

PCTEST ENGINEERING LABORATORY, INC.

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



MEASUREMENT REPORT FCC Part 22, 24, 27 LTE

Applicant Name:

LG Electronics MobileComm U.S.A 1000 Sylvan Avenue Englewood Cliffs, NJ 07632 United States Date of Testing: January 7-18, 2013 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 0Y1301020027.ZNF

ZNFE980

APPLICANT:

FCC ID :

LG ELECTRONICS MOBILECOMM U.S.A

FCC Classification: FCC Rule Part(s): EUT Type: Model(s): Test Device Serial No.: PCS Licensed Transmitter Held to Ear (PCE) §2; §22; §24; §27 Portable Handset E980, LGE980, LG-E980 *identical prototype* [S/N: 02JAN-7]

				ERP/EIRP	
Mode	Tx Frequency	Emission	Modulation	Max.	Max.
	(MHz)	Designator		Power	Power
				(W)	(dBm)
LTE Band 17	706.5 - 713.5	4M46G7D	QPSK	0.268	24.28
LTE Band 17	706.5 - 713.5	4M50W7D	16QAM	0.208	23.18
LTE Band 17	709 - 711	8M97G7D	QPSK	0.197	22.95
LTE Band 17	709 - 711	8M95W7D	16QAM	0.150	21.75
LTE Band 5	826.5 - 846.5	4M48G7D	QPSK	0.065	18.11
LTE Band 5	826.5 - 846.5	4M47W7D	16QAM	0.053	17.21
LTE Band 5	829 - 844	8M91G7D	QPSK	0.074	18.69
LTE Band 5	829 - 844	8M96W7D	16QAM	0.059	17.69
LTE Band 4	1712.5 - 1752.5	4M48G7D	QPSK	0.155	21.89
LTE Band 4	1712.5 - 1752.5	4M50W7D	16QAM	0.120	20.79
LTE Band 4	1715 - 1750	8M94G7D	QPSK	0.119	20.75
LTE Band 4	1715 - 1750	8M94W7D	16QAM	0.101	20.05
LTE Band 2	1852.5 - 1907.5	4M48G7D	QPSK	0.168	22.26
LTE Band 2	1852.5 - 1907.5	4M48W7D	16QAM	0.135	21.31
LTE Band 2	1855 - 1905	8M91G7D	QPSK	0.176	22.46
LTE Band 2	1855 - 1905	8M91W7D	16QAM	0.125	20.97

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.



FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 1 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 1 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.	•		REV 4.0AWSC



TABLE OF CONTENTS

FCC PAF	RT 22 24	27 MEASUREMENT REPORT	.4
1.0	INTRO	DUCTION	4
	1.1	SCOPE	4
	1.2	TESTING FACILITY	4
2.0	PRODL	JCT INFORMATION	5
	2.1	EQUIPMENT DESCRIPTION	5
	2.2	DEVICE CAPABILITIES	5
	2.3	EMI SUPPRESSION DEVICE(S)/MODIFICATIONS	5
	2.4	LABELING REQUIREMENTS	5
3.0	DESCR	RIPTION OF TESTS	6
	3.1	MEASUREMENT PROCEDURE	6
	3.2	BLOCK A FREQUENCY RANGE	6
	3.3	CELLULAR - BASE FREQUENCY BLOCKS	6
	3.4	CELLULAR - MOBILE FREQUENCY BLOCKS	6
	3.5	PCS - BASE FREQUENCY BLOCKS	6
	3.6	PCS - MOBILE FREQUENCY BLOCKS	7
	3.7	AWS - BASE FREQUENCY BLOCKS	7
	3.8	AWS - MOBILE FREQUENCY BLOCKS	7
	3.9	OCCUPIED BANDWIDTH	7
	3.10	SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL	8
	3.11	PEAK-AVERAGE RATIO	8
	3.12	RADIATED POWER AND RADIATED SPURIOUS EMISSIONS	9
	3.13	FREQUENCY STABILITY / TEMPERATURE VARIATION	.10
4.0	TEST E	EQUIPMENT CALIBRATION DATA	.11
5.0	SAMPL	E CALCULATIONS	.12
6.0	TEST F	RESULTS	.13
	6.1	SUMMARY	.13
	6.2	EFFECTIVE RADIATED POWER (ERP)	.14
	6.3	EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)	.15
	6.4	BAND 17 RADIATED SPURIOUS EMISSIONS	.16
	6.5	BAND 5 RADIATED SPURIOUS EMISSIONS	.19
	6.6	BAND 4 RADIATED SPURIOUS EMISSIONS	.22
	6.7	BAND 2 RADIATED SPURIOUS EMISSIONS	.25
	6.8	BAND 17 FREQUENCY STABILITY MEASUREMENTS	.28
	6.9	BAND 5 FREQUENCY STABILITY MEASUREMENTS	. 30
	6.10	BAND 4 FREQUENCY STABILITY MEASUREMENTS	.32
	6.11	BAND 2 FREQUENCY STABILITY MEASUREMENTS	.34
7.0	BAND [·]	17 PLOTS OF EMISSIONS	.36
8.0	BAND	5 PLOTS OF EMISSIONS	.44
9.0	BAND 4	4 PLOTS OF EMISSIONS	.52
10.0	BAND	2 PLOTS OF EMISSIONS	.64
11.0	CONCL	USION	.76

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 2 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 2 01 76
© 2013 PCTEST Engineerin	ng Laboratory, Inc.			REV 4.0AWSC
				12/10/00





MEASUREMENT REPORT FCC Part 22, 24, 27



§2.1033 General Information

APPLICANT:	LG Electronics Mobile	Comm U.S.A		
APPLICANT ADDRESS:	1000 Sylvan Avenue			
	Englewood Cliffs, NJ	07632, United St	ates	
TEST SITE:	PCTEST ENGINEER	NG LABORATO	RY, INC.	
TEST SITE ADDRESS:	7185 Oakland Mills R	oad, Columbia, M	ID 21045 USA	
FCC RULE PART(S):	§2; §22; §24; §27			
BASE MODEL:	E980			
FCC ID:	ZNFE980			
FCC CLASSIFICATION:	PCS Licensed Transm	nitter Held to Ear	(PCE)	
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)		
Test Device Serial No.:	02JAN-7	Production	Pre-Production	Engineering
DATE(S) OF TEST:	January 7-18, 2013			
TEST REPORT S/N:	0Y1301020027.ZNF			

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab. located in Columbia, MD 21045, U.S.A.

98	THE COLUMN AN	
10	FIRE LABOR (FIRE)	
1	ACCREDITED LABORATORY	
11	A2LA has accepted	
18	POTEST ENGINEERING LABORATORY, INC.	
88	Columna BD	
311	for Molecul comparisons in the Sold of	
46	Enstrinal Testing	
	The statement of statement of the statem	
115	Common of the local states of the state of t	
11		
41	2mg Leidager	
15	Carl interaction	
11.		
11.	and on the second state of the product of the second state of the	
11-	and on the second state of the Property of the	

- 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.
- 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.
- <text>
- 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 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.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 2 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 3 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.	•		REV 4.0AWSC



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 C63.4-2003 on February 15, 2012.

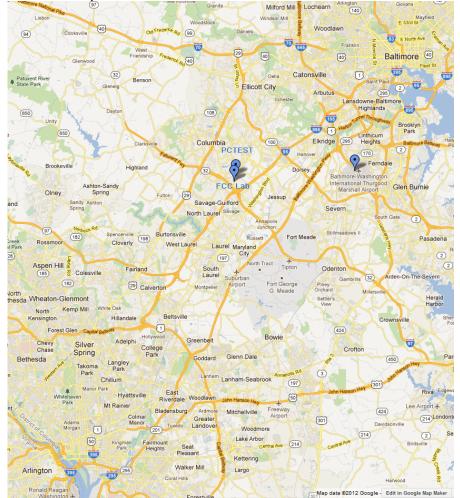


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕞 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 4 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 4 of 76
© 2013 PCTEST Engineering	2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC



2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFE980**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Note: The EUT's LTE transmitter was tested while wirelessly charging via the LG Nexus 4 Wireless Charger Model: WCP-400. Worst case emissions from the EUT's LTE transmitter did not occur during wireless charging. The data contained in this report represent worst case emissions.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Band 2, 4, 5, 17 LTE with 5 and 10MHz Bandwidth, 802.11a/b/g/n WLAN (DTS/NII), Bluetooth (1x,EDR, LE), NFC

2.3 EMI Suppression Device(s)/Modifications

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

2.4 Labeling Requirements

Per 2.925

The FCC identifier shall be permanently affixed to the equipment and shall be readily visible to the purchaser at the time of purchase.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga E of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 5 of 76
© 2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC	



DESCRIPTION OF TESTS 3.0

3.1 Measurement Procedure

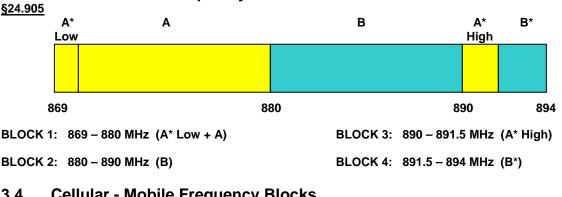
The measurement procedures described in the document titled "Land Mobile FM or PM - Communications Equipment - Measurements and Performance Standards" (ANSI/TIA-603-C-2004) was used in the measurement of the LG Portable Handset FCC ID: ZNFE980.

3.2 **Block A Frequency Range** §27.5(c)

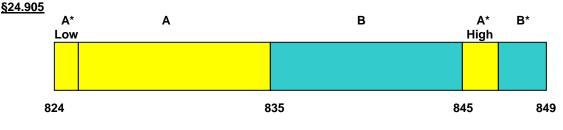
698-746 MHz band. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

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.

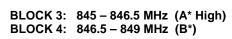
3.3 **Cellular - Base Frequency Blocks**



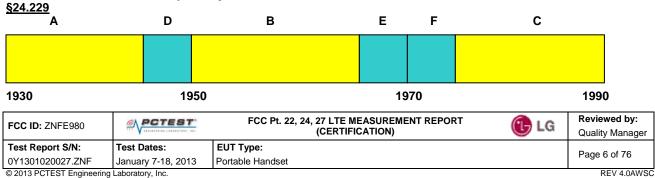
Cellular - Mobile Frequency Blocks 3.4



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



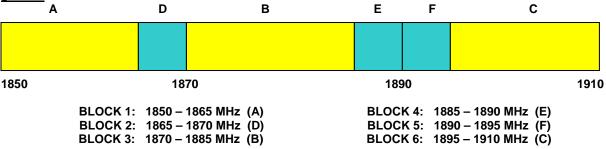
3.5 **PCS - Base Frequency Blocks**





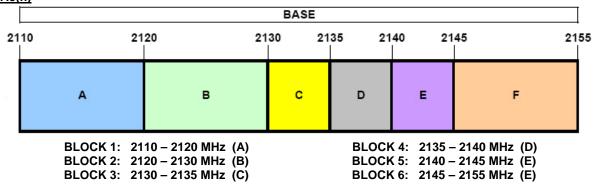
BLOCK 1:	1930 – 1945 MHz (A)	BLOCK 4:	1965 – 1970 MHz (E)
BLOCK 2:	1945 – 1950 MHz (D)	BLOCK 5:	1970 – 1975 MHz (F)
BLOCK 3:	1950 – 1965 MHz (B)	BLOCK 6:	1975 – 1990 MHz (C)





3.7 **AWS - Base Frequency Blocks**





3.8 **AWS - Mobile Frequency Blocks**

§27.5(h) MOBILE 1710 1720 1730 1735 1740 1745 1755 в С Е F D А BLOCK 1: 1710 - 1720 MHz (A) BLOCK 4: 1735 - 1740 MHz (D) BLOCK 2: 1720 - 1730 MHz (B) BLOCK 5: 1740 - 1745 MHz (E) BLOCK 3: 1730 – 1735 MHz (C) BLOCK 6: 1745 – 1755 MHz (F)

3.9 **Occupied Bandwidth** §2.1049 RSS-Gen(4.6.1) RSS-133(2.3) RSS-139(2.3)

The implementation of this test is performed by the spectrum analyzer's occupied bandwidth function. 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.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 7 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 7 01 76
© 2013 PCTEST Engineering	2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC



3.10 Spurious and Harmonic Emissions at Antenna Terminal §2.1051 §22.917(a)(b) §24.238(a)(b) §27.53(g) §27.53(h) RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)

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. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Cell band, 698–746 MHz band, or 1 MHz or greater for PCS band, AWS band. 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 for PCS band, AWS band. 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.

3.11 Peak-Average Ratio §24.232(d) §27.50(d.5) RSS-133(6.4) RSS-139(6.4)

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

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 8 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 8 01 76
© 2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC	



3.12 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) RSS-132(4.4) RSS-132(4.5.1) RSS-133(6.4) RSS-133(6.5.1) RSS-139(6.5.1)

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. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It 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 78cm high PVC support structure is placed on top of the turntable. A 3/4" (~1.9cm) sheet of high density polyethylene 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 wooden turntable 80cm above the ground plane and 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.

Per the guidance of ANSI/TIA-603-C-2004, 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 $_{\text{[dB]}}$.

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]) specified in 22.917(a) and 24.238(a).

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 0 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 9 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.			REV 4.0AWSC



3.13 Frequency Stability / Temperature Variation

§2.1055 §22.863 §22.905 §24.229 §24.235 §27.5(c) §27.5(h) §27.54 RSS-132(4.3) RSS-133(6.3) RSS-139(6.3)

The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block for Part 24 and 27. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency for Part 22.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).

2. The equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A sufficient stabilization period at each temperature shall be used prior to each frequency requirement.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 10 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 10 01 76
© 2013 PCTEST Engineering	Laboratory, Inc.	·		REV 4.0AWSC



4.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx1	Licensed Transmitter Cable Set	1/17/2013	Annual	1/17/2014	N/A
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/10/2012	Annual	7/10/2013	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	2/13/2012	Annual	2/13/2013	N/A
-	LTx2	Licensed Transmitter Cable Set	1/17/2013	Annual	1/17/2014	N/A
Agilent	N9020A	MXA Signal Analyzer	10/9/2012	Annual	10/9/2013	US46470561
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	2/23/2012	Annual	2/23/2013	MY49432391
Espec	ESX-2CA	Environmental Chamber	4/4/2012	Annual	4/4/2013	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Biennial	7/22/2013	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	5/30/2012	Biennial	5/30/2014	135427
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	11/7/2012	Biennial	11/7/2014	128338
Mini-Circuits	VHF-1200+	High Pass Filter	1/17/2013	Annual	1/17/2014	30923
Mini-Circuits	VHF-3100+	High Pass Filter	1/17/2013	Annual	1/17/2014	30841
Mini-Circuits	SSG-4000HP	Signal Generator	12/1/2012	Annual	12/1/2013	11208010032
Mini-Circuits	WR-SEN-4RM	USB Power Sensor	12/1/2012	Annual	12/1/2013	11210140001
Rohde & Schwarz	CMU200	Base Station Simulator	5/22/2012	Annual	5/22/2013	109892
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	6/26/2012	Annual	6/26/2013	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/30/2012	Annual	5/30/2013	100040
Rohde & Schwarz	ESU26	EMI Test Receiver	2/15/2012	Annual	2/15/2013	100342
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	3/5/2012	Annual	3/5/2013	102060
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/14/2011	Biennial	11/14/2013	9105-2404
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	11/14/2011	Biennial	11/14/2013	9105-2403
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107

Table 4-1. Test Equipment

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)				
Test Report S/N:	Test Dates:	EUT Type:		Dogo 11 of 76		
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 11 of 76		
© 2013 PCTEST Engineering	g Laboratory, Inc.	·		REV 4.0AWSC		



5.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz G = Phase Modulation 7 = Quantized/Digital Info D = Amplitude/Angle Modulated

16QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Combination (Audio/Data)

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).

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 12 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Fage 12 01 70
© 2013 PCTEST Engineering	Laboratory, Inc.	•		REV 4.0AWSC



6.0 TEST RESULTS

6.1 Summary

Company Name:	LG Electronics MobileComm U.S.A
FCC ID:	ZNFE980
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	LTE

FCC Part Section(s)	RSS Section(s)	Test Description Test Limit		Test Condition	Result	Reference
TRANSMITTER MC	DE (TX)					
2.1049	RSS-Gen (4.6.1) RSS-133(2.3) RSS-139(2.3)	Occupied Bandwidth	N/A		PASS	Section 7.0 8.0 9.0 10.0
2.1051 22.917(a) 24.238(a) 27.53(g) 27.53(h)	RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)	Band Edge / Conducted Spurious Emissions	< 43 + 10log ₁₀ (P[Watts]) at Band Edge and for all out-of-band emissions	CONDUCTED	PASS	Section 7.0 8.0 9.0 10.0
24.232(d) 27.50(d.5)	RSS-133(6.4) RSS-139(6.4)	Peak-Average Ratio	< 13 dB		PASS	Section 9.0 10.0
2.1046	RSS-132(4.4) RSS-133(4.1) RSS-139(4.1)	Transmitter Conducted Output Power	N/A		PASS	See RF Exposure Report
22.913(a.2)	RSS-132(4.4) [SRSP- 503(5.1.3)]	Effective Radiated Power (Band 5)	< 7 Watts max. ERP		PASS	Section 6.2
27.50(c.10)	N/A	Effective Radiated Power (Band 17)	< 3 Watts max. ERP		PASS	Section 6.2
24.232(c)	RSS-133(6.4) [SRSP-510 (5.1.2)]	Equivalent Isotropic Radiated Power (Band 2)	< 2 Watts max. EIRP		PASS	Section 6.3
27.50(d.4)	RSS-139(6.4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP	RADIATED	PASS	Section 6.3
2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)	Undesirable Emissions	< 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 6.4 6.5 6.6 6.7
2.1055.22.355 22.863 22.905 24.229 24.235 27.5(c) 27.5(h) 27.54	RSS-132(4.3) RSS-133(6.3) RSS-139(6.3)	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24, 27)		PASS	Section 6.8 6.9 6.10 6.11

Notes:

Table 6-1. Summary of Test Results

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 shown in Section 7.0 8.0 9.0 10.0 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.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 at 70	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 13 of 76	
© 2013 PCTEST Engineering	a laboratory Inc	•		REV 4 0AWSC	

© 2013 PCTEST Engineering Laboratory, Inc.



6.2 Effective Radiated Power (ERP) §22.913(a.2) §27.50(c.10) RSS-132(4.4)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	Margin [dB]
706.50	5	QPSK	Standard	1/0	21.16	2.35	Н	23.51	0.225	-11.26
710.00	5	QPSK	Standard	1/0	21.86	2.42	Н	24.28	0.268	-10.49
713.50	5	QPSK	Standard	1/0	19.26	2.49	Н	21.75	0.150	-13.02
706.50	5	16-QAM	Standard	1/0	20.06	2.35	Н	22.41	0.174	-12.36
710.00	5	16-QAM	Standard	1/0	20.76	2.42	Н	23.18	0.208	-11.59
713.50	5	16-QAM	Standard	1/0	18.26	2.49	Н	20.75	0.119	-14.02
709.00	10	QPSK	Standard	1/0	19.56	2.35	Н	21.91	0.155	-12.86
710.00	10	QPSK	Standard	1/0	20.06	2.42	Н	22.48	0.177	-12.29
711.00	10	QPSK	Standard	1/0	20.46	2.49	Н	22.95	0.197	-11.82
709.00	10	16-QAM	Standard	1/0	18.56	2.35	Н	20.91	0.123	-13.86
710.00	10	16-QAM	Standard	1/0	18.96	2.42	Н	21.38	0.138	-13.39
711.00	10	16-QAM	Standard	1/0	19.26	2.49	Н	21.75	0.150	-13.02

Table 6-2. ERP Data (Band 17)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	Margin [dB]
826.50	5	QPSK	Standard	1 / 24	13.43	4.68	Н	18.11	0.065	-20.34
836.50	5	QPSK	Standard	1 / 24	12.93	4.82	Н	17.75	0.060	-20.70
846.50	5	QPSK	Standard	1/0	12.03	4.96	Н	16.99	0.050	-21.46
826.50	5	16-QAM	Standard	1 / 24	12.53	4.68	Н	17.21	0.053	-21.24
836.50	5	16-QAM	Standard	1 / 24	11.83	4.82	Н	16.65	0.046	-21.80
846.50	5	16-QAM	Standard	1/0	11.03	4.96	Н	15.99	0.040	-22.46
829.00	10	QPSK	Standard	1/0	12.83	4.68	Н	17.51	0.056	-20.94
836.50	10	QPSK	Standard	1 / 49	12.63	4.82	Н	17.45	0.056	-21.00
844.00	10	QPSK	Standard	1/0	13.73	4.96	Н	18.69	0.074	-19.76
829.00	10	16-QAM	Standard	1/0	11.63	4.68	Н	16.31	0.043	-22.14
836.50	10	16-QAM	Standard	1 / 49	11.53	4.82	Н	16.35	0.043	-22.10
844.00	10	16-QAM	Standard	1/0	12.73	4.96	Н	17.69	0.059	-20.76

Table 6-3. ERP Data (Band 5)

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. The highest ERP measured is listed above.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 14 of 76	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 14 of 76	
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09	



6.3 Equivalent Isotropic Radiated Power (EIRP) §24.232(c) §27.50(d.4) RSS-133(6.4) RSS-139(6.4)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
1712.50	5	QPSK	Standard	1 / 24	12.00	9.89	Н	21.89	0.155	-8.11
1732.50	5	QPSK	Standard	1/0	11.40	9.85	Н	21.25	0.133	-8.75
1752.50	5	QPSK	Standard	1/0	11.70	9.80	Н	21.50	0.141	-8.50
1712.50	5	16-QAM	Standard	1 / 24	10.90	9.89	Н	20.79	0.120	-9.21
1732.50	5	16-QAM	Standard	1/0	10.20	9.85	Н	20.05	0.101	-9.95
1752.50	5	16-QAM	Standard	1/0	10.70	9.80	Н	20.50	0.112	-9.50
1715.00	10	QPSK	Standard	1 / 49	10.70	9.89	Н	20.59	0.115	-9.41
1732.50	10	QPSK	Standard	1/0	10.90	9.85	Н	20.75	0.119	-9.25
1750.00	10	QPSK	Standard	1/0	10.80	9.80	Н	20.60	0.115	-9.40
1715.00	10	16-QAM	Standard	1 / 49	9.70	9.89	Н	19.59	0.091	-10.41
1732.50	10	16-QAM	Standard	1/0	10.20	9.85	Н	20.05	0.101	-9.95
1750.00	10	16-QAM	Standard	1/0	9.70	9.80	Н	19.50	0.089	-10.50

Table 6-4. EIRP Data (Band 4)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
1852.50	5	QPSK	Standard	1 / 24	12.28	9.59	Н	21.87	0.154	-11.14
1880.00	5	QPSK	Standard	1 / 24	12.68	9.53	Н	22.21	0.166	-10.80
1907.50	5	QPSK	Standard	1 / 24	12.78	9.48	Н	22.26	0.168	-10.75
1852.50	5	16-QAM	Standard	1 / 24	11.28	9.59	Н	20.87	0.122	-12.14
1880.00	5	16-QAM	Standard	1 / 24	11.78	9.53	Н	21.31	0.135	-11.70
1907.50	5	16-QAM	Standard	1 / 24	11.78	9.48	Н	21.26	0.134	-11.75
1855.00	10	QPSK	Standard	1 / 49	12.87	9.59	Н	22.46	0.176	-10.55
1880.00	10	QPSK	Standard	1 / 49	12.11	9.53	Н	21.64	0.146	-11.37
1905.00	10	QPSK	Standard	1 / 49	11.84	9.48	Н	21.32	0.135	-11.69
1855.00	10	16-QAM	Standard	1 / 49	11.38	9.59	Н	20.97	0.125	-12.04
1880.00	10	16-QAM	Standard	1 / 49	11.18	9.53	Н	20.71	0.118	-12.30
1905.00	10	16-QAM	Standard	1 / 49	11.18	9.48	Н	20.66	0.116	-12.35

Table 6-5. EIRP Data (Band 2)

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. The highest EIRP measured is listed above.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 15 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 15 of 76
© 2013 PCTEST Engineering Laboratory, Inc.				



6.4 Band 17 Radiated Spurious Emissions §27.1053 §27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	706.	50	MHz
CHANNEL:	2375	55	_
MEASURED OUTPUT POWER:	23.51	dBm =	<u>0.225</u> W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5 MHz		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	36.51	dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1413.00	-45.45	3.63	-41.82	Н	65.33
2119.50	-56.11	3.90	-52.21	Н	75.73
2826.00	-43.03	5.01	-38.02	Н	61.53
3532.50	-81.11	6.25	-74.86	Н	98.37
4239.00	-80.17	7.23	-72.93	Н	96.45
4945.50	-79.72	7.86	-71.86	Н	95.37

Table 6-6. Radiated Spurious Data

NOTES:

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 16 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		
© 2013 PCTEST Engineering Laboratory, Inc.				REV 4.0AWSC



Band 17 Radiated Spurious Measurements (continued) §2.1053 §27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	710.00)	MHz	
CHANNEL:	23790			
MEASURED OUTPUT POWER:	24.28	dBm =	0.268	W
MODULATION SIGNAL:	QPSK	_		
BANDWIDTH:	5 MHz	_		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	37.28	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1420.00	-46.91	3.68	-43.23	Н	67.51
2130.00	-57.29	3.92	-53.38	Н	77.66
2840.00	-44.15	5.02	-39.13	н	63.41
3550.00	-81.01	6.25	-74.76	Н	99.05
4260.00	-80.15	7.25	-72.90	Н	97.19
4970.00	-79.74	7.90	-71.84	Н	96.12

Table 6-7. Radiated Spurious Data

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 17 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 17 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09



Band 17 Radiated Spurious Measurements (continued) §2.1053 §27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	713.	MHz	
CHANNEL:	2382	_	
MEASURED OUTPUT POWER:	21.75	dBm =	<u>0.150</u> W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5 MHz		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	34.75	dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1427.00	-46.98	3.73	-43.25	Н	65.01
2140.50	-58.08	3.94	-54.14	Н	75.89
2854.00	-44.44	5.04	-39.40	Н	61.16
3567.50	-80.92	6.25	-74.67	Н	96.42
4281.00	-80.11	7.25	-72.86	Н	94.61
4994.50	-79.76	7.94	-71.82	Н	93.58

Table 6-8. Radiated Spurious Data

NOTES:

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 19 of 76	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 18 of 76	
© 2013 PCTEST Engineering Laboratory, Inc.				REV 4.0AWSC	



6.5 Band 5 Radiated Spurious Emissions §2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	826.	MHz	
CHANNEL:	20425		_
MEASURED OUTPUT POWER:	18.11	dBm =	<u>0.065</u> W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5 MHz		
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10} (W) =$	31.11	dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1653.00	-52.54	2.50	-50.04	Н	68.15
2479.50	-49.88	2.82	-47.06	Н	65.17
3306.00	-45.20	5.52	-39.68	Н	57.79
4132.50	-80.08	7.08	-72.99	Н	91.11
4959.00	-79.75	7.91	-71.84	Н	89.95
5785.50	-77.41	8.51	-68.90	Н	87.02

Table 6-9. Radiated Spurious Data

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 10 of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 19 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09



Band 5 Radiated Spurious Measurements (continued) §2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.50)	MHz	
CHANNEL:	20525)	_	
MEASURED OUTPUT POWER:	17.75	dBm =	0.060	_w
MODULATION SIGNAL:	QPSK	_		
BANDWIDTH:	5 MHz	_		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	30.75	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1673.00	-55.11	2.34	-52.77	Н	70.53
2509.50	-48.35	2.84	-45.51	Н	63.27
3346.00	-46.26	5.64	-40.61	н	58.37
4182.50	-80.11	7.14	-72.97	Н	90.72
5019.00	-79.72	7.97	-71.76	Н	89.51
5855.50	-77.08	8.46	-68.62	Н	86.37

Table 6-10. Radiated Spurious Data

NOTES:

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 20 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.	·		REV 4.0AWSC



Band 5 Radiated Spurious Measurements (continued) §2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:		50	MHz
CHANNEL:	2062	25	_
MEASURED OUTPUT POWER:	16.99	dBm =	<u>0.050</u> W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5 MHz		
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10} (W) =$	29.99	dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1693.00	-42.31	2.18	-40.13	Н	57.12
2539.50	-50.28	3.04	-47.23	Н	64.22
3386.00	-48.55	5.76	-42.79	Н	59.78
4232.50	-80.15	7.20	-72.95	Н	89.94
5079.00	-79.62	8.00	-71.62	Н	88.61
5925.50	-76.76	8.42	-68.33	Н	85.32

Table 6-11. Radiated Spurious Data

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕧 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 01 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 21 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09



6.6 Band 4 Radiated Spurious Emissions §2.1053 §27.53(h) RSS-139(6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1712.	.50	MHz
CHANNEL:	1997	75	_
MEASURED OUTPUT POWER:	21.89	dBm =	<u>0.155</u> W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5 MHz		
DISTANCE:	3	meters	
LIMIT:	43 + 10 log ₁₀ (W) =	34.89	dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3425.00	-39.24	8.09	-31.14	Н	53.03
5137.50	-54.55	10.21	-44.35	Н	66.24
6850.00	-49.93	11.31	-38.62	Н	60.51
8562.50	-50.66	13.02	-37.64	Н	59.53
10275.00	-55.73	13.01	-42.71	Н	64.60
11987.50	-50.21	13.21	-37.00	Н	58.89

Table 6-12. Radiated Spurious Data

NOTES:

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 22 of 76
© 2013 PCTEST Engineerin	ng Laboratory, Inc.	·		REV 4.0AWSC



Band 4 Radiated Spurious Measurements (continued) §2.1053 §27.53(h) RSS-139(6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1732.5	0	MHz	
CHANNEL:	20175			
MEASURED OUTPUT POWER:	21.25	dBm =	0.133	_w
MODULATION SIGNAL:	QPSK	_		
BANDWIDTH:	5 MHz	_		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log ₁₀ (W) =	34.25	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3465.00	-40.62	8.26	-32.35	Н	53.60
5197.50	-51.54	10.26	-41.28	Н	62.53
6930.00	-51.45	11.42	-40.03	Н	61.28
8662.50	-52.99	13.07	-39.93	Н	61.17
10395.00	-55.56	13.12	-42.45	Н	63.69
12127.50	-52.84	13.25	-39.59	Н	60.83

Table 6-13. Radiated Spurious Data

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 23 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09



Band 4 Radiated Spurious Measurements (continued) §2.1053 §27.53(h) RSS-139(6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1752	MHz	
CHANNEL:	2037	_	
MEASURED OUTPUT POWER:	21.50	dBm =	<u>0.141</u> W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5 MHz		
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10} (W) =$	34.50	dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3505.00	-36.08	8.40	-27.68	Н	49.19
5257.50	-53.72	10.32	-43.40	Н	64.91
7010.00	-47.53	11.51	-36.01	Н	57.52
8762.50	-50.35	13.11	-37.24	Н	58.74
10515.00	-56.02	13.20	-42.82	Н	64.32
12267.50	-51.28	13.31	-37.97	Н	59.47

Table 6-14. Radiated Spurious Data

NOTES:

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 24 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.	·		REV 4.0AWSC



6.7 Band 2 Radiated Spurious Emissions §2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1852.	MHz	
CHANNEL:	1862	_	
MEASURED OUTPUT POWER:	21.87	dBm =	<u>0.154</u> W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5 MHz		
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10} (W) =$	34.87	dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3705.00	-44.48	8.40	-36.08	Н	57.95
5557.50	-47.92	10.63	-37.30	Н	59.16
7410.00	-43.68	11.84	-31.85	Н	53.72
9262.50	-48.47	13.29	-35.18	Н	57.05
11115.00	-45.38	13.50	-31.88	Н	53.75
12967.50	-75.46	13.68	-61.79	Н	83.65

Table 6-15. Radiated Spurious Data

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 25 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset	Page 25 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.		REV 4.0AWSC 12/10/09



Band 2 Radiated Spurious Measurements (continued) §2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.0	0		MHz	
CHANNEL:	18900				
MEASURED OUTPUT POWER:	22.21	dBm =	= .	0.166	W
MODULATION SIGNAL:	QPSK	_			
BANDWIDTH:	5 MHz	_			
DISTANCE:	3	meters			
LIMIT:	43 + 10 log ₁₀ (W) =	35.21		dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-40.24	8.42	-31.82	Н	54.03
5640.00	-49.67	10.66	-39.02	Н	61.23
7520.00	-42.12	11.92	-30.20	Н	52.41
9400.00	-47.56	13.24	-34.32	Н	56.53
11280.00	-47.69	13.49	-34.20	Н	56.41
13160.00	-75.34	13.83	-61.51	н	83.72

Table 6-16. Radiated Spurious Data

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 06 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 26 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09



Band 2 Radiated Spurious Measurements (continued) §2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1907.	MHz	
CHANNEL:	1917	_	
MEASURED OUTPUT POWER:	22.26	dBm =	<u>0.168</u> W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5 MHz		
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10} (W) =$	35.26	dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3815.00	-41.74	8.55	-33.19	Н	55.45
5722.50	-52.59	10.69	-41.91	Н	64.17
7630.00	-40.80	12.05	-28.76	Н	51.02
9537.50	-48.45	13.20	-35.25	н	57.51
11445.00	-47.85	13.43	-34.42	Н	56.68
13352.50	-75.25	14.00	-61.24	Н	83.50

Table 6-17. Radiated Spurious Data

- 1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with QPSK modulation, RB size = 1, RB offset = 0, and 5MHz Bandwidth.
- 2. This unit was tested with its standard battery.
- 3. The worst case test configuration was found in the horizontal setup.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕞 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 07 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 27 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09



6.8 Band 17 Frequency Stability Measurements §2.1055 §22.355 §27.5(c) §27.54

OPERATING FREQUENCY: 710,000,000 Hz

CHANNEL: 23090

REFERENCE VOLTAGE: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	710,000,005	5	0.000001
100 %		- 30	710,000,024	24	0.000003
100 %		- 20	710,000,021	21	0.000003
100 %		- 10	710,000,012	12	0.000002
100 %		0	710,000,015	15	0.000002
100 %		+ 10	710,000,017	17	0.000002
100 %		+ 20	710,000,029	29	0.000004
100 %		+ 30	710,000,017	17	0.000002
100 %		+ 40	710,000,009	9	0.000001
100 %		+ 50	710,000,022	22	0.000003
115 %	4.37	+ 20	710,000,011	11	0.000002
85 %	3.23	+ 20	710,000,015 Stability Data (Ba	15	0.000002

Table 6-18. Frequency Stability Data (Band 17)

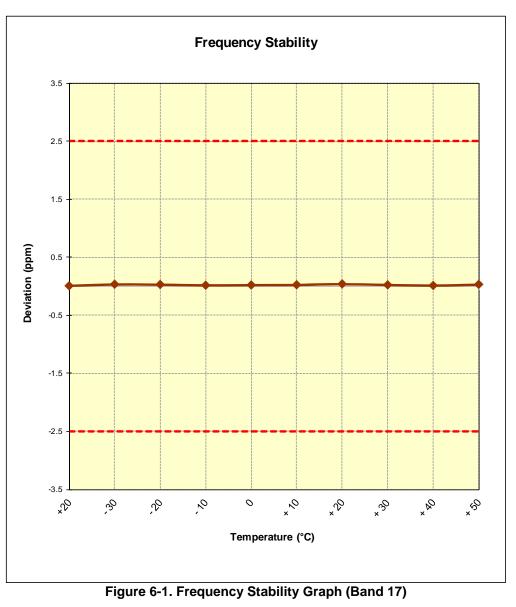
Note:

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

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 29 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 28 of 76
© 2013 PCTEST Engineerin	© 2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC



Band 17 Frequency Stability Measurements (Cont'd) §2.1055 §22.355 §27.5(c) §27.54



FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset	Page 29 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.		REV 4.0AWSC 12/10/09



6.9 Band 5 Frequency Stability Measurements §2.1055 §22.355 §22.863 §22.905 RSS-132(4.3)

OPERATING FREQUENCY: 836,500,000 Hz

CHANNEL: 20525

REFERENCE VOLTAGE: 3.8 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

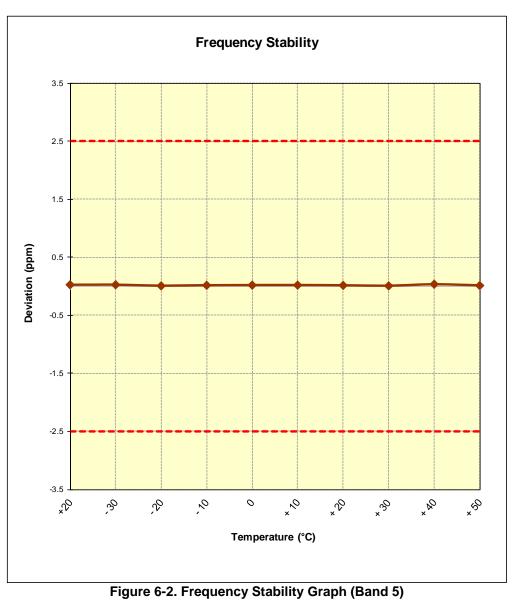
VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,500,020	20	0.000002
100 %		- 30	836,500,021	21	0.000002
100 %		- 20	836,500,005	5	0.000001
100 %		- 10	836,500,013	13	0.000002
100 %		0	836,500,015	15	0.000002
100 %		+ 10	836,500,015	15	0.000002
100 %		+ 20	836,500,011	11	0.000001
100 %		+ 30	836,500,005	5	0.000001
100 %		+ 40	836,500,028	28	0.000003
100 %		+ 50	836,500,010	10	0.000001
115 %	4.37	+ 20	836,500,005	5	0.000001
85 %	3.23	+ 20	836,500,020	20	0.000002

Table 6-19. Frequency Stability Data (Band 5)

FCC ID: ZNFE980		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 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 30 of 76
© 2013 PCTEST Engineering	© 2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC



Band 5 Frequency Stability Measurements (Cont'd) §2.1055 §22.355 §22.863 §22.905 RSS-132(4.3)



FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dego 21 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset	Page 31 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.		REV 4.0AWSC 12/10/09



6.10 Band 4 Frequency Stability Measurements §2.1055 §22.355 §27.5(h) §27.54 RSS-139(6.3)

OPERATING FREQUENCY: 1,732,500,000 Hz

CHANNEL: 20175

 REFERENCE VOLTAGE:
 3.8
 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,500,008	8	0.0000005
100 %		- 30	1,732,500,006	6	0.0000003
100 %		- 20	1,732,500,012	12	0.0000007
100 %		- 10	1,732,500,007	7	0.0000004
100 %		0	1,732,500,019	19	0.0000011
100 %		+ 10	1,732,500,012	12	0.0000007
100 %		+ 20	1,732,500,018	18	0.0000011
100 %		+ 30	1,732,500,012	12	0.0000007
100 %		+ 40	1,732,500,024	24	0.0000014
100 %		+ 50	1,732,500,029	29	0.0000017
115 %	4.37	+ 20	1,732,500,009	9	0.0000005
85 %	3.23	+ 20	1,732,500,030	30	0.0000017

 Table 6-20. Frequency Stability Data (Band 4)

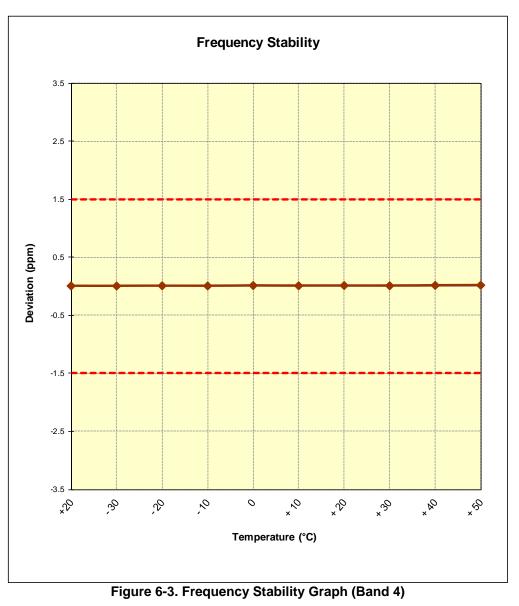
Note:

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

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 32 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09



Band 4 Frequency Stability Measurements (Cont'd) §2.1055 §22.355 §27.5(h) §27.54 RSS-139(6.3)



FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 33 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC 12/10/09



6.11 Band 2 Frequency Stability Measurements §2.1055 §22.355 §24.229 §24.235 RSS-133(6.3)

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 18900

REFERENCE VOLTAGE: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,880,000,027	27	0.0000014
100 %		- 30	1,880,000,011	11	0.0000006
100 %		- 20	1,880,000,027	27	0.0000014
100 %		- 10	1,880,000,026	26	0.0000014
100 %		0	1,880,000,015	15	0.0000008
100 %		+ 10	1,880,000,001	1	0.0000001
100 %		+ 20	1,880,000,029	29	0.0000016
100 %		+ 30	1,880,000,003	3	0.0000002
100 %		+ 40	1,880,000,009	9	0.0000005
100 %		+ 50	1,880,000,024	24	0.0000013
115 %	4.37	+ 20	1,880,000,027	27	0.0000014
85 %	3.23 Table 6-2'	+ 20	1,880,000,004	4	0.0000002

Table 6-21. Frequency Stability Data (Band 2)

Note:

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

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 24 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 34 of 76
© 2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC	



Band 2 Frequency Stability Measurements (Cont'd) §2.1055 §22.355 §22.229 §24.235 RSS-133(6.3)

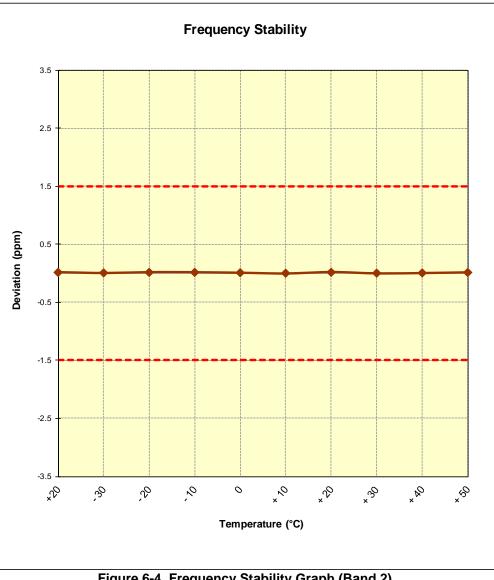


Figure 6-4. Frequency Stability Graph (Band 2)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 35 of 76	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset			
© 2013 PCTEST Engineering	g Laboratory, Inc.			REV 4.0AWSC 12/10/09	



7.0 BAND 17 PLOTS OF EMISSIONS

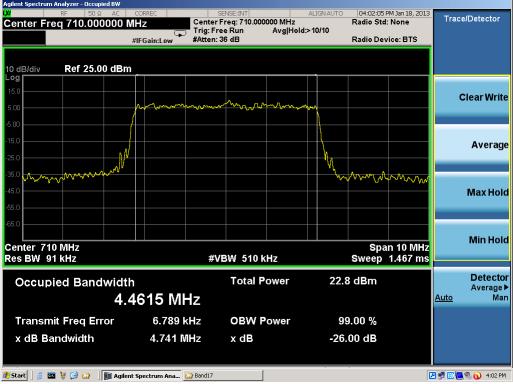
Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.



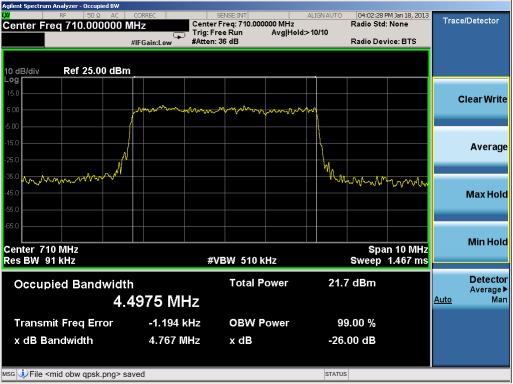
Plot 7-1. Lower Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 26 of 76	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 36 of 76	
© 2013 PCTEST Engineering Laboratory, Inc.				REV 4.0AWSC	







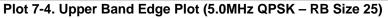


Plot 7-3. Occupied Bandwidth Plot (5.0MHz 16-QAM - RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 27 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 37 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.	·		REV 4.0AWSC



Agilent Spectrum Analyzer - Swept SA					
RF 50 Ω AC	CORREC	SENSE:INT	ALIGNAUTO #Avg Type: RMS	04:07:20 PM Jan 18, 2013 TRACE 1 2 3 4 5 6 TYPE MWWWW	Frequency
	PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 36 dB		DET A N N N N N	
10 dB/div Ref 25.00 dBm			Mk	r1 716.00 MHz -23.592 dBm	Auto Tune
15.0	Auto				Center Freq 716.000000 MHz
-5.00				-13.00 dBm	Start Freq 706.000000 MHz
-15.0		1			Stop Freq 726.000000 MHz
-35.0					CF Step 2.000000 MHz <u>Auto</u> Man
-45.0				and the second	Freq Offset 0 Hz
-65.0					
Center 716.00 MHz #Res BW 100 kHz	#VBW	300 kHz	#Sweep	Span 20.00 MHz 3.00 s (1001 pts)	
MSG			STATUS		

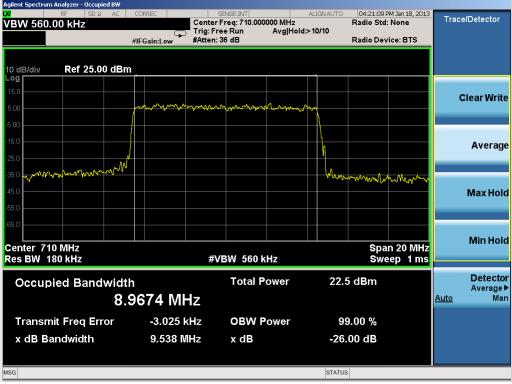




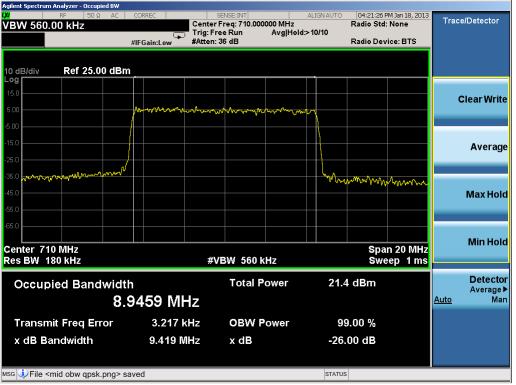
Plot 7-5. Lower Band Edge Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 29 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 38 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC





Plot 7-6. Occupied Bandwidth Plot (10.0MHz QPSK - RB Size 50)



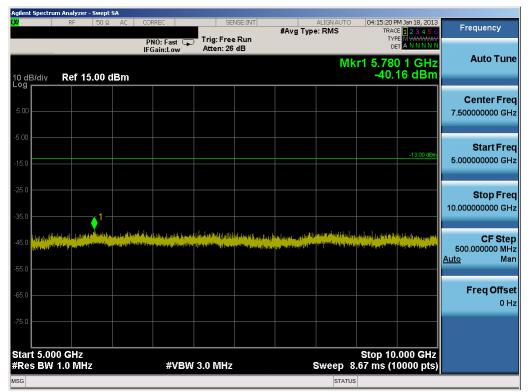
Plot 7-7. Occupied Bandwidth Plot (10.0MHz 16-QAM - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 39 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC



<mark>u</mark>	RF	50 Ω AC	CORREC	SE	NSE:INT		ALIGN AUTO	04:14:48 F	M Jan 18, 2013	Frequency
			PNO: Fast 😱 IFGain:Low	Trig: Free Atten: 36		#Avg Typ	e: RMS	TYF DE	E 123456 E M MMMMM T A N N N N N	ricquoney
0 dB/div	Ref 2	5.00 dBm	I SUMEON				Mk	r1 3.119 -29.4	9 7 GHz 49 dBm	Auto Tun
15.0										Center Fre 2.515000000 G⊦
5.00									-13.00 dBm	Start Fre 30.000000 MI
25.0						1				Stop Fr 5.000000000 G
35.0 1.1.1 15.0		an a		nan hanging belan pananging belan pananging belanging b		i an	a bid Alaria, Masella (Iso Alaria, Santa (Iso)	liffered and the set of the set and a floor sequence of the set	al e a la part de sig (u. La parte de la company	CF St 497.000000 M <u>Auto</u> M
5.0										Freq Offs 0
65.0 Start 30) MHz W 1.0 MH		#)/P)4	/ 3.0 MHz			Sweep 8	Stop 5	.000 GHz	
RES D		2	# V D V	7 J.V IVINZ			sweep o.	.07 IIIS (1	0000 pts)	

Plot 7-8. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0- Low Channel)



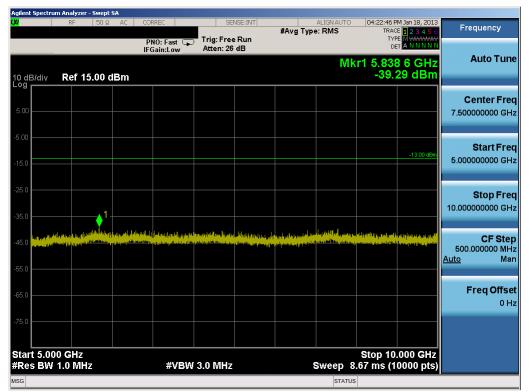
Plot 7-9. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 40 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.	•		REV 4.0AWSC



	RF	50 Ω		RREC	Trig: Free		#Avg Typ	ALIGNAUTO e: RMS	TRAC	M Jan 18, 2013 E 1 2 3 4 5 6 E M WWWWW	Frequency
0 dB/di	v Ref	2 <mark>5.00 c</mark>	IF	Gain:Low	Atten: 36	dB		М	kr1 3.15	6 9 GHz 58 dBm	Auto Tun
15.0											Center Fre 2.515000000 G⊦
5.00											Start Fre 30.000000 Mi
25.0							11			-13.00 dBm	Stop Fr 5.000000000 GI
35.0 	Angelija over seda se a biskog stere over kongeles kongeles konge	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	ng pilong series bester for	pay the dense of a first of a second s	n an far frei fan fan fan fan fan stear Segen fan far fan fan stear stear	l) and line (1) and (14) - A contraction	l particular digorita Provinsional and a second		يا و العليان و ان العلي و المربع و ال الإسلامين الموجود و الم	Warns of a state of the State of the state o	CF Ste 497.000000 Mi <u>Auto</u> Mi
55.0											Freq Offs
55.0	0 MHz								Stop 5	.000 GHz	
	W 1.0 M	Hz		#VBW	3.0 MHz			Sweep	8.67 ms (1	0000 pts)	

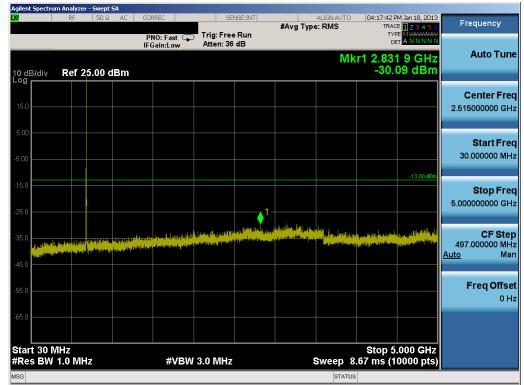
Plot 7-10. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



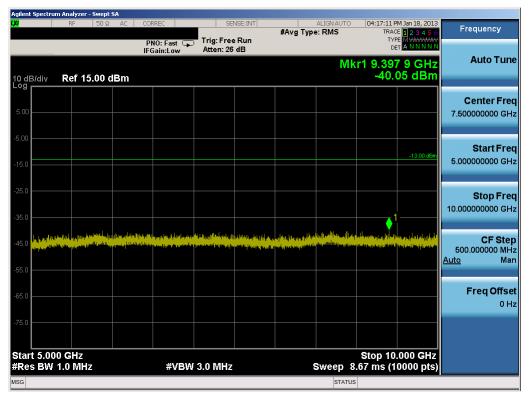
Plot 7-11. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 41 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 41 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.			REV 4.0AWSC





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



Plot 7-13. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 42 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 42 01 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC



Agilent Spectrum An		500055					2210
L <mark>XI</mark>	RF 50 Ω AC	CORREC	SENSE:INT	#Avg Type: I	.IGN AUTO RMS	04:19:36 PM Jan 18 TRACE 1 2 3 TYPE MWW	
		PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 36 dB				N N N
10 dB/div R	ef 25.00 dBm				Mk	r1 716.00 N -32.04 d	IHz Auto Tune Bm
15.0							Center Freq 716.000000 MHz
-5.00		and a second					Start Freq 701.000000 MHz
-15.0						-13.0	Stop Freq 731.000000 MHz
-35.0			1		~		CF Step 3.000000 MHz <u>Auto</u> Man
-45.0						have a source of the states	Freq Offset
-65.0	0 MHz					Span 30.00 ľ	<u>АН</u> 7
#Res BW 10		#VBW	300 kHz		#Sweep	3.00 s (1001	pts)
MSG					STATUS		

Plot 7-14. Upper Band Edge Plot (10.0MHz QPSK – RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dega 42 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset	Page 43 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.		REV 4.0AWSC 12/10/09



8.0 BAND 5 PLOTS OF EMISSIONS

Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.



Plot 8-1. Lower Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 44 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 44 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.			REV 4.0AWSC





Plot 8-2. Occupied Bandwidth Plot (5.0MHz QPSK - RB Size 25)



Plot 8-3. Occupied Bandwidth Plot (5.0MHz 16-QAM - RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dego 45 of 70	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 45 of 76	
© 2013 PCTEST Engineerin	2013 PCTEST Engineering Laboratory, Inc.				



Agilent Spectrum Analyzer - Swept S#	Ą				
<mark>ΙΧΙ</mark> RF 50 Ω	AC CORREC	SENSE:INT	ALIGN AUTO	03:43:59 PM Jan 18, 2013	Frequency
		Trig: Free Run	#Avg Type: RMS	TRACE 123456 TYPE MWWWW DET A N N N N N	rioquonoy
	PNO: Fast 🧔 IFGain:Low	Atten: 36 dB		DET A N N N N N	
	II GUIILEON		Mice	4 940 000 MH-	Auto Tune
			IVINI	1 849.000 MHz -24.842 dBm	
10 dB/div Ref 25.00 dE	3m			-24.842 abm	
					Center Freq
15.0					849.000000 MHz
5.00					
					Start Freq
-5.00					841.500000 MHz
-3.00					
				-13.00 dBm	
-15.0					Stop Freq
		1			856.500000 MHz
-25.0		Y			000.000000 11112
-35.0					CF Step
-33.0		a sources			1.500000 MHz
			and grant of the state of the s		<u>Auto</u> Man
-45.0			Ve	many	
				and the second sec	
-55.0					Freq Offset
					0 Hz
-65.0					
-08.0					
Center 849.000 MHz				Span 15.00 MHz	
#Res BW 100 kHz	#\/R\A(300 kHz	#Sween	3.00 s (1001 pts)	
	# 8 D 8 8	500 MH2		5.00 3 (1001 pts)	
MSG			STATUS		

Plot 8-4. Upper Band Edge Plot (5.0MHz QPSK - RB Size 25)



Plot 8-5. Lower Band Edge Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980		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 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 46 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC





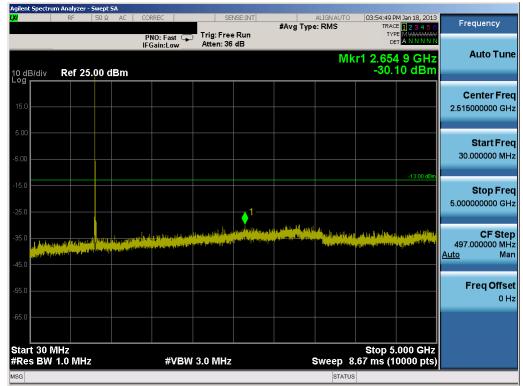
Plot 8-6. Occupied Bandwidth Plot (10.0MHz QPSK - RB Size 50)



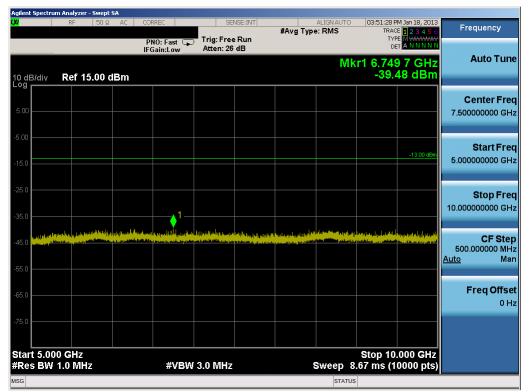
Plot 8-7. Occupied Bandwidth Plot (10.0MHz 16-QAM - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 47 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 47 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC





Plot 8-8. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)



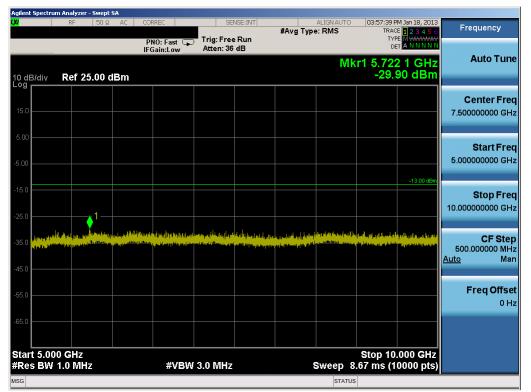
Plot 8-9. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 49 of 70	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 48 of 76	
© 2013 PCTEST Engineering	2013 PCTEST Engineering Laboratory, Inc.				



U.	ectrum Analyz RF	50 Ω	CORREC	SE	NSE:INT		ALIGN AUTO		M Jan 18, 2013	Frequency
			PNO: Fast 🖵 IFGain:Low	Trig: Free Atten: 36		#Avg Typ	e: RMS	TRAC TYF DE	^{)Е} <mark>123456</mark> РЕМ ИЛИИИ ТАИЛИИИ	Trequency
0 dB/di	iv Ref	25.00	I Gam.Euw				MI	(r1 3.35 -29.5	1 3 GHz 99 dBm	Auto Tune
15.0 —										Center Fre 2.515000000 GH
5.00									-13.00 dBm	Start Fre 30.000000 MH
25.0						1				Stop Fre 5.000000000 G⊦
35.0			lan pantitan Kana Lan dalah dalam Ing dapat Peters Penting dan se	l og hydrychen som lloget Synamicke som	las pelifik dala dala Manana di Kangarang	an an di Afrika kana yanga Tangga sala yan kangan yang		A Jalopa Antona Antona Antona Mana antona Mana Antona Antona Mana antona Mana Antona Antona	l tur an an an An Alberton. Maria an Anna an Anna Anna Anna Anna Anna A	CF Ste 497.000000 M⊢ <u>Auto</u> Ma
55.0 —										Freq Offs 0 F
65.0										
	60 MHz 3W 1.0 M	Hz	#VBV	V 3.0 MHz			Sweep 8	5 Stop 1.67 ms (1	.000 GHz 0000 pts)	
SG							STATUS			

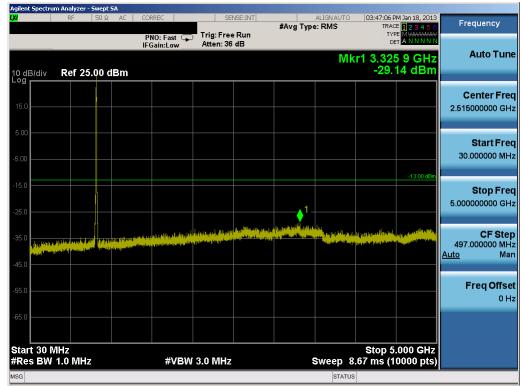
Plot 8-10. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



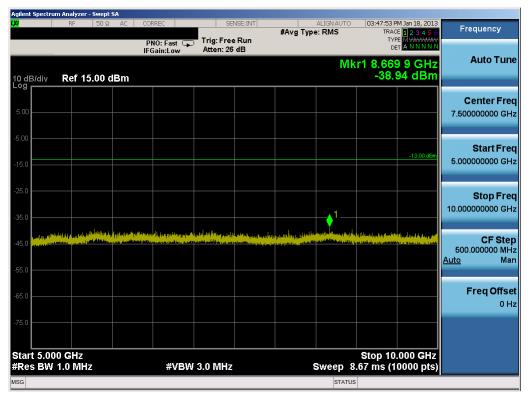
Plot 8-11. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 49 of 76
© 2013 PCTEST Engineering	g Laboratory, Inc.	-		REV 4.0AWSC





Plot 8-12. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 8-13. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 50 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 50 01 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC



PNO: Fast PIO: Fast Trig: Free Run Atten: 36 dB PIO: 44 yrg Type: RMS Trace 123 4 5 m PIO: 44 yrg Type: RMS Trace 123 4 s m PIO: 44 yrg Type: RMS		um Analyzer - Swept SA					1	
Mkr1 849.00 MHz -32.766 dBm Auto Tune 0 dB/div Ref 25.00 dBm -32.766 dBm 150 -32.766 dBm -34.766 dBm 150 -30.000 MHz -39.00000 MHz 500 -30.000 MHz -30.000 MHz 500 -30.0000 MHz -30.0000 MHz 500 -30.000 MHz -30.00000 MHz 500 -30.000 MHz -30.00000 MHz 500 -30.000 MHz -30.000000 MHz 500 -30.000 MHz -30.00000000000000000000000000000000000	XI	RF 50Ω AC	CORREC			ALIGNAUTO E: RMS	03:46:08 PM Jan 18, 2013 TRACE 123456 TYPE MWWWWW DET A N N N N N	Frequency
15.0 Center Free 600 Start Free 700 Start Free 700	10 dB/div	Ref 25.00 dBm	IFGain:Low	Atten: 30 dB		Mk	r1 849.00 MHz -32.766 dBm	Auto Tune
5.00 5.00	15.0							Center Freq 849.000000 MHz
15.0 25.0	-5.00	in your and a promotion of provide and the provide					_13.00 dBm	Start Freq 839.000000 MHz
45.0 40.0 40.0 <td< td=""><td>-15.0</td><td></td><td></td><td>1</td><td></td><td></td><td></td><td>Stop Fred 859.000000 MH2</td></td<>	-15.0			1				Stop Fred 859.000000 MH2
65.0 Image: Content of the second secon	-35.0				Markey and the age of games and	*****	Marana and	2.000000 MHz
Center 849.00 MHz Span 20.00 MHz Res BW 100 kHz #VBW 300 kHz #Sweep 3.00 s (1001 pts)	-55.0							
							Span 20.00 MHz	
		100 kHz	#VBW	300 kHz			3.00 s (1001 pts)	

Plot 8-14. Upper Band Edge Plot (10.0MHz QPSK – RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dego E1 of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset	Page 51 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.		REV 4.0AWSC 12/10/09



9.0 BAND 4 PLOTS OF EMISSIONS

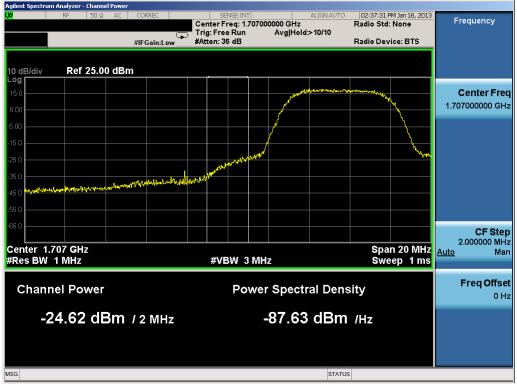
Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.



Plot 9-1. Lower Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Daga 52 of 76		
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 52 of 76		
© 2013 PCTEST Engineerin	2013 PCTEST Engineering Laboratory, Inc.					





Plot 9-2. Lower Extended Band Edge Plot (5.0MHz QPSK - RB Size 25)



Plot 9-3. Occupied Bandwidth Plot (5.0MHz QPSK - RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 52 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 53 of 76
© 2013 PCTEST Engineerin	2013 PCTEST Engineering Laboratory, Inc.			





Plot 9-4. Occupied Bandwidth Plot (5.0MHz 16-QAM - RB Size 25)



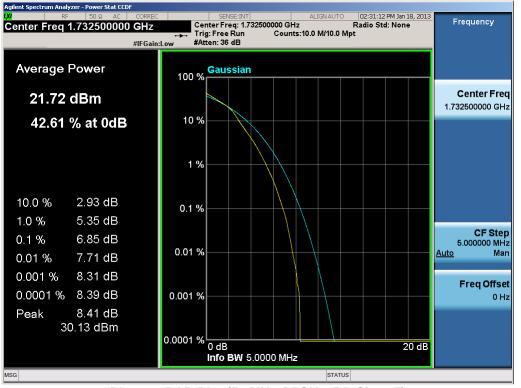
Plot 9-5. Upper Band Edge Plot (5.0MHz QPSK - RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 54 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 54 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC





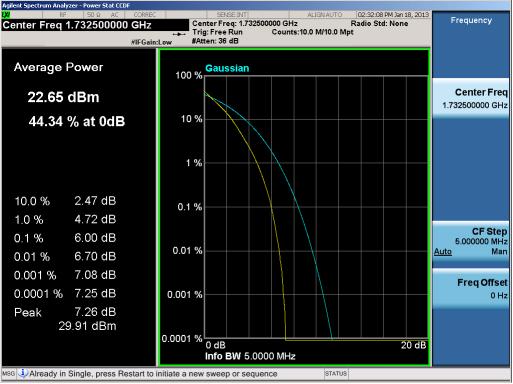
Plot 9-6. Upper Extended Band Edge Plot (5.0MHz QPSK - RB Size 25)



Plot 9-7. PAR Plot (5.0MHz QPSK – RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage EE of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 55 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.	·		REV 4.0AWSC





Plot 9-8. PAR Plot (5.0MHz 16-QAM - RB Size 25)



Plot 9-9. Lower Band Edge Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege EC of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 56 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.	·		REV 4.0AWSC





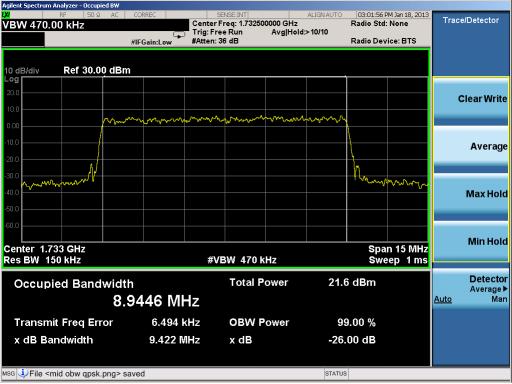




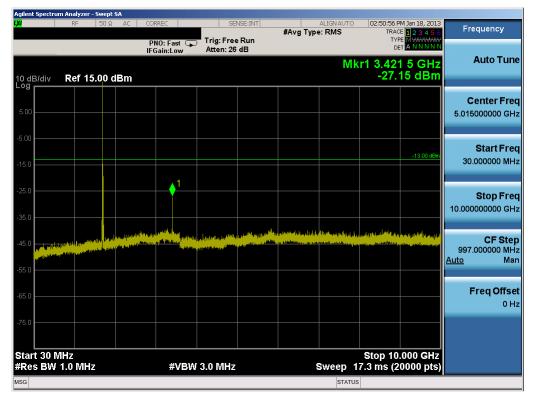
Plot 9-11. Occupied Bandwidth Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 57 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 57 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC





Plot 9-12. Occupied Bandwidth Plot (10.0MHz 16-QAM - RB Size 50)



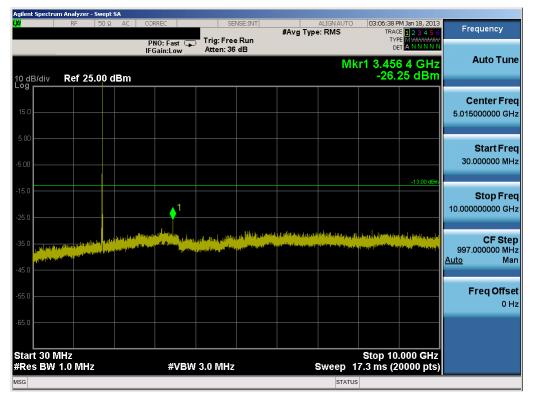
Plot 9-13. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0- Low Channel)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 59 of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 58 of 76
© 2013 PCTEST Engineerin	a Laboratory. Inc.	•		REV 4.0AWSC



gilent Spe (/		alyzer - Swep		CORREC	CF	NSE:INT		ALIGNAU	TO 03-50-03	PM Jan 18, 2013	
v		// 1907	2 AC		.		#Avg	Type: RMS	TRA	CE 1 2 3 4 5 6	Frequency
				PNO: Fast G	Atten: 26				ĩ		
			el D me					Μ	kr1 16.84	0 8 GHz 45 dBm	Auto Tun
10 dB/di - ^{og} r	V RO	ef 15.00	авт								
											Center Fre
5.00											15.00000000 GI
5.00											
										-13.00 dBm	Start Fre
15.0											10.00000000 GI
25.0 —											
23.0								1			Stop Fre
35.0						الأدريب بالله		C POT DO DE LA COMPANY	وروا والقور أورا أألفكم وأرأ		20.000000000 GI
in the	harrantatha	International second	u L _{page} score	Windowski and		agenter andere	and some states of		and the second second		CF Ste
45.0 <mark>pt.4</mark> .	alian ya ta wasa la	de la constitue de la residió	مەرىپىيە بىللەر _{بىل} امە ئۇللار	A CONTRACTOR OF THE OWNER OF THE							1.000000000 G
55.0											<u>Auto</u> M
											Erog Offo
65.0											Freq Offs
75.0											
Start 1	000	GH7							Stop 20).000 GHz	
Res B	W 1.0	MHz		#VBV	V 3.0 MHz			Sweep	25.3 ms (2	20000 pts)	
SG								ST/	ATUS		

Plot 9-14. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



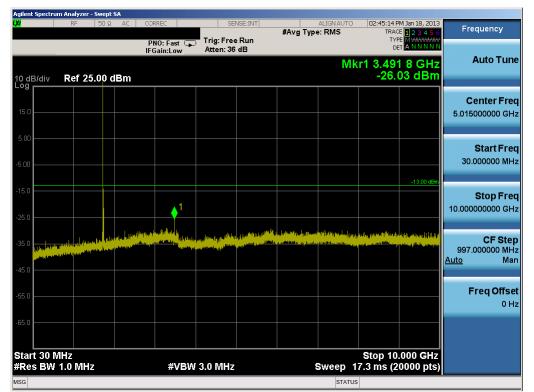
Plot 9-15. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 50 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 59 of 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC



RF 50 Ω AC	CORREC	SENSE:		ALIGN AUTO	03:07:08 PM Jan 18, 2013	Frequency
	PNO: Fast 🖵 IFGain:Low	Trig: Free Ru Atten: 26 dB		ype: RMS	TRACE 123456 TYPE M WWWWW DET A N N N N N	
0 dB/div Ref 15.00 dBm				Mkr	1 17.064 4 GHz -34.84 dBm	Auto Tuno
5.00						Center Fre 15.000000000 GH
15.0					-13.00 dBm	Start Fre 10.000000000 GH
36.0			an side	1	terrentificze de bâ ter final des main	Stop Fre 20.000000000 GH
45.0	ne fall here gy an and bly at here the second s				Child Lee al box, any all they produce by another	CF Ste 1.000000000 GH <u>Auto</u> Ma
36.0						Freq Offs 0 H
r5.0					Stop 20.000 GHz	
Res BW 1.0 MHz		3.0 MHz			5.3 ms (20000 pts)	

Plot 9-16. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 9-17. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 60 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 60 01 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC



7	RF 50	Ω AC	CORREC	SE	VSE:INT		ALIGN AUTO	02:46:21 F	M Jan 18, 2013	
			PNO: Fast 🗔	Trig: Free	Run	#Avg Typ	e: RMS	TRAC TYF	^E 123456 E M WWWW	Frequency
			IFGain:Low	Atten: 26	dB			DE		
							Mkr	1 16.95	78GHz	Auto Tune
0 dB/div .og	Ref 15.00	dBm						-33.	71 dBm	
										Center Fre
5.00										15.000000000 GH
5.00										Start Fre
15.0									-13.00 dBm	10.000000000 GH
25.0										Stop Fre
							1			20.000000000 GH
35.0				ورو بالمعر بعه أفندور	Nong and the		ale	and Steel and parts	and the state of the	
45.0 		and a straight and a straight of the straighto		and the second second	وكالمشرور ومشالك	ton Kindola Million	Concert Mildle State	فالمريبين وماكالكر ومريدهما	a a substantion of the state of the second	CF Ste
45.0										1.00000000 GH
55.0										<u>Auto</u> Ma
										Ener Offer
65.0										Freq Offse 0 H
75.0										
itart 10.0	00 GHz 1.0 MHz		#1/D14	/ 3.0 MHz			Swoon 2		.000 GHz	
RC5 DW	1.0 10172		#VDV	J.0 191HZ			Sweep 2	-	0000 pts)	

Plot 9-18. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



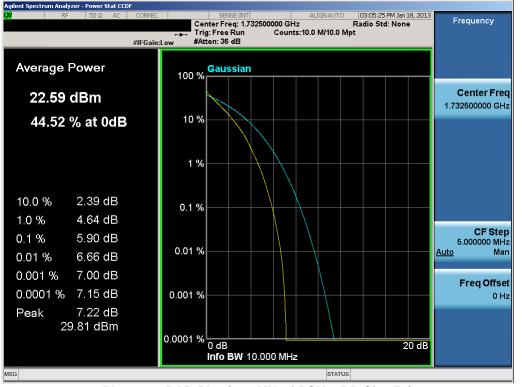
Plot 9-19. Upper Band Edge Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 61 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 61 01 76
© 2013 PCTEST Engineering	Laboratory, Inc.			REV 4.0AWSC





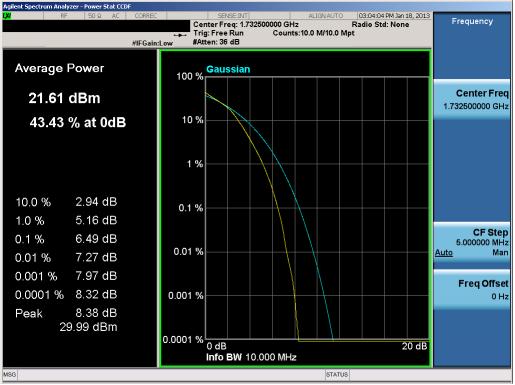
Plot 9-20. Upper Extended Band Edge Plot (10.0MHz QPSK - RB Size 50)



Plot 9-21. PAR Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 62 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 62 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.			REV 4.0AWSC





Plot 9-22. PAR Plot (10.0MHz 16-QAM - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 62 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 63 of 76
© 2013 PCTEST Engineering Laboratory, Inc.				REV 4.0AWSC



10.0 BAND 2 PLOTS OF EMISSIONS

Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.



Plot 10-1. Lower Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 64 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset	Fage 64 01 76
© 2013 PCTEST Engineering	Laboratory, Inc.		REV 4.0AWSC 12/10/09





Plot 10-2. Lower Extended Band Edge Plot (5.0MHz QPSK - RB Size 25)



Plot 10-3. Occupied Bandwidth Plot (5.0MHz QPSK - RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage CE of 70
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 65 of 76
© 2013 PCTEST Engineerin	g Laboratory, Inc.	·		REV 4.0AWSC





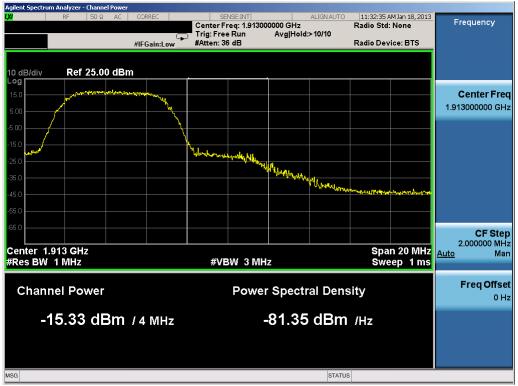
Plot 10-4. Occupied Bandwidth Plot (5.0MHz 16-QAM - RB Size 25)



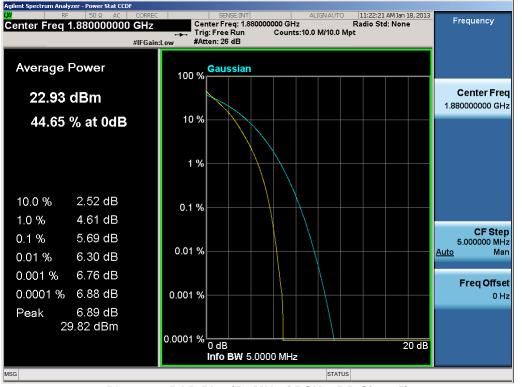
Plot 10-5. Upper Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage CC of 70	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 66 of 76	
© 2013 PCTEST Engineering Laboratory, Inc.					





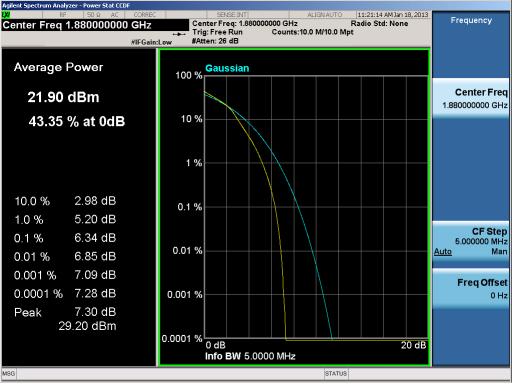
Plot 10-6. Upper Extended Band Edge Plot (5.0MHz QPSK - RB Size 25)



Plot 10-7. PAR Plot (5.0MHz QPSK - RB Size 25)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 67 of 76	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 67 of 76	
© 2013 PCTEST Engineering Laboratory, Inc.					





Plot 10-8. PAR Plot (5.0MHz 16-QAM - RB Size 25)



Plot 10-9. Lower Band Edge Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 69 of 76	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 68 of 76	
© 2013 PCTEST Engineering Laboratory, Inc.					









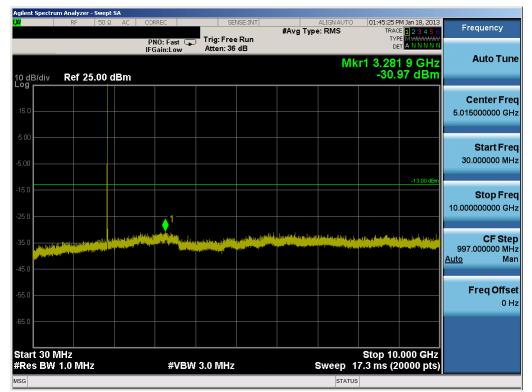
Plot 10-11. Occupied Bandwidth Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	.G	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 60 of 76	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 69 of 76	
© 2013 PCTEST Engineering Laboratory, Inc.					





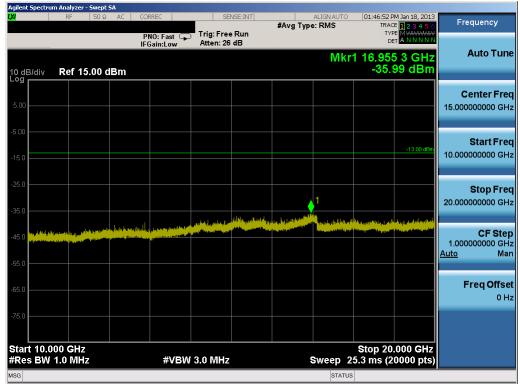
Plot 10-12. Occupied Bandwidth Plot (10.0MHz 16-QAM - RB Size 50)



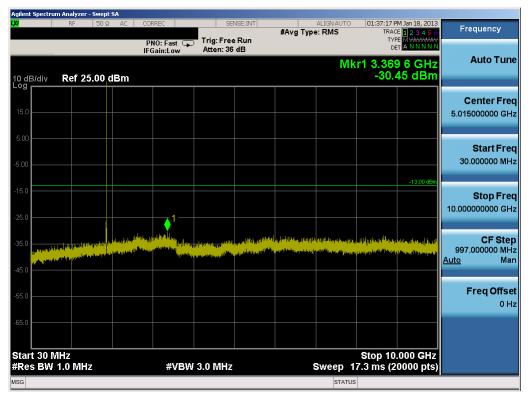
Plot 10-13. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0- Low Channel)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 70 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 70 of 76
© 2013 PCTEST Engineering	REV 4.0AWSC			





Plot 10-14. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



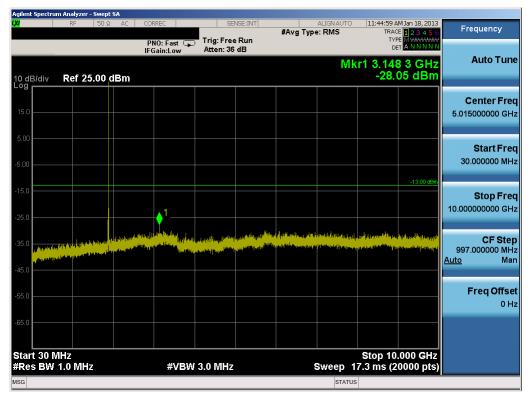
Plot 10-15. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 71 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset	Page / 1 01 / 6
© 2013 PCTEST Engineering	REV 4.0AWSC		



igilent Specti <mark>X/</mark>	rum Analyzer - Swej RF 50		CORREC	SE	NSE:INT		ALIGN AUTO	01:38:27 P	M Jan 18, 2013	
			PNO: Fast 🗔			#Avg Typ	e: RMS	TRAC		Frequency
	_		IFGain:Low	Atten: 26	dB			DE		Auto Tune
10 dB/div	Ref 15.00	dBm					Mkr	1 17.003 -36.2	3 9 GHz 29 dBm	Auto Tun
										Center Fre
5.00										15.000000000 GH
-5.00										
-3.00									-13.00 dBm	Start Fre
-15.0										10.000000000 GH
-25.0										
-20.0							1			Stop Fre 20.000000000 GH
-35.0					adan atu	البريديان.	<u></u>			20.0000000000
-45.0 <mark>41/1</mark> 44	and the second stands	No. of the second second	The second second				and the spectrum	languate of spaces of the second s		CF Ste
ALC: MALEN	ومحاطية ويرجع والطليقين ولاله	a change and a second								1.000000000 GH <u>Auto</u> Ma
55.0										
-65.0										Freq Offse
										он
-75.0										
	000 GHz 1.0 MHz		#\/B\/	V 3.0 MHz			Sween 2	Stop 20. 5.3 ms (2	000 GHz	
ISG			7 Y D Y				SWEEP Z		5600 pts)	

Plot 10-16. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 10-17. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 70 of 76	
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 72 of 76	
© 2013 PCTEST Engineering Laboratory, Inc.				REV 4.0AWSC	



Agilent Spectrum Analyzer - Swept SA						
<mark>ΧΙ</mark> RF 50Ω AC	CORREC	SENSE:INT	#Avg Type	ALIGNAUTO	11:47:13 AM Jan 18, 2013 TRACE 1 2 3 4 5 6	Frequency
		Free Run n: 26 dB	0 //			
10 dB/div Ref 15.00 dBm	I SUMEON			Mkr1	17.017 4 GHz -33.64 dBm	Auto Tune
						Center Freq 15.000000000 GHz
-5.00						Start Freq
-15.0					-13.00 dBm	10.000000000 GHz
-25.0				1		Stop Freq 20.000000000 GHz
-35.0					ng kanawa kata ili panga kata kata pangan kata jili. Kanawa kati na pangan kata pinanga pangan kata pinangan kata ji	CF Step
-45.0						1.00000000 GHz <u>Auto</u> Mar
-65.0						Freq Offset 0 Hz
-75.0						
Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 M	1Hz		Sweep 25	Stop 20.000 GHz 5.3 ms (20000 pts)	
MSG				STATUS		

Plot 10-18. Conducted Spurious Plot (10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



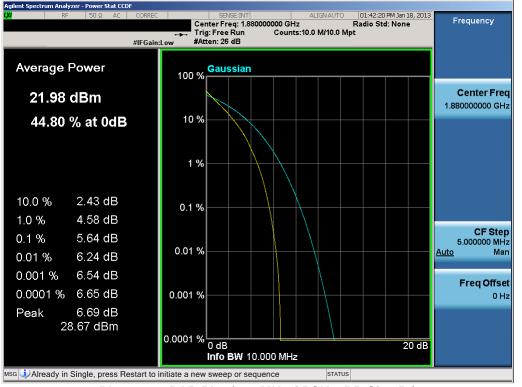
Plot 10-19. Upper Band Edge Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 72 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 73 of 76
© 2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC	





Plot 10-20. Upper Extended Band Edge Plot (10.0MHz QPSK - RB Size 50)

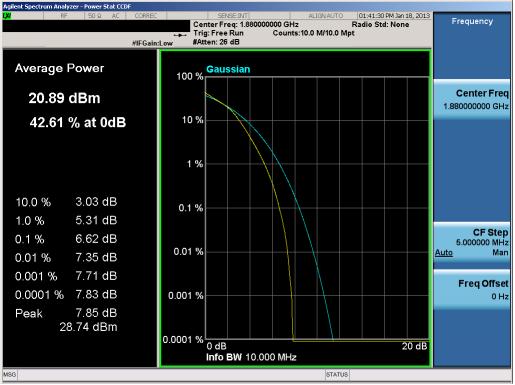


Plot 10-21. PAR Plot (10.0MHz QPSK - RB Size 50)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 74 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 74 of 76
© 2013 PCTEST Engineering Laboratory, Inc.				REV 4.0AWSC

12/10/09





Plot 10-22. PAR Plot (10.0MHz 16-QAM - RB Size 50)

FCC ID: ZNFE980	PCTEST	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 75 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset		Page 75 of 76
© 2013 PCTEST Engineering Laboratory, Inc.			REV 4.0AWSC	



11.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFE980** complies with all the requirements of Parts 2, 22, 24, 27 of the FCC rules for LTE operation only.

FCC ID: ZNFE980		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 76 of 76
0Y1301020027.ZNF	January 7-18, 2013	Portable Handset	Page 76 of 76
© 2013 PCTEST Engineering Laboratory, Inc.			