

Shenzhen HTT Technology Co., Ltd.

Report No.: HTT202309010F01

TEST Report

Applicant: Dalian Cloud Force Technologies Co., Ltd.

Address of Applicant: Unit1, Block B,6th Floor, No.23 Honggang Rd. Ganjingzi Distr.

Dalian, Liaoning Province, China

Manufacturer: Dalian Cloud Force Technologies Co., Ltd.

Address of Unit1, Block B,6th Floor, No.23 Honggang Rd. Ganjingzi Distr.

Manufacturer: Dalian, Liaoning Province, China

Equipment Under Test (EUT)

Product Name: Air Quality Sensor

Model No.: AQS1

Series model: AQS1-A, AQS1-S

Trade Mark: Ubibot

FCC ID: 2AMFC-AQS1

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: Aug.31,2023

Date of Test: Aug.31,2023~Sep.06,2023

Date of report issued: Sep.06,2023

Test Result: PASS *

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



1. Version

Version No.	Date	Description
00	Sep.06,2023	Original

Tested/ Prepared By	Heber He	Date:	Sep.06,2023
	Project Engineer		
Check By:	Bruce Zhu	Date:	Sep.06,2023
	Reviewer		
Approved By :	Kevin Yang HT	TDate:	Sep.06,2023
	Authorized Signature		



2. Contents

	Page
1. VERSION	2
2. CONTENTS	3
3. TEST SUMMARY	4
4. GENERAL INFORMATION	
4.1. GENERAL DESCRIPTION OF EUT 4.2. TEST MODE 4.3. DESCRIPTION OF SUPPORT UNITS 4.4. DEVIATION FROM STANDARDS 4.5. ABNORMALITIES FROM STANDARD CONDITIONS 4.6. TEST FACILITY 4.7. TEST LOCATION 4.8. ADDITIONAL INSTRUCTIONS	
5. TEST INSTRUMENTS LIST	
6. TEST RESULTS AND MEASUREMENT DATA	9
6.1. CONDUCTED EMISSIONS 6.2. CONDUCTED PEAK OUTPUT POWER 6.3. CHANNEL BANDWIDTH 6.4. POWER SPECTRAL DENSITY 6.5. BAND EDGE 6.5.1. Conducted Emission Method 6.5.2. Radiated Emission Method 6.6. SPURIOUS EMISSION 6.6.1. Conducted Emission Method 6.6.2. Radiated Emission Method 6.6.3. Radiated Emission Method 6.6.4. Radiated Emission Method 6.6.5. ANTENNA REQUIREMENT	
7. TEST SETUP PHOTO	37
8 FUT CONSTRUCTIONAL DETAILS	37



3. Test Summary

		1
Test Item	Section	Result
Antenna requirement	FCC part 15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	FCC part 15.207	Pass
Conducted Peak Output Power	FCC part 15.247 (b)(3)	Pass
6dB Bandwidth	FCC part 15.247 (a)(2)	Pass
Power Spectral Density	FCC part 15.247 (e)	Pass
Band Edge	FCC part 15.247(d)	Pass
Spurious Emission	FCC part 15.205/15.209	Pass

Remark: Test according to ANSI C63.10:2013 and RSS-Gen

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 unce	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

Tit. Ochicial Description of Lot	
Product Name:	Air Quality Sensor
Model No.:	AQS1
Series model:	AQS1-A, AQS1-S
Test sample(s) ID:	HTT202309010-1(Engineer sample) HTT202309010-2(Normal sample)
Channel numbers:	802.11b/802.11g /802.11n(HT20): 11 802.11n(HT40):7
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/802.11n(H20)/802.11n(HT40): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	PCB Antenna
Antenna Gain:	5.30 dBi
Power supply:	Micro USB (5V/2A) DC 12V/1A
Adapter Information (Auxiliary test provided by the lab):	Mode: GS-0500200 Input: AC100-240V, 50/60Hz, 0.3A max Output: DC 5V, 2A
Hardware Version:	V1.0.3
Software Version:	V1.0.7



Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

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

T	Frequency (MHz)			
Test channel	802.11b/802.11g/802.11n(HT20)	802.11n(HT40)		
Lowest channel	2412MHz	2422MHz		
Middle channel	2437MHz	2437MHz		
Highest channel	2462MHz	2452MHz		



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	802.11b	802.11g 802.11n(HT20		802.11n(HT40)
Data rate	1Mbps	6Mbps	6.5Mbps	13Mbps

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. In	ventory Cal.Date	Cal.Due date
----------------------------------	--------------	------------------	--------------

Shenzhen HTT Technology Co.,Ltd.

Tel: 0755-23595200 Fax: 0755-23595201



	1			Nepo	ORT NO.: H11202	309010101
				No.	(mm-dd-yy)	(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

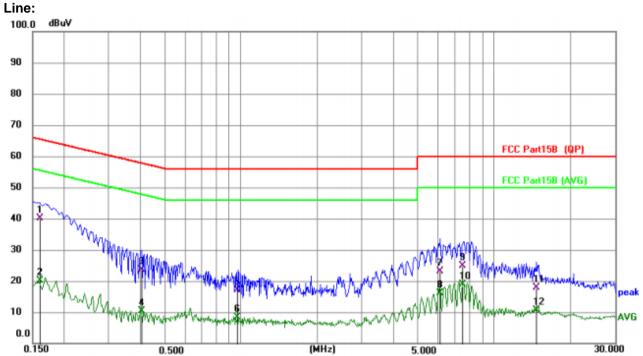
O	Oondacted Emissions								
	Test Requirement:	FCC Part15 C	Section 15.2	207					
	Test Method:	ANSI C63.10:	:2013						
	Test Frequency Range:	150KHz to 30	MHz						
	Class / Severity:	Class B							
	Receiver setup:	RBW=9KHz,	VBW=30KHz	, Sweep tir	ne=auto				
	Limit:		· ****** (NALI=)		Limit	(dBuV)			
		Frequency	range (MHz)	Qu	asi-peak	Aver	age		
		0.1	6	66 to 56*	56 to	46*			
			.5-5		56	46			
			5-30	:41 41	60	50	0		
	Test setup:	" Decreases \	with the logari Reference Pl		rrequency.				
	Test procedure:	Remark E.U.T. Equipment Under Test LISN Line impedence Stabilization Network Test table height=0.8m 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 500hm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 500hm/50uH coupling impedance with 500hm 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 secti							
	Test environment:	Temp.: 2	25 °C ⊦	lumid.:	52%	Press.:	1012mbar		
	Test voltage:	AC 120V, 60H				I	l		
	Test results:	Pass							

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



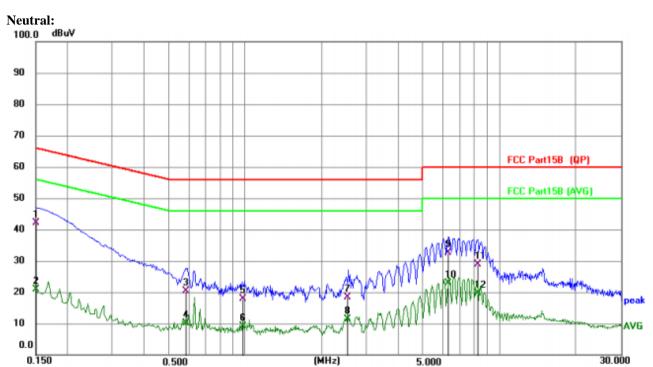
Measurement data:





No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit Over		
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.1606	30.02	10.17	40.19	65.43	-25.24	QP
2		0.1606	10.02	10.17	20.19	55.43	-35.24	AVG
3		0.4029	13.38	10.26	23.64	57.79	-34.15	QP
4		0.4029	0.03	10.26	10.29	47.79	-37.50	AVG
5		0.9663	6.75	10.40	17.15	56.00	-38.85	QP
6		0.9663	-2.07	10.40	8.33	46.00	-37.67	AVG
7		6.0996	12.45	10.61	23.06	60.00	-36.94	QP
8		6.0996	5.61	10.61	16.22	50.00	-33.78	AVG
9		7.5417	14.30	10.63	24.93	60.00	-35.07	QP
10		7.5417	8.37	10.63	19.00	50.00	-31.00	AVG
11		14.7310	6.77	11.04	17.81	60.00	-42.19	QP
12		14.7310	-0.46	11.04	10.58	50.00	-39.42	AVG





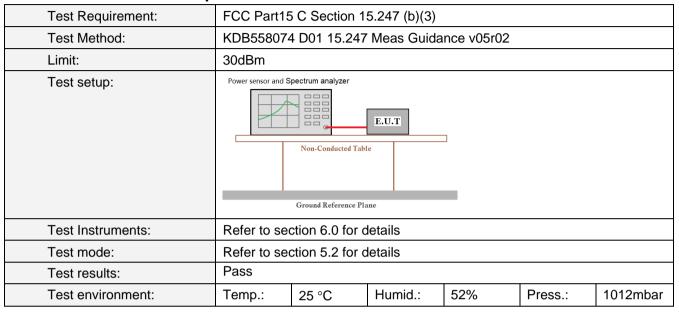
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz		dB	dBuV	dBuV	dB	Detector
1 *	0.1512	31.90	10.16	42.06	65.93	-23.87	QP
2	0.1512	10.70	10.16	20.86	55.93	-35.07	AVG
3	0.5844	10.09	10.32	20.41	56.00	-35.59	QP
4	0.5844	-0.23	10.32	10.09	46.00	-35.91	AVG
5	0.9869	7.59	10.32	17.91	56.00	-38.09	QP
6	0.9869	-1.26	10.32	9.06	46.00	-36.94	AVG
7	2.5479	7.98	10.43	18.41	56.00	-37.59	QP
8	2.5479	1.05	10.43	11.48	46.00	-34.52	AVG
9	6.3024	21.91	10.65	32.56	60.00	-27.44	QP
10	6.3024	12.24	10.65	22.89	50.00	-27.11	AVG
11	8.2146	18.14	10.77	28.91	60.00	-31.09	QP
12	8.2146	8.80	10.77	19.57	50.00	-30.43	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. Conducted Peak Output Power

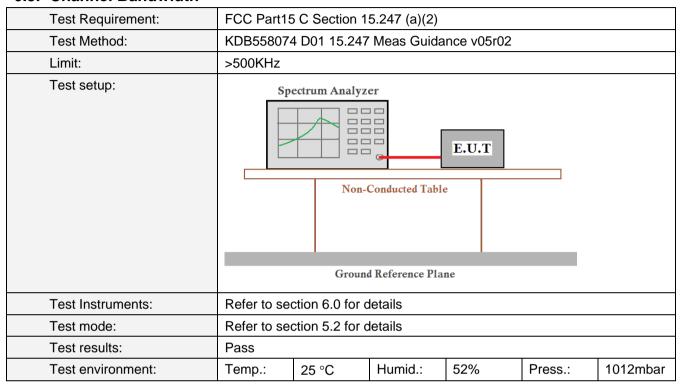


Measurement Data

Test CH		Peak Outp								
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	Limit(dBm)	Result				
Lowest	13.48	16.51	17.06	15.04						
Middle	13.72	15.90	16.64	14.36 30.00		Pass				
Highest	13.28	15.75	16.62	14.48						



6.3. Channel Bandwidth

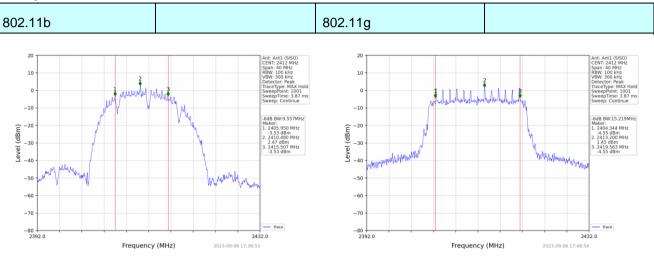


Measurement Data

		Channel E	Bandwidth (MHz)				
Test CH	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	Limit(KHz)	Result	
Lowest	9.557	15.219	18.187	35.167			
Middle	10.584	15.205	18.151	35.113	>500	Pass	
Highest	ighest 10.098 15.200 18.265		35.119				



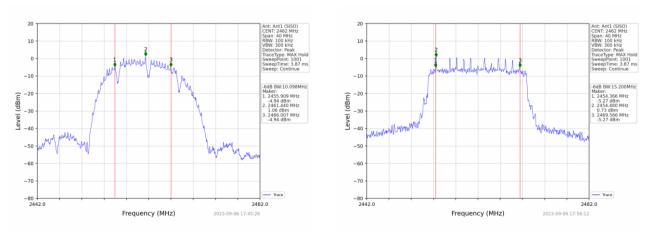
Test plot as follows:



Lowest channel

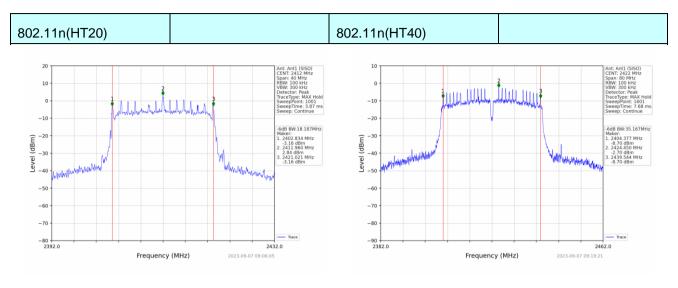


Middle channel

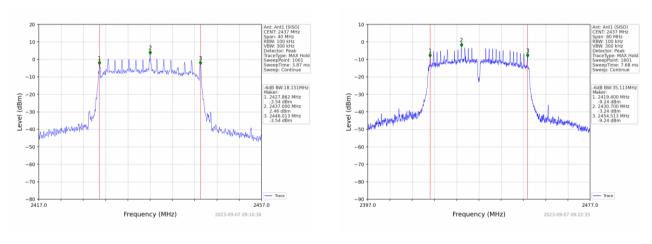


Highest channel

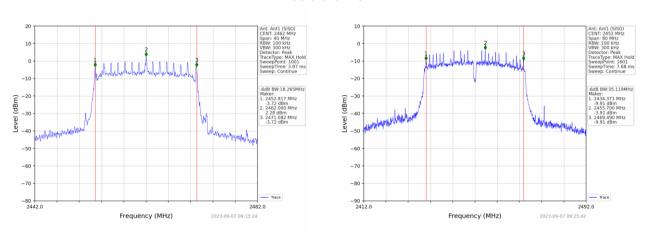




Lowest channel



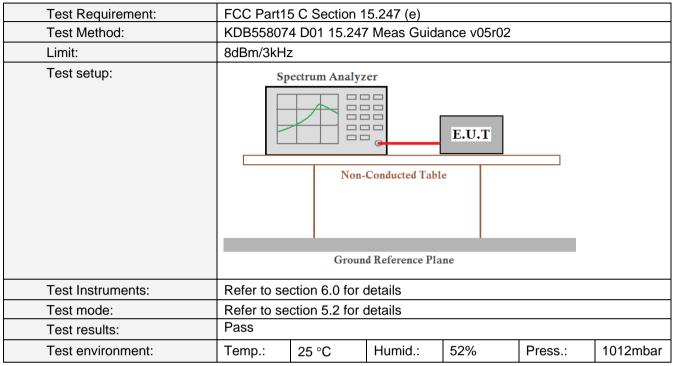
Middle channel



Highest channel



6.4. Power Spectral Density



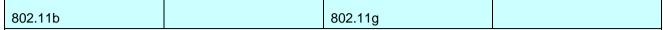
Measurement Data

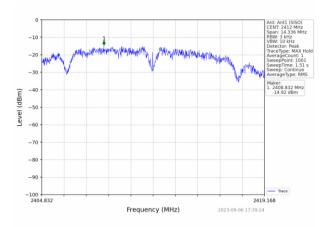
	Weasuremen	ii Dala					
	-		Power Spectra	Hz)	Limit		
Test CH		802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	(dBm/3kHz)	Result
	Lowest	-14.92	-17.09	-16.17	-22.21		
	Middle	-14.65	-16.85	-17.70	-22.31	31 8.00	
Highest		-15.24	-17.47	-17.68	-21.64		

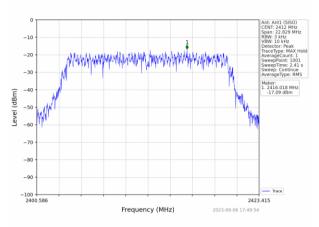
Remark: We have tested all mode at high, middle and low channel, and recorded worst case at middle



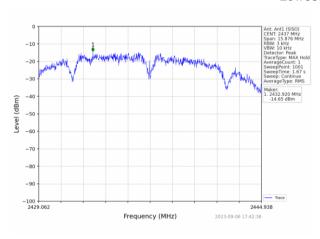
Test plot as follows:

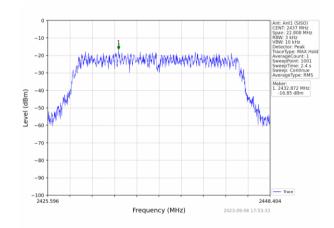




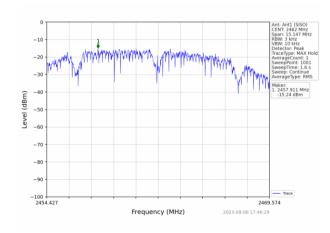


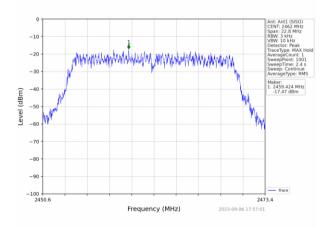
Lowest channel





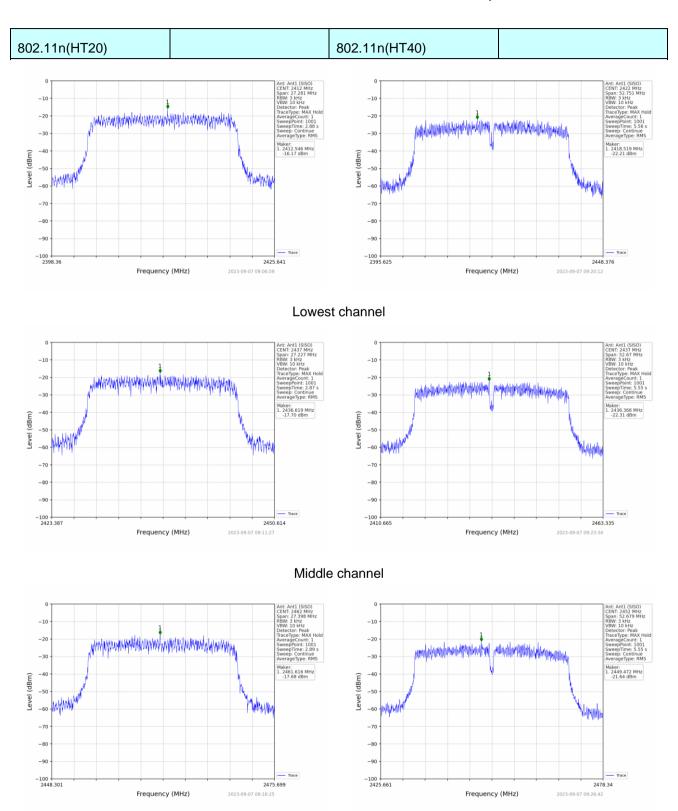
Middle channel





Highest channel





Highest channel



6.5. Band Edge

6.5.1. Conducted Emission Method

Test Requirement:	FCC Part1	FCC Part15 C Section 15.247 (d)							
Test Method:	KDB55807	4 D01 15.247	' Meas Guida	ance v05r02					
Limit:	spectrum in its produced the 100 kH the desired	kHz bandwid ntentional rac d by the inten Iz bandwidth d power, ba ent.	liator is oper tional radiato within the ba	ating, the rac or shall be at l and that cont	dio frequency least 20 dB b ains the high	power that below that in nest level of			
Test setup:	Spec	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane							
Test Instruments:	Refer to se	ction 6.0 for o	details						
Test mode:	Refer to se	Refer to section 5.2 for details							
Test results:	Pass	Pass							
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar			



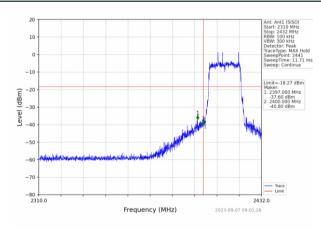
Test plot as follows:

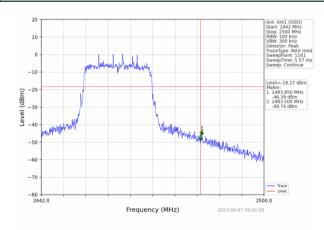
Test mode: 802.11b Art. Art1 (\$550) Soft: 2310 Mit (\$650) Soft:

Lowest channel

Highest channel

Test mode: 802.11g





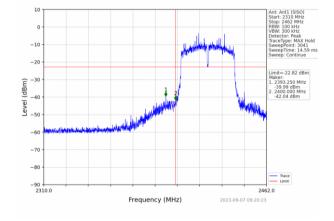
Lowest channel

Highest channel

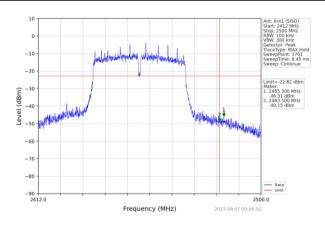


Test mode: 802.11n(HT20) Art. Art. (SiSO) Surt. 2310 Mirk. Right 100 Hz. Right 100 Hz. Right 242 Mirk. Right 100 Hz. Right 100

Test mode: 802.11n(HT40)



Lowest channel



Highest channel

Lowest channel

Highest channel



6.5.2. Radiated Emission Method

0.5.2. Radiated Emission Wethod								
Test Requirement:	FCC Part15 (5.209 a	and 15.205				
Test Method:	ANSI C63.10							
Test Frequency Range:	All of the res 2500MHz) da			ested, only	the wo	orst band's	(2310MHz to	
Test site:	Measuremen	t Distance:	3m					
Receiver setup:	Frequency			RBW	VBW		emark	
	Above 1GH	z Pea Pea		1MHz 1MHz	3MH 10Hz		ak Value age Value	
Limit:	Fred	quency	L	₋imit (dBuV			emark	
	Abov	e 1GHz		54.0 74.0			age Value ak Value	
Test setup:	Test Antenna. Turn Table Variable Var							
Test Procedure:	1 The FUT	was placed	on the			olo 1 5 moto	ure above the	
	 The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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 							
Test Instruments:	Refer to sect	ion 6.0 for d	etails					
Test mode:	Refer to sect	ion 5.2 for d	etails					
Test results:	Pass					1		
Test environment:	Temp.:	25 °C	Humi	d.: 52%	6	Press.:	1012mbar	



Measurement Data

Remark: During the test, pre-scan the 802.11b/802.11g/802.11n (H20)/802.11n (H40) modulation, and found the 802.11b modulation which it is worse case.

Freque	ncy(MHz)	:	24	12	Pola	arity:		HORIZONT	AL
Frequency (MHz)	Emis Le (dBu	vel	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
2390.00	62.17	PK	74	11.83	63.56	27.2	4.31	32.9	-1.39
2390.00	42.82	AV	54	11.18	44.21	27.2	4.31	32.9	-1.39
Freque	ncy(MHz)	:	24	12	Pola	arity:		VERTICA	L
Frequency (MHz)	Emis Le (dBu	vel	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
2390.00	60.57	PK	74	13.43	61.96	27.2	4.31	32.9	-1.39
2390.00	45.32	AV	54	8.68	46.71	27.2	4.31	32.9	-1.39
Freque	ncy(MHz)	:	24	62	Pola	arity:		HORIZONT	AL
Frequency (MHz)	Emis Le (dBu	vel	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
2483.50	56.15	PK	74	17.85	57.08	27.4	4.47	32.8	-0.93
2483.50	43.92	AV	54	10.08	44.85	27.4	4.47	32.8	-0.93
Freque	ncy(MHz)	:	24	62	Pola	arity:		VERTICA	L
Frequency (MHz)	Emis Le (dBu	vel	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
2483.50	55.35	PK	74	18.65	56.28	27.4	4.47	32.8	-0.93
2483.50	45.15	AV	54	8.85	46.08	27.4	4.47	32.8	-0.93



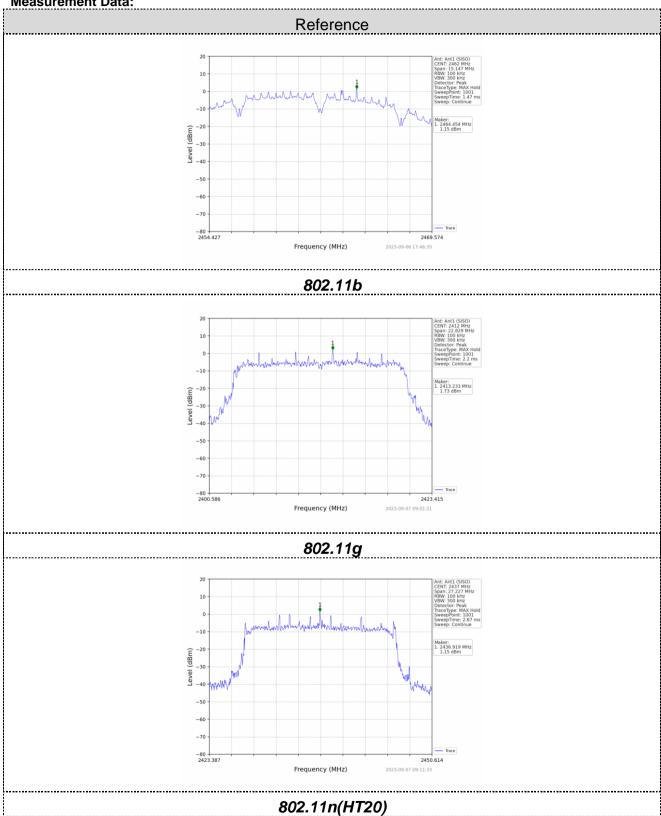
6.6. Spurious Emission

6.6.1. Conducted Emission Method

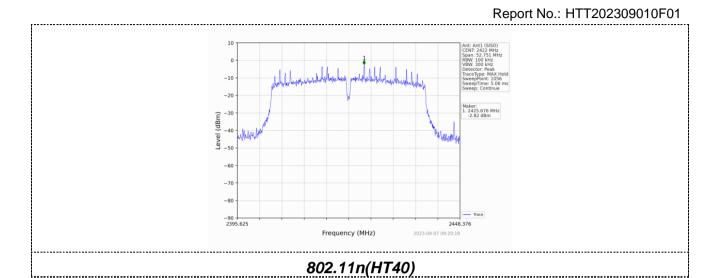
Test Requirement:	FCC Part1	5 C Section 1	5.247 (d)				
Test Method:	KDB55807	4 D01 15.247	Meas Guida	ance v05r02			
Limit:	spectrum in is produced the 100 kH the desired	ntentional rac d by the inten Iz bandwidth d power, ba	diator is oper tional radiato within the b	e frequency bating, the racer shall be at and that conter an RF c	lio frequency least 20 dB b ains the high	power that elow that in nest level of	
Test setup:	Sp	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane					
Test Instruments:	Refer to section 6.0 for details						
Test mode:	Refer to section 5.2 for details						
Test results:	Pass						
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar	







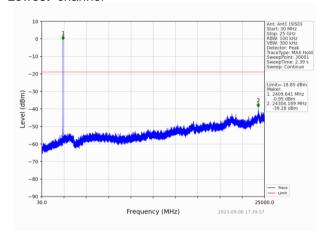


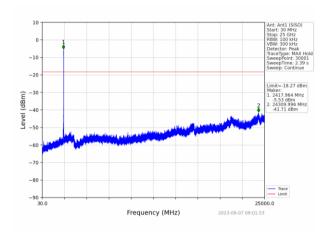




802.11b 802.11g

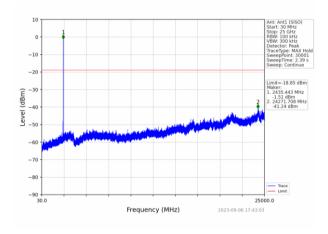
Lowest channel

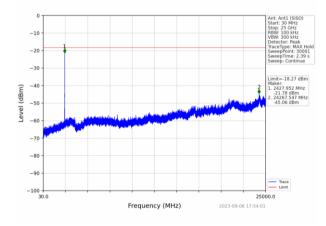




30MHz~25GHz

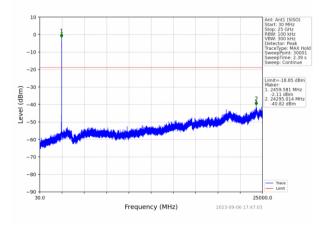
Middle channel

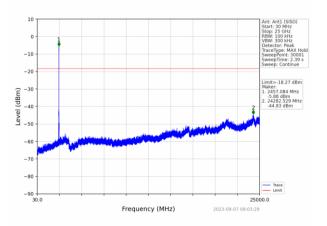




30MHz~25GHz

Highest channel





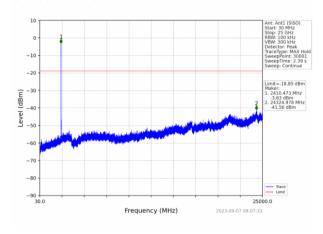
30MHz~25GHz

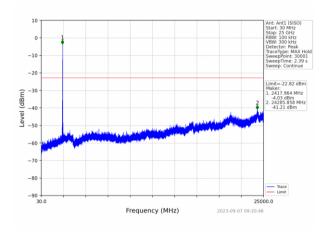


802.11n(HT20)

802.11n(HT40)

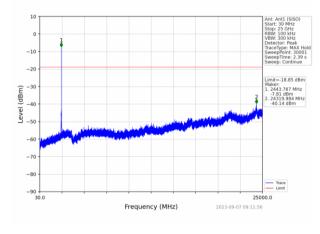
Lowest channel

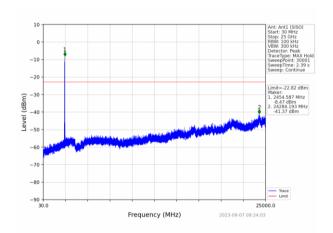




30MHz~25GHz

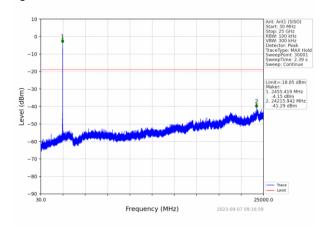
Middle channel

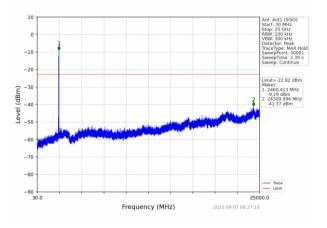




30MHz~25GHz

Highest channel





30MHz~25GHz

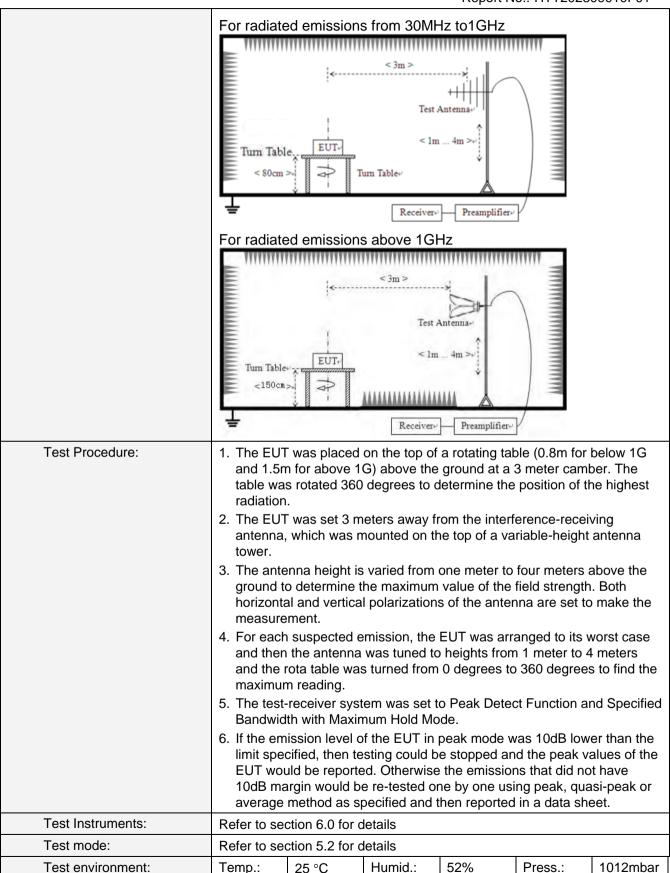
¹F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road, Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China



6.6.2. Radiated Emission Method

0.0.2. Radiated L	d Lillission Metriod							
Test Requirement:	FCC Part15 C Section	on 15	5.209					
Test Method:	ANSI C63.10:2013							
Test Frequency Range:	9kHz to 25GHz							
Test site:	Measurement Distar	nce: 3	3m					
Receiver setup:	Frequency		Detector	RB∖	Ν	VBW	'	Value
	9KHz-150KHz	Qι	ıasi-peak	200Hz		lz 600Hz		Quasi-peak
	150KHz-30MHz	150KHz-30MHz Quasi-peak		9KH	lz	30KH:	Z	Quasi-peak
	30MHz-1GHz	Qι	ıasi-peak	120K	Hz	300KH	lz	Quasi-peak
	Above 1GHz	About 1015		1MF	łz	3MHz	<u>z</u>	Peak
	Above 10112		Peak	1MF	łz	10Hz		Average
Limit:	Frequency Limit			//m)	٧	'alue	N	Measurement Distance
	0.009MHz-0.490MHz 2400/F(KHz) QP 300m						300m	
	0.490MHz-1.705M	0.490MHz-1.705MHz 24000/F(KHz) QP						30m
	1.705MHz-30MHz 30 QP					30m		
	30MHz-88MHz	30MHz-88MHz 100 QP						
	88MHz-216MHz	<u>z</u>	150			QP		
	216MHz-960MH	Z	200			QP		3m
	960MHz-1GHz		500		QP			3111
	Above 1GHz		500		Average			
	7.5575 15112		5000)	F	Peak		
Test setup:	For radiated emiss	sions	from 9kH	z to 30	MH:	Z		
	**************	,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	*****	****	*****	=	
	Turn Table EUT Im Receiver							





Tel: 0755-23595200 Fax: 0755-23595201



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:

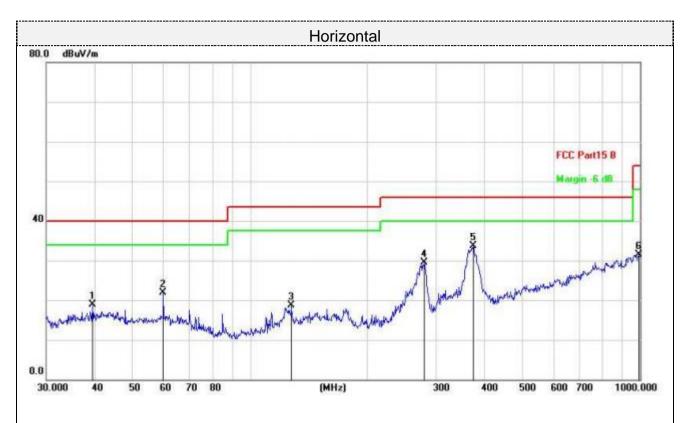
■ 9kHz~30MHz

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

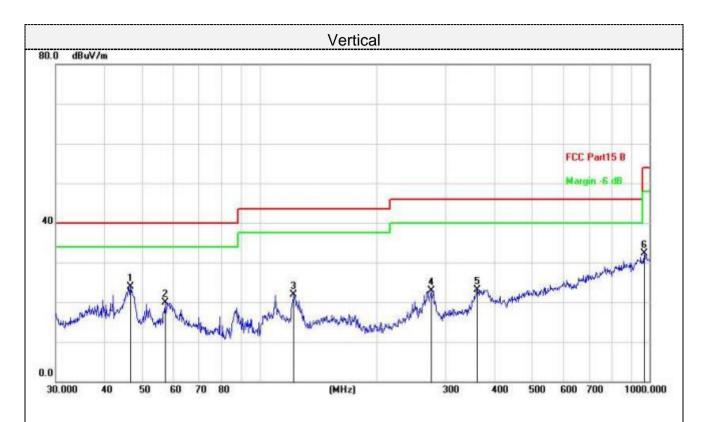
Pre-scan all test modes, found worst case at 802.11b 2437MHz, and so only show the test result of 802.11b 2437MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dB/m	dB	Detector
1		39.4371	29.20	-10.31	18.89	40.00	-21.11	QP
2		59.8588	33.56	-11.60	21.96	40.00	-18.04	QP
3		127.6645	31.30	-12.64	18.66	43.50	-24.84	QP
4		280.0237	40.91	-11.39	29.52	46.00	-16.48	QP
5	*	373.3112	42.63	-8.91	33.72	46.00	-12.28	QP
6		993.0114	27.77	3.74	31.51	54.00	-22.49	QP

Final Level =Receiver Read level + Correct Factor





No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dB/m	dB	Detector
1	*	46.6664	34.55	-10.65	23.90	40.00	-16.10	QP
2		57.1914	31.53	-11.60	19.93	40.00	-20.07	QP
3		122.4040	34.91	-12.93	21.98	43.50	-21.52	QP
4		275.1570	34.36	-11.41	22.95	46.00	-23.05	QP
5		361.7139	32.81	-9.62	23.19	46.00	-22.81	QP
6		968.9338	28.80	3.51	32.31	54.00	-21.69	QP

Final Level = Receiver Read level + Correct Factor



■ Above 1-25GHz

Note: During the test, pre-scan the 802.11b/802.11g/802.11n (H20)/802.11n (H40) modulation, and found the 802.11b modulation which it is worse case.

802.11b:

Freq	uency(MI	Hz):	2412		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4824.00	59.78	PK	74	14.22	53.96	31.05	6.52	31.75	5.82
4824.00 7236.00	44.34 57.60	AV PK	54 74	9.66 16.40	38.52 44.79	31.05 36.08	6.52 8.18	31.75 31.45	5.82 12.81
7236.00	47.80	AV	54	6.20	34.99	36.08	8.18	31.45	12.81

Frequency(MHz):			2412		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4824.00	59.35	PK	74	14.65	53.53	31.05	6.52	31.75	5.82
4824.00	44.37	AV	54	9.63	38.55	31.05	6.52	31.75	5.82
7236.00	57.27	PK	74	16.73	44.46	36.08	8.18	31.45	12.81
7236.00	46.02	AV	54	7.98	33.21	36.08	8.18	31.45	12.81

Frequency(MHz):			2437		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4874.00	61.61	PK	74	12.39	55.17	31.25	6.7	31.51	6.44
4874.00	45.22	AV	54	8.78	38.78	31.25	6.7	31.51	6.44
7311.00	56.21	PK	74	17.79	43.07	36.25	8.31	31.42	13.14
7311.00	45.38	AV	54	8.62	32.24	36.25	8.31	31.42	13.14



Frequency(MHz):			2437		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4874.00	61.60	PK	74	12.40	55.16	31.25	6.7	31.51	6.44
4874.00	45.08	AV	54	8.92	38.64	31.25	6.7	31.51	6.44
7311.00	57.10	PK	74	16.90	43.96	36.25	8.31	31.42	13.14
7311.00	47.59	AV	54	6.41	34.45	36.25	8.31	31.42	13.14

Frequency(MHz):			2462		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4924.00	61.15	PK	74	12.85	54.28	31.52	6.8	31.45	6.87
4924.00	44.59	AV	54	9.41	37.72	31.52	6.8	31.45	6.87
7386.00	55.27	PK	74	18.73	41.71	36.51	8.4	31.35	13.56
7386.00	46.32	AV	54	7.68	32.76	36.51	8.4	31.35	13.56

Frequency(MHz):			2462		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4924.00	59.96	PK	74	14.04	53.09	31.52	6.8	31.45	6.87
4924.00	45.46	AV	54	8.54	38.59	31.52	6.8	31.45	6.87
7386.00	55.80	PK	74	18.20	42.24	36.51	8.4	31.35	13.56
7386.00	47.47	AV	54	6.53	33.91	36.51	8.4	31.35	13.56

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.



6.7. 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 5.30 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.

