



MEASUREMENT REPORT

Part 96 LTE

Applicant Name:

LG Electronics USA, Inc.

1000 Sylvan Avenue

Englewood Cliffs, NJ 07632

United States

Date of Testing:

8/19 - 9/4/2019

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M1908190143-05-R1.ZNF

FCC ID:

ZNFG850UM

APPLICANT:

LG Electronics USA, Inc.

Application Type:

Class II Permissive Change

Model:

LM-G850UM

Additional Models:

LM-G850QM, LM-G850QM6, LM-G850V, LM-G850UM2, LM-G850UM2X, LMG850UM, LMG850QM, LMG850QM6, LMG850V, LMG850UM2, LMG850UM2X, G850UM, G850QM, G850QM6, G850V, G850UM2, G850UM2X

EUT Type:

Portable Handset

FCC Classification:

Citizens Band End User Devices (CBE)

FCC Rule Part(s):

96

Test Procedure(s):

ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, KDB 648474 D03 v01r04, KDB 940660 D01 v02, WINNF-TS-0122 V1.0.0

Class II Permissive Change:

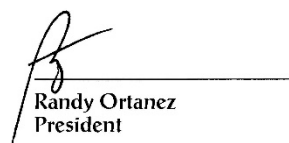
Please see FCC Change document

Original Grant Date:

9/18/2019

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.

This revised Test Report (S/N: 1M1908190143-05-R1.ZNF) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.



Randy Ortanez
President

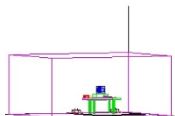


FCC ID: ZNFG850UM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset	Page 1 of 19

TABLE OF CONTENTS

1.0	INTRODUCTION	4
1.1	Scope	4
1.2	PCTEST Test Location.....	4
1.3	Test Facility / Accreditations.....	4
2.0	PRODUCT INFORMATION.....	5
2.1	Equipment Description	5
2.2	Device Capabilities.....	5
2.3	Test Configuration	5
2.4	EMI Suppression Device(s)/Modifications	5
3.0	DESCRIPTION OF TESTS	6
3.1	Measurement Procedure.....	6
3.2	Radiated Power and Radiated Spurious Emissions	6
4.0	MEASUREMENT UNCERTAINTY	7
5.0	TEST EQUIPMENT CALIBRATION DATA	8
6.0	SAMPLE CALCULATIONS	9
7.0	TEST RESULTS	10
7.1	Summary	10
7.2	Radiated Power (EIRP).....	11
7.3	Radiated Spurious Emissions Measurements	14
8.0	CONCLUSION	19

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 2 of 19



MEASUREMENT REPORT

FCC Part 96



Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
LTE Band 48	96	3552.5 - 3697.5	0.030	14.80	4M55G7D	QPSK
LTE Band 48	96	3552.5 - 3697.5	0.025	13.91	4M53W7D	16QAM
LTE Band 48	96	3552.5 - 3697.5	0.020	12.94	4M53W7D	64QAM
LTE Band 48	96	3555 - 3695	0.030	14.78	9M05G7D	QPSK
LTE Band 48	96	3555 - 3695	0.024	13.89	9M08W7D	16QAM
LTE Band 48	96	3555 - 3695	0.020	12.92	9M04W7D	64QAM
LTE Band 48	96	3557.5 - 3692.5	0.029	14.61	13M5G7D	QPSK
LTE Band 48	96	3557.5 - 3692.5	0.024	13.72	13M5W7D	16QAM
LTE Band 48	96	3557.5 - 3692.5	0.019	12.75	13M5W7D	64QAM
LTE Band 48	96	3560 - 3690	0.031	14.90	18M0G7D	QPSK
LTE Band 48	96	3560 - 3690	0.024	13.82	18M0W7D	16QAM
LTE Band 48	96	3560 - 3690	0.021	13.31	18M0W7D	64QAM

EUT Overview (LTE B48)

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset	Page 3 of 19	

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

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

- PCTEST is a CBRS Alliance (OnGo) Approved Test Lab
- PCTEST is a WinnForum Approved Test Lab
- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for CBRS Alliance Certification Test Plan and WinnForum Conformance and Performance Test Technical Standard.
- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISSED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISSED.

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 4 of 19

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFG850UM**. The test data contained in this report pertains only to the emissions due to the EUT's LTE Band 48 operation in the CBRS band.

Test Device Serial No.: 0022M, 0502M, 0510M, 0367M, 0650M

2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ac WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT placed on an authorized wireless charging pad (WCP) FCC ID: A3LEPPN920 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

During testing the EUT was installed onto the dual display cover and was set to operate in normal operation. The worst case radiated emission data with the dual display cover is included in this report.

2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset	Page 5 of 19	

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-E-2016) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

3.2 Radiated Power and Radiated Spurious Emissions

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. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

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 v03r01.

Per the guidance of ANSI/TIA-603-E-2016, 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 $43 + 10\log_{10}(\text{Power [Watts]})$.

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 6 of 19

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 uncertainty shown below 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)
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 7 of 19

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 C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx1	Licensed Transmitter Cable Set	6/4/2019	Annual	6/4/2020	LTx1
-	LTx3	Licensed Transmitter Cable Set	6/3/2019	Annual	6/3/2020	LTx3
Agilent	N9020A	MXA Signal Analyzer	4/20/2019	Annual	4/20/2020	US46470561
Agilent	N9038A	MXE EMI Receiver	7/17/2019	Annual	7/17/2020	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	6/12/2019	Annual	6/12/2020	MY52350166
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	9/17/2018	Annual	9/17/2019	441119
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	5/10/2019	Annual	5/10/2020	441112
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/9/2018	Biennial	8/9/2020	135427
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	4/19/2019	Annual	4/19/2020	11401010036
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	9/19/2018	Annual	9/19/2019	100040
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	6/5/2019	Annual	6/5/2020	100342
Seekonk	NC-100	Torque Wrench (8" lb)	5/10/2018	Biennial	5/10/2020	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

Notes:

- For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
- Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: ZNFG850UM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 8 of 19

6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 9 of 19

7.0 TEST RESULTS

7.1 Summary

Company Name: LG Electronics USA, Inc.
 FCC ID: ZNFG850UM
 FCC Classification: Citizens Band End User Devices (CBE)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
96.41(b)	Equivalent Isotropic Radiated Power (EIRP)	23 dBm/10MHz	RADIATED	PASS	Section 7.2
2.1053 96.41(e)	Undesirable Emissions	-40 dBm/MHz		PASS	Section 7.3

Table 7-1. Summary of Radiated 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.

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset	Page 10 of 19	

7.2 Radiated Power (EIRP)

§96.41(b)

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. 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 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – 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 $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ 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 set equal to 10MHz.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: ZNFG850UM	 PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 LG	Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset	Page 11 of 19	

Test Setup

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

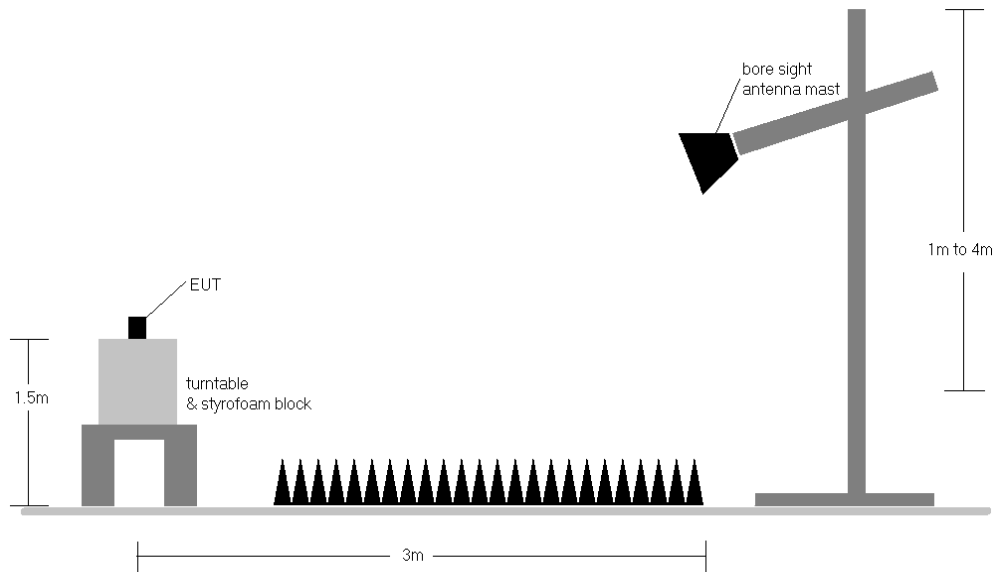


Figure 7-1. Radiated Test Setup >1GHz

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.
- 3) The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz).

FCC ID: ZNFG850UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 12 of 19

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 [Watts]	EIRP Limit [dBm]	Margin [dB]
3552.50	5	QPSK	V	108	23	1 / 0	7.57	7.23	14.80	0.030	23.00	-8.20
3625.00	5	QPSK	V	150	133	1 / 24	6.06	6.96	13.02	0.020	23.00	-9.98
3697.50	5	QPSK	V	130	56	1 / 0	6.64	6.41	13.05	0.020	23.00	-9.95
3552.50	5	16-QAM	V	108	23	1 / 0	6.68	7.23	13.91	0.025	23.00	-9.09
3552.50	5	64-QAM	V	108	23	1 / 0	5.71	7.23	12.94	0.020	23.00	-10.06
3555.00	10	QPSK	V	105	19	1 / 0	7.56	7.22	14.78	0.030	23.00	-8.22
3625.00	10	QPSK	V	122	28	1 / 49	6.20	6.96	13.16	0.021	23.00	-9.84
3695.00	10	QPSK	V	133	27	1 / 0	6.67	6.43	13.10	0.020	23.00	-9.90
3555.00	10	16-QAM	V	105	19	1 / 0	6.67	7.22	13.89	0.024	23.00	-9.11
3555.00	10	64-QAM	V	105	19	1 / 0	5.70	7.22	12.92	0.020	23.00	-10.08
3557.50	15	QPSK	V	105	19	1 / 0	7.39	7.22	14.61	0.029	23.00	-8.39
3625.00	15	QPSK	V	122	28	1 / 74	6.10	6.96	13.06	0.020	23.00	-9.94
3692.50	15	QPSK	V	133	27	1 / 0	6.59	6.45	13.04	0.020	23.00	-9.96
3557.50	15	16-QAM	V	105	19	1 / 0	6.50	7.22	13.72	0.024	23.00	-9.28
3557.50	15	64-QAM	V	105	19	1 / 0	5.53	7.22	12.75	0.019	23.00	-10.25
3560.00	20	QPSK	V	105	19	1 / 0	7.69	7.21	14.90	0.031	23.00	-8.10
3625.00	20	QPSK	V	122	28	1 / 99	6.24	6.96	13.20	0.021	23.00	-9.80
3690.00	20	QPSK	V	133	27	1 / 0	6.67	6.47	13.14	0.021	23.00	-9.86
3560.00	20	16-QAM	V	105	19	1 / 0	6.61	7.21	13.82	0.024	23.00	-9.18
3560.00	20	64-QAM	V	105	19	1 / 0	6.10	7.21	13.31	0.021	23.00	-9.69
3560.00	20	QPSK	H	245	325	1 / 0	6.07	7.21	13.28	0.021	23.00	-9.72
3560.00	20	QPSK(WCP)	H	152	266	1 / 0	2.57	7.21	9.78	0.010	23.00	-13.22
3560.00	20	QPSK(DD)	H	160	251	1 / 0	6.62	7.21	13.83	0.024	23.00	-9.17
3560.00	20	QPSK(WCP & DD)	H	144	240	1 / 0	6.45	7.21	13.66	0.023	23.00	-9.34

Table 7-2. EIRP Data (Band 48)

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 13 of 19

7.3 Radiated Spurious Emissions Measurements

\$2.1053 \$96.41(e)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 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.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

FCC ID: ZNFG850UM	 PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 LG	Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset	Page 14 of 19	

Test Setup

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

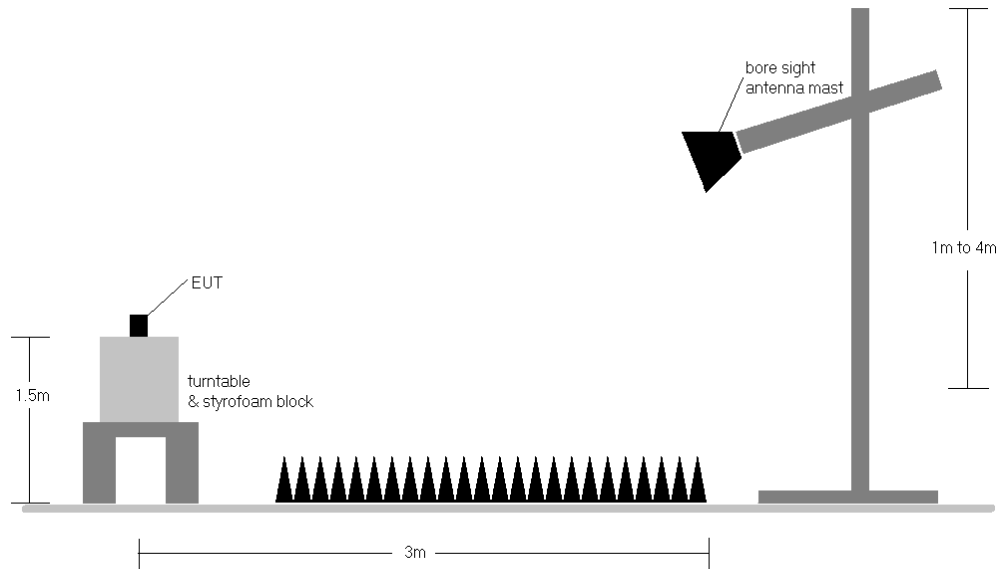


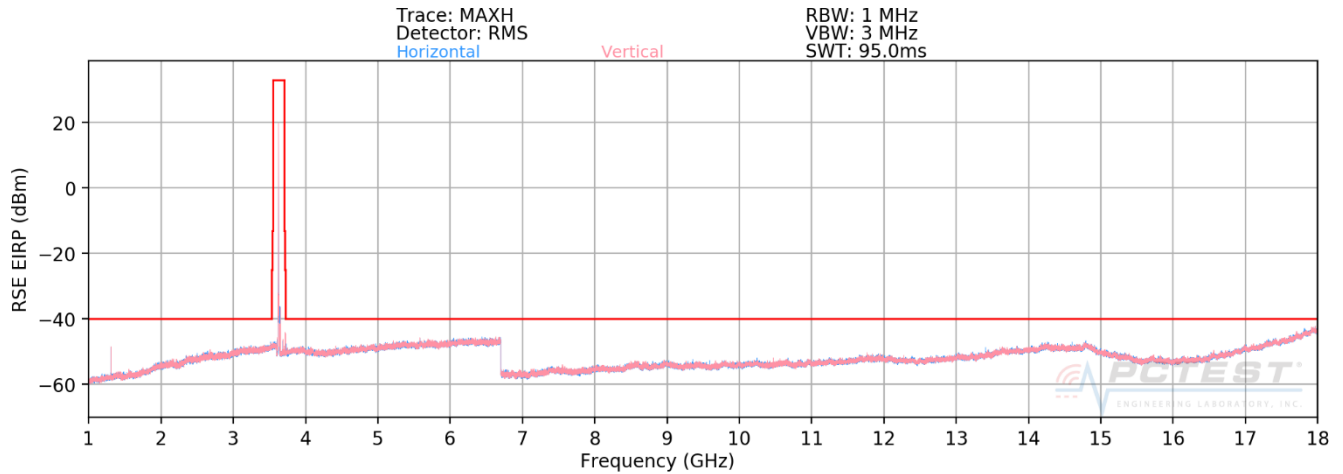
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

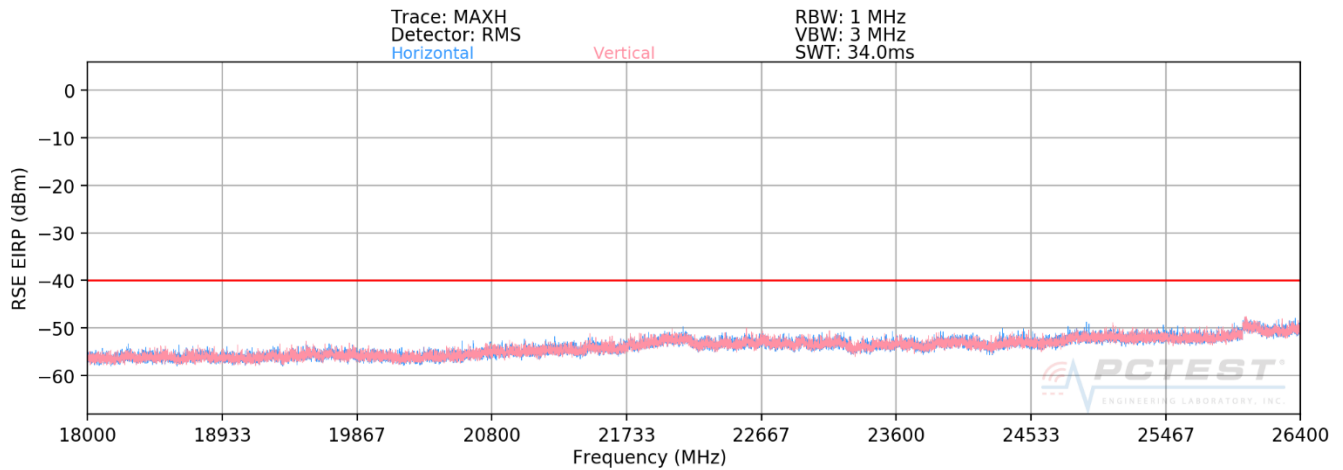
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with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

FCC ID: ZNFG850UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 15 of 19

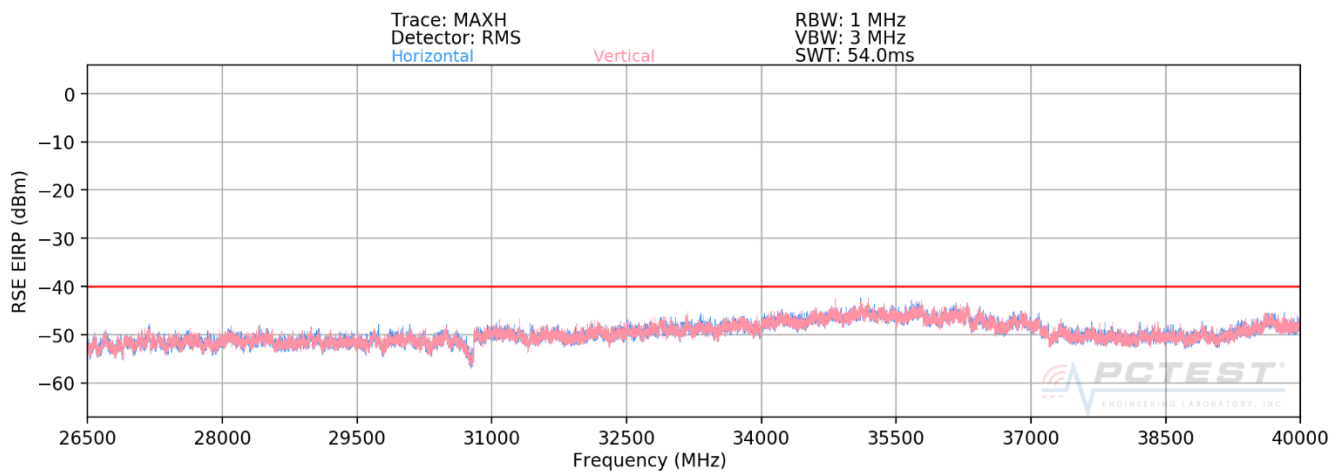
Band 48



Plot 7-1. Radiated Spurious Plot 1 - 18GHz (Band 48)



Plot 7-2. Radiated Spurious Plot 18 - 26.5GHz (Band 48)



Plot 7-3. Radiated Spurious Plot 26.5 - 40GHz (Band 48)

FCC ID: ZNFG850UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 16 of 19

OPERATING FREQUENCY: 3560.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

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]	Margin [dB]
7120.00	H	180	55	-69.96	11.71	-58.26	-18.3
10680.00	H	-	-	-67.97	12.55	-55.42	-15.4

Table 7-3. Radiated Spurious Data (Band 48 – Low Channel)

OPERATING FREQUENCY: 3625.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

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]	Margin [dB]
7250.00	H	116	360	-68.86	11.32	-57.54	-17.5
10875.00	H	-	-	-68.52	12.71	-55.81	-15.8

Table 7-4. Radiated Spurious Data (Band 48 – Mid Channel)

OPERATING FREQUENCY: 3690.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

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]	Margin [dB]
7380.00	H	170	360	-67.06	10.96	-56.10	-16.1
11070.00	H	-	-	-68.47	12.72	-55.74	-15.7

Table 7-5. Radiated Spurious Data (Band 48 – High Channel)

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)					Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset				Page 17 of 19	

OPERATING FREQUENCY: 3690.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

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]	Margin [dB]
7380.00	H	164	222	-56.24	9.18	-47.06	-7.1
11070.00	H	-	-	-53.70	9.48	-44.22	-4.2

Table 7-6. Radiated Spurious Data with WCP (Band 48 – High Channel)

OPERATING FREQUENCY: 3690.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

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]	Margin [dB]
7120.00	H	164	106	-56.09	9.18	-46.91	-6.9
10680.00	H	-	-	-52.52	9.48	-43.04	-3.0

Table 7-7. Radiated Spurious Data with Dual Display (Band 48 – High Channel)

OPERATING FREQUENCY: 3690.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

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]	Margin [dB]
7380.00	H	201	112	-57.29	9.18	-48.11	-8.1
11070.00	H	-	-	-52.87	9.48	-43.39	-3.4

Table 7-8. Radiated Spurious Data with Dual Display and WCP (Band 48 – High Channel)

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset	Page 18 of 19	

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFG850UM** complies with all of the End User Device requirements of Part 96 of the FCC Rules.

FCC ID: ZNFG850UM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1908190143-05-R1.ZNF	Test Dates: 8/19 - 9/4/2019	EUT Type: Portable Handset		Page 19 of 19