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MEASUREMENT REPORT FCC Part 22, 24, 27 LTE

Applicant Name:
LG Electronics MobileComm U.S.A
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

Date of Testing:
2/16/2013
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1302130272.ZNF

FCC ID :	ZNFE980
APPLICANT:	LG ELECTRONICS MOBILECOMM U.S.A

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s): §2; §22; §24; §27
EUT Type: Portable Handset
Model(s): E980, LGE980, LG-E980
Test Device Serial No.: *identical prototype* [S/N: 301KPDT230098]
Class II Permissive Change: Please See FCC Change Document
Original Grant Date: 3/21/2013

Mode	Tx Frequency (MHz)	Modulation	ERP/EIRP	
			Max. Power (W)	Max. Power (dBm)
LTE Band 17	706.5 - 713.5	QPSK	0.146	21.64
LTE Band 17	706.5 - 713.5	16QAM	0.122	20.87
LTE Band 17	709 - 711	QPSK	0.102	20.09
LTE Band 17	709 - 711	16QAM	0.084	19.23
LTE Band 5	826.5 - 846.5	QPSK	0.117	20.70
LTE Band 5	826.5 - 846.5	16QAM	0.086	19.37
LTE Band 5	829 - 844	QPSK	0.120	20.78
LTE Band 5	829 - 844	16QAM	0.102	20.10
LTE Band 4	1712.5 - 1752.5	QPSK	0.247	23.92
LTE Band 4	1712.5 - 1752.5	16QAM	0.215	23.32
LTE Band 4	1715 - 1750	QPSK	0.180	22.55
LTE Band 4	1715 - 1750	16QAM	0.151	21.80
LTE Band 2	1852.5 - 1907.5	QPSK	0.239	23.79
LTE Band 2	1852.5 - 1907.5	16QAM	0.164	22.15
LTE Band 2	1855 - 1905	QPSK	0.259	24.14
LTE Band 2	1855 - 1905	16QAM	0.181	22.58

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested. I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



Randy Ortañez
President

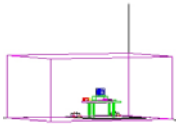


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T A B L E O F C O N T E N T S

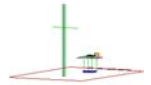
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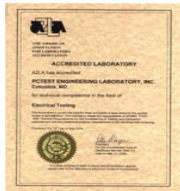


§2.1033 General Information



APPLICANT: LG Electronics MobileComm U.S.A
APPLICANT ADDRESS: 1000 Sylvan Avenue
 Englewood Cliffs, NJ 07632, United States
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S): §2; §22; §24; §27
BASE MODEL: E980
FCC ID: ZNFE980
FCC CLASSIFICATION: PCS Licensed Transmitter Held to Ear (PCE)
FREQUENCY TOLERANCE: ±0.00025 % (2.5 ppm)
Test Device Serial No.: 301KPDT230098 Production Pre-Production Engineering
DATE(S) OF TEST: 2/16/2013
TEST REPORT S/N: 0Y1302130272.ZNF

Test Facility / Accreditations

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



- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

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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'l (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 in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on January 10, 2012.

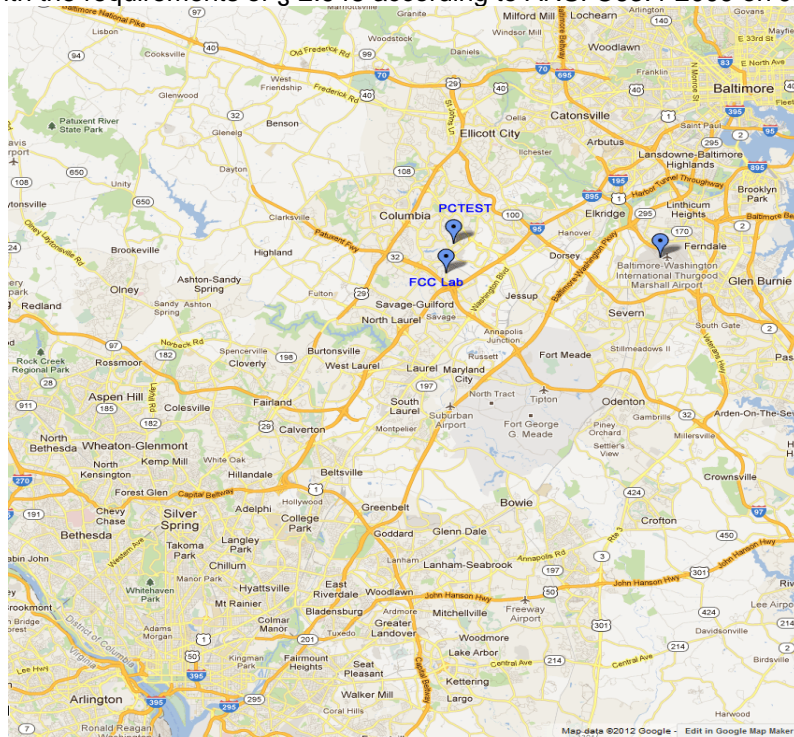




Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: 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 a representative charging pad (the LG Nexus 4 Wireless Charger Model: WCP-300). Worst case emissions from the EUT's LTE transmitter did not occur during wireless charging.

In addition, the EUT was also tested with a Folio Cover (LG-F240). Worst case emissions from the EUT's LTE transmitter did not occur this time either.

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.

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

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

3.2 Block A Frequency Range

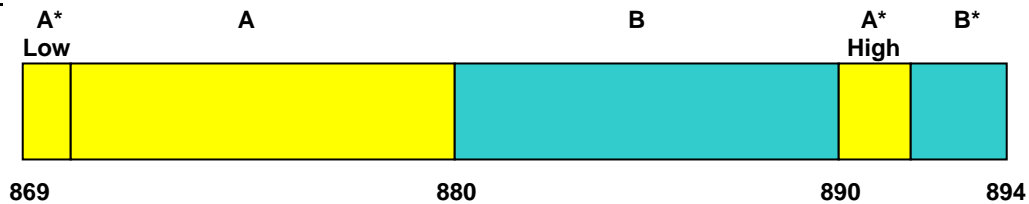
§27.5(c)

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

§24.905



BLOCK 1: 869 – 880 MHz (A* Low + A)

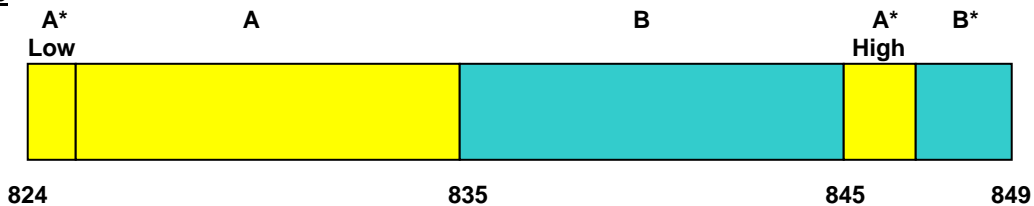
BLOCK 3: 890 – 891.5 MHz (A* High)

BLOCK 2: 880 – 890 MHz (B)

BLOCK 4: 891.5 – 894 MHz (B*)

3.4 Cellular - Mobile Frequency Blocks

§24.905



BLOCK 1: 824 – 835 MHz (A* Low + A)

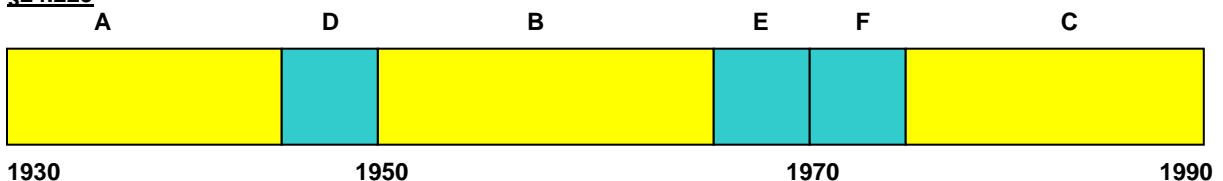
BLOCK 3: 845 – 846.5 MHz (A* High)



BLOCK 2: 835 – 845 MHz (B)

BLOCK 4: 846.5 – 849 MHz (B*)

3.5 PCS - Base Frequency Blocks

§24.229



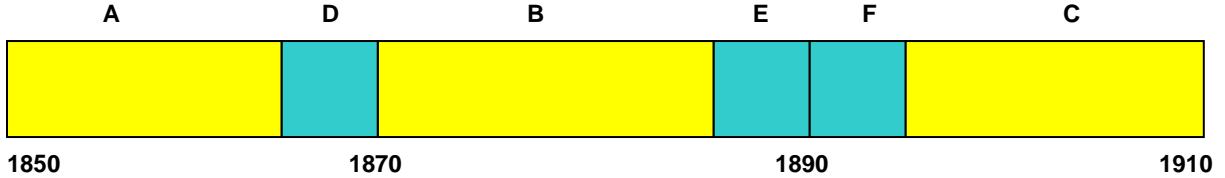
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BLOCK 1: 1930 – 1945 MHz (A)
 BLOCK 2: 1945 – 1950 MHz (D)
 BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 4: 1965 – 1970 MHz (E)
 BLOCK 5: 1970 – 1975 MHz (F)
 BLOCK 6: 1975 – 1990 MHz (C)

3.6 PCS - Mobile Frequency Blocks

§24.229

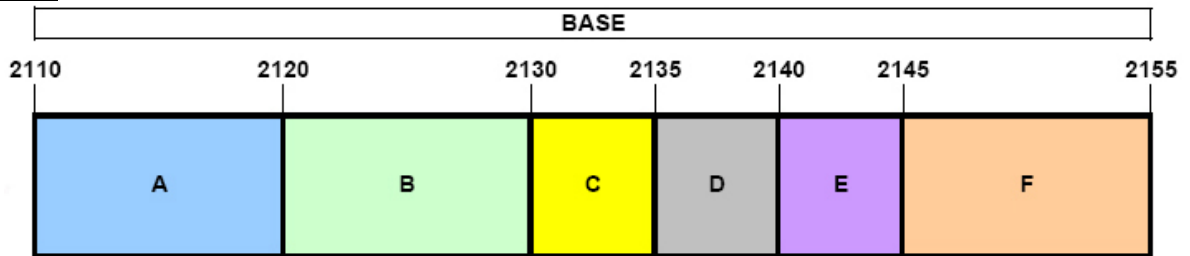


BLOCK 1: 1850 – 1865 MHz (A)
 BLOCK 2: 1865 – 1870 MHz (D)
 BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 4: 1885 – 1890 MHz (E)
 BLOCK 5: 1890 – 1895 MHz (F)
 BLOCK 6: 1895 – 1910 MHz (C)

3.7 AWS - Base Frequency Blocks

§27.5(h)

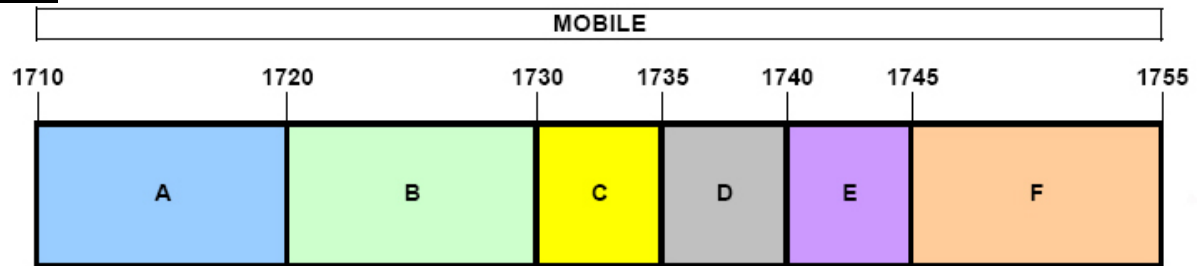


BLOCK 1: 2110 – 2120 MHz (A)
 BLOCK 2: 2120 – 2130 MHz (B)
 BLOCK 3: 2130 – 2135 MHz (C)

BLOCK 4: 2135 – 2140 MHz (D)
 BLOCK 5: 2140 – 2145 MHz (E)
 BLOCK 6: 2145 – 2155 MHz (F)



3.8 AWS - Mobile Frequency Blocks

§27.5(h)



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

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

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3.9 Radiated Power and Radiated Spurious Emissions

§2.1053 §22.913(a.2) §22.917(a) §24.232(c) §24.238(a) §27.50(c.10) §27.50(d.4) §27.53(g) RSS-132(4.4) RSS-132(4.5.1) RSS-133(6.4) RSS-133(6.5.1) RSS-139(6.5.1)

Radiated spurious emissions are investigated indoors in a semi-anechoic chamber to determine the frequencies producing the worst case emissions. Final measurements for radiated power and radiated spurious emissions are performed on the 3 meter OATS per the guidelines of ANSI/TIA-603-C-2004. The measurement area is situated on an 18 meter x 20 meter galvanized 1/2" hardware cloth as the conducting ground plane. This material is sewn together in sections 4 feet wide and 60 feet long. A total of eighteen sections are required to cover the entire measurement area. Sections are laid across the width of the pad, overlapped 1" and sewn and soldered together at intervals of 3" (7.6 cm.) The terrain of the test site is reasonably flat and level. Power and cable to the test site are buried 18" deep into the ground outside the perimeter of the site. An all-weather non-metallic housing is situated on a 2 x 3 meter area adjacent to the measurement area to house the test equipment. 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 spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. 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. Emissions are also investigated with the receive antenna horizontally and vertically polarized. The level of the maximized emission is recorded with the spectrum analyzer using a peak detector with RBW = 1MHz, VBW = 3MHz for emissions greater than 1GHz. For emissions below 1GHz, the spectrum analyzer is set to RBW = 100kHz and VBW = 300kHz.

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:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

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 $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power [Watts]})$ specified in 22.917(a), 24.238(a), and 27.53(g)(h).

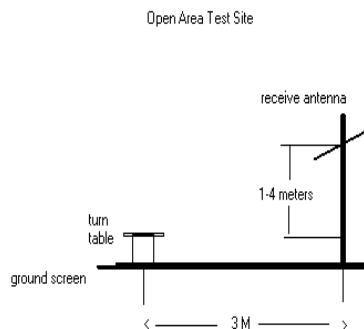




Figure 3-1. Diagram of 3-meter Test Range

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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
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/10/2012	Annual	7/10/2013	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	3/13/2012	Annual	3/13/2013	N/A
-	LTx2	Licensed Transmitter Cable Set	1/17/2013	Annual	1/17/2014	N/A
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	2/15/2013	Annual	2/15/2014	3008A00985
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/10/2012	Annual	10/10/2013	3613A00315
Agilent	N9020A	MXA Signal Analyzer	10/9/2012	Annual	10/9/2013	US46470561
Agilent	N9038A	MXE EMI Receiver	12/8/2012	Annual	12/8/2013	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	1/11/2013	Annual	1/11/2014	MY52350166
Anritsu	MA2411B	Pulse Sensor	9/19/2012	Annual	9/19/2013	1027293
Anritsu	ML2495A	Power Meter	10/11/2012	Annual	10/11/2013	1039008
Mini-Circuits	VHF-1300+	High Pass Filter	1/21/2013	Annual	1/21/2014	30716
Mini-Circuits	VHF-3100+	High Pass Filter	1/21/2013	Annual	1/21/2014	31144
Rohde & Schwarz	CMU200	Base Station Simulator	5/22/2012	Annual	5/22/2013	109892
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836536/0005
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Biennial	10/7/2013	103962
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	10/3/2011	Biennial	10/3/2013	91052522TX
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	10/3/2011	Biennial	10/3/2013	91052523RX
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	7/5/2011	Biennial	7/5/2013	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	6/17/2011	Biennial	6/17/2013	A042511

Table 4-1. Test Equipment

Note:

Equipment used for signaling with a calibration date of "N/A" shown in this list was only used for maintaining a link between the piece of equipment and the EUT. This equipment was not used to make direct calibrated measurements.

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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).

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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)	Test Description	Test Limit	Test Condition	Result	Reference
TRANSMITTER MODE (TX)					
22.913(a.2)	Effective Radiated Power (Band 5)	< 7 Watts max. ERP	RADIATED	PASS	Section 6.2
27.50(c.10)	Effective Radiated Power (Band 17)	< 3 Watts max. ERP		PASS	Section 6.2
24.232(c)	Equivalent Isotropic Radiated Power (Band 2)	< 2 Watts max. EIRP		PASS	Section 6.3
27.50(d.4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP		PASS	Section 6.3
2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	Undesirable Emissions	< 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 6.4, 6.5, 6.6, 6.7

Table 6-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

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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	19.49	2.15	V	21.64	0.146	-13.13
710.00	5	QPSK	Standard	1/0	19.32	2.15	V	21.47	0.140	-13.30
713.50	5	QPSK	Standard	1/0	18.47	2.15	V	20.62	0.115	-14.15
706.50	5	16-QAM	Standard	1/0	18.72	2.15	V	20.87	0.122	-13.90
710.00	5	16-QAM	Standard	1/0	18.22	2.15	V	20.37	0.109	-14.40
713.50	5	16-QAM	Standard	1/0	17.37	2.15	V	19.52	0.090	-15.25
709.00	10	QPSK	Standard	1/0	17.35	2.15	V	19.50	0.089	-15.27
710.00	10	QPSK	Standard	1/0	17.52	2.15	V	19.67	0.093	-15.10
711.00	10	QPSK	Standard	1/0	17.94	2.15	V	20.09	0.102	-14.68
709.00	10	16-QAM	Standard	1/0	16.16	2.15	V	18.31	0.068	-16.46
710.00	10	16-QAM	Standard	1/0	17.08	2.15	V	19.23	0.084	-15.54
711.00	10	16-QAM	Standard	1/0	16.87	2.15	V	19.02	0.080	-15.75



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	18.43	2.15	V	20.58	0.114	-17.87
836.50	5	QPSK	Standard	1/0	18.55	2.15	V	20.70	0.117	-17.75
846.50	5	QPSK	Standard	1/24	17.54	2.15	V	19.69	0.093	-18.76
826.50	5	16-QAM	Standard	1/0	16.86	2.15	V	19.01	0.080	-19.44
836.50	5	16-QAM	Standard	1/0	17.22	2.15	V	19.37	0.086	-19.08
846.50	5	16-QAM	Standard	1/0	16.63	2.15	V	18.78	0.076	-19.67
829.00	10	QPSK	Standard	1/0	18.35	2.15	V	20.50	0.112	-17.95
836.50	10	QPSK	Standard	1/49	18.08	2.15	V	20.23	0.105	-18.22
844.00	10	QPSK	Standard	1/0	18.63	2.15	V	20.78	0.120	-17.67
829.00	10	16-QAM	Standard	1/0	16.60	2.15	V	18.75	0.075	-19.70
836.50	10	16-QAM	Standard	1/49	16.78	2.15	V	18.93	0.078	-19.52
844.00	10	16-QAM	Standard	1/0	17.95	2.15	V	20.10	0.102	-18.35

Table 6-3. ERP Data (Band 5)

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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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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	15.54	8.09	H	23.63	0.231	-6.37
1732.50	5	QPSK	Standard	1/24	14.22	7.97	H	22.19	0.166	-7.81
1752.50	5	QPSK	Standard	1/0	16.07	7.85	H	23.92	0.247	-6.08
1712.50	5	16-QAM	Standard	1/24	14.75	8.09	H	22.84	0.192	-7.16
1732.50	5	16-QAM	Standard	1/24	13.51	7.97	H	21.48	0.141	-8.52
1752.50	5	16-QAM	Standard	1/0	15.47	7.85	H	23.32	0.215	-6.68
1715.00	10	QPSK	Standard	1/49	14.46	8.09	H	22.55	0.180	-7.45
1732.50	10	QPSK	Standard	1/49	14.33	7.97	H	22.30	0.170	-7.70
1750.00	10	QPSK	Standard	1/49	14.50	7.85	H	22.35	0.172	-7.65
1715.00	10	16-QAM	Standard	1/0	13.55	8.09	H	21.64	0.146	-8.36
1732.50	10	16-QAM	Standard	1/0	13.53	7.97	H	21.50	0.141	-8.50
1750.00	10	16-QAM	Standard	1/49	13.95	7.85	H	21.80	0.151	-8.20



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	1/0	13.49	7.76	H	21.25	0.133	-11.76
1880.00	5	QPSK	Standard	1/0	15.96	7.83	H	23.79	0.239	-9.22
1907.50	5	QPSK	Standard	1/0	13.55	7.91	H	21.46	0.140	-11.55
1852.50	5	16-QAM	Standard	1/0	12.98	7.76	H	20.74	0.119	-12.27
1880.00	5	16-QAM	Standard	1/0	14.32	7.83	H	22.15	0.164	-10.86
1907.50	5	16-QAM	Standard	1/24	12.52	7.91	H	20.43	0.110	-12.58
1855.00	10	QPSK	Standard	1/49	14.21	7.76	H	21.97	0.157	-11.04
1880.00	10	QPSK	Standard	1/0	16.31	7.83	H	24.14	0.259	-8.87
1905.00	10	QPSK	Standard	1/49	14.71	7.91	H	22.62	0.183	-10.39
1855.00	10	16-QAM	Standard	1/0	13.06	7.76	H	20.82	0.121	-12.19
1880.00	10	16-QAM	Standard	1/49	14.75	7.83	H	22.58	0.181	-10.43
1905.00	10	16-QAM	Standard	1/0	13.20	7.91	H	21.11	0.129	-11.90

Table 6-5. EIRP Data (Band 2)

NOTES:

1. 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, and RB size =1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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6.4 Band 17 Radiated Spurious Emissions

§2.1053 §27.53(g)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 706.50 MHz
 MEASURED OUTPUT POWER: 21.64 dBm = 0.146 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.64 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1413.00	-51.48	5.80	-45.67	V	67.31
2119.50	-53.89	6.48	-47.41	V	69.05
2826.00	-84.17	7.70	-76.47	V	98.11
3532.50	-81.04	7.47	-73.56	V	95.20
4239.00	-79.66	8.08	-71.58	V	93.22

Table 6-6. Radiated Spurious Data

NOTES:

1. 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, and RB size=1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 710.00 MHz
 MEASURED OUTPUT POWER: 21.47 dBm = 0.140 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.47 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1420.00	-51.30	5.84	-45.47	V	66.94
2130.00	-53.32	6.48	-46.84	V	68.31
2840.00	-84.10	7.69	-76.41	V	97.88
3550.00	-81.03	7.50	-73.53	V	95.00
4260.00	-79.77	8.17	-71.59	V	93.07

Table 6-7. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 713.50 MHz
 MEASURED OUTPUT POWER: 20.62 dBm = 0.115 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.62 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1427.00	-51.63	5.87	-45.76	V	66.38
2140.50	-53.82	6.48	-47.34	V	67.96
2854.00	-84.03	7.67	-76.35	V	96.97
3567.50	-81.02	7.53	-73.49	V	94.11
4281.00	-79.87	8.26	-71.60	V	92.23

Table 6-8. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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6.5 Band 5 Radiated Spurious Emissions

§2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 829.00 MHz
 MEASURED OUTPUT POWER: 20.50 dBm = 0.112 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 33.50 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1658.00	-56.37	6.13	-50.24	V	70.74
2487.00	-54.72	6.35	-48.37	V	68.87
3316.00	-80.47	6.78	-73.69	V	94.19
4145.00	-78.87	7.54	-71.33	V	91.83
4974.00	-78.56	8.86	-69.70	V	90.20

Table 6-9. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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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
 MEASURED OUTPUT POWER: 20.23 dBm = 0.105 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.23 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1673.00	-50.69	6.09	-44.60	V	64.83
2509.50	-51.25	6.38	-44.87	V	65.10
3346.00	-80.60	6.90	-73.70	V	93.93
4182.50	-79.26	7.79	-71.47	V	91.70
5019.00	-78.32	8.83	-69.50	V	89.73

Table 6-10. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 844.00 MHz
 MEASURED OUTPUT POWER: 20.78 dBm = 0.120 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.78 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1688.00	-53.36	6.04	-47.32	V	68.10
2532.00	-49.12	6.44	-42.68	V	63.46
3376.00	-80.73	7.02	-73.70	V	94.48
4220.00	-79.55	8.00	-71.55	V	92.33
5064.00	-78.15	8.85	-69.30	V	90.08

Table 6-11. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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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
 MEASURED OUTPUT POWER: 23.63 dBm = 0.231 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 36.63 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3425.00	-39.02	9.34	-29.69	H	53.32
5137.50	-49.86	10.96	-38.90	H	62.53
6850.00	-75.75	10.51	-65.24	H	88.87
8562.50	-73.04	11.07	-61.97	H	85.61
10275.00	-72.67	12.47	-60.20	H	83.83

Table 6-12. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1732.50 MHz
 MEASURED OUTPUT POWER: 22.19 dBm = 0.166 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.19 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3465.00	-34.10	9.47	-24.63	H	46.82
5197.50	-50.10	10.87	-39.23	H	61.42
6930.00	-75.91	10.68	-65.22	H	87.42
8662.50	-72.92	11.25	-61.67	H	83.86
10395.00	-72.42	12.52	-59.89	H	82.08

Table 6-13. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1752.50 MHz
 MEASURED OUTPUT POWER: 23.92 dBm = 0.247 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 36.92 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3505.00	-38.14	9.58	-28.55	H	52.48
5257.50	-49.42	10.54	-38.88	H	62.80
7010.00	-76.06	10.86	-65.21	H	89.13
8762.50	-73.07	11.52	-61.55	H	85.47
10515.00	-72.17	12.56	-59.61	H	83.53

Table 6-14. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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6.7 Band 2 Radiated Spurious Emissions

§2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1855.00 MHz
 MEASURED OUTPUT POWER: 21.97 dBm = 0.157 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.97 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3710.00	-51.54	9.58	-41.96	H	63.93
5565.00	-51.07	10.65	-40.41	H	62.38
7420.00	-75.08	10.84	-64.25	H	86.22
9275.00	-73.84	12.20	-61.64	H	83.61
11130.00	-71.00	12.87	-58.12	H	80.09

Table 6-15. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1880.00 MHz
 MEASURED OUTPUT POWER: 24.14 dBm = 0.259 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 37.14 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-49.93	9.30	-40.64	H	64.77
5640.00	-52.16	10.89	-41.27	H	65.41
7520.00	-74.88	10.85	-64.03	H	88.17
9400.00	-73.66	12.17	-61.49	H	85.63
11280.00	-70.90	13.05	-57.85	H	81.99

Table 6-16. Radiated Spurious Data

NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1905.00 MHz
 MEASURED OUTPUT POWER: 22.62 dBm = 0.183 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.62 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3810.00	-50.43	9.06	-41.37	H	63.99
5715.00	-51.22	11.06	-40.16	H	62.77
7620.00	-75.21	11.09	-64.11	H	86.73
9525.00	-73.80	12.32	-61.48	H	84.10
11430.00	-70.24	13.20	-57.04	H	79.65

Table 6-17. Radiated Spurious Data



NOTES:

1. 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, and RB size = 1.
2. This unit was tested with its standard battery.
3. The worst case test configuration was found in the Horizontal setup.

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7.0 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.

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