FCC RADIO TEST REPORT

FCC ID:2BXVO-BY-80-H

Sample : ICE BATH CHILLER

Trade Mark : N/A

Main Model : BY-80-H

Additional Model : BY-15-H, BY-35-H, BY-50-H, BY-25-H

Report No. : UNIA26051908ER-62

Prepared for

Guangzhou Fengmang Technology Co., Ltd.

Room 301, No. 9, Dongsheng 3rd Cross Road, Dalong Subdistrict, Panyu District, Guangzhou City

Prepared by

Shenzhen United Testing Technology Co., Ltd.

D101&D401, No. 107, Kaicheng High-Tech Park, Taoyuan Community, Dalang Sub-District, Longhua District, Shenzhen, Guangdong, China

TEST RESULT CERTIFICATION

Applicant ..... : Guangzhou Fengmang Technology Co., Ltd.

Address ..... : Room 301, No. 9, Dongsheng 3rd Cross Road, Dalong Subdistrict, Panyu District, Guangzhou City

Manufacturer ..... : Guangzhou Fengmang Technology Co., Ltd.

Address ..... : Room 301, No. 9, Dongsheng 3rd Cross Road, Dalong Subdistrict, Panyu District, Guangzhou City

Product description

Product ..... : ICE BATH CHILLER

Trade Mark ..... : N/A

Model Name ..... : BY-80-H, BY-15-H, BY-35-H, BY-50-H, BY-25-H

Test Methods ..... : FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2020

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests ..... : Aug. 06, 2026 ~ Aug. 20, 2026

Date of Issue ..... : Sep. 09, 2026

Test Result ..... : Pass

Edited by: Abe Yang

Reviewed by: Kelly Cheng

Approved by: Liuze

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1 TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

Item	FCC Rules	Description Of Test	Result
1	FCC Part 15.207	Conducted Emission	Pass
2	FCC Part 15.209(a)	Radiated Emission	Pass
3	FCC Part 15.247(a)(2)	6dB Occupied Bandwidth	Pass
4	FCC Part 15.247(e)	Power Spectral Density	Pass
5	FCC Part 15.247(b)	Average Output Power	Pass
6	FCC Part 15.247(d)	Out Of Band Emissions	Pass
7	FCC Part 15.247(d)	Conducted Spurious Emission	Pass
8	FCC Part 15.203	Antenna Requirement	Pass

Note:

“N/A” denotes test is not applicable in this Test Report.

1.2 TEST FACILITY

Test Firm : Shenzhen United Testing Technology Co., Ltd.

Address : D101&D401, No. 107, Kaicheng High-Tech Park, Taoyuan Community, Dalang Sub-District, Longhua District, Shenzhen, Guangdong, China

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

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

A2LA Certificate Number: 4747.01
The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 674885
The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 31584

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

1.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
UNI	ANSI	9kHz ~ 150kHz	2.96
		150kHz ~ 30MHz	2.44

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
UNI	ANSI	9kHz ~ 30MHz	2.50
		30MHz ~ 1000MHz	4.80
		1000MHz ~ 18000MHz	4.13

C. RF Conducted Method:

Item	Measurement Uncertainty
Uncertainty of total RF power, conducted	U_c = ±0.8 dB
Uncertainty of RF power density, conducted	U_c = ±2.6 dB
Uncertainty of spurious emissions, conducted	U_c = ±2 %
Uncertainty of Occupied Channel Bandwidth	U_c = ±2 %

1.4 ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

	NORMAL CONDITIONS	EXTREME CONDITIONS
Temperature range (℃)	15 - 35	-20 - 50
Relative humidty range	20 % - 75 %	20 % - 75 %
Pressure range (kPa)	86 - 106	86 - 106
Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.		

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product:	ICE BATH CHILLER
Trade Mark:	N/A
Main Model:	BY-80-H
Additional Model:	BY-15-H, BY-35-H, BY-50-H, BY-25-H
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color ,Cooling capacity,Heating capacity,net weight,Product Dimensions,Water volume and cooling time and model named different. Test sample model: BY-80-H.
FCC ID:	2BXVO-BY-80-H
Operation Frequency:	802.11b/g/n20: 2412~2462MHz
Number of Channels:	802.11b/g/n20:11CH
Average Conducted Output Power:	**12.306**dBm
Modulation Type:	CCK, OFDM, DBPSK, DAPSK
Antenna Type:	PCB Antenna
Antenna Gain:	2.54dBi
Battery:	N/A
Adapter:	N/A
Power Source:	AC 120V, 60HZ

2.2 CARRIER FREQUENCY OF CHANNELS

Channel List for 802.11b/g/n/(HT20)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

2.3 TEST MODE

The EUT was programmed to be in continuously transmitting mode.

Channel List for 802.11b/g/n(HT20)		
Test Channel	EUT Channel	Test Frequency (MHz)
Low	CH01	2412
Middle	CH06	2437
High	CH11	2462

2.4 DESCRIPTION OF THE TEST MODES

During the measurement the environmental conditions were within the listed ranges:

Voltage	Normal Voltage	AC 120V
	High Voltage	AC 132V
	Low Voltage	AC 108V
Other	Normal Temperature	24°C
	Relative Humidity	55 %
	Air Pressure	989 hPa

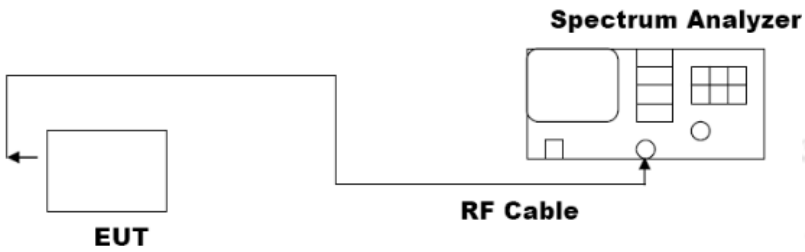
Note: All modes were test at Normal Voltage, High Voltage, and Low Voltage, only the worst results of Normal Voltage was reported in the test report.

2.5 TEST SETUP

Operation of EUT during Conducted testing:

Operation of EUT during Radiation testing:

Operation of EUT during RF Conducted testing:



2.6 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model/Type No.	Cable Length(m)	Note
1	ICE BATH CHILLER	BY-25-H	--	EUT

Note:1. The support equipment was authorized by Declaration of Confirmation.

2. All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

2.7 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Conduction Emissions Measurement					
1	Conducted Emission Test Software	EZ-EMC	Ver.CCS-3A1-CE	N/A	N/A
2	AMN	Schwarzbeck	NNLK8121	8121370	2027.03.25
3	AAN	TESEQ	T8-Cat6	38888	2027.03.25
4	Pulse Limiter	CYBRTEK	EM5010	E115010056	2027.03.25
5	EMI Test Receiver	Rohde&Schwarz	ESCI	101210	2027.03.25
Radiated Emissions Measurement					
1	Radiated Emission Test Software	EZ-EMC	Ver.CCS-03A1	N/A	N/A
2	Horn Antenna	Sunol	DRH-118	A101415	2027.03.27
3	Broadband Hybrid Antenna	Sunol	JB1	A090215	2027.03.27
4	PREAMP	HP	8449B	3008A00160	2027.03.29
5	PREAMP	HP	8447D	2944A07999	2027.03.25
6	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2027.03.25
7	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2027.03.25
8	Signal Generator	Agilent	E4421B	MY4335105	2027.03.25
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2027.03.25
10	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2027.03.25
11	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2027.03.26
12	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2027.03.26
13	RF power divider	Anritsu	K241B	992289	2027.03.26
14	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2027.03.25
15	Active Loop Antenna	Com-Power	AL-130R	10160009	2027.05.26
16	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2027.03.25
17	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2027.03.25
18	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2027.03.25
19	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2027.03.26
20	Signal Generator	Agilent	N5183A	MY47420153	2027.03.27
21	Spctrum Analyzer	Rohde&Schwarz	FSP 40	100501	2027.03.27
22	Power Meter	KEYSIGHT	N1911A	MY50520168	2027.03.27
23	Frequency Meter	VICTOR	VC2000	997406086	2027.03.27
24	DC Power Source	HYELEC	HY5020E	055161818	2027.03.27
25	Low-noise Amplifier	WSC	DLNA-9K-1000	WCSLNA240816A	2027.03.25

26	Spctrum Analyzer	Rohde&Schwarz	FSV40-N	101798	2027.06.25
27	MTS 8310	MW	Copyright MWRFtest 2017	V2.0.0.0	N/A

3 CONDUCTED EMISSION

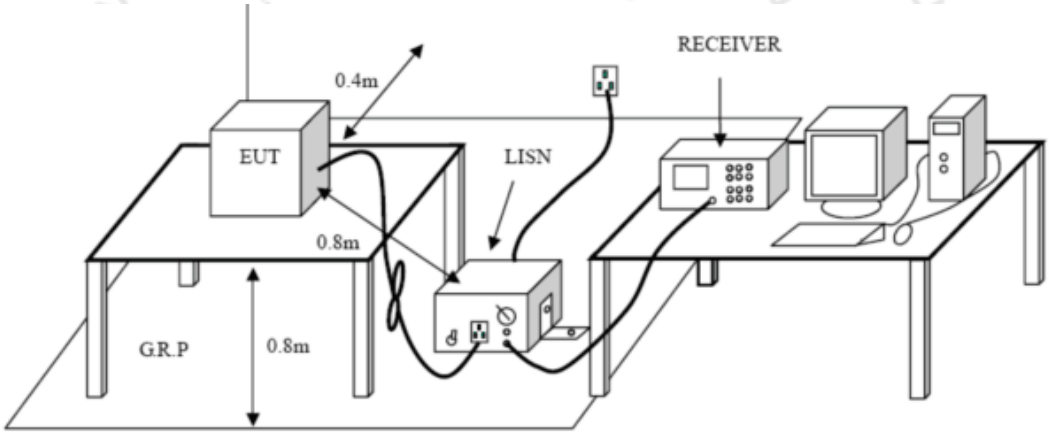
3.1 TEST LIMIT

For unintentional device, according to § 15.207(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	79	66	66~56*	56~46*
0.50~5.00	73	60	56	46
5.00~30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency.
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 TEST SETUP



3.3 TEST PROCEDURE

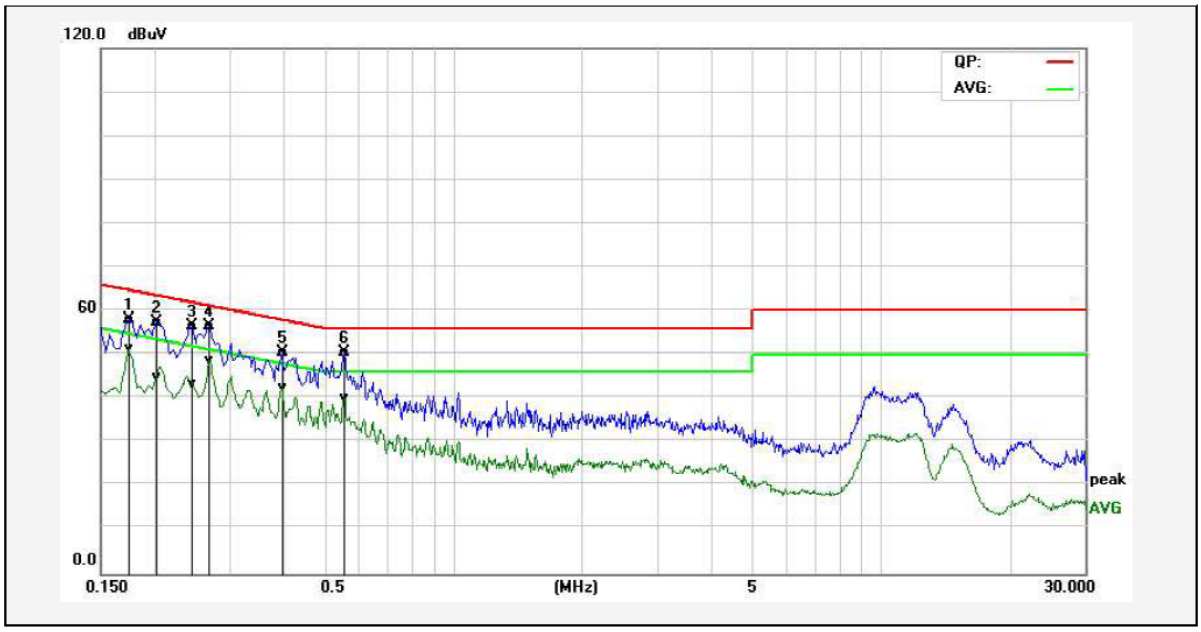
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is placed on a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10: 2013.
2. Support equipment, if needed, was placed as per ANSI C63.10: 2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10: 2013.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hzpower through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

3.4 TEST RESULT

PASS

Remark:
1. All modes were tested at AC 120V and 240V, only the worst result of AC 120V was reported.

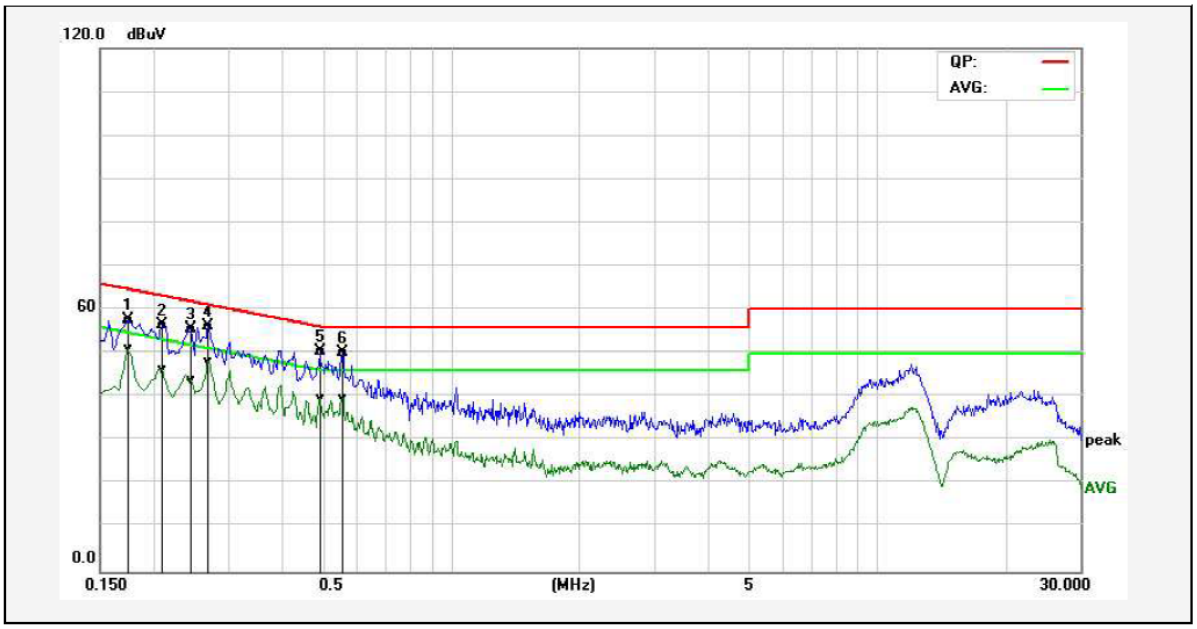
Temperature:	26℃	Relative Humidity:	60%
Test Date:	Aug. 19, 2026	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode of 802.11b 2437MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1740	47.34	40.67	10.69	58.03	51.36	64.76	54.77	-6.73	-3.41	Pass
2P	0.2020	46.92	34.07	10.66	57.58	44.73	63.52	53.53	-5.94	-8.80	Pass
3P	0.2460	45.84	32.61	10.62	56.46	43.23	61.89	51.89	-5.43	-8.66	Pass
4*	0.2700	45.99	38.05	10.61	56.60	48.66	61.12	51.12	-4.52	-2.46	Pass
5P	0.3980	39.81	31.85	10.62	50.43	42.47	57.89	47.90	-7.46	-5.43	Pass
6P	0.5580	39.85	29.45	10.56	50.41	40.01	56.00	46.00	-5.59	-5.99	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

Temperature:	26℃	Relative Humidity:	60%
Test Date:	Aug. 19, 2026	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode of 802.11b 2437MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1740	46.92	40.59	10.69	57.61	51.28	64.76	54.77	-7.15	-3.49	Pass
2P	0.2100	45.91	35.60	10.66	56.57	46.26	63.20	53.21	-6.63	-6.95	Pass
3P	0.2460	45.15	33.37	10.62	55.77	43.99	61.89	51.89	-6.12	-7.90	Pass
4*	0.2700	45.65	37.64	10.61	56.26	48.25	61.12	51.12	-4.86	-2.87	Pass
5P	0.4940	39.98	29.25	10.57	50.55	39.82	56.10	46.10	-5.55	-6.28	Pass
6P	0.5580	39.84	29.16	10.56	50.40	39.72	56.00	46.00	-5.60	-6.28	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

4.1 RADIATED EMISSION

3.5 TEST LIMIT

For unintentional device, according to §15.209(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F (kHz)	-	Quasi-peak	300
0.490MHz-1.705MHz	24000/F (kHz)	-	Quasi-peak	30
1.705MHz-30MHz	30	-	Quasi-peak	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3
		74.0	Peak	3

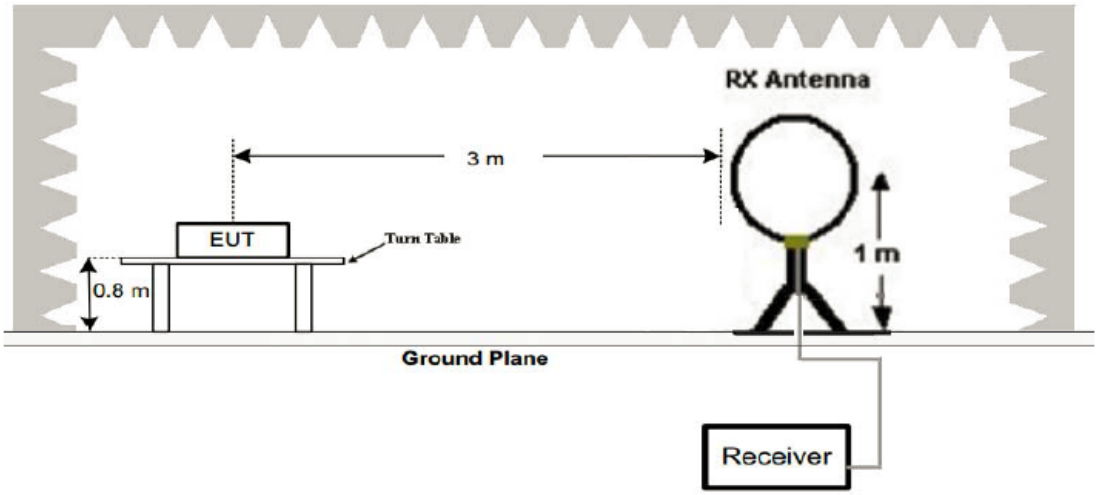
Limit calculation and transfer to 3m distance as showed in the following table:

Frequency (MHz)	Limit (dBuV/m)	Distance (m)
0.009-0.490	20log(2400/F(KHz))+40log(300/3)	3
0.490-1.705	20log(24000/F(KHz))+40log(30/3)	3
1.705-30.0	69.5	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

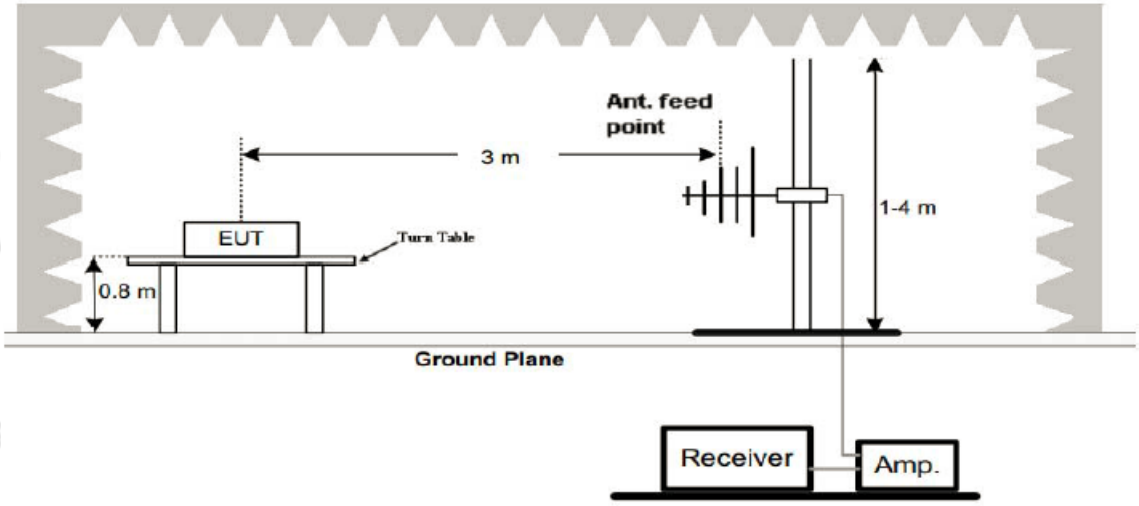
For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

3.6 TEST SETUP

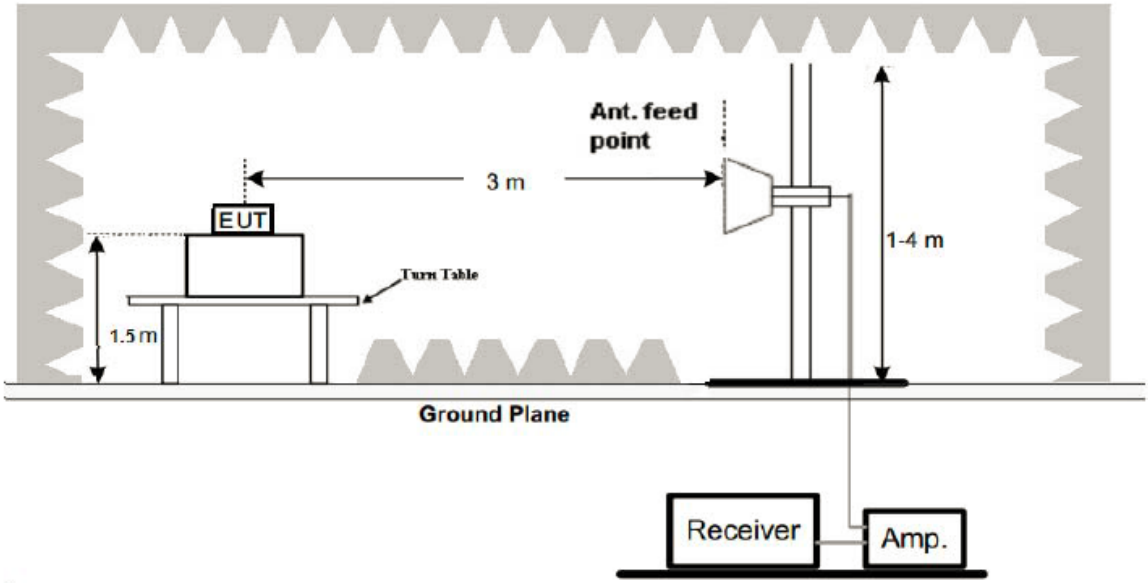
1. Radiated Emission Test-Up Frequency Below 30MHz



2. Radiated Emission Test-Up Frequency 30MHz~1GHz



3. Radiated Emission Test-Up Frequency Above 1GHz



3.7 TEST PROCEDURE

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9kHz to25GHz per FCC PART 15.33(a).

Note: For battery operated equipment, the equipment tests shall be performed using a new battery.

3.8 TEST RESULT

PASS

Remark:

1. All modes were test at Low, Middle, and High channel, only the worst result was reported for below 1GHz test.
2. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, and test data recorded in this report.

Below 1GHz Test Results:

Temperature:	25℃	Relative Humidity:	60%
Test Date:	Aug. 19, 2026	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Horizontal
Test Mode:	Transmitting mode of 802.11b 2437MHz		

No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	31.9546	28.41	-10.40	18.01	40.00	-21.99			QP
2	130.8369	30.64	-13.30	17.34	43.50	-26.16			QP
3	312.1794	37.42	-11.84	25.58	46.00	-20.42			QP
4	432.5457	32.73	-9.82	22.91	46.00	-23.09			QP
5	520.8882	34.86	-7.01	27.85	46.00	-18.15			QP
6*	827.4934	34.13	-1.80	32.33	46.00	-13.67			QP

Remark: Result = Reading Level + Factor, Margin = Result – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	25℃	Relative Humidity:	60%
Test Date:	Aug. 19, 2026	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Vertical
Test Mode:	Transmitting mode of 802.11b 2437MHz		

No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	31.8427	29.86	-10.34	19.52	40.00	-20.48			QP
2	53.6932	37.67	-20.88	16.79	40.00	-23.21			QP
3	130.8369	35.69	-13.30	22.39	43.50	-21.11			QP
4	290.0172	38.18	-11.89	26.29	46.00	-19.71			QP
5	520.8882	34.63	-7.01	27.62	46.00	-18.38			QP
6*	719.1995	34.47	-4.02	30.45	46.00	-15.55			QP

Remark: Result = Reading Level + Factor, Margin = Result – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Remark：
1. Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, emission from 9kHz to 30MHz are more than 20dB below the limit, so it was not recorded in this report.
2. * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
3. The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120kHz, 1MHz for measuring above 1GHz, below 30MHz was 10kHz.

Above 1 GHz Test Results:

CH01 of 802.11b Mode (2412MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	63.55	-3.64	59.91	74	-14.09	PK
4824	50.67	-3.64	47.03	54	-6.97	AV
7236	58.24	-0.95	57.29	74	-16.71	PK
7236	46.46	-0.95	45.51	54	-8.49	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	62.74	-3.64	59.1	74	-14.9	PK
4824	49.55	-3.64	45.91	54	-8.09	AV
7236	59.35	-0.95	58.4	74	-15.6	PK
7236	47.37	-0.95	46.42	54	-7.58	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

CH06 of 802.11b Mode (2437MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	62.45	-3.51	58.94	74	-15.06	PK
4874	49.74	-3.51	46.23	54	-7.77	AV
7311	59.44	-0.82	58.62	74	-15.38	PK
7311	47.64	-0.82	46.82	54	-7.18	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	61.54	-3.51	58.03	74	-15.97	PK
4874	49.74	-3.51	46.23	54	-7.77	AV
7311	58.19	-0.82	57.37	74	-16.63	PK
7311	46.47	-0.82	45.65	54	-8.35	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

CH11 of 802.11b Mode (2462MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	61.25	-3.43	57.82	74	-16.18	PK
4924	50.17	-3.43	46.74	54	-7.26	AV
7386	58.63	-0.75	57.88	74	-16.12	PK
7386	46.66	-0.75	45.91	54	-8.09	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	62.56	-3.43	59.13	74	-14.87	PK
4924	49.68	-3.43	46.25	54	-7.75	AV
7386	58.55	-0.75	57.8	74	-16.2	PK
7386	46.77	-0.75	46.02	54	-7.98	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

CH01 of 802.11g Mode (2412MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	61.49	-3.64	57.85	74	-16.15	PK
4824	50.67	-3.64	47.03	54	-6.97	AV
7236	57.67	-0.95	56.72	74	-17.28	PK
7236	46.94	-0.95	45.99	54	-8.01	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	60.78	-3.64	57.14	74	-16.86	PK
4824	49.45	-3.64	45.81	54	-8.19	AV
7236	57.67	-0.95	56.72	74	-17.28	PK
7236	46.77	-0.95	45.82	54	-8.18	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

CH06 of 802.11g Mode (2437MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	60.53	-3.51	57.02	74	-16.98	PK
4874	49.88	-3.51	46.37	54	-7.63	AV
7311	57.63	-0.82	56.81	74	-17.19	PK
7311	46.53	-0.82	45.71	54	-8.29	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	61.45	-3.51	57.94	74	-16.06	PK
4874	49.16	-3.51	45.65	54	-8.35	AV
7311	57.69	-0.82	56.87	74	-17.13	PK
7311	46.76	-0.82	45.94	54	-8.06	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

CH11 of 802.11g Mode (2462MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	61.23	-3.43	57.8	74	-16.2	PK
4924	49.16	-3.43	45.73	54	-8.27	AV
7386	57.59	-0.75	56.84	74	-17.16	PK
7386	46.32	-0.75	45.57	54	-8.43	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	61.23	-3.43	57.8	74	-16.2	PK
4924	49.45	-3.43	46.02	54	-7.98	AV
7386	57.29	-0.75	56.54	74	-17.46	PK
7386	46.88	-0.75	46.13	54	-7.87	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

CH01 of 802.11n/HT20 Mode (2412MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	61.47	-3.64	57.83	74	-16.17	PK
4824	49.69	-3.64	46.05	54	-7.95	AV
7236	57.86	-0.95	56.91	74	-17.09	PK
7236	46.65	-0.95	45.7	54	-8.3	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	61.44	-3.64	57.8	74	-16.2	PK
4824	49.45	-3.64	45.81	54	-8.19	AV
7236	57.84	-0.95	56.89	74	-17.11	PK
7236	46.55	-0.95	45.6	54	-8.4	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

CH06 of 802.11n/HT20 Mode (2437MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	60.59	-3.51	57.08	74	-16.92	PK
4874	49.49	-3.51	45.98	54	-8.02	AV
7311	57.65	-0.82	56.83	74	-17.17	PK
7311	46.77	-0.82	45.95	54	-8.05	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	61.16	-3.51	57.65	74	-16.35	PK
4874	49.38	-3.51	45.87	54	-8.13	AV
7311	58.66	-0.82	57.84	74	-16.16	PK
7311	46.69	-0.82	45.87	54	-8.13	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

CH11of 802.11n/HT20 Mode (2462MHz):

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	63.22	-3.43	59.79	74	-14.21	PK
4924	49.57	-3.43	46.14	54	-7.86	AV
7386	57.45	-0.75	56.7	74	-17.3	PK
7386	46.42	-0.75	45.67	54	-8.33	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	65.24	-3.43	61.81	74	-12.19	PK
4924	49.35	-3.43	45.92	54	-8.08	AV
7386	57.16	-0.75	56.41	74	-17.59	PK
7386	46.69	-0.75	45.94	54	-8.06	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Remark:

1. Measuring frequencies from 1GHz to the 25GHz.
2. “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
3. * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
4. The emissions are attenuated more than 20dB below the permissible limits are not recorded in the report.
5. The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120kHz, 1 MHz for measuring above 1GHz, below 30MHz was 10kHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
6. When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20dBuV/m(PK Value) <54dBuV/m(AV Limit), the Average Detected not need to completed.
7. All modes of operation were investigated and the worst-case emissions are reported.

Operation Mode: CH01 of 802.11b Mode (2412MHz)

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	58.77	-5.81	52.96	74	-21.04	PK
2310	/	-5.81	/	54	/	AV
2390	66.74	-5.84	60.9	74	-13.1	PK
2390	48.69	-5.84	42.85	54	-11.15	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	57.74	-5.81	51.93	74	-22.07	PK
2310	/	-5.81	/	54	/	AV
2390	66.56	-5.84	60.72	74	-13.28	PK
2390	49.74	-5.84	43.9	54	-10.1	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Operation Mode: CH11 of 802.11b Mode (2462MHz)

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	57.68	-5.65	52.03	74	-21.97	PK
2483.5	/	-5.65	/	54	/	AV
2500	58.19	-5.72	52.47	74	-21.53	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	57.78	-5.65	52.13	74	-21.87	PK
2483.5	/	-5.65	/	54	/	AV
2500	57.68	-5.72	51.96	74	-22.04	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Operation Mode: CH01 of 802.11g Mode (2412MHz)

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	57.88	-5.81	52.07	74	-21.93	PK
2310	/	-5.81	/	54	/	AV
2390	65.68	-5.84	59.84	74	-14.16	PK
2390	49.55	-5.84	43.71	54	-10.29	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	57.23	-5.81	51.42	74	-22.58	PK
2310	/	-5.81	/	54	/	AV
2390	66.33	-5.84	60.49	74	-13.51	PK
2390	48.11	-5.84	42.27	54	-11.73	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Operation Mode: CH11 of 802.11g Mode (2462MHz)

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	57.64	-5.65	51.99	74	-22.01	PK
2483.5	/	-5.65	/	54	/	AV
2500	57.64	-5.72	51.92	74	-22.08	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	57.33	-5.65	51.68	74	-22.32	PK
2483.5	/	-5.65	/	54	/	AV
2500	57.34	-5.72	51.62	74	-22.38	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Operation Mode: CH01 of 802.11n/HT20 Mode (2412MHz)

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	57.85	-5.81	52.04	74	-21.96	PK
2310	/	-5.81	/	54	/	AV
2390	66.25	-5.84	60.41	74	-13.59	PK
2390	48.84	-5.84	43	54	-11	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	57.99	-5.81	52.18	74	-21.82	PK
2310	/	-5.81	/	54	/	AV
2390	65.65	-5.84	59.81	74	-14.19	PK
2390	48.24	-5.84	42.4	54	-11.6	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Operation Mode: CH11 of 802.11n/HT20 Mode (2462MHz)

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	57.64	-5.65	51.99	74	-22.01	PK
2483.5	/	-5.65	/	54	/	AV
2500	57.34	-5.72	51.62	74	-22.38	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	57.66	-5.65	52.01	74	-21.99	PK
2483.5	/	-5.65	/	54	/	AV
2500	57.74	-5.72	52.02	74	-21.98	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Note:

1. Since the peak value is less than the average limit, the average value does not reflected in the report.

4 6dB OCCUPIED BANDWIDTH

4.1 TEST LIMIT

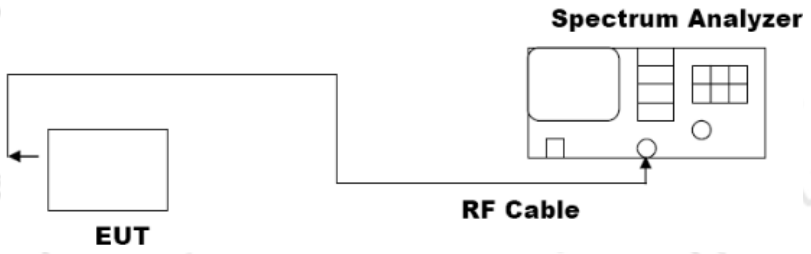
FCC Part15(15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

4.2 TEST PROCEDURE

4.2.1 6dB BANDWIDTH MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 300 KHz, VBW≥3×RBW.
4. Set SPA Trace 1 Max hold, then View.

4.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



4.4 MEASUREMENT EQUIPMENT USED

The same as described in section 2.7.

4.5 TEST RESULT

PASS

Please Refer to Appendix 2.4G WIFI RF test data for Details

5 POWER SPECTRAL DENSITY

5.1 TEST LIMIT

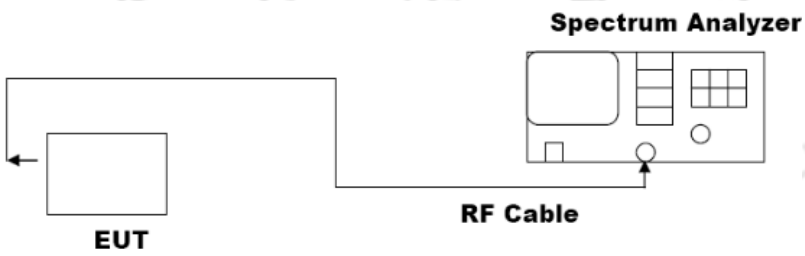
FCC Part15(15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3kHz)	2400-2483.5	PASS

5.2 TEST PROCEDURE

(1) Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
(2)Set the EUT Work on the top, the middle and the bottom operation frequency individually.
(3)Set SPA Trace 1 Max hold, then View.
Note: The method of AVGPSD-3 in the ANSI C63.10 item 11.10 was used in this testing.

The procedure for this method is as follows:
a) Set the instrument span to > 1.5 times the OBW.
b) Set sweep trigger to “free run.”
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set VBW ≥ [3 × RBW].
e) Number of points in sweep ≥ [2 × span / RBW]. (This ensures that bin-to-bin spacing is
f) ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
g) Sweep time ≤ [(number of points in sweep) × T], where T is defined in 11.6.
NOTE—If this results in a sweep time less than the auto sweep time of the instrument, then this method shall not be used (use AVGPSD-2A instead). The purpose of this step is to ensure that averaging time in each bin is less than or equal to the minimum time of a transmission.
h) Detector = Power averaging (rms).
i) Trace mode = max-hold.
j) Allow max-hold to run for at least 60 s or longer as needed to allow the trace to stabilize.
k) Use the peak marker function to determine the maximum PSD level.
l) If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this might require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

5.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



5.4 EQUIPMENT USED

The same as described in section 2.7.

5.5 TEST RESULT

PASS

Please Refer to Appendix 2.4G WIFI RF test data for Details

6 AVERAGE OUTPUT POWER

6.1 TEST LIMIT

FCC Part15(15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Average Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.2 TEST PROCEDURE

For average power test:

1. Connect EUT RF output port to Spectrum Analyzer.
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Record the average output power from the software.

Note: The method of AVGSA-3 in the ANSI C63.10 item 11.9 was used in this testing.

The procedure for this method is as follows:

a) Set span to >1.5 times the OBW.

b) Set sweep trigger to “free run.”

c) Set RBW = 1% to 5% of the OBW, but do not exceed 1 MHz.

d) Set VBW ≥ [3 × RBW].

e) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)

f) Sweep time ≤ (number of points in sweep) × T, where T is defined in 11.6. If this gives a sweep time less than the auto sweep time of the instrument, then method AVGSA-3 shall not be used (use AVGSA-3A). The purpose of this step is so that the averaging time in each bin is less than or equal to the minimum time of a transmission.

g) Detector = power averaging (rms).

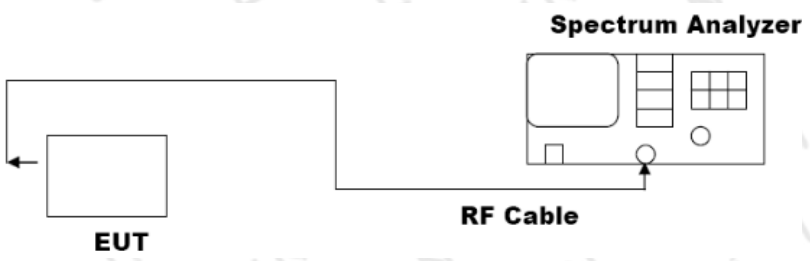
h) Trace mode = max-hold.

i) Allow max-hold to run for at least 60 s or longer as needed to allow the trace to stabilize.

j) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band-power measurement function with band limits set equal to the OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW.

Note：The EUT was tested according to ANSI C63.10 for compliance to FCC 47CFR 15.247 requirements.

6.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



6.4 EQUIPMENT USED

The same as described in section 2.7.

6.5 TEST RESULT

PASS

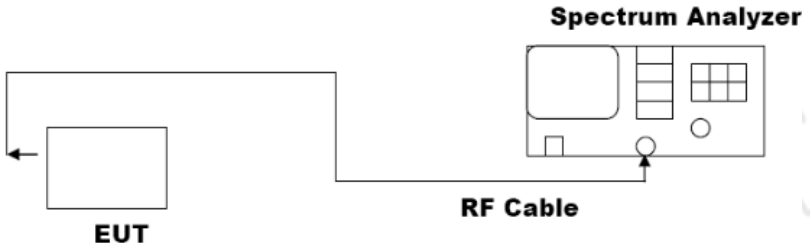
Please Refer to Appendix 2.4G WIFI RF test data for Details

7 OUT OF BAND EMISSIONS

7.1 TEST LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



7.3 TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as TX operation and connect directly to the spectrum analyzer.
3. Based on FCC Part15 C Section 15.247: RBW=100kHz, VBW=300kHz.
4. Set detected by the spectrum analyzer with peak detector.

7.4 MEASUREMENT EQUIPMENT USED

The same as described in section 2.7.

7.5 TEST RESULT

PASS

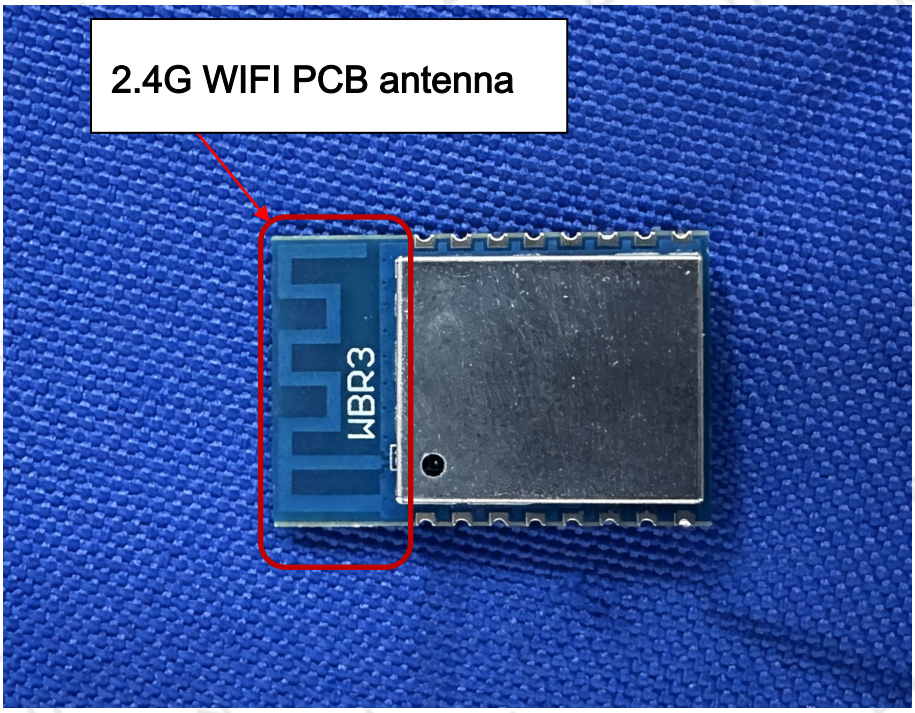
Please Refer to Appendix 2.4G WIFI RF test data for Details

8 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.

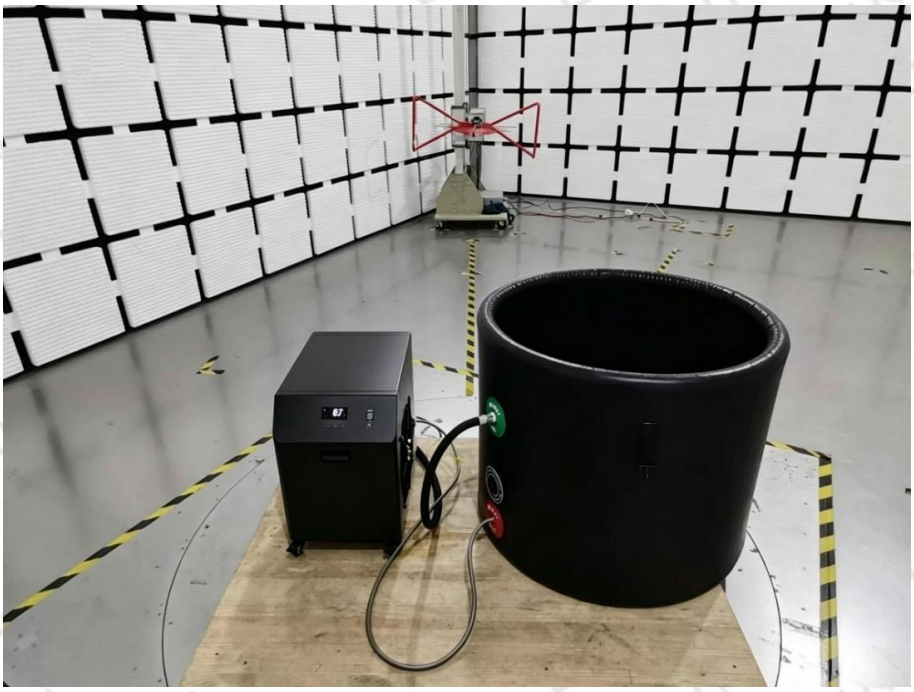
Antenna Connected Construction
The antenna used in this product is a PCB Antenna, The directional gains of antenna used for transmitting is 2.54dBi.

ANTENNA:

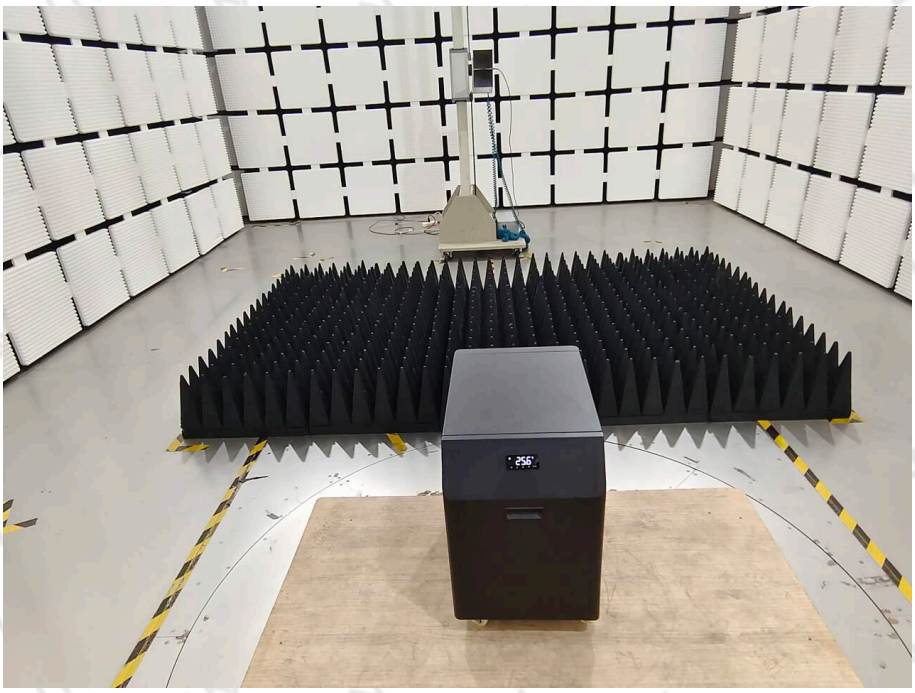


9 PHOTO OF TEST

RADIATED EMISSION

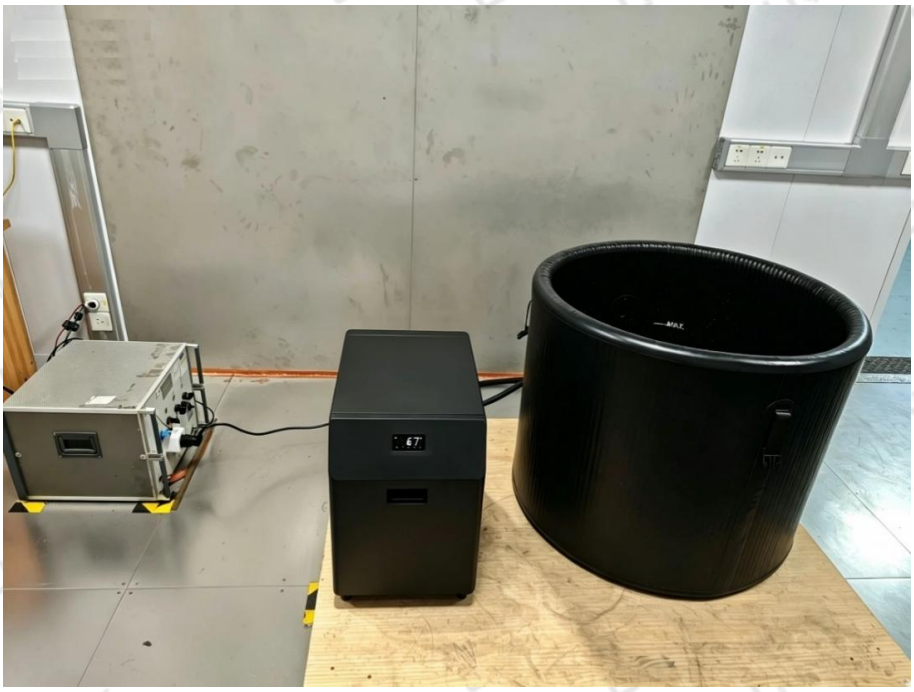


30MHz-1000MHz

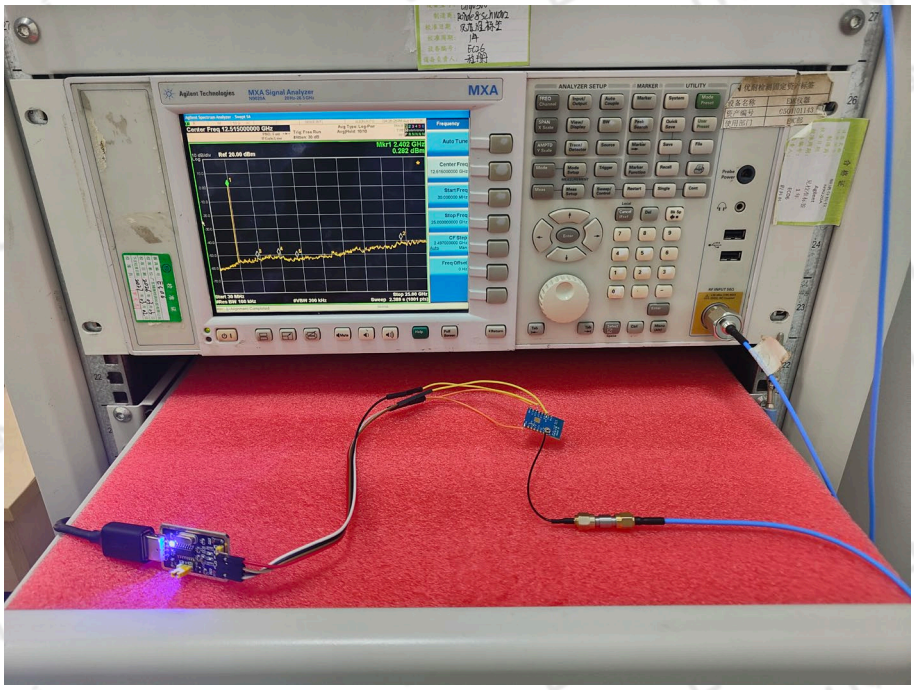


Above 1GHz

CONDUCTED EMISSION



RF CONDUCTED



10 EUT Constructional Details

Refer to the External Photos and Internal Photos for details.

End of Report