TEST REPORT

Product Name:	WIFI+BT Module
Trade Mark:	GSD
Model No.:	WCT6LA2701
Report Number:	170615002RFC-4
Test Standards:	FCC 47 CFR Part 15 Subpart E RSS-247 Issue 2 RSS-Gen Issue 4
FCC ID:	2AC23-WCT6LA2701
IC:	12290A-WCT6LA2701
Test Result:	PASS
Date of Issue:	July 11, 2017

Prepared for:

Hui Zhou Gaoshengda Technology Co.,LTD
NO.75 Zhongkai Development Area, Huizhou, Guangdong, China

Prepared by:

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Date: July 11, 2017

Version

Version No.	Date	Description
V1.0	July 11, 2017	Original

CONTENTS

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of Applicant:	NO.75 Zhongkai Development Area, Huizhou, Guangdong, China
Manufacturer:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of Manufacturer:	NO.75 Zhongkai Development Area, Huizhou, Guangdong, China

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	WIFI+BT Module		
Model No.:	WCT6LA2701		
Add. Model No.:	N/A		
Trade Mark:	GSD		
DUT Stage:	Identical Prototype		
EUT Supports Function:	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth: V3.0+EDR & V4.1 LE	
	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:	N/A		
Hardware Version:	94V-0		
Sample Received Date:	June 20, 2017		
Sample Tested Date:	June 20, 2017 to July 11, 2017		

1.2.2 Description of Accessories

None.

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:	N/A
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 MCS15
	IEEE 802.11n-HT40: Up to MCS15
	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:	Chain 0	PIFA Antenna	
	Chain 1	PIFA Antenna	
Antenna Gain:	Chain 0	5150 MHz to 5250 MHz: 2.57 dBi	
		5725 MHz to 5850 MHz: 2.57 dBi	
	Chain 1	5150 MHz to 5250 MHz: 2.57 dBi	
		5725 MHz to 5850 MHz: 2.57 dBi	
Directional gain:	5150 MHz to 5250 MHz:	5.58 dBi	
	5725 MHz to 5850 MHz:	5.58 dBi	
Maximum Conducted Output Power (dBm):	**SISO_Chain 0**	**U-NII-1**	**U-NII-3**
	IEEE 802.11a:	14.70	14.78
	IEEE 802.11n-HT20:	11.20	11.37
	IEEE 802.11n-HT40:	11.06	10.84
	IEEE 802.11ac-VHT80:	9.82	8.95
	SISO_Chain 1	**U-NII-1**	**U-NII-3**
	IEEE 802.11a:	14.00	14.05
	IEEE 802.11n-HT20:	10.37	9.34
	IEEE 802.11n-HT40:	10.12	9.01
	IEEE 802.11ac-VHT80:	8.15	7.24
	MIMO_Chain 0+1	**U-NII-1**	**U-NII-3**
	IEEE 802.11n-HT20:	13.82	13.48
	IEEE 802.11n-HT40:	13.63	13.03
	IEEE 802.11ac-VHT80:	12.08	11.19
Maximum EIRP (dBm):	**SISO_Chain 0**	**U-NII-1**	**U-NII-3**
	IEEE 802.11a:	17.27	17.35
	IEEE 802.11n-HT20:	13.77	13.94
	IEEE 802.11n-HT40:	13.63	13.41
	IEEE 802.11ac-VHT80:	12.39	11.52
	SISO_Chain 1	**U-NII-1**	**U-NII-3**
	IEEE 802.11a:	16.57	16.62
	IEEE 802.11n-HT20:	12.94	11.91
	IEEE 802.11n-HT40:	12.69	11.58
	IEEE 802.11ac-VHT80:	10.72	9.81
	MIMO_Chain 0+1	**U-NII-1**	**U-NII-3**
	IEEE 802.11n-HT20:	19.40	19.06
	IEEE 802.11n-HT40:	19.21	18.61
	IEEE 802.11ac-VHT80:	17.66	16.77
Normal Test Voltage:	3.3 Vdc		
Extreme Test Voltage:	2.8 to 3.8 Vdc		
Extreme Test Temperature:	-20 °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	40	5200 MHz	44	5220 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
Notebook	Lenovo	E450	SL10G10780	UnionTrust
--	--	--	--	--

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable * 2	SMA	0.30 Meter	UnionTrust
2	USB Cable	USB	0.80 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

Tests were sub-contracted.
Compliance Certification Services (Shenzhen) Inc.

Address: No.10-1 Mingkeda Logistics Park, No.18 Huanguan South RD. Guan lan Town, Baoan Distr, Shenzhen, Guangdong, China.
Telephone: +86 (0) 755 28055000 Fax: +86 (0) 755 29055221

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.

Compliance Certification Services (Shenzhen) Inc.

FCC Registration Number is 441872.
IC Registration Number is 2324I-2.

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	±3.2878 dB
2	Conducted emission 150KHz-30MHz	±3.2878 dB
3	Radiated emission 30MHz-200Hz	±3.8928 dB
4	Radiated emission 200MHz-1GHz	±3.8753 dB
5	Radiated emission 1GHz-8GHz	±5.3112 dB
6	Radiated emission Above 8GHz	±5.3493 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	N/A NOTE 2

Note:
1) N/A: In this whole report not application.
2) This EUT is powered by DC.
3) “*”: In this whole report “*” means tests were sub-contracted Item.

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)
☑	PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	Feb. 17, 2017	Feb. 16, 2018
☑	High Noise Amplifier	Agilent	8449B	3008A01838	Feb. 11, 2017	Feb. 10, 2018
☑	Amplifier	HP	8447D	2944A08999	Feb. 12, 2017	Feb. 11, 2018
☑	Antenna	SCHAFFNER	CBL6143	5082	Feb. 12, 2017	Feb. 11, 2018
☑	Horn Antenna	SCHWARZBECK	BBHA9120	D286	Feb. 12, 2017	Feb. 11, 2018
☑	Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	Feb. 11, 2017	Feb. 10, 2018
☑	Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
☑	Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
☑	Controller	CT	N/A	N/A	N.C.R	N.C.R
☑	Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
☑	Temp. / Humidity Meter	Anymetre	JR913	N/A	Feb. 15, 2017	Feb. 14, 2018

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
☐	Receiver	R&S	ESR7	1316.3003K07-101181-K3	Dec. 22, 2016	Dec. 22, 2017
☑	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430035	Dec. 22, 2016	Dec. 22, 2017
☑	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430023	Dec. 22, 2016	Dec. 22, 2017
☐	EXG-B RF Analog Signal Generator	KEYSIGHT	N5171B	MY53051777	Jan. 09, 2016	Jan. 08, 2018
☑	MXG X-Series RF Vector Signal Generator	KEYSIGHT	N5182B	MY51350267	Jan. 08, 2016	Jan. 07, 2018
☑	DC Source	KIKUSUI	PWR400L	LK003024	Sep. 21, 2016	Sep. 20, 2017
☑	Temp & Humidity chamber	Ispec	GL(U)04KA(W)	1692H201P3	Sep. 21, 2016	Sep. 20, 2017
☑	Temp & Humidity chamber	Votisch	VT4002	58566133290020	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. 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
☐	LISN	ETS-Lindgren	3816/2SH	00201088	Aug. 24, 2016	Aug. 23, 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	3.3	20 to 75
TL/VL	-20	2.8	20 to 75
TH/VL	+50	2.8	20 to 75
TL/VH	-20	3.8	20 to 75
TH/VH	+50	3.8	20 to 75

Remark:
1) The EUT just work in such extreme temperature of -20 °C to +50 °C and the extreme voltage of 2.8 V to 3.8 V, so here the EUT is tested in the temperature of -20 °C to +50 °C and the voltage of 2.8 V to 3.8 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	N/A	N/A	N/A	N/A
26 dB emission bandwidth & Occupied Bandwidth	24.8	52	100.1	Tiny You
Maximum conducted output power	25.3	57	100.2	Tiny You
Peak Power Spectral Density	24.8	52	100.1	Tiny You
6 dB bandwidth & Occupied Bandwidth	24.8	52	100.1	Tiny You
Dynamic Frequency Selection	N/A	N/A	N/A	N/A
Radiated Emissions and Band Edge Measurement	25.6	49	100.2	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	--

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China
Tel: +86-755-28230888 Fax: +86-755-28230886 E-mail: info@uttlab.com Http://www.uttlab.com

4.3 EUT TEST STATUS

Mode	Tx/Rx Function	Description
IEEE 802.11a/n/ac	1Tx/1Rx or 2Tx/2Rx	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
	14.52	14.36	14.31	14.29	11.93	11.71	11.7	10.38
IEEE 802.11n-HT20 5180 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	10.25	10.01	9.67	7.53	7.29	7.05	5.87	4.98
	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
	10.26	9.97	9.75	7.45	7.26	7.25	6.18	5.14
IEEE 802.11n-HT40 5190 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	10.11	9.49	9.37	7.71	7.55	7.26	6.26	4.51
	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
	10.13	9.31	9.09	7.56	7.21	7.05	5.57	4.13
IEEE 802.11ac-VHT20 5180 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	9.47	9.16	8.94	6.64	6.45	6.44	5.37	4.33
	MCS8							
	4.27							
IEEE 802.11ac-VHT40 5190 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	9.13	8.60	8.48	7.82	7.66	7.37	6.37	5.62
	MCS8	MCS9						
	4.70	4.00						
IEEE 802.11ac-VHT80 5210 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	9.03	7.96	7.72	7.33	6.06	5.86	4.51	4.10
	MCS8	MCS9						
	3.19	3.26						

4.4.2 Worst-case data rates

Mode	Worst-case data rates
IEEE 802.11a	6 Mbps
IEEE 802.11n-HT20	MCS8
IEEE 802.11n-HT40	MCS8
IEEE 802.11ac-VHT20	MCS0
IEEE 802.11ac-VHT40	MCS0
IEEE 802.11ac-VHT80	MCS0

4.4.3 Test mode selected

Mode	Test and report
IEEE 802.11a	☑
IEEE 802.11n-HT20	☑
IEEE 802.11n-HT40	☑
IEEE 802.11ac-VHT20	☐
IEEE 802.11ac-VHT40	☐
IEEE 802.11ac-VHT80	☑

Remark:

1. The mark "☑" means is chosen for testing;
2. The mark "☐" means is not chosen for testing.

4.5 TEST SETUP

4.5.1 For Radiated Emissions test setup

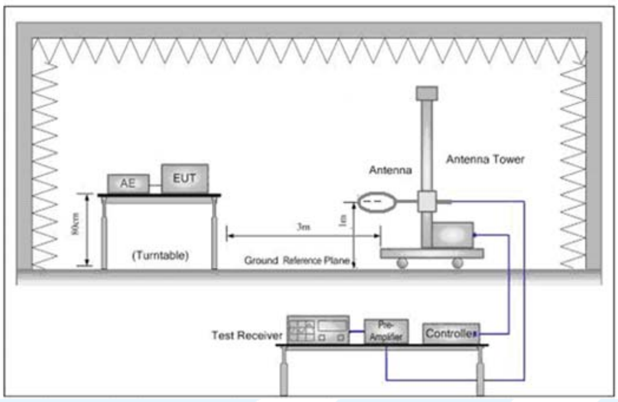


Figure 1. Below 30MHz

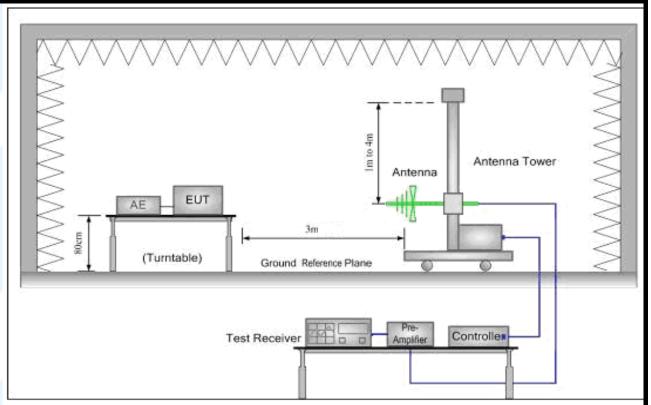


Figure 2. 30MHz to 1GHz

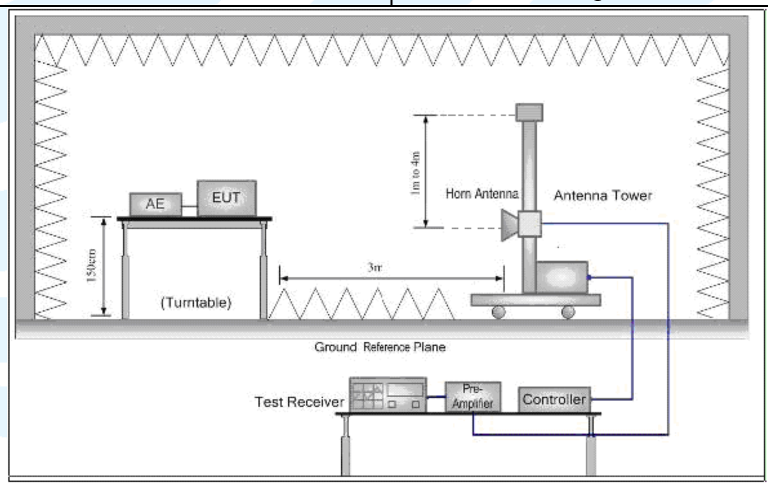
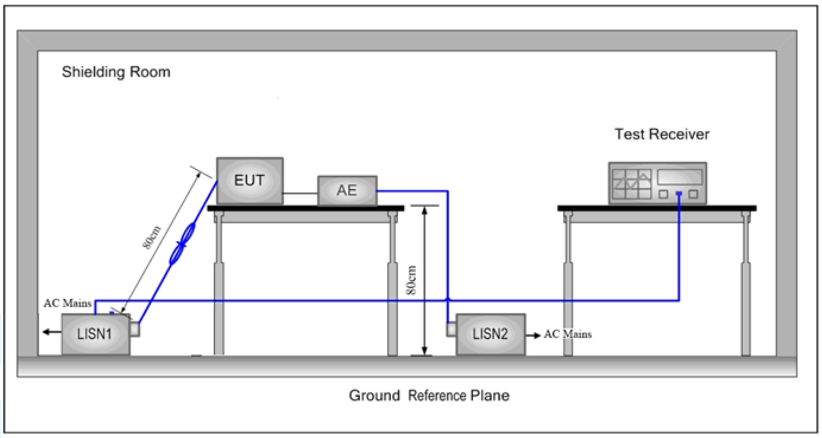


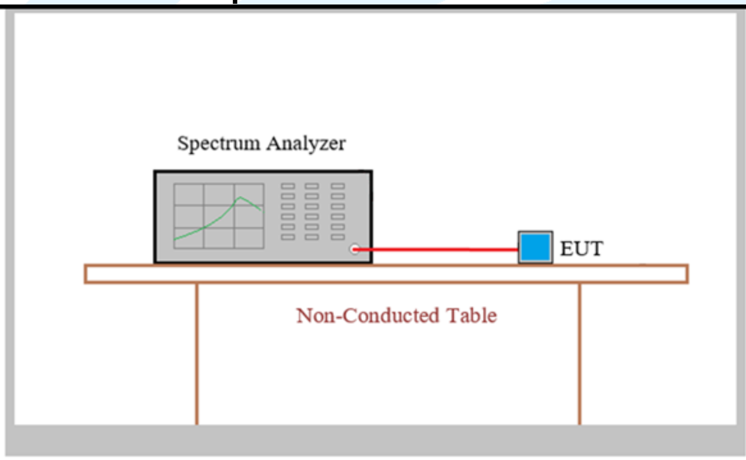
Figure 3. Above 1GHz

4.5.2 For Conducted Emissions test setup

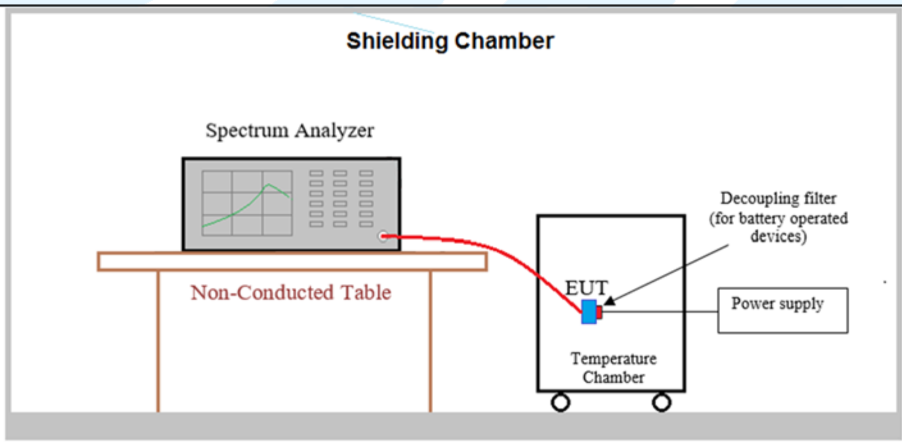
Figure 3. Conducted Emissions setup



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 3.3Vdc. 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
	1TX	Chain 1	Z axis
	2TX	Chain 0+1	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.

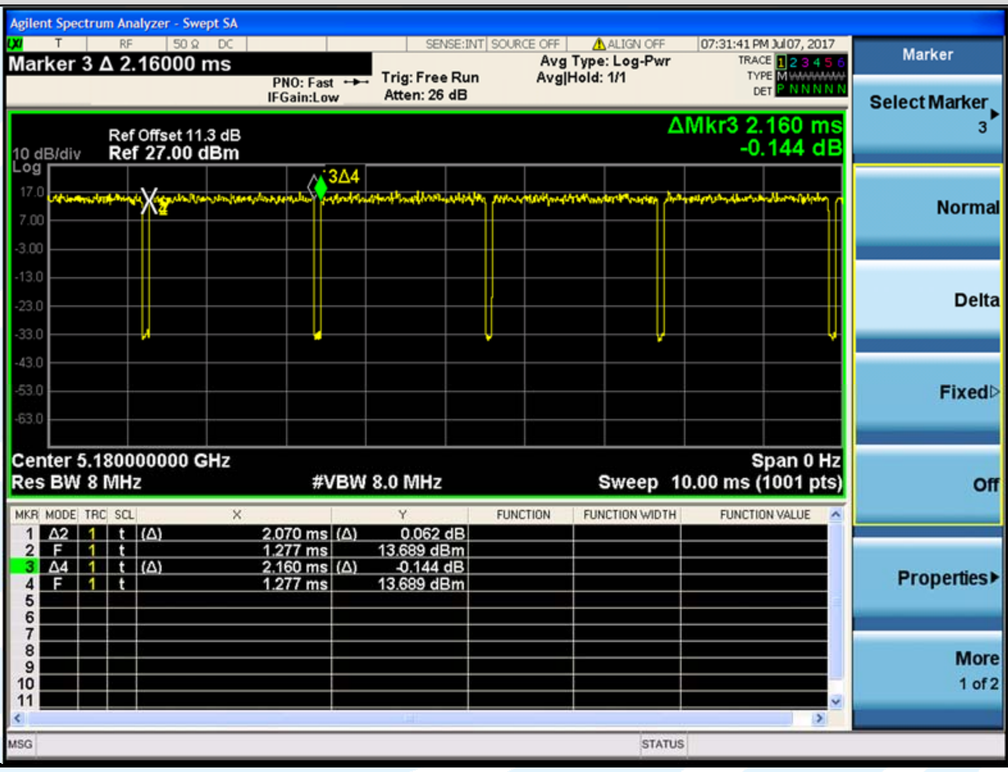
4.7 DUTY CYCLE

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	2.07	2.16	0.96	95.83	0.18	0.48	-0.37
IEEE 802.11n-HT20	MCS8	1.92	2.02	0.95	95.05	0.22	0.52	-0.44
IEEE 802.11n-HT40	MCS8	0.95	1.045	0.91	90.91	0.41	1.05	-0.83
IEEE 802.11ac-VHT80	MCS0	0.465	0.558	0.83	83.33	0.79	2.15	-1.58

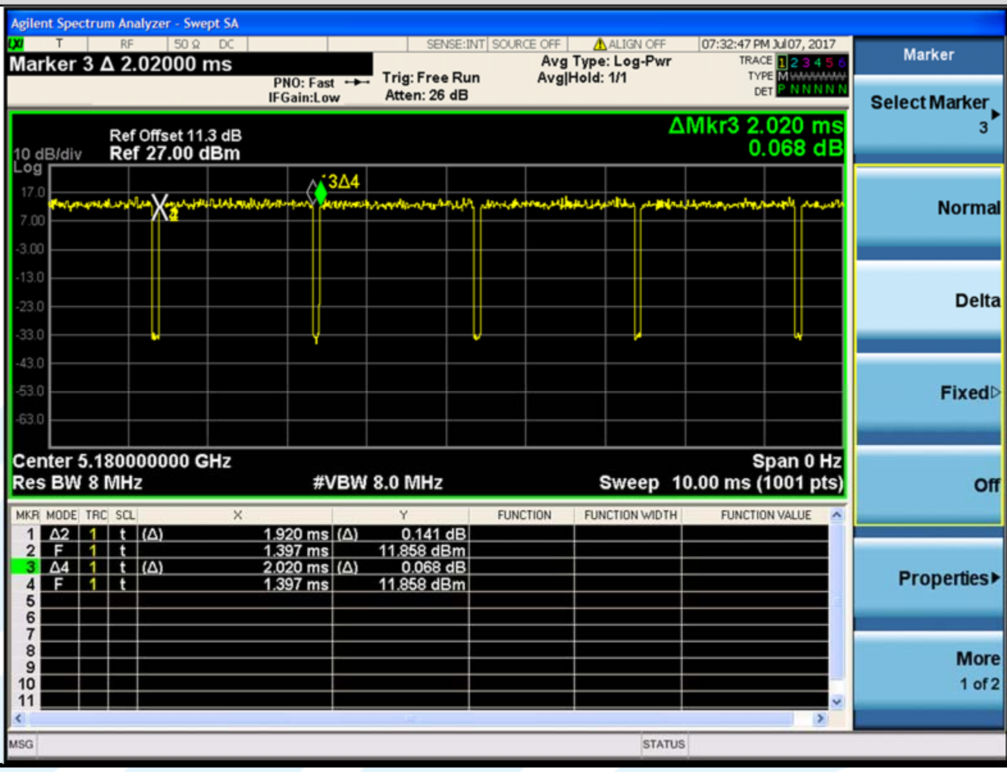
Remark:
1) Duty cycle= On Time/ Period;
2) Duty Cycle factor = 10 * log(1/ Duty cycle);
3) Average factor = 20 $\log_{10}$ Duty Cycle.

The test plot as follows

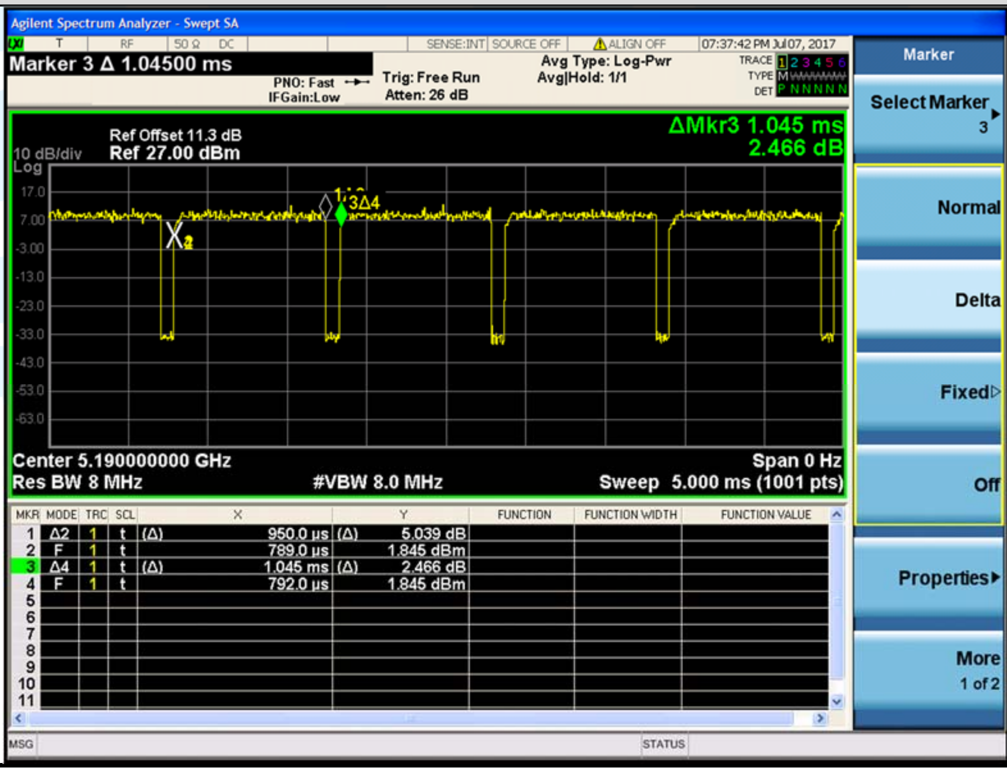
IEEE 802.11a



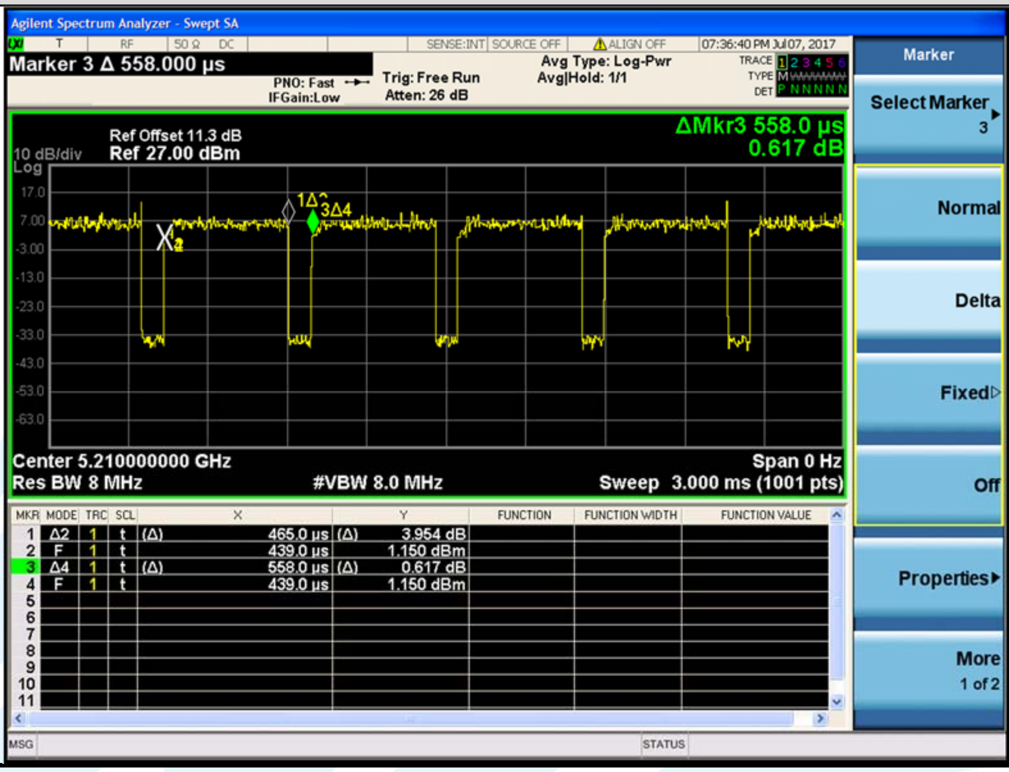
IEEE 802.11n-HT20



IEEE 802.11n-HT40



IEEE 802.11ac-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 Unlicensed 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)
8	KDB 662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

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:
Both antenna in the interior of the equipment and no consideration of replacement. The transmit signals are correlated with each other and the antenna gain of both chains is completely consistent, the best case directional gain of the antenna is 5.58 dBi (See section 5.5).

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

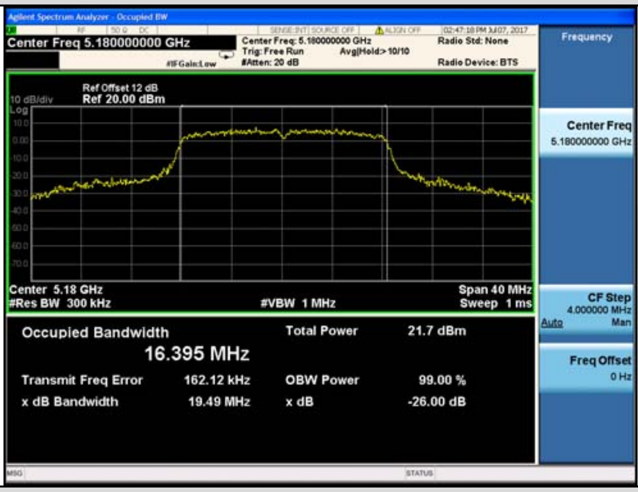
Test Data:

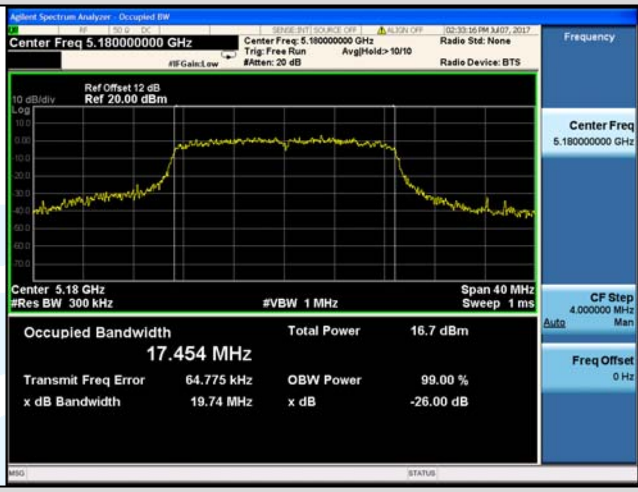
Mode	Channel	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
The worst case test data: Chain 0			
IEEE 802.11a	36 (5180)	19.49	16.395
	44 (5220)	19.34	16.337
	48 (5240)	20.84	16.422
IEEE 802.11n-HT20	36 (5180)	19.74	17.454
	44 (5220)	20.28	17.426
	48 (5240)	19.87	17.462
IEEE 802.11n-HT40	38 (5190)	40.25	35.865
	46 (5230)	40.74	35.867
IEEE 802.11ac-VHT80	42 (5230)	83.89	75.201

The test plot as follows:

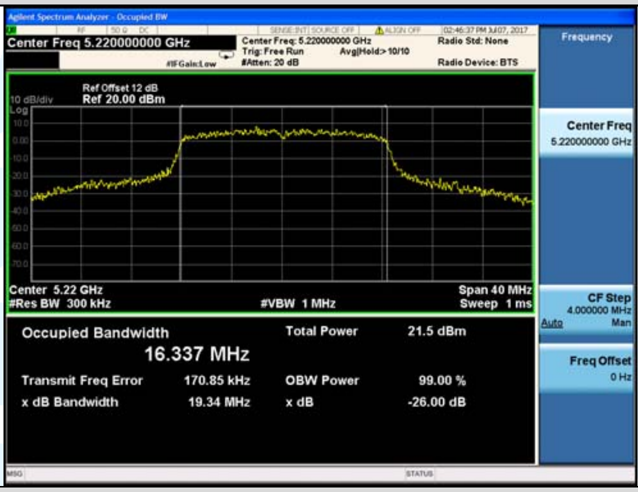
IEEE 802.11a	IEEE 802.11n-HT20

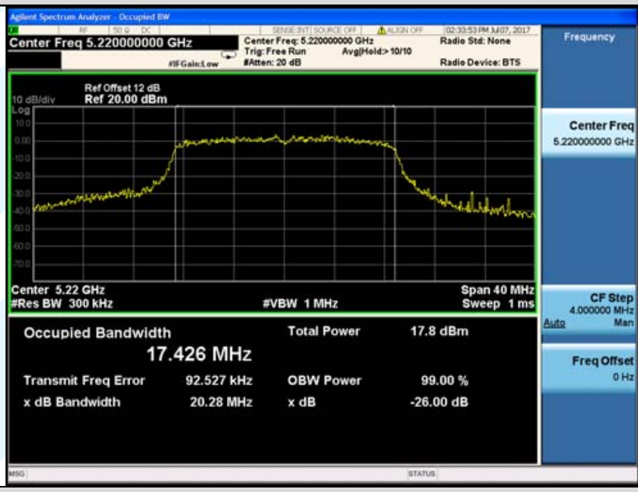
Channel 36



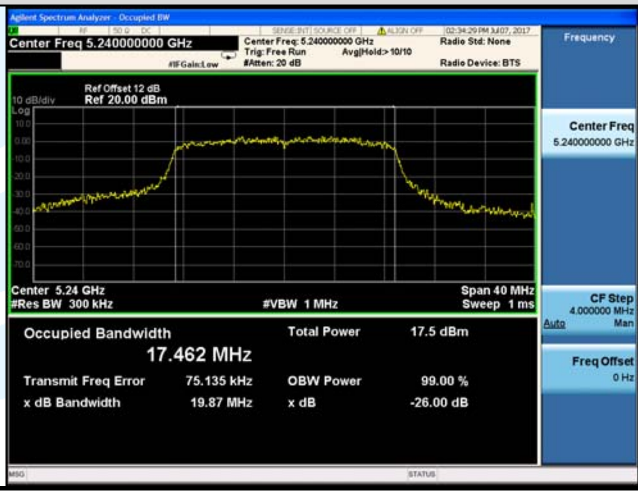


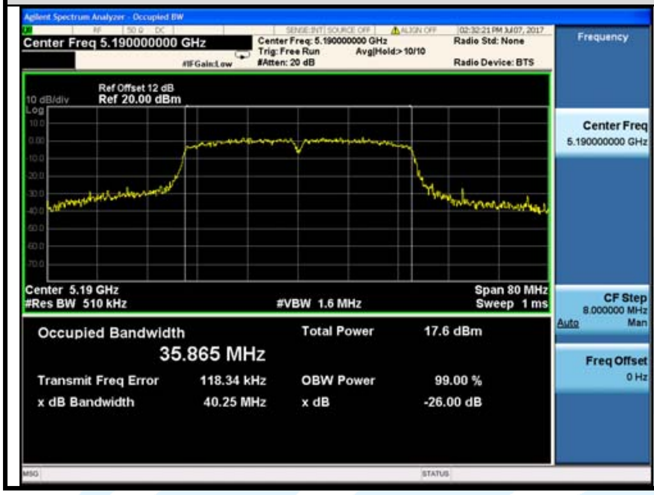
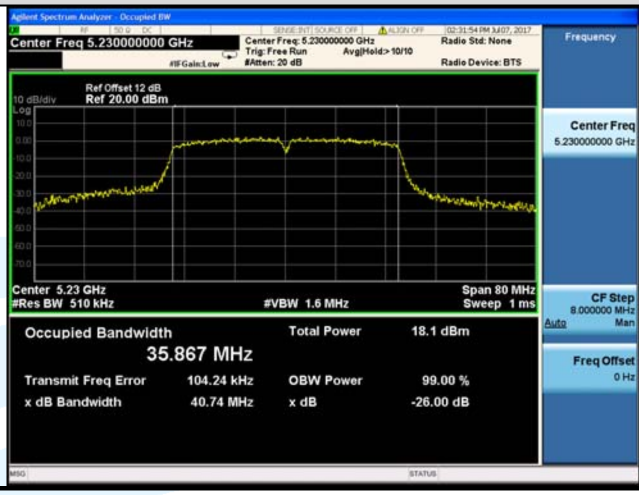
Channel 44

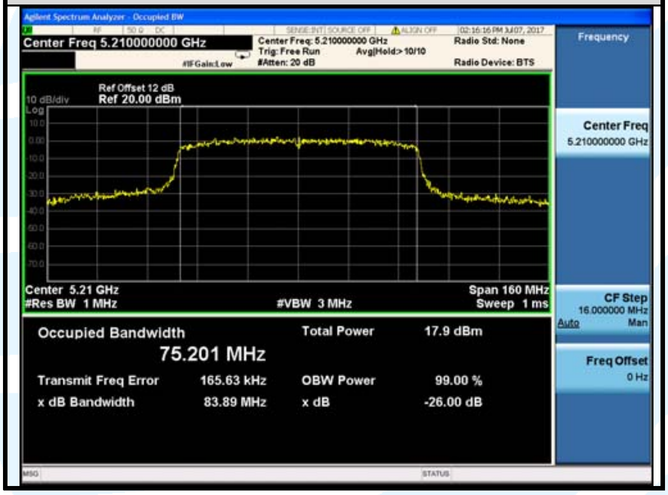




Channel 48



IEEE 802.11n-HT40	
Channel 38	Channel 46
	

IEEE 802.11ac-VHT80
Channel 45


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

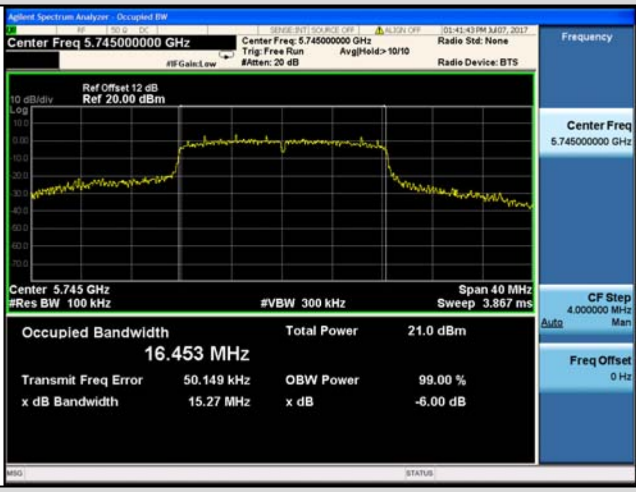
Test Data:

Mode	Channel/ Frequency (MHz)	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limit	Pass / Fail
The worst case test data: Chain 0					
IEEE 802.11a	149 (5745)	15.27	16.453	> 500 kHz	Pass
	157 (5785)	15.32	16.405	> 500 kHz	Pass
	165 (5825)	15.10	16.292	> 500 kHz	Pass
IEEE 802.11n-HT20	149 (5745)	15.11	17.425	> 500 kHz	Pass
	157 (5785)	15.45	17.448	> 500 kHz	Pass
	165 (5825)	15.47	17.434	> 500 kHz	Pass
IEEE 802.11n-HT40	151 (5755)	33.94	35.759	> 500 kHz	Pass
	159 (5795)	35.19	35.726	> 500 kHz	Pass
IEEE 802.11ac-VHT80	155 (5775)	75.21	75.057	> 500 kHz	Pass

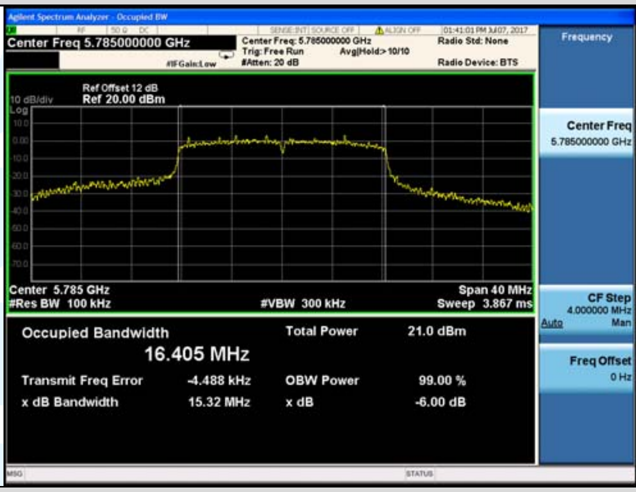
The test plot as follows:

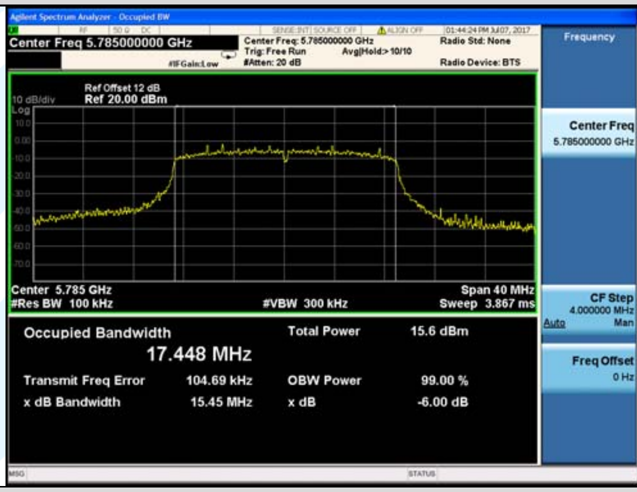
IEEE 802.11a	IEEE 802.11n-HT20

Channel 149

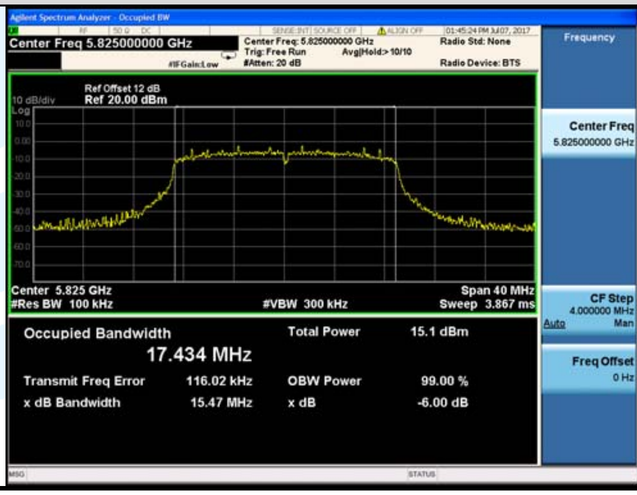


Channel 157

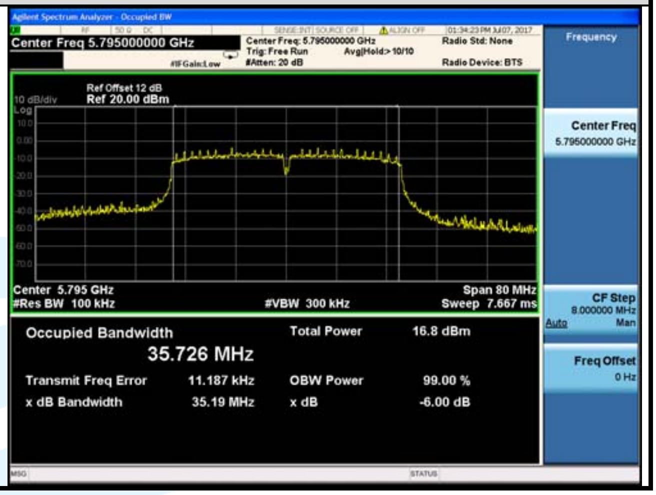




Channel 165



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 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.

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 5250-5350 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 TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:
a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Additional requirements
In addition to the above requirements, devices shall comply with the following, where applicable:
a) Outdoor fixed devices with a maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:

i. -13 dBW/MHz	for $0^o \le \theta < 8^o$
ii. -13 − 0.716 (θ-8) dBW/MHz	for $8^o \le \theta < 40^o$
iii. -35.9 − 1.22 (θ-40) dBW/MHz	for $40^o \le \theta \le 45^o$
iv. -42 dBW/MHz	for $\theta > 45^o$

The measurement procedure defined in Annex A of this document shall be used to verify the compliance to the e.i.r.p. at different elevations.
b) Devices, other than outdoor fixed devices, having an e.i.r.p. greater than 200 mW shall comply with either i. or ii. below:
i. devices shall comply with the e.i.r.p. elevation mask in 6.2.2.3(a); or
ii. devices shall implement a method to permanently reduce their e.i.r.p. via a firmwarefeature in the event that the Department requires it. The test report must demonstratehow the device's power table can be updated to meet this firmware requirement. Themanufacturer shall provide this firmware to update all systems automatically incompliance with the directions received from the Department.

3. **Frequency bands 5470-5600 MHz and 5650-5725 MHz**
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

4. **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-multipoint[3] 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:

Directional gain and the maximum output power limit.

RSS-247 Issue 2

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Peak Power Limits (dBm)
U-NII-1	2.57	2.57	5.58	23.00
U-NII-3	2.57	2.57	5.58	30.00
Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows:				
If *any* transmit signals are *correlated* with each other,				
Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi				

FCC 47 CFR Part 15 Subpart E

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Peak Power Limits (dBm)
U-NII-1	2.57	2.57	5.58	24.00
U-NII-3	2.57	2.57	5.58	30.00
Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows:				
If *any* transmit signals are *correlated* with each other,				
Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi				

Frequency band 5150-5250 MHz

RSS-247 Issue 2:

For IEEE 802.11 a, the minimum 99% emission bandwidth is 16.337 MHz
10 dBm + $10\log_{10}$ (16.337) = 22.13 dBm < 23 dBm (200mW)
So the 22.13 dB limit applicable

For IEEE 802.11 n-HT20, the minimum 99% emission bandwidth is 17.426 MHz
10 dBm + $10\log_{10}$ (17.426) = 22.41 dBm < 23 dBm (200mW)
So the 22.41 dB limit applicable

For IEEE 802.11 n-HT40/ac-VHT80, the minimum 99% emission bandwidth is 35.865 MHz
10 dBm + $10\log_{10}$ (35.865) = 25.55 dBm > 23 dBm (200mW)
So the 23 dB limit applicable

Mode	Channel/ Frequency (MHz)	Maximum e.i.r.p (dBm) SISO		Total e.i.r.p MIMO_ Chain 0+1 (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	36 (5180)	**17.27**	16.57	N/A	22.13	Pass
	44 (5220)	17.00	16.55	N/A	22.13	Pass
	48 (5240)	16.96	16.86	N/A	22.13	Pass
IEEE 802.11n-HT20	36 (5180)	13.05	12.26	18.69	22.41	Pass
	44 (5220)	13.35	12.51	18.97	22.41	Pass
	48 (5240)	13.77	12.94	**19.40**	22.41	Pass
IEEE 802.11n-HT40	38 (5190)	13.11	12.11	18.66	23	Pass
	46 (5230)	13.63	12.69	**19.21**	23	Pass
IEEE 802.11ac-VHT80	42 (5210)	12.39	10.72	**17.66**	23	Pass

Remark:

1. Maximum e.i.r.p = Maximum conducted output power + Antenna Gain
2. Total e.i.r.p (Chain 0+1) = 10*log[(10$^{\text{Chain }0/10}$)+(10$^{\text{Chain }1/10}$)] + Directional gain

FCC 47 CFR Part 15 Subpart E:

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm) SISO		Total Power MIMO_ Chain 0+1 (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	36 (5180)	**14.70**	14.00	N/A	24	Pass
	44 (5220)	14.43	13.98	N/A	24	Pass
	48 (5240)	14.39	14.29	N/A	24	Pass
IEEE 802.11n-HT20	36 (5180)	10.48	9.69	13.11	24	Pass
	44 (5220)	10.78	9.94	13.39	24	Pass
	48 (5240)	11.20	10.37	**13.82**	24	Pass
IEEE 802.11n-HT40	38 (5190)	10.54	9.54	13.08	24	Pass
	46 (5230)	11.06	10.12	**13.63**	24	Pass
IEEE 802.11ac-VHT80	42 (5210)	9.82	8.15	**12.08**	24	Pass

Remark:

1. Maximum conducted output power = Conducted output power + Duty Cycle Factor
2. Total Power (Chain 0+1) = 10*log[(10$^{\text{Chain }0/10}$)+(10$^{\text{Chain }1/10}$)]

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Frequency band 5725-5850 MHz

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm)		Total Power MIMO_ Chain 0+1 (dBm)	Limit (dBm)	Pass / Fail
		SISO				
		Chain 0	Chain 1			
IEEE 802.11a	149 (5745)	**14.78**	14.05	N/A	30	Pass
	157 (5785)	14.40	14.02	N/A	30	Pass
	165 (5825)	14.01	13.60	N/A	30	Pass
IEEE 802.11n-HT20	149 (5745)	11.37	9.34	**13.48**	30	Pass
	157 (5785)	10.76	8.91	12.94	30	Pass
	165 (5825)	10.21	8.67	12.52	30	Pass
IEEE 802.11n-HT40	151 (5755)	10.84	9.01	**13.03**	30	Pass
	159 (5795)	10.08	8.52	12.38	30	Pass
IEEE 802.11ac-VHT80	155 (5775)	8.95	7.24	**11.19**	30	Pass

Remark:

1. Maximum conducted output power = Conducted output power + Duty Cycle Factor
2. Total Power(Chain 0+1) = 10*log[(10$^{\text{Chain 0/10}}$)+(10$^{\text{Chain 1/10}}$)]

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 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.

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 5250-5350 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 TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:
   a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

   b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Additional requirements
In addition to the above requirements, devices shall comply with the following, where applicable:
   a) Outdoor fixed devices with a maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:

i. -13 dBW/MHz	for $0° \le \theta < 8°$
ii. -13 − 0.716 (θ-8) dBW/MHz	for $8° \le \theta < 40°$
iii. -35.9 − 1.22 (θ-40) dBW/MHz	for $40° \le \theta \le 45°$
iv. -42 dBW/MHz	for $\theta > 45°$

The measurement procedure defined in Annex A of this document shall be used to verify the compliance to the e.i.r.p. at different elevations.
   b) Devices, other than outdoor fixed devices, having an e.i.r.p. greater than 200 mW shall comply with either i. or ii. below:
      iii. devices shall comply with the e.i.r.p. elevation mask in 6.2.2.3(a); or
      iv. devices shall implement a method to permanently reduce their e.i.r.p. via a firmwarefeature in the event that the Department requires it. The test report must demonstratehow the device's power table can be updated to meet this firmware requirement. Themanufacturer shall provide this firmware to update all systems automatically incompliance with the directions received from the Department.

3. **Frequency bands 5470-5600 MHz and 5650-5725 MHz**
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

4. **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-multipoint[3] 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:	

Directional gain and the maximum power spectral density limit.

RSS-247 Issue 2

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	PSD Limits (dBm/MHz or dBm/500kHz)
U-NII-1	2.57	2.57	5.58	10.00
U-NII-3	2.57	2.57	5.58	30.00

Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows:

If *any* transmit signals are *correlated* with each other,

Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi

FCC 47 CFR Part 15 Subpart E

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	PSD Limits (dBm/MHz or dBm/500kHz)
U-NII-1	2.57	2.57	5.58	11.00
U-NII-3	2.57	2.57	5.58	30.00

Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows:

If *any* transmit signals are *correlated* with each other,

Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi

The worst case test data:

Frequency band 5150-5250 MHz

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Mode	Channel/ Frequency (MHz)	e.i.r.p. spectral density (dBm/MHz) SISO		Total e.i.r.p. spectral density MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	36 (5180)	8.457	--	--	10	Pass
	44 (5220)	8.766	--	--	10	Pass
	48 (5240)	8.823	--	--	10	Pass
IEEE 802.11n-HT20	36 (5180)	4.028	2.643	9.41	10	Pass
	44 (5220)	4.498	2.346	9.57	10	Pass
	48 (5240)	4.760	2.627	9.84	10	Pass
IEEE 802.11n-HT40	38 (5190)	1.151	-0.421	6.46	10	Pass
	46 (5230)	1.397	-0.555	6.55	10	Pass
IEEE 802.11ac-VHT80	42 (5210)	-3.022	-5.292	2.01	10	Pass

Remark:

1. e.i.r.p. spectral density = Power spectral density + Duty Cycle Factor + Antenna Gain
2. Total e.i.r.p. spectral density (Chain 0+1) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$ + Directional gain

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Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/MHz) SISO		Total power spectral density MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	36 (5180)	5.887	--	--	11	Pass
	44 (5220)	6.196	--	--	11	Pass
	48 (5240)	6.253	--	--	11	Pass
IEEE 802.11n-HT20	36 (5180)	1.458	0.073	3.83	11	Pass
	44 (5220)	1.928	-0.224	3.99	11	Pass
	48 (5240)	2.190	0.057	4.26	11	Pass
IEEE 802.11n-HT40	38 (5190)	-1.419	-2.991	0.88	11	Pass
	46 (5230)	-1.173	-3.125	0.97	11	Pass
IEEE 802.11ac-VHT80	42 (5210)	-5.592	-7.862	-3.57	11	Pass

Remark:

1. Power spectral density = Conducted power spectral density + Duty Cycle Factor
2. Total Power (Chain 0+1) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$

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Frequency band 5725-5850 MHz

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/MHz) SISO		Total power spectral density MIMO_ Chain 0+1 (dBm/MHz)	Limit (dBm/500KHz)	Pass / Fail
		Chain 0	Chain 1			
IEEE 802.11a	149 (5745)	2.221	--	--	30	Pass
	157 (5785)	1.690	--	--	30	Pass
	165 (5825)	1.595	--	--	30	Pass
IEEE 802.11n-HT20	149 (5745)	-1.013	-3.574	0.90	30	Pass
	157 (5785)	-2.062	-3.808	0.16	30	Pass
	165 (5825)	-1.941	-3.645	0.30	30	Pass
IEEE 802.11n-HT40	151 (5755)	-3.921	-5.958	-1.81	30	Pass
	159 (5795)	-4.444	-6.274	-2.25	30	Pass
IEEE 802.11ac-VHT80	155 (5775)	-8.100	-9.862	-5.88	30	Pass

Remark:

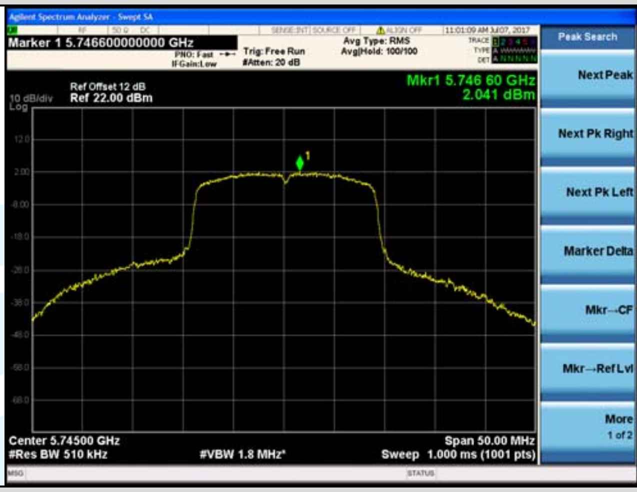
1. Power spectral density = Conducted power spectral density + Duty Cycle Factor
2. Total Power (Chain 0+1) = 10*log[(10$^{\text{Chain 0/10}}$)+(10$^{\text{Chain 1/10}}$)]

The test plot as follows:

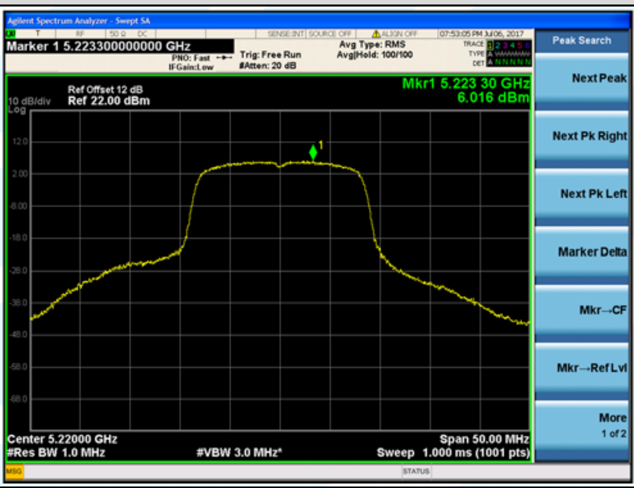
IEEE 802.11a_Chain 0

Channel 36

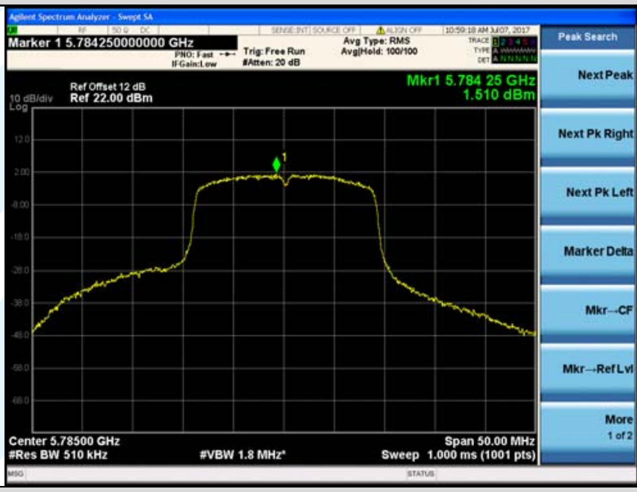
Channel 149



Channel 44

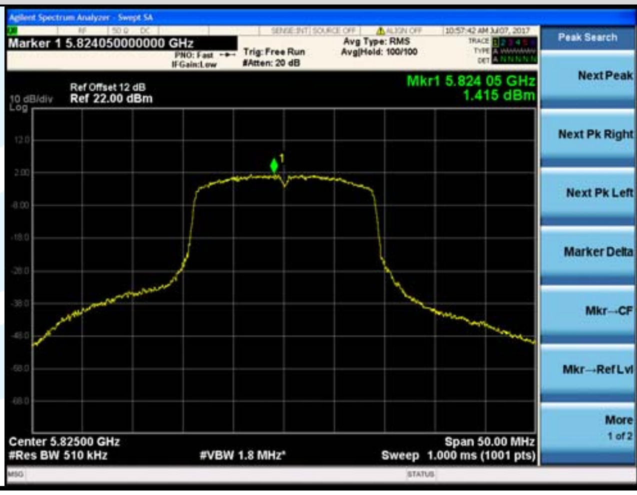


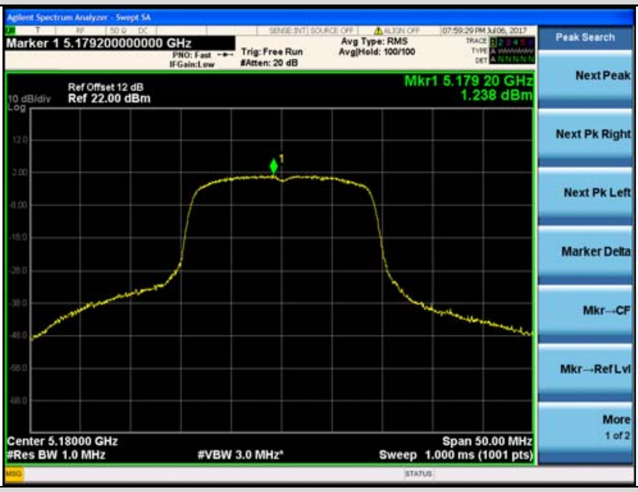
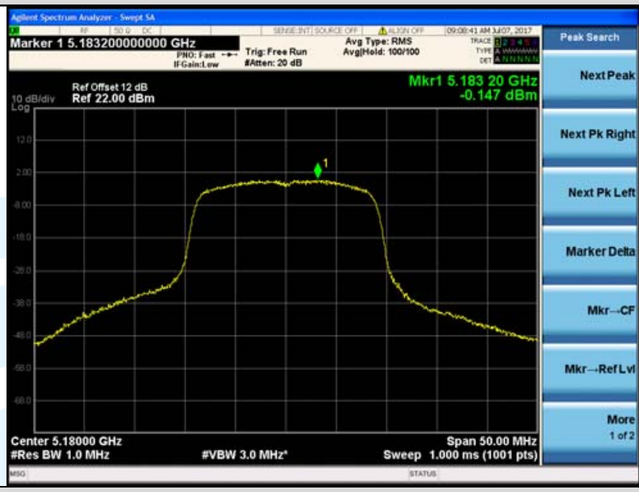
Channel 157



Channel 48

Channel 165



IEEE 802.11n-HT20	
Chain 0	Chain 1
Channel 36	
	
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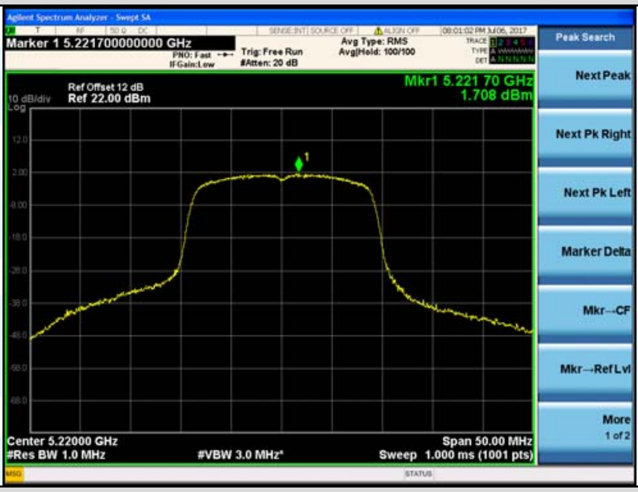
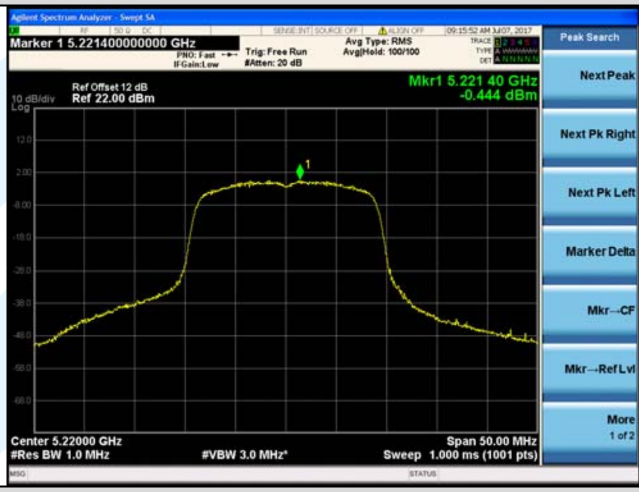
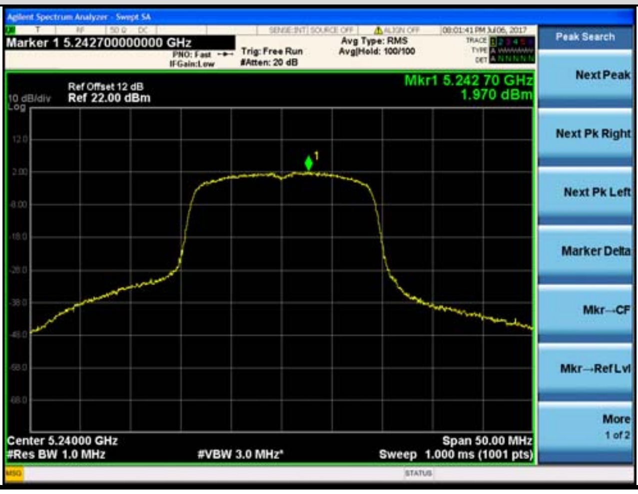
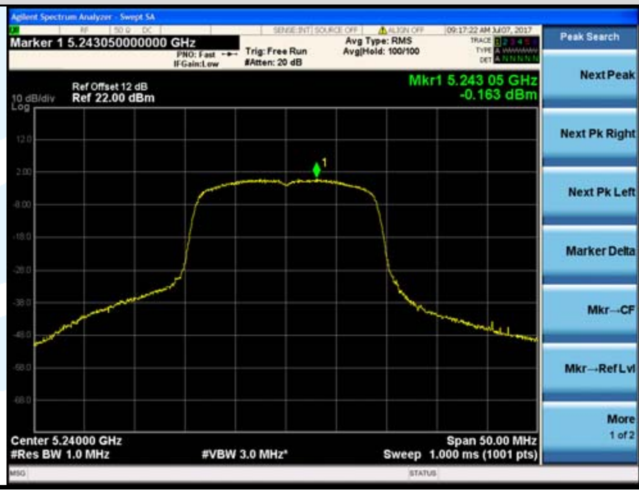
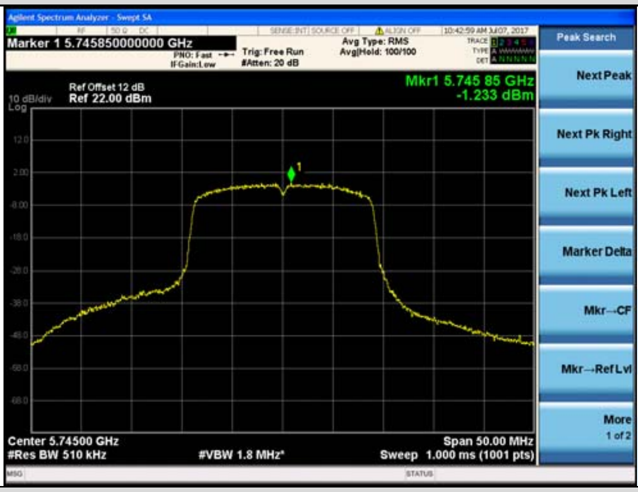
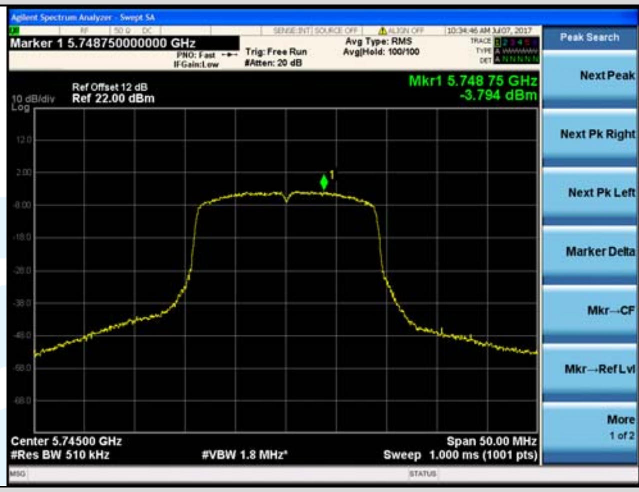
	
Channel 48	
	

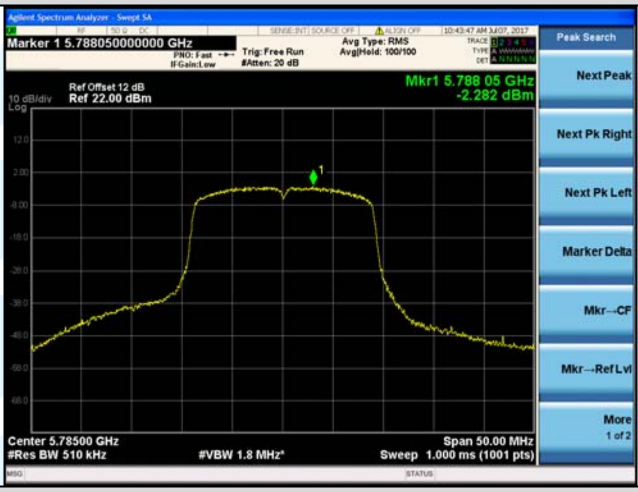
IEEE 802.11n-HT20	
Chain 0	Chain 1

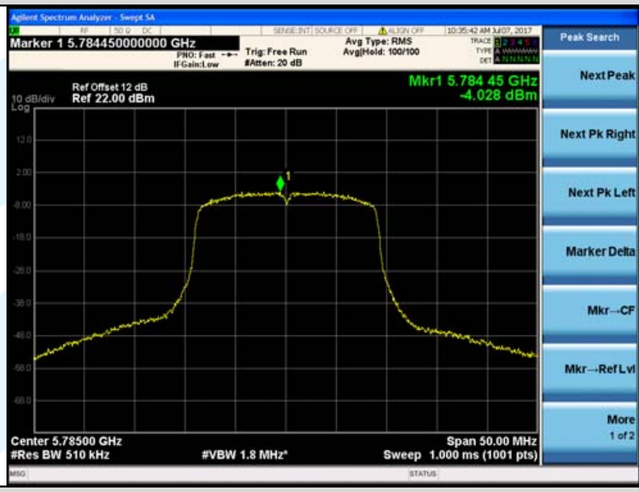
Channel 149





Channel 157





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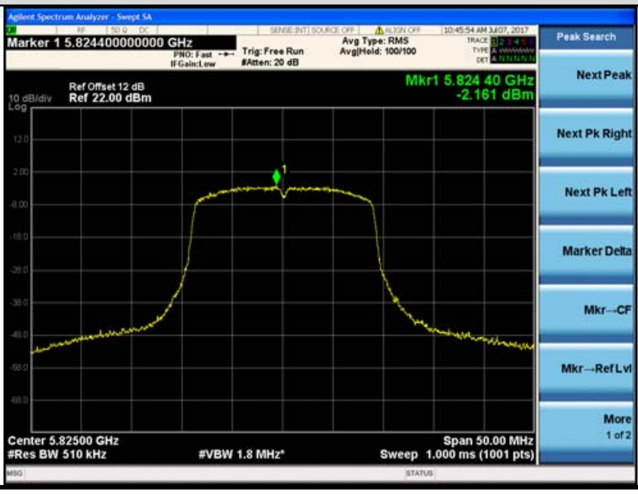
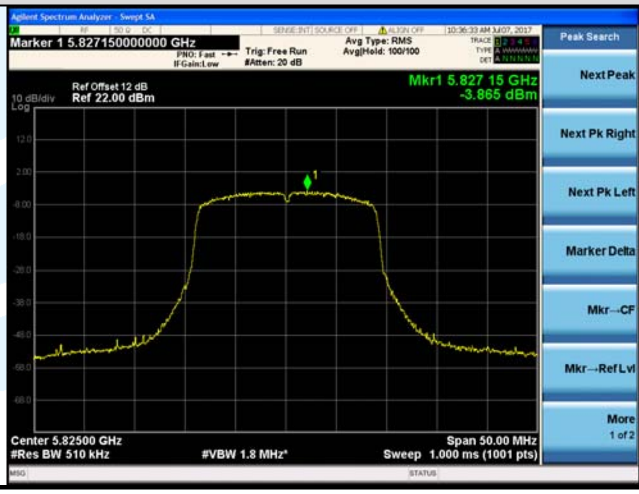
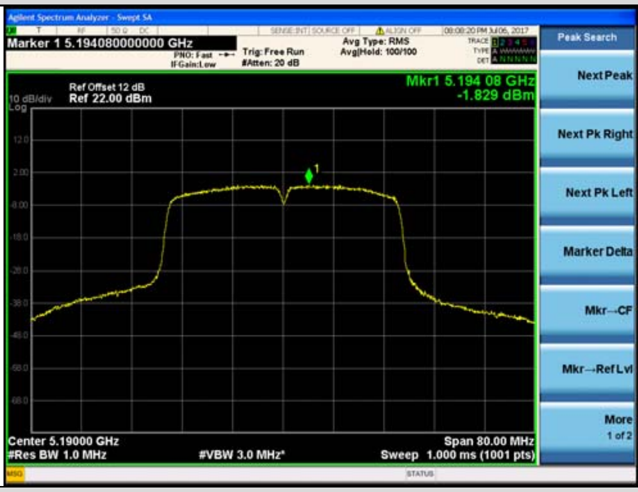
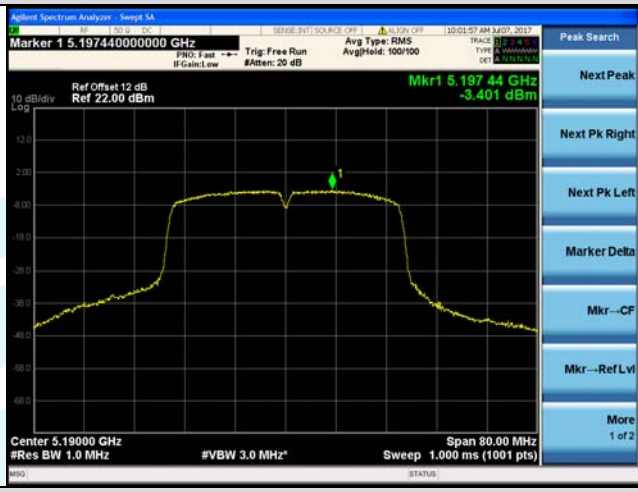
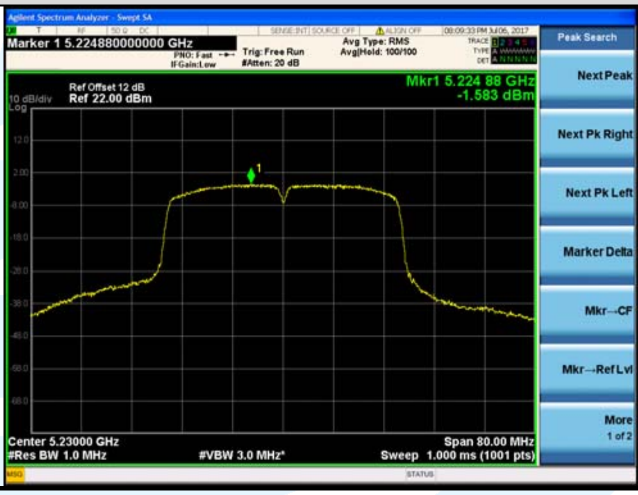
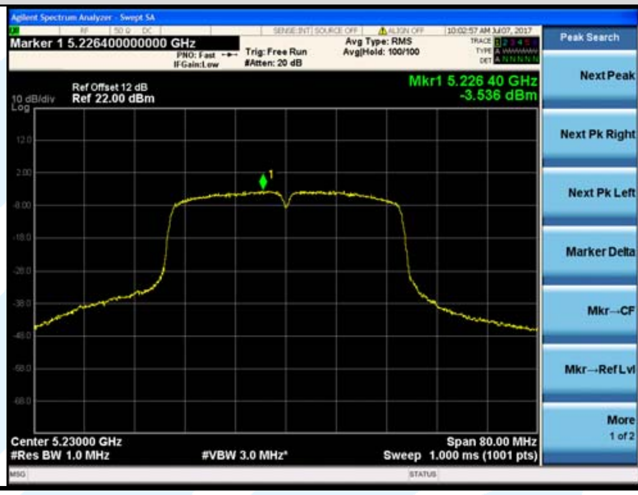




IEEE 802.11n-HT40	
Chain 0	Chain 1
Channel 38	
	
Channel 46	
	

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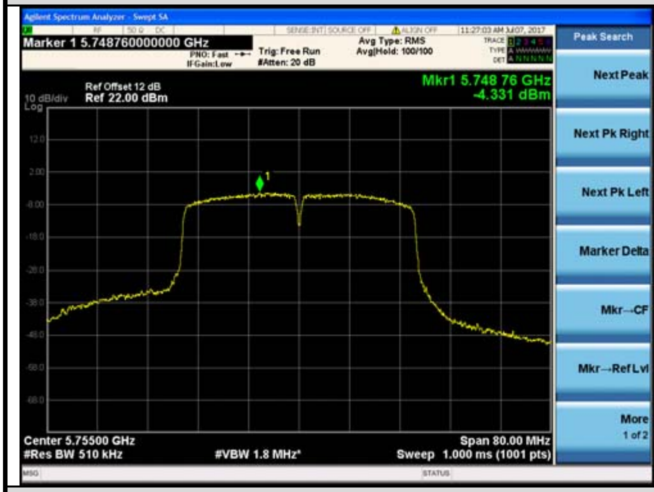
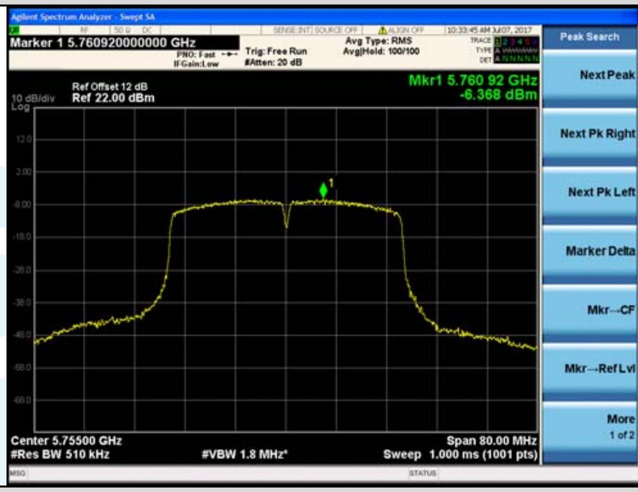
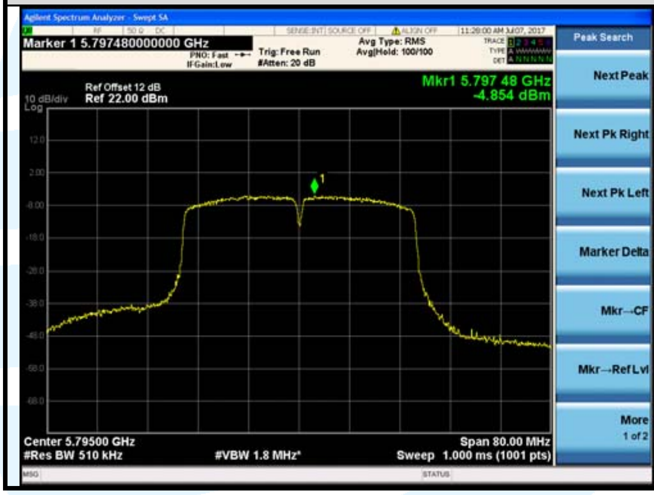
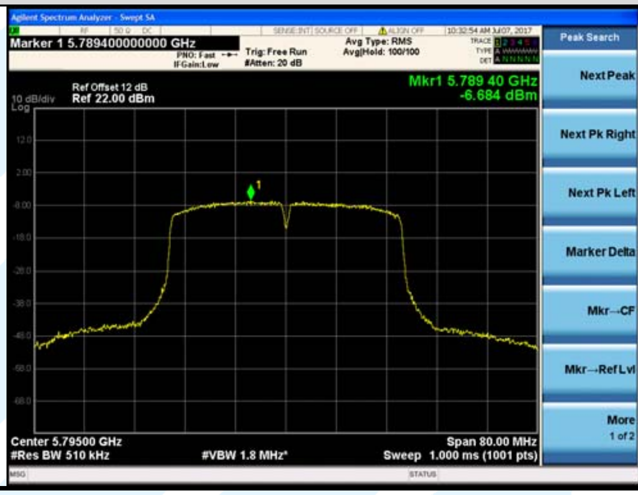
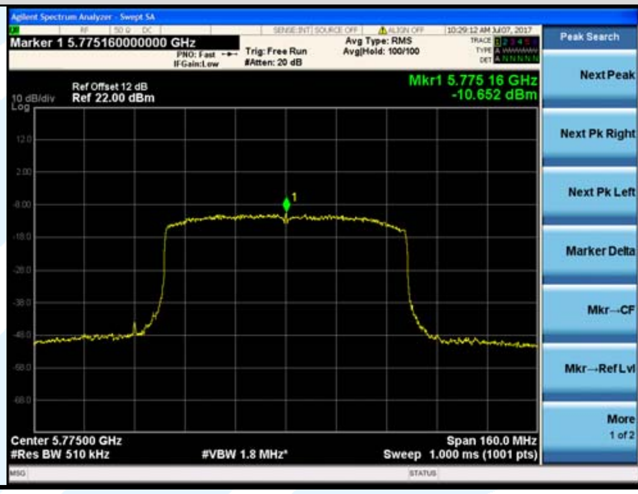
IEEE 802.11n-HT40	
Chain 0	Chain 1
Channel 151	
	
Channel 159	
	

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.	Voltage	Measured Frequency (MHz)			Frequency Drift
(°C)		FL	FH	FC	(ppm)
50	VN	5171.640119	5188.394511	5180.017315	3.342664
40		5171.640070	5188.398629	5180.019350	3.735425
30		5171.640362	5188.394524	5180.017443	3.367375
20		5171.639830	5188.392617	5180.016224	3.131950
10		5171.639271	5188.393760	5180.016516	3.188320
0		5171.639506	5188.390775	5180.015141	2.922876
-10		5171.639548	5188.388989	5180.014269	2.754537
-20		5171.639860	5188.395820	5180.017840	3.444015

Frequency Stability Versus Voltage					
Operation Frequency: 5180 MHz					
Temp.	Voltage	Measured Frequency (MHz)			Frequency Drift
		FL	FH	FC	(ppm)
TN	VL	5171.639537	5188.391989	5180.015763	3.043050
	VN	5171.639830	5188.392617	5180.016224	3.131950
	VH	5171.639950	5188.397913	5180.018932	3.654730

Frequency Stability Versus Temp.					
Operation Frequency: 5745 MHz					
Temp. (℃)	Voltage	Measured Frequency (MHz)			Frequency Drift (ppm)
		FL	FH	FC	
50	VN	5736.750927	5753.320178	5745.035553	6.188425
40		5736.750742	5753.321841	5745.036292	6.317058
30		5736.750246	5753.320603	5745.035425	6.166144
20		5736.750246	5753.321750	5745.035998	6.265970
10		5736.749936	5753.321098	5745.035517	6.182245
0		5736.750121	5753.321363	5745.035742	6.221410
-10		5736.750076	5753.322344	5745.036210	6.302872
-20		5736.750752	5753.322001	5745.036377	6.331854

Frequency Stability Versus Voltage					
Operation Frequency: 5745 MHz					
Temp.	Voltage	Measured Frequency (MHz)			Frequency Drift (ppm)
		FL	FH	FC	
TN	VL	5736.750312	5753.322697	5745.036505	6.354134
	VN	5736.750246	5753.321750	5745.035998	6.265970
	VH	5736.750444	5753.322309	5745.036377	6.331854

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	Detector	RBW	VBW	Remark
0.009 MHz-0.090 MHz	Peak	10 kHz	30 KHz	Peak
0.009 MHz-0.090 MHz	Average	10 kHz	30 KHz	Average
0.090 MHz-0.110 MHz	Quasi-peak	10 kHz	30 KHz	Quasi-peak
0.110 MHz-0.490 MHz	Peak	10 kHz	30 KHz	Peak
0.110 MHz-0.490 MHz	Average	10 kHz	30 KHz	Average
0.490 MHz -30 MHz	Quasi-peak	10 kHz	30 kHz	Quasi-peak
30 MHz-1 GHz	Quasi-peak	100 kHz	300 KHz	Quasi-peak
Above 1 GHz	Peak	1 MHz	3 MHz	Peak
	Peak	1 MHz	10 Hz	Average

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

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

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.

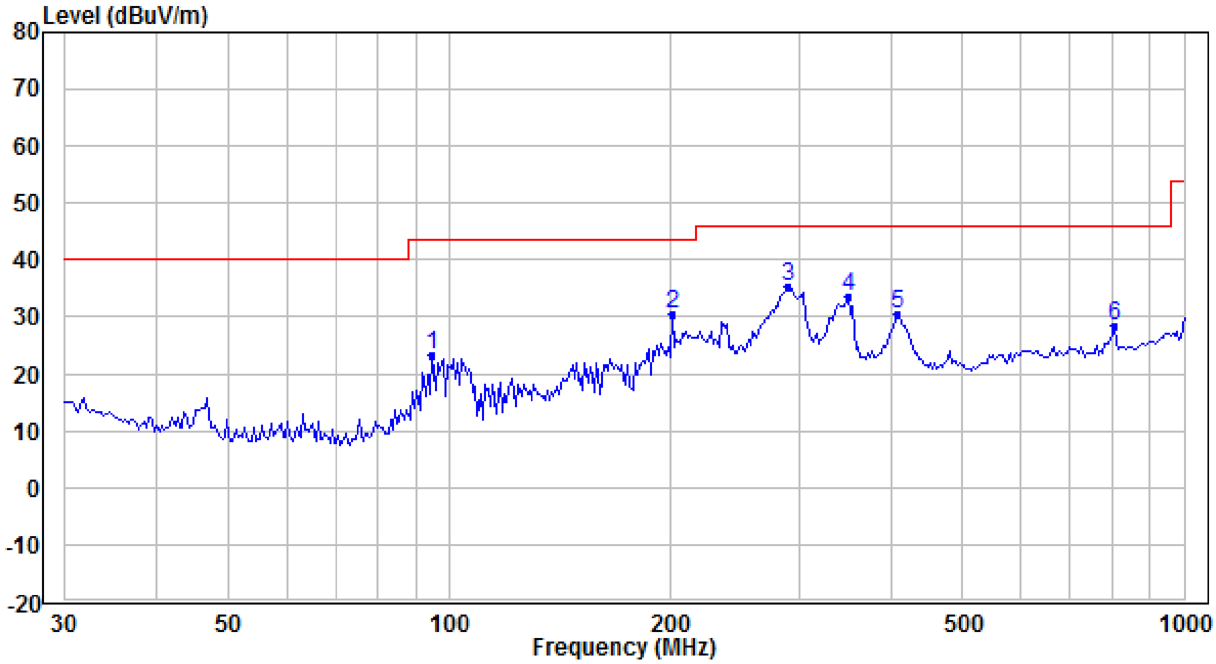
Test Result: Pass

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.

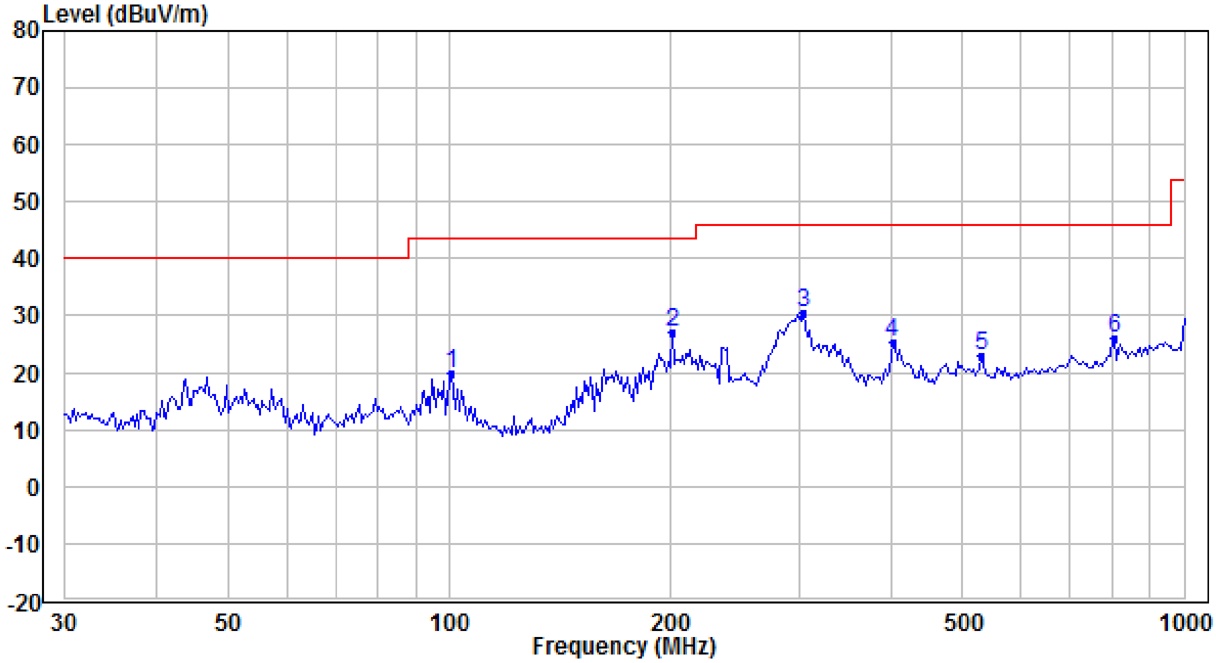
Radiated Emission Test Data (30 MHz ~ 1 GHz Worst Case):
IEEE 802.11n-HT20_MIMO_Chain 0 +1
Channel 48

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	94.979	41.57	-18.31	23.26	43.50	-20.24	QP
2	201.454	45.83	-15.44	30.39	43.50	-13.11	QP
3	288.284	46.74	-11.54	35.20	46.00	-10.80	QP
4	348.514	43.38	-9.76	33.62	46.00	-12.38	QP
5	406.782	38.81	-8.20	30.61	46.00	-15.39	QP
6	804.252	29.73	-1.40	28.33	46.00	-17.67	QP

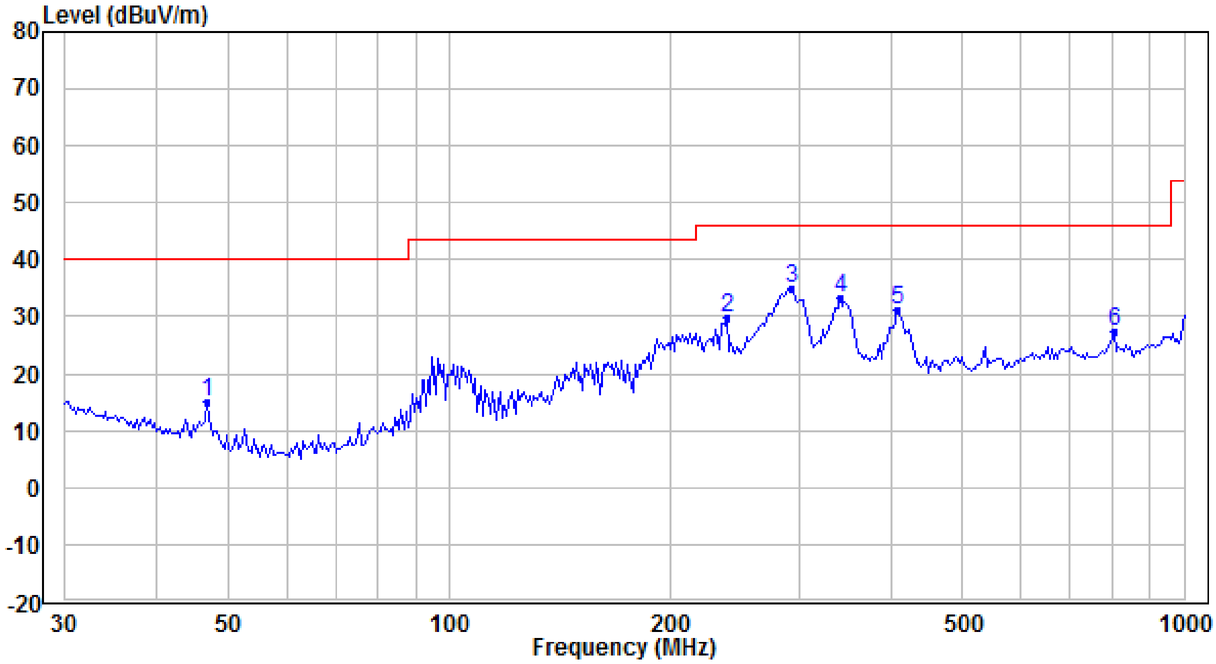
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	100.471	38.57	-18.85	19.72	43.50	-23.78	QP
2	201.454	42.16	-15.23	26.93	43.50	-16.57	QP
3	302.819	41.66	-11.26	30.40	46.00	-15.60	QP
4	401.105	34.20	-8.73	25.47	46.00	-20.53	QP
5	531.291	28.57	-5.76	22.81	46.00	-23.19	QP
6	804.252	28.06	-2.18	25.88	46.00	-20.12	QP

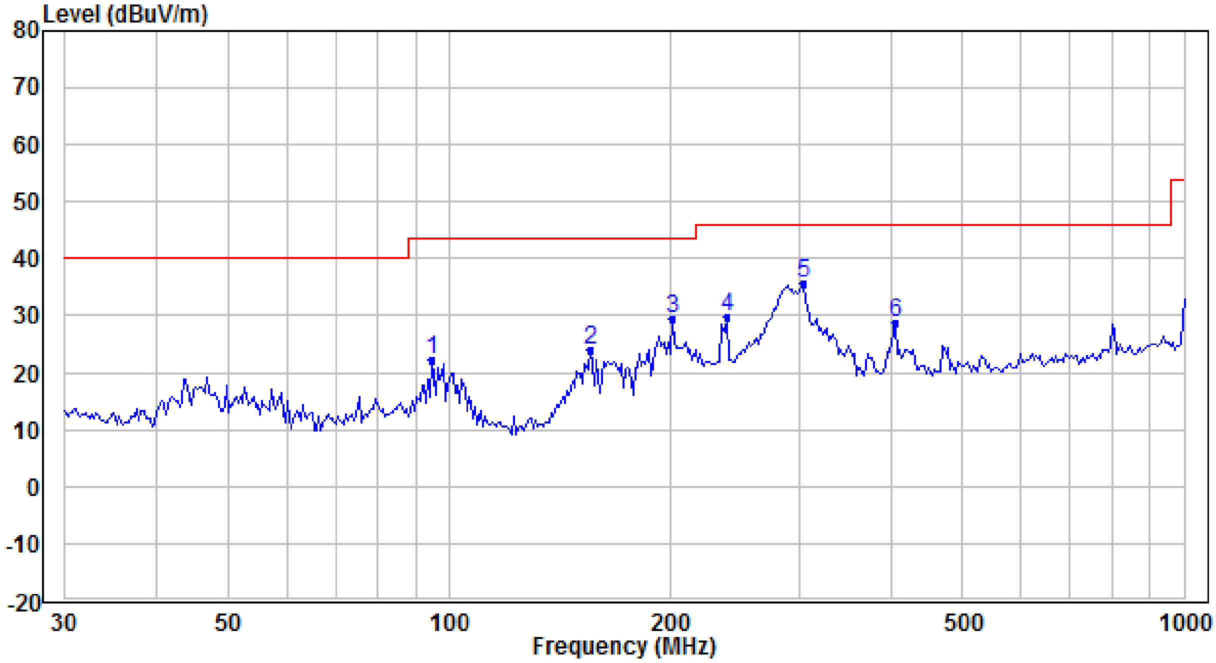
IEEE 802.11n-HT20_MIMO_Chain 0 +1
Channel 149

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	46.708	34.16	-18.97	15.19	40.00	-24.81	QP
2	238.463	43.04	-13.33	29.71	46.00	-16.29	QP
3	292.364	46.40	-11.40	35.00	46.00	-11.00	QP
4	341.244	43.13	-10.03	33.10	46.00	-12.90	QP
5	406.782	39.44	-8.20	31.24	46.00	-14.76	QP
6	804.252	28.83	-1.40	27.43	46.00	-18.57	QP

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	94.979	41.60	-19.16	22.44	43.50	-21.06	QP
2	155.331	40.80	-16.88	23.92	43.50	-19.58	QP
3	201.454	44.76	-15.23	29.53	43.50	-13.97	QP
4	238.463	43.08	-13.20	29.88	46.00	-16.12	QP
5	302.819	47.04	-11.26	35.78	46.00	-10.22	QP
6	403.934	37.57	-8.77	28.80	46.00	-17.20	QP

Radiated Emission Test Data (Above 1GHz):

IEEE 802.11a_SISO_Chain 0_Channel 36

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10360.00	62.48	74.00	-11.52	Peak	Horizontal
2	10360.00	47.86	54.00	-6.14	Average	Horizontal
3	15540.00	53.01	74.00	-20.99	Peak	Horizontal
4	15540.00	40.58	54.00	-13.42	Average	Horizontal
5	10360.00	61.52	74.00	-12.48	Peak	Vertical
6	10360.00	47.78	54.00	-6.22	Average	Vertical
7	15540.00	51.63	74.00	-22.37	Peak	Vertical
8	15540.00	39.48	54.00	-14.52	Average	Vertical

IEEE 802.11a_SISO_Chain 0_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10440.00	62.51	74.00	-11.49	Peak	Horizontal
2	10440.00	46.50	54.00	-7.50	Average	Horizontal
3	15660.00	51.67	74.00	-22.33	Peak	Horizontal
4	15660.00	39.30	54.00	-14.70	Average	Horizontal
5	10440.00	58.93	74.00	-15.07	Peak	Vertical
6	10440.00	46.67	54.00	-7.33	Average	Vertical
7	15660.00	52.44	74.00	-21.56	Peak	Vertical
8	15660.00	40.25	54.00	-13.75	Average	Vertical

IEEE 802.11a_SISO_Chain 0_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10480.00	62.17	74.00	-11.83	Peak	Horizontal
2	10480.00	47.76	54.00	-6.24	Average	Horizontal
3	15720.00	52.43	74.00	-21.57	Peak	Horizontal
4	15720.00	39.94	54.00	-14.06	Average	Horizontal
5	10480.00	62.63	74.00	-11.37	Peak	Vertical
6	10480.00	47.03	54.00	-6.97	Average	Vertical
7	15720.00	51.90	74.00	-22.10	Peak	Vertical
8	15720.00	38.99	54.00	-15.01	Average	Vertical

IEEE 802.11a_SISO_Chain 0_Channel 149						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11490.00	65.59	74.00	-8.41	Peak	Horizontal
2	11490.00	47.59	54.00	-6.41	Average	Horizontal
3	17235.00	53.20	74.00	-20.80	Peak	Horizontal
4	17235.00	40.45	54.00	-13.55	Average	Horizontal
5	11490.00	60.91	74.00	-13.09	Peak	Vertical
6	11490.00	43.26	54.00	-10.74	Average	Vertical
7	17235.00	54.49	74.00	-19.51	Peak	Vertical
8	17235.00	41.29	54.00	-12.71	Average	Vertical

IEEE 802.11a_SISO_Chain 0_Channel 157						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11570.00	52.54	74.00	-21.46	Peak	Horizontal
2	11570.00	40.41	54.00	-13.59	Average	Horizontal
3	17355.00	53.20	74.00	-20.80	Peak	Horizontal
4	17355.00	42.39	54.00	-11.61	Average	Horizontal
5	11570.00	66.33	74.00	-7.67	Peak	Vertical
6	11570.00	49.35	54.00	-4.65	Average	Vertical
7	17355.00	54.46	74.00	-19.54	Peak	Vertical
8	17355.00	41.50	54.00	-12.50	Average	Vertical

IEEE 802.11a_SISO_Chain 0_Channel 165						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11650.00	63.80	74.00	-10.20	Peak	Horizontal
2	11650.00	49.10	54.00	-4.90	Average	Horizontal
3	17475.00	54.39	74.00	-19.61	Peak	Horizontal
4	17475.00	42.50	54.00	-11.50	Average	Horizontal
5	11650.00	58.05	74.00	-15.95	Peak	Vertical
6	11650.00	47.37	54.00	-6.63	Average	Vertical
7	17475.00	55.64	74.00	-18.36	Peak	Vertical
8	17475.00	43.29	54.00	-10.71	Average	Vertical

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IEEE 802.11n-HT20_MIMO_Chain 0+1_Channel 36						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10360.00	61.59	74.00	-12.41	Peak	Horizontal
2	10360.00	45.55	54.00	-8.45	Average	Horizontal
3	15540.00	53.12	74.00	-20.88	Peak	Horizontal
4	15540.00	40.58	54.00	-13.42	Average	Horizontal
5	10360.00	60.53	74.00	-13.47	Peak	Vertical
6	10360.00	44.77	54.00	-9.23	Average	Vertical
7	15540.00	51.70	74.00	-22.30	Peak	Vertical
8	15540.00	39.63	54.00	-14.37	Average	Vertical

IEEE 802.11n-HT20_MIMO_Chain 0+1_Channel 44						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10440.00	58.57	74.00	-15.43	Peak	Horizontal
2	10440.00	42.61	54.00	-11.39	Average	Horizontal
3	15660.00	52.80	74.00	-21.20	Peak	Horizontal
4	15660.00	40.25	54.00	-13.75	Average	Horizontal
5	10440.00	59.90	74.00	-14.10	Peak	Vertical
6	10440.00	45.00	54.00	-9.00	Average	Vertical
7	15660.00	52.86	74.00	-21.14	Peak	Vertical
8	15660.00	39.45	54.00	-14.55	Average	Vertical

IEEE 802.11n-HT20_MIMO_Chain 0+1_Channel 48						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10480.00	60.71	74.00	-13.29	Peak	Horizontal
2	10480.00	44.94	54.00	-9.06	Average	Horizontal
3	15720.00	52.21	74.00	-21.79	Peak	Horizontal
4	15720.00	40.09	54.00	-13.91	Average	Horizontal
5	10480.00	58.77	74.00	-15.23	Peak	Vertical
6	10480.00	43.00	54.00	-11.00	Average	Vertical
7	15720.00	51.55	74.00	-22.45	Peak	Vertical
8	15720.00	38.99	54.00	-15.01	Average	Vertical

IEEE 802.11n-HT20_MIMO_Chain 0+1_Channel 149						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11490.00	56.72	74.00	-17.28	Peak	Horizontal
2	11490.00	42.25	54.00	-11.75	Average	Horizontal
3	17235.00	55.17	74.00	-18.83	Peak	Horizontal
4	17235.00	41.29	54.00	-12.71	Average	Horizontal
5	11490.00	61.35	74.00	-12.65	Peak	Vertical
6	11490.00	43.34	54.00	-10.66	Average	Vertical
7	17235.00	53.24	74.00	-20.76	Peak	Vertical
8	17235.00	40.45	54.00	-13.55	Average	Vertical

IEEE 802.11n-HT20_MIMO_Chain 0+1_Channel 157						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11570.00	56.27	74.00	-17.73	Peak	Horizontal
2	11570.00	44.33	54.00	-9.67	Average	Horizontal
3	17355.00	55.22	74.00	-18.78	Peak	Horizontal
4	17355.00	42.39	54.00	-11.61	Average	Horizontal
5	11570.00	61.56	74.00	-12.44	Peak	Vertical
6	11570.00	44.11	54.00	-9.89	Average	Vertical
7	17355.00	55.54	74.00	-18.46	Peak	Vertical
8	17355.00	41.50	54.00	-12.50	Average	Vertical

IEEE 802.11n-HT20_MIMO_Chain 0+1_Channel 165						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11650.00	55.74	74.00	-18.26	Peak	Horizontal
2	11650.00	43.39	54.00	-10.61	Average	Horizontal
3	17475.00	55.06	74.00	-18.94	Peak	Horizontal
4	17475.00	43.29	54.00	-10.71	Average	Horizontal
5	11650.00	61.10	74.00	-12.90	Peak	Vertical
6	11650.00	43.64	54.00	-10.36	Average	Vertical
7	17475.00	54.87	74.00	-19.13	Peak	Vertical
8	17475.00	42.50	54.00	-11.50	Average	Vertical

IEEE 802.11n-HT40_MIMO_Chain 0+1_Channel 38						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10380.00	59.48	74.00	-14.52	Peak	Horizontal
2	10380.00	45.67	54.00	-8.33	Average	Horizontal
3	15570.00	53.29	74.00	-20.71	Peak	Horizontal
4	15570.00	40.58	54.00	-13.42	Average	Horizontal
5	10380.00	57.14	74.00	-16.86	Peak	Vertical
6	10380.00	43.47	54.00	-10.53	Average	Vertical
7	15570.00	51.63	74.00	-22.37	Peak	Vertical
8	15570.00	39.63	54.00	-14.37	Average	Vertical

IEEE 802.11n-HT40_MIMO_Chain 0+1_Channel 46						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10460.00	56.48	74.00	-17.52	Peak	Horizontal
2	10460.00	44.71	54.00	-9.29	Average	Horizontal
3	15690.00	53.08	74.00	-20.92	Peak	Horizontal
4	15690.00	40.40	54.00	-13.60	Average	Horizontal
5	10460.00	56.99	74.00	-17.01	Peak	Vertical
6	10460.00	43.78	54.00	-10.22	Average	Vertical
7	15690.00	51.98	74.00	-22.02	Peak	Vertical
8	15690.00	39.45	54.00	-14.55	Average	Vertical

IEEE 802.11n-HT40_MIMO_Chain 0+1_Channel 151						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11510.00	55.45	74.00	-18.55	Peak	Horizontal
2	11510.00	42.52	54.00	-11.48	Average	Horizontal
3	17265.00	53.93	74.00	-20.07	Peak	Horizontal
4	17265.00	42.55	54.00	-11.45	Average	Horizontal
5	11510.00	58.69	74.00	-15.31	Peak	Vertical
6	11510.00	45.93	54.00	-8.07	Average	Vertical
7	17265.00	53.44	74.00	-20.56	Peak	Vertical
8	17265.00	40.63	54.00	-13.37	Average	Vertical

IEEE 802.11n-HT40_MIMO_Chain 0+1_Channel 159						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11590.00	54.93	74.00	-19.07	Peak	Horizontal
2	11590.00	43.11	54.00	-10.89	Average	Horizontal
3	17385.00	55.33	74.00	-18.67	Peak	Horizontal
4	17385.00	42.39	54.00	-11.61	Average	Horizontal
5	11590.00	60.67	74.00	-13.33	Peak	Vertical
6	11590.00	45.90	54.00	-8.10	Average	Vertical
7	17385.00	53.62	74.00	-20.38	Peak	Vertical
8	17385.00	41.66	54.00	-12.34	Average	Vertical

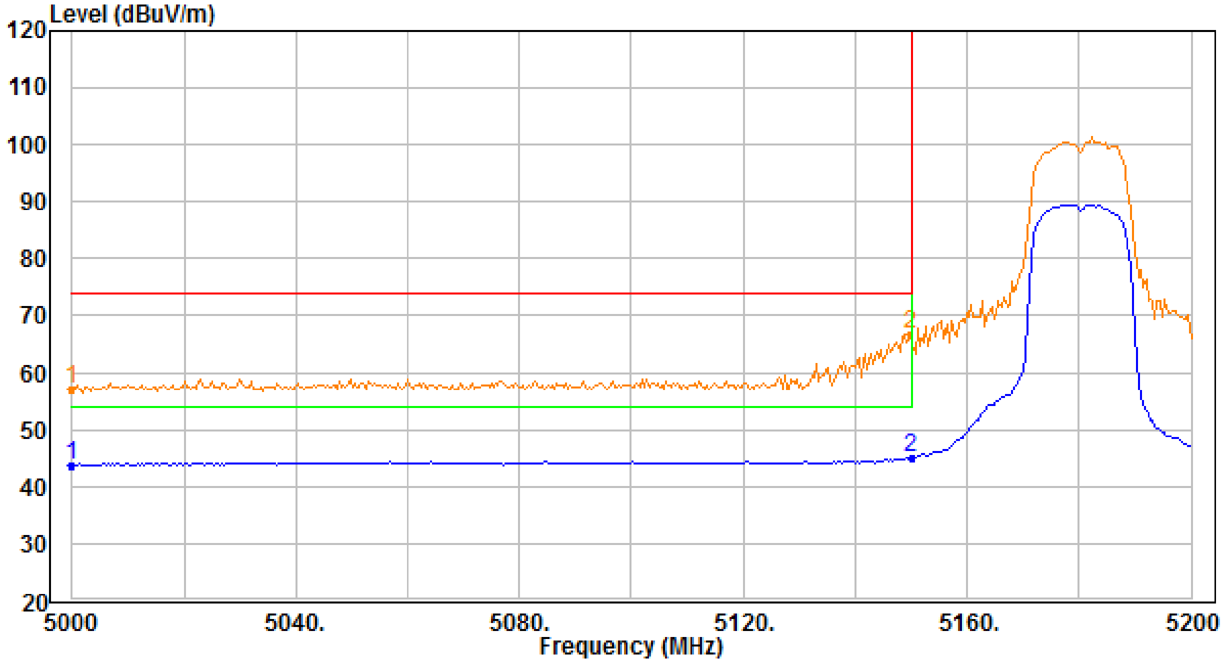
IEEE 802.11ac-VHT80_MIMO_Chain 0+1_Channel 42						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	10420.00	57.31	74.00	-16.69	Peak	Horizontal
2	10420.00	46.04	54.00	-7.96	Average	Horizontal
3	15630.00	52.91	74.00	-21.09	Peak	Horizontal
4	15630.00	40.55	54.00	-13.45	Average	Horizontal
5	10420.00	56.76	74.00	-17.24	Peak	Vertical
6	10420.00	43.17	54.00	-10.83	Average	Vertical
7	15630.00	52.70	74.00	-21.30	Peak	Vertical
8	15630.00	39.59	54.00	-14.41	Average	Vertical

IEEE 802.11ac-VHT80_MIMO_Chain 0+1_Channel 155						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	11550.00	54.01	74.00	-19.99	Peak	Horizontal
2	11550.00	43.05	54.00	-10.95	Average	Horizontal
3	17325.00	53.89	74.00	-20.11	Peak	Horizontal
4	17325.00	41.47	54.00	-12.53	Average	Horizontal
5	11550.00	57.44	74.00	-16.56	Peak	Vertical
6	11550.00	47.38	54.00	-6.62	Average	Vertical
7	17325.00	53.16	74.00	-20.84	Peak	Vertical
8	17325.00	40.63	54.00	-13.37	Average	Vertical

Band Edge Measurements (Radiated)

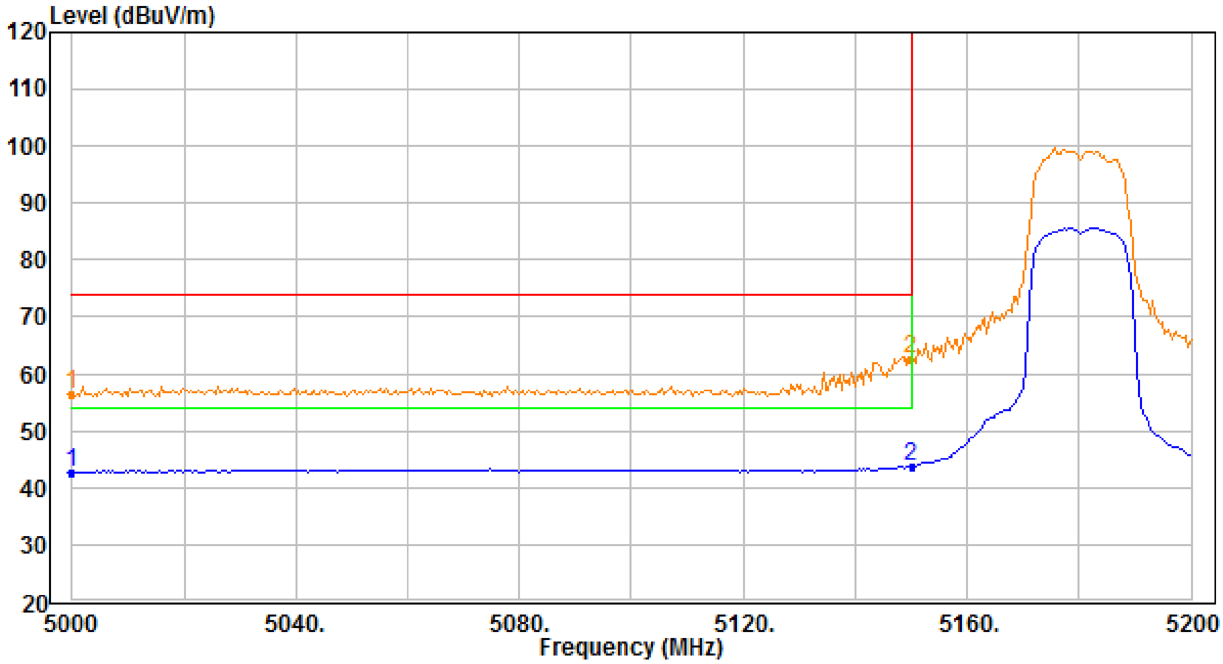
IEEE 802.11a_SISO_Chain 0

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	66.65	74	45.22	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	62.72	74	43.79	54	Pass

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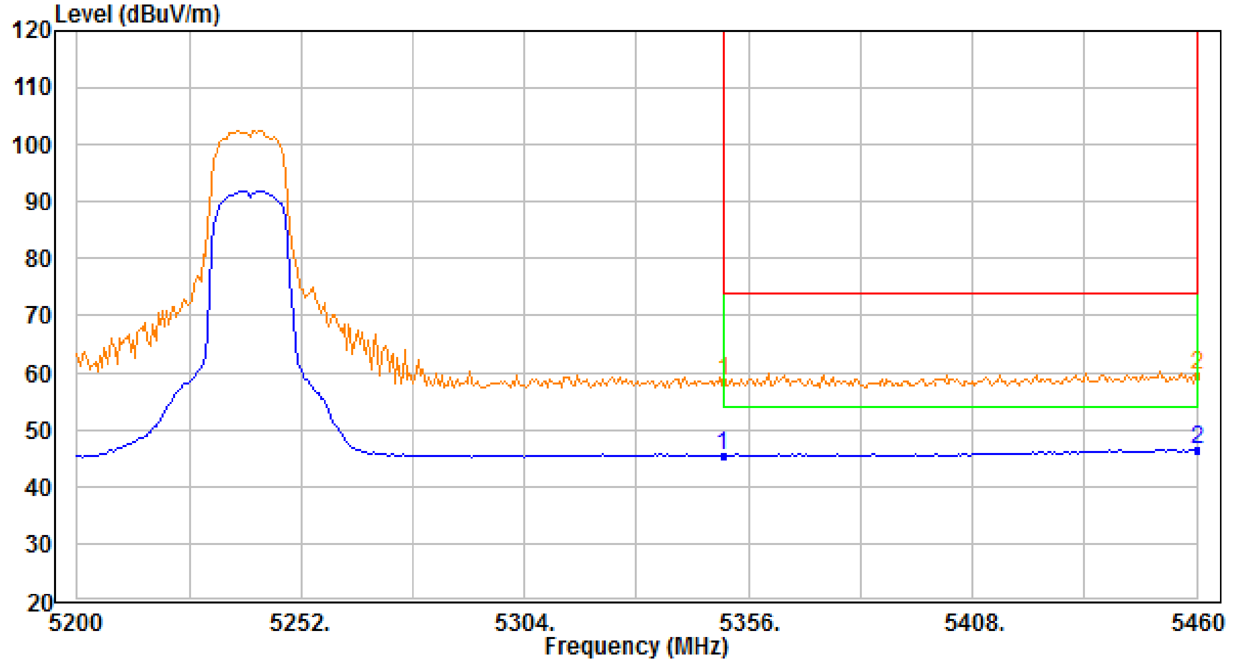
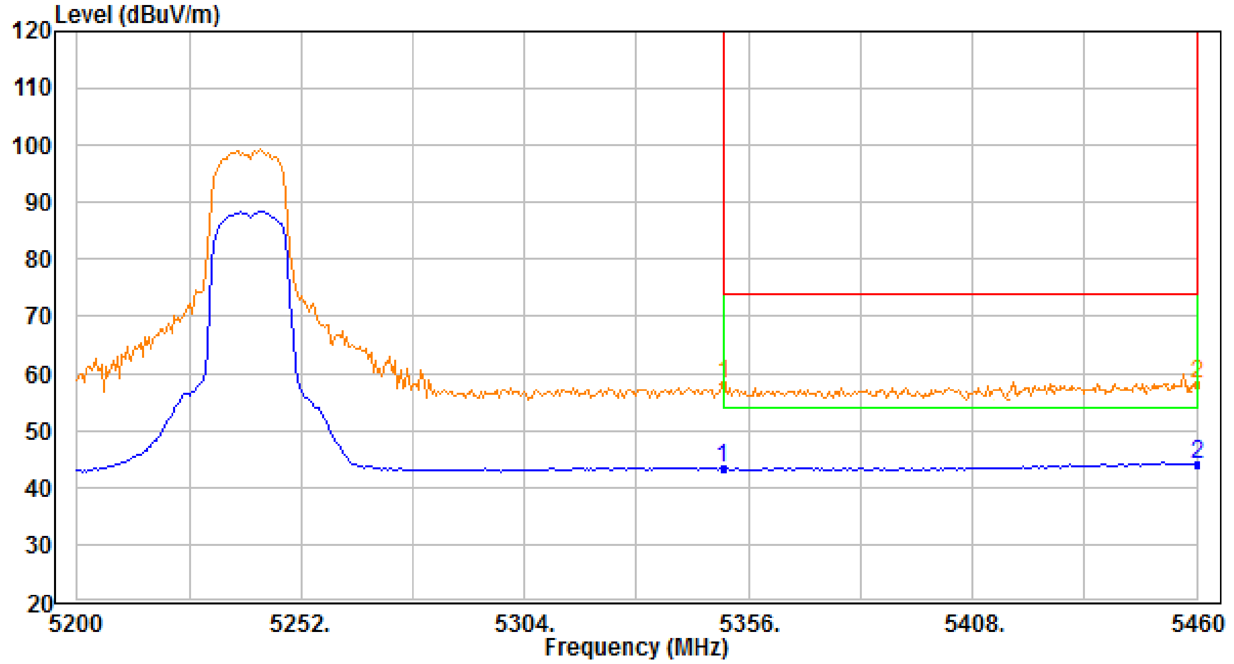
Tel: +86-755-28230888 Fax: +86-755-28230886 E-mail: info@uttlab.com Http://www.uttlab.com

Test Channel:	Channel 64	Ant. Polar. :	Horizontal



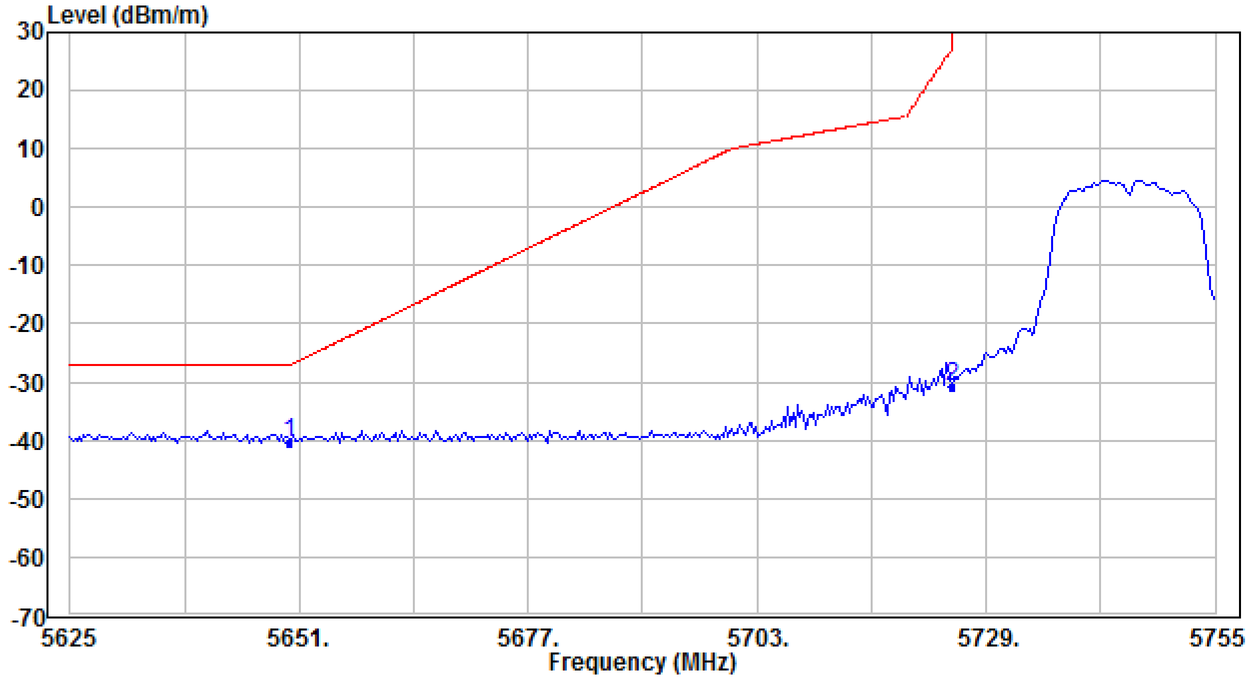
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	58.45	74	45.49	54	Pass

Test Channel:	Channel 64	Ant. Polar. :	Vertical



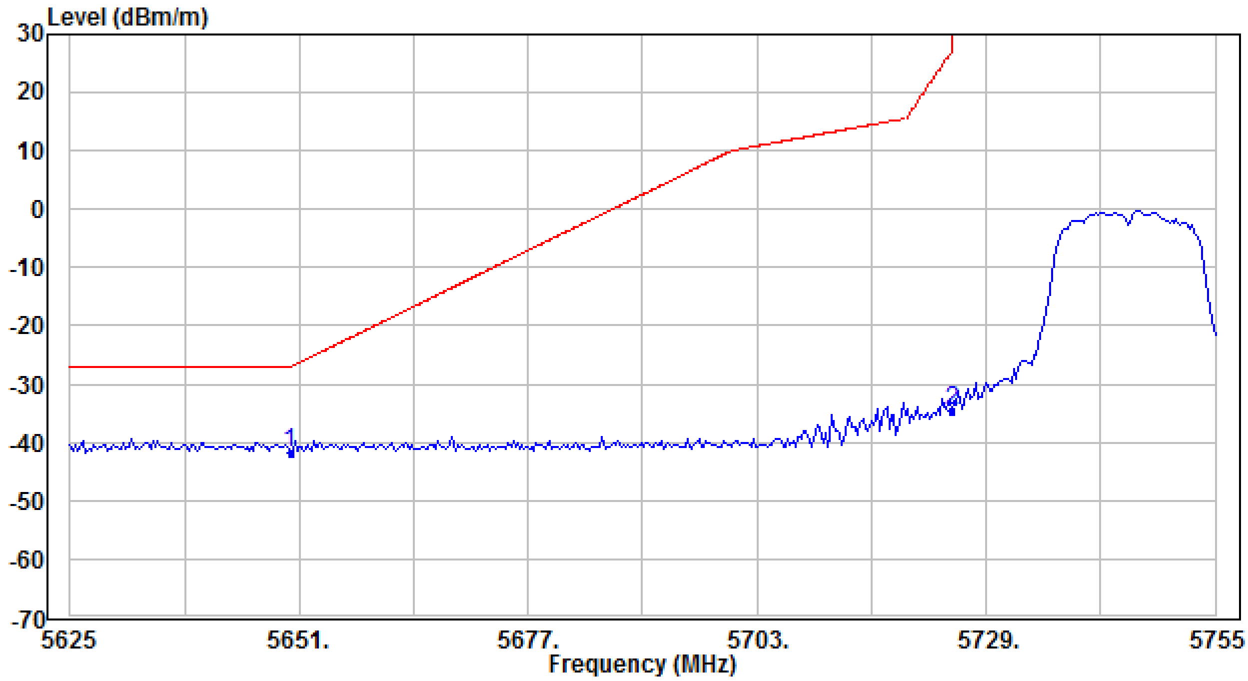
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	58.05	74	43.27	54	Pass

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



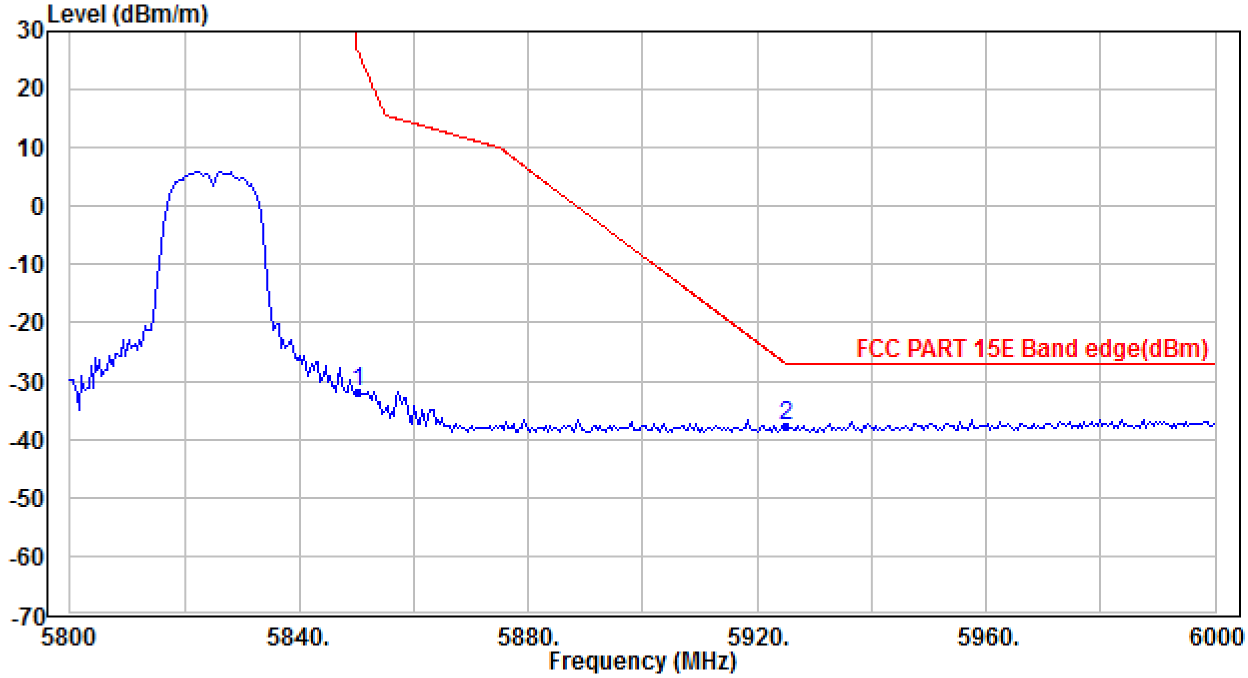
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-40.35	-27	Pass

Test Channel:	Channel 149	Ant. Polar. :	Vertical



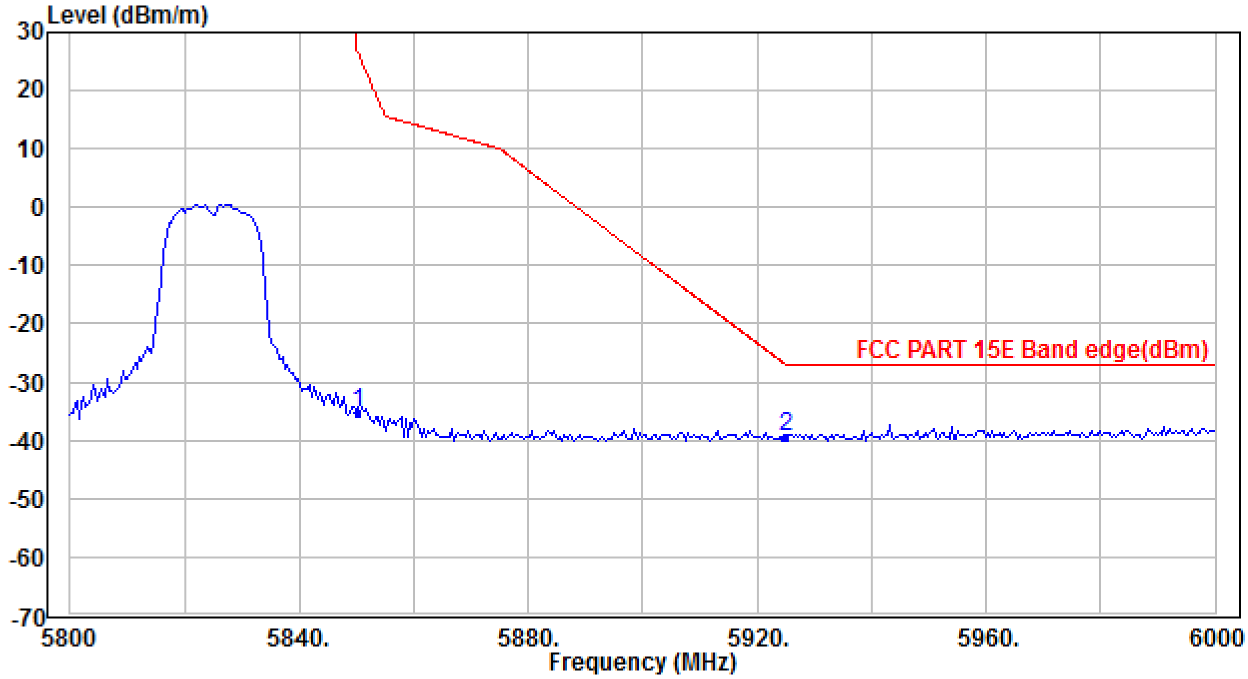
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-41.72	-27	Pass

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-37.6	-27	Pass

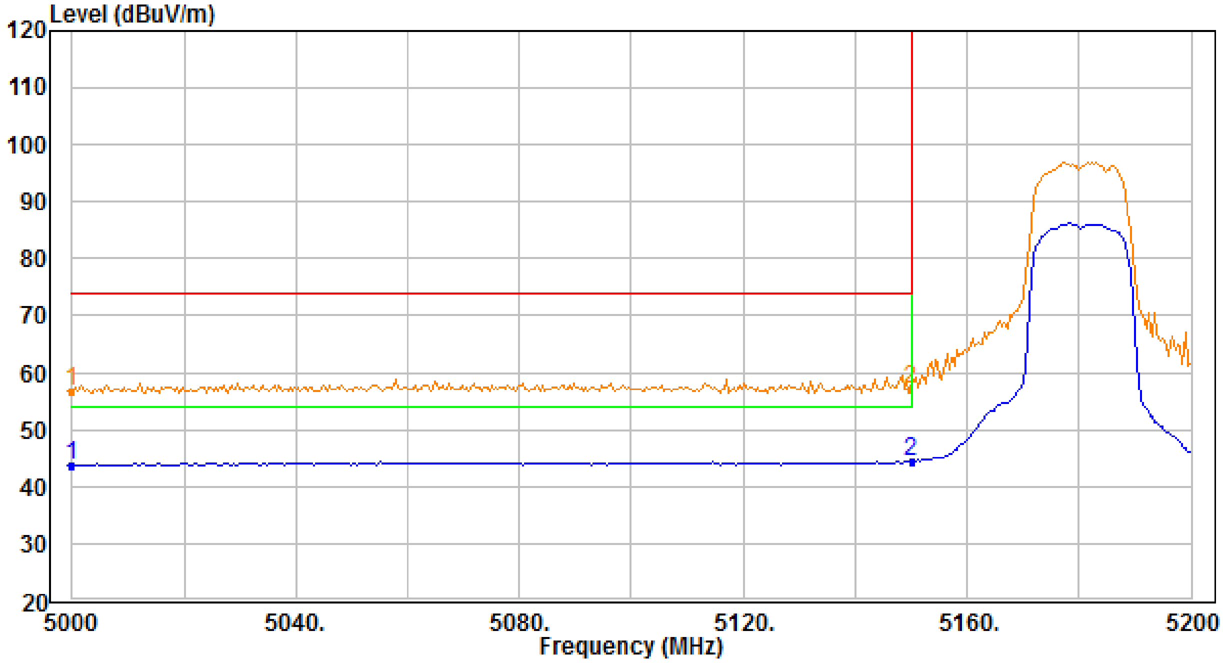
Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-39.26	-27	Pass

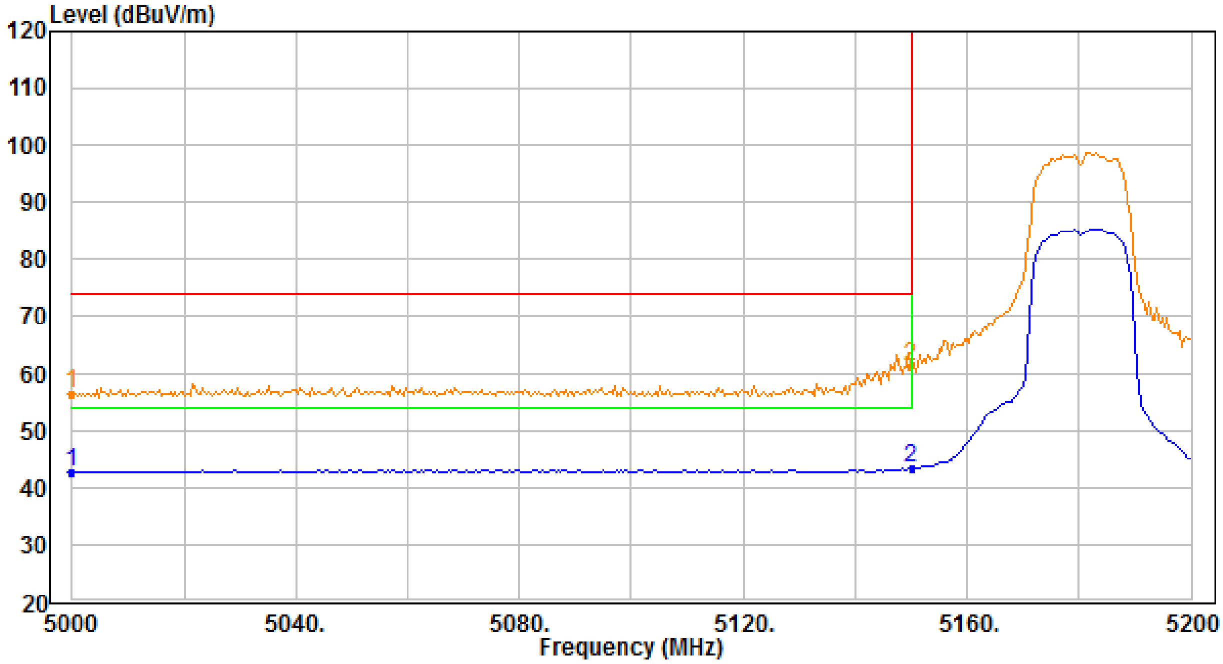
IEEE 802.11a_SISO_Chain 1

Test Channel:	Channel 36	Ant. Polar. :	Horizontal



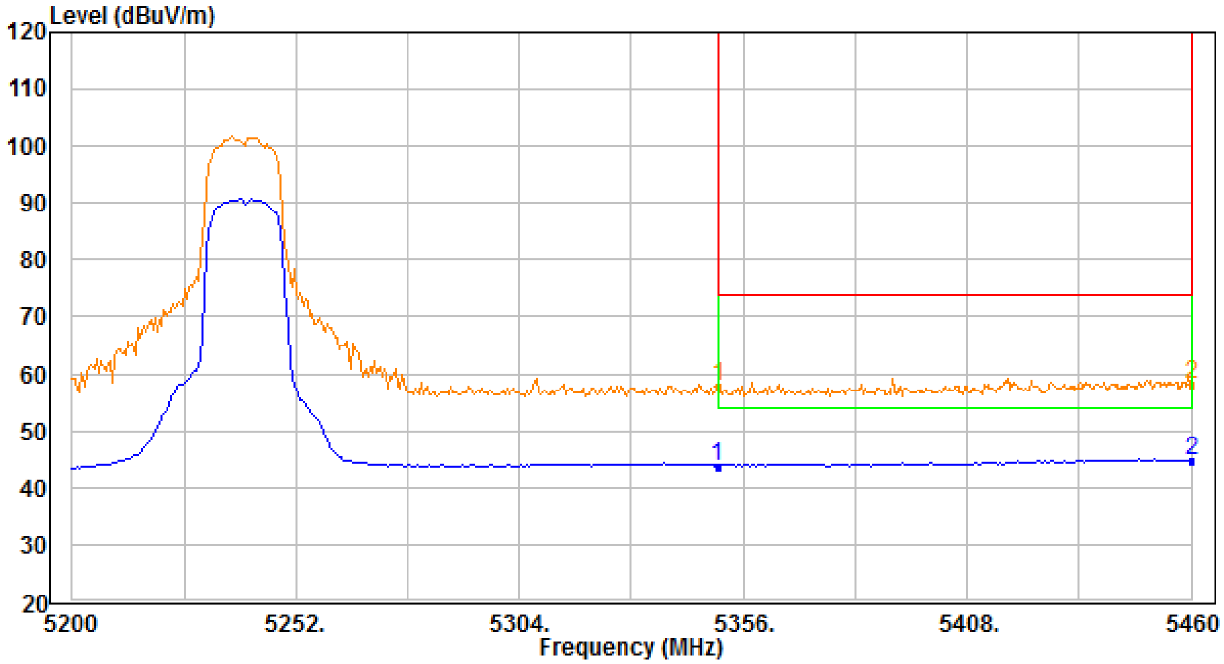
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	56.98	74	44.37	54	Pass

Test Channel:	Channel 36	Ant. Polar. :	Vertical



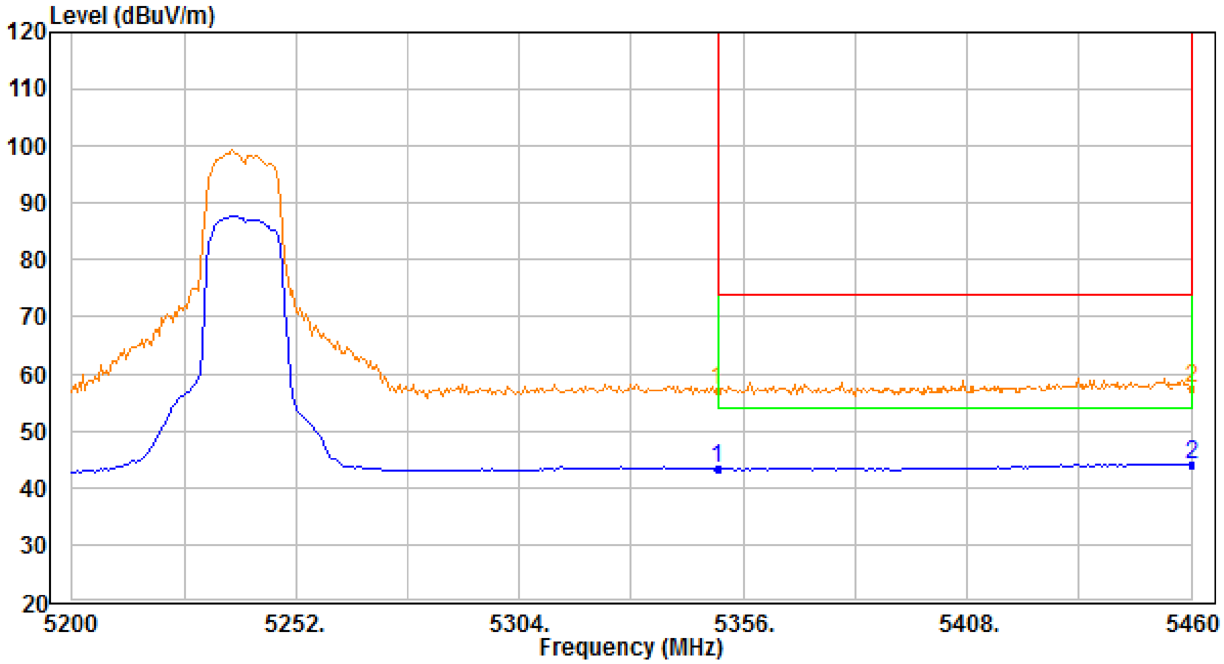
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	61.29	74	43.38	54	Pass

Test Channel:	Channel 64	Ant. Polar. :	Horizontal



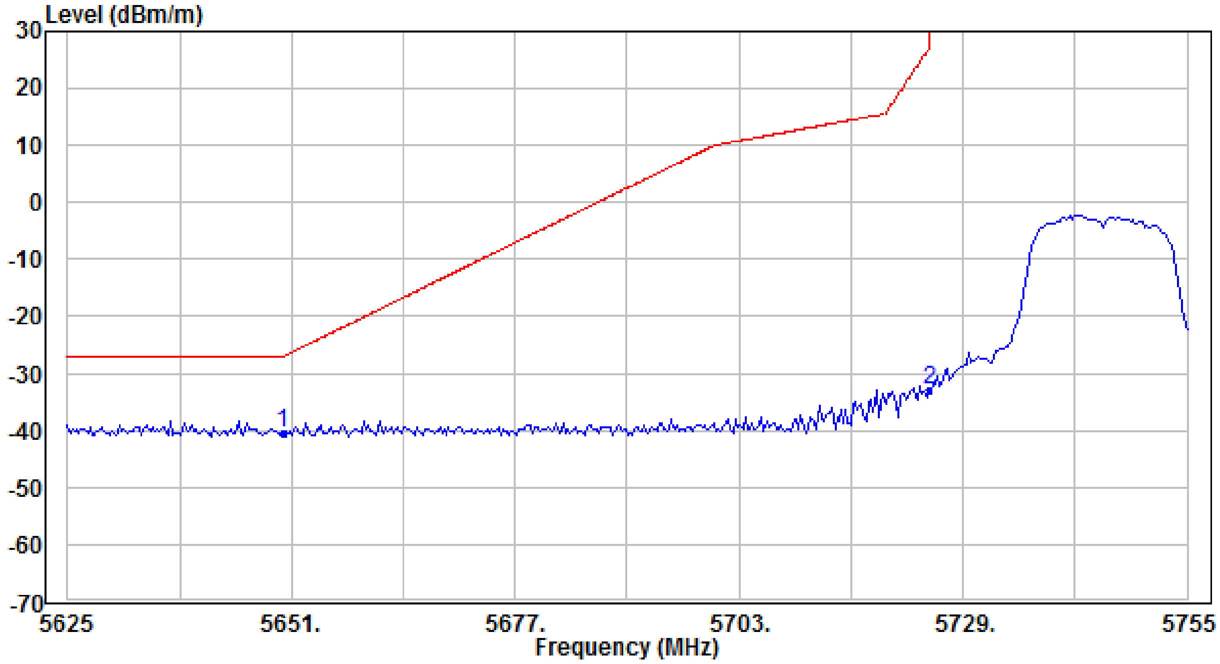
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	57.79	74	43.81	54	Pass

Test Channel:	Channel 64	Ant. Polar. :	Vertical



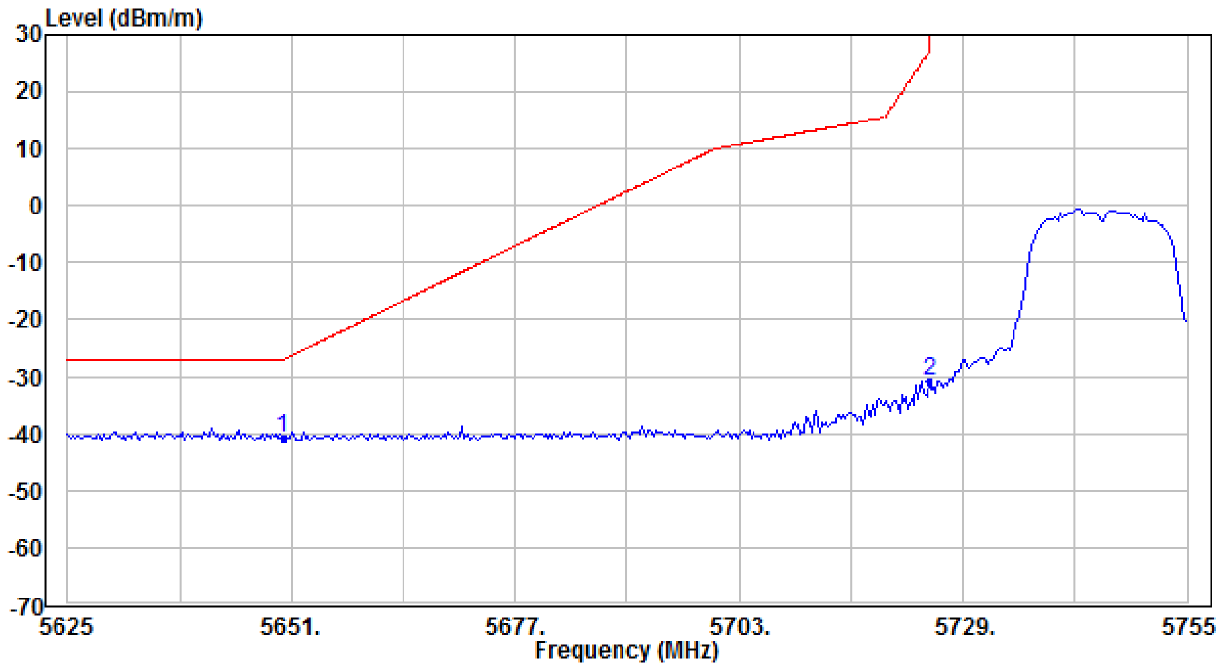
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	57.00	74	43.24	54	Pass

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



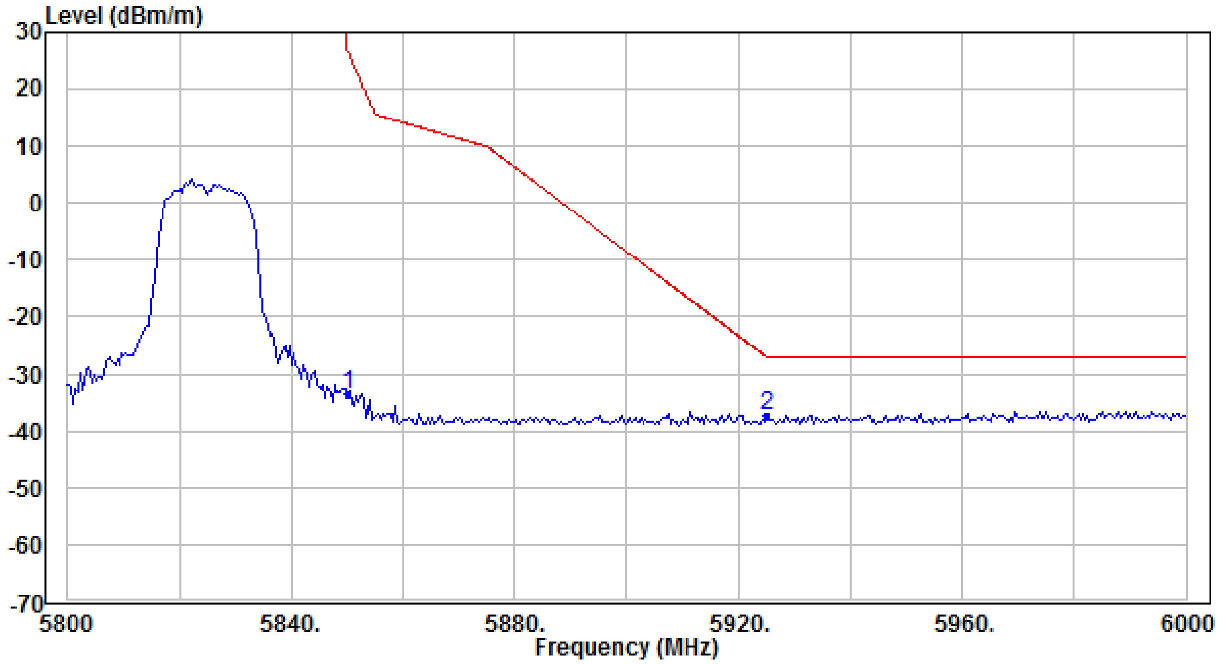
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-40.37	-27	Pass

Test Channel:	Channel 149	Ant. Polar. :	Vertical



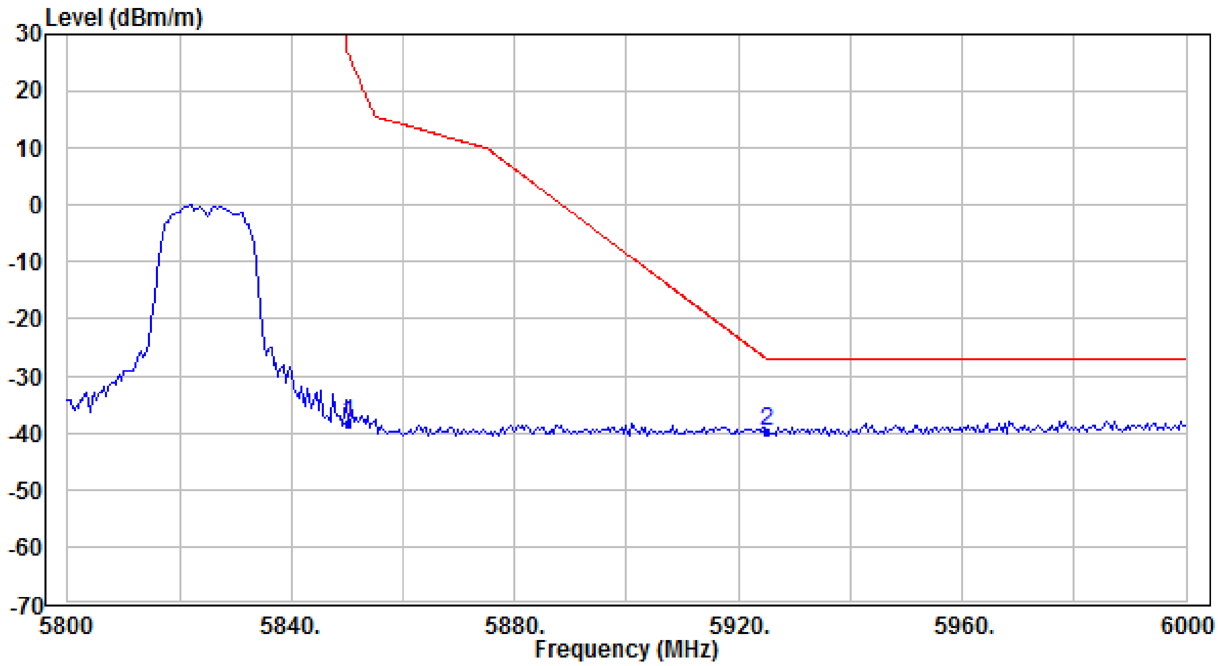
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-40.65	-27	Pass

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-37.42	-27	Pass

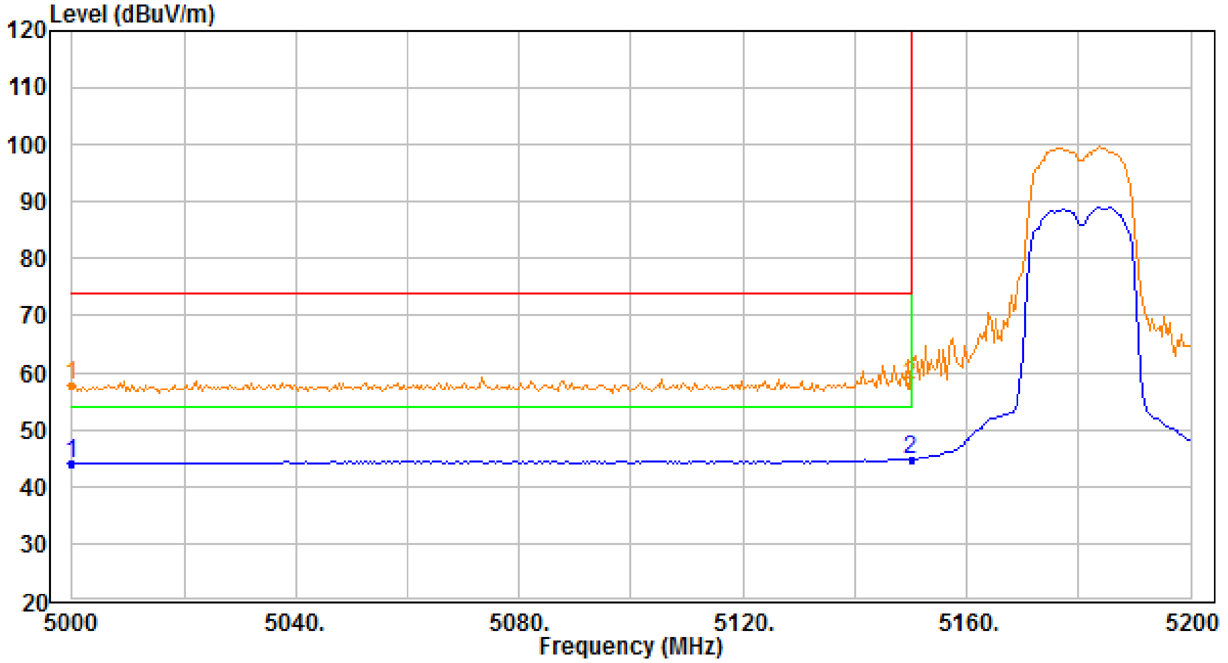
Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-39.63	-27	Pass

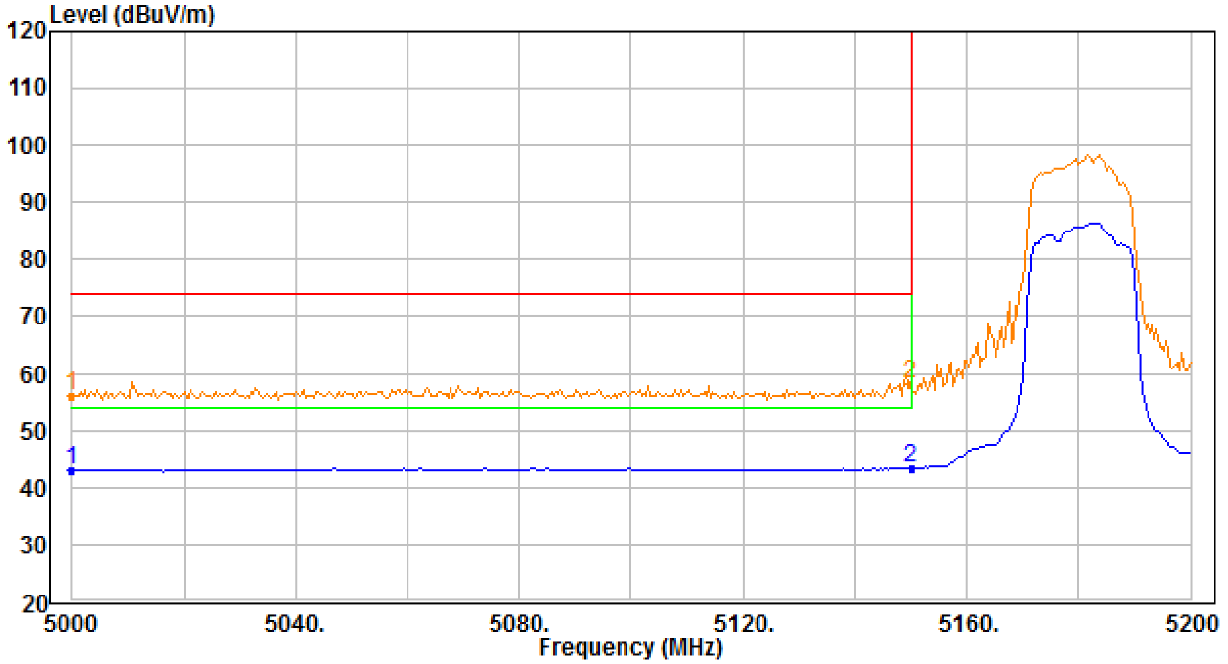
IEEE 802.11n-HT20_MIMO_Chain 0+1

Test Channel:	Channel 36	Ant. Polar. :	Horizontal



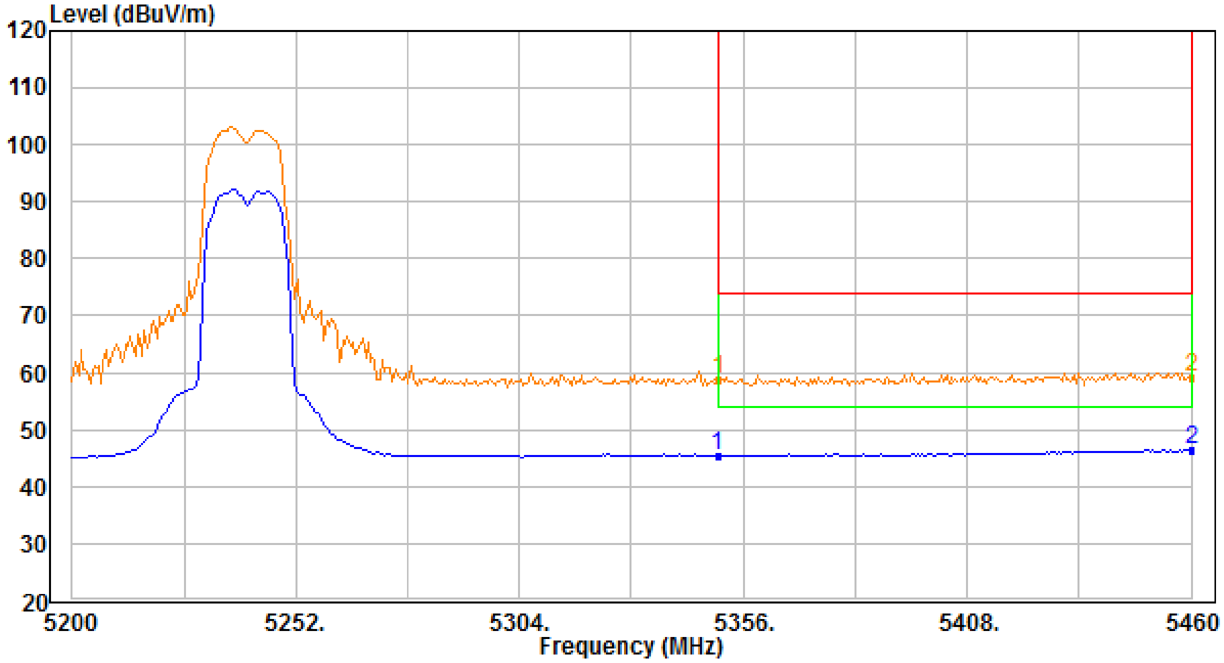
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	57.82	74	44.87	54	Pass

Test Channel:	Channel 36	Ant. Polar. :	Vertical



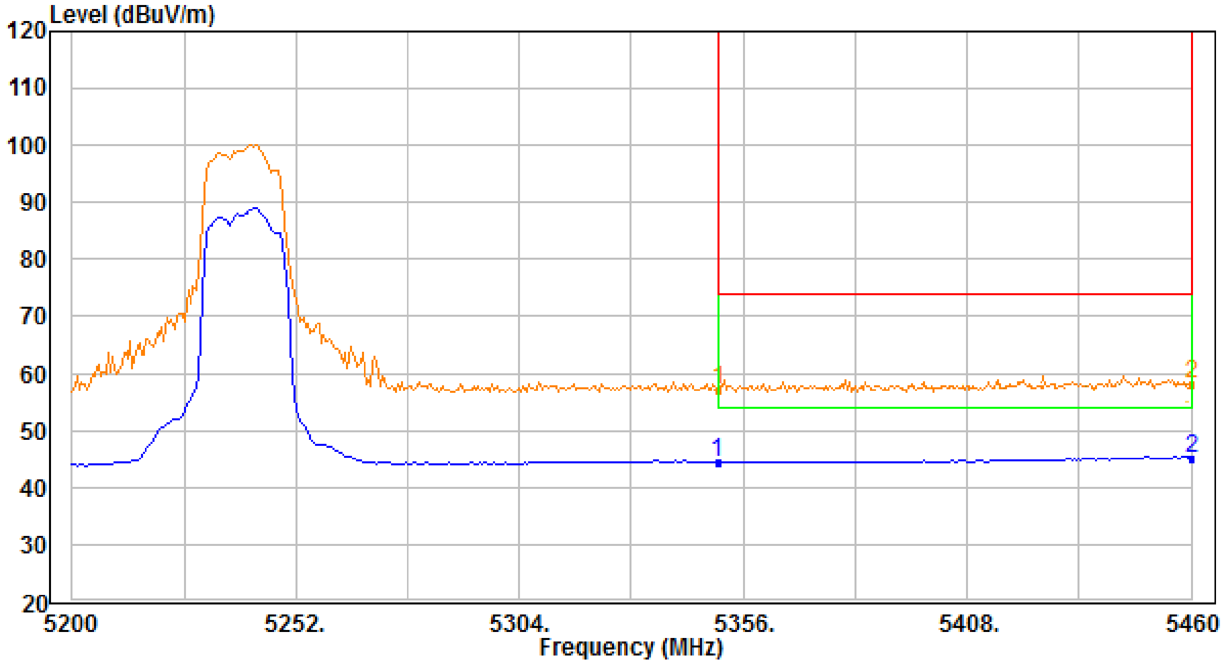
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	58.22	74	43.31	54	Pass

Test Channel:	Channel 64	Ant. Polar. :	Horizontal



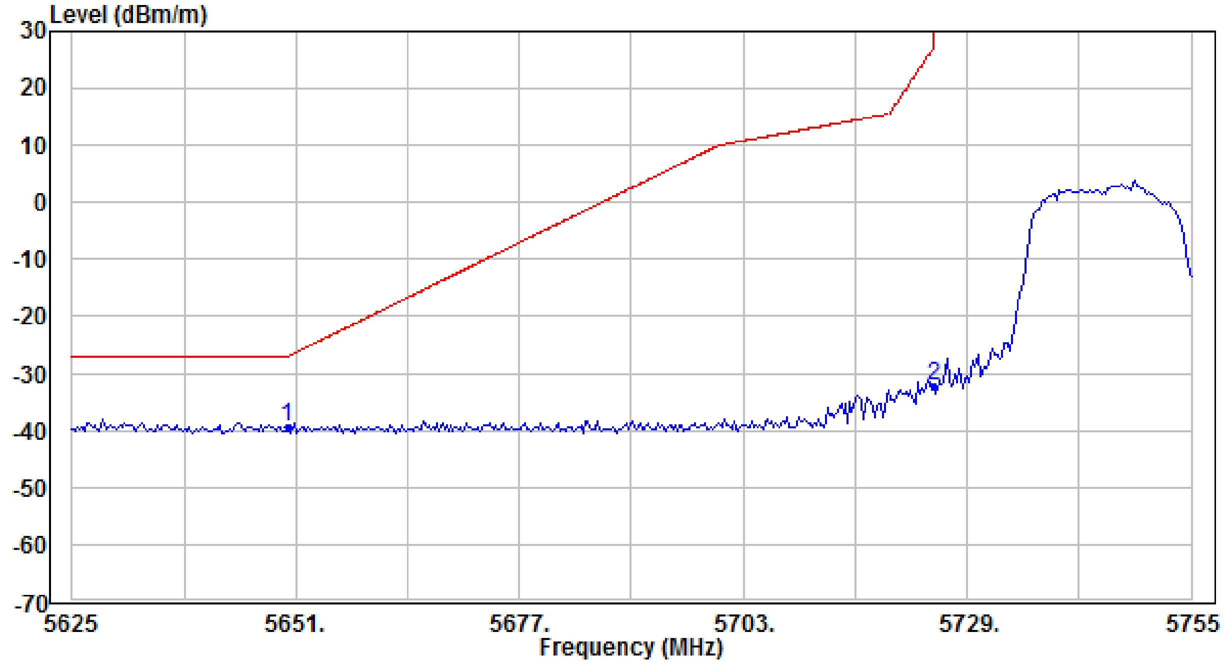
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	58.04	74	46.3	54	Pass

Test Channel:	Channel 64	Ant. Polar. :	Vertical



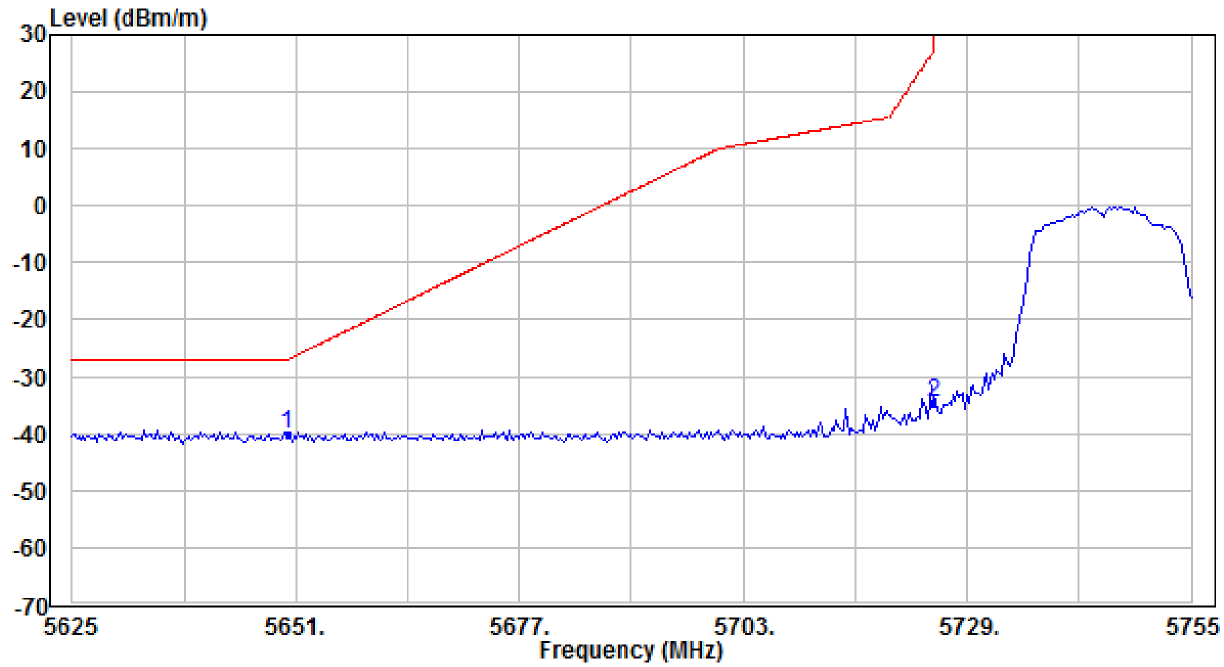
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	59.18	74	45.21	54	Pass

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



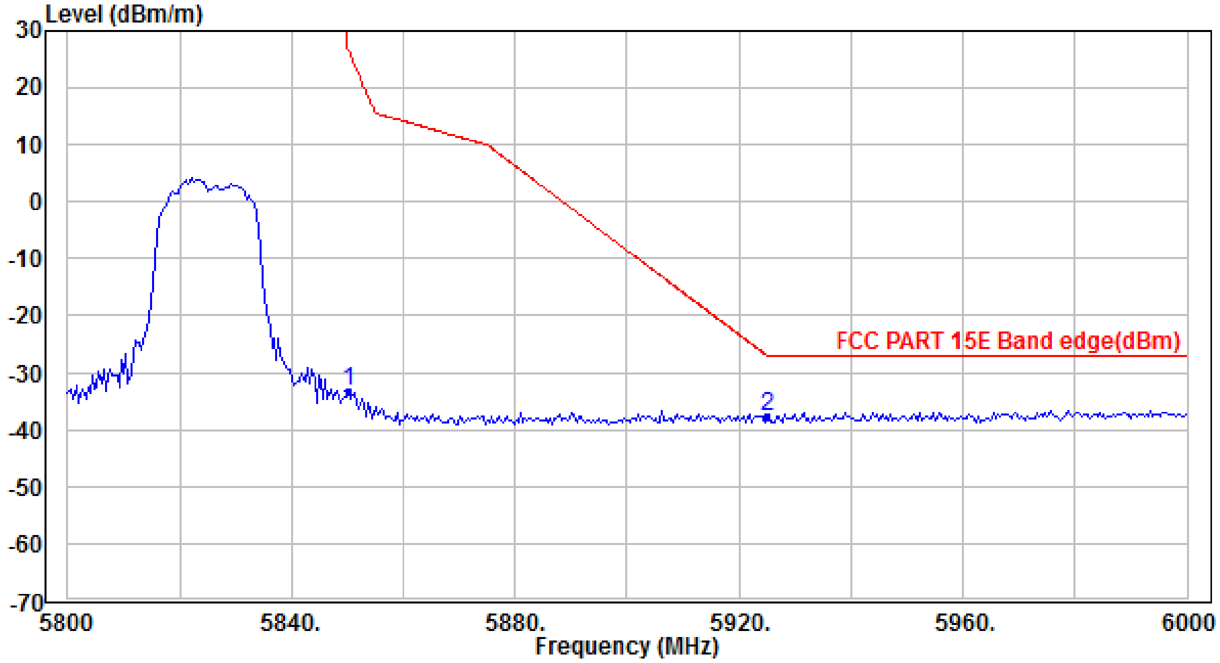
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-39.46	-27	Pass

Test Channel:	Channel 149	Ant. Polar. :	Vertical



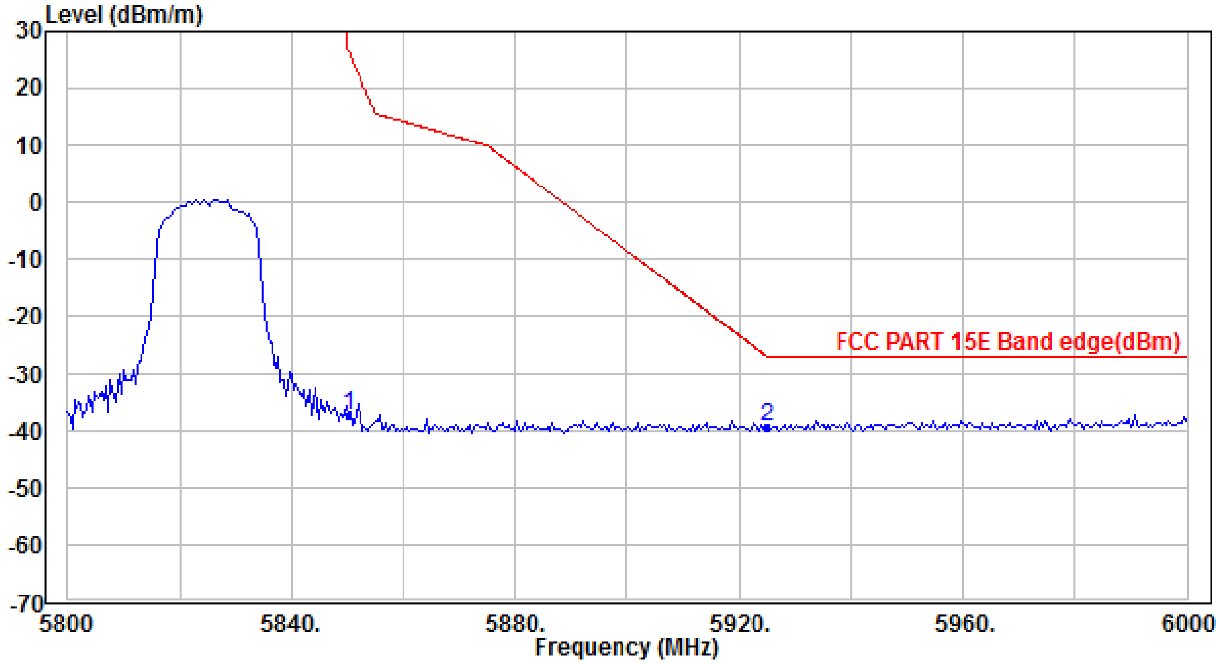
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-40.1	-27	Pass

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-37.8	-27	Pass

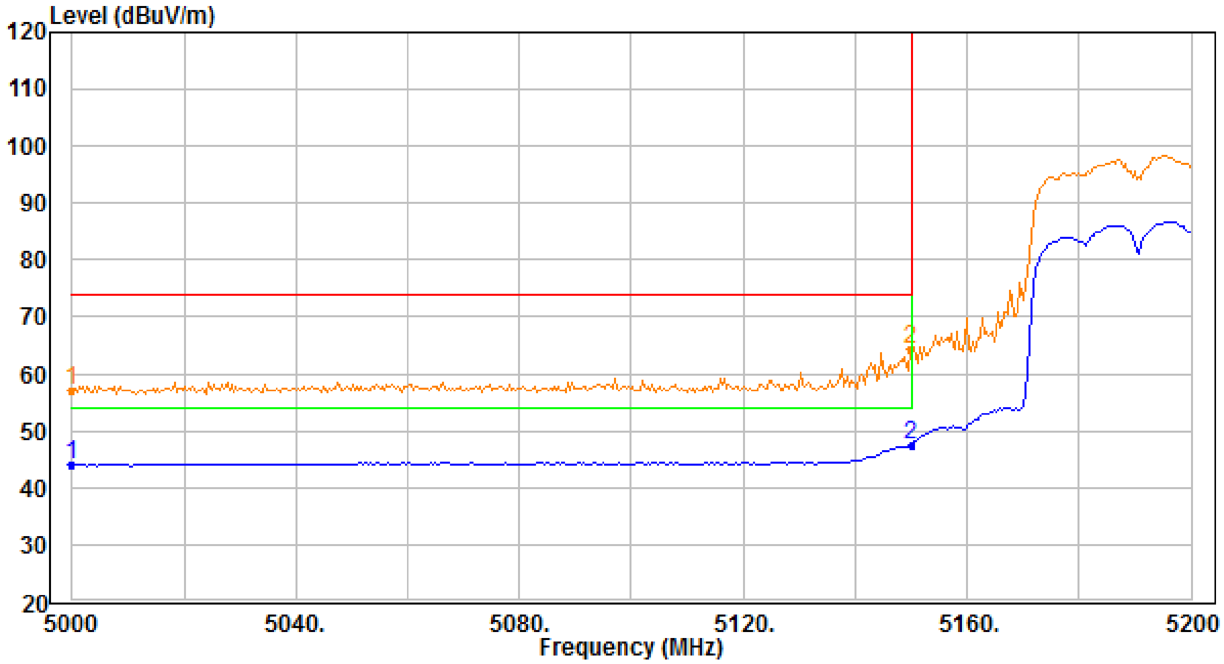
Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-39.4	-27	Pass

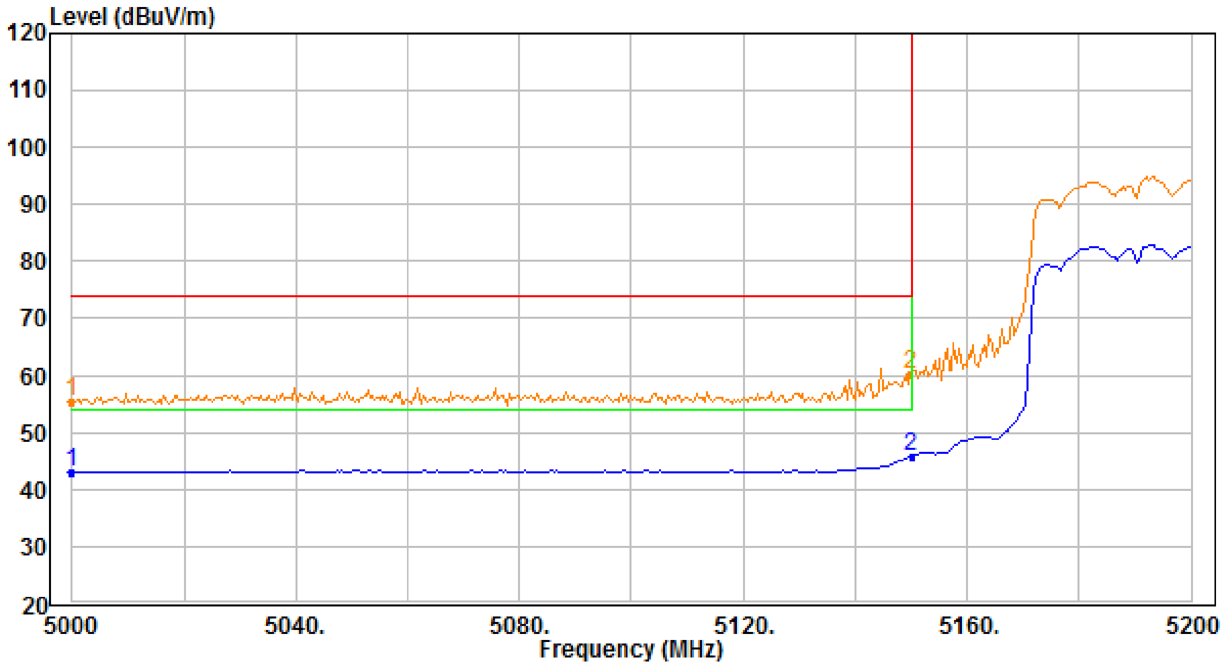
IEEE 802.11n-HT40_MIMO_Chain 0+1

Test Channel:	Channel 38	Ant. Polar. :	Horizontal



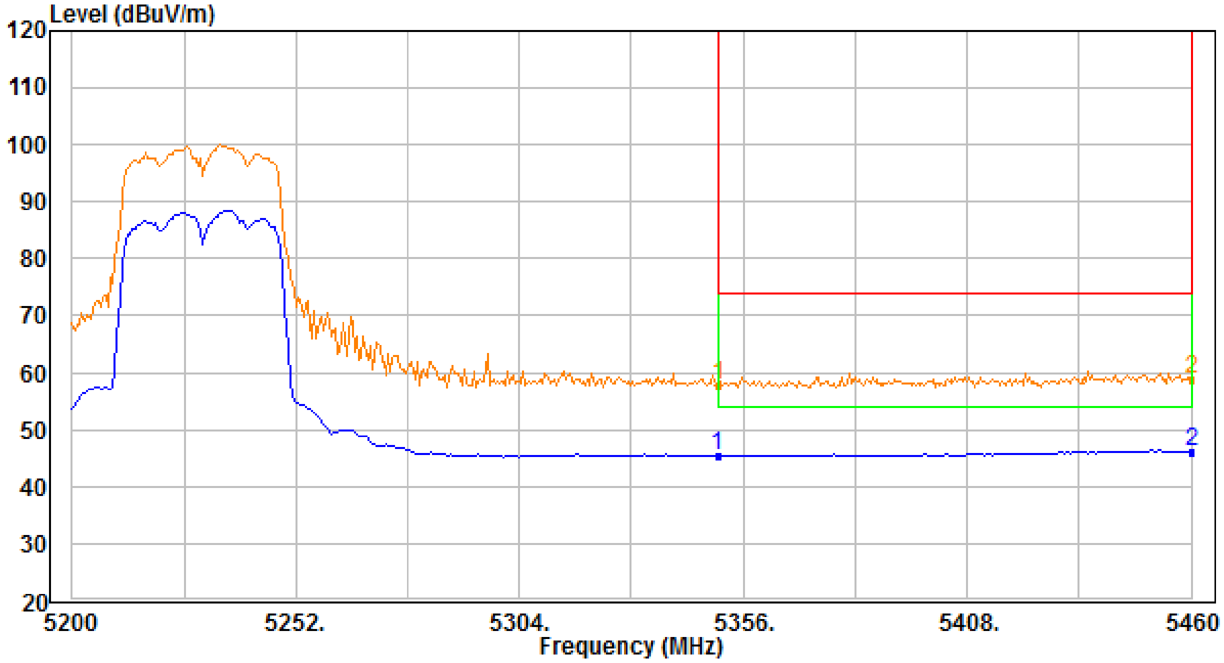
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	64.38	74	47.39	54	Pass

Test Channel:	Channel 38	Ant. Polar. :	Vertical



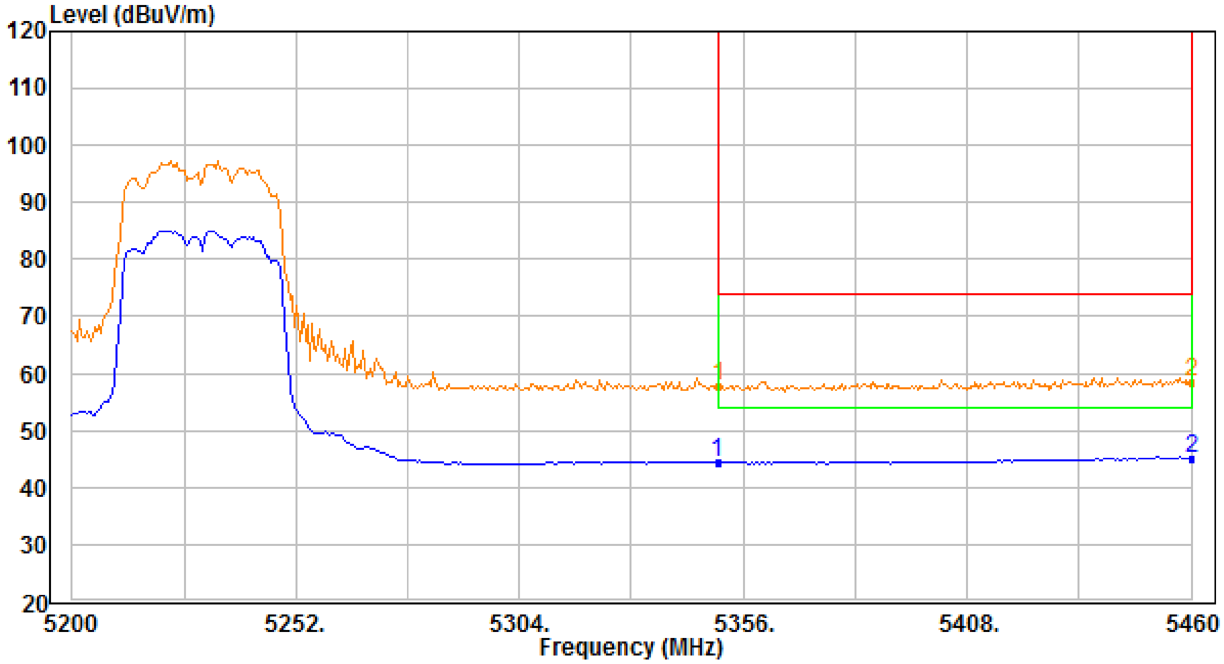
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	60.19	74	45.83	54	Pass

Test Channel:	Channel 62	Ant. Polar. :	Horizontal



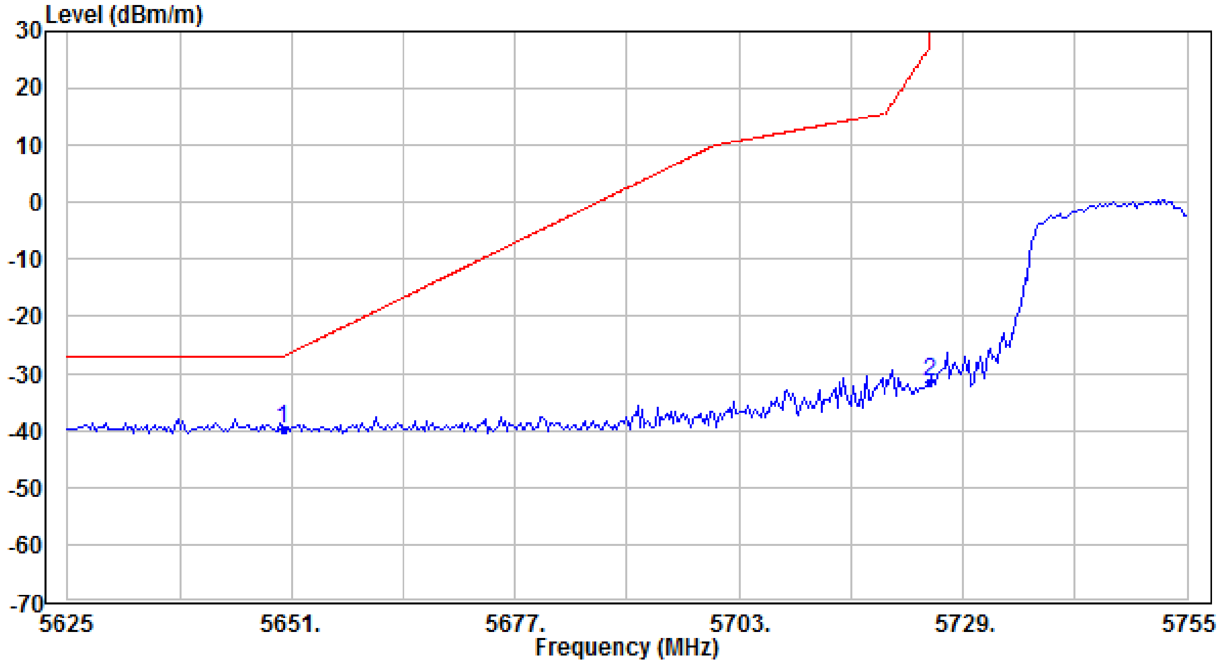
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	57.83	74	45.38	54	Pass

Test Channel:	Channel 62	Ant. Polar. :	Vertical



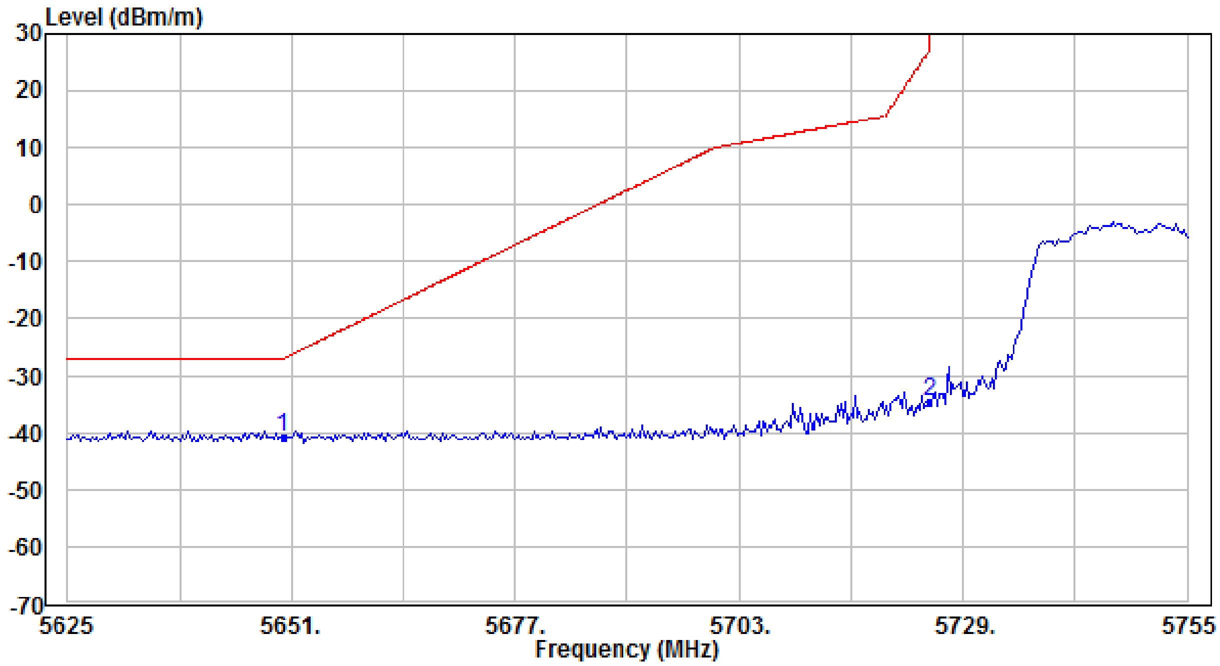
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	57.86	74	44.47	54	Pass

Test Channel:	Channel 151	Ant. Polar. :	Horizontal



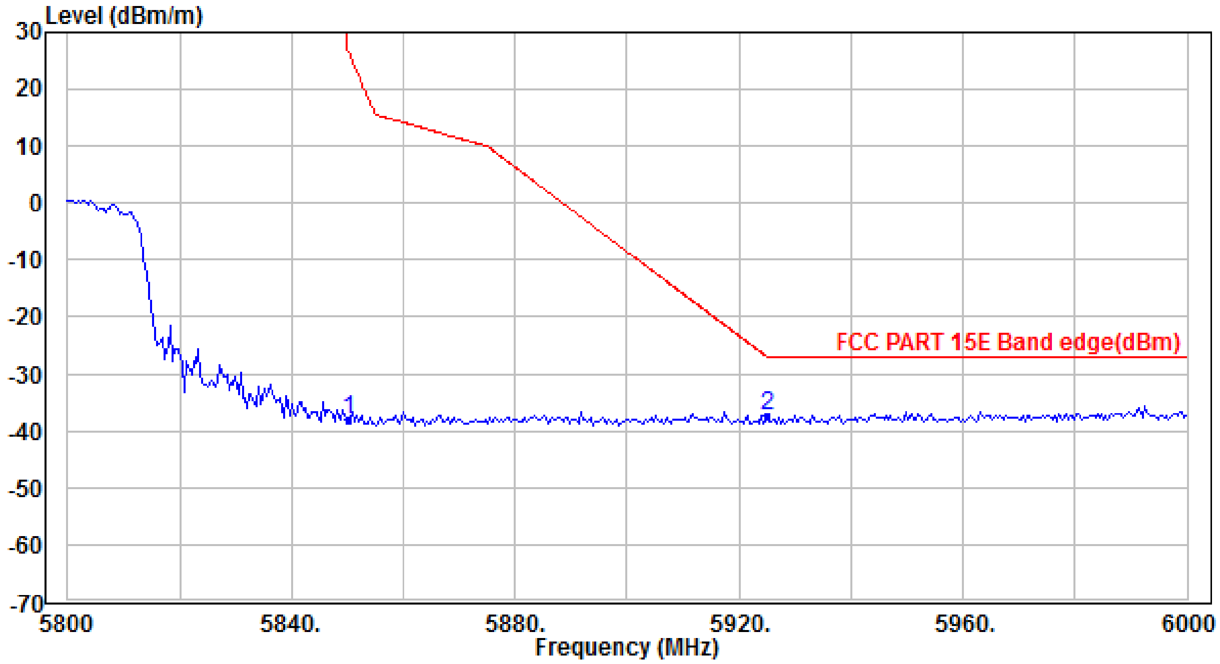
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-39.77	-27	Pass

Test Channel:	Channel 151	Ant. Polar. :	Vertical



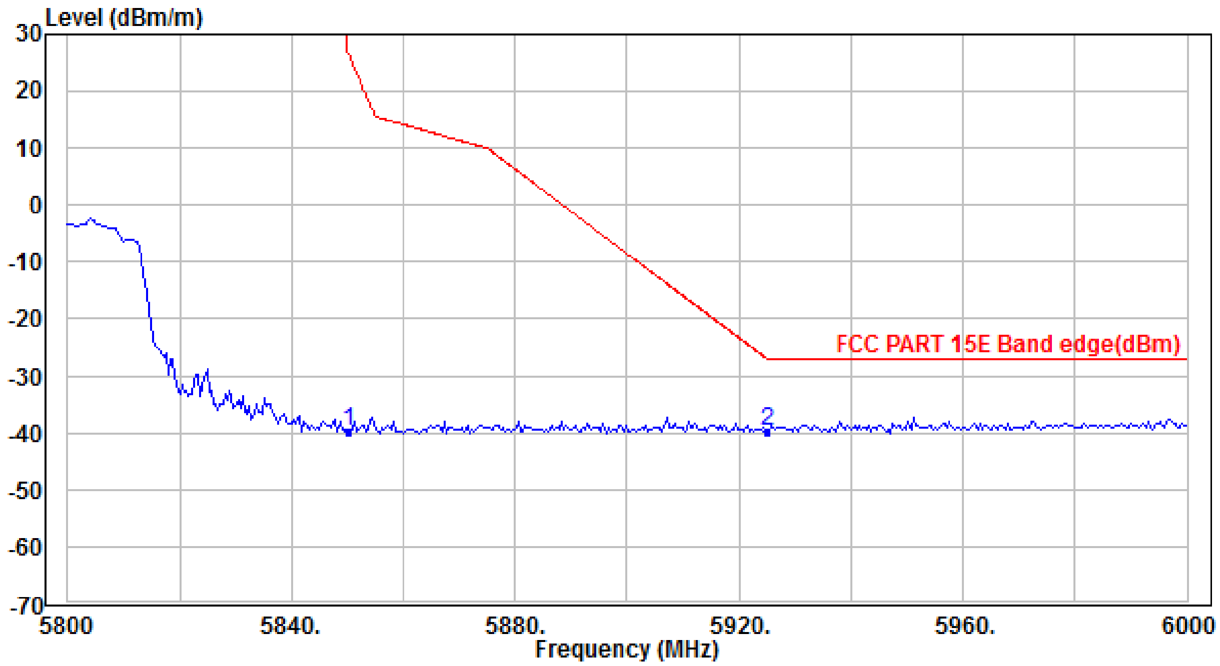
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-40.94	-27	Pass

Test Channel:	Channel 159	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-37.46	-27	Pass

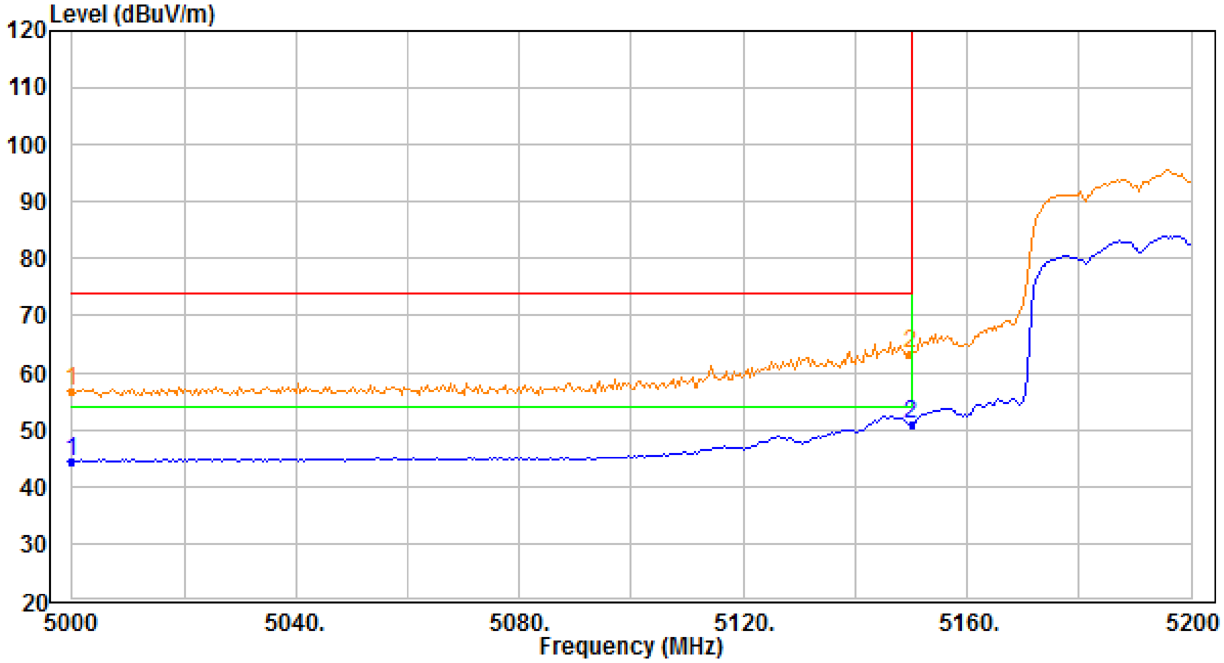
Test Channel:	Channel 159	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-39.72	-27	Pass

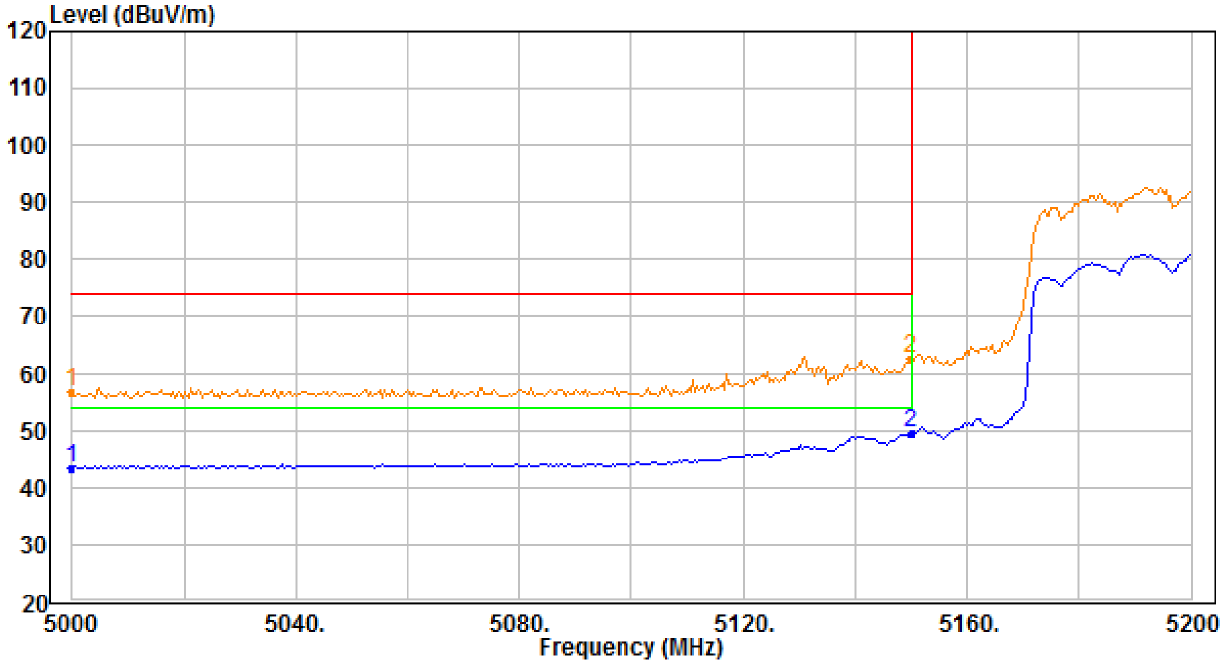
IEEE 802.11ac-VHT80_MIMO_Chain 0+1

Test Channel:	Channel 38	Ant. Polar. :	Horizontal



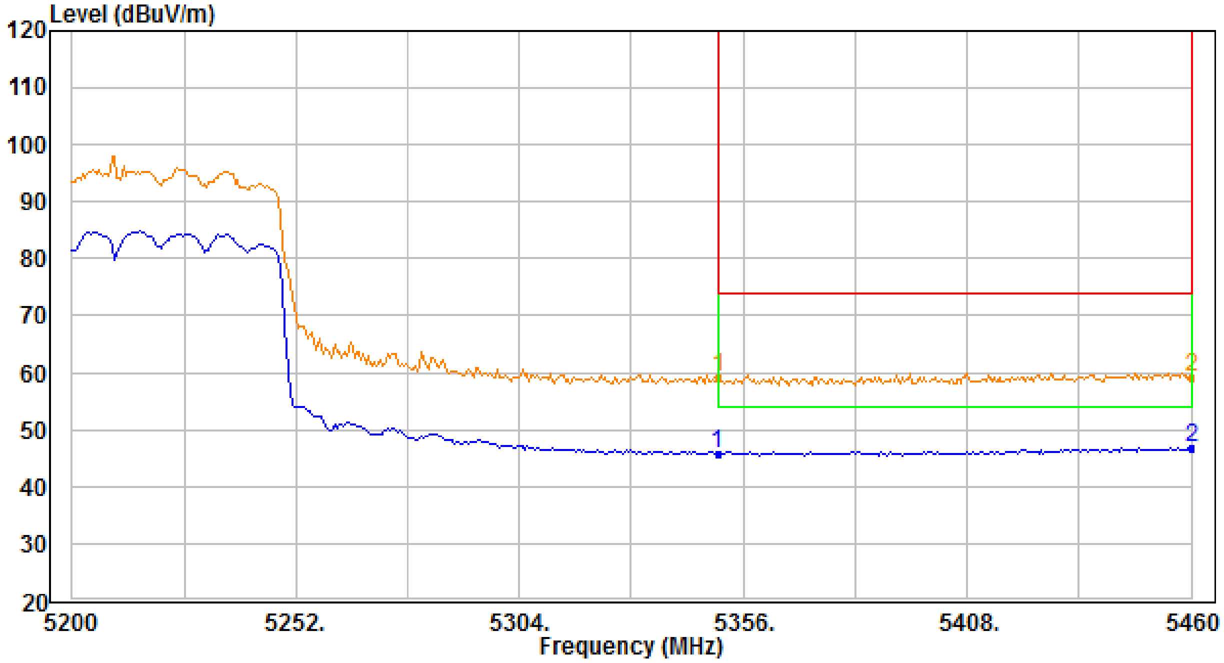
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	63.2	74	50.85	54	Pass

Test Channel:	Channel 38	Ant. Polar. :	Vertical



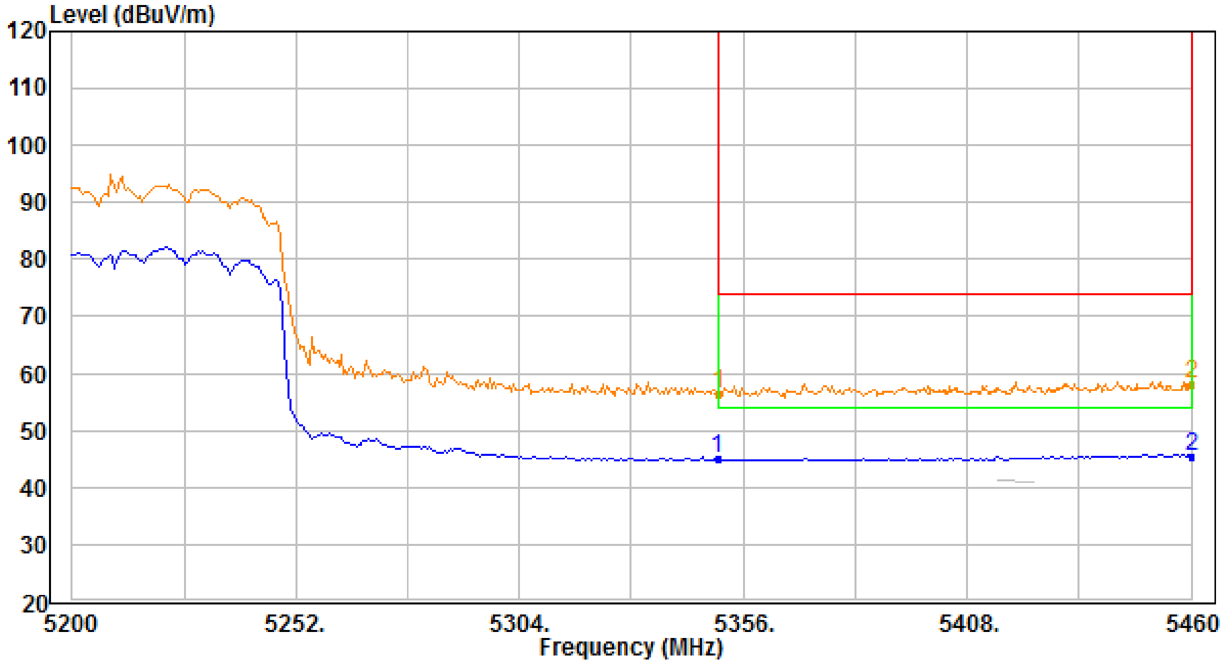
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150	62.44	74	49.47	54	Pass

Test Channel:	Channel 62	Ant. Polar. :	Horizontal



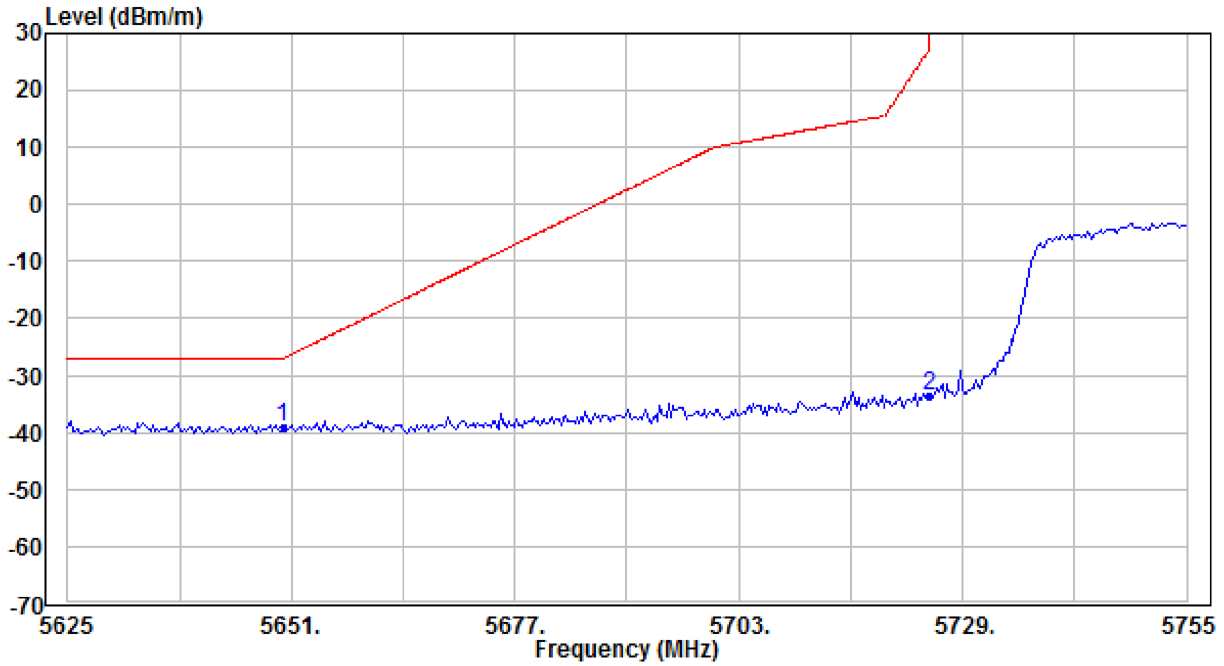
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	59.23	74	45.75	54	Pass

Test Channel:	Channel 62	Ant. Polar. :	Vertical



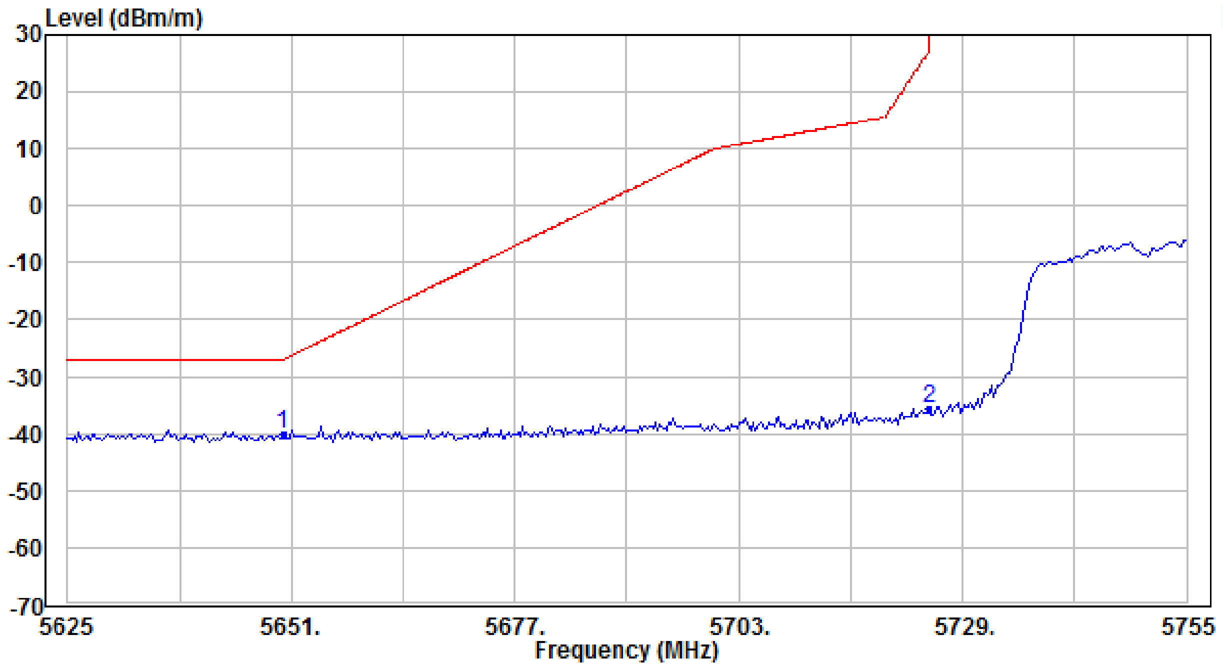
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350	56.54	74	44.96	54	Pass

Test Channel:	Channel 151	Ant. Polar. :	Horizontal



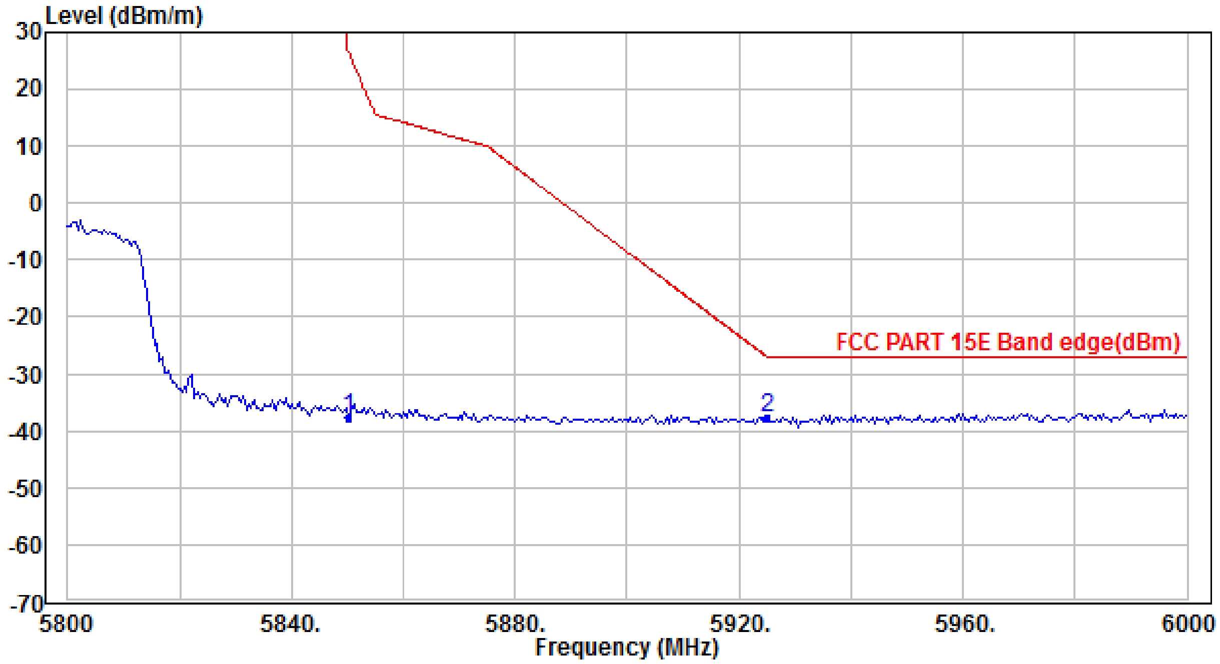
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-39.08	-27	Pass

Test Channel:	Channel 151	Ant. Polar. :	Vertical



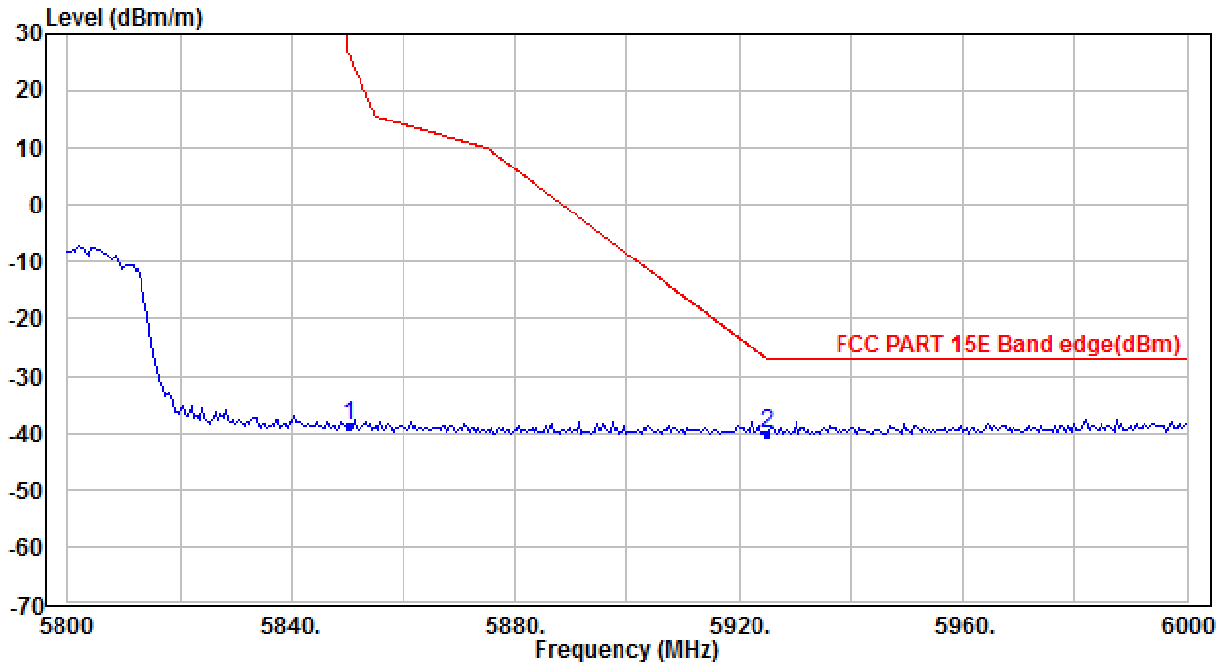
Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.00	-40.11	-27	Pass

Test Channel:	Channel 159	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-37.74	-27	Pass

Test Channel:	Channel 159	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5925.00	-39.95	-27	Pass

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

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

APPENDIX 2 PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photographs.

*** End of Report ***