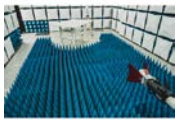
PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctest.com



MEASUREMENT REPORT
GSM / GPRS / EDGE / WCDMA

Applicant Name:
LG Electronics USA, Inc.
111 Sylvan Avenue, North Building
Englewood Cliffs, NJ 07632
United States

Date of Testing:
09/08/2020 - 10/05/2020
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2007230115-03.ZNF

FCC ID:	**ZNFF100TM**
APPLICANT:	**LG Electronics USA, Inc.**

Application Type:	Class II Permissive Change
Model:	LM-F100TM
Additional Model(s):	LMF100TM, F100TM
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	22, 24 & 27
Test Procedure(s):	ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, KDB 648474 D03 v01r04
Class II Permissive Change:	Please see FCC change document

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

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

Randy Ortanez
President

ACCREDITED
CERT #2041.01

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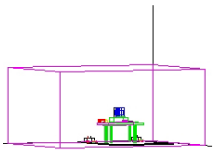
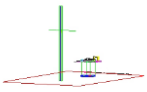


MEASUREMENT REPORT
GSM / GPRS / EDGE / WCDMA



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP	
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)
GPRS850	22H	824.2 - 848.8	0.276	24.41	0.452	26.56
EDGE850	22H	824.2 - 848.8	0.095	19.78	0.156	21.93
CDMA850	22H	824.70 - 848.31	0.067	18.23	0.109	20.38
WCDMA850	22H	826.4 - 846.6	0.075	18.75	0.123	20.90
WCDMA1700	27	1712.4 - 1752.6			0.299	24.75
GPRS1900	24E	1850.2 - 1909.8			1.139	30.57
EDGE1900	24E	1850.2 - 1909.8			0.401	26.04
CDMA1900	24E	1851.25 - 1908.75			0.287	24.58
WCDMA1900	24E	1852.4 - 1907.6			0.242	23.83

EUT Overview

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 and the Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST 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 located in Columbia, MD 21046, U.S.A.

- 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.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFF100TM**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

Test Device Serial No.: 01845, 01860

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, Multi-Band 5G NR, 802.11b/g/n 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 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 lying flat on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

The EUT is capable of operating in screen closed and screen open configurations. The worst-case configuration for radiated emissions was determined from open and closed configurations in X, Y, and Z orientations for horizontal and vertical antenna polarizations. The worst case radiated emissions data is shown in this report. Additionally, the EUT is support a camera that mechanically pops up from the device. The worst case configuration was investigated with the camera down and popped up and worst case radiated data is reported herein.

2.4 EMI Suppression Device(s)/Modifications

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

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-E-2016) and “Measurement Guidance for Certification of Licensed Digital Transmitters” (KDB 971168 D01 v03r01) were used in the measurement of the EUT**.**

Deviation from Measurement Procedure……..None

3.2 Radiated Measurements

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.

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

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.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

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 (±dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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
-	LTx2	Licensed Transmitter Cable Set	10/30/2019	Annual	10/30/2020	LTx2
-	LTx3	LIcensed Transmitter Cable Set	10/30/2019	Annual	10/30/2020	LTx3
Agilent	N9038A	MXE EMI Receiver	8/11/2020	Annual	8/11/2021	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MY52350166
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	2/22/2019	Biennial	2/22/2021	128338
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Mini Circuits	PWR-4GHS	USB Power Sensor	6/18/2020	Annual	6/18/2021	12001070013
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			102060
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/10/2020	Annual	2/10/2021	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/21/2020	Annual	2/21/2021	102133
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol Science	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511

Table 5-1. Test Equipment

Notes:

1. 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.

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

6.0 SAMPLE CALCULATIONS

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

The receive 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 3700.40 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm – (-24.80) = 50.3 dBc.

7.0 TEST RESULTS

7.1 Summary

Company Name: LG Electronics USA, Inc.

FCC ID: ZNFF100TM

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): GSM / GPRS / EDGE / WCDMA

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	RSS-132(5.4)	Effective Radiated Power	< 7 Watts max. ERP	RADIATED	PASS	Section 7.2
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS	Section 7.2
27.50(d)(4)	RSS-139(6.5)	Equivalent Isotropic Radiated Power	< 1 Watts max. EIRP		PASS	Section 7.2
2.1053 22.917(a) 24.238(a) 27.53(h)	RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Radiated Spurious Emissions	> 43 + 10 $\log_{10}$ (P[Watts]) for all out-of-band emissions		PASS	Section 7.3

Table 7-1. 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.

7.2 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and 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 below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at 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 ≥ 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".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Setup

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

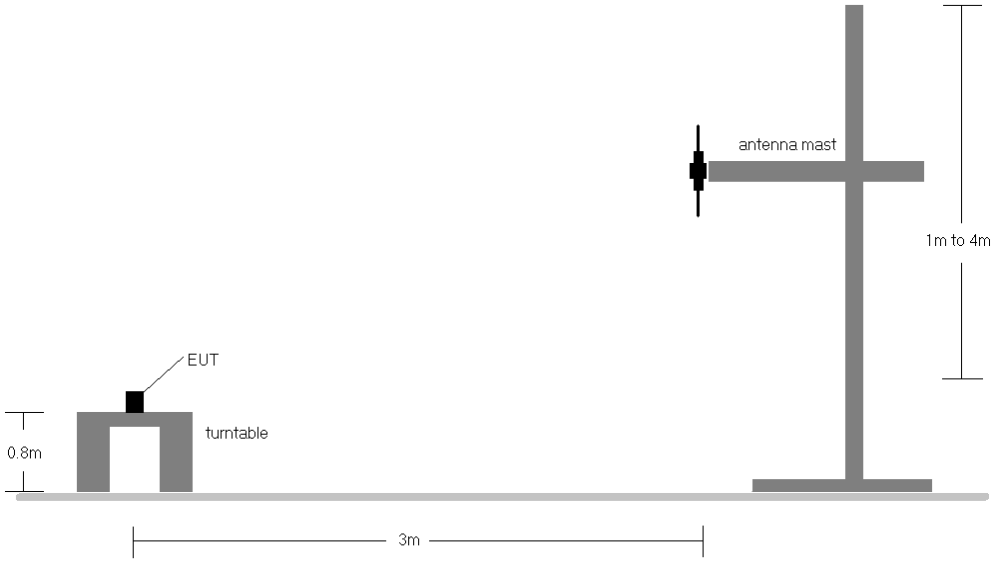


Figure 7-1. Radiated Test Setup <1GHz

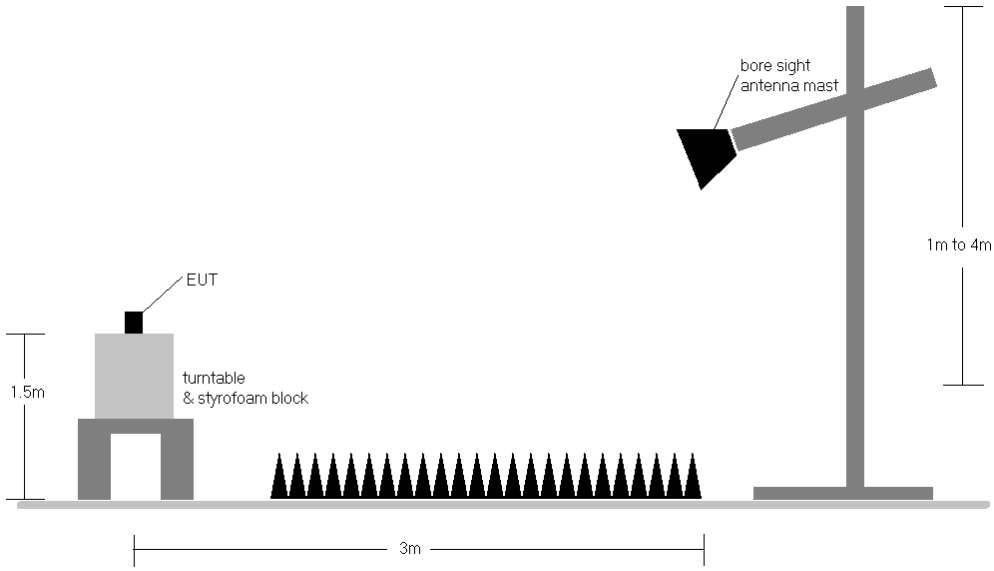


Figure 7-2. Radiated Test Setup >1GHz

Test Notes

1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.

2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."

3) This device employs CDMA mode. The EUT was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.

4) This unit was tested with its standard battery.

5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.20	GPRS850 (Open)	V	124	120	19.11	6.75	23.71	0.235	38.45	-14.74	25.86	0.385	40.61	-14.75
836.60	GPRS850 (Open)	V	130	134	18.55	6.68	23.08	0.203	38.45	-15.37	25.23	0.333	40.61	-15.38
848.80	GPRS850 (Open)	V	157	127	19.85	6.71	**24.41**	**0.276**	38.45	-14.05	**26.56**	**0.452**	40.61	-14.05
848.80	GPRS850 (Open)	H	124	225	16.12	6.71	20.68	0.117	38.45	-17.78	22.83	0.192	40.61	-17.78
848.80	EDGE850	V	157	127	15.22	6.71	**19.78**	0.095	38.45	-18.68	**21.93**	**0.156**	40.61	-18.68
848.80	GPRS850 (WCP)	V	124	95	16.77	6.71	21.33	0.136	38.45	-17.13	23.48	0.223	40.61	-17.13
848.80	GPRS850 (Closed)	H	147	110	16.30	6.71	**20.86**	**0.122**	38.45	-17.60	23.01	0.200	40.61	-17.60
848.80	GPRS (Camera)	H	137	57	13.89	6.71	18.45	**0.070**	38.45	-20.01	20.60	0.115	40.61	-20.01

Table 7-2. ERP/EIRP (Cellular GPRS)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	CDMA850 (Open)	V	165	270	13.68	6.70	**18.23**	**0.067**	38.45	-20.22	**20.38**	**0.109**	40.61	-20.23
836.52	CDMA850 (Open)	V	134	224	13.28	6.70	17.83	0.061	38.45	-20.62	19.98	0.100	40.61	-20.63
848.31	CDMA850 (Open)	V	224	351	13.10	6.70	17.65	0.058	38.45	-20.80	19.80	0.095	40.61	-20.81
824.70	CDMA850 (Open)	V	240	241	8.93	6.70	13.48	0.022	38.45	-24.97	15.63	0.037	40.61	-24.98
824.70	CDMA850 (Closed)	H	128	255	7.63	6.70	12.18	0.017	38.45	-26.27	14.33	0.027	40.61	-26.28
824.70	CDMA850 (WCP)	V	135	240	9.78	6.70	14.33	0.027	38.45	-24.12	16.48	0.044	40.61	-24.13
824.70	CDMA850 (Camera)	H	128	267	7.94	6.70	12.49	0.018	38.45	-25.96	14.64	0.029	40.61	-25.97

Table 7-3. ERP/EIRP (Cellular CDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
826.40	WCDMA850 (Open)	H	164	57	13.83	6.77	18.45	0.070	38.45	-20.00	20.60	0.115	40.61	-20.00
836.60	WCDMA850 (Open)	H	140	241	14.13	6.77	**18.75**	**0.075**	38.45	-19.70	**20.90**	**0.123**	40.61	-19.71
846.60	WCDMA850 (Open)	H	121	27	13.61	6.77	18.23	0.067	38.45	-20.22	20.38	0.109	40.61	-20.23
836.60	WCDMA850 (Closed)	V	241	255	12.75	6.77	17.37	0.055	38.45	-21.08	19.52	0.090	40.61	-21.09
836.60	WCDMA850 (Camera)	H	157	38	12.28	6.77	16.90	0.049	38.45	-21.55	19.05	0.080	40.61	-21.56
836.60	WCDMA850 (WCP)	H	220	251	12.23	6.77	16.85	0.048	38.45	-21.60	19.00	0.079	40.61	-21.61

Table 7-4. ERP/EIRP (Cellular WCDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700 (Open)	H	144	265	15.29	9.46	**24.75**	**0.299**	30.00	-5.25
1732.60	WCDMA1700 (Open)	H	250	281	15.15	9.34	24.49	0.281	30.00	-5.51
1752.60	WCDMA1700 (Open)	H	167	224	15.49	9.24	24.73	0.297	30.00	-5.27
1712.40	WCDMA1700 (Open)	V	134	54	15.12	9.46	24.58	0.287	30.00	-5.42
1712.40	WCDMA1700 (Closed)	H	133	142	14.69	9.46	**24.15**	**0.260**	30.00	-5.85
1712.40	WCDMA1700 (WCP)	V	140	154	12.27	9.46	**21.73**	**0.149**	30.00	-8.27
1712.40	WCDMA1700 (Camera)	V	227	35	12.31	9.46	21.77	0.150	30.00	-8.23

Table 7-5. EIRP (AWS WCDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900 (Open)	H	162	254	19.37	9.51	28.88	0.772	33.01	-4.13
1880.00	GPRS1900 (Open)	H	151	224	20.64	9.93	**30.57**	**1.139**	33.01	-2.44
1909.80	GPRS1900 (Open)	H	134	351	20.04	10.28	30.32	1.077	33.01	-2.69
1880.00	GPRS1900 (Open)	V	120	271	19.00	9.93	28.93	0.781	33.01	-4.08
1880.00	EDGE1900 (Open)	H	154	241	16.11	9.93	**26.04**	0.401	33.01	-6.97
1880.00	GPRS1900 (Closed)	H	124	255	18.72	9.93	28.65	0.732	33.01	-4.36
1880.00	GPRS1900 (WCP)	H	134	212	18.82	9.93	28.75	**0.749**	33.01	-4.26
1880.00	GPRS (Camera)	H	127	231	18.79	9.93	28.72	**0.744**	33.01	-4.29

Table 7-6. EIRP (PCS GPRS)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1851.25	CDMA1900 (Closed)	H	133	142	14.68	9.90	**24.58**	**0.287**	33.01	-8.43
1880.00	CDMA1900 (Closed)	H	120	184	14.54	9.90	24.44	0.278	33.01	-8.57
1908.75	CDMA1900 (Closed)	H	121	132	14.28	9.90	24.18	0.262	33.01	-8.83
1851.25	CDMA1900 (Closed)	V	134	154	11.69	9.90	21.59	0.144	33.01	-11.42
1851.25	CDMA1900 (Open)	H	132	161	13.60	9.90	23.50	0.224	33.01	-9.51
1851.25	CDMA1900 (WCP)	H	154	124	12.83	9.90	22.73	0.187	33.01	-10.28
1851.25	CDMA1900 (Camera)	H	134	133	14.45	9.90	24.35	0.272	33.01	-8.66

Table 7-7. EIRP (PCS CDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900 (Closed)	V	135	288	13.60	9.92	23.52	0.225	33.01	-9.49
1880.00	WCDMA1900 (Closed)	V	134	212	13.70	10.13	**23.83**	**0.242**	33.01	-9.18
1907.60	WCDMA1900 (Closed)	V	120	321	13.30	10.33	23.63	0.231	33.01	-9.38
1880.00	WCDMA1900 (Closed)	H	154	221	13.29	10.13	23.42	0.220	33.01	-9.59
1880.00	WCDMA1900 (WCP)	V	164	124	10.41	9.92	20.33	0.108	33.01	-12.68
1880.00	WCDMA1900 (Open)	H	121	142	11.82	10.13	21.95	0.157	33.01	-11.06
1880.00	WCDMA1900 (Camera)	V	134	134	13.41	10.13	23.54	0.226	33.01	-9.47

Table 7-8. EIRP (PCS WCDMA)

7.3 Radiated Spurious Emissions Measurements

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 horizontally 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 maximum power, and at the appropriate frequencies.

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 = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

Test Setup

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

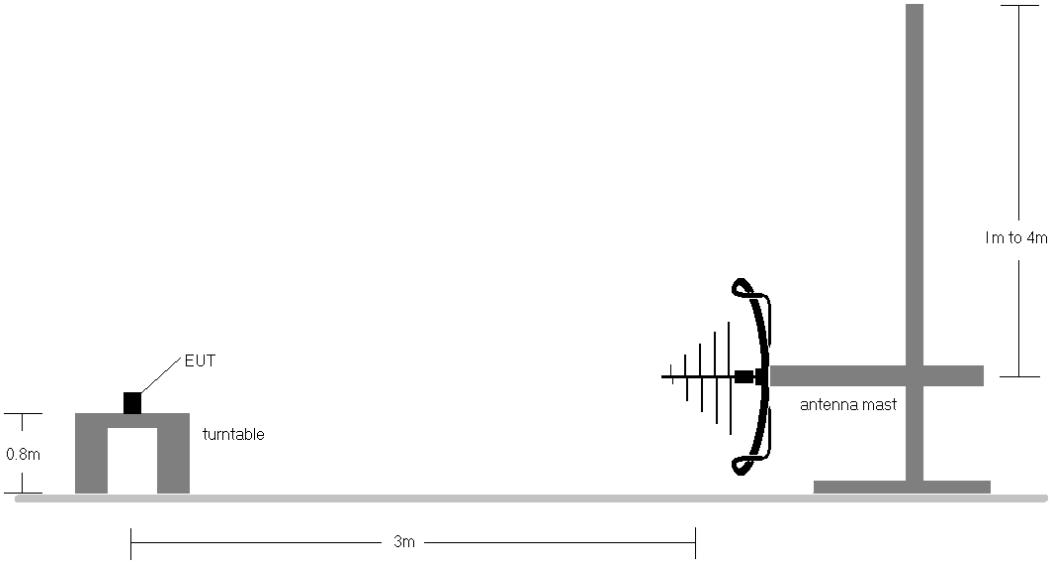


Figure 7-3. Test Instrument & Measurement Setup < 1GHz

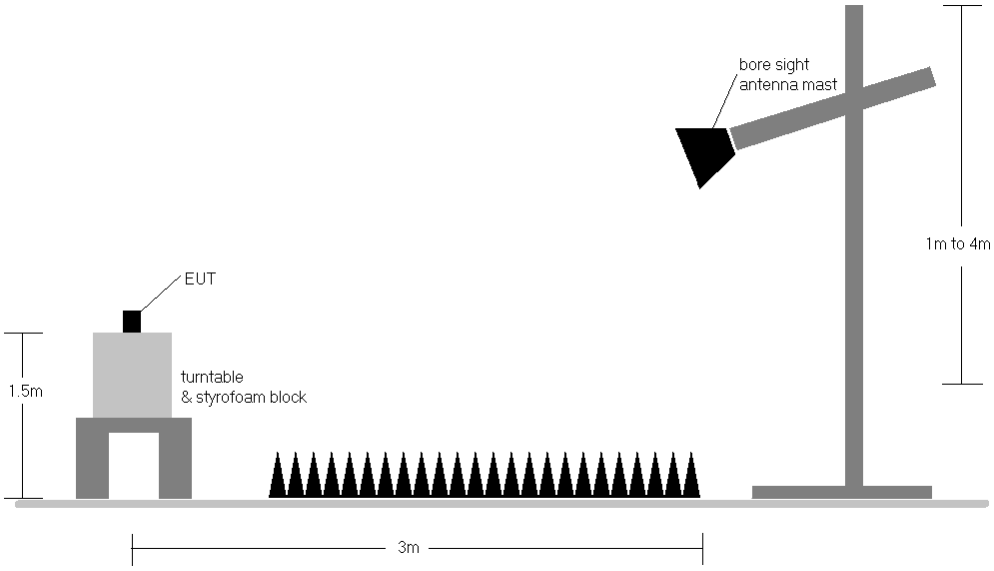


Figure 7-4. Test Instrument & Measurement Setup >1 GHz

Test Notes

1) This unit was tested with its standard battery.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

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.

Cellular GPRS Mode

OPERATING FREQUENCY:	836.60	MHz
CHANNEL:	190	
MODULATION SIGNAL:	GPRS (GMSK)	
DISTANCE:	3	meters
LIMIT:	-13	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]
1673.20	H	138	321	-63.75	3.88	-59.87	-46.9
2509.80	H	143	306	-42.71	4.48	-38.23	-25.2
3346.40	H	101	61	-61.91	6.03	-55.87	-42.9
4183.00	H	102	49	-64.46	7.90	-56.56	-43.6
5019.60	H	-	-	-65.01	8.83	-56.18	-43.2
5856.20	H	-	-	-63.57	8.92	-54.65	-41.7
6692.80	H	-	-	-61.97	8.90	-53.07	-40.1

Table 7-9. Radiated Spurious Data (Cellular GPRS Mode – Ch. 190)

OPERATING FREQUENCY:	836.60	MHz
CHANNEL:	190	
MODULATION SIGNAL:	GSM (GMSK)	
DISTANCE:	3	meters
LIMIT:	-13	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]
1673.20	H	140	320	-59.66	3.88	-55.78	-42.8
2509.80	H	132	221	-46.28	4.48	-41.80	-28.8
3346.40	H	141	124	-61.27	6.03	-55.24	-42.2
4183.00	H	134	221	-63.66	7.90	-55.76	-42.8

Table 7-10. Radiated Spurious Data with WCP (Cellular GPRS Mode – Ch. 190)

Cellular CDMA Mode

Mode:	CDMA
Channel:	384
Frequency (MHz):	836.52

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1673.04	H	242	303	-76.25	0.67	31.42	-63.84	-13.00	-50.84
2509.56	H	118	228	-76.31	5.01	35.70	-59.56	-13.00	-46.56
3346.08	H	-	-	-80.49	6.54	33.05	-62.21	-13.00	-49.21
4182.60	H	-	-	-81.12	8.35	34.23	-61.03	-13.00	-48.03

Table 7-11. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

Cellular WCDMA Mode

OPERATING FREQUENCY:	836.60	MHz
CHANNEL:	4183	
MODULATION SIGNAL:	WCDMA	
DISTANCE:	3	meters
LIMIT:	-13	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]
1673.20	V	-	-	-74.46	3.88	-70.58	-57.6
2509.80	V	100	39	-63.10	4.48	-58.62	-45.6
3346.40	V	-	-	-71.81	6.03	-65.77	-52.8
4183.00	V	-	-	-72.11	7.90	-64.21	-51.2
5019.60	V	-	-	-72.79	8.83	-63.96	-51.0

Table 7-12. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

AWS WCDMA Mode

OPERATING FREQUENCY:	1732.60	MHz
CHANNEL:	1413	
MODULATION SIGNAL:	WCDMA	
DISTANCE:	3	meters
LIMIT:	-13	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]
3465.20	H	-	-	-72.67	6.41	-66.26	-53.3
5197.80	H	-	-	-71.97	8.80	-63.17	-50.2
6930.40	H	-	-	-69.92	8.85	-61.06	-48.1
8663.00	H	-	-	-68.28	9.34	-58.94	-45.9

Table 7-13. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)

PCS GPRS Mode

OPERATING FREQUENCY:	1880.00	MHz
CHANNEL:	661	
MODULATION SIGNAL:	GPRS (GMSK)	
DISTANCE:	3	meters
LIMIT:	-13	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]
3760.00	V	100	41	-58.61	6.92	-51.69	-38.7
5640.00	V	111	31	-50.48	8.92	-41.56	-28.6
7520.00	V	101	110	-43.69	8.44	-35.25	-22.2
9400.00	V	-	-	-58.61	9.30	-49.31	-36.3
11280.00	V	-	-	-56.56	9.40	-47.16	-34.2
13160.00	V	-	-	-54.79	9.10	-45.69	-32.7

Table 7-14. Radiated Spurious Data (PCS GPRS Mode – Ch. 661)

PCS CDMA Mode

Mode:	CDMA
Channel:	600
Frequency (MHz):	1880

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3760.00	H	118	12	-78.74	7.91	36.17	-59.09	-13.00	-46.09
5640.00	H	107	324	-78.47	10.76	39.29	-55.97	-13.00	-42.97
7520.00	H	-	-	-83.42	15.34	38.92	-56.34	-13.00	-43.34

Table 7-15. Radiated Spurious Data (PCS CDMA Mode – Ch. 600)

PCS WCDMA Mode

OPERATING FREQUENCY:	1880.00	MHz
CHANNEL:	9400	
MODULATION SIGNAL:	WCDMA	
DISTANCE:	3	meters
LIMIT:	-13	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]
3760.00	H	130	345	-69.58	6.92	-62.66	-49.7
5640.00	H	145	347	-70.09	8.92	-61.17	-48.2
7520.00	H	160	333	-62.25	8.44	-53.81	-40.8
9400.00	H	-	-	-66.46	9.30	-57.16	-44.2
11280.00	H	-	-	-65.18	9.40	-55.78	-42.8
13160.00	H	-	-	-62.63	9.10	-53.53	-40.5

Table 7-16. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFF100TM** complies with all the requirements of Part of the FCC Rules.