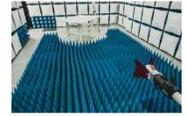




**PCTEST**  
 7185 Oakland Mills Road, Columbia, MD 21046 USA  
 Tel. 410.290.6652 / Fax 410.290.6654  
<http://www.pctest.com>



## MEASUREMENT REPORT Part 96 LTE

**Applicant Name:**  
 LG Electronics USA, Inc.  
 1000 Sylvan Avenue  
 Englewood Cliffs, NJ 07632  
 United States

**Date of Testing:**  
 1/21 - 2/15/2020  
**Test Site/Location:**  
 PCTEST Lab. Columbia, MD, USA  
**Test Report Serial No.:**  
 1M1912300226-05.ZNF

<b>FCC ID:</b>	<b>ZNFV600TM</b>
<b>APPLICANT:</b>	<b>LG Electronics USA, Inc.</b>

**Application Type:** Class II Permissive Change  
**Model:** LM-V600TM  
**Additional Models:** LMV600TM, V600TM  
**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

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

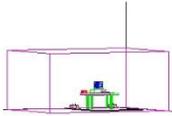


<b>FCC ID:</b> ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> Portable Handset	Page 1 of 19

## TABLE OF CONTENTS

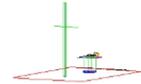
1.0	INTRODUCTION .....	4
1.1	Scope .....	4
1.2	PCTEST Test Location.....	4
1.3	Test Facility / Accreditations.....	4
2.0	PRODUCT INFORMATION.....	5
2.1	Equipment Description .....	5
2.2	Device Capabilities.....	5
2.3	Test Configuration .....	5
2.4	EMI Suppression Device(s)/Modifications .....	5
3.0	DESCRIPTION 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

<b>FCC ID:</b> ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> Portable Handset	Page 2 of 19



## MEASUREMENT REPORT

### FCC Part 96



Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W/10MHz)	Max. Power (dBm/10MHz)	
LTE Band 48	96	3552.5 - 3697.5	0.089	19.47	QPSK
LTE Band 48	96	3552.5 - 3697.5	0.076	18.80	16QAM
LTE Band 48	96	3552.5 - 3697.5	0.071	18.53	64QAM
LTE Band 48	96	3552.5 - 3697.5	0.036	15.55	256QAM
LTE Band 48	96	3555 - 3695	0.091	19.61	QPSK
LTE Band 48	96	3555 - 3695	0.078	18.94	16QAM
LTE Band 48	96	3555 - 3695	0.072	18.60	64QAM
LTE Band 48	96	3555 - 3695	0.034	15.29	256QAM
LTE Band 48	96	3557.5 - 3692.5	0.089	19.47	QPSK
LTE Band 48	96	3557.5 - 3692.5	0.076	18.79	16QAM
LTE Band 48	96	3557.5 - 3692.5	0.060	17.81	64QAM
LTE Band 48	96	3557.5 - 3692.5	0.033	15.24	256QAM
LTE Band 48	96	3560 - 3690	0.093	19.69	QPSK
LTE Band 48	96	3560 - 3690	0.080	19.01	16QAM
LTE Band 48	96	3560 - 3690	0.068	18.30	64QAM
LTE Band 48	96	3560 - 3690	0.033	15.16	256QAM

**EUT Overview (LTE B48)**

**Note:**

EIRP levels shown in the table above are measured over the full channel bandwidth. These values will appear on the Grant of Authorization.

FCC ID: ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	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 ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

<b>FCC ID:</b> ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> 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: ZNFV600TM**. 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. Per FCC Part 96, this device is evaluated under Citizens Band End User Devices (CBE).

**Test Device Serial No.:** 04240

### 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, 5G NR (n71, n66, n25, n2, n41(PC2)), 802.11b/g/n/ac/ax WLAN, 802.11a/n/ac/ax 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) Model: YZP-PWMAW815A while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

This device supports Dual Display (DD) Cover, which attaches to the device to provide a secondary display on the inside of the cover. The display was rotated through all possible orientations to determine worst case angle. 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: ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> 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:

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

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

The calculated  $P_d$  levels are then compared to the absolute spurious emission limit of -40dBm/MHz for End User Devices.

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 414788 D01.

FCC ID: ZNFV600TM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	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  $U_{\text{CISPR}}$  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

FCC ID: ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	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
Agilent	N9038A	MXE EMI Receiver	7/17/2019	Annual	7/17/2020	MY51210133
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
EMCO	3116	Horn Antenna (18-40GHz)	6/7/2018	Biennial	6/7/2020	9203-2178
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			833855/0010
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	6/5/2019	Annual	6/5/2020	100342
Rohde & Schwarz	FSV40-N	Spectrum Analyzer (9K - 40GHz)	12/6/2019	Annual	12/6/2020	101814
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz	TS-PR18	18-26.5 GHz Pre-Amplifier	1/31/2020	Annual	1/31/2021	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	10/8/2019	Annual	10/8/2020	100037
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/11/2019	Annual	7/11/2020	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/8/2019	Annual	7/8/2020	102133
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			165450
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

**Table 5-1. Test Equipment**

**Notes:**

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

<b>FCC ID:</b> ZNFV600TM		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> Portable Handset	<b>Approved by:</b> Quality Manager
			Page 8 of 19

## 6.0 SAMPLE CALCULATIONS

### Spurious Radiated Emission – LTE Band

#### Example: Middle Channel LTE Mode 2<sup>nd</sup> Harmonic (7250 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: ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	EUT Type: Portable Handset	Page 9 of 19

## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: LG Electronics USA, Inc.  
 FCC ID: ZNFV600TM  
 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 7.5
2.1053 96.41(e)	Undesirable Emissions	-40 dBm/MHz		PASS	Section 7.3

**Table 7-1. Summary of Radiated 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.

FCC ID: ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	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

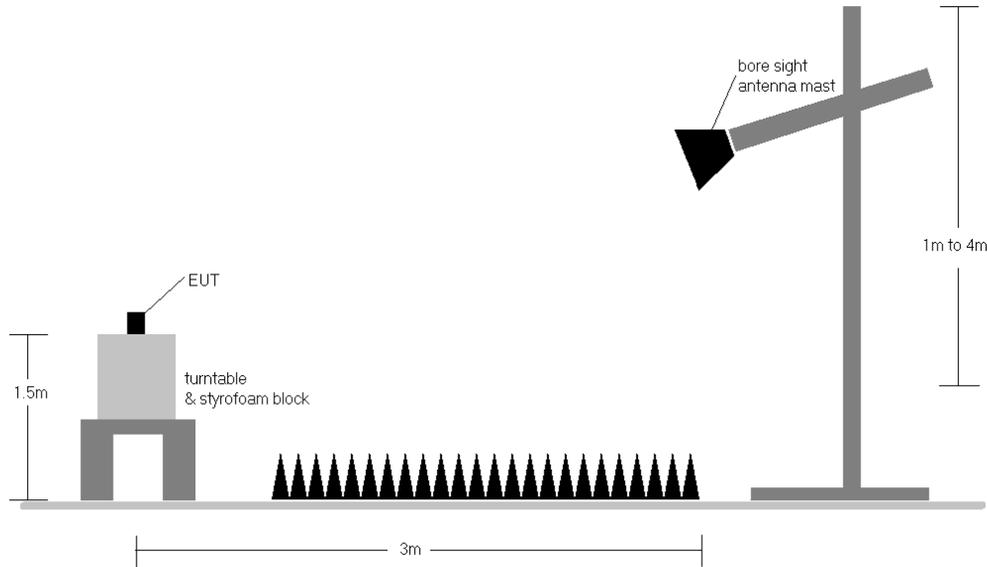
### Test Settings

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 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 set equal to 10MHz.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: ZNFV600TM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	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).

<b>FCC ID:</b> ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> Portable Handset	Page 12 of 19

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turtable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
3552.50	5	QPSK	V	174	361	1 / 24	12.08	7.23	19.31	0.085	23.00	-3.69
3625.00	5	QPSK	V	156	360	1 / 24	12.46	6.96	19.42	0.088	23.00	-3.58
3697.50	5	QPSK	V	164	357	1 / 24	13.06	6.41	<b>19.47</b>	0.089	23.00	-3.53
3697.50	5	16-QAM	V	164	357	1 / 24	12.39	6.41	<b>18.80</b>	0.076	23.00	-4.20
3697.50	5	64-QAM	V	164	357	1 / 24	12.12	6.41	<b>18.53</b>	0.071	23.00	-4.47
3697.50	5	256-QAM	V	164	357	1 / 24	9.14	6.41	<b>15.55</b>	<b>0.036</b>	23.00	-7.45
3555.00	10	QPSK	V	171	357	1 / 49	12.16	7.22	19.38	0.087	23.00	-3.62
3625.00	10	QPSK	V	152	364	1 / 49	12.64	6.96	19.60	0.091	23.00	-3.40
3695.00	10	QPSK	V	160	361	1 / 49	13.18	6.43	<b>19.61</b>	0.091	23.00	-3.39
3695.00	10	16-QAM	V	160	361	1 / 49	12.51	6.43	<b>18.94</b>	0.078	23.00	-4.06
3695.00	10	64-QAM	V	160	361	1 / 49	12.17	6.43	<b>18.60</b>	0.072	23.00	-4.40
3695.00	10	256-QAM	V	160	361	1 / 49	8.86	6.43	15.29	0.034	23.00	-7.71
3557.50	15	QPSK	V	168	360	1 / 74	12.06	7.22	19.28	0.085	23.00	-3.72
3625.00	15	QPSK	V	149	361	1 / 74	12.51	6.96	<b>19.47</b>	0.089	23.00	-3.53
3692.50	15	QPSK	V	156	367	1 / 74	13.00	6.45	19.45	0.088	23.00	-3.55
3625.00	15	16-QAM	V	149	361	1 / 74	11.83	6.96	18.79	0.076	23.00	-4.21
3625.00	15	64-QAM	V	149	361	1 / 74	10.85	6.96	17.81	0.060	23.00	-5.19
3625.00	15	256-QAM	V	149	361	1 / 74	8.28	6.96	15.24	0.033	23.00	-7.76
3560.00	20	QPSK	V	172	356	1 / 99	12.15	7.21	19.36	0.086	23.00	-3.64
3625.00	20	QPSK	V	147	358	1 / 99	12.73	6.96	<b>19.69</b>	<b>0.093</b>	23.00	-3.31
3690.00	20	QPSK	V	158	370	1 / 99	13.10	6.47	19.57	0.091	23.00	-3.43
3625.00	20	16-QAM	V	147	358	1 / 99	12.05	6.96	19.01	0.080	23.00	-3.99
3625.00	20	64-QAM	V	147	358	1 / 99	11.34	6.96	18.30	0.068	23.00	-4.70
3625.00	20	256-QAM	V	147	358	1 / 99	8.20	6.96	15.16	0.033	23.00	-7.84
3625.00	20	QPSK	H	164	363	1 / 99	11.81	6.85	18.66	0.073	23.00	-4.34
3625.00	20 (WCP+DD)	QPSK	H	104	239	1 / 99	2.71	6.85	9.56	0.009	23.00	-13.44

**Table 7-2. EIRP Data (Band 48)**

FCC ID: ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> 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

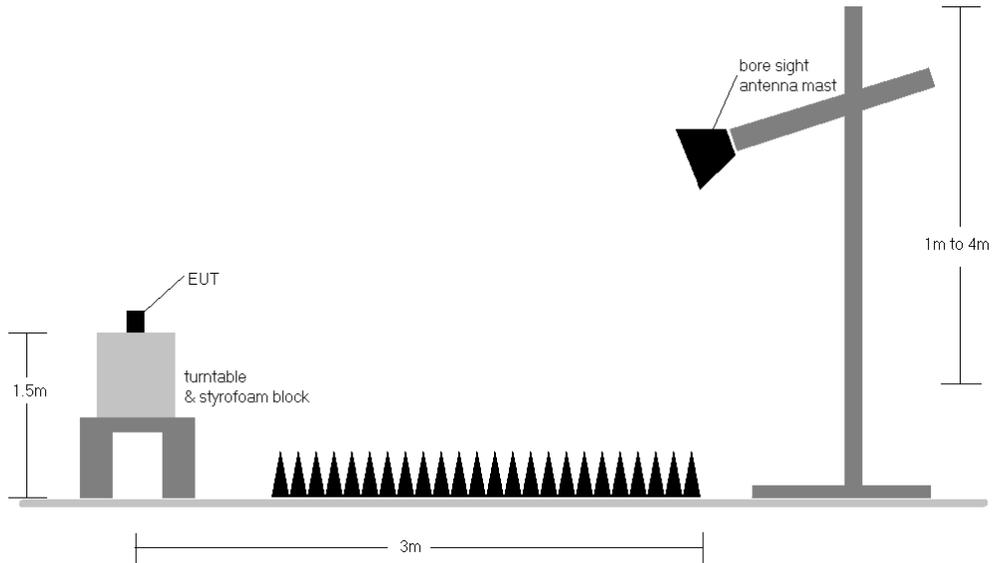
#### Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Max Hold (In cases where the level is within 2dB of the limit, the final measurement is taken using triggering/gating and trace averaging.)
7. The trace was allowed to stabilize

<b>FCC ID:</b> ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> 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**

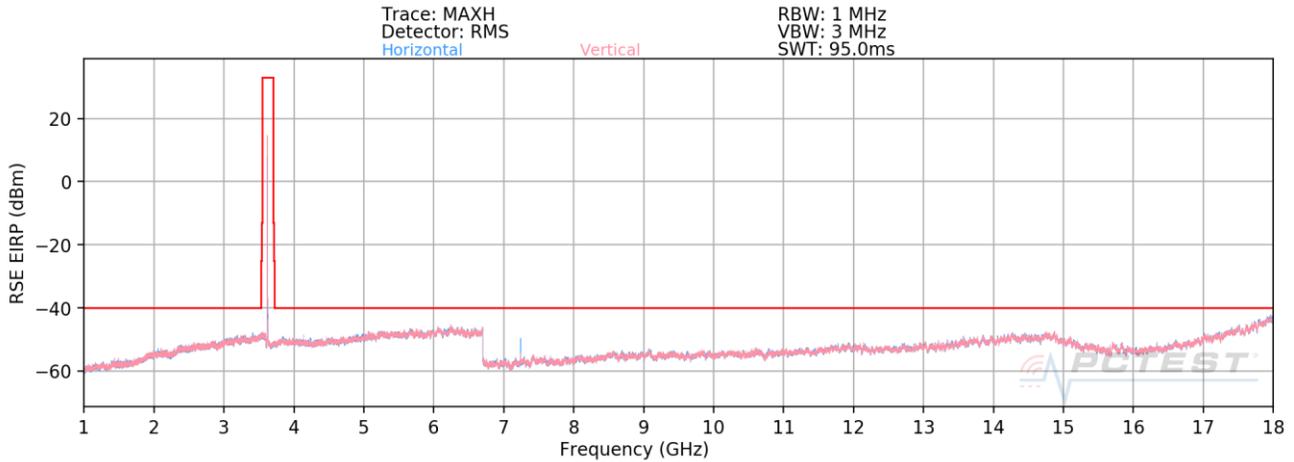
**Test Notes**

- 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.
- 6) Per KDB 971168, Field Strength Level (dBµV/m) is converted to EIRP Spurious Emission Level (dBm) using the formula in Section 5.8.4 (d):

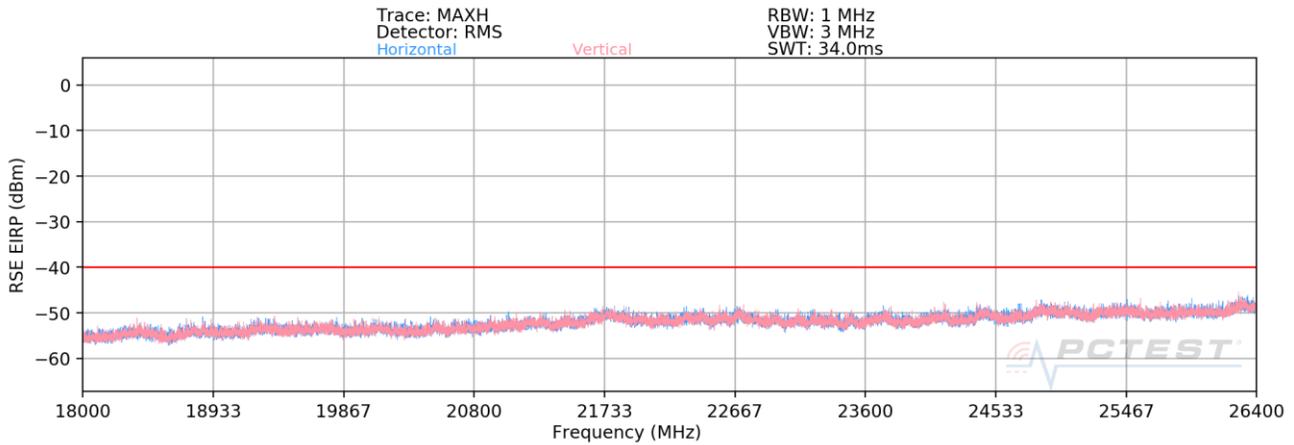
$$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8; \text{ where } D \text{ is the measurement distance in meters}$$

FCC ID: ZNFV600TM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> Portable Handset	Page 15 of 19	

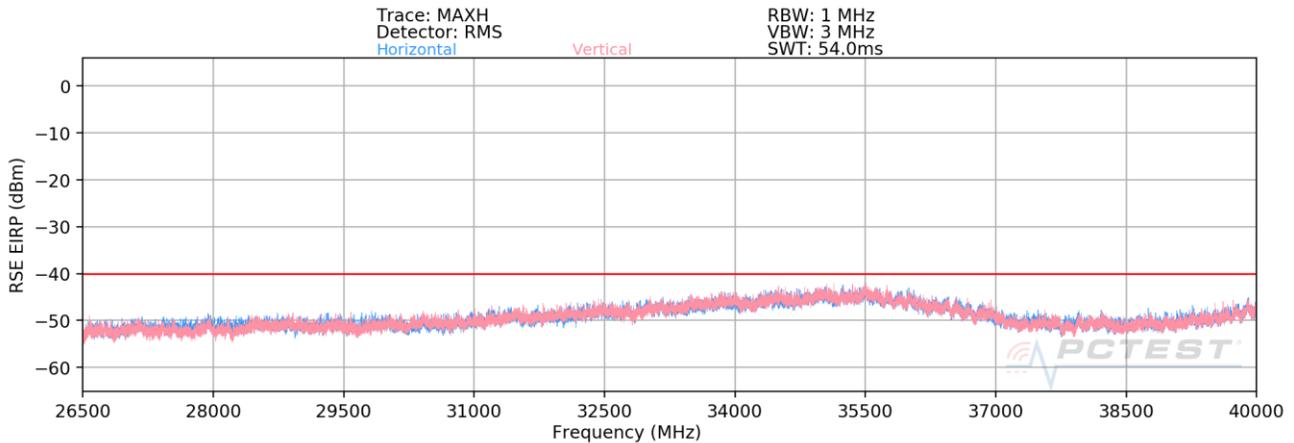
# LTE Band 48



**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: ZNFV600TM	MEASUREMENT REPORT (CERTIFICATION)		LG	Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	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	V	118	169	-60.39	11.71	-48.68	-8.7
10680.00	V	133	99	-68.82	12.55	-56.27	-16.3
14240.00	V	-	-	-64.84	11.35	-53.49	-13.5
17800.00	V	-	-	-57.86	10.01	-47.84	-7.8
21360.00	V	-	-	-59.22	11.75	-47.47	-7.5

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	V	122	161	-58.22	11.32	-46.90	-6.9
10875.00	V	114	313	-62.62	12.71	-49.91	-9.9
14500.00	V	128	351	-63.02	11.61	-51.41	-11.4
18125.00	V	-	-	-63.12	11.45	-51.67	-11.7
21750.00	V	-	-	-58.91	11.92	-46.99	-7.0

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

FCC ID: ZNFV600TM			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	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	V	100	181	-55.07	9.27	-45.80	-5.8
11070.00	V	111	344	-62.55	12.72	-49.83	-9.8
14760.00	V	-	-	-64.12	12.02	-52.09	-12.1
18450.00	V	-	-	-62.02	11.66	-50.36	-10.4

Table 7-5. Radiated Spurious Data (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	V	127	232	-61.43	11.32	-50.11	-10.1
11070.00	V	296	75	-59.50	12.71	-46.79	-6.8
14760.00	V	-	-	-64.75	11.61	-53.14	-13.1
18450.00	V	-	-	-62.11	11.66	-50.45	-10.5

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

FCC ID: ZNFV600TM			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1912300226-05.ZNF	Test Dates: 1/21 - 2/15/2020	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: ZNFV600TM** complies with all of the End User Device requirements of Part 96 of the FCC Rules for LTE operation only.

<b>FCC ID:</b> ZNFV600TM		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1912300226-05.ZNF	<b>Test Dates:</b> 1/21 - 2/15/2020	<b>EUT Type:</b> Portable Handset		Page 19 of 19