TEST REPORT

Product Name:	10.1" Tablet
Trade Mark:	Outcome HEALTH
Model No.:	P-TAB-XXX-XXX-XX (X equals to 0 ~ 9, A ~ Z)
HVIN:	PIRT001
Report Number:	170911001RFC-4
Test Standards:	FCC 47 CFR Part 15 Subpart E RSS-247 Issue 2 RSS-Gen Issue 4
FCC ID:	2AI6X-PIRT001
IC:	21722-PIRT001
Test Result:	PASS
Date of Issue:	October 19, 2017

Prepared for:

ContextMedia Health LLC.
330 N. Wabash Ave STE 2500, Chicago, Illinois, United States

Prepared by:

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Reviewed by: Jim Long, Senior Supervisor

Approved by: Billy Li, Technical Director

Date: October 19, 2017

Version

Version No.	Date	Description
V1.0	October 19, 2017	Original

CONTENTS

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	ContextMedia Health LLC.
Address of Applicant:	330 N. Wabash Ave STE 2500, Chicago, Illinois, United States
Manufacturer:	ContextMedia Health LLC.
Address of Manufacturer:	330 N. Wabash Ave STE 2500, Chicago, Illinois, United States

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	10.1" Tablet		
Model No.:	P-TAB-XXX-XXX-XX (X equals to 0 ~ 9, A ~ Z)		
Model Declaration:	All the models P-TAB-XXX-XXX-XX (X equals to 0 ~ 9, A ~ Z) are same with each other in hardware and electronics aspects, only difference of model no. for market strategy.		
Trade Mark:	Outcome HEALTH		
DUT Stage:	Identical Prototype		
EUT Supports Function:	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth: V4.0 (dual mode)	
	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
Sample Received Date:	September 12, 2017		
Sample Tested Date:	September 12, 2017 to September 22, 2017		

1.2.2 Description of Accessories

Adapter	
Model No.:	NBS18C50250VU
Input:	100-240 V~50/60 Hz 0.6 A
Output:	5.0 V ⎓ 2.5 A
AC Cable:	N/A
DC Cable:	3 Meter, Unshielded without ferrite

Battery	
Model No.:	PL2969140*2P
Battery Type:	Rechargeable Li-polymer Battery
Rated Voltage:	3.7 Vdc
Limited Charge Voltage:	4.2 Vdc
Rated Capacity:	7400 mAh

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Frequency Range:	5150 MHz to 5250 MHz
	5 725 MHz to 5850 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:	PIFA Antenna	
Antenna Gain:	5150 MHz to 5250 MHz: 3.2 dBi	
	5725 MHz to 5850 MHz: 3.2 dBi	
U-NII-1 Maximum EIRP (dBm):	IEEE 802.11a:	18.19
	IEEE 802.11n-HT20:	17.91
	IEEE 802.11n-HT40:	17.09
	IEEE 802.11ac-VHT20:	17.82
	IEEE 802.11ac-VHT40:	13.86
	IEEE 802.11ac-VHT80:	13.54

Maximum Output Power (dBm):	**U-NII-1**	**U-NII-3**
IEEE 802.11a:	14.99	16.51
IEEE 802.11n-HT20:	14.71	16.27
IEEE 802.11n-HT40:	13.89	15.23
IEEE 802.11ac-VHT20:	14.62	16.30
IEEE 802.11ac-VHT40:	17.06	15.52
IEEE 802.11ac-VHT80:	16.74	15.00

Normal Test Voltage:	120V~60Hz and/or 3.7V⎓7400mAh Rechargeable Li-polymer Battery
Extreme Test Voltage:	3.4 to 4.2 Vdc
Extreme Test Temperature:	-30 °C to +50 °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
--	--	--	--	--

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.30 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

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) RSS-Gen Issue 4, Section 8.3	ANSI C63.10-2013	PASS
26 dB emission bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(2)(5) RSS-247 Issue 2 Section 6.2.1.2	KDB 789033 D02 v01r04 Section C.1	PASS
6 dB bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (e) RSS-247 Issue 2 Section 6.2.4.1	KDB 789033 D02 v01r04 Section C.2	PASS
Occupied Bandwidth	RSS-Gen section 6.6	KDB 789033 D02 v01r04 Section D	PASS
Maximum conducted output power	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3) RSS-247 Issue 2 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1	KDB 789033 D02 v01r04 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) RSS-247 Issue 2 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1	KDB 789033 D02 v01r04 Section F	PASS
Frequency stability	FCC 47 CFR Part 15 Subpart E Section 15.407 (g) RSS-Gen Issue 4, Section 6.11	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 RSS-247 Issue 2 Section 6.2.1.2/6.2.2.2/6.2.3.2/6.2.4.2	KDB 789033 D02 v01r04 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) RSS-247 Issue 2 Section 6.3	KDB 905462 D03 Client Without DFS New Rules v01r02	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 RSS-Gen Issue 4, Section 8.8	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. 22, 2016	Dec. 22, 2017
☑	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Dec. 22, 2016	Dec. 22, 2017
☑	Loop Antenna	ETS-LINDGREN	6502	00202525	Jun. 24, 2015	Jun. 23, 2018
☑	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Jul. 24, 2015	Jul. 23, 2018
☑	Preamplifier	HP	8447F	2805A02960	Dec. 22, 2016	Dec. 22, 2017
☑	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	Dec. 30, 2016	Dec. 30, 2017
☑	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Jul. 29, 2015	Jul. 28, 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. 22, 2016	Dec. 22, 2017
☑	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430023	Dec. 22, 2016	Dec. 22, 2017
☑	DC Source	KIKUSUI	PWR400L	LK003024	Sep. 14, 2017	Sep. 13, 2018
☑	Temp & Humidity chamber	Espec	GL(U)04KA(W)	16921H201P3	Sep. 14, 2017	Sep. 13, 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. 22, 2016	Dec. 22, 2017
☑	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	Dec. 22, 2016	Dec. 22, 2017
☑	LISN	R&S	ESH2-Z5	860014/024	Dec. 22, 2016	Dec. 22, 2017
☑	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 (V)	Relative Humidity (%)
TN/VN	+15 to +35	3.7	20 to 75
TL/VL	-30	3.4	20 to 75
TH/VL	+50	3.4	20 to 75
TL/VH	-30	4.2	20 to 75
TH/VH	+50	4.2	20 to 75

Remark:
1) The EUT just work in such extreme temperature of -30 °C to +50 °C and the extreme voltage of 3.4 V to 4.2 V, so here the EUT is tested in the temperature of -30 °C to +50 °C and the voltage of 3.4 V to 4.2 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	25.1	56	99.36	Bessy Xu
26 dB emission bandwidth & Occupied Bandwidth	24.7	49	99.94	Henry Lu
Maximum conducted output power	24.7	49	99.94	Henry Lu
Peak Power Spectral Density	24.7	49	99.94	Henry Lu
6 dB bandwidth & Occupied Bandwidth	24.7	49	99.94	Henry Lu
Radiated Emissions and Band Edge Measurement	25.5	60	99.41	Tiny You

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	1Tx/1Rx	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 5220 MHz	6	9	12	18	24	36	48	54
	14.86	14.73	14.66	14.57	14.47	14.24	12.13	12.02
IEEE 802.11n-HT20 5220 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	14.50	14.39	14.25	14.18	13.95	11.74	11.68	10.68
IEEE 802.11n-HT40 5190 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	13.58	13.29	13.05	12.90	12.61	10.24	10.16	10.10
IEEE 802.11ac-VHT20 5240 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	14.28	14.25	14.19	14.13	13.96	11.77	11.7	10.79
	MCS8							
	9.80							
IEEE 802.11ac-VHT40 5190 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	13.59	13.36	13.14	12.95	12.67	10.34	10.26	10.17
	MCS8	MCS9						
	8.84	7.42						
IEEE 802.11ac-VHT80 5210 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	13.01	12.68	12.36	12.12	11.82	9.52	9.43	9.47
	MCS8	MCS9						
	8.01	6.37						

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

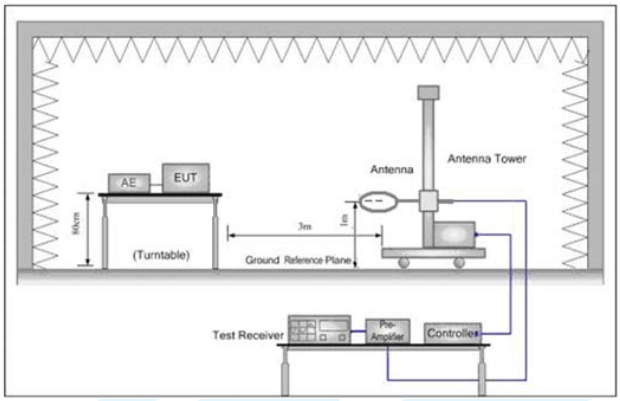


Figure 1. Below 30MHz

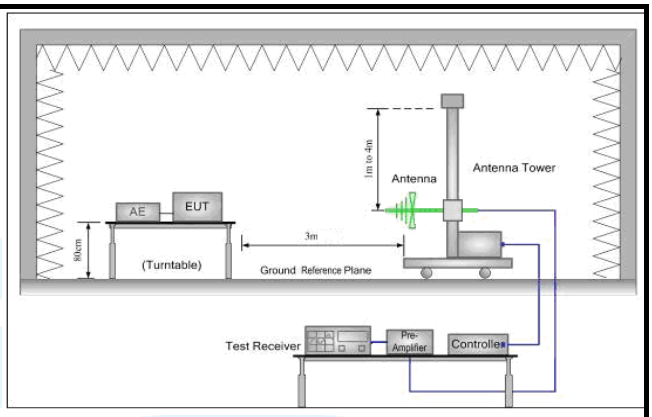


Figure 2. 30MHz to 1GHz

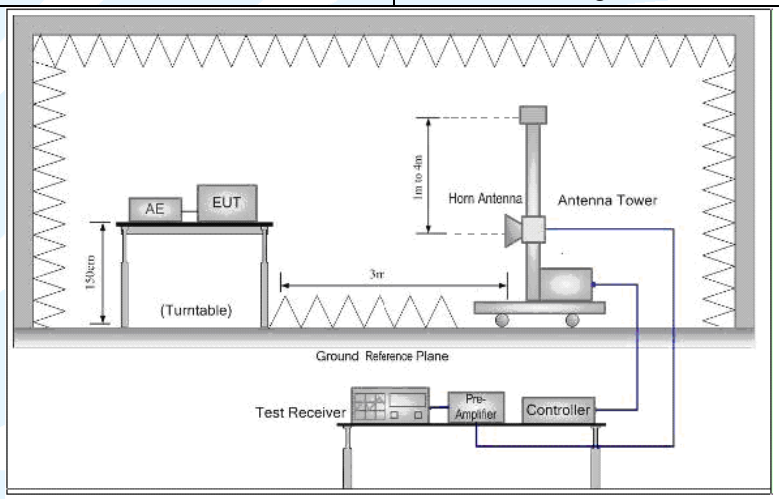
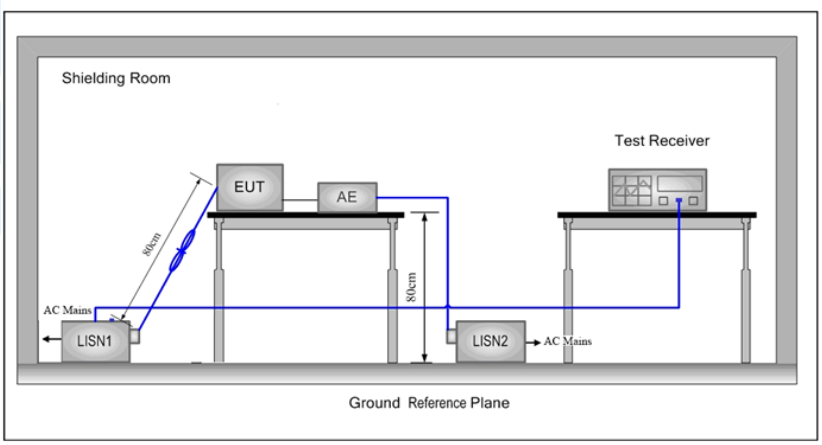


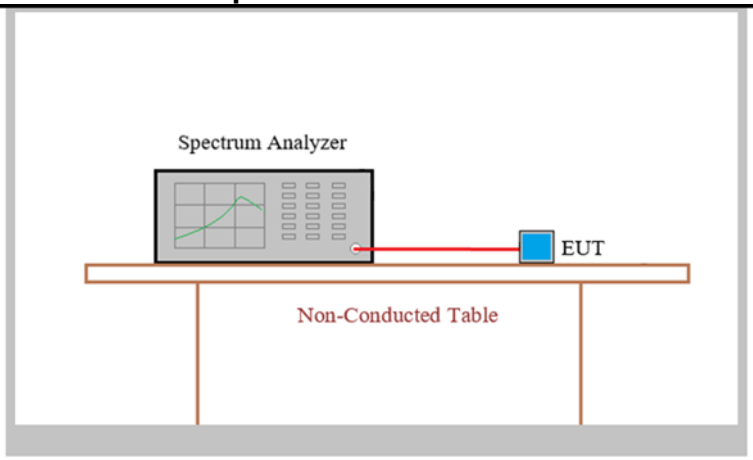
Figure 3. Above 1GHz

4.5.2 For Conducted Emissions test setup

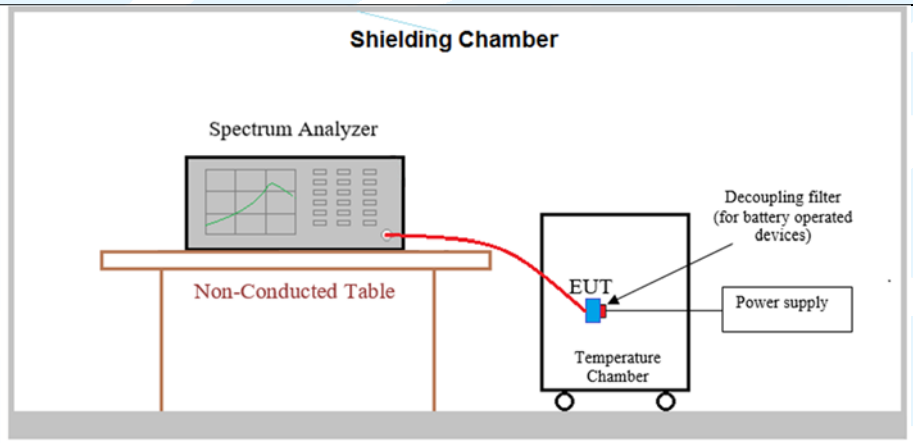
Figure 3. Conducted Emissions setup



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 3.7Vdc rechargeable Li-polymer battery. 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	X 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.

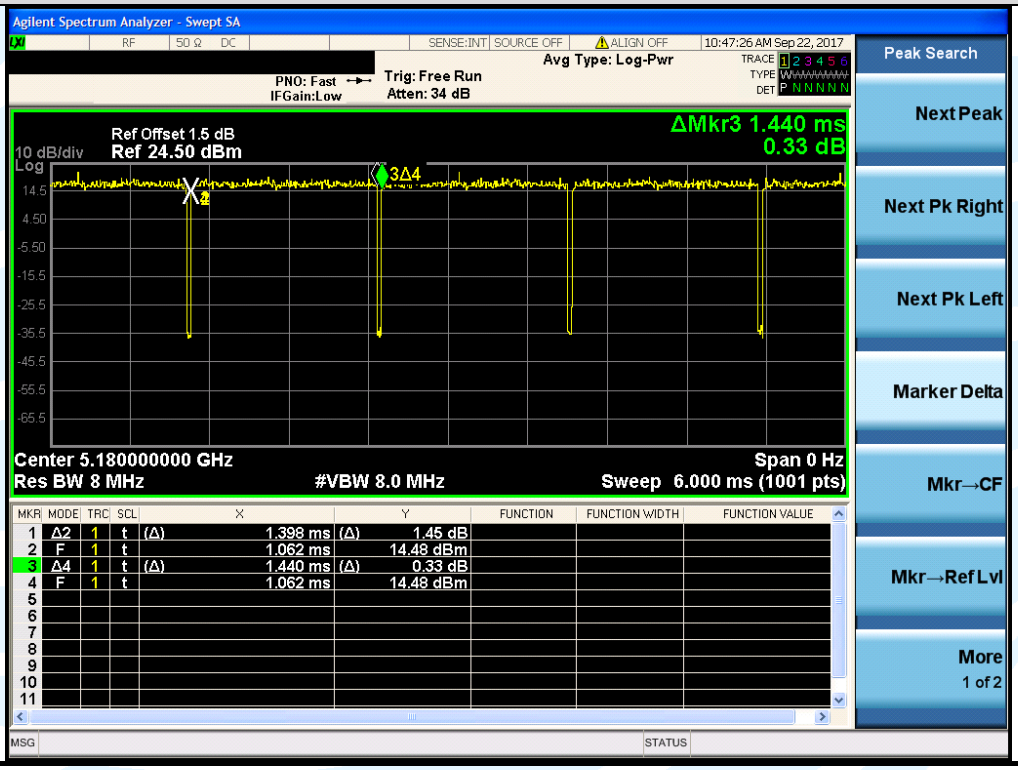
4.7 DUTY CYCLE

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	1.40	1.44	0.97	97.08	0.13	0.72	-0.26
IEEE 802.11n-HT20	MCS0	1.30	1.34	0.97	96.88	0.14	0.77	-0.28
IEEE 802.11n-HT40	MCS0	0.65	0.69	0.94	94.32	0.25	1.54	-0.51
IEEE 802.11ac-VHT20	MCS0	1.32	1.36	0.97	96.69	0.15	0.76	-0.29
IEEE 802.11ac-VHT40	MCS0	0.66	0.70	0.94	93.99	0.27	1.52	-0.54
IEEE 802.11ac-VHT80	MCS0	0.32	0.37	0.89	88.52	0.53	3.09	-1.06

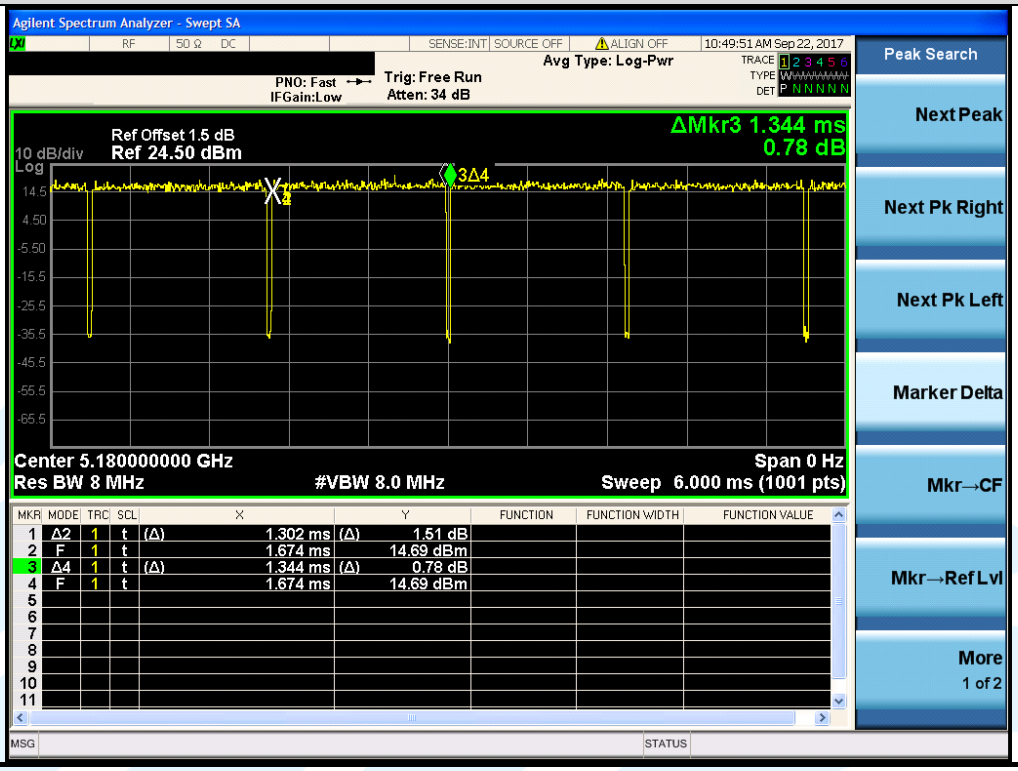
Remark:
1) Duty cycle= On Time/ Period;
2) Duty Cycle factor = 10 * log(1/ Duty cycle);
3) Average factor = 20 $\log_{10}$ Duty Cycle.

The test plot as follows

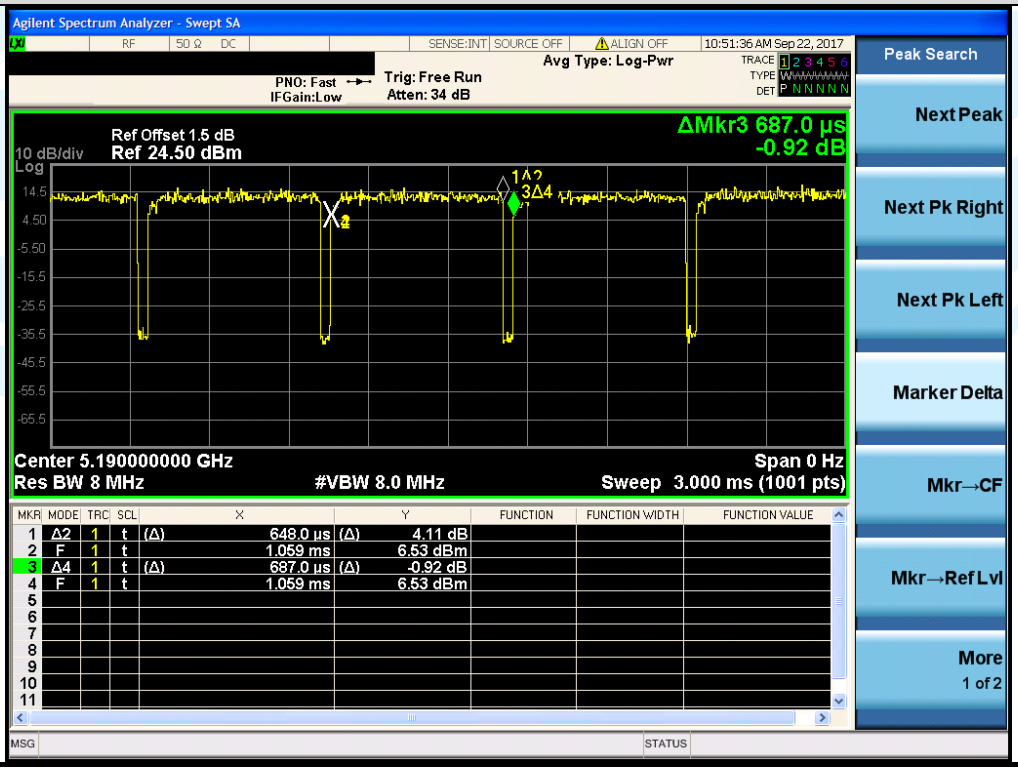
IEEE 802.11a



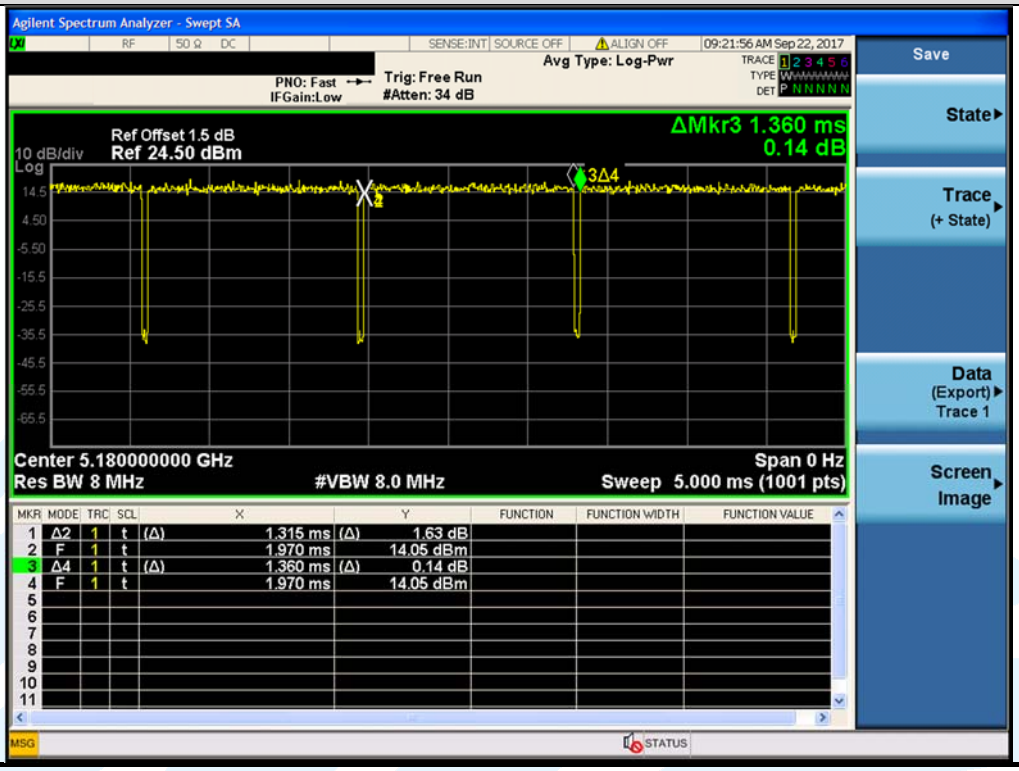
IEEE 802.11n-HT20



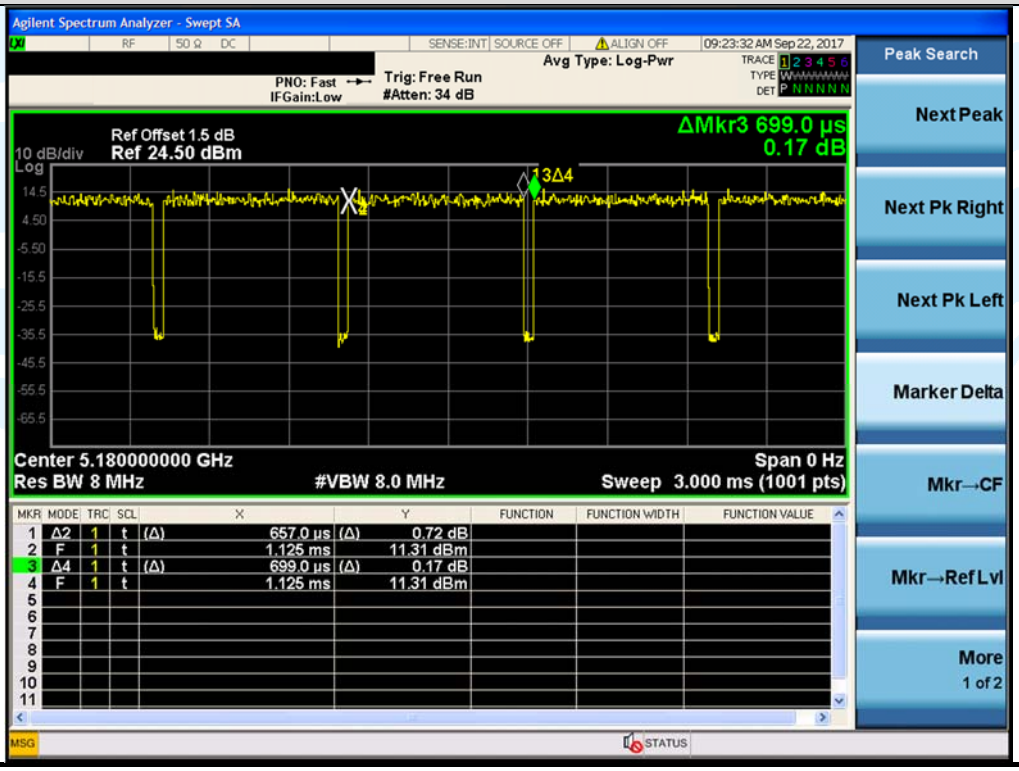
IEEE 802.11n-HT40



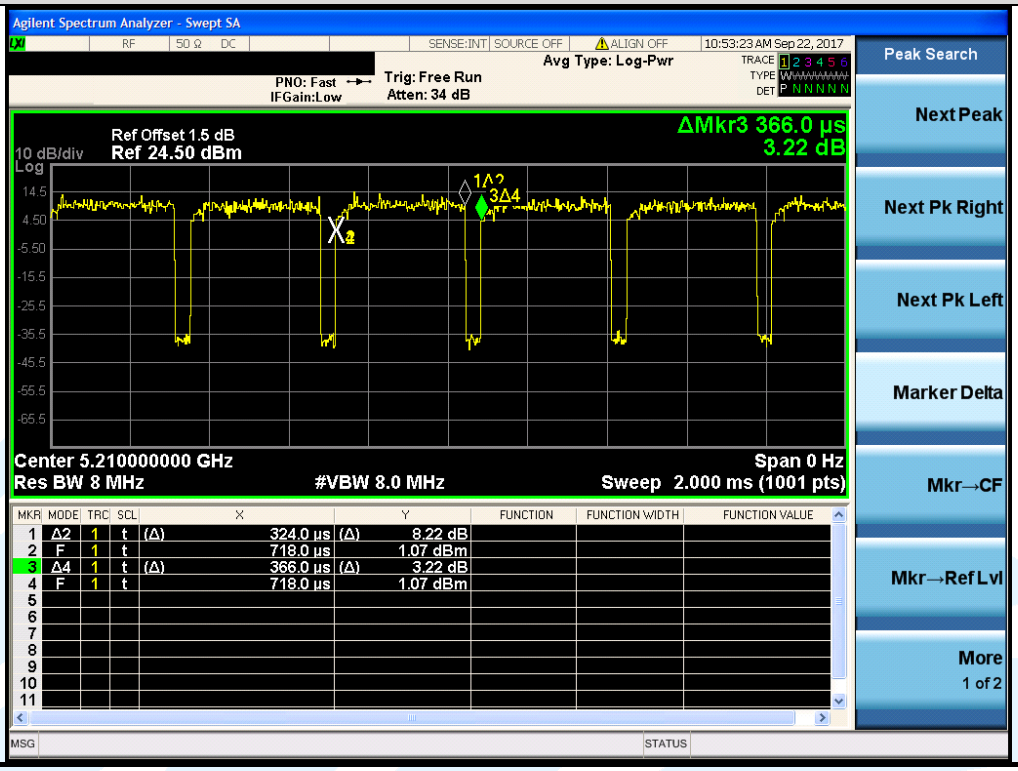
IEEE 802.11ac-VHT20



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	RSS-247 Issue 2	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
4	RSS-Gen Issue 4	General Requirements for Compliance of Radio Apparatus
5	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices
6	KDB 789033 D02 General UNII Test Procedures New Rules v01r04	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15 subpart E
7	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. **RSS-Gen Issue 4, Section 8.3 requirement:** According to RSS-Gen Issue 4, section 8.3, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns.
EUT Antenna:
Antenna in the interior of the equipment and no consideration of replacement. The gain of the antenna is 3.2 dBi.

5.3 26 DB BANDWIDTH & OCCUPIED BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a) (2)(5)
RSS-247 Issue 2 Section 6.2.1.2

Test Method: KDB 789033 D02 v01r04 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

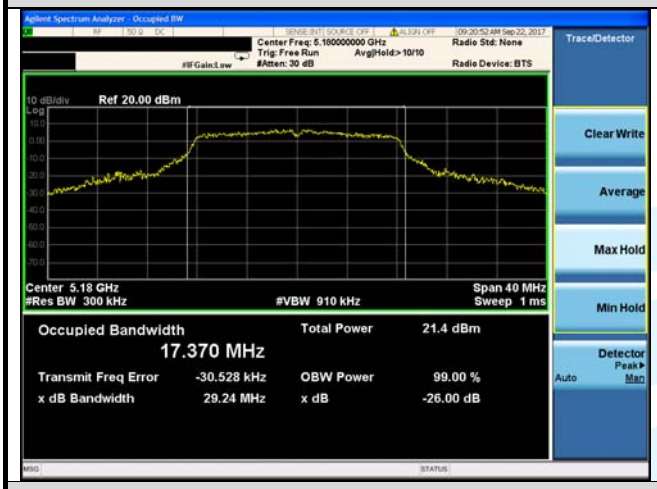
Test Mode: Transmitter mode

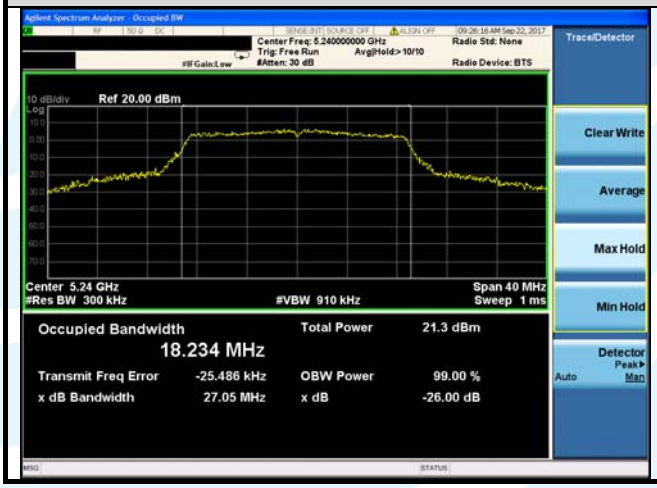
Test Results: Pass

Test Data:

Mode	Channel	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
IEEE 802.11a	36 (5180)	29.24	17.370
	44 (5220)	27.88	17.208
	48 (5240)	27.24	17.091
IEEE 802.11n-HT20	36 (5180)	26.46	18.214
	44 (5220)	26.38	18.180
	48 (5240)	27.05	18.234
IEEE 802.11n-HT40	38 (5190)	50.46	36.359
	46 (5230)	45.70	36.479
IEEE 802.11ac-VHT80	42 (5210)	95.53	75.659

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	
	/

5.4 6 DB BANDWIDTH & OCCUPIED BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.407 (e)
RSS-247 Issue 2 Section 6.2.4.1

Test Method: KDB 789033 D02 v01r04Section 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

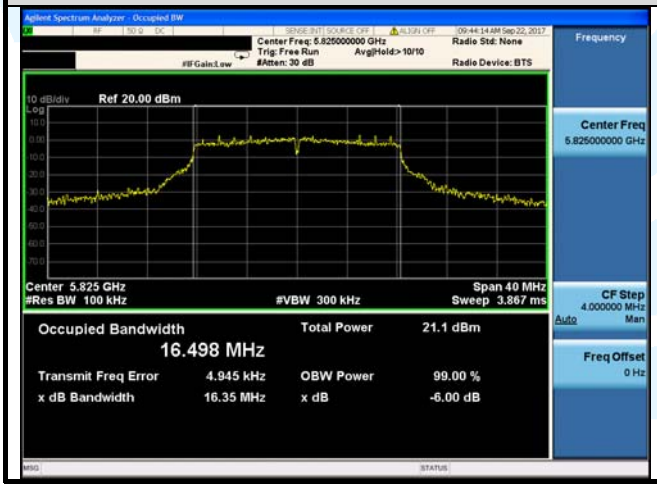
Test Mode: Transmitter mode

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)	16.35	16.511	> 500 kHz	Pass
	157 (5785)	16.32	16.508	> 500 kHz	Pass
	165 (5825)	16.35	16.498	> 500 kHz	Pass
IEEE 802.11n-HT20	149 (5745)	17.06	17.688	> 500 kHz	Pass
	157 (5785)	17.53	17.717	> 500 kHz	Pass
	165 (5825)	17.21	17.694	> 500 kHz	Pass
IEEE 802.11n-HT40	151 (5755)	36.35	36.206	> 500 kHz	Pass
	159 (5795)	35.69	36.170	> 500 kHz	Pass
IEEE 802.11ac-VHT80	155 (5775)	15.48	75.377	> 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 OR E.I.R.P

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)
RSS-247 Issue 2 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1

Test Method: KDB 789033 D02 v01r04 Section E.3.a(Method PM)

Limits: FCC 47 CFR Part 15 Subpart E

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 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.

Limits: RSS-247 Issue 2

1. **Frequency band 5150-5250 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever

power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

2. **Frequency band 5725-5850 MHz**
The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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-multipoint3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

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:

Frequency band 5150-5250 MHz

RSS-247 Issue 2:

For IEEE 802.11 a, the minimum 99% emission bandwidth is 17.091 MHz
10 dBm + $10\log_{10}$ (17.091) = 22.33 dBm < 23 dBm (200mW)
So the 22.33 dB limit applicable

For IEEE 802.11 n-HT20/ac-VHT20, the minimum 99% emission bandwidth is 18.180 MHz
10 dBm + $10\log_{10}$ (18.180) = 22.60 dBm < 23 dBm (200mW)
So the 22.60 dB limit applicable

For IEEE 802.11 n-HT40/ac-VHT40/ac-VHT80, the minimum 99% emission bandwidth is 36.359 MHz
10 dBm + $10\log_{10}$ (36.359) = 25.61 dBm > 23 dBm (200mW)
So the 23 dB limit applicable

Mode	Channel/ Frequency (MHz)	Maximum Output Power (dBm)		FCC Part 15E Limit (dBm)	e.i.r.p (dBm)	RSS-247 Limit (dBm)	Pass / Fail
		Meas Conducted Power	Corr'd Conducted Power				
IEEE 802.11a	36 (5180)	14.80	14.93	24	18.13	22.33	Pass
	44 (5220)	14.86	14.99	24	18.19	22.33	Pass
	48 (5240)	14.81	14.94	24	18.14	22.33	Pass
IEEE 802.11n-HT20	36 (5180)	14.57	14.71	24	17.91	22.60	Pass
	44 (5220)	14.50	14.64	24	17.84	22.60	Pass
	48 (5240)	14.50	14.64	24	17.84	22.60	Pass
IEEE 802.11n-HT40	38 (5190)	13.58	13.83	24	17.03	23	Pass
	46 (5230)	13.64	13.89	24	17.09	23	Pass
IEEE 802.11ac-VHT20	36 (5180)	14.47	14.62	24	17.82	22.60	Pass
	44 (5220)	14.47	14.62	24	17.82	22.60	Pass
	48 (5240)	14.28	14.43	24	17.63	22.60	Pass
IEEE 802.11ac-VHT40	38 (5190)	13.59	13.86	24	17.06	23	Pass
	46 (5230)	13.56	13.83	24	17.03	23	Pass
IEEE 802.11ac-VHT80	42 (5210)	13.01	13.54	24	16.74	23	Pass

Remark:

1. Maximum e.i.r.p = Meas Conducted Power + Duty Cycle Factor + Antenna Gain.
2. Corr'd Conducted Power = Meas Conducted Power + Duty Cycle Factor.

Frequency band 5725-5850 MHz

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm)		Limit (dBm)	Pass / Fail
		Meas Conducted Power	Corr'd Conducted Power		
IEEE 802.11a	149 (5745)	16.38	16.51	30	Pass
	157 (5785)	16.16	16.29	30	Pass
	165 (5825)	15.73	15.86	30	Pass
IEEE 802.11n-HT20	149 (5745)	16.13	16.27	30	Pass
	157 (5785)	15.80	15.94	30	Pass
	165 (5825)	15.37	15.51	30	Pass
IEEE 802.11n-HT40	151 (5755)	14.98	15.23	30	Pass
	159 (5795)	14.64	14.89	30	Pass
IEEE 802.11ac-VHT20	149 (5745)	16.15	16.30	30	Pass
	157 (5785)	15.82	15.97	30	Pass
	165 (5825)	15.40	15.55	30	Pass
IEEE 802.11ac-VHT40	151 (5755)	15.25	15.52	30	Pass
	159 (5795)	14.92	15.19	30	Pass
IEEE 802.11ac-VHT80	155 (5775)	14.47	15.00	30	Pass

Remark:

1. Maximum conducted output power = Conducted output 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)
RSS-247 Issue 2 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1

Test Method: KDB 789033 D02 v01r04 Section F

Limits: FCC 47 CFR Part 15 Subpart E

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 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.

Limits: RSS-247 Issue 2

1. **Frequency band 5150-5250 MHz**
   For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

   For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever

power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

2. **Frequency band 5725-5850 MHz**
The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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-multipoint3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

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:

Frequency band 5150-5250 MHz
For U-NII-1 Band:

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/MHz)		FCC Part 15E Limit (dBm/MHz)	e.i.r.p PSD (dBm/MHz)	RSS-247 Limit (dBm/MHz)	Pass / Fail
		Meas Conducted PSD	Corr'd Conducted PSD				
IEEE 802.11a	36 (5180)	4.391	4.52	11	7.72	10	Pass
	44 (5220)	4.139	4.27	11	7.47	10	Pass
	48 (5240)	3.702	3.83	11	7.03	10	Pass
IEEE 802.11n-HT20	36 (5180)	3.858	4.00	11	7.20	10	Pass
	44 (5220)	3.569	3.71	11	6.91	10	Pass
	48 (5240)	3.323	3.46	11	6.66	10	Pass
IEEE 802.11n-HT40	38 (5190)	1.065	1.32	11	4.52	10	Pass
	46 (5230)	0.743	0.99	11	4.19	10	Pass
IEEE 802.11ac-VHT20	36 (5180)	4.023	4.17	11	7.37	10	Pass
	44 (5220)	3.429	3.58	11	6.78	10	Pass
	48 (5240)	3.500	3.65	11	6.85	10	Pass
IEEE 802.11ac-VHT40	38 (5190)	1.265	1.54	11	4.74	10	Pass
	46 (5230)	0.654	0.92	11	4.12	10	Pass
IEEE 802.11ac-VHT80	42 (5210)	-2.763	-2.23	11	0.97	10	Pass

Remark:

1. Maximum e.i.r.p = Meas Conducted PSD + Duty Cycle Factor + Antenna Gain.
2. Corr'd Conducted PSD = Meas Conducted PSD + Duty Cycle Factor.

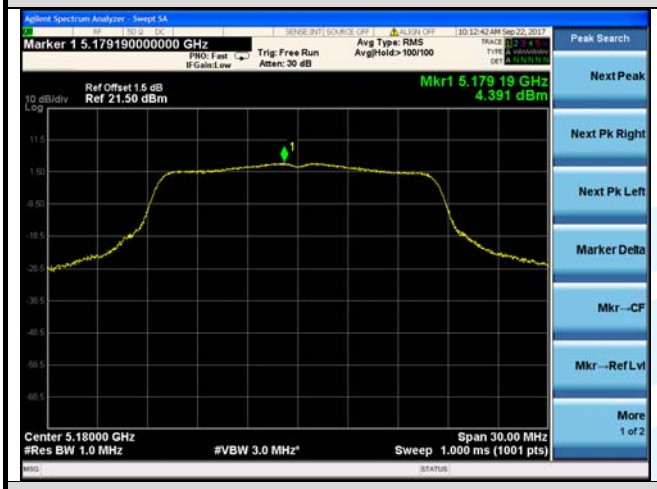
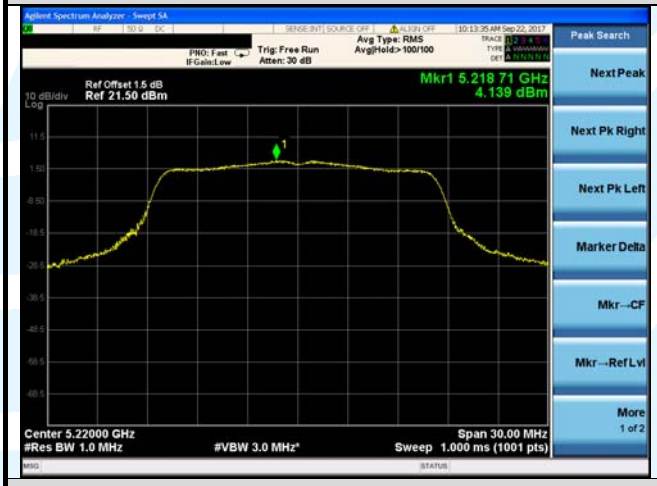
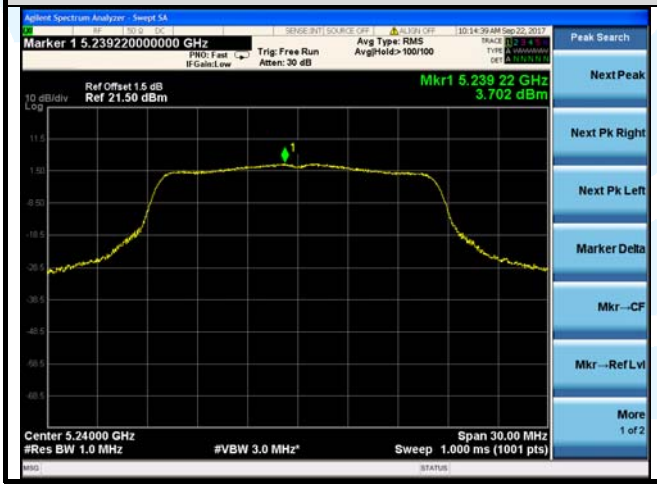
FCC 47 CFR Part 15 Subpart E
For U-NII-3 Band:

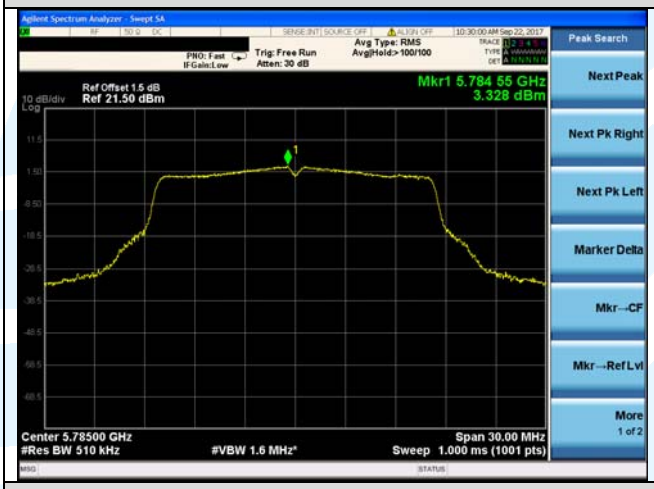
Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/500KHz)		Limit (dBm/500KHz)	Pass / Fail
		Meas PSD	Corr'd PSD		
IEEE 802.11a	149 (5745)	3.897	4.03	30	Pass
	157 (5785)	3.328	3.46	30	Pass
	165 (5825)	2.767	2.90	30	Pass
IEEE 802.11n-HT20	149 (5745)	3.356	3.50	30	Pass
	157 (5785)	2.865	3.01	30	Pass
	165 (5825)	1.930	2.07	30	Pass
IEEE 802.11n-HT40	151 (5755)	0.309	0.56	30	Pass
	159 (5795)	0.304	0.55	30	Pass
IEEE 802.11ac-VHT20	149 (5745)	3.684	3.83	30	Pass
	157 (5785)	3.041	3.19	30	Pass
	165 (5825)	2.175	2.33	30	Pass
IEEE 802.11ac-VHT40	151 (5755)	0.839	1.11	30	Pass
	159 (5795)	-0.058	0.21	30	Pass
IEEE 802.11ac-VHT80	155 (5775)	-3.654	-3.12	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	
	
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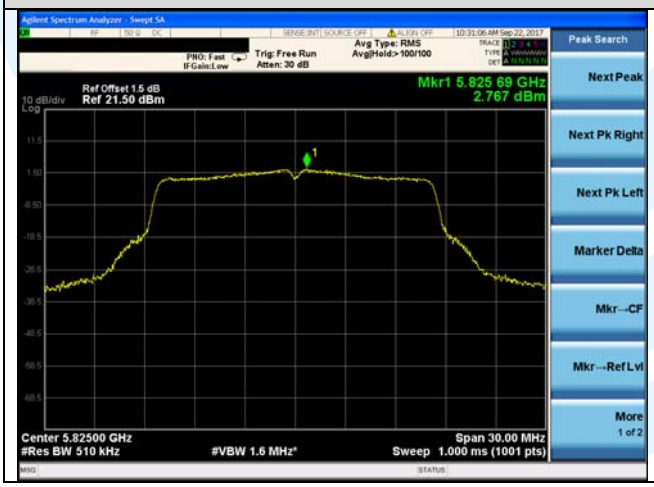	

IEEE 802.11n-HT40	
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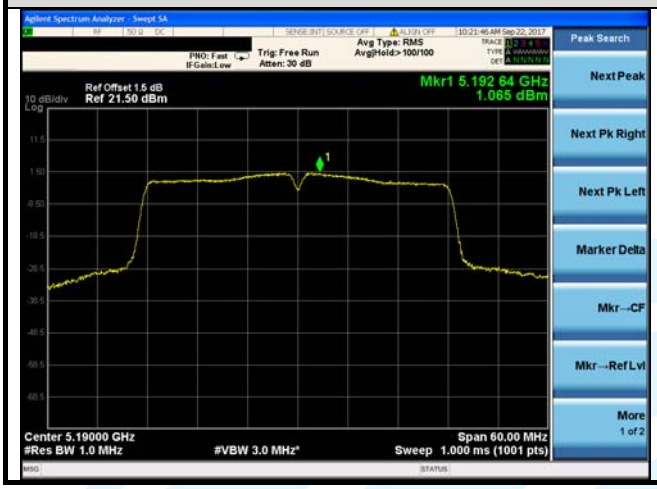
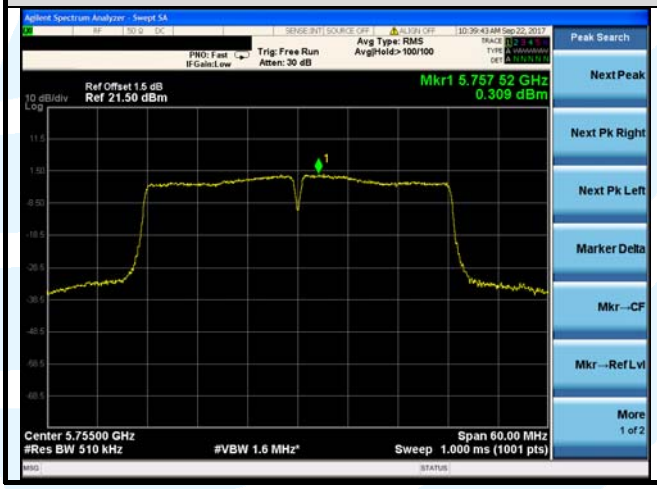
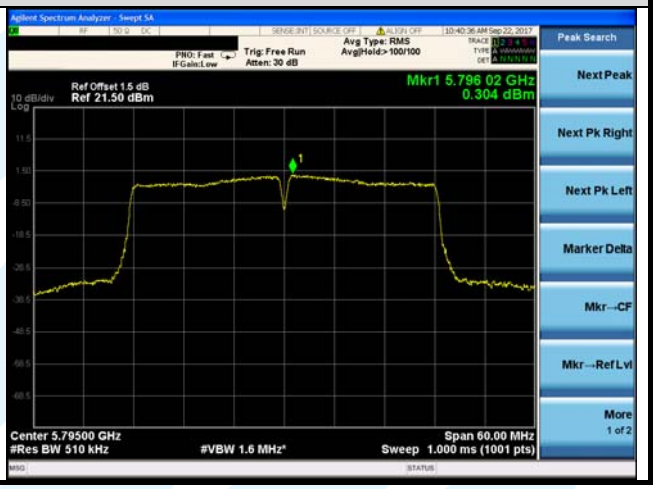
	

IEEE 802.11n-HT40	
Channel 151	Channel 159
	

IEEE 802.11ac-VHT20	
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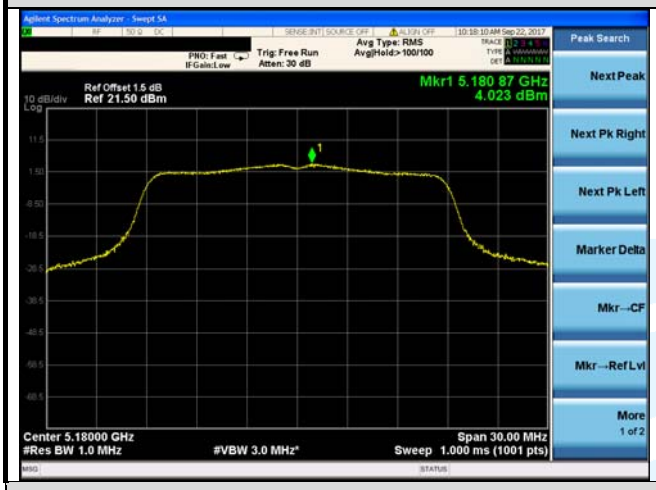	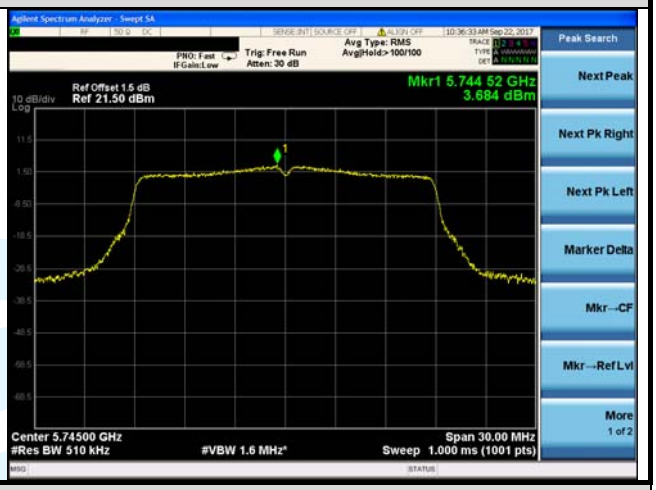
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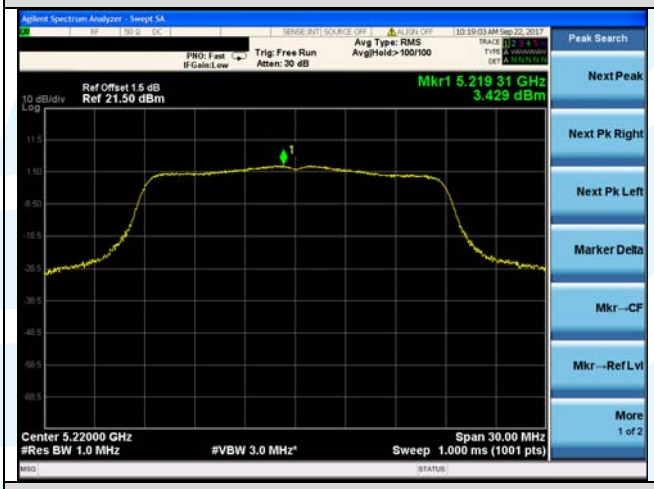	
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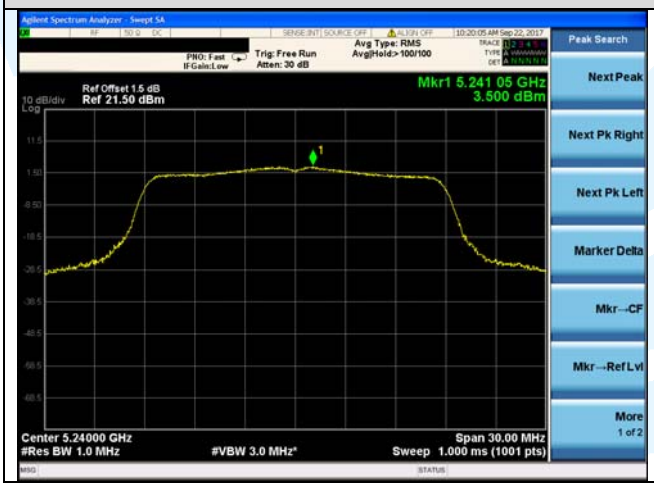
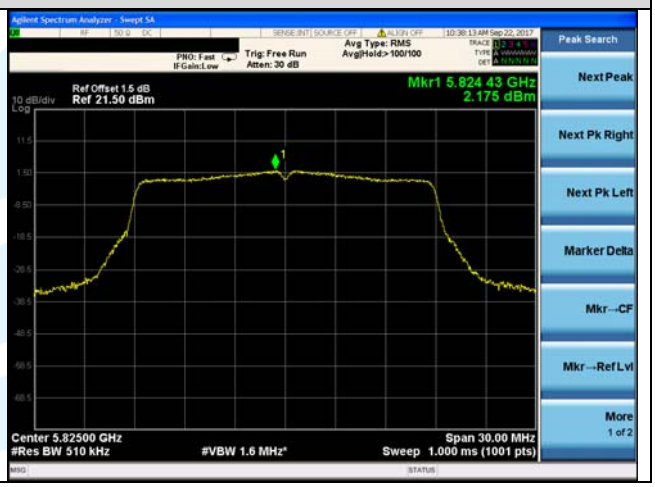
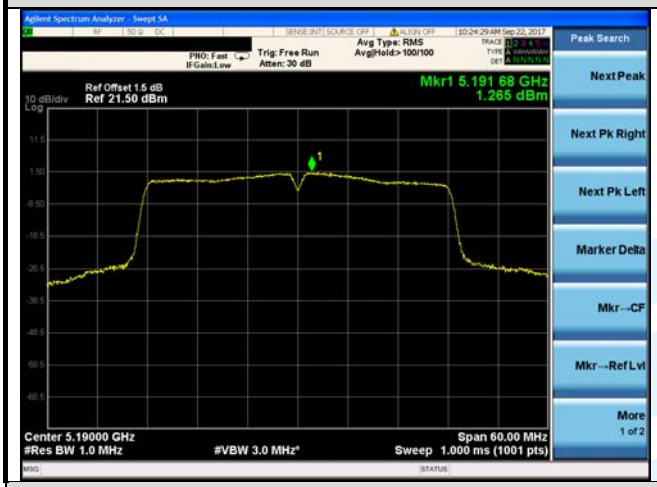
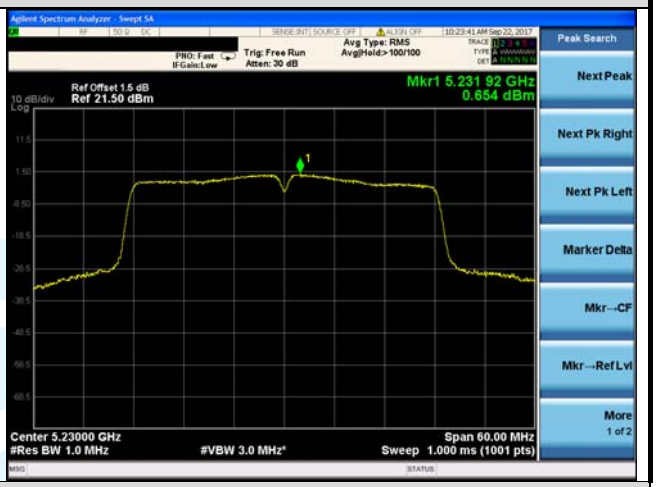
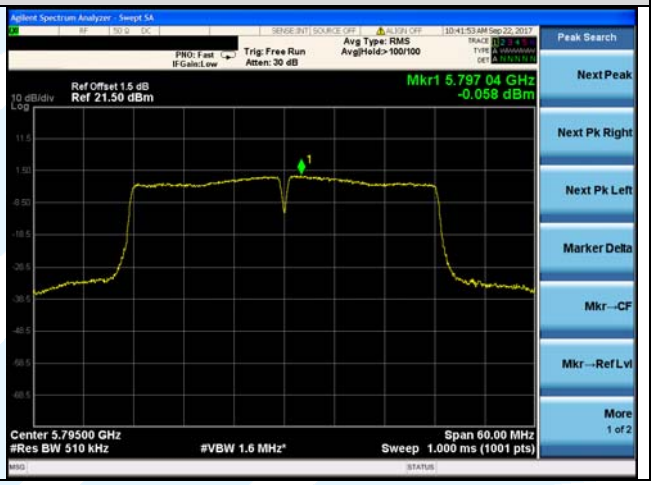
	

IEEE 802.11ac-VHT40	
Channel 38	Channel 46
	
Channel 151	Channel 159
	

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)
RSS-Gen Issue 4, Section 6.11

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)
50	VN	5180.010946	2.113127
40		5180.010281	1.984749
30		5180.010366	2.001158
20		5180.010321	1.992471
10		5180.010196	1.968340
0		5180.010111	1.951931
-10		5180.010056	1.941313
-20		5180.010166	1.962548
-30		5180.010156	1.960618

Frequency Stability Versus Voltage			
Operation Frequency: 5180 MHz			
Temp.	Voltage	Measured Frequency (MHz)	Frequency Drift (ppm)
TN	VL	5180.010426	2.012741
	VN	5180.010211	1.971236
	VH	5180.010631	2.052317

Frequency Stability Versus Temp.			
Operation Frequency: 5745 MHz			
Temp. (°C)	Voltage	Measured Frequency (MHz)	Frequency Drift (ppm)
50	VN	5745.010945	1.905135
40		5745.010096	1.757354
30		5745.009955	1.732811
20		5745.009987	1.738381
10		5745.01009	1.756310
0		5745.010099	1.757876
-10		5745.009592	1.669626
-20		5745.010096	1.757354
-30		5745.009668	1.682855

Frequency Stability Versus Voltage			
Operation Frequency: 5745 MHz			
Temp.	Voltage	Measured Frequency (MHz)	Frequency Drift (ppm)
TN	VL	5745.011145	1.939948
	VN	5745.009844	1.713490
	VH	5745.010351	1.801793

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
RSS-247 Issue 2 Section 6.2.1.2/6.2.2.2/6.2.3.2/6.2.4.2

Test Method: KDB 789033 D02 v01r04 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
RSS-247 Issue 2 Section 6.2.1.2	PK: -27 (dBm/MHz)	PK: 74 (dBμV/m)
RSS-247 Issue 2 Section 6.2.2.2	PK: -27 (dBm/MHz)	PK: 74 (dBμV/m)
RSS-247 Issue 2 Section 6.2.3.2	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
RSS-247 Issue 2 Section 6.2.4.2	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

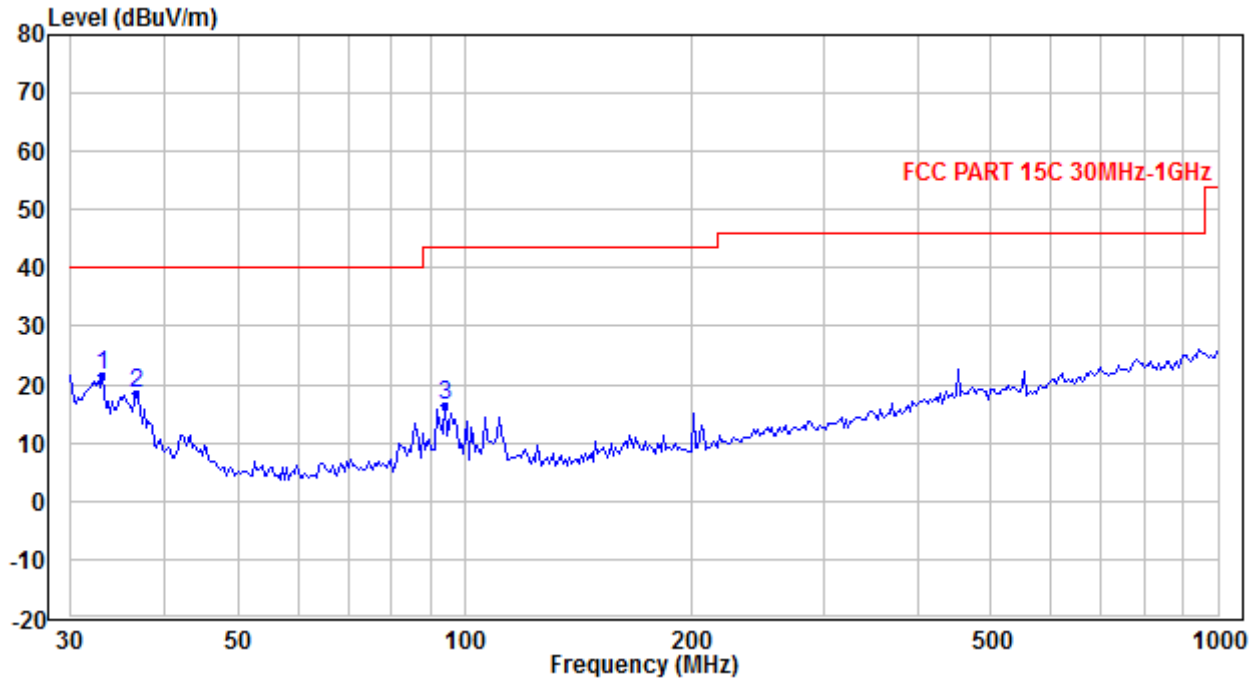
The measurement data as follows:

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):

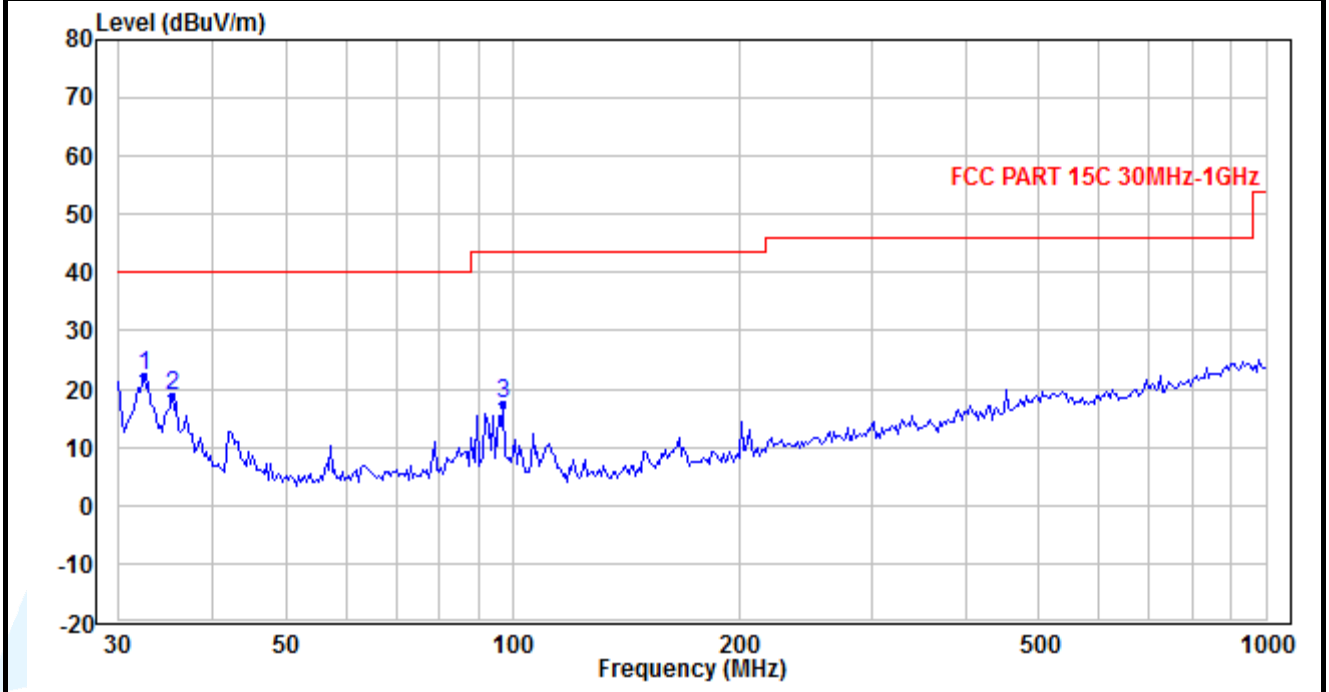
Worst-Case Configuration

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	33.101	34.39	-12.85	21.54	40.00	-18.46	QP
2	36.524	33.28	-14.66	18.62	40.00	-21.38	QP
3	94.314	34.77	-18.36	16.41	43.50	-27.09	QP

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	32.411	35.74	-13.46	22.28	40.00	-17.72	QP
2	35.263	33.81	-14.94	18.87	40.00	-21.13	QP
3	97.002	36.32	-19.03	17.29	43.50	-26.21	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	48.73	74.00	-25.27	Peak	Horizontal
2	15540.00	52.17	74.00	-21.83	Peak	Horizontal
3	10360.00	47.43	74.00	-26.57	Peak	Vertical
4	15540.00	51.40	74.00	-22.60	Peak	Vertical

IEEE 802.11a_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	49.40	74.00	-24.60	Peak	Horizontal
2	15660.00	53.01	74.00	-20.99	Peak	Horizontal
3	10440.00	48.98	74.00	-24.60	Peak	Vertical
4	15660.00	51.78	74.00	-20.99	Peak	Vertical

IEEE 802.11a_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	49.88	74.00	-24.12	Peak	Horizontal
2	15720.00	52.80	74.00	-21.20	Peak	Horizontal
3	10480.00	47.89	74.00	-26.11	Peak	Vertical
4	15720.00	51.93	74.00	-22.07	Peak	Vertical

IEEE 802.11a_Channel 149

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	50.54	74.00	-23.46	Peak	Horizontal
2	15720.00	53.92	74.00	-20.08	Peak	Horizontal
3	10480.00	49.37	74.00	-24.63	Peak	Vertical
4	15720.00	52.90	74.00	-21.10	Peak	Vertical

IEEE 802.11a_Channel 157

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	51.02	74.00	-22.98	Peak	Horizontal
3	17355.00	53.27	74.00	-20.73	Peak	Horizontal
5	11570.00	49.02	74.00	-24.98	Peak	Vertical
7	17355.00	53.13	74.00	-20.87	Peak	Vertical

IEEE 802.11a_Channel 165

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	52.20	74.00	-21.80	Peak	Horizontal
2	17475.00	53.67	74.00	-20.33	Peak	Horizontal
3	11650.00	49.84	74.00	-24.16	Peak	Vertical
4	17475.00	53.19	74.00	-20.81	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	49.36	74.00	-24.64	Peak	Horizontal
2	15540.00	52.77	74.00	-21.23	Peak	Horizontal
3	10360.00	48.78	74.00	-25.22	Peak	Vertical
4	15540.00	51.66	74.00	-22.34	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	49.95	74.00	-24.05	Peak	Horizontal
2	15660.00	52.71	74.00	-21.29	Peak	Horizontal
3	10440.00	48.39	74.00	-25.61	Peak	Vertical
4	15660.00	52.31	74.00	-21.69	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	48.86	74.00	-25.14	Peak	Horizontal
2	15720.00	53.26	74.00	-20.74	Peak	Horizontal
3	10480.00	47.53	74.00	-26.47	Peak	Vertical
4	15720.00	52.35	74.00	-21.65	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	51.10	74.00	-22.90	Peak	Horizontal
2	17235.00	53.98	74.00	-20.02	Peak	Horizontal
3	11490.00	50.11	74.00	-23.89	Peak	Vertical
4	17235.00	52.88	74.00	-21.12	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	53.82	74.00	-20.18	Peak	Horizontal
2	17355.00	53.08	74.00	-20.92	Peak	Horizontal
3	11570.00	49.88	74.00	-24.12	Peak	Vertical
4	17355.00	52.72	74.00	-21.28	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	51.42	74.00	-22.58	Peak	Horizontal
2	17475.00	53.37	74.00	-20.63	Peak	Horizontal
3	11650.00	49.64	74.00	-24.36	Peak	Vertical
4	17475.00	53.39	74.00	-20.61	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	49.70	74.00	-24.30	Peak	Horizontal
2	15570.00	52.73	74.00	-21.27	Peak	Horizontal
3	10380.00	48.03	74.00	-25.97	Peak	Vertical
4	15570.00	51.82	74.00	-22.18	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	50.14	74.00	-23.86	Peak	Horizontal
2	15690.00	53.25	74.00	-20.75	Peak	Horizontal
3	10460.00	48.95	74.00	-25.05	Peak	Vertical
4	15690.00	51.92	74.00	-22.08	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	51.21	74.00	-22.79	Peak	Horizontal
2	17265.00	53.46	74.00	-20.54	Peak	Horizontal
3	11510.00	50.10	74.00	-23.90	Peak	Vertical
4	17265.00	53.17	74.00	-20.83	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	51.82	74.00	-22.18	Peak	Horizontal
2	17385.00	53.72	74.00	-20.28	Peak	Horizontal
3	11590.00	49.86	74.00	-24.14	Peak	Vertical
4	17385.00	53.16	74.00	-20.84	Peak	Vertical

IEEE 802.11ac-VHT80_Channel 42						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10460.00	50.39	74.00	-23.61	Peak	Horizontal
2	15690.00	53.43	74.00	-20.57	Peak	Horizontal
3	10460.00	48.99	74.00	-25.01	Peak	Vertical
4	15690.00	51.44	74.00	-22.56	Peak	Vertical

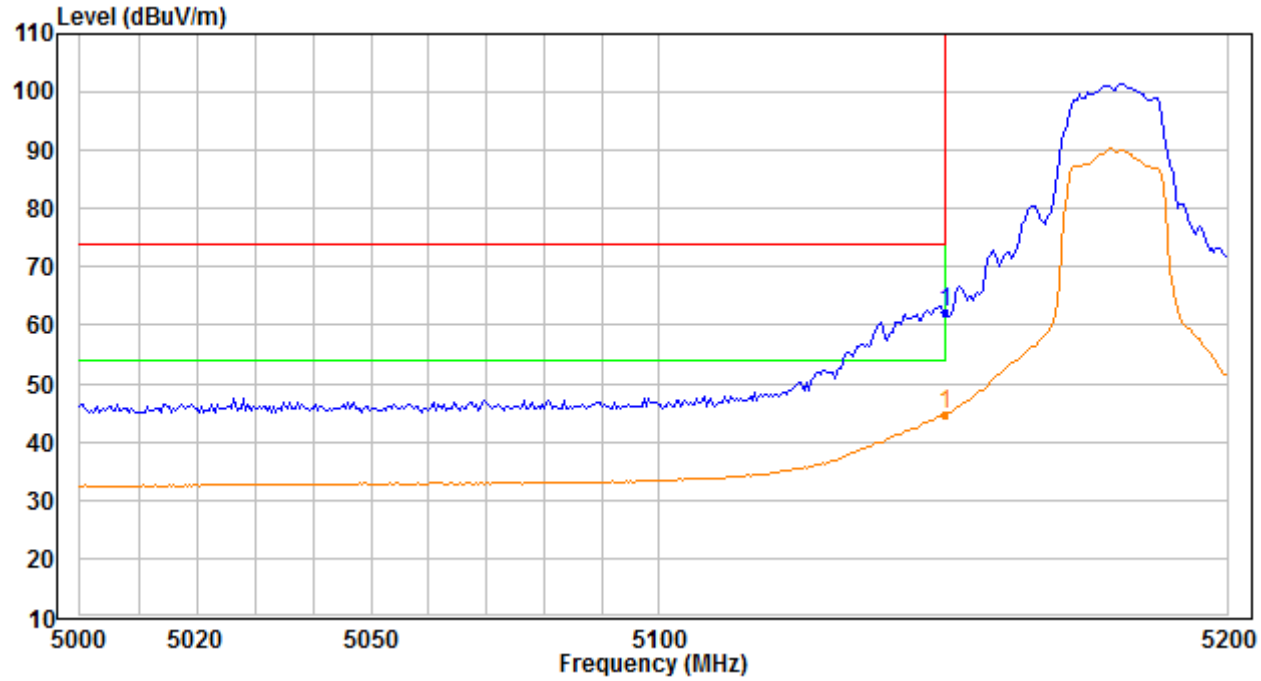
IEEE 802.11ac-VHT80_Channel 155

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11550.00	52.13	74.00	-21.87	Peak	Horizontal
2	17325.00	53.71	74.00	-20.29	Peak	Horizontal
3	11550.00	50.28	74.00	-23.72	Peak	Vertical
4	17325.00	53.47	74.00	-20.53	Peak	Vertical

Band Edge Measurements (Radiated)

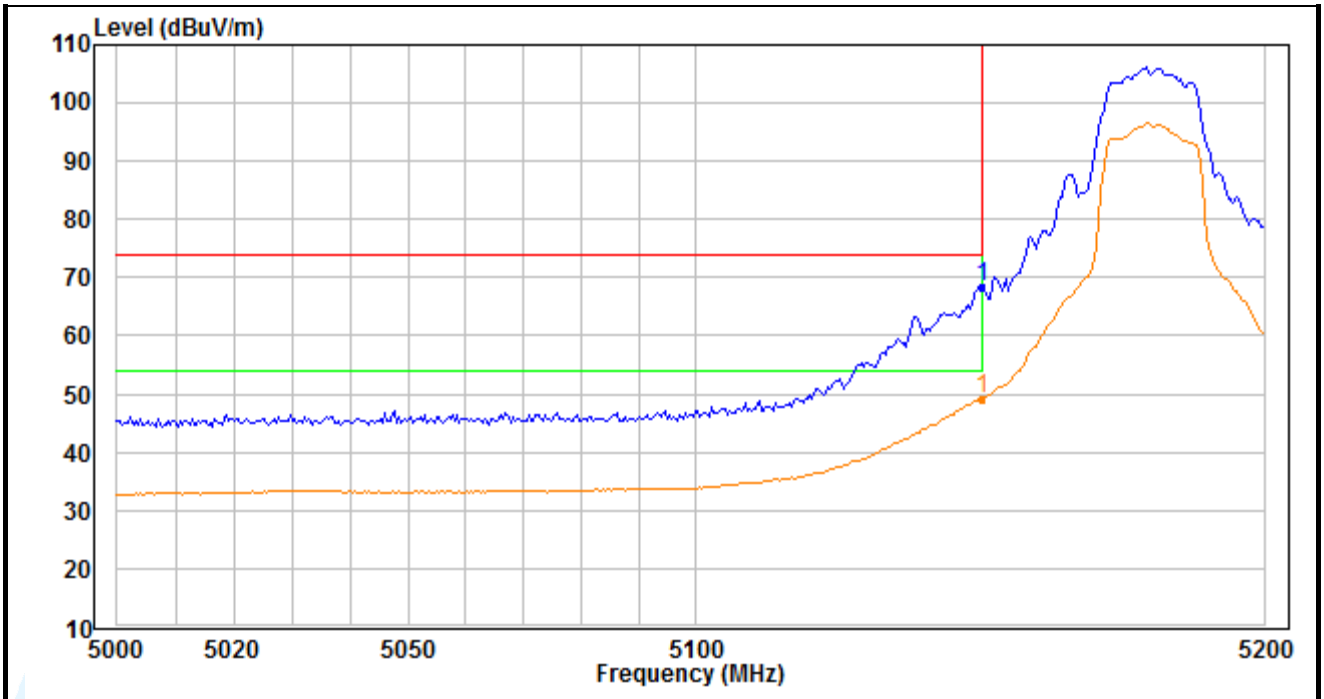
IEEE 802.11a

Test Channel:	Channel 36	Ant. Polar. :	Horizontal



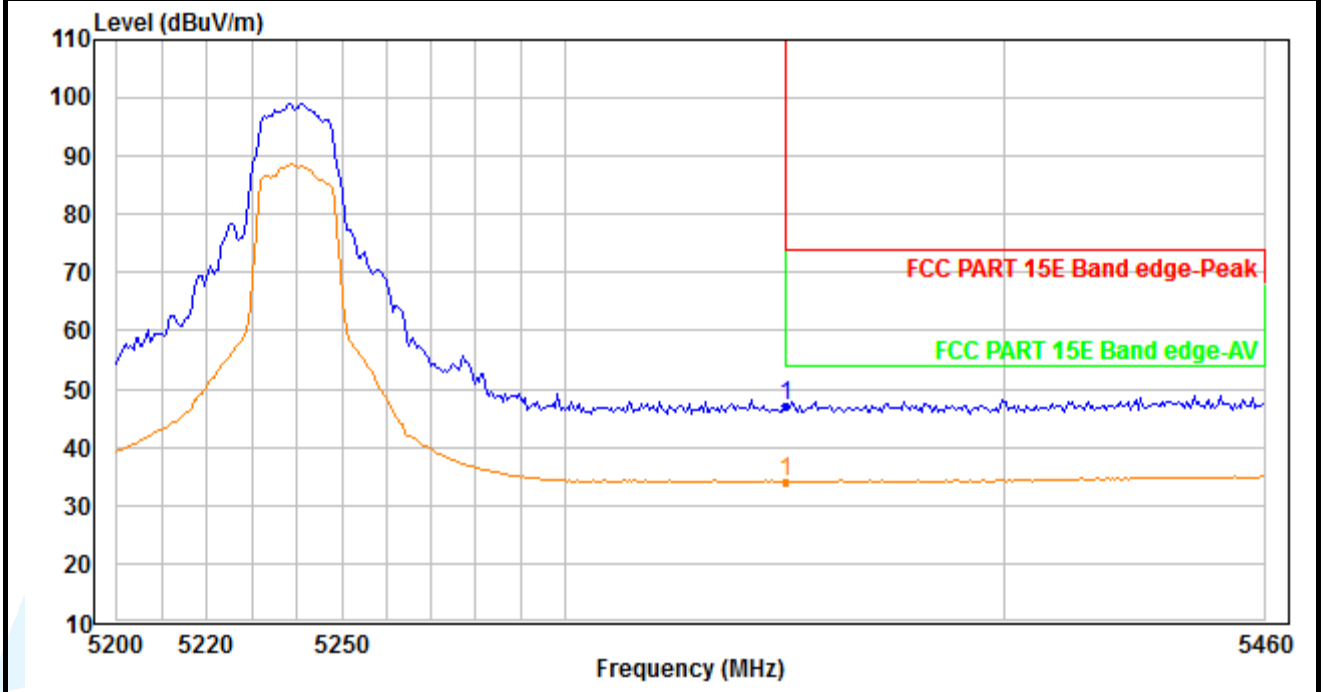
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	62.18	74	44.80	54	Pass

Test Channel:	Channel 36	Ant. Polar. :	Vertical



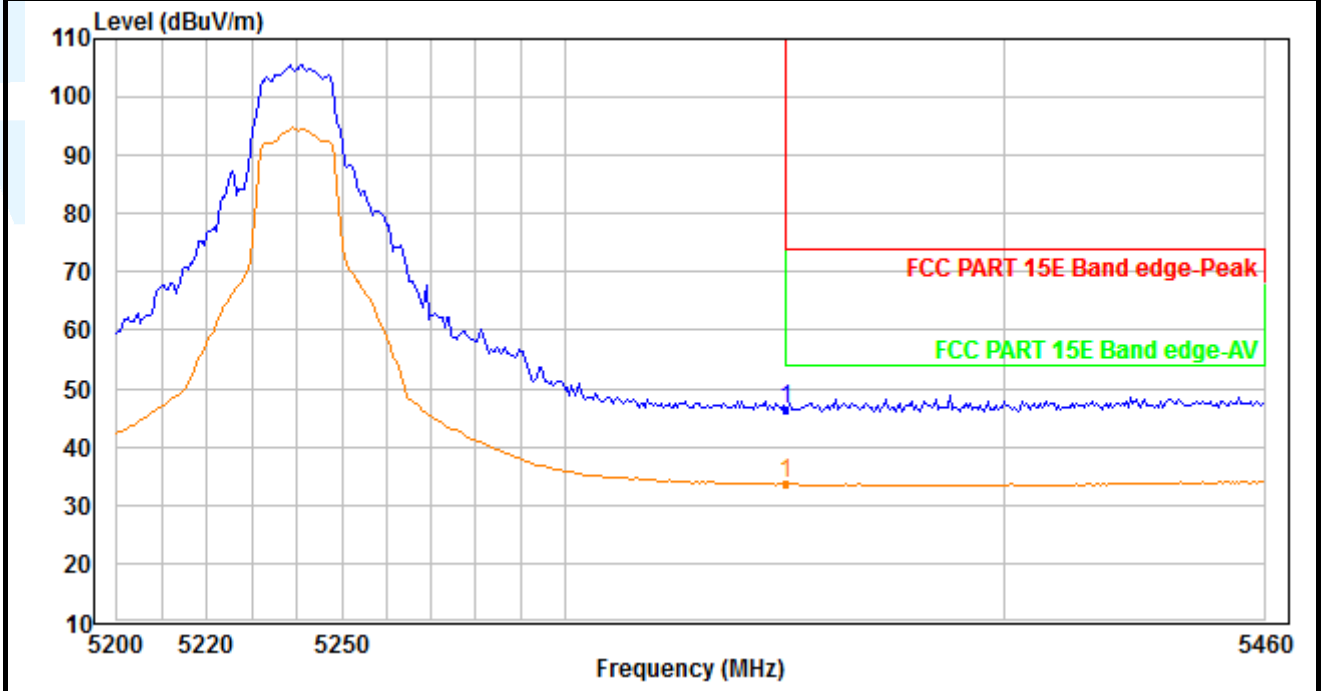
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	67.10	74	48.18	54	Pass

Test Channel:	Channel 48	Ant. Polar. :	Horizontal



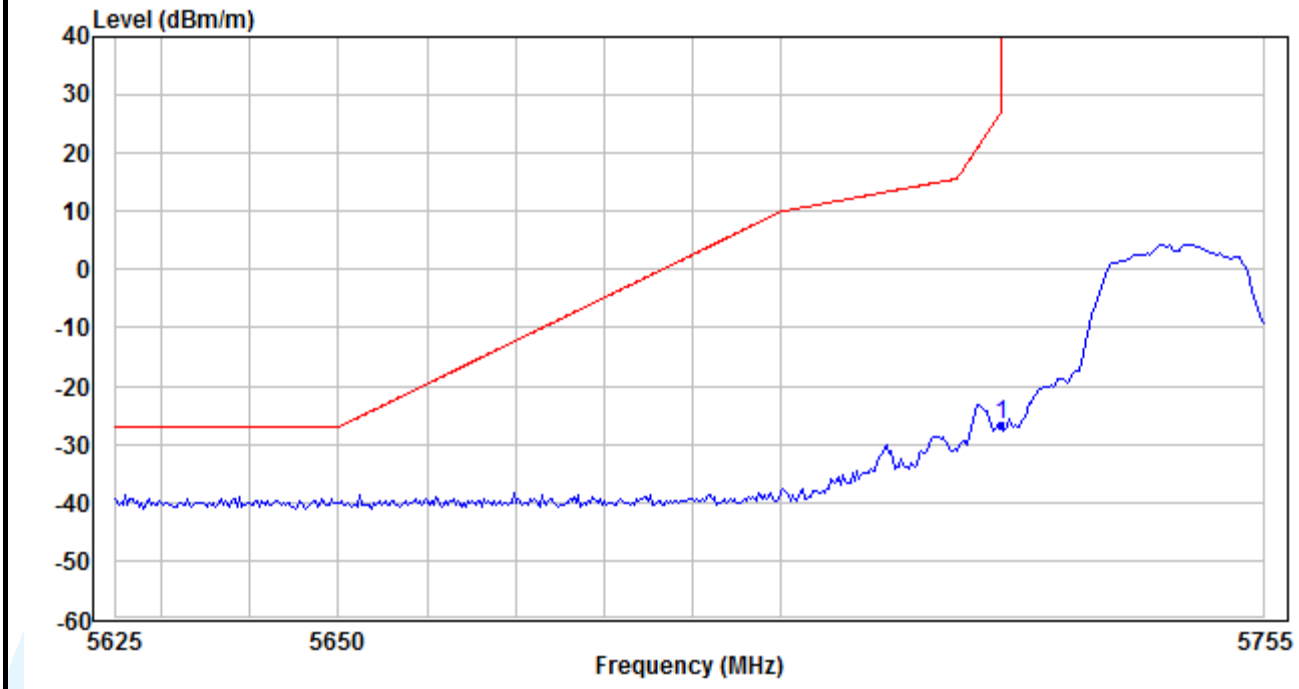
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	47.21	74	34.09	54	Pass

Test Channel:	Channel 48	Ant. Polar. :	Vertical



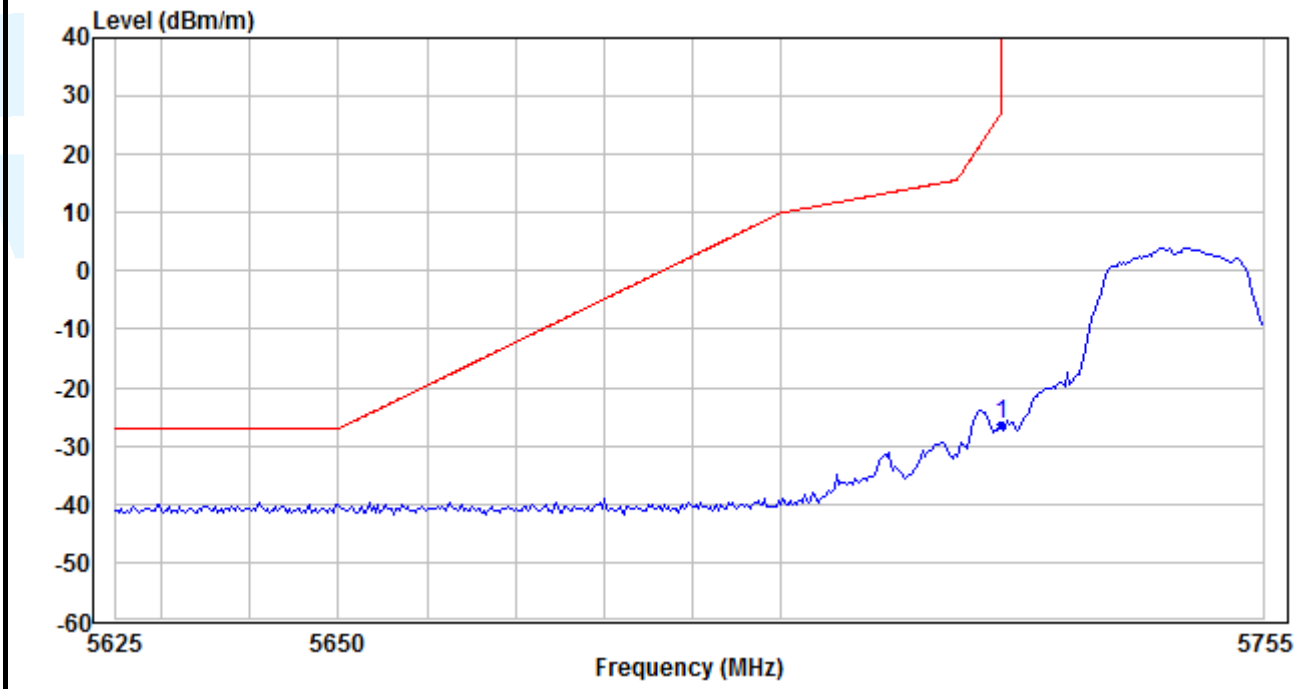
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	46.40	74	33.58	54	Pass

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



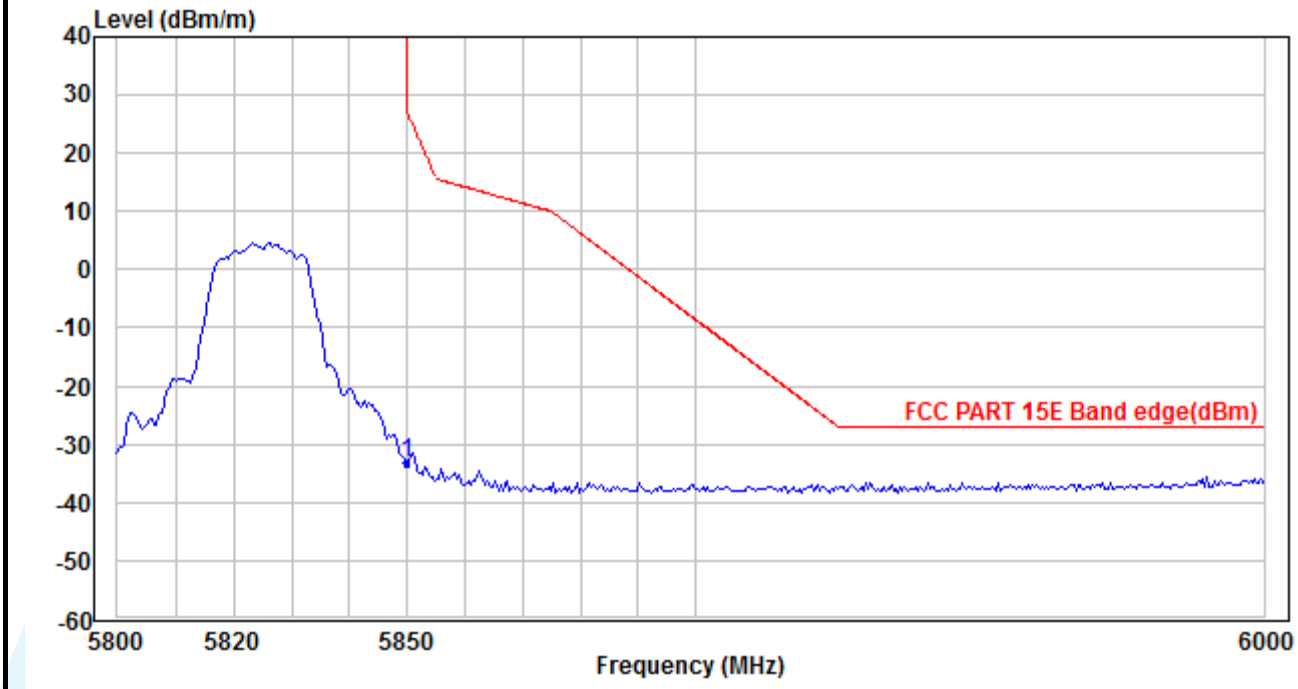
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.00	-26.74	26.97	Pass

Test Channel:	Channel 149	Ant. Polar. :	Vertical



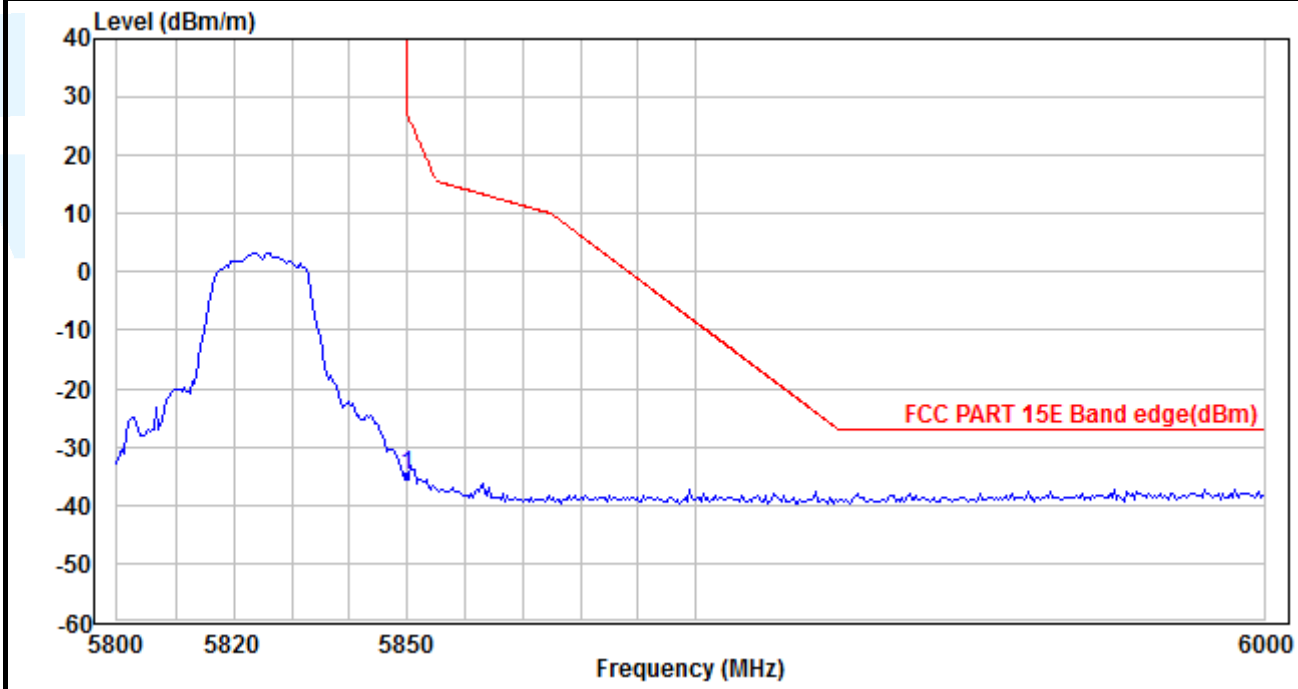
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.00	-26.35	26.97	Pass

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.00	-33.24	26.94	Pass

Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.00	-34.89	26.94	Pass

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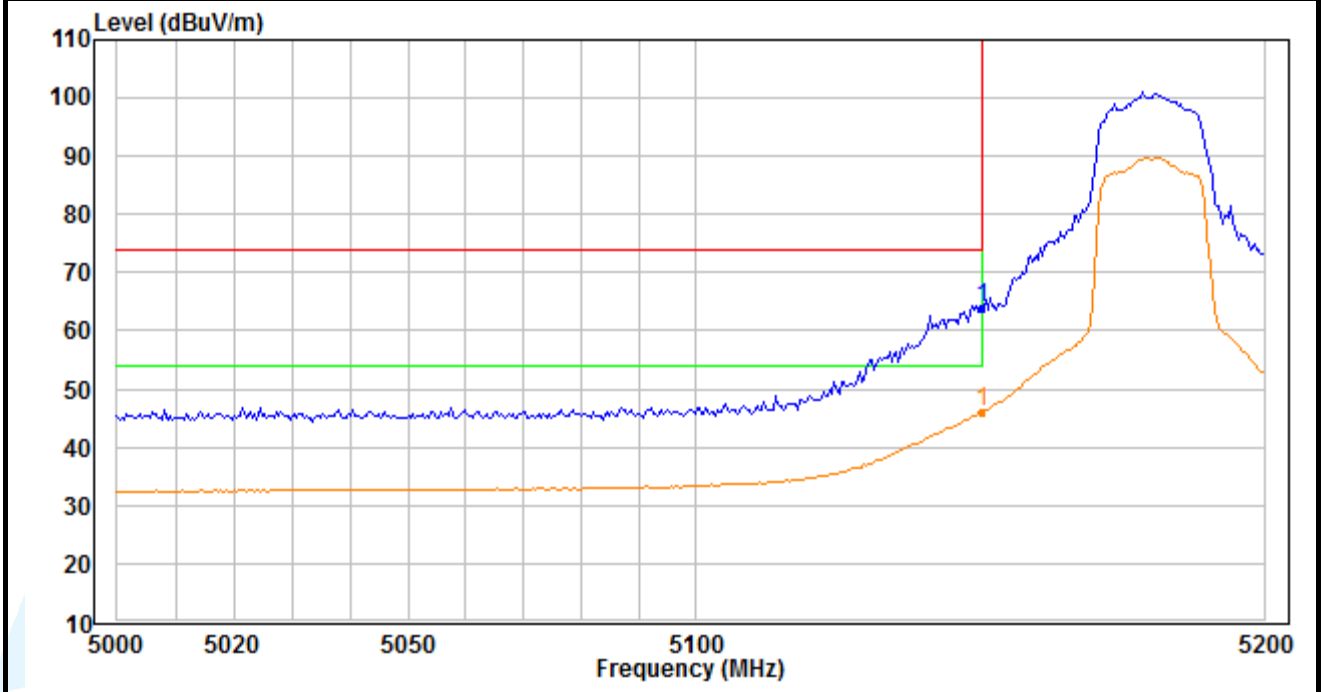
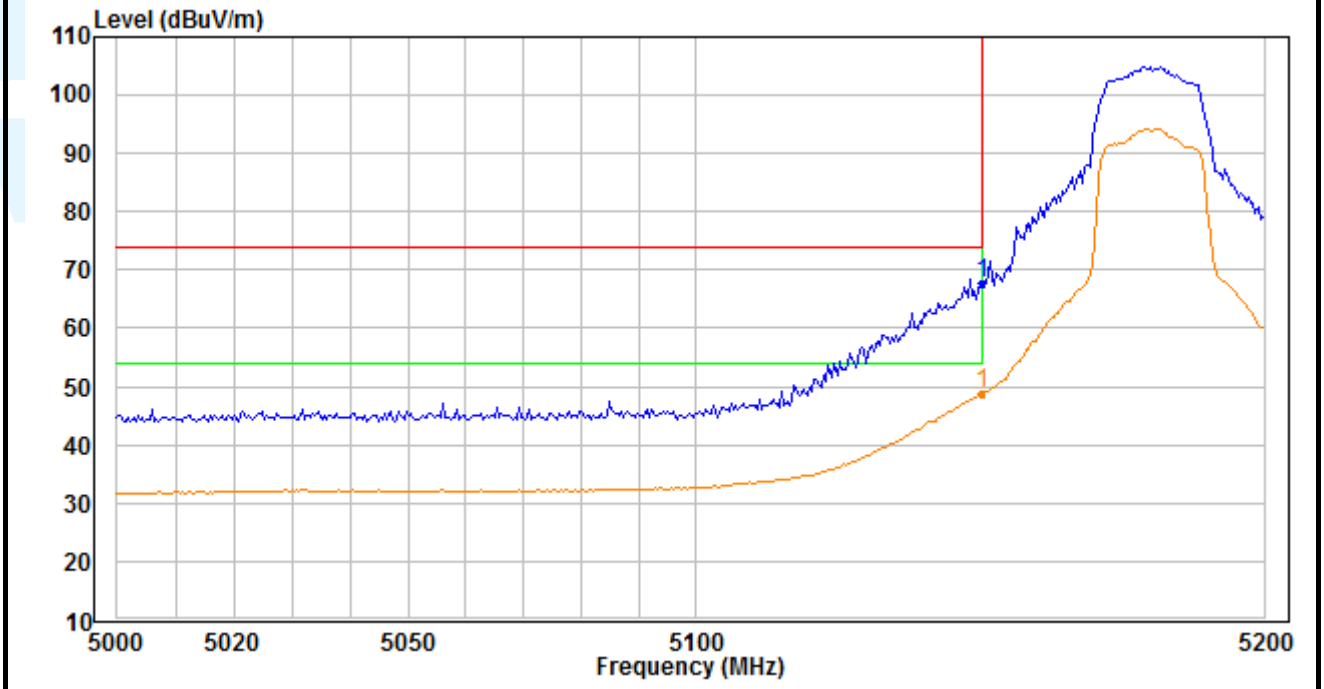
Test Channel:	Channel 36	Ant. Polar. :	Horizontal



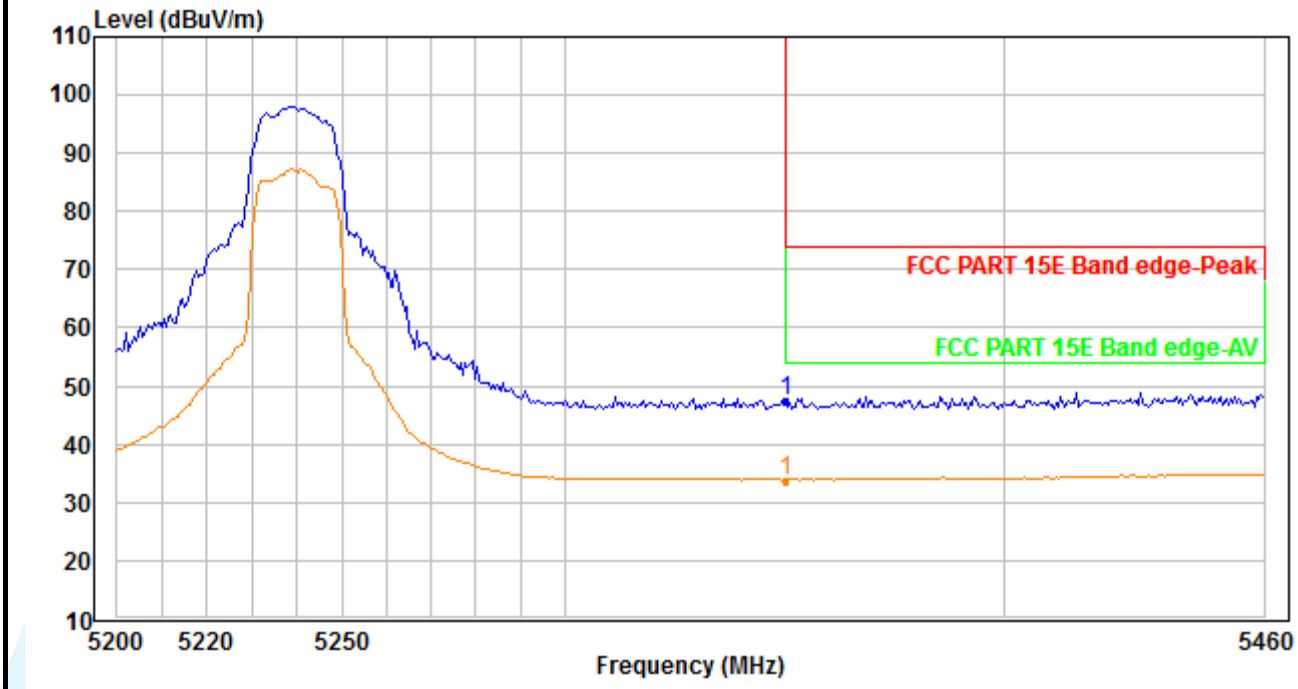
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	64.08	74	46.04	54	Pass

Test Channel:	Channel 36	Ant. Polar. :	Vertical



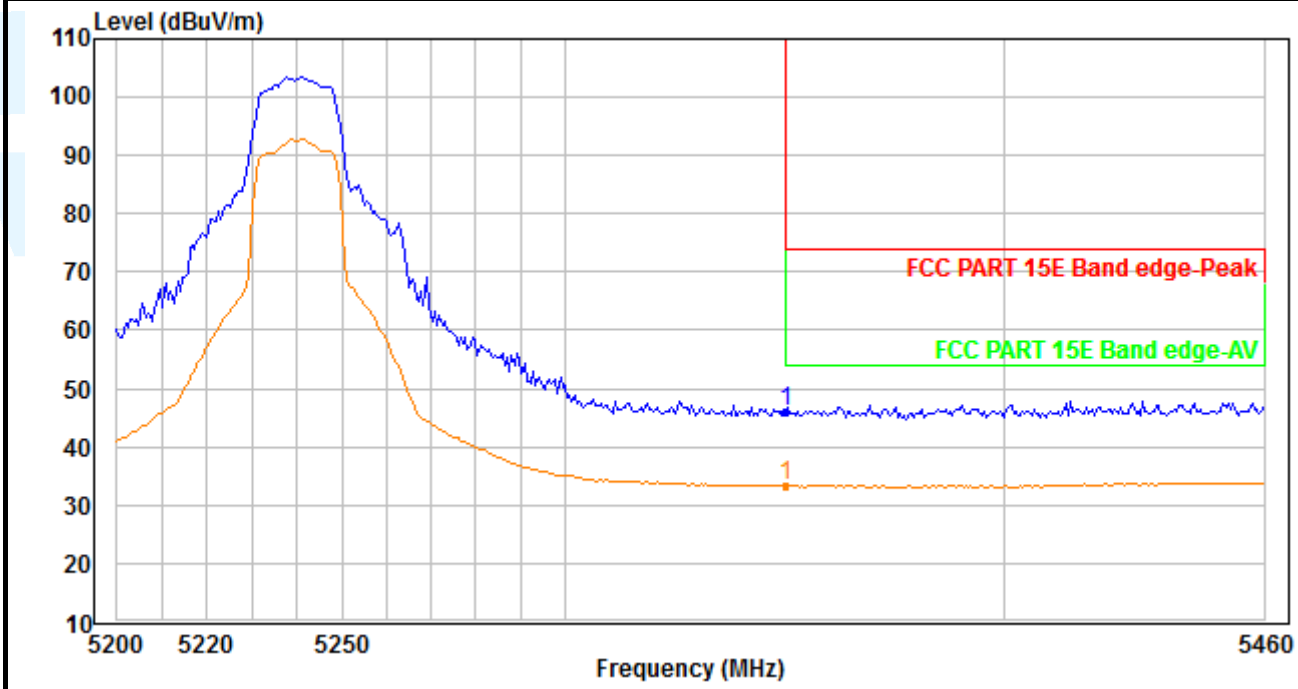
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	67.92	74	48.79	54	Pass

Test Channel:	Channel 48	Ant. Polar. :	Horizontal



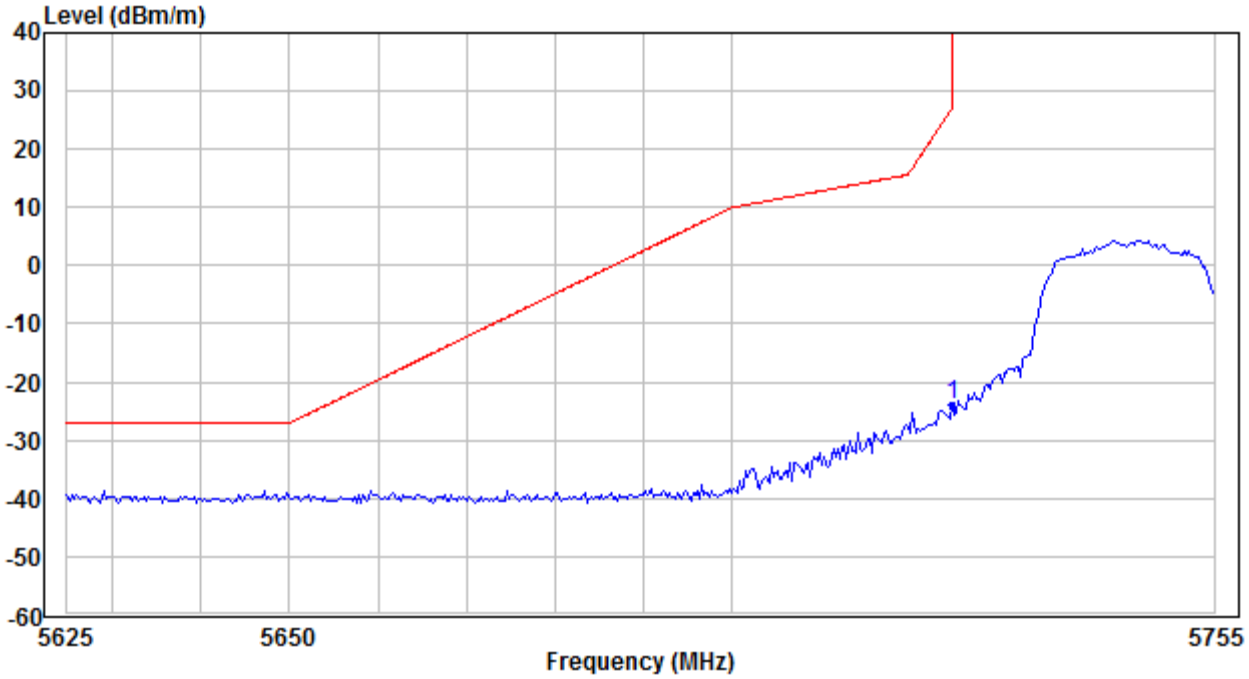
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	47.32	74	33.86	54	Pass

Test Channel:	Channel 48	Ant. Polar. :	Vertical



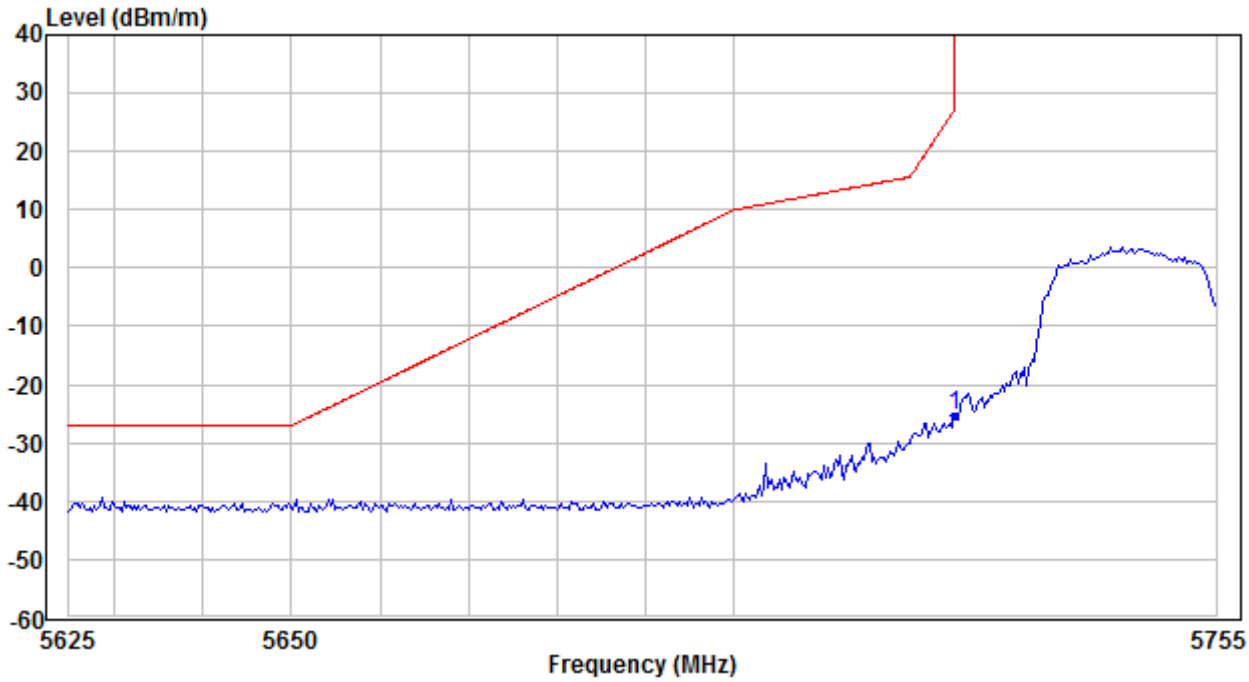
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	46.03	74	33.42	54	Pass

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



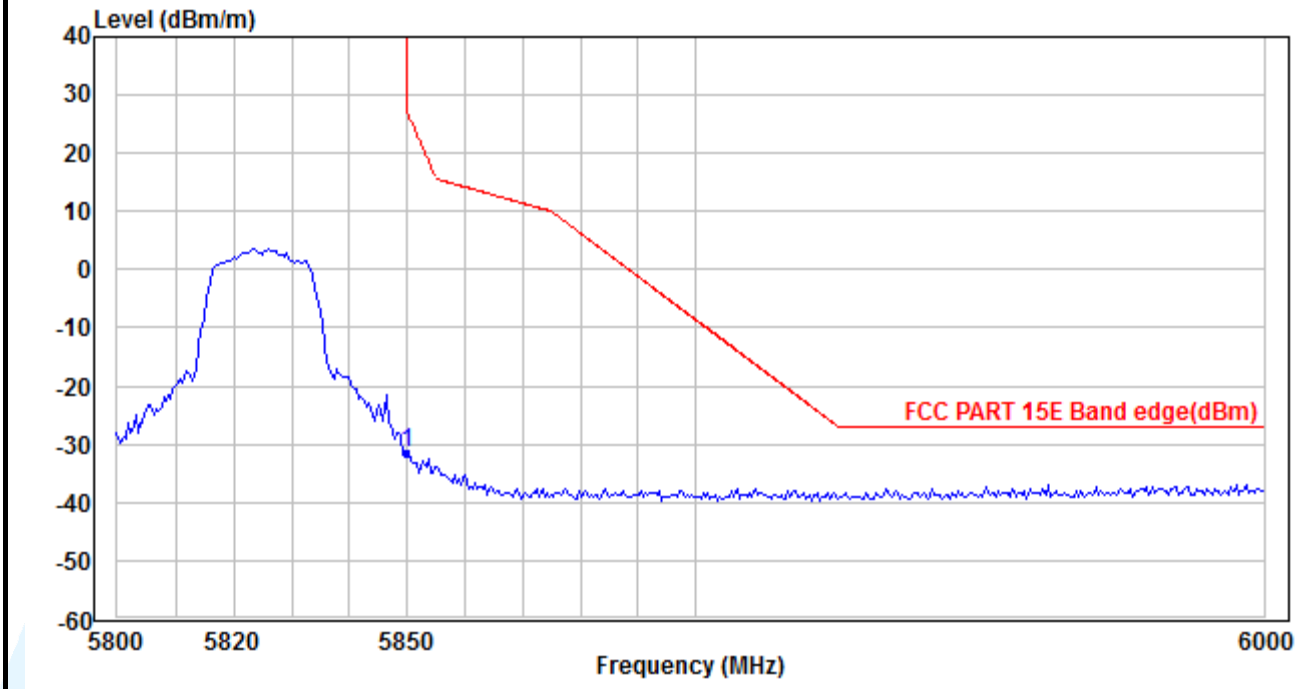
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.00	-24.01	26.97	Pass

Test Channel:	Channel 149	Ant. Polar. :	Vertical



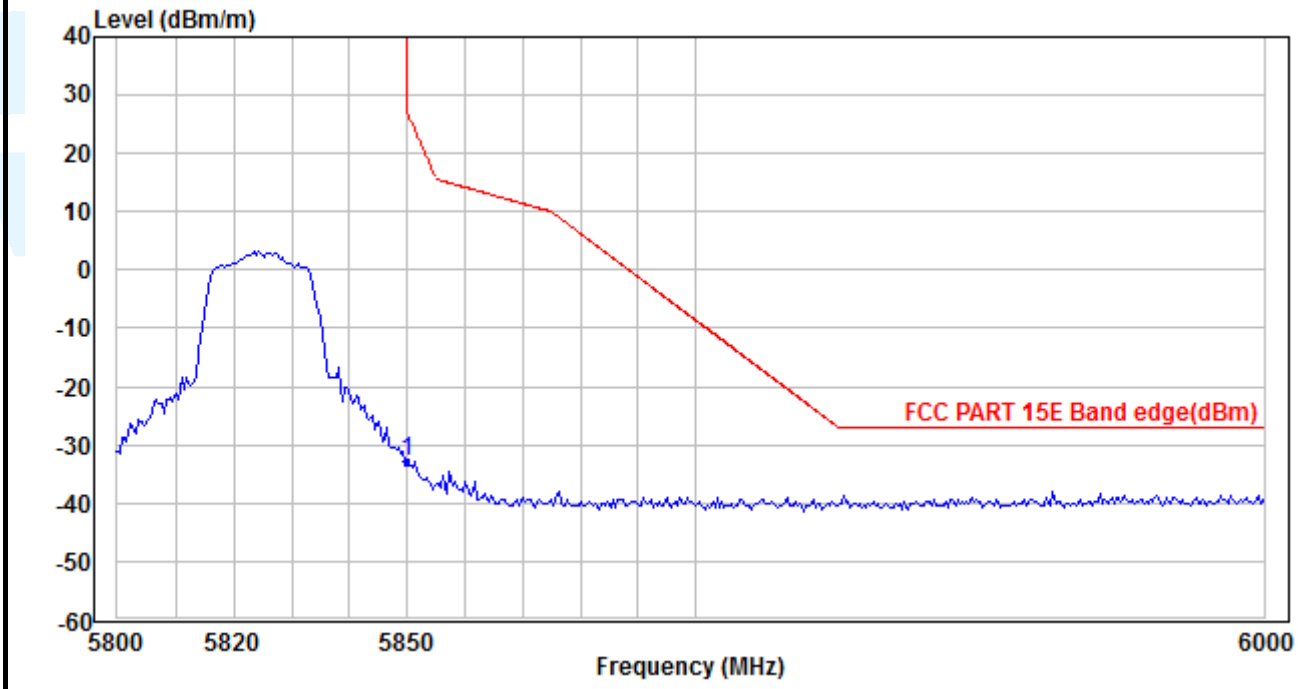
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.00	-25.38	26.97	Pass

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.00	-31.56	26.94	Pass

Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.00	-32.90	26.94	Pass

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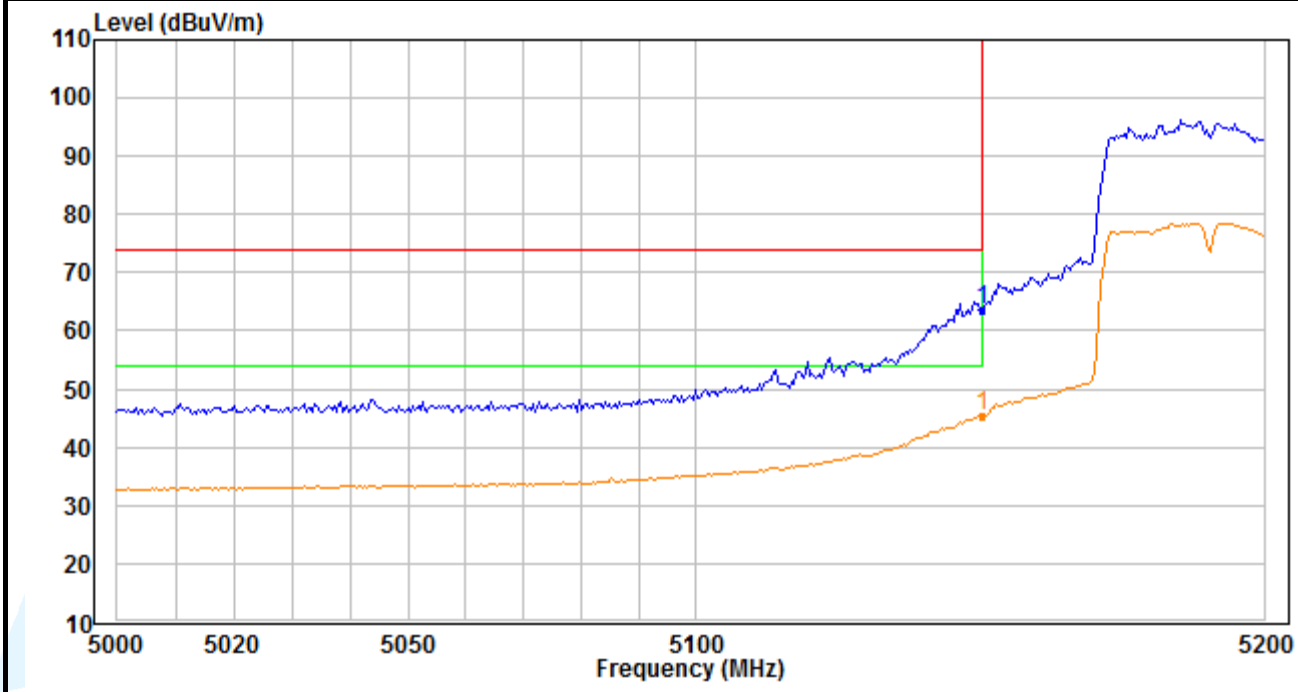
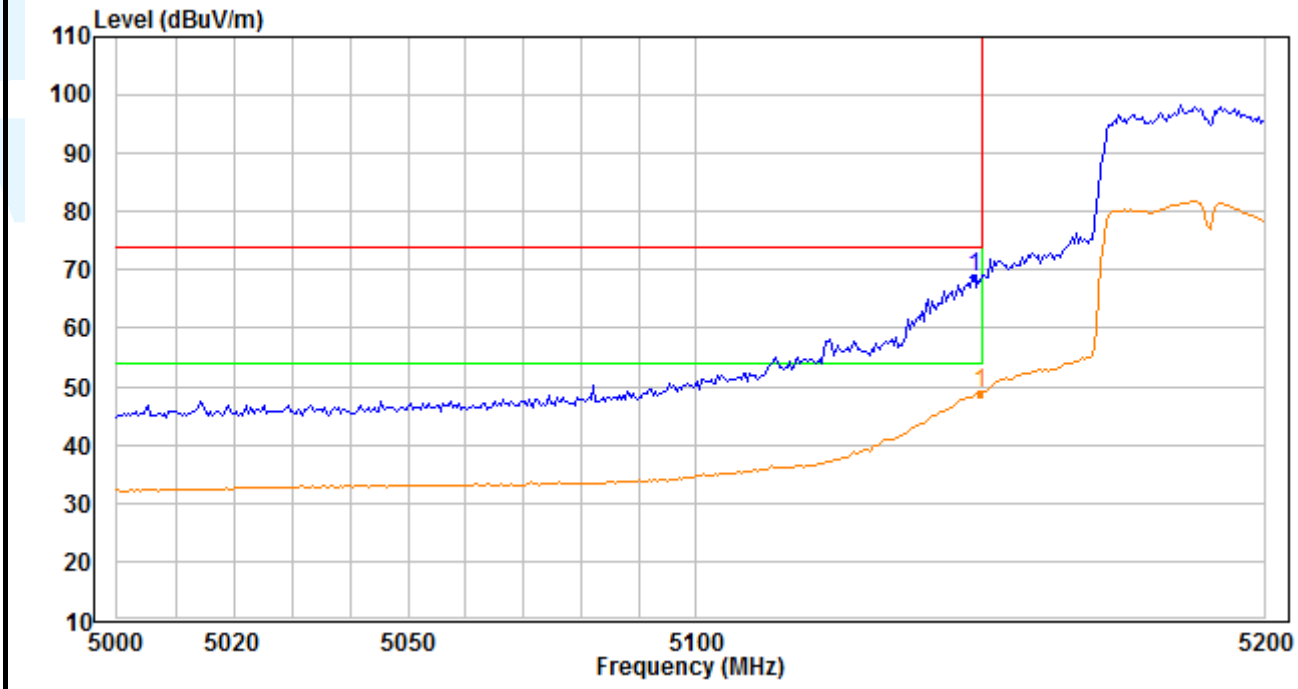
Test Channel:	Channel 38	Ant. Polar. :	Horizontal



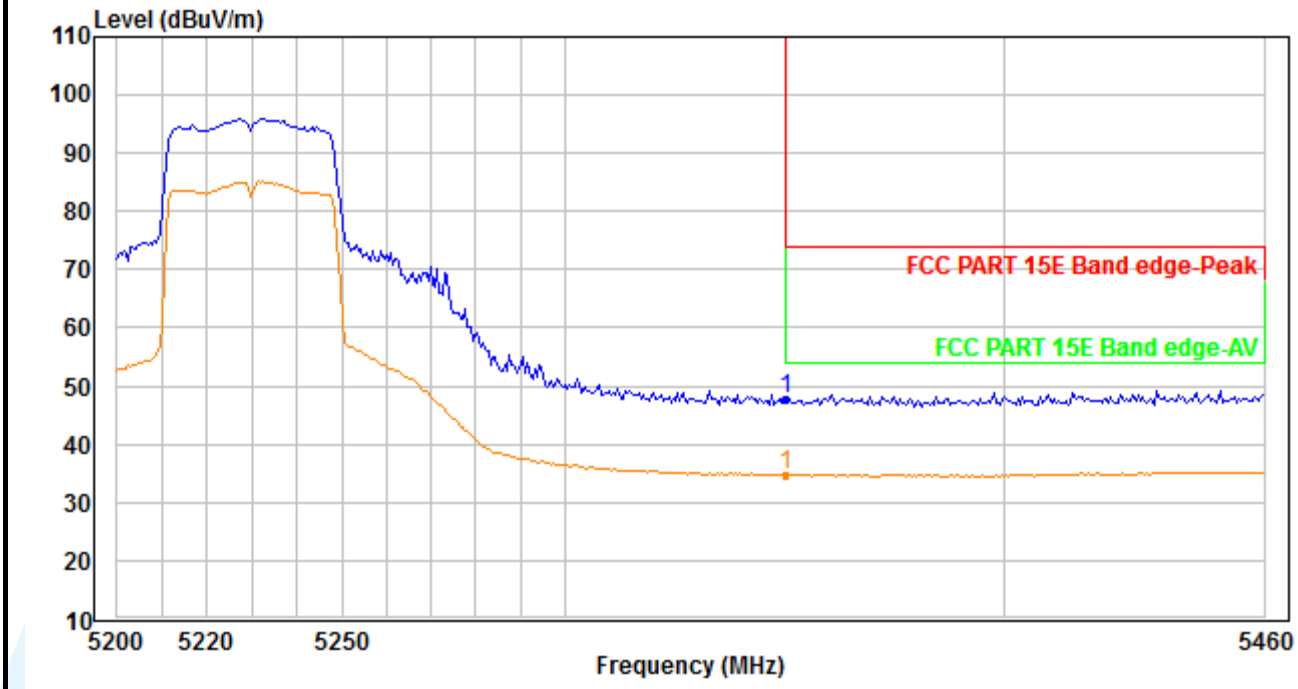
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	63.59	74	45.41	54	Pass

Test Channel:	Channel 38	Ant. Polar. :	Vertical



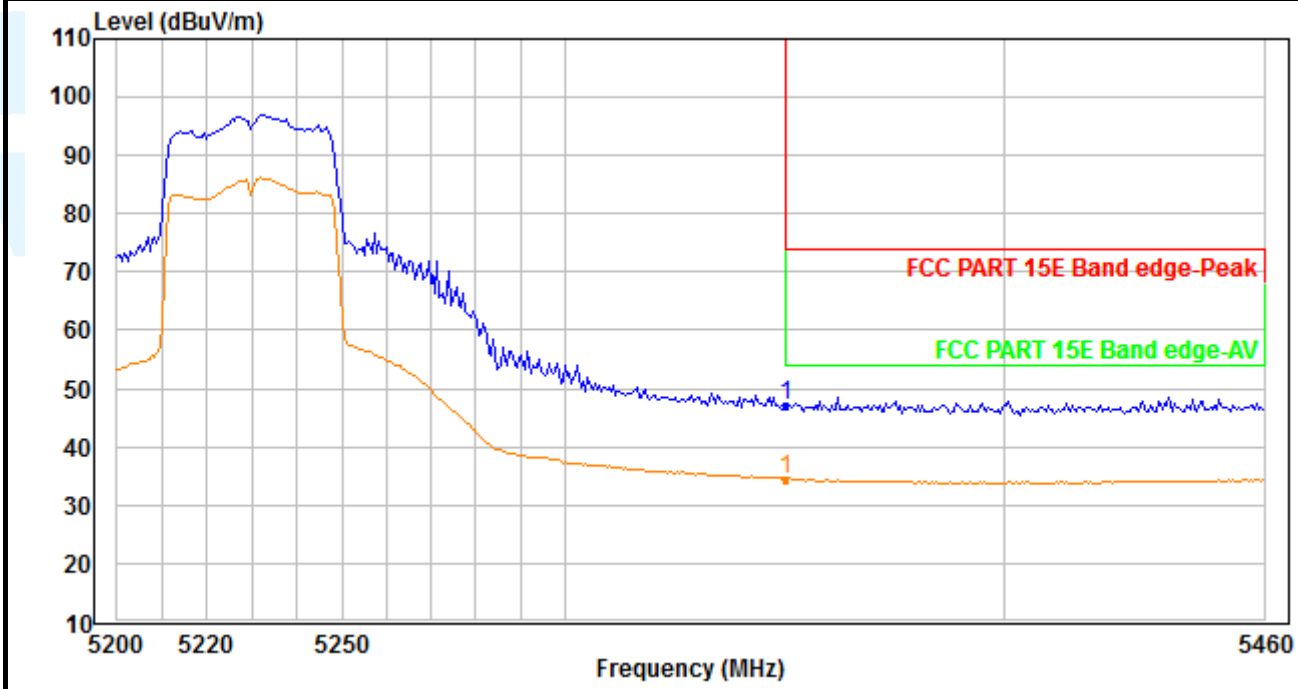
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	68.60	74	48.89	54	Pass

Test Channel:	Channel 46	Ant. Polar. :	Horizontal



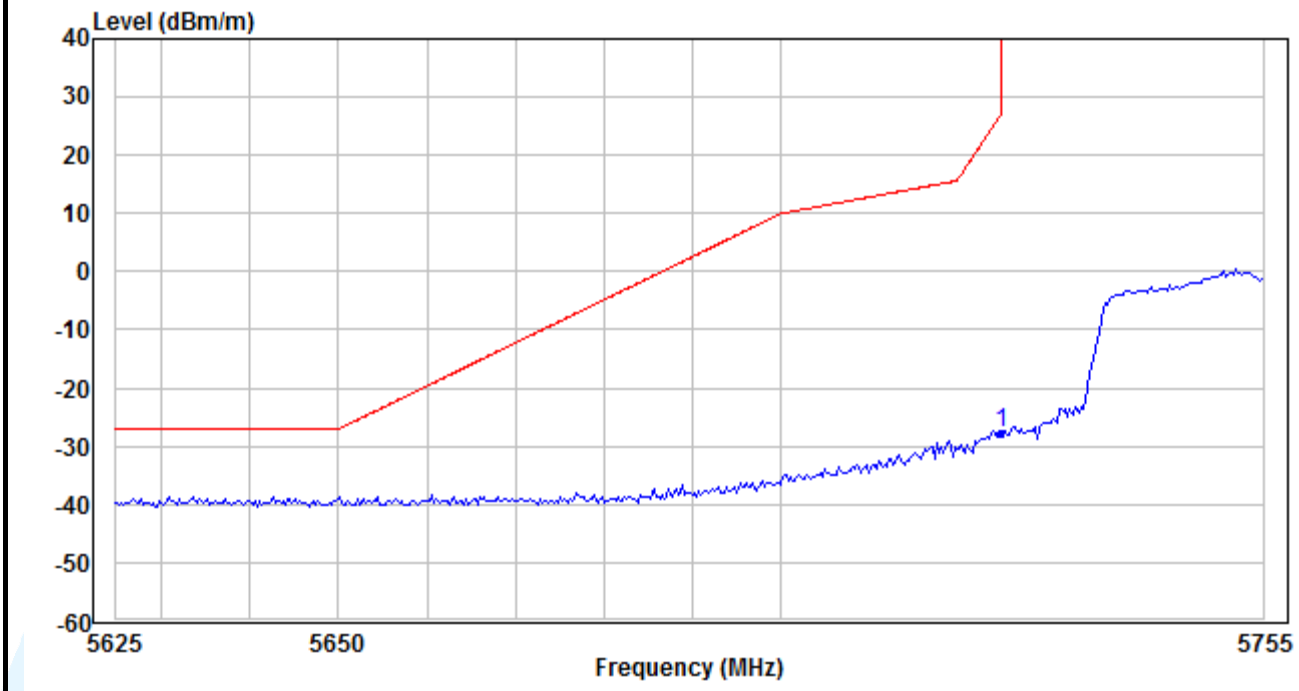
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	47.95	74	34.63	54	Pass

Test Channel:	Channel 46	Ant. Polar. :	Vertical



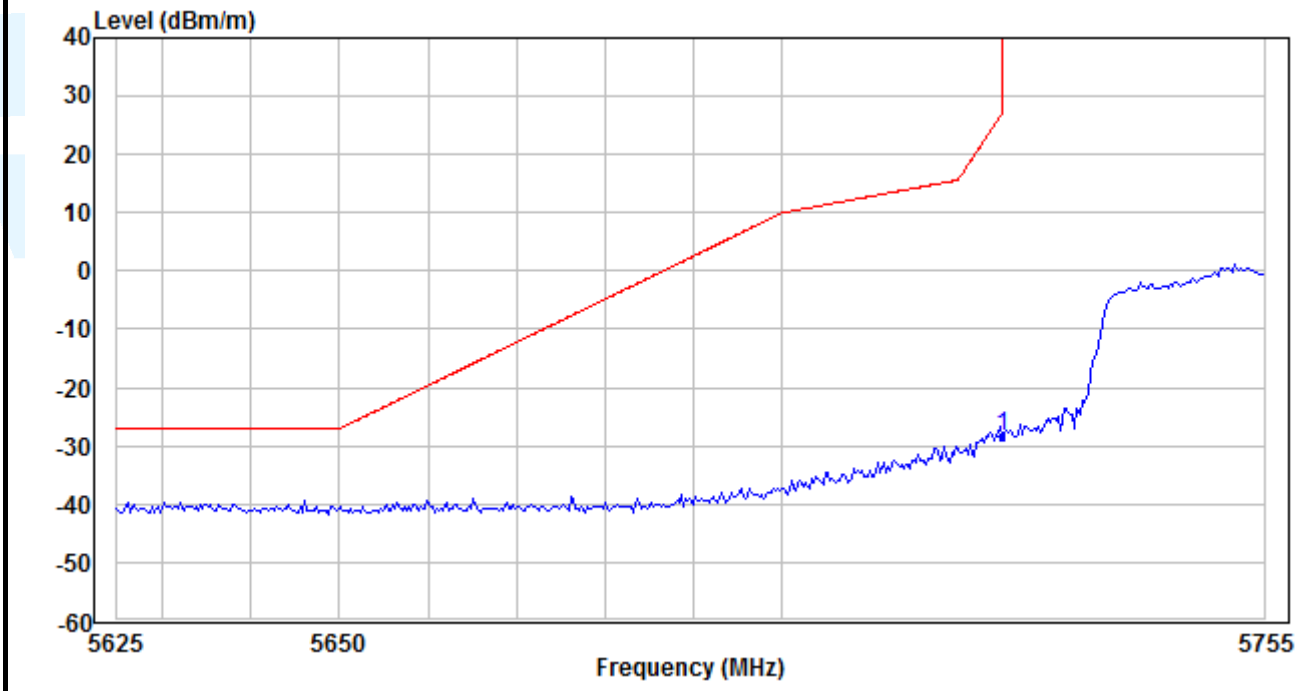
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	46.99	74	34.49	54	Pass

Test Channel:	Channel 151	Ant. Polar. :	Horizontal



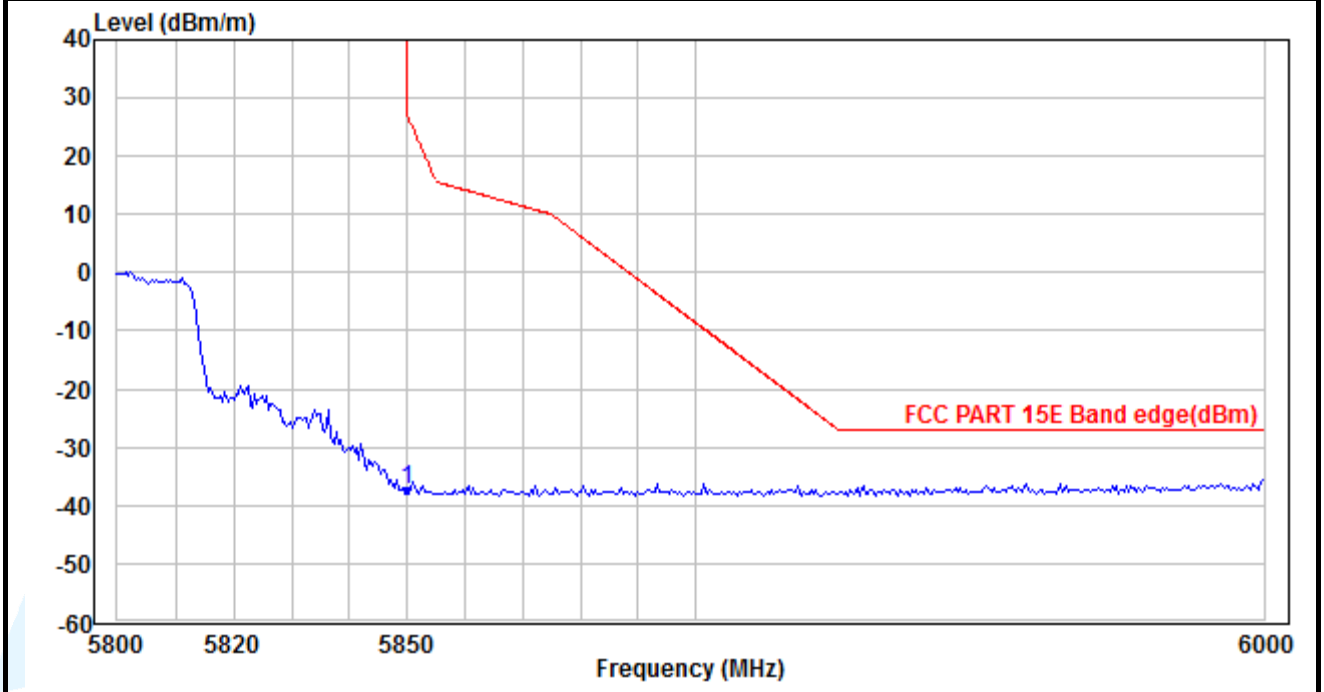
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.00	-27.87	26.97	Pass

Test Channel:	Channel 151	Ant. Polar. :	Vertical



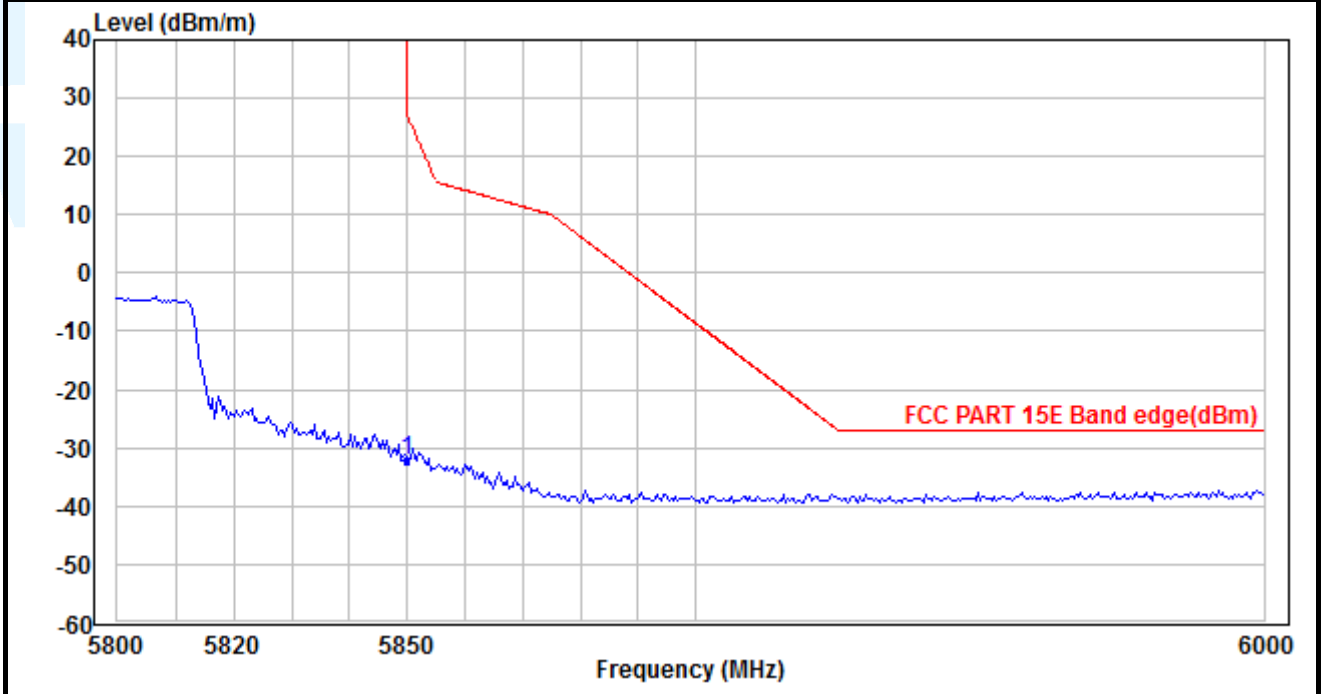
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.00	-28.43	26.97	Pass

Test Channel:	Channel 159	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.00	-37.45	26.94	Pass

Test Channel:	Channel 159	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.00	-31.99	26.94	Pass

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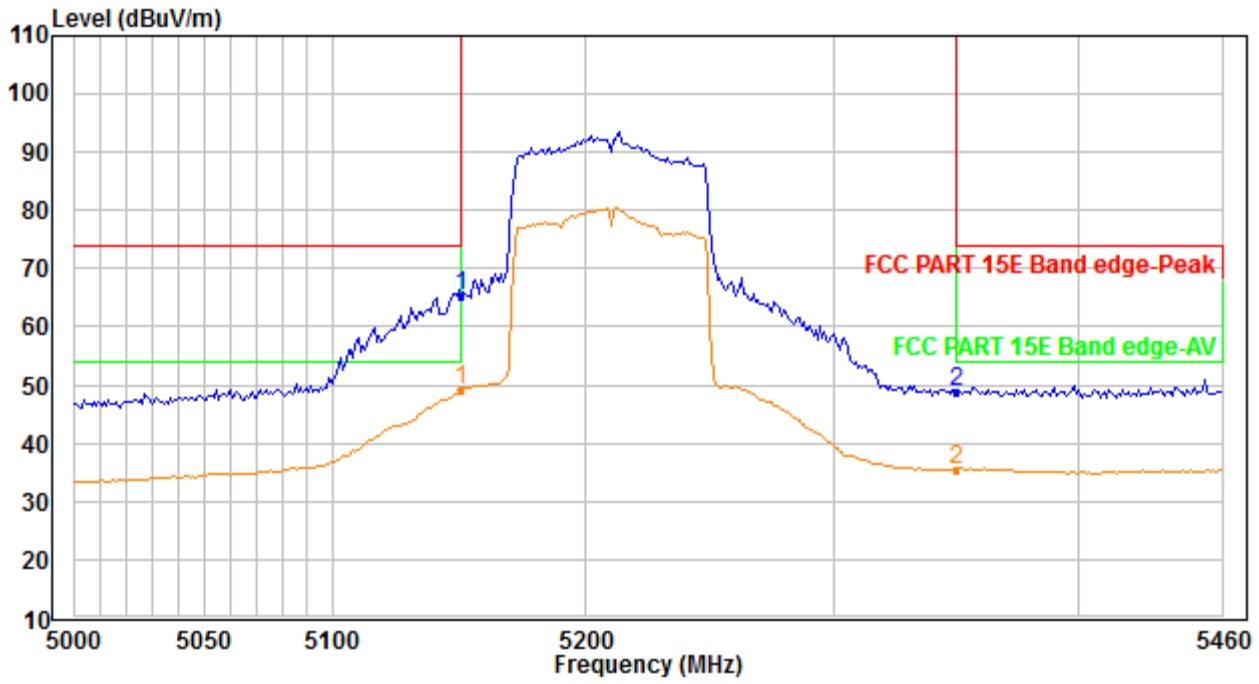
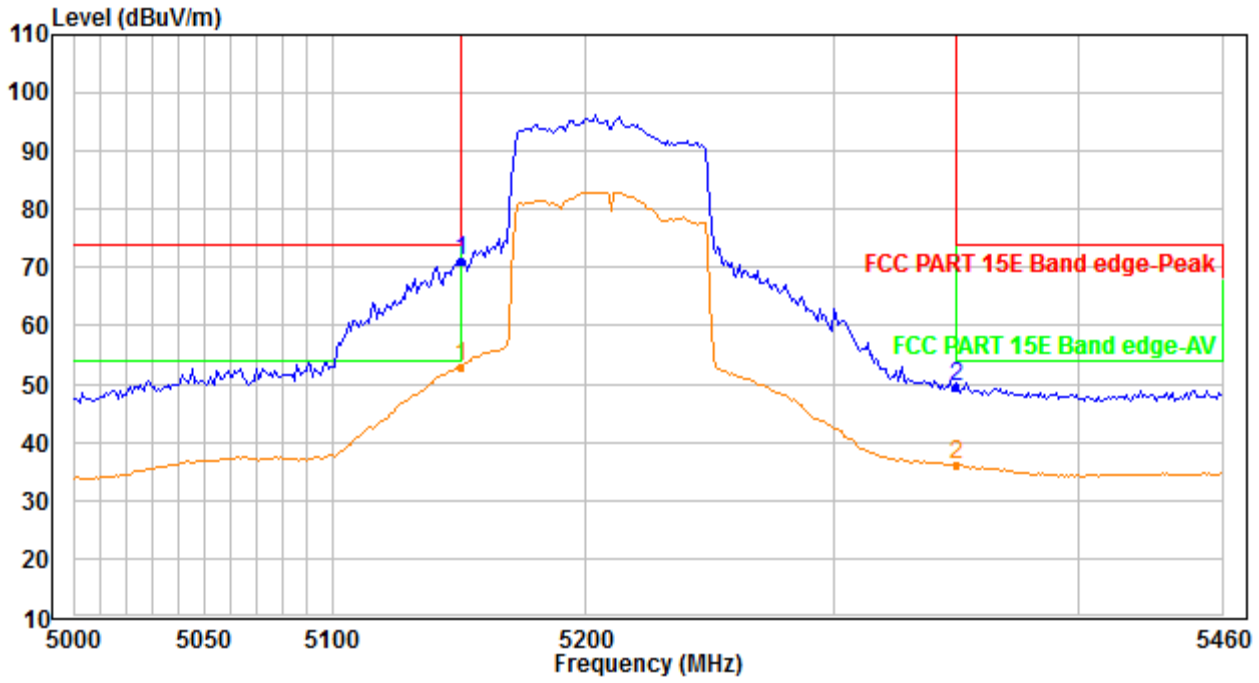
Test Channel:	Channel 42	Ant. Polar. :	Horizontal



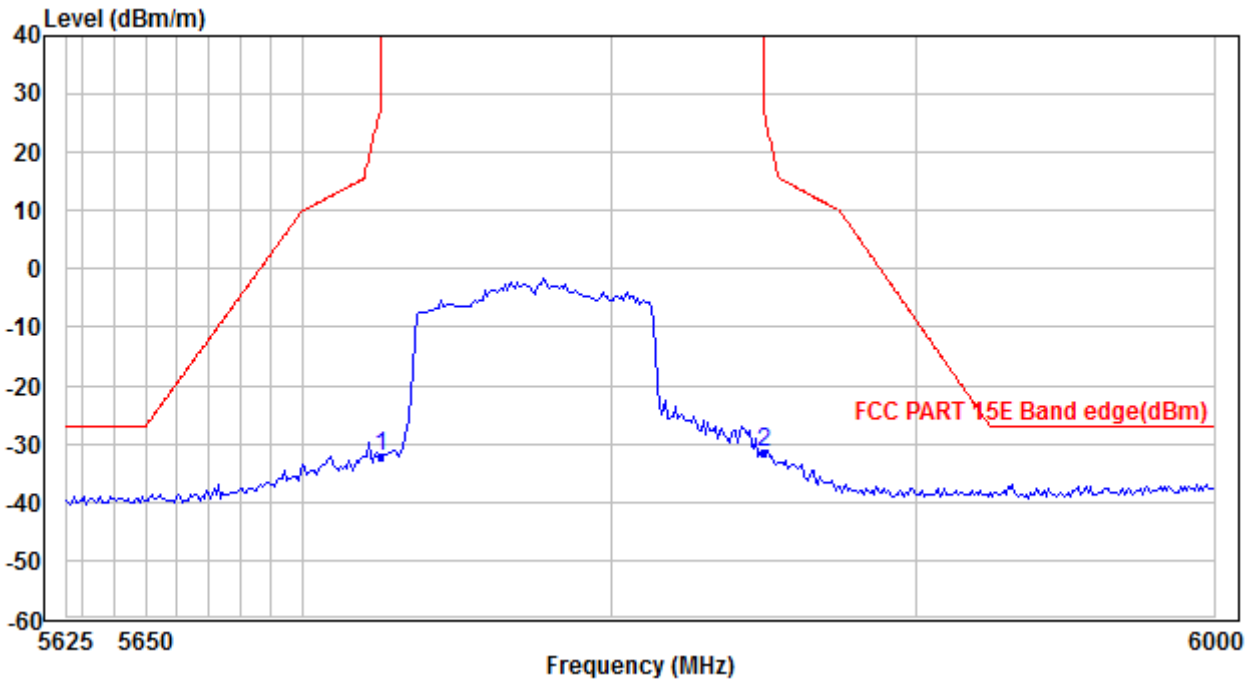
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	65.22	74	49.01	54	Pass
5350	48.71	74	35.52	54	Pass

Test Channel:	Channel 42	Ant. Polar. :	Vertical



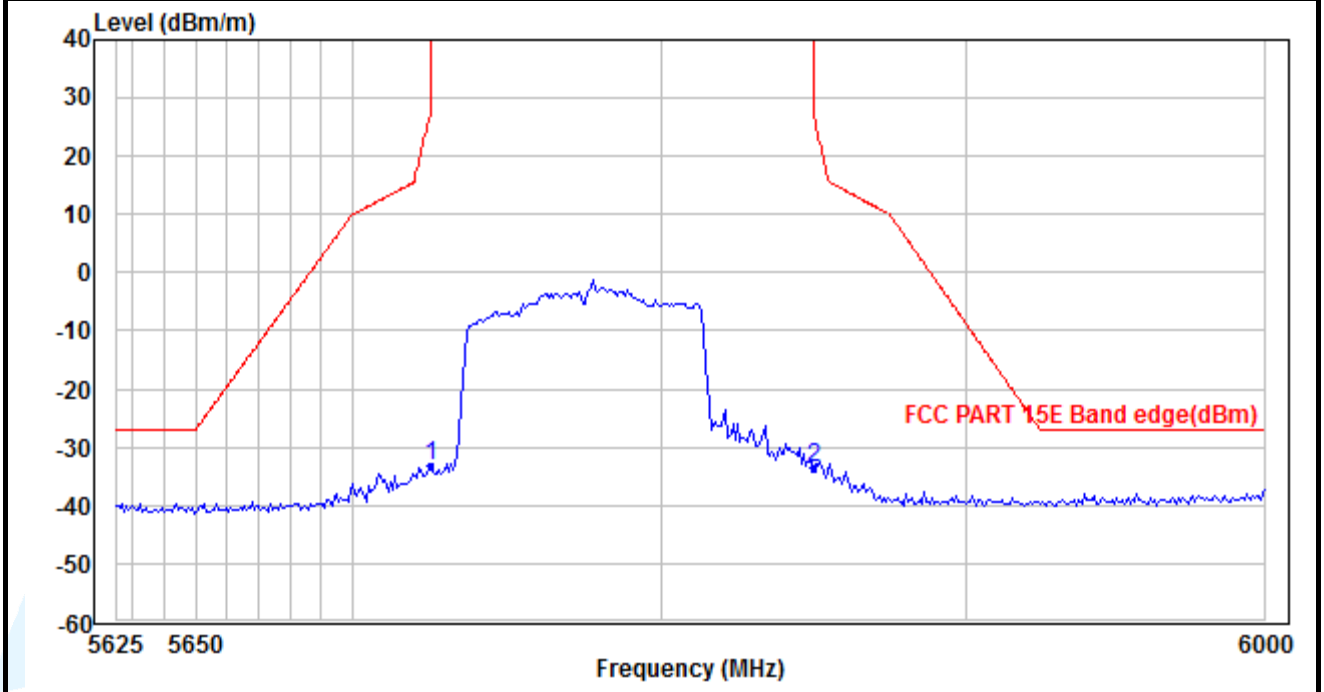
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	71.23	74	53.00	54	Pass
5350	49.47	74	36.06	54	Pass

Test Channel:	Channel 155	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.00	-32.07	26.97	Pass
5850.00	-31.59	26.94	Pass

Test Channel:	Channel 155	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.00	-33.22	26.97	Pass
5850.00	-33.54	26.94	Pass

5.9 AC POWER LINE CONDUCTED EMISSION

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.207
RSS-Gen Issue 4, Section 8.8

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

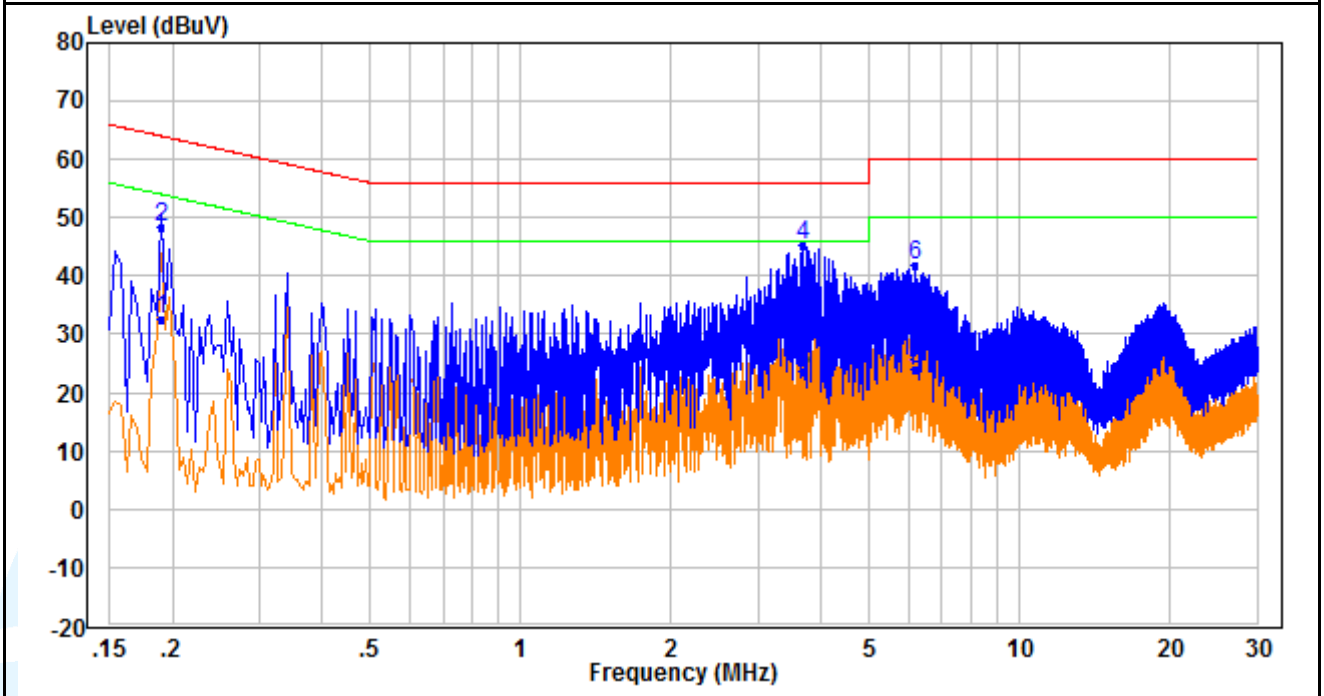
1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second 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

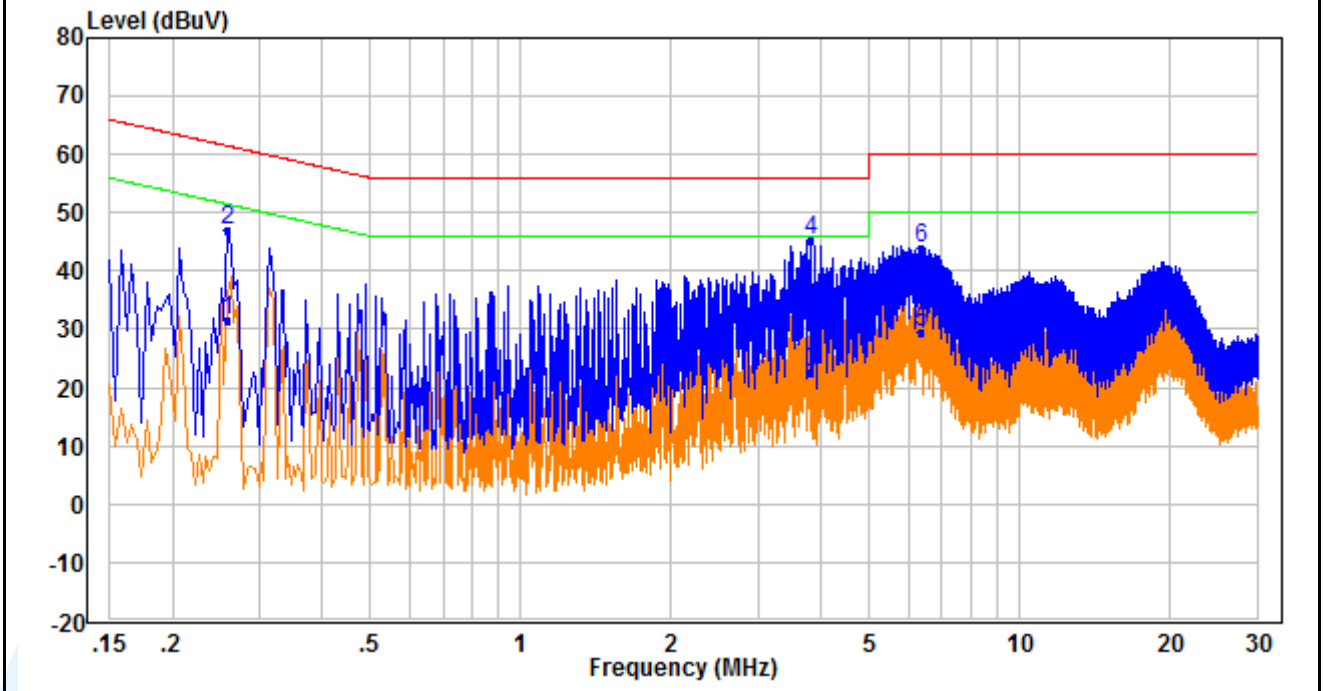
The measurement data as follows:
Quasi Peak and Average:
Mode: WIFI Link

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.190	22.30	10.20	32.50	54.00	-21.50	Average
2	0.190	38.20	10.20	48.40	64.00	-15.60	QP
3	3.690	13.40	10.40	23.80	46.00	-22.20	Average
4*	3.690	34.80	10.40	45.20	56.00	-10.80	QP
5	6.190	13.30	10.60	23.90	50.00	-26.10	Average
6	6.190	31.20	10.60	41.80	60.00	-18.20	QP

Neutral Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.258	21.20	10.30	31.50	51.50	-20.00	Average
2	0.258	36.80	10.30	47.10	61.50	-14.40	QP
3	3.810	11.90	10.60	22.50	46.00	-23.50	Average
4*	3.810	34.80	10.60	45.40	56.00	-10.60	QP
5	6.338	18.60	10.70	29.30	50.00	-20.70	Average
6	6.338	33.00	10.70	43.70	60.00	-16.30	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 ***