MEASUREMENT REPORT

FCC PART 15.407 / RSS-210 WLAN 802.11a/n/ac

FCC ID:	VW3FAST5250
IC:	9140A-FAST5250
APPLICANT:	SAGEMCOM SAS

Application Type:	Certification
Product:	Router
Model No.:	Fast 5250
Brand Name:	Sagemcom
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part 15.407
IC Specification(s):	RSS-210 Issue 8
Test Procedure(s):	ANSI C63.10-2009
	KDB 789033 D01v01r03, KDB 662911 D01v02r01,
	KDB 644545 D01v01r02
Test Date:	October 20, 2013 ~ January 04, 2014

Reviewed By : Sunny Sun

(Engineer: Sunny Sun)

Approved By : Robin Wu

(Manager: Robin Wu)

The test results relate only to the samples tested.

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 D01v01r03. Test results reported herein relate only to the item(s) tested.

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Revision History

Report No.	Version	Description	Issue Date
1312RSU01002	Rev. 01	Initial report	01-28-2014

§2.1033 General Information

Applicant:	SAGEMCOM SAS
Applicant Address:	250 Route de l'Empereur RUEIL MALMAISON CEDEX, 92848 France
Manufacturer:	Askey Technology (Jiangsu) Ltd.
Manufacturer Address:	No. 1388, Jiao Tong Road, WuJiang Economic-Technological Development Area, Jiangsu Province, P.R.C.
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT FCC Registration No.:	809388
MRT IC Registration No.:	11384A
FCC Rule Part(s):	Part 15.407
IC SPECIFICATION(S):	RSS-210 Issue 8
Model Name:	Fast 5250
FCC ID:	VW3FAST5250
IC:	9140A-FAST5250
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
Date(s) of Test:	October 20, 2013 ~ January 04, 2014
Test Report S/N:	1312RSU01002

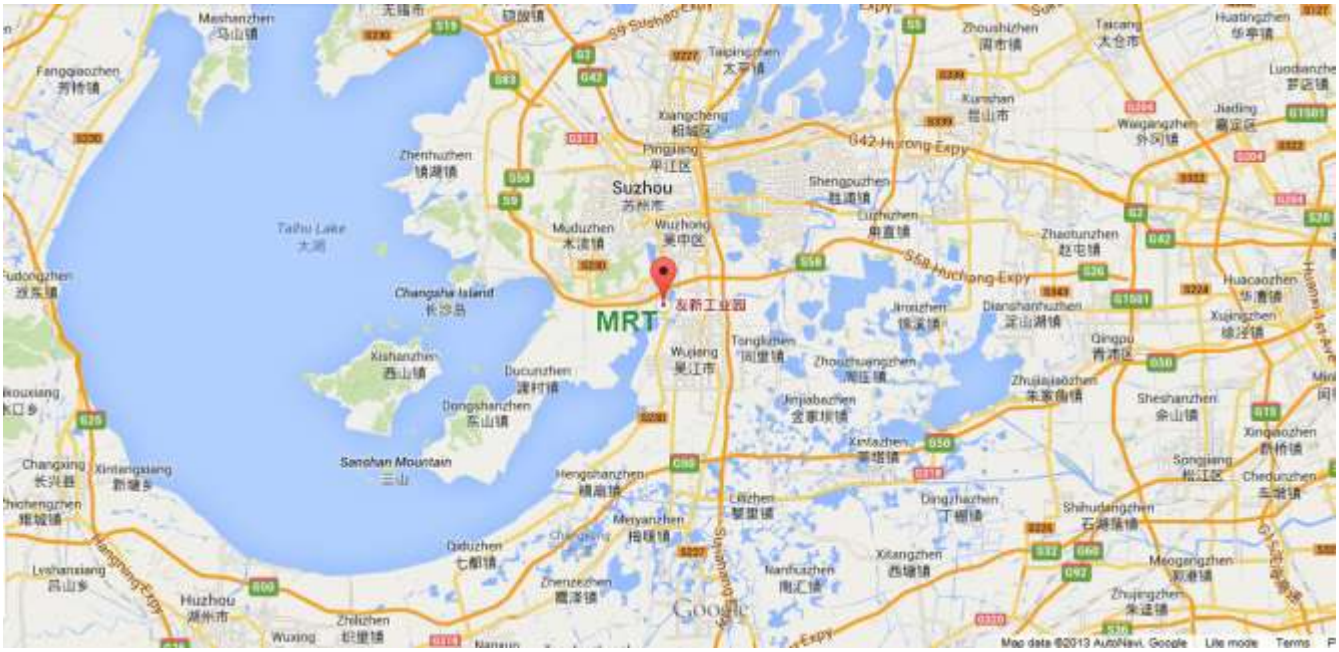
1. INTRODUCTION

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. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. 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 September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Router
Model No.	Fast 5250
Frequency Range	802.11a/n/ac: 5180 ~ 5240MHz
Maximum Output Power	**802.11a/n/ac:** 802.11a: 14.03dBm 802.11n-HT20: 15.18dBm 802.11n-HT40: 15.70dBm 802.11ac-VHT20: 15.02dBm 802.11ac-VHT40: 15.97dBm 802.11ac-VHT80: 13.84dBm
Type of Modulation	802.11a/n/ac: OFDM

2.2. Description of Available Antennas

Frequency Band (GHz)	Directional Gain (dBi)
5.2	5.7

Note:

1. The EUT supports CDD (Cyclic Delay Diversity) and transmit beamforming mode (transmit beamforming mode just for 2.4GHz), CDD and transmit beamforming signals are correlated.
2. The Directional Gain = $10*\log\{[10^{(Gain1/20)}+10^{(Gain2/20)}+10^{(Gain3/20)}]/3\}$

2.3. Frequency / Channel Opreation

Channel for 802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	N/A	N/A	N/A	N/A

Channel for 802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	N/A	N/A

Channel for 802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	N/A	N/A	N/A	N/A

2.4. Device Capabilities

This device contains the following capabilities:

802.11a/n/ac WLAN (NII)

Note: 5GHz WLAN (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 D01v01r03. 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/g 20MHz Bandwidth – 98.1%
- 802.11n/ac 20MHz Bandwidth – 91.78%
- 802.11n/ac 40MHz Bandwidth – 86.3%
- 802.11ac 80MHz Bandwidth – 77%

2.5. Test Configuration

The Router FCC ID: VW3FAST5250 was tested per the guidance of KDB 789033 D01v01r03. ANSI C63.10-2009 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.6. Test Software

The test utility software used during testing was ART2 Version 0703.

Power Parameter Value of the test software setting:

Test Mode	Test Channel	Chain 1+2+3	Test Mode	Test Channel	Chain 1+2+3
802.11a	5180	9	802.11ac-VHT20	5180	10
	5220	9		5220	10
	5240	9		5240	10
802.11n-HT20	5180	10	802.11ac-VHT40	5190	12
	5220	10		5230	12
	5240	10	802.11ac-VHT80	5210	10
802.11n-HT40	5190	11	- -	- -	- -
	5230	11	- -	- -	- -

2.7. EMI Suppression Device(s)/Modifications

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

2.8. 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.

3. 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 D01v01r03 were used in the measurement of the **Router FCC ID: VW3FAST5250.**

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

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

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 RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or resolution, clock or data exchange speed, scrolling H pattern to the EUT and/or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site.

Line conducted emissions test results are shown in Section 7.9.

3.3. 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. For measurements above 1GH 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 MF Model 210SS 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. An 80cm high PVC support structure is placed on top of the turntable.
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. According to 3dB Beamwidth of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. 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 antenna of the Tablet PC is **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The **Router FCC ID: VW3FAST5250** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATA

AC Conducted Emissions Test Equipment

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESR7	101209	2014/07/16
Two-Line V-Network	R&S	ENV216	101683	2014/07/21
Two-Line V-Network	R&S	ENV216	101684	2014/07/21
Temperature/ Meter Humidity	Anymetre	TH101B	SR2-01	2014/08/15

Radiated Test Equipment

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4447A	MY45300136	2014/08/15
Preamplifier	MRT	AP01G18	1310002	2014/10/08
Preamplifier	MRT	AP18G40	1310003	2014/10/08
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	2014/09/12
TRILOG Antenna	Schwarzbeck	VULB9162	9162-047	2014/09/12
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	2014/09/12
Broadband Horn Antenna	Schwarzbeck	BBHA9170	9170-549	2014/09/12
Temperature/Humidity Meter	Anymetre	TH101B	AC1-01	2014/08/15

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY51440164	2014/08/15
Power Meter	Anritsu	ML2495A	0905006	2014/11/01
Power Sensor	Anritsu	MA2411B	0846014	2014/11/01
Temperature & Humidity Chamber	BAOYT	BYH-1500L	1309W043	2014/10/08
AC Power Supply	APECC	CVCF-11005PIM3	00002015	2014/10/08
Temperature/Humidity Meter	Anymetre	TH101B	TR3-01	2014/08/15

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: ±3.5dB
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: ±4.2dB 1GHz ~ 40GHz: ±4.7dB

7. TEST RESULT

7.1. Summary

Company Name:	**SAGEMCOM SAS**
FCC ID:	**VW3FAST5250**
IC:	**9140A-FAST5250**
FCC Classification:	**Unlicensed National Information Infrastructure (UNII)**
Data Rate(s) Tested:	**1Mbps ~ 11Mbps (b);** **6Mbps ~ 54Mbps (a/g);** **19.5/21.7Mbps ~ 195/216.7Mbps (n-HT20MHz BW);** **40.5/45Mbps ~ 405/450Mbps (n-HT40MHz BW);** **19.5/21.7Mbps ~ 234/260.2Mbps (ac-VHT20MHz BW);** **40.5/45Mbps ~ 540/600Mbps (ac-VHT40MHz BW);** **87.9/97.5Mbps ~ 1170/1299.9Mbps (ac-VHT80MHz BW)**

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	RSS-210 [A9.2]	26dB Bandwidth (FCC) Occupied Bandwidth (IC)	N/A	Conducted	Pass	Section 7.2
15.407(a)(1)	RSS-210 [A9.2]	Maximum Conducted Output Power	< 4 + 10log$_{10}$(BW) dBm (5150-5250MHz) (FCC) < 10 + 10log10(BW) dBm (5150-5250MHz) (IC)		Pass	Section 7.3
15.407(a)(1), (5)	RSS-210 [A9.2]	Peak Power Spectral Density	< 4 dBm/MHz (5150-5250MHz) (FCC) < 10dBm/MHz (5150-5250) (IC)		Pass	Section 7.4
15.407(a)(6)	N/A	Peak Excursion	< 13dB/MHz maximum difference		Pass	Section 7.5
15.407(g)	N/A	Frequency Stability	N/A		Pass	Section 7.6
15.407(b)(1)	RSS-210 [A9.2]	Undesirable Emissions	< -27dBm/MHz EIRP (5150-5250MHz)	Radiated	Pass	Section 7.7 & 7.8
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	
15.207	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits < RSS-Gen table 2 limits	Line Conducted	Pass	Section 7.9

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.
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

7.2. 26dB Bandwidth Measurement *§15.407 (a); RSS-210 [A9.2]*

7.2.1. Test Limit

N/A

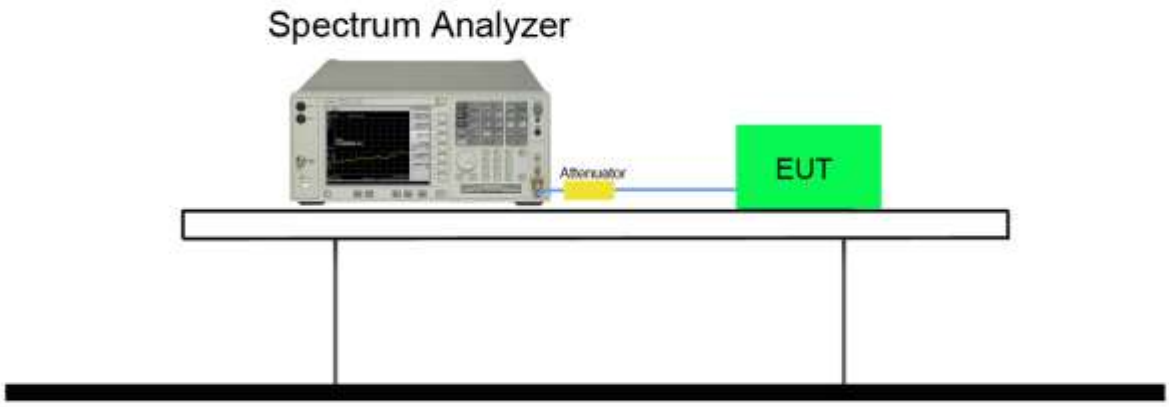
7.2.2. Test Procedure used

KDB 789033 D01v01r03 – Section C

7.2.3. Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = max hold

7.2.4. Test Setup



7.2.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Chain 1 / Chain 1 + 2 + 3						
802.11a	6	36	5180	23.91	16.77	Pass
802.11a	6	44	5220	24.25	16.88	Pass
802.11a	6	48	5240	23.86	16.84	Pass
Chain 2 / Chain 1 + 2 + 3						
802.11a	6	36	5180	24.46	16.90	Pass
802.11a	6	44	5220	24.78	16.92	Pass
802.11a	6	48	5240	24.04	16.92	Pass
Chain 3 / Chain 1 + 2 + 3						
802.11a	6	36	5180	24.02	17.06	Pass
802.11a	6	44	5220	23.77	16.86	Pass
802.11a	6	48	5240	24.31	16.87	Pass

802.11a 26dB Bandwidth - Chain 1 / Chain 1 + 2 + 3

Channel 36 (5180MHz)	Channel 44 (5220MHz)
	

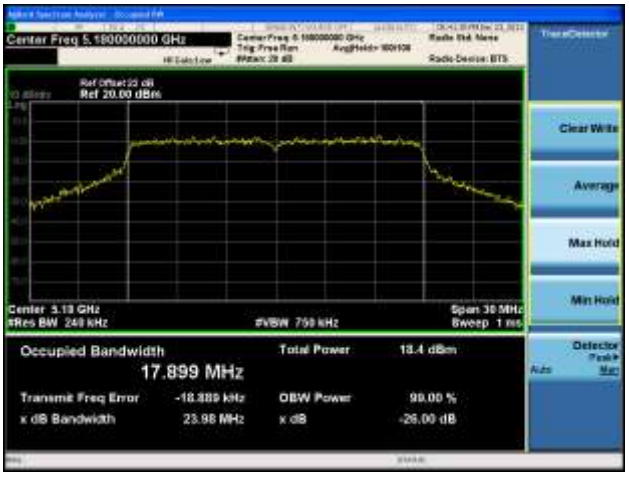
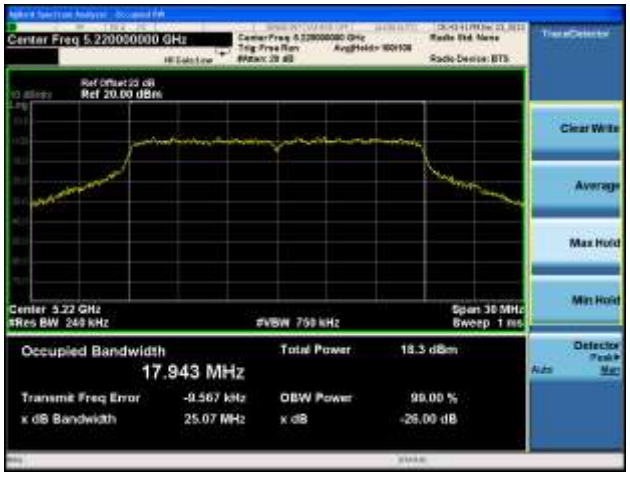
Channel 48 (5240MHz)	
	

802.11a 26dB Bandwidth - Chain 2 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	
	

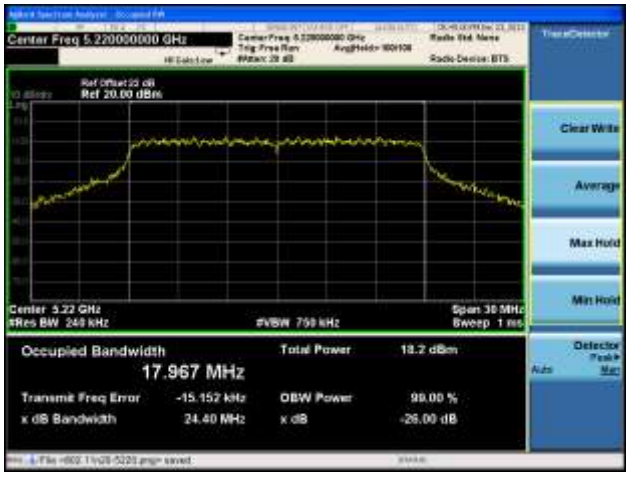
802.11a 26dB Bandwidth - Chain 3 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	
	

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Chain 1 / Chain 1 + 2 + 3						
802.11n-HT20	19.5/21.7	36	5180	23.98	17.90	Pass
802.11n-HT20	19.5/21.7	44	5220	25.07	17.94	Pass
802.11n-HT20	19.5/21.7	48	5240	24.46	17.91	Pass
Chain 2 / Chain 1 + 2 + 3						
802.11n-HT20	19.5/21.7	36	5180	24.76	17.96	Pass
802.11n-HT20	19.5/21.7	44	5220	24.40	17.97	Pass
802.11n-HT20	19.5/21.7	48	5240	24.36	17.89	Pass
Chain 3 / Chain 1 + 2 + 3						
802.11n-HT20	19.5/21.7	36	5180	23.79	17.92	Pass
802.11n-HT20	19.5/21.7	44	5220	23.81	17.85	Pass
802.11n-HT20	19.5/21.7	48	5240	24.59	17.89	Pass

802.11n-HT20 26dB Bandwidth – Chain 1 / Chain 1 + 2 + 3

Channel 36 (5180MHz)	Channel 44 (5220MHz)
	

Channel 48 (5240MHz)	
	

802.11n-HT20 26dB Bandwidth – Chain 2 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
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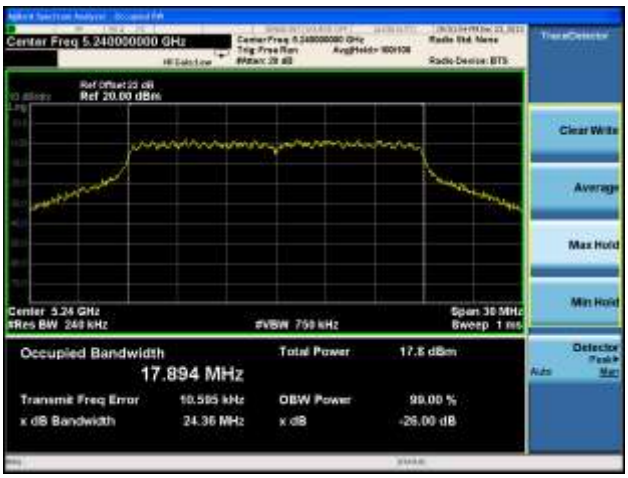
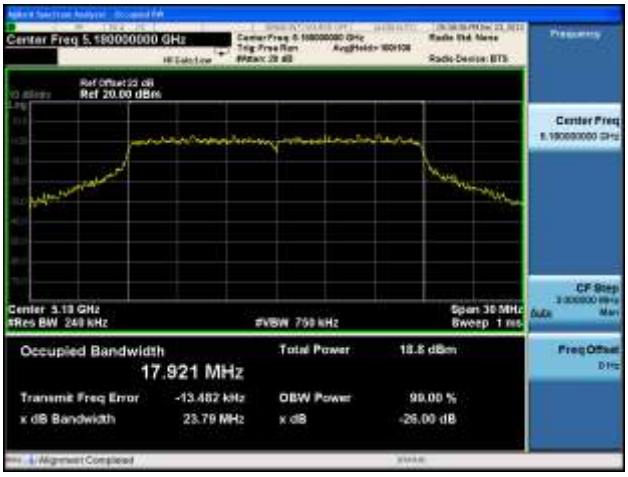
	

802.11n-HT20 26dB Bandwidth – Chain 3 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
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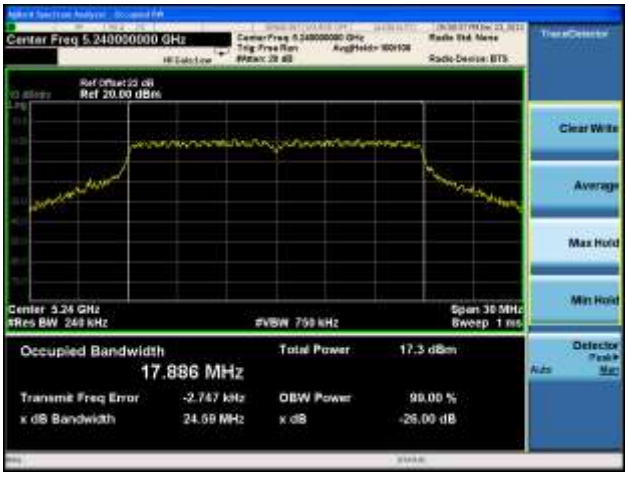
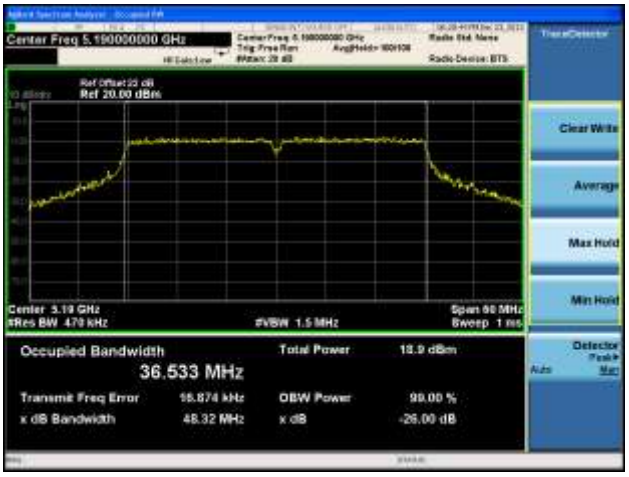
	

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Chain 1 / Chain 1 + 2 + 3						
802.11n-HT40	40.5/45	38	5190	48.32	36.53	Pass
802.11n-HT40	40.5/45	46	5230	48.00	36.60	Pass
Chain 2 / Chain 1 + 2 + 3						
802.11n-HT40	40.5/45	38	5190	47.02	36.45	Pass
802.11n-HT40	40.5/45	46	5230	47.16	36.47	Pass
Chain 3 / Chain 1 + 2 + 3						
802.11n-HT40	40.5/45	38	5190	46.23	36.41	Pass
802.11n-HT40	40.5/45	46	5230	47.12	36.40	Pass

802.11n-HT40 26dB Bandwidth – Chain 1 / Chain 1 + 2 + 3

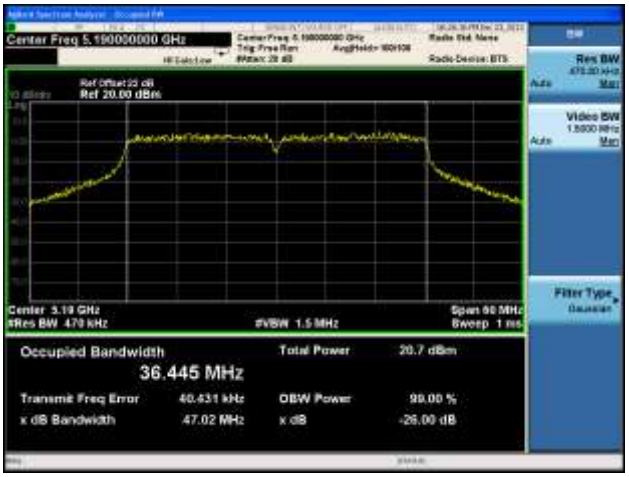
Channel 38 (5190MHz)



Channel 46 (5230MHz)

802.11n-HT40 26dB Bandwidth – Chain 2 / Chain 1 + 2 + 3

Channel 38 (5190MHz)

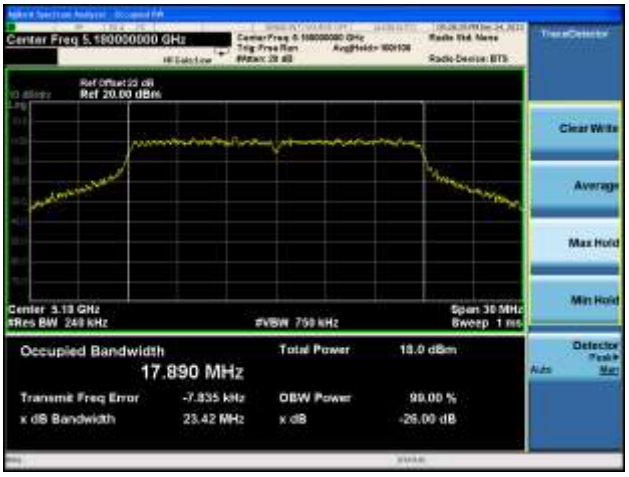
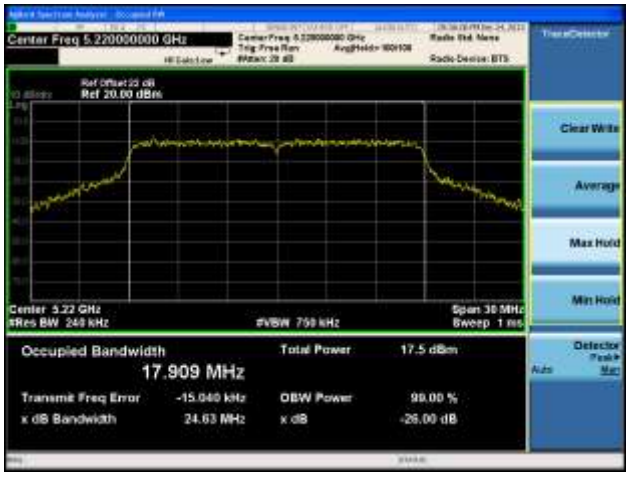


Channel 46 (5230MHz)

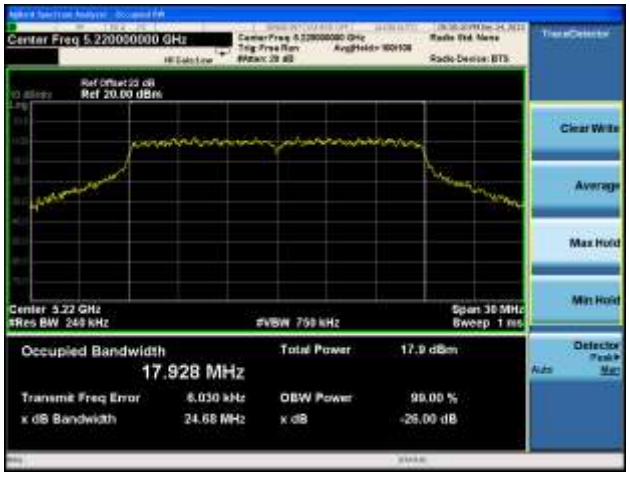
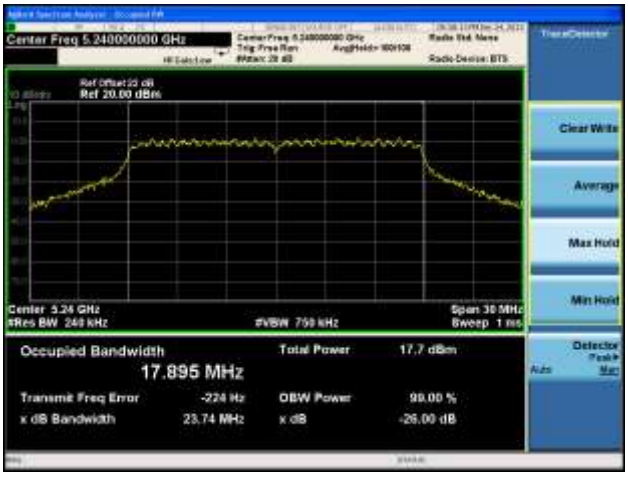
802.11n-HT40 26dB Bandwidth – Chain 3 / Chain 1 + 2 + 3	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	

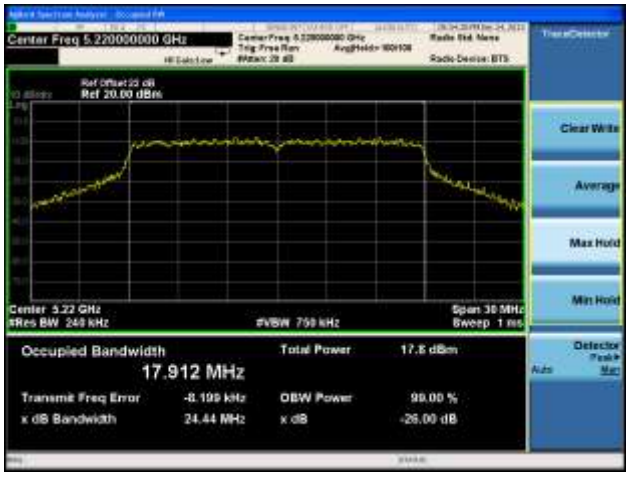
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Chain 1 / Chain 1 + 2 + 3						
802.11ac-VHT20	19.5/21.7	36	5180	23.42	17.89	Pass
802.11ac-VHT20	19.5/21.7	44	5220	24.63	17.91	Pass
802.11ac-VHT20	19.5/21.7	48	5240	24.57	17.93	Pass
Chain 2 / Chain 1 + 2 + 3						
802.11ac-VHT20	19.5/21.7	36	5180	24.48	17.90	Pass
802.11ac-VHT20	19.5/21.7	44	5220	24.68	17.93	Pass
802.11ac-VHT20	19.5/21.7	48	5240	23.74	17.90	Pass
Chain 3 / Chain 1 + 2 + 3						
802.11ac-VHT20	19.5/21.7	36	5180	24.24	17.88	Pass
802.11ac-VHT20	19.5/21.7	44	5220	24.44	17.91	Pass
802.11ac-VHT20	19.5/21.7	48	5240	24.23	17.89	Pass

802.11ac-VHT20 26dB Bandwidth – Chain 1 / Chain 1 + 2 + 3

Channel 36 (5180MHz)	Channel 44 (5220MHz)
	

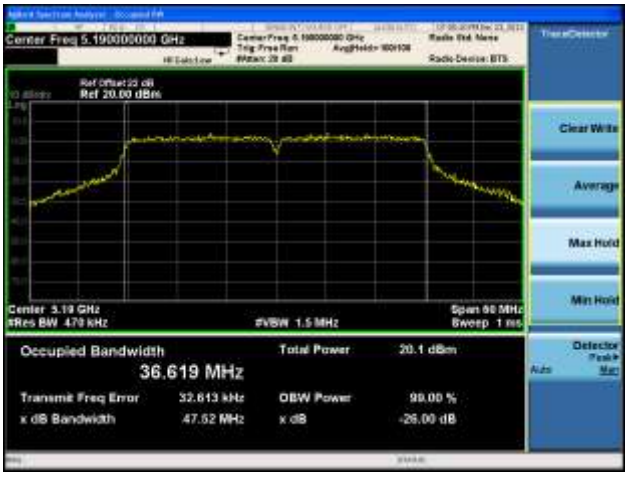
Channel 48 (5240MHz)	
	

802.11ac-VHT20 26dB Bandwidth – Chain 2 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	
	

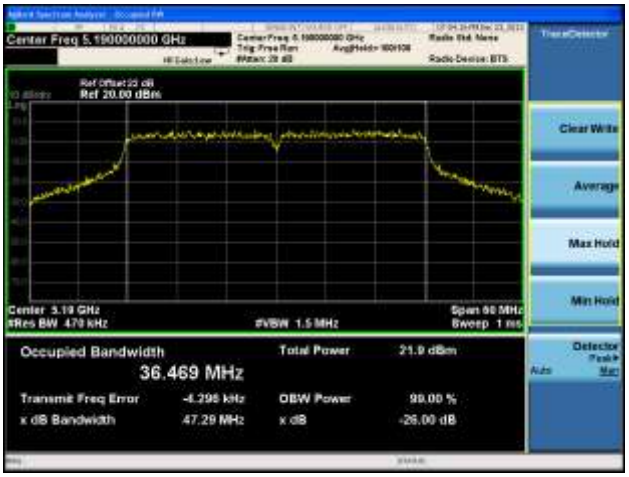
802.11ac-VHT20 26dB Bandwidth – Chain 3 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	
	

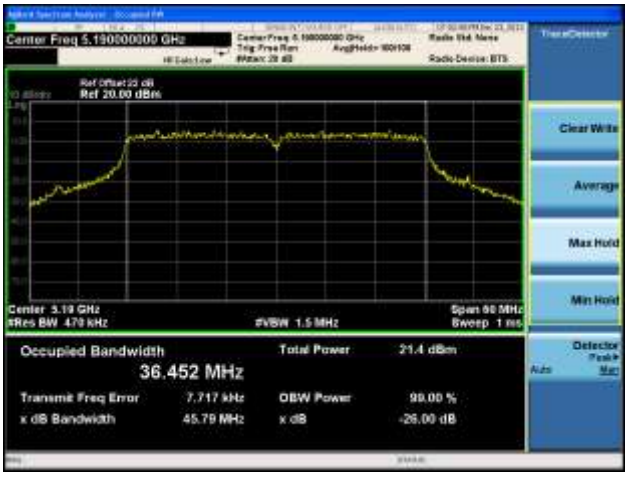
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Chain 1 / Chain 1 + 2 + 3						
802.11ac-VHT40	40.5/45	38	5190	47.52	36.62	Pass
802.11ac-VHT40	40.5/45	46	5230	49.74	36.66	Pass
Chain 2 / Chain 1 + 2 + 3						
802.11ac-VHT40	40.5/45	38	5190	47.29	36.47	Pass
802.11ac-VHT40	40.5/45	46	5230	46.60	36.50	Pass
Chain 3 / Chain 1 + 2 + 3						
802.11ac-VHT40	40.5/45	38	5190	45.79	36.45	Pass
802.11ac-VHT40	40.5/45	46	5230	45.65	36.40	Pass

802.11ac-VHT40 26dB Bandwidth – Chain 1 / Chain 1 + 2 + 3

Channel 38 (5190MHz)	Channel 46 (5230MHz)
	

802.11ac-VHT40 26dB Bandwidth – Chain 2 / Chain 1 + 2 + 3

Channel 38 (5190MHz)	Channel 46 (5230MHz)
	

802.11ac-VHT40 26dB Bandwidth – Chain 3 / Chain 1 + 2 + 3	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Chain 1 / Chain 1 + 2 + 3						
802.11ac-VHT80	87.8/97.5	42	5210	94.86	76.02	Pass
Chain 2 / Chain 1 + 2 + 3						
802.11ac-VHT80	87.8/97.5	42	5210	94.59	76.30	Pass
Chain 3 / Chain 1 + 2 + 3						
802.11ac-VHT80	87.8/97.5	42	5210	94.22	75.95	Pass

802.11ac-VHT80 26dB Bandwidth – Chain 1 / Chain 1 + 2 + 3

Channel 42 (5210MHz)

802.11ac-VHT80 26dB Bandwidth – Chain 2 / Chain 1 + 2 + 3

Channel 42 (5210MHz)

802.11ac-VHT80 26dB Bandwidth – Chain 3 / Chain 1 + 2 + 3	
Channel 42 (5210MHz)	
	

7.3. Output Power Measurement *§15.407 (a)(1); RSS-210 [A9.2]*

7.3.1. Test Limit

For FCC

In the 5.15-5.25GHz band, the maximum permissible conducted output power is the lesser of 50mW (16.99dBm) and 4dBm + 10*Log (26dB BW) = 4dBm + $10\log_{10}(23.77)$ = 17.76dBm

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Limit (dBm) = 16.99dBm

For IC

The maximum e.i.r.p. shall not exceed 200mW (23.01dBm) or 10dBm + $10\log_{10}$(99% BW) = 10dBm + $10\log_{10}(16.77)$ = 22.45dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Limit (dBm) = 22.45dBm

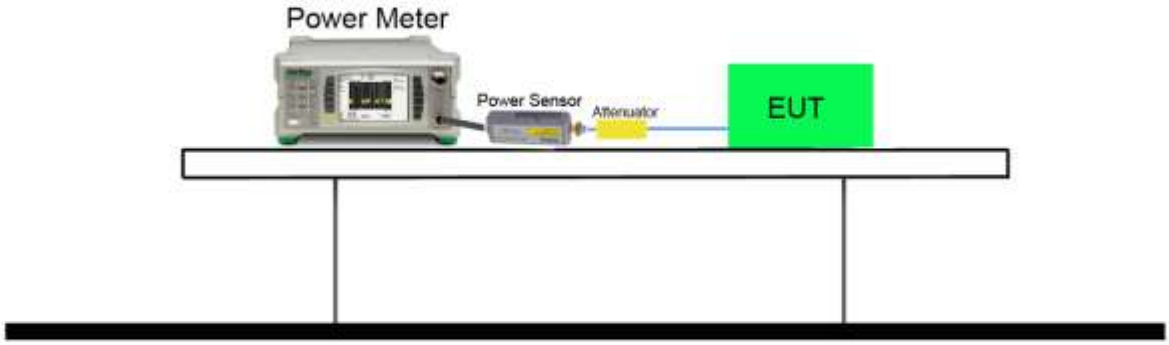
7.3.2. Test Procedure Used

KDB 789033 D01v01r03 - Section E) 3) b) Method PM-G

7.3.3. Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.3.4. Test Setup



7.3.5. Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (yellow marker) for final test of each channel.

MCS Index for 802.11n	N_{Tx}				Data Rate (Mbps)			
		b	g	a	20MHz Bandwidth		40MHz Bandwidth	
					800ns GI	400ns GI	800ns GI	400ns GI
0	1	1	6	6	6.5	7.2	13.5	15.0
1	1	2	9	9	13.0	14.4	27.0	30.0
2	1	5.5	12	12	19.5	21.7	40.5	45.0
3	1	11	18	18	26.0	28.9	54.0	60.0
4	1	--	24	24	39.0	43.3	81.0	90.0
5	1	--	36	36	52.0	57.8	108.0	120.0
6	1	--	48	48	58.5	65.0	121.5	135.0
7	1	--	54	54	65.0	72.2	135.0	150.0
8	2	1	6	6	13.0	14.4	27.0	30.0
9	2	2	9	9	26.0	28.9	54.0	60.0
10	2	5.5	12	12	39.0	43.3	81.0	90.0
11	2	11	18	18	52.0	57.8	108.0	120.0
12	2	--	24	24	78.0	86.7	162.0	180.0
13	2	--	36	36	104.0	115.6	216.0	240.0
14	2	--	48	48	117.0	130.0	243.0	270.0
15	2	--	54	54	130.0	144.0	270.0	300.0
16	3	1	6	6	19.5	21.7	40.5	45.0
17	3	2	9	9	39.0	43.3	81.0	90.0
18	3	5.5	12	12	58.5	65.0	121.5	135.0
19	3	11	18	18	78.0	86.7	162.0	180.0
20	3	--	24	24	117.0	130.0	243.0	270.0
21	3	--	36	36	156.0	173.3	324.0	360.0
22	3	--	48	48	175.5	195.0	364.5	405.0
23	3	--	54	54	195.0	216.7	405.0	450.0

MCS Index for 802.11ac	N_{Tx}	Data Rate (Mbps)					
		20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
		800ns GI	400ns GI	800ns GI	400ns GI	800ns GI	400ns GI
0	1	6.5	7.2	13.5	15.0	29.3	32.5
1	1	13.0	14.4	27.0	30.0	58.5	65.0
2	1	19.5	21.7	40.5	45.0	87.8	97.5
3	1	26.0	28.9	54.0	60.0	117.0	130.0
4	1	39.0	43.3	81.0	90.0	175.5	195
5	1	52.0	57.8	108.0	120.0	234.0	260.0
6	1	58.5	65.0	121.5	135.0	263.3	292.5
7	1	65.0	72.2	135.0	150.0	292.5	325
8	1	78.0	86.7	162.0	180.0	351.0	390.0
9	1	--	--	180.0	200.0	390.0	433.3
10	2	13.0	14.4	27.0	30.0	58.6	65.0
11	2	26.0	28.8	54.0	60.0	117.0	130.0
12	2	39.0	43.4	81.0	90.0	175.6	195.0
13	2	52.0	57.8	108.0	120.0	234.0	260.0
14	2	78.0	86.6	162.0	180.0	351.0	390.0
15	2	104.0	115.6	216.0	240.0	468.0	520.0
16	2	117.0	130.0	243.0	270.0	526.6	585.0
17	2	130.0	144.4	270.0	300.0	585.0	650.0
18	2	156.0	173.4	324.0	360.0	702.0	780.0
19	2	--	--	360.0	400.0	780.0	866.6
20	3	19.5	21.7	40.5	45.0	87.9	97.5
21	3	39.0	43.3	81.0	90.0	175.5	195.0
22	3	58.5	65.0	121.5	135.0	263.4	292.5
23	3	78.0	86.7	162.0	180.0	351.0	390.0
24	3	117.0	130.0	243.0	270.0	526.5	585.0
25	3	156.0	173.3	324.0	360.0	702.0	780.0
26	3	175.5	195.0	364.5	405.0	789.9	877.5
27	3	195.0	216.7	405.0	450.0	877.5	975.0
28	3	234.0	260.2	486.0	540.0	1053.0	1170.0
29	3	--	--	540.0	600.0	1170.0	1299.9

Output power at various data rates for Chain 1 / Chain 1 + 2 + 3:

Test Mode	Bandwidth	Frequency (MHz)	Channel	Data Rate (Mbps)	RMS Power (dBm)
802.11a	20	5220	44	6	9.82
				24	9.38
				54	8.58
802.11n	20	5220	44	19.5/21.7(MCS16)	10.97
				117/130.0(MCS20)	9.87
				195/216.7(MCS23)	9.08
802.11n	40	5190	38	40.5/45(MCS16)	11.51
				243/270(MCS20)	10.19
				405/450(MCS23)	9.90
802.11ac	20	5220	44	19.5/21.7(MCS20)	10.61
				117/130.0(MCS24)	9.90
				234/260.2(MCS28)	9.01
802.11ac	40	5190	38	40.5/45(MCS20)	11.70
				243/270(MCS24)	10.64
				540/600(MCS29)	10.07
802.11ac	80	5210	42	87.8/97.5(MCS20)	9.58
				526.5/585(MCS24)	8.19
				1170/1299.9(MCS29)	8.17

Power Table List

Test Mode	N_{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Chain 1 Average Power (dBm)	Chain 2 Average Power (dBm)	Chain 3 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)	Result
11a	3	6	36	5180	10.05	8.91	8.68	14.03	≤ 16.99	19.73	≤ 22.45	Pass
11a	3	6	44	5220	9.82	9.12	8.63	13.99	≤ 16.99	19.69	≤ 22.45	Pass
11a	3	6	48	5240	9.72	9.28	8.6	14.00	≤ 16.99	19.70	≤ 22.45	Pass
11n-HT20	3	19.5/21.7	36	5180	11.08	9.88	9.96	15.11	≤ 16.99	20.81	≤ 22.45	Pass
11n-HT20	3	19.5/21.7	44	5220	10.97	10.48	9.67	15.18	≤ 16.99	20.88	≤ 22.45	Pass
11n-HT20	3	19.5/21.7	48	5240	10.78	10.49	9.61	15.09	≤ 16.99	20.79	≤ 22.45	Pass
11n-HT40	3	40.5/45	38	5190	11.51	10.96	10.23	15.70	≤ 16.99	21.40	≤ 22.45	Pass
11n-HT40	3	40.5/45	46	5230	11.17	10.9	10.02	15.50	≤ 16.99	21.20	≤ 22.45	Pass
11ac-VHT20	3	19.5/21.7	36	5180	10.95	10.03	8.95	14.82	≤ 16.99	20.52	≤ 22.45	Pass
11ac-VHT20	3	19.5/21.7	44	5220	10.61	10.26	9.69	14.97	≤ 16.99	20.67	≤ 22.45	Pass
11ac-VHT20	3	19.5/21.7	48	5240	10.65	10.44	9.57	15.02	≤ 16.99	20.72	≤ 22.45	Pass
11ac-VHT40	3	40.5/45	38	5190	11.7	11.44	10.33	15.97	≤ 16.99	21.67	≤ 22.45	Pass
11ac-VHT40	3	40.5/45	46	5230	11.57	11.43	10.05	15.84	≤ 16.99	21.54	≤ 22.45	Pass
11ac-VHT80	3	87.8/97.5	42	5210	9.58	9.25	8.29	13.84	≤ 16.99	19.54	≤ 22.45	Pass

Note: The E.I.R.P power = Average Power + Directional Gain.

7.4. Power Spectral Density Measurement *§15.407 (a)(1)(2),(5) / RSS-210 [A9.2]*

7.4.1. Test Limit

For FCC:

In the 5.15-5.25GHz band, the maximum permissible power spectral density is 4dBm/MHz.

If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Limit (dBm/MHz) = 4dBm/MHz

For IC:

The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

Limit (dBm/MHz) = 10dBm/MHz

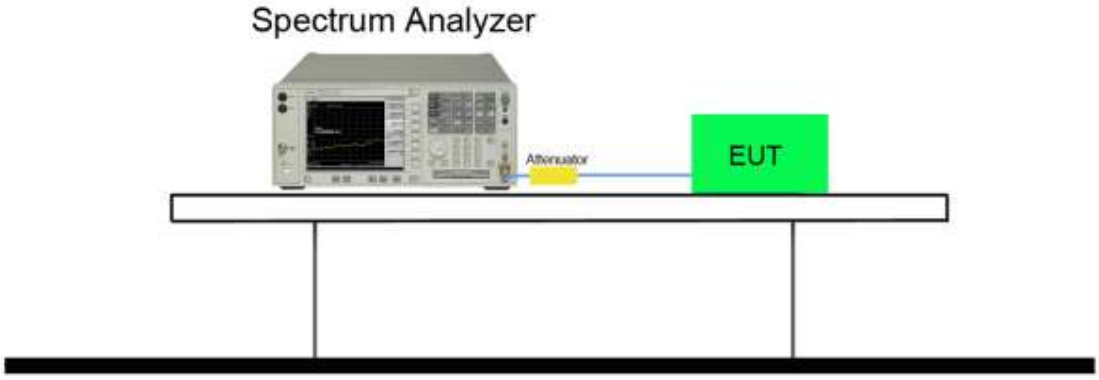
7.4.2. Test Procedure Used

KDB 789033 D01v01r03 - Section F

7.4.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal.
3. RBW = 1MHz
4. VBW = 3MHz
5. Number of sweep points ≥ 2 × (span / RBW)
6. Detector = power averaging (RMS)
7. Sweep time = auto
8. Trigger was set to free run since the EUT was operating at a duty cycle ≥ 98%
9. Trace was averaged over 100 sweeps
10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

7.4.4. Test Setup



7.4.5. Test Result

Test Mode	N_{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	Chain 3 PSD (dBm)	Duty Cycle (%)	Total PSD (dBm)	Limit (dBm /MHz)	Total e.i.r.p PSD (dBm)	Limit (dBm /MHz)	Result
11a	3	6	36	5180	-1.052	-0.889	-0.973	99.2	3.80	≤ 4	9.50	≤ 10	Pass
11a	3	6	44	5220	-0.918	-1.031	-1.309	99.2	3.69	≤ 4	9.39	≤ 10	Pass
11a	3	6	48	5240	-0.951	-1.293	-1.337	99.2	3.58	≤ 4	9.28	≤ 10	Pass
11n-HT20	3	19.5/21.7	36	5180	-1.051	-1.651	-0.933	91.78	3.94	≤ 4	9.64	≤ 10	Pass
11n-HT20	3	19.5/21.7	44	5220	-1.178	-1.274	-1.485	91.78	3.83	≤ 4	9.53	≤ 10	Pass
11n-HT20	3	19.5/21.7	48	5240	-1.370	-1.399	-2.131	91.78	3.52	≤ 4	9.22	≤ 10	Pass
11n-HT40	3	40.5/45	38	5190	-3.637	-3.743	-3.864	86.3	1.66	≤ 4	7.36	≤ 10	Pass
11n-HT40	3	40.5/45	46	5230	-3.965	-3.847	-4.547	86.3	1.30	≤ 4	7.00	≤ 10	Pass
11ac-VHT20	3	19.5/21.7	36	5180	-1.140	-1.237	-1.309	91.78	3.92	≤ 4	9.62	≤ 10	Pass
11ac-VHT20	3	19.5/21.7	44	5220	-1.131	-1.260	-1.816	91.78	3.75	≤ 4	9.45	≤ 10	Pass
11ac-VHT20	3	19.5/21.7	48	5240	-1.289	-1.151	-2.000	91.78	3.68	≤ 4	9.38	≤ 10	Pass
11ac-VHT40	3	40.5/45	38	5190	-2.771	-2.465	-2.777	86.3	2.74	≤ 4	8.44	≤ 10	Pass
11ac-VHT40	3	40.5/45	46	5230	-2.888	-2.578	-3.689	86.3	2.38	≤ 4	8.08	≤ 10	Pass
11ac-VHT80	3	87.8/97.5	42	5210	-8.202	-8.399	-8.761	77.0	-2.54	≤ 4	3.16	≤ 10	Pass

Note:

1. When EUT duty cycle < 98%, the total PSD = $10*\log\{10^{(\text{Chain 1 PSD}/10)}+10^{(\text{Chain 2 PSD}/10)}+10^{(\text{Chain 3 PSD}/10)}\}+10*\log(1/\text{duty cycle})$

2. The E.I.R.P PSD = PSD + Directional Gain.

802.11a PSD – Chain 1 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	

Channel 48 (5240MHz)	
	
802.11a PSD – Chain 2 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	
	

802.11a PSD – Chain 3 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	
	

802.11n-HT20 PSD – Chain 1 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	

Channel 48 (5240MHz)	
	

802.11n-HT20 PSD – Chain 2 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	
	

802.11n-HT20 PSD – Chain 3 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5200MHz)**
	
Channel 48 (5240MHz)	
	

802.11n-HT40 PSD – Chain 1 / Chain 1 + 2 + 3	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	

802.11n-HT40 PSD – Chain 2 / Chain 1 + 2 + 3	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
802.11n-HT40 PSD – Chain 3 / Chain 1 + 2 + 3	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
802.11ac-VHT20 PSD – Chain 1 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	

Channel 48 (5240MHz)	
	

802.11ac-VHT20 PSD – Chain 2 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	
	

802.11ac-VHT20 PSD – Chain 3 / Chain 1 + 2 + 3	
Channel 36 (5180MHz)	**Channel 44 (5200MHz)**
	
Channel 48 (5240MHz)	
	

802.11ac-VHT40 PSD – Chain 1 / Chain 1 + 2 + 3	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	

802.11ac-VHT40 PSD – Chain 2 / Chain 1 + 2 + 3	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
802.11ac-VHT40 PSD – Chain 3 / Chain 1 + 2 + 3	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
802.11ac-VHT80 PSD – Chain 1 / Chain 1 + 2 + 3	
Channel 42 (5210MHz)	
	

802.11ac-VHT80 PSD – Chain 2 / Chain 1 + 2 + 3	
Channel 42 (5210MHz)	
	
802.11ac-VHT80 PSD – Chain 3 / Chain 1 + 2 + 3	
Channel 42 (5210MHz)	
	

7.5. Peak Excursion Ratio Measurement *§15.407(a)(6)*

7.5.1. Test Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

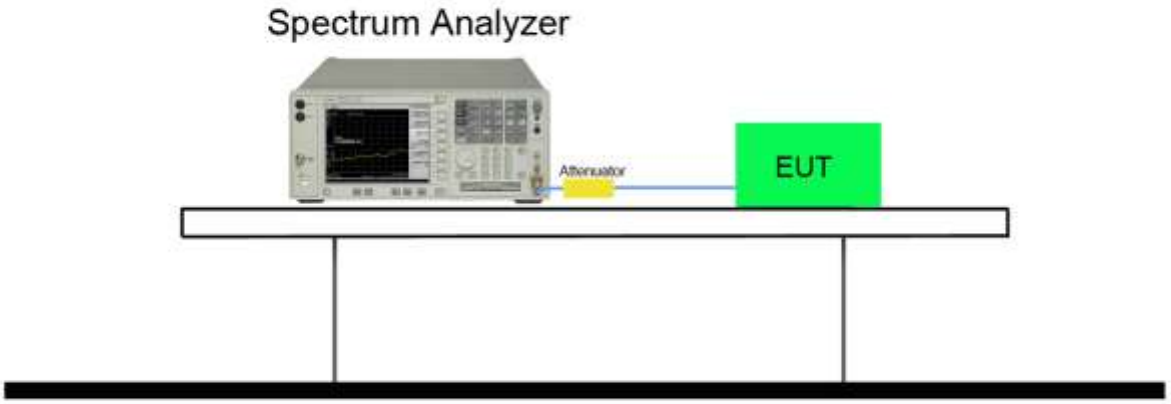
7.5.2. Test Procedure Used

KDB 789033 D01v01r03 – Section G

7.5.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Detector = Peak
6. Trace mode = max hold
7. Trace was allowed to stabilize
8. The peak search function of the spectrum analyzer was used to find the peak of the spectrum. This level was compared to the peak power density level found from the previous section to determine the peak excursion.

7.5.4. Test Setup

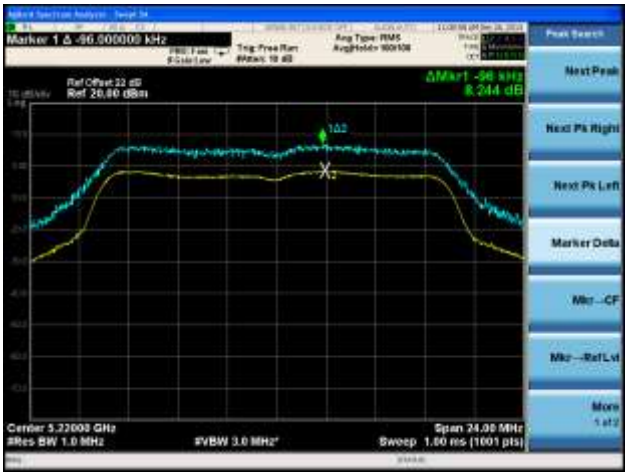


7.5.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Excursion Ratio (dB)	Max. Permissible Peak Excursion Ratio (dB)	Result
802.11a	6	44	5220	8.244	13	Pass
802.11n-HT20	19.5/21.7	44	5220	8.664	13	Pass
802.11n-HT40	40.5/45	38	5190	9.255	13	Pass
802.11ac-VHT20	19.5/21.7	44	5220	9.124	13	Pass
802.11ac-VHT40	40.5/45	38	5190	9.064	13	Pass
802.11ac-VHT80	87.8/97.5	42	5210	10.426	13	Pass

Peak Excursion

802.11a Channel 44 (5220MHz)



802.11n-HT20 Channel 44 (5220MHz)

802.11n-HT40 Channel 38 (5190MHz)

802.11ac-VHT20 Channel 44 (5220MHz)

802.11ac-VHT40 Channel 38 (5190MHz)	802.11ac-VHT80 Channel 42 (5210MHz)
	

7.6. Frequency Stability Measurement *§15.407(g)*

7.6.1. Test Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

7.6.2. Test Procedure Used

Frequency Stability Under Temperature Variations:

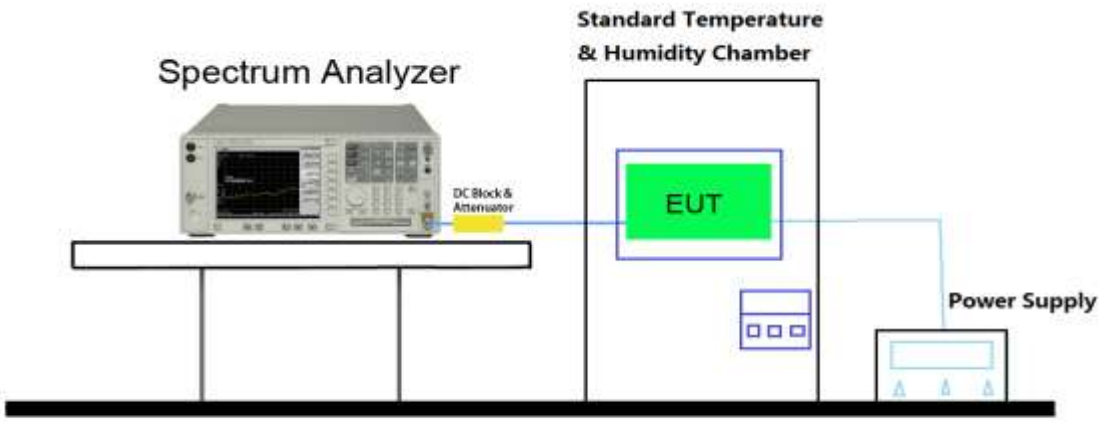
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

7.6.3. Test Setup



7.6.4. Test Result

Test Mode:	802.11a	Test Site:	TR3
Test Channel:	44	Test Engineer:	Roy Cheng
Remark:	5220MHz		

Voltage (%)	Power (VAC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	120	+ 20 (Ref)	5220083043.753	83043.753	0.00001591
100%		- 30	5219952951.763	-47048.237	-0.00000901
100%		- 20	5220038536.940	38536.940	0.00000738
100%		- 10	5220043215.957	43215.957	0.00000828
100%		0	5220068102.693	68102.693	0.00001305
100%		+ 10	5220073273.355	73273.355	0.00001404
100%		+ 20	5220083043.753	83043.753	0.00001591
100%		+ 30	5219958223.279	-41776.721	-0.00000800
100%		+ 40	5220049962.467	49962.467	0.00000957
100%		+ 50	5220047552.998	47552.998	0.00000911
115%	138	+ 20	5220084006.530	84006.530	0.00001609
85%	102	+ 20	5220085996.605	85996.605	0.00001647

Test Mode:	802.11n-HT20	Test Site:	TR3
Test Channel:	44	Test Engineer:	Roy Cheng
Remark:	5220MHz		

Voltage (%)	Power (VAC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	120	+ 20 (Ref)	5220034736.672	34736.672	0.00000665
100%		- 30	5220000813.995	813.995	0.00000016
100%		- 20	5220008924.471	8924.471	0.00000171
100%		- 10	5220039008.209	39008.209	0.00000747
100%		0	5220026555.016	26555.016	0.00000509
100%		+ 10	5220032026.363	32026.363	0.00000614
100%		+ 20	5220034736.672	34736.672	0.00000665
100%		+ 30	5220027903.552	27903.552	0.00000535
100%		+ 40	5220043145.487	43145.487	0.00000827
100%		+ 50	5220040203.864	40203.864	0.00000770
115%	138	+ 20	5220035258.150	35258.150	0.00000675
85%	102	+ 20	5220035442.154	35442.154	0.00000679

Test Mode:	802.11n-HT40	Test Site:	TR3
Test Channel:	38	Test Engineer:	Roy Cheng
Remark:	5190MHz		

Voltage (%)	Power (VAC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	120	+ 20 (Ref)	5190060949.305	60949.305	0.00001174
100%		- 30	5189966860.680	-33139.320	-0.00000639
100%		- 20	5189977850.595	-22149.405	-0.00000427
100%		- 10	5189991550.831	-8449.169	-0.00000163
100%		0	5190035865.790	35865.790	0.00000691
100%		+ 10	5190043205.864	43205.864	0.00000832
100%		+ 20	5190060949.305	60949.305	0.00001174
100%		+ 30	5190040308.012	40308.012	0.00000777
100%		+ 40	5190068508.785	68508.785	0.00001320
100%		+ 50	5190056157.254	56157.254	0.00001082
115%	138	+ 20	5190062581.840	62581.840	0.00001206
85%	102	+ 20	5190063404.441	63404.441	0.00001222

Test Mode:	802.11ac-VHT20	Test Site:	TR3
Test Channel:	44	Test Engineer:	Roy Cheng
Remark:	5220MHz		

Voltage (%)	Power (VAC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	120	+ 20 (Ref)	5220040057.603	40057.603	0.00000767
100%		- 30	5220021907.792	21907.792	0.00000420
100%		- 20	5220000974.654	974.654	0.00000019
100%		- 10	5220012735.016	12735.016	0.00000244
100%		0	5220023426.107	23426.107	0.00000449
100%		+ 10	5220036024.998	36024.998	0.00000690
100%		+ 20	5220040057.603	40057.603	0.00000767
100%		+ 30	5220031543.909	31543.909	0.00000604
100%		+ 40	5220048481.043	48481.043	0.00000929
100%		+ 50	5220038155.560	38155.560	0.00000731
115%	138	+ 20	5220041769.863	41769.863	0.00000800
85%	102	+ 20	5220042401.716	42401.716	0.00000812

Test Mode:	802.11ac-VHT40	Test Site:	TR3
Test Channel:	38	Test Engineer:	Roy Cheng
Remark:	5190MHz		

Voltage (%)	Power (VAC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	120	+ 20 (Ref)	5190059186.700	59186.700	0.00001140
100%		- 30	5189912473.651	-87526.349	-0.00001686
100%		- 20	5189992494.889	-7505.111	-0.00000145
100%		- 10	5190002342.350	2342.350	0.00000045
100%		0	5190034250.065	34250.065	0.00000660
100%		+ 10	5190058195.670	58195.670	0.00001121
100%		+ 20	5190059186.700	59186.700	0.00001140
100%		+ 30	5190043470.081	43470.081	0.00000838
100%		+ 40	5190065424.024	65424.024	0.00001261
100%		+ 50	5190063350.267	63350.267	0.00001221
115%	138	+ 20	5190061947.561	61947.561	0.00001194
85%	102	+ 20	5190061712.790	61712.790	0.00001189

Test Mode:	802.11ac-VHT80	Test Site:	TR3
Test Channel:	42	Test Engineer:	Roy Cheng
Remark:	5210MHz		

Voltage (%)	Power (VAC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	120	+ 20 (Ref)	5210008130.645	8130.645	0.00000156
100%		- 30	5210106310.011	106310.011	0.00002040
100%		- 20	5209975350.963	-24649.037	-0.00000473
100%		- 10	5209994980.873	-5019.127	-0.00000096
100%		0	5210001152.909	1152.909	0.00000022
100%		+ 10	5210042481.872	42481.872	0.00000815
100%		+ 20	5210008130.645	8130.645	0.00000156
100%		+ 30	5210037551.722	37551.722	0.00000721
100%		+ 40	5210048676.747	48676.747	0.00000934
100%		+ 50	5210045739.746	45739.746	0.00000878
115%	138	+ 20	5210009184.358	9184.358	0.00000176
85%	102	+ 20	5210011500.194	11500.194	0.00000221

7.7. Radiated Spurious Emission Measurement *§15.407(b)(1) (6) §15.205 §15.209; RSS-210 [A9.2]*

7.7.1. Test Limit

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 per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.7.2. Test Procedure Used

KDB 789033 D01v01r03 – Section H

7.7.3. Test Setting

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

Quasi-Peak Measurements below 1GHz

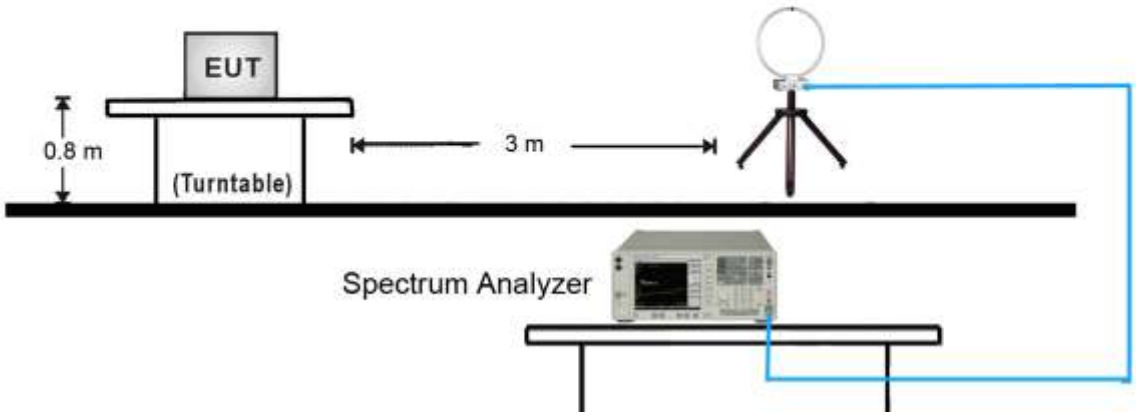
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120 kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Average Measurements above 1GHz (Method AD)

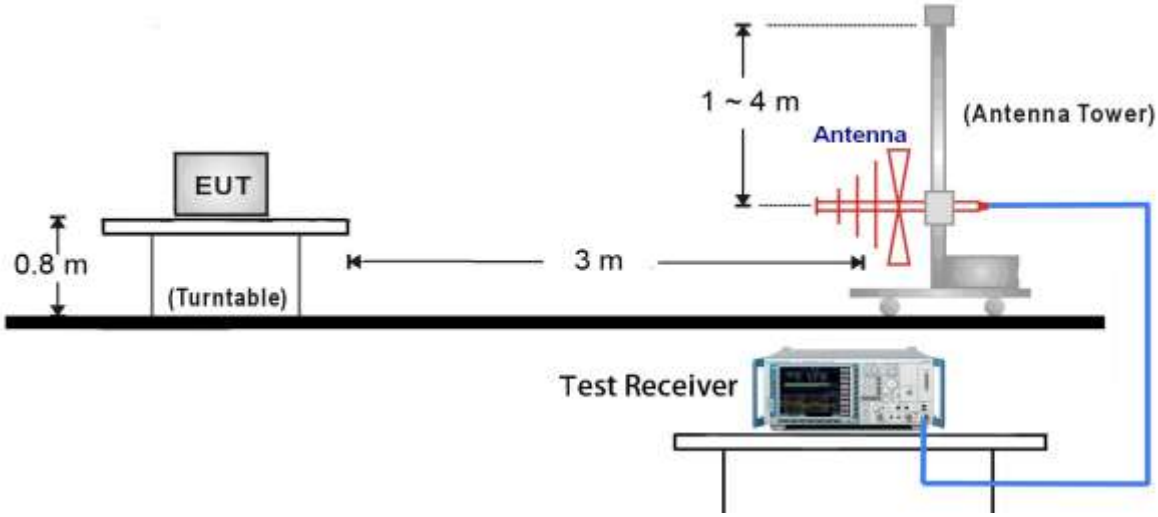
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be > 2 x span/RBW)
6. Sweep time = auto
7. Trace was averaged over at 100 sweeps

7.7.4. Test Setup

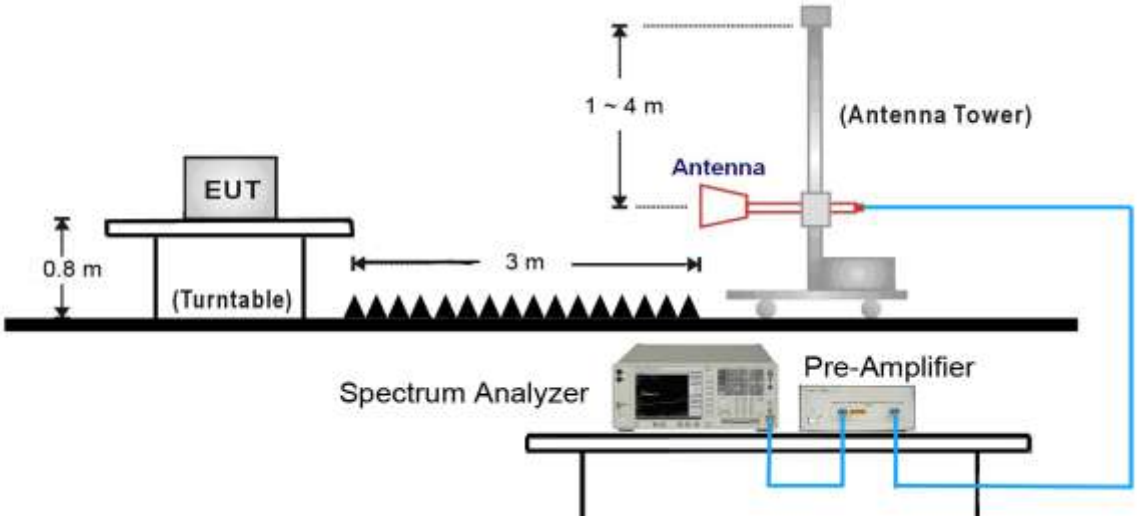
9kHz ~ 30MHz Test Setup:



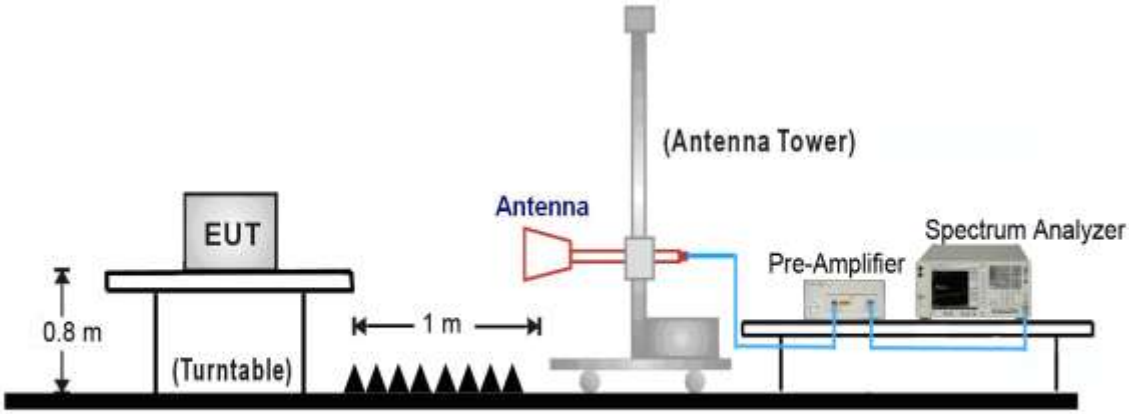
30MHz ~ 1GHz Test Setup:



1GHz ~18GHz Test Setup:



18GHz ~40GHz Test Setup:



7.7.5. Test Result

Test Mode:	802.11a – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	36	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7326.3	35.7	14.0	49.7	68.2	-18.5	Peak	Horizontal
*	7943.8	35.2	15.1	50.3	68.2	-17.9	Peak	Horizontal
	9073.5	36.8	14.6	51.4	74.0	-22.6	Peak	Horizontal
	10484.2	35.5	17.4	52.9	74.0	-21.1	Peak	Horizontal
*	7097.0	34.1	13.4	47.5	68.2	-20.7	Peak	Vertical
*	7807.3	32.6	15.0	47.6	68.2	-20.6	Peak	Vertical
	9073.5	33.9	14.6	48.5	74.0	-25.5	Peak	Vertical
	10606.2	34.8	17.9	52.7	74.0	-21.3	Peak	Vertical

Note: “*” is not in restricted band, its limit is -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.

Test Mode:	802.11a – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	44	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7097.0	34.1	13.4	47.5	68.2	-20.7	Peak	Horizontal
*	7807.3	33.0	15.0	48.0	68.2	-20.2	Peak	Horizontal
	9152.5	35.7	15.3	51.0	74.0	-23.0	Peak	Horizontal
	10606.2	34.1	17.9	52.0	74.0	-22.0	Peak	Horizontal
*	7179.5	33.9	13.6	47.5	68.2	-20.7	Peak	Vertical
*	8588.6	34.1	14.7	48.8	68.2	-19.4	Peak	Vertical
	9047.3	36.1	14.5	50.6	74.0	-23.4	Peak	Vertical
	11269.9	33.9	18.7	52.6	74.0	-21.4	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11a – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	48	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7158.8	33.0	13.6	46.6	68.2	-21.6	Peak	Horizontal
*	7920.9	33.1	15.0	48.1	68.2	-20.1	Peak	Horizontal
	9073.5	35.0	14.6	49.6	74.0	-24.4	Peak	Horizontal
	9420.9	73.0	-22.5	50.5	74.0	-23.5	Peak	Horizontal
*	7138.1	34.0	13.5	47.5	68.2	-20.7	Peak	Vertical
*	7920.9	33.5	15.0	48.5	68.2	-19.7	Peak	Vertical
	9312.6	71.6	-22.5	49.1	74.0	-24.9	Peak	Vertical
	9393.7	35.1	15.4	50.5	74.0	-23.5	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11n-HT20 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	36	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7762.3	69.7	-21.8	47.9	68.2	-20.3	Peak	Horizontal
*	8638.4	71.8	-22.0	49.8	68.2	-18.4	Peak	Horizontal
	9179.0	72.0	-22.2	49.8	74.0	-24.2	Peak	Horizontal
	9448.2	73.6	-22.5	51.1	74.0	-22.9	Peak	Horizontal
*	7035.7	71.4	-22.7	48.7	68.2	-19.5	Peak	Vertical
*	7784.7	68.9	-21.7	47.2	68.2	-21.0	Peak	Vertical
	8465.4	70.7	-22.0	48.7	74.0	-25.3	Peak	Vertical
	9448.2	73.8	-22.5	51.3	74.0	-22.7	Peak	Vertical

Note: “*” is not in restricted band, its limit is -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.

Test Mode:	802.11n-HT20 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	44	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7056.1	69.6	-22.7	46.9	68.2	-21.3	Peak	Horizontal
*	7943.8	71.7	-22.0	49.7	68.2	-18.5	Peak	Horizontal
	8368.1	70.3	-22.0	48.3	74.0	-25.7	Peak	Horizontal
	9448.2	74.0	-22.5	51.5	74.0	-22.5	Peak	Horizontal
*	7015.4	69.3	-22.7	46.6	68.2	-21.6	Peak	Vertical
*	7762.3	69.2	-21.8	47.4	68.2	-20.8	Peak	Vertical
	8248.0	70.3	-22.1	48.2	74.0	-25.8	Peak	Vertical
	9339.5	73.3	-22.5	50.8	74.0	-23.2	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11n-HT20 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	48	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7097.0	68.9	-22.7	46.2	68.2	-22.0	Peak	Horizontal
*	7989.9	70.7	-22.2	48.5	68.2	-19.7	Peak	Horizontal
	8441.0	69.5	-21.9	47.6	74.0	-26.4	Peak	Horizontal
	9420.9	73.0	-22.5	50.5	74.0	-23.5	Peak	Horizontal
*	7035.7	69.5	-22.7	46.8	68.2	-21.4	Peak	Vertical
*	7807.3	69.8	-21.7	48.1	68.2	-20.1	Peak	Vertical
	8224.2	71.0	-22.1	48.9	74.0	-25.1	Peak	Vertical
	9021.2	70.7	-22.4	48.3	74.0	-25.7	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11n-HT40 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	38	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7056.1	70.3	-22.7	47.6	68.2	-20.6	Peak	Horizontal
*	7920.9	71.8	-22.0	49.8	68.2	-18.4	Peak	Horizontal
	9047.3	72.3	-22.5	49.8	74.0	-24.2	Peak	Horizontal
	9448.2	74.6	-22.5	52.1	74.0	-21.9	Peak	Horizontal
*	7035.7	70.6	-22.7	47.9	68.2	-20.3	Peak	Vertical
*	7762.3	68.9	-21.8	47.1	68.2	-21.1	Peak	Vertical
	8465.4	71.4	-22.0	49.4	74.0	-24.6	Peak	Vertical
	9420.9	73.5	-22.5	51.0	74.0	-23.0	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11n-HT40 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	46	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7015.4	69.7	-22.7	47.0	68.2	-21.2	Peak	Horizontal
*	7784.7	69.7	-21.7	48.0	68.2	-20.2	Peak	Horizontal
	9126.1	72.7	-22.4	50.3	74.0	-23.7	Peak	Horizontal
	9448.2	73.4	-22.5	50.9	74.0	-23.1	Peak	Horizontal
*	7015.4	69.0	-22.7	46.3	68.2	-21.9	Peak	Vertical
*	8013.0	71.8	-22.2	49.6	68.2	-18.6	Peak	Vertical
	8416.6	71.8	-21.9	49.9	74.0	-24.1	Peak	Vertical
	9420.9	73.4	-22.5	50.9	74.0	-23.1	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11ac-VHT20 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	36	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7035.7	71.7	-22.7	49.0	68.2	-19.2	Peak	Horizontal
*	7875.3	70.2	-21.9	48.3	68.2	-19.9	Peak	Horizontal
	9179.0	72.0	-22.2	49.8	74.0	-24.2	Peak	Horizontal
	10606.2	74.0	-21.8	52.2	74.0	-21.8	Peak	Horizontal
*	7056.1	70.9	-22.7	48.2	68.2	-20.0	Peak	Vertical
*	7898.1	71.1	-22.0	49.1	68.2	-19.1	Peak	Vertical
	9047.3	72.2	-22.5	49.7	74.0	-24.3	Peak	Vertical
	9448.2	73.5	-22.5	51.0	74.0	-23.0	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11ac-VHT20 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	44	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7076.5	70.3	-22.7	47.6	68.2	-20.6	Peak	Horizontal
*	7762.3	69.0	-21.8	47.2	68.2	-21.0	Peak	Horizontal
	8416.6	70.4	-21.9	48.5	74.0	-25.5	Peak	Horizontal
	9475.5	73.9	-22.6	51.3	74.0	-22.7	Peak	Horizontal
*	7015.4	69.4	-22.7	46.7	68.2	-21.5	Peak	Vertical
*	7762.3	69.1	-21.8	47.3	68.2	-20.9	Peak	Vertical
	8392.3	70.2	-22.0	48.2	74.0	-25.8	Peak	Vertical
	9475.5	73.8	-22.6	51.2	74.0	-22.8	Peak	Vertical

Note: “*” is not in restricted band, its limit is -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.

Test Mode:	802.11ac-VHT20 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	48	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7158.8	69.7	-22.8	46.9	68.2	-21.3	Peak	Horizontal
*	7966.8	70.8	-22.1	48.7	68.2	-19.5	Peak	Horizontal
	9312.6	71.6	-22.5	49.1	74.0	-24.9	Peak	Horizontal
	10636.9	74.1	-21.6	52.5	74.0	-21.5	Peak	Horizontal
*	7138.1	69.9	-22.8	47.1	68.2	-21.1	Peak	Vertical
*	7943.8	71.8	-22.0	49.8	68.2	-18.4	Peak	Vertical
	9126.1	71.5	-22.4	49.1	74.0	-24.9	Peak	Vertical
	10636.9	74.5	-21.6	52.9	74.0	-21.1	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11ac-VHT40 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	38	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7158.8	69.7	-22.8	46.9	68.2	-21.3	Peak	Horizontal
*	7784.7	69.9	-21.7	48.2	68.2	-20.0	Peak	Horizontal
	8441.0	70.7	-21.9	48.8	74.0	-25.2	Peak	Horizontal
	9366.6	72.2	-22.5	49.7	74.0	-24.3	Peak	Horizontal
*	7035.7	69.6	-22.7	46.9	68.2	-21.3	Peak	Vertical
*	7762.3	69.5	-21.8	47.7	68.2	-20.5	Peak	Vertical
	9073.5	71.9	-22.5	49.4	74.0	-24.6	Peak	Vertical
	9475.5	74.8	-22.6	52.2	74.0	-21.8	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

Test Mode:	802.11ac-VHT40 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	46	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7035.7	69.5	-22.7	46.8	68.2	-21.4	Peak	Horizontal
*	7762.3	68.6	-21.8	46.8	68.2	-21.4	Peak	Horizontal
	9047.3	71.7	-22.5	49.2	74.0	-24.8	Peak	Horizontal
	10636.9	74.3	-21.6	52.7	74.0	-21.3	Peak	Horizontal
*	7076.5	70.3	-22.7	47.6	68.2	-20.6	Peak	Vertical
*	7920.9	70.9	-22.0	48.9	68.2	-19.3	Peak	Vertical
	8392.3	70.0	-22.0	48.0	74.0	-26.0	Peak	Vertical
	9448.2	73.5	-22.5	51.0	74.0	-23.0	Peak	Vertical

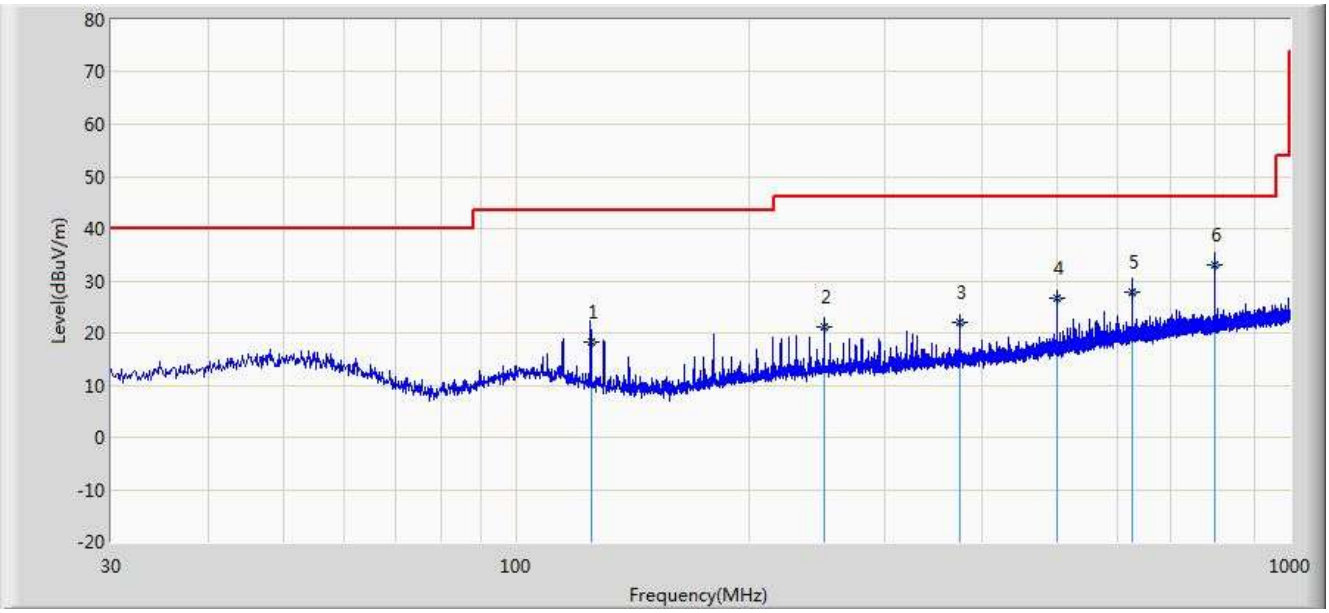
Note: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Test Mode:	802.11ac-VHT80 – Chain 1 + 2 + 3	Test Site:	AC1
Test Channel:	42	Test Engineer:	Roy Cheng
Remark:	1. There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report. 2. Average measurement was not performed if peak level lower than average limit.		

Mark	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7117.5	69.5	-22.7	46.8	68.2	-21.4	Peak	Horizontal
*	7943.8	70.8	-22.0	48.8	68.2	-19.4	Peak	Horizontal
	9099.7	72.0	-22.6	49.4	74.0	-24.6	Peak	Horizontal
	11269.9	73.9	-21.3	52.6	74.0	-21.4	Peak	Horizontal
*	7035.7	69.2	-22.7	46.5	68.2	-21.7	Peak	Vertical
*	7829.9	70.1	-21.8	48.3	68.2	-19.9	Peak	Vertical
	9099.7	72.3	-22.6	49.7	74.0	-24.3	Peak	Vertical
	11302.5	74.2	-21.1	53.1	74.0	-20.9	Peak	Vertical
Note: “*” is not in restricted band, its limit is -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.								

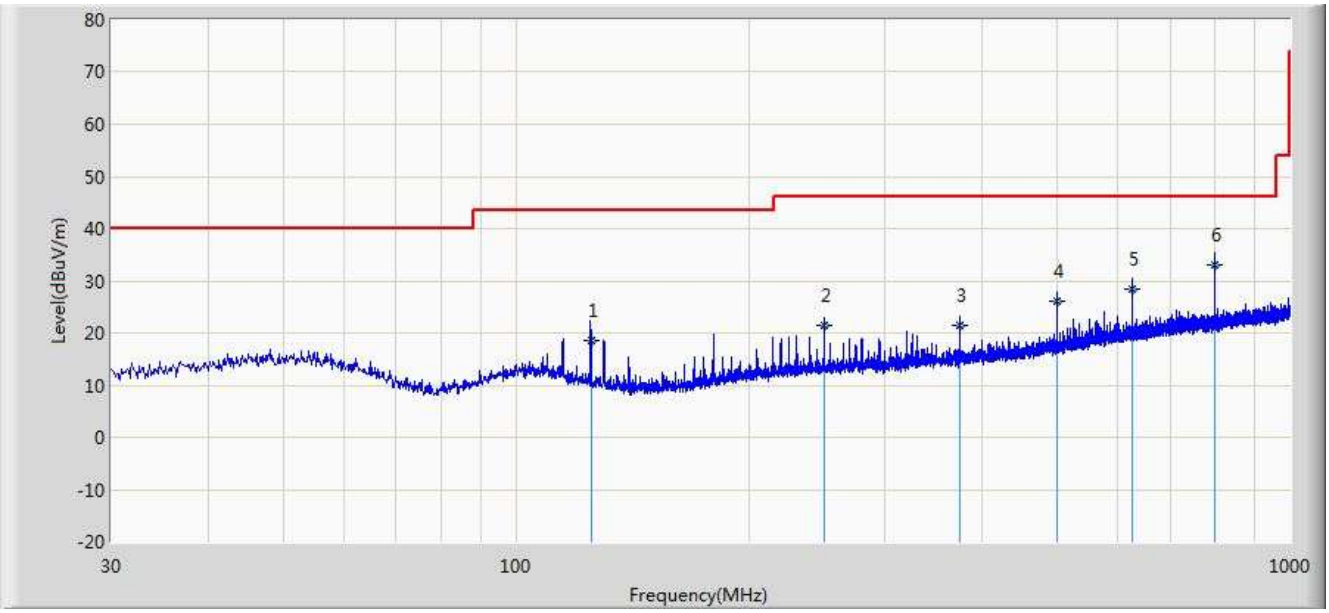
The worst case of Radiated Emission below 1GHz:

Test Engineer: Roy Cheng	
Test Site: AC1	Time: 2013/12/28 - 17:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT Model: Fast 5250	Power: AC 120V/60Hz
Worst Case Mode: 802.11a Channel 5180MHz Chain 1+2+3	



No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Over Limit (dB)	Limit (dBµV/m)	Factor	Type
1		125.020	18.284	8.025	-25.216	43.500	10.259	QP
2		250.021	21.300	8.020	-24.700	46.000	13.279	QP
3		375.072	22.069	6.336	-23.931	46.000	15.733	QP
4		500.017	26.606	8.864	-19.394	46.000	17.742	QP
5		625.014	27.962	8.240	-18.038	46.000	19.722	QP
6	*	800.054	33.135	11.024	-12.865	46.000	22.111	QP

Test Engineer: Roy Cheng	
Test Site: AC1	Time: 2013/12/28 - 17:47
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT Model: Fast 5250	Power: AC 120V/60Hz
Worst Case Mode: 802.11a Channel 5180MHz Chain 1+2+3	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Over Limit (dB)	Limit (dBμV/m)	Factor	Type
1		125.001	18.627	8.365	-24.873	43.500	10.262	QP
2		250.202	21.308	8.024	-24.692	46.000	13.284	QP
3		375.002	21.421	5.689	-24.579	46.000	15.732	QP
4		500.021	26.096	8.354	-19.904	46.000	17.742	QP
5		625.010	28.382	8.660	-17.618	46.000	19.722	QP
6	*	800.025	33.134	11.024	-12.866	46.000	22.111	QP

7.8. Radiated Restricted Band Edge Measurement *§15.407(b)(1)(2)§15.205§15.209;RSS-210[A9.2]*

7.8.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

For 15.407(b) requirement:

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.

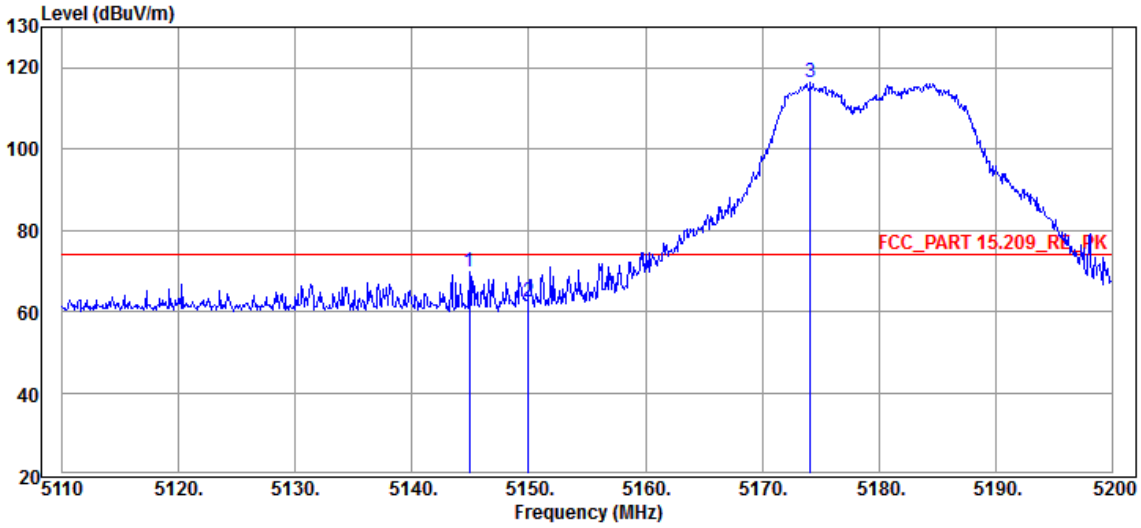
Operating Frequency Band (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength at 3m (dBμV/m)
5150 - 5250	-27	68.2

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 per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.8.2. Test Result of Radiated Restricted Band Edge

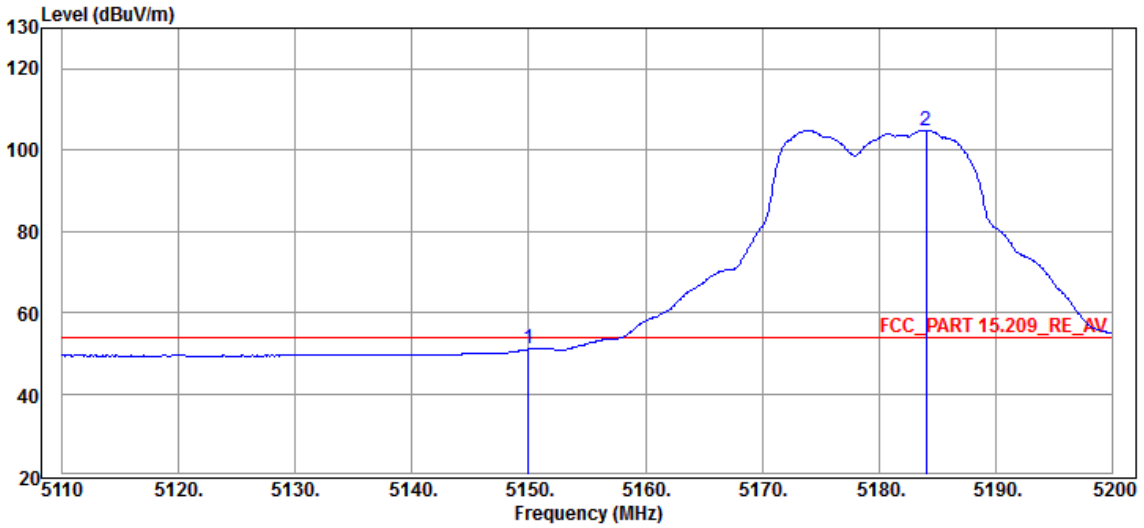
Tested by	Roy Cheng	Test Data	2013-11-12- 13:42:44
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11a Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5144.92	69.82	33.06	Peak	36.76	74.00	-4.18
5150.00	62.38	25.62	Peak	36.76	74.00	-11.62
5174.17	116.38	79.70	Peak	36.68	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

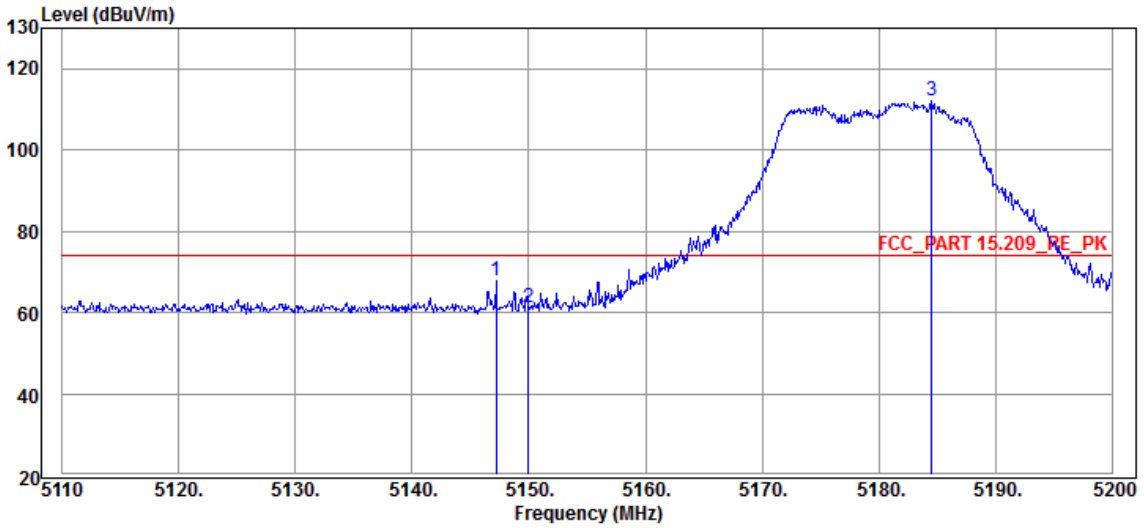
Tested by	Roy Cheng	Test Data	2013-11-12- 13:47:10
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11a Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	50.95	14.19	Average	36.76	54.00	-3.05
5184.07	104.82	68.17	Average	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

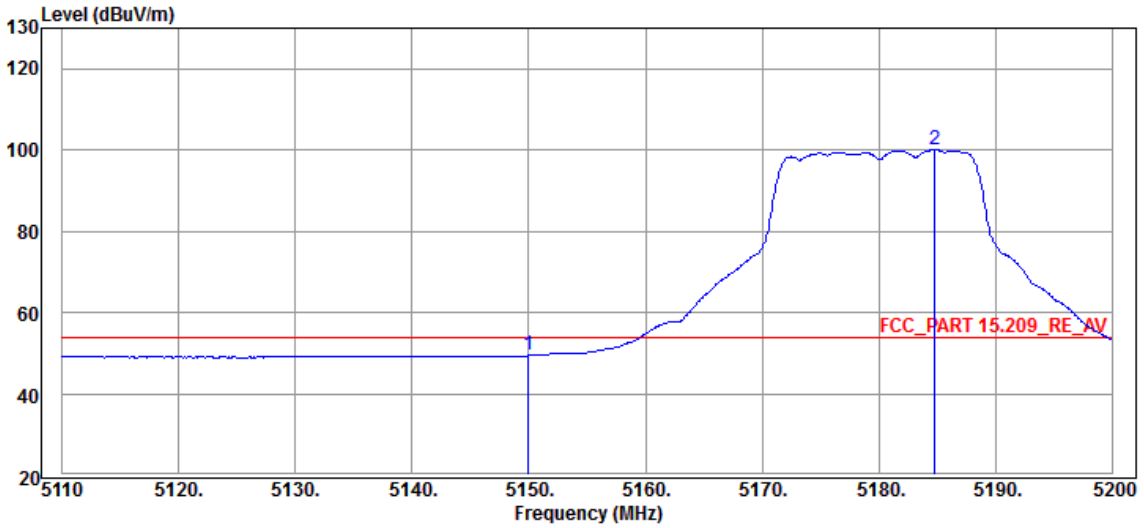
Tested by	Roy Cheng	Test Data	2013-11-12- 13:49:33
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11a Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5147.17	67.83	31.07	Peak	36.76	74.00	-6.17
5150.00	61.23	24.47	Peak	36.76	74.00	-12.77
5184.52	112.06	75.41	Peak	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

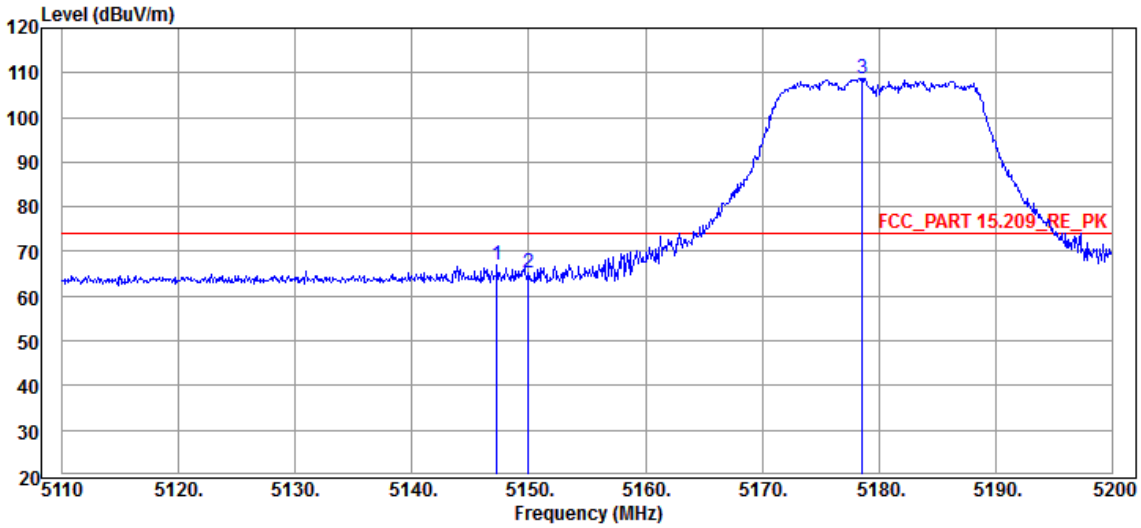
Tested by	Roy Cheng	Test Data	2013-11-12- 13:54:00
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11a Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	49.38	12.62	Average	36.76	54.00	-4.62
5184.79	100.03	63.38	Average	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

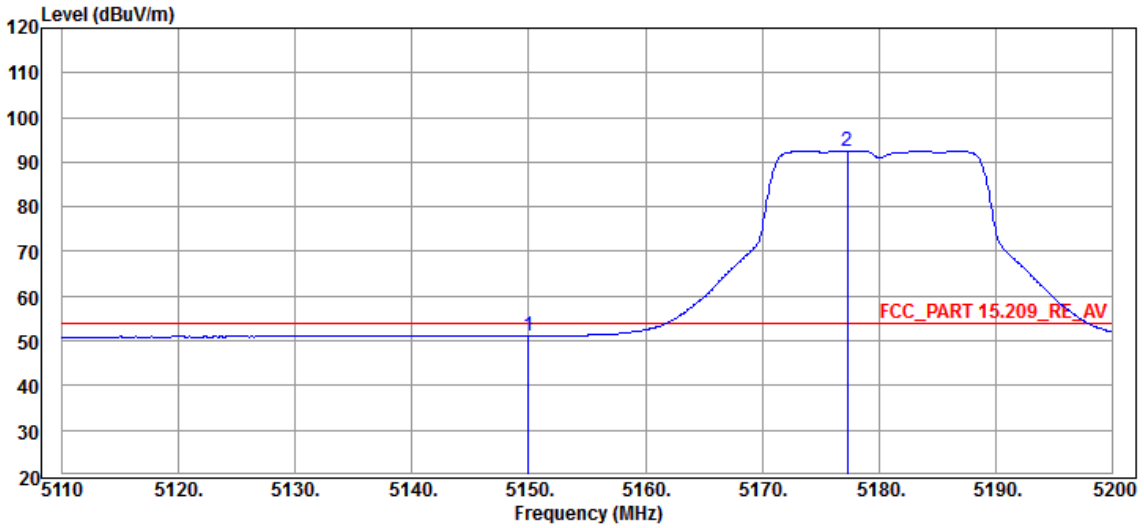
Tested by	Roy Cheng	Test Data	2013-10-18- 21:22:05
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11n20 Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5147.26	67.11	30.35	Peak	36.76	74.00	-6.89
5150.00	65.37	28.61	Peak	36.76	74.00	-8.63
5178.58	108.84	72.17	Peak	36.67	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

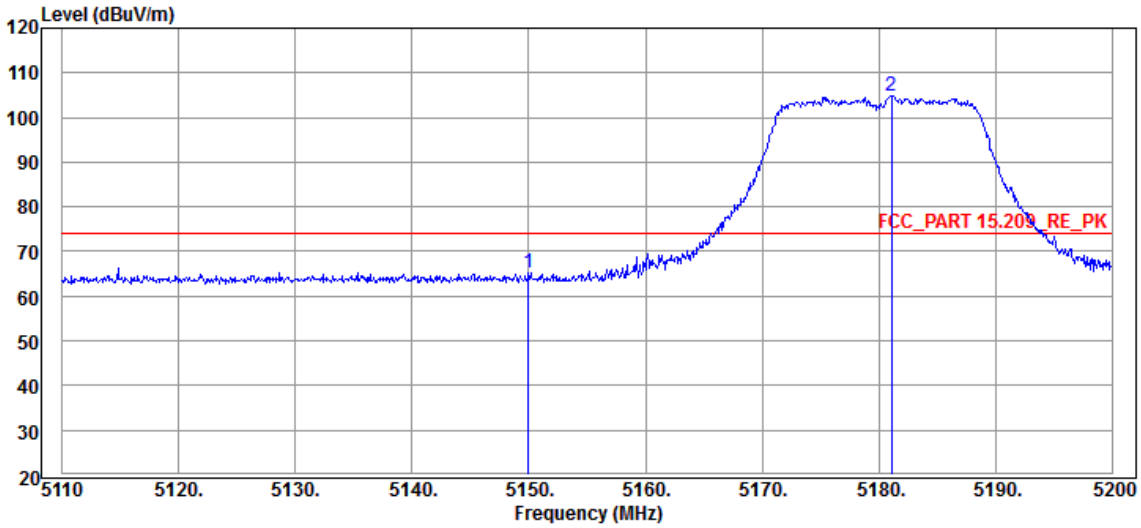
Tested by	Roy Cheng	Test Data	2013-10-18- 21:22:47
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11n20 Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.14	14.38	Average	36.76	54.00	-2.86
5177.32	92.54	55.87	Average	36.67	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

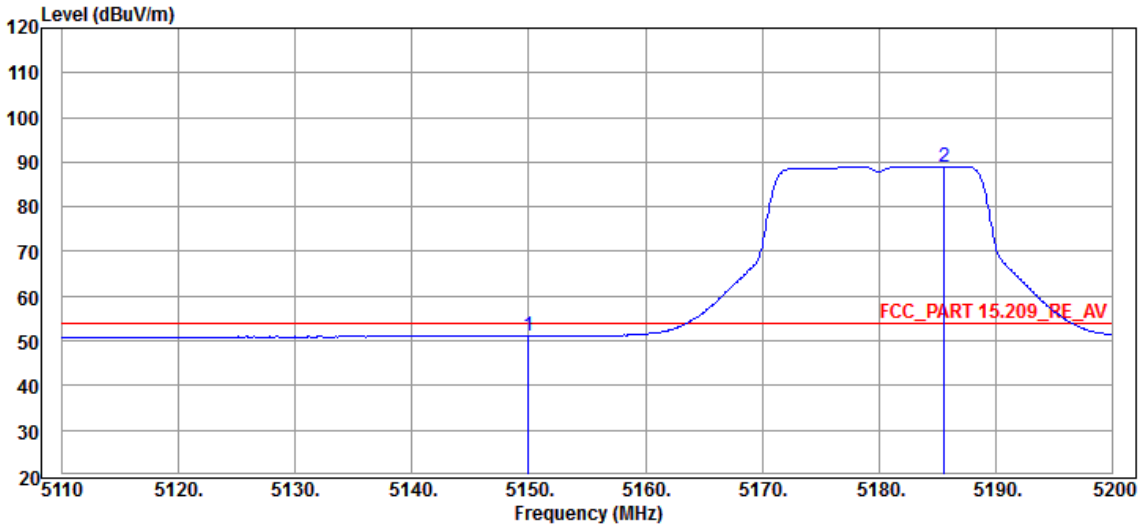
Tested by	Roy Cheng	Test Data	2013-10-18- 21:23:53
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11n20 Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	65.08	28.32	Peak	36.76	74.00	-8.92
5181.10	104.89	68.23	Peak	36.66	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

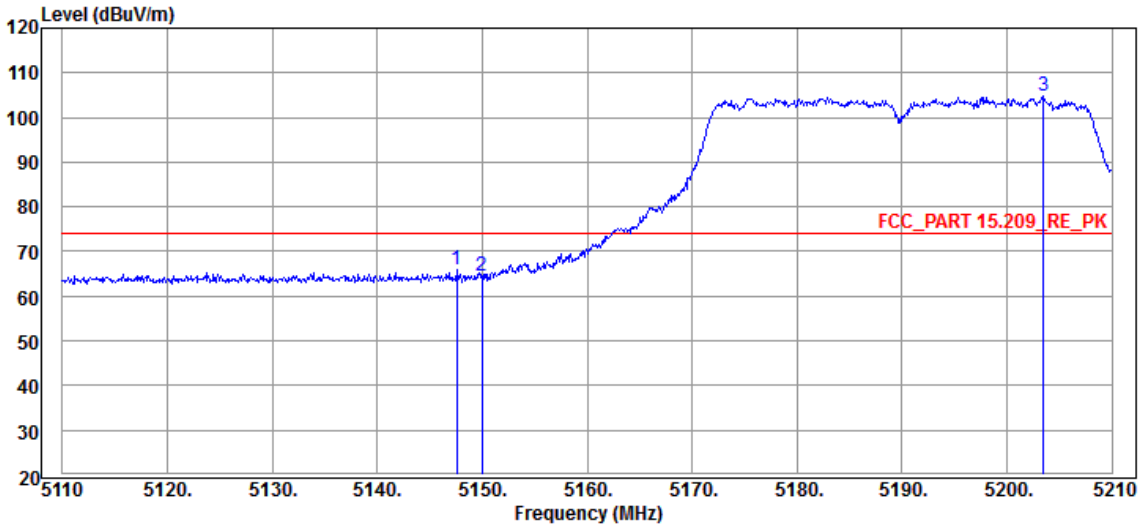
Tested by	Roy Cheng	Test Data	2013-10-18- 21:24:29
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11n20 Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.01	14.25	Average	36.76	54.00	-2.99
5185.60	89.07	52.42	Average	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

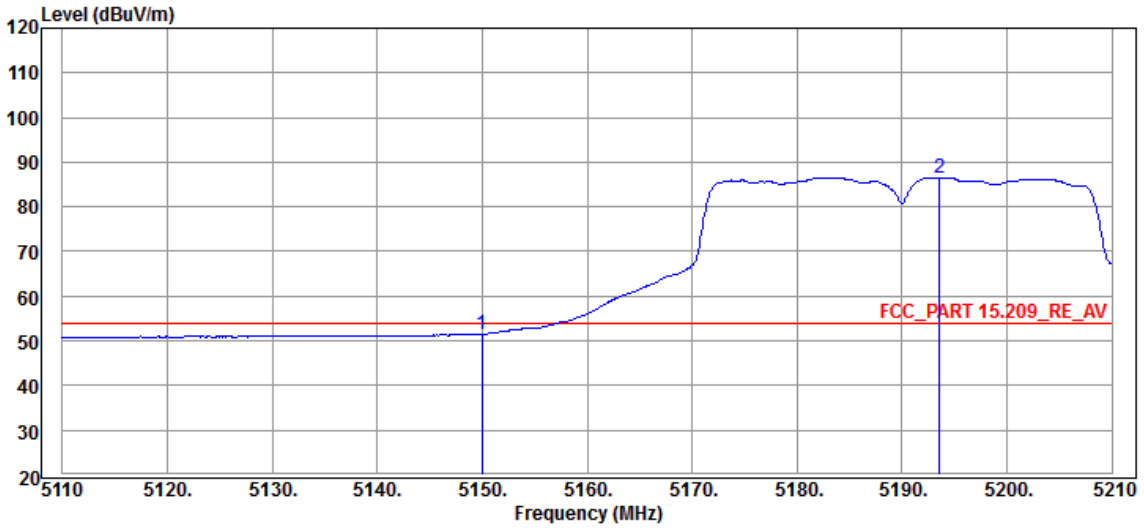
Tested by	Roy Cheng	Test Data	2013-10-18- 23:02:32
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11n40 Chain 1+2+3 - Channel 5190MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5147.60	66.05	29.29	Peak	36.76	74.00	-7.95
5150.00	64.47	27.71	Peak	36.76	74.00	-9.53
5203.50	104.84	68.24	Peak	36.60	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

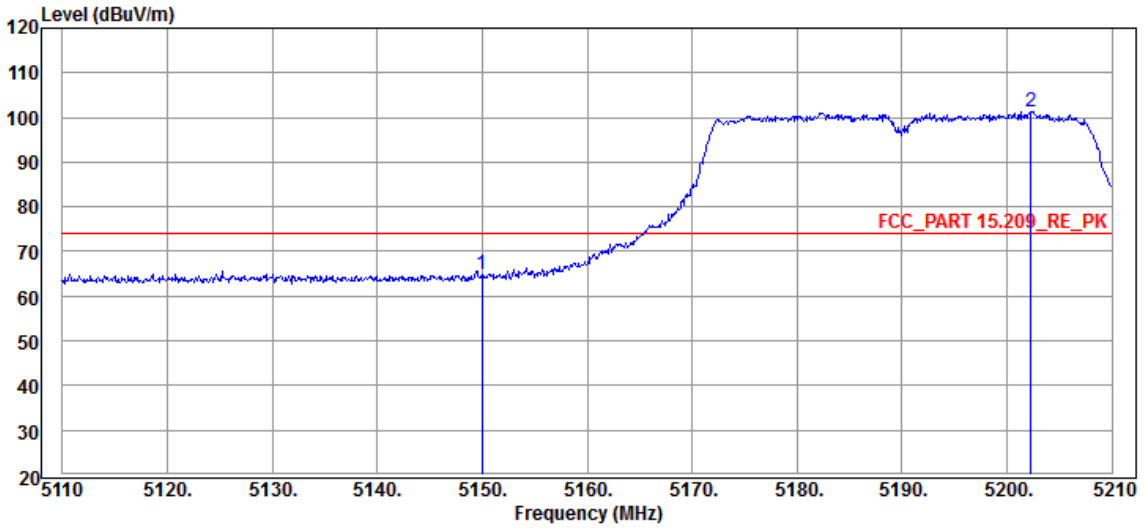
Tested by	Roy Cheng	Test Data	2013-10-18- 23:03:23
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11n40 Chain 1+2+3 - Channel 5190MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.57	14.81	Average	36.76	54.00	-2.43
5193.60	86.52	49.90	Average	36.62	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

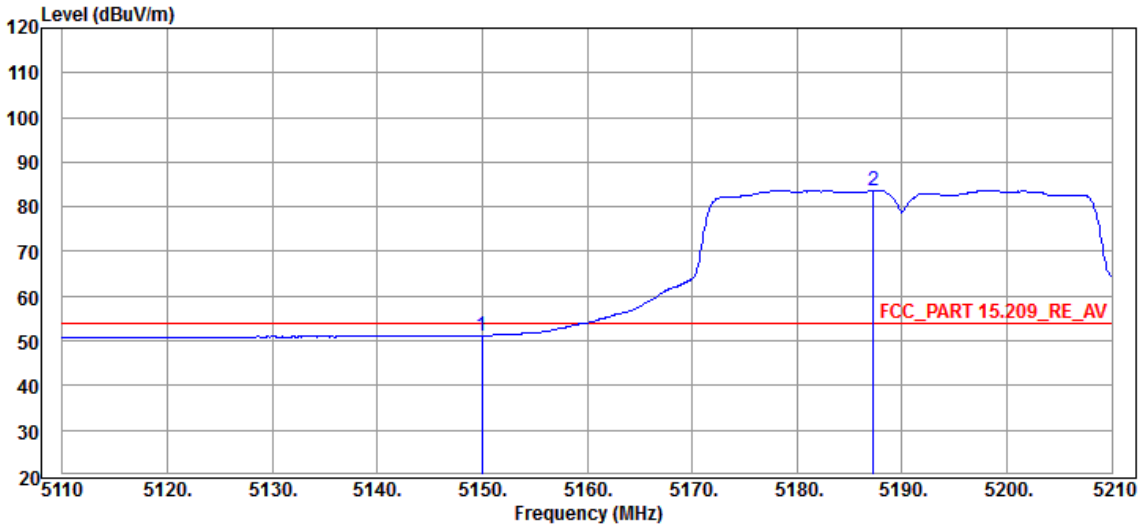
Tested by	Roy Cheng	Test Data	2013-10-18- 23:04:47
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11n40 Chain 1+2+3 - Channel 5190MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	64.91	28.15	Peak	36.76	74.00	-9.09
5202.30	101.40	64.80	Peak	36.60	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

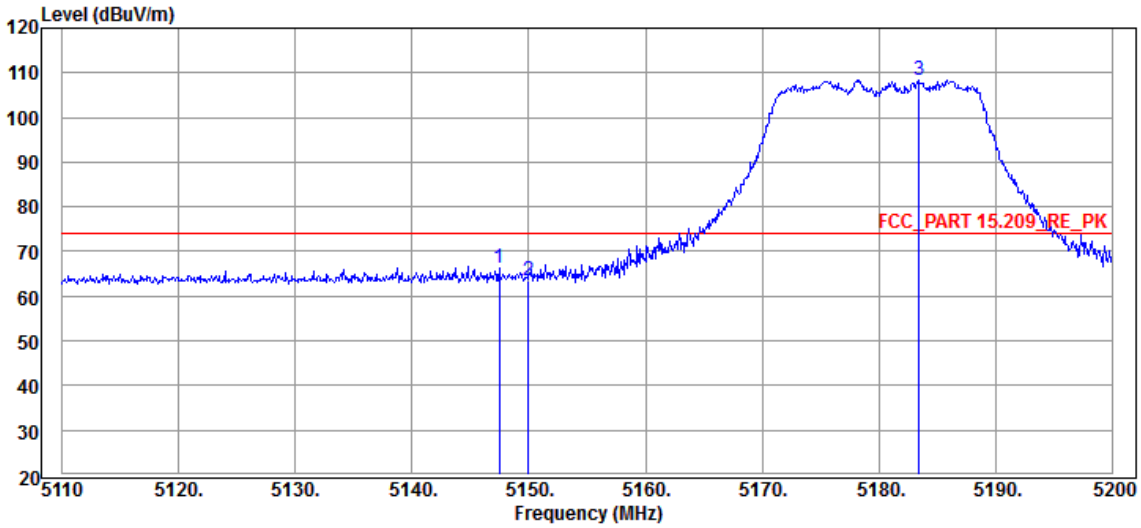
Tested by	Roy Cheng	Test Data	2013-10-20- 00:53:52
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11n40 Chain 1+2+3 - Channel 5190MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.19	14.43	Average	36.76	54.00	-2.81
5187.30	83.76	47.12	Average	36.64	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

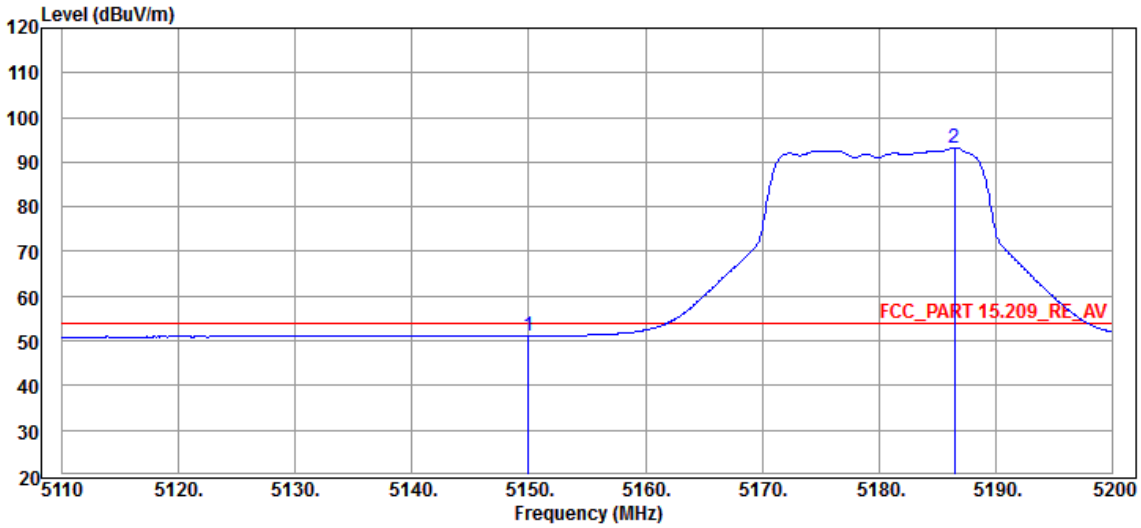
Tested by	Roy Cheng	Test Data	2013-10-19- 00:48:42
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT20 Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5147.44	66.29	29.53	Peak	36.76	74.00	-7.71
5150.00	63.42	26.66	Peak	36.76	74.00	-10.58
5183.44	108.34	71.68	Peak	36.66	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

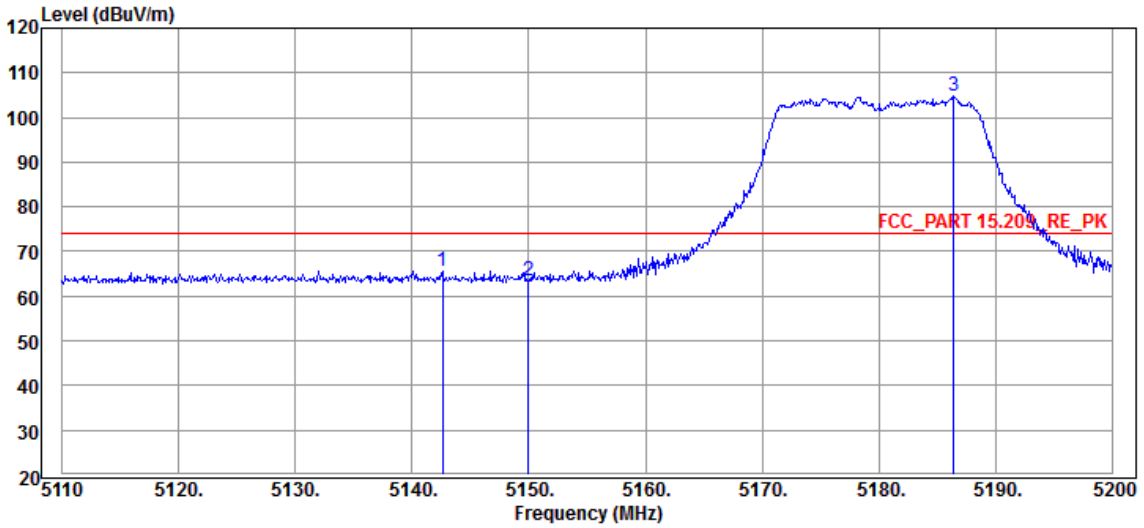
Tested by	Roy Cheng	Test Data	2013-10-19- 00:49:25
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT20 Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.14	14.38	Average	36.76	54.00	-2.86
5186.50	93.27	56.62	Average	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

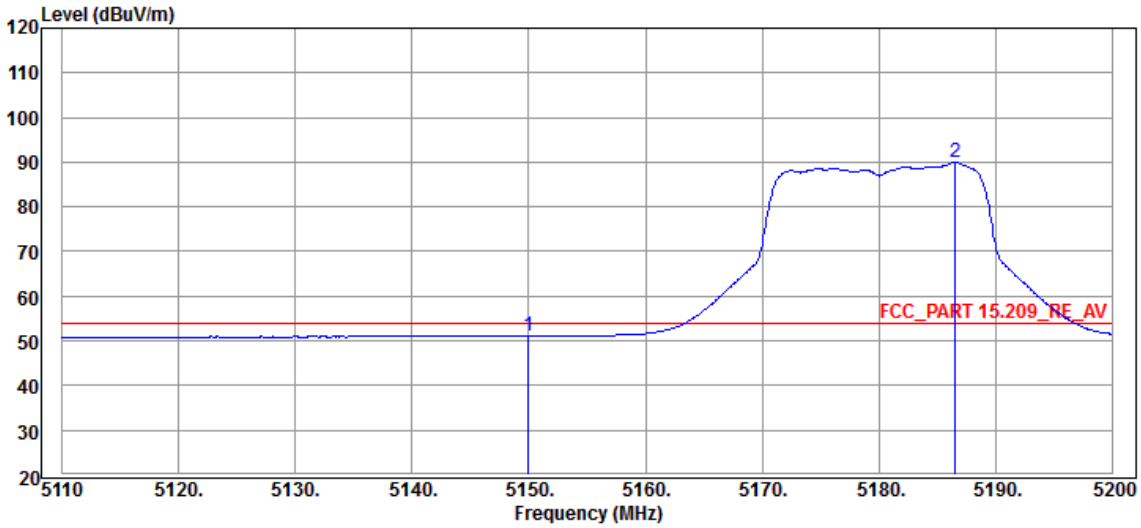
Tested by	Roy Cheng	Test Data	2013-10-19- 00:50:50
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT20 Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5142.58	65.65	28.88	Peak	36.77	74.00	-8.35
5150.00	63.58	26.82	Peak	36.76	74.00	-10.42
5186.41	104.67	68.02	Peak	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

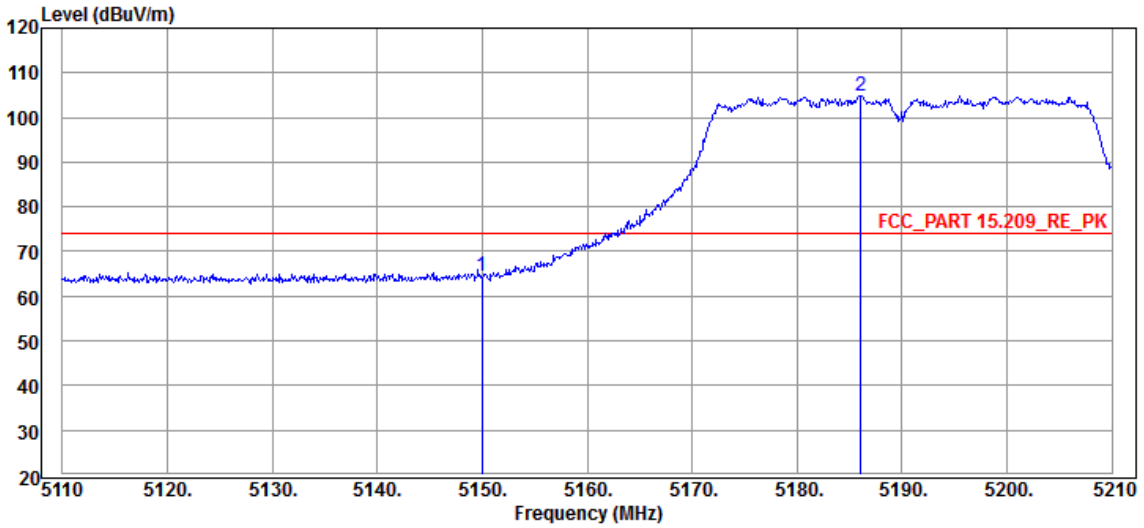
Tested by	Roy Cheng	Test Data	2013-10-19- 00:51:36
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT20 Chain 1+2+3 - Channel 5180MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.02	14.26	Average	36.76	54.00	-2.98
5186.59	89.99	53.34	Average	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

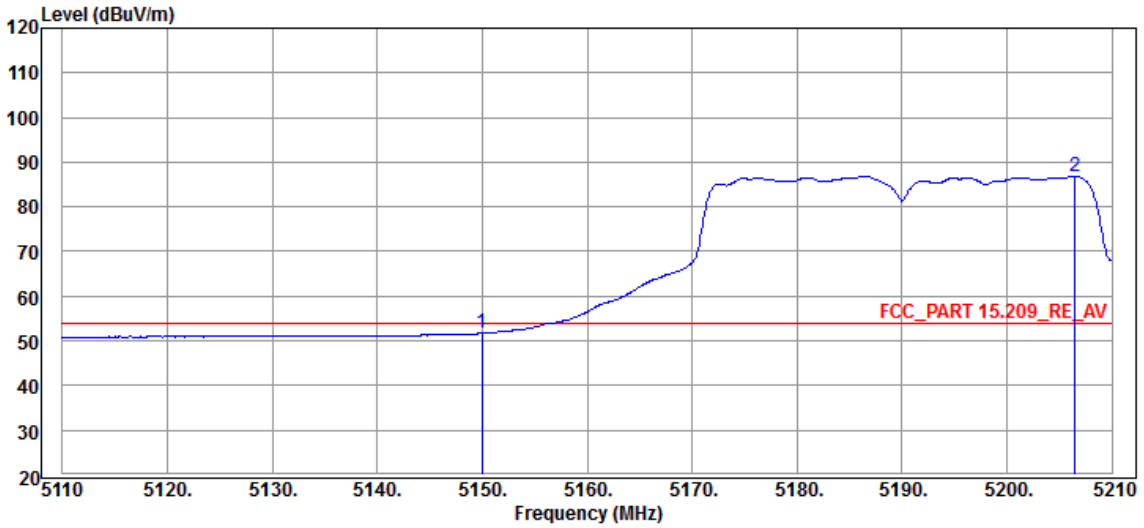
Tested by	Roy Cheng	Test Data	2013-10-19- 02:28:58
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT40 Chain 1+2+3 - Channel 5190MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	64.67	27.91	Peak	36.76	74.00	-9.33
5186.10	104.85	68.20	Peak	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

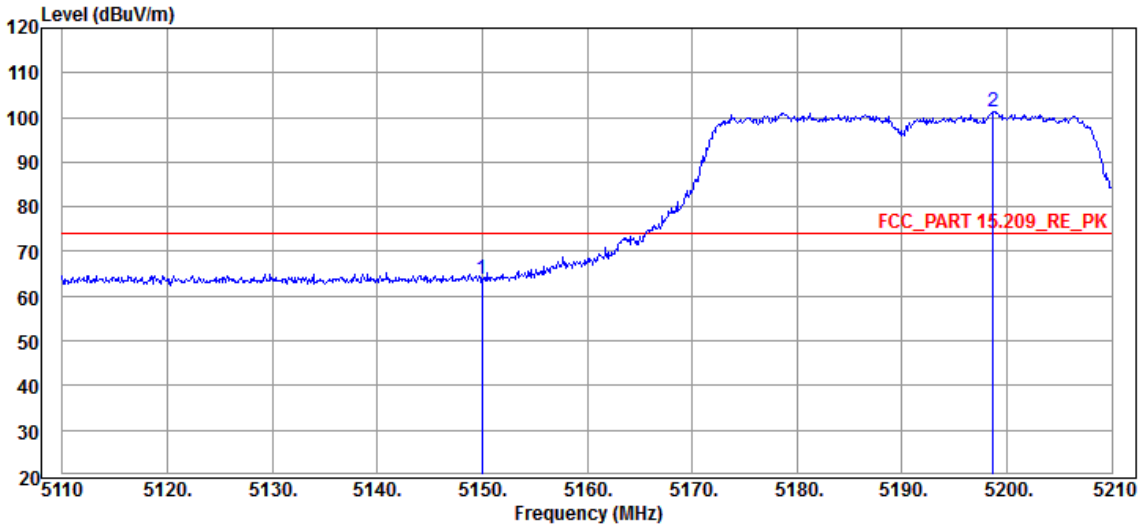
Tested by	Roy Cheng	Test Data	2013-10-19- 02:29:50
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT40 Chain 1+2+3 - Channel 5190MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.71	14.95	Average	36.76	54.00	-2.29
5206.50	86.94	50.35	Average	36.59	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

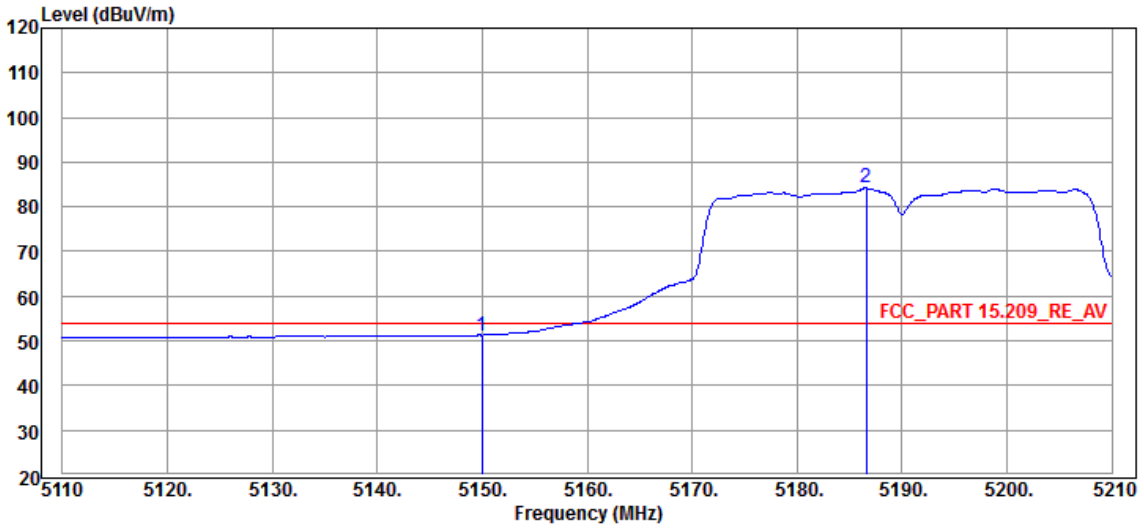
Tested by	Roy Cheng	Test Data	2013-10-19- 02:30:55
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT40 Chain 1+2+3 - Channel 5190MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	63.81	27.05	Peak	36.76	74.00	-10.19
5198.70	101.29	64.68	Peak	36.61	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

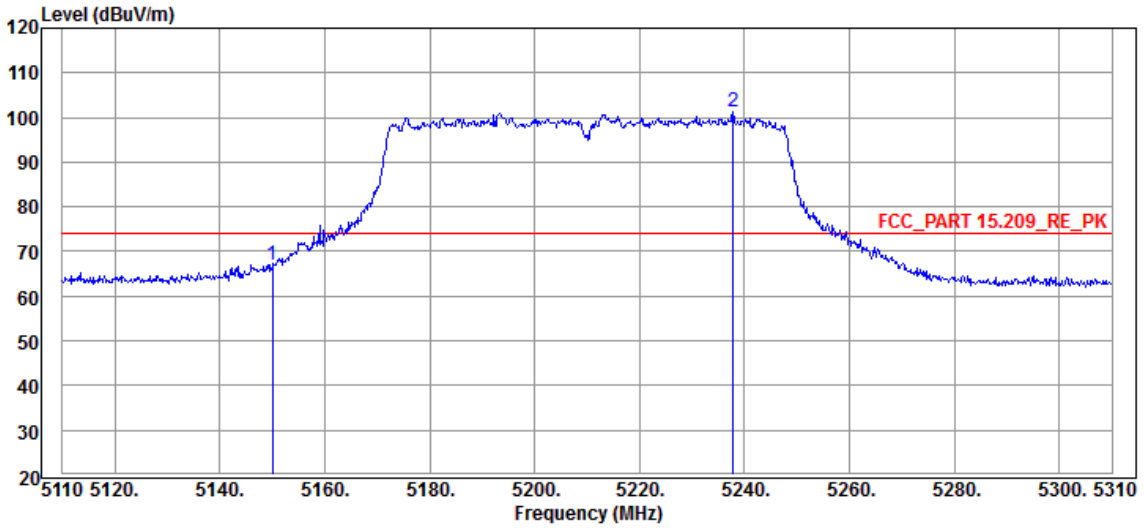
Tested by	Roy Cheng	Test Data	2013-10-19- 02:31:36
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT40 Chain 1+2+3 - Channel 5190MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.27	14.51	Average	36.76	54.00	-2.73
5186.60	84.18	47.53	Average	36.65	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

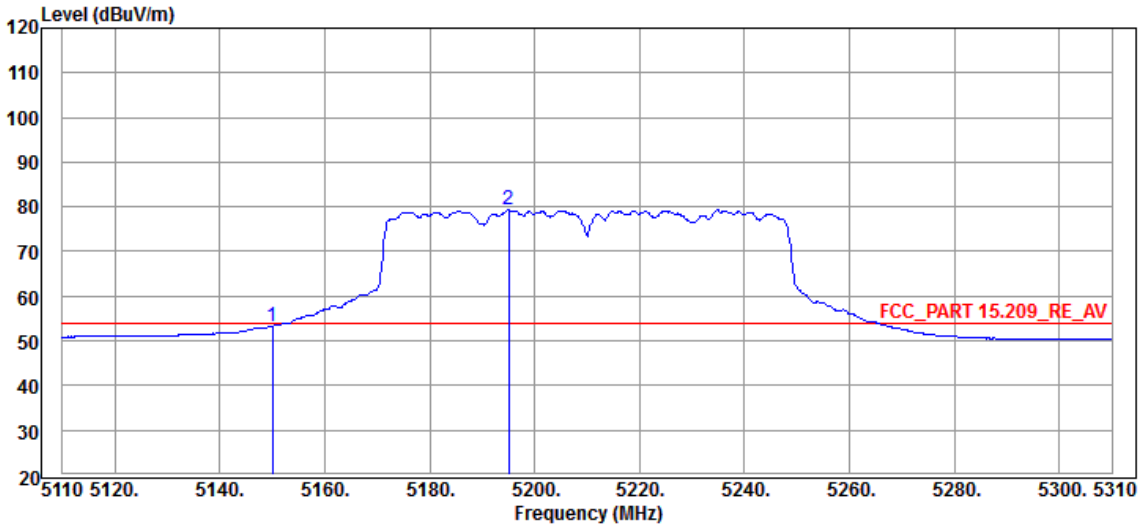
Tested by	Roy Cheng	Test Data	2013-10-19- 03:46:22
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT80 Chain 1+2+3 - Channel 5210MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	66.99	30.23	Peak	36.76	74.00	-7.01
5237.80	101.13	64.60	Peak	36.53	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

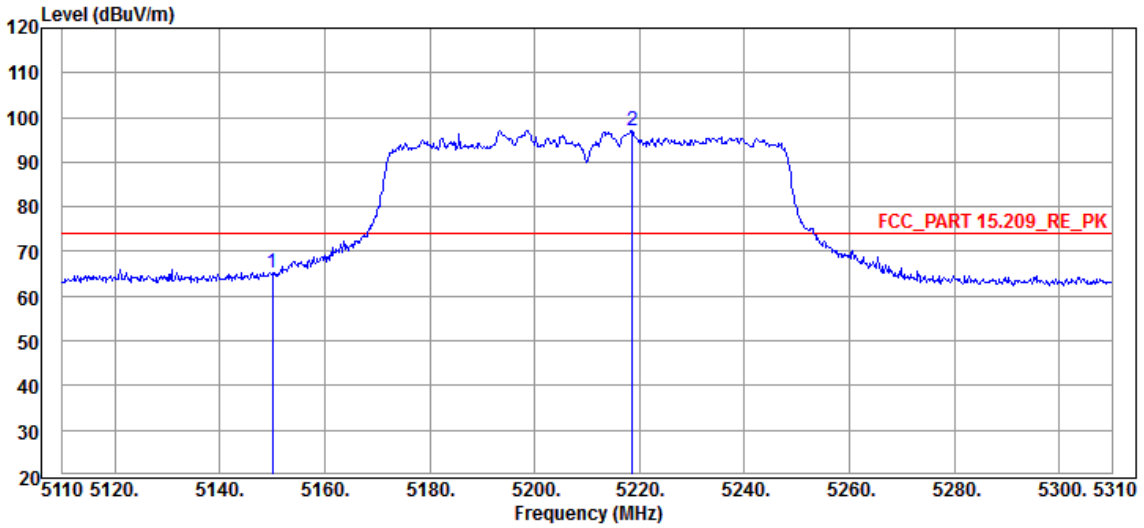
Tested by	Roy Cheng	Test Data	2013-10-19- 03:48:08
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Horizontal
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT80 Chain 1+2+3 - Channel 5210MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	53.20	16.44	Average	36.76	54.00	-0.80
5195.00	79.22	42.60	Average	36.62	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

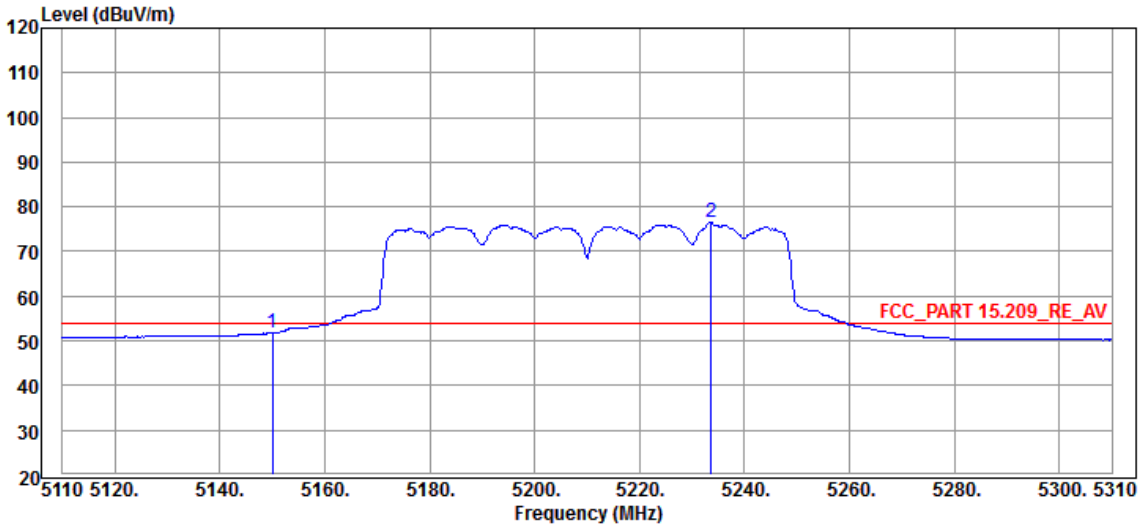
Tested by	Roy Cheng	Test Data	2013-10-19- 03:49:31
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT80 Chain 1+2+3 - Channel 5210MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	65.15	28.39	Peak	36.76	74.00	-8.85
5218.60	97.08	60.51	Peak	36.57	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

Tested by	Roy Cheng	Test Data	2013-10-19- 03:50:16
Site	AC1	Power	120V/60Hz
Limit	FCC_PART 15.209_RE	Polarity	Vertical
Antenna	BBHA_9120D	EUT	Router
Test Mode: 802.11ac-VHT80 Chain 1+2+3 - Channel 5210MHz			



Freq (MHz)	Level (dBμV/m)	Reading (dBuV)	Detector	C.F (dB)	Limit (dBuV/m)	Over Limit (dB)
5150.00	51.68	14.92	Average	36.76	54.00	-2.32
5233.60	76.53	39.99	Average	36.54	N/A	N/A

Remarks: C.F (Correction Factor) = Antenna Factor + Cable Loss

7.9. AC Conducted Emissions Measurement *§15.207; RSS-Gen [7.2.2]*

7.9.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 & RSS-Gen Limits		
Frequency (MHz)	QP (dBμV)	AV (dBμV)
0.15 - 0.50	66 - 56	56 – 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

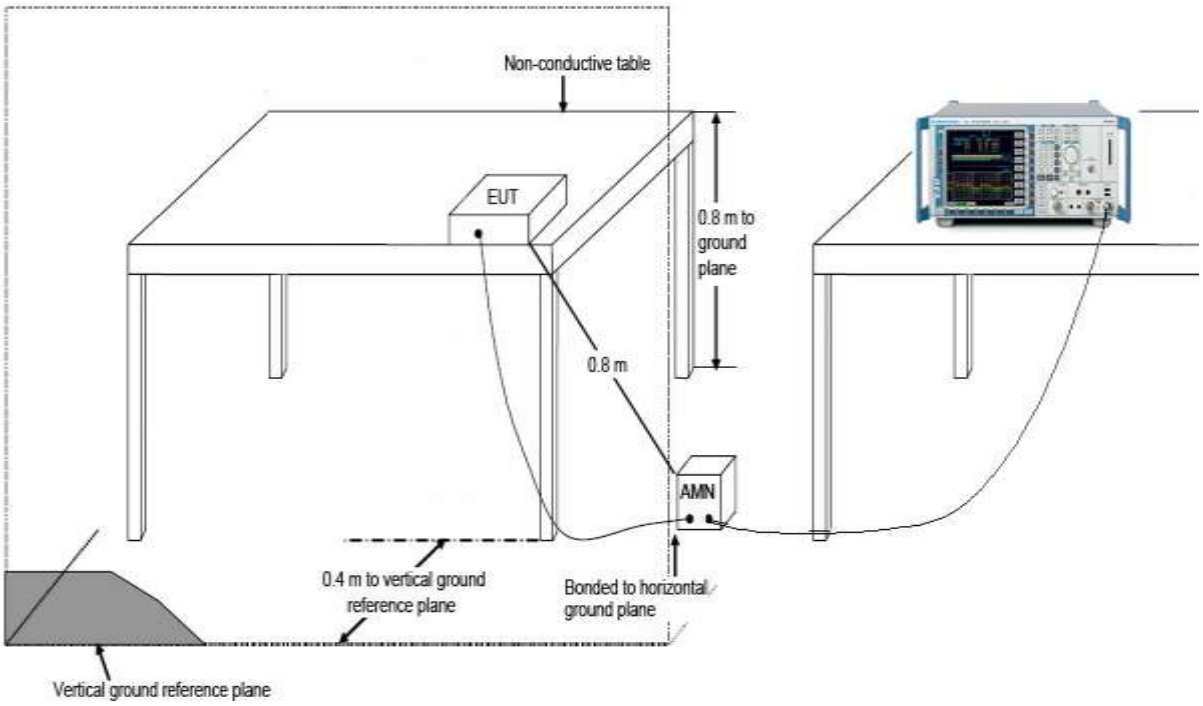
7.9.2. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to KDB 789033 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

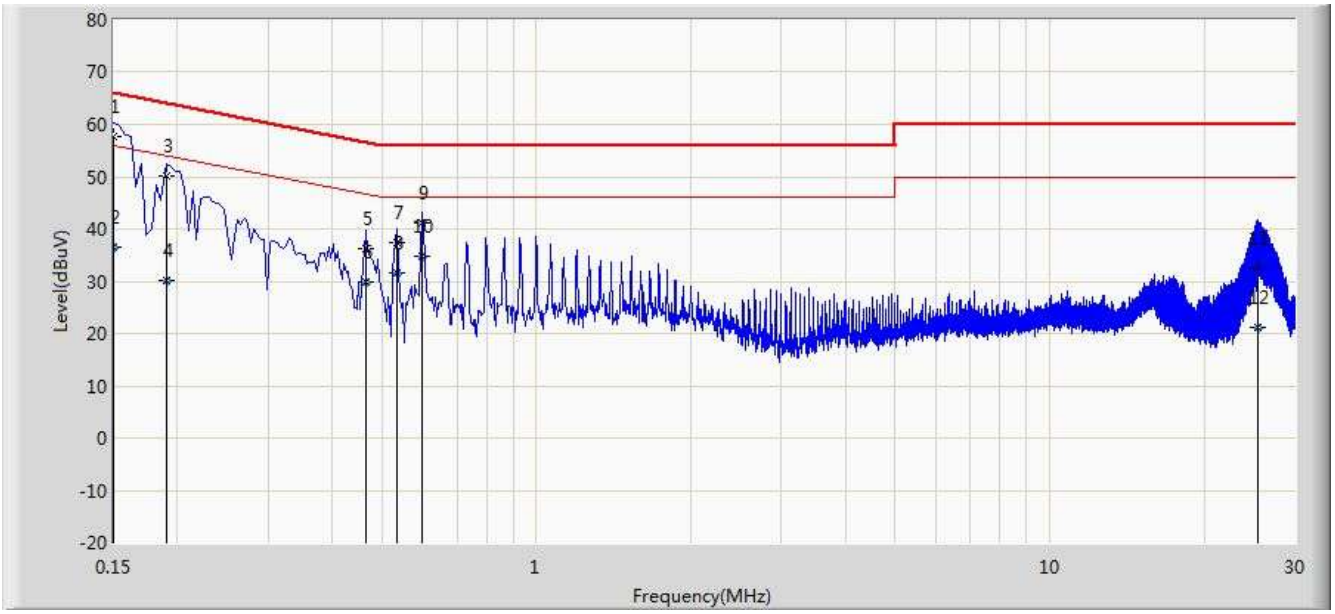
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

7.9.3. Test Setup



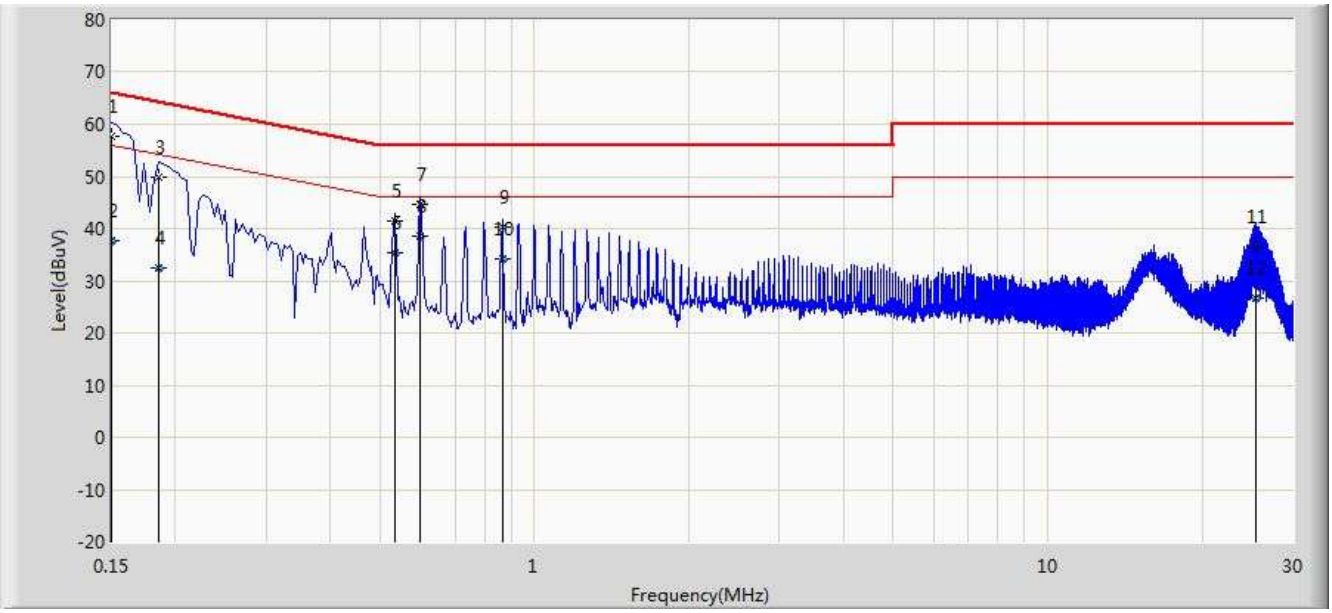
7.9.4. Test Result

Engineer: Roy Cheng	
Site: SR2	Time: 2014/01/03 - 18:05
Limit: FCC_Part15.207	Margin: 0
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Router	Power: AC 120V/60Hz
Note: Normal Operation	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type
1		*	0.150	57.701	46.533	-8.299	66.000	11.168	QP
2			0.150	36.450	25.281	-19.550	56.000	11.168	AV
3			0.190	50.007	39.978	-14.030	64.037	10.029	QP
4			0.190	30.027	19.998	-24.010	54.037	10.029	AV
5			0.466	36.365	26.226	-20.220	56.585	10.139	QP
6			0.466	29.956	19.817	-16.629	46.585	10.139	AV
7			0.534	37.500	27.351	-18.500	56.000	10.149	QP
8			0.534	31.698	21.549	-14.302	46.000	10.149	AV
9			0.598	41.042	30.926	-14.958	56.000	10.116	QP
10			0.598	34.665	24.549	-11.335	46.000	10.116	AV
11			25.354	32.334	22.107	-27.666	60.000	10.227	QP
12			25.354	21.076	10.849	-28.924	50.000	10.227	AV

Engineer: Roy Cheng	
Site: SR2	Time: 2014/01/03 - 18:09
Limit: FCC_Part15.207	Margin: 0
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Router	Power: AC 120V/60Hz
Note: Normal Operation	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type
1			0.150	57.817	46.675	-8.183	66.000	11.142	QP
2			0.150	37.738	26.596	-18.262	56.000	11.142	AV
3			0.186	49.936	39.901	-14.277	64.213	10.035	QP
4			0.186	32.319	22.284	-21.894	54.213	10.035	AV
5			0.534	41.384	31.216	-14.616	56.000	10.168	QP
6			0.534	35.400	25.233	-10.600	46.000	10.168	AV
7			0.598	44.729	34.596	-11.271	56.000	10.132	QP
8		*	0.598	38.449	28.316	-7.551	46.000	10.132	AV
9			0.866	40.342	30.359	-15.658	56.000	9.983	QP
10			0.866	34.347	24.364	-11.653	46.000	9.983	AV
11			25.378	36.657	26.334	-23.343	60.000	10.323	QP
12			25.378	26.534	16.211	-23.466	50.000	10.323	AV

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **Router FCC ID: VW3FAST5250** is in compliance with Part 15E of the FCC Rules.

The End