

FCC Test Report (Class II Permissive Change)

Product Name	Moxa IEEE 802.11a/b/g/n MiniPCI Module
Model No	WAPN001
FCC ID	SLE-WAPN001

Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST.,NEW TAIPEI CITY, TAIWAN

Date of Receipt	March 04, 2015
Issued Date	April 13, 2015
Report No.	1530096R-RFUSP47V00
Report Version	V1.0



The test results relate only to the samples tested.
 The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
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Test Report

Issued Date: April 13, 2015

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Product Name	Moxa IEEE 802.11a/b/g/n MiniPCI Module
Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST.,NEW TAIPEI CITY, TAIWAN
Manufacturer	MOXA Inc.
Model No.	WAPN001
FCC ID.	SLE-WAPN001
EUT Rated Voltage	DC 3.3V/2A
EUT Test Voltage	AC 120V/60Hz
Trade Name	MOXA
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2014 ANSI C63.4: 2014, C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01
Test Result	Complied

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 (Director / Vincent Lin)

TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION.....	5
1.1. EUT Description	5
1.2. Operational Description	7
1.3. Tested System Details	8
1.4. Configuration of tested System	8
1.5. EUT Exercise Software.....	8
1.6. Test Facility	9
2. Conducted Emission	10
2.1. Test Equipment	10
2.2. Test Setup.....	10
2.3. Limits	11
2.4. Test Procedure.....	11
2.5. Uncertainty.....	11
2.6. Test Result of Conducted Emission	12
3. Maximun conducted output power.....	15
3.1. Test Equipment	16
3.2. Test Setup.....	16
3.3. Limits	17
3.4. Test Procedure.....	18
3.5. Uncertainty.....	18
3.6. Test Result of Maximum conducted output power	19
4. Peak Power Spectral Density	25
4.1. Test Equipment	25
4.2. Test Setup.....	25
4.3. Limits	25
4.4. Test Procedure.....	26
4.5. Uncertainty.....	26
4.6. Test Result of Peak Power Spectral Density	27
5. Radiated Emission.....	43
5.1. Test Equipment	43
5.2. Test Setup.....	44
5.3. Limits	45
5.4. Test Procedure.....	46
5.5. Uncertainty.....	46
5.6. Test Result of Radiated Emission	47
6. Band Edge.....	69

6.1.	Test Equipment	69
6.2.	Test Setup.....	70
6.3.	Limits	71
6.4.	Test Procedure.....	71
6.5.	Uncertainty.....	71
6.6.	Test Result of Band Edge.....	72
7.	Occupied Bandwidth.....	83
7.1.	Test Equipment	84
7.2.	Test Setup.....	84
7.3.	Limits	84
7.4.	Test Procedure.....	84
7.5.	Uncertainty.....	84
7.6.	Test Result of Occupied Bandwidth.....	85
8.	Frequency Stability	94
8.1.	Test Equipment	94
8.2.	Test Setup.....	94
8.3.	Limits	94
8.4.	Test Procedure.....	94
8.5.	Uncertainty.....	94
8.6.	Test Result of Frequency Stability	95
9.	EMI Reduction Method During Compliance Testing	99

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Moxa IEEE 802.11a/b/g/n MiniPCI Module
Trade Name	MOXA
FCC ID.	SLE-WAPN001
Model No.	WAPN001
Frequency Range	802.11a/n-20MHz: 5180-5240MHz, 5745-5825MHz 802.11n-40MHz: 5190-5230, 5755-5795MHz
Number of Channels	802.11a/n-20MHz: 9; 802.11n-40MHz: 4
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 300Mbps
Type of Modulation	802.11a/n:OFDM, BPSK, QPSK, 16QAM, 64QAM
Channel Control	Auto
Antenna type	Dipole Antenna
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	KINSUN	ANT-WDB-O-2	Dipole	2.0 dBi in 5GHz
2	KINSUN	ANT-WDB-ANM-0502	Dipole	2.0 dBi in 5GHz

Note:

1. The antenna of EUT is conform to FCC 15.203

802.11a/n-20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 36:	5180 MHz	Channel 40:	5200 MHz	Channel 44:	5220 MHz	Channel 48:	5240 MHz
Channel 149:	5745 MHz	Channel 153:	5765 MHz	Channel 157:	5785 MHz	Channel 161:	5805 MHz
Channel 165:	5825 MHz						

802.11n-40MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 38:	5190 MHz	Channel 46:	5230 MHz	Channel 151:	5755 MHz	Channel 159:	5795 MHz

Note:

1. This device is a Moxa IEEE 802.11a/b/g/n MiniPCI Module with a built-in 802.11a/b/g/n WLAN transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. At result of pretests, module supports dual-channel transmission, only the worst case is shown in the report. (802.11a is chain A)
4. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11a is 6Mbps 、802.11n-20BW is 14.4Mbps 、802.11n-40BW is 30Mbps)
5. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.
7. This is requesting a Class II permissive change for FCC ID: SLE-WAPN001. originally granted on 09/10/2010.

The differences are listed as below:

- (1) Original grant compliance band 1 and band 3 are following old rule of UNII requirements, changed to meet the requirements of the new rules, and all other hardware is identical with original granted.
- (2) Band 2a and Band 2c UNII requirements haven't changed, the test data is not presented in the test report.

Test Mode	Mode 1: Transmit (802.11a-6Mbps) Mode 2: Transmit (802.11n-20BW 14.4Mbps) Mode 3: Transmit (802.11n-40BW 30Mbps)
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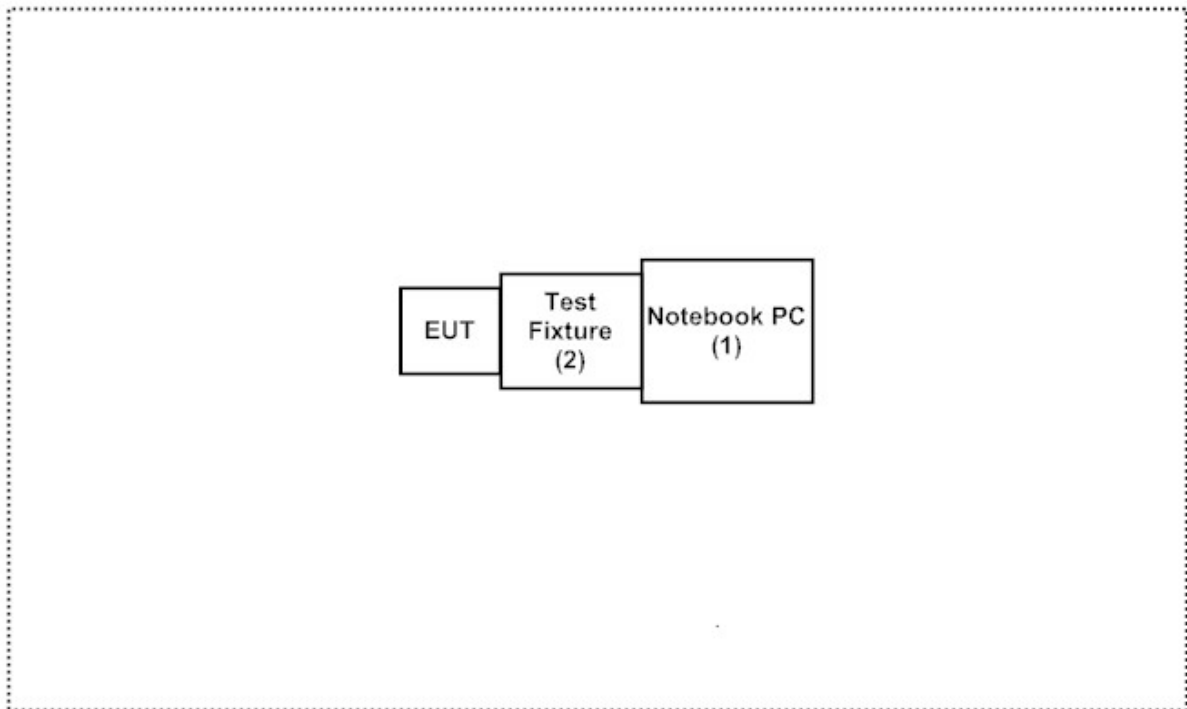
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
2 Test Fixture	MOXA	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
N/A	

1.4. Configuration of tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute program (“ART Version 0_9_b27”) on the Notebook.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Start the continuous transmission.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : <http://tw.quietek.com/modules/myalbum/>

The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

Site Description: File on
 Federal Communications Commission
 FCC Engineering Laboratory
 7435 Oakland Mills Road
 Columbia, MD 21046
 Registration Number: 92195

Site Name: Quietek Corporation
 Site Address: No.5-22, Ruishukeng Linkou Dist., New Taipei City
 24451, Taiwan, R.O.C.
 TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
 E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

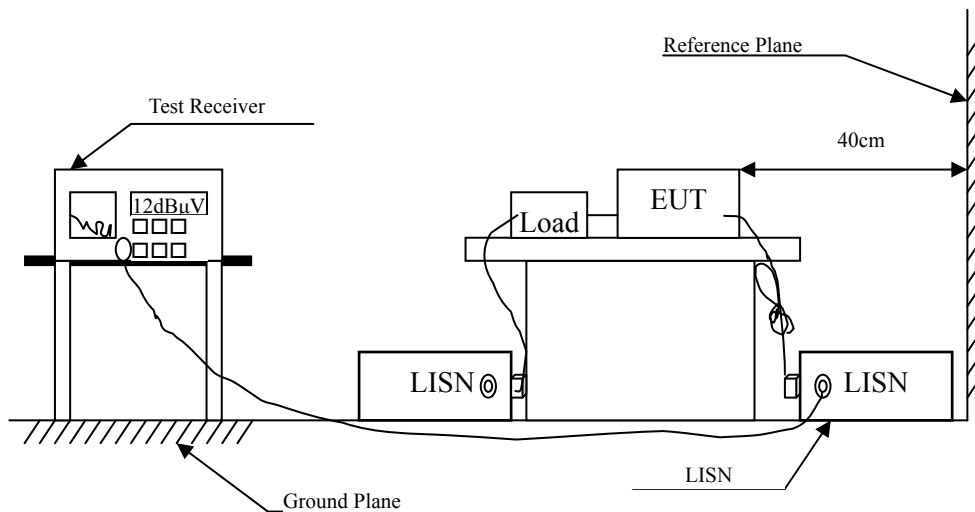
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2014	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2015	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2015	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar., 2015	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2015	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

2.2. Test Setup



2.3. Limits

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

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.

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

The EUT was setup to ANSI C63.4, 2014; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 1					
Quasi-Peak					
0.158	9.756	36.510	46.266	-19.505	65.771
0.216	9.696	32.010	41.706	-22.408	64.114
0.279	9.657	33.790	43.447	-18.867	62.314
0.380	9.650	25.090	34.740	-24.689	59.429
0.517	9.640	22.270	31.910	-24.090	56.000
0.584	9.638	27.150	36.788	-19.212	56.000
Average					
0.158	9.756	23.630	33.386	-22.385	55.771
0.216	9.696	17.610	27.306	-26.808	54.114
0.279	9.657	15.560	25.217	-27.097	52.314
0.380	9.650	13.730	23.380	-26.049	49.429
0.517	9.640	15.690	25.330	-20.670	46.000
0.584	9.638	27.140	36.778	-9.222	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 2					
Quasi-Peak					
0.170	9.742	36.160	45.903	-19.526	65.429
0.197	9.719	33.810	43.529	-21.128	64.657
0.220	9.703	32.600	42.303	-21.697	64.000
0.279	9.667	33.840	43.507	-18.807	62.314
0.420	9.650	24.020	33.670	-24.616	58.286
0.638	9.650	20.460	30.110	-25.890	56.000
Average					
0.170	9.742	20.700	30.443	-24.986	55.429
0.197	9.719	17.490	27.209	-27.448	54.657
0.220	9.703	18.390	28.093	-25.907	54.000
0.279	9.667	27.400	37.067	-15.247	52.314
0.420	9.650	12.380	22.030	-26.256	48.286
0.638	9.650	8.890	18.540	-27.460	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 1					
Quasi-Peak					
0.158	9.756	27.910	37.666	-28.105	65.771
0.205	9.703	21.800	31.503	-32.926	64.429
0.252	9.675	22.990	32.665	-30.421	63.086
0.283	9.656	34.750	44.406	-17.794	62.200
0.357	9.650	8.340	17.990	-42.096	60.086
0.798	9.650	13.380	23.030	-32.970	56.000
Average					
0.158	9.756	6.130	15.886	-39.885	55.771
0.205	9.703	8.430	18.133	-36.296	54.429
0.252	9.675	12.630	22.305	-30.781	53.086
0.283	9.656	31.760	41.416	-10.784	52.200
0.357	9.650	3.210	12.860	-37.226	50.086
0.798	9.650	10.680	20.330	-25.670	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 2					
Quasi-Peak					
0.162	9.751	27.670	37.421	-28.236	65.657
0.189	9.724	25.070	34.794	-30.092	64.886
0.283	9.666	34.890	44.556	-17.644	62.200
0.412	9.650	9.950	19.600	-38.914	58.514
0.595	9.645	15.510	25.155	-30.845	56.000
0.892	9.670	10.620	20.290	-35.710	56.000
Average					
0.162	9.751	9.320	19.071	-36.586	55.657
0.189	9.724	14.400	24.124	-30.762	54.886
0.283	9.666	34.580	44.246	-7.954	52.200
0.412	9.650	5.200	14.850	-33.664	48.514
0.595	9.645	14.010	23.655	-22.345	46.000
0.892	9.670	6.240	15.910	-30.090	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Maximun conducted output power

3.1. Test Equipment

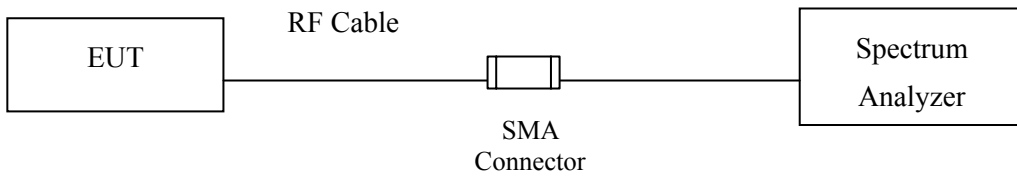
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2014
X	Power Sensor	Anritsu	MA2411B/0738448	Jun., 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015

Note:

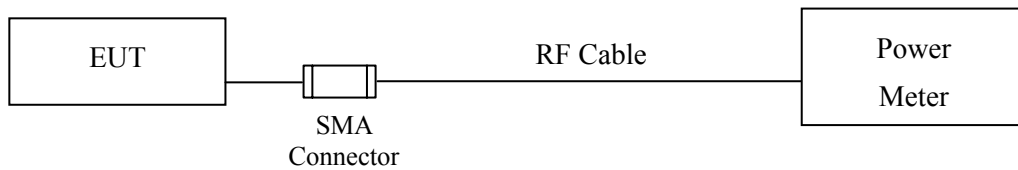
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

3.2. Test Setup

26dBc Occupied Bandwidth



Conduction Power Measurement (for 802.11a)



3.3. Limits

3.3.1. For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W, provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.3. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII devices operating in

this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

3.4. Test Procedure

As an alternative to FCC KDB-789033, the EUT maximum conducted output power was measured with an average power meter employing a video bandwidth greater the 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of FCC KDB-789033, and provides more accurate measurements.

802.11an (BW ≤ 40MHz) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter)

Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth, (Anritsu/ MA2411B video bandwidth: 65MHz)

802.11ac (BW=80MHz) Maximum conducted output power using KDB 789033 section E)2)b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep).

When transmitted signals consist of two or more non-contiguous spectrum segments (e.g., 80+80 MHz mode) or when a single spectrum segment of a transmission crosses the boundary between two adjacent U-NII bands, KDB 644545 D01 section F) procedure is used for measurements.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Maximum conducted output power

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Chain A

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		6	9	12	18	24	36	48	54	
		Measurement Level (dBm)								
36	5180	16.38	--	--	--	--	--	--	--	<24dBm
44	5220	16.35	16.19	16.04	15.88	15.73	15.57	15.42	15.26	<24dBm
48	5240	16.68	--	--	--	--	--	--	--	<24dBm
149	5745	17.25	--	--	--	--	--	--	--	<30dBm
157	5785	17.20	17.17	17.01	16.98	16.85	16.71	16.48	16.24	<30dBm
165	5825	17.11	--	--	--	--	--	--	--	<30dBm

Chain B

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		6	9	12	18	24	36	48	54	
		Measurement Level (dBm)								
36	5180	16.29	--	--	--	--	--	--	--	<24dBm
44	5220	16.24	16.03	15.87	15.68	15.49	15.31	15.12	14.94	<24dBm
48	5240	16.11	--	--	--	--	--	--	--	<24dBm
149	5745	17.19	--	--	--	--	--	--	--	<30dBm
157	5785	17.06	16.91	16.87	16.72	16.68	16.43	16.19	15.94	<30dBm
165	5825	17.02	--	--	--	--	--	--	--	<30dBm

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:
Chain A

Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	--	16.38	24	--
44	5220	--	16.35	24	--
48	5240	--	16.68	24	--
149	5745	--	17.25	30	--
157	5785	--	17.20	30	--
165	5825	--	17.11	30	--

Note:

1. Power Output Value =Reading value on average power meter + cable loss
2. 26 dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

Chain A

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	
		Measurement Level (dBm)								
36	5180	10.54	--	--	--	--	--	--	--	<24dBm
44	5220	10.20	10.03	9.79	9.60	9.39	9.19	8.98	8.78	<24dBm
48	5240	10.59	--	--	--	--	--	--	--	<24dBm
149	5745	10.51	--	--	--	--	--	--	--	<30dBm
157	5785	10.48	10.33	10.27	10.17	10.06	9.95	9.84	9.73	<30dBm
165	5825	10.42	--	--	--	--	--	--	--	<30dBm

Chain B

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	
		Measurement Level (dBm)								
36	5180	10.13	--	--	--	--	--	--	--	<24dBm
44	5220	10.02	9.74	9.51	9.25	8.99	8.74	8.48	8.23	<24dBm
48	5240	10.06	--	--	--	--	--	--	--	<24dBm
149	5745	10.38	--	--	--	--	--	--	--	<30dBm
157	5785	10.41	10.31	10.29	10.18	10.07	9.96	9.75	9.54	<30dBm
165	5825	10.33	--	--	--	--	--	--	--	<30dBm

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

(Chain A+ B)

Channel Number	Frequency (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	
						(dBm)	dBm+10log(BW)
36	5180	--	10.54	10.13	13.35	24	--
44	5220	--	10.20	10.02	13.12	24	--
48	5240	--	10.59	10.06	13.34	24	--
149	5745	--	10.51	10.38	13.46	30	--
157	5785	--	10.48	10.41	13.46	30	--
165	5825	--	10.42	10.33	13.39	30	--

Note:

1. Power Output Value =Reading value on average power meter + cable loss
2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
3. 26 dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

Chain A

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		30	60	90	120	180	240	270	300	
		Measurement Level (dBm)								
38	5190	10.36	--	--	--	--	--	--	--	<24dBm
46	5230	10.33	10.14	9.94	9.75	9.55	9.36	9.16	8.97	<24dBm
151	5755	10.52	10.32	10.06	9.91	9.73	9.55	9.37	9.19	<30dBm
159	5795	10.47	--	--	--	--	--	--	--	<30dBm

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Chain B

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		30	60	90	120	180	240	270	300	
		Measurement Level (dBm)								
38	5190	10.26	--	--	--	--	--	--	--	<24dBm
46	5230	10.29	10.02	9.73	9.49	9.21	8.94	8.67	8.40	<24dBm
151	5755	10.44	10.13	9.96	9.76	9.57	9.38	9.19	9.00	<30dBm
159	5795	10.13	--	--	--	--	--	--	--	<30dBm

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

(Chain A+ B)

Channel Number	Frequency (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	
						(dBm)	dBm+10log(BW)
38	5190	--	10.36	10.26	13.32	24	--
46	5230	--	10.33	10.29	13.32	24	--
151	5755	--	10.52	10.44	13.49	30	--
159	5795	--	10.47	10.13	13.31	30	--

Note:

1. Power Output Value =Reading value on average power meter + cable loss
2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
3. 26 dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

4. Peak Power Spectral Density

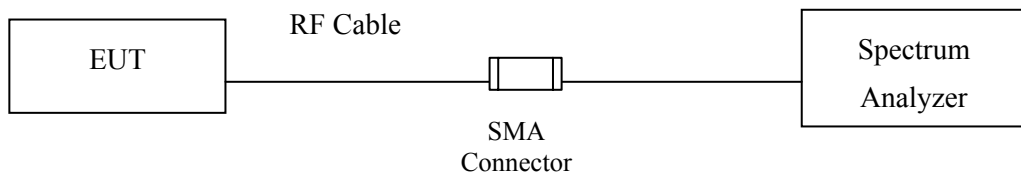
4.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2014
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr, 2015

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

4.2. Test Setup



4.3. Limits

- (1) For the band 5.15-5.25 GHz,
 - (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
 - (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
 - (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the

equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.+

- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

4.4. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

The Peak Power Spectral Density using KDB 789033 section F) procedure, Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer.

SA-1 method is selected to run the test.

For the band 5.725-5.85 GHz, Scale the observed power level to an equivalent value in 500 kHz by adjusting (increase) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{ kHz}/100\text{ kHz}) = 6.98\text{ dB}$.

4.5. Uncertainty

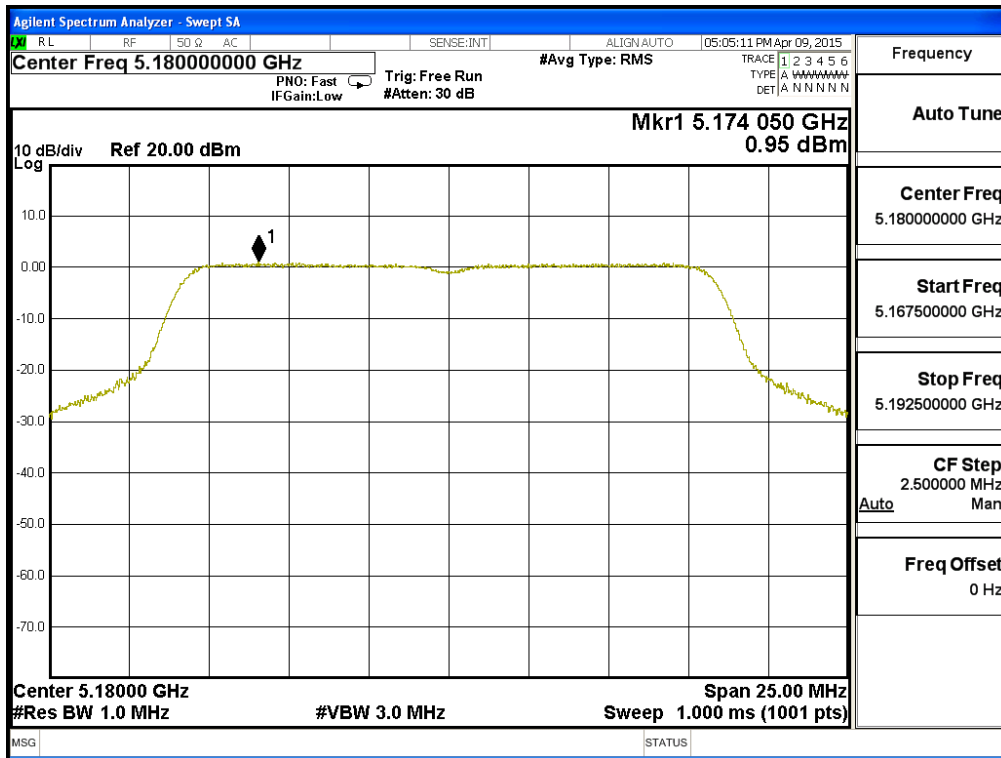
± 1.27 dB

4.6. Test Result of Peak Power Spectral Density

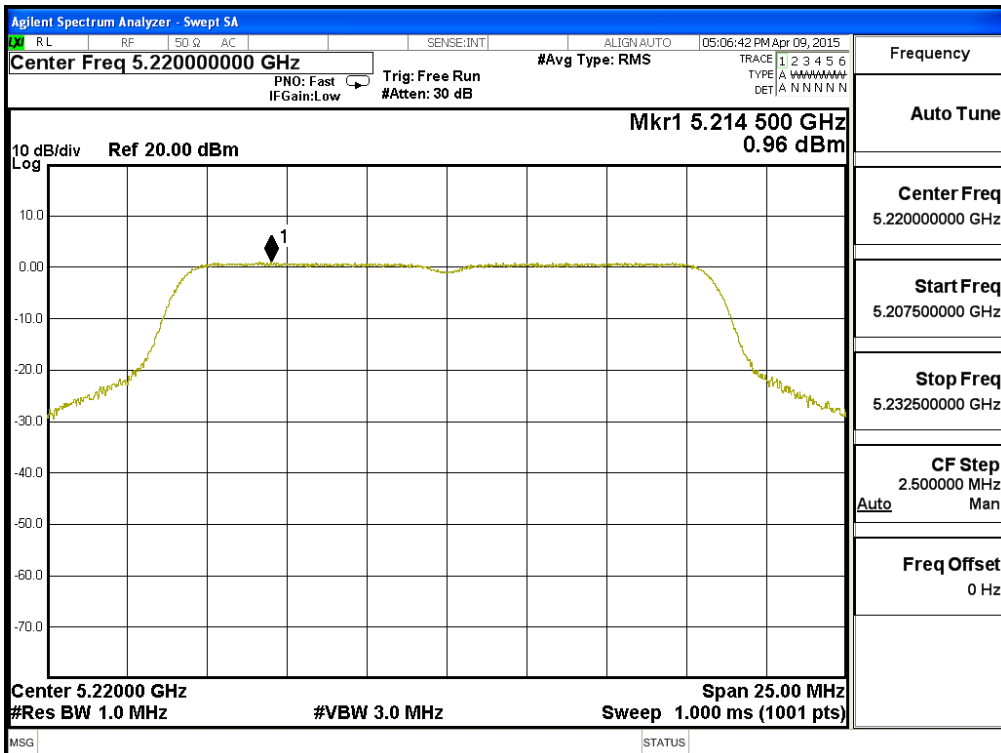
Product : Moxa IEEE 802.11 a/b/g/n MiniPCI Module
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	6	0.95	11	Pass
44	5220	6	0.96	11	Pass
48	5240	6	1.02	11	Pass
149	5745	6	-0.98	30	Pass
157	5785	6	-1.60	30	Pass
165	5825	6	-1.02	30	Pass

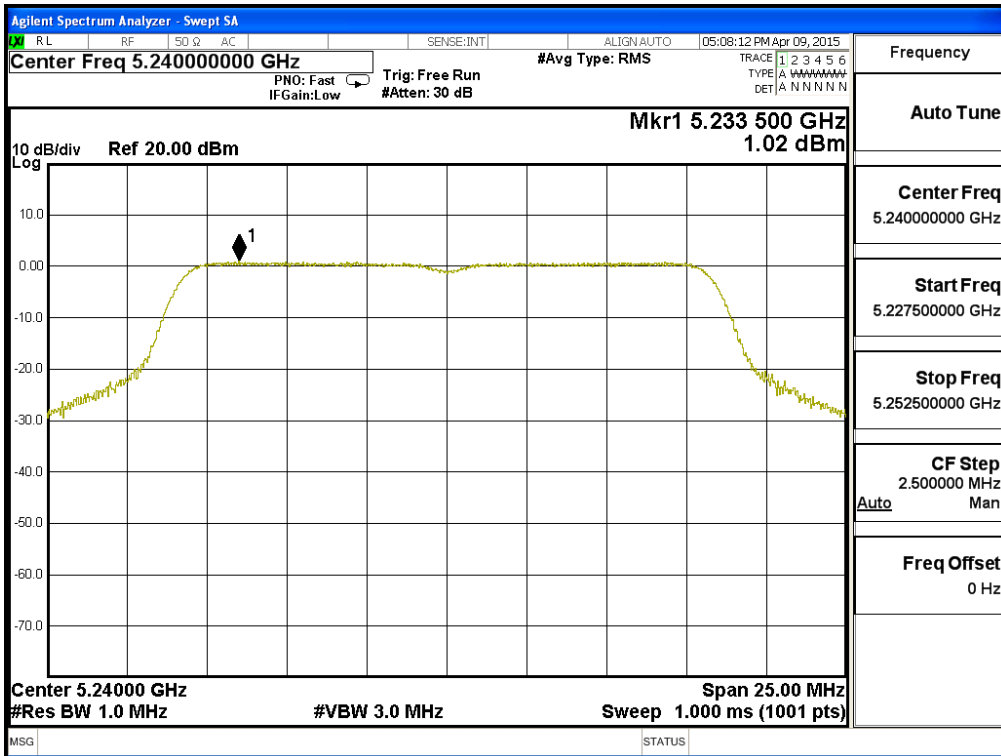
Channel 36:



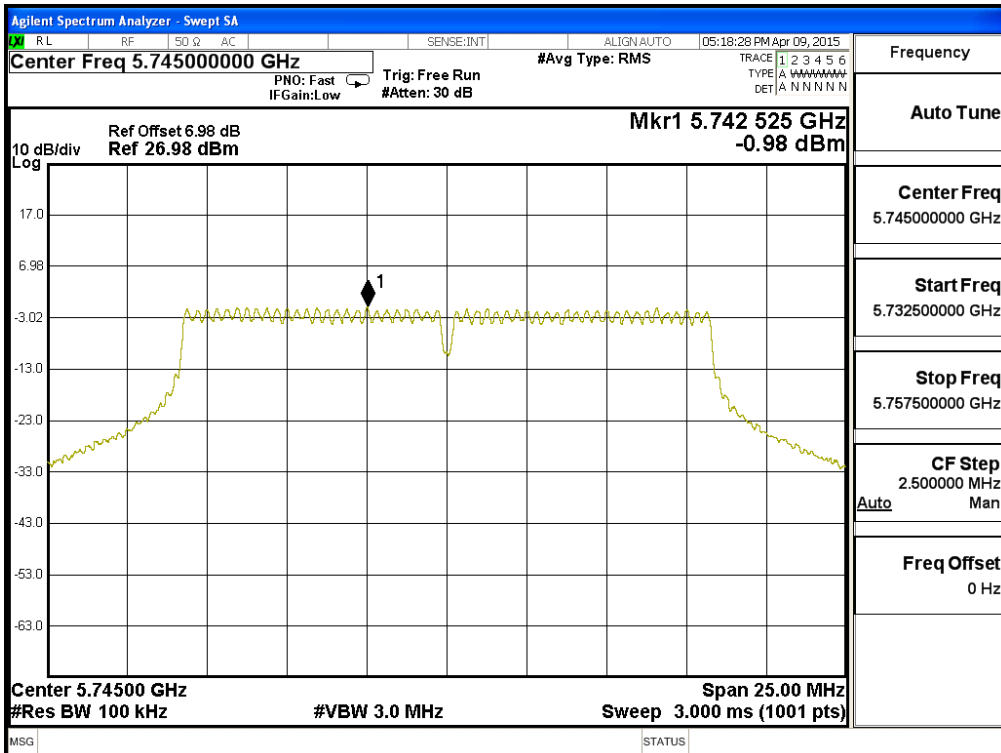
Channel 44:



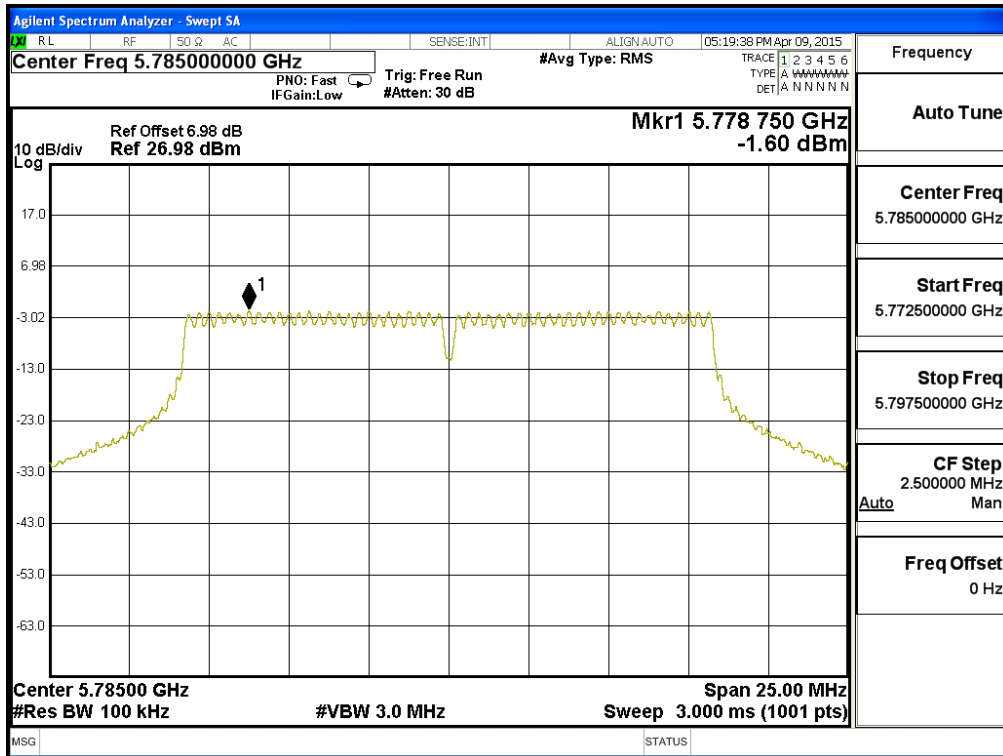
Channel 48:



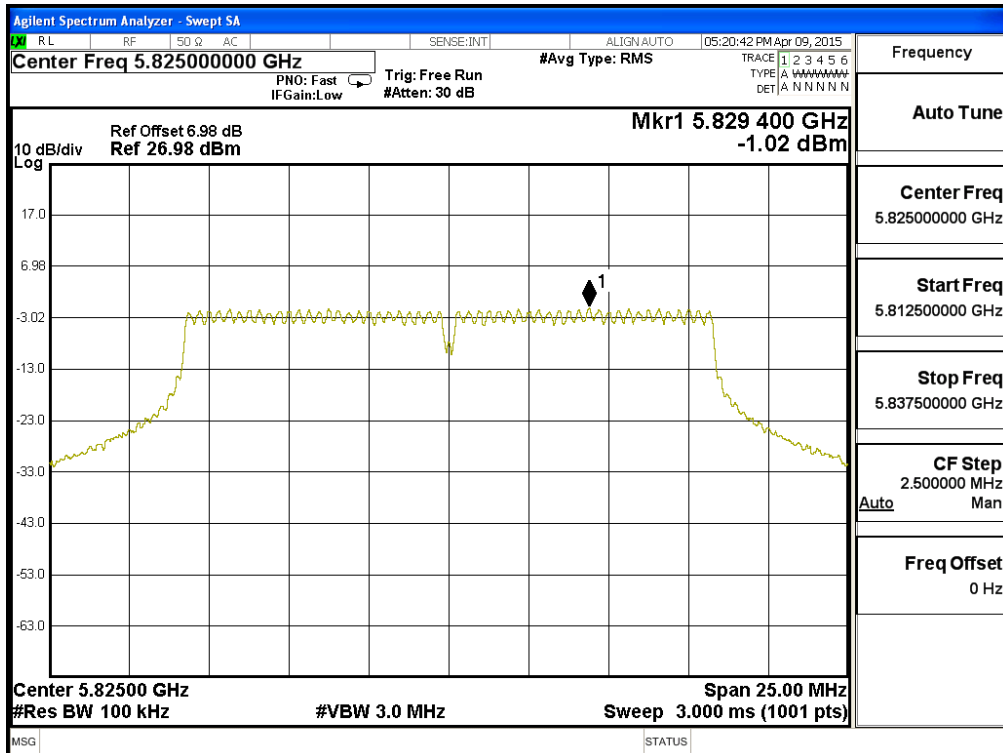
Channel 149:



Channel 157:



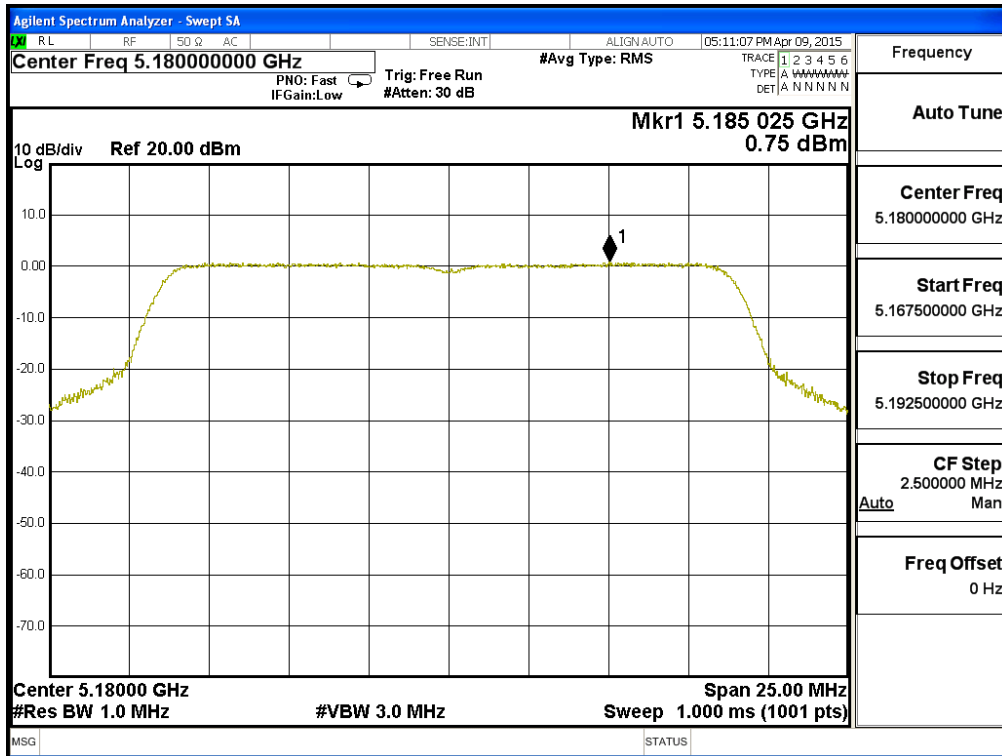
Channel 165:



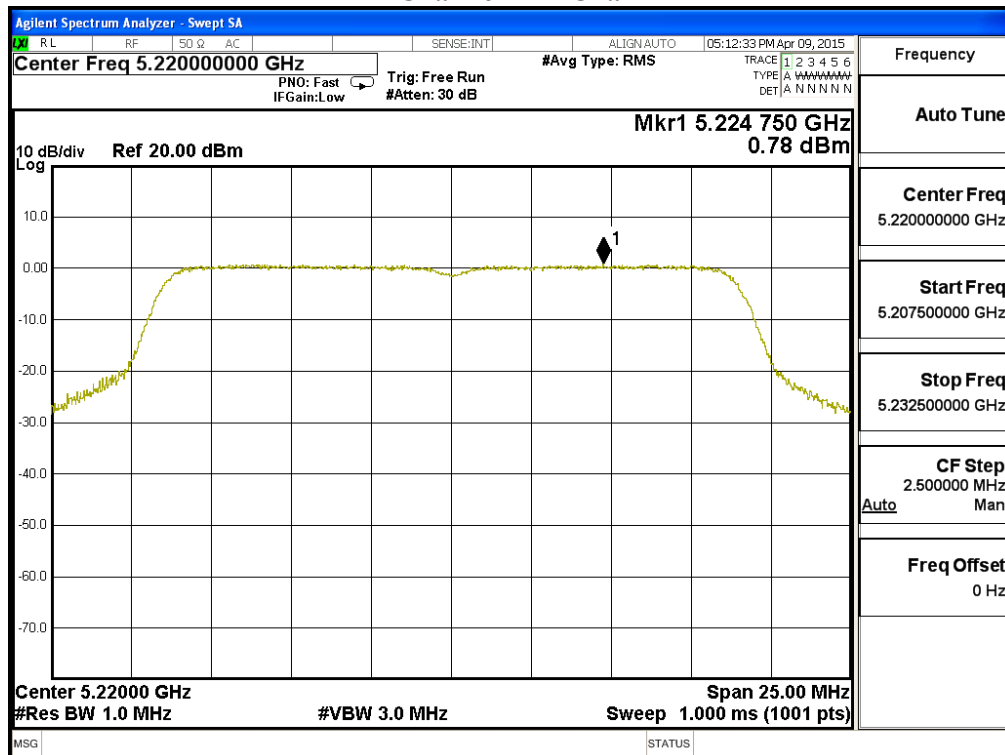
Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

Channel Number	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Required Limit (dBm)	Result
36	5180	0.75	1.35	4.07	11	Pass
44	5220	0.78	1.36	4.09	11	Pass
48	5240	0.61	1.27	3.96	11	Pass
149	5745	-1.14	-1.46	1.71	30	Pass
157	5785	-1.46	-2.06	1.26	30	Pass
165	5825	-1.55	-1.70	1.39	30	Pass

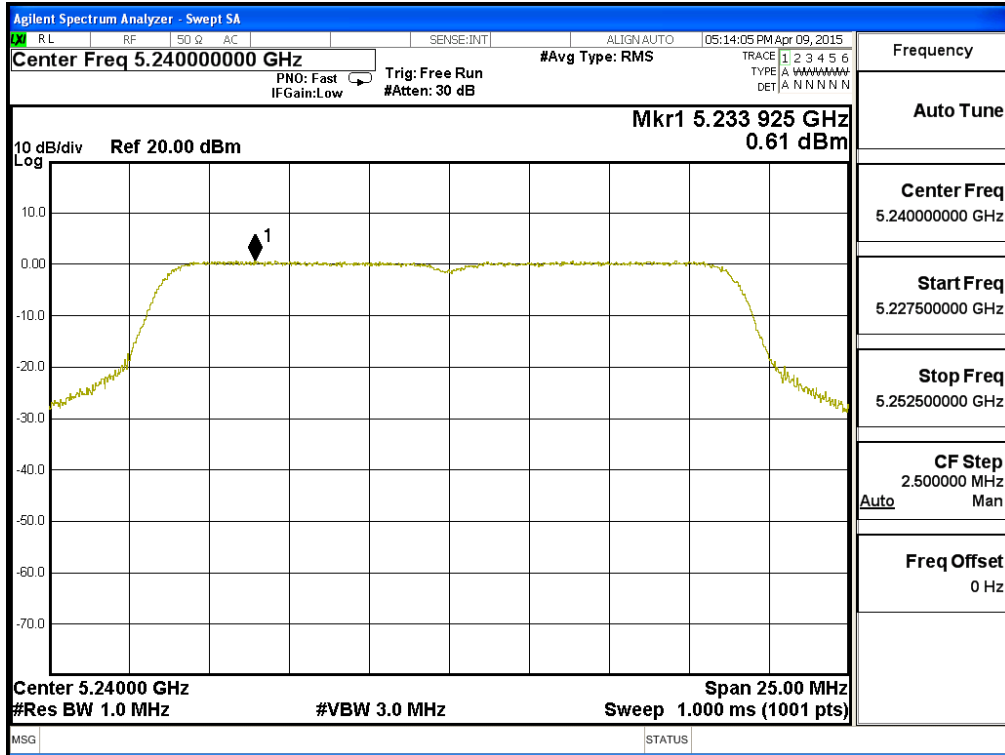
Channel 36 – Chain A



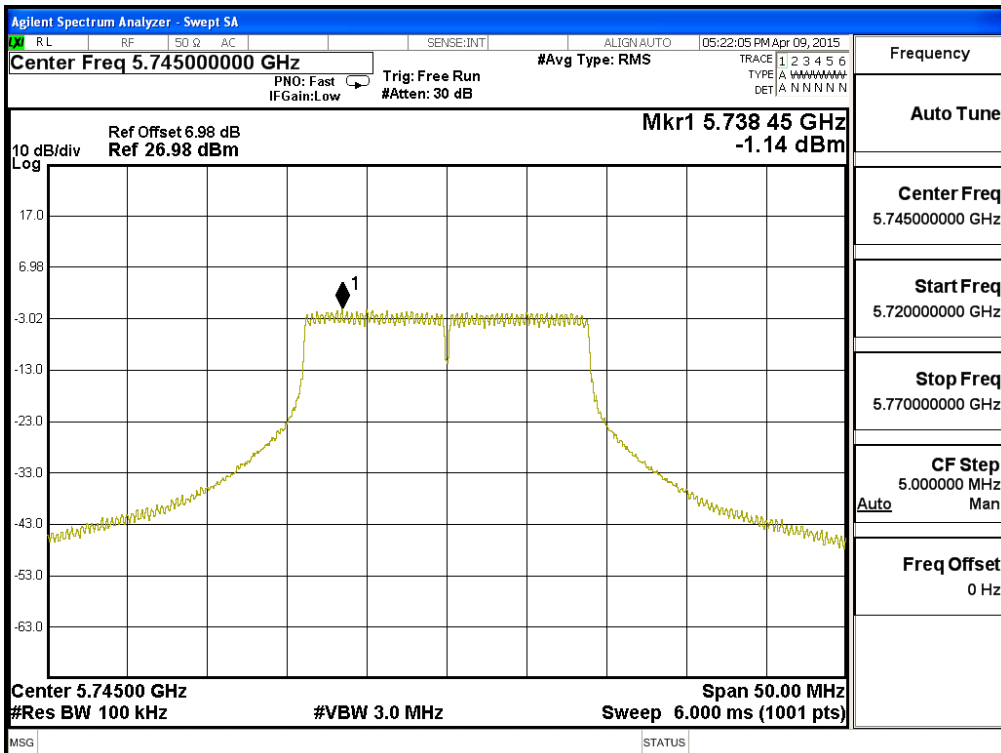
Channel 44 – Chain A



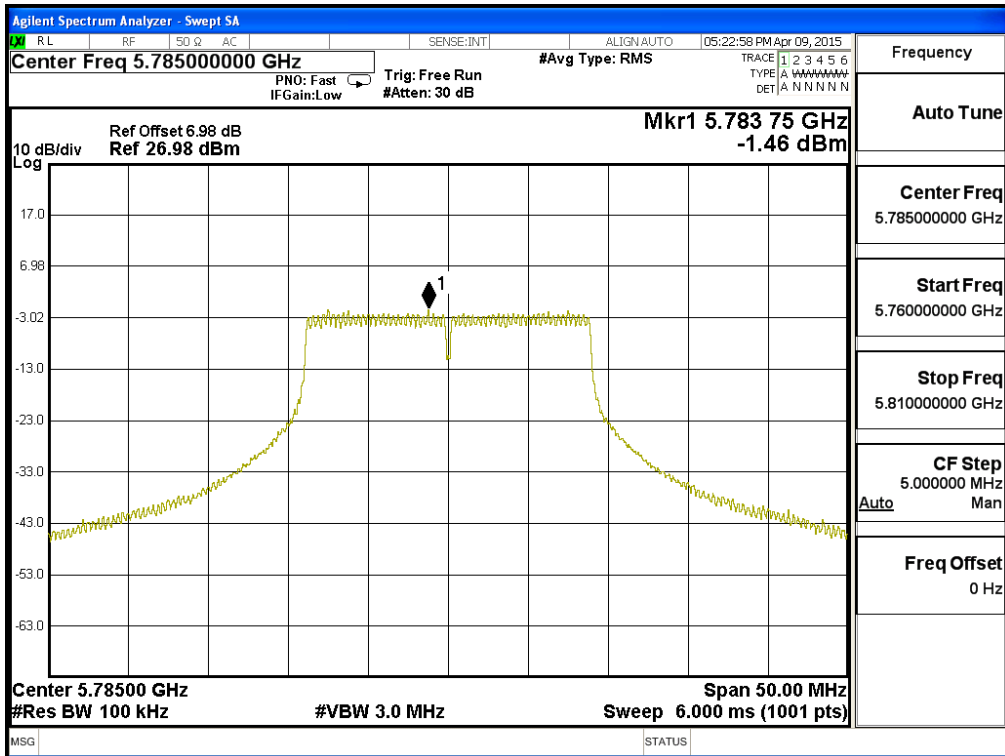
Channel 48 – Chain A



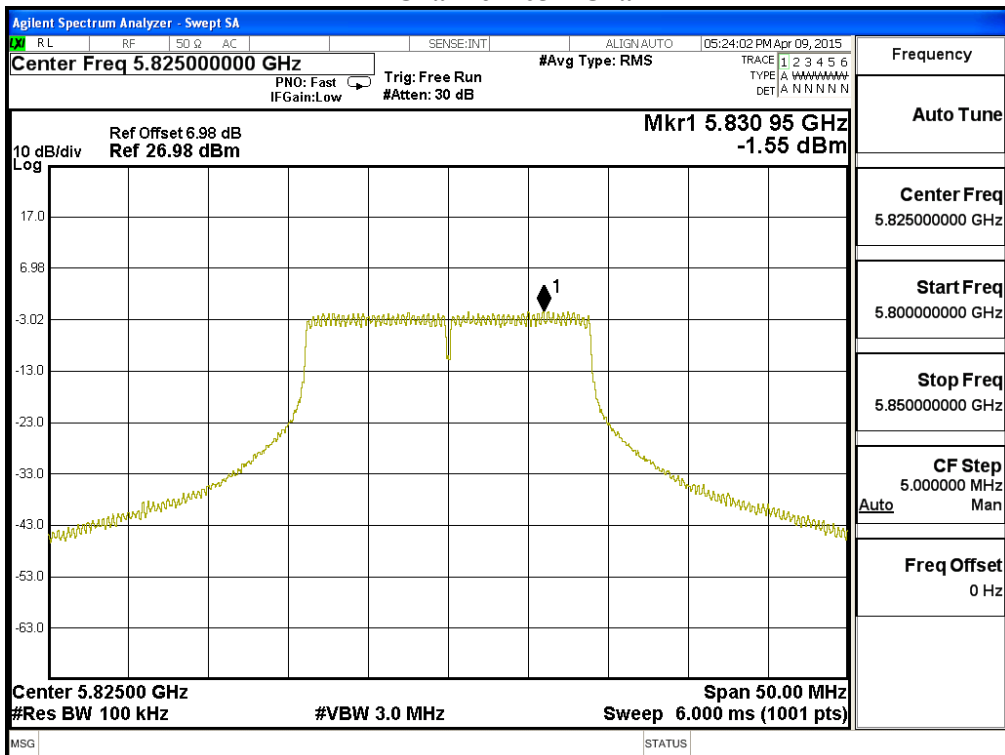
Channel 149 – Chain A



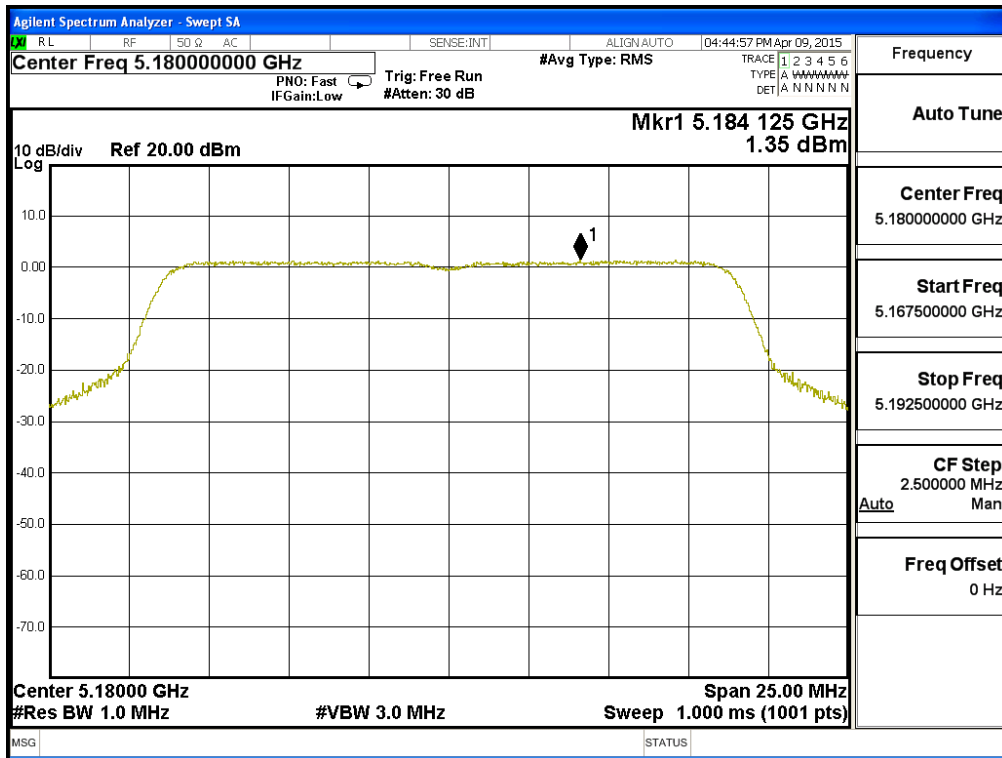
Channel 157 – Chain A



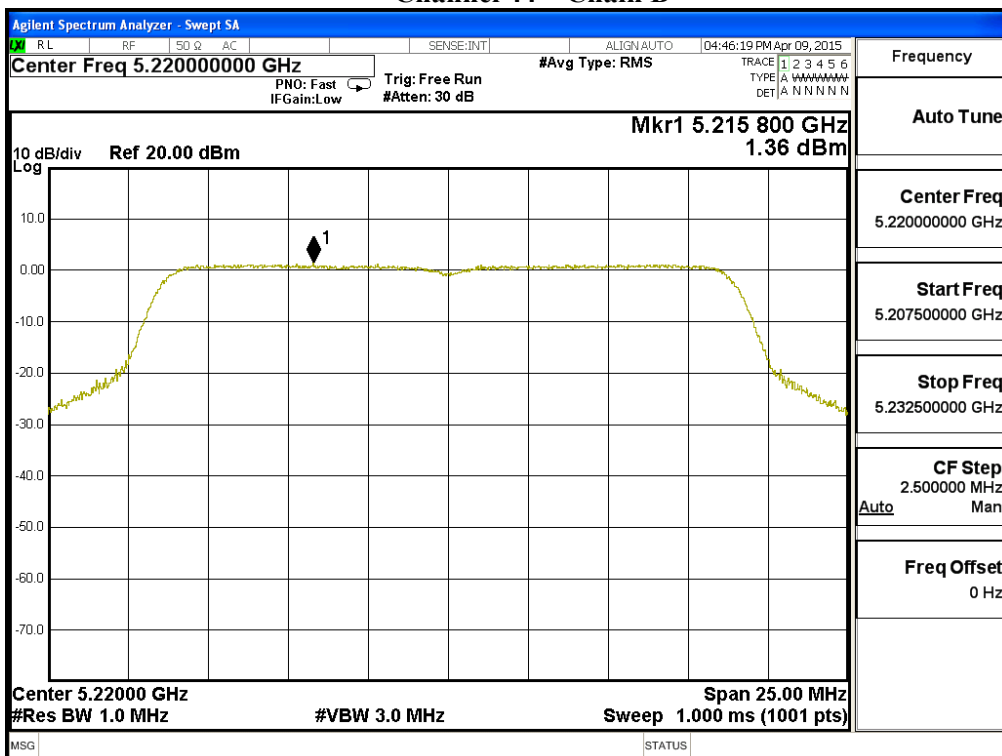
Channel 165 – Chain A



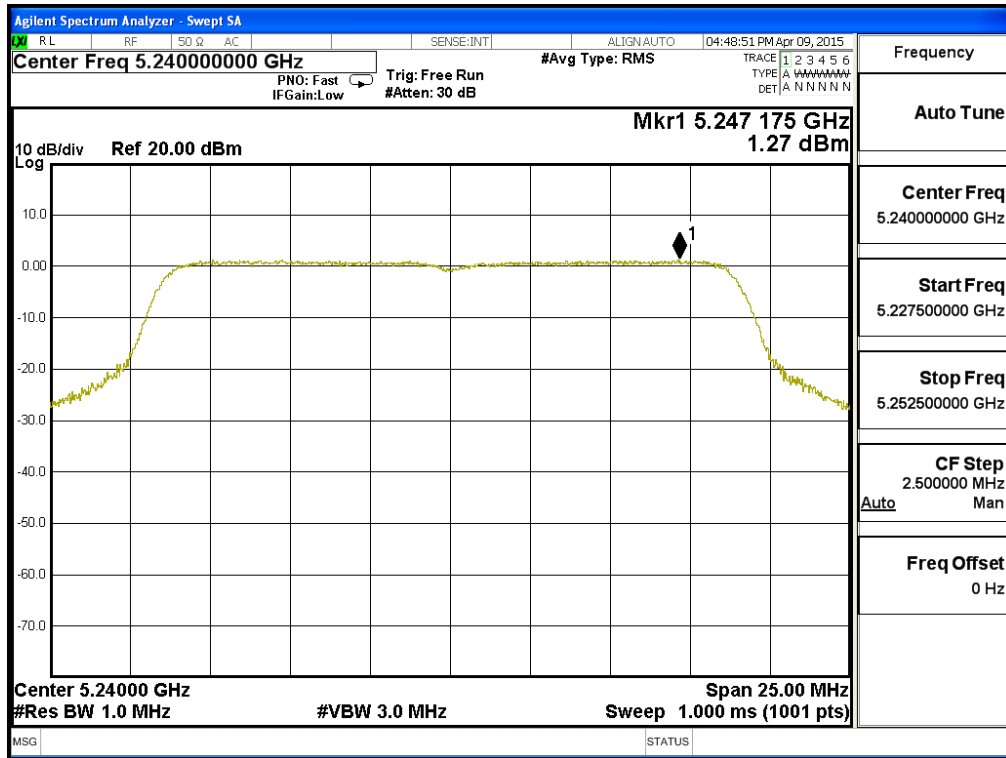
Channel 36 – Chain B



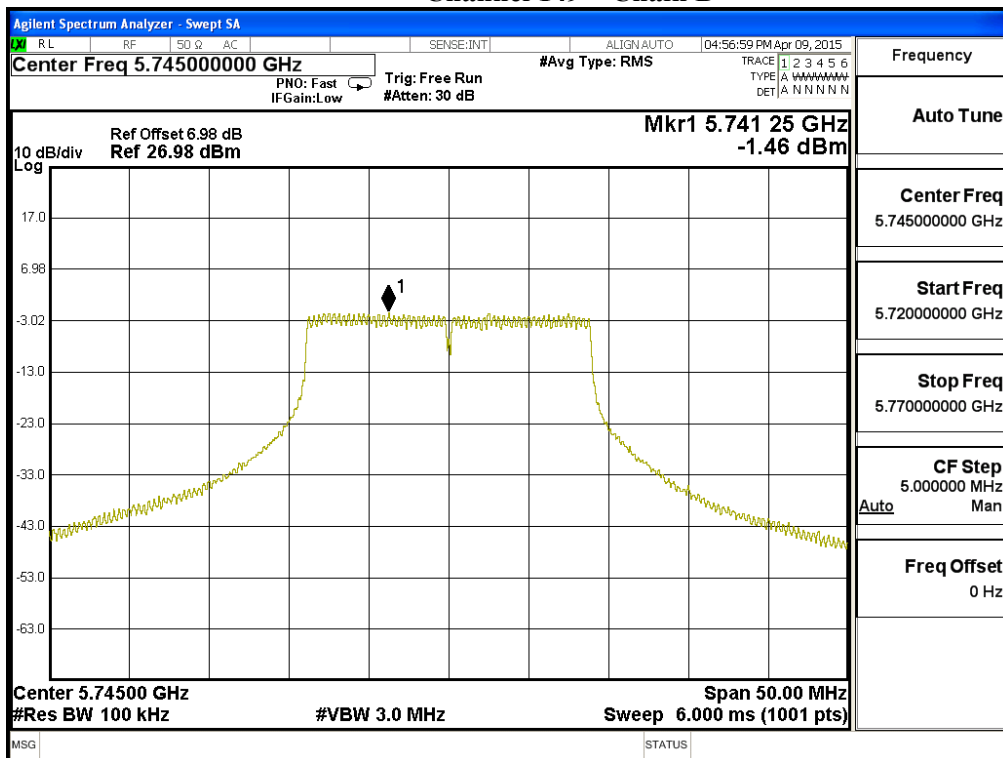
Channel 44 – Chain B



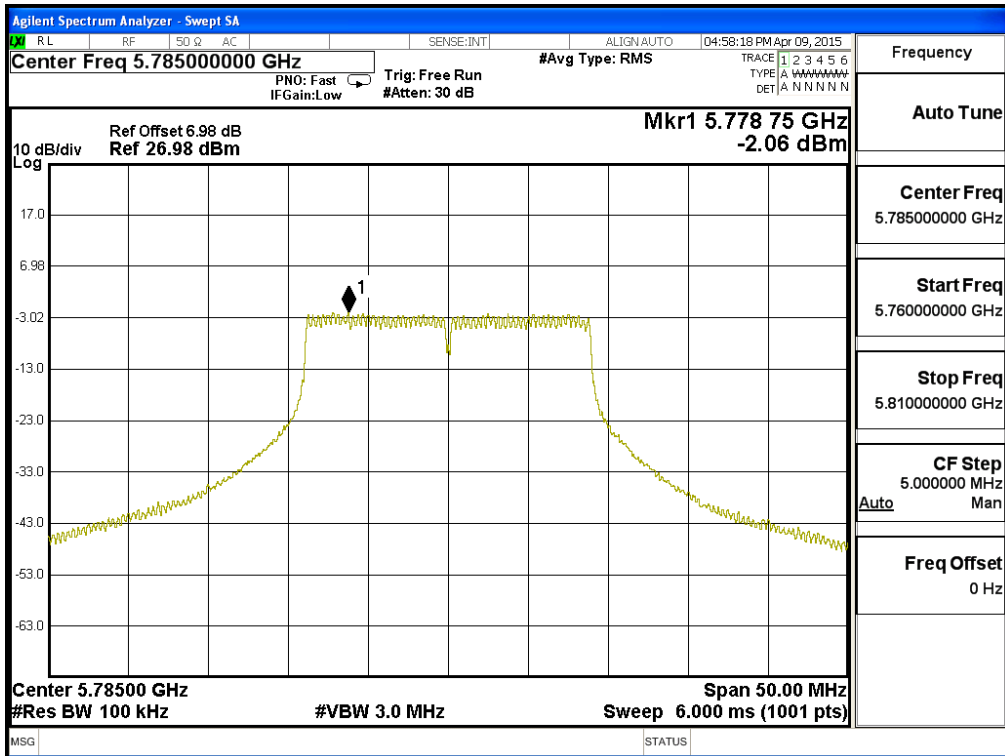
Channel 48 – Chain B



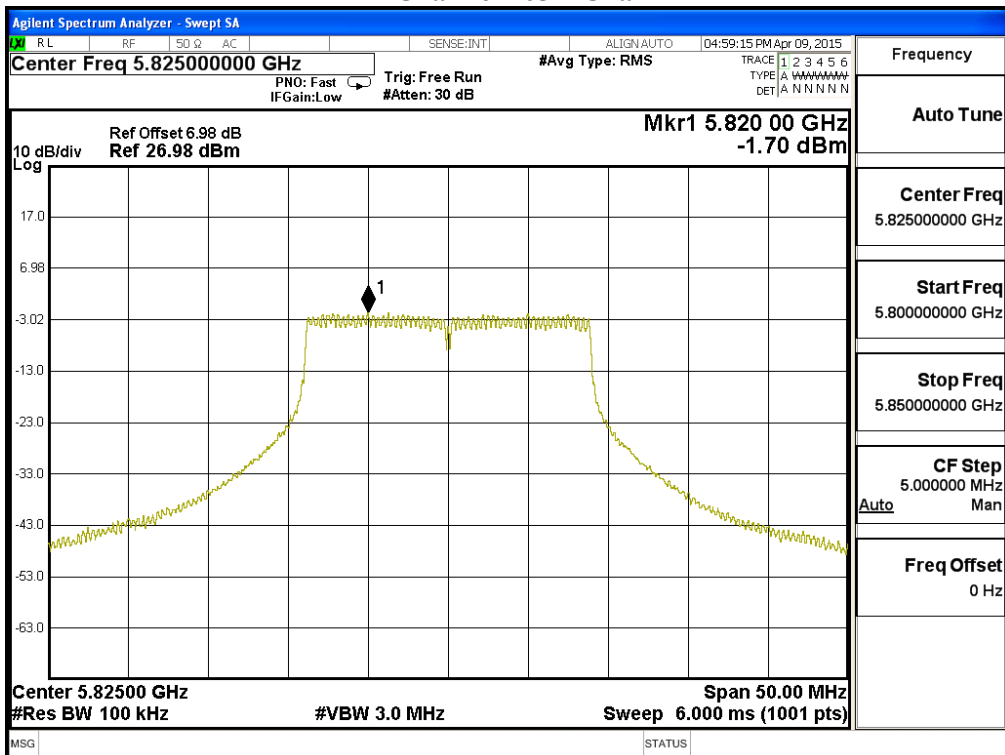
Channel 149 – Chain B



Channel 157 – Chain B



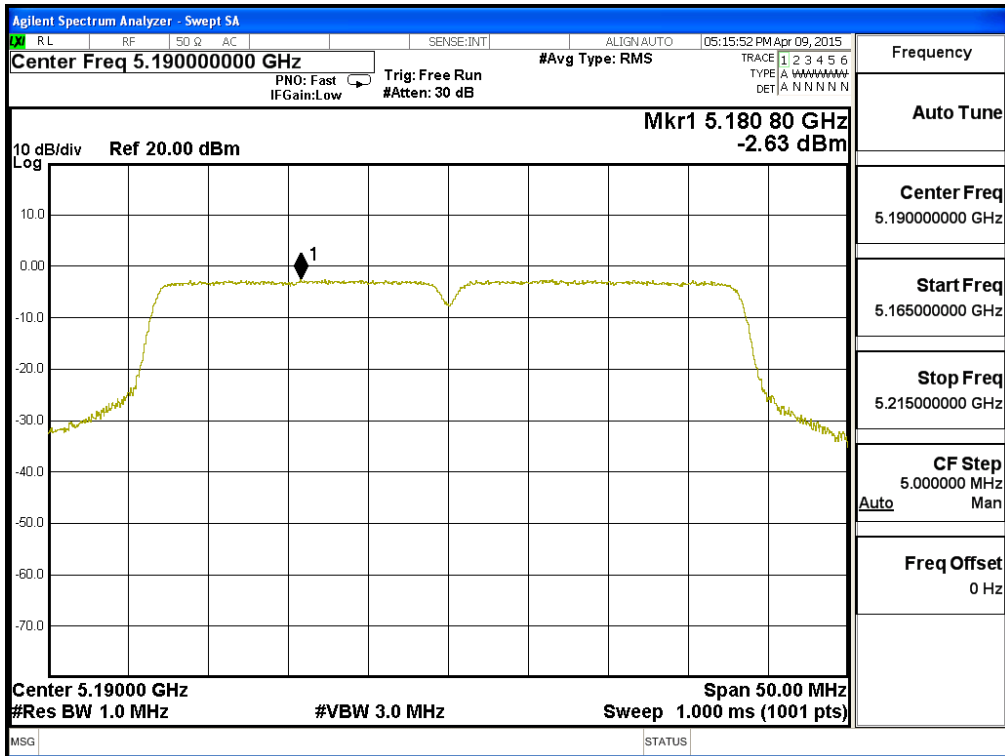
Channel 165 – Chain B



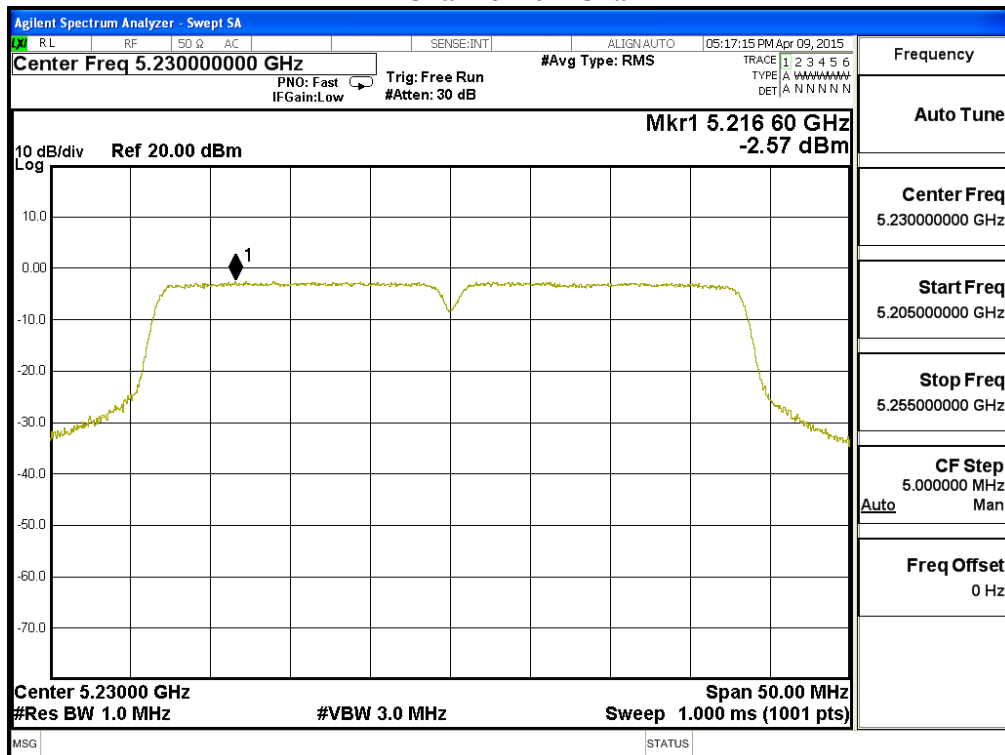
Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

Channel Number	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Required Limit (dBm)	Result
38	5190	-2.63	-1.90	0.76	11	Pass
46	5230	-2.57	-2.07	0.70	11	Pass
151	5755	-4.58	-4.84	-1.69	30	Pass
159	5795	-4.72	-5.32	-2.00	30	Pass

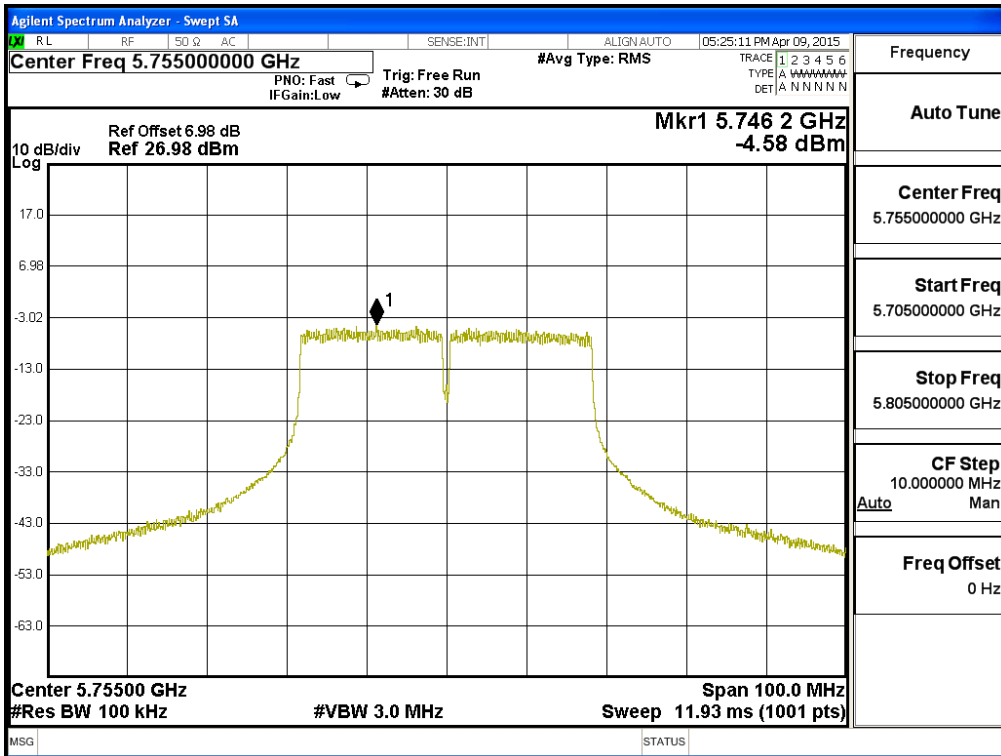
Channel 38 – Chain A



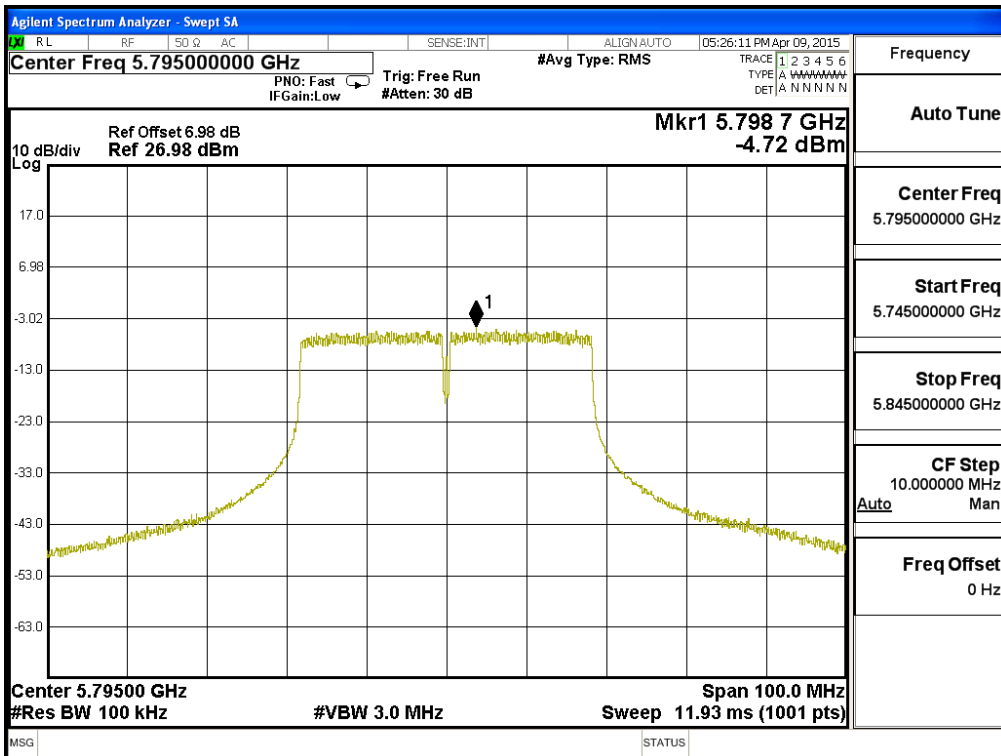
Channel 46 – Chain A



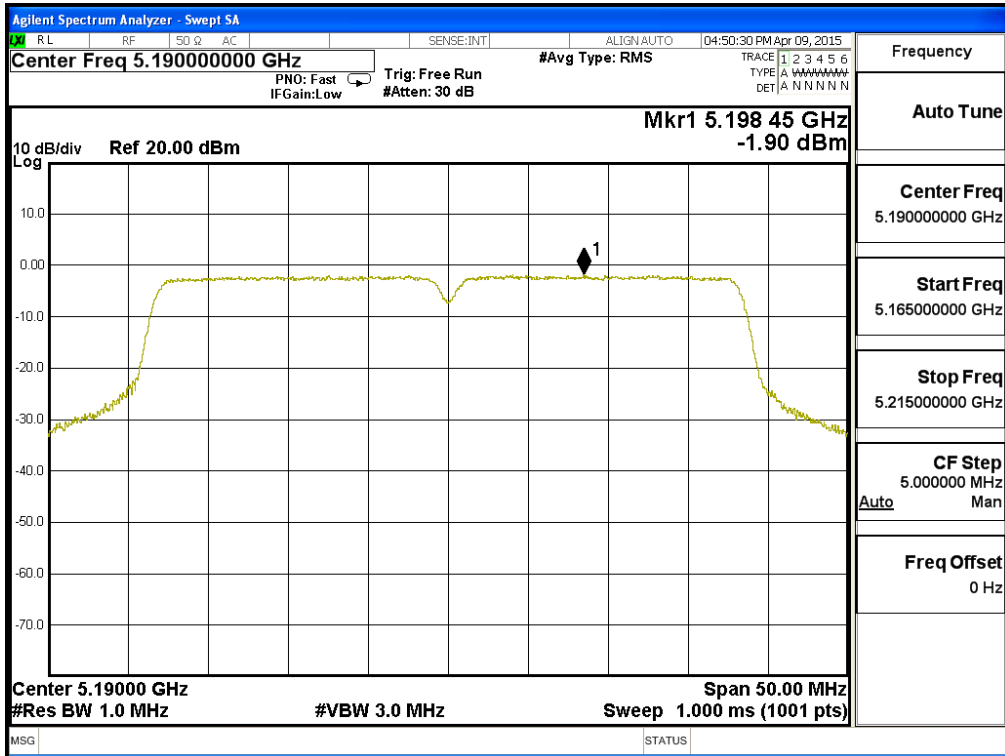
Channel 151 – Chain A



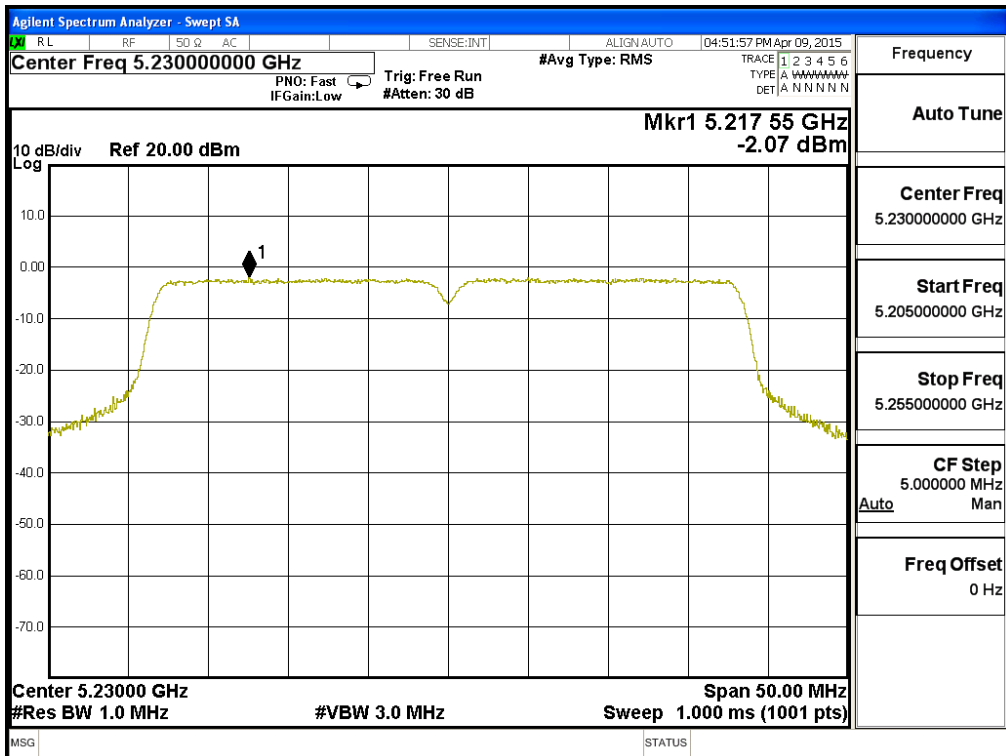
Channel 159 – Chain A



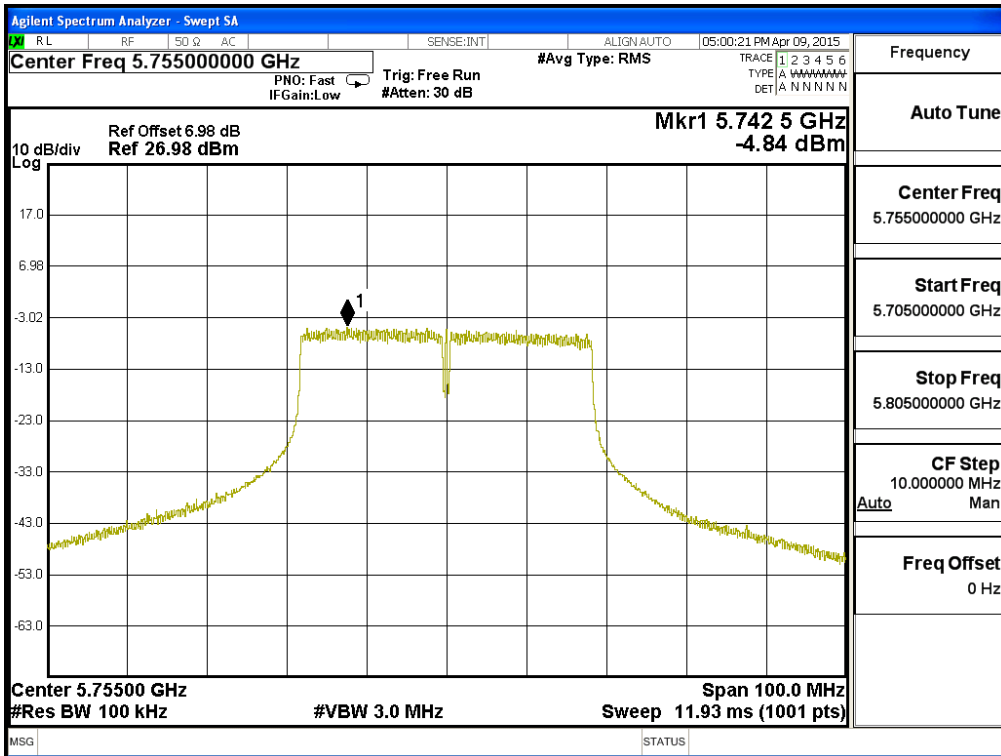
Channel 38 – Chain B



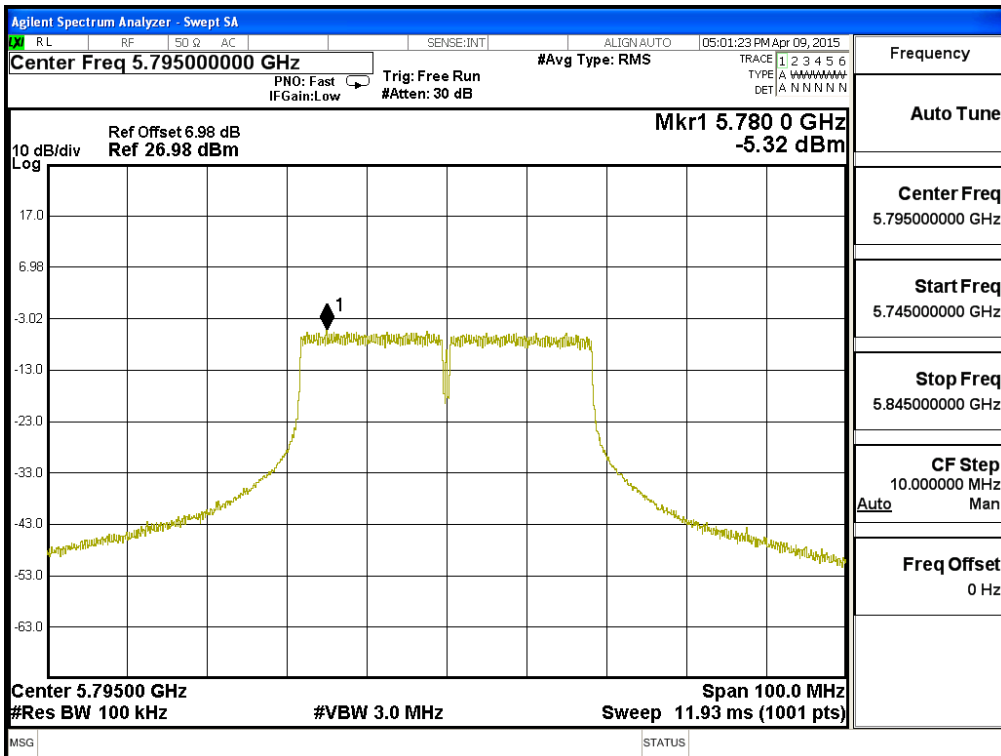
Channel 46 – Chain B



Channel 151 – Chain B



Channel 159 – Chain B



5. Radiated Emission

5.1. Test Equipment

The following test equipments are used during the radiated emission test:

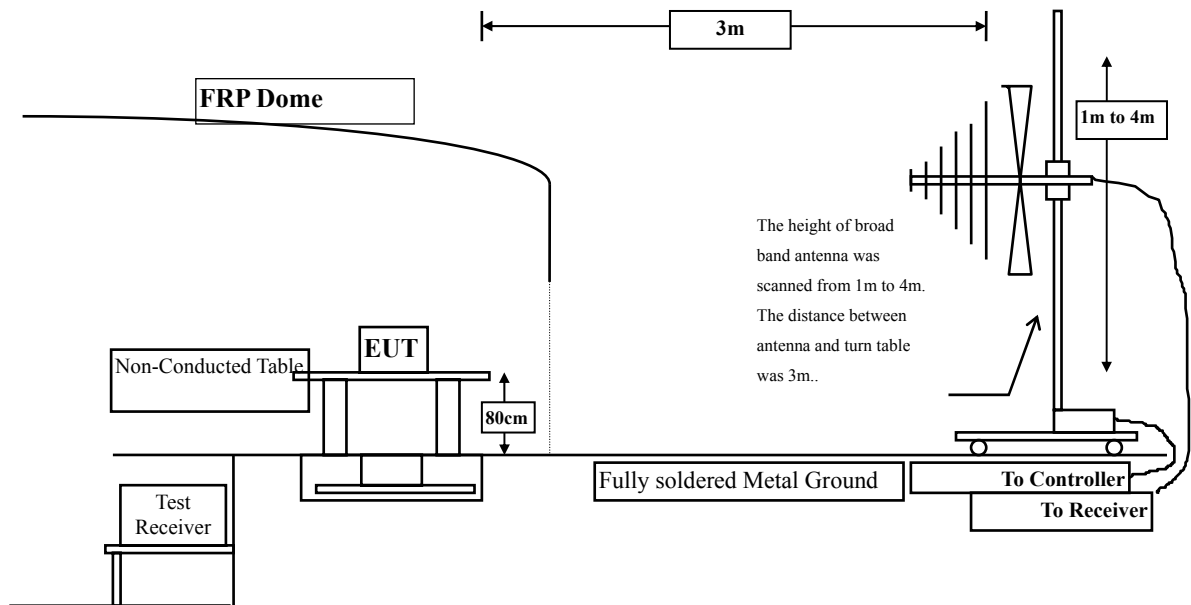
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
<input checked="" type="checkbox"/> Site # 3	X	Magnetic Loop Antenna	Teseq	HLA6121/ 37133	Sep., 2014
	X	Bilog Antenna	Schaffner Chase	CBL6112B/ 2707	Jun., 2014
	X	EMI Test Receiver	R&S	ESCS 30/838251/ 001	Jun., 2014
	X	Coaxial Cable	QTK(Arnist)	RG 214/ LC003-RG	Jun., 2014
	X	Coaxial signal switch	Arnist	MP59B/ 6200798682	Jun., 2014

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
<input checked="" type="checkbox"/> CB # 8	X	Spectrum Analyzer	R&S	FSP40/ 100339	Oct, 2014
	X	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar, 2015
	X	Horn Antenna	Schwarzbeck	BBHA9170/209	Jan, 2015
	X	Horn Antenna	TRC	AH-0801/95051	Aug, 2014
	X	Pre-Amplifier	EMCI	EMC012630SE/980210	Jan, 2015
	X	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul, 2014
	X	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul, 2014

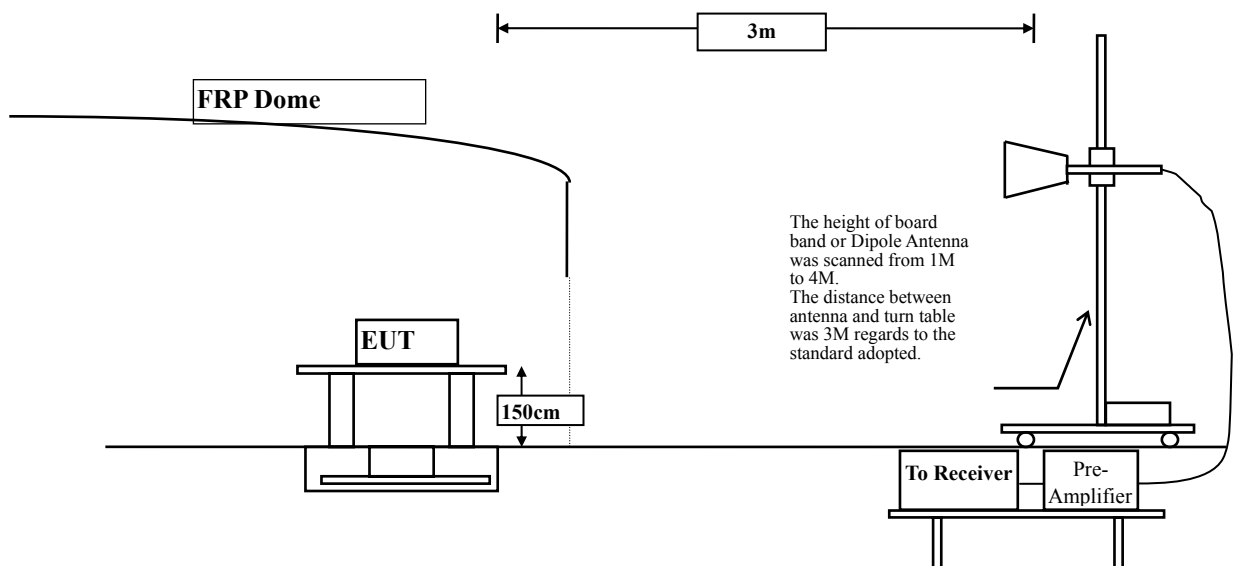
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with “X” are used to measure the final test results.

5.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



5.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
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

Remarks: E field strength (dBμV/m) = 20 log E field strength (uV/m)

5.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to FCC KDB-789033 test procedure for compliance to FCC 47CFR 15. 407 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

5.5. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

5.6. Test Result of Radiated Emission

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
10360.000	12.930	38.150	51.080	-22.920	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10360.000	13.724	37.300	51.024	-22.976	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10440.000	13.322	40.590	53.912	-20.088	74.000
15660.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10440.000	14.245	37.590	51.835	-22.165	74.000
15660.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5240MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10480.000	13.693	40.130	53.824	-20.176	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10480.000	14.620	37.940	52.561	-21.439	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11490.000	17.106	44.120	61.227	-12.773	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
11490.000	17.106	29.490	46.597	-7.403	54.000
Vertical					
Peak Detector:					
11490.000	18.034	42.550	60.585	-13.415	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
11490.000	18.034	27.450	45.485	-8.515	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11570.000	16.809	44.390	61.199	-12.801	74.000
17355.000	*	*	*	*	74.000
20800.000	*	*	*	*	74.000
26000.000	*	*	*	*	74.000
31200.000	*	*	*	*	74.000
36400.000	*	*	*	*	74.000
Average Detector:					
11570.000	16.809	29.220	46.029	-7.971	54.000
Vertical					
Peak Detector:					
11570.000	17.698	43.910	61.608	-12.392	74.000
17355.000	*	*	*	*	74.000
20800.000	*	*	*	*	74.000
26000.000	*	*	*	*	74.000
31200.000	*	*	*	*	74.000
36400.000	*	*	*	*	74.000
Average Detector:					
11570.000	17.698	29.300	46.998	-7.002	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11650.000	16.158	44.400	60.558	-13.442	74.000
17475.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
31440000	*	*	*	*	74.000
36680.000	*	*	*	*	74.000
Average Detector:					
11650.000	16.158	29.410	45.568	-8.432	54.000
Vertical					
Peak Detector:					
11650.000	17.274	43.380	60.655	-13.345	74.000
17475.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
31440000	*	*	*	*	74.000
36680.000	*	*	*	*	74.000
Average Detector:					
11650.000	17.274	28.590	45.865	-8.135	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5180MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10360.000	12.930	39.690	52.620	-21.380	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10360.000	13.724	37.900	51.624	-22.376	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
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Horizontal

Peak Detector:

10440.000	13.322	39.690	53.012	-20.988	74.000
15660.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000

**Average
Detector:**

--

Vertical

Peak Detector:

10440.000	14.245	37.420	51.665	-22.335	74.000
15660.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000

**Average
Detector:**

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Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5240MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10480.000	13.693	39.670	53.364	-20.636	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10480.000	14.620	37.890	52.511	-21.489	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5745MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11490.000	17.106	42.730	59.837	-14.163	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
11490.000	17.106	27.410	44.517	-9.483	54.000
Vertical					
Peak Detector:					
11490.000	18.034	41.780	59.815	-14.185	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
11490.000	18.034	25.880	43.915	-10.085	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11570.000	16.809	42.350	59.159	-14.841	74.000
17355.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
31320.000	*	*	*	*	74.000
36540.000	*	*	*	*	74.000
Average Detector:					
11570.000	16.809	27.370	44.179	-9.821	54.000
Vertical					
Peak Detector:					
11570.000	17.698	41.790	59.488	-14.512	74.000
17355.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
31320.000	*	*	*	*	74.000
36540.000	*	*	*	*	74.000
Average Detector:					
11570.000	17.698	26.700	44.398	-9.602	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5825MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11650.000	16.158	41.530	57.688	-16.312	74.000
17475.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
31440.000	*	*	*	*	74.000
36680.000	*	*	*	*	74.000
Average Detector:					
11650.000	16.158	27.250	43.408	-10.592	54.000
Vertical					
Peak Detector:					
11650.000	17.274	41.420	58.695	-15.305	74.000
17475.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
31440.000	*	*	*	*	74.000
36680.000	*	*	*	*	74.000
Average Detector:					
11650.000	17.274	26.610	43.885	-10.115	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10380.000	12.939	37.130	50.069	-23.931	74.000
15570.000	*	*	*	*	74.000
20760.000	*	*	*	*	74.000
25950.000	*	*	*	*	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10380.000	13.796	36.960	50.756	-23.244	74.000
15570.000	*	*	*	*	74.000
20760.000	*	*	*	*	74.000
25950.000	*	*	*	*	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5230MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10460.000	13.508	38.190	51.698	-22.302	74.000
15690.000	*	*	*	*	74.000
20920.000	*	*	*	*	74.000
26150.000	*	*	*	*	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10460.000	14.433	37.440	51.873	-22.127	74.000
15690.000	*	*	*	*	74.000
20920.000	*	*	*	*	74.000
26150.000	*	*	*	*	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11510.000	17.124	40.320	57.444	-16.556	74.000
17265.000	*	*	*	*	74.000
20760.000	*	*	*	*	74.000
25950.000	*	*	*	*	74.000
31140.000	*	*	*	*	74.000
36330.000	*	*	*	*	74.000
Average Detector:					
11510.000	17.124	25.050	42.174	-11.826	54.000
Vertical					
Peak Detector:					
11510.000	18.081	40.010	58.091	-15.909	74.000
17265.000	*	*	*	*	74.000
20760.000	*	*	*	*	74.000
25950.000	*	*	*	*	74.000
31140.000	*	*	*	*	74.000
36330.000	*	*	*	*	74.000
Average Detector:					
11510.000	18.081	23.990	42.071	-11.929	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5795MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11590.000	16.701	41.620	58.320	-15.680	74.000
17385.000	*	*	*	*	74.000
20920.000	*	*	*	*	74.000
26150.000	*	*	*	*	74.000
31380.000	*	*	*	*	74.000
36610.000	*	*	*	*	74.000
Average Detector:					
11590.000	16.701	25.840	42.540	-11.460	54.000
Vertical					
Peak Detector:					
11590.000	17.567	40.830	58.396	-15.604	74.000
17385.000	*	*	*	*	74.000
20920.000	*	*	*	*	74.000
26150.000	*	*	*	*	74.000
31380.000	*	*	*	*	74.000
36610.000	*	*	*	*	74.000
Average Detector:					
11590.000	17.567	25.100	42.666	-11.334	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
90.140	-9.449	44.689	35.240	-8.260	43.500
167.740	-10.799	36.934	26.135	-17.365	43.500
369.500	-1.098	42.194	41.096	-4.904	46.000
499.480	0.048	35.889	35.937	-10.063	46.000
602.300	4.287	30.571	34.858	-11.142	46.000
875.840	5.271	32.434	37.705	-8.295	46.000
Vertical					
Peak Detector					
101.780	-0.021	37.571	37.549	-5.951	43.500
231.760	-8.848	44.502	35.654	-10.346	46.000
367.560	-2.545	40.309	37.764	-8.236	46.000
538.280	0.020	34.168	34.188	-11.812	46.000
749.740	2.510	30.850	33.360	-12.640	46.000
965.080	7.932	24.407	32.339	-21.661	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
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Horizontal

Peak Detector

88.200	-9.696	45.591	35.895	-7.605	43.500
367.560	-1.205	41.040	39.835	-6.165	46.000
499.480	0.048	34.548	34.596	-11.404	46.000
625.580	1.770	34.510	36.280	-9.720	46.000
749.740	3.320	30.386	33.706	-12.294	46.000
984.480	7.679	25.415	33.094	-20.906	54.000

Vertical

Peak Detector

72.680	-5.622	37.735	32.112	-7.888	40.000
159.980	-6.185	35.244	29.059	-14.441	43.500
365.620	-2.179	40.051	37.872	-8.128	46.000
536.340	-0.305	34.309	34.004	-11.996	46.000
749.740	2.510	28.183	30.693	-15.307	46.000
901.060	3.331	31.015	34.346	-11.654	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector					
88.200	-9.696	44.930	35.234	-8.266	43.500
167.740	-10.799	35.456	24.657	-18.843	43.500
369.500	-1.098	39.245	38.147	-7.853	46.000
499.480	0.048	36.284	36.332	-9.668	46.000
625.580	1.770	34.648	36.418	-9.582	46.000
875.840	5.271	32.439	37.710	-8.290	46.000
Vertical					
Peak Detector					
103.720	-0.151	37.421	37.269	-6.231	43.500
367.560	-2.545	37.495	34.950	-11.050	46.000
499.480	-0.852	36.808	35.956	-10.044	46.000
600.360	-2.833	35.667	32.834	-13.166	46.000
749.740	2.510	28.806	31.316	-14.684	46.000
963.140	7.604	24.952	32.556	-21.444	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector					
90.140	-9.449	45.562	36.113	-7.387	43.500
249.220	-6.014	30.374	24.360	-21.640	46.000
367.560	-1.205	39.382	38.177	-7.823	46.000
499.480	0.048	34.901	34.949	-11.051	46.000
625.580	1.770	32.968	34.738	-11.262	46.000
901.060	5.591	27.018	32.609	-13.391	46.000
Vertical					
Peak Detector					
105.660	-0.253	33.930	33.677	-9.823	43.500
255.040	-7.648	25.932	18.284	-27.716	46.000
375.320	-2.029	33.651	31.622	-14.378	46.000
586.780	-5.884	40.694	34.810	-11.190	46.000
796.300	2.831	32.574	35.405	-10.595	46.000
968.960	8.191	24.082	32.273	-21.727	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector					
86.260	-9.948	42.478	32.530	-7.470	40.000
367.560	-1.205	38.785	37.580	-8.420	46.000
499.480	0.048	34.888	34.936	-11.064	46.000
602.300	4.287	32.557	36.844	-9.156	46.000
875.840	5.271	34.611	39.882	-6.118	46.000
986.420	7.773	24.831	32.604	-21.396	54.000
Vertical					
Peak Detector					
101.780	-0.021	36.338	36.316	-7.184	43.500
375.320	-2.029	34.060	32.031	-13.969	46.000
540.220	0.121	34.640	34.761	-11.239	46.000
749.740	2.510	29.495	32.005	-13.995	46.000
875.840	1.621	30.370	31.991	-14.009	46.000
968.960	8.191	24.638	32.829	-21.171	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
111.480	-7.914	35.075	27.161	-16.339	43.500
369.500	-1.098	41.132	40.034	-5.966	46.000
499.480	0.048	35.576	35.624	-10.376	46.000
749.740	3.320	28.982	32.302	-13.698	46.000
860.320	5.656	23.114	28.770	-17.230	46.000
963.140	6.664	23.517	30.181	-23.819	54.000
Vertical					
Peak Detector					
99.840	-0.021	37.812	37.791	-5.709	43.500
268.620	-8.842	26.319	17.477	-28.523	46.000
505.300	-0.772	26.468	25.696	-20.304	46.000
625.580	-2.600	31.803	29.203	-16.797	46.000
804.060	3.587	23.833	27.420	-18.580	46.000
945.680	6.594	24.792	31.386	-14.614	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

6. Band Edge

6.1. Test Equipment

RF Conducted Measurement

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2014
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

RF Radiated Measurement:

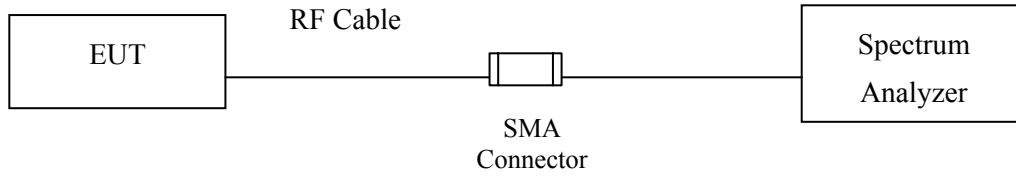
The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ CB # 8	X	Spectrum Analyzer	R&S	FSP40/ 100339	Oct., 2014
	X	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar., 2015
	X	Horn Antenna	Schwarzbeck	BBHA9170/209	Jan., 2015
	X	Horn Antenna	TRC	AH-0801/95051	Aug., 2014
	X	Pre-Amplifier	EMCI	EMC012630SE/980210	Jan., 2015
	X	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul., 2014
	X	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul., 2014

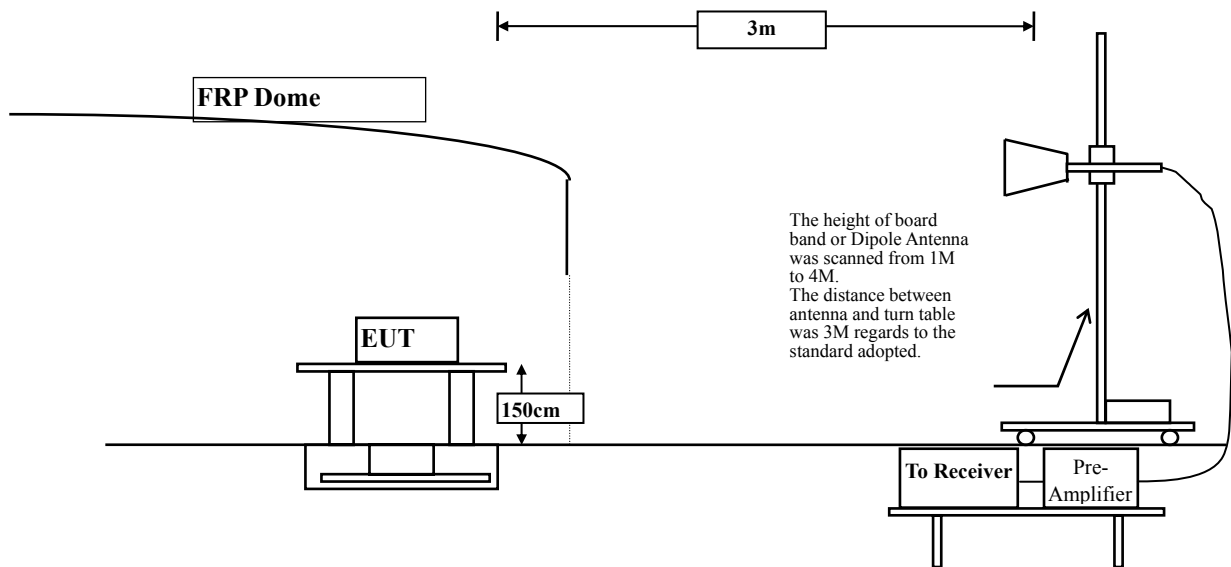
- Note:
1. All instruments are calibrated every one year.
 2. The test instruments marked by “X” are used to measure the final test results.

6.2. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



6.3. Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBµV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBµV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

6.4. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10:2013 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

6.5. Uncertainty

- ± 3.8 dB below 1GHz
- ± 3.9 dB above 1GHz

6.6. Test Result of Band Edge

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 36

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5149.600	3.342	56.127	59.469	74.00	54.00	Pass
36 (Peak)	5150.000	3.340	54.369	57.709	74.00	54.00	Pass
36 (Peak)	5174.400	3.254	98.098	101.352	--	--	--
36 (Average)	5149.600	3.342	40.612	43.954	74.00	54.00	Pass
36 (Average)	5150.000	3.340	40.700	44.040	74.00	54.00	Pass
36 (Average)	5173.600	3.257	87.970	91.227	--	--	--

Figure Channel 36: Horizontal (Peak)

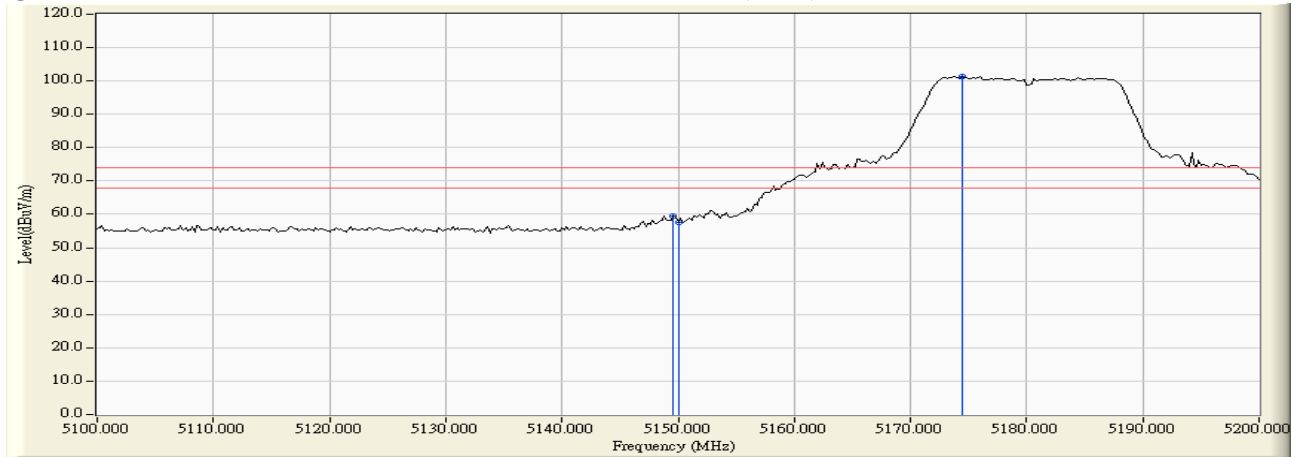
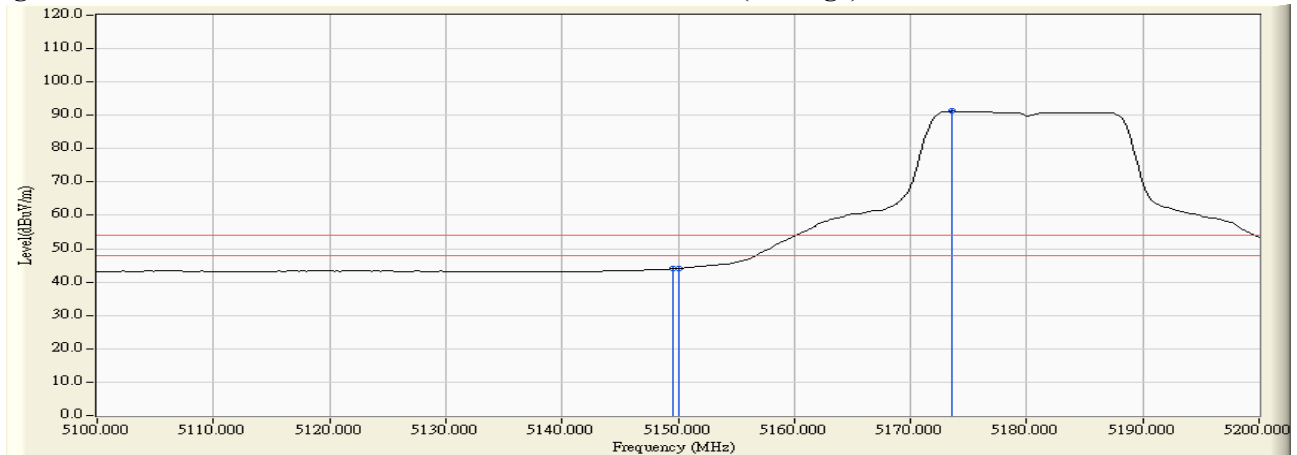


Figure Channel 36: Horizontal (Average)



- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 36

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5149.000	5.257	56.191	61.448	74.00	54.00	Pass
36 (Peak)	5150.000	5.260	54.920	60.180	74.00	54.00	Pass
36 (Peak)	5186.000	5.359	100.043	105.401	--	--	--
36 (Average)	5149.000	5.257	40.907	46.164	74.00	54.00	Pass
36 (Average)	5150.000	5.260	41.231	46.491	74.00	54.00	Pass
36 (Average)	5186.800	5.360	90.352	95.713	--	--	--

Figure Channel 36: Vertical (Peak)

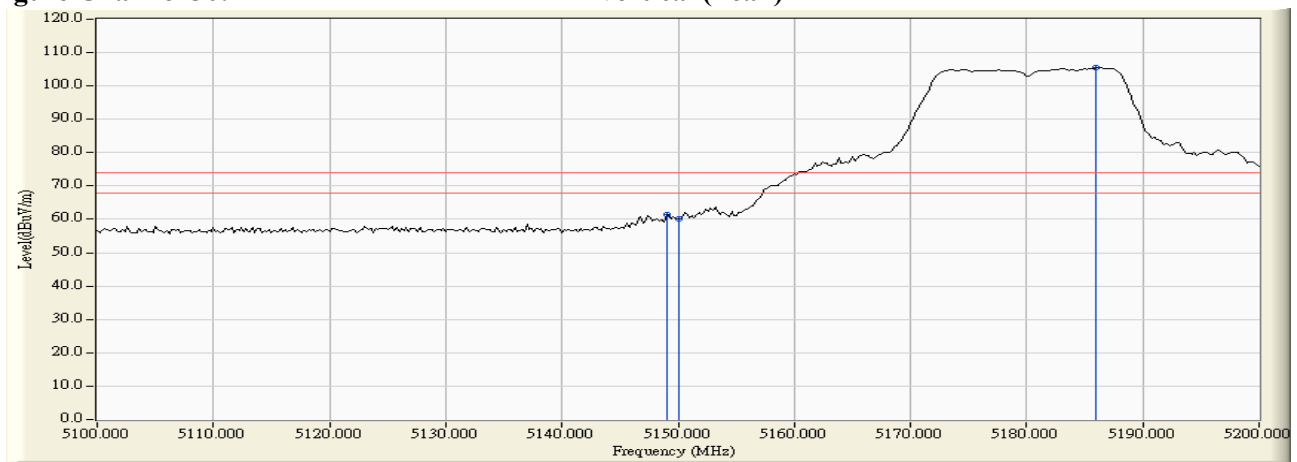
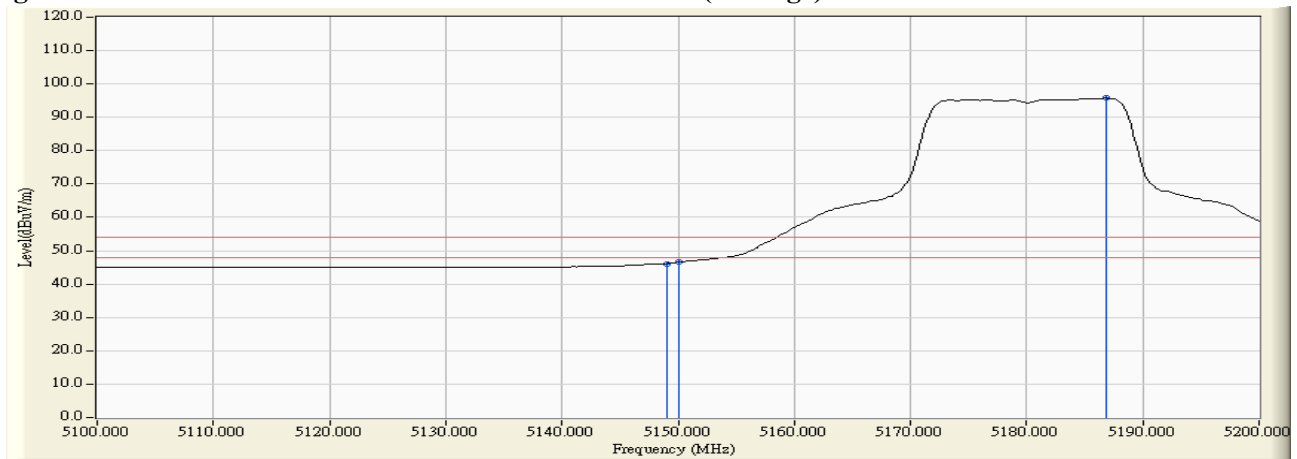


Figure Channel 36: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) -Channel 149

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5715.000	18.644	-58.550	-39.906	-12.906	-27.000	Pass
Horizontal	5725.000	18.649	-48.980	-30.331	-13.331	-17.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5715.000	19.296	-58.550	-39.254	-12.254	-27.000	Pass
Vertical	5725.000	19.372	-49.260	-29.888	-12.888	-17.000	Pass

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) -Channel 165

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5850.000	19.292	-58.590	-39.298	-22.298	-17.000	Pass
Horizontal	5860.000	19.415	-62.320	-42.905	-15.905	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5850.000	20.512	-56.960	-36.448	-19.448	-17.000	Pass
Vertical	5860.000	20.635	-63.210	-42.575	-15.575	-27.000	Pass

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 36

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5150.000	3.340	52.526	55.866	74.00	54.00	Pass
36 (Peak)	5186.600	3.211	98.300	101.511	--	--	--
36 (Average)	5150.000	3.340	40.358	43.698	74.00	54.00	Pass
36 (Average)	5185.800	3.214	85.959	89.173	--	--	--

Figure Channel 36: Horizontal (Peak)

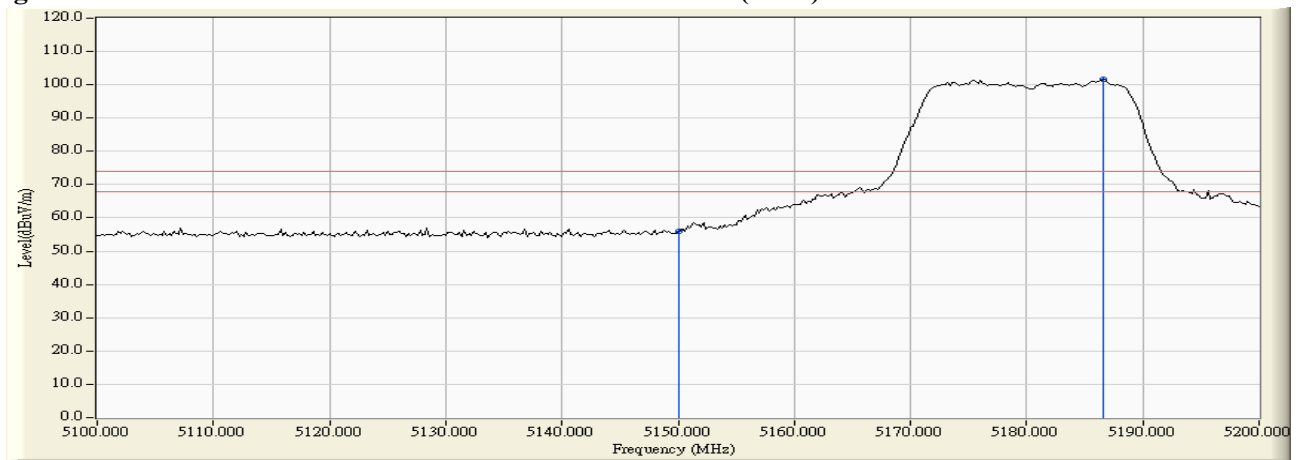
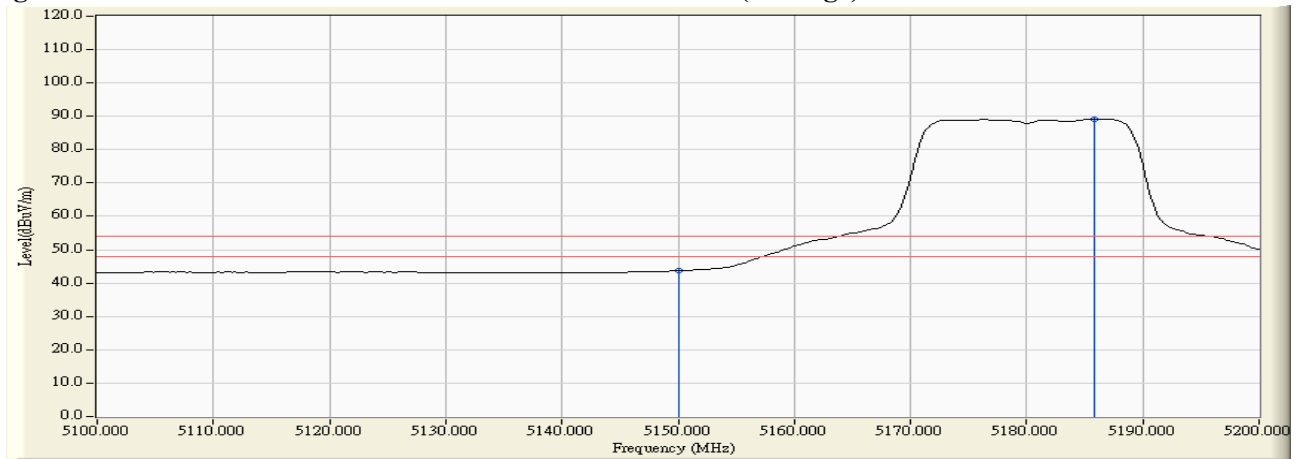


Figure Channel 36: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 36

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5150.000	5.260	52.390	57.650	74.00	54.00	Pass
36 (Peak)	5174.400	5.327	98.243	103.570	--	--	--
36 (Average)	5150.000	5.260	40.290	45.550	74.00	54.00	Pass
36 (Average)	5186.800	5.360	86.181	91.542	--	--	--

Figure Channel 36: Vertical (Peak)

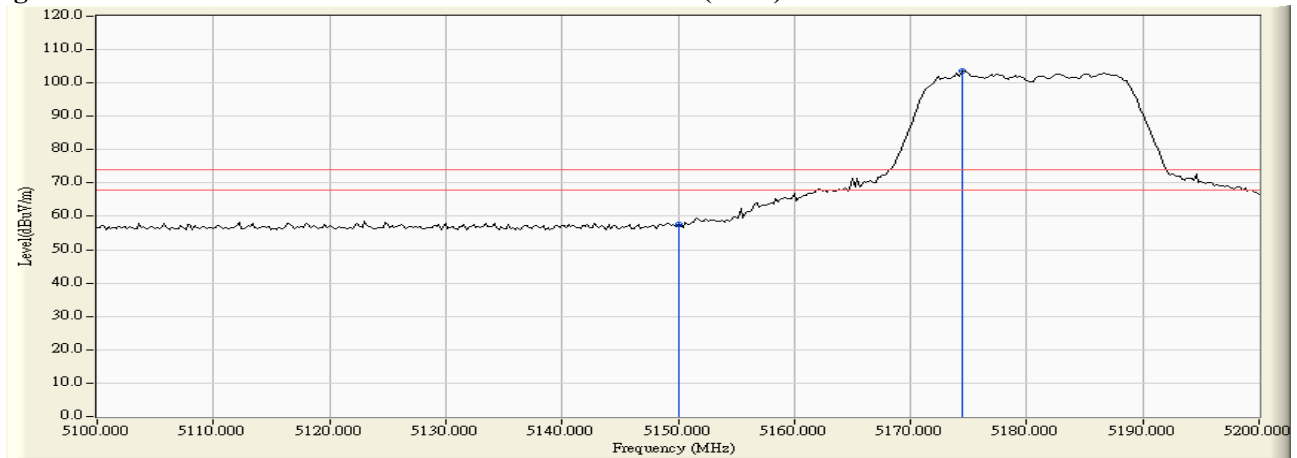
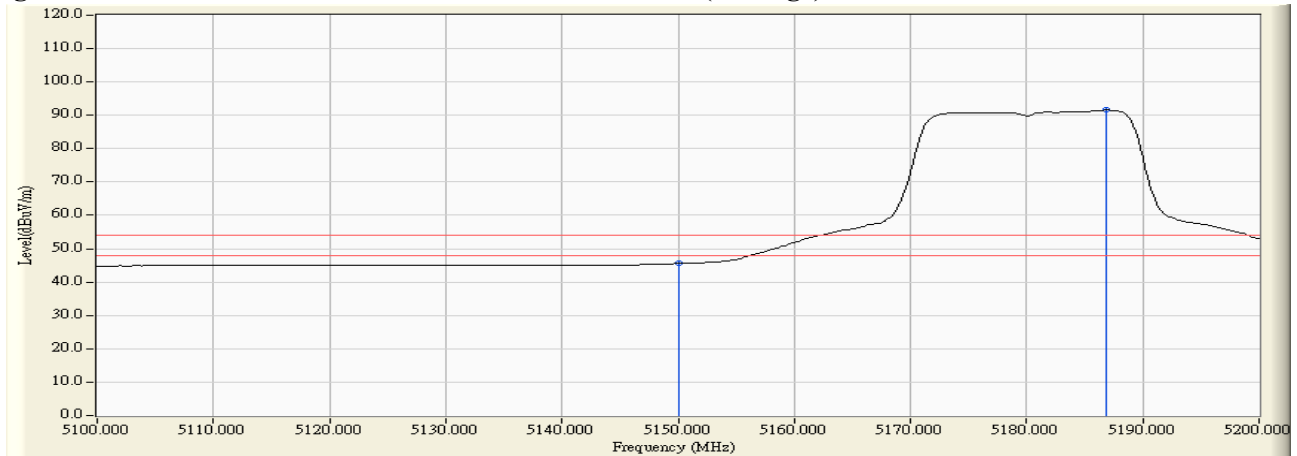


Figure Channel 36: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 149

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5715.000	18.644	-58.610	-39.966	-12.966	-27.000	Pass
Horizontal	5725.000	18.649	-45.540	-26.891	-9.891	-17.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5715.000	19.296	-59.430	-40.134	-13.134	-27.000	Pass
Vertical	5725.000	19.372	-49.120	-29.748	-12.748	-17.000	Pass

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 165

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5850.000	19.292	-56.650	-37.358	-20.358	-17.000	Pass
Horizontal	5860.000	19.415	-63.090	-43.675	-16.675	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5850.000	20.512	-56.650	-36.138	-19.138	-17.000	Pass
Vertical	5860.000	20.635	-63.090	-42.455	-15.455	-27.000	Pass

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 38

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
38 (Peak)	5150.000	3.340	55.064	58.404	74.00	54.00	Pass
38 (Peak)	5182.400	3.226	93.719	96.944	--	--	--
38 (Average)	5150.000	3.340	42.181	45.521	74.00	54.00	Pass
38 (Average)	5187.200	3.208	80.664	83.873	--	--	--

Figure Channel 38: Horizontal (Peak)

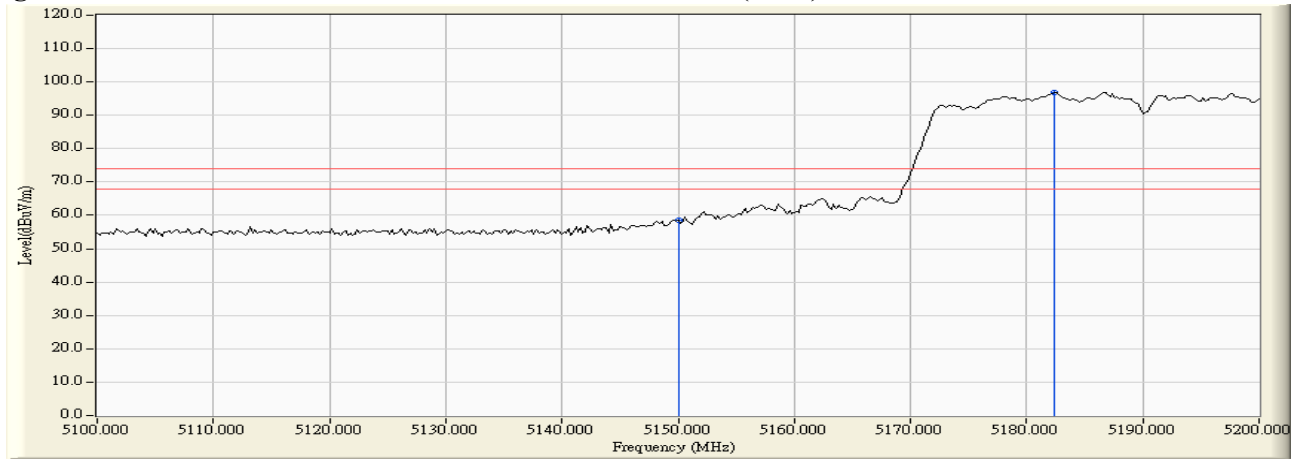
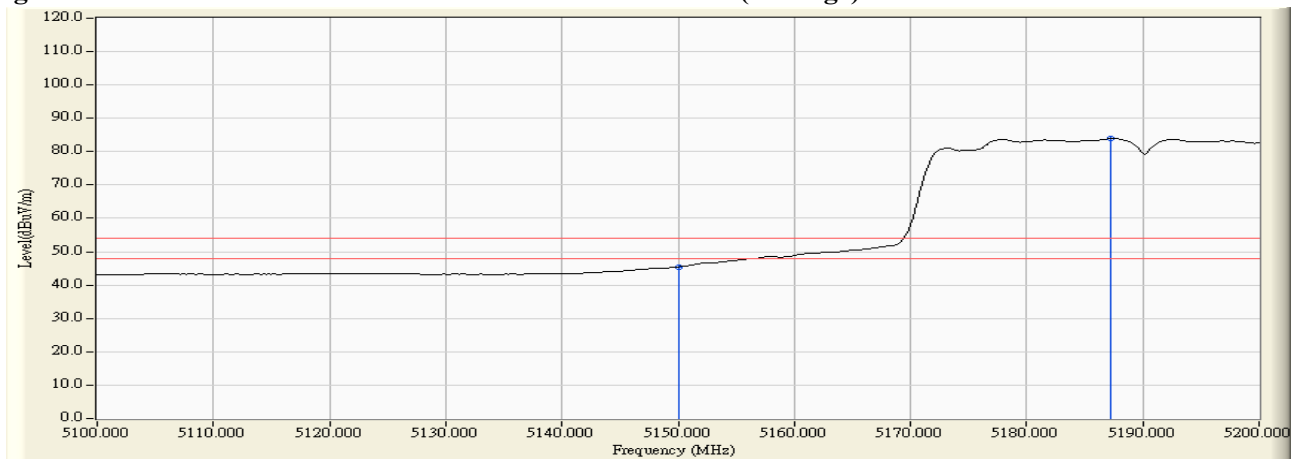


Figure Channel 38: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 38

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
38 (Peak)	5150.000	5.260	55.437	60.697	74.00	54.00	Pass
38 (Peak)	5198.200	5.382	94.047	99.428	--	--	--
38 (Average)	5150.000	5.260	42.011	47.271	74.00	54.00	Pass
38 (Average)	5192.800	5.372	81.040	86.412	--	--	--

Figure Channel 38: Vertical (Peak)

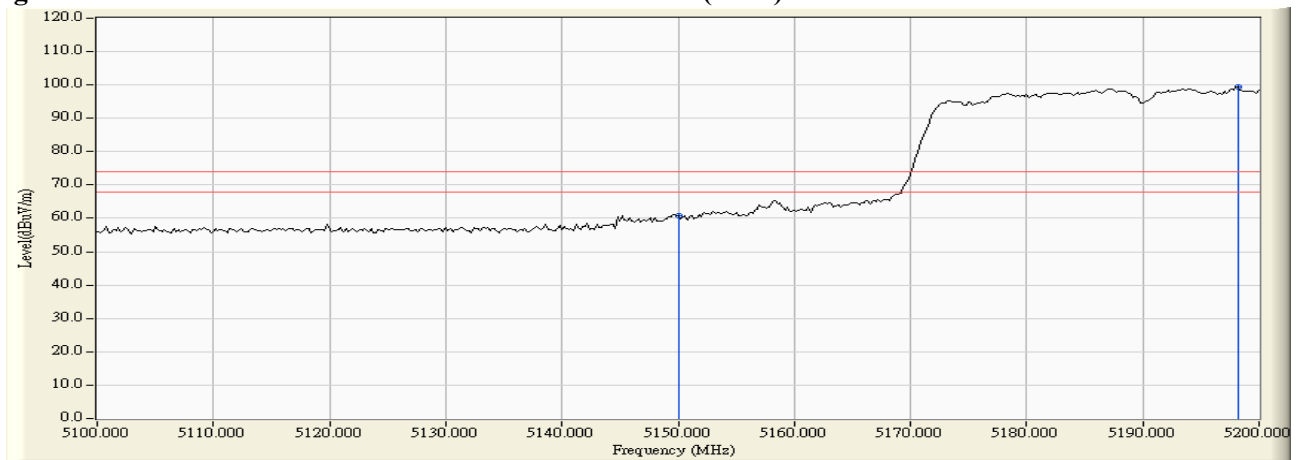
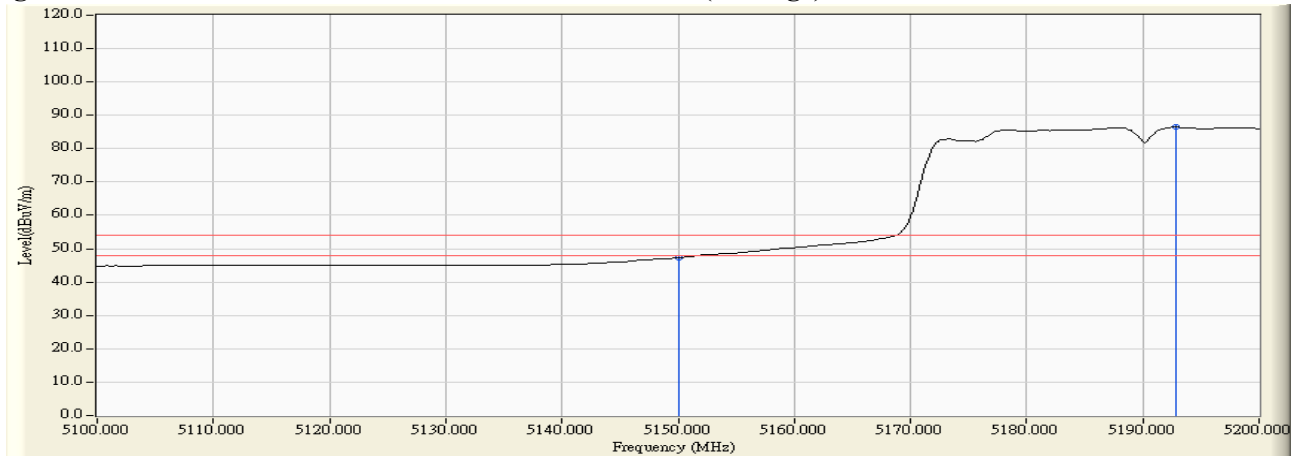


Figure Channel 38: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 151

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5715.000	18.644	-50.520	-31.876	-4.876	-27.000	Pass
Horizontal	5725.000	18.649	-48.430	-29.781	-12.781	-17.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5715.000	19.296	-51.820	-32.524	-5.524	-27.000	Pass
Vertical	5725.000	19.372	-48.780	-29.408	-12.408	-17.000	Pass

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 159

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5850.000	19.292	-62.720	-43.428	-26.428	-17.000	Pass
Horizontal	5860.000	19.415	-63.790	-44.375	-17.375	-27.000	Pass

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5850.000	20.512	-62.650	-42.138	-25.138	-17.000	Pass
Vertical	5860.000	20.635	-64.260	-43.625	-16.625	-27.000	Pass

7. Occupied Bandwidth

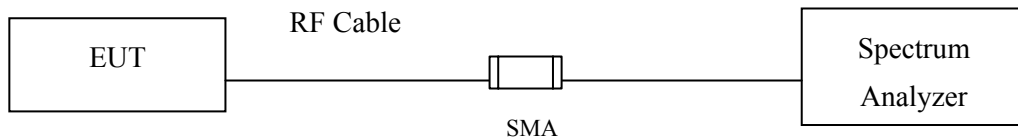
7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2014
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

7.2. Test Setup



7.3. Limits

For the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

7.4. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

7.5. Uncertainty

± 150Hz

7.6. Test Result of Occupied Bandwidth

Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	16400	>500	Pass
157	5785	16500	>500	Pass
165	5825	16450	>500	Pass

Figure Channel 149:

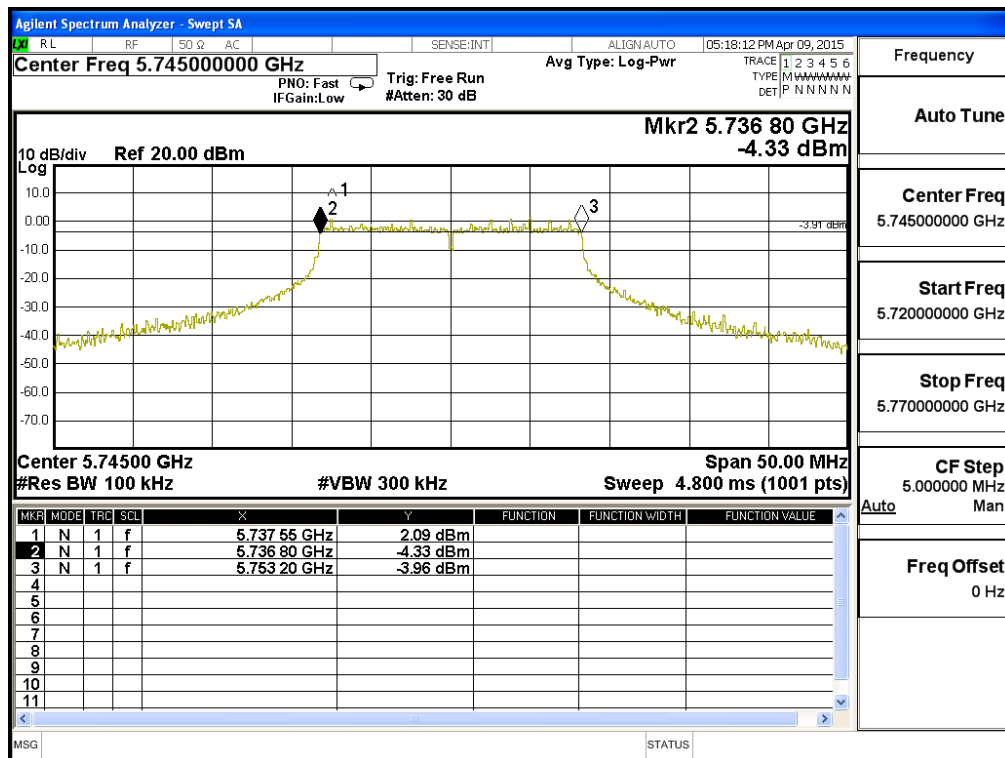


Figure Channel 157:

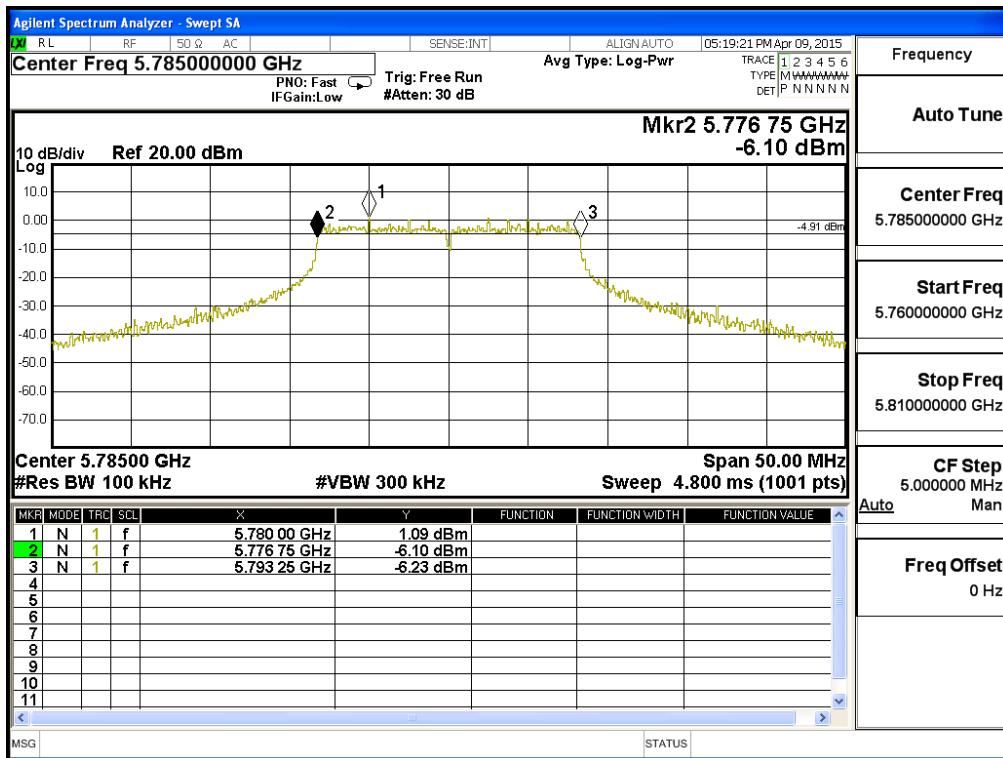
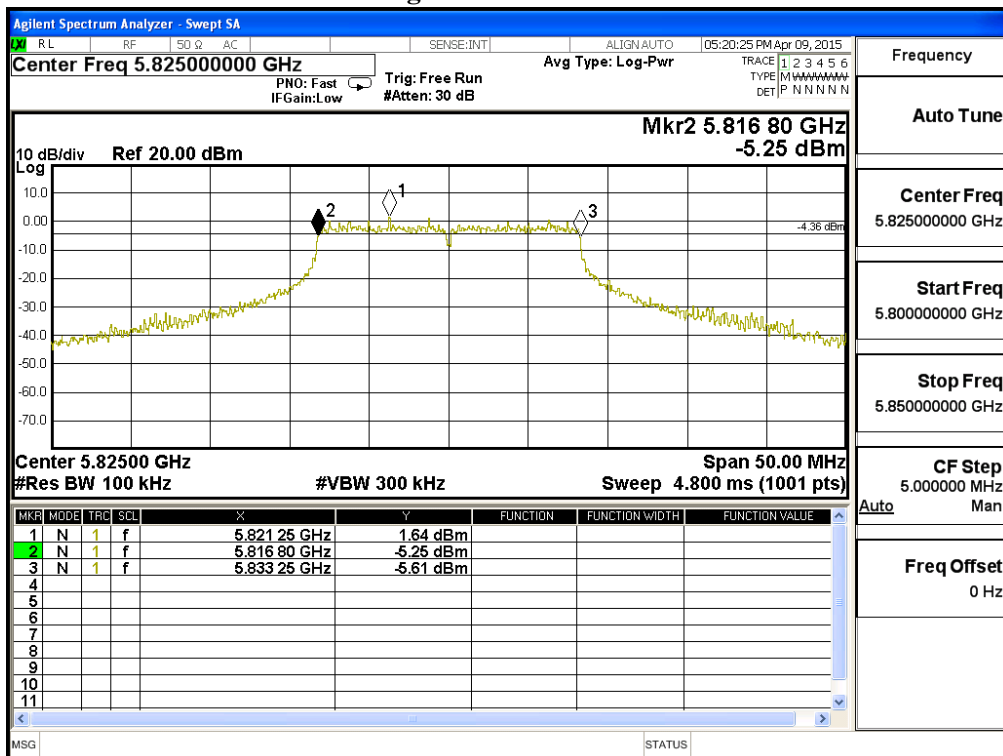


Figure Channel 165:



Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

Chain A

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	17700	>500	Pass
157	5785	17750	>500	Pass
165	5825	17750	>500	Pass

Chain B

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	17750	>500	Pass
157	5785	17800	>500	Pass
165	5825	17800	>500	Pass

Figure Channel 149: (Chain A)

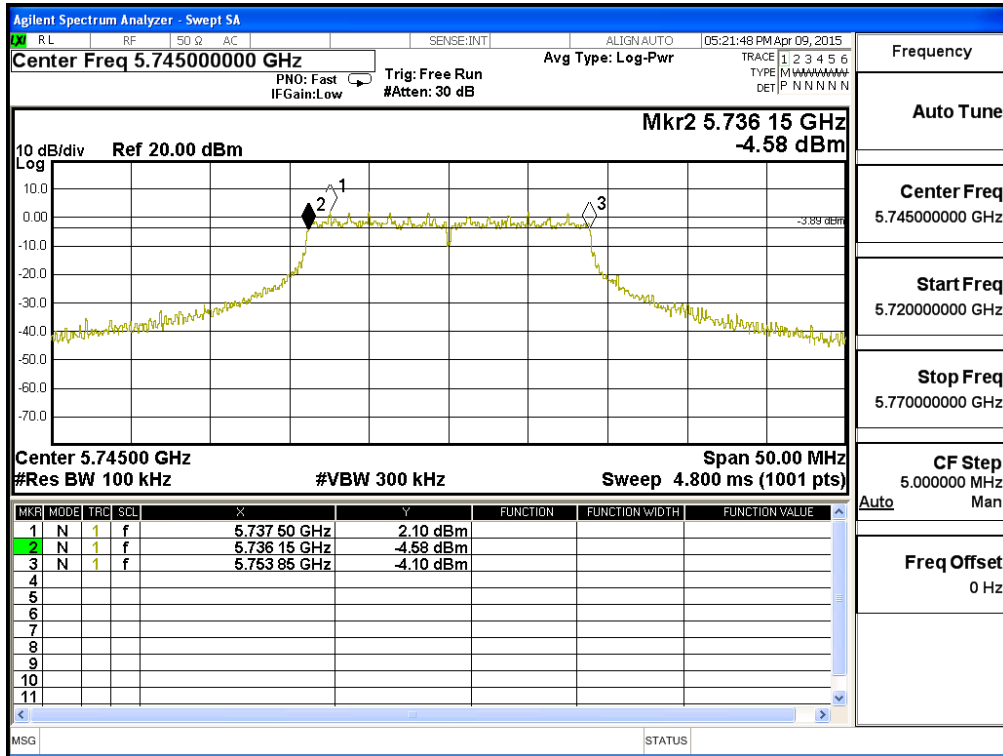


Figure Channel 157: (Chain A)

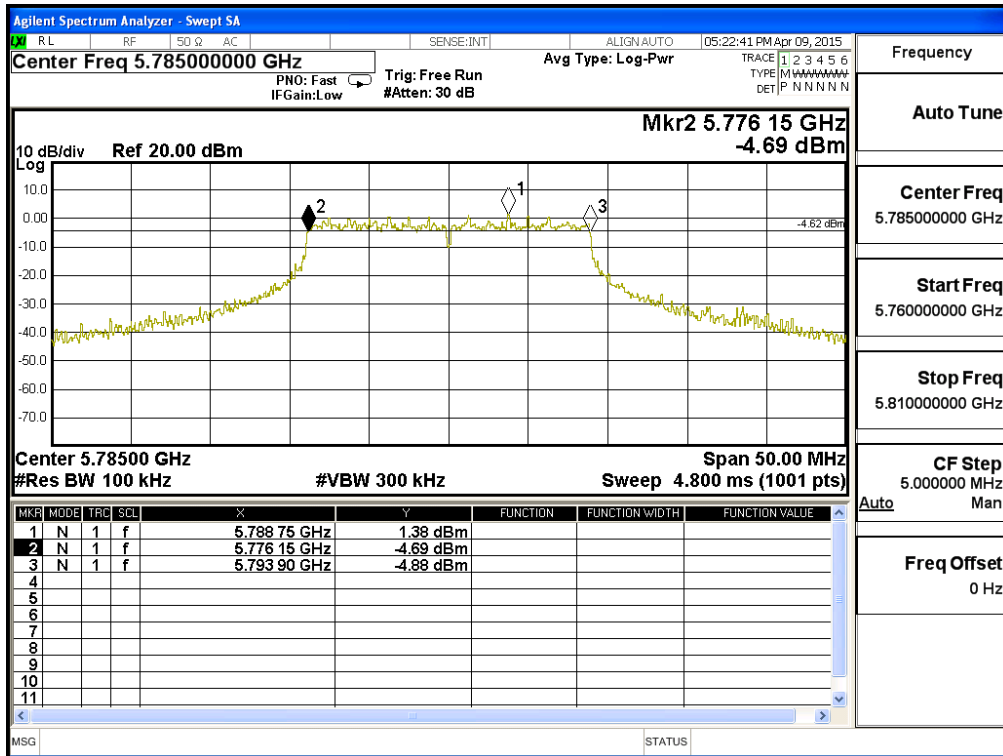


Figure Channel 165: (Chain A)

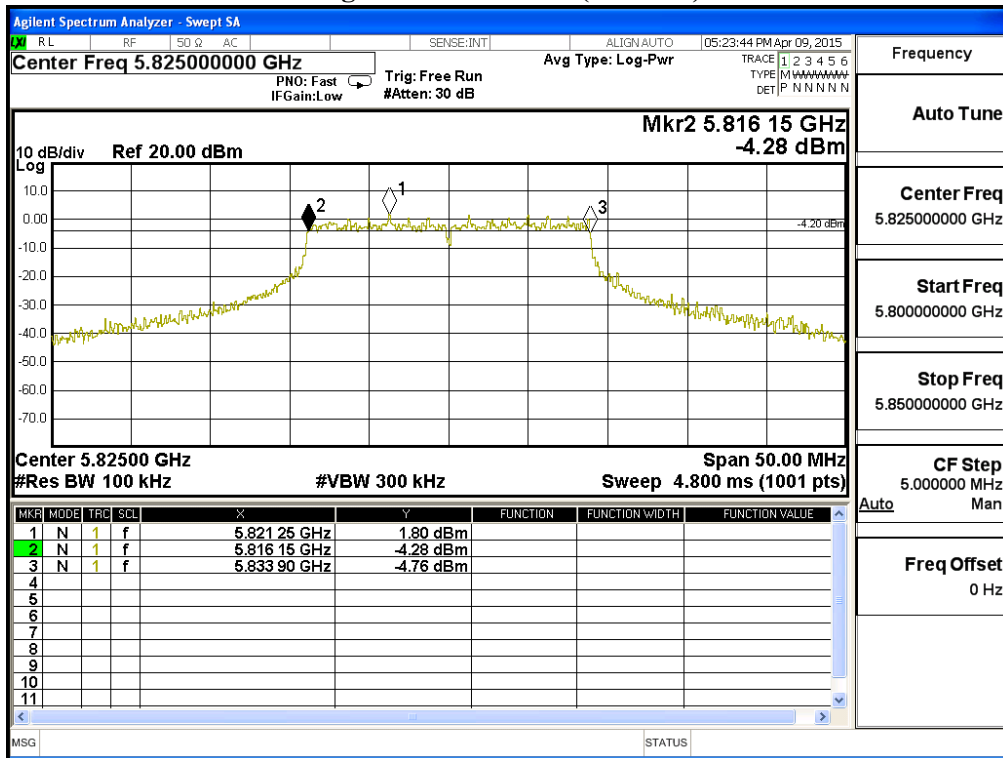


Figure Channel 149: (Chain B)

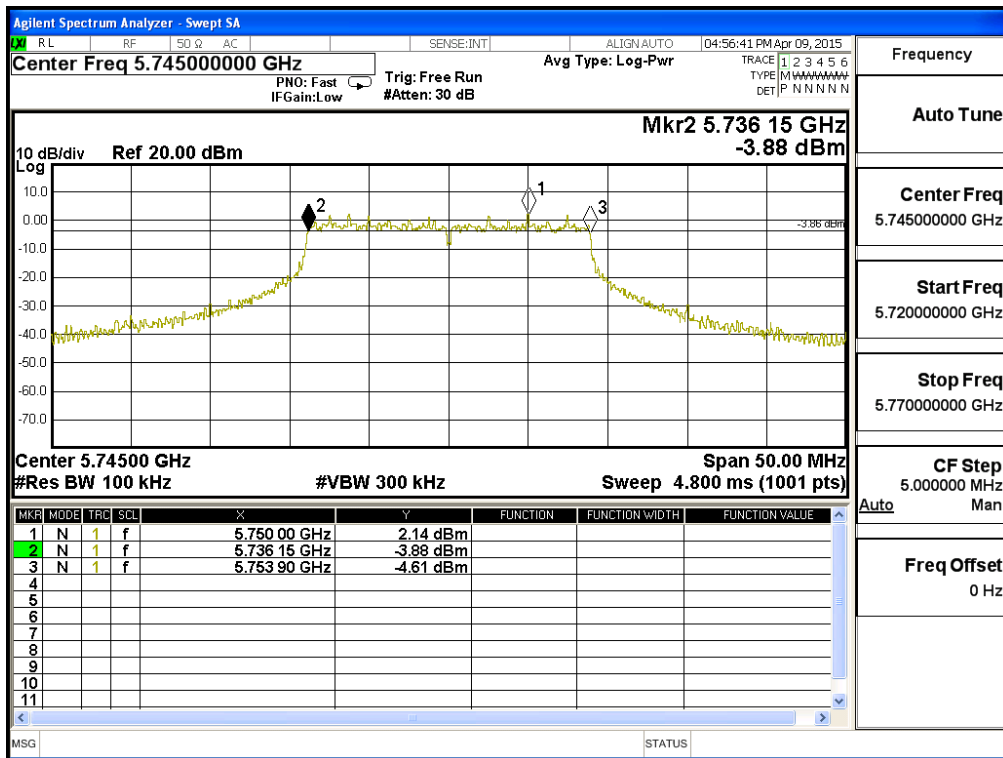


Figure Channel 157: (Chain B)

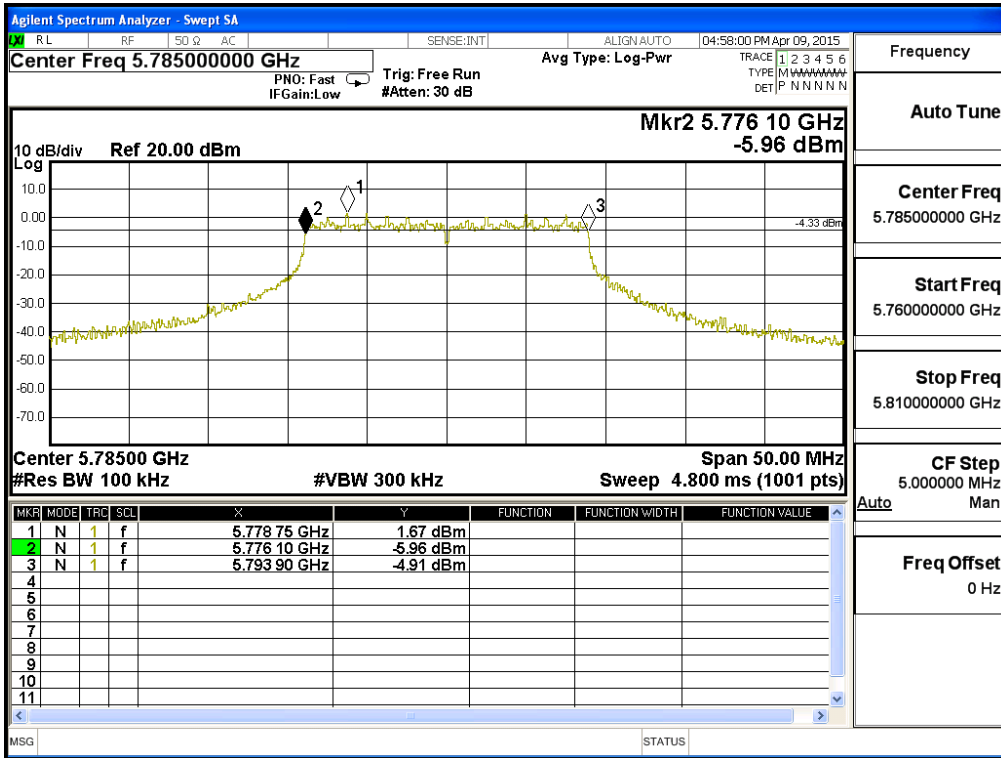
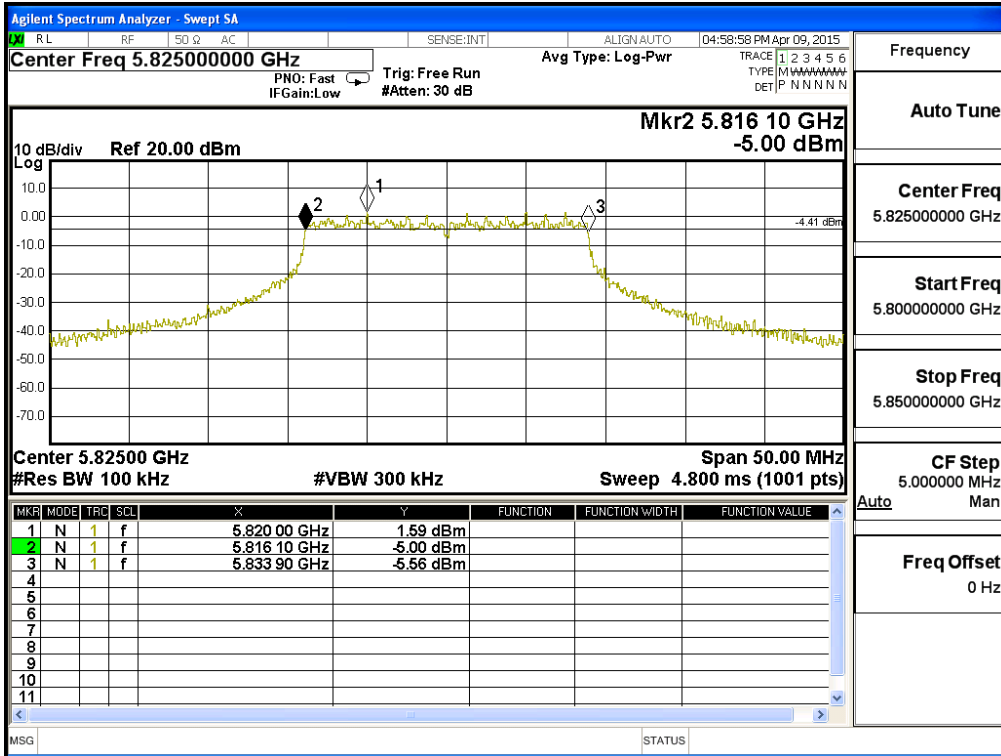


Figure Channel 165: (Chain B)



Product : Moxa IEEE 802.11a/b/g/n MiniPCI Module
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

Chain A

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755	36300	>500	Pass
159	5795	36500	>500	Pass

Chain B

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755	36300	>500	Pass
159	5795	36200	>500	Pass

Figure Channel 151: (Chain A)

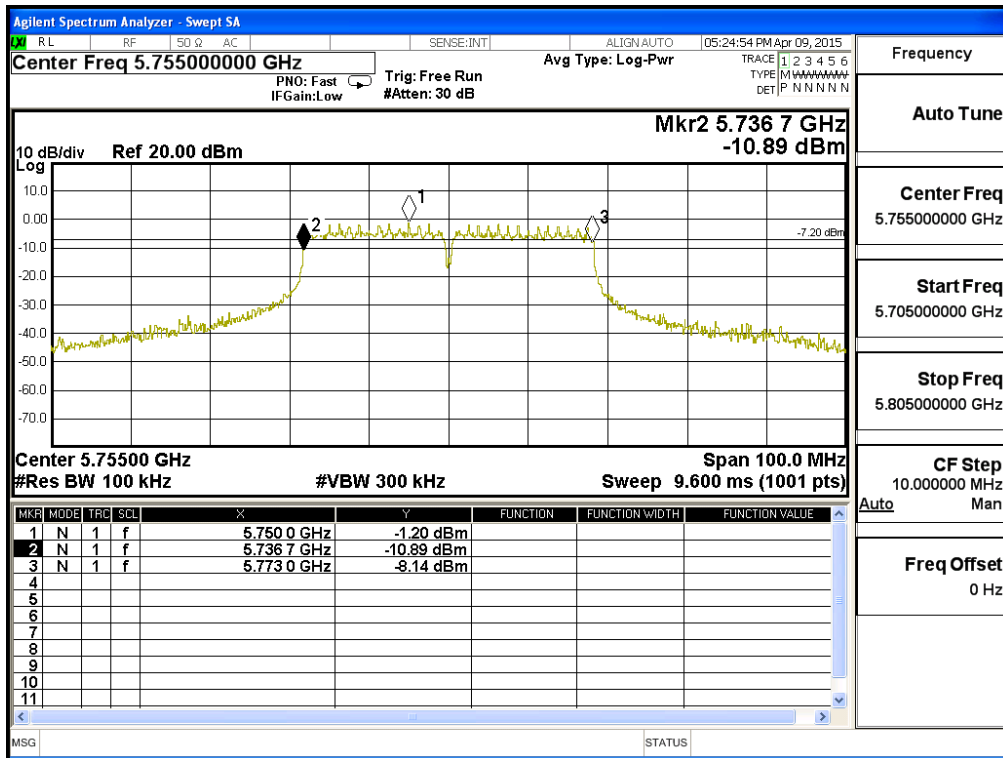


Figure Channel 159: (Chain A)

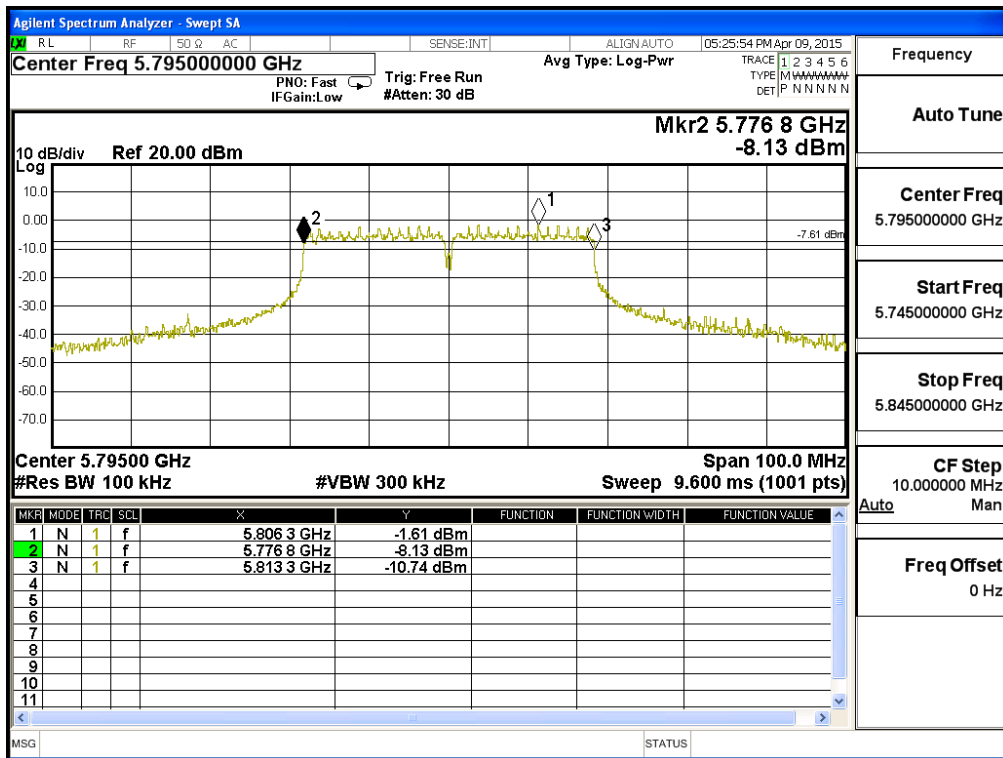


Figure Channel 151: (Chain B)

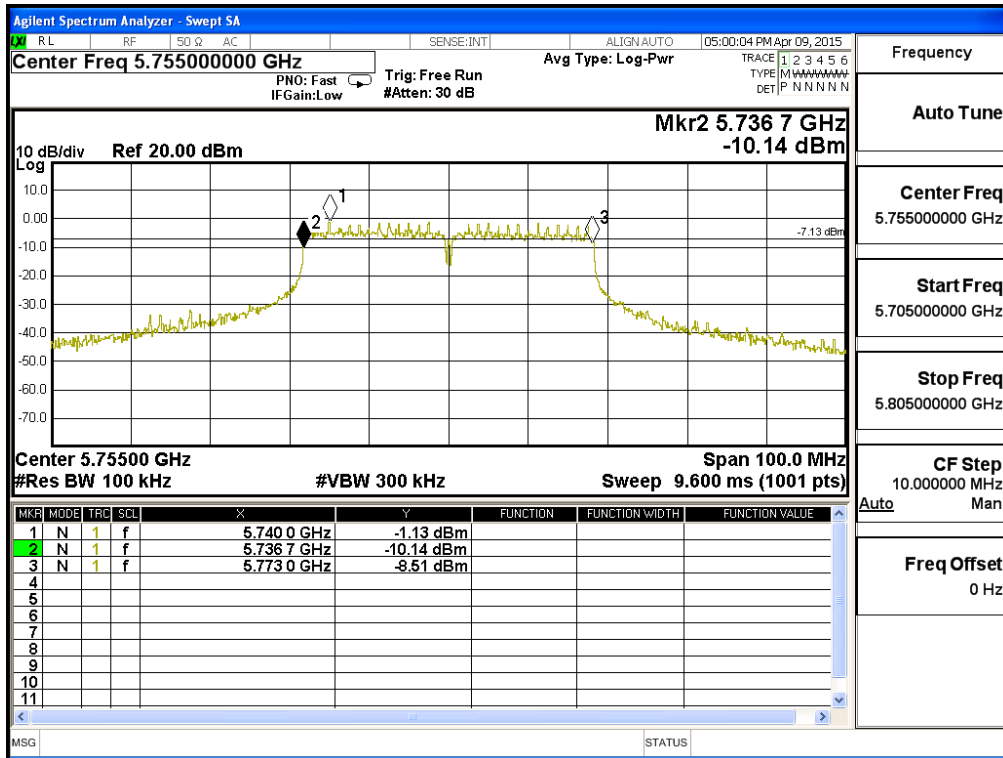
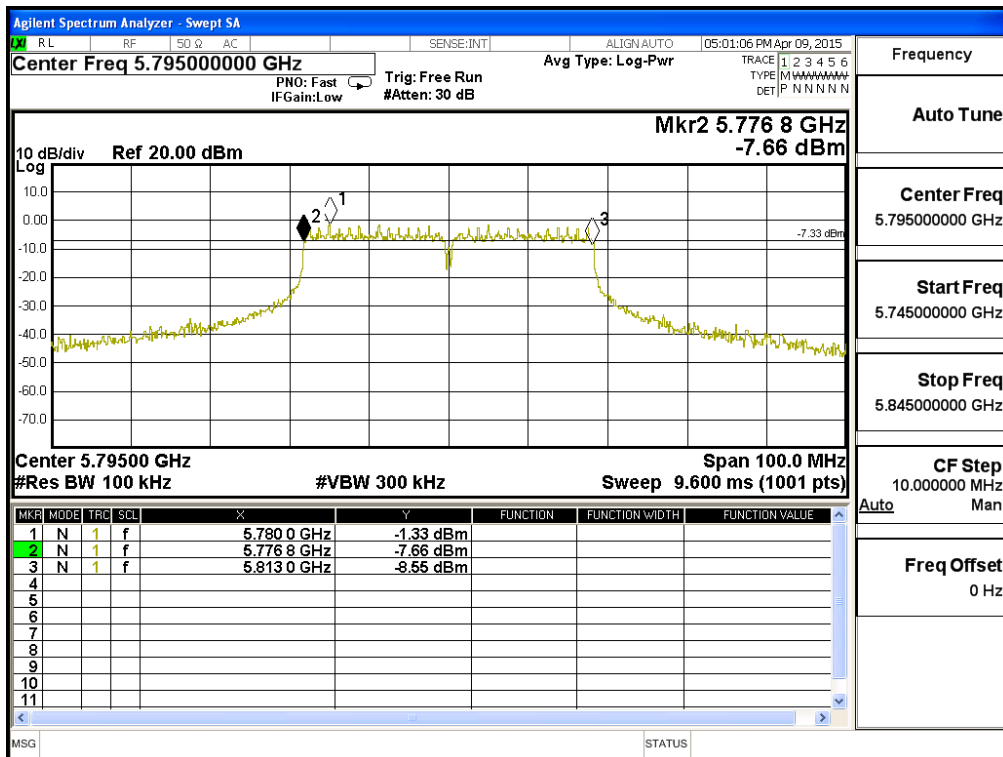


Figure Channel 159: (Chain B)



8. Frequency Stability

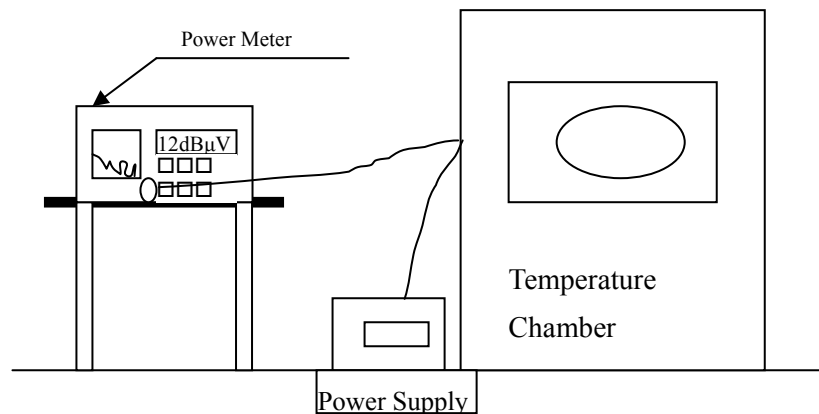
8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2014
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

8.2. Test Setup



8.3. Limits

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

8.4. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

8.5. Uncertainty

± 150 Hz

8.6. Test Result of Frequency Stability

Product : Moxa IEEE 802.11 a/b/g/n MiniPCI Module
 Test Item : Frequency Stability
 Test Site : Temperature Chamber
 Test Mode : Carrier Wave

Chain A

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (20) °C	Vnom (120)V	36	5180.0000	5180.0064	-0.0064
		38	5190.0000	5190.0089	-0.0089
		44	5220.0000	5220.0095	-0.0095
		46	5230.0000	5230.0085	-0.0085
		48	5240.0000	5240.0099	-0.0099
		149	5745.0000	5745.0100	-0.0100
		151	5755.0000	5755.0098	-0.0098
		157	5785.0000	5785.0105	-0.0105
		159	5795.0000	5795.0088	-0.0088
		165	5825.0000	5825.0097	-0.0097
Tmax (50) °C	Vmax (138)V	36	5180.0000	5180.0058	-0.0058
		38	5190.0000	5190.0099	-0.0099
		44	5220.0000	5220.0095	-0.0095
		46	5230.0000	5230.0085	-0.0085
		48	5240.0000	5240.0098	-0.0098
		149	5745.0000	5745.0112	-0.0112
		151	5755.0000	5755.0106	-0.0106
		157	5785.0000	5785.0119	-0.0119
		159	5795.0000	5795.0099	-0.0099
		165	5825.0000	5825.0107	-0.0107

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (50) °C	Vmin (102)V	36	5180.0000	5180.0058	-0.0058
		38	5190.0000	5190.0089	-0.0089
		44	5220.0000	5220.0095	-0.0095
		46	5230.0000	5230.0085	-0.0085
		48	5240.0000	5240.0098	-0.0098
		149	5745.0000	5745.0112	-0.0112
		151	5755.0000	5755.0106	-0.0106
		157	5785.0000	5785.0119	-0.0119
		159	5795.0000	5795.0099	-0.0099
		165	5825.0000	5825.0107	-0.0107
Tnom (-10) °C	Vnom (138)V	36	5180.0000	5180.0100	-0.0100
		38	5190.0000	5190.0089	-0.0089
		44	5220.0000	5220.0095	-0.0095
		46	5230.0000	5230.0098	-0.0098
		48	5240.0000	5240.0094	-0.0094
		149	5745.0000	5745.0088	-0.0088
		151	5755.0000	5755.0077	-0.0077
		157	5785.0000	5785.0084	-0.0084
		159	5795.0000	5795.0068	-0.0068
		165	5825.0000	5825.0071	-0.0071
Tmax (-10) °C	Vmax (102)V	36	5180.0000	5180.0100	-0.0100
		38	5190.0000	5190.0089	-0.0089
		44	5220.0000	5220.0095	-0.0095
		46	5230.0000	5230.0098	-0.0098
		48	5240.0000	5240.0094	-0.0094
		149	5745.0000	5745.0088	-0.0088
		151	5755.0000	5755.0077	-0.0077
		157	5785.0000	5785.0084	-0.0084
		159	5795.0000	5795.0068	-0.0068
		165	5825.0000	5825.0071	-0.0071

Chain B

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (20) °C	Vnom (120)V	36	5180.0000	5180.0065	-0.0065
		38	5190.0000	5190.0091	-0.0091
		44	5220.0000	5220.0098	-0.0098
		46	5230.0000	5230.0087	-0.0087
		48	5240.0000	5240.0101	-0.0101
		149	5745.0000	5745.0120	-0.0099
		151	5755.0000	5755.0108	-0.0103
		157	5785.0000	5785.0094	-0.0103
		159	5795.0000	5795.0099	-0.0094
		165	5825.0000	5825.0111	-0.0086
Tmax (50) °C	Vmax (138)V	36	5180.0000	5180.0059	-0.0059
		38	5190.0000	5190.0101	-0.0101
		44	5220.0000	5220.0098	-0.0098
		46	5230.0000	5230.0087	-0.0087
		48	5240.0000	5240.0100	-0.0100
		149	5745.0000	5745.0111	-0.0103
		151	5755.0000	5755.0103	-0.0101
		157	5785.0000	5785.0082	-0.0099
		159	5795.0000	5795.0099	-0.0090
		165	5825.0000	5825.0101	-0.0091

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (50) °C	Vmin (102)V	36	5180.0000	5180.0059	-0.0059
		38	5190.0000	5190.0101	-0.0101
		44	5220.0000	5220.0098	-0.0098
		46	5230.0000	5230.0087	-0.0087
		48	5240.0000	5240.0100	-0.0100
		149	5745.0000	5745.0111	-0.0103
		151	5755.0000	5755.0103	-0.0101
		157	5785.0000	5785.0082	-0.0099
		159	5795.0000	5795.0099	-0.0090
		165	5825.0000	5825.0101	-0.0091
Tnom (-10) °C	Vnom (138)V	36	5180.0000	5180.0101	-0.0101
		38	5190.0000	5190.0091	-0.0091
		44	5220.0000	5220.0098	-0.0098
		46	5230.0000	5230.0100	-0.0100
		48	5240.0000	5240.0096	-0.0096
		149	5745.0000	5745.0094	-0.0094
		151	5755.0000	5755.0083	-0.0097
		157	5785.0000	5785.0079	-0.0091
		159	5795.0000	5795.0078	-0.0084
		165	5825.0000	5825.0096	-0.0083
Tmax (-10) °C	Vmax (102)V	36	5180.0000	5180.0101	-0.0101
		38	5190.0000	5190.0091	-0.0091
		44	5220.0000	5220.0098	-0.0098
		46	5230.0000	5230.0100	-0.0100
		48	5240.0000	5240.0096	-0.0096
		149	5745.0000	5745.0094	-0.0094
		151	5755.0000	5755.0083	-0.0097
		157	5785.0000	5785.0079	-0.0091
		159	5795.0000	5795.0078	-0.0084
		165	5825.0000	5825.0096	-0.0083

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs