

PCTEST

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MEASUREMENT REPORT GSM / GPRS / EDGE / WCDMA

Applicant Name:

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

Date of Testing:

02/12 - 03/13/2020 **Test Site/Location:** PCTEST Lab. Columbia, MD, USA **Test Report Serial No.:** 1M2002110017-03.ZNF

FCC ID: IC:

ZNFQ630UM

Certification

2703C-Q630UM

APPLICANT:

LG Electronics USA, Inc.

Application Type: Model/HVIN: Additional Model(s)/HVIN(s): EUT Type: FCC Classification: FCC Rule Part(s): ISED Specification: Test Procedure(s):

LM-Q630UM LMQ630UM, Q630UM Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 22, 24, & 27 RSS-132, RSS-133, RSS-139 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.

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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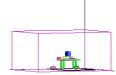


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			Ef	RP	EI	RP	
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	Emission Designator
GPRS850	22H	824.2 - 848.8	0.435	26.38	0.713	28.53	245KGXW
EDGE850	22H	824.2 - 848.8	0.143	21.54	0.234	23.69	249KG7W
WCDMA850	22H	826.4 - 846.6	0.063	18.02	0.104	20.17	4M19F9W
WCDMA1700	27	1712.4 - 1752.6			0.308	24.89	4M18F9W
GPRS1900	24E	1850.2 - 1909.8			1.373	31.38	245KGXW
EDGE1900	24E	1850.2 - 1909.8			0.331	25.20	242KG7W
WCDMA1900	24E	1852.4 - 1907.6			0.377	25.76	4M19F9W

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 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 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 **LG Portable Handset FCC ID: ZNFQ630UM**. 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.: 02232, 01515, 03032, 02513

2.2 Device Capabilities

This device contains the following capabilities:

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

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 EMI Suppression Device(s)/Modifications

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

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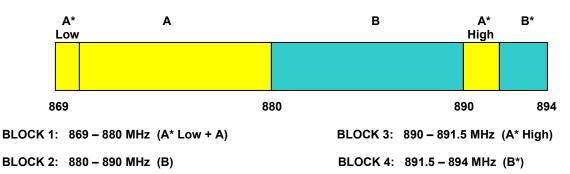
3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

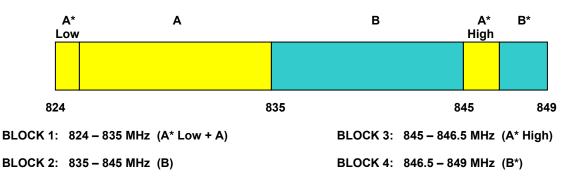
The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure.....None

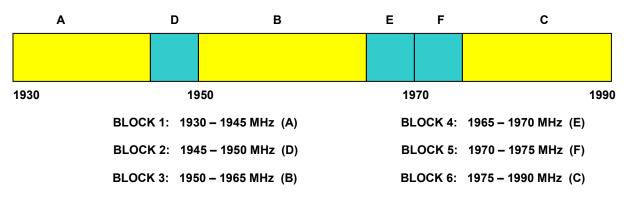
3.2 Cellular - Base Frequency Blocks



3.3 Cellular - Mobile Frequency Blocks

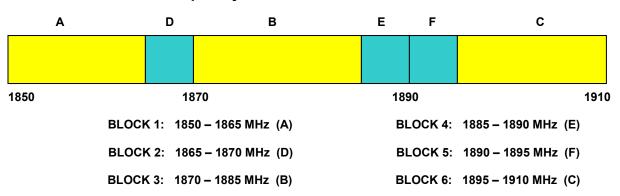


3.4 PCS - Base Frequency Blocks



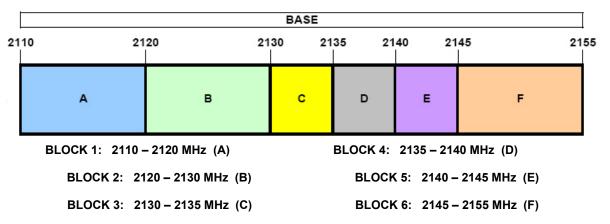
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3.5 PCS - Mobile Frequency Blocks





3.7 AWS - Mobile Frequency Blocks

				MOBILE				
17	10	1	720 17 	7 30 17	'35 17 	40 17	45	1755
		A	в	с	D	E	F	
			710 – 1720 MHz (A) 720 – 1730 MHz (B)				1740 MHz (D) 1745 MHz (E)	
		BLOCK 3: 17	730 – 1735 MHz (C)		BLOCK	6: 1745 –	1755 MHz (F)	

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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	6/3/2019	Annual	6/3/2020	LTx3
-	LTx4	Licensed Transmitter Cable Set	6/4/2019	Annual	6/4/2020	LTx4
Agilent	N9030A	PXA Signal Analyzer (44GHz)	6/12/2019	Annual	6/12/2020	MY52350166
COM-Power	AL-130R	Active Loop Antenna	8/22/2019	Annual	8/22/2020	121085
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	6/7/2018	Triennial	6/7/2021	9203-2178
Espec	ESX-2CA	Environmental Chamber	6/13/2019	Annual	6/13/2020	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	4/19/2019	Annual	4/19/2020	11401010036
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		
Rohde & Schwarz	CMW500	Radio Communication Tester	8/26/2019	Annual	8/26/2020	100976
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	6/5/2019	Annual	6/5/2020	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	10/16/2019	Annual	10/16/2020	101716
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	5/6/2019	Annual	5/6/2020	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/11/2019	Annual	7/11/2020	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/8/2019	Annual	7/8/2020	102133
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/9/2019	Annual	7/9/2020	102138
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Test Antenna	7/16/2018	Biennial	7/16/2020	101073
Rohde & Schwarz	TC-TA18	Vivaldi Antenna	8/17/2018	Biennial	8/17/2020	101072
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

Notes:

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

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6.0 SAMPLE CALCULATIONS

GSM Emission Designator

Emission Designator = 250KGXW

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

EDGE Emission Designator

Emission Designator = 250KG7W

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

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:	ZNFQ630UM
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM / GPRS / EDGE / 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 + 10 log 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	- Ν/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	Frequency Stability <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			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 + 10 log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "2G/3G Automation," Version 4.2.

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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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Plot 7-3. Occupied Bandwidth Plot (PCS GPRS Mode)



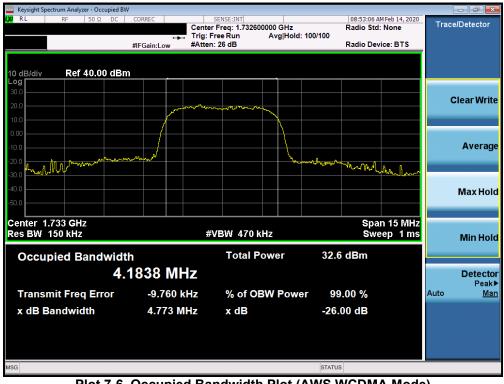
Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode)

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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 BW				
XIRL RF 50Ω DC	Trig:	SENSE:INT ter Freq: 1.880000000 GHz : Free Run Avg Hold: 10 en: 26 dB	09:04:16 AM Feb 14, 2020 Radio Std: None 00/100 Radio Device: BTS	Trace/Detector
10 dB/div Ref 40.00 dBm				
30.0 20.0 10.0		man whoman and		Clear Write
20.0 			-n-un Atra proving the second	Averag
40.0				Max Hol
Center 1.88 GHz Res BW 150 kHz		#VBW 470 kHz	Span 15 MHz Sweep 1 ms	Min Hol
Occupied Bandwidth 4.1	1 886 MHz	Total Power	32.6 dBm	Detecto
Transmit Freq Error	-6.508 kHz	% of OBW Power	99.00 %	Auto <u>Ma</u>
x dB Bandwidth	4.792 MHz	x dB	-26.00 dB	
6G			STATUS	

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

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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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 10GHz for Cell, 20GHz for AWS, 20GHz for PCS (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

Test Notes

Per 24.238(b), 27.53(h)(3), and RSS-133(6.5), RSS-139(6.5), compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz, and 100 kHz or greater for Part 22 and RSS-132 measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

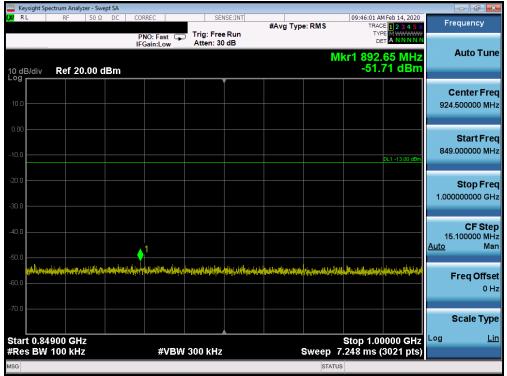
FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Cellular GPRS Mode

	nt Spectrum Ana	lyzer - Swep	ot SA									
L <mark>XI</mark> RL	RF	50 Ω		PNO: Fast		NSE:INT	#Avg Typ	e: RMS	TRAC	MFeb 14, 2020 E 1 2 3 4 5 6 E M WWWW	Fre	equency
10 dB/di Log r	iv Ref 2	0.00 dl		Figain:Low	Atten: 3			M	DE kr1 823.	00 MHz 30 dBm		Auto Tune
10.0												enter Fred 500000 MH
-10.0										DL1 -13.00 dBm	30.	Start Free 000000 MH
-20.0										1	823.	Stop Fre 000000 МН
-40.0											79. <u>Auto</u>	CF Stej 300000 MH Ma
-60.0 *****	n time (1917) server (1912) In the server are coming for the server	ang din pang	Herblinser gewande Minister gewande	gaa ally baby ally paratic frantsissio	Daarde yn Urymeine gynte denn meg yn yn annel an trifferin denna		ayıl talıkın kunditaril Yer	a general di pana dagi ng da Gana dagi ng da Gana dagi ng da	graphic out out the Normalis		F	F req Offse 0 H
-70.0												Scale Type
	0.0 MHz W 100 kH	7		#VI	300 kHz	,		ween 38	Stop 8	23.0 MHz 5861 pts)	Log	<u>Lir</u>
WSG				<i>"</i> • I	500 KH2			STATUS		soor pisj		

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

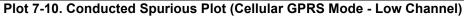


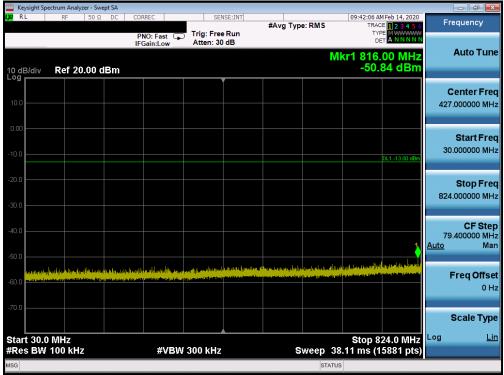
Plot 7-9. Conducted Spurious Plot (Cellular GPRS Mode - Low Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dara 40 af 07
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	pectrum Analyzer - Sw										
LXU RL	RF 50 Ω	P	RREC NO: Fast Gain:Low			#Avg Typ	e: RMS	TYPE	eb 14, 2020 1 2 3 4 5 6 M WWWWW A N N N N N	Free	quency
10 dB/div Log	Ref 10.00 (Gam.Low				MI	(r1 9.238 -26.69	5 GHz 9 dBm	Ļ	Auto Tune
0.00											enter Fred 000000 GHz
-10.0									1 -13.00 dBm		Start Free 000000 GH:
-30.0	A pre principal de la constante				Vivin				nya kanga (Alter Kanaling da diken		Stop Fred
-50.0										900.0 <u>Auto</u>	CF Stej 000000 MH Mai
-50.0										FI	r eq Offse 0 H
-80.0											cale Typ
Start 1.0 #Res BW	00 GHz / 1.0 MHz		#VBW	3.0 MHz		s	weep 15	Stop 10.0 6.60 ms (180	00 0112	Log	Lir
MSG							STATUS	3			





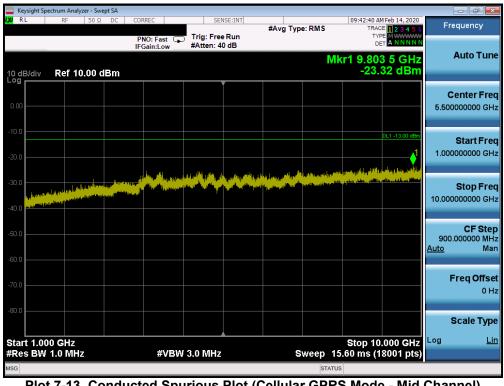
Plot 7-11. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	oectrum Analyzer - S	wept SA									×
LXI RL	RF 50	Ω DC CC	ORREC	SEN	ISE:INT	#Avg Typ	e: RMS		M Feb 14, 2020	Frequency	
		F IF	PNO: Fast 🖵 Gain:Low	Trig: Free Atten: 30				TYP De			
10 dB/div Log	Ref 20.00	dBm					N	lkr1 901. -52.	20 MHz 54 dBm	Auto Tu	une
10.0										Center F 924.500000 M	
-10.0									DL1 -13.00 dBm	Start Fi 849.000000 N	
-20.0										Stop F i 1.000000000 C	
-40.0			1							CF Si 15.100000 M <u>Auto</u> M	
-60.0	havellopeisticenseel	nanenni feilinin dal	rescharter and	a iley for the second	erenden fan fregeren fere	and a factor of the second	istyle officiate	nin in the share of the second se	tion with the post of the post	Freq Off 0	f set DHz
-70.0										Scale Ty	ype
	4900 GHz 100 kHz		#VBW	300 kHz			Sweep	Stop 1.00 7.248 ms (0000 GHz 3021 pts)	-	Lin
MSG							STATU				

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



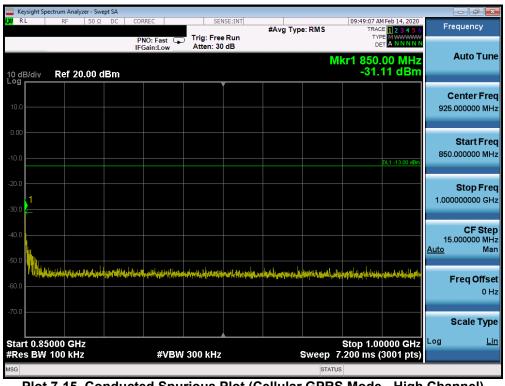
Plot 7-13. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 97
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	ectrum Analyzer										
XI RL	RF	50Ω DC	CORREC	Trig: Free		#Avg Type	RMS	TRAC	Feb 14, 2020 1 2 3 4 5 6 M M N N N N	Freque	ncy
10 dB/div Log	Ref 20.0	0 dBm	IFGain:Low	Atten: 30	dB		Mk	r1 761.		Aut	o Tun
10.0										Cent 427.0000	er Fre DOO MH
10.00									DL1 -13.00 dBm	Sta 30.0000	I rt Fre DOO MH
20.0 30.0										Sto 824.0000	р Fre 000 МН
40.0									<u>↓</u> 1	79.4000 <u>Auto</u>	F Ste 000 M⊢ Ma
60.0 <mark>Alyalaala</mark>	(haf þas far þaða það það den skur skill för skill för skill skill för skill skill för skill skill skill skill Letter skill ski Letter skill sk	ol MyKill (<mark>han k</mark> i Kupa Jalah ata ng mugana	hilessen meder på sky kryter nyturg i skreden av plangen av s	e (normal) og år from etter år atterne 1. mars og afterne atterne for atterne atterne atterne atterne atterne atterne atterne atterne atterne atterne 1. mars og atterne atte	and Station Independent	runsen länden på på på Här angend av ersenader	tyn op norm pydat Nyw op norm	na propositi da de California Processione e since de colos		Fred	Offso 0 ⊦
-70.0) MHz							Stop 8	24.0 19112	Log	le Typ <u>Li</u>
	100 kHz		#VBW	/ 300 kHz		S		11 ms (1	5881 pts)		
SG							STATUS				

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



Plot 7-15. Conducted Spurious Plot (Cellular GPRS Mode - High Channel)

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Keysig	ght Spectrum	Analyzer - Swe	ept SA								
X/RL	RI	50 Ω	DC	CORREC	Tria:	SENSE:INT	#Avg Type	RMS	TRAC	M Feb 14, 2020 CE 1 2 3 4 5 6 DE M WWWW	Frequency
				PNO: Fast IFGain:Lov		en: 36 dB					Auto Tur
10 dB/c	div Re	f 15.00 c	∄Bm					IVIR	(r1 7.24) -27.	8 5 GHz 60 dBm	
5.00											Center Fre 5.50000000 G
-5.00											
-15.0										DL1 -13.00 dBm	Start Fre 1.000000000 GF
-25.0 —								1			Stop Fre
-35.0 —			- Training and and and a					الأولية الإيمانية ومراقعة والم الأفاس محالية مريد مكاني	a an	And Harden Brand Market Principal Annual Market	10.000000000 GF
-45.0	-u-u-u-u-u-u-u-u-u-u-u-u-u-u-u-u-u-u-u	and the second	Number of States								CF Ste 900.000000 MI
-55.0											<u>Auto</u> Ma
-65.0											Freq Offs
-75.0											
	4 0 0 0	-							84.5.5.40		Scale Typ
	1.000 GI BW 1.0			#V	BW 3.0 N	IHz	Si	weep 15	Stop 10 6.60 ms (1	.000 GHz 8001 pts)	
MSG								STATUS	3		

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

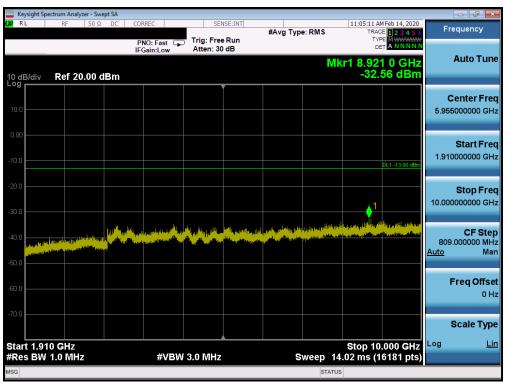
FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 97
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PCS GPRS Mode

🔤 Keysight Spectrum Analyzer - Sv					
(XU RL RF 50 Ω	PNO: Fast	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	11:04:45 AM Feb 14, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWWW DFT A N N N N N	Frequency
10 dB/div Ref 20.00	IFGain:Low	Atten: 30 dB	M	kr1 1.758 5 GHz -41.08 dBm	Auto Tune
10.0					Center Fred 937.500000 MH
-10.0				DL1 -13.00 dBm	Start Fre 30.000000 MH
-20.0					Stop Fre 1.845000000 GH
-40.0	فالمتعاد والمتعاد والمتعاد والمتعاد والمعاد والمعادية والمعادة والمعادة والمعادة والمعادة والمعادة والمعاد والم	ge dal disease for the state of a part from	a state for the second state of	1 hy ny diasa ay fitti katining metanan katin katina	CF Ste 181.50000 MH <u>Auto</u> Ma
60.0					Freq Offse 0 ⊦
-70.0					Scale Typ
Start 0.0300 GHz #Res BW 1.0 MHz	#VB\	V 3.0 MHz	Sweep 2	Stop 1.8450 GHz 2.420 ms (3631 pts)	Log <u>Li</u> i
MSG			STATU	s	

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



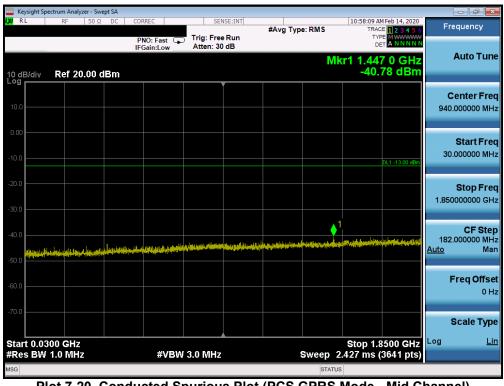
Plot 7-18. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 04 af 07
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PNO: Fast Trig: Free Run Atten: 20 dB #Avg Type: RMS Trace [] 28 4567 Trace [] 28 4567 Frequency 0 dB/div Ref 10.00 dBm -37.90 dBm -37.90 dBm -37.90 dBm 0 dB/div Ref 10.00 dBm -37.90 dBm -37.90 dBm -37.90 dBm 0 dB/div Ref 10.00 dBm -31.10000 -31.10000 -31.10000 -31.10000 0 dB/div Ref 10.00 dBm -31.10000 -31.10000 -31.10000 -31.10000 0 dB/div -31.10000 -31.10000 -31.10000 -31.10000 -31.10000 0 dB/div -31.10000 -31.10000 -31.10000 -31.10000 -31.10000 0 dB/div -31.1000 -31.1000 -31.10000 -31.10000 -31.10000 0 dB/div -31.1000 -31.1000 -31.100000 -31.100000 -31.		pectrum Analyz	er - Swept SA						
Inclusion Mikr1 19.502 0 GHz -37.90 dBm Auto Turn 0 dB/div Ref 10.00 dBm -37.90 dBm Center Fre 0 dB/div Ref 10.00 dBm -37.90 dBm Center Fre 0 dB/div Ref 10.00 dBm -37.90 dBm Center Fre 0 dB/div Ref 10.00 dBm -37.90 dBm Start Fre 0 dB/div Ref 10.00 dBm -37.90 dBm Start Fre 0 dB/div Ref 10.00 dBm -37.90 dBm Start Fre 0 dB/div -37.90 dBm -37.90 dBm Start Fre 10.00000000 GF -37.90 dBm -37.90 dBm -37.90 dBm 0 dB/div -37.90 dBm -37.90 dBm	LXI RL	RF	50 Ω DC	PNO: Fast	Trig: Free R	#Avg T un	ype: RMS	TRACE 1 2 3 4 5 6	Frequency
0.000 Image: Center Free 0.000000000 Image: Center Free 0.000000000 Image: Center Free 0.000000000 Image: Center Free 0.0000000000 Image: Cen	10 dB/div	Ref 10	.00 dBm	IFGain:Low	Atten: 20 di	3	Mk	r1 19.502 0 GHz	Auto Tune
Start Fre 10.00000000 GH Start 10.000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Start	0.00								Center Fre 15.000000000 GH
1 1	20.0							DL1 -13.00 dBm	
500 500 500 500 500 500 500 500	-30.0	ut.e. 1		مەنلىپ	المتعادية إحتاج وقالتها فيقتعه	hlen bi spoulen biskel sitseen.	ەلەرلەرىلى ۋەراھى بىرىيەر	1	
tart 10.000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 17.33 ms (20001 pts)	50.0 H			N. AND ADDRESS OF					1.000000000 GH
tart 10.000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 17.33 ms (20001 pts)	70.0								
	Start 10.0							Stop 20.000 GHZ	
	#Res BW	1.0 MHz		#VB\	V 3.0 MHz				

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



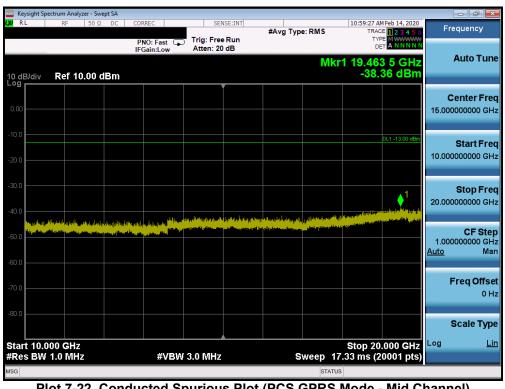
Plot 7-20. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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🔤 Keysight Sp	ectrum Analyze	er - Swept SA								
XI RL	RF	50 Ω DC	PNO: Fast	Trig: Free		#Avg Typ	e: RMS	TRAC	4 Feb 14, 2020 E 1 2 3 4 5 6 E M M A N N N N	Frequency
10 dB/div Log	Ref 20.	00 dBm	IFGain:Low _	Atten: 30	dB		MI	kr1 9.69		Auto Tune
10.0										Center Free 5.955000000 GH
-10.0									DL1 -13.00 dBm	Start Free 1.910000000 GH
-20.0									1	Stop Free 10.000000000 GH
-40.0	a a a a a a a a a a a a a a a a a a a						an falour fal de la constance. Per se constance en la constanc		Ang pad Apag pilana an Nang sang paganakaharat	CF Step 809.000000 MH <u>Auto</u> Mar
-60.0										Freq Offse 0 H
-70.0								Oton 40		Scale Type
Start 1.9′ #Res BW			#VB	W 3.0 MHz		S	weep 14	stop 10 4.02 ms (1		
MSG							STATU	s		

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



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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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🔤 Keysight S	pectrum Analyze	er - Swept SA									×
LXU RL	RF	50 Ω DC	CORREC		Run	#Avg Typ	e: RMS	TRAC	M Feb 14, 2020 E 1 2 3 4 5 6 E M WWWW A N N N N N	Frequency	y
10 dB/div	Ref 20.	00 dBm	IFGain:Low	Atten: 30	dB		Μ	kr1 1.62		Auto T	une
10.0										Center I 940.000000	
-10.0									DL1 -13.00 dBm	Start I 30.000000	
-20.0										Stop I 1.85000000	
-40.0	kolmatel an de sta	n an	handisitel factoria and the fill	n a stal a st	lassa lit pitati asta	ing a state of the second s	a ang a fa a basa pang	1 Anggelamatabilishin	Aliter and the state of the sta	CF \$ 182.000000 <u>Auto</u>	
-60.0										Freq Of	ffsel 0 Hz
-70.0	300 GHz							Stop 1 8	3500 GHz	Scale T	Гуре Lin
	1.0 MHz		#VB	№ 3.0 MHz			Sweep	2.427 ms (3641 pts)		
MSG							STAT	JS			

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



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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		D
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	Spectrum Ana	ilyzer - Swe	pt SA									_	- ē 🔀
RL	RF	50 Ω	DC	CORREC PNO: F	ast 🖵	Trig: Free #Atten: 3		#Avg Typ	e: RMS	TRAC	M Feb 14, 2020 CE 1 2 3 4 5 6 PE M WWWWW T A N N N N N	Freq	uency
0 dB/div	Ref 1	0.00 d	Bm	IFGallit	.ow	#Atten: 0			Mkr	1 19.58	2 0 GHz 74 dBm	A	uto Tun
og													nter Fre 00000 GH
20.0											DL1 -13.00 dBm		Start Fre 00000 G⊢
1 A 4	and the product of the second s	10 11 10	Teng (g ^{an} tiper Staat (gan gan gan gan gan gan gan gan gan gan	frage fille Maria and a second		lenger og som	yani ilayyawani waina waini ilay	na fel fan fel ferste fel fan stik synge In Stevel af fan skil sen sjere af stere sjere	la _{se} ter fra Nagara (1994) General Statistica	anders and the second sec	rajat dini ang		Stop Fre 00000 G⊦
i0.0												1.0000 <u>Auto</u>	CF Ste 00000 GH Ma
0.0												Fr	e q Offs 0 H
:0.0	.000 GH	7								Stop 20	.000 GHz	So Log	ale Typ: L
	V 1.0 MI			;	≠vBW :	3.0 MHz		5	weep 17	.33 ms (2	0001 pts)		
G									STATUS	5			

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

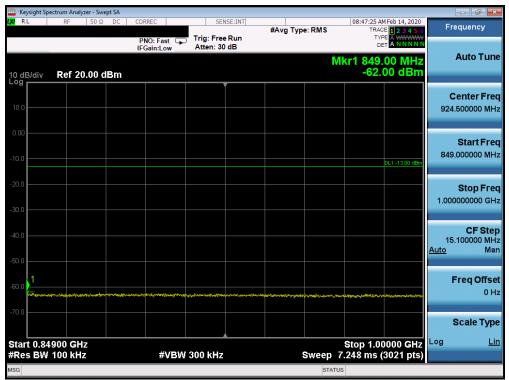
FCC ID: ZNFQ630UM	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Cellular WCDMA Mode

	ctrum Analyzer - Swept S					- 6 -
X/RL	RF 50Ω D	PNO: Fast	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	08:47:18 AM Feb 14, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN	Frequency
10 dB/div	Ref 20.00 dBi		Autor of dB	N	lkr1 822.05 MHz -33.58 dBm	Auto Tun
10.0						Center Fre 426.500000 MH
10.00					DL1 -13.00 dBm	Start Fre 30.000000 M⊦
20.0 30.0 					1	Stop Fre 823.000000 M⊦
40.0						CF Ste 79.300000 MH <u>Auto</u> Ma
60.0		and for the state of the state		and a subscription of the product of the subscription of the subsc		Freq Offs 0 H
-70.0						Scale Typ
Start 30.0 Res BW		#VBV	V 300 kHz	Sweep 3	Stop 823.0 MHz 8.06 ms (15861 pts)	Log <u>L</u> i
ISG				STATU	IS	

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



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

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ctrum Analyze	er - Swept	t SA									_	J X
XI RL	RF	50 Ω	DC	CORREC PNO: Fa	ast 🖵	SET Trig: Free #Atten: 3		#Avg Typ	e: RMS	TRA	M Feb 14, 2020 CE 1 2 3 4 5 6 PE A M N N N N ET A N N N N N	Frequ	ency
10 dB/div	Ref 10.	00 dE	3m	II Gam.E					M	(r1 9.75 -41.	0 0 GHz 58 dBm	Au	to Tune
0.00												Cen 5.50000	ter Free 0000 GH
20.0											DL1 -13.00 dBm	St 1.000000	art Free
40.0											↓ ¹	St 10.000000	op Free 0000 GH
50.0				_~~		~~~	\sim					900.000 <u>Auto</u>	CF Ste 0000 MH Ma
70.0												Fre	q Offse 0 H
										04			ale Typ Li
start 1.00 Res BW	1.0 MHz			#	VBW	3.0 MHz		S	weep 15	Stop 10 .60 ms (*).000 GHz 18001 pts)		<u></u>
ISG									STATUS	5			

Plot 7-28. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)



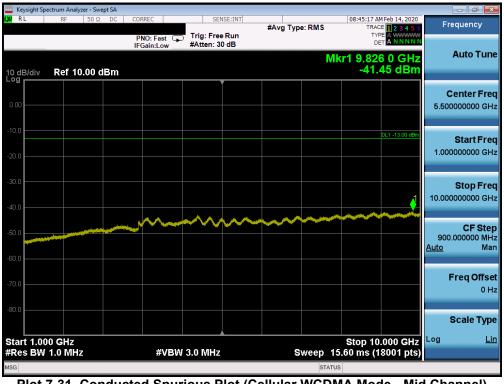
Plot 7-29. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analyze										-	
(IRL	RF	50 Ω DC		EC		NSE:INT	#Avg Type:	RMS	TRA	M Feb 14, 2020 CE 1 2 3 4 5 6 PE A WWWW ET A NNNN	Frequ	iency
0 dB/div	Ref 20.	00 dBm	IFGa	ain:Low	Atten: 30			М	kr1 849	.85 MHz .11 dBm	Aı	ıto Tun
10.0												n ter Fre 0000 MH
10.0										DL1 -13.00 dBm		t art Fre 0000 MH
80.0												top Fre 0000 G⊦
io.o												CF Ste 0000 M⊦ Ma
	un anter anter a set der	yaanda kuu mu	n State of Franker and the	an grant and an	สารใจเสริงในสูงเลกรู	gabigereter-contende	1942 ******	و برو به مواد و معروفونو و	รอาร ^เ หนุ่มสู่สี่งๆกันไประเภาไ	مريدني هذه المراجع الإير مرا ^ل مريك	Fre	e q Offs o 0 H
10.0	900 GHz								Stop 1.0	0000 GHz		ale Typ <u>Li</u>
	100 kHz			#VBV	V 300 kHz		\$	weep 7	.248 ms	(3021 pts)		
G								STATUS	S			

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



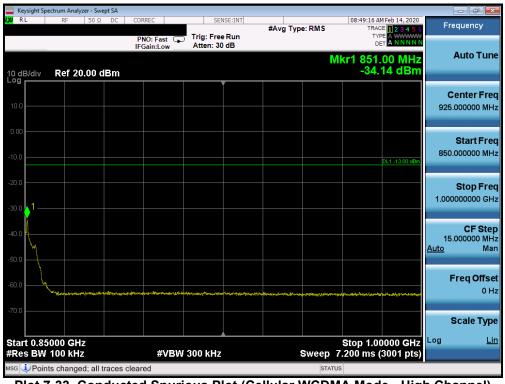
Plot 7-31. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analyzer								
X/RL	RF	50Ω DC	CORREC PNO: Fast	Trig: F	SENSE:INT	#Avg Type: RM		C:09 AM Feb 14, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency
10 dB/div	Ref 20.0	00 dBm	IFGain:Lov	V Atten:	30 dB		Mkr1 8 -	23.50 MHz 59.58 dBm	Auto Tune
10.0									Center Freq 427.000000 MHz
-10.0								DL1 -13.00 dBm	Start Freq 30.000000 MHz
-20.0									Stop Fred 824.000000 MHz
-40.0									CF Step 79.400000 MH <u>Auto</u> Mar
60.0			a a star a st					<u>t</u>	Freq Offse 0 H:
									Scale Type
Start 30.0 #Res BW			#V	'BW 300 kH	Iz	Swee	p 38.11 m	op 824.0 MHz s (15881 pts)	
ISG							STATUS		

Plot 7-32. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)



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

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analy	zer - Swept											d X
I <mark>XU</mark> RL	RF	50 Ω	DC (CORREC	st 😱	Trig: Free		#Avg Typ	e: RMS	TR/	AM Feb 14, 2020 ACE 1 2 3 4 5 6 APE A WWWWW DET A NNNNN	Freque	ncy
10 dB/div Log	Ref 10	.00 dE		IFGain:L	ow	#Atten: 3	0 dB		Mk	(r1 9.76	3 0 GHz .66 dBm	Auto	o Tune
0.00												Cento 5.5000000	e r Freq 000 GHz
-10.0											DL1 -13.00 dBm	Sta 1.0000000	rt Freq 000 GHz
-30.0						<i>A</i>					∮ ¹	Sto 10.0000000	p Freq 000 GHz
-50.0						~~~						C 900.0000 <u>Auto</u>	F Step 00 MHz Man
-70.0												Freq	Offset 0 Hz
-80.0												Scal	e Type _{Lin}
Start 1.00 #Res BW		2		#	VBW	3.0 MHz		S	weep 15	Stop 1 .60 ms (0.000 GHz 18001 pts)	-	
MSG									STATUS	5			

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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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AWS WCDMA Mode

🔤 Keysight Spectrum Analyzer - Swept SA 🚽				- 6 💌
XV RL RF 50Ω DC	CORREC SENSE:INT PNO: Fast Frig: Free Run Atten: 30 dB	#Avg Type: RMS	08:55:42 AM Feb 14, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
10 dB/div Ref 20.00 dBm	IFGain:Low Atten: 30 dB	М	kr1 1.705 0 GHz -31.79 dBm	Auto Tune
10.0				Center Fred 867.500000 MH
-10.0			DL1 -13.00 dBm	Start Free 30.000000 MH
-20.0			1	Stop Fre 1.705000000 GH
40.0				CF Ste 167.50000 MH <u>Auto</u> Ma
60.0	gannage Remember genomen 1994 and see an one of a second second second second second second second second second			Freq Offse 0 ⊦
-70.0 Start 0.0300 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Sween	Stop 1.7050 GHz 2.233 ms (3351 pts)	Scale Typ Log <u>Li</u>
ISG		STATU		

Plot 7-35. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)



Plot 7-36. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analy:												
X/RL	RF	50 Ω		CORREC PNO: Fa	ast 😱	SE Trig: Fre Atten: 2		#Avg Typ	e: RMS	TR	AM Feb 14, 2020 ACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	Freq	uency
10 dB/div	Ref 10	.00 dB		IFGain:L	.ow	Atten: 20	Jab		Mk	r1 19.5	43 5 GHz 5.55 dBm	A	uto Tun
0.00													nter Free 10000 GH
20.0											DL1 -13.00 dBm		tart Fre
40.0											1		top Fre 100000 GH
50.0	~~~		~	-								1.00000 <u>Auto</u>	CF Ste 00000 GH Ma
70.0												Fr	e qOffs e 0⊦
80.0 Start 10.0										Stop 2	0.000 0112	Sc Log	ale Typ <u>Li</u>
¢Res BW	1.0 MHz	2		#	¢VBW	3.0 MHz		s	weep 1	7.33 ms	(20001 pts)		
SG									STATI	JS			

Plot 7-37. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)



Plot 7-38. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 25 of 97
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	ctrum Analyze											
X/RL	RF	50 Ω D		RREC		NSE:INT	#Avg Typ	e: RMS	TRA	M Feb 14, 2020 CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Frequ	uency
10 dB/div	Ref 20.	00 dBr	IF	Gain:Low	Atten: 3			Mł	(r1 9.80	2 5 GHz 69 dBm	A	uto Tune
10.0												n ter Fre 0000 GH
10.0										DL1 -13.00 dBm		tart Fre 0000 GH
20.0 30.0 											S 10.00000	t op Fre 0000 GH
40.0			\sim		~~~				~~~	~ ¹		CF Ste 0000 M⊢ Ma
50.0											Fre	e q Offs e 0 ⊦
5tart 1.75	5 6 47								Stop 10	.000 GHz		ale Typ _{Li}
Res BW				#VE	W 3.0 MHz	2	9	weep 14	.29 ms (1	6491 pts)		_
SG								STATUS	5			

Plot 7-39. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)



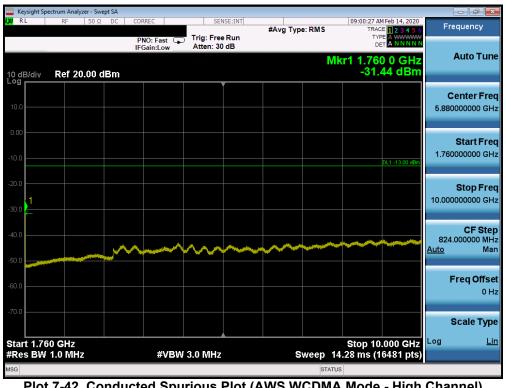
Plot 7-40. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 26 of 97
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	ectrum Analyze	r - Swept SA										- 0
X/RL	RF	50 Ω DC	CORREC				#Avg Typ	e: RMS	TRA	M Feb 14, 2020 CE 1 2 3 4 5 6 PE A WWWWW	Fre	quency
			PNO: IFGain	Fast 🖵	Atten: 30				C	ET A N N N N N		
10 dB/div Log	Ref 20.	00 dBm						Μ	kr1 1.69 -50	4 0 GHz 26 dBm		Auto Tuno
											C	enter Fre
10.0											870.0	00000 MH
0.00												Stort Ero
-10.0												Start Fre
										DL1 -13.00 dBm		
20.0												Stop Fre
-30.0											1.7100	00000 GH
40.0											460.0	CF Ste
										1	Auto	Ma
-50.0	4.1945 ⁴ -19 ₄₁ .1 ₈₄₄ .45°.4***				وسيحود فعافيت ويتجل والمعو	ومرادرهم ومرادا والم			وابدؤه المواديدين وليسور والمقدر	and the second	_	0#
60.0											F	r eq Offse 0 H
-70.0												
											S	cale Typ
Start 0.03 #Res BW				#VBM	3.0 MHz			Sween	Stop 1.	7100 GHz (3361 pts)	Log	<u>Li</u>
	1.0 10112			<i></i>	5.0 10112			SWEEP		(oour pis)		

Plot 7-41. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)



Plot 7-42. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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🔤 Keysight Sp	ectrum Ana	lyzer - Swe	ept SA									- • ×
XV RL	RF	50 Ω	DC	CORREC PNO: Fa	ast 🖵	Trig: Free Atten: 20	#Avg Typ	e: RMS	TRAC	M Feb 14, 2020 DE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Free	quency
10 dB/div	Ref 1	0.00 c	lBm	IF Galli.L	.0w	, alen. 20		Mkr	1 19.52 -46.	2 0 GHz 69 dBm	4	Auto Tune
0.00												e nter Frec 000000 GH:
20.0										DL1 -13.00 dBm		Start Free
40.0										1		Stop Fre 000000 GH
50.0		~~		~~~~	~~~						1.0000 <u>Auto</u>	CF Stej 000000 GH Ma
70.0											Fi	r eq Offse 0 H
80.0		7				,			Stop 20	.000 GHz		cale Typ
Res BW				\$	¢VBW	3.0 MHz	s	weep 17	.33 ms (2	20001 pts)		
ISG								STATUS	5			

Plot 7-43. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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PCS WCDMA Mode

	rum Analyzer - Swept SA					
X/ RL	RF 50 Ω DC	CORREC	SENSE:INT	#Avg Type: RMS	09:07:36 AM Feb 14, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWW DFT A N N N N N	Frequency
10 dB/div	Ref 20.00 dBm	IFGain:Low	Atten: 30 dB	M	kr1 1.845 0 GHz -30.59 dBm	Auto Tune
10.0						Center Free 937.500000 MH:
-10.0					DL1 -13.00 dBm	Start Free 30.000000 MH
-20.0					1) 	Stop Fre 1.845000000 GH
-40.0						CF Ste 181.50000 MH <u>Auto</u> Ma
-60.0		Ŋerseynejhidefeligenejaeftelefeligenegkaar 			nganagang naga pangang nagang nag	Freq Offse 0 H
-70.0						Scale Type
Start 0.0300 #Res BW 1.		#VBW	3.0 MHz	Sweep 2	Stop 1.8450 GHz 2.420 ms (3631 pts)	Log <u>Lir</u>
MSG				STATU	IS	

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



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

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analy										_	- 0 💌
0 RL	RF	50 Ω	DC	CORREC PNO: F IFGain:	ast 🖵		#Avg Typ	e: RMS	TRAC	M Feb 14, 2020 CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Free	quency
0 dB/div	Ref 10).00 dE	3m					Mkr	1 19.51 -46.	3 5 GHz 63 dBm	-	Auto Tun
0.00												enter Fre
20.0										DL1 -13.00 dBm		Start Fre 000000 G⊦
80.0 										1_		Stop Fre 000000 G⊦
io.o	~~~	~	-		~~~						1.0000 <u>Auto</u>	CF Ste 000000 GH Ma
0.0											F	r eq Offs 0 H
									O tore 00		S	cale Typ L
tart 10.0 Res BW					#VBW	3.0 MHz	s	weep 17	33 ms (2	.000 GHz 20001 pts)	_	<u> </u>
G								STATUS				

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



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

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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🔤 Keysight Spe		zer - Swep	t SA										X
LXU RL	RF	50 Ω	DC	CORREC PNO: Fa	ast 🖵	Trig: Free Atten: 30		#Avg Typ	e: RMS	TI	2 AM Feb 14, 2020 RACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency	
10 dB/div	Ref 20	0.00 dE	Зm	in ourine					Μ	kr1 9.7 -4	89 0 GHz 1.67 dBm	Auto T	une
10.0												Center F 5.955000000	
10.00											DL1 -13.00 dBm	Start F 1.910000000	
30.0												Stop F 10.000000000	
40.0			\sim	<u> </u>	~	~~~	~~	~~~			<u></u> 1	CF S 809.000000 <u>Auto</u>	
60.0												Freq Of	ffse 0 H
-70.0	0 GHz									Stop	10.000 GHz	Scale T	'ур <u>Li</u>
Res BW	1.0 MH	z		\$	¢VB₩	3.0 MHz		4	weep 1	4.02 ms	(16181 pts)		
ISG									STAT	JS			

Plot 7-48. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)



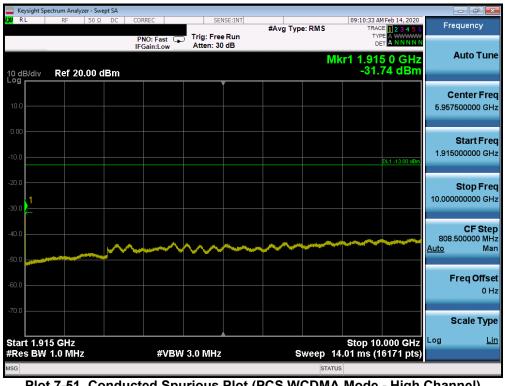
Plot 7-49. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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🔤 Keysight Spe	ectrum Analyzei	- Swept SA						
LXU RL	RF	50 Ω DC	CORREC PNO: Fast	Trig: Free	Run	vg Type: RMS	09:10:10 AM Feb 14, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN	Frequency
10 dB/div Log	Ref 20.0	00 dBm	IFGain:Low _	Atten: 30 o	iB	М	kr1 1.681 5 GHz -50.04 dBm	Auto Tune
10.0								Center Freq 940.000000 MHz
-10.0							DL1 -13.00 dBm	Start Freq 30.000000 MHz
-20.0								Stop Freq 1.850000000 GHz
-40.0							1	CF Step 182.000000 MHz <u>Auto</u> Man
-60.0	1999 (Findle of general field of the second s	<u></u>	gen da ik-da ang pangan na manakan		an a	nag uguni pakal Alak Magarijan kalan		Freq Offset 0 Hz
-70.0								Scale Type
Start 0.03 #Res BW			#VB	W 3.0 MHz		Sweep 2	Stop 1.8500 GHz 2.427 ms (3641 pts)	Log <u>Lin</u>
MSG						STATU	IS	

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



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

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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🔤 Keysight Sp	ectrum An	alyzer - Sw	ept SA									
XI RL	RF	50 Ω	DC	CORREC PNO: Fa	ast 🖵	Trig: Free Atten: 20	#Avg Typ	e: RMS	TRAC	M Feb 14, 2020 DE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Free	quency
10 dB/div	Ref '	10.00 (dBm					Mkr	1 19.53 -46.	0 5 GHz 47 dBm	4	uto Tune
0.00												e nter Freq 00000 GHz
-10.0										DL1 -13.00 dBm		Start Freq 00000 GHz
40.0												Stop Freq 00000 GHz
-50.0	~		~~	~~~~							1.0000 <u>Auto</u>	CF Step 00000 GHz Mar
70.0											Fi	r eq Offse 0 Hz
-80.0	100 GH	7							Stop 20	.000 GHz		cale Type <u>Lin</u>
#Res BW				\$	ŧνв₩	3.0 MHz	s	weep 17	.33 ms (2	20001 pts)		
ISG								STATUS	5			

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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	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 > 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 for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

Test Notes

Per 22.917(b), 24.238(b), 27.53(h)(3), and RSS-132(5.5), RSS-133(6.5), RSS-139(6.5), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

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Cellular GSM Mode



Plot 7-53. Band Edge Plot (Cellular GSM Mode - Low Channel)

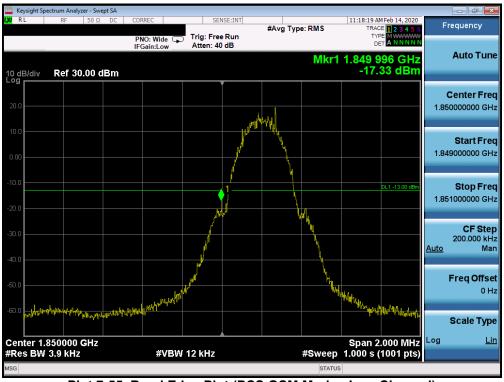


Plot 7-54. Band Edge Plot (Cellular GSM Mode - High Channel)

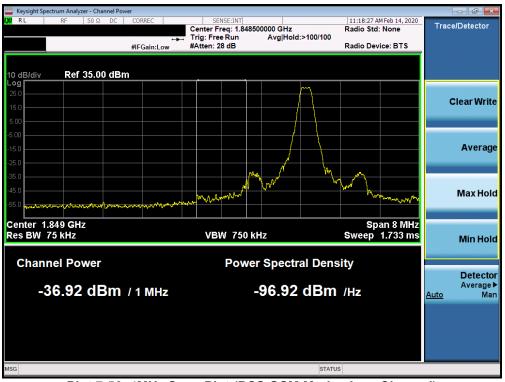
FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:			
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PCS GSM Mode



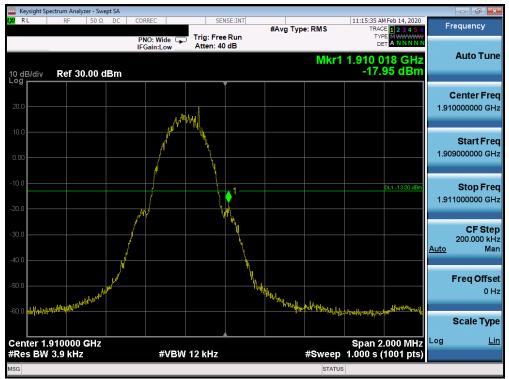
Plot 7-55. Band Edge Plot (PCS GSM Mode - Low Channel)



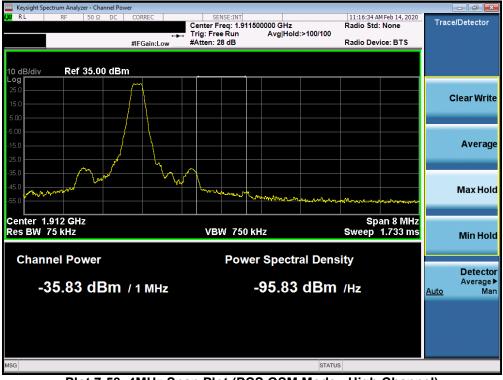
Plot 7-56. 4MHz Span Plot (PCS GSM Mode - Low Channel)

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dawa 40 af 07
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Plot 7-57. Band Edge Plot (PCS GSM Mode - High Channel)



Plot 7-58. 4MHz Span Plot (PCS GSM Mode - High Channel)

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Cellular WCDMA Mode



Plot 7-59. Band Edge Plot (Cellular WCDMA Mode - Low Channel)



Plot 7-60. Band Edge Plot (Cellular WCDMA Mode - High Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dawa 40 af 07	
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AWS WCDMA Mode



Plot 7-61. Band Edge Plot (AWS WCDMA Mode - Low Channel)



Plot 7-62. 4MHz Span Plot (AWS WCDMA Mode - Low Channel)

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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LXI RL												d X
	RF 50	Ω DC	CORREC PNO: W IFGain:	/ide 🖵	Trig: Free Atten: 40		#Avg Typ	e: RMS	TRA	AM Feb 14, 2020 ACE 1 2 3 4 5 6 APE A ANNNNN DET A NNNNN	Freque	ncy
10 dB/div Log	Ref 30.00	dBm	IPGalli.	LOW	, men. 4e			Mkr	1 1.755 -20	000 GHz .12 dBm	Auto	o Tune
20.0											Cento 1.7550000	e r Frec 000 GH:
0.00				~~~~							Sta 1.7475000	rt Fred 000 GH:
-10.0						1				DL1 -13.00 dBm	Sto 1.7625000	p Fred 000 GH:
30.0						h	a h	n				F Stej 000 MH Ma
50.0										and a series of the series of	Freq	Offse 0 H
-60.0	55000 GH	7							Snan	15.00 MHz		e Type Lir
#Res BW 1				#VBW :	300 kHz			Sweep	1.000 ms	(1001 pts)		

Plot 7-63. Band Edge Plot (AWS WCDMA Mode - High Channel)



Plot 7-64. 4MHz Span Plot (AWS WCDMA Mode - High Channel)

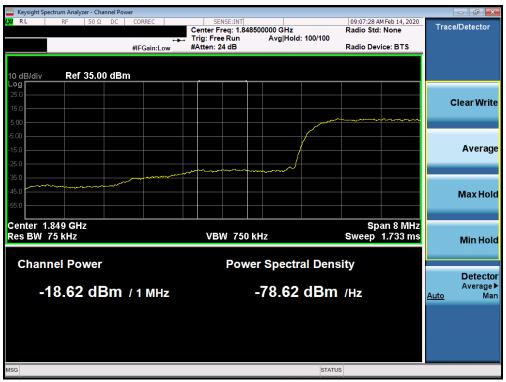
FCC ID: ZNFQ630UM	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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PCS WCDMA Mode



Plot 7-65. Band Edge Plot (PCS WCDMA Mode - Low Channel)



Plot 7-66. 4MHz Span Plot (PCS WCDMA Mode - Low Channel)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	ectrum Analyzer											
<mark>(</mark> RL	RF	50Ω DC	CORREC	Nide 🖵	Trig: Fre		#Avg Ty	e: RMS	TRAC	M Feb 14, 2020 DE 1 2 3 4 5 6 PE A WWWW ET A N N N N N	Fi	requency
0 dB/div	Ref 30.0	00 dBm	IFGain	:Low	Atten: 40	dB		Mkr	1 1.910 (Auto Tun
20.0												Center Fre 0000000 GH
10.0 D.00			·····	~~_,~~							1.90	Start Fre 2500000 G⊦
20.0						1				DL1 -13.00 dBm	1.91	Stop Fre 7500000 GH
30.0		<u>ک</u>				~~~~					Auto	CF Ste 1.500000 MH Ma
i0.0										mon		Freq Offs 0 H
60.0	910000 G	H7							Snap-1	5.00 MHz		Scale Typ
	100 kHz	112		#VBW	300 kHz			Sweep	1.000 ms ((1001 pts)		
SG								STATU	IS			

Plot 7-67. Band Edge Plot (PCS WCDMA Mode - High Channel)



Plot 7-68. 4MHz Span Plot (PCS WCDMA Mode - High Channel)

FCC ID: ZNFQ630UM	<u>PCTEST</u>	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. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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



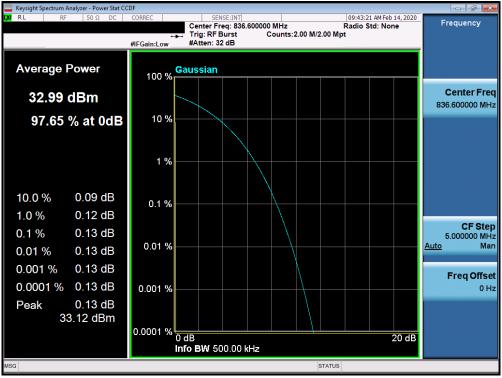
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

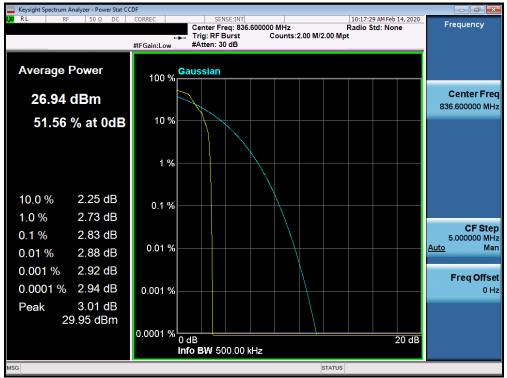
None

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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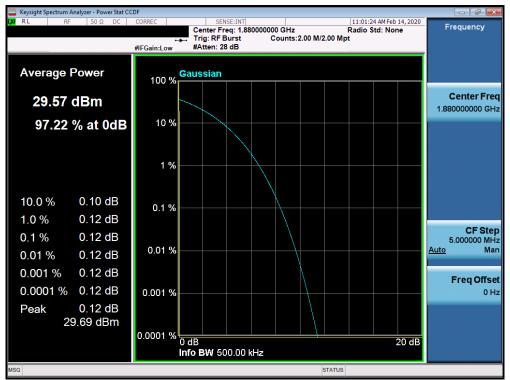




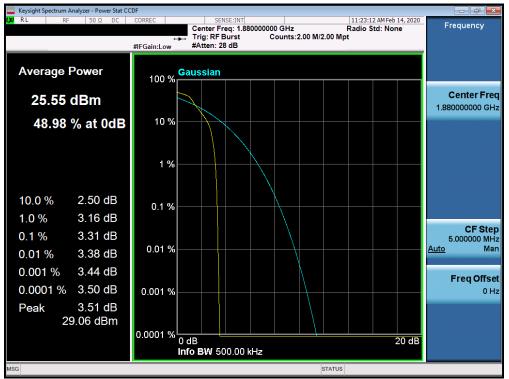
Plot 7-70. Peak-Average Ratio Plot (EDGE850 Mode)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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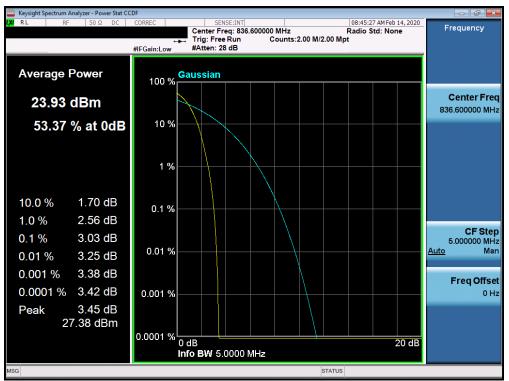
Plot 7-71. Peak-Average Ratio Plot (PCS GPRS Mode)



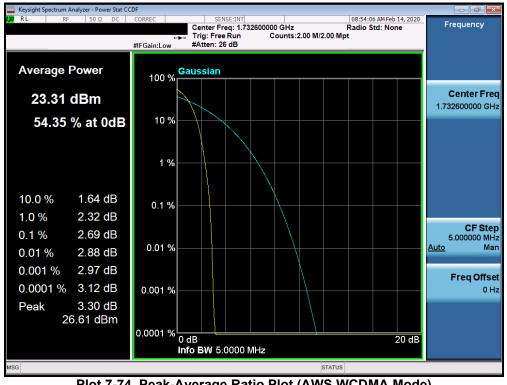
Plot 7-72. Peak-Average Ratio Plot (EDGE1900 Mode)

FCC ID: ZNFQ630UM	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege EE of 97
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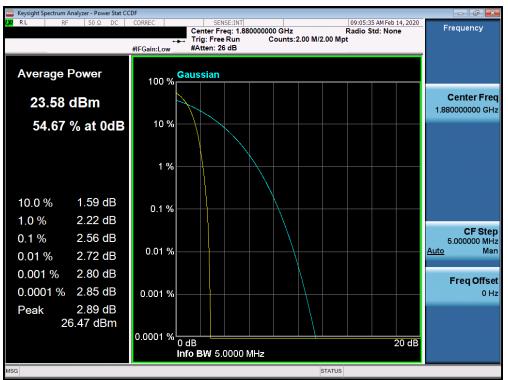




Plot 7-74. Peak-Average Ratio Plot (AWS WCDMA Mode)

FCC ID: ZNFQ630UM	<u><u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Plot 7-75. Peak-Average Ratio Plot (PCS WCDMA Mode)

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

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Test Setup

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

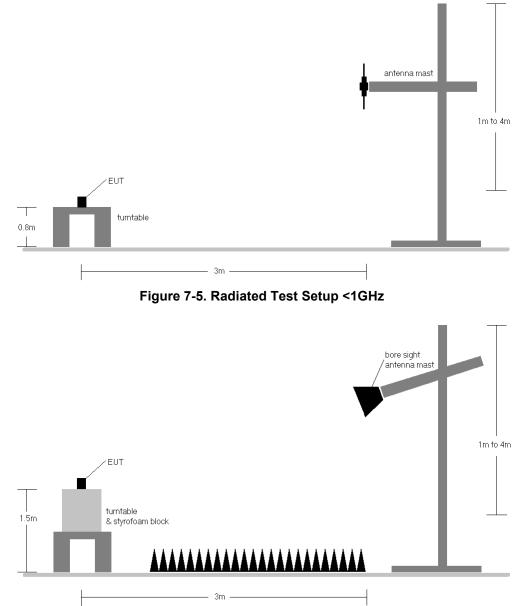


Figure 7-6. Radiated Test Setup >1GHz

FCC ID: ZNFQ630UM	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."
- 3) This unit was tested with its standard battery.
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

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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	н	100	304	20.27	6.70	24.82	0.303	38.45	-13.63	26.97	0.498	40.61	-13.64
836.60	GPRS850	Н	203	318	21.83	6.70	26.38	0.435	38.45	-12.07	28.53	0.713	40.61	-12.08
848.80	GPRS850	н	192	320	21.63	6.70	26.18	0.415	38.45	-12.27	28.33	0.681	40.61	-12.28
836.60	GPRS850	V	100	189	21.23	6.40	25.48	0.353	38.45	-12.97	27.63	0.579	40.61	-12.98
836.60	EDGE850	Н	203	318	16.99	6.70	21.54	0.143	38.45	-16.91	23.69	0.234	40.61	-16.92

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]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
826.40	WCDMA850	н	203	317	12.44	6.70	16.99	38.45	-21.46	19.14	40.61	-21.47
836.60	WCDMA850	н	199	319	13.47	6.70	18.02	38.45	-20.43	20.17	40.61	-20.44
846.60	WCDMA850	н	202	317	12.96	6.60	17.41	38.45	-21.04	19.56	40.61	-21.05
836.60	WCDMA850	V	149	199	13.39	6.40	17.64	38.45	-20.81	19.79	40.61	-20.82

Table 7-3. 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 Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	Н	144	29	15.41	9.43	24.84	30.00	-5.16
1732.60	WCDMA1700	Н	104	28	15.58	9.31	24.89	30.00	-5.11
1752.60	WCDMA1700	н	143	24	15.54	9.21	24.75	30.00	-5.25
1732.60	WCDMA1700	V	119	96	15.49	9.19	24.68	30.00	-5.32

Table 7-4. EIRP (AWS WCDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900	Н	120	20	20.08	9.48	29.56	33.01	-3.45
1880.00	GPRS1900	Н	113	17	21.14	9.90	31.04	33.01	-1.97
1909.80	GPRS1900	Н	144	16	21.12	10.26	31.38	33.01	-1.63
1909.80	GPRS1900	V	159	114	20.57	10.31	30.88	33.01	-2.13
1909.80	EDGE1900	Н	144	16	14.94	10.26	25.20	33.01	-7.81

Table 7-5. EIRP (PCS GPRS)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	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 Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	Н	130	20	15.37	9.51	24.88	33.01	-8.13
1880.00	WCDMA1900	Н	119	18	15.59	9.90	25.49	33.01	-7.52
1907.60	WCDMA1900	н	149	16	15.52	10.24	25.76	33.01	-7.25
1907.60	WCDMA1900	V	109	121	15.03	10.30	25.33	33.01	-7.68

Table 7-6. EIRP (PCS WCDMA)

FCC ID: ZNFQ630UM	<u>PCTEST</u>	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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Test Setup

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

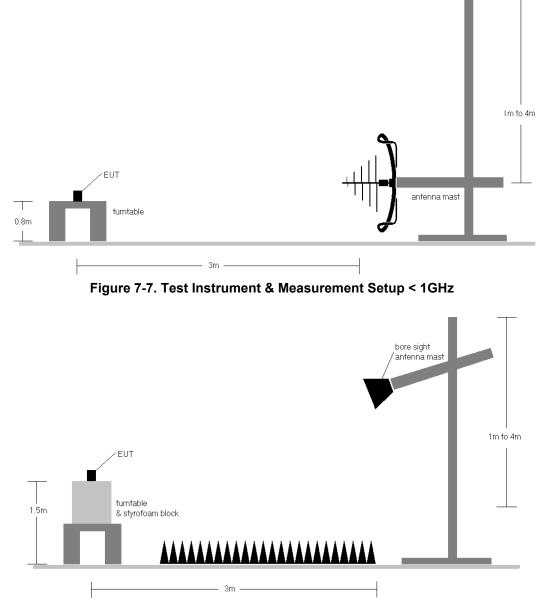


Figure 7-8. Test Instrument & Measurement Setup >1 GHz

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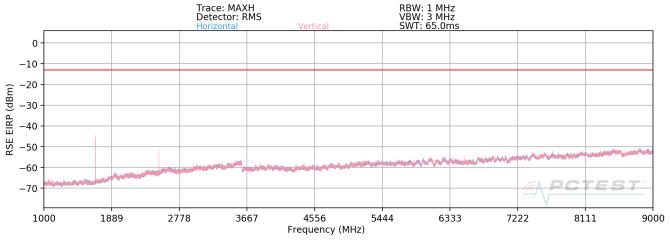
Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."
- 3) This unit was tested with its standard battery.
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 5) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 6) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 7) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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Cellular GPRS Mode



Plot 7-76. Radiated Spurious Plot above 1GHz (Cellular GPRS Mode)

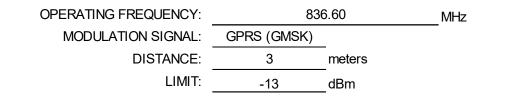
OPERATING FREQUENCY:	824	4.20	MHz
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	
		-	

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]
1648.40	Н	131	10	-41.47	3.07	-38.40	-25.4
2472.60	Н	102	29	-47.60	3.82	-43.78	-30.8
3296.80	Н	219	10	-56.01	6.00	-50.01	-37.0
4121.00	Н	209	1	-56.53	7.67	-48.86	-35.9
4945.20	Н	-	-	-57.12	8.72	-48.40	-35.4
5769.40	Н	-	-	-57.42	9.09	-48.33	-35.3
6593.60	Н	-	-	-54.56	9.22	-45.34	-32.3

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

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		
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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	Н	124	28	-41.13	3.10	-38.03	-25.0
2509.80	Н	101	26	-45.87	4.02	-41.85	-28.8
3346.40	Н	101	255	-55.70	6.03	-49.67	-36.7
4183.00	Н	-	-	-58.03	7.79	-50.24	-37.2
5019.60	Н	-	-	-57.55	8.78	-48.77	-35.8
5856.20	Н	-	-	-57.34	9.18	-48.16	-35.2

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

OPERATING FREQUENCY:

MODULATION SIGNAL:

DISTANCE: _____

848.80 GPRS (GMSK) 3 meters -13 dBm

MHz

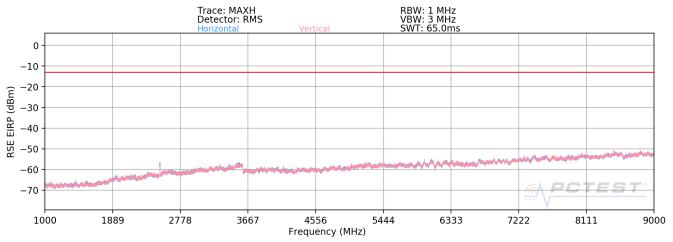
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1697.60	Н	122	16	-41.80	3.15	-38.65	-25.6
2546.40	Н	111	320	-48.02	4.15	-43.87	-30.9
3395.20	Н	176	247	-56.33	6.24	-50.09	-37.1
4244.00	Н	-	-	-58.92	7.97	-50.94	-37.9
5092.80	Н	-	-	-57.88	8.88	-49.00	-36.0
5941.60	Н	-	-	-55.07	9.31	-45.76	-32.8

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

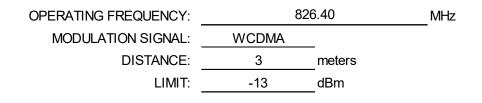
FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dege 67 of 97	
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Cellular WCDMA Mode





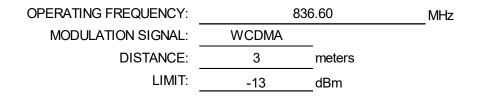


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1652.80	V	163	213	-69.56	3.09	-66.47	-53.5
2479.20	V	153	146	-65.71	3.91	-61.80	-48.8
3305.60	V	-	-	-65.44	6.00	-59.43	-46.4
4132.00	V	-	-	-70.17	7.72	-62.45	-49.5
4958.40	V	-	-	-70.80	8.72	-62.08	-49.1

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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 69 of 97	
1M2002110017-03.ZNF	02/12 - 03/13/2020	/2020 Portable Handset		Page 68 of 87	
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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	-	-	-69.27	3.10	-66.17	-53.2
2509.80	V	151	149	-65.25	4.02	-61.23	-48.2
3346.40	V	-	-	-66.43	6.03	-60.40	-47.4
4183.00	V	-	-	-70.99	7.79	-63.20	-50.2
5019.60	V	-	-	-70.09	8.78	-61.31	-48.3

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

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

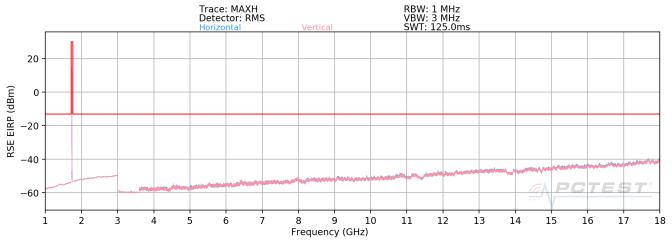
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.20	V	400	76	-68.60	3.17	-65.42	-52.4
2539.80	V	-	-	-67.28	4.13	-63.16	-50.2
3386.40	V	-	-	-66.82	6.20	-60.62	-47.6
4233.00	V	-	-	-71.45	7.93	-63.52	-50.5

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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dege 60 of 97
1M2002110017-03.ZNF	02/12 - 03/13/2020	Portable Handset	Page 69 of 87
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AWS WCDMA Mode



Plot 7-78. Radiated Spurious Plot above 1GHz (AWS WCDMA Mode)

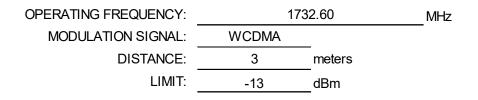
OPERATING FREQUENCY:	171	2.40	MHz
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]
3424.80	Н	231	8	-63.78	6.27	-57.50	-44.5
5137.20	Н	-	-	-69.31	8.94	-60.37	-47.4
6849.60	Н	-	-	-66.96	9.44	-57.51	-44.5
8562.00	Н	-	-	-64.99	9.58	-55.41	-42.4

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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dawa 70 of 07	
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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	Н	231	334	-64.16	6.35	-57.80	-44.8
5197.80	Н	-	-	-69.20	9.05	-60.16	-47.2
6930.40	Н	-	-	-68.26	9.38	-58.87	-45.9
8663.00	Н	-	-	-64.98	9.58	-55.40	-42.4

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

OPERATING FREQUENCY

MODULATION SIGNA

REQUENCY:	175	2.60
ON SIGNAL:	WCDMA	
DISTANCE:	3	meters
LIMIT:	-13	dBm

MHz

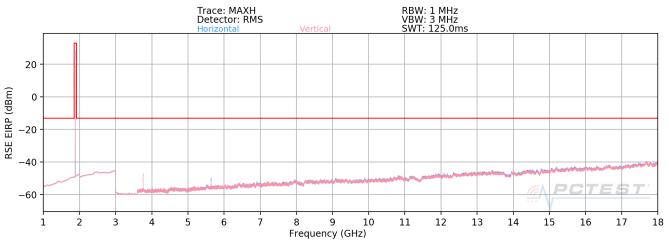
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3505.20	Н	210	345	-63.83	6.50	-57.33	-44.3
5257.80	Н	-	-	-69.19	8.96	-60.23	-47.2
7010.40	Н	-	-	-67.30	9.14	-58.16	-45.2
8763.00	Н	-	-	-65.11	9.58	-55.53	-42.5

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

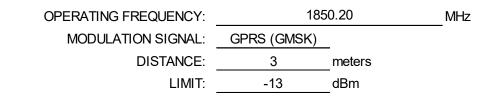
FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 71 of 97	
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PCS GPRS Mode





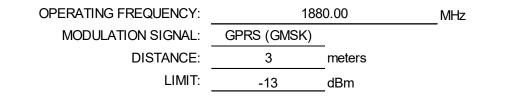


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3700.40	Н	168	132	-54.85	9.58	-45.27	-32.3
5550.60	Н	112	177	-60.96	10.94	-50.02	-37.0
7400.80	Н	115	189	-60.01	10.96	-49.05	-36.1
9251.00	Н	-	-	-66.90	11.63	-55.27	-42.3
11101.20	Н	-	-	-67.01	12.74	-54.27	-41.3

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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 70 of 97	
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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	Н	152	38	-55.71	9.37	-46.35	-33.3
5640.00	Н	131	179	-57.66	11.17	-46.49	-33.5
7520.00	Н	117	191	-59.82	11.11	-48.70	-35.7
9400.00	Н	-	-	-65.70	11.57	-54.13	-41.1
11280.00	Н	-	-	-66.57	12.72	-53.85	-40.9

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

OPERATING FREQUENCY:	190	9.80	MHz
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

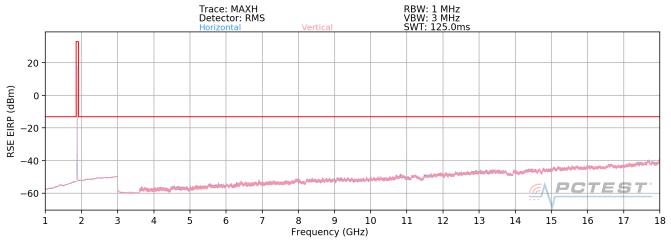
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3819.60	Н	150	326	-54.01	9.30	-44.71	-31.7
5729.40	Н	111	170	-56.09	11.39	-44.70	-31.7
7639.20	Н	113	30	-62.12	11.33	-50.78	-37.8
9549.00	Н	-	-	-66.76	11.79	-54.97	-42.0
11458.80	Н	-	-	-66.69	12.82	-53.87	-40.9

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

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 72 of 97
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PCS WCDMA Mode



Plot 7-80. Radiated Spurious Plot above 1GHz (PCS WCDMA Mode)

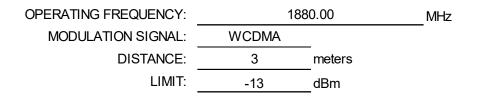
OPERATING FREQUENCY:	185	52.40	MHz
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]
3704.80	Н	-	-	-74.08	9.57	-64.52	-51.5
5557.20	Н	-	-	-73.35	10.95	-62.40	-49.4
7409.60	Н	-	-	-69.21	10.96	-58.25	-45.3

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

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dere 74 of 97
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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	Н	215	354	-73.58	9.37	-64.22	-51.2
5640.00	Н	-	-	-72.70	11.17	-61.53	-48.5
7520.00	Н	-	-	-69.88	11.11	-58.76	-45.8
9400.00	Н	-	-	-67.16	11.57	-55.59	-42.6

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

OPERATING FREQUENCY

MODULATION SIGNA

190	7.60
WCDMA	_
3	meters
-13	dBm
	WCDMA 3

MHz

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	Н	163	27	-72.09	9.30	-62.79	-49.8
5722.80	Н	-	-	-73.27	11.37	-61.90	-48.9
7630.40	Н	-	-	-70.80	11.31	-59.49	-46.5
9538.00	Н	-	-	-68.09	11.76	-56.33	-43.3

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

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 75 of 97	
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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.

For Part 22, RSS-132, and RSS-133, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24, Part 27, and RSS-139, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 76 of 97
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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	190	
REFERENCE VOLTAGE:	4.30	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	- 30	836,599,962	-38	-0.0000045
100 %		- 20	836,600,012	12	0.0000014
100 %		- 10	836,600,135	135	0.0000161
100 %		0	836,600,010	10	0.0000012
100 %		+ 10	836,599,918	-82	-0.000098
100 %		+ 20	836,600,036	36	0.0000043
100 %		+ 30	836,599,652	-348	-0.0000416
100 %		+ 40	836,600,040	40	0.0000048
100 %		+ 50	836,599,800	-200	-0.0000239
BATT. ENDPOINT	3.57	+ 20	836,599,741	-259	-0.0000310

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

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 77 of 97
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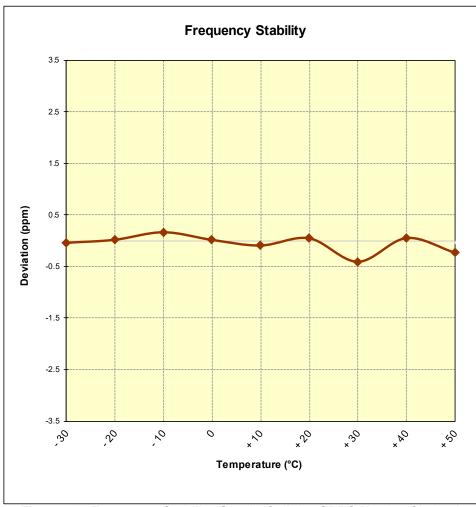


Figure 7-9. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 70 of 07
1M2002110017-03.ZNF	02/12 - 03/13/2020	Portable Handset		Page 78 of 87
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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	4183	
REFERENCE VOLTAGE:	4.30	VDC
DEVIATION LIMIT :	± 0.00025 % or 2.5 ppm	_

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	- 30	836,600,008	8	0.0000010
100 %		- 20	836,600,214	214	0.0000256
100 %		- 10	836,600,286	286	0.0000342
100 %		0	836,600,003	3	0.0000004
100 %		+ 10	836,599,994	-6	-0.0000007
100 %		+ 20	836,600,033	33	0.0000039
100 %		+ 30	836,600,095	95	0.0000114
100 %		+ 40	836,600,132	132	0.0000158
100 %		+ 50	836,599,987	-13	-0.0000016
BATT. ENDPOINT	3.57	+ 20	836,599,811	-189	-0.0000226

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

FCC ID: ZNFQ630UM	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 70 of 97
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© 2020 PCTEST	•	•		V 9.0 02/01/2019



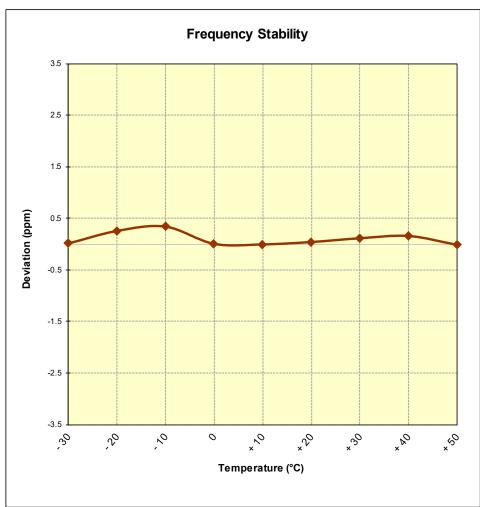


Figure 7-10. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 90 of 97
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OPERATING FREQUENCY:	1,732,600,000	Hz
CHANNEL:	1413	_
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	- 30	1,732,600,093	93	0.0000054
100 %		- 20	1,732,600,060	60	0.0000035
100 %		- 10	1,732,600,082	82	0.0000047
100 %		0	1,732,600,049	49	0.0000028
100 %		+ 10	1,732,600,048	48	0.0000028
100 %		+ 20	1,732,600,239	239	0.0000138
100 %		+ 30	1,732,599,628	-372	-0.0000215
100 %		+ 40	1,732,600,257	257	0.0000148
100 %		+ 50	1,732,599,890	-110	-0.0000063
BATT. ENDPOINT	3.57	+ 20	1,732,600,136	136	0.0000078

Table 7-24. 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.

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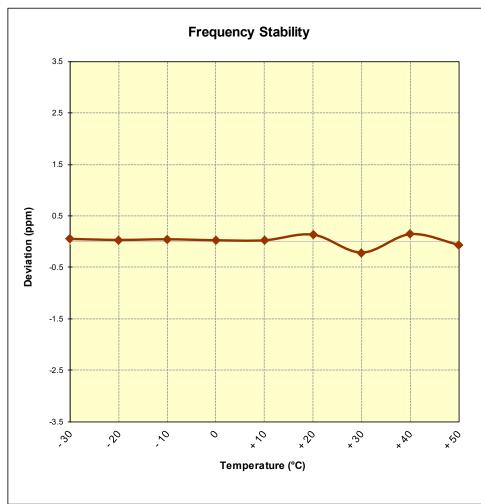


Figure 7-11. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	661	_
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	- 30	1,879,999,975	-25	-0.0000013
100 %		- 20	1,880,000,246	246	0.0000131
100 %		- 10	1,879,999,986	-14	-0.0000007
100 %		0	1,879,999,725	-275	-0.0000146
100 %		+ 10	1,879,999,912	-88	-0.0000047
100 %		+ 20	1,880,000,264	264	0.0000140
100 %		+ 30	1,879,999,727	-273	-0.0000145
100 %		+ 40	1,879,999,708	-292	-0.0000155
100 %		+ 50	1,880,000,232	232	0.0000123
BATT. ENDPOINT	3.57	+ 20	1,879,999,760	-240	-0.0000128

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

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain 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: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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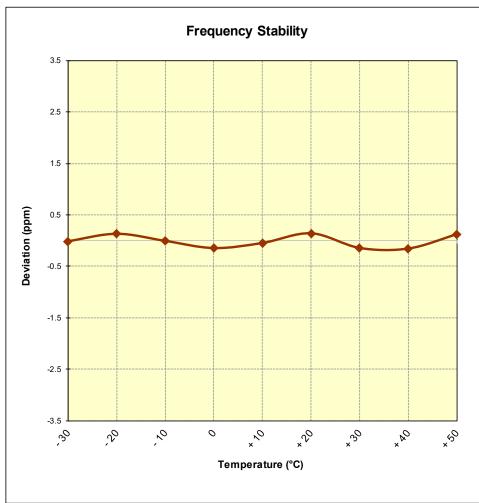


Figure 7-12. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

FCC ID: ZNFQ630UM	<u><u>PCTEST</u></u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	9400	_
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	- 30	1,880,000,259	259	0.0000138
100 %		- 20	1,879,999,886	-114	-0.0000061
100 %		- 10	1,879,999,809	-191	-0.0000102
100 %		0	1,880,000,068	68	0.0000036
100 %		+ 10	1,879,999,904	-96	-0.0000051
100 %		+ 20	1,879,999,625	-375	-0.0000199
100 %		+ 30	1,880,000,127	127	0.0000068
100 %		+ 40	1,879,999,944	-56	-0.0000030
100 %		+ 50	1,879,999,937	-63	-0.0000034
BATT. ENDPOINT	3.57	+ 20	1,879,999,898	-102	-0.0000054

 Table 7-26. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain 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: ZNFQ630UM	<u>PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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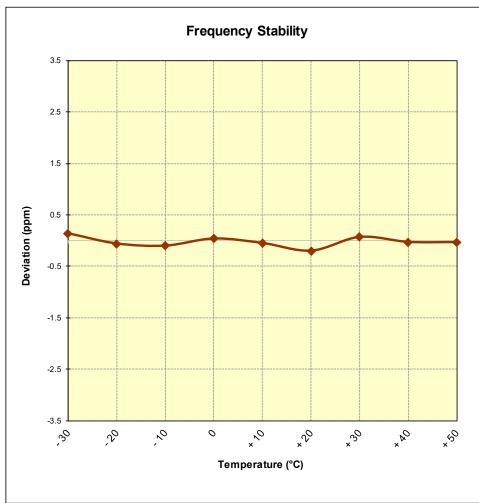


Figure 7-13. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFQ630UM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules and RSS-132, RSS-133, RSS-139 of the Innovation, Science and Economic Development Canada Rules.

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