

FCC Test Report

Product Name	MOXA IEEE 802.11a/n/ac 4*4 module
Model No	WAPC002
FCC ID	SLE-WAPC002

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

Date of Receipt	Apr. 20, 2018
Issued Date	Sep. 25, 2019
Report No.	1870151R-RFUSP54V00
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: Sep. 25, 2019

Report No.: 1870151R-RFUSP54V00



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Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST., NEW TAIPEI CITY, TAIWAN
Manufacturer	MOXA Inc.
Model No.	WAPC002
FCC ID.	SLE-WAPC002
EUT Rated Voltage	DC 24~110V
EUT Test Voltage	DC 24V
Trade Name	MOXA
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v02
Test Result	Complied

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Approved By : Vincent Lin
(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	MOXA IEEE 802.11a/n/ac 4*4 module
Trade Name	MOXA
FCC ID.	SLE-WAPC002
Model No.	WAPC002
Frequency Range	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz, 5755-5795MHz 802.11ac-20MHz: 5720, 802.11ac-40MHz: 5710 802.11ac-80MHz: 5210-5290MHz, 5530-5690MHz, 5775MHz
Number of Channels	802.11a/n-20MHz: 24; 802.11n-40MHz: 11 802.11ac-20MHz: 1, 802.11ac-40MHz: 1, 802.11ac-80MHz: 6
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 600Mbps 802.11ac-80MHz: up to 1733.3MHz
Channel Control	Auto
Type of Modulation	802.11a/n/ac: OFDM, BPSK, QPSK, 16QAM, 64QAM, 256QAM
Antenna type	Panel Antenna, Dipole Antenna, Railway Antenna, Sector Antenna, Patch Antenna
Antenna Gain	Refer to the table “Antenna List”
Contains Module	FCC ID: SLE-WAPN010

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 52:	5260 MHz	Channel 56:	5280 MHz	Channel 60:	5300 MHz	Channel 64:	5320 MHz
Channel 100:	5500 MHz	Channel 104:	5520 MHz	Channel 108:	5540 MHz	Channel 112:	5560 MHz
Channel 116:	5580 MHz	Channel 120:	5600 MHz	Channel 124:	5620 MHz	Channel 128:	5640 MHz
Channel 132:	5660 MHz	Channel 136:	5680 MHz	Channel 140:	5700 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 54:	5270 MHz	Channel 62:	5310 MHz
Channel 102:	5510 MHz	Channel 110:	5550 MHz	Channel 118:	5590 MHz	Channel 126:	5630 MHz
Channel 134:	5670 MHz	Channel 151:	5755 MHz	Channel 159:	5795 MHz		

802.11ac-20MHz Center Working Frequency of Each Channel:

Channel	Frequency
Channel 144:	5720 MHz

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

Channel	Frequency
Channel 142:	5710 MHz

802.11ac-80MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 42:	5210 MHz	Channel 58:	5290 MHz	Channel 106:	5530 MHz	Channel 122:	5610 MHz
Channel 138:	5690 MHz	Channel 155:	5775 MHz				

Test Condition			Test Item	
			Radiated Emission	
Antenna Type	Part No.	Antenna Gain (dBi)	Radiated Emission	Band Edge
No.1 Panel	MAT-WDB-PA-NF-2-0708	7.63dBi For 2.4GHz 8.77dBi for 5.15~5.25GHz 8.77dBi for 5.25~5.35GHz 8.50dBi for 5.47~5.725GHz 8.18dBi for 5.725~5.825GHz	✓	✓
No.14 Omni	ANT-WDB-ARM-02	2.04dBi For 2.4GHz 0.81dBi for 5GHz	✓	✓
No.20 Railway	MHH-A11-XX110170-X0	9dBi For 2.4GHz 8.0dBi for 5GHz	✓	✓
No.21 Sector	WI25-A1-1215053-X0	12dBi For 2.4GHz 15dBi for 5GHz	✓	✓
No.22 Patch	TOP 200 AMR MF-05-4	8.2dBi For 2.4GHz 8.5dBi for 5GHz	✓	✓

Note: The worst case according to the has both 2.4GHz and 5GHz antenna.

Note:

1. This device is a MOXA IEEE 802.11a/n/ac 4*4 module with a built-in 802.11a/b/g/n/ac WLAN transceiver ,this report for 5GHz WLAN
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 28.8Mbps 、802.11n-40BW is 60Mbps and 802.11ac(80M-BW) is 130 Mbps)
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.
6. This device contains the two signal modules certified FCC ID: SLE-WAPC002 and FCC ID: SLE-WAPN010

Test Mode (Simultaneous Transmit)	Mode 1: Transmit (802.11a-6Mbps) Mode 2: Transmit (802.11n-20BW 28.8Mbps) Mode 3: Transmit (802.11n-40BW 60Mbps) Mode 4: Transmit (802.11ac-20BW-28.8Mbps) Mode 5: Transmit (802.11ac-40BW-60Mbps) Mode 6: Transmit (802.11ac-80BW-130Mbps)
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Test Condition	Test Item	
	Radiated Emission	
Antenna Type	Radiated Emission	Band Edge
No.1 Panel	2.4G b 2437MHz + 5G a 5745MHz	2.4G n20 2412MHz + 5G ac80 5210MHz 5G n20 5745MHz
No.14 Omni	2.4G b 2437MHz + 5G a 5785MHz	2.4G n20 2462MHz + 5G ac80 5210MHz 5G n40 5670MHz
No.20 Railway	2.4G b 2412MHz + 5G a 5700MHz	2.4G n20 2412MHz + 5G ac80 5290MHz 5G n20 5500MHz
No.21 Sector	2.4G b 2437MHz + 5G a 5240MHz	2.4G g 2412MHz + 5G ac80 5290MHz 5G ac80 5530MHz
No.22 Patch	2.4G b 2412MHz + 5G a 5700MHz	2.4G g 2412MHz + 5G n40 5310MHz 5G ac80 5530MHz

Note: The worst case according to the Original report.

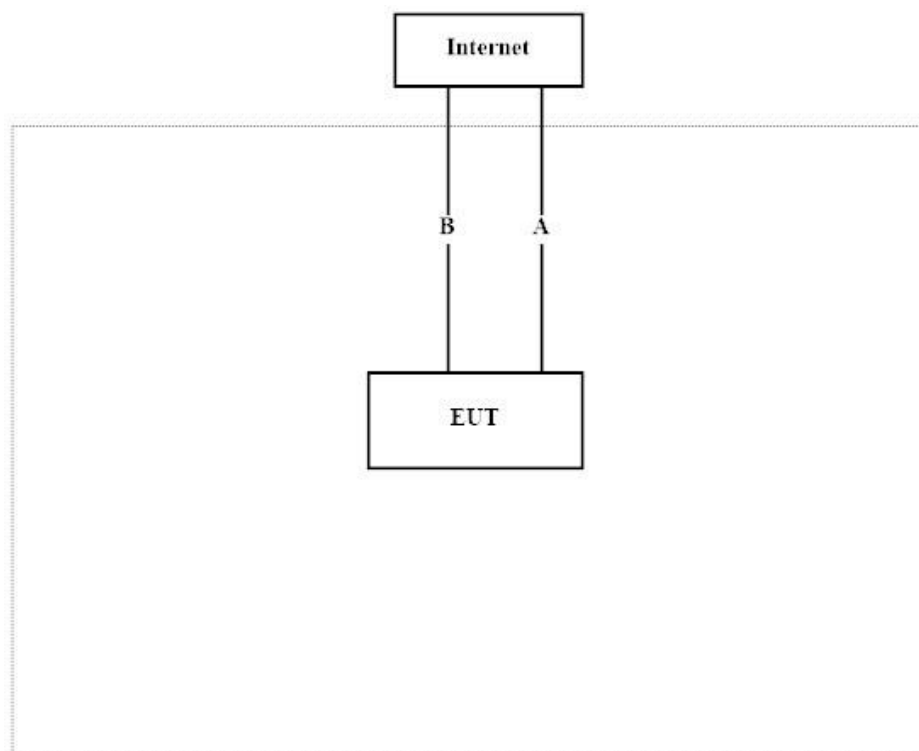
1.3. Tested System Details

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
N/A				

Signal Cable Type		Signal cable Description
A	LAN Cable	Shielded, 2m
B	RS-232 Cable	Non-shielded, 1.5m

1.4. Configuration of tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown on 1.4
- (2) Execute “QRCT Ver. 3.0.210.0” program on the Notebook PC.
- (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

USA : FCC Registration Number: TW3023

Canada : IC Registration Number: 4075A

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,
Taiwan, R.O.C.
Phone number: 886-2-8601-3788
Fax number: 886-2-8601-3789
Email address: info.tw@dekra.com
Website: <http://www.dekra.com.tw>

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2019/02/26	2020/02/25
	Spectrum Analyzer	Agilent	N9010A	MY48030495	2018/09/27	2019/09/26
	Peak Power Analyzer	Keysight	8990B	MY51000410	2019/07/30	2020/07/29
	Wideband Power Sensor	Keysight	N1923A	MY56080003	2019/07/30	2020/07/29
	Wideband Power Sensor	Keysight	N1923A	MY56080004	2019/07/30	2020/07/29
	EMI Test Receiver	R&S	ESCS 30	100369	2018/11/19	2019/11/18
	LISN	R&S	ESH3-Z5	836679/017	2019/04/10	2020/04/09
	LISN	R&S	ENV216	100097	2019/04/10	2020/04/09
	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21	2019/06/20

For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2019/03/11	2020/03/10
X	Loop Antenna	Teseq	HLA6121	37133	2017/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2019/06/23	2020/06/22
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2019/06/13	2020/06/12
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2019/06/13	2020/06/12
X	Horn Antenna	ETS-Lindgren	3117	00135205	2019/04/30	2020/04/29
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/12/18	2019/12/17
X	Coaxial Cable	DEKRA	SF-106	LC035/37/41-SF	2019/04/16	2020/04/15
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2019/01/19	2020/01/18
X	Horn Antenna	Com-Power	AH-840	101043	2019/03/27	2020/03/26
X	Filter	MicroTRON	BRM50701	019	2019/08/08	2020/08/07
X	Filter	Microwave Circuits	N0257881	36681	2019/08/08	2020/08/07

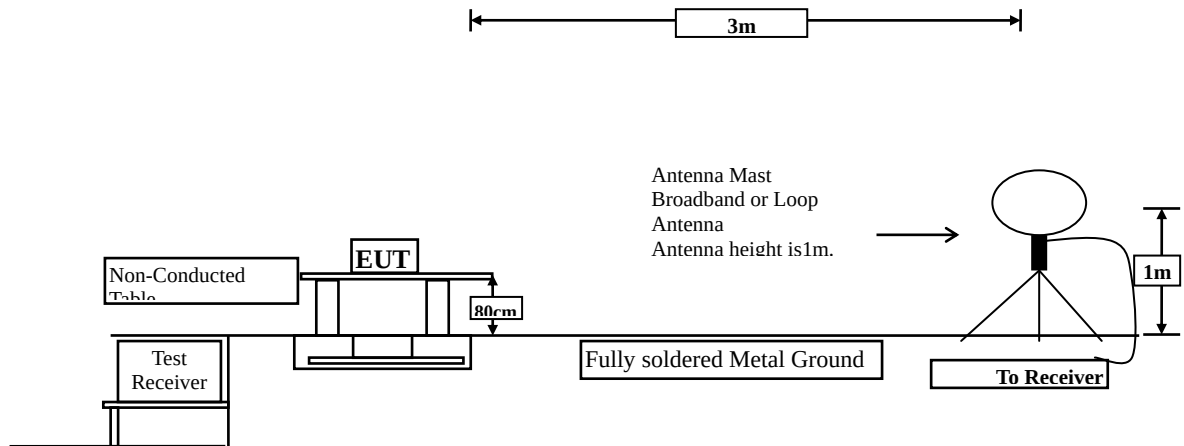
Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version :QuiTek EMI 2.0 V2.1.113.

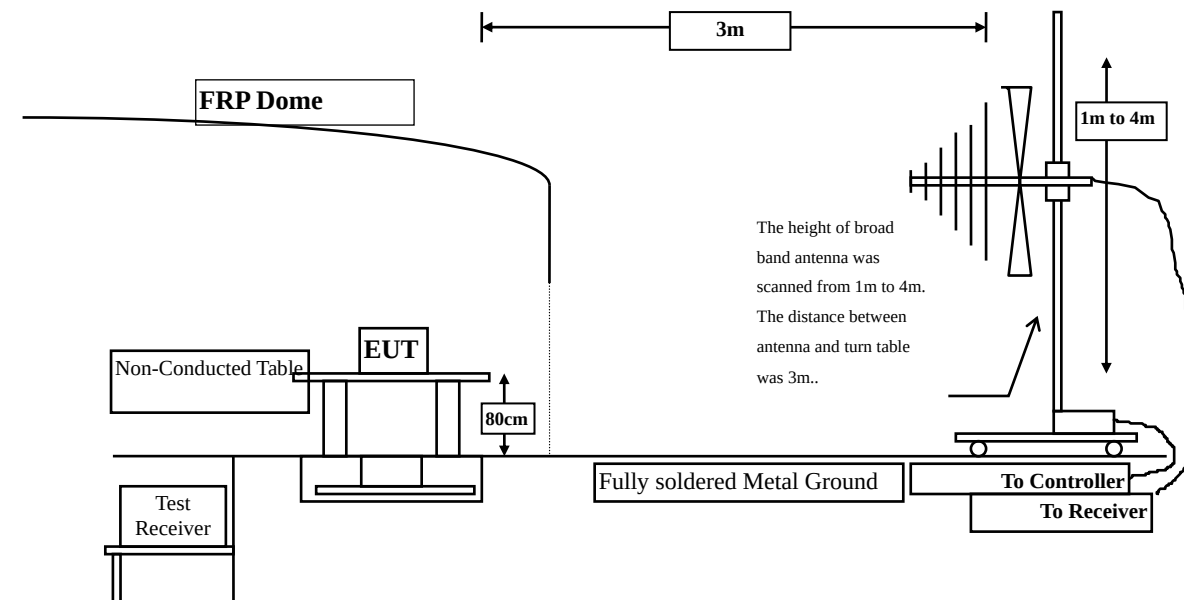
2. Radiated Emission

2.1. Test Setup

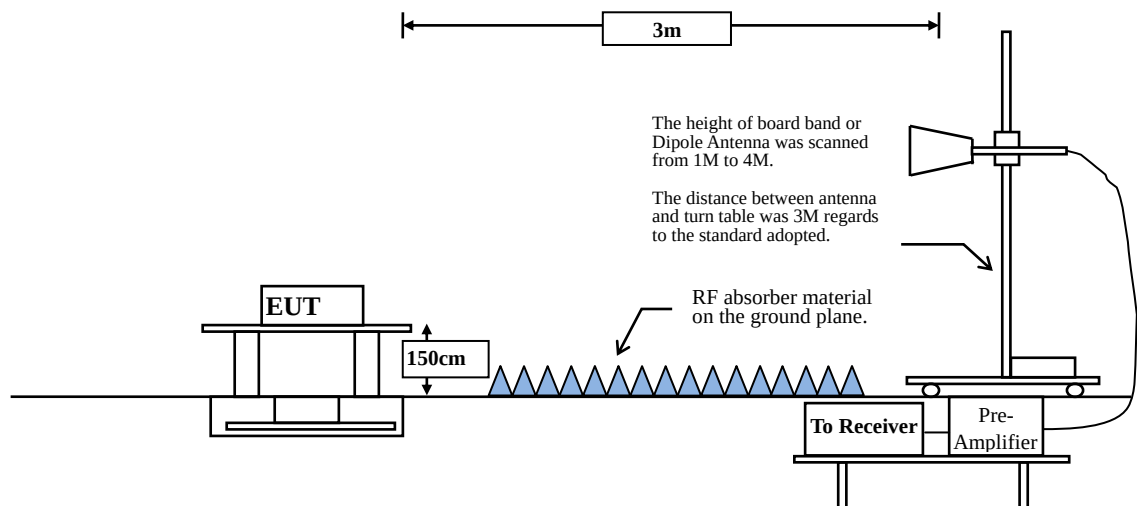
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



2.2. 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 (dB μ V/m) = 20 log E field strength (uV/m)

2.3. 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.

RBW and VBW Parameter setting:

According to KDB 789033 section II.G.5 Procedure for Unwanted Maximum Emissions
Measurements above 1000 MHz.

RBW = 1MHz.

VBW $\geq$ 3MHz.

According to KDB 789033 section II.G.6 Procedures for Average Unwanted Emissions
Measurements above 1000 MHz.

RBW = 1MHz.

VBW = 10Hz, when duty cycle $\geq$ 98 %

VBW $\geq$ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

5GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11 a	96.60	2.0580	486	500
802.11n20	98.00	4.9855	201	10
802.11n40	95.93	2.3913	418	500
802.11ac80	94.01	1.1377	879	1000

Note: Duty Cycle Refer to Section 8

2.4. Uncertainty

$\pm$ 4.08 dB above 1GHz

$\pm$ 4.22 dB below 1GHz

2.5. Test Result of Radiated Emission

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz) (Antenna No.1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11490.000	-10.055	54.470	44.415	-29.585	74.000
17235.000	*	*	*	*	74.000
22980.000	*	*	*	*	74.000
28752.000	*	*	*	*	74.000
34470.000	*	*	*	*	74.000
40215.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11490.000	-10.055	60.000	49.945	-24.055	74.000
17235.000	*	*	*	*	74.000
22980.000	*	*	*	*	74.000
28752.000	*	*	*	*	74.000
34470.000	*	*	*	*	74.000
40215.000	*	*	*	*	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz) (Antenna No.14)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11570.000	-9.778	56.920	47.143	-26.857	74.000
17355.000	*	*	*	*	74.000
20800.000	*	*	*	*	74.000
26000.000	*	*	*	*	74.000
31200.000	*	*	*	*	74.000
36400.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11570.000	-9.778	57.220	47.443	-26.557	74.000
17355.000	*	*	*	*	74.000
20800.000	*	*	*	*	74.000
26000.000	*	*	*	*	74.000
31200.000	*	*	*	*	74.000
36400.000	*	*	*	*	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5700MHz) (Antenna No.20)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11400.000	-9.439	58.990	49.552	-24.448	74.000
17100.000	*	*	*	*	74.000
22800.000	*	*	*	*	74.000
28500.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11400.000	-9.439	58.800	49.362	-24.638	74.000
17100.000	*	*	*	*	74.000
22800.000	*	*	*	*	74.000
28500.000	*	*	*	*	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5240MHz) (Antenna No.21)

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	-10.805	57.530	46.725	-27.275	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10480.000	-10.805	57.600	46.795	-27.205	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5700MHz) (Antenna No.22)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
11400.000	-9.439	58.320	48.882	-25.118	74.000
17100.000	*	*	*	*	74.000
22800.000	*	*	*	*	74.000
28500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11400.000	-9.439	58.060	48.622	-25.378	74.000
17100.000	*	*	*	*	74.000
22800.000	*	*	*	*	74.000
28500.000	*	*	*	*	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz) (Antenna No.1)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector					
167.768	-20.344	53.669	33.325	-10.175	43.500
250.710	-17.940	50.428	32.487	-13.513	46.000
499.536	-10.867	41.479	30.613	-15.387	46.000
600.754	-6.657	40.960	34.304	-11.696	46.000
700.565	-9.152	46.381	37.229	-8.771	46.000
856.609	-8.385	37.364	28.979	-17.021	46.000
Vertical					
Peak Detector					
127.000	-16.313	52.028	35.715	-7.785	43.500
302.725	-14.612	50.908	36.296	-9.704	46.000
443.304	-9.888	37.093	27.206	-18.794	46.000
607.783	-7.174	37.186	30.013	-15.987	46.000
732.899	-6.726	35.938	29.212	-16.788	46.000
859.420	-8.409	35.004	26.595	-19.405	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz) (Antenna No.14)

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					
173.391	-19.913	55.680	35.768	-7.732	43.500
329.435	-14.011	47.893	33.882	-12.118	46.000
499.536	-10.867	42.793	31.927	-14.073	46.000
600.754	-6.657	42.995	36.339	-9.661	46.000
700.565	-9.152	45.842	36.690	-9.310	46.000
881.913	-8.531	38.705	30.174	-15.826	46.000
Vertical					
Peak Detector					
127.000	-16.313	51.898	35.585	-7.915	43.500
302.725	-14.612	49.921	35.309	-10.691	46.000
446.116	-10.001	35.604	25.603	-20.397	46.000
592.319	-6.946	37.480	30.533	-15.467	46.000
753.986	-7.047	36.716	29.669	-16.331	46.000
942.362	-8.762	36.643	27.881	-18.119	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5700MHz) (Antenna No.20)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector					
176.203	-19.651	54.795	35.144	-8.356	43.500
249.304	-17.969	49.722	31.753	-14.247	46.000
371.609	-12.315	43.079	30.764	-15.236	46.000
499.536	-10.867	42.858	31.992	-14.008	46.000
600.754	-6.657	41.835	35.179	-10.821	46.000
700.565	-9.152	46.190	37.038	-8.962	46.000
Vertical					
Peak Detector					
143.870	-18.476	51.296	32.820	-10.680	43.500
249.304	-17.969	47.913	29.944	-16.056	46.000
436.275	-10.230	37.444	27.213	-18.787	46.000
599.348	-6.631	37.376	30.745	-15.255	46.000
746.957	-6.271	36.576	30.306	-15.694	46.000
810.217	-8.944	39.118	30.174	-15.826	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5400MHz) (Antenna No.21)

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					
164.957	-20.490	53.011	32.522	-10.978	43.500
249.304	-17.969	50.252	32.283	-13.717	46.000
371.609	-12.315	44.762	32.447	-13.553	46.000
600.754	-6.657	40.893	34.237	-11.763	46.000
700.565	-9.152	45.807	36.655	-9.345	46.000
800.377	-8.930	40.656	31.726	-14.274	46.000
Vertical					
Peak Detector					
145.275	-18.789	49.602	30.813	-12.687	43.500
302.725	-14.612	49.885	35.273	-10.727	46.000
439.087	-9.871	35.732	25.861	-20.139	46.000
590.913	-7.009	36.813	29.804	-16.196	46.000
700.565	-9.152	40.350	31.198	-14.802	46.000
810.217	-8.944	38.946	30.002	-15.998	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5700MHz) (Antenna No.22)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector					
163.551	-20.566	56.622	36.056	-7.444	43.500
371.609	-12.315	44.006	31.691	-14.309	46.000
499.536	-10.867	42.462	31.596	-14.404	46.000
600.754	-6.657	42.398	35.742	-10.258	46.000
700.565	-9.152	46.288	37.136	-8.864	46.000
800.377	-8.930	41.484	32.554	-13.446	46.000
Vertical					
Peak Detector					
150.899	-19.926	50.389	30.462	-13.038	43.500
302.725	-14.612	50.922	36.310	-9.690	46.000
455.957	-10.354	36.306	25.952	-20.048	46.000
592.319	-6.946	36.582	29.635	-16.365	46.000
744.145	-5.966	36.309	30.342	-15.658	46.000
877.696	-8.401	36.936	28.535	-17.465	46.000

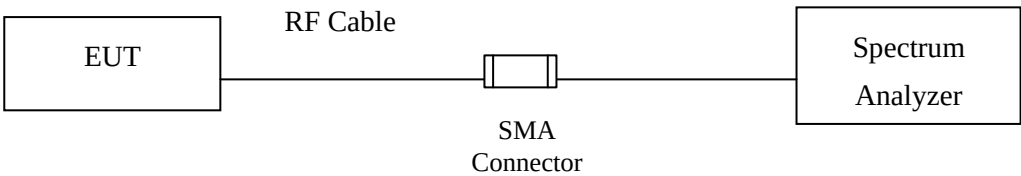
Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

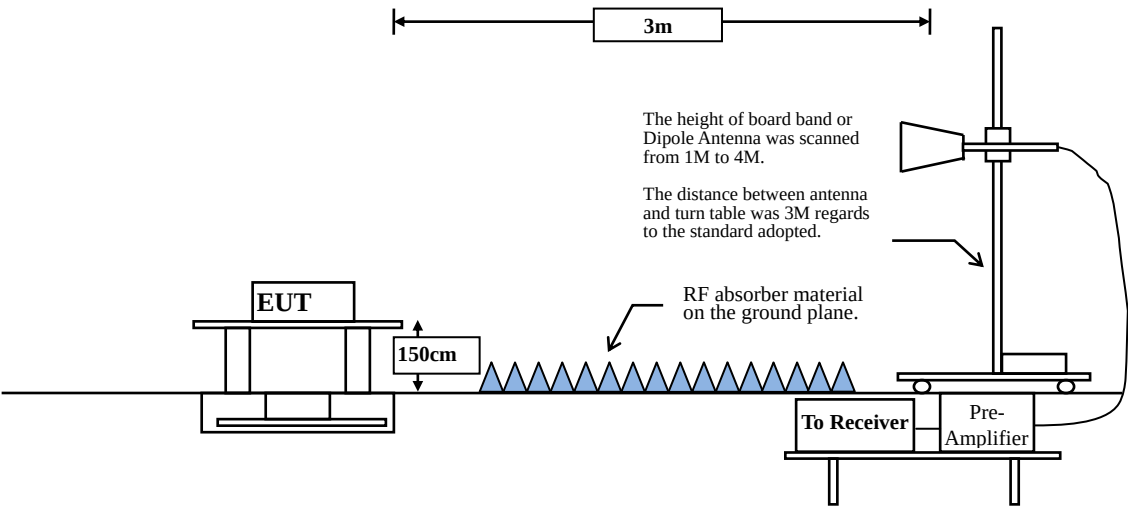
3. Band Edge

3.1. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



3.2. 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.

3.3. 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.

RBW and VBW Parameter setting:

According to KDB 789033 section II.G.5 Procedure for Unwanted Maximum Emissions
Measurements above 1000 MHz.

RBW = 1MHz.

VBW $\geq$ 3MHz.

According to KDB 789033 section II.G.6 Procedures for Average Unwanted Emissions
Measurements above 1000 MHz.

RBW = 1MHz.

VBW = 10Hz, when duty cycle $\geq$ 98 %

VBW $\geq$ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

5GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11 a	96.60	2.0580	486	500
802.11n20	98.00	4.9855	201	10
802.11n40	95.93	2.3913	418	500
802.11ac80	94.01	1.1377	879	1000

Note: Duty Cycle Refer to Section 8

3.4. Uncertainty

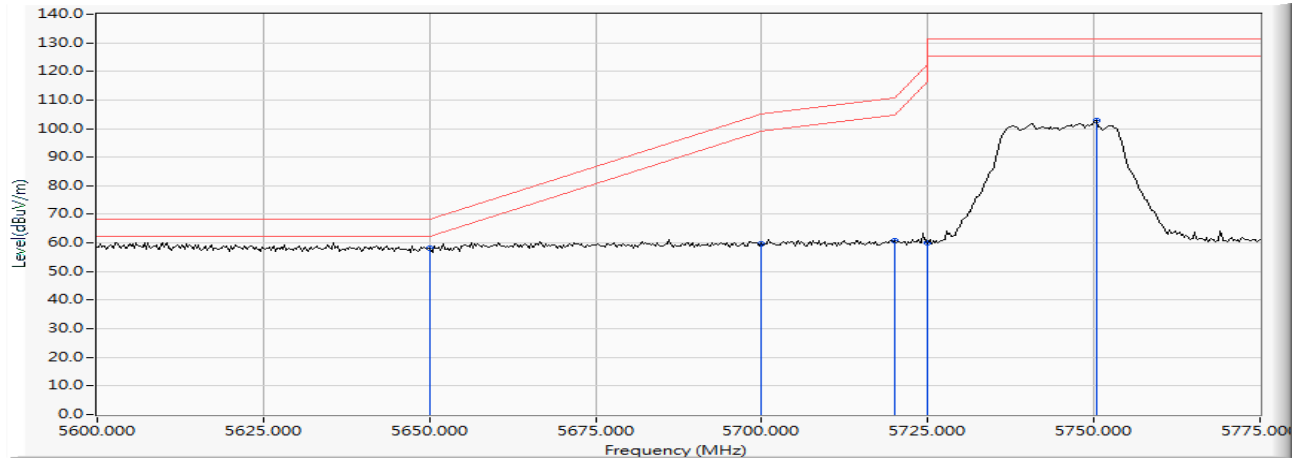
$\pm$ 4.08 dB above 1GHz

$\pm$ 4.22 dB below 1GHz

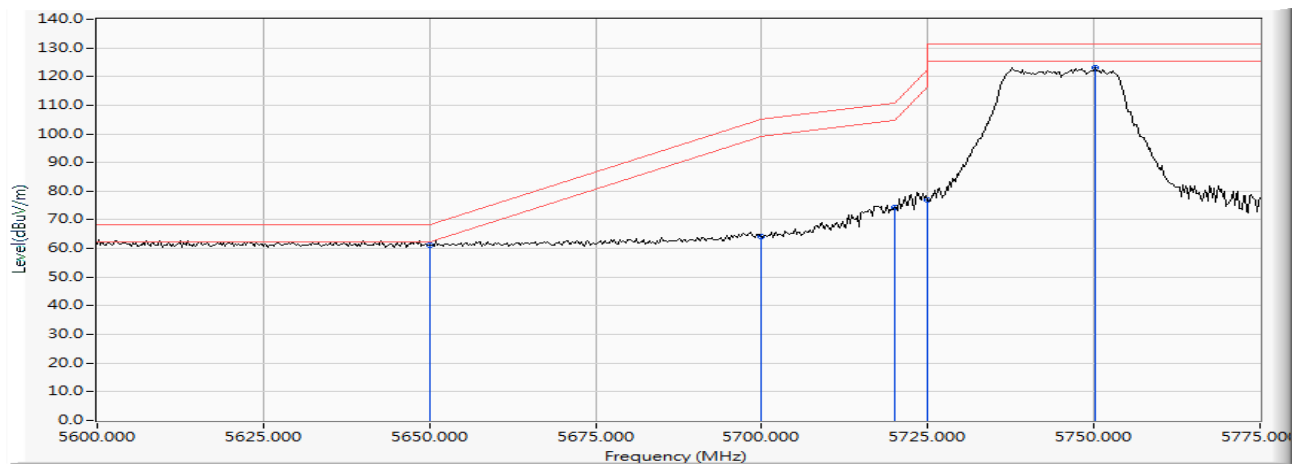
3.5. Test Result of Band Edge

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 28.8Mbps) -Channel 149 (Antenna No.1)

RF Radiated Measurement:



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Measure Level (dB μ V /m)	Margin (dB)	Limit (dB μ V /m)	Result
Horizontal	5650.000	16.772	41.355	58.127	-10.093	68.220	Pass
Horizontal	5700.000	16.636	43.153	59.789	-45.411	105.200	Pass
Horizontal	5720.000	16.623	44.089	60.712	-50.088	110.800	Pass
Horizontal	5725.000	16.624	43.361	59.985	-62.215	122.200	Pass
Horizontal	5750.399	16.642	86.113	102.755	-28.445	131.200	Pass

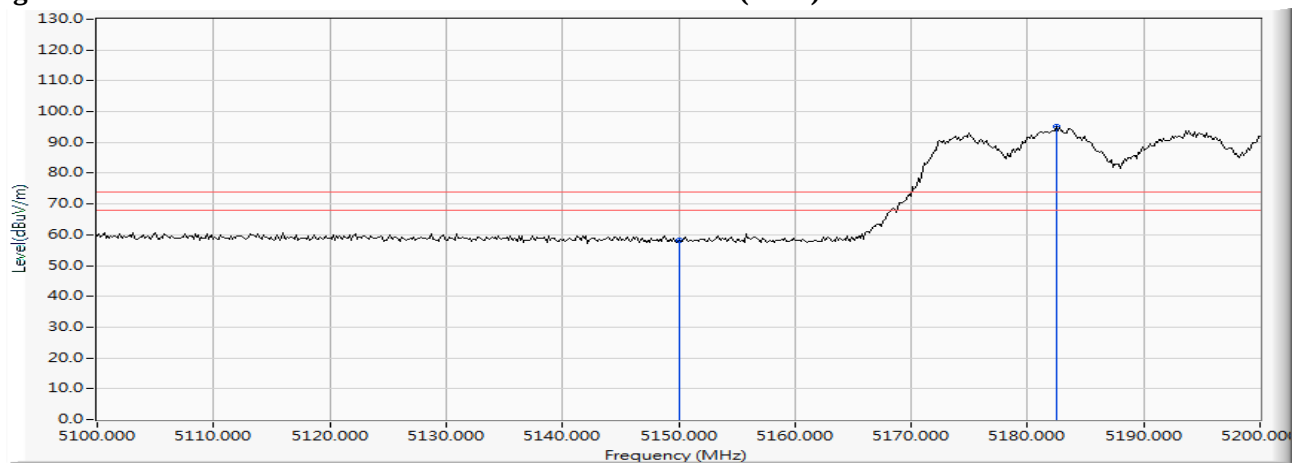
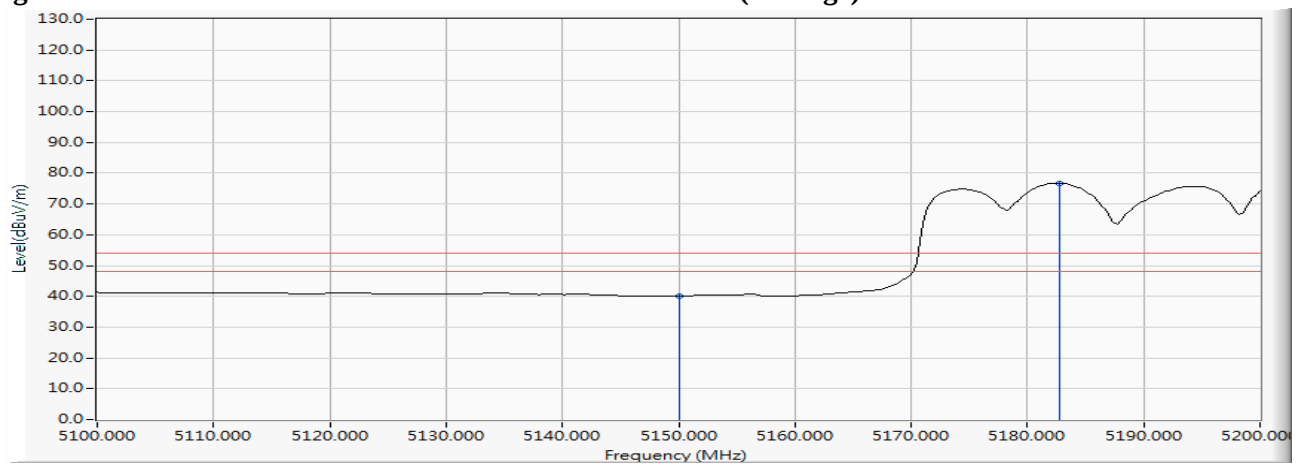


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Measure Level (dB μ V /m)	Margin (dB)	Limit (dB μ V /m)	Result
Vertical	5650.000	16.772	44.460	61.232	-6.988	68.220	Pass
Vertical	5700.000	16.636	47.589	64.225	-40.975	105.200	Pass
Vertical	5720.000	16.623	57.712	74.335	-36.465	110.800	Pass
Vertical	5725.000	16.624	60.362	76.986	-45.214	122.200	Pass
Vertical	5750.145	16.641	106.386	123.028	-8.172	131.200	Pass

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 42 (Antenna No.1)

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
42 (Peak)	5150.000	16.185	42.002	58.187	74.00	54.00	Pass
42 (Peak)	5182.464	15.814	79.189	95.003	--	--	--
42 (Average)	5150.000	16.185	23.960	40.145	74.00	54.00	Pass
42 (Average)	5182.754	15.811	60.891	76.702	--	--	--

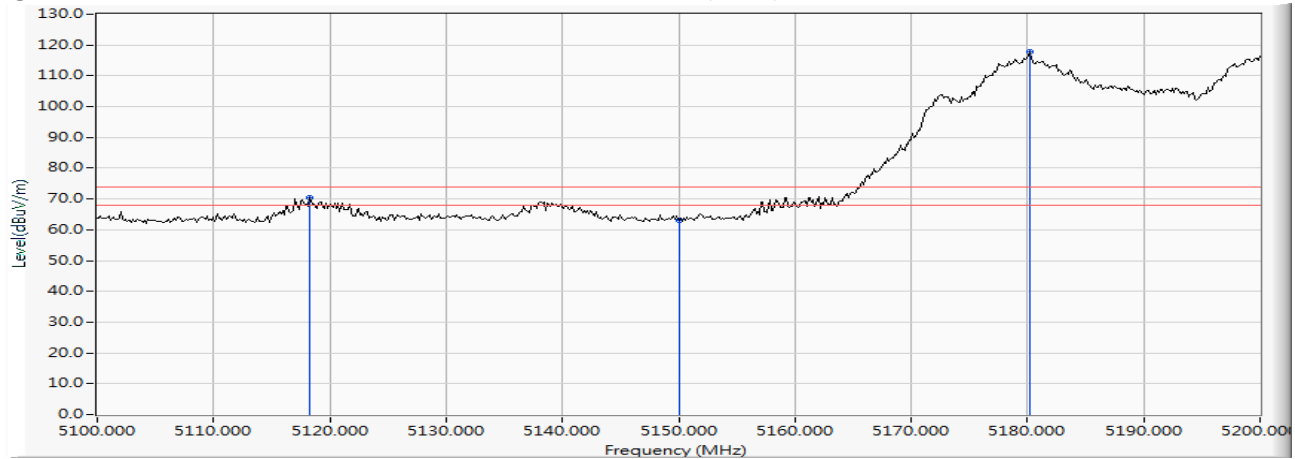
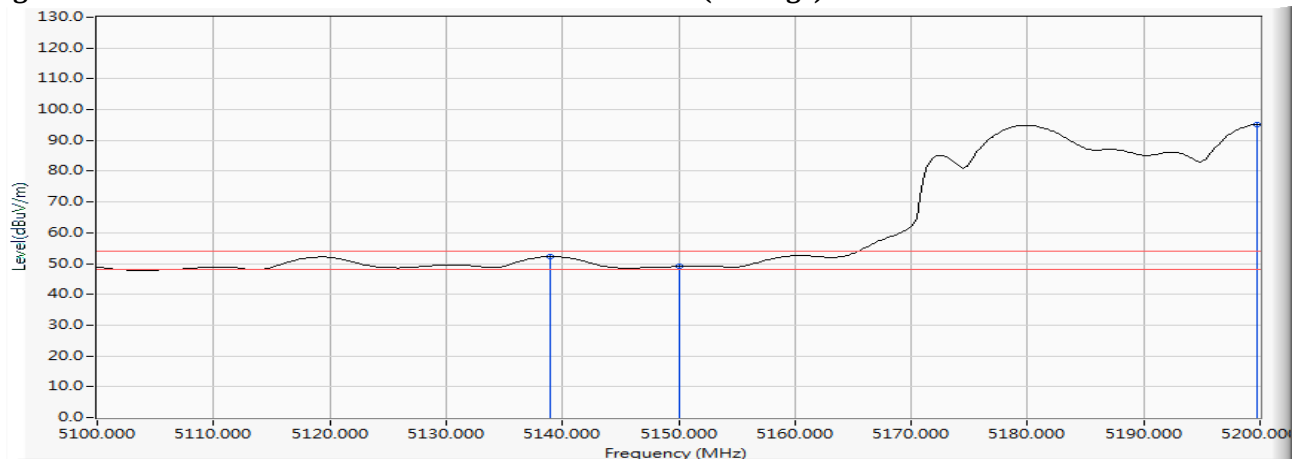
Figure Channel 42: Horizontal (Peak)

Figure Channel 42: Horizontal (Average)

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 42 (Antenna No.1)

RF Radiated Measurement (Vertical):

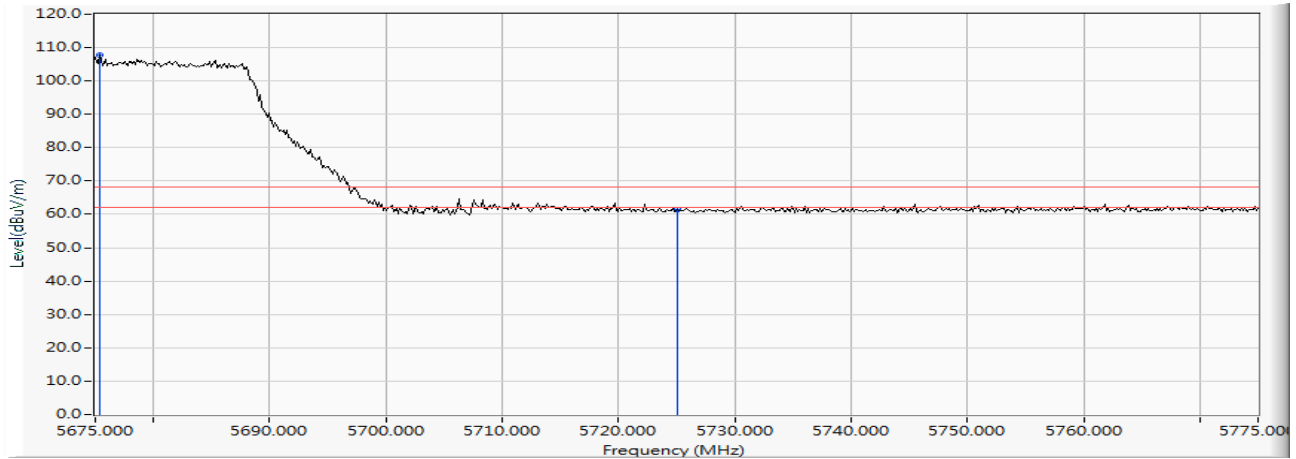
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
42 (Peak)	5118.261	16.547	53.687	70.234	74.00	54.00	Pass
42 (Peak)	5150.000	16.185	47.055	63.240	74.00	54.00	Pass
42 (Peak)	5180.145	15.841	101.879	117.720	--	--	--
42 (Average)	5138.986	16.311	36.044	52.355	74.00	54.00	Pass
42 (Average)	5150.000	16.185	32.825	49.010	74.00	54.00	Pass
42 (Average)	5199.710	15.619	79.621	95.241	--	--	--

Figure Channel 42:**Vertical (Peak)****Figure Channel 42:****Vertical (Average)**

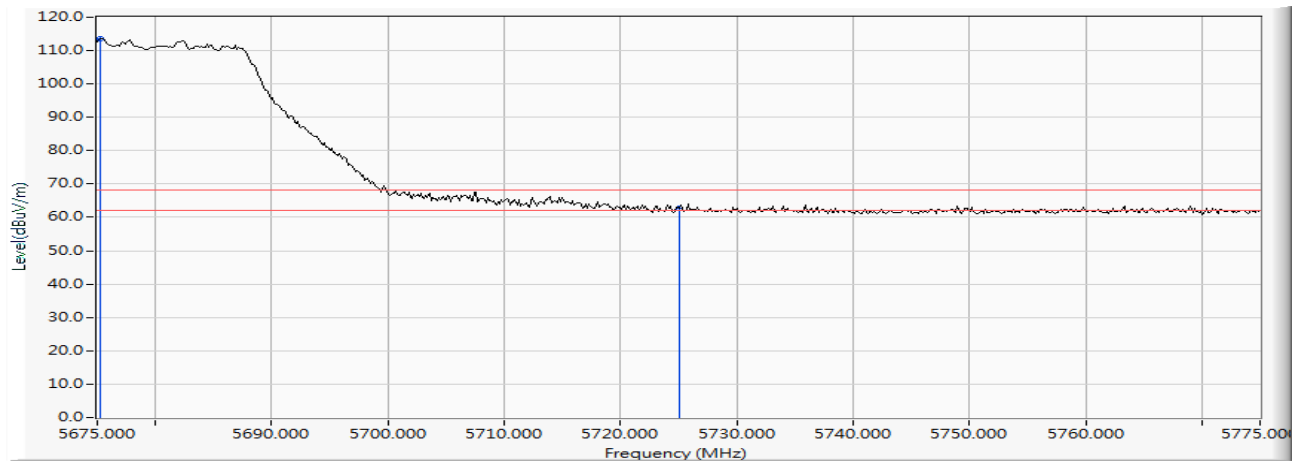
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 3: Transmit (802.11n-40BW 60Mbps) -Channel 102 (Antenna No.14)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Horizontal	5675.435	16.697	90.972	107.669	--	--	Pass
Horizontal	5725.000	16.624	44.924	61.548	-6.672	68.220	Pass
Horizontal	5506.500	12.191	83.847	96.039	27.819	68.220	Pass

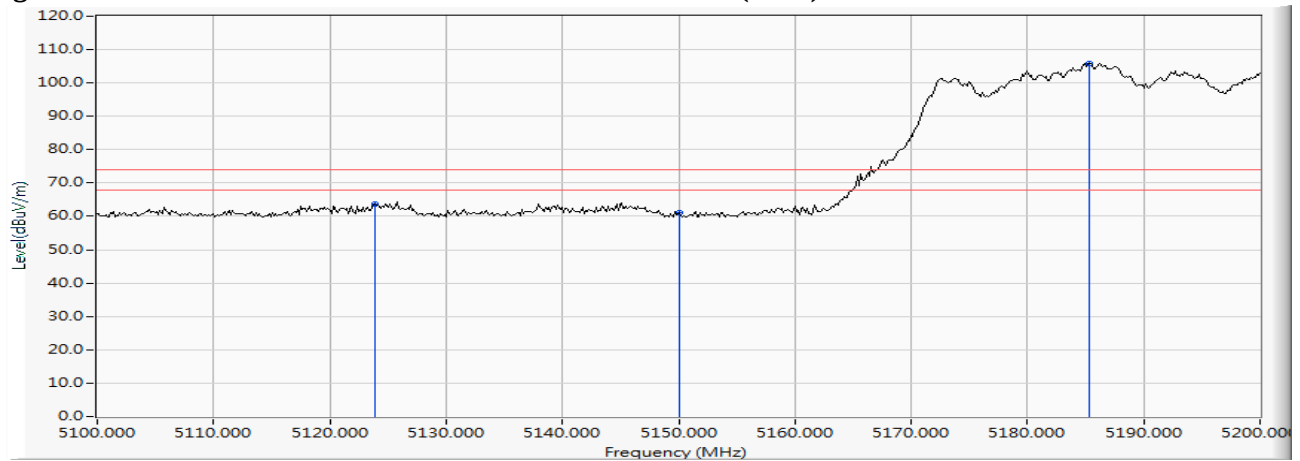
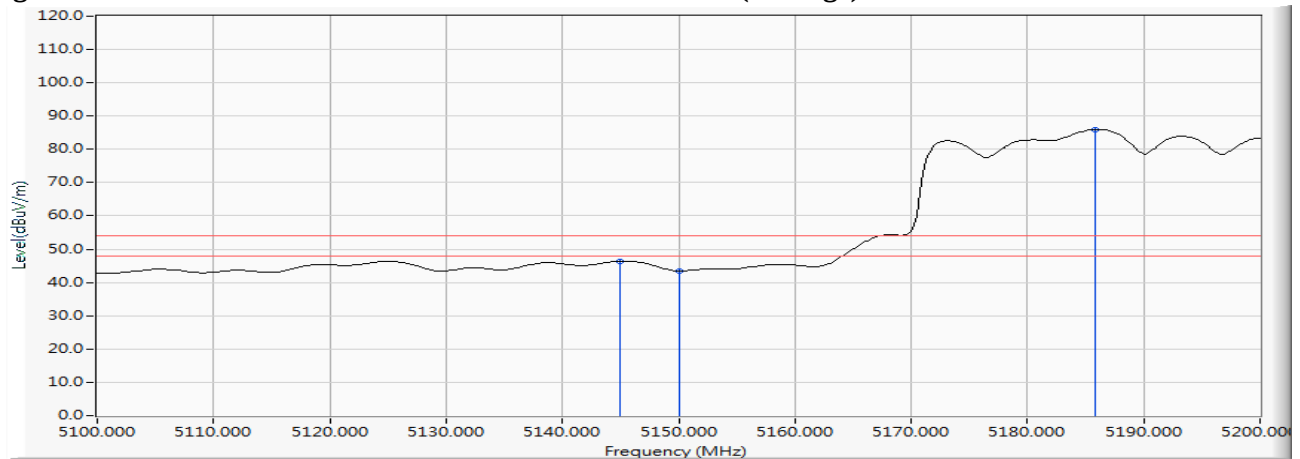


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Vertical	5675.290	16.697	96.724	113.421	--	--	Pass
Vertical	5725.000	16.624	46.182	62.806	-5.414	68.220	Pass

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 42 (Antenna No.14)

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
42 (Peak)	5123.913	16.483	47.305	63.788	74.00	54.00	Pass
42 (Peak)	5150.000	16.185	44.852	61.037	74.00	54.00	Pass
42 (Peak)	5185.362	15.782	90.166	105.948	--	--	--
42 (Average)	5144.928	16.242	30.124	46.367	74.00	54.00	Pass
42 (Average)	5150.000	16.185	27.250	43.435	--	--	--
	5185.797	15.777	70.270	86.047			

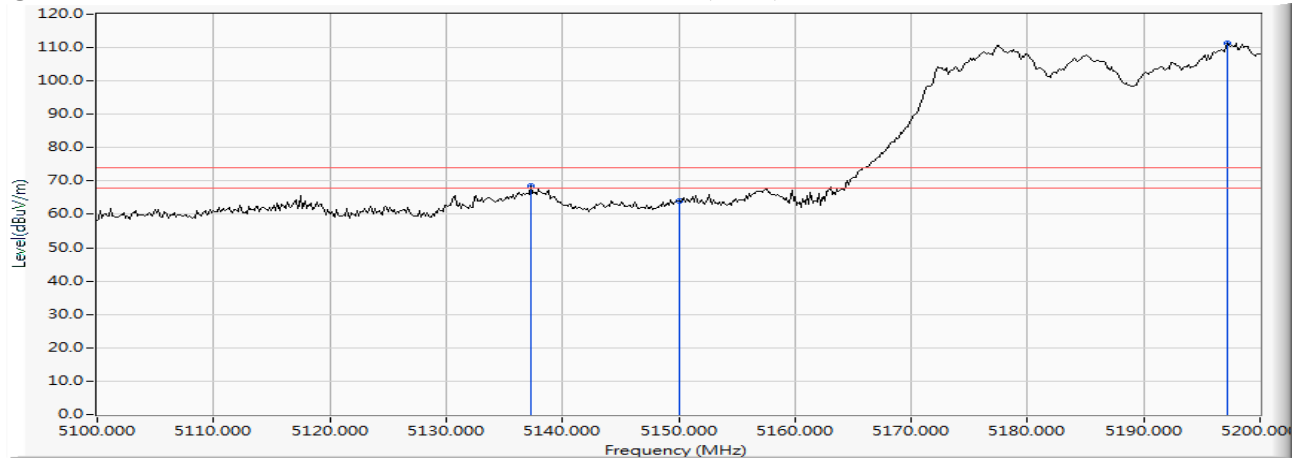
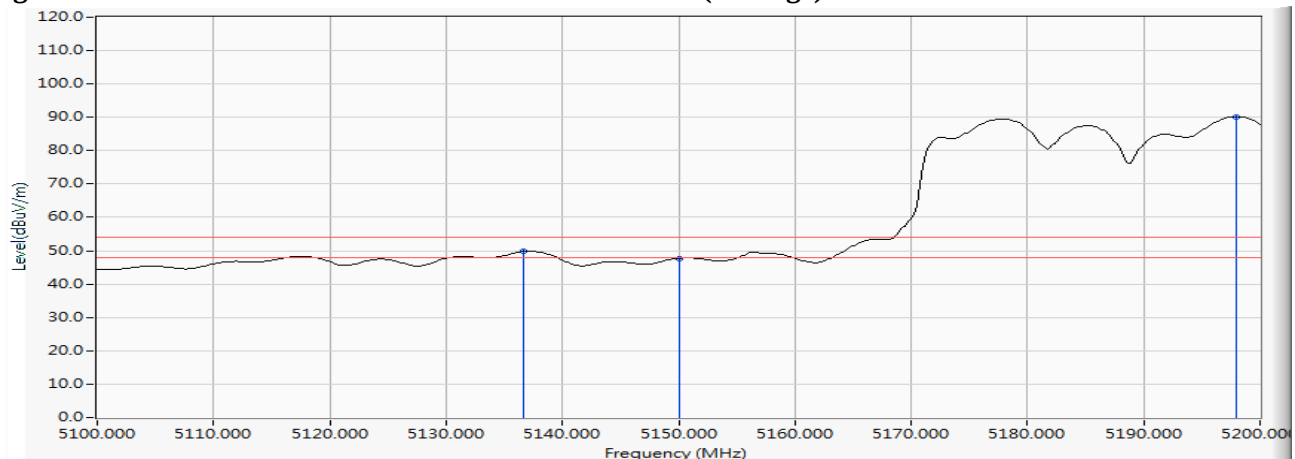
Figure Channel 42: Horizontal (Peak)

Figure Channel 42: Horizontal (Average)

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/18
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 42 (Antenna No.14)

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
42 (Peak)	5137.246	16.330	52.115	68.446	74.00	54.00	Pass
42 (Peak)	5150.000	16.185	47.700	63.885	74.00	54.00	Pass
42 (Peak)	5197.246	15.646	95.699	111.345	--	--	--
42 (Average)	5136.667	16.337	33.472	49.809	74.00	54.00	Pass
42 (Average)	5150.000	16.185	31.521	47.706	74.00	54.00	Pass
42 (Average)	5197.971	15.638	74.591	90.229	--	--	--

Figure Channel 42:**Vertical (Peak)****Figure Channel 42:****Vertical (Average)**

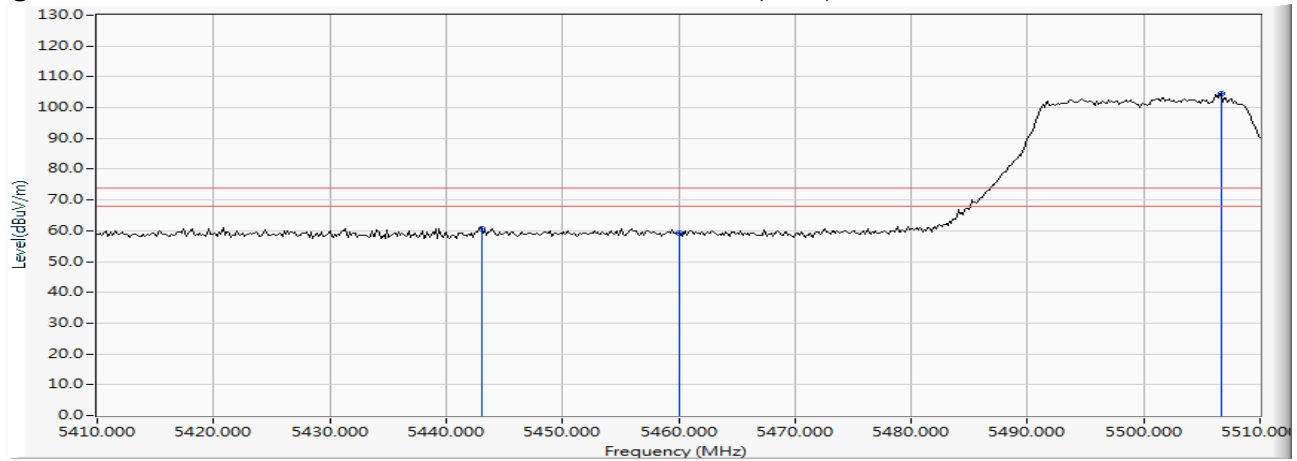
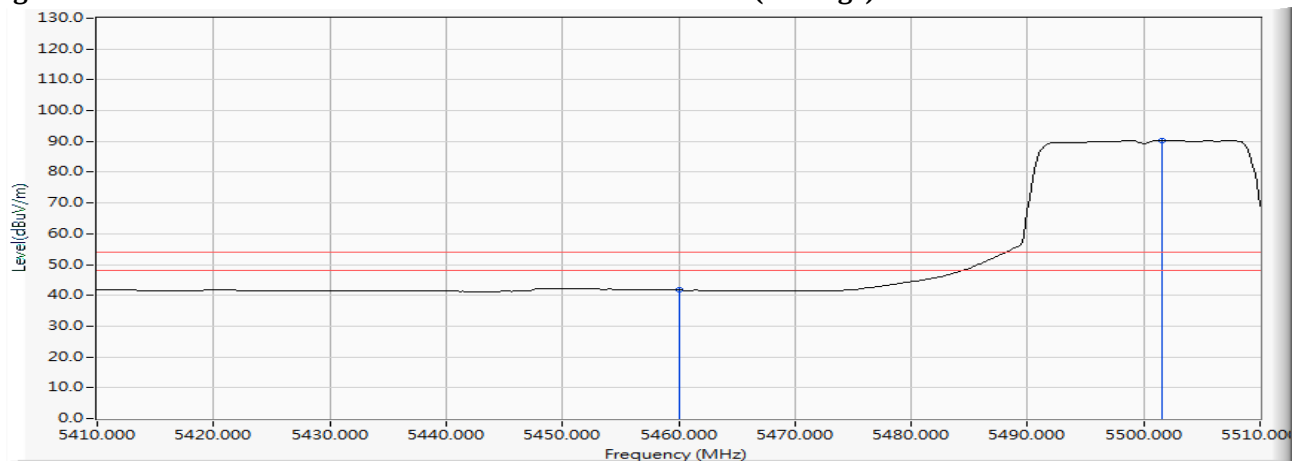
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 2: Transmit (802.11n-20BW 28.8Mbps) -Channel 100 (Antenna No.20)

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
100 (Peak)	5443.043	16.722	43.985	60.708	74.00	54.00	Pass
100 (Peak)	5460.000	16.870	42.403	59.273	74.00	54.00	Pass
100 (Peak)	5506.667	17.198	87.226	104.424	--	--	--
100 (Average)	5460.000	16.870	24.916	41.786	74.00	54.00	Pass
100 (Average)	5501.594	17.185	73.094	90.279	--	--	--

Figure Channel 100: Horizontal (Peak)**Figure Channel 100: Horizontal (Average)**

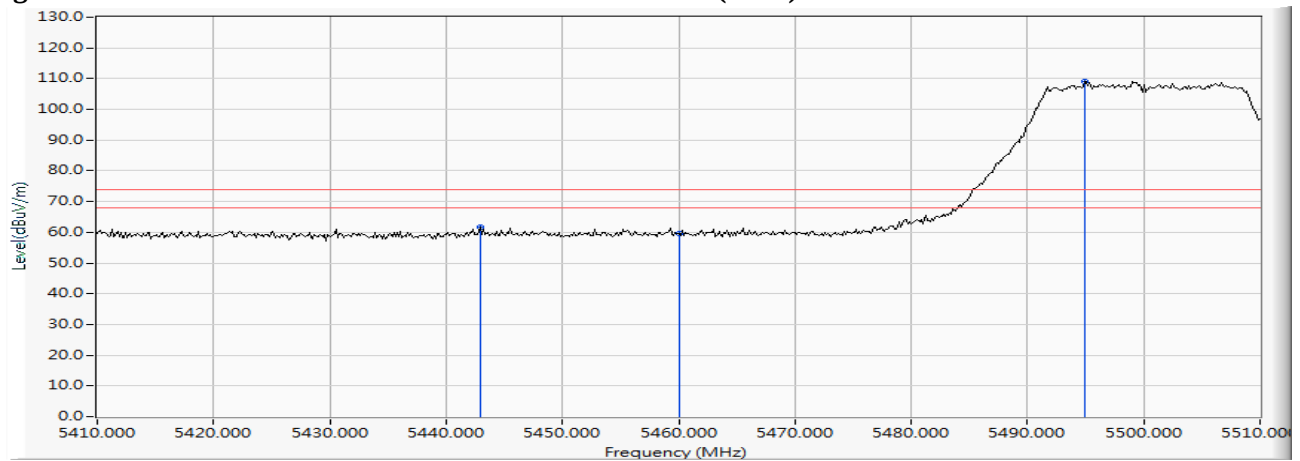
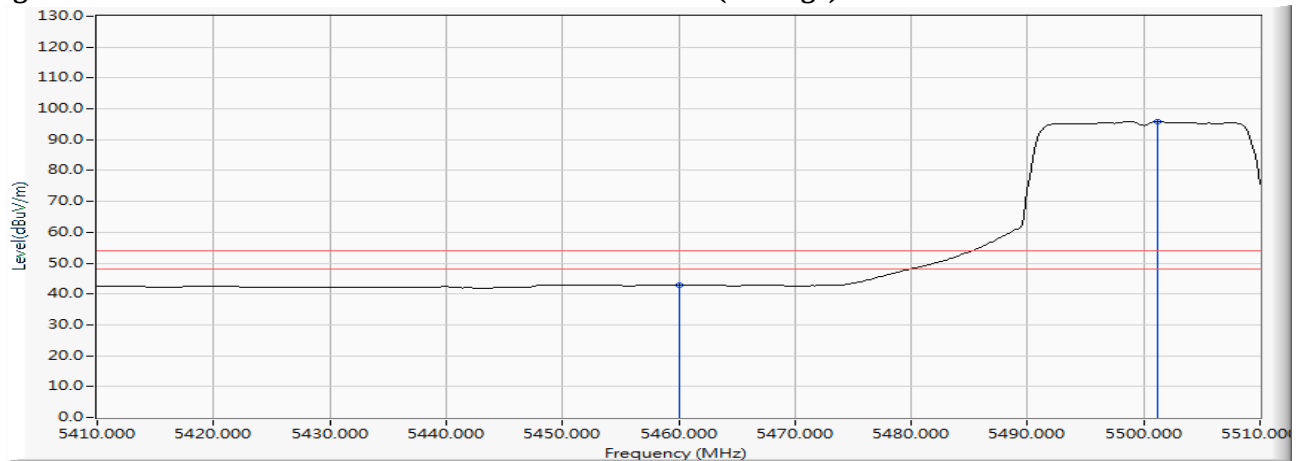
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 2: Transmit (802.11n-20BW 28.8Mbps) -Channel 100 (Antenna No.20)

RF Radiated Measurement (Vertical):

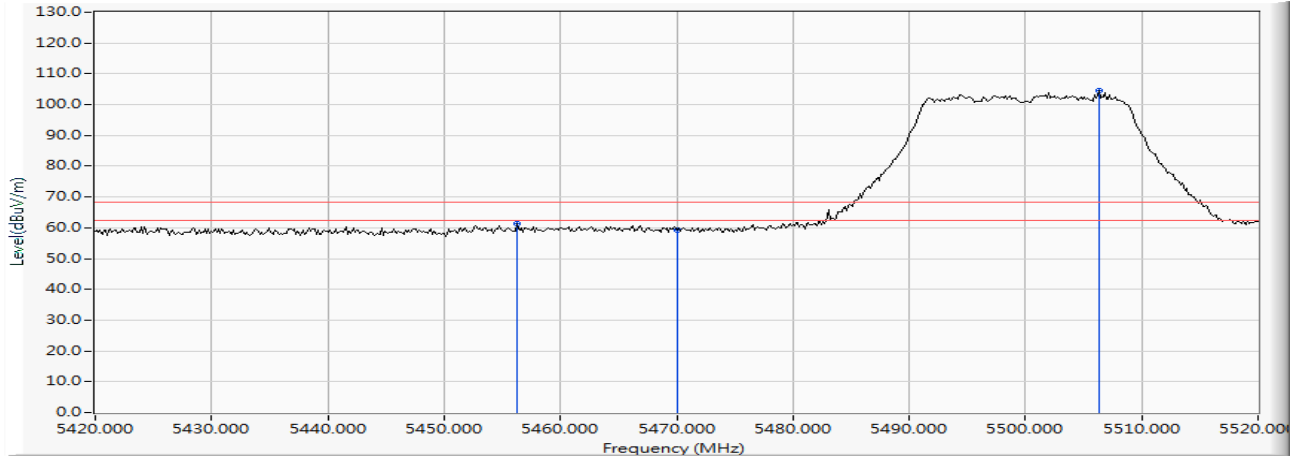
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
100 (Peak)	5442.898	16.721	44.795	61.516	74.00	54.00	Pass
100 (Peak)	5460.000	16.870	42.592	59.462	74.00	54.00	Pass
100 (Peak)	5494.928	17.151	91.910	109.060	--	--	--
100 (Average)	5460.000	16.870	25.954	42.824	74.00	54.00	Pass
100 (Average)	5501.159	17.183	78.616	95.799	--	--	--

Figure Channel 100:**Vertical (Peak)****Figure Channel 100:****Vertical (Average)**

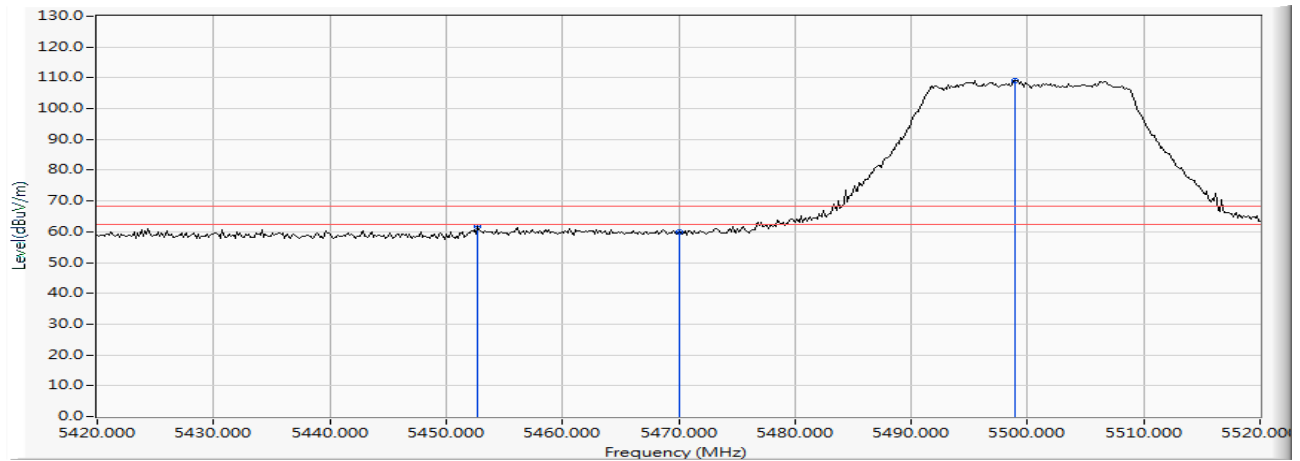
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 2: Transmit (802.11n-20BW 28.8Mbps) -Channel 100 (Antenna No.20)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Horizontal	5456.232	16.837	44.343	61.180	-7.040	68.220	Pass
Horizontal	5470.000	16.957	42.296	59.253	-8.967	68.220	Pass
Horizontal	5506.377	17.199	87.238	104.437	--	--	Pass

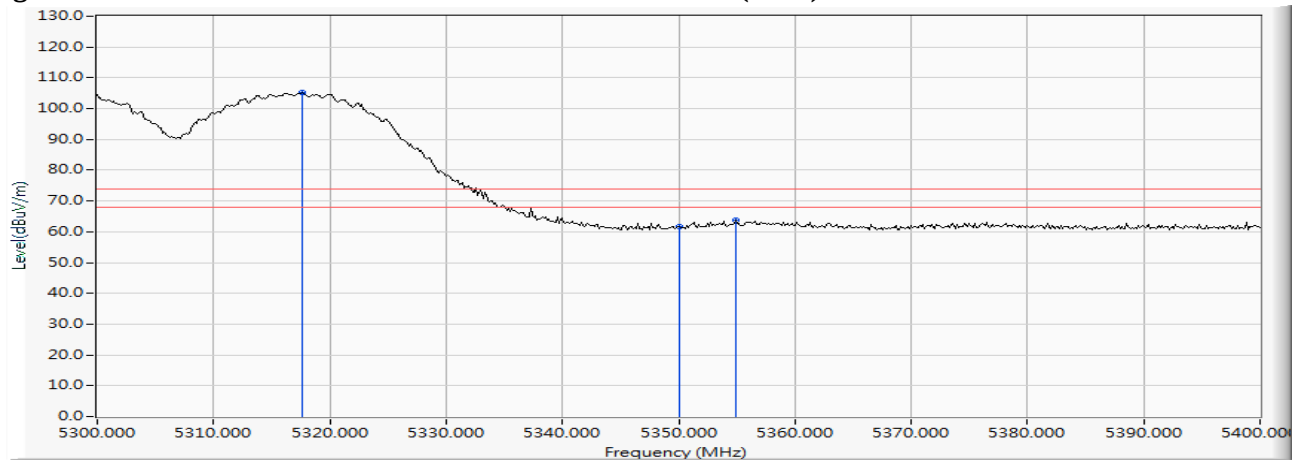
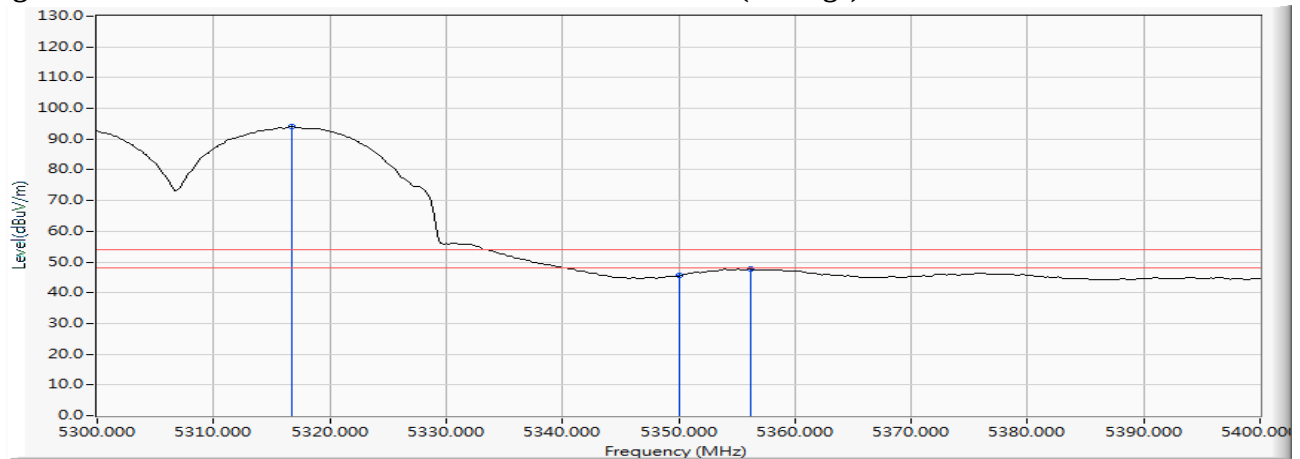


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Vertical	5452.753	16.807	44.879	61.686	-6.534	68.220	Pass
Vertical	5470.000	16.957	42.882	59.839	-8.381	68.220	Pass
Vertical	5498.985	17.172	91.849	109.021	--	--	Pass

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 58 (Antenna No.20)

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
58 (Peak)	5317.681	15.550	89.578	105.129	--	--	--
58 (Peak)	5350.000	15.865	45.798	61.662	74.00	54.00	Pass
58 (Peak)	5354.928	15.912	48.006	63.918	74.00	54.00	Pass
58 (Average)	5316.667	15.541	78.456	93.997	--	--	--
58 (Average)	5350.000	15.865	29.619	45.483	74.00	54.00	Pass
58 (Average)	5356.232	15.925	31.835	47.760	74.00	54.00	Pass

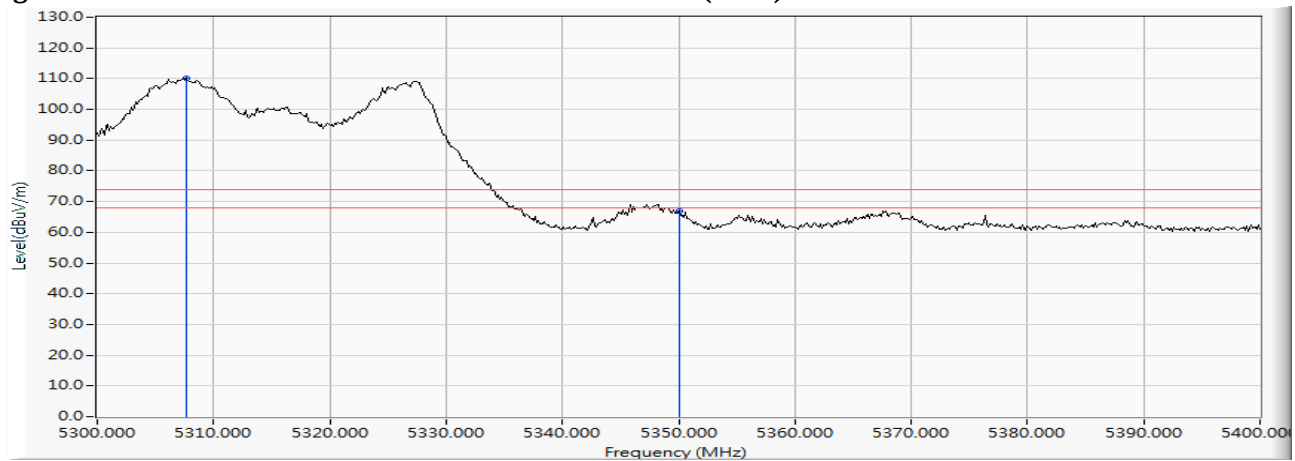
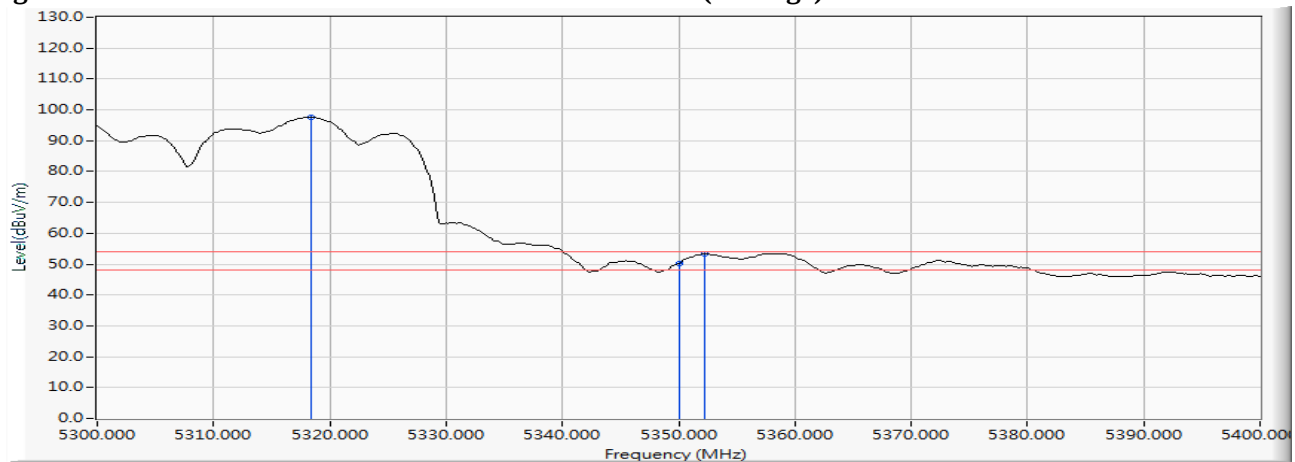
Figure Channel 58: Horizontal (Peak)

Figure Channel 58: Horizontal (Average)

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 58 (Antenna No.20)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
58 (Peak)	5307.681	15.454	94.747	110.201	--	--	--
58 (Peak)	5350.000	15.865	51.158	67.022	74.00	54.00	Pass
58 (Average)	5318.406	15.558	82.105	97.662	--	--	--
58 (Average)	5350.000	15.865	34.343	50.207	74.00	54.00	Pass
58 (Average)	5352.174	15.886	37.551	53.437	74.00	54.00	Pass

Figure Channel 58:**Vertical (Peak)****Figure Channel 58:****Vertical (Average)**

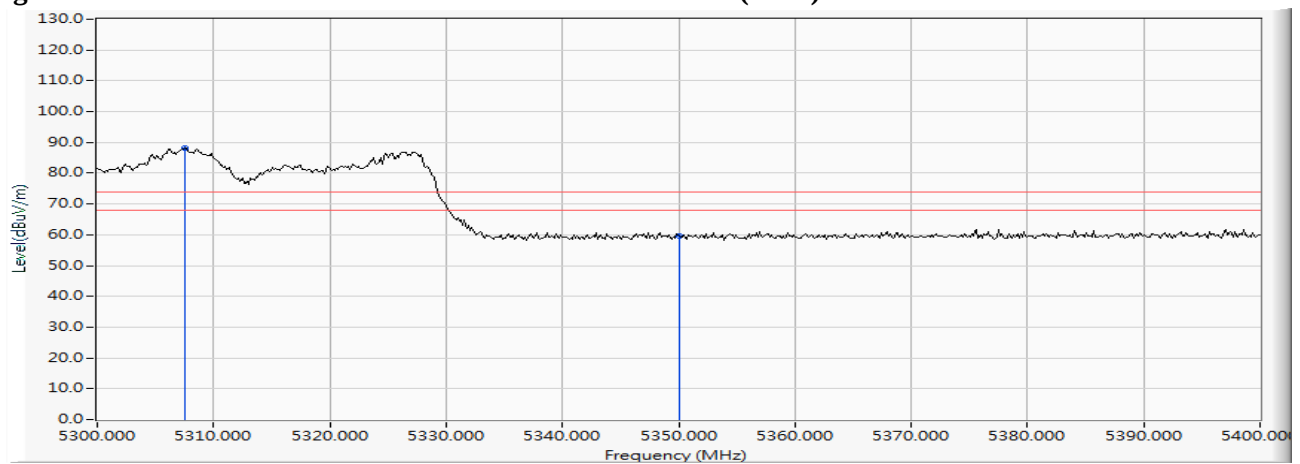
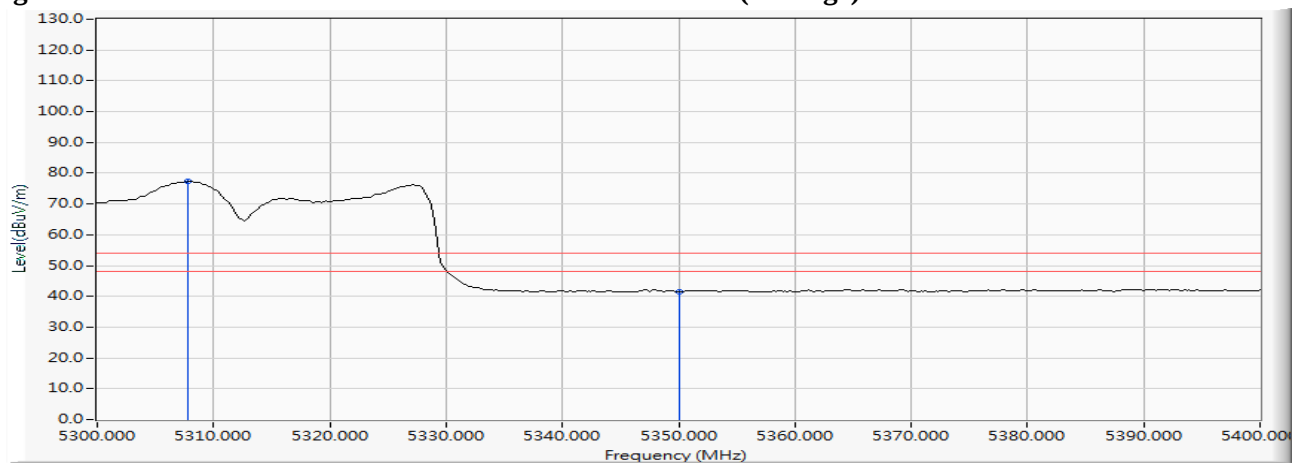
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 58 (Antenna No.21)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
58 (Peak)	5307.536	15.452	72.856	88.308	--	--	--
58 (Peak)	5350.000	15.865	43.661	59.525	74.00	54.00	Pass
58 (Average)	5307.826	15.455	61.826	77.281	--	--	--
58 (Average)	5350.000	15.865	25.585	41.449	74.00	54.00	Pass

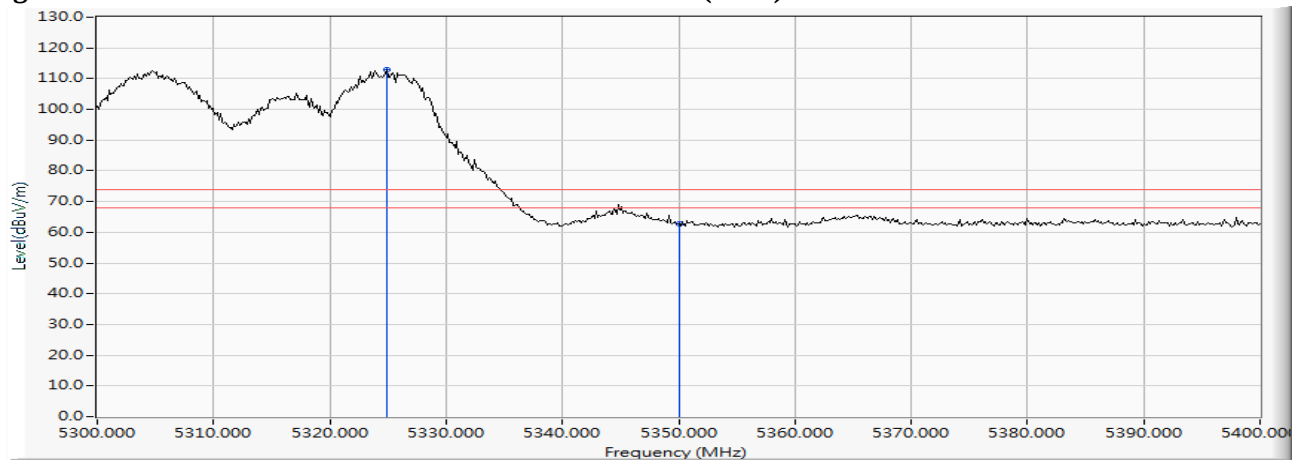
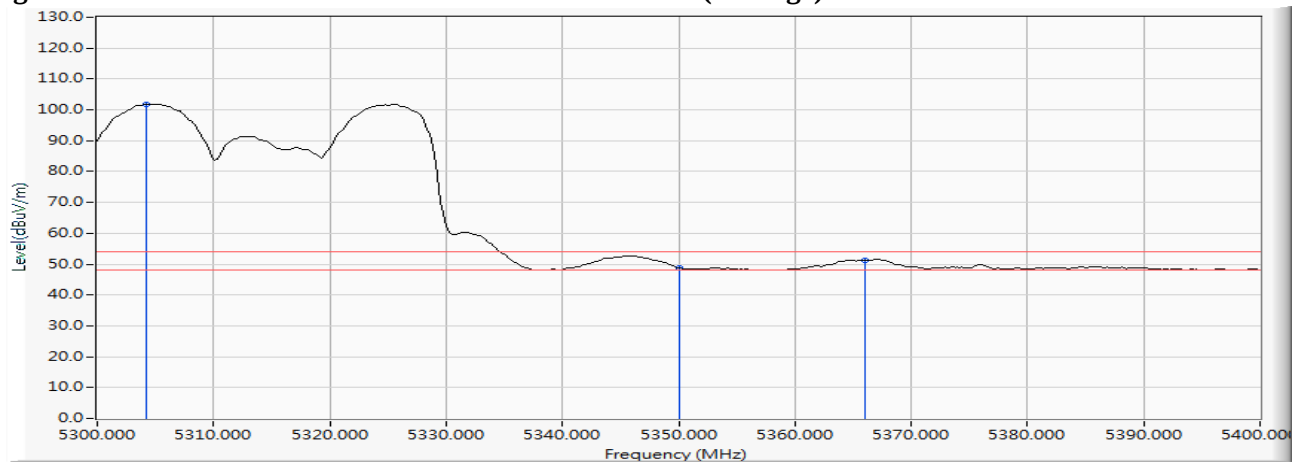
Figure Channel 58:
Horizontal (Peak)

Figure Channel 58:
Horizontal (Average)

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 58 (Antenna No.21)

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
58 (Peak)	5324.928	15.621	97.418	113.039	--	--	--
58 (Peak)	5350.000	15.865	46.732	62.596	74.00	54.00	Pass
58 (Average)	5304.203	15.421	86.465	101.885	--	--	--
58 (Average)	5350.000	15.865	32.883	48.747	74.00	54.00	Pass
58 (Average)	5366.087	16.020	35.326	51.346	74.00	54.00	Pass

Figure Channel 58: Vertical (Peak)**Figure Channel 58: Vertical (Average)**

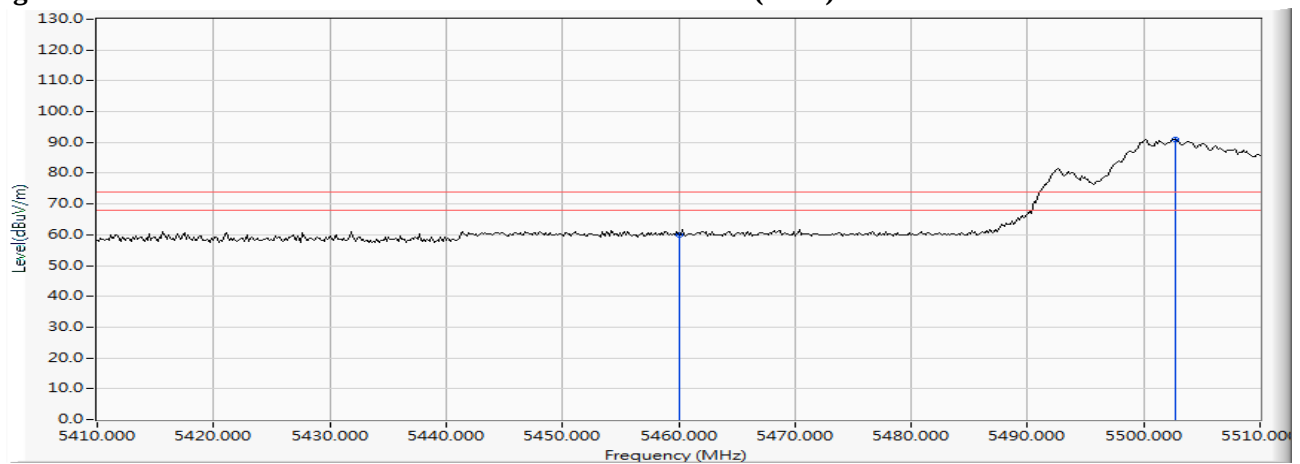
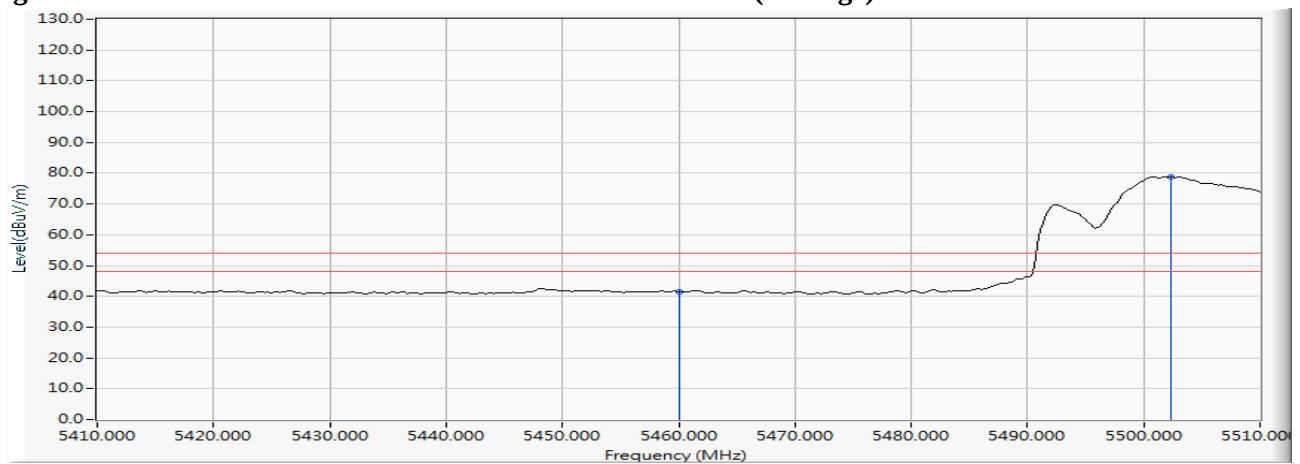
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 106 (Antenna No.21)

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
106 (Peak)	5460.000	16.870	43.179	60.049	74.00	54.00	Pass
106 (Peak)	5502.754	17.192	73.877	91.068	--	--	--
106 (Average)	5460.000	16.870	24.627	41.497	74.00	54.00	Pass
106 (Average)	5502.319	17.189	61.661	78.850	--	--	--

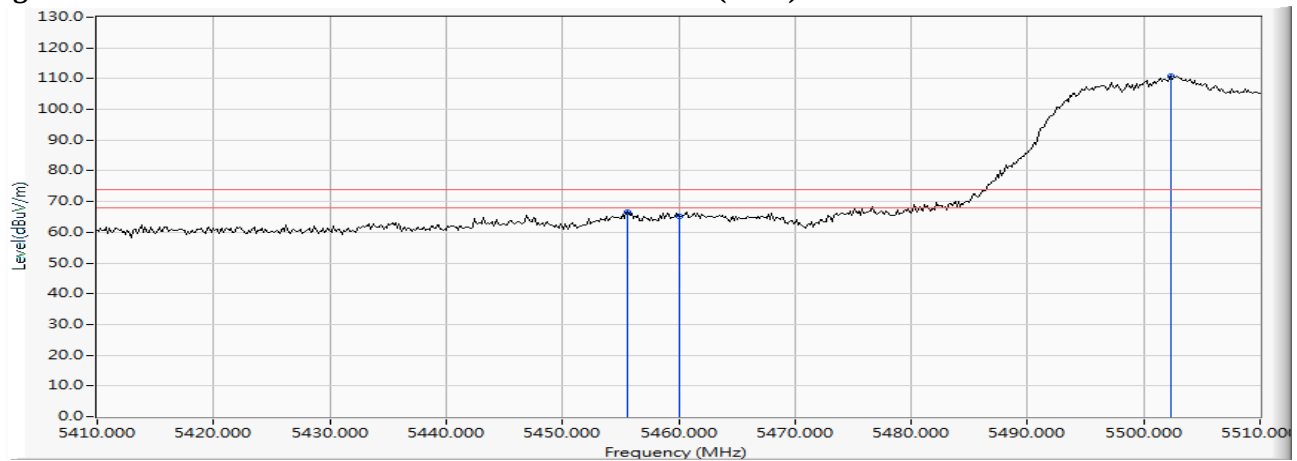
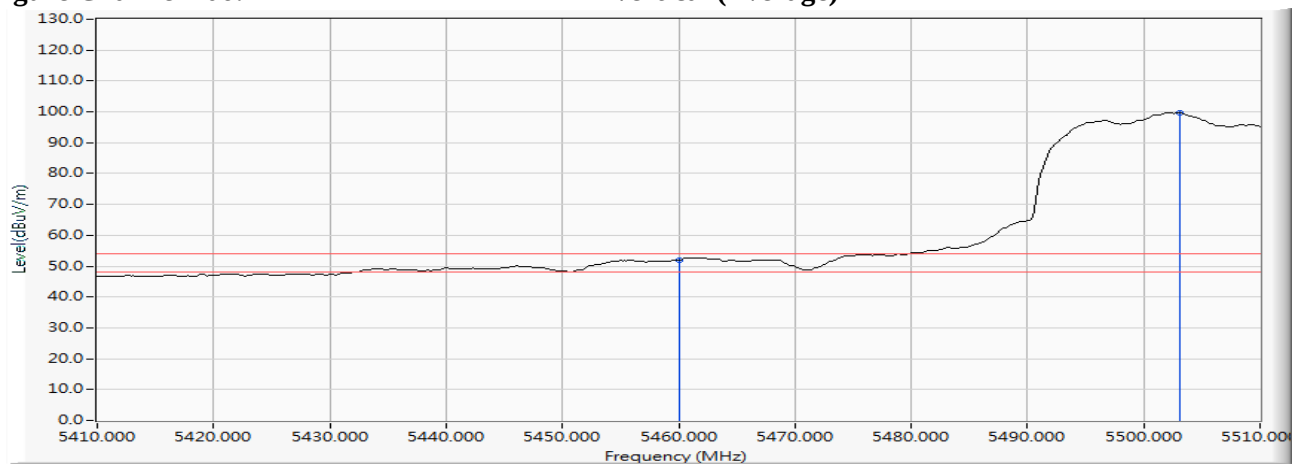
Figure Channel 106:
Horizontal (Peak)

Figure Channel 106:
Horizontal (Average)

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 106 (Antenna No.21)

RF Radiated Measurement (Vertical):

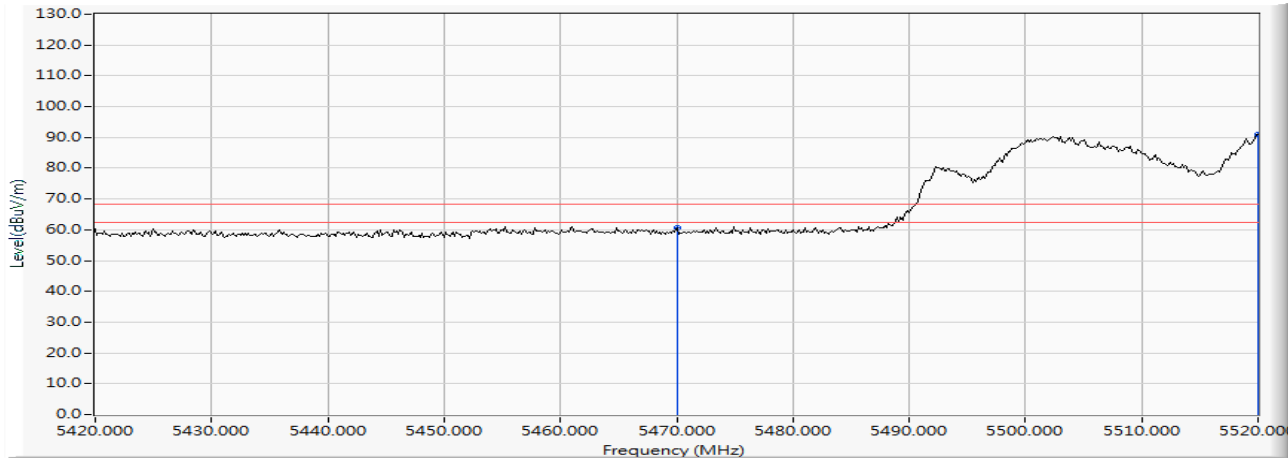
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
106 (Peak)	5455.652	16.832	49.754	66.586	74.00	54.00	Pass
106 (Peak)	5460.000	16.870	48.414	65.284	74.00	54.00	Pass
106 (Peak)	5502.319	17.189	93.535	110.724	--	--	--
106 (Average)	5460.000	16.870	35.086	51.956	74.00	54.00	Pass
106 (Average)	5503.043	17.193	82.525	99.718	--	--	--

Figure Channel 106:**Vertical (Peak)****Figure Channel 106:****Vertical (Average)**

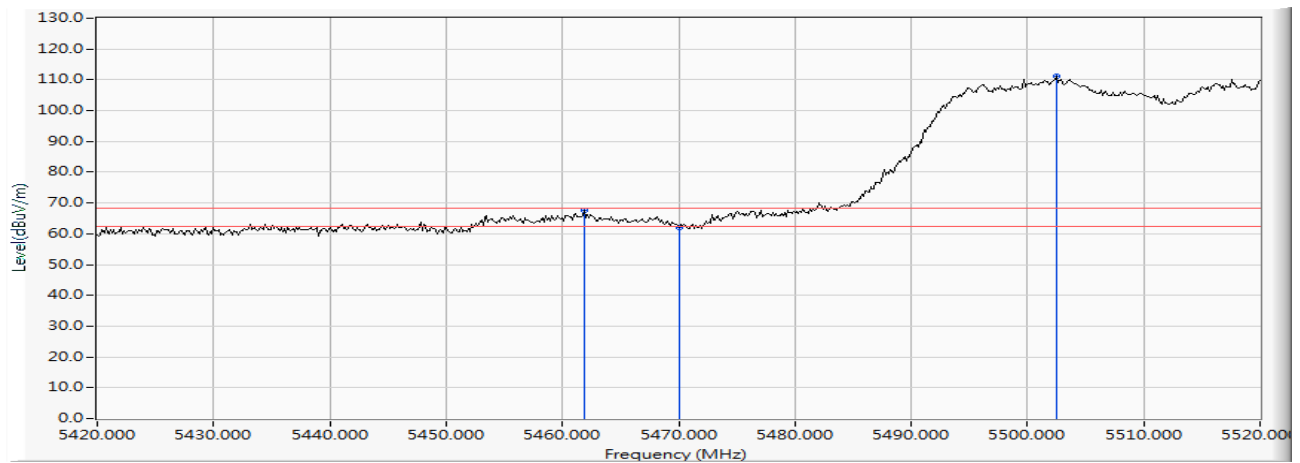
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 106 (Antenna No.21)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Horizontal	5470.000	16.957	43.848	60.805	-7.415	68.220	Pass
Horizontal	5520.000	17.158	73.671	90.829	--	--	Pass

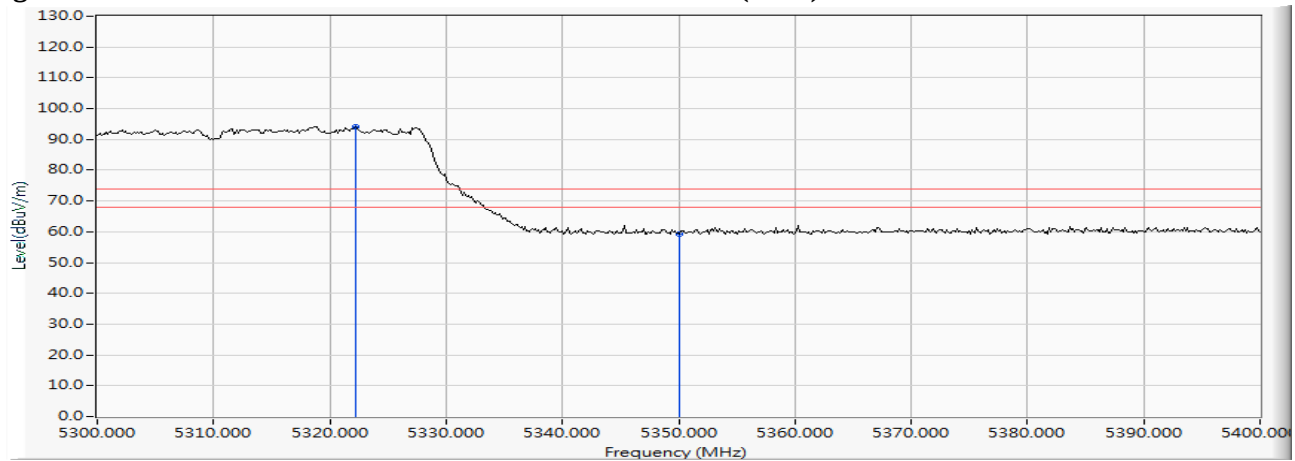
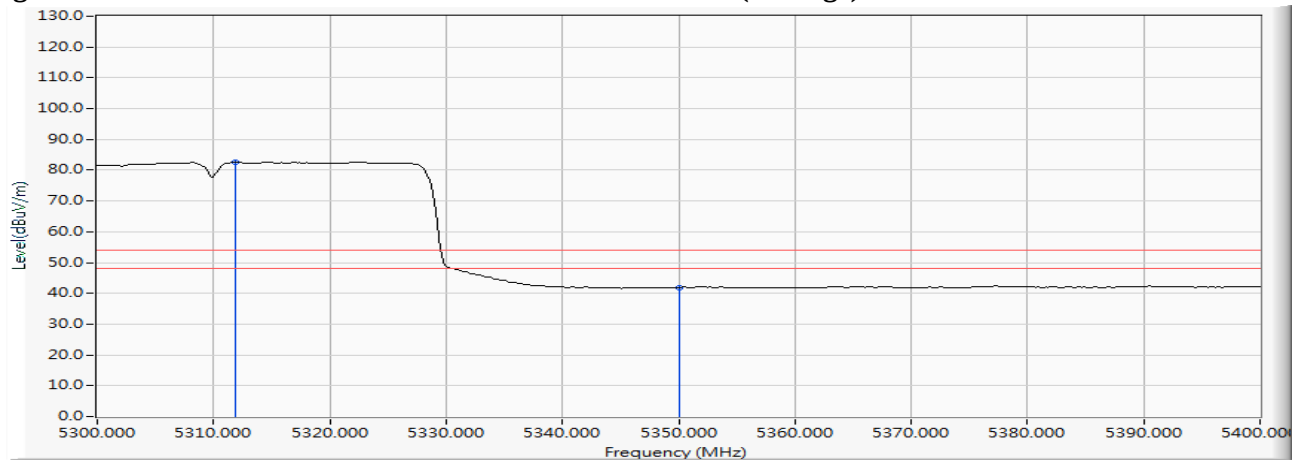


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Vertical	5461.884	16.887	50.799	67.685	-0.535	68.220	Pass
Vertical	5470.000	16.957	45.078	62.035	-6.185	68.220	Pass
Vertical	5502.464	17.190	93.892	111.082	--	--	Pass

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 3: Transmit (802.11n-40BW 60Mbps) -Channel 62 (Antenna No.22)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
62 (Peak)	5322.174	15.595	78.433	94.027	--	--	--
62 (Peak)	5350.000	15.865	43.332	59.196	74.00	54.00	Pass
62 (Average)	5311.884	15.495	67.124	82.619	--	--	--
62 (Average)	5350.000	15.865	25.923	41.787	74.00	54.00	Pass

Figure Channel 62:**Horizontal (Peak)****Figure Channel 62:****Horizontal (Average)**

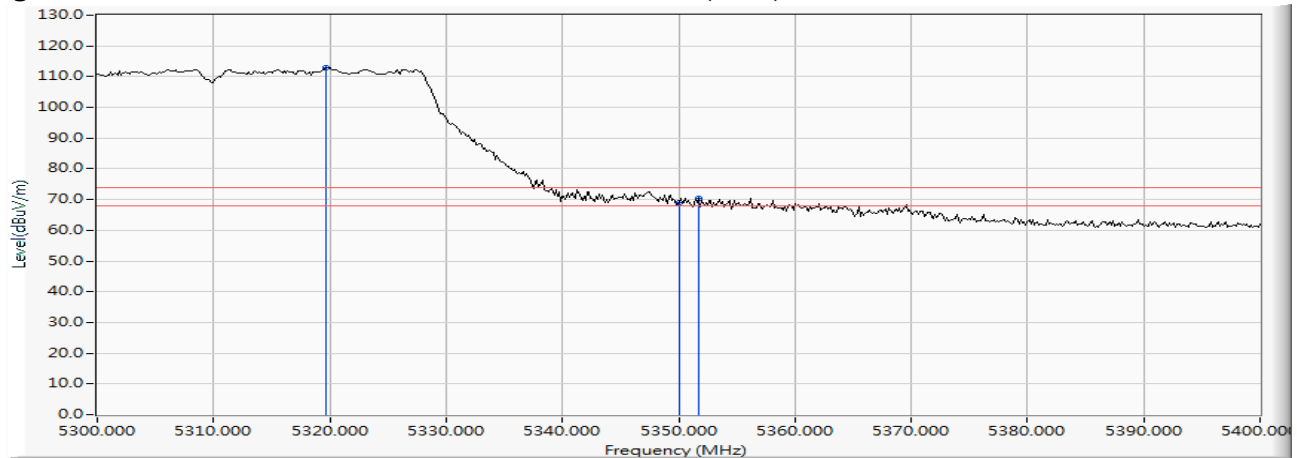
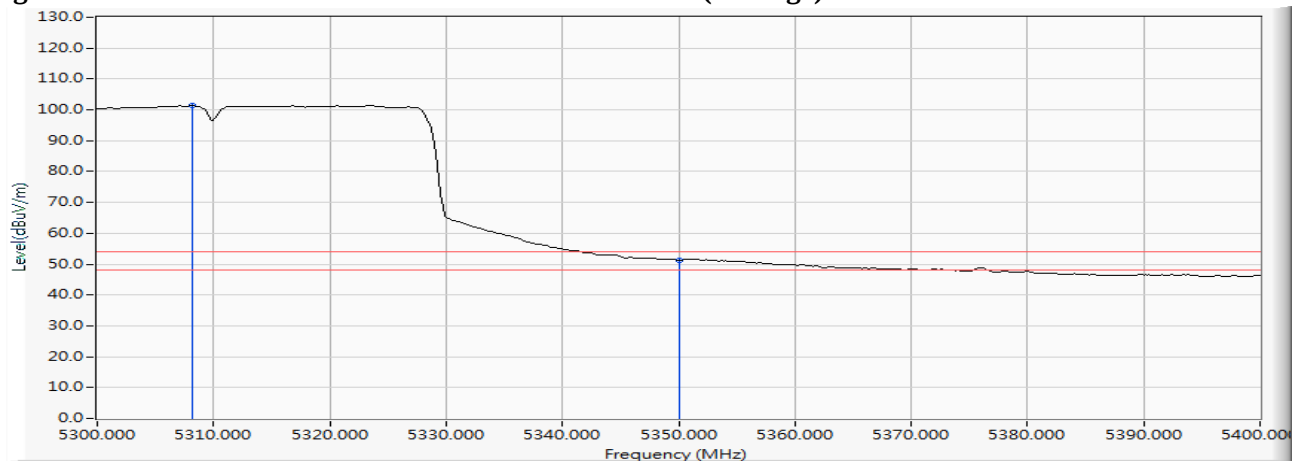
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 3: Transmit (802.11n-40BW 60Mbps) -Channel 62 (Antenna No.22)

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
62 (Peak)	5319.710	15.570	97.368	112.938	--	--	--
62 (Peak)	5350.000	15.865	52.978	68.842	74.00	54.00	Pass
62 (Peak)	5351.739	15.881	54.601	70.482	74.00	54.00	Pass
62 (Average)	5308.116	15.458	85.881	101.339	--	--	--
62 (Average)	5350.000	15.865	35.426	51.290	74.00	54.00	Pass

Figure Channel 62: Vertical (Peak)**Figure Channel 62: Vertical (Average)**

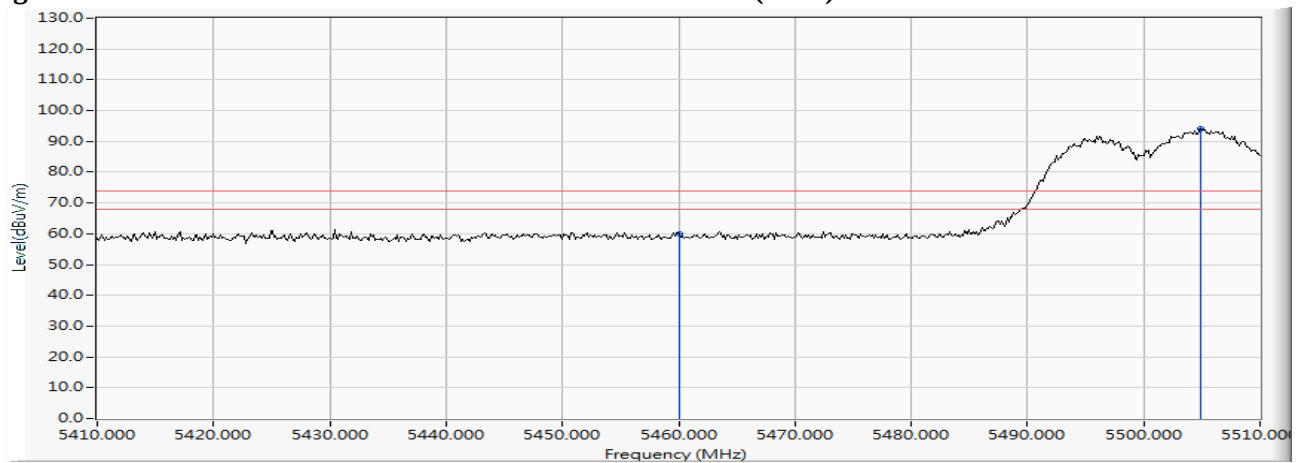
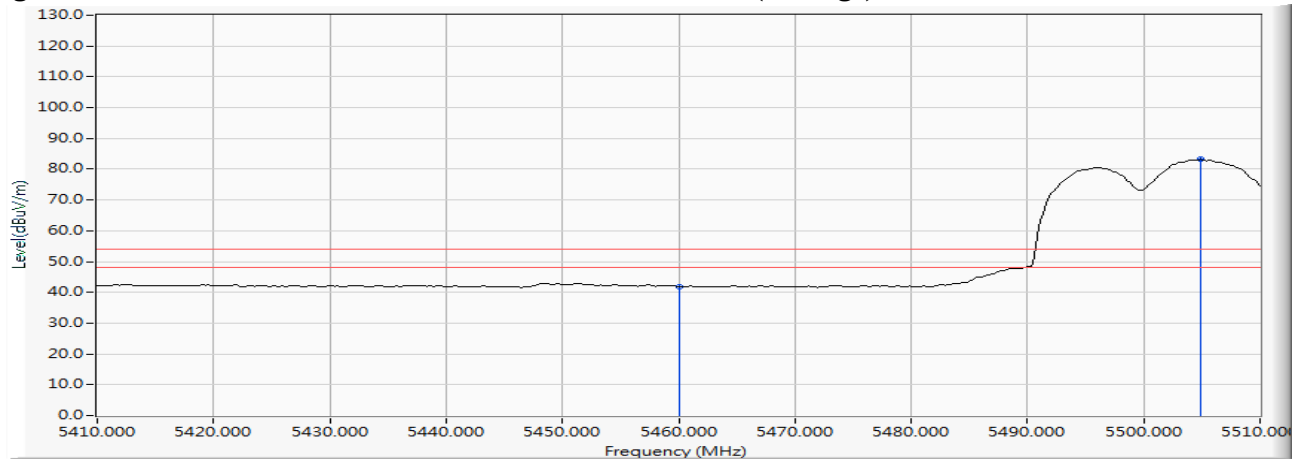
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 106 (Antenna No.22)

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
106 (Peak)	5460.000	16.870	42.985	59.855	74.00	54.00	Pass
106 (Peak)	5504.928	17.203	77.063	94.266	--	--	--
106 (Average)	5460.000	16.870	24.925	41.795	74.00	54.00	Pass
106 (Average)	5504.928	17.203	65.935	83.138	--	--	--

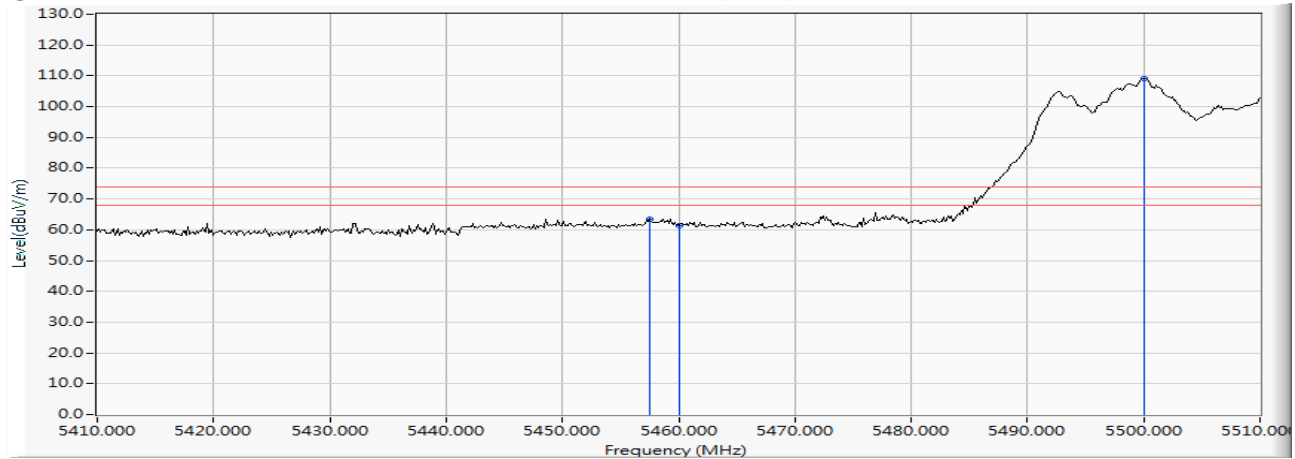
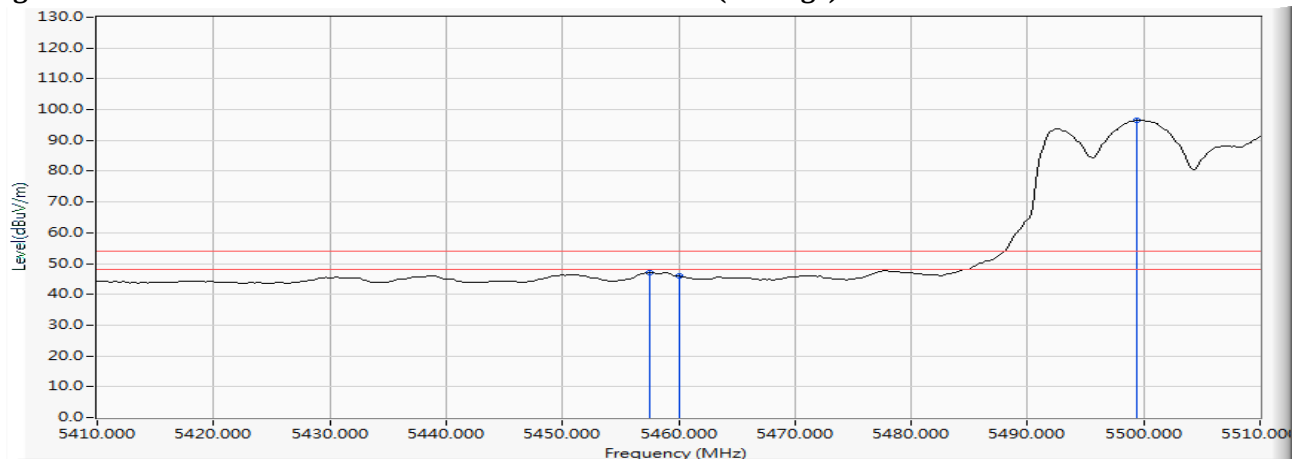
Figure Channel 106: Horizontal (Peak)**Figure Channel 106: Horizontal (Average)****Note:**

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 106 (Antenna No.22)

RF Radiated Measurement (Vertical):

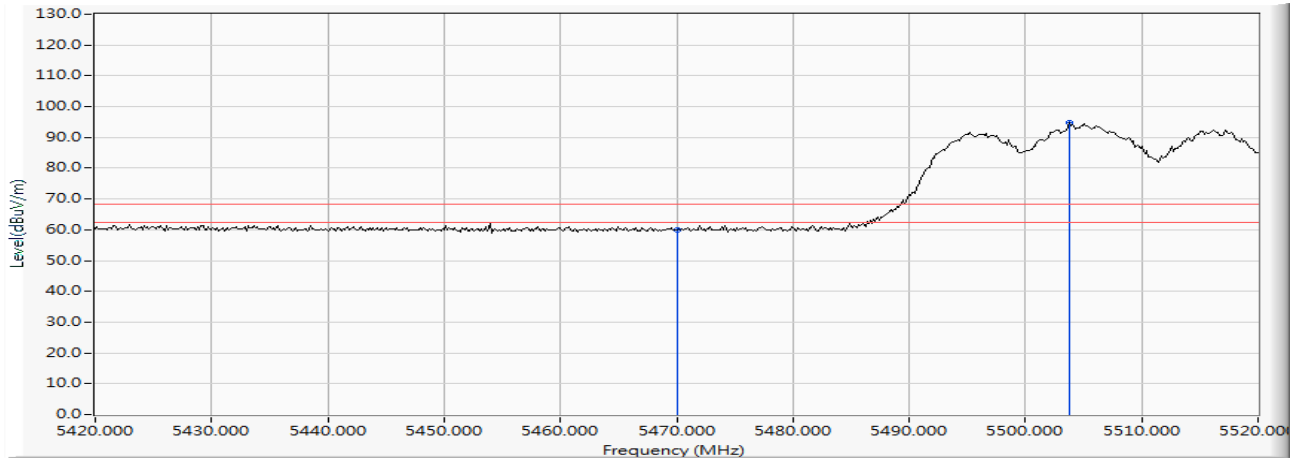
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
106 (Peak)	5457.536	16.848	46.610	63.458	74.00	54.00	Pass
106 (Peak)	5460.000	16.870	44.536	61.406	74.00	54.00	Pass
106 (Peak)	5500.000	17.177	91.884	109.061	--	--	--
106 (Average)	5457.536	16.848	30.112	46.960	74.00	54.00	Pass
106 (Average)	5460.000	16.870	29.013	45.883	74.00	54.00	Pass
106 (Average)	5499.420	17.174	79.372	96.546	--	--	--

Figure Channel 106:**Vertical (Peak)****Figure Channel 106:****Vertical (Average)**

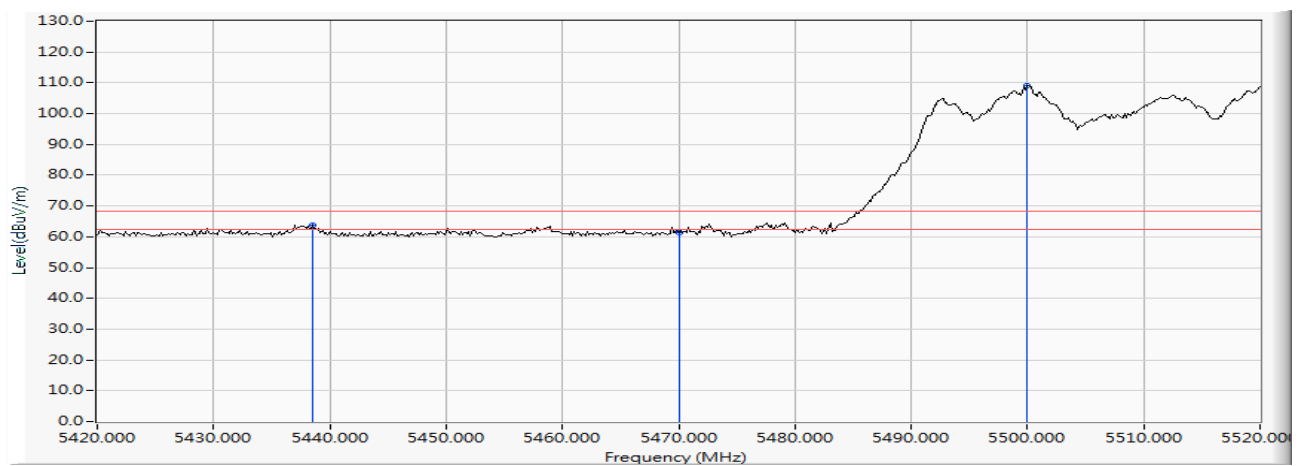
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection

Product : MOXA IEEE 802.11a/n/ac 4*4 module
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2019/09/19
 Test Mode : Mode 6: Transmit (802.11ac-80BW-130Mbps) -Channel 106 (Antenna No.22)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Horizontal	5470.000	16.957	42.898	59.855	-8.365	68.220	Pass
Horizontal	5503.768	17.197	77.439	94.636	26.416	68.220	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Vertical	5438.551	16.684	47.092	63.776	-4.444	68.220	Pass
Vertical	5470.000	16.957	44.241	61.198	-7.022	68.220	Pass
Vertical	5500.000	17.177	91.886	109.063	40.843	68.220	Pass

4. EMI Reduction Method During Compliance Testing

No modification was made during testing.