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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:
8/9-8/18/2016
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1608121385.ZNF

FCC ID :	ZNFH918
APPLICANT:	LG ELECTRONICS MOBILECOMM U.S.A

Application Type: Class II Permissive Change
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s): §2; §22; §24; §27
Test Procedure(s): ANSI/TIA-603-D-2010, KDB 971168 D01 v02r02
EUT Type: Portable Handset
Model(s): LG-H918, LGH918, H918, LG-H910PR, LGH910PR, H910PR
Test Device Serial No.: *identical prototype* [S/N: 09296, 09312, 09346]
Class II Permissive Change: Please see FCC change document

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.


 Randy Ortanez
 President

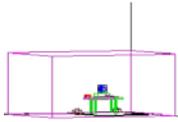


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T A B L E O F C O N T E N T S

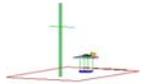
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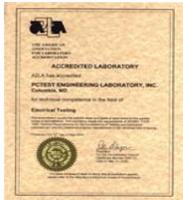


§2.1033 General Information

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: 7185 Oakland Mills Road, Columbia, MD 21045 USA
FCC RULE PART(S): §2; §22; §24; §27
BASE MODEL: LG-H918
FCC ID: ZNFH918
FCC CLASSIFICATION: PCS Licensed Transmitter Held to Ear (PCE)
FREQUENCY TOLERANCE: ±0.00025 % (2.5 ppm)
Test Device Serial No.: 09296, 09312, 09346 Production Pre-Production Engineering
DATE(S) OF TEST: 8/9-8/18/2016
TEST REPORT S/N: 0Y1608121385.ZNF

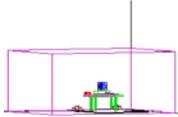
Test Facility / Accreditations

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



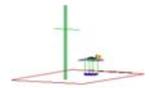
- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards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

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Mode	Tx Frequency (MHz)	Emission Designator	Modulation	ERP/EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE Band 12	699.7 - 715.3	1M11G7D	QPSK	0.104	20.18
LTE Band 12	699.7 - 715.3	1M11W7D	16QAM	0.083	19.18
LTE Band 12	700.5 - 714.5	2M71G7D	QPSK	0.107	20.30
LTE Band 12	700.5 - 714.5	2M71W7D	16QAM	0.085	19.29
LTE Band 12	701.5 - 713.5	4M49G7D	QPSK	0.107	20.28
LTE Band 12	701.5 - 713.5	4M50W7D	16QAM	0.085	19.32
LTE Band 12	704 - 711	9M00G7D	QPSK	0.099	19.95
LTE Band 12	704 - 711	8M96W7D	16QAM	0.077	18.88
LTE Band 13	779.5 - 784.5	4M49G7D	QPSK	0.094	19.75
LTE Band 13	779.5 - 784.5	4M49W7D	16QAM	0.071	18.50
LTE Band 13	782	8M97G7D	QPSK	0.095	19.77
LTE Band 13	782	8M93W7D	16QAM	0.068	18.35
LTE Band 5	824.7 - 848.3	1M11G7D	QPSK	0.071	18.51
LTE Band 5	824.7 - 848.3	1M11W7D	16QAM	0.056	17.50
LTE Band 5	825.5 - 847.5	2M71G7D	QPSK	0.070	18.43
LTE Band 5	825.5 - 847.5	2M70W7D	16QAM	0.054	17.34
LTE Band 5	826.5 - 846.5	4M49G7D	QPSK	0.065	18.10
LTE Band 5	826.5 - 846.5	4M48W7D	16QAM	0.051	17.05
LTE Band 5	829 - 844	8M99G7D	QPSK	0.056	17.51
LTE Band 5	829 - 844	8M95W7D	16QAM	0.057	17.57
LTE Band 4	1710.7 - 1754.3	1M11G7D	QPSK	0.313	24.96
LTE Band 4	1710.7 - 1754.3	1M12W7D	16QAM	0.249	23.97
LTE Band 4	1711.5 - 1753.5	2M72G7D	QPSK	0.313	24.96
LTE Band 4	1711.5 - 1753.5	2M73W7D	16QAM	0.249	23.96
LTE Band 4/66	1712.5 - 1777.5	4M55G7D	QPSK	0.284	24.53
LTE Band 4/66	1712.5 - 1777.5	4M51W7D	16QAM	0.268	24.28
LTE Band 4/66	1715 - 1775	8M98G7D	QPSK	0.304	24.83
LTE Band 4/66	1715 - 1775	9M01W7D	16QAM	0.273	24.36
LTE Band 4/66	1717.5 - 1772.5	13M5G7D	QPSK	0.305	24.84
LTE Band 4/66	1717.5 - 1772.5	13M5W7D	16QAM	0.246	23.91
LTE Band 4/66	1720 - 1770	18M0G7D	QPSK	0.301	24.79
LTE Band 4/66	1720 - 1770	18M0W7D	16QAM	0.222	23.46
LTE Band 2	1850.7 - 1909.3	1M11G7D	QPSK	0.260	24.15
LTE Band 2	1850.7 - 1909.3	1M11W7D	16QAM	0.205	23.11
LTE Band 2	1851.5 - 1908.5	2M71G7D	QPSK	0.286	24.56
LTE Band 2	1851.5 - 1908.5	2M71W7D	16QAM	0.239	23.78
LTE Band 2	1852.5 - 1907.5	4M48G7D	QPSK	0.281	24.49
LTE Band 2	1852.5 - 1907.5	4M49W7D	16QAM	0.223	23.48
LTE Band 2	1855 - 1905	8M99G7D	QPSK	0.199	22.99
LTE Band 2	1855 - 1905	8M95W7D	16QAM	0.156	21.94
LTE Band 2	1857.5 - 1902.5	13M5G7D	QPSK	0.337	25.27
LTE Band 2	1857.5 - 1902.5	13M4W7D	16QAM	0.254	24.04
LTE Band 2	1860 - 1900	17M9G7D	QPSK	0.294	24.68
LTE Band 2	1860 - 1900	18M0W7D	16QAM	0.237	23.75

EUT Overview

Note:

- 1) Class 2 Permissive Change test samples were used for ERP/EIRP measurements. It has been determined that radiated powers were not changed for the ZNFH918. Differences in radiated powers from the original certification ERP/EIRP that are reported herein are within expected measurement tolerance.

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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 Intern't'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 located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2014 on January 22, 2015.

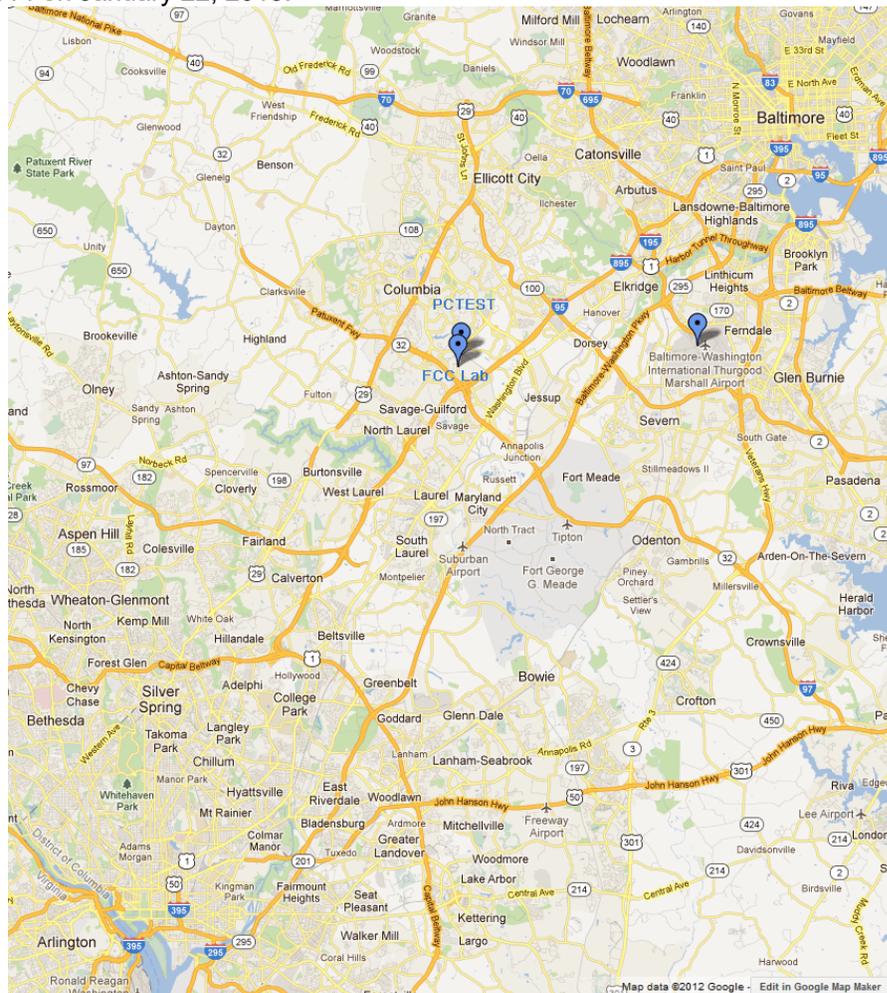


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFH918**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

2.2 Device Capabilities

This device contains the following capabilities:

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

LTE Band 66 (1710 - 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 - 1755 MHz). Therefore, test data provided in this report covers Band 66 as well as Band 4.

This device also employs an antenna switching diversity (ASDiv) mechanism that allows for radiated transmission from one of two antennas at a time for LTE Band 5, 12 and 13. Both antennas cannot transmit simultaneously so dual transmission conditions were not investigated. The two antennas share the same conducted circuitry so only one set of conducted measurements is included. The main transmit antenna data is labeled as "Antenna 1" and the Secondary Antenna data is labeled as "Antenna 2" in the radiated section of this report.

In addition, in order to optimize antenna performance, the tuner for this device was set to simulate a "free space" condition in which the transmit antenna is matched to the medium into which it is transmitting and, thus, all power is at its maximum level.

2.3 Test Configuration

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

2.4 EMI Suppression Device(s)/Modifications

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

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

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

3.1 Block C Frequency Range

§27.5(b)(3)

Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746-757 MHz and 776-787 MHz bands will instead be made available for assignment at a subsequent auction as follows: (i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746-752 MHz and 776-782 MHz bands. (ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752-757 MHz and 782-787 MHz bands.

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

§22.905



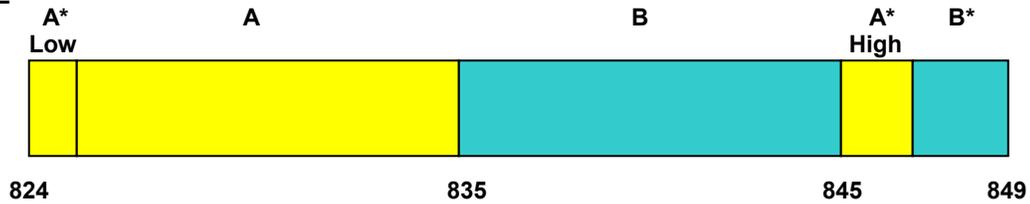
BLOCK 1: 869 – 880 MHz (A* Low + A)
BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)
BLOCK 4: 891.5 – 894 MHz (B*)

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3.4 Cellular - Mobile Frequency Blocks

§22.905

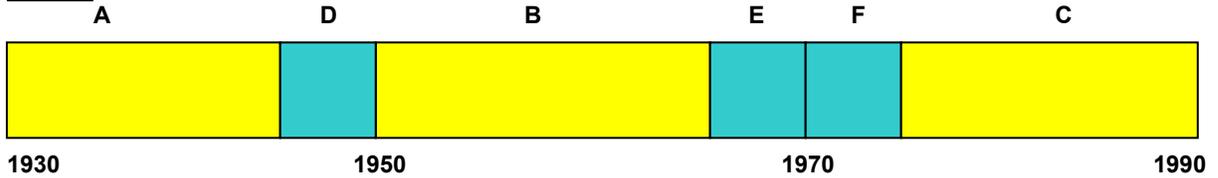


BLOCK 1: 824 – 835 MHz (A* Low + A)
 BLOCK 2: 835 – 845 MHz (B)

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

3.5 PCS - Base Frequency Blocks

§24.229

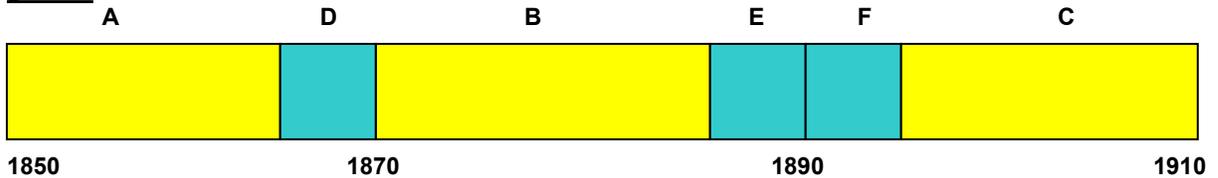


BLOCK 1: 1930 – 1945 MHz (A)
 BLOCK 2: 1945 – 1950 MHz (D)
 BLOCK 3: 1950 – 1965 MHz (B)

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

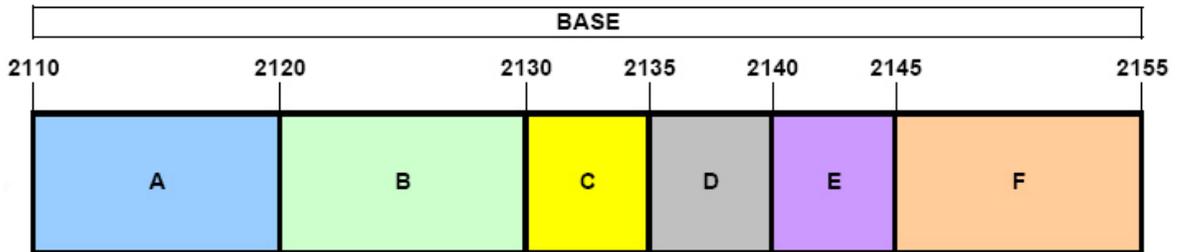


BLOCK 1: 1850 – 1865 MHz (A)
 BLOCK 2: 1865 – 1870 MHz (D)
 BLOCK 3: 1870 – 1885 MHz (B)

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)



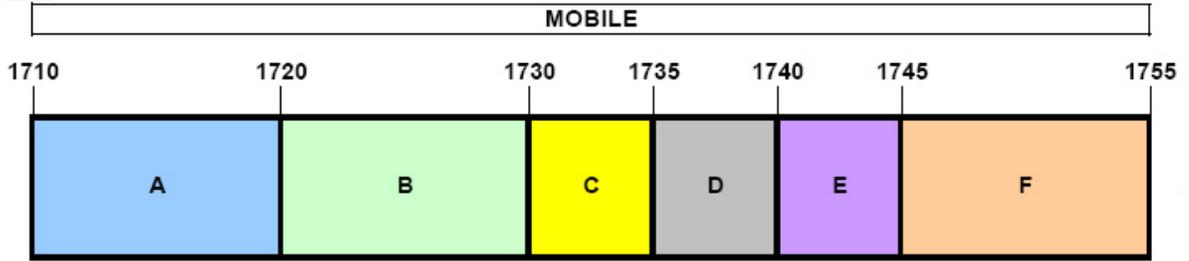
BLOCK 1: 2110 – 2120 MHz (A)
 BLOCK 2: 2120 – 2130 MHz (B)
 BLOCK 3: 2130 – 2135 MHz (C)

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

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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)

3.9 WCS – Mobile/Base Frequency Blocks

§27.5(a)

The following frequencies are available for WCS in the 2305-2320 MHz and 2345-2360 MHz bands:

BLOCK 1: 2305-2310 and 2350-2355 MHz (A)

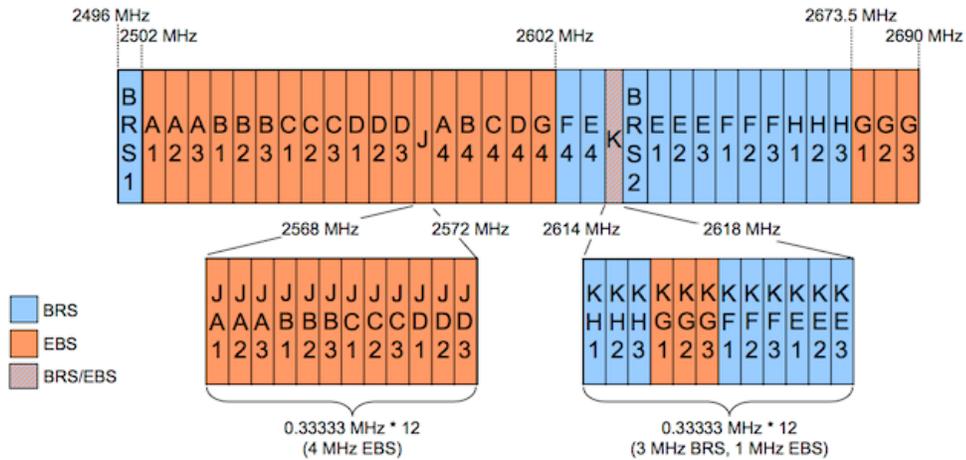
BLOCK 2: 2310-2315 and 2355-236 MHz (B)

BLOCK 3: 2315-2320 MHz (C)

BLOCK 4: 2345-2350 MHz (D)

3.10 BRS/EBS Frequency Block

§27.5



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3.11 Radiated Power and Radiated Spurious Emissions

§2.1053 §22.913(a.2) §22.917(a) §24.232(c) §24.238(a) §27.50(b.10) §27.50(c.10) §27.50(d.4) §27.53(a.4) §27.53(f) §27.53(g) §27.53(h)

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

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

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

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

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 $43 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$. For Band 7, the calculated P_d levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of $55 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$. For Band 30, the calculated P_d levels are compared to the absolute spurious emission limit of -40dBm which is equivalent to the required minimum attenuation of $70 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$.

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4.0 MEASUREMENT UNCERTAINTY

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

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

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5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/11/2016	Annual	7/11/2017	RE1
Agilent	E5515C	Wireless Communications Test Set	1/29/2016	Biennial	1/29/2018	GB46310798
Agilent	N9038A	MXE EMI Receiver	4/21/2016	Annual	4/21/2017	MY51210133
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	7/20/2016	Annual	7/20/2017	MY49432391
Agilent	N9030A	PXA Signal Analyzer (44GHz)	3/1/2016	Annual	3/1/2017	MY52350166
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	7/30/2015	Biennial	7/30/2017	121034
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/26/2016	Biennial	4/26/2018	125518
PCTEST	-	EMC Switch System	7/11/2016	Annual	7/11/2017	NM1
PCTEST	-	EMC Switch System	7/6/2016	Annual	7/6/2017	NM2
Rhode & Schwarz	TS-PR18	Pre-Amplifier	7/6/2016	Annual	7/6/2017	101622
Rohde & Schwarz	CMU200	Base Station Simulator	3/29/2016	Annual	3/29/2017	836371/0079
Rohde & Schwarz	CMW500	Radio Communication Tester	10/13/2015	Annual	10/13/2016	100976
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	7/11/2016	Annual	7/11/2017	100071
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/16/2016	Annual	5/16/2017	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/15/2016	Annual	7/15/2017	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	7/27/2016	Annual	7/27/2017	103200
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	3/30/2016	Biennial	3/30/2018	9105-2404
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107

Table 5-1. Test Equipment

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6.0 SAMPLE CALCULATIONS

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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7.0 TEST RESULTS

7.1 Summary

Company Name: LG Electronics MobileComm U.S.A
 FCC ID: ZNFH918
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Result	Reference
22.913(a.2)	Effective Radiated Power (Band 5)	< 7 Watts max. ERP	RADIATED	PASS	Section 7.2
27.50(b.10) 27.50(c.10)	Effective Radiated Power (Band 12 13)	< 3 Watts max. ERP		PASS	Section 7.2
24.232(c) 27.50(h.2)	Equivalent Isotropic Radiated Power (Band 2)	< 2 Watts max. EIRP		PASS	Section 7.2
27.50(d.4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP		PASS	Section 7.2
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions	> 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 7.3
27.53(f)	Undesirable Emissions (Band 13)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 – 1610 MHz		PASS	Section 7.3
27.53(m)	Undesirable Emissions	> 43 + 10log ₁₀ (P[Watts]) at channel edges > 55 + 10log ₁₀ (P[Watts]) at 5.5MHz away and beyond channel edges		PASS	Section 7.3

Table 7-1. Summary of Test Results

Notes:

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

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7.2 Radiated Power (ERP/EIRP)

§22.913(a.2) §24.232(c.2) §27.50(h.2) §27.50(b.10) §27.50(c.10) §27.50(d.4) §27.50(a.3)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.2.1

ANSI/TIA-603-D-2010 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW \geq 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points \geq 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

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Test Setup

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

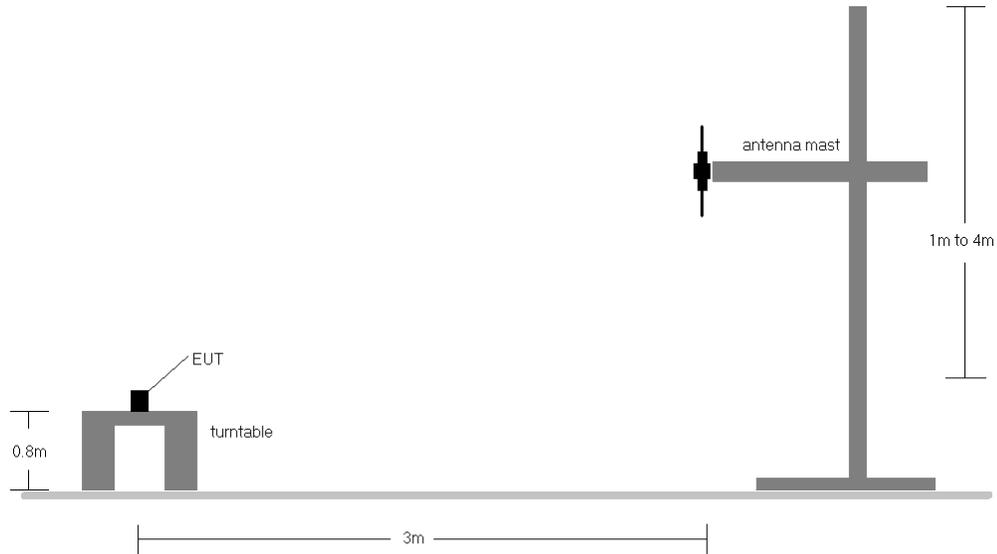


Figure 7-1. Radiated Test Setup <1GHz

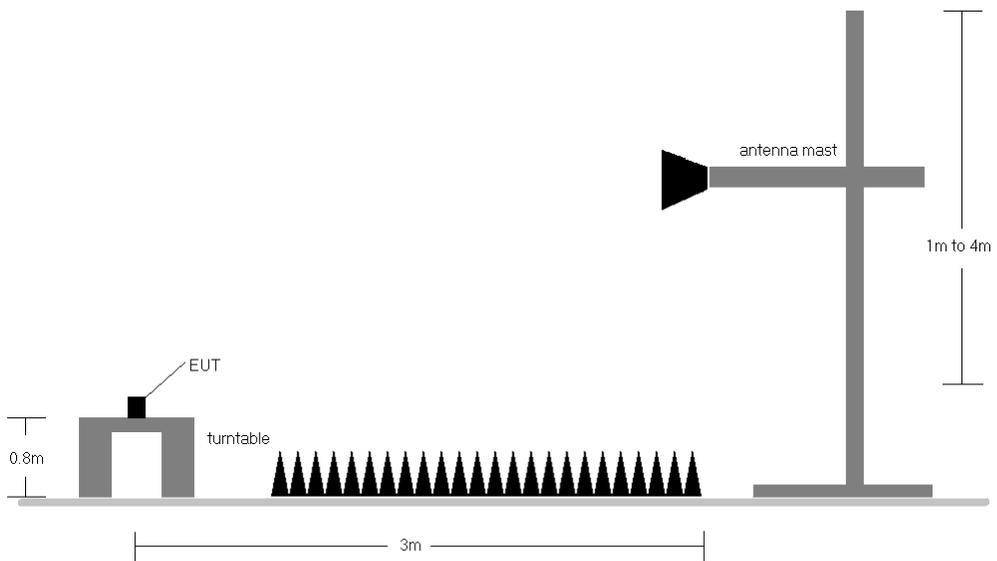


Figure 7-2. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

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7.2.1 Antenna-1 Radiated Power (ERP/EIRP)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	271	194	1 / 0	17.50	2.31	19.81	34.77	-14.96
707.50	1.4	QPSK	H	271	194	3 / 2	17.40	2.31	19.71	34.77	-15.06
715.30	1.4	QPSK	H	271	19	1 / 0	16.39	2.52	18.91	34.77	-15.86
699.70	1.4	16-QAM	H	271	194	1 / 5	16.64	2.31	18.95	34.77	-15.82
707.50	1.4	16-QAM	H	271	194	1 / 0	16.44	2.31	18.75	34.77	-16.02
715.30	1.4	16-QAM	H	271	19	1 / 0	15.36	2.52	17.88	34.77	-16.89
700.50	3	QPSK	H	270	190	1 / 14	17.48	2.12	19.60	34.77	-15.17
707.50	3	QPSK	H	270	190	1 / 0	17.37	2.31	19.68	34.77	-15.09
714.50	3	QPSK	H	270	190	1 / 0	16.72	2.50	19.22	34.77	-15.55
700.50	3	16-QAM	H	270	190	1 / 14	16.57	2.12	18.69	34.77	-16.08
707.50	3	16-QAM	H	270	190	1 / 0	16.47	2.31	18.78	34.77	-15.99
714.50	3	16-QAM	H	270	190	1 / 0	15.81	2.50	18.31	34.77	-16.46
701.50	5	QPSK	H	261	189	1 / 0	17.55	2.15	19.70	34.77	-15.07
707.50	5	QPSK	H	261	189	1 / 0	17.38	2.31	19.69	34.77	-15.08
713.50	5	QPSK	H	261	189	1 / 0	17.09	2.48	19.57	34.77	-15.21
701.50	5	16-QAM	H	261	189	1 / 0	16.56	2.15	18.71	34.77	-16.06
707.50	5	16-QAM	H	261	189	1 / 0	16.62	2.31	18.93	34.77	-15.84
713.50	5	16-QAM	H	261	189	1 / 0	16.12	2.48	18.60	34.77	-16.18
704.00	10	QPSK	H	276	189	1 / 0	17.51	2.22	19.73	34.77	-15.05
707.50	10	QPSK	H	276	189	1 / 0	17.31	2.31	19.62	34.77	-15.15
711.00	10	QPSK	H	276	189	1 / 0	17.17	2.41	19.58	34.77	-15.19
704.00	10	16-QAM	H	276	189	1 / 0	16.56	2.22	18.78	34.77	-16.00
707.50	10	16-QAM	H	276	189	1 / 0	16.34	2.31	18.65	34.77	-16.12
711.00	10	16-QAM	H	276	189	1 / 0	16.25	2.41	18.66	34.77	-16.11
699.70	1.4	QPSK	V	152	182	1 / 5	18.37	2.31	20.68	34.77	-14.09

Table 7-2. ERP Data (Band 12)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	237	287	1 / 24	16.93	4.19	21.12	34.77	-13.65
782.00	5	QPSK	H	240	297	1 / 24	17.23	4.25	21.48	34.77	-13.29
784.50	5	QPSK	H	236	290	1 / 24	17.02	4.32	21.34	34.77	-13.43
779.50	5	16QAM	H	237	287	1 / 0	15.54	4.19	19.73	34.77	-15.04
782.00	5	16QAM	H	240	297	1 / 24	16.01	4.25	20.26	34.77	-14.51
784.50	5	16QAM	H	236	290	1 / 0	15.85	4.32	20.17	34.77	-14.60
782.00	10	QPSK	H	238	295	1 / 49	17.01	4.25	21.26	34.77	-13.51
782.00	10	16QAM	H	238	295	1 / 49	15.64	4.25	19.89	34.77	-14.88
782.00	5	QPSK	V	137	213	1 / 0	15.03	4.25	19.28	34.77	-15.49

Table 7-3. ERP Data (Band 13)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	210	223	1 / 0	13.72	5.01	18.73	38.45	-19.72
836.50	1.4	QPSK	H	210	223	3 / 2	13.99	5.16	19.15	38.45	-19.30
848.30	1.4	QPSK	H	210	223	1 / 0	14.09	5.30	19.39	38.45	-19.06
824.70	1.4	16-QAM	H	210	223	1 / 5	13.31	5.01	18.32	38.45	-20.13
836.50	1.4	16-QAM	H	210	223	1 / 0	12.95	5.16	18.11	38.45	-20.34
848.30	1.4	16-QAM	H	210	223	1 / 0	12.97	5.30	18.27	38.45	-20.18
825.50	3	QPSK	H	214	209	1 / 0	13.41	5.02	18.43	38.45	-20.02
836.50	3	QPSK	H	214	209	1 / 14	13.71	5.16	18.87	38.45	-19.58
847.50	3	QPSK	H	214	209	1 / 0	12.96	5.29	18.25	38.45	-20.20
825.50	3	16-QAM	H	214	209	1 / 14	11.83	5.02	16.85	38.45	-21.60
836.50	3	16-QAM	H	214	209	1 / 0	13.14	5.16	18.30	38.45	-20.15
847.50	3	16-QAM	H	214	209	1 / 0	11.89	5.29	17.19	38.45	-21.27
826.50	5	QPSK	H	206	216	1 / 0	13.87	5.03	18.90	38.45	-19.55
836.50	5	QPSK	H	206	216	1 / 24	13.00	5.16	18.15	38.45	-20.30
846.50	5	QPSK	H	206	216	1 / 0	13.09	5.28	18.37	38.45	-20.08
826.50	5	16-QAM	H	206	216	1 / 0	12.27	5.03	17.31	38.45	-21.14
836.50	5	16-QAM	H	206	216	1 / 24	12.16	5.16	17.32	38.45	-21.13
846.50	5	16-QAM	H	206	216	1 / 0	11.74	5.28	17.02	38.45	-21.43
829.00	10	QPSK	H	359	127	1 / 49	12.95	5.06	18.01	38.45	-20.44
836.50	10	QPSK	H	195	127	1 / 49	12.92	5.16	18.08	38.45	-20.37
844.00	10	QPSK	H	195	124	1 / 49	12.28	5.25	17.53	38.45	-20.92
829.00	10	16-QAM	H	359	127	1 / 0	13.38	5.06	18.44	38.45	-20.01
836.50	10	16-QAM	H	195	127	1 / 49	11.90	5.16	17.06	38.45	-21.39
844.00	10	16-QAM	H	195	124	1 / 49	11.24	5.25	16.49	38.45	-21.96
848.30	1.4	QPSK	V	131	165	1 / 0	11.47	5.30	16.77	38.45	-21.68

Table 7-4. ERP Data (Band 5)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	117	134	1 / 5	15.81	9.66	25.47	30.00	-4.53
1732.50	1.4	QPSK	H	117	138	1 / 5	15.00	9.61	24.61	30.00	-5.39
1754.30	1.4	QPSK	H	112	287	1 / 0	15.02	9.57	24.59	30.00	-5.41
1710.70	1.4	16-QAM	H	117	134	1 / 5	14.92	9.66	24.57	30.00	-5.43
1732.50	1.4	16-QAM	H	117	138	1 / 0	14.13	9.61	23.74	30.00	-6.26
1754.30	1.4	16-QAM	H	112	287	1 / 0	14.35	9.57	23.93	30.00	-6.07
1711.50	3	QPSK	H	108	354	1 / 0	16.20	9.65	25.86	30.00	-4.14
1732.50	3	QPSK	H	110	360	1 / 0	15.02	9.61	24.64	30.00	-5.36
1753.50	3	QPSK	H	115	288	1 / 0	14.71	9.57	24.29	30.00	-5.71
1711.50	3	16-QAM	H	108	354	1 / 14	15.29	9.65	24.94	30.00	-5.06
1732.50	3	16-QAM	H	110	360	1 / 14	13.76	9.61	23.38	30.00	-6.62
1753.50	3	16-QAM	H	115	288	1 / 14	14.07	9.57	23.65	30.00	-6.35
1711.50	3	QPSK	V	112	183	1 / 0	14.11	9.65	23.76	30.00	-6.24

Table 7-5. EIRP Data (Band 4)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1712.50	5	QPSK	H	116	134	1 / 0	15.62	9.65	25.28	30.00	-4.72
1732.50	5	QPSK	H	117	138	1 / 0	15.62	9.61	25.23	30.00	-4.77
1752.50	5	QPSK	H	109	289	1 / 0	14.35	9.57	23.92	30.00	-6.08
1712.50	5	16-QAM	H	116	134	1 / 0	15.15	9.65	24.80	30.00	-5.20
1732.50	5	16-QAM	H	117	138	1 / 0	14.89	9.61	24.50	30.00	-5.50
1752.50	5	16-QAM	H	109	289	1 / 24	14.35	9.57	23.92	30.00	-6.08
1715.00	10	QPSK	H	118	360	1 / 0	15.30	9.65	24.95	30.00	-5.05
1732.50	10	QPSK	H	164	13	1 / 49	15.25	9.61	24.86	30.00	-5.14
1750.00	10	QPSK	H	163	360	1 / 0	15.09	9.58	24.67	30.00	-5.33
1715.00	10	16-QAM	H	118	360	1 / 49	15.42	9.65	25.07	30.00	-4.93
1732.50	10	16-QAM	H	164	13	1 / 49	14.08	9.61	23.70	30.00	-6.30
1750.00	10	16-QAM	H	163	360	1 / 49	14.53	9.58	24.11	30.00	-5.89
1717.50	15	QPSK	H	119	197	1 / 74	15.40	9.64	25.05	30.00	-4.95
1732.50	15	QPSK	H	120	196	1 / 0	15.19	9.61	24.81	30.00	-5.19
1747.50	15	QPSK	H	173	193	1 / 74	15.26	9.58	24.84	30.00	-5.16
1717.50	15	16-QAM	H	119	197	1 / 74	14.55	9.64	24.19	30.00	-5.81
1732.50	15	16-QAM	H	120	196	1 / 0	13.65	9.61	23.27	30.00	-6.73
1747.50	15	16-QAM	H	173	193	1 / 74	14.74	9.58	24.32	30.00	-5.68
1720.00	20	QPSK	H	118	9	1 / 0	15.39	9.64	25.03	30.00	-4.97
1732.50	20	QPSK	H	168	360	1 / 0	15.07	9.61	24.68	30.00	-5.32
1745.00	20	QPSK	H	100	357	1 / 99	15.28	9.59	24.87	30.00	-5.13
1720.00	20	16-QAM	H	118	9	1 / 0	14.66	9.64	24.30	30.00	-5.70
1732.50	20	16-QAM	H	168	360	1 / 0	14.28	9.61	23.90	30.00	-6.10
1745.00	20	16-QAM	H	100	357	1 / 99	14.49	9.59	24.08	30.00	-5.92

Table 7-6. EIRP Data (Band 4/66)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	110	93	1 / 5	13.77	9.35	23.12	33.01	-9.89
1880.00	1.4	QPSK	H	110	93	3 / 2	14.83	9.27	24.10	33.01	-8.91
1909.30	1.4	QPSK	H	110	94	1 / 5	14.17	9.25	23.42	33.01	-9.59
1850.70	1.4	16-QAM	H	110	93	1 / 5	12.86	9.35	22.21	33.01	-10.80
1880.00	1.4	16-QAM	H	110	93	1 / 0	13.74	9.27	23.01	33.01	-10.00
1909.30	1.4	16-QAM	H	110	94	1 / 5	13.31	9.25	22.56	33.01	-10.45
1851.50	3	QPSK	H	110	84	1 / 14	13.91	9.35	23.26	33.01	-9.75
1880.00	3	QPSK	H	110	80	1 / 0	14.80	9.27	24.07	33.01	-8.94
1908.50	3	QPSK	H	110	51	1 / 0	14.11	9.25	23.36	33.01	-9.65
1851.50	3	16-QAM	H	110	84	1 / 14	13.05	9.35	22.40	33.01	-10.61
1880.00	3	16-QAM	H	110	80	1 / 0	13.82	9.27	23.09	33.01	-9.92
1908.50	3	16-QAM	H	110	51	1 / 14	13.23	9.25	22.48	33.01	-10.53
1852.50	5	QPSK	H	110	90	1 / 24	14.17	9.34	23.51	33.01	-9.50
1880.00	5	QPSK	H	110	93	1 / 0	14.88	9.27	24.15	33.01	-8.86
1907.50	5	QPSK	H	110	89	1 / 0	14.22	9.24	23.46	33.01	-9.55
1852.50	5	16-QAM	H	110	90	1 / 24	13.28	9.34	22.62	33.01	-10.39
1880.00	5	16-QAM	H	110	93	1 / 0	14.10	9.27	23.37	33.01	-9.64
1907.50	5	16-QAM	H	110	89	1 / 0	13.38	9.24	22.62	33.01	-10.39
1855.00	10	QPSK	H	110	58	1 / 0	12.26	9.34	21.60	33.01	-11.41
1880.00	10	QPSK	H	110	54	1 / 0	13.18	9.27	22.45	33.01	-10.56
1905.00	10	QPSK	H	110	50	1 / 49	12.94	9.24	22.18	33.01	-10.83
1855.00	10	16-QAM	H	110	58	1 / 0	11.31	9.34	20.65	33.01	-12.36
1880.00	10	16-QAM	H	110	54	1 / 0	12.21	9.27	21.48	33.01	-11.53
1905.00	10	16-QAM	H	110	50	1 / 49	11.95	9.24	21.19	33.01	-11.82
1857.50	15	QPSK	H	110	194	1 / 0	12.99	9.33	22.32	33.01	-10.69
1880.00	15	QPSK	H	110	198	1 / 0	13.32	9.27	22.59	33.01	-10.42
1902.50	15	QPSK	H	110	190	1 / 0	13.03	9.23	22.26	33.01	-10.75
1857.50	15	16-QAM	H	110	194	1 / 0	11.85	9.33	21.18	33.01	-11.83
1880.00	15	16-QAM	H	110	198	1 / 0	12.49	9.27	21.76	33.01	-11.25
1902.50	15	16-QAM	H	110	190	1 / 0	11.93	9.23	21.16	33.01	-11.85
1860.00	20	QPSK	H	110	198	1 / 99	13.11	9.32	22.43	33.01	-10.58
1880.00	20	QPSK	H	110	199	1 / 0	13.47	9.27	22.74	33.01	-10.27
1900.00	20	QPSK	H	145	195	1 / 0	13.56	9.22	22.78	33.01	-10.23
1860.00	20	16-QAM	H	110	198	1 / 99	12.30	9.32	21.62	33.01	-11.39
1880.00	20	16-QAM	H	110	199	1 / 0	12.55	9.27	21.82	33.01	-11.19
1900.00	20	16-QAM	H	145	195	1 / 0	12.68	9.22	21.90	33.01	-11.11
1880.00	5	QPSK	V	110	255	1 / 0	12.74	9.27	22.01	33.01	-11.00

Table 7-7. EIRP Data (Band 2)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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7.2.2 Antenna-2 Radiated Power (ERP/EIRP)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	135	264	1 / 5	8.04	2.31	10.35	34.77	-24.42
707.50	1.4	QPSK	H	142	258	1 / 5	8.07	2.31	10.38	34.77	-24.39
715.30	1.4	QPSK	H	145	253	1 / 0	7.59	2.52	10.11	34.77	-24.66
699.70	1.4	16-QAM	H	135	264	1 / 5	6.95	2.31	9.26	34.77	-25.51
707.50	1.4	16-QAM	H	142	258	1 / 5	6.87	2.31	9.18	34.77	-25.59
715.30	1.4	16-QAM	H	145	253	1 / 0	6.58	2.52	9.10	34.77	-25.67
700.50	3	QPSK	H	134	259	1 / 14	8.64	2.12	10.76	34.77	-24.01
707.50	3	QPSK	H	139	260	1 / 14	8.43	2.31	10.74	34.77	-24.03
714.50	3	QPSK	H	145	253	1 / 0	8.08	2.50	10.58	34.77	-24.19
700.50	3	16-QAM	H	134	259	1 / 14	7.56	2.12	9.68	34.77	-25.09
707.50	3	16-QAM	H	139	260	1 / 14	7.51	2.31	9.82	34.77	-24.95
714.50	3	16-QAM	H	145	253	1 / 0	7.19	2.50	9.69	34.77	-25.08
701.50	5	QPSK	H	135	257	1 / 0	9.41	2.15	11.56	34.77	-23.21
707.50	5	QPSK	H	140	268	1 / 24	9.71	2.31	12.02	34.77	-22.75
713.50	5	QPSK	H	140	241	1 / 0	9.25	2.48	11.73	34.77	-23.05
701.50	5	16-QAM	H	135	257	1 / 0	8.59	2.15	10.74	34.77	-24.03
707.50	5	16-QAM	H	140	268	1 / 24	8.59	2.31	10.90	34.77	-23.87
713.50	5	16-QAM	H	140	241	1 / 0	8.12	2.48	10.60	34.77	-24.18
704.00	10	QPSK	H	132	265	1 / 0	9.69	2.22	11.91	34.77	-22.87
707.50	10	QPSK	H	140	260	1 / 0	9.90	2.31	12.21	34.77	-22.56
711.00	10	QPSK	H	138	252	1 / 0	9.96	2.41	12.37	34.77	-22.40
704.00	10	16-QAM	H	132	265	1 / 0	8.33	2.22	10.55	34.77	-24.23
707.50	10	16-QAM	H	140	260	1 / 0	8.62	2.31	10.93	34.77	-23.84
711.00	10	16-QAM	H	138	252	1 / 0	8.70	2.41	11.11	34.77	-23.66
711.00	10	QPSK	V	145	135	1 / 0	9.32	2.41	11.73	34.77	-23.04

Table 7-8. ERP Data (Band 12)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	248	254	1 / 0	7.69	4.19	11.88	34.77	-22.89
782.00	5	QPSK	H	242	257	1 / 24	7.09	4.25	11.34	34.77	-23.43
784.50	5	QPSK	H	232	258	1 / 0	7.16	4.32	11.48	34.77	-23.29
779.50	5	16QAM	H	248	254	1 / 0	6.50	4.19	10.69	34.77	-24.08
782.00	5	16QAM	H	242	257	1 / 0	5.72	4.25	9.97	34.77	-24.80
784.50	5	16QAM	H	232	258	1 / 0	6.00	4.32	10.32	34.77	-24.45
782.00	10	QPSK	H	256	205	1 / 0	7.59	4.25	11.84	34.77	-22.93
782.00	10	16QAM	H	256	205	1 / 0	5.88	4.25	10.13	34.77	-24.64
779.50	5	QPSK	V	124	270	1 / 0	7.24	4.19	11.43	34.77	-23.34

Table 7-9. ERP Data (Band 13)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	218	74	1 / 5	8.25	5.01	13.26	38.45	-25.19
836.50	1.4	QPSK	H	216	80	1 / 0	8.93	5.16	14.09	38.45	-24.36
848.30	1.4	QPSK	H	194	79	1 / 5	8.01	5.30	13.31	38.45	-25.14
824.70	1.4	16-QAM	H	218	74	1 / 5	7.37	5.01	12.38	38.45	-26.07
836.50	1.4	16-QAM	H	216	80	1 / 5	7.86	5.16	13.02	38.45	-25.43
848.30	1.4	16-QAM	H	194	79	1 / 0	6.82	5.30	12.12	38.45	-26.33
825.50	3	QPSK	H	222	70	1 / 14	8.73	5.02	13.75	38.45	-24.70
836.50	3	QPSK	H	206	78	1 / 14	9.33	5.16	14.49	38.45	-23.96
847.50	3	QPSK	H	200	75	1 / 0	9.11	5.29	14.40	38.45	-24.05
825.50	3	16-QAM	H	222	70	1 / 14	7.76	5.02	12.78	38.45	-25.67
836.50	3	16-QAM	H	206	78	1 / 14	8.32	5.16	13.48	38.45	-24.97
847.50	3	16-QAM	H	200	75	1 / 0	8.31	5.29	13.60	38.45	-24.85
826.50	5	QPSK	H	221	72	1 / 24	8.89	5.03	13.92	38.45	-24.53
836.50	5	QPSK	H	225	67	1 / 0	8.86	5.16	14.02	38.45	-24.43
846.50	5	QPSK	H	201	83	1 / 24	7.98	5.28	13.26	38.45	-25.19
826.50	5	16-QAM	H	221	72	1 / 24	7.96	5.03	12.99	38.45	-25.46
836.50	5	16-QAM	H	225	67	1 / 0	7.97	5.16	13.13	38.45	-25.32
846.50	5	16-QAM	H	201	83	1 / 24	7.26	5.28	12.54	38.45	-25.91
829.00	10	QPSK	H	216	75	1 / 49	8.80	5.06	13.86	38.45	-24.59
836.50	10	QPSK	H	224	75	1 / 0	9.36	5.16	14.52	38.45	-23.93
844.00	10	QPSK	H	200	78	1 / 49	9.25	5.25	14.50	38.45	-23.95
829.00	10	16-QAM	H	216	75	1 / 0	8.45	5.06	13.51	38.45	-24.94
836.50	10	16-QAM	H	224	75	1 / 49	7.71	5.16	12.87	38.45	-25.58
844.00	10	16-QAM	H	200	78	1 / 49	8.10	5.25	13.35	38.45	-25.10
836.50	10	QPSK	V	121	77	1 / 0	7.04	5.16	12.20	38.45	-26.25

Table 7-10. ERP Data (Band 5)

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7.3 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(c) §27.53(f) §27.53(g) §27.53(h) §27.53(m) §27.53(a.4)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW \geq 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points \geq 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

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Test Setup

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

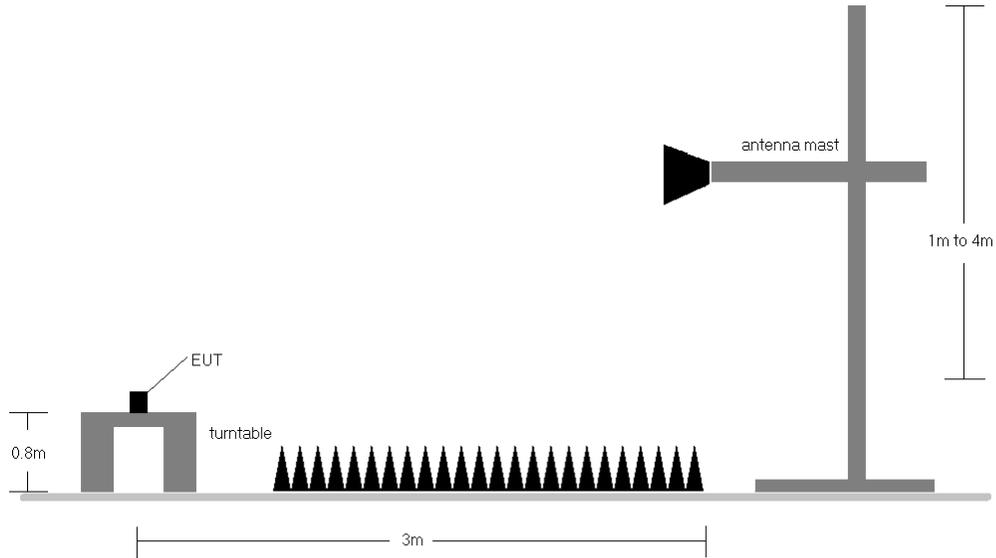


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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7.3.1 Antenna-1 Radiated Spurious Emissions Measurements

OPERATING FREQUENCY: 699.70 MHz
 CHANNEL: 23017
 MEASURED OUTPUT POWER: 19.81 dBm = 0.096 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 32.81 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1399.40	H	-	-	-62.69	5.57	-57.12	76.9
2099.10	H	162	212	-52.11	6.65	-45.46	65.3

Table 7-11. Radiated Spurious Data (Band 12 – Low Channel)

OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 MEASURED OUTPUT POWER: 19.71 dBm = 0.094 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 32.71 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	-	-	-63.75	5.69	-58.06	77.8
2122.50	H	129	273	-51.18	6.75	-44.43	64.1

Table 7-12. Radiated Spurious Data (Band 12 – Mid Channel)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 715.30 MHz
 CHANNEL: 23173
 MEASURED OUTPUT POWER: 18.91 dBm = 0.078 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 31.91 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1430.60	H	-	-	-62.64	5.82	-56.83	75.7
2145.90	H	122	215	-53.21	6.84	-46.37	65.3

Table 7-13. Radiated Spurious Data (Band 12 – High Channel)

OPERATING FREQUENCY: 779.50 MHz
 CHANNEL: 23205
 MEASURED OUTPUT POWER: 21.12 dBm = 0.129 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.12 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2338.50	H	112	261	-71.98	7.35	-64.63	85.8
3118.00	H	-	-	-72.46	7.19	-65.27	86.4

Table 7-14. Radiated Spurious Data (Band 13 – Low Channel)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 MEASURED OUTPUT POWER: 21.48 dBm = 0.141 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.48 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2346.00	H	-	-	-61.36	7.33	-54.03	75.5
3128.00	H	-	-	-59.27	7.20	-52.07	73.6

Table 7-15. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY: 784.50 MHz
 CHANNEL: 23255
 MEASURED OUTPUT POWER: 21.34 dBm = 0.136 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.34 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2353.50	H	122	9	-71.82	7.30	-64.51	85.8
3138.00	H	-	-	-70.61	7.21	-63.40	84.7

Table 7-16. Radiated Spurious Data (Band 13 – High Channel)

MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	H	120	182	-76.48	6.55	-69.93	-29.9
1564.00	H	-	-	-66.16	6.57	-59.59	-19.6
1569.00	H	114	10	-76.74	6.59	-70.16	-30.2

Table 7-17. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY: 824.70 MHz
 CHANNEL: 20407
 MEASURED OUTPUT POWER: 18.73 dBm = 0.075 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 31.73 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1649.40	H	-	-	-63.28	6.70	-56.58	75.3
2474.10	H	196	102	-59.07	7.52	-51.55	70.3

Table 7-18. Radiated Spurious Data (Band 5 – Low Channel)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 20525
 MEASURED OUTPUT POWER: 19.15 dBm = 0.082 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 32.15 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	110	200	-61.46	6.70	-54.76	73.9
2509.50	H	117	80	-54.19	7.63	-46.57	65.7

Table 7-19. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY: 848.30 MHz
 CHANNEL: 20643
 MEASURED OUTPUT POWER: 19.39 dBm = 0.087 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 32.39 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1696.60	H	109	207	-59.51	6.70	-52.81	72.2
2544.90	H	110	274	-59.69	7.60	-52.09	71.5

Table 7-20. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 1717.50 MHz
 CHANNEL: 20025
 MEASURED OUTPUT POWER: 25.05 dBm = 0.320 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 38.05 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3435.00	H	-	-	-57.70	9.88	-47.83	72.9
5152.50	H	-	-	-51.13	10.75	-40.38	65.4

Table 7-21. Radiated Spurious Data (Band 4/66 – Low Channel)

OPERATING FREQUENCY: 1732.50 MHz
 CHANNEL: 20175
 MEASURED OUTPUT POWER: 24.81 dBm = 0.303 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 37.81 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3465.00	H	116	314	-52.02	9.91	-42.11	66.9
5197.50	H	145	111	-44.46	10.75	-33.71	58.5

Table 7-22. Radiated Spurious Data (Band 4/66 – Mid Channel)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 1747.50 MHz
 CHANNEL: 20325
 MEASURED OUTPUT POWER: 24.84 dBm = 0.305 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 37.84 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3495.00	H	113	316	-53.25	9.94	-43.31	68.1
5242.50	H	181	118	-51.44	10.72	-40.72	65.6

Table 7-23. Radiated Spurious Data (Band 4/66 – High Channel)

OPERATING FREQUENCY: 1852.50 MHz
 CHANNEL: 18625
 MEASURED OUTPUT POWER: 23.51 dBm = 0.225 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 36.51 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3705.00	H	198	62	-52.84	9.52	-43.32	66.8
5557.50	H	112	137	-52.52	11.03	-41.49	65.0

Table 7-24. Radiated Spurious Data (Band 2 – Low Channel)

OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 18900
 MEASURED OUTPUT POWER: 24.15 dBm = 0.260 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 37.15 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	H	115	7	-52.76	9.39	-43.38	67.5
5640.00	H	123	127	-53.44	11.22	-42.22	66.4

Table 7-25. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY: 1907.50 MHz
 CHANNEL: 19175
 MEASURED OUTPUT POWER: 23.46 dBm = 0.222 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 36.46 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3815.00	H	197	77	-52.24	9.32	-42.92	66.4
5722.50	H	110	149	-55.64	11.35	-44.29	67.8

Table 7-26. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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7.3.2 Antenna-2 Radiated Spurious Emissions Measurements

OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 MEASURED OUTPUT POWER: 12.21 dBm = 0.017 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 25.21 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	-	-	-64.18	5.69	-58.49	70.7
2122.50	H	-	-	-63.57	6.75	-56.82	69.0

Table 7-27. Radiated Spurious Data (Band 12 – Mid Channel)

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 18900
 MEASURED OUTPUT POWER: 11.34 dBm = 0.014 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 24.34 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2346.00	H	-	-	-63.19	7.33	-55.86	67.2
3128.00	H	-	-	-60.06	7.20	-52.86	64.2

Table 7-28. Radiated Spurious Data (Band 13 – Mid Channel)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	-	-	-65.75	6.57	-59.18	-19.2

Table 7-29. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 26365
 MEASURED OUTPUT POWER: 14.52 dBm = 0.028 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 27.52 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	-	-	-66.14	6.70	-59.44	74.0
2509.50	H	-	-	-63.38	7.63	-55.76	70.3

Table 7-30. Radiated Spurious Data (Band 5 – Mid Channel)

FCC ID: ZNFH918		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFH918** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

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