

PCTEST ENGINEERING LABORATORY, INC.

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



MEASUREMENT REPORT

FCC Part 22, 24, & 27

Applicant Name:

LG Electronics MobileComm U.S.A 1000 Sylvan Avenue Englewood Cliffs, NJ 07632 United States

Date of Testing:

May 31 - July 07, 2016 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 0Y1605310985.ZNF

FCC ID:

ZNFLS755

APPLICANT:

LG ELECTRONICS MOBILECOMM U.S.A

Application Type: Model(s): EUT Type: FCC Classification: FCC Rule Part(s): Test Procedure(s): Test Device Serial No.: Certification LG-LS755, LGLS755, LS755 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) §2 §22(H) §24(E) §27(L) ANSI/TIA-603-D-2010, KDB 971168 v02r02 *identical prototype* [S/N: 2KV5A, 2KV52]

			ERP/	EIRP
Mode	Tx Frequency (MHz)	Emission Designator	Max. Power (W)	Max. Power (dBm)
GSM850	824.2 - 848.8	245KGXW	0.672	28.28
EDGE850	824.2 - 848.8	247KG7W	0.142	21.52
GSM1900	1850.2 - 1909.8	244KGXW	0.960	29.82
EDGE1900	1850.2 - 1909.8	253KG7W	0.291	24.63
CDMA850	824.70 - 848.31	1M28F9W	0.094	19.75
CDMA1900	1851.25 - 1908.75	1M28F9W	0.438	26.42
WCDMA850	826.4 - 846.6	4M16F9W	0.108	20.32
WCDMA1700	1712.4 - 1752.6	4M16F9W	0.314	24.97
WCDMA1900	1852.4 - 1907.6	4M16F9W	0.354	25.49

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.

ndy Ortanez President



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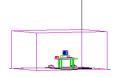


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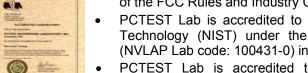
§2.1033 General Information

APPLICANT:	LG Electronics MobileComm	ו U.S.A	
APPLICANT ADDRESS:	1000 Sylvan Avenue		
	Englewood Cliffs, NJ 07632,	, United States	
TEST SITE:	PCTEST ENGINEERING LA	ABORATORY, INC.	
TEST SITE ADDRESS:	7185 Oakland Mills Road, C	olumbia, MD 21046 USA	
FCC RULE PART(S):	§2 §22(H) §24(E) §27(L)		
BASE MODEL:	LG-LS755		
FCC ID:	ZNFLS755		
FCC CLASSIFICATION:	PCS Licensed Transmitter H	leld to Ear (PCE)	
MODE:	GSM / EDGE / CDMA / WCI	DMA	
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)		
Test Device Serial No.:	2KV5A, 2KV52	Production X Pre-Production	Engineering
DATE(S) OF TEST:	May 31 - July 07, 2016		
TEST REPORT S/N:	0Y1605310985.ZNF		

Test Facility / Accreditations

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

• PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).



- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

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1.0 INTRODUCTION

1.1 Scope

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

1.2 Testing Facility

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

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

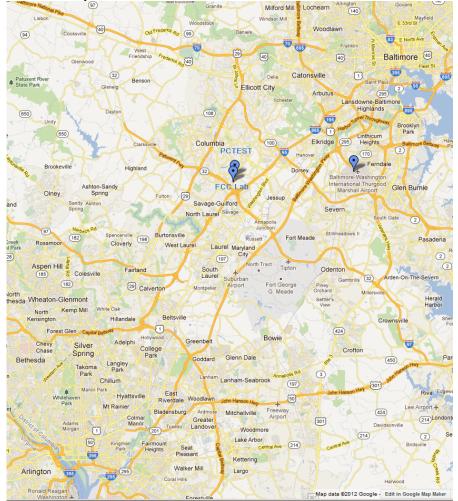


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFLS755**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA, Multi-band LTE, 802.11b/g/n WLAN, Bluetooth (1x, EDR, LE)

2.3 Test Configuration

The LG Portable Handset FCC ID: ZNFLS755 was tested per the guidance of ANSI/TIA-603-D-2010 and KDB 971168 v02r02. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 EMI Suppression Device(s)/Modifications

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

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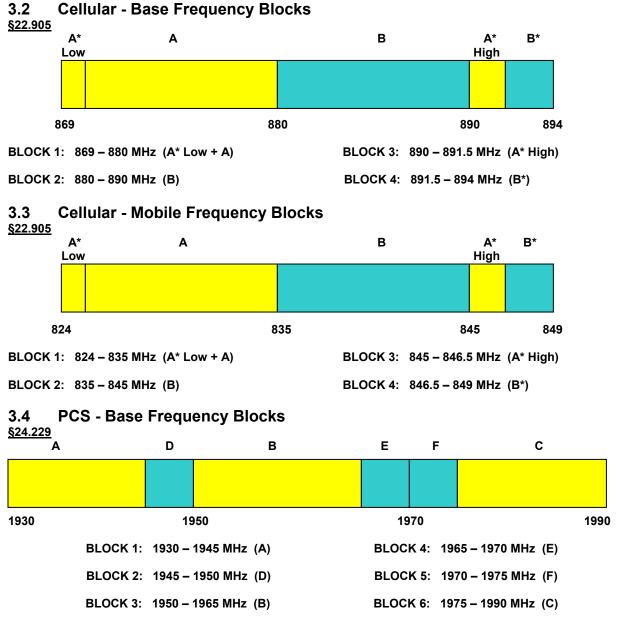


DESCRIPTION OF TESTS 3.0

Evaluation Procedure 3.1

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 v02r02) were used in the measurement of the LG Portable Handset FCC ID: ZNFLS755.





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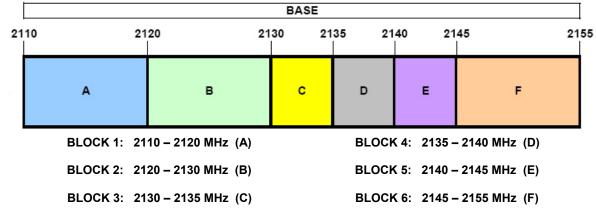


3.5 PCS - Mobile Frequency Blocks

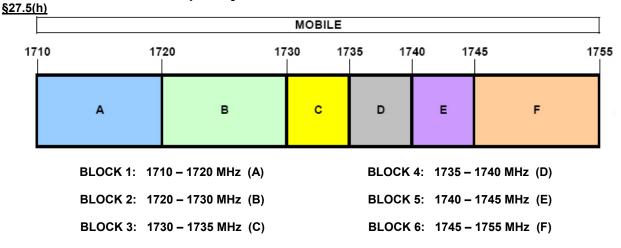
<u>§24.229</u>	<u>9</u> A	D	В	E	F	с	
1850		18	370	189	90	·	1910
	BLOCK 1:	1850 –	1865 MHz (A)	BLOC	K4: 18	85 – 1890 MHz (E)	
	BLOCK 2:	1865 –	1870 MHz (D)	BLOC	K 5: 18	90 – 1895 MHz (F)	
	BLOCK 3:	1870 —	1885 MHz (B)	BLOC	K6: 189	95 – 1910 MHz (C)	

3.6 AWS - Base Frequency Blocks

<u>§27.5(h)</u>



3.7 AWS - Mobile Frequency Blocks



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

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Clause 5, Figure 5.7 of ANSI C63.4-2014. For measurements above 1GHz, absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements above 1GHz, 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 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:

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

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

Radiated power levels and radiated spurious levels are investigated \with the receive antenna horizontally and vertically polarized per ANSI/TIA-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_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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

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5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	4/28/2016	Annual	4/28/2017	RE1
-	LTx2	Licensed Transmitter Cable Set	4/20/2016	Annual	4/20/2017	LTx2
Agilent	8648D	(9kHz-4GHz) Signal Generator	11/4/2015	Annual	11/4/2016	3613A00315
Agilent	N9020A	MXA Signal Analyzer	11/5/2015	Annual	11/5/2016	US46470561
Agilent	N9038A	MXE EMI Receiver	4/21/2016	Annual	4/21/2017	MY51210133
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	7/22/2015	Annual	7/22/2016	MY49432391
Com-Power	PAM-118A	Pre-Amplifier	4/10/2016	Annual	4/10/2017	551042
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	2/26/2016	Annual	2/26/2017	441128
Emco	6502	Active Loop Antenna (10k - 30 MHz)	6/24/2014	Biennial	6/24/2016	267
Espec	ESX-2CA	Environmental Chamber	3/4/2016	Annual	3/4/2017	17620
K & L	13SH10-1000/U1000	N Type High Pass Filter	7/18/2015	Annual	7/18/2016	13SH10-1000/U1000-4
K & L	11SH10-3075/U18000	High Pass Filter	12/1/2015	Annual	12/1/2016	3
Mini Circuits	TVA-11-422	RF Power Amp		N/A		QA1317001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/4/2016	Annual	3/4/2017	11401010036
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
Mini-Circuits	PWR-SENS-4RMS	USB Power Sensor	3/4/2016	Annual	3/4/2017	11210140001
Mini-Circuits	TVA-11-422	RF Power Amp		N/A		QA1303002
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester	4/13/2016	Annual	4/13/2017	140148
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	11/18/2015	Biennial	11/18/2017	91052522TX
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	DRH-118	Horn Antenna (1-18GHz)	7/30/2015	Biennial	7/30/2017	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	7/30/2015	Biennial	7/30/2017	A042511
VWR	62344-734	Thermometer with Clock	2/20/2016	Biennial	2/20/2018	140140336

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.

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6.0 SAMPLE CALCULATIONS

GSM Emission Designator

Emission Designator = 250KGXW

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

EDGE Emission Designator

Emission Designator = 250KG7W

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

CDMA Emission Designator

Emission Designator = 1M25F9W

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

WCDMA Emission Designator

Emission Designator = 4M16F9W

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

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

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

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7.0 TEST RESULTS

7.1 Summary

Company Name:	LG Electronics MobileComm U.S.A
FCC ID:	ZNFLS755
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM / EDGE / CDMA / WCDMA</u>

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

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

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "2G/3G Automation," Version 3.2.

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7.2 Occupied Bandwidth §2.1049

Test Overview

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

Test Procedure Used

KDB 971168 v02r02 - Section 4.2

Test Settings

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

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

Test Setup

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

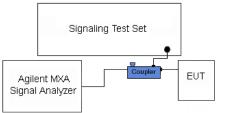


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-1. Occupied Bandwidth Plot (Cellular GSM Mode - Ch. 190)



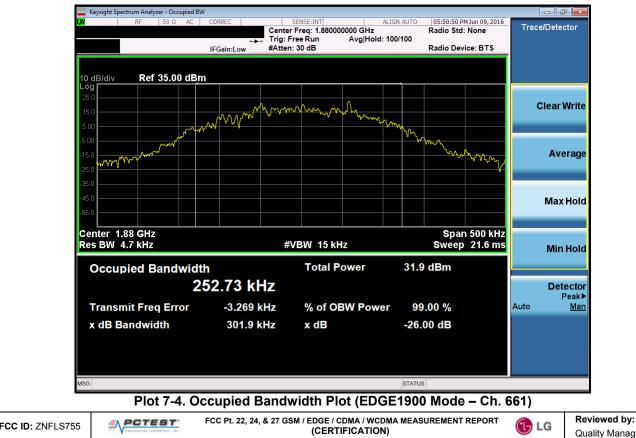


FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 14 of 101
0Y1605310985.ZNF	May 31 - July 07, 2016	Portable Handset		Page 14 of 101
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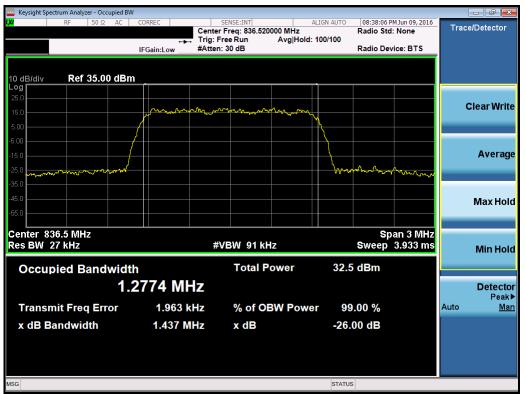


Plot 7-3. Occupied Bandwidth Plot (PCS GSM Mode - Ch. 661)

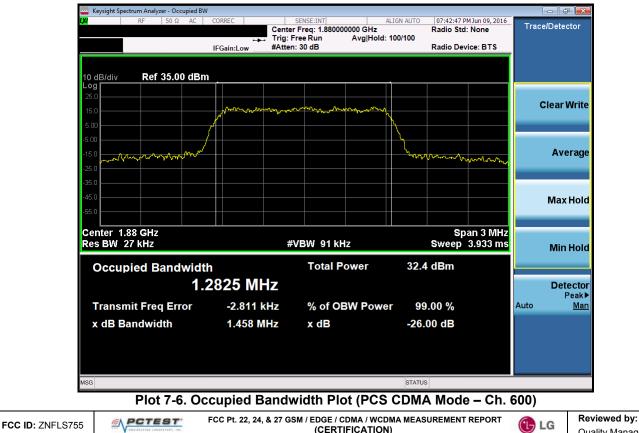


FUC ID: ZNFLS755	······································	(CERTIFICATION)	Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 15 of 101	
0Y1605310985.ZNF	May 31 - July 07, 2016	Portable Handset	Fage 15 01 101	
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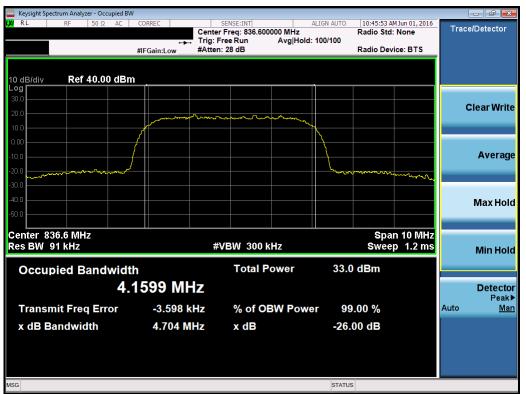


Plot 7-5. Occupied Bandwidth Plot (Cellular CDMA Mode – Ch. 384)

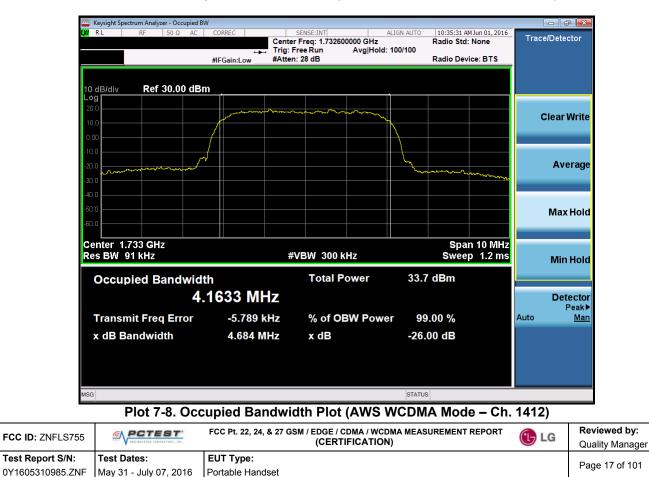


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Test Report S/N:	Test Dates:	EUT Type:	Page 16 of 101
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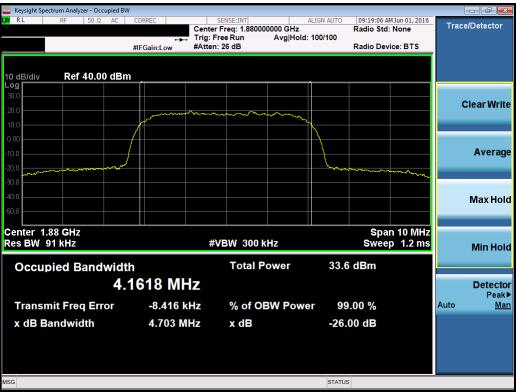




Plot 7-7. Occupied Bandwidth Plot (Cellular WCDMA Mode – Ch. 4183)







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

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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7.3 Spurious and Harmonic Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(h)

Test Overview

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

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

Test Procedure Used

KDB 971168 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.

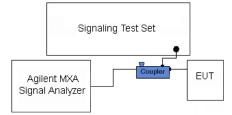


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

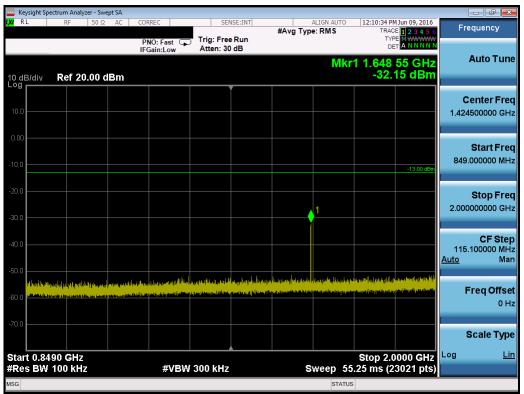
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Part 22 and 1 MHz or greater for Part 24, Part 27. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth 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.

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Keysight Spectrum Analyzer - Swept SA				- 7 💌
XIRL RF 50Ω AC	CORREC SEN	SE:INT ALIGN AUTO #Avg Type: RMS	12:10:25 PM Jun 09, 2016 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast Trig: Free IFGain:Low Atten: 30	Run dB	TYPE MWWWW DET ANNNN	
10 dB/div Ref 20.00 dBm		N	/kr1 822.30 MHz -44.65 dBm	Auto Tun
_og				Center Fre
10.0				426.500000 MH
0.00				
0.00				Start Free
-10.0			-13.00 dBm	30.000000 MH:
20.0				
				Stop Free 823.000000 MH
-30.0				
-40.0			1	CF Ste
				79.300000 MH <u>Auto</u> Ma
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app <mark>lated and the second stated and the second stated and the second stated as a second s</mark>	and the product of the second s	n fan fan skrifter fan de skrifter fan fan fan skrifter fan skrifter fan skrifter fan skrifter fan skrifter fan I an sen af welken skrifter fan de skrifter fan skrifter fan skrifter fan skrifter fan skrifter fan skrifter sk	en fan fan fan fan fan fan fan fan fan fa	Freq Offse
				ОН
-70.0				Scale Type
Start 30.0 MHz #Res BW 100 kHz	#VBW 300 kHz	Sween 3	Stop 823.0 MHz 8.06 ms (15861 pts)	Log <u>Li</u> i
ISG	#**BM 000 MHZ	STAT		





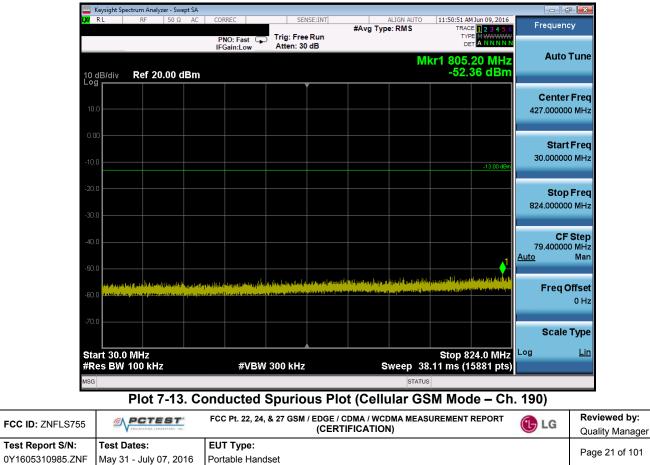
Plot 7-11. Conducted Spurious Plot (Cellular GSM Mode – Ch. 128)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 101
0Y1605310985.ZNF	May 31 - July 07, 2016	Portable Handset		Page 20 of 101
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	pectrum Analy:											7 X
L <mark>XI</mark> RL	RF	50 Ω AC	CORRE	C		ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Jun 09, 2016 E 1 2 3 4 5 6	Frequen	су
				:Fast 🖵 in:Low	Trig: Free Atten: 20				TYI Di			
10 dB/div	Ref 10	.00 dBm						M	(r1 2.47) -18.	2 5 GHz 60 dBm	Auto	Tune
Log											Center 6.00000000	
-10.0	¢ ¹									-13.00 dBm	Star 2.00000000	t Fred 00 GH:
-30.0											Stop 10.00000000	
-50.0	er elle half garantiare		an an a support of the support of th		and the second second second	undertin displate			gennen an help gan bester gennen af neder gan bester	n <mark>g Danangang Padyo</mark> 1 ₉ Juli Padyon 19 Juli Padanan Chanar	CF 800.00000 <u>Auto</u>	Ste 10 MH Ma
-60.0											Freq	Offse 0 H
-80.0											Scale	Тур
Start 2.0 #Res BV	00 GHz V 1.0 MHz	2		#VBW	3.0 MHz		s	weep 13	Stop 10 .87 ms (1	.000 GHz 6001 pts)	Log	Li
ISG								STATUS	5			

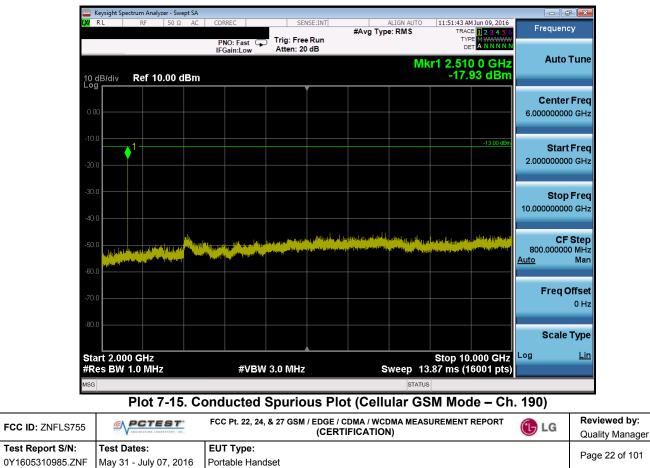






🛄 Keysight Sp	ectrum Analyze	er - Swept	SA									P X
L <mark>XI</mark> RL	RF	50 Ω	AC CO	RREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO		MJun 09, 2016 E 1 2 3 4 5 6	Frequenc	:y
				NO: Fast Gain:Low	Trig: Free Atten: 30		#///g / yp	e. King	TYF			_
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0.00												
-10.0										-13.00 dBm	Start 849.000000	
-20.0											Stop	Fred
-30.0								♦ ¹			2.00000000	0 GHz
-40.0											CF 115.100000	Step 0 MHz
-50.0						1		с. Г. Ю. Т.	a na data tata a	والريسية بالمأ أناب	<u>Auto</u>	Man
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-70.0											Scale	Type
Start 0.84					<u> </u>				Stop 2.0		Log	Lin
#Res BW					/ 300 kHz		S		5.25 ms (2	3021 pts)		
isg 🕹 Poin	nts changed	l; all tra	ces clea	red				STATU	IS			

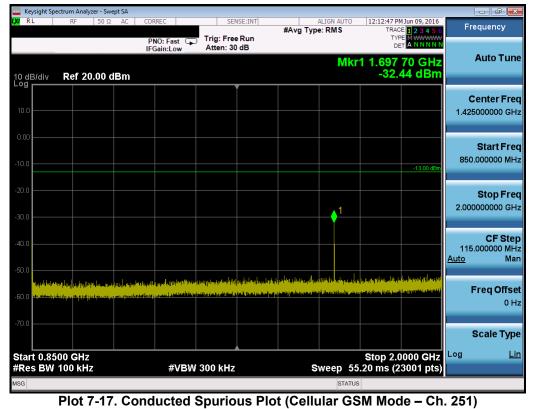






	pectrum Analyzer -										7 X
XI RL	RF 50	Ω AC	CORREC		SE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	1 Jun 09, 2016 E 1 2 3 4 5 6 E M WWWWW	Frequen	су
10 dB/div	Ref 20.00) dBm	PNO: Fast IFGain:Low	Atten: 30			M	lkr1 734.	15 MHz 54 dBm	Auto	Tune
10.0										Cente 427.00000	
•10.00									-13.00 dBm	Star 30.00000	tFree 00 MH
-20.0										Stop 824.00000	o Free 00 MH:
-40.0									<u> </u>	CF 79.40000 <u>Auto</u>	Stej 00 MH Ma
60.0 ^{Juli Jine} , a	n na han an a	y a hi ya di Lafan ⁽ i fassara) Ana ya ku wa Kasana ya ana a	na ny taona amin'ny faritsi amin'ny faritsi amin'ny faritsi amin'ny faritsi amin'ny faritsi amin'ny faritsi ami Ny faritsi amin'ny faritsi amin'ny faritsi amin'ny faritsi amin'ny faritsi amin'ny faritsi amin'ny faritsi amin'	a gyr Den hy y Arnel (r Gans Anna Mailtean	a Line di Pope Generali State et	n Anaron Allandi An Malayan Alaka a	r <mark>an 1944 an Angelanda an Angelanda.</mark> Yang kana kana kana pala kana	a <mark>hore and a star and a star and a star a star A star a star A star a star</mark>	nya kupi ng kupi ng kupi () ku	Freq	Offse 0 H
-70.0										Scale	
Start 30. #Res BW	0 MHz / 100 kHz		#VBW	/ 300 kHz		s	weep 3	8 Stop 8.11 ms (1	24.0 MHz 5881 pts)	LUg	Lir
MSG							STATU	JS			

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



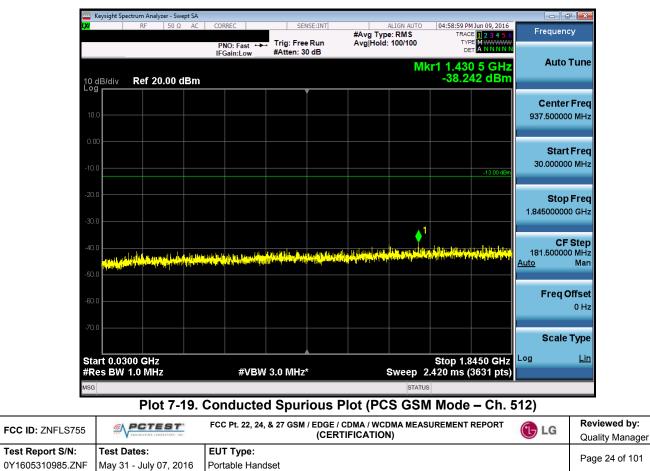
FCC ID: ZNFLS755	<u>PCTEST</u>	FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🔁 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 22 of 101
0Y1605310985.ZNF	May 31 - July 07, 2016	Portable Handset		Page 23 of 101
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ngineering Laboratory, I



	Spectrum Analyz	er - Swept SA									×
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC		NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	MJun 09, 2016 DE 1 2 3 4 5 6	Frequency	У
			PNO: Fas IFGain:Lo					DI	PE MWWWWW ET ANNNNN		
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-10.0	1								-13.00 dBm	Start F	Fred
-20.0										2.000000000	
-30.0										Stop F	
-40.0	A State of the sta		ana yang balayan tabuta Manang balayan tabuta	ng king babang sini ng	land (and a bird a bird An an a the contract of the second			u la fai fa fa fa suisse d	laga kenjinlagi peru téhekeré peru tetén ginengeni tened	CF S 800.000000 <u>Auto</u>	
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-80.0										Scale T	Гур
Start 2.0 #Res BV	00 GHz V 1.0 MHz		#\	/BW 3.0 MHz		s	weep 1	Stop 10 3.87 ms (1	.000 GHz 6001 pts)	Log	<u>Lir</u>
MSG							STATU	s			

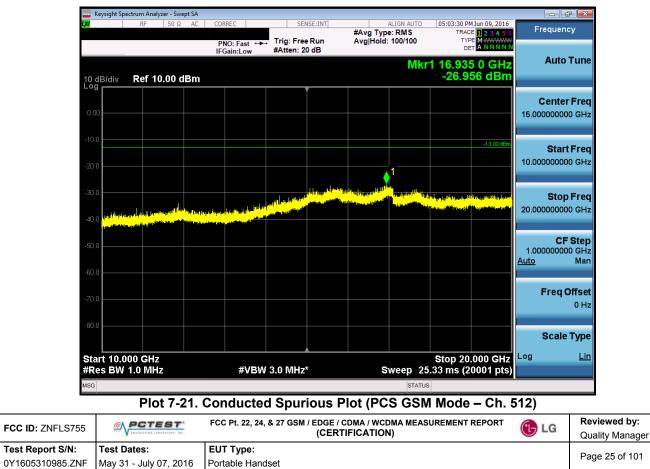






🔤 Keysight Sp	pectrum Analy												- # X
L <mark>XI</mark>	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	ALIGN AUTO		M Jun 09, 2016	Free	quency
				PNO: F IFGain:	ast ↔ Low	Trig: Fre #Atten: 3		Avg Hold	: 100/100	TY D			
10 dB/div Log	Ref 20).00 de	Зm						M	kr1 9.91 -27.3	4 0 GHz 90 dBm		Auto Tune
10.0													enter Fred 000000 GH
-10.0											-13.00 dBm		Start Free
-20.0								. Liberts for	الدين والقارات				Stop Fre 000000 GH
-40.0 <mark>(1999) (1</mark>				esti ettänt Asia anti-	a a faile da a la Martina a constante Martina a constante da			n in des in the standard and an		an a	An a la de la d	809.0 <u>Auto</u>	CF Stej 000000 MH Ma
-60.0												Fi	r eq Offse 0 H
-70.0													cale Typ
Start 1.9′ #Res BW		z			#VBW	3.0 MHz	*	s	weep 1	Stop 10 4.02 ms (*).000 GHz 16181 pts)	Log	Li
ISG									STATU				

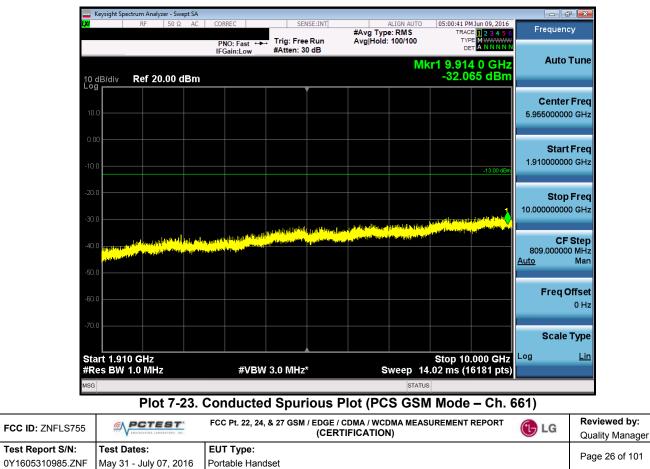






🔤 Keysight Sp	pectrum Analy	/zer - Swep	t SA									-	- # X
X	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	ALIGN AUTO		PM Jun 09, 2016 ACE 1 2 3 4 5 6	Freq	uency
				PNO: F IFGain:	ast ⊶ Low	Trig: Fre #Atten: 3		Avg Hold	: 100/100	T			.
10 dB/div Log	Ref 2	0.00 dE	Зm						N	lkr1 1.38 -38.3	32 5 GHz 774 dBm	A	uto Tune
							Í						nter Freq
10.0												940.00	00000 MHz
0.00													start Freq
-10.0											-13.00 dBm	30.00	00000 MHz
-20.0												s	Stop Fred
-30.0												1.8500	00000 GH2
-40.0									↓ 1				CF Step
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												Fr	eq Offse
-60.0													0 Hz
-70.0												Sc	ale Type
Start 0.03	300 GHz									Stop 1	.8500 GHz	Log	Lir
#Res BW					#VBW	3.0 MHz	*		Sweep	2.427 ms	(3641 pts)		
ISG									STAT	US			

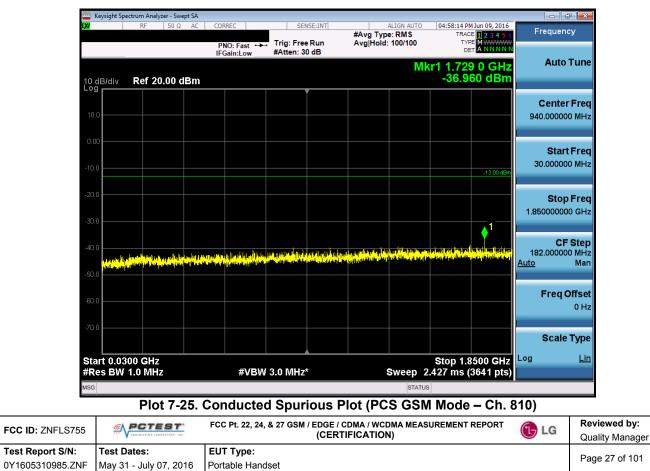






🛄 Keysight Sp	ectrum Analy												- F ×
L <mark>XI</mark>	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Jun 09, 2016	Fre	quency
	_			PNO: F IFGain:	ast ↔ Low	Trig: Free #Atten: 2		Avg Hold	: 100/100	TY D			
10 dB/div Log	Ref 10).00 dl	Bm						Mk	r1 16.87 -27.0	8 5 GHz 36 dBm		Auto Tune
0.00													enter Fred 000000 GH:
-10.0											-13.00 dBm		Start Free
-30.0	ungunangendarangen	Holine a		ulan tu akka							<mark>Manjury K</mark> ilong Nasa ^I Desena Milang panany		Stop Free
50.0												1.000 <u>Auto</u>	CF Ste 000000 GH Ma
70.0												F	req Offse 0 H
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Start 10.0 #Res BW					#VBW	3.0 MHz	ـــــــــــــــــــــــــــــــــــــ	s	weep 2	Stop 20 5.33 ms (2	.000 GHz 20001 pts)	Log	<u>Lii</u>
ISG									STATU	s			

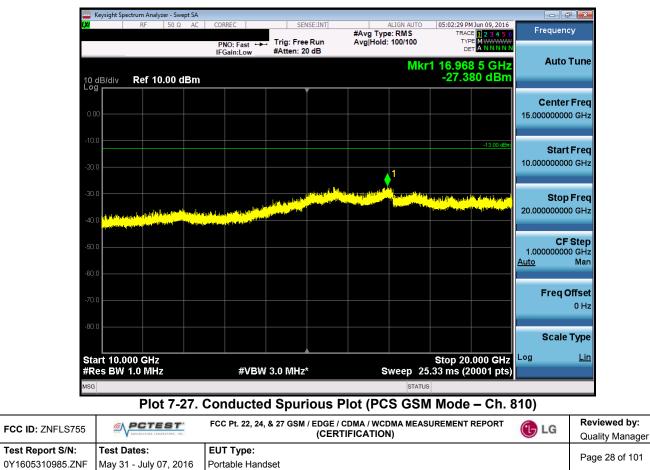






🔤 Keysight Sp	pectrum Analy	/zer - Swep	t SA										- # =×
<mark>XI</mark>	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	ALIGN AUTO		PMJun 09, 2016 ACE 1 2 3 4 5 6	Fred	luency
				PNO: F IFGain:	ast ⊶⊷ Low	Trig: Fre #Atten: 3		Avg Hold	: 100/100	1			
10 dB/div Log	Ref 2	0.00 di	Зm						Μ	kr1 9.5 -28.	02 0 GHz 271 dBm	A	uto Tun
10.0													nter Fre 00000 GH
•10.00											-13.00 dBm		Start Fre 00000 GH
-20.0									l datation de si		1 program the base to realize		Stop Fre 00000 GH
-40.0 <mark>Jacobaro</mark> Jacobaro -50.0	na dhail ain da	a tal ⁱ ti dan b	a <mark>n (and) and</mark> Tag ^{an (a} n (and	ralis disellar second second	an <mark>da banda</mark> An ang ang ang ang ang ang ang ang ang an				n the gradient and a second		an a sharan ta ta sharan ta sha	808.5 <u>Auto</u>	CF Ste 00000 MH Ma
60.0												Fr	r eq Offs o 0 ⊦
-70.0													cale Typ
Start 1.9 [∙] ≉Res BW		z			#VBW	3.0 MHz	*	s	weep 1	Stop 1 4.01 ms	0.000 GHz (16171 pts)	Log	Li
ISG									STATU				

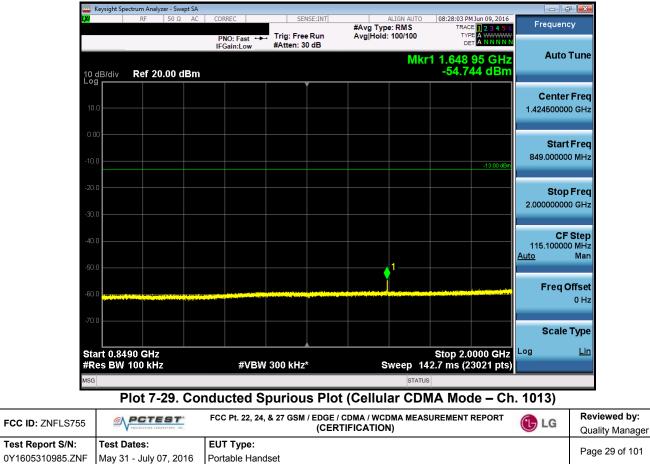






Keysight Spi	ectrum Analyzer						- 6 - 8
XI	RF 5	50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS Avg Hold: 100/100	08:26:42 PM Jun 09, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
	D -6 00 0		IFGain:Low	#Atten: 30 dB	М	kr1 823.00 MHz -30.655 dBm	Auto Tune
10 dB/div ^{Log}	Ref 20.0	0 dBm				-30.035 dBm	
10.0							Center Fred 426.500000 MH;
0.00							Start Free 30.000000 MH
-10.0						-13.00 dBm	
-20.0						1	Stop Fre 823.000000 MH
40.0							CF Stej 79.300000 MH <u>Auto</u> Ma
50.0 60.0							Freq Offse
70.0							Scale Typ
Start 30.0 #Res BW	MHz 100 kHz		#VBW	300 kHz*	Sweep 98	Stop 823.0 MHz .33 ms (15861 pts)	Log <u>Li</u>
ISG					STATUS		

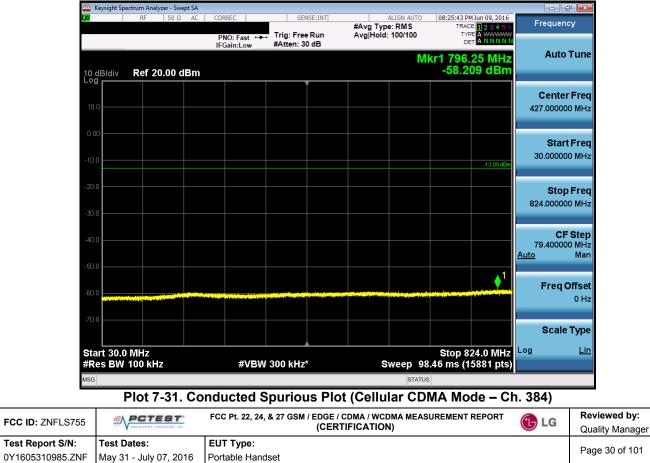






Keysight Spectrum Analys						
LXI RF	50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	08:32:17 PM Jun 09, 2016 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast +++ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold: 100/100		
).00 dBm			M	kr1 9.686 0 GHz -46.042 dBm	Auto Tune
Log			Ĭ			Center Freq
0.00						6.000000000 GHz
-10.0					-13.00 dBm	
-20.0						Start Freq 2.000000000 GHz
-20.0						
-30.0						Stop Freq
-40.0					1 -	10.000000000 GHz
-50.0						CF Step
						800.000000 MHz <u>Auto</u> Mar
-00.0						Freq Offset
-70.0						0 Hz
-80.0						
						Scale Type
Start 2.000 GHz #Res BW 1.0 MHz	2	#VBW	3.0 MHz*	Sweep 1	Stop 10.000 GHz 3.87 ms (16001 pts)	Log <u>Lin</u>
MSG				STATU		







	rum Analyzer - Sv						ē <mark>.</mark>
LXI	RF 50 S	2 AC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	08:28:40 PM Jun 09, 2016 TRACE 1 2 3 4 5 6	Frequency
			PNO: Fast ++ IFGain:Low	 Trig: Free Run #Atten: 30 dB 	Avg Hold: 100/100	TYPE A WWWW DET A NNNNN	Auto Tomo
10 dB/div Log	Ref 20.00	dBm			Mkr	1 1.648 95 GHz -59.275 dBm	Auto Tune
							Center Freq
10.0							1.424500000 GHz
0.00							Start Freq
-10.0						-13.00 dBm	849.000000 MHz
-20.0							Stop Freq
-30.0							2.000000000 GHz
-40.0							CF Step
-50.0							115.100000 MHz <u>Auto</u> Man
-50.0					↓ ¹		Freq Offset
-60.0							0 Hz
-70.0							Scale Type
Start 0.849						OLOP 2.0000 GHZ	Log <u>Lin</u>
#Res BW 1	00 kHz		#VBV	/ 300 kHz*		2.7 ms (23021 pts)	
ISG					STATUS	3	

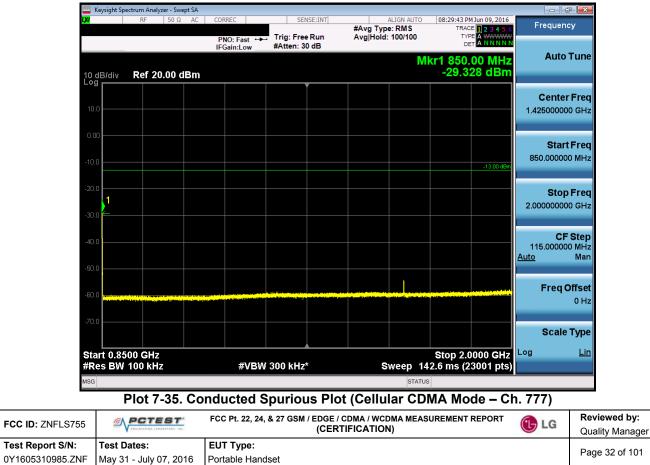






🔤 Keysight Spe													- 6 ×
L <mark>XI</mark>	RF	50 Ω	AC	CORREC	ast ↔		NSE:INT	#Avg Typ Avg Hold		TRAC	MJun 09, 2016 2E 1 2 3 4 5 6 2E A WWWWW ET A N N N N N	Fre	quency
				IFGain:		#Atten: 3	0 dB	0.	M		50 MHz		Auto Tune
10 dB/div Log	Ref 20).00 dE	3m							-58.4	09 dBm		
							Ĭ						enter Freq
10.0												427.0	00000 MHz
0.00													Start Freq
-10.0											-13.00 dBm	30.0	000000 MHz
-20.0													Stop Fred
-30.0													000000 MHz
													CF Step
-40.0												79.4 <u>Auto</u>	100000 MHz Man
-50.0											1		
-60.0	aliza Aprila (14) din											F	r eq Offset 0 Hz
-70.0													
													cale Type
Start 30.0 #Res BW		z			#VBW	300 kHz	*	s	weep 98	Stop 8 .46 ms (1	24.0 MHz 5881 pts)	Log	Lin
MSG									STATUS				







🛄 Keysight Sp	ectrum A	nalyzer - Sw	ept SA										- # <mark>-×</mark>
LXI	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	ALIGN AUTO	T	0 PM Jun 09, 2016 RACE 1 2 3 4 5 6	Fre	quency
				PNO: F IFGain:I	ast ↔ ₋ow	Trig: Free #Atten: 2		Avg Hold	: 100/100		TYPE A WWWW DET A N N N N N		
									N	lkr1 2.5	44 5 GHz	4	Auto Tune
10 dB/div Log	Ref	10.00 c	lBm							-44	.479 dBm		
												Ce	enter Freq
0.00												6.0000	000000 GHz
-10.0											-13.00 dBm		
											-13.00 dBm		Start Freq
-20.0												2.0000	000000 GHz
-30.0													Oton From
													Stop Freq
-40.0	≬ 1†												
-50.0													CF Step
												Auto	000000 MHz Man
-60.0													
-70.0												F	req Offset
													0 Hz
-80.0												S	cale Type
Start 2.00 #Res BW					¢VB₩	3.0 MHz	*	s	weep	Stop 13.87 ms	10.000 GHz (16001 pts)	Log	<u>Lin</u>
MSG									STAT				

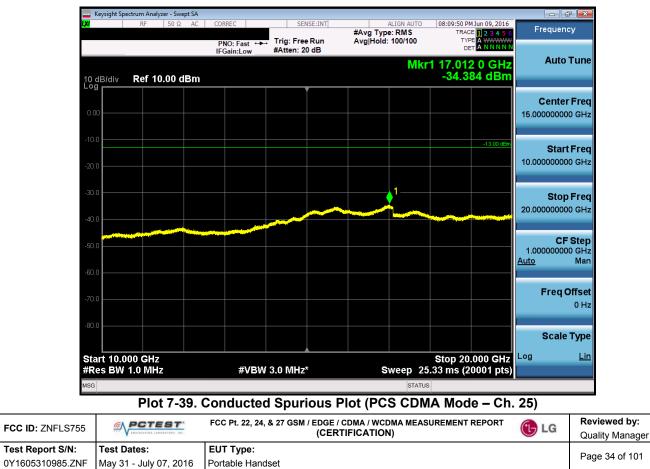






	ectrum Analyz				1								
U	RF	50 Ω	AC		ast ↔	Trig: Fre		#Avg Typ Avg Hold		TRA	PMJun 09, 2016 CE 1 2 3 4 5 6 (PE A WWWWW DET A NNNNN	Frequ	lency
0 dB/div	Ref 20	.00 dE	3m	IFGain:L	_ow	#Atten: 3	0 dB		M	kr1 9.94	4 5 GHz 68 dBm	Αι	ıto Tun
10.0													n ter Fre 0000 G⊦
10.0											-13.00 dBm		t art Fre 0000 G⊦
30.0											<u>1</u>	S 10.00000	top Fre 0000 GH
i0.0		~~~~			_								CF Ste 0000 M⊦ Ma
0.0												Fre	e q Offs 0 H
										Ston-4		Sc Log	ale Typ L
tart 1.91 Res BW				3	#VBW	3.0 MHz	*	s	weep 14	4.02 ms (0.000 GHz 16181 pts)	-	<u> </u>
SG									STATU	s			







Keysight Spe													
X	RF	50 Ω	AC		ast 🔸			#Avg Typ Avg Hold		TRAC TYP	1 Jun 09, 2016 E 1 2 3 4 5 6 PE A WWWW T A N N N N N	Frequ	lency
10 dB/div	Ref 2	0.00 dl	Bm	IFGain:	Low	#Atten: 3	U dB		MI	kr1 1.61 ⁻		Αι	ito Tune
10.0													n ter Fre e 0000 MH
0.00											-13.00 dBm		t art Fre 0000 MH
30.0													top Fre 0000 GH
40.0						an and an and a second second second		a da la característica de l	e presiv policija policija da s	1			CF Ste 0000 M⊢ Ma
60.0												Fre	e q Offse 0 H
-70.0													ale Typ
Start 0.03 #Res BW					#VBW	3.0 MHz	*		Sweep 2	Stop 1.8 2.427 ms (500 GHz 3641 pts)	LOG	Lii
ISG									STATU	s			

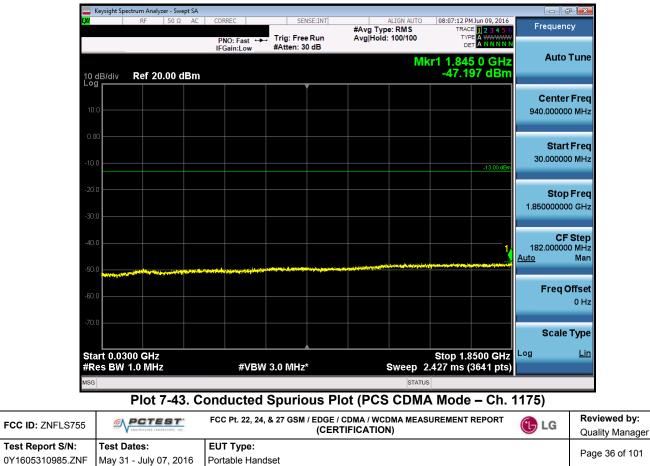






Keysight Spectrum	ectrum Analyzer - S	Swept SA									- 0 ×
L <mark>XI</mark>	RF 50	Ω AC	CORREC	SEN	SE:INT	#Avg Typ		TRAC	MJun 09, 2016	Fr	equency
			PNO: Fast +++ IFGain:Low	Trig: Free #Atten: 20		Avg Hold:		TYF DE			
10 dB/div Log	Ref 10.00	dBm					Mkr	1 16.93 -34.5	1 0 GHz 50 dBm		Auto Tune
				Ĭ							enter Freq
0.00										15.000	000000 GHz
-10.0									-13.00 dBm		Start Freq
-20.0										10.000	0000000 GHz
-30.0						L	1				Stop Freq
-40.0					~					20.000	0000000 GHz
-40.0		-									
-50.0										1.000 <u>Auto</u>	CF Step 0000000 GHz Man
-60.0											
-70.0										F	F req Offset 0 Hz
-80.0											
											Scale Type
Start 10.0 #Res BW			#VBM	3.0 MHz*			ween 25	Stop 20	.000 GHz 0001 pts)	Log	<u>Lin</u>
MSG							STATUS		aver proj		

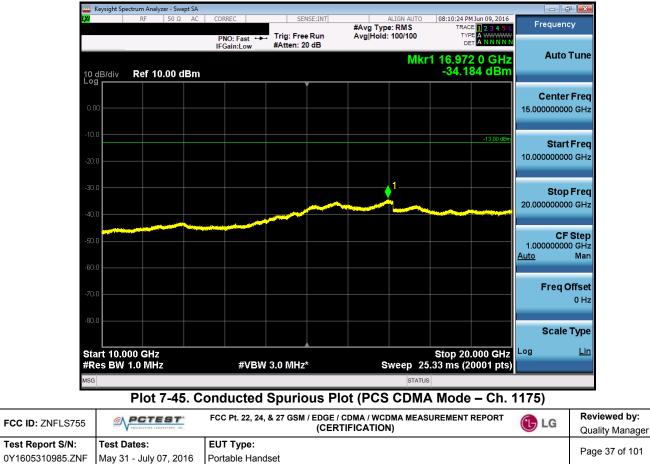






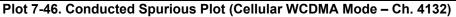
	ectrum Analyz			000050			NOT THE			00.00.07			
0	RF	50 Ω	AC	CORREC	ast ↔	Trig: Fre		#Avg Typ Avg Hold	ALIGN AUTO be: RMS i: 100/100	TR	PM Jun 09, 2016 ACE 1 2 3 4 5 6 YPE A WWWWW DET A N N N N N	Freq	uency
0 dB/div	Ref 20	.00 dE	3m	IFGain:L	.ow	#Atten: 3	30 dB		М		15 0 GHz dBm	A	uto Tun
10.0													n ter Fre 00000 GH
0.0											-13.00 dBm		tart Fre 00000 Gi
0.0												S 10.00000	t op Fr 00000 GI
0.0 1		<u> </u>										808.50 <u>Auto</u>	CF Ste 00000 MI M
0.0												Fre	e q Offs 0 I
1.0 tart 1.91	5 GH7									Stop 1	0.000 GHz		ale Tyr
Res BW				1	≠VB₩	3.0 MHz	*	\$	Sweep 1	4.01 ms (16171 pts)		
G									STATU	JS			

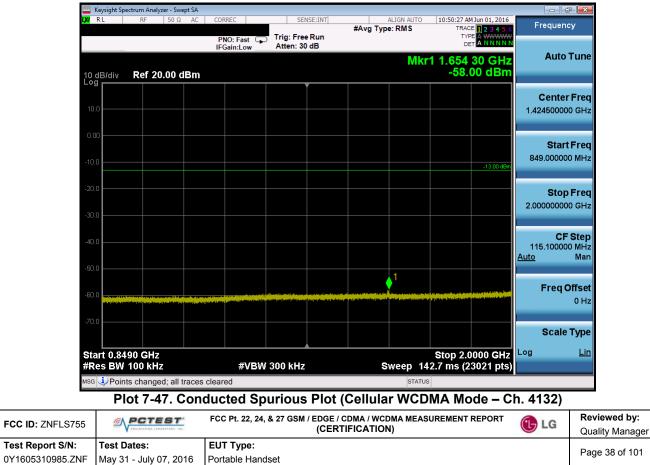






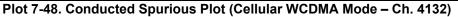
	ectrum Analyzer - S	wept SA									- 7 💌
LXU RL	RF 50	Ω AC	CORREC	Trig: Free		#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Jun 01, 2016 E 1 2 3 4 5 6 PE A WWWW T A N N N N N	Frec	quency
10 dB/div Log	Ref 20.00	dBm	IFGain:Low	Atten: 30	dB		Μ	kr1 822.		A	uto Tune
10.0											e nter Freq 00000 MHz
-10.0									-13.00 dBm		Start Freq 00000 MHz
-20.0									1,		Stop Freq 00000 MHz
-40.0										79.3 <u>Auto</u>	CF Step 00000 MHz Man
-60.0			anti aliyo daqtal yayan yayaya ata						e da na seconda de la composición de la	Fr	r eq Offset 0 Hz
-70.0 Start 30.0								Stop 9	23.0 MHz	So Log	c <mark>ale Type</mark> <u>Lin</u>
#Res BW			#VBV	/ 300 kHz		s		3.33 ms (1	23.0 MH2 5861 pts)	_	
MSG							STATUS	8			

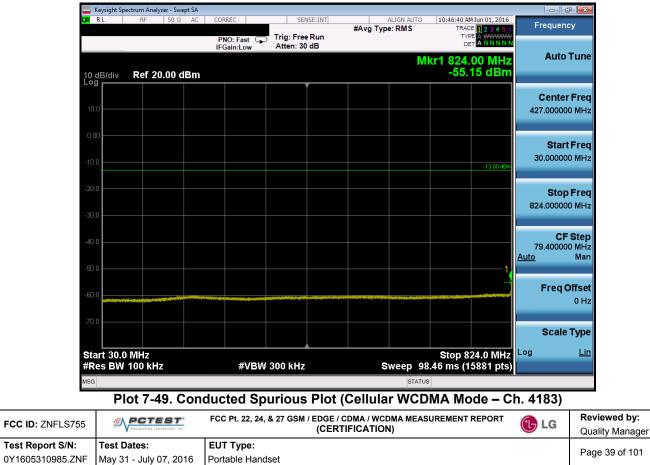






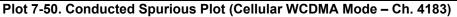
🛄 Keysight Sp	ectrum An	alyzer - Swe	pt SA										- 6 💌
LXI RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	MJun 01, 2016 CE <mark>1 2 3 4 5 6</mark>	Fre	equency
				PNO: F IFGain:	ast 🖵 Low	Trig: Fre Atten: 2				TYI Di	ET A WWWWW ET A N N N N N		Auto Tune
10 dB/div Log	Ref '	10.00 d	Bm						Mk	r1 2.48 -52.	2 5 GHz 02 dBm		Auto Tune
0.00													enter Freq 000000 GHz
-10.0											-13.00 dBm	2.000	Start Freq 000000 GHz
-30.0												10.000	Stop Freq 000000 GHz
-50.0	1				and the second	_						800. <u>Auto</u>	CF Step 000000 MHz Man
-70.0												F	F req Offset 0 Hz
-80.0 Start 2.00										Stop 10		tog	Scale Type Lin
#Res BW					#VBW	3.0 MHz		s	weep 13	- Stop 10 .87 ms (1	.000 GHz 6001 pts)	_09	
мsg 🔱 Poin	ts chan	ged; all t	races c	leared					STATUS				

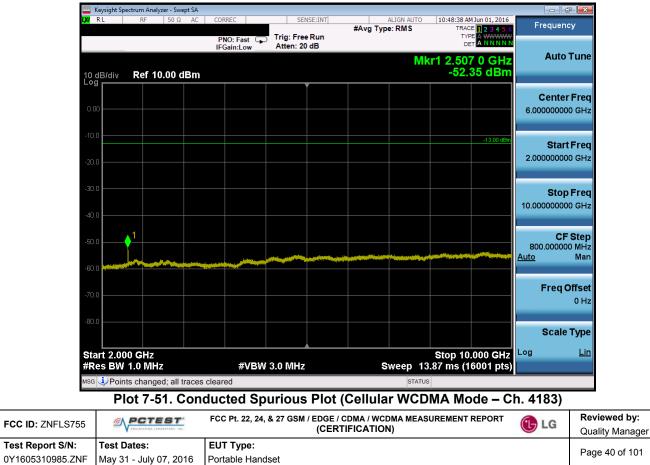






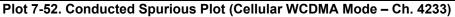
	ectrum Analyze	r - Swept SA									, # <mark>×</mark>
XI RL	RF	50 Ω AC	CORREC PNO: Fast	Trig: Free		#Avg Type	ERMS	TRAC	4 Jun 01, 2016 E 1 2 3 4 5 6 E A WWWWW T A N N N N N	Frequ	uency
10 dB/div	Ref 20.0	00 dBm	IFGain:Low	Atten: 30	dB		Μ	kr1 849.		Aı	uto Tune
10.0											n ter Freq 0000 GHz
0.00									-13.00 dBm		t art Frec 0000 MHz
-20.0											top Fred 0000 GHz
40.0 50.0											CF Step 0000 MH: Mar
60.0										Fre	e q Offse 0 Hi
-70.0											ale Type <u>Lir</u>
Start 0.84 #Res BW			#V	BW 300 kHz		Si	weep 14	Stop 2.0 12.7 ms (2	000 9112	-	<u>LIN</u>
ısg 🔱 Poin	ts changed	; all traces	cleared				STATU	s			

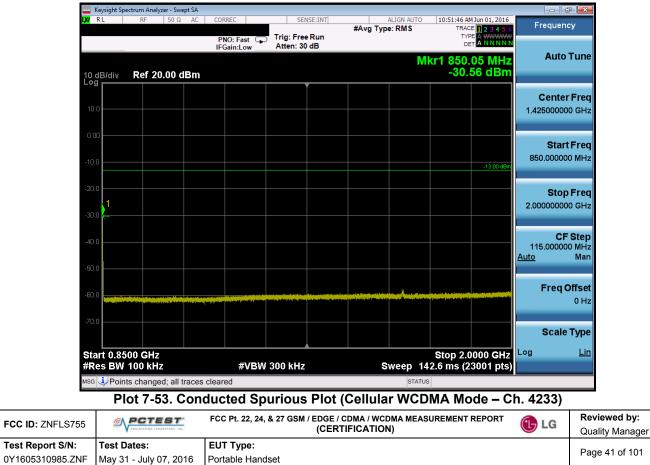






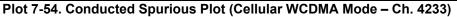
- ē <mark>- X</mark>							t SA	Analyzer - Swep	ysight Spectru	Key
Frequency	M Jun 01, 2016 CE 1 2 3 4 5 6 PE A WWWW A N N N N N	TRA	ALIGN AUTO pe: RMS	#Avg T		REC IO:Fast 🕞 Sain:Low	F	F 50 Ω	L	XI RI
Auto Tune	.60 MHz 00 dBm	lkr1 802	М		Atten: or	Sain:Low		f 20.00 dl	B/div	10 dE Log
Center Freq 427.000000 MHz										10.0
Start Freq 30.000000 MHz	-13.00 dBm									0.00 -10.0
Stop Freq 824.000000 MHz										-20.0 -30.0
CF St ep 79.400000 MHz <u>Auto</u> Mar										-40.0 -50.0
Freq Offset 0 Hz	↓ 1	ng a sa bahasa na sa	an a		ergeget of the second					-60.0
Scale Type	324.0 MHz	Stop 8	Swoon A		200 kU	#\/D\A			t 30.0 M	
	15881 pts)		Sweep 98		300 kHz	#VBV		КПZ	s BW 10	MSG

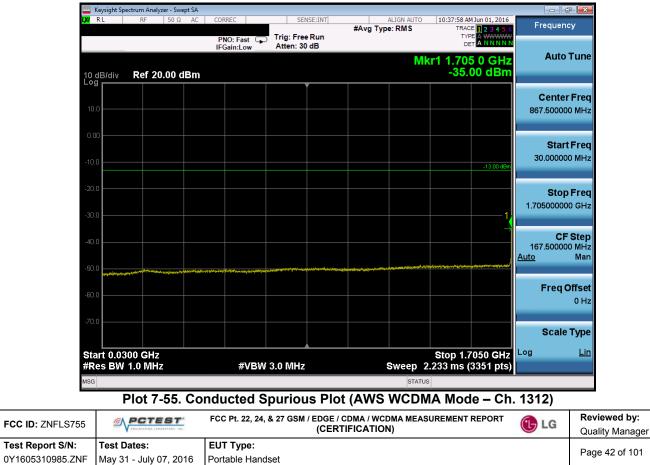






PNO: Fast PNO: Fast Frequency Auto Tune Auto Tune Mkr1 2,537 5 GHz -51.40 dBm Center Freq Code and a set and a		pectrum A	nalyzer - Swe	ept SA								- 6 ×
Industry Mikr1 2,537 5 GHz -51,40 dBm Auto Tune 0 dB/div Ref 10.00 dBm Center Free 6.00000000 GHz 000 -100 -1100 -1100 000 -1100 -1100 -1100 -1100 000 -1100 -1100 -1100 -1100 -1100 000 -1100 -1100 -1100 -1100 -1100 000 -1100 -1100 -1100 -1100 -1100 000 -1100 -1100 -1100 -1100 -1100 000 -1100 -1100 -1100 -1100 -1100 -1100 000 -1100 -1100 -1100 -1100 -1100 -1100 -1100 -1100000000 -110000000000 -1100000000000000000000000000000000000	L <mark>XI</mark> RL	RF	50 Ω	AC					TRAC		Fre	quency
Center Free 6.00000000 GH2 Tree BW 1.0 MHz #VBW 3.0 MHz Center Free Center Free	10 dB/div	Ref	10.00 c	∄Bm				Mk	r1 2.53	75GHz		Auto Tune
200 200 200 200 200 200 200 200	Log											
40.0 50.0	-10.0									-13.00 dBm		
Start 2.000 GHz #VBW 3.0 MHz Start 2.000 GHz Stop 10.000 GHz	-30.0											
20.0 20.0 0 Hz 80.0 20.00 GHz Start 2.000 GHz Start 2.000 GHz #VBW 3.0 MHz Sweep 13.87 ms (16001 pts)	-50.0											00000 мн
Start 2.000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 13.87 ms (16001 pts)	-70.0										F	
	Start 2.00								Stop 10	.000 GHz		
					VBW	3.0 MHz	S	status		6001 pts)		

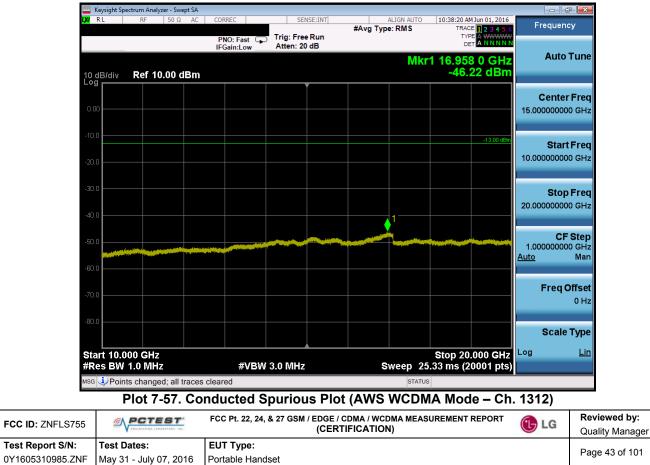






🛄 Keysight Spr	ectrum Analyzer - S	wept SA									đX
LXI RL	RF 50	Ω AC	CORREC		SE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Jun 01, 2016 CE 1 2 3 4 5 6 PF A MARAAAAA	Freque	ncy
10 dB/div	Ref 20.00	dBm	PNO: Fast G	Atten: 30			М	kr1 9.45	2 0 GHz 57 dBm	Aut	o Tune
10.0										Cent 5.8775000	er Freq 000 GHz
-10.0									-13.00 dBm	Sta 1.7550000	rt Freq 000 GHz
-20.0										Sto 10.0000000	p Freq 000 GHz
-40.0									1	C 824.5000 <u>Auto</u>	F Step 000 MHz Mar
-60.0										Freq	Offset 0 Hz
-70.0											e Type
Start 1.75 #Res BW			#VBV	V 3.0 MHz		s	weep 1	Stop 10 4.29 ms (1	.000 GHz 6491 pts)	LUg	<u>Lin</u>
usg 🧼 Poin	ts changed; a	II traces of	leared				STATU	JS			

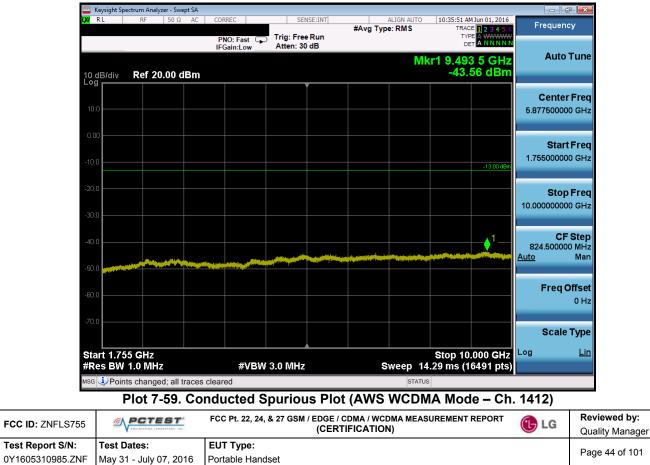






Keysight Spec	trum Analyzer - Sv	vept SA									ð 🗙
IXI RL	RF 50 Ω	2 AC	CORREC PNO: Fast	Trig: Fre		#Avg Type	EIGN AUTO	TRAC	MJun 01, 2016 E 1 2 3 4 5 6 PE A WWWW A NNNN	Frequer	псу
10 dB/div	Ref 20.00	dBm	IFGain:Low	Atten: 30) dB		M	(r1 1.34	0 5 GHz 24 dBm	Auto	Tune
10.0										Cente 870.0000	e r Freq 00 MHz
-10.0									-13.00 dBm	Sta i 30.0000	' t Freq 00 MHz
-20.0										Sto 1.7100000	p Freq 00 GHz
-40.0								1 	. danishi tigiti kiyala a sa a sa	C 168.0000 <u>Auto</u>	F Step 00 MHz Mar
-60.0										Freq	Offset 0 Hz
-70.0								Stop <u>1.</u>	7100 GHz		e Type <u>Lin</u>
#Res BW '	1.0 MHz		#VI	BW 3.0 MHz		S	Sweep 2	.240 ms (3361 pts)		

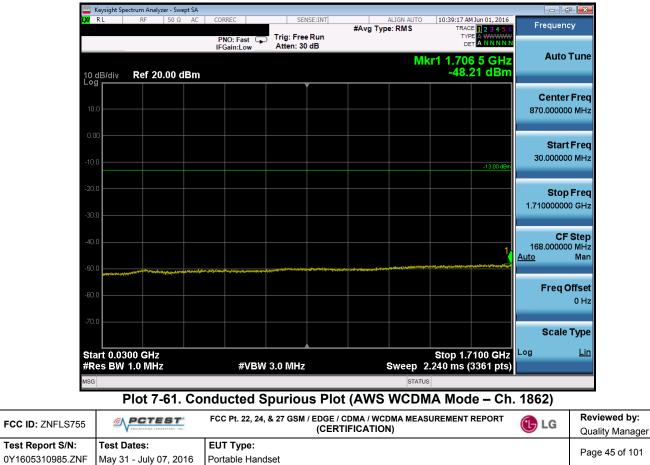






	ectrum Analyze	r - Swept S/	A									- ē 💌
IXI RL	RF	50 Ω A	C COF	RREC	SE	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRA	MJun 01, 2016 CE 1 2 3 4 5 6	Freq	uency
				NO: Fast 🕞 Gain:Low	Trig: Fre				TY D	PE A WWWWW ET A N N N N N		
			IF	Sam.Low	Atten: 2	U U D		Mk	r1 17 00	8 5 GHz	A	uto Tune
10 dB/div	Ref 10.	00 dBr	n						-46.	11 dBm		
						Ĭ						
0.00												n ter Freq 00000 GHz
0.00											13.00000	0000 9H2
-10.0										-13.00 dBm		
												tart Freq
-20.0											10.00000	0000 GH2
-30.0												
30.0												top Freq
-40.0								1			20.00000	0000 GH2
							العالم بد	2				CF Step
-50.0												00000 GHz
-60.0		Average albert.									<u>Auto</u>	Man
-80.0												
-70.0											Fr	e q Offset 0 Hz
												UHZ
-80.0												ale Type
												ale Type
Start 10.0									Stop 20	1.000 GHZ	Log	<u>Lin</u>
#Res BW					V 3.0 MHz		S			20001 pts)		
мsg 🤳 Poin	is changed	; all trac	es clear	ea				STATU	s			

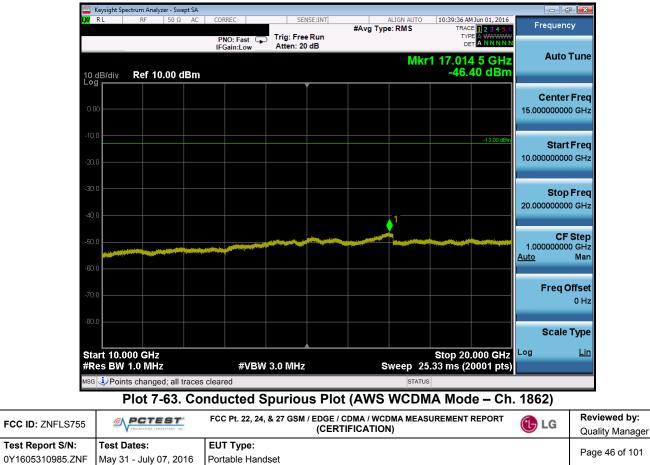






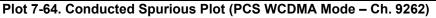
🛄 Keysight Sp	ectrum Analyzer	- Swept SA										X-
LXI RL	RF	50Ω AC				ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	MJun 01, 2016 DE 1 2 3 4 5 6	Freque	ency
10 dB/div	Ref 20.0	0 dBm	IFGa): Fast 🖵 in:Low	Trig: Free Atten: 30			M	kr1 1.76	0 0 GHz 94 dBm	Au	to Tune
10.0											Cent 5.880000	t er Freq 000 GHz
-10.0										-13.00 dBm	Sta 1.760000	a rt Freq 000 GHz
-20.0											Sto 10.000000	o p Frec 000 GHz
-40.0											(824.000 <u>Auto</u>	CF Step 000 MHz Mar
-60.0											Free	q Offse 0 Hz
-70.0 Start 1.76									Stop 10	.000 GHz	Log	le Type <u>Lin</u>
#Res BW					3.0 MHz		s			6481 pts)		
ISG 🕹 Poin	ts changed;	all trace	s cleared	1				STATUS	s			







	ectrum Analy		ot SA										- 6 🗙
RL	RF	50 Ω	AC	CORREC	ast 😱	SE	NSE:INT	#Avg Ty	ALIGN AUTO pe: RMS	TRA	M Jun 01, 2016 CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Fre	quency
0 dB/div	Ref 20).00 dl	Зm	IFGain:L	.ow	Atten: 3			M	(r1 1.84	5 0 GHz 01 dBm	,	Auto Tun
10.0													e nter Fre 500000 МН
0.00											-13.00 dBm		Start Fre 000000 M⊢
80.0											1		Stop Fre 000000 G⊦
io.o			44 1-044/7 art 9	hartellinha shoasada		y ta banda sa gita jaka jak				ing the second second		181.8 <u>Auto</u>	CF Ste 500000 M⊦ Ma
0.0												F	reqOffso 0 ⊦
10.0	800 GHz									Stop 1	8450 GHz		cale Typ L
Res BW				#	≠VBW	3.0 MHz			Sweep 2	2.420 ms	(3631 pts)		
6G									STATU	s			







	ectrum Analyze	er - Swept	SA										- 6 X
LXI RL	RF	50 Ω	AC	CORREC	ast 🕟	Trig: Fr		#Avg Typ	ALIGN AUTO	TR	AM Jun 01, 2016 ACE 1 2 3 4 5 6 YPE A WWWWW DET A NNNNN	Fre	equency
10 dB/div	Ref 10.	00 dE	3m	IFGain:L		Atten:	20 dB		MI		44 5 GHz 5.97 dBm		Auto Tune
0.00													enter Fred 000000 GHz
-10.0											-13.00 dBm	10.000	Start Fred 000000 GHz
-30.0									1			20.000	Stop Fred 000000 GHz
-50.0												1.000 <u>Auto</u>	CF Step 000000 GH: Mar
70.0												F	F req Offse 0 Hi
-80.0 Start 10.0 #Res BW					4V/B14/	3.0 MH	7		ween	Stop 2	0.000 GHz (20001 pts)	Log	Scale Type Lir
ARES DVV			ices cl		FVDVV	3.0° IVIN	2		STAT		(20001 pts)		

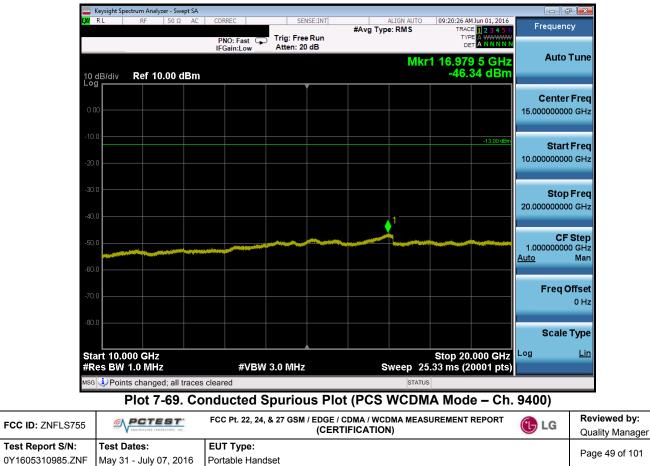






🔤 Keysight Spe	ectrum Analyz	ter - Swep	ot SA										, 6 <mark>- x</mark>
I XI RL	RF	50 Ω	AC	CORREC	ast 😱	SE	NSE:INT	#Avg Typ	ALIGN AUTO	TR	AM Jun 01, 2016 ACE 1 2 3 4 5 6 YPE A WWWWW DET A NNNNN	Freq	uency
10 dB/div Log	Ref 20	.00 dl	Bm	IFGain:L	.ow	Atten: 3	0 dB		N	lkr1 9.5	09 5 GHz .03 dBm	A	uto Tune
10.0													n ter Freq 00000 GHz
-10.0											-13.00 dBm		tart Freq 00000 GHz
-20.0													t op Freq 00000 GHz
-40.0		~~~	Ange and Parcel								<u>1</u>	809.00 <u>Auto</u>	CF Step 00000 MHz Mar
-60.0												Fre	e q Offse 0 Hz
-70.0												Sc Log	ale Type Lin
Start 1.91 #Res BW				#	¢VBW	3.0 MHz		s	weep 1	Stop 1 4.02 ms	0.000 GHz (16181 pts)	LUY	<u>LIN</u>
MSG 🗼 Poin	ts change	d; all tr	aces c	leared					STAT	us			

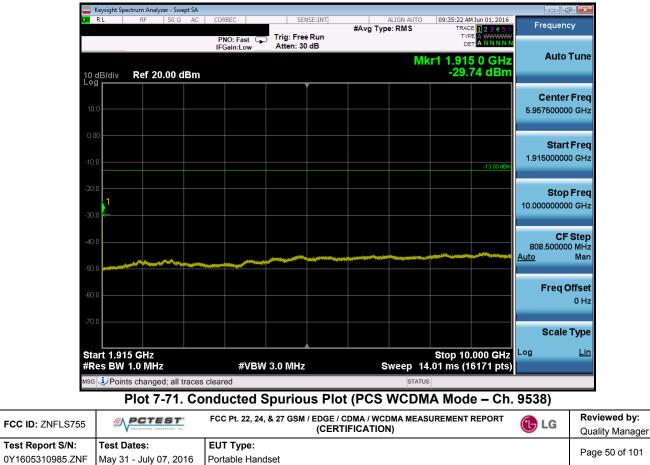






	pectrum Analy	/zer - Swep	it SA										a x
X/RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Typ	ALIGN AUTO		AM Jun 01, 2016 CE 1 2 3 4 5 6	Frequ	ency
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Plot 7-72. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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7.4 Band Edge Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(h)

Test Overview

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

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

Test Procedure Used

KDB 971168 v02r02 – Section 6.0

Test Settings

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

Test Setup

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

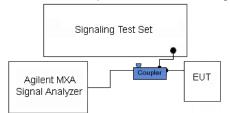


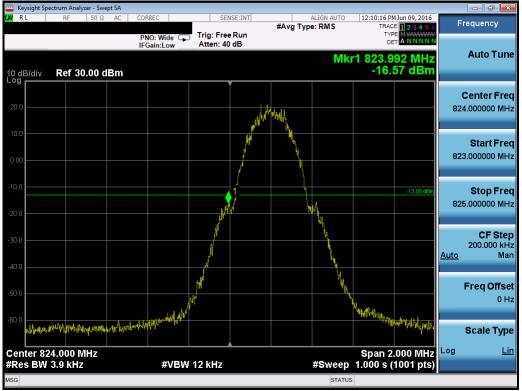
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

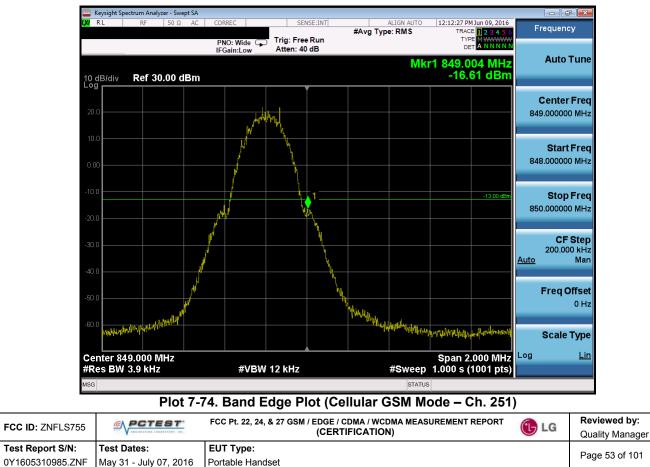
Per 22.917(b), 24.238(b), 27.53(h)(3), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions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

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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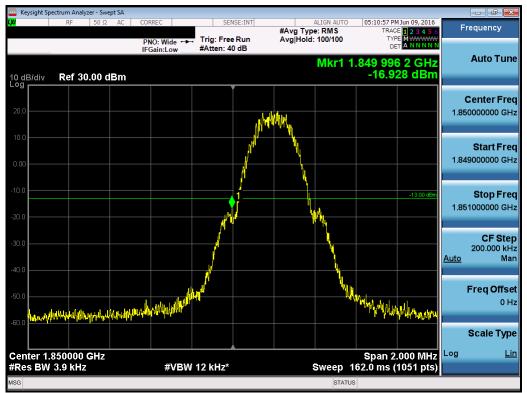


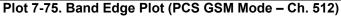


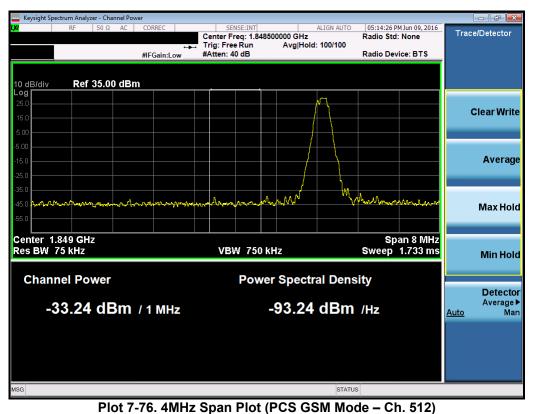
Plot 7-73. Band Edge Plot (Cellular GSM Mode - Ch. 128)





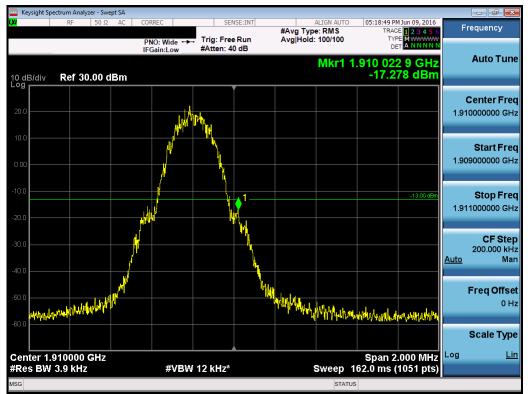




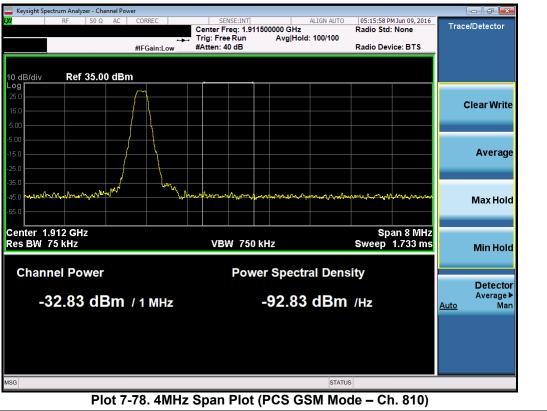


FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT Reviewed by: PCTEST 🕒 LG FCC ID: ZNFLS755 (CERTIFICATION) Quality Manager Test Report S/N: Test Dates: EUT Type: Page 54 of 101 0Y1605310985.ZNF May 31 - July 07, 2016 Portable Handset V 3.3





Plot 7-77. Band Edge Plot (PCS GSM Mode - Ch. 810)



FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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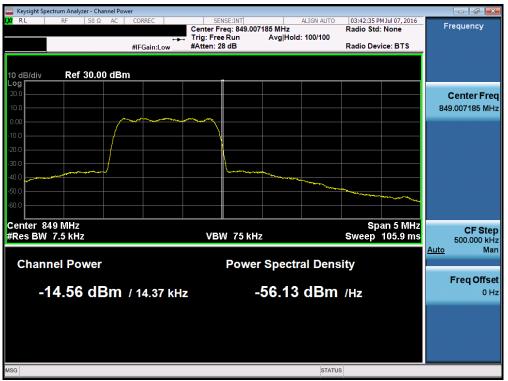


	ectrum Analyzer - Si	•									
RL	RF 50 9	Ω AC	CORREC		NSE:INT	#Avg Typ	ALIGN AUTO	TRAC	M Jul 07, 2016	F	requency
0 dB/div	Ref 30.00	dBm	PNO: Wide G IFGain:Low	Trig: Free Atten: 40			M	kr1 824.0	er A NNNNN 100 MHz 48 dBm		Auto Tun
og											Center Fre 4.000000 M⊦
0.00					~~~	ana and	m			82 [.]	Start Fre 1.500000 MH
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0.0			www.	nmm				mann	hnymaalas	<u>Auto</u>	CF Ste 500.000 kl M
	www.m.m.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	•v-								Freq Offs 0 I
											Scale Typ
enter 82 Res BW	24.000 MHz 15 kHz		#VBV	V 47 kHz			Sweep	Span 5 8.800 ms (.000 MHz (1001 pts)	Log	Ĺ
G							STAT	US			









Plot 7-81. Band Edge Plot (Cellular CDMA Mode – Ch. 777)

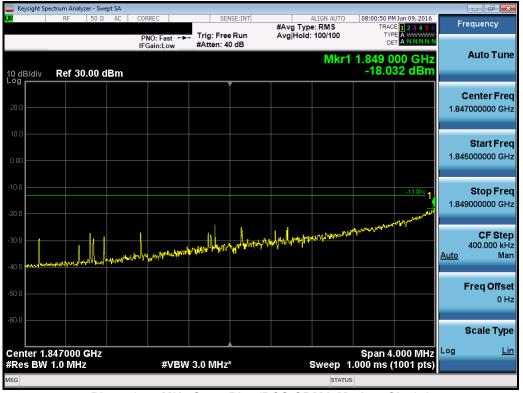


Plot 7-82. 4MHz Span Plot (Cellular CDMA Mode – Ch. 777)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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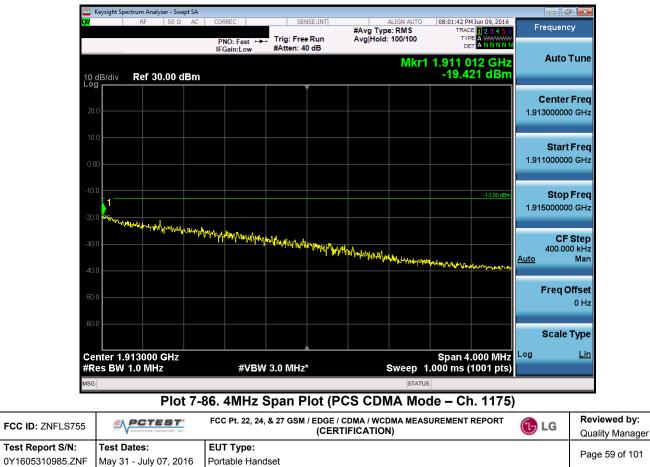
Plot 7-84. 4MHz Span Plot (PCS CDMA Mode – Ch. 25)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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	ectrum Analyze												
u I	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Ava Tu	ALIGN AUTO		MJun 09, 2016	F	requency
				PNO: W IFGain:L	ide ↔→ .ow	Trig: Free #Atten: 4			ld: 100/100	TY D	PE A WWWW ET A N N N N N		Auto Tur
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10.0	~	- John Marth	man	~~~~~~	\sim								Start Fre
0.00												1.9)7500000 GH
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and the second						a na haife in the	Marthallo Mar	Mary Marian	4			<u>Auto</u>	500.000 kł Ma
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G									STATU				

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





	ectrum Analy												- 6 💌
KI RL	RF	50 Ω	AC	CORREC			VSE:INT	#Avg Typ	ALIGN AUTO	TRA	M Jun 01, 2016 CE 1 2 3 4 5 6	Fre	quency
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0.00)	y L		816.5	500000 MH
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~~~~	man and a second											F	req Offs
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enter 82	24 000 8	AH7								Snan 1	15.00 MHz		د د د د د د د د د د د د د د د د د د د
Res BW				#V	BW 30	00 kHz			Sweep 1	.867 ms	(1001 pts)		
SG									STATUS				



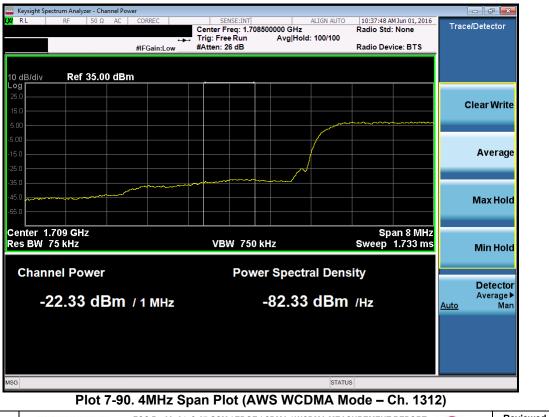


FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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	ectrum Analyze	er - Swept S	A									- 6 🔀
X/RL	RF	50 Ω A	KC COF	RREC	SE	NSE:INT	#Avg Typ	ALIGN AUTO		M Jun 01, 2016	Fred	quency
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10 dB/div Log	Ref 30.	.00 dBr	m					Mkr1	1.710 ( -23.	00 GHz 75 dBm	<u></u>	uto Tune
						Ĭ						enter Freq
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0.00											1.7025	00000 GHz
-10.0										-13.00 dBm		Stop Fred
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					/				4			CF Step
-30.0			معمر	m	man				hurrow	mon	1.5 <u>Auto</u>	00000 MHz Mar
-40.0	مسريد	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sim^{f}$									
-50.0	~~										Fr	r <b>eq Offset</b> 0 Hz
-60.0												
												cale Type
	710000 G 100 kHz			#VB	N 300 kHz			Sweep 1	Span 1 .867 m <u>s (</u>	5.00 MHz 1001 pts)	Log	Lin
ISG								STATUS				

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



	FCC ID: ZNFLS755	PCTEST	FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
Γ	Test Report S/N:	Test Dates:	EUT Type:		Page 61 of 101	ĺ
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MSG

	oectrum Analyze	er - Swep	it SA										
RL	RF	50 Ω	AC	CORREC		SE	NSE:INT		ALIGN AUTO		M Jun 01, 2016	E	requency
				PNO: Fa	ast ⊊ ₋ow	Trig: Fre Atten: 40		#Avg Ty	pe:RMS	TΥ	CE 1 2 3 4 5 6 PE A WWWWW ET A NNNNN		
) dB/div	Ref 30.	00 di	Зm						Mkr	1 1.755 -23	000 GHz 05 dBm		Auto Tur
0.0													<b>Center Fre</b> 5000000 GI
.00		/	, mm	~~~~~	~~~~	um						1.74	<b>Start Fre</b> 7500000 Gi
0.0							1				-13.00 dBm	1.76	<b>Stop Fr</b> 2500000 GI
0.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u>/~</u>					L	· · · · · · · · · · · · · · · · · · ·	~~~~			Auto	<b>CF St</b> 1.500000 M M
).0									- Mun		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Freq Offs 0
).0													Scale Ty
	.755000 G 100 kHz	Hz		;	¢VB₩	300 kHz			Sweep	Span 1 1.867 ms	15.00 MHz (1001 pts)	Log	Ĺ

Keysight Spectrum Analyzer - Channel Pow d7 🛛 🗙 SENSE:INT ALIGN AUTO Center Freq: 1.756500000 GHz Trig: Free Run Avg|Hold: 100/100 #Atten: 24 dB 10:39:06 AM Jun 01, 2016 Radio Std: None V RI Trace/Detector Radio Device: BTS #IFGain:Low Ref 35.00 dBm 10 dB/div Log **Clear Write** Average Max Hold Center 1.757 GHz Res BW 75 kHz Span 8 MHz Sweep 1.733 ms VBW 750 kHz **Min Hold Channel Power Power Spectral Density** Detector Average ► Man -22.85 dBm / 1 MHz -82.85 dBm /Hz <u>Auto</u>

#### Plot 7-92. 4MHz Span Plot (AWS WCDMA Mode – Ch. 1862)

STATUS

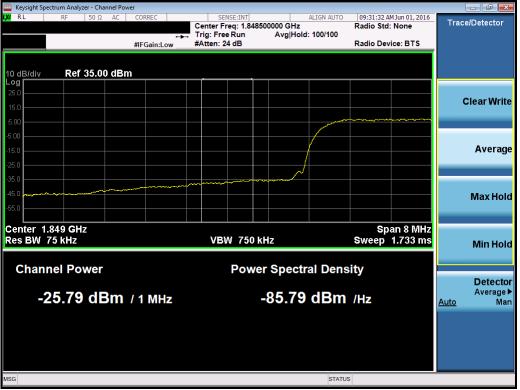
FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-91. Band Edge Plot (AWS WCDMA Mode - Ch. 1862)



	ectrum Analyzer -	Swept SA								-	- 6 💌
RL	RF 5	0Ω AC	CORREC	SE	NSE:INT		ALIGN AUTO		M Jun 01, 2016	Ere	quency
			PNO: Fast IFGain:Low	Trig: Free Atten: 40		#Avg Ty	pe: RMS	TY	CE 1 2 3 4 5 6 PE A WWWW T A N N N N N		
0 dB/div	Ref 30.0	0 dBm					Mkr1	1.850 0 -24.	00 GHz 02 dBm	,	Auto Tun
20.0											enter Fre 000000 G⊢
0.00						mm-n	m				Start Fre 500000 G⊦
20.0					1				-13.00 dBm		<b>Stop Fre</b> 500000 G⊦
0.0			and the second	m				han	www	1.6 <u>Auto</u>	CF Ste 500000 MH Ma
0.0	man marine marine and m	mont								F	r <b>eq Offs</b> 0 H
60.0											cale Typ
enter 1.8 Res BW	350000 GH 100 kHz	İZ	#VE	3W 300 kHz			Sweep 1	Span 1 1.867 ms (	5.00 MHz (1001 pts)	Log	L
G							STATU	5			





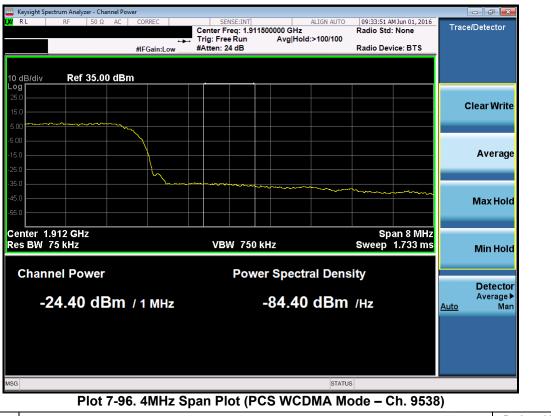
#### Plot 7-94. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9262)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 62 of 101
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	ectrum Analyzer - Swe									_	- 6 🗾
( <mark> </mark> RL	RF 50 Ω	AC	CORREC		NSE:INT	#Avg Ty	ALIGN AUTO	TR/	AM Jun 01, 2016 ACE 1 2 3 4 5 6	Free	quency
			PNO: Fast C IFGain:Low	Trig: Fre Atten: 4			Mkr			ŀ	Auto Tun
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0.00			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m							<b>StartFre</b> 600000 G⊦
10.0											
20.0					1				-13.00 dBm		<b>Stop Fre</b> 500000 G⊦
20.0											05.04+
30.0 ~~~~~ 40.0					hum	v	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~		1.5 <u>Auto</u>	CF Ste 00000 MH Ma
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50.0											r <b>eq Offs</b> 0 H
50.0										e	cale Typ
											L care ryp
enter 1. Res B <u>W</u>	910000 GHz 100 kHz		#VB	W 300 kHz			Sweep	Span 1.867 ms	15.00 MHz (1001 pts)	LUg	<u> </u>
SG							STATU				

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



FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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# 7.5 Peak-Average Ratio

#### Test Overview

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

#### Test Procedure Used

KDB 971168 v02r02 - Section 5.7.1

#### Test Settings

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

#### <u>Test Setup</u>

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

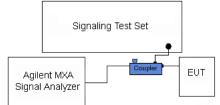


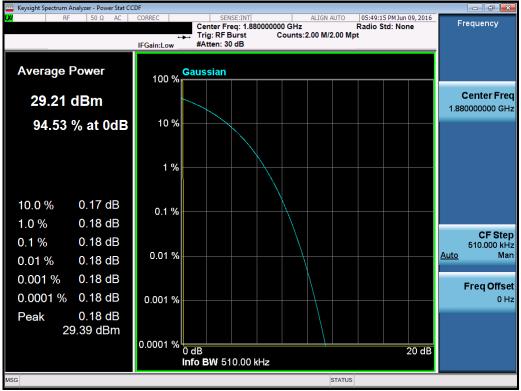
Figure 7-4. Test Instrument & Measurement Setup

#### <u>Test Notes</u>

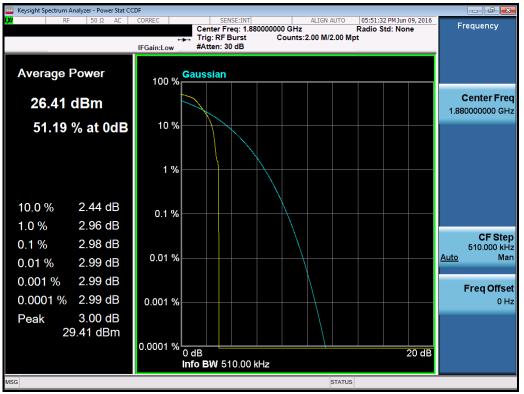
None

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dage 65 of 101			
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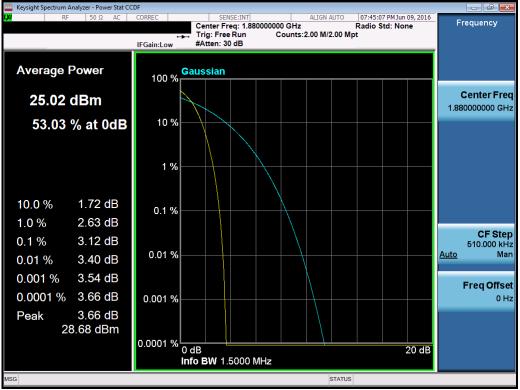
Plot 7-97. Peak-Average Ratio Plot (PCS GSM Mode - Ch. 661)



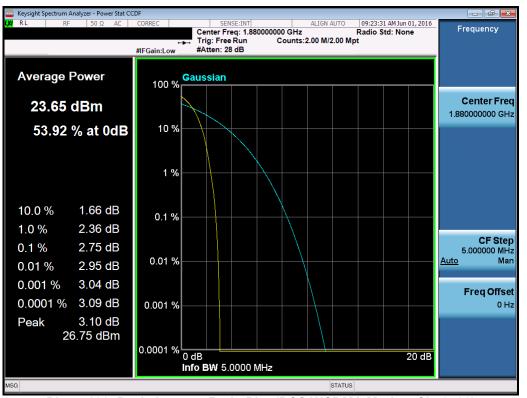
Plot 7-98. Peak-Average Ratio Plot (EDGE1900 Mode - Ch. 661)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-99. Peak-Average Ratio Plot (PCS CDMA Mode - Ch. 600)



#### Plot 7-100. Peak-Average Ratio Plot (PCS WCDMA Mode - Ch. 9400)

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

#### Test Overview

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

#### Test Procedures Used

KDB 971168 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.

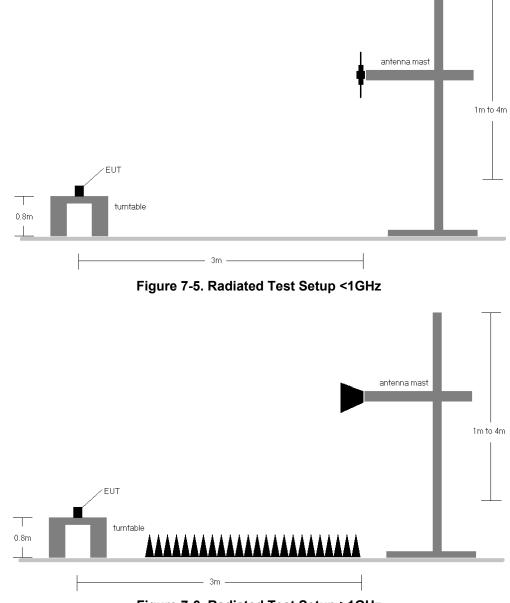


Figure 7-6. Radiated Test Setup >1GHz

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- This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."
- 3) This device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

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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	GSM850	Н	162	13	27.77	-0.75	27.03	0.504	38.45	-11.42
836.60	GSM850	Н	100	33	29.12	-0.84	28.28	0.672	38.45	-10.17
848.80	GSM850	Н	120	38	28.56	-0.94	27.62	0.578	38.45	-10.83
836.60	EDGE850	Н	100	32	22.36	-0.84	21.52	0.142	38.45	-16.93
836.60	GSM850	V	120	5	25.14	-0.84	24.30	0.269	38.45	-14.15

Table 7-2. ERP (Cellular GSM)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	CDMA850	Н	101	42	19.54	-0.75	18.79	0.076	38.45	-19.66
836.52	CDMA850	Н	100	40	20.29	-0.84	19.45	0.088	38.45	-19.00
848.31	CDMA850	н	100	40	20.69	-0.94	19.75	0.094	38.45	-18.70
848.31	CDMA850	V	100	40	17.25	-0.94	16.31	0.043	38.45	-22.14

Table 7-3. ERP (Cellular CDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
826.40	WCDMA850	Н	217	286	14.80	7.18	19.83	0.096	38.45	-18.62
836.60	WCDMA850	Н	205	285	15.16	7.31	20.32	0.108	38.45	-18.13
846.60	WCDMA850	Н	204	288	14.04	7.43	19.32	0.086	38.45	-19.13
836.60	WCDMA850	V	138	340	14.70	7.31	19.86	0.097	38.45	-18.59

# Table 7-4. 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	146	298	16.71	8.23	24.94	0.312	30.00	-5.06
1732.60	WCDMA1700	Н	106	106	16.79	8.18	24.97	0.314	30.00	-5.03
1752.60	WCDMA1700	Н	175	110	16.15	8.13	24.28	0.268	30.00	-5.72
1752.60	WCDMA1700	V	175	110	14.38	8.13	22.51	0.178	30.00	-7.49

# Table 7-5. EIRP (AWS WCDMA)

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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GSM1900	V	188	45	21.39	7.99	29.37	0.866	33.01	-3.64
1880.00	GSM1900	V	167	244	21.85	7.98	29.82	0.960	33.01	-3.19
1909.80	GSM1900	V	175	355	19.88	8.04	27.92	0.619	33.01	-5.09
1880.00	EDGE1900	V	108	185	16.66	7.98	24.63	0.291	33.01	-8.38
1880.00	GSM1900	Н	151	210	21.47	7.98	29.44	0.879	33.01	-3.57

### Table 7-6. EIRP (PCS GSM)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1851.25	CDMA1900	Н	132	287	18.43	7.99	26.42	0.438	33.01	-6.59
1880.00	CDMA1900	Н	168	291	17.50	7.98	25.48	0.353	33.01	-7.54
1908.75	CDMA1900	Н	168	291	17.88	8.03	25.91	0.390	33.01	-7.10
1851.25	CDMA1900	V	190	100	16.21	7.99	24.32	0.270	33.01	-8.69

#### Table 7-7. EIRP (PCS CDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	Н	167	281	17.50	7.99	25.49	0.354	33.01	-7.52
1880.00	WCDMA1900	Н	166	297	16.78	7.98	24.76	0.299	33.01	-8.26
1907.60	WCDMA1900	Н	166	297	16.80	8.02	24.82	0.304	33.01	-8.19
1852.40	WCDMA1900	V	166	297	15.00	7.99	22.99	0.199	33.01	-10.02

Table 7-8. 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 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 = Peak
- 6. Trace mode = max hold
- 7. The trace was allowed to stabilize

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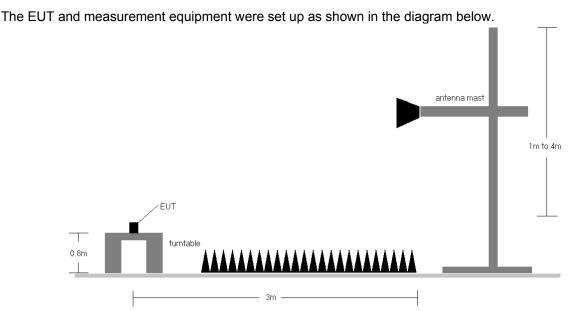


Figure 7-7. Test Instrument & Measurement Setup

### Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."
- 3) This device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 6) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 7) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 8) Data with "-" indicate that only noise floor was measured.

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OPERATING FREQUENCY:	824	MHz	
CHANNEL:	12	28	-
MEASURED OUTPUT POWER:	27.03	dBm =	0.504 W
MODULATION SIGNAL:	GSM (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	40.03	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1648.40	Н	104	215	-52.82	6.24	-46.57	73.6
2472.60	Н	117	3	-43.66	6.59	-37.07	64.1
3296.80	Н	-	-	-58.60	6.91	-51.69	78.7

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

OPERATING FREQUENCY:	836	MHz	
CHANNEL:	19		
MEASURED OUTPUT POWER:	28.28	dBm =	0.672 W
MODULATION SIGNAL:	GSM (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	41.28	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	101	215	-48.06	6.12	-41.94	70.2
2509.80	Н	100	100	-51.28	6.63	-44.66	72.9
3346.40	Н	-	-	-58.89	7.09	-51.80	80.1

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

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OPERATING FREQUENCY:	848	3.80	MHz
CHANNEL:	2	51	•
MEASURED OUTPUT POWER:	27.62	dBm =	0.578 W
MODULATION SIGNAL:	GSM (GMSK)	-	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) :	40.62	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	163	207	-41.71	6.00	-35.71	63.3
2546.40	Н	100	100	-44.09	6.74	-37.35	65.0
3395.20	Н	-	-	-59.07	7.27	-51.80	79.4

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

OPERATING FREQUENCY:	824	MHz	
CHANNEL:	10	13	
MEASURED OUTPUT POWER:	18.79	dBm =	0.076 W
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	31.79	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1649.40	Н	117	297	-58.98	6.24	-52.74	71.5
2474.10	Н	117	291	-45.95	6.59	-39.36	58.1
3298.80	Н	-	-	-58.65	6.91	-51.75	70.5

Table 7-12. Radiated Spurious Data (Cellular CDMA Mode – Ch. 1013)

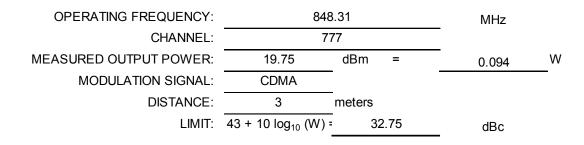
FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
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OPERATING FREQUENCY:	836	5.52	MHz
CHANNEL:	38	34	
MEASURED OUTPUT POWER:	19.45	dBm =	0.088 W
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	32.45	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.04	Н	100	345	-61.03	6.12	-54.91	74.4
2509.56	Н	201	101	-42.60	6.62	-35.98	55.4
3346.08	Н	-	-	-58.37	7.09	-51.28	70.7

Table 7-13. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)



Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1696.62	Н	170	192	-53.79	6.00	-47.79	67.5
2544.93	Н	167	280	-45.76	6.73	-39.03	58.8
3393.24	Н	-	-	-59.04	7.27	-51.78	71.5

Table 7-14. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

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OPERATING FREQUENCY:	826	MHz	
CHANNEL:	41	•	
MEASURED OUTPUT POWER:	19.83	dBm =	0.096 W
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	32.83	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1652.80	Н	-	-	-58.14	6.22	-51.92	71.8
2479.20	Н	-	-	-57.93	6.59	-51.34	71.2

 Table 7-15. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

OPERATING FREQUENCY:	836	6.60	MHz
CHANNEL:	41	83	•
MEASURED OUTPUT POWER:	20.32	dBm =	0.108 W
MODULATION SIGNAL:	WCDMA	-	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	33.32	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.20	Н	-	-	-63.10	6.12	-56.98	77.3
2509.80	Н	-	-	-60.30	6.63	-53.68	74.0

Table 7-16. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

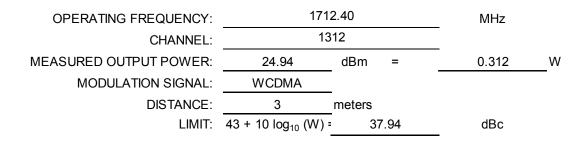
FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	846	6.60	MHz
CHANNEL:	42	33	
MEASURED OUTPUT POWER:	19.32	dBm =	0.086 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	32.32	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.20	Н	-	-	-57.96	6.02	-51.94	71.3
2539.80	Н	-	-	-57.78	6.72	-51.07	70.4

Table 7-17. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3424.80	Н	-	-	-52.91	9.53	-43.37	68.3
5137.20	Н	-	-	-51.53	11.03	-40.50	65.4

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

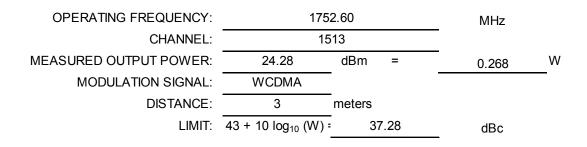
FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	173	2.60	MHz
CHANNEL:	14	13	-
MEASURED OUTPUT POWER:	24.97	dBm =	0.314 W
MODULATION SIGNAL:	WCDMA	•	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	37.97	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]
ſ	3465.20	Н	-	-	-58.26	9.64	-48.62	73.6
	5197.80	Н	-	-	-54.14	10.98	-43.16	68.1

Table 7-19. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3505.20	Н	-	-	-53.44	9.75	-43.69	68.6
5257.80	Н	-	-	-51.75	11.06	-40.69	65.6

Table 7-20. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕞 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	185	0.20	MHz	
CHANNEL:	5	12		
MEASURED OUTPUT POWER:	29.37	dBm =	0.866	W
MODULATION SIGNAL:	GSM (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	42.37	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]
3700.40	Н	147	14	-56.81	9.92	-46.89	76.3
5550.60	Н	-	-	-55.17	11.15	-44.02	73.4

 Table 7-21. Radiated Spurious Data (PCS GSM Mode – Ch. 512)

OPERATING FREQUENCY:	188	0.00	MHz
CHANNEL:	60	61	
MEASURED OUTPUT POWER:	29.82	dBm =	0.960 W
MODULATION SIGNAL:	GSM (GMSK)		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	42.82	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	Η	161	276	-56.82	9.63	-47.19	76.6
5640.00	Н	-	-	-55.20	11.29	-43.91	73.3

Table 7-22. Radiated Spurious Data (PCS GSM Mode – Ch. 661)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	190	9.80	MHz	
CHANNEL:	8	10	-	
MEASURED OUTPUT POWER:	27.92	dBm =	- 0.619 W	
MODULATION SIGNAL:	GSM (GMSK)	-		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) :	40.92	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	289	-55.99	9.39	-46.60	76.0
5729.40	Н	-	-	-55.32	11.37	-43.96	73.3

 Table 7-23. Radiated Spurious Data (PCS GSM Mode – Ch. 810)

OPERATING FREQUENCY:	185	MHz		
CHANNEL:	2			
MEASURED OUTPUT POWER:	26.42	dBm =	0.438	W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	39.42	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3702.50	Н	122	9	-53.73	9.91	-43.82	70.2
5553.75	Н	-	-	-54.42	11.16	-43.27	69.7

Table 7-24. Radiated Spurious Data (PCS CDMA Mode – Ch. 25)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
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OPERATING FREQUENCY:	188	MHz	
CHANNEL:	60		
MEASURED OUTPUT POWER:	25.48	dBm =	0.353 W
MODULATION SIGNAL:	CDMA	-	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	38.48	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	120	26	-54.00	9.63	-44.37	70.8
5640.00	Н	105	248	-49.06	11.29	-37.77	64.2
7520.00	Н	-	-	-51.22	11.12	-40.09	66.5

 Table 7-25. Radiated Spurious Data (PCS CDMA Mode – Ch. 600)

OPERATING FREQUENCY:	1908	MHz	
CHANNEL:	11		
MEASURED OUTPUT POWER:	25.91	dBm =	0.390 W
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	38.91	dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3817.50	Н	119	313	-51.30	9.40	-41.90	68.3
5726.25	Н	124	273	-49.94	11.37	-38.57	65.0
7635.00	Н	-	-	-51.63	11.34	-40.29	66.7

 Table 7-26. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	185	2.40	MHz	
CHANNEL:	92			
MEASURED OUTPUT POWER:	25.49	dBm =	0.354	W
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	38.49	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	134	325	-57.06	9.89	-47.17	72.7
5557.20	Н	-	-	-55.78	11.16	-44.61	70.1

 Table 7-27. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

OPERATING FREQUENCY:	188	MHz	
CHANNEL:	94		
MEASURED OUTPUT POWER:	24.76	dBm =	0.299 W
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	37.76	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	126	285	-56.95	9.63	-47.32	72.8
5640.00	Н	-	-	-55.99	11.29	-44.70	70.2

 Table 7-28. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
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OPERATING FREQUENCY:	190	1907.60		
CHANNEL:	95	9538		
MEASURED OUTPUT POWER:	24.82	dBm =	0.304 W	
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	37.82	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]
Ī	3815.20	Н	130	286	-56.10	9.40	-46.70	72.2
	5722.80	Н	-	-	-56.10	11.37	-44.73	70.2

 Table 7-29. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager		
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### 7.8 Frequency Stability / Temperature Variation §2.1055 §22.355 §24.235 §27.54

#### Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-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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OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL:

190

VDC

REFERENCE VOLTAGE: 3.85

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,600,201	201	0.0000240
100 %		- 30	836,600,162	162	0.0000194
100 %		- 20	836,600,177	177	0.0000212
100 %		- 10	836,599,888	-112	-0.0000134
100 %		0	836,600,124	124	0.0000148
100 %		+ 10	836,600,163	163	0.0000195
100 %		+ 20	836,600,201	201	0.0000240
100 %		+ 30	836,600,231	231	0.0000276
100 %		+ 40	836,600,110	110	0.0000131
100 %		+ 50	836,600,216	216	0.0000258
115 %	4.43	+ 20	836,600,204	204	0.0000244
BATT. ENDPOINT	3.45	+ 20	836,600,235	235	0.0000281

Table 7-30. Frequency Stability Data (Cellular GSM Mode – Ch. 190)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
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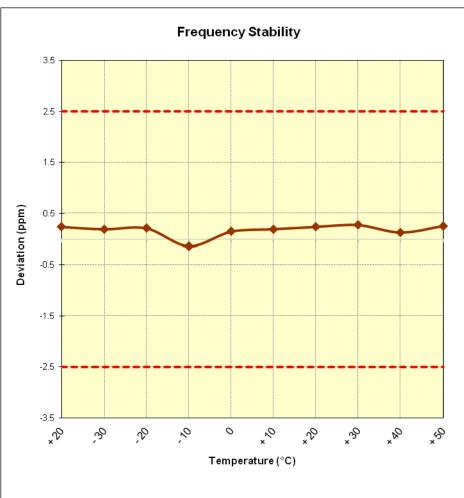


Figure 7-8. Frequency Stability Graph (Cellular GSM Mode – Ch. 190)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
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OPERATING FREQUENCY: 836,520,000 Hz

CHANNEL:

384

VDC

REFERENCE VOLTAGE: 3.85

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,520,204	204	0.0000244
100 %		- 30	836,520,161	161	0.0000192
100 %		- 20	836,520,216	216	0.0000258
100 %		- 10	836,520,210	210	0.0000251
100 %		0	836,520,184	184	0.0000220
100 %		+ 10	836,520,147	147	0.0000176
100 %		+ 20	836,520,204	204	0.0000244
100 %		+ 30	836,520,176	176	0.0000210
100 %		+ 40	836,520,207	207	0.0000247
100 %		+ 50	836,520,193	193	0.0000231
115 %	4.43	+ 20	836,520,218	218	0.0000261
BATT. ENDPOINT	3.45	+ 20	836,520,229	229	0.0000274

Table 7-31. Frequency Stability Data (Cellular CDMA Mode – Ch. 384)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
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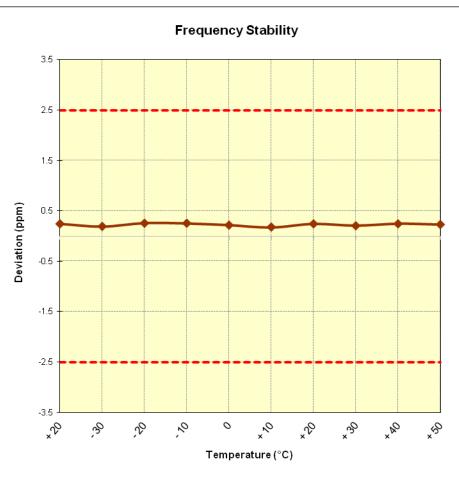


Figure 7-9. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY: 836,600,000 Ηz CHANNEL: 4183 REFERENCE VOLTAGE: VDC 3.85

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,600,168	168	0.0000201
100 %		- 30	836,600,213	213	0.0000255
100 %		- 20	836,600,189	189	0.0000226
100 %		- 10	836,600,197	197	0.0000235
100 %		0	836,600,188	188	0.0000225
100 %		+ 10	836,600,206	206	0.0000246
100 %		+ 20	836,600,168	168	0.0000201
100 %		+ 30	836,600,224	224	0.0000268
100 %		+ 40	836,600,182	182	0.0000218
100 %		+ 50	836,600,207	207	0.0000247
115 %	4.43	+ 20	836,600,232	232	0.0000277
BATT. ENDPOINT	3.45	+ 20	836,600,246	246	0.0000294

Table 7-32. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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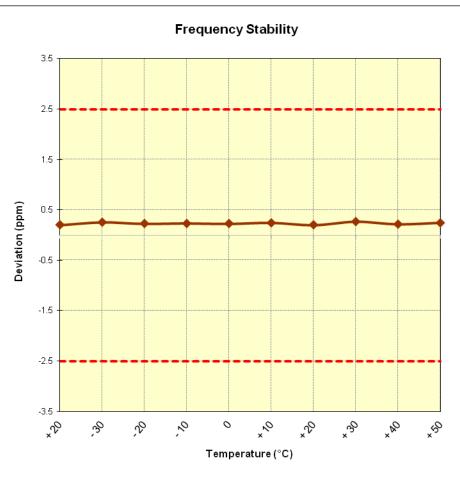


Figure 7-10. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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## Frequency Stability / Temperature Variation

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,732,600,194	194	0.0000112
100 %		- 30	1,732,599,880	-120	-0.0000069
100 %		- 20	1,732,600,214	214	0.0000124
100 %		- 10	1,732,600,182	182	0.0000105
100 %		0	1,732,600,167	167	0.0000096
100 %		+ 10	1,732,600,189	189	0.0000109
100 %		+ 20	1,732,600,194	194	0.0000112
100 %		+ 30	1,732,600,231	231	0.0000133
100 %		+ 40	1,732,600,158	158	0.0000091
100 %		+ 50	1,732,600,207	207	0.0000119
115 %	4.43	+ 20	1,732,600,223	223	0.0000129
BATT. ENDPOINT	3.45	+ 20	1,732,600,237	237	0.0000137

Table 7-33. Frequency Stability Data (AWS WCDMA Mode – Ch. 1413)

### Note:

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

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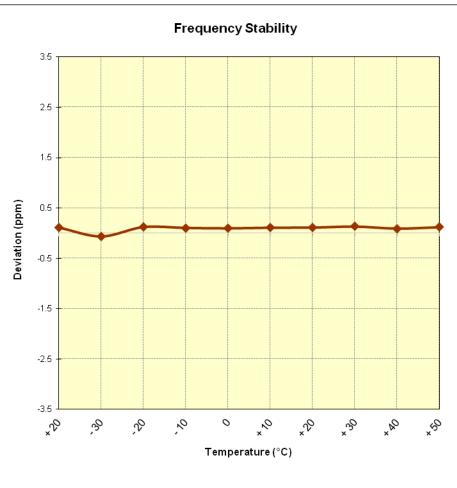


Figure 7-11. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz	
CHANNEL:	661	-	
REFERENCE VOLTAGE:	3.85	VDC	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,880,000,184	184	0.000098
100 %		- 30	1,880,000,219	219	0.0000116
100 %		- 20	1,880,000,202	202	0.0000107
100 %		- 10	1,880,000,152	152	0.0000081
100 %		0	1,880,000,173	173	0.0000092
100 %		+ 10	1,880,000,206	206	0.0000110
100 %		+ 20	1,880,000,184	184	0.0000098
100 %		+ 30	1,880,000,208	208	0.0000111
100 %		+ 40	1,880,000,165	165	0.000088
100 %		+ 50	1,880,000,129	129	0.0000069
115 %	4.43	+ 20	1,880,000,201	201	0.0000107
BATT. ENDPOINT	3.45	+ 20	1,880,000,226	226	0.0000120

Table 7-34. Frequency Stability Data (PCS GSM Mode – Ch. 661)

### Note:

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

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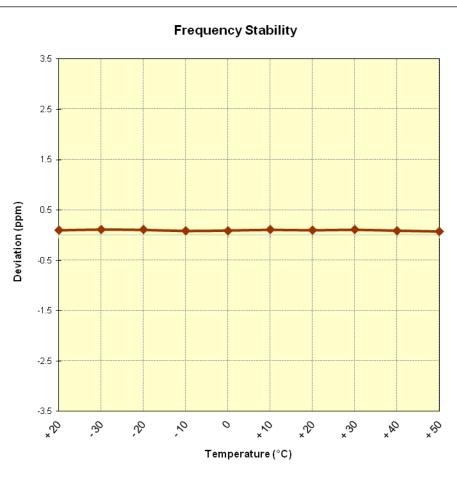


Figure 7-12. Frequency Stability Graph (PCS GSM Mode – Ch. 661)

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## Frequency Stability / Temperature Variation

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,880,000,190	190	0.0000101
100 %		- 30	1,880,000,112	112	0.0000060
100 %		- 20	1,880,000,206	206	0.0000110
100 %		- 10	1,880,000,167	167	0.0000089
100 %		0	1,880,000,182	182	0.0000097
100 %		+ 10	1,880,000,191	191	0.0000102
100 %		+ 20	1,880,000,190	190	0.0000101
100 %		+ 30	1,880,000,158	158	0.0000084
100 %		+ 40	1,880,000,201	201	0.0000107
100 %		+ 50	1,880,000,177	177	0.0000094
115 %	4.43	+ 20	1,880,000,214	214	0.0000114
BATT. ENDPOINT	3.45	+ 20	1,880,000,232	232	0.0000123

Table 7-35. Frequency Stability Data (PCS CDMA Mode – Ch. 600)

### Note:

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

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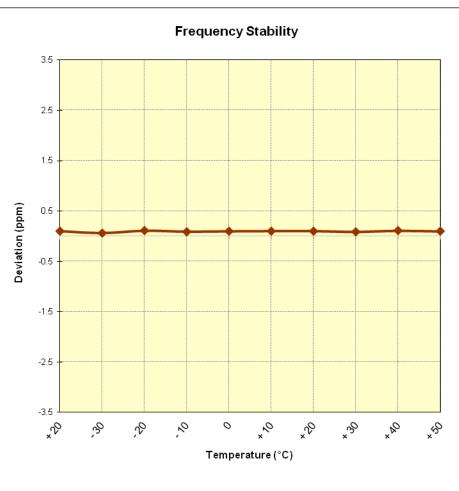


Figure 7-13. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

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## Frequency Stability / Temperature Variation

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,880,000,178	178	0.0000095
100 %		- 30	1,880,000,203	203	0.0000108
100 %		- 20	1,880,000,164	164	0.0000087
100 %		- 10	1,880,000,188	188	0.0000100
100 %		0	1,880,000,210	210	0.0000112
100 %		+ 10	1,880,000,188	188	0.0000100
100 %		+ 20	1,880,000,178	178	0.0000095
100 %		+ 30	1,880,000,208	208	0.0000111
100 %		+ 40	1,880,000,197	197	0.0000105
100 %		+ 50	1,880,000,202	202	0.0000107
115 %	4.43	+ 20	1,880,000,216	216	0.0000115
BATT. ENDPOINT	3.45	+ 20	1,880,000,228	228	0.0000121

 Table 7-36. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

### Note:

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

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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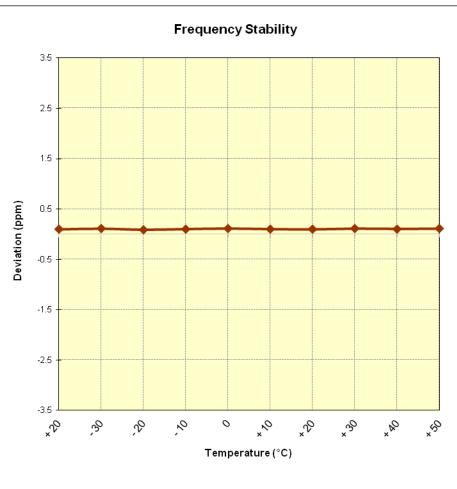


Figure 7-14. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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### 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the LG Portable Handset FCC ID: ZNFLS755 complies with all the requirements of Parts 22, 24, & 27 of the FCC rules.

FCC ID: ZNFLS755		FCC Pt. 22, 24, & 27 GSM / EDGE / CDMA / WCDMA MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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