



# PCTEST ENGINEERING LABORATORY, INC.

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## MEASUREMENT REPORT FCC Part 22 & 24 / IC RSS-132/RSS-133

**Applicant Name:**  
LG Electronics MobileComm U.S.A., Inc.  
1000 Sylvan Avenue  
Englewood Cliffs, NJ 07632  
USA

**Date of Testing:**  
April 19 - 21, 2012  
**Test Site/Location:**  
PCTEST Lab., Columbia, MD, USA  
**Test Report Serial No.:**  
0Y1204180523.ZNF

<b>FCC ID:</b>	<b>ZNFL40G</b>
<b>APPLICANT:</b>	<b>LG ELECTRONICS MOBILECOMM U.S.A., INC.</b>

**Application Type:** Certification  
**Model(s):** LGL40G, LG-L40G, LG-L40g, LGL40g, L40g, L40G  
**EUT Type:** Portable Handset  
**FCC Classification:** PCS Licensed Transmitter Held to Ear (PCE)  
**FCC Rule Part(s):** §2; §22(H), §24(E)  
**IC Specification(s):** RSS-132 Issue 2; RSS-133 Issue 5  
**Test Procedure(s):** ANSI/TIA-603-C-2004  
**Test Device Serial No.:** *identical prototype* [S/N: 203KPDT165018]

Mode	Tx Frequency (MHz)	Emission Designator	ERP/EIRP	
			Max. Power (W)	Max. Power (dBm)
GSM850	824.2 - 848.8	243KGXW	1.849	32.67
GSM1900	1850.2 - 1909.8	245KGXW	1.638	32.14
WCDMA850	826.4 - 846.6	4M18F9W	0.273	24.36
WCDMA1900	1852.4 - 1907.6	4M18F9W	0.399	26.01

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.

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.

*PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.*

Randy Ortanez  
President

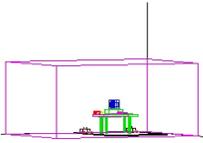


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# T A B L E O F C O N T E N T S

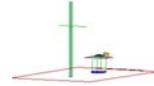
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# MEASUREMENT REPORT

## FCC Part 22 & 24



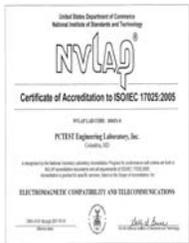
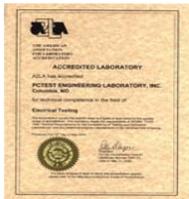
### §2.1033 General Information

**APPLICANT:** LG Electronics MobileComm U.S.A., Inc.  
**APPLICANT ADDRESS:** 1000 Sylvan Avenue  
 Englewood Cliffs, NJ 07632, USA  
**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.  
**TEST SITE ADDRESS:** 6660-B Dobbin Road, Columbia, MD 21045 USA  
**FCC RULE PART(S):** §2; §22(H), §24(E)  
**IC SPECIFICATION(S):** RSS-132 Issue 2; RSS-133 Issue 5  
**BASE MODEL:** LGL40G  
**FCC ID:** ZNFL40G  
**FCC CLASSIFICATION:** PCS Licensed Transmitter Held to Ear (PCE)  
**MODE:** GSM/WCDMA  
**FREQUENCY TOLERANCE:** ±0.00025 % (2.5 ppm)  
**Test Device Serial No.:** 203KPDT165018     Production     Pre-Production     Engineering  
**DATE(S) OF TEST:** April 19 - 21, 2012  
**TEST REPORT S/N:** 0Y1204180523.ZNF

### Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21045, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) 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 (2451A-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 (2451A-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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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFL40G**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitter.

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS, 850/1900 WCDMA, 802.11b/g/n WLAN, Bluetooth (1x,EDR)

### 2.3 Test Configuration

The LG Portable Handset FCC ID: ZNFL40G was tested per the guidance of ANSI/TIA-603-C-2004. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

### 2.4 EMI Suppression Device(s)/Modifications

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

### 2.5 Labeling Requirements

Per 2.925

The FCC identifier shall be permanently affixed to the equipment and shall be readily visible to the purchaser at the time of purchase.

Per 15.19; Docket 95-19

In addition to this requirement, a device subject to certification shall be labeled as follows:

*This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

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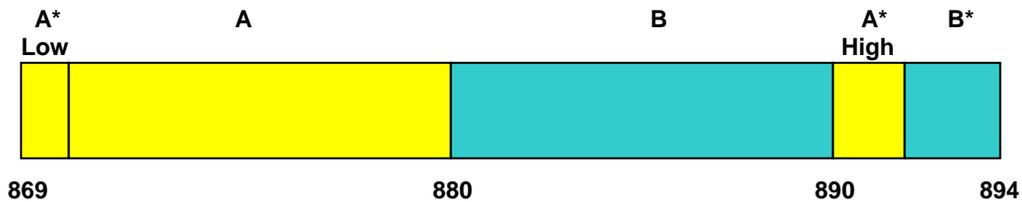
### 3.0 DESCRIPTION OF TESTS

#### 3.1 Evaluation Procedure

The measurement procedures described in the document titled “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-C-2004) was used in the measurement of the measurement of the **LG Portable Handset FCC ID: ZNFL40G**.

Deviation from Measurement Procedure.....None

#### 3.2 Cellular - Base Frequency Blocks



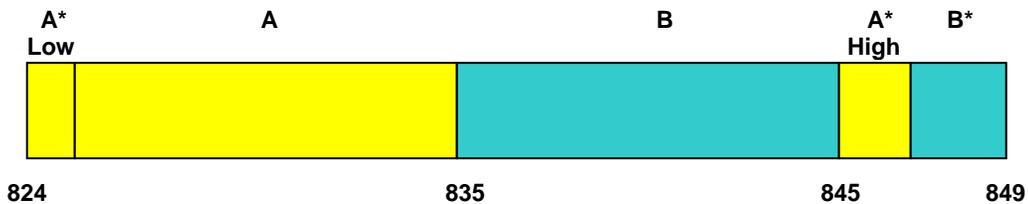
BLOCK 1: 869 – 880 MHz (A\* Low + A)

BLOCK 3: 890 – 891.5 MHz (A\* High)

BLOCK 2: 880 – 890 MHz (B)

BLOCK 4: 891.5 – 894 MHz (B\*)

#### 3.3 Cellular - Mobile Frequency Blocks



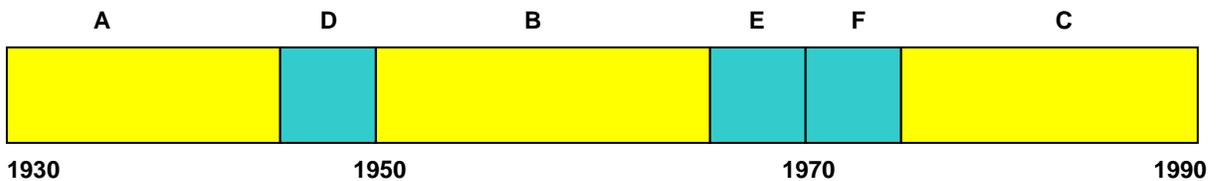
BLOCK 1: 824 – 835 MHz (A\* Low + A)

BLOCK 3: 845 – 846.5 MHz (A\* High)

BLOCK 2: 835 – 845 MHz (B)

BLOCK 4: 846.5 – 849 MHz (B\*)

#### 3.4 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 4: 1965 – 1970 MHz (E)

BLOCK 2: 1945 – 1950 MHz (D)

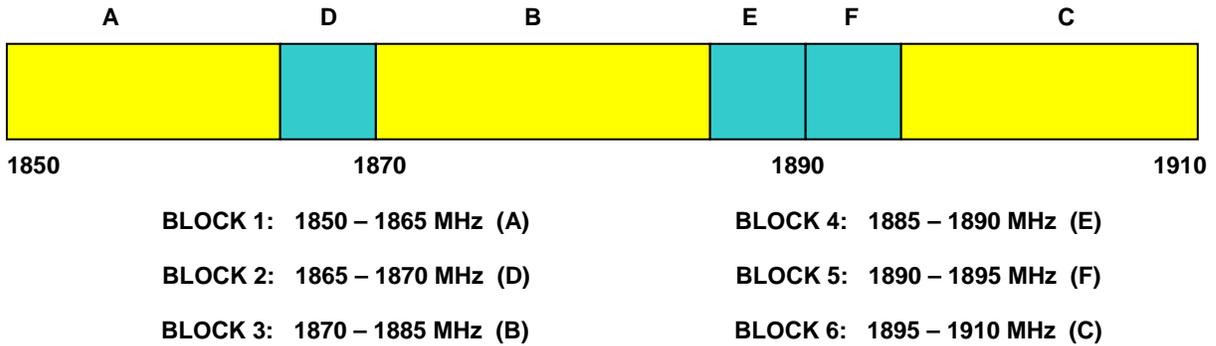
BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 6: 1975 – 1990 MHz (C)

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### 3.5 PCS - Mobile Frequency Blocks



### 3.6 Occupied Bandwidth

#### §2.1049, RSS-Gen (4.6.1)

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. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

### 3.7 Spurious and Harmonic Emissions at Antenna Terminal

#### §2.1051, 22.917(a), 24.238(a)(b); RSS-132 (4.5.1), RSS-133 (6.5.1)

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 10<sup>th</sup> harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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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### 3.8 Radiated Power and Radiated Spurious Emissions

**§2.1053, 22.913(a)(2), 22.917(a), 24.232(c), 24.238(a); RSS-132 (4.5.1), RSS-133 (6.5.1)**

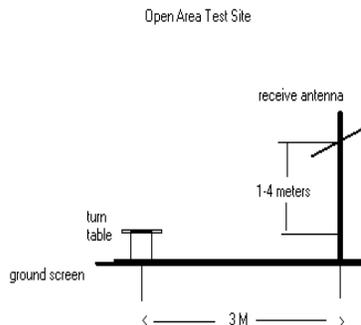
Radiated spurious emissions are investigated indoors in a semi-anechoic chamber to determine the frequencies producing the worst case emissions. Final measurements for radiated power and radiated spurious emissions are performed on the 3 meter OATS per the guidelines of ANSI/TIA-603-C-2004. The measurement area is situated on an 18 meter x 20 meter galvanized 1/2" hardware cloth as the conducting ground plane. This material is sewn together in sections 4 feet wide and 60 feet long. A total of eighteen sections are required to cover the entire measurement area. Sections are laid across the width of the pad, overlapped 1" and sewn and soldered together at intervals of 3" (7.6 cm.) The terrain of the test site is reasonably flat and level. Power and cable to the test site are buried 18" deep into the ground outside the perimeter of the site. An all-weather non-metallic housing is situated on a 2 x 3 meter area adjacent to the measurement area to house the test equipment. The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. 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. Emissions are also investigated with the receive antenna horizontally and vertically polarized. The level of the maximized emission is recorded with the spectrum analyzer using a peak detector with RBW = 1MHz, VBW = 3MHz for emissions greater than 1GHz. For emissions below 1GHz, the spectrum analyzer is set to RBW = 100kHz and VBW = 300kHz.

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:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

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  $P_g \text{ [dBm]} - \text{cable loss [dB]}$ .

The calculated  $P_d$  levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of  $43 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$  specified in 22.917(a) and 24.238(a).



**Figure 3-1. Diagram of 3-meter outdoor test range**

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### 3.9 Peak-Average Ratio

#### §24.232(d); RSS-133 (6.4)

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, 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. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

### 3.10 Frequency Stability / Temperature Variation

#### §2.1055, 22.355, 24.235; RSS-132 (4.3) / RSS-133 (6.3)

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. 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.

*Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency.*

#### **Time Period and Procedure:**

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.

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## 4.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTX1	Licensed Transmitter Cable Set	1/25/2012	Annual	1/25/2013	N/A
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	6/7/2011	Annual	6/7/2012	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	2/13/2012	Annual	2/13/2013	N/A
Agilent	8447D	Broadband Amplifier	4/17/2012	Annual	4/17/2013	1937A03348
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	2/15/2012	Annual	2/15/2013	3008A00985
Agilent	E4432B	ESG-D Series Signal Generator	3/15/2012	Annual	3/15/2013	US40053896
Agilent	E8267C	Vector Signal Generator	10/10/2011	Biennial	10/10/2013	US42340152
Agilent	N9038A	MXE EMI Receiver	8/5/2011	Annual	8/5/2012	MY51210133
Agilent	N9030A	PXA Signal Analyzer	2/23/2012	Annual	2/23/2013	MY49432391
Anritsu	MA2411B	Power Sensor	3/5/2012	Annual	3/5/2013	846215
Anritsu	MA2411B	Pulse Sensor	10/13/2011	Annual	10/13/2012	1027293
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Emco	3115	Horn Antenna (1-18GHz)	1/12/2012	Biennial	1/12/2014	9704-5182
Emco	3115	Horn Antenna (1-18GHz)	4/8/2010	Biennial	4/8/2012	9205-3874
Espec	ESX-2CA	Environmental Chamber	4/21/2011	Annual	4/21/2012	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	10/1/2010	Biennial	10/1/2012	128337
Mini-Circuits	VHF-1300+	High Pass Filter	2/7/2012	Annual	2/7/2013	30716
Mini-Circuits	VHF-1200+	High Pass Filter	1/15/2012	Annual	1/15/2013	30923
Mini-Circuits	VHF-3100+	High Pass Filter	1/15/2012	Annual	1/15/2013	30841
Pasternack	PE2208-6	Bidirectional Coupler	6/3/2011	Annual	6/3/2012	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836536/0005
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/25/2011	Annual	8/25/2012	100976
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Annual	10/7/2012	103962
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/5/2011	Annual	8/5/2012	112347
Rohde & Schwarz	RS-PR18	1-18 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100071
Rohde & Schwarz	RS-PR26	18-26.5 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100040
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	10/3/2011	Biennial	10/3/2013	91052522TX
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	10/3/2011	Biennial	10/3/2013	91052523RX
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	7/5/2011	Biennial	7/5/2013	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	6/17/2011	Biennial	6/17/2013	A042511

**Table 4-1. Test Equipment**

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## 5.0 SAMPLE CALCULATIONS

### GSM Emission Designator

**Emission Designator = 250KGXW**

GSM BW = 250 kHz  
 G = Phase Modulation  
 X = Cases not otherwise covered  
 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) (Measured at the 99.75% power bandwidth)

### Spurious Radiated Emission - PCS Band

**Example: GSM Channel 512 PCS Mode 2<sup>nd</sup> Harmonic (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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## 6.0 TEST RESULTS

### 6.1 Summary

Company Name: LG Electronics MobileComm U.S.A., Inc.  
 FCC ID: ZNFL40G  
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)  
 Mode(s): GSM/WCDMA

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
<b>TRANSMITTER MODE (TX)</b>						
2.1049, 22.917(a), 24.238(a)	RSS-Gen (4.6.1) RSS-133 (2.3)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0
2.1051, 22.917(a), 24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge / Conducted Spurious Emissions	< 43 + log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Section 7.0
24.232(d)	RSS-133 (6.4)	Peak-Average Ratio	< 13 dB		PASS	Section 7.0
2.1046	RSS-132 (4.4) RSS-133 (4.1)	Transmitter Conducted Output Power	N/A		PASS	RF Exposure Report
22.913(a)(2)	RSS-132 (4.4) [SRSP-503(5.1.3)]	Effective Radiated Power	< 7 Watts max. ERP	RADIATED	PASS	Section 6.2
24.232(c)	RSS-133 (6.4) [SRSP-510 (5.1.2)]	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS	Section 6.3
2.1053, 22.917(a), 24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Undesirable Emissions	< 43 + log <sub>10</sub> (P[Watts]) for all out-of-band emissions		PASS	Sections 6.4, 6.5, 6.6, 6.7
2.1055, 22.355, 24.235	RSS-132 (4.3) RSS-133 (6.3)	Frequency Stability	< 2.5 ppm		PASS	Sections 6.8, 6.9, 6.10, 6.11
<b>RECEIVER MODE (RX) / DIGITAL EMISSIONS</b>						
N/A	RSS-132 (4.6) RSS-133 (6.6)	Receiver Spurious Emissions Limits	< RSS-Gen limits [Section 6; Table 1]	RADIATED	PASS	Section 6.12

**Table 6-1. 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 shown in Section **Error! Reference source not found.** 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.

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## 6.2 Effective Radiated Power Output Data

§22.913(a)(2); RSS-132 (4.4) [SRSP-503(5.1.3)]

Frequency [MHz]	Mode	Battery Type	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.20	GSM850	Standard	31.91	0.00	V	31.91	1.552	38.45	-6.54
836.60	GSM850	Standard	32.21	0.00	V	32.21	1.663	38.45	-6.24
848.80	GSM850	Standard	32.67	0.00	V	32.67	1.849	38.45	-5.78

**Table 6-2. Effective Radiated Power Output Data (GSM)**

Frequency [MHz]	Mode	Battery Type	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
826.40	WCDMA850	Standard	21.72	0.00	V	21.72	0.149	38.45	-16.73
836.60	WCDMA850	Standard	23.51	0.00	V	23.51	0.224	38.45	-14.94
846.60	WCDMA850	Standard	24.36	0.00	V	24.36	0.273	38.45	-14.09

**Table 6-3. Effective Radiated Power Output Data (WCDMA)**

### **NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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### 6.3 Equivalent Isotropic Radiated Power Output Data §24.232(c); RSS-133 (6.4) [SRSP-510 (5.1.2)]

Frequency [MHz]	Mode	Battery Type	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GSM1900	Standard	24.39	7.75	H	32.14	1.638	33.01	-0.87
1880.00	GSM1900	Standard	22.19	7.83	H	30.02	1.005	33.01	-2.99
1909.80	GSM1900	Standard	22.27	7.92	H	30.19	1.045	33.01	-2.82

**Table 6-4. Equivalent Isotropic Radiated Power Output Data (GSM)**

Frequency [MHz]	Mode	Battery Type	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	Standard	16.99	7.75	H	24.74	0.298	33.01	-8.27
1880.00	WCDMA1900	Standard	16.49	7.83	H	24.32	0.270	33.01	-8.69
1907.60	WCDMA1900	Standard	18.09	7.92	H	26.01	0.399	33.01	-7.00

**Table 6-5. Equivalent Isotropic Radiated Power Output Data (WCDMA)**

#### **NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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## 6.4 Cellular GSM Radiated Measurements

§2.1053, 22.917(a); RSS-132 (4.5.1)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 824.20 MHz  
 CHANNEL: 128  
 MEASURED OUTPUT POWER: 31.91 dBm = 1.552 W  
 MODULATION SIGNAL: GSM (GMSK)  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  44.91 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1648.40	-54.35	6.16	-48.19	V	80.1
2472.60	-44.53	6.34	-38.18	V	70.1
3296.80	-92.52	6.70	-85.82	V	117.7
4121.00	-90.72	7.38	-83.34	V	115.3
4945.20	-90.58	8.91	-81.67	V	113.6

Table 6-6. Radiated Spurious Data (Cellular GSM Mode – Ch. 128)

#### NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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**Cellular GSM Radiated Measurements (Cont'd)**  
§2.1053, 22.917(a); RSS-132 (4.5.1)

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 836.60 MHz  
 CHANNEL: 190  
 MEASURED OUTPUT POWER: 32.21 dBm = 1.663 W  
 MODULATION SIGNAL: GSM (GMSK)  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  45.21 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1673.20	-54.83	6.09	-48.74	V	80.9
2509.80	-47.62	6.38	-41.24	V	73.5
3346.40	-92.72	6.90	-85.82	V	118.0
4183.00	-91.33	7.80	-83.53	V	115.7
5019.60	-90.17	8.83	-81.34	V	113.5

**Table 6-7. Radiated Spurious Data (Cellular GSM Mode – Ch. 190)**

**NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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**Cellular GSM Radiated Measurements (Cont'd)**  
§2.1053, 22.917(a); RSS-132 (4.5.1)

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 848.80 MHz  
 CHANNEL: 251  
 MEASURED OUTPUT POWER: 32.67 dBm = 1.849 W  
 MODULATION SIGNAL: GSM (GMSK)  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  45.67 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1697.60	-52.96	6.01	-46.95	V	79.6
2546.40	-47.22	6.48	-40.74	V	73.4
3395.20	-51.13	7.10	-44.03	V	76.7
4244.00	-91.72	8.10	-83.62	V	116.3
5092.80	-89.86	8.86	-81.01	V	113.7

**Table 6-8. Radiated Spurious Data (Cellular GSM Mode – Ch. 251)**

**NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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## 6.5 Cellular WCDMA Radiated Measurements

### §2.1053, 22.917(a); RSS-132 (4.5.1)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 826.40 MHz  
 CHANNEL: 4132  
 MEASURED OUTPUT POWER: 21.72 dBm = 0.149 W  
 MODULATION SIGNAL: WCDMA  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  34.72 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1652.80	-59.00	6.15	-52.85	V	74.6
2479.20	-55.29	6.34	-48.95	V	70.7
3305.60	-92.54	6.73	-85.81	V	107.5
4132.00	-90.83	7.45	-83.38	V	105.1
4958.40	-90.50	8.89	-81.61	V	103.3

**Table 6-9. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)**

#### NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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**Cellular WCDMA Radiated Measurements (Cont'd)**  
**§2.1053, 22.917(a); RSS-132 (4.5.1)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 836.60 MHz  
 CHANNEL: 4183  
 MEASURED OUTPUT POWER: 23.51 dBm = 0.224 W  
 MODULATION SIGNAL: WCDMA  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  36.51 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1673.20	-59.02	6.10	-52.93	V	76.4
2509.80	-54.99	6.37	-48.62	V	72.1
3346.40	-92.69	6.88	-85.82	V	109.3
4183.00	-91.25	7.74	-83.51	V	107.0
5019.60	-90.21	8.82	-81.38	V	104.9

**Table 6-10. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)**

**NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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**Cellular WCDMA Radiated Measurements (Cont'd)**  
**§2.1053, 22.917(a); RSS-132 (4.5.1)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 846.60 MHz  
 CHANNEL: 4233  
 MEASURED OUTPUT POWER: 24.36 dBm = 0.273 W  
 MODULATION SIGNAL: WCDMA  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  37.36 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1693.20	-58.55	6.02	-52.53	V	76.9
2539.80	-55.06	6.46	-48.60	V	73.0
3386.40	-92.89	7.07	-85.82	V	110.2
4233.00	-91.66	8.05	-83.61	V	108.0
5079.60	-89.92	8.85	-81.06	V	105.4

**Table 6-11. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)**

**NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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## 6.6 PCS GSM Radiated Measurements

### §2.1053, 24.238(a); RSS-133 (6.5.1)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1850.20 MHz  
 CHANNEL: 512  
 MEASURED OUTPUT POWER: 32.14 dBm = 1.638 W  
 MODULATION SIGNAL: GSM (GMSK)  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  45.14 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3700.40	-52.70	9.63	-43.07	H	75.2
5550.60	-47.86	10.60	-37.26	H	69.4
7400.80	-85.28	10.85	-74.43	H	106.6
9251.00	-83.92	12.20	-71.72	H	103.9
11101.20	-80.49	12.85	-67.64	H	99.8

**Table 6-12. Radiated Spurious Data (PCS GSM Mode – Ch. 512)**

#### NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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**PCS GSM Radiated Measurements (Cont'd)**  
§2.1053, 24.238(a); RSS-133 (6.5.1)

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 661  
 MEASURED OUTPUT POWER: 30.02 dBm = 1.005 W  
 MODULATION SIGNAL: GSM (GMSK)  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  43.02 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-50.20	9.30	-40.90	H	70.9
5640.00	-49.39	10.89	-38.50	H	68.5
7520.00	-85.04	10.85	-74.19	H	104.2
9400.00	-83.69	12.17	-71.51	H	101.5
11280.00	-80.60	13.05	-67.55	H	97.6

**Table 6-13. Radiated Spurious Data (PCS GSM Mode – Ch. 661)**

**NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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**PCS GSM Radiated Measurements (Cont'd)**  
§2.1053, 24.238(a); RSS-133 (6.5.1)

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 1909.80 MHz  
 CHANNEL: 810  
 MEASURED OUTPUT POWER: 30.19 dBm = 1.045 W  
 MODULATION SIGNAL: GSM (GMSK)  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  43.19 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3819.60	-50.86	9.05	-41.82	H	72.0
5729.40	-50.40	11.08	-39.32	H	69.5
7639.20	-85.30	11.11	-74.19	H	104.4
9549.00	-83.84	12.37	-71.47	H	101.7
11458.80	-80.33	13.23	-67.10	H	97.3

**Table 6-14. Radiated Spurious Data (PCS GSM Mode – Ch. 810)**

**NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

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## 6.7 PCS WCDMA Radiated Measurements

§2.1053, 24.238(a); RSS-133 (6.5.1)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1852.40 MHz  
 CHANNEL: 9262  
 MEASURED OUTPUT POWER: 24.74 dBm = 0.298 W  
 MODULATION SIGNAL: WCDMA  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  37.74 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3704.80	-53.76	9.61	-44.16	H	68.9
5557.20	-89.26	10.62	-78.64	H	103.4
7409.60	-85.25	10.84	-74.41	H	99.2
9262.00	-83.91	12.20	-71.71	H	96.5
11114.40	-80.49	12.86	-67.63	H	92.4

**Table 6-15. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)**

#### NOTES:

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

FCC ID: ZNFL40G		FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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**PCS WCDMA Radiated Measurements (Cont'd)**  
**§2.1053, 24.238(a); RSS-133 (6.5.1)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 9400  
 MEASURED OUTPUT POWER: 24.32 dBm = 0.270 W  
 MODULATION SIGNAL: WCDMA  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  37.32 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-50.29	9.30	-40.99	H	65.3
5640.00	-89.56	10.89	-78.67	H	103.0
7520.00	-85.04	10.85	-74.19	H	98.5
9400.00	-83.69	12.17	-71.51	H	95.8
11280.00	-80.60	13.05	-67.55	H	91.9

**Table 6-16. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)**

**NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

FCC ID: ZNFL40G		FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset	Page 25 of 57	

**PCS WCDMA Radiated Measurements (Cont'd)**  
**§2.1053, 24.238(a); RSS-133 (6.5.1)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 1907.60 MHz  
 CHANNEL: 9538  
 MEASURED OUTPUT POWER: 26.01 dBm = 0.399 W  
 MODULATION SIGNAL: WCDMA  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  39.01 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3815.20	-49.41	9.05	-40.36	H	66.4
5722.80	-89.70	11.07	-78.63	H	104.6
7630.40	-85.30	11.10	-74.20	H	100.2
9538.00	-83.82	12.34	-71.47	H	97.5
11445.60	-80.35	13.22	-67.13	H	93.1

**Table 6-17. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)**

**NOTES:**

1. This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode while transmitting with one slot active.
2. This unit was tested with its standard battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the vertical polarity and horizontal polarity for PCS. The data reported in the table above was measured in this test setup.

FCC ID: ZNFL40G		FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset	Page 26 of 57	

## 6.8 Cellular GSM Frequency Stability Measurements

§2.1055, 22.355; RSS-132 (4.3)

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL: 190

REFERENCE VOLTAGE: 3.7 VDC

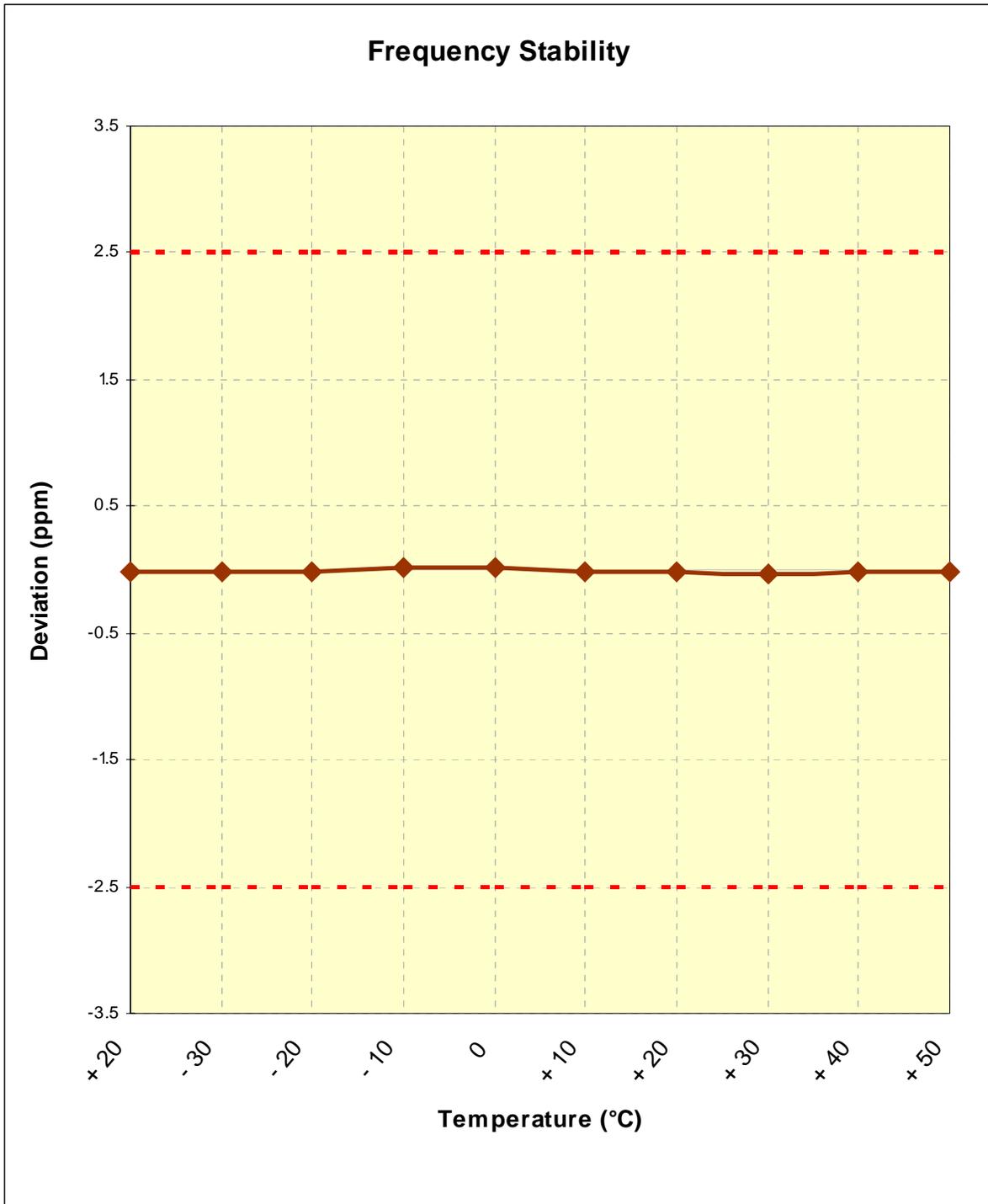
DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	836,599,984	-16	-0.000002
100 %		- 30	836,599,981	-19	-0.000002
100 %		- 20	836,599,980	-20	-0.000002
100 %		- 10	836,600,012	12	0.000001
100 %		0	836,600,017	17	0.000002
100 %		+ 10	836,599,985	-15	-0.000002
100 %		+ 20	836,599,984	-16	-0.000002
100 %		+ 30	836,599,978	-22	-0.000003
100 %		+ 40	836,599,986	-14	-0.000002
100 %		+ 50	836,599,982	-18	-0.000002
115 %		4.26	+ 20	836,599,978	-22
BATT. ENDPOINT	3.40	+ 20	836,599,976	-24	-0.000003

**Table 6-18. Frequency Stability Data (Cellular GSM Mode – Ch. 190)**

FCC ID: ZNFL40G		FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset	Page 27 of 57	

**Cellular GSM Frequency Stability Measurements (Cont'd)**  
§2.1055, 22.355; RSS-132 (4.3)



**Figure 6-1. Frequency Stability Graph (Cellular GSM Mode – Ch. 190)**

<b>FCC ID:</b> ZNFL40G	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)</b>	<b>LG</b>	<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1204180523.ZNF	<b>Test Dates:</b> April 19 - 21, 2012	<b>EUT Type:</b> Portable Handset	Page 28 of 57	

## 6.9 Cellular WCDMA Frequency Stability Measurements

**§2.1055, 22.355; RSS-132 (4.3)**

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL: 4183

REFERENCE VOLTAGE: 3.7 VDC

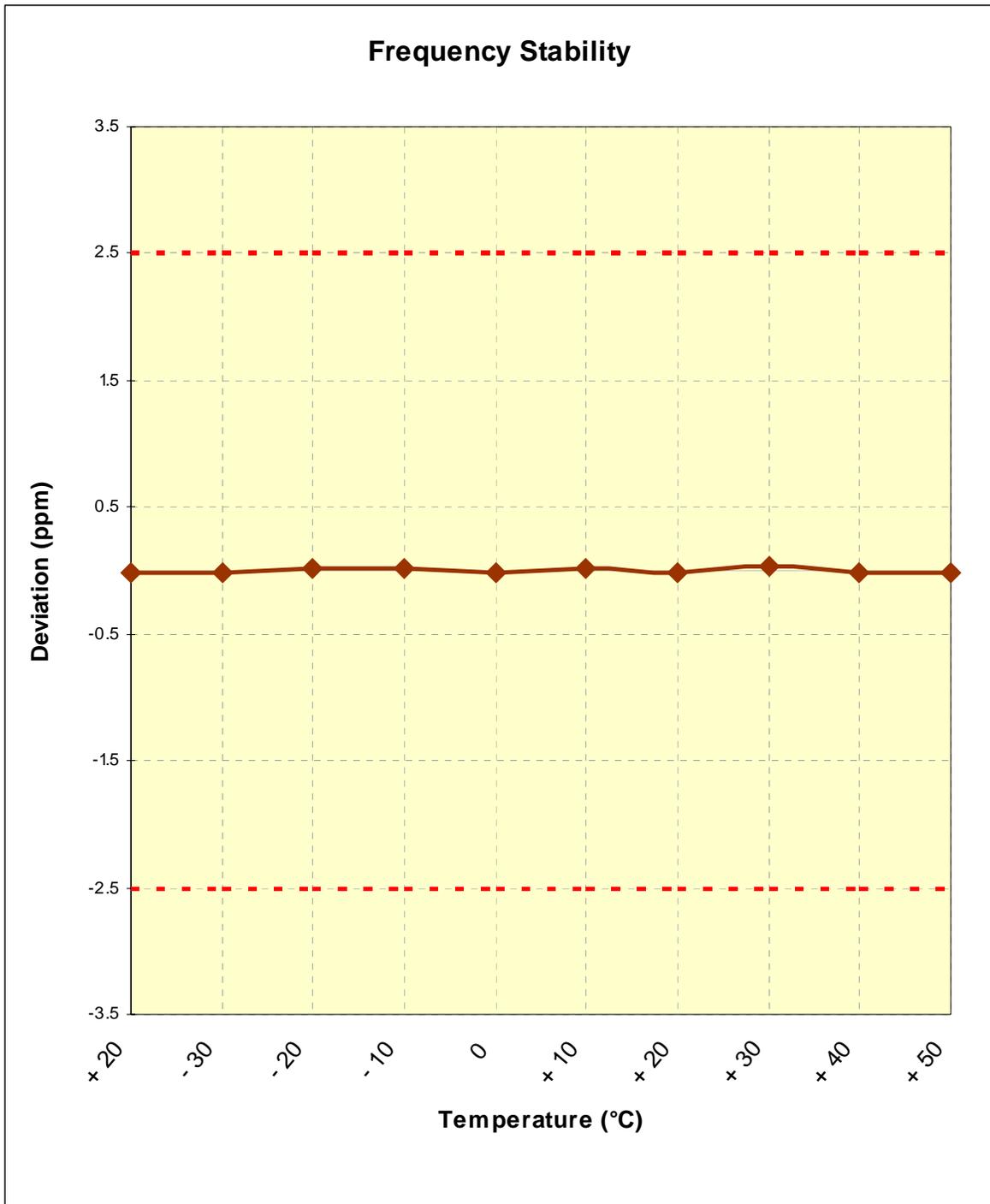
DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	836,599,981	-19	-0.000002
100 %		- 30	836,599,979	-21	-0.000003
100 %		- 20	836,600,018	18	0.000002
100 %		- 10	836,600,014	14	0.000002
100 %		0	836,599,981	-19	-0.000002
100 %		+ 10	836,600,016	16	0.000002
100 %		+ 20	836,599,981	-19	-0.000002
100 %		+ 30	836,600,022	22	0.000003
100 %		+ 40	836,599,983	-17	-0.000002
100 %		+ 50	836,599,986	-14	-0.000002
115 %	4.26	+ 20	836,599,976	-24	-0.000003
BATT. ENDPOINT	3.40	+ 20	836,599,971	-29	-0.000003

**Table 6-19. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)**

FCC ID: ZNFL40G		FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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**Cellular WCDMA Frequency Stability Measurements (Cont'd)**  
**§2.1055, 22.355; RSS-132 (4.3)**



**Figure 6-2. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)**

<b>FCC ID:</b> ZNFL40G	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)</b>	<b>LG</b>	<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1204180523.ZNF	<b>Test Dates:</b> April 19 - 21, 2012	<b>EUT Type:</b> Portable Handset	Page 30 of 57	

## 6.10 PCS GSM Frequency Stability Measurements

§2.1055, 24.235; RSS-133 (6.3)

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 661

REFERENCE VOLTAGE: 3.7 VDC

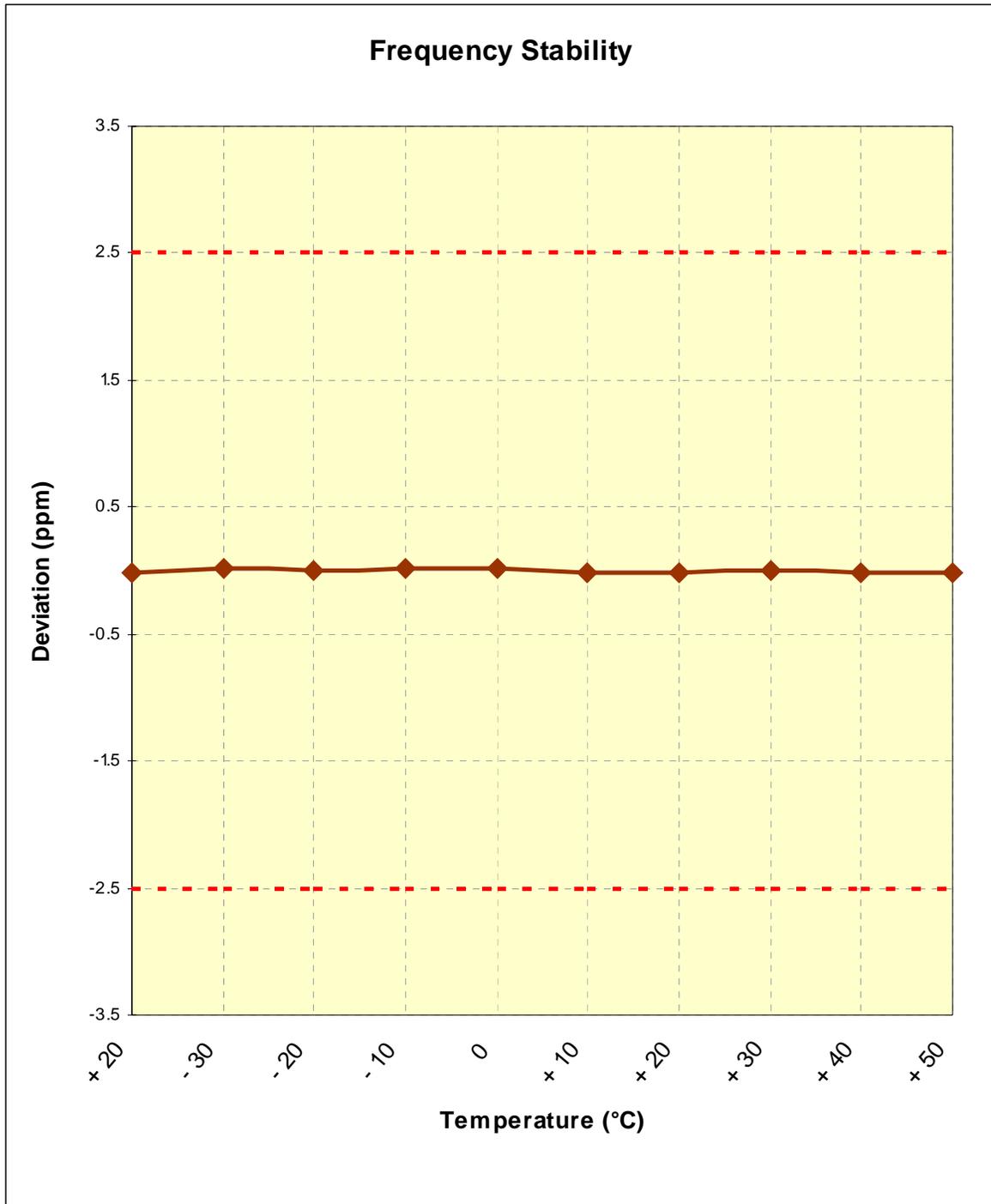
DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,879,999,978	-22	-0.000001
100 %		- 30	1,880,000,019	19	0.000001
100 %		- 20	1,879,999,988	-12	-0.000001
100 %		- 10	1,880,000,017	17	0.000001
100 %		0	1,880,000,016	16	0.000001
100 %		+ 10	1,879,999,980	-20	-0.000001
100 %		+ 20	1,879,999,978	-22	-0.000001
100 %		+ 30	1,879,999,986	-14	-0.000001
100 %		+ 40	1,879,999,979	-21	-0.000001
100 %		+ 50	1,879,999,984	-16	-0.000001
115 %		4.26	+ 20	1,879,999,975	-25
BATT. ENDPOINT	3.40	+ 20	1,879,999,969	-31	-0.000002

**Table 6-20. Frequency Stability Data (PCS GSM Mode – Ch. 661)**

FCC ID: ZNFL40G		FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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**PCS GSM Frequency Stability Measurements (Cont'd)**  
§2.1055, 24.235; RSS-133 (6.3)



**Figure 6-3. Frequency Stability Graph (PCS GSM Mode – Ch. 661)**

<b>FCC ID:</b> ZNFL40G		<b>FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1204180523.ZNF	<b>Test Dates:</b> April 19 - 21, 2012	<b>EUT Type:</b> Portable Handset		Page 32 of 57

### 6.11 PCS WCDMA Frequency Stability Measurements

§2.1055, 24.235; RSS-133 (6.3)

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 9400

REFERENCE VOLTAGE: 3.7 VDC

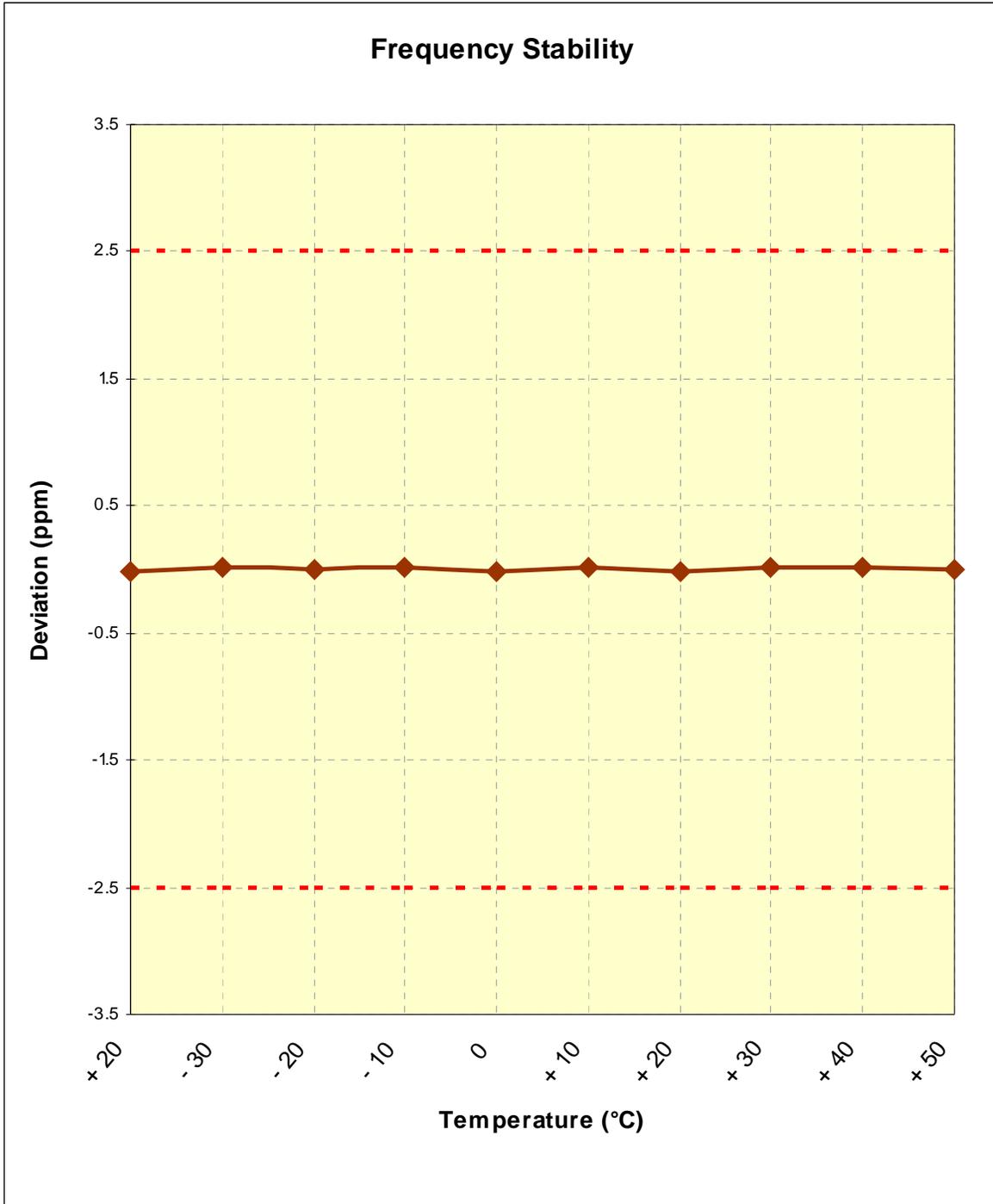
DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,879,999,980	-20	-0.000001
100 %		- 30	1,880,000,019	19	0.000001
100 %		- 20	1,880,000,012	12	0.000001
100 %		- 10	1,880,000,018	18	0.000001
100 %		0	1,879,999,984	-16	-0.000001
100 %		+ 10	1,880,000,017	17	0.000001
100 %		+ 20	1,879,999,980	-20	-0.000001
100 %		+ 30	1,880,000,022	22	0.000001
100 %		+ 40	1,880,000,023	23	0.000001
100 %		+ 50	1,879,999,989	-11	-0.000001
115 %		4.26	+ 20	1,879,999,976	-24
BATT. ENDPOINT	3.40	+ 20	1,879,999,972	-28	-0.000001

**Table 6-21. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)**

FCC ID: ZNFL40G		FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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**PCS WCDMA Frequency Stability Measurements (Cont'd)**  
§2.1055, 24.235; RSS-133 (6.3)



**Figure 6-4. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)**

FCC ID: ZNFL40G		FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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## 6.12 Receiver Spurious Emissions

**RSS-132 (4.6), RSS-133 (6.6)**

Frequency [MHz]	Level [dBm]	AFCL [dB/m]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
229.82	-90.92	13.47	H	1.2	165	29.55	46.02	-16.47
236.61	-89.45	13.53	H	1.2	135	31.09	46.02	-14.93
337.49	-93.47	16.68	H	1.4	220	30.21	46.02	-15.81
436.43	-94.66	19.16	H	1.2	180	31.50	46.02	-14.52
508.21	-94.25	20.19	H	1.2	45	32.95	46.02	-13.08
549.92	-93.55	21.21	H	1.2	15	34.66	46.02	-11.36

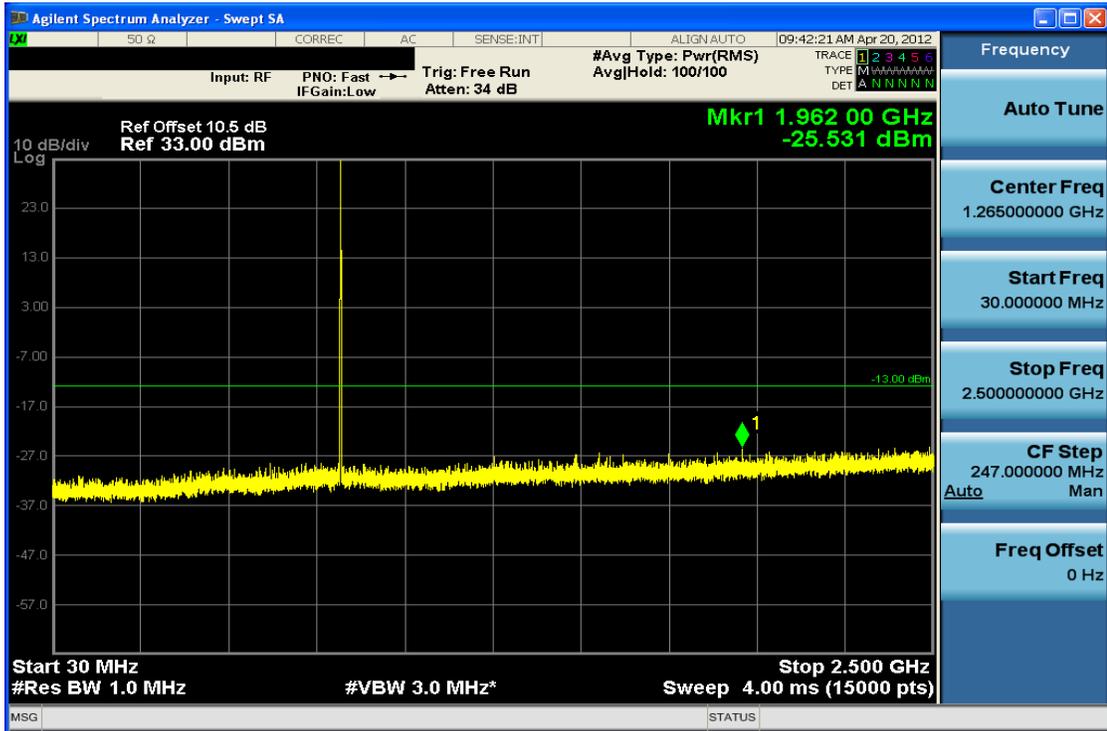
**Table 6-22. Radiated Measurements at 3-meters**

**NOTES:**

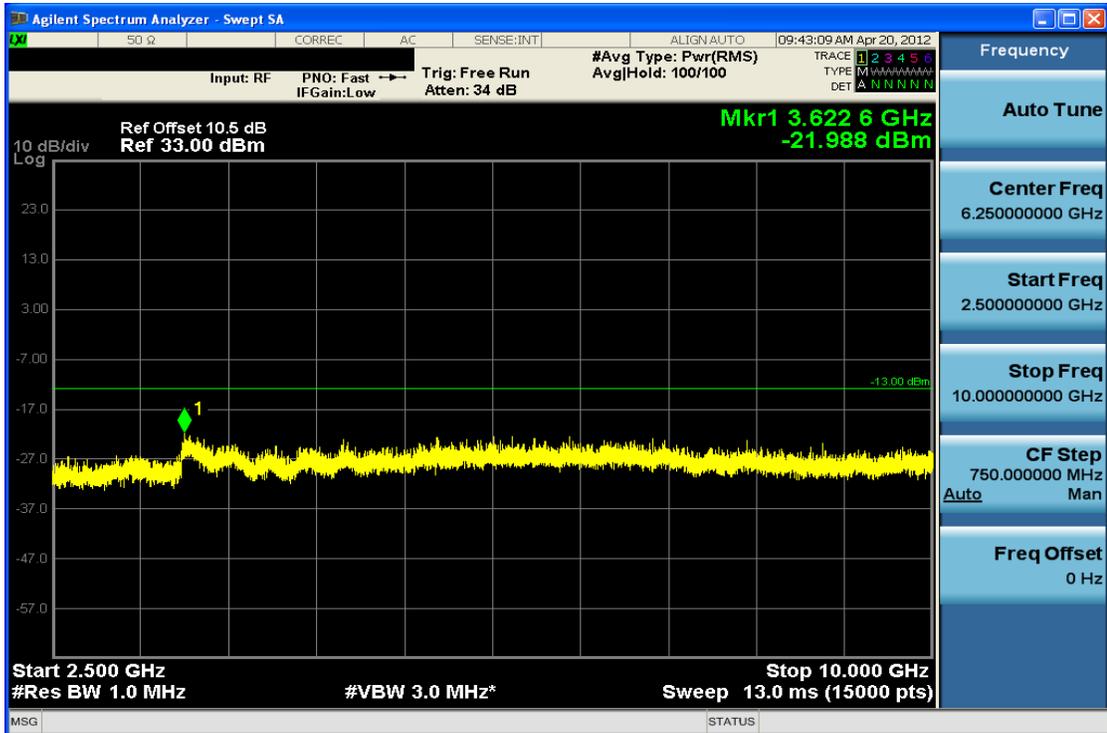
- All modes of operation were investigated and the worst-case emissions are reported.
- Radiated emissions were measured from 30MHz – 6000MHz to ensure that the provisions of 15.33(b)(1) are satisfied with respect to the upper frequency scanning range.
- The radiated limits for unintentional radiators at a distance of 3 meters are used in the table above, as specified in 15.109(a).
- All readings are calibrated by a signal generator with accuracy traceable to the National Institute of Standards and Technology (NIST).
- AFCL (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
- Level (dB $\mu$ V/m) = Analyzer Reading (dBm) + AFCL (dB/m) + 107
- Margin (dB) = Field strength (dB $\mu$ V/m) – Limit (dB $\mu$ V/m)
- Measurements are made using a CISPR quasi-peak detector with a 100kHz resolution bandwidth. Above 1GHz, peak measurements are made using a peak detector with a resolution bandwidth of 1MHz and a video bandwidth of 3MHz and average measurements are made with a peak detector using a resolution bandwidth of 1MHz and a video bandwidth of 10Hz.
- Calibrated linearly polarized broadband and horn antennas were used for measurements below and above 1GHz, respectively. For measurements made below 1GHz, the results recorded using the broadband antenna are known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy.
- Calibrated low-loss microwaves cables and broadband amplifiers are used.

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## 7.0 PLOTS OF EMISSIONS



**Plot 7-1. Conducted Spurious Plot (Cellular GSM Mode – Ch. 128)**

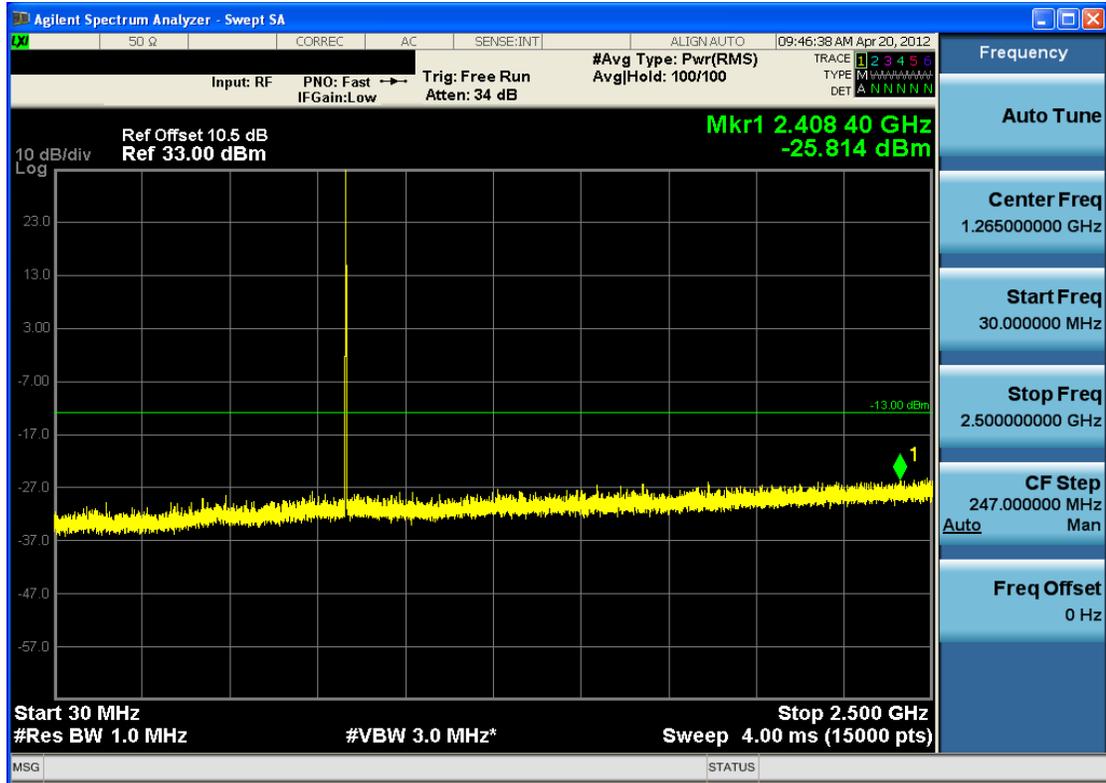


**Plot 7-2. Conducted Spurious Plot (Cellular GSM Mode – Ch. 128)**

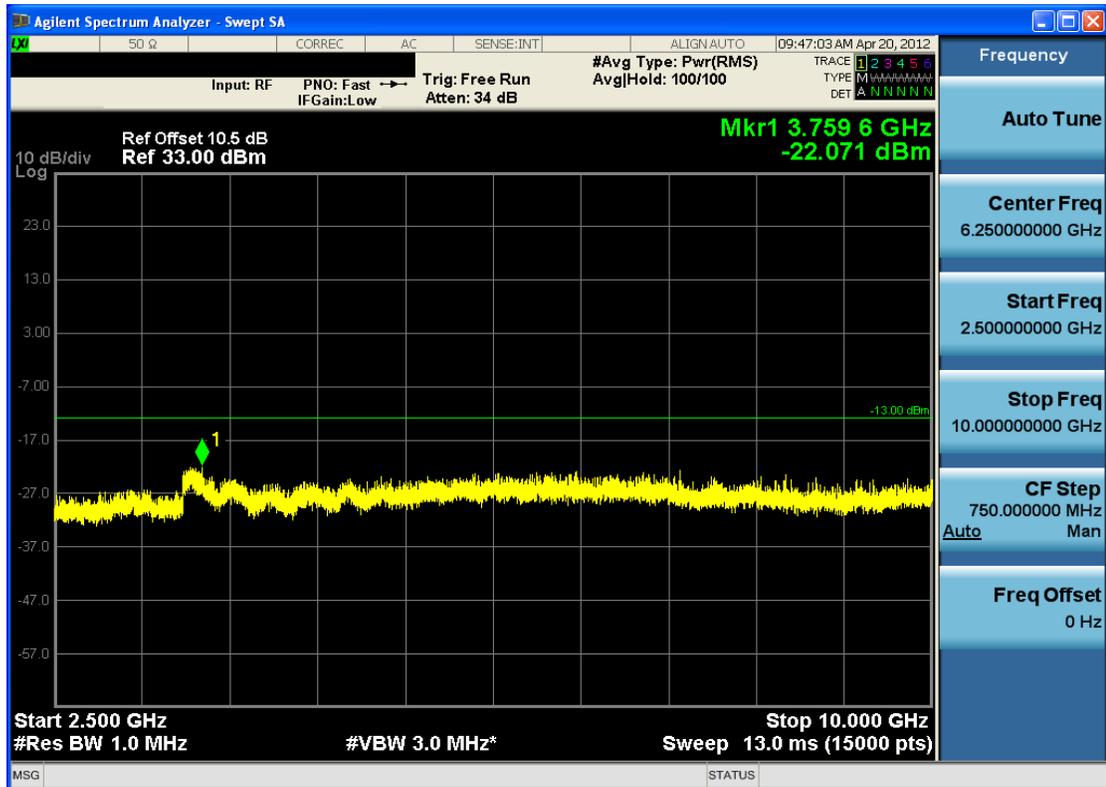
FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 36 of 57





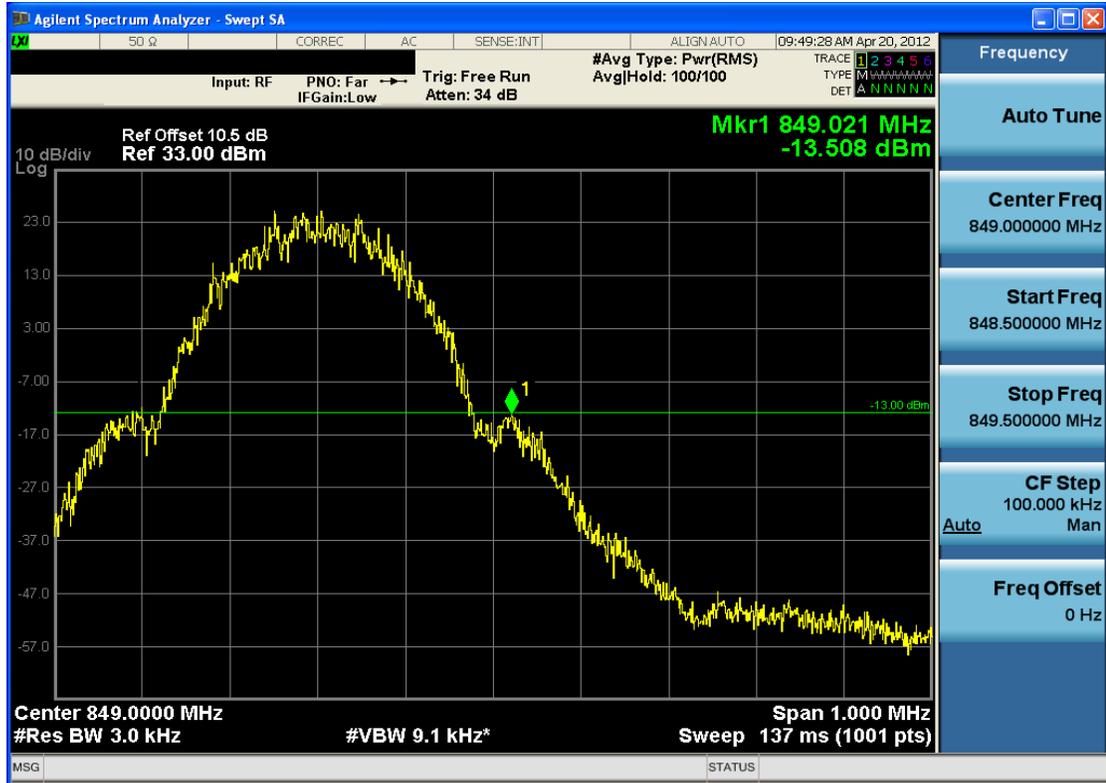


Plot 7-7. Conducted Spurious Plot (Cellular GSM Mode – Ch. 251)

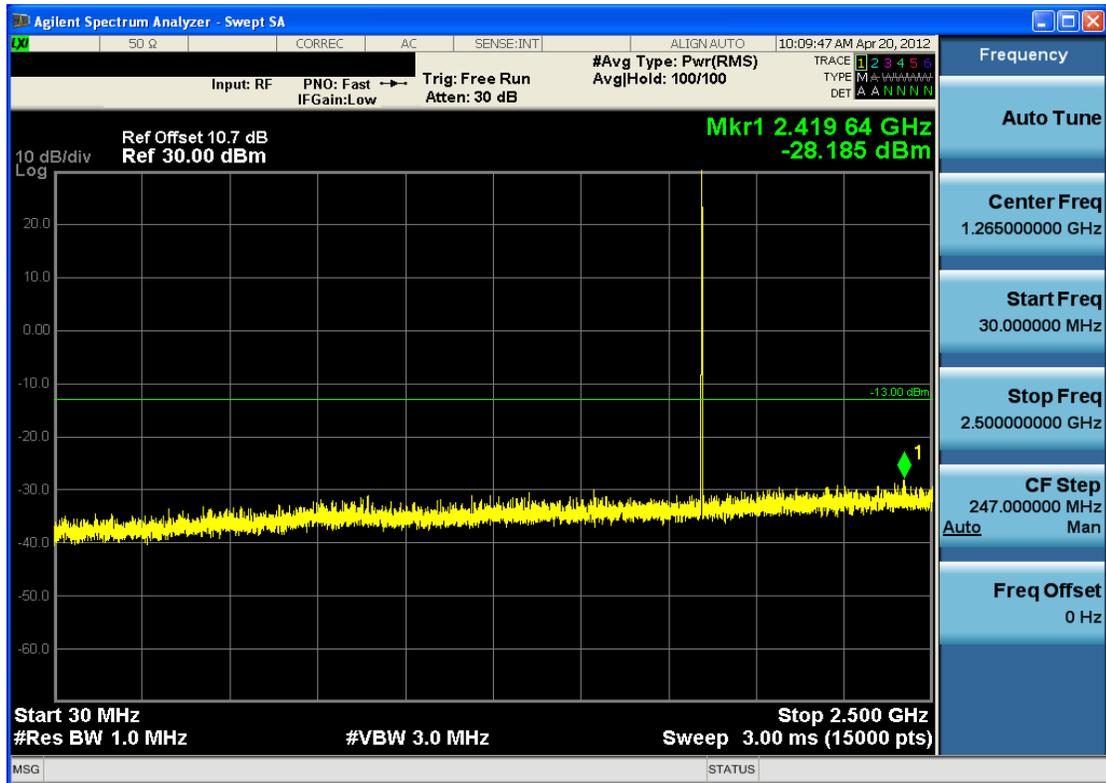


Plot 7-8. Conducted Spurious Plot (Cellular GSM Mode – Ch. 251)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 39 of 57



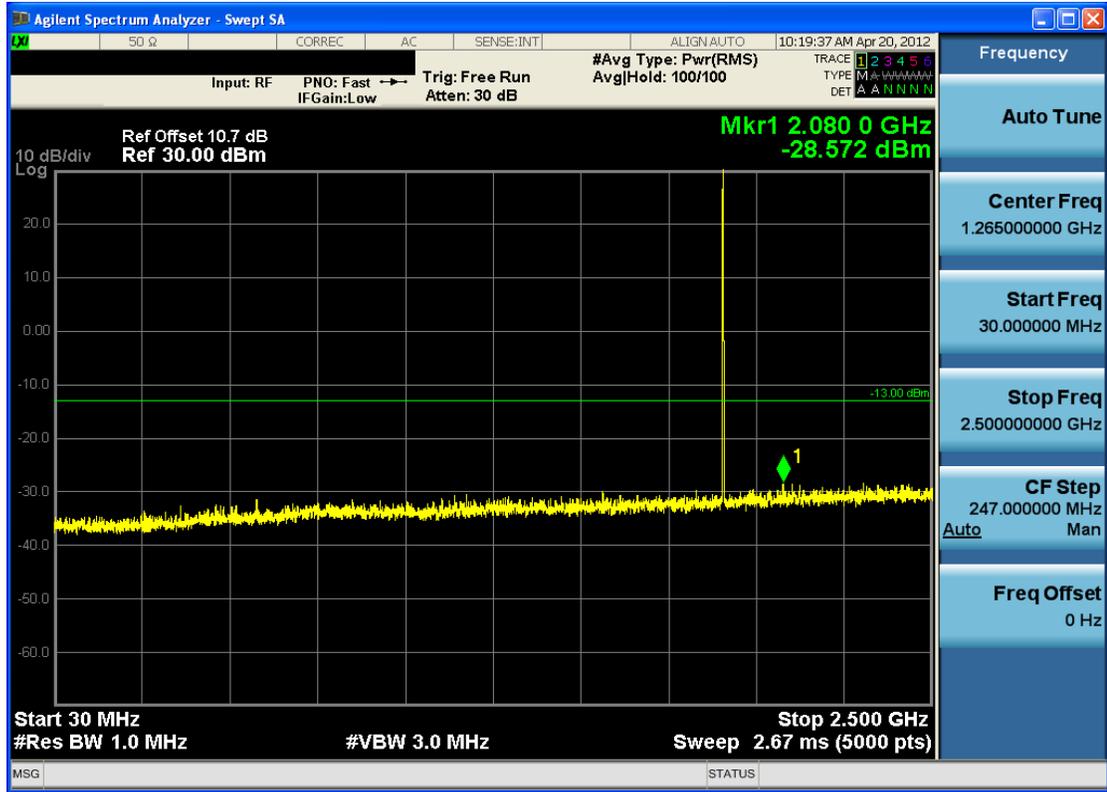
Plot 7-9. Band Edge Plot (Cellular GSM Mode – Ch. 251)



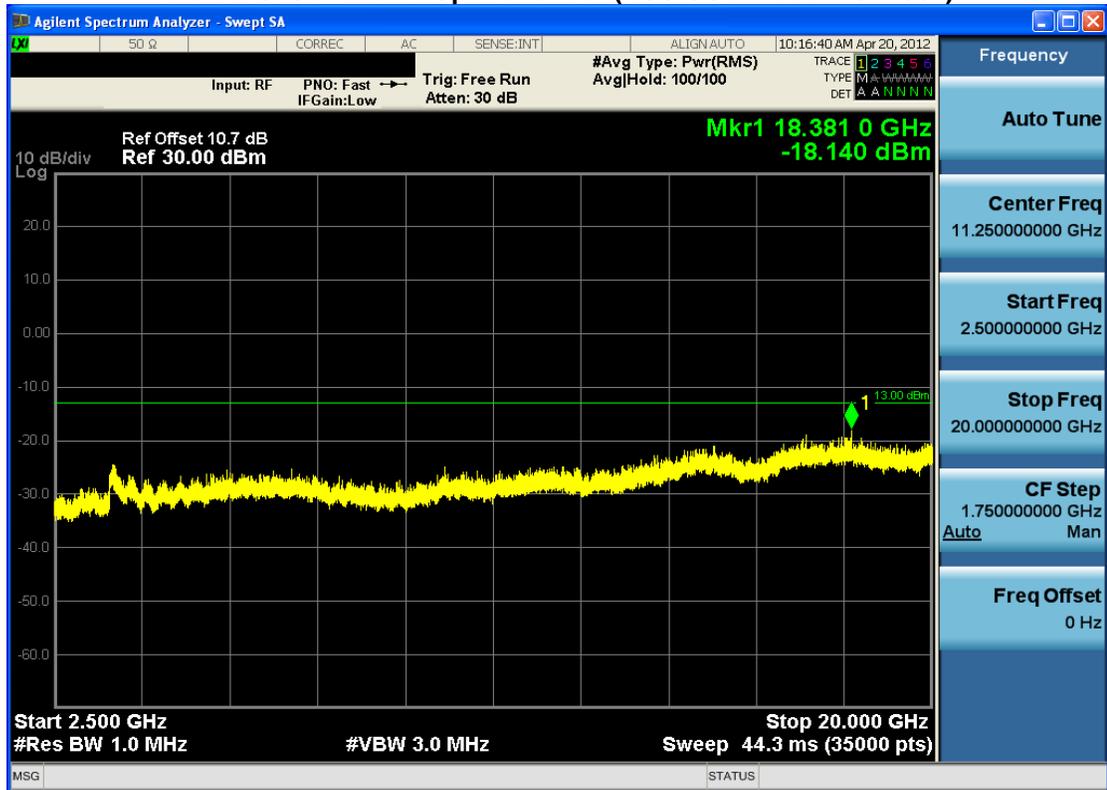
Plot 7-10. Conducted Spurious Plot (PCS GSM Mode – Ch. 512)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 40 of 57





Plot 7-13. Conducted Spurious Plot (PCS GSM Mode – Ch. 661)

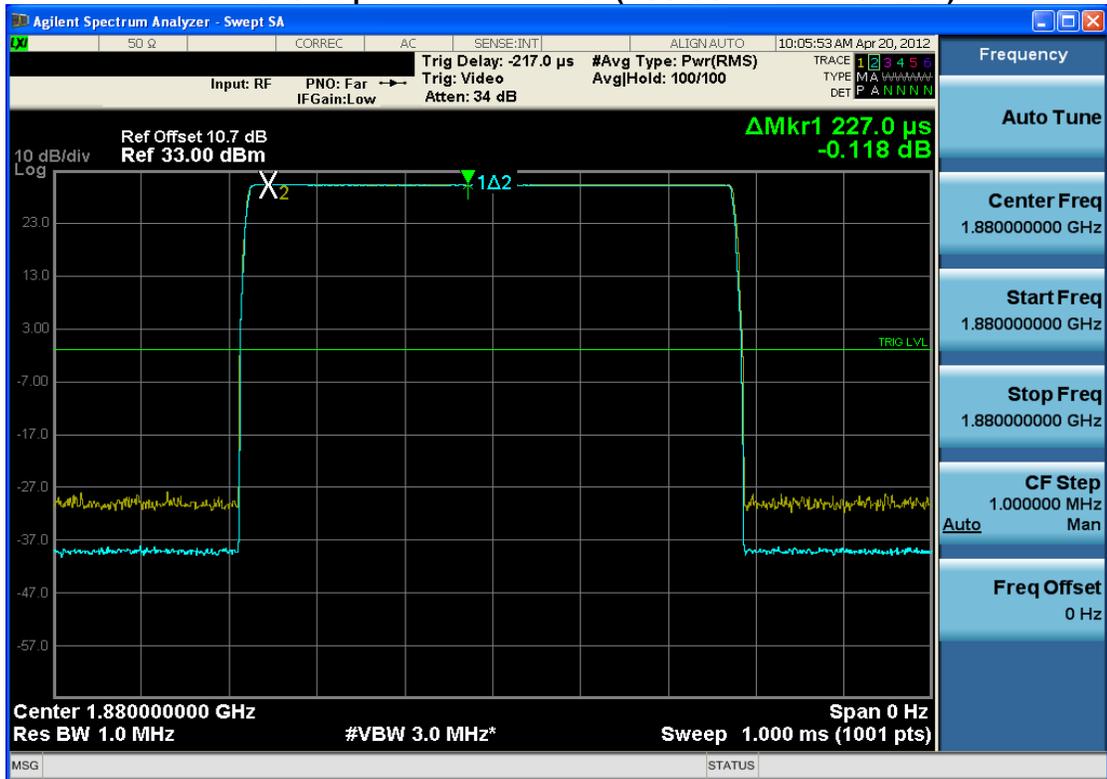


Plot 7-14. Conducted Spurious Plot (PCS GSM Mode – Ch. 661)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
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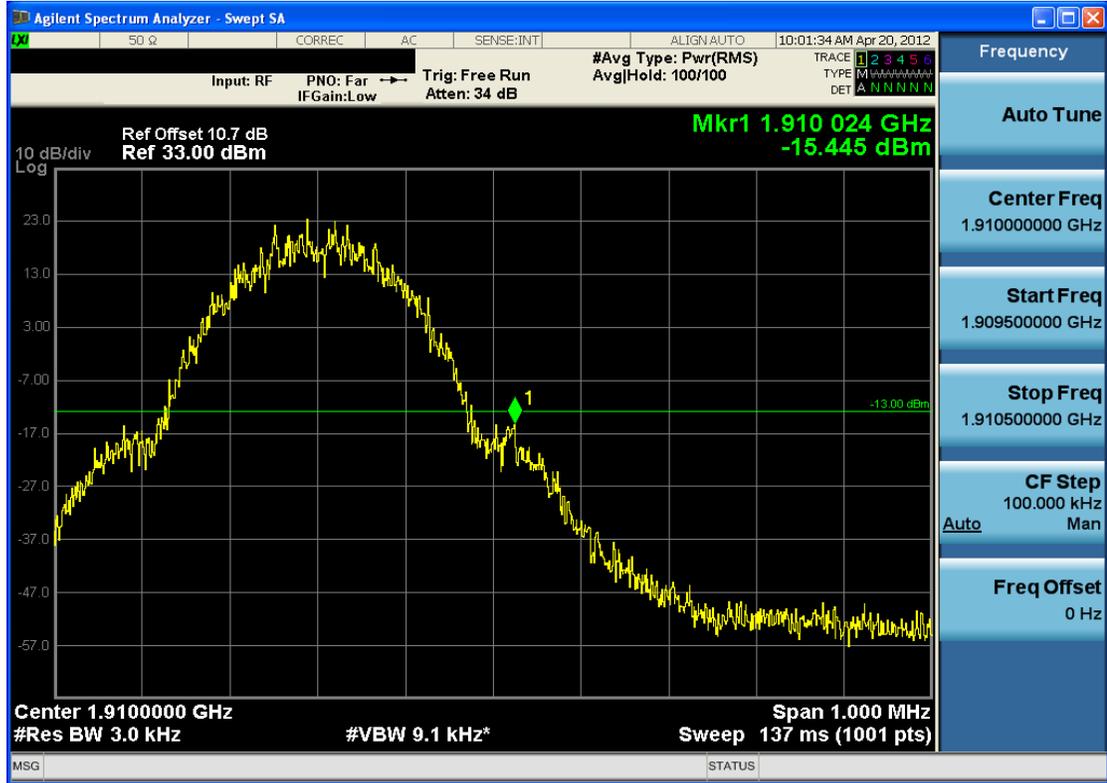
Plot 7-15. Occupied Bandwidth Plot (PCS GSM Mode – Ch. 661)



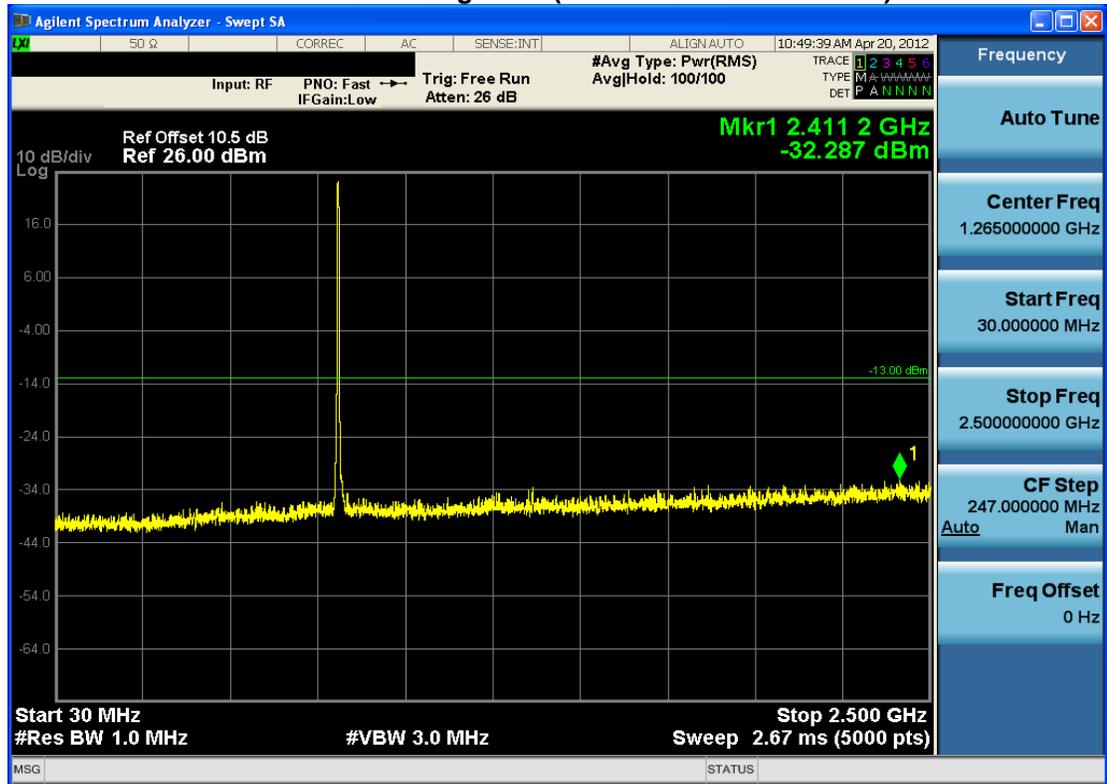
Plot 7-16. Peak-Average Ratio Plot (PCS GSM Mode – Ch. 661)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 43 of 57



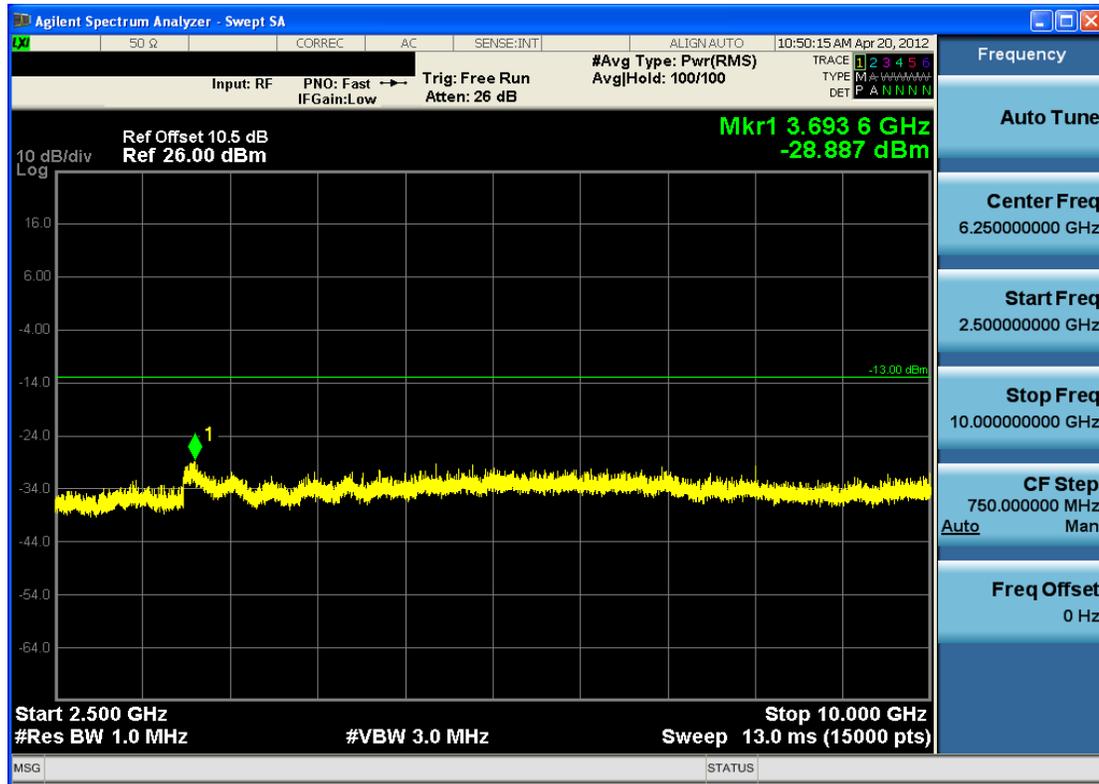


Plot 7-19. Band Edge Plot (PCS GSM Mode – Ch. 810)

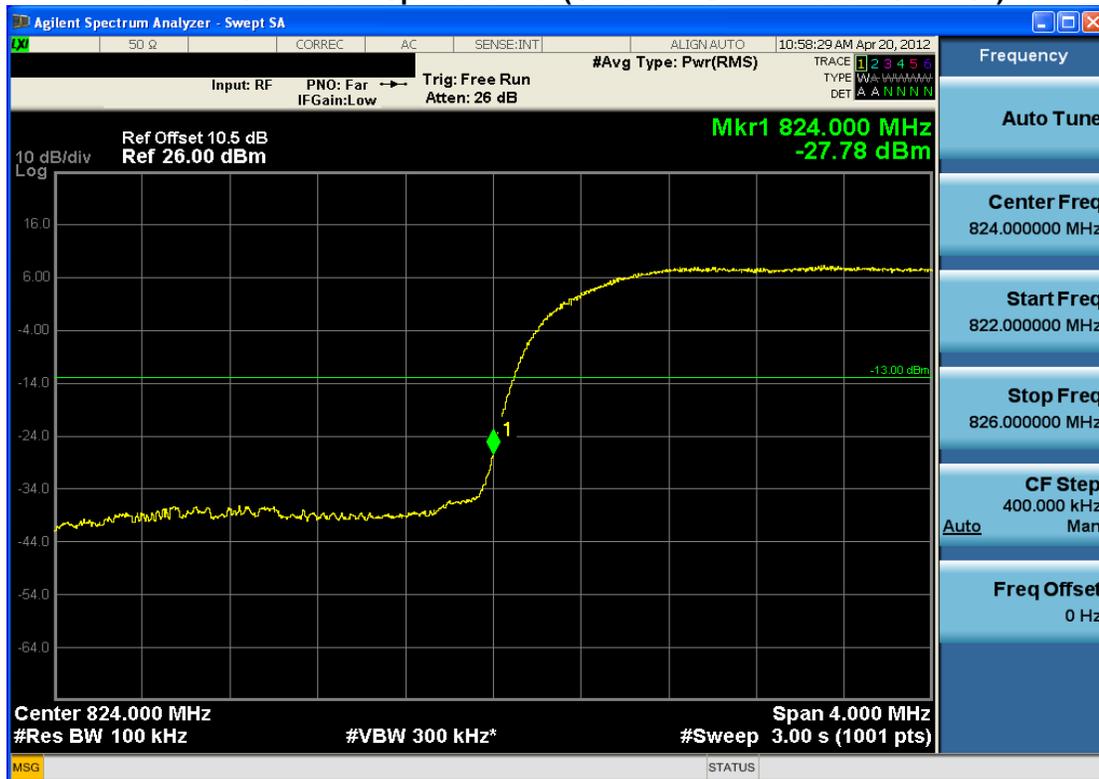


Plot 7-20. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 45 of 57



Plot 7-21. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)

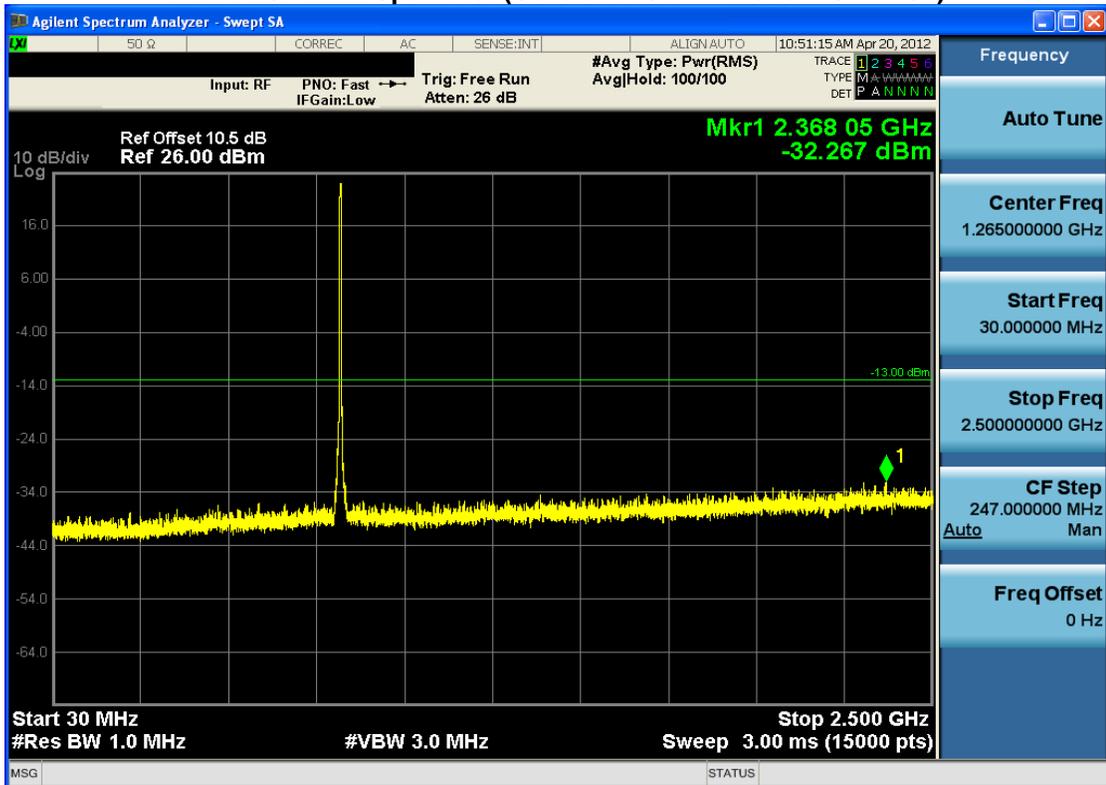


Plot 7-22. Band Edge Plot (Cellular WCDMA Mode – Ch. 4132)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 46 of 57

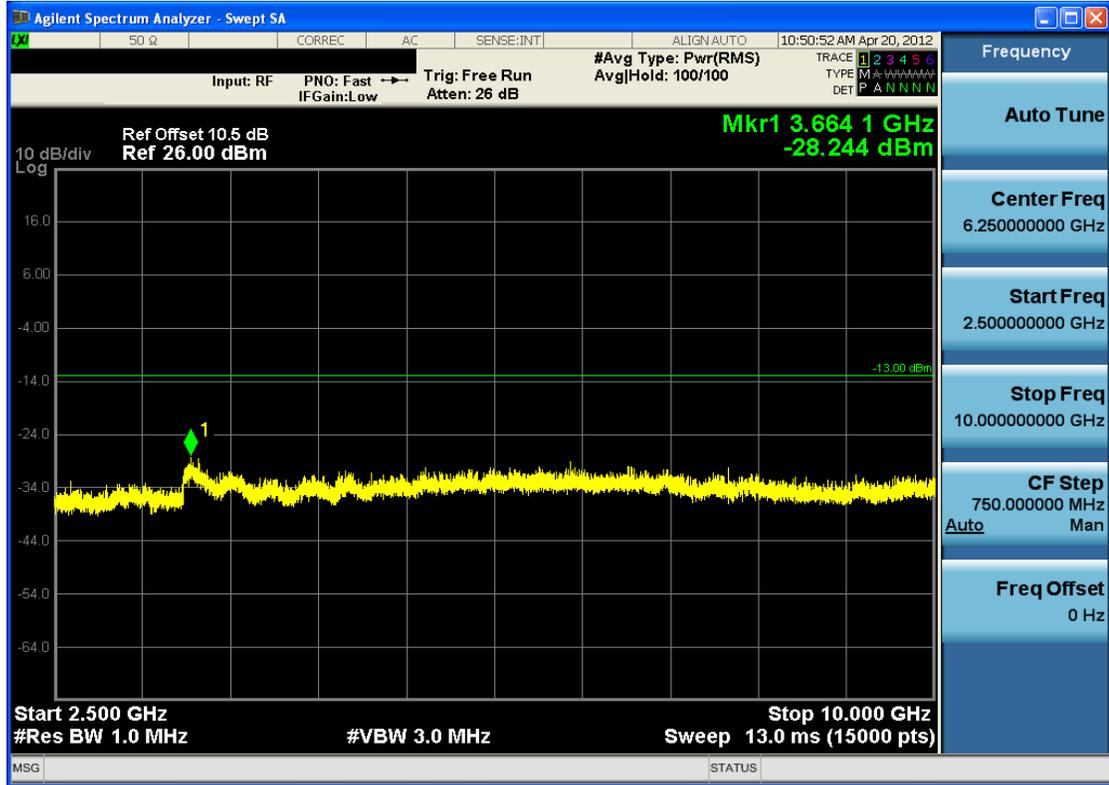


Plot 7-23. 4MHz Span Plot (Cellular WCDMA Mode – Ch. 4132)

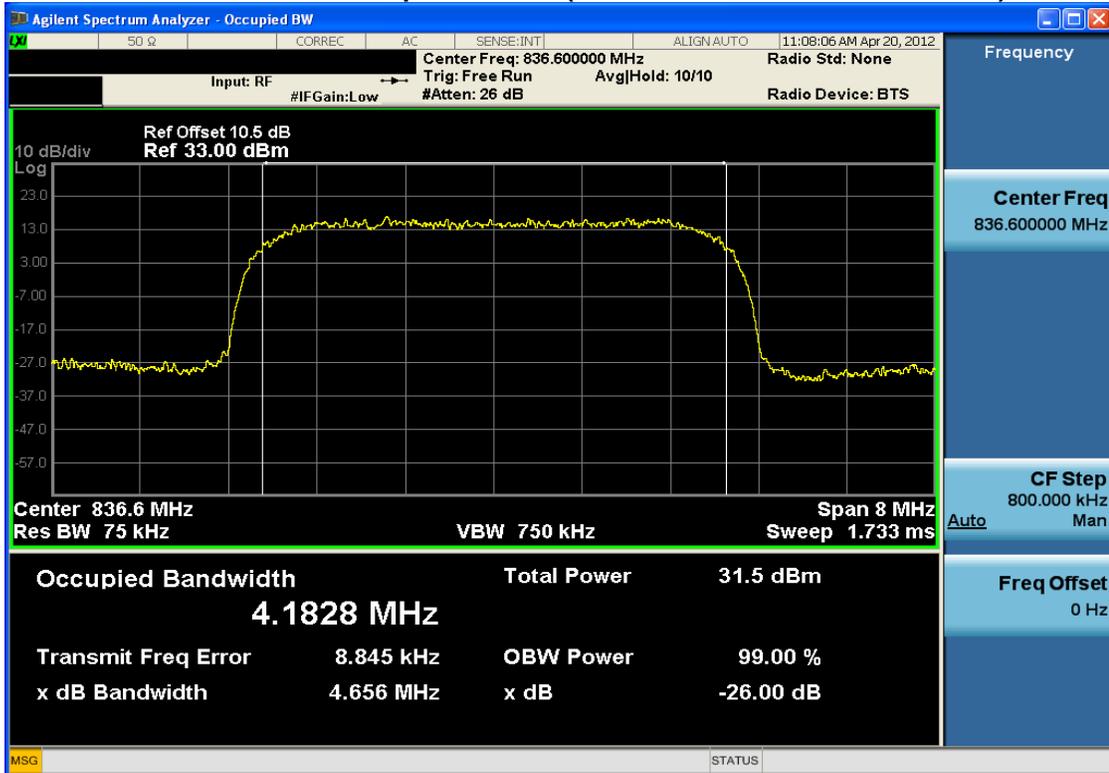


Plot 7-24. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 47 of 57

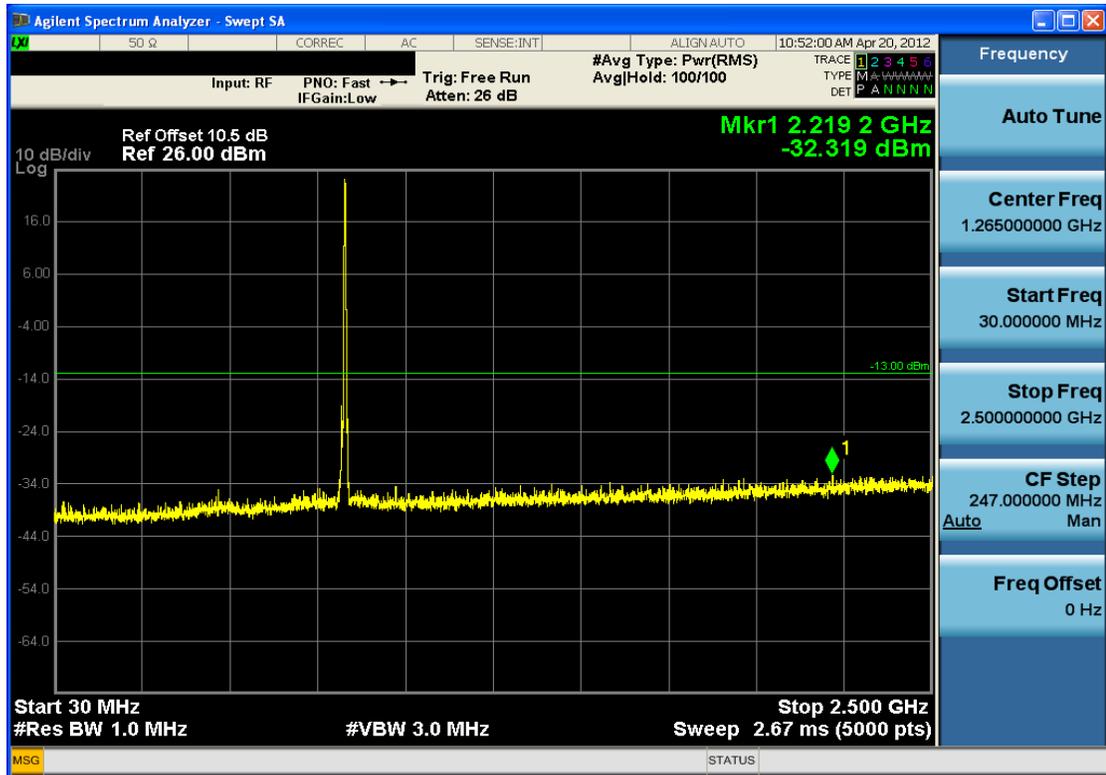


**Plot 7-25. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)**

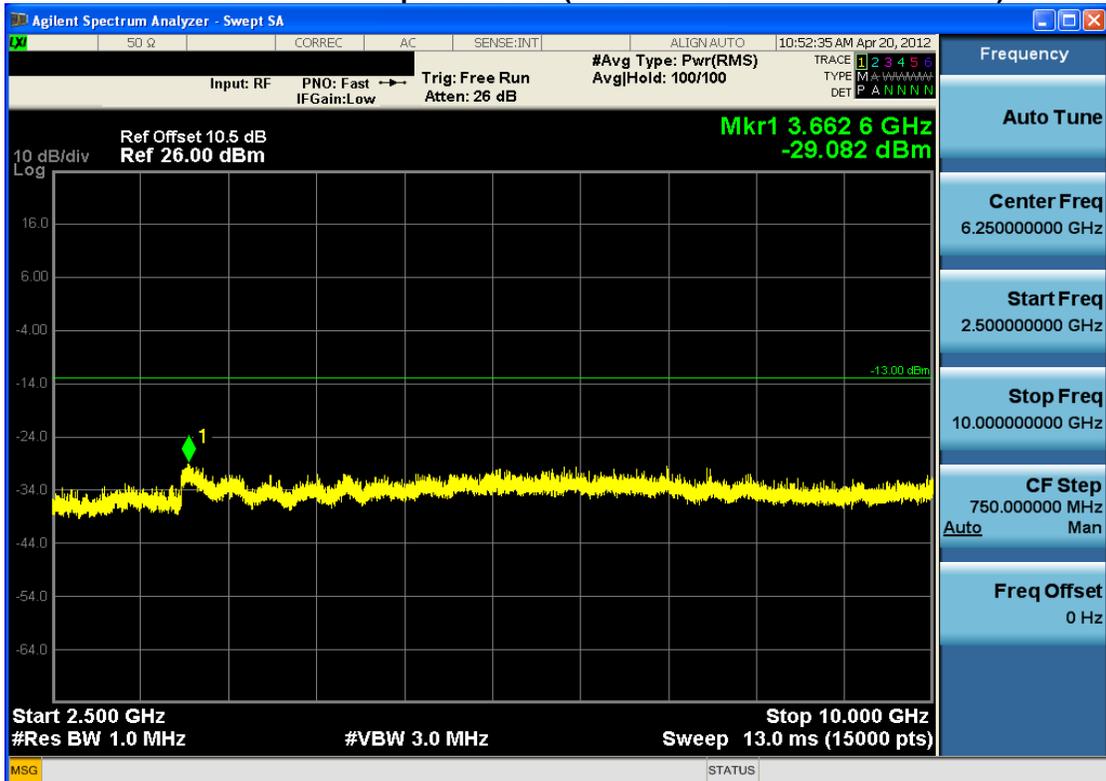


**Plot 7-26. Occupied Bandwidth Plot (Cellular WCDMA Mode – Ch. 4183)**

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 48 of 57

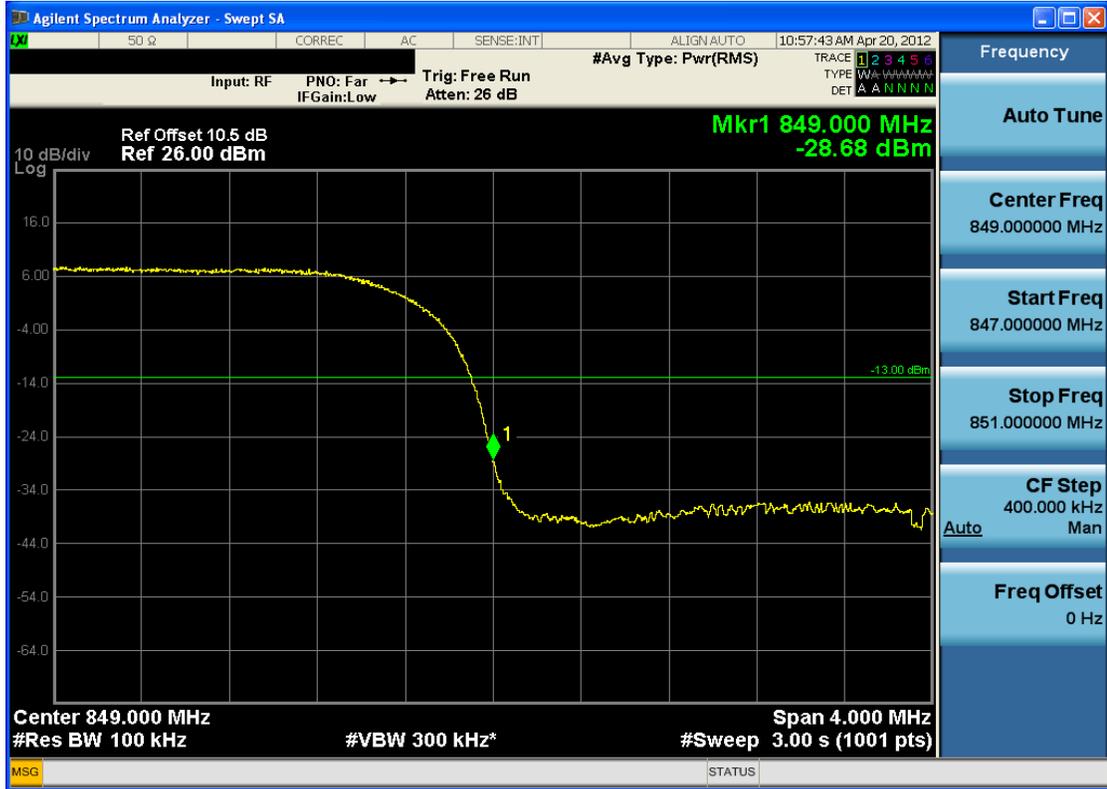


Plot 7-27. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)



Plot 7-28. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 49 of 57

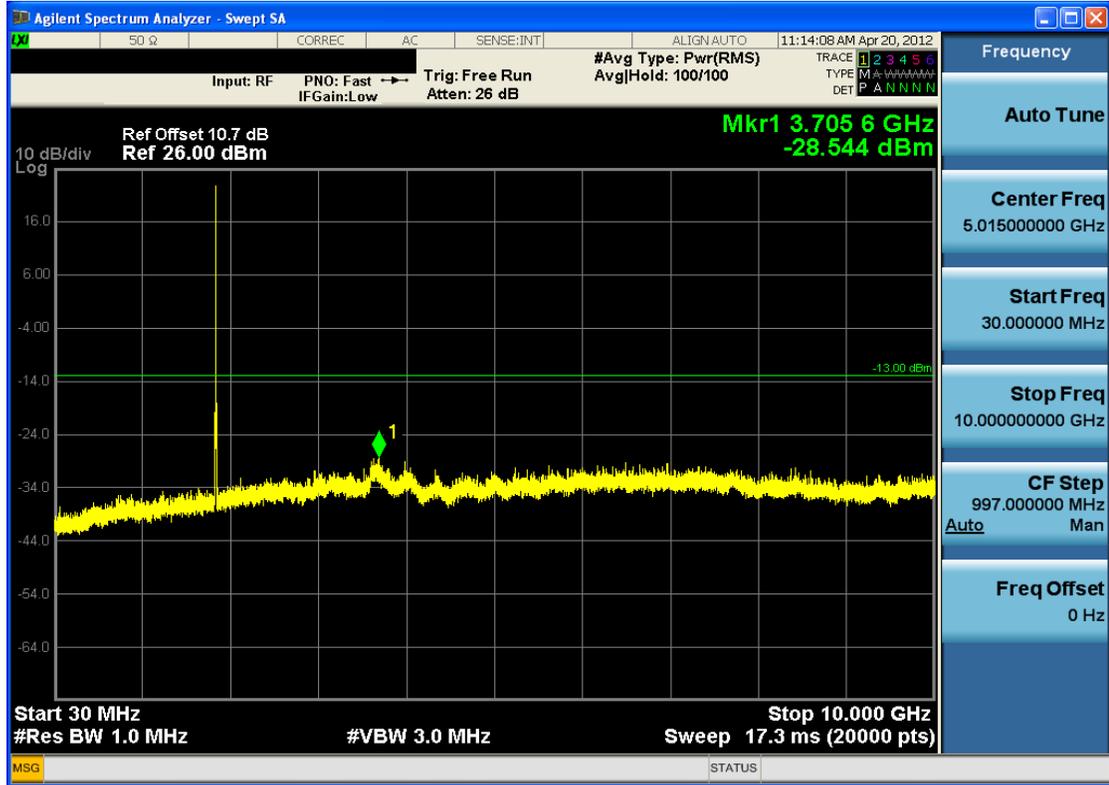


Plot 7-29. Band Edge Plot (Cellular WCDMA Mode – Ch. 4233)

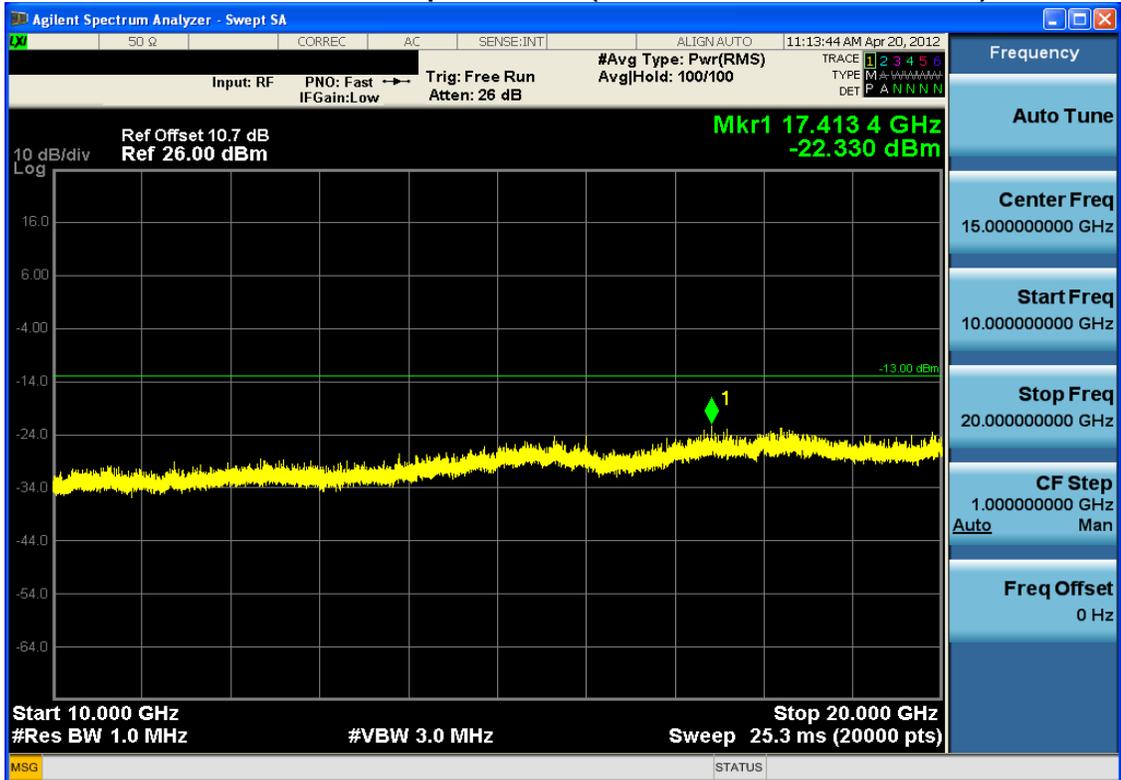


Plot 7-30. 4MHz Span Plot (Cellular WCDMA Mode – Ch. 4233)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 50 of 57

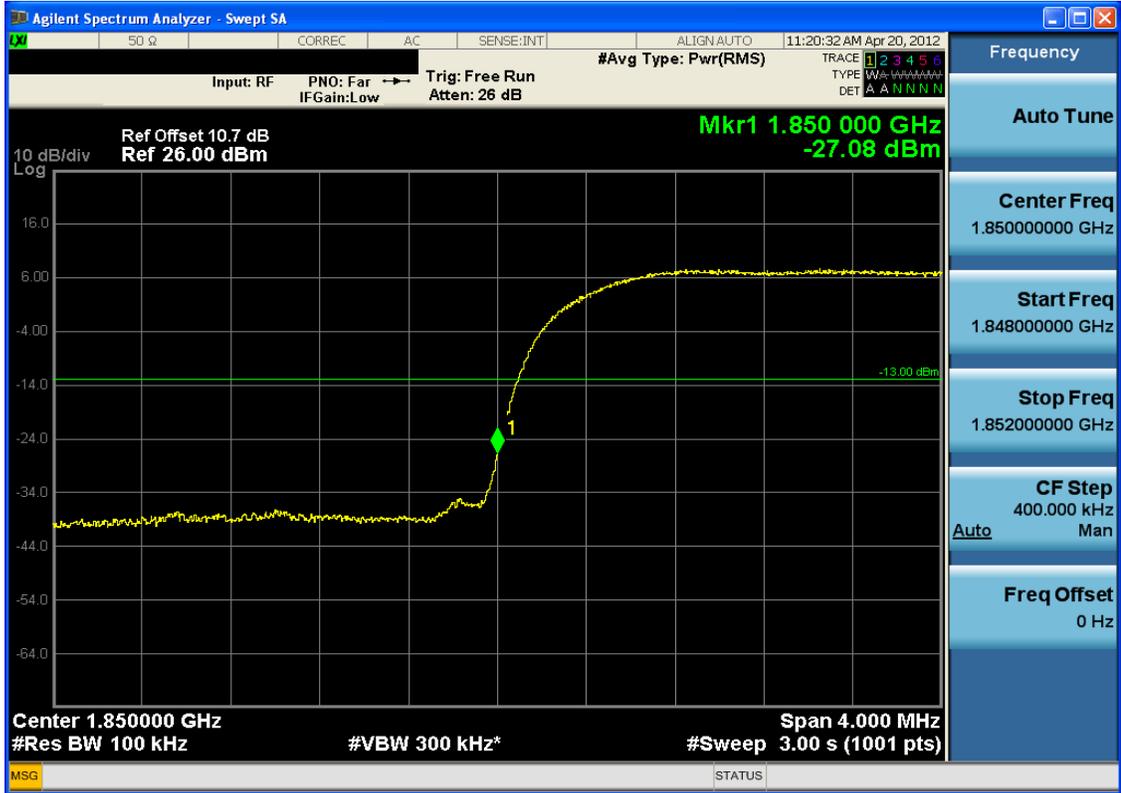


Plot 7-31. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)



Plot 7-32. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 51 of 57

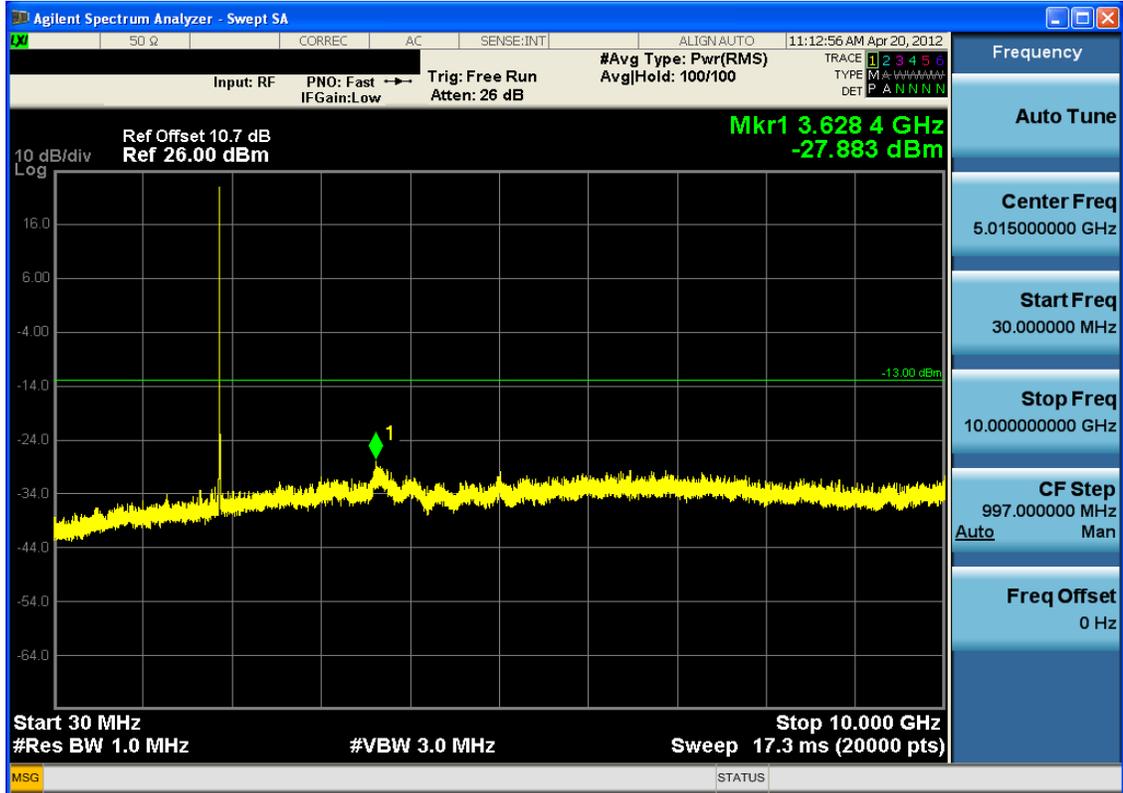


Plot 7-33. Band Edge Plot (PCS WCDMA Mode – Ch. 9262)

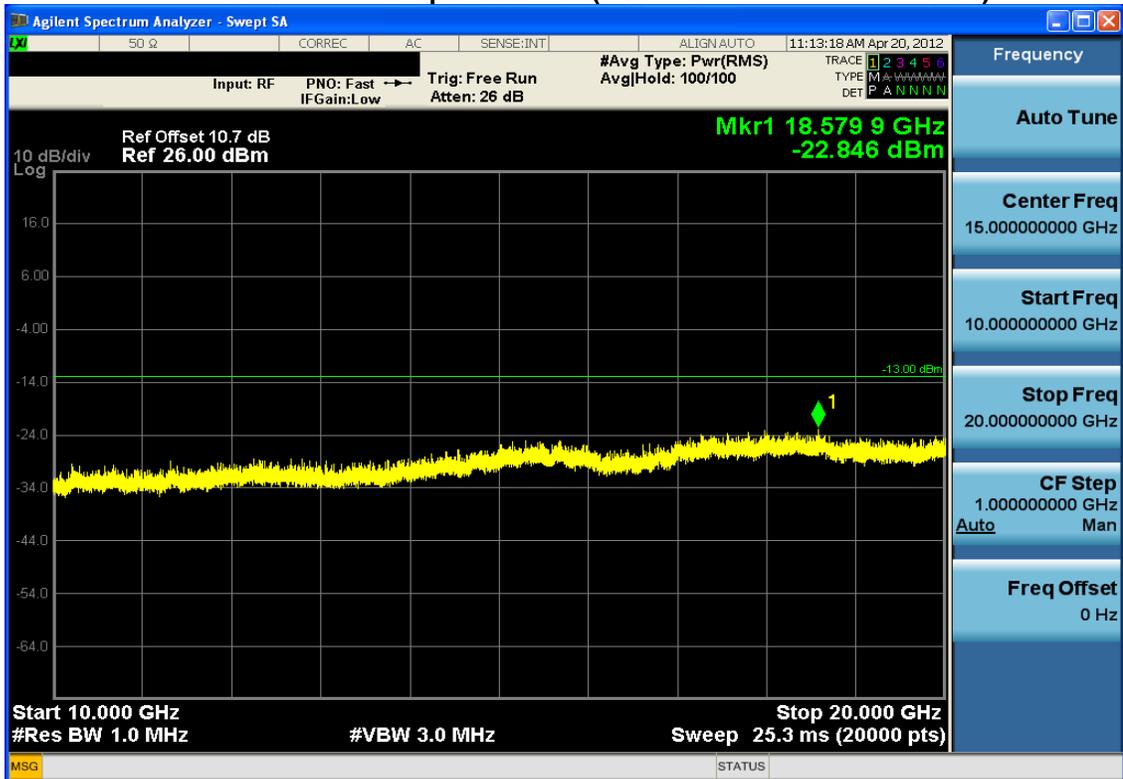


Plot 7-34. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9262)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 52 of 57

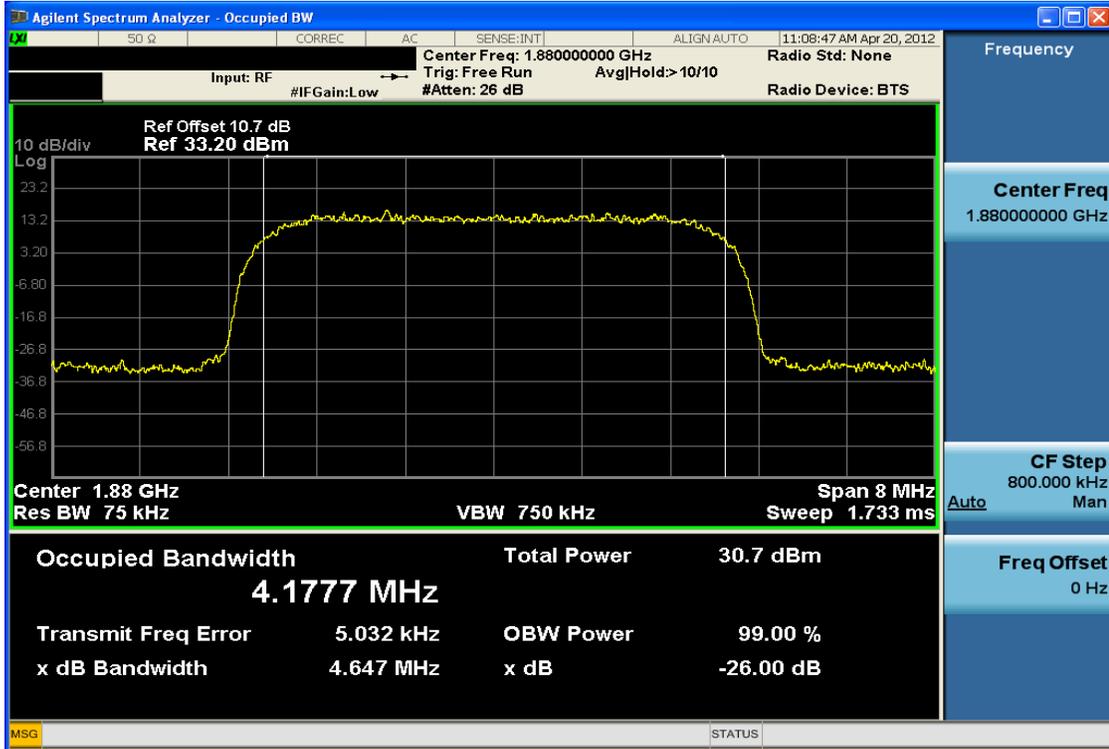


Plot 7-35. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9400)

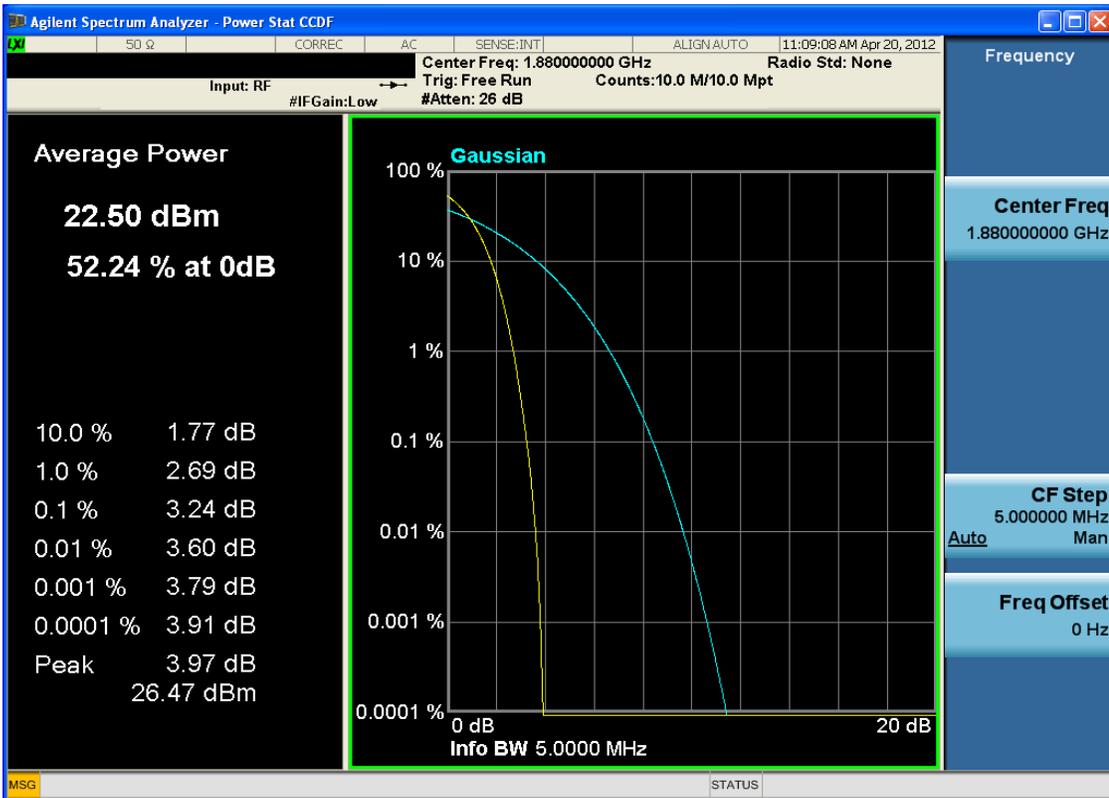


Plot 7-36. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 53 of 57

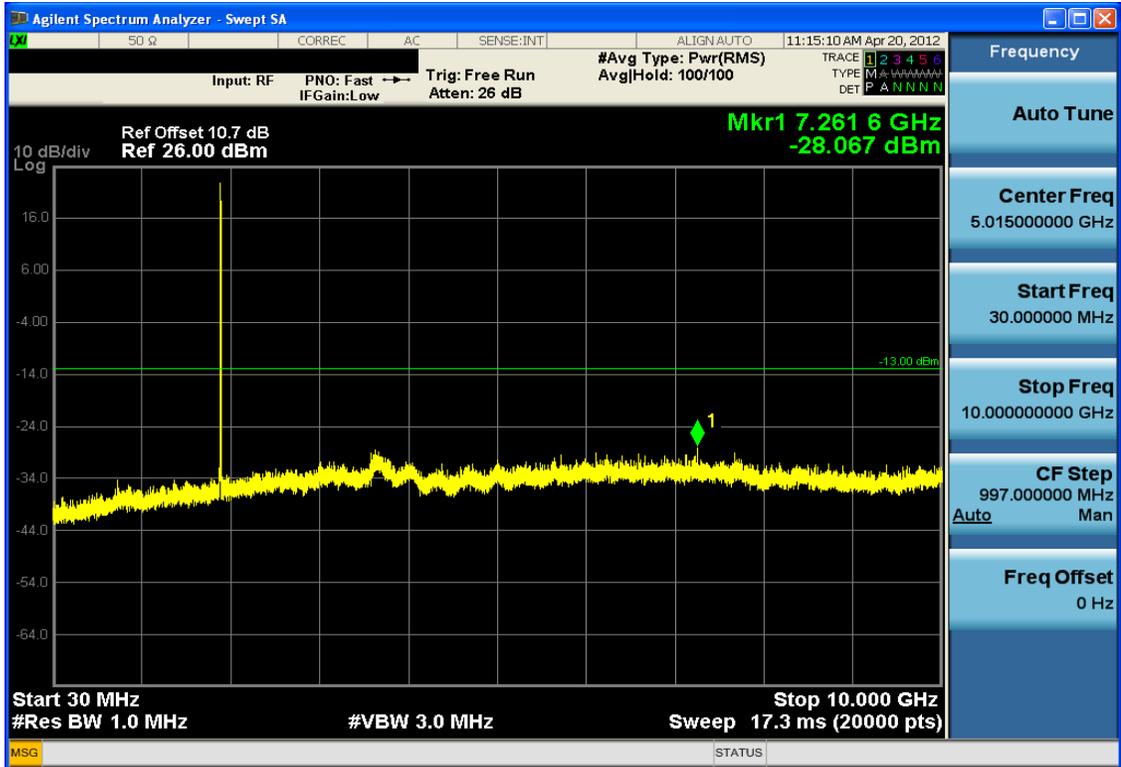


Plot 7-37. Occupied Bandwidth Plot (PCS WCDMA Mode – Ch. 9400)



Plot 7-38. Peak-Average Ratio Plot (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFL40G	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 54 of 57



**Plot 7-39. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)**

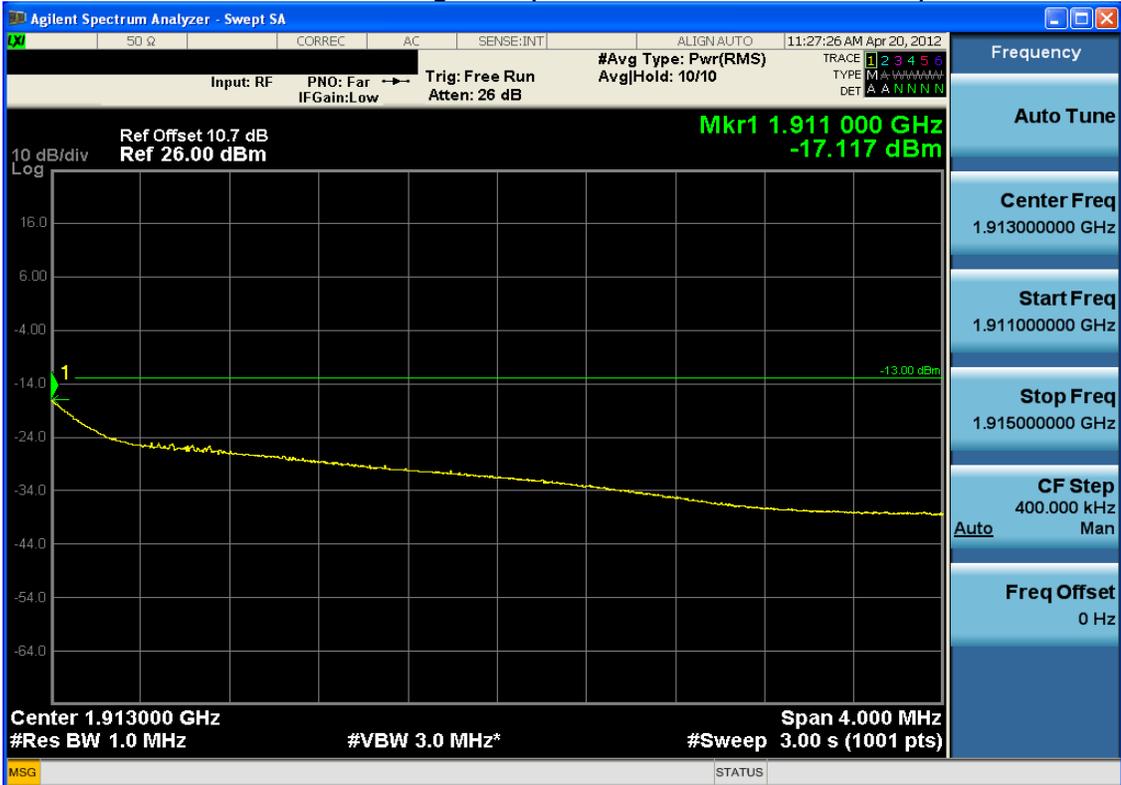


**Plot 7-40. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)**

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 55 of 57



Plot 7-41. Band Edge Plot (PCS WCDMA Mode – Ch. 9538)



Plot 7-42. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9538)

FCC ID: ZNFL40G	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1204180523.ZNF	Test Dates: April 19 - 21, 2012	EUT Type: Portable Handset		Page 56 of 57

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFL40G** complies with all the requirements of Parts 2, 22, and 24 of the FCC rules and RSS-132 and RSS-133 of the Industry Canada rules.

<b>FCC ID:</b> ZNFL40G		<b>FCC Pt. 22/24 GSM/WCDMA MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1204180523.ZNF	<b>Test Dates:</b> April 19 - 21, 2012	<b>EUT Type:</b> Portable Handset		Page 57 of 57