

PCTEST ENGINEERING LABORATORY, INC.

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MEASUREMENT REPORT FCC Part 22, 24, & 27 LTE

Applicant Name:

LG Electronics MobileComm U.S.A 1000 Sylvan Avenue Englewood Cliffs, NJ 07632 United States Date of Testing: 11/8-12/8/2016 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 0Y1611071732.ZNF

FCC ID :

ZNFL83BL

APPLICANT:

LG ELECTRONICS MOBILECOMM U.S.A

Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§2; §22; §24; §27
Test Procedure(s):	ANSI/TIA-603-D-2010, KDB 971168 D01 v02r02
EUT Type:	Portable Handset
Model(s):	LGL83BL, LG-L83BL, L83BL, LG-M430, LGM430, M430
Test Device Serial No.:	identical prototype [S/N: 01641, 01732, 01740, 00160]

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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MEASUREMENT REPORT FCC Part 22, 24, & 27



§2.1033 General Information

APPLICANT:	LG Electronics MobileCon	nm U.S.A		
APPLICANT ADDRESS:	1000 Sylvan Avenue			
	Englewood Cliffs, NJ 0763	32, United States		
TEST SITE:	PCTEST ENGINEERING	LABORATORY, INC.		
TEST SITE ADDRESS:	7185 Oakland Mills Road,	Columbia, MD 21045	5 USA	
FCC RULE PART(S):	§2; §22; §24; §27			
BASE MODEL:	LGL83BL			
FCC ID:	ZNFL83BL			
FCC CLASSIFICATION:	PCS Licensed Transmitter	r Held to Ear (PCE)		
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)			
Test Device Serial No.:	01641, 01732, 01740, 00160	Production	Pre-Production	Engineering
DATE(S) OF TEST:	11/8-12/8/2016			
TEST REPORT S/N:	0Y1611071732.ZNF			

Test Facility / Accreditations

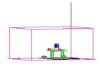
Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

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			ERP/	/EIRP		
Mode	FCC Rule	Tx Frequency (MHz)	Max. Pow er	Max. Pow er	Emission	Modulation
Mode	Part		(W)	(dBm)	Designator	modulation
LTE Band 12	27	699.7 - 715.3	0.190	22.78	1M12G7D	QPSK
LTE Band 12	27	699.7 - 715.3	0.190	22.78	1M12W7D	16QAM
LTE Band 12	27	700.5 - 714.5	0.134	21.00	2M71G7D	QPSK
LTE Band 12	27	700.5 - 714.5	0.170	22.31	2M71G7D 2M72W7D	16QAM
LTE Band 12	27	701.5 - 713.5	0.143	21.01	4M53G7D	QPSK
LTE Band 12	27	701.5 - 713.5	0.162	22.01	4M51W7D	16QAM
LTE Band 12	27	701.5 - 713.5	0.140	21.70	8M96G7D	QPSK
LTE Band 12	27	704 - 711	0.181	22.56	8M99W7D	16QAM
LTE Band 12	27 22H	824.7 - 848.3	0.145	18.18	1M12G7D	QPSK
LTE Band 5	22H 22H	824.7 - 848.3	0.052	17.13	1M12W7D	16QAM
LTE Band 5	22H 22H	825.5 - 847.5	0.052	19.89	2M72G7D	QPSK
LTE Band 5	22H 22H	825.5 - 847.5		19.89		16QAM
LTE Band 5	22H 22H	826.5 - 846.5	0.077	21.27	2M72W7D	QPSK
		826.5 - 846.5	0.134		4M51G7D 4M51W7D	
LTE Band 5	22H		0.105	20.21		16QAM
LTE Band 5	22H	829 - 844	0.140	21.47	8M98G7D	QPSK 1604M
LTE Band 5	22H	829 - 844	0.101	20.04	8M98W7D	16QAM
LTE Band 4	27	1710.7 - 1754.3	0.219	23.41	1M12G7D	QPSK 1604M
LTE Band 4	27	1710.7 - 1754.3	0.177	22.48	1M12W7D	16QAM
LTE Band 4	27	1711.5 - 1753.5	0.221	23.44	2M73G7D	QPSK 460.4M
LTE Band 4	27	1711.5 - 1753.5	0.178	22.49	2M72W7D	16QAM
LTE Band 4	27	1712.5 - 1752.5	0.226	23.53	4M50G7D	QPSK
LTE Band 4	27	1712.5 - 1752.5	0.180	22.55	4M50W7D	16QAM
LTE Band 4	27	1715 - 1750	0.241	23.82	8M95G7D	QPSK
LTE Band 4	27	1715 - 1750	0.202	23.04	8M98W7D	16QAM
LTE Band 4	27	1717.5 - 1747.5	0.222	23.46	13M4G7D	QPSK
LTE Band 4	27	1717.5 - 1747.5	0.183	22.62	13M4W7D	16QAM
LTE Band 4	27	1720 - 1745	0.232	23.65	17M9G7D	QPSK
LTE Band 4	27	1720 - 1745	0.194	22.87	17M9W7D	16QAM
LTE Band 2	24E	1850.7 - 1909.3	0.227	23.57	1M13G7D	QPSK
LTE Band 2	24E	1850.7 - 1909.3	0.191	22.81	1M13W7D	16QAM
LTE Band 2	24E	1851.5 - 1908.5	0.229	23.60	2M72G7D	QPSK
LTE Band 2	24E	1851.5 - 1908.5	0.181	22.58	2M72W7D	16QAM
LTE Band 2	24E	1852.5 - 1907.5	0.228	23.58	4M52G7D	QPSK
LTE Band 2	24E	1852.5 - 1907.5	0.174	22.41	4M50W7D	16QAM
LTE Band 2	24E	1855 - 1905	0.244	23.88	8M97G7D	QPSK
LTE Band 2	24E	1855 - 1905	0.182	22.61	8M96W7D	16QAM
LTE Band 2	24E	1857.5 - 1902.5	0.254	24.04	13M4G7D	QPSK
LTE Band 2	24E	1857.5 - 1902.5	0.200	23.00	13M5W7D	16QAM
LTE Band 2	24E	1860 - 1900	0.234	23.69	17M9G7D	QPSK
LTE Band 2	24E	1860 - 1900	0.186	22.70	17M9W7D	16QAM

EUT Overview

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1.0 INTRODUCTION

1.1 Scope

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

1.2 Testing Facility

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

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

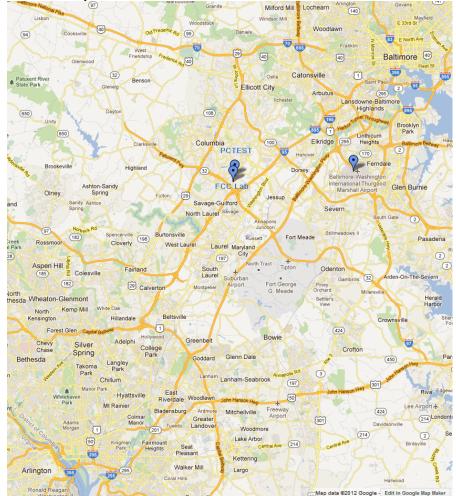


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFL83BL**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

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, Bluetooth (1x, EDR, LE)

2.3 Test Configuration

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

2.4 EMI Suppression Device(s)/Modifications

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

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

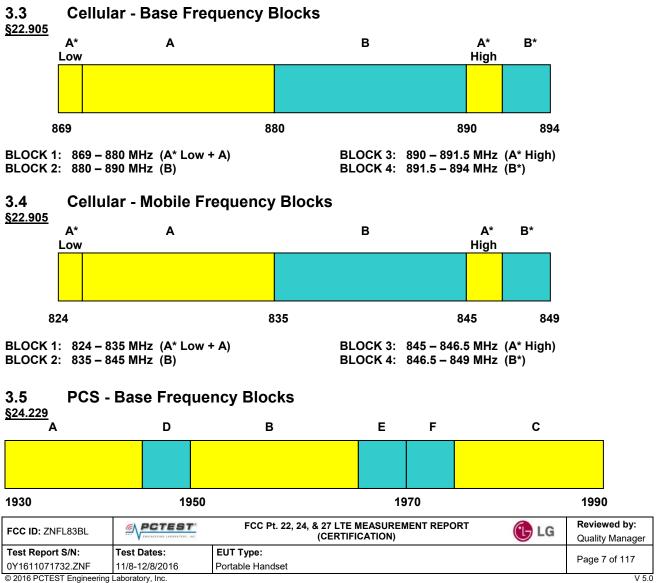
The measurement procedures described in the document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-D-2010) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" (KDB 971168 D01 v02r02) were used in the measurement of the EUT.

3.2 Block A Frequency Range

<u>§27.5(c)</u>

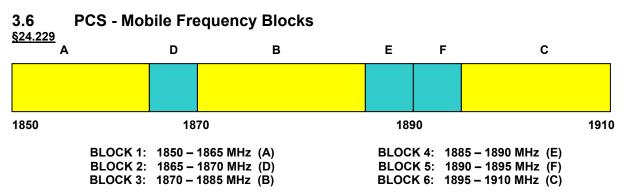
<u>698-746 MHz band</u>. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

Block A: 698-704 MHz and 728-734 MHz; Block B: 704-710 MHz and 734-740 MHz; and Block C: 710-716 MHz and 740-746 MHz.



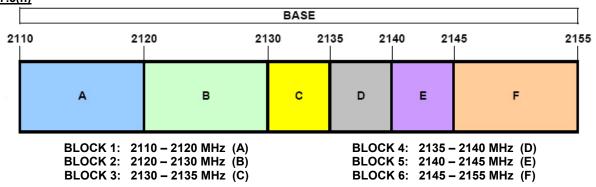


BLOCK 2:	1930 – 1945 MHz (A) 1945 – 1950 MHz (D) 1966 – 1965 MHz (B)	BLOCK 5:	1965 – 1970 MHz (E) 1970 – 1975 MHz (F) 1975 – 1990 MHz (C)
BLOCK 3:	1950 – 1965 MHz (B)	BLOCK 6:	1975 – 1990 MHz (C)



AWS - Base Frequency Blocks 3.7

<u>§27.5(h)</u>



3.8 **AWS - Mobile Frequency Blocks**

§27.5(h)

			MOBILE				
1710	17	20 1	1730 1	735 17	40 17	45	175
	А	в	с	D	E	F	

BLOCK 1: 1710 - 1720 MHz (A) BLOCK 2: 1720 - 1730 MHz (B) BLOCK 3: 1730 - 1735 MHz (C)

BLOCK 4: 1735 - 1740 MHz (D) BLOCK 5: 1740 - 1745 MHz (E) BLOCK 6: 1745 – 1755 MHz (F)

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3.9 Radiated Power and Radiated Spurious Emissions §2.1053 §22.913(a.2) §22.917(a) §24.232(c) §24.238(a) §27.50(c.10) §27.50(d.4) §27.53(g) §27.53(h)

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

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v02r02.

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

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

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

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + 10log₁₀(Power [Watts]).

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4.0 MEASUREMENT UNCERTAINTY

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

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

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5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2006.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx1	Licensed Transmitter Cable Set	4/11/2016	Annual	4/11/2017	LTx1
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/11/2016	Annual	7/11/2017	RE1
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	7/20/2016	Annual	7/20/2017	MY49432391
Agilent	N9030A	PXA Signal Analyzer (44GHz)	3/1/2016	Annual	3/1/2017	MY52350166
Agilent	N9038A	MXE EMI Receiver	4/21/2016	Annual	4/21/2017	MY51210133
Anritsu	MA2411B	Pulse Power Sensor	10/14/2015	Biennial	10/14/2017	846215
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	7/30/2015	Biennial	7/30/2017	121034
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	7/6/2016	Annual	7/6/2017	441119
Com-Power	PAM-118A	PREAMPLIFIER 500MHZ TO 18GHZ	7/26/2016	Annual	7/26/2017	551079
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
EMCO	3160-09	Small Horn	8/23/2016	Biennial	8/23/2018	135427
Espec	ESX-2CA	Environmental Chamber	3/4/2016	Annual	3/4/2017	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/26/2016	Biennial	4/26/2018	125518
PCTEST	-	EMC Switch System	7/11/2016	Annual	7/11/2017	NM1
PCTEST	-	EMC Switch System	7/6/2016	Annual	7/6/2017	NM2
Rohde & Schwarz	CMW500	Radio Communication Tester	10/20/2016	Annual	10/20/2017	100976
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/16/2016	Annual	5/16/2017	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/15/2016	Annual	7/15/2017	100348
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	7/11/2016	Annual	7/11/2017	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	3/7/2016	Annual	3/7/2017	100040
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	3/30/2016	Biennial	3/30/2018	9105-2404
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A

 Table 5-1. Test Equipment

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6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

16QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average 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 1564 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

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TEST RESULTS 7.0

7.1 Summary

Company Name:	LG Electronics MobileComm U.S.A
FCC ID:	ZNFL83BL
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Result	Reference
2.1049	Occupied Bandwidth	N/A		PASS	Section 7.2
2.1051 22.917(a) 24.238(a) 27.53(g) 27.53(h)	Out of Band Emissions	> 43 + 10log ₁₀ (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Section 7.3, 7.4
24.232(d)	Peak-Average Ratio	< 13 dB	-	PASS	Section 7.5
2.1046	Transmitter Conducted Output Power	N/A	CONDUCTED	PASS	See RF Exposure Report
2.1055. 22.355 24.235 27.54	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24, 27)		PASS	Section 7.8
22.913(a.2)	Effective Radiated Power (Band 5)	< 7 Watts max. ERP		PASS	Section 7.6
27.50(c.10)	Effective Radiated Power (Band 12)	< 3 Watts max. ERP		PASS	Section 7.6
24.232(c)	Equivalent Isotropic Radiated Power (Band 2)	< 2 Watts max. EIRP	RADIATED	PASS	Section 7.6
27.50(d.4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP		PASS	Section 7.6
2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	Undesirable Emissions	> 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

- All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst 1) case emissions.
- The analyzer plots (Sections 7.2, 7.3, 7.4, 7.5) were all taken with a correction table loaded into the analyzer. The correction 2) 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 "LTE Automation," Version 4.4.

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Occupied Bandwidth 7.2 §2.1049

Test Overview

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

Test Procedure Used

KDB 971168 D01 v02r02 - Section 4.2

Test Settings

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

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

Test Setup

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

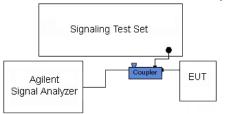


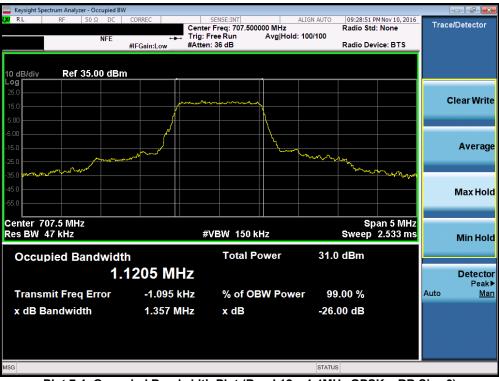
Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

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Plot 7-1. Occupied Bandwidth Plot (Band 12 – 1.4MHz QPSK – RB Size 6)



Plot 7-2. Occupied Bandwidth Plot (Band 12 – 1.4MHz 16-QAM – RB Size 6)

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Plot 7-3. Occupied Bandwidth Plot (Band 12 – 3.0MHz QPSK – RB Size 15)



Plot 7-4. Occupied Bandwidth Plot (Band 12 – 3.0MHz 16-QAM – RB Size 15)

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Plot 7-5. Occupied Bandwidth Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



Plot 7-6. Occupied Bandwidth Plot (Band 12 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-7. Occupied Bandwidth Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

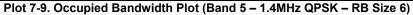


Plot 7-8. Occupied Bandwidth Plot (Band 12 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-10. Occupied Bandwidth Plot (Band 5 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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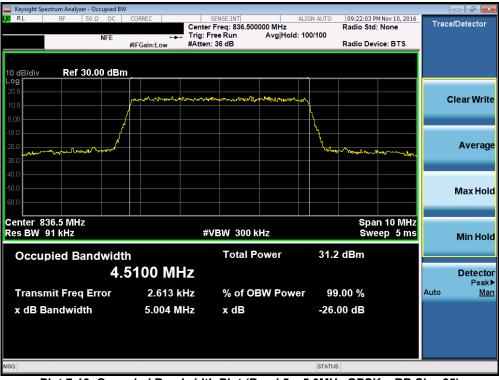
Plot 7-11. Occupied Bandwidth Plot (Band 5 – 3.0MHz QPSK – RB Size 15)



Plot 7-12. Occupied Bandwidth Plot (Band 5 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-13. Occupied Bandwidth Plot (Band 5 – 5.0MHz QPSK – RB Size 25)



Plot 7-14. Occupied Bandwidth Plot (Band 5 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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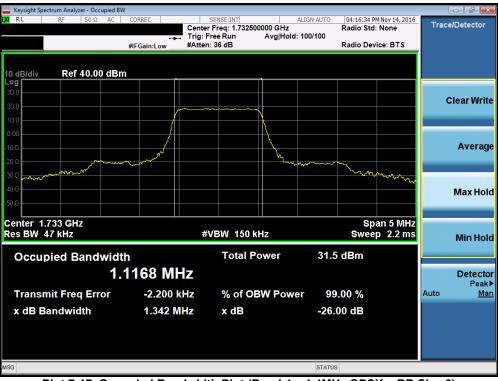
Plot 7-15. Occupied Bandwidth Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



Plot 7-16. Occupied Bandwidth Plot (Band 5 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-17. Occupied Bandwidth Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



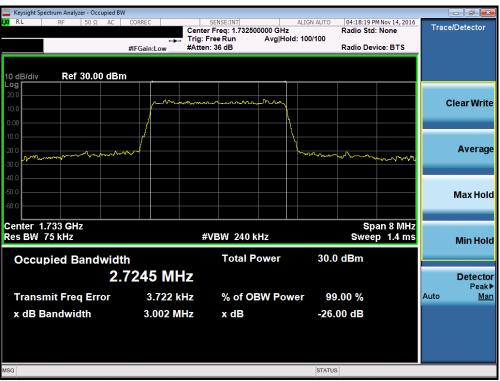
Plot 7-18. Occupied Bandwidth Plot (Band 4 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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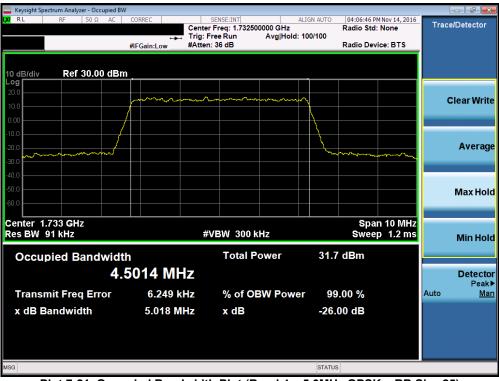
Plot 7-19. Occupied Bandwidth Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



Plot 7-20. Occupied Bandwidth Plot (Band 4 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-21. Occupied Bandwidth Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



Plot 7-22. Occupied Bandwidth Plot (Band 4 – 5.0MHz 16-QAM – RB Size 25)

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Plot 7-23. Occupied Bandwidth Plot (Band 4 – 10.0MHz QPSK – RB Size 50)



Plot 7-24. Occupied Bandwidth Plot (Band 4 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-25. Occupied Bandwidth Plot (Band 4 – 15.0MHz QPSK – RB Size 75)



Plot 7-26. Occupied Bandwidth Plot (Band 4 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-27. Occupied Bandwidth Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



Plot 7-28. Occupied Bandwidth Plot (Band 4 – 20.0MHz 16-QAM – RB Size 100)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
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Plot 7-29. Occupied Bandwidth Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



Plot 7-30. Occupied Bandwidth Plot (Band 2 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-31. Occupied Bandwidth Plot (Band 2 – 3.0MHz QPSK – RB Size 15)



Plot 7-32. Occupied Bandwidth Plot (Band 2 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
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Plot 7-33. Occupied Bandwidth Plot (Band 2 – 5.0MHz QPSK – RB Size 25)



Plot 7-34. Occupied Bandwidth Plot (Band 2 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-35. Occupied Bandwidth Plot (Band 2 – 10.0MHz QPSK – RB Size 50)



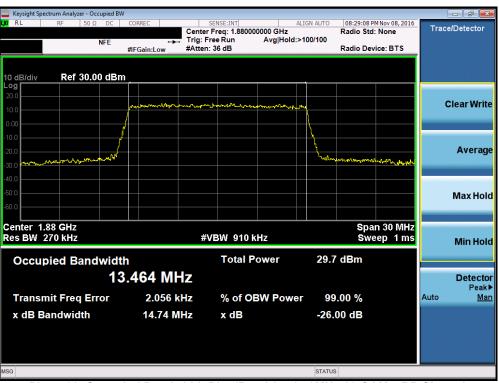
Plot 7-36. Occupied Bandwidth Plot (Band 2 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFL83BL	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		🕒 LG	Reviewed by: Quality Manager	
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Plot 7-37. Occupied Bandwidth Plot (Band 2 – 15.0MHz QPSK – RB Size 75)



Plot 7-38. Occupied Bandwidth Plot (Band 2 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Plot 7-39. Occupied Bandwidth Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



Plot 7-40. Occupied Bandwidth Plot (Band 2 – 20.0MHz 16-QAM – RB Size 100)

FCC ID: ZNFL83BL				Reviewed by: Quality Manager	
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7.3 Spurious and Harmonic Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)

Test Overview

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

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

Test Procedure Used

KDB 971168 D01 v02r02 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

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

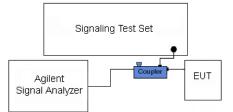


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

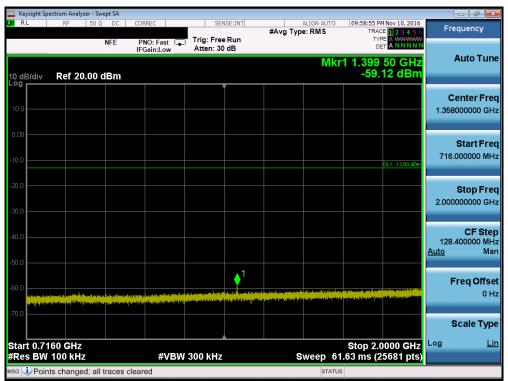
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the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

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	ectrum Analyz										
LXU RL	RF	50 Ω DC	CORREC PNO: Fast			#Avg Typ	ALIGN AUTO e: RMS	TRACE	Nov 10, 2016 1 2 3 4 5 6 A WWWWW A NNNN	Fr	equency
10 dB/div	Ref 20.	00 dBm	IPGalli.LOw	, Allen. or			M	kr1 697.8 -37.6	85 MHz 67 dBm		Auto Tune
10.0											enter Freq .950000 MHz
-10.0									DL1 -13.00 dBm	30	Start Freq .000000 MHz
-20.0										697	Stop Freq .900000 MHz
-40.0									↓ 	66 <u>Auto</u>	CF Step 790000 MHz Man
-50.0		an tel a firm a sur	م المحمد الم	and a second second	nt kongerer proj institute	n a day sa dina may data akina da ang	en over David State (1997) State State State (1997)	en en la frans fan hierer fan i	and a linear second stands	ł	F req Offset 0 Hz
-70.0	an server a part of	ilenen filite piteten in		n son af 2 fride of () and the							Scale Type
Start 30.0 #Res BW			#VBW	300 kHz		s	weep <u>32</u>	Stop 69 .06 ms (1	77.3 IVII 12	Log	Lin
MSG							STATUS	;			

Plot 7-41. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



Plot 7-42. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Keysight Spectrum Analy	/zer - Swept SA					
KU RE RF	50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	09:59:04 PM Nov 10, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
	NFE	PNO: Fast IFGain:Low	Atten: 10 dB		DETANNNN	Auto Tuno
10 dB/div Ref 0.	00 dBm			N	kr1 2.100 0 GHz -29.76 dBm	Auto Tune
Log			Ĭ			Center Freq
-10.0					DL1 -13.00 dBm	6.00000000 GHz
-20.0						
-30.0 1						Start Fred 2.000000000 GHz
-50.01						
-40.0						Stop Fred
-50.0						10.00000000 GHz
-60.0						CF Step
-00.0	^					800.000000 MHz <u>Auto</u> Mar
-70.0						
-80.0						Freq Offset
-90.0						
00.0						Scale Type
Start 2.000 GHz					Stop 10.000 GHz	Log <u>Lin</u>
#Res BW 1.0 MH			3.0 MHz	Sweep 1	3.87 ms (16001 pts)	
MSG 🗼 Points change	ed; all traces c	eared		STAT	US	

Plot 7-43. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



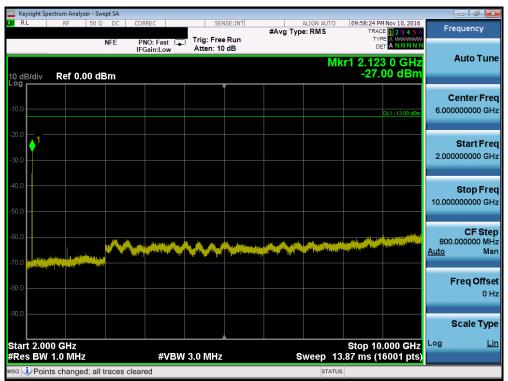
Plot 7-44. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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Keysight Spe												
RL	RF	50 Ω D	C (CORREC			SENSE:INT	#	ALIGN AUTO Type: RMS		M Nov 10, 2016	Frequency
		NFE		PNO: Fa IFGain:Lo	st 😱	Trig: F Atten:	ree Run 30 dB	#AVŞ	g Type: RIVIS	TY	CE 123456 PE A WWWWW ET A NNNNN	
0 dB/div	Ref 20).00 dBi	n						Mkr	1 1.415 -60.	40 GHz 53 dBm	Auto Tur
10.0												Center Fre 1.358000000 GF
0.00											DL1 -13.00 dBm	Start Fre 716.000000 MH
80.0												Stop Fre 2.000000000 GF
0.0												CF Ste 128.400000 Mi <u>Auto</u> Mi
0.0							1		Lingung an International State			Freq Offs 0 F
70.0												Scale Typ
tart 0.71 Res BW				#	VBW	300 kH	Iz		Sweep 61	Stop 2. .63 ms (2	0000 GHZ	Log <u>L</u>
sg 🛈 Point	s change	d; all trac	es cle	ared					STATUS			

Plot 7-45. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



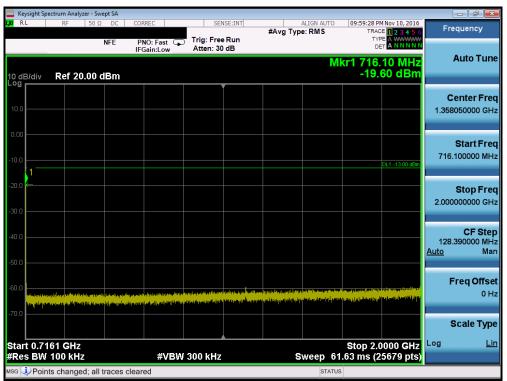
Plot 7-46. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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MSG								STATUS				
Start 30.0 #Res BW		2	4	#VBW 3	00 kHz		s	weep <u>32</u>	Stop 6 .06 ms (1		Log	Lin
												Scale Type
-70.0		and a start of the second s			(). 		an ing at sylf, yang kewiti yaki in	a la sine fa statistich (a.e.)	for a string of the state of the string	a da na sa sa kan kan kan kan kan kan kan kan kan ka		
-60.0							and the second second second	in alata wana kale na akata na	and a second stress stark two colo	Les Surgerster		F req Offset 0 Hz
-50.0										1		
											66 <u>Auto</u>	.800000 MHz Man
-40.0												CF Step
-30.0											698	.000000 MHz
-20.0												Stop Freq
-10.0										DL1 -13.00 dBm	30	.000000 MHz
0.00												Start Freq
											004	.000000 14112
10.0												enter Freq
10 dB/div ^{Log} r	Ref 20	.00 dBm							-58.	67 dBm		
			IFGain:L	ow	Atten: 30	dB		M		15 MHz		Auto Tune
		NFE		ast 🖵	Trig: Free	Run	#Avg Typ		TRAC		Fr	equency
Keysight Sp	ectrum Analy RF	zer - Swept SA 50 Ω DC	CORREC	1	SEN	SE:INT		ALIGN AUTO	00-50-23 PM	4 Nov 10, 2016	_	

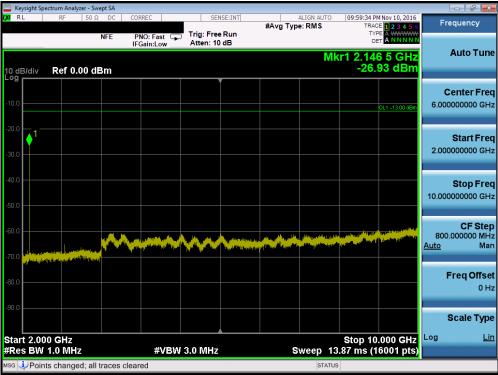
Plot 7-47. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-48. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 117
0Y1611071732.ZNF	11/8-12/8/2016	Portable Handset		Page 39 of 117
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Plot 7-49. Conducted Spurious Plot (Band 12 – 1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-50. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 40 of 117
0Y1611071732.ZNF	11/8-12/8/2016	Portable Handset		Page 40 of 117
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Keysight Spe										
U RL	RF	50Ω DC	CORREC PNO: Fast IFGain:Low	Trig: Fr		#Avg Typ	ALIGN AUTO e: RMS	TRACE	Nov 10, 2016 1 2 3 4 5 6 A WWWWW A N N N N N	Frequency
0 dB/div	Ref 20.0	00 dBm	IFGall:Low	Auen			Mkr	1 1.995 -60.0	40 GHz)1 dBm	Auto Tui
10.0										Center Fro 1.424500000 Gi
0.00									DL1 -13.00 dBm	Start Fr 849.000000 Mi
80.0										Stop Fro 2.000000000 Gi
io.o										CF Ste 115.100000 MI <u>Auto</u> Mi
	Terranen propieren en televis en sin alterne en place en	¹¹ que function de la filmine par participation de la compaction de la com	n ga ku ku sa ku sa ku ku ku ku ku ku ku ku ku sa k	ngangang pala pada pantapana ng kapatan ni si pada pantapana	nega disebut di kerangan ke	enten aus phonoise (fille aus ante 1939 - La sur forte phonoise de si	hand you month to the first your and to a sort of gaps	e den generalen den der der andere en geher eine generalen der	1	Freq Offs 01
70.0										Scale Ty
itart 0.84 Res BW			#V	BW 300 kH	z	S	weep 55	Stop 2.0 .25 ms (23	VUU GIIZ	Log <u>L</u>
3G 連 Point	s changed	; all traces	cleared				STATUS			

Plot 7-51. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



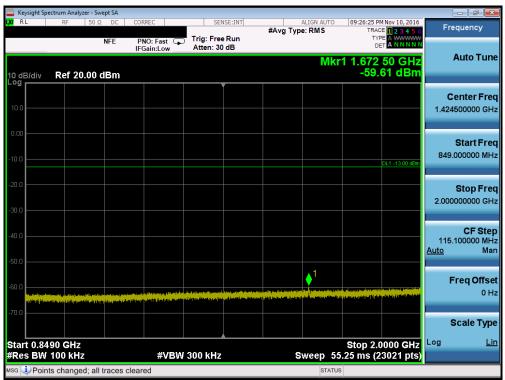
Plot 7-52. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 41 of 117
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	ectrum Analyzer - S	wept SA									
XI RL	RF 50	Ω DC NFE	CORREC PNO: Fast			#Avg Type	ALIGN AUTO e: RMS	TRAC	1 Nov 10, 2016 E 1 2 3 4 5 6 E A WWWW T A N N N N N	Fre	equency
10 dB/div	Ref 20.00	dBm	IFGam:Low	Atten: 00	40		MI	kr1 823. -61.4	95 MHz 48 dBm		Auto Tune
10.0											enter Fred
.10.0									DL1 -13.00 dBm	30	Start Free 000000 MH
30.0										824	Stop Free .000000 MH
-40.0										79 <u>Auto</u>	CF Stej 400000 MH Ma
60.0	na sta juni na jung mengena kata sta jung mengena kata sta sta sta sta sta sta sta sta sta					end for Junior and provide the form				F	F req Offse 0 H
-70.0										tog	Scale Type Lir
Start 30.0 #Res BW	0 MHz 100 kHz		#VBN	/ 300 kHz		S	weep 38	Stop 8: .11 ms (1	2-7. V 1911 12	LUg	<u>L</u>
ISG							STATUS				

Plot 7-53. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-54. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 42 of 117
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	rum Analyzer - Sv									
X/RL	RF 50 9	Ω DC	PNO: Fast		Run	#Avg Typ	ALIGN AUTO e: RMS	TRAC	4 Nov 10, 2016 E 1 2 3 4 5 6 E A WWWW	Frequency
			IFGain:Low	Atten: 10	dB				ANNNN	Auto Tun
10 dB/div	Ref 0.00 d	IBm					Mk	-32.	9 5 GHz 82 dBm	
				\ ``						Center Free
10.0									DL1 -13.00 dBm	6.00000000 GH
20.0										
										Start Fre
30.0										2.000000000 GH
40.0										
										Stop Fre 10.00000000 GH
50.0										
60.0									ويتر الأقربين	CF Ste
.0.0		3		\sim		Mar Marth	Headquart			800.000000 MH Auto Ma
70.0										
80.0										Freq Offs
										0 H
90.0										Ocole Tree
										Scale Typ
Start 2.000 Res BW 1			#\/B\A	2004			waan 12	Stop 10	.000 0112	Log <u>Li</u>
sg Di Points		L troppo ol		/ 3.0 MHz		5	status		6001 pts)	
	changed, an									

Plot 7-55. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-56. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 42 of 117
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Keysight Spectrum A								-		
RL RF	50 Ω DC			rig: Free Atten: 30		#Avg Typ	ALIGN AUTO e: RMS	TRAC TYP	Nov 10, 2016 E 1 2 3 4 5 6 E A WWWWW T A N N N N N	Frequency
	20.00 dBm		ow P	Atten: 30	άB		M	kr1 850.		Auto Tui
0.0										Center Fr 1.425000000 Gi
.00 									DL1 -13.00 dBm	Start Fr 850.000000 M
0.0 0.0 <mark>1</mark>										Stop Fr 2.000000000 G
.0										CF St 115.000000 M <u>Auto</u> M
	na na antara a serie da antará da desta de series d	h heriyana katika katika dinata Nyenye pakatana ^{nata} na katika	ng gang ting tit pal proving galance ting, sit provided			teri (an fan fan tie Andrewin (de Sterne yn Sterne fan de gente	and and a failed and a second	t gang bi dagi bi san da kata da ka	eng nagarang kabang na kabang kabang na	Freq Offs 0
).0										Scale Ty
art 0.8500 G les BW 100 I		#	VBW 30)0 kHz		s	weep 55	Stop 2.0 20 ms (2	000 0112	Log
SG UPoints changed; all traces cleared										

Plot 7-57. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-58. Conducted Spurious Plot (Band 5 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 44 of 117
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10 dB/div Ref 20 10 dB/div Ref 20 0 00	P	PRREC POINT PREC PREC PROVIDENT	SENS Trig: Free Atten: 30	#Avg Type		TRACE TYPI DE 1 1.708 -22.7	Nov14,2016	A Ce 869.0 ٤	uto Tune nter Frec 00000 MH2 Start Frec
Log					Mkr	-22.7	8 0 GHz 79 dBm	Ce 869.0	nter Fred 00000 MH: Start Fred
								869.0	00000 MH Start Free
20.0									
30.0							DL1 -13.00 dBm	00.0	00000 MH
10.0									Stop Fre 00000 GH
0.0							an a gaing de route datai	167.8 <u>Auto</u>	CF Ste 00000 MI Ma
	en geste den en fan de en effender of de en effender fan de en effender fan de en effender fan de en effender f	\$445 ⁶ 6767 ₆ 9 ₆ 9 ₆ 94946678979						Fr	e q Offs 0 I
0.0 tart 0.0300 GHz						Stop 1 <u>.</u> 7	080 GHz		cale Typ
Res BW 1.0 MHz	4	#VBW	3.0 MHz	ŝ	Sweep 2.2	239 ms (:	3359 pts)		

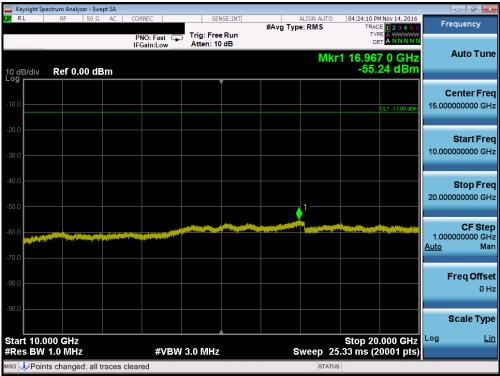
Plot 7-59. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



Plot 7-60. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager		
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Plot 7-61. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



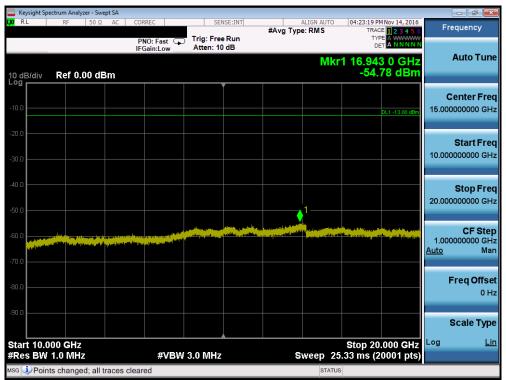
Plot 7-62. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 46 of 117
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Keysight Spectru											d X
U RL	RF 50 Ω	AC	PNO: Fast	Trig: Fre		#Avg Typ	ALIGN AUTO e: RMS	TRAC TYP	Nov 14, 2016 E 1 2 3 4 5 6 E A WWWWW	Frequer	ncy
0 dB/div R	ef 20.00 c	dBm	IFGain:Low	Atten: 3	0 dB		Mk	r 1 9.69 1	0 GHz 0 dBm	Auto	o Tun
10.0										Cente 5.8775000	
0.0									DL1 -13.00 dBm	Star 1.7550000	
0.0										Sto j 10.0000000	
						ni post primo di secole Ingeneratione processione	i bi i mu i purposa na manja p	a ang situ kaon panga Magan Pangan pangaharan	1 participant	CI 824.5000 <u>Auto</u>	F Ste 00 M M
0.0										Freq	Offs 0
tart 1.755 0	247							Stop 10	000 GHz	Scale	e Tyj
Res BW 1.0			#VB	W 3.0 MHz		S	weep 14	.29 ms (1	6491 pts)		
🛯 🗼 Points c	hanged; all t	traces cle	eared				STATUS				

Plot 7-63. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-64. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 47 of 117
0Y1611071732.ZNF	11/8-12/8/2016	Portable Handset		Page 47 of 117
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	ectrum Analyzer	- Swept SA									
L <mark>XI</mark> RL	RF	50Ω AC	CORREC PNO: Fast IFGain:Low	Trig: Fre		ALT #Avg Type:	IGN AUTO RMS	TRAC	I Nov 14, 2016 E 1 2 3 4 5 6 E A WWWWW A N N N N N	Fre	equency
10 dB/div Log	Ref 20.0	0 dBm	II Gam.Low				Mk	r1 1.499 -48.3	9 5 GHz 35 dBm		Auto Tune
10.0											enter Freq .000000 MHz
-10.0									DL1 -13.00 dBm	30	Start Freq .000000 MHz
-20.0										1.710	Stop Freq
-40.0					an sing the other		So abactanti di Milan Bory di	↓1	and the second second	168 <u>Auto</u>	CF Step .000000 MHz Man
-60.0										F	F req Offset 0 Hz
-70.0										tog	Scale Type Lin
Start 0.03 #Res BW			#V	BW 3.0 MHz		Sv	weep 2	Stop 1.7 .240 ms ('100 GHz 3361 pts)	LUg	
MSG							STATUS				

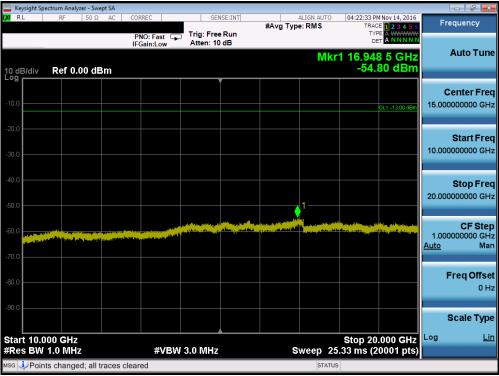
Plot 7-65. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-66. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager		
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Plot 7-67. Conducted Spurious Plot (Band 4 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



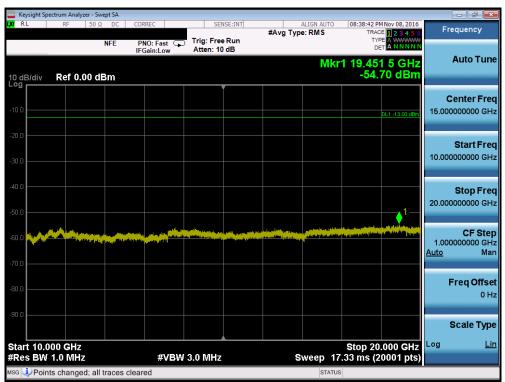
Plot 7-68. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager			
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Plot 7-69. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



Plot 7-70. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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ASG							STATUS	3			
Start 0.03 #Res BW			#VBV	V 3.0 MHz		ę	Sweep 2	Stop 1.8 427 ms (3500 GHz 3641 pts)	Log	<u></u>
								04			Lin
-70.0											Scale Type
											0 Hz
-60.0	an a	terre and the second states									Freq Offset
-50.0				and and an of the second second		الاستنباب ويتجروه وبالمدار		, ¹ 142-1472-1472-1472-1472-1472-1472-1472-1			
-40.0									14	182 <u>Auto</u>	000000 MHz. Man
											CF Step
-30.0										1.85	0000000 GHz
20.0											Stop Freq
									DL1 -13.00 dBm		
-10.0										30	Start Freq
0.00											
10.0										940	.000000 MHz
										(Center Freq
10 dB/div Log	Ref 20.0	0 dBm						-50.	82 dBm		
			IFGain:Low	Atten: 30	dB		MI		0 5 GHz		Auto Tune
		NFE	PNO: Fast	Trig: Free		#Avg Type	e: RMS	TYP	E 1 2 3 4 5 6 E A WWWWW T A N N N N N	Fr	equency
X RL	ectrum Analyzer RF 5	50 Ω DC	CORREC	SEN	SE:INT		ALIGN AUTO	08:36:23 Pf	4 Nov 08, 2016	Ξ.	equency

Plot 7-71. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-72. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 51 of 117
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	pectrum Analyz	ter - Swept SA									
I <mark>XI</mark> RL	RF	50 Ω DC	CORREC	Trig: Free		#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Nov 08, 2016 CE 1 2 3 4 5 6 PE A WWWW	Fr	equency
10 dB/div Log	Ref 0.0	00 dBm	IFGain:Low	Atten: 10	dB		Mk	r1 19.44	9 0 GHz 40 dBm		Auto Tune
-10.0									DL1 -13.00 dBm		enter Freq
-20.0										10.000	Start Fred
-40.0									1	20.000	Stop Fred 0000000 GH2
-60.0	<u>A</u> therese		find and the formula of the state of the sta	a la politica da contra la contra da La politica da contra da la politica da La politica politica d	nar fra gyar ye nye ta' a ta'	a a la constituti d'a constituti de la cons Constituti de la constituti	a distri jeter sener a di	ann a là tha ann an taon an tao an taoinn an taoinn An taoinn an taoinn a		1.000 <u>Auto</u>	CF Step 0000000 GH: Mar
-70.0										ł	F req Offse 0 H
-90.0											Scale Type
	.000 GHz V 1.0 MHz		#VBW	/ 3.0 MHz		S	weep 1	Stop 20 7.33 ms (2		Log	Lin
MSG							STAT	US			

Plot 7-73. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



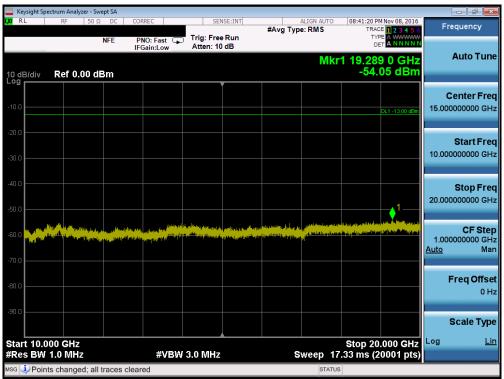
Plot 7-74. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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	Keysight Spectrum Analyzer - Swept SA 👘 🔂													
l XI RI	L	RF	50 Ω	DC (PNO: Fas	t (a)	SEN	Run	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Nov 08, 2016 CE 1 2 3 4 5 6 PE A *******	Fn	equency
10 dE Log	3/div	Ref 20			IFGain:Lo	w	Atten: 30	dB		M	lkr1 1.91	3 0 GHz 46 dBm		Auto Tune
10.0														enter Freq 5500000 GHz
0.00 -10.0												DL1 -13.00 dBm	1.913	Start Freq 3000000 GHz
-20.0 -30.0	1												10.000	Stop Freq
-40.0 -50.0		<u>a Harakara) M</u>		MA				and the second s					808 <u>Auto</u>	CF Step .700000 MHz Man
-60.0	teore and an instant	andra de sin line											ŀ	Freq Offset 0 Hz
-70.0													Log	Scale Type
	t 1.913 s BW 1	B GHZ I.0 MHz	z		#\	/BW	3.0 MHz		S	weep 1	Stop 10 14.02 ms (1	.000 GHz 6179 pts)		
MSG										STAT	US			

Plot 7-75. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-76. Conducted Spurious Plot (Band 2 – 3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFL83BL		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
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