

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: 1/16 - 3/7/2017 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 1M1702280075-02.ZNF

### FCC ID:

### ZNFM710H

**APPLICANT:** 

### LG ELECTRONICS MOBILECOMM U.S.A

Application Type:	Certification
Model:	LG-M710H
Additional Model(s):	LGM710H, M710H
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
Test Device Serial No.:	identical prototype [S/N: 06358, 06424, 11317]

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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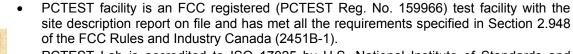


### §2.1033 General Information

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-M710H				
FCC ID:	ZNFM710H				
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.:	06358, 06424, 11317				
DATE(S) OF TEST:	1/16 - 3/7/2017				
TEST REPORT S/N:	1M1702280075-02.ZNF				

### **Test Facility / Accreditations**

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



- 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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			ERP/	EIRP	
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Emission Designator
GPRS850	22H	824.2 - 848.8	0.883	29.46	245KGXW
EDGE850	22H	824.2 - 848.8	0.166	22.19	245KG7W
WCDMA850	22H	826.4 - 846.6	0.122	20.85	4M15F9W
WCDMA1700	27	1712.4 - 1752.6	0.175	22.43	4M14F9W
GPRS1900	24E	1850.2 - 1909.8	0.718	28.56	244KGXW
EDGE1900	24E	1850.2 - 1909.8	0.460	26.63	245KG7W
WCDMA1900	24E	1852.4 - 1907.6	0.184	22.64	4M13F9W

**EUT Overview** 

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#### INTRODUCTION . 0

#### 1.1 Scope

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

#### **Testing Facility** 1.2

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.

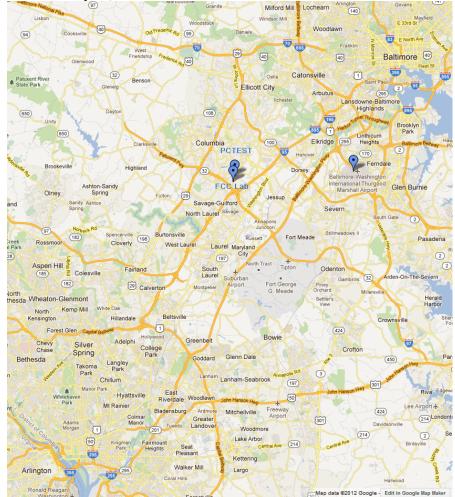


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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### 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LGE Portable Handset FCC ID: ZNFM710H**. 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.

### 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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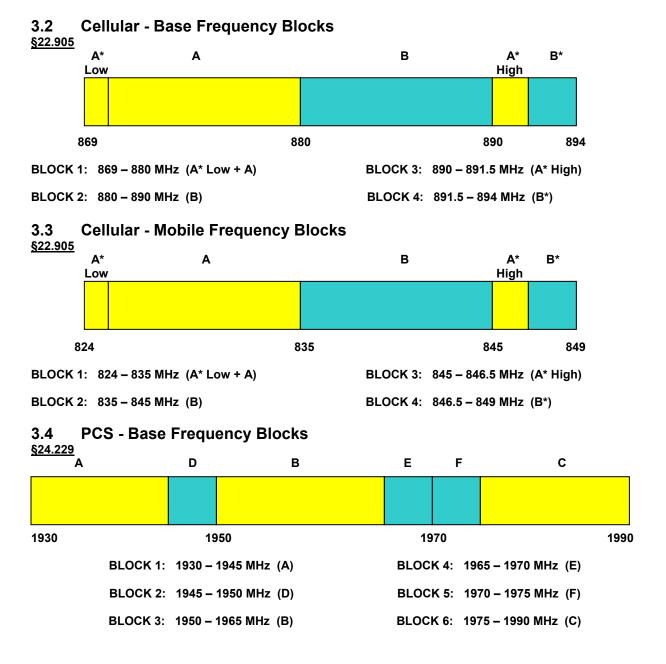


### 3.0 DESCRIPTION OF TESTS

### 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.



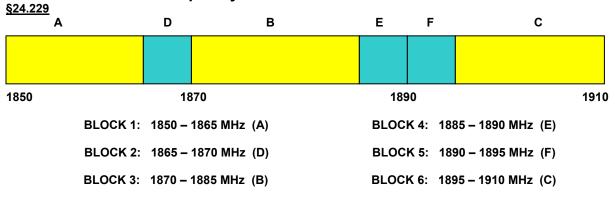


#### Approved by: FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT PCTEST FCC ID: ZNFM710H 🔁 LG **REPORT (CERTIFICATION)** Quality Manager Test Report S/N: EUT Type: Test Dates: Page 7 of 81 1M1702280075-02.ZNF 1/16 - 3/7/2017 Portable Handset © 2017 PCTEST Engineering Laboratory, Inc. V 6 2

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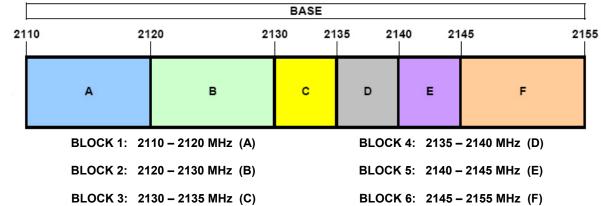


### 3.5 PCS - Mobile Frequency Blocks



### 3.6 AWS - Base Frequency Blocks

<u>§27.5(h)</u>



### 3.7 AWS - Mobile Frequency Blocks

§27.5(h)

	MOBILE								
17	10	1720 17	730 17 	'35 17 	40 17	45	1755		
	A	в	с	D	E	F			
	BLOCK 1: 1	710 – 1720 MHz (A)		BLOCK	4: 1735 –	1740 MHz (D)			
	BLOCK 2: 1	720 – 1730 MHz (B)		BLOCK	5: 1740 –	1745 MHz (E)			
	BLOCK 3: 1	730 – 1735 MHz (C)		BLOCK	6: 1745 –	1755 MHz (F)			

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### 3.8 Radiated Measurements

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

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

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

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

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

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

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

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### 4.0 MEASUREMENT UNCERTAINTY

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx3	Licensed Transmitter Cable Set	7/12/2016	Annual	7/12/2017	LTx3
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/11/2016	Annual	7/11/2017	RE1
Agilent	N9020A	MXA Signal Analyzer	10/28/2016	Annual	10/28/2017	US46470561
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	7/11/2016	Annual	7/11/2017	441128
Emco	6502	Active Loop Antenna (10k - 30 MHz)	8/9/2016	Biennial	8/9/2018	2936
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
Espec	ESX-2CA	Environmental Chamber	3/4/2016	Annual	3/4/2017	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/26/2016	Biennial	4/26/2018	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	4/26/2016	Biennial	4/26/2018	128337
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	8/23/2016	Biennial	8/23/2018	135427
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/4/2016	Annual	3/4/2017	11401010036
Mini Circuits	TVA-11-422	RF Power Amp	N/A		QA1317001	
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A		11208010032	
PCTEST	-	EMC Switch System	7/11/2016	Annual	7/11/2017	NM1
PCTEST	-	EMC Switch System	7/6/2016	Annual	7/6/2017	NM2
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	7/27/2016	Annual	7/27/2017	103200
Rohde & Schwarz	CMU200	Base Station Simulator	6/2/2016	Annual	6/2/2017	109892
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/15/2016	Annual	7/15/2017	100348
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	3/7/2016	Annual	3/7/2017	100040
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/18/2015	Biennial	11/18/2017	91052523RX
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107
Sunol Sciences	DRH-118	Horn Antenna (1-18GHz)	7/1/2015	Biennial	7/1/2017	A060215

Table 5-1. Test Equipment

### Notes:

- 1. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.
- 2. 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.

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### 6.0 SAMPLE CALCULATIONS

### **GPRS Emission Designator**

#### Emission Designator = 250KGXW

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

### **EDGE Emission Designator**

#### Emission Designator = 250KG7W

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

### 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:	ZNFM710H		
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 <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
------------	---------	---------	---------

### Notes:

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

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# 7.2 Occupied Bandwidth §2.1049

#### Test Overview

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

#### Test Procedure Used

KDB 971168 D01 v02r02 - Section 4.2

#### Test Settings

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

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

#### Test Setup

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

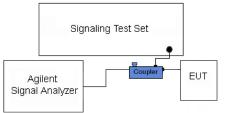


Figure 7-1. Test Instrument & Measurement Setup

### Test Notes

None.

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Keysight Spectrum Analyzer - Occupied B	W					
α RL RF 50 Ω AC	AC CORREC SENSE:INT ALIGN AUTO 11:58:12 PM Jan 17, 2017 Center Freq: 836.600000 MHz Radio Std: None Trig: Free Run Avg Hold: 100/100 #IFGain:Low #Atten: 32 dB Radio Device: BTS		one	Trace/Detector		
15 dB/div Ref 35.00 dB		u mar and a former				
5.00 10.0				www.	~~~~~	Clear Write
40.0 55.0 70.0						Average
-100 Center 836.6 MHz				Spand	500 kHz	Max Hold
Res BW 4.7 kHz		/BW 15 kHz Total Power	39.7	Sweep 3		Min Hold
	245.46 kHz					Detecto Peak
Transmit Freq Error x dB Bandwidth	117 Hz 314.0 kHz	% of OBW Pow x dB		.00 % 00 dB		Auto <u>Mar</u>
sg			STATUS			

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



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

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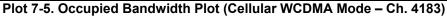


Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode - Ch. 661)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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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 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 D01 v02r02 - Section 6.0

#### Test Settings

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

### Test Setup

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

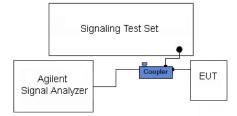


Figure 7-2. Test Instrument & Measurement Setup

#### Test Notes

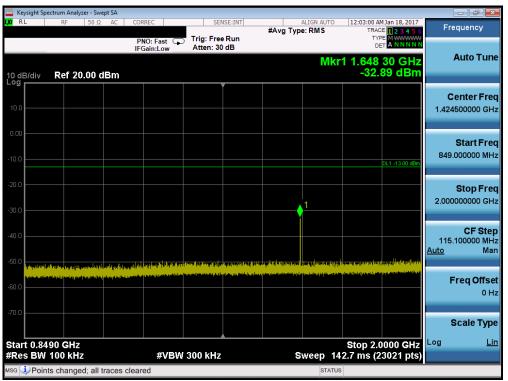
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Part 22 and 1 MHz or greater for Part 24, Part 27. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth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

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	ctrum Analyze												- 6
RL	RF	50 Ω	AC	CORREC		SE	NSE:INT		ALIGN AUTO		M Jan 18, 2017	Fre	quency
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0.00											DL1 -13.00 dBm		Start Fre 000000 M⊦
20.0													<b>Stop Fre</b> 000000 МН
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												S Log	cale Typ
tart 30.0 Res BW				#	VBW :	300 kHz	2		Sweep 98	Stop 8 3.33 ms (1	20.0 10112	LUg	<u> </u>
G									STATUS				

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



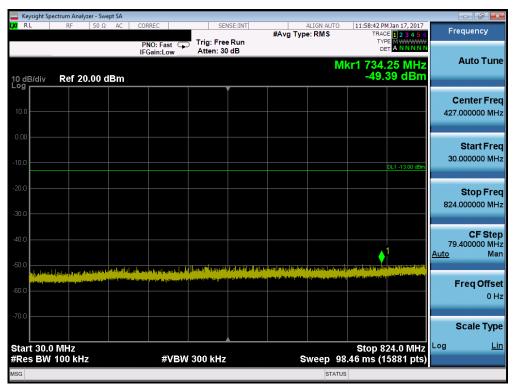
Plot 7-9. Conducted Spurious Plot (Cellular GPRS Mode – Ch. 128)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🔤 Keysight S	ectrum Analy	zer - Swep	ot SA										- 6 <b>-</b>
L <mark>X/</mark> RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TR	AM Jan 18, 2017 ACE 1 2 3 4 5 6	Fre	equency
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-10.0											DL1 -13.00 dBm	2.000	Start Freq 000000 GHz
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-70.0												F	F <b>req Offsel</b> 0 Hz
-80.0										Stop 1	0.000 CH2	s Log	Scale Type Lin
#Res BW		z		#	VBW	3.0 MHz		s	weep 1	3.87 ms (	0.000 GHz 16001 pts)		
MSG									STATU	s			





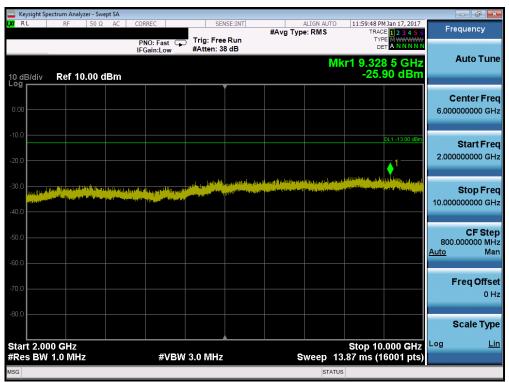
Plot 7-11. Conducted Spurious Plot (Cellular GPRS Mode – Ch. 190)

FCC ID: ZNFM710H	A PCTEST	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyz												
X/RL	RF	50Ω A	C CO	RREC		SE	NSE:INT	#Avg Typ	ALIGN AUTO	TRAC	M Jan 17, 2017 E <b>1 2 3 4 5 6</b>	Free	quency
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-10.0											DL1 -13.00 dBm		Start Freq 00000 MHz
-20.0													<b>Stop Freq</b> 00000 GHz
-40.0 -50.0	Aller and the second of the second		gaagaadhaadh Naccionalaccio	oraf el oraș G <sup>erra</sup> n	gyatista <sup>b</sup> asi sin	an daga ya Maran ngana na ana dag	la provi del possi de se na statione de possi de se	leg on the start for the character for ingen generation the start start for a generation of the start start start start start start start start start s		U <mark>na kazartan diparteksian Manangan katalakan ja</mark>	(Jernerster) (sen <sup>ter</sup> n se som sigter)	115.1 <u>Auto</u>	CF Step 00000 MHz Man
.60.0												Fi	r <b>eq Offse</b> l 0 Hz
-70.0													cale Type
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ISG									STATU	6			





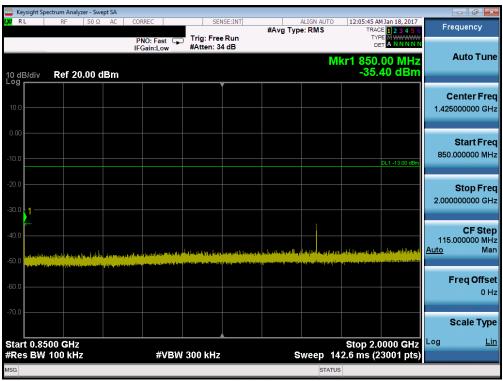
Plot 7-13. Conducted Spurious Plot (Cellular GPRS Mode – Ch. 190)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight S	ectrum Analyzer -	Swept SA								
LXU RL	RF 50	Ω AC	CORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO	12:05:08 AM Ja TRACE	23456	Frequency
			PNO: Fast IFGain:Low	Trig: Free Atten: 30				TYPE DET		
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-10.0								DL1	-13.00 dBm	Start Free 30.000000 MH:
-20.0										Stop Free 824.000000 MH;
-40.0				↓ <sup>1</sup>						CF Step 79.400000 MH: <u>Auto</u> Mar
without	a dityy hay na tasan Unitada Ang sanay ng ata ata patanaka		en her og som for en som e Som en som en	Talanan (1997) ya kuta ya kuta Ali kuta ya kuta		en hjen grave beser for en hjener hie Dien i ner verster ofte foren hie order d	ka (ka ka k			Freq Offse 0 H;
-70.0										Scale Type
Start 30. #Res BW	0 MHz 100 kHz		#V	BW 300 kHz		s	weep 98	Stop 824 3.46 ms (158	.V 19112	Log <u>Lir</u>
MSG							STATUS			





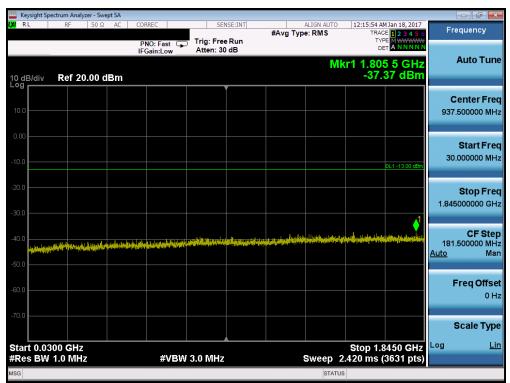
Plot 7-15. Conducted Spurious Plot (Cellular GPRS Mode – Ch. 251)

FCC ID: ZNFM710H	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyz	zer - Swep	ot SA										- • •
LXI RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#A T	ALIGN AUTO		M Jan 18, 2017	Fre	quency
				PNO: Fa	ow	Trig: Free #Atten: 34		#Avg Typ	DE: KIVIS	TY	CE 1 2 3 4 5 6 PE MWWWWW ET A N N N N N		
10 dB/div Log	Ref 10	.00 dl	Bm						N	lkr1 8.93 -29.	9 0 GHz 56 dBm		Auto Tune
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-10.0										1	DL1 -13.00 dBm		<b>Start Freq</b> 000000 GHz
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-50.0												800.0 <u>Auto</u>	CF Step 000000 MHz Man
-70.0												F	r <b>eq Offset</b> 0 Hz
-80.0													cale Type
Start 2.00 #Res BW				#	VBW	3.0 MHz		\$	weep	Stop 10 13.87 ms (*		Log	<u>Lin</u>
MSG 🤙 Poin	ts change	d; all tr	aces cl	eared					STAT	rus			

Plot 7-16. Conducted Spurious Plot (Cellular GPRS Mode - Ch. 251)



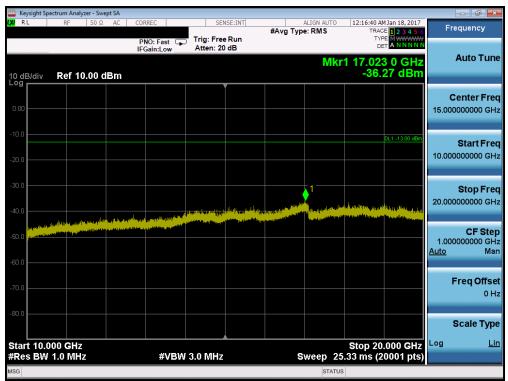
Plot 7-17. Conducted Spurious Plot (PCS GPRS Mode - Ch. 512)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyzer	- Swept SA									d X
XI RL	RF 5	i0 Ω AC	CORREC		ENSE:INT	#Avg Typ	ALIGN AUTO e: RMS	12:16:12 AM TRACE	123456	Freque	ncy
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10.0										Cente 5.9550000	
10.00									DL1 -13.00 dBm	Sta 1.9100000	rt Free 100 GH
20.0 <b></b> 30.0 <b></b>									<b>↓</b> 1	Sto 10.0000000	<b>p Fre</b> 100 GH
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ISG							STATU	s			





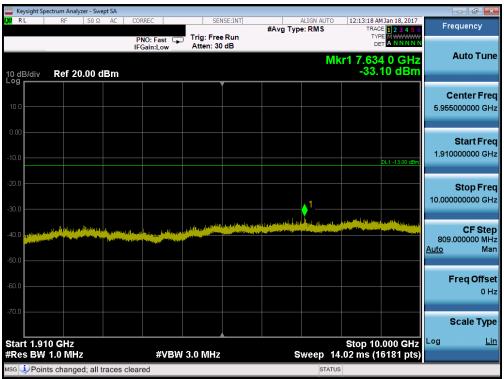
Plot 7-19. Conducted Spurious Plot (PCS GPRS Mode – Ch. 512)

FCC ID: ZNFM710H		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	i0 Ω AC	CORREC		SEN	ISE:INT	#Avg Ty	ALIGN AUTO		M Jan 18, 2017	Frea	uency
			PNO: F IFGain:		Trig: Free Atten: 30		#Avg Typ		TY D	DE 1 2 3 4 5 6 PE M WWWW ET A N N N N N		
10 dB/div Log	Ref 20.0	0 dBm						M	kr1 1.71 -37.	7 5 GHz 50 dBm	A	uto Tune
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.10.0										DL1 -13.00 dBm		tart Fred 10000 MH:
30.0										<u> </u>		top Free
40.0 	nige the first fill gates	şişedişin gör <mark>bilen f</mark> i							Holony (nij feder, A. f. Ada),	a the set of the set of the set	182.00 <u>Auto</u>	CF Stej 10000 MH Mai
60.0											Fre	e <b>q Offse</b> 0 H
70.0											Sc	ale Typ
Start 0.03 ≇Res BW				#VBW 3	.0 MHz			Sweep	Stop 1. 2.427 ms	8500 GHz (3641 pts)	Log	<u>Lir</u>
ISG								STATU	JS			





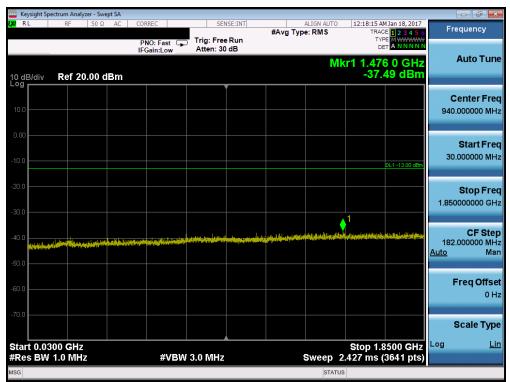
Plot 7-21. Conducted Spurious Plot (PCS GPRS Mode - Ch. 661)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🔁 LG	Approved by: Quality Manager
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🔤 Keysight Sp	ectrum Analyz	er - Swept	t SA										
LXI RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Avg Typ	ALIGN AUTO		M Jan 18, 2017 CE <b>1 2 3 4 5 6</b>	Fre	equency
				PNO: Fa IFGain:L	ist 🖵 ow	Trig: Free Atten: 20		#Avg Typ	e. RIVIS	ווס- די נ			
10 dB/div Log	Ref 10	.00 dE	3m						Mk	r1 17.00 -36	1 0 GHz .01 dBm		Auto Tune
0.00													enter Freq 0000000 GHz
-10.0											DL1 -13.00 dBm	10.000	<b>Start Freq</b> 0000000 GHz
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-50.0			ARMAN TAKE									1.000 <u>Auto</u>	<b>CF Step</b> 0000000 GHz Man
-70.0												F	F <b>req Offset</b> 0 Hz
-80.0													Scale Type
Start 10.0 #Res BW				#	VBW 3	3.0 MHz		s	weep 2	Stop 20 5.33 ms (2	).000 GHz 20001 pts)	Log	Lin
MSG									STATU	IS			





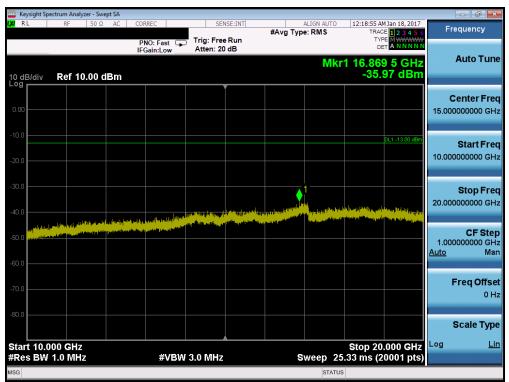
Plot 7-23. Conducted Spurious Plot (PCS GPRS Mode – Ch. 810)

FCC ID: ZNFM710H	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🔤 Keysight Sp	ectrum Analyze	r - Swep	et SA									-	
LXI RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	ALIGN AUTO		M Jan 18, 2017 E <b>1 2 3 4 5 6</b>	Free	quency
				PNO: F	ast 😱 .ow	Trig: Fre Atten: 3		#Avg iy	JE. KINIS	TYI			
10 dB/div Log	Ref 20.	00 dl	Вm						MI	(r1 8.83 -33.	7 0 GHz 57 dBm		luto Tune
10.0							Ĭ						e <b>nter Freq</b> 600000 GHz
-10.0											DL1 -13.00 dBm		<b>Start Freq</b> 1000000 GHz
-20.0													<b>Stop Freq</b> 100000 GHz
-40.0 property and a	angstatt <mark>(</mark> Hel <mark>andan) (</mark> Sangstatt ( Sangstatt) Sangstatt ( Sangstatt)		e (ny fire) <u>- soj</u> Dana Statel de la s		an a su a			) an agus ann an an ann an ann an ann an ann an a	al Alexandra and a second spectrum.	a para ang katalang ang pang katalan ng mang pang katalang katalang katalan ng mang pang katalang katalang katalang katalang katalang katalang katalang		808.5 <u>Auto</u>	<b>CF Step</b> 00000 MHz Man
-60.0												F	r <b>eq Offset</b> 0 Hz
-70.0													cale Type
Start 1.9′ #Res BW				;	≠vbw	3.0 MHz	2	s	weep 14	Stop 10 01 ms (1	.000 GHz 6171 pts)	Log	Lin
	nts changed	: all tr	aces cl						STATUS				





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

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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Keysight Spe													
LXI RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Ava -	ALIGN AUTO Type: RMS		PMJan 17, 2017 ACE 1 2 3 4 5 6	Fi	requency
				PNO: Fa IFGain:L	ow	Trig: Fre Atten: 3		#Avg	Type. KW3	Т			
10 dB/div Log	Ref 20	.00 dl	Bm							/lkr1 82: -25	2.85 MHz 5.35 dBm		Auto Tune
10.0													Center Freq 6.500000 MHz
-10.0											DL1 -13.00 dBm	30	Start Freq 0.000000 MHz
-20.0											1, 	823	Stop Freq 3.000000 MHz
-40.0												79 <u>Auto</u>	CF Step 9.300000 MHz Man
-60.0	ng mjaar ee staat st								Helin performation (herean performance)	ola palificata posta da Ministera			Freq Offset 0 Hz
-70.0													Scale Type
Start 30.0 #Res BW		2		#	VBW	300 kHz			Sweep §	Stop 98.33 ms (	823.0 MHz (15861 pts)	Log	<u>Lin</u>
MSG									STAT	US			

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



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

FCC ID: ZNFM710H	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyze										-0-	d X
X/RL	RF	50 Ω AC	CORR	EC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO	TRA	MJan 17, 2017 DE <b>1 2 3 4 5 6</b>	Freque	ncy
				): Fast 🖵 in:Low	Trig: Fre Atten: 20				TY D	PE A WWWWW ET A N N N N N		
								M	kr1 8.65	8 0 GHz	Aut	o Tune
10 dB/div Log	Ref 10.	00 dBn	1			-			-51.	91 dBm		
											Cent	er Freq
0.00											6.0000000	000 GHz
-10.0												
										DL1 -13.00 dBm		rt Freq
-20.0											2.0000000	000 GHz
-30.0												
-30.0											Sto 10.0000000	p Freq
-40.0											10.000000	JUU GHZ
									<b>1</b>		C	F Step
-50.0											800.000	000 мн <sup>і</sup> з
-60.0	and the second sec										<u>Auto</u>	Man
											Fred	Offset
-70.0											Ticq	0 Hz
-80.0												
											Scal	е Туре
Start 2.00	0 GHz								Ston 40	.000 GHz	Log	Lin
#Res BW				#VBW	3.0 MHz		s	weep 1	3.87 ms (1	6001 pts)		
ASG								STATU	s			

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



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

FCC ID: ZNFM710H	A PGTEST	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ctrum Analyze	r - Swept S	A										- 6 ×
LXI RL	RF	50 Ω A	AC O	ORREC		SE	NSE:INT		ALIGN AUTO		M Jan 17, 2017	Ere	equency
				PNO: Fa: FGain:Lo		Trig: Fre Atten: 3		#Avg	Type: RMS	TRAI TY D	CE 1 2 3 4 5 6 PE A WWWW ET A N N N N N		
10 dB/div Log	Ref 20.0	00 dBr	m						M	kr1 849 -52.	.75 MHz 20 dBm		Auto Tune
10.0							• 						<b>enter Freq</b> 500000 GHz
-10.0											DL1 -13.00 dBm	849.	Start Freq 000000 MHz
-20.0												2.000	Stop Freq 000000 GHz
-40.0												115. <u>Auto</u>	CF Step 100000 MHz Man
-60.0												F	F <b>req Offset</b> 0 Hz
-70.0													Scale Type
Start 0.84 #Res BW				#	VBW 3	300 kHz			Sweep 14	Stop 2. 2.7 ms (2	0000 0112	Log	Lin
MSG									STATUS	S			

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



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

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyze										[	
X/RL	RF	50 Ω AC		Fast 😱	SEI	NSE:INT	#Avg Ty	ALIGN AUTO	TRAC	M Jan 17, 2017 E 1 2 3 4 5 6 E A WWWW A N N N N N	Fre	quency
			IFGain	Low	Atten: 30							
10 dB/div Log	Ref 20.	00 dBm	1					M	kr1 800. -58.	75 MHz 02 dBm		Auto Tune
						Ĭ					С	enter Freq
10.0											427.	000000 MHz
0.00												Start Freq
-10.0										DL1 -13.00 dBm	30.	000000 MHz
-20.0												Stop Freq
-30.0											824.	000000 MHz
-40.0											70	CF Step 400000 MHz
-50.0											Auto Auto	400000 MH2 Man
										<b>♦</b> <sup>1</sup>	F	req Offset
-60.0										daude daud de al		0 Hz
-70.0											S	Scale Type
Start 30.0	MHz								Stop 8	24.0 MHz		<u>Lin</u>
#Res BW				#VBW	300 kHz		ę	Sweep 98	.46 ms (1	5881 pts)		
MSG								STATUS				



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

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🔤 Keysight Sp	ectrum Ai	nalyzer - Sv	vept SA										
LXI RL	RF	50 \$	2 AC	CORREC		SEI	NSE:INT	#Avg Typ	ALIGN AUTO		MJan 17, 2017 CE 1 2 3 4 5 6	Fr	equency
				PNO: F IFGain:	Fast 🖵 Low	Trig: Free Atten: 20				TY			
10 dB/div Log	Ref	10.00	dBm						M	kr1 2.53 -39.	7 5 GHz 97 dBm		Auto Tune
0.00													<b>Center Freq</b> 0000000 GHz
-10.0											DL1 -13.00 dBm	2.00	Start Freq 0000000 GHz
-30.0	1											10.00	Stop Freq 0000000 GHz
-50.0					<i></i>							800 <u>Auto</u>	CF Step 0.000000 MHz Man
-70.0												1	F <b>req Offset</b> 0 Hz
-80.0													Scale Type
Start 2.00 #Res BW					#VBW	3.0 MHz		s	weep 1	Stop 10 3.87 ms (*	).000 GHz 16001 pts)	Log	Lin
MSG									STATU	s			

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

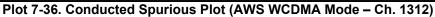
	ctrum Analyzer - Swe	pt SA								
RL	RF 50 Ω	PI	RREC NO:Fast 🖵 Gain:Low	Trig: Free Atten: 30	Run dB	#Avg Type	ALIGN AUTO e: RMS	TRACI TYP	Jan 17, 2017 <b>1 2 3 4 5</b> 6 A WWWWW A N N N N N	Frequency
) dB/div	Ref 20.00 d		Jameow				Mk	(r1 1.705 -32.0	i 0 GHz 67 dBm	Auto Tur
0.0										Center Fre 867.500000 MH
0.0									DL1 -13.00 dBm	Start Fre 30.000000 Mi
D.O									1	<b>Stop Fr</b> 1.705000000 G
D.0				مۇروۋىدومە يىلىدىلەردۇرىيى.	an first viltagingen	and the state of t			and a state of the	<b>CF St</b> 167.500000 M <u>Auto</u> M
).0										Freq Offs 0
tart 0.03								Stop 1.7	000 0112	Scale Ty Log <u>l</u>
Res BW	1.0 MHz		#VBW	3.0 MHz			Sweep 2	.233 ms (3	3351 pts)	

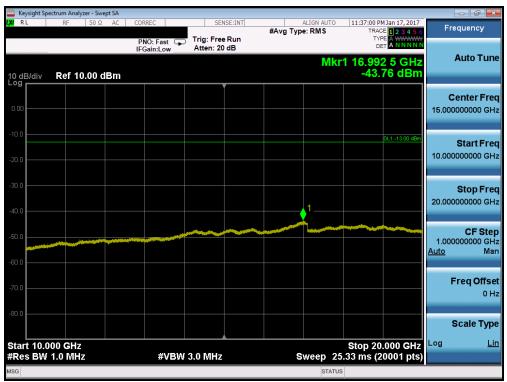
Plot 7-35. Conducted Spurious Plot (AWS WCDMA Mode – Ch. 1312)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyzer - S	Swept SA							_	- 0
X/RL	RF 50	Ω AC	CORREC		#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Jan 17, 2017 CE 1 2 3 4 5 6	Freq	luency
			PNO: Fast IFGain:Low				D		_	
10 dB/div Log	Ref 20.00	dBm				M	kr1 8.68 -41.	3 5 GHz 94 dBm	A	uto Tune
10.0										<b>nter Freq</b> 00000 GHz
-10.0								DL1 -13.00 dBm		Start Freq 00000 GHz
-20.0										Stop Freq 00000 GHz
-40.0		^					1		824.5 <u>Auto</u>	CF Step 00000 MHz Man
-60.0									Fr	e <b>q Offset</b> 0 Hz
-70.0									S	cale Type
Start 1.75 #Res BW			#V	BW 3.0 MHz	s	weep 14	Stop 10 1.29 ms (1	.000 GHz 6491 pts)	Log	<u>Lin</u>
MSG						STATU	s			





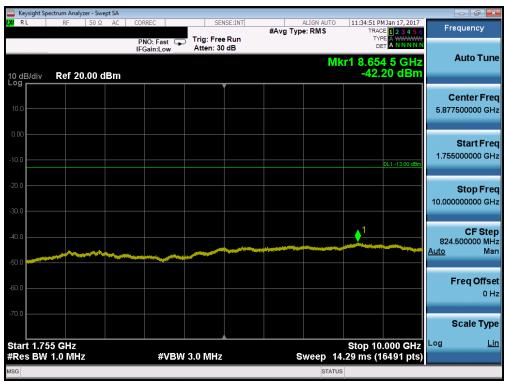
Plot 7-37. Conducted Spurious Plot (AWS WCDMA Mode – Ch. 1312)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyz	er - Swep	ot SA										
XIRL	RF	50 Ω	AC	CORREC		SEN	ISE:INT		ALIGN AUTO		M Jan 17, 2017	En	equency
				PNO: Fa	ast 🖵	Trig: Free Atten: 30		#Avg Ty	rpe: RMS	TYI Di	E 1 2 3 4 5 6 E A WWWW A NNNNN		
10 dB/div Log	Ref 20	.00 dl	Зm						M	kr1 1.51 -47.	2 0 GHz 03 dBm		Auto Tune
10.0													<b>enter Freq</b> .000000 MHz
-10.0											DL1 -13.00 dBm	30	Start Freq .000000 MHz
-20.0												1.710	Stop Freq
-40.0						and the second second		an states the feature and the			1 	168 <u>Auto</u>	CF Step .000000 MHz Man
-60.0												i	F <b>req Offset</b> 0 Hz
-70.0													Scale Type
Start 0.03 #Res BW				\$	¢VB₩	3.0 MHz			Sweep :	Stop 1.7 2.240 ms (		Log	Lin
MSG									STATU	JS			





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

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	pectrum Analyz	er - Swept	SA										
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		MJan 17, 2017 CE <b>1 2 3 4 5 6</b>	Fr	equency
				PNO: Fa	et 🕢	Trig: Fre	e Run	#Avg iy	pe. Rivi S	TY	PE A WWWW ET A NNNNN		
				IFGain:L		Atten: 2	0 dB			D	ET <mark>A N N N N N</mark>		
									Mkr	1 17.00	8 0 GHz		Auto Tune
10 dB/div Log	Ref 10	.00 dB	m							-43.	65 dBm		
LUg							Ĭ					-	enter Freg
0.00													0000000 GHz
												15.000	000000 0H2
-10.0													
10.0											DL1 -13.00 dBm		Start Freq
-20.0												10.000	0000000 GHz
20.0													
-30.0													
-30.0													Stop Freq
-40.0									1			20.000	0000000 GHz
-40.0									2				
-50.0					-		-	-	- Contraction of the Contraction				CF Step
-30.0													0000000 GHz
-60.0												<u>Auto</u>	Man
-60.0													
-70.0													Freq Offset
-70.0													0 Hz
-80.0													
-00.0													Scale Type
													ocule Type
Start 10.	000 GHz									Stop 20	.000 0112	Log	Lin
#Res BW	1.0 MHz			#	VBW 3	3.0 MHz	:	5	Sweep 25	.33 ms (2	20001 pts)		
MSG									STATUS	5			





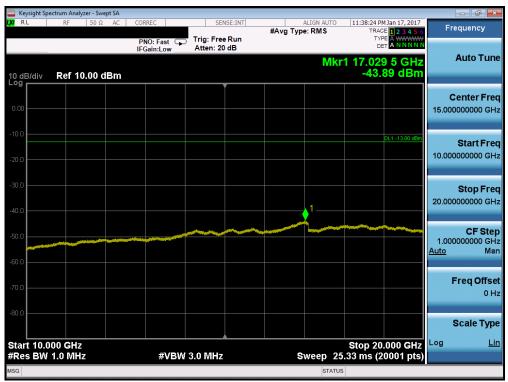
Plot 7-41. Conducted Spurious Plot (AWS WCDMA Mode – Ch. 1513)

FCC ID: ZNFM710H	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyzer										_	- • ×
X/RL	RF	50 Ω AC	CORREC			ISE:INT	#Avg Ty	ALIGN AUTO pe: RMS	TRA	PM Jan 17, 2017 ACE 1 2 3 4 5 6	Fre	equency
			PNO: Fa		Trig: Free Atten: 30				T			
10 dB/div	Ref 20.0	00 dBm						Μ	kr1 1.76 -32	60 0 GHz .89 dBm		Auto Tune
					,							optor From
10.0												enter Freq
0.00												Start Freq
-10.0										DL1 -13.00 dBm	1.760	000000 GHz
-20.0											40.000	Stop Freq
-30.0											10.000	1000000 GHZ
												CF Step
-40.0										-	824 Auto	000000 MHz. Man
-50.0											<u>r turo</u>	
-60.0											F	req Offset
-60.0												0 Hz
-70.0												
												Scale Type
Start 1.76 #Res BW			_	≇VBW 3.	0 MHz			Sween_1	Stop 1	0.000 GHz 16481 pts)	Log	<u>Lin</u>
	1.0 10112		· · · · · · · · · · · · · · · · · · ·	JUDINU J	.0 191112			Sweep 1		10481 pts)		





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

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyz											[	- 6 ×
XI RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT		ALIGN AUTO		PM Jan 17, 2017	Fre	quency
				PNO: Fa IFGain:L	ow	Trig: Free Atten: 30		#Avg Ty	pe: RMS	TR T	ACE 1 2 3 4 5 6 YPE A WWWW DET A NNNNN		
10 dB/div Log	Ref 20.	.00 di	Зm						M	kr1 1.8 -37	45 0 GHz .85 dBm		Auto Tune
10.0													enter Freq 500000 MHz
-10.0											DL1 -13.00 dBm		Start Freq 000000 MHz
30.0											1	1.845	Stop Fred 000000 GHz
-40.0						ndit generalan ing Verferen	Meddama, ay ya ay na a	n, la jangi saliya sa ku jangi sali	an the state of th	******		181. <u>Auto</u>	CF Step 500000 MH Mar
.60.0												F	r <b>eq Offse</b> 0 Ha
-70.0													Scale Type
Start 0.03 #Res BW				#	VBW :	3.0 MHz			Sweep	Stop 1 2.420 ms	.8450 GHz (3631 pts)	Log	Lir
ISG									STATI	JS			

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

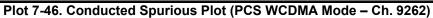


Plot 7-45. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spect	rum Analyzer -	Swept SA								- ē <mark>-</mark> ×
LXI RL	RF 50	Ω AC	CORREC PNO: Fa	t 💭 Tri	SENSE:INT	#Avg Typ	ALIGN AUTO	11:28:16 PM J TRACE TYPE	123456	Frequency
10 dB/div	Ref 10.00	) dBm	IFGain:L		ten: 20 dB		Mkr	DET 1 17.011 -43.9	0 GHz 5 dBm	Auto Tune
0.00										Center Freq 15.000000000 GHz
-10.0								DL	.1 -13.00 dBm	Start Freq 10.00000000 GHz
-30.0							¢1			Stop Freq 20.000000000 GHz
-50.0										CF Step 1.000000000 GHz <u>Auto</u> Man
-70.0										Freq Offset 0 Hz
-80.0 Start 10.00								Stop 20.0	00 0112	Scale Type
#Res BW 1	.0 MHz		#	VBW 3.0	MHz	S	status	.33 ms (20	001 pts)	



	ectrum Analyzer	- Swept SA								[	
LXI RL	RF 5	50 Ω AC	CORREC		ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	MJan 17, 2017 E <b>1 2 3 4 5 6</b> E A WWWWW	Fre	quency
10 dB/div	Ref 20.0	0 dBm	PNO: Fast IFGain:Low				M	or 1.84	7 0 GHz 79 dBm		Auto Tune
10.0											<b>enter Freq</b> 000000 MHz
-10.0									DL1 -13.00 dBm		Start Freq 000000 MHz
-20.0										1.850	<b>Stop Freq</b> 000000 GHz
-40.0			ومواطرهم وبينه وبيداله والمراس	ىرىنى خىلىكى ئىلىدەردىكە ئىكى ك <sub>ە</sub> يىرىنى	and for galaxy and the set of			niversite the second	1	182. <u>Auto</u>	CF Step 000000 MHz Man
-60.0										F	r <b>eq Offsel</b> 0 Hz
-70.0 Start 0.03								Stop 1	3500 GHz	S Log	Scale Type Lin
#Res BW			#V	BW 3.0 MHz			Sweep 2	2.427 ms (	3641 pts)		
MSG							STATU	5			

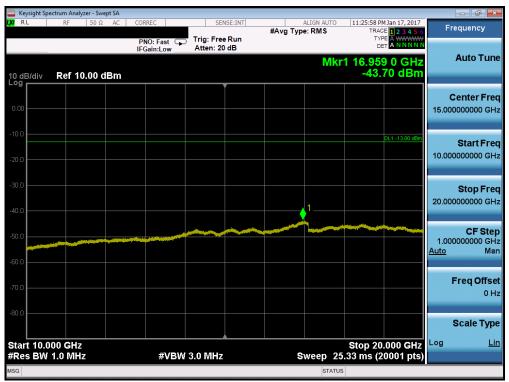
Plot 7-47. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyzer -										
X/RL	RF 50	Ω AC	CORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO	TRA	M Jan 17, 2017 DE <b>1 2 3 4 5 6</b>	Frequ	iency
			PNO: Fast G	Trig: Free Atten: 30		• ,,		TY D	PE A WWWWW A NNNNN		
			IFGain:Low	Atten. 30	/ub		MI		2 0 GHz	Αι	ito Tune
10 dB/div Log	Ref 20.00	) dBm						-42.	38 dBm		
					Ĭ					Cer	nter Freg
10.0											0000 GHz
0.00										9	tart Freq
-10.0											0000 GHz
-10.0									DL1 -13.00 dBm		
-20.0										6	top Freq
											0000 GHz
-30.0											
								▲1			CF Step
-40.0									and the second	809.00	0000 MHz
-50.0	man	m		and the second s						<u>Auto</u>	Man
-60.0										Fre	e <b>q Offset</b> 0 Hz
											0112
-70.0										Sc	ale Type
Start 1.91			<i>#</i> ) (5)					Stop 10	.000 0112	Log	Lin
#Res BW	1.0 MHZ		#VBI	N 3.0 MHz		S			6181 pts)		
MSG							STATUS				





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

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 40 of 81
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🔤 Keysight Spe	ectrum Analyze	er - Swep	t SA										
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		SEI	NSE:INT		ALIGN AUTO		M Jan 17, 2017	Er	equency
				PNO: Fa IFGain:Lo		Trig: Free Atten: 30		#Avg Ty	vpe: RMS	TY D	CE 1 2 3 4 5 6 PE A WWWW ET A N N N N N		
10 dB/div Log	Ref 20.	00 de	Зm						M	kr1 1.83 -47.	8 0 GHz 11 dBm		Auto Tune
10.0													enter Freq 000000 MHz
-10.0											DL1 -13.00 dBm	30	Start Freq 000000 MHz
-20.0												1.850	Stop Freq 0000000 GHz
-40.0					ادوبر محصور چر هر برم	an a she she she she	and the second		4694481 <sup>414</sup> 194618446484	franker og som franker for til	1 	182 <u>Auto</u>	<b>CF Step</b> 000000 MHz Man
-60.0												F	F <b>req Offset</b> 0 Hz
-70.0													Scale Type
Start 0.03 #Res BW				#	VBW 3	3.0 MHz			Sweep :	Stop 1.3 2.427 ms	8500 GHz (3641 pts)	Log	<u>Lin</u>
MSG									STATU	JS			





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

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 41 of 81
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🔤 Keysight Spe	ectrum Analy	zer - Swept	SA										- 0 ×
X RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Jan 17, 2017	Fre	equency
				PNO: Fa		Trig: Fre	e Run	#Avg iy	pe: KIVI S	TY	CE 1 2 3 4 5 6 PE A WWWW		,
				IFGain:Lo		Atten: 2				D			
									Mkr	1 16 95	9 5 GHz		Auto Tune
10 dB/div	Dof 10	).00 dB	200							-43	82 dBm		
Log	Rei Iu	лоо ub					<b>•</b>						
												C	enter Freq
0.00													000000 GHz
0.00												15.000	000000 GHZ
-10.0											DL1 -13.00 dBm		
													Start Freq
-20.0												10.000	000000 GHz
-30.0													
00.0													Stop Freq
									. 1			20.000	000000 GHz
-40.0									• '				
						and an			1		in the second second		CF Step
-50.0							a second a second de la second					1 000	000000 GHz
												Auto	Man
-60.0												<u></u>	
70.0												F	req Offset
-70.0													0 Hz
-80.0													
												5	Scale Type
													1.5-
Start 10.0										Stop 20	000 0112	Log	Lin
#Res BW	1.0 MH:	Z		#	VBW	3.0 MHz	4		Sweep 25	.33 ms (2	20001 pts)		
wsg 連 Poin	ts change	ed; all tra	ces cl	eared					STATUS	3			
			_		_								

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

FCC ID: ZNFM710H	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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#### 7.4 Band Edge Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(h)

#### Test Overview

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

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

#### Test Procedure Used

KDB 971168 D01 v02r02 - Section 6.0

#### Test Settings

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

#### Test Setup

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

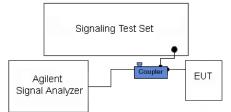


Figure 7-3. Test Instrument & Measurement Setup

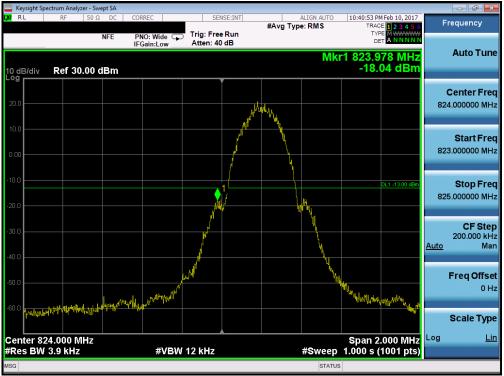
#### **Test Notes**

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

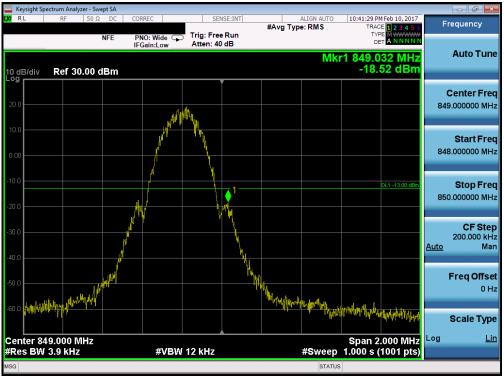
FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 43 of 81
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01/09/2016





Plot 7-53. Band Edge Plot (Cellular GPRS Mode – Ch. 128)

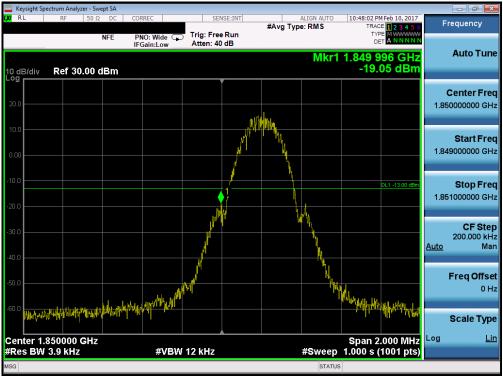


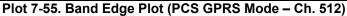
Plot 7-54. Band Edge Plot (Cellular GPRS Mode – Ch. 251)

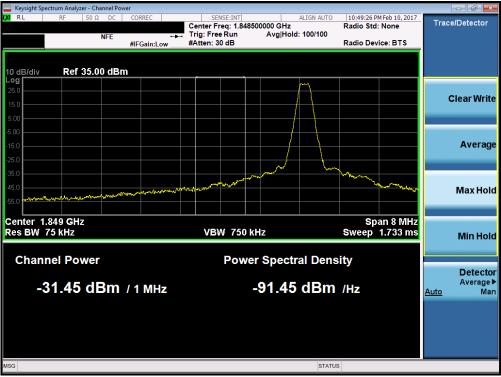
FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🔁 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 44 of 91
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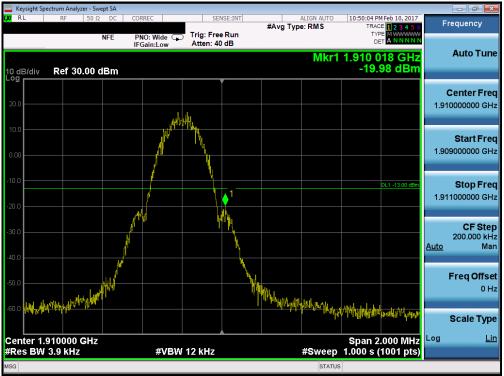


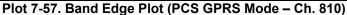


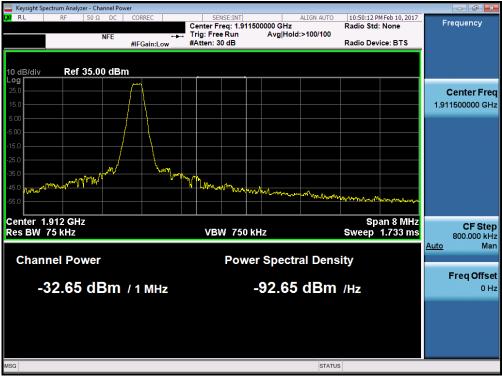
Plot 7-56. 4MHz Span Plot (PCS GPRS Mode – Ch. 512)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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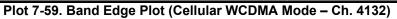


Plot 7-58. 4MHz Span Plot (PCS GPRS Mode – Ch. 810)

FCC ID: ZNFM710H		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									
L <mark>XI</mark> RL	RF 5	50Ω AC	CORREC	SEI	NSE:INT	#Avg Ty	ALIGN AUTO		M Jan 17, 2017 DE <b>1 2 3 4 5 6</b>	F	equency
			PNO: Fast	🖵 Trig: Free		#Avg iy	De: KINIS	TY	PE A WWWWW ET A NNNNN		, ,
			IFGain:Low	Atten: 40	) dB						Auto Tune
							Mk	r1 824.0	00 MHz		Auto Tune
10 dB/div Log	Ref 30.0	0 dBm						-16.	35 dBm		
					Ĩ						Center Freq
20.0											1.000000 MHz
										02.	
10.0						1					
					- And - Contraction		Lane and	x .			Start Freq
0.00					/			\		816	5.500000 MHz
					/			N .			
-10.0											
10.0				_	<sup>1</sup>				DL1 -13.00 dBm		Stop Freq
-20.0										83	.500000 MHz
20.0								Lan	Mars		
-30.0			~						My		CF Step
-30.0			manda								.500000 MHz
-40.0	~~~	mon	~/							<u>Auto</u>	Man
-40.0	مىمىم مى										
-50.0											Freq Offset
											0 Hz
-60.0											
-00.0											Scale Type
	24.000 MH	z						Span 1	5.00 MHz (1001 pts)	Log	Lin
#Res BW	100 kHz		#V	BW 300 kHz			Sweep 7	1.867 ms	(1001 pts)		
MSG							STATU	s			





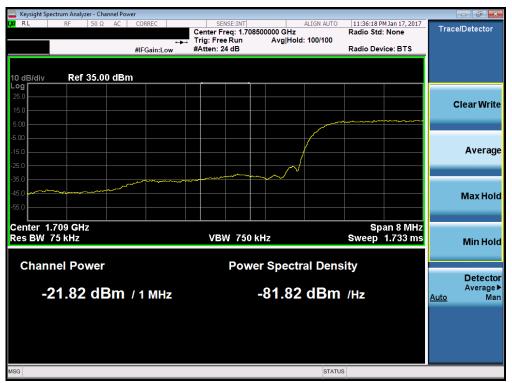
Plot 7-60. Band Edge Plot (Cellular WCDMA Mode - Ch. 4233)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyzei	- Swept	SA										
XI RL	RF	50 Ω /	AC CO	RREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Jan 17, 2017 DE <b>1 2 3 4 5 6</b>	F	requency
			F	NO: Fa Gain:Lo	st 🖵	Trig: Fre Atten: 4		#r.vg i y	pe. Kino	TY D	PE A WWWWW ET A NNNNN		
10 dB/div	Ref 30.0	)0 dB	m						Mkr1	1.710 ( -21.	000 GHz 69 dBm		Auto Tune
20.0													Center Free 0000000 GH
0.00								Jun	mun			1.70	Start Fre
20.0							1				DL1 -13.00 dBm	1.71	<b>Stop Fre</b> 7500000 GH
40.0					,,	- J				hver	han	Auto	CF Ste 1.500000 MH Ma
50.0	www	~~~~											Freq Offse 0 H
60.0													Scale Typ
	710000 G 100 kHz	Hz		#	VBW	300 kHz			Sweep ′	Span 1 1.867 ms	5.00 MHz (1001 pts)	Log	Li
SG									STATU	s			

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

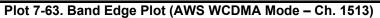


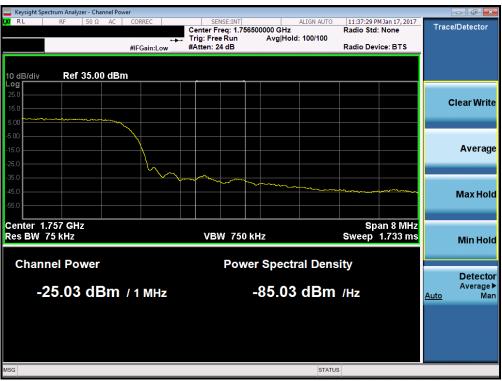
Plot 7-62. 4MHz Span Plot (AWS WCDMA Mode – Ch. 1312)

FCC ID: ZNFM710H	<u> PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyzer -											
RL	RF 5	0Ω AC	COR	REC		SENSE:INT	#Avg Typ	ALIGN AUTO	TR	PM Jan 17, 2017 ACE 1 2 3 4 5 6		equency
			PN IFG	IO: Fast ( ain:Low	Trig: F Atten:	ree Run 40 dB			Т			
0 dB/div og	Ref 30.0	0 dBn	า					Mkr	1 1.755 -18	000 GHz .74 dBm		Auto Tun
20.0												Center Free 5000000 GH
).00		1	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www	m						1.74	Start Fre 7500000 GH
20.0						1				DL1 -13.00 dBm	1.76	<b>Stop Fre</b> 2500000 GH
30.0	~~~~					h	V~~,	101			1 <u>Auto</u>	<b>CF Ste</b> .500000 MH Ma
i0.0								and the second sec	·····	Maria		Freq Offse 0 H
60.0												Scale Typ
	755000 GH 100 kHz	IZ		#VB	W 300 kH	z		Sweep	Span 1.867 ms	15.00 MHz (1001 pts)	Log	Li
G								STATL		(		





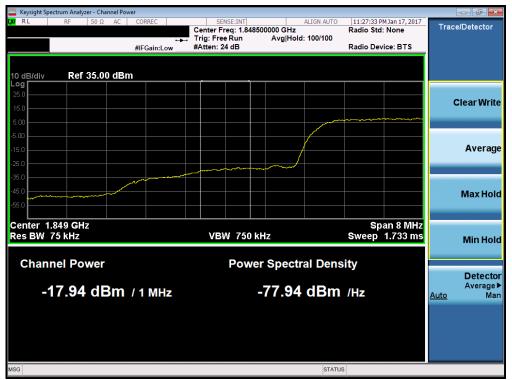
Plot 7-64. 4MHz Span Plot (AWS WCDMA Mode - Ch. 1513)

FCC ID: ZNFM710H	<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										
RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Jan 17, 2017 DE <b>1 2 3 4 5 6</b>	Fr	equency
				PNO: Fa	ast 🖵 .ow	Trig: Fre Atten: 4				TY D			Auto Tun
0 dB/div og	Ref 30.	00 di	Зm						Mkr1	1.850 ( -18.	000 GHz 00 dBm		Auto Tun
20.0							Ĭ						Center Fre
												1.85	0000000 GH
10.0							Jam .	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	vmm			1.04	Start Fre
).00												1.84	2500000 GF
0.0							1				DL1 -13.00 dBm	1 95	Stop Fre 7500000 GH
0.0												1.00	7500000 GI
0.0					mand					Vm	mont		CF Ste 1.500000 MI
0.0			/	AS THE								<u>Auto</u>	Ma
0.0	mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m										Freq Offs ۱
0.0													01
													Scale Typ
enter 1.8 Res BW				#	¢VBW	300 kHz			Sweep 1	Span 1 .867 ms	5.00 MHz (1001 pts)	Log	L
G									STATUS	;			

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



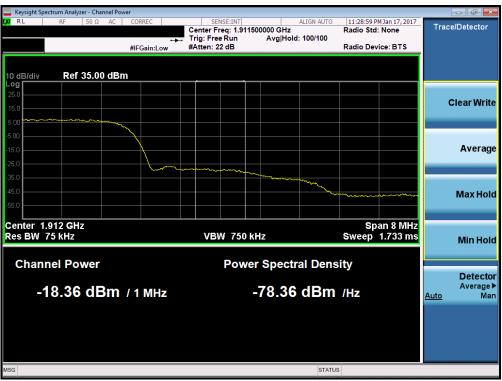
Plot 7-66. 4MHz Span Plot (PCS WCDMA Mode - Ch. 9262)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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	pectrum Analyzer - Swept SA	Ą								- 0 ×
Center F	RF 50 Ω A	00 GHz	SENSE		#Avg Typ	ALIGN AUTO e: RMS	TRA	PM Jan 17, 2017 ACE 1 2 3 4 5 6	Fr	equency
10 dB/div	Ref 30.00 dBr	PNO: Fast 🕞 IFGain:Low	Trig: Free R Atten: 40 dl			Mkr1	1.910	000 GHz .29 dBm		Auto Tune
20.0										<b>Center Freq</b>
0.00			~~~~						1.902	Start Freq 2500000 GHz
-10.0			1					DL1 -13.00 dBm	1.917	<b>Stop Freq</b> 7500000 GHz
-30.0	~~~~~		<u> </u>	~~~~	Renord to a march	hong -			1 <u>Auto</u>	<b>CF Step</b> .500000 MHz Man
-50.0							Marman.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1	F <b>req Offset</b> 0 Hz
-60.0										Scale Type
Center 1. #Res BW	.910000 GHz 100 kHz	#VBW	300 kHz			Sweep	Span 1.867 ms	15.00 MHz (1001 pts)	Log	<u>Lin</u>
MSG						STATU	IS			





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

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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#### Peak-Average Ratio 7.5 §24.232(d)

#### **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
- Frequency = carrier center frequency
- 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.

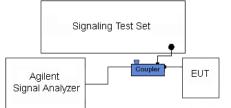


Figure 7-4. Test Instrument & Measurement Setup

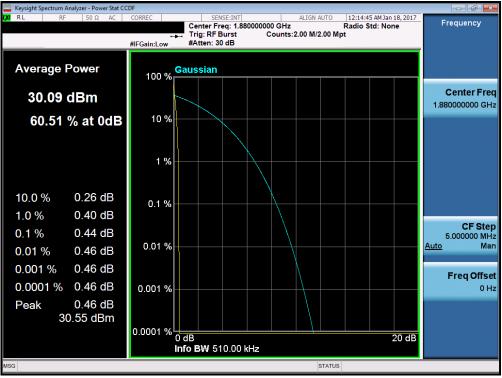
#### **Test Notes**

None

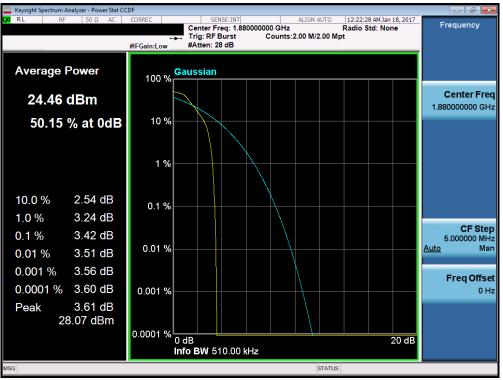
FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕐 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 52 of 91	
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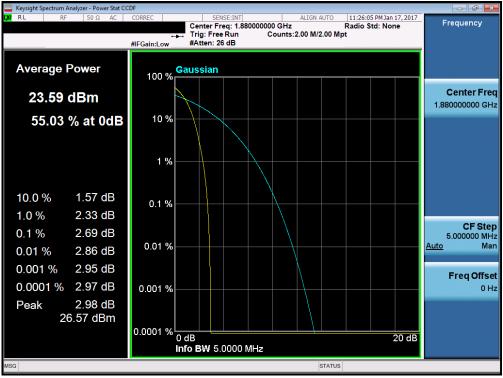




Plot 7-70. Peak-Average Ratio Plot (EDGE1900 Mode - Ch. 661)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Plot 7-71. Peak-Average Ratio Plot (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFM710H		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:		Dego E4 of 91	
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#### 7.6 Radiated Power (ERP/EIRP) §22.913(a)(2) 24.232(c) 27.50(d.4)

#### Test Overview

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

#### Test Procedures Used

KDB 971168 D01 v02r02 - Section 5.2.1

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

#### Test Settings

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

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#### Test Setup

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

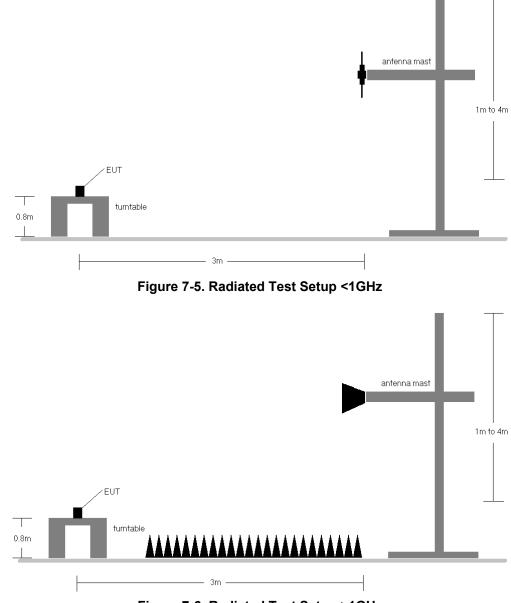


Figure 7-6. Radiated Test Setup >1GHz

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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 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.

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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.20	GPRS850	Н	229	180	29.69	-0.75	28.94	0.784	38.45	-9.51
836.60	GPRS850	н	208	180	29.46	-0.84	28.62	0.727	38.45	-9.83
848.80	GPRS850	Н	214	184	30.40	-0.94	29.46	0.883	38.45	-8.99
848.80	GPRS850	V	143	128	28.62	-0.94	27.68	0.586	38.45	-10.77
848.80	EDGE850	Н	214	184	23.13	-0.94	22.19	0.166	38.45	-16.26

Table 7-2. ERP (Cellular GPRS/EDGE)

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	88	21.09	-0.65	20.44	0.111	38.45	-18.01
836.60	WCDMA850	н	150	89	21.50	-0.65	20.85	0.122	38.45	-17.60
846.60	WCDMA850	н	150	92	21.42	-0.65	20.77	0.119	38.45	-17.68
836.60	WCDMA850	V	150	338	19.71	-0.65	19.06	0.081	38.45	-19.39

Table 7-3. ERP (Cellular 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]
1712.40	WCDMA1700	н	150	356	16.88	5.55	22.43	0.175	30.00	-7.57
1732.60	WCDMA1700	н	150	355	16.73	5.41	22.14	0.164	30.00	-7.86
1752.60	WCDMA1700	н	150	350	16.86	5.27	22.13	0.163	30.00	-7.87
1712.40	WCDMA1700	V	150	341	16.16	5.55	21.71	0.148	30.00	-8.29

Table 7-4. EIRP (AWS WCDMA)

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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900	Η	150	204	23.74	4.82	28.56	0.718	33.01	-4.45
1880.00	GPRS1900	н	150	212	23.61	4.74	28.35	0.684	33.01	-4.66
1909.80	GPRS1900	Н	150	217	23.20	4.68	27.88	0.614	33.01	-5.13
1850.20	GPRS1900	V	150	353	23.59	4.82	28.41	0.693	33.01	-4.60
1850.20	EDGE1900	Н	110	102	21.81	4.82	26.63	0.460	33.01	-6.38

Table 7-5. EIRP (PCS GPRS/EDGE)

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	н	150	92	17.77	4.81	22.58	0.181	33.01	-10.43
1880.00	WCDMA1900	н	150	93	17.90	4.74	22.64	0.184	33.01	-10.37
1907.60	WCDMA1900	н	150	96	17.75	4.68	22.43	0.175	33.01	-10.58
1880.00	WCDMA1900	V	150	360	17.36	4.74	22.10	0.162	33.01	-10.91

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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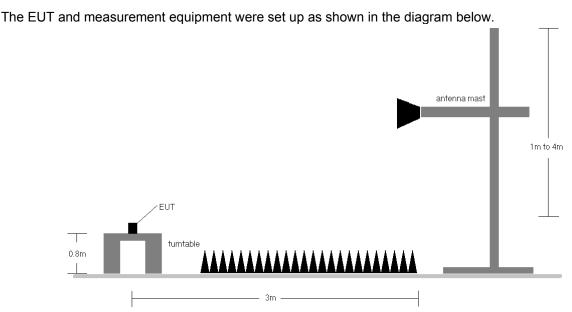


Figure 7-7. Test Instrument & Measurement Setup

#### 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 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 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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OPERATING FREQUENCY:	824	MHz		
CHANNEL:	12	28		
MEASURED OUTPUT POWER:	28.94	dBm =	0.784	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	41.94	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]
1648.40	Н	117	22	-66.04	6.30	-59.74	88.7
2472.60	Н	117	332	-49.58	6.85	-42.73	71.7
3296.80	Н	-	-	-61.49	7.12	-54.37	83.3

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

OPERATING FREQUENCY:	836	6.60	MHz	
CHANNEL:	19	•		
MEASURED OUTPUT POWER:	28.62	dBm =	0.727	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	41.62	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	112	200	-65.11	6.21	-58.91	87.5
2509.80	Н	112	217	-46.18	6.86	-39.32	67.9
3346.40	Н	315	275	-61.83	7.26	-54.57	83.2

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

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OPERATING FREQUENCY:	848	3.80	MHz	
CHANNEL:	2	51		
MEASURED OUTPUT POWER:	29.46	dBm =	0.883	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) :	42.46	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	Н	160	196	-49.26	6.12	-43.14	72.6
2546.40	Н	108	221	-44.30	6.97	-37.33	66.8
3395.20	Н	-	-	-62.02	7.41	-54.61	84.1

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

OPERATING FREQUENCY:	826	MHz	
CHANNEL:	41	32	
MEASURED OUTPUT POWER:	20.44	dBm =	0.111 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	33.44	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	117	61	-67.07	6.28	-60.78	81.2
2479.20	Н	197	317	-68.61	6.84	-61.77	82.2
3305.60	Н	-	-	-70.14	7.14	-63.00	83.4

Table 7-10. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	836	MHz		
CHANNEL:	41	•		
MEASURED OUTPUT POWER:	20.85	dBm =	0.122 W	
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	33.85	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	128	91	-66.09	6.21	-59.89	80.7
2509.80	Н	103	159	-57.49	6.86	-50.63	71.5
3346.40	Н	-	-	-68.61	7.26	-61.35	82.2

Table 7-11. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

OPERATING FREQUENCY:	846	MHz		
CHANNEL:	42			
MEASURED OUTPUT POWER:	20.77	dBm =	0.119	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	33.77	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	112	160	-73.27	6.13	-67.14	87.9
2539.80	Н	100	159	-54.73	6.95	-47.78	68.6
3386.40	Н	-	-	-70.56	7.38	-63.17	83.9

Table 7-12. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	171	MHz	
CHANNEL:	13		
MEASURED OUTPUT POWER:	22.43	dBm =	0.175 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.43	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	-	-	-69.01	9.65	-59.36	81.8
5137.20	Н	-	-	-68.23	10.91	-57.32	79.7

Table 7-13. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1312)

OPERATING FREQUENCY:	173	2.60	MHz	
CHANNEL:	14	-		
MEASURED OUTPUT POWER:	22.14	dBm =	0.164 V	V
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.14	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]
3465.20	Н	-	-	-70.84	9.77	-61.06	83.2
5197.80	Н	-	-	-68.27	10.81	-57.46	79.6

Table 7-14. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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OPERATING FREQUENCY:	175	2.60	MHz	
CHANNEL:	15	513		
MEASURED OUTPUT POWER:	22.13	dBm =	0.163 V	N
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) :	35.13	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	-	-	-70.45	9.89	-60.57	82.7

Table 7-15. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

OPERATING FREQUENCY:	185	0.20	MHz
CHANNEL:	51	2	_
MEASURED OUTPUT POWER:	28.56	dBm =	0.718 W
MODULATION SIGNAL:	GPRS (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	41.56	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	160	232	-63.34	10.03	-53.31	81.9
5550.60	Н	-	-	-65.70	11.18	-54.52	83.1

Table 7-16. Radiated Spurious Data (PCS GPRS Mode – Ch. 512)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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OPERATING FREQUENCY:	188	0.00	MHz
CHANNEL:	66	61	_
MEASURED OUTPUT POWER:	28.35	dBm =	0.684 W
MODULATION SIGNAL:	GPRS (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	41.35	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	100	139	-61.97	9.79	-52.18	80.5
5640.00	Н	-	-	-64.61	11.35	-53.26	81.6

Table 7-17. Radiated Spurious Data (PCS GPRS Mode – Ch. 661)

OPERATING FREQUENCY:	190	9.80	MHz	
CHANNEL:	8	10		
MEASURED OUTPUT POWER:	27.88	dBm =	0.614	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	40.88	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	147	108	-59.17	9.56	-49.61	77.5
5729.40	Н	-	-	-64.77	11.43	-53.33	81.2
7639.20	Н	-	-	-58.65	11.50	-47.15	75.0

Table 7-18. Radiated Spurious Data (PCS GPRS Mode – Ch. 810)

FCC ID: ZNFM710H	<u>«NPGTEST</u>	FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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OPERATING FREQUENCY:	1852.40		MHz	
CHANNEL:	92			
MEASURED OUTPUT POWER:	22.58	dBm =	0.181 W	
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.58	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	-	-	-71.07	10.01	-61.05	83.6
5557.20	Н	-	-	-68.99	11.20	-57.79	80.4

Table 7-19. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

OPERATING FREQUENCY:	188	0.00	MHz
CHANNEL:	94	00	-
MEASURED OUTPUT POWER:	22.64	dBm =	0.184 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.64	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	-	-	-70.60	9.79	-60.81	83.5
5640.00	Н	-	-	-68.88	11.35	-57.53	80.2

Table 7-20. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

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OPERATING FREQUENCY:	190	7.60	MHz	
CHANNEL:	95	38		
MEASURED OUTPUT POWER:	22.43	dBm =	0.175	W
MODULATION SIGNAL:	WCDMA	-		—
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.43	dBc	

F	requency [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	-	-	-69.55	9.57	-59.97	82.4	
	Table 7.21 Redicted Spurious Date (RCS WCDMA Mode Ch. 9528)								

Table 7-21. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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#### 7.8 Frequency Stability / Temperature Variation §2.1055 §22.355 §24.235 §27.54

#### Test Overview and Limit

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

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

For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  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-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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### Frequency Stability / Temperature Variation §2.1055 §22.355

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL:

190

VDC

**REFERENCE VOLTAGE:** 3.85

> ± 0.00025 % or 2.5 ppm DEVIATION LIMIT:

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,599,919	-81	-0.0000097
100 %		- 30	836,599,825	-175	-0.0000210
100 %		- 20	836,599,823	-177	-0.0000211
100 %		- 10	836,599,852	-148	-0.0000177
100 %		0	836,599,935	-65	-0.0000078
100 %		+ 10	836,599,809	-191	-0.0000229
100 %		+ 20	836,599,840	-160	-0.0000191
100 %		+ 30	836,599,819	-181	-0.0000216
100 %		+ 40	836,599,907	-93	-0.0000111
100 %		+ 50	836,599,945	-55	-0.0000065
BATT. ENDPOINT	3.45	+ 20	836,599,964	-36	-0.0000043

Table 7-22. Frequency Stability Data (Cellular GPRS Mode - Ch. 190)

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## Frequency Stability / Temperature Variation §2.1055 §22.355

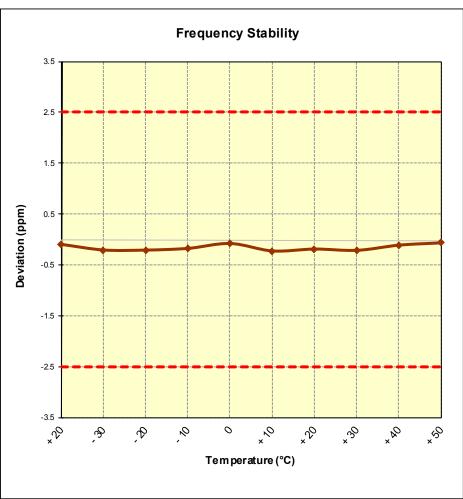


Figure 7-8. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

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#### Frequency Stability / Temperature Variation §2.1055 §22.355

**OPERATING FREQUENCY:** 836,600,000 Hz 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)	836,599,809	-191	-0.0000229
100 %		- 30	836,599,982	-18	-0.0000021
100 %		- 20	836,599,943	-57	-0.000068
100 %		- 10	836,599,859	-141	-0.0000169
100 %		0	836,599,873	-127	-0.0000152
100 %		+ 10	836,599,995	-5	-0.000006
100 %		+ 20	836,599,942	-58	-0.0000069
100 %		+ 30	836,599,935	-65	-0.0000077
100 %		+ 40	836,599,971	-29	-0.0000035
100 %		+ 50	836,599,957	-43	-0.0000052
BATT. ENDPOINT	3.45	+ 20	836,599,861	-139	-0.0000166

Table 7-23. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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### Frequency Stability / Temperature Variation §2.1055 §22.355

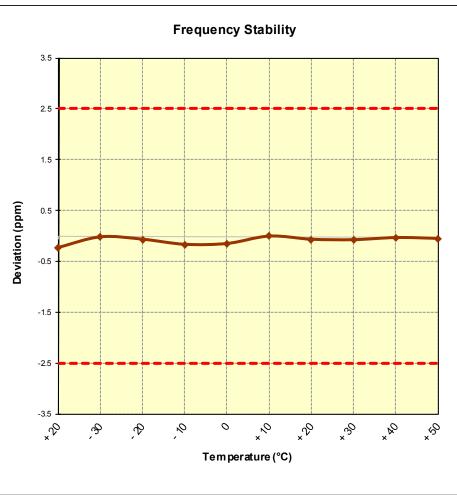


Figure 7-9. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved 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)	1,732,599,932	-68	-0.000039
100 %		- 30	1,732,599,998	-2	-0.0000001
100 %		- 20	1,732,599,930	-70	-0.0000041
100 %		- 10	1,732,599,991	-9	-0.0000005
100 %		0	1,732,599,917	-83	-0.0000048
100 %		+ 10	1,732,599,989	-11	-0.0000006
100 %		+ 20	1,732,599,869	-131	-0.0000076
100 %		+ 30	1,732,599,996	-4	-0.0000002
100 %		+ 40	1,732,599,964	-36	-0.0000021
100 %		+ 50	1,732,599,830	-170	-0.000098
BATT. ENDPOINT	3.45	+ 20	1,732,599,955	-45	-0.0000026

Table 7-24. 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.

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## Frequency Stability / Temperature Variation §2.1055 §27.54

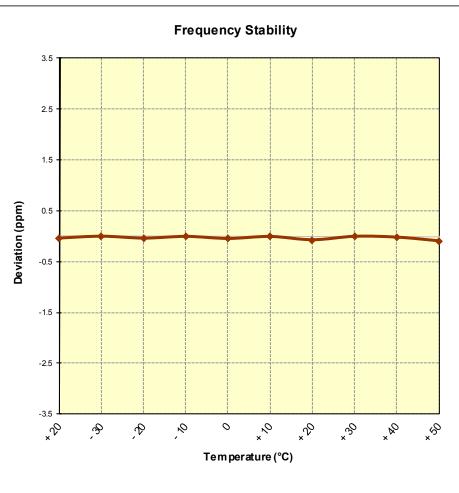


Figure 7-10. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1412)

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### Frequency Stability / Temperature Variation §2.1055 §24.235

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)	1,879,999,870	-130	-0.0000069
100 %		- 30	1,879,999,816	-184	-0.000098
100 %		- 20	1,879,999,962	-38	-0.0000020
100 %		- 10	1,879,999,866	-134	-0.0000071
100 %		0	1,879,999,801	-199	-0.0000106
100 %		+ 10	1,879,999,941	-59	-0.0000031
100 %		+ 20	1,879,999,901	-99	-0.0000053
100 %		+ 30	1,879,999,844	-156	-0.000083
100 %		+ 40	1,879,999,876	-124	-0.0000066
100 %		+ 50	1,879,999,835	-165	-0.000088
BATT. ENDPOINT	3.45	+ 20	1,879,999,831	-169	-0.0000090

Table 7-25. Frequency Stability Data (PCS GPRS Mode – Ch. 661)

#### Note:

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

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## Frequency Stability / Temperature Variation §2.1055 §24.235

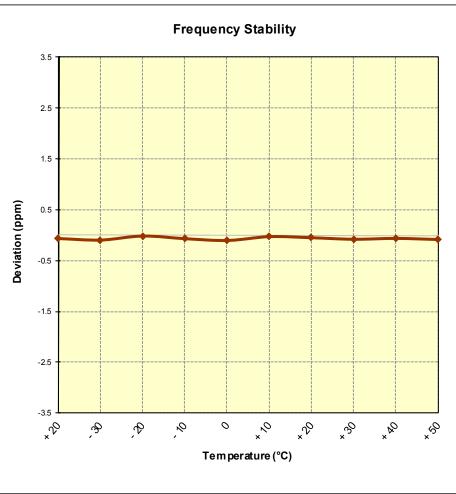


Figure 7-11. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	Approved 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)	1,879,999,831	-169	-0.000090
100 %		- 30	1,879,999,951	-49	-0.0000026
100 %		- 20	1,879,999,915	-85	-0.0000045
100 %		- 10	1,879,999,893	-107	-0.0000057
100 %		0	1,879,999,920	-80	-0.0000042
100 %		+ 10	1,879,999,980	-20	-0.0000011
100 %		+ 20	1,879,999,902	-98	-0.0000052
100 %		+ 30	1,879,999,911	-89	-0.0000047
100 %		+ 40	1,879,999,928	-72	-0.000038
100 %		+ 50	1,879,999,959	-41	-0.0000022
BATT. ENDPOINT	3.45	+ 20	1,879,999,827	-173	-0.0000092

 Table 7-26. 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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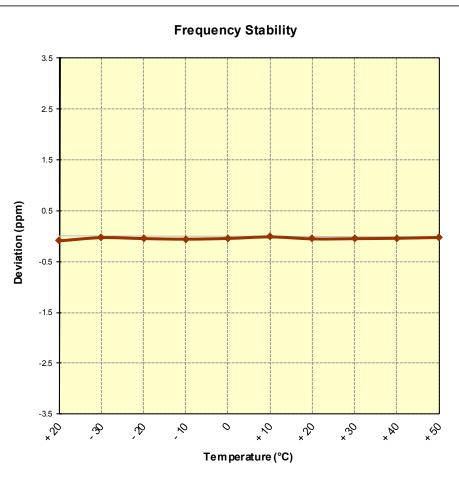


Figure 7-12. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFM710H		FCC Pt. 22, 24, & 27 GSM / GPRS / EDGE / WCDMA MEASUREMENT REPORT (CERTIFICATION)	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 LGE Portable Handset FCC ID: ZNFM710H complies with all the requirements of Parts 22, 24, & 27 of the FCC rules.

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