 1 | | Mkr | 1 16.858 0 GHz -41.63 dBm | Auto Tune |
| | | | ľ | | | Center Freq |
| 0.00 | | | | | | 15.00000000 GHz |
| -10.0 | | | | | DL1 -13.00 dBm | Start Freq |
| -20.0 | | | | | | 10.000000000 GHz |
| -30.0 | | | | | | Stop Freq |
| -40.0 | | | | | | 20.000000000 GHz |
| | | | والمشمور معقفتين | | | CF Step |
| -50.0 | | | | | | 1.000000000 GHz Auto Man |
| -60.0 | | | | | | |
| -70.0 | | | | | | Freq Offset 0 Hz |
| -80.0 | | | | | | |
| | | | | | | Scale Type |
| Start 10.0 #Res BW | | #VBW | 3.0 MHz | Sweep 25 | Stop 20.000 GHz .33 ms (20001 pts) | Log <u>Lin</u> |
| | s changed; all trace | | | STATUS | | |

Plot 7-72. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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7.4 Band Edge Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(h)

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v02r02 - Section 6.0

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1% of the emission bandwidth
- 4. VBW <u>></u> 3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

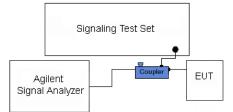


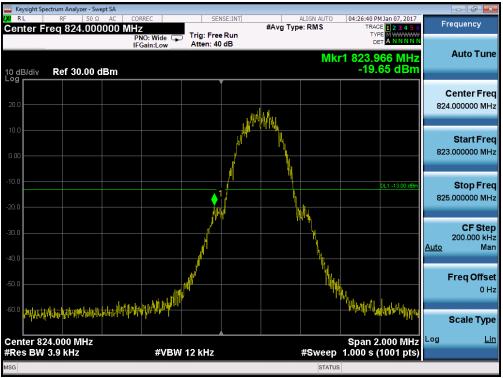
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

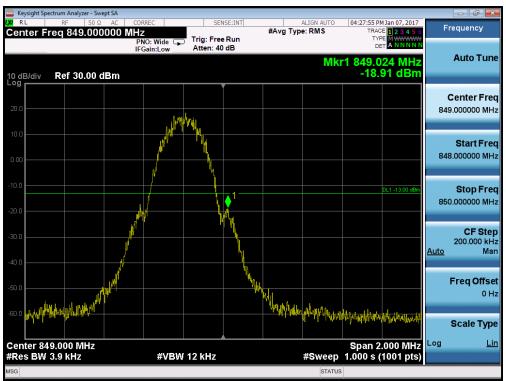
Per 22.917(b), 24.238(b), 27.53(h)(3), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. 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 emission are attenuated at least 26 dB below the transmitter power.

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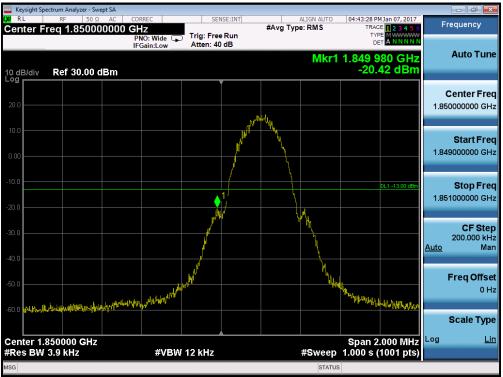
Plot 7-73. Band Edge Plot (Cellular GPRS Mode – Ch. 128)

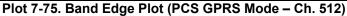


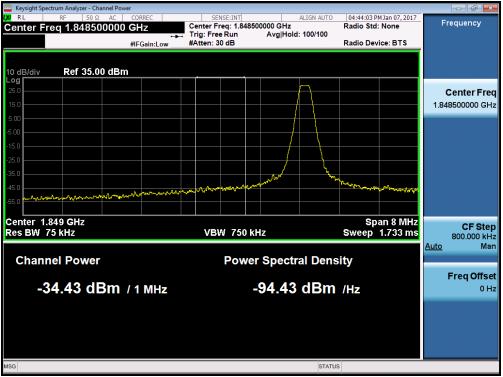
Plot 7-74. Band Edge Plot (Cellular GPRS Mode – Ch. 251)

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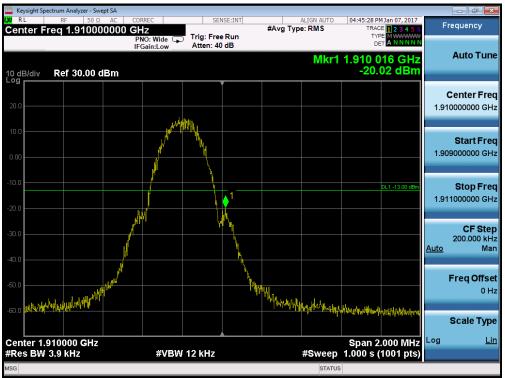


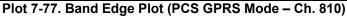


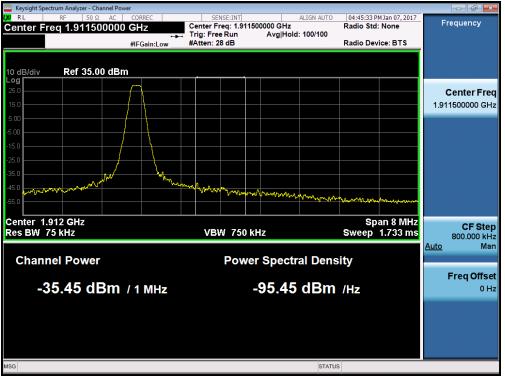
Plot 7-76. 4MHz Span Plot (PCS GPRS Mode – Ch. 512)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--------------------------------|----------------------|---|------|---------------------------------|
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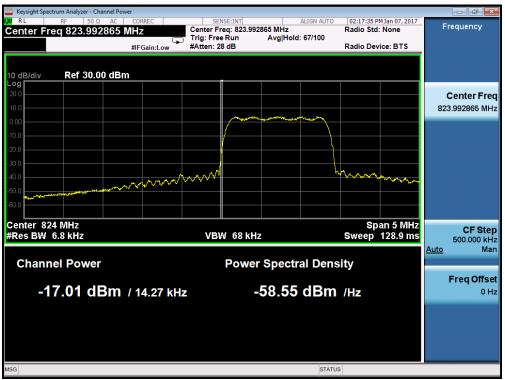


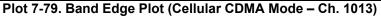


Plot 7-78. 4MHz Span Plot (PCS GPRS Mode – Ch. 810)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Daga EC of 107 |
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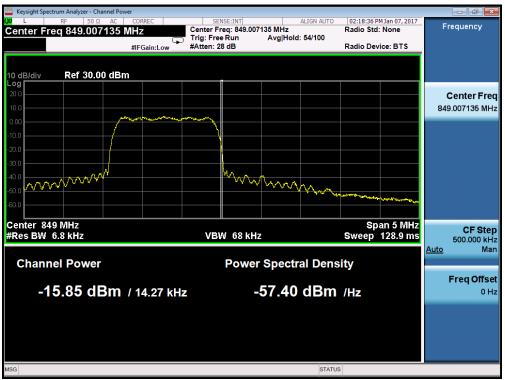




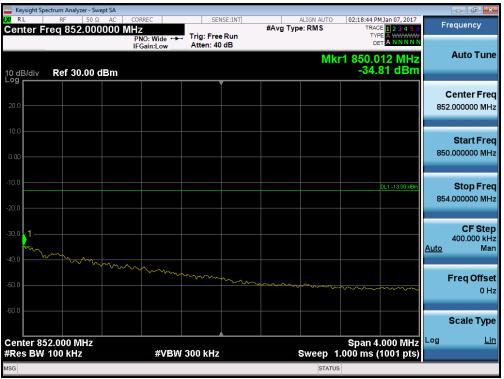
Plot 7-80. 4MHz Span Plot (Cellular CDMA Mode – Ch. 1013)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
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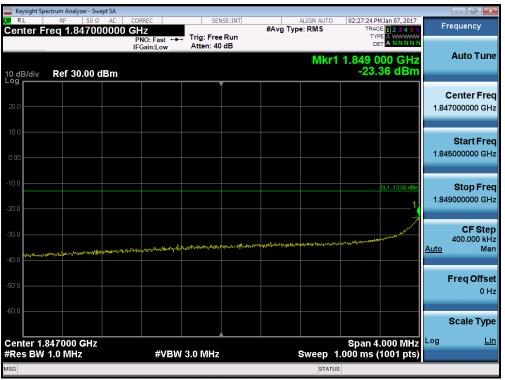
Plot 7-82. 4MHz Span Plot (Cellular CDMA Mode – Ch. 777)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
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| 🔤 Keysight Spectrur | | wept SA | | | | | | | | | |
|----------------------------|--------------|---------|--------------------------------|-----------|----------------------|----------|--|--------------------|--|-------------|--------------------------------------|
| | | Ω AC | CORREC | | SENSE:INT | | ALIGN AUTO | | PM Jan 07, 2017 | F | requency |
| Center Frec | 1.8500 | 00000 |) GHZ PNO: Wid IFGain:Lo | | Free Run n: 40 dB | #Avg Ty | pe: RMS | T) [| CE 1 2 3 4 5 6 (PE A WWWWW DET A NNNNN | | Auto Tune |
| 10 dB/div R | ef 30.00 | dBm | | | | | Mkr | 1 1.849 | 915 GHz .20 dBm | | Auto Tune |
| 20.0 | | | | | | | | | | | Center Freq 0000000 GHz |
| 0.00 | | | | | | | And the second s | m | | 1.84 | Start Freq 7500000 GHz |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | 1.85 | Stop Freq 2500000 GHz |
| -30.0 | | | | | | V | | | Mm | <u>Auto</u> | CF Step 500.000 kHz Man |
| -50.0 | ᢧᢝᢩᡅ᠇ᠬᢛᠬ᠋ᡎᡐᠰ | | - | ~~~~ | | | | | | | Freq Offset 0 Hz |
| -60.0 | | | | | | | | | | | Scale Type |
| Center 1.850 #Res BW 15 | | Z | # | VBW 47 kH | Iz | | Sweep | Span : 27.33 ms | 5.000 MHz (1001 pts) | Log | <u>Lin</u> |
| MSG | | | | | | | STAT | JS | | | |

Plot 7-83. Band Edge Plot (PCS CDMA Mode – Ch. 25)



Plot 7-84. 4MHz Span Plot (PCS CDMA Mode - Ch. 25)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
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| 🤐 Keysight Spectrum A | Analyzer - Sw | ept SA | | | | | | | | | |
|-------------------------------|---------------|--------|-----------------------------------|-------------------------|----------------|----------|------------|---------------------|---|-------------|-----------------------------------|
| LXI RL RF | 50 Ω | | CORREC | SEN | SE:INT | #Avg Typ | ALIGN AUTO | | M Jan 07, 2017 DE 1 2 3 4 5 6 | F | equency |
| Center Freq ² | 1.91000 | 00000 | ⊐FIZ PNO: Wide G IFGain:Low | Trig: Free Atten: 40 | | #Avg Typ | e. Rivis | TY D | PE A WWWWW ET A N N N N N | | |
| 10 dB/div Ref | 30.00 c | iBm | | | | | Mkr | 1 1.910 (-39. | 060 GHz 15 dBm | | Auto Tune |
| 20.0 | | | | | | | | | | | Center Freq 0000000 GHz |
| 0.00 | \bigwedge | | | | | | | | | 1.90 | Start Freq 7500000 GHz |
| -10.0 | | | | | | | | | DL1 -13.00 dBm | 1.91 | Stop Freq 2500000 GHz |
| -30.0 | | | | Mark Mark | ↓ ¹ | | | | | <u>Auto</u> | CF Step 500.000 kHz Man |
| -50.0 | | | | M | × W W | www. | M. Martham | and Channel Marcard | hormany | | Freq Offset 0 Hz |
| -60.0 | | | | | | | | | | | Scale Type |
| Center 1.9100 #Res BW 15 k | | | #VBN | N 47 kHz | | | Sweep | Span 5 27.33 ms | .000 MHz (1001 pts) | Log | Lin |
| MSG | | | | | | | STATU | JS | | | |



Plot 7-85. Band Edge Plot (PCS CDMA Mode - Ch. 1175)

Plot 7-86. 4MHz Span Plot (PCS CDMA Mode - Ch. 1175)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
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| | ectrum Analyzer - S | wept SA | | | | | | | | | |
|----------------------|-----------------------|---|--------------------------|-------------------------|---------|----------|---------------|--------------------|--|-------------|---------------------------------------|
| LXI RL | RF 50 9 req 824.00 | | ORREC | SEN | ISE:INT | #Avg Typ | ALIGN AUTO | | M Jan 07, 2017 CE 1 2 3 4 5 6 | F | requency |
| Center F | req 824.00 | | PNO: Fast G FGain:Low | Trig: Free Atten: 36 | | | | TY D | | | |
| 10 dB/div Log | Ref 25.00 | dBm | | | | | Mk | r1 824.0 -20. | 000 MHz 15 dBm | | Auto Tune |
| 15.0 | | | | | | 1 | line can be a | | | | Center Freq 4.000000 MHz |
| -5.00 | | | | | | | | | | 810 | Start Freq 5.500000 MHz |
| -15.0 | | | | | 1 | | | | DL1 -13.00 dBm | 83 | Stop Freq 1.500000 MHz |
| -35.0 | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | mann | m | | | | hr | Mathing and a start of the star | <u>Auto</u> | CF Step 1.500000 MHz Man |
| -45.0 | | | | | | | | | | | Freq Offset 0 Hz |
| -65.0 | | | | | | | | | | | Scale Type |
| Center 82 #Res BW | 4.000 MHz 100 kHz | | #VBV | V 300 kHz | | | Sweep ′ | Span ′ 1.867 ms | 15.00 MHz (1001 pts) | Log | Lin |
| MSG | | | | | | | STATU | s | | | |

Plot 7-87. Band Edge Plot (Cellular WCDMA Mode - Ch. 4132)



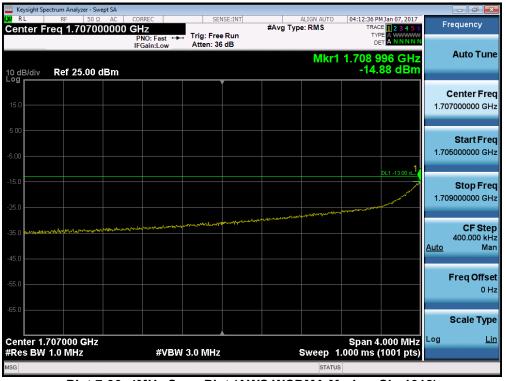
Plot 7-88. Band Edge Plot (Cellular WCDMA Mode - Ch. 4233)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--------------------------------|----------------------|---|------|---------------------------------|
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| | Analyzer - Swept SA | | | | | |
|------------------------------|--------------------------|---|-----------|----------------|---|--|
| Center Freq | F 50 Ω AC 1.710000000 | CORREC CORREC OGHZ PNO: Fast IFGain:Low | SENSE:INT | #Avg Type: RMS | 04:12:28 PM Jan 07, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N | Frequency |
| 10 dB/div Re | ef 25.00 dBm | | | Mkr1 | 1.710 000 GHz -20.72 dBm | Auto Tune |
| 15.0 | | | | mmmmmm | | Center Freq 1.710000000 GHz |
| -5.00 | | | | | | Start Freq 1.702500000 GHz |
| -15.0 | | | 1 | | DL1 -13.00 dBm | Stop Fred 1.717500000 GHz |
| -35.0 | | warwown | | | Ma forman | CF Step 1.500000 MHz <u>Auto</u> Man |
| 55.0 | | | | | | Freq Offset 0 Hz |
| -65.0 | | | | | | Scale Type |
| Center 1.7100 #Res BW 100 | | #VBW | 300 kHz | Sweep 1 | Span 15.00 MHz I.867 ms (1001 pts) | Log <u>Lin</u> |
| ISG | | | | STATU | S | |

Plot 7-89. Band Edge Plot (AWS WCDMA Mode - Ch. 1312)



Plot 7-90. 4MHz Span Plot (AWS WCDMA Mode - Ch. 1312)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
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| | ectrum Analyzer - Sw | | | | | | | | | | |
|----------------------|--|-------|-------------------------|-----------------------|-----------------------|--------|----------------|---------|---|-----------------|----------------------------|
| Center 5 | RF 50 Ω req 1.75500 | | | SI | ENSE:INT | #Avg T | ALIGN AUTO | | M Jan 07, 2017 DE 1 2 3 4 5 6 | Freque | ncy |
| Center 1 | req 1.75500 | ,0000 | PNO: Fast IFGain:Lov | Trig: Fro Atten: 3 | | | | TY D | | Aut | o Tune |
| 10 dB/div Log | Ref 25.00 (| dBm | | | | | MKr | -24. |)60 GHz 17 dBm | Aut | orune |
| 15.0 | | | | | ľ | | | | | Cent | er Freq |
| 5.00 | | m | v-w-w- | m | | | | | | 1.755000 | JUU GH2 |
| | | | | | | | | | | Sta 1.747500 | n rt Freq |
| -5.00 | | | | | | | | | DL1 -13.00 dBm | 1.141000 | |
| -15.0 | | | | | ♦ ¹ | | | | | Sto 1.762500 | o p Freq 000 GHz |
| | ~~~~ | | | | h | M. | | | | c | F Step |
| -35.0 | and the second sec | | | | | | and the second | | | | 000 MHz Man |
| -45.0 | | | | | | | | | the way was a start way was a start was | Fred | Offset |
| -55.0 | | | | | | | | | | | 0 Hz |
| -65.0 | | | | | | | | | | Sca | іе Туре |
| Center 1. #Res BW | 755000 GHz | | | /BW 300 kH; | | | Curoon | Span 1 | 5.00 MHz | Log | Lin |
| #Res BW | TUU KHZ | | #\ | 15W 300 KH | | | Sweep | | (1001 pts) | | |



Plot 7-91. Band Edge Plot (AWS WCDMA Mode – Ch. 1513)

Plot 7-92. 4MHz Span Plot (AWS WCDMA Mode – Ch. 1513)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | |
|---------------------------------|----------------------|---|---------|---------------------------------|--|--|--|
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| 🔤 Keysight Sp | ectrum Analyzer - Swe | ept SA | | | | | | | | [| - 🗗 🗙 |
|----------------------|--|---------------------------------------|---------------------------|-------------------------|--------|----------|------------|--------------------|--|-------------------|------------------------------|
| KI RL | RF 50 Ω | | RREC | SEI | SE:INT | | ALIGN AUTO | | M Jan 07, 2017 | Fre | quency |
| Center F | req 1.85000 | F | Z NO: Fast Gain:Low | Trig: Free Atten: 36 | | #Avg Typ | | TY D | DE 1 2 3 4 5 6 PE A WWWWW ET A NNNNN | | |
| 10 dB/div | Ref 25.00 d | IBm | | | | | Mkr1 | 1.850 (-20. | 000 GHz 43 dBm | | Auto Tune |
| 15.0 | | | | | | A | | | | | enter Fred 000000 GH: |
| 5.00 | | | | | | | | | | | Start Free 500000 GH |
| 25.0 | | | | ^ | 1 | | | | DL1 -13.00 dBm | 1.857 | Stop Fre 500000 GH |
| 45.0 | | | have | M | | | | M | www. | 1. <u>Auto</u> | CF Stej 500000 MH Ma |
| 55.0 | and providence of the second s | | | | | | | | | F | r eq Offs e 0 H |
| 65.0 | | | | | | | | | | ş | Scale Typ |
| Center 1.3 Res BW | 850000 GHz 100 kHz | · · · · · · · · · · · · · · · · · · · | #VB | W 300 kHz | | | Sweep ′ | Span 1 1.867 ms | 5.00 MHz (1001 pts) | Log | <u>Lii</u> |
| SG | | | | | | | STATU | IS | | | |

Plot 7-93. Band Edge Plot (PCS WCDMA Mode - Ch. 9262)

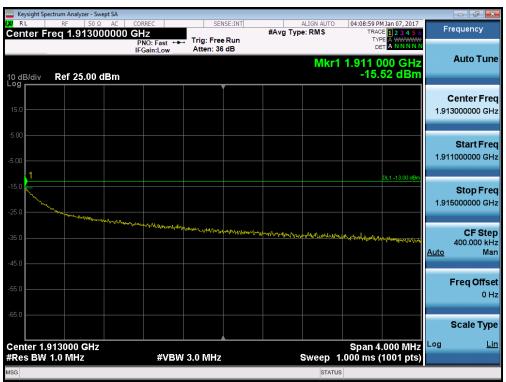


Plot 7-94. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9262)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | |
|---------------------------------|--|---|------|---------------------------------|--|--|--|
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| | ctrum Analyzer - Swept SA | | | | | | | |
|-----------------------|------------------------------|------------|----------------|---|------------|----------------------|--|--|
| Center Fi | RF 50 Ω AC req 1.91000000 | PNO: Fast | Trig: Free Run | | ALIGN AUTO | TRAC | MJan 07, 2017 CE 1 2 3 4 5 6 DE A WWWWW A N N N N N | Frequency |
| 10 dB/div Log | Ref 25.00 dBm | IFGain:Low | Atten: 36 dB | | Mkr | 1 1.910 0 | | Auto Tune |
| 15.0 | 0 | mananan | | | | | | Center Freq 1.910000000 GHz |
| -5.00 | | | | | | | | Start Freq 1.902500000 GHz |
| -15.0 | | | | | | | DL1 -13.00 dBm | Stop Freq 1.917500000 GHz |
| -35.0 | | | γ | And a | hm | | | CF Step 1.500000 MHz <u>Auto</u> Man |
| -45.0 | | | | | | | 2mm Manne | Freq Offset 0 Hz |
| -65.0 | | | | | | | | Scale Type |
| Center 1.9 #Res BW | 10000 GHz 100 kHz | #VBV | N 300 kHz | | Sweep | Span 1 1.867 ms (| 0.00 10112 | Log <u>Lin</u> |



Plot 7-95. Band Edge Plot (PCS WCDMA Mode – Ch. 9538)

Plot 7-96. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9538)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | | |
|---------------------------------|--|---|------|---------------------------------|--|--|--|
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7.5 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Test Procedure Used

KDB 971168 D01 v02r02 - Section 5.7.1

Test Settings

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- 3. Measurement BW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

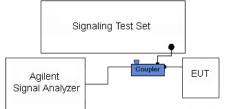


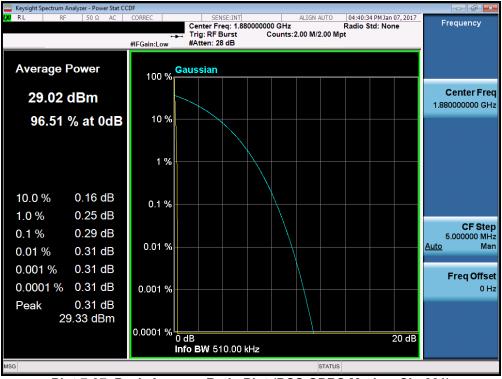
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

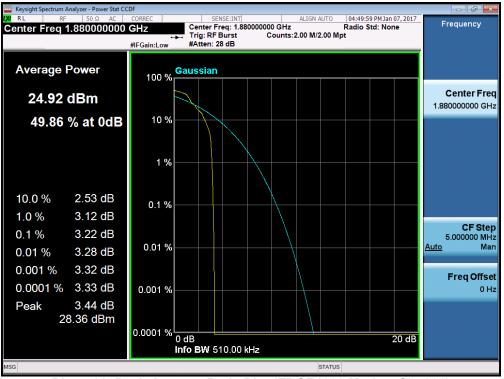
None

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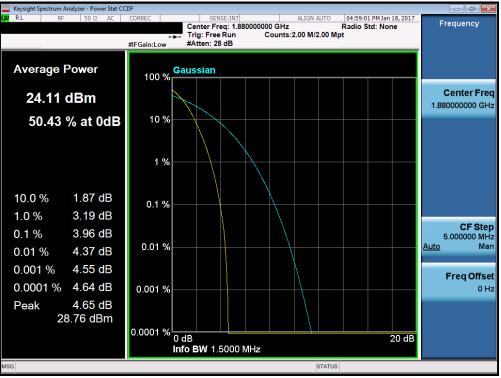




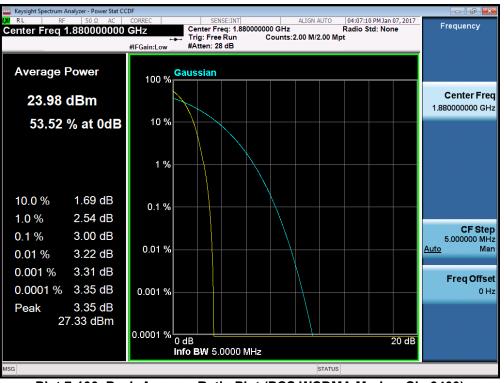
Plot 7-98. Peak-Average Ratio Plot (EDGE1900 Mode - Ch. 661)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕑 LG | Approved by: Quality Manager |
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Plot 7-100. Peak-Average Ratio Plot (PCS WCDMA Mode – Ch. 9400)

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7.6 Radiated Power (ERP/EIRP) §22.913(a)(2) 24.232(c) 27.50(d.4)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 - Section 5.2.1

ANSI/TIA-603-D-2010 - Section 2.2.17

Test Settings

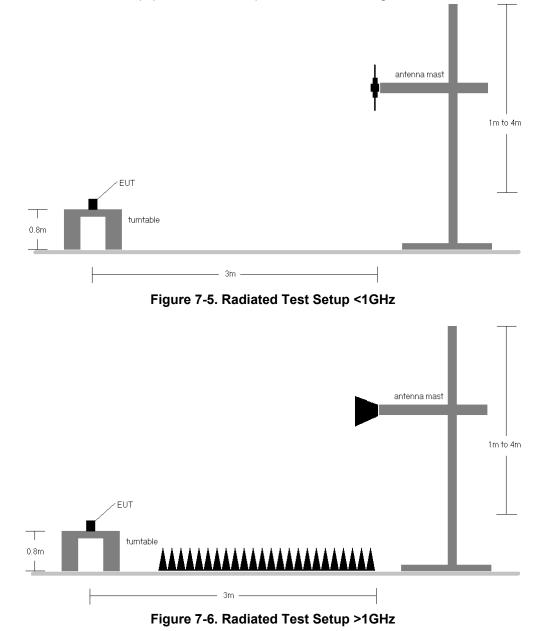
- Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \ge 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points \geq 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

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Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



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- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- This device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

| Frequency [MHz] | Mode | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Substitute Level [dBm] | Ant. Gain [dBd] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|--------------------|---------------|-----------------------|---------------------------|----------------------------------|------------------------------|-----------------------|--------------|----------------|-----------------------|----------------|
| 824.20 | GPRS850 | V | 132 | 254 | 21.38 | 5.36 | 26.74 | 0.472 | 38.45 | -11.71 |
| 836.60 | GPRS850 | V | 150 | 285 | 21.73 | 5.15 | 26.88 | 0.487 | 38.45 | -11.57 |
| 848.80 | GPRS850 | V | 141 | 297 | 21.90 | 5.16 | 27.06 | 0.509 | 38.45 | -11.39 |
| 848.80 | GPRS850 | Н | 209 | 307 | 20.30 | 5.13 | 25.43 | 0.349 | 38.45 | -13.02 |
| 848.80 | EDGE850 | V | 141 | 297 | 18.30 | 5.16 | 23.46 | 0.222 | 38.45 | -14.99 |
| 848.80 | GPRS850 (WCP) | Н | 355 | 33 | 19.81 | 5.13 | 24.94 | 0.312 | 38.45 | -13.51 |

Table 7-2. ERP (Cellular GPRS)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
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| Frequency [MHz] | Mode | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Substitute Level [dBm] | Ant. Gain [dBd] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|--------------------|---------------|-----------------------|---------------------------|----------------------------------|------------------------------|-----------------------|--------------|----------------|-----------------------|----------------|
| 824.70 | CDMA850 | V | 132 | 241 | 12.40 | 5.36 | 17.76 | 0.060 | 38.45 | -20.69 |
| 836.52 | CDMA850 | V | 123 | 59 | 11.23 | 5.15 | 16.38 | 0.043 | 38.45 | -22.07 |
| 848.31 | CDMA850 | V | 110 | 230 | 10.16 | 5.16 | 15.32 | 0.034 | 38.45 | -23.13 |
| 824.70 | CDMA850 | н | 110 | 163 | 10.86 | 5.51 | 16.37 | 0.043 | 38.45 | -22.08 |
| 824.70 | CDMA850 (WCP) | н | 388 | 345 | 8.95 | 5.51 | 14.46 | 0.028 | 38.45 | -23.99 |

Table 7-3. ERP (Cellular CDMA)

| Frequency [MHz] | Mode | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Substitute Level [dBm] | Ant. Gain [dBd] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|--------------------|----------------|-----------------------|---------------------------|----------------------------------|------------------------------|-----------------------|--------------|----------------|-----------------------|----------------|
| 826.40 | WCDMA850 | ~ | 127 | 109 | 13.76 | 5.34 | 19.10 | 0.081 | 38.45 | -19.35 |
| 836.60 | WCDMA850 | V | 152 | 90 | 12.90 | 5.15 | 18.05 | 0.064 | 38.45 | -20.40 |
| 846.60 | WCDMA850 | V | 151 | 72 | 12.11 | 5.13 | 17.24 | 0.053 | 38.45 | -21.21 |
| 826.40 | WCDMA850 | н | 219 | 356 | 11.99 | 5.51 | 17.50 | 0.056 | 38.45 | -20.95 |
| 826.40 | WCDMA850 (WCP) | Н | 199 | 352 | 11.86 | 5.51 | 17.37 | 0.055 | 38.45 | -21.08 |

Table 7-4. ERP (Cellular WCDMA)

| Frequency [MHz] | lviode | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|--------------------|-----------------|-----------------------|---------------------------|----------------------------------|------------------------------|-----------------------|---------------|-----------------|------------------------|----------------|
| 1712.40 | WCDMA1700 | Н | 112 | 297 | 12.25 | 9.61 | 21.86 | 0.153 | 30.00 | -8.14 |
| 1732.60 | WCDMA1700 | Н | 108 | 306 | 12.94 | 9.50 | 22.44 | 0.175 | 30.00 | -7.56 |
| 1752.60 | WCDMA1700 | Н | 114 | 310 | 12.44 | 9.39 | 21.83 | 0.152 | 30.00 | -8.17 |
| 1732.60 | WCDMA1700 | V | 124 | 316 | 12.30 | 9.32 | 21.62 | 0.145 | 30.00 | -8.38 |
| 1732.60 | WCDMA1700 (WCP) | Н | 109 | 289 | 12.43 | 9.50 | 21.93 | 0.156 | 30.00 | -8.07 |

Table 7-5. EIRP (AWS WCDMA)

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| Frequency [MHz] | Mode | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|--------------------|----------------|-----------------------|---------------------------|----------------------------------|------------------------------|-----------------------|---------------|-----------------|------------------------|----------------|
| 1850.20 | GPRS1900 | Н | 100 | 132 | 19.12 | 9.12 | 28.24 | 0.667 | 33.01 | -4.77 |
| 1880.00 | GPRS1900 | Н | 140 | 142 | 19.48 | 9.10 | 28.58 | 0.721 | 33.01 | -4.43 |
| 1909.80 | GPRS1900 | Н | 100 | 143 | 19.41 | 9.16 | 28.57 | 0.719 | 33.01 | -4.44 |
| 1880.00 | GPRS1900 | V | 129 | 275 | 18.78 | 8.99 | 27.77 | 0.598 | 33.01 | -5.24 |
| 1880.00 | EDGE1900 | н | 140 | 142 | 12.02 | 9.10 | 21.12 | 0.129 | 33.01 | -11.89 |
| 1880.00 | GPRS1900 (WCP) | Н | 152 | 328 | 18.42 | 9.10 | 27.52 | 0.565 | 33.01 | -5.49 |

Table 7-6. EIRP (PCS GPRS)

| Frequency [MHz] | Mode | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|--------------------|----------------|-----------------------|---------------------------|----------------------------------|------------------------------|-----------------------|---------------|-----------------|------------------------|----------------|
| 1851.25 | CDMA1900 | V | 123 | 364 | 11.87 | 8.97 | 20.84 | 0.121 | 33.01 | -12.17 |
| 1880.00 | CDMA1900 | V | 116 | 368 | 11.82 | 8.99 | 20.81 | 0.120 | 33.01 | -12.20 |
| 1908.75 | CDMA1900 | V | 100 | 337 | 10.54 | 8.98 | 19.52 | 0.090 | 33.01 | -13.49 |
| 1851.25 | CDMA1900 | Н | 100 | 335 | 11.49 | 9.12 | 20.61 | 0.115 | 33.01 | -12.40 |
| 1851.25 | CDMA1900 (WCP) | Н | 100 | 331 | 11.37 | 9.12 | 20.49 | 0.112 | 33.01 | -12.52 |

Table 7-7. EIRP (PCS CDMA)

| Frequency [MHz] | Mode | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|--------------------|-----------------|-----------------------|---------------------------|----------------------------------|------------------------------|-----------------------|---------------|-----------------|------------------------|----------------|
| 1852.40 | WCDMA1900 | V | 100 | 126 | 13.85 | 8.97 | 22.82 | 0.191 | 33.01 | -10.19 |
| 1880.00 | WCDMA1900 | V | 100 | 127 | 14.10 | 8.99 | 23.09 | 0.204 | 33.01 | -9.92 |
| 1907.60 | WCDMA1900 | V | 100 | 131 | 14.03 | 8.99 | 23.02 | 0.200 | 33.01 | -9.99 |
| 1880.00 | WCDMA1900 | Н | 113 | 341 | 12.46 | 9.10 | 21.56 | 0.143 | 33.01 | -11.45 |
| 1880.00 | WCDMA1900 (WCP) | Н | 100 | 129 | 12.28 | 9.10 | 21.38 | 0.137 | 33.01 | -11.63 |

Table 7-8. EIRP (PCS WCDMA)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA OB LG | Approved by: Quality Manager | | |
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7.7 Radiated Spurious Emissions Measurements §2.1053 §22.917(a) 24.238(a) 27.53(h)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 - Section 5.8

ANSI/TIA-603-D-2010 - Section 2.2.12

Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW \geq 3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points \geq 2 x span / RBW
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

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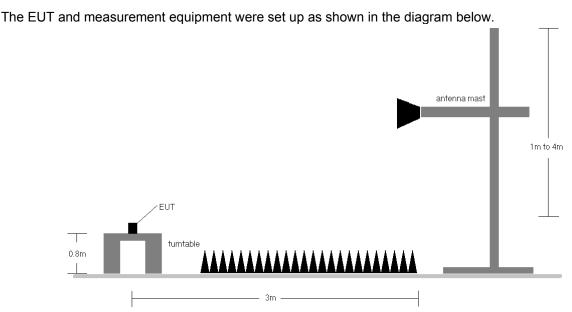


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- This device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 6) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 7) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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| OPERATING FREQUENCY: | 824 | MHz | | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 12 | | | |
| MEASURED OUTPUT POWER: | 26.74 | dBm = | 0.472 | W |
| MODULATION SIGNAL: | GPRS (GMSK) | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 39.74 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1648.40 | V | 110 | 98 | -55.50 | 6.73 | -48.77 | 75.5 |
| 2472.60 | V | 127 | 72 | -51.34 | 7.50 | -43.84 | 70.6 |
| 3296.80 | V | 114 | 180 | -63.30 | 7.49 | -55.81 | 82.5 |
| 4121.00 | V | 120 | 154 | -65.18 | 8.04 | -57.14 | 83.9 |
| 4945.20 | V | 100 | 178 | -64.24 | 8.66 | -55.58 | 82.3 |
| 5769.40 | V | - | - | -63.12 | 9.28 | -53.84 | 80.6 |
| 6593.60 | V | - | - | -60.13 | 9.84 | -50.29 | 77.0 |
| 7417.80 | V | 120 | 198 | -53.44 | 8.80 | -44.64 | 71.4 |
| 8242.00 | V | 103 | 166 | -49.21 | 9.05 | -40.17 | 66.9 |

Table 7-9. Radiated Spurious Data (Cellular GPRS Mode – Ch. 128)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 836 | 6.60 | MHz | |
|------------------------|---------------------------------|--------|---------|--|
| CHANNEL: | 19 | 90 | • | |
| MEASURED OUTPUT POWER: | 26.88 | dBm = | 0.487 W | |
| MODULATION SIGNAL: | GPRS (GMSK) | • | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 39.88 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1673.20 | V | 100 | 93 | -52.88 | 6.77 | -46.11 | 73.0 |
| 2509.80 | V | 100 | 8 | -50.29 | 7.65 | -42.64 | 69.5 |
| 3346.40 | V | 123 | 217 | -60.57 | 7.53 | -53.04 | 79.9 |
| 4183.00 | V | 100 | 183 | -62.23 | 8.23 | -54.00 | 80.9 |
| 5019.60 | V | 100 | 191 | -64.86 | 8.72 | -56.14 | 83.0 |
| 5856.20 | V | - | - | -65.38 | 9.36 | -56.02 | 82.9 |
| 6692.80 | V | 100 | 138 | -57.39 | 9.60 | -47.79 | 74.7 |
| 7529.40 | V | 115 | 197 | -52.54 | 8.98 | -43.55 | 70.4 |
| 8366.00 | V | 117 | 161 | -52.20 | 9.00 | -43.20 | 70.1 |

Table 7-10. Radiated Spurious Data (Cellular GPRS Mode – Ch. 190)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 848 | 3.80 | MHz | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 25 | 51 | - | |
| MEASURED OUTPUT POWER: | 27.06 | dBm = | 0.509 | W |
| MODULATION SIGNAL: | GPRS (GMSK) | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 40.06 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1697.60 | V | 100 | 95 | -50.58 | 6.80 | -43.78 | 70.8 |
| 2546.40 | V | 100 | 351 | -51.56 | 7.61 | -43.94 | 71.0 |
| 3395.20 | V | 100 | 8 | -58.44 | 7.56 | -50.88 | 77.9 |
| 4244.00 | V | 100 | 273 | -60.06 | 8.41 | -51.65 | 78.7 |
| 5092.80 | V | - | - | -65.57 | 8.66 | -56.92 | 84.0 |
| 5941.60 | V | - | - | -64.94 | 9.31 | -55.64 | 82.7 |
| 6790.40 | V | 113 | 131 | -53.90 | 9.45 | -44.45 | 71.5 |
| 7639.20 | V | 100 | 151 | -54.14 | 9.17 | -44.97 | 72.0 |
| 8488.00 | V | - | - | -56.88 | 8.94 | -47.94 | 75.0 |

Table 7-11. Radiated Spurious Data (Cellular GPRS Mode – Ch. 251)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 848 | 3.80 | MHz | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 2 | 51 | - | |
| MEASURED OUTPUT POWER: | 24.94 | dBm = | 0.312 | Ν |
| MODULATION SIGNAL: | GPRS (GMSK) | • | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 37.94 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1697.60 | V | 176 | 42 | -55.65 | 6.80 | -48.85 | 73.8 |
| 2546.40 | V | 100 | 122 | -49.69 | 7.61 | -42.07 | 67.0 |
| 3395.20 | V | 100 | 275 | -59.91 | 7.56 | -52.35 | 77.3 |
| 4244.00 | V | 100 | 93 | -62.16 | 8.41 | -53.75 | 78.7 |
| 5092.80 | V | - | - | -65.86 | 8.66 | -57.21 | 82.1 |
| 5941.60 | V | - | - | -54.57 | 9.31 | -45.27 | 70.2 |
| 6790.40 | V | 100 | 49 | -51.95 | 9.45 | -42.50 | 67.4 |
| 7639.20 | V | 100 | 47 | -53.26 | 9.17 | -44.09 | 69.0 |
| 8488.00 | V | - | - | -56.98 | 8.94 | -48.04 | 73.0 |

Table 7-12. Radiated Spurious Data with WCP (Cellular GPRS Mode - Ch.251)

| OPERATING FREQUENCY: | 824 | .70 | MHz | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 10 | 13 | | |
| MEASURED OUTPUT POWER: | 17.76 | dBm = | 0.060 | W |
| MODULATION SIGNAL: | CDMA | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 30.76 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1649.40 | V | 100 | 113 | -64.27 | 6.28 | -57.99 | 75.8 |
| 2474.10 | V | 100 | 118 | -64.76 | 6.89 | -57.87 | 75.6 |
| 3298.80 | V | - | - | -67.64 | 7.09 | -60.55 | 78.3 |
| 4123.50 | V | - | - | -67.40 | 7.73 | -59.67 | 77.4 |

Table 7-13. Radiated Spurious Data (Cellular CDMA Mode – Ch. 1013)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 836 | 6.52 | MHz | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 38 | 34 | • | |
| MEASURED OUTPUT POWER: | 16.38 | dBm = | 0.043 | N |
| MODULATION SIGNAL: | CDMA | - | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 29.38 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1673.04 | V | 141 | 247 | -64.19 | 6.21 | -57.98 | 74.4 |
| 2509.56 | V | - | - | -64.49 | 6.90 | -57.59 | 74.0 |
| 3346.08 | V | - | - | -67.87 | 7.26 | -60.61 | 77.0 |

Table 7-14. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

| OPERATING FREQUENCY: | 848 | 3.31 | MHz | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 77 | 77 | - | |
| MEASURED OUTPUT POWER: | 15.32 | dBm = | 0.034 | W |
| MODULATION SIGNAL: | CDMA | _ | | _ |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 28.32 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1696.62 | V | 129 | 250 | -62.23 | 6.14 | -56.08 | 71.4 |
| 2544.93 | V | 100 | 233 | -63.50 | 7.02 | -56.48 | 71.8 |
| 3393.24 | V | - | - | -68.13 | 7.43 | -60.70 | 76.0 |
| 4241.55 | V | - | - | -68.40 | 8.40 | -60.00 | 75.3 |

Table 7-15. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 824 | MHz | |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 10 | • | |
| MEASURED OUTPUT POWER: | 14.46 | dBm = | 0.028 W |
| MODULATION SIGNAL: | CDMA | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 27.46 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Height | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|--------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1649.40 | Н | 100 | 161 | -70.43 | 6.30 | -64.13 | 78.6 |
| 2474.10 | Н | - | - | -70.87 | 6.85 | -64.02 | 78.5 |
| 3298.80 | Н | - | - | -67.62 | 7.12 | -60.50 | 75.0 |

Table 7-16. Radiated Spurious Data with WCP (Cellular CDMA Mode – Ch. 1013)

| OPERATING FREQUENCY: | 826 | .40 | MHz |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 41 | | |
| MEASURED OUTPUT POWER: | 19.10 | dBm = | 0.081 W |
| MODULATION SIGNAL: | WCDMA | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 32.10 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1652.80 | V | 100 | 131 | -61.76 | 6.27 | -55.49 | 74.6 |
| 2479.20 | V | 100 | 328 | -59.49 | 6.88 | -52.61 | 71.7 |
| 3305.60 | V | - | - | -61.52 | 7.11 | -54.40 | 73.5 |
| 4132.00 | V | - | - | -65.00 | 7.78 | -57.22 | 76.3 |

Table 7-17. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 836 | MHz | | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 41 | • | | |
| MEASURED OUTPUT POWER: | 18.05 | dBm = | 0.064 | W |
| MODULATION SIGNAL: | WCDMA | - | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 31.05 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1673.20 | V | 100 | 121 | -60.30 | 6.21 | -54.09 | 72.1 |
| 2509.80 | V | 100 | 173 | -57.02 | 6.90 | -50.12 | 68.2 |
| 3346.40 | V | - | - | -62.41 | 7.26 | -55.14 | 73.2 |
| 4183.00 | V | - | - | -65.43 | 8.11 | -57.32 | 75.4 |

Table 7-18. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

| OPERATING FREQUENCY: | 846 | 6.60 | MHz |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 42 | - | |
| MEASURED OUTPUT POWER: | 17.24 | dBm = | 0.053 W |
| MODULATION SIGNAL: | WCDMA | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 30.24 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1693.20 | V | 137 | 100 | -58.03 | 6.15 | -51.88 | 69.1 |
| 2539.80 | V | 100 | 195 | -58.89 | 7.00 | -51.88 | 69.1 |
| 3386.40 | V | - | - | -62.41 | 7.40 | -55.01 | 72.2 |
| 4233.00 | V | - | - | -65.85 | 8.37 | -57.48 | 74.7 |

Table 7-19. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 826 | MHz | | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 41 | • | | |
| MEASURED OUTPUT POWER: | 17.37 | dBm = | 0.055 | N |
| MODULATION SIGNAL: | WCDMA | - | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 30.37 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBd] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 1652.80 | Н | 100 | 281 | -64.77 | 6.28 | -58.48 | 75.9 |
| 2479.20 | Н | 100 | 35 | -63.67 | 6.84 | -56.83 | 74.2 |
| 3305.60 | Н | - | - | -62.72 | 7.14 | -55.58 | 72.9 |
| 4132.00 | Н | - | - | -64.91 | 7.74 | -57.17 | 74.5 |

Table 7-20. Radiated Spurious Data with WCP (Cellular WCDMA Mode – Ch. 4132)

| OPERATING FREQUENCY: | 171 | MHz | |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 13 | 12 | |
| MEASURED OUTPUT POWER: | 21.86 | dBm = | 0.153 W |
| MODULATION SIGNAL: | WCDMA | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 34.86 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3424.80 | Н | - | - | -63.88 | 9.65 | -54.23 | 76.1 |
| 5137.20 | Н | 100 | 157 | -59.84 | 10.91 | -48.93 | 70.8 |
| 6849.60 | Н | - | - | -58.23 | 10.78 | -47.45 | 69.3 |

Table 7-21. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1312)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | |
|--|----------------------|---|------|---------------------------------|--|--|
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| OPERATING FREQUENCY: | 173 | MHz | | |
|------------------------|---------------------------------|--------|---------|--|
| CHANNEL: | 14 | 13 | - | |
| MEASURED OUTPUT POWER: | 22.44 | dBm = | 0.175 W | |
| MODULATION SIGNAL: | WCDMA | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 35.44 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3465.20 | Н | - | - | -64.41 | 9.77 | -54.64 | 77.1 |
| 5197.80 | Н | 100 | 59 | -58.83 | 10.81 | -48.01 | 70.5 |
| 6930.40 | Н | - | - | -57.89 | 10.89 | -47.00 | 69.4 |

Table 7-22. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)

| OPERATING FREQUENCY: | 175 | MHz | | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 15 | | | |
| MEASURED OUTPUT POWER: | 21.83 | dBm = | 0.152 | W |
| MODULATION SIGNAL: | WCDMA | | | _ |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 34.83 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3505.20 | Н | 100 | 321 | -63.23 | 9.89 | -53.34 | 75.2 |
| 5257.80 | Н | 100 | 59 | -55.82 | 10.92 | -44.90 | 66.7 |
| 7010.40 | Н | - | - | -55.65 | 11.06 | -44.59 | 66.4 |

Table 7-23. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

| FCC ID: ZNFVS988 | PCTEST | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | | |
|--|----------------------|---|------|---------------------------------|--|--|
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| OPERATING FREQUENCY: | 173 | MHz | |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 14 | | |
| MEASURED OUTPUT POWER: | 21.93 | dBm = | 0.156 W |
| MODULATION SIGNAL: | WCDMA | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 34.93 | dBc |

| F | requency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|---|-------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| | 3465.20 | Н | 100 | 316 | -62.97 | 9.77 | -53.20 | 75.1 |
| | 5197.80 | Н | 100 | 152 | -58.50 | 10.81 | -47.68 | 69.6 |
| | 6930.40 | Н | - | - | -57.86 | 10.89 | -46.97 | 68.9 |

Table 7-24. Radiated Spurious Data with WCP (AWS WCDMA Mode - Ch. 1413)

| OPERATING FREQUENCY: | 185 | MHz | |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 5 | | |
| MEASURED OUTPUT POWER: | 28.24 | dBm = | 0.667 W |
| MODULATION SIGNAL: | GPRS (GMSK) | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 41.24 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3700.40 | Н | 163 | 305 | -56.82 | 10.03 | -46.78 | 75.0 |
| 5550.60 | Н | 103 | 100 | -49.18 | 11.18 | -38.00 | 66.2 |
| 7400.80 | Н | - | - | -55.64 | 10.85 | -44.79 | 73.0 |
| 9251.00 | Н | - | - | -56.30 | 12.37 | -43.93 | 72.2 |

Table 7-25. Radiated Spurious Data (PCS GPRS Mode – Ch. 512)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 188 | 0.00 | MHz | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 66 | 61 | - | |
| MEASURED OUTPUT POWER: | 28.58 | dBm = | 0.721 | W |
| MODULATION SIGNAL: | GPRS (GMSK) | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 41.58 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3760.00 | Н | 100 | 134 | -52.86 | 9.79 | -43.08 | 71.7 |
| 5640.00 | Н | 100 | 297 | -47.23 | 11.35 | -35.88 | 64.5 |
| 7520.00 | Н | - | - | -56.85 | 11.22 | -45.64 | 74.2 |
| 9400.00 | Н | - | - | -55.61 | 12.30 | -43.31 | 71.9 |

Table 7-26. Radiated Spurious Data (PCS GPRS Mode – Ch. 661)

| OPERATING FREQUENCY: | 190 | 9.80 | MHz |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 8 | 10 | |
| MEASURED OUTPUT POWER: | 28.57 | dBm = | 0.719 W |
| MODULATION SIGNAL: | GPRS (GMSK) | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 41.57 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3819.60 | Н | 100 | 41 | -49.61 | 9.56 | -40.05 | 68.6 |
| 5729.40 | Н | 100 | 106 | -49.65 | 11.43 | -38.21 | 66.8 |
| 7639.20 | Н | - | - | -56.76 | 11.50 | -45.26 | 73.8 |
| 9549.00 | Н | - | - | -55.67 | 12.39 | -43.29 | 71.9 |

Table 7-27. Radiated Spurious Data (PCS GPRS Mode – Ch. 810)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕑 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 188 | 0.00 | MHz |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 66 | 61 | - |
| MEASURED OUTPUT POWER: | 27.52 | dBm = | 0.565 W |
| MODULATION SIGNAL: | GPRS (GMSK) | - | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 40.52 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3760.00 | Н | 100 | 43 | -50.39 | 9.79 | -40.61 | 68.1 |
| 5640.00 | Н | 100 | 310 | -48.21 | 11.35 | -36.86 | 64.4 |
| 7520.00 | Н | - | - | -57.01 | 11.22 | -45.80 | 73.3 |
| 9400.00 | Н | - | - | -55.84 | 12.30 | -43.54 | 71.1 |

Table 7-28. Radiated Spurious Data with WCP (PCS GPRS Mode - Ch. 661)

| OPERATING FREQUENCY: | 185 | 1.25 | MHz | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 2 | 5 | | |
| MEASURED OUTPUT POWER: | 20.84 | dBm = | 0.121 | W |
| MODULATION SIGNAL: | CDMA | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 33.84 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3702.50 | V | 100 | 102 | -64.75 | 10.08 | -54.67 | 75.5 |
| 5553.75 | V | 100 | 359 | -60.40 | 11.21 | -49.19 | 70.0 |
| 7405.00 | V | - | - | -57.06 | 10.87 | -46.19 | 67.0 |

Table 7-29. Radiated Spurious Data (PCS CDMA Mode – Ch. 25)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 188 | MHz | |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 60 | 00 | - |
| MEASURED OUTPUT POWER: | 20.81 | dBm = | 0.120 W |
| MODULATION SIGNAL: | CDMA | - | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 33.81 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3760.00 | V | 100 | 288 | -62.86 | 9.80 | -53.06 | 73.9 |
| 5640.00 | V | 100 | 8 | -58.51 | 11.37 | -47.14 | 67.9 |
| 7520.00 | V | - | - | -58.34 | 11.24 | -47.10 | 67.9 |
| 9400.00 | V | - | - | -56.39 | 12.35 | -44.05 | 64.9 |

Table 7-30. Radiated Spurious Data (PCS CDMA Mode – Ch. 600)

| OPERATING FREQUENCY: | 190 | 8.75 | MHz |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 11 | 75 | |
| MEASURED OUTPUT POWER: | 19.52 | dBm = | 0.090 W |
| MODULATION SIGNAL: | CDMA | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 32.52 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3817.50 | V | 100 | 74 | -61.14 | 9.56 | -51.58 | 71.1 |
| 5726.25 | V | 100 | 5 | -58.98 | 11.46 | -47.53 | 67.1 |
| 7635.00 | V | - | - | -58.16 | 11.51 | -46.65 | 66.2 |
| 9543.75 | V | - | - | -56.39 | 12.40 | -43.99 | 63.5 |

Table 7-31. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 185 | MHz | | |
|------------------------|---------------------------------|--------|---------|---|
| CHANNEL: | 2 | 25 | • | |
| MEASURED OUTPUT POWER: | 20.49 | dBm = | 0.112 V | N |
| MODULATION SIGNAL: | CDMA | - | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 33.49 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3702.50 | Н | 100 | 259 | -63.51 | 10.02 | -53.48 | 74.0 |
| 5553.75 | Н | 100 | 153 | -61.95 | 11.19 | -50.76 | 71.3 |
| 7405.00 | Н | - | - | -56.99 | 10.87 | -46.12 | 66.6 |
| 9256.25 | Н | - | - | -56.62 | 12.37 | -44.26 | 64.7 |

Table 7-32. Radiated Spurious Data with WCP (PCS CDMA Mode - Ch. 25)

| OPERATING FREQUENCY: | 1852 | MHz | |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 92 | 62 | |
| MEASURED OUTPUT POWER: | 22.82 | dBm = | 0.191 W |
| MODULATION SIGNAL: | WCDMA | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 35.82 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3704.80 | V | 100 | 98 | -62.70 | 10.07 | -52.63 | 75.4 |
| 5557.20 | V | 100 | 257 | -58.11 | 11.21 | -46.89 | 69.7 |
| 7409.60 | V | - | - | -56.58 | 10.89 | -45.69 | 68.5 |
| 9262.00 | V | - | - | -56.41 | 12.37 | -44.04 | 66.9 |

Table 7-33. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 188 | MHz | | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 94 | - | | |
| MEASURED OUTPUT POWER: | 23.09 | dBm = | 0.204 | W |
| MODULATION SIGNAL: | WCDMA | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 36.09 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3760.00 | V | 100 | 260 | -62.84 | 9.80 | -53.04 | 76.1 |
| 5640.00 | V | 100 | 192 | -57.88 | 11.37 | -46.51 | 69.6 |
| 7520.00 | V | - | - | -57.91 | 11.24 | -46.67 | 69.8 |
| 9400.00 | V | - | - | -56.29 | 12.35 | -43.95 | 67.0 |

Table 7-34. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

| OPERATING FREQUENCY: | 190 | 7.60 | MHz |
|------------------------|---------------------------------|--------|---------|
| CHANNEL: | 95 | 9538 | |
| MEASURED OUTPUT POWER: | 23.02 | dBm = | 0.200 W |
| MODULATION SIGNAL: | WCDMA | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 36.02 | dBc |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3815.20 | V | 100 | 285 | -62.10 | 9.56 | -52.54 | 75.6 |
| 5722.80 | V | 100 | 203 | -57.94 | 11.45 | -46.48 | 69.5 |
| 7630.40 | V | - | - | -58.66 | 11.50 | -47.16 | 70.2 |
| 9538.00 | V | - | - | -56.47 | 12.39 | -44.08 | 67.1 |

Table 7-35. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | LG | Approved by: Quality Manager |
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| OPERATING FREQUENCY: | 1880.00 | | MHz | |
|------------------------|---------------------------------|--------|-------|---|
| CHANNEL: | 94 | 00 | - | |
| MEASURED OUTPUT POWER: | 21.38 | dBm = | 0.137 | W |
| MODULATION SIGNAL: | WCDMA | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 43 + 10 log ₁₀ (W) = | 34.38 | dBc | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | [dBc] |
|--------------------|-----------------------|---------------------------|----------------------------------|--|-------------------------------------|-------------------------------------|-------|
| 3760.00 | Н | 100 | 102 | -63.14 | 9.79 | -53.36 | 74.7 |
| 5640.00 | Н | 100 | 281 | -55.68 | 11.35 | -44.33 | 65.7 |
| 7520.00 | Н | - | - | -58.41 | 11.22 | -47.19 | 68.6 |
| 9400.00 | Н | - | - | -56.19 | 12.30 | -43.89 | 65.3 |

Table 7-36. Radiated Spurious Data with WCP (PCS WCDMA Mode - Ch. 9400)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
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7.8 Frequency Stability / Temperature Variation §2.1055 §22.355 §24.235 §27.54

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-D-2010. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-D-2010

Test Settings

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕑 LG | Approved by: Quality Manager |
|--------------------------------|----------------------|---|------|---------------------------------|
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Frequency Stability / Temperature Variation §2.1055 §22.355

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL:

VDC

190

REFERENCE VOLTAGE: 3.80

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.80 | + 20 (Ref) | 836,599,715 | -285 | -0.0000341 |
| 100 % | | - 30 | 836,599,956 | -44 | -0.0000053 |
| 100 % | | - 20 | 836,600,011 | 11 | 0.0000013 |
| 100 % | | - 10 | 836,600,021 | 21 | 0.0000025 |
| 100 % | | 0 | 836,600,028 | 28 | 0.0000033 |
| 100 % | | + 10 | 836,600,418 | 418 | 0.0000500 |
| 100 % | | + 20 | 836,599,857 | -143 | -0.0000171 |
| 100 % | | + 30 | 836,599,871 | -129 | -0.0000154 |
| 100 % | | + 40 | 836,600,047 | 47 | 0.0000056 |
| 100 % | | + 50 | 836,599,839 | -161 | -0.0000192 |
| BATT. ENDPOINT | 3.40 | + 20 | 836,599,913 | -87 | -0.0000104 |

Table 7-37. Frequency Stability Data (Cellular GPRS Mode - Ch. 190)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Quality Manager |
|---------------------------------|----------------------|---|--|---------------------------------|
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Frequency Stability / Temperature Variation §2.1055 §22.355

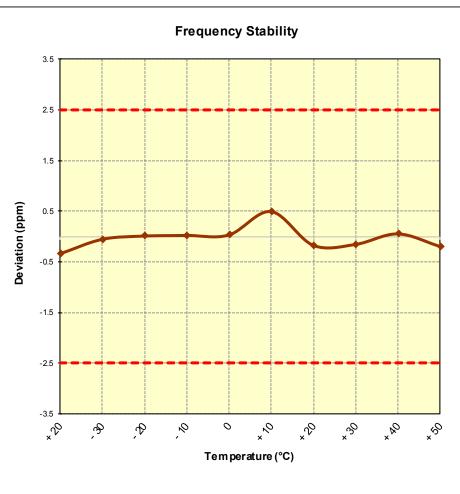


Figure 7-8. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕑 LG | Approved by: Quality Manager | |
|---------------------------------|----------------------|---|------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dama 04 of 407 | |
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Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 836,520,000 Hz CHANNEL: 384

REFERENCE VOLTAGE: 3.8

GE: 3.80

VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.80 | + 20 (Ref) | 836,520,301 | 301 | 0.0000360 |
| 100 % | | - 30 | 836,519,685 | -315 | -0.0000377 |
| 100 % | | - 20 | 836,520,045 | 45 | 0.0000054 |
| 100 % | | - 10 | 836,520,185 | 185 | 0.0000221 |
| 100 % | | 0 | 836,519,944 | -56 | -0.0000067 |
| 100 % | | + 10 | 836,519,683 | -317 | -0.0000379 |
| 100 % | | + 20 | 836,520,084 | 84 | 0.0000100 |
| 100 % | | + 30 | 836,520,311 | 311 | 0.0000372 |
| 100 % | | + 40 | 836,520,265 | 265 | 0.0000317 |
| 100 % | | + 50 | 836,519,704 | -296 | -0.0000354 |
| BATT. ENDPOINT | 3.40 | + 20 | 836,519,879 | -121 | -0.0000145 |

Table 7-38. Frequency Stability Data (Cellular CDMA Mode - Ch. 384)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
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Frequency Stability / Temperature Variation §2.1055 §22.355

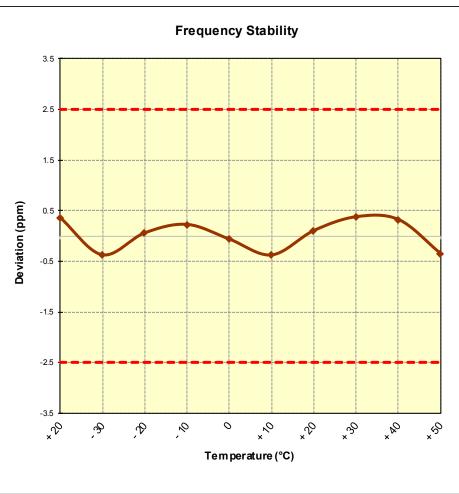


Figure 7-9. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dego 06 of 107 |
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Frequency Stability / Temperature Variation §2.1055 §22.355

OPERATING FREQUENCY: 836,600,000 Hz CHANNEL: 4183 REFERENCE VOLTAGE: VDC 3.80

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.80 | + 20 (Ref) | 836,599,999 | -1 | -0.0000001 |
| 100 % | | - 30 | 836,600,009 | 9 | 0.0000011 |
| 100 % | | - 20 | 836,600,024 | 24 | 0.0000029 |
| 100 % | | - 10 | 836,600,223 | 223 | 0.0000267 |
| 100 % | | 0 | 836,600,424 | 424 | 0.0000507 |
| 100 % | | + 10 | 836,599,819 | -181 | -0.0000216 |
| 100 % | | + 20 | 836,600,151 | 151 | 0.0000180 |
| 100 % | | + 30 | 836,599,777 | -223 | -0.0000267 |
| 100 % | | + 40 | 836,600,015 | 15 | 0.0000018 |
| 100 % | | + 50 | 836,599,692 | -308 | -0.0000368 |
| BATT. ENDPOINT | 3.40 | + 20 | 836,600,161 | 161 | 0.0000192 |

Table 7-39. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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Frequency Stability / Temperature Variation §2.1055 §22.355

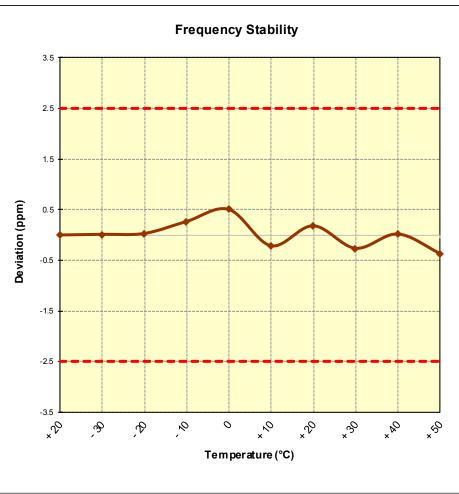


Figure 7-10. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
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Frequency Stability / Temperature Variation

| OPERATING FREQUENCY: | 1,732,600,000 | Hz |
|----------------------|---------------|-----|
| CHANNEL: | 1413 | |
| REFERENCE VOLTAGE: | 3.80 | VDC |

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.80 | + 20 (Ref) | 1,732,599,913 | -87 | -0.0000050 |
| 100 % | | - 30 | 1,732,600,346 | 346 | 0.0000200 |
| 100 % | | - 20 | 1,732,599,892 | -108 | -0.0000062 |
| 100 % | | - 10 | 1,732,600,145 | 145 | 0.0000084 |
| 100 % | | 0 | 1,732,600,028 | 28 | 0.0000016 |
| 100 % | | + 10 | 1,732,600,231 | 231 | 0.0000133 |
| 100 % | | + 20 | 1,732,599,962 | -38 | -0.0000022 |
| 100 % | | + 30 | 1,732,599,595 | -405 | -0.0000234 |
| 100 % | | + 40 | 1,732,599,833 | -167 | -0.0000096 |
| 100 % | | + 50 | 1,732,599,992 | -8 | -0.0000005 |
| BATT. ENDPOINT | 3.40 | + 20 | 1,732,599,889 | -111 | -0.0000064 |

Table 7-40. Frequency Stability Data (AWS WCDMA Mode – Ch. 1413)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
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Frequency Stability / Temperature Variation §2.1055 §27.54

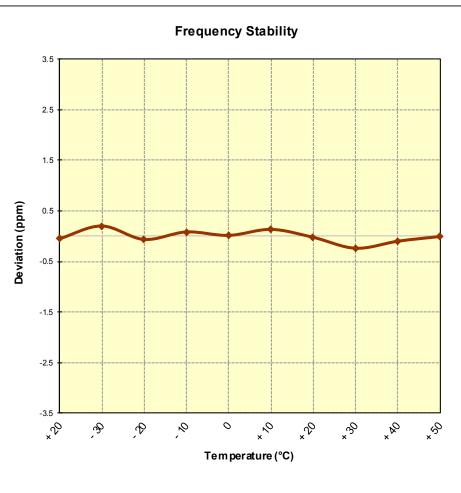


Figure 7-11. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|---------------------------------|----------------------|---|------|---------------------------------|
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Frequency Stability / Temperature Variation §2.1055 §24.235

| OPERATING FREQUENCY: | 1,880,000,000 | Hz |
|----------------------|---------------|-----|
| CHANNEL: | 661 | - |
| REFERENCE VOLTAGE: | 3.80 | VDC |

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.80 | + 20 (Ref) | 1,879,999,926 | -74 | -0.000039 |
| 100 % | | - 30 | 1,880,000,041 | 41 | 0.0000022 |
| 100 % | | - 20 | 1,879,999,955 | -45 | -0.0000024 |
| 100 % | | - 10 | 1,880,000,028 | 28 | 0.0000015 |
| 100 % | | 0 | 1,880,000,062 | 62 | 0.0000033 |
| 100 % | | + 10 | 1,879,999,767 | -233 | -0.0000124 |
| 100 % | | + 20 | 1,879,999,855 | -145 | -0.0000077 |
| 100 % | | + 30 | 1,879,999,818 | -182 | -0.0000097 |
| 100 % | | + 40 | 1,879,999,963 | -37 | -0.0000020 |
| 100 % | | + 50 | 1,879,999,672 | -328 | -0.0000174 |
| BATT. ENDPOINT | 3.40 | + 20 | 1,880,000,120 | 120 | 0.0000064 |

Table 7-41. Frequency Stability Data (PCS GPRS Mode – Ch. 661)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--|----------------------|---|------|---------------------------------|
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Frequency Stability / Temperature Variation §2.1055 §24.235

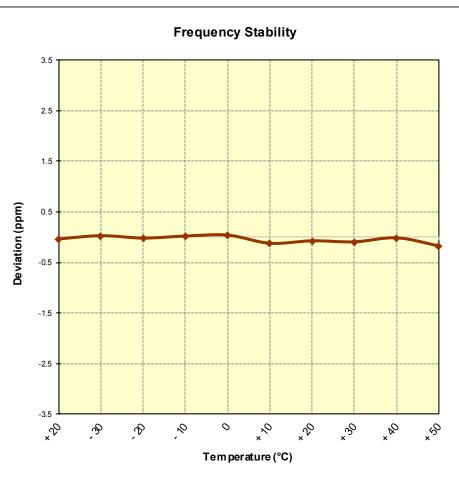


Figure 7-12. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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Frequency Stability / Temperature Variation

| OPERATING FREQUENCY: | 1,880,000,000 | Hz |
|----------------------|---------------|-----|
| CHANNEL: | 600 | |
| REFERENCE VOLTAGE: | 3.80 | VDC |

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.80 | + 20 (Ref) | 1,880,000,318 | 318 | 0.0000169 |
| 100 % | | - 30 | 1,880,000,300 | 300 | 0.0000160 |
| 100 % | | - 20 | 1,879,999,998 | -2 | -0.0000001 |
| 100 % | | - 10 | 1,880,000,036 | 36 | 0.0000019 |
| 100 % | | 0 | 1,880,000,097 | 97 | 0.0000052 |
| 100 % | | + 10 | 1,880,000,065 | 65 | 0.0000035 |
| 100 % | | + 20 | 1,879,999,733 | -267 | -0.0000142 |
| 100 % | | + 30 | 1,879,999,739 | -261 | -0.0000139 |
| 100 % | | + 40 | 1,880,000,005 | 5 | 0.000003 |
| 100 % | | + 50 | 1,879,999,915 | -85 | -0.0000045 |
| BATT. ENDPOINT | 3.40 | + 20 | 1,879,999,953 | -47 | -0.0000025 |

Table 7-42. Frequency Stability Data (PCS CDMA Mode – Ch. 600)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Frequency Stability / Temperature Variation §2.1055 §24.235

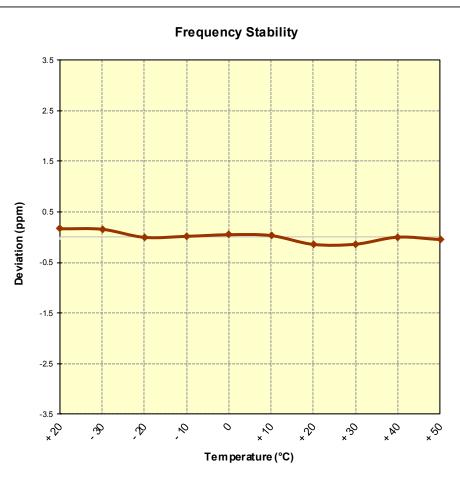


Figure 7-13. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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Frequency Stability / Temperature Variation

| OPERATING FREQUENCY: | 1,880,000,000 | Hz |
|----------------------|---------------|-----|
| CHANNEL: | 9400 | |
| REFERENCE VOLTAGE: | 3.80 | VDC |

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.80 | + 20 (Ref) | 1,879,999,745 | -255 | -0.0000136 |
| 100 % | | - 30 | 1,879,999,596 | -404 | -0.0000215 |
| 100 % | | - 20 | 1,880,000,203 | 203 | 0.0000108 |
| 100 % | | - 10 | 1,879,999,999 | -1 | -0.0000001 |
| 100 % | | 0 | 1,880,000,084 | 84 | 0.0000045 |
| 100 % | | + 10 | 1,880,000,084 | 84 | 0.0000045 |
| 100 % | | + 20 | 1,879,999,854 | -146 | -0.0000078 |
| 100 % | | + 30 | 1,879,999,695 | -305 | -0.0000162 |
| 100 % | | + 40 | 1,879,999,834 | -166 | -0.000088 |
| 100 % | | + 50 | 1,880,000,027 | 27 | 0.0000014 |
| BATT. ENDPOINT | 3.40 | + 20 | 1,880,000,171 | 171 | 0.0000091 |

Table 7-43. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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Frequency Stability / Temperature Variation §2.1055 §24.235

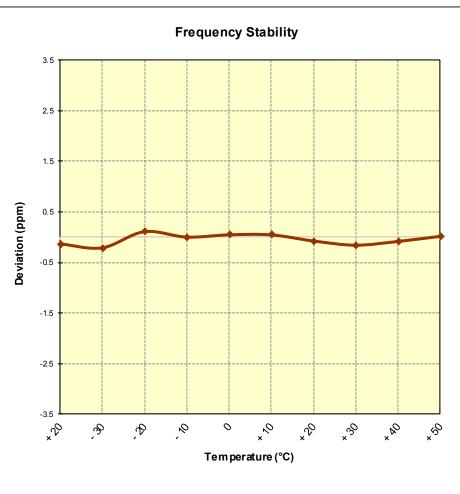


Figure 7-14. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the LG Portable Handset FCC ID: ZNFVS988 complies with all the requirements of Parts 22, 24, & 27 of the FCC rules.

| FCC ID: ZNFVS988 | | FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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