TEST REPORT

FCC ID: 2BNTX-88824

Product	**:**	**Bluetooth Headphone**
Model Name	**:**	**SunoFi XM-001, LE824 ANC, D8**
Brand	**:**	**N/A**
Report No.	**:**	**NCT250081025XE**

Prepared for

SHENZHEN LENSCO TRONICS CO.,LTD

4F, No 20 xihu industrial park, xikeng Yuanshan street, Longgang district, shenzhen

Prepared by

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1 TEST RESULT CERTIFICATION

Manufacture's name	:	SHENZHEN LENSCO TRONICS CO.,LTD
Address	:	4F, No 20 xihu industrial park, xikeng Yuanshan street, Longgang district, shenzhen
Product name	:	Bluetooth Headphone
Model name	:	SunoFi XM-001, LE824 ANC, D8
Model difference	:	Only the model names are different.
Standards	:	FCC CFR47 Part 15 Section 15.249
Test procedure	:	ANSI C63.10:2020
Date of test	:	Feb. 14, 2025 to Feb. 21, 2025
Date of Issue	:	Feb. 21, 2025

This device described above has been tested by NCT, 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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Test Engineer:

Keven Wu / Engineer

Technical Manager:

Henry Wang / Manager

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 9

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, RESTRICT BAND AND FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL 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 21

7 BANDWIDTH MEASUREMENT 32

7.1 TEST SETUP 32

7.2 TEST PROCEDURE 32
7.3 TEST RESULT 32
8 ANTENNA APPLICATION 42
8.1 ANTENNA REQUIREMENT 42
8.2 RESULT 42
9 TEST SETUP PHOTOS AND EUT PHOTOS 43

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2008

2 Test Summary

Test Items	Test Requirement	Result
FCC part 15.203/15.249 (c)	Antenna requirement	PASS
FCC part 15.207	AC Power Line Conducted Emission	PASS
FCC part 15.15.249 (a)	Field strength of the fundamental signal	PASS
FCC part 15.15.249 (a) (d)/15.209	Spurious emissions	PASS
FCC part 15.249 (d)/15.205	Band edge	PASS
FCC part 15.215 (c)	20dB Occupied Bandwidth	PASS

Remark:

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

2.1 Test Site

Site Description

EMC Lab.	:	Accredited by CNAS, 2022-09-27
		The certificate is valid until 2028.01.07
		The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)
		The Certificate Registration Number is L8251
		Designation Number: CN1347
		Test Firm Registration Number: 894804
		Accredited by A2LA, June 14, 2023
		The Certificate Registration Number is 6837.01
		Accredited by Industry Canada, November 09, 2018
		The Conformity Assessment Body Identifier is CN0150
		Company Number: 30806
Name of Firm	:	Shenzhen NCT Testing Technology Co., Ltd.
Site Location	:	A101&2F B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan District, Shenzhen, People's Republic of China

3 General Information

3.1 General Description of E.U.T.

Series model	:	N/A
HVIN	:	N/A
Sample ID	:	1-1(Normal Sample), 1-2(Engineering Sample)
Sample(s) Status:	:	Engineer sample
Operating frequency	:	2402MHz-2480MHZ
Number of Channels	:	79 channels
Type of Modulation	:	GFSK, Π/4-DQPSK,8DPSK
Antenna installation	:	Internal Antenna
Antenna Gain	:	1.70dBi
Power supply	:	DC 5V adapter power or DC 3.7V battery power
Hardware Version	:	N/A
Software Version	:	N/A
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	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480	-	-

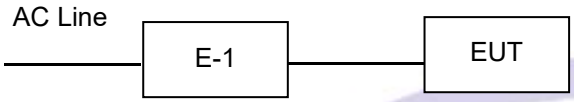
Note:

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)

Conducted Spurious

3.4 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode.

Test Software	RF Test Software
Power level setup	< 4 dBm

	Channel	Frequency(MHz)
Low Channel	0	2402
Mid Channel	39	2441
High Channel	78	2480

4 Equipment During Test

4.1 Equipments List

Conducted emission Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	944 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESPI	101604	Rohde & Schwarz	2024/6/17	2025/6/16
LISN	ENV 216	102796	Rohde & Schwarz	2024/6/17	2025/6/16
LISN	VN1-13S	004023	CRANAGE	2024/6/17	2025/6/16
Cable	RG223-1500MM	NA	RG	2024/6/17	2025/6/16

Radiated emission & Radio Frequency Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESCI	101178	Rohde & Schwarz	2024/6/17	2025/6/16
Amplifi（30MHz-1GHz）	BBV 9743 B	00374	SCHNWARZBECK	2024/6/17	2025/6/16
Bilog Antenna（30MHz-1GHz）	VULB9162	00473	SCHNWARZBECK	2023/3/19	2025/3/18
Horn antenna（1GHz-18GHz）	BBHA 9120 D	02622	SCHNWARZBECK	2023/3/19	2025/3/18
Pream plifier（1GHz-18GHz）	BBV 9718D	0024	SCHNWARZBECK	2024/6/17	2025/6/16
Spectrum Analyze（10Hz-40GHz）	FSV 40	100952	Rohde & Schwarz	2024/6/17	2025/6/16
Pream plifier（18GHz-40GHz）	BBV 9721	0056	SCHNWARZBECK	2024/6/17	2025/6/16
Double Ridge Guide Horn Antenna（18GHz-40GHz）	SAS-574	588	A.H.System	2023/3/19	2025/3/18
Loop Antenna (9KHz-30MHz)	FMZB1519B	014	SCHNWARZBECK	2024/6/17	2025/6/16
Amplifier (9KHz-30MHz)	CVP 9222 C	00109	CHNWARZBECK	2024/6/17	2025/6/16

MXG Signal Analyzer	N9020A	MY50510202	Agilent	2024/6/17	2025/6/16
MXG Vector Signal Generator	N5182A	MY50140020	Agilent	2024/6/17	2025/6/16
MXG Analog Signal Generator	N5181A	MY47420919	Agilent	2024/6/17	2025/6/16
Power Sensor	TR1029-2	512364	Techoy	2024/6/17	2025/6/16
RF Swith	TR1029-1	512364	Techoy	2024/6/17	2025/6/16
Cable	DA800-4000MM	NA	DA	2024/6/17	2025/6/16
Cable	DA800-11000MM	NA	DA	2024/6/17	2025/6/16

Other

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

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	Adapter	HUAWEI	H302	N/A	N/A

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 C63.10:2020
Test Result	:	N/A
Frequency Range	:	150kHz to 30MHz
Class/Severity	:	Class B

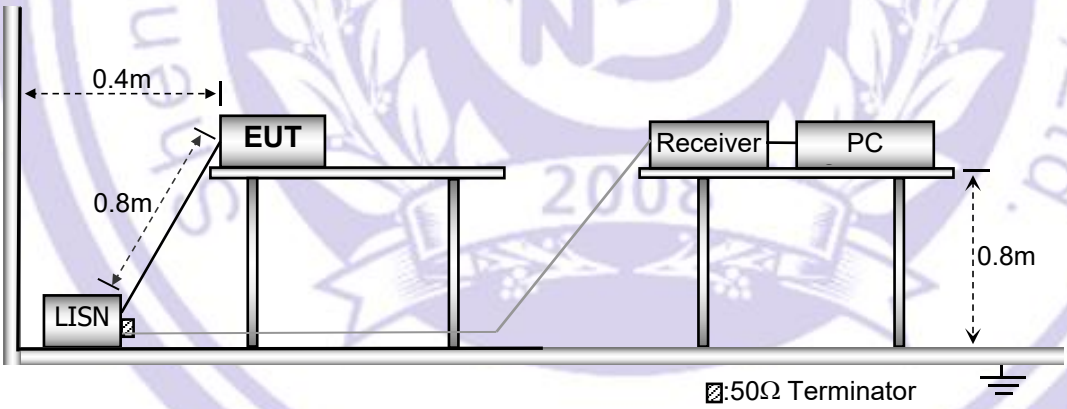
5.1 E.U.T. Operation

Operating Environment :

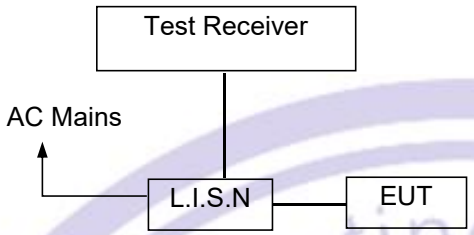
Temperature	:	25.5 °C
Humidity	:	51 % RH
Atmospheric Pressure	:	101.2kPa

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.

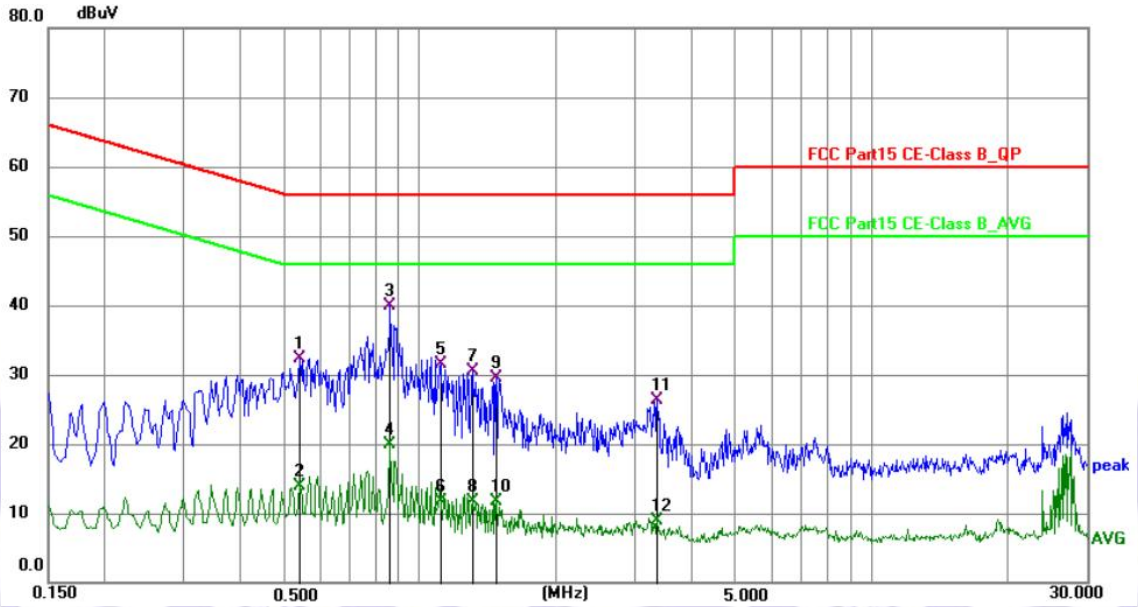
5.6 Measurement Description

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

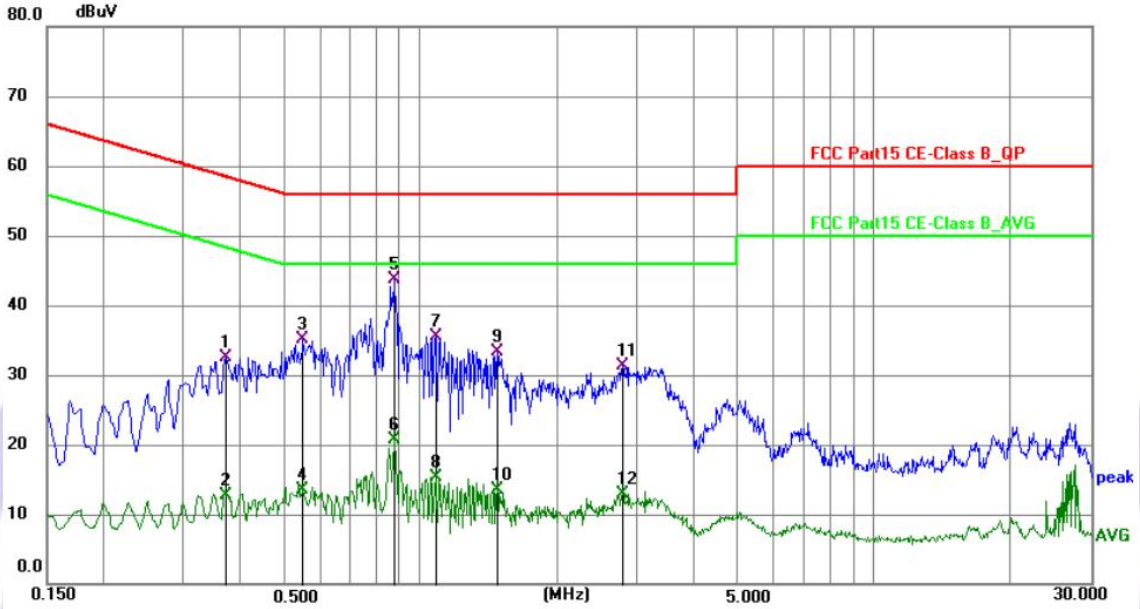
Conducted emission at both 120V & 240V is assessed, and emission at 120V represents the worst case. All the modulation modes were tested the data of the worst mode (GFSK) are recorded in the following pages and the others modulation methods do not exceed the limits.

Channel:	GFSK-Middle	Phase :	L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.5415	22.70	9.64	32.34	56.00	-23.66	QP	P
2	0.5415	4.21	9.64	13.85	46.00	-32.15	AVG	P
3 *	0.8610	30.35	9.61	39.96	56.00	-16.04	QP	P
4	0.8610	10.30	9.61	19.91	46.00	-26.09	AVG	P
5	1.1130	21.87	9.54	31.41	56.00	-24.59	QP	P
6	1.1130	2.14	9.54	11.68	46.00	-34.32	AVG	P
7	1.3065	20.87	9.58	30.45	56.00	-25.55	QP	P
8	1.3065	2.04	9.58	11.62	46.00	-34.38	AVG	P
9	1.4775	19.83	9.62	29.45	56.00	-26.55	QP	P
10	1.4775	1.99	9.62	11.61	46.00	-34.39	AVG	P
11	3.3630	16.64	9.59	26.23	56.00	-29.77	QP	P
12	3.3630	-0.59	9.59	9.00	46.00	-37.00	AVG	P

Channel:	GFSK-Middle	Phase :	N



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.3704	22.81	9.65	32.46	58.49	-26.03	QP	P
2	0.3704	3.13	9.65	12.78	48.49	-35.71	AVG	P
3	0.5505	25.37	9.65	35.02	56.00	-20.98	QP	P
4	0.5505	3.92	9.65	13.57	46.00	-32.43	AVG	P
5 *	0.8790	34.01	9.60	43.61	56.00	-12.39	QP	P
6	0.8790	11.06	9.60	20.66	46.00	-25.34	AVG	P
7	1.0770	25.88	9.54	35.42	56.00	-20.58	QP	P
8	1.0770	5.69	9.54	15.23	46.00	-30.77	AVG	P
9	1.4730	23.66	9.61	33.27	56.00	-22.73	QP	P
10	1.4730	3.82	9.61	13.43	46.00	-32.57	AVG	P
11	2.7825	21.60	9.64	31.24	56.00	-24.76	QP	P
12	2.7825	3.32	9.64	12.96	46.00	-33.04	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.Mesurement Level = Reading level + Correct Factor
4.Only reflect the worst mode.

6 Radiated Spurious Emissions, Restrict band and Field Strength of The Fundamental Signal

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.205&15.249

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(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
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

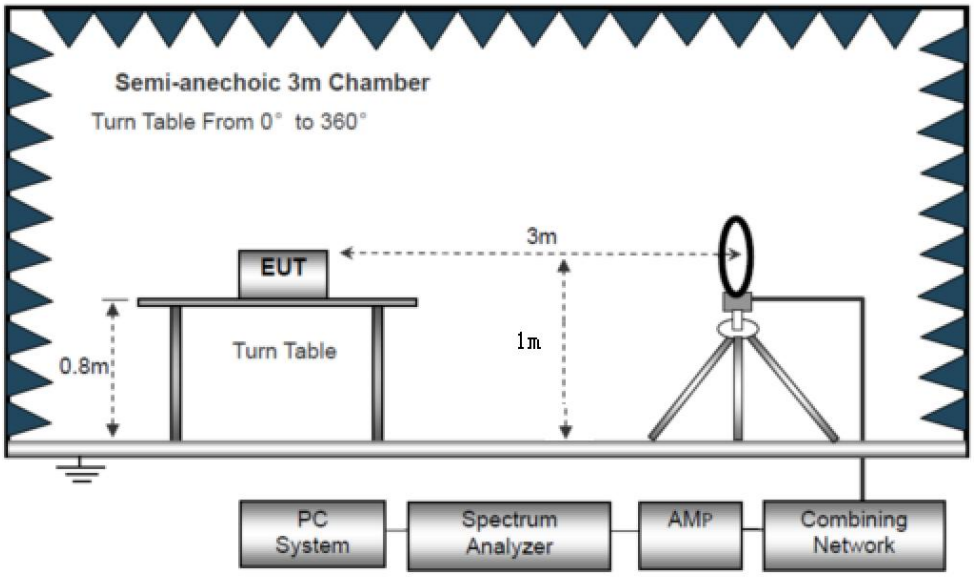
Humidity : 51.1 % RH

Atmospheric Pressure : 101.2kPa

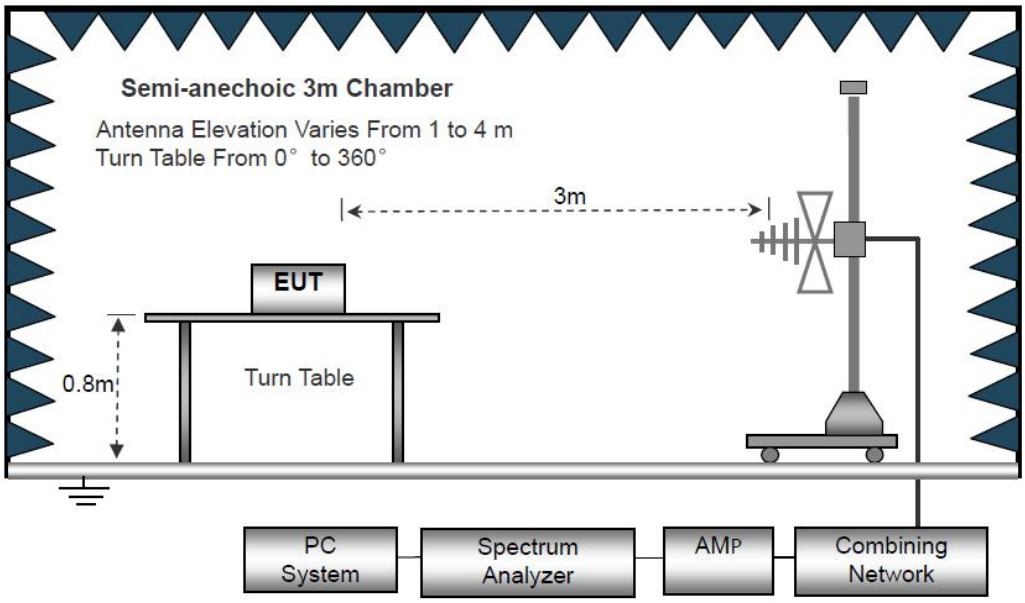
6.2 Test Setup

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

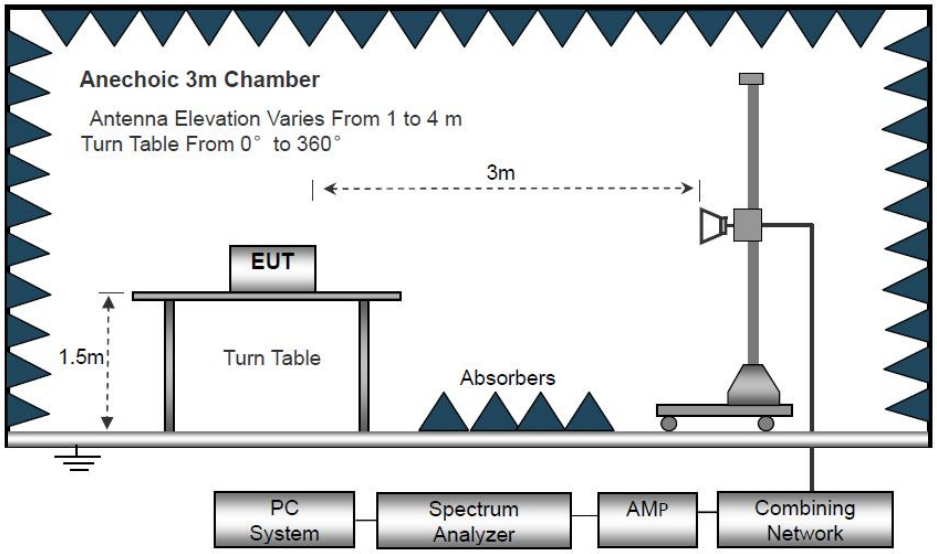
The test setup for emission measurement below 30MHz



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.

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.

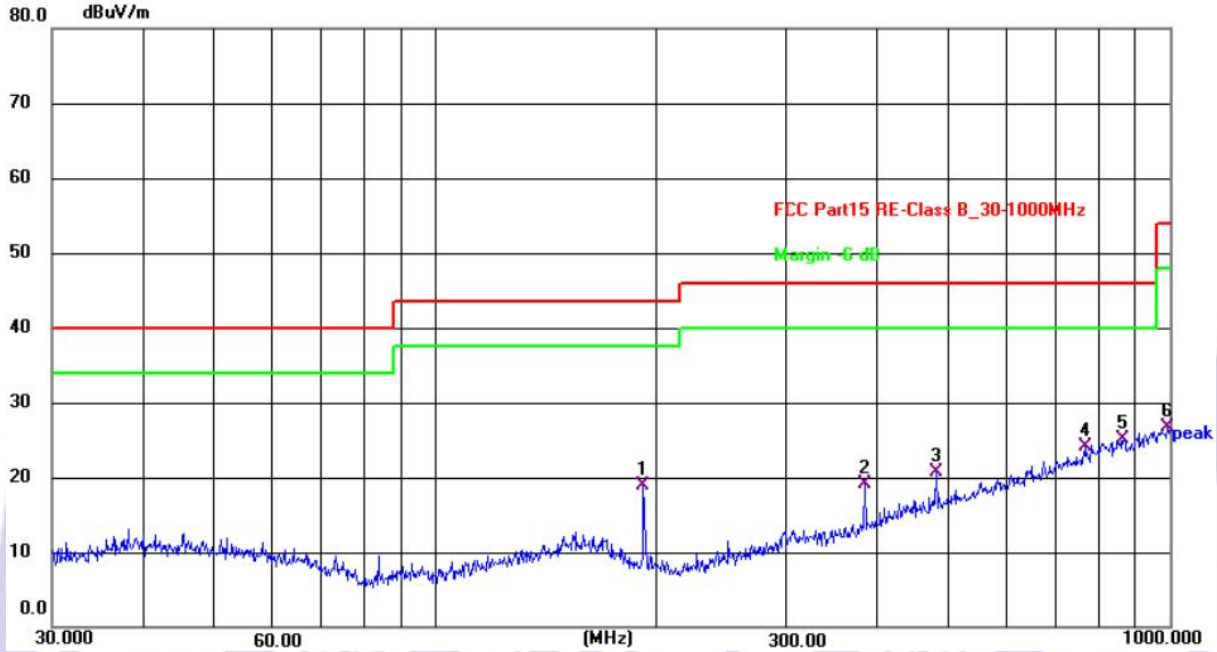
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

Pass.

Please refer to the following test plots for the worst test mode (GFSK (CH39: 2441MHz).

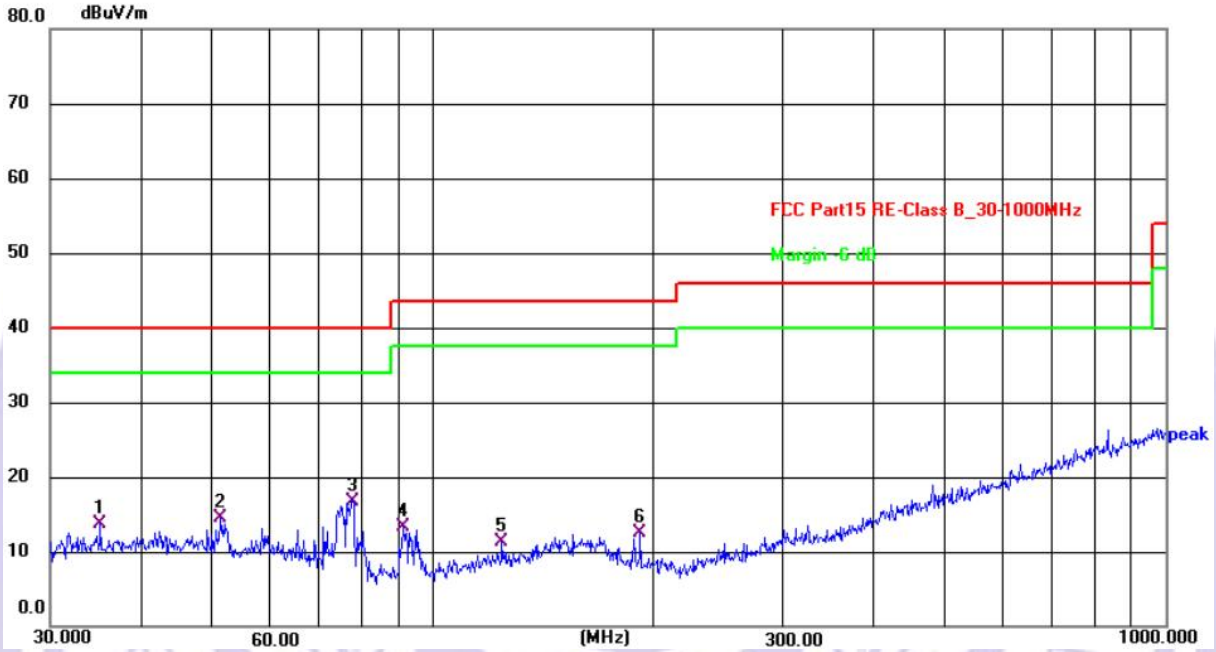
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 3.7V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	191.7450	37.65	-18.78	18.87	43.50	-24.63	QP
2	383.9318	32.89	-13.81	19.08	46.00	-26.92	QP
3	480.5276	32.04	-11.26	20.78	46.00	-25.22	QP
4	768.7481	29.31	-5.30	24.01	46.00	-21.99	QP
5 *	866.0879	29.16	-4.09	25.07	46.00	-20.93	QP
6	993.0114	28.71	-2.10	26.61	54.00	-27.39	QP

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

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Vertical
Test Voltage:	DC 3.7		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.1277	30.09	-16.41	13.68	40.00	-26.32	QP
2	51.3005	31.15	-16.71	14.44	40.00	-25.56	QP
3 *	77.5927	36.96	-20.16	16.80	40.00	-23.20	QP
4	91.1745	33.50	-20.18	13.32	43.50	-30.18	QP
5	124.1330	29.28	-17.94	11.34	43.50	-32.16	QP
6	191.7450	31.22	-18.78	12.44	43.50	-31.06	QP

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

Test Frequency 1GHz-25GHz:

GFSK

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	4804.000	53.12	30.55	5.77	24.66	53.00	74.00	-21.00	Pk
V	4804.000	43.50	30.55	5.77	24.66	43.38	54.00	-10.62	AV
V	7206.000	52.23	30.33	6.32	24.55	52.77	74.00	-21.23	Pk
V	7206.000	43.62	30.33	6.32	24.55	44.16	54.00	-9.84	AV
V	9608.000	51.54	30.85	7.45	24.69	52.83	74.00	-21.17	Pk
V	9608.000	43.03	30.85	7.45	24.69	44.32	54.00	-9.68	AV
V	12010.000	52.27	31.02	8.99	25.57	55.81	74.00	-18.19	Pk
V	12010.000	43.77	31.02	8.99	25.57	47.31	54.00	-6.69	AV
H	4804.000	52.65	30.55	5.77	24.66	52.53	74.00	-21.47	Pk
H	4804.000	43.64	30.55	5.77	24.66	43.52	54.00	-10.48	AV
H	7206.000	54.92	30.33	6.32	24.55	55.46	74.00	-18.54	Pk
H	7206.000	43.65	30.33	6.32	24.55	44.19	54.00	-9.81	AV
H	9608.000	52.01	30.85	7.45	24.69	53.30	74.00	-20.70	Pk
H	9608.000	43.60	30.85	7.45	24.69	44.89	54.00	-9.11	AV
H	12010.000	51.54	31.02	8.99	25.57	55.08	74.00	-18.92	Pk
H	12010.000	43.06	31.02	8.99	25.57	46.60	54.00	-7.40	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
Middle Channel:2441MHz									
V	4882.00	52.46	30.55	5.77	24.66	52.34	74.00	-21.66	Pk
V	4882.00	43.64	30.55	5.77	24.66	43.52	54.00	-10.48	AV
V	7323.00	50.78	30.33	6.32	24.55	51.32	74.00	-22.68	Pk
V	7323.00	43.94	30.33	6.32	24.55	44.48	54.00	-9.52	AV
V	9764.00	54.36	30.85	7.45	24.69	55.65	74.00	-18.35	Pk
V	9764.00	43.52	30.85	7.45	24.69	44.81	54.00	-9.19	AV
V	12205.00	52.09	31.02	8.99	25.57	55.63	74.00	-18.37	Pk
V	12205.00	43.66	31.02	8.99	25.57	47.20	54.00	-6.80	AV
H	4882.00	53.77	30.55	5.77	24.66	53.65	74.00	-20.35	Pk
H	4882.00	43.92	30.55	5.77	24.66	43.80	54.00	-10.20	AV
H	7323.00	52.65	30.33	6.32	24.55	53.19	74.00	-20.81	Pk
H	7323.00	43.96	30.33	6.32	24.55	44.50	54.00	-9.50	AV
H	9764.00	51.32	30.85	7.45	24.69	52.61	74.00	-21.39	Pk
H	9764.00	43.59	30.85	7.45	24.69	44.88	54.00	-9.12	AV
H	12205.00	50.95	31.02	8.99	25.57	54.49	74.00	-19.51	Pk
H	12205.00	43.17	31.02	8.99	25.57	46.71	54.00	-7.29	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	51.23	30.55	5.77	24.66	51.11	74.00	-22.89	Pk
V	4960.00	43.85	30.55	5.77	24.66	43.73	54.00	-10.27	AV
V	7440.00	54.37	30.33	6.32	24.55	54.91	74.00	-19.09	Pk
V	7440.00	44.00	30.33	6.32	24.55	44.54	54.00	-9.46	AV
V	9920.00	50.73	30.85	7.45	24.69	52.02	74.00	-21.98	Pk
V	9920.00	43.12	30.85	7.45	24.69	44.41	54.00	-9.59	AV
V	12400.00	52.61	31.02	8.99	25.57	56.15	74.00	-17.85	Pk
V	12400.00	43.50	31.02	8.99	25.57	47.04	54.00	-6.96	AV
H	4960.00	52.95	30.55	5.77	24.66	52.83	74.00	-21.17	Pk
H	4960.00	43.05	30.55	5.77	24.66	42.93	54.00	-11.07	AV
H	7440.00	52.73	30.33	6.32	24.55	53.27	74.00	-20.73	Pk
H	7440.00	43.80	30.33	6.32	24.55	44.34	54.00	-9.66	AV
H	9920.00	52.16	30.85	7.45	24.69	53.45	74.00	-20.55	Pk
H	9920.00	43.80	30.85	7.45	24.69	45.09	54.00	-8.91	AV
H	12400.00	52.04	31.02	8.99	25.57	55.58	74.00	-18.42	Pk
H	12400.00	43.03	31.02	8.99	25.57	46.57	54.00	-7.43	AV

Note: 1. The testing has been conformed to 10*2480MHz=24800MHz.

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

Spurious Emission in Restricted Band 2310-2400 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)	Detector Type	Result
GFSK	Low Channel: 2402MHz									
	H	2390.00	54.65	30.22	4.85	23.98	53.26	74.00	Pk	PASS
	H	2390.00	44.04	30.22	4.85	23.98	42.65	54.00	AV	PASS
	H	2400.00	54.44	30.22	4.85	23.98	53.05	74.00	Pk	PASS
	H	2400.00	44.88	30.22	4.85	23.98	43.49	54.00	AV	PASS
	V	2390.00	53.45	30.22	4.85	23.98	52.06	74.00	Pk	PASS
	V	2390.00	44.38	30.22	4.85	23.98	42.99	54.00	AV	PASS
	V	2400.00	54.26	30.22	4.85	23.98	52.87	74.00	Pk	PASS
	V	2400.00	44.49	30.22	4.85	23.98	43.10	54.00	AV	PASS
	High Channel: 2480MHz									
	H	2483.50	54.99	30.22	4.85	23.98	53.60	74.00	Pk	PASS
	H	2483.50	44.67	30.22	4.85	23.98	43.28	54.00	AV	PASS
	H	2500.00	53.80	30.22	4.85	23.98	52.41	74.00	Pk	PASS
	H	2500.00	44.80	30.22	4.85	23.98	43.41	54.00	AV	PASS
	V	2483.50	53.66	30.22	4.85	23.98	52.27	74.00	Pk	PASS
	V	2483.50	44.24	30.22	4.85	23.98	42.85	54.00	AV	PASS
	V	2500.00	54.57	30.22	4.85	23.98	53.18	74.00	Pk	PASS
	V	2500.00	44.16	30.22	4.85	23.98	42.77	54.00	AV	PASS

Remark:

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

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

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

Field Strength of The Fundamental Signal Data

GFSK

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel: 2402MHz									
2402	103.12	PK	286	1.4	H	-4.06	99.06	114.00	-14.94
2402	86.15	Ave	342	1.1	V	-4.06	82.09	94.00	-11.91
2402	102.34	PK	39	1.7	H	-4.06	98.28	114.00	-15.72
2402	88.59	Ave	319	1.5	V	-4.06	84.53	94.00	-9.47

Mid CH

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel:2441MHz									
2441	102.59	PK	229	1.4	H	-3.97	98.62	114.00	-15.38
2441	86.77	Ave	41	1.1	V	-3.97	82.80	94.00	-11.20
2441	102.03	PK	341	1.9	H	-3.97	98.06	114.00	-15.94
2441	85.22	Ave	238	1.0	V	-3.97	81.25	94.00	-12.75

High CH

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel: 2480MHz									
2480	101.88	PK	295	2.0	H	-3.90	97.98	114.00	-16.02
2480	87.99	Ave	178	1.6	V	-3.90	84.09	94.00	-9.91
2480	101.81	PK	277	1.0	H	-3.90	97.91	114.00	-16.09
2480	86.53	Ave	279	1.4	V	-3.90	82.63	94.00	-11.37

PI/4 DQPSK

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel: 2402MHz									
2402	102.19	PK	70	1.6	H	-4.06	98.13	114.00	-15.87
2402	85.92	Ave	9	1.3	V	-4.06	81.86	94.00	-12.14
2402	102.56	PK	64	1.5	H	-4.06	98.50	114.00	-15.50
2402	88.65	Ave	176	1.7	V	-4.06	84.50	94.00	-9.50

Mid CH

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel:2441MHz									
2441	103.15	PK	150	1.3	H	-3.97	**99.18**	114.00	-14.82

2441	85.96	Ave	25	1.2	V	-3.97	81.99	94.00	-12.01
2441	101.66	PK	317	1.3	H	-3.97	97.69	114.00	-16.31
2441	85.16	Ave	314	1.3	V	-3.97	81.19	94.00	-12.81

High CH

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel: 2480MHz									
2480	102.74	PK	272	1.8	H	-3.90	98.84	114.00	-15.16
2480	87.56	Ave	225	1.7	V	-3.90	83.66	94.00	-10.34
2480	102.06	PK	308	1.7	H	-3.90	98.16	114.00	-15.84
2480	87.23	Ave	60	1.3	V	-3.90	83.33	94.00	-10.67

8DPSK

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel: 2402MHz									
2402	102.82	PK	196	1.2	H	-4.06	98.76	114.00	-15.24
2402	87.69	Ave	141	1.7	V	-4.06	83.63	94.00	-10.37
2402	102.12	PK	19	1.3	H	-4.06	98.06	114.00	-15.94
2402	88.44	Ave	192	1.2	V	-4.06	84.38	94.00	-9.62

Mid CH

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel:2441MHz									
2441	102.55	PK	282	1.3	H	-3.97	98.58	114.00	-15.42
2441	83.56	Ave	322	1.2	V	-3.97	79.59	94.00	-14.41
2441	101.89	PK	214	1.9	H	-3.97	97.92	114.00	-16.08
2441	83.74	Ave	111	1.4	V	-3.97	79.77	94.00	-14.23

High CH

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel: 2480MHz									
2480	101.65	PK	160	1.4	H	-3.90	97.75	114.00	-16.25
2480	86.95	Ave	158	1.5	V	-3.90	83.05	94.00	-10.95
2480	102.51	PK	325	1.9	H	-3.90	98.61	114.00	-15.39
2480	87.12	Ave	120	1.4	V	-3.90	83.22	94.00	-10.78

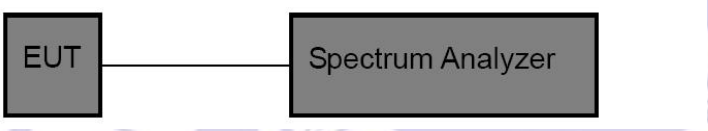
7 Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.215

Test Method : ANSI C63.10:2020

FCC Part15 (15.215) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.215	Bandwidth	(-20dB bandwidth)	2402-2480	PASS

7.1 Test Setup



7.2 Test Procedure

For 20dB 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 ≥ 3RBW

For 99% Bandwidth Measurement

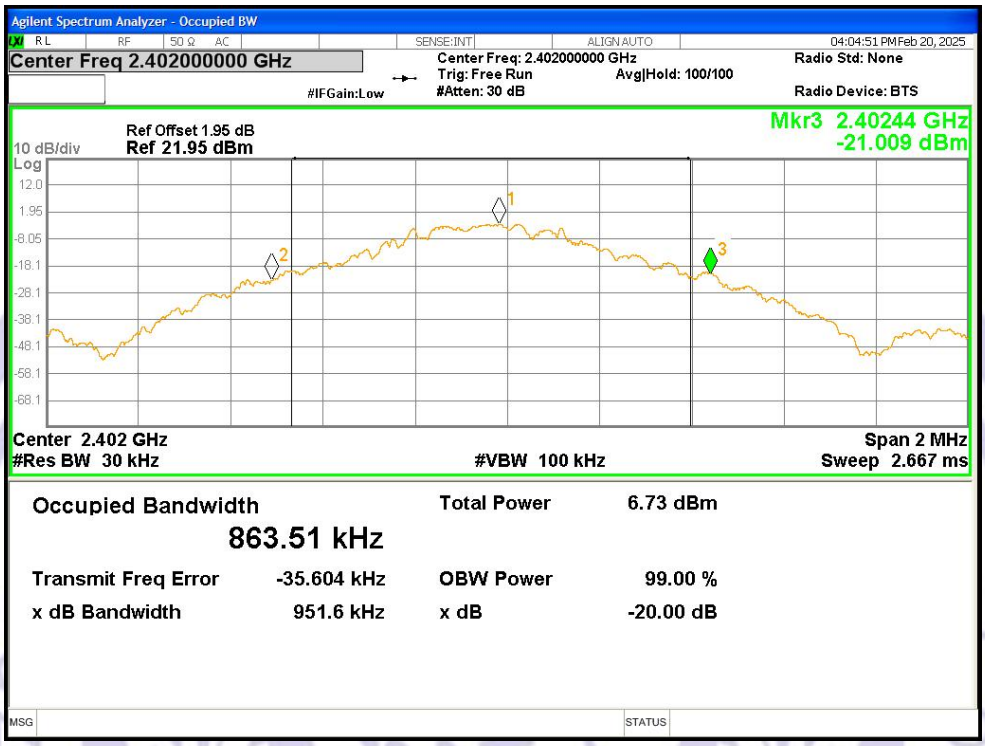
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW ≥ 3RBW

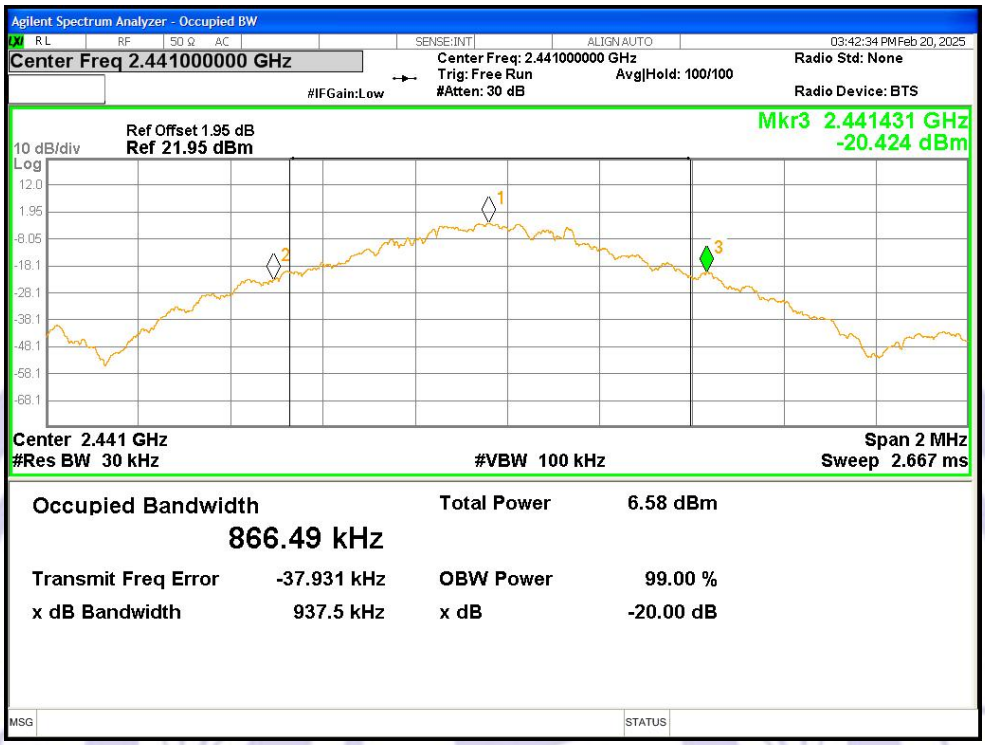
7.3 Test Result

Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Verdict
1-DH5	2402	Ant1	0.952	Pass
1-DH5	2441	Ant1	0.938	Pass
1-DH5	2480	Ant1	0.942	Pass
2-DH5	2402	Ant1	1.306	Pass
2-DH5	2441	Ant1	1.355	Pass
2-DH5	2480	Ant1	1.276	Pass
3-DH5	2402	Ant1	1.294	Pass
3-DH5	2441	Ant1	1.288	Pass
3-DH5	2480	Ant1	1.302	Pass

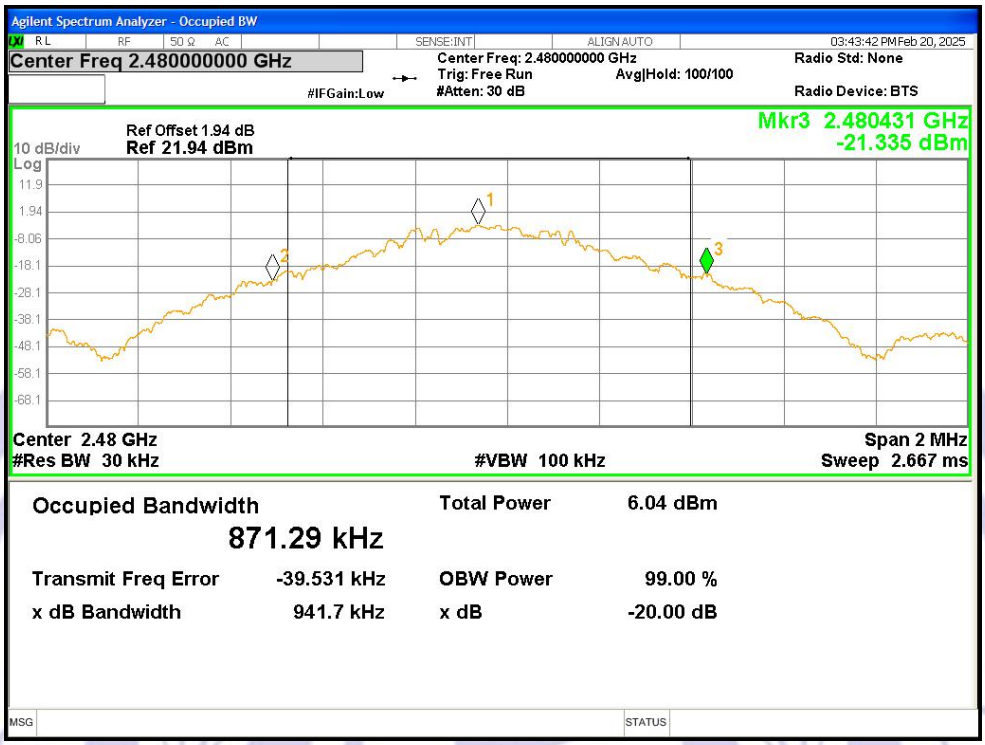
-20dB Occupy Bandwidth



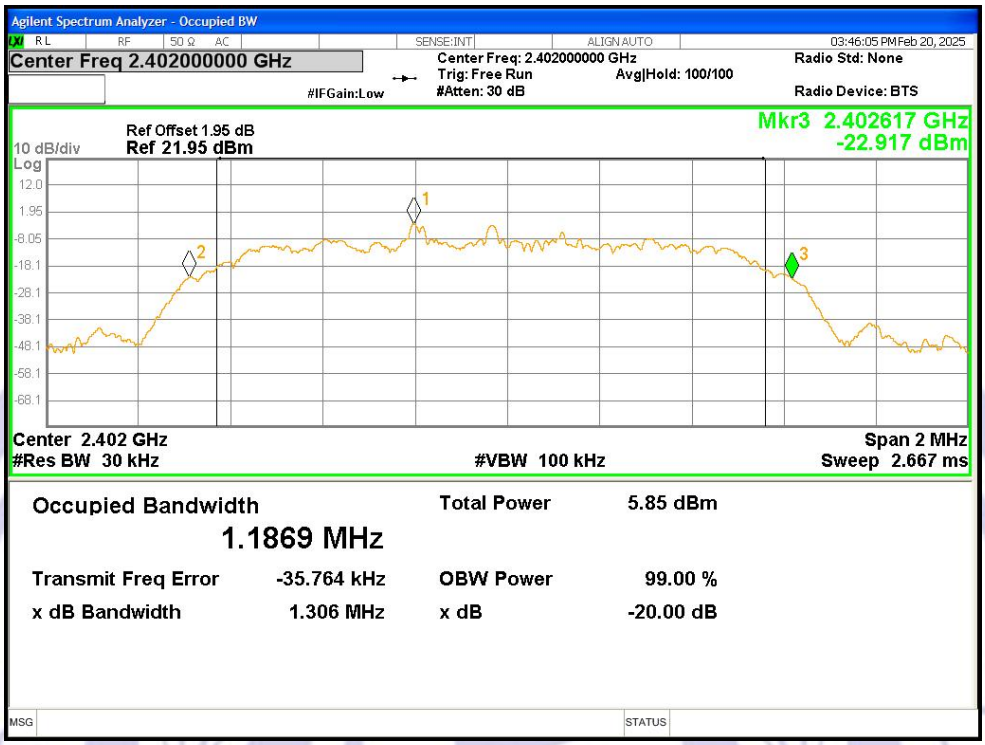
-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



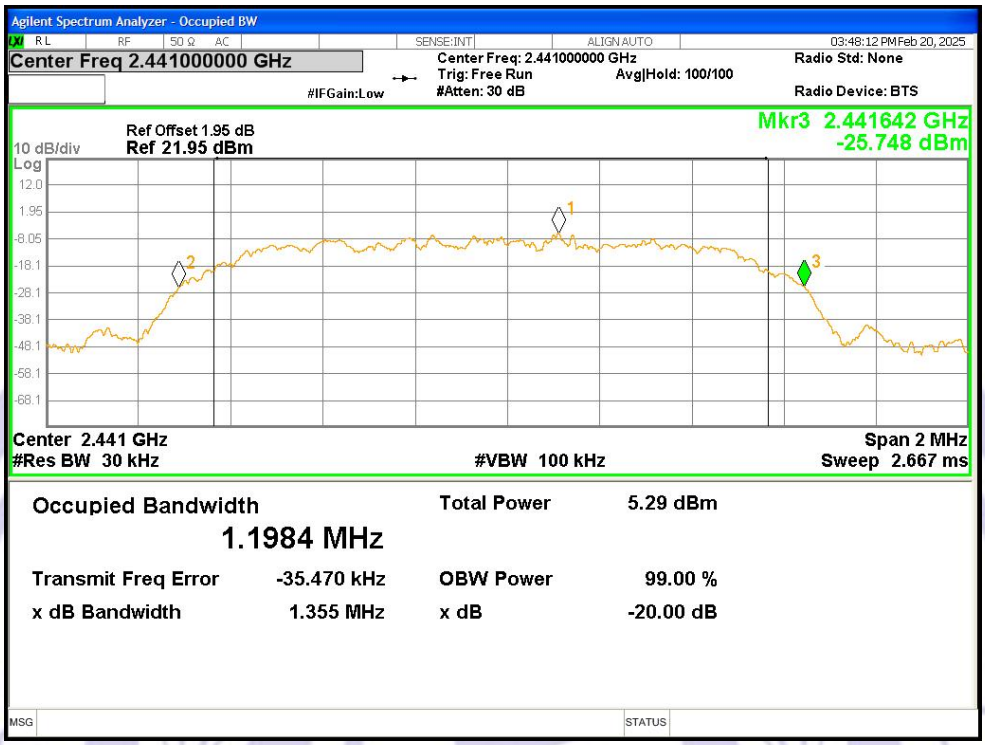
-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1



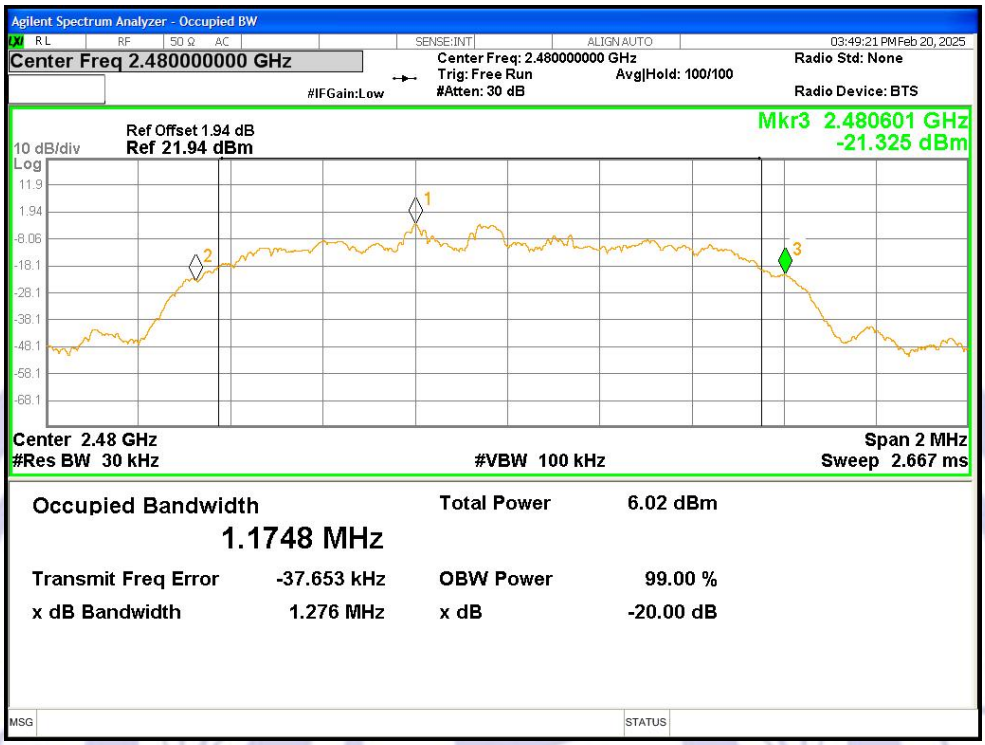
-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1



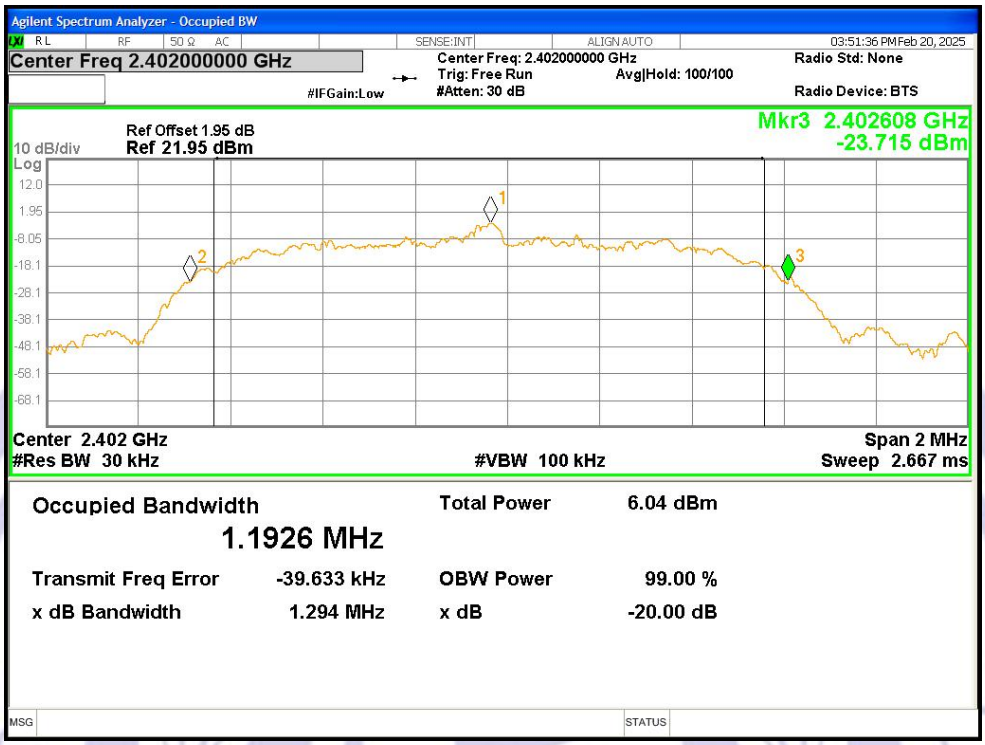
-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1



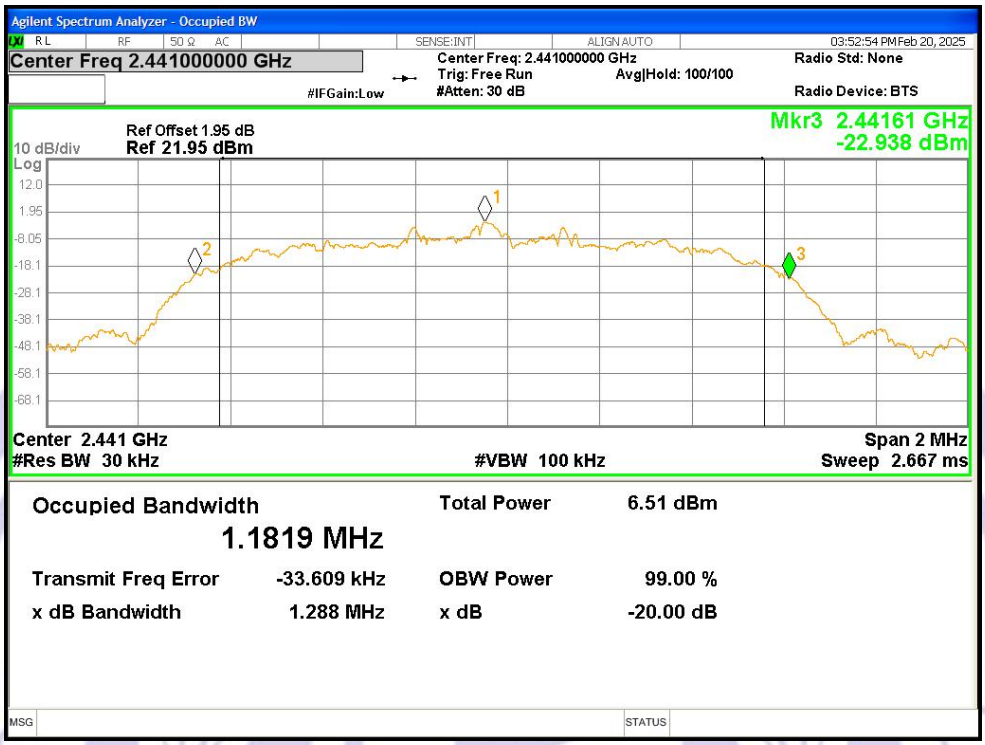
-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1



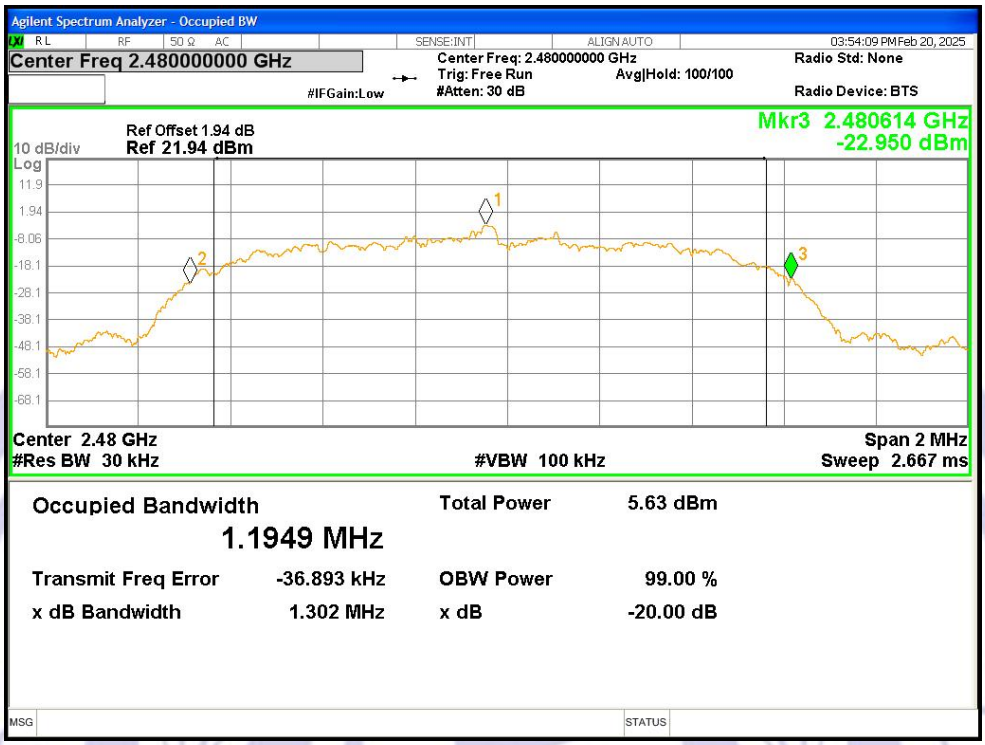
-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2480MHz Ant1

8 Antenna Application

8.1 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.

8.2 Result

The antenna is Internal Antenna, the best case gain of the antennas is 1.70dBi, reference to the attachment for details.

9 Test Setup Photos and EUT Photos

Please see the attachment for details.

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