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

MEASUREMENT REPORT
FCC Part 22, 24, & 27 LTE

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

Date of Testing:
6/9-6/20/2014
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1406091174.ZNF

FCC ID : **ZNFLS885**

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-C-2004, KDB 971168 v02r01
EUT Type: Portable Handset
Model(s): LS885, LG-LS885, LS885
Test Device Serial No.: *identical prototype* [S/N: 9JUNE-6]
Class II Permissive Change: Please see FCC change document
Original Grant Date: 6/9/2014

Mode	Tx Frequency (MHz)	Modulation	ERP/EIRP	
			Max. Power (W)	Max. Power (dBm)
LTE Band 26	824.7 - 848.3	QPSK	0.044	16.40
LTE Band 26	824.7 - 848.3	16QAM	0.034	15.35
LTE Band 26	825.5 - 847.5	QPSK	0.045	16.49
LTE Band 26	825.5 - 847.5	16QAM	0.034	15.32
LTE Band 26	826.5 - 846.5	QPSK	0.046	16.64
LTE Band 26	826.5 - 846.5	16QAM	0.035	15.45
LTE Band 26	829 - 844	QPSK	0.047	16.69
LTE Band 26	829 - 844	16QAM	0.035	15.46
LTE Band 25	1851.5 - 1913.5	QPSK	0.064	18.03
LTE Band 25	1851.5 - 1913.5	16QAM	0.048	16.79
LTE Band 25	1852.5 - 1912.5	QPSK	0.083	19.19
LTE Band 25	1852.5 - 1912.5	16QAM	0.061	17.88
LTE Band 25	1855 - 1910	QPSK	0.091	19.57
LTE Band 25	1855 - 1910	16QAM	0.068	18.32
LTE Band 41	2501 - 2685	QPSK	0.191	22.82
LTE Band 41	2501 - 2685	16QAM	0.152	21.83
LTE Band 41	2503.5 - 2682.5	QPSK	0.216	23.34
LTE Band 41	2503.5 - 2682.5	16QAM	0.209	23.21
LTE Band 41	2506 - 2680	QPSK	0.231	23.63
LTE Band 41	2506 - 2680	16QAM	0.189	22.76

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

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

Randy Ortanez
President

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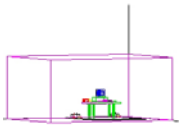
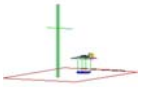


MEASUREMENT REPORT
FCC Part 22, 24, & 27



§2.1033 General Information

APPLICANT:	LG Electronics 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:	LS885
FCC ID:	ZNFLS885
FCC CLASSIFICATION:	PCS Licensed Transmitter Held to Ear (PCE)
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)
Test Device Serial No.:	9JUNE-6 ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	6/9-6/20/2014
TEST REPORT S/N:	0Y1406091174.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.

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. (S*ee Figure 1-1*).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on February 15, 2012.

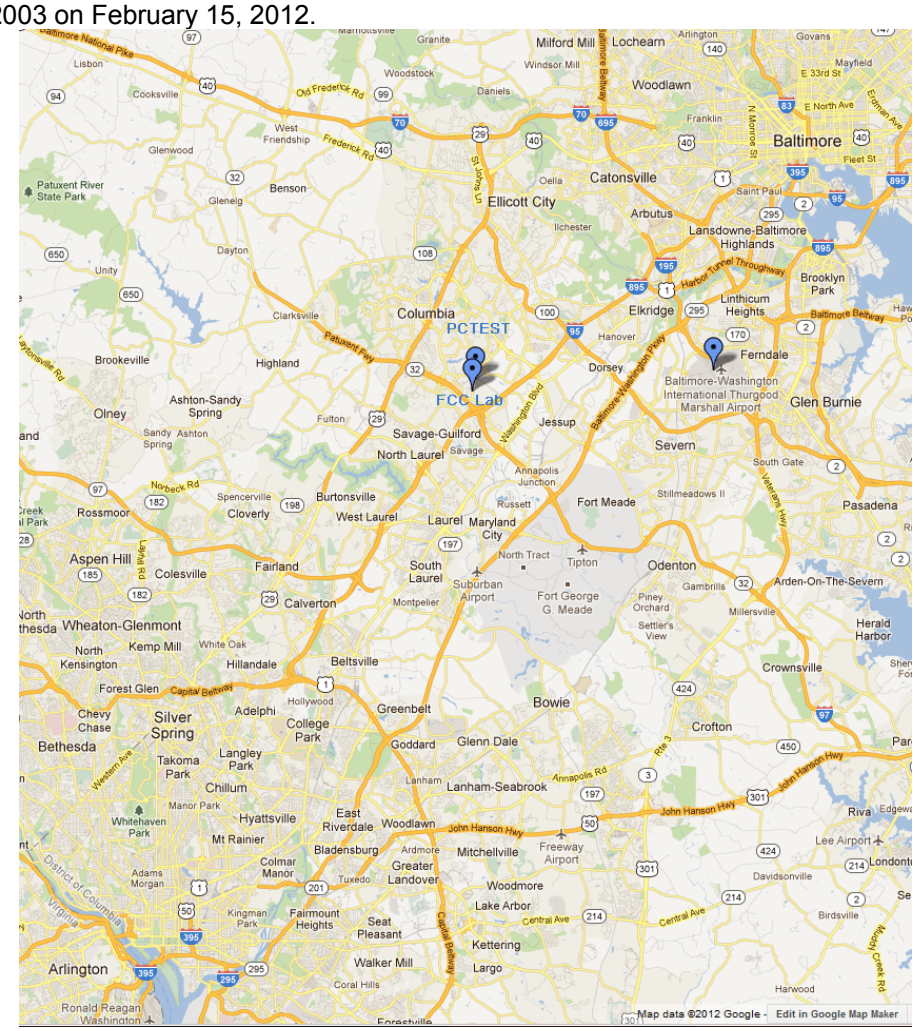


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFLS885**. 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 CDMA (BC0, BC1, BC10), Multi-band LTE, 802.11a/b/g/n WLAN, 802.11a/n UNII, Bluetooth (1x, EDR, LE)

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.

3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

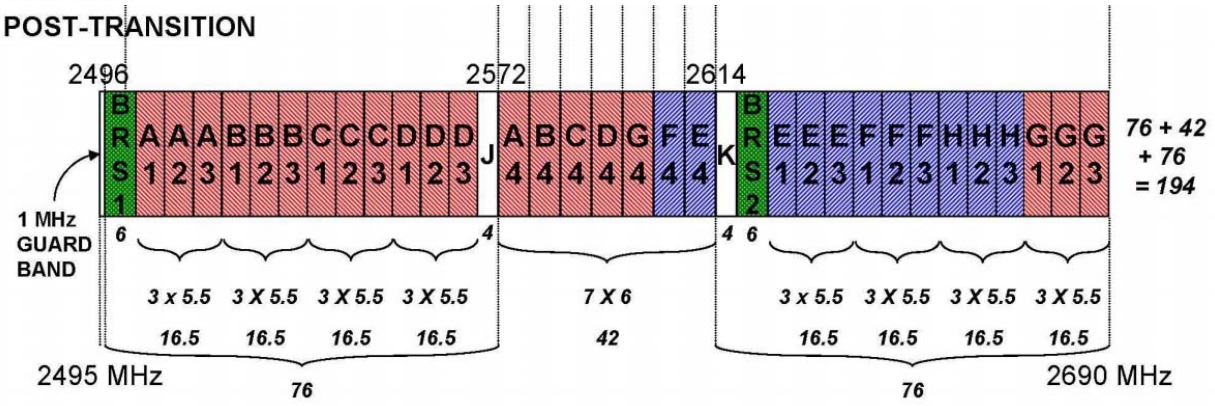
The measurement procedures described in the document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-C-2004) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" (KDB 971168) were used in the measurement of the **LG Portable Handset FCC ID: ZNFLS885.**

3.2 BRS/EBS Frequency Range

§27.5(h)(i)(1)

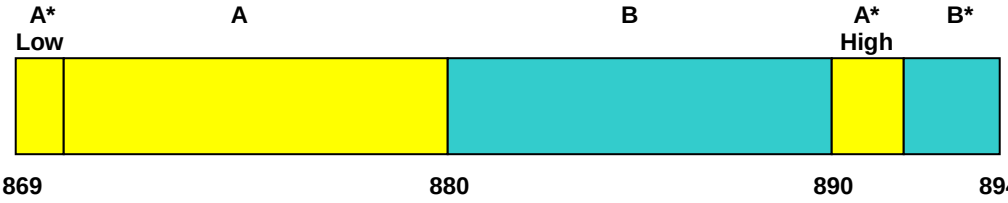
2496-2690 MHz bands. The following frequencies are available for licensing pursuant to this part in the 2496-2690 MHz band:

Lower Band Segment	Middle Band Segment	Upper Band Segment
BRS Channel 1: 2496-2502 MHz or 2150-2156 MHz	EBS Channel A4: 2572-2578 MHz	BRS Channel KH1: 2614.00000-2614.33333 MHz.
EBS Channel A1: 2502-2507.5 MHz	EBS Channel B4: 2578-2584 MHz	BRS Channel KH2: 2614.33333-2614.66666 MHz.
EBS Channel A2: 2507.5-2513 MHz	EBS Channel C4: 2584-2590 MHz	BRS Channel KH3: 2614.66666-2615.00000 MHz.
EBS Channel A3: 2513-2518.5 MHz	EBS Channel D4: 2590-2596 MHz	EBS Channel KG1: 2615.00000-2615.33333 MHz.
EBS Channel B1: 2518.5-2524 MHz	EBS Channel G4: 2596-2602 MHz	EBS Channel KG2: 2615.33333-2615.66666 MHz.
EBS Channel B2: 2524-2529.5 MHz	BRS/EBS Channel F4: 2602-2608 MHz	EBS Channel KG3: 2615.66666-2616.00000 MHz.
EBS Channel B3: 2529.5-2535 MHz	BRS/EBS Channel E4: 2608-2614 MHz	BRS Channel KF1: 2616.00000-2616.33333 MHz.
EBS Channel C1: 2535-2540.5 MHz		BRS Channel KF2: 2616.33333-2616.66666 MHz.
EBS Channel C2: 2540.5-2546 MHz		BRS Channel KF3: 2616.66666-2617.00000 MHz.
EBS Channel C3: 2546-2551.5 MHz		BRS Channel KE1: 2617.00000-2617.33333 MHz.
EBS Channel D1: 2551.5-2557 MHz		BRS Channel KE2: 2617.33333-2617.66666 MHz.
EBS Channel D2: 2557-2562.5 MHz		BRS Channel KE3: 2617.66666-2618.00000 MHz.
EBS Channel D3: 2562.5-2568 MHz		BRS Channel 2: 2618-2624 MHz or 2156-2162 MHz.
EBS Channel JA1: 2568.00000-2568.33333 MHz		BRS Channel 2A: 2618-2624 MHz or 2156-2160 MHz.
EBS Channel JA2: 2568.33333-2568.66666 MHz		BRS/EBS Channel E1: 2624-2629.5 MHz.
EBS Channel JA3: 2568.66666-2569.00000 MHz		BRS/EBS Channel E2: 2629.5-2635 MHz.
EBS Channel JB1: 2569.00000-2569.33333 MHz		BRS/EBS Channel E3: 2635-2640.5 MHz.
EBS Channel JB2: 2569.33333-2569.66666 MHz		BRS/EBS Channel F1: 2640.5-2646 MHz.
EBS Channel JB3: 2569.66666-2570.00000 MHz		BRS/EBS Channel F2: 2646-2651.5 MHz.
EBS Channel JC1: 2570.00000-2570.33333 MHz		BRS/EBS Channel F3: 2651.5-2657 MHz.
EBS Channel JC2: 2570.33333-2570.66666 MHz		BRS Channel H1: 2657-2662.5 MHz.
EBS Channel JC3: 2570.66666-2571.00000 MHz		BRS Channel H2: 2662.5-2668 MHz.
EBS Channel JD1: 2571.00000-2571.33333 MHz		BRS Channel H3: 2668-2673.5 MHz.
EBS Channel JD2: 2571.33333-2571.66666 MHz		EBS Channel G1: 2673.5-2679 MHz.
EBS Channel JD3: 2571.66666-2572.00000 MHz		EBS Channel G2: 2679-2684.5 MHz.
		EBS Channel G3: 2684.5-2690 MHz.



3.3 Cellular - Base Frequency Blocks

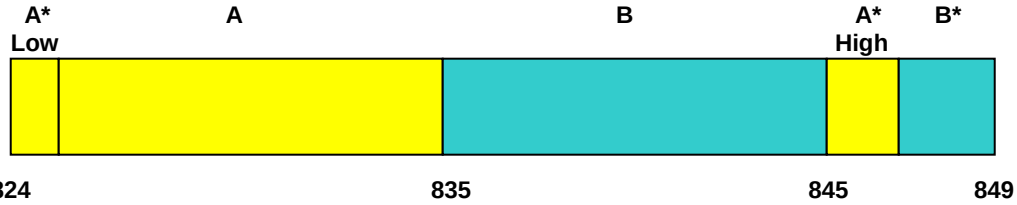
§22.905



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*)

3.4 Cellular - Mobile Frequency Blocks

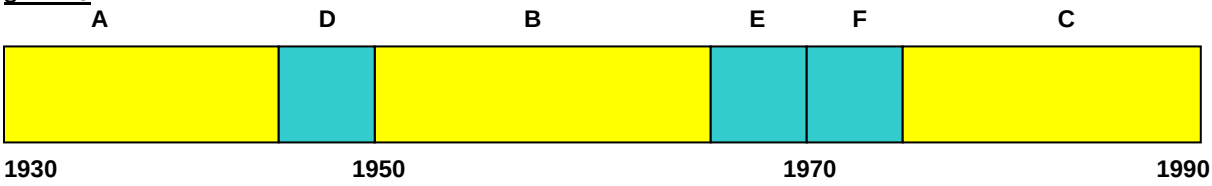
§22.905



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

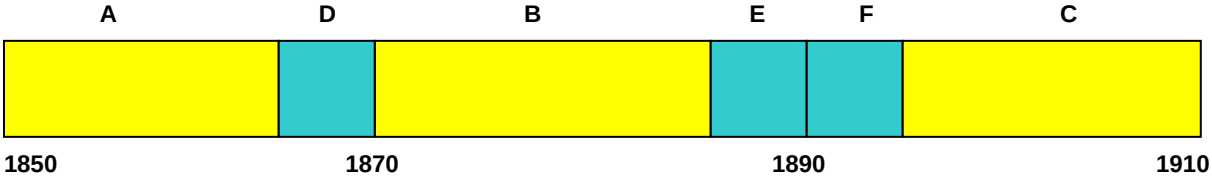
§24.229



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 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) §27.53(f) §27.53(g)

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 Clause 5, Figure 5.7 of ANSI C63.4-2009. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 78cm high PVC support structure is placed on top of the turntable. A ¾" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168.

Per the guidance of ANSI/TIA-603-C-2004, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

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

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 $P_{g\ [dBm]}$ – cable loss $_{[dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power}_{[Watts]})$. For Band 41, the calculated P_d levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of $55 + 10\log_{10}(\text{Power}_{[Watts]})$.

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)	5/29/2014	Annual	5/29/2015	N/A
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	5/11/2014	Annual	5/11/2015	3008A00985
Agilent	87405C	Pre-amplifier (0.1 - 18 GHz)	3/19/2014	Annual	3/19/2015	MY53010007
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	6/26/2013	Biennial	6/26/2015	121034
Espec	ESX-2CA	Environmental Chamber	4/16/2014	Annual	4/16/2015	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/8/2014	Biennial	4/8/2016	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2014	Biennial	3/12/2016	128337
K & L	13SH10-1000/U1000	N Type High Pass Filter	5/22/2014	Annual	5/22/2015	2
K & L	11SH10-3075/U18000	High Pass Filter	5/2/2014	Annual	5/2/2015	2
Mini-Circuits	PWR-SENS-4RMS	USB Power Sensor	4/17/2014	Annual	4/17/2015	11210140001
Mini-Circuits	TVA-11-422	RF Power Amp	N/A			QA1303002
Rhode & Schwarz	TS-PR18	Pre-Amplifier	6/12/2014	Annual	6/12/2015	101622
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/4/2013	Biennial	10/4/2015	103962
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/5/2014	Annual	3/5/2015	100071
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	5/21/2014	Annual	5/21/2015	100348
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/1/2013	Biennial	11/1/2015	91052523RX
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/28/2014	Biennial	1/28/2016	A051107
VWR	62344-734	Thermometer with Clock	2/20/2014	Biennial	2/20/2016	140140336

Table 4-1. Test Equipment

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

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 analzyer. 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).

6.0 TEST RESULTS

6.1 Summary

Company Name: LG Electronics MobileComm U.S.A
FCC ID: ZNFLS885
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 26)	< 7 Watts max. ERP	RADIATED	PASS	Section 6.2
24.232(c) 27.50(h.2)	Equivalent Isotropic Radiated Power (Band 25 41)	< 2 Watts max. EIRP		PASS	Section 6.2
2.1053 22.917(a) 24.238(a)	Undesirable Emissions	> 43 + 10log$_{10}$ (P[Watts]) for all out-of-band emissions		PASS	Section 6.3
27.53(l)	Undesirable Emissions	> 43 + 10log$_{10}$ (P[Watts]) at channel edges and > 55 + 10log$_{10}$ (P[Watts]) at 5.5MHz away and beyond channel edges		PASS	Section 6.3

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.

6.2 Radiated Power (ERP/EIRP)

§22.913(a.2) §24.232(c) §27.50(h.2)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically 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 v02r01 – Section 5.2.1

ANSI/TIA-603-C-2004 – 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. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 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". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Setup

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

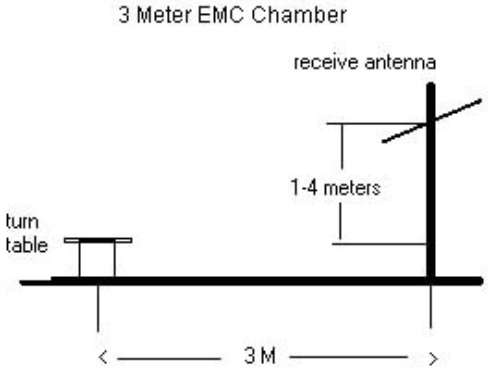


Figure 6-1. Test Instrument & Measurement Setup

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The “H” positioning is defined with the EUT lying flat on the test surface, the “H2” positioning is defined with the EUT standing up on its side, and the “V” positioning is defined with the EUT standing upright. 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.

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	Ant. Pol. [H/V]	EUT Pol.	ERP [dBm]	ERP [Watts]	Margin [dB]
824.70	1.4	QPSK	Standard	3 / 2	11.72	4.68	V	H2	16.40	0.044	-22.05
836.50	1.4	QPSK	Standard	3 / 2	10.93	4.82	V	H2	15.75	0.038	-22.70
848.30	1.4	QPSK	Standard	3 / 2	10.02	4.96	V	H2	14.98	0.031	-23.47
824.70	1.4	16-QAM	Standard	3 / 2	10.67	4.68	V	H2	15.35	0.034	-23.10
836.50	1.4	16-QAM	Standard	3 / 2	9.73	4.82	V	H2	14.55	0.029	-23.90
848.30	1.4	16-QAM	Standard	3 / 2	9.03	4.96	V	H2	13.99	0.025	-24.46
825.50	3	QPSK	Standard	1 / 14	11.81	4.68	V	H2	16.49	0.045	-21.96
836.50	3	QPSK	Standard	1 / 0	11.07	4.82	V	H2	15.89	0.039	-22.56
847.50	3	QPSK	Standard	1 / 14	9.98	4.96	V	H2	14.94	0.031	-23.51
825.50	3	16-QAM	Standard	1 / 14	10.64	4.68	V	H2	15.32	0.034	-23.13
836.50	3	16-QAM	Standard	1 / 0	9.93	4.82	V	H2	14.75	0.030	-23.70
847.50	3	16-QAM	Standard	1 / 14	8.79	4.96	V	H2	13.75	0.024	-24.70
826.50	5	QPSK	Standard	1 / 0	11.96	4.68	V	H2	16.64	0.046	-21.81
836.50	5	QPSK	Standard	1 / 0	11.23	4.82	V	H2	16.05	0.040	-22.40
846.50	5	QPSK	Standard	1 / 0	10.31	4.96	V	H2	15.27	0.034	-23.18
826.50	5	16-QAM	Standard	1 / 0	10.77	4.68	V	H2	15.45	0.035	-23.00
836.50	5	16-QAM	Standard	1 / 0	10.04	4.82	V	H2	14.86	0.031	-23.59
846.50	5	16-QAM	Standard	1 / 0	8.88	4.96	V	H2	13.84	0.024	-24.61
829.00	10	QPSK	Standard	1 / 0	12.01	4.68	V	H2	16.69	0.047	-21.76
836.50	10	QPSK	Standard	1 / 0	11.62	4.82	V	H2	16.44	0.044	-22.01
844.00	10	QPSK	Standard	1 / 0	10.75	4.96	V	H2	15.71	0.037	-22.74
829.00	10	16-QAM	Standard	1 / 0	10.78	4.68	V	H2	15.46	0.035	-22.99
836.50	10	16-QAM	Standard	1 / 0	10.45	4.82	V	H2	15.27	0.034	-23.18
844.00	10	16-QAM	Standard	1 / 0	9.61	4.96	V	H2	14.57	0.029	-23.88

Table 6-2. ERP Data (Band 26)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	Ant. Pol. [H/V]	EUT Pol.	EIRP [dBm]	EIRP [Watts]	Margin [dB]
1851.50	3	QPSK	Standard	1 / 14	12.98	5.05	V	H2	18.03	0.063	-14.98
1882.50	3	QPSK	Standard	1 / 14	13.14	4.89	V	H2	18.03	0.064	-14.98
1913.50	3	QPSK	Standard	1 / 14	11.44	4.84	V	H2	16.28	0.043	-16.73
1851.50	3	16-QAM	Standard	1 / 14	11.65	5.05	V	H2	16.70	0.047	-16.31
1882.50	3	16-QAM	Standard	1 / 14	11.90	4.89	V	H2	16.79	0.048	-16.22
1913.50	3	16-QAM	Standard	1 / 14	9.86	4.84	V	H2	14.70	0.030	-18.31
1852.50	5	QPSK	Standard	1 / 0	14.14	5.05	V	H2	19.19	0.083	-13.82
1882.50	5	QPSK	Standard	1 / 0	13.49	4.89	V	H2	18.38	0.069	-14.63
1912.50	5	QPSK	Standard	1 / 24	11.00	4.84	V	H2	15.84	0.038	-17.17
1852.50	5	16-QAM	Standard	1 / 0	12.83	5.05	V	H2	17.88	0.061	-15.13
1882.50	5	16-QAM	Standard	1 / 0	12.29	4.89	V	H2	17.18	0.052	-15.83
1912.50	5	16-QAM	Standard	1 / 24	9.70	4.84	V	H2	14.54	0.028	-18.47
1855.00	10	QPSK	Standard	1 / 0	14.52	5.05	V	H2	19.57	0.091	-13.44
1882.50	10	QPSK	Standard	1 / 0	13.46	4.89	V	H2	18.35	0.068	-14.66
1910.00	10	QPSK	Standard	1 / 0	11.46	4.84	V	H2	16.30	0.043	-16.71
1855.00	10	16-QAM	Standard	1 / 0	13.27	5.05	V	H2	18.32	0.068	-14.69
1882.50	10	16-QAM	Standard	1 / 0	12.31	4.89	V	H2	17.20	0.052	-15.81
1910.00	10	16-QAM	Standard	1 / 0	10.39	4.84	V	H2	15.23	0.033	-17.78

Table 6-3. EIRP Data (Band 25)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	Ant. Pol. [H/V]	EUT Pol.	EIRP [dBm]	EIRP [Watts]	Margin [dB]
2501.00	10	QPSK	Standard	1 / 49	14.16	8.66	V	H2	22.82	0.191	-10.19
2593.00	10	QPSK	Standard	1 / 0	13.60	8.68	V	H2	22.28	0.169	-10.73
2685.00	10	QPSK	Standard	1 / 0	12.54	8.70	V	H2	21.24	0.133	-11.77
2501.00	10	16-QAM	Standard	1 / 49	12.94	8.66	V	H2	21.60	0.144	-11.41
2593.00	10	16-QAM	Standard	1 / 0	13.15	8.68	V	H2	21.83	0.152	-11.18
2685.00	10	16-QAM	Standard	1 / 0	11.53	8.70	V	H2	20.23	0.105	-12.78
2503.50	15	QPSK	Standard	1 / 0	13.56	8.66	V	H2	22.22	0.167	-10.79
2593.00	15	QPSK	Standard	1 / 0	14.66	8.68	V	H2	23.34	0.216	-9.67
2682.50	15	QPSK	Standard	1 / 0	12.23	8.70	V	H2	20.93	0.124	-12.08
2503.50	15	16-QAM	Standard	1 / 0	11.91	8.66	V	H2	20.57	0.114	-12.44
2593.00	15	16-QAM	Standard	1 / 0	14.53	8.68	V	H2	23.21	0.209	-9.80
2682.50	15	16-QAM	Standard	1 / 0	10.73	8.70	V	H2	19.43	0.088	-13.58
2506.00	20	QPSK	Standard	1 / 0	14.78	8.66	V	H2	23.44	0.221	-9.57
2593.00	20	QPSK	Standard	1 / 0	14.95	8.68	V	H2	23.63	0.231	-9.38
2680.00	20	QPSK	Standard	1 / 99	12.29	8.70	V	H2	20.99	0.126	-12.02
2506.00	20	16-QAM	Standard	1 / 0	14.10	8.66	V	H2	22.76	0.189	-10.25
2593.00	20	16-QAM	Standard	1 / 0	14.02	8.68	V	H2	22.70	0.186	-10.31
2680.00	20	16-QAM	Standard	1 / 99	10.10	8.70	V	H2	18.80	0.076	-14.21

Table 6-4. EIRP Data (Band 41)

6.3 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(l)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and vertically 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 v02r01 – Section 5.8

ANSI/TIA-603-C-2004 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = Peak
6. Trace mode = max hold
7. The trace was allowed to stabilize

Test Setup

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

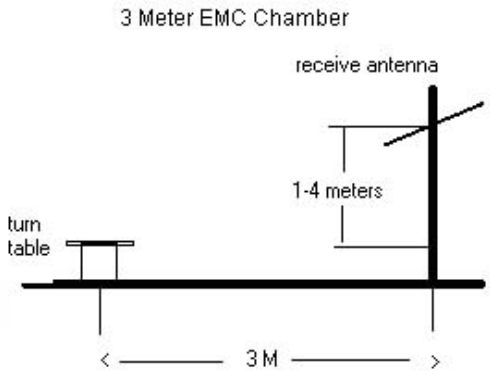


Figure 6-2. Test Instrument & Measurement Setup

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. 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 using CISPR quasi peak detector below 1GHz. 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.

OPERATING FREQUENCY:	829.00	MHz		
CHANNEL:	26840			
MEASURED OUTPUT POWER:	16.69	dBm	=	0.047 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	29.69	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
1658.00	-59.62	3.58	-56.04	H	H	72.7

Table 6-5. Radiated Spurious Data (Band 26 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz		
CHANNEL:	26915			
MEASURED OUTPUT POWER:	16.44	dBm	=	0.044 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	29.44	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
1673.00	-58.69	3.53	-55.16	H	H	71.6

Table 6-6. Radiated Spurious Data (Band 26 – Mid Channel)

OPERATING FREQUENCY:	844.00	MHz		
CHANNEL:	26990			
MEASURED OUTPUT POWER:	15.71	dBm	=	0.037 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	28.71	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
1688.00	-58.30	3.47	-54.83	H	H	70.5

Table 6-7. Radiated Spurious Data (Band 26 – High Channel)

OPERATING FREQUENCY:	1855.00	MHz		
CHANNEL:	26090			
MEASURED OUTPUT POWER:	19.57	dBm	=	0.091 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	32.57	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
3710.00	-51.19	8.40	-42.79	H	H	62.4
5565.00	-41.30	10.59	-30.72	H	H	50.3
7420.00	-57.51	12.06	-45.45	H	H	65.0
9275.00	-57.17	13.22	-43.96	H	H	63.5
11130.00	-54.62	13.26	-41.35	H	H	60.9
12985.00	-55.12	13.45	-41.67	H	H	61.2

Table 6-8. Radiated Spurious Data (Band 25 – Low Channel)

OPERATING FREQUENCY:	1882.50	MHz		
CHANNEL:	26365			
MEASURED OUTPUT POWER:	18.35	dBm	=	0.068 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	31.35	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
3765.00	-52.46	8.38	-44.08	H	H	62.4
5647.50	-44.18	10.70	-33.48	H	H	51.8
7530.00	-56.69	12.11	-44.58	H	H	62.9
9412.50	-57.75	13.19	-44.56	H	H	62.9

Table 6-9. Radiated Spurious Data (Band 25 – Mid Channel)

OPERATING FREQUENCY:	1910.00	MHz		
CHANNEL:	26640			
MEASURED OUTPUT POWER:	16.30	dBm	=	0.043 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	29.30	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
3820.00	-55.60	8.41	-47.19	H	H	63.5
5730.00	-48.03	10.76	-37.27	H	H	53.6
7640.00	-56.78	12.22	-44.56	H	H	60.9
9550.00	-56.99	13.18	-43.81	H	H	60.1

Table 6-10. Radiated Spurious Data (Band 25 – High Channel)

OPERATING FREQUENCY:	2506.00	MHz		
CHANNEL:	39750			
MEASURED OUTPUT POWER:	23.44	dBm	=	0.221 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	36.44	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
5012.00	-46.47	10.15	-36.32	H	H	59.8
7518.00	-52.64	12.10	-40.54	H	H	64.0

Table 6-11. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY:	2593.00	MHz		
CHANNEL:	40620			
MEASURED OUTPUT POWER:	23.63	dBm	=	0.231 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	36.63	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
5186.00	-50.18	10.33	-39.85	H	H	63.5
7779.00	-52.60	12.32	-40.28	H	H	63.9

Table 6-12. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY:	2680.00	MHz		
CHANNEL:	41490			
MEASURED OUTPUT POWER:	20.99	dBm	=	0.126 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W) =	33.99	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	EUT Pol. [H/H2/V]	[dBc]
5360.00	-47.39	10.37	-37.02	H	H	58.0
8040.00	-52.57	12.58	-39.99	H	H	61.0

Table 6-13. Radiated Spurious Data (Band 41 – High Channel)

7.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFLS885** complies with all the requirements of Parts 2, 22, 24, 27 of the FCC rules for LTE operation only.