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MEASUREMENT REPORT
FCC Part 15.247 WLAN 802.11b/g/n

Applicant Name:
Panasonic Corporation of North America
Two Riverfront Plaza, 9th Floor
Newark, NJ 07102-5490
United States

Date of Testing:
12/17/2014-02/13/2015
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1412152289.ACJ

FCC ID:	**ACJ9TGWL13A**
APPLICANT:	**Panasonic Corporation of North America**

Application Type:	Class II Permissive Change
Model(s):	WL13A
EUT Type:	Wireless Network Adapter
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15.247
Test Procedure(s):	KDB 558074 v03r02, KDB 662911 v02r01
Class II Permissive Change:	The wireless module FCC ID: ACJ9TGWL13A is integrated into the host tablet FZ-R1
Original Grant Date:	09/11/2013

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 558074 v03r02. 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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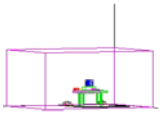

MEASUREMENT REPORT
FCC Part 15.247

§ 2.1033 General Information

APPLICANT:	Panasonic Corporation of North America
APPLICANT ADDRESS:	Two Riverfront Plaza, 9th Floor
	Newark, NJ 07102-5490, United States
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	7185 Oakland Mills Road, Columbia, MD 21046 USA
FCC RULE PART(S):	Part 15.247
BASE MODEL:	WL13A
FCC ID:	ACJ9TGWL13A
FCC CLASSIFICATION:	Digital Transmission System (DTS)
Test Device Serial No.:	WWAN 3 ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	12/17/2014-02/13/2015
TEST REPORT S/N:	0Y1412152289.ACJ

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.

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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 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.

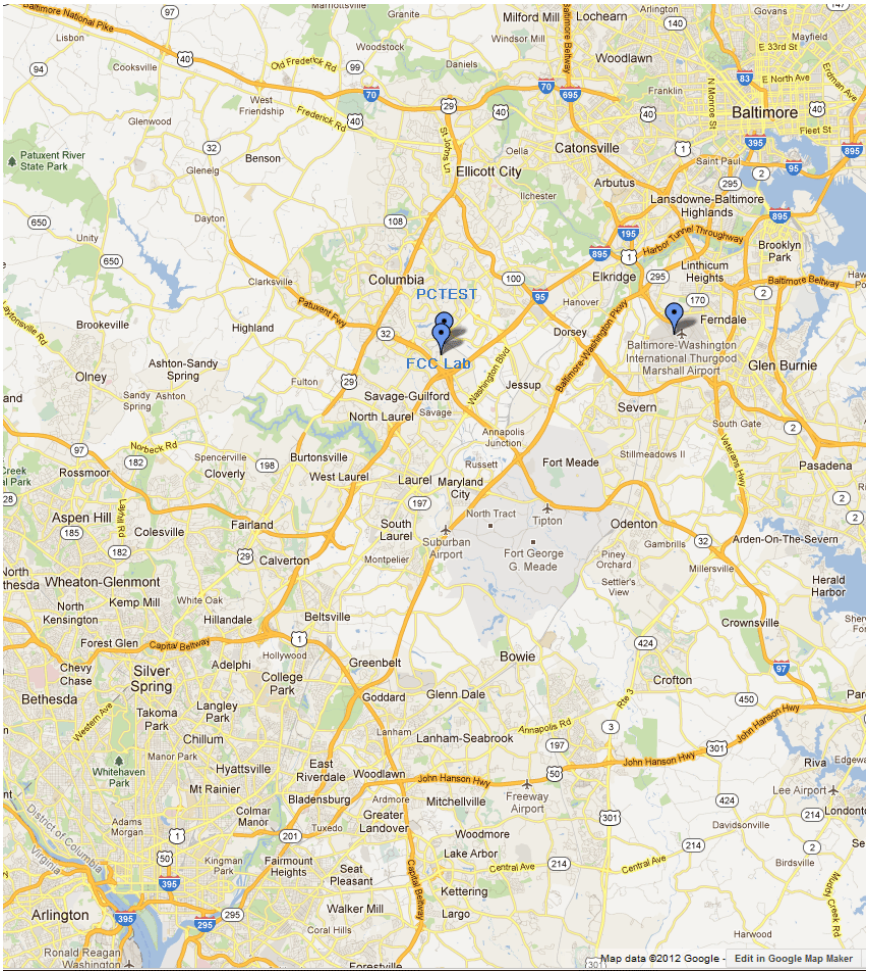

Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Panasonic Wireless Network Adapter FCC ID: ACJ9TGWL13A**. The test data contained in this report pertains only to the emissions due to the EUT's WLAN (DTS) transmitter.

2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE)

Note: 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 6.0 b) of KDB 558074 v03r02. 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 [%]		
		ANT1	ANT2	MIMO
2.4GHz	b	99.30	99.10	N/A
	g	99.30	99.00	N/A
	n	99.00	99.00	99.20

The device employs MIMO technology. Below are the possible configurations.

WiFi Configurations		SISO		SDM	
		ANT1	ANT2	ANT1	ANT2
2.4GHz	11b	✓	✓	×	×
	11g	✓	✓	×	×
	11n	✓	✓	✓	✓

Table 2-1. Frequency / Channel Operations

✓= Support ; × = NOT Support
SISO = Single Input Single Output
SDM = Spatial Diversity Multiplexing – MIMO function

Data Rates Supported: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps (b)
6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps (g)
6.5/7.2Mbps, 13/14.4Mbps, 19.5/21.7Mbps, 26/28.9Mbps, 39/43.3Mbps, 52/57.8Mbps, 58.5/65Mbps, 65/72.2Mbps (n)

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2.3 Test Configuration

The Panasonic Wireless Network Adapter FCC ID: ACJ9TGWL13A was tested per the guidance of KDB 558074 v03r02. 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

2.4 EMI Suppression Device(s)/Modifications

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

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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 558074 v03r02 were used in the measurement of the **Panasonic Wireless Network Adapter FCC ID: ACJ9TGWL13A.**

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).

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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 Wireless Network Adapter are **permanently attached.**
- There are no provisions for connections to an external antenna.

Conclusion:

The **Panasonic Wireless Network Adapter FCC ID: ACJ9TGWL13A** unit complies with the requirement of §15.203.

Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

Table 4-1. Frequency/ Channel Operations

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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)	5/29/2014	Annual	5/29/2015	N/A
Agilent	8447D	Broadband Amplifier	5/30/2014	Annual	5/30/2015	2443A01900
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	6/26/2013	Biennial	6/26/2015	121034
Emco	3115	Horn Antenna (1-18GHz)	1/30/2014	Biennial	1/30/2016	9704-5182
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/8/2014	Biennial	4/8/2016	125518
K & L	11SH10-3075/U18000	High Pass Filter	5/2/2014	Annual	5/2/2015	2
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	1/27/2014	Annual	1/27/2015	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	3/5/2014	Annual	3/5/2015	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	3/12/2014	Annual	3/12/2015	100040
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
VWR	62344-734	Thermometer with Clock	2/20/2014	Biennial	2/20/2016	140140420

Table 5-1. Annual Test Equipment Calibration Schedule

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6.0 TEST RESULTS

6.1 Summary

Company Name: Panasonic Corporation of North America
FCC ID: ACJ9TGWL13A
FCC Classification: Digital Transmission System (DTS)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	RADIATED	PASS	Sections 6.2

Table 6-1. Summary of Test Results

Notes:

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

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6.2 Radiated Spurious Emission Measurements – Above 1 GHz

§15.247(d) §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, 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 6-2 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 558074 v03r02 – Section 12.1, 12.2.7

Test Settings

Average Field Strength Measurements per Section 12.2.5.1 of KDB 558074 v03r02

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. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces

Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 v03r02

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

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Test Setup

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

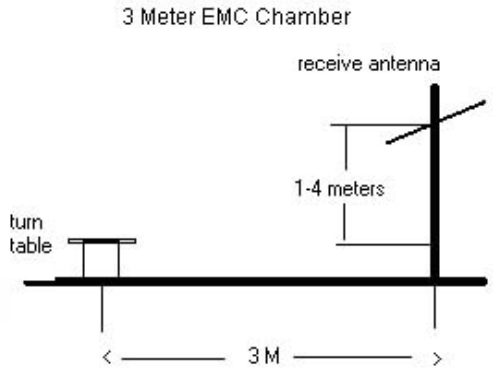

Figure 6-1. Test Instrument & Measurement Setup

Test Notes

1. The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 558074 v03r02 were not used to evaluate this device for compliance to radiated limits. All radiated spurious emissions levels were measured in a radiated test setup.
2. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-2.
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. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.

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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

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6.2.1 Antenna-1 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	01

Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4824.00	-109.62	Avg	H	38.64	36.02	53.98	-17.96
4824.00	-100.01	Peak	H	38.64	45.63	73.98	-28.35
12060.00	-117.49	Avg	H	48.85	38.36	53.98	-15.62
12060.00	-104.69	Peak	H	48.85	51.16	73.98	-22.82

Table 6-3. Radiated Measurements

Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2437MHz
Channel:	06

Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4874.00	-106.27	Avg	H	38.77	39.50	53.98	-14.48
4874.00	-98.95	Peak	H	38.77	46.82	73.98	-27.16
7311.00	-111.12	Avg	H	43.79	39.67	53.98	-14.31
7311.00	-100.13	Peak	H	43.79	50.66	73.98	-23.32
12185.00	-117.40	Avg	H	48.71	38.31	53.98	-15.67
12185.00	-104.20	Peak	H	48.71	51.51	73.98	-22.47

Table 6-4. Radiated Measurements

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Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11

Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4924.00	-106.47	Avg	H	38.90	39.42	53.98	-14.56
4924.00	-98.36	Peak	H	38.90	47.53	73.98	-26.45
7386.00	-107.26	Avg	H	43.97	43.71	53.98	-10.27
7386.00	-98.63	Peak	H	43.97	52.34	73.98	-21.64
12310.00	-117.07	Avg	H	48.75	38.68	53.98	-15.30
12310.00	-103.77	Peak	H	48.75	51.98	73.98	-22.00

Table 6-5. Radiated Measurements

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6.2.2 Antenna-2 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	01

Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4824.00	-99.77	Avg	H	38.64	45.87	53.98	-8.11
4824.00	-95.61	Peak	H	38.64	50.03	73.98	-23.95
12060.00	-117.71	Avg	H	48.85	38.14	53.98	-15.84
12060.00	-105.18	Peak	H	48.85	50.67	73.98	-23.31

Table 6-6. Radiated Measurements

Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2437MHz
Channel:	06

Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4874.00	-100.71	Avg	H	38.77	45.06	53.98	-8.92
4874.00	-96.25	Peak	H	38.77	49.52	73.98	-24.46
7311.00	-114.72	Avg	H	43.79	36.07	53.98	-17.91
7311.00	-101.10	Peak	H	43.79	49.69	73.98	-24.29
12185.00	-117.63	Avg	H	48.71	38.08	53.98	-15.90
12185.00	-105.49	Peak	H	48.71	50.22	73.98	-23.76

Table 6-7. Radiated Measurements

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Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11

Frequency [MHz]	Analyzer Level [dBm]	Detector	Ant. Pol. [H/V]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4924.00	-100.77	Avg	H	38.90	45.12	53.98	-8.86
4924.00	-96.00	Peak	H	38.90	49.89	73.98	-24.09
7386.00	-114.36	Avg	H	43.97	36.61	53.98	-17.37
7386.00	-101.81	Peak	H	43.97	49.16	73.98	-24.82
12310.00	-117.21	Avg	H	48.75	38.54	53.98	-15.44
12310.00	-104.56	Peak	H	48.75	51.19	73.98	-22.79

Table 6-8. Radiated Measurements

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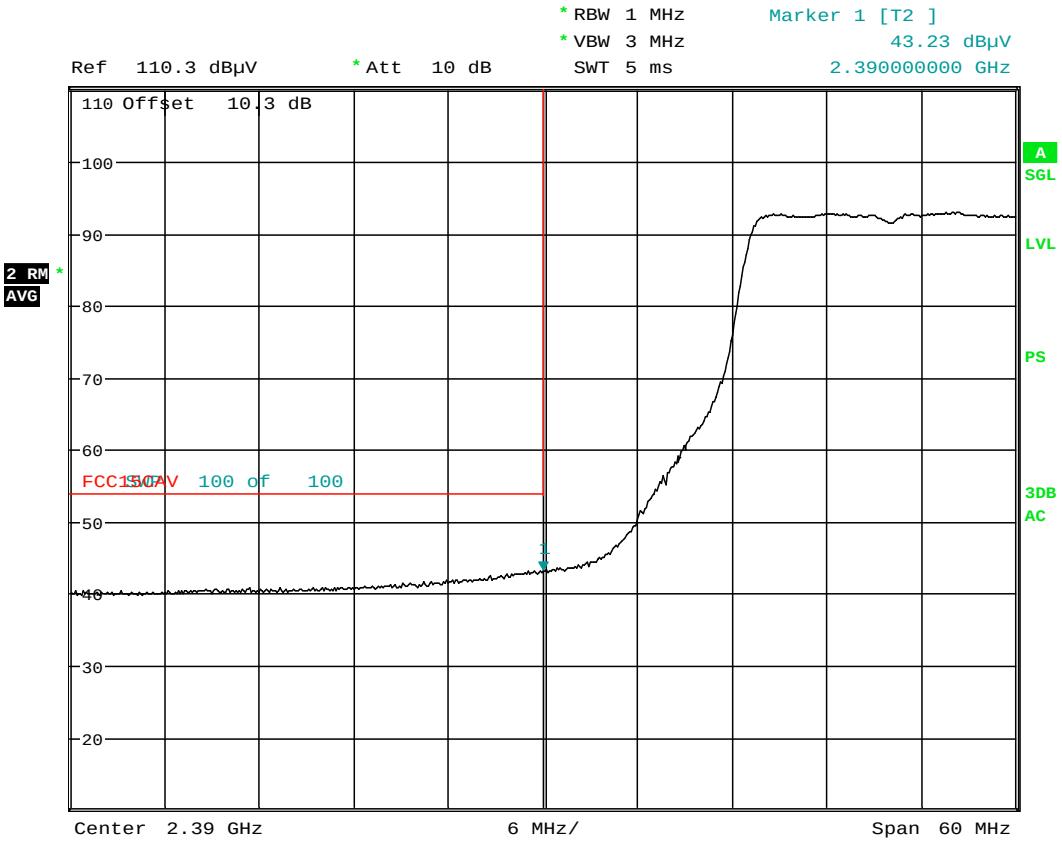
6.2.3 Antenna-1 Radiated Restricted Band Edge Measurements

§15.205 §15.209

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	1



Date: 17.DEC.2014 21:51:13

Plot 6-1. Radiated Restricted Lower Band Edge Measurement (Average)

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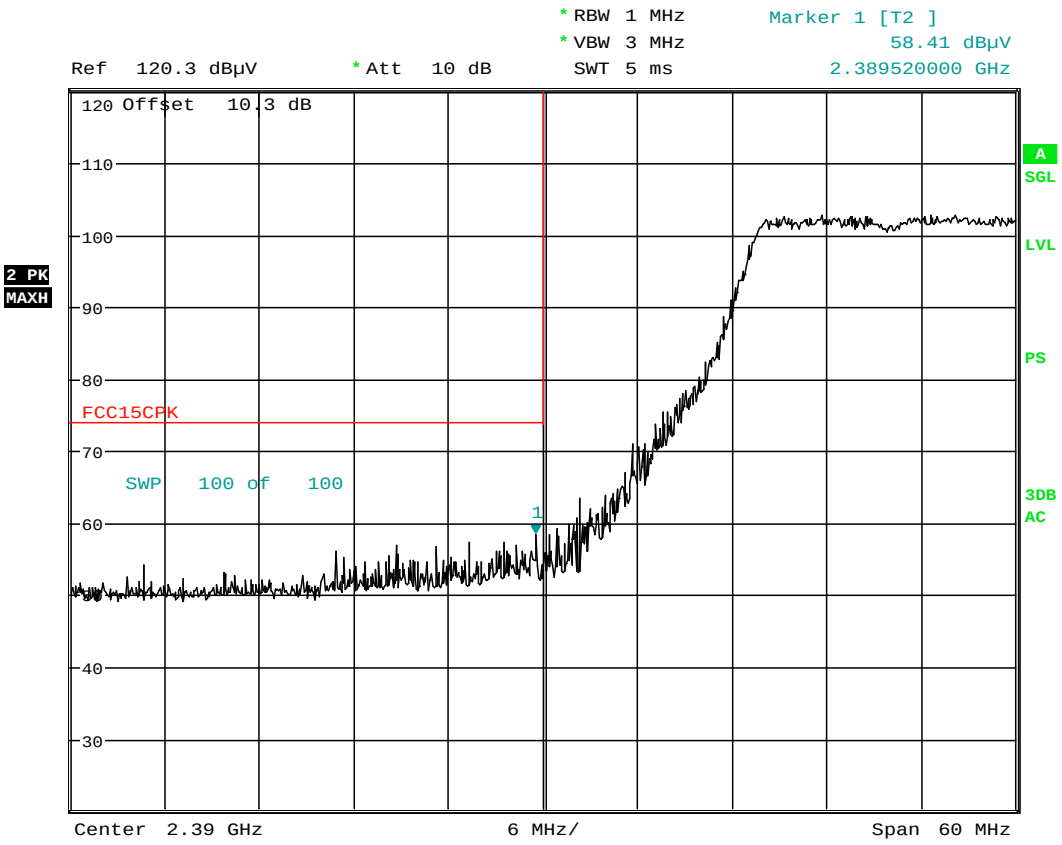
Antenna-1 Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 21:54:24

Plot 6-2. Radiated Restricted Lower Band Edge Measurement (Peak)

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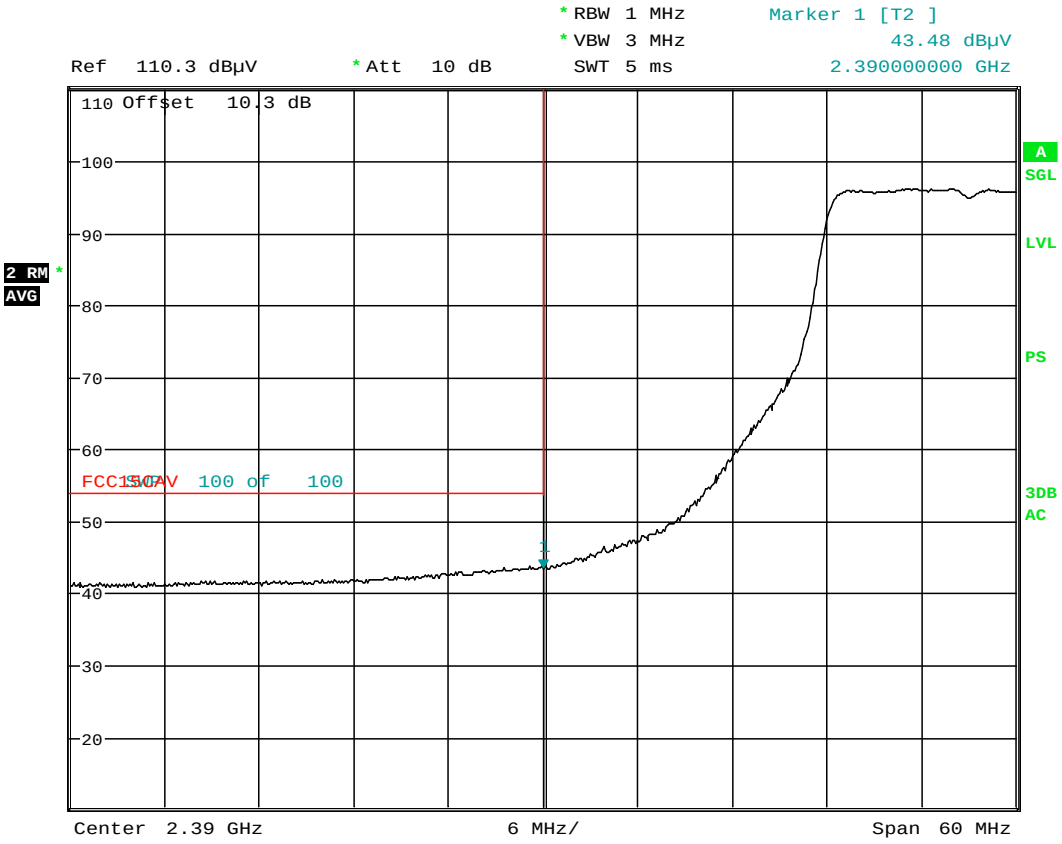
Antenna-1 Radiated Restricted Band Edge Measurements
§15.205 §15.209

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2417MHz
Channel:	2



Date: 17.DEC.2014 21:52:01

Plot 6-3. Radiated Restricted Lower Band Edge Measurement (Average)

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Antenna-1 Radiated Restricted Band Edge Measurements

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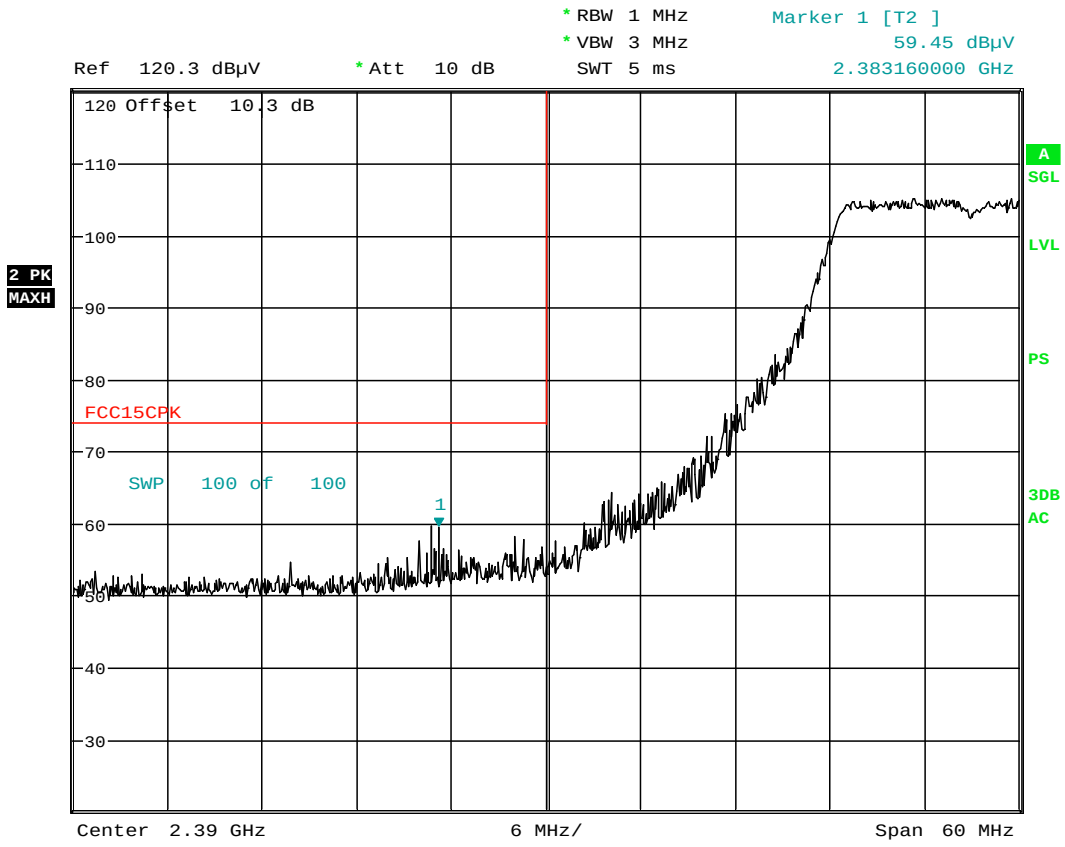

Date: 17.DEC.2014 21:53:20

Plot 6-4. Radiated Restricted Lower Band Edge Measurement (Peak)

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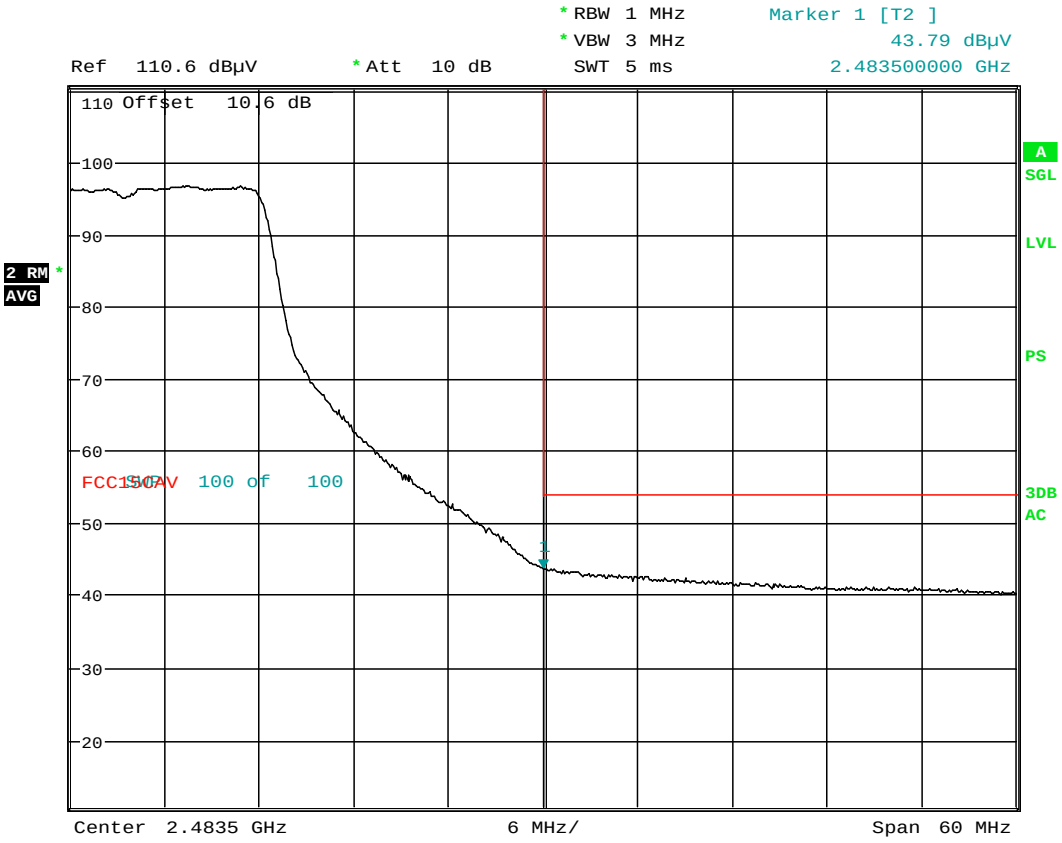
Antenna-1 Radiated Restricted Band Edge Measurements

§15.205 §15.209

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2457MHz
Channel:	10



Date: 17.DEC.2014 22:02:01

Plot 6-5. Radiated Restricted Upper Band Edge Measurement (Average)

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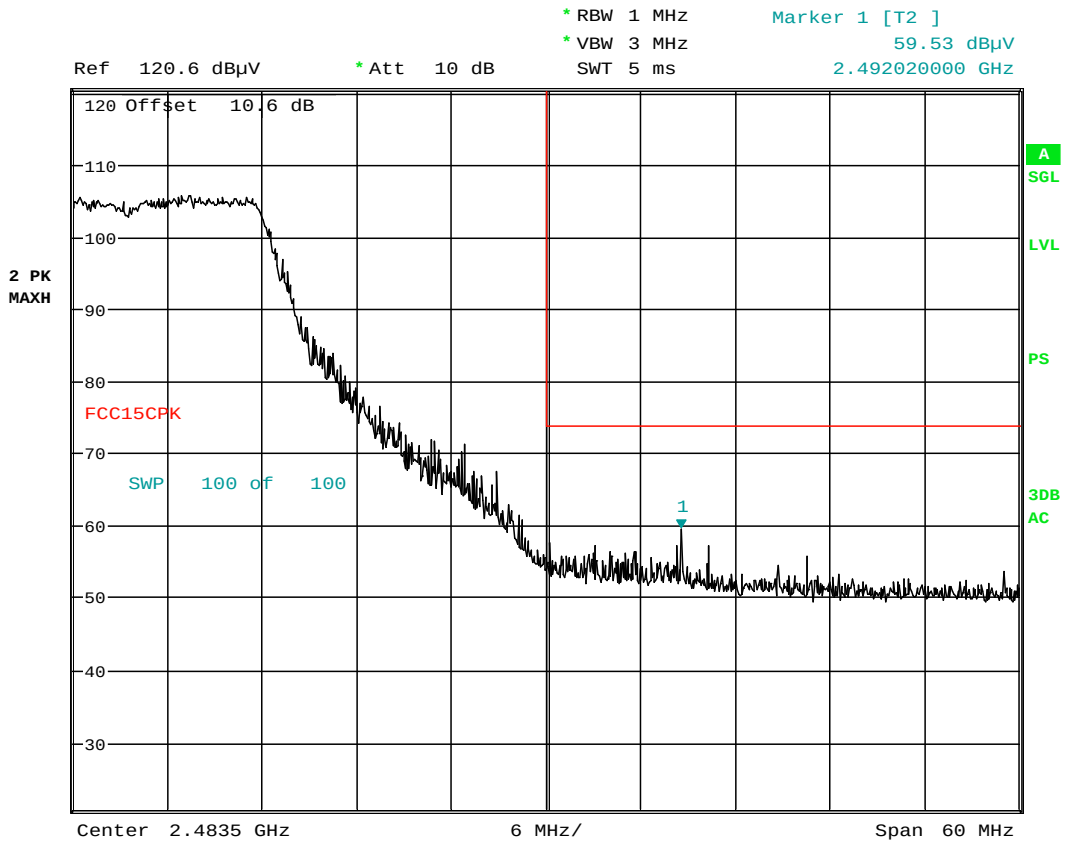
Antenna-1 Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:02:50

Plot 6-6. Radiated Restricted Upper Band Edge Measurement (Peak)

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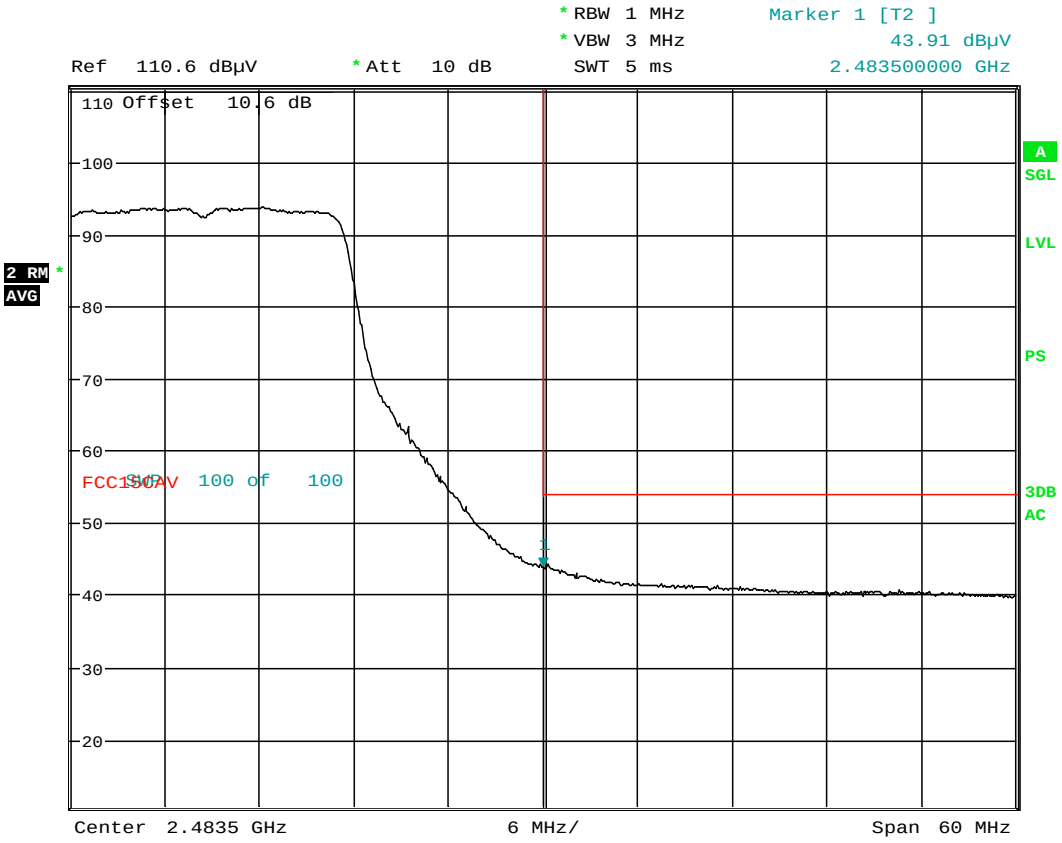
Antenna-1 Radiated Restricted Band Edge Measurements

§15.205 §15.209

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11



Date: 17.DEC.2014 22:00:20

Plot 6-7. Radiated Restricted Upper Band Edge Measurement (Average)

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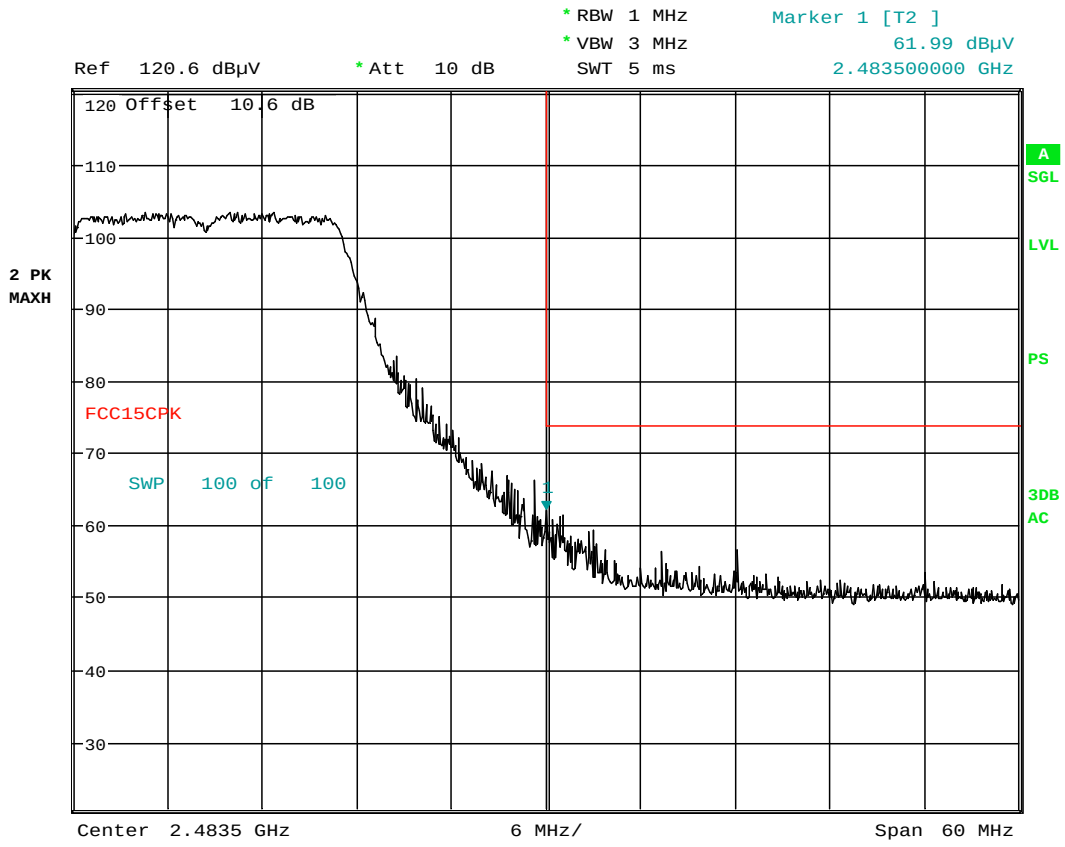
Antenna-1 Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:03:51

Plot 6-8. Radiated Restricted Upper Band Edge Measurement (Peak)

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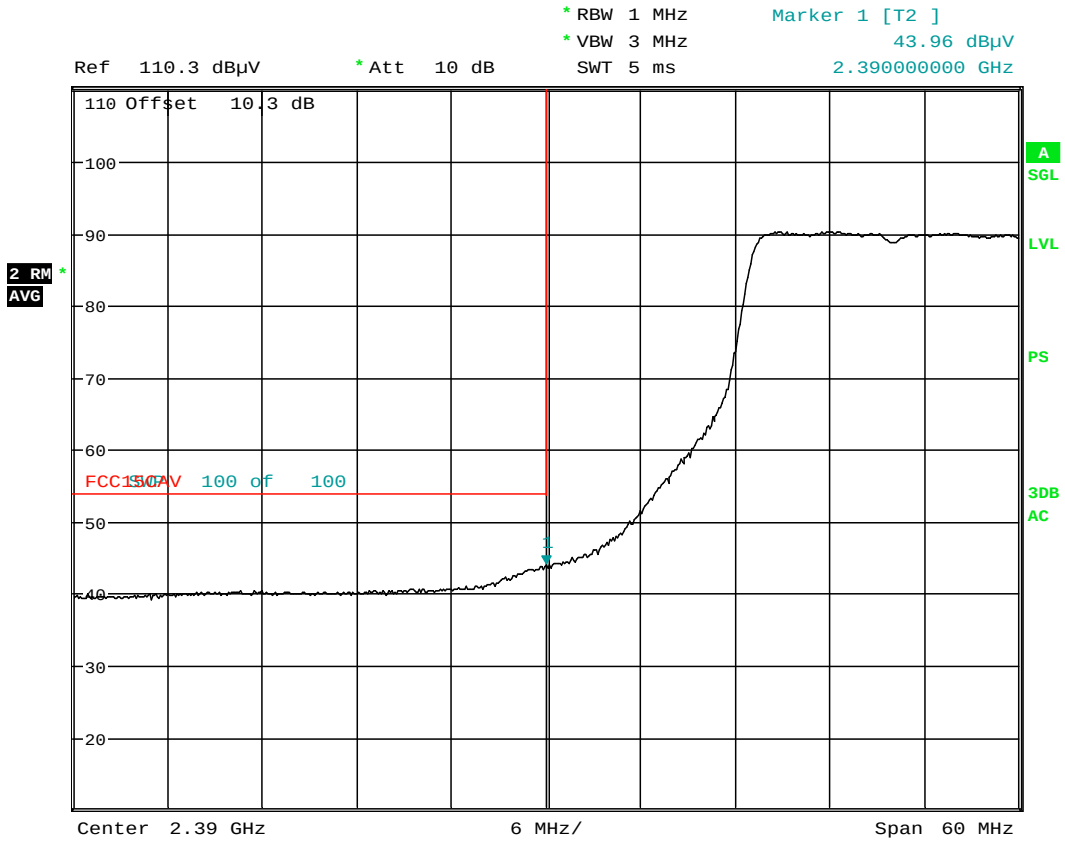
6.2.4 Antenna-2 Radiated Restricted Band Edge Measurements

§15.205 §15.209

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	1



Date: 17.DEC.2014 22:19:33

Plot 6-9. Radiated Restricted Lower Band Edge Measurement (Average)

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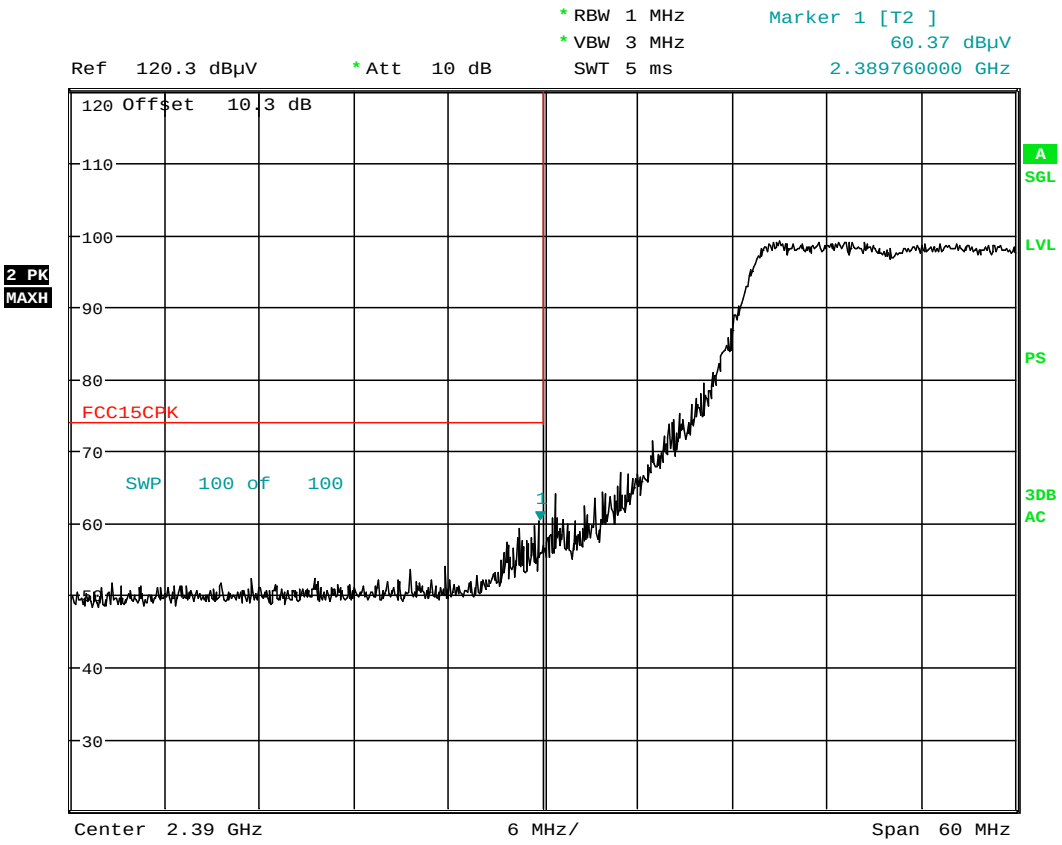
Antenna-2 Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:22:24

Plot 6-10. Radiated Restricted Lower Band Edge Measurement (Peak)

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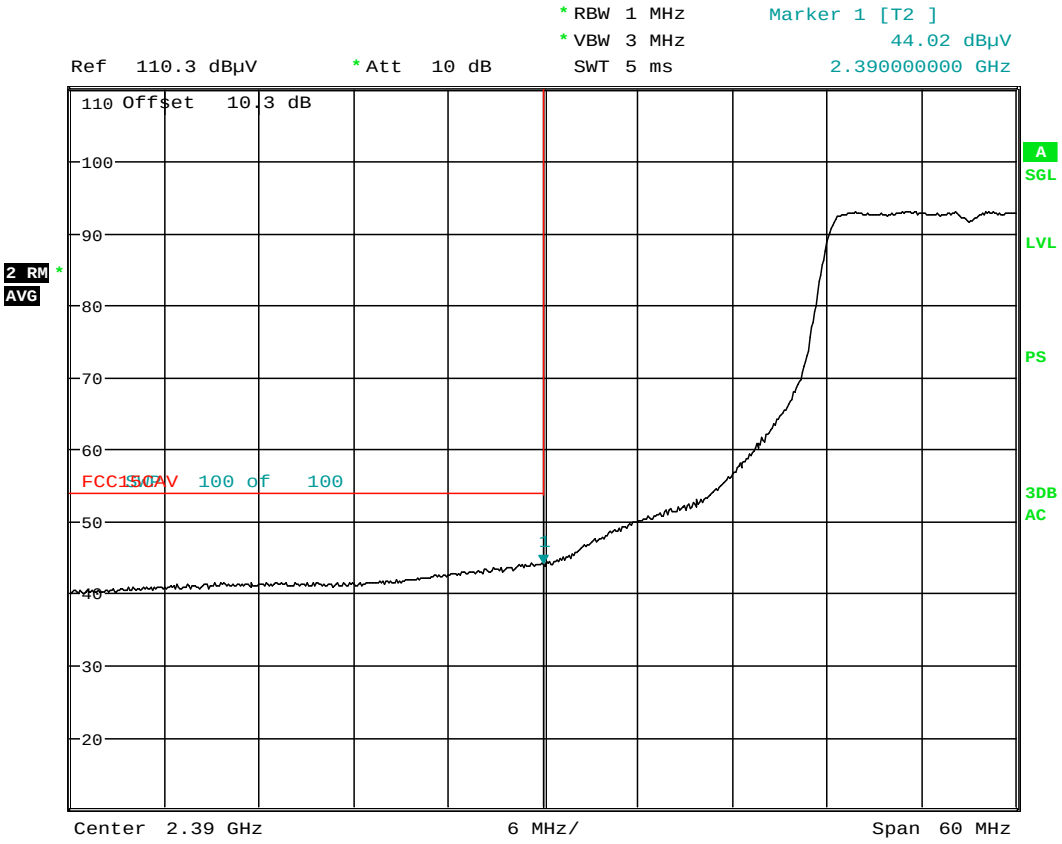
Antenna-2 Radiated Restricted Band Edge Measurements

§15.205 §15.209

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2417MHz
Channel:	2



Date: 17.DEC.2014 22:20:59

Plot 6-11. Radiated Restricted Lower Band Edge Measurement (Average)

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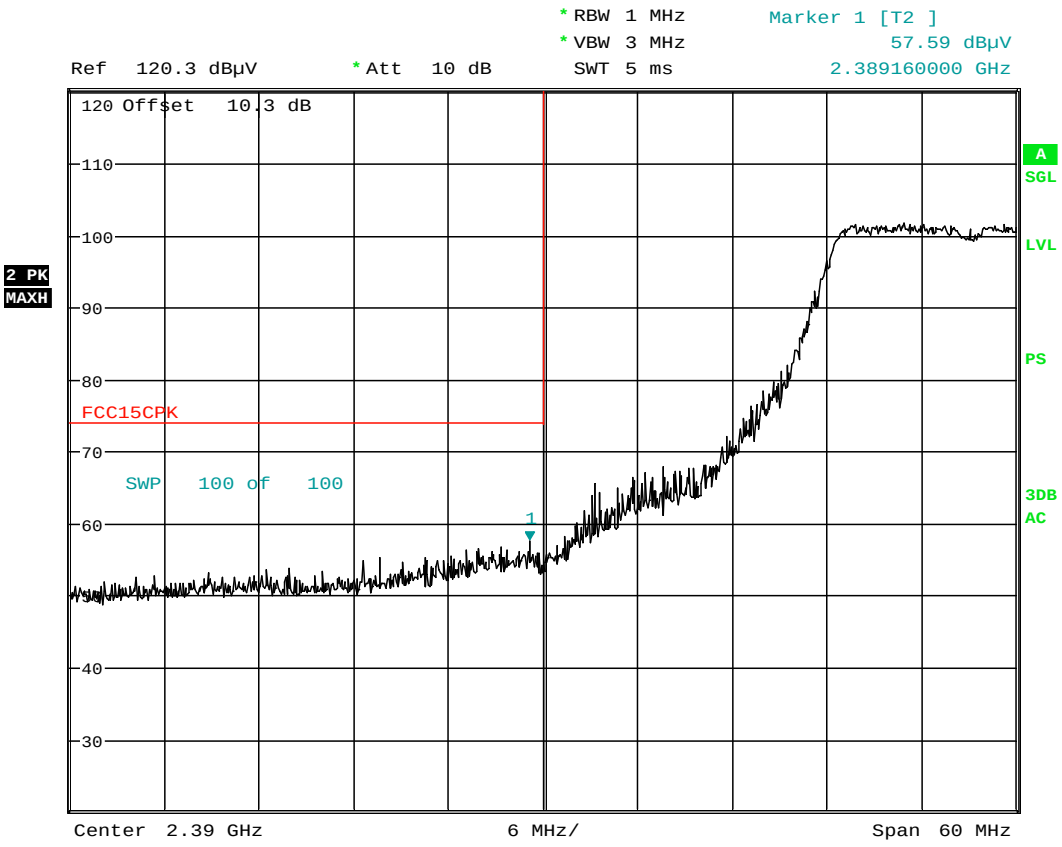
Antenna-2 Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:21:29

Plot 6-12. Radiated Restricted Lower Band Edge Measurement (Peak)

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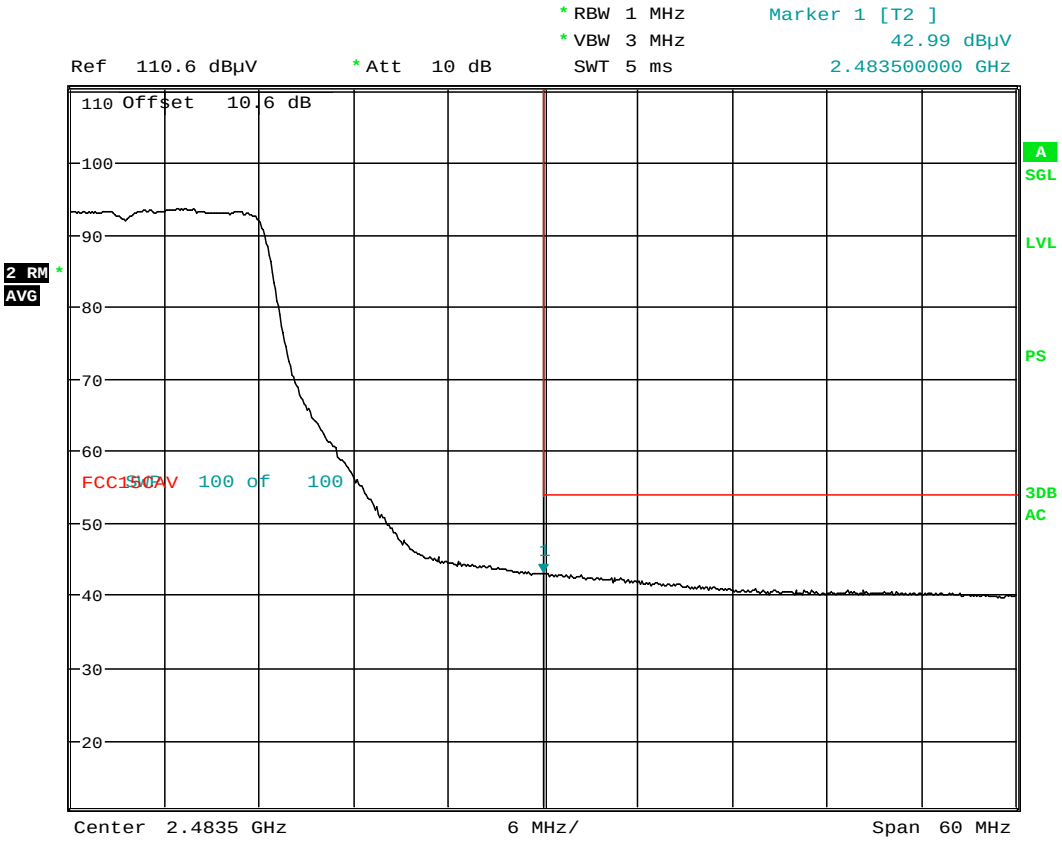
Antenna-2 Radiated Restricted Band Edge Measurements

§15.205 §15.209

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2457MHz
Channel:	10



Date: 17.DEC.2014 22:12:02

Plot 6-13. Radiated Restricted Upper Band Edge Measurement (Average)

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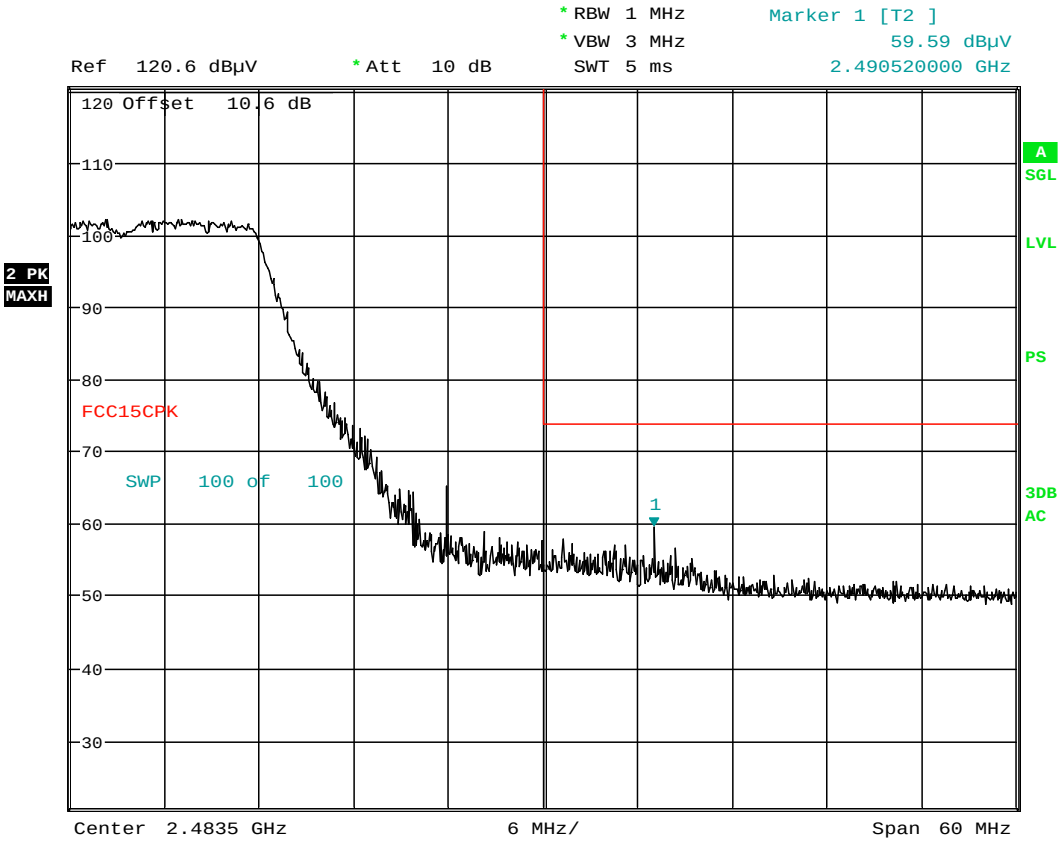
Antenna-2 Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:12:32

Plot 6-14. Radiated Restricted Upper Band Edge Measurement (Peak)

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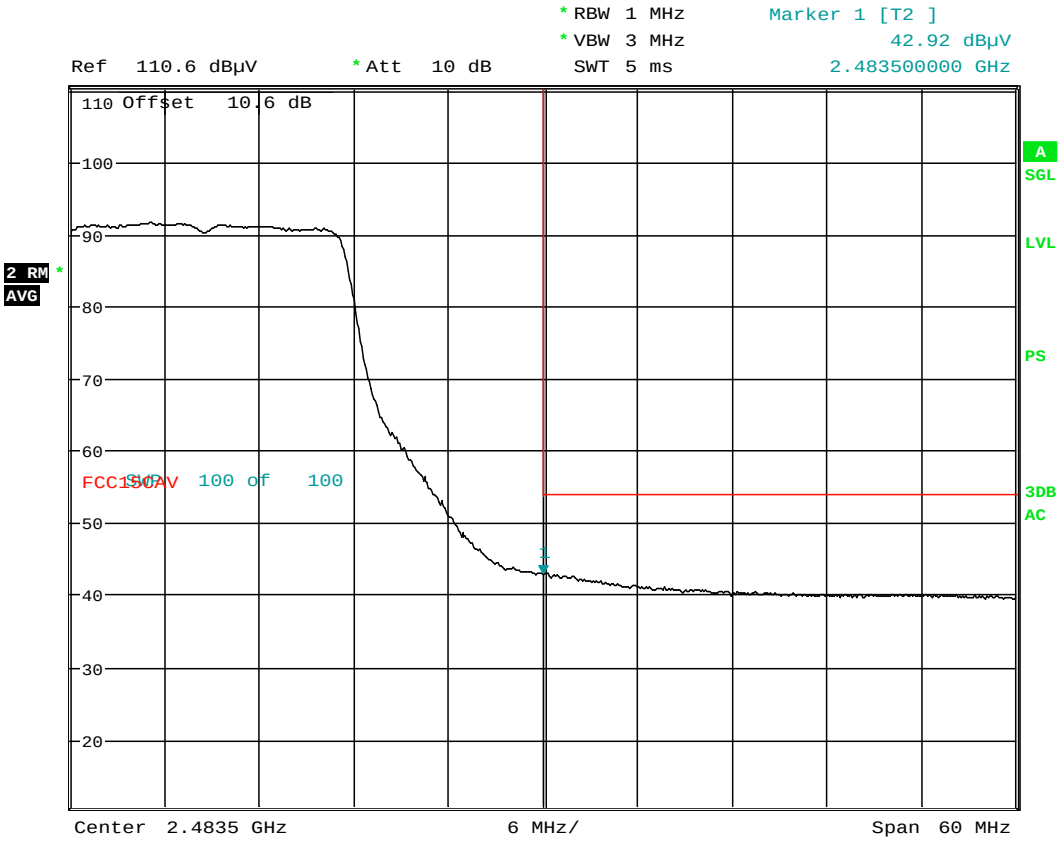
Antenna-2 Radiated Restricted Band Edge Measurements

§15.205 §15.209

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11



Date: 17.DEC.2014 22:11:03

Plot 6-15. Radiated Restricted Upper Band Edge Measurement (Average)

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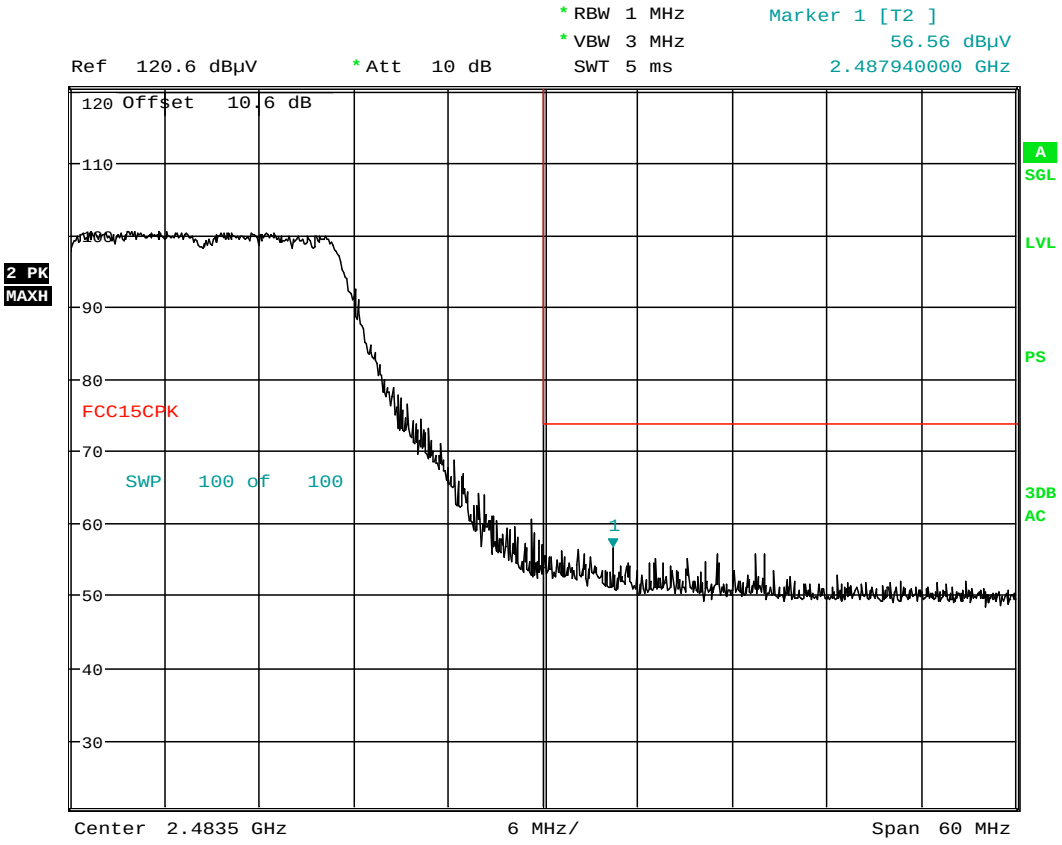
Antenna-2 Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:13:45

Plot 6-16. Radiated Restricted Upper Band Edge Measurement (Peak)

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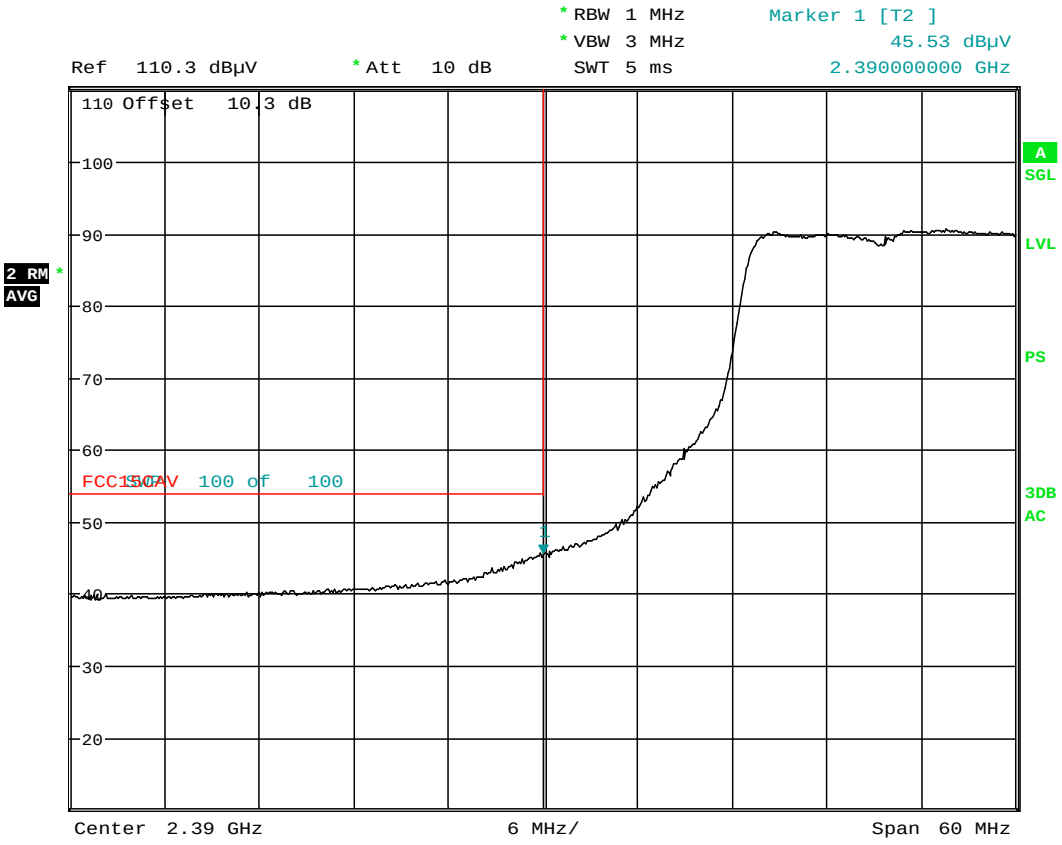
6.2.5 MIMO Radiated Restricted Band Edge Measurements

§15.205 §15.209

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	1



Date: 17.DEC.2014 22:27:51

Plot 6-17. Radiated Restricted Lower Band Edge Measurement (Average)

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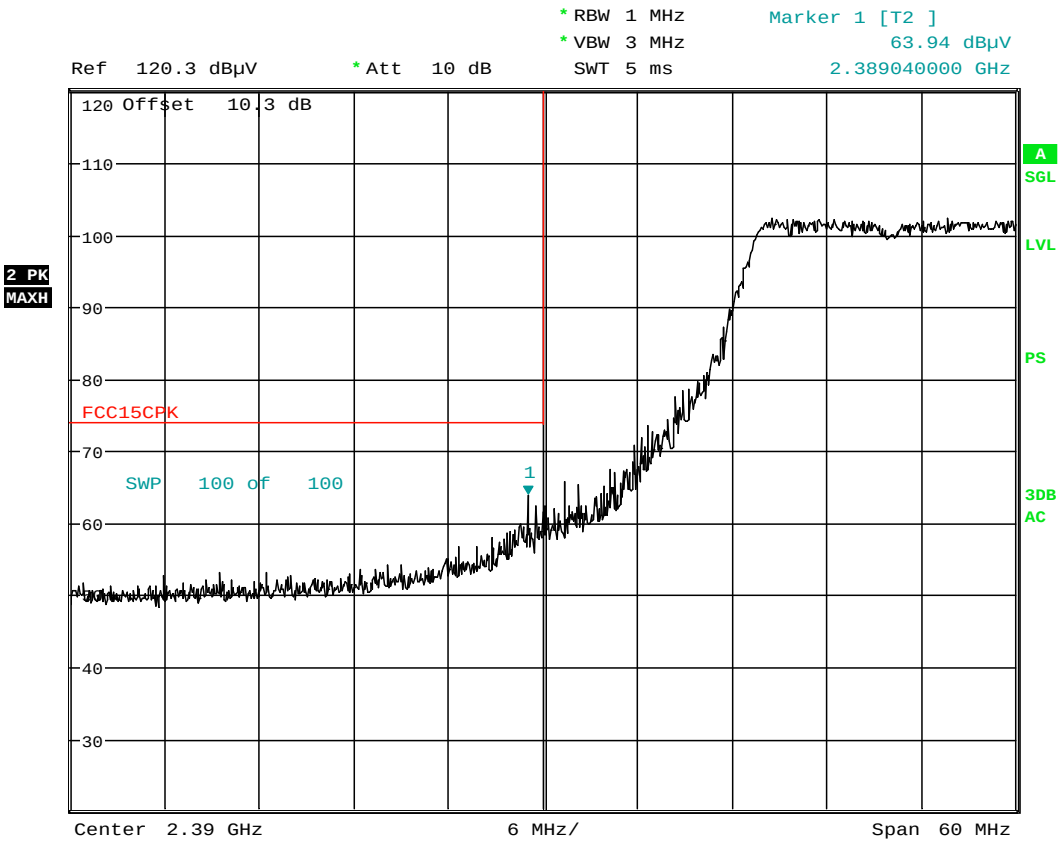
MIMO Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:31:12

Plot 6-18. Radiated Restricted Lower Band Edge Measurement (Peak)

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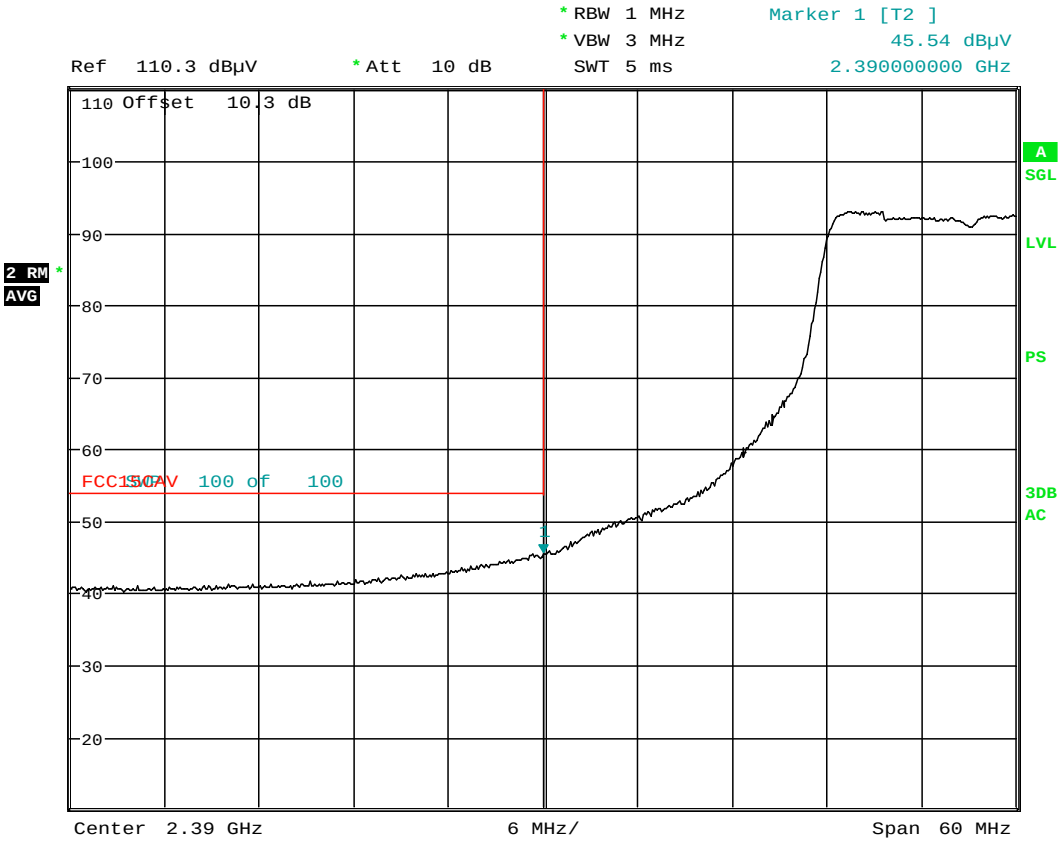
MIMO Radiated Restricted Band Edge Measurements

§15.205 §15.209

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	2417MHz
Channel:	2



Date: 17.DEC.2014 22:28:55

Plot 6-19. Radiated Restricted Lower Band Edge Measurement (Average)

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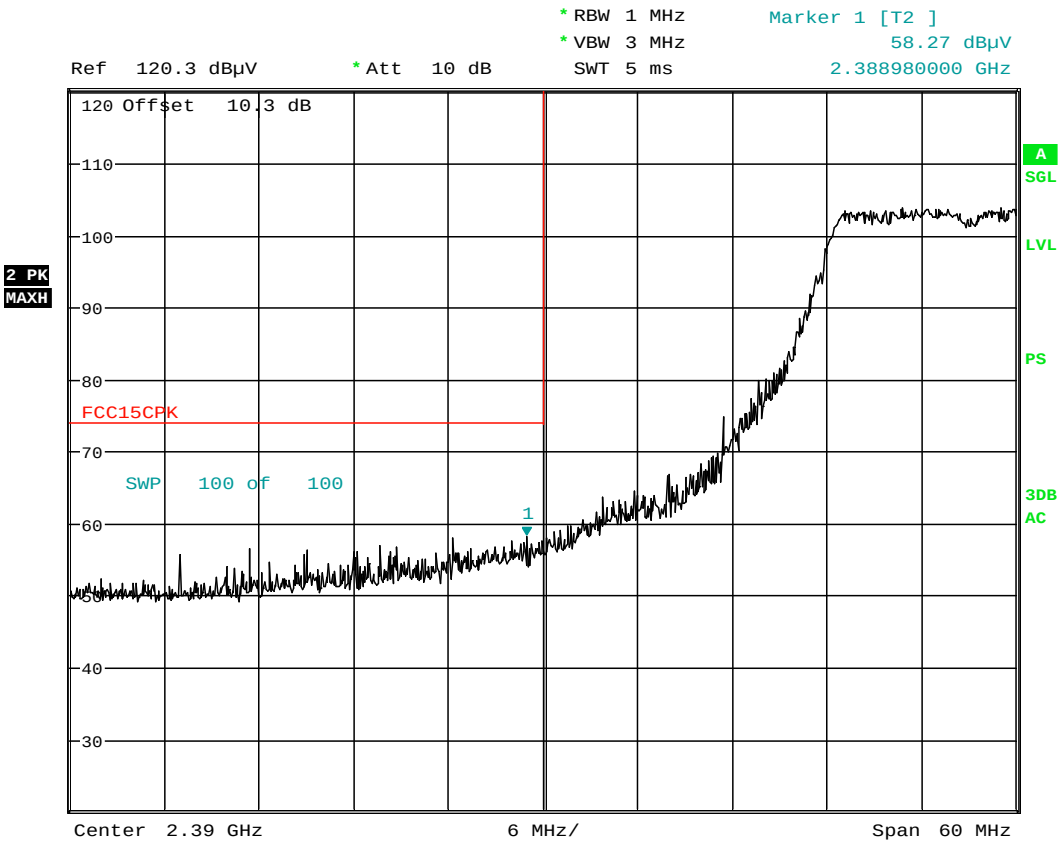
MIMO Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:30:08

Plot 6-20. Radiated Restricted Lower Band Edge Measurement (Peak)

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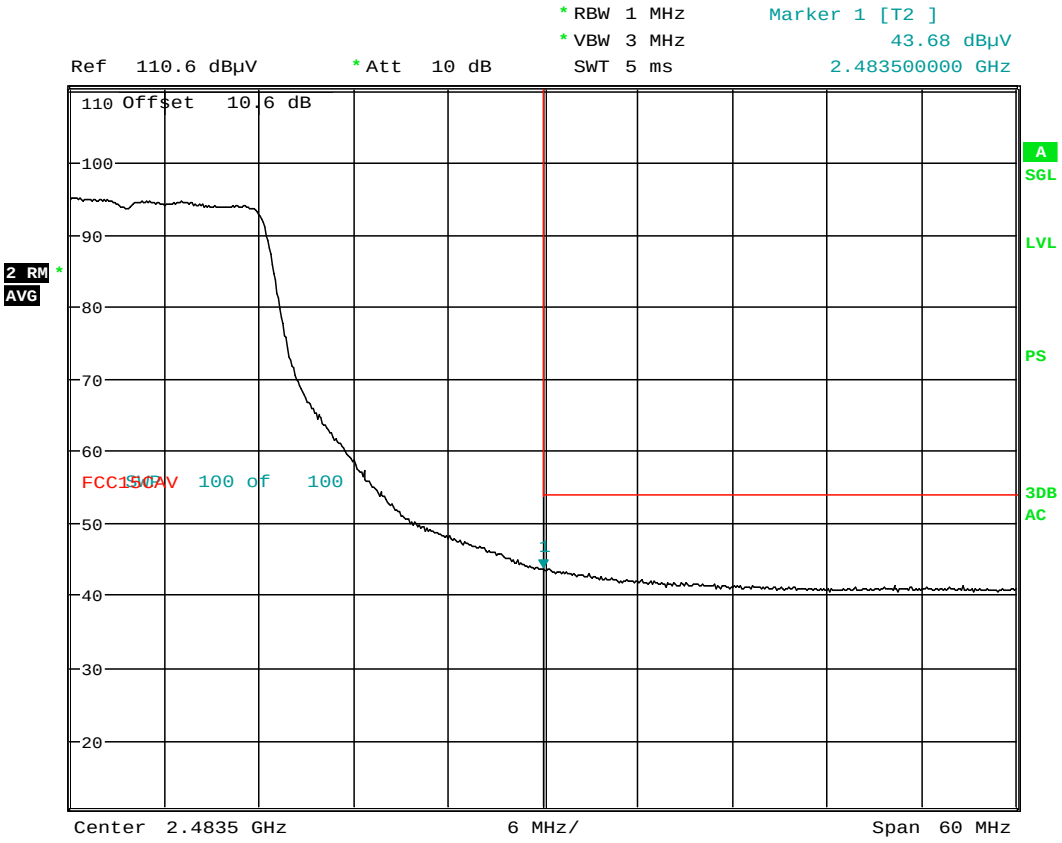
MIMO Radiated Restricted Band Edge Measurements

§15.205 §15.209

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	2457MHz
Channel:	10



Date: 17.DEC.2014 22:37:20

Plot 6-21. Radiated Restricted Upper Band Edge Measurement (Average)

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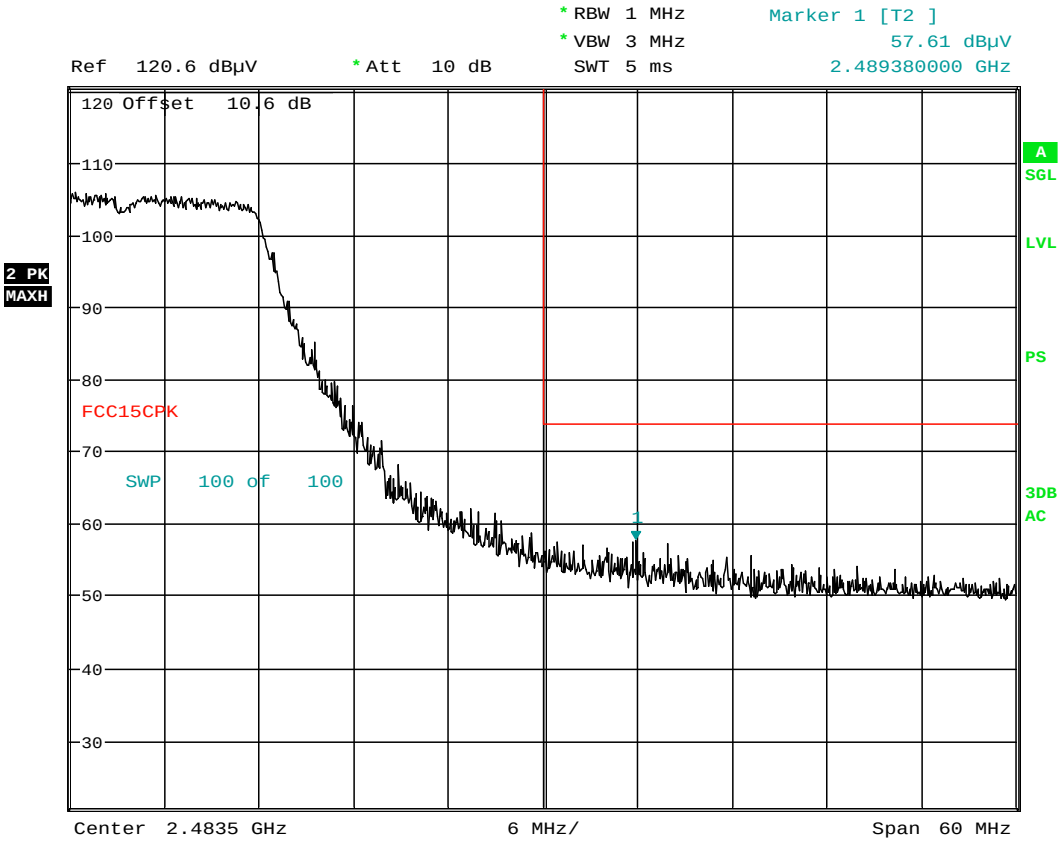
MIMO Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:38:45

Plot 6-22. Radiated Restricted Upper Band Edge Measurement (Peak)

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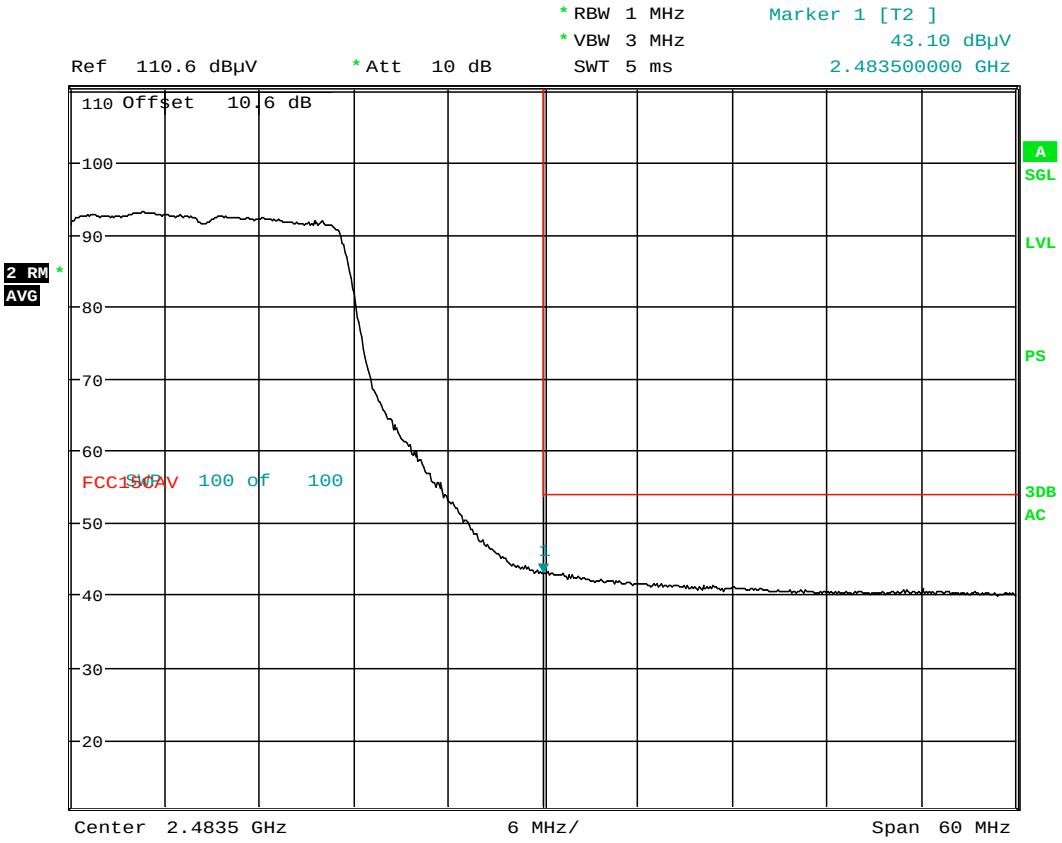
MIMO Radiated Restricted Band Edge Measurements

§15.205 §15.209

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11



Date: 17.DEC.2014 22:40:58

Plot 6-23. Radiated Restricted Upper Band Edge Measurement (Average)

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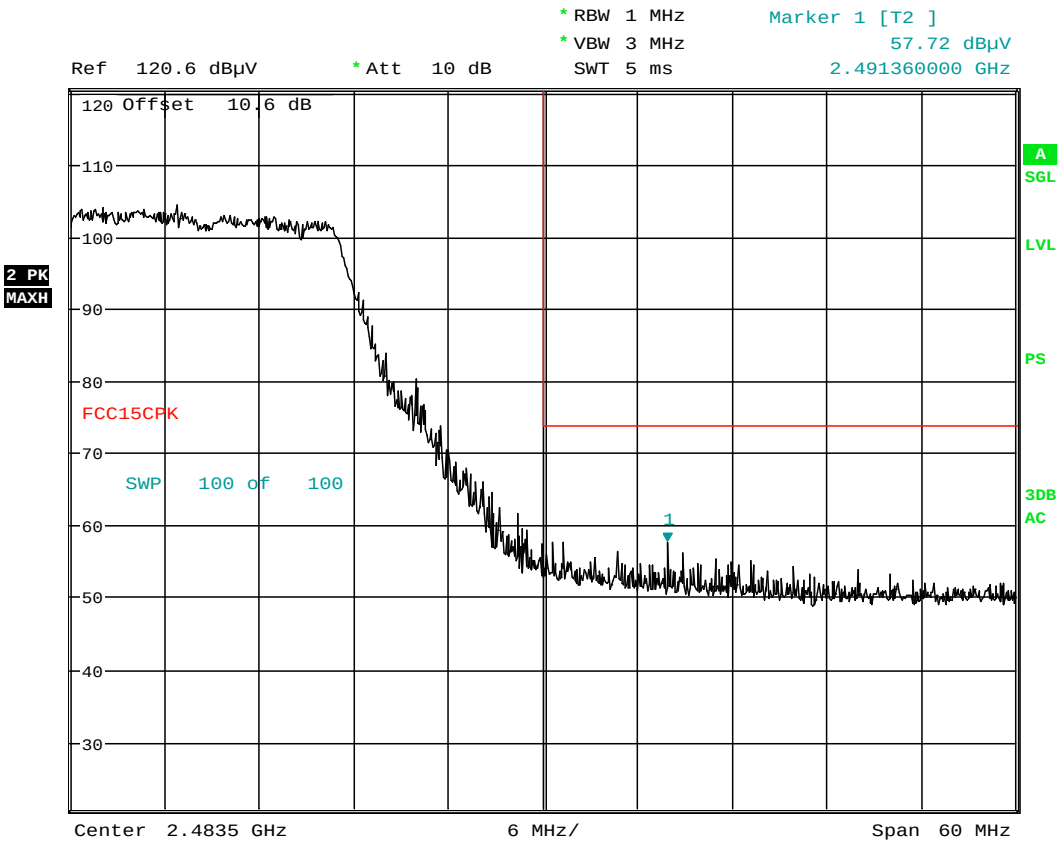
MIMO Radiated Restricted Band Edge Measurements

§15.205 §15.209



Date: 17.DEC.2014 22:39:00

Plot 6-24. Radiated Restricted Upper Band Edge Measurement (Peak)

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7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Panasonic Wireless Network Adapter FCC ID: ACJ9TGWL13A** is in compliance with Part 15C of the FCC Rules.

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