Measurement Data

Modulation	Duty cycle	Duty Factor
802.11a	98.8%	0.05
802.11n(HT20)	98.8%	0.05
802.11n(HT40)	97.5%	0.11
802.11ac(HT20)	98.9%	0.05
802.11ac(HT40)	97.4%	0.11
802.11ac(HT80)	95.2%	0.21

ANT1:

802.11a mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	7.30	0.05	7.35	23.98	Pass
40	5200	8.64	0.05	8.69	23.98	Pass
48	5240	8.39	0.05	8.44	23.98	Pass
802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	7.28	0.05	7.33	23.98	Pass
40	5200	8.60	0.05	8.65	23.98	Pass
48	5240	8.38	0.05	8.43	23.98	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	7.47	0.05	7.52	23.98	Pass
40	5200	8.69	0.05	8.74	23.98	Pass
48	5240	8.37	0.05	8.42	23.98	Pass
802.11n(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190	7.73	0.11	7.84	23.98	Pass
46	5230	8.46	0.11	8.57	23.98	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190	7.77	0.11	7.88	23.98	Pass
46	5230	8.48	0.11	8.59	23.98	Pass
802.11 ac(HT80)						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
42	5210	7.88	0.21	8.09	23.98	Pass

ANT2:

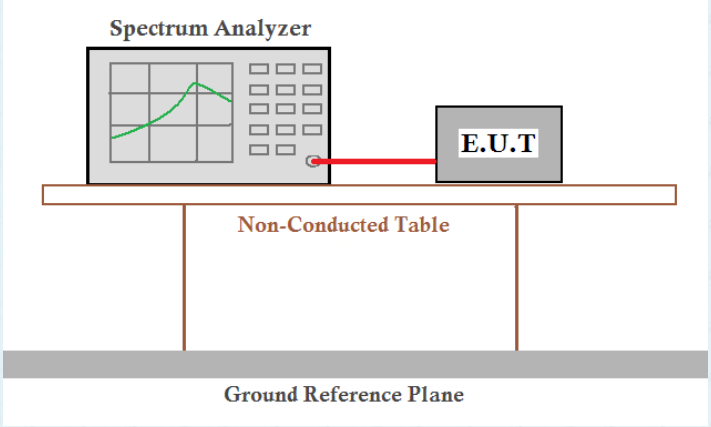
802.11a mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	6.74	0.05	6.79	23.98	Pass
40	5200	7.01	0.05	7.06	23.98	Pass
48	5240	7.77	0.05	7.82	23.98	Pass
802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	6.62	0.05	6.67	23.98	Pass
40	5200	6.91	0.05	6.96	23.98	Pass
48	5240	7.70	0.05	7.75	23.98	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	6.67	0.05	6.72	23.98	Pass
40	5200	6.84	0.05	6.89	23.98	Pass
48	5240	7.61	0.05	7.66	23.98	Pass
802.11n(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190	6.55	0.11	6.66	23.98	Pass
46	5230	7.43	0.11	7.54	23.98	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190	6.58	0.11	6.69	23.98	Pass
46	5230	7.39	0.11	7.50	23.98	Pass
802.11 ac(HT80)						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
42	5210	6.56	0.21	6.77	23.98	Pass

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

ANT1+ANT2:

802.11n(HT20) mode						
CH No.	Frequency (MHz)	Output Power (dBm) ANT1	Output Power (dBm) ANT2	MIMO Output Power (dBm)	Limit (dBm)	Result
36	5180	7.33	6.67	10.02	23.98	Pass
40	5200	8.65	6.96	10.90	23.98	Pass
48	5240	8.43	7.75	11.11	23.98	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Output Power (dBm) ANT1	Output Power (dBm) ANT2	MIMO Output Power (dBm)	Limit (dBm)	Result
36	5180	7.52	6.72	10.15	23.98	Pass
40	5200	8.74	6.89	10.92	23.98	Pass
48	5240	8.42	7.66	11.07	23.98	Pass
802.11n(HT40) mode						
CH No.	Frequency (MHz)	Output Power (dBm) ANT1	Output Power (dBm) ANT2	MIMO Output Power (dBm)	Limit (dBm)	Result
38	5190	7.84	6.66	10.30	23.98	Pass
46	5230	8.57	7.54	11.10	23.98	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Output Power (dBm) ANT1	Output Power (dBm) ANT2	MIMO Output Power (dBm)	Limit (dBm)	Result
38	5190	7.88	6.69	10.34	23.98	Pass
46	5230	8.59	7.5	11.09	23.98	Pass
802.11 ac(HT80)						
CH No.	Frequency (MHz)	Output Power (dBm) ANT1	Output Power (dBm) ANT2	MIMO Output Power (dBm)	Limit (dBm)	Result
42	5210	8.09	6.77	10.49	23.98	Pass

7.5 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><td>Frequency band (MHz)</td><td>Limit</td></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

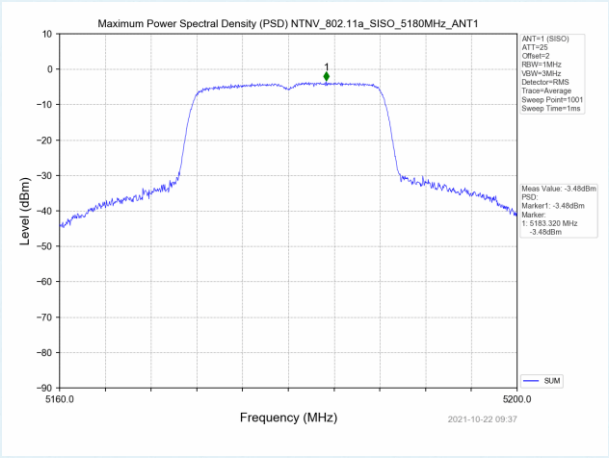
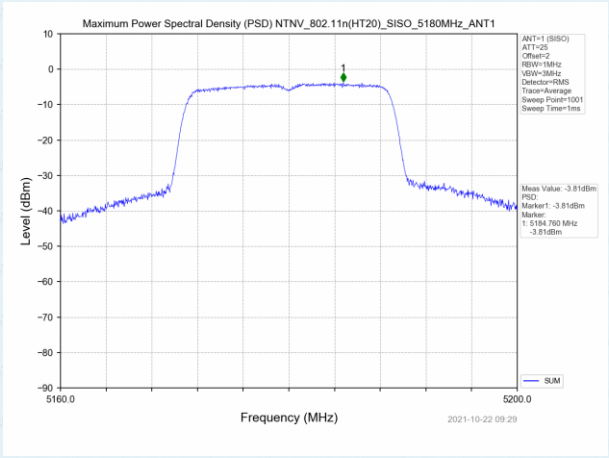
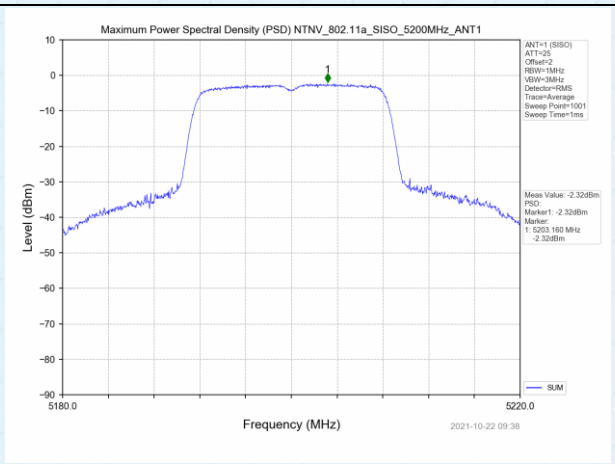
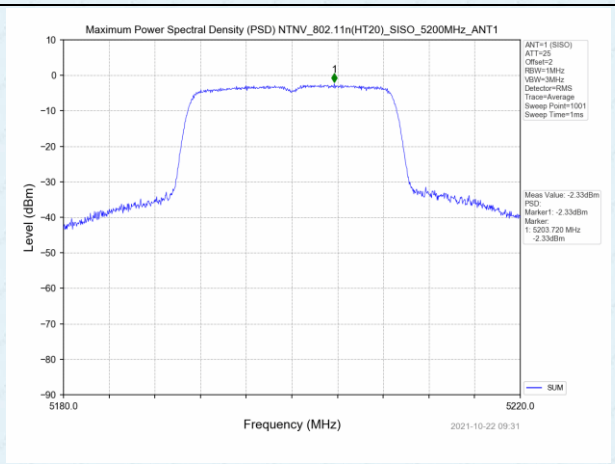
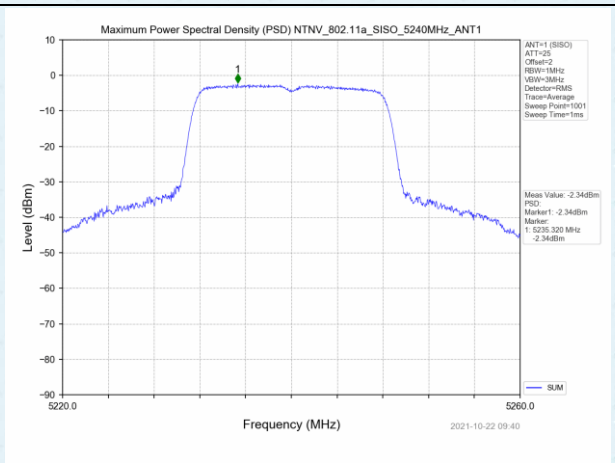
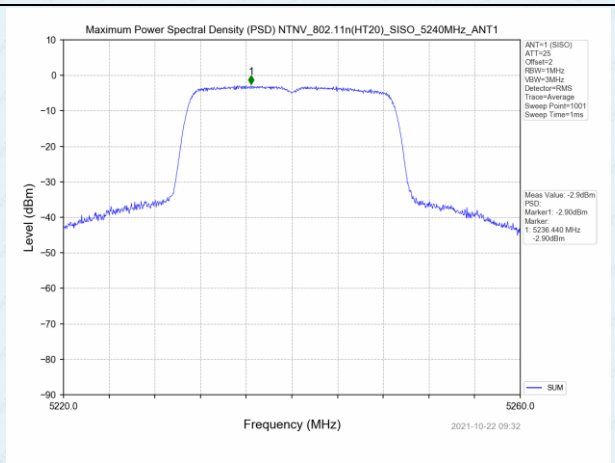
Modulation	Duty cycle	Duty Factor
802.11a	98.8%	0.05
802.11n(HT20)	98.8%	0.05
802.11n(HT40)	97.5%	0.11
802.11ac(HT20)	98.9%	0.05
802.11ac(HT40)	97.4%	0.11
802.11ac(HT80)	95.2%	0.21

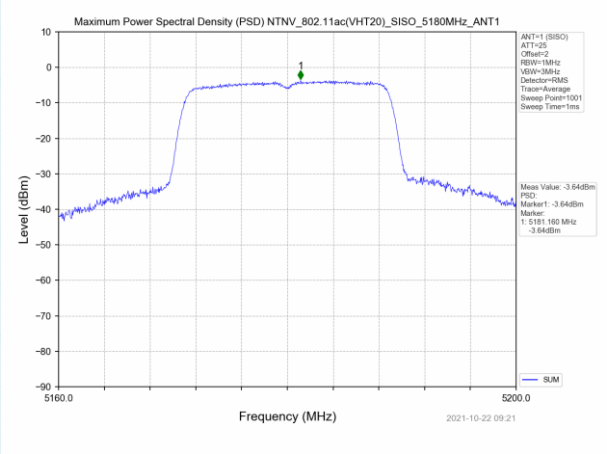
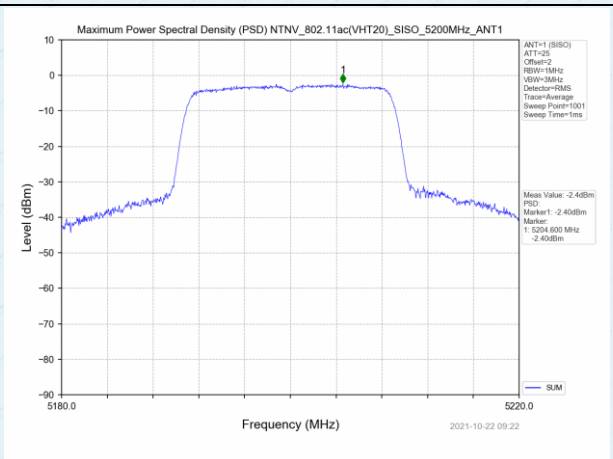
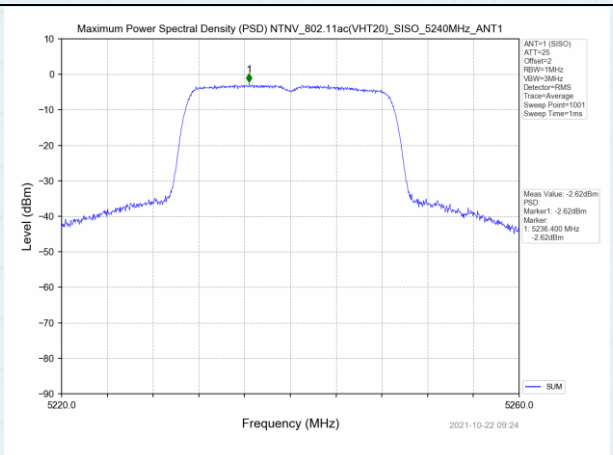
ANT1:

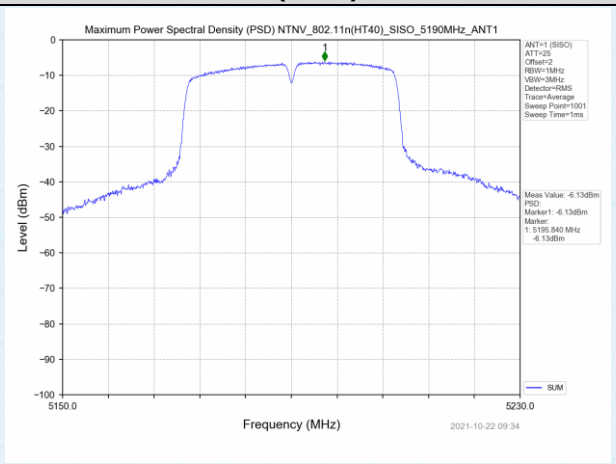
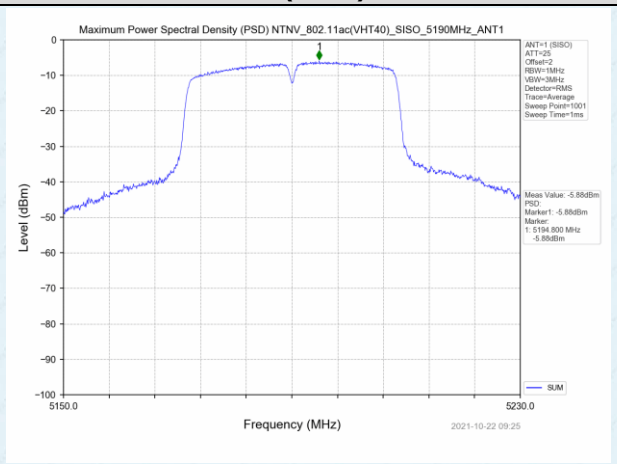
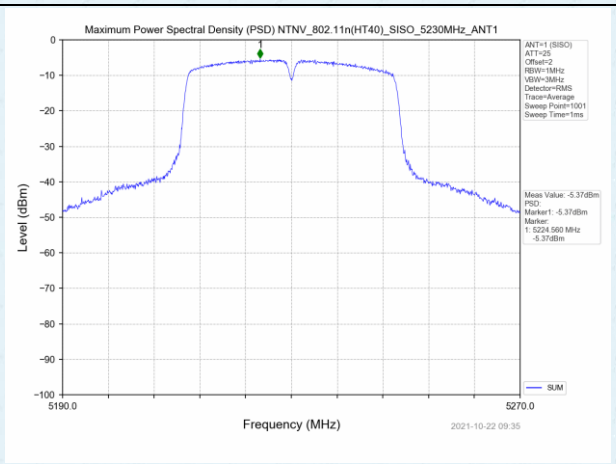
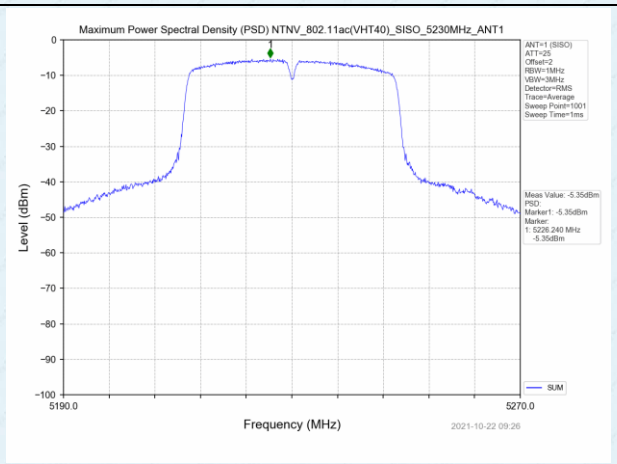
802.11a mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	-3.48	0.05	-3.43	11	Pass
40	5200	-2.32	0.05	-2.27	11	Pass
48	5240	-2.34	0.05	-2.29	11	Pass
802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	-3.81	0.05	-3.76	11	Pass
40	5200	-2.33	0.05	-2.28	11	Pass
48	5240	-2.90	0.05	-2.85	11	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	-3.64	0.05	-3.59	11	Pass
40	5200	-2.40	0.05	-2.35	11	Pass
48	5240	-2.62	0.05	-2.57	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
38	5190	-6.13	0.11	-6.02	11	Pass
46	5230	-5.37	0.11	-5.26	11	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
38	5190	-5.88	0.11	-5.77	11	Pass
46	5230	-5.35	0.11	-5.24	11	Pass
802.11 ac(HT80)						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
42	5210	-8.39	0.21	-8.18	11	Pass

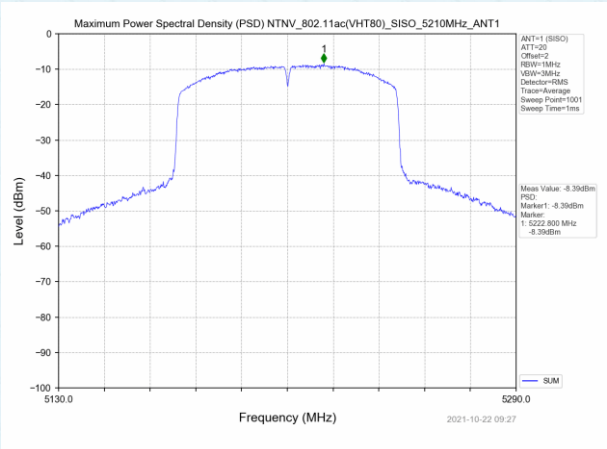
Note: Output Power = Measured Power + Duty Factor
Duty Factor = 10 log (1/Duty Cycle)

Test plots as followed:

802.11a mode	802.11n(HT20) mode
	
5180	**5180**
	
5200	**5200**
	
5240	**5240**

802.11ac(HT20) mode

5180

5200

5240

802.11n(HT40) mode	802.11ac(HT40) mode
	
5190	5190
	
5230	5230

802.11ac(HT80) mode

5210

ANT2:

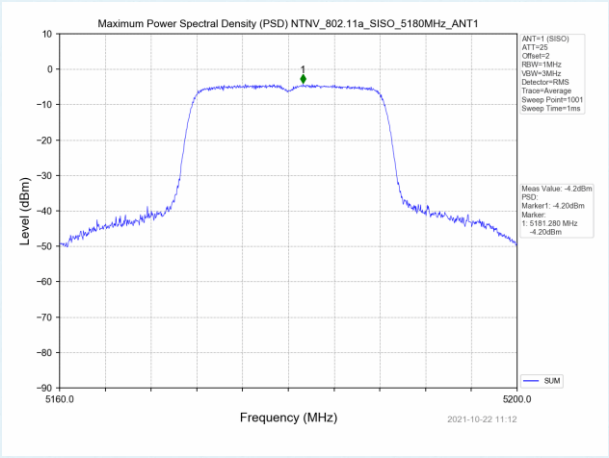
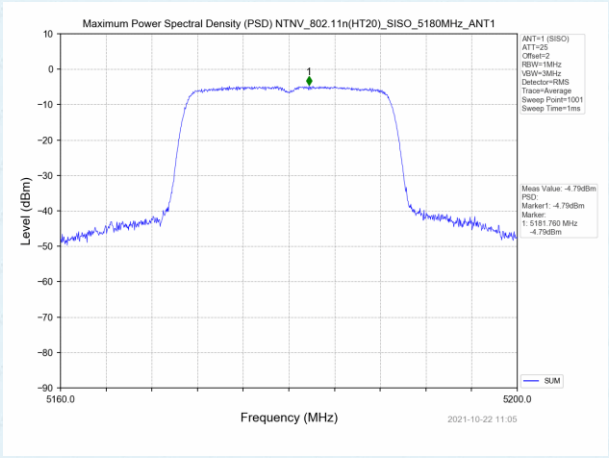
802.11a mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	-4.20	0.05	-4.15	11	Pass
40	5200	-3.96	0.05	-3.91	11	Pass
48	5240	-3.21	0.05	-3.16	11	Pass
802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	-4.79	0.05	-4.74	11	Pass
40	5200	-4.31	0.05	-4.26	11	Pass
48	5240	-3.45	0.05	-3.40	11	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	-4.61	0.05	-4.56	11	Pass
40	5200	-4.43	0.05	-4.38	11	Pass
48	5240	-3.53	0.05	-3.48	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
38	5190	-7.44	0.11	-7.33	11	Pass
46	5230	-6.48	0.11	-6.37	11	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
38	5190	-7.67	0.11	-7.56	11	Pass
46	5230	-6.60	0.11	-6.49	11	Pass
802.11 ac(HT80)						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
42	5210	-10.03	0.21	-9.82	11	Pass

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

ANT1+ANT2:

802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz) ANT1	Measured PSD (dBm/MHz) ANT2	MIMO Measured PSD (dBm/MHz)	Limit (dBm)	Result
36	5180	-3.76	-4.74	-1.21	11	Pass
40	5200	-2.28	-4.26	-0.15	11	Pass
48	5240	-2.85	-3.4	-0.11	11	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz) ANT1	Measured PSD (dBm/MHz) ANT2	MIMO Measured PSD (dBm/MHz)	Limit (dBm)	Result
36	5180	-3.59	-4.56	-1.04	11	Pass
40	5200	-2.35	-4.38	-0.24	11	Pass
48	5240	-2.57	-3.48	0.01	11	Pass
802.11n(HT40) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz) ANT1	Measured PSD (dBm/MHz) ANT2	MIMO Measured PSD (dBm/MHz)	Limit (dBm)	Result
38	5190	-6.02	-7.33	-3.62	11	Pass
46	5230	-5.26	-6.37	-2.77	11	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz) ANT1	Measured PSD (dBm/MHz) ANT2	MIMO Measured PSD (dBm/MHz)	Limit (dBm)	Result
38	5190	-5.77	-7.56	-3.56	11	Pass
46	5230	-5.24	-6.49	-2.81	11	Pass
802.11 ac(HT80)						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz) ANT1	Measured PSD (dBm/MHz) ANT2	MIMO Measured PSD (dBm/MHz)	Limit (dBm)	Result
42	5210	-8.18	-9.82	-5.91	11	Pass

Test plots as followed:

802.11a mode	802.11n(HT20) mode
	
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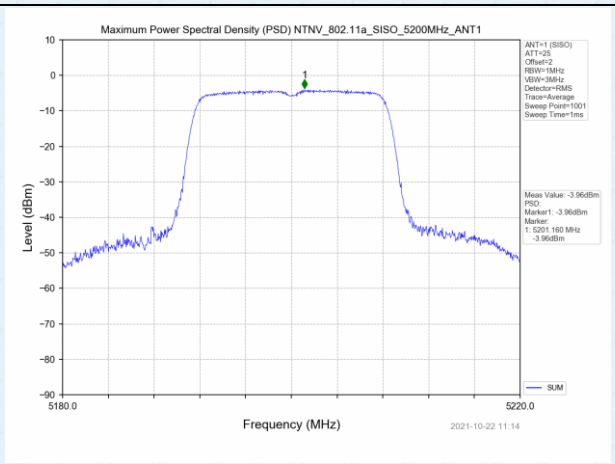
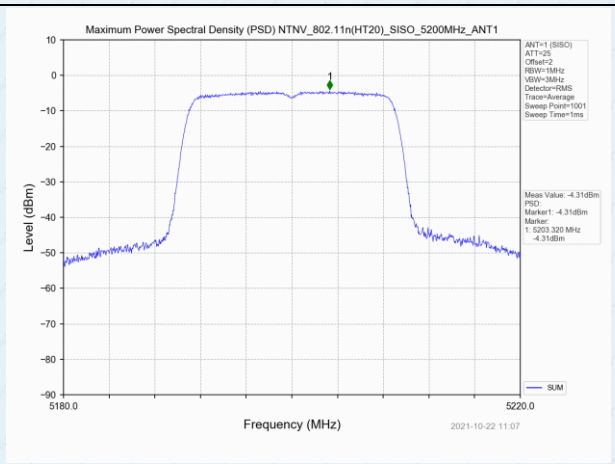
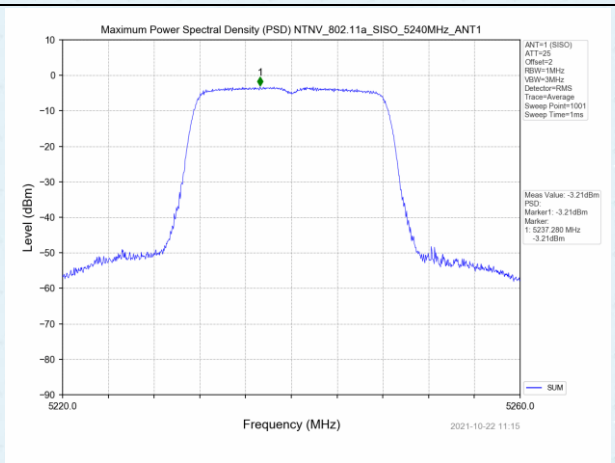
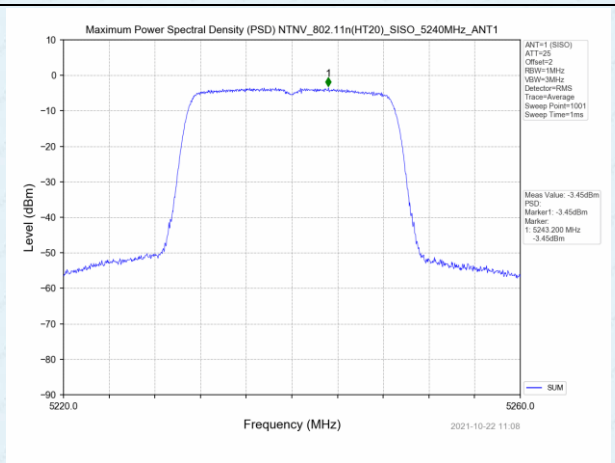
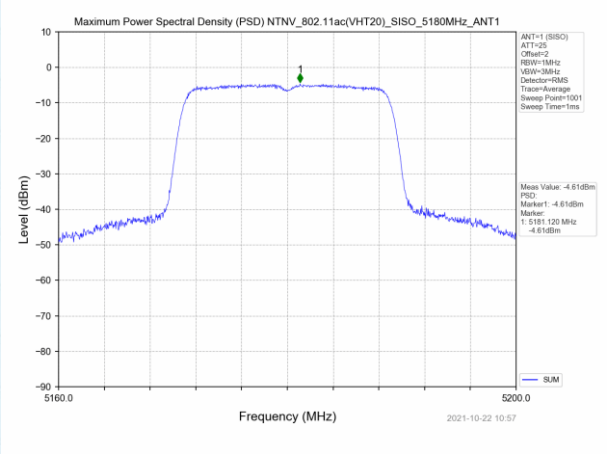
	
5200	**5200**
	
5240	**5240**

802.11ac(HT20) mode

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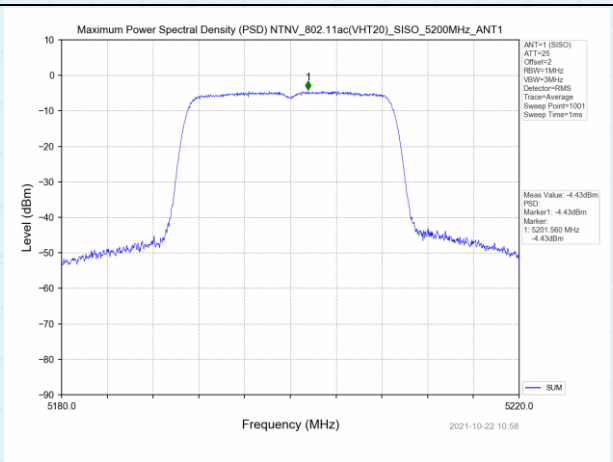
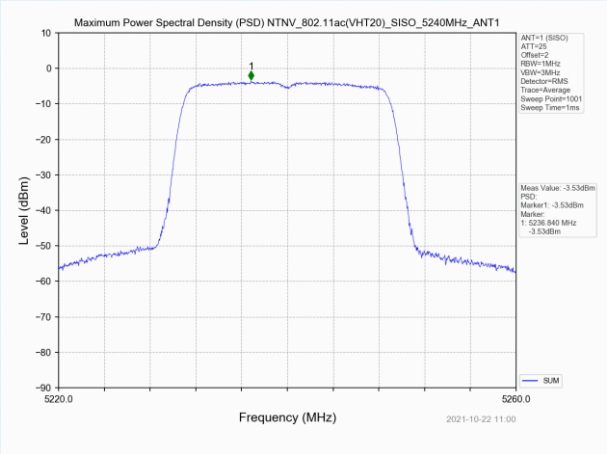
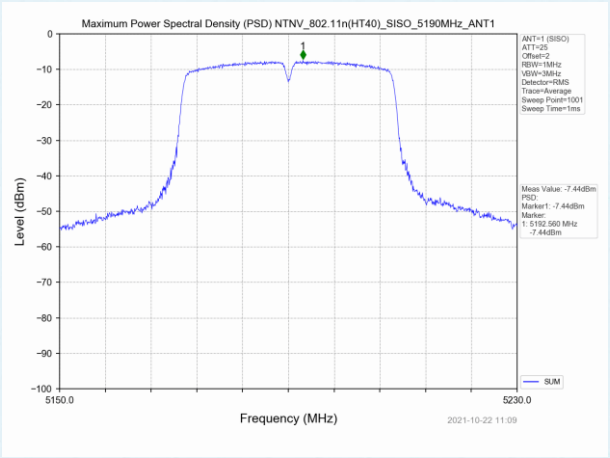
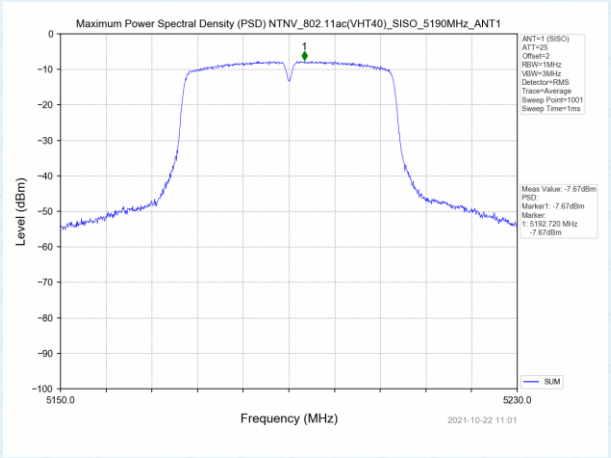
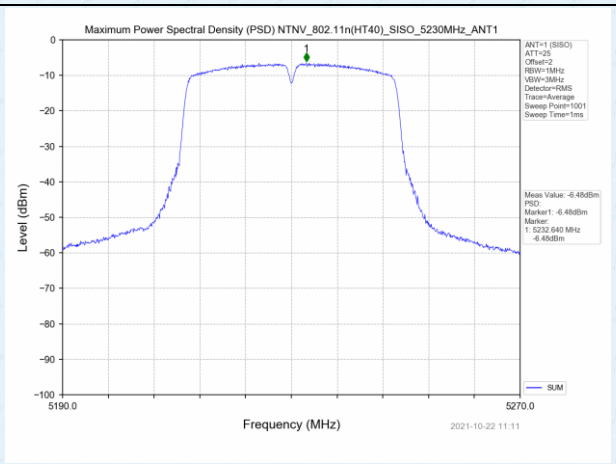
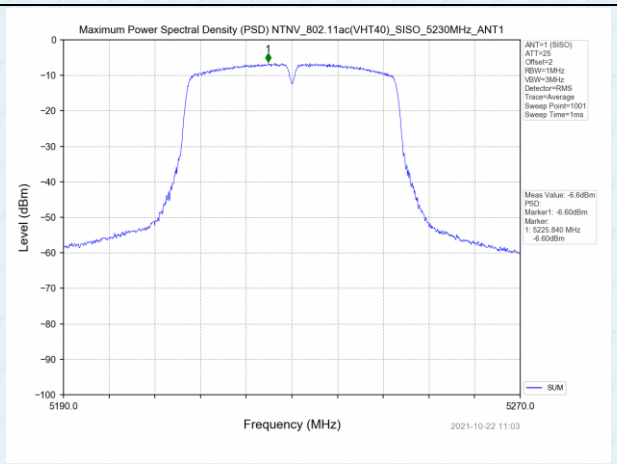
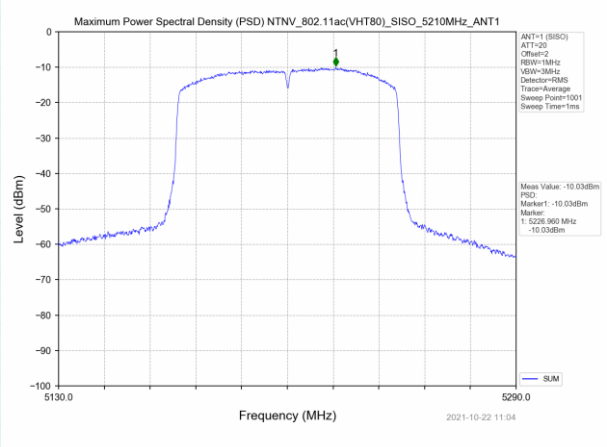
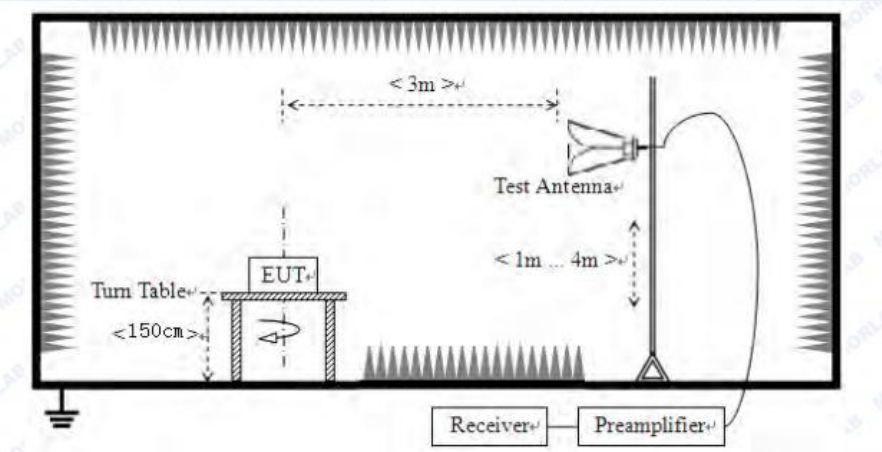

5200

5240

802.11n(HT40) mode	802.11ac(HT40) mode
	
5190	5190
	
5230	5230

802.11ac(HT80) mode

5210

7.6 Band Edge

<table>
<tr><td>Test Requirement:</td><td>RSS-Gen 8.10</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013 & RSS-Gen</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 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
</td></tr>
</table>

	sheet.
Test setup:	For radiated emissions above 1GHz 
Test Instruments:	Refer to section 5.10 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.

Measurement Data:

802.11ac(HT20)					PK			
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
5150	51.26	31.82	5.4	35.98	52.5	68.2	-15.7	Horizontal
5350	46.89	31.98	5.98	35.68	49.17	68.2	-19.03	Horizontal
5150	54.28	31.82	5.4	35.98	55.52	68.2	-12.68	Vertical
5350	54.33	31.98	5.98	35.68	56.61	68.2	-11.59	Vertical

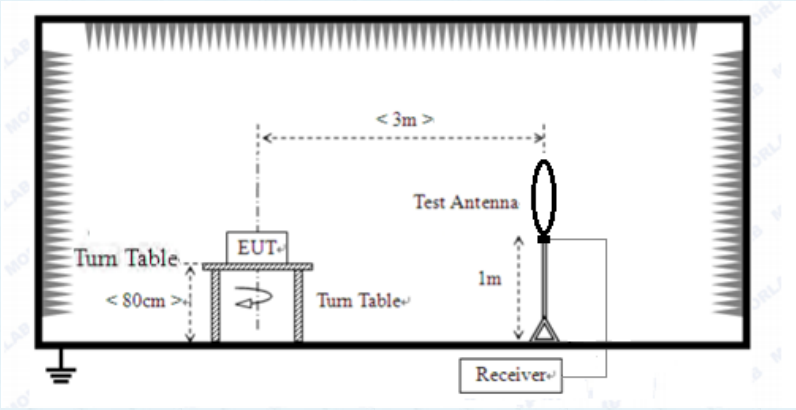
802.11ac(HT20)					AV			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5150	32.49	31.82	5.4	35.98	33.73	54	-20.27	Horizontal
5350	32.44	31.98	5.98	35.68	34.72	54	-19.28	Horizontal
5150	33.49	31.82	5.4	35.98	34.73	54	-19.27	Vertical
5350	34.03	31.98	5.98	35.68	36.31	54	-17.69	Vertical

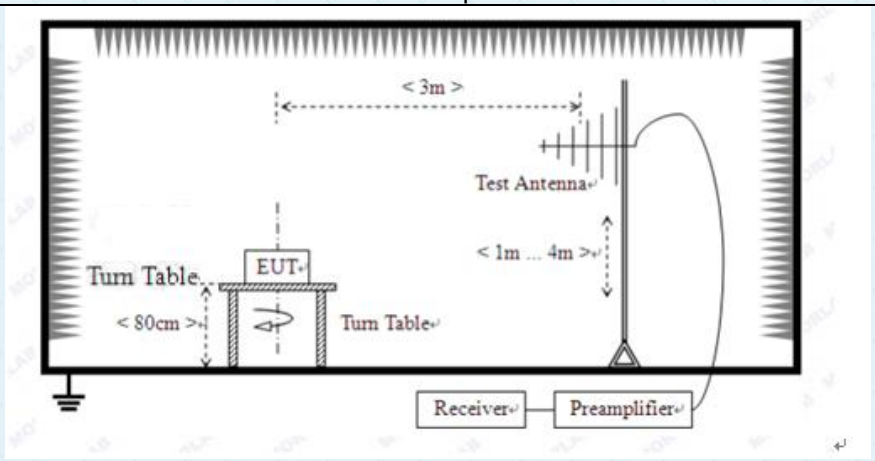
Notes:

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.
4. All modes were tested, only recorded the worst case data in the test report.

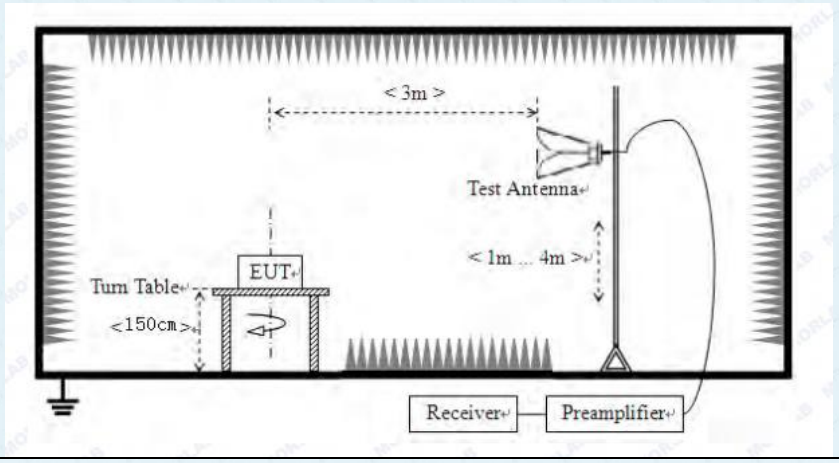
7.7 Radiated Emission

<table>
<tr><td>Test Requirement :</td><td>RSS-Gen 8.9 & 8.10</td></tr>
<tr><td>Test Method :</td><td>ANSI C63.10: 2013 & RSS-Gen</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="6">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 rowspan="2">Above 1GHz</td><td>500</td><td>Average</td></tr>
<tr><td>5000</td><td>Peak</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 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</td></tr>
</table>

	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 5.10 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

1. *Antenna 1 and antenna 2 have been tested to show only the worst antenna 1 test data.*
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.*

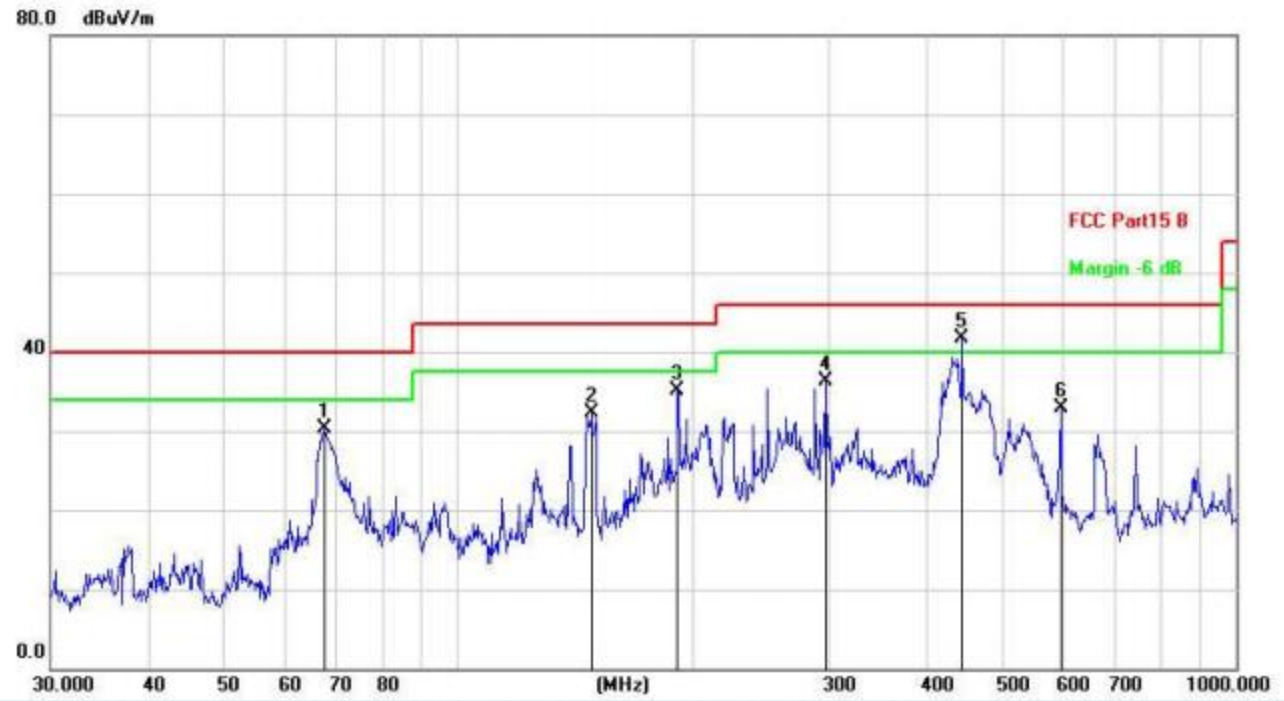
Measurement Data:

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

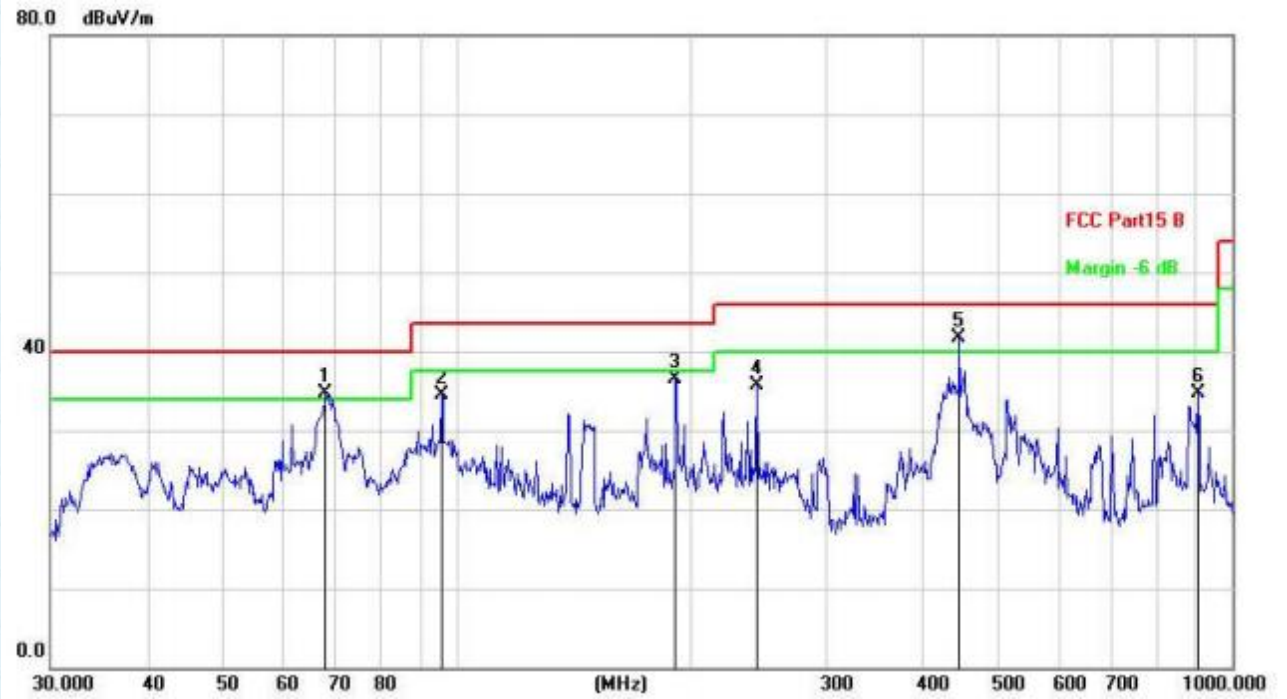
Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		67.4381	49.86	-19.63	30.23	40.00	-9.77	QP
2		148.4410	50.07	-17.74	32.33	43.50	-11.17	QP
3		191.7450	55.10	-19.94	35.16	43.50	-8.34	QP
4		297.2241	54.70	-18.38	36.32	46.00	-9.68	QP
5	*	444.8514	57.81	-16.15	41.66	46.00	-4.34	QP
6		595.1326	46.29	-13.34	32.95	46.00	-13.05	QP

Final Level =Receiver Read level + Correct Factor

Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	!	67.9128	54.39	-19.68	34.71	40.00	-5.29	QP
2		95.7622	55.40	-20.85	34.55	43.50	-8.95	QP
3		191.7450	56.43	-19.94	36.49	43.50	-7.01	QP
4		244.2321	55.16	-19.51	35.65	46.00	-10.35	QP
5	*	444.8514	57.78	-16.15	41.63	46.00	-4.37	QP
6		903.3093	44.15	-9.54	34.61	46.00	-11.39	QP

Final Level =Receiver Read level + Correct Factor

Above 1-40GHz:

Pre-scan all test modes of antenna 1 and antenna 2, found worst case at 802.11ac(HT20), and so only show the test result of 802.11ac(HT20).

Above 1GHz:

802.11ac(HT20) 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	30.22	39.67	14.62	32.65	51.86	68.2	-16.34	Vertical
15540	30.59	38.6	17.66	34.46	52.39	68.2	-15.81	Vertical
10360	29.98	39.67	14.62	32.65	51.62	68.2	-16.58	Horizontal
15540	29.22	38.6	17.66	34.46	51.02	68.2	-17.18	Horizontal

802.11ac(HT20) 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	43.88	39.44	8.12	33.85	57.59	68.2	-10.61	Vertical
15600	41.33	38.28	9.58	31.51	57.68	68.2	-10.52	Vertical
10400	40.01	39.44	8.12	33.85	53.72	68.2	-14.48	Horizontal
15600	39.79	38.28	9.58	31.51	56.14	68.2	-12.06	Horizontal

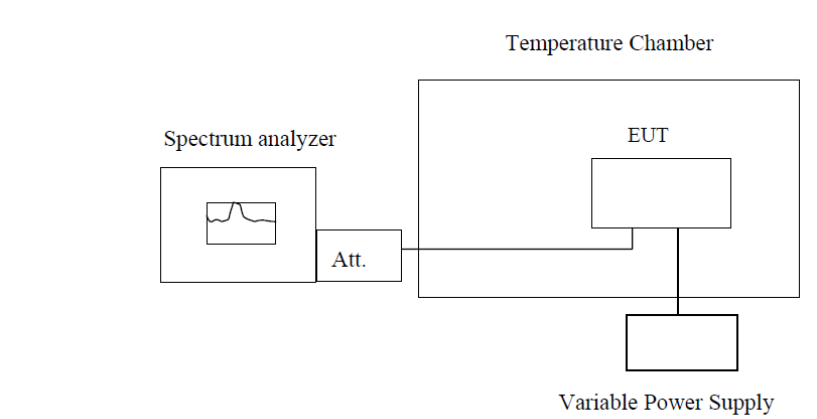
802.11ac(HT20) 5240MHz

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	44.59	39.65	8.19	33.74	58.69	68.2	-9.51	Vertical
15720	41.02	37.72	9.5	31.43	56.81	68.2	-11.39	Vertical
10480	39.55	39.65	8.19	33.74	53.65	68.2	-14.55	Horizontal
15720	38.97	37.72	9.5	31.43	54.76	68.2	-13.44	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.

7.8 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.

Note:Measured all conditions and recorded worst case.

Measurement data:

IEEE 802.11a Mode / 5180 – 5240 MHz / 5180 MHz

Enviroment Temperature (Dregree)	Voltage (V)	Measured Frequency (MHz)	Limit Range (MHz)	Test Results
20	20.9	5179.954616	5150 – 5250	PASS
20	17.1	5179.941177	5150 – 5250	PASS
50	19.0	5179.952473	5150 – 5250	PASS
40	19.0	5179.925261	5150 – 5250	PASS
30	19.0	5179.965407	5150 – 5250	PASS
20	19.0	5179.985144	5150 – 5250	PASS
10	19.0	5179.964798	5150 – 5250	PASS
0	19.0	5179.995492	5150 – 5250	PASS
-10	19.0	5179.968255	5150 – 5250	PASS
-20	19.0	5179.962132	5150 – 5250	PASS
-30	19.0	5179.956178	5150 – 5250	PASS

IEEE 802.11a Mode / 5180 – 5240 MHz / 5240 MHz

Enviroment Temperature (Dregree)	Voltage (V)	Measured Frequency (MHz)	Limit Range (MHz)	Test Results
20	20.9	5239.975444	5150 – 5250	PASS
20	17.1	5239.984171	5150 – 5250	PASS
50	19.0	5239.967177	5150 – 5250	PASS
40	19.0	5239.965763	5150 – 5250	PASS
30	19.0	5239.984411	5150 – 5250	PASS
20	19.0	5239.974717	5150 – 5250	PASS
10	19.0	5239.969769	5150 – 5250	PASS
0	19.0	5239.977543	5150 – 5250	PASS
-10	19.0	5239.955170	5150 – 5250	PASS
-20	19.0	5239.994413	5150 – 5250	PASS
-30	19.0	5239.975415	5150 – 5250	PASS

8 Test Setup Photo

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

9 EUT Constructional Details

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

---END---