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

MEASUREMENT REPORT
FCC Part 15.407 UNII 802.11a/n/ac

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

Date of Testing:
4/15-4/28/2015
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1504130699.ZNF

FCC ID:	**ZNFH811**
APPLICANT:	**LG Electronics MobileComm U.S.A**

Application Type:	Class II Permissive Change
Model(s):	LG-H811, LGH811, H811
EUT Type:	Portable Handset
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part 15.407
Test Procedure(s):	KDB 789033 D02 v01, KDB 644545 D02 v01r02, KDB 648474 D03 v01r02
Class II Permissive Change:	Please see FCC change document
Original Grant Date:	5/1/2015

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 D02 v01 and KDB 644545 v01r02. 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
TESTING CERT#2041.01

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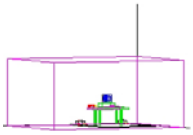
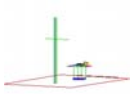


MEASUREMENT REPORT
FCC Part 15.407



§ 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:	7185 Oakland Mills Road, Columbia, MD 21046 USA
FCC RULE PART(S):	Part 15.407
BASE MODEL:	LG-H811
FCC ID:	ZNFH811
FCC CLASSIFICATION:	Unlicensed National Information Infrastructure (UNII)
Test Device Serial No.:	359105-06-001614-8, 359105-06-001602-3 ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	4/15-4/28/2015
TEST REPORT S/N:	0Y1504130699.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. 159966) 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 (2451B-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 (2451B-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.

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 Internt'l (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 located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. 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 February 15, 2012.

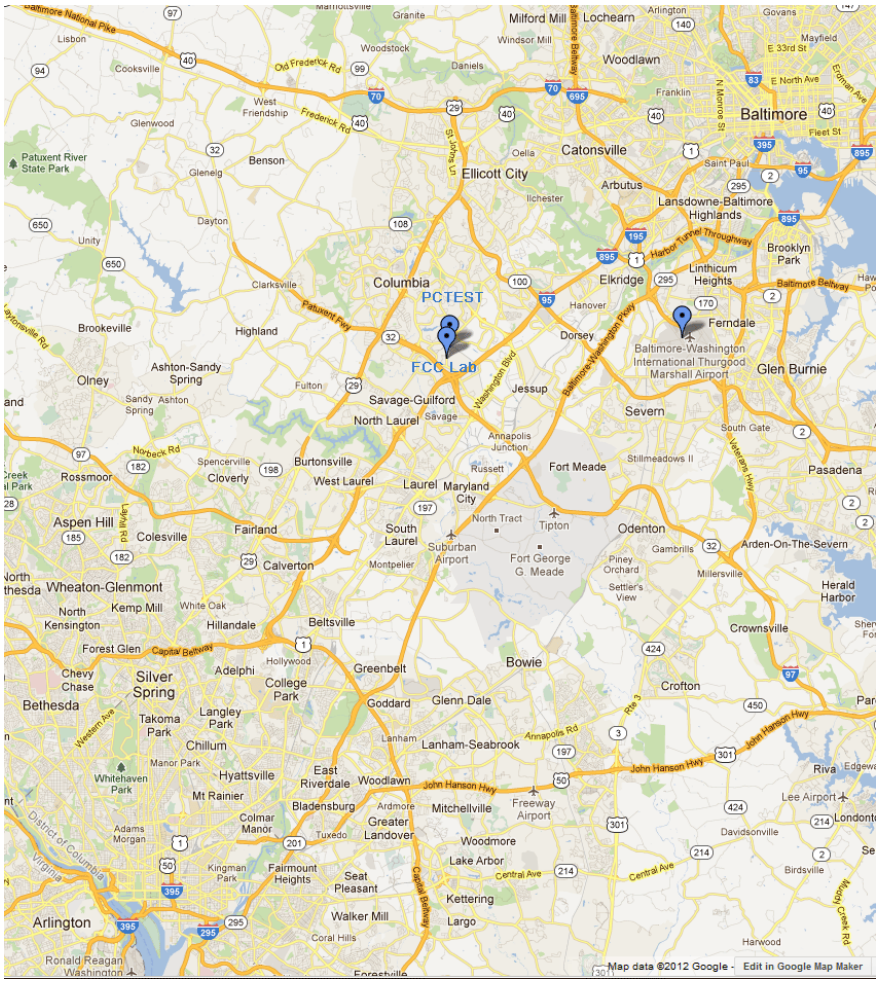


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFH811**. 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 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), NFC

Note: 5GHz NII operation is possible in 20MHz, and 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:

Maximum Achievable Duty Cycles

802.11 Mode/Band		Duty Cycle [%]
2.4GHz	b	99.2
	g	95.2
	n	95.4
	ac	95.5
5GHz	a	95.4
	n (HT20)	95.5
	ac (HT20)	95.6
	n (HT40)	91.5
	ac (HT40)	93.5
	ac (HT80)	91.2

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)
29.3/32.5, 58.5/65, 87.8/97.5, 117/130, 175.5/195, 234/260, 263.3/292.5, 292.5/325, 351/390, 390/433.3 (ac – 80MHz BW)

2.3 Test Configuration

The LG Portable Handset FCC ID: ZNFH811 was tested per the guidance of KDB 789033 D02 v01. ANSI C63.10-2009 was used to reference the appropriate EUT setup for radiated spurious emissions testing. See Section 3.2 for radiated emissions test setups

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r02. Additional radiated spurious emission measurements were performed with the EUT lying flat on a certified wireless charging pad while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

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

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 D02 v01 were used in the measurement of **LG Portable Handset FCC ID: ZNFH811.**

Deviation from measurement procedure……..…….....None

3.2 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Clause 5, Figure 5.7 of ANSI C63.4-2009. For measurements above 1GHz 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 below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It 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. A 78cm high PVC support structure is placed on top of the turntable. A ¾" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

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 above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes 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 the 0.8 meter high, 1 x 1.5 meter table. 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, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT 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.

3.3 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

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: ZNFH811** unit complies with the requirement of §15.203.

Band 1		Band 2A		Band 2C		Band 3	
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 / 802.11ac (20MHz) Frequency / Channel Operations

Band 1		Band 2A		Band 2C		Band 3	
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		
				:	:		
				142	5710	159	5795

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

Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
42	5210	58	5290	106	5530	155	5775
				:	:		
				138	5690		

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)	10/24/2014	Annual	10/24/2015	N/A
-	RE3	Radiated Emissions Cable Set	10/17/2014	Annual	10/17/2015	N/A
Anritsu	ML2495A	Power Meter	7/12/2013	Biennial	7/12/2015	1328004
Emco	3115	Horn Antenna (1-18GHz)	1/30/2014	Biennial	1/30/2016	9704-5182
Espec	ESX-2CA	Environmental Chamber	3/17/2015	Annual	3/17/2016	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/8/2014	Biennial	4/8/2016	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	6/17/2014	Biennial	6/17/2016	135427
ETS Lindgren	3160-10	26.5-40 GHz Standard Gain Horn	6/17/2014	Biennial	6/17/2016	130993
Huber+Suhner	Sucoflex 102A	40GHz Radiated Cable	10/15/2014	Annual	10/15/2015	251425001
K & L	11SH10-3075/U18000	High Pass Filter	12/1/2014	Annual	12/1/2015	2
K & L	11SH10-6000/T18000	High Pass Filter	12/1/2014	Annual	12/1/2015	1
Pasternack	NMLC-1	Line Conducted Emissions Cable (NM)	10/17/2014	Annual	10/17/2015	N/A
Rhode & Schwarz	TS-PR18	Pre-Amplifier	3/5/2015	Annual	3/5/2016	101622
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	3/12/2015	Annual	3/12/2016	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	5/21/2014	Annual	5/21/2015	100348
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/5/2015	Annual	3/5/2016	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	3/3/2015	Annual	3/3/2016	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	3/3/2015	Annual	3/3/2016	100037
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/18/2014	Biennial	3/18/2016	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/28/2014	Biennial	1/28/2016	A051107

Table 5-1. Annual Test Equipment Calibration Schedule

6.0 TEST RESULTS

6.1 Summary

Company Name: LG Electronics MobileComm U.S.A
FCC ID: ZNFH811
Method/System: Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
15.407(b.1), (2),(3)	Undesirable Emissions	< -27 dBm/MHz EIRP (ouside 5150-5350MHz, 5470-5725MHz, 5715-5860MHz) < -17 dBm/MHz EIRP (within 5715-5725MHz and 5850-5860MHz)	RADIATED	PASS	Section 6.2
15.205, 15.407(b.1), (5), (6)	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 6.2, 6.3

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.

6.2 Radiated Spurious Emission Measurements – Above 1GHz

§15.407(b.1)(b.6) §15.205 §15.209

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, at its maximum power control level, as defined in KDB 789033 D02 v01, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW), and 802.11ac (80MHz)), 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 [μV/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 6-2. Radiated Limits

Test Procedures Used

KDB 789033 D02 v01 – Section G

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 ≥ 2 x span/RBW)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

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.

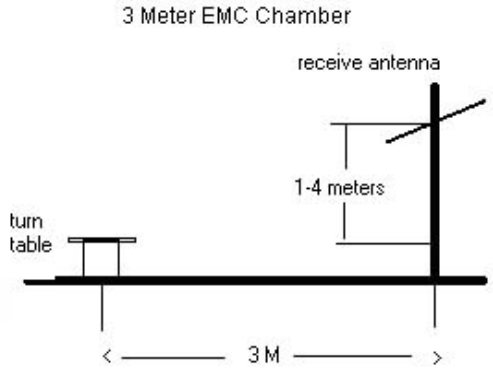


Figure 6-1. Test Instrument & Measurement Setup

Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01 Section H.
2. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 6-2.
3. 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 dBμV/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 68.2dBμV/m.
4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. This unit was tested with its standard battery.

6. 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.
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 wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.

Sample Calculations

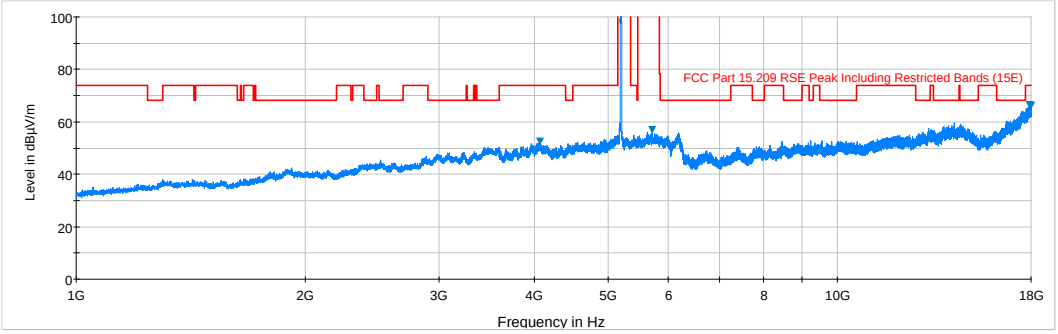
Determining Spurious Emissions Levels

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

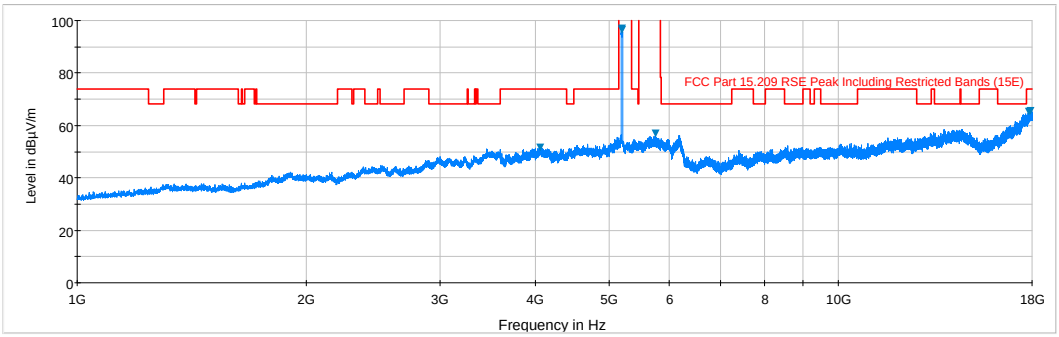
Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 6.8 was calculated using the formula:
  Offset (dB) = (Antenna Factor + Cable Loss + 10 dB Attenuator) – Preamplifier Gain

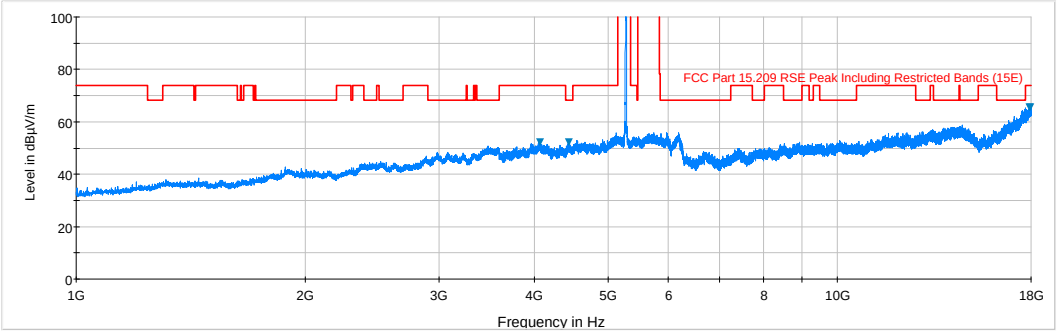
6.7.1 Radiated Spurious Emission Measurements



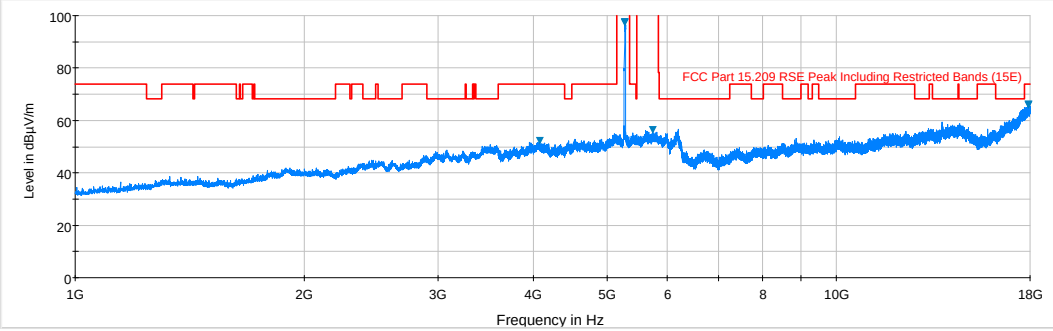
Plot 6-1. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)



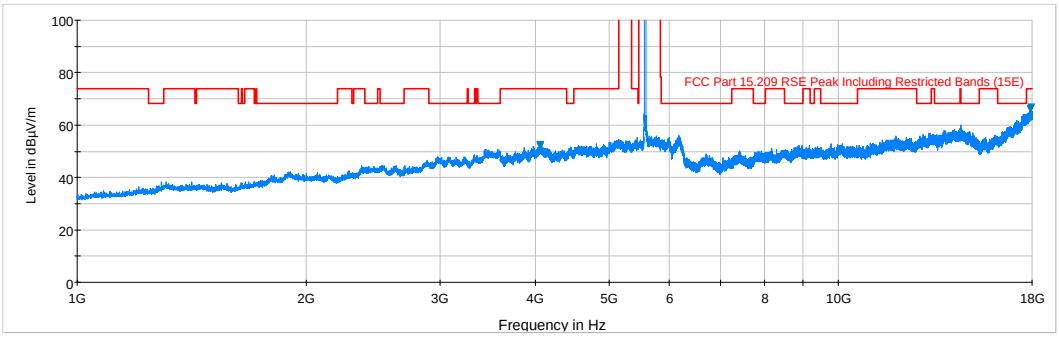
Plot 6-2. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)



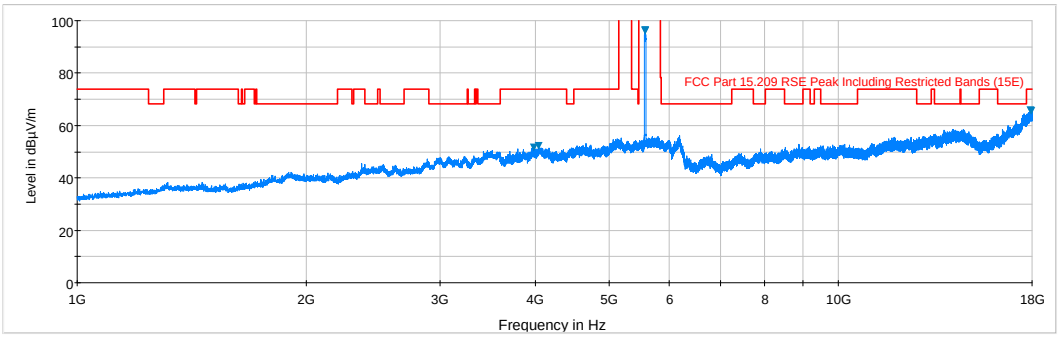
Plot 6-3. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)



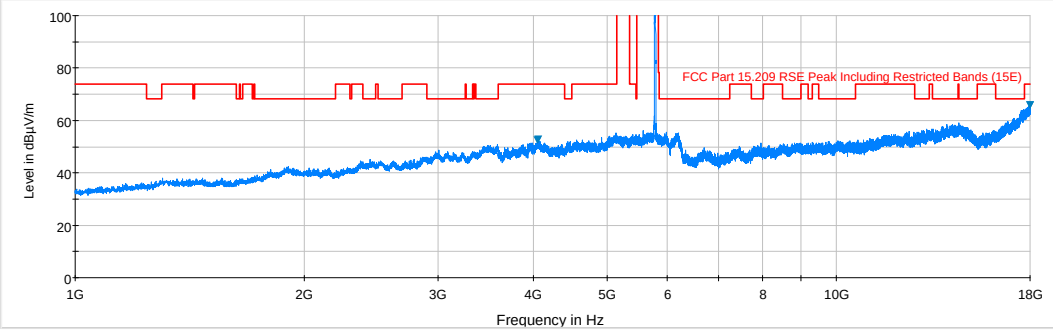
Plot 6-4. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



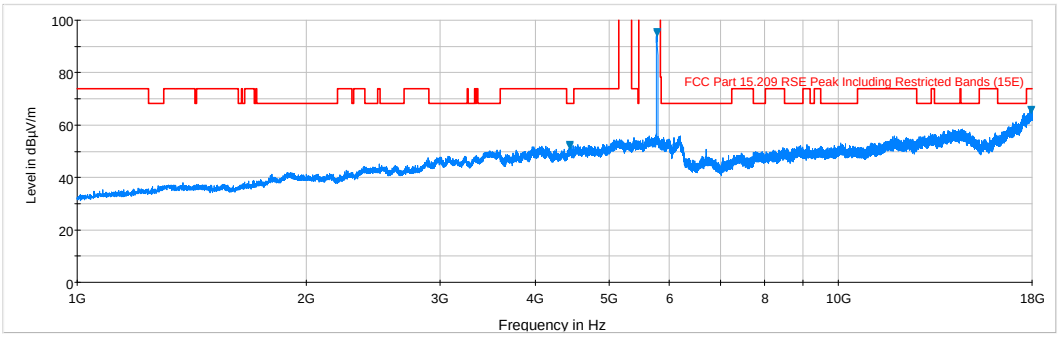
Plot 6-5. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)



Plot 6-6. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)



Plot 6-7. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 6-8. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5180MHz
Channel: 36

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	-98.60	Peak	H	46.32	0.00	54.72	68.20	-13.48
*	15540.00	-112.63	Average	H	55.02	0.00	49.39	53.98	-4.59
*	15540.00	-99.89	Peak	H	55.02	0.00	62.13	73.98	-11.85
*	20720.00	-114.24	Average	V	44.20	-9.54	27.41	53.98	-26.56
*	20720.00	-104.28	Peak	V	44.20	-9.54	37.37	73.98	-36.60
	25900.00	-104.22	Peak	V	45.08	-9.54	38.32	68.20	-29.88

Table 6-3. Radiated Measurements

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6 Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 5200MHz
Channel: 40

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	-98.72	Peak	H	46.40	0.00	54.68	68.20	-13.52
*	15600.00	-112.20	Average	H	54.53	0.00	49.33	53.98	-4.65
*	15600.00	-99.81	Peak	H	54.53	0.00	61.72	73.98	-12.26
*	20800.00	-112.37	Average	V	44.20	-9.54	29.29	53.98	-24.68
*	20800.00	-103.71	Peak	V	44.20	-9.54	37.95	73.98	-36.02
	26000.00	-103.68	Peak	V	45.11	-9.54	38.89	68.20	-29.31

Table 6-4. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5240MHz
Channel:	48

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	-98.77	Peak	H	46.57	0.00	54.79	68.20	-13.41
*	15720.00	-112.36	Average	H	53.47	0.00	48.11	53.98	-5.87
*	15720.00	-99.69	Peak	H	53.47	0.00	60.78	73.98	-13.20
*	20960.00	-114.28	Average	V	44.19	-9.54	27.36	53.98	-26.62
*	20960.00	-103.42	Peak	V	44.19	-9.54	38.22	73.98	-35.76
	26200.00	-104.04	Peak	V	44.95	-9.54	38.37	68.20	-29.83

Table 6-5. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5260MHz
Channel:	52

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	-98.76	Peak	H	46.59	0.00	54.84	68.20	-13.36
*	15780.00	-113.12	Average	H	54.29	0.00	48.17	53.98	-5.81
*	15780.00	-100.47	Peak	H	54.29	0.00	60.82	73.98	-13.16
*	21040.00	-113.71	Average	V	44.18	-9.54	27.92	53.98	-26.06
*	21040.00	-103.49	Peak	V	44.18	-9.54	38.14	73.98	-35.84
	26300.00	-103.31	Peak	V	44.95	-9.54	39.09	68.20	-29.11

Table 6-6. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5280MHz
Channel:	56

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	-99.25	Peak	H	46.57	0.00	54.32	68.20	-13.88
*	15840.00	-113.52	Average	H	54.93	0.00	48.41	53.98	-5.57
*	15840.00	-100.69	Peak	H	54.93	0.00	61.24	73.98	-12.74
*	21120.00	-114.28	Average	V	44.17	-9.54	27.35	53.98	-26.63
*	21120.00	-103.49	Peak	V	44.17	-9.54	38.14	73.98	-35.84
	26400.00	-102.71	Peak	V	45.01	-9.54	39.76	68.20	-28.44

Table 6-7. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5320MHz
Channel:	64

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	-111.17	Average	H	46.59	0.00	42.43	53.98	-11.55
*	10640.00	-98.84	Peak	H	46.59	0.00	54.76	73.98	-19.22
*	15960.00	-113.14	Average	H	55.40	0.00	49.27	53.98	-4.71
*	15960.00	-100.55	Peak	H	55.40	0.00	61.86	73.98	-12.12
*	21280.00	-113.45	Average	V	44.18	-9.54	28.18	53.98	-25.80
*	21280.00	-104.38	Peak	V	44.18	-9.54	37.25	73.98	-36.73
	26600.00	-123.67	Peak	V	47.61	-9.54	21.40	68.20	-46.80

Table 6-8. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5500MHz
Channel:	100

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	-110.46	Average	H	47.17	0.00	43.70	53.98	-10.28
*	11000.00	-97.64	Peak	H	47.17	0.00	56.52	73.98	-17.46
	16500.00	-101.07	Peak	H	55.63	0.00	61.56	68.20	-6.64
	22000.00	-103.54	Peak	V	44.47	-9.54	38.39	68.20	-29.81
	27500.00	-129.05	Peak	V	47.92	-9.54	16.33	68.20	-51.87

Table 6-9. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5580MHz
Channel:	116

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	-110.56	Average	H	46.87	0.00	43.31	53.98	-10.67
*	11160.00	-98.58	Peak	H	46.87	0.00	55.29	73.98	-18.69
	16740.00	-100.12	Peak	H	55.08	0.00	61.96	68.20	-6.24
*	22320.00	-112.62	Average	V	44.59	-9.54	29.44	53.98	-24.54
*	22320.00	-104.51	Peak	V	44.59	-9.54	37.55	73.98	-36.43
	27900.00	-128.76	Peak	V	48.09	-9.54	16.79	68.20	-51.41

Table 6-10. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5580MHz
Channel:	116

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	-111.43	Average	V	46.87	0.00	42.44	53.98	-11.54
*	11160.00	-98.61	Peak	V	46.87	0.00	55.26	73.98	-18.72
	16740.00	-100.08	Peak	V	55.08	0.00	62.00	68.20	-6.20
	22320.00	-113.51	Average	V	44.59	-9.54	28.55	53.98	-25.43
	22320.00	-103.36	Peak	V	44.59	-9.54	38.70	73.98	-35.28
	27900.00	-128.22	Peak	V	48.09	-9.54	17.33	68.20	-50.87

Table 6-11. Radiated Measurements with WCP

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5745MHz
Channel:	149

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	-111.45	Average	H	46.94	0.00	42.50	53.98	-11.48
*	11490.00	-98.90	Peak	H	46.94	0.00	55.05	73.98	-18.93
	17235.00	-101.32	Peak	H	54.28	0.00	59.97	68.20	-8.23
*	22980.00	-114.07	Average	V	44.64	-9.54	28.02	53.98	-25.96
*	22980.00	-102.77	Peak	V	44.64	-9.54	39.32	73.98	-34.66
	28725.00	-129.66	Peak	V	48.26	-9.54	16.06	68.20	-52.14

Table 6-12. Radiated Measurements

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5785MHz
Channel:	157

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	-110.65	Average	V	47.13	0.00	43.49	53.98	-10.49
*	11570.00	-98.45	Peak	V	47.13	0.00	55.69	73.98	-18.29
	17355.00	-99.71	Peak	V	53.84	0.00	61.13	68.20	-7.07
	23140.00	-104.24	Peak	V	44.73	-9.54	37.95	68.20	-30.25
	28925.00	-128.75	Peak	V	48.28	-9.54	16.98	68.20	-51.22

Table 6-13. Radiated Measurements

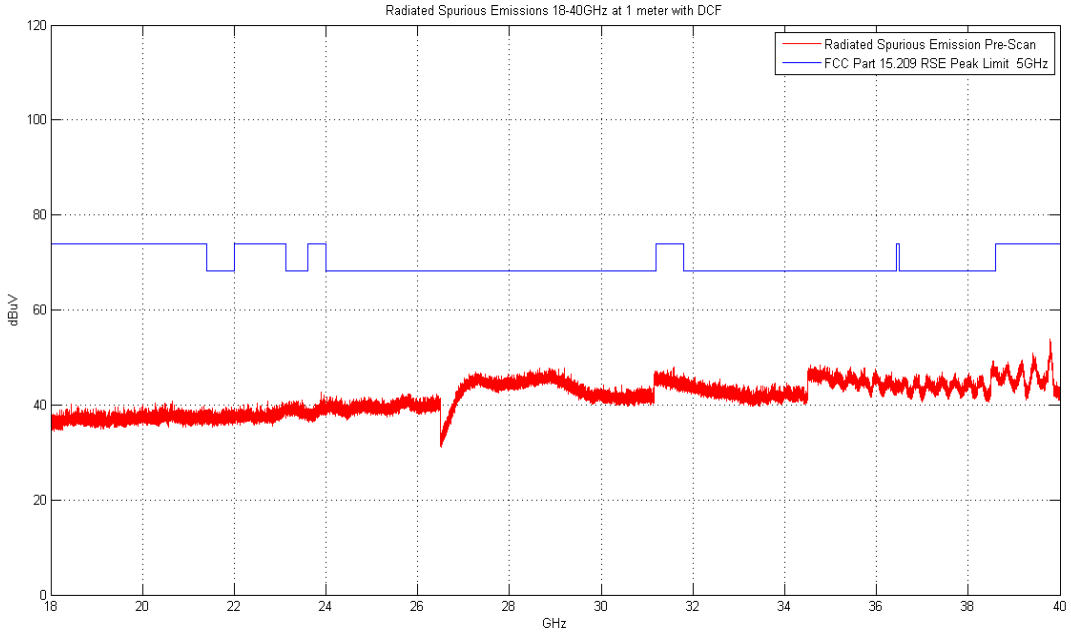
Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5825MHz
Channel:	165

	Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	-110.89	Average	V	47.44	0.00	43.56	53.98	-10.42
*	11650.00	-98.86	Peak	V	47.44	0.00	55.59	73.98	-18.39
	17475.00	-99.75	Peak	V	53.84	0.00	61.09	68.20	-7.11
	23300.00	-103.12	Peak	V	44.76	-9.54	39.10	68.20	-29.10
	29125.00	-130.10	Peak	V	48.24	-9.54	15.60	68.20	-52.60

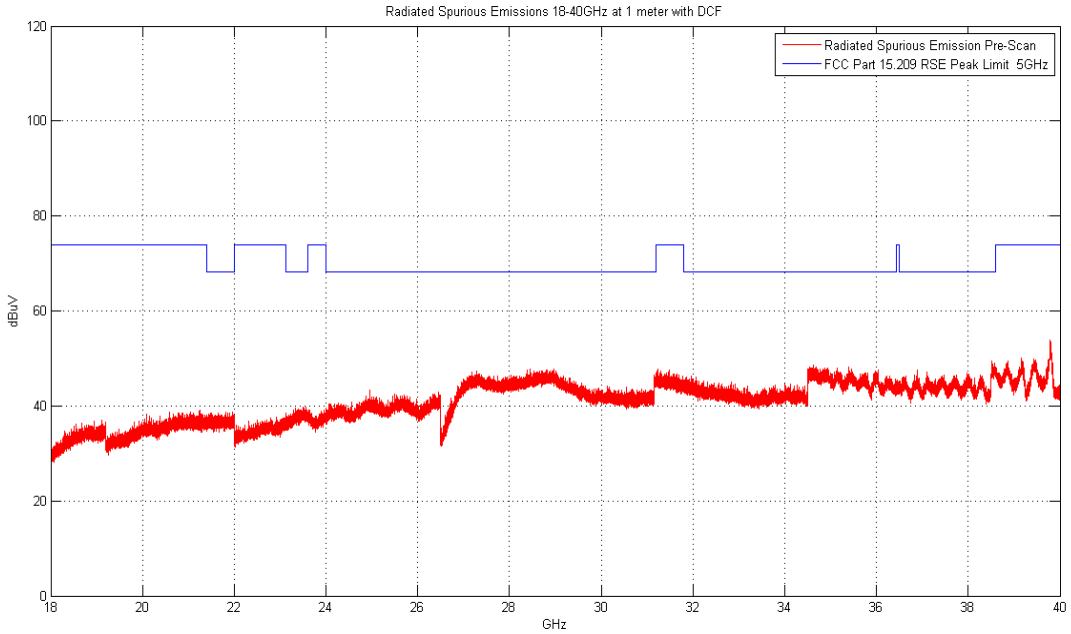
Table 6-14. Radiated Measurements

Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



Plot 6-9. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. H)

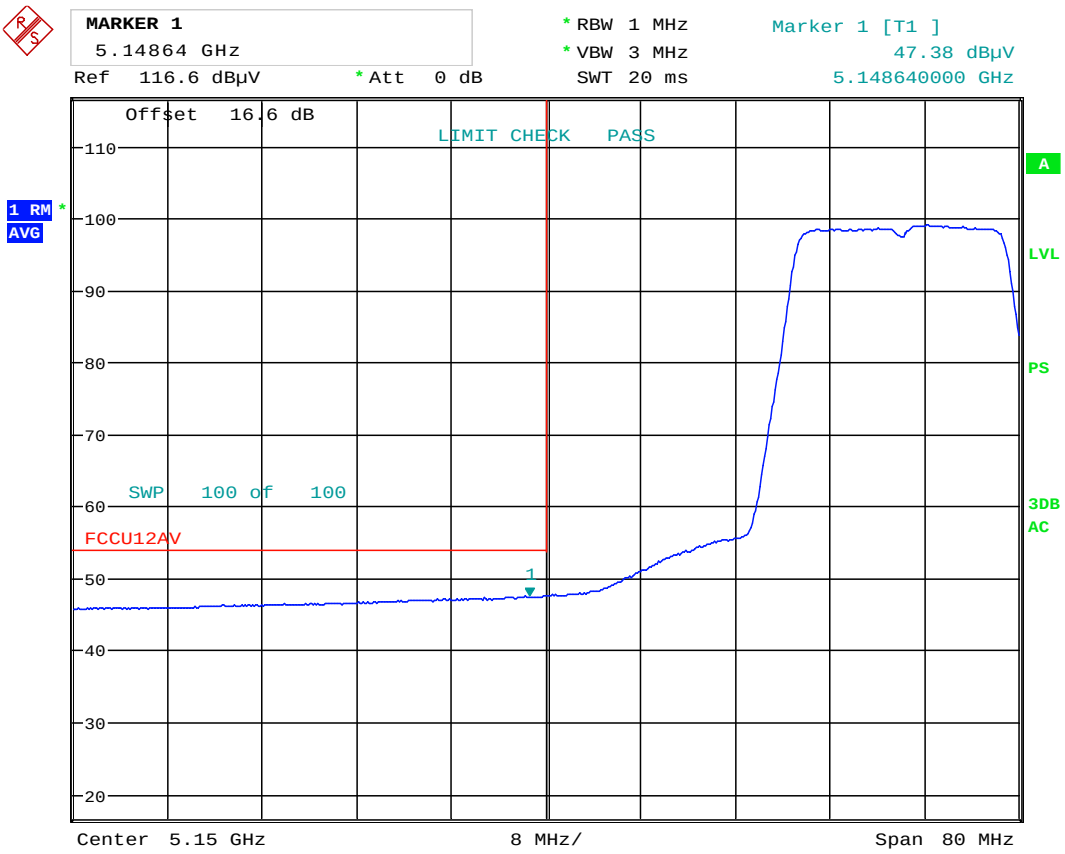


Plot 6-10. Radiated Spurious Plot above 18GHz (802.11a – Ant. Pol. V)

6.7.2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36

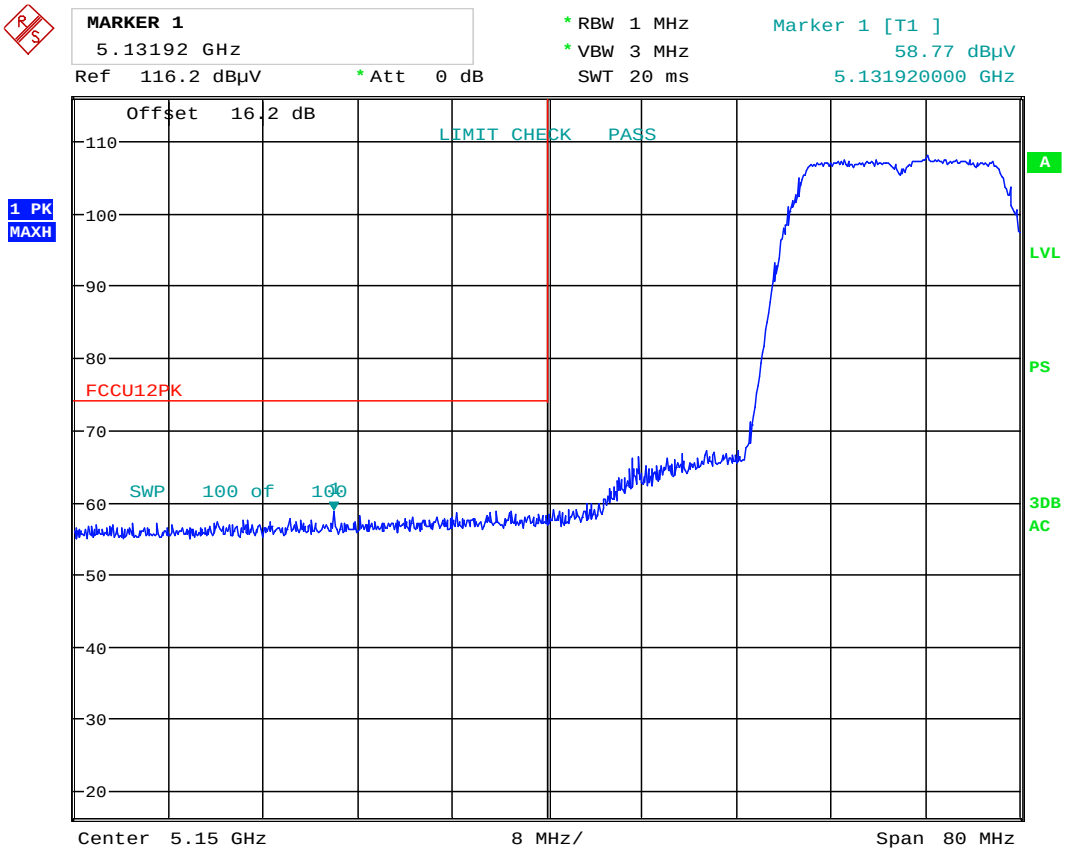


Date: 15.APR.2015 13:51:04

Plot 6-11. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



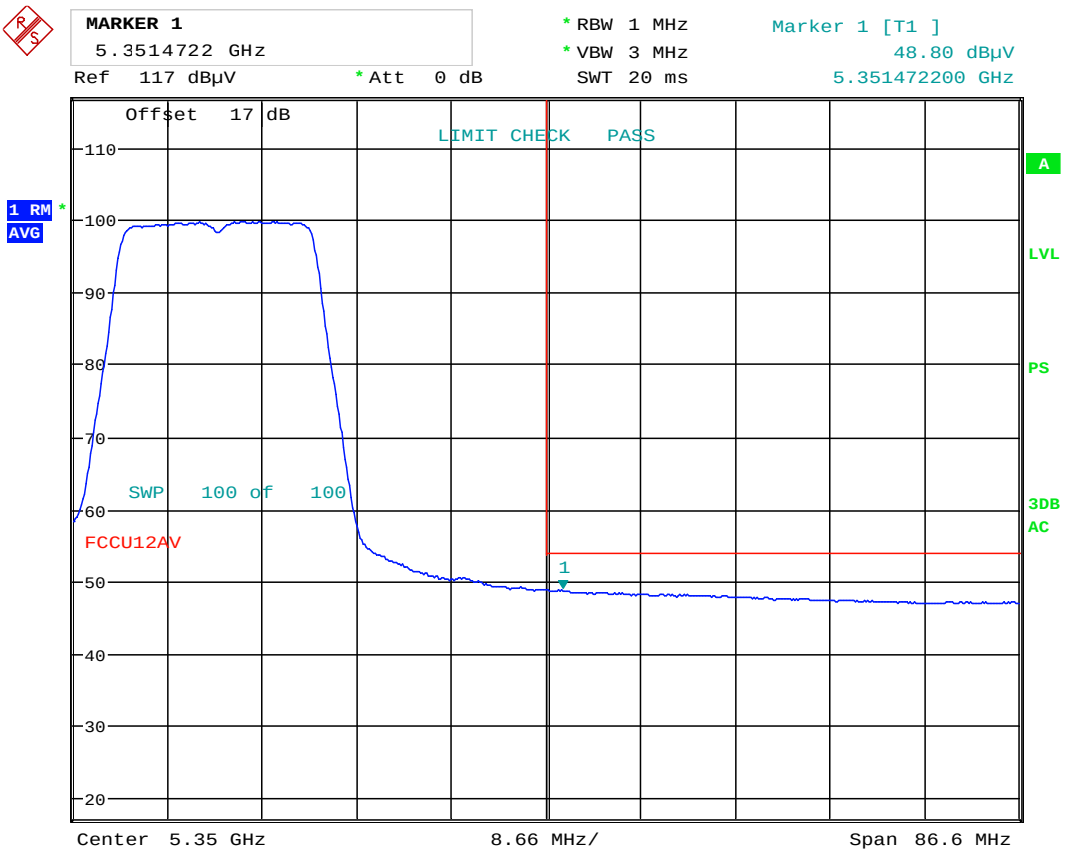
Date: 15.APR.2015 13:52:24

Plot 6-12. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64

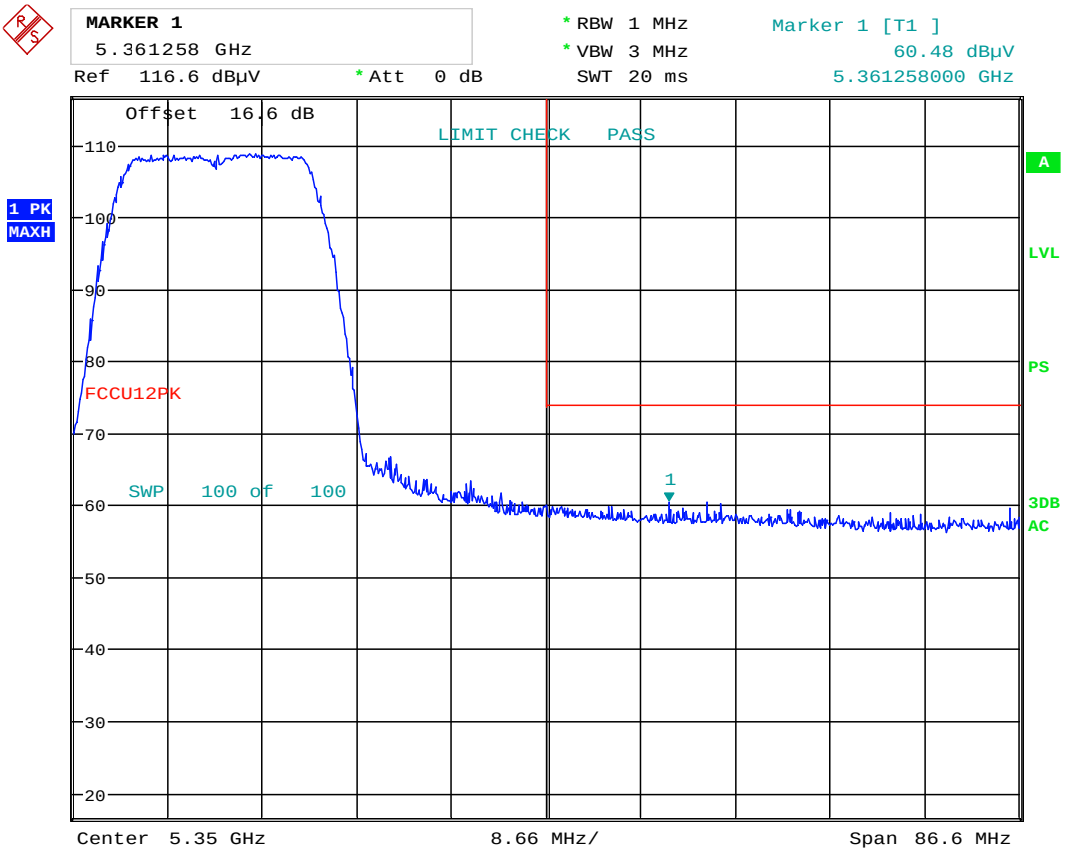


Date: 15.APR.2015 15:00:49

Plot 6-13. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



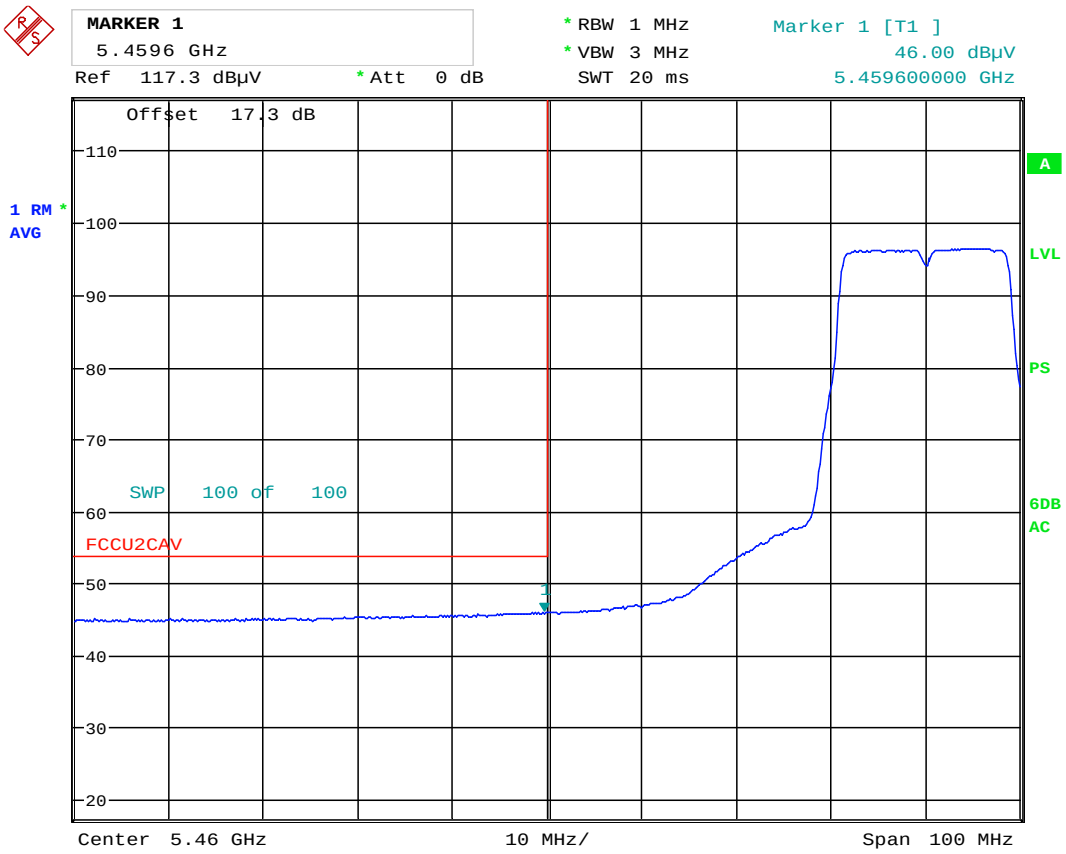
Date: 15.APR.2015 15:01:55

Plot 6-14. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100

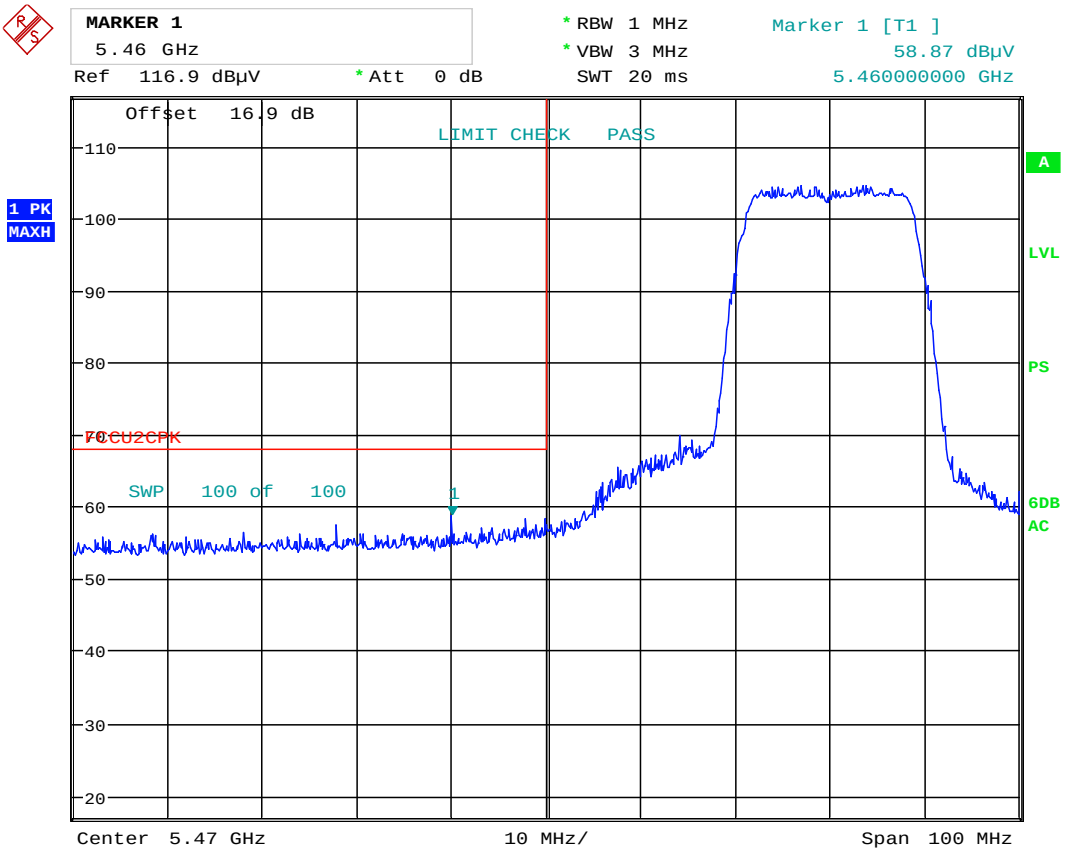


Date: 15.APR.2015 15:18:39

Plot 6-15. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



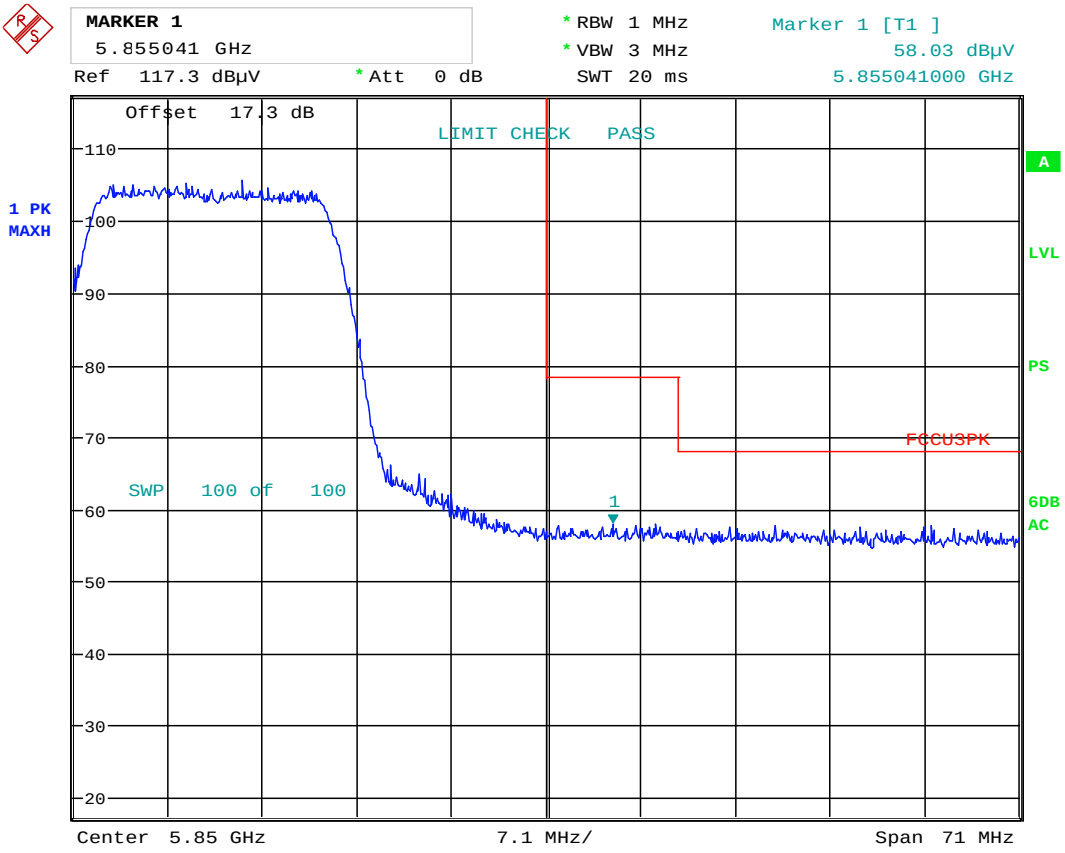
Date: 15.APR.2015 15:19:47

Plot 6-16. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165



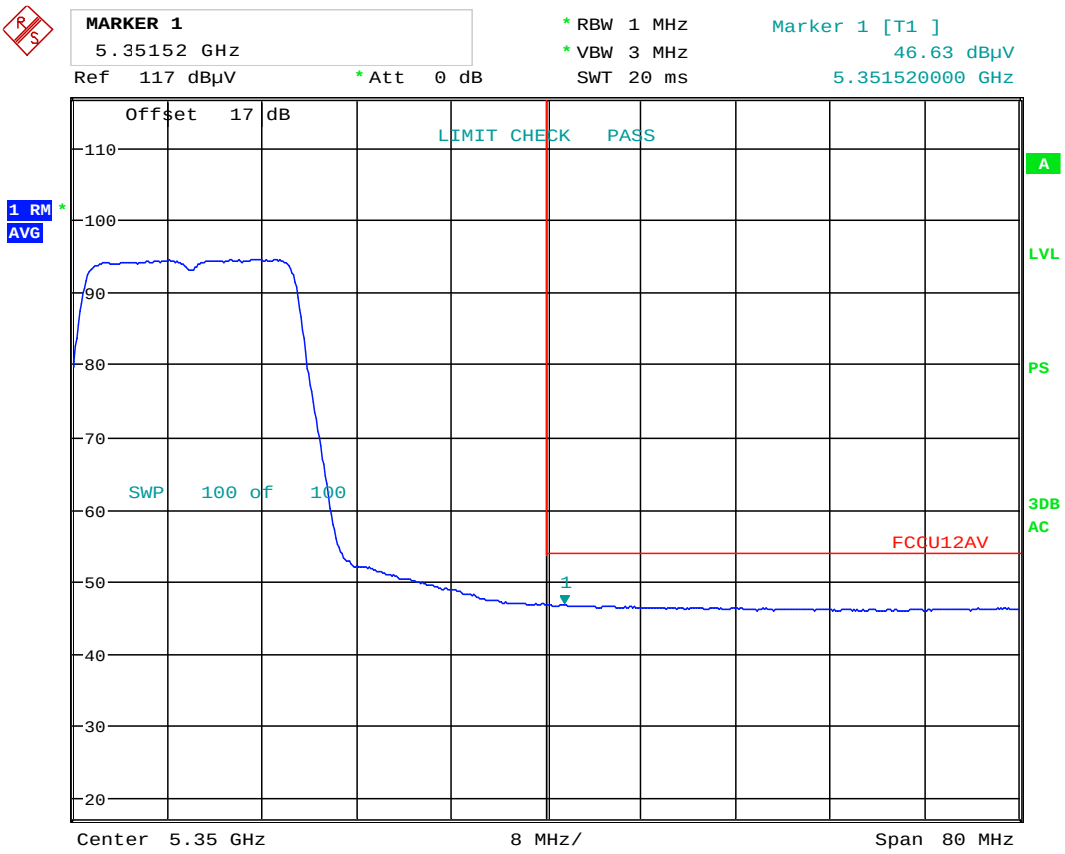
Date: 15.APR.2015 15:34:44

Plot 6-17. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

WCP Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64

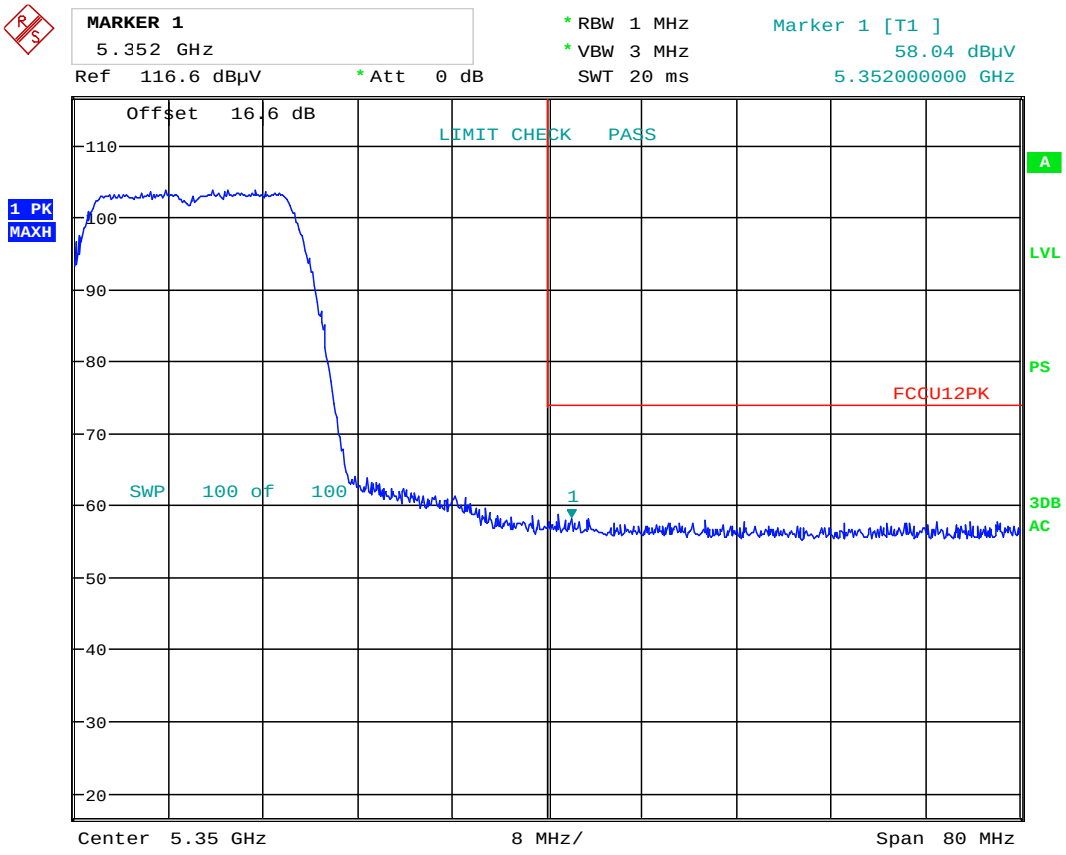


Date: 28.APR.2015 12:45:02

Plot 6-18. Radiated Restricted Upper Band Edge Plot with WCP (Average – UNII Band 2A)

WCP Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



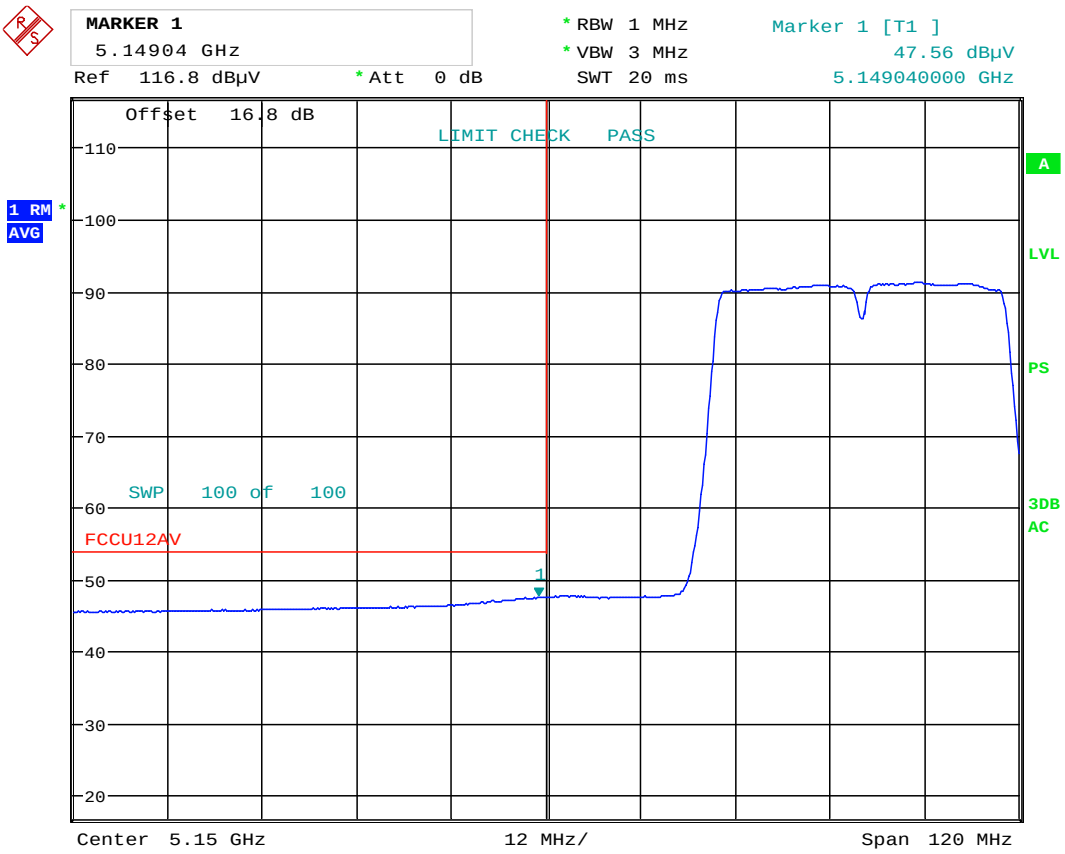
Date: 28.APR.2015 12:46:03

Plot 6-19. Radiated Restricted Upper Band Edge Plot with WCP (Peak – UNII Band 2A)

6.7.3 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

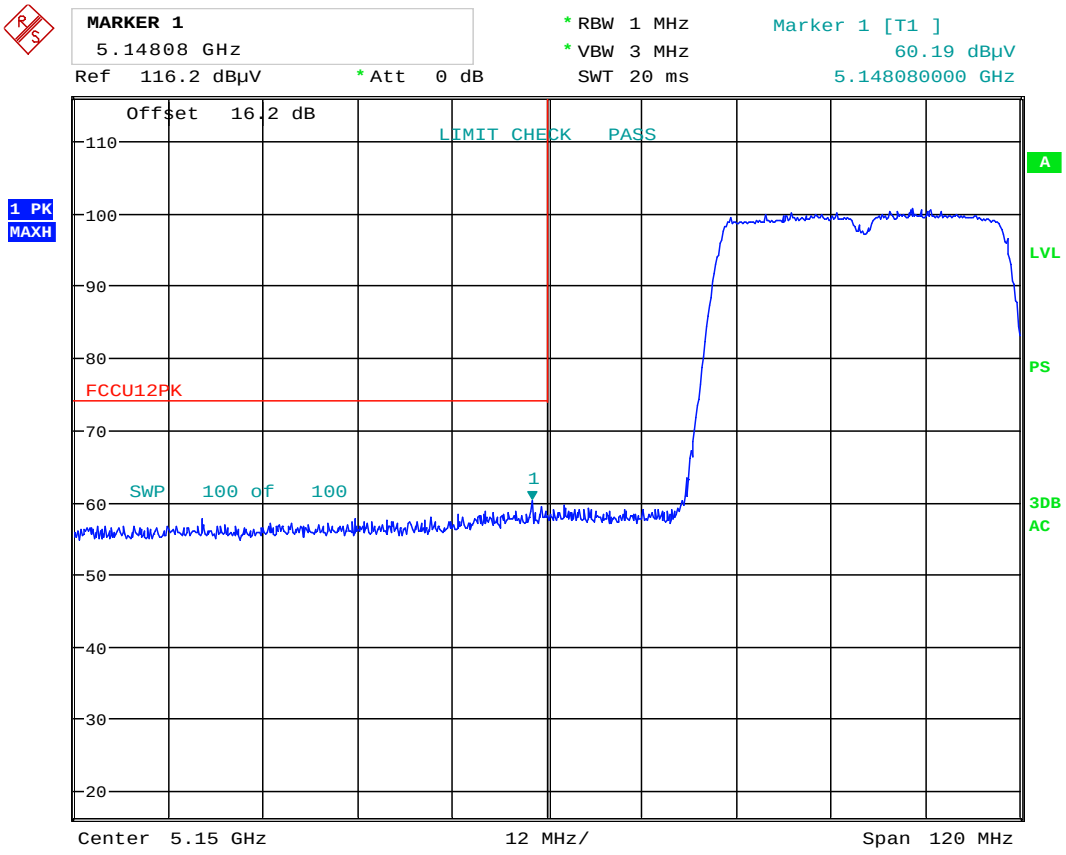


Date: 15.APR.2015 14:44:49

Plot 6-20. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



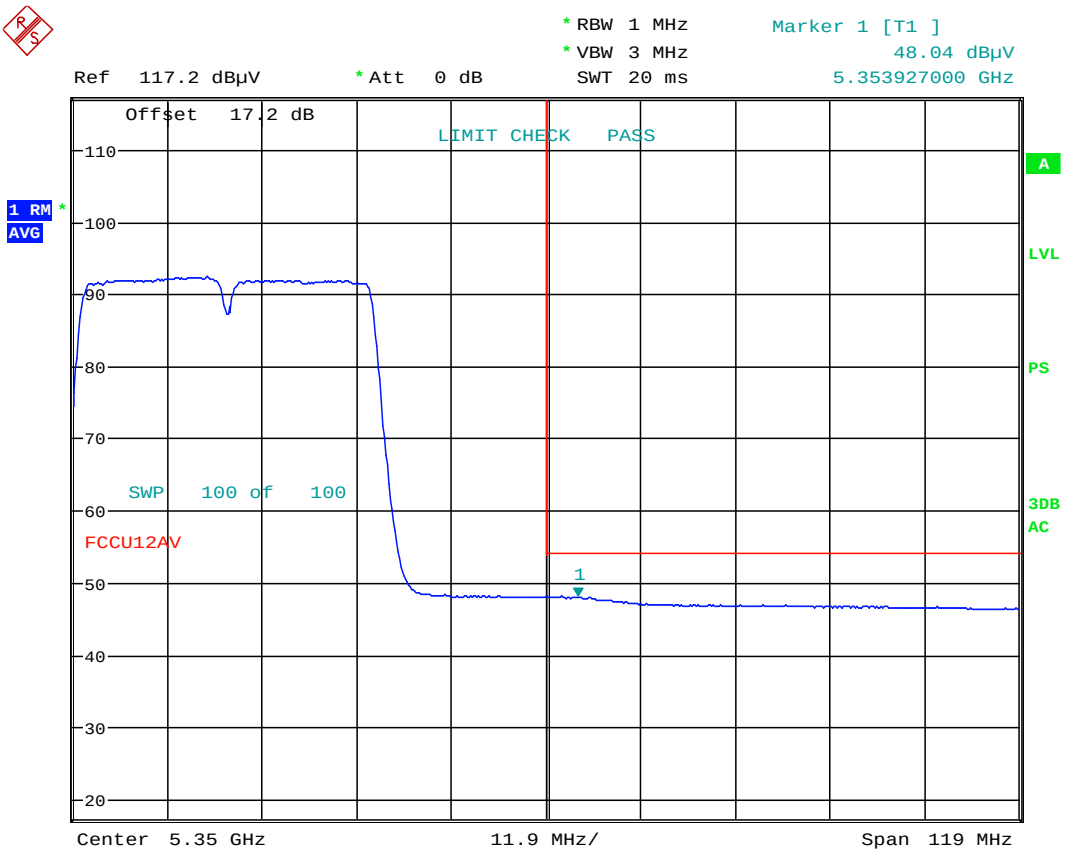
Date: 15.APR.2015 14:48:22

Plot 6-21. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

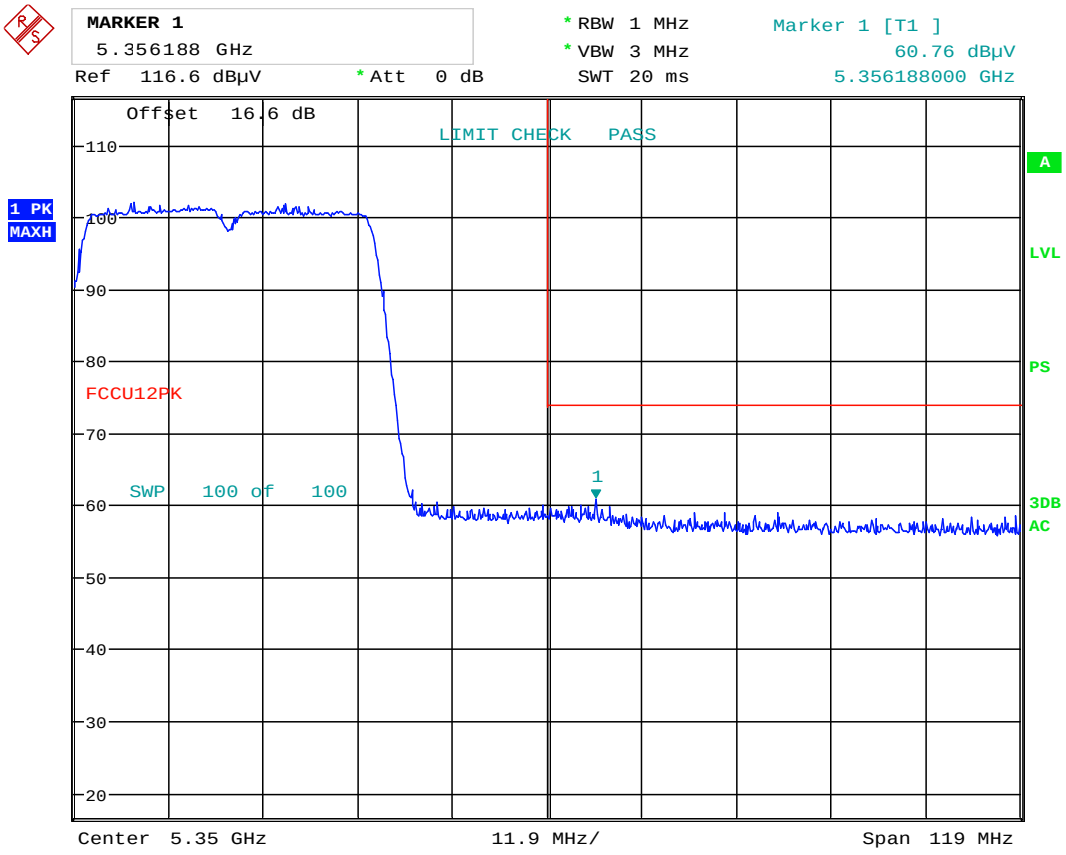


Date: 15.APR.2015 15:07:00

Plot 6-22. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



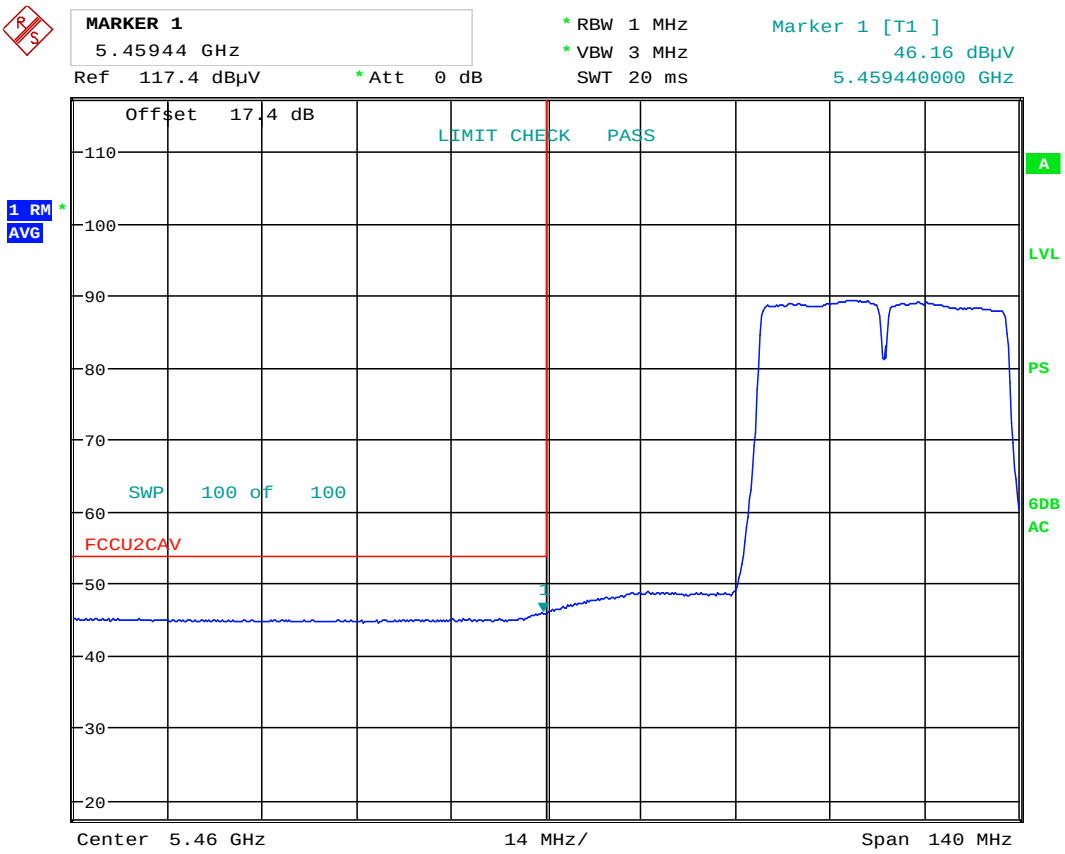
Date: 15.APR.2015 15:08:24

Plot 6-23. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

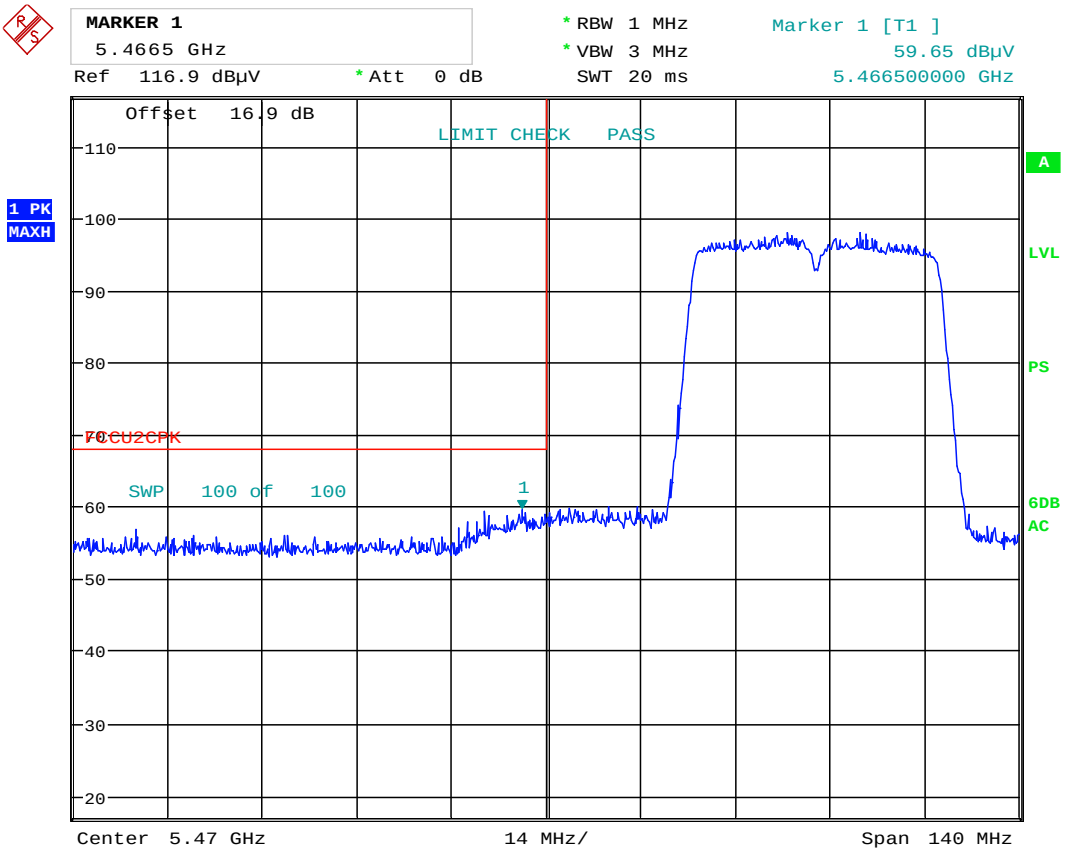


Date: 15.APR.2015 15:23:13

Plot 6-24. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



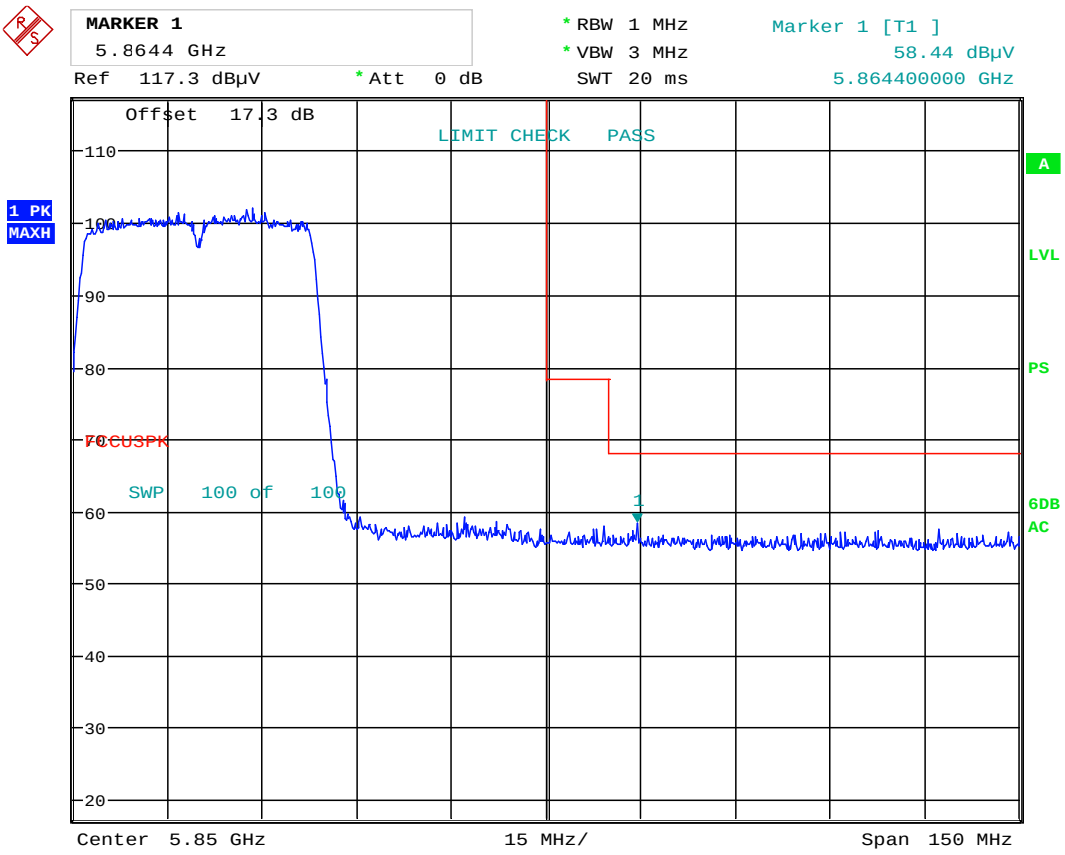
Date: 15.APR.2015 15:23:54

Plot 6-25. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Radiated Band Edge Measurements (40MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



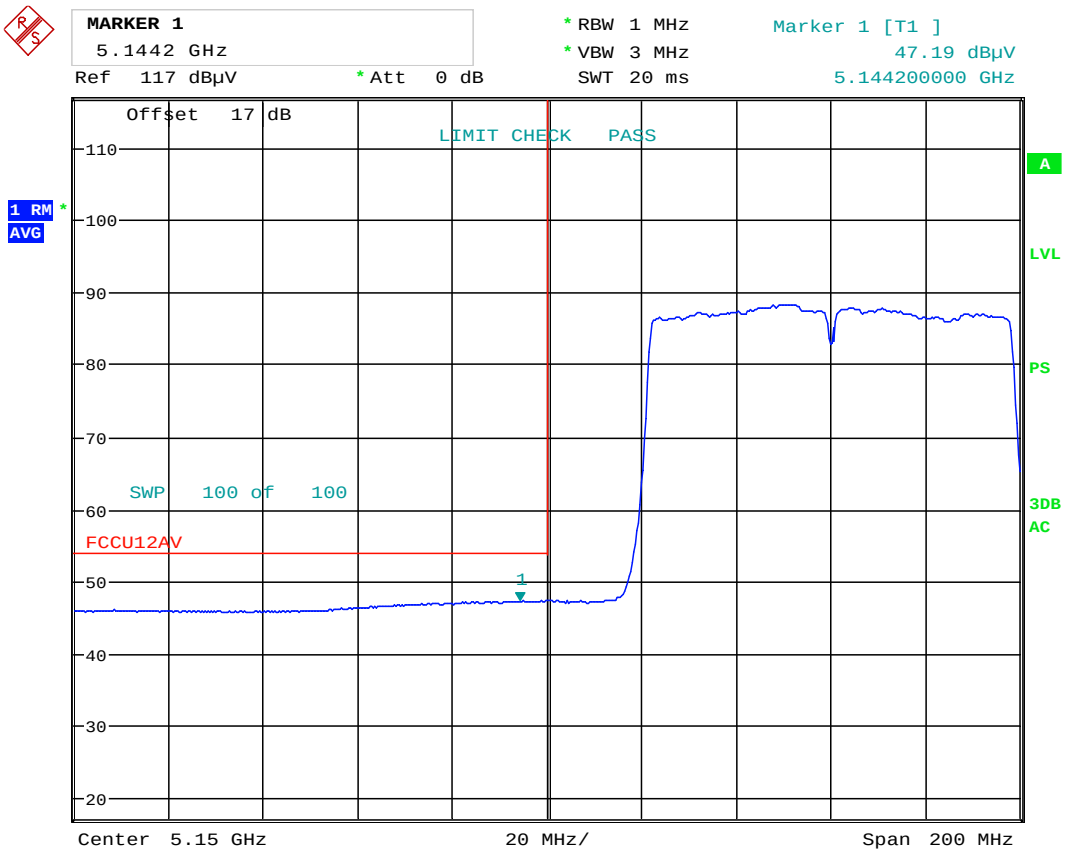
Date: 15.APR.2015 15:36:37

Plot 6-26. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

6.7.4 Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

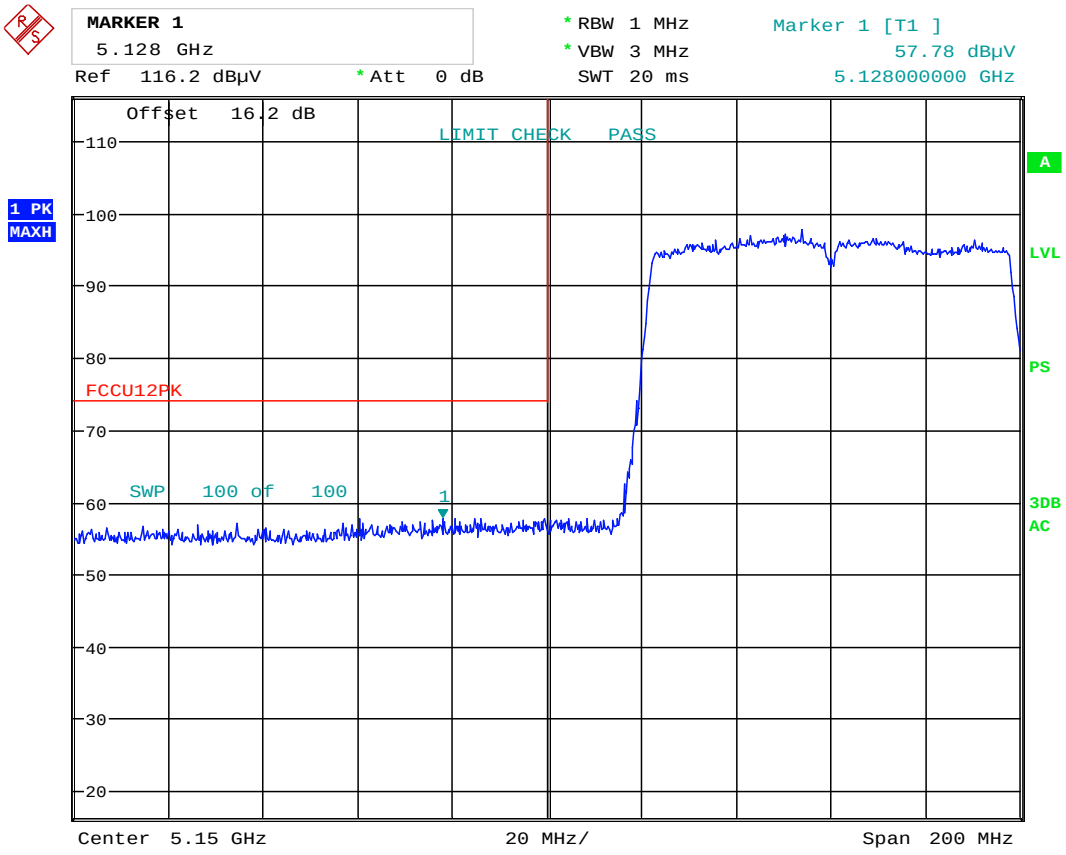
Worst Case Mode:	802.11n (80MHz)
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5210MHz
Channel:	42



Plot 6-27. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



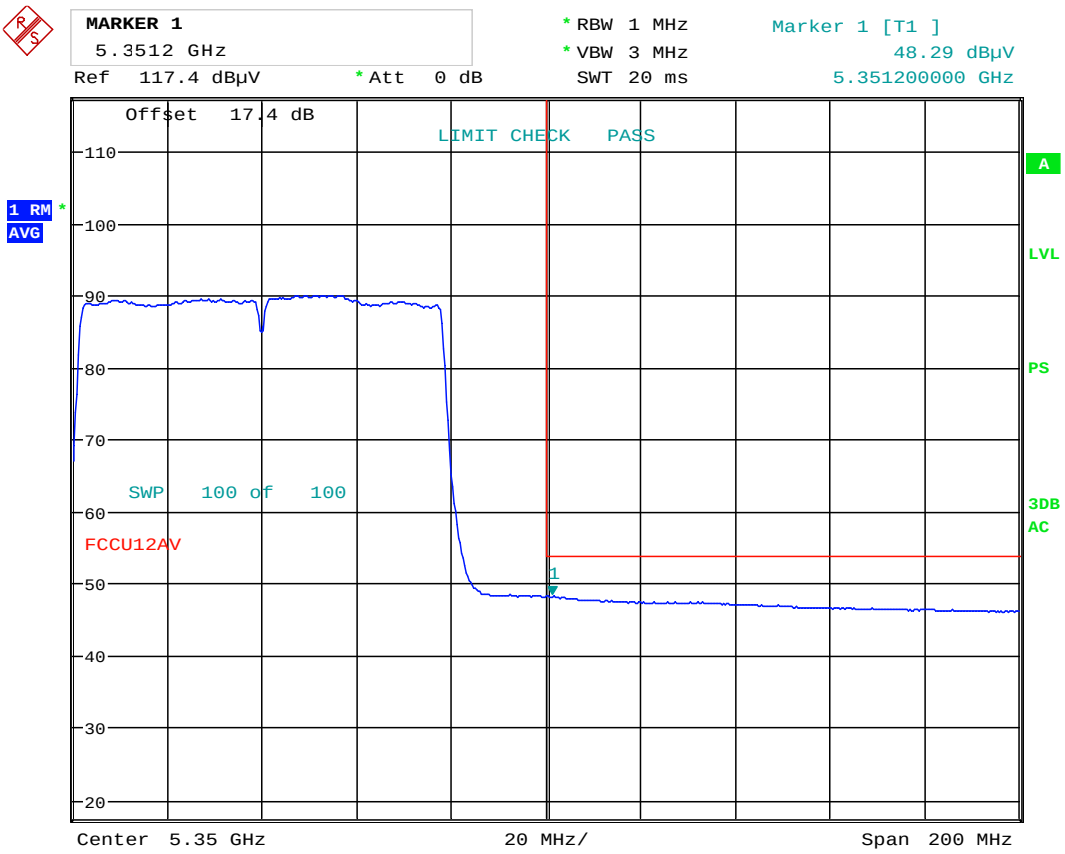
Date: 15.APR.2015 14:52:54

Plot 6-28. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

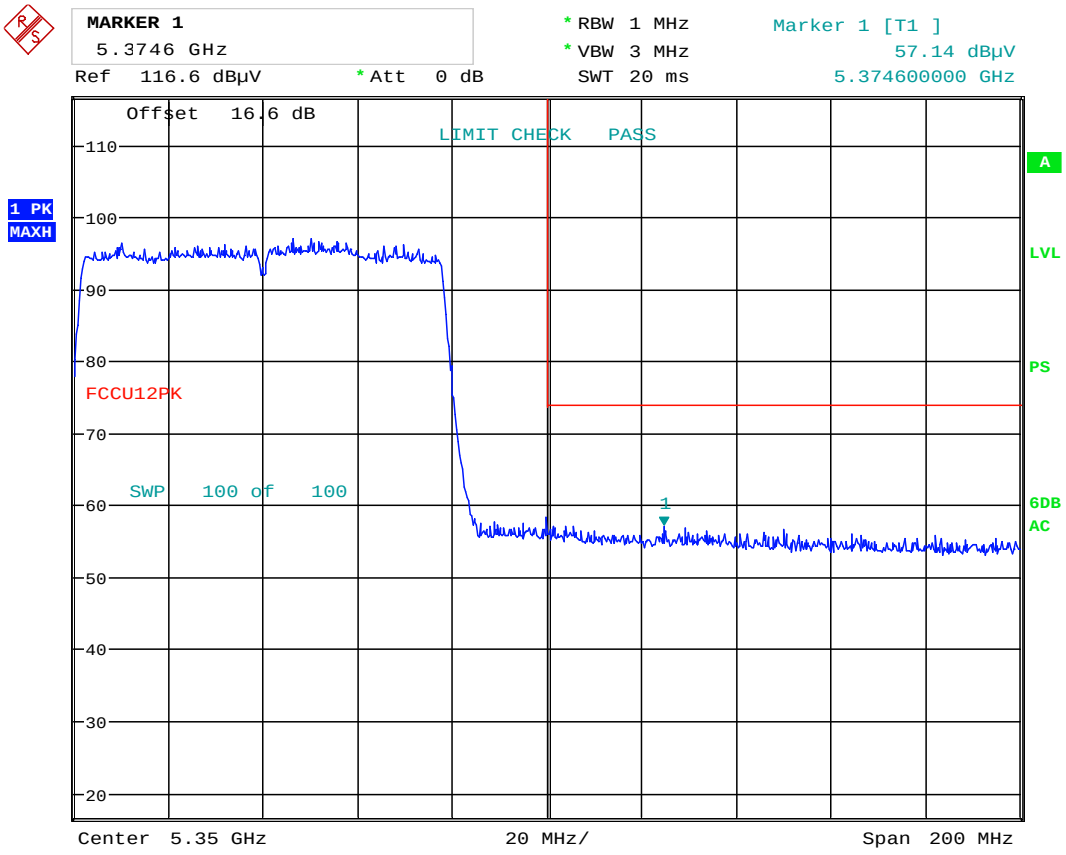


Date: 15.APR.2015 15:11:48

Plot 6-29. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



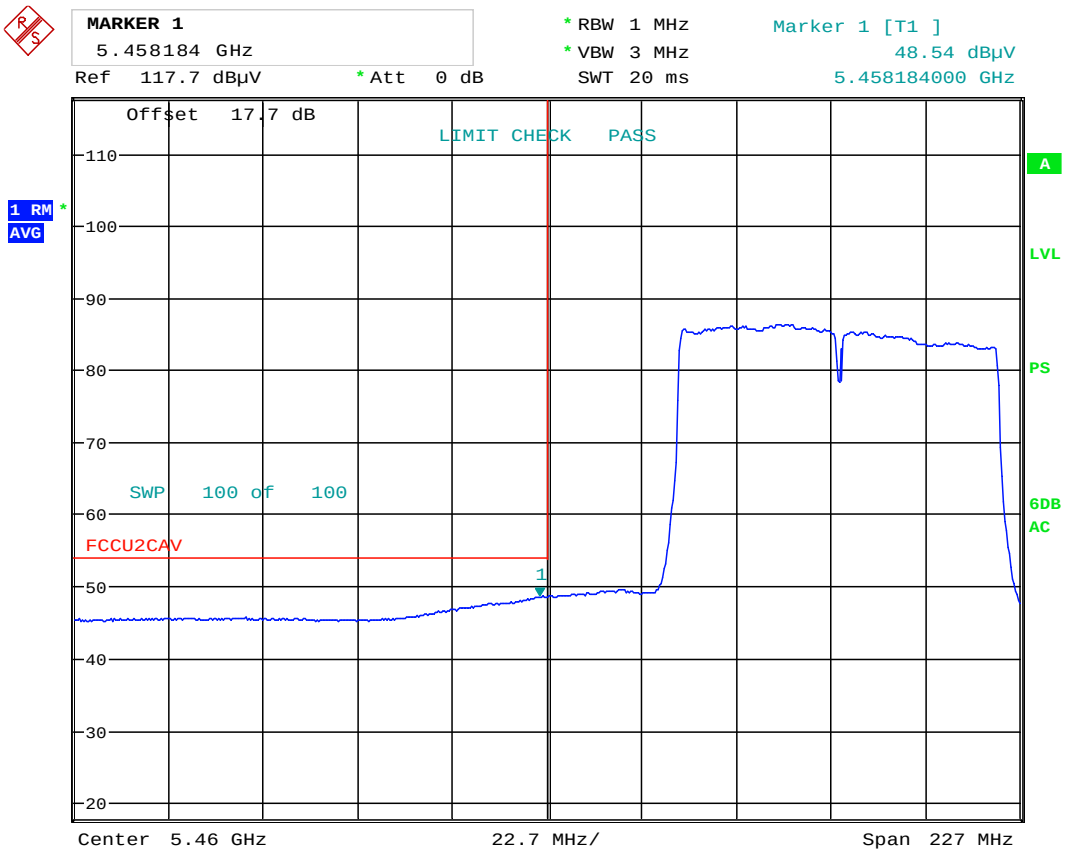
Date: 15.APR.2015 15:12:46

Plot 6-30. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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

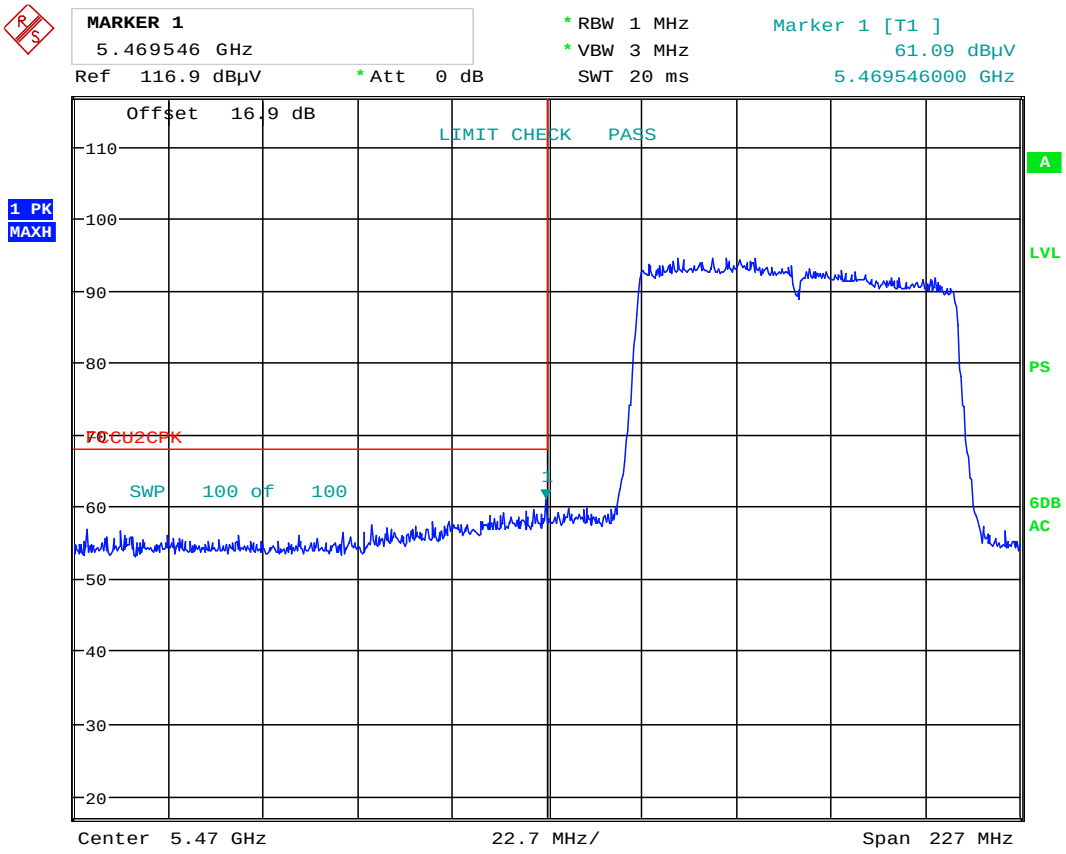


Date: 15.APR.2015 15:27:08

Plot 6-31. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209



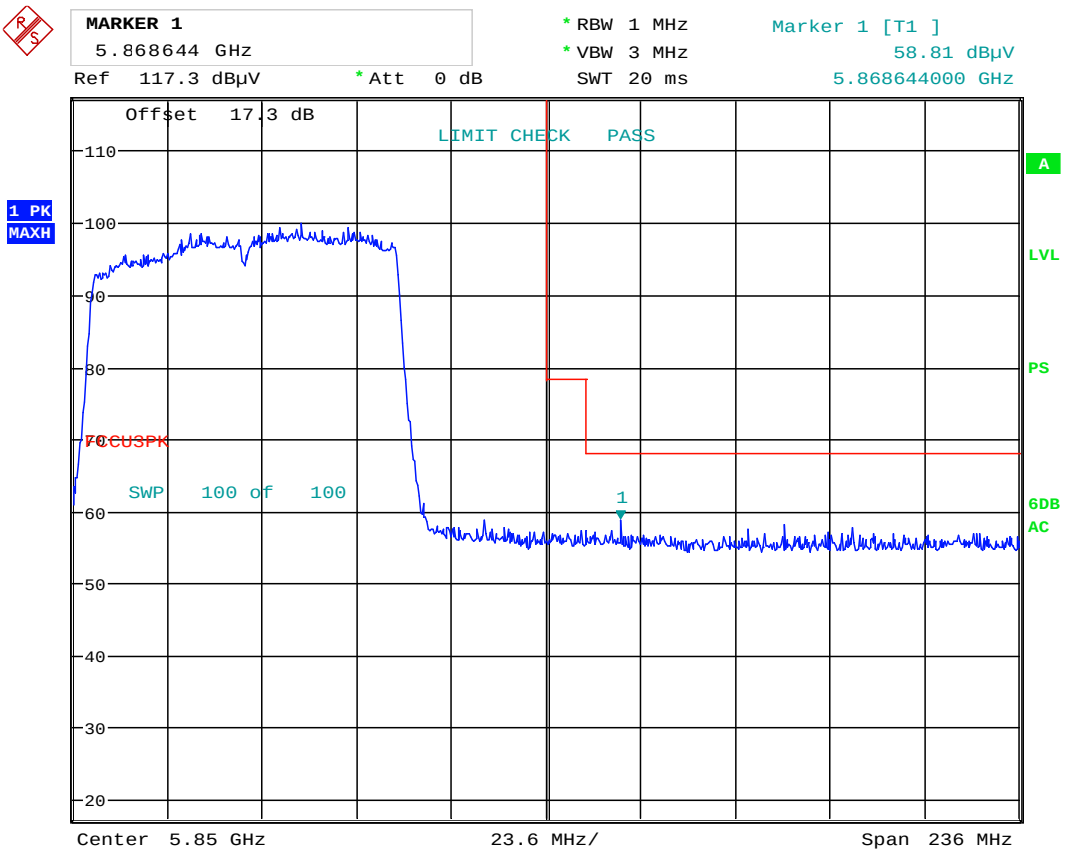
Date: 15.APR.2015 15:28:09

Plot 6-32. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Radiated Band Edge Measurements (80MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209

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



Date: 15.APR.2015 15:38:35

Plot 6-33. Radiated Upper Band Edge Plot (Peak – UNII Band 3)

6.3 Radiated Spurious Emissions Measurements – Below 1GHz

§15.209

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, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. 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 6-15 per Section 15.209.

Frequency	Field Strength [μV/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 6-15. Radiated Limits

Test Procedures Used

ANSI C63.4-2009

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Test Setup

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

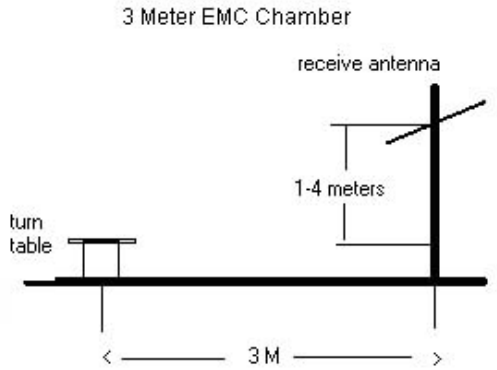


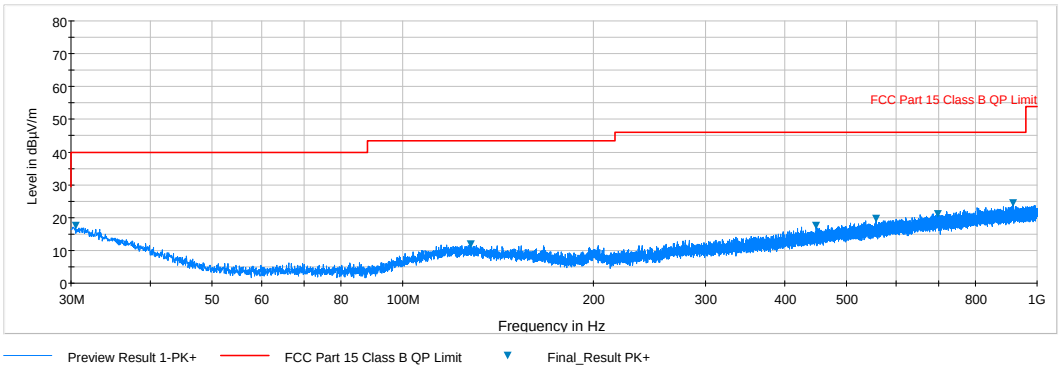
Figure 6-2. Test Instrument & Measurement Setup

Test Notes

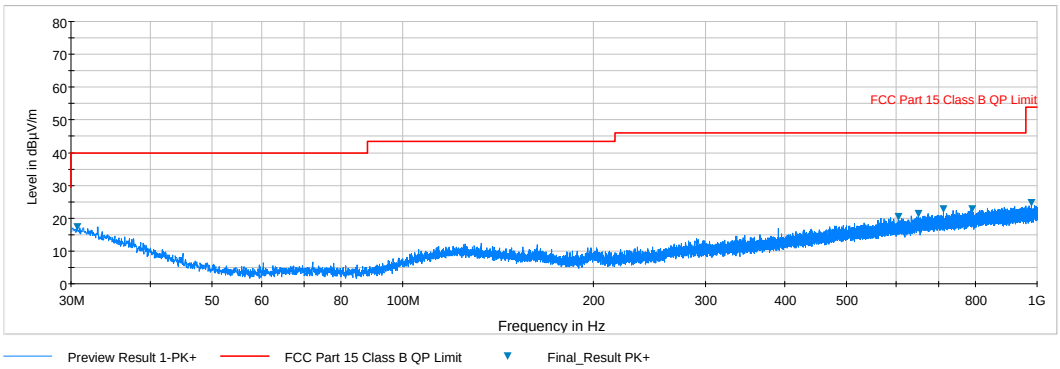
1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-10.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209



Plot 6-34. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)



Plot 6-35. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFH811** is in compliance with Part 15E of the FCC Rules.