Shenzhen HTT Technology Co., Ltd.

Report No.: HTT202112466F03

TEST Report

Applicant:	Shen zhen Powerful Photoelectron Co.,Ltd
Address of Applicant:	5th Floor, Building 3, Zone B, Hongfa Science and Technology Industrial Park, Tangtou Community, Shiyan Street, Baoan District, Shenzhen, China
Manufacturer :	Shen zhen Powerful Photoelectron Co.,Ltd
Address of Manufacturer :	5th Floor, Building 3, Zone B, Hongfa Science and Technology Industrial Park, Tangtou Community, Shiyan Street, Baoan District, Shenzhen, China

Equipment Under Test (EUT)

Product Name:	PROJECTOR
Model No.:	DP01
Series model:	QP01, Q5, U5, Spare-P1
Trade Mark:	N/A
FCC ID:	2A3DJDP01
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of sample receipt:	Dec.31,2021
Date of Test:	Dec.31,2021- Jan.20,2022
Date of report issued:	Jan.20,2022
Test Result :	PASS *

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

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

1. Version

Version No.	Date	Description
00	*Jan.20,2022*	*Original*

Tested/ Prepared By	Ervin Xu	***Date:***	***Jan.20,2022***
	Project Engineer		
Check By:	Bruce Zhu	***Date:***	***Jan.20,2022***
	Reviewer		
Approved By :	Kevin Yang	***Date:***	***Jan.20,2022***
	Authorized Signature		

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3. Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	PASS
AC Power Line Conducted Emission	15.207	PASS
26dB Bandwidth	FCC §15.407(a)	PASS
Maximum Conducted Output Power	15.407(a)	PASS
Power Spectral Density	15.407(a)	PASS
Undesirable Emission	FCC Part 15.407(b)	PASS
Radiated Emission	FCC Part 15.407(b)/15.205/15.209	PASS
Frequency Stability	15.407(g)	PASS

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

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.45 dB	(1)
Radiated Emission	1~6GHz	3.54 dB	(1)
Radiated Emission	6~40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.66 dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

4. General Information

4.1. General Description of EUT

<table>
<tr><td>Product Name:</td><td>PROJECTOR</td></tr>
<tr><td>Model No.:</td><td>DP01</td></tr>
<tr><td>Series model:</td><td>QP01, Q5, U5, Spare-P1</td></tr>
<tr><td>Test sample(s) ID:</td><td>HTT202112466-1(Engineer sample)
HTT202112466-2(Normal sample)</td></tr>
<tr><td>Operation Frequency:</td><td>
<table>
<tr><th>Band</th><th>Mode</th><th>Frequency Range(MHz)</th><th>Number of channels</th></tr>
<tr><td rowspan="3">U-NII Band I</td><td>IEEE 802.11a</td><td>5180-5240</td><td>4</td></tr>
<tr><td>IEEE 802.11n 20MHz</td><td>5180-5240</td><td>4</td></tr>
<tr><td>IEEE 802.11n 40MHz</td><td>5190-5230</td><td>2</td></tr>
</table>
</td></tr>
<tr><td>Modulation technology:</td><td>OFDM</td></tr>
<tr><td>Antenna Type:</td><td>FPC Antenna</td></tr>
<tr><td>Antenna gain:</td><td>1.60dBi</td></tr>
<tr><td>Power supply:</td><td>AC 100-240V, 50/60Hz, 0.70A, 45W</td></tr>
</table>

Channel list for 802.11a/n(HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

Channel list for 802.11n(HT40)(HT40)			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

4.2. Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the dutycycle >98%, 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/n(HT20)	6/6.5 Mbps
802.11n(HT40)	13.5 Mbps

4.3. Description of Support Units

None.

4.4. Deviation from Standards

None.

4.5. Abnormalities from Standard Conditions

None.

4.6. Test Facility

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

FCC-Registration No.: 779513 Designation Number: CN1319
Shenzhen HTT Technology Co.,Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6435.01
Shenzhen HTT Technology Co.,Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

4.7. Test Location

All tests were performed at:

Shenzhen HTT Technology Co.,Ltd.
1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
Tel: 0755-23595200
Fax: 0755-23595201

4.8. Additional Instructions

Test Software	Special AT test command provided by manufacturer to Keep the EUT in continuously transmitting mode and hopping mode

Power level setup	Default

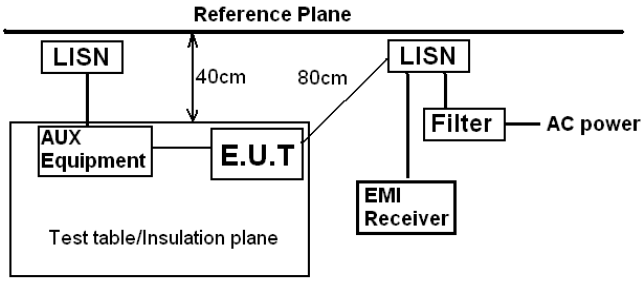
5. Test Instruments list

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	Shenzhen C.R.T technology co., LTD	9*6*6	HTT-E028	Aug. 10 2020	Aug. 09 2024
2	Control Room	Shenzhen C.R.T technology co., LTD	4.8*3.5*3.0	HTT-E030	Aug. 10 2020	Aug. 09 2024
3	EMI Test Receiver	Rohde&Schwar	ESCI7	HTT-E022	May 21 2021	May 20 2022
4	Spectrum Analyzer	Rohde&Schwar	FSP	HTT-E037	May 21 2021	May 20 2022
5	Coaxial Cable	ZDecl	ZT26-NJ-NJ-0.6M	HTT-E018	May 21 2021	May 20 2022
6	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-2M	HTT-E019	May 21 2021	May 20 2022
7	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-0.6M	HTT-E020	May 21 2021	May 20 2022
8	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-8.5M	HTT-E021	May 21 2021	May 20 2022
9	Composite logarithmic antenna	Schwarzbeck	VULB 9168	HTT-E017	Aug. 22 2021	Aug. 21 2022
10	Horn Antenna	Schwarzbeck	BBHA9120D	HTT-E016	Aug. 22 2021	Aug. 21 2022
11	Loop Antenna	Zhinan	ZN30900C	HTT-E039	Aug. 22 2021	Aug. 21 2022
12	Horn Antenna	Beijing Hangwei Dayang	OBH100400	HTT-E040	Aug. 22 2021	Aug. 21 2022
13	low frequency Amplifier	Sonoma Instrument	310	HTT-E015	May 21 2021	May 20 2022
14	high-frequency Amplifier	HP	8449B	HTT-E014	May 21 2021	May 20 2022
15	Variable frequency power supply	Shenzhen Anbiao Instrument Co., Ltd	ANB-10VA	HTT-082	May 21 2021	May 20 2022
16	EMI Test Receiver	Rohde & Schwarz	ESCS30	HTT-E004	May 21 2021	May 20 2022
17	Artificial Mains	Rohde & Schwarz	ESH3-Z5	HTT-E006	May 21 2021	May 20 2022
18	Artificial Mains	Rohde & Schwarz	ENV-216	HTT-E038	May 21 2021	May 20 2022
19	Cable Line	Robinson	Z302S-NJ-BNCJ-1.5M	HTT-E001	May 21 2021	May 20 2022
20	Attenuator	Robinson	6810.17A	HTT-E007	May 21 2021	May 20 2022
21	Variable frequency power supply	Shenzhen Yanghong Electric Co., Ltd	YF-650（5KVA）	HTT-E032	May 21 2021	May 20 2022
22	Control Room	Shenzhen C.R.T technology co., LTD	8*4*3.5	HTT-E029	May 21 2021	May 20 2022
23	DC power supply	Agilent	E3632A	HTT-E023	May 21 2021	May 20 2022
24	EMI Test Receiver	Agilent	N9020A	HTT-E024	May 21 2021	May 20 2022
25	Analog signal generator	Agilent	N5181A	HTT-E025	May 21 2021	May 20 2022
26	Vector signal generator	Agilent	N5182A	HTT-E026	May 21 2021	May 20 2022
27	Power sensor	Keysight	U2021XA	HTT-E027	May 21 2021	May 20 2022
28	Temperature and humidity meter	Shenzhen Anbiao Instrument Co., Ltd	TH10R	HTT-074	May 21 2021	May 20 2022
29	Radiated Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
30	Conducted Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
31	RF Test Software	panshanrf	TST	N/A	N/A	N/A

32	Pre-Amplifier	Schwarzbeck	BBV-9721	HTT-E105	May 21 2021	May 20 2022

6. Test results and Measurement Data

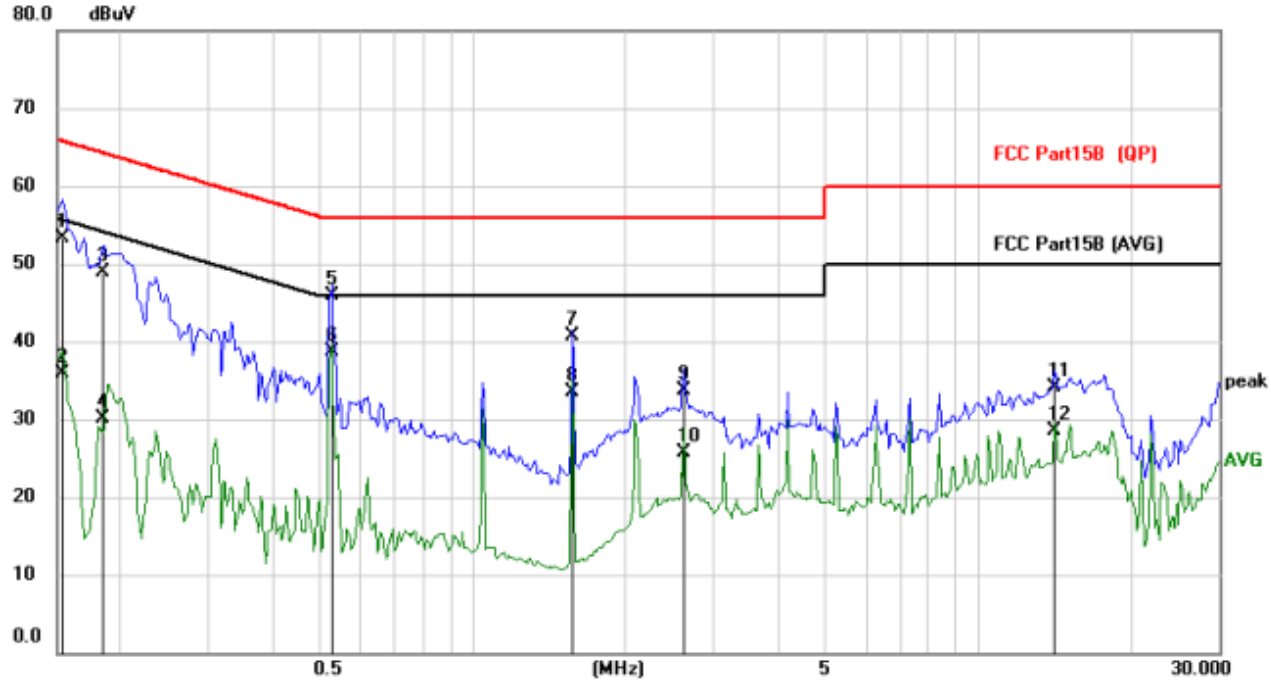
6.1. Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz
Limit:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.
Test Instruments:	Refer to section 6.0 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

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

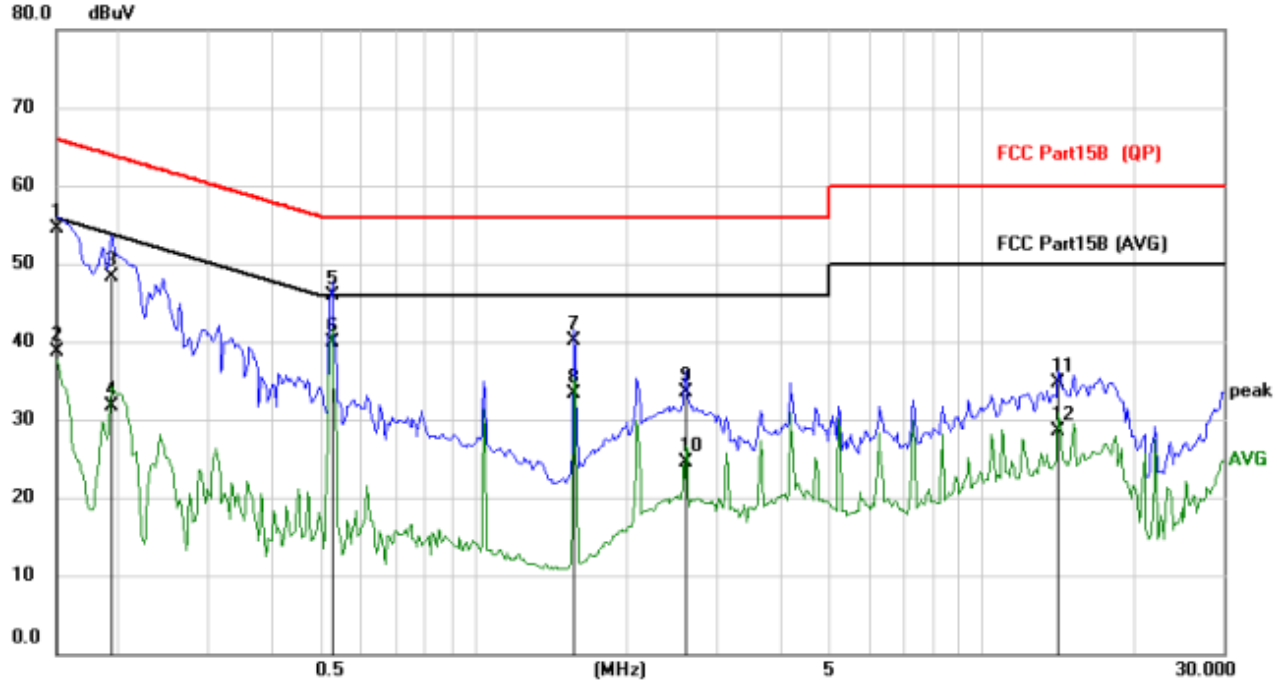
Measurement data:

Line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1539	43.12	10.26	53.38	65.79	-12.41	QP
2		0.1539	25.59	10.26	35.85	55.79	-19.94	AVG
3		0.1850	38.76	10.22	48.98	64.26	-15.28	QP
4		0.1850	19.86	10.22	30.08	54.26	-24.18	AVG
5		0.5243	35.58	10.38	45.96	56.00	-10.04	QP
6	*	0.5243	28.35	10.38	38.73	46.00	-7.27	AVG
7		1.5696	29.81	10.81	40.62	56.00	-15.38	QP
8		1.5696	22.70	10.81	33.51	46.00	-12.49	AVG
9		2.6187	22.83	10.84	33.67	56.00	-22.33	QP
10		2.6187	14.87	10.84	25.71	46.00	-20.29	AVG
11		14.1423	22.00	12.08	34.08	60.00	-25.92	QP
12		14.1423	16.52	12.08	28.60	50.00	-21.40	AVG

Neutral:

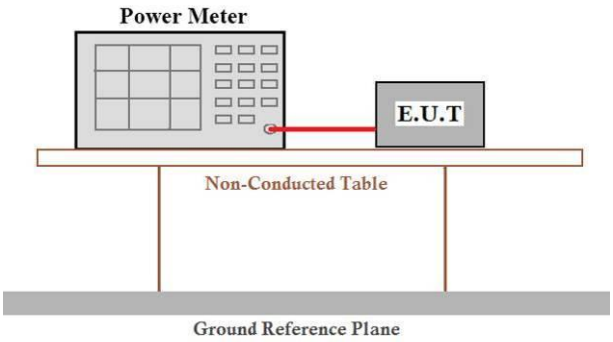


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	44.30	10.27	54.57	66.00	-11.43	QP
2		0.1500	28.35	10.27	38.62	56.00	-17.38	AVG
3		0.1929	38.08	10.20	48.28	63.91	-15.63	QP
4		0.1929	21.43	10.20	31.63	53.91	-22.28	AVG
5		0.5243	35.56	10.38	45.94	56.00	-10.06	QP
6	*	0.5243	29.43	10.38	39.81	46.00	-6.19	AVG
7		1.5696	29.30	10.81	40.11	56.00	-15.89	QP
8		1.5696	22.55	10.81	33.36	46.00	-12.64	AVG
9		2.6187	22.59	10.84	33.43	56.00	-22.57	QP
10		2.6187	13.72	10.84	24.56	46.00	-21.44	AVG
11		14.1423	22.64	12.08	34.72	60.00	-25.28	QP
12		14.1423	16.35	12.08	28.43	50.00	-21.57	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Los

6.2. Maximum Conducted Output Power

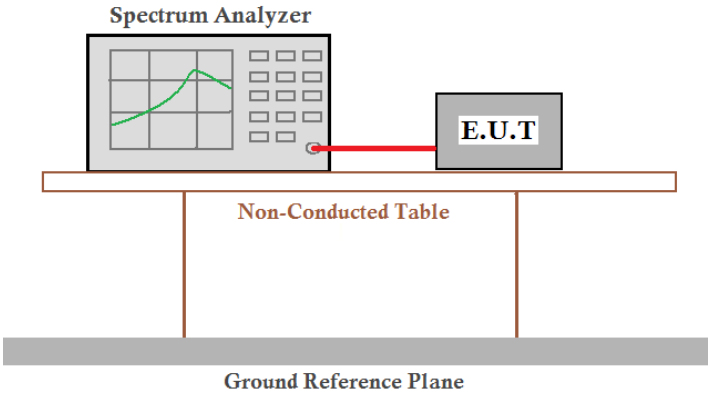
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	<table><tr><td>Frequency band (MHz)</td><td>Limit</td></tr><tr><td rowspan="2">5150-5250</td><td>≤1W(30dBm) for master device</td></tr><tr><td>≤250mW(23.98dBm) for client device</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>
Test setup:	
Test procedure:	**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).
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

Measurement Data

Test Mode	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Result
802.11a	5180	13.58	23.98	PASS
	5200	13.32	23.98	PASS
	5240	12.98	23.98	PASS
802.11n(HT20)	5180	13.52	23.98	PASS
	5200	13.28	23.98	PASS
	5240	12.98	23.98	PASS
802.11n(HT40)	5190	13.96	23.98	PASS
	5230	13.60	23.98	PASS

6.3. Emission 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

Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

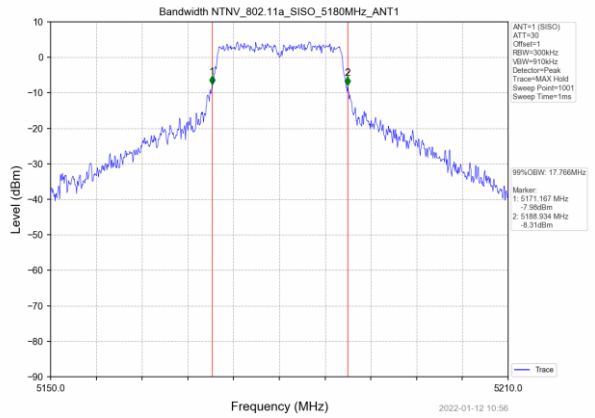
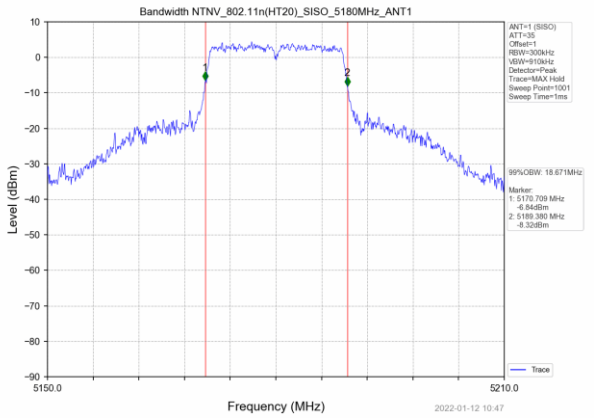
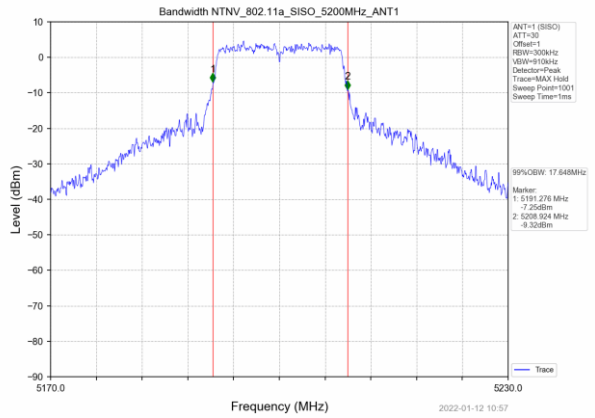
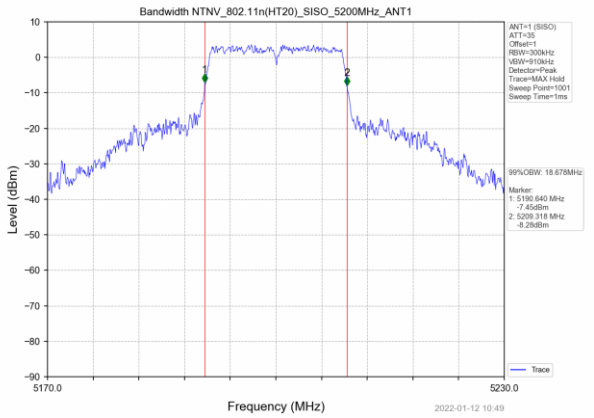
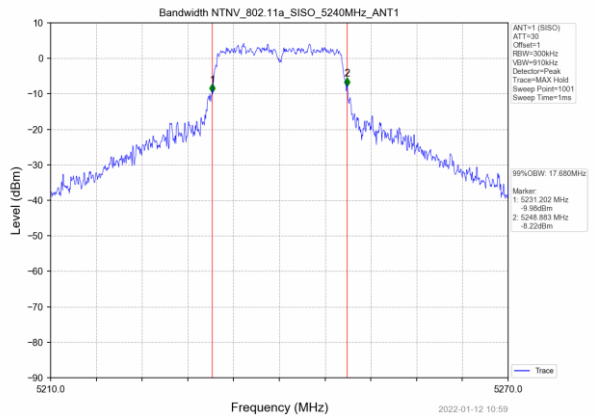
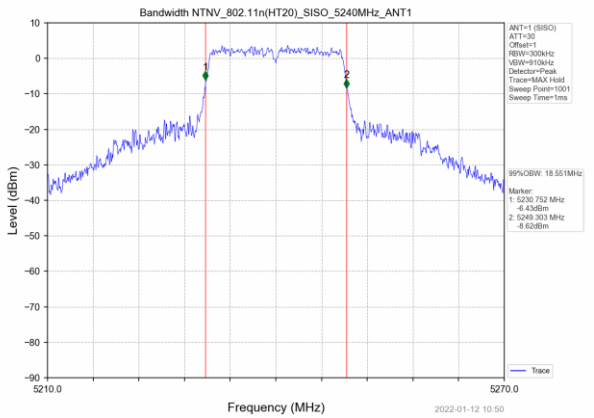
Measurement Data

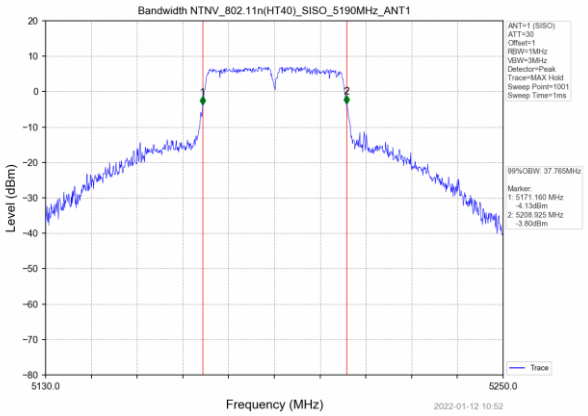
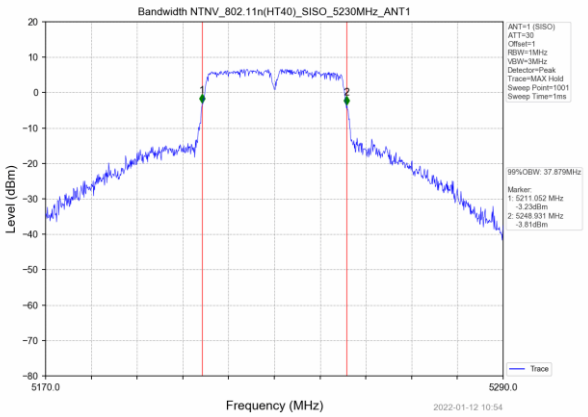
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Occupied Bandwidth (MHz)		
		802.11a	802.11n(HT20)	802.11ac(HT20)	802.11a	802.11n(HT20)	802.11ac(HT20)
36	5180	17.766	18.671	/	34.450	40.437	/
40	5200	17.648	18.678	/	34.394	40.119	/
48	5240	17.680	18.551	/	32.863	38.497	/

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11n(HT40)	802.11ac(HT40)	802.11n(HT40)	802.11ac(HT40)
38	5190	37.765	/	78.263	/
46	5230	37.879	/	72.409	/

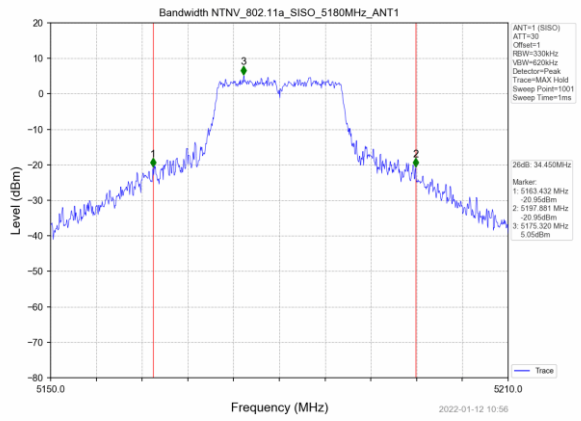
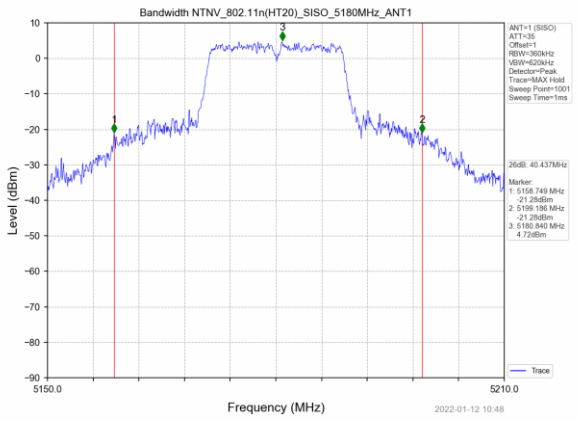
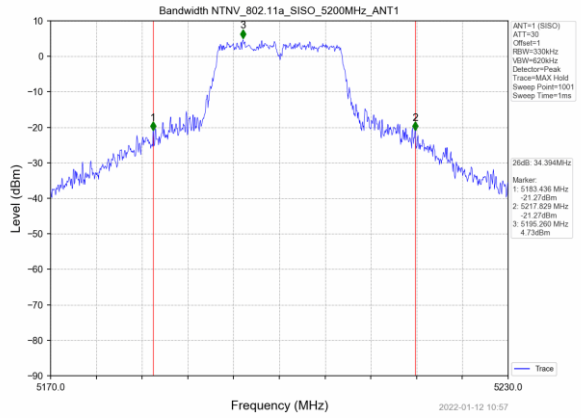
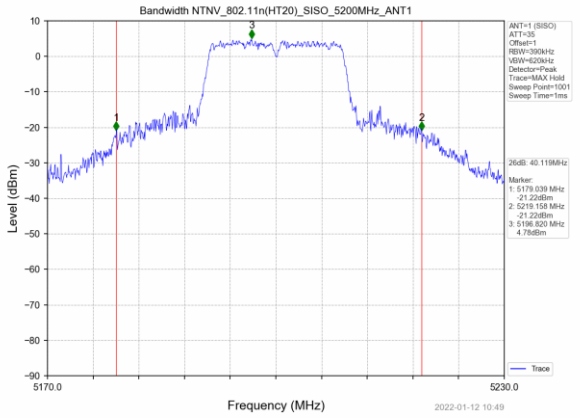
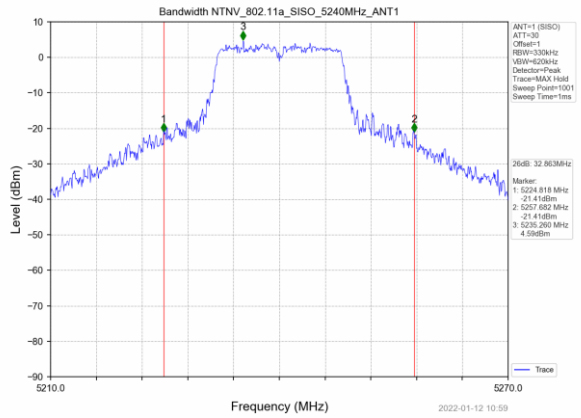
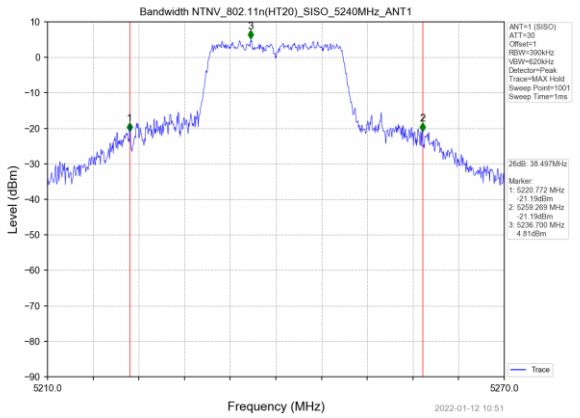
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Occupied Bandwidth (MHz)
		802.11ac(HT80)	802.11ac(HT80)
42	5210	/	/

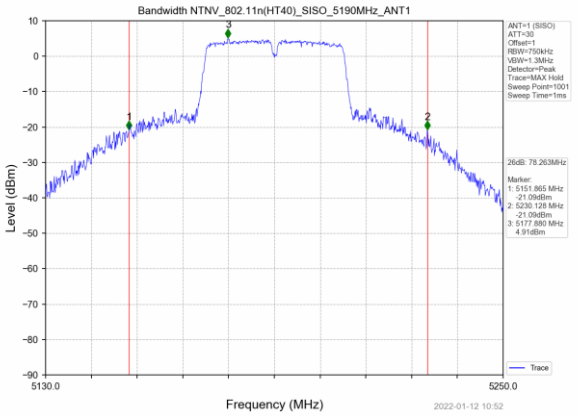
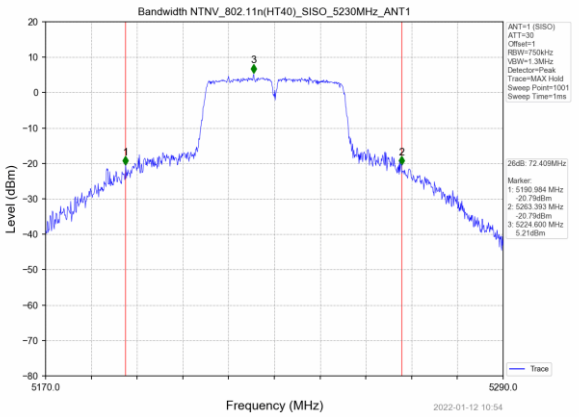
99% Occupied Bandwidth:

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

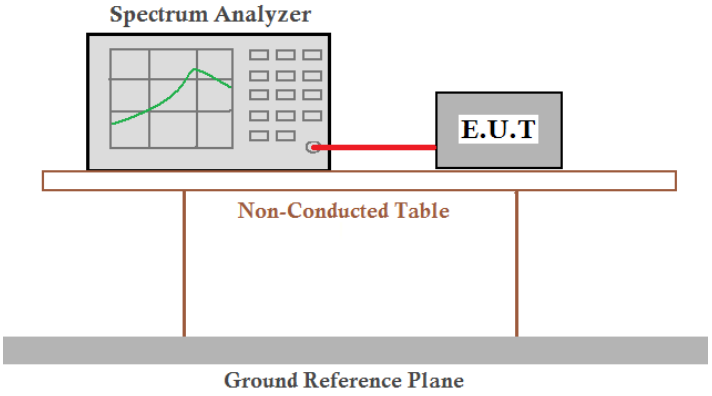
802.11n(HT40) mode	
	
5190	
	
5230	

26dB Occupied Bandwidth:

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

802.11n(HT40) mode	
	
5190	
	
5230	

6.4. Power Spectral Density

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

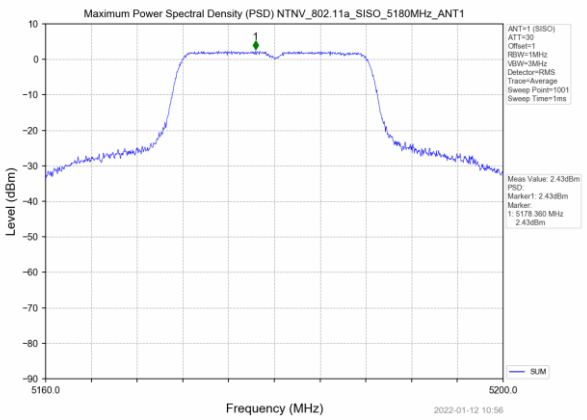
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

Measurement Data

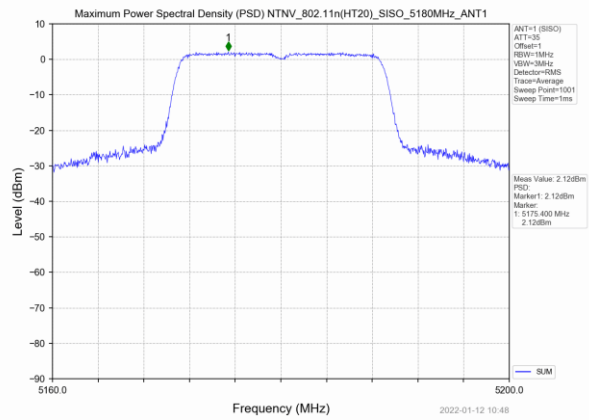
Test Mode	Frequency (MHz)	Total PSD Power(dBm/MHz)	Limits (dBm/MHz)	Result
802.11a	5180	2.43	11	PASS
	5200	2.12	11	PASS
	5240	1.95	11	PASS
802.11n(HT20)	5180	2.12	11	PASS
	5200	1.71	11	PASS
	5240	1.71	11	PASS
802.11n(HT40)	5190	-0.47	11	PASS
	5230	-0.72	11	PASS

Test plots as followed:

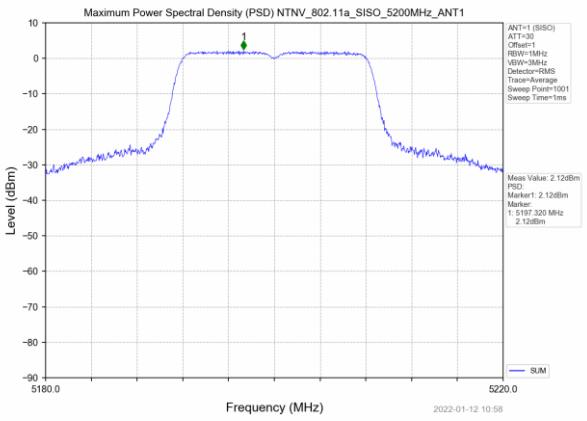
802.11a mode	802.11n(HT20) mode



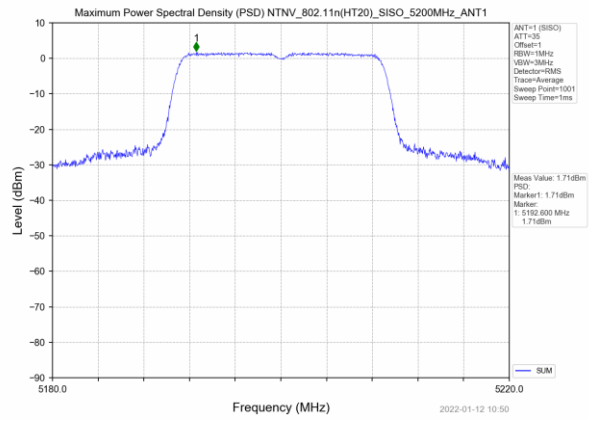
5180



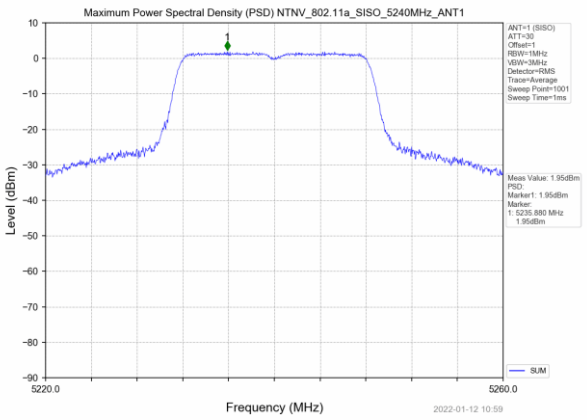
5180



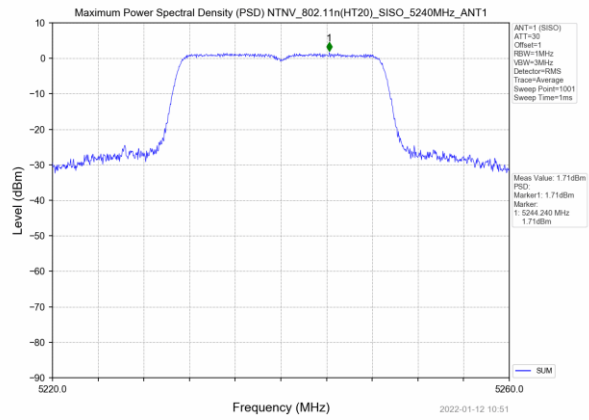
5200



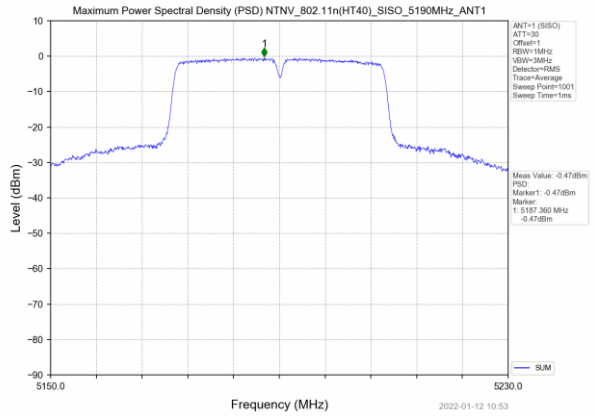
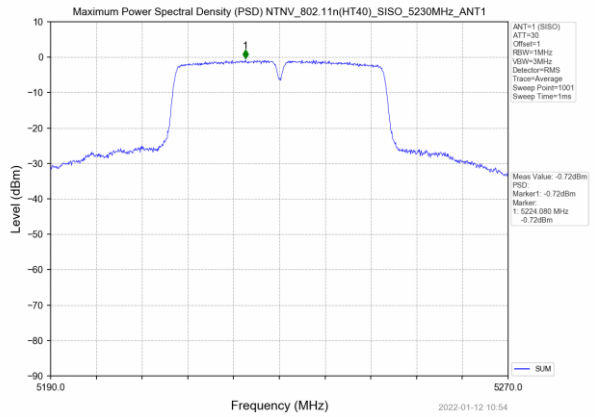
5200



5240



5240

802.11n(HT40) mode	
	
5190	
	
5230	

6.5. Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 25GHz
Test site:	Measurement Distance: 3m

Receiver setup:

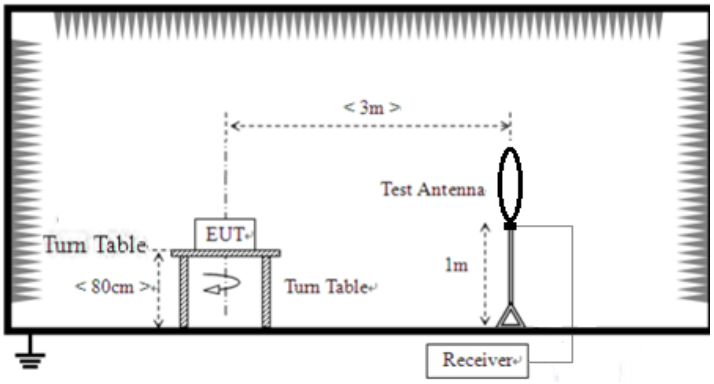
Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

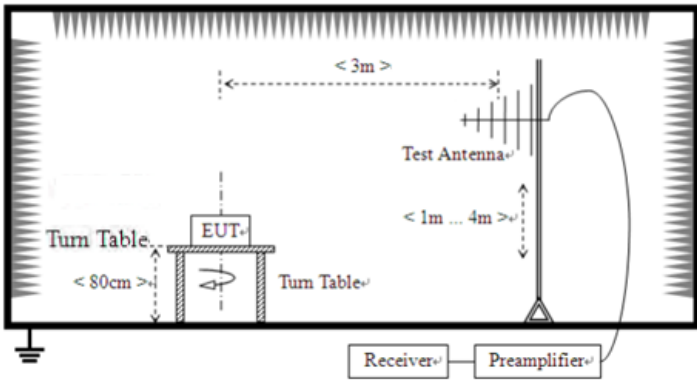
Limit:

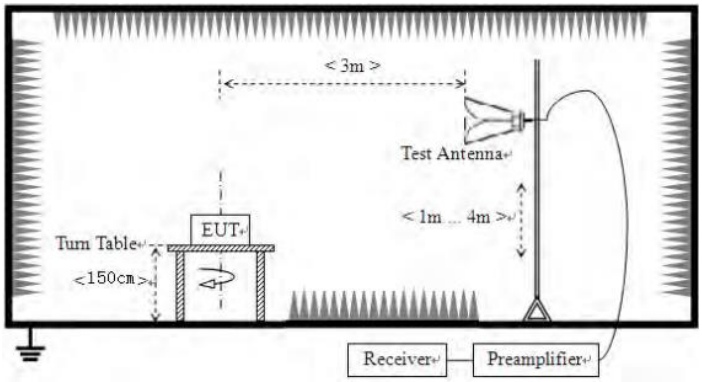
Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	30m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

Test setup:

For radiated emissions from 9kHz to 30MHz



<table>
<tr><td></td><td>For radiated emissions from 30MHz to1GHz
 

For radiated emissions above 1GHz
 
</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) 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 rota 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.</td></tr>
<tr><td>Test Instruments:</td><td colspan="5">Refer to section 6.0 for details</td></tr>
<tr><td>Test mode:</td><td colspan="5">Refer to section 5.2 for details</td></tr>
<tr><td>Test environment:</td><td>Temp.:</td><td>25 °C</td><td>Humid.:</td><td>52%</td><td>Press.:</td><td>1012mbar</td></tr>
</table>

Test voltage:	AC 120V, 60Hz
Test results:	Pass

Remarks:
1.Only the worst case Main Antenna 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:

■ **9kHz~30MHz**

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

■ **Below 1GHz**

Pre-scan all test modes, found worst case at 802.11b 2437MHz, and so only show the test result of 802.11b 2437MHz

Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	!	339.5887	59.50	-17.95	41.55	46.00	-4.45	QP
2	!	446.4141	59.01	-16.12	42.89	46.00	-3.11	QP
3	!	744.8659	53.93	-11.02	42.91	46.00	-3.09	QP
4	!	893.8567	52.78	-9.59	43.19	46.00	-2.81	QP
5	*	952.0937	52.97	-8.98	43.99	46.00	-2.01	QP
6		982.6200	55.83	-8.70	47.13	54.00	-6.87	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	!	44.4307	53.40	-18.25	35.15	40.00	-4.85	QP
2		150.0107	53.97	-17.60	36.37	43.50	-7.13	QP
3	!	254.7281	61.77	-19.29	42.48	46.00	-3.52	QP
4	*	446.4141	59.99	-16.12	43.87	46.00	-2.13	QP
5	!	952.0937	52.34	-9.08	43.26	46.00	-2.74	QP
6		982.6200	56.72	-8.73	47.99	54.00	-6.01	QP

Final Level =Receiver Read level + Correct Factor

■ **Above 1-40GHz**

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

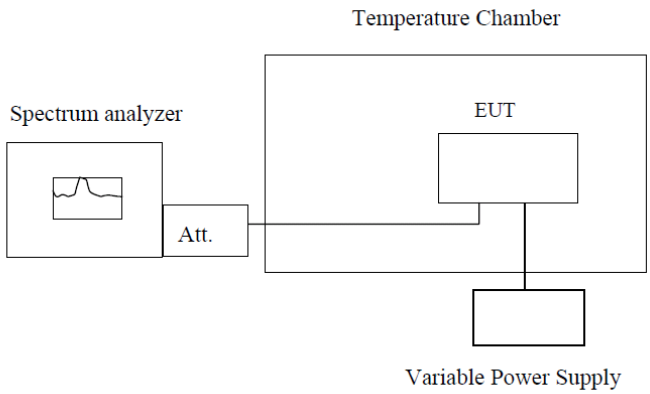
U-NII 1 & 802.11n(HT20) (above 1GHz)

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
	5150.00	55.04	PK	H	68.20	13.16	46.70	31.4	8.44	31.5	8.34
36.00	5150.00	42.97	AV	H	54.00	11.03	34.63	31.4	8.44	31.5	8.34
(5180MHz)	10360.00	53.52	PK	H	68.20	14.68	38.83	38.21	11.59	38.26	11.54
	--	--	--	--	--	--	--	--	--	--	--
40.00	10400.00	53.71	PK	H	68.20	14.49	42.17	38.21	11.59	38.26	11.54
(5200MHz)	--	--	--	--	--	--	--	--	--	--	--
48.00	5350.50	42.81	PK	H	68.20	25.39	34.47	31.4	8.44	31.5	8.34
(5240MHz)	10480.00	54.13	PK	H	68.20	14.07	42.99	38.21	11.19	38.26	11.14
	--	--	--	--	--	--	--	--	--	--	--

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
	5150.00	53.38	PK	V	68.20	14.82	45.04	31.4	8.44	31.5	8.34
36.00	5150.00	43.01	AV	V	54.00	10.99	34.67	31.4	8.44	31.5	8.34
(5180MHz)	10360.00	50.28	PK	V	68.20	17.92	38.74	38.21	11.59	38.26	11.54
	--	--	--	--	--	--	--	--	--	--	--
40.00	10400.00	50.43	PK	V	68.20	17.77	38.89	38.21	11.59	38.26	11.54
(5200MHz)	--	--	--	--	--	--	--	--	--	--	--
48.00	5350.50	52.73	PK	V	68.20	15.47	44.39	31.4	8.44	31.5	8.34
(5240MHz)	10480.00	50.43	PK	V	68.20	17.77	39.29	38.21	11.19	38.26	11.14
	--	--	--	--	--	--	--	--	--	--	--

Remark：
(1) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(2) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed.

6.6. 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

Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

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

Reference Frequency: 802.11n(HT20) channel=36 frequency=5180MHz					
Voltage (V)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
AC120	-30	90.35	0.01744	Within the band of operation	Pass
	-20	110.25	0.02128		
	-10	97.26	0.01878		
	0	102.36	0.01976		
	10	80.63	0.01557		
	20	95.35	0.01841		
	30	100.35	0.01937		
	40	91.36	0.01764		
	50	103.26	0.01993		
AC138	25	110.36	0.02131		
AC102	25	119.25	0.02302		

Reference Frequency: 802.11n(HT20) channel=149 frequency=5745MHz					
Voltage (V)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
AC120	-30	119.25	0.02076	Within the band of operation	Pass
	-20	120.36	0.02095		
	-10	101.25	0.01762		
	0	117.25	0.02041		
	10	102.23	0.01779		
	20	103.53	0.01802		
	30	98.53	0.01715		
	40	99.35	0.01729		
	50	90.36	0.01573		
AC138	25	120.28	0.02094		
AC102	25	110.24	0.01919		

7. Test Setup Photo

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

8. EUT Constructional Details

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

------End------