

PCTEST ENGINEERING LABORATORY, INC.

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MEASUREMENT REPORT GSM / GPRS / EDGE / CDMA / WCDMA

Applicant Name:

LG Electronics USA, Inc. 1000 Sylvan Avenue Englewood Cliffs, NJ 07632 United States

Date of Testing: 12/4/2018 - 1/14/2019 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1811280213-02-R2.ZNF

FCC ID:

ZNFL423DL

APPLICANT:

LG Electronics USA, Inc.

Application Type: Model: EUT Type: FCC Classification: FCC Rule Part(s): Test Procedure(s): Certification LG L423DL, LGL423DL, L423DL Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 22, 24, & 27 ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01

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

This revised Test Report (S/N: 1M1811280213-02-R2.ZNF) supersedes and replaces the previously issued test report (S/N: 1M1811280213-02-R1.ZNF) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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

Randy Ortanez President



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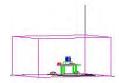


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			EF	RP	El	RP	
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	Emission Designator
GPRS850	22H	824.2 - 848.8	0.469	26.71	0.769	28.86	244KGXW
EDGE850	22H	824.2 - 848.8	0.197	22.94	0.323	25.09	240KG7W
CDMA850	22H	824.70 - 848.31	0.052	17.16	0.085	19.31	1M29F9W
WCDMA850	22H	826.4 - 846.6	0.065	18.13	0.107	20.28	4M15F9W
WCDMA1700	27	1712.4 - 1752.6			0.236	23.73	4M16F9W
GPRS1900	24E	1850.2 - 1909.8			0.969	29.86	246KGXW
EDGE1900	24E	1850.2 - 1909.8			0.232	23.65	241KG7W
CDMA1900	24E	1851.25 - 1908.75			0.123	20.89	1M29F9W
WCDMA1900	24E	1852.4 - 1907.6			0.215	23.33	4M18F9W

EUT Overview

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1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) 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 Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LGE Portable Handset FCC ID: ZNFL423DL**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

Test Device Serial No.: 11290, 11282, 11183, 11266, 11274, 11233

2.2 Device Capabilities

This device contains the following capabilities:

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

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 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

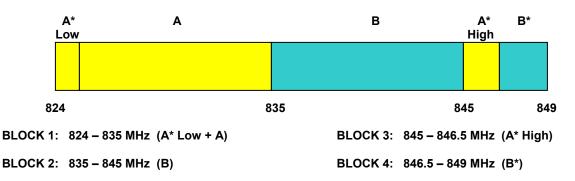
3.1 **Evaluation Procedure**

The measurement procedures described in the "Land Mobile FM or PM - Communications Equipment -Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

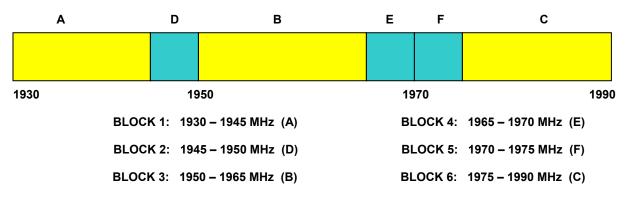
Deviation from Measurement Procedure.....None

3.2 Cellular - Base Frequency Blocks **A*** В* Α В A* Low High 869 880 890 894 BLOCK 1: 869 - 880 MHz (A* Low + A) BLOCK 3: 890 - 891.5 MHz (A* High) BLOCK 2: 880 - 890 MHz (B) BLOCK 4: 891.5 - 894 MHz (B*)

Cellular - Mobile Frequency Blocks 3.3



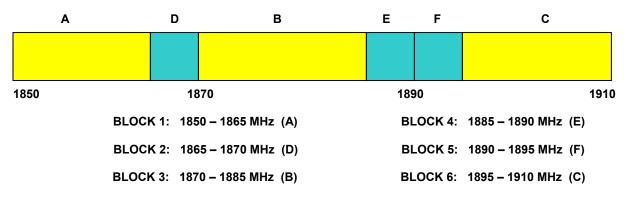
3.4 PCS - Base Frequency Blocks



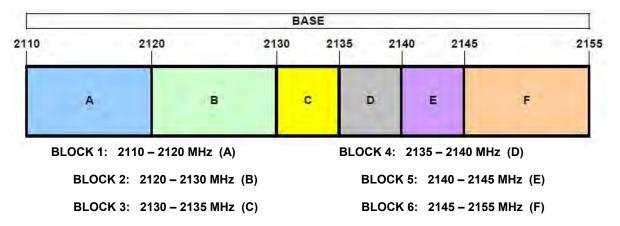
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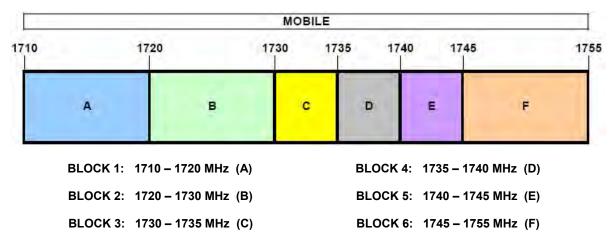
3.5 PCS - Mobile Frequency Blocks



^{3.6} AWS - Base Frequency Blocks



3.7 AWS - Mobile Frequency Blocks



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3.8 Radiated Measurements

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

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

Per the guidance of ANSI/TIA-603-E-2016, 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].

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

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4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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

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5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx3	LIcensed Transmitter Cable Set	8/23/2018	Annual	8/23/2019	LTx3
Agilent	E5515C	Wireless Communications Test Set	1/29/2016	Triennial	1/29/2019	GB46310798
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	E5515C	Wireless Communications Test Set	3/4/2016	Triennial	3/4/2019	GB45360985
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	9/17/2018	Annual	9/17/2019	441119
Espec	ESX-2CA	Environmental Chamber	3/28/2018	Annual	3/28/2019	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Mini Circuits	TVA-11-422	RF Power Amp	N/A	N/A		QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A		11208010032	
Mini-Circuits	PWR-SEN-4RMS	USB Power Sensor	3/30/2018	3/30/2018 Annual		11210140001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMU200	Base Station Simulator	5/18/2018	5/18/2018 Annual 5		109892
Rohde & Schwarz	CMW500	Radio Communication Tester	6/8/2018	Annual	6/8/2019	112347
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	1/24/2018	Annual	1/24/2019	100040
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/9/2018	Annual	8/9/2019	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	4/30/2018	Biennial	4/30/2020	9105-2404
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	4/30/2018	Biennial	4/30/2020	9105-2403
Seekonk	NC-100	Torque Wrench (8" lb)	5/10/2018	Biennial	5/10/2020	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/11/2017	Biennial	8/11/2019	A042511

Table 5-1. Test Equipment

Notes:

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

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6.0 SAMPLE CALCULATIONS

GPRS Emission Designator

Emission Designator = 250KGXW

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

EDGE Emission Designator

Emission Designator = 250KG7W

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

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 USA, Inc.
FCC ID:	ZNFL423DL
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM / GPRS / EDGE / CDMA / WCDMA</u>

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	RSS-Gen (4.6.1) RSS-133(2.3) RSS-139(2.3)	Occupied Bandwidth	N/A		PASS	Section 7.2
2.1051 22.917(a) 24.238(a) 27.53(h)	RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Conducted Band Edge / Spurious Emissions	> 43 + 10log ₁₀ (P[Watts]) at Band Edge and for all out-of- band emissions		PASS	Sections 7.3, 7.4
24.232(d)	RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)	Peak-Average Ratio	< 13 dB	CONDUCTED	PASS	Section 7.5
2.1046	RSS-132(5.4) RSS-133(4.1) RSS-139(4.1)	Transmitter Conducted Output Power	N/A		PASS	RF Exposure Report
2.1055 22.355 24.235 27.54	RSS-132(5.3) RSS-133(6.3) RSS-139(6.4)	Frequency Stability	ability <a> < 2.5 ppm (Part 22) Emission must remain in band (Part 24, 27)		PASS	Section 7.8
22.913(a)(5)	RSS-132(5.4)	Effective Radiated Power	< 7 Watts max. ERP		PASS	Section 7.6
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS	Section 7.6
27.50(d)(4)	RSS-139(6.5)	Equivalent Isotropic Radiated Power	< 1 Watts max. EIRP	RADIATED	PASS	Section 7.6
2.1053 22.917(a) 24.238(a) 27.53(h)	RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Radiated Spurious Emissions	> 43 + 10log 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 3.9.

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7.2 Occupied Bandwidth

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 - Section 4.2

Test Settings

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

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

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



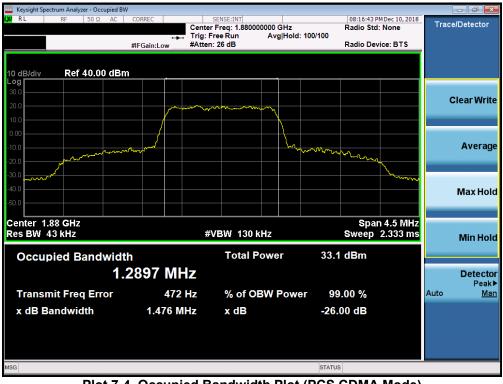
Plot 7-2. Occupied Bandwidth Plot (EDGE850 Mode)

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www.www.www.analyzer - Occupied BW				- 5 💌
XVIRL RF 50Ω AC	CORREC	SENSE:INT ter Freg: 836.520000 MHz	08:02:20 PM Dec 10, 2018 Radio Std: None	Trace/Detector
	+++ Trig:	Free Run Avg Hold: 100		
	#IFGain:Low #Atte	en: 28 dB	Radio Device: BTS	
10 dB/div Ref 35.00 dBn Log				
25.0				
15.0		mont		Clear Write
5.00				
-5.00				
-15.0		- la		Average
-25.0	~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
-35.0			how	
-45.0				Max Hole
-55.0				Maxilon
Center 836.5 MHz Res BW 43 kHz		#VBW 130 kHz	Span 4.5 MHz Sweep 2.333 ms	
		#4044 130 KHZ	Gweep 2:000 ms	Min Hole
Occupied Bandwidt	h	Total Power	34.1 dBm	
1	2887 MHz			Detecto
				Peak
Transmit Freq Error	461 Hz	% of OBW Power	99.00 %	Auto <u>Mar</u>
x dB Bandwidth	1.451 MHz	x dB	-26.00 dB	
ISG			STATUS	

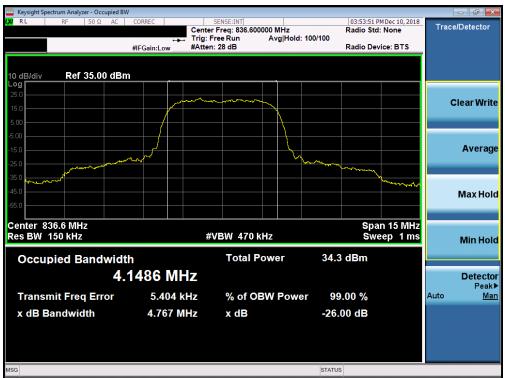
Plot 7-3. Occupied Bandwidth Plot (Cellular CDMA Mode)



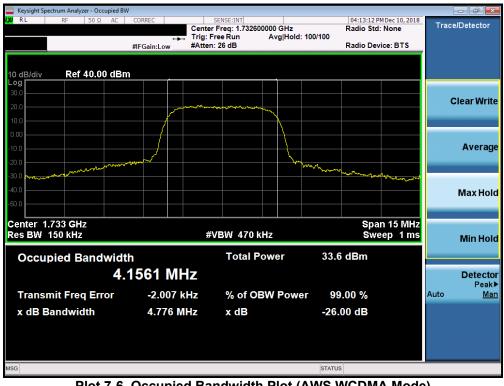
Plot 7-4. Occupied Bandwidth Plot (PCS CDMA Mode)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 15 of 107
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Plot 7-5. Occupied Bandwidth Plot (Cellular WCDMA Mode)



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

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Keysight Spectrum Analyzer - Occupied B				
RL RF 50Ω AC	CORREC	SENSE:INT er Freg: 1.880000000 GHz	03:23:56 PM Dec 10, 2018 Radio Std: None	Trace/Detector
		Free Run Avg Hold:>100/10 n: 26 dB	00 Radio Device: BTS	
	#IFGain:Low #Atte	n. 26 dD	Radio Device. B13	
0 dB/div Ref 40.00 dBr	~			
.og				
30.0				Clear Writ
20.0		mun		
10.0				
0.00				_
10.0	marg	han	mature	Averag
20.0			mon	
30.0 horan			mon	
40.0				Max Hol
50.0				
Center 1.88 GHz			Span 15 MHz	
Res BW 150 kHz	#	VBW 470 kHz	Sweep 1 ms	Min Hol
Occupied Bandwidt	b	Total Power 3	33.4 dBm	
4.	1833 MHz			Detecto Peak
Transmit Freq Error	1.234 kHz	% of OBW Power	99.00 %	Auto <u>Ma</u>
x dB Bandwidth	4.829 MHz	xdB -	26.00 dB	
SG			TATUS	

Plot 7-7. Occupied Bandwidth Plot (PCS WCDMA Mode)

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7.3 Spurious and Harmonic Emissions at Antenna Terminal

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 $43 + 10\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 20GHz for AWS, 20GHz for PCS (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average
- 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

Per and compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz. 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.

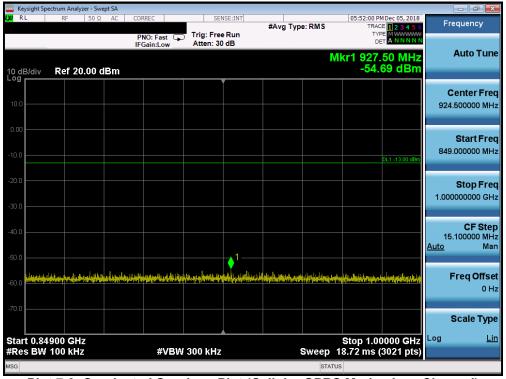
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 19 of 107
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Cellular GPRS Mode

	oectrum Analyze	er - Swept S	A								
LXU RL	RF	50Ω A	AC COR PN	REC		#Avg Typ	e: RMS	TRAC	M Dec 05, 2018 DE 1 2 3 4 5 6 PE M WWWWW ET A N N N N	F	requency
10 dB/div	Ref 20.	00 dBr					Μ	kr1 822 -35.7	.50 MHz 64 dBm		Auto Tune
10.0											Center Freq 5.500000 MHz
-10.0									DL1 -13.00 dBm	30	Start Freq 0.000000 MHz
-20.0									1	823	Stop Freq 3.000000 MHz
-40.0									→ 	79 <u>Auto</u>	CF Step 9.300000 MHz Man
-60.0	al) o ang aya kalamana (pa Ang ang ang ang ang ang ang ang ang ang a		n a star som det som d		a ya jedini kate at Daya ya ta	II (A IN A		a la ang la ang la paga la baga la bag Pang la baga la			Freq Offset 0 Hz
-70.0											Scale Type
Start 30. #Res BW				#VBV	/ 300 kHz	s	weep 98	Stop 8 3.33 ms (1	23.0 MHz 5861 pts)	Log	Lin
MSG							STATU				

Plot 7-8. Conducted Spurious Plot (Cellular GPRS Mode - Low Channel)

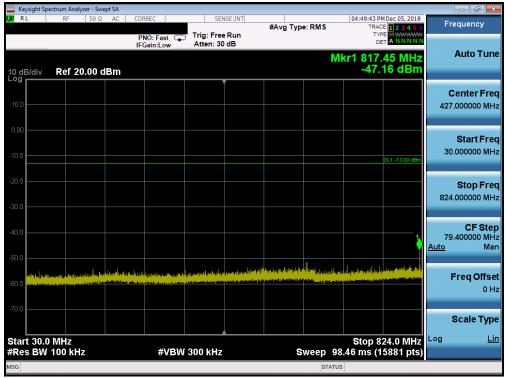


Plot 7-9. Conducted Spurious Plot (Cellular GPRS Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	pectrum Analyzer - Si	wept SA								
L <mark>X/</mark> RL	RF 50 9	Ω AC (CORREC	SEN	NSE:INT	#Avg Typ	e: RMS	TRAC	MDec 05, 2018 E 1 2 3 4 5 6	Frequency
			PNO: Fast 🕞 IFGain:Low	Trig: Free Atten: 20				TYF De		
10 dB/div Log	Ref 10.00	dBm					M	kr1 7.13 -48.	5 5 GHz 69 dBm	Auto Tune
0.00										Center Fred 5.500000000 GH:
-10.0									DL1 -13.00 dBm	Start Free 1.000000000 GH:
-30.0										Stop Free 10.000000000 GH:
-50.0			tin service and the service of the s				lan sina si sa si	a atawa ka ka atau	na manana ka kati ya terangga s Manana ka kati ya kati ya kati ya kati	CF Step 900.000000 MH: <u>Auto</u> Mar
-70.0										Freq Offse 0 H
-80.0										Scale Type
Start 1.0 #Res BW	00 GHz / 1.0 MHz		#VBV	V 3.0 MHz		S	weep 1	Stop 10 5.60 ms (1	.000 GHz 8001 pts)	Log <u>Lir</u>
MSG							STATU			



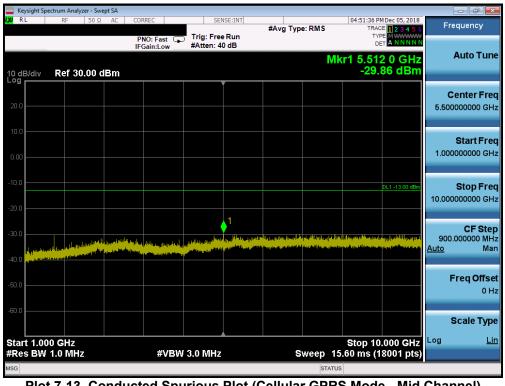
Plot 7-11. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 107
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		Analyzer - Swe	ept SA									
LXI RL	R	F 50 Ω	AC	CORREC	SEI	ISE:INT	#Avg Typ	e: RMS		MDec 05, 2018 E 1 2 3 4 5 6	Fre	quency
				PNO: Fast	Trig: Free #Atten: 4				TYF			
				IFGain:Low	#Atten: 4							Auto Tune
10 dB	alia De	f 20.00 d	IBm					n	-42	66 dBm		
		1 20.00 0			,,							
											С	enter Freq
10.0											924.	500000 MHz
0.00												Start Freq
-10.0											849.	000000 MHz
										DL1 -13.00 dBm		
-20.0												Stop Freq
											1.000	000000 GHz
-30.0												
	1											CF Step
-40.0	_ † '											100000 MHz
-50.0	indeg winter	dia di Aladahi	and in spectra	وردانا ازجابا الرابي	en lit bind huid.		a sector and the sector of the	the state of the s	neilige sielen in		<u>Auto</u>	Man
-50.0												
-60.0											F	req Offset
												0 Hz
-70.0												
											S	cale Type
Start	0.84900	GH7							Stop 1.00	0000 GHz	Log	Lin
	BW 100			#VBW	300 kHz			Sweep	18.72 ms (3021 pts)		
MSG								STAT				

Plot 7-12. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)



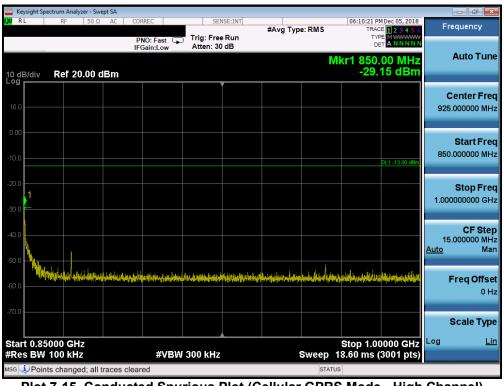
Plot 7-13. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)

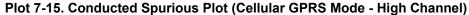
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 21 of 107
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	ectrum Analyze	er - Swept	: SA										
LXI RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	e: RMS		52 PM Dec 05, 2018 TRACE 1 2 3 4 5 6	Fr	equency
				PNO: Fa		Trig: Fre Atten: 3							
				II Oulli.L	.011					Mkr1 7	33.60 MHz		Auto Tune
10 dB/div	Ref 20.	00 dE	3m								52.29 dBm		
							Ĭ						
10.0													enter Freq
												421	.000000 1411 12
0.00													
												30	Start Freq
-10.0											DL1 -13.00 dBm	50	.000000 141112
-20.0													
20.0												004	Stop Freq .000000 MHz
-30.0												824	
													CF Step
-40.0												79	.400000 MHz
-50.0											1	<u>Auto</u>	Man
									alum	a hala sa kara sa	. It is another		
	aling a fing parties of the second	and a state of the second s Second second s		a na kata na k Na kata na kata n	pitelegiligen Society society	entre services de la competencia. Estis dissipation de la competencia	and the second sec	n sign na masang a parangan Milan di kanangan sa sa	Openity whe	an a	e the star of the light of the second se	1	Freq Offset
													0 Hz
-70.0													
													Scale Type
Start 30.0										Sto	p 824.0 MHz	Log	<u>Lin</u>
#Res BW	100 kHz			#	#VBW	300 kHz		S	weep	98.46 m	s (15881 pts)		
MSG									ST	ATUS			

Plot 7-14. Conducted Spurious Plot (Cellular GPRS Mode - High Channel)





FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyze											x
L <mark>XI</mark> RL	RF	50 Ω A	AC COF	RREC	SEN	ISE:INT	#Avg Typ	e: RMS		M Dec 05, 2018 CE 1 2 3 4 5 6	Frequency	,
			PI IFC	NO: Fast 🕞 Gain:Low	Trig: Free #Atten: 4				TY			
10 dB/div Log	Ref 30.	.00 dBi	m					M	kr1 6.33 -29.	2 5 GHz 94 dBm	Auto T	une
20.0											Center F 5.500000000	
0.00											Start F 1.000000000	
-10.0										DL1 -13.00 dBm	Stop F 10.000000000	
-30.0	The second s	and and the sol		a iku na poda jaji di kao gana poda poda poda poda poda poda poda pod	, alabiya da ang biya. Mang sa	and the second sec		l nga bina kang bigang ka	n (m. 18. an a ^{ma} inteacha) a (m. 18. an a ^{main} teacha)	a (sec left) statistica (sec lega) 1 - Transferring on Konstan	CF S 900.000000 I <u>Auto</u>	
-50.0											Freq Ofi	fsel 0 Hz
-60.0											Scale T	
Start 1.00 #Res BW				#VBW	/ 3.0 MHz		S	weep 1		.000 GHz 8001 pts)	Log	Lin
MSG								STATU	s			

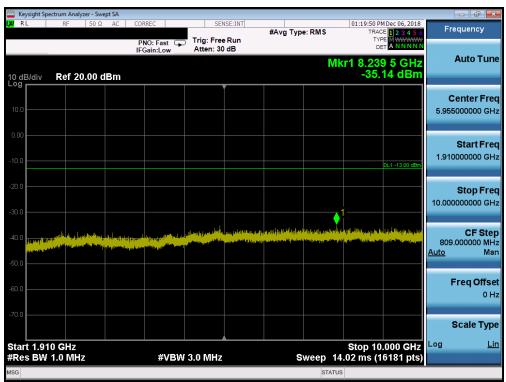
Plot 7-16. Conducted Spurious Plot (Cellular GPRS Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 107
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	um Analyzer - Swept								
0 RL	RF 50 Ω	AC CORREC	ast 🕞 Trig: Fi	ree Run 30 dB	#Avg Typ	e:RMS	TRAC TYP	E 1 2 3 4 5 6 A NNNNN	Frequency
0 dB/div	Ref 20.00 dB					Mk		55GHz 06dBm	Auto Tu
10.0									Center Fr 937.500000 M
10.0								DL1 -13.00 dBm	Start Fr 30.000000 M
80.0									Stop Fr 1.845000000 G
0.0 (mining and and	alahisi galahisi dalahi	la distanta da sua any la trastica di Nana manda trastica di nana mangang					n ji ca malak di kapan kad		CF Sto 181.500000 M <u>Auto</u> M
0.0									Freq Offs 0
°0.0									Scale Ty
tart 0.0300 Res BW 1.		#	¢VBW 3.0 MH	Iz		Sweep 2.		450 GHz 3631 pts)	Log <u>l</u>
SG						STATUS			

Plot 7-17. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)



Plot 7-18. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyze										
LXI RL	RF	50 Ω AC	CORREC		SEN	ISE:INT	#Avg Typ	e: RMS		PM Dec 06, 2018 ACE 1 2 3 4 5 6	Frequency
			PNO: F IFGain:		Trig: Free Atten: 20				т		
10 dB/div Log	Ref 10.	00 dBm						M	kr1 16.7 -38	55 0 GHz .77 dBm	Auto Tune
0.00											Center Freq 15.000000000 GHz
-10.0										DL1 -13.00 dBm	Start Freq 10.000000000 GHz
-30.0						ana : <mark>dâ Di</mark> strinad	niveli entre i	an a	<mark>f ki)</mark> saligansak ést ji	de Barry for you the best of providing	Stop Freq 20.000000000 GHz
-50.0	99(4)]](4)]](4) 		ng laga tang diapang di Ing diapang diap					Constant of the second se		a hé i a _{sun} an kata da se Na	CF Step 1.00000000 GHz <u>Auto</u> Man
-70.0											Freq Offset 0 Hz
-80.0									Stor	0.000 CH-	Scale Type
Start 10.0 #Res BW				#VBW 3.	.0 MHz		S	weep	stop 2 25.33 ms (0.000 GHz (20001 pts)	
MSG								STAT	rus		

Plot 7-19. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)



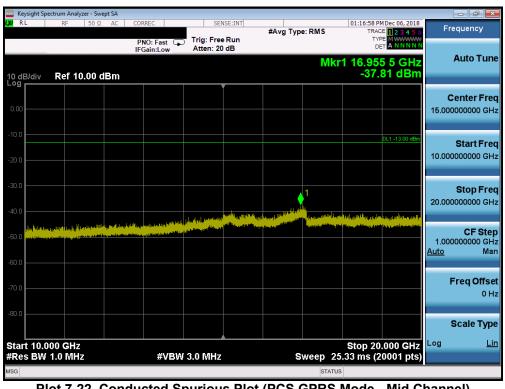
Plot 7-20. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 05 of 107
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	ectrum Analyz	er - Swept											
LXU RL	RF	50 Ω		ORREC	l	SE Trig: Fre	NSE:INT	#Avg Typ	e:RMS	TRA	PM Dec 06, 2018 ACE 1 2 3 4 5 6 APE M 4 4 5 6 DET A N N N N N	Fre	equency
10 dB/div Log	Ref 20	.00 dE	1	FGain:Lo		Atten: 30) dB		N	/kr1 9.4	51 5 GHz .94 dBm		Auto Tune
10.0													enter Freq 5000000 GHz
-10.0											DL1 -13.00 dBm	1.910	Start Freq 0000000 GHz
-20.0											1	10.000	Stop Fred 0000000 GH2
-40.0 100000	an a				UDarychor Alsia (bala	a de la constante de la constante la constante de la constante de la constante de la constante de la constante la constante de la constante de		a na ang pang pang pang pang pang pang p		la filing a filing line. Nga kanang	(all perf line) en pap Internet ^{den} state parte	809 <u>Auto</u>	CF Step 000000 MH2 Mar
-60.0												F	F req Offse 0 Ha
-70.0 Start 1.91										Stop 1	0.000 GHz	tog	Scale Type Lin
#Res BW				#	VBW	3.0 MHz		s	weep	14.02 ms (16181 pts)		
MSG									STA	TUS			

Plot 7-21. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)



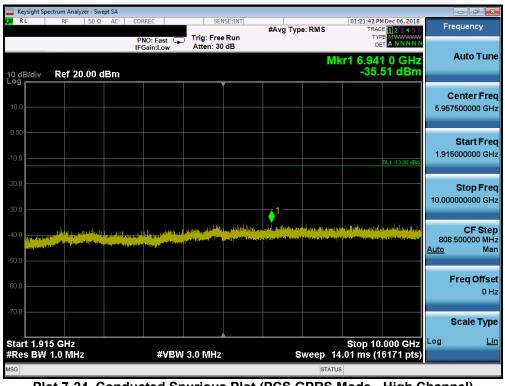
Plot 7-22. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	pectrum Analyz											
LXU RL	RF	50 Ω /	AC CO	RREC	SE	NSE:INT	#Avg Typ	e: RMS		M Dec 06, 2018	Free	quency
			Р	NO: Fast	Trig: Free Atten: 30				TY	PE MWWWWW		
			11-	Gain:Low	Atten. 30	ub .		M	ord 4 75	6.5.CH-	4	Auto Tune
10 dB/div	Ref 20		20					IVII	-36	6 5 GHz 76 dBm		
	Rel 20	.00 UB										
											Ce	enter Freq
10.0											940.0	00000 MHz
0.00												Start Freq
-10.0												000000 MHz
-10.0										DL1 -13.00 dBm		
-20.0												
												Stop Freq
-30.0											1.8500	00000 GHZ
										♦'		
-40.0	11.1.	ا بابر م	. entredar d	المربيب بالا	, and the second	distinguati kaali		and the shifts	allin all ana tata	the state of the	182.0	CF Step
t af which will		in an	All and the second		and the second second	dates all bindle	and the state of the	later total.			Auto	Man
-50.0												
											FI	req Offset
-60.0												0 Hz
70.0												
-70.0											S	cale Type
Start 0.0									Stop 1.	8500 GHz	Log	Lin
	/ 1.0 MHz			#VB	W 3.0 MHz					(3641 pts)		
MSG								STATU	S			

Plot 7-23. Conducted Spurious Plot (PCS GPRS Mode - High Channel)



Plot 7-24. Conducted Spurious Plot (PCS GPRS Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyzer	- Swept SA									X
X/RL	RF	50 Ω AC	CORREC PNO: Fast	Trig: Fre		#Avg Type	RMS	TRAC	E 1 2 3 4 5 6 A NNNN	Frequenc	у
10 dB/div Log	Ref 10.0	00 dBm	IFGain:Low	Atten: 20) dB		Mkr	1 16.988		Auto 1	Гune
0.00										Center 15.000000000	
-10.0									DL1 -13.00 dBm	Start 10.000000000	
40.0				en din din din din din din din din din di	a second and a second	huilte dhen sets de de	1 Julips Officers	and a second parts	falletet frankeiter.	Stop 20.000000000	
50.0 10.00			ang gana di akan di kana ng mang ang mang ang mang ang mang m							CF 1.000000000 <u>Auto</u>	
70.0										Freq O	Offs 0 H
	000 GHz							Stop 20	000 GHZ	Scale ⁻ Log	Typ Li
Res BW	1.0 MHz		#V	BW 3.0 MHz		SV	status		0001 pts)		

Plot 7-25. Conducted Spurious Plot (PCS GPRS Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Cellular CDMA Mode

	ctrum Analyzer - Swept SA					
LXI RL	RF 50 Ω AC	CORREC PNO: Fast	SENSE:INT Trig: Free Run Atten: 30 dB	#Avg Type: RMS	08:05:50 PM Dec 10, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	Frequency
10 dB/div Log	Ref 20.00 dBm	II Guilleow		N	lkr1 823.00 MHz -28.94 dBm	Auto Tune
10.0						Center Freq 426.500000 MHz
-10.0					DL1 -13.00 dBm	Start Free 30.000000 MHz
-20.0					1	Stop Free 823.000000 MH;
-40.0						CF Step 79.300000 MH <u>Auto</u> Mar
-60.0		an a suite a s		an na tha tha an that an t	an dinamatang ang pangang kanang pangang pangang pangang pangang pangang pangang pangang pangang pangang panga	Freq Offse 0 H
-70.0						Scale Type
Start 30.0 #Res BW 1	MHz 100 kHz	#VBW	300 kHz	Sweep 9	Stop 823.0 MHz 8.33 ms (15861 pts)	Log <u>Lir</u>
MSG				STATU	JS	

Plot 7-26. Conducted Spurious Plot (Cellular CDMA Mode - Low Channel)

	ectrum Analyzer	- Swept SA					
I <mark>XI</mark> RL	RF	50 Ω AC	CORREC	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	08:05:57 PM Dec 10, 2018 TRACE 2 3 4 5 6 TYPE A WWWW DET A N N N N	Frequency
10 dB/div	Ref 20.0	00 dBm	" Sameon			Mkr1 883.25 MHz -60.04 dBm	Auto Tune
10.0							Center Freq 924.500000 MHz
-10.0						DL1 -13.00 dBm	Start Freq 849.000000 MHz
-20.0							Stop Fred 1.000000000 GHz
-40.0							CF Step 15.100000 MH: <u>Auto</u> Mar
-60.0	an all the faith of the fact	1	alatan panal sala ara da fina	₩₩₩₽₩₽₩₽₩₩₩₽₽₩₩₽₽₩₩₽₩₽₩₩₩₩₽₽₩₩₩₽₽₩₽	าสารให้ประการใหญ่และกราง _เ อร์สุขารสาร <mark>ม</mark> าตรายไปประเภท	าร่ะนุกฏิโกรการแห่งกลังรูกสระบาทจึงสามารถในการเป็นการเป็นการเป็นการเป็นการเป็นการเป็นการเป็นการเป็นการเป็นการเ	Freq Offse 0 Hz
-70.0							Scale Type
Start 0.84 #Res BW			#VBW	300 kHz	Sweep	Stop 1.00000 GHz 18.72 ms (3021 pts)	Log <u>Lin</u>
MSG					ST	ATUS	

Plot 7-27. Conducted Spurious Plot (Cellular CDMA Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 29 of 107
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🔤 Keysight Spectrum Analy	zer - Swept SA					
LXI RL RF	50 Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	08:06:18 PM Dec 10, 2018 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast 🖵 IFGain:Low	Trig: Free Run #Atten: 30 dB			
10 dB/div Ref 10).00 dBm			Μ	kr1 8.654 0 GHz -43.76 dBm	Auto Tune
0.00						Center Freq 5.50000000 GHz
-10.0					DL1 -13.00 dBm	Start Fred 1.000000000 GHz
-30.0					1	Stop Fred 10.000000000 GHz
-50.0						CF Step 900.000000 MH: <u>Auto</u> Mar
-70.0						Freq Offse 0 Hi
-80.0						Scale Type
Start 1.000 GHz #Res BW 1.0 MHz	Z	#VBW	3.0 MHz	Sweep 1	Stop 10.000 GHz 5.60 ms (18001 pts)	Log <u>Lir</u>
MSG				STATI	US	



Plot 7-29. Conducted Spurious Plot (Cellular CDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyzer -										
XI RL	RF 50	Ω AC	CORREC PNO: Fast			#Avg Type	RMS	TRAC	M Dec 10, 2018 E 1 2 3 4 5 6 E A WWWW A N N N N N	Frequen	ісу
10 dB/div	Ref 20.00) dBm	IFGain:Low	Atten. or			Μ	kr1 855.	45 MHz 00 dBm	Auto	Tune
10.0										Cente 924.50000	
-10.0									DL1 -13.00 dBm	Star 849.00000	t Freq 00 MHz
-20.0										Stop 1.00000000	o Freq 00 GHz
-40.0										CF 15.10000 <u>Auto</u>	F Step 00 MHz Man
.60.0	พร้างหรือ <mark>สุรักษณ์และ</mark> จากเรื่อ	ulas i u las site	a ng mangang pang pang balang magana pang balang magana pang	an a	an a		Stand and the Stand of the Stan	ĸĹġŢĨŢĨŢŎŢŢŎŢŎŎŎŎŢŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎ	**************************************	Freq	Offset 0 Hz
										Scale	е Туре
Start 0.84 #Res BW			#VB	W 300 kHz		s	weep 1	Stop 1.0 8.72 ms (0000 GHz 3021 pts)	Log	<u>Lin</u>
ISG							STATUS	5			

Plot 7-30. Conducted Spurious Plot (Cellular CDMA Mode - Mid Channel)

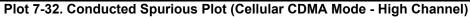


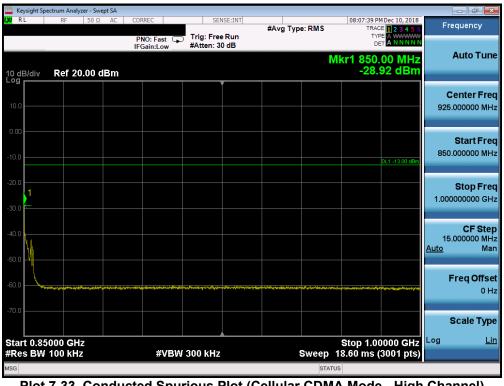
Plot 7-31. Conducted Spurious Plot (Cellular CDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 107
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	trum Analyzer - S								
LXU RL	RF 50	Ω AC	CORREC PNO: Fas	t 🕞 Tri	g: Free Run	#Avg Type: RM	S TR.	PM Dec 10, 2018 ACE 1 2 3 4 5 6 YPE A WWWWW DET A NNNNN	Frequency
10 dB/div	Ref 20.00	dBm	IFGain:Lo	w At	ten: 30 dB		Mkr1 788		Auto Tune
10.0									Center Freq 427.000000 MHz
-10.0								DL1 -13.00 dBm	Start Freq 30.000000 MHz
-20.0									Stop Freq 824.000000 MHz
-40.0									CF Step 79.400000 MHz <u>Auto</u> Man
-60.0	nghian Mangungangangangangangangangangangangangangan							↓ ¹	Freq Offset 0 Hz
Start 30.0							Stop	024.0 191112	Scale Type Log <u>Lin</u>
#Res BW 1	00 kHz		#\	VBW 300) kHz	Swee	p 98.46 ms (15881 pts)	





Plot 7-33. Conducted Spurious Plot (Cellular CDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyzer -										-	
LXI RL	RF 5	0Ω AC	CORREC		SEN	ISE:INT	#Avg Typ	e: RMS	TRA	MDec 10, 2018 CE 1 2 3 4 5 6	Freq	uency
			PNO: Fa IFGain:L		Frig: Free Atten: 30		• //		TY D			
10 dB/div Log	Ref 10.0	0 dBm						Mk	r1 8.66 -44.	7 0 GHz 05 dBm		uto Tune
0.00												n ter Freq 00000 GHz
-10.0										DL1 -13.00 dBm		tart Freq
-20.0											1.00000	JUUUU GHZ
-30.0									1_			top Freq
-50.0			~~~~		~						900.00 <u>Auto</u>	CF Step 00000 MHz Man
-70.0											Fr	e q Offset 0 Hz
-80.0											Sc	ale Type
Start 1.00 #Res BW			#	VBW 3.	0 MHz		s	weep 15	Stop 10 .60 ms (1).000 GHz 18001 pts)	Log	Lin
MSG								STATUS				

Plot 7-34. Conducted Spurious Plot (Cellular CDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Keysight Spectrum Analyz						
UXURL RF		PNO: Fast	SENSE:INT Trig: Free Run Atten: 30 dB	#Avg Type: RMS	08:18:28 PM Dec 10, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency
10 dB/div Ref 20.	.00 dBm	IFGain:Low	Atten: 30 dB	N	lkr1 1.845 0 GHz -44.73 dBm	Auto Tune
10.0						Center Fred 937.500000 MH;
-10.0					DL1 -13.00 dBm	Start Free 30.000000 MH
-20.0						Stop Free 1.845000000 GH
-40.0				a main and a start and a start and a start and a start	1	CF Stej 181.50000 MH <u>Auto</u> Ma
.60.0						Freq Offse 0 H
-70.0						Scale Type
Start 0.0300 GHz #Res BW 1.0 MHz		#VBW	3.0 MHz	Sweep	Stop 1.8450 GHz 2.420 ms (3631 pts)	Log <u>Lir</u>
MSG				STAT	US	

Plot 7-35. Conducted Spurious Plot (PCS CDMA Mode - Low Channel)



Plot 7-36. Conducted Spurious Plot (PCS CDMA Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyze											
LXI RL	RF	50 Ω A	C COR	REC	SE	NSE:INT	#Avg Typ	e RMS		M Dec 10, 2018 DE 1 2 3 4 5 6	Fre	quency
			PI	NO: Fast 🗔	Trig: Fre				TY			
			IFC	Gain:Low	Atten: 2	U dB		D Aller				Auto Tune
	B-6.40							IVIKI	-45	0 5 GHz 85 dBm		
10 dB/div	Ref 10.	оо авп	1			• · · · ·						
											C	enter Freq
0.00											15.000	000000 GHz
-10.0										DL1 -13.00 dBm		Otort From
												Start Freq 000000 GHz
-20.0											10.000	000000 GH2
-30.0												Stop Freq
											20.000	000000 GHz
-40.0								1				
-50.0												CF Step
-30.0												000000 GHz Man
-60.0											<u>Auto</u>	Iviari
-70.0											F	req Offset
												0 Hz
-80.0												
											S	cale Type
Start 10.0	00 CHz								Stop 20	.000 GHz	Log	Lin
#Res BW				#VBN	/ 3.0 MHz		s	weep 25	.33 ms (2	20001 pts)		
MSG								STATUS				

Plot 7-37. Conducted Spurious Plot (PCS CDMA Mode - Low Channel)



Plot 7-38. Conducted Spurious Plot (PCS CDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
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LXI RL	RF	50 Ω AC	C CORI	REC	SEI	ISE:INT	#Avg Typ	e: RMS	08:17:07 P	M Dec 10, 2018 CE 1 2 3 4 5 6	Frequ	iency
			PN	IO: Fast 🕞 ain:Low	Trig: Free Atten: 30		• ,,		TY	PE A WWWWW ET A N N N N N		
			IFG	am:Low	Atten. ot	ub .		ML	rf 0 30	4 0 GHz	Au	ito Tune
10 dB/div Log	Ref 20.0	00 dBn	n						-43.	99 dBm		
											Cen	ter Freg
10.0												0000 GHz
0.00											St	art Freq
-10.0												0000 GHz
										DL1 -13.00 dBm		
-20.0											St	op Freq
												0000 GHz
-30.0												
-40.0									1			CF Step
				-interior in a sec	-		-	- State and the state of the st	an print and a second second	-	809.000 Auto	0000 MHz Man
-50.0												
											Fre	qOffset
-60.0												0 Hz
-70.0												
											Sca	ale Type
Start 1.91	0 GHz								Stop 10	0.000 GHz	Log	Lin
#Res BW				#VBW	3.0 MHz		S	weep 14	.02 ms (6181 pts)		
MSG								STATUS	6			

Plot 7-39. Conducted Spurious Plot (PCS CDMA Mode - Mid Channel)



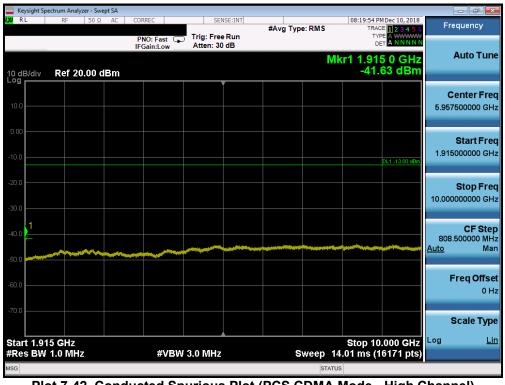
Plot 7-40. Conducted Spurious Plot (PCS CDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 26 of 107	
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	ectrum Analyzer										×
LX/IRL	RF 5	OΩ AC	CORREC	SENS	SE:INT	#Avg Typ	e: RMS		MDec 10, 2018 E 1 2 3 4 5 6	Frequenc	у
			PNO: Fast 🖵 IFGain:Low	Trig: Free Atten: 30		• ,,		TY			
			IFGain:Low	Atten: 00	ab		ML	r1 1 59	2 5 GHz	Auto 1	Гune
10 dB/div	Ref 20.0	0 dBm						-47.	65 dBm		
										Center	
10.0										940.000000	MHz
0.00											
0.00										Start	Freq
-10.0										30.000000	MHz
									DL1 -13.00 dBm		
-20.0										Stop	Fred
										1.850000000	
-30.0											
										CE	Step
-40.0								1		182.000000) MHz
-50.0						A DESCRIPTION OF THE OWNER				<u>Auto</u>	Man
-50.0			,								
-60.0										Freq O	
											0 Hz
-70.0											
										Scale	Туре
Start 0.03	00 CHz							Stop 1	3500 GHz	Log	Lin
#Res BW			#VBW	3.0 MHz			Sweep 2		3641 pts)		
MSG							STATUS				

Plot 7-41. Conducted Spurious Plot (PCS CDMA Mode - High Channel)



Plot 7-42. Conducted Spurious Plot (PCS CDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyze												ð - X -
LXI RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	e: RMS		M Dec 10, 2018 CE 1 2 3 4 5 6	Frequen	icy
				PNO: Fa	st 🖵 ow	Trig: Fre Atten: 2		0 71		T	PE A WWWWW DET A N N N N N		
10 dB/div Log	Ref 10.	00 dB	m						Mki	1 17.01 -45	3 5 GHz .86 dBm	Auto	Tune
0.00												Cente 15.00000000	
-10.0											DL1 -13.00 dBm	Star	tFreq
-20.0												10.0000000	
-30.0												Stop 20.00000000	o Freq 00 GHz
-40.0								_	1			CF 1.00000000 Auto	5 Step 00 GHz Man
-60.0													
-70.0												Freq	Offset 0 Hz
-80.0												Scale	е Туре
Start 10.0 #Res BW				#	VBW	3.0 MHz	·	S	weep 2	Stop 20 5.33 ms (0.000 GHz 20001 pts)	Log	Lin
MSG									STATU	S			

Plot 7-43. Conducted Spurious Plot (PCS CDMA Mode - High Channel)

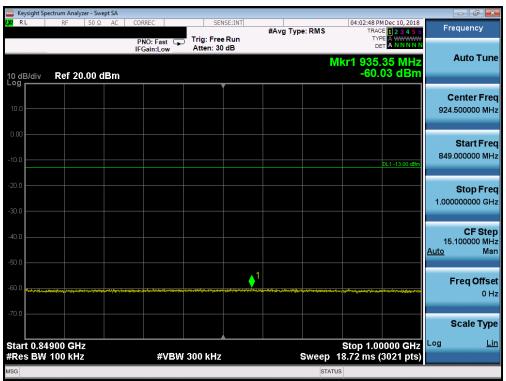
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Cellular WCDMA Mode

Keysight Spectrum A						
XIRL RF	50 Ω AC	CORREC PNO: Fast	SENSE:INT Trig: Free Run Atten: 30 dB	#Avg Type: RMS	04:02:41 PM Dec 10, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency
10 dB/div Ref	20.00 dBm	- Gameon		N	/kr1 822.85 MHz -33.13 dBm	Auto Tune
10.0						Center Fred 426.500000 MH;
-10.0					DL1 -13.00 dBm	Start Free 30.000000 MH:
-20.0					1	Stop Free 823.000000 MH
-40.0						CF Stej 79.300000 MH <u>Auto</u> Ma
60.0			n fan ferste	te anno an air ann a lathan agus an		Freq Offse 0 H
-70.0						Scale Type
Start 30.0 MHz #Res BW 100 I	KHz	#VBW	300 kHz	Sweep 9	Stop 823.0 MHz 8.33 ms (15861 pts)	Log <u>Lir</u>
MSG				STAT	US	

Plot 7-44. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)



Plot 7-45. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	🕐 LG	Approved by: Quality Manager
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	ectrum Analyzer											x
LXI RL	RF 5	50 Ω AC	COR	REC	SEI	ISE:INT	#Avg Typ	e RMS	04:03:11 P	M Dec 10, 2018 CE 1 2 3 4 5 6	Frequency	
			PN IFG	IO: Fast 🖵 ain:Low	Trig: Free #Atten: 2				TY	PE A WWWWW ET A N N N N N		
10 dB/div Log	Ref 10.0	0 dBm						M	kr1 8.66 -45.	7 0 GHz 78 dBm	Auto Tui	ne
0.00											Center Fre 5.500000000 Gi	
-10.0										DL1 -13.00 dBm	Start Fre 1.000000000 Gi	
-30.0									1-		Stop Fro 10.000000000 GI	
-50.0	-		~~~~								CF Ste 900.000000 Mi <u>Auto</u> Mi	
-70.0											Freq Offs 01	set Hz
-80.0											Scale Typ	
Start 1.00 #Res BW				#VBW	3.0 MHz		s	weep 1	Stop 10 5.60 ms (*).000 GHz 18001 pts)		<u>Lin</u>
MSG								STATU				

Plot 7-46. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)

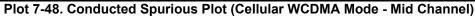


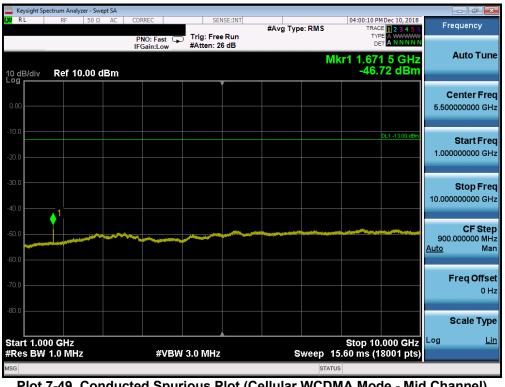
Plot 7-47. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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RL RF 50		PNO: Fast G			#Avg Type		TRAC TYI DI	M Dec 10, 2018 DE 1 2 3 4 5 6 PE A WWWWWW ET A N N N N N	Frequency Auto T	У
		IFGain:Low	Atten: 30) dB		M			Auto T	
							-55.	.30 MHz 25 dBm	Autor	ſur
0.0									Center 924.500000	
0.0								DL1 -13.00 dBm	Start I 849.000000	
0.0									Stop I 1.000000000	
0.0 1									CF \$ 15.100000 <u>Auto</u>	
	en all game age of the second	ndræfna for att stør følget hat stør øfter o	ي رو	and a francisco and a francisco a franc	9449 (**********************************	er fan en an	if full hands a trap of the state of the	Qfauftyr ymaef a Rinneyfaef algae	Freq O	ffs 0 I
									Scale 1	
tart 0.84900 GHz Res BW 100 kHz		#VBW	300 kHz		:	Sweep 1	Stop 1.0 8.72 ms (0000 GHz (3021 pts)	Log	L





Plot 7-49. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyzer -							
L <mark>XI</mark> RL	RF 50	Ω AC	CORREC	SENSE	#Avg Typ	e: RMS	04:04:23 PM Dec 10, 2018 TRACE 1 2 3 4 5 6	Frequency
			PNO: Fast G	Trig: Free R Atten: 30 dB			TYPE A WWWW DET A NNNNN	
10 dB/div Log	Ref 20.00	dBm				М	kr1 794.25 MHz -58.69 dBm	Auto Tune
10.0								Center Freq 427.000000 MHz
0.00								427.000000 MH2
-10.0								Start Freq 30.000000 MHz
							DL1 -13.00 dBm	
-20.0								Stop Freq 824.000000 MHz
-40.0								CF Step 79.400000 MHz
-50.0								79.400000 MHz <u>Auto</u> Man
-60.0							↓ ¹	Freq Offset
-70.0								
								Scale Type
Start 30.0 #Res BW			#VBI	V 300 kHz	s	weep 98	Stop 824.0 MHz 8.46 ms (15881 pts)	Log <u>Lin</u>
MSG						STATUS		

Plot 7-50. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)



Plot 7-51. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyze	er - Swep	ot SA										×
LX/IRL	RF	50 Ω	AC	CORREC	ist 🖵	SE Trig: Fre #Atten: 3		#Avg Typ	e: RMS	TR	PM Dec 10, 2018 ACE 1 2 3 4 5 6 YPE A WWWW DET A NNNN	Frequenc	У
10 dB/div Log	Ref 10.	.00 di	Bm	IFGain:L	ow	#Atten: 3	0 ab		Mł	(r1 8.39	91 5 GHz .01 dBm	Auto 1	Гune
0.00												Center 5.500000000	
-20.0											DL1 -13.00 dBm	Start 1.000000000	
-30.0										1		Stop 10.000000000	
-50.0												CF 900.000000 <u>Auto</u>	Step 0 MHz Mar
70.0												Freq O	Offse 0 Hi
-80.0 Start 1.00	0 GH7									Stop 1	0.000 GHz	Scale ⁻	Type <u>Lin</u>
#Res BW				#	VBW	3.0 MHz		S	weep 15	.60 ms (18001 pts)		

Plot 7-52. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)

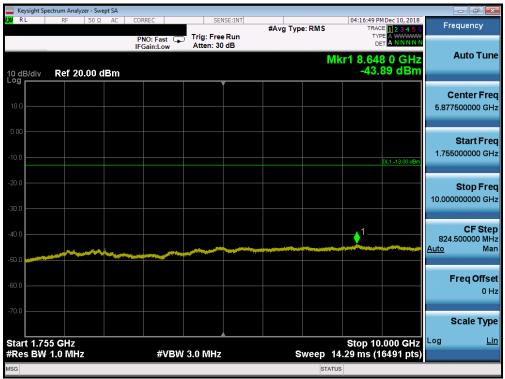
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 12 of 107
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AWS WCDMA Mode

	ctrum Analyzer - Swept SA	A Contraction of the second seco				
LX// RL	RF 50 Ω A(SENSE:INT	#Avg Type: RMS	04:16:33 PM Dec 10, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
		PNO: Fast G	Atten: 30 dB		DETANNNN	Auto Tune
10 dB/div Log	Ref 20.00 dBn	n		IVI	kr1 1.705 0 GHz -31.11 dBm	
						Center Freq
10.0						867.500000 MHz
0.00						Start Freq
-10.0					DL1 -13.00 dBm	30.000000 MHz
-20.0						
					1	Stop Fred 1.705000000 GHz
-30.0						
-40.0						CF Step 167.500000 MHz
-50.0		President of the state of the s	er genergel for finderstation of the state o			<u>Auto</u> Man
-60.0						Freq Offset
-70.0						0 Hz
-70:0						Scale Type
Start 0.03			· · · · · · · · · · · · · · · · · · ·		Stop 1.7050 GHz	Log <u>Lin</u>
#Res BW	1.0 MHz	#VBV	V 3.0 MHz	Sweep :	2.233 ms (3351 pts)	

Plot 7-53. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)



Plot 7-54. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyzer - Sw	ept SA									
LX/IRL	RF 50 Ω	AC	CORREC	SE	NSE:INT	#Avg Type	e: RMS	TRACI	Dec 10, 2018	Fre	quency
			PNO: Fast IFGain:Low	Trig: Fre Atten: 2				TYP DE			
10 dB/div Log	Ref 10.00 (dBm					Mkı	1 17.018 -45.7	3 0 GHz 79 dBm		Auto Tune
0.00											e nter Freq 000000 GHz
-10.0									DL1 -13.00 dBm		Start Freq 000000 GHz
-30.0							1				Stop Freq 000000 GHz
-50.0										1.000 <u>Auto</u>	CF Step 000000 GHz Man
-70.0										F	req Offsel 0 Hz
-80.0											cale Type
Start 10.0 #Res BW			#VB	SW 3.0 MHz	,		ween 24	Stop 20. 5.33 ms (20	000 GHz	Log	Lin
MSG	1.0 10112		#00	W 5.0 WH2		3	STATU		oor pis)		



Plot 7-56. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	pectrum Analyz											-	
LX/IRL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	e: RMS		06 PM Dec 10, 2018 TRACE 1 2 3 4 5 6	Freq	uency
				PNO: Fa	ast 🖵	Trig: Fre Atten: 30		• ,,					
				IFGain:L	.ow	Atten: 5	Jub		N	Akr1 Q	699 5 GHz	A	uto Tune
10 dB/div Log	Ref 20.	.00 dE	Зm							-4	3.81 dBm		
209												Cei	nter Freq
10.0													00000 GHz
0.00												S	tart Freq
-10.0													00000 GHz
-10.0											DL1 -13.00 dBm		
-20.0												S	top Freq
													00000 GHz
-30.0													
-40.0										1			CF Step
40.0												824.50 Auto	00000 MHz Man
-50.0	and the second s												
												Ere	eq Offset
-60.0													0 Hz
-70.0													
												Sc	ale Type
Start 1.7	55 CH7									Stop	10.000 GHz	Log	Lin
	55 GHZ / 1.0 MHz			#	¢VBW	3.0 MHz		s	weep	ຣເວຍ 14.29 <u>m</u> s	(16491 pts)		
MSG									STA				

Plot 7-57. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)



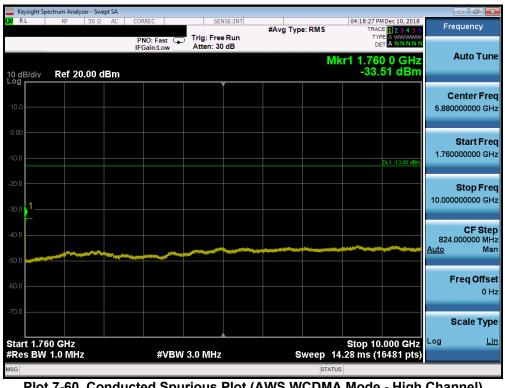
Plot 7-58. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 46 of 107
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	ectrum Analyzer - S									-	
LXI RL	RF 50	Ω AC	CORREC	SENS	E:INT	#Avg Typ	e: RMS		Dec 10, 2018	Freq	uency
			PNO: Fast 😱	Trig: Free Atten: 30 o		• ,,		TYP			
			IFGain:Low	Atten: 30 t	U.		ML	(r1 1.59		A	uto Tune
10 dB/div Log	Ref 20.00	dBm						-47.	63 dBm		
				Ĭ						Ce	nter Freg
10.0											00000 MHz
0.00										9	tart Freq
-10.0											00000 MHz
-10.0									DL1 -13.00 dBm		
-20.0											top Freq
											00000 GHz
-30.0											
											CF Step
-40.0									▲1	168.00 Auto	0000 MHz
-50.0	and and the state of the state	and a state of the	and the second secon	and the second	-					Auto	Man
										Er	eq Offset
-60.0										- FI	0 Hz
-70.0										Sc	ale Type
Start 0.03 #Res BW			#\/D\M	3.0 MHz			Sween_2	Stop 1.7	'100 GHz 3361 pts)	Log	Lin
#Res DW	1.0 MHZ		#VDVV	3.0 WHZ			sweep 2		JJUT PLS)		
							UNATUR				

Plot 7-59. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)



Plot 7-60. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 47 of 107
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	ectrum Analy:	zer - Swep	ot SA										
XI RL	RF	50 Ω	AC	CORREC	ast 🗔	Trig: Fre		#Avg Typ	e: RMS		6 PM Dec 10, 2018 RACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Freque	ncy
10 dB/div	Ref 10	.00 dl	Bm	IFGain:L	ow	Atten: 2	0 dB		M	kr1 16.9 -4	84 5 GHz 5.83 dBm	Aut	o Tune
0.00												Cent 15.000000	e r Fred 000 GH:
20.0											DL1 -13.00 dBm	Sta 10.000000	irt Fre 000 GH
40.0									1			Sto 20.000000	р Fre 000 GH
50.0												C 1.0000000 <u>Auto</u>	F Stej 000 GH Mai
70.0												Frec	Offse
-80.0						3.0 MHz				Stop	20.000 GHz	Sca Log	le Type <u>Lir</u>
#Res BW	T.U WIHZ				ABW	3.0 IWH2			stat		(20001 pts)		

Plot 7-61. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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ISG							STATUS				
Res BW			#VBW	/ 3.0 MHz			Sweep 2.4	300 1.8 20 ms (3	450 GHZ 3631 pts)		
Start 0.030								Stop 1.9	450 GHz	Log	Li
/ 0.0										S	cale Typ
70.0											
50.0										Fi	r eq Offs ۱۰
50.0 	^{ير} المريدية الشيها المحاجبة في ^{العر} اب الم	وې يې د نېستورنو دو. نور ور		الاست شام معريد المعريد.	a fanginga (ay an Pilanda (ay ang	and a protocol of the second sec					
								Company of the second	and the sector of the sector	Auto	Ma
\$0.0										101 6	CF Ste
30.0											
									1		Stop Fre
20.0											
10.0									DL1 -13.00 dBm	30.0	000000 MH
0.00										;	Start Fre
10.0											enter Fre
0 dB/div	Ref 20.00 (dBm						-29.0			
		_					Mkr	1 1.845	i 0 GHz 31 dBm	4	Auto Tun
			NO: Fast 🗔 Gain:Low	Trig: Free Atten: 30				TYP			
(<mark>RL</mark>	RF 50 Ω	AC COI	RREC		ISE:INT	#Avg Typ	e: RMS	TRACE	Dec 10, 2018	Free	quency
	trum Analyzer - Sw									_	- 0

Plot 7-62. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)



Plot 7-63. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyze											
LXU RL	RF	50 Ω AC	CORREC		SE	NSE:INT	#Avg Typ	e: RMS		PM Dec 10, 2018 ACE 1 2 3 4 5 6	Fr	equency
			PNO: IFGain	Fast 😱 :Low	Trig: Fre Atten: 20				Т	YPE A WWWWW DET A NNNNN		
10 dB/div Log	Ref 10.	00 dBm						Mk	r1 16.98 -45	39 5 GHz .65 dBm		Auto Tune
0.00												enter Freq
-10.0										DL1 -13.00 dBm	10.000	Start Freq
-30.0											20.000	Stop Freq
-40.0								1			1.000 <u>Auto</u>	CF Step 0000000 GHz Man
-60.0												Freq Offset 0 Hz
-80.0												Scale Type
Start 10.0 #Res BW				#VBW	3.0 MHz		s	weep 2	Stop 2 5.33 ms (0.000 GHz 20001 pts)	Log	Lin
MSG								STATI	JS			

Plot 7-64. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)



Plot 7-65. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyze											×
LXI RL	RF	50 Ω AC	C COR	REC	SE	NSE:INT	#Avg Typ			M Dec 10, 2018 CE 1 2 3 4 5 6	Frequenc	У
			P	IO: Fast 🗔	Trig: Fre		#///g i yp	e. 14115	TY	PE A WWWWW ET A NNNNN		
			IFO	Gain:Low	Atten: 3	0 dB					Auto T	Tuno
								Mk	(r1 8.67	55GHz	Autor	lune
10 dB/div Log	Ref 20.0	00 dBn	n						-44.	02 dBm		
						Ť					Center	From
10.0											5.955000000	
											0.00000000	0112
0.00												
											Start	
-10.0										DL1 -13.00 dBm	1.91000000) GHz
										DET -15.00 UDII		
-20.0											Stop	Fred
											10.000000000	
-30.0												, one
												-
-40.0									⊢_ ≜ ¹ ──		809.000000	Step
									-		Auto	Man
-50.0					<u> </u>							
											Freq O	ffset
-60.0										+		0 Hz
-70.0											Sector	Tume
											Scale 1	ype
Start 1.91	0 GHz								Stop 10	0.000 GHz	Log	Lin
#Res BW				#VBW	/ 3.0 MHz	4	S	weep 14	.02 ms (1	6181 pts)		
MSG								STATUS	5			

Plot 7-66. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)



Plot 7-67. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyzer -									- 6 -
LXU RL	RF 5	0Ω AC	CORREC	SEN	SE:INT	#Avg Typ	e: RMS		MDec 10, 2018	Frequency
			PNO: Fast 😱 IFGain:Low	Trig: Free Atten: 30		0 ,1		TYF		
10 dB/div Log	Ref 20.0	0 dBm					M	kr1 1.60 -47.	0 5 GHz 59 dBm	Auto Tun
10.0										Center Fre 940.000000 MH
-10.0									DL1 -13.00 dBm	Start Fre 30.000000 MH
-20.0										Stop Fre 1.850000000 GH
-40.0				ووالاستعادية والمحافظ والمحافظ		and an inclusion of the main states	1999 ^{al} - 1999 July (1999 - 1999)	1 	und der an freihoften für fan	CF Ste 182.000000 MH <u>Auto</u> Ma
-60.0										Freq Offse 0 H
-70.0										Scale Typ
Start 0.03 #Res BW			#VBW	3.0 MHz			Sweep 2	Stop 1.8 2.427 ms (3500 GHz 3641 pts)	Log <u>Li</u>
MSG							STATU			

Plot 7-68. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)



Plot 7-69. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	ectrum Analyz	zer - Swep	it SA									X
XI RL	RF	50 Ω	AC	CORREC	ast 🖵	Trig: Fre	#Avg Typ	e:RMS	т	2 PM Dec 10, 2018 RACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	Frequenc	су
10 dB/div	Ref 10	.00 di	Bm	IFGain:L	.ow	Atten: 2		M		29 5 GHz 5.76 dBm	Auto	Tune
0.00											Center 15.00000000	
-10.0										DL1 -13.00 dBm	Start 10.00000000	
40.0								1			Stop 20.00000000	
50.0											CF 1.00000000 <u>Auto</u>	Stej 0 GH Mai
70.0											Freq C	Offse 0 H
-80.0						0.0.000			Stop	20.000 GHz	Scale	Type Lir
#Res BW	T.U IVIHZ			*	VBW	3.0 MH;		SWEED 2		(20001 pts)		

Plot 7-70. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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7.4 Band Edge Emissions at Antenna Terminal

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 $43 + 10\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 - 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 \geq 3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average
- 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

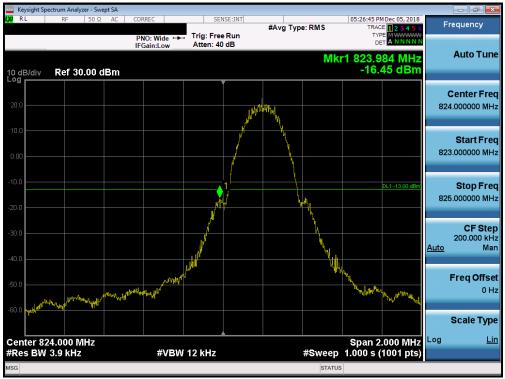
Test Notes

Per and 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.

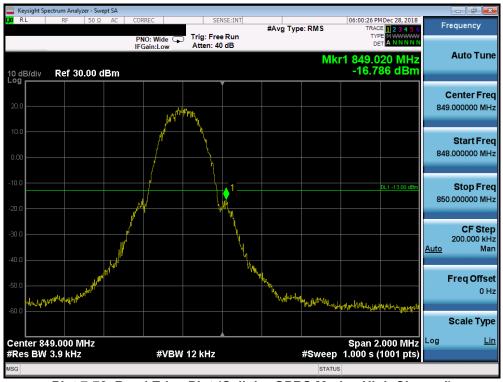
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 54 of 107
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Cellular GPRS Mode



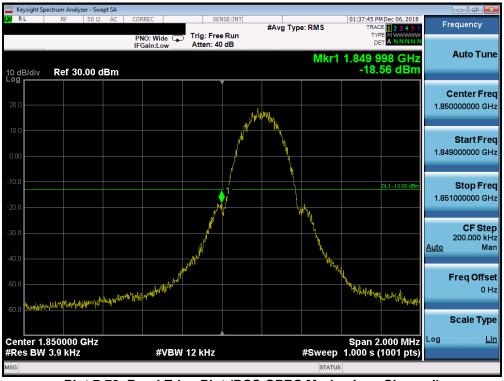
Plot 7-71. Band Edge Plot (Cellular GPRS Mode - Low Channel)



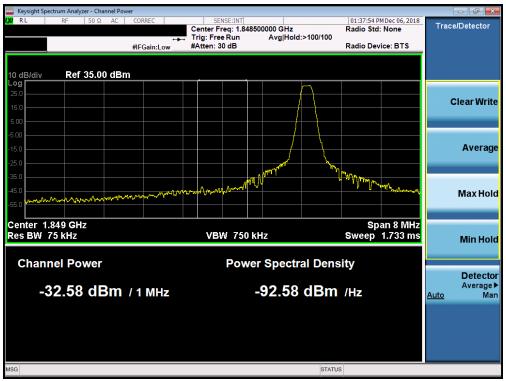
Plot 7-72. Band Edge Plot (Cellular GPRS Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 55 of 107
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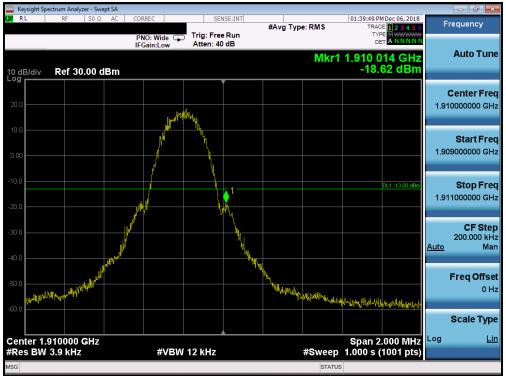
Plot 7-73. Band Edge Plot (PCS GPRS Mode - Low Channel)



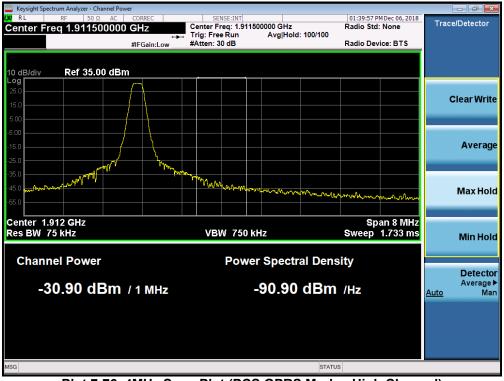
Plot 7-74. 4MHz Span Plot (PCS GPRS Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Plot 7-75. Band Edge Plot (PCS GPRS Mode - High Channel)

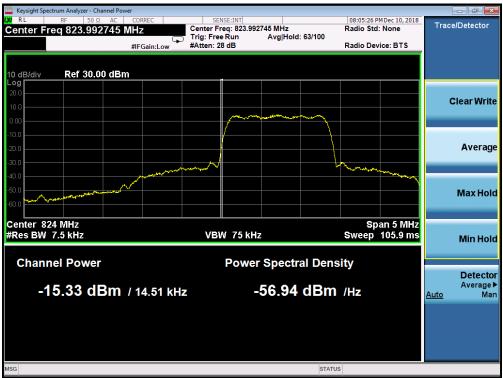


Plot 7-76. 4MHz Span Plot (PCS GPRS Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Cellular CDMA Mode



Plot 7-77. Band Edge Plot (Cellular CDMA Mode - Low Channel)



Plot 7-78. 4MHz Span Plot (Cellular CDMA Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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	1/0044/40/0040			









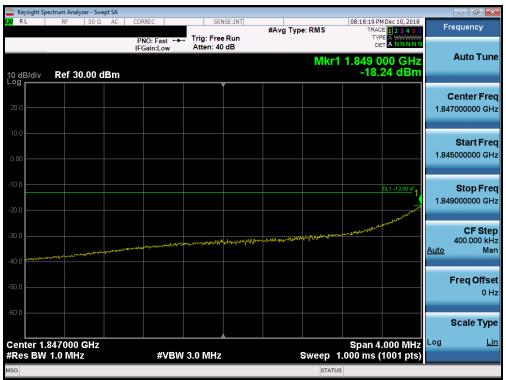
Plot 7-80. 4MHz Span Plot (Cellular CDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-81. Band Edge Plot (PCS CDMA Mode - Low Channel)



Plot 7-82. 4MHz Span Plot (PCS CDMA Mode - Low Channel)

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PNO: Wide IFGain:Low Trig: Free Run Atten: 40 dB #Avg Type: RMS TRACE 12.3.4.5 M Frequency 10 dE/div Ref 30.00 dBm		ctrum Analyzer											
Instant words Mkr1 1.910 000 GHz Auto T 0 dB/div Ref 30.00 dBm -33.162 dBm Center I 20	XI RL	RF	50Ω AI	PNO:	Wide 🕟	Trig: Free	Run	#Avg Typ	e: RMS	TRAC	E 1 2 3 4 5 6	F	requency
200 200 200 200 200 200 200 200	10 dB/div	Ref 30.0	00 dBn		n:Low	Atten: 40	dB		Mkr1	1.910 (00 GHz		Auto Tun
Start F 0.00 0.111300.000 100 0.111300.000 200 0.111300.000 30.0 0.111300.000 40.0 0.01110000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.0 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00 0.000 60.00	20.0												Center Fre 0000000 GH
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300 40.0 Auto 500.000 50.0 40.0 Freq OI Freq OI 60.0 Image: Span S.000 MHz Span S.000 MHz Log											DL1 -13.00 dBm	1.91	Stop Fre 2500000 GH
Senter 1.910000 GHz Span 5.000 MHz	n	_~~				manan	1					<u>Auto</u>	CF Ste 500.000 kH Ma
Center 1.910000 GHz Span 5.000 MHz								- Maria	war have been been been been been been been be	and the second s	9		FreqOffse 0⊦
	50.0												Scale Typ
	Res BW		Hz		#VBW	47 kHz			Sweep 2	Span 5 27.33 ms (.000 MHz (1001 pts)	Log	Li

Plot 7-83. Band Edge Plot (PCS CDMA Mode - High Channel)



Plot 7-84. 4MHz Span Plot (PCS CDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 01 -6 107
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Cellular WCDMA Mode



Plot 7-85. Band Edge Plot (Cellular WCDMA Mode - Low Channel)



Plot 7-86. Band Edge Plot (Cellular WCDMA Mode - High Channel)

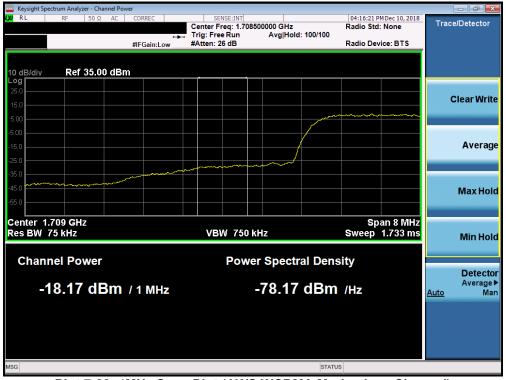
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 62 of 107
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AWS WCDMA Mode



Plot 7-87. Band Edge Plot (AWS WCDMA Mode - Low Channel)



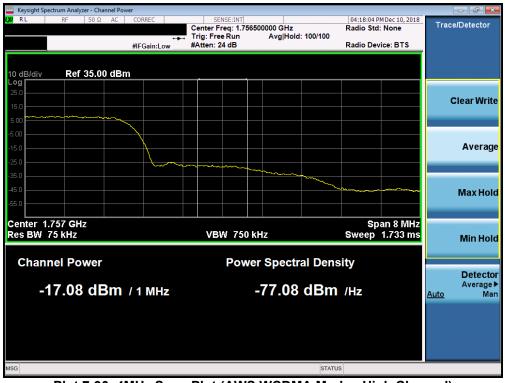
Plot 7-88. 4MHz Span Plot (AWS WCDMA Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	E LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 62 of 107	
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🦲 Keysight Spectrum Analyzer - Swept	t SA			
RL RF 50 Ω	AC CORREC SE PNO: Fast Frig: Fre IFGain:Low Atten: 4		04:17:55 PM Dec 10, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN	Frequency
10 dB/div Ref 30.00 dE			Mkr1 1.755 000 GHz -15.95 dBm	Auto Tune
20.0				Center Fred 1.755000000 GHz
0.00				Start Fred 1.747500000 GH:
-10.0		1	DL1 -13.00 dBm	Stop Fred 1.762500000 GH:
-30.0			M.	CF Stej 1.500000 MH <u>Auto</u> Ma
-50.0			man	Freq Offse 0 H
-60.0				Scale Typ
Center 1.755000 GHz #Res BW 100 kHz	#VBW 300 kHz	2 S	Span 15.00 MHz Sweep 1.867 ms (1001 pts)	Log <u>Lir</u>
MSG			STATUS	

Plot 7-89. Band Edge Plot (AWS WCDMA Mode - High Channel)



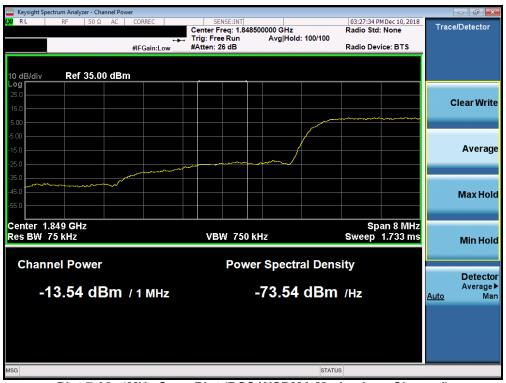
Plot 7-90. 4MHz Span Plot (AWS WCDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type: Portable Handset		Daga 64 of 107	
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Plot 7-91. Band Edge Plot (PCS WCDMA Mode - Low Channel)



Plot 7-92. 4MHz Span Plot (PCS WCDMA Mode - Low Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 65 of 107
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	ectrum Analyzer - S	wept SA									- # ×
X/RL	RF 50	Ω AC	CORREC			#Avg Typ	e: RMS	TR/	PM Dec 10, 2018 ACE 1 2 3 4 5 6 APE A WWWWWW DET A N N N N N	Fr	equency
10 dB/div Log	Ref 30.00	dBm	IFGain:Low	Atten: 40			Mkr	1 1.910	000 GHz .36 dBm		Auto Tune
20.0											Center Fred
0.00		/ mm	and the second second							1.90	Start Fred 2500000 GH2
-10.0					1				DL1 -13.00 dBm	1.91	Stop Fred 7500000 GH2
30.0					Mon	www.www.	non the second	an - no from the bar		1 <u>Auto</u>	CF Stej .500000 MH Mar
50.0									~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		F req Offse 0 H
-60.0	910000 GH	z						Span	15.00 MHz		Scale Type <u>Lir</u>
	100 kHz		#VB	№ 300 kHz			Sweep	1.867 ms	15.00 MHz (1001 pts)		
ISG							STAT	US			

Plot 7-93. Band Edge Plot (PCS WCDMA Mode - High Channel)



Plot 7-94. 4MHz Span Plot (PCS WCDMA Mode - High Channel)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved 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 D01 v03r01 - 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.

Test Setup

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



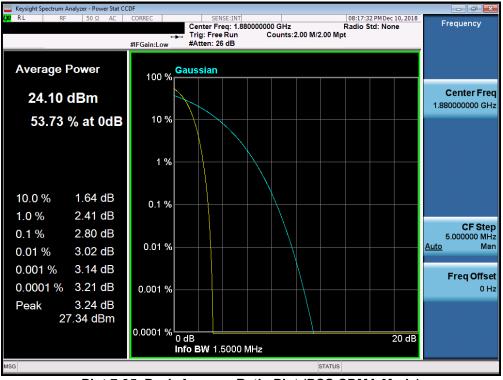
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

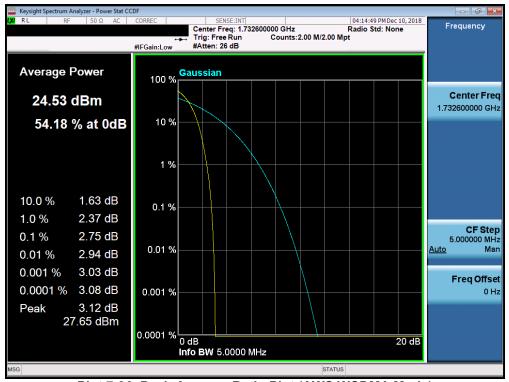
None

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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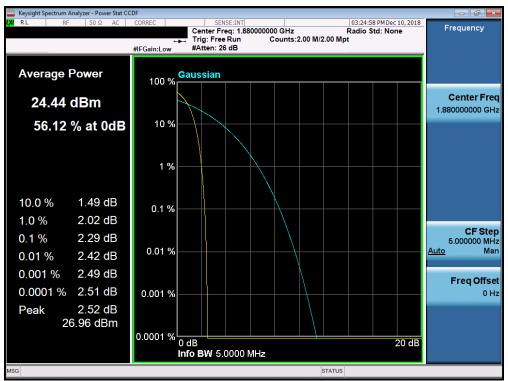




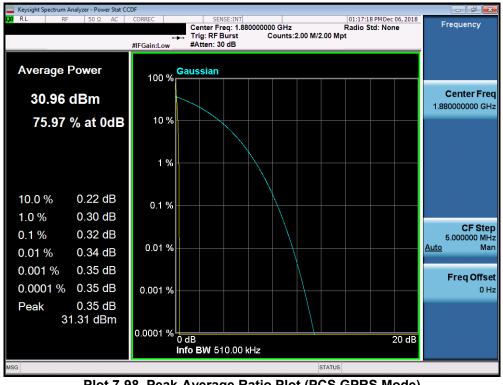
Plot 7-96. Peak-Average Ratio Plot (AWS WCDMA Mode)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 69 of 107
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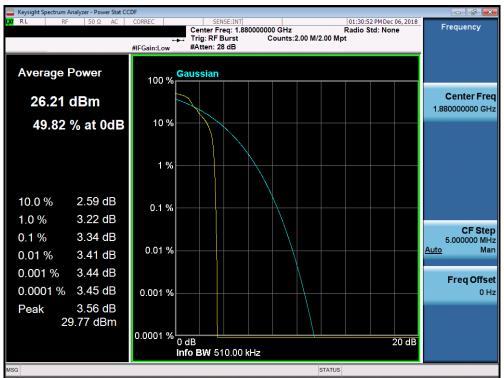




Plot 7-98. Peak-Average Ratio Plot (PCS GPRS Mode)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 60 of 107
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Plot 7-99. Peak-Average Ratio Plot (PCS EDGE Mode)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 70 of 107
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7.6 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 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 and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 - Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

- 1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \geq 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points \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".
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
- 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.

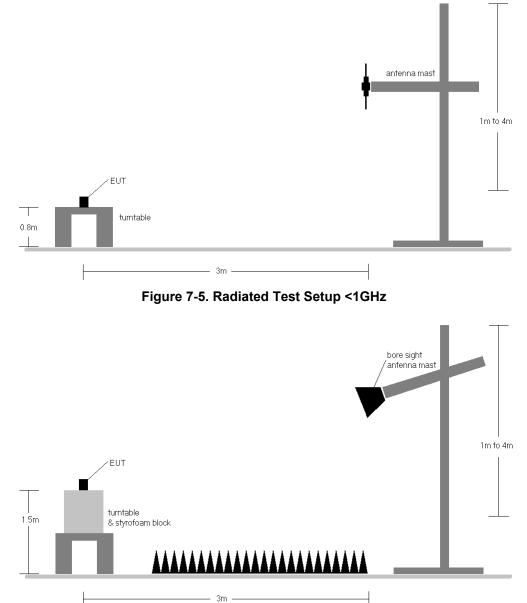


Figure 7-6. Radiated Test Setup >1GHz

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This device was employs CDMA technology and was tested under all RC and SO combinations. 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.

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.20	GPRS850	V	135	329	20.54	6.75	25.14	0.327	38.45	-13.31	27.29	0.536	40.61	-13.32
836.60	GPRS850	V	239	239	21.39	6.78	26.02	0.400	38.45	-12.44	28.17	0.656	40.61	-12.44
848.80	GPRS850	V	255	234	22.06	6.80	26.71	0.469	38.45	-11.74	28.86	0.769	40.61	-11.75
848.80	GPRS850	н	122	298	21.78	6.80	26.43	0.440	38.45	-12.02	28.58	0.721	40.61	-12.03
848.80	EDGE850	V	255	234	18.29	6.80	22.94	0.197	38.45	-15.51	25.09	0.323	40.61	-15.51

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

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	[dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	CDMA850	V	136	257	11.76	6.75	16.36	0.043	38.45	-22.09	18.51	0.071	40.61	-22.10
836.52	CDMA850	V	136	237	12.53	6.78	17.16	0.052	38.45	-21.30	19.31	0.085	40.61	-21.30
848.31	CDMA850	V	133	270	11.95	6.80	16.60	0.046	38.45	-21.85	18.75	0.075	40.61	-21.86
836.52	CDMA850	Н	209	285	12.46	6.78	17.09	0.051	38.45	-21.37	19.24	0.084	40.61	-21.37

Table 7-3. ERP/EIRP (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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
826.40	WCDMA850	V	240	107	13.03	6.76	17.64	0.058	38.45	-20.82	19.79	0.095	40.61	-20.82
836.60	WCDMA850	V	236	146	13.50	6.78	18.13	0.065	38.45	-20.33	20.28	0.107	40.61	-20.33
846.60	WCDMA850	V	238	121	13.00	6.80	17.65	0.058	38.45	-20.80	19.80	0.095	40.61	-20.81
836.60	WCDMA850	Н	119	290	12.72	6.78	17.35	0.054	38.45	-21.11	19.50	0.089	40.61	-21.11

Table 7-4. ERP/EIRP (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	V	118	37	14.88	8.16	23.04	0.201	30.00	-6.96
1732.60	WCDMA1700	V	108	48	15.55	8.18	23.73	0.236	30.00	-6.27
1752.60	WCDMA1700	V	108	49	15.05	8.20	23.25	0.212	30.00	-6.75
1732.60	WCDMA1700	н	180	31	14.91	8.18	23.09	0.204	30.00	-6.91

Table 7-5. EIRP (AWS WCDMA)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900	V	146	115	21.26	8.37	29.63	0.918	33.01	-3.38
1880.00	GPRS1900	V	108	95	21.45	8.41	29.86	0.969	33.01	-3.15
1909.80	GPRS1900	V	100	69	20.99	8.46	29.45	0.881	33.01	-3.56
1880.00	GPRS1900	н	100	20	21.41	8.41	29.82	0.960	33.01	-3.19
1880.00	EDGE1900	V	108	95	15.24	8.41	23.65	0.232	33.01	-9.36

Table 7-6. EIRP (PCS GPRS)

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	V	100	82	12.25	8.46	20.71	0.118	33.01	-12.30
1880.00	CDMA1900	V	120	56	12.30	8.59	20.89	0.123	33.01	-12.12
1908.75	CDMA1900	V	100	56	11.74	8.72	20.46	0.111	33.01	-12.55
1880.00	CDMA1900	Н	102	369	11.76	8.59	20.35	0.108	33.01	-12.66

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	100	23	14.96	8.37	23.33	0.215	33.01	-9.68
1880.00	WCDMA1900	Н	151	100	14.36	8.41	22.77	0.189	33.01	-10.24
1907.60	WCDMA1900	Н	113	9	14.66	8.46	23.12	0.205	33.01	-9.89
1852.40	WCDMA1900	V	104	62	13.93	8.37	22.30	0.170	33.01	-10.71

Table 7-8. EIRP (PCS WCDMA)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 - Section 5.8

ANSI/TIA-603-E-2016 - Section 2.2.12

Test Settings

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

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EUT turntable 8. styrofoam block 3m

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

Figure 7-7. Test Instrument & Measurement Setup

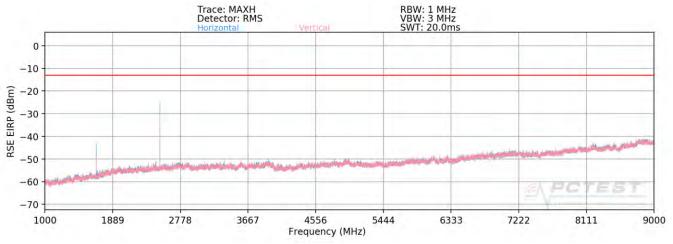
Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This device was employs CDMA technology and was tested under all RC and SO combinations. 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) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

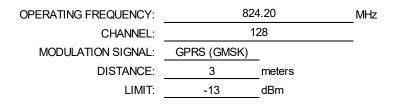
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Cellular GPRS Mode



Plot 7-100. Radiated Spurious Emission Plot >1GHz (Cellular GPRS Mode)

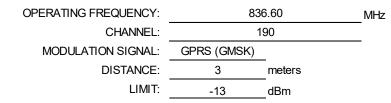


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1648.40	V	395	276	-40.81	3.61	-37.21	-24.2
2472.60	V	165	132	-35.80	4.21	-31.58	-18.6
3296.80	V	144	95	-62.74	5.77	-56.96	-44.0
4121.00	V	-	-	-69.11	7.59	-61.52	-48.5
4945.20	V	-	-	-68.74	8.56	-60.18	-47.2

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

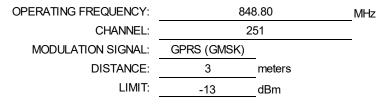
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 79 of 107
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.20	V	391	305	-42.36	3.62	-38.74	-25.7
2509.80	V	217	240	-44.25	4.34	-39.91	-26.9
3346.40	V	122	129	-56.08	5.92	-50.16	-37.2
4183.00	V	387	269	-38.76	7.70	-31.06	-18.1
5019.60	V	137	176	-64.86	8.56	-56.30	-43.3
5856.20	V	117	274	-50.46	8.87	-41.59	-28.6
6692.80	V	114	290	-65.50	8.92	-56.58	-43.6
7529.40	V	398	292	-43.39	8.46	-34.93	-21.9
8366.00	V	339	57	-64.17	8.99	-55.19	-42.2

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



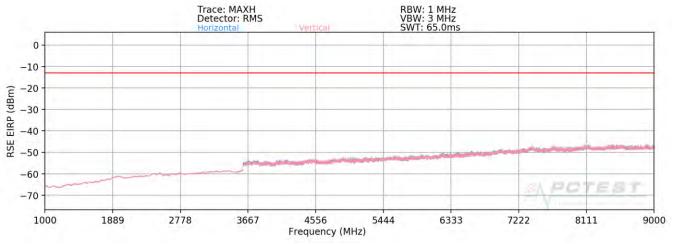
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1697.60	V	367	289	-44.96	3.63	-41.33	-28.3
2546.40	V	105	300	-36.62	4.56	-32.06	-19.1
3395.20	V	153	205	-56.59	6.14	-50.46	-37.5
4244.00	V	397	271	-38.29	7.80	-30.50	-17.5
5092.80	V	130	79	-58.87	8.64	-50.23	-37.2
5941.60	V	118	92	-46.58	8.83	-37.75	-24.8
6790.40	V	113	53	-65.51	8.82	-56.69	-43.7
7639.20	V	116	69	-38.08	8.54	-29.54	-16.5
8488.00	V	-	-	-63.49	9.03	-54.45	-41.5

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

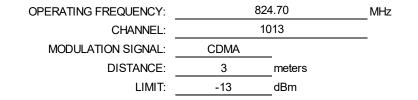
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 70 of 107	
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Cellular CDMA Mode

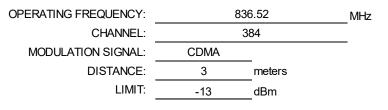






Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1649.40	Н	164	102	-65.61	3.61	-62.01	-49.0
2474.10	Н	133	37	-59.54	4.22	-55.32	-42.3
3298.80	Н	-	-	-65.93	5.78	-60.15	-47.2

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



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]	Margin [dB]
1673.04	Н	179	164	-66.71	3.62	-63.09	-50.1
2509.56	Н	110	41	-62.56	4.33	-58.22	-45.2
3346.08	Н	-	-	-64.90	5.92	-58.98	-46.0

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:				Dege 90 of 107
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 OPERATING FREQUENCY:
 848.31
 MHz

 CHANNEL:
 777

 MODULATION SIGNAL:
 CDMA

 DISTANCE:
 3
 meters

 LIMIT:
 -13
 dBm

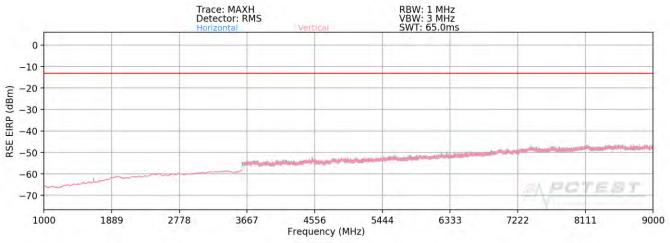
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1696.62	Н	127	170	-63.78	3.63	-60.15	-47.1
2544.93	Н	-	-	-66.26	4.55	-61.72	-48.7

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

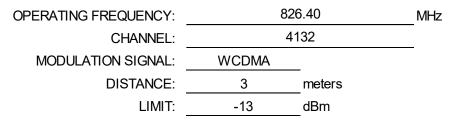
FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 91 of 107
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Cellular WCDMA Mode



Plot 7-102. Radiated Spurious Emission Plot >1GHz (Cellular WCDMA Mode)



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]	Margin [dB]
1652.80	V	116	99	-65.73	3.61	-62.12	-49.1
2479.20	V	-	-	-66.24	4.23	-62.01	-49.0

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 92 of 107	
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OPERATING FREQUENCY:	83	6.60	MHz
CHANNEL:	4	183	_
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]	Margin [dB]
1673.20	V	100	97	-67.25	3.62	-63.63	-50.6
2509.80	V	-	-	-65.93	4.34	-61.59	-48.6

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

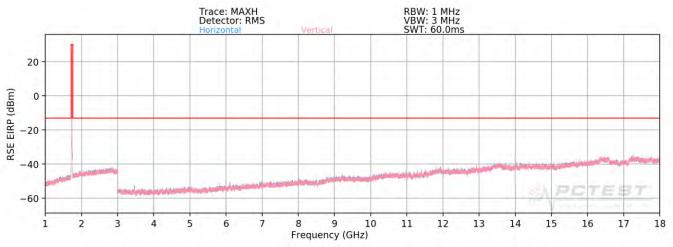
OPERATING FREQUENCY:	84	6.60	MHz
CHANNEL:	42	233	_
MODULATION SIGNAL:	WCDMA	_	_
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]	Margin [dB]
1693.20	V	-	-	-68.46	3.63	-64.83	-51.8
2539.80	V	-	-	-66.56	4.52	-62.04	-49.0

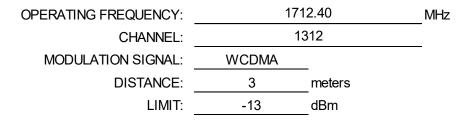
Table 7-17. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 92 of 107
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Plot 7-103. Radiated Spurious Emission Plot >1GHz (AWS WCDMA Mode)

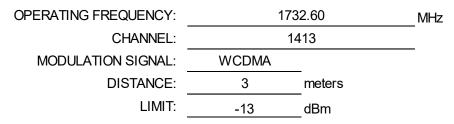


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3424.80	V	151	259	-64.80	6.20	-58.60	-45.6
5137.20	V	-	-	-68.09	8.66	-59.43	-46.4

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 94 of 107
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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]	Margin [dB]
3465.20	V	108	71	-64.44	6.27	-58.17	-45.2
5197.80	V	-	-	-67.93	8.71	-59.22	-46.2

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

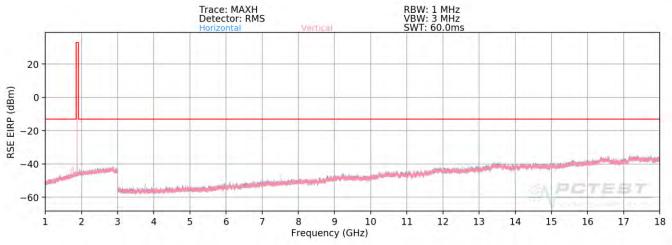
OPERATING FREQUENCY:	175	52.60	MHz
CHANNEL:	1	513	
MODULATION SIGNAL:	WCDMA	_	_
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]	Margin [dB]
3505.20	V	110	76	-65.28	6.34	-58.94	-45.9
5257.80	V	-	-	-67.72	8.72	-59.00	-46.0

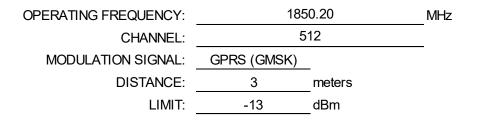
Table 7-20. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 95 of 107
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Plot 7-104. Radiated Spurious Emission Plot >1GHz (PCS GPRS Mode)



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]	Margin [dB]
3700.40	Н	175	57	-55.19	6.89	-48.30	-35.3
5550.60	Н	325	114	-57.98	9.02	-48.96	-36.0
7400.80	Н	-	-	-56.57	9.21	-47.36	-34.4

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dege 96 of 107	
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OPERATING FREQUENCY:	188	30.00	MHz
CHANNEL:	6	61	
MODULATION SIGNAL:	GPRS (GMSK)	_	_
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequen [MHz]	-	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.0	0	Н	144	19	-54.70	6.93	-47.77	-34.8
5640.0	0	Н	207	272	-58.56	9.15	-49.41	-36.4
7520.0	0	Н	-	-	-55.78	9.31	-46.46	-33.5

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

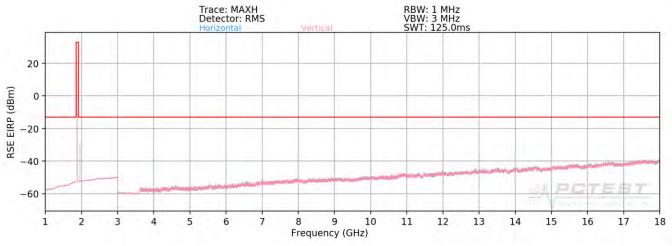
OPERATING FREQUENCY:	190	9.80	MHz
CHANNEL:	8	510	_
MODULATION SIGNAL:	GPRS (GMSK)		
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

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]	Margin [dB]
3819.60	Н	163	37	-55.22	7.11	-48.12	-35.1
5729.40	Н	350	329	-58.65	9.03	-49.62	-36.6
7639.20	Н	-	-	-57.66	9.29	-48.37	-35.4

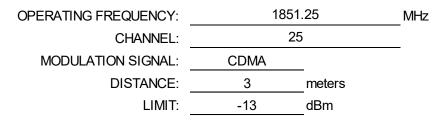
Table 7-23. Radiated Spurious Data (PCS GPRS Mode – Ch. 810)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dege 97 of 107	
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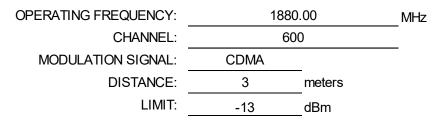


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3702.50	V	-	-	-66.73	6.56	-60.16	-47.2
5553.75	V	-	-	-66.74	8.72	-58.01	-45.0

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dege 99 of 107	
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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]	Margin [dB]
3760.00	V	-	-	-66.93	6.67	-60.26	-47.3
5640.00	V	-	-	-68.02	8.81	-59.20	-46.2

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

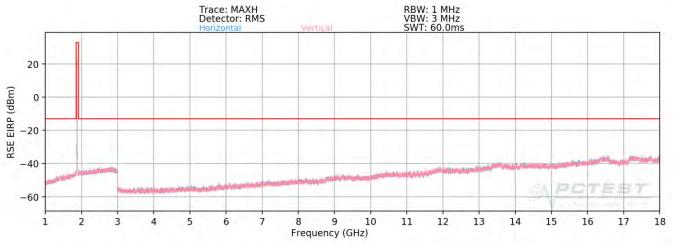
OPERATING FREQUENCY:	1908	.75 MHz
CHANNEL:	117	5
MODULATION SIGNAL:	CDMA	_
DISTANCE:	3	meters
LIMIT:	-13	dBm
		-

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]	Margin [dB]
3817.50	V	-	-	-66.86	6.98	-59.88	-46.9
5726.25	V	-	-	-67.61	8.77	-58.84	-45.8

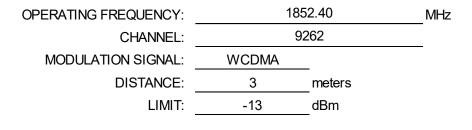
Table 7-26. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Plot 7-106. Radiated Spurious Emission Plot >1GHz (PCS WCDMA Mode)



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]	Margin [dB]
3704.80	V	-	-	-67.14	6.57	-60.57	-47.6
5557.20	V	-	-	-66.34	8.72	-57.62	-44.6

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
Test Report S/N: Test Dates:		EUT Type:		Dega 00 of 107	
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OPERATING FREQUENCY:	188	0.00	MHz
CHANNEL:	94	400	
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]	Margin [dB]
3760.00	V	-	-	-67.23	6.67	-60.56	-47.6
5640.00	V	-	-	-67.27	8.81	-58.45	-45.5

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

OPERATING FREQUENCY:	190	7.60	MHz
CHANNEL:	95	538	
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]	Margin [dB]
3815.20	V	343	303	-66.92	6.97	-59.95	-46.9
5722.80	V	-	-	-67.04	8.77	-58.27	-45.3

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 01 of 107	
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Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. 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.

Test Procedure Used

ANSI/TIA-603-E-2016

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	190	_
REFERENCE VOLTAGE:	3.80	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	836,599,873	-127	-0.0000151
100 %		- 20	836,599,852	-148	-0.0000177
100 %		- 10	836,599,952	-48	-0.0000057
100 %		0	836,599,877	-123	-0.0000147
100 %		+ 10	836,599,994	-6	-0.0000007
100 %		+ 20	836,599,882	-118	-0.0000141
100 %		+ 30	836,599,997	-3	-0.0000004
100 %		+ 40	836,599,929	-71	-0.0000085
100 %		+ 50	836,599,898	-102	-0.0000122
BATT. ENDPOINT	3.40	+ 20	836,599,934	-66	-0.0000079

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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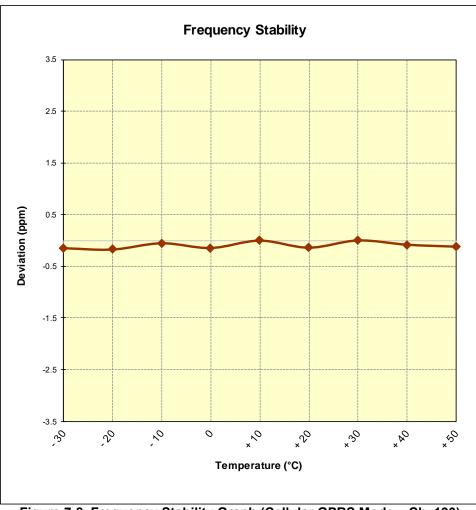


Figure 7-8. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: Test Dates:		EUT Type:		Dega 04 of 107
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836,520,000	Hz
384	
3.80	VDC
± 0.00025 % or 2.5 ppm	
	384

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	836,519,919	-81	-0.0000097
100 %		- 20	836,519,820	-180	-0.0000215
100 %		- 10	836,519,911	-89	-0.0000107
100 %		0	836,519,858	-142	-0.0000170
100 %		+ 10	836,519,868	-132	-0.0000158
100 %		+ 20	836,519,891	-109	-0.0000130
100 %		+ 30	836,519,807	-193	-0.0000231
100 %		+ 40	836,519,881	-119	-0.0000142
100 %		+ 50	836,519,977	-23	-0.0000027
BATT. ENDPOINT	3.40	+ 20	836,519,969	-31	-0.0000037

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 05 of 107
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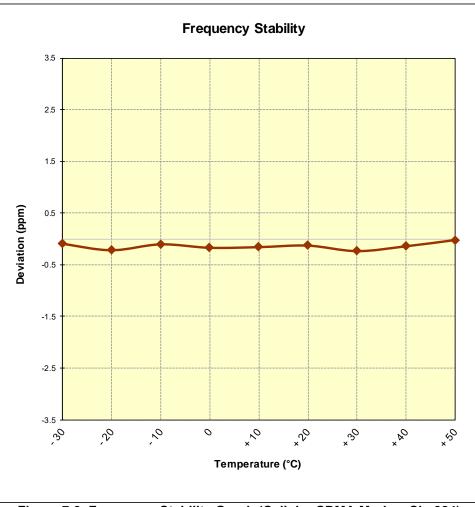


Figure 7-9. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 06 of 107
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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	4183	_
REFERENCE VOLTAGE:	3.80	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	836,599,909	-91	-0.0000108
100 %		- 20	836,599,865	-135	-0.0000162
100 %		- 10	836,599,848	-152	-0.0000182
100 %		0	836,599,889	-111	-0.0000133
100 %		+ 10	836,599,831	-169	-0.0000202
100 %		+ 20	836,599,910	-90	-0.0000107
100 %		+ 30	836,599,834	-166	-0.0000198
100 %		+ 40	836,599,917	-83	-0.0000099
100 %		+ 50	836,599,822	-178	-0.0000212
BATT. ENDPOINT	3.40	+ 20	836,599,832	-168	-0.0000200

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

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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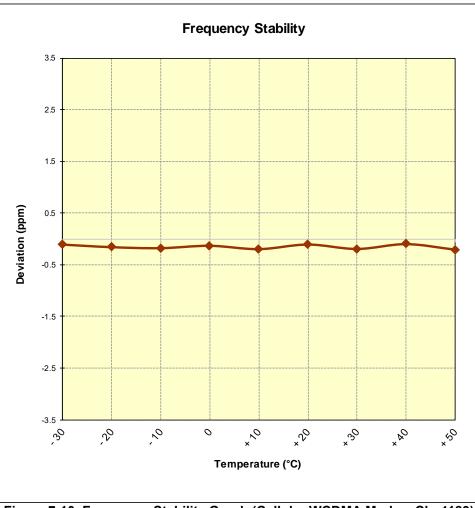


Figure 7-10. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,732,600,000	Hz
CHANNEL:	1413	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,732,599,959	-41	-0.0000024
100 %		- 20	1,732,599,892	-108	-0.0000062
100 %		- 10	1,732,599,803	-197	-0.0000114
100 %		0	1,732,599,891	-109	-0.0000063
100 %		+ 10	1,732,599,974	-26	-0.0000015
100 %		+ 20	1,732,599,887	-113	-0.0000065
100 %		+ 30	1,732,599,841	-159	-0.0000092
100 %		+ 40	1,732,599,875	-125	-0.0000072
100 %		+ 50	1,732,599,901	-99	-0.0000057
BATT. ENDPOINT	3.40	+ 20	1,732,599,905	-95	-0.0000055

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 in-band 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: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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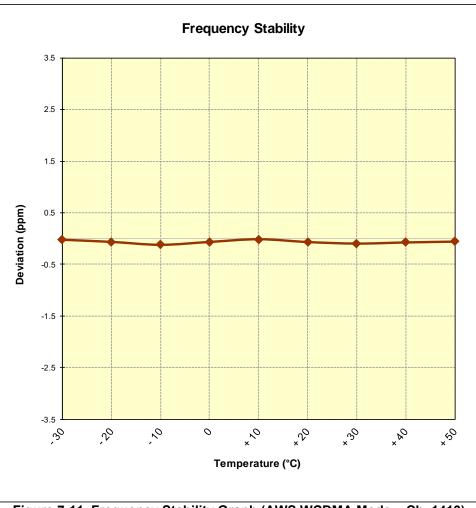


Figure 7-11. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	661	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,879,999,973	-27	-0.0000015
100 %		- 20	1,879,999,823	-177	-0.0000094
100 %		- 10	1,879,999,937	-63	-0.0000033
100 %		0	1,879,999,893	-107	-0.0000057
100 %		+ 10	1,879,999,914	-86	-0.0000046
100 %		+ 20	1,879,999,950	-50	-0.0000027
100 %		+ 30	1,879,999,828	-172	-0.0000091
100 %		+ 40	1,879,999,813	-187	-0.0000099
100 %		+ 50	1,879,999,845	-155	-0.000082
BATT. ENDPOINT	3.40	+ 20	1,879,999,932	-68	-0.0000036

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

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band 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: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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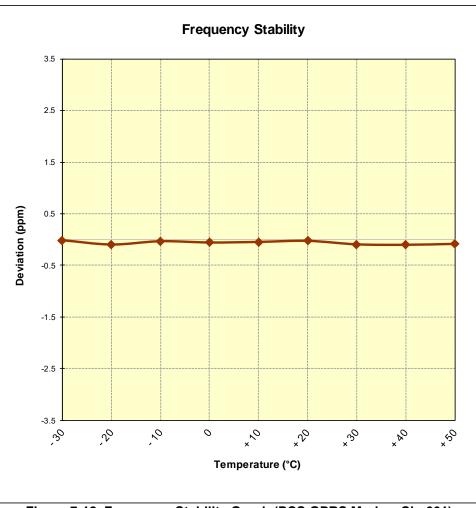


Figure 7-12. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	600	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,879,999,905	-95	-0.0000051
100 %		- 20	1,879,999,835	-165	-0.000088
100 %		- 10	1,879,999,948	-52	-0.0000027
100 %		0	1,879,999,981	-19	-0.0000010
100 %		+ 10	1,879,999,973	-27	-0.0000014
100 %		+ 20	1,879,999,946	-54	-0.0000029
100 %		+ 30	1,879,999,964	-36	-0.0000019
100 %		+ 40	1,879,999,873	-127	-0.000068
100 %		+ 50	1,879,999,982	-18	-0.0000009
BATT. ENDPOINT	3.40	+ 20	1,879,999,931	-69	-0.0000037

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 in-band 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: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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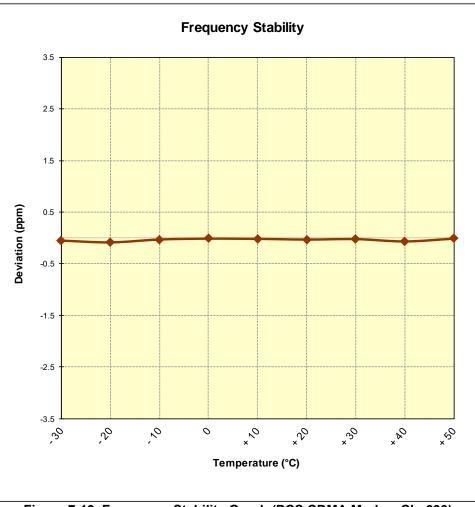


Figure 7-13. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	9400	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,879,999,908	-92	-0.0000049
100 %		- 20	1,879,999,900	-100	-0.0000053
100 %		- 10	1,879,999,810	-190	-0.0000101
100 %		0	1,879,999,977	-23	-0.0000012
100 %		+ 10	1,879,999,920	-80	-0.0000043
100 %		+ 20	1,879,999,805	-195	-0.0000104
100 %		+ 30	1,879,999,907	-93	-0.0000049
100 %		+ 40	1,879,999,923	-77	-0.0000041
100 %		+ 50	1,879,999,833	-167	-0.000089
BATT. ENDPOINT	3.40	+ 20	1,879,999,814	-186	-0.0000099

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 in-band 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: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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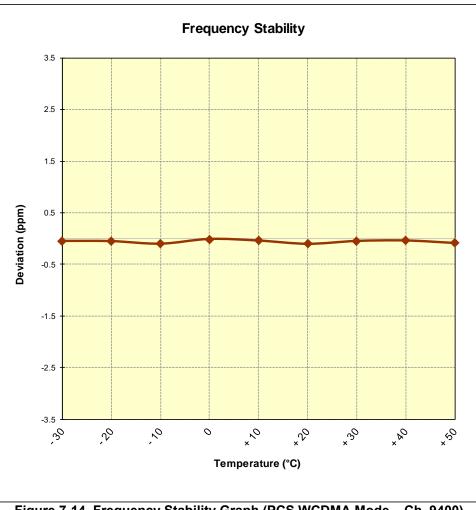


Figure 7-14. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the LGE Portable Handset FCC ID: ZNFL423DL complies with all the requirements of Part 22, 24, & 27 of the FCC Rules.

FCC ID: ZNFL423DL		MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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