

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 - 11/14/2016, 11/17/2016 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 0Y1611070714.ZNF

### ZNFM150

### APPLICANT:

FCC ID :

### 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):	LG-M150, LGM150, M150, LG-M151, LGM151, M151, LG-M153, LGM153, M153, LG-M154, LGM154, M154
Test Device Serial No.:	identical prototype [S/N: 00871, 00897]

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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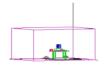
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# MEASUREMENT REPORT FCC Part 22, 24, & 27



### §2.1033 General Information

APPLICANT: APPLICANT ADDRESS:	LG Electronics MobileComm U.S.A 1000 Sylvan Avenue Englewood Cliffs, NJ 07632, United States			
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.			
TEST SITE ADDRESS:	7185 Oakland Mills Road	d, Columbia, MD 21045	USA	
FCC RULE PART(S):	§2; §22; §24; §27			
BASE MODEL:	LG-M150			
FCC ID:	ZNFM150			
FCC CLASSIFICATION:	PCS Licensed Transmitter Held to Ear (PCE)			
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)			
Test Device Serial No.:	00871, 00897			
DATE(S) OF TEST:	11/8 - 11/14/2016, 11/17/2016			
TEST REPORT S/N:	0Y1611070714.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** FCC Rule Emission Max. Power Max. Power Mode Tx Frequency (MHz) Modulation Part Designator (W) (dBm) LTE Band 12 QPSK 27 699.7 - 715.3 0.112 20.48 1M12G7D LTE Band 12 27 699.7 - 715.3 0.097 19.85 1M11W7D 16QAM LTE Band 12 27 700.5 - 714.5 20.76 2M72G7D QPSK 0.119 LTE Band 12 27 700.5 - 714.5 20.09 2M71W7D 16QAM 0.102 QPSK LTE Band 12/17 27 701.5 - 713.5 0.120 20.78 4M51G7D LTE Band 12/17 27 701.5 - 713.5 0.097 19.86 4M53W7D 16QAM LTE Band 12/17 27 704 - 711 0.120 20.78 9M00G7D QPSK LTE Band 12/17 27 704 - 711 0.097 19.89 8M98W7D 16QAM LTE Band 5 22H 824.7 - 848.3 0.083 19.17 1M12G7D QPSK LTE Band 5 22H 824.7 - 848.3 0.062 17.95 1M12W7D 16QAM LTE Band 5 22H 825.5 - 847.5 0.085 19.29 2M72G7D QPSK 2M73W7D LTE Band 5 22H 825.5 - 847.5 0.064 18.08 16QAM LTE Band 5 22H 826.5 - 846.5 0.090 19.52 4M54G7D QPSK 22H 826.5 - 846.5 17.97 4M50W7D 16QAM LTE Band 5 0.063 LTE Band 5 22H 829 - 844 0.091 19.59 8M99G7D QPSK LTE Band 5 22H 829 - 844 0.073 18.65 8M97W7D 16QAM LTE Band 4 27 1710.7 - 1754.3 24.02 1M12G7D QPSK 0.253 LTE Band 4 27 1710.7 - 1754.3 22.63 1M11W7D 16QAM 0.183 27 QPSK LTE Band 4 1711.5 - 1753.5 0.293 24.66 2M72G7D LTE Band 4 27 1711.5 - 1753.5 0.222 23.46 2M71W7D 16QAM LTE Band 4 27 1712.5 - 1752.5 0.313 24.95 4M50G7D QPSK 1712.5 - 1752.5 LTE Band 4 27 0.230 23.61 4M53W7D 16QAM LTE Band 4 27 1715 - 1750 0.262 24.18 8M99G7D QPSK 8M99W7D LTE Band 4 27 1715 - 1750 0.192 22.83 16QAM LTE Band 4 27 1717.5 - 1747.5 0.306 24.85 13M5G7D QPSK 16QAM LTE Band 4 27 1717.5 - 1747.5 0.212 23.26 13M5W7D LTE Band 4 27 1720 - 1745 0.306 24.86 17M9G7D QPSK LTE Band 4 27 1720 - 1745 0.233 23.67 17M9W7D 16QAM 1850.7 - 1909.3 LTE Band 2 24E 0.315 24.98 1M12G7D QPSK 24F 1850.7 - 1909.3 0.242 16QAM LTE Band 2 23.84 1M11W7D 24E 25.22 QPSK 1851.5 - 1908.5 0.333 2M72G7D LTE Band 2 LTE Band 2 24E 1851.5 - 1908.5 24.25 2M71W7D 16QAM 0.266 24E QPSK LTE Band 2 1852.5 - 1907.5 0.322 25.08 4M58G7D LTE Band 2 24E 1852.5 - 1907.5 0.241 23.81 4M62W7D 16QAM LTE Band 2 24E 1855 - 1905 0.335 25.25 9M00G7D QPSK 1855 - 1905 LTE Band 2 24E 0.262 24.19 8M99W7D 16QAM 13M5G7D LTE Band 2 24E 1857.5 - 1902.5 0.318 25.02 QPSK 24E 1857.5 - 1902.5 13M5W7D 16QAM LTE Band 2 0.261 24.17 LTE Band 2 24E 1860 - 1900 0.304 24.83 18M0G7D **QPSK** LTE Band 2 24E 1860 - 1900 0.243 23.86 18M0W7D 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.

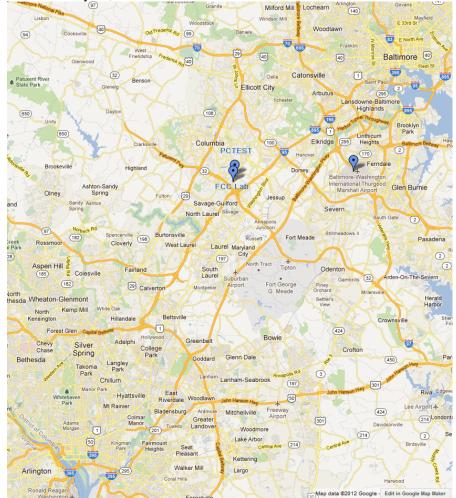


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFM150**. 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)

LTE Band 12 (698 - 716 MHz) overlaps the entire frequency range of LTE Band 17 (704 - 716 MHz). Therefore, test data provided in this report covers Band 17 as well as Band 12.

### 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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#### **DESCRIPTION OF TESTS** 3.0

#### 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.

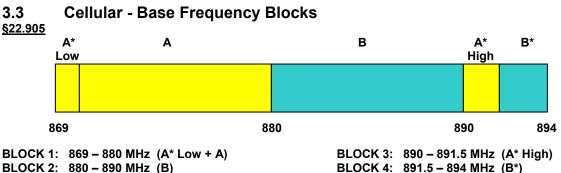
#### 3.2 Block A Frequency Range

§27.5(c)

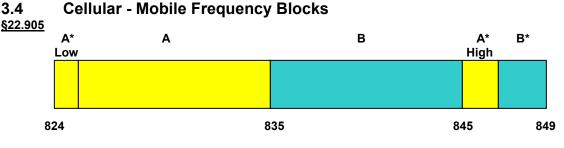
3.4

698-746 MHz band. 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.



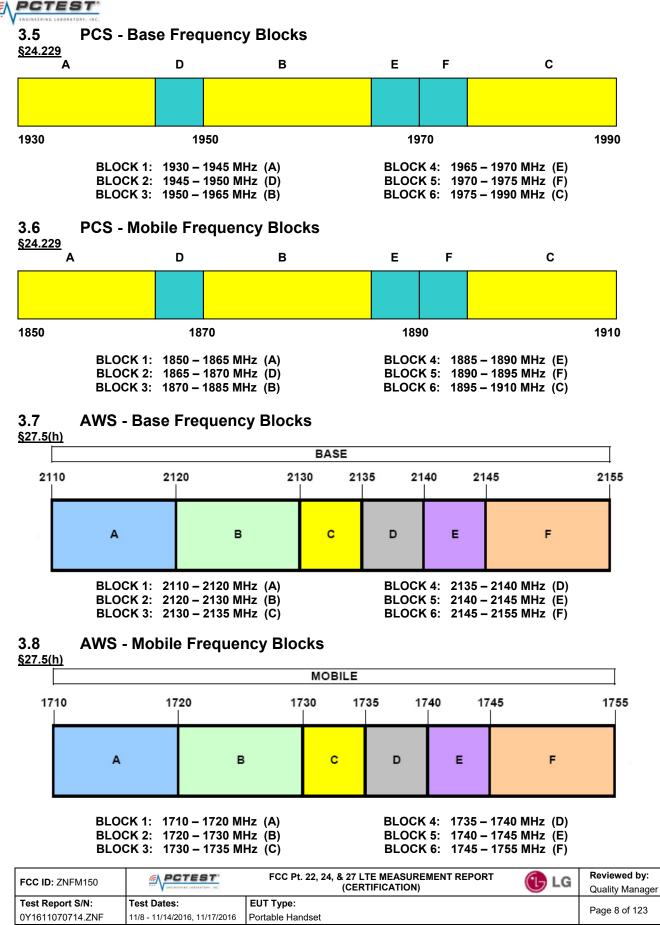
BLOCK 2: 880 - 890 MHz (B)



BLOCK 1: 824 - 835 MHz (A\* Low + A) BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 - 846.5 MHz (A\* High) BLOCK 4: 846.5 - 849 MHz (B\*)

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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  $P_{g \text{ [dBm]}}$  – 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 + 10log<sub>10</sub>(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  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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

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# 5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx3	Licensed Transmitter Cable Set	7/12/2016	Annual	7/12/2017	N/A
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	3/4/2016	Annual	3/4/2017	RE1
Agilent	N9030A	PXA Signal Analyzer (44GHz)	3/1/2016	Annual	3/1/2017	MY52350166
Anritsu	MT8820C	Radio Communication Analyzer	4/14/2016	Annual	4/14/2017	6201240328
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	2/26/2016	Annual	2/26/2017	441112
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
Espec	ESX-2CA	Environmental Chamber	3/4/2016	Annual	3/4/2017	17620
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	8/28/2016	Biennial	8/28/2018	135427
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	4/26/2016	Biennial	4/26/2018	128338
K & L	11SH10-3075/U18000	High Pass Filter	7/11/2016	Annual	7/11/2017	11SH10-3075/U18000-2
K & L	13SH10-1000/U1000	N Type High Pass Filter	7/6/2016	Annual	7/6/2017	13SH10-1000/U1000-1
Mini-Circuits	PWR-SENS-4RMS	USB Power Sensor	3/4/2016	Annual	3/4/2017	11210140001
Mini-Circuits	SSG-4000HP	USB Synthesized Signal Generator		N/A		11208010032
Mini-Circuits	TVA-11-422	RF Power Amp		N/A		QA1303002
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	ESU40	EMI Test Receiver (40GHz)	7/15/2016	Annual	7/15/2017	100348
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/7/2016	Annual	3/7/2017	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
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107

Table 5-1. Test Equipment

### Notes:

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

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## 6.0 SAMPLE CALCULATIONS

### **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 2<sup>nd</sup> 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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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name:	LG Electronics MobileComm U.S.A
FCC ID:	<u>ZNFM150</u>
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 <sub>10</sub> (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, 17)	< 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 66)	< 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 <sub>10</sub> (P[Watts]) for all out-of-band emissions		PASS	Section 7.7		
	Table 7-1. Summary of Test Results						

#### Notes:

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

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# 7.2 Occupied Bandwidth §2.1049

### Test Overview

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

### Test Procedure Used

KDB 971168 D01 v02r02 - Section 4.2

### Test Settings

- 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.

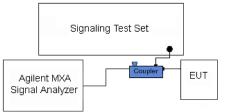


Figure 7-1. Test Instrument & Measurement Setup

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

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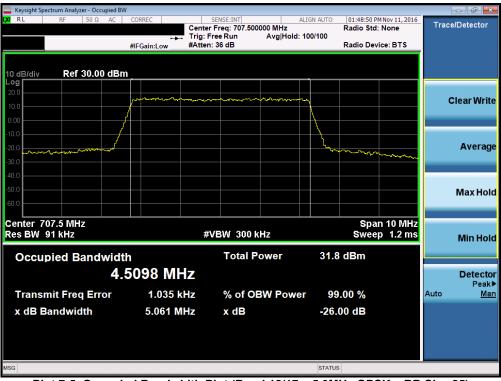
Plot 7-3. Occupied Bandwidth Plot (Band 12 – 3.0MHz QPSK – RB Size 15)



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

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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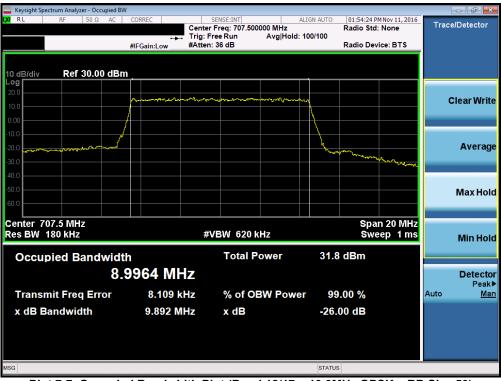
Plot 7-5. Occupied Bandwidth Plot (Band 12/17 – 5.0MHz QPSK – RB Size 25)



Plot 7-6. Occupied Bandwidth Plot (Band 12/17 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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Plot 7-7. Occupied Bandwidth Plot (Band 12/17 - 10.0MHz QPSK - RB Size 50)

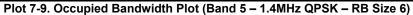


Plot 7-8. Occupied Bandwidth Plot (Band 12/17 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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Plot 7-10. Occupied Bandwidth Plot (Band 5 – 1.4MHz 16-QAM – RB Size 6)

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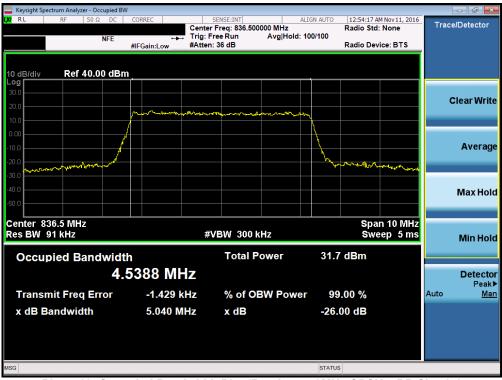
Plot 7-11. Occupied Bandwidth Plot (Band 5 – 3.0MHz QPSK – RB Size 15)



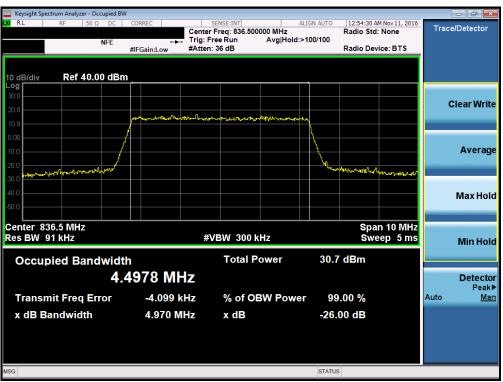
Plot 7-12. Occupied Bandwidth Plot (Band 5 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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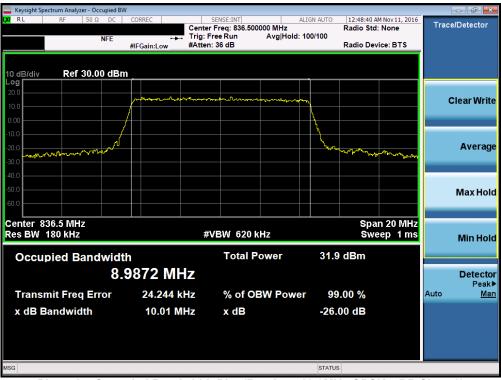
Plot 7-13. Occupied Bandwidth Plot (Band 5 – 5.0MHz QPSK – RB Size 25)



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

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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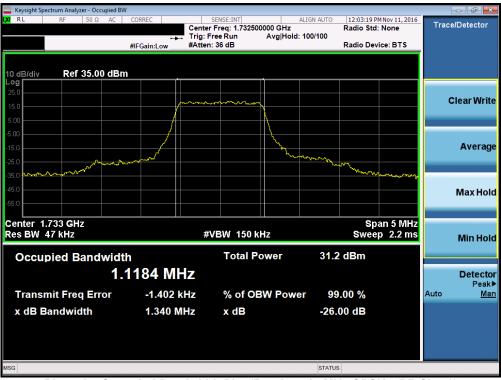
Plot 7-15. Occupied Bandwidth Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

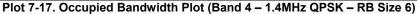


Plot 7-16. Occupied Bandwidth Plot (Band 5 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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Plot 7-18. Occupied Bandwidth Plot (Band 4 – 1.4MHz 16-QAM – RB Size 6)

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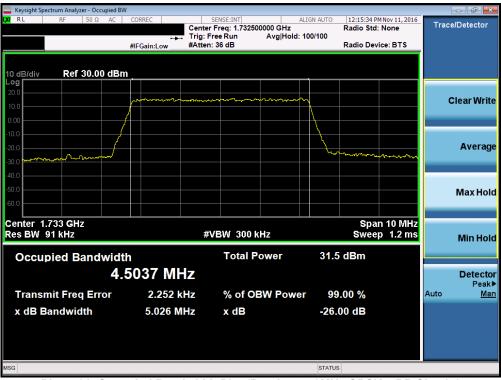
Plot 7-19. Occupied Bandwidth Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

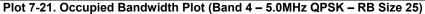


Plot 7-20. Occupied Bandwidth Plot (Band 4 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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Plot 7-22. Occupied Bandwidth Plot (Band 4 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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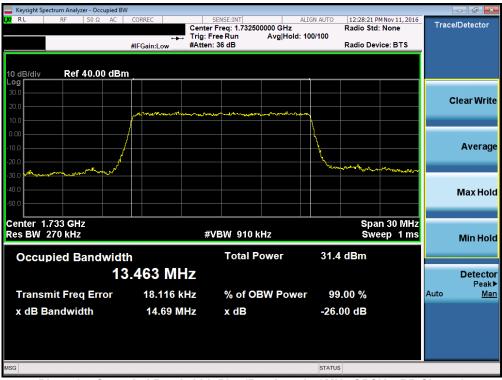
Plot 7-23. Occupied Bandwidth Plot (Band 4 – 10.0MHz QPSK – RB Size 50)



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

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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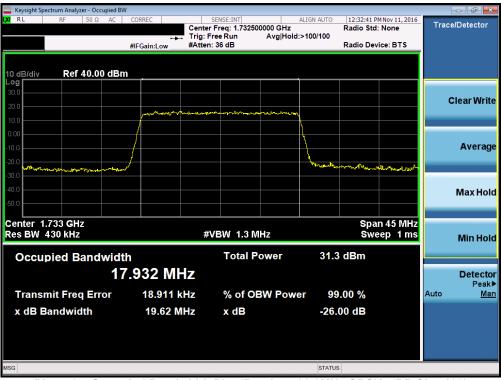
Plot 7-25. Occupied Bandwidth Plot (Band 4 – 15.0MHz QPSK – RB Size 75)



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

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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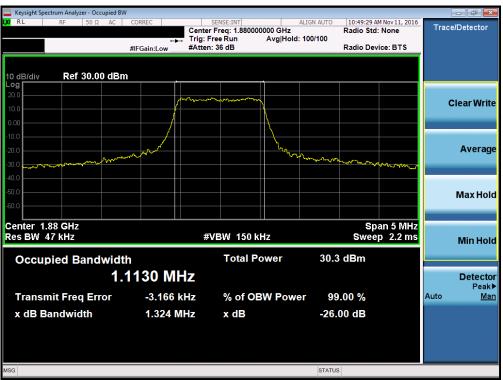
Plot 7-28. Occupied Bandwidth Plot (Band 4 – 20.0MHz 16-QAM – RB Size 100)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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Plot 7-29. Occupied Bandwidth Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



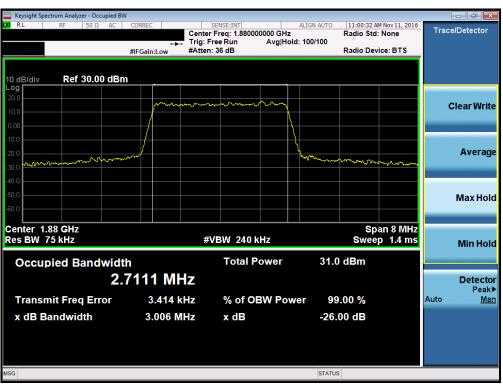
Plot 7-30. Occupied Bandwidth Plot (Band 2 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> 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: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> 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: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		<b>Reviewed by:</b> Quality Manager	
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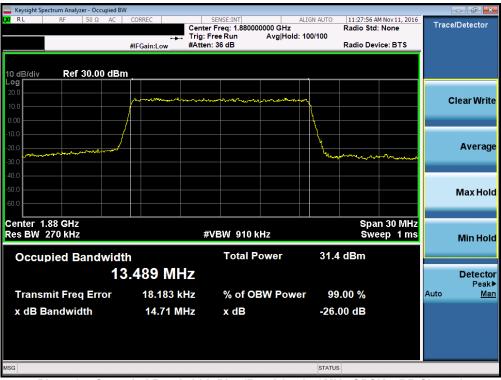
Plot 7-35. Occupied Bandwidth Plot (Band 2 – 10.0MHz QPSK – RB Size 50)



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

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		<b>Reviewed by:</b> Quality Manager	
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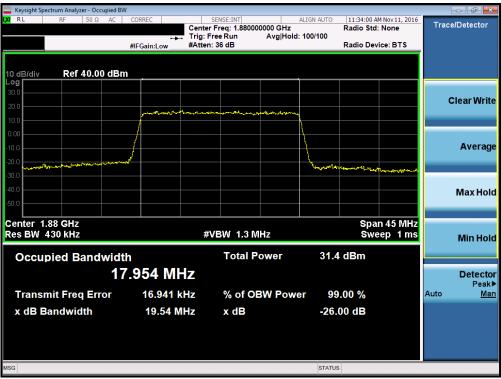
Plot 7-37. Occupied Bandwidth Plot (Band 2 – 15.0MHz QPSK – RB Size 75)



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

FCC ID: ZNFM150			<b>Reviewed by:</b> 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: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		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 10<sup>th</sup> harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at 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.

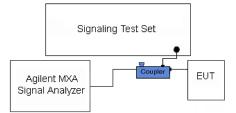


Figure 7-2. Test Instrument & Measurement Setup

### Test Notes

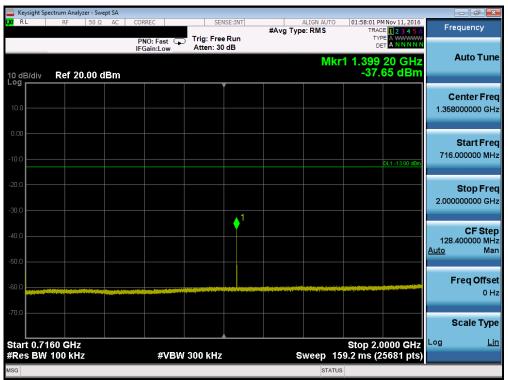
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the 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.

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager	
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	ectrum Analyze										
X/RL	RF	50 Ω AC	PNO: F	ast 🖵	Trig: Free Atten: 30	#Avg Typ	ALIGN AUTO e: RMS	TRAC	E 1 2 3 4 5 6 A WWWWW T A NNNNN	Fr	equency
10 dB/div	Ref 20.	00 dBm	II Gam.	LOW			Μ	kr1 697. -45.	90 MHz 26 dBm		Auto Tune
10.0											Center Fred 9.950000 MH:
10.00									DL1 -13.00 dBm	30	Start Free
20.0										697	<b>Stop Fre</b> .900000 MH
40.0									1 1	66 <u>Auto</u>	<b>CF Ste</b> 790000 MH Ma
50.0											Freq Offse 0 H
70.0											Scale Typ
Start 30.0 #Res BW	0 MHz 100 kHz		-	#VBW	300 kHz	s	weep 82	Stop 6 8.82 ms (1	97.9 MHz 3359 pts)	Log	Lii
MSG							STATUS	3			

Plot 7-41. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)



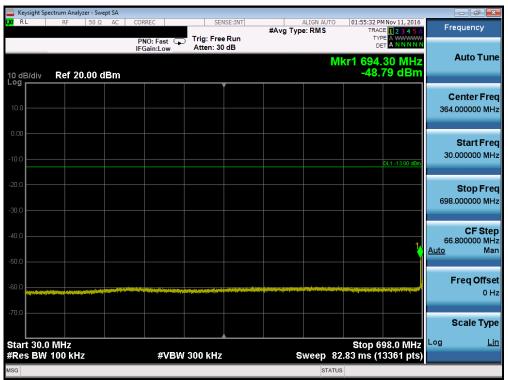
Plot 7-42. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)				<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 26 of 122		
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🔤 Ke	ysight Spe	ctrum Anal	/zer - Swep	pt SA										
<b>lxi</b> R	L	RF	50 Ω	AC	CORREC	ast 🖵	Trig: Free		#Avg Typ	ALIGN AUTO e: RMS	TRA	MNov 11, 2016 CE 1 2 3 4 5 6 PE A MANNAN ET A NNNNN	Fr	equency
10 dE Log	B/div	Ref 0.	00 dB	m	IFGain:L	_ow	Atten: 10	) dB		Μ	lkr1 2.09	9 0 GHz 72 dBm		Auto Tune
-10.0												DL1 -13.00 dBm		enter Freq
-20.0 -30.0	<b>∳'</b>												2.000	Start Freq
-40.0 -50.0													10.000	Stop Freq
-60.0 -70.0		~				ور و الم							800 <u>Auto</u>	<b>CF Step</b> .000000 MHz Man
-80.0													ŀ	F <b>req Offset</b> 0 Hz
-90.0													: Log	Scale Type Lin
#Re	t 2.00 s BW	0 GHz 1.0 MH	z		#	¢VB₩	3.0 MHz		s		3.87 ms (	).000 GHz 16001 pts)	209	
MSG										STAT	US			

Plot 7-43. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



Plot 7-44. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 37 of 123		
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	ectrum Analy		5A										- 6 ×
X/RL	RF	50 Ω A		CORREC PNO: Fa	ist 🖵	Trig: Fre Atten: 30		#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Nov 11, 2016 DE <b>1 2 3 4 5</b> 6 PE A WWWWWW ET A N N N N N	F	requency
10 dB/div	Ref 20	).00 dBi		IFGain:L	ow	Atten: 30			Mki	1 1.406	20 GHz 94 dBm		Auto Tune
10.0													Center Fred 8000000 GHz
10.00											DL1 -13.00 dBm	716	Start Free 5.000000 MH:
20.0												2.00	Stop Free
40.0							1 					128 <u>Auto</u>	CF Stej 3.400000 MH Mai
60.0													Freq Offse 0 H
70.0													Scale Type
Start 0.71 #Res BW				#	VBW	300 kHz		s	weep 1	Stop 2.0 59.2 ms (2	0000 GHz 25681 pts)	Log	Lin
ISG									STATU	S			

Plot 7-45. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-46. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 29 of 122
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🔤 Keysight Spectrum Analyzer - Swept SA			
XXIRL RF 50Ω AC	PNO: Fast Trig: Free IFGain:Low Atten: 30		Frequency
10 dB/div Ref 20.00 dBm	i dameou	Mkr1 697.85 MHz -51.49 dBm	Auto Tune
10.0			Center Freq 364.000000 MHz
-10.0		DL1 -13.00 dBm	Start Freq 30.000000 MHz
-20.0			<b>Stop Freq</b> 698.000000 MHz
-40.0		1	CF Step 66.800000 MHz <u>Auto</u> Man
-60.0	angel i handre sol and hydrogina din yw rogwyg nywyd yn a dywrogwyn r		Freq Offsel 0 Hz
-70.0 Start 30.0 MHz			Scale Type
#Res BW 100 kHz	#VBW 300 kHz	 p 82.83 ms (13361 pts)	

Plot 7-47. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



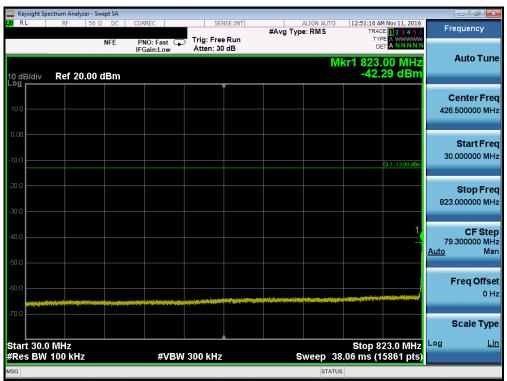
Plot 7-48. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dago 20 of 122		
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	ectrum Analyzer	- Swept SA									
(X) RL	RF 5	0Ω AC	CORREC PNO: Fa		Trig: Free Atten: 10		#Avg Typ	ALIGN AUTO	TR	PM Nov 11, 2016 ACE 1 2 3 4 5 6 YPE A WWWWW DET A NNNNN	Frequency
10 dB/div Log	Ref 0.00	dBm	IFGain:L	.0W	Atten: 10	dB		N	/kr1 2.1	20 0 GHz ).80 dBm	Auto Tuno
-10.0										DL1 -13.00 dBm	Center Fred 6.000000000 GH
-20.0											Start Free 2.000000000 GH
-40.0											<b>Stop Free</b> 10.000000000 GH
-60.0	~~~										CF Step 800.000000 MH <u>Auto</u> Mar
-70.0											Freq Offse 0 H
-90.0											Scale Type
Start 2.00 #Res BW			#	¢VBW 3	3.0 MHz		s	weep	Stop 1 13.87 ms (	0.000 GHz (16001 pts)	Log <u>Lir</u>
MSG								STA	TUS		

Plot 7-49. Conducted Spurious Plot (Band 12/17 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-50. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 40 of 123		
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	ectrum Analyzer	- Swept SA									- # ×
XI RL	RF 5	50 Ω DC	CORREC PNO: Fast		ENSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	Nov 11, 2016 E 1 2 3 4 5 6 E A WWWWW	Fre	quency
10 dB/div	Ref 20.0		IFGain:Low				Mkr	1 1.649	ANNNN		Auto Tune
10.0											e <b>nter Freq</b> 500000 GHz
-10.0									DL1 -13.00 dBm		Start Fred 000000 MH
-20.0											Stop Free
40.0							1			115. <u>Auto</u>	CF Stej 100000 MH Mai
60.0	Medical all of particular sources and a site			s and a discontration of a set of the set of	a station of the state					F	r <b>eq Offse</b> 0 H
-70.0											cale Type
Start 0.84 #Res BW			#V	BW 300 kH	z	s	weep 55	Stop 2.0 .25 ms (2	000 9112	Log	Lin
MSG							STATUS	3			

Plot 7-51. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



Plot 7-52. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 41 of 122
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		zer - Swept SA						
(IRL	RF	50 Ω DC	CORREC	SENSE:	#Avg	ALIGN AUTO Type: RMS	12:50:17 AM Nov 11, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWWW	
l0 dB/div	Ref 20	0.00 dBm	IFGain:Low	Atten: 30 dB		М	ьет <mark>А N N N N kr1 823.35 MHz -53.45 dBm</mark>	Auto Tun
10.0								Center Fre 427.000000 MH
10.0							DL1 -13.00 dBm	Start Fre 30.000000 M⊦
20.0								Stop Fre 824.000000 MH
io.o							1	CF Ste 79.400000 Mi <u>Auto</u> Mi
60.0 <b></b>		Alfantinetta attine attine attine Alfantinetta attine attine attine	in the second					Freq Offs 01
								Scale Tyr
tart 30.0 Res BW	0 MHz 100 kHz	z	#VB\	V 300 kHz		Sweep 38	Stop 824.0 MHz 3.11 ms (15881 pts)	
SG						STATUS	3	

Plot 7-53. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-54. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 42 of 102
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Plot 7-55. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-56. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 43 of 123
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	ectrum Analyzer - Swej							
X/RL	RF 50 Ω		CORREC	SENSE:INT	#Avg Type	ALIGN AUTO e: RMS	12:53:01 AM Nov 11, 2010 TRACE 1 2 3 4 5 TYPE A WWWW	Frequency
		NFE	PNO: Fast IFGain:Low	Atten: 30 dB		Mkr	1 1.679 25 GH	Auto Tune
10 dB/div _og	Ref 20.00 d	Bm					-50.68 dBn	
10.0								Center Fre 1.425000000 GH
10.00							DL1 -13.00 dBn	Start Fre 850.000000 MH
20.0								<b>Stop Fre</b> 2.000000000 GH
40.0						<b>↓</b> <sup>1</sup>		CF Ste 115.000000 MH Auto Ma
50.0 60.0	teres and the approximately set of the set o	n January and Marked Statistics		and dense of the second state of the second st				Freq Offso 0 ⊦
70.0								Scale Typ
Start 0.85 Res BW	500 GHz 100 kHz		#VBW	300 kHz	S	weep 55	Stop 2.0000 GHz .20 ms (23001 pts	Log <u>Li</u>
ISG						STATUS	3	

Plot 7-57. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-58. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 44 of 123
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Keysight Spectrum Ar	alyzer - Swept SA					
X RL RF	50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	12:36:11 PM Nov 11, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N	Frequency
10 dB/div Ref	20.00 dBm	IFGain:Low	Atten: 30 dB	М	kr1 1.709 0 GHz -30.99 dBm	Auto Tune
10.0						Center Fred 869.500000 MH;
-10.0					DL1 -13.00 dBm	Start Free 30.000000 MH:
-20.0					1	Stop Free 1.709000000 GH
-40.0					ور موجود به المراجع وي المراجع وي مراجع وي م	CF Step 167.900000 MH <u>Auto</u> Ma
60.0	alantification and produce ships on the	a, editor (* 1997) 				Freq Offse 0 H
-70.0					Stop 1.7090 GHz	Scale Type
#Res BW 1.0 M		#VBW	3.0 MHz	Sweep	2.239 ms (3359 pts)	

Plot 7-59. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)



Plot 7-60. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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	nt Spectrum An	alyzer - Swe	pt SA										- • ×
L <mark>X/</mark> RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRA	M Nov 11, 2016 CE 1 2 3 4 5 6 PE A WWWWW	F	requency
				PNO: F IFGain:l	ast ⊊ ₋ow	Trig: Free Atten: 10				D			Auto Tune
10 dB/di Log	v Ref	0.00 dE	Sm						IVIK	r1 16.95 -55.	4 5 GHZ 61 dBm		
													Center Freq
-10.0											DL1 -13.00 dBm	15.00	0000000 GHz
-20.0													Start Freq
-30.0												10.00	0000000 GHz
-40.0													Stop Freq
-50.0									4			20.00	0000000 GHz
						-			1				CF Step
-60.0											a the last design of the loss of the last design of	1.00 <u>Auto</u>	0000000 GHz Man
-70.0													
-80.0													Freq Offset 0 Hz
-90.0													
													Scale Type
	0.000 GH W 1.0 M				¢VB₩	3.0 MHz		s	weep 2	Stop 20 5.33 ms (2	0.000 GHz 20001 pts)	Log	<u>Lin</u>
MSG									STAT				

Plot 7-61. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



Plot 7-62. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 46 of 123
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PNO: Fast IFGain:Low         Trig: Free Run Atten: 30 dB         #Avg Type: RMS         TRACE         12 2 4 5 6 TYPE         Frequi           Mkr1 9.974 0 GHz	- 0										ept SA		ight Spectrum	
Mkr1 9.974 0 GHz         Au           10.0         Mkr1 9.974 0 GHz         Au           10.0         Image: State of the state	uency	Frequ	23456	TRACE			Run	Trig: Free		PNO: F	AC	50 Ω	RF	LXI RL
100       Image: state sta	uto Tune	Αι	0 GHz	1 9.974	Mk		dB	Atten: 30	OW	IFGain:L	IBm	f 20.00 c	div Re	
100       11000       1100       1100	nter Fred 00000 GH:													
-30.0 -30.0 -40.0 -5	Start Fred 00000 GH:		1-13.00 dBm											
	Stop Fred 00000 GH:													
-600	CF Step 00000 MH: Mar	824.50	1									~~~		
Sca	e <b>q Offse</b> 0 H:	Fre												-60.0 -
Start 1.755 GHZ Stop 10.000 GHZ	c <b>ale Typ</b> e Lir			04									4 755 0	
#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 14.29 ms (16491 pts)				stop 10. 29 ms (16	_	Sw		3.0 MHz	¢VB₩	7				#Res

Plot 7-63. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-64. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 47 of 123
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	ectrum Analyzer - S									
XI RL	RF 50	Ω ΑC	CORREC PNO: Fast		#Avg Typ	ALIGN AUTO e: RMS	TRAC	4 Nov 11, 2016 E 1 2 3 4 5 6 A WWWWW A N N N N N	Fr	equency
10 dB/div	Ref 20.00	dBm	II GUILLEOW			MI	kr1 1.62 -48.	6 0 GHz 38 dBm		Auto Tune
10.0										Center Fred 0.000000 MHz
0.00								DL1 -13.00 dBm	30	Start Fred
30.0									1.71	Stop Free
40.0								1	168 <u>Auto</u>	CF Step 000000 MH Mar
50.0 60.0			And in the second s							F <b>req Offse</b> 0 H
-70.0										Scale Type
Start 0.03 #Res BW			#VB	N 3.0 MHz		Sweep 2	Stop 1.7 2.240 ms (	'100 GHz 3361 pts)	Log	Lir
ISG						STATU	S			

Plot 7-65. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-66. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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	ectrum Analyze	er - Swept S	A										
L <mark>XI</mark> RL	RF	50 Ω A	AC CO	RREC		SEN	NSE:INT	#Avg Typ	ALIGN AUT		MNov 11, 2016 CE 1 2 3 4 5 6	F	requency
			F	NO: Fas Gain:Lo	t 🖵 W	Trig: Free Atten: 10		#///8/JP		T) [			
10 dB/div Log	Ref 0.0	0 dBm	1						M	kr1 16.94 -55	9 0 GHz 63 dBm		Auto Tune
-10.0											DL1 -13.00 dBm		<b>Center Freq</b> 0000000 GHz
-20.0												10.00	Start Freq 0000000 GHz
-40.0												20.00	Stop Freq 0000000 GHz
-50.0									1			1.00 <u>Auto</u>	CF Step 0000000 GH Mar
-70.0													Freq Offset
-90.0													Scale Type
Start 10.0 #Res BW				#\	/BW :	3.0 MHz		s	weep	Stop 20 25.33 ms (2	).000 GHz 20001 pts)	Log	Lir
MSG									STA				

Plot 7-67. Conducted Spurious Plot (Band 4 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



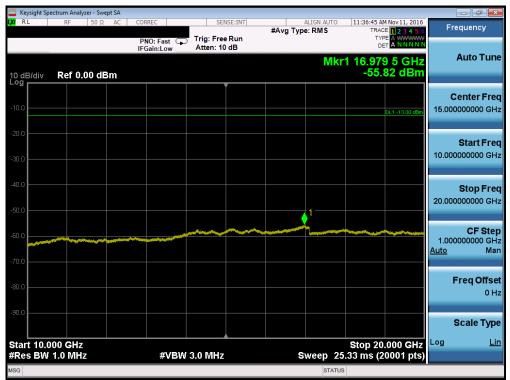
Plot 7-68. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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🔤 Keysight Sp	ectrum Analyz	er - Swep	t SA										- 6 ×
IXV RL	RF	<u>50 Ω</u>	AC	CORREC PNO: Fa	ast 🖵	Trig: Free		#Avg Typ	ALIGN AUTO e: RMS	TRA	M Nov 11, 2016 DE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Fr	requency
10 dB/div	Ref 20	.00 dE	Зm	IFGain:L	ow	Atten: 30	dB		М	kr1 9.98			Auto Tune
10.0													<b>Center Freq</b> 5000000 GHz
-10.0											DL1 -13.00 dBm	1.91	Start Freq 0000000 GHz
-20.0												10.00	Stop Fred
-40.0		~~~~								-	1, 	809 <u>Auto</u>	CF Step 0.000000 MH2 Mar
-60.0													Freq Offse 0 H:
-70.0													Scale Type
Start 1.91 #Res BW		2		#	≠VBW	3.0 MHz		s	weep 1	Stop 10 4.02 ms (1	.000 GHz  6181 pts)	Log	Lin
MSG									STATU	JS			

Plot 7-69. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



Plot 7-70. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Daga 50 of 102		
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	ectrum Analyz		А									
KU RL	RF	50 Ω A	Р	RREC			#Avg Typ	ALIGN AUTO De: RMS	TRAC	M Nov 11, 2016 DE <b>1 2 3 4 5</b> 6 DE A WWWWW T A N N N N N	Fr	requency
10 dB/div	Ref 20	.00 dBr		Gain:Low	Atten.	30 dB		MI	(r1 1.83	6 0 GHz 19 dBm		Auto Tune
- <b>og</b>												Center Fred 0.000000 MHz
10.00										DL1 -13.00 dBm	30	Start Fred
20.0 30.0											1.85	Stop Fred
40.0									ول ومنافظ مراجع ومنطقه ومراجع	1	182 <u>Auto</u>	CF Step 2.000000 MH Mar
60.0	**************************************			elagandes-opticidades								Freq Offse 0 H
70.0												Scale Type
Start 0.03 #Res BW				#VE	3W 3.0 MH	z		Sweep 2	Stop 1.8 2.427 ms (	3500 GHz 3641 pts)	Log	Lir
ISG								STATU	5			

Plot 7-71. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-72. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager		
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	ectrum Analy:	zer - Swep	ot SA										
X/ RL	RF	<u>50</u> Ω	AC	CORREC PNO: Fa	ist 🖵	Trig: Free Atten: 10		#Avg Typ	ALIGN AUTO e: RMS	TRA	M Nov 11, 2016 CE 1 2 3 4 5 6 PE A WWWWWW ET A N N N N N	Fi	requency
10 dB/div	Ref 0.0	00 dBi	m	IFGallitL	.ow	Atten. It			M	(r1 16.98 -55.	2 0 GHz 57 dBm		Auto Tune
-10.0											DL1 -13.00 dBm		Center Freq 0000000 GHz
-20.0												10.00	Start Fred
-40.0												20.00	Stop Fred 0000000 GH:
-60.0				(Change of the second sec		ang the state of the same of	~~~~					1.00 <u>Auto</u>	CF Step 0000000 GH: Mar
-70.0													Freq Offse 0 Ha
-90.0													Scale Type
Start 10.0 #Res BW				#	VBW	3.0 MHz		s	weep 2	Stop 20 25.33 ms (2		Log	Lin
MSG									STAT	US			

Plot 7-73. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-74. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
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Mike T 3-762 5 G G FZ         -43.04 d Bm           10 d B/div         Ref 20.00 dBm         -43.04 d Bm           10 d B/div         Ref 20.00 dBm         Center Fr           10 d	Keysight Spectru	m Analyzer - Swept	t SA									
Income         Mitri 3.782 5 GHz 43.04 dBm         Auto Tur 43.04 dBm           100         Generation         Generation         Generation           200         Generation	L <mark>X/</mark> RL	RF 50 Ω	PI	NO: Fast 🗔	Trig: Free	Run			TRAC		Fr	equency
100 Center Fr   000 Start Fr   000 Cut start Fr   100 Cut s	10 dB/div R	ef 20.00 dE		Gain:Low	Atten: 30	dB		Mk	r1 3.78	2 5 GHz		Auto Tune
-100       0.11.4300000 Gl         -200       0.11.43000000 Gl         -200       0.11.43000000 Gl         -200       0.11.41000000 Gl         -200       0.11.410000000 Gl         -200       0.11.4100000000 Gl         -200       0.11.4100000000000000000000000000000000												<b>enter Freq</b> 5500000 GHz
-300         -1         -										DL1 -13.00 dBm	1.91 <sup>,</sup>	Start Freq
-40.0       -50.0 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>10.000</td><td>Stop Freq</td></td<>											10.000	Stop Freq
.60.0			<b>♦</b> <sup>1</sup>									CF Step 900000 MHz. Man
Start 1.911 GHz Stop 10.000 GHz	-60.0										1	F <b>req Offsel</b> 0 Hz
									Stop 10			Scale Type Lin
MSG STATUS	#Res BW 1.0			#VBW	3.0 MHz		s		.02 ms (1	.000 0112	209	

Plot 7-75. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-76. Conducted Spurious Plot (Band 2 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: ZNFM150		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	<b>Reviewed by:</b> Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 52 of 122
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