

PCTEST ENGINEERING LABORATORY, INC.

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## **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: 1/20-2/18/2016 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 0Y1601180117-R2.ZNF

## FCC ID:

## ZNFVS987

APPLICANT:

## LG ELECTRONICS MOBILECOMM U.S.A.

**Application Type:** 

Model(s):

EUT Type: FCC Classification: FCC Rule Part(s): Test Procedure(s): Test Device Serial No.: Certification LG-VS987, LG-US992, LG-RS988, LG-VS987T, LG-VS987G, LG-VS987P, LGVS987, VS987, LGUS992, US992, LGRS988, RS988, LG-RS988L, LGRS988L, RS988L Portable Handset PCS Licensed Transmitter Held to Ear (PCE) §2 §22(H) §24(E) §27(L) ANSI/TIA-603-C-2004, KDB 971168 v02r02 *identical prototype* [S/N: 03738, 03746, 03720]

			ERP/	EIRP
Mode	Tx Frequency (MHz)	Emission Designator	Max. Power (W)	Max. Power (dBm)
GSM850	824.2 - 848.8	240KGXW	2.453	33.90
EDGE850	824.2 - 848.8	243KG7W	0.624	27.95
GSM1900	1850.2 - 1909.8	246KGXW	0.773	28.88
EDGE1900	1850.2 - 1909.8	244KG7W	0.235	23.71
CDMA850	824.70 - 848.31	1M27F9W	0.204	23.10
CDMA1900	1851.25 - 1908.75	1M27F9W	0.068	18.31
WCDMA850	826.4 - 846.6	4M14F9W	0.311	24.93
WCDMA1700	1712.4 - 1752.6	4M13F9W	0.179	22.53
WCDMA1900	1852.4 - 1907.6	4M16F9W	0.319	25.04

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: 0Y1601180117-R2.ZNF) supersedes and replaces the previously issued test report (S/N: 0Y1601180117-R1.ZNF) 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 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.





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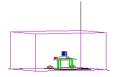


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## MEASUREMENT REPORT FCC Part 22, 24, & 27



## §2.1033 General Information

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-VS987			
FCC ID:	ZNFVS987			
FCC CLASSIFICATION:	PCS Licensed Transmitter Held to Ear (PCE)			
MODE:	GSM/ CDMA / WCDMA			
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)			
Test Device Serial No.:	03738, 03746, 03720			
DATE(S) OF TEST:	1/20-2/18/2016			
TEST REPORT S/N:	0Y1601180117-R2.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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## 1.0 INTRODUCTION

## 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.

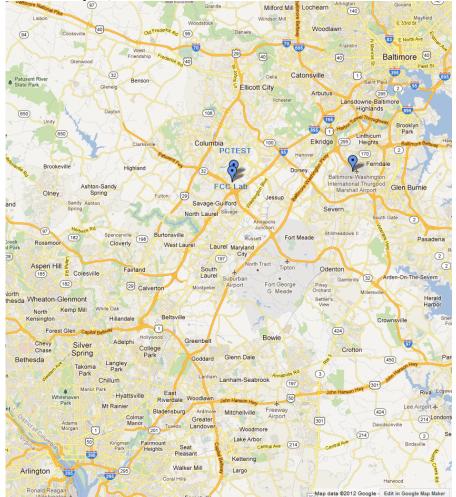


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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## 2.0 PRODUCT INFORMATION

## 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFVS987**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

For PCS Band CDMA, this device employs an antenna switching mechanism that allows the EUT's uplink transmission to switch entirely from the main antenna to the diversity antenna. Both antennas cannot transmit simultaneously so dual transmission conditions were not investigated. The diversity transmit antenna transmits at a lower power level than the main antenna. Test data for the diversity antenna's EIRP are reported herein.

This EUT supports a Camera Module accessory (Model: CBG-700) that can be installed on the EUT. Additional ERP/EIRP and spurious emission measurements were performed with a Camera Module accessory installed on the EUT to ensure compliance. The worst case radiated emissions data is reported herein.

## 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC

## 2.3 Test Configuration

The LG Portable Handset FCC ID: ZNFVS987 was tested per the guidance of ANSI/TIA-603-C-2004 and KDB 971168 v02r02. 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.

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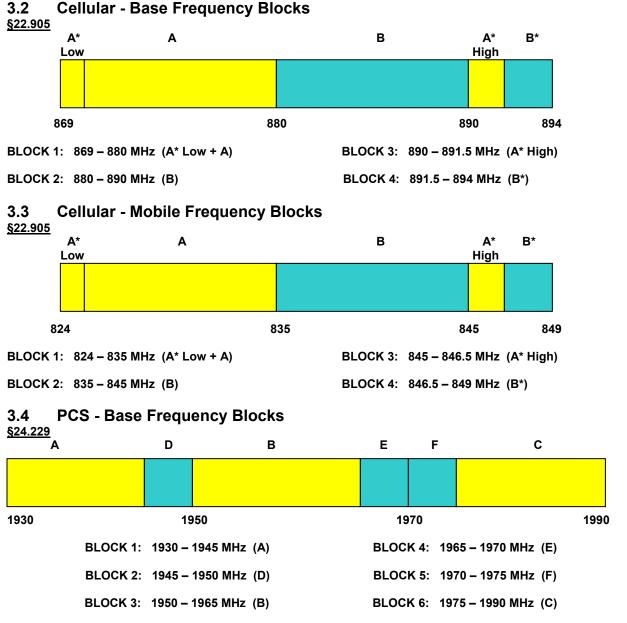


#### 3.0 **DESCRIPTION OF TESTS**

#### **Evaluation Procedure** 3.1

The measurement procedures described in the "Land Mobile FM or PM - Communications Equipment -Measurements and Performance Standards" (ANSI/TIA-603-C-2004) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 v02r02) were used in the measurement of the LG Portable Handset FCC ID: ZNFVS987.





## 3.2

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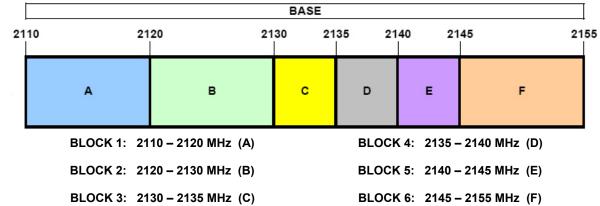


## 3.5 PCS - Mobile Frequency Blocks

<u>§24.229</u>	Α	D	В	Е	F	С	
1850		18	70	189	90		1910
	BLOCK 1:	1850 —	1865 MHz (A)	BLOC	K4: 18	85 – 1890 MHz (E)	
	BLOCK 2:	1865 –	1870 MHz (D)	BLOC	K 5: 18	90 – 1895 MHz (F)	
	BLOCK 3:	1870 —	1885 MHz (B)	BLOC	K6: 189	95 – 1910 MHz (C)	

## 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	1	720 17 	'30 17 	35 17	40 17	45	1755
		А	в	с	D	E	F	
	B	LOCK 1: 17	10 – 1720 MHz (A)		BLOCK	4: 1735 –	1740 MHz (D)	
	В	LOCK 2: 17	′20 – 1730 MHz (B)		BLOCK	5: 1740 –	1745 MHz (E)	
	В	LOCK 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 Clause 5, Figure 5.7 of ANSI C63.4-2009. For measurements above 1GHz 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 below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It 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 78cm high PVC support structure is placed on top of the turntable. A  $\frac{3}{4}$ " (~1.9cm) sheet of high density polyethylene 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-C-2004, 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:

 $P_{d [dBm]} = P_{g [dBm]} - cable loss_{[dB]} + antenna gain_{[dBd/dBi]}$ 

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  $P_{g \text{ [dBm]}}$  – cable loss  $_{\text{[dB]}}$ .

Radiated power levels are investigated with the receive antenna vertically polarized while radiated spurious emissions levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-C-2004.

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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 herein meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx3	Licensed Transmitter Cable Set	6/12/2015	Annual	6/12/2016	LTx3
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	4/28/2015	Annual	4/28/2016	RE1
Agilent	8447D	Broadband Amplifier	6/12/2015	Annual	6/12/2016	2443A01900
Agilent	N9020A	MXA Signal Analyzer	11/5/2015	Annual	11/5/2016	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	3/24/2015	Annual	3/24/2016	MY52350166
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	7/30/2015	Biennial	7/30/2017	121034
Com-Power	PAM-118A	Pre-Amplifier	4/10/2015	Annual	4/10/2016	551042
Emco	3115	Horn Antenna (1-18GHz)	3/30/2014	Biennial	3/30/2016	9704-5182
Espec	ESX-2CA	Environmental Chamber	3/17/2015	Annual	3/17/2016	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	10/22/2014	Biennial	10/22/2016	128338
K & L	11SH10-3075/U18000	High Pass Filter	7/18/2015	Annual	7/18/2016	11SH10-3075/U18000-2
K & L	13SH10-1000/U1000	N Type High Pass Filter	7/18/2015	Annual	7/18/2016	13SH10-1000/U1000-2
Mini-Circuits	PWR-SENS-4RMS	USB Power Sensor	3/11/2015	Annual	3/11/2016	11210140001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
Mini-Circuits	TVA-11-422	RF Power Amp		N/A		QA1303002
Rohde & Schwarz	CMU200	Base Station Simulator		N/A		107826
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	3/12/2015	Annual	3/12/2016	100342
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/5/2015	Annual	3/5/2016	100071
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	2/21/2014	Biennial	2/21/2016	9105-2404
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/28/2014	Biennial	3/28/2016	A051107

 Table 5-1. Test Equipment

## Note:

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

## **GSM Emission Designator**

#### Emission Designator = 250KGXW

GSM 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:	ZNFVS987
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM/ CDMA / WCDMA</u>

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference			
TRANSMITTER	TRANSMITTER MODE (TX)							
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 <sub>10</sub> (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 <sub>10</sub> (P[Watts]) for all out-of-band emissions		PASS	Section 7.7			

Table 7-1	. Summary of	Test Results
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#### 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 3.2.

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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 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.

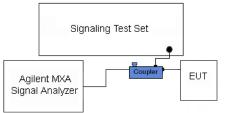


Figure 7-1. Test Instrument & Measurement Setup

## <u>Test Notes</u>

None.

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

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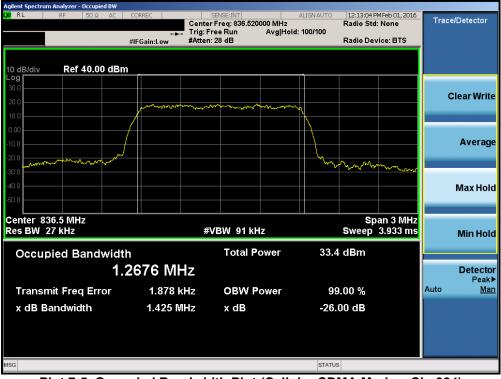




Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode – Ch. 661)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
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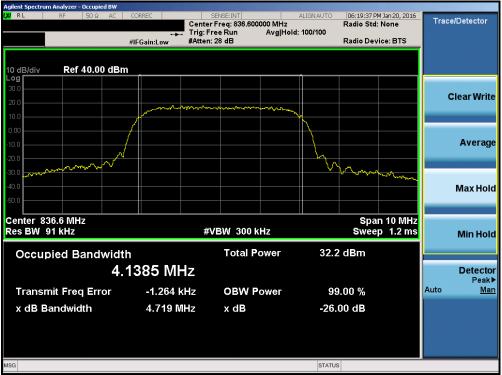
Plot 7-5. Occupied Bandwidth Plot (Cellular CDMA Mode – Ch. 384)

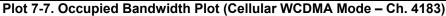


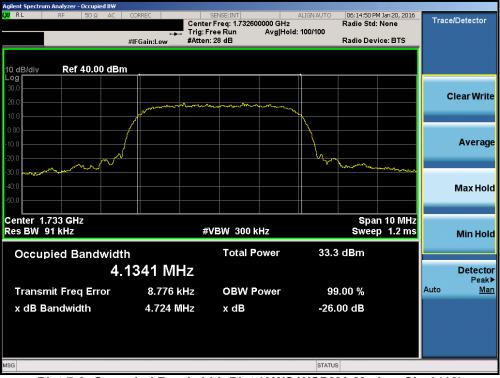
Plot 7-6. Occupied Bandwidth Plot (PCS CDMA Mode – Ch. 600)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager						
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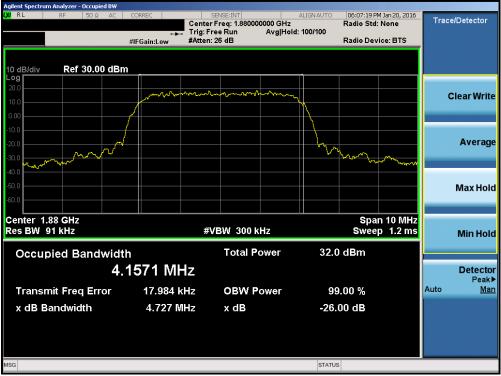




Plot 7-8. Occupied Bandwidth Plot (AWS WCDMA Mode – Ch. 1412)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
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Plot 7-9. Occupied Bandwidth Plot (PCS WCDMA Mode - Ch. 9400)

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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 10<sup>th</sup> 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 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.

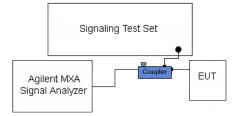


Figure 7-2. Test Instrument & Measurement Setup

#### Test Notes

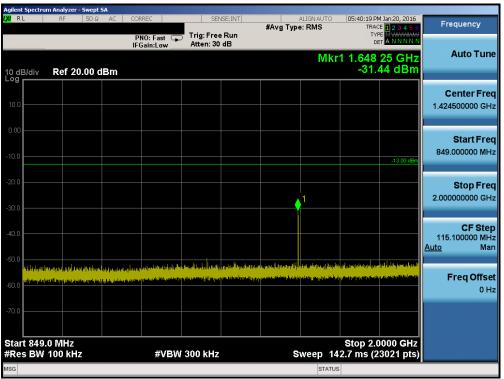
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Part 22 and 1 MHz or greater for Part 24, Part 27. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth 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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Agilent LXI R		n Analyzer - Swe									
L <mark>XO</mark> RI		RF 50	Ω AC	CORREC		ISE:INT	#Avg Typ	ALIGNAUTO e: RMS	TRAC	4 Jan 20, 2016 E <mark>1 2 3 4 5 6</mark>	Frequency
				PNO: Fast 🖵 IFGain:Low	Trig: Free Atten: 30			MI	DE k <b>r1 822.</b>		Auto Tune
10 dE Log	3/div	Ref 20.00	dBm						-43.	02 dBm	
10.0											Center Freq 426.500000 MHz
0.00 -10.0										-13.00 dBm	Start Freq 30.000000 MHz
-20.0 -30.0											Stop Freq 823.000000 MHz
-40.0 -50.0										1	<b>CF Step</b> 79.300000 MHz <u>Auto</u> Man
-60.0	(1991) (genze szaszáki keste	۲۹۱۹ (۲۹۱۹ (۲۹۱۹ میرید) <mark>ور امی</mark> ر (۱۹۹۹ هوری ور اور این ماه مقطر	n <mark>a konstruktion o</mark> ksio Kina aktiv <sup>in kandan oksio</sup>	4) og Uporgeren og gan hans. Ginde som gefinder av andere for	gaar fan sy alf jit in taalay geste kelegien staffen geb	adalar atar Manangana	ng mangpakkapilinga an antikakka akang	n ddalaw y ywy america a tygor Y galego y dalara a tygor a dalara a	n parting an ang dal Mananaka ka pitanak	<mark>versika Del bask pri</mark> tten Morela Artika bishkoler	Freq Offset 0 Hz
-70.0											
	t 30.0	MHz 100 kHz		#\/D1A	300 kHz		_	ween 09	Stop 8	23.0 MHz 5861 pts)	
MSG	5 8 9 9			#VDV	500 KHZ			status		580 F pts)	
MSG		1 - 4 - 7 - 44		-1414							400

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



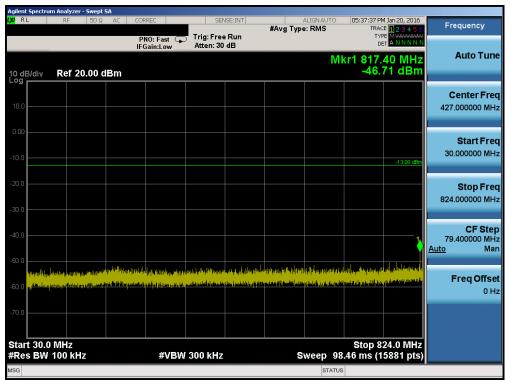
Plot 7-11. Conducted Spurious Plot (Cellular GSM Mode – Ch. 128)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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			yzer - Swept :										
l <mark>xi</mark> Rl	-	RF	- 50 Ω	AC (	ORREC	SE	NSE:INT	#Avg Typ	ALIGNAUTO		4 Jan 20, 2016 E <mark>1 2 3 4 5 6</mark>	Frequency	,
					PNO: Fast 🕞	Trig: Fre		and give	0.14110	TY			
					IFGain:Low	Atten: 20	dB					Auto T	une
									IVI	(r1 2.47)	2 5 GHz 08 dBm	Auton	unc
10 dE Log	3/div	Re	f 10.00 d	IBm						-20.			
Ĩ												Center F	rea
0.00												6.000000000	
-10.0											-13.00 dBm		
		1									-10.00 0.011	Start F	
-20.0	<b></b>	<u> </u>										2.00000000	GHz
-30.0												Stop F	rea
												10.000000000	
-40.0													
												CF S	
-50.0	pholio San I	Р, ЧЦ	ARC IN STREET		المحالة الترجيعا فلله	and the second states of the	and the development of	upped to the second	والداميدي كالالساب	- to and the state of the state	alle a segulter t	800.000000	
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-60.0													
												Freq Off	fset
-70.0													0 Hz
-80.0													
Star	t 2.00	0 GI	z							Stop 10	.000 GHz		
	s BW				#VBW	/ 3.0 MHz		s	weep 13	1.87 ms (1	6001 pts)		
MSG									STATUS				
	_	-											-





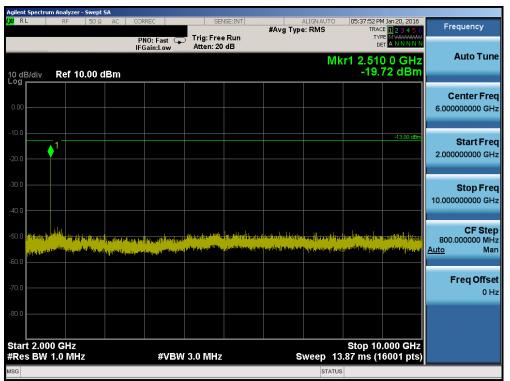
Plot 7-13. Conducted Spurious Plot (Cellular GSM Mode – Ch. 190)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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	m Analyzer - Swept 9									
L <mark>XI</mark> RL	RF 50 Ω	AC COF	RREC	SEM	ISE:INT	#Avg Type	ALIGN AUTO		M Jan 20, 2016 CE <mark>1 2 3 4 5 6</mark>	Frequency
			NO: Fast 🖵 Gain:Low	Trig: Free Atten: 30		ming typ.		TY		
10 dB/div	Ref 20.00 d	Bm					Mkr	1 1.673 -32.	30 GHz 36 dBm	Auto Tune
10.0										Center Freq 1.424500000 GHz
-10.0									-13.00 dBm	Start Freq 849.000000 MHz
-20.0							<b>♦</b> <sup>1</sup>			<b>Stop Freq</b> 2.000000000 GHz
-40.0										CF Step 115.100000 MHz <u>Auto</u> Man
(all treaty)	n Mar <sup>t</sup> le ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (									Freq Offset 0 Hz
-70.0 Start 849.	0 MHz							Stop 2.0	0000 GHz	
#Res BW	100 kHz		#VBW	300 kHz		S		2.7 ms (2	3021 pts)	
MSG							STATUS			





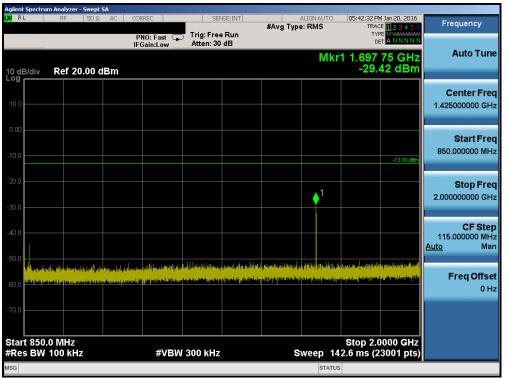
Plot 7-15. Conducted Spurious Plot (Cellular GSM Mode – Ch. 190)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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		n Analyzer ·										
l <b>XI</b> R	L	RF	50 Ω	AC O	ORREC	SE	NSE:INT		ALIGNAUTO Type: RMS		4 Jan 20, 2016 E <mark>1 2 3 4 5 6</mark>	Frequency
					PNO: Fast ⊂ FGain:Low	Trig: Fre Atten: 30		#Avg	туре: км5	TYP		
10 dl Log	B/div	Ref 20	0.00 d	Bm					M	kr1 808. -49.0	65 MHz 69 dBm	Auto Tune
10.0												Center Freq 427.000000 MHz
0.00 -10.0											-13.00 dBm	Start Freq 30.000000 MHz
-20.0 -30.0												Stop Freq 824.000000 MHz
-40.0 -50.0											4	CF Step 79.400000 MHz <u>Auto</u> Man
	19-10 percent	randes der ander ander Renders en gesetet <sup>kand</sup>	nggy (ng lipit) in a nama dinika	a filosofia a secondadore	h Balanta ya shekiri ya ku Malanta ya shekiri ya ku	<mark>la andra sa sa angana sa sa</mark>	aland Jonesian (Sa	lipus sessi (DP) <sub>pp</sub> nong sekalapinak	telletigen) et e <mark>n post (heren bitten).</mark> Et el esta post des post de post de post de la const Et el esta post de post de post de la const	and free program the political star in we glow and have of the second	n jeret (nikeri inda) derekseden indaal	<b>Freq Offset</b> 0 Hz
-70.0 Star	t 30.0	MHz								Stop 8	24.0 MHz	
#Re		100 kHz	z		#VB	N 300 kHz	4		Sweep 98	.46 ms (1		
MSG									STATUS	6		





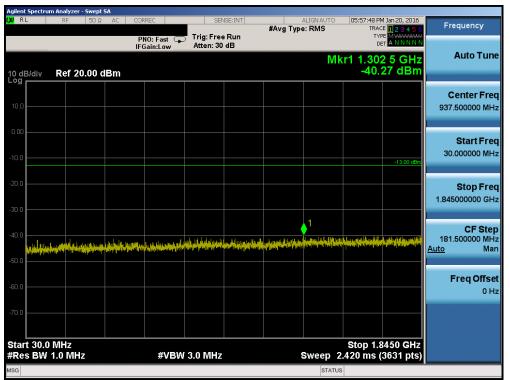
Plot 7-17. Conducted Spurious Plot (Cellular GSM Mode – Ch. 251)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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	ectrum Analyzer											
IXI RL	RF	50 Ω	AC COF	RREC	SEI	VSE:INT	#Avg Typ	ALIGNAUTO		4 Jan 20, 2016 E <mark>1 2 3 4 5 6</mark>	Frequency	/
				NO: Fast 🔾 Gain:Low	Trig: Fre Atten: 20		worg ryp		TYF			
10 dB/d Log	liv Ref 1	0.00 dl	Зm					Mk	(r1 2.54) -17.	6 5 GHz 76 dBm	Auto T	une
0.00											Center F 6.000000000	-
-10.0	¢ <sup>1</sup>									-13.00 dBm	Start F 2.000000000	
-30.0											Stop F 10.000000000	
-50.0 TT	The state of the s	n n n la na a na a na a na a na a na a	n fall fallen som	lesterny to the first state		a dia dia kaominina dia kaominina Jeografia dia kaominina dia	liteliteren felgete Gerleteren er	n ang mang mang ang ang ang ang ang ang ang ang ang	r nord a <sup>la</sup> ndra seriela a	uleya <sup>lije</sup> (i t <sup>e</sup> yî ne layey (	CF S 800.000000 <u>Auto</u>	
-60.0											Freq Of	<b>fset</b> 0 Hz
-80.0	2.000 GHz								Stop 40			
	2.000 GHZ BW 1.0 MH	z		#VBV	/ 3.0 MHz		s	Sweep 13	5.0p 10 8.87 ms (1	.000 GHz 6001 pts)		
MSG								STATUS	6			





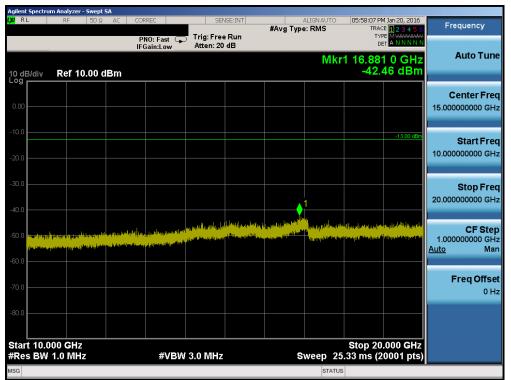
Plot 7-19. Conducted Spurious Plot (PCS GSM Mode – Ch. 512)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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Agilent Spectru <mark>X/</mark> R L	m Analyzer - Swe		CORDEC	051	05 11 17			05 53 54 0		
AU RL	RF 50	Ω AC	CORREC		SE:INT	#Avg Typ	ALIGNAUTO e: RMS	TRAC	M Jan 20, 2016 DE <mark>1 2 3 4 5 6</mark>	Frequency
			PNO: Fast 🕞 IFGain:Low	Trig: Free Atten: 30						
							M	(r1 7.47	8 5 GHz	Auto Tune
10 dB/div Log	Ref 20.00	) dBm						-37.	80 dBm	
										Center Freq
10.0										5.955000000 GHz
0.00										Start Freq
										1.910000000 GHz
-10.0									-13.00 dBm	
-20.0										Stop Freq
										10.000000000 GHz
-30.0							1			
						•				CF Step
-40.0 American	a tan a sangaran a sa s	a van <u>Bahilli</u> n an <sup>D</sup>	a an a an	Character Street St.	المحمد المعرفة. المحمد المعرفة	a station and a state of a	A LANSING MALES	مر میں میں اور اور اور میں اور میں اور	r in the second secon	809.000000 MHz
-50.0 Watershit	gaan. Alangah pilati	alling the condition with a	Second protocol and the large		entre colla	and a free field.	and the second second	d for a line of the		<u>Auto</u> Man
										Ener Offerst
-60.0										Freq Offset 0 Hz
-70.0										
Start 1.91									.000 GHz	
≇Res BW	1.0 ⊮IHz		#VBW	/ 3.0 MHz		s			6181 pts)	
ISG							STATUS	3		





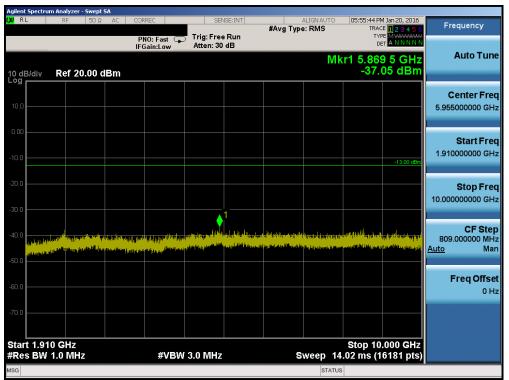
Plot 7-21. Conducted Spurious Plot (PCS GSM Mode - Ch. 512)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
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	m Analyzer - Swept									
LXI RL	RF 50 Ω	AC COI	RREC	SEN	ISE:INT	#Avg Typ	ALIGNAUTO		4 Jan 20, 2016 E <mark>1 2 3 4 5 6</mark>	Frequency
			NO: Fast 🔾 Gain:Low	Trig: Free Atten: 30				TYF DE		Auto Turo
10 dB/div	Ref 20.00 c	IBm					Mł	(r1 1.64) -39.	7 5 GHz 72 dBm	Auto Tune
10.0										Center Freq 940.000000 MHz
-10.0									-13.00 dBm	Start Freq 30.000000 MHz
-20.0										<b>Stop Freq</b> 1.85000000 GHz
-40.0		alahan dikana dika	a kanala katala kata	diday	Marijski skilitisty	uluundu din kani	a fan ski jar ji ji ji ji ji ka fa		1 An Ala Malanda	<b>CF Step</b> 182.000000 MHz <u>Auto</u> Man
-60.0										Freq Offset 0 Hz
-70.0										
Start 30.0 #Res BW			#VBW	3.0 MHz			Sweep 2	Stop 1.8 427 ms (	3500 GHz 3641 pts)	
MSG							STATUS	-		





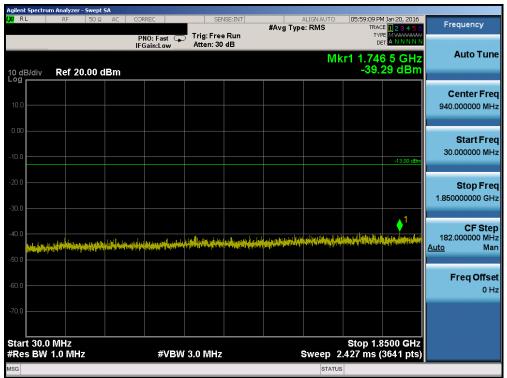
Plot 7-23. Conducted Spurious Plot (PCS GSM Mode – Ch. 661)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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	ım Analyzer - Swept Sı								
LXI RL	RF 50 Ω	AC CORREC		NSE:INT	#Avg Type	ALIGNAUTO	TRAC	4 Jan 20, 2016 E <b>1 2 3 4 5 6</b>	Frequency
		PNO: Fast IFGain:Lov	t 🕞 Trig: Free Atten: 20				TYP		
		IF Galli.200				Mkr	1 16 000	5 GHz	Auto Tune
10 dB/div	Ref 10.00 dl	Rm				IVITAI	-42.0	61 dBm	
	Kei 10.00 di								
									Center Freq
0.00									15.00000000 GHz
-10.0								-13.00 dBm	Start Freq
									10.000000000 GHz
-20.0									
-30.0									
-50.0									Stop Freq
-40.0						1			20.00000000 GHz
-40.0				A strategy and the store	h	14 	. 4	handralder mote	
-50.0 <b>model</b>	en det street de street de la de	and a state of the	a de la contrata de l	angeren anteren aktiki	A CONTRACTOR OF THE OWNER OWNE		وينا بن المربور برايا المربور. (بالگل المربور برايا المكري	perior require the second of the second s	CF Step
	والمتلاف والمتلك المتعاد والتكري	and a state of the second s	A STREET						1.00000000 GHz Auto Man
-60.0									
									Freq Offset
-70.0									0 Hz
-80.0									
Start 10.0	000 GHz						Stop 20	.000 GHz	
#Res BW		#\	/BW 3.0 MHz		S	weep 25	.33 ms (2	0001 pts)	
MSG						STATUS			





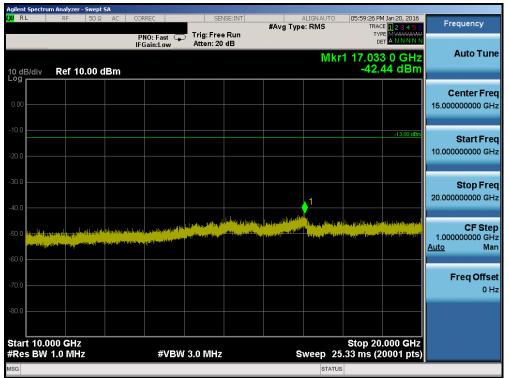
Plot 7-25. Conducted Spurious Plot (PCS GSM Mode - Ch. 810)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 27 of 104
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 27 of 104
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	ım Analyzer - Swep									
LXI RL	RF 50 \$	2 AC	CORREC	SEr	ISE:INT	#Avg Typ	ALIGN AUTO		4 Jan 20, 2016 E <mark>1 2 3 4 5 6</mark>	Frequency
			PNO: Fast 🕞 IFGain:Low	Trig: Free Atten: 30		and give	e. 1400	TYF		
10 dB/div	Ref 20.00	dBm					Mk	(r1 7.20) -37.	9 5 GHz 39 dBm	Auto Tune
10.0										Center Freq 5.957500000 GHz
-10.0									-13.00 dBm	<b>Start Freq</b> 1.915000000 GHz
-20.0										<b>Stop Freq</b> 10.000000000 GHz
-40.0 <mark>  </mark>	ten da anticipation de la composition d	er versterster av Alsteineralister	anan sana yang dan sala dan sa	al haraya ka sa	an la sa	n for france of the former of the former The former of the	a di di kamangan di palanca di Nga kalangan di kamangan di kamangan di kamangan di kamangan di kamangan di kama	n de la constant de l La constant de la cons	an a sura na ang ang ang ang ang ang ang ang ang	CF Step 808.500000 MHz <u>Auto</u> Man
-50.0										<b>Freq Offset</b> 0 Hz
-70.0	15 GHz							Ston 10	.000 GHz	
#Res BW			#VBW	/ 3.0 MHz		s	weep 14	.01 ms (1	6171 pts)	
MSG							STATUS	6		



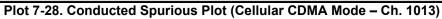


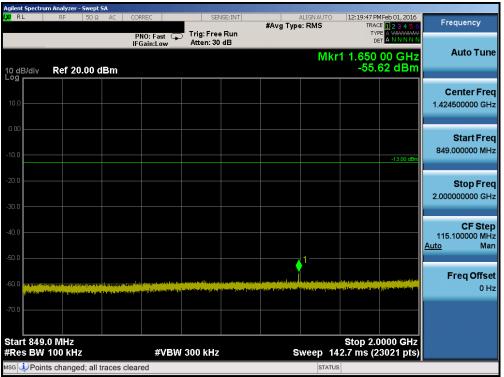
Plot 7-27. Conducted Spurious Plot (PCS GSM Mode - Ch. 810)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 28 of 104
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 26 01 104
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		n Analyzer													
l <b>XI</b> RI	L	RF	50 Ω	AC	CORREC		S	ENSE:INT	#Av		ALIGNAUTO		MFeb 01, 2016	Fr	equency
					PNO: IFGain	Fast 🖵 :Low	Trig: Fr Atten: 3			3 . ) .		TY			
10 dE Log I	3/div	Ref 2	0.00 d	Bm							MI	(r1 823. -33.	00 MHz 96 dBm		Auto Tune
10.0															<b>Center Freq</b> 5500000 MHz
0.00 -10.0													-13.00 dBm	30	Start Freq 0.000000 MHz
-20.0 -30.0													1	823	Stop Freq 0000000 MHz
-40.0 -50.0														79 <u>Auto</u>	<b>CF Step</b> 0.300000 MHz Man
-60.0	ante produced	and all a subscription	an far an far an i		ter til for a bring	i nanan amerika a s					an a	an gana gang bagan daga sa sa Santa daga sa sa galan sa d			Freq Offset 0 Hz
-70.0 Star	t 30.0	MHz										Stop 9	23.0 MHz		
		100 kH	z			#VBW	300 kH	z		S	weep 98	.33 ms (1	5861 pts)		
MSG											STATUS				





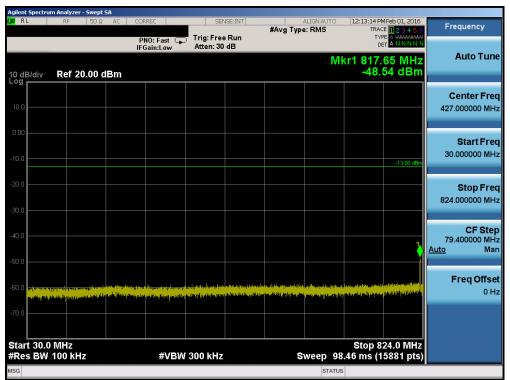
Plot 7-29. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 1013)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Page 29 of 104				
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 29 01 104				
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	ım Analyzer - Swe									
L <mark>XI</mark> RL	RF 50	ΩAC	CORREC	SEN	SE:INT	#Avg Typ	ALIGNAUTO		IFeb 01, 2016	Frequency
			PNO: Fast 🖵 IFGain:Low	Trig: Free Atten: 20		word the	e. NW5	TYP	E A WARMAN T A N N N N N	
10 dB/div Log	Ref 10.00	dBm					Mk	r1 2.474 -47.5	0 GHz 24 dBm	Auto Tune
0.00										Center Freq 6.000000000 GHz
-10.0									-13.00 dBm	<b>Start Freq</b> 2.000000000 GHz
-30.0	.1									<b>Stop Freq</b> 10.000000000 GHz
-50.0		lante este print a		Jana Kana Jasi Indonesi Maning Kanada Indonesi		(et in your your terrer and terrer you) (et in you (terrer and terrer you) (terrer you (terrer and terrer and terrer you)	a for failed and the state of t	and faith and the second processing of	ر بر المراجع (مراجع المراجع ال المراجع المراجع	CF Step 800.000000 MHz Auto Man
-70.0										Freq Offset 0 Hz
-80.0	10 GHz							Stop 10	000 GHz	
#Res BW			#VBW	3.0 MHz		S		.87 ms (1		
MSG							STATUS			





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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕐 LG	Reviewed by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 104				
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 30 of 104				
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		n Analyzer ·										
l <mark>XI</mark> R	L	RF	50 Ω	AC C	ORREC		SENSE:INT	#Δ0	ALIGNAUTO g Type: RMS		4Feb 01, 2016 E <b>1 2 3 4 5 6</b>	Frequency
					PNO: Fast FGain:Low		: Free Run en: 30 dB		g Type. Tune	TYP		
10 dl Log	B/div	Ref 20	).00 dE	3m					Mkr	1 1.673 -55.4	65 GHz 45 dBm	Auto Tune
												Center Freq 1.424500000 GHz
											-13.00 dBm	Start Freq 849.000000 MHz
												<b>Stop Freq</b> 2.000000000 GHz
-40.0												<b>CF Step</b> 115.100000 MHz <u>Auto</u> Man
	lan in state		uran (i e da Digikin ili je		e e e e e e e e e e e e e e e e e e e	Des Operations	and been and the state of the s	energi bereri antal dal mini ju denerali dar	at a strategy of the second according to the second s	lannaga sila da ta ta ta ta ta ta	terging terminal and a start of the start of	Freq Offset 0 Hz
		0 MHz 100 kHz	z		#VB	W 300	kHz		Sweep 14	Stop 2.( 2.7 ms (2	0000 GHz 3021 pts)	
MSG									STATUS			





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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Page 31 of 104				
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		n Analyzer													
IXI RL	-	RF	50 Ω	AC	CORREC		9	ENSE:INT	# <b>A</b> u	∕ g Tγpe	ALIGN AUTO		MFeb 01, 2016	Fr	equency
					PNO: IFGair	Fast 🖵	Trig: Fr Atten: 3			3.1160		TY			
10 dE Log	3/div	Ref 20	0.00 d	Bm							MI	(r1 809 -57.	.90 MHz 98 dBm		Auto Tune
10.0															<b>Center Freq</b> 000000 MHz
0.00 - -10.0 -													-13.00 dBm	30	Start Freq .000000 MHz
-20.0 -30.0														824	Stop Freq .000000 MHz
-40.0														79 <u>Auto</u>	CF Step .400000 MHz Man
-60.0	and any second second second	antiputera (electronia) Interneti (electronia)		for the standard		a Maria da Barda da Barda da				an a stalla ang an Ng Balakang Sa	attanente attatatul) ja eta mingeles (tegelesen	legeneri festeri etter i De		•	F <b>req Offset</b> 0 Hz
-70.0															
	t 30.0 s BW	MHz 100 kH	z			#VBW	300 kH	z		S	weep 98	Stop 8 46 ms (1	24.0 MHz 15881 pts)		
MSG											STATUS				





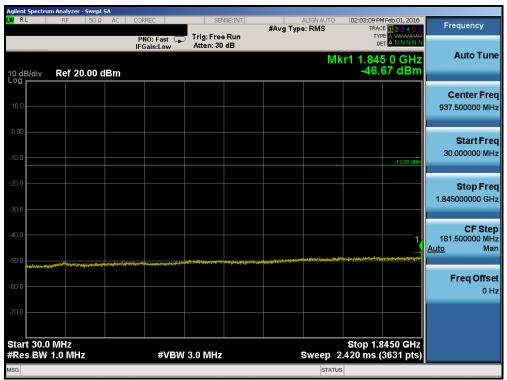
Plot 7-35. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Page 32 of 104			
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 32 01 104			
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	m Analyzer - Swept									
LXI RL	RF 50 Ω	AC AC	CORREC	SEM	ISE:INT	#444	ALIGNAUTO Type: RMS		MFeb 01, 2016 CE <mark>1 2 3 4 5 6</mark>	Frequency
			PNO: Fast 🕞 IFGain:Low	Trig: Free Atten: 20	Run	mining.	Type. Tano	TY	PE A WATAWAY ET A N N N N N	
			IFGain:Low	Atten. 20	40		ML	r1 2 54	5 5 GHz	Auto Tune
10 dB/div Log	Ref 10.00	dBm					IVID	-46.	63 dBm	
										Center Freq
0.00										6.000000000 GHz
-10.0									-13.00 dBm	Start Freq
										2.000000000 GHz
-20.0										
-30.0										Oton From
										Stop Freq 10.00000000 GHz
-40.0	1									
	•									CF Step
-50.0										800.000000 MHz
-60.0	and the second second	Constant Provident				and participations				<u>Auto</u> Man
-00.0										
-70.0										Freq Offset 0 Hz
										0112
-80.0										
Start 2.00								Stop 10	.000 GHz	
#Res BW				3.0 MHz			Sweep 13		6001 pts)	
мsg 🗼 Poin	ts changed; all	traces cl	eared				STATUS	;		

Plot 7-36. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)



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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Page 33 of 104				
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 33 01 104				
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URL	RF	50 Ω AC	CORREC		SEM	ISE:INT		ALIGN AUTO		MFeb 01, 2016	En anten anten
			PNO: Fa		Trig: Free Atten: 30	e Run dB	#Avg Typ	e: RMS	TY	CE 123456 PE A WATAWAY ET A N N N N N	Frequency
0 dB/div	Ref 20.0	00 dBm						M	(r1 9.51 -45.	1 0 GHz 00 dBm	Auto Tun
10.0											<b>Center Fre</b> 5.955000000 GH
										-13.00 dBm	<b>Start Fre</b> 1.910000000 G⊦
20.0											<b>Stop Fre</b> 10.000000000 GH
40.0				ىلى بەر يەر بەلەردى. ئەر بەر بەر بەر بەلەردى			n fan sjoner i sjoner i serene 19 det is soner ferste in billes te ged	tile for her group and group and the group of the second and the second and the second and the second and the s			<b>CF Ste</b> 809.000000 MH <u>Auto</u> Ma
60.0											Freq Offs 0 ⊦
70.0	0 GHz									.000 GHz	
Res BW	1.0 MHz		#	VBW 3	3.0 MHz		\$	Sweep 14	.02 ms (1	6181 pts)	





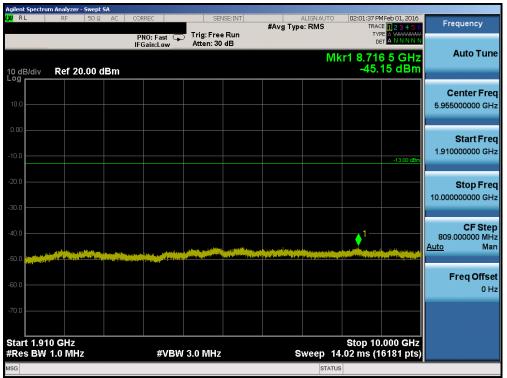
Plot 7-39. Conducted Spurious Plot (PCS CDMA Mode - Ch. 25)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Daga 24 of 104				
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		n Analyzer - S										
l <mark>XI</mark> RL		RF	50 Ω AC	CORRE	C	SEN	ISE:INT	#49.47	ALIGNAUTO		AFeb 01, 2016	Frequency
					:Fast 🖵 in:Low	Trig: Free Atten: 30		#019 I		TYP		
10 dE Log r	3/div	Ref 20.	00 dBm						MI	(r1 1.614 -48.4	4 5 GHz 41 dBm	Auto Tune
10.0 -												Center Freq 940.000000 MHz
0.00 : -10.0 :											-13.00 dBm	Start Freq 30.000000 MHz
-20.0 - -30.0 -												<b>Stop Freq</b> 1.85000000 GHz
-40.0									and the state of the	↓ 1		CF Step 182.00000 MHz <u>Auto</u> Man
-60.0	a fisiona si si si si			/4, ///////////////////////////////////								<b>Freq Offset</b> 0 Hz
-70.0	t 30.0									Stop 1		
		MHZ 1.0 MHZ			#VBW	3.0 MHz			Sweep 2		500 GHz 3641 pts)	
MSG									STATUS	3		





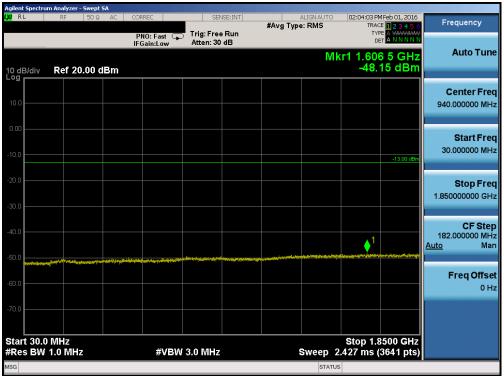
Plot 7-41. Conducted Spurious Plot (PCS CDMA Mode - Ch. 600)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 25 of 104	
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 35 of 104	
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Agilent Spectru	m Analyzer - Swept S								
XI RL	RF 50 Ω	AC CORREC		SENSE:INT	#Avg Type	ERMS	TRAC	4Feb 01, 2016 <sup>3E</sup> 1 2 3 4 5 6	Frequency
		PNO: IFGain		ig: Free Run ten: 20 dB			TYF DE	A MARAAAAA A N N N N N	
		ii ouii				Mkr	1 16 93	4 0 GHz	Auto Tune
10 dB/div	Ref 10.00 dl	Bm					-49.	11 dBm	
									Center Freq
0.00									15.000000000 GHz
-10.0								-13.00 dBm	Start Freq
									10.000000000 GHz
-20.0									10.000000000000
-30.0									
-30.0									Stop Freq 20.00000000 GHz
-40.0									20.00000000 GHz
						1			
-50.0				antitian antitan			فلار والمعالية الم	والاسترب بالطويب وريطا	CF Step 1.000000000 GHz
apped the office	Constitution of the second second second			and the state of the second state	No. of the August And Man Public	a hora a positivita a di	Stand Andrew Stand	Margarit Benefits	<u>Auto</u> Man
-60.0 -60.0	and the local difference of th	فللبلغ بغائبة فالتقاط فتتكل المحرر							
									Freq Offset
-70.0									0 Hz
-80.0									
							<b>O</b> ton 99		
Start 10.0 #Res BW			#VBW 3.0	MHz	S	weep 25	Stop 20 .33 ms (2	.000 GHz 0001 pts)	
ISG						STATUS		ooo i pis)	
						0			





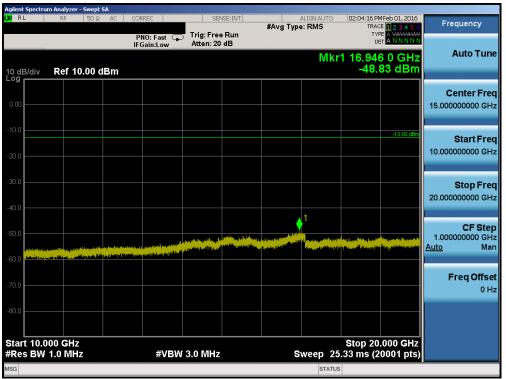
Plot 7-43. Conducted Spurious Plot (PCS CDMA Mode – Ch. 1175)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕐 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 26 of 104	
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 36 of 104	
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RL	RF !	50 Ω AC	CORREC		SE	NSE:INT		ALIGN AUTO		MFeb 01, 2016	Ereguener
			PNO: IFGai	Fast 🖵 n:Low	Trig: Fre Atten: 30	e Run ) dB	#Avg Typ	e: RMS	TY	CE 123456 PE A WARAWA ET A N N N N N	Frequency
0 dB/div	Ref 20.0	)0 dBm						M	(r1 7.06 -44.	6 5 GHz 99 dBm	Auto Tuno
10.0											<b>Center Fre</b> 5.957500000 GH
10.0										-13.00 dBm	<b>Start Fre</b> 1.915000000 GH
20.0											<b>Stop Fre</b> 10.000000000 GH
			land to the state of the	a provinsi kata para para para para para para para p		Ng sadat balan di kang s		C <sup>1</sup> P <sup>art</sup> Property parts Compt <sup>1</sup> Decay (se	E seel for the second		<b>CF Ste</b> 808.50000 MH <u>Auto</u> Ma
60.0											Freq Offse 0 H
70.0	5 GHz								Stop 11	.000 GHz	
Res BW				#VBW	3.0 MHz			Sweep 14	.01 ms (1	6171 pts)	





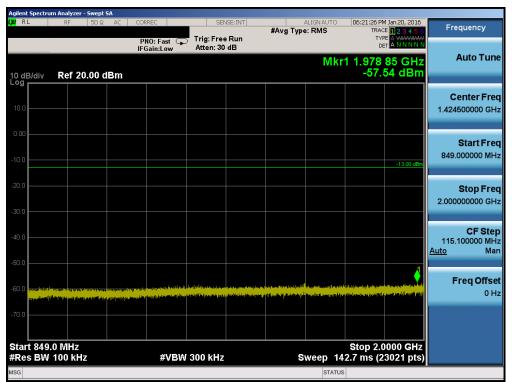
Plot 7-45. Conducted Spurious Plot (PCS CDMA Mode - Ch. 1175)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Dega 27 of 104				
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset	Page 37 of 104					
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	ım Analyzer - Swept SA					
L <mark>XI</mark> RL	RF 50 Ω	AC CORREC	SENSE:INT	ALIGNAUTO #Avg Type: RMS	06:21:19 PM Jan 20, 2016 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 30 dB	•	TYPE A WWWWW DET A N N N N N	Auto Tune
10 dB/div Log	Ref 20.00 dB	m		M	kr1 822.80 MHz -35.95 dBm	Auto Tune
						Center Freq
10.0						426.500000 MHz
0.00						Start Freq
-10.0					-13.00 dBm	30.000000 MHz
					-15.00 (15)	
-20.0						Stop Freq 823.000000 MHz
-30.0						
-40.0						CF Step 79.300000 MHz
50.0						<u>Auto</u> Man
-50.0						Freq Offset
-60.0		والمراجع والم	an a	a de la companya de La companya de la comp		0 Hz
-70.0						
Start 30.0 #Res BW		#\/B\/	300 kHz	Sween 05	Stop 823.0 MHz 3.33 ms (15861 pts)	
MSG	TOURNZ	#0000	500 MH2	Sweep 98		
				on not		

Plot 7-46. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



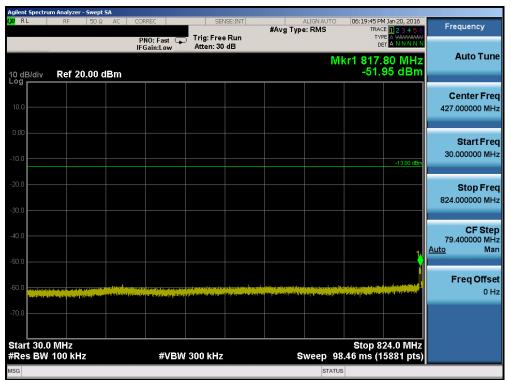
Plot 7-47. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager				
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	m Analyzer - Swept S									
X/RL	RF 50 Ω	AC COR	REC	SEM	ISE:INT	#Avg Typ	ALIGNAUTO e: RMS	TRAG	M Jan 20, 2016 CE 1 2 3 4 5 6	Frequency
			IO: Fast 🖵 iain:Low	Trig: Free Atten: 20				TY D	PE A WARAAAA ET A N N N N N	
10 dB/div	Ref 10.00 d	Bm					Mk	r1 2.47 -50.	6 5 GHz 59 dBm	Auto Tune
0.00										Center Freq 6.000000000 GHz
-10.0									-13.00 dBm	<b>Start Freq</b> 2.000000000 GHz
-30.0										<b>Stop Freq</b> 10.000000000 GHz
-50.0		a je na fili na sveti stala sveti stala s Na je na sveti stala sveti sveti stala sveti sveti stala sveti sveti s				n le su provinció de la constan provinció de la constantina for provinció	Vera ligastargatarilarian la Part musicari ya di mayari	() A Develo <sup>nd</sup> Construction of the second		CF Step 800.000000 MHz <u>Auto</u> Man
-70.0										<b>Freq Offset</b> 0 Hz
-80.0	0 GHz							Stop 10	.000 GHz	
#Res BW	1.0 MHz		#VBW	3.0 MHz		s		.87 ms (1	6001 pts)	
MSG							STATUS			

Plot 7-48. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



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

FCC ID: ZNFVS987	PCTEST	FCC PL 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Page 39 of 104				
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 39 01 104				
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Agilent Spectri <mark>LXI</mark> RL	um Analyzer - Swept SA RF 50 Ω A	C CORREC	SENSE:INT	ALIGNAUTO	06:19:52 PM Jan 20, 2016	-
		PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	TRACE 123456 TYPE A WWWWW DET A N N N N N	Frequency
10 dB/div Log	Ref 20.00 dBr	n		Mkr	1 1.671 55 GHz -57.37 dBm	Auto Tune
10.0						Center Freq 1.424500000 GHz
-10.0					-13.00 dBm	Start Freq 849.000000 MHz
-20.0						<b>Stop Freq</b> 2.000000000 GHz
-40.0						CF Step 115.100000 MHz <u>Auto</u> Man
		an a		grander protoch a probability for the second s	in Lopergr Developed by the state of the State	Freq Offset 0 Hz
-70.0						
Start 849 #Res BW	.0 MHz 100 kHz	#VBW	300 kHz	Sweep 14	Stop 2.0000 GHz 2.7 ms (23021 pts)	
MSG				STATUS	;	

Plot 7-50. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)



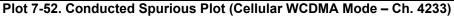
Plot 7-51. Conducted Spurious Plot (Cellular WCDMA Mode - Ch. 4183)

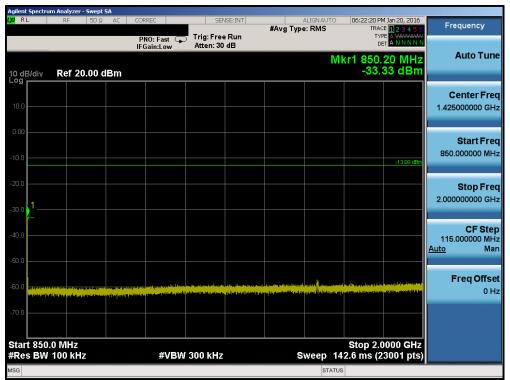
FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Page 40 of 104				
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12/01/2015



02 RL RF 50Ω AC	CORREC PNO: Fast	SENSE:INT Trig: Free Run Atten: 30 dB	ALIGNAUTO #Avg Type: RMS	06:22:12 PM Jan 20, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NIN NIN kr1 823, 70 MHz	Frequency Auto Tune
	IFGain:Low		M	DET A NNNN	
to JERRIN Dof 20.00 dBm					Auto Tune
Log				kr1 823.70 MHz -58.54 dBm	
10.0					Center Freq 427.000000 MHz
-10.0					Start Freq 30.000000 MHz
-20.0				43.00 dBm	Stop Freq 824.000000 MHz
-30.0					CF Step 79.400000 MHz
-50.0				1,	<u>Auto</u> Man Freq Offset
-60.0					0 Hz
-70.0					
Start 30.0 MHz #Res BW 100 kHz	#VBW	300 kHz	Sweep 98	Stop 824.0 MHz 8.46 ms (15881 pts)	
MSG			STATUS		





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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager				
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	m Analyzer - Swept S									
LXVI RL	RF 50 Ω	AC CORRE	:C		SE:INT	#Avg Type	ALIGN AUTO e: RMS	TRAG	4 Jan 20, 2016 <sup>CE</sup> <mark>1 2 3 4 5 6</mark>	Frequency
			:Fast 🖵	Trig: Free Atten: 20				TY D	ET A NNNNN	
		IFGa	111.2.0W	1111011120			Mk	r1 2 53	7 0 GHz	Auto Tune
10 dB/div Log	Ref 10.00 dl	Bm						-48.	69 dBm	
-09										Center Freq
0.00										6.000000000 GHz
-10.0									-13.00 dBm	Start Freq
										2.000000000 GHz
-20.0										
-30.0										
55.5										Stop Freq 10.00000000 GHz
-40.0										10.00000000 GHz
	▲1									OF Otom
-50.0										CF Step 800.000000 MHz
. specificate		ala dina manana ana ana ana ana ana ana ana an	and the second				Name and Statistics (Statistics)			<u>Auto</u> Man
-60.0	A DESCRIPTION OF THE OWNER OF THE	A STREET	A distant and a second distant				h <u>Bailin Baile an</u> Ai		<u>ىنە ئەينا ئار كان كەتلەرم</u> ار را	
-70.0										Freq Offset
-70.0										0 Hz
-80.0										
Start 2.00	0.6Hz							Stop 10	.000 GHz	
#Res BW			#VBW	3.0 MHz		s	weep 13	.87 ms (1	6001 pts)	
MSG							STATUS			

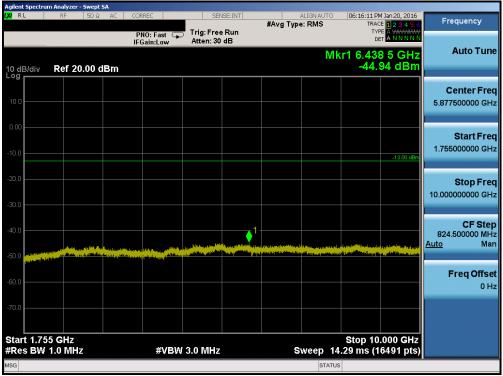
Plot 7-54. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)

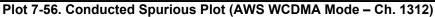


Plot 7-55. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1312)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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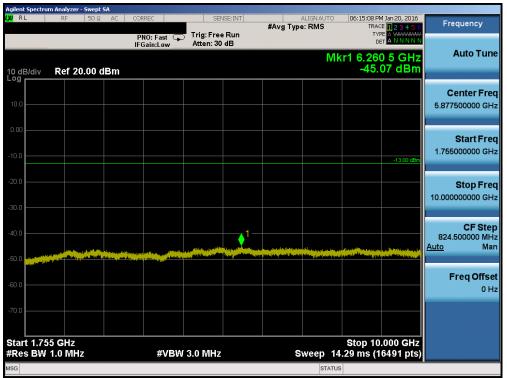
Plot 7-57. Conducted Spurious Plot (AWS WCDMA Mode – Ch. 1312)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕧 LG	Reviewed by: Quality Manager
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		n Analyzer		A										
l <mark>XI</mark> RI	L	RF	50 Ω	AC	CORREC	-	9	ENSE:INT	#Au	g Type: F	GN AUTO		M Jan 20, 2016	Frequency
					PNO: IFGai	Fast 🖵 n:Low	) Trig: Fr Atten: 3		#O¥	g type.r		T\ [	ET A WATAWAY	Auto Tune
10 dE Log i	3/div	Ref 2	).00 d	Bm							Mk	r1 1.60 -48	0 0 GHz 32 dBm	Auto Tune
														Center Freq
10.0														870.000000 MHz
0.00														Start Freq
-10.0													-13.00 dBm	30.00000 MHz
-20.0														
20.0														Stop Freq 1.71000000 GHz
-30.0														
-40.0														CF Step 168.000000 MHz
-50.0														<u>Auto</u> Man
-30.0			ismugen Artae	ylernet Tilleri	ig	heingen (Begleren /B								Freq Offset
-60.0														0 Hz
-70.0														
	t 30.0 s BM	MHz 1.0 MH	,			#VBM	3.0 MH	7		Qu	veen 2		7100 GHz (3361 pts)	
MSG	5 0 1 1	1.0 1011	_			# V D V V	5.0 1011	2		30	STATUS		(oour pts)	
											014103			





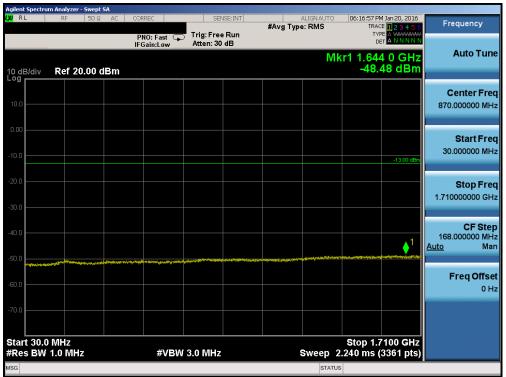
Plot 7-59. Conducted Spurious Plot (AWS WCDMA Mode – Ch. 1412)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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	m Analyzer - Swep									
XVIRL	RF 50 \$	2 AC	CORREC	SEN	ISE:INT	#440	ALIGNAUTO Type: RMS		4 Jan 20, 2016 E <mark>1 2 3 4 5 6</mark>	Frequency
			PNO: Fast 🔾 IFGain:Low	Trig: Free Atten: 20	e Run dB	, na s	Type. Tuno	TYP		
10 dB/div Log	Ref 10.00	dBm					Mkr	1 17.029 -48.9	9 5 GHz 94 dBm	Auto Tune
0.00										Center Freq 15.000000000 GHz
-10.0									-13.00 dBm	<b>Start Freq</b> 10.000000000 GHz
-30.0										<b>Stop Freq</b> 20.000000000 GHz
-50.0			Truck of the second					fores and the first and the first of the fir	ala <sub>n ya</sub> ng pangan karang p Pangang pangan karang pangang pa	<b>CF Step</b> 1.00000000 GHz <u>Auto</u> Man
-70.0										<b>Freq Offset</b> 0 Hz
-80.0								Ston 20		
Start 10.0 #Res BW			#VBW	/ 3.0 MHz			Sweep 25	33 ms (2	.000 GHz 0001 pts)	
MSG							STATUS			





Plot 7-61. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1862)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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	m Analyzer - Swept S			-	1			-		
L <mark>XI</mark> RL	RF 50 Ω	AC COR	REC	SEM	ISE:INT	#Avg Typ	ALIGNAUTO e: RMS		M Jan 20, 2016	Frequency
		P1 IF6	NO: Fast 🖵 Gain:Low	Trig: Free Atten: 30				TY		
10 dB/div Log	Ref 20.00 di	Bm					Mk	r1 1.76 -34.	0 0 GHz 16 dBm	Auto Tune
10.0										Center Freq 5.880000000 GHz
-10.0									-13.00 dBm	<b>Start Freq</b> 1.760000000 GHz
-20.0 -30.0 <mark>1</mark> —										<b>Stop Freq</b> 10.000000000 GHz
-40.0							(a) Marine prime (basileters);			CF Step 824.000000 MHz <u>Auto</u> Man
-60.0										<b>Freq Offset</b> 0 Hz
-70.0	60 GHz							Stop 10	.000 GHz	
#Res BW			#VBW	3.0 MHz		S	weep 14	.28 ms (1	6481 pts)	
MSG							STATUS			





Plot 7-63. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1862)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
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Agilent Spectrum Analyzer - Swept SA				1		
LXU RL RF 50Ω AC	CORREC	SENSE:INT	ALIGNAU #Avg Type: RMS	TRACE	123456	Frequency
		Trig: Free Run Atten: 30 dB		TYPE DE1	A WATAWAY A N N N N N	
	IFGam:Luw	Atten. 00 dB		Mkr1 1 945		Auto Tune
10 dB/div Ref 20.00 dBm				Mkr1 1.845 -35.7	0 dBm	
						Center Freq
10.0						937.500000 MHz
0.00						Start Freq
						30.000000 MHz
-10.0					-13.00 dBm	
-20.0						
-20.0						Stop Freq
-30.0						1.845000000 GHz
					<u> </u>	
-40.0						CF Step 181.500000 MHz
						Auto Man
-50.0		ananang kang pang bang bang bang bang bang bang bang b		and the second secon	<del>a set miner</del>	
						Freq Offset
-60.0						0 Hz
-70.0						
Start 30.0 MHz				Stop 1.8	450 GHz	
#Res BW 1.0 MHz	#VBW 3	.0 MHz	Swee	p 2.420 ms (3	631 pts)	
MSG			s	TATUS		

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



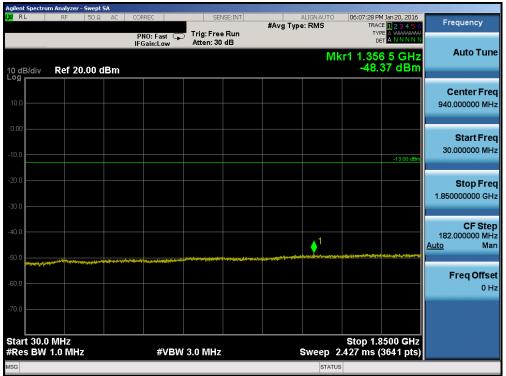
Plot 7-65. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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	ım Analyzer - Swept									
LXI RL	RF 50 Ω	AC CC	RREC	SEM	ISE:INT	#Avg Typ	ALIGNAUTO		4 Jan 20, 2016 E <b>1 2 3 4 5 6</b>	Frequency
			PNO: Fast 🕞 Gain:Low	Trig: Free Atten: 20				TYI Di	ET A NNNNN	
10 dB/div Log	Ref 10.00 c	1Bm					Mkr	1 17.00 -49.	9 5 GHz 22 dBm	Auto Tune
0.00										Center Freq 15.00000000 GHz
										15.00000000 GHZ
-10.0									-13.00 dBm	Start Freq
-20.0										10.00000000 GHz
-30.0										Stop Freq
-40.0										20.000000000 GHz
-50.0							<b>↓</b> <sup>1</sup>			CF Step
	مراجع المراجع المراجع مستقدم من المراجع									1.000000000 GHz <u>Auto</u> Man
										Freq Offset
-70.0										0 Hz
-80.0										
Start 10.0								Stop 20	.000 GHz	
#Res BW			#VBW	/ 3.0 MHz			weep 25	.33 ms (2	0000 GH2	
MSG							STATUS			





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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
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Agilent Spectru <mark>LXI</mark> RL	m Analyzer - Swept SA RF 50 Ω	AC CORREC	SENSE:INT	ALIGNAUTO	06:07:38 PM Jan 20, 2016	English
		PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	TRACE 123456 TYPE A WWWW DET A N N N N N	Frequency
10 dB/div	Ref 20.00 dB		Atten. 30 db	Mł	r1 7.624 5 GHz -44.98 dBm	Auto Tune
10.0						Center Freq 5.955000000 GHz
-10.0					-13.00 dBm	<b>Start Freq</b> 1.910000000 GHz
-20.0						<b>Stop Freq</b> 10.000000000 GHz
-40.0		المتحديثة المربي معاملة المربي معاملة المحدية إلى أستعمل			a la terreta de la constante d La constante de la constante de	CF Step 809.000000 MHz <u>Auto</u> Man
-60.0						Freq Offset 0 Hz
-70.0 Start 1.91					Stop 10.000 GHz	
#Res BW	1.0 MHz	#VBW	3.0 MHz	-	.02 ms (16181 pts)	
MSG				STATUS		





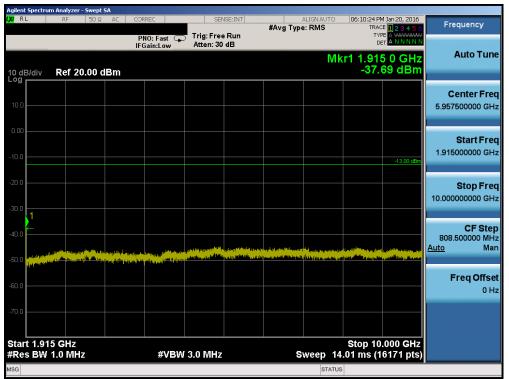
Plot 7-69. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕞 LG	Reviewed by: Quality Manager		
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	ım Analyzer - Swept S									
L <mark>XI</mark> RL	RF 50 Ω	AC CORRE	EC	SEN	ISE:INT		ALIGNAUTO Type: RMS	06:10:17 PM	4 Jan 20, 2016 E <mark>1 2 3 4 5 6</mark>	Frequency
			): Fast 😱 in:Low	Trig: Free Atten: 30		#Avg	Туре: КМБ	TYP	ETANNNNN	
10 dB/div Log	Ref 20.00 d	IBm					Mk	r1 1.763 -48.	3 5 GHz 17 dBm	Auto Tune
10.0										Center Freq 940.000000 MHz
-10.0									-13.00 dBm	Start Freq 30.000000 MHz
-20.0										<b>Stop Freq</b> 1.850000000 GHz
-40.0							u., u. aala (episat viidal maanina, 1965).	andra i Merendi de	1	<b>CF Step</b> 182.000000 MHz <u>Auto</u> Man
-50.0	an a	ng Alahat Annihit an Indonesia (Alahat angin	**********							Freq Offset 0 Hz
-70.0										
Start 30.0 #Res BW			#VBW	3.0 MHz			Sweep 2	Stop 1.8 .427 ms (	3500 GHz 3641 pts)	
MSG							STATUS			





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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager		
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	ectrum Analyzer - S					1		-			
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC	SEN	ISE:INT	#Avg Typ	ALIGNAUTO		4 Jan 20, 2016 E <b>1 2 3 4 5 6</b>	Frequency	
			PNO: Fast 🕞	Trig: Free				TY			
			IFGain:Low	Atten: 20	dB					Auto T	une
							Mkr	1 17.04	7 0 GHz	Auton	une
10 dB/d	iv Ref 10.	00 dBm						-48.	95 dBm		
										Center F	iroa
0.00										15.000000000	
										13.000000000	GHZ
-10.0											
									-13.00 dBm	Start F	req
-20.0										10.00000000	GHz
-20.0											
-30.0											
-30.0										Stop F	-
										20.00000000	GHz
-40.0							. 1				
							<u>ا</u>			CF S	
-50.0				سي بيناك د بي تأسي		and a stand of the			Report Press Mer	1.00000000	
	a na sang sa taon ng sa sa taon Ng sang sa sang sa	and provide the provide state and provide the provide state and the provide state and the provide state and the provide state and the provide	and the part of th	and a statistical data and a second state of the second state of the second state of the second state of the se		Auto Marine	Beljise Hitteliek	lenne på det skil	and the second	Auto	Man
-60.0											
										Freq Of	fset
-70.0										(	0 Hz
-80.0											
Start_1	0.000 GHz							Stop 20	.000 GHz		
	3W 1.0 MHz		#VBW	/ 3.0 MHz		s	weep 25	.33 ms (2	0001 pts)		
MSG							STATUS				
							0.1100				

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

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed 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 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  $\geq$  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.

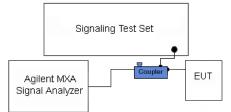


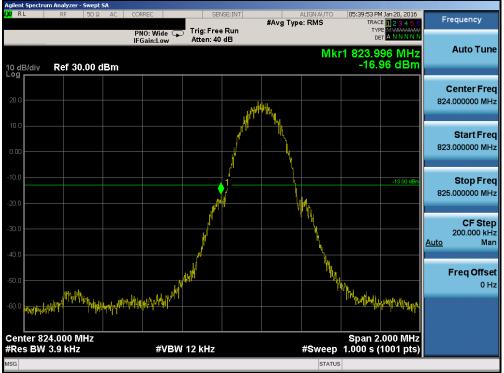
Figure 7-3. Test Instrument & Measurement Setup

#### **Test Notes**

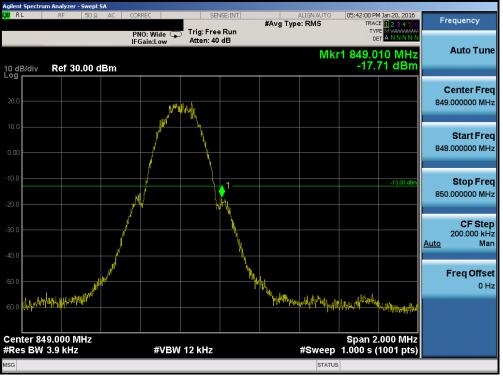
Per 22.917(b), 24.238(b), 27.53(h)(3), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions 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 GSM Mode – Ch. 128)



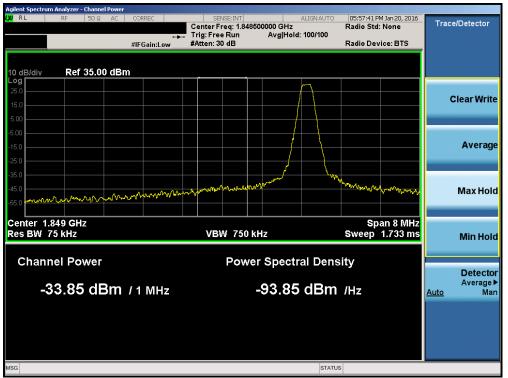
Plot 7-74. Band Edge Plot (Cellular GSM Mode – Ch. 251)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager			
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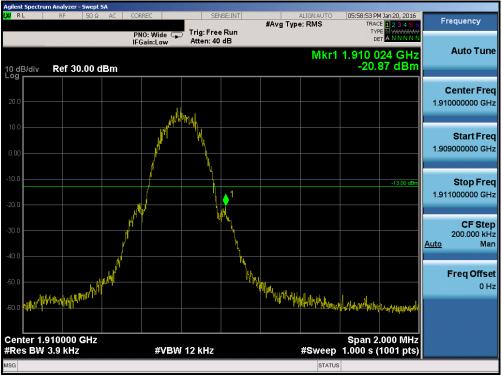
Plot 7-75. Band Edge Plot (PCS GSM Mode - Ch. 512)

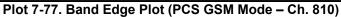


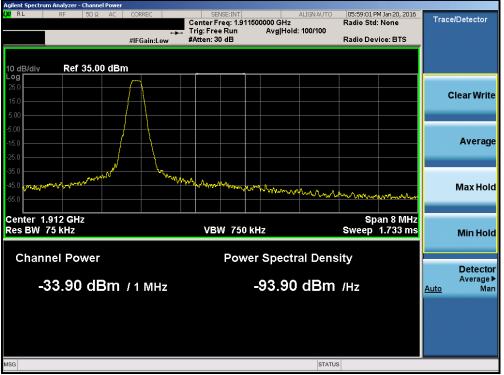
Plot 7-76. 4MHz Span Plot (PCS GSM Mode – Ch. 512)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager	
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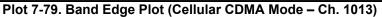


Plot 7-78. 4MHz Span Plot (PCS GSM Mode - Ch. 810)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga EE of 104
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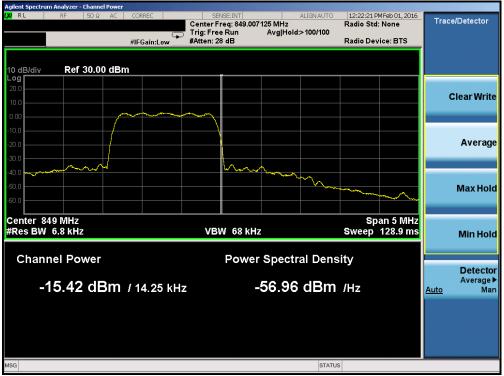


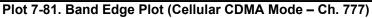


Plot 7-80. 4MHz Span Plot (Cellular CDMA Mode – Ch. 1013)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage EC of 104	
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Plot 7-82. 4MHz Span Plot (Cellular CDMA Mode – Ch. 777)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dega 57 of 104		
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	n Analyzer - Swept SA					
LXI RL	RF 50 Ω	AC CORREC	SENSE:INT	ALIGNAUTO #Avg Type: RMS	02:02:52 PM Feb 01, 2016 TRACE 123456	Frequency
		PNO: Wide 🌩 IFGain:Low	Trig: Free Run Atten: 40 dB		TYPE A WWWWW DET A N N N N N	
10 dB/div Log	Ref 30.00 dE	3m		Mkr	1.849 995 GHz -32.40 dBm	Auto Tune
20.0						Center Freq 1.85000000 GHz
0.00					~~~	<b>Start Freq</b> 1.847500000 GHz
-10.0					-13.00 dBm	<b>Stop Freq</b> 1.852500000 GHz
-30.0			1			CF Step 500.000 kHz <u>Auto</u> Man
-50.0		m				Freq Offset 0 Hz
	350000 GHz				Span 5.000 MHz	
#Res BW	15 kHz	#VBW	47 kHz		27.33 ms (1001 pts)	
MSG				STATU	5	

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



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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕐 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 59 of 104
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Plot 7-86. 4MHz Span Plot (PCS CDMA Mode – Ch. 1175)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage E0 of 104
0Y1601180117-R2.ZNF	1/20-2/18/2016	Portable Handset		Page 59 of 104
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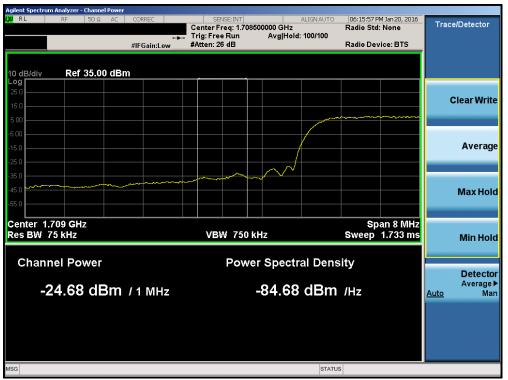
Plot 7-88. Band Edge Plot (Cellular WCDMA Mode - Ch. 4233)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 60 of 104
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Plot 7-89. Band Edge Plot (AWS WCDMA Mode – Ch. 1312)



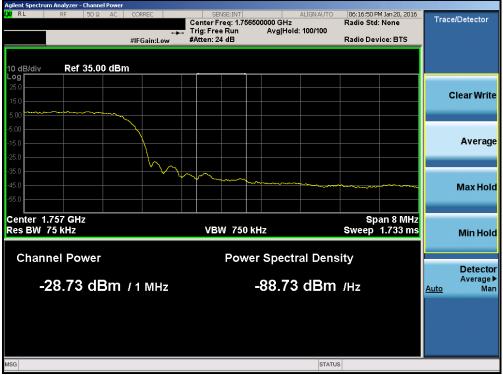
Plot 7-90. 4MHz Span Plot (AWS WCDMA Mode – Ch. 1312)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dega 61 of 104	
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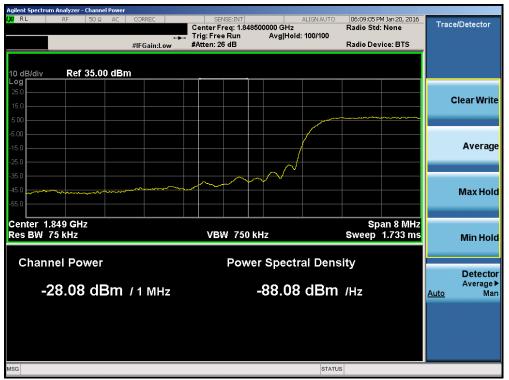
Plot 7-92. 4MHz Span Plot (AWS WCDMA Mode - Ch. 1862)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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Plot 7-93. Band Edge Plot (PCS WCDMA Mode – Ch. 9262)



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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 63 of 104
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	m Analyzer - Swepl								
L <mark>XI</mark> RL	RF 50 S	AC AC	CORREC	SENSE:INT	#Ava T	ALIGNAUTO vpe: RMS		Jan 20, 2016	Frequency
			PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 40 dB			TYP DE		
10 dB/div Log	Ref 30.00	dBm				Mkr1	1.910 0 -18.90	00 GHz 02 dBm	Auto Tune
20.0									Center Freq 1.910000000 GHz
0.00		/ mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						Start Freq 1.902500000 GHz
-10.0				1				-13.00 dBm	<b>Stop Freq</b> 1.917500000 GHz
-30.0	~~~~^			- W	n				CF Step 1.500000 MHz <u>Auto</u> Man
-50.0						un want	and the second second	and the second second	<b>Freq Offset</b> 0 Hz
	910000 GHz		#\/DW	300 kHz		Swaap-4	Span 14 .867 ms (*	5.00 MHz	
#Res BW	TOU KHZ		#vBW	JUU KHZ		Sweep 1		roon pis)	
						STATUS	<u></u>		





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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 64 of 104
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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 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.

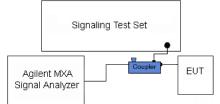


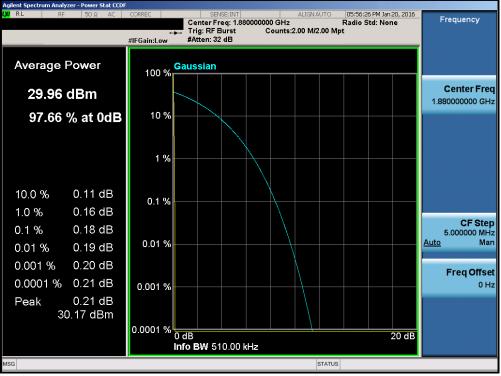
Figure 7-4. Test Instrument & Measurement Setup

# <u>Test Notes</u>

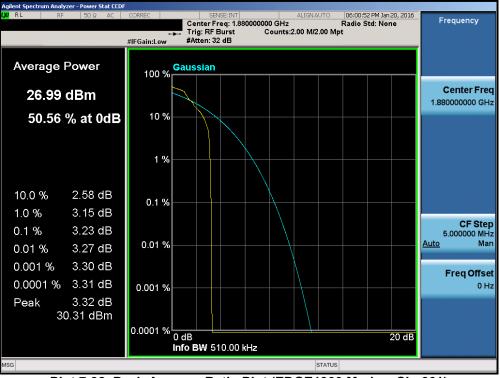
None

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT	Reviewed by: Quality Manager		
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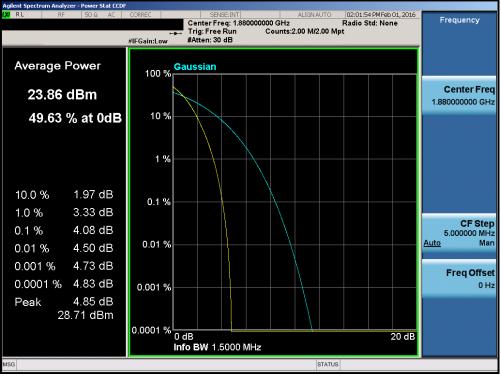




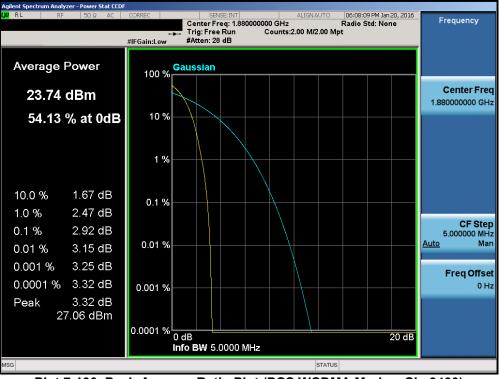
Plot 7-98. Peak-Average Ratio Plot (EDGE1900 Mode – Ch. 661)

FCC ID: ZNFVS987	<u>PCTEST</u>	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 66 of 104
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Plot 7-100. Peak-Average Ratio Plot (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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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-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically 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 v02r02 - Section 5.2.1

ANSI/TIA-603-C-2004 – Section 2.2.17

#### Test Settings

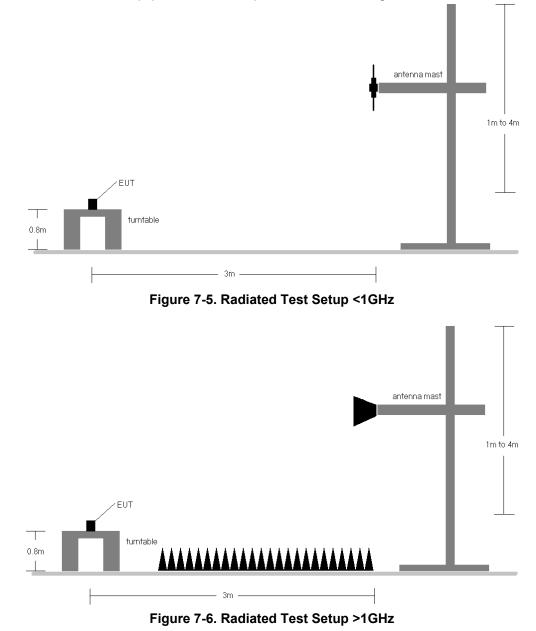
- Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW  $\ge$  3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points  $\geq 2 \times \text{span} / \text{RBW}$
- 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

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕐 LG	Reviewed by: Quality Manager
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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."
- 3) 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	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.20	GSM850	Standard	Н	1.81	76	29.02	4.27	33.29	2.131	38.45	-5.17
836.60	GSM850	Standard	Н	1.69	65	29.41	4.46	33.87	2.440	38.45	-4.58
848.80	GSM850	Standard	н	1.71	75	29.24	4.66	33.90	2.453	38.45	-4.55
848.80	EDGE850	Standard	Н	1.71	75	23.29	4.66	27.95	0.624	38.45	-10.50
848.80	GSM850	Camera	Н	2.70	29	26.33	5.03	30.99	1.255	38.45	-7.46

Table 7-2. ERP (Cellular GSM)

FCC ID: ZNFVS987		FCC PL 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	G Reviewed by: Quality Manage	ər		
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Frequency [MHz]	Mode	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	CDMA850	Standard	Н	1.94	72	18.05	4.27	22.32	0.171	38.45	-16.13
836.52	CDMA850	Standard	Н	1.93	75	18.31	4.46	22.77	0.189	38.45	-15.68
848.31	CDMA850	Standard	Н	1.94	72	18.45	4.65	23.10	0.204	38.45	-15.35
848.31	CDMA850	Camera	Н	2.67	43	17.71	5.02	22.36	0.172	38.45	-16.09

Table 7-3. ERP (Cellular CDMA)

Frequency [MHz]	Mode	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
826.40	WCDMA850	Standard	Н	1.74	72	18.77	4.30	23.07	0.203	38.45	-15.38
836.60	WCDMA850	Standard	Н	1.69	67	19.47	4.46	23.93	0.247	38.45	-14.52
846.60	WCDMA850	Standard	Н	1.74	71	19.28	4.62	23.90	0.246	38.45	-14.55
836.60	WCDMA850	Camera	V	1.37	176	20.47	4.46	24.93	0.311	38.45	-13.52

Table 7-4. ERP (Cellular WCDMA)

Frequency [MHz]	Mode	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	Standard	н	1.12	313	12.72	9.45	22.17	0.165	30.00	-7.83
1732.60	WCDMA1700	Standard	н	1.12	313	12.28	9.41	21.69	0.148	30.00	-8.31
1752.60	WCDMA1700	Standard	н	1.12	313	12.46	9.38	21.84	0.153	30.00	-8.16
1712.40	WCDMA1700	Camera	Н	1.22	338	13.08	9.65	22.53	0.179	30.00	-7.47

Table 7-5. EIRP (AWS WCDMA)

Frequency [MHz]	Mode	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GSM1900	Standard	Н	1.55	327	18.19	9.24	27.43	0.554	33.01	-5.58
1880.00	GSM1900	Standard	Н	1.72	323	15.71	9.21	24.92	0.311	33.01	-8.09
1909.80	GSM1900	Standard	н	1.72	329	14.64	9.25	23.89	0.245	33.01	-9.12
1850.20	EDGE1900	Standard	Н	1.55	327	14.47	9.24	23.71	0.235	33.01	-9.30
1850.20	GSM1900	Camera	V	1.78	94	19.67	9.21	28.88	0.773	33.01	-4.13

Table 7-6. EIRP (PCS GSM)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	<b>Reviewed by:</b> Quality Manager			
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Frequency [MHz]	Mode	Module	Antenna	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1851.25	CDMA1900	Standard	Main	Н	1.12	326	8.86	9.24	18.10	0.065	33.01	-14.91
1880.00	CDMA1900	Standard	Main	н	1.12	326	6.99	9.21	16.20	0.042	33.01	-16.81
1908.75	CDMA1900	Standard	Main	н	1.12	326	6.62	9.24	15.86	0.039	33.01	-17.15
1851.25	CDMA1900	Standard	Diversity	н	1.34	84	7.69	9.24	16.93	0.049	33.01	-16.08
1851.25	CDMA1900	Camera	Main	Н	1.12	326	13.60	9.54	18.31	0.068	33.01	-14.70

Table 7-7. EIRP (PCS CDMA)

Frequency [MHz]	Mode	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	Standard	н	1.16	329	14.38	9.24	23.62	0.230	33.01	-9.39
1880.00	WCDMA1900	Standard	н	1.12	320	14.84	9.21	24.05	0.254	33.01	-8.96
1907.60	WCDMA1900	Standard	н	1.08	329	14.19	9.23	23.42	0.220	33.01	-9.59
1880.00	WCDMA1900	Camera	н	2.44	336	15.83	9.27	25.04	0.319	33.01	-7.97

Table 7-8. EIRP (PCS WCDMA)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed 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-C-2004 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 v02r02 - Section 5.8

ANSI/TIA-603-C-2004 – 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  $\geq 2 \times \text{span} / \text{RBW}$
- 5. Detector = Peak
- 6. Trace mode = max hold
- 7. The trace was allowed to stabilize

FCC ID: ZNFVS987	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 73 of 104		
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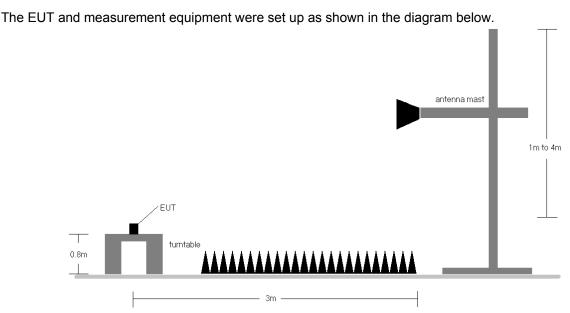


Figure 7-7. Test Instrument & Measurement Setup

### 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.

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OPERATING FREQUENCY:	824	MHz		
CHANNEL:	1:			
MEASURED OUTPUT POWER:	33.29	dBm =	2.131 W	
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) :	46.29	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1648.40	Н	1.29	247	-56.59	6.56	-50.03	83.3
2472.60	Н	1.17	224	-48.42	7.29	-41.12	74.4
3296.80	Н	1.19	211	-57.62	7.37	-50.26	83.5
4121.00	Н	-	-	-57.79	8.02	-49.77	83.1

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

OPERATING FREQUENCY:	836	6.60	MHz
CHANNEL:	1	90	
MEASURED OUTPUT POWER:	33.87	dBm =	2.440 W
MODULATION SIGNAL:	GPRS (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W)	46.87	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.20	Н	1.01	242	-48.01	6.55	-41.45	75.3
2509.80	Н	1.12	222	-49.53	7.34	-42.19	76.1
3346.40	Н	1.02	215	-58.79	7.44	-51.35	85.2
4183.00	Н	-	-	-57.71	8.20	-49.51	83.4

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

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OPERATING FREQUENCY:	848	8.80	MHz	
CHANNEL:	25	51	-	
MEASURED OUTPUT POWER:	33.90	dBm =	2.453 W	
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	46.90	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1697.60	Н	1.04	250	-46.20	6.55	-39.65	73.6
2546.40	Н	1.02	250	-49.37	7.36	-42.00	75.9
3395.20	Н	1.01	260	-58.30	7.51	-50.79	84.7
4244.00	Н	-	-	-57.48	8.40	-49.08	83.0

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

OPERATING FREQUENCY:	848.	80	MHz	
CHANNEL:	25	1		
MEASURED OUTPUT POWER:	33.90	dBm =	2.453	W
MODULATION SIGNAL:	GSM (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	46.90	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1697.60	Н	1.65	16	-45.82	6.55	-39.28	73.2
2546.40	Н	1.71	332	-43.22	7.36	-35.86	69.8
3395.20	Н	1.78	5	-58.42	7.51	-50.91	84.8
4244.00	Н	-	-	-57.83	8.40	-49.43	83.3

Table 7-12. Radiated Spurious Data with Camera Module (Cellular GSM Mode – Ch. 251)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager	
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OPERATING FREQUENCY:	824	.70	MHz
CHANNEL:	10		
MEASURED OUTPUT POWER:	22.32	dBm =	0.171 W
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.32	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	1.06	350	-56.66	6.56	-50.10	72.4
2474.10	Н	2.25	0	-54.21	7.30	-46.91	69.2
3298.80	Н	-	-	-59.50	7.37	-52.13	74.5

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

OPERATING FREQUENCY:	836	MHz	
CHANNEL:	38	-	
MEASURED OUTPUT POWER:	22.77	dBm =	0.189 W
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.77	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]
1673.04	Н	1.09	340	-52.74	6.55	-46.19	69.0
2509.56	Н	2.53	10	-54.50	7.34	-47.15	69.9
3346.08	Н	-	-	-60.47	7.44	-53.03	75.8

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

FCC ID: ZNFVS987	PCTEST	FCC PL 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager		
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OPERATING FREQUENCY:	848	9.31	MHz	
CHANNEL:	77	77		
MEASURED OUTPUT POWER:	23.10	dBm =	0.204 V	V
MODULATION SIGNAL:	CDMA	· ·		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	36.10	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1696.62	Н	1.10	341	-50.60	6.55	-44.05	67.1
2544.93	Н	2.18	331	-56.63	7.36	-49.27	72.4
3393.24	Н	-	-	-59.48	7.51	-51.97	75.1

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

OPERATING FREQUENCY:	848	MHz		
CHANNEL:	7			
MEASURED OUTPUT POWER:	23.10	dBm =	0.204	W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	36.10	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1696.62	Н	1.75	7	-53.52	6.55	-46.97	70.1
2544.93	Н	1.68	131	-42.13	7.36	-34.77	57.9
3393.24	Н	-	-	-60.36	7.51	-52.85	75.9

Table 7-16. Radiated Spurious Data with Camera Module (Cellular CDMA Mode – Ch. 777)

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OPERATING FREQUENCY:	826	826.40		
CHANNEL:	41			
MEASURED OUTPUT POWER:	23.07	dBm =	0.203	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	36.07	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]
1652.80	Н	2.84	180	-59.94	6.56	-53.38	76.5
2479.20	Н	-	-	-63.67	7.30	-56.37	79.4

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

OPERATING FREQUENCY:	836	MHz		
CHANNEL:	41			
MEASURED OUTPUT POWER:	23.93	dBm =	0.247	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	36.93	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]
1673.20	Н	2.67	180	-57.24	6.55	-50.68	74.6
2509.80	Н	-	-	-62.99	7.34	-55.65	79.6

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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	846	MHz		
CHANNEL:	42	•		
MEASURED OUTPUT POWER:	23.90	dBm =	0.246	N
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	36.90	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]
1693.20	Н	2.56	179	-56.49	6.55	-49.95	73.8
2539.80	Н	-	-	-63.34	7.36	-55.98	79.9

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

846	MHz		
42	-		
23.90	dBm =	0.246	W
WCDMA	•		-
3	meters		
43 + 10 log <sub>10</sub> (W) =	36.91	dBc	
	42 23.90 WCDMA 3	4233 23.90 dBm = WCDMA 3 meters	4233 23.90 dBm = 0.246 WCDMA 3 meters

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.20	V	2.11	203	-54.62	6.58	-48.03	71.9
2539.80	V	-	-	-53.63	7.37	-46.26	70.2

Table 7-20. Radiated Spurious Data with Camera Module (Cellular WCDMA Mode – Ch. 4233)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	171	2.40	MHz
CHANNEL:	13	• -	
MEASURED OUTPUT POWER:	22.17	dBm =	0.165 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.17	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3424.80	Н	2.08	123	-53.91	9.68	-44.23	66.4
5137.20	Н	-	-	-56.23	10.68	-45.55	67.7

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

OPERATING FREQUENCY:	173	MHz		
CHANNEL:	14			
MEASURED OUTPUT POWER:	21.69	dBm =	0.148	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	34.69	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3465.20	Н	2.01	138	-51.66	9.71	-41.95	64.1
5197.80	Н	-	-	-55.71	10.59	-45.12	67.3

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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	OPERATING FREQUENCY: 1752			
CHANNEL:	15			
MEASURED OUTPUT POWER:	21.84	dBm =	0.153	W
MODULATION SIGNAL:	WCDMA			_
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	34.84	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3505.20	Н	2.00	128	-49.48	9.73	-39.75	61.9
5257.80	Н	-	-	-55.87	10.64	-45.23	67.4

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

OPERATING FREQUENCY:	175	2.60	MHz
CHANNEL:	15		
MEASURED OUTPUT POWER:	21.84	dBm =	0.153 W
MODULATION SIGNAL:	WCDMA	-	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	34.85	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3505.20	Н	2.52	234	-57.16	8.40	-48.75	70.9
5257.80	Н	-	-	-57.50	10.36	-47.14	69.3

Table 7-24. Radiated Spurious Data with Camera Module (AWS WCDMA Mode – Ch. 1513)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager		
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OPERATING FREQUENCY:	185	MHz		
CHANNEL:	5			
MEASURED OUTPUT POWER:	27.43	dBm =	0.554	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	40.43	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3700.40	Н	1.33	19	-43.59	9.44	-34.15	61.6
5550.60	Н	1.64	10	-49.59	10.78	-38.80	66.2
7400.80	Н	-	-	-52.00	10.69	-41.32	68.7

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

OPERATING FREQUENCY:	188	MHz		
CHANNEL:	66			
MEASURED OUTPUT POWER:	24.92	dBm =	0.311	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	37.92	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	Н	1.31	10	-46.43	9.28	-37.15	64.6
5640.00	Н	1.34	343	-51.67	11.03	-40.64	68.1
7520.00	Н	-	-	-52.73	10.97	-41.76	69.2

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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	G Reviewed by: Quality Manager		
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OPERATING FREQUENCY:	190	9.80	MHz	
CHANNEL:	8	•		
MEASURED OUTPUT POWER:	23.89	dBm =	0.245	W
MODULATION SIGNAL:	GPRS (GMSK)	-		-
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) :	36.89	dBc	

Ant. Pol. [H/V]	Height	Azimuth	Antenna	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
Н	1.43	342	-46.46	9.19	-37.27	64.7
Н	-	-	-54.72	11.28	-43.43	70.9
	Pol. [H/V] H	Pol.         Height [M/V]           H         1.43           H         -	Pol.Height [m]Azimuth [degree]H1.43342H	Pol. [H/V]Height [m]Azimuth [degree]Antenna Terminals [dBm]H1.43342-46.46H54.72	Pol. [H/V]Height [m]Azimuth [degree]Antenna Terminals [dBm]Antenna Gain [dBi]H1.43342-46.469.19	Pol. [H/V]Height [m]Azimuth [degree]Antenna Terminals [dBm]Antenna Gain [dBi]Emission Level [dBm]H1.43342-46.469.19-37.27H54.7211.28-43.43

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

185	0.20	MHz	
5	12		
28.88	dBm =	0.773	W
GSM (GMSK)			
3	meters		
43 + 10 log <sub>10</sub> (W) =	41.88	dBc	
	51 28.88 GSM (GMSK) 3	GSM (GMSK) 3 meters	$\frac{512}{28.88} \text{ dBm} = 0.773$ $\frac{\text{GSM}(\text{GMSK})}{3} \text{ meters}$

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3700.40	V	1.20	0	-56.55	8.39	-48.16	75.6
5550.60	V	-	-	-57.06	10.54	-46.52	74.0

Table 7-28. Radiated Spurious Data with Camera Module (PCS GSM Mode – Ch. 512)

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OPERATING FREQUENCY:	185	MHz	
CHANNEL:	2		
MEASURED OUTPUT POWER:	20.74	dBm =	0.119 W
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	33.74	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3702.50	Н	1.72	41	-45.28	9.43	-35.85	56.6
5553.75	Н	1.85	350	-52.25	10.79	-41.46	62.2
7405.00	Н	-	-	-51.92	10.70	-41.22	62.0

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

OPERATING FREQUENCY:	188	0.00	MHz
CHANNEL:	60		
MEASURED OUTPUT POWER:	18.84	dBm =	0.077 W
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	31.84	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	Н	1.66	7	-45.37	9.28	-36.09	56.8
5640.00	Н	-	-	-54.54	11.03	-43.51	64.2

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

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	190	8.75	MHz	
CHANNEL:	11	75		
MEASURED OUTPUT POWER:	18.50	dBm =	0.071	W
MODULATION SIGNAL:	CDMA			_
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	31.50	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3817.50	Н	1.66	7	-50.97	9.19	-41.78	62.5
5726.25	Н	1.65	8	-53.82	11.28	-42.54	63.3
7635.00	Н	-	-	-51.98	11.17	-40.81	61.6

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

OPERATING FREQUENCY:	185	1.25	MHz
CHANNEL:	2		
MEASURED OUTPUT POWER:	20.74	dBm =	0.119 W
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	33.76	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3702.50	Н	1.91	336	-55.30	9.43	-45.87	64.0
5553.75	Н	1.58	65	-46.54	10.79	-35.75	53.9
7405.00	Н	-	-	-52.02	10.70	-41.32	59.4

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

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager	
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OPERATING FREQUENCY:	185	MHz	
CHANNEL:	92	- -	
MEASURED OUTPUT POWER:	23.62	dBm =	0.230 W
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	36.62	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3704.80	Н	1.97	348	-51.80	9.43	-42.38	66.0
5557.20	Н	-	-	-52.92	10.80	-42.12	65.7

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

OPERATING FREQUENCY:	188	0.00	MHz	
CHANNEL:	94	00		
MEASURED OUTPUT POWER:	24.05	dBm =	0.254	W
MODULATION SIGNAL:	WCDMA			-
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	37.05	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	Н	1.94	357	-54.31	9.28	-45.03	68.6
5640.00	Н	-	-	-54.07	11.03	-43.04	66.7

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

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	G Reviewed by: Quality Manager		
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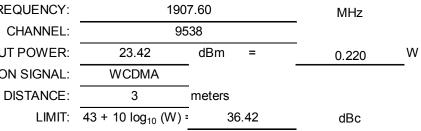
OPERATING FREQUENCY:	190	7.60	MHz	
CHANNEL:	95	38		
MEASURED OUTPUT POWER:	23.42	dBm =	0.220	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	36.42	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3815.20	Н	1.71	325	-50.25	9.19	-41.06	64.7
5722.80	Н	-	-	-54.72	11.27	-43.45	67.1

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

OPERATING FREQUENCY:	
CHANNEL:	

MEASURED OUTPUT POWER	R
MODULATION SIGNA	L



Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3815.20	Н	2.21	358	-53.53	8.40	-45.14	68.8
5722.80	Н	-	-	-56.21	10.76	-45.45	69.1

Table 7-36. Radiated Spurious Data with Camera Module (PCS WCDMA Mode – Ch. 9538)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed 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-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.

For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  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-C-2004

#### 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

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## Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL:

190

VDC

REFERENCE VOLTAGE: 3.85

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,600,308	308	0.0000368
100 %		- 30	836,600,131	131	0.0000157
100 %		- 20	836,599,771	-229	-0.0000274
100 %		- 10	836,599,912	-88	-0.0000105
100 %		0	836,600,022	22	0.0000026
100 %		+ 10	836,599,897	-103	-0.0000123
100 %		+ 20	836,600,011	11	0.0000013
100 %		+ 30	836,599,680	-320	-0.0000383
100 %		+ 40	836,600,179	179	0.0000214
100 %		+ 50	836,600,072	72	0.000086
BATT. ENDPOINT	3.45	+ 20	836,599,878	-122	-0.0000146

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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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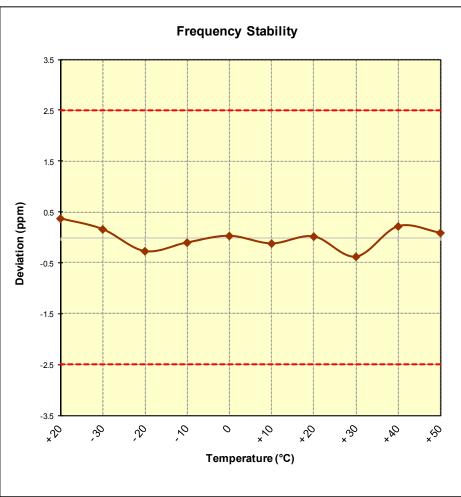


Figure 7-8. Frequency Stability Graph (Cellular GSM Mode – Ch. 190)

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OPERATING FREQUENCY: 836,520,000 Hz

CHANNEL:

VDC

384

REFERENCE VOLTAGE: 3.85

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,519,956	-44	-0.0000053
100 %		- 30	836,519,719	-281	-0.0000336
100 %		- 20	836,519,770	-230	-0.0000275
100 %		- 10	836,520,018	18	0.0000022
100 %		0	836,520,186	186	0.0000222
100 %		+ 10	836,520,060	60	0.0000072
100 %		+ 20	836,519,973	-27	-0.0000032
100 %		+ 30	836,520,304	304	0.0000363
100 %		+ 40	836,520,449	449	0.0000537
100 %		+ 50	836,520,009	9	0.0000011
BATT. ENDPOINT	3.45	+ 20	836,520,173	173	0.0000207

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

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
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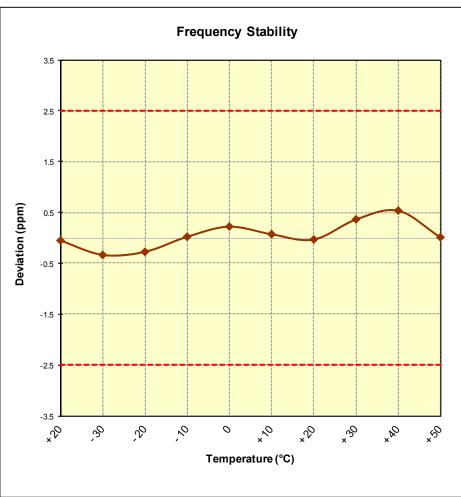


Figure 7-9. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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**OPERATING FREQUENCY:** 836,600,000 Ηz CHANNEL: 4183 REFERENCE VOLTAGE: VDC 3.85

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,600,066	66	0.0000079
100 %		- 30	836,600,069	69	0.0000082
100 %		- 20	836,599,941	-59	-0.0000071
100 %		- 10	836,599,841	-159	-0.0000190
100 %		0	836,600,204	204	0.0000244
100 %		+ 10	836,599,665	-335	-0.0000400
100 %		+ 20	836,599,778	-222	-0.0000265
100 %		+ 30	836,599,822	-178	-0.0000213
100 %		+ 40	836,600,103	103	0.0000123
100 %		+ 50	836,600,074	74	0.000088
BATT. ENDPOINT	3.45	+ 20	836,600,139	139	0.0000166

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

FCC ID: ZNFVS987	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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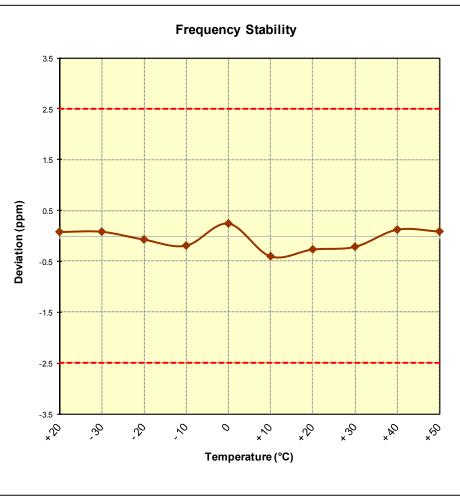


Figure 7-10. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFVS987	PCTEST	FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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# Frequency Stability / Temperature Variation

OPERATING FREQUENCY:	1,732,600,000	Hz
CHANNEL:	1413	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,732,599,810	-190	-0.0000110
100 %		- 30	1,732,600,133	133	0.0000077
100 %		- 20	1,732,600,017	17	0.0000010
100 %		- 10	1,732,599,982	-18	-0.0000010
100 %		0	1,732,599,753	-247	-0.0000143
100 %		+ 10	1,732,599,961	-39	-0.0000023
100 %		+ 20	1,732,600,100	100	0.0000058
100 %		+ 30	1,732,599,962	-38	-0.0000022
100 %		+ 40	1,732,600,078	78	0.0000045
100 %		+ 50	1,732,599,922	-78	-0.0000045
BATT. ENDPOINT	3.45	+ 20	1,732,599,923	-77	-0.0000044

Table 7-40. Frequency Stability Data (AWS WCDMA Mode – Ch. 1412)

### 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: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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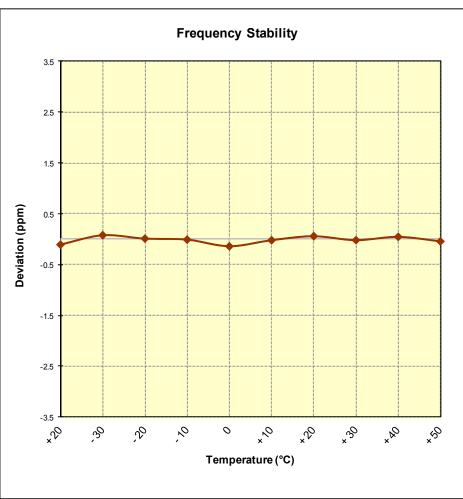


Figure 7-11. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1412)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	661	-
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,879,999,767	-233	-0.0000124
100 %		- 30	1,880,000,041	41	0.0000022
100 %		- 20	1,879,999,758	-242	-0.0000129
100 %		- 10	1,879,999,869	-131	-0.0000070
100 %		0	1,880,000,035	35	0.0000019
100 %		+ 10	1,879,999,679	-321	-0.0000171
100 %		+ 20	1,879,999,916	-84	-0.0000045
100 %		+ 30	1,879,999,823	-177	-0.0000094
100 %		+ 40	1,879,999,814	-186	-0.0000099
100 %		+ 50	1,880,000,037	37	0.0000020
BATT. ENDPOINT	3.45	+ 20	1,879,999,701	-299	-0.0000159

Table 7-41. Frequency Stability Data (PCS GSM 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.

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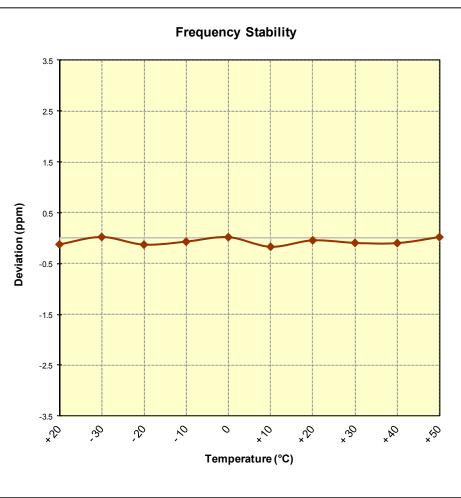


Figure 7-12. Frequency Stability Graph (PCS GSM Mode – Ch. 661)

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# Frequency Stability / Temperature Variation

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	600	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,879,999,777	-223	-0.0000119
100 %		- 30	1,880,000,028	28	0.0000015
100 %		- 20	1,880,000,051	51	0.0000027
100 %		- 10	1,879,999,898	-102	-0.0000054
100 %		0	1,879,999,791	-209	-0.0000111
100 %		+ 10	1,880,000,199	199	0.0000106
100 %		+ 20	1,879,999,930	-70	-0.0000037
100 %		+ 30	1,879,999,936	-64	-0.0000034
100 %		+ 40	1,880,000,091	91	0.0000048
100 %		+ 50	1,879,999,966	-34	-0.0000018
BATT. ENDPOINT	3.45	+ 20	1,879,999,920	-80	-0.0000043

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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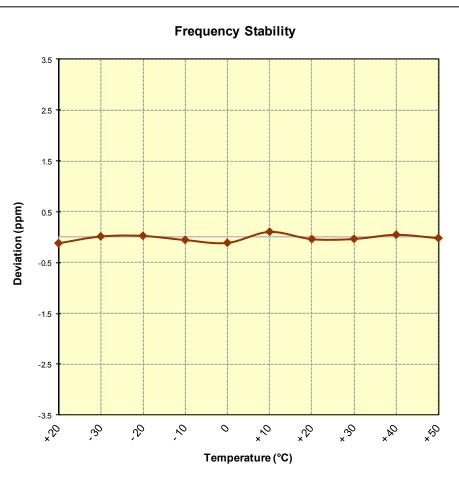


Figure 7-13. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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# Frequency Stability / Temperature Variation

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	9400	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,880,000,014	14	0.0000007
100 %		- 30	1,880,000,070	70	0.0000037
100 %		- 20	1,879,999,904	-96	-0.0000051
100 %		- 10	1,879,999,916	-84	-0.0000045
100 %		0	1,879,999,999	-1	-0.0000001
100 %		+ 10	1,880,000,103	103	0.0000055
100 %		+ 20	1,880,000,171	171	0.0000091
100 %		+ 30	1,880,000,184	184	0.000098
100 %		+ 40	1,880,000,194	194	0.0000103
100 %		+ 50	1,880,000,383	383	0.0000204
BATT. ENDPOINT	3.45	+ 20	1,879,999,788	-212	-0.0000113

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.

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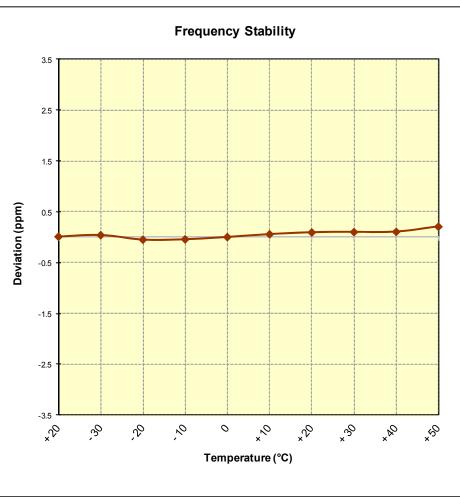


Figure 7-14. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed 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: ZNFVS987** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules.

FCC ID: ZNFVS987		FCC Pt. 22, 24, & 27 GSM/ CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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