TEST REPORT

FCC ID: 2BMWX-MTN

Product	**:**	**mini pc**
Model Name	**:**	**MTN N100, MTN N305, MTN 5800H, MTN 1240P, MTN 3020e, MTN 7735HS, MTN 11320H, MTN 1135G7, MTN 8845HS, MTN 6900HX, MTN 6600H, MTN 12450H, MTN 13620H, MTN 8745HS, mini pc, MTN *********(*represents any character from 0 to 9, A to Z)**
Brand	**:**	**Maxtang**
Report No.	**:**	**NCT24051468E1-1**

Prepared for

Shenzhen Maxtang Computer Company Limited

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Liuxian 2nd Road, Bao'an District, Shenzhen City, Guangdong Province China

Prepared by

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1 TEST RESULT CERTIFICATION

Manufacture's name	:	Shenzhen Maxtang Computer Company Limited
Address	:	6th Floor, Bldg.3, HonghuiIndustial Park, Liuxian 2nd Road, Bao'an District, Shenzhen City, Guangdong Province China
Product name	:	mini pc
Model name	:	MTN N100, MTN N305, MTN 5800H, MTN 1240P, MTN 3020e, MTN 7735HS, MTN 11320H, MTN 1135G7, MTN 8845HS, MTN 6900HX, MTN 6600H, MTN 12450H, MTN 13620H, MTN 8745HS, mini pc, MTN *********(*represents any character from 0 to 9, A to Z)
Model difference	:	Only Model name is different, Select the model: MTN N100 for all testing
Standards	:	FCC CFR47 Part 15 Section 15.249
Test procedure	:	ANSI C63.10:2020
Date of test	:	Dec. 06, 2024 to Dec. 19, 2024
Date of Issue	:	Dec. 27, 2024

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

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Shenzhen NCT Testing Technology Co., Ltd.
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	:	MTN N100, MTN N305, MTN 5800H, MTN 1240P, MTN 3020e, MTN 7735HS, MTN 11320H, MTN 1135G7, MTN 8845HS, MTN 6900HX, MTN 6600H, MTN 12450H, MTN 13620H, MTN 8745HS, mini pc, MTN *********(*represents any character from 0 to 9, A to Z)
HVIN	:	N/A
Sample ID	:	NCT241203141
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	:	-0.81dBi
Power supply	:	Input: DC 19V for Adapter
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

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
1	Display	Dell	1080P	/	AE
2	keyboard	Dell	AC5214	/	AE
3	Mouse	Dell	DC5VAB	/	AE
4	ADPATER	Huntkey	HKA12019063-0C6	/	AE

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

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

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

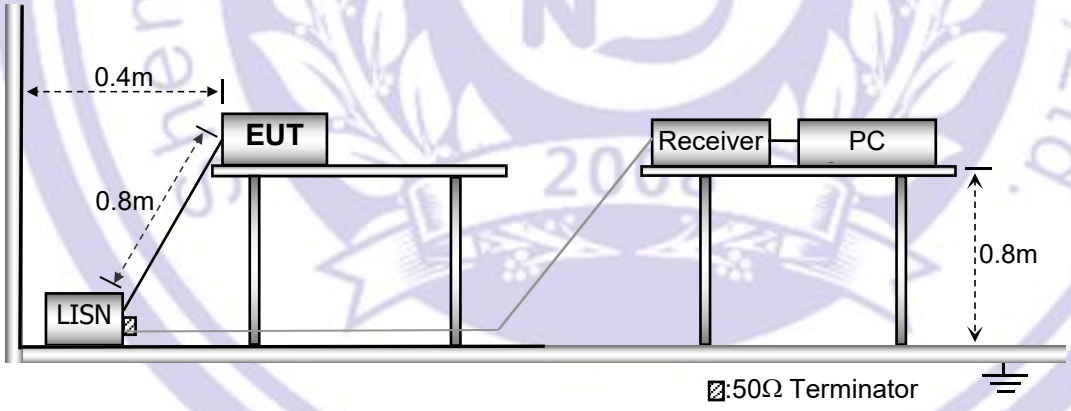
5.1 E.U.T. Operation

Operating Environment :

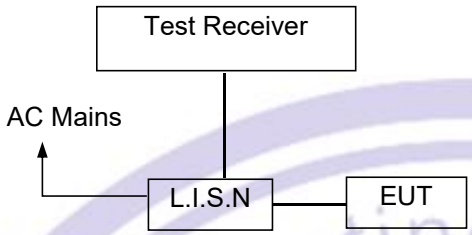
Temperature	:	25.5 °C
Humidity	:	51 % RH
Atmospheric Pressure	:	101.2kPa

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.

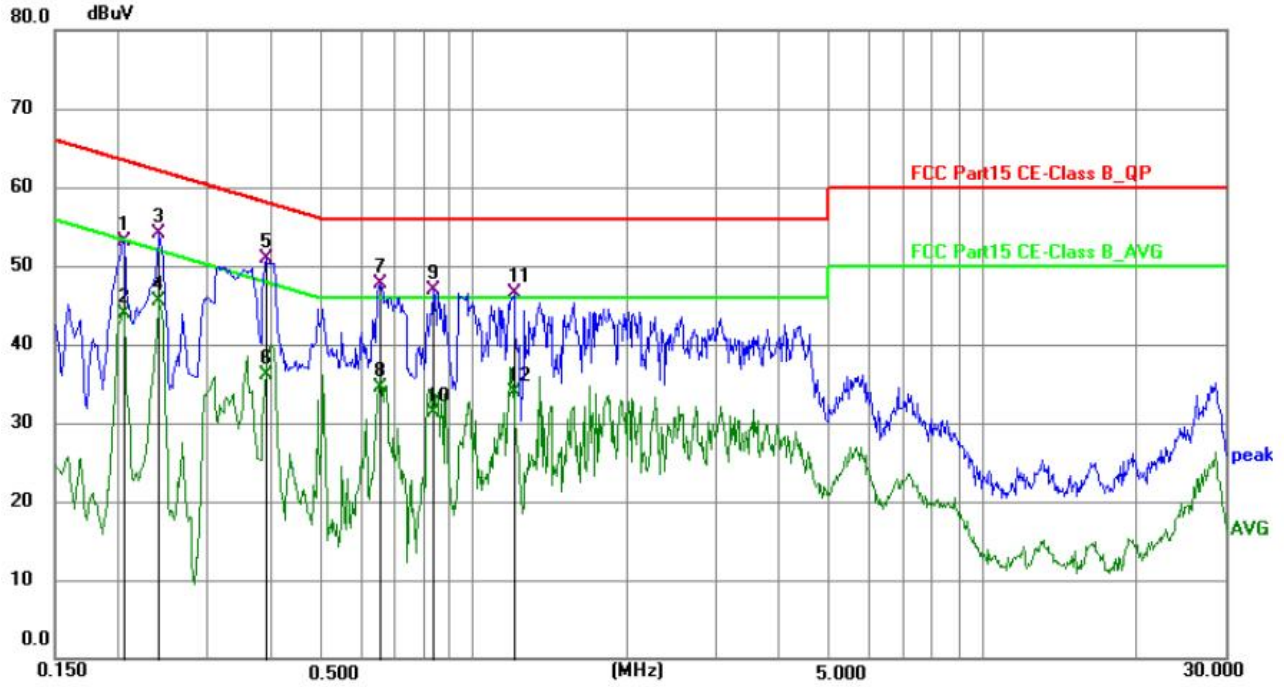
5.6 Measurement Description

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

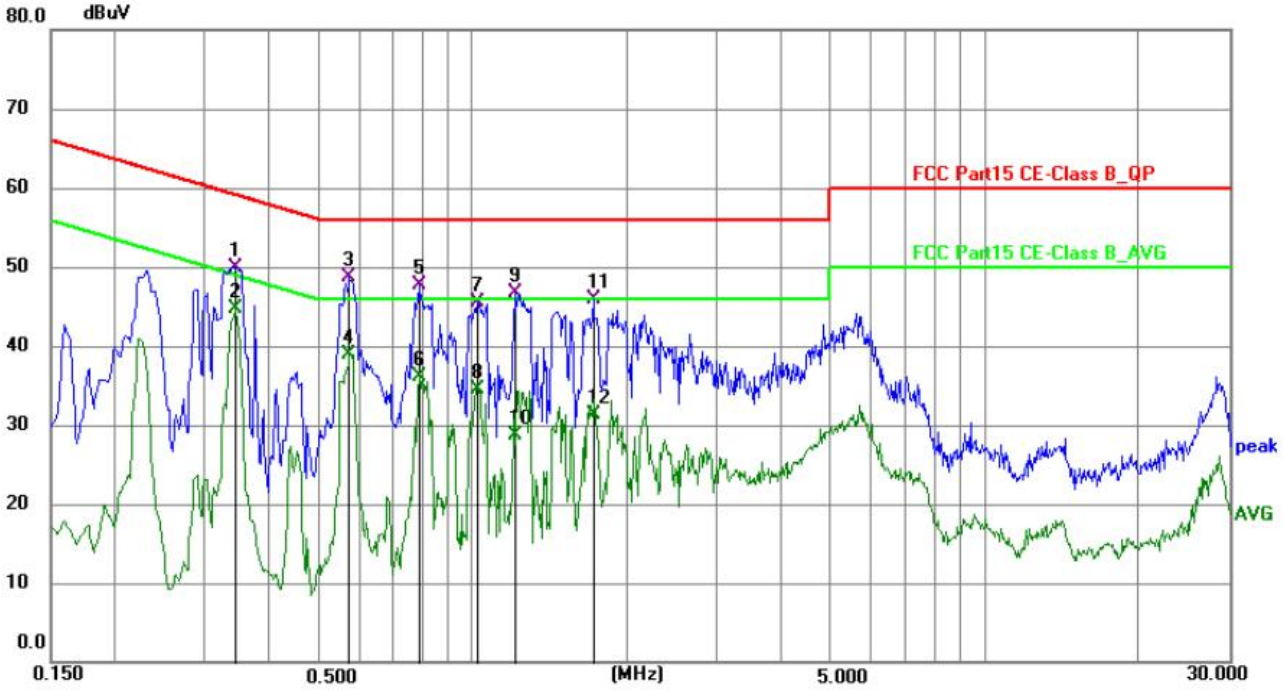
Conducted emission at both 120V & 240V is assessed, and emission at 120V represents the worst case. All the modulation modes were tested the data of the worst mode (GFSK) are recorded in the following pages and the others modulation methods do not exceed the limits.

Channel:	Middle	Phase :	L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2039	43.43	9.71	53.14	63.45	-10.31	QP	P	
2	0.2039	34.16	9.71	43.87	53.45	-9.58	AVG	P	
3	0.2400	44.43	9.70	54.13	62.10	-7.97	QP	P	
4 *	0.2400	35.90	9.70	45.60	52.10	-6.50	AVG	P	
5	0.3885	41.26	9.65	50.91	58.10	-7.19	QP	P	
6	0.3885	26.54	9.65	36.19	48.10	-11.91	AVG	P	
7	0.6540	37.95	9.70	47.65	56.00	-8.35	QP	P	
8	0.6540	24.77	9.70	34.47	46.00	-11.53	AVG	P	
9	0.8339	37.21	9.63	46.84	56.00	-9.16	QP	P	
10	0.8339	21.77	9.63	31.40	46.00	-14.60	AVG	P	
11	1.1984	37.00	9.56	46.56	56.00	-9.44	QP	P	
12	1.1984	24.34	9.56	33.90	46.00	-12.10	AVG	P	

Channel:	Middle	Phase :	N



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.3435	40.24	9.66	49.90	59.12	-9.22	QP	P	
2 *	0.3435	35.09	9.66	44.75	49.12	-4.37	AVG	P	
3	0.5728	39.09	9.66	48.75	56.00	-7.25	QP	P	
4	0.5728	29.25	9.66	38.91	46.00	-7.09	AVG	P	
5	0.7842	38.07	9.66	47.73	56.00	-8.27	QP	P	
6	0.7842	26.51	9.66	36.17	46.00	-9.83	AVG	P	
7	1.0227	36.02	9.52	45.54	56.00	-10.46	QP	P	
8	1.0227	25.07	9.52	34.59	46.00	-11.41	AVG	P	
9	1.2118	37.16	9.56	46.72	56.00	-9.28	QP	P	
10	1.2118	19.16	9.56	28.72	46.00	-17.28	AVG	P	
11	1.7250	36.15	9.66	45.81	56.00	-10.19	QP	P	
12	1.7250	21.69	9.66	31.35	46.00	-14.65	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

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

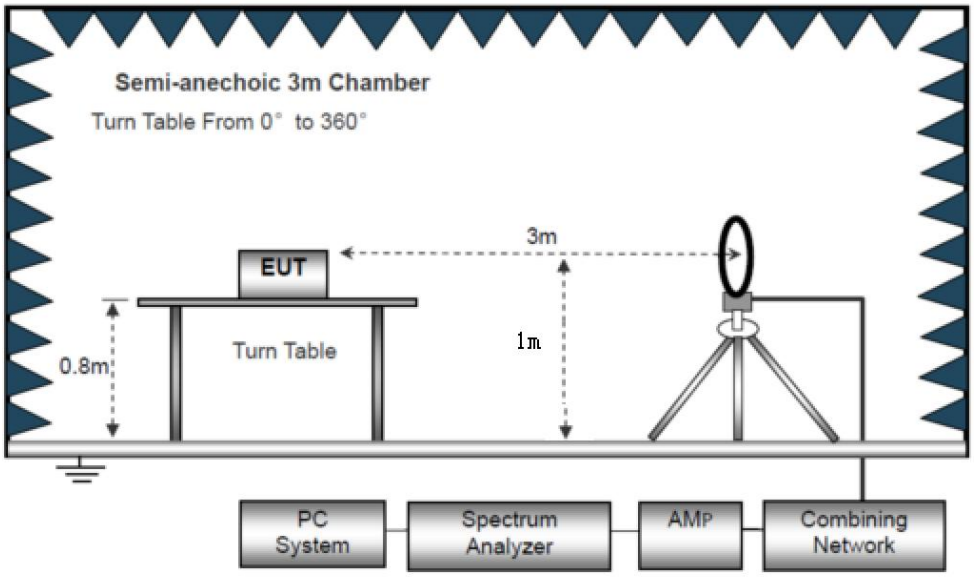
Humidity : 51.1 % RH

Atmospheric Pressure : 101.2kPa

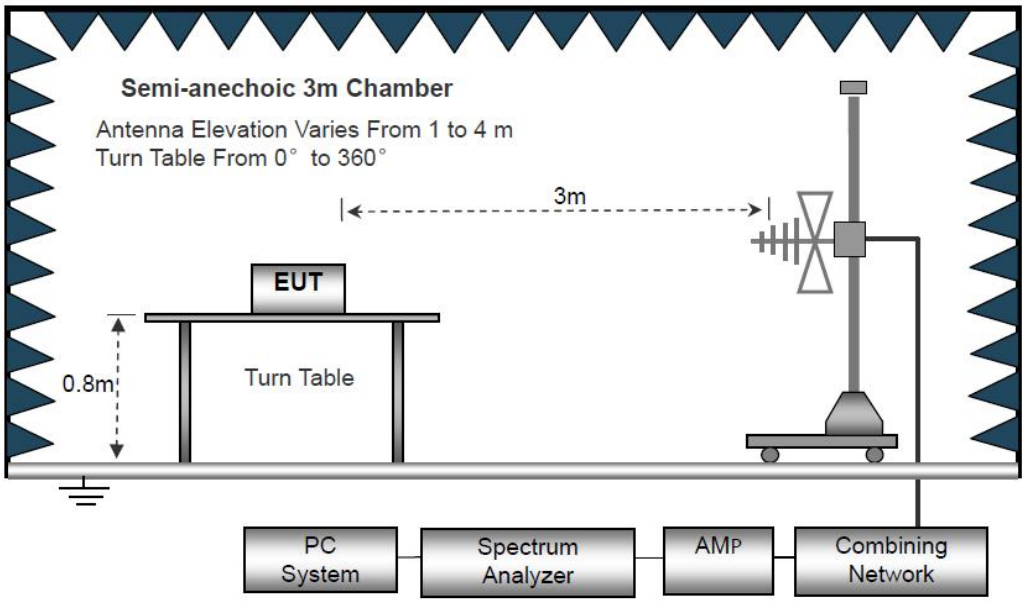
6.2 Test Setup

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

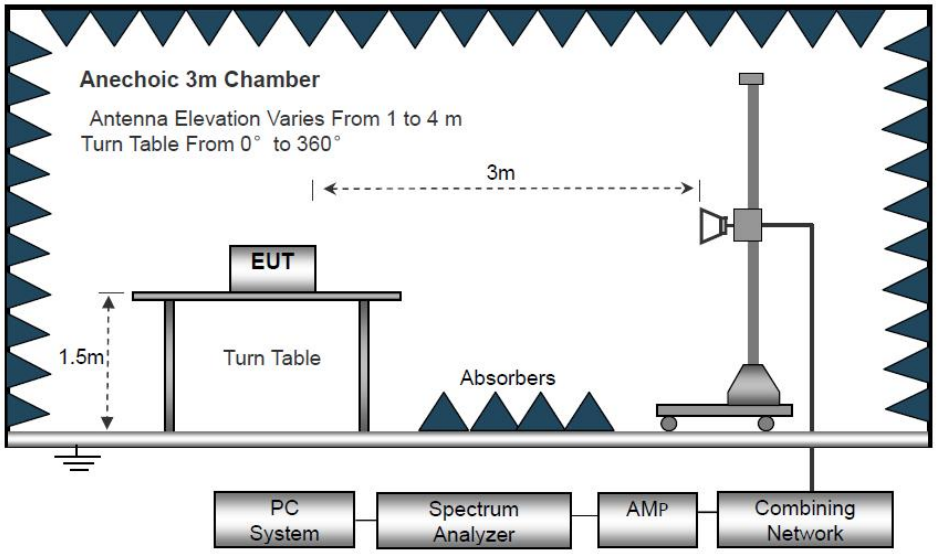
The test setup for emission measurement below 30MHz



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.

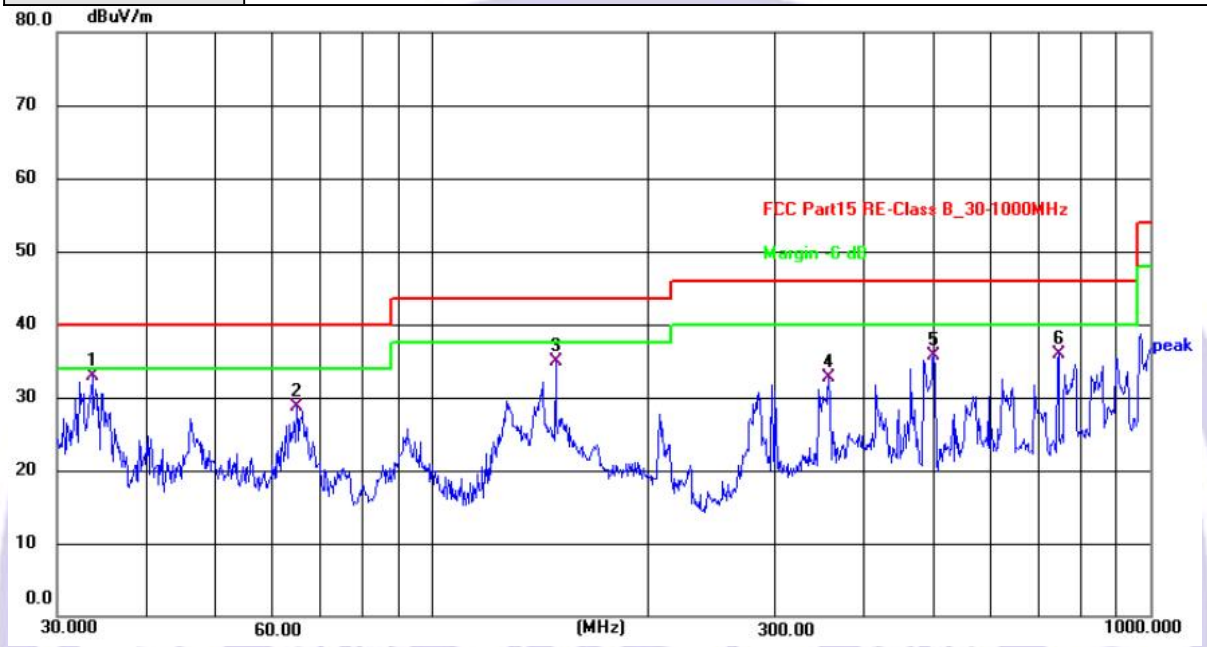
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

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:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	33.5624	49.57	-16.73	32.84	40.00	-7.16	QP
2	64.6594	46.45	-17.69	28.76	40.00	-11.24	QP
3	148.4410	50.86	-15.94	34.92	43.50	-8.58	QP
4	356.6758	47.52	-14.82	32.70	46.00	-13.30	QP
5	499.4247	46.56	-10.89	35.67	46.00	-10.33	QP
6	744.8661	41.84	-5.94	35.90	46.00	-10.10	QP

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

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz		

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	34.1560	49.52	-16.61	32.91	40.00	-7.09	QP
2	46.0162	43.88	-16.09	27.79	40.00	-12.21	QP
3	65.3431	46.06	-17.81	28.25	40.00	-11.75	QP
4	148.4410	51.82	-15.94	35.88	43.50	-7.62	QP
5	420.5803	46.26	-12.65	33.61	46.00	-12.39	QP
6	483.9094	46.53	-11.19	35.34	46.00	-10.66	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	51.51	30.55	5.77	24.66	51.39	74.00	-22.61	Pk
V	4804.000	43.19	30.55	5.77	24.66	43.07	54.00	-10.93	AV
V	7206.000	53.55	30.33	6.32	24.55	54.09	74.00	-19.91	Pk
V	7206.000	43.86	30.33	6.32	24.55	44.40	54.00	-9.60	AV
V	9608.000	51.38	30.85	7.45	24.69	52.67	74.00	-21.33	Pk
V	9608.000	43.74	30.85	7.45	24.69	45.03	54.00	-8.97	AV
V	12010.000	54.27	31.02	8.99	25.57	57.81	74.00	-16.19	Pk
V	12010.000	43.88	31.02	8.99	25.57	47.42	54.00	-6.58	AV
H	4804.000	54.90	30.55	5.77	24.66	54.78	74.00	-19.22	Pk
H	4804.000	43.74	30.55	5.77	24.66	43.62	54.00	-10.38	AV
H	7206.000	51.30	30.33	6.32	24.55	51.84	74.00	-22.16	Pk
H	7206.000	43.45	30.33	6.32	24.55	43.99	54.00	-10.01	AV
H	9608.000	50.07	30.85	7.45	24.69	51.36	74.00	-22.64	Pk
H	9608.000	43.33	30.85	7.45	24.69	44.62	54.00	-9.38	AV
H	12010.000	53.84	31.02	8.99	25.57	57.38	74.00	-16.62	Pk
H	12010.000	43.46	31.02	8.99	25.57	47.00	54.00	-7.00	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	52.73	30.55	5.77	24.66	52.61	74.00	-21.39	Pk
V	4882.00	43.73	30.55	5.77	24.66	43.61	54.00	-10.39	AV
V	7323.00	51.32	30.33	6.32	24.55	51.86	74.00	-22.14	Pk
V	7323.00	43.01	30.33	6.32	24.55	43.55	54.00	-10.45	AV
V	9764.00	54.10	30.85	7.45	24.69	55.39	74.00	-18.61	Pk
V	9764.00	43.17	30.85	7.45	24.69	44.46	54.00	-9.54	AV
V	12205.00	51.72	31.02	8.99	25.57	55.26	74.00	-18.74	Pk
V	12205.00	43.36	31.02	8.99	25.57	46.90	54.00	-7.10	AV
H	4882.00	54.16	30.55	5.77	24.66	54.04	74.00	-19.96	Pk
H	4882.00	43.99	30.55	5.77	24.66	43.87	54.00	-10.13	AV
H	7323.00	52.79	30.33	6.32	24.55	53.33	74.00	-20.67	Pk
H	7323.00	43.67	30.33	6.32	24.55	44.21	54.00	-9.79	AV
H	9764.00	53.65	30.85	7.45	24.69	54.94	74.00	-19.06	Pk
H	9764.00	43.15	30.85	7.45	24.69	44.44	54.00	-9.56	AV
H	12205.00	54.84	31.02	8.99	25.57	58.38	74.00	-15.62	Pk
H	12205.00	43.86	31.02	8.99	25.57	47.40	54.00	-6.60	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	53.22	30.55	5.77	24.66	53.10	74.00	-20.90	Pk
V	4960.00	43.63	30.55	5.77	24.66	43.51	54.00	-10.49	AV
V	7440.00	54.89	30.33	6.32	24.55	55.43	74.00	-18.57	Pk
V	7440.00	43.65	30.33	6.32	24.55	44.19	54.00	-9.81	AV
V	9920.00	50.01	30.85	7.45	24.69	51.30	74.00	-22.70	Pk
V	9920.00	43.09	30.85	7.45	24.69	44.38	54.00	-9.62	AV
V	12400.00	52.50	31.02	8.99	25.57	56.04	74.00	-17.96	Pk
V	12400.00	43.37	31.02	8.99	25.57	46.91	54.00	-7.09	AV
H	4960.00	54.78	30.55	5.77	24.66	54.66	74.00	-19.34	Pk
H	4960.00	43.56	30.55	5.77	24.66	43.44	54.00	-10.56	AV
H	7440.00	52.00	30.33	6.32	24.55	52.54	74.00	-21.46	Pk
H	7440.00	43.87	30.33	6.32	24.55	44.41	54.00	-9.59	AV
H	9920.00	51.89	30.85	7.45	24.69	53.18	74.00	-20.82	Pk
H	9920.00	43.83	30.85	7.45	24.69	45.12	54.00	-8.88	AV
H	12400.00	54.05	31.02	8.99	25.57	57.59	74.00	-16.41	Pk
H	12400.00	43.31	31.02	8.99	25.57	46.85	54.00	-7.15	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	53.91	30.22	4.85	23.98	52.16	74.00	PK	PASS
	H	2390.00	44.20	30.22	4.85	23.98	42.81	54.00	AV	PASS
	H	2400.00	54.32	30.22	4.85	23.98	52.93	74.00	PK	PASS
	H	2400.00	44.23	30.22	4.85	23.98	42.84	54.00	AV	PASS
	V	2390.00	53.18	30.22	4.85	23.98	51.79	74.00	PK	PASS
	V	2390.00	44.92	30.22	4.85	23.98	43.53	54.00	AV	PASS
	V	2400.00	53.12	30.22	4.85	23.98	51.73	74.00	PK	PASS
	V	2400.00	44.76	30.22	4.85	23.98	43.37	54.00	AV	PASS
	High Channel: 2480MHz									
	H	2483.50	53.45	30.22	4.85	23.98	52.06	74.00	PK	PASS
	H	2483.50	44.03	30.22	4.85	23.98	42.64	54.00	AV	PASS
	H	2500.00	54.40	30.22	4.85	23.98	53.01	74.00	PK	PASS
	H	2500.00	44.29	30.22	4.85	23.98	42.90	54.00	AV	PASS
	V	2483.50	53.65	30.22	4.85	23.98	52.26	74.00	PK	PASS
	V	2483.50	44.79	30.22	4.85	23.98	43.40	54.00	AV	PASS
	V	2500.00	54.13	30.22	4.85	23.98	52.74	74.00	PK	PASS
	V	2500.00	44.02	30.22	4.85	23.98	42.63	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.

	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
Π/4-DQPSK	Low Channel: 2402MHz									
	H	2390.00	54.45	30.22	4.85	23.98	53.06	74.00	PK	PASS
	H	2390.00	44.32	30.22	4.85	23.98	42.93	54.00	AV	PASS
	H	2400.00	53.41	30.22	4.85	23.98	52.02	74.00	PK	PASS
	H	2400.00	44.87	30.22	4.85	23.98	43.48	54.00	AV	PASS
	V	2390.00	54.36	30.22	4.85	23.98	52.97	74.00	PK	PASS
	V	2390.00	44.24	30.22	4.85	23.98	42.85	54.00	AV	PASS
	V	2400.00	53.75	30.22	4.85	23.98	52.36	74.00	PK	PASS
	V	2400.00	44.65	30.22	4.85	23.98	43.26	54.00	AV	PASS
	High Channel: 2480MHz									
	H	2483.50	53.68	30.22	4.85	23.98	52.29	74.00	PK	PASS
	H	2483.50	44.37	30.22	4.85	23.98	42.98	54.00	AV	PASS
	H	2500.00	54.49	30.22	4.85	23.98	53.10	74.00	PK	PASS
	H	2500.00	44.96	30.22	4.85	23.98	43.57	54.00	AV	PASS
	V	2483.50	54.63	30.22	4.85	23.98	53.24	74.00	PK	PASS
	V	2483.50	44.46	30.22	4.85	23.98	43.07	54.00	AV	PASS
	V	2500.00	53.23	30.22	4.85	23.98	51.84	74.00	PK	PASS
	V	2500.00	44.62	30.22	4.85	23.98	43.23	54.00	AV	PASS

Remark:

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

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

	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
8DPSK	Low Channel: 2402MHz									
	H	2390.00	54.51	30.22	4.85	23.98	53.12	74.00	PK	PASS
	H	2390.00	44.53	30.22	4.85	23.98	43.14	54.00	AV	PASS
	H	2400.00	53.48	30.22	4.85	23.98	52.09	74.00	PK	PASS
	H	2400.00	44.66	30.22	4.85	23.98	43.27	54.00	AV	PASS
	V	2390.00	53.77	30.22	4.85	23.98	52.38	74.00	PK	PASS
	V	2390.00	44.67	30.22	4.85	23.98	43.28	54.00	AV	PASS
	V	2400.00	53.67	30.22	4.85	23.98	52.28	74.00	PK	PASS
	V	2400.00	44.40	30.22	4.85	23.98	43.01	54.00	AV	PASS
	High Channel: 2480MHz									
	H	2483.50	54.67	30.22	4.85	23.98	53.28	74.00	PK	PASS
	H	2483.50	44.49	30.22	4.85	23.98	43.10	54.00	AV	PASS
	H	2500.00	54.43	30.22	4.85	23.98	53.04	74.00	PK	PASS
	H	2500.00	44.79	30.22	4.85	23.98	43.40	54.00	AV	PASS
	V	2483.50	53.17	30.22	4.85	23.98	51.78	74.00	PK	PASS
	V	2483.50	44.64	30.22	4.85	23.98	43.25	54.00	AV	PASS
	V	2500.00	54.14	30.22	4.85	23.98	52.75	74.00	PK	PASS
	V	2500.00	44.45	30.22	4.85	23.98	43.06	54.00	AV	PASS

Remark:

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

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

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	102.89	PK	230	1.8	V	-1.06	101.83	114.00	-12.17
2402	90.00	Ave	289	1.9	V	-1.06	88.94	94.00	-9.07
2402	102.26	PK	130	1.4	H	-1.06	101.20	114.00	-12.80
2402	89.56	Ave	130	1.4	H	-1.06	88.50	94.00	-5.50

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	101.26	PK	229	1.3	V	-1.32	99.94	114.00	-14.06
2441	88.56	Ave	229	1.3	V	-1.32	87.24	94.00	-6.76
2441	103.26	PK	156	1.6	H	-1.32	**101.94**	114.00	-12.06
2441	91.23	Ave	156	1.6	H	-1.32	89.91	94.00	-4.09

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	101.58	PK	164	1.7	V	-1.78	99.80	114.00	-14.20
2480	90.23	Ave	164	1.7	V	-1.78	88.45	94.00	-5.55
2480	103.17	PK	264	1.9	H	-1.78	101.39	114.00	-12.61
2480	91.27	Ave	264	1.9	H	-1.78	89.49	94.00	-4.51

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	101.26	PK	86	1.4	V	-1.06	100.20	114.00	-13.80
2402	89.26	Ave	86	1.4	V	-1.06	88.20	94.00	-5.80
2402	101.34	PK	252	1.9	H	-1.06	100.28	114.00	-13.72
2402	88.96	Ave	252	1.9	H	-1.06	87.90	94.00	-6.10

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	102.36	PK	181	1.2	V	-1.32	101.04	114.00	-12.96

2441	89.36	Ave	181	1.2	V	-1.32	88.04	94.00	-5.96
2441	102.36	PK	203	1.6	H	-1.32	101.04	114.00	-12.96
2441	90.11	Ave	203	1.6	H	-1.32	88.79	94.00	-5.21

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	102.26	PK	331	1.3	V	-1.78	100.48	114.00	-13.52
2480	89.29	Ave	331	1.3	V	-1.78	87.51	94.00	-6.49
2480	102.69	PK	138	1.9	H	-1.78	100.91	114.00	-13.09
2480	90.23	Ave	138	1.9	H	-1.78	88.45	94.00	-5.55

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	102.26	PK	42	2.0	V	-1.06	101.20	114.00	-12.80
2402	88.36	Ave	42	2.0	V	-1.06	87.30	94.00	-6.70
2402	101.78	PK	304	1.6	H	-1.06	100.72	114.00	-13.28
2402	89.25	Ave	304	1.6	H	-1.06	88.19	94.00	-5.81

Mid CH

Frequency	Receiver	Detector	Turn table	RX Antenna	Corrected	Corrected	Limit	Margin

	Reading		Angle	Height	Polar	Factor	Amplitude		
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel:2441MHz									
2441	102.39	PK	38	1.9	V	-1.32	101.07	114.00	-12.93
2441	88.39	Ave	38	1.9	V	-1.32	87.07	94.00	-6.93
2441	101.26	PK	10	1.0	H	-1.32	99.94	114.00	-14.06
2441	89.36	Ave	10	1.0	H	-1.32	88.04	94.00	-5.96

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	102.89	PK	150	1.7	V	-1.78	101.11	114.00	-12.89
2480	90.36	Ave	150	1.7	V	-1.78	88.58	94.00	-5.42
2480	101.38	PK	263	1.5	H	-1.78	99.60	114.00	-14.40
2480	89.36	Ave	263	1.5	H	-1.78	87.58	94.00	-6.42

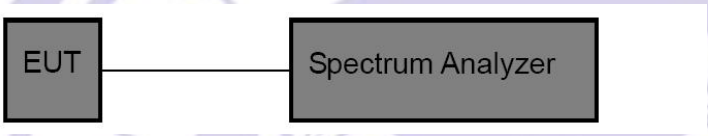
7 Bandwidth Measurement

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

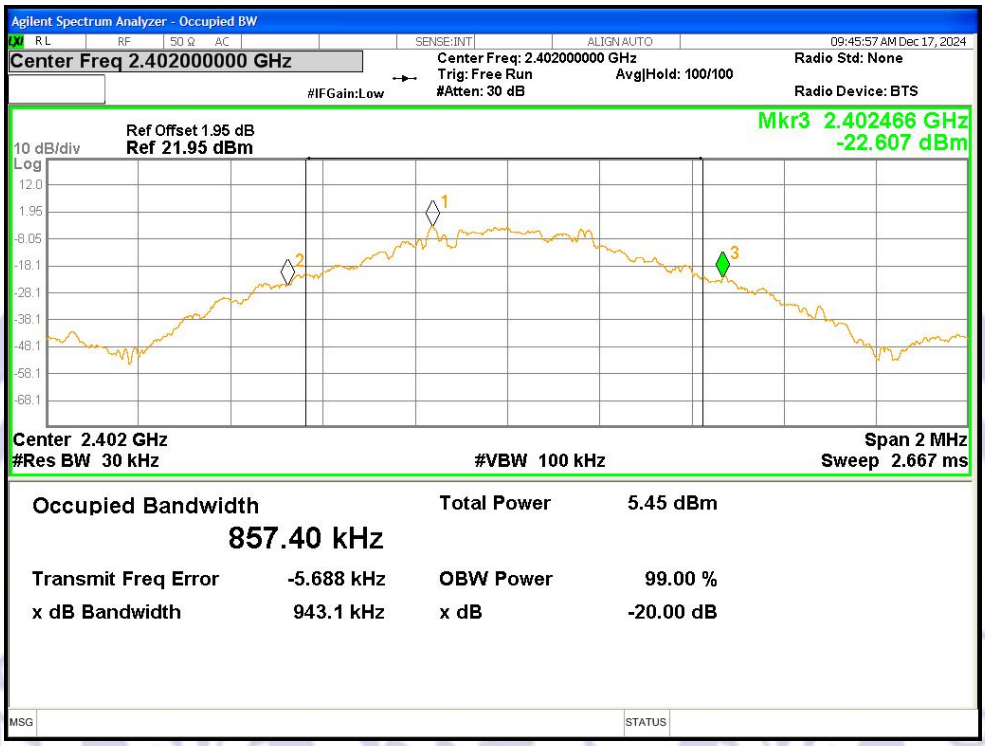
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

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

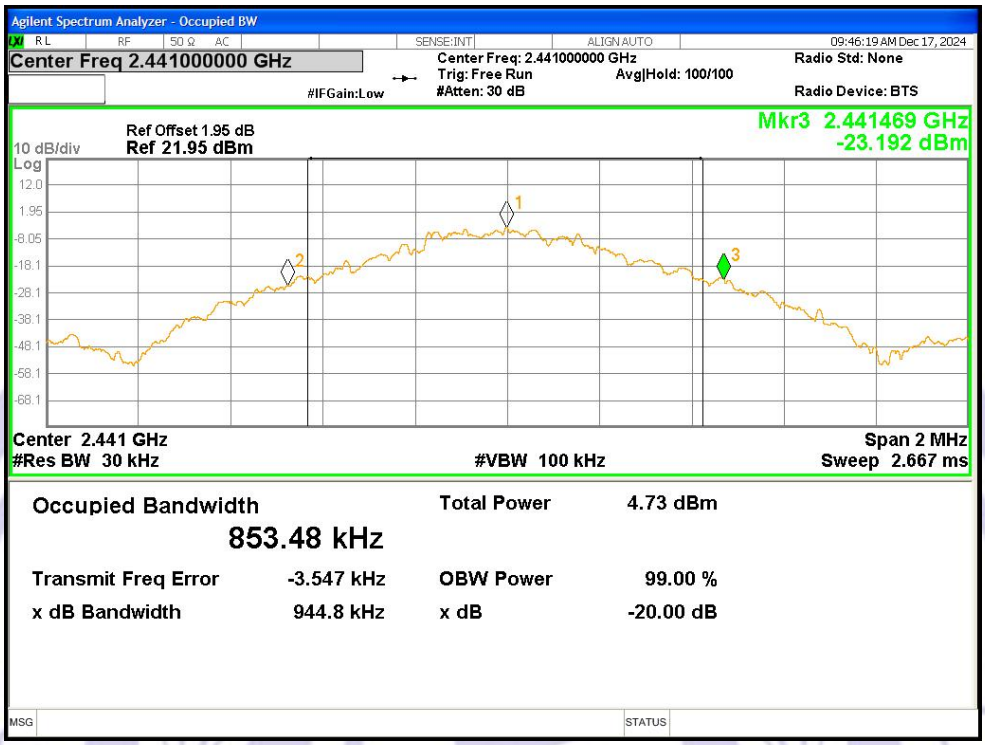
7.3 Test Result

Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
1-DH5	2402	Ant1	0.943	0	Pass
1-DH5	2441	Ant1	0.945	0	Pass
1-DH5	2480	Ant1	0.953	0	Pass
2-DH5	2402	Ant1	1.316	0	Pass
2-DH5	2441	Ant1	1.32	0	Pass
2-DH5	2480	Ant1	1.323	0	Pass
3-DH5	2402	Ant1	1.279	0	Pass
3-DH5	2441	Ant1	1.312	0	Pass
3-DH5	2480	Ant1	1.308	0	Pass

-20dB Occupy Bandwidth



-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



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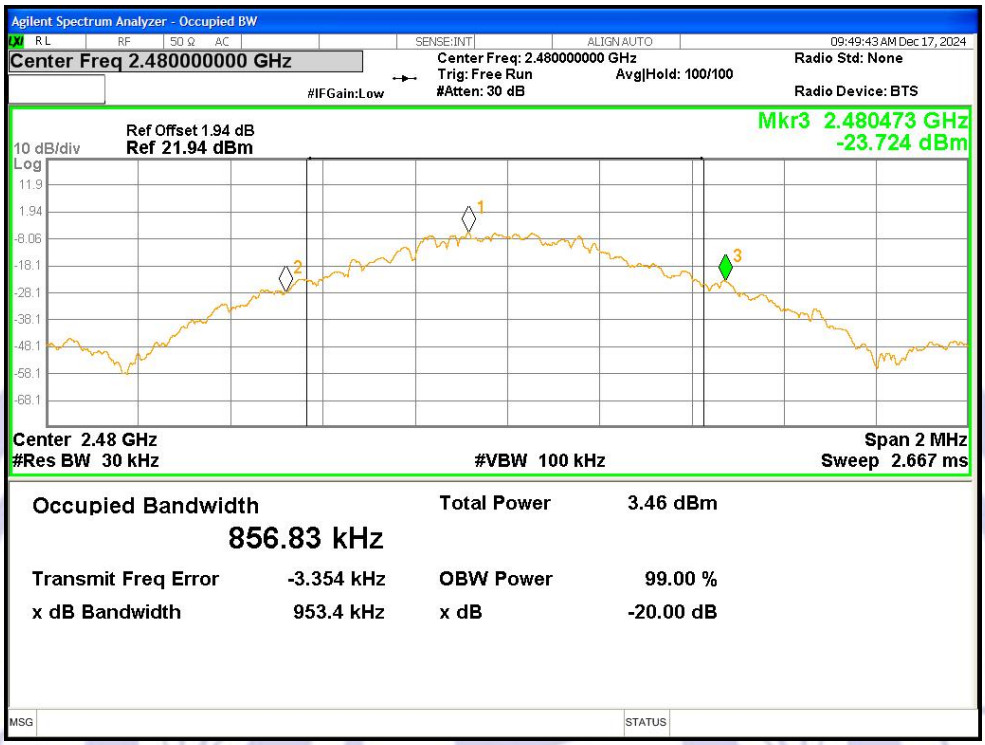
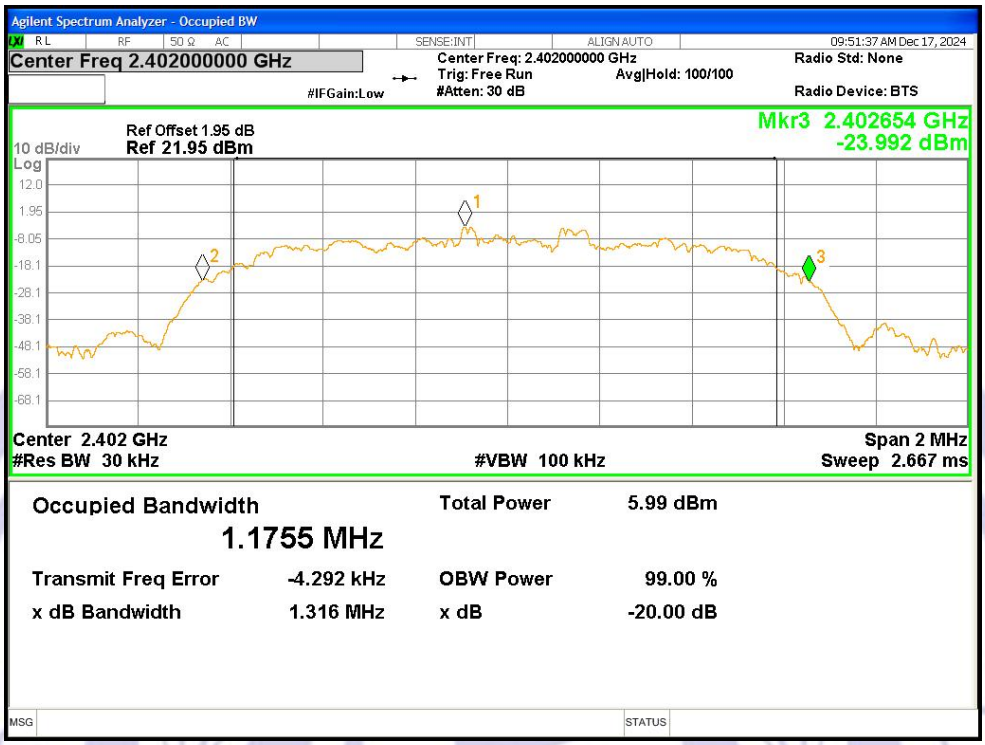
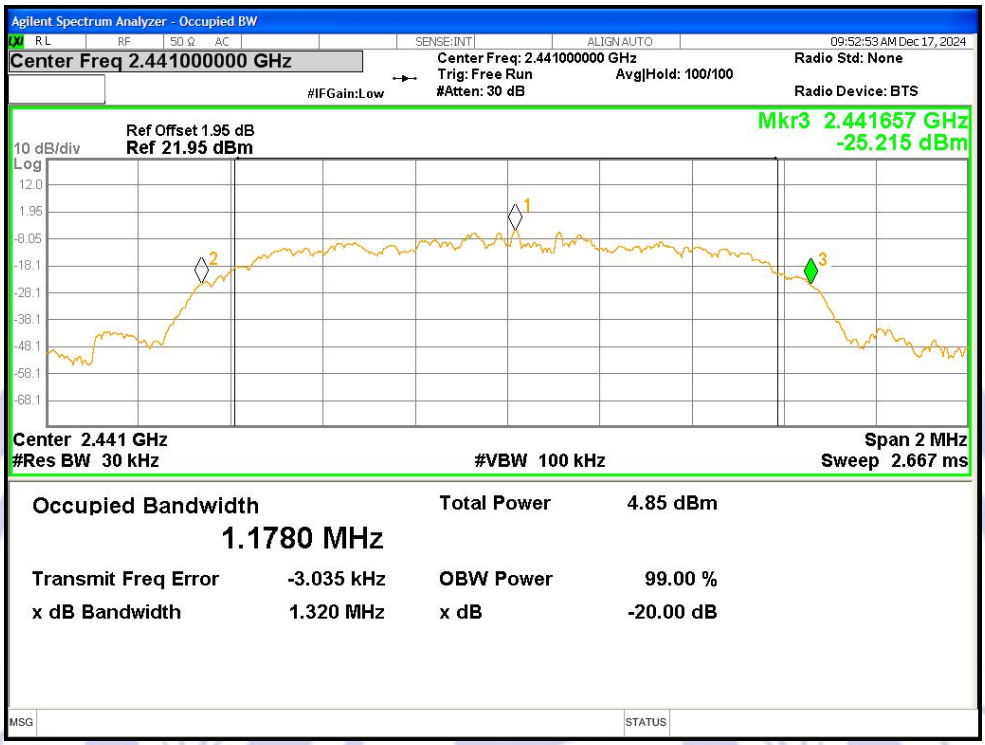


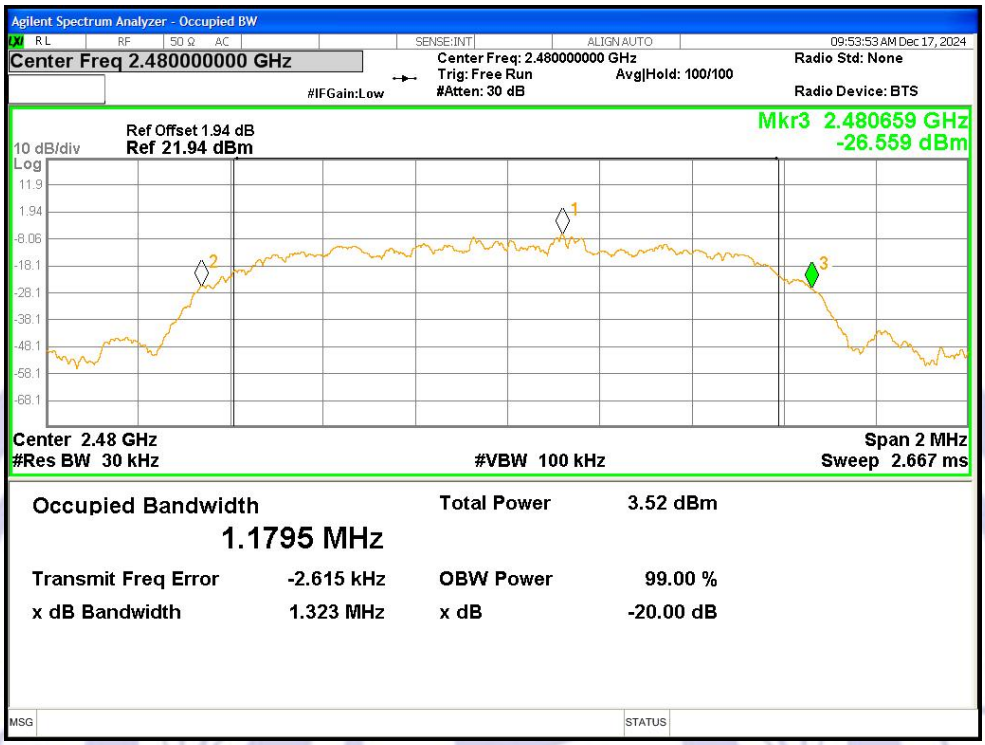
-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1



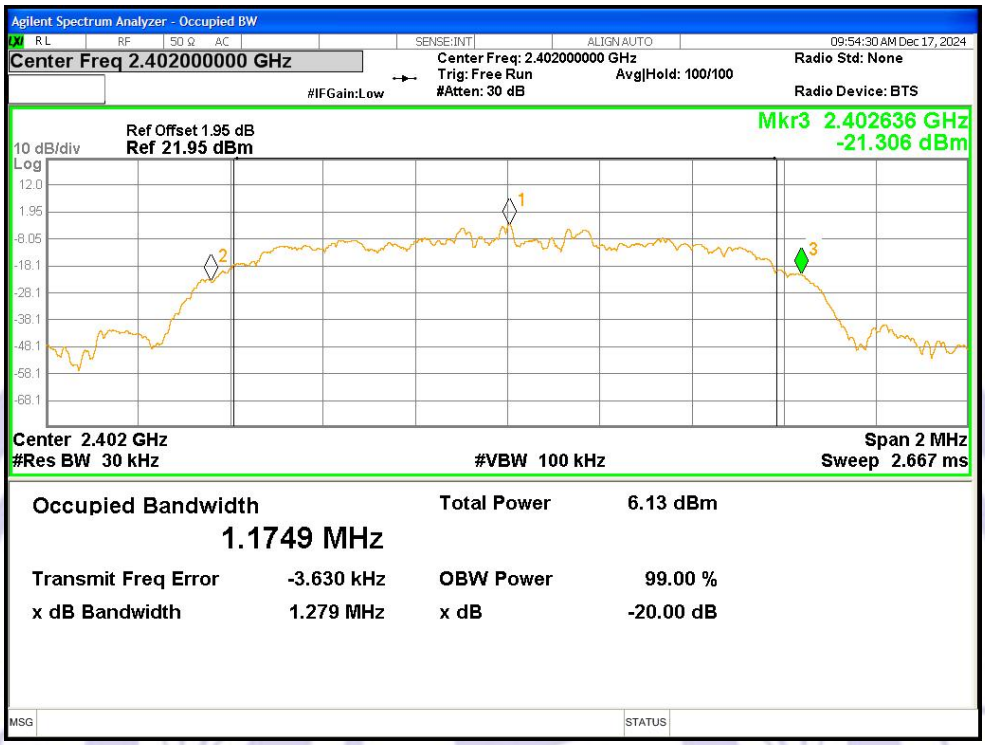
-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1



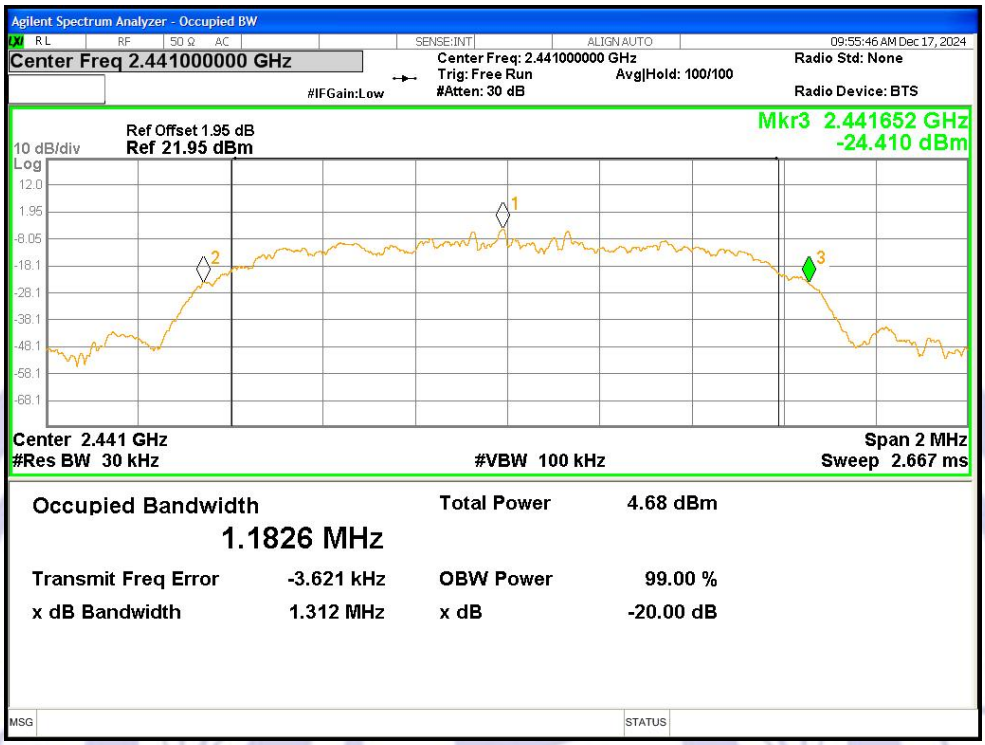
-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1



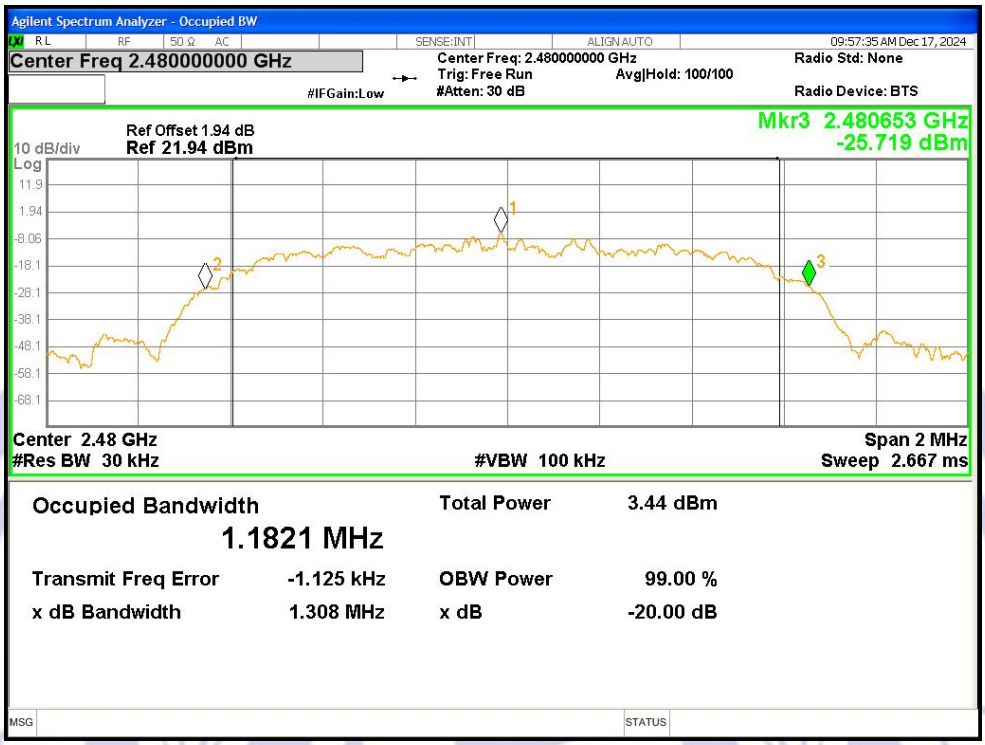
-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1



-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 -0.81dBi, reference to the attachment for details.

9 Test Setup Photos and EUT Photos

Please see the attachment for details.

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