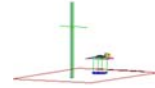




PCTEST ENGINEERING LABORATORY, INC.

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MEASUREMENT REPORT FCC PART 15.407 (UNII)

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

Date of Testing:
7/26/2013
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1307031179.ZNF

FCC ID:	ZNFLS980
APPLICANT:	LG Electronics MobileComm U.S.A

Application Type: Class II Permissive Change
Model(s): LS-980, LGLS980
EUT Type: Portable Handset
FCC Classification: Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s): Part 15.407 (UNII Band 1-4), 15.247 (UNII Band 4, 802.11ac)
Test Procedure(s): KDB 789033 v01r03, 644545 D02 Alternative Guidance for 802.11ac v01.
Class II Permissive Change: Please see FCC change documents.
Original Grant Date: 7/23/2013

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 KDB 789033 v01r03 and KDB 644545 v01r01. Test results reported herein relate only to the item(s) tested.

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


 Randy Ortanez
 President







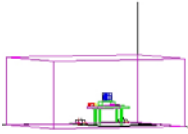
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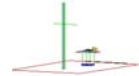
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MEASUREMENT REPORT

FCC Part 15.407



§ 2.1033 General Information

APPLICANT: LG Electronics MobileComm U.S.A

APPLICANT ADDRESS: 1000 Sylvan Avenue
Englewood Cliffs, NJ 07632, United States

TEST SITE: PCTEST ENGINEERING LABORATORY, INC.

TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA

FCC RULE PART(S): Part 15.407

IC SPECIFICATION(S): RSS-210 Issue 8

MODEL NAME: LS-980

FCC ID: ZNFLS980

Test Device Serial No.: BT_WIIFI Radiated Production Pre-Production Engineering

FCC CLASSIFICATION: Unlicensed National Information Infrastructure (UNII)

DATE(S) OF TEST: 7/26/2013



TEST REPORT S/N: 0Y1307031179.ZNF

Test Facility / Accreditations

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

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.



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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 Industry Canada Certification and Engineering Bureau.

1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern'tl (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on January 10, 2012.

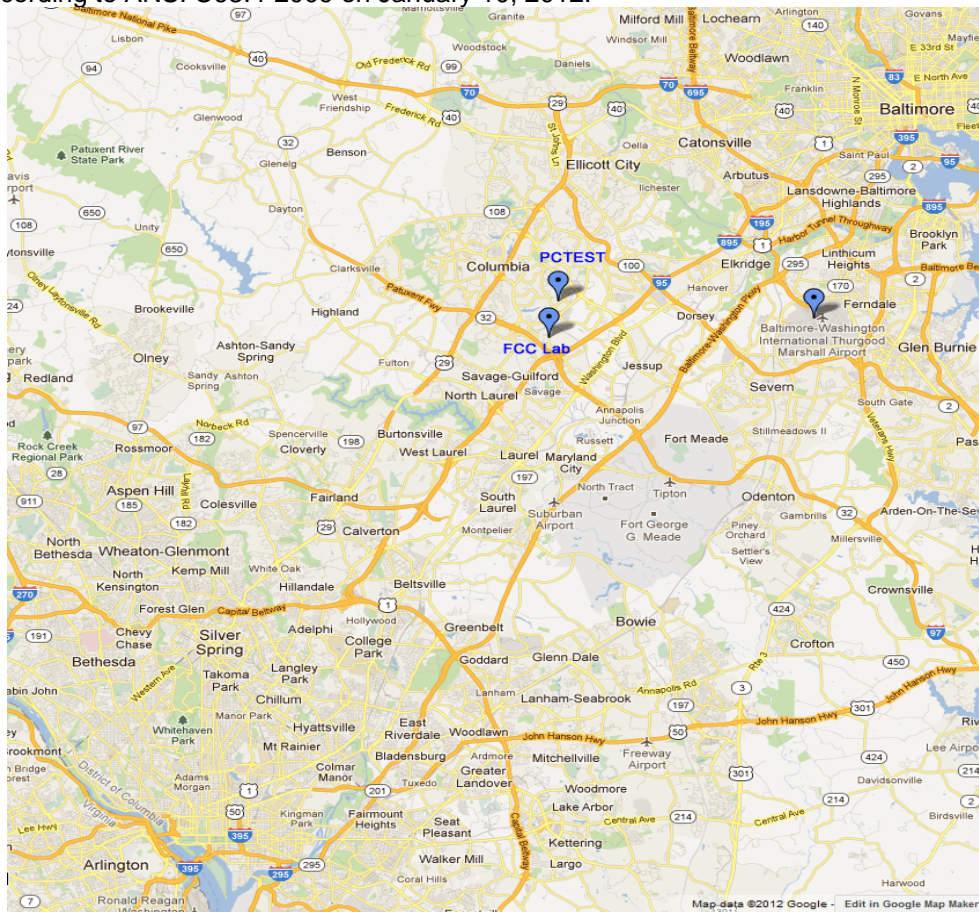




Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFLS980**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO Rev0/A (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Band 25 (3,5,10MHz), 26 (1.4,3,5,10 MHz), 41 (10,15,20 MHz) LTE, 802.11a/b/g/n/ac WLAN (DTS/NII), Bluetooth (1x,EDR, LE), NFC

Note: 5GHz WLAN (DTS/NII) operation is possible in 20MHz, 40MHz, and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) of KDB 789033. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

- 802.11a/n 20MHz Bandwidth – 95.7%
- 802.11n 40MHz Bandwidth – 90.8%
- 802.11ac 80MHz Bandwidth – 81.4%

2.3 Test Configuration

The LG Portable Handset FCC ID: ZNFLS980 was tested per the guidance of KDB 789033. ANSI C63.10-2009 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. U-NII procedures and limits were applied for operations in the frequency band from 5.725-5.850 GHz in accordance with KDB 644545 D02 v01 to demonstrate compliance with 15.247 requirements. See Sections 3.2, 3.3, and 6.1 of this test report for a description of the AC line conducted emissions, radiated emissions, and antenna port conducted emissions test setups, respectively.



2.4 EMI Suppression Device(s)/Modifications

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

2.5 Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.



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3.0 DESCRIPTION OF TEST

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009) and the guidance provided in KDB 789033 v01r03 were used in the measurement of **LG Portable Handset FCC ID: ZNFLS980**.

Deviation from measurement procedure.....None

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3.2 Radiated Emissions

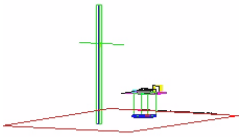


Figure 3-1. 3-Meter Test Site

The radiated test facilities consisted of an indoor semi-anechoic chamber used for exploratory measurements and an open area test site (OATS) used for final measurements. For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies higher than the upper frequency range of the broadband antenna used for testing, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used.

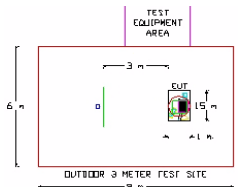


Figure 3-2. Dimensions of Outdoor Test Site

Exploratory measurements were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of a 0.8 meter high non-metallic 1 x 1.5 meter table (see Figure 3-3). The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth, and receive antenna height was noted for each frequency found. To record the exploratory measurements, the analyzers' detector function was set to peak mode and the bandwidth was set to 100kHz.

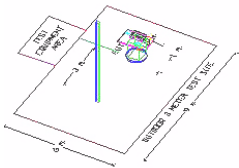


Figure 3-3. Turntable and System Setup

Final measurements were made on the OATS at 3 meter test range using calibrated, linearly polarized broadband or horn antennas (see Figure 3-1). The measurement area is situated on an 18 meter x 20 meter galvanized 1/2" hardware cloth as the conducting ground plane. This material is sewn together in sections 4 feet wide and 60 feet long. A total of eighteen sections are required to cover the entire measurement area. Sections are laid across the width of the pad, overlapped 1" and sewn and soldered together at intervals of 3" (7.6 cm.) The terrain of the test site is reasonably flat and level. Power and cable to the test site are buried 18" deep into the ground outside the perimeter of the site. An all-weather non-metallic housing is situated on a 2 x 3 meter area adjacent to the measurement area to house the test equipment (see Figure 3-2). The test set-up was again placed on top of the same a 0.8 meter high non-metallic 1 x 1.5 meter table on the OATS as used for exploratory measurements in the indoor chamber. The test set-up was re-configured to the same setup that was previously determined through exploratory measurements to have produced the worst case emissions. The spectrum analyzer was set to the frequencies found to have caused the highest radiated disturbances with respect to the limit during preliminary radiated measurements. The turntable containing the system was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. For the EUT positioning, "H" is defined with the EUT lying flat on the test surface, "H2" is defined with the EUT standing up on its side, and "V" is defined with the EUT standing upright. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3-4.

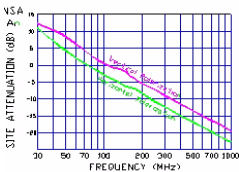


Figure 3-4. Normalized Site Attenuation Curves (H&V)

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4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antennas of the Portable Handset are **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The **LG Portable Handset FCC ID: ZNFLS980** unit complies with the requirement of §15.203.

Band 1		Band 2		Band 3		Band 4	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
36	5180	52	5260	100	5500	149	5745
:	:	:	:	:	:	:	:
42	5210	56	5280	116	5580	157	5785
:	:	:	:	:	:	:	:
48	5240	64	5320	144	5720	165	5825

Table 4-1. 802.11a / 802.11n (20MHz) Frequency / Channel Operations

Band 1		Band 2		Band 3		Band 4	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
38	5190	54	5270	102	5510	151	5755
:	:	:	:	:	:	:	:
46	5230	62	5310	110	5550	159	5795
				:	:		
				142	5710		

Table 4-2. 802.11n (40MHz BW) Frequency / Channel Operations

Band 1		Band 2		Band 3		Band 4	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
42	5210	58	5290	106	5530	155	5755

Table 4-3. 802.11ac (80MHz BW) Frequency / Channel Operations

5.0 TEST EQUIPMENT CALIBRATION DATA



Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	3/29/2013	Annual	3/29/2014	N/A
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	4/17/2013	Annual	4/17/2014	3008A00985
Agilent	N9038A	MXE EMI Receiver	12/8/2012	Annual	12/8/2013	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	1/11/2013	Annual	1/11/2014	MY52350166
Agilent	N9020A	MXA Signal Analyzer	10/9/2012	Annual	10/9/2013	US46470561
Anritsu	MA2411B	Pulse Sensor	9/19/2012	Annual	9/19/2013	1027293
Anritsu	ML2495A	Power Meter	10/11/2012	Annual	10/11/2013	1039008
Emco	3116	Horn Antenna (18 - 40GHz)	1/20/2012	Triennial	1/20/2015	9203-2178
Emco	3816/2	LISN	2/12/2013	Biennial	2/12/2015	9707-1077
Huber+Suhner	Sucoflex 102A	40GHz Radiated Cable	3/1/2013	Annual	3/1/2014	251425001
Mini-Circuits	VHF-3100+	High Pass Filter	1/21/2013	Annual	1/21/2014	31144
Mini-Circuits	VHF-8400+	3.4GHz - 9.9GHz High Pass Filter	1/17/2013	Annual	1/17/2014	31048
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	5/31/2013	Annual	5/31/2014	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/31/2013	Annual	5/31/2014	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	6/6/2012	Biennial	6/6/2014	100037
Sunol	DRH-118	Horn Antenna (1-18 GHz)	6/19/2013	Biennial	6/19/2015	A042511

Table 5-1. Annual Test Equipment Calibration Schedule

Note:

For equipment listed above that has a calibration due date that falls within the test date range, care was taken to ensure that this equipment was utilized prior to the calibration due date.

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6.0 TEST RESULTS

6.1 Summary



Company Name: LG Electronics MobileComm U.S.A
 FCC ID: ZNFLS980
 Method/System: Unlicensed National Information Infrastructure (UNII)
 Data Rate(s) Tested: 6, 9, 12, 18, 24, 36, 48, 54Mbps (802.11a)
6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2 (n – 20MHz)
13.5/15, 27/30, 40.5/45, 54/60, 81/90, 108/120, 121.5/135, 135/150 (n – 40MHz BW)
29.3/32.5Mbps, 58.5/65Mbps, 87.8/97.5Mbps, 117/130Mbps, 175.5/195Mbps,
234/260Mbps, 263.3/292.5Mbps, 292.5/325Mbps, 351/390Mbps, 390/433.3Mbps
(ac – 80MHz BW)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)						
15.407(b)(1), (2),(3)	RSS-210 [A9.2]	Undesirable Emissions	< -27 dBm/MHz EIRP (5150-5350MHz, 5470-5725MHz)	RADIATED	PASS	Section 6.2
15.205, 15.407(b)(1), (5), (6)	RSS-Gen [7.2.3.2]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-210 table 3 limits)		PASS	Section 6.3, 6.4, 6.5

Table 6-1. Summary of Test Results

Notes:

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.

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6.2 Radiated Spurious Emission Measurements

§15.407(b)(1), (6), §15.205, §15.209; RSS-210 [A9.2]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle (>98%), at its maximum power control level, as defined in KDB 789033 v01r03, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20/40 MHz BW), and 802.11ac (20/40/80 MHz BW)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-2 per Section 15.209.

Frequency	Field Strength [μ V/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 6-2. Radiated Limits

Test Procedures Used



KDB 789033 v01r03 – Section H

KDB 644545 D02 v01

Test Settings

Average Measurements above 1GHz (Method AD)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span/RBW}$)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

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Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Test Setup

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

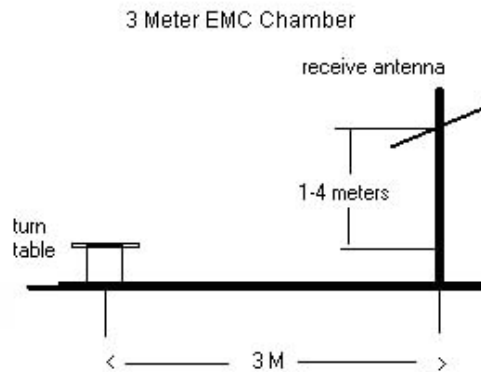




Figure 6-1. Test Instrument & Measurement Setup

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Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 v01r03 Section H.
2. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-11. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dB μ V/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dB μ V/m.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
6. 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.
7. Average levels at -135dBm and peak levels at -125dBm represent the analyzer noise floor and signify that no emission was detected.

Sample Calculations



Determining Spurious Emissions Levels

- Field Strength Level $_{[dB\mu V/m]} = \text{Analyzer Level }_{[dBm]} + 107 + \text{AFCL }_{[dB/m]}$
- $\text{AFCL }_{[dB/m]} = \text{Antenna Factor }_{[dB/m]} + \text{Cable Loss }_{[dB]}$
- $\text{Margin }_{[dB]} = \text{Field Strength Level }_{[dB\mu V/m]} - \text{Limit }_{[dB\mu V/m]}$

Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 6.8 was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + 10 \text{ dB Attenuator}) - \text{Pre-amplifier Gain}$$

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Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5180MHz
 Channel: 36

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10360.00	-99.75	Peak	H	55.49	-9.54	53.20	68.20	-15.00
* 15540.00	-135.00	Average	H	58.14	0.00	30.14	53.98	-23.84
* 15540.00	-125.00	Peak	H	58.14	0.00	40.14	73.98	-33.84
* 20720.00	-108.34	Average	H	44.04	-9.54	33.15	53.98	-20.83
* 20720.00	-100.50	Peak	H	44.04	-9.54	41.00	73.98	-32.98
25900.00	-125.00	Peak	H	44.84	0.00	26.84	68.20	-41.36

Table 6-3. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5200MHz
 Channel: 40

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10400.00	-99.14	Peak	H	55.75	-9.54	54.07	68.20	-14.13
* 15600.00	-135.00	Average	H	57.97	0.00	29.97	53.98	-24.01
* 15600.00	-125.00	Peak	H	57.97	0.00	39.97	73.98	-34.01
* 20800.00	-108.26	Average	H	44.03	-9.54	33.23	53.98	-20.75
* 20800.00	-100.40	Peak	H	44.03	-9.54	41.09	73.98	-32.89
26000.00	-125.00	Peak	H	44.96	0.00	26.96	68.20	-41.24

Table 6-4. Radiated Measurements

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5240MHz
 Channel: 48

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10480.00	-98.63	Peak	H	56.26	-9.54	55.09	68.20	-13.11
* 15720.00	-135.00	Average	H	57.76	0.00	29.76	53.98	-24.22
* 15720.00	-125.00	Peak	H	57.76	0.00	39.76	73.98	-34.22
* 20960.00	-109.72	Average	H	44.00	-9.54	31.74	53.98	-22.24
* 20960.00	-102.80	Peak	H	44.00	-9.54	38.66	73.98	-35.32
26200.00	-125.00	Peak	H	44.75	0.00	26.75	68.20	-41.45

Table 6-5. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5260MHz
 Channel: 52

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10520.00	-100.13	Peak	H	55.57	-9.54	52.89	68.20	-15.31
* 15780.00	-135.00	Average	H	57.44	0.00	29.44	53.98	-24.54
* 15780.00	-125.00	Peak	H	57.44	0.00	39.44	73.98	-34.54
* 21040.00	-109.78	Average	H	43.95	-9.54	31.63	53.98	-22.35
* 21040.00	-101.31	Peak	H	43.95	-9.54	40.10	73.98	-33.88
26300.00	-125.00	Peak	H	236.06	0.00	218.06	68.20	149.86

Table 6-6. Radiated Measurements

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5280MHz
 Channel: 56



Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10560.00	-100.45	Peak	H	55.80	-9.54	52.81	68.20	-15.39
* 15840.00	-135.00	Average	H	57.41	0.00	29.41	53.98	-24.57
* 15840.00	-125.00	Peak	H	57.41	0.00	39.41	73.98	-34.57
* 21120.00	-108.57	Average	H	43.83	-9.54	32.72	53.98	-21.26
* 21120.00	-101.47	Peak	H	43.83	-9.54	39.82	73.98	-34.16
26400.00	-125.00	Peak	H	44.72	0.00	26.72	68.20	-41.48

Table 6-7. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5320MHz
 Channel: 64

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 10640.00	-110.42	Average	H	56.24	-9.54	43.27	53.98	-10.71
* 10640.00	-100.42	Peak	H	56.24	-9.54	53.28	73.98	-20.70
* 15960.00	-135.00	Average	H	57.26	0.00	29.26	53.98	-24.72
* 15960.00	-125.00	Peak	H	57.26	0.00	39.26	73.98	-34.72
* 21280.00	-109.61	Average	H	43.71	-9.54	31.56	53.98	-22.42
* 21280.00	-100.45	Peak	H	43.71	-9.54	40.72	73.98	-33.26
26600.00	-125.00	Peak	H	47.29	0.00	29.29	68.20	-38.91

Table 6-8. Radiated Measurements

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Radiated Spurious Emission Measurements (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5500MHz
 Channel: 100

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11000.00	-111.38	Average	H	55.68	-9.54	41.77	53.98	-12.21
* 11000.00	-100.66	Peak	H	55.68	-9.54	52.48	73.98	-21.50
16500.00	-125.00	Peak	H	57.03	0.00	39.03	68.20	-29.17
22000.00	-99.14	Peak	H	43.95	-9.54	42.27	68.20	-25.93
27500.00	-125.00	Peak	H	48.50	0.00	30.50	68.20	-37.70

Table 6-9. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5580MHz
 Channel: 116

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11160.00	-110.48	Average	H	56.06	-9.54	43.04	53.98	-10.94
* 11160.00	-99.99	Peak	H	56.06	-9.54	53.53	73.98	-20.45
16740.00	-125.00	Peak	H	57.32	0.00	39.32	68.20	-28.88
* 22320.00	-107.15	Average	H	44.47	-9.54	34.78	53.98	-19.20
* 22320.00	-99.82	Peak	H	44.47	-9.54	42.12	73.98	-31.86
27900.00	-125.00	Peak	H	48.02	0.00	30.02	68.20	-38.18

Table 6-10. Radiated Measurements

Radiated Spurious Emission Measurements (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5700MHz
 Channel: 140

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 11400.00	-111.36	Average	H	56.56	-9.54	42.66	53.98	-11.32
* 11400.00	-100.52	Peak	H	56.56	-9.54	53.50	73.98	-20.48
17100.00	-125.00	Peak	H	59.92	0.00	41.92	68.20	-26.28
* 22800.00	-108.22	Average	H	44.47	-9.54	33.71	53.98	-20.27
* 22800.00	-98.18	Peak	H	44.47	-9.54	43.75	73.98	-30.23
28500.00	-125.00	Peak	H	48.08	0.00	30.08	68.20	-38.12

Table 6-11. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5745MHz
 Channel: 149

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
11490.00	-111.75	Avg	H	56.91	-9.54	42.62	53.98	-11.35
11490.00	-101.87	Peak	H	56.91	-9.54	52.50	73.98	-21.48
17235.00	-125.00	Peak	H	59.91	0.00	41.91	68.20	-26.29
22980.00	-135.00	Avg	H	44.53	0.00	16.53	53.98	-37.45
22980.00	-125.00	Peak	H	44.53	0.00	26.53	73.98	-47.45

Table 6-12. Radiated Measurements

Radiated Spurious Emission Measurements (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5785MHz
 Channel: 157



Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
11570.00	-112.25	Avg	H	56.39	-9.54	41.60	53.98	-12.38
11570.00	-102.58	Peak	H	56.39	-9.54	51.27	73.98	-22.71
17355.00	-125.00	Peak	H	59.73	0.00	41.73	68.20	-26.47
23140.00	-125.00	Peak	H	44.49	0.00	26.49	68.20	-41.71
28925.00	-125.00	Peak	H	42.76	0.00	24.76	68.20	-22.71

Table 6-13. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meters
 Operating Frequency: 5825MHz
 Channel: 165

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
11650.00	-112.12	Avg	H	56.09	-9.54	41.43	53.98	-12.55
11650.00	-101.67	Peak	H	56.09	-9.54	51.88	73.98	-22.10
17475.00	-125.00	Peak	H	59.67	0.00	41.67	68.20	-26.53
23300.00	-125.00	Peak	H	44.47	0.00	26.47	68.20	-41.73
29125.00	-125.00	Peak	H	42.71	0.00	24.71	68.20	-43.49

Table 6-14. Radiated Measurements

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6.3 Radiated Band Edge Measurements (20MHz BW)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (20MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5180MHz
 Channel: 36

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
5142.40	-107.57	Average	H	42.82	42.25	53.98	-11.73
5142.40	-93.42	Peak	H	42.82	56.40	73.98	-17.58
5148.00	-106.86	Average	H	42.82	42.95	53.98	-11.03
5148.00	-90.70	Peak	H	42.82	59.11	73.98	-14.87
5150.00	-106.31	Average	H	42.84	43.53	53.98	-10.45
5150.00	-90.58	Peak	H	42.84	59.26	73.98	-14.72



Table 6-15. Radiated Restricted Band Measurements (4.5 – 5.15GHz)

Radiated Band Edge Measurements (20MHz BW) (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (20MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5320MHz
 Channel: 64

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5350.00	-105.59	Average	H	43.34	44.75	53.98	-9.23
5350.00	-85.96	Peak	H	43.34	64.38	73.98	-9.60
5353.65	-106.58	Average	H	43.35	43.77	53.98	-10.21
5353.65	-87.52	Peak	H	43.35	62.83	73.98	-11.15
5358.55	-106.98	Average	H	43.35	43.37	53.98	-10.61
5358.55	-90.02	Peak	H	43.35	60.32	73.98	-13.66

Table 6-16. Radiated Restricted Band Measurements (5.35 – 5.46GHz, 5.46 – 5.47GHz)

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Radiated Band Edge Measurements (20MHz BW) (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (20MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5500MHz
 Channel: 100

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5457.08	-108.40	Average	H	43.64	42.24	53.98	-11.74
5457.08	-93.02	Peak	H	43.64	57.62	73.98	-16.36
5459.71	-108.60	Average	H	43.65	42.05	53.98	-11.93
5459.71	-92.33	Peak	H	43.65	58.32	73.98	-15.66
5469.75	-88.45	Peak	H	43.69	62.24	68.20	-5.96

Table 6-17. Radiated Restricted Band Measurements (5.35 – 5.46GHz, 5.46 – 5.47GHz)

Worst Case Mode: 802.11n (20MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5825MHz
 Channel: 165

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5850.00	-98.25	Peak	H	44.41	53.17	68.20	-15.03
5850.90	-89.92	Peak	H	44.42	61.50	68.20	-6.70
5852.80	-91.53	Peak	H	44.44	59.91	68.20	-8.29



Table 6-18. Radiated Restricted Band Measurements

6.4 Radiated Band Edge Measurements (40MHz BW)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5190MHz
 Channel: 38

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5140.30	-105.20	Average	H	42.81	44.61	53.98	-9.37
5140.30	-90.07	Peak	H	42.81	59.74	73.98	-14.24
5146.60	-103.04	Average	H	42.81	46.77	53.98	-7.21
5146.60	-89.34	Peak	H	42.81	60.46	73.98	-13.52
5150.00	-101.79	Average	H	42.83	48.04	53.98	-5.94
5150.00	-87.29	Peak	H	42.83	62.54	73.98	-11.43

Table 6-19. Radiated Restricted Band Measurements (4.5 – 5.15GHz)



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Radiated Band Edge Measurements (40MHz BW) (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5310MHz
 Channel: 62

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5350.00	-102.26	Average	H	43.34	48.07	53.98	-5.91
5350.00	-84.33	Peak	H	43.34	66.00	73.98	-7.98
5350.63	-102.70	Average	H	43.34	47.64	53.98	-6.33
5350.63	-85.09	Peak	H	43.34	65.25	73.98	-8.72
5353.52	-103.47	Average	H	43.34	46.87	53.98	-7.10
5353.52	-86.93	Peak	H	43.34	63.41	73.98	-10.57

Table 6-20. Radiated Restricted Band Measurements (5.35 – 5.46GHz, 5.46 – 5.47GHz)

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Radiated Band Edge Measurements (40MHz BW) (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5510MHz
 Channel: 102

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5854.44	-106.55	Average	H	44.42	44.88	53.98	-9.10
5854.44	-94.29	Peak	H	44.42	57.13	73.98	-16.85
5459.50	-107.25	Average	H	43.65	43.40	53.98	-10.58
5459.50	-91.52	Peak	H	43.65	59.13	73.98	-14.85
5469.50	-89.56	Peak	H	43.69	61.13	68.20	-7.07

Table 6-21. Radiated Restricted Band Measurements (5.35 – 5.46GHz, 5.46 – 5.47GHz)

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5795MHz
 Channel: 159

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5850.00	-100.19	Peak	H	44.41	51.22	68.20	-16.98
5856.60	-98.96	Peak	H	44.42	52.46	68.20	-15.74
5873.60	-98.87	Peak	H	44.42	52.55	68.20	-15.65



Table 6-22. Radiated Restricted Band Measurements

6.5 Radiated Band Edge Measurements (80MHz BW)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5210MHz
 Channel: 42

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
5136.25	-104.93	Average	H	42.79	44.87	53.98	-9.11
5136.25	-97.10	Peak	H	42.79	52.69	73.98	-21.29
5143.65	-104.38	Average	H	42.79	45.41	53.98	-8.57
5143.65	-94.88	Peak	H	42.79	54.91	73.98	-19.07
5150.00	-103.09	Average	H	42.82	46.73	53.98	-7.25
5150.00	-84.55	Peak	H	42.82	65.27	73.98	-8.71

Table 6-23. Radiated Restricted Band Measurements



FCC ID: ZNFLS980		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Radiated Band Edge Measurements (80MHz BW) (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5290MHz
 Channel: 58

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
5350.00	-104.21	Average	H	43.34	46.13	53.98	-7.85
5350.00	-82.44	Peak	H	43.34	67.90	73.98	-6.08
5350.41	-106.06	Average	H	43.34	44.28	53.98	-9.70
5350.41	-83.75	Peak	H	43.34	66.59	73.98	-7.39
5352.03	-105.39	Average	H	43.34	44.94	53.98	-9.04
5352.03	-84.29	Peak	H	43.34	66.05	73.98	-7.93

Table 6-24. Radiated Restricted Band Measurements

FCC ID: ZNFLS980		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
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Radiated Band Edge Measurements (80MHz BW) (Cont'd)
§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5530MHz
 Channel: 106

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
5456.80	-105.32	Average	H	43.64	45.32	53.98	-8.66
5456.80	-92.08	Peak	H	43.64	58.56	73.98	-15.42
5459.50	-105.82	Average	H	43.65	44.83	53.98	-9.15
5459.50	-90.56	Peak	H	43.65	60.09	73.98	-13.89
5467.50	-88.27	Peak	H	43.68	62.41	68.20	-5.79



Table 6-25. Radiated Restricted Band Measurements

Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5775MHz
 Channel: 155

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
5850.00	-100.32	Peak	H	44.41	51.10	68.20	-17.10
5852.50	-92.89	Peak	H	44.42	58.53	68.20	-9.67
5861.50	-95.77	Peak	H	44.42	55.65	68.20	-12.55

7. CONCLUSION

The data collected relate only the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFLS980** is in compliance with Part 15E of the FCC Rules.

FCC ID: ZNFLS980		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Reviewed by: Quality Manager
Test Report S/N: 0Y1307031179.ZNF	Test Dates: 7/26/2013	EUT Type: Portable Handset	Page 29 of 29	