Shenzhen HTT Technology Co., Ltd.

Report No.: HTT202309378F01

TEST Report

Applicant:	Yusense Information Technology and Equipment (Qingdao) Co., Ltd
Address of Applicant:	Building 3F, China Europe Science and Technology Innovation Park, No. 67, Taihong Road, High-tech Zone, Qingdao, Shandong Province
Manufacturer :	Yusense Information Technology and Equipment (Qingdao) Co., Ltd
Address of Manufacturer :	Building 3F, China Europe Science and Technology Innovation Park, No. 67, Taihong Road, High-tech Zone, Qingdao, Shandong Province

Equipment Under Test (EUT)

Product Name:	MS200 Series Multispectral Camera
Model No.:	MS200
Series model:	MS200Pro
Trade Mark:	YUSENSE
FCC ID:	2BC4V-MS200
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of sample receipt:	Sep.27,2023
Date of Test:	Sep.27,2023~Oct.09,2023
Date of report issued:	Oct.09,2023
Test Result :	PASS *

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

1. Version

Version No.	Date	Description
00	*Oct.09,2023*	*Original*

Tested/ Prepared By Heber He ***Date:*** ***Oct.09,2023***

Project Engineer

Check By: Bruce Zhu ***Date:*** ***Oct.09,2023***

Reviewer

Approved By : Kevin Yang ***Date:*** ***Oct.09,2023***

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

Product Name:	MS200 Series Multispectral Camera
Model No.:	MS200
Series model:	MS200Pro
Test sample(s) ID:	HTT202309378-1(Engineer sample) HTT202309378-2(Normal sample)
Antenna Type:	FPC Antenna
Antenna gain:	3.97 dBi
Power Supply:	DC 12V From External Circuit
Adapter Information (Auxiliary test provided by the lab):	Mode: CD264 Input: AC100-240V, 50/60Hz, 600mA Output: DC 12V, 2A
Hardware version:	V1.0
Software version:	V1.0

WIFI		
Supported type:	20MHz system	40MHz system
	802.11a 802.11n	802.11n
Operation frequency:	5180MHz-5240MHz	5190MHz-5230MHz
Modulation:	OFDM	OFDM
Channel number:	4	2
Channel separation:	20MHz	40MHz

Operating band	20MHz		40MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII 1 (5150MHz-5250MHz)	36	5180	38	5190
	40	5200		
	44	5220	46	5230
	48	5240		

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 accredited 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

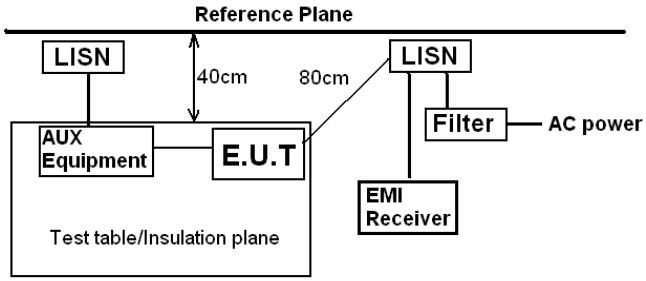
5. Test Instruments list

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 2021	Aug. 09 2024
2	Control Room	Shenzhen C.R.T technology co., LTD	4.8*3.5*3.0	HTT-E030	Aug. 10 2021	Aug. 09 2024
3	EMI Test Receiver	Rohde&Schwar	ESCI7	HTT-E022	Apr. 26 2023	Apr. 25 2024
4	Spectrum Analyzer	Rohde&Schwar	FSP	HTT-E037	Apr. 26 2023	Apr. 25 2024
5	Coaxial Cable	ZDecl	ZT26-NJ-NJ-0.6M	HTT-E018	Apr. 26 2023	Apr. 25 2024
6	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-2M	HTT-E019	Apr. 26 2023	Apr. 25 2024
7	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-0.6M	HTT-E020	Apr. 26 2023	Apr. 25 2024
8	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-8.5M	HTT-E021	Apr. 26 2023	Apr. 25 2024
9	Composite logarithmic antenna	Schwarzbeck	VULB 9168	HTT-E017	May. 21 2023	May. 20 2024
10	Horn Antenna	Schwarzbeck	BBHA9120D	HTT-E016	May. 20 2023	May. 19 2024
11	Loop Antenna	Zhinan	ZN30900C	HTT-E039	Apr. 26 2023	Apr. 25 2024
12	Horn Antenna	Beijing Hangwei Dayang	OBH100400	HTT-E040	Apr. 26 2023	Apr. 25 2024
13	low frequency Amplifier	Sonoma Instrument	310	HTT-E015	Apr. 26 2023	Apr. 25 2024
14	high-frequency Amplifier	HP	8449B	HTT-E014	Apr. 26 2023	Apr. 25 2024
15	Variable frequency power supply	Shenzhen Anbiao Instrument Co., Ltd	ANB-10VA	HTT-082	Apr. 26 2023	Apr. 25 2024
16	EMI Test Receiver	Rohde & Schwarz	ESCS30	HTT-E004	Apr. 26 2023	Apr. 25 2024
17	Artificial Mains	Rohde & Schwarz	ESH3-Z5	HTT-E006	May. 23 2023	May. 22 2024
18	Artificial Mains	Rohde & Schwarz	ENV-216	HTT-E038	May. 23 2023	May. 22 2024
19	Cable Line	Robinson	Z302S-NJ-BNCJ-1.5M	HTT-E001	Apr. 26 2023	Apr. 25 2024
20	Attenuator	Robinson	6810.17A	HTT-E007	Apr. 26 2023	Apr. 25 2024
21	Variable frequency power supply	Shenzhen Yanghong Electric Co., Ltd	YF-650（5KVA）	HTT-E032	Apr. 26 2023	Apr. 25 2024
22	Control Room	Shenzhen C.R.T technology co., LTD	8*4*3.5	HTT-E029	Aug. 10 2021	Aug. 09 2024
23	DC power supply	Agilent	E3632A	HTT-E023	Apr. 26 2023	Apr. 25 2024
24	EMI Test Receiver	Agilent	N9020A	HTT-E024	Apr. 26 2023	Apr. 25 2024

25	Analog signal generator	Agilent	N5181A	HTT-E025	Apr. 26 2023	Apr. 25 2024
26	Vector signal generator	Agilent	N5182A	HTT-E026	Apr. 26 2023	Apr. 25 2024
27	Power sensor	Keysight	U2021XA	HTT-E027	Apr. 26 2023	Apr. 25 2024
28	Temperature and humidity meter	Shenzhen Anbiao Instrument Co., Ltd	TH10R	HTT-074	Apr. 28 2023	Apr. 27 2024
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

6. Test results and Measurement Data

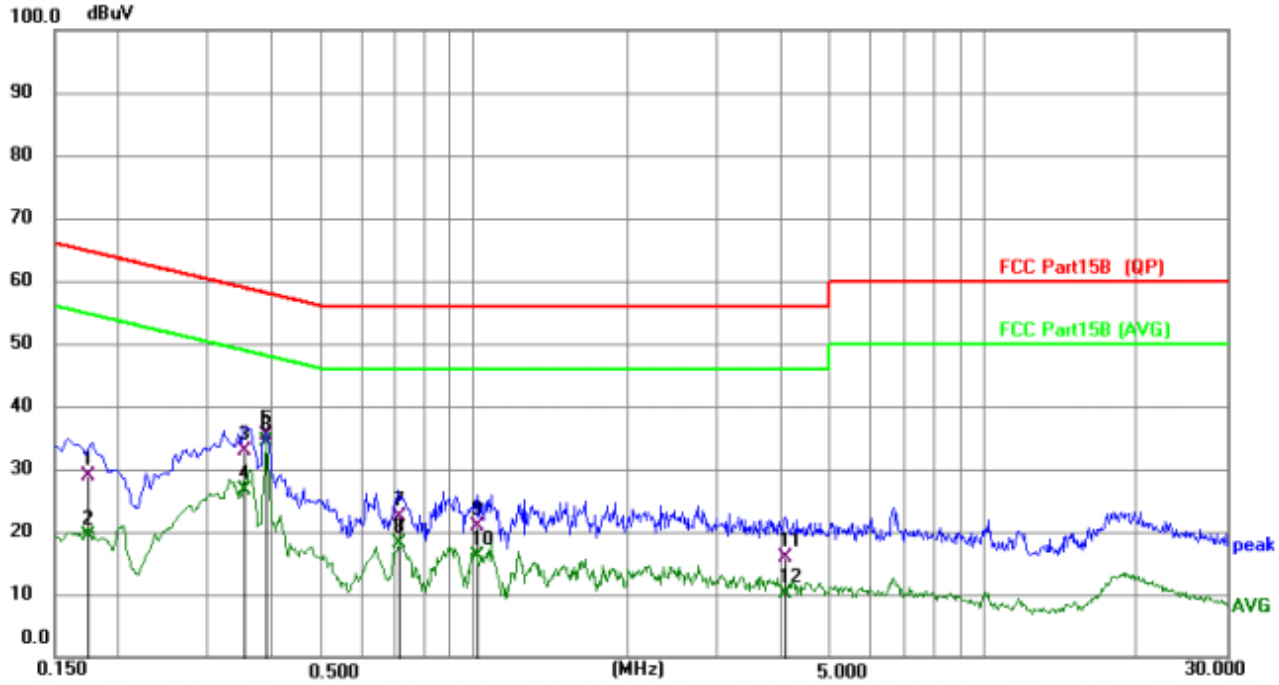
6.1. Conducted Emissions

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.

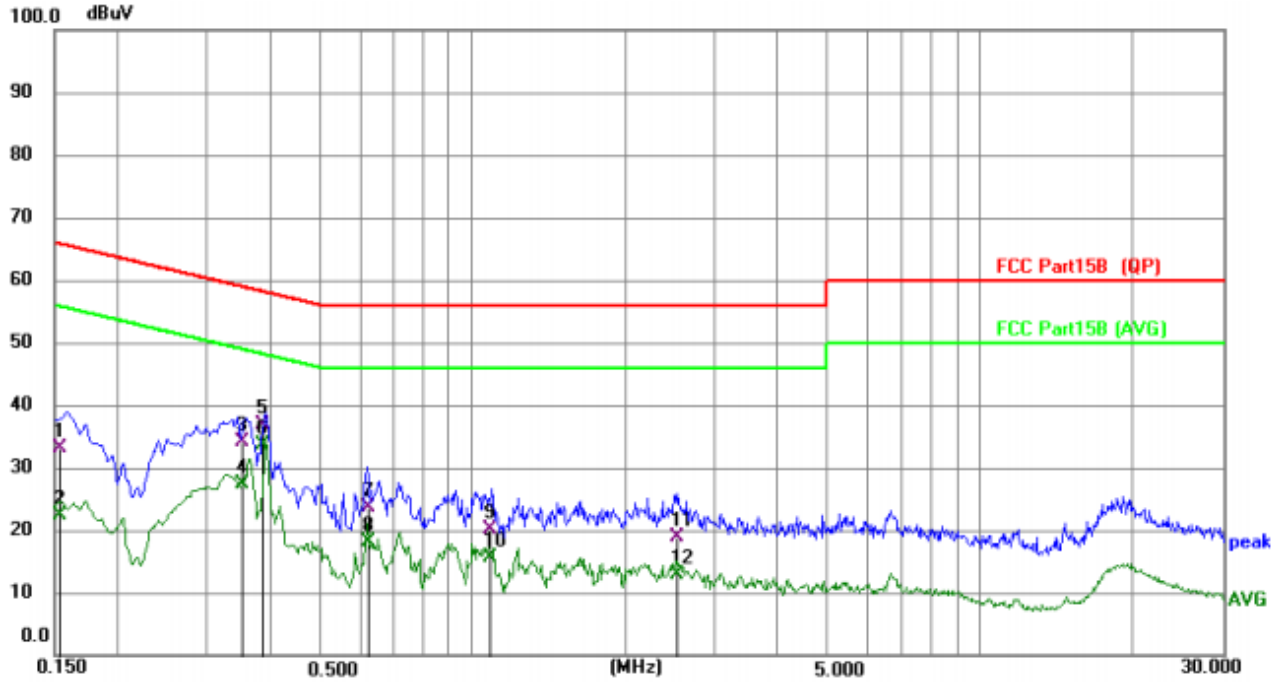
Measurement data:

Line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1751	18.70	10.19	28.89	64.71	-35.82	QP
2		0.1751	9.21	10.19	19.40	54.71	-35.31	AVG
3		0.3527	22.68	10.25	32.93	58.90	-25.97	QP
4		0.3527	16.26	10.25	26.51	48.90	-22.39	AVG
5		0.3889	25.19	10.26	35.45	58.09	-22.64	QP
6	*	0.3889	24.22	10.26	34.48	48.09	-13.61	AVG
7		0.7149	12.05	10.34	22.39	56.00	-33.61	QP
8		0.7149	7.80	10.34	18.14	46.00	-27.86	AVG
9		1.0188	10.50	10.41	20.91	56.00	-35.09	QP
10		1.0188	5.83	10.41	16.24	46.00	-29.76	AVG
11		4.0977	5.28	10.60	15.88	56.00	-40.12	QP
12		4.0977	-0.40	10.60	10.20	46.00	-35.80	AVG

Neutral:

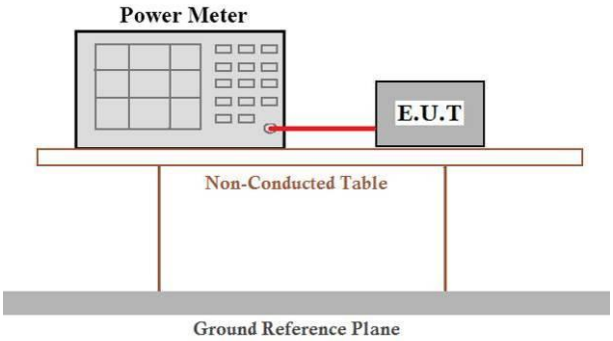


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1541	23.03	10.16	33.19	65.78	-32.59	QP
2		0.1541	12.23	10.16	22.39	55.78	-33.39	AVG
3		0.3506	23.79	10.25	34.04	58.95	-24.91	QP
4		0.3506	17.11	10.25	27.36	48.95	-21.59	AVG
5		0.3868	26.56	10.25	36.81	58.13	-21.32	QP
6	*	0.3868	23.38	10.25	33.63	48.13	-14.50	AVG
7		0.6225	13.39	10.35	23.74	56.00	-32.26	QP
8		0.6225	7.85	10.35	18.20	46.00	-27.80	AVG
9		1.0852	9.81	10.33	20.14	56.00	-35.86	QP
10		1.0852	5.33	10.33	15.66	46.00	-30.34	AVG
11		2.5478	8.37	10.43	18.80	56.00	-37.20	QP
12		2.5478	2.45	10.43	12.88	46.00	-33.12	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

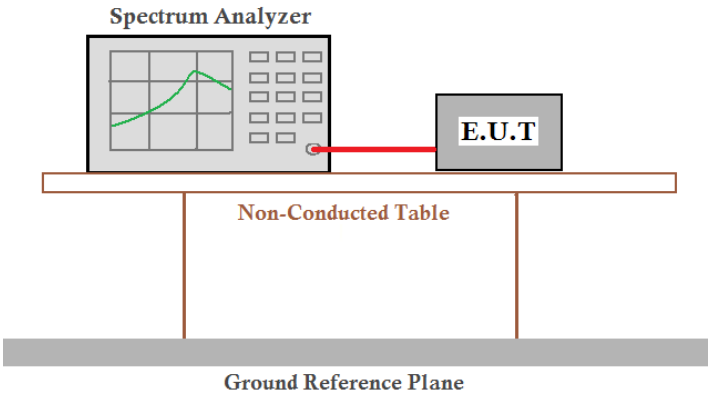
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

Measurement Data

U-NII 1

Type	Channel	Output power (dBm)	Limit (dBm)	Result
802.11a	36	14.70	30.0	Pass
	40	13.66		
	48	13.35		
802.11n(HT20)	36	14.56	30.0	Pass
	40	13.66		
	48	13.42		
802.11n(HT40)	38	13.88	30.0	Pass
	46	13.05		

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

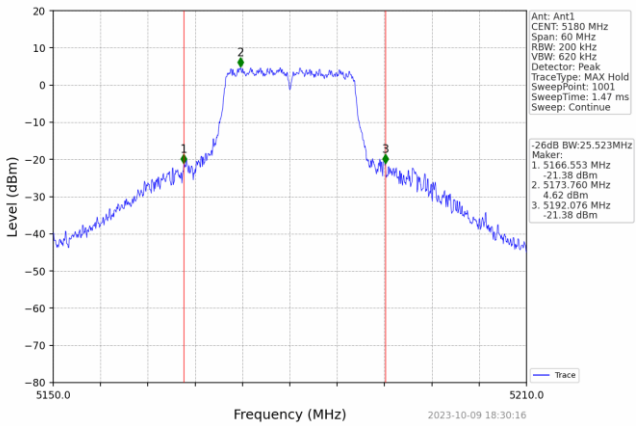
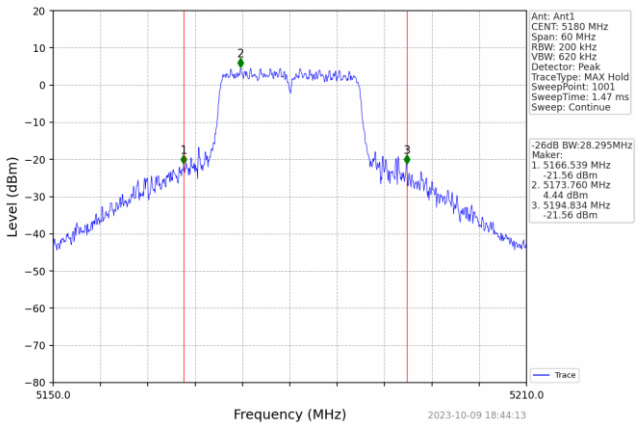
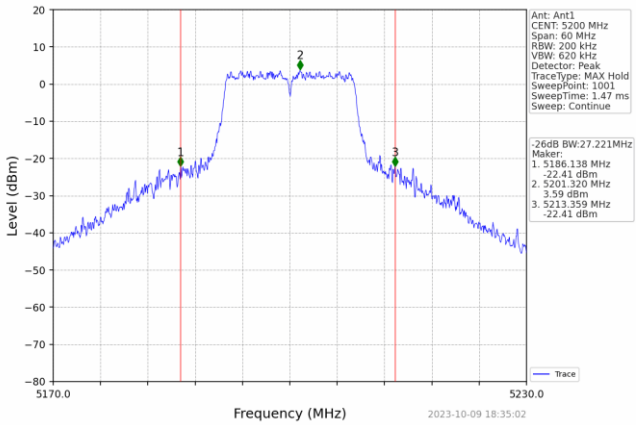
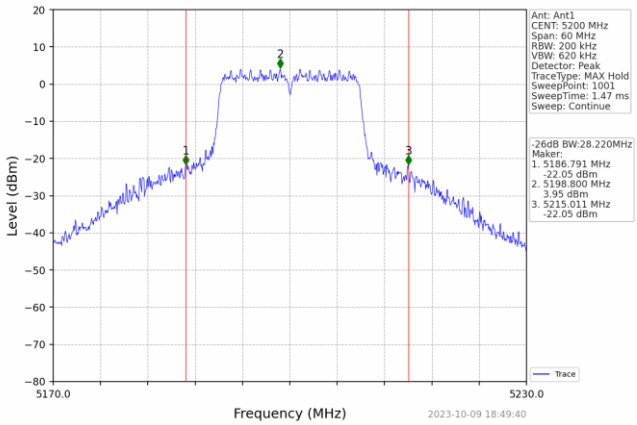
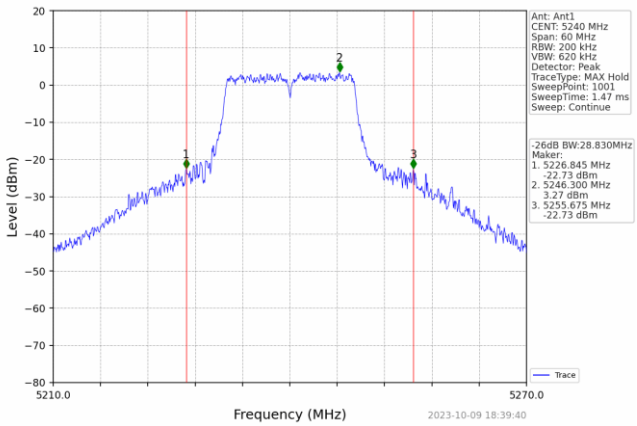
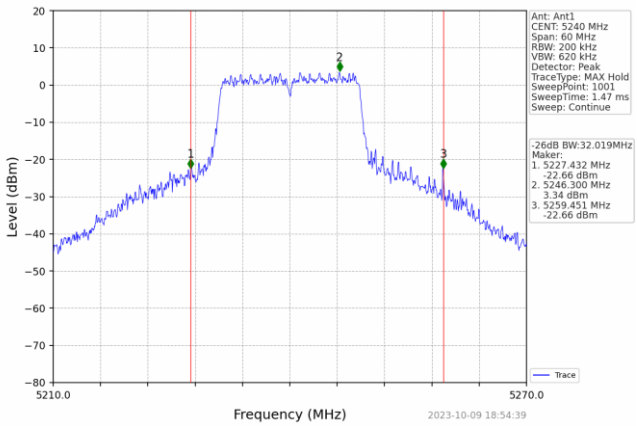
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

Measurement Data

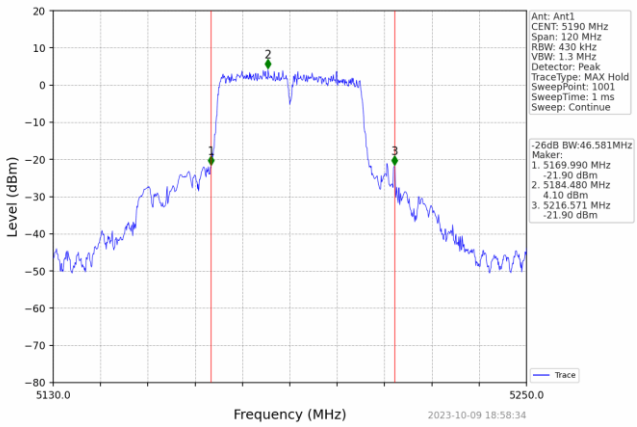
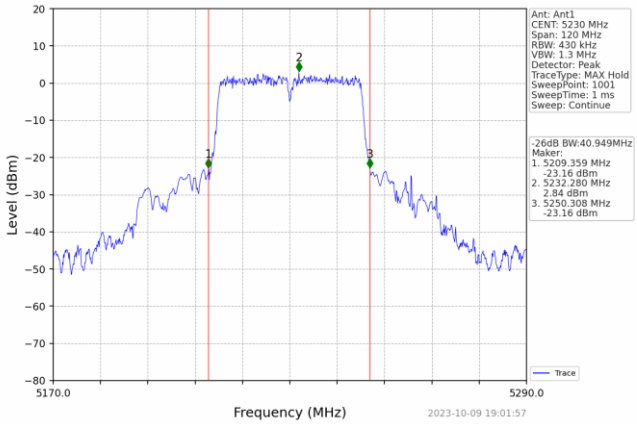
Type	Bands	Channel	26dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	U-NII 1	36	25.523	N/A	Pass
		40	27.221		
		48	28.830		
802.11n(HT20)	U-NII 1	36	28.295		
		40	28.220		
		48	32.019		
802.11n(HT40)	U-NII 1	38	46.581		
		46	40.949		

Test plot as follows:

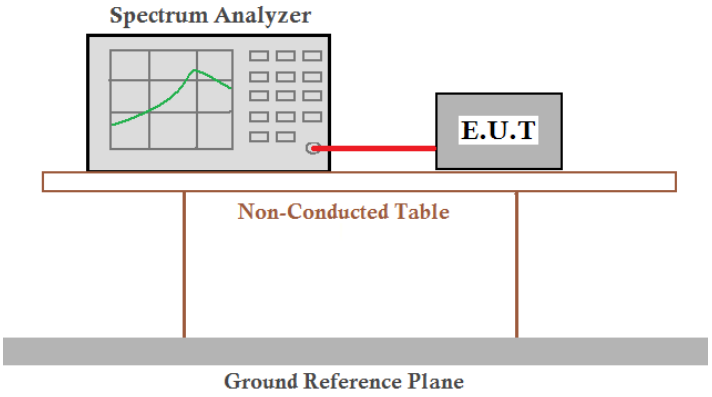
26dB Occupied Bandwidth:

802.11a	*802.11n(HT20)*
	
CH36	*CH36*
	
CH40	*CH40*
	

CH48	CH48

802.11n(HT40)	
	
CH38	
	
CH46	

6.4. Power Spectral Density

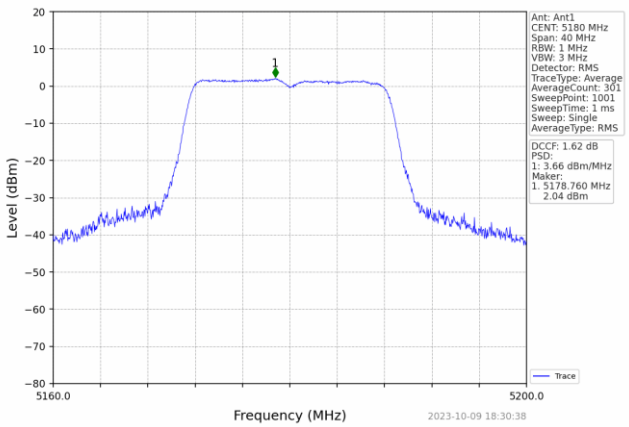
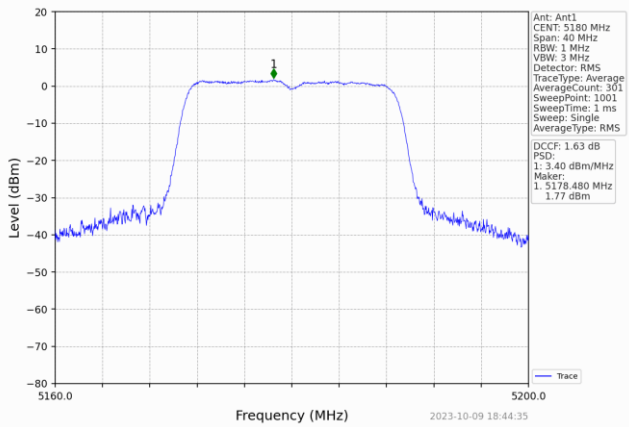
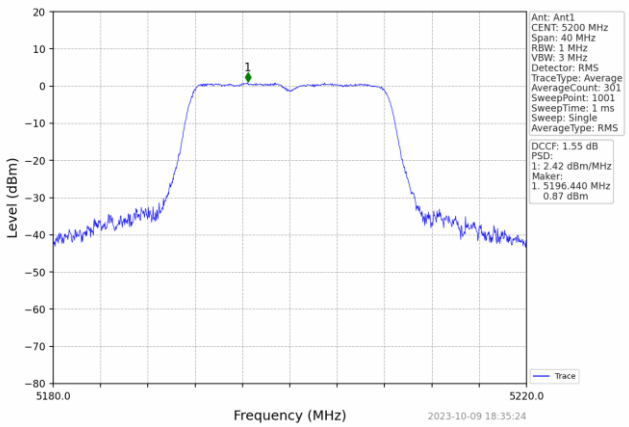
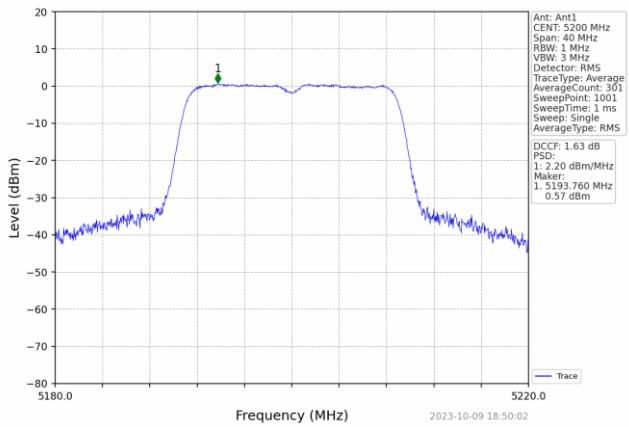
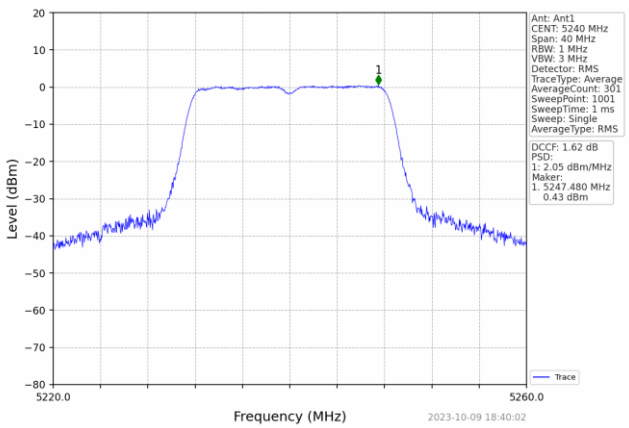
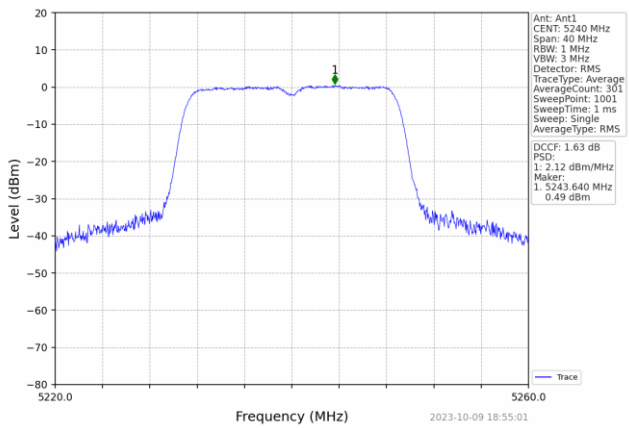
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	<table><tr><td>Frequency band (MHz)</td><td>Limit</td></tr><tr><td rowspan="2">5150-5250</td><td>≤17dBm in 1MHz for master device</td></tr><tr><td>≤11dBm in 1MHz for client 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

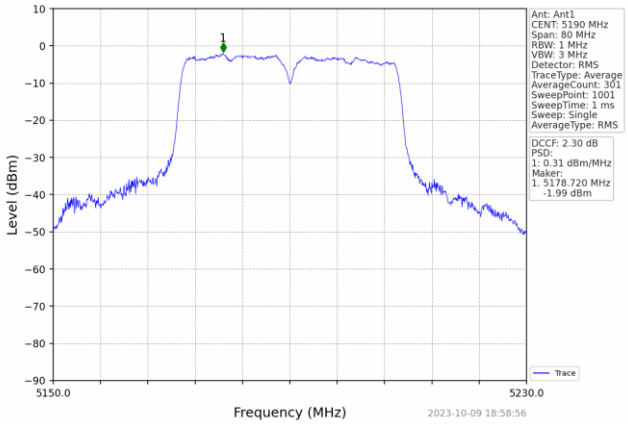
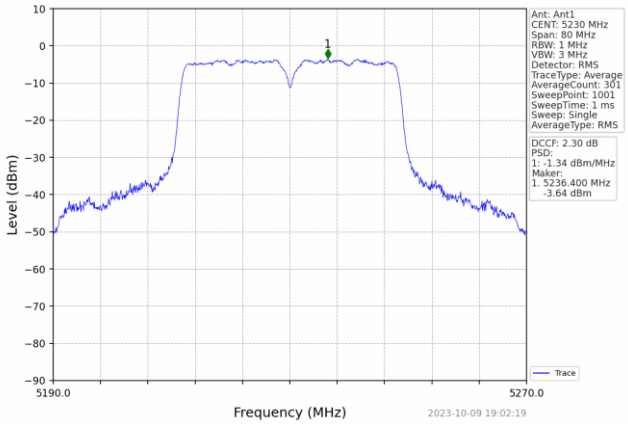
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

Measurement Data

Type	Bands	Channel	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	U-NII 1	36	3.66	17.0	Pass
		40	2.42		
		48	2.05		
802.11n (HT20)	U-NII 1	36	3.40		
		40	2.20		
		48	2.12		
802.11n (HT40)	U-NII 1	38	0.31		
		46	-1.34		

Test plots as followed:

802.11a	802.11n(HT20)
	
CH36	CH36
	
CH40	CH40
	
CH48	CH48

802.11n(HT40)	
	
CH38	
	
CH46	

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:

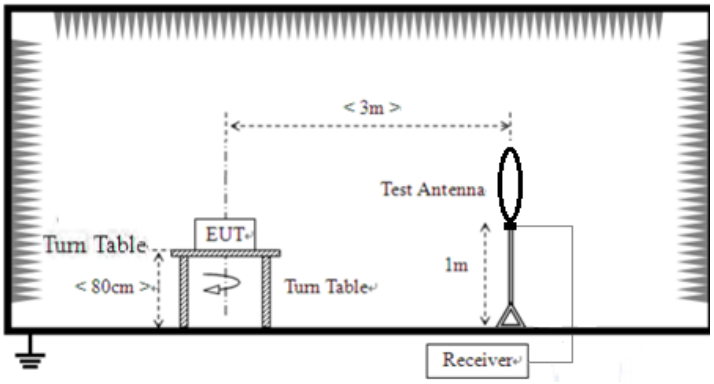
Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

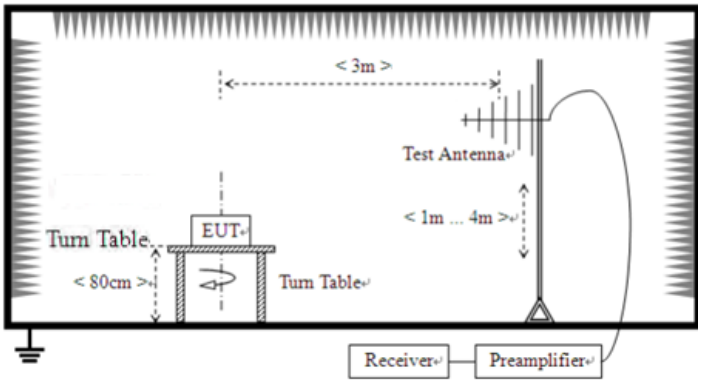
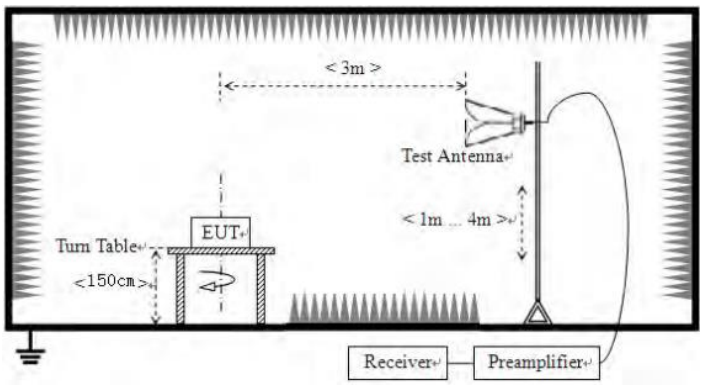
Limit:

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



	For radiated emissions from 30MHz to1GHz  For radiated emissions above 1GHz 
Test Procedure:	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.
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					

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:

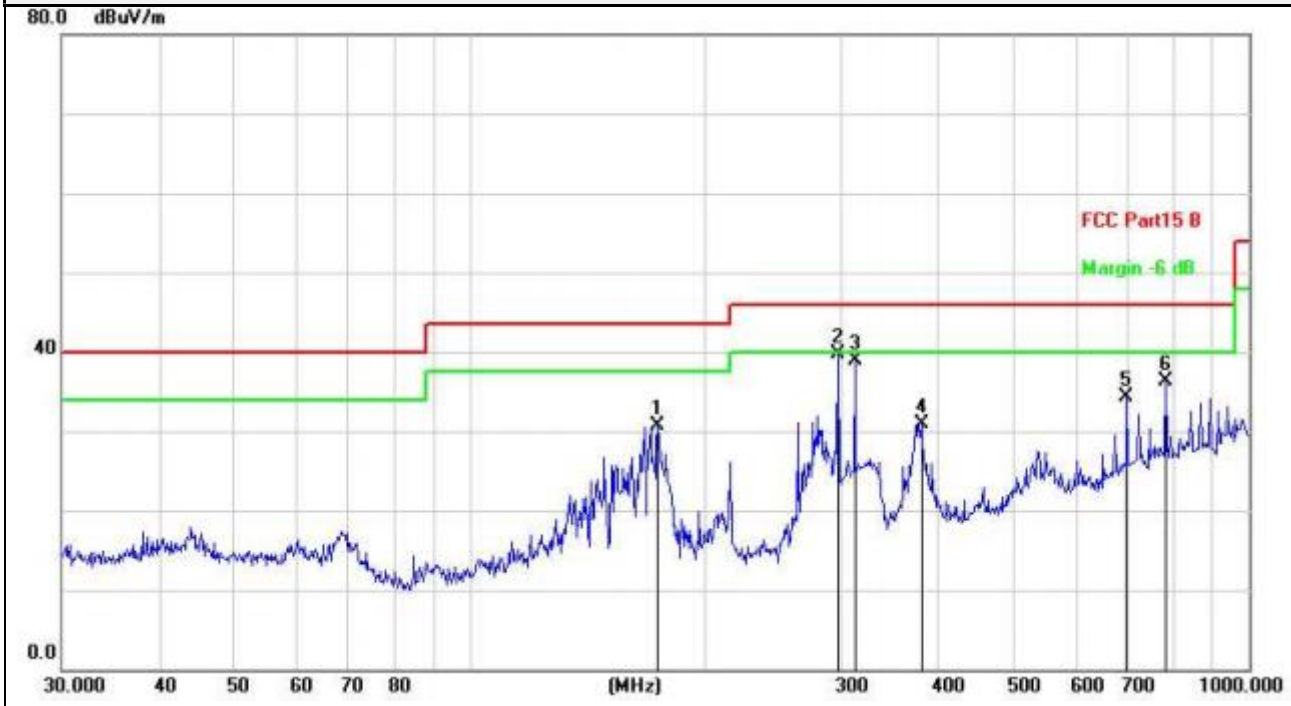
■ **9kHz~30MHz**

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 802.11a 5180MHz, and so only show the test result of 802.11a 5180MHz

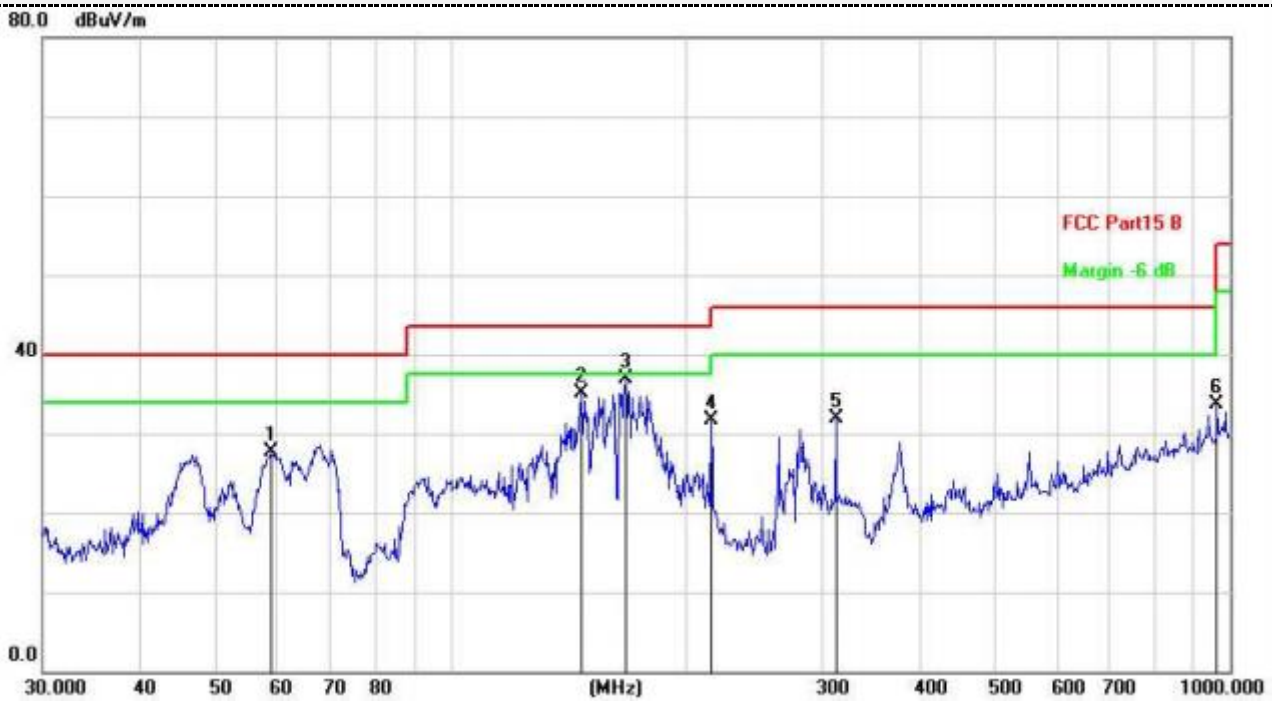
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dB/m	dB	Detector
1		174.4241	42.46	-11.77	30.69	43.50	-12.81	QP
2	*	297.2241	50.26	-10.55	39.71	46.00	-6.29	QP
3		312.1794	49.38	-10.42	38.96	46.00	-7.04	QP
4		379.9141	39.57	-8.70	30.87	46.00	-15.13	QP
5		696.8567	35.85	-1.52	34.33	46.00	-11.67	QP
6		782.3453	36.09	0.14	36.23	46.00	-9.77	QP

Final Level =Receiver Read level + Correct Factor

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dB/m	dB	Detector
1		59.0251	39.25	-11.60	27.65	40.00	-12.35	QP
2		147.4036	45.94	-10.91	35.03	43.50	-8.47	QP
3	*	167.8243	47.78	-10.88	36.90	43.50	-6.60	QP
4		216.0240	45.09	-13.31	31.78	46.00	-14.22	QP
5		312.1794	42.31	-10.42	31.89	46.00	-14.11	QP
6		962.1623	30.32	3.45	33.77	54.00	-20.23	QP

Final Level =Receiver Read level + Correct Factor

■ **Above 1-40GHz**

Note: All 802.11a / 802.11n (HT20) /802.11n (HT40) modes have been tested for above 1GHz test, only the worst case 802.11a was recorded.

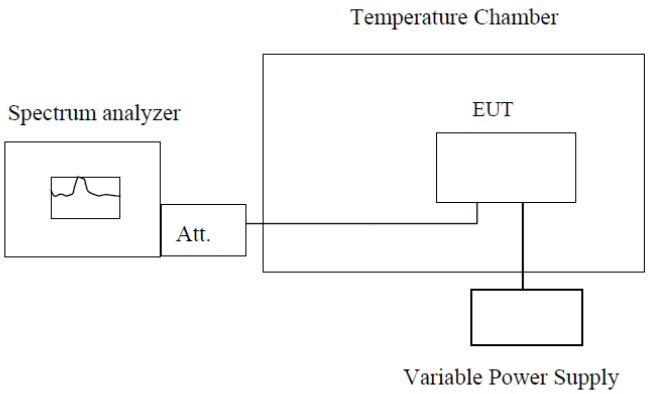
U-NII 1 & 802.11a (above 1GHz)

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	55.24	PK	H	68.20	12.96	46.90	31.4	8.44	31.5	8.34
36.00	5150.00	45.30	AV	H	54.00	8.70	36.96	31.4	8.44	31.5	8.34
(5180MHz)	10360.00	53.96	PK	H	68.20	14.24	38.83	38.21	11.59	38.26	11.54
	--	--	--	--	--	--	--	--	--	--	--
40.00	10400.00	54.20	PK	H	68.20	14.00	42.66	38.21	11.59	38.26	11.54
(5200MHz)	--	--	--	--	--	--	--	--	--	--	--
48.00	5350.50	43.51	PK	H	68.20	24.69	35.17	31.4	8.44	31.5	8.34
(5240MHz)	10480.00	54.05	PK	H	68.20	14.15	42.91	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	52.48	PK	V	68.20	15.72	44.14	31.4	8.44	31.5	8.34
36.00	5150.00	43.59	AV	V	54.00	10.41	35.25	31.4	8.44	31.5	8.34
(5180MHz)	10360.00	52.69	PK	V	68.20	15.51	41.15	38.21	11.59	38.26	11.54
	--	--	--	--	--	--	--	--	--	--	--
40.00	10400.00	52.64	PK	V	68.20	15.56	41.10	38.21	11.59	38.26	11.54
(5200MHz)	--	--	--	--	--	--	--	--	--	--	--
48.00	5350.50	54.11	PK	V	68.20	14.09	45.77	31.4	8.44	31.5	8.34
(5240MHz)	10480.00	52.39	PK	V	68.20	15.81	41.25	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: 802.11a channel=36 frequency=5180MHz					
Voltage (V)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
AC120	-30	76.71	0.01481	Within the band of operation	Pass
	-20	85.73	0.01655		
	-10	71.32	0.01377		
	0	62.22	0.01201		
	10	72.19	0.01394		
	20	90.49	0.01747		
	30	56.02	0.01082		
	40	63.38	0.01224		
	50	69.67	0.01345		
AC138	25	70.09	0.01353		
AC102	25	77.96	0.01505		

6.7. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

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

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1) (I):

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Antenna Connected Construction

The maximum gain of antenna was 3.97 dBi.

Remark:The antenna gain is provided by the customer , if the data provided by the customer is not accurate, Shenzhen HTT Technology Co.,Ltd. does not assume any responsibility.

7. Test Setup Photo

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

8. EUT Constructional Details

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

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