FCC TEST REPORT

Product Name:	Android BOX
Trade Mark:	Newline
Model No.:	X10D
Report Number:	180228003RFC-2
Test Standards:	FCC 47 CFR Part 15 Subpart E
FCC ID:	2APNX-X10D
Test Result:	PASS
Date of Issue:	June 5, 2018

Prepared for:

Newline Interactive Inc.
101 East Park Blvd. Suite 807 Plano TX 75074 USA

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd.
16/F, Block A, Building 6, Baoneng Science and Technology Park,
Qingxiang Road No.1, Longhua New District, Shenzhen, China
TEL: +86-755-2823 0888
FAX: +86-755-2823 0886

Tested by: Henry Lu, Engineer

Reviewed by: Kevin Liang, Assistant Manager

Approved by: Billy Li, Technical Director

Date: June 5, 2018

UnionTrust Laboratories * Certified *

Version

Version No.	Date	Description
V1.0	June 5, 2018	Original

CONTENTS

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Newline Interactive Inc..
Address of Applicant:	101 East Park Blvd. Suite 807 Plano TX 75074 USA
Manufacturer:	Newline Interactive Inc..
Address of Manufacturer:	101 East Park Blvd. Suite 807 Plano TX 75074 USA
Factory:	Shenzhen Zidoo Technology Co., Ltd
Address of Factory:	Room 12 D,Block A Central Great Searchings,Xixiang Ave,BaoAn District,Shenzhen.

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Android BOX		
Model No.:	X10D		
Trade Mark:	Newline		
DUT Stage:	Identical Prototype		
EUT Supports Function:	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
	5 GHz U-NII Bands:	5 150 MHz to 5 250 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
Software Version:	V1.0.x		
Hardware Version:	V1.3		
Sample Received Date:	March 19, 2018		
Sample Tested Date:	March 20, 2018 to March 28, 2018		

1.2.2 Description of Accessories

Adapter(1)	
Trade Mark:	ULLPOWER
Model No.:	ICP12-050-2000D
Input:	100-240 V~50/60 Hz 0.3 A
Output:	5.0 V ⎓ 2000mA
AC Cable:	N/A
DC Cable:	2.0 Meter, Unshielded with ferrite

Cable(1)	
Trade Mark:	N/A
Model No.:	N/A
Description:	HDMI Cable
Cable Type:	Shielded with two ferrite
Length:	1.50 Meter

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Frequency Range:	5150 MHz to 5250 MHz		
	5 725 MHz to 5 850 MHz		
Support Standards:	IEEE 802.11a/n/ac		
TPC Function:	Not Support		
DFS Operational mode:	Slave without radar Interference detection function		
Type of Modulation:	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)		
	IEEE 802.11n: OFDM(64QAM, 16QAM, QPSK, BPSK)		
	IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)		
Channel Spacing:	IEEE 802.11a/n-HT20/ac-VHT20: 20 MHz		
	IEEE 802.11n-HT40/ac-VHT40: 40 MHz		
	IEEE 802.11ac-VHT80/: 80 MHz		
Data Rate:	IEEE 802.11a: Up to 54 Mbps		
	IEEE 802.11n-HT20: Up to MCS7		
	IEEE 802.11n-HT40: Up to MCS7		
	IEEE 802.11ac-VHT20: Up to MCS8		
	IEEE 802.11ac-VHT40: Up to MCS9		
	IEEE 802.11ac-VHT80: Up to MCS9		
Number of Channels:	5150 MHz to 5250 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40)/ac-VHT40 1 for IEEE 802.11acVHT80		
	5725 MHz to 5850 MHz: 5 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11ac-VHT80		
Antenna Type:	FPCB Antenna		
Antenna Gain:	5150 MHz to 5250 MHz	2 dBi	
	5725 MHz to 5850 MHz	2 dBi	
Maximum Conducted Output Power (dBm):	**Mode**	**U-NII-1**	**U-NII-3**
	IEEE 802.11a	15.00	16.07
	IEEE 802.11n-HT20	14.84	16.02
	IEEE 802.11n-HT40	10.82	15.15
	IEEE 802.11ac-VHT20	14.82	15.51
	IEEE 802.11ac-VHT40	10.72	15.68
	IEEE 802.11ac-VHT80	10.44	15.88
Normal Test Voltage:	AC 120V/60Hz		
Extreme Test Voltage:	102 to 138 VAC		
Extreme Test Temperature:	-10 °C to +60 °C		

1.4 OTHER INFORMATION

Operation Frequency Each of Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
For IEEE 802.11a/n-HT20/ac-VHT20 operation in the 5150 MHz to 5250 MHz band							
36	5180 MHz	44	5220 MHz	40	5200 MHz	48	5240 MHz
For IEEE 802.11a/n-HT20/ac-VHT20 operation in the 5725 MHz to 5850 MHz band							
149	5745 MHz	153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825 MHz	--	--	--	--	--	--
For IEEE 802.11n-HT40/ac-VHT40 operation in the 5150 MHz to 5250 MHz band							
38	5190 MHz	46	5230 MHz	--	--	--	--
For IEEE 802.11n-HT40/ac-VHT40 operation in the 5725 MHz to 5850 MHz band							
151	5755 MHz	159	5795 MHz	--	--	--	--
For IEEE 802.11ac-VHT80 operation in the 5150 MHz to 5250 MHz band							
42	5210 MHz	--	--	--	--	--	--
For IEEE 802.11ac-VHT80 operation in the 5725 MHz to 5850 MHz band							
155	5775 MHz	--	--	--	--	--	--

1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Display	DELL	P2416Db	CN-0NDY73-74261-SC9-0LVS	UnionTrust
Mouse	DELL	MS111	CN-011D3V-73826-62N-0CUT	UnionTrust
U Disk	Kingstion	DTSE9 G2	N/A	UnionTrust
TF Card	Kingston	N/A	N/A	UnionTrust
Dummy load	UnionTrust	E214887	---	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.20 Meter	UnionTrust
2	AC Cable	N/A	1.50 Meter	UnionTrust

1.6 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

1.7 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

IC-Registration No.: 21600-1
The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.8 DEVIATION FROM STANDARDS

None.

1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.11 MEASUREMENT UNCERTAINTY

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

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.8 dB
2	Conducted emission 150KHz-30MHz	±3.4 dB
3	Radiated emission 9KHz-30MHz	±4.9 dB
4	Radiated emission 30MHz-1GHz	±4.7 dB
5	Radiated emission 1GHz-18GHz	±5.1 dB
6	Radiated emission 18GHz-26GHz	±5.2 dB
7	Radiated emission 26GHz-40GHz	±5.2 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart E Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Antenna Requirement	FCC 47 CFR Part 15 Subpart C Section 15.203 FCC 47 CFR Part 15 Subpart C Section 15.407(a)(1) (2)	ANSI C63.10-2013	PASS
26 dB emission bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(2)(5)	KDB 789033 D02 v02r01 Section C.1	PASS
6 dB bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (e)	KDB 789033 D02 v02r01 Section C.2	PASS
Maximum conducted output power	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)	KDB 789033 D02 v02r01 Section E.3.a(Method PM)	PASS
Peak Power Spectral Density	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)	KDB 789033 D02 v02r01 Section F	PASS
Frequency stability	FCC 47 CFR Part 15 Subpart E Section 15.407 (g)	ANSI C63.10-2013	PASS
Radiated Emissions and Band Edge Measurement	FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(4)(6) FCC 47 CFR Part 15 Subpart C Section 15.209/205	KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6	PASS
Dynamic Frequency Selection	FCC 47 CFR Part 15 Subpart E Section 15.407 (h)	KDB 905462 D03 Client Without DFS New Rules v02r01	N/A
AC Power Line Conducted Emission	FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(6) FCC 47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Note: 1) N/A: In this whole report not application.			

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	N/A	Dec. 20, 2015	Dec. 19, 2018
☑	Receiver	R&S	ESIB26	100114	Dec. 10, 2017	Dec. 10, 2018
☑	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Dec.10, 2017	Dec. 10, 2018
☑	Loop Antenna	ETS-LINDGREN	6502	00202525	Jun. 24, 2015	Jun. 23, 2018
☑	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Dec. 17, 2017	Dec. 17, 2018
☑	Preamplifier	HP	8447F	2805A02960	Dec. 10, 2017	Dec. 10, 2018
☑	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Dec. 17, 2017	Dec. 17, 2018
☑	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☑	Band Rejection Filter (5150MHz~5880MHz)	Micro-Tronics	BRM50716	G1868	Jun. 15, 2017	Jun. 14, 2018
☑	Test Software	Audix	e3	Software Version: 9.160323		

Conducted RF test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Dec. 10, 2017	Dec. 10, 2018
☑	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430035	Dec. 22, 2016	Dec. 10, 2018
☑	DC Source	KIKUSUI	PWR400L	LK003024	Sep. 14, 2017	Sep. 13, 2018
☑	Temp & Humidity chamber	Votisch	VT4002	58566133290 020	Jun. 19, 2017	Jun. 18, 2018

Conducted Emission Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	Receiver	R&S	ESR7	1316.3003K07 -101181-K3	Dec. 10, 2017	Dec. 10, 2018
☑	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	Dec. 10, 2017	Dec. 10, 2018
☑	LISN	R&S	ESH2-Z5	860014/024	Dec. 10, 2017	Dec. 10, 2018
☑	LISN	ETS-Lindgren	3816/2SH	00201088	Aug. 24, 2016	Aug. 23, 2018
☑	Test Software	Audix	e3	Software Version: 9.160323		

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Test Environment	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage	Relative Humidity (%)
TN/VN	+15 to +35	AC 120V/60Hz	20 to 75
TL/VL	-10	102 VAC	20 to 75
TH/VL	+60	102 VAC	20 to 75
TL/VH	-10	138 VAC	20 to 75
TH/VH	+60	138 VAC	20 to 75

Remark:

1) The EUT just work in such extreme temperature of -10 °C to +60 °C and the extreme voltage of 102 V to 138 V, so here the EUT is tested in the temperature of -10 °C to +60 °C and the voltage of 102 V to 138 V.
2) VN: Normal Voltage; TN: Normal Temperature;
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.

4.1.2 Record of Normal Environment

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)	Tested by
AC Power Line Conducted Emission	22.4	47	100.2	Andy Lin
26 dB emission bandwidth	23.5	51	100.2	Warlen Song
Maximum conducted output power	23.5	51	100.2	Warlen Song
Peak Power Spectral Density	23.5	51	100.2	Warlen Song
6 dB bandwidth	23.5	51	100.2	Warlen Song
Frequency stability	23.5	51	100.2	Warlen Song
Radiated Emissions and Band Edge Measurement	24.4	47	100.2	Terence Chen

4.2 TEST CHANNELS

Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11a IEEE 802.11n-HT20 IEEE 802.11ac-VHT20	5150 MHz to 5250 MHz	Channel 36	Channel 44	Channel 48
		5180 MHz	5220 MHz	5240 MHz
	5725 MHz to 5850 MHz	Channel 149	Channel 157	Channel 165
		5745 MHz	5785 MHz	5825 MHz
IEEE 802.11n-HT40 IEEE 802.11ac-VHT40	5150 MHz to 5250 MHz	Channel 38	--	Channel 46
		5190 MHz	--	5230 MHz
	5725 MHz to 5850 MHz	Channel 151	--	Channel 159
		5755 MHz	--	5795 MHz
IEEE 802.11ac-VHT80	5150 MHz to 5250 MHz	--	Channel 42	--
		--	5210 MHz	--
	5725 MHz to 5850 MHz	--	Channel 155	--
		--	5775 MHz	--

4.3 EUT TEST STATUS

Mode	Tx/Rx Function	Description
IEEE 802.11a/n/ac	Tx	1. Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

4.4 PRE-SCAN

4.4.1 Pre-scan under all rates

Mode and Frequency	Maximum Conducted Average Power (dBm) for Data Rates (Mbps)							
IEEE 802.11a 5180 MHz	6	9	12	18	24	36	48	54
	14.88	14.66	14.59	14.51	14.35	14.23	14.12	14.05
IEEE 802.11n-HT20 5180 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	14.70	14.65	14.60	14.40	14.30	14.11	13.99	13.86
IEEE 802.11n-HT40 5190 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	10.57	10.21	10.03	9.78	9.46	9.30	9.13	9.06
IEEE 802.11ac-VHT20 5180 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	14.68	14.61	14.41	14.39	14.16	14.08	13.90	13.84
	MCS8							
	13.73							
IEEE 802.11ac-VHT40 5190 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	10.45	10.21	9.94	9.84	9.50	9.39	9.32	9.07
	MCS8	MCS9						
	8.95	8.90						
IEEE 802.11ac-VHT80 5210 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	9.90	9.58	9.24	9.04	8.65	8.49	8.45	8.42
	MCS8	MCS9						
	8.25	8.20						

4.4.2 Worst-case data rates

Mode	Worst-case data rates
IEEE 802.11a	6 Mbps
IEEE 802.11n-HT20	MCS0
IEEE 802.11n-HT40	MCS0
IEEE 802.11ac-VHT20	MCS0
IEEE 802.11ac-VHT40	MCS0
IEEE 802.11ac-VHT80	MCS0

4.5 TEST SETUP

4.5.1 For Radiated Emissions test setup

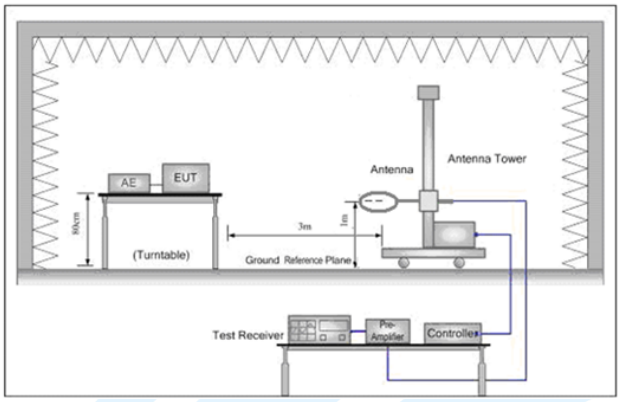


Figure 1. Below 30MHz

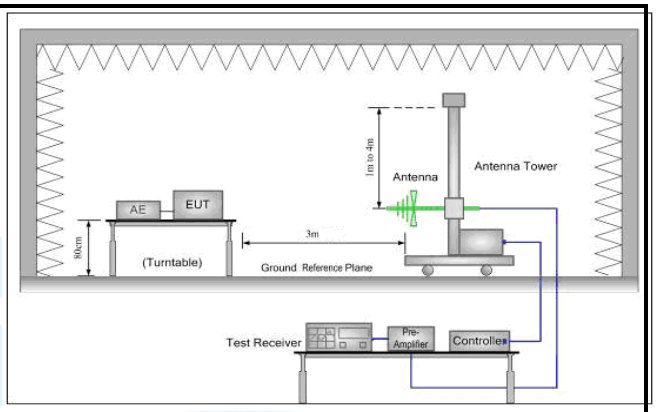


Figure 2. 30MHz to 1GHz

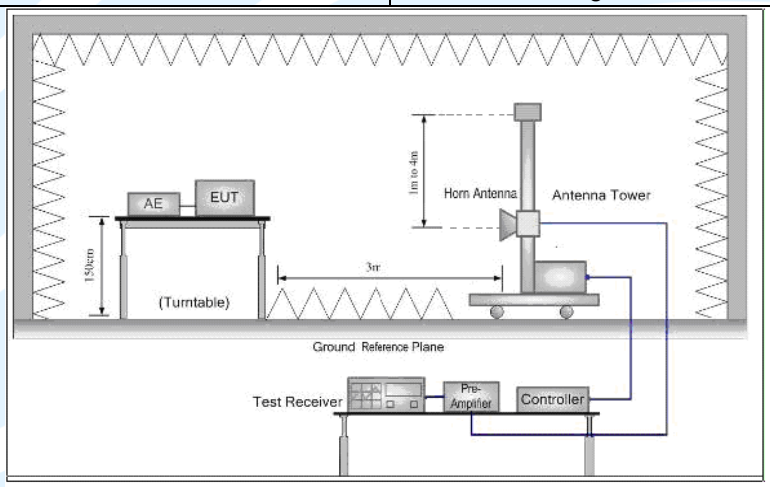
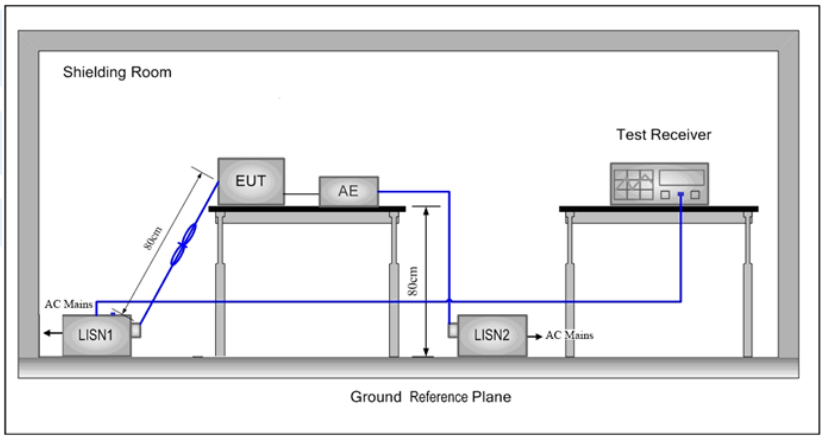


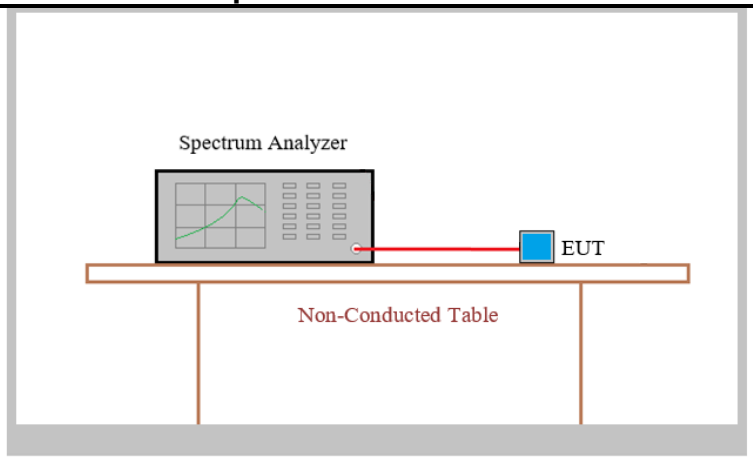
Figure 3. Above 1GHz

4.5.2 For Conducted Emissions test setup

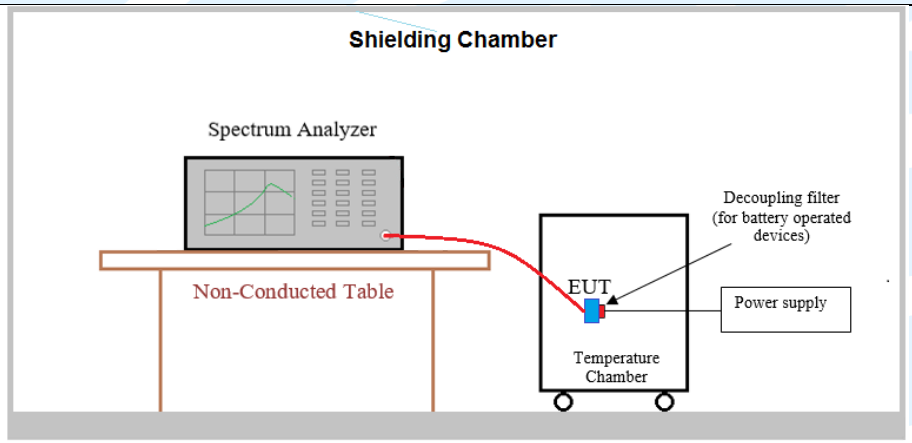
Figure 3. Conducted Emissions setup



4.5.3 For Conducted RF test setup



Normal Environment



Extreme Environment

4.6 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 120Vac/60Hz. Only the worst case data were recorded in this test report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Therefore, all final radiated testing was performed with the EUT in (see table below) orientation.

Frequency	Mode	Antenna Port	Worst-case axis positioning
Above 1GHz	1TX	Chain 0	Z axis

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

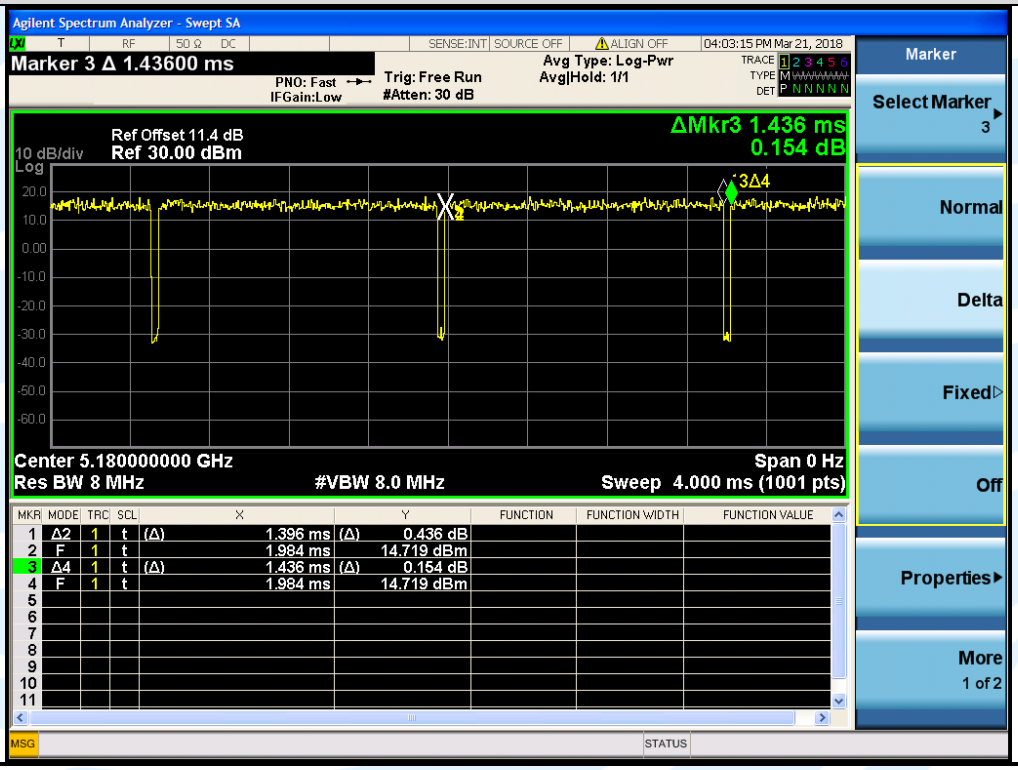
4.7 DUTY CYCLE

Mode	Data rates (Mbps)	On Time (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
IEEE 802.11a	6	1.396	1.436	0.97	97.21	0.12	0.72	-0.25
IEEE 802.11n-HT20	MCS0	1.304	1.348	0.97	96.74	0.14	0.77	-0.29
IEEE 802.11n-HT40	MCS0	0.647	0.686	0.94	94.31	0.25	1.55	-0.51
IEEE 802.11ac-VHT20	MCS0	1.316	1.360	0.97	96.76	0.14	0.76	-0.29
IEEE 802.11ac-VHT40	MCS0	0.653	0.695	0.94	93.96	0.27	1.53	-0.54
IEEE 802.11ac-VHT80	MCS0	0.323	0.366	0.88	88.25	0.54	3.10	-1.09

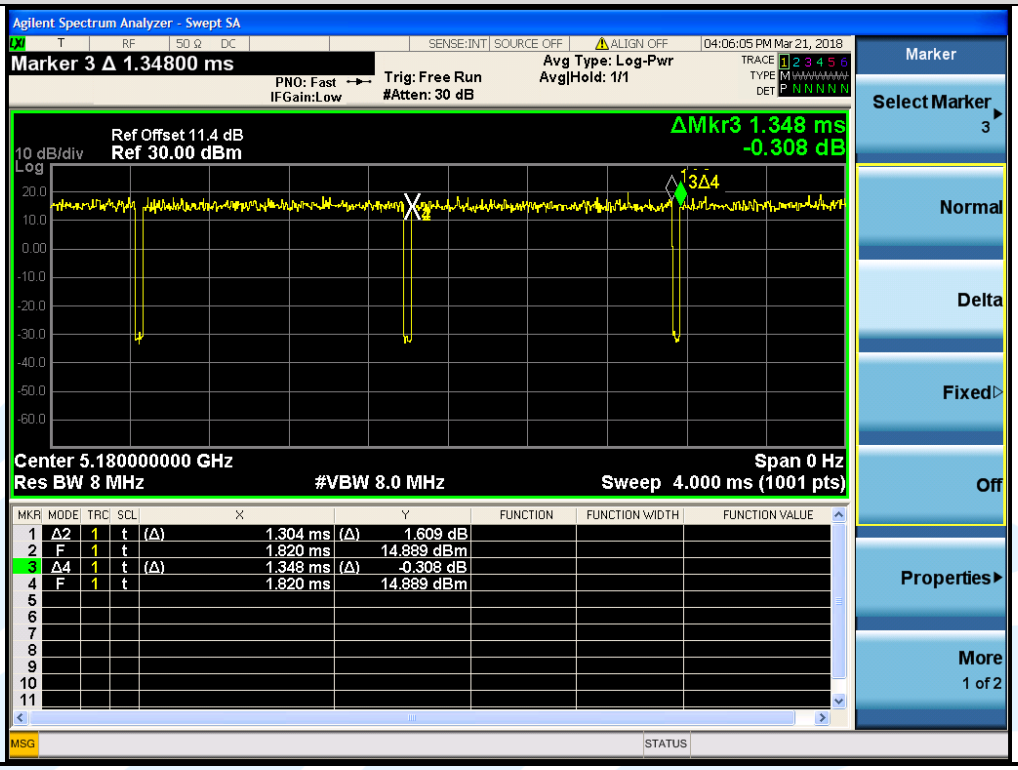
Remark:
1) Duty cycle= On Time/ Period;
2) Duty Cycle factor = 10 * log(1/ Duty cycle);
3) Average factor = 20 $\log_{10}$ Duty Cycle.

The test plot as follows

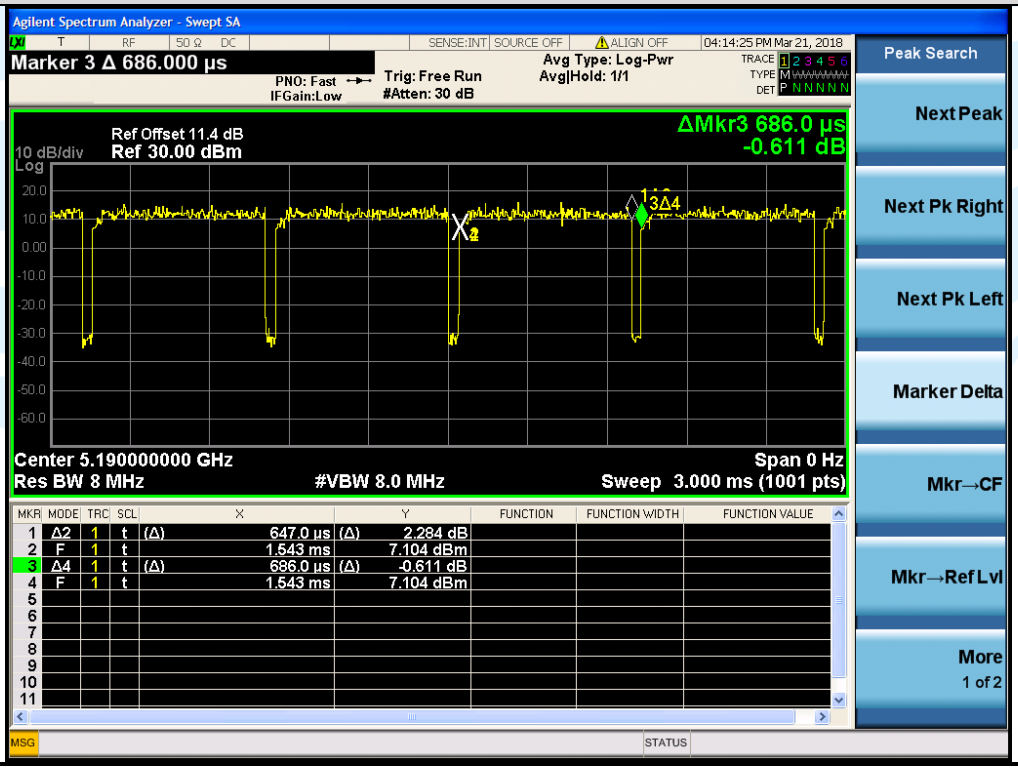
IEEE 802.11a



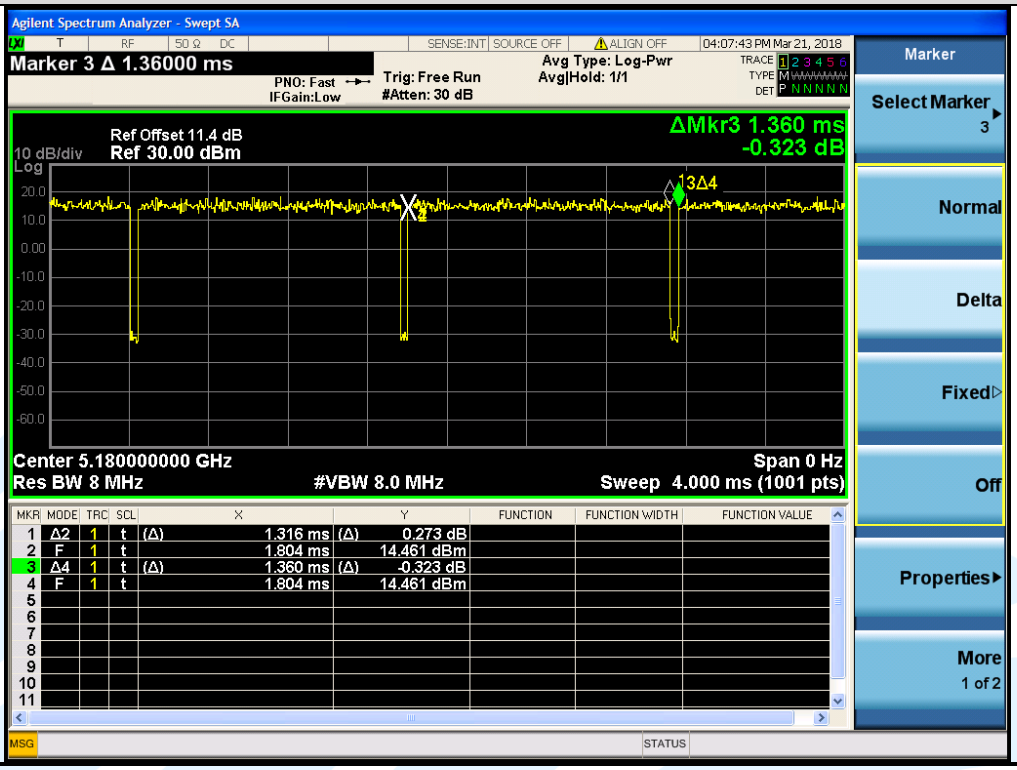
IEEE 802.11n-HT20



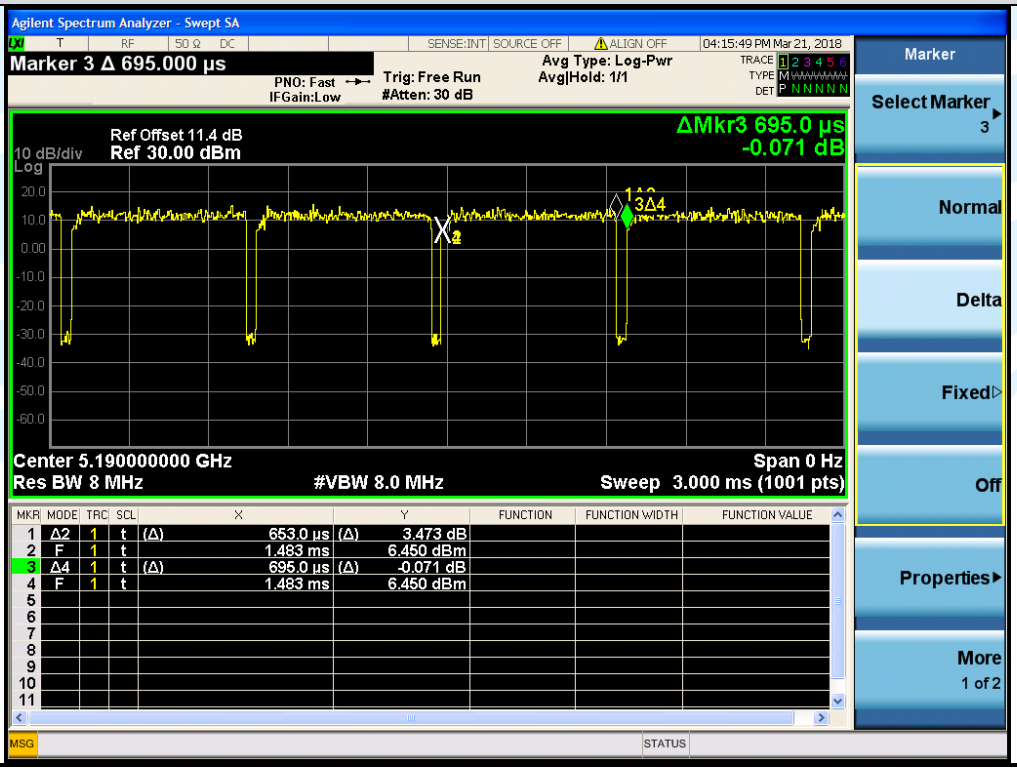
IEEE 802.11n-HT40



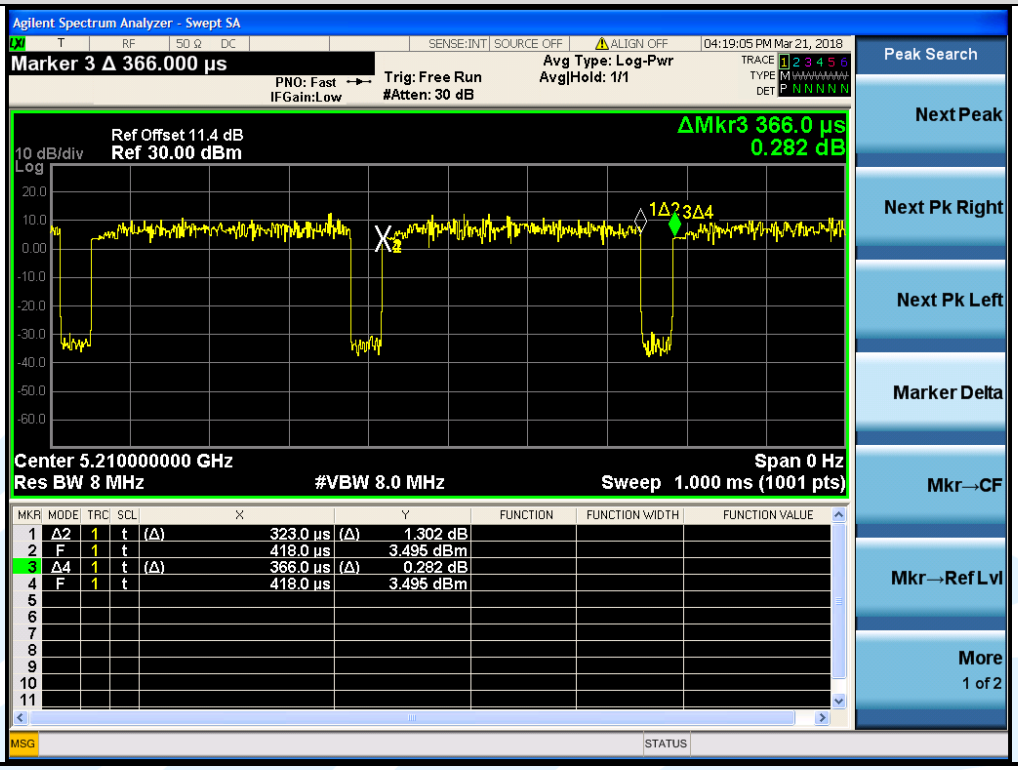
IEEE 802.11ac-VHT20



IEEE 802.11ac-VHT40



IEEE 802.11ac-VHT80



5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices
4	789033 D02 General UNII Test Procedures New Rules v02r01	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15 subpart E
5	905462 D06 802.11 Channel Plans New Rules v02	Operation in U-NII bands -802.11 channel PLAN(§15.407)

5.2 ANTENNA REQUIREMENT

Standard Requirement
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. **15.407(a)(1) (2) requirement:** The conducted output power limit specified in paragraph (a) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (a) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power and the peak power spectral density shall be reduced by the by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
EUT Antenna:
Antenna in the interior of the equipment and no consideration of replacement. The gain of the antenna is 2 dBi.

5.3 26 DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a) (2)(5)

Test Method: KDB 789033 D02 v02r01 Section C.1

Limit: None; for reporting purposes only.

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum analyzer.

Spectrum analyzer according to the following Settings:
a) Set RBW = approximately 1 % of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

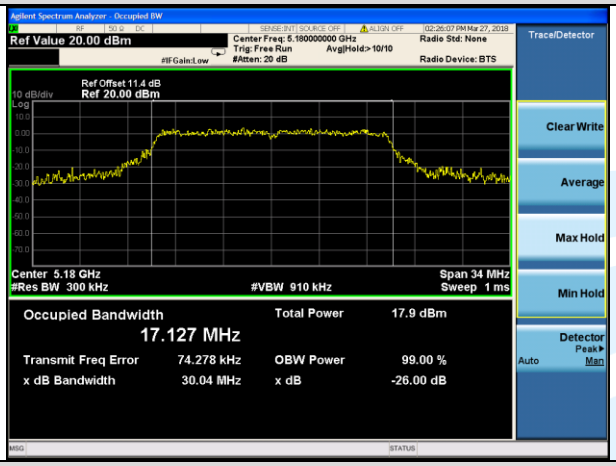
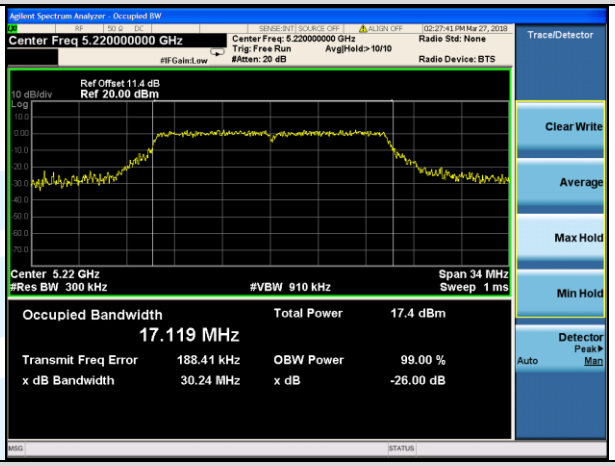
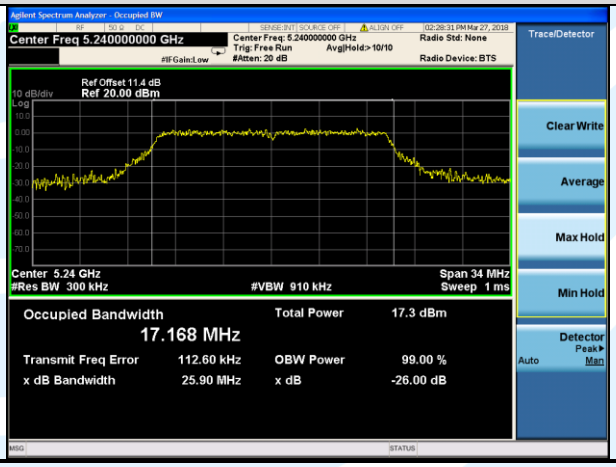
Test Data:

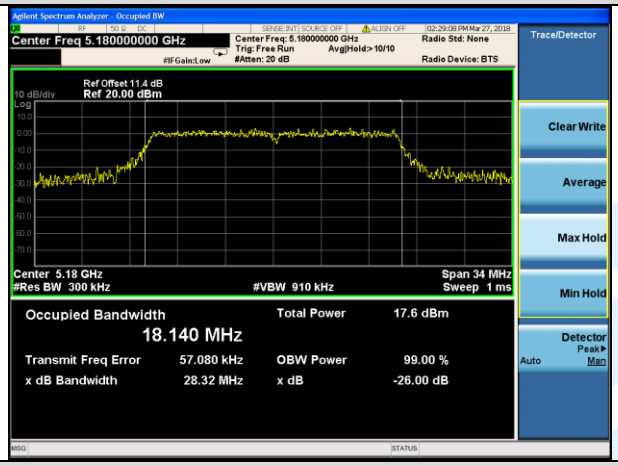
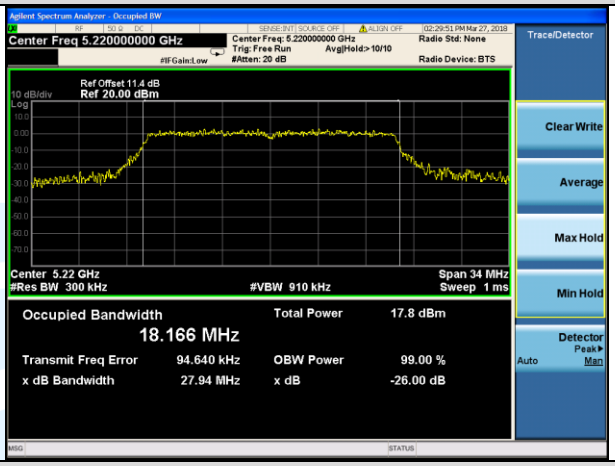
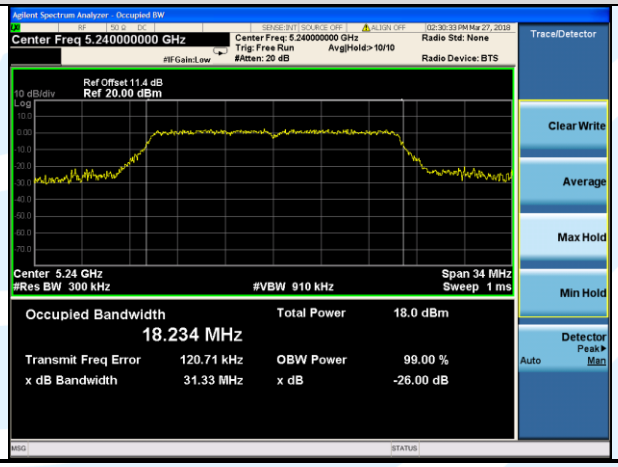
Mode	Channel	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
IEEE 802.11a	36 (5180)	30.04	17.127
	44 (5220)	30.24	17.119
	48 (5240)	25.90	17.168
IEEE 802.11n-HT20	36 (5180)	28.32	18.140
	44 (5220)	27.94	18.166
	48 (5240)	31.33	18.234
IEEE 802.11n-HT40	38 (5190)	59.67	36.762
	46 (5230)	59.71	36.585
IEEE 802.11ac-VHT80	42 (5210)	81.73	75.872

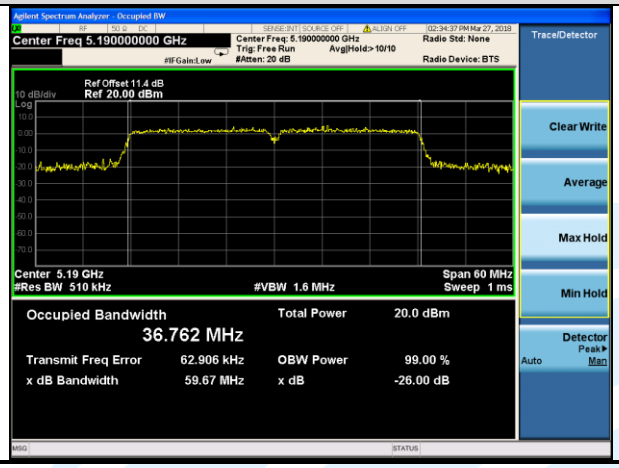
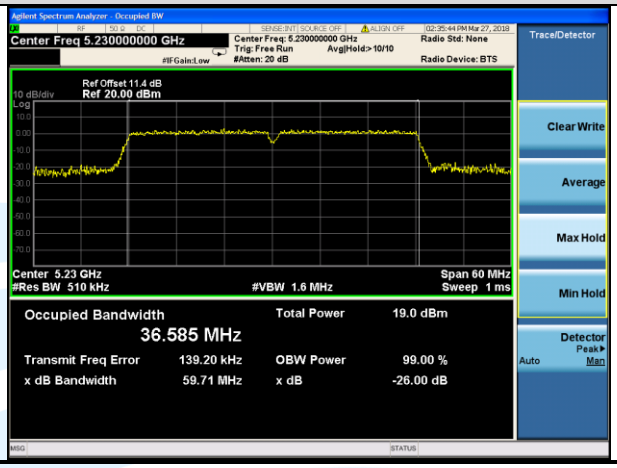
Remark:

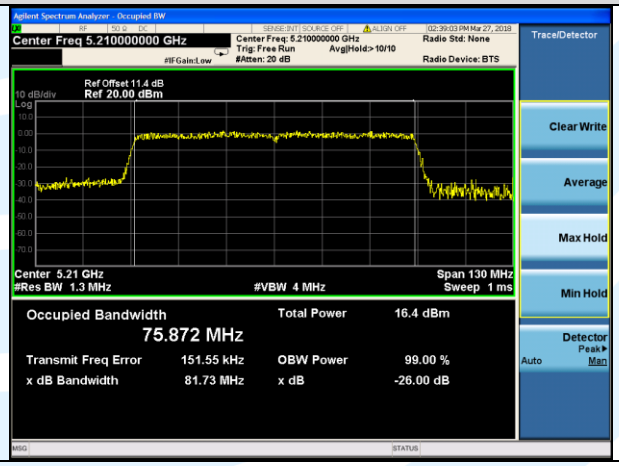
For the case if a channel operating in U-NII 1 band has a 26-dB bandwidth that straddles into U-NII 2A band but its 99% occupied power bandwidth does not. For this rare case, DFS requirement does not apply.

The test plot as follows:

IEEE 802.11a	
Channel 36	**Channel 44**
	
Channel 48	
	/

IEEE 802.11n-HT20	
Channel 36	**Channel 44**
	
Channel 48	
	/

IEEE 802.11n-HT40	
Channel 38	Channel 46
	

IEEE 802.11ac-VHT80	
Channel 42	
	/

5.46 DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.407 (e)

Test Method: KDB 789033 D02 v02r01Section C.2

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

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer.

Spectrum analyzer according to the following Settings:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 * RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

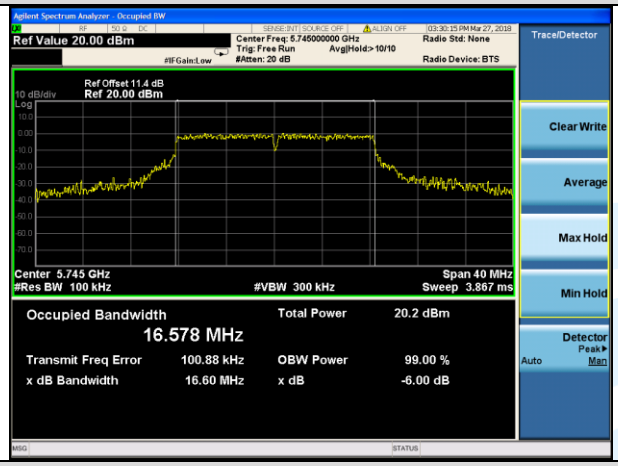
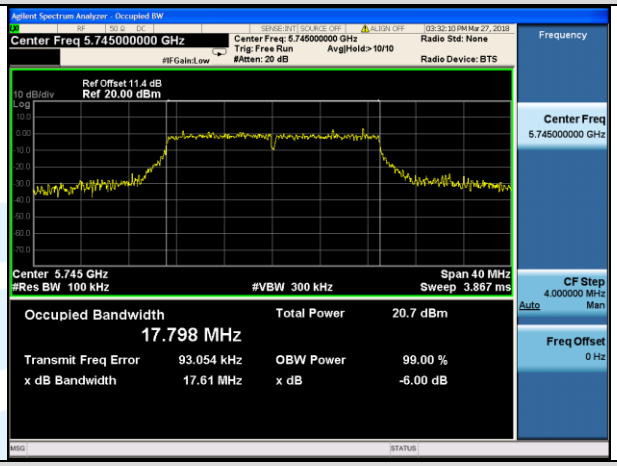
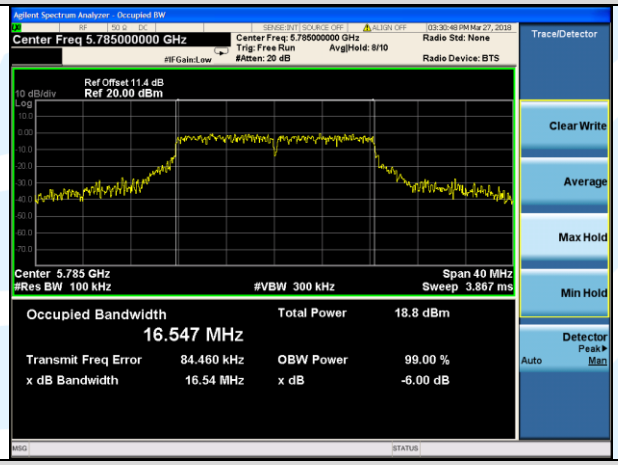
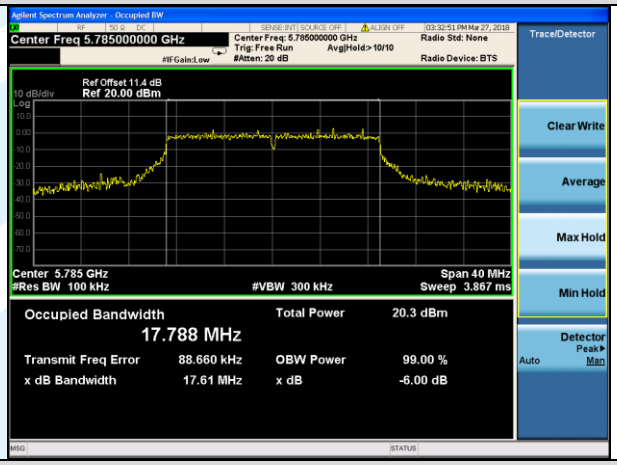
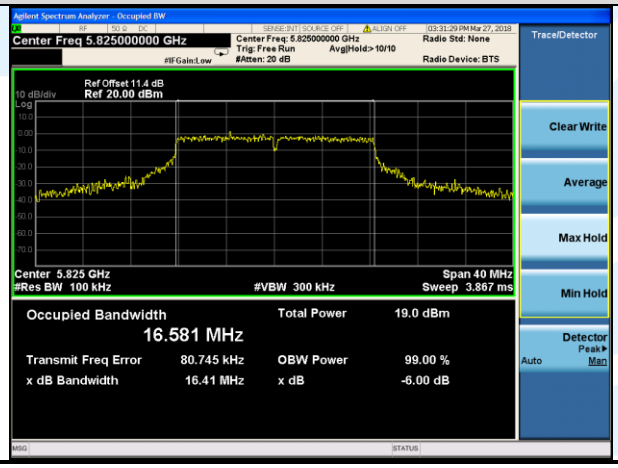
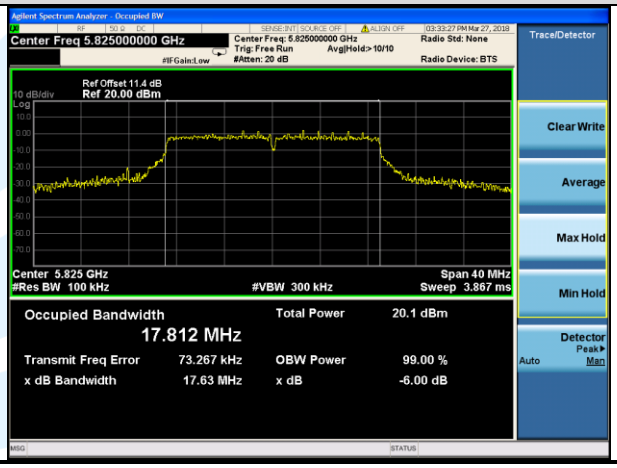
Test Mode: Transmitter mode

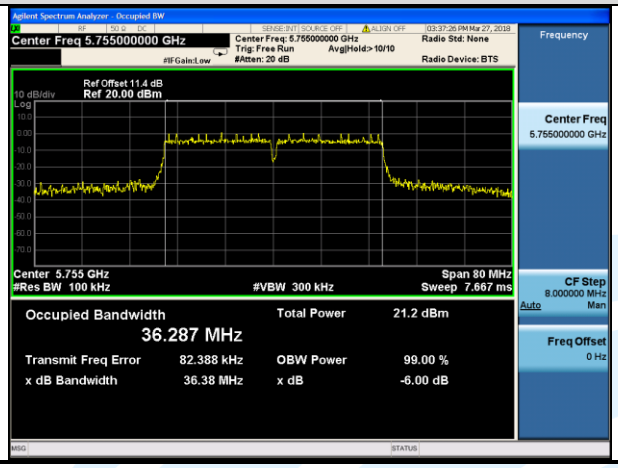
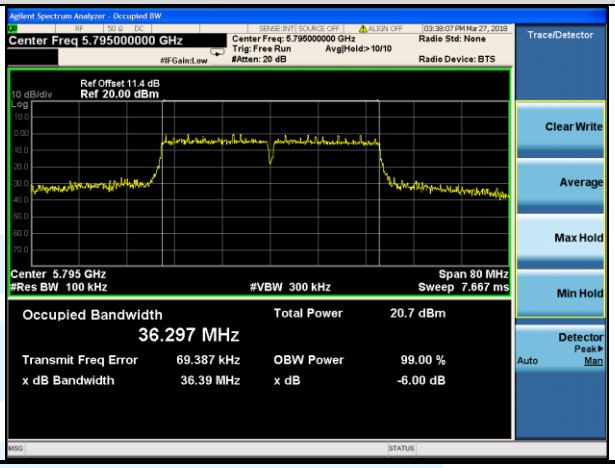
Test Results: Pass

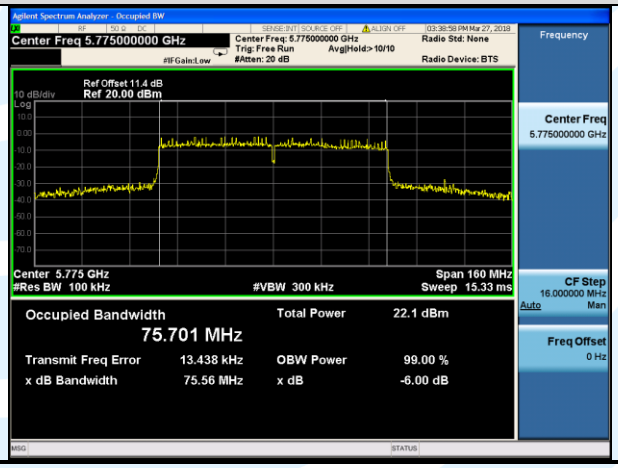
Test Data:

Mode	Channel/ Frequency (MHz)	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limit	Pass / Fail
IEEE 802.11a	149 (5745)	16.60	16.578	> 500 kHz	Pass
	157 (5785)	16.54	16.547	> 500 kHz	Pass
	165 (5825)	16.41	16.581	> 500 kHz	Pass
IEEE 802.11n-HT20	149 (5745)	17.61	17.798	> 500 kHz	Pass
	157 (5785)	17.61	17.788	> 500 kHz	Pass
	165 (5825)	17.63	17.812	> 500 kHz	Pass
IEEE 802.11n-HT40	151 (5755)	36.38	36.287	> 500 kHz	Pass
	159 (5795)	36.39	36.297	> 500 kHz	Pass
IEEE 802.11ac-VHT80	155 (5775)	75.56	75.701	> 500 kHz	Pass

The test plot as follows:

IEEE 802.11a	IEEE 802.11n-HT20
Channel 149	
	
Channel 157	
	
Channel 165	
	

IEEE 802.11n-HT40	
Channel 151	Channel 159
	

IEEE 802.11ac-VHT80
Channel 155


5.5 MAXIMUM CONDUCTED OUTPUT POWER

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)

Test Method: KDB 789033 D02 v02r01 Section E.3.a(Method PM)

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 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, 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, both the maximum conducted output power and the maximum power spectral density 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, 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, both the maximum conducted output power and 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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 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, 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, both the maximum conducted output power and 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 conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, 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, both the maximum conducted output power and 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 conducted output power over the frequency band of operation shall not exceed 1 W. In addition, 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, both the maximum conducted output power and 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 U-NII 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.

Test Procedure:

1. Connected the EUT's antenna port to measure device by 10dB attenuator.
2. Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of Tx on burst.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

For U-NII-1 Band:

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm)		Limit (dBm)	Pass / Fail
		Meas Power	Corr'd Power		
IEEE 802.11a	36 (5180)	14.88	15.00	24	Pass
	44 (5220)	14.30	14.42	24	Pass
	48 (5240)	13.90	14.02	24	Pass
IEEE 802.11n-HT20	36 (5180)	14.70	14.84	24	Pass
	44 (5220)	14.17	14.31	24	Pass
	48 (5240)	13.77	13.91	24	Pass
IEEE 802.11n-HT40	38 (5190)	10.57	10.82	24	Pass
	46 (5230)	9.84	10.09	24	Pass
IEEE 802.11ac-VHT20	36 (5180)	14.68	14.82	24	Pass
	44 (5220)	13.95	14.09	24	Pass
	48 (5240)	13.68	13.82	24	Pass
IEEE 802.11ac-VHT40	38 (5190)	10.45	10.72	24	Pass
	46 (5230)	9.77	10.04	24	Pass
IEEE 802.11ac-VHT80	42 (5210)	9.90	10.44	24	Pass

Remark:

1. Corr'd Power = Meas Power + Duty Cycle Factor

For U-NII-3 Band:

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm)		Limit (dBm)	Pass / Fail
		Meas Power	Corr'd Power		
IEEE 802.11a	149 (5745)	15.95	16.07	30	Pass
	157 (5785)	14.98	15.10	30	Pass
	165 (5825)	14.82	14.94	30	Pass
IEEE 802.11n-HT20	149 (5745)	15.88	16.02	30	Pass
	157 (5785)	15.00	15.14	30	Pass
	165 (5825)	14.83	14.97	30	Pass
IEEE 802.11n-HT40	151 (5755)	14.90	15.15	30	Pass
	159 (5795)	14.65	14.90	30	Pass
IEEE 802.11ac-VHT20	149 (5745)	15.37	15.51	30	Pass
	157 (5785)	14.92	15.06	30	Pass
	165 (5825)	14.73	14.87	30	Pass
IEEE 802.11ac-VHT40	151 (5755)	15.41	15.68	30	Pass
	159 (5795)	14.54	14.81	30	Pass
IEEE 802.11ac-VHT80	155 (5775)	15.34	15.88	30	Pass

Remark:

1. Corr'd Power = Meas Power + Duty Cycle Factor

5.6 PEAK POWER SPECTRAL DENSITY

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)

Test Method: KDB 789033 D02 v02r01 Section F

Limits:

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. In addition, 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, both the maximum conducted output power and the maximum power spectral density 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, 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, both the maximum conducted output power and 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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 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, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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, 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, both the maximum conducted output power and 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 U-NII 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.

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer.

Spectrum analyzer according to the following Settings:

1. For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

a) Set span to encompass the entire emission bandwidth (EBW) of the signal.
b) Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
c) Sweep time = auto, trigger set to “free run”.
d) Trace average at least 100 traces in power averaging mode.
e) Record the max value and add 10 log (1/duty cycle)

2. For U-NII-3 band:

a) Set span to encompass the entire emission bandwidth (EBW) of the signal.
b) Set RBW = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
c) Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
d) Sweep time = auto, trigger set to “free run”.
e) Trace average at least 100 traces in power averaging mode.
f) Record the max value and add 10 log (1/duty cycle)

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

For U-NII-1 Band:

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/MHz)		Limit (dBm/MHz)	Pass / Fail
		Meas PSD	Corr’d PSD		
IEEE 802.11a	36 (5180)	3.035	3.155	11	Pass
	44 (5220)	2.444	2.564	11	Pass
	48 (5240)	2.338	2.458	11	Pass
IEEE 802.11n-HT20	36 (5180)	2.982	3.122	11	Pass
	44 (5220)	2.069	2.209	11	Pass
	48 (5240)	1.718	1.858	11	Pass
IEEE 802.11n-HT40	38 (5190)	-5.217	-4.967	11	Pass
	46 (5230)	-6.105	-5.855	11	Pass
IEEE 802.11ac-VHT80	42 (5210)	-8.733	-8.193	11	Pass

Remark:

1. Corr’d PSD = Meas PSD + Duty Cycle Factor

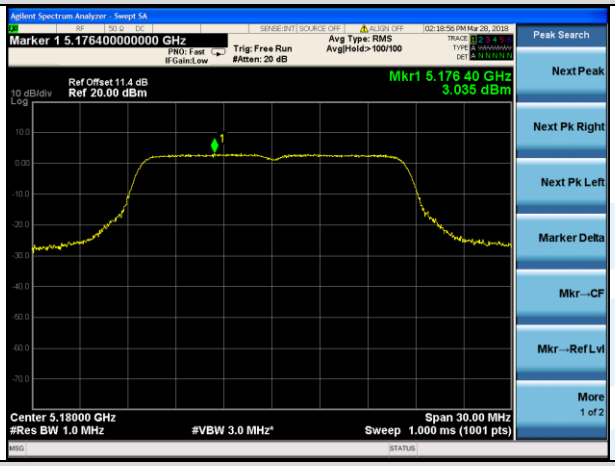
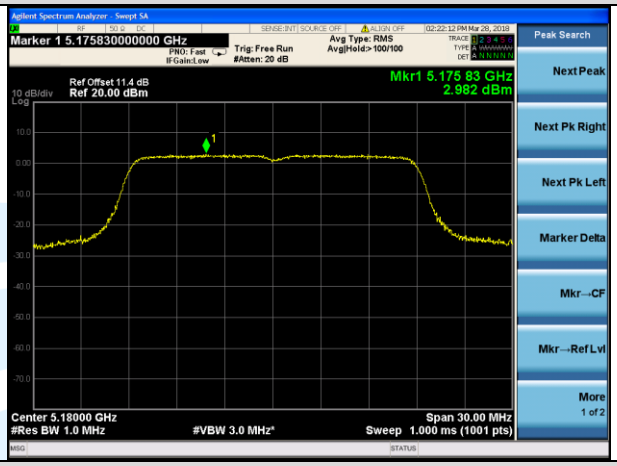
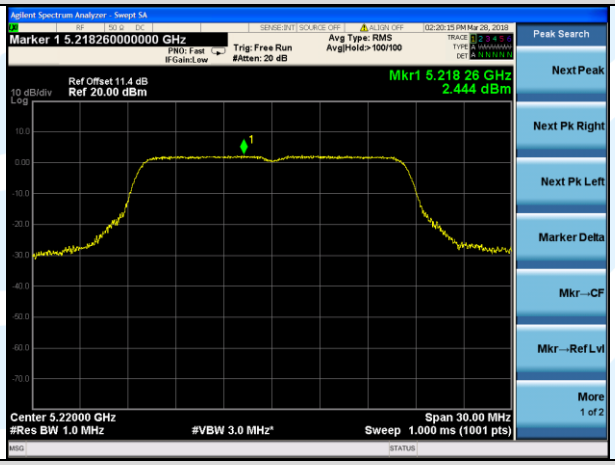
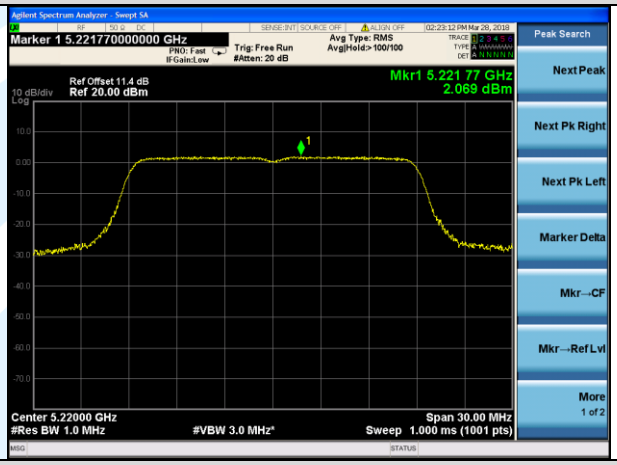
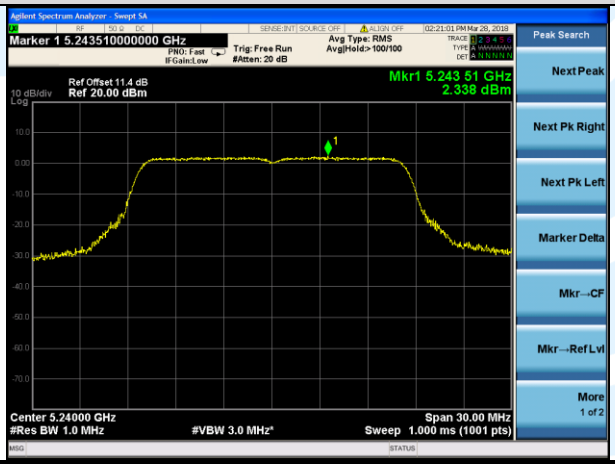
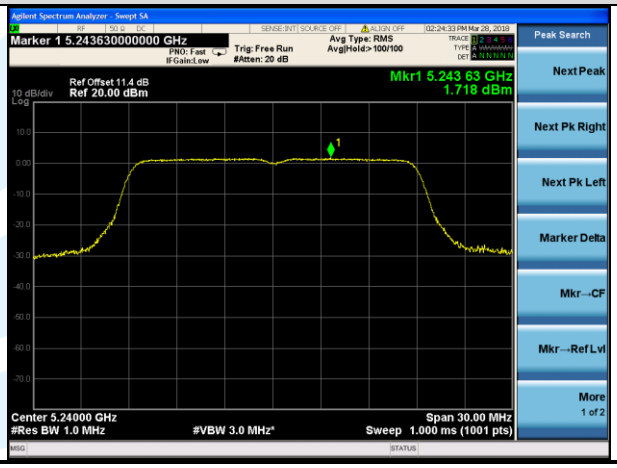
For U-NII-3 Band:

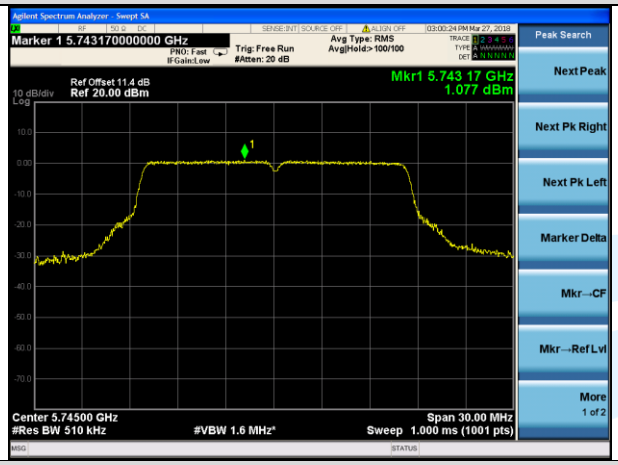
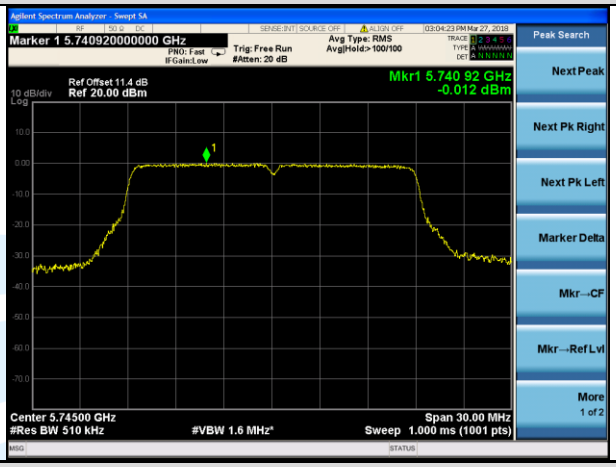
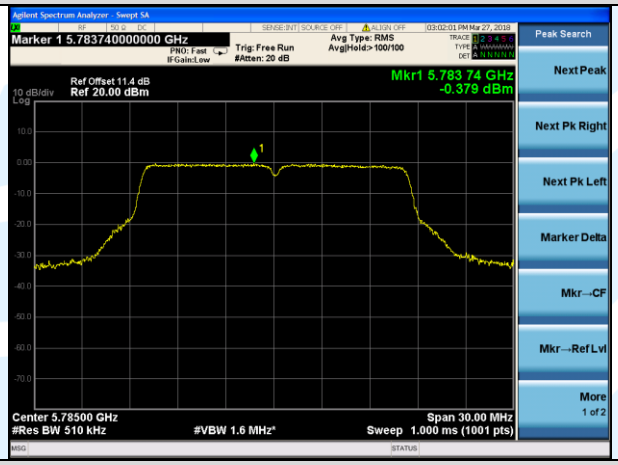
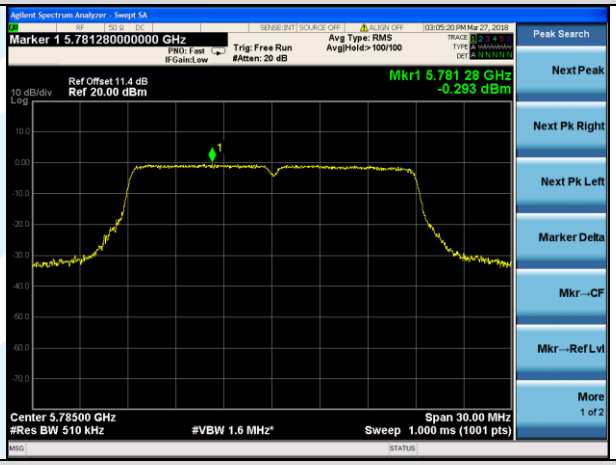
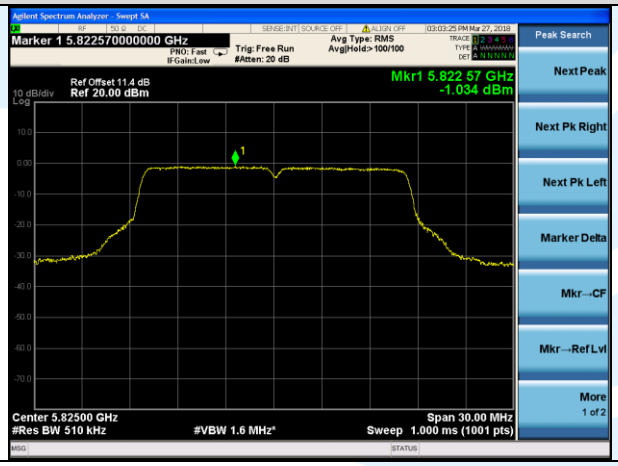
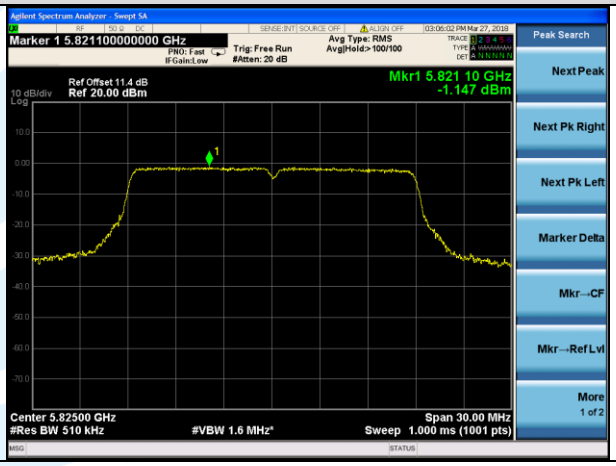
Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/500KHz)		Limit (dBm/500KHz)	Pass / Fail
		Meas PSD	Corr'd PSD		
IEEE 802.11a	149 (5745)	1.077	1.197	30	Pass
	157 (5785)	-0.379	-0.259	30	Pass
	165 (5825)	-1.034	-0.914	30	Pass
IEEE 802.11n-HT20	149 (5745)	-0.012	0.128	30	Pass
	157 (5785)	-0.293	-0.153	30	Pass
	165 (5825)	-1.147	-1.007	30	Pass
IEEE 802.11n-HT40	151 (5755)	-2.195	-1.945	30	Pass
	159 (5795)	-2.906	-2.656	30	Pass
IEEE 802.11ac-VHT80	155 (5775)	-5.303	-4.763	30	Pass

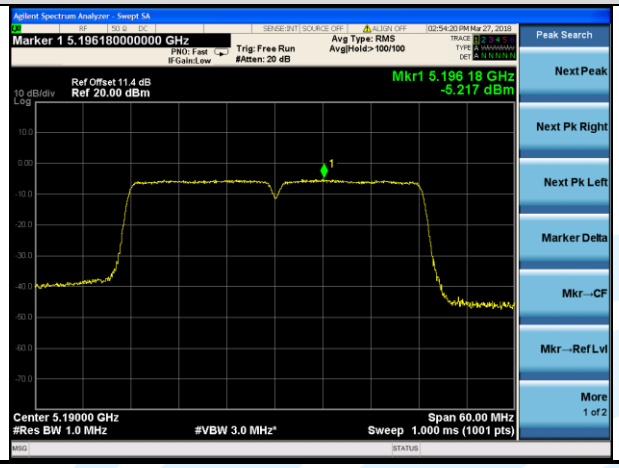
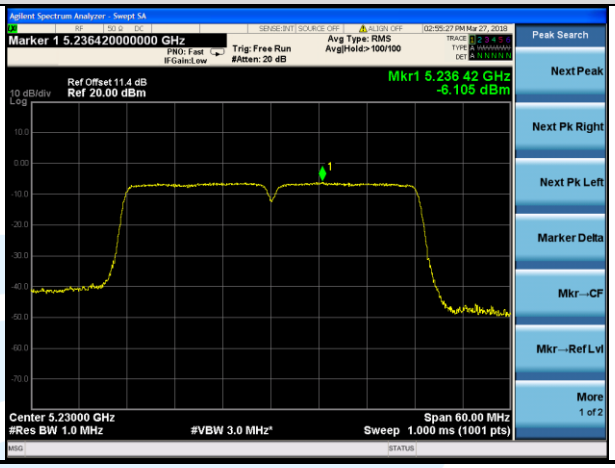
Remark:

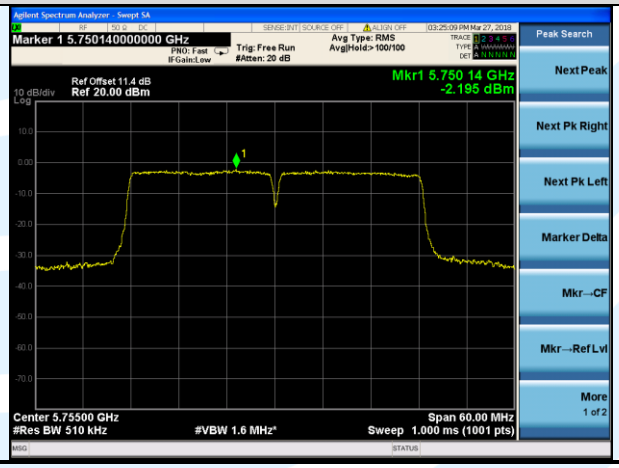
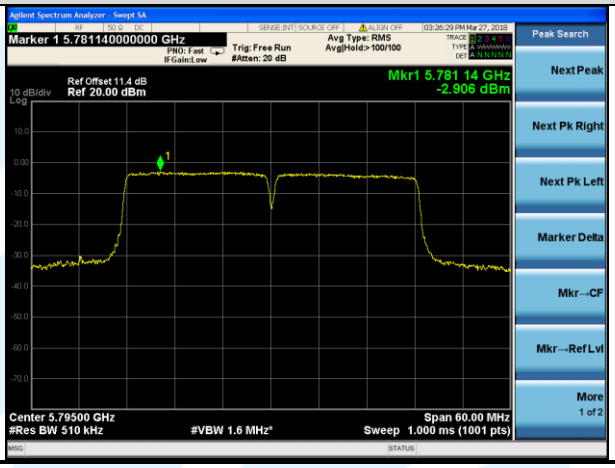
1. Corr'd PSD = Meas PSD + Duty Cycle Factor

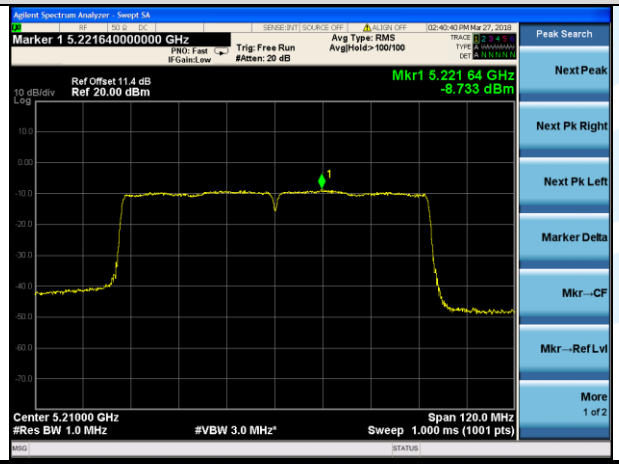
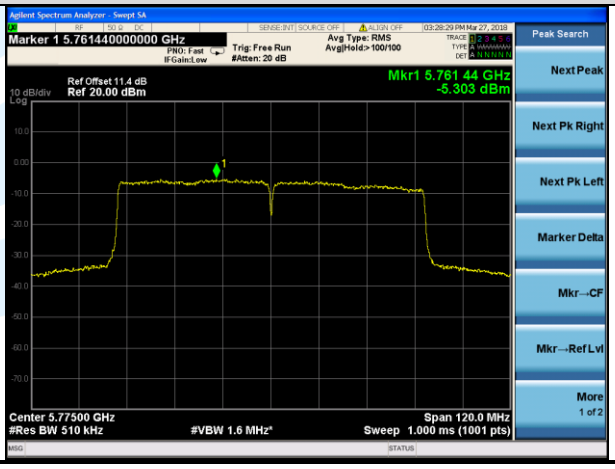
The test plot as follows:

IEEE 802.11a	IEEE 802.11n-HT20
Channel 36	
	
Channel 44	
	
Channel 48	
	

IEEE 802.11a	IEEE 802.11n-HT20
Channel 149	
	
Channel 157	
	
Channel 165	
	

IEEE 802.11n-HT40	
Channel 38	Channel 46
	

IEEE 802.11n-HT40	
Channel 151	Channel 159
	

IEEE 802.11ac-VHT80	
Channel 42	Channel 155
	

5.7 FREQUENCY STABILITY

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (g)

Test Method: ANSI C63.10-2013

Limit: The frequency of the carrier signal shall be maintained within band of operation.

Test Procedure:

a) To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.

b) The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.

c) The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

EUT Operation Condition:

☐ Keep the EUT transmit at un-modulation mode to frequency stability

☑ Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

Frequency Stability Versus Temp.			
Operation Frequency: 5180 MHz			
Temp. (°C)	Voltage	Measured Frequency (MHz)	Frequency Drift (ppm)
60	VN	5180.084790	16.368726
50		5180.086924	16.780695
40		5180.086341	16.668147
30		5180.086452	16.689575
20		5180.069932	13.500386
10		5180.066936	12.922008
0		5180.076939	14.853089
-10		5180.074580	14.397683

Frequency Stability Versus Voltage			
Operation Frequency: 5180 MHz			
Temp.	Voltage	Measured Frequency (MHz)	Frequency Drift (ppm)
TN	VL	5180.086342	16.668340
	VN	5180.086930	16.781853
	VH	5180.081235	15.682432

Frequency Stability Versus Temp.			
Operation Frequency: 5745 MHz			
Temp. (°C)	Voltage	Measured Frequency (MHz)	Frequency Drift (ppm)
60	V/N	5745.084530	14.713664
50		5745.093451	16.266493
40		5745.089532	15.584334
30		5745.097346	16.944473
20		5745.082135	14.296780
10		5745.084657	14.735770
0		5745.085421	14.868755
-10		5745.084452	14.700104

Frequency Stability Versus Voltage			
Operation Frequency: 5745 MHz			
Temp.	Voltage	Measured Frequency (MHz)	Frequency Drift (ppm)
TN	VL	5745.097231	16.924456
	VN	5745.097630	16.993908
	VH	5745.094560	16.459530

It is proved that the frequency stability such that an emission is maintained within the band of operation under all condition.

5.8 RADIATED EMISSIONS AND BAND EDGE MEASUREMENT

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(4)(6)
FCC 47 CFR Part 15 Subpart C Section 15.209/205

Test Method: KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6

Receiver Setup:

Frequency	RBW
0.009 MHz-0.150 MHz	200/300 kHz
0.150 MHz -30 MHz	9/10 kHz
30 MHz-1 GHz	100/120 kHz
Above 1 GHz	1 MHz

Limits:

1. Limits of Radiated Emission and Band edge Measurement

Radiated emissions that fall in the restricted bands must comply with the general emissions limits in 15.209(a) as below table. Other emissions shall be at least 20 dB below the highest level of the desired power.

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009 MHz-0.490 MHz	2400/F(kHz)	--	--	300
0.490 MHz-1.705 MHz	24000/F(kHz)	--	--	30
1.705 MHz-30 MHz	30	--	--	30
30 MHz-88 MHz	100	40.0	Quasi-peak	3
88 MHz-216 MHz	150	43.5	Quasi-peak	3
216 MHz-960 MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1 GHz	500	54.0	Average	3

Remark:

a. The lower limit shall apply at the transition frequencies.
b. Emission level (dBuV/m) = 20 log Emission level (uV/m).
c. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

2. Limits of Unwanted Emission Out of the Restricted Bands

Applicable To	Limit	
789033 D02 General U-NII Test Procedures New Rules v01r04	Field Strength at 3 m	
	PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
FCC Part 15.407 (b)(1)	PK: -27 (dBm/MHz)	PK: 74 (dBμV/m)
FCC Part 15.407 (b)(2)	PK: -27 (dBm/MHz)	PK: 74 (dBμV/m)
FCC Part 15.407 (b)(3)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
FCC Part 15.407 (b)(4)	27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;	PK: 68.2 (dBμV/m)
	15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;	
	10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges;	

	-27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.	

Test Setup: Refer to section 4.5.1 for details.

Test Procedures:

1. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
6. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Remark:

a) The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
b) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
c) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for RMS Average (Duty cycle < 98 %) for Average detection (AV) at frequency above 1 GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
d) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle ≥ 98 %) or ≥ 1/T(duty cycle is < 98%) for Average detection (AV) at frequency above 1 GHz.
e) All modes of operation were investigated and the worst-case emissions are reported.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

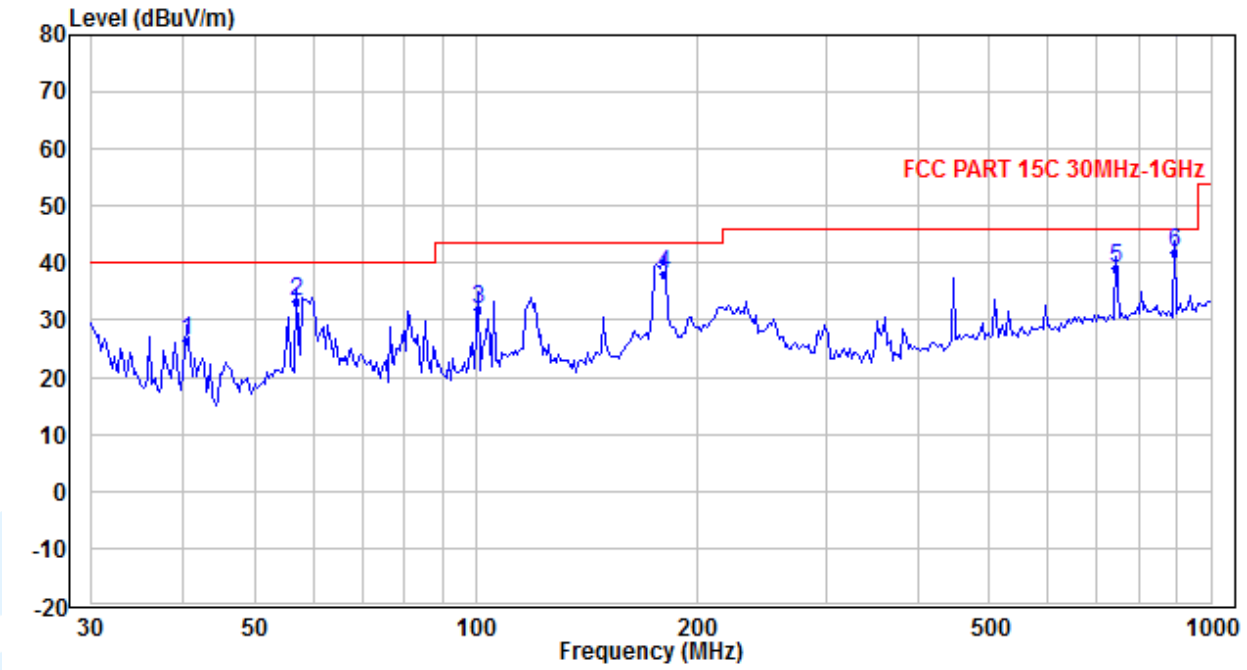
The measurement data as follows:

Radiated Emission Test Data (9 KHz ~ 30 MHz):
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

Radiated Emission Test Data (30 MHz ~ 1 GHz Worst Case):

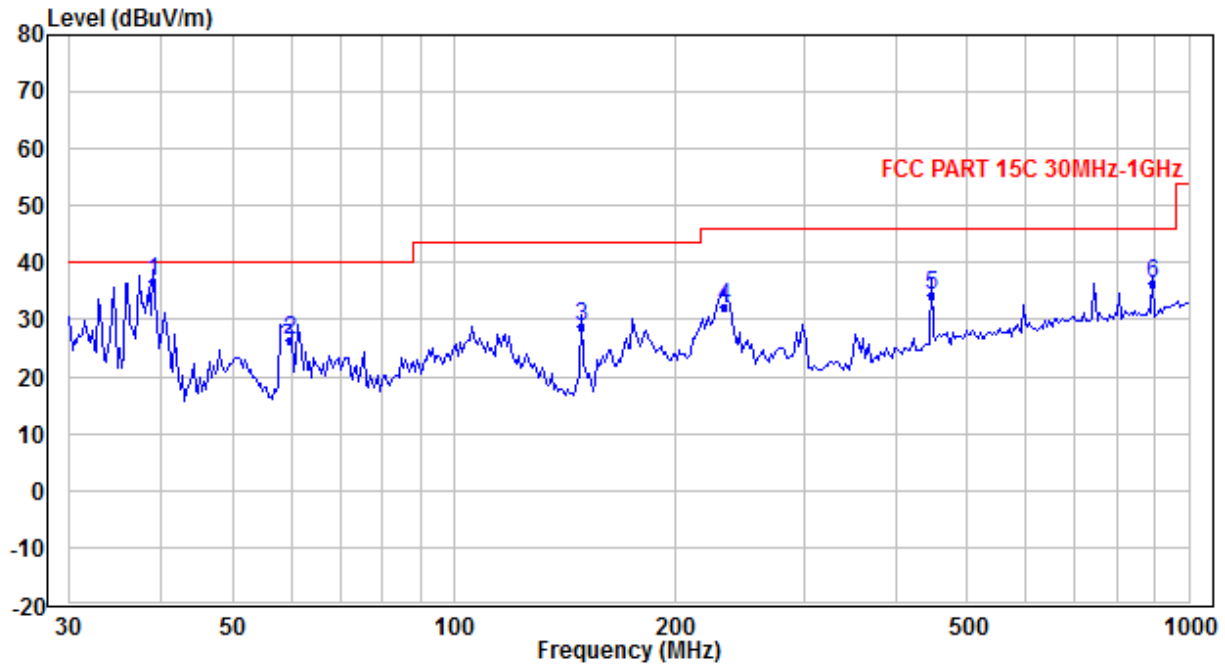
Worst-Case Configuration

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	40.299	36.95	-10.70	26.25	40.00	-13.75	QP
2	56.864	47.49	-14.31	33.18	40.00	-6.82	QP
3	100.471	43.32	-11.40	31.92	43.50	-11.58	QP
4	180.030	47.55	-9.40	38.15	43.50	-5.35	QP
5	744.427	34.68	4.57	39.25	46.00	-6.75	QP
6	893.656	36.15	5.83	41.98	46.00	-4.02	QP

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	38.908	46.61	-9.96	36.65	40.00	-3.35	QP
2	59.732	40.63	-14.39	26.24	40.00	-13.76	QP
3*	148.917	40.00	-11.12	28.88	43.50	-14.62	QP
4	233.488	39.63	-7.30	32.33	46.00	-13.67	QP
5	445.693	35.01	-0.71	34.30	46.00	-11.70	QP
6	893.656	30.59	5.83	36.42	46.00	-9.58	QP

Radiated Emission Test Data (Above 1GHz):

IEEE 802.11a_Channel 36

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10360.00	46.94	74.00	-27.06	Peak	Horizontal
2	15540.00	49.67	74.00	-24.33	Peak	Horizontal
3	10360.00	44.63	74.00	-29.37	Peak	Vertical
4	15540.00	48.70	74.00	-25.30	Peak	Vertical

IEEE 802.11a_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	46.87	74.00	-27.13	Peak	Horizontal
2	15660.00	48.86	74.00	-25.14	Peak	Horizontal
3	10440.00	45.14	74.00	-28.86	Peak	Vertical
4	15660.00	47.56	74.00	-26.44	Peak	Vertical

IEEE 802.11a_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	45.89	74.00	-28.11	Peak	Horizontal
2	15720.00	50.08	74.00	-23.92	Peak	Horizontal
3	10480.00	45.67	74.00	-28.33	Peak	Vertical
4	15720.00	47.86	74.00	-26.14	Peak	Vertical

IEEE 802.11a_Channel 149

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11490.00	47.65	74.00	-26.35	Peak	Horizontal
2	17235.00	49.91	74.00	-24.09	Peak	Horizontal
3	11490.00	46.87	74.00	-27.13	Peak	Vertical
4	17235.00	49.93	74.00	-24.07	Peak	Vertical

IEEE 802.11a_Channel 157

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	48.06	74.00	-25.94	Peak	Horizontal
3	17355.00	50.88	74.00	-23.12	Peak	Horizontal
5	11570.00	46.40	74.00	-27.60	Peak	Vertical
7	17355.00	50.82	74.00	-23.18	Peak	Vertical

IEEE 802.11a_Channel 165

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	48.80	74.00	-25.20	Peak	Horizontal
2	17475.00	51.29	74.00	-22.71	Peak	Horizontal
3	11650.00	46.78	74.00	-27.22	Peak	Vertical
4	17475.00	50.32	74.00	-23.68	Peak	Vertical

IEEE 802.11n-HT20_Channel 36						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10360.00	46.53	74.00	-27.47	Peak	Horizontal
2	15540.00	48.69	74.00	-25.31	Peak	Horizontal
3	10360.00	45.58	74.00	-28.42	Peak	Vertical
4	15540.00	48.22	74.00	-25.78	Peak	Vertical

IEEE 802.11n-HT20_Channel 44						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	46.56	74.00	-27.44	Peak	Horizontal
2	15660.00	48.77	74.00	-25.23	Peak	Horizontal
3	10440.00	47.21	74.00	-26.79	Peak	Vertical
4	15660.00	47.80	74.00	-26.20	Peak	Vertical

IEEE 802.11n-HT20_Channel 48						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	46.14	74.00	-27.86	Peak	Horizontal
2	15720.00	49.22	74.00	-24.78	Peak	Horizontal
3	10480.00	44.70	74.00	-29.30	Peak	Vertical
4	15720.00	48.27	74.00	-25.73	Peak	Vertical

IEEE 802.11n-HT20_Channel 149						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11490.00	47.82	74.00	-26.18	Peak	Horizontal
2	17235.00	50.85	74.00	-23.15	Peak	Horizontal
3	11490.00	46.44	74.00	-27.56	Peak	Vertical
4	17235.00	49.87	74.00	-24.13	Peak	Vertical

IEEE 802.11n-HT20_Channel 157						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	48.29	74.00	-25.71	Peak	Horizontal
2	17355.00	51.05	74.00	-22.95	Peak	Horizontal
3	11570.00	46.36	74.00	-27.64	Peak	Vertical
4	17355.00	49.45	74.00	-24.55	Peak	Vertical

IEEE 802.11n-HT20_Channel 165						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	48.22	74.00	-25.78	Peak	Horizontal
2	17475.00	50.74	74.00	-23.26	Peak	Horizontal
3	11650.00	46.33	74.00	-27.67	Peak	Vertical
4	17475.00	50.36	74.00	-23.64	Peak	Vertical

IEEE 802.11n-HT40_Channel 38

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10380.00	47.30	74.00	-26.70	Peak	Horizontal
2	15570.00	49.51	74.00	-24.49	Peak	Horizontal
3	10380.00	45.32	74.00	-28.68	Peak	Vertical
4	15570.00	48.20	74.00	-25.80	Peak	Vertical

IEEE 802.11n-HT40_Channel 46

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10460.00	48.12	74.00	-25.88	Peak	Horizontal
2	15690.00	48.45	74.00	-25.55	Peak	Horizontal
3	10460.00	44.97	74.00	-29.03	Peak	Vertical
4	15690.00	47.17	74.00	-26.83	Peak	Vertical

IEEE 802.11n-HT40_Channel 151

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11510.00	48.31	74.00	-25.69	Peak	Horizontal
2	17265.00	50.00	74.00	-24.00	Peak	Horizontal
3	11510.00	47.03	74.00	-26.97	Peak	Vertical
4	17265.00	49.72	74.00	-24.28	Peak	Vertical

IEEE 802.11n-HT40_Channel 159

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11590.00	48.01	74.00	-25.99	Peak	Horizontal
2	17385.00	50.68	74.00	-23.32	Peak	Horizontal
3	11590.00	46.68	74.00	-27.32	Peak	Vertical
4	17385.00	50.03	74.00	-23.97	Peak	Vertical

IEEE 802.11ac-VHT80_Channel 42

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10420.00	46.71	74.00	-27.29	Peak	Horizontal
2	15630.00	49,17	74.00	#VALUE!	Peak	Horizontal
3	10420.00	47.37	74.00	-26.63	Peak	Vertical
4	15630.00	47.24	74.00	-26.76	Peak	Vertical

IEEE 802.11ac-VHT80_Channel 155

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11550.00	47.85	74.00	-26.15	Peak	Horizontal
2	17325.00	50.61	74.00	-23.39	Peak	Horizontal
3	11550.00	46.50	74.00	-27.50	Peak	Vertical
4	17325.00	48.96	74.00	-25.04	Peak	Vertical

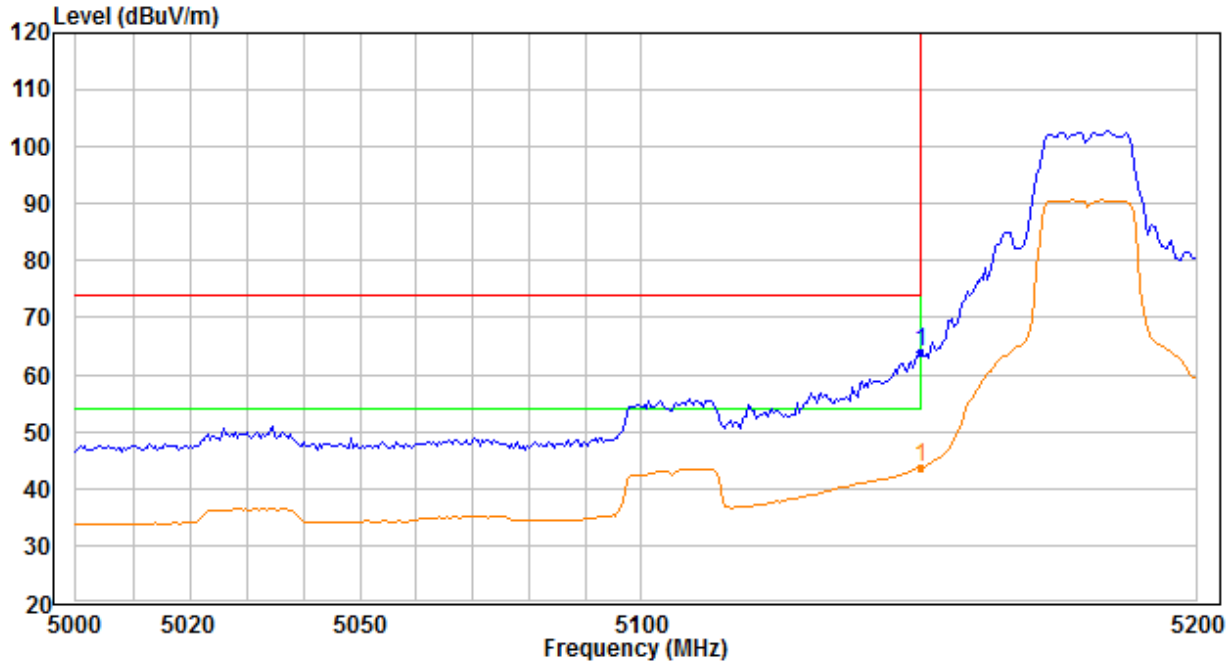
Remark:

As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

Band Edge Measurements (Radiated)

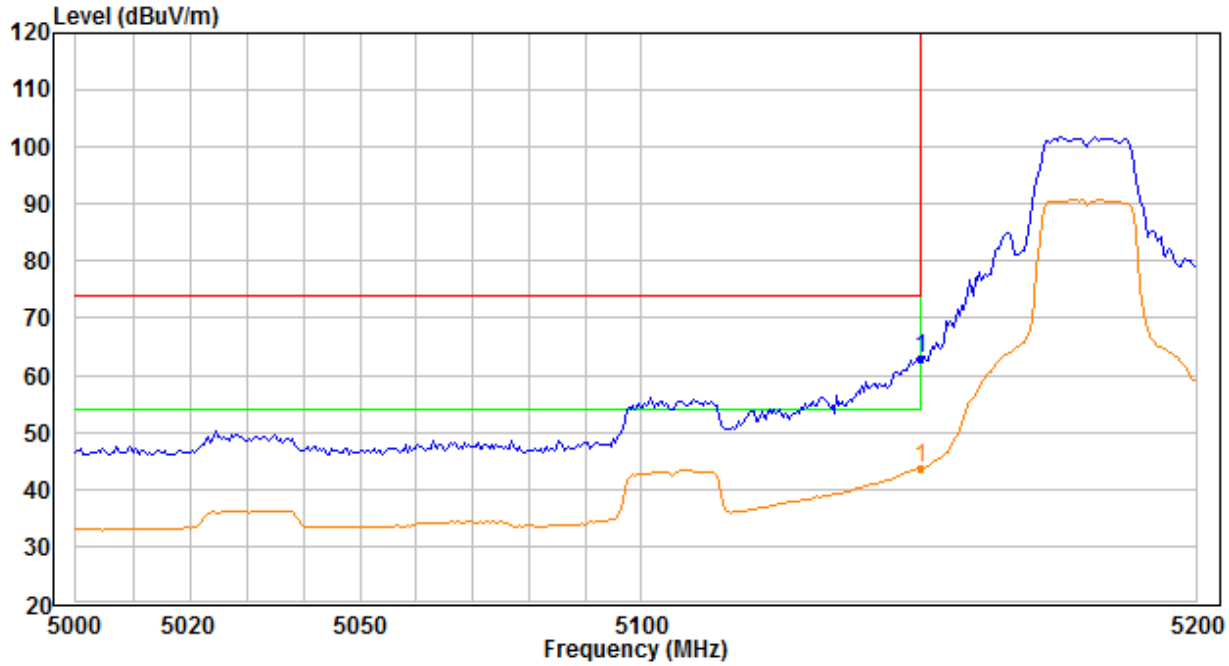
IEEE 802.11a

Test Channel:	Channel 36	Ant. Polar. :	Horizontal



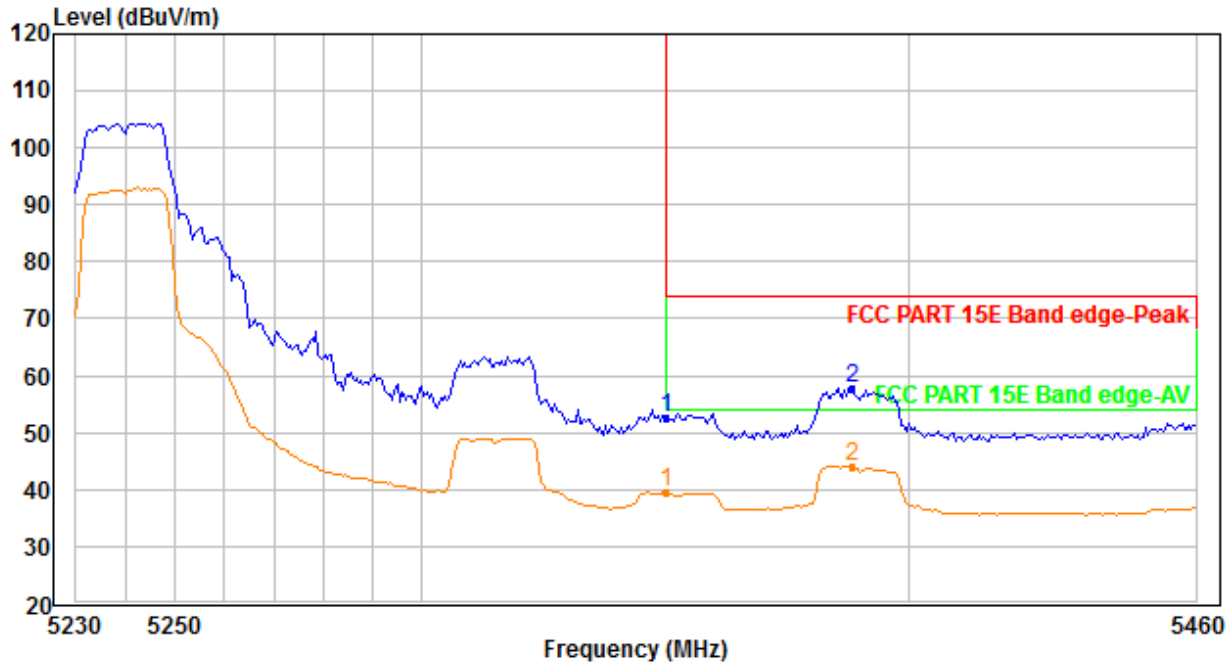
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	64	74	43.61	54	Pass

Test Channel:	Channel 36	Ant. Polar. :	Vertical



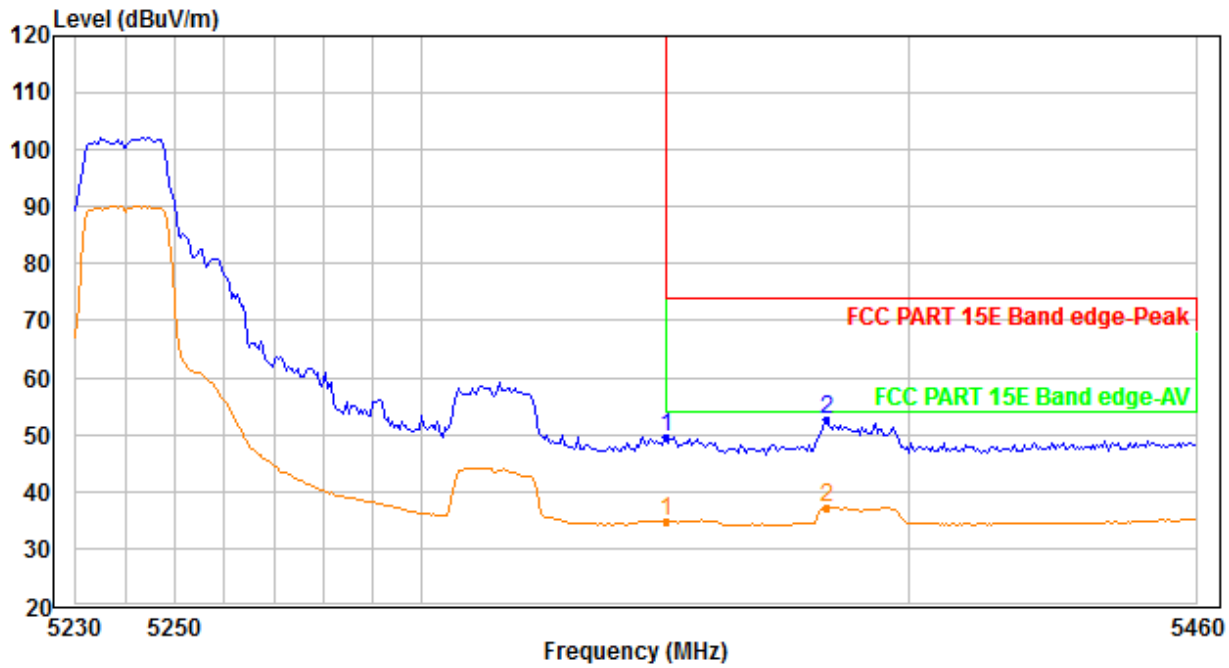
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	63	74	43.64	54	Pass

Test Channel:	Channel 48	Ant. Polar. :	Horizontal



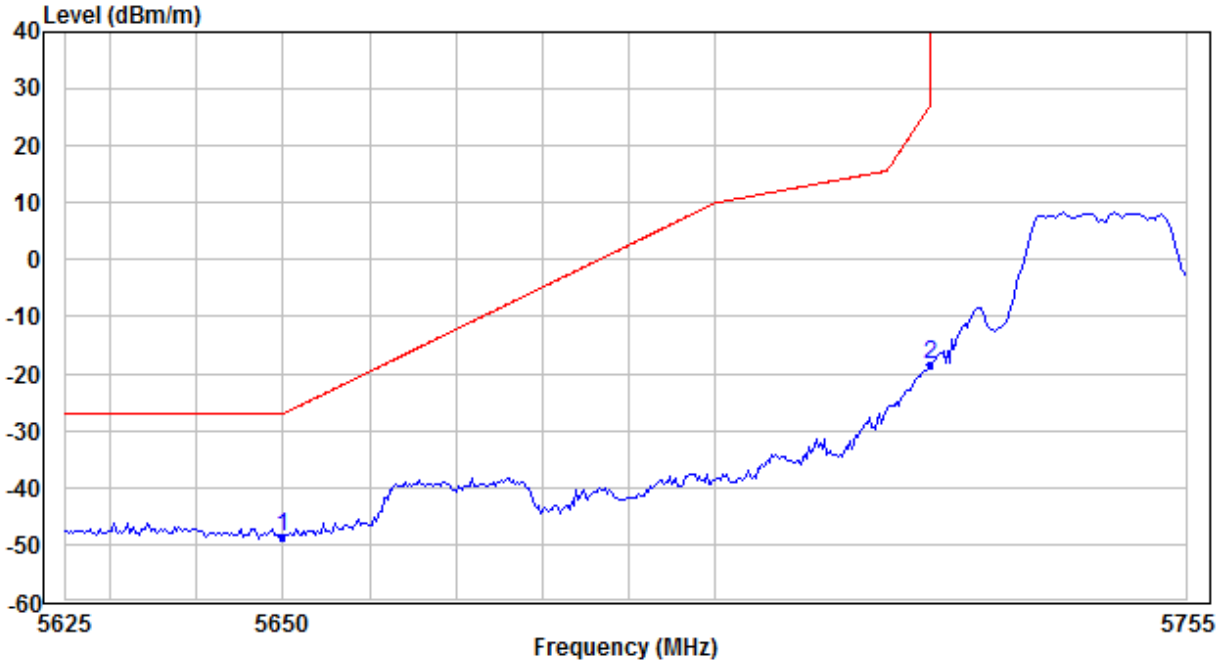
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	52.53	74	39.43	54	Pass
5388.557	57.80	74	43.91	54	Pass

Test Channel:	Channel 48	Ant. Polar. :	Vertical



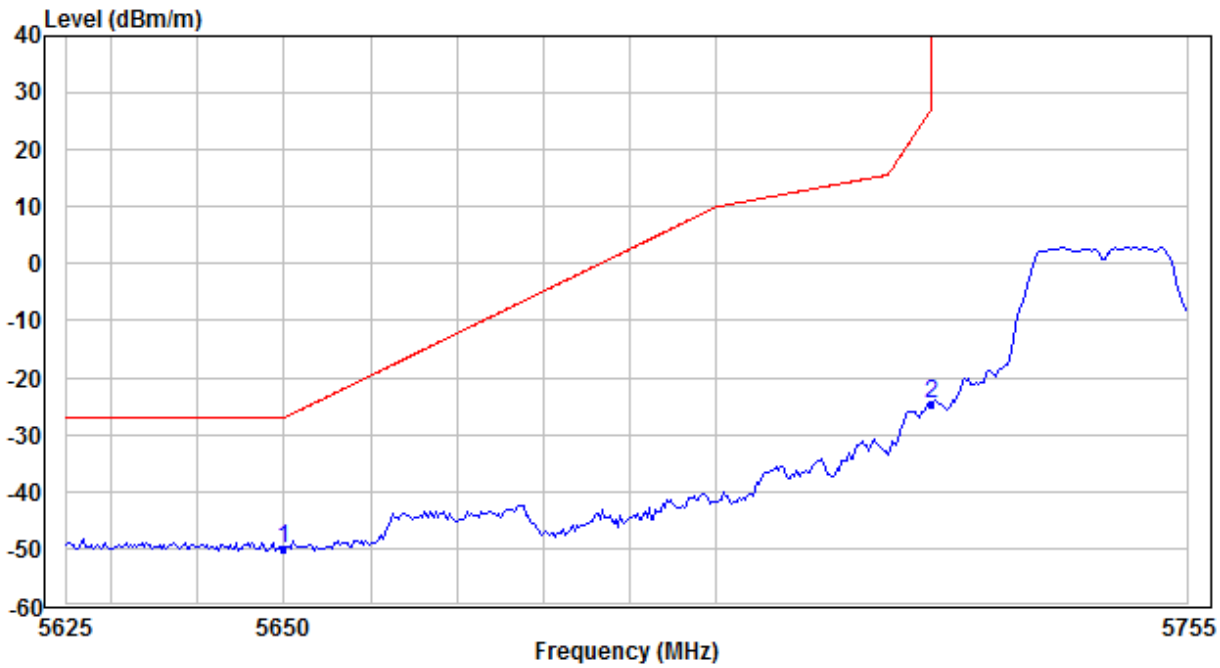
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	49.68	74	34.77	54	Pass
5383.026	52.80	74	37.27	54	Pss

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



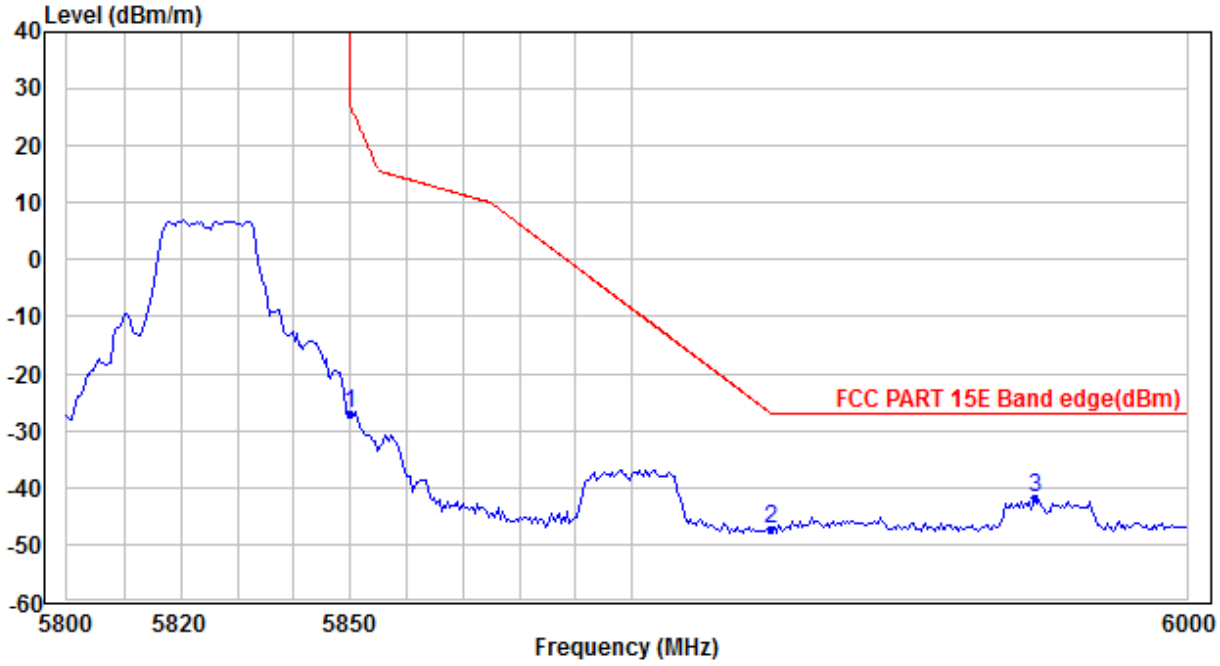
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650	-48.50	-27	Pass
5725	-18.45	27	Pass

Test Channel:	Channel 149	Ant. Polar. :	Vertical



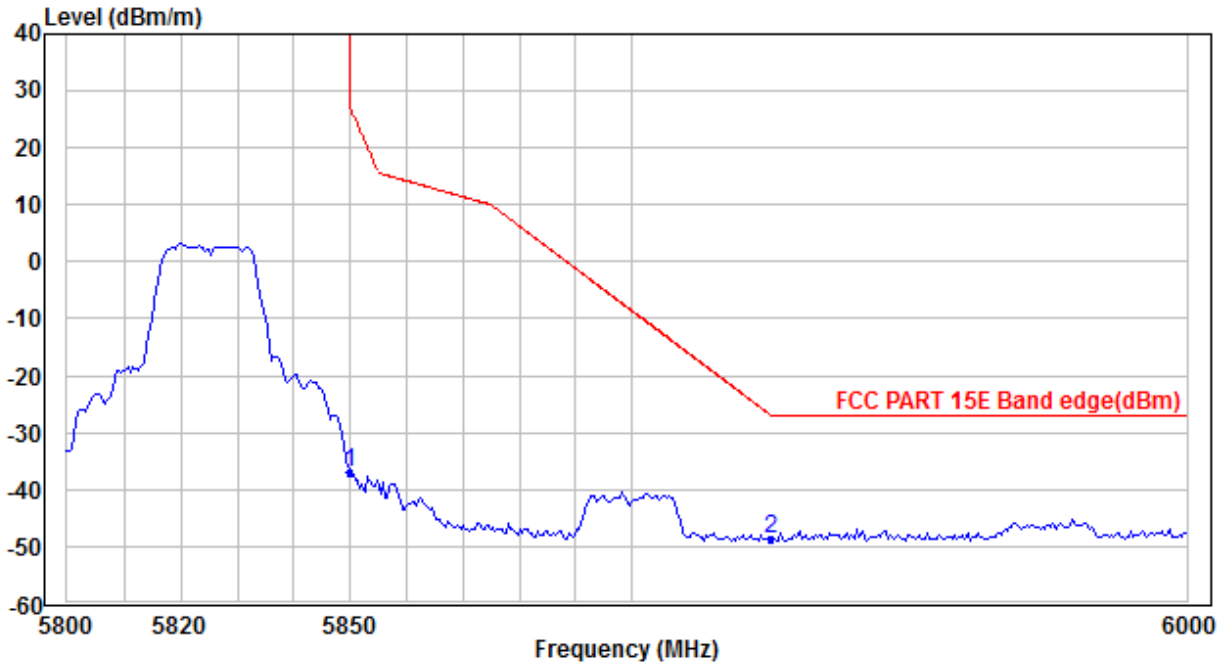
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650	-50.08	-27	Pass
5725	-24.46	27	Pass

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850	-26.95	27	Pass
5925	-47.26	-27	Pass
5972.345	-41.64	-27	Pass

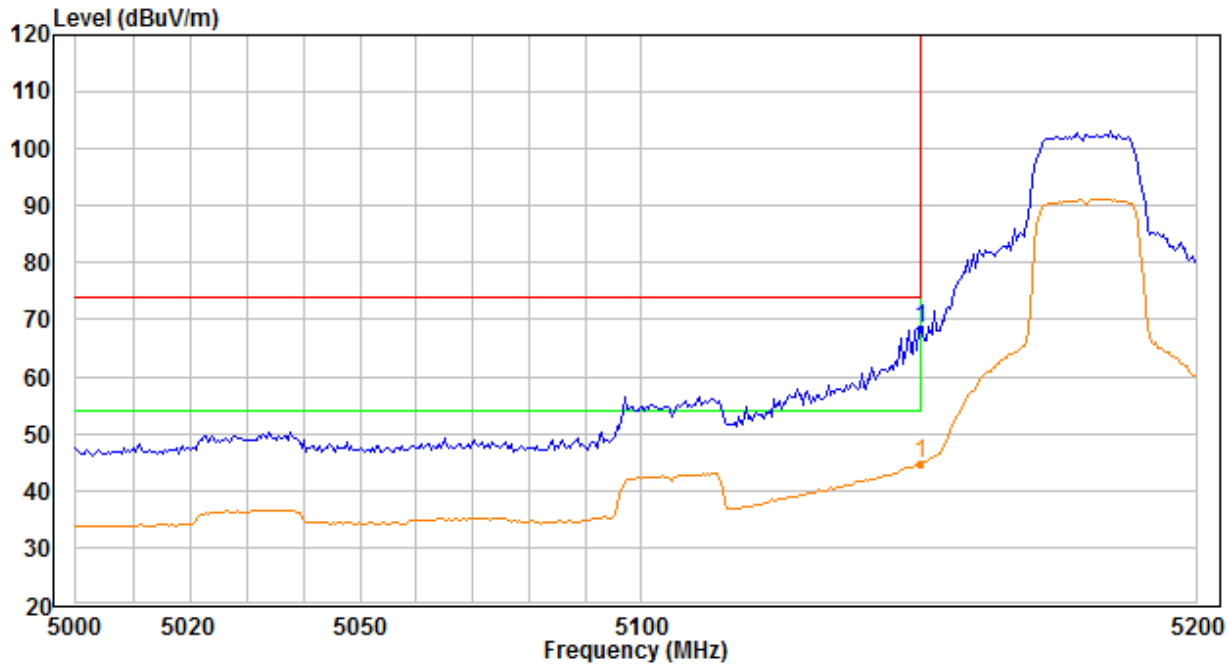
Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850	-36.92	27	Pass
5925	-48.69	-27	Pass

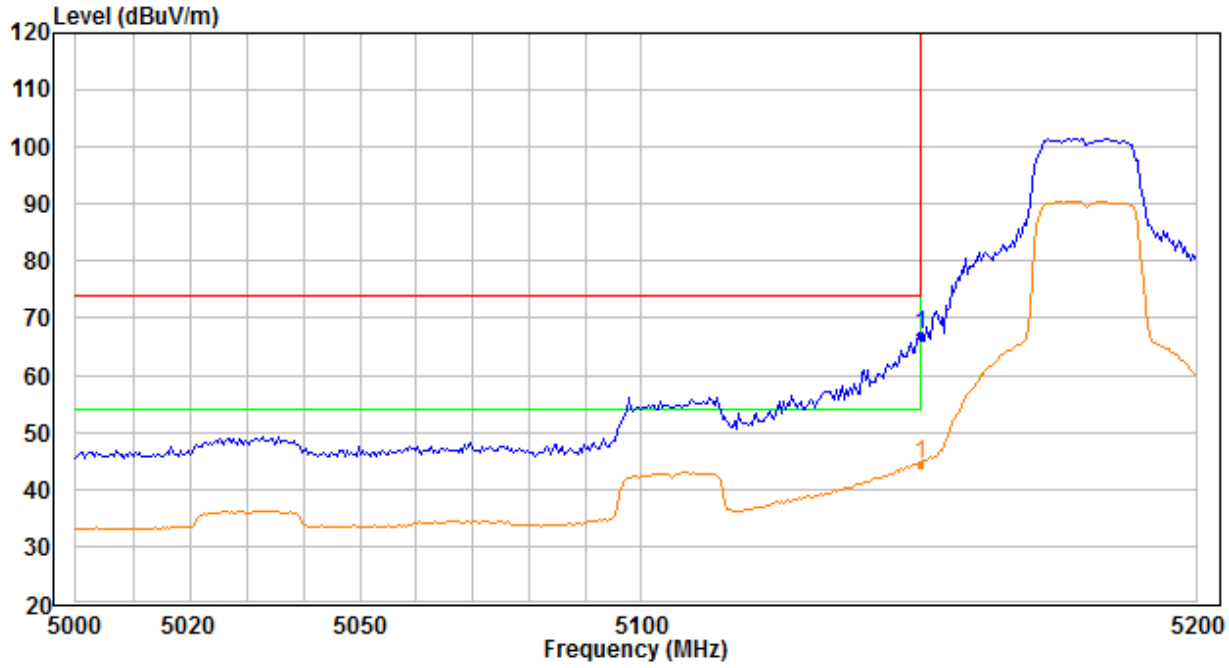
IEEE 802.11n-HT20

Test Channel:	Channel 36	Ant. Polar. :	Horizontal



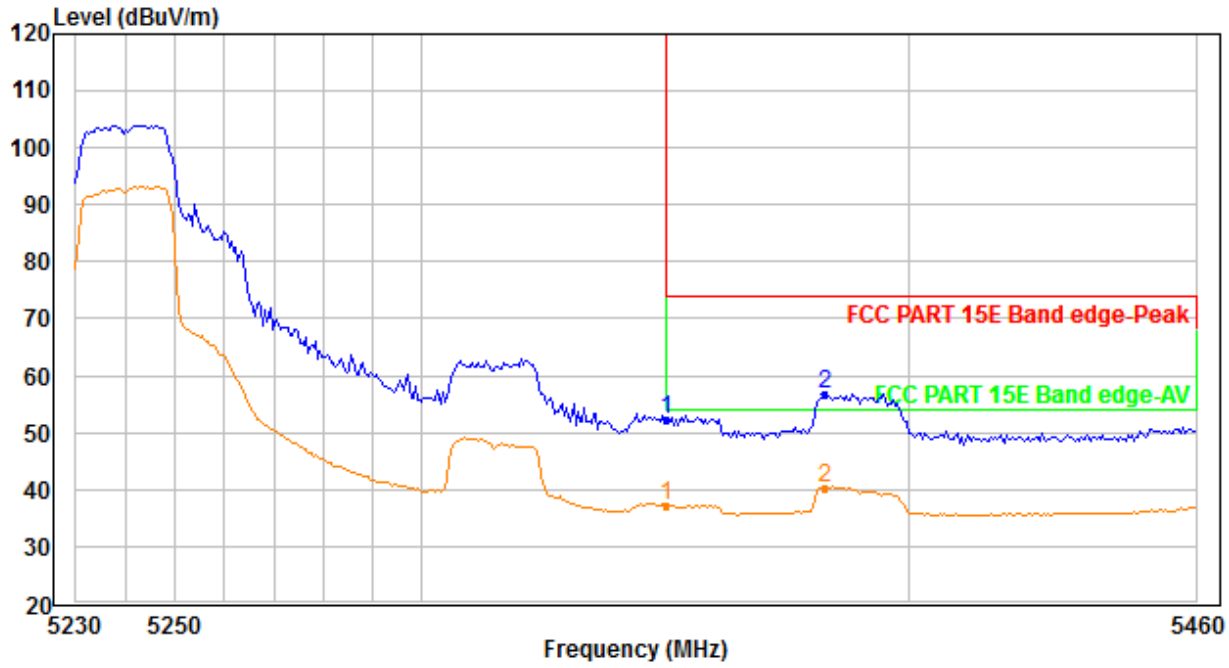
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	68.38	74	44.63	54	Pass

Test Channel:	Channel 36	Ant. Polar. :	Vertical



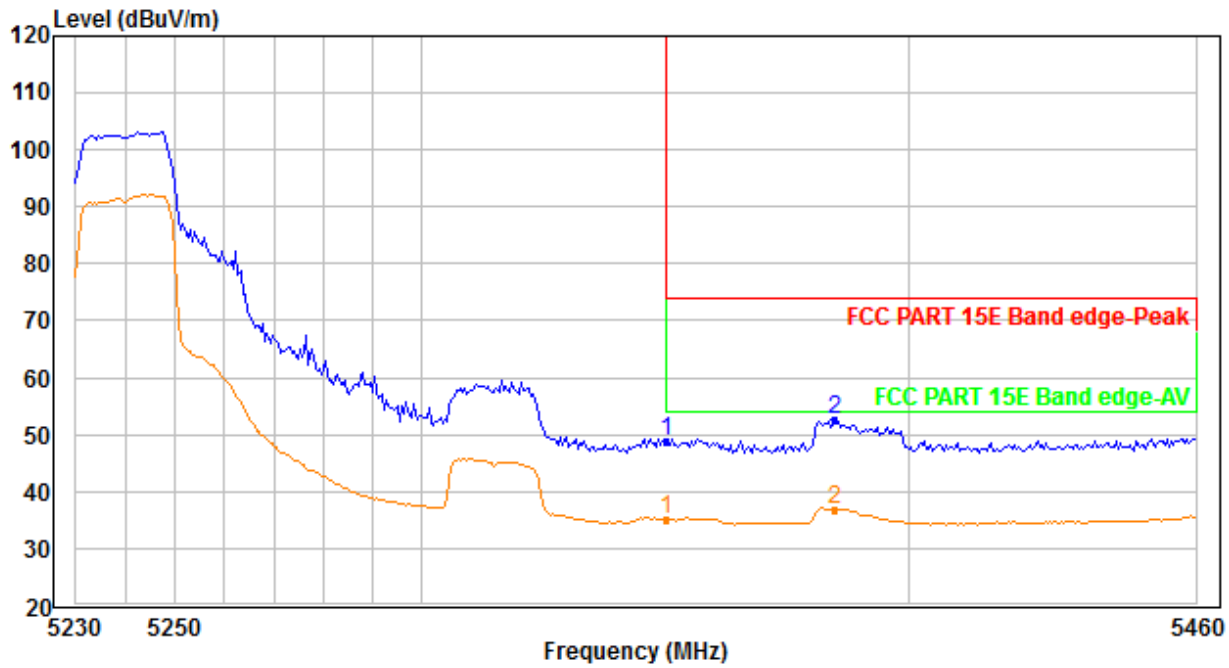
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	67.19	74	44.52	54	Pass

Test Channel:	Channel 48	Ant. Polar. :	Horizontal



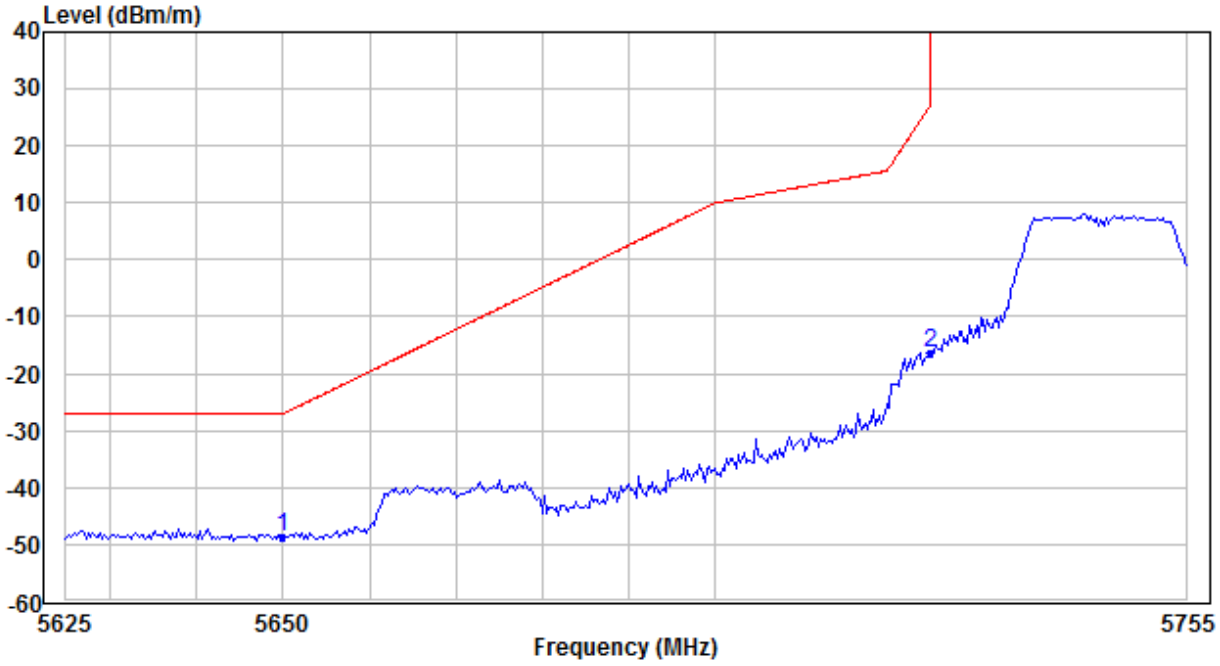
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	52.45	74	37.24	54	Pass
5382.565	56.92	74	40.24	54	Pass

Test Channel:	Channel 48	Ant. Polar. :	Vertical



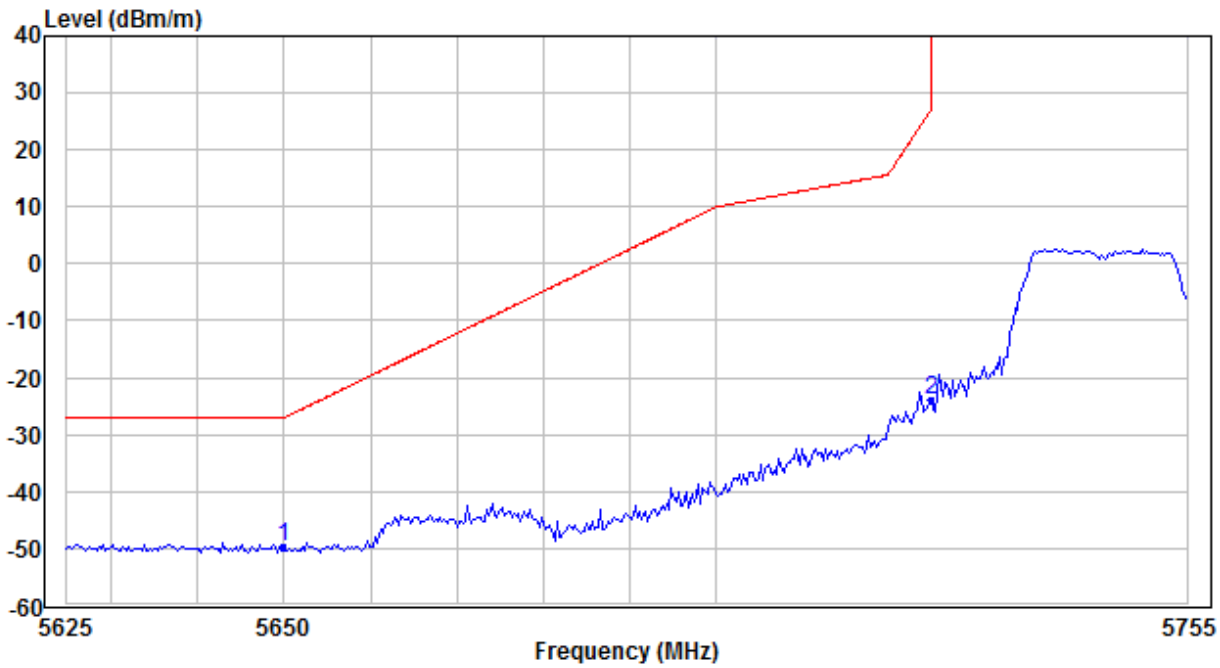
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	48.74	74	35.27	54	Pass
5384.87	52.56	74	37.00	54	Pass

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



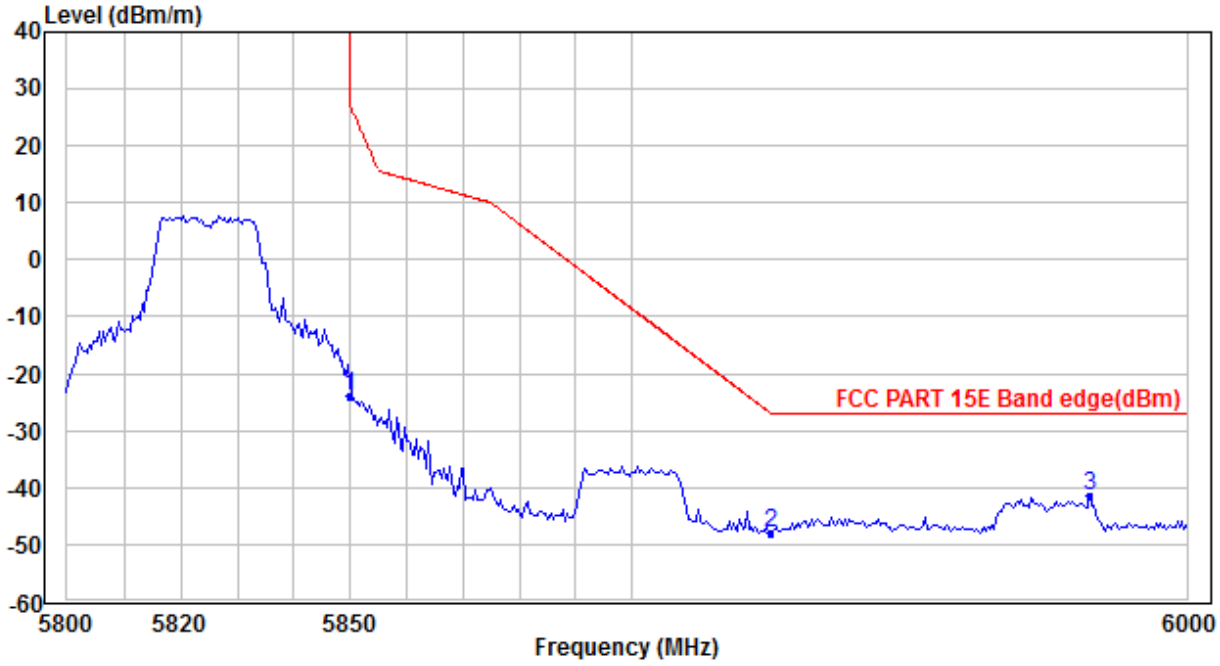
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650	-48.74	-27	Pass
5725	-16.41	27	Pass

Test Channel:	Channel 149	Ant. Polar. :	Vertical



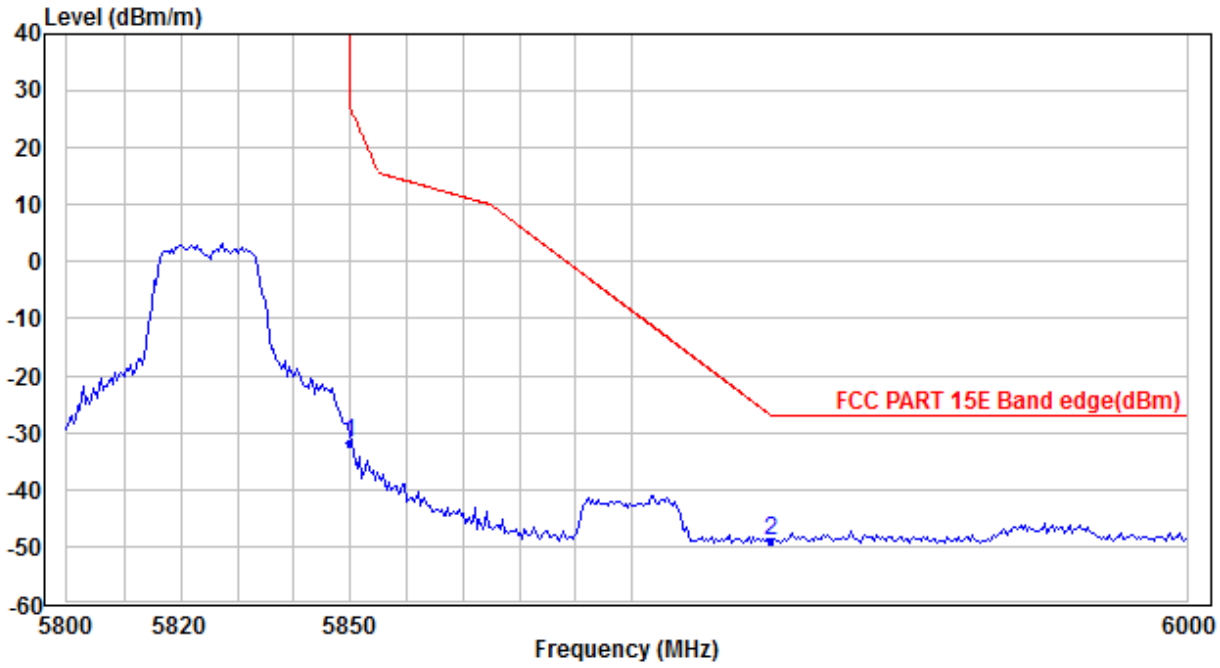
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650	-49.59	-27	Pass
5725	-23.81	27	Pass

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850	-23.80	27	Pass
5925	-47.86	-27	Pass
5982.365	-41.59	-27	Pass

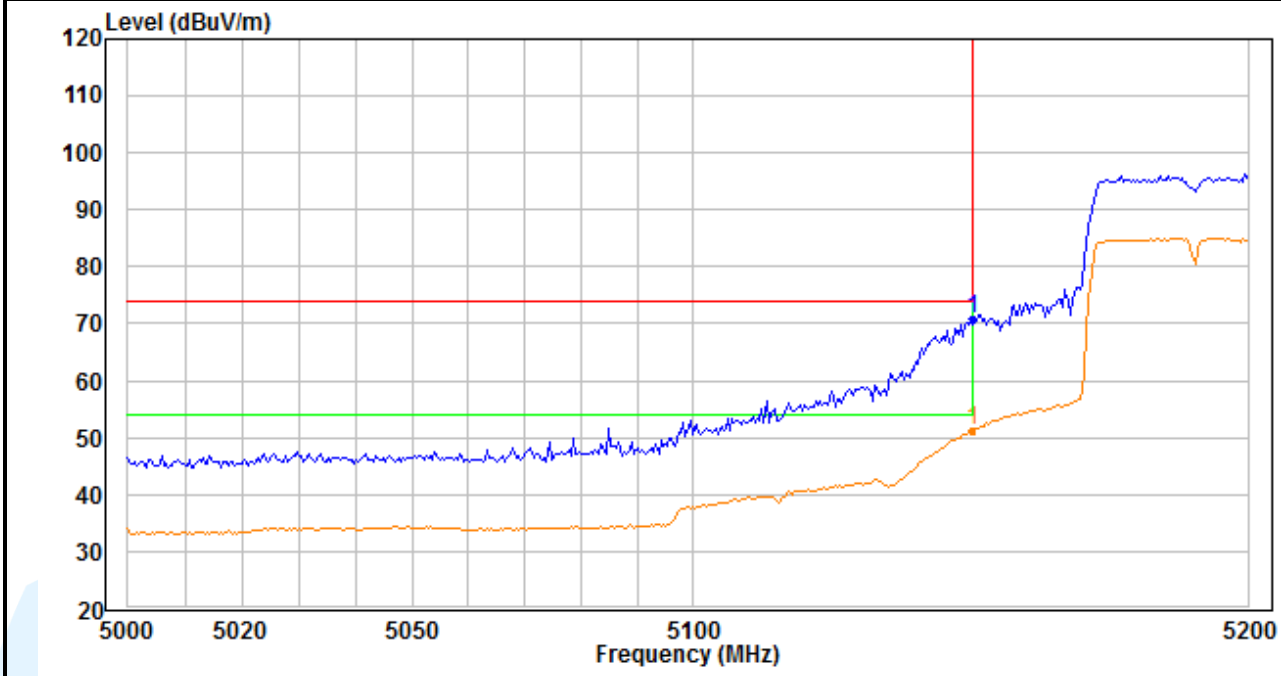
Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850	-31.90	27	Pass
5925	-48.90	-27	Pass

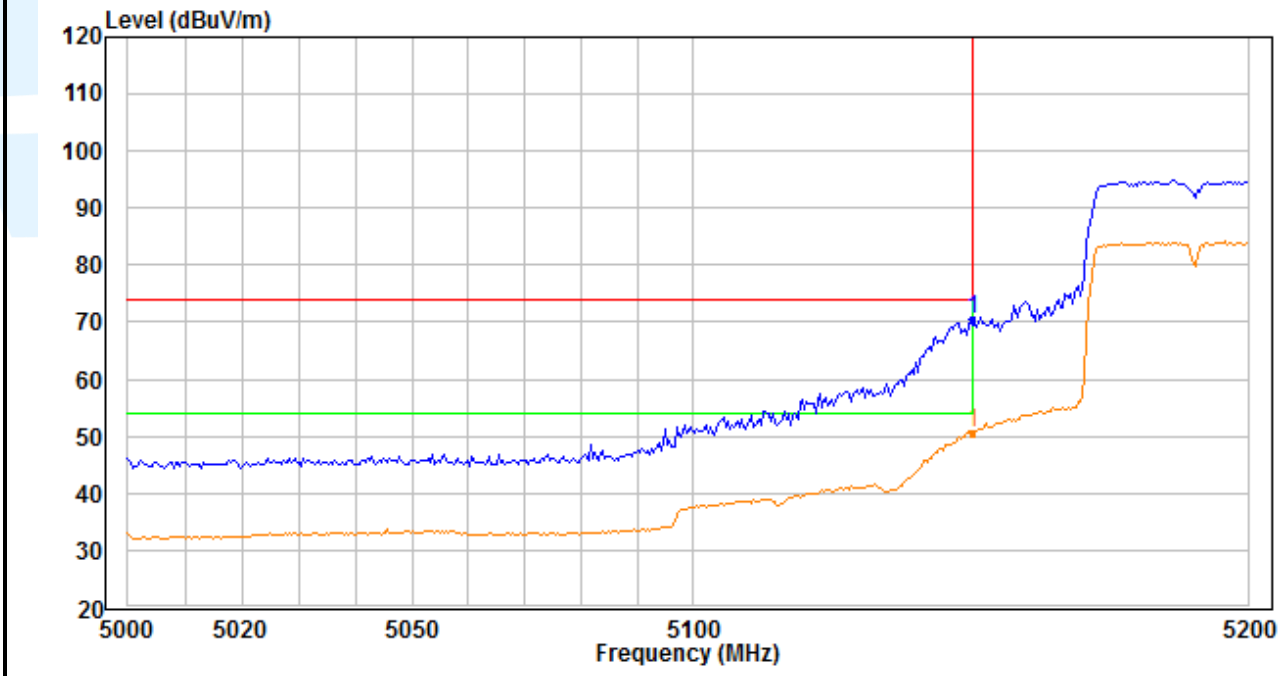
IEEE 802.11n-HT40

Test Channel:	Channel 38	Ant. Polar. :	Horizontal



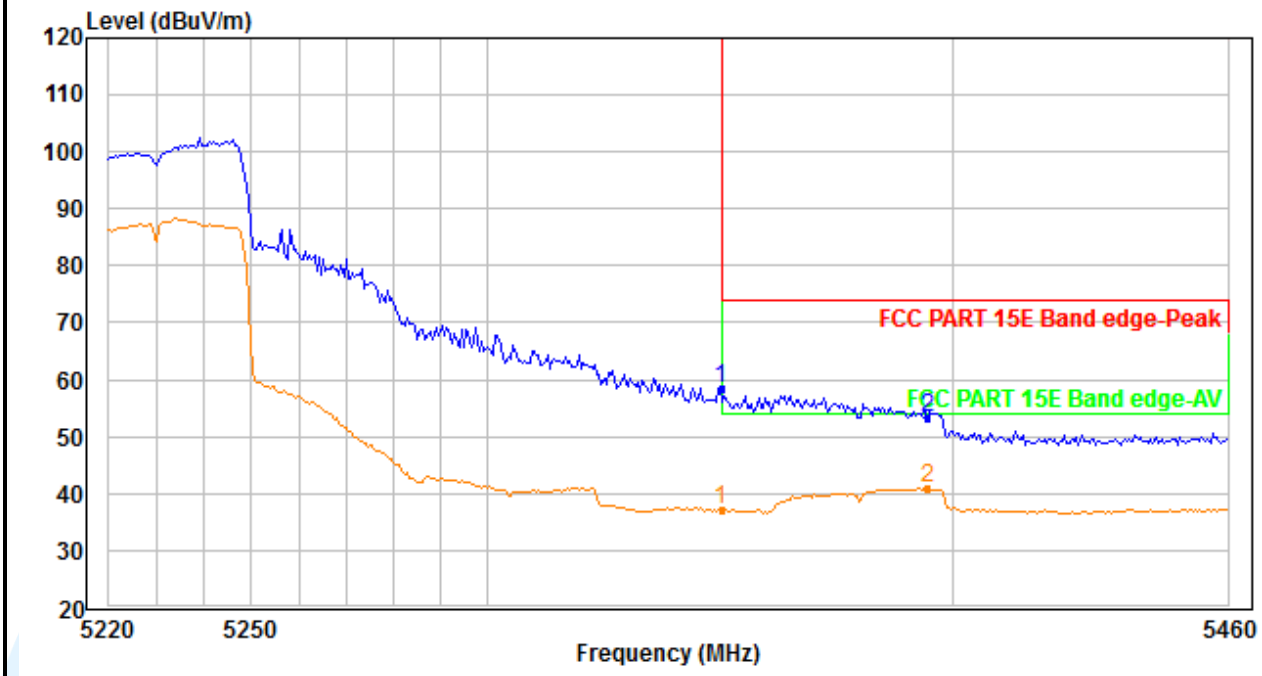
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	70.98	74	51.15	54	Pass

Test Channel:	Channel 38	Ant. Polar. :	Vertical



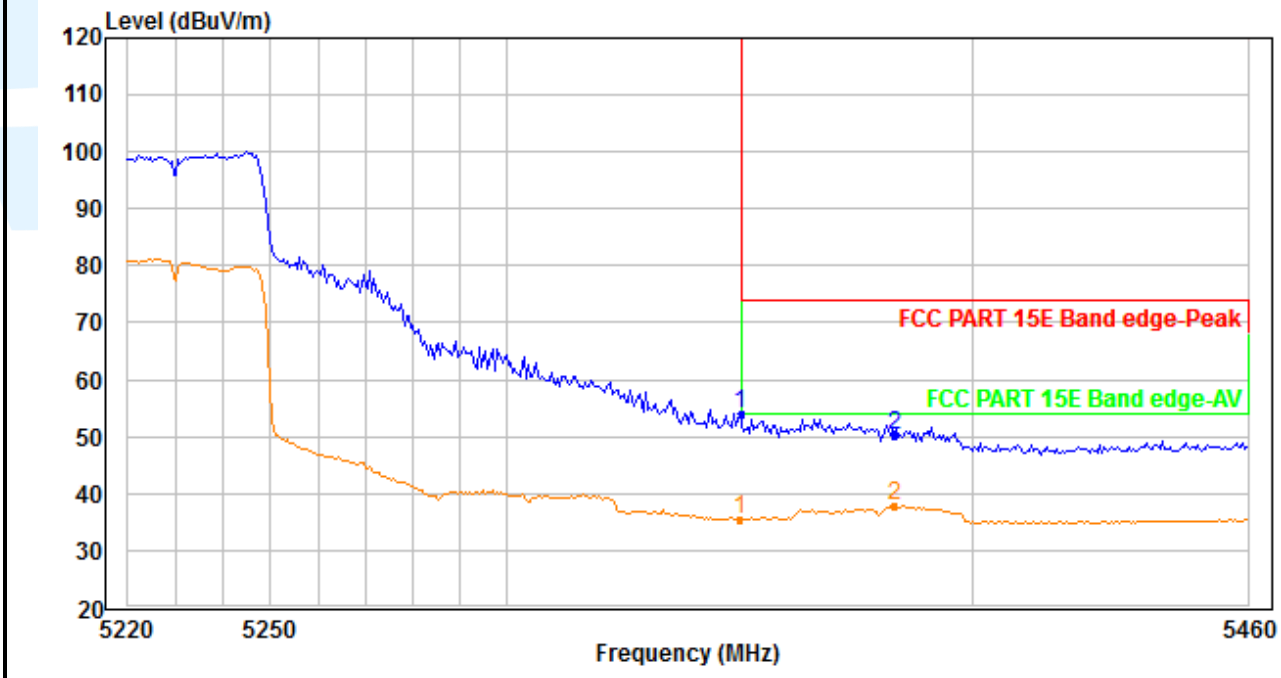
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	70.46	74	50.60	54	Pass

Test Channel:	Channel 46	Ant. Polar. :	Horizontal



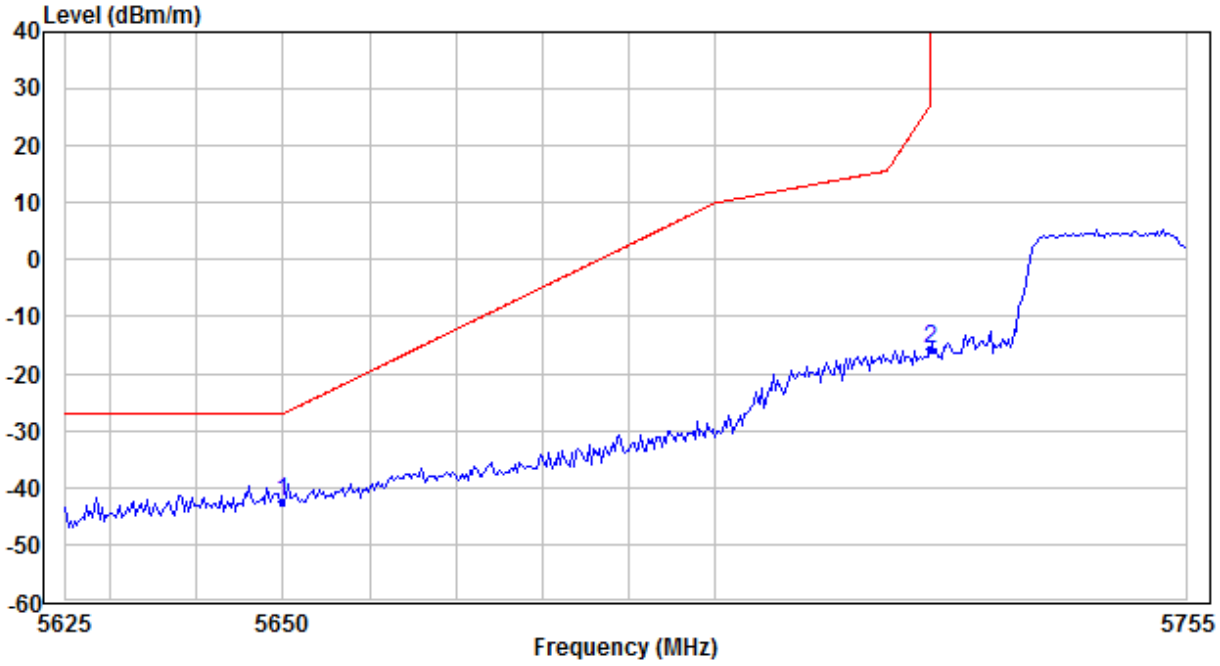
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	58.34	74	37.17	54	Pass
5394.589	53.48	74	40.90	54	Pass

Test Channel:	Channel 46	Ant. Polar. :	Vertical



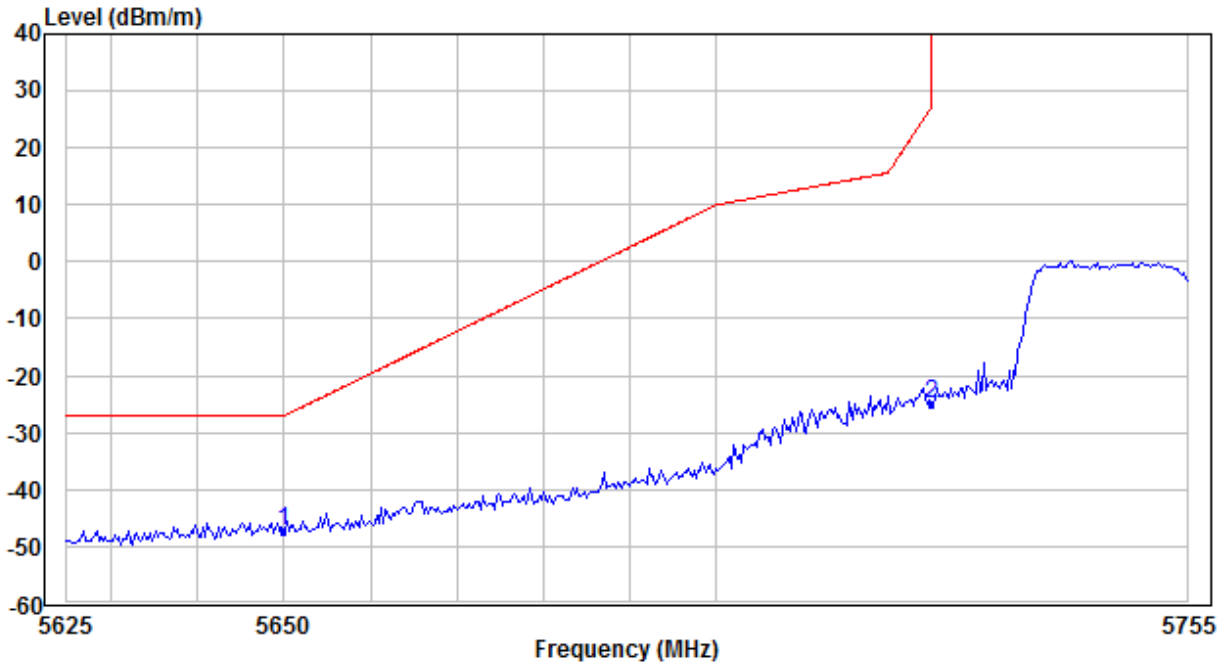
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	53.87	74	35.60	54	Pass
5383.046	50.35	74	37.75	54	Pass

Test Channel:	Channel 151	Ant. Polar. :	Horizontal



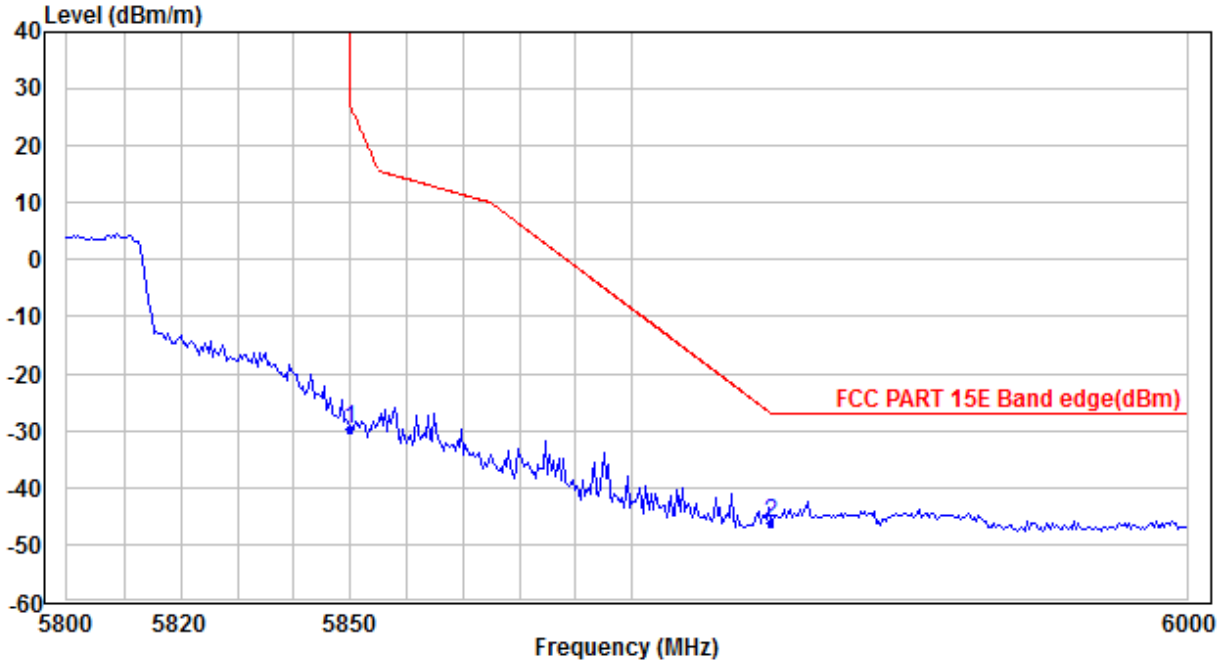
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650	-42.39	-27	Pass
5725	-15.80	27	Pass

Test Channel:	Channel 151	Ant. Polar. :	Vertical



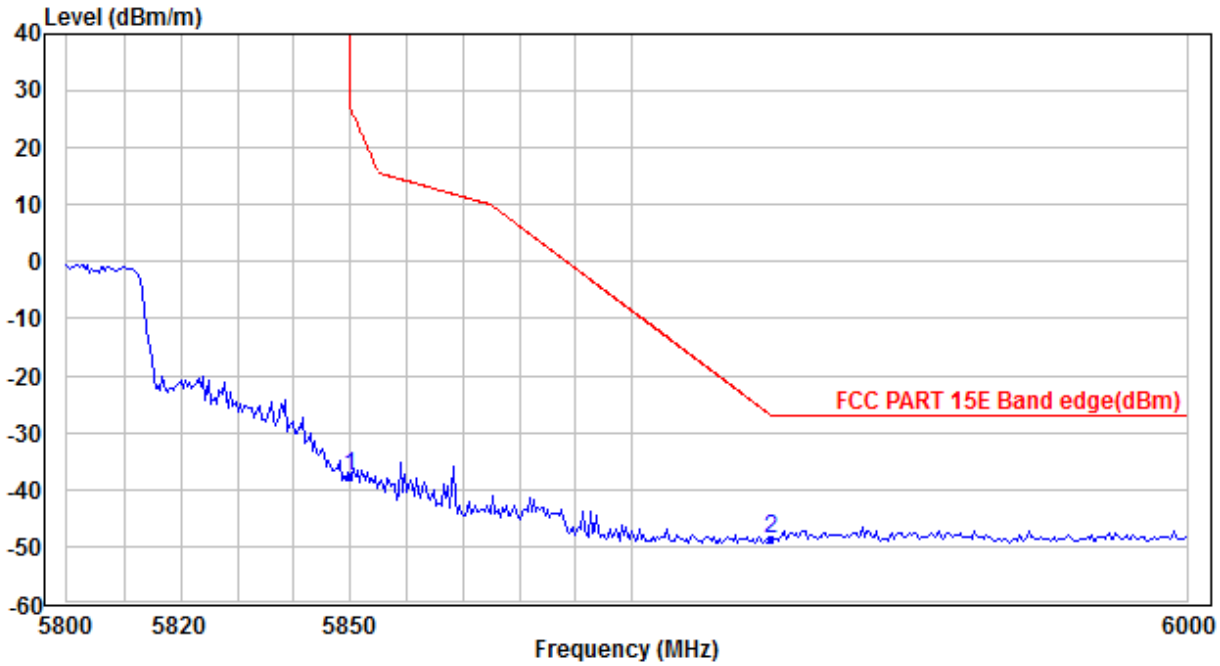
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650	-47.29	-27	Pass
5725	-25.12	27	Pass

Test Channel:	Channel 159	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850	-29.69	27	Pass
5925	-46.23	-27	Pass

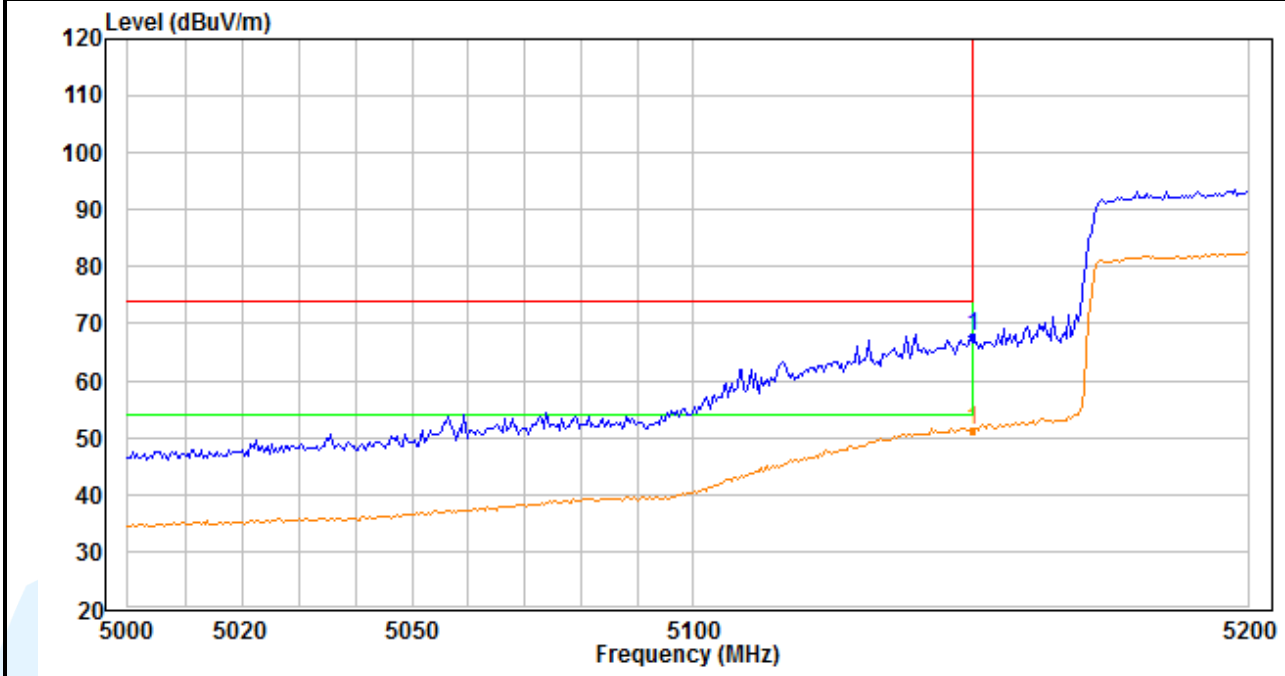
Test Channel:	Channel 159	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850	-37.74	27	Pass
5925	-48.65	-27	Pass

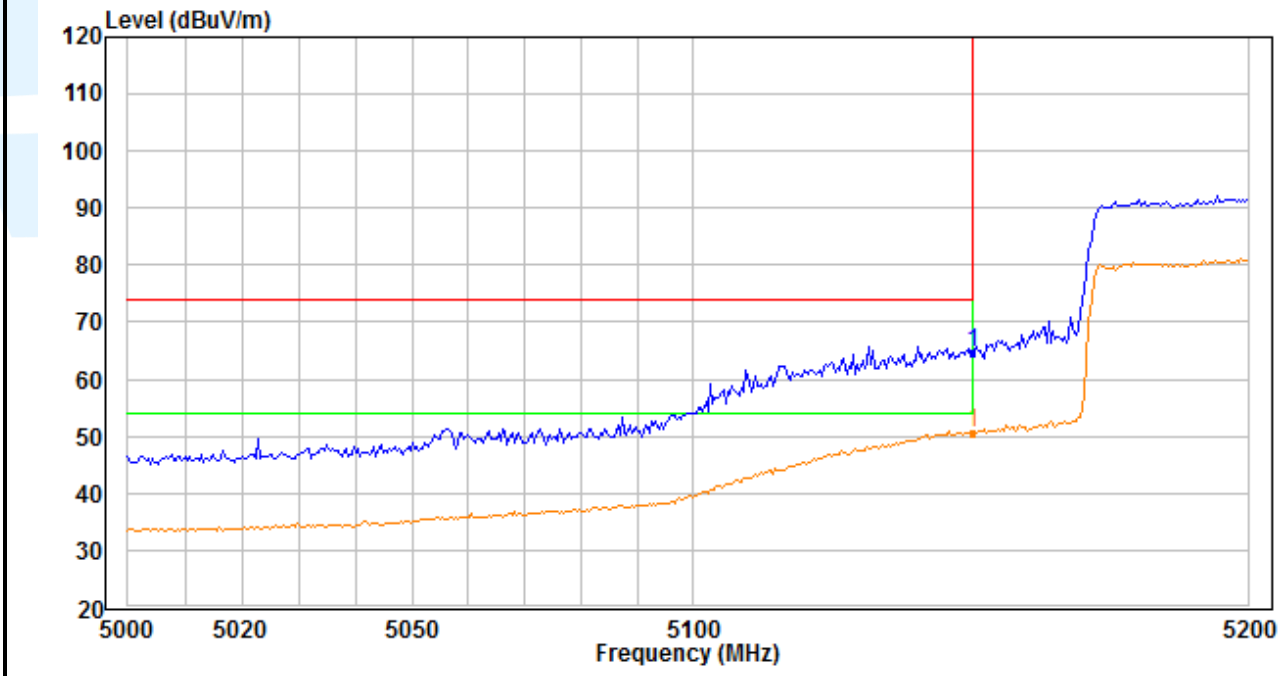
IEEE 802.11ac-VHT80

Test Channel:	Channel 42	Ant. Polar. :	Horizontal



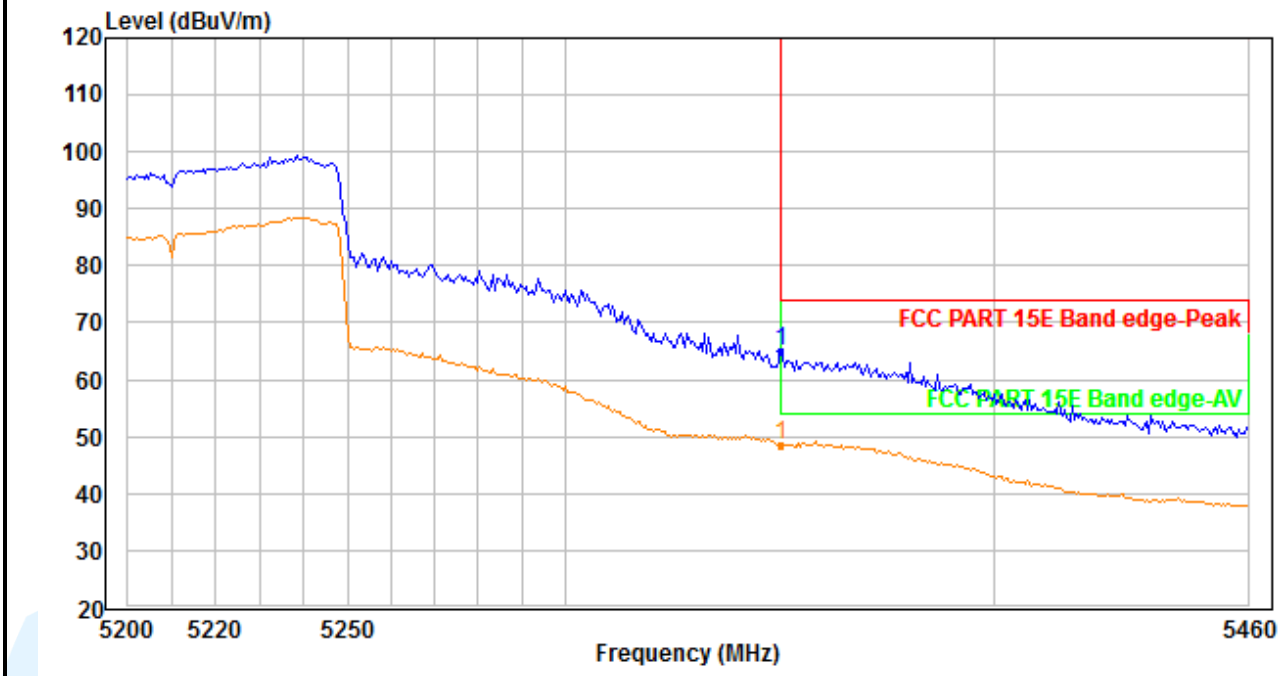
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	67.63	74	51.29	54	Pass

Test Channel:	Channel 42	Ant. Polar. :	Vertical



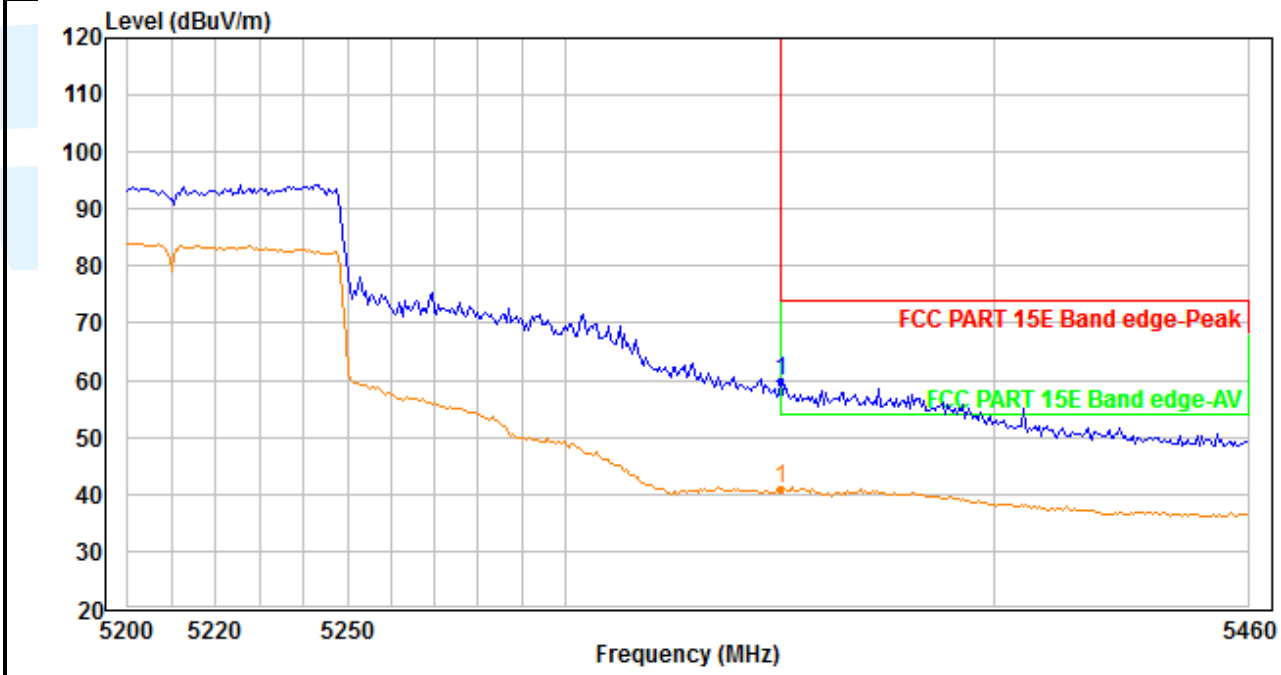
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	64.83	74	50.52	54	Pass

Test Channel:	Channel 42	Ant. Polar. :	Horizontal



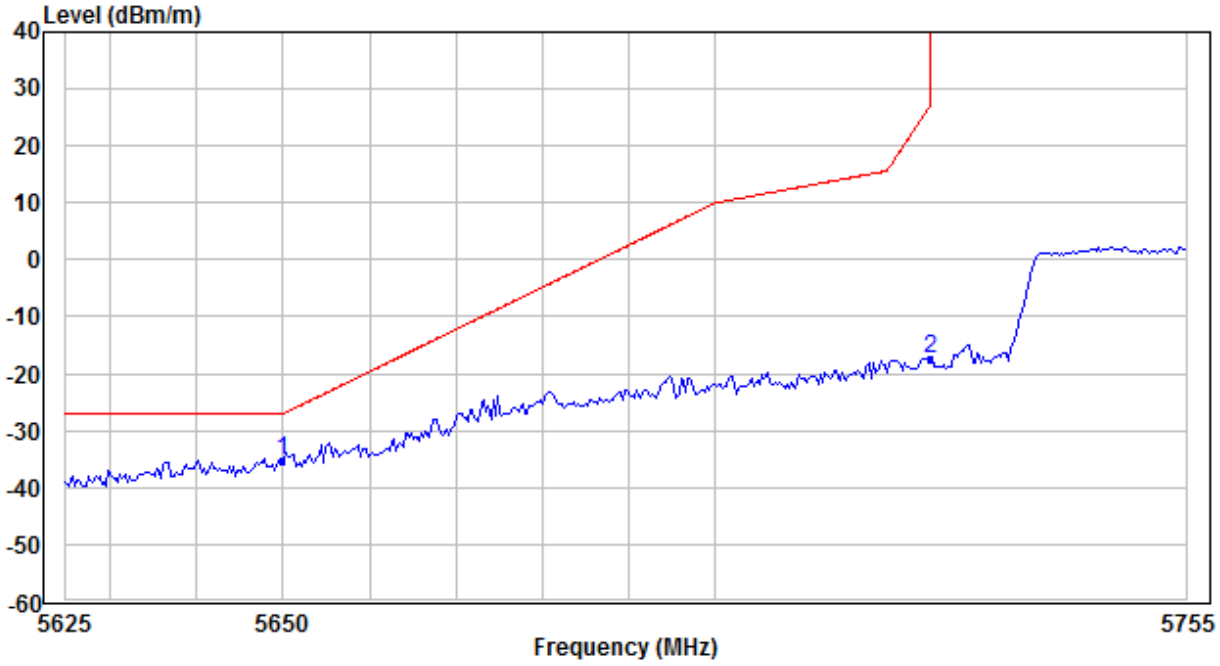
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	64.99	74	48.61	54	Pass

Test Channel:	Channel 42	Ant. Polar. :	Vertical



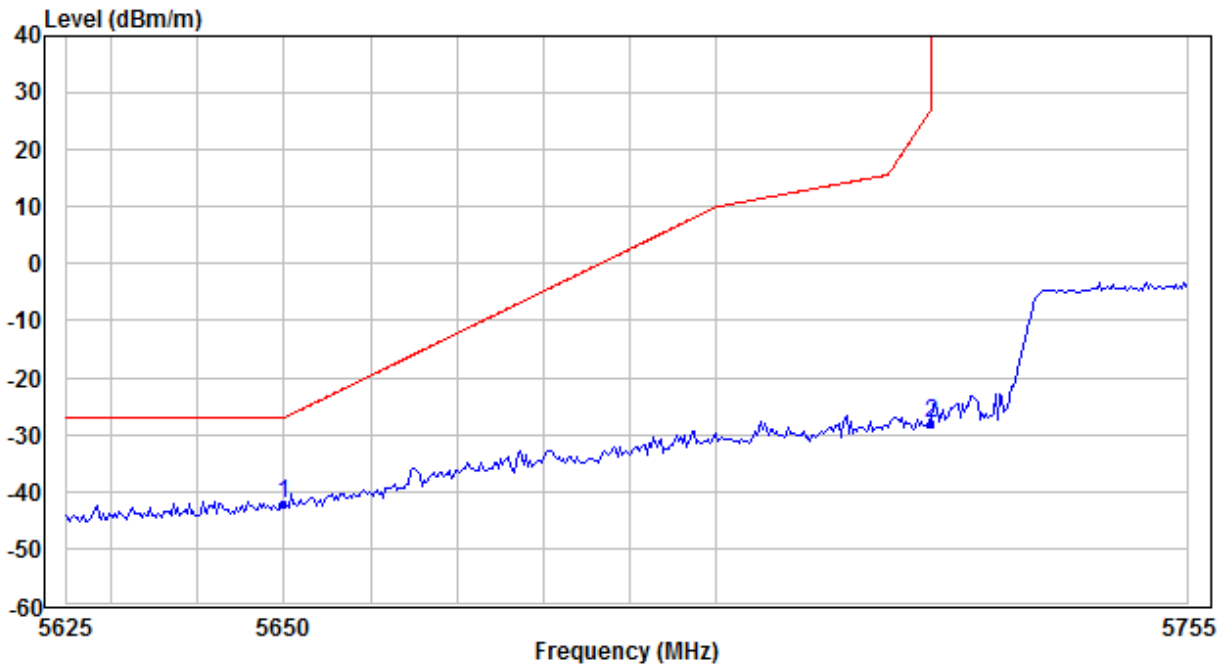
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	59.78	74	40.94	54	Pass

Test Channel:	Channel 155	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650	-35.13	-27	Pass
5725	-17.33	27	Pass

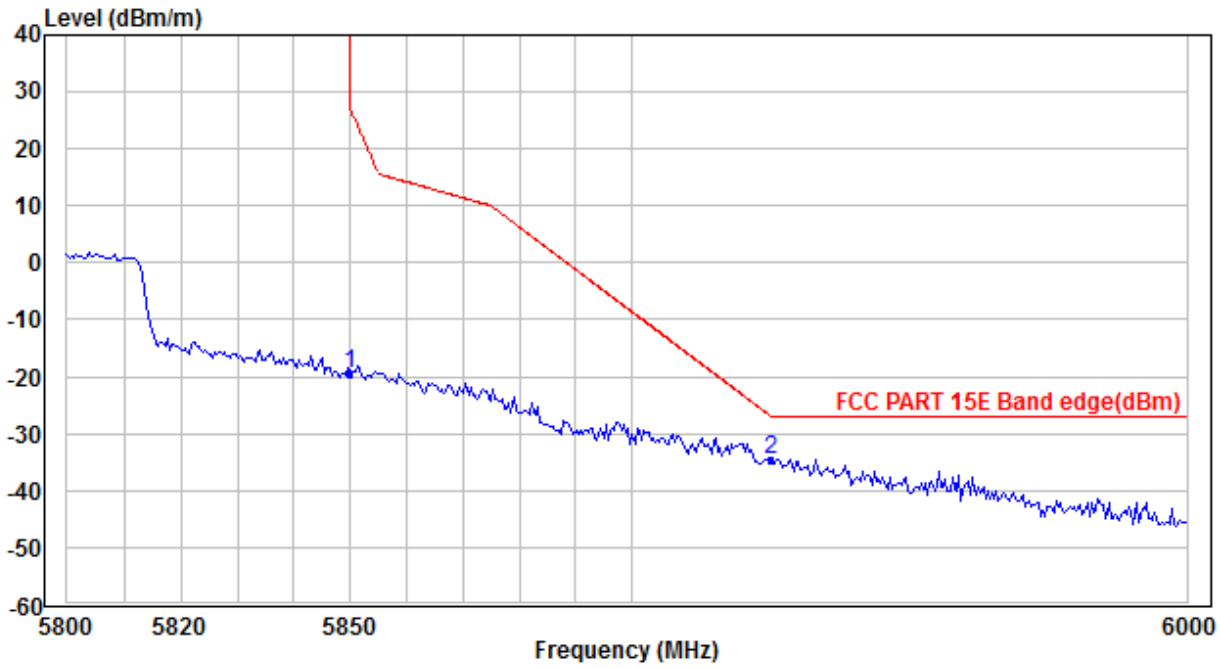
Test Channel:	Channel 155	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650	-42.00	-27	Pass
5725	-28.11	27	Pass

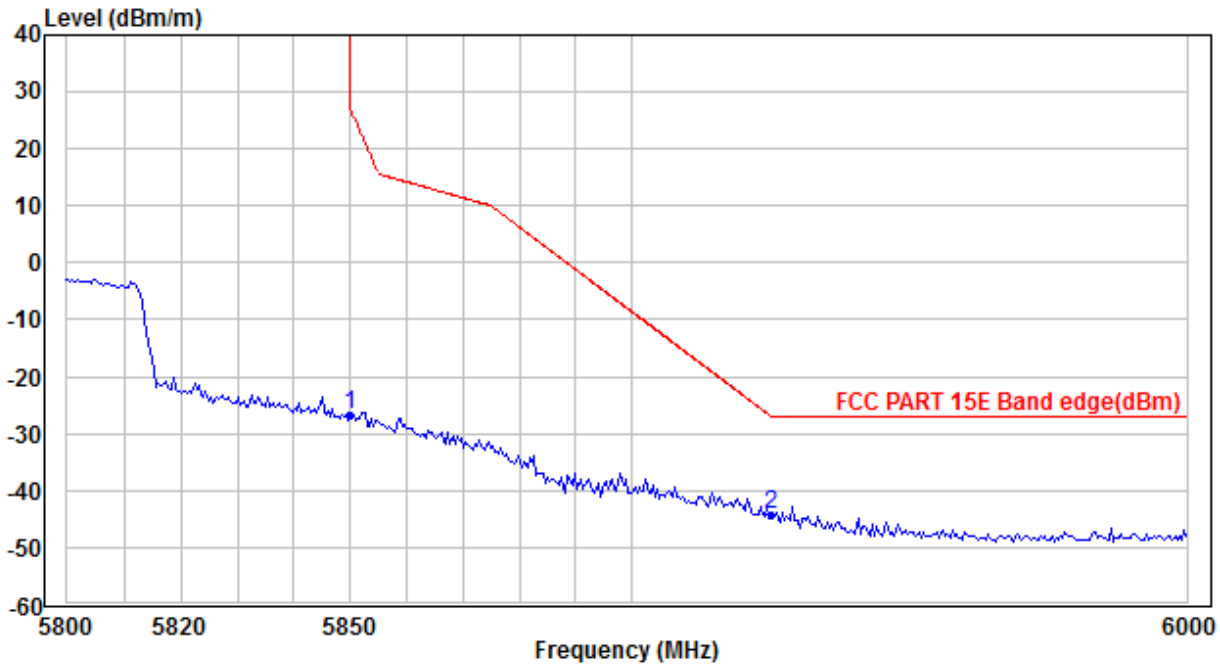
IEEE 802.11ac-VHT80

Test Channel:	Channel 155	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850	-19.40	27	Pass
5925	-34.61	-27	Pass

Test Channel:	Channel 155	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850	-26.69	27	Pass
5925	-44.10	-27	Pass

5.9 AC POWER LINE CONDUCTED EMISSION

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.207

Test Method: ANSI C63.10-2013 Section 6.2

Limits:

Frequency range (MHz)	Limits (dB(μV))	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Remark:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

Test Setup: Refer to section 4.4.2 for details.

Test Procedures:

Test frequency range :150KHz-30MHz

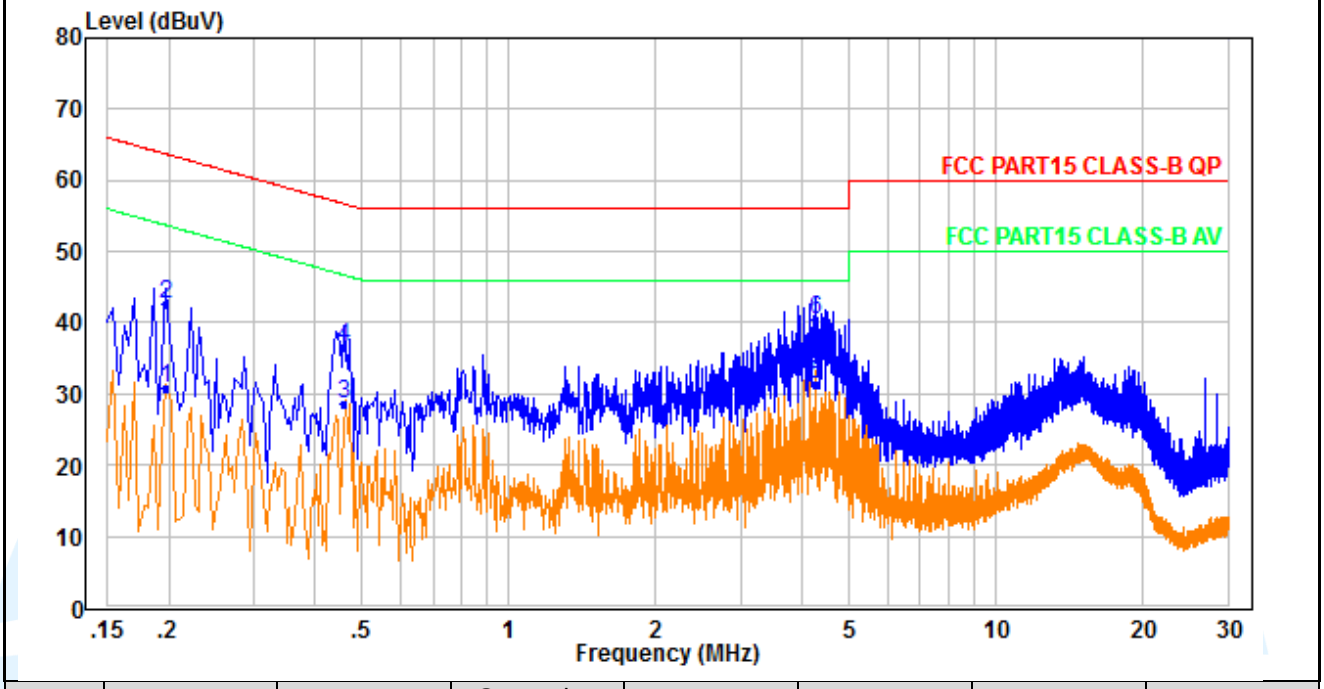
1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) 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 on conducted measurement.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

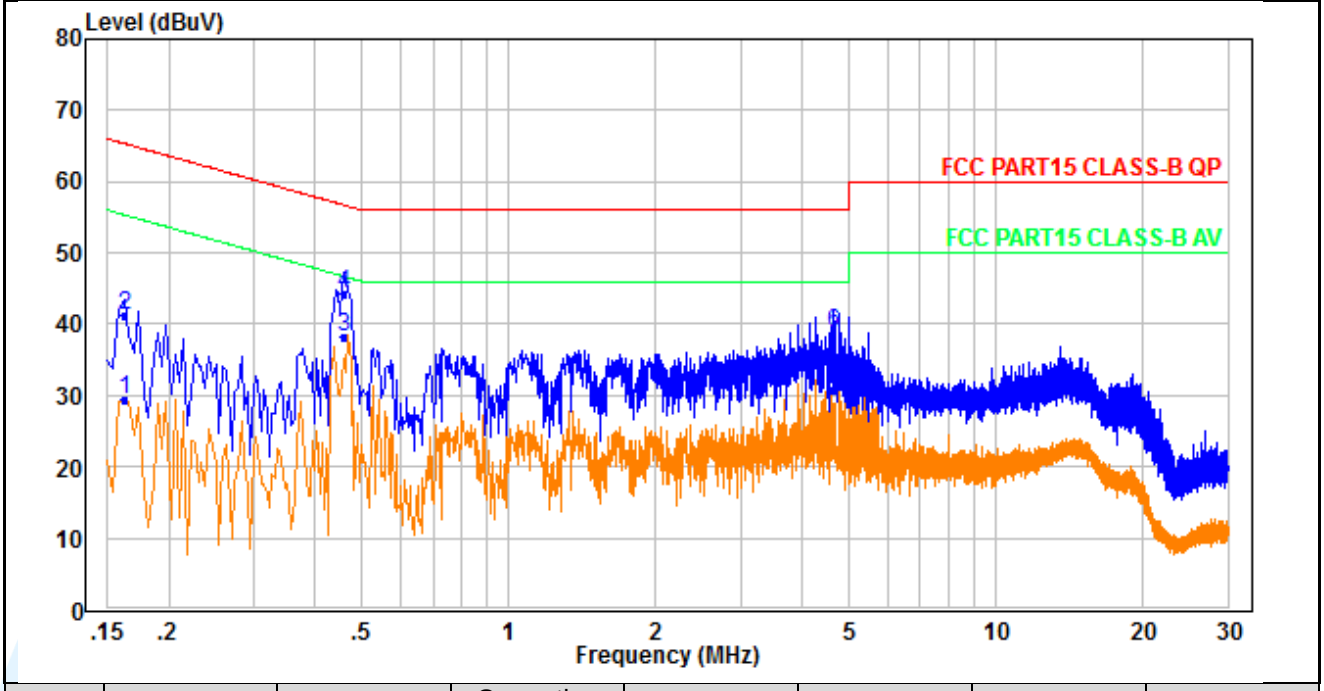
The measurement data as follows:
Quasi Peak and Average:
Mode: WIFI Link

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1*	0.198	20.50	10.20	30.70	53.70	-23.00	Average
2	0.198	32.50	10.20	42.70	63.70	-21.00	QP
3	0.458	18.20	10.40	28.60	46.70	-18.10	Average
4	0.458	26.20	10.40	36.60	56.70	-20.10	QP
5	4.274	21.10	10.40	31.50	46.00	-14.50	Average
6	4.274	30.10	10.40	40.50	56.00	-15.50	QP

Neutral Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1*	0.162	19.10	10.20	29.30	55.40	-26.10	Average
2	0.162	31.10	10.20	41.30	65.40	-24.10	QP
3	0.458	27.80	10.40	38.20	46.70	-8.50	Average
4	0.458	33.80	10.40	44.20	56.70	-12.50	QP
5	4.638	20.10	10.60	30.70	46.00	-15.30	Average
6	4.638	28.10	10.60	38.70	56.00	-17.30	QP

Remark:
1. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***