



MAXLAB Testing Co.,Ltd.

Report No.: MAX250303110P02-R01

FCC TEST REPORT

FCC ID: 2BMXP-BTW46

Product : TRUE WIRELESS EARPHONE
Model Name : BTW46
Brand : N/A
Report No. : MAX250303110P02-R01

Prepared for

Shenzhen Sound Bass Technology Co., Ltd.

Kvance Industrial Zone, No. 6285 Longgang Avenue, Yuanshan Street, Longgang District, Shenzhen City, China

Prepared by

MAXLAB Testing Co.,Ltd.

**1/F, Building B, Xinshidai GR Park, Shiyan Street, Bao'an District,
Shenzhen, Guangdong, 518052, People's Republic of China**

1 TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Sound Bass Technology Co., Ltd.
Address : Kvance Industrial Zone, No. 6285 Longgang Avenue, Yuanshan Street,
Longgang District, Shenzhen City, China
Manufacture's name : Shenzhen Sound Bass Technology Co., Ltd.
Address : Kvance Industrial Zone, No. 6285 Longgang Avenue, Yuanshan Street,
Longgang District, Shenzhen City, China
Product name : TRUE WIRELESS EARPHONE
Model name : BTW46
Standards : FCC CFR47 Part 15 Section 15.247
Test procedure : ANSI C63.10:2020
Date of test : Mar. 03, 2025- Mar. 14, 2025
Date of Issue : Mar. 14, 2025

This device described above has been tested by MAXLAB, 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 of MAXLAB, this document may be altered or revised by MAXLAB, personal only, and shall be noted in the revision of the document.

Test Engineer:

Cindy Zheng

Engineer/ Cindy Zheng

Technical Manager:

Vivian Jiang

RF Manager/ Vivian Jiang

Contents

Page

1 TEST RESULT CERTIFICATION	2
2 TEST SUMMARY	5
2.1 TEST SITE	6
3 GENERAL INFORMATION	7
3.1 GENERAL DESCRIPTION OF E.U.T.	7
3.2 CHANNEL LIST	8
3.3 TEST SETUP CONFIGURATION	8
3.4 TEST MODE	9
4 EQUIPMENT DURING TEST	10
4.1 EQUIPMENTS LIST	10
4.2 MEASUREMENT UNCERTAINTY	12
4.3 DESCRIPTION OF SUPPORT UNITS	12
5 CONDUCTED EMISSION	13
5.1 E.U.T. OPERATION	13
5.2 EUT SETUP	13
5.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	14
5.4 MEASUREMENT PROCEDURE	14
5.5 CONDUCTED EMISSION LIMIT	14
5.6 MEASUREMENT DESCRIPTION	14
5.7 CONDUCTED EMISSION TEST RESULT	14
6 RADIATED SPURIOUS EMISSIONS	17
6.1 EUT OPERATION	17
6.2 TEST SETUP	18
6.3 SPECTRUM ANALYZER SETUP	19
6.4 TEST PROCEDURE	20
6.5 SUMMARY OF TEST RESULTS	23
7 CONDUCT BAND EDGE AND SPURIOUS EMISSIONS MEASUREMENT	30
7.1 TEST PROCEDURE	30
7.2 TEST RESULT	31

8 6DB BANDWIDTH MEASUREMENT	36
8.1 TEST PROCEDURE	36
8.2 TEST RESULT	36
9 MAXIMUM PEAK OUTPUT POWER	39
9.1 TEST PROCEDURE	39
9.2 TEST RESULT	39
10 POWER SPECTRAL DENSITY	42
10.1 TEST PROCEDURE	42
10.2 TEST RESULT	42
11 ANTENNA APPLICATION	45
11.1 ANTENNA REQUIREMENT	45
11.2 RESULT	45
12 TEST SETUP PHOTOS AND EUT PHOTOS	46

2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	FCC part 15.207	PASS
Radiated Spurious Emissions	FCC part 15.205/15.209	PASS
Conducted Spurious Emission	FCC part 15. 247(d)	PASS
Band edge	FCC part 15.247(d)	PASS
6dB&99% Bandwidth	FCC part 15.247 (a)(2)	PASS
Maximum Peak Output Power	FCC part 15.247 (b)(3)	PASS
Power Spectral Density	FCC part 15.247 (e)	PASS
Antenna Requirement	FCC part 15.203/15.247 (c)	PASS

Remark:

1. "N/A" denotes test is not applicable in this Test Report.

2.1 Test Site

Site Description

EMC Lab.: FCC-Registration No:562200 Designation Number: CN1338

MAXLAB Testing Co., Ltd.has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert.No:4707.01

MAXLAB Testing Co, Ltd.has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

Industry Canada Registration Number.Is:11093A

CAB identifier: CN0019

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

Name of Firm: MAXLAB Testing Co, Ltd.

Site Location: 1/F, Building B, Xinshidai GR Park, Shiyan Street, Bao'an District, Shenzhen, Guangdong, 518052, People's Republic of China

3 General Information

3.1 General Description of E.U.T.

Product Name	:	TRUE WIRELESS EARPHONE
Model Name	:	BTW46
Sample ID	:	250303110P02-R01
Sample(s) Status:	:	Engineer sample
Series Model	:	N/A
Model Different.:	:	N/A
Operating frequency	:	2402-2480MHz
Number of Channels	:	40 channels
Type of Modulation	:	GFSK
Antenna installation	:	Internal antenna
Antenna Gain	:	2.67 dBi
Power supply	:	DC 3.7V from Battery; Charging input: DC 5V
Hardware Version	:	V03
Software Version	:	V233
Remark: the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.		

3.2 Channel List

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2020 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The details of test channels and bandwidth were for RF conductive measurement.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	14	2430	28	2458
01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	19	2440	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	39	2480
12	2426	26	2454		
13	2428	27	2456		

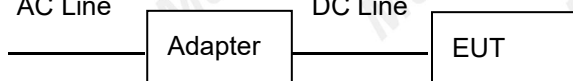
Note:

1. Test of channel was included the lowest, middle and highest frequency in highest data rate and to perform the test, then record on this report.

3.3 Test Setup Configuration

Conducted Emission

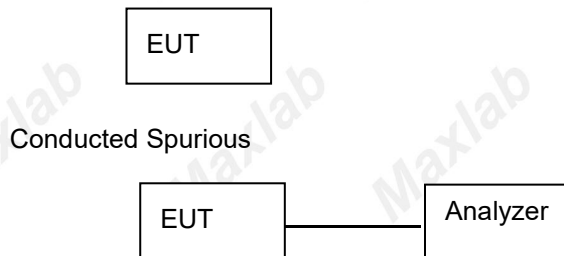
AC Line



Radiated Emission(30MHz-1GHz)



Radiated Emission (above 1GHz)



3.4 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
-------------------	---

Test Software	RFTest
Power level setup	0 dBm

	Channel	Frequency(MHz)
Low Channel	0	2402
Mid Channel	19	2440
High Channel	39	2480

4 Equipment During Test

4.1 Equipments List

Conducted Emission					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	MAX252	2024-10-27	2025-10-26
EMI Test Receiver	R&S	ESCI 7	MAX552	2024-10-27	2025-10-26
Coaxial Switch	ANRITSU CORP	MP59B	MAX225	2024-10-27	2025-10-26
ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	MAX226	2024-10-27	2025-10-26
Coaxial Cable	MAX	N/A	MAX227	N/A	N/A
Thermo meter	KTJ	TA328	MAX233	2024-10-27	2025-10-26
Absorbing clamp	Elektronik-Feinmechanik	MDS21	MAX229	2024-10-27	2025-10-26
LISN	R&S	ENV216	308	2024-10-27	2025-10-26
LISN	R&S	ENV216	314	2024-10-27	2025-10-26

Radiation Test equipment					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)*6.4(H)	MAX250	2024-10-27	2025-10-26
Control Room	ZhongYu Electron	6.2(L)*2.5(W)*2.4(H)	MAX251	N/A	N/A
EMI Test Receiver	Rohde & Schwarz	ESU26	MAX203	2024-10-27	2025-10-26
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	MAX214	2024-10-27	2025-10-26
Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	MAX208	2024-10-27	2025-10-26
Horn Antenna	ETS-LINDGREN	3160	MAX217	2024-10-27	2025-10-26
Coaxial Cable	MAX	N/A	MAX213	2024-10-27	2025-10-26
Coaxial Cable	MAX	N/A	MAX211	2024-10-27	2025-10-26
Coaxial cable	MAX	N/A	MAX210	2024-10-27	2025-10-26
Coaxial Cable	MAX	N/A	MAX212	2024-10-27	2025-10-26
Amplifier(100kHz-3GHz)	HP	8347A	MAX204	2024-10-27	2025-10-26
Amplifier(2GHz-20GHz)	HP	84722A	MAX206	2024-10-27	2025-10-26
Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	MAX218	2024-10-27	2025-10-26
Band filter	Amindeon	82346	MAX219	2024-10-27	2025-10-26
Power Meter	Anritsu	ML2495A	MAX540	2024-10-27	2025-10-26
Power Sensor	Anritsu	MA2411B	MAX541	2024-10-27	2025-10-26
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	MAX575	2024-10-27	2025-10-26

Splitter	Agilent	11636B	MAX237	2024-10-27	2025-10-26
Loop Antenna	ZHINAN	ZN30900A	MAX534	2024-10-27	2025-10-26
Breitband hornantenne	SCHWARZBECK	BBHA 9170	MAX579	2024-10-27	2025-10-26
Amplifier	TDK	PA-02-02	MAX574	2024-10-27	2025-10-26
Amplifier	TDK	PA-02-03	MAX576	2024-10-27	2025-10-26
PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	MAX578	2024-10-27	2025-10-26

RF Conducted Test:					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
MXA Signal Analyzer	Agilent	N9020A	MAX566	2024-10-27	2025-10-26
EMI Test Receiver	R&S	ESCI 7	MAX552	2024-10-27	2025-10-26
Spectrum Analyzer	Agilent	E4440A	MAX533	2024-10-27	2025-10-26
MXG vector Signal Generator	Agilent	N5182A	MAX567	2024-10-27	2025-10-26
ESG Analog Signal Generator	Agilent	E4428C	MAX568	2024-10-27	2025-10-26
USB RF Power Sensor	DARE	RPR3006W	MAX569	2024-10-27	2025-10-26
RF Switch Box	Shongyi	RFSW3003328	MAX571	2024-10-27	2025-10-26
Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	MAX572	2024-10-27	2025-10-26

Other

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

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9kHz~30MHz)	±4.51dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

4.3 Description of Support Units

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.	Series No.	Note
E-1	TRUE WIRELESS E ARPHONE	N/A	BTW46	N/A	EUT
E-2	QUICK CHARGE	HUAWEI	HW-090200CH0	B98787L5E00423	Auxiliary

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.

5 Conducted Emission

Test Requirement	: FCC CFR 47 Part 15 Section 15.207
Test Method	: ANSI C63.10: 2013
Test Result	: PASS
Frequency Range	: 150kHz to 30MHz
Class/Severity	: Class B

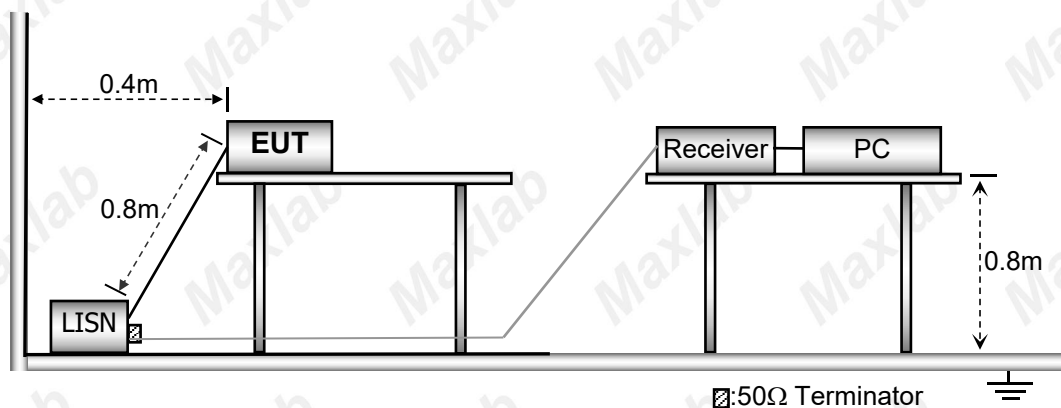
5.1 E.U.T. Operation

Operating Environment :

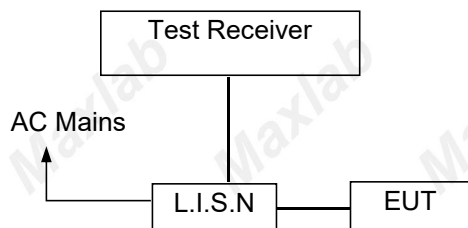
Temperature	: 25.5 °C
Humidity	: 51 % RH
Atmospheric Pressure	: 101.2kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2020.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

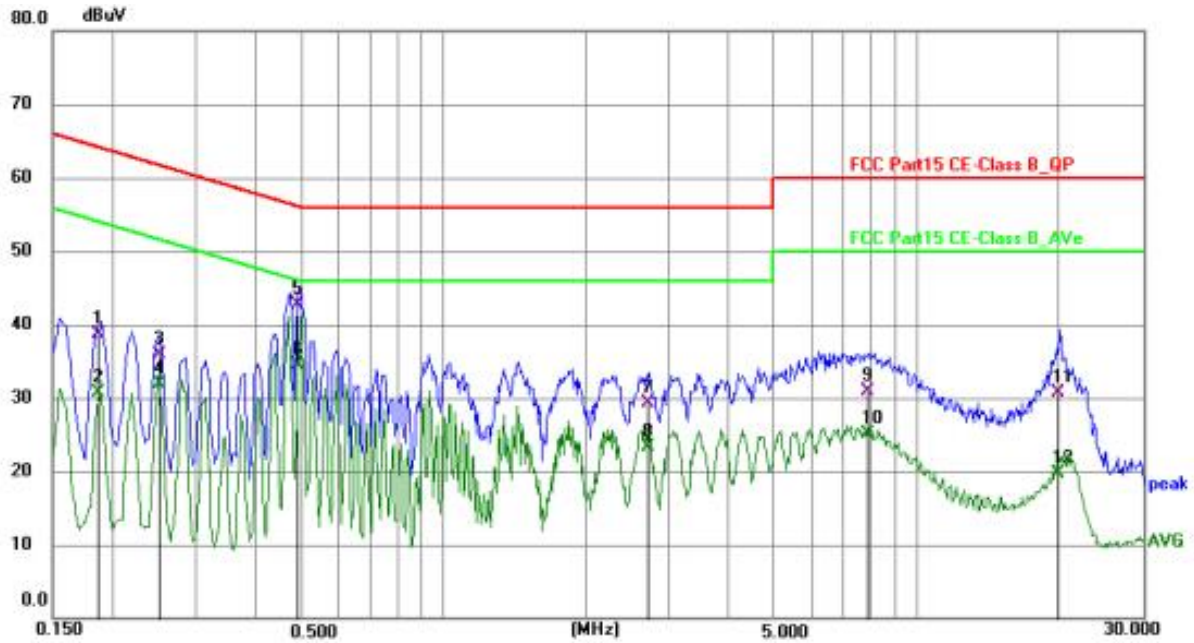
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.7 Conducted Emission Test Result

Pass

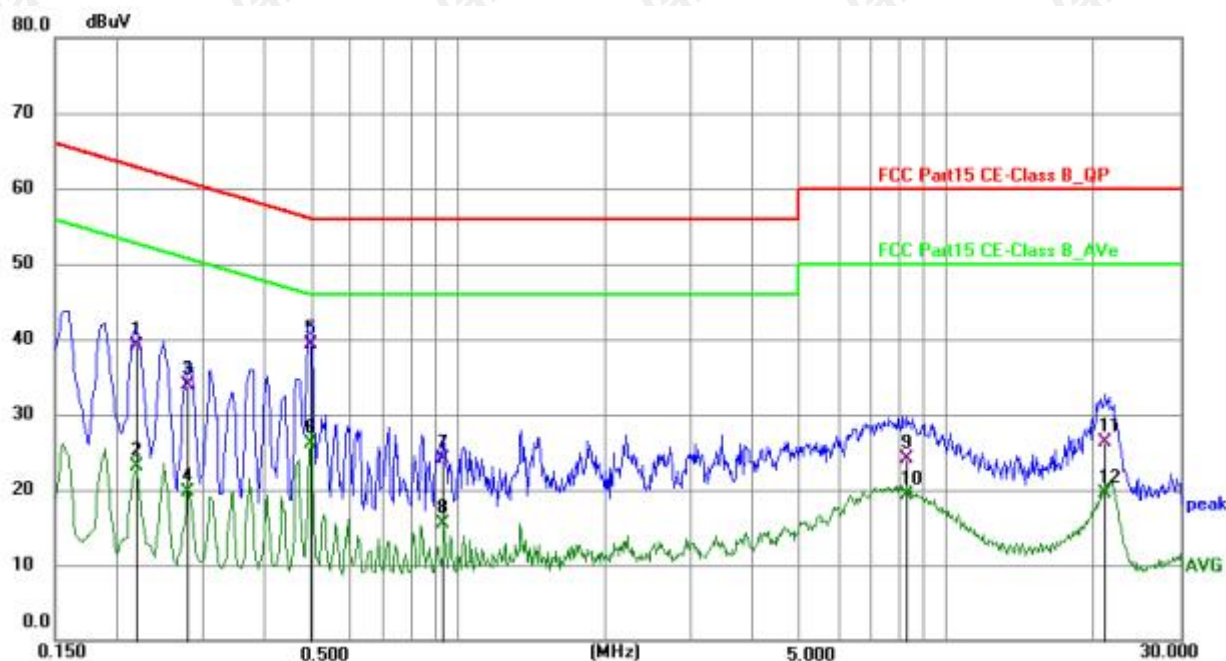
Conducted emission at both 120V & 240V is assessed, and emission at 120V represents the worst case. All the modulation modes were tested the data of the worst mode (GFSK) are recorded in the following pages and the others modulation methods do not exceed the limits.

Channel:	Middle	Phase :	L
----------	--------	---------	---



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1876	19.26	19.50	38.76	64.14	-25.38	QP	P
2	0.1876	11.15	19.50	30.65	54.14	-23.49	AVG	P
3	0.2524	16.41	19.49	35.90	61.68	-25.78	QP	P
4	0.2524	12.39	19.49	31.88	51.68	-19.80	AVG	P
5	0.4947	23.30	19.48	42.78	56.09	-13.31	QP	P
6 *	0.4947	15.10	19.48	34.58	46.09	-11.51	AVG	P
7	2.7156	9.74	19.55	29.29	56.00	-26.71	QP	P
8	2.7156	3.68	19.55	23.23	46.00	-22.77	AVG	P
9	7.9215	11.31	19.67	30.98	60.00	-29.02	QP	P
10	7.9215	5.34	19.67	25.01	50.00	-24.99	AVG	P
11	20.0376	10.72	20.03	30.75	60.00	-29.25	QP	P
12	20.0376	-0.30	20.03	19.73	50.00	-30.27	AVG	P

Channel:	Middle	Phase :	N
----------	--------	---------	---



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2195	19.53	19.49	39.02	62.84	-23.82	QP	P
2	0.2195	3.52	19.49	23.01	52.84	-29.83	AVG	P
3	0.2815	14.42	19.48	33.90	60.77	-26.87	QP	P
4	0.2815	0.19	19.48	19.67	50.77	-31.10	AVG	P
5 *	0.4993	19.89	19.49	39.38	56.01	-16.63	QP	P
6	0.4993	6.67	19.49	26.16	46.01	-19.85	AVG	P
7	0.9371	4.50	19.51	24.01	56.00	-31.99	QP	P
8	0.9371	-4.05	19.51	15.46	46.00	-30.54	AVG	P
9	8.2836	4.42	19.68	24.10	60.00	-35.90	QP	P
10	8.2836	-0.46	19.68	19.22	50.00	-30.78	AVG	P
11	21.0673	6.24	20.14	26.38	60.00	-33.62	QP	P
12	21.0673	-0.57	20.14	19.57	50.00	-30.43	AVG	P

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor

6 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247,
 Test Method : ANSI C63.10:2020
 Test Result : PASS
 Measurement Distance : 3m
 Limit : See the follow table

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	$20\log^{(500)}$

6.1 EUT Operation

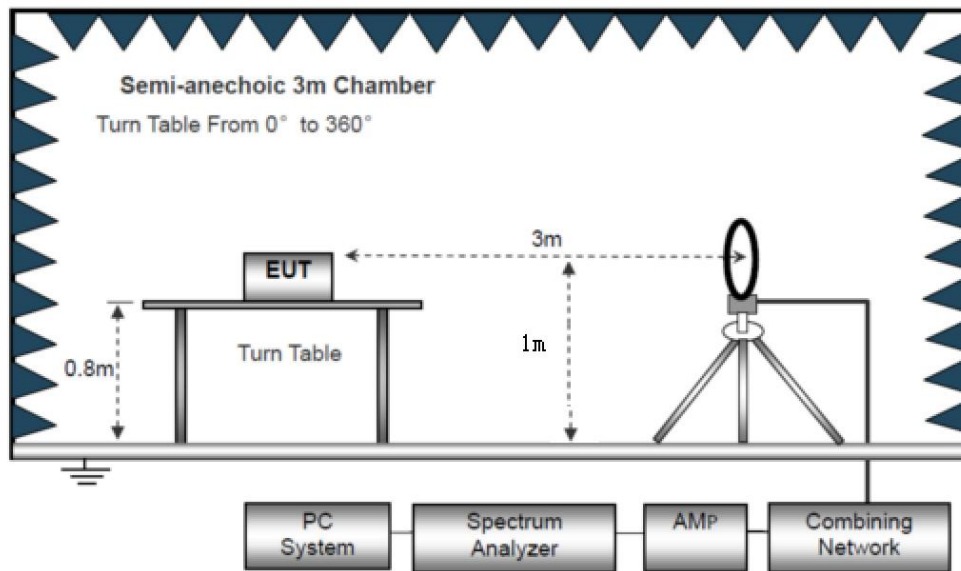
Operating Environment :

Temperature : 23.5 °C
 Humidity : 51.1 % RH
 Atmospheric Pressure : 101.2kPa

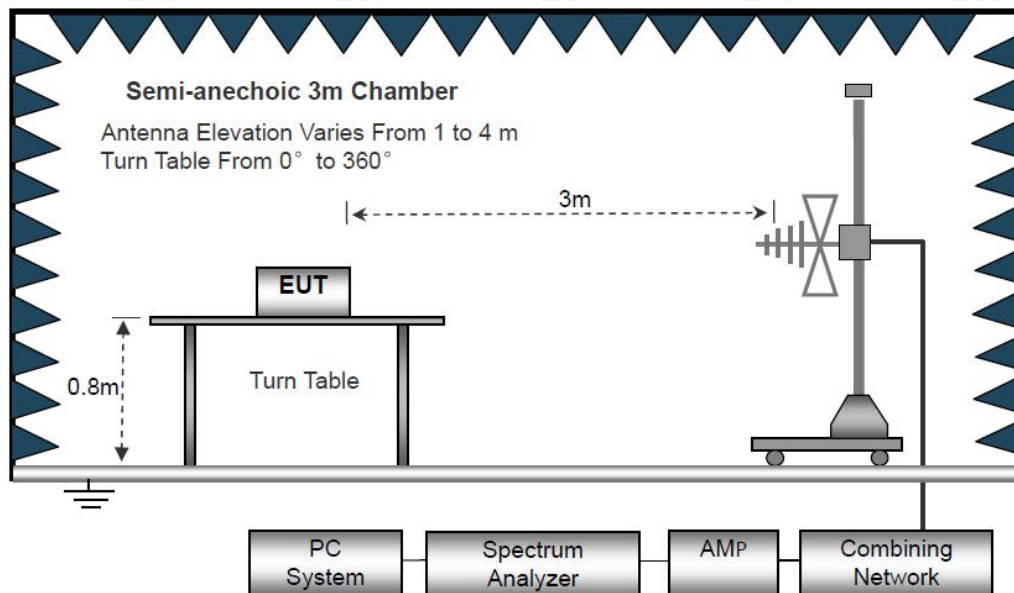
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

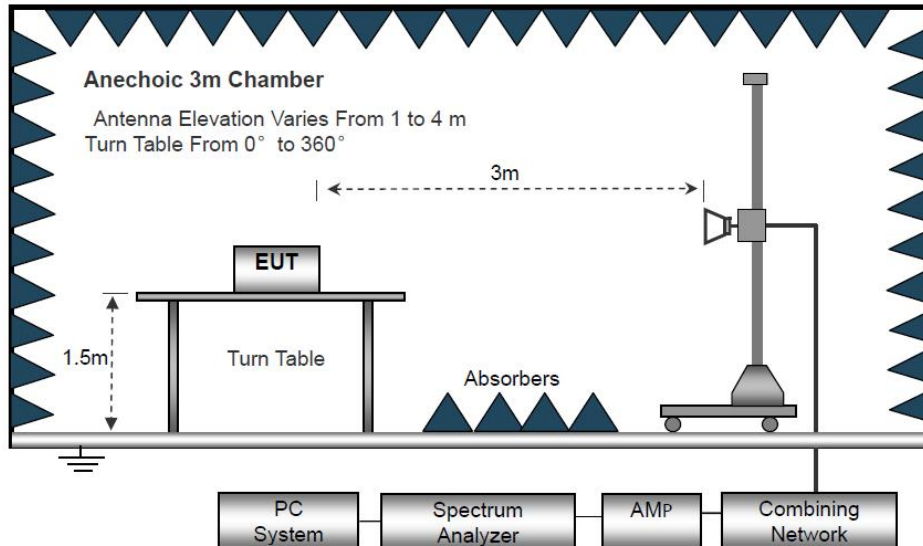
The test setup for emission measurement below 30MHz



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



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

6.4 Test Procedure

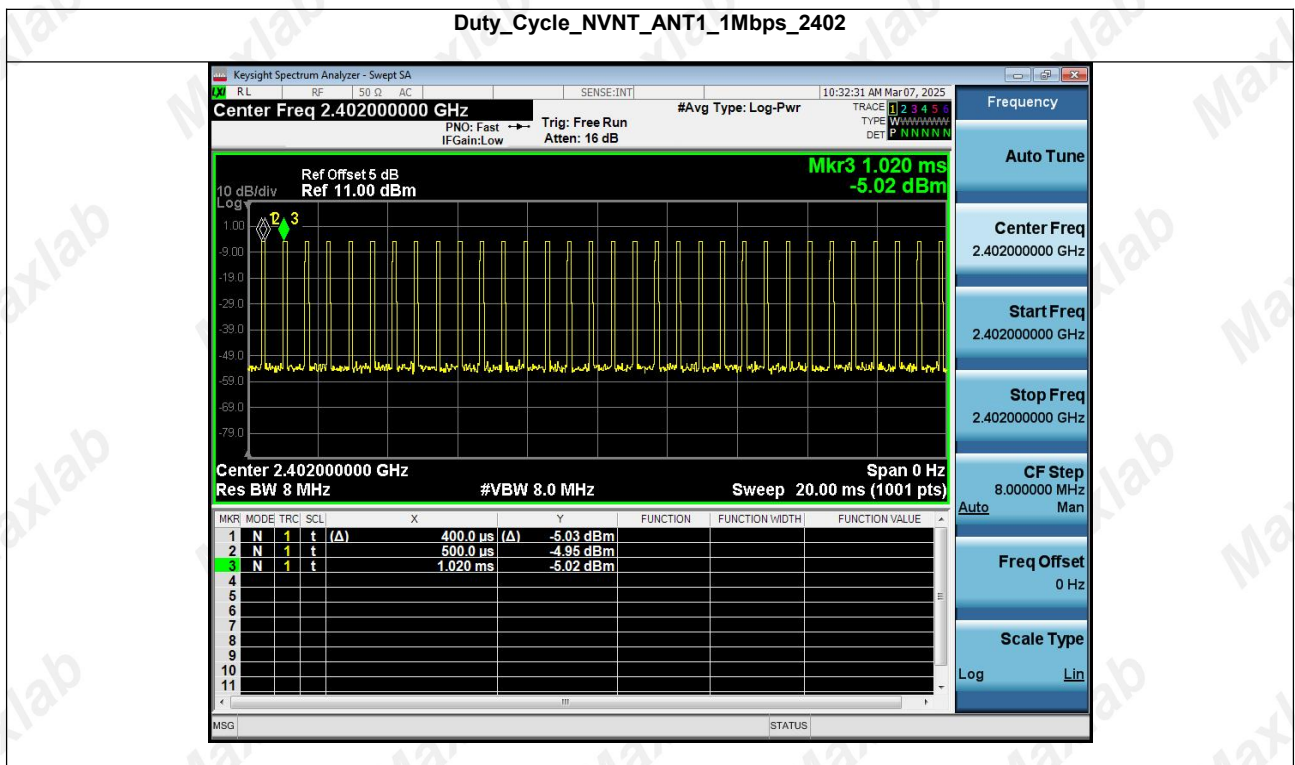
1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2020.
2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.
7. Test Procedure of measurement (For Above 1GHz):
 - 1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).
 - 2) Change the antenna polarization and repeat 1) with vertical polarization.
 - 3) Make a hardcopy of the spectrum.
 - 4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
 - 5) Change the analyser mode to Clear/ Write and found the cone of emission.
 - 6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.
 - 7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.
 - 8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.
8. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

For Average Measurement:

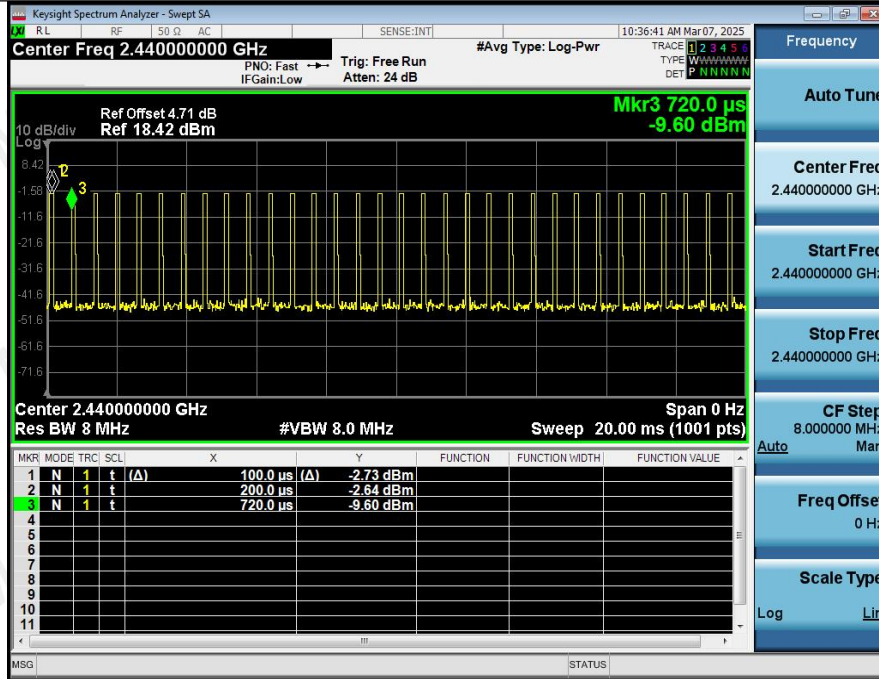
VBW=10Hz, when duty cycle is no less than 98 percent.

$VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

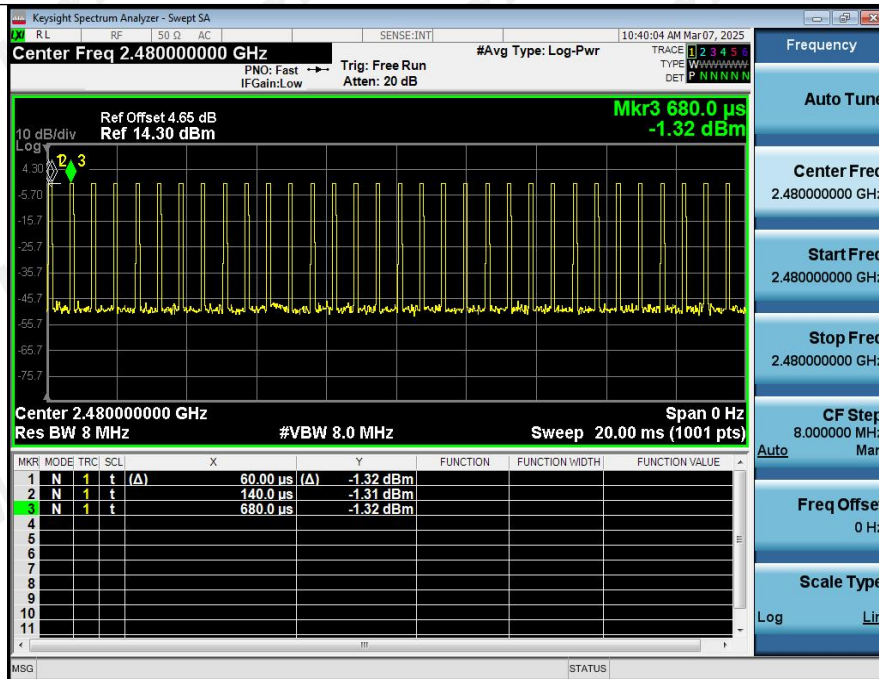
Condition	Antenna	Rate	Frequency (MHz)	Dutycycle(%)	Duty_factor
NVNT	ANT1	1Mbps	2402.00	16.13	7.92
NVNT	ANT1	1Mbps	2440.00	16.13	7.92
NVNT	ANT1	1Mbps	2480.00	12.90	8.89



Duty_Cycle_NVNT_ANT1_1Mbps_2440



Duty_Cycle_NVNT_ANT1_1Mbps_2480



6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

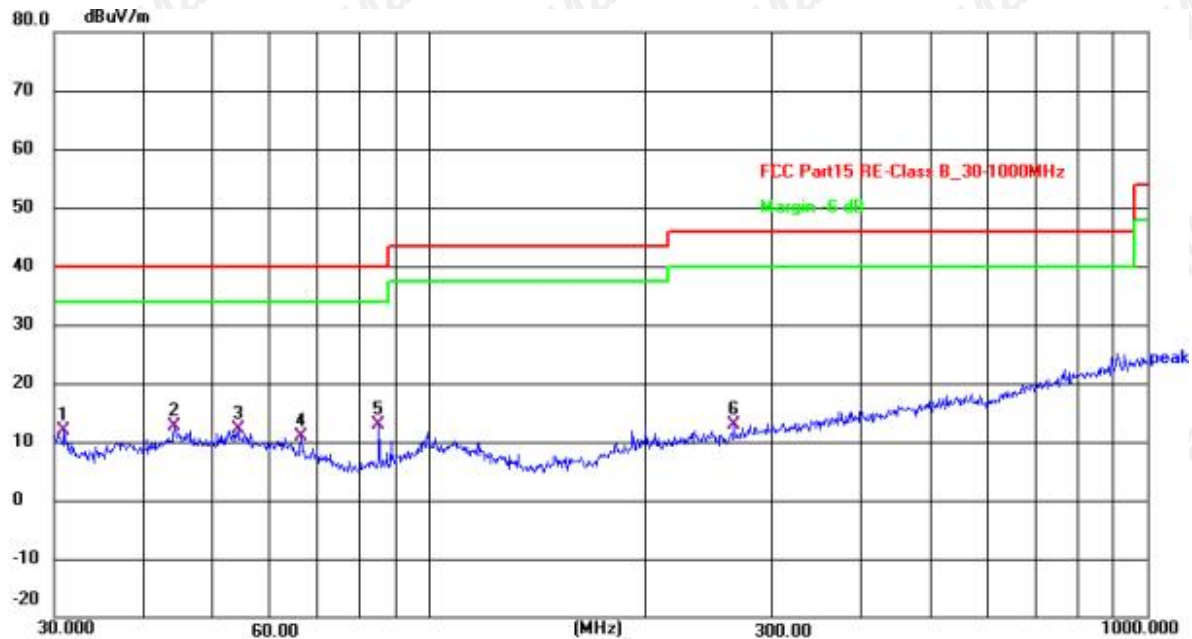
Distance extrapolation factor = $40 \log(\text{Specific distance} / \text{test distance})$ (dB);
Limit line = Specific limits (dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

Pass.

Please refer to the following test plots for the worst test mode (GFSK (CH00: 2402MHz)).

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 3.7V		

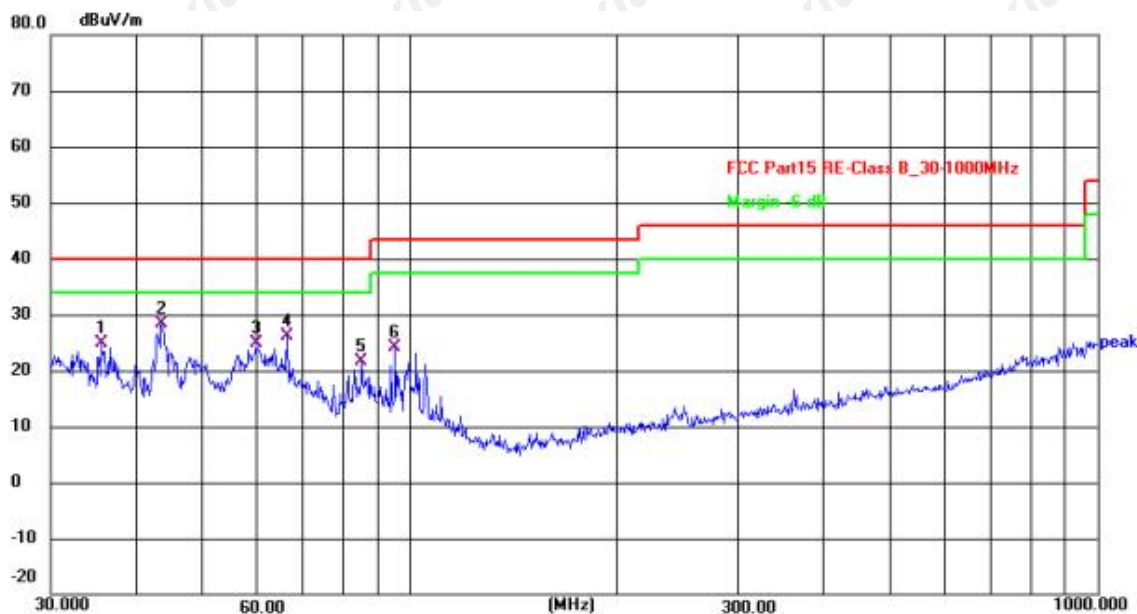


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.9618	28.36	-16.38	11.98	40.00	-28.02	QP
2	44.1202	27.10	-14.45	12.65	40.00	-27.35	QP
3	54.0710	26.59	-14.55	12.04	40.00	-27.96	QP
4	66.2661	27.84	-16.95	10.89	40.00	-29.11	QP
5	84.9995	31.97	-19.17	12.80	40.00	-27.20	QP
6	265.6757	27.56	-14.59	12.97	46.00	-33.03	QP

Remark: Emission Level = Reading + Cable Loss + ANT Factor - AMP Factor

Temperature:	26°C	Relative Humidity:	54%
--------------	------	--------------------	-----

Pressure:	101 kPa	Polarization:	Vertical
Test Voltage:	DC 3.7V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.4993	41.07	-16.18	24.89	40.00	-15.11	QP
2	43.5057	42.80	-14.53	28.27	40.00	-11.73	QP
3	59.6493	39.85	-14.99	24.86	40.00	-15.14	QP
4	66.2662	43.13	-16.95	26.18	40.00	-13.82	QP
5	84.9993	40.72	-19.17	21.55	40.00	-18.45	QP
6	95.0930	41.24	-17.05	24.19	43.50	-19.31	QP

Remark: Emission Level = Reading + Cable Loss + ANT Factor - AMP Factor

Test Frequency 1GHz-25GHz:

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
Low Channel:2402MHz									
V	4804.00	51.42	34.12	5.03	32.39	54.72	74.00	-19.28	Pk
V	4804.00	40.93	34.12	5.03	32.39	44.23	54.00	-9.77	AV
V	7206.00	46.35	32.54	6.29	35.86	55.96	74.00	-18.04	Pk
V	7206.00	33.99	32.54	6.29	35.86	43.60	54.00	-10.40	AV
V	9608.00	45.23	32.98	7.55	38.40	58.20	74.00	-15.80	Pk
V	9608.00	31.05	32.98	7.55	38.40	44.02	54.00	-9.98	AV
V	12010.00	43.60	32.09	8.93	39.00	59.44	74.00	-14.56	Pk
V	12010.00	26.61	32.09	8.93	39.00	42.45	54.00	-11.55	AV
H	4804.00	50.58	34.12	5.03	32.39	53.88	74.00	-20.12	Pk
H	4804.00	38.00	34.12	5.03	32.39	41.30	54.00	-12.70	AV
H	7206.00	47.32	32.54	6.29	35.86	56.93	74.00	-17.07	Pk
H	7206.00	30.00	32.54	6.29	35.86	39.61	54.00	-14.39	AV
H	9608.00	45.80	32.98	7.55	38.40	58.77	74.00	-15.23	Pk
H	9608.00	28.22	32.98	7.55	38.40	41.19	54.00	-12.81	AV
H	12010.00	40.09	32.09	8.93	39.00	55.93	74.00	-18.07	Pk
H	12010.00	26.69	32.09	8.93	39.00	42.53	54.00	-11.47	AV

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:2440MHz									
V	4880.00	48.26	34.07	5.09	32.59	51.87	74.00	-22.13	Pk
V	4880.00	40.19	34.07	5.09	32.59	43.80	54.00	-10.20	AV
V	7320.00	45.03	32.63	6.34	35.96	54.70	74.00	-19.30	Pk
V	7320.00	36.15	32.63	6.34	35.96	45.82	54.00	-8.18	AV
V	9760.00	42.54	32.92	7.59	38.40	55.61	74.00	-18.39	Pk
V	9760.00	28.91	32.92	7.59	38.40	41.98	54.00	-12.02	AV
V	12200.00	39.95	31.96	8.88	39.04	55.91	74.00	-18.09	Pk
V	12200.00	29.38	31.96	8.88	39.04	45.34	54.00	-8.66	AV
H	4880.00	49.82	34.07	5.09	32.59	53.43	74.00	-20.57	Pk
H	4880.00	38.82	34.07	5.09	32.59	42.43	54.00	-11.57	AV
H	7320.00	44.79	32.63	6.34	35.96	54.46	74.00	-19.54	Pk
H	7320.00	33.82	32.63	6.34	35.96	43.49	54.00	-10.51	AV
H	9760.00	39.37	32.92	7.59	38.40	52.44	74.00	-21.56	Pk
H	9760.00	30.01	32.92	7.59	38.40	43.08	54.00	-10.92	AV
H	12200.00	39.20	31.96	8.88	39.04	55.16	74.00	-18.84	Pk
H	12200.00	27.49	31.96	8.88	39.04	43.45	54.00	-10.55	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:2480MHz									
V	4960.00	47.13	34.02	5.15	32.80	51.06	74.00	-22.94	Pk
V	4960.00	37.60	34.02	5.15	32.80	41.53	54.00	-12.47	AV
V	7440.00	45.00	32.71	6.40	36.05	54.74	74.00	-19.26	Pk
V	7440.00	35.47	32.71	6.40	36.05	45.21	54.00	-8.79	AV
V	9920.00	39.60	32.86	7.62	38.40	52.76	74.00	-21.24	Pk
V	9920.00	28.64	32.86	7.62	38.40	41.80	54.00	-12.20	AV
V	12400.00	39.09	31.82	8.84	39.08	55.19	74.00	-18.81	Pk
V	12400.00	26.11	31.82	8.84	39.08	42.21	54.00	-11.79	AV
H	4960.00	47.04	34.02	5.15	32.80	50.97	74.00	-23.03	Pk
H	4960.00	37.57	34.02	5.15	32.80	41.50	54.00	-12.50	AV
H	7440.00	43.26	32.71	6.40	36.05	53.00	74.00	-21.00	Pk
H	7440.00	31.88	32.71	6.40	36.05	41.62	54.00	-12.38	AV
H	9920.00	39.99	32.86	7.62	38.40	53.15	74.00	-20.85	Pk
H	9920.00	26.98	32.86	7.62	38.40	40.14	54.00	-13.86	AV
H	12400.00	39.46	31.82	8.84	39.08	55.56	74.00	-18.44	Pk
H	12400.00	26.82	31.82	8.84	39.08	42.92	54.00	-11.08	AV

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

Margin= Emission Level - Limit

2. If peak below the average limit, the average emission was no test.

3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

	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)	Detec tor Type	Result
GFSK	Low Channel: 2402MHz									
	H	2390.00	57.72	35.17	3.48	27.49	53.52	74.00	PK	PASS
	H	2390.00	49.50	35.17	3.48	27.49	45.30	54.00	AV	PASS
	H	2400.00	58.53	35.16	3.49	27.52	54.38	74.00	PK	PASS
	H	2400.00	49.43	35.16	3.49	27.52	45.28	54.00	AV	PASS
	V	2390.00	57.11	35.17	3.48	27.49	52.91	74.00	PK	PASS
	V	2390.00	48.62	35.17	3.48	27.49	44.42	54.00	AV	PASS
	V	2400.00	58.78	35.16	3.49	27.52	54.63	74.00	PK	PASS
	V	2400.00	49.06	35.16	3.49	27.52	44.91	54.00	AV	PASS
	High Channel: 2480MHz									
	H	2483.50	57.24	35.11	3.56	27.75	53.44	74.00	PK	PASS
	H	2483.50	48.73	35.11	3.56	27.75	44.93	54.00	AV	PASS
	H	2500.00	58.62	35.10	3.57	27.80	54.89	74.00	PK	PASS
	H	2500.00	49.30	35.10	3.57	27.80	45.57	54.00	AV	PASS
	V	2483.50	57.65	35.11	3.56	27.75	53.85	74.00	PK	PASS
	V	2483.50	49.64	35.11	3.56	27.75	45.84	54.00	AV	PASS
	V	2500.00	58.14	35.10	3.57	27.80	54.41	74.00	PK	PASS
	V	2500.00	49.00	35.10	3.57	27.80	45.27	54.00	AV	PASS
Remark:										
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit										

7 Conduct Band Edge And Spurious Emissions Measurement

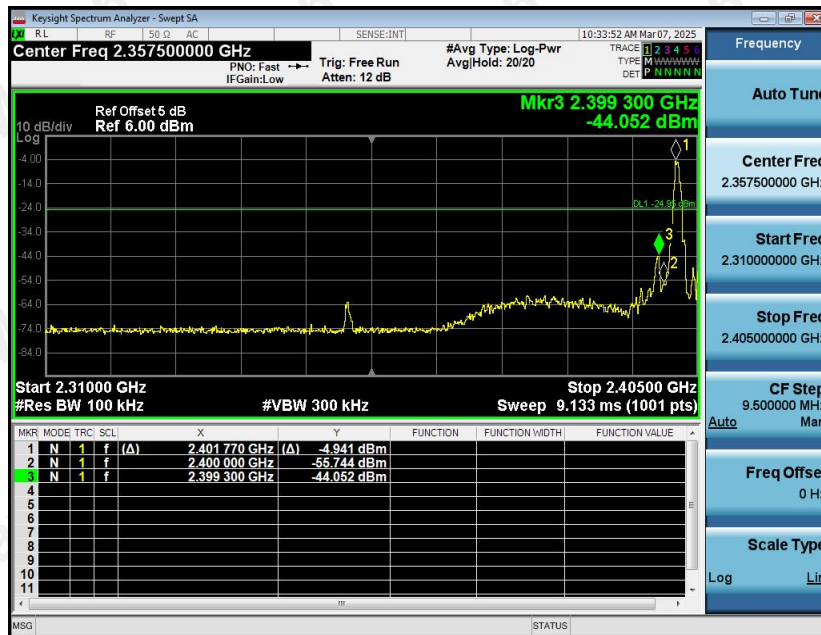
Test Requirement	: Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	: ANSI C63.10:2020
Test Limit	: Regulation 15.247 (d),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. Attenuation below the general limits specified in §15.209(a) is not required. 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) (see §15.205(c)).

7.1 Test Procedure

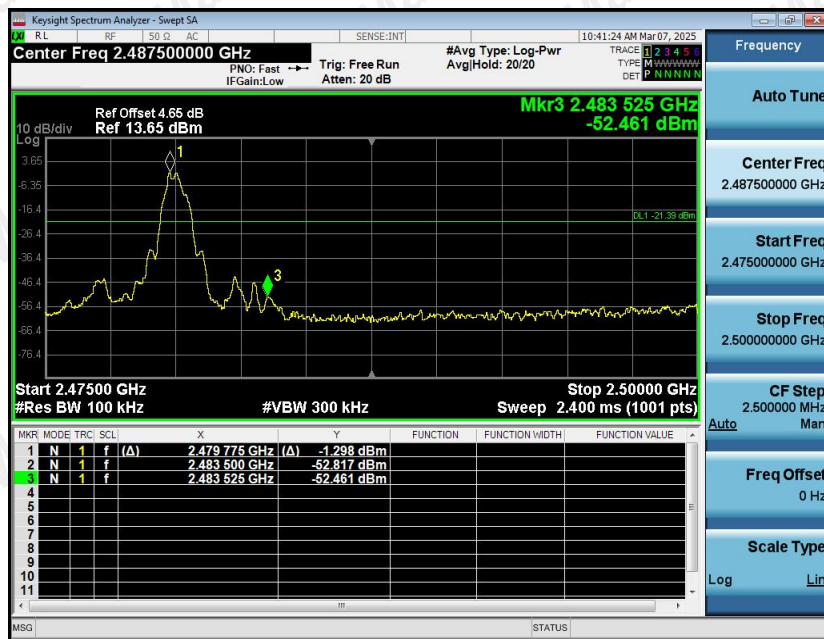
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

7.2 Test Result

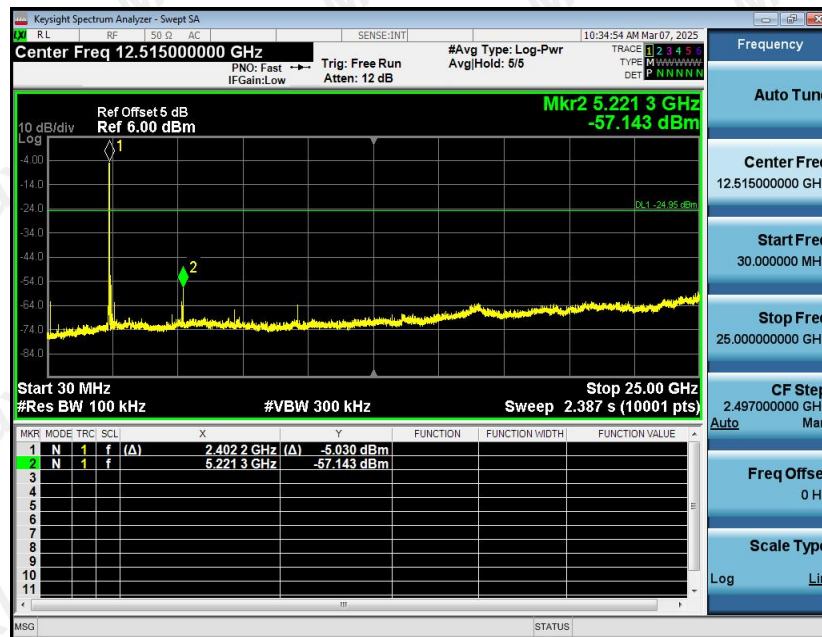
GFSK: Band Edge, Left Side



GFSK: Band Edge, Right Side



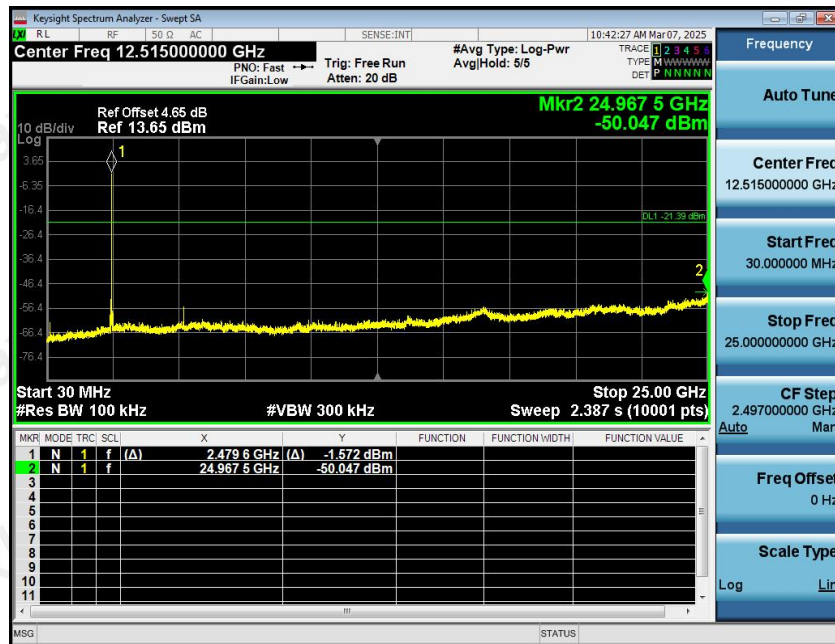
Lowest channel



Mid channel



Highest channel



8 6dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2020

Test Limit : Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

8.1 Test Procedure

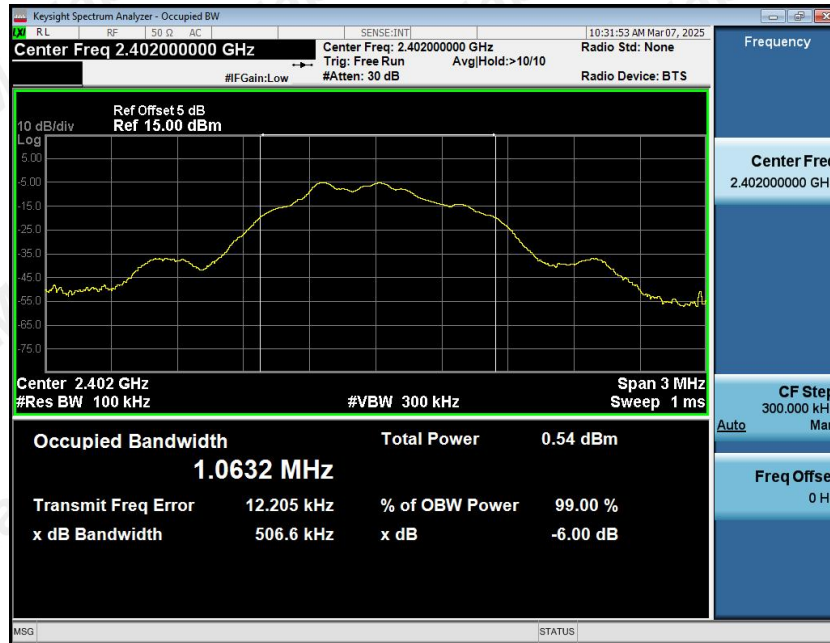
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

8.2 Test Result

Channel number	Channel frequency (MHz)	-6dB Occupy Bandwidth (KHz)	Limit (KHz)	99% Occupy Bandwidth (MHz)	Limit (KHz)
00	2402	506.65	>500	/	/
19	2440	507.41	>500	/	/
39	2480	507.21	>500	/	/

-6dB Occupy Bandwidth

CH00



CH19



CH39



9 Maximum Peak Output Power

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2020

Test Limit : Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

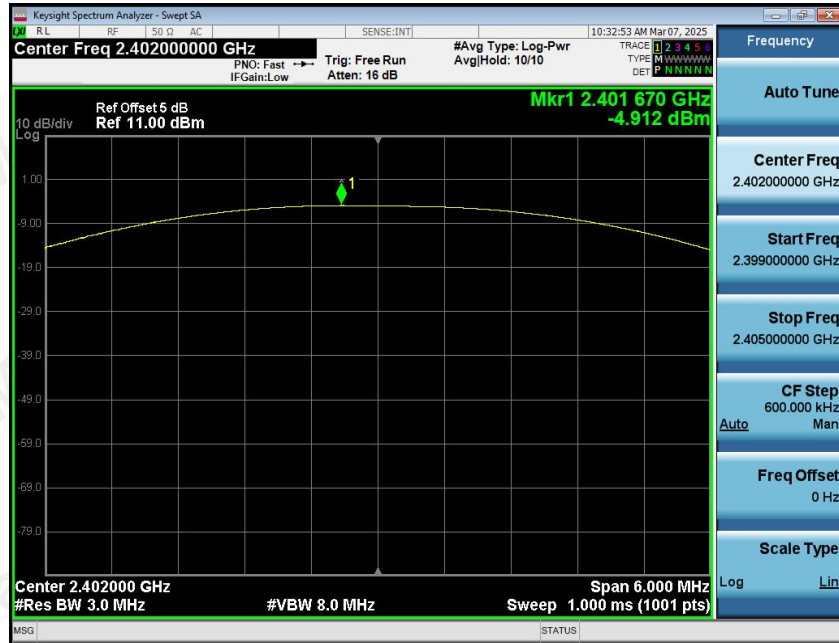
9.1 Test Procedure

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. Measure the conducted output power and record the results in the test report.

9.2 Test Result

Channel number	Channel Frequency (MHz)	Peak Power Output(dBm)	Peak Power Limit(dBm)	Verdict
00	2402	-4.91	30	PASS
19	2440	-2.63	30	PASS
39	2480	-1.32	30	PASS

CH00



CH19



CH39



10 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10:2020
Test Limit	: Regulation 15.247(f) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

10.1 Test Procedure

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 = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

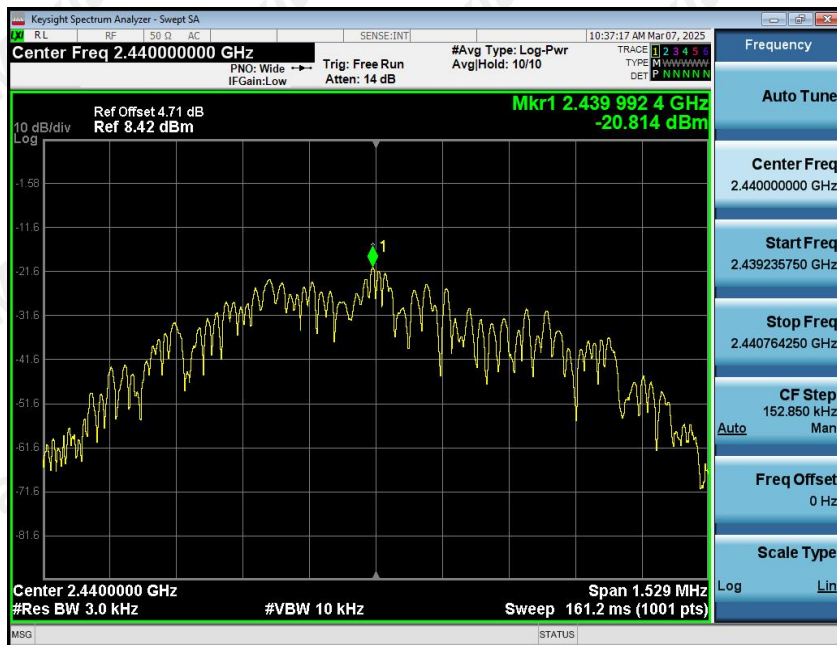
10.2 Test Result

Channel number	Channel frequency (MHz)	Measurement level (dBm)	Required Limit (dBm/3kHz)	Pass/Fail
		PSD/3kHz		
00	2402	-23.09	8	PASS
19	2440	-20.81	8	PASS
39	2480	-19.50	8	PASS

CH00



CH19



CH39



11 Antenna Application

11.1 Antenna Requirement

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.

15.247(c) (1)(i) requirement:

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

11.2 Result

The antenna is Internal antenna, the best case gain of the antennas is 2.67 dBi, reference to the attachment for details.

12 Test Setup Photos and EUT Photos

Please see the attachment for details.

*****THE END REPORT*****