TEST REPORT

Applicant:	**CTOUCH Europe B.V.**
Address of Applicant:	**Achtseweg Zuid 153R, 5651 GW Eindhoven, The Nederlands**
Manufacturer/Factory:	**CTOUCH Europe B.V.**
Address of Manufacturer/Factory:	**Achtseweg Zuid 153R, 5651 GW Eindhoven, The Nederlands**
Equipment Under Test (EUT)	
Product Name:	**Wireless AC Module**
Model No.:	**01WIMRA**
Trade Mark:	**CTOUCH**
FCC ID:	**2APQQ-01WIMRA**
Applicable standards:	**FCC CFR Title 47 Part 15 Subpart E Section 15.407**
Date of sample receipt:	**March 28, 2022**
Date of Test:	**March 30-April 21, 2022**
Date of report issue:	**April 21, 2022**
Test Result :	**PASS ***

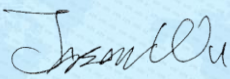
* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

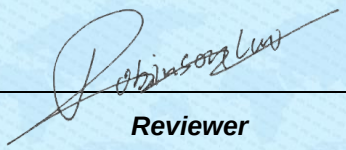
Robinson Luo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*2022-4-21*	*Original*

Prepared By:  ***Date:*** *2022-4-21*

Project Engineer

Check By:  ***Date:*** *2022-4-21*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	PASS
AC Power Line Conducted Emission	15.207	Not Applicable
Peak Transmit Power	15.407(a)(1)	PASS
Power Spectral Density	15.407(a)(1)	PASS
Undesirable Emission	15.407(b)(1), 15.205/15.209	PASS
Radiated Emission	15.205/15.209	PASS
Band Edge	15.407(b)(1)	PASS
Frequency Stability	15.407(g)	PASS

Remark:

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	1 x 10-7
2	Duty cycle	0.37%
3	Occupied Bandwidth	2.8dB
4	RF conducted power	0.75dB
5	RF power density	3dB
6	Conducted Spurious emissions	2.58dB
7	AC Power Line Conducted Emission	3.44dB (0.15MHz ~ 30MHz)
8	Radiated Spurious emission test	3.1dB (9kHz-30MHz)
		3.8039dB (30MHz-200MHz)
		3.9679dB (200MHz-1GHz)
		4.29dB (1GHz-18GHz)
		3.30dB (18GHz-40GHz)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.		

5 General Information

5.1 General Description of EUT

Product Name:	Wireless AC Module
Model No.:	01WIMRA
Serial No.:	N/A
Hardware Version:	6PH0914610
Software Version:	MT7663BU_mp1.4.1_202105142505501
Test sample(s) ID:	GTSL202204000115-1
Sample(s) Status:	Engineer sample
Operation Frequency:	See table below
Modulation technology:	OFDM MIMO: 802.11n/ac SISO: 802.11a
Antenna Type:	External Antenna
Antenna gain:	ANT1:2.0dBi ANT2:2.0dBi (PSD directional gain=5.01dBi, Power directional gain=5.01dBi)
Power supply:	DC 5V (Powered by USB Port)

Band	Mode	Frequency Range (MHz)	Number of channels
U-NII Band I	IEEE 802.11a	5180-5240	4
	IEEE 802.11n 20MHz	5180-5240	4
	IEEE 802.11n 40MHz	5190-5230	2
	IEEE 802.11ac 20MHz	5180-5240	4
	IEEE 802.11ac 40MHz	5190-5230	2
	IEEE 802.11ac 80MHz	5210	1

Remark: The EUT is only designed to be used in large-screen TVS and other products, not directly connected to a computer

Channel list							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz
38	5190MHz	42	5210MHz	46	5230MHz		

Note: In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	**Frequency (MHz)**					
	802.11 a	802.11 n(HT20)	802.11 n(HT40)	802.11 ac(VHT20)	802.11 ac(VHT40)	802.11 ac(VHT80)
Lowest channel	5180	5180	5190	5180	5190	5210
Middle channel	5200	5200	/	5200	/	/
Highest channel	5240	5240	5230	5240	5230	/

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting with modulation.

Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11a	6Mbps
n(HT20)	MCS0
n(HT40)	MCS0
ac(VHT20)	MCS0
ac(VHT40)	MCS0
ac(VHT80)	MCS0

5.3 Test Facility

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

● **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

● **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.4 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, sBaoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480 Fax: 0755-27798960

5.5 Description of Support Units

Notebook PC Mode Number: 500RSH

Remark: The computer used for auxiliary testing is only used for fixed-frequency control, and the product cannot work normally if directly connected to the computer. USB extension cable is used to connect EUT in the test, and the fixed-frequency computer is placed outside the shielding room.

5.6 Deviation from Standards

None.

5.7 Additional Instructions

Test Software	QATool_Dbg	Power level setup	Default

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 24 2021	June. 23 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 24 2021	June. 23 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 24 2021	June. 23 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 24 2021	June. 23 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 24 2021	June. 23 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 24 2021	June. 23 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 24 2021	June. 23 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 24 2021	June. 23 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 24 2021	June. 23 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 24 2021	June. 23 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 24 2021	June. 23 2022
15	Band filter	Amindeon	82346	GTS219	June. 24 2021	June. 23 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 24 2021	June. 23 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 24 2021	June. 23 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 24 2021	June. 23 2022
19	Splitter	Agilent	11636B	GTS237	June. 24 2021	June. 23 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 24 2021	June. 23 2022
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 17 2021	Oct. 16 2022
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 17 2021	Oct. 16 2022
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 17 2021	Oct. 16 2022
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 24 2021	June. 23 2022

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 24 2021	June. 23 2022
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 24 2021	June. 23 2022
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 24 2021	June. 23 2022
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 24 2021	June. 23 2022
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	June. 24 2021	June. 23 2022
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	July. 09 2021	July. 08 2022

RF Conducted Test:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 24 2021	June. 23 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 24 2021	June. 23 2022
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 24 2021	June. 23 2022
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 24 2021	June. 23 2022
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 24 2021	June. 23 2022
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 24 2021	June. 23 2022
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 24 2021	June. 23 2022

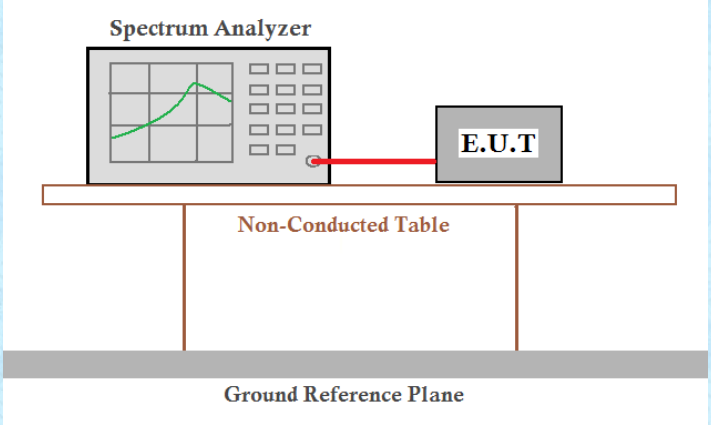
General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022
2	Barometer	ChangChun	DYM3	GTS255	June. 24 2021	June. 23 2022

7 Test results and Measurement Data

7.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
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.*	
E.U.T Antenna:	
The antennas are external antenna, the best case gain of the antennas are 2.0dBi, reference to the appendix II for details	

7.2 Emission Bandwidth and 99% Occupied Bandwidth

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	N/A
Test setup:	
Test procedure:	According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data:

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11a		802.11a	
		ANT1	ANT2	ANT1	ANT2
36	5180	16.46	16.38	19.53	19.82
40	5200	16.697	16.473	28.87	19.94
48	5240	16.69	16.43	26.32	19.88

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11n(HT20)		802.11n(HT20)	
		ANT1	ANT2	ANT1	ANT2
36	5180	17.56	17.57	19.97	19.87
40	5200	17.606	17.567	20.39	19.87
48	5240	17.63	17.56	22.20	20.03

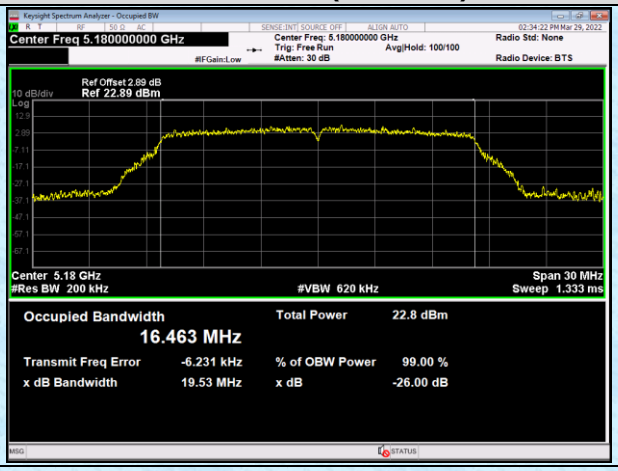
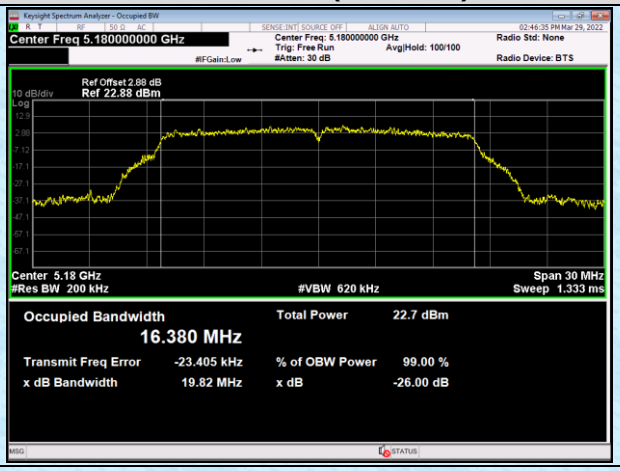
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11n(HT40)		802.11n(HT40)	
		ANT1	ANT2	ANT1	ANT2
38	5190	36.07	36.03	40.02	39.91
46	5230	36.07	35.98	43.97	39.96

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11ac(VHT20)		802.11ac(VHT20)	
		ANT1	ANT2	ANT1	ANT2
36	5180	17.56	17.56	19.80	19.79
40	5200	17.628	17.562	20.67	19.91
48	5240	17.58	17.57	20.63	19.99

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11ac(VHT40)		802.11ac(VHT40)	
		ANT1	ANT2	ANT1	ANT2
38	5190	35.99	36.00	40.42	39.81
46	5230	36.04	36.01	47.88	39.73

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11ac(VHT80)		802.11ac(VHT80)	
		ANT1	ANT2	ANT1	ANT2
42	5210	75.43	75.30	80.53	80.15

Test plots as followed:

802.11a mode (Antenna1)	802.11a mode (Antenna2)
	
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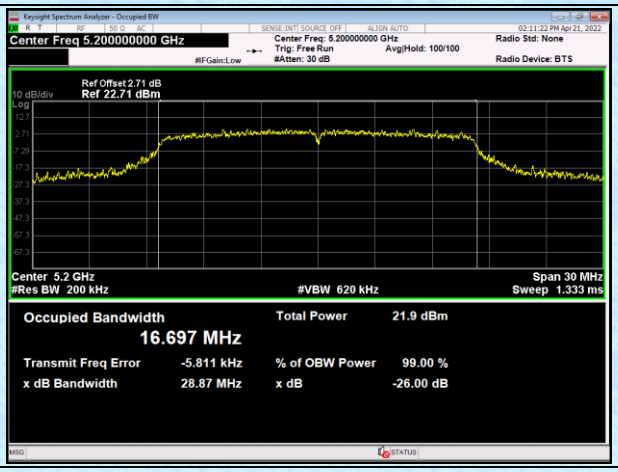	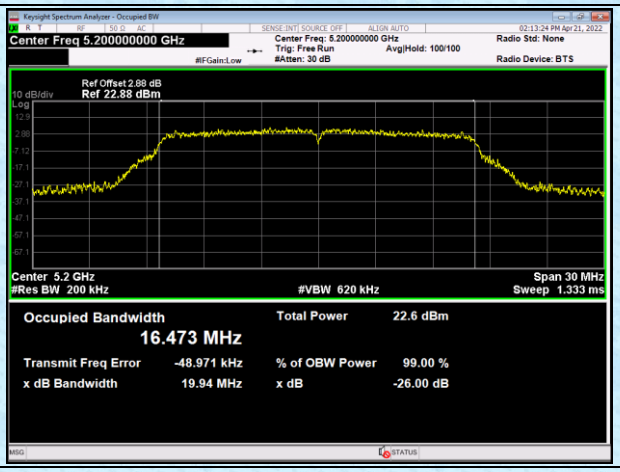
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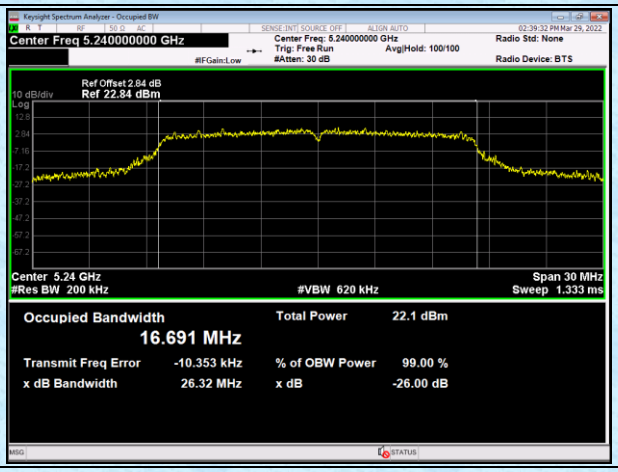
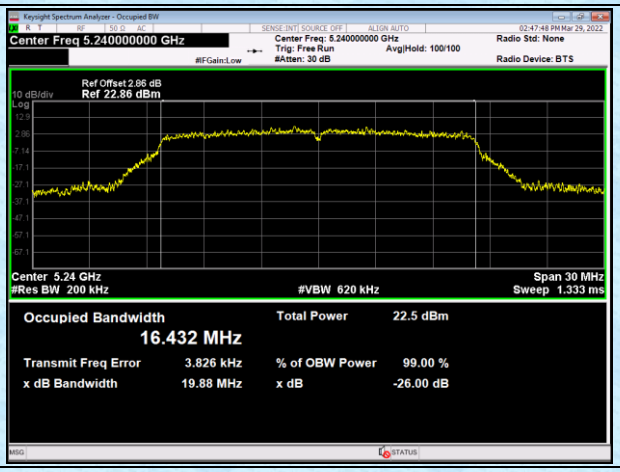
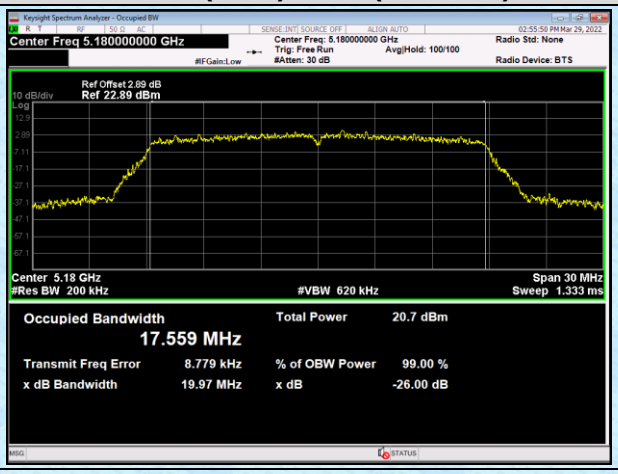
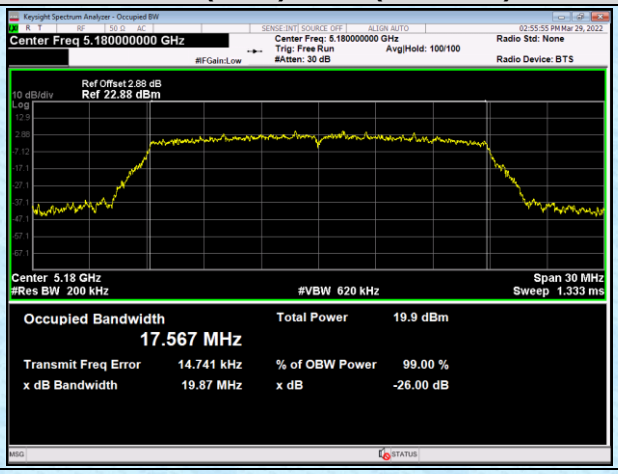
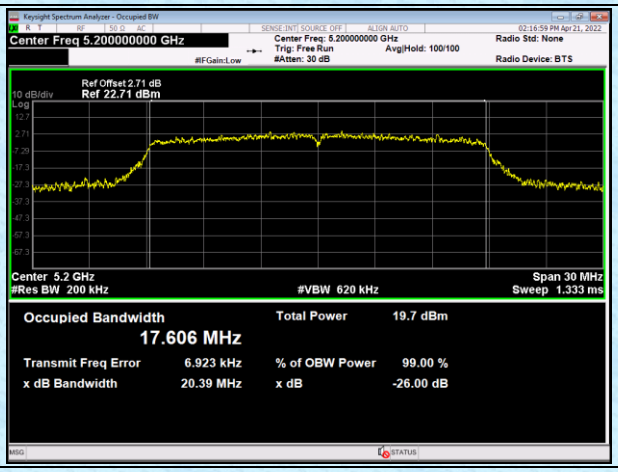
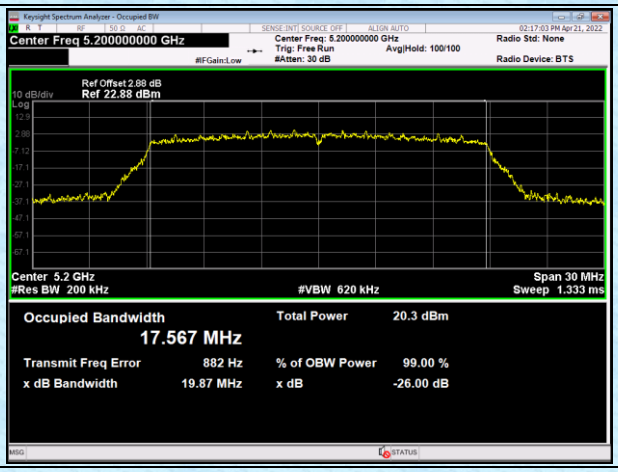
	
5240	5240

802.11n(HT20) mode (Antenna1)	802.11n(HT20) mode (Antenna2)
	
5180	5180
	
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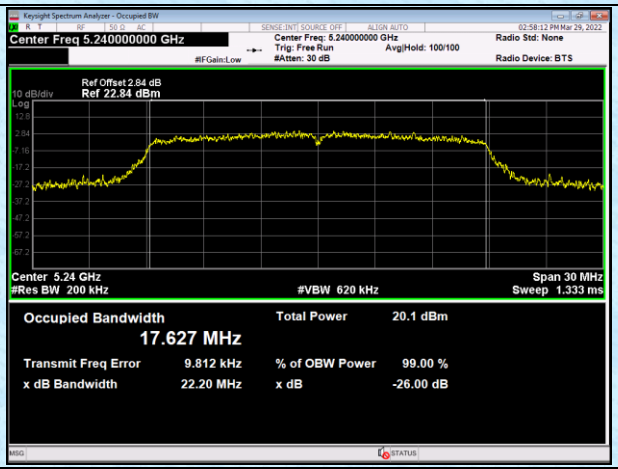
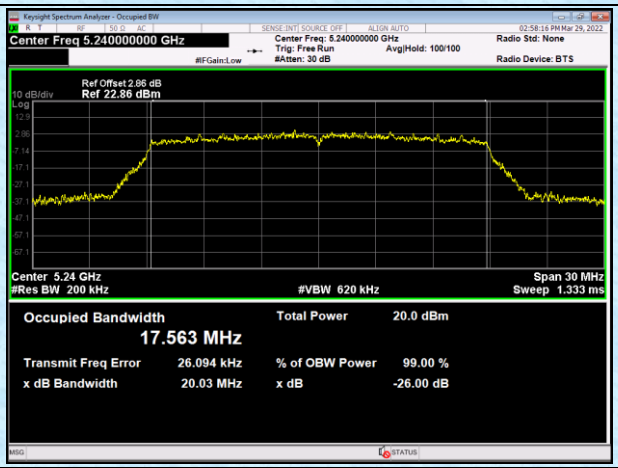
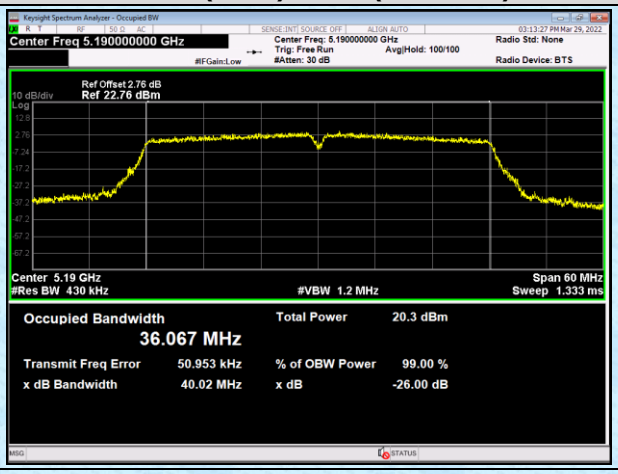
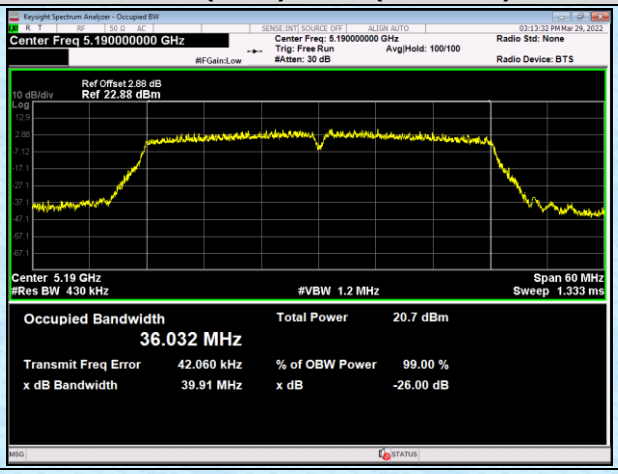
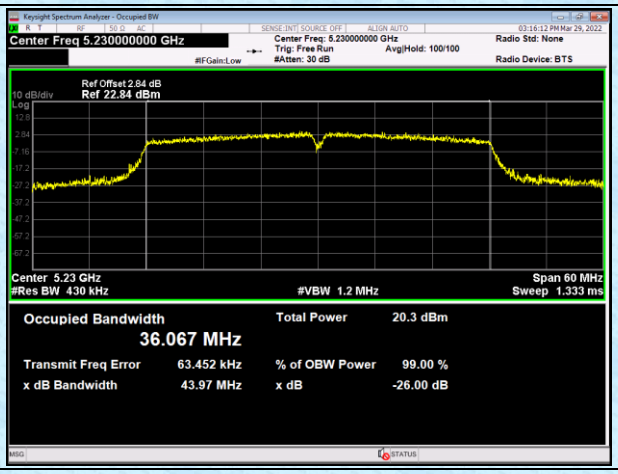
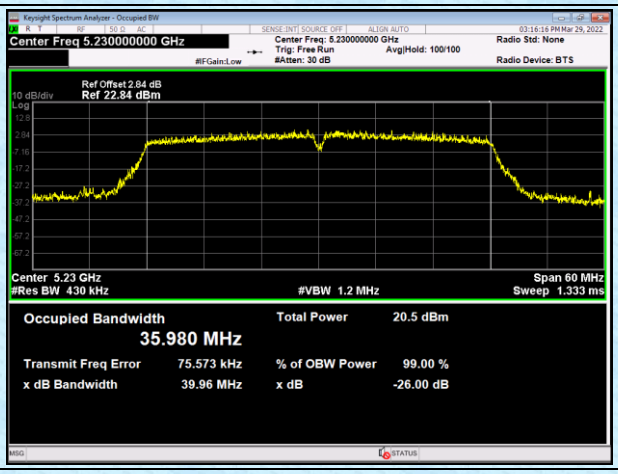
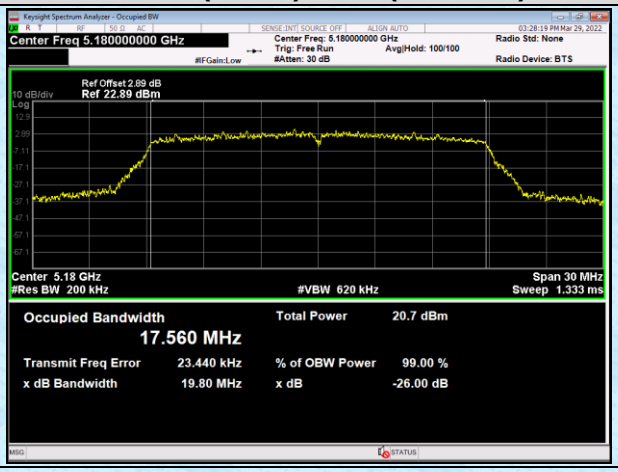
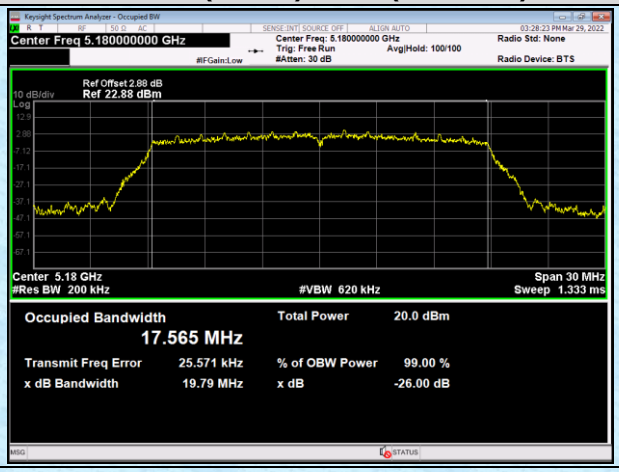
	
5240	5240

802.11n(HT40) mode (Antenna1)	802.11n(HT40) mode (Antenna2)
	
5190	5190
	
5230	5230

802.11ac(VHT20) mode (Antenna1)	802.11ac(VHT20) mode (Antenna2)
	
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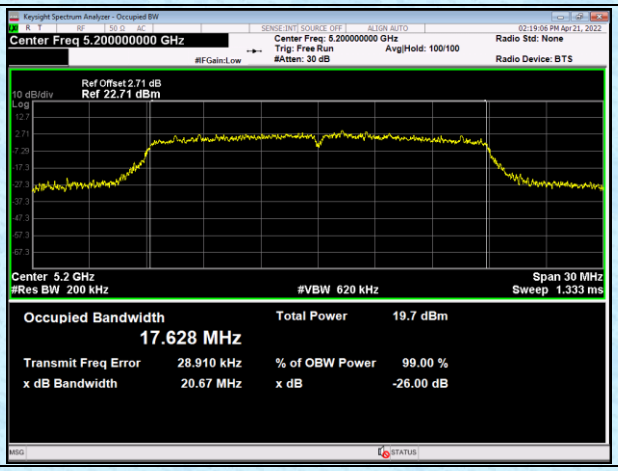
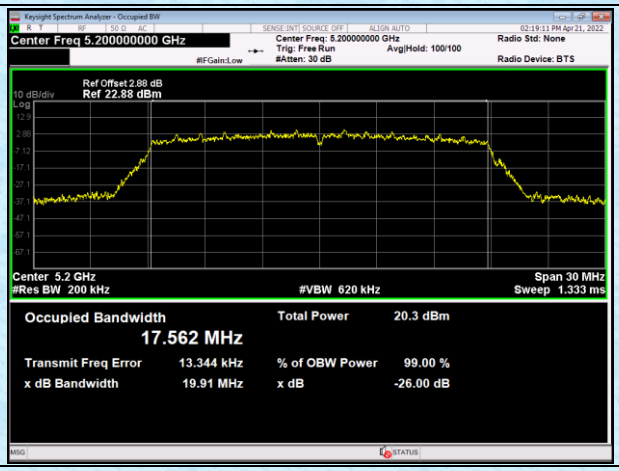
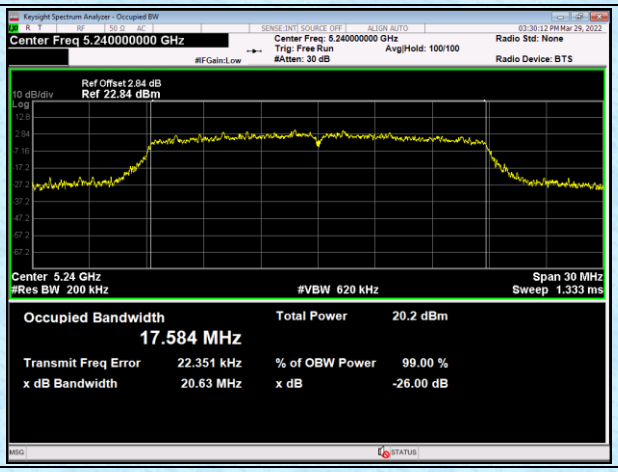
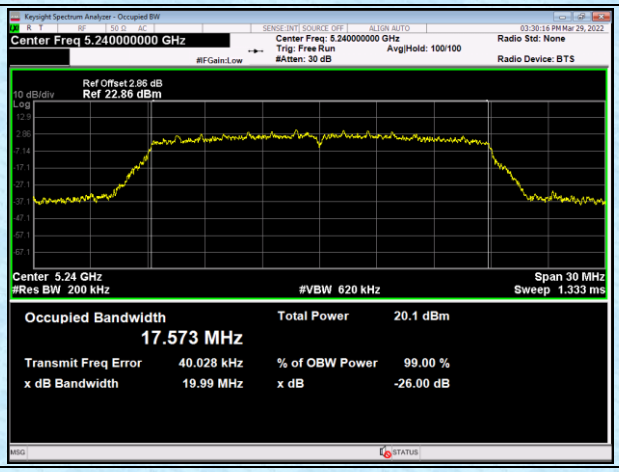
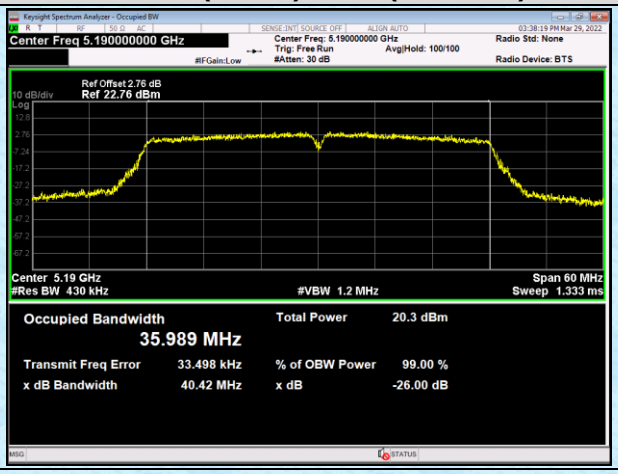
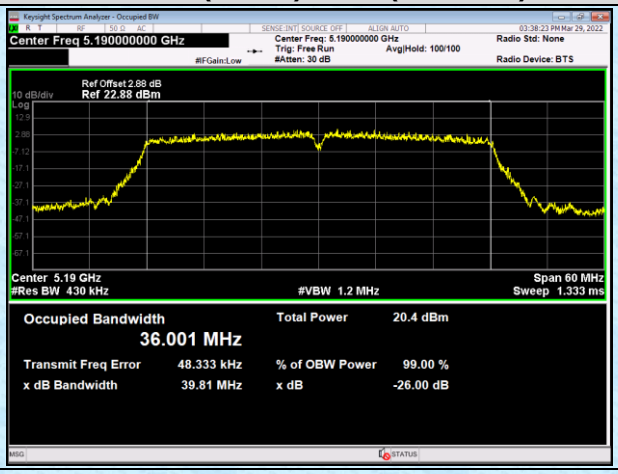
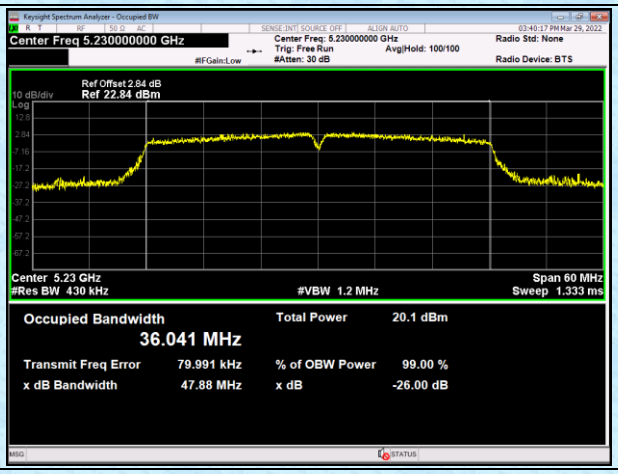
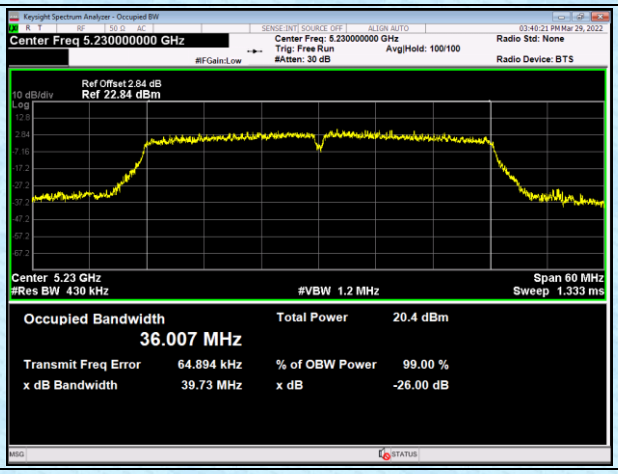
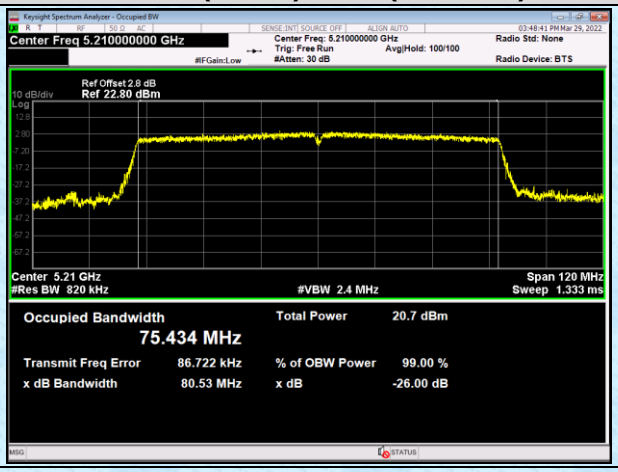
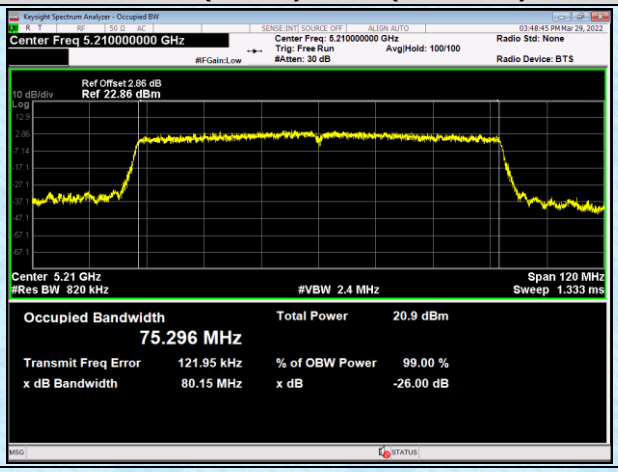
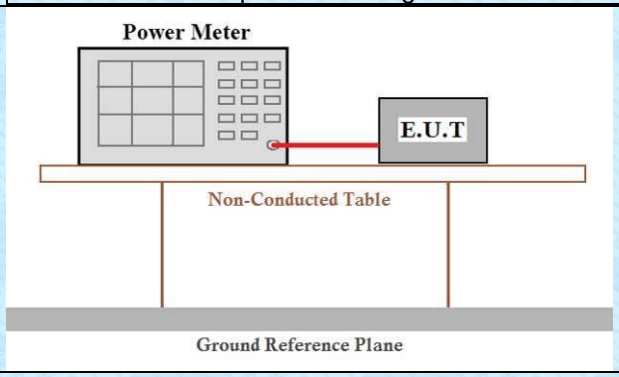
	
5200	5200
	
5240	5240

802.11ac(VHT40) mode (Antenna1)	802.11ac(VHT40) mode (Antenna2)
	
5190	5190
	
5230	5230
802.11ac(VHT80) mode (Antenna1)	802.11ac(VHT80) mode (Antenna2)
	
5210	5210

7.3 Peak Transmit Power

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407</td></tr>
<tr><td>Test Method:</td><td>KDB 789033 D02 General U-NII Test Procedures New Rules v02r01</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency band (MHz)</th><th>Limit</th></tr>
<tr><td rowspan="2">5150-5250</td><td>≤1W(30dBm) for master device</td></tr>
<tr><td>≤250mW(23.98dBm) for client device</td></tr>
<tr><td>5250-5350</td><td>≤250mW(23.98dBm) for client device or 11dBm+10logB*</td></tr>
<tr><td>5470-5725</td><td>≤250mW(23.98dBm) for client device or 11dBm+10logB*</td></tr>
<tr><td colspan="2">Remark: *Where B is the 26dB emission bandwidth in MHz.
The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test procedure:</td><td>Measurement using an RF average power meter
(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied
a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B).
(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
(iv) Adjust the measurement in dBm by adding 10 log(1/x) where x is the duty cycle (e.g., 10log(1/0.25) if the duty cycle is 25 percent).</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 6 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.2 for details</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

Measurement Data

Modulation	Frequency (MHz)	Duty cycle		Duty Factor	
		Antenna1	Antenna2	Antenna1	Antenna2
802.11a	5180	97.83	97.83	0.1	0.1
	5200	97.82	97.81	0.1	0.1
	5240	97.82	97.82	0.1	0.1
802.11n(HT20)	5180	97.71	97.71	0.1	0.1
	5200	97.7	97.7	0.1	0.1
	5240	97.68	97.68	0.1	0.1
802.11n(HT40)	5190	95.65	95.65	0.19	0.19
	5230	95.36	95.36	0.21	0.21
802.11ac(VHT20)	5180	95.69	95.69	0.19	0.19
	5200	95.71	95.71	0.19	0.19
	5240	95.7	95.7	0.19	0.19
802.11ac(VHT40)	5190	92.43	92.43	0.34	0.34
	5230	91.91	91.91	0.37	0.37
802.11ac(VHT80)	5210	86.59	86.59	0.63	0.63

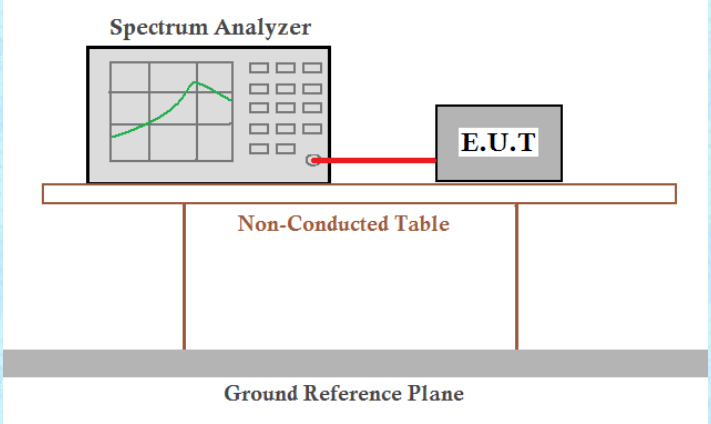
802.11a mode										
CH No.	Frequency (MHz)	Measured Power (dBm)			Duty Factor	Output Power (dBm)			Limit (dBm)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
36	5180	17.208	16.949	--	0.1	17.308	17.049	--	24	Pass
40	5200	16.193	17.007		0.1	16.293	17.107			
48	5240	16.41	16.771	--	0.1	16.51	16.871	--		

802.11n(HT20) mode										
CH No.	Frequency (MHz)	Measured Power (dBm)			Duty Factor	Output Power (dBm)			Limit (dBm)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
36	5180	14.896	14.376	17.654	0.1	14.996	14.476	17.754	24	Pass
40	5200	13.922	14.792	17.389	0.1	14.022	14.892	17.489		
48	5240	14.371	14.481	17.437	0.1	14.471	14.581	17.537		
802.11n(HT40) mode										
CH No.	Frequency (MHz)	Measured Power (dBm)			Duty Factor	Output Power (dBm)			Limit (dBm)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
38	5190	14.555	14.472	17.524	0.19	14.745	14.662	17.714	24	Pass
46	5230	14.271	14.417	17.355	0.21	14.481	14.627	17.565		
802.11ac(VHT20) mode										
CH No.	Frequency (MHz)	Measured Power (dBm)			Duty Factor	Output Power (dBm)			Limit (dBm)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
36	5180	14.872	14.206	17.562	0.19	15.062	14.396	17.752	24	Pass
40	5200	13.842	14.602	17.249	0.19	14.032	14.792	17.439		
48	5240	14.176	14.315	17.256	0.19	14.366	14.505	17.446		

802.11ac(VHT40) mode										
CH No.	Frequency (MHz)	Measured Power (dBm)			Duty Factor	Output Power (dBm)			Limit (dBm)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
38	5190	14.352	14.149	17.262	0.34	14.692	14.489	17.602	24	Pass
46	5230	14.046	14.031	17.049	0.37	14.416	14.401	17.419		
802.11ac(VHT80) mode										
CH No.	Frequency (MHz)	Measured Power (dBm)			Duty Factor	Output Power (dBm)			Limit (dBm)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
42	5210	13.659	13.536	16.608	0.63	14.289	14.166	17.238	24	Pass

Note: Output Power = Measured Power + Duty Factor
Duty Factor = 10 log (1/Duty Cycle)

7.4 Power Spectral Density

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407</td></tr>
<tr><td>Test Method:</td><td>KDB 789033 D02 General U-NII Test Procedures New Rules v02r01</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency band (MHz)</th><th>Limit</th></tr>
<tr><td rowspan="2">5150-5250</td><td>≤17dBm in 1MHz for master device</td></tr>
<tr><td>≤11dBm in 1MHz for client device</td></tr>
<tr><td>5250-5350</td><td>≤11dBm in 1MHz for client device</td></tr>
<tr><td>5470-5725</td><td>≤11dBm in 1MHz for client device</td></tr>
<tr><td colspan="2">Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test procedure:</td><td>1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”.
2) Use the peak search function on the instrument to find the peak of the spectrum.
3) Make the following adjustments to the peak value of the spectrum, if applicable:
a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.
b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4) The result is the PSD.</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 6 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.2 for details</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

Measurement Data Measurement Data

Modulation	Frequency (MHz)	Duty cycle		Duty Factor	
		Antenna1	Antenna2	Antenna1	Antenna2
802.11a	5180	97.83	97.83	0.1	0.1
	5200	97.82	97.81	0.1	0.1
	5240	97.82	97.82	0.1	0.1
802.11n(HT20)	5180	97.71	97.71	0.1	0.1
	5200	97.7	97.7	0.1	0.1
	5240	97.68	97.68	0.1	0.1
802.11n(HT40)	5190	95.65	95.65	0.19	0.19
	5230	95.36	95.36	0.21	0.21
802.11ac(VHT20)	5180	95.69	95.69	0.19	0.19
	5200	95.71	95.71	0.19	0.19
	5240	95.7	95.7	0.19	0.19
802.11ac(VHT40)	5190	92.43	92.43	0.34	0.34
	5230	91.91	91.91	0.37	0.37
802.11ac(VHT80)	5210	86.59	86.59	0.63	0.63

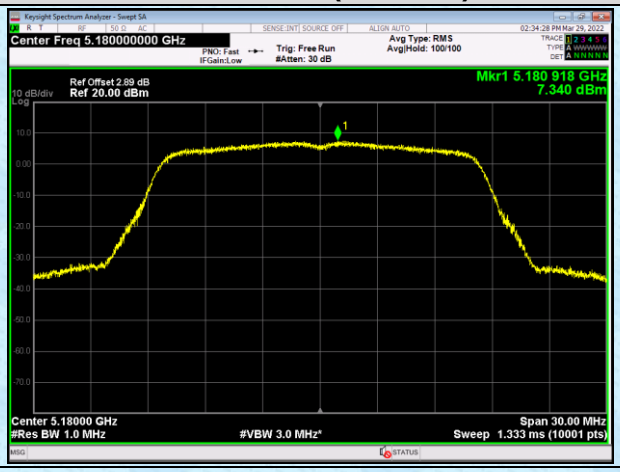
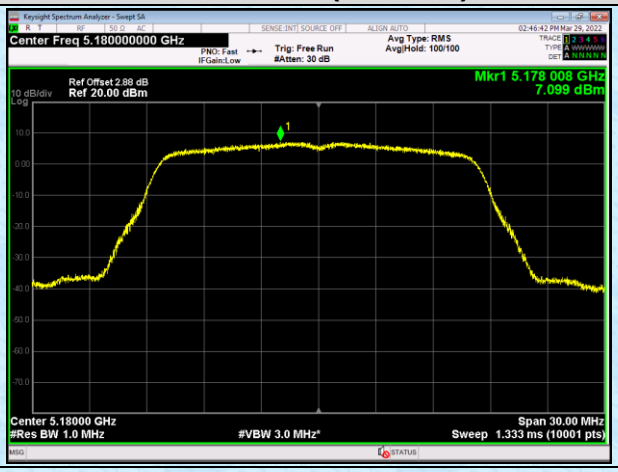
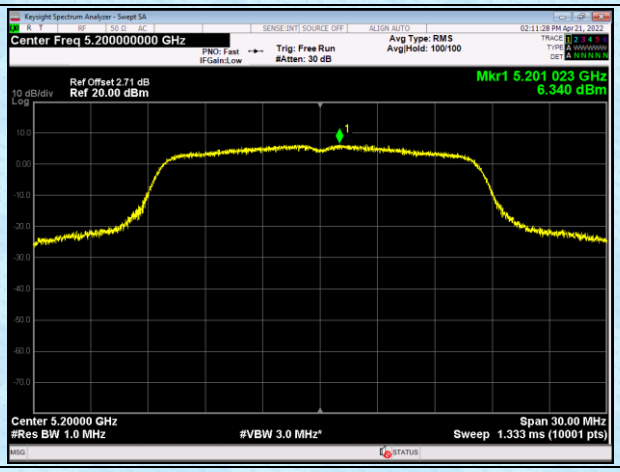
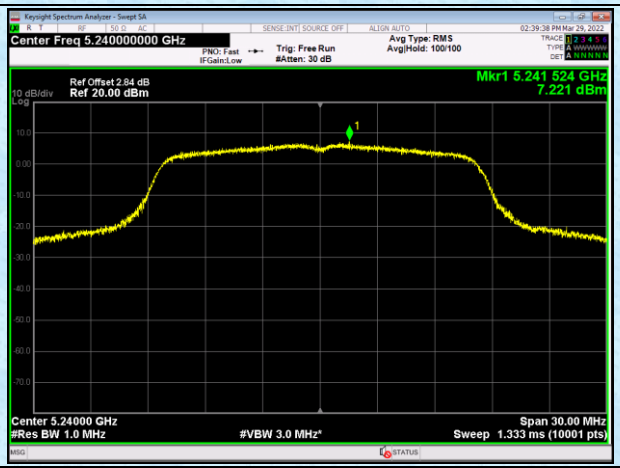
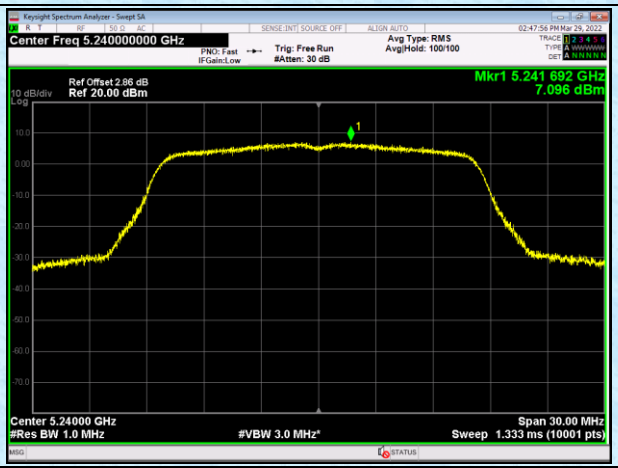
802.11a mode										
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)			Duty Factor	Total PSD Power(dBm/MHz)			Limit (dBm/MHz)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
36	5180	7.34	7.099	--	0.1	7.44	7.199	--	11	Pass
40	5200	6.34	7.228	--	0.1	6.44	7.328	--	11	Pass
48	5240	7.221	7.096	--	0.1	7.321	7.196	--	11	Pass

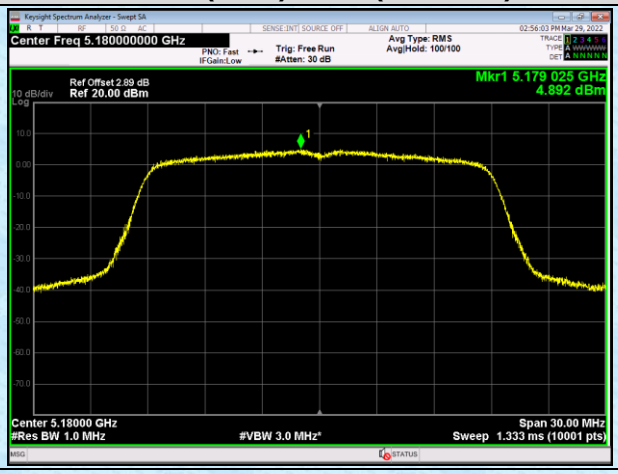
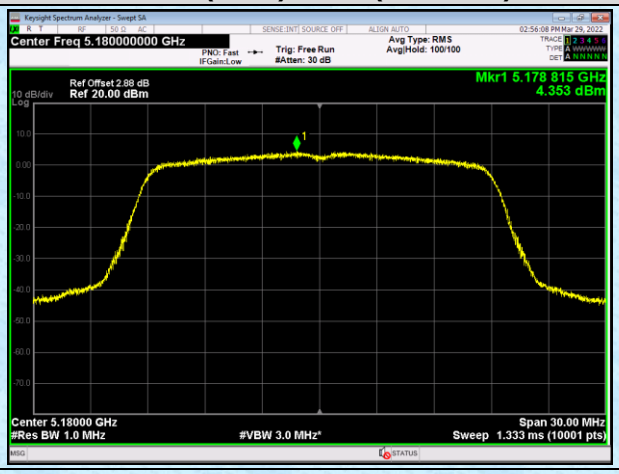
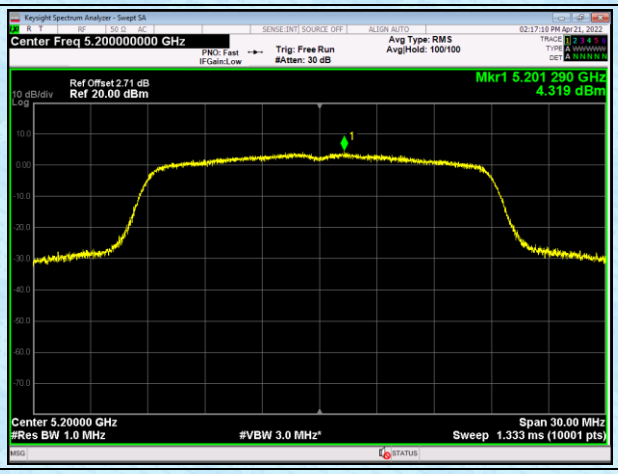
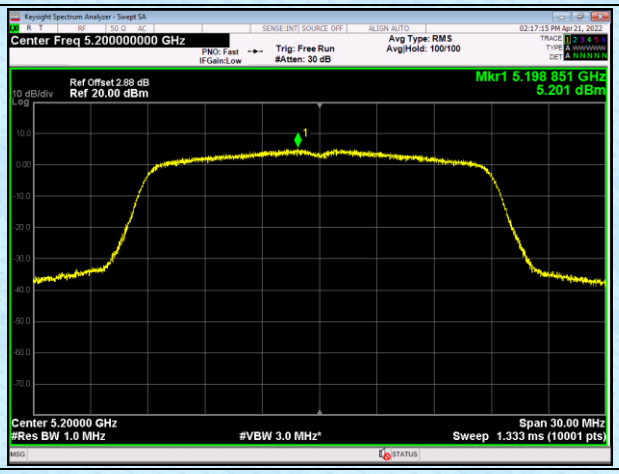
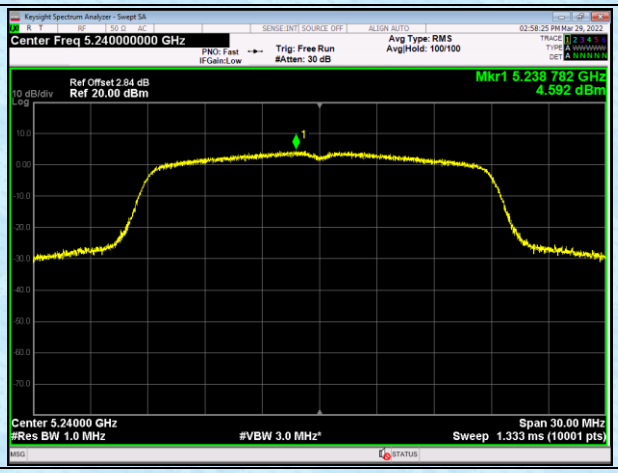
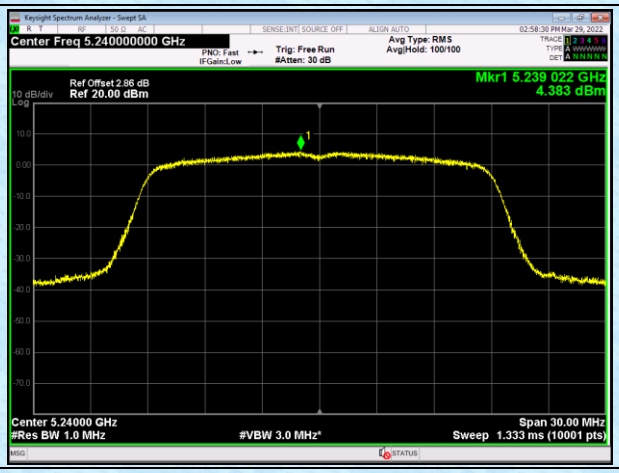
802.11n(HT20) mode										
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)			Duty Factor	Total PSD Power(dBm/MHz)			Limit (dBm/MHz)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
36	5180	4.892	4.353	7.641	0.1	4.992	4.453	7.741	11	Pass
40	5200	4.319	5.201	7.793	0.1	4.419	5.301	7.893	11	Pass
48	5240	4.592	4.383	7.499	0.1	4.692	4.483	7.599	11	Pass
802.11n(HT40) mode										
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)			Duty Factor	Total PSD Power(dBm/MHz)			Limit (dBm/MHz)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
38	5190	1.741	2.019	4.893	0.19	1.931	2.209	5.083	11	Pass
46	5230	2.193	1.772	4.998	0.21	2.403	1.982	5.208	11	Pass
802.11ac(VHT20) mode										
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)			Duty Factor	Total PSD Power(dBm/MHz)			Limit (dBm/MHz)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
36	5180	4.9	4.53	7.729	0.19	5.09	4.72	7.919	11	Pass
40	5200	4.184	4.981	7.611	0.19	4.374	5.171	7.801	11	Pass
48	5240	4.425	4.86	7.658	0.19	4.615	5.05	7.848	11	Pass
802.11ac(VHT40) mode										
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)			Duty Factor	Total PSD Power(dBm/MHz)			Limit (dBm/MHz)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
38	5190	1.468	1.506	4.497	0.34	1.808	1.846	4.837	11	Pass
46	5230	1.56	1.268	4.427	0.37	1.93	1.638	4.797	11	Pass

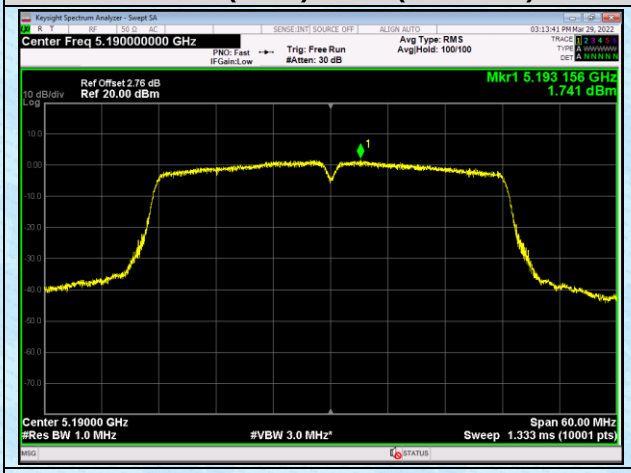
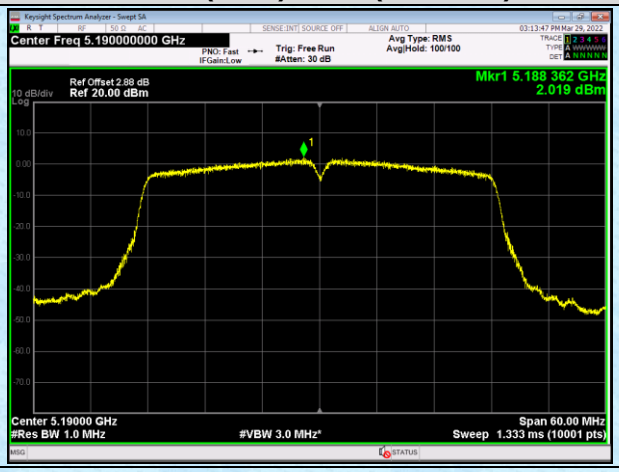
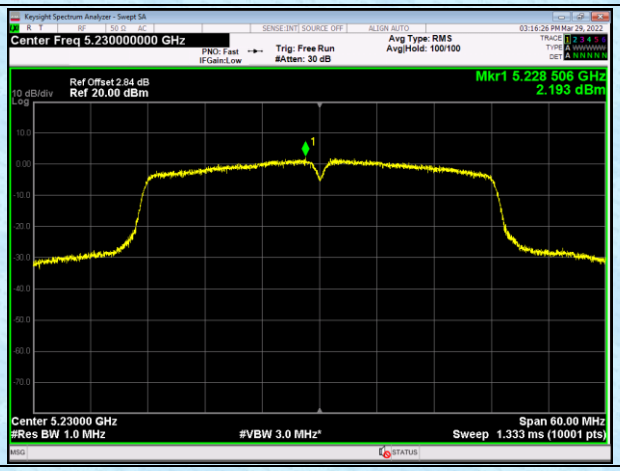
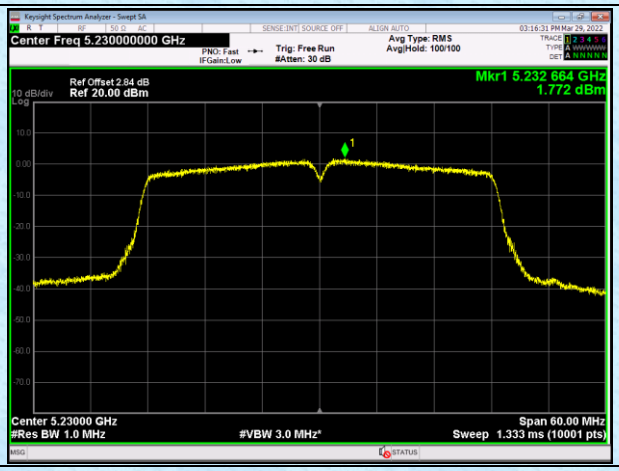
802.11ac(VHT80) mode										
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)			Duty Factor	Total PSD Power(dBm/MHz)			Limit (dBm/MHz)	Result
		ANT1	ANT2	ANT 1+2		ANT1	ANT2	ANT 1+2		
42	5210	-2.066	-2.163	0.896	0.63	-1.436	-1.533	1.526	11	Pass

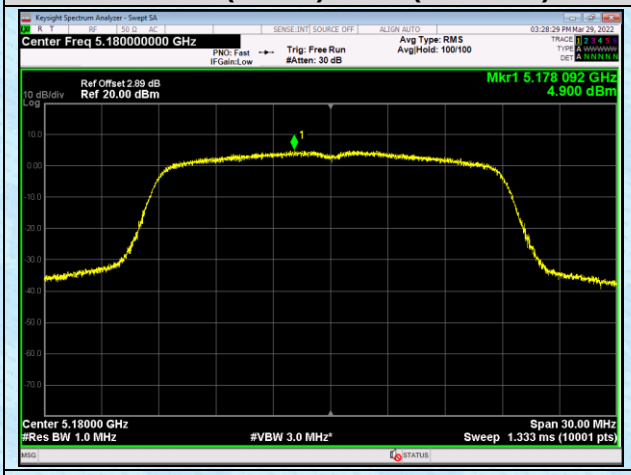
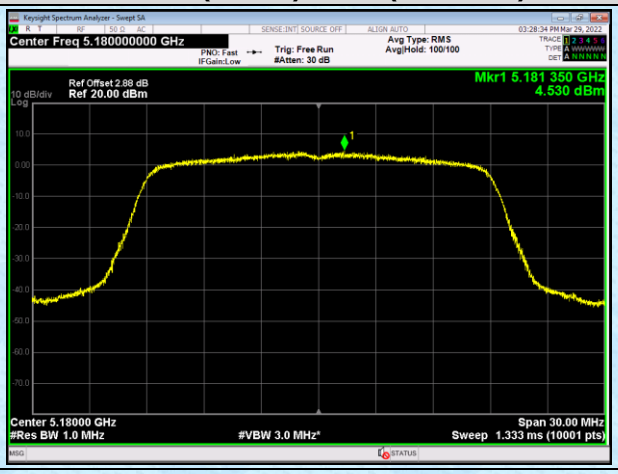
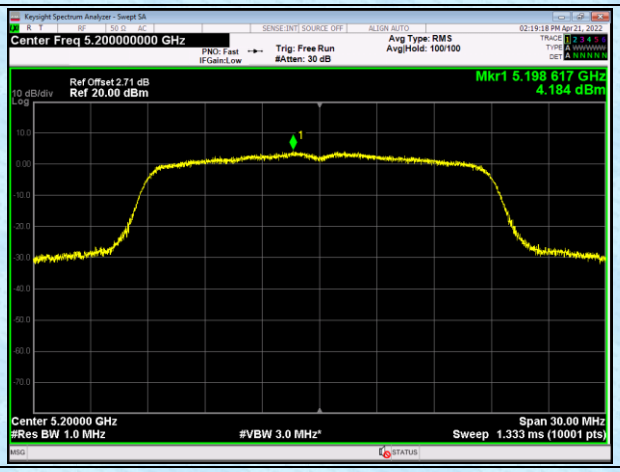
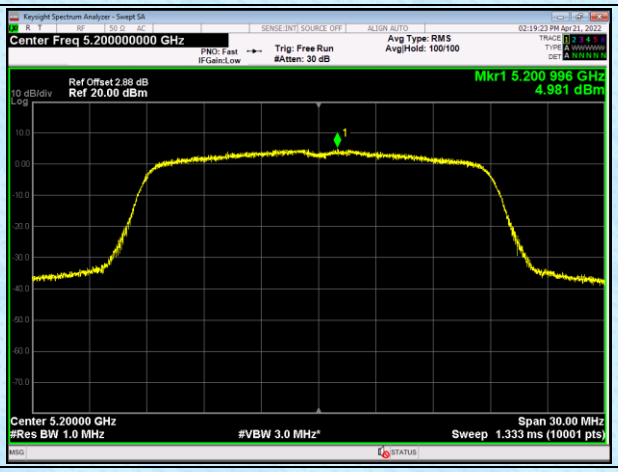
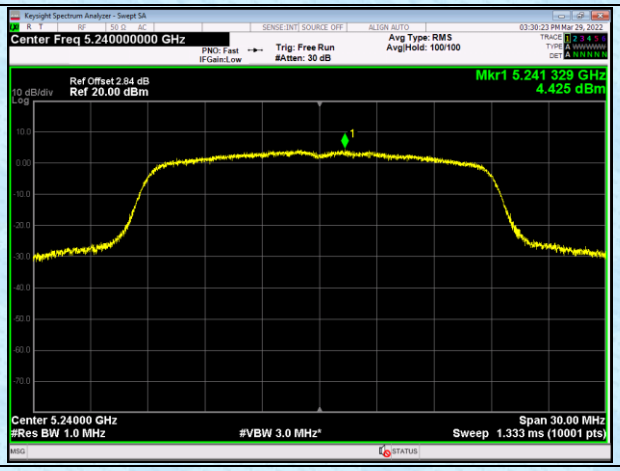
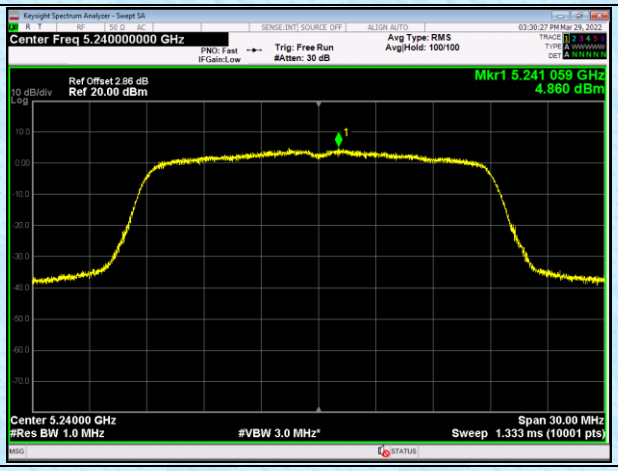
Note: Output Power = Measured Power + Duty Factor
Duty Factor = 10 log (1/Duty Cycle)

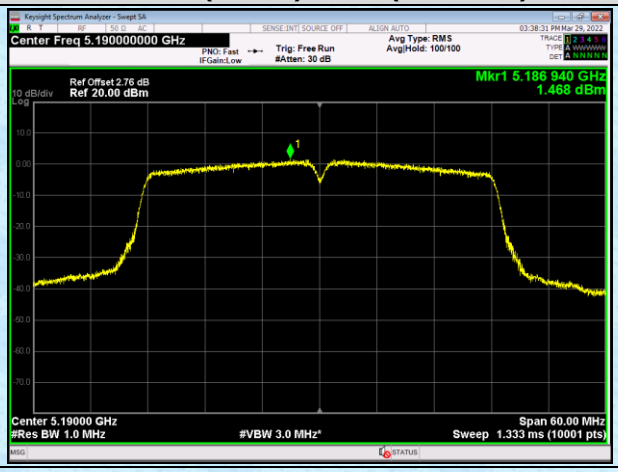
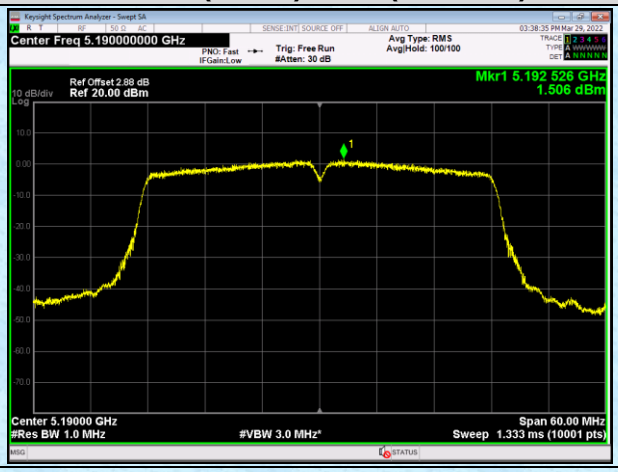
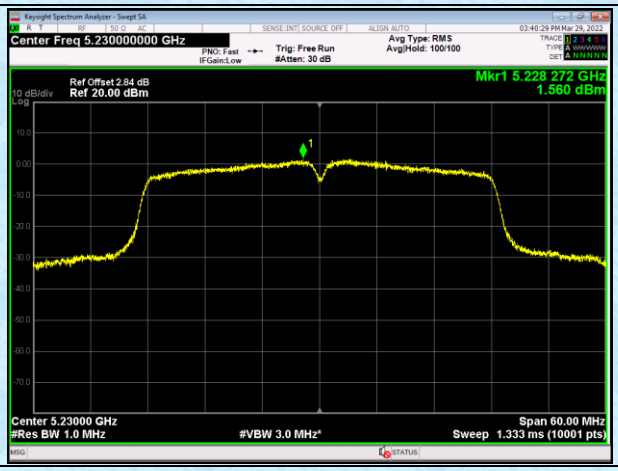
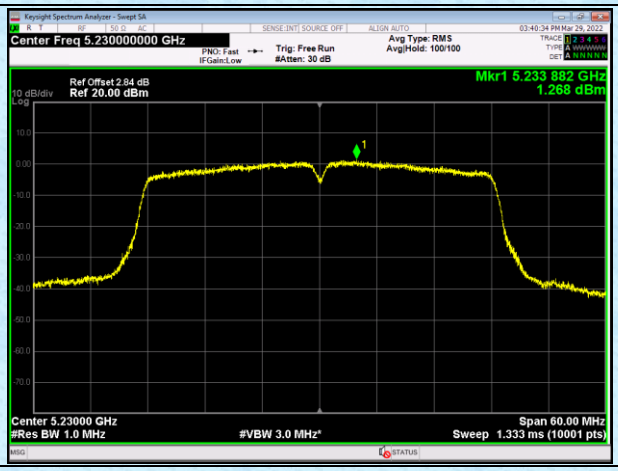
Test plots as followed:

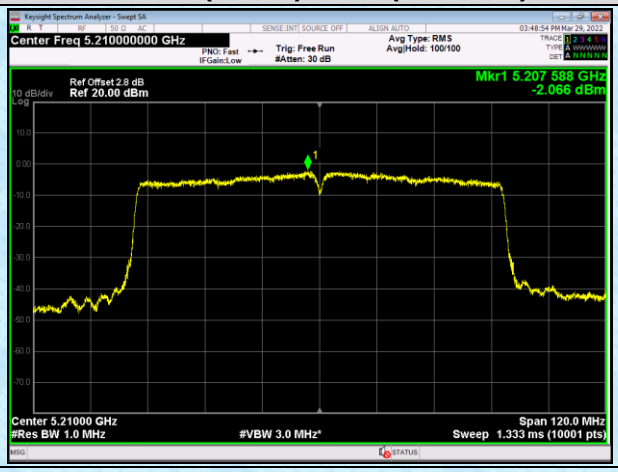
802.11a mode (Antenna1)	802.11a mode (Antenna2)
	
5180	**5180**
	
5200	**5200**
	
5240	**5240**

802.11n(HT20) mode (Antenna1)	802.11n(HT20) mode (Antenna2)
	
5180	5180
	
5200	5200
	
5240	5240

802.11n(HT40) mode (Antenna1)	802.11n(HT40) mode (Antenna2)
	
5190	**5190**
	
5230	**5230**

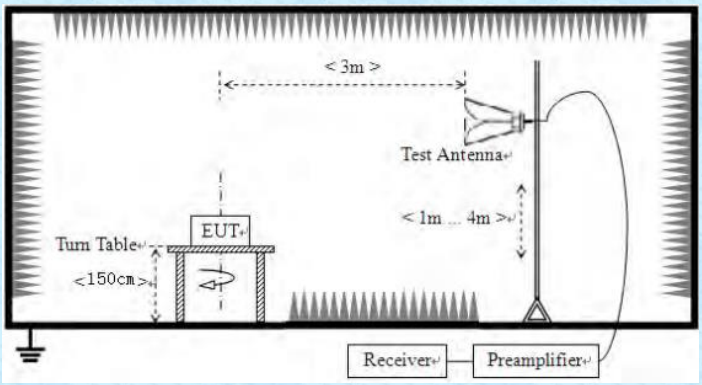
802.11ac(VHT20) mode (Antenna1)	802.11ac(VHT20) mode (Antenna2)
	
5180	5180
	
5200	5200
	
5240	5240

802.11ac(VHT40) mode (Antenna1)	802.11ac(VHT40) mode (Antenna2)
	
5190	5190
	
5230	5230

802.11ac(VHT80) mode (Antenna1)	802.11ac(VHT80) mode (Antenna2)
	
5210	5210

7.5 Band Edge

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>68.2</td><td>Peak Value</td></tr>
</table>
Undesirable emission limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
(3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.
</td></tr>
<tr><td>Test Procedure:</td><td>
a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height 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.
d. 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 rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not
</td></tr>
</table>

	have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test setup:	For radiated emissions above 1GHz 
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remarks:

1. *Only the worst case Main Antenna test data.*
2. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.*
5. *According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:*
   E[dBuV/m] = EIRP[dBm] + 95.2;
   For example, if EIRP = -27dBm
   E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

Worse case mode: ANT 1		802.11a		Test Frequency:		5180MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	52.97	-3.63	49.34	68.2	-18.86	peak	H
5150	49.14	-3.63	45.51	54	-8.49	AVG	H
5150	50.02	-3.63	46.39	68.2	-21.81	peak	V
5150	43.69	-3.63	40.06	54	-13.94	AVG	V

Worse case mode: ANT 1		802.11a		Test Frequency:		5240MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	50.43	-3.59	46.84	68.2	-21.36	peak	H
5350	48.52	-3.59	44.93	54	-9.07	AVG	H
5350	50.13	-3.59	46.54	68.2	-21.66	peak	V
5350	48.01	-3.59	44.42	54	-9.58	AVG	V

Worse case mode: SUM		802.11n(HT20)		Test Frequency:		5180MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	54.12	-3.63	50.49	68.2	-17.71	peak	H
5150	49.47	-3.63	45.84	54	-8.16	AVG	H
5150	49.43	-3.63	45.8	68.2	-22.4	peak	V
5150	43.82	-3.63	40.19	54	-13.81	AVG	V

Worse case mode: SUM		802.11n(HT20)		Test Frequency:		5240MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	51.02	-3.59	47.43	68.2	-20.77	peak	H
5350	50.16	-3.59	46.57	54	-7.43	AVG	H
5350	49.8	-3.59	46.21	68.2	-21.99	peak	V
5350	48.09	-3.59	44.5	54	-9.5	AVG	V

Worse case mode: SUM		802.11n(HT40)		Test Frequency:		5190MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	53.12	-3.63	49.49	68.2	-18.71	peak	H
5150	47.41	-3.63	43.78	54	-10.22	AVG	H
5150	53.5	-3.63	49.87	68.2	-18.33	peak	V
5150	46.52	-3.63	42.89	54	-11.11	AVG	V

Worse case mode: SUM		802.11n(HT40)		Test Frequency:		5230MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	51.62	-3.59	48.03	68.2	-20.17	peak	H
5350	46.23	-3.59	42.64	54	-11.36	AVG	H
5350	53.49	-3.59	49.9	68.2	-18.3	peak	V
5350	50.22	-3.59	46.63	54	-7.37	AVG	V

Worse case mode: SUM		802.11ac(VHT20)		Test Frequency:		5180MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	54.01	-3.63	50.38	68.2	-17.82	peak	H
5150	50.19	-3.63	46.56	54	-7.44	AVG	H
5150	50.8	-3.63	47.17	68.2	-21.03	peak	V
5150	43.39	-3.63	39.76	54	-14.24	AVG	V

Worse case mode: SUM		802.11ac(VHT20)		Test Frequency:		5240MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	50.07	-3.59	46.48	68.2	-21.72	peak	H
5350	49.79	-3.59	46.2	54	-7.8	AVG	H
5350	49.35	-3.59	45.76	68.2	-22.44	peak	V
5350	49.27	-3.59	45.68	54	-8.32	AVG	V

Worse case mode: SUM		802.11ac(VHT40)		Test Frequency:		5190MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	53.39	-3.63	49.76	68.2	-18.44	peak	H
5150	46.65	-3.63	43.02	54	-10.98	AVG	H
5150	51.95	-3.63	48.32	68.2	-19.88	peak	V
5150	49.64	-3.63	46.01	54	-7.99	AVG	V

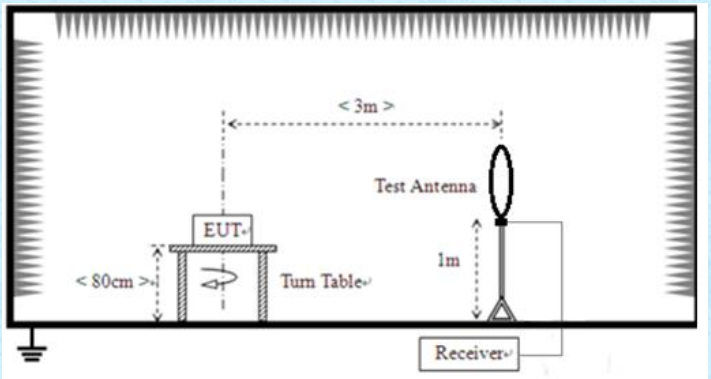
Worse case mode: SUM		802.11ac(VHT40)		Test Frequency:		5230MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	53.21	-3.59	49.62	68.2	-18.58	peak	H
5350	49.67	-3.59	46.08	54	-7.92	AVG	H
5350	53.37	-3.59	49.78	68.2	-18.42	peak	V
5350	46.3	-3.59	42.71	54	-11.29	AVG	V

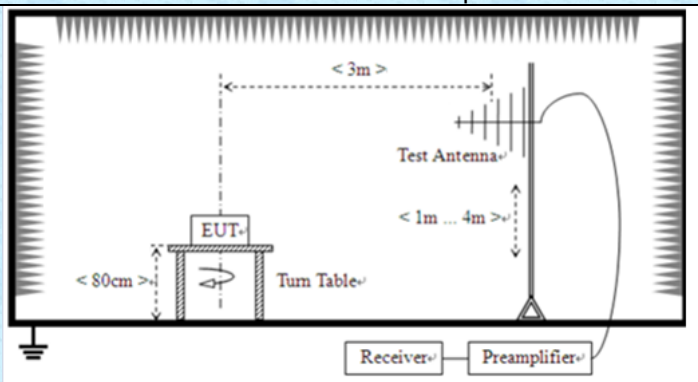
Worse case mode: SUM		802.11ac(VHT80)		Test Frequency:		5210MHz	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	52.47	-3.63	48.84	68.2	-19.36	peak	H
5150	45.7	-3.63	42.07	54	-11.93	AVG	H
5150	53.48	-3.63	49.85	68.2	-18.35	peak	V
5150	46.68	-3.63	43.05	54	-10.95	AVG	V
5350	51.92	-3.59	48.33	68.2	-19.87	peak	H
5350	45.66	-3.59	42.07	54	-11.93	AVG	H
5350	54.08	-3.59	50.49	68.2	-17.71	peak	V
5350	47	-3.59	43.41	54	-10.59	AVG	V

Measurement Data:

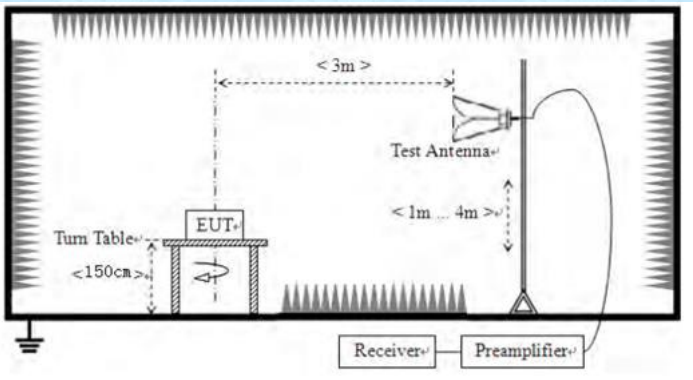
7.6 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209 and 15.205, Part 15E Section 15.407(b)(4)</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Value</th></tr>
<tr><td>9kHz-150KHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (uV/m)</th><th>Value</th><th>Measurement Distance</th></tr>
<tr><td>0.009MHz-0.490MHz</td><td>2400/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>0.490MHz-1.705MHz</td><td>24000/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>1.705MHz-30MHz</td><td>30</td><td>QP</td><td>30m</td></tr>
<tr><td>30MHz-88MHz</td><td>100</td><td>QP</td><td rowspan="4">3m</td></tr>
<tr><td>88MHz-216MHz</td><td>150</td><td>QP</td></tr>
<tr><td>216MHz-960MHz</td><td>200</td><td>QP</td></tr>
<tr><td>960MHz-1GHz</td><td>500</td><td>QP</td></tr>
<tr><td>Frequency</td><td>Limit (dBuV/m)</td><td colspan="2">Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>68.20</td><td colspan="2">Peak</td></tr>
<tr><td>54.00</td><td colspan="2">Average</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>Substitution method was performed to determine the actual ERP emission levels of the EUT.
The following test procedure as below:
1>.Below 1GHz test procedure:
1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. 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 antenna height 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 rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported</td></tr>
</table>

	in a data sheet. 2>.Above 1GHz test procedure: 1. On the test site as test setup graph above,the EUT shall be placed at the 0.8m support on the turntable and in the position closest to normal use as declared by the provider. 2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver. 3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test. 4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. 5. Repeat step 4 for test frequency with the test antenna polarized horizontally. 6. Remove the transmitter and replace it with a substitution antenna 7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output. 8. Repeat step 7 with both antennas horizontally polarized for each test frequency. 9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi) where: Pg is the generator output power into the substitution antenna.
Test setup:	For radiated emissions from 9kHz to 30MHz  For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	DC 5V					
Test results:	Pass					

Remarks:

1. For 802.11a test, only the worse case (ANT A) test result recorded in the report, For 802.11n(HT20)/ 802.11n(HT40)/ 802.11ac(VHT20)/ 802.11ac(VHT40)/ 802.11ac(VHT80), only the worse case(MIMO) test result recorded in the report.
2. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

Measurement Data:

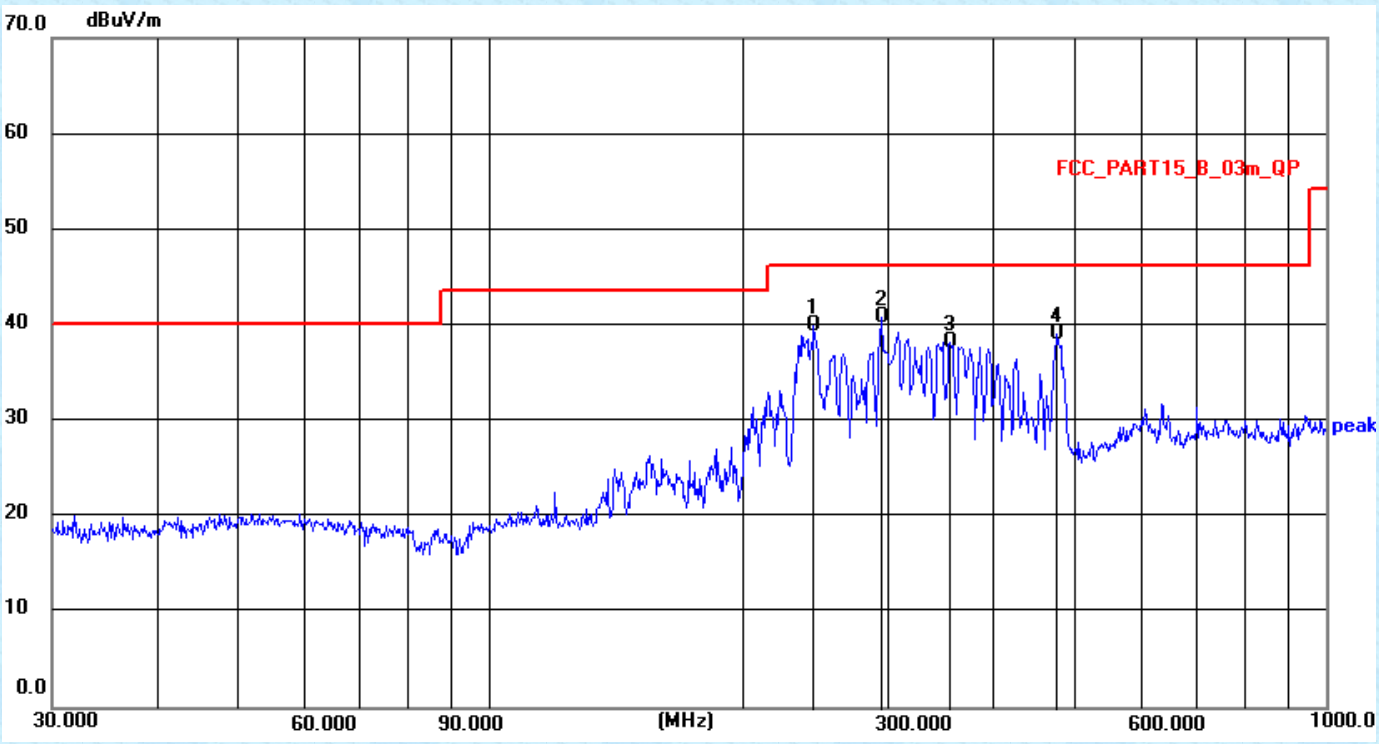
9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

30MHz~ 1GHz

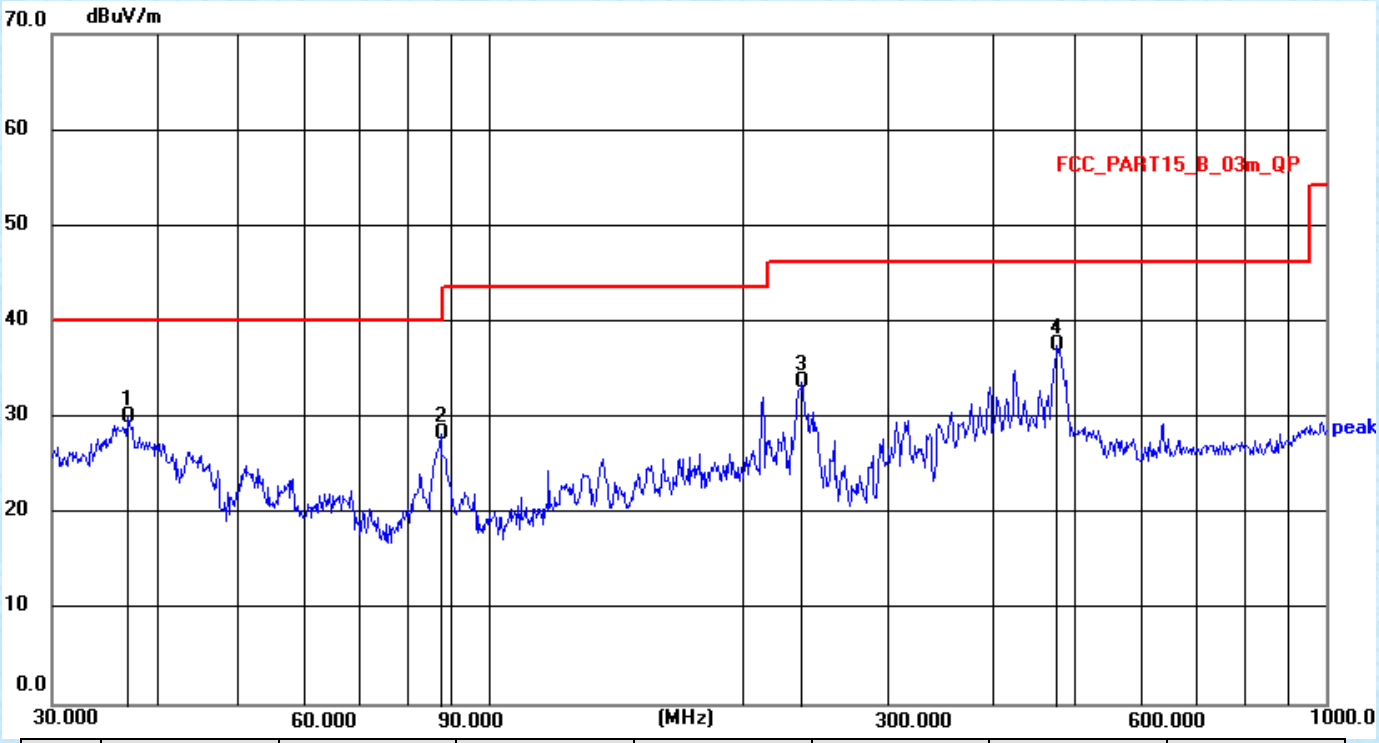
Pre-scan all test modes, found worst case at 802.11n(HT20) 5180MHz of MIMO, and so only show the test result of 802.11n(HT20) 5180MHz of MIMO.

Horizont



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	244.2321	26.54	13.43	39.97	46.00	6.03	QP
2	294.1136	26.16	14.62	40.78	46.00	5.22	QP
3	355.4272	22.21	15.94	38.15	46.00	7.85	QP
4	477.1693	20.78	18.32	39.10	46.00	6.90	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	37.0248	16.54	13.44	29.98	40.00	10.02	QP
2	87.4175	17.31	11.00	28.31	40.00	11.69	QP
3	236.6447	20.39	13.22	33.61	46.00	12.39	QP
4	477.1693	19.12	18.32	37.44	46.00	8.56	QP

Above 1GHz:

802.11a					Test Frequency: 5180MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	37.76	38.96	8.27	35.64	49.35	68.2	-18.85	Vertical
15540	36.06	38.4	10.57	35.35	49.68	68.2	-18.52	Vertical
10360	36.24	38.96	8.27	35.64	47.83	68.2	-20.37	Horizontal
15540	33.2	38.4	10.57	35.35	46.82	68.2	-21.38	Horizontal
10360	31.09	38.96	8.27	35.64	42.68	54	-11.32	Vertical
15540	29.03	38.4	10.57	35.35	42.65	54	-11.35	Vertical
10360	27.06	38.96	8.27	35.64	38.65	54	-15.35	Horizontal
15540	28.07	38.4	10.57	35.35	41.69	54	-12.31	Horizontal

802.11a					Test Frequency: 5200MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	35.46	39.01	8.29	35.67	47.09	68.2	-21.11	Vertical
15600	31.61	38.3	10.62	35.36	45.17	68.2	-23.03	Vertical
10400	33.49	39.01	8.29	35.67	45.12	68.2	-23.08	Horizontal
15600	28.79	38.3	10.62	35.36	42.35	68.2	-25.85	Horizontal
10400	28.5	39.01	8.29	35.67	40.13	54	-13.87	Vertical
15600	26.84	38.3	10.62	35.36	40.4	54	-13.6	Vertical
10400	23.61	39.01	8.29	35.67	35.24	54	-18.76	Horizontal
15600	23.6	38.3	10.62	35.36	37.16	54	-16.84	Horizontal

802.11a					Test Frequency: 5240MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	38.57	39.15	8.32	35.78	50.26	68.2	-17.94	Vertical
15720	34.76	38	10.72	35.37	48.11	68.2	-20.09	Vertical
10480	34.32	39.15	8.32	35.78	46.01	68.2	-22.19	Horizontal
15720	34.49	38	10.72	35.37	47.84	68.2	-20.36	Horizontal
10480	28.28	39.15	8.32	35.78	39.97	54	-14.03	Vertical
15720	27.46	38	10.72	35.37	40.81	54	-13.19	Vertical
10480	28.33	39.15	8.32	35.78	40.02	54	-13.98	Horizontal
15720	23.49	38	10.72	35.37	36.84	54	-17.16	Horizontal

802.11n(HT20)					Test Frequency: 5180MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	37.76	38.96	8.27	35.64	49.35	68.2	-18.85	Vertical
15540	35.58	38.4	10.57	35.35	49.2	68.2	-19	Vertical
10360	37.81	38.96	8.27	35.64	49.4	68.2	-18.8	Horizontal
15540	34.09	38.4	10.57	35.35	47.71	68.2	-20.49	Horizontal
10360	29.39	38.96	8.27	35.64	40.98	54	-13.02	Vertical
15540	27.83	38.4	10.57	35.35	41.45	54	-12.55	Vertical
10360	27.02	38.96	8.27	35.64	38.61	54	-15.39	Horizontal
15540	28.8	38.4	10.57	35.35	42.42	54	-11.58	Horizontal

802.11n(HT20)					Test Frequency: 5200MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	35.37	39.01	8.29	35.67	47	68.2	-21.2	Vertical
15600	31.06	38.3	10.62	35.36	44.62	68.2	-23.58	Vertical
10400	33.35	39.01	8.29	35.67	44.98	68.2	-23.22	Horizontal
15600	28.73	38.3	10.62	35.36	42.29	68.2	-25.91	Horizontal
10400	28.45	39.01	8.29	35.67	40.08	54	-13.92	Vertical
15600	26.68	38.3	10.62	35.36	40.24	54	-13.76	Vertical
10400	23.26	39.01	8.29	35.67	34.89	54	-19.11	Horizontal
15600	23.27	38.3	10.62	35.36	36.83	54	-17.17	Horizontal

802.11n(HT20)					Test Frequency: 5240MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	38.26	39.15	8.32	35.78	49.95	68.2	-18.25	Vertical
15720	35.6	38	10.72	35.37	48.95	68.2	-19.25	Vertical
10480	35.01	39.15	8.32	35.78	46.7	68.2	-21.5	Horizontal
15720	34.28	38	10.72	35.37	47.63	68.2	-20.57	Horizontal
10480	29.9	39.15	8.32	35.78	41.59	54	-12.41	Vertical
15720	25.77	38	10.72	35.37	39.12	54	-14.88	Vertical
10480	27.08	39.15	8.32	35.78	38.77	54	-15.23	Horizontal
15720	24.28	38	10.72	35.37	37.63	54	-16.37	Horizontal

802.11n(HT40)					Test Frequency: 5190MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380	38.13	39.01	8.28	35.67	49.75	68.2	-18.45	Vertical
15570	34.53	38.3	10.6	35.36	48.07	68.2	-20.13	Vertical
10380	35.83	39.01	8.28	35.67	47.45	68.2	-20.75	Horizontal
15570	32.78	38.3	10.6	35.36	46.32	68.2	-21.88	Horizontal
10380	28.71	39.01	8.28	35.67	40.33	54	-13.67	Vertical
15570	28.18	38.3	10.6	35.36	41.72	54	-12.28	Vertical
10380	29.74	39.01	8.28	35.67	41.36	54	-12.64	Horizontal
15570	24.74	38.3	10.6	35.36	38.28	54	-15.72	Horizontal

802.11n(HT40)					Test Frequency: 5230MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460	37.89	39.11	8.31	35.75	49.56	68.2	-18.64	Vertical
15690	35.21	38.1	10.7	35.37	48.64	68.2	-19.56	Vertical
10460	34.79	39.11	8.31	35.75	46.46	68.2	-21.74	Horizontal
15690	33.39	38.1	10.7	35.37	46.82	68.2	-21.38	Horizontal
10460	32.39	39.11	8.31	35.75	44.06	54	-9.94	Vertical
15690	29.75	38.1	10.7	35.37	43.18	54	-10.82	Vertical
10460	27.2	39.11	8.31	35.75	38.87	54	-15.13	Horizontal
15690	27.97	38.1	10.7	35.37	41.4	54	-12.6	Horizontal

802.11ac(VHT20)					Test Frequency: 5180MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	37.92	38.96	8.27	35.64	49.51	68.2	-18.69	Vertical
15540	36.73	38.4	10.57	35.35	50.35	68.2	-17.85	Vertical
10360	37.57	38.96	8.27	35.64	49.16	68.2	-19.04	Horizontal
15540	33.57	38.4	10.57	35.35	47.19	68.2	-21.01	Horizontal
10360	29.88	38.96	8.27	35.64	41.47	54	-12.53	Vertical
15540	28.8	38.4	10.57	35.35	42.42	54	-11.58	Vertical
10360	28.76	38.96	8.27	35.64	40.35	54	-13.65	Horizontal
15540	28.61	38.4	10.57	35.35	42.23	54	-11.77	Horizontal

802.11ac(VHT20)					Test Frequency: 5200MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	34.46	39.01	8.29	35.67	46.09	68.2	-22.11	Vertical
15600	30.67	38.3	10.62	35.36	44.23	68.2	-23.97	Vertical
10400	32.46	39.01	8.29	35.67	44.09	68.2	-24.11	Horizontal
15600	28.01	38.3	10.62	35.36	41.57	68.2	-26.63	Horizontal
10400	28.29	39.01	8.29	35.67	39.92	54	-14.08	Vertical
15600	26.18	38.3	10.62	35.36	39.74	54	-14.26	Vertical
10400	22.53	39.01	8.29	35.67	34.16	54	-19.84	Horizontal
15600	22.55	38.3	10.62	35.36	36.11	54	-17.89	Horizontal

802.11ac(VHT20)					Test Frequency: 5240MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	38.47	39.15	8.32	35.78	50.16	68.2	-18.04	Vertical
15720	35.15	38	10.72	35.37	48.5	68.2	-19.7	Vertical
10480	35.1	39.15	8.32	35.78	46.79	68.2	-21.41	Horizontal
15720	35.91	38	10.72	35.37	49.26	68.2	-18.94	Horizontal
10480	28.8	39.15	8.32	35.78	40.49	54	-13.51	Vertical
15720	26.45	38	10.72	35.37	39.8	54	-14.2	Vertical
10480	26.66	39.15	8.32	35.78	38.35	54	-15.65	Horizontal
15720	24.53	38	10.72	35.37	37.88	54	-16.12	Horizontal

802.11ac(VHT40)					Test Frequency: 5190MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380	38.82	39.01	8.28	35.67	50.44	68.2	-17.76	Vertical
15570	34.88	38.3	10.6	35.36	48.42	68.2	-19.78	Vertical
10380	36.14	39.01	8.28	35.67	47.76	68.2	-20.44	Horizontal
15570	31.02	38.3	10.6	35.36	44.56	68.2	-23.64	Horizontal
10380	28.92	39.01	8.28	35.67	40.54	54	-13.46	Vertical
15570	28.37	38.3	10.6	35.36	41.91	54	-12.09	Vertical
10380	28.81	39.01	8.28	35.67	40.43	54	-13.57	Horizontal
15570	26.26	38.3	10.6	35.36	39.8	54	-14.2	Horizontal

802.11ac(VHT40)					Test Frequency: 5230MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460	37.17	39.11	8.31	35.75	48.84	68.2	-19.36	Vertical
15690	34.16	38.1	10.7	35.37	47.59	68.2	-20.61	Vertical
10460	35.34	39.11	8.31	35.75	47.01	68.2	-21.19	Horizontal
15690	32.89	38.1	10.7	35.37	46.32	68.2	-21.88	Horizontal
10460	32.11	39.11	8.31	35.75	43.78	54	-10.22	Vertical
15690	30.85	38.1	10.7	35.37	44.28	54	-9.72	Vertical
10460	25.78	39.11	8.31	35.75	37.45	54	-16.55	Horizontal
15690	28.29	38.1	10.7	35.37	41.72	54	-12.28	Horizontal

802.11ac(VHT80)					Test Frequency: 5210MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420	38.48	39.06	8.29	35.71	50.12	68.2	-18.08	Vertical
15630	35.96	38.2	10.65	35.36	49.45	68.2	-18.75	Vertical
10420	37.68	39.06	8.29	35.71	49.32	68.2	-18.88	Horizontal
15630	35.1	38.2	10.65	35.36	48.59	68.2	-19.61	Horizontal
10420	31.73	39.06	8.29	35.71	43.37	54	-10.63	Vertical
15630	30.13	38.2	10.65	35.36	43.62	54	-10.38	Vertical
10420	26.56	39.06	8.29	35.71	38.2	54	-15.8	Horizontal
15630	29.01	38.2	10.65	35.36	42.5	54	-11.5	Horizontal

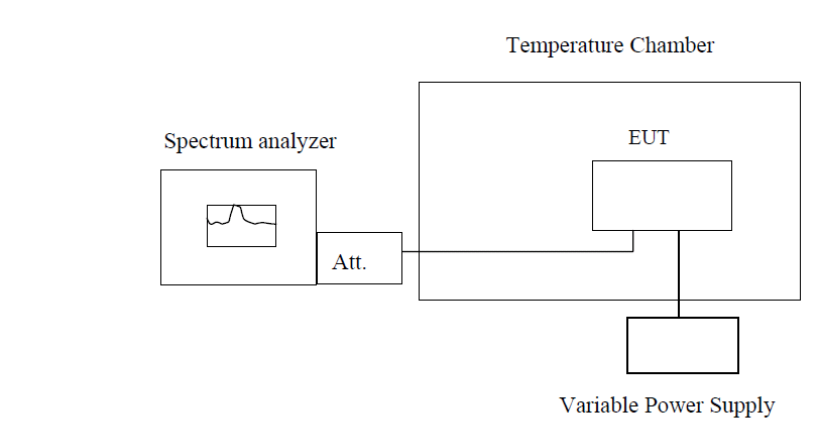
Notes:

1. Level = Read Level + Antenna Factor+ Cable loss- Preamp Factor.

2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.

3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

7.7 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.10:2013, FCC Part 2.1055
Limit:	Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	The EUT was setup to ANSI C63.4, 2003; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

Measurement data:

Frequency stability versus Temp.													
Worst Case Operating Frequency：5180MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
-30	5	5180.0339	6.54	P	5180.0296	5.71	P	5180.0323	6.24	P	5180.0333	6.43	P
-20	5	5179.9868	-2.55	P	5179.9915	-1.64	P	5179.9882	-2.28	P	5179.9874	-2.43	P
-10	5	5179.975	-4.83	P	5179.9825	-3.38	P	5179.9777	-4.31	P	5179.9751	-4.81	P
0	5	5180.0181	3.49	P	5180.0245	4.73	P	5180.0157	3.03	P	5180.0235	4.54	P
10	5	5179.9634	-7.07	P	5179.9599	-7.74	P	5179.9571	-8.28	P	5179.9634	-7.07	P
20	5	5179.9497	-9.71	P	5179.952	-9.27	P	5179.9524	-9.19	P	5179.9532	-9.03	P
30	5	5180.0221	4.27	P	5180.0233	4.5	P	5180.0248	4.79	P	5180.0232	4.48	P
40	5	5180.0062	1.2	P	5180.0006	0.12	P	5180.0086	1.66	P	5179.9951	-0.95	P
50	5	5179.9807	-3.73	P	5179.9751	-4.81	P	5179.9747	-4.88	P	5179.9746	-4.9	P
Frequency stability versus Voltage.													
Worst Case Operating Frequency：5180MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
25	4.25	5180.0271	5.23	P	5179.9904	-1.85	P	5180	0	P	5180.032	6.18	P
25	5	5179.993	-1.35	P	5179.9768	-4.48	P	5180.0314	6.06	P	5179.986	-2.7	P
25	5.75	5179.9753	-4.77	P	5180	0	P	5179.9895	-2.03	P	5180	0	P

Frequency stability versus Temp.													
Worst Case Operating Frequency：5200MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
-30	5	5200.01	1.92	P	5200.0104	2	P	5200.0075	1.44	P	5200.0058	1.12	P
-20	5	5199.9899	-1.94	P	5199.9882	-2.27	P	5199.9904	-1.85	P	5199.9946	-1.04	P
-10	5	5199.9821	-3.44	P	5199.983	-3.27	P	5199.9745	-4.9	P	5199.9781	-4.21	P
0	5	5200.0175	3.37	P	5200.0186	3.58	P	5200.0216	4.15	P	5200.0161	3.1	P
10	5	5199.962	-7.31	P	5199.9574	-8.19	P	5199.9568	-8.31	P	5199.9609	-7.52	P
20	5	5199.9496	-9.69	P	5199.9488	-9.85	P	5199.9528	-9.08	P	5199.9497	-9.67	P
30	5	5200.0178	3.42	P	5200.018	3.46	P	5200.0243	4.67	P	5200.0246	4.73	P
40	5	5200.0027	0.52	P	5200.0032	0.62	P	5200.0016	0.31	P	5200.0031	0.6	P
50	5	5199.977	-4.42	P	5199.9812	-3.62	P	5199.9841	-3.06	P	5199.9823	-3.4	P
Frequency stability versus Voltage.													
Worst Case Operating Frequency：5200MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
25	4.25	5200.0184	3.54	P	5200.0158	3.04	P	5200.0146	2.81	P	5200.0134	2.58	P
25	5	5199.9874	-2.42	P	5199.9871	-2.48	P	5199.9891	-2.1	P	5199.9905	-1.83	P
25	5.75	5199.9799	-3.87	P	5199.9757	-4.67	P	5199.9791	-4.02	P	5199.9812	-3.62	P

Frequency stability versus Temp.													
Worst Case Operating Frequency：5240MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
-30	5	5240.0273	5.21	P	5240.0356	6.79	P	5240.0337	6.43	P	5240.0312	5.95	P
-20	5	5239.993	-1.34	P	5239.9884	-2.21	P	5239.9879	-2.31	P	5239.9896	-1.98	P
-10	5	5239.9791	-3.99	P	5239.979	-4.01	P	5239.9796	-3.89	P	5239.9813	-3.57	P
0	5	5240.0214	4.08	P	5240.0189	3.61	P	5240.0238	4.54	P	5240.0216	4.12	P
10	5	5239.9534	-8.89	P	5239.9534	-8.89	P	5239.9602	-7.6	P	5239.9584	-7.94	P
20	5	5239.9511	-9.33	P	5239.9502	-9.5	P	5239.9499	-9.56	P	5239.9501	-9.52	P
30	5	5240.0228	4.35	P	5240.0257	4.9	P	5240.0233	4.45	P	5240.016	3.05	P
40	5	5240.0035	0.67	P	5240.0102	1.95	P	5239.9998	-0.04	P	5239.9971	-0.55	P
50	5	5239.9797	-3.87	P	5239.9806	-3.7	P	5239.9822	-3.4	P	5239.9786	-4.08	P
Frequency stability versus Voltage.													
Worst Case Operating Frequency：5240MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
25	4.25	5239.9768	-4.43	P	5239.9745	-4.87	P	5240	0	P	5239.978	-4.2	P
25	5	5240.0195	3.72	P	5240.0204	3.89	P	5240.0193	3.68	P	5240.0259	4.94	P
25	5.75	5240.0068	1.3	P	5240.007	1.34	P	5240.0087	1.66	P	5239.9981	-0.36	P

Frequency stability versus Temp.													
Worst Case Operating Frequency：5190MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
-30	5	5190.0248	4.78	P	5190.0104	2	P	5190.0233	4.49	P	5190.0128	2.47	P
-20	5	5189.9895	-2.02	P	5189.9914	-1.66	P	5189.9857	-2.76	P	5189.9897	-1.98	P
-10	5	5189.9808	-3.7	P	5189.9773	-4.37	P	5189.9834	-3.2	P	5189.9821	-3.45	P
0	5	5190.0189	3.64	P	5190.0157	3.03	P	5190.0171	3.29	P	5190.025	4.82	P
10	5	5189.9548	-8.71	P	5189.9605	-7.61	P	5189.9551	-8.65	P	5189.9626	-7.21	P
20	5	5189.9496	-9.71	P	5189.9491	-9.81	P	5189.9528	-9.09	P	5189.95	-9.63	P
30	5	5190.0203	3.91	P	5190.018	3.47	P	5190.0234	4.51	P	5190.0205	3.95	P
40	5	5190.0095	1.83	P	5190.0053	1.02	P	5190.0043	0.83	P	5190.003	0.58	P
50	5	5189.9797	-3.91	P	5189.9804	-3.78	P	5189.978	-4.24	P	5189.9765	-4.53	P
Frequency stability versus Voltage.													
Worst Case Operating Frequency：5190MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
25	4.25	5189.9807	-3.72	P	5189.9881	-2.29	P	5189.9848	-2.93	P	5189.9797	-3.91	P
25	5	5190.02	3.85	P	5190.0174	3.35	P	5190.0228	4.39	P	5190.0226	4.35	P
25	5.75	5190	0	P	5190.0049	0.94	P	5190.0071	1.37	P	5190.0059	1.14	P

Frequency stability versus Temp.													
Worst Case Operating Frequency：5230MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
-30	5	5230.0112	2.14	P	5230.0228	4.36	P	5230.0186	3.56	P	5230.0229	4.38	P
-20	5	5229.9943	-1.09	P	5229.9936	-1.22	P	5229.988	-2.29	P	5229.9901	-1.89	P
-10	5	5229.9834	-3.17	P	5229.9763	-4.53	P	5229.9808	-3.67	P	5229.9768	-4.44	P
0	5	5230.0208	3.98	P	5230.0175	3.35	P	5230.0198	3.79	P	5230.0179	3.42	P
10	5	5229.9564	-8.34	P	5229.9605	-7.55	P	5229.9631	-7.06	P	5229.9596	-7.72	P
20	5	5229.9507	-9.43	P	5229.9496	-9.64	P	5229.9491	-9.73	P	5229.9523	-9.12	P
30	5	5230.0236	4.51	P	5230.018	3.44	P	5230.0235	4.49	P	5230.0203	3.88	P
40	5	5230.0094	1.8	P	5230.0087	1.66	P	5230.0039	0.75	P	5230.0039	0.75	P
50	5	5229.982	-3.44	P	5229.9824	-3.37	P	5229.9823	-3.38	P	5229.9819	-3.46	P
Frequency stability versus Voltage.													
Worst Case Operating Frequency：5230MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
25	4.25	5229.9526	-9.06	P	5229.9872	-2.45	P	5230	0	P	5229.9884	-2.22	P
25	5	5230.0187	3.58	P	5230.0186	3.56	P	5230.0207	3.96	P	5230.0163	3.12	P
25	5.75	5229.9951	-0.94	P	5230.0104	1.99	P	5230.0092	1.76	P	5230.0042	0.8	P

Frequency stability versus Temp.													
Worst Case Operating Frequency：5210MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
-30	5	5210.0181	3.47	P	5210.0183	3.51	P	5210.0116	2.23	P	5210.0158	3.03	P
-20	5	5209.9942	-1.11	P	5209.9861	-2.67	P	5209.9877	-2.36	P	5209.994	-1.15	P
-10	5	5209.9774	-4.34	P	5209.9748	-4.84	P	5209.9763	-4.55	P	5209.9781	-4.2	P
0	5	5210.0196	3.76	P	5210.0232	4.45	P	5210.0196	3.76	P	5210.0249	4.78	P
10	5	5209.9575	-8.16	P	5209.9561	-8.43	P	5209.9607	-7.54	P	5209.9586	-7.95	P
20	5	5209.953	-9.02	P	5209.9496	-9.67	P	5209.9486	-9.87	P	5209.948	-9.98	P
30	5	5210.0169	3.24	P	5210.0213	4.09	P	5210.0218	4.18	P	5210.0179	3.44	P
40	5	5209.9963	-0.71	P	5210.0079	1.52	P	5210.0039	0.75	P	5209.9996	-0.08	P
50	5	5209.9769	-4.43	P	5209.9825	-3.36	P	5209.9821	-3.44	P	5209.9844	-2.99	P
Frequency stability versus Voltage.													
Worst Case Operating Frequency：5210MHz													
Temp. (°C)	Power Supply(VDC)	0 minute			2 minute			5 minute			10 minute		
		Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F	Measured Frequency (MHz)	Frequency Error (ppm)	P/F
25	4.25	5209.9838	-3.11	P	5209.9835	-3.17	P	5210	0	P	5209.9745	-4.89	P
25	5	5210.0204	3.92	P	5210.0203	3.9	P	5210.0199	3.82	P	5210.0168	3.22	P
25	5.75	5209.9976	-0.46	P	5210.0058	1.11	P	5210.003	0.58	P	5210.0048	0.92	P

Note: P for PASS and F for Fail.

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

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