

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: 7/12/2017-8/8/2017 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 1M1707110215-02.ZNF

FCC ID:

ZNFH932

APPLICANT:

LG ELECTRONICS MOBILECOMM U.S.A

Application Type:	Certification
Model:	LG-H932
Additional Model(s):	LGH932, H932, LG-H932PR, LGH932PR, H932PR
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§2 §22(H) §24(E) §27(L)
Test Procedure(s):	ANSI/TIA-603-D-2010, KDB 971168 D01 v02r02, KDB 648474 D03 v01r04
Test Device Serial No.:	identical prototype [S/N: 00539, 05522, 05530, 05365, 05373]

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

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

Randy Ortanez President



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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-H932
FCC ID:	ZNFH932
FCC CLASSIFICATION:	PCS Licensed Transmitter Held to Ear (PCE)
MODE:	GSM / GPRS / EDGE / WCDMA
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)
Test Device Serial No.:	00539, 05522, 05530, 05365, 05373 □ Production □ Pre-Production □ Engineering
DATE(S) OF TEST:	7/12/2017-8/8/2017
TEST REPORT S/N:	1M1707110215-02.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 17025-2005 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, , GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

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			ERP/	EIRP		
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Emission Designator	
GSM850	22H	824.2 - 848.8	0.316	25.00	243KGXW	
EDGE850	22H	824.2 - 848.8	0.053	17.22	245KG7W	
WCDMA850	22H	826.4 - 846.6	0.067	18.27	4M16F9W	
WCDMA1700	27	1712.4 - 1752.6	0.198	22.96	4M15F9W	
GSM1900	24E	1850.2 - 1909.8	1.370	31.37	243KGXW	
EDGE1900	24E	1850.2 - 1909.8	0.423	26.26	245KG7W	
WCDMA1900	24E	1852.4 - 1907.6	0.165	22.16	4M15F9W	

EUT Overview

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INTRODUCTION 1.0

1.1 Scope

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

1.2 **Testing Facility**

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

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

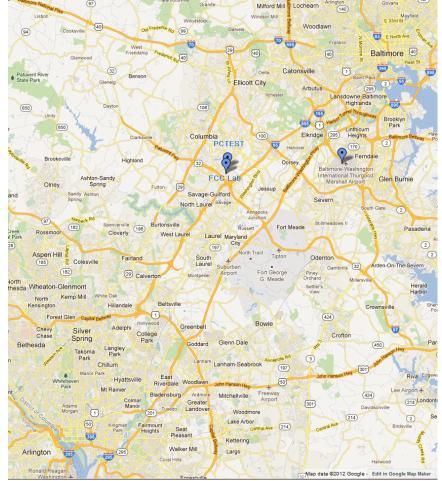


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFH932**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 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 EUT was tested per the guidance of ANSI/TIA-603-D-2010 and KDB 971168 D01 v02r02. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

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

2.4 EMI Suppression Device(s)/Modifications

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

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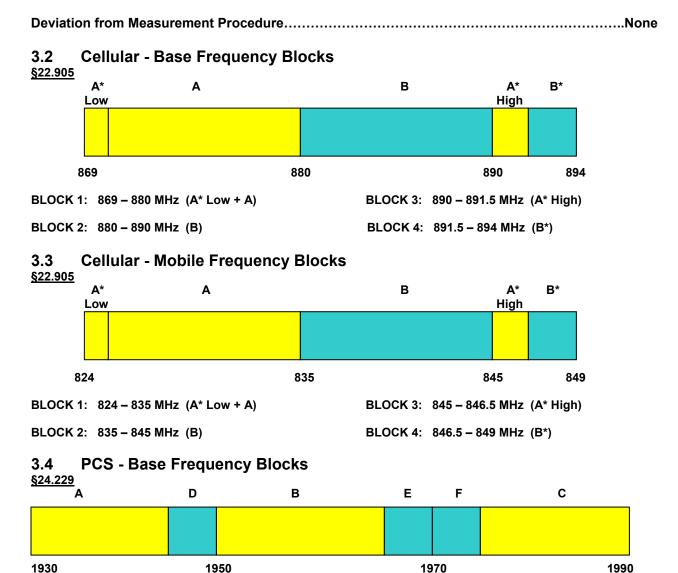
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3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

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



BLOCK 4: 1965 - 1970 MHz (E)

BLOCK 5: 1970 - 1975 MHz (F)

BLOCK 6: 1975 - 1990 MHz (C)

BLOCK 1: 1930 - 1945 MHz (A)

BLOCK 2: 1945 - 1950 MHz (D)

BLOCK 3: 1950 – 1965 MHz (B)

Approved by: PCTEST FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT FCC ID: ZNFH932 🕞 LG **REPORT (CERTIFICATION) Quality Manager** EUT Type: Test Report S/N: Test Dates: Page 7 of 82 1M1707110215-02.ZNF 7/12/2017-8/8/2017 Portable Handset © 2017 PCTEST Engineering Laboratory, Inc. V 6.7 06/23/2017

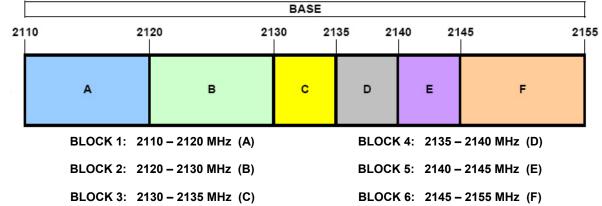


3.5 PCS - Mobile Frequency Blocks

<u>§24.229</u>	A .	D	В	E	F	С	
1850		18	370	189	90		1910
	BLOCK 1:	1850 —	1865 MHz (A)	BLOC	K 4: 188	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				
1710	17	/20 17 	730 17 	'35 17 	40 17	45	1755
	A	В	с	D	E	F	
	BLOCK 1: 17	10 – 1720 MHz (A)		BLOCK	4: 1735 –	1740 MHz (D)	
	BLOCK 2: 17	20 – 1730 MHz (B)		BLOCK	5: 1740 –	1745 MHz (E)	
	BLOCK 3: 17	30 – 1735 MHz (C)		BLOCK	6: 1745 –	1755 MHz (F)	

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

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

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

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

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

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

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

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4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{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). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2006.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	6/21/2017	Annual	6/21/2018	RE1
-	LTx2	Licensed Transmitter Cable Set	5/3/2017	Annual	5/3/2018	LTx2
Agilent	N9020A	MXA Signal Analyzer	10/28/2016	Annual	10/28/2017	US46470561
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	6/21/2017	Annual	6/21/2018	441112
Emco	6502	Active Loop Antenna (10k - 30 MHz)	8/9/2016	Biennial	8/9/2018	2936
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/23/2016	Biennial	8/23/2018	135427
Espec	ESX-2CA	Environmental Chamber	4/11/2017	Annual	4/11/2018	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	4/26/2016	Biennial	4/26/2018	128337
Mini Circuits	TVA-11-422	RF Power Amp	N/A		QA1317001	
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/24/2017	Annual	3/24/2018	11401010036
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11403100002
PCTEST	-	EMC Switch System	6/21/2017	Annual	6/21/2018	NM2
Rohde & Schwarz	CMU200	Base Station Simulator		N/A		107826
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/7/2017	Annual	3/7/2018	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/11/2017	Annual	5/11/2018	100040
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	7/27/2016	Annual	7/27/2017	103200
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	3/30/2016	Biennial	3/30/2018	9105-2404
Sunol	DRH-118	Horn Antenna (1-18GHz)	7/30/2015	Biennial	7/30/2017	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107

Table 5-1. Test Equipment

Notes:

- 1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
- 2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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SAMPLE CALCULATIONS 6.0

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)

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:	ZNFH932
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM / GPRS / EDGE / WCDMA</u>

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

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 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 3.9.

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7.2 Occupied Bandwidth §2.1049

Test Overview

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

Test Procedure Used

KDB 971168 D01 v02r02 - Section 4.2

Test Settings

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

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

Test Setup

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

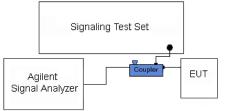


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

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Keysight Spectrum Analyzer - Occupied BW				
XIRL RF 50Ω AC	Center →→ Trig: F	SENSE:INT Freq: 836.600000 MHz free Run Avg Hold: 1 : 40 dB	12:21:32 PMJ Radio Std: N 100/100 Radio Devic	Ione Trace/Detector
15 dB/div Ref 35.00 dBm		m		
5.00 -10.0 -25.0				Clear Writ
-40.0				Averag
-100				Max Hol
Center 836.6 MHz Res BW 6.2 kHz		VBW 18 kHz Total Power	Span (Sweep 41.4 dBm	625 kHz 15.6 ms Min Hol
	43.13 kHz			Detecto Peak
Transmit Freq Error x dB Bandwidth	-690 Hz 320.3 kHz	% of OBW Power x dB	r 99.00 % -26.00 dB	Auto <u>Ma</u>
SG			STATUS	

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



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

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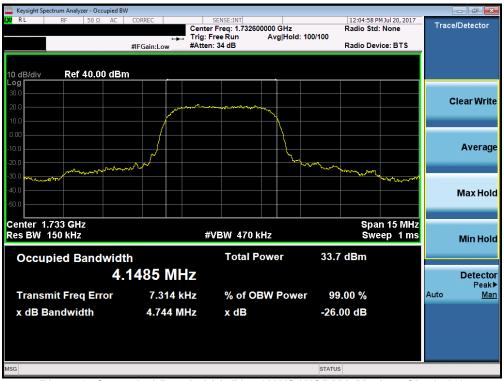
Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode - Ch. 661)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Plot 7-5. Occupied Bandwidth Plot (Cellular WCDMA Mode – Ch. 4183)



Plot 7-6. Occupied Bandwidth Plot (AWS WCDMA Mode - Ch. 1413)

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Plot 7-7. 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 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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

Test Procedure Used

KDB 971168 D01 v02r02 - Section 6.0

Test Settings

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

Test Setup

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

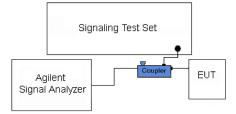


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

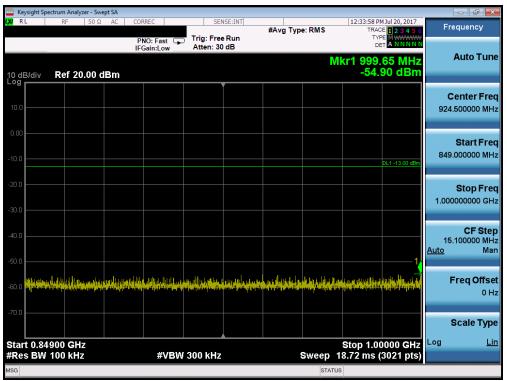
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz, and 100 kHz or greater for Part 22 measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 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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	ctrum Analyze		A								[
I <mark>XI</mark> RL	RF	50Ω A	Р	RREC NO: Fast Gain:Lov		SE Trig: Fre Atten: 30	#Avg Typ	e: RMS	TRAC	M Jul 20, 2017 DE 1 2 3 4 5 6 DE MWWWWW A N N N N N	Fre	quency
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-20.0												Stop Freq 000000 MHz
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-60.0 <mark>1400/0-</mark>		in a state of the second s	and a factor of	n fallen gesterfelde.		ng Kiyang Kalendara Sadara Kalendara	jenn grynddiada ac adairaethad	n a parte a sector travalage a	t Lippilles professioner professioner professioner and the second second second second second second second se		F	req Offset 0 Hz
-70.0											S Log	cale Type Lin
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MSG								STATUS				

Plot 7-8. Conducted Spurious Plot (Cellular GSM Mode – Ch. 128)



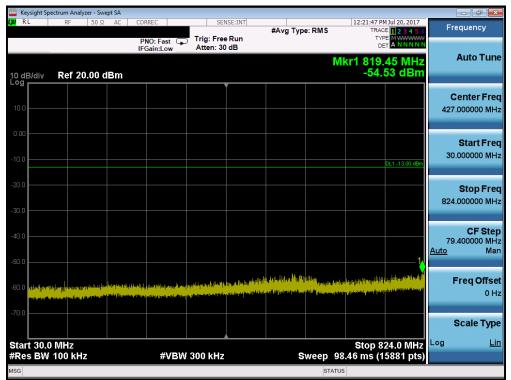
Plot 7-9. Conducted Spurious Plot (Cellular GSM Mode – Ch. 128)

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	ectrum Analyzer -					1			
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0.0									CF Ste 900.000000 Mi <u>Auto</u> Ma
0.0									Freq Offs 0 F
0.0									Scale Typ
tart 1.00 Res BW	0 GHz 1.0 MHz		#VB	W 3.0 MHz		Sweep	Stop 10. 15.60 ms (1	000 GHz 8001 pts)	Log <u>L</u>





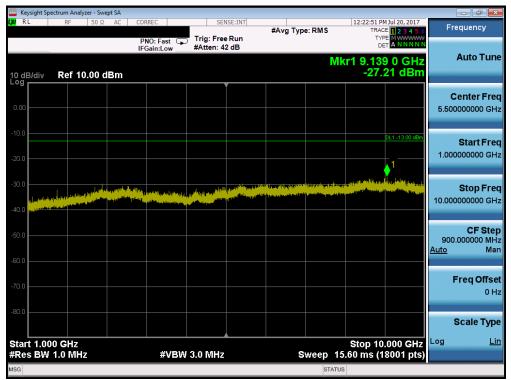
Plot 7-11. Conducted Spurious Plot (Cellular GSM Mode – Ch. 190)

FCC ID: ZNFH932	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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🔤 Keysight Sp	ectrum Analyzer	- Swept S	SA								
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-10.0										DL1 -13.00 dBm	Start Fr 849.000000 M
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-70.0											Scale Ty
	900 GHz 100 kHz			#VBW	/ 300 kHz			Sweep 1	Stop 1.00 8.72 ms (0000 GHz 3021 pts)	Log <u>l</u>
MSG								STATUS	3		





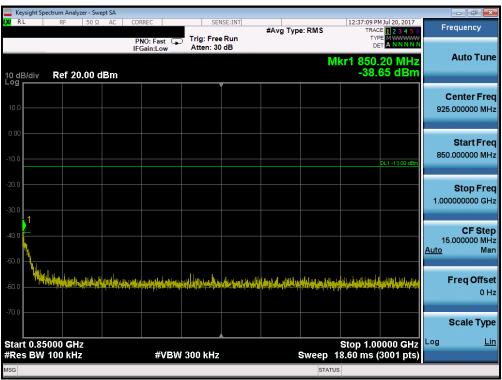
Plot 7-13. Conducted Spurious Plot (Cellular GSM Mode - Ch. 190)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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art 30.0 MHz Stop 824.0 MHz ^{Log} Lir	-70.0													
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Res BW 100 kHz #VBW 300 kHz Sweep 98.46 ms (15881 pts)	#Res DW	TOU KHZ			#				5			rəss r pis)		





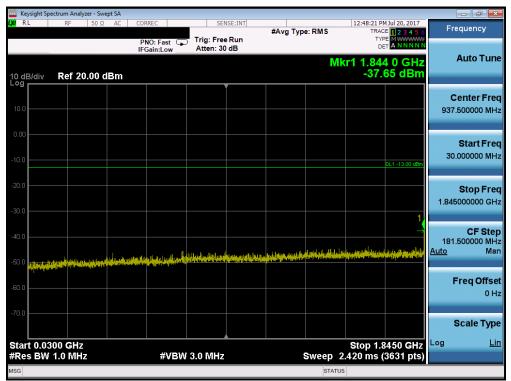
Plot 7-15. Conducted Spurious Plot (Cellular GSM Mode - Ch. 251)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	oectrum Analyzer - S	wept SA					
L <mark>XI</mark> RL	RF 50	Ω AC	CORREC	SENSE:IN	#Avg Type: RMS	12:37:35 PM Jul 20, 2017 TRACE 1 2 3 4 5 6	Frequency
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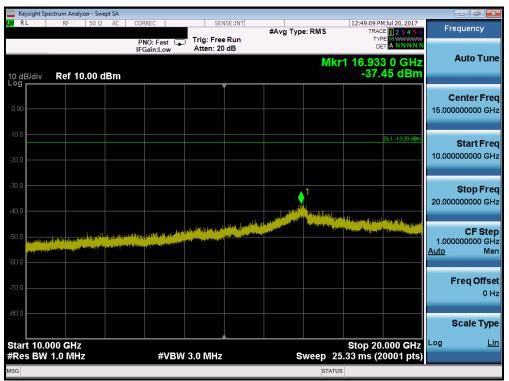
Plot 7-17. Conducted Spurious Plot (PCS GSM Mode - Ch. 512)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Scale										Freq C	Offso 0⊦
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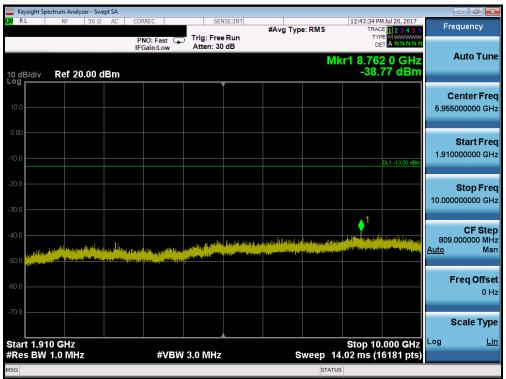
Plot 7-19. Conducted Spurious Plot (PCS GSM Mode - Ch. 512)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analyzer - Sw	vept SA								
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-10.0									DL1 -13.00 dBm	30.000000 MH
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-60.0										Freq Offse 0 H
-70.0										Coole Tra
										Scale Type
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ISG							STATUS			





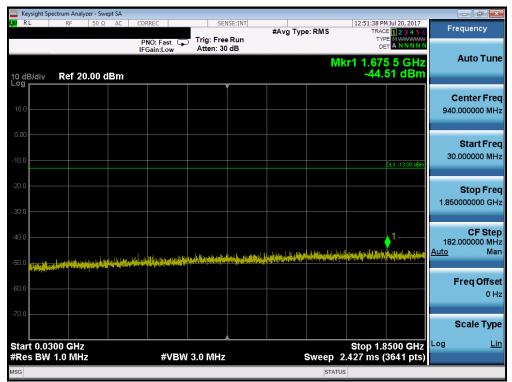
Plot 7-21. Conducted Spurious Plot (PCS GSM Mode - Ch. 661)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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	ectrum Analyzer - S	Swept SA								
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Plot 7-23. Conducted Spurious Plot (PCS GSM Mode - Ch. 810)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager						
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	ectrum Analyzer - S	wept SA									
L <mark>XI</mark> RL	RF 50	Ω AC (CORREC	SEN	SE:INT	#Avg Type	e: RMS	TRAC	M Jul 20, 2017 E 1 2 3 4 5 6	Freque	ency
			PNO: Fast IFGain:Low	Trig: Free #Atten: 32		• /		TYF DE			
10 dB/div Log	Ref 20.00	dBm					Mk	r1 8.66 -37.	4 5 GHz 47 dBm	Aut	o Tune
10.0										Cent 5.957500	er Freq 000 GHz
-10.0									DL1 -13.00 dBm	St a 1.915000	art Freq 000 GHz
-20.0										Sto	o p Freq 000 GHz
-40.0	t til se filt delta e a statistica e	MilletteredMilgeret Intercontribution	ang da bagang papatakén kerina. Ang da pang papatakén kerina		enneg projekti annak Mali ma da projekti a		i në possentë vetë Ngjana son tetkori	and and the formation of the second s	n ya alika kata alika ƙasa Tana Internet (Jana Kaya In	C 808.500 <u>Auto</u>	F Step 000 MHz Man
-60.0										Frec	Offset 0 Hz
-70.0										Sca	Іе Туре
Start 1.9 [,] #Res BW			#VBW	/ 3.0 MHz		s	weep 14	Stop 10 .01 ms (1	.000 GHz 6171 pts)	Log	<u>Lin</u>
MSG							STATUS				





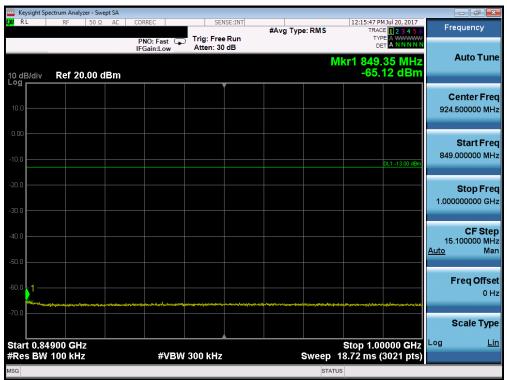
Plot 7-25. Conducted Spurious Plot (PCS GSM Mode - Ch. 810)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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	rum Analyzer -	Swept SA										- đ 🗙
X/RL	RF 50	Ω AC	CORREC		SEI	NSE:INT	#Avg Type:	RMS		M Jul 20, 2017 E <mark>1 2 3 4 5</mark> 6	Fre	quency
			PNO: Fa IFGain:L	st 🖵	Trig: Fre Atten: 30		0 ,,		TYI Di			
10 dB/div Log	Ref 20.00	dBm						Mk	r1 822. -32.	.85 MHz 98 dBm		Auto Tune
10.0												enter Frec 500000 MHz
-10.0										DL1 -13.00 dBm	30.	Start Fred 000000 MHz
-20.0										1	823.	Stop Fred 000000 MH2
-40.0											79. <u>Auto</u>	CF Step 300000 MHz Mar
60.0								Thur and the share stige			F	F req Offse 0 Ha
-70.0											5	Scale Type
Start 30.0 P #Res BW 1	VIHz 00 kHz		#	VBW :	300 kHz		Sw	eep 98.	Stop 8 33 ms <u>(</u> 1	23.0 MHz 5861 pts)	Log	Lir
ISG								STATUS				

Plot 7-26. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



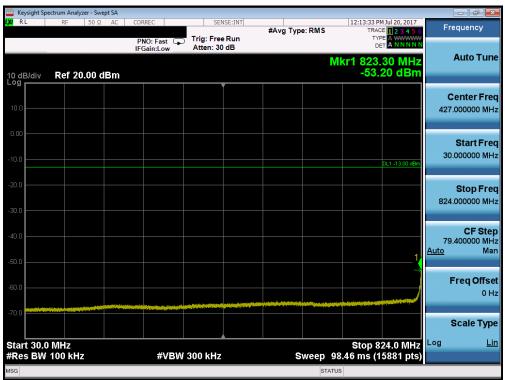
Plot 7-27. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analyzer - S								
X/RL	RF 50	Ω AC	CORREC	SE	NSE:INT	#Avg Type: RMS	TRAC	1 Jul 20, 2017 E 1 2 3 4 5 6	Frequency
			PNO: Fast (IFGain:Low	Trig: Fre #Atten: 3			TYP DE		
10 dB/div Log	Ref 10.00	dBm				N	/kr1 8.680 -41.9) 5 GHz 98 dBm	Auto Tune
0.00									Center Fred 5.50000000 GHz
-10.0								DL1 -13.00 dBm	Start Fred 1.000000000 GHz
-30.0							1		Stop Fred 10.000000000 GHz
-50.0	silected and the second second	~~~~~							CF Step 900.000000 MHz <u>Auto</u> Mar
-70.0									Freq Offset 0 Hz
-80.0									Scale Type
Start 1.00 #Res BW			#VB	W 3.0 MHz		Sweep	Stop 10. 15.60 ms (1	000 0112	Log <u>Lir</u>
ISG						STA	TUS		

Plot 7-28. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



Plot 7-29. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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🔤 Keysight Spectrum Ana	lyzer - Swept S	5A								
XIRL RF	50 Ω A	AC CORF	REC	SEI	NSE:INT	#Avg Type:	RMS	TRAC	MJul 20, 2017 E 1 2 3 4 5 6	Frequency
		PN IFG	0:Fast 🖵 ain:Low	Trig: Free Atten: 30				TYF DE		
10 dB/div Ref 2	20.00 dBi	m					Mk	r1 849. -53.	75 MHz 62 dBm	Auto Tuno
10.0										Center Free 924.500000 MH
-10.0									DL1 -13.00 dBm	Start Free 849.000000 MH
-20.0										Stop Free 1.000000000 GH
-40.0										CF Step 15.100000 MH <u>Auto</u> Mar
60.0	ر. در معید بطرو اور می	وفو والبار مروسي والم	والموافق والمراجعة والمراجعة	anaha Manazaran yang bang bang bang bang bang bang bang b	4).55.599.795.694 9 4.6-6-6	inegret Britships Bitcherter Bitcher	ي مېرىمىزىمۇلىرىمىرەسواسورامىزومىز	alengelegelegelegelegelegelegelegelegeleg	anta (hilikana) kanada k	Freq Offse 이 H:
-70.0										Scale Type
Start 0.84900 G #Res BW 100 ki			#VBW	300 kHz		S	weep 18	Stop 1.00 3.72 ms (0000 GHz 3021 pts)	Log <u>Lir</u>
ISG							STATUS			

Plot 7-30. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)



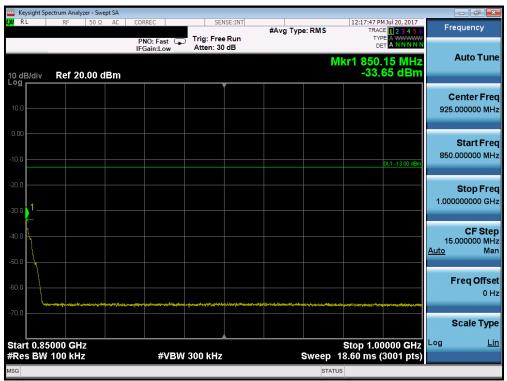
Plot 7-31. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analyze	er - Swep	t SA										
XI RL	RF	50 Ω	AC	CORREC		9	ENSE:INT	#Avg Type	RMS		PMJul 20, 2017 ACE 1 2 3 4 5 6	Freque	ency
				PNO: F IFGain:I	ast Ģ ∟ow	Trig: Fr Atten:				٦		_	_
10 dB/div Log	Ref 20.	00 dE	3m						N	lkr1 823 -62	3.80 MHz 2.87 dBm	Aut	to Tune
10.0													t er Freq 000 MHz
-10.0											DL1 -13.00 dBm		art Freq 000 MHz
-20.0													o p Freq 000 MHz
-40.0													C F Step 000 MHz Man
-60.0								1			1	Free	q Offset 0 Hz
-70.0												Sca	le Type
Start 30.0 #Res BW	MHz 100 kHz				#VBW	300 kH	z	Sv	veep 9	Stop 8.46 ms	824.0 MHz (15881 pts)	Log	Lin
ASG									STATU	JS			

Plot 7-32. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)



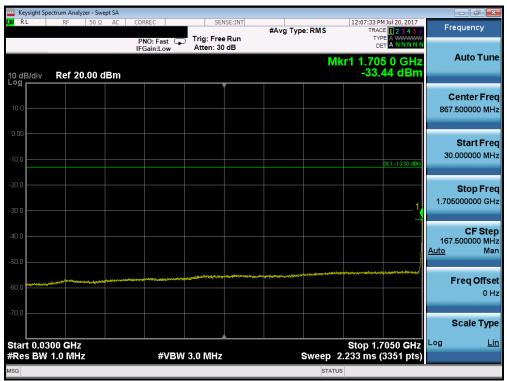
Plot 7-33. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analyzer -	Swept SA										
X/RL	RF 50	Ω AC	CORREC		SEI	SE:INT	#Avg Type: F	RMS		M Jul 20, 2017 CE 1 2 3 4 5 6	Frequ	iency
			PNO: F IFGain:I	ast ⊊ _ow	Trig: Free #Atten: 3				TY D		_	
10 dB/div Log	Ref 10.00	dBm						Mkr	1 8.66 -41	5 0 GHz 93 dBm	Au	ito Tune
0.00												i ter Freq 0000 GHz
-10.0										DL1 -13.00 dBm		a rt Freq 0000 GHz
-30.0									● ¹		St 10.00000	t op Freq 0000 GHz
-50.0	- Les anno an	~~~~~	~									CF Step 0000 MHz Man
-70.0											Fre	q Offset 0 Hz
-80.0											Sca	ale Type
Start 1.00 #Res BW				#VBW	3.0 MHz		Swe	eep 15.6	Stop 10 i0 ms (*).000 GHz 18001 pts)	Log	<u>Lin</u>
ISG								STATUS				

Plot 7-34. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)



Plot 7-35. Conducted Spurious Plot (AWS WCDMA Mode – Ch. 1312)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 33 of 82
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	ectrum Analyzer	- Swept SA							
X/RL	RF 5	OΩ AC	CORREC	SE	ENSE:INT	#Avg Type: RMS		PM Jul 20, 2017 ACE 1 2 3 4 5 6	Frequency
			PNO: Fast IFGain:Low	Trig: Fre			Т		
10 dB/div Log	Ref 20.0	0 dBm				N	lkr1 8.67 -47	76 5 GHz .88 dBm	Auto Tune
10.0									Center Freq 5.877500000 GHz
-10.0								DL1 -13.00 dBm	Start Freq 1.755000000 GHz
-20.0									Stop Freq 10.000000000 GHz
-40.0							1		CF Step 824.500000 MHz <u>Auto</u> Man
-60.0									Freq Offset 0 Hz
-70.0									Scale Type
Start 1.75 #Res BW			#V	BW 3.0 MH;	2	Sweep 1	Stop 1 14.29 ms (0.000 GHz 16491 pts)	Log <u>Lin</u>
ISG						STAT	US		





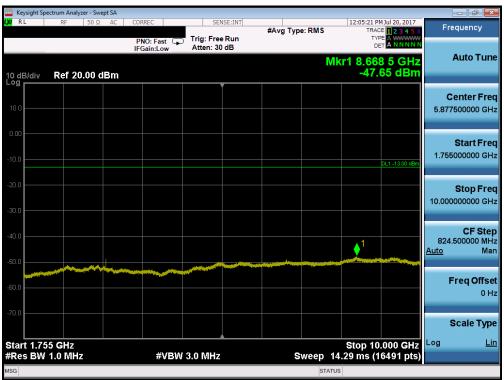
Plot 7-37. Conducted Spurious Plot (AWS WCDMA Mode – Ch. 1312)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 34 of 82
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	ectrum Analyzer -							
RL	RF 5	OΩ AC	CORREC	S	ENSE:INT	#Avg Type: RMS	12:05:07 PM Jul 20, 2017 TRACE 1 2 3 4 5 6	Frequency
			PNO: Fas IFGain:Lo	t Trig: Fr w Atten: 3			DET A WWWW	
0 dB/div	Ref 20.0	0 dBm				N	lkr1 1.710 0 GHz -52.63 dBm	Auto Tun
10.0								Center Free 870.000000 MH
0.00							DL1 -13.00 dBm	Start Free 30.000000 MH
20.0								Stop Fre 1.710000000 GH
10.0							1	CF Ste 168.000000 M⊦ <u>Auto</u> Ma
50.0 60.0		411-12-11-11-11-11-11-11-11-11-11-11-11-1		enternal de la construction de la constru	244444 244444 24444 244444 2444444		un an freight frei a fran staffen staffen fra an	Freq Offse 0 ⊦
70.0								Scale Typ
tart 0.03 Res BW	00 GHz 1.0 MHz		#\	/BW 3.0 MH	z	Sweep	Stop 1.7100 GHz 2.240 ms (3361 pts)	Log <u>Li</u>
G						STAT		





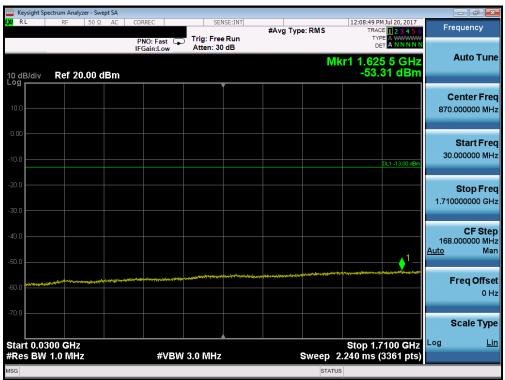
Plot 7-39. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1413)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	trum Analyzer - S										
X/RL	RF 50 :	Ω AC	CORREC	SENS	E:INT	#Avg Type:	RMS	TRAC	MJul 20, 2017 E 1 2 3 4 5 6	Frequ	ency
			PNO: Fast 🕞 IFGain:Low	Trig: Free Atten: 20 c				TYF DE			
10 dB/div	Ref 10.00	dBm					Mkr′	16.960 -45.2) 5 GHz 22 dBm	Au	to Tune
0.00										Cen 15.000000	ter Fred 0000 GH
-10.0									DL1 -13.00 dBm	St 10.000000	art Free
-30.0						1				St 20.000000	op Free 0000 GH
-50.0					~~~			*****		1.000000 <u>Auto</u>	CF Stej 0000 GH Mai
70.0										Fre	q Offse 0 H
-80.0										Sca	ale Typ
Start 10.00 Res BW 1			#VBW	/ 3.0 MHz		Sw	eep 25.	Stop 20 33 ms (2	.000 GHz 0001 pts)	Log	<u>Lii</u>
ISG							STATUS				





Plot 7-41. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1513)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager		
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	trum Analyze:	- Swept SA								
XI RL	RF	50Ω AC	CORR	EC	SEI	NSE:INT	#Avg Type: RMS	12:09:10 PM Jul TRACE	20,2017 2 3 4 5 6	Frequency
			PN IFGa	0:Fast ⊆ ain:Low	Trig: Free Atten: 30			TYPE A DET A	NNNN	
10 dB/div	Ref 20.0)0 dBn	n				ľ	/lkr1 1.760 (-34.69) GHz dBm	Auto Tune
10.0										Center Fred 5.880000000 GH;
10.00								DL1	-13.00 dBm	Start Fred 1.760000000 GH:
20.0 30.0 <mark>× 1</mark> ——										Stop Fred 10.000000000 GH:
€- 40.0 50.0								المريدة الاندوان ومدامه الموجور	Ē	CF Step 824.000000 MH <u>auto</u> Mar
60.0		~~~L_		and the second						Freq Offse 0 H
70.0										Scale Type
tart 1.760 Res BW 1				#VBW	/ 3.0 MHz		Sweep	Stop 10.00 14.28 ms (164	0 GHz 81 pts)	.og <u>Lir</u>
SG							STA	TUS		





Plot 7-43. Conducted Spurious Plot (AWS WCDMA Mode - Ch. 1513)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Demo 27 of 92				
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	ectrum Analyz	zer - Swep	t SA									
LXI RL	RF	50 Ω	AC	CORREC		S	ENSE:INT	#Avg Type: RMS	11:	52:35 AM Jul 20, 2017 TRACE 1 2 3 4 5 6	Fre	quency
				PNO: Fa IFGain:L		Trig: Fr Atten:				DET A WWWW		
10 dB/div Log	Ref 20	.00 dE	3m					· · · · · ·	Mkr1 1	l.845 0 GHz -34.23 dBm		Auto Tune
10.0												enter Freq 600000 MHz
-10.0										DL1 -13.00 dBm		Start Freq
-20.0										1		Stop Freq 000000 GHz
-40.0											181.5 <u>Auto</u>	CF Step 000000 MHz Man
-60.0	مەرىيەت ب ارمىيەرل		tertegromitel		1,7007964(19,070638VA	anal-répecia Pagya Jagitan			Mine of - 200 jug and	an a	F	r eq Offset 0 Hz
-70.0											S	cale Type
Start 0.03 #Res BW		L		#	VBW	3.0 MH	z	Sweep	Sto 2.420	p 1.8450 GHz ms (3631 pts)	Log	Lin
MSG								STA	TUS			

Plot 7-44. Conducted Spurious Plot (PCS WCDMA Mode - Ch. 9262)



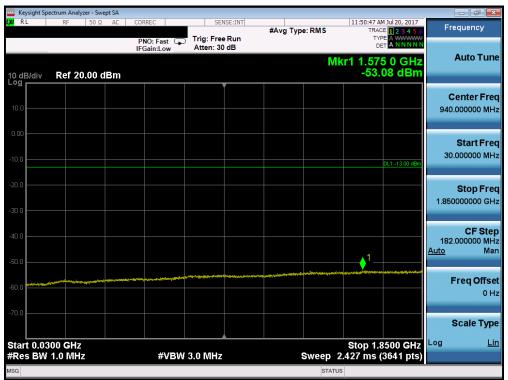
Plot 7-45. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager				
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	ctrum Analyzer - S						
X/RL	RF 50	Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	11:53:06 AM Jul 20, 2017 TRACE 1 2 3 4 5 6	Frequency
			PNO: Fast G	Trig: Free Run Atten: 20 dB			
10 dB/div Log	Ref 10.00	dBm			Mk	r1 16.957 5 GHz -45.26 dBm	Auto Tune
0.00							Center Freq 15.00000000 GHz
-10.0						DL1 -13.00 dBm	Start Freq 10.000000000 GHz
-30.0					1		Stop Freq 20.000000000 GHz
-50.0							CF Step 1.00000000 GH <u>Auto</u> Mar
70.0							Freq Offse 0 H
-80.0							Scale Type
Start 10.0 #Res BW			#VBW	/ 3.0 MHz	Sweep 2	Stop 20.000 GHz 5.33 ms (20001 pts)	Log <u>Lir</u>
SG					STATI	JS	





Plot 7-47. Conducted Spurious Plot (PCS WCDMA Mode - Ch. 9400)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 92			
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	ctrum Analyzer - S								
X/RL	RF 50	Ω AC	CORREC PNO: Fast		NSE:INT	#Avg Type: RMS	TR	AM Jul 20, 2017 ACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency
			IFGain:Low	Atten: 3				DETANNNN	
10 dB/div	Ref 20.00	dBm					Mkr1 8.6 -47	84 5 GHz 7.96 dBm	Auto Tune
10.0									Center Free 5.955000000 GH:
10.0								DL1 -13.00 dBm	Start Free 1.910000000 GH:
20.0 30.0 									Stop Free 10.000000000 GH
40.0							1		CF Step 809.000000 MH <u>Auto</u> Mar
60.0									Freq Offse 0 H
70.0									Scale Type
tart 1.910 Res BW			#VE	3W 3.0 MHz		Sweep	Stop 1 14.02 ms	0.000 GHz (16181 pts)	Log <u>Li</u>
SG						ST	ATUS		





Plot 7-49. Conducted Spurious Plot (PCS WCDMA Mode - Ch. 9400)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dogo 40 of 92			
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Keysight Spectrum /									
K RL RF	50 Ω	AC (CORREC	SE	NSE:INT	#Avg Type: RMS	TR.	AM Jul 20, 2017 ACE 1 2 3 4 5 6	Frequency
			PNO: Fast C IFGain:Low	Trig: Fre Atten: 3			т		
IO dB/div Rel	20.00 di	Bm				N	lkr1 1.50 -53	66 5 GHz 24 dBm	Auto Tune
10.0									Center Fred 940.000000 MH:
10.0								DL1 -13.00 dBm	Start Free 30.000000 MH:
30.0									Stop Fred 1.850000000 GH:
40.0							1_		CF Step 182.000000 MH <u>Auto</u> Mar
50.0 	analy subject of the second	n fagi matta y tir bað	and the apply says of the other		1	and an analysis of the second		, high an a surger of the surg	Freq Offse 0 H
70.0									Scale Type
tart 0.0300 G Res BW 1.0 N			#VB	W 3.0 MHz	2	Sweep	Stop 1 2.427 ms	.8500 GHz (3641 pts)	Log <u>Li</u> i
SG						STAT	US		





Plot 7-51. Conducted Spurious Plot (PCS WCDMA Mode - Ch. 9538)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ctrum Analyzer - S						
X/RL	RF 50	Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	11:54:15 AM Jul 20, 2017 TRACE 1 2 3 4 5 6	Frequency
			PNO: Fast G	Trig: Free Run Atten: 20 dB		TYPE A WWWW DET A N N N N N	
10 dB/div	Ref 10.00	dBm			Mk	r1 16.970 5 GHz -45.37 dBm	Auto Tune
0.00							Center Fred 15.000000000 GH;
20.0						DL1 -13.00 dBm	Start Fred 10.000000000 GH;
-30.0					1		Stop Fred 20.000000000 GH:
-50.0							CF Step 1.00000000 GH: <u>Auto</u> Mar
70.0							Freq Offse 0 H
80.0							Scale Type
Start 10.00			#VBW	3.0 MHz	Sweep 2	Stop 20.000 GHz 5.33 ms (20001 pts)	Log <u>Lir</u>
SG					STATI	JS	

Plot 7-52. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Page 42 of 82				
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7.4 Band Edge Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(h)

Test Overview

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

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

Test Procedure Used

KDB 971168 D01 v02r02 - Section 6.0

Test Settings

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

Test Setup

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

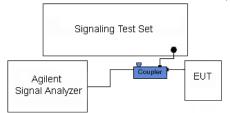


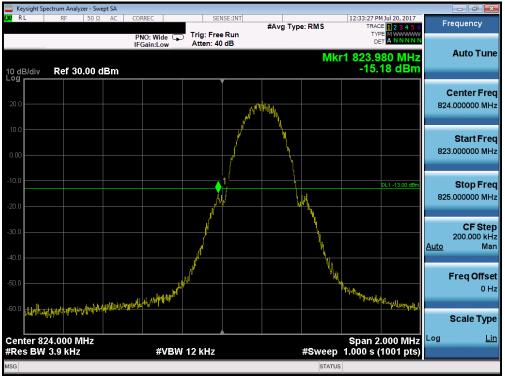
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

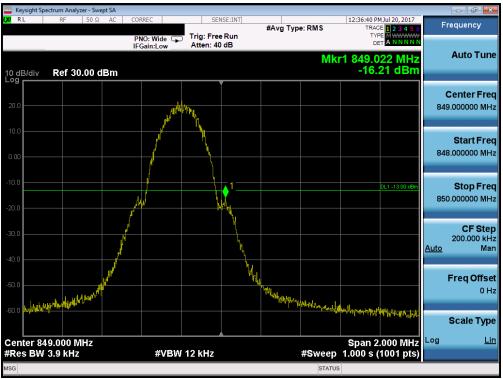
Per 22.917(b), 24.238(b), 27.53(h)(3), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
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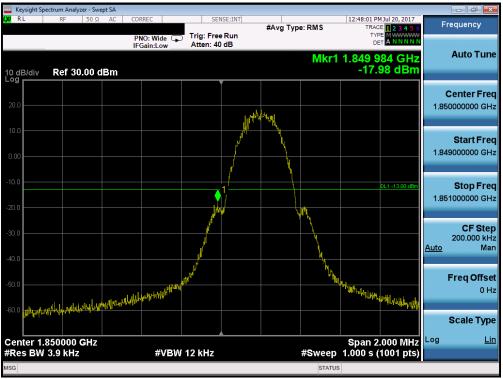
Plot 7-53. Band Edge Plot (Cellular GSM Mode - Ch. 128)

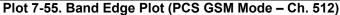


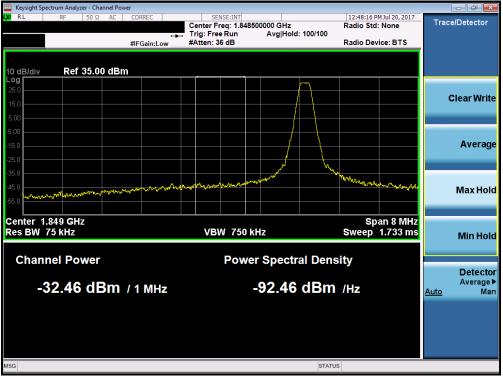
Plot 7-54. Band Edge Plot (Cellular GSM Mode – Ch. 251)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
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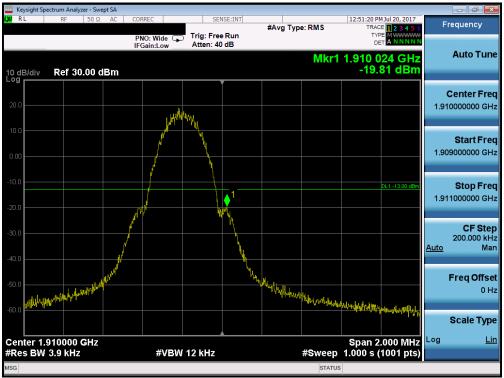


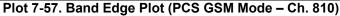


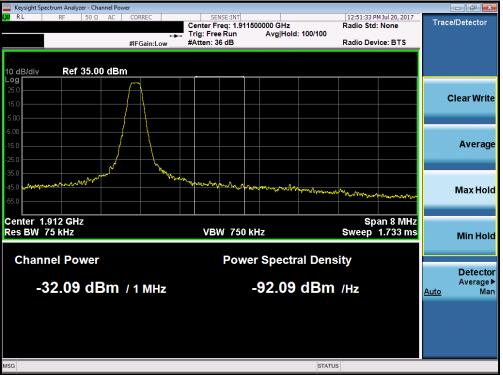
Plot 7-56. 4MHz Span Plot (PCS GSM Mode - Ch. 512)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
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Plot 7-58. 4MHz Span Plot (PCS GSM Mode - Ch. 810)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Keysight Spectrum Analyz	er - Swept SA					
K RL RF	50 Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	12:15:13 PM Jul 20, 2017 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast G	Trig: Free Run Atten: 40 dB		TYPE A WWWWW DET A NNNNN	
10 dB/div Ref 30	.00 dBm			Mk	r1 824.000 MHz -20.56 dBm	Auto Tune
20.0						Center Freq 824.000000 MHz
0.00						Start Fred 816.500000 MHz
-10.0			1		DL1 -13.00 dBm	Stop Fred 831.500000 MHz
40.0		m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Martin	CF Step 1.500000 MH <u>Auto</u> Mar
50.0	m					Freq Offse 0 H
60.0						Scale Type
Center 824.000 M #Res BW 100 kHz		#VBW	/ 300 kHz	Sweep	Span 15.00 MHz I.867 ms (1001 pts)	Log <u>Lir</u>
ISG				STATU		





Plot 7-60. Band Edge Plot (Cellular WCDMA Mode - Ch. 4233)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dogo 47 of 92			
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	ectrum Analyzei												- ¢ 💌
RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Ty	e: RMS		PM Jul 20, 2017 CE 1 2 3 4 5 6	Fr	equency
				PNO: Fa IFGain:L	ast 😱 .ow	Trig: Fre Atten: 4		#711g 1 j		T) [
0 dB/div og r	Ref 30.0	00 dl	3m						Mkr	1 1.710 -20	000 GHz .27 dBm		Auto Tun
20.0													Center Fre 0000000 G⊦
).00									and a low and a low and a low and a low			1.70	Start Fre 2500000 G⊦
0.0							1				DL1 -13.00 dBm	1.71	Stop Fre 7500000 G⊦
0.0			ſ	p-h-h-	~~~~					Y.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1 <u>Auto</u>	CF Ste .500000 MH Ma
0.0	-new North	~~~~											Freq Offs 0 H
0.0													Scale Typ
	710000 G 100 kHz	Hz		\$	¢VBW	300 kHz			Sweep	Span 1.867 ms	15.00 MHz (1001 pts)	Log	Li
G									STATU	JS			

Plot 7-61. Band Edge Plot (AWS WCDMA Mode - Ch. 1312)



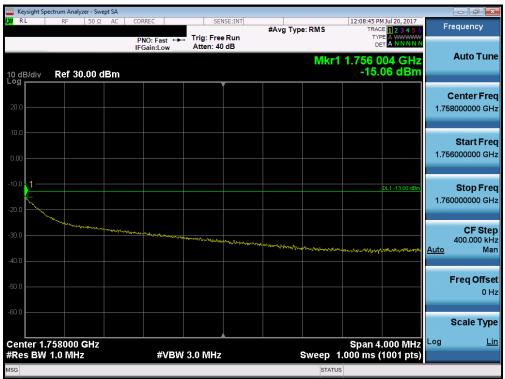
Plot 7-62. 4MHz Span Plot (AWS WCDMA Mode - Ch. 1312)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analyzer	- Swept SA									
X/RL	RF 5	iOΩ AC	CORREC	S	ENSE:INT	#Avg Typ	e: RMS	TRAC	MJul 20, 2017	Fr	equency
			PNO: Fas IFGain:Lo	t 🕞 Trig: Fr w Atten: 4		•		TYF De			
10 dB/div Log	Ref 30.0	0 dBm					Mkr1	1.755 0 -18.	00 GHz 59 dBm		Auto Tune
20.0											Center Fred 5000000 GHz
0.00			~~~~	antimit						1.74	Start Fred 7500000 GHz
-10.0					1				DL1 -13.00 dBm	1.76	Stop Fred 2500000 GH2
-30.0	m	N			h	mm				1 <u>Auto</u>	CF Step .500000 MH: Mar
-50.0							- marker		in water water	1	Freq Offse 0 H:
-60.0											Scale Type
	755000 GI 100 kHz	lz	#	VBW 300 kH	z		Sweep 1	Span 1 .867 ms (5.00 MHz 1001 pts)	Log	Lir
ISG							STATU				





Plot 7-64. 4MHz Span Plot (AWS WCDMA Mode - Ch. 1513)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dago 40 of 92			
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	ectrum Analyzer - Swept									_	- 6 .
XI RL	RF 50 Ω	AC CORREC	Fast	Trig: Free		#Avg Typ	e: RMS	TRA	M Jul 20, 2017 CE 1 2 3 4 5 6 PE A WWWW ET A N N N N N	Fred	luency
10 dB/div	Ref 30.00 dE	IFGair	n:Low	Atten: 40	dB		Mkr1	1.850 (000 GHz 66 dBm	A	uto Tune
20.0											nter Fre 00000 GH
0.00							when				Start Fre 00000 GH
20.0					1				DL1 -13.00 dBm		Stop Fre 00000 GH
40.0		~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	\sim				h	and the second	1.5 <u>Auto</u>	CF Ste 00000 M⊦ Ma
50.0	mon man	www								Fr	r eq Offs 0 H
60.0	850000 GHz							Span 1	5.00 MHz	So Log	cale Typ <u>Li</u>
	100 kHz		#VBW 3	800 kHz			Sweep 1.	867 ms	(1001 pts)		
SG							STATUS				

Plot 7-65. Band Edge Plot (PCS WCDMA Mode - Ch. 9262)



Plot 7-66. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9262)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dago 50 of 92			
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	ectrum Analyzer - Swept S					
XI RL	RF 50 Ω A	C CORREC	SENSE:INT	#Avg Type: RMS	11:53:27 AM Jul 20, 2017 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast 🕞	Trig: Free Run Atten: 40 dB		TYPE A WWWWW DET A NNNNN	
10 dB/div	Ref 30.00 dBr	n		Mkr	1 1.910 000 GHz -18.67 dBm	Auto Tune
20.0						Center Fred 1.910000000 GH
0.00			www			Start Fre 1.902500000 GH
-10.0			1		DL1 -13.00 dBm	Stop Free 1.917500000 GH
30.0 40.0	~~~~~		h	Common Maria		CF Ste j 1.500000 MH <u>Auto</u> Ma
50.0					mmmmmm	Freq Offse 0 H
60.0						Scale Type
	910000 GHz 100 kHz	#VBW	300 kHz	Sweep	Span 15.00 MHz 1.867 ms (1001 pts)	Log <u>Li</u> i
ISG				STATU		





Plot 7-68. 4MHz Span Plot (PCS WCDMA Mode - Ch. 9538)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dago 51 of 92	
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7.5 Peak-Average Ratio

Test Overview

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

Test Procedure Used

KDB 971168 D01 v02r02 - Section 5.7.1

Test Settings

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

Test Setup

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

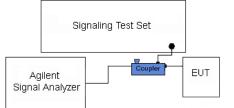


Figure 7-4. Test Instrument & Measurement Setup

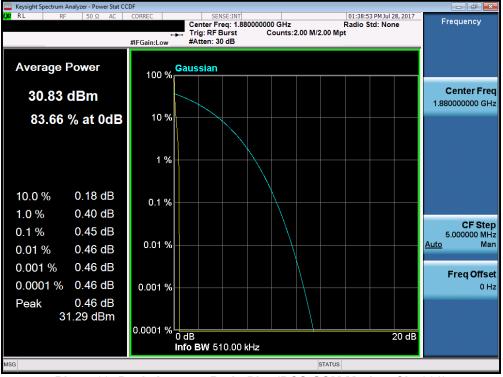
Test Notes

None.

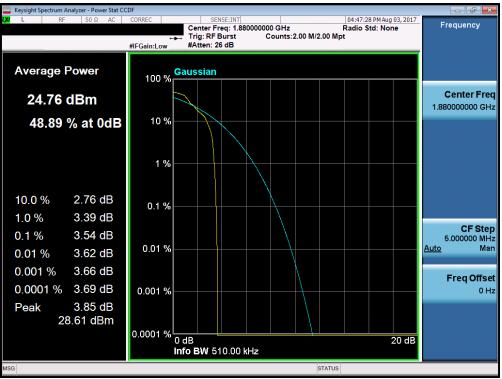
FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 52 of 92
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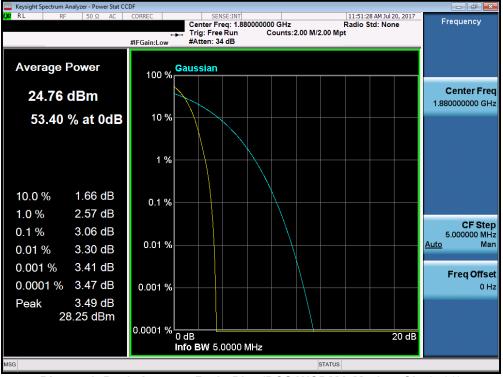




Plot 7-70. Peak-Average Ratio Plot (EDGE1900 Mode - Ch. 661)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 53 of 82
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Plot 7-71. Peak-Average Ratio Plot (PCS WCDMA Mode - Ch. 9400)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Daga 54 of 92	
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7.6 Radiated Power (ERP/EIRP) §22.913(a)(2) 24.232(c) 27.50(d.4)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v02r02 - Section 5.2.1

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

Test Settings

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

FCC ID: ZNFH932	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 55 of 82
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Test Setup

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

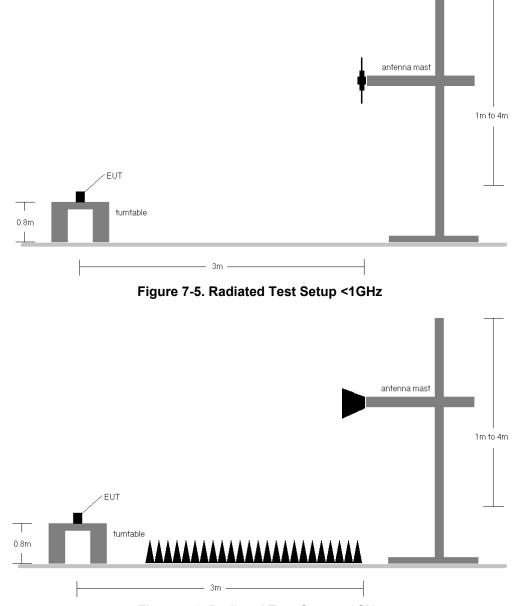


Figure 7-6. Radiated Test Setup >1GHz

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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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 GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."
- 3) This unit was tested with its standard battery.
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.20	GSM850	V	150	106	25.65	-0.65	25.00	0.316	38.45	-13.45
836.60	GSM850	V	150	108	25.53	-0.65	24.88	0.308	38.45	-13.57
848.80	GSM850	V	150	95	25.08	-0.65	24.43	0.277	38.45	-14.02
824.20	GSM850	Н	150	324	24.91	-0.65	24.26	0.266	38.45	-14.19
824.20	EDGE850	V	150	106	17.87	-0.65	17.22	0.053	38.45	-21.23
824.20	GSM850 (WCP)	Н	150	185	25.53	-0.65	24.88	0.307	38.45	-13.57

Table 7-2. ERP (Cellular GSM)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
826.40	WCDMA850	Н	150	35	18.83	-0.65	18.18	0.066	38.45	-20.27
836.60	WCDMA850	н	150	37	18.92	-0.65	18.27	0.067	38.45	-20.18
846.60	WCDMA850	Н	150	38	17.91	-0.65	17.26	0.053	38.45	-21.19
836.60	WCDMA850	V	150	138	16.75	-0.65	16.10	0.041	38.45	-22.35
836.60	WCDMA850 (WCP)	Н	150	67	18.55	-0.65	17.90	0.062	38.45	-20.55

Table 7-3. ERP (Cellular WCDMA)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	Н	150	27	17.41	5.55	22.96	0.198	30.00	-7.04
1732.60	WCDMA1700	Н	150	38	17.08	5.41	22.49	0.177	30.00	-7.51
1752.60	WCDMA1700	Н	150	27	16.68	5.27	21.95	0.157	30.00	-8.05
1712.40	WCDMA1700	V	150	310	14.42	5.63	20.05	0.101	30.00	-9.95
1712.40	WCDMA1700 (WCP)	Н	150	145	16.39	5.55	21.94	0.156	30.00	-8.06

Table 7-4. EIRP (AWS WCDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GSM1900	н	150	324	26.55	4.82	31.37	1.370	33.01	-1.64
1880.00	GSM1900	Н	150	320	25.55	4.74	30.29	1.069	33.01	-2.72
1909.80	GSM1900	н	150	322	26.43	4.68	31.11	1.292	33.01	-1.90
1850.20	GSM1900	V	150	23	23.53	4.79	28.32	0.679	33.01	-4.69
1850.20	EDGE1900	н	150	324	21.44	4.82	26.26	0.423	33.01	-6.75
1850.20	GSM1900 (WCP)	Н	150	16	25.61	4.82	30.43	1.103	33.01	-2.58

Table 7-5. EIRP (PCS GSM)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	V	150	35	16.44	4.79	21.23	0.133	33.01	-11.78
1880.00	WCDMA1900	V	150	27	17.32	4.84	22.16	0.165	33.01	-10.85
1907.60	WCDMA1900	V	150	38	16.81	4.87	21.68	0.147	33.01	-11.33
1880.00	WCDMA1900	Н	150	237	16.89	4.74	21.63	0.146	33.01	-11.38
1880.00	WCDMA1900 (WCP)	V	150	234	15.68	4.84	20.52	0.113	33.01	-12.49

Table 7-6. EIRP (PCS WCDMA)

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7.7 Radiated Spurious Emissions Measurements §2.1053 §22.917(a) 24.238(a) 27.53(h)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v02r02 - Section 5.8

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

Test Settings

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

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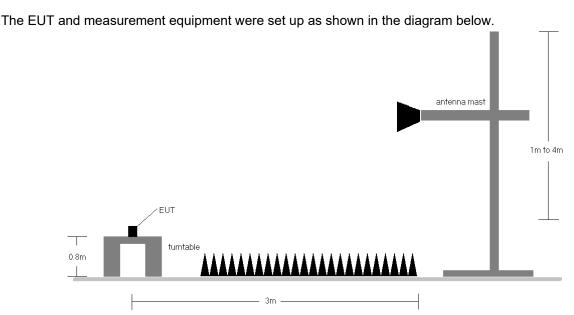


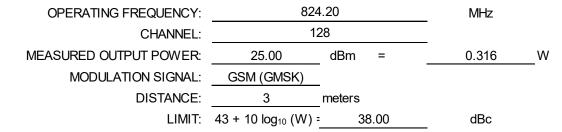
Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."
- 3) This unit was tested with its standard battery.
- 4) 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.
- 5) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 6) 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.
- 7) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1648.40	V	104	85	-51.24	6.28	-44.95	70.0
2472.60	V	101	73	-41.59	6.89	-34.70	59.7
3296.80	V	-	-	-62.67	7.10	-55.58	80.6
4121.00	V	100	4	-64.26	7.71	-56.55	81.6
4945.20	V	-	-	-65.09	9.14	-55.95	80.9

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

OPERATING FREQUENCY:	836	6.60	MHz	
CHANNEL:	1	90	•	
MEASURED OUTPUT POWER:	24.88	dBm =	0.308	W
MODULATION SIGNAL:	GSM (GMSK)	-		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	37.88	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.20	V	101	109	-52.61	6.21	-46.40	71.3
2509.80	V	101	73	-39.14	6.90	-32.24	57.1
3346.40	V	-	-	-62.83	7.26	-55.57	80.5
4183.00	V	100	221	-63.74	8.11	-55.63	80.5
5019.60	V	-	-	-65.26	9.02	-56.24	81.1

Table 7-8. Radiated Spurious Data (Cellular GSM Mode - Ch. 190)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	848	3.80	MHz
CHANNEL:	2	51	_
MEASURED OUTPUT POWER:	24.43	dBm =	0.277 W
MODULATION SIGNAL:	GSM (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	37.43	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1697.60	V	102	114	-53.79	6.14	-47.65	72.1
2546.40	V	101	95	-40.70	7.03	-33.68	58.1
3395.20	V	-	-	-62.45	7.43	-55.02	79.4
4244.00	V	100	204	-63.79	8.41	-55.37	79.8
5092.80	V	-	-	-64.26	8.87	-55.38	79.8

Table 7-9. Radiated Spurious Data (Cellular GSM Mode – Ch. 251)

OPERATING FREQUENCY:	824	1.20	MHz
CHANNEL:	12	28	
MEASURED OUTPUT POWER:	24.88	dBm =	0.307 W
MODULATION SIGNAL:	GSM (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	37.88	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1648.40	V	100	327	-49.50	6.28	-43.21	68.1
2472.60	V	100	2	-54.20	6.89	-47.31	72.2
3296.80	V	-	-	-59.65	7.10	-52.56	77.4
4121.00	V	-	-	-58.64	7.71	-50.93	75.8
4945.20	V	-	-	-58.96	9.14	-49.82	74.7

Table 7-10. Radiated Spurious Data with WCP (Cellular GSM Mode – Ch. 128)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	826	.40	MHz
CHANNEL:	41		
MEASURED OUTPUT POWER:	18.18	dBm =	0.066 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	31.18	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1652.80	Н	125	210	-72.11	6.28	-65.82	84.0
2479.20	Н	106	211	-67.88	6.84	-61.04	79.2
3305.60	Н	-	-	-67.32	7.14	-60.18	78.4

Table 7-11. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

OPERATING FREQUENCY:	836	6.60	MHz	
CHANNEL:	41			
MEASURED OUTPUT POWER:	18.27	dBm =	0.067	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	31.27	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.20	Н	114	187	-71.53	6.13	-65.40	83.7
2509.80	Н	121	60	-67.84	6.86	-60.98	79.3
3346.40	Н	-	-	-67.37	7.26	-60.11	78.4

Table 7-12. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	846	60	MHz
CHANNEL:	42		
MEASURED OUTPUT POWER:	17.26	dBm =	0.053 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	30.26	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.20	Н	110	163	-71.75	6.13	-65.62	82.9
2539.80	Н	115	34	-68.29	6.95	-61.34	78.6
3386.40	Н	-	-	-67.66	7.38	-60.27	77.5

Table 7-13. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

OPERATING FREQUENCY:	836	6.60	MHz	
CHANNEL:	41			
MEASURED OUTPUT POWER:	17.90	dBm =	0.062	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	30.90	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.20	Н	151	282	-69.70	6.21	-63.50	81.4
2509.80	Н	230	45	-68.59	6.86	-61.73	79.6
3346.40	Н	-	-	-67.63	7.26	-60.37	78.3

Table 7-14. Radiated Spurious Data with WCP (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1712	2.40	MHz	
CHANNEL:	13	12		
MEASURED OUTPUT POWER:	22.96	dBm =	0.198	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	35.96	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3424.80	Н	-	-	-69.17	9.65	-59.52	82.5
5137.20	Н	-	-	-66.98	10.91	-56.07	79.0

Table 7-15. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1312)

OPERATING FREQUENCY:	173	MHz		
CHANNEL:	14	13		
MEASURED OUTPUT POWER:	22.49	dBm =	0.177 W	
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	35.49	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3465.20	Н	-	-	-69.12	9.77	-59.34	81.8
5197.80	Н	-	-	-66.65	10.81	-55.84	78.3

Table 7-16. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	175	MHz	
CHANNEL:	15		
MEASURED OUTPUT POWER:	21.95	dBm =	0.157 W
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	34.95	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3505.20	Н	-	-	-69.61	9.89	-59.73	81.7
5257.80	Н	-	-	-66.27	10.92	-55.35	77.3

Table 7-17. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

171	MHz		
13			
21.94	dBm =	0.156	W
WCDMA			
3	meters		
43 + 10 log ₁₀ (W) =	34.94	dBc	
	13 21.94 WCDMA 3	WCDMA 3 meters	$\frac{1312}{21.94} dBm = 0.156$ $\frac{WCDMA}{3} meters$

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3424.80	Н	-	-	-67.74	9.65	-58.09	80.0
5137.20	Н	-	-	-66.00	10.91	-55.09	77.0

Table 7-18. Radiated Spurious Data with WCP (AWS WCDMA Mode – Ch. 1312)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1850.	MHz		
CHANNEL:	512			
MEASURED OUTPUT POWER:	31.37	dBm =	1.370	W
MODULATION SIGNAL:	GSM (GMSK)			
DISTANCE:	<u> </u>	neters		
LIMIT:	43 + 10 log ₁₀ (W) =	44.37	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3700.40	Н	100	167	-56.50	10.03	-46.47	77.8
5550.60	Н	100	164	-56.54	11.18	-45.36	76.7
7400.80	Н	-	-	-54.87	10.85	-44.02	75.4
9251.00	Н	-	-	-52.55	12.37	-40.18	71.5

Table 7-19. Radiated Spurious Data (PCS GSM Mode – Ch. 512)

OPERATING FREQUENCY:	188	0.00	MHz
CHANNEL:	66		
MEASURED OUTPUT POWER:	30.29	dBm =	1.069 W
MODULATION SIGNAL:	GSM (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	43.29	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	Н	100	170	-57.87	9.79	-48.08	78.4
5640.00	Н	100	178	-56.25	11.35	-44.90	75.2
7520.00	Н	-	-	-54.15	11.22	-42.93	73.2
9400.00	Н	-	-	-51.76	12.30	-39.46	69.7

Table 7-20. Radiated Spurious Data (PCS GSM Mode – Ch. 661)

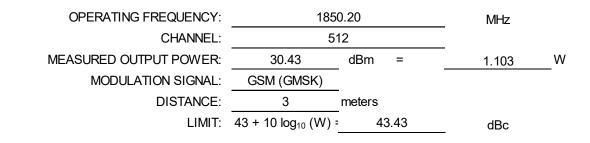
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OPERATING FREQUENCY:	190	9.80	MHz
CHANNEL:	8	10	
MEASURED OUTPUT POWER:	31.11	dBm =	1.292 W
MODULATION SIGNAL:	GSM (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	44.11	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3819.60	Н	100	239	-58.02	9.56	-48.46	79.6
5729.40	Н	100	185	-56.54	11.43	-45.10	76.2
7639.20	Н	-	-	-51.25	11.50	-39.75	70.9
9549.00	Н	-	-	-50.96	12.39	-38.58	69.7

Table 7-21. Radiated Spurious Data (PCS GSM Mode – Ch. 810)



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3700.40	Н	100	348	-56.01	10.03	-45.98	76.4
5550.60	Н	100	123	-57.86	11.18	-46.68	77.1
7400.80	Н	-	-	-51.61	10.85	-40.76	71.2
9251.00	Н	-	-	-51.82	12.37	-39.45	69.9

Table 7-22. Radiated Spurious Data with WCP (PCS GSM Mode - Ch. 512)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1852	2.40	MHz
CHANNEL:	92	62	_
MEASURED OUTPUT POWER:	21.23	dBm =	0.133 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	34.23	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3704.80	V	-	-	-69.25	10.07	-59.18	80.4
5557.20	V	-	-	-66.79	11.21	-55.57	76.8

Table 7-23. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

OPERATING FREQUENCY:	188	0.00	MHz	
CHANNEL:	94	00		
MEASURED OUTPUT POWER:	22.16	dBm =	0.165 W	
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	35.16	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	V	-	-	-67.81	9.80	-58.01	80.2
5640.00	V	-	-	-65.56	11.37	-54.19	76.4

Table 7-24. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

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OPERATING FREQUENCY:	190	7.60	MHz
CHANNEL:	95	38	_
MEASURED OUTPUT POWER:	21.68	dBm =	0.147 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	34.68	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3815.20	V	-	-	-67.95	9.56	-58.38	80.1
5722.80	V	-	-	-66.57	11.45	-55.12	76.8

Table 7-25. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

OPERATING FREQUENCY:	188	0.00	MHz	
CHANNEL:	94	.00		
MEASURED OUTPUT POWER:	20.52	dBm =	0.113 W	
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	33.52	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	V	-	-	-68.27	9.80	-58.47	79.0
5640.00	V	-	-	-64.80	11.37	-53.43	74.0

Table 7-26. Radiated Spurious Data with WCP (PCS WCDMA Mode - Ch. 9400)

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7.8 Frequency Stability / Temperature Variation §2.1055 §22.355 §24.235 §27.54

Test Overview and Limit

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

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

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

Test Procedure Used

ANSI/TIA-603-D-2010

Test Settings

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

Test Setup

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

Test Notes

None

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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	190	
REFERENCE VOLTAGE:	3.85	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,600,125	125	0.0000149
100 %		- 30	836,599,961	-39	-0.0000047
100 %		- 20	836,600,019	19	0.0000023
100 %		- 10	836,600,073	73	0.0000087
100 %		0	836,599,921	-79	-0.0000094
100 %		+ 10	836,600,127	127	0.0000152
100 %		+ 20	836,600,045	45	0.0000054
100 %		+ 30	836,600,080	80	0.0000096
100 %		+ 40	836,599,972	-28	-0.0000033
100 %		+ 50	836,600,041	41	0.0000049
BATT. ENDPOINT	3.45	+ 20	836,600,047	47	0.0000056

Table 7-27. Frequency Stability Data (Cellular GSM Mode – Ch. 190)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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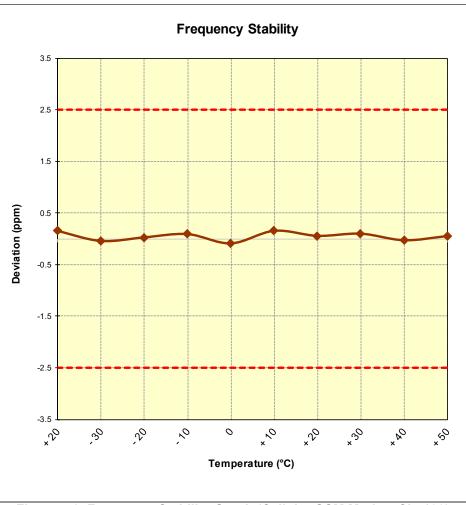


Figure 7-8. Frequency Stability Graph (Cellular GSM Mode – Ch. 190)

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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	4183	
REFERENCE VOLTAGE:	3.85	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	_

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,600,168	168	0.0000201
100 %		- 30	836,599,936	-64	-0.0000077
100 %		- 20	836,599,902	-98	-0.0000117
100 %		- 10	836,599,678	-322	-0.0000385
100 %		0	836,599,800	-200	-0.0000239
100 %		+ 10	836,599,630	-370	-0.0000442
100 %		+ 20	836,600,147	147	0.0000176
100 %		+ 30	836,599,728	-272	-0.0000325
100 %		+ 40	836,599,849	-151	-0.0000180
100 %		+ 50	836,600,120	120	0.0000143
BATT. ENDPOINT	3.45	+ 20	836,599,654	-346	-0.0000414

Table 7-28. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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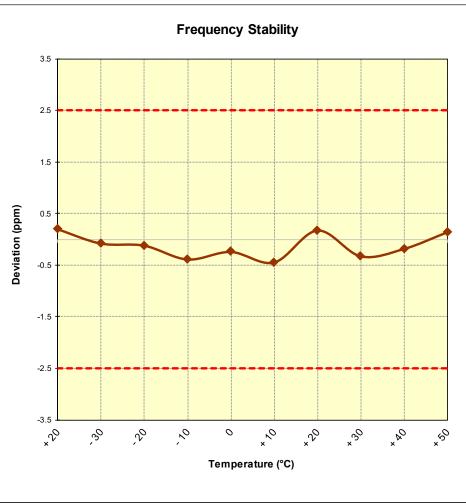


Figure 7-9. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

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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)	1,732,599,985	-15	-0.0000009
100 %		- 30	1,732,600,196	196	0.0000113
100 %		- 20	1,732,599,851	-149	-0.0000086
100 %		- 10	1,732,600,084	84	0.0000048
100 %		0	1,732,600,036	36	0.0000021
100 %		+ 10	1,732,600,045	45	0.0000026
100 %		+ 20	1,732,600,069	69	0.0000040
100 %		+ 30	1,732,599,697	-303	-0.0000175
100 %		+ 40	1,732,599,881	-119	-0.0000069
100 %		+ 50	1,732,599,871	-129	-0.0000074
BATT. ENDPOINT	3.45	+ 20	1,732,599,886	-114	-0.0000066

 Table 7-29. Frequency Stability Data (AWS WCDMA Mode – Ch. 1413)

Note:

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

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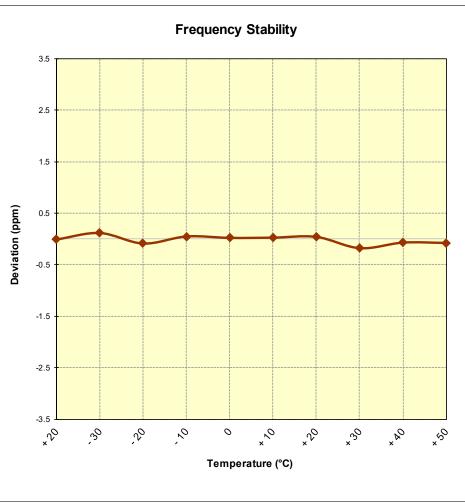


Figure 7-10. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved 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)	1,879,999,878	-122	-0.0000065
100 %		- 30	1,879,999,900	-100	-0.0000053
100 %		- 20	1,880,000,014	14	0.0000007
100 %		- 10	1,880,000,054	54	0.0000029
100 %		0	1,879,999,845	-155	-0.000082
100 %		+ 10	1,880,000,120	120	0.0000064
100 %		+ 20	1,879,999,731	-269	-0.0000143
100 %		+ 30	1,880,000,125	125	0.0000066
100 %		+ 40	1,879,999,966	-34	-0.0000018
100 %		+ 50	1,880,000,001	1	0.0000001
BATT. ENDPOINT	3.45	+ 20	1,880,000,068	68	0.0000036

Table 7-30. 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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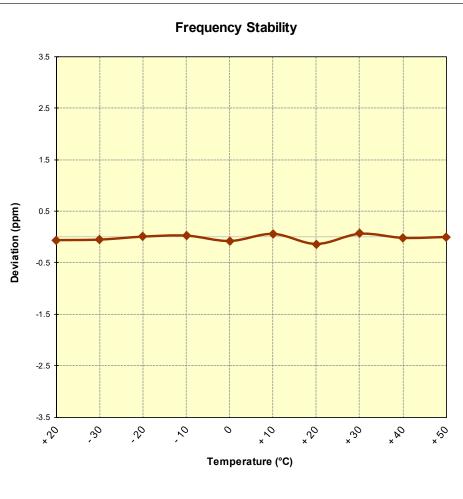


Figure 7-11. Frequency Stability Graph (PCS GSM Mode – Ch. 661)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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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)	1,879,999,862	-138	-0.0000073
100 %		- 30	1,880,000,080	80	0.0000043
100 %		- 20	1,879,999,675	-325	-0.0000173
100 %		- 10	1,879,999,998	-2	-0.0000001
100 %		0	1,880,000,225	225	0.0000120
100 %		+ 10	1,879,999,906	-94	-0.0000050
100 %		+ 20	1,880,000,050	50	0.0000027
100 %		+ 30	1,879,999,897	-103	-0.0000055
100 %		+ 40	1,879,999,791	-209	-0.0000111
100 %		+ 50	1,879,999,844	-156	-0.000083
BATT. ENDPOINT	3.45	+ 20	1,880,000,181	181	0.0000096

Table 7-31. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

Note:

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

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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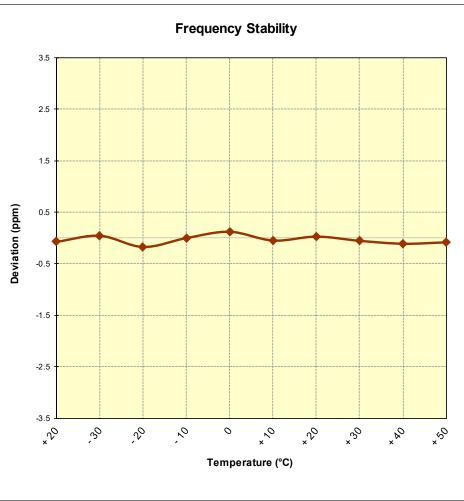


Figure 7-12. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFH932	<u>«NPCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the LG Portable Handset FCC ID: ZNFH932 complies with all the requirements of Parts 22, 24, & 27 of the FCC rules.

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