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MEASUREMENT REPORT GSM / GPRS / EDGE / CDMA / WCDMA

Applicant Name:

LG Electronics USA, Inc. 1000 Sylvan Avenue Englewood Cliffs, NJ 07632 United States

Date of Testing: 11/26/2019 - 1/8/2020 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1911260200-02-R1.ZNF

ZNFL555DL

APPLICANT:

FCC ID:

LG Electronics USA, Inc.

Application Type: Model: Additional Model(s):	Class II Permissive Change LG L555DL LG-L555DL, LM-K500UM, LM-K500QM, LM-K500QM5, LM-K500QM6, LM-K500MM, LM-K500UL, LM-K500VPP, LGL555DL, LMK500UM, LMK500QM, LMK500QM5, LMK500QM6, LMK500MM, LMK500UL, LMK500VPP, L555DL, K500UM, K500QM, K500QM5, K500QM6, K500MM, K500UL, K500VPP
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
Class II Permissive Change:	Please see FCC change document
Original Grant Date:	12/13/2019

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: 1M1911260200-02-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.

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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			Ef	RP	El	RP
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)
GSM850	22H	824.2 - 848.8	0.518	27.14	0.849	29.29
EDGE850	22H	824.2 - 848.8	0.100	20.01	0.164	22.16
CDMA850	22H	824.70 - 848.31	0.061	17.87	0.100	20.02
WCDMA850	22H	826.4 - 846.6	0.064	18.05	0.105	20.20
WCDMA1700	27	1712.4 - 1752.6			0.272	24.34
GSM1900	24E	1850.2 - 1909.8			0.968	29.86
EDGE1900	24E	1850.2 - 1909.8			0.330	25.19
CDMA1900	24E	1851.25 - 1908.75			0.309	24.90
WCDMA1900	24E	1852.4 - 1907.6			0.292	24.66

EUT Overview

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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 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 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.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFL555DL**. 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.: 14677, 14669, 14693

2.2 Device Capabilities

This device contains the following capabilities:

850/850/1900 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 WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE)

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.

2.4 EMI Suppression Device(s)/Modifications

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

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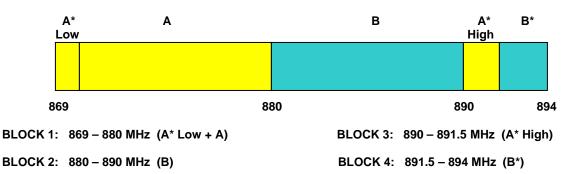
3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

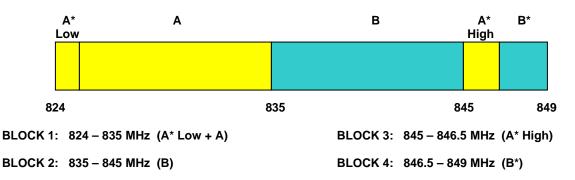
The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure.....None

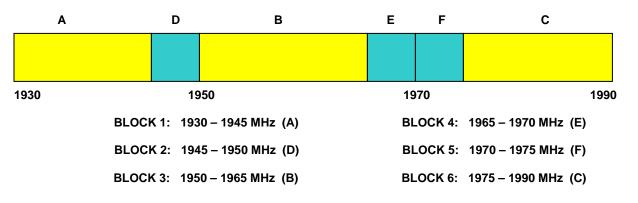
3.2 Cellular - Base Frequency Blocks



3.3 Cellular - Mobile Frequency Blocks



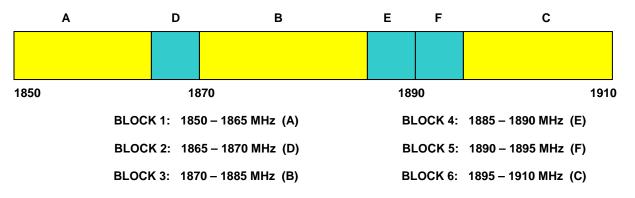
3.4 PCS - Base Frequency Blocks



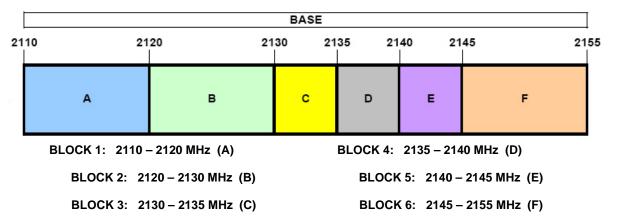
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3.5 PCS - Mobile Frequency Blocks



3.6 AWS - Base Frequency Blocks



3.7 AWS - Mobile Frequency Blocks

	MOBILE							
17	10	1	720 17 	730 17	'35 17 	40 17	45	1755
		A	в	с	D	E	F	
		BLOCK 1: 17	710 – 1720 MHz (A)		BLOCK	4: 1735 –	1740 MHz (D)	
		BLOCK 2: 17	720 – 1730 MHz (B)		BLOCK	5: 1740 –	1745 MHz (E)	
		BLOCK 3: 17	730 – 1735 MHz (C)		BLOCK	6: 1745 –	1755 MHz (F)	

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3.8 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:

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

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.

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4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement 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

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5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer Model		Model Description		Cal Interval	Cal Due	Serial Number
Agilent	N9020A	MXA Signal Analyzer	4/20/2019	Annual	4/20/2020	US46470561
Agilent	E5515C	Wireless Communications Test Set		N/A		GB45360985
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
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	3164-08	Quad Ridge Horn Antenna	Quad Ridge Horn Antenna 2/22/2019		2/22/2021	128338
Rohde & Schwarz	CMU200	Base Station Simulator		N/A		107826
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	1/31/2019	Annual	1/31/2020	100040
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz FSW67 Rohde & Schwarz SFUNIT-Rx		Signal / Spectrum Analyzer	5/6/2019	Annual	5/6/2020	103200
		Shielded Filter Unit	7/11/2019	Annual	7/11/2020	102134
Seekonk	NC-100	Torque Wrench (8" lb)	5/10/2018	Biennial	5/10/2020	N/A

Table 5-1. Test Equipment

Note:

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

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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.

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7.0 TEST RESULTS

7.1 Summary

Company Name:	LG Electronics USA, Inc.
FCC ID:	ZNFL555DL
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM / GPRS / EDGE / CDMA / WCDMA</u>

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		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	RADIATED	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

Note:

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

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7.2 Radiated Power (ERP/EIRP)

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 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

- 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 \ge 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". 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

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Test Setup

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

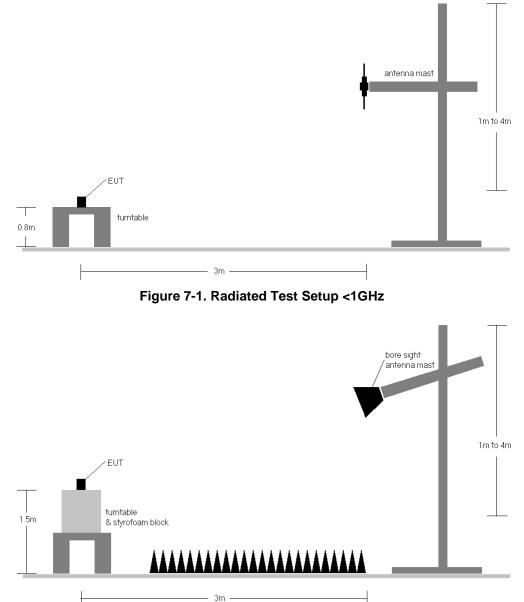


Figure 7-2. Radiated Test Setup >1GHz

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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), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This device 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	GSM850	V	135	256	22.37	6.30	26.52	0.449	38.45	-11.93	28.67	0.736	40.61	-11.94
836.60	GSM850	V	131	251	22.89	6.40	27.14	0.518	38.45	-11.31	29.29	0.849	40.61	-11.32
848.80	GSM850	V	146	253	22.30	6.50	26.65	0.462	38.45	-11.80	28.80	0.759	40.61	-11.81
836.60	GSM850	н	101	295	20.62	6.70	25.17	0.329	38.45	-13.28	27.32	0.540	40.61	-13.29
836.60	EDGE850	V	131	251	15.76	6.40	20.01	0.100	38.45	-18.44	22.16	0.164	40.61	-18.45

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

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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	V	133	275	13.45	6.30	17.60	0.058	38.45	-20.85	19.75	0.094	40.61	-20.86
836.52	CDMA850	V	133	271	13.06	6.40	17.31	0.054	38.45	-21.14	19.46	0.088	40.61	-21.15
848.31	CDMA850	V	144	267	13.52	6.50	17.87	0.061	38.45	-20.58	20.02	0.100	40.61	-20.59
848.31	CDMA850	н	211	287	13.23	6.70	17.78	0.060	38.45	-20.67	19.93	0.098	40.61	-20.68

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

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
826.40	WCDMA850	V	136	258	13.90	6.30	18.05	0.064	38.45	-20.40	20.20	0.105	40.61	-20.41
836.60	WCDMA850	V	139	269	12.85	6.40	17.10	0.051	38.45	-21.35	19.25	0.084	40.61	-21.36
846.60	WCDMA850	V	144	263	13.25	6.50	17.60	0.058	38.45	-20.85	19.75	0.094	40.61	-20.86
826.40	WCDMA850	н	221	292	13.35	6.70	17.90	0.062	38.45	-20.55	20.05	0.101	40.61	-20.56

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	н	141	17	14.91	9.43	24.34	0.272	30.00	-5.66
1732.60	WCDMA1700	н	141	23	14.35	9.31	23.66	0.232	30.00	-6.34
1752.60	WCDMA1700	н	139	23	14.29	9.21	23.50	0.224	30.00	-6.50
1712.40	WCDMA1700	V	142	81	13.97	9.34	23.31	0.214	30.00	-6.69

1712.40	WCDMA1700	V	142	81	13.97	9.34	23.31	0.214	30.00	-6.69
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	GSM1900	Н	158	23	19.89	9.48	29.37	0.864	33.01	-3.64

Frequency [MHz]	Mode	Pol. [H/V]	Height [cm]	Azimuth [degree]	Level [dBm]	Gain [dBi]	EIRP [dBm]	EIRP [Watts]	Limit [dBm]	Margin [dB]
1850.20	GSM1900	Н	158	23	19.89	9.48	29.37	0.864	33.01	-3.64
1880.00	GSM1900	Н	147	19	19.96	9.90	29.86	0.968	33.01	-3.15
1909.80	GSM1900	н	147	9	19.19	10.26	29.45	0.880	33.01	-3.56
1880.00	GSM1900	V	107	80	19.74	9.90	29.64	0.920	33.01	-3.37
1880.00	EDGE1900	Н	147	19	15.29	9.90	25.19	0.330	33.01	-7.82

Table 7-6. EIRP (PCS GSM)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
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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	н	123	32	15.23	9.49	24.72	0.297	33.01	-8.29
1880.00	CDMA1900	н	115	18	15.00	9.90	24.90	0.309	33.01	-8.11
1908.75	CDMA1900	н	155	9	13.03	10.25	23.28	0.213	33.01	-9.73
1880.00	CDMA1900	V	144	95	14.37	10.10	24.47	0.280	33.01	-8.54

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	н	123	20	15.06	9.51	24.57	0.286	33.01	-8.44
1880.00	WCDMA1900	н	153	31	14.76	9.90	24.66	0.292	33.01	-8.35
1907.60	WCDMA1900	н	155	17	13.30	10.24	23.54	0.226	33.01	-9.47
1880.00	WCDMA1900	V	133	97	14.01	10.10	24.11	0.258	33.01	-8.90

Table 7-8. EIRP (PCS WCDMA)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
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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 \geq 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

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

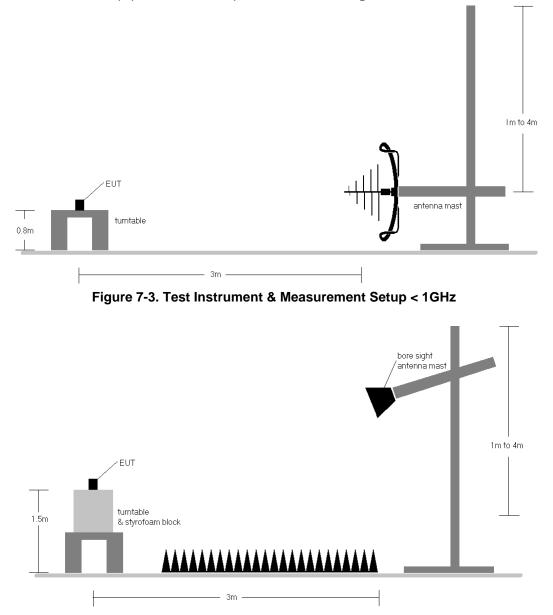


Figure 7-4. Test Instrument & Measurement Setup >1 GHz

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), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."

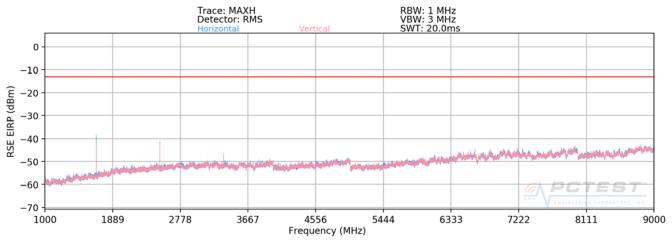
FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	Approved by: Quality Manager	
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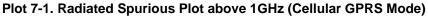


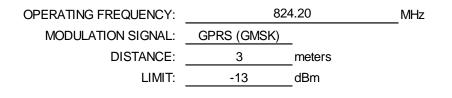
- 3) This device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 6) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 7) 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.
- 8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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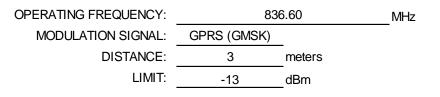


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1648.40	Н	158	22	-40.17	3.61	-36.57	-23.6
2472.60	Н	371	187	-46.41	4.21	-42.20	-29.2
3296.80	Н	166	92	-57.31	5.77	-51.54	-38.5
4121.00	Н	-	-	-66.64	7.59	-59.05	-46.0

Table 7-9. Radiated Spurious Data (Cellular GPRS Mode – Ch. 128)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager	
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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	Н	147	22	-41.79	3.62	-38.17	-25.2
2509.80	Н	326	158	-44.64	4.34	-40.30	-27.3
3346.40	Н	109	131	-59.95	5.92	-54.03	-41.0
4183.00	Н	193	187	-63.07	7.70	-55.37	-42.4
5019.60	Н	-	-	-67.25	8.56	-58.69	-45.7

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

OPERATING FREQUENCY:

MODULATION SIGNAL:					
DISTANCE:					

JENCY:	84	MHz	
IGNAL:	GPRS (GMSK)	_	
TANCE:	3	meters	
LIMIT:	-13	dBm	

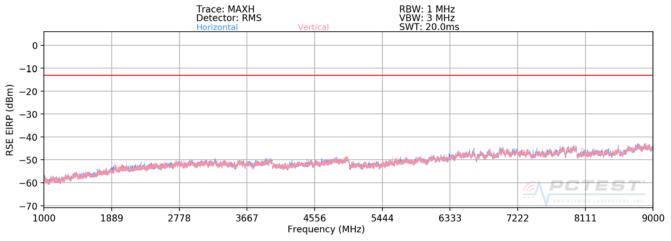
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1697.60	Н	194	23	-41.15	3.63	-37.52	-24.5
2546.40	Н	180	145	-45.57	4.56	-41.02	-28.0
3395.20	Н	165	116	-57.32	6.14	-51.19	-38.2
4244.00	Н	-	-	-65.92	7.80	-58.12	-45.1

Table 7-11. Radiated Spurious Data (Cellular GPRS Mode – Ch. 251)

FCC ID: ZNFL555DL	<u> PCTEST</u>	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕑 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 25
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Cellular CDMA Mode

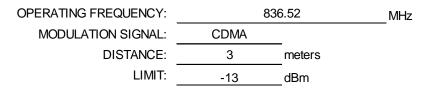




OPERATING FREQUENCY:		824.70	MHz
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]
1649.40	Н	-	-	-66.80	3.61	-63.19	-50.2
2474.10	Н	-	-	-63.68	4.22	-59.46	-46.5

Table 7-12. Radiated Spurious Data (Cellular CDMA Mode - Ch. 1013)



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]
1673.04	Н	-	-	-67.64	3.62	-64.02	-51.0
2509.56	Н	-	-	-64.71	4.33	-60.38	-47.4

Table 7-13. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 25	
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OPERATING FREQUENCY:	84	8.31	MHz
MODULATION SIGNAL:	CDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

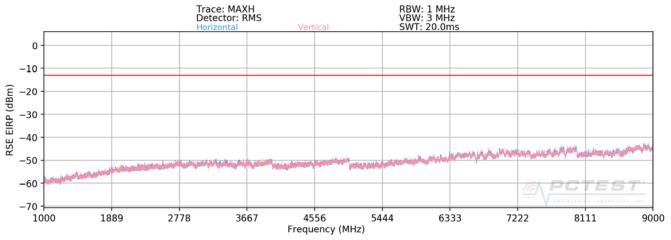
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1696.62	H	-	-	-66.50	3.63	-62.87	-49.9
2544.93	Н	-	-	-63.80	4.55	-59.25	-46.3

Table 7-14. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 25
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Cellular WCDMA Mode

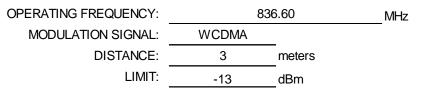




826	6.40	MHz
WCDMA	_	
3	meters	
-13	dBm	
	WCDMA 3	<u> </u>

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]
1652.80	Н	-	-	-69.41	3.61	-65.80	-52.8
2479.20	Н	-	-	-67.07	4.23	-62.84	-49.8

Table 7-15. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

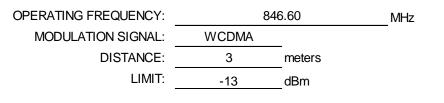


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.20	Н	-	-	-69.44	3.62	-65.82	-52.8
2509.80	Н	-	-	-66.89	4.34	-62.55	-49.6

Table 7-16. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
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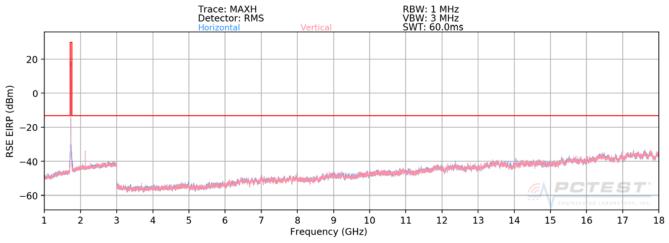


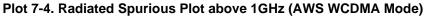
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.20	Н	-	-	-69.04	3.63	-65.42	-52.4
2539.80	Н	-	-	-66.88	4.52	-62.37	-49.4

Table 7-17. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	171	2.40	MHz
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]	Antenna Gain	Spurious Emission Level [dBm]	Margin [dB]
3424.80	V	-	-	-74.22	9.83	-64.39	-51.4
5137.20	V	-	-	-73.53	10.69	-62.84	-49.8

 Table 7-18. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1312)

OPERATING FREQUENCY:	173	2.60	MHz
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]	Antenna Gain	Spurious Emission Level [dBm]	Margin [dB]
3465.20	V	-	-	-75.18	9.88	-65.30	-52.3
5197.80	V	-	-	-73.87	10.76	-63.12	-50.1

Table 7-19. Radiated Spurious Data (AWS WCDMA Mode - Ch. 1413)

FCC ID: ZNFL555DL	<u> PCTEST</u>	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
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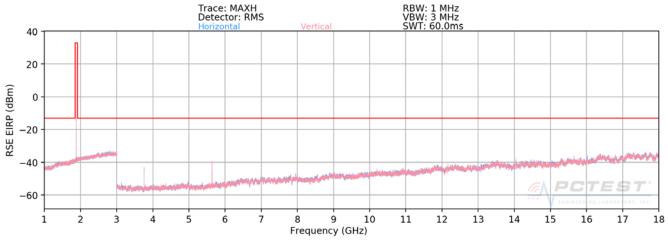
OPERATING FREQUENCY:	175	MHz	
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Antenna Gain	Spurious Emission Level [dBm]	Margin [dB]
3505.20	V	-	-	-74.40	9.92	-64.48	-51.5
5257.80	V	-	-	-73.45	10.72	-62.74	-49.7

Table 7-20. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
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Plot 7-5. Radiated Spurious Plot above 1GHz (PCS GPRS Mode)

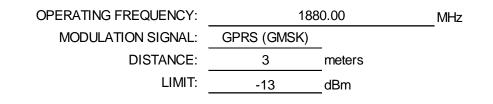
OPERATING FREQUENCY:	185	60.20	MHz
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]
3700.40	V	138	48	-44.95	6.56	-38.39	-25.4
5550.60	V	115	56	-48.21	8.72	-39.49	-26.5
7400.80	V	139	253	-61.40	8.41	-52.99	-40.0
9251.00	V	-	-	-62.20	9.47	-52.74	-39.7
11101.20	V	-	-	-59.16	9.31	-49.85	-36.9

Table 7-21. Radiated Spurious Data (PCS GPRS Mode – Ch. 512)

FCC ID: ZNFL555DL	<u> PCTEST</u>	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager	
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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	109	130	-48.70	6.67	-42.03	-29.0
5640.00	V	104	33	-52.03	8.81	-43.22	-30.2
7520.00	V	380	187	-58.44	8.48	-49.96	-37.0
9400.00	V	107	146	-58.58	9.32	-49.26	-36.3
11280.00	V	-	-	-59.37	9.24	-50.14	-37.1
13160.00	V	-	-	-56.45	9.07	-47.38	-34.4

Table 7-22. Radiated Spurious Data (PCS GPRS Mode - Ch. 661)

1909.80

MHz

OPERATING FREQUENCY:

MODULATION SIGNAL:

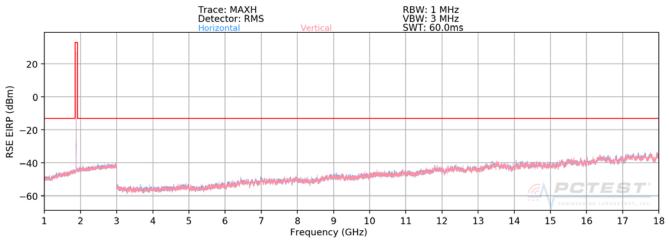
ON SIGNAL: <u>GPRS (GMSK)</u> DISTANCE: <u>3</u> meters LIMIT: -13 dBm

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]
3819.60	V	101	57	-49.06	7.00	-42.07	-29.1
5729.40	V	306	341	-53.01	8.77	-44.24	-31.2
7639.20	V	-	-	-61.89	8.54	-53.35	-40.4
9549.00	V	107	331	-60.69	9.43	-51.26	-38.3
11458.80	V	-	-	-59.30	9.17	-50.13	-37.1
13368.60	V	-	-	-56.62	8.85	-47.77	-34.8

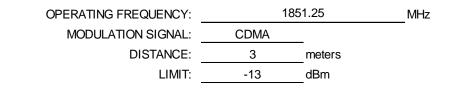
Table 7-23. Radiated Spurious Data (PCS GPRS Mode – Ch. 810)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕑 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 25
1M1911260200-02-R1.ZNF	11/26/2019 - 1/8/2020	2019 - 1/8/2020 Portable Handset		Page 30 of 35
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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]
3702.50	V	-	-	-65.75	6.56	-59.18	-46.2
5553.75	V	-	-	-64.56	8.72	-55.84	-42.8

Table 7-24. Radiated Spurious Data (PCS CDMA Mode - Ch. 25)

OPERATING FREQUENCY:	188	30.00	MHz
MODULATION SIGNAL:	CDMA	_	
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	-	-	-65.03	6.67	-58.36	-45.4
5640.00	V	-	-	-65.16	8.81	-56.35	-43.3

Table 7-25. Radiated Spurious Data (PCS CDMA Mode - Ch. 600)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 25	
1M1911260200-02-R1.ZNF	11/26/2019 - 1/8/2020	019 - 1/8/2020 Portable Handset		Page 31 of 35	
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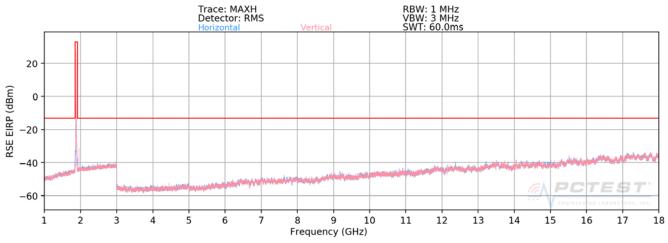
OPERATING FREQUENCY:	190	08.75	MHz
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

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]
3817.50	V	-	-	-66.22	6.98	-59.23	-46.2
5726.25	V	-	-	-64.92	8.77	-56.15	-43.2

Table 7-26. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 22 of 25
1M1911260200-02-R1.ZNF	11/26/2019 - 1/8/2020	Portable Handset		Page 32 of 35
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Plot 7-7. Radiated Spurious Plot above 1GHz (PCS WCDMA Mode)

OPERATING FREQUENCY:	185	52.40	MHz
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]
3704.80	V	-	-	-68.68	6.57	-62.11	-49.1
5557.20	V	-	-	-67.37	8.72	-58.65	-45.7

Table 7-27. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

OPERATING FREQUENCY:	188	30.00	MHz
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	V	-	-	-67.76	6.67	-61.09	-48.1
5640.00	V	-	-	-67.79	8.81	-58.98	-46.0
						Oh 0400)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

Table 7-28. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 25	
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OPERATING FREQUENCY:	190	MHz	
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]
3815.20	V	-	-	-68.95	6.97	-61.98	-49.0
5722.80	V	-	-	-67.57	8.77	-58.80	-45.8

Table 7-29. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

FCC ID: ZNFL555DL	PCTEST	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 25
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the LG Portable Handset FCC ID: ZNFL555DL complies with all the requirements of Part 22, 24, & 27 of the FCC Rules.

FCC ID: ZNFL555DL	<u>«</u> <i>PCTEST</i>	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	💽 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 35 of 35
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