

TEST REPORT

Applicant : SHENZHEN DUMBO MODEL CO., LTD.
Address : C301, Kedasi Industrial Park, No. 42, Xinzhang Rd., Guanhu Street,
Longhua District, Shenzhen, Guangdong, China
Manufacturer : SHENZHEN DUMBO MODEL CO., LTD.
Address : C301, Kedasi Industrial Park, No. 42, Xinzhang Rd., Guanhu Street,
Longhua District, Shenzhen, Guangdong, China
Product Name : Pistol Grip Transmitter
Model Number : DDF-MT, DDF-MT6
Trademark : /
FCC ID : 2ATHVDDF-MT
Test Date : May 06, 2026 – Jun. 04, 2026
Date of Report : Jun. 04, 2026

Test Result : This device described above has been tested by NTT, and the test results show that the equipment under test (EUT) is in compliance with the Standard requirements. And it is applicable only to the tested sample identified in the report.

Test Procedure Used:

Standards : FCC CFR Title 47 Part 15 Subpart C Section 15.247
ANSI C63.10-2020+Cor.1-2023
KDB 558074 D01 15.247 Meas Guidance v05r02 April 2,2019

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Revision History of This Test Report

[illegible]

1. General Information

1.1. Description of Device (EUT)

EUT Name : Pistol Grip Transmitter
 Model No. : DDF-MT, DDF-MT6
 Model Difference : Only the model name is different.
 Power supply : DC 7.2V from Battery; Charging input:DC 5V
 Operation frequency : 2402-2481.2MHz
 Modulation : GFSK
 Antenna Type : copper tube antenna, Maximum Gain is 2.80 dBi
 Intend use environment : Residential, commercial and light industrial environment

1.2. Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2402.0MHz	21	2426.0MHz	41	2450.00MH	61	2474.0MHz
2	2403.2MHz	22	2427.2MHz	42	2451.2MHz	62	2475.2MHz
3	2404.4MHz	23	2428.4MHz	43	2452.4MHz	63	2476.4MHz
4	2405.6MHz	24	2429.6MHz	44	2453.6MHz	64	2477.6MHz
5	2406.8MHz	25	2430.8MHz	45	2454.8MHz	65	2478.8MHz
6	2408.0MHz	26	2432.0MHz	46	2456.0MHz	66	2480MHz
7	2409.2MHz	27	2433.2MHz	47	2457.2MHz	67	2481.2MHz
8	2410.4MHz	28	2434.4MHz	48	2458.4MHz	-	-
9	2411.6MHz	29	2435.6MHz	49	2459.6MHz	-	-
10	2412.8MHz	30	2436.8MHz	50	2460.8MHz	-	-
11	2414.0MHz	31	2438.0MHz	51	2462.0MHz	-	-
12	2415.2MHz	32	2439.2MHz	52	2463.2MHz	-	-
13	2416.4MHz	33	2440.4MHz	53	2464.4MHz	-	-
14	2417.6MHz	34	2441.6MHz	54	2465.6MHz	-	-
15	2418.8MHz	35	2442.8MHz	55	2466.8MHz	-	-
16	2420.0MHz	36	2444.0MHz	56	2468.0MHz	-	-
17	2421.2MHz	37	2445.2MHz	57	2469.2MHz	-	-
18	2422.4MHz	38	2446.4MHz	58	2470.4MHz	-	-
19	2423.6MHz	39	2447.6MHz	59	2471.6MHz	-	-
20	2424.8MHz	40	2448.8MHz	60	2472.8MHz	-	-

1.3. Summary of test result

RF PART		
Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
AC Power Line Conducted Emission	15.207	PASS
20dB Bandwidth 99% Occupied Bandwidth	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Antenna Requirement	15.203	PASS
Remark: N/A is an abbreviation for Not Applicable. Measurement Uncertainty is not taken into account for conformity statement		

1.4. Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Hardware Version	Software Version
Adapter	XIAOMI	MDY-12-EF	/	/

1.5. Test mode

The special RF test software was used to control EUT work in Continuous BT TX mode, and select test channel, wireless mode.

Test mode	Low channel	Middle channel	High channel
GFSK	2402MHz	2441.6MHz	2481.2MHz

Note: Only the worst Data Record in the report

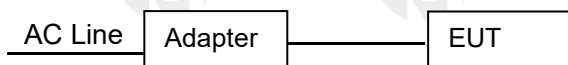
1.6. Test configuration

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, 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.	

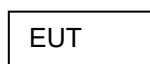
Test Software	FCC V1.2.2.1
Power level setup	1

1.7. Block Diagram

AC Power Line Conducted Emission



Radiated Emission



Conducted Spurious



1.8. Test Conditions

Category	Normal Conditions	Extreme Conditions
Temperature range	15-35°C	N/A
Humidity range	20-75%	N/A
Pressure range	86-106kPa	N/A
Power supply	DC 5V or Battery DC 7.2V	N/A

Note: N/A is an abbreviation for Not Applicable.

1.9. Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for radio frequency	$\pm 7 \times 10^{-8}$	
Conducted Emissions (150kHz~30MHz)	$\pm 3.64\text{dB}$	
Radiated Emission(9KHz~30MHz)	$\pm 4.51\text{dB}$	
Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$	
Radiated Emission(1GHz~6GHz)	$\pm 3.92\text{dB}$	
Radiated Emission(6GHz~18GHz)	$\pm 4.33\text{dB}$	
Radiated Emission(18GHz~40GHz)	$\pm 3.38\text{dB}$	
Uncertainty for conducted RF Power	$\pm 0.20\text{dB}$	
Conducted spurious emissions	$\pm 0.24\text{dB}$	
Uncertainty for temperature	0.6°C	
Uncertainty for humidity	1%	
Bandwidth	$\pm 1.5 \times 10^{-6}$	
Time	$\pm 2\%$	
Duty Cycle	$\pm 2\%$	

Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%

1.10. Test Facility

Site Description	
Name of Firm	: Shenzhen NTT Testing Technology Co.,Ltd.
Site Location	: 1B, Building 2, Factory Building & 103, Building 3, Factory Building, Dayang Industrial Park, No.4, Industrial Avenue, Tangwei Community, Fuhai Sub-district, Bao 'an District, Shenzhen City, Guangdong, China
FCC Designation Number	: CN3446
FCC Test Firm Registration Number	: 129414

1.11. Test Equipment

Conducted Test Site

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	HSRCE944	/	HTEC	2025/4/30	2028/4/29
EMI Test Receiver	ESPI	/	RS	2025/9/8	2026/9/7
LISN	NNLK 8129	00603	Schwarzbeck	2025/9/8	2026/9/7
LISN	NNHV 8123-400	00694	Schwarzbeck	2025/9/8	2026/9/7
LISN	NNHV 8123-400	00680	Schwarzbeck	2025/9/8	2026/9/7
Cable	RG223-1500MM	NA	RG	2025/9/8	2026/9/7

Radiated Test Site(Below 1G and Above 1G)&RF Test Site

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2025/7/24	2028/7/23
EMI Test Receiver	ESCI	101018	RS	2025/9/8	2026/9/7
Amplifi (30MHz-1GHz)	BBV 9718D	00042	SCHWARZBECK	2025/9/8	2026/9/7
Bilog Antenna (30MHz-1GHz)	VULB9168	1858	SCHWARZBECK	2025/9/9	2026/9/8
Horn antenna (1GHz-18GHz)	BBHA 9120 D	02622	SCHWARZBECK	2025/9/9	2026/9/8
Pream plifier (1GHz-18GHz)	BBV 9718D	0024	SCHWARZBECK	2025/9/8	2026/9/7
Spectrum Analyze (10Hz-40GHz)	FSV 40	100952	Rohde & Schwarz	2025/9/8	2026/9/7

Pream plifier (18GHz-40GHz)	BBV 9721	0056	SCHWARZBECK	2025/9/8	2026/9/7
Double Ridge Guide Horn Antenna (18GHz-40GHz)	SAS-574	588	A.H.System	2025/9/8	2026/9/7
Loop Antenna (9KHz-30MHz)	FMZB1519B	014	SCHWARZBECK	2025/9/8	2026/9/7
Amplifier (9KHz-30MHz)	CVP 9222 C	00109	SCHWARZBECK	2025/9/8	2026/9/7
MXG Signal Analyzer	N9020A	MY50510202	Agilent	2025/9/8	2026/9/7
MXG Vector Signal Generator	N5182A	MY50140020	Agilent	2025/9/8	2026/9/7
MXG Analog Signal Generator	N5181A	MY47420919	Agilent	2025/9/8	2026/9/7
Power Sensor	TR1029-2	512364	Techoy	2025/9/8	2026/9/7
RF Swith	TR1029-1	512364	Techoy	2025/9/8	2026/9/7
Cable	DA800- 4000MM	NA	DA	2025/9/8	2026/9/7
Cable	DA800- 11000MM	NA	DA	2025/9/8	2026/9/7

Test software

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ-EMC	Ver.EMC-CON 3A1.1+
2	EMC radiation test system	FALA	EZ-EMC	Ver.FA-03A2 RE+
3	RF test system	TACHOY	RFTest	V1.0.0
4	RF communication test system	TACHOY	RFTest	V1.0.0

2. Conducted emission at the mains terminals test

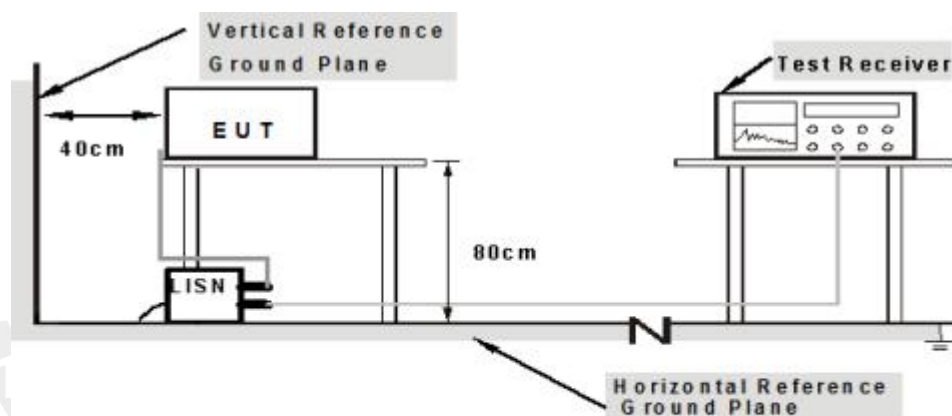
2.1. Limit

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10-2020+Cor.1-2023
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

2.2. Test Setup



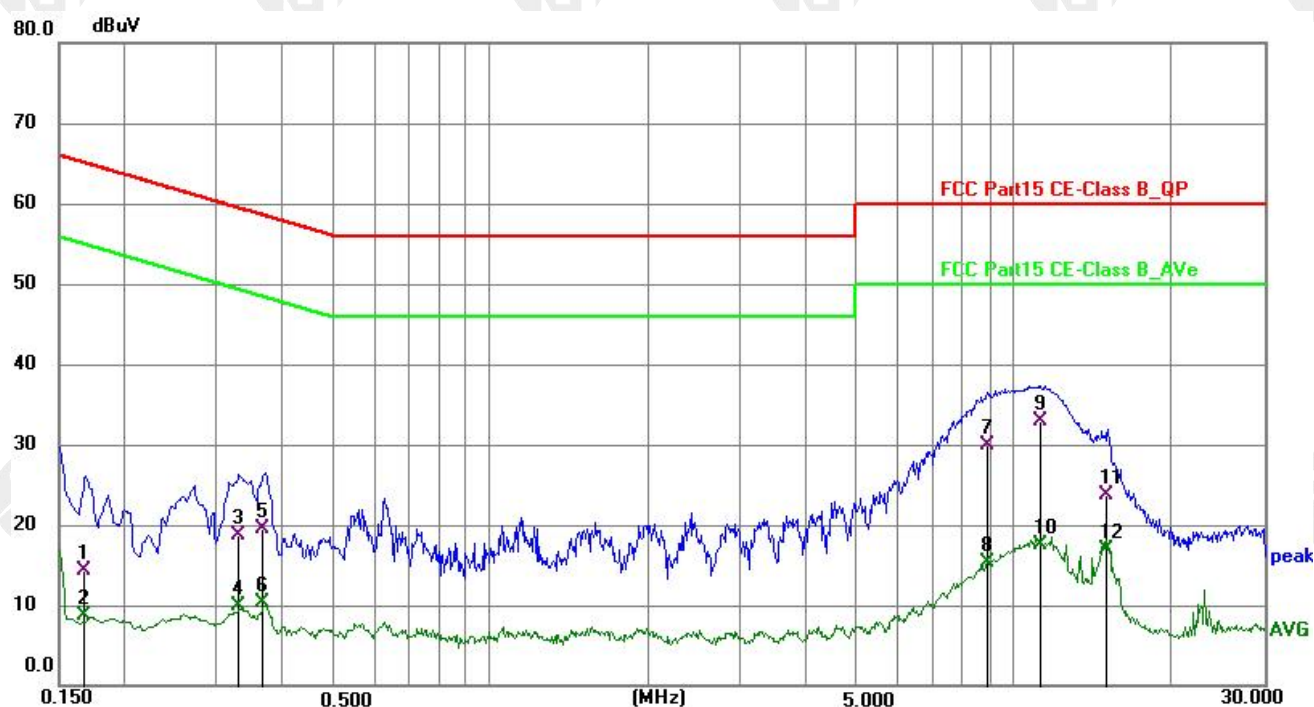
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

2.3. Test Procedure

1. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
2. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
3. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
4. LISN at least 80 cm from nearest part of EUT chassis.
- 5.For the actual test configuration, please refer to the related Item - EUT Test Photos.

2.4. Test Result

Conducted Emission At The Mains Terminals Test Data			
Temperature:	25.1°C	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Line
Test Voltage :	DC 5V from Adapter Input AC 120V/60Hz	Test Mode:	GFSK(2402MHz)



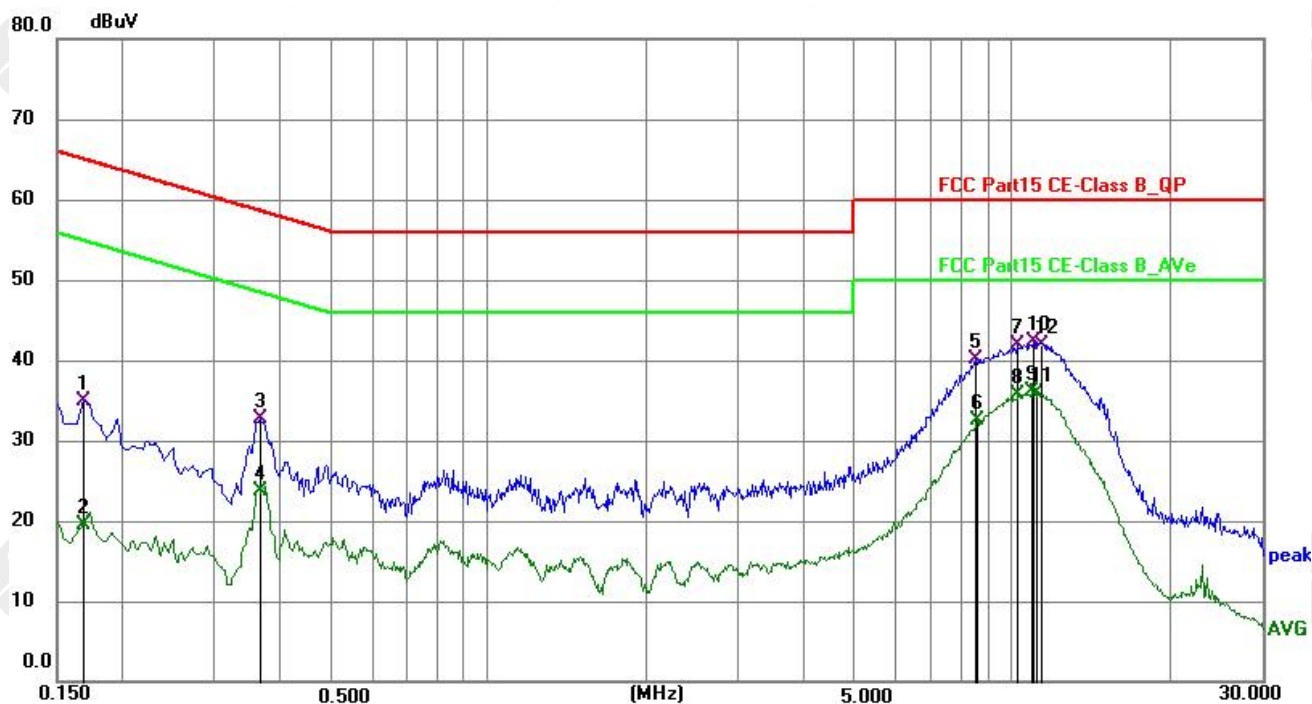
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1671	4.08	10.18	14.26	65.10	-50.84	QP	P
2	0.1671	-1.43	10.18	8.75	55.10	-46.35	AVG	P
3	0.3314	8.63	10.12	18.75	59.42	-40.67	QP	P
4	0.3314	-0.15	10.12	9.97	49.42	-39.45	AVG	P
5	0.3655	9.33	10.13	19.46	58.60	-39.14	QP	P
6	0.3655	0.08	10.13	10.21	48.60	-38.39	AVG	P
7	8.9092	19.62	10.32	29.94	60.00	-30.06	QP	P
8	8.9092	4.90	10.32	15.22	50.00	-34.78	AVG	P
9 *	11.2554	22.47	10.39	32.86	60.00	-27.14	QP	P
10	11.2554	7.19	10.39	17.58	50.00	-32.42	AVG	P
11	15.0882	13.20	10.55	23.75	60.00	-36.25	QP	P
12	15.0882	6.41	10.55	16.96	50.00	-33.04	AVG	P

Note:

1. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
2. Margin = Reading level + Correct Factor - Limit

3. All the modes have tested and recorded the worst mode(GFSK) in the report

Conducted Emission At The Mains Terminals Test Data			
Temperature:	25.1°C	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Neutral
Test Voltage :	DC 5V from Adapter Input AC 120V/60Hz	Test Mode:	GFSK(2402MHz)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1680	24.79	10.18	34.97	65.06	-30.09	QP	P
2	0.1680	9.40	10.18	19.58	55.06	-35.48	AVG	P
3	0.3653	22.50	10.12	32.62	58.61	-25.99	QP	P
4	0.3653	13.51	10.12	23.63	48.61	-24.98	AVG	P
5	8.5380	29.69	10.32	40.01	60.00	-19.99	QP	P
6	8.5875	22.13	10.32	32.45	50.00	-17.55	AVG	P
7	10.2255	31.56	10.36	41.92	60.00	-18.08	QP	P
8	10.2345	25.30	10.36	35.66	50.00	-14.34	AVG	P
9 *	10.9409	25.64	10.38	36.02	50.00	-13.98	AVG	P
10	10.9905	31.87	10.38	42.25	60.00	-17.75	QP	P
11	11.1750	25.46	10.39	35.85	50.00	-14.15	AVG	P
12	11.4584	31.43	10.40	41.83	60.00	-18.17	QP	P

Note:

1. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
2. Margin = Reading level + Correct Factor - Limit
3. All the modes have tested and recorded the worst mode(GFSK) in the report

3. Radiated Spurious Emissions

3.1. Limit

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247
 Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2,2019;
 ANSI C63.10-2020+Cor.1-2023
 Test Result: PASS
 Measurement Distance: 3m

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

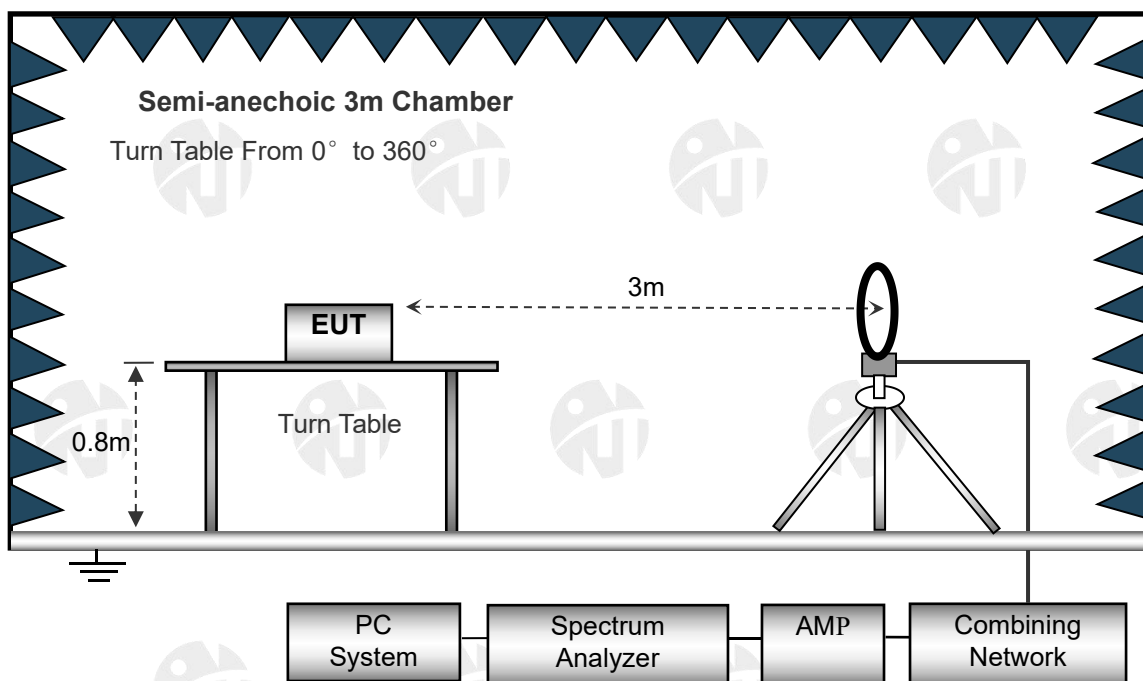
Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log(2400/F(\text{kHz})) + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log(24000/F(\text{kHz})) + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log(30) + 40$
30 ~ 88	100	3	100	$20\log(100)$
88 ~ 216	150	3	150	$20\log(150)$
216 ~ 960	200	3	200	$20\log(200)$
Above 960	500	3	500	$20\log(500)$

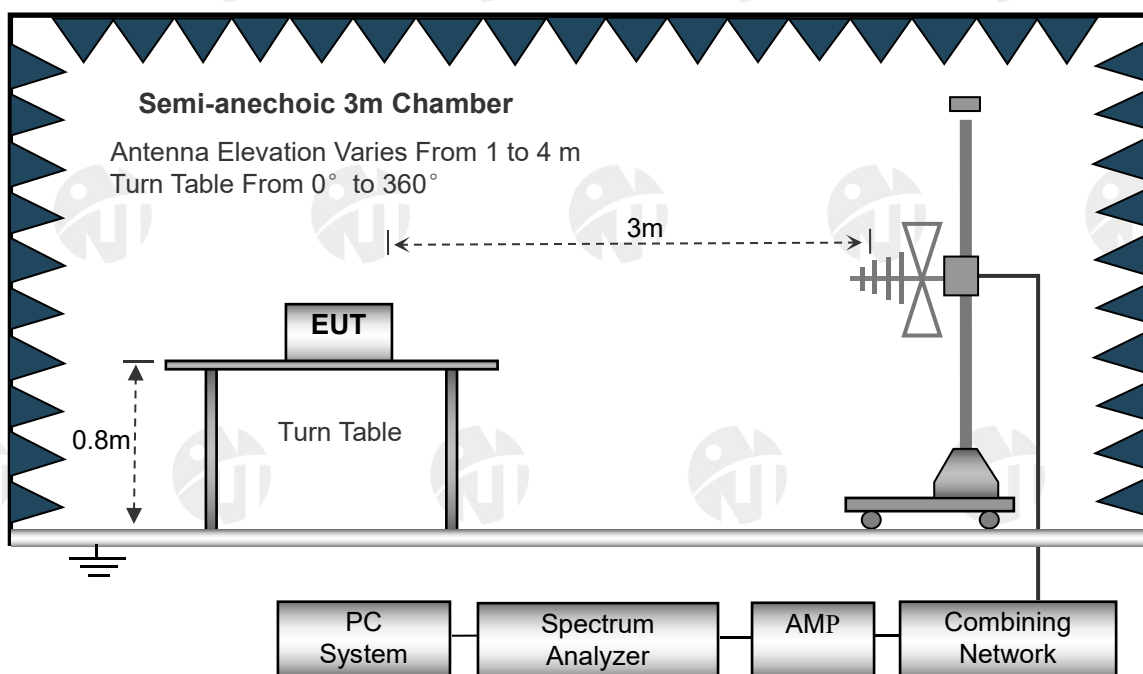
3.2. Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

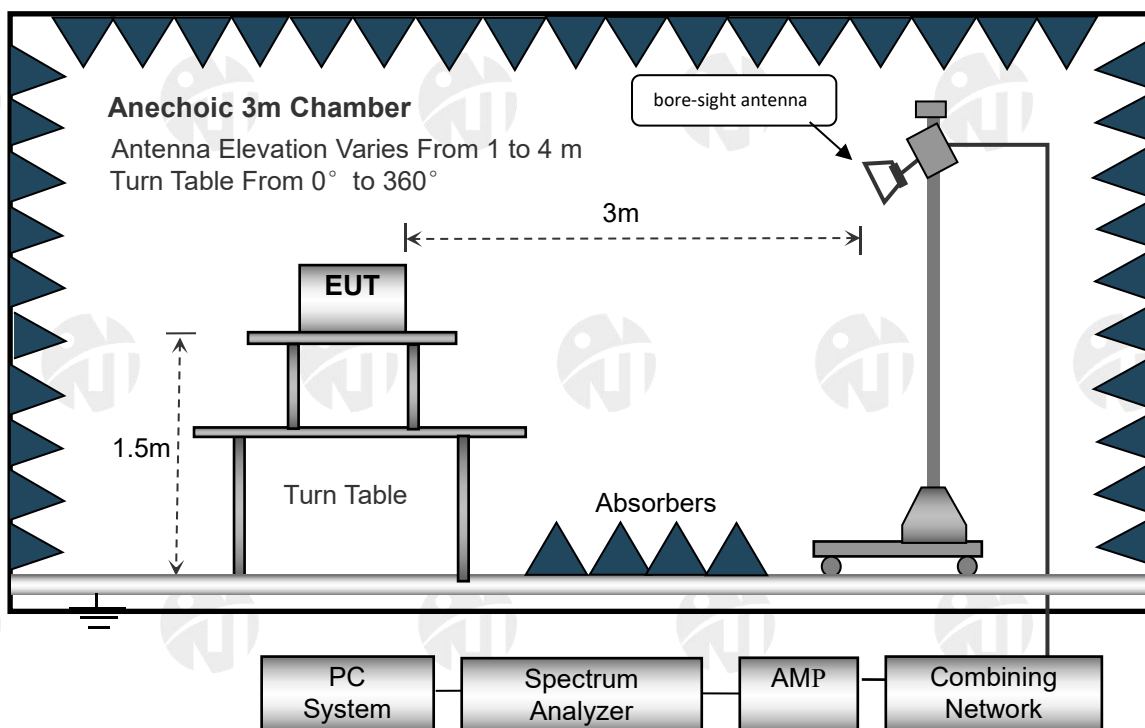
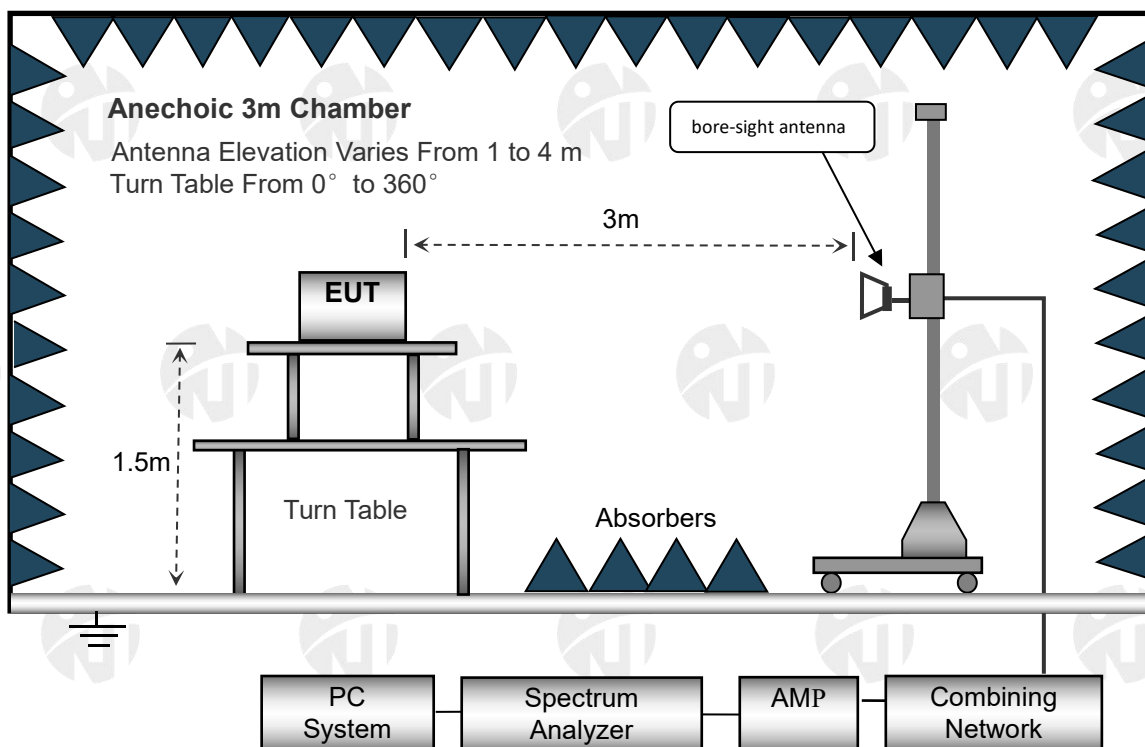
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



3.3. Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
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 moved from 1m to 4m to find out the maximum 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 radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in Z axis,so the worst data were shown as follow.
8. A 2.4GHz high - pass filter is used during radiated emissions above 1GHz measurement.

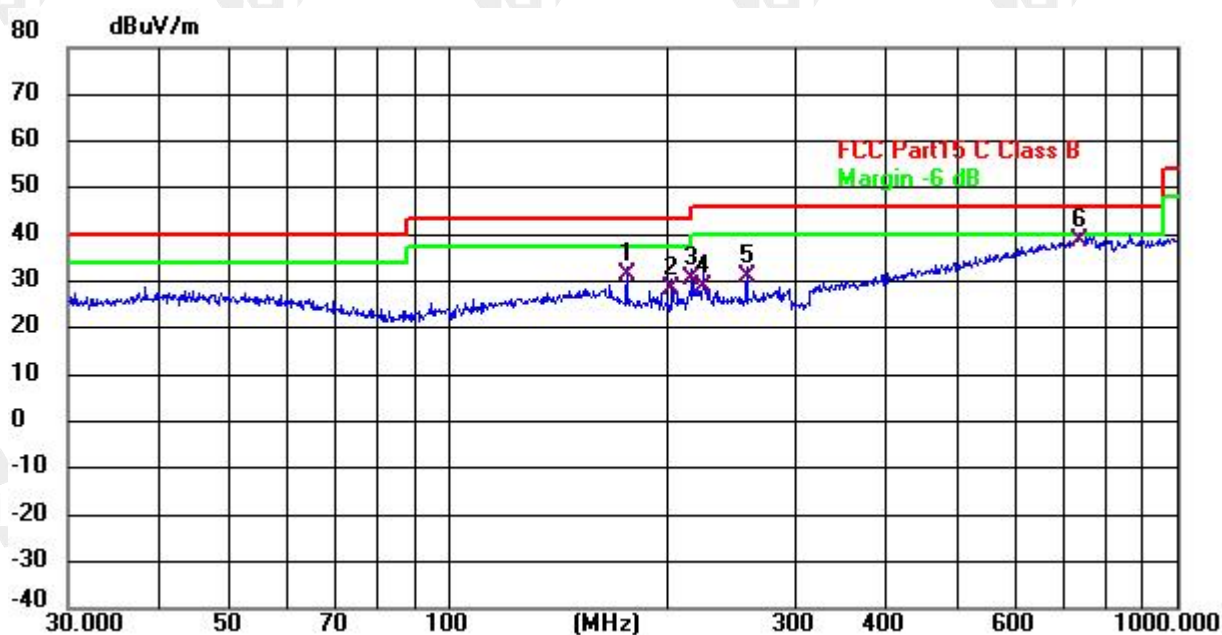
3.4. Test Result

Test Frequency: 9KHz~30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency : 30MHz ~ 1GHz

Radiation Emission Test Data			
Temperature:	25.1℃	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Horizontal
Test Voltage :	DC 7.2V	Test Mode	GFSK(2402MHz)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	175.6516	17.56	13.64	31.20	43.50	-12.30	QP
2	202.8104	16.24	12.26	28.50	43.50	-15.00	QP
3	216.0240	17.92	12.68	30.60	46.00	-15.40	QP
4	224.5193	15.79	13.01	28.80	46.00	-17.20	QP
5	256.5211	16.92	14.18	31.10	46.00	-14.90	QP
6 *	734.4913	12.43	26.07	38.50	46.00	-7.50	QP

Note:

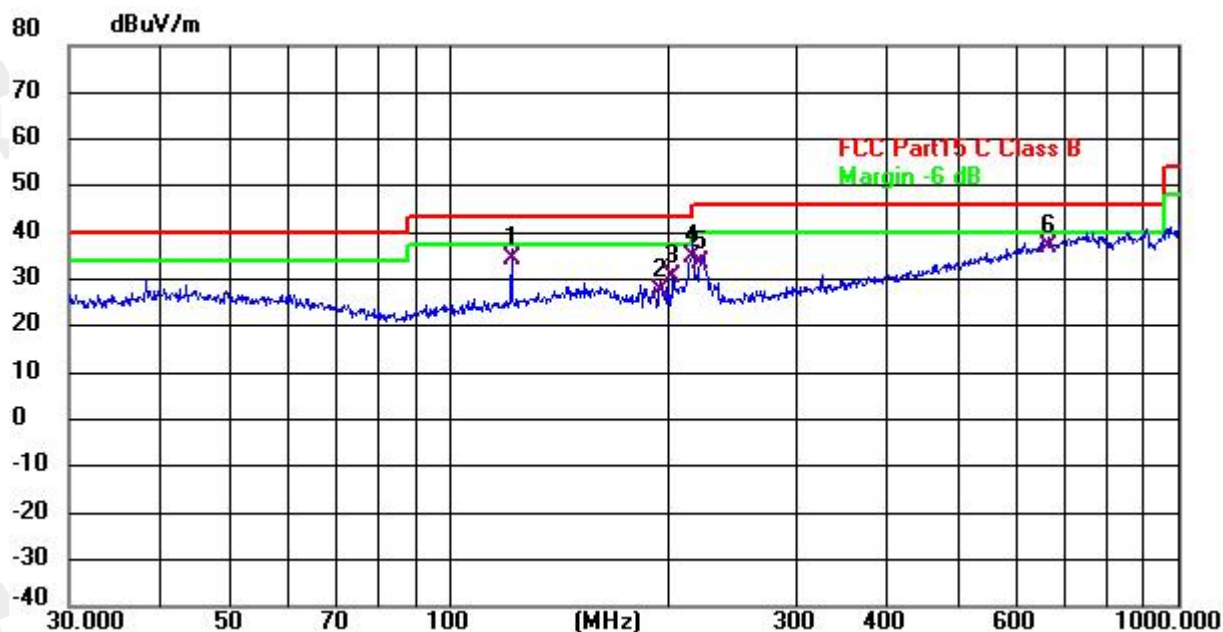
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Reading + Factor

Margin=Emission Level-Limit

2. All the modes have tested and recorded the worst mode(GFSK) in the report

Radiation Emission Test Data			
Temperature:	25.1°C	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Vertical
Test Voltage :	DC 7.2V	Test Mode	GFSK(2402MHz)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	121.5485	20.54	13.86	34.40	43.50	-9.10	QP
2	195.1363	15.23	12.37	27.60	43.50	-15.90	QP
3	202.8103	18.04	12.26	30.30	43.50	-13.20	QP
4	216.0240	22.12	12.68	34.80	46.00	-11.20	QP
5	221.3921	20.53	12.87	33.40	46.00	-12.60	QP
6 *	665.8034	12.41	24.69	37.10	46.00	-8.90	QP

Note:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Reading + Factor

Margin=Emission Level-Limit

2. All the modes have tested and recorded the worst mode(GFSK) in the report

Polar (H/V)	Frequency	Meter Reading	Pre-ampli fier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel:2402MHz									
V	4804.00	50.67	34.12	5.03	32.39	53.97	74.00	-20.03	Pk
V	4804.00	40.46	34.12	5.03	32.39	43.76	54.00	-10.24	AV
V	7206.00	48.22	32.54	6.29	35.86	57.83	74.00	-16.17	Pk
V	7206.00	33.59	32.54	6.29	35.86	43.20	54.00	-10.80	AV
V	9608.00	46.46	32.98	7.55	38.40	59.43	74.00	-14.57	Pk
V	9608.00	31.80	32.98	7.55	38.40	44.77	54.00	-9.23	AV
V	12010.00	42.81	32.09	8.93	39.00	58.65	74.00	-15.35	Pk
V	12010.00	27.13	32.09	8.93	39.00	42.97	54.00	-11.03	AV
H	4804.00	48.70	34.12	5.03	32.39	52.00	74.00	-22.00	Pk
H	4804.00	39.74	34.12	5.03	32.39	43.04	54.00	-10.96	AV
H	7206.00	47.11	32.54	6.29	35.86	56.72	74.00	-17.28	Pk
H	7206.00	30.55	32.54	6.29	35.86	40.16	54.00	-13.84	AV
H	9608.00	46.23	32.98	7.55	38.40	59.20	74.00	-14.80	Pk
H	9608.00	29.25	32.98	7.55	38.40	42.22	54.00	-11.78	AV
H	12010.00	39.25	32.09	8.93	39.00	55.09	74.00	-18.91	Pk
H	12010.00	24.95	32.09	8.93	39.00	40.79	54.00	-13.21	AV

Polar (H/V)	Frequency	Meter Reading	Pre-ampli fier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:2441.6MHz									
V	4883.20	48.51	34.07	5.09	32.59	52.12	74.00	-21.88	Pk
V	4883.20	38.26	34.07	5.09	32.59	41.87	54.00	-12.13	AV
V	7324.80	45.49	32.63	6.34	35.96	55.16	74.00	-18.84	Pk
V	7324.80	34.08	32.63	6.34	35.96	43.75	54.00	-10.25	AV
V	9766.40	42.37	32.92	7.59	38.40	55.44	74.00	-18.56	Pk
V	9766.40	29.21	32.92	7.59	38.40	42.28	54.00	-11.72	AV
V	12208.00	39.52	31.96	8.88	39.04	55.48	74.00	-18.52	Pk
V	12208.00	28.19	31.96	8.88	39.04	44.15	54.00	-9.85	AV
H	4883.20	47.85	34.07	5.09	32.59	51.46	74.00	-22.54	Pk
H	4883.20	39.78	34.07	5.09	32.59	43.39	54.00	-10.61	AV
H	7324.80	44.35	32.63	6.34	35.96	54.02	74.00	-19.98	Pk
H	7324.80	33.63	32.63	6.34	35.96	43.30	54.00	-10.70	AV
H	9766.40	39.23	32.92	7.59	38.40	52.30	74.00	-21.70	Pk
H	9766.40	30.58	32.92	7.59	38.40	43.65	54.00	-10.35	AV
H	12208.00	40.39	31.96	8.88	39.04	56.35	74.00	-17.65	Pk
H	12208.00	29.68	31.96	8.88	39.04	45.64	54.00	-8.36	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:2481.2MHz									
V	4962.40	45.88	34.02	5.15	32.80	49.81	74.00	-24.19	Pk
V	4962.40	36.96	34.02	5.15	32.80	40.89	54.00	-13.11	AV
V	7443.60	46.13	32.71	6.40	36.05	55.87	74.00	-18.13	Pk
V	7443.60	33.55	32.71	6.40	36.05	43.29	54.00	-10.71	AV
V	9924.80	41.18	32.86	7.62	38.40	54.34	74.00	-19.66	Pk
V	9924.80	28.36	32.86	7.62	38.40	41.52	54.00	-12.48	AV
V	12406.00	37.99	31.82	8.84	39.08	54.09	74.00	-19.91	Pk
V	12406.00	27.64	31.82	8.84	39.08	43.74	54.00	-10.26	AV
H	4962.40	48.40	34.02	5.15	32.80	52.33	74.00	-21.67	Pk
H	4962.40	35.97	34.02	5.15	32.80	39.90	54.00	-14.10	AV
H	7443.60	44.34	32.71	6.40	36.05	54.08	74.00	-19.92	Pk
H	7443.60	31.48	32.71	6.40	36.05	41.22	54.00	-12.78	AV
H	9924.80	38.61	32.86	7.62	38.40	51.77	74.00	-22.23	Pk
H	9924.80	29.03	32.86	7.62	38.40	42.19	54.00	-11.81	AV
H	12406.00	38.43	31.82	8.84	39.08	54.53	74.00	-19.47	Pk
H	12406.00	28.40	31.82	8.84	39.08	44.50	54.00	-9.50	AV

Note: 1. The testing has been conformed to 10*2481.2MHz=24812MHz.

2. All other emissions more than 30dB below the limit.

3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Reading + Factor

Margin=Emission Level-Limit

4. All the modes have tested and recorded the worst mode(GFSK) in the report

Radiated Band Emission Measurement:

	Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect or Type
GFSK	Low Channel: 2402MHz									
	H	2390	57.19	35.17	3.48	27.49	52.99	74.00	-21.01	PK
	H	2390	48.47	35.17	3.48	27.49	44.27	54.00	-9.73	AV
	H	2400	58.64	35.16	3.49	27.52	54.49	74.00	-19.51	PK
	H	2400	49.20	35.16	3.49	27.52	45.05	54.00	-8.95	AV
	V	2390	57.16	35.17	3.48	27.49	52.96	74.00	-21.04	PK
	V	2390	49.52	35.17	3.48	27.49	45.32	54.00	-8.68	AV
	V	2400	59.11	35.16	3.49	27.52	54.96	74.00	-19.04	PK
	V	2400	48.57	35.16	3.49	27.52	44.42	54.00	-9.58	AV
	High Channel: 2481.2MHz									
	H	2483.5	57.37	35.11	3.56	27.75	53.57	74.00	-20.43	PK
	H	2483.5	47.96	35.11	3.56	27.75	44.16	54.00	-9.84	AV
	H	2500	58.58	35.10	3.57	27.80	54.85	74.00	-19.15	PK
	H	2500	48.95	35.10	3.57	27.80	45.22	54.00	-8.78	AV
	V	2483.5	57.76	35.11	3.56	27.75	53.96	74.00	-20.04	PK
	V	2483.5	49.75	35.11	3.56	27.75	45.95	54.00	-8.05	AV
	V	2500	58.11	35.10	3.57	27.80	54.38	74.00	-19.62	PK
	V	2500	49.29	35.10	3.57	27.80	45.56	54.00	-8.44	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

4. Maximum Peak Output Power

4.1. Limit

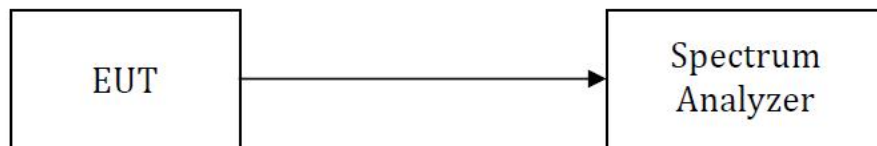
Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2,2019;
ANSI C63.10-2020+Cor.1-2023

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1)	Peak Output Power	1 watt or 21dBm	2400-2483.5	PASS

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

4.2. Test Setup



4.3. Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above,
2. Spectrum Setting:
 RBW > the 20 dB bandwidth of the emission being measured
 Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
 VBW ≥ RBW
 Sweep = auto
 Detector function = peak
 Trace = max hold

4.4. Test Result

Please see the attachment for data.

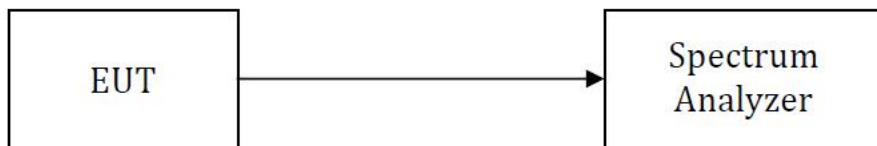
5. -20 dB Bandwidth Measurement

5.1. Limit

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2,2019; ANSI C63.10-2020+Cor.1-2023

5.2. Test Setup



5.3. Test Procedure

For 20dB Bandwidth Measurement

Using the following spectrum analyzer settings:

1. Span= approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel.
2. Set the RBW = 3 kHz.
3. Set the VBW = 9.1 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

For 99% Bandwidth Measurement

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW $\geq$ 3RBW

5.4. Test Result

Please see the attachment for data.

6. Carrier Frequency Separation Test

6.1. Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	>25KHz or >two-thirds of the 20 dB bandwidth

6.2. Test Setup



6.3. Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer settings:

1. Span= Wide enough to capture the peaks of two adjacent channels
2. Set the RBW = 360 kHz.
3. Set the VBW = 1.2 MHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

6.4. Test Result

Please see the attachment for data.

7. Number of Hopping Channel Test

7.1. Limit

Test Standard	FCC Part15 C Section 15.247(a)(1)(iii)
Test Limit	>15 channels

7.2. Test Setup



7.3. Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer settings:

1. Span= Wide enough to capture the peaks of two adjacent channels
2. Set the RBW = 100 kHz.
3. Set the VBW = 300 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

7.4. Test Result

Please see the attachment for data.

8. Dwell Time Test

8.1. Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Limit	0.4 sec

8.2. Test setup



8.3. Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span= zero span, centered on a hopping channel
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. The burst width [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.
 The hops per second for all channels: The selected EUT Conf uses a slot type of 5-Tx&1-Rx and a Hopping rate of 1600 [ch*hop/s] for all channels. So the final hopping rate for all channels is $1600/6=266.67$ [ch*hop/s]
 The hops per second on one channel: 266.67 [ch*hops/s]/ 79 [ch]= 3.38 [hop/s].
 The total hops for all channels within the dwell time calculation
 duration: 3.38 [hop/s]* 31.6 [s*ch]= 106.67 [hop*ch].
 The dwell time for all channels hopping: 106.67 [hop*ch]*Burst Width [ms/hop/ch].
9. The duration for dwell time calculation: 0.4 [s]*hopping number= 0.4 [s]* 79 [ch]= 31.6 [s*ch].
10. Pulse Time(ms)*Total Hops=Dwell Time

8.4. Test Result

Please see the attachment for data.

9. Conducted Spurious Emissions and Band Edge Requirement

9.1. Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

9.2. Test Setup



9.3. Test Procedure

The EUT must have its hopping/Non-hopping function enabled. Using the following spectrum analyzer setting:

1. Set the RBW = 100kHz.
2. Set the VBW = 300kHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

9.4. Test Result

Please see the attachment for data.

10. Antenna Requirement

10.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(b)(4)
Requirement	1) 15.203 requirement: 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. 2) 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

10.2. Antenna Connected Construction

The antenna is copper tube antenna which permanently attached, and the best case gain of the antenna is 2.80 dBi.
It complies with the standard requirement.

11. TEST SETUP & EUT PHOTOGRAPH

Please see the attachment for details.

----- End of Report -----