

FCC RADIO TEST REPORT

FCC ID: 2BBW9-M202

Sample : Wireless Mouse

Trade Mark : Lenovo

Main Model : M202

Additional Model : M120 Pro, XM300

Report No. : 23062614ER-61

Prepared for

Shenzhen Zhongchuang Xinyuan Communication Co., Ltd.
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Longgang, Shenzhen, China

Prepared by

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TEST RESULT CERTIFICATION

Applicant : Shenzhen Zhongchuang Xinyuan Communication Co., Ltd.
 Address : 108, Bldg A, Urban Shanghai Center, No. 11 Zhongxing Rd, Bantian,
 Longgang, Shenzhen
Manufacturer : Lenovo(Beijing) Co., Ltd.
 Address : 201-H2-6, Floor 2, Building 2, No.6, Shangdi West Road,
 Haidian District, Beijing

Product description

Product..... : Wireless Mouse
 Trade Mark : Lenovo
 Model Name : M202, M120 Pro, XM300

Test Methods..... : FCC Rules and Regulations Part 15 Subpart C Section 15.249,
 ANSI C63.10: 2013

This device described above has been tested by Global United Technology Services 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. This report shall not be reproduced except in full, without the written approval, this document may be altered or revised by Global United Technology Services Co. Ltd., personnel only, and shall be noted in the revision of the document.

Date of Test

Date (s) of performance of tests..... : Jun. 26, 2023 ~ Jul. 01, 2023
 Date of Issue..... : Jul. 15, 2023
 Test Result..... : Pass



Prepared By:	 <hr/> Project Engineer	Date:	<hr/> 2023-7-15
Check By:	 <hr/> Reviewer	Date:	<hr/> 2023-7-15

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1 TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

ITEM	STANGARD	RESULT
CONDUCTED EMISSION	FCC Part 15.207	N/A
RADIATED EMISSION	FCC Part 15.209/15.249	COMPLIANT
BAND EDGE	FCC Part 15.249/15.205	COMPLIANT
20dB BANDWIDTH	FCC Part 15.215	COMPLIANT
ANTENNA REQUIREMENT	FCC Part 15.203	COMPLIANT

1.2 TEST FACILITY

Test Firm : Global United Technology Services Co. Ltd.

Address : No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

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

- **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

1.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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)	NOTE
UNI	ANSI	9kHz ~ 150kHz	2.96	
		150kHz ~ 30MHz	2.44	

B. Radiated Measurement:

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

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product:	Wireless Mouse
Trade Name:	Lenovo
Main Model:	M202
Additional Model:	M120 Pro, XM300
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: M202.
FCC ID:	2BBW9-M202
Frequency Range:	2405MHz-2475MHz
Number of Channels:	15CH
Modulation Type:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	1.6dBi
Battery:	N/A
Adapter:	N/A
Power Source:	DC 1.5V

2.2 CARRIER FREQUENCY OF CHANNELS

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2405	05	2417	09	2457	13	2469
02	2408	06	2448	10	2460	14	2472
03	2411	07	2451	11	2463	15	2475
04	2414	08	2454	12	2466		

2.3 TEST MODE

The EUT was programmed to be in continuously transmitting mode.

Channel List		
Test Channel	EUT Channel	Test Frequency (MHz)
Low channel	CH01	2405.000
Middle channel	CH07	2451.000
High channel	CH15	2475.000

2.4 TEST SETUP

Operation of EUT during Radiation testing:



2.5 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Note
E-1	Wireless Mouse	Lenovo	M202	EUT
E-2	Laptop	Dell	Compaq CQ45	AE

Note:

1. The support equipment was authorized by Declaration of Confirmation.
2. For detachable type I/O cable should be specified the length in cm in 『Length』 column.
3. “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.6 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	2023.09.22
3	AAN	TESEQ	T8-Cat6	38888	2023.09.22
4	Pulse Limiter	CYBRTEK	EM5010	E115010056	2024.05.30
5	EMI Test Receiver	Rohde&Schwarz	ESCI	101210	2023.09.22
Radiated Emissions Measurement					
1	Radiated Emission Test Software	EZ-EMC	Ver.CCS-03A1	N/A	N/A
2	Horn Antenna	Sunol	DRH-118	A101415	2023.09.27
3	Broadband Hybrid Antenna	Sunol	JB1	A090215	2024.02.26
4	PREAMP	HP	8449B	3008A00160	2023.09.22
5	PREAMP	HP	8447D	2944A07999	2024.05.30
6	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2023.09.22
7	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2023.09.22
8	Signal Generator	Agilent	E4421B	MY4335105	2023.09.22
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2023.09.22
10	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2023.09.22
11	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2024.06.05
12	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2024.06.05
13	RF power divider	Anritsu	K241B	992289	2023.09.22
14	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2023.09.22
15	Active Loop Antenna	Com-Power	AL-130R	10160009	2024.05.28
16	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2023.09.22
17	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2024.05.27
18	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2023.10.30
19	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2023.09.22
20	Signal Generator	Agilent	N5183A	MY47420153	2023.09.22
21	Spectrum Analyzer	Rohde&Schwarz	FSP 40	100501	2023.09.22
22	Power Meter	KEYSIGHT	N1911A	MY50520168	2023.09.22
23	Frequency Meter	VICTOR	VC2000	997406086	2023.09.22
24	DC Power Source	HYELEC	HY5020E	055161818	2023.09.22

3 CONDUCTED EMISSION

3.1 TEST LIMIT

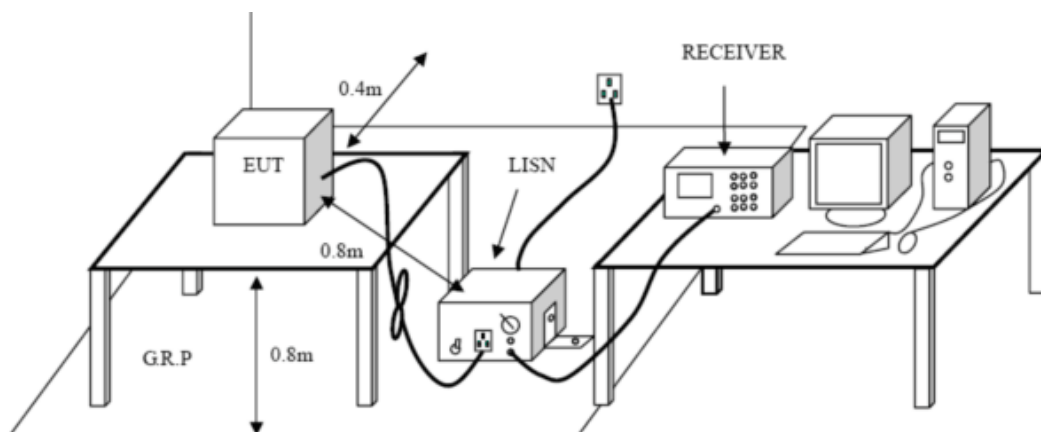
For unintentional device, according to § 15.207(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dB μ V)			
	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.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power 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 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected 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

N/A

Remark:

The EUT is powered by battery.

4 RADIATED EMISSION

4.1 TEST LIMIT

For unintentional device, according to § 15.209(a), except for Class B 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

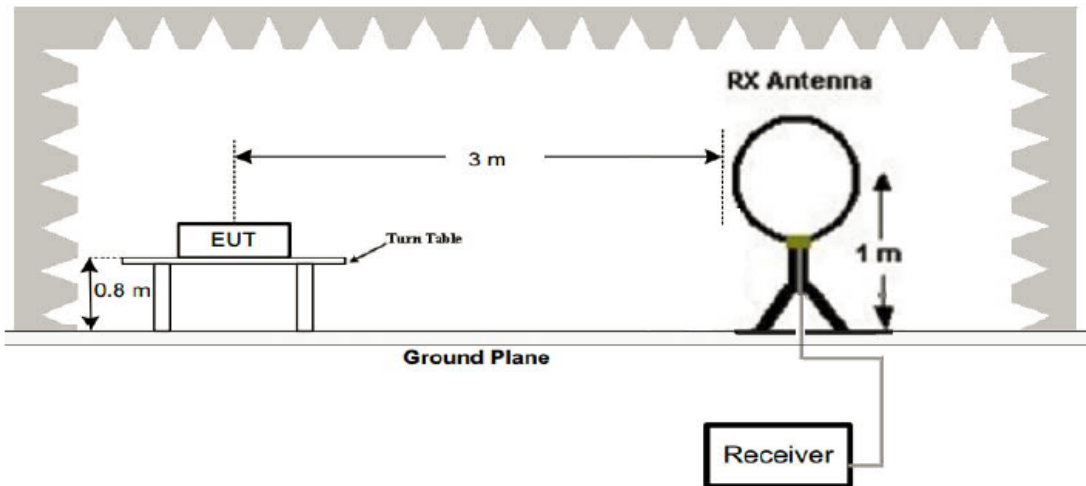
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

Limit: (Field strength of the fundamental signal)

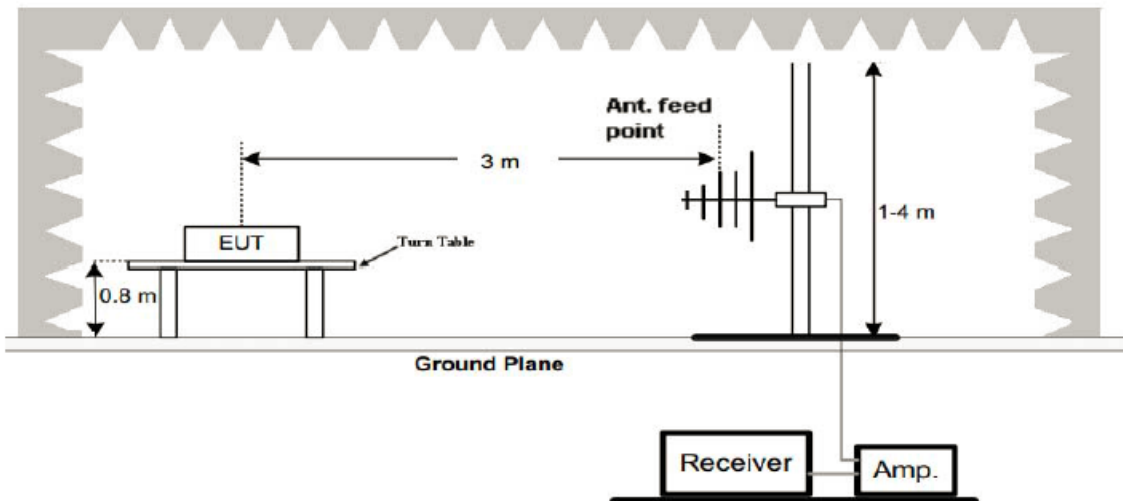
Frequency	Limit (dBuV/m @3m)	Remark
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value

4.2 TEST SETUP

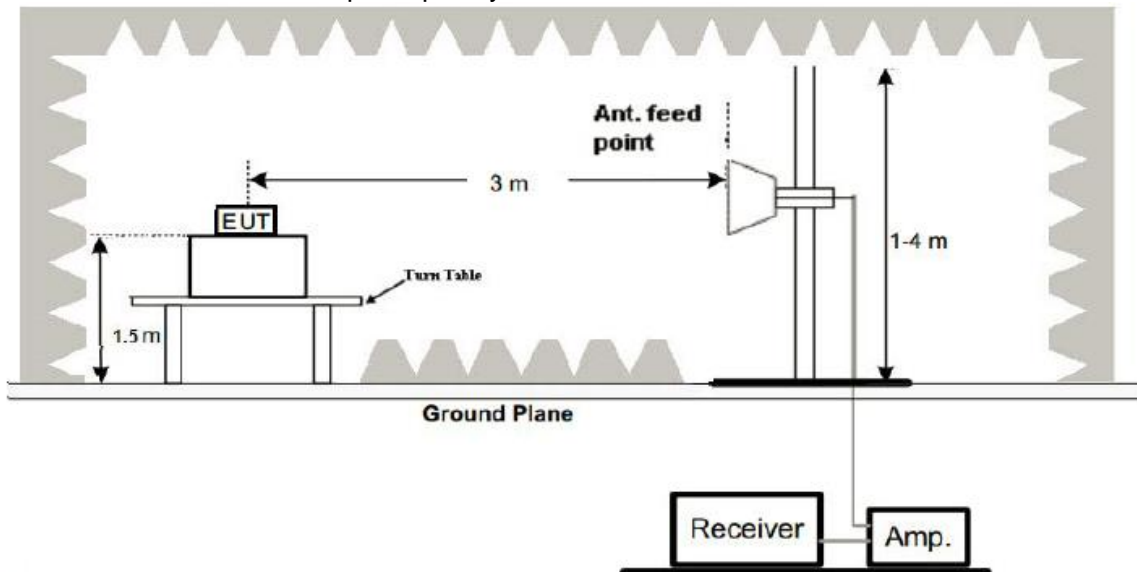
1. Radiated Emission Test-Up Frequency Below 30MHz



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



3. Radiated Emission Test-Up Frequency Above 1GHz



4.3 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 to 25GHz per FCC PART 15.33(a).

Note:

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

4.4 TEST RESULT

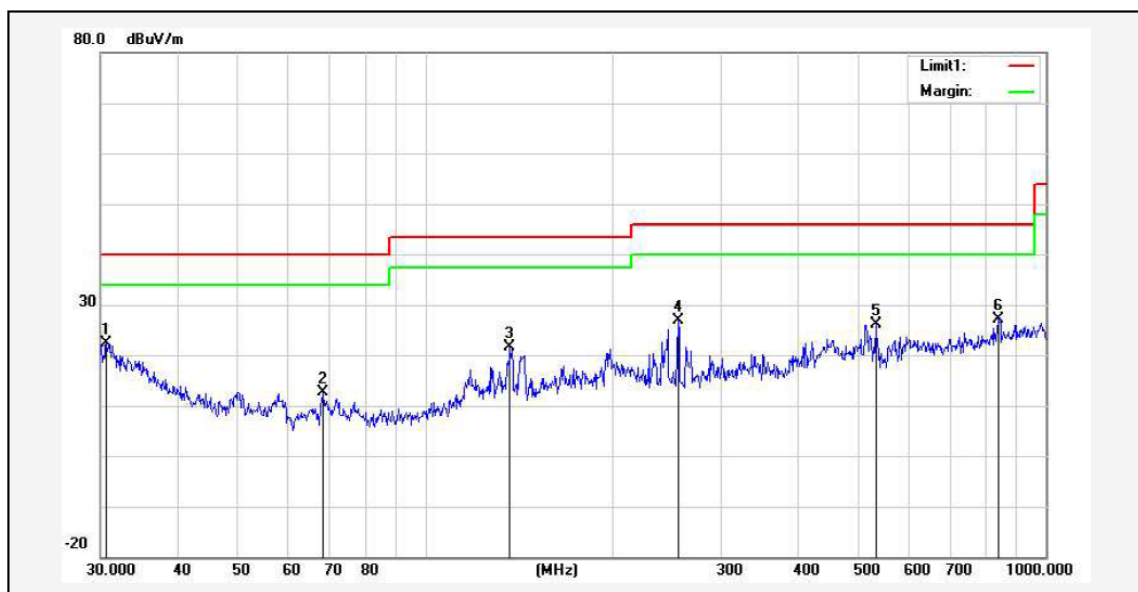
PASS

Remark:

1. All modes were test at Low, Middle, and High channel, only the worst result of GFSK Low Channel 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.
3. Radiated emission test from 9kHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9kHz to 30MHz and not recorded in this report.

Below 1GHz Test Results:

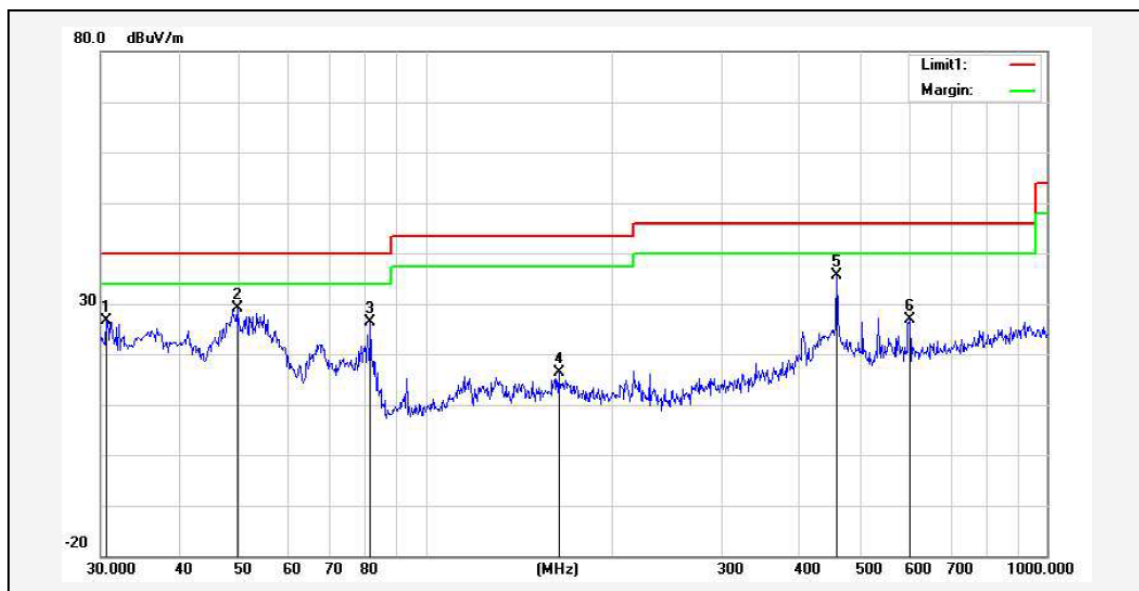
Temperature:	24°C	Relative Humidity:	48%
Test Date:	Jun. 27, 2023	Pressure:	1010hPa
Test Voltage:	DC 1.5V	Phase:	Horizontal
Test Mode:	Transmitting mode of GFSK 2405.0MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	30.6379	29.36	-7.10	22.26	40.00	-17.74	208	100	peak
2	68.3908	32.59	-20.06	12.53	40.00	-27.47	143	100	peak
3	136.9392	36.54	-14.85	21.69	43.50	-21.81	57	100	peak
4	255.6231	41.37	-14.40	26.97	46.00	-19.03	96	100	peak
5	531.9635	36.30	-10.15	26.15	46.00	-19.85	107	100	peak
6	839.1818	30.04	-2.98	27.06	46.00	-18.94	232	100	peak

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

Temperature:	24°C	Relative Humidity:	48%
Test Date:	Jun. 27, 2023	Pressure:	1010hPa
Test Voltage:	DC 1.5V	Phase:	Vertical
Test Mode:	Transmitting mode of GFSK 2405.0MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	30.6379	33.72	-7.10	26.62	40.00	-13.38	128	100	peak
2	49.7068	48.69	-19.51	29.18	40.00	-10.82	110	100	peak
3	81.4970	46.25	-19.91	26.34	40.00	-13.66	73	100	peak
4	163.7550	31.72	-15.43	16.29	43.50	-27.21	189	100	peak
5*	459.1144	44.92	-9.32	35.60	46.00	-10.40	167	100	peak
6	601.4265	33.19	-6.31	26.88	46.00	-19.12	43	100	peak

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

Remark:

1. Measuring frequencies from 9 kHz to the 1 GHz, Radiated emission test from 9kHz to 30MHz was verified, and no any emission was found except system noise floor.
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, 1 MHz for measuring above 1 GHz, below 30MHz was 10kHz.

Above 1 GHz Test Results:

CH01 (2405.0MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2405	105.05	-5.84	99.21	114	-14.79	PK
2405	81.4	-5.84	75.56	94	-18.44	AV
4810	59.01	-3.64	55.37	74	-18.63	PK
4810	46.88	-3.64	43.24	54	-10.76	AV
7215	54.73	-0.95	53.78	74	-20.22	PK
7215	42.98	-0.95	42.03	54	-11.97	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2405	103.68	-5.84	97.84	114	-16.16	PK
2405	81.84	-5.84	76	94	-18	AV
4810	59.69	-3.64	56.05	74	-17.95	PK
4810	47.02	-3.64	43.38	54	-10.62	AV
7215	56.03	-0.95	55.08	74	-18.92	PK
7215	42.91	-0.95	41.96	54	-12.04	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

CH07 (2451.0MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2451	101.05	-5.71	95.34	114	-18.66	PK
2451	81.21	-5.71	75.5	94	-18.5	AV
4902	58.52	-3.51	55.01	74	-18.99	PK
4902	46.87	-3.51	43.36	54	-10.64	AV
7353	56.09	-0.82	55.27	74	-18.73	PK
7353	43.45	-0.82	42.63	54	-11.37	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2451	99.68	-5.71	93.97	114	-20.03	PK
2451	81.75	-5.71	76.04	94	-17.96	AV
4902	59.07	-3.51	55.56	74	-18.44	PK
4902	46.79	-3.51	43.28	54	-10.72	AV
7353	56.83	-0.82	56.01	74	-17.99	PK
7353	44.02	-0.82	43.2	54	-10.8	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

CH15 (2475.0MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2475	101.17	-5.65	95.52	114	-18.48	PK
2475	81.79	-5.65	76.14	94	-17.86	AV
4950	58.72	-3.43	55.29	74	-18.71	PK
4950	46.46	-3.43	43.03	54	-10.97	AV
7425	55.75	-0.75	55	74	-19	PK
7425	43.39	-0.75	42.64	54	-11.36	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2475	99.8	-5.65	94.15	114	-19.85	PK
2475	81.56	-5.65	75.91	94	-18.09	AV
4950	58.37	-3.43	54.94	74	-19.06	PK
4950	46.69	-3.43	43.26	54	-10.74	AV
7425	55.72	-0.75	54.97	74	-19.03	PK
7425	43.96	-0.75	43.21	54	-10.79	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Remark:

1. Measuring frequencies from 1 GHz to the 25 GHz.
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. 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.
5. The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120kHz, 1 MHz for measuring above 1 GHz, 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 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.
7. All modes of operation were investigated and the worst-case emissions of $\pi/4$ DQPSK are reported.
8. For fundamental frequency, RBW >20dB BW, VBW=>3XRBW, PK detector for PK value, AV detector for AV value.

5 BAND EDGE

5.1 TEST LIMIT

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

5.2 TEST PROCEDURE

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 1MHz and VBW to 3MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength. Peak detector is for both.

5.3 TEST RESULT

PASS

Operation Mode: TX CH01 (2405.0MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2310	55.79	-5.81	49.98	74	-24.02	PK
2310	/	-5.81	/	54	/	AV
2390	54.85	-5.84	49.01	74	-24.99	PK
2390	/	-5.84	/	54	/	AV
2400	57.23	-5.84	51.39	74	-22.61	PK
2400	/	-5.84	/	54	/	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2310	55.52	-5.81	49.71	74	-24.29	PK
2310	/	-5.81	/	54	/	AV
2390	56.07	-5.84	50.23	74	-23.77	PK
2390	/	-5.84	/	54	/	AV
2400	57.64	-5.84	51.8	74	-22.2	PK
2400	/	-5.84	/	54	/	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: TX CH15 (2475.0MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2483.5	54.55	-5.65	48.9	74	-25.1	PK
2483.5	/	-5.65	/	54	/	AV
2500	55.7	-5.72	49.98	74	-24.02	PK
2500	/	-5.72	/	54	/	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

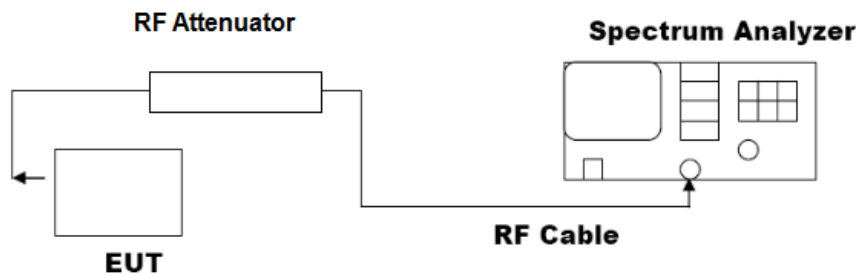
Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type
2483.5	54.46	-5.65	48.81	74	-25.19	PK
2483.5	/	-5.65	/	54	/	AV
2500	55.55	-5.72	49.83	74	-24.17	PK
2500	/	-5.72	/	54	/	AV

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

6 20dB BANDWIDTH

6.1 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)



6.2 MEASUREMENT EQUIPMENT USED

Refer to Section 3.3.

6.3 TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 30 kHz. Set the Video bandwidth (VBW) = 100 kHz. In order to make an accurate measurement.
4. For 20dB Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) $\geq 3 * RBW$.
5. Measure and record the results in the test report.

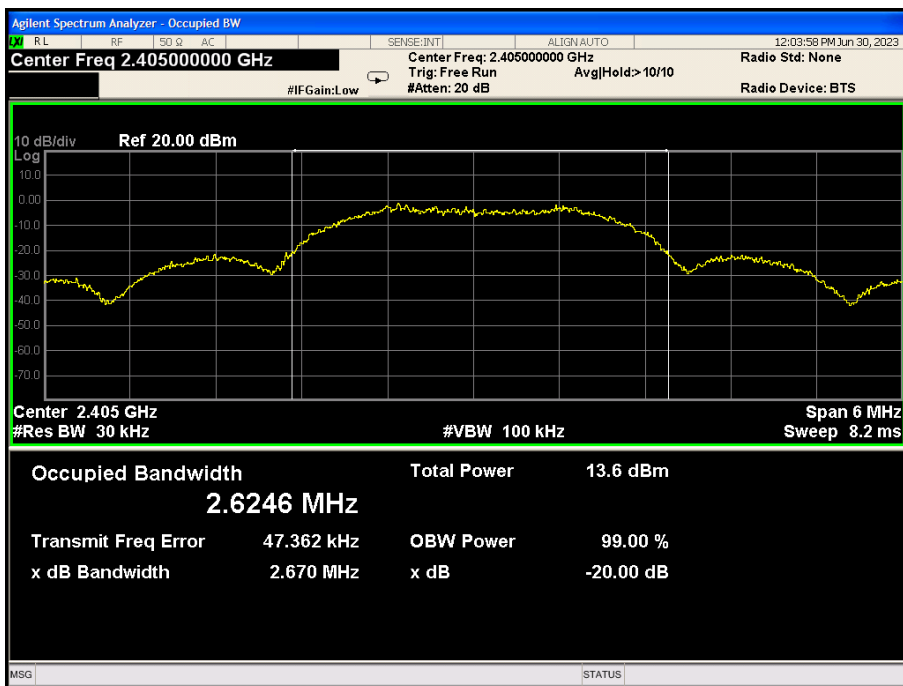
6.4 TEST RESULT

PASS

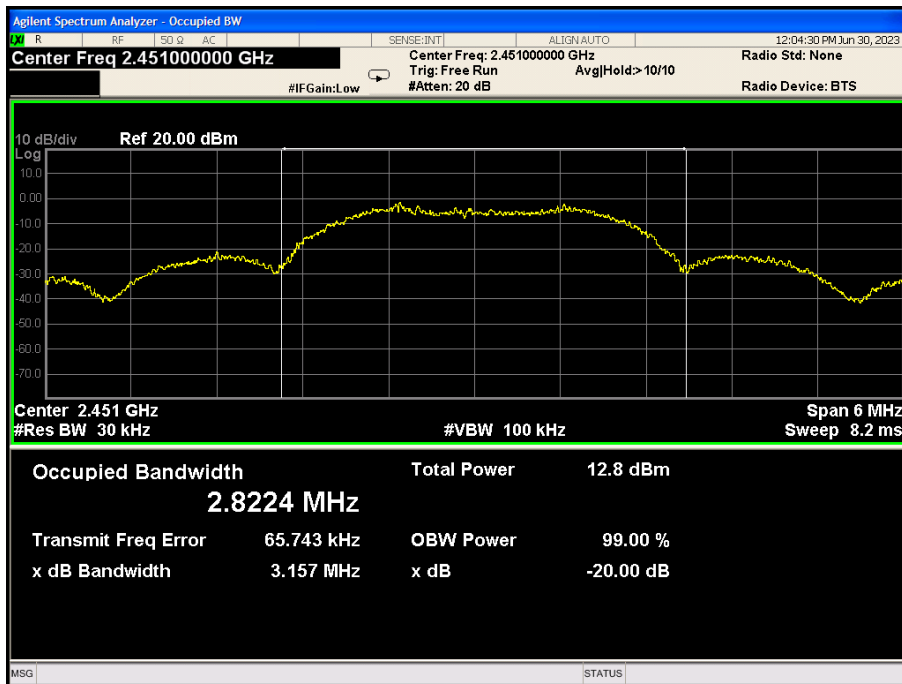
GFSK Modulation:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
Low Channel	2405.00	2.670	PASS
Middle Channel	2451.00	3.157	PASS
High Channel	2475.00	3.207	PASS

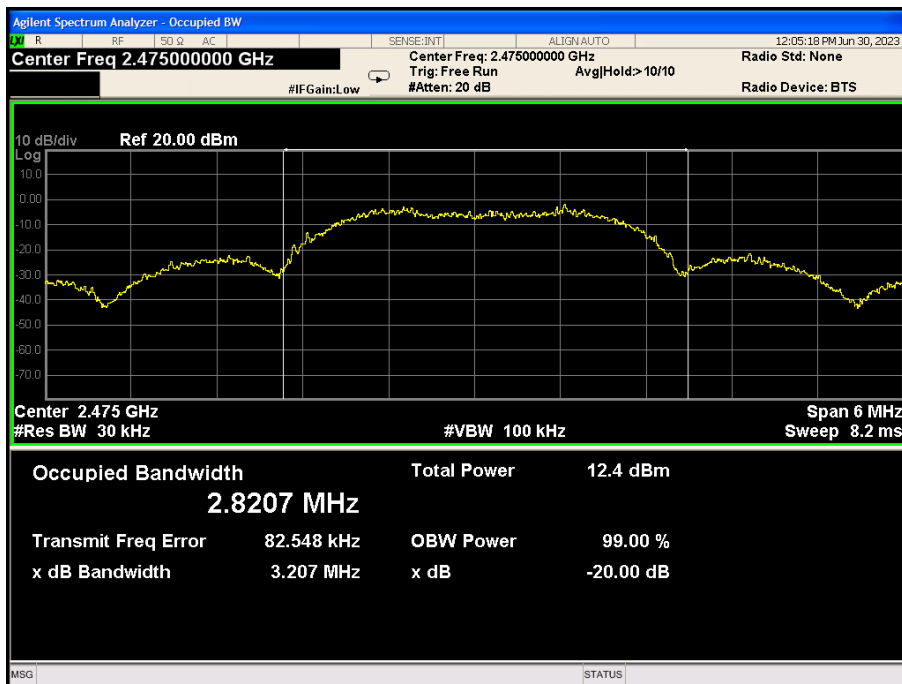
CH01: 2405.00MHz



CH07: 2451.00MHz



CH15: 2475.00MHz



7 ANTENNA REQUIREMENT

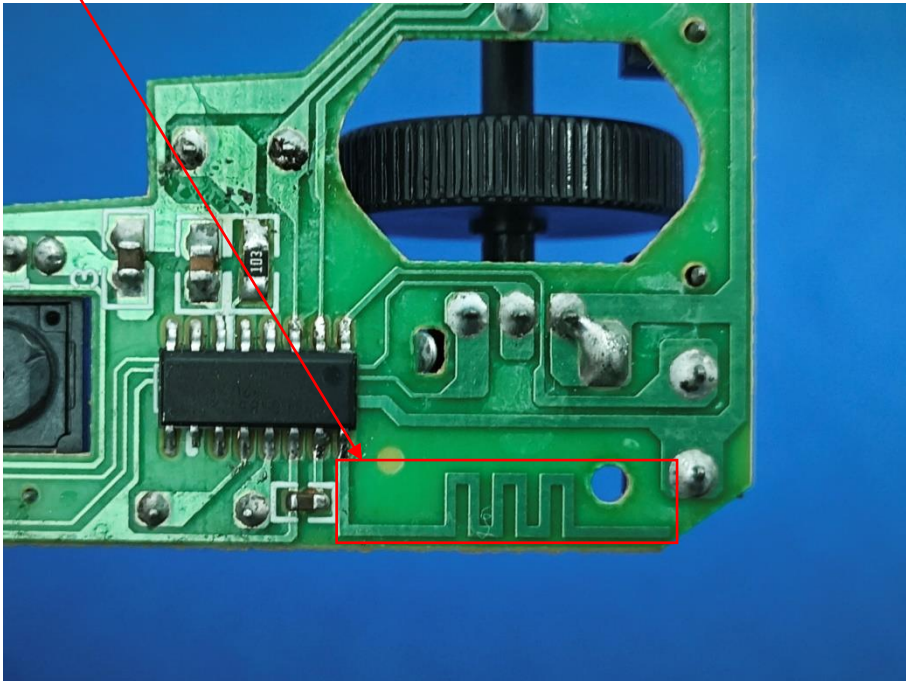
Standard Applicable:

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.

Antenna Conncted Construction

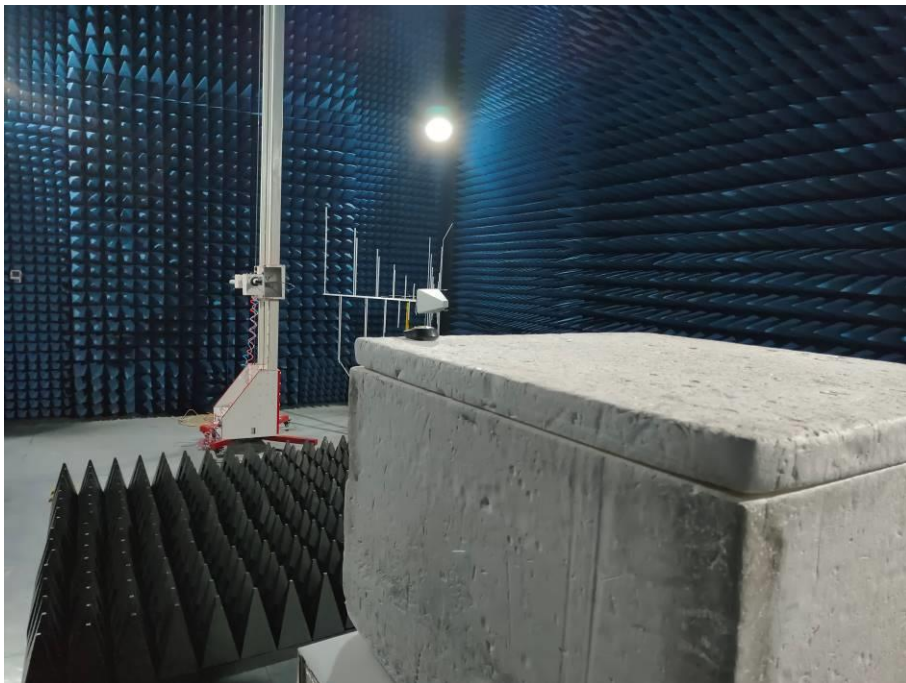
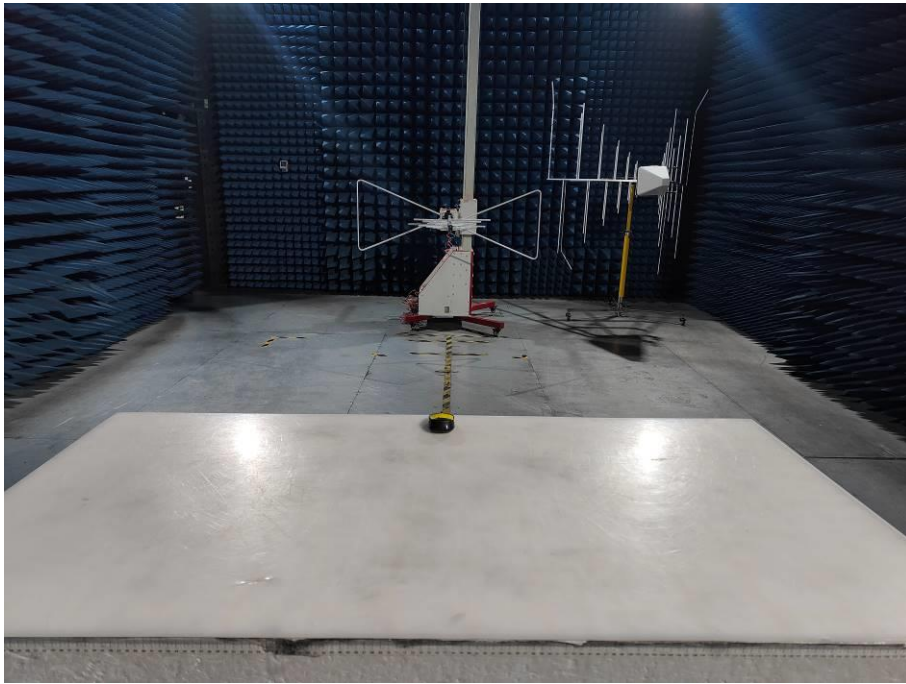
The antenna used in this product is a PCB Antenna, The directional gains of antenna used for transmitting is 1.6dBi.

ANTENNA:



8 PHOTO OF TEST

8.1 RADIATED EMISSION



8.2 RF CONDUCTED



End of Report