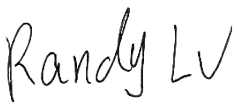
Product Name: Smart Phone	**Report No: FCC2022-06453RF2**
Product Model: V Max	**Security Classification: Open**
Version: V1.0	**Total Page: 69**

TIRT Testing Report

Prepared By:	**Checked By:**	**Approved By:**	
Stone Tang	Randy Lv	Daniel Chen	
			

RF TEST REPORT

FCC ID: 2AX4YVMAX

According to

47 CFR FCC Part 15, Subpart C(Section 15.247)

Equipment	:	Smart Phone
Model No.	:	V Max, S100Pro All models are with same schematic, The only diffrences are model no. V Max is main test model, S100Pro is the adding model. No other differences.
Trademark	:	DOOGEE
Product No.	:	20221220021903
Applicant	:	Shenzhen DOOGEE Hengtong Technology CO.,LTD

- The test result referred exclusively to the presented test model /sample.
- Without written approval of TIRT Inc. the test report shall not reproduced except in full.
- Test Date: 2022.12.13-2023.1.8

Lab: Beijing TIRT Technology Service Co.,Ltd Shenzhen
Add: 101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
TEL: +86-0755-27087573

Table of Contents

History of this test report

Original Report Issue Date: 2023.01.09

● No additional attachment

○ Additional attachments were issued following record

Attachment No.	Issue Date	Description

1. General Information

1.1 Applicant

Shenzhen DOOGEE Hengtong Technology CO.,LTD

B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No.22, Longhua New District, Shenzhen, China

1.2 Manufacturer

Shenzhen DOOGEE Hengtong Technology CO.,LTD

B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No.22, Longhua New District, Shenzhen, China

1.3 Basic Description of Equipment Under Test

Items	**Description**	
Equipment Name	Smart Phone	
Model Number	V Max	
Sample ID	20221220021903	
Product Code	N/A	
Power Supply	Input: 100~240V, 50/60Hz	
Adapter /Model /Description	Model: HJ-1203000-09 Input: 100-240V~50/60Hz, 0.8A Output: 5V⎓3A , 9V⎓3A, 12V⎓2.75A, 33.0W Max. PPS:5.0V-11.0V 3.0A 33.0W Max.	
Operate temperature	0℃-45℃	
EUT Stage	○ Product Unit	● Final-Sample
Operation Frequency	2402~2480MHz	
Channel numbers	40	
Channel separation	2MHz	
Modulation technology	GFSK	
Antenna Type	PIFA Antenna	
Antenna gain	0.36dBi	

Operation Frequency each of channel			
Channel	Frequency(MHz)	Channel	Frequency(MHz)
0	2402	21	2444
1	2404	22	2446
2	2406	22	2448
3	2408	24	2450

4	2410	25	2452
5	2412	26	2454
6	2414	27	2456
7	2416	28	2458
8	2418	29	2460
9	2420	30	2462
10	2422	31	2464
11	2424	32	2466
12	2426	33	2468
13	2428	34	2470
14	2430	35	2472
15	2432	36	2474
16	2434	37	2476
17	2436	38	2478
18	2438	39	2480
19	2440		
20	2442		

The test frequencies are below:

Channel	Frequency (MHz)
Lowest:	2402
Middle:	2440
Highest:	2480

1.5 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain
1	N/A	N/A	PIFA	N/A	0.36 dBi

2. Summary of Test Results

2.1 Summary of Test Items

47 CFR FCC Part 15, Subpart C (Section 15.247)			
Test item	FCC Clause	Results	Remarks
Antenna Requirement	15.203	Pass	--
Peak Output Power	15.247(b)	Pass	--
Occupied Bandwidth	15.247(a)	Pass	--
Conducted Spurious	15.247(d)	Pass	--
Emission	15.247(d)	Pass	--
Band Edge(Authorized-	15.207	Pass	--
band band-edge)	15.209 15.247(d)	Pass	--
Conducted Emission	15.209 15.247(d)	Pass	--
Radiated Spurious	15.247(e)	Pass	--
Note: NA denotes Not Applicable in this part			

2.2 Application of Standard

47 CFR FCC Part 15, Subpart C (Section 15.247)

KDB 558074 D01 v05r02

ANSI C63.10:2013

2.3 Test Instruments

No.	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
RF Output Power Test					
1	Power Collection Unit	Tonscend	JS0806-2	188060134	2023/11/08
2	Tonscend Test System	Tonscend	EN300328 V2.2.2	NA	NA
3	Temp&Humidity Chamber	ETOMA	NTH1100-30A	16080628	2023/11/08
4	Temp&Humidity Recorder	Anymetre	JR900	NA	2023/11/08
Occupied Bandwidth					
1	Spectrum Analyzer	Agilent	N9010A	MY52221119	2023/11/08
2	Power Collection Unit	Tonscend	JS0806-2	188060134	2023/11/08
3	Tonscend Test System	Tonscend	EN300328 V2.2.2	NA	NA
4	Temp&Humidity Recorder	Anymetre	JR900	NA	2023/11/08
Conducted Spurious Emission					
1	Spectrum Analyzer	Agilent	N9010A	MY52221119	2023/11/08
2	Power Collection Unit	Tonscend	JS0806-2	188060134	2023/11/08
3	Tonscend Test System	Tonscend	EN300328 V2.2.2	NA	NA
4	Temp&Humidity Recorder	Anymetre	JR900	NA	2023/11/08
Band Edge(Authorized-band band-edge)					
1	Spectrum Analyzer	Agilent	N9010A	MY52221119	2023/11/08
2	Power Collection Unit	Tonscend	JS0806-2	188060134	2023/11/08
3	Tonscend Test System	Tonscend	EN300328 V2.2.2	NA	NA
4	Temp&Humidity Recorder	Anymetre	JR900	NA	2023/11/08
Power spectral density(PSD)					
1	Spectrum Analyzer	Agilent	N9010A	MY52221119	2023/11/08
2	Power Collection Unit	Tonscend	JS0806-2	188060134	2023/11/08
3	Tonscend Test	Tonscend	EN300328	NA	NA

	System		V2.2.2		
4	Temp&Humidity Recorder	Anymetre	JR900	NA	2023/11/08
Transmitter Emissions In Spurious Domain					
1	Spectrum Analyzer	Rohde & Schwarz	FSV30	103741	2023/11/08
2	Integral antenna	SCHWARZBECK	VULB9163	9163-868	2023/11/08
3	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-123	2023/11/08
4	Broadband amplifier	SCHWARZBECK	BBV9745	9745#46	2023/11/08
5	Broadband amplifier	SCHWARZBECK	BBV9718	9718-284	2023/11/08
6	Temp&Humidity Recorder	Anymetre	JR900	NA	2023/11/08

2.4 Test Mode

Test mode:			
Transmitting mode:	Keep the EUT in transmitting mode with modulation.		
Operating Environment:			
Item	Normal condition	Extreme condition	
		HT	LT
Temperature	+15ºC to + 35ºC	+45ºC	0ºC
Humidity	20%-95%		
Atmospheric Pressure:	100.65 kPa		

Setting	Value
Modulation	GFSK
Adaptive	No
Antenna Gain	0.36 dBi
Nominal Channel Bandwidth	1.016MHz(1M),2.0350MHz(2M)
DUT Frequency not configurable	No
Frequency Low	2402MHz
Frequency Mid	2440MHz
Frequency High	2480MHz

2.5 Test Condition

Applicable to	Environmental conditions	Input Power	Tested by
Antenna Requirement	24.6°C, 56 % RH	120V AC	Stone Tang
Peak Output Power	24.2°C, 55 % RH	120V AC	Stone Tang
Occupied Bandwidth	24.6°C, 56 % RH	120V AC	Stone Tang
Conducted Spurious	24.6°C, 56 % RH	120V AC	Stone Tang
Emission	24.5°C, 56 % RH	120V AC	Stone Tang
Band Edge(Authorized-	24.4°C, 56 % RH	120V AC	Stone Tang
band band-edge)	24.6°C, 56 % RH	120V AC	Stone Tang
Conducted Emission	24.5°C, 56 % RH	120V AC	Stone Tang
Radiated Spurious	24.6°C, 56 % RH	120V AC	Stone Tang

The applicant declare the operating environment of EUT as below:

Normal conditions: 120V AC ,15~35°C

2.6 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT.
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	±142.12 KHz
RF power conducted	±0.74 dB
RF power radiated	±3.25dB
Spurious emissions, conducted	±1.78dB
Spurious emissions, radiated (9KHz~30MHz)	±2.56dB
Spurious emissions, radiated (30MHz～1GHz)	±4.6dB
Spurious emissions, radiated (Above 1GHz)	±4.9dB
Conduction Emissions(150kHz~30MHz)	±3.1 dB
Humidity	±4.6%
Temperature	±0.7°C
Time	±1.25%

2.7 Test Location

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Designation Number:	CN1309
Test Firm Registration Number:	825524
Telephone:	+86-0755-27087573

2.8 Deviation from Standards

None

2.9 Abnormalities from Standard Conditions

None

3. Test Procedure And Results

3.1 AC Power Line Conducted Emission

3.1.1 Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.1.2 Test Procedure

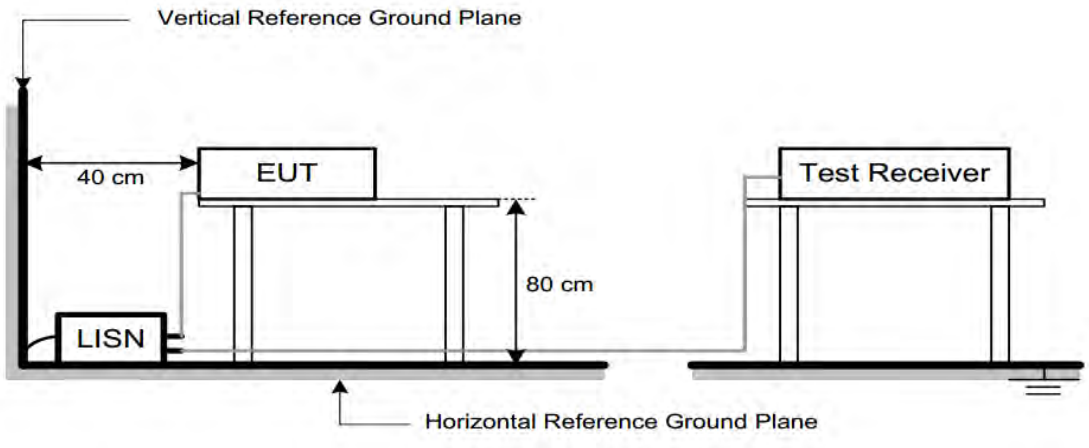
Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
○Lowest, Middle and Highest Channel	○Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

a) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c) The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

3.1.3 Test Setup



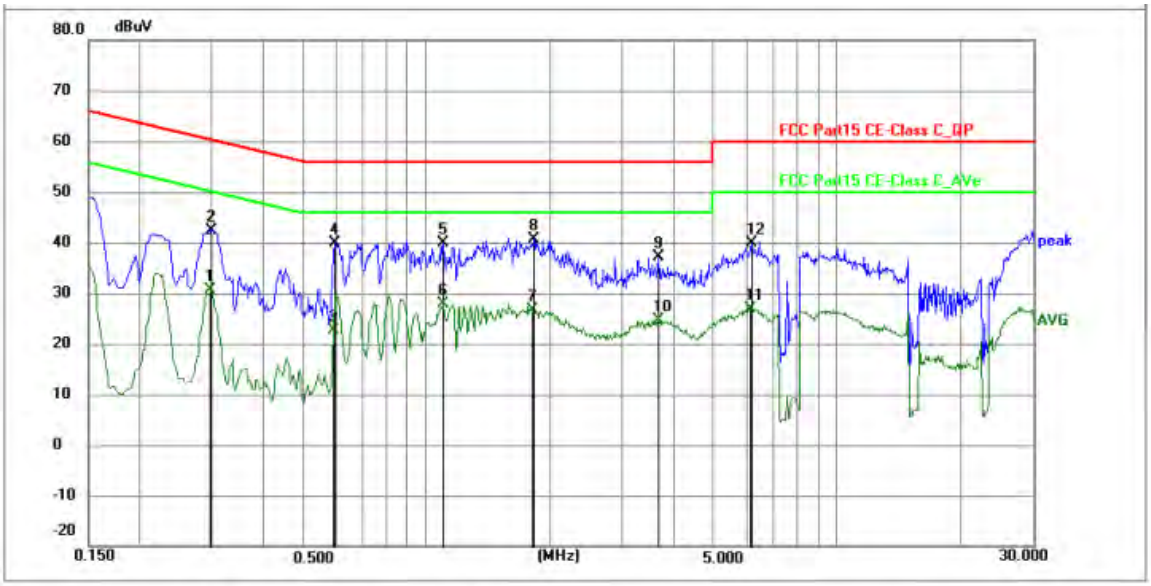
3.1.4 Test Result

Note:

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Measurement = Reading + Correct Factor.
3. Over = Measurement - Limit

150kHz~30MHz	Worst Case Operating Mode: Simultaneous transmission

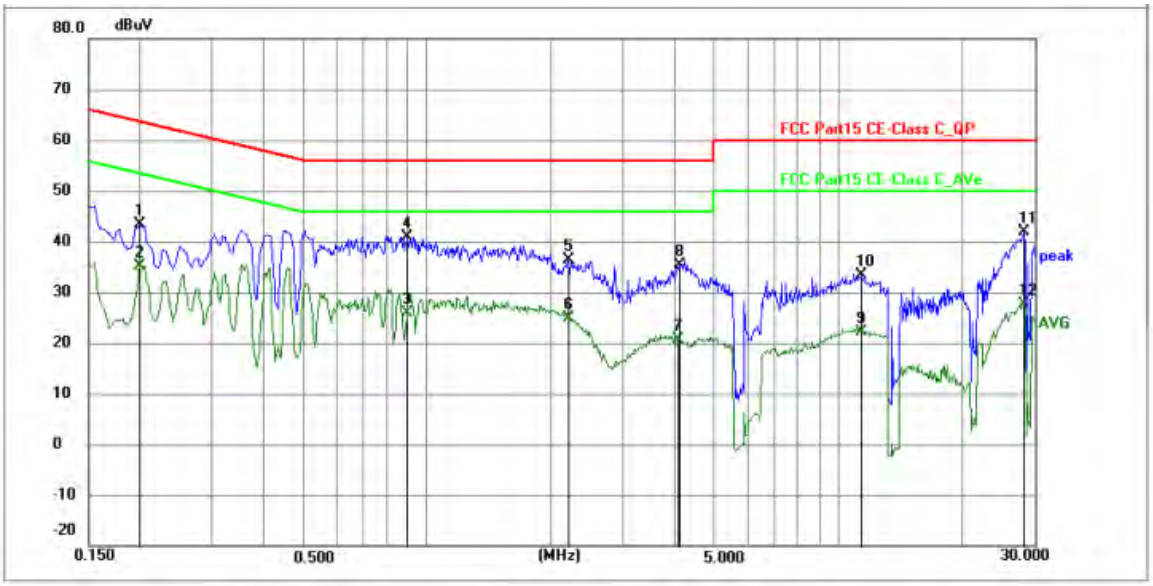
Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2970	20.50	10.18	30.68	50.33	-19.65	AVG	P	
2	0.2983	32.30	10.18	42.48	60.29	-17.81	peak	P	
3	0.5910	12.37	10.25	22.62	46.00	-23.38	AVG	P	
4	0.5955	29.61	10.25	39.86	56.00	-16.14	peak	P	
5	1.0950	29.60	10.25	39.85	56.00	-16.15	peak	P	
6	1.0950	17.66	10.25	27.91	46.00	-18.09	AVG	P	
7	1.8104	16.44	10.24	26.68	46.00	-19.32	AVG	P	
8 *	1.8193	30.40	10.24	40.64	56.00	-15.36	peak	P	
9	3.6690	26.89	10.27	37.16	56.00	-18.84	peak	P	
10	3.6690	14.48	10.27	24.75	46.00	-21.25	AVG	P	
11	6.1573	16.52	10.25	26.77	50.00	-23.23	AVG	P	
12	6.1935	29.61	10.25	39.86	60.00	-20.14	peak	P	

150kHz~30MHz	Worst Case Operating Mode: Simultaneous transmission

Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1995	33.09	10.20	43.29	63.63	-20.34	peak	P	
2	0.1995	25.00	10.20	35.20	53.63	-18.43	AVG	P	
3	0.8923	15.61	10.25	25.86	46.00	-20.14	AVG	P	
4 *	0.8970	30.63	10.25	40.88	56.00	-15.12	peak	P	
5	2.2110	26.20	10.29	36.49	56.00	-19.51	peak	P	
6	2.2110	14.67	10.29	24.96	46.00	-21.04	AVG	P	
7	4.0830	10.35	10.22	20.57	46.00	-25.43	AVG	P	
8	4.1010	25.16	10.22	35.38	56.00	-20.62	peak	P	
9	11.3460	11.98	10.27	22.25	50.00	-27.75	AVG	P	
10	11.3773	23.10	10.27	33.37	60.00	-26.63	peak	P	
11	28.2840	31.99	9.85	41.84	60.00	-18.16	peak	P	
12	28.3920	17.70	9.85	27.55	50.00	-22.45	AVG	P	

3.2 Radiated Emission and Band Edge

3.2.1 Limit

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequency (MHz)	Distance Meters(m)	Field Strength Limit	
		μV/m	dB(μV)/m
0.009 – 0.49	300	2400/F(kHz)	-
0.490 – 1.705	30	24000/F(kHz)	-
1.705 – 30	30	30	-
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Note: (1) Emission level dBμV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.2.2 Test Procedure

Test Method	
○Conducted Measurement	●Radiated Measurement
Test Channels	
●Lowest, Middle and Highest Channel	○ Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

a) The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)

b) The measuring distance of 3 m or 1.5m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)

c) The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of

the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).

e) The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

f) The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

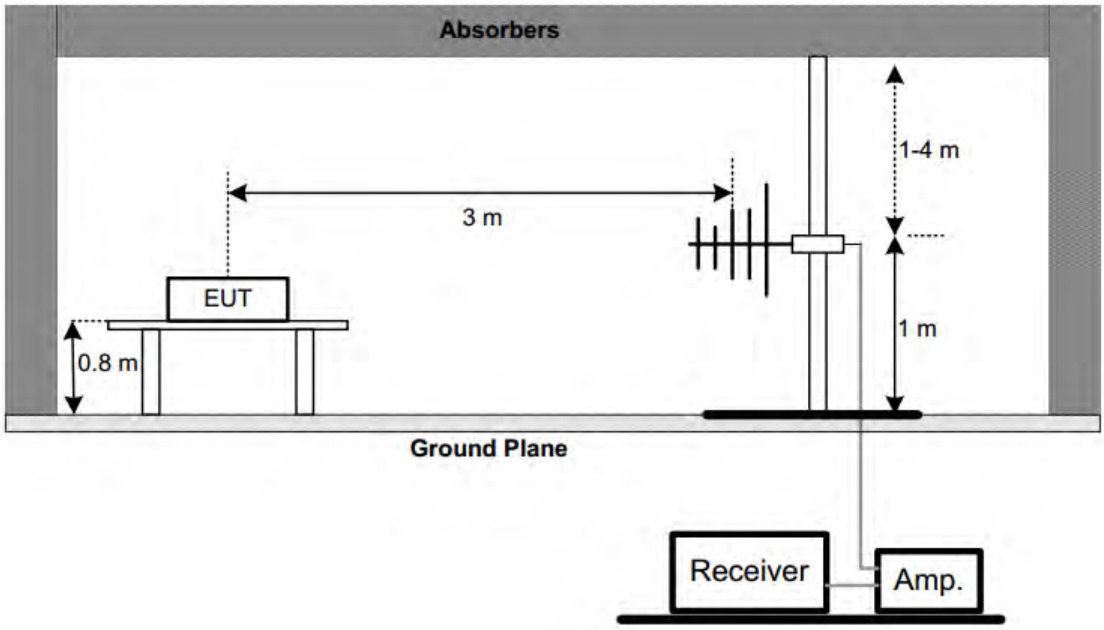
g) All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1 GHz)

h) All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1 GHz)

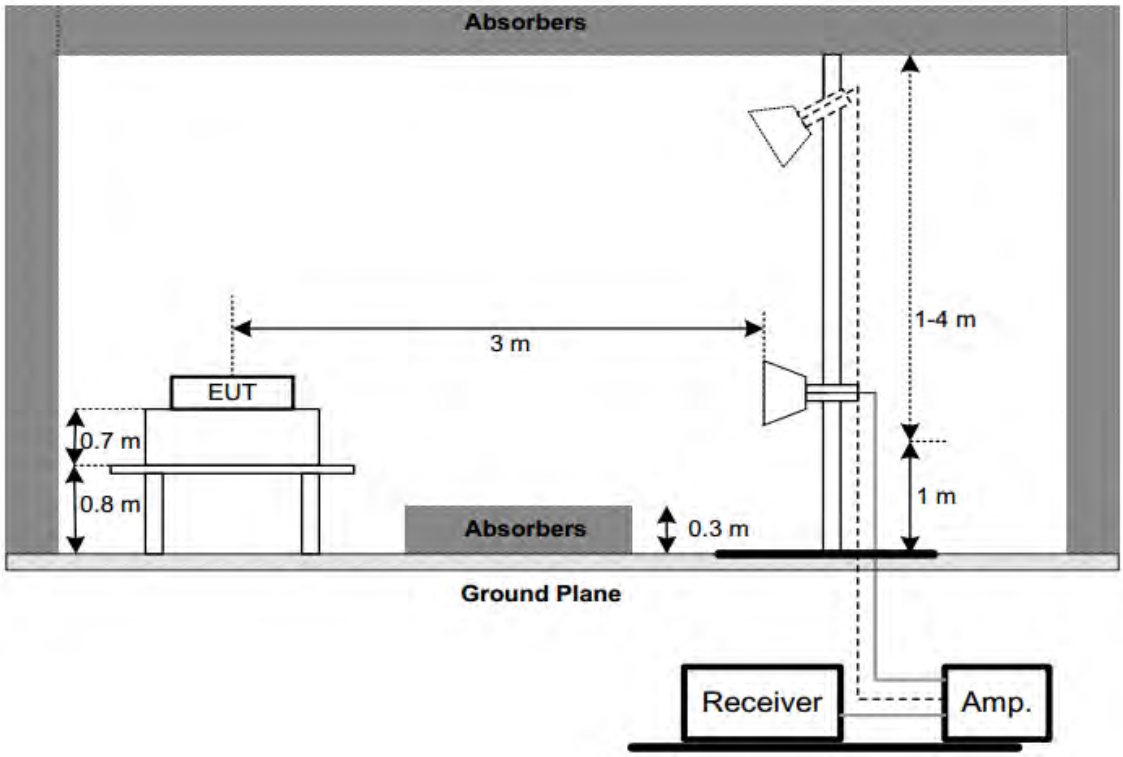
i) For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.2.3 Test Setup

(A) Radiated Emission Test Set-Up Frequency 30 MHz-1000 MHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



3.2.4 Test Result

1) Radiated emission: 9KHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

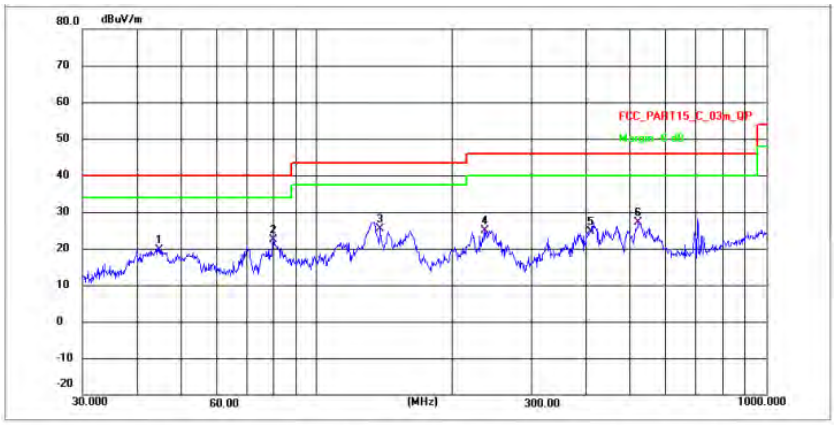
2) Radiated emission: 30MHz-1G

Note:

1. Measurement = Reading + Correct Factor.
2. Over = Measurement - Limit

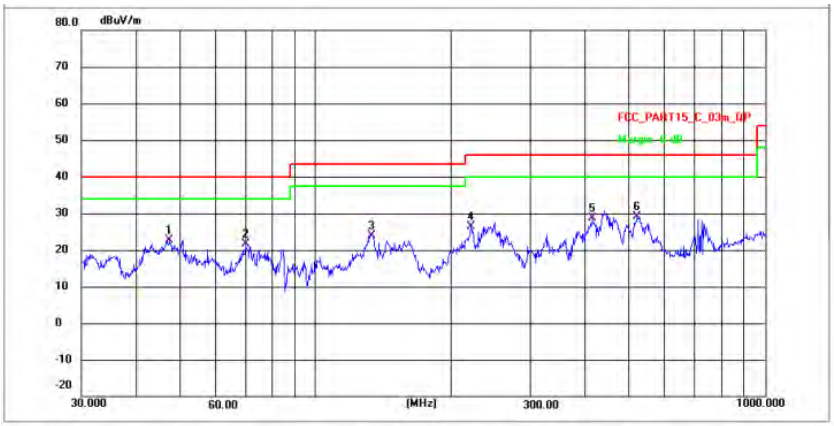
Below 1G (30MHz~1GHz)	Test mode: 1MHz	Test Channel:0

HORIZONTAL



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	44.7433	47.84	-28.10	19.74	40.00	-20.26	QP	P
2 *	79.9402	50.22	-27.88	22.34	40.00	-17.66	QP	P
3	138.1450	52.76	-27.32	25.44	43.50	-18.06	QP	P
4	235.8163	51.66	-26.80	24.86	46.00	-21.14	QP	P
5	406.8005	50.25	-25.72	24.53	46.00	-21.47	QP	P
6	519.0650	52.65	-25.40	27.25	46.00	-18.75	QP	P

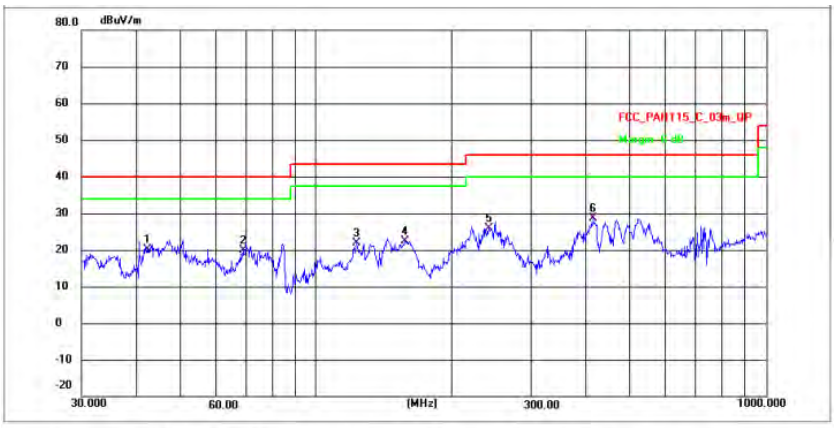
VERTICAL



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	47.2426	50.78	-28.08	22.70	40.00	-17.30	QP	P
2	69.8450	49.43	-27.92	21.51	40.00	-18.49	QP	P
3	132.9176	51.20	-27.37	23.83	43.50	-19.67	QP	P
4	221.3920	53.20	-26.88	26.32	46.00	-19.68	QP	P
5	413.2706	54.38	-25.70	28.68	46.00	-17.32	QP	P
6 *	519.0650	54.65	-25.40	29.25	46.00	-16.75	QP	P

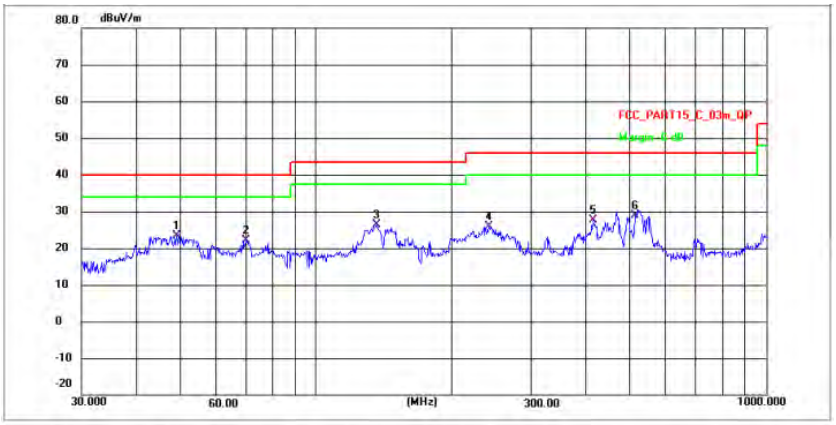
Below 1G (30MHz~1GHz)	Test mode: 1MHz	Test Channel:19

HORIZONTAL



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	42.3021	48.25	-28.12	20.13	40.00	-19.87	QP	P
2	68.8721	47.91	-27.92	19.99	40.00	-20.01	QP	P
3	123.0494	49.42	-27.47	21.95	43.50	-21.55	QP	P
4	157.2828	49.55	-27.21	22.34	43.50	-21.16	QP	P
5	242.5252	52.56	-26.75	25.81	46.00	-20.19	QP	P
6 *	413.2706	54.38	-25.70	28.68	46.00	-17.32	QP	P

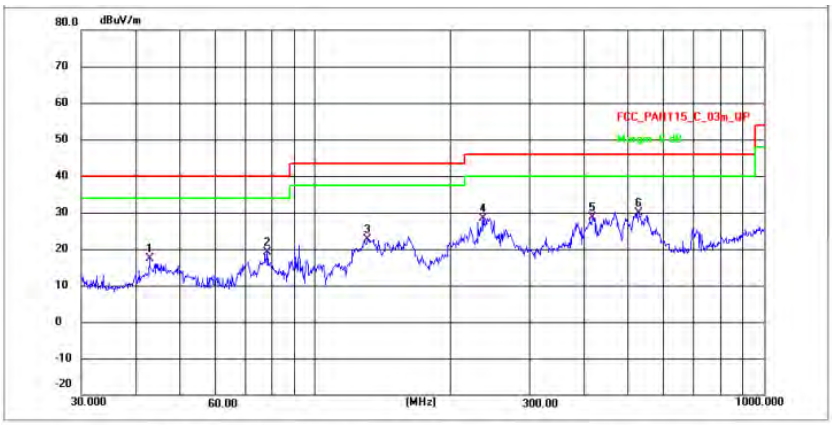
VERTICAL



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	48.8427	51.38	-28.06	23.32	40.00	-16.68	QP	P
2	69.9675	50.00	-27.92	22.08	40.00	-17.92	QP	P
3	136.2204	53.73	-27.34	26.39	43.50	-17.11	QP	P
4	242.5252	52.56	-26.75	25.81	46.00	-20.19	QP	P
5	413.2706	53.38	-25.70	27.68	46.00	-18.32	QP	P
6	510.9386	54.19	-25.42	28.77	46.00	-17.23	QP	P

Below 1G (30MHz~1GHz)	Test mode: 1MHz	Test Channel:6

HORIZONTAL



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	42.6747	45.50	-28.12	17.38	40.00	-22.62	QP	P
2	78.1388	47.10	-27.89	19.21	40.00	-20.79	QP	P
3	130.3790	50.01	-27.40	22.61	43.50	-20.89	QP	P
4	235.8163	55.16	-26.80	28.36	46.00	-17.64	QP	P
5	415.4501	54.22	-25.70	28.52	46.00	-17.48	QP	P
6 *	525.4746	55.36	-25.38	29.98	46.00	-16.02	QP	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	35.6240	31.96	-15.77	16.19	40.00	-23.81	QP	P
2	44.7433	44.90	-28.10	16.80	40.00	-23.20	QP	P
3	78.1388	48.19	-27.89	20.30	40.00	-19.70	QP	P
4	144.3343	51.37	-27.28	24.09	43.50	-19.41	QP	P
5 *	235.8163	56.16	-26.80	29.36	46.00	-16.64	QP	P
6	465.5994	54.68	-25.56	29.12	46.00	-16.88	QP	P

3) Radiated emission: Above 1G

Note:

1. Measurement = Reading + Correct Factor.
2. Over = Measurement - Limit

Above 1G (1GHz~26.5GHz)	Test mode:1MHz	Test Channel:0

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1181.146	67.70	-30.40	37.30	74.00	-36.70	peak	P
2	2002.820	71.26	-31.54	39.72	74.00	-34.28	peak	P
3	2891.926	70.82	-30.15	40.67	74.00	-33.33	peak	P
4	3831.115	68.64	-30.34	38.30	74.00	-35.70	peak	P
5	5090.007	68.09	-28.27	39.82	74.00	-34.18	peak	P
6 *	7631.011	70.19	-26.25	43.94	74.00	-30.06	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1097.221	68.69	-29.92	38.77	74.00	-35.23	peak	P
2	1936.223	66.92	-31.63	35.29	74.00	-38.71	peak	P
3	3006.130	66.71	-29.89	36.82	74.00	-37.18	peak	P
4	4266.004	65.42	-30.36	35.06	74.00	-38.94	peak	P
5	6320.309	66.97	-26.30	40.67	74.00	-33.33	peak	P
6 *	8680.950	68.11	-25.63	42.48	74.00	-31.52	peak	P

Above 1G (1GHz~26.5GHz)	Test mode: 1MHz	Test Channel:19

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1300.106	66.85	-31.07	35.78	74.00	-38.22	peak	P
2	2022.600	71.44	-31.52	39.92	74.00	-34.08	peak	P
3	2891.926	73.32	-30.15	43.17	74.00	-30.83	peak	P
4	3877.906	71.03	-30.40	40.63	74.00	-33.37	peak	P
5	4930.721	69.15	-28.66	40.49	74.00	-33.51	peak	P
6 *	7946.135	71.13	-26.14	44.99	74.00	-29.01	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1181.146	65.20	-30.40	34.80	74.00	-39.20	peak	P
2	1954.779	67.17	-31.60	35.57	74.00	-38.43	peak	P
3	3152.969	66.11	-29.89	36.22	74.00	-37.78	peak	P
4	4754.381	68.73	-29.29	39.44	74.00	-34.56	peak	P
5 *	6669.394	70.93	-25.94	44.99	74.00	-29.01	peak	P
6	10508.501	69.04	-25.43	43.61	74.00	-30.39	peak	P

Above 1G (1GHz~26.5GHz)	Test mode: 1MHz	Test Channel:39

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1264.527	63.69	-30.87	32.82	74.00	-41.18	peak	P
2	1954.779	63.17	-31.60	31.57	74.00	-42.43	peak	P
3	3307.937	65.18	-29.90	35.28	74.00	-38.72	peak	P
4	4986.617	64.19	-28.47	35.72	74.00	-38.28	peak	P
5	6682.902	71.12	-25.92	45.20	74.00	-28.80	peak	P
6 *	10841.708	71.32	-24.73	46.59	74.00	-27.41	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1193.156	66.18	-30.47	35.71	74.00	-38.29	peak	P
2	2022.600	67.94	-31.52	36.42	74.00	-37.58	peak	P
3	3502.771	66.35	-29.90	36.45	74.00	-37.55	peak	P
4	5090.007	66.09	-28.27	37.82	74.00	-36.18	peak	P
5	6682.902	70.62	-25.92	44.70	74.00	-29.30	peak	P
6 *	11053.709	72.65	-24.43	48.22	74.00	-25.78	peak	P

Above 1G (1GHz~26.5GHz)	Test mode: 2MHz	Test Channel:0

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1220.361	65.25	-30.62	34.63	74.00	-39.37	peak	P
2	1814.835	64.57	-31.79	32.78	74.00	-41.22	peak	P
3	2833.183	66.80	-30.29	36.51	74.00	-37.49	peak	P
4	4580.374	66.30	-29.90	36.40	74.00	-37.60	peak	P
5	6872.919	66.69	-25.76	40.93	74.00	-33.07	peak	P
6 *	10873.090	70.23	-24.66	45.57	74.00	-28.43	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2891.926	67.82	-30.15	37.67	74.00	-36.33	peak	P
2	3877.906	66.03	-30.40	35.63	74.00	-38.37	peak	P
3	5090.007	66.59	-28.27	38.32	74.00	-35.68	peak	P
4	7275.622	71.60	-26.00	45.60	74.00	-28.40	peak	P
5	8499.703	72.45	-25.79	46.66	74.00	-27.34	peak	P
6 *	10209.114	72.80	-24.95	47.85	74.00	-26.15	peak	P

Above 1G (1GHz~26.5GHz)	Test mode: 2MHz	Test Channel:19

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3244.494	64.79	-29.89	34.90	74.00	-39.10	peak	P
2	3915.071	65.23	-30.45	34.78	74.00	-39.22	peak	P
3	5527.054	65.85	-27.57	38.28	74.00	-35.72	peak	P
4	6598.449	68.16	-25.99	42.17	74.00	-31.83	peak	P
5	8499.703	70.45	-25.79	44.66	74.00	-29.34	peak	P
6 *	11490.229	73.74	-24.63	49.11	74.00	-24.89	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3252.945	63.99	-29.90	34.09	74.00	-39.91	peak	P
2	3911.678	64.80	-30.45	34.35	74.00	-39.65	peak	P
3	4986.617	63.69	-28.47	35.22	74.00	-38.78	peak	P
4	6149.124	64.53	-26.50	38.03	74.00	-35.97	peak	P
5	7631.011	71.69	-26.25	45.44	74.00	-28.56	peak	P
6 *	11053.709	73.65	-24.43	49.22	74.00	-24.78	peak	P

Above 1G (1GHz~26.5GHz)	Test mode: 2MHz	Test Channel:39

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2837.281	65.85	-30.27	35.58	74.00	-38.42	peak	P
2	3502.771	66.85	-29.90	36.95	74.00	-37.05	peak	P
3	4505.530	66.73	-30.17	36.56	74.00	-37.44	peak	P
4	5588.094	66.20	-27.45	38.75	74.00	-35.25	peak	P
5	6910.767	69.44	-25.72	43.72	74.00	-30.28	peak	P
6 *	9144.546	70.57	-25.11	45.46	74.00	-28.54	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1406.850	60.62	-31.68	28.94	74.00	-45.06	peak	P
2	1875.630	64.57	-31.70	32.87	74.00	-41.13	peak	P
3	3453.511	66.57	-29.90	36.67	74.00	-37.33	peak	P
4	5965.308	65.62	-26.75	38.87	74.00	-35.13	peak	P
5	10289.097	68.93	-25.09	43.84	74.00	-30.16	peak	P
6 *	12415.665	70.86	-22.84	48.02	74.00	-25.98	peak	P

4) Band Edge

Test mode:	GFSK	Test Channel:	0

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	41.88	-5.05	36.83	74.00	-37.17	peak	P
2	2390.000	40.41	-4.97	35.44	74.00	-38.56	peak	P
3 *	2400.000	56.25	-4.96	51.29	74.00	-22.71	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	38.38	-5.05	33.33	74.00	-40.67	peak	P
2	2390.000	40.41	-4.97	35.44	74.00	-38.56	peak	P
3 *	2400.000	55.75	-4.96	50.79	74.00	-23.21	peak	P

Test mode:	GFSK	Test Channel:	39

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	47.93	-4.89	43.04	74.00	-30.96	peak	P
2	2500.000	41.33	-4.87	36.46	74.00	-37.54	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	47.33	-6.29	41.04	74.00	-32.96	peak	P
2	2500.000	42.23	-6.27	35.96	74.00	-38.04	peak	P

Test mode:	GFSK	Test Channel:	0

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	40.78	-5.05	35.73	74.00	-38.27	peak	P
2	2390.000	41.49	-4.97	36.52	74.00	-37.48	peak	P
3 *	2400.000	55.96	-4.96	51.00	74.00	-23.00	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	37.78	-5.05	32.73	74.00	-41.27	peak	P
2	2390.000	39.99	-4.97	35.02	74.00	-38.98	peak	P
3 *	2400.000	57.96	-4.96	53.00	74.00	-21.00	peak	P

Test mode:	GFSK	Test Channel:	39

HORIZONTAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	49.62	-4.89	44.73	74.00	-29.27	peak	P
2	2500.000	40.86	-4.87	35.99	74.00	-38.01	peak	P

VERTICAL

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	73.82	-31.09	42.73	74.00	-31.27	peak	P
2	2500.000	64.56	-31.07	33.49	74.00	-40.51	peak	P

3.3 Spurious Emission at Antenna Port

3.3.1 Limit

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 Output Power limits. If the transmitter complies with the Output 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 Section 15.209(a) is not required. 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)).

3.3.2 Test Procedure

Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
● Lowest, Middle and Highest Channel	○ Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

a) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

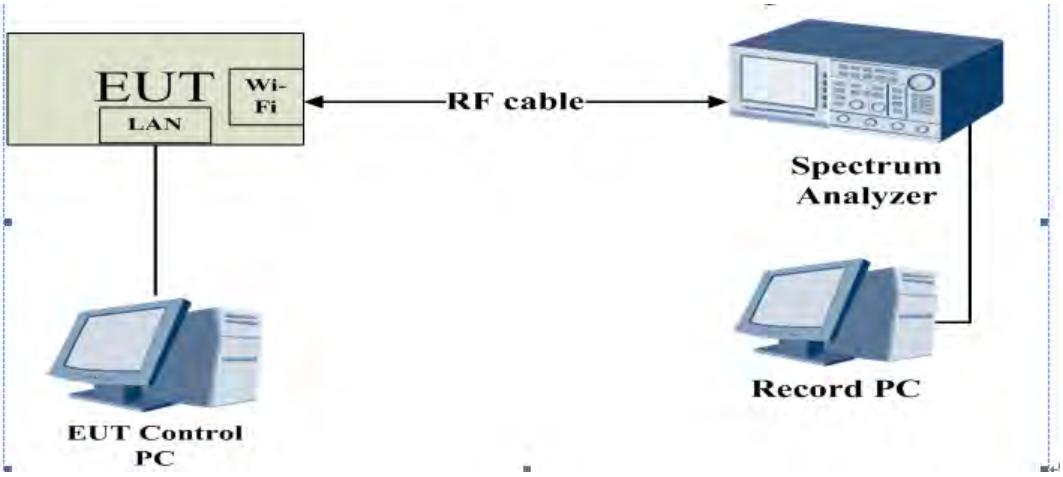
b) Spectrum Setting as below:

Centre Frequency	The centre frequency of the channel under test
RBW	100 kHz
VBW	300 kHz
Frequency span	2 x Nominal Channel Bandwidth
Detector Mode	Peak
Trace Mode	Max Hold
Sweep Time	Auto Couple

c) Allow trace to full stabilize.

d) Use the peak marker function to determine the maximum power level in any 100kHz band segment within the fundamental EBW.

3.3.3 Test Setup



3.3.4 The Result

3.3.5.1. Conducted Spurious Emission

Please Refer to Appendix for Details.

3.3.5.2. Band edge measurements

Please Refer to Appendix for Details.

3.4 20dB Occupy Bandwidth

3.4.1 Limit

N/A

3.4.2 Test Procedure

Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
●Lowest, Middle and Highest Channel	○ Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

e) The EUT shall be connected to the spectrum analyser, and the spectrum analyser is set as follow:

Centre Frequency	The centre frequency of the channel under test
RBW	100kHz
VBW	300kHz
Frequency span	2x Nominal Channel Bandwidth
Detector Mode	Peak
Trace Mode	Max Hold
Sweep Time	Auto Couple

f) 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.

g) Set to the maximum power setting and enable the EUT transmit continuously.

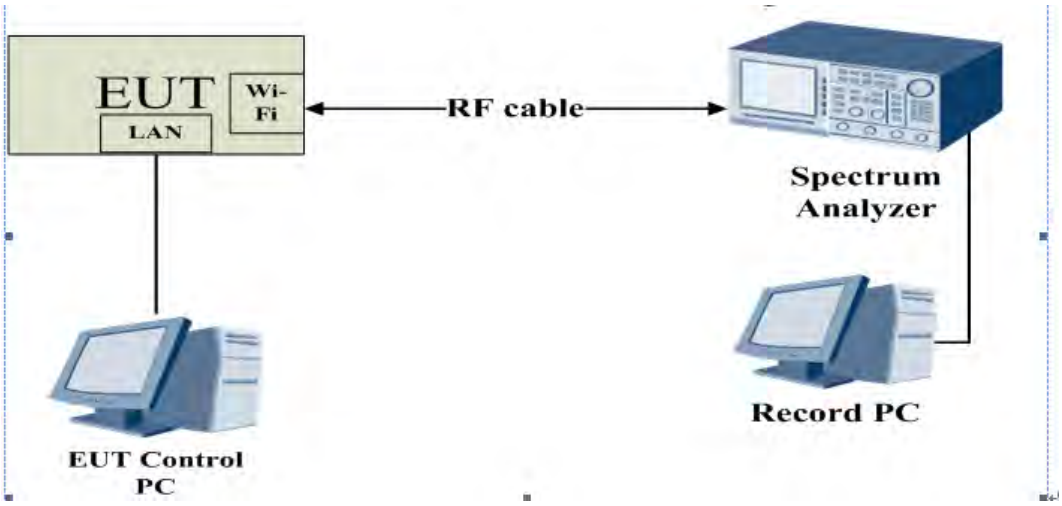
h) Use the following spectrum analyzer settings for 20dB Bandwidth measurement.

Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel; 1%≤RBW ≤5% of the 20 dB bandwidth; VBW≥3RBW;

Sweep = auto; Detector function = peak; Trace = max hold.

i) Measure and record the results in the test report.

3.4.3 Test Setup



3.4.4 Test Result

Please Refer to Appendix for Details.

3.5 Maximum conducted (average) output power

3.5.1 Limit

For systems using digital modulation in the 2400~2483.5MHz, The Maximum output Power shall not exceed 1W(30dBm)

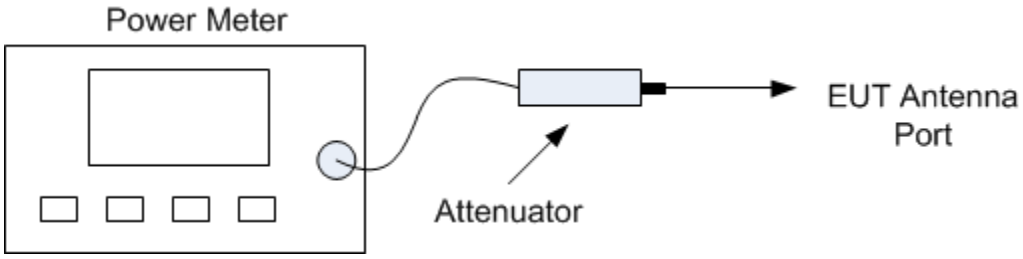
3.5.2 Test Procedure

Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
●Lowest, Middle and Highest Channel	○ Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

a) The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.

b) The maximum output power was performed in accordance with method 11.9.2.3 of ANSI C63.10.

3.5.3 Test Setup



3.5.4 The Result

Please Refer to Appendix for Details.

3.6 Power Spectral Density

3.6.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

3.6.2 Test Peripherals

3.6.3 Test Procedure

Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
●Lowest, Middle and Highest Channel	○ Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

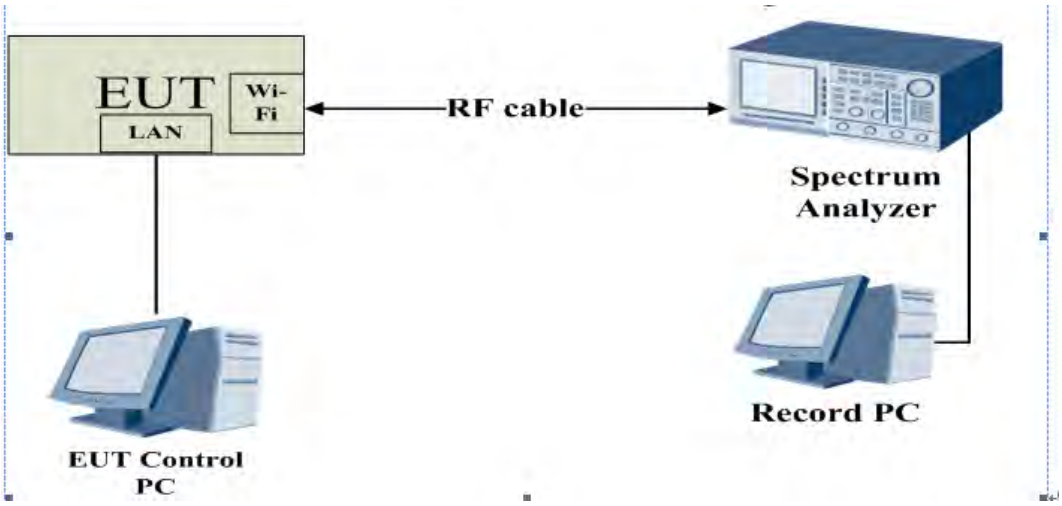
a) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below. Spectrum analyser settings as following:

RBW	3 kHz
VBW	10 kHz
Detector Mode	RMS
Trace Mode	Max Hold
Sweep Time	Auto

b) Wait for the trace to stabilize. Use the peak marker function to determine the maximum amplitude level within the RBW.

c) The value defined in step b shall be compared to the limits and be recorded .

3.6.4 Test Setup



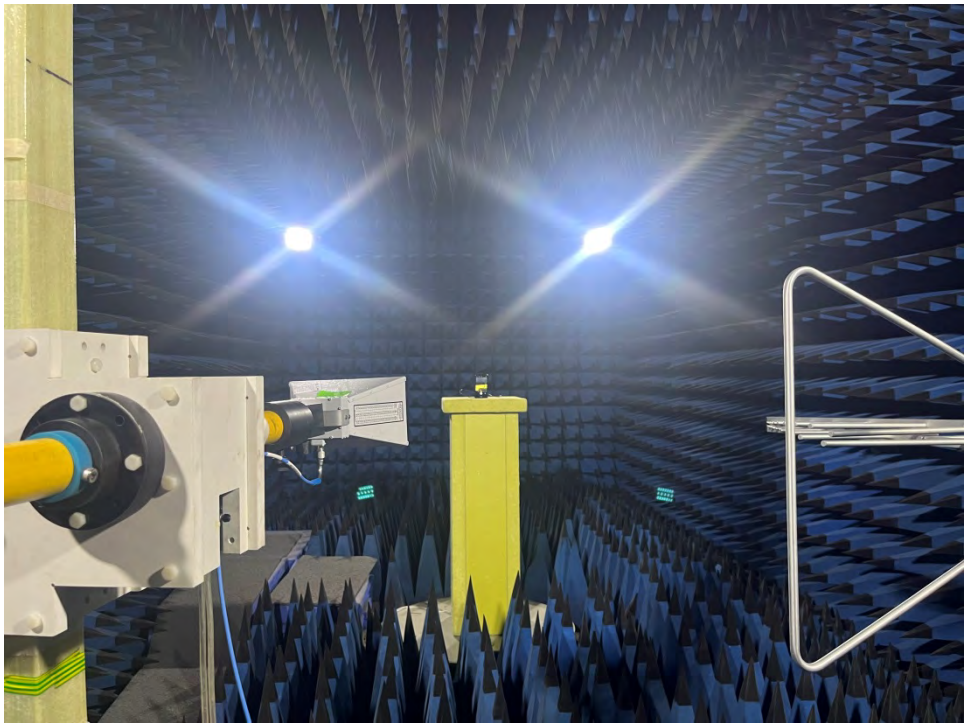
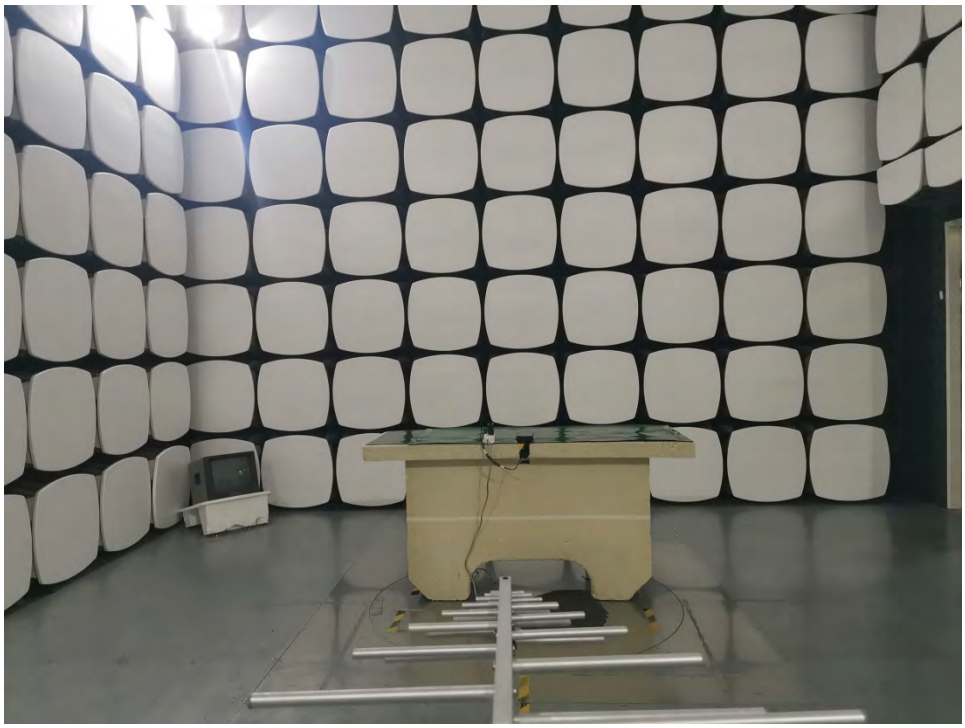
3.6.5 The Result

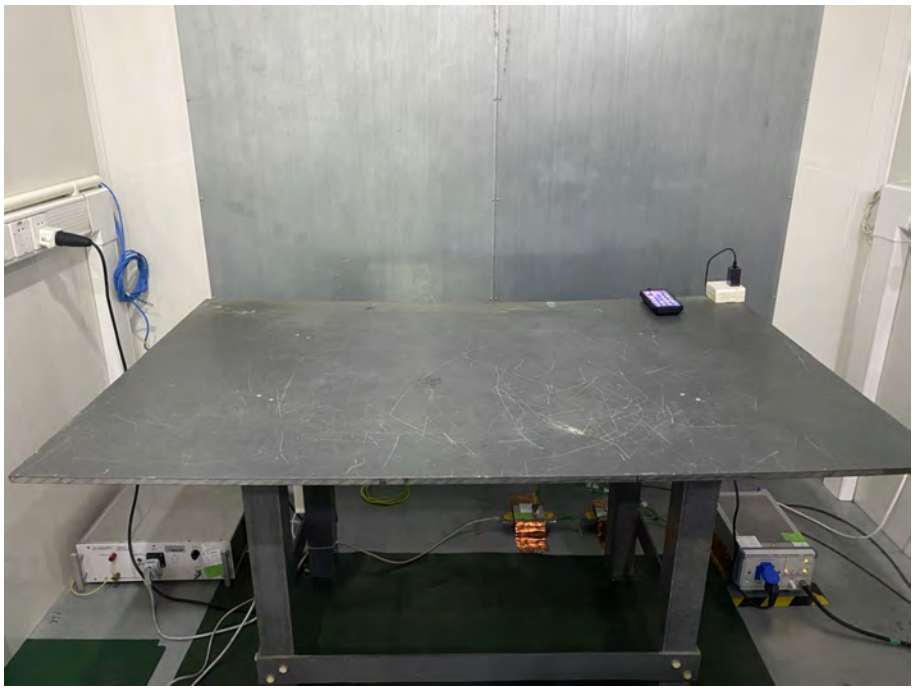
Please Refer to Appendix for Details.

4. Photographs of EUT

Refer to Report No: FCC2022-06453RF1 for EUT external and internal photos.

5. Photographs of Test Set-up

ERP/EIRP Test setup



CE


Appendix

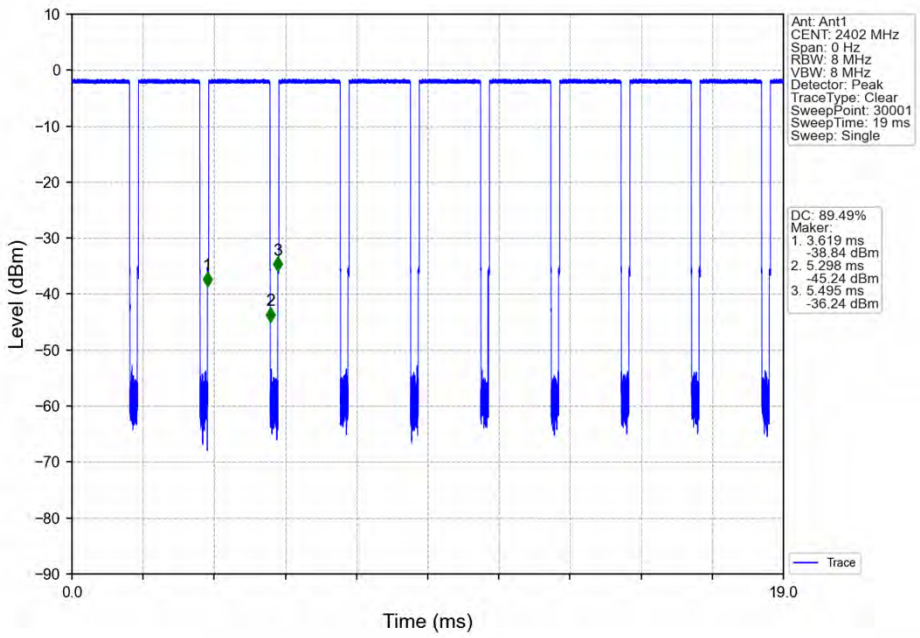
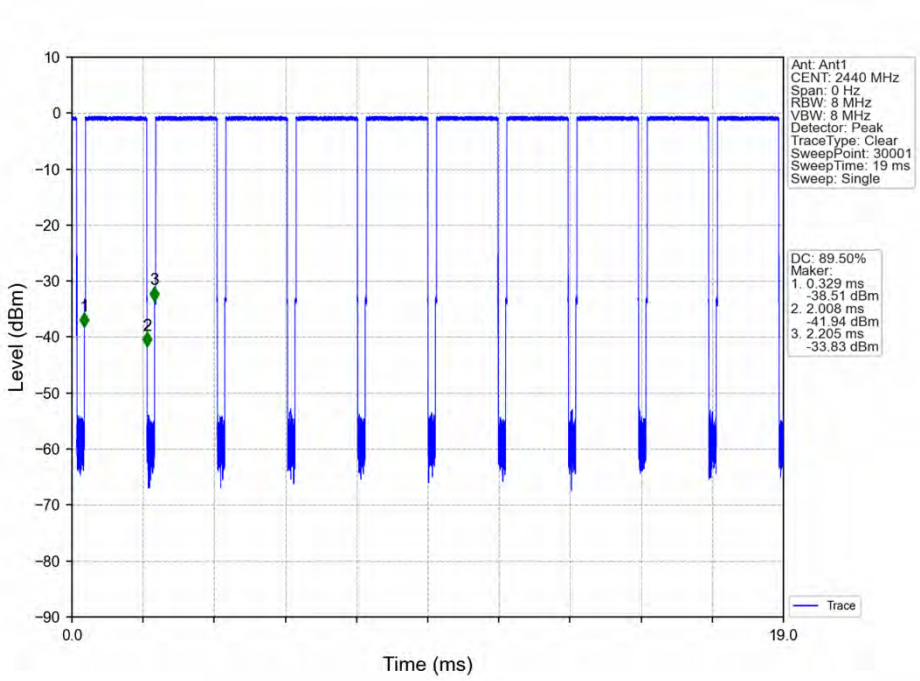
1. Duty Cycle

1.1 Ant1

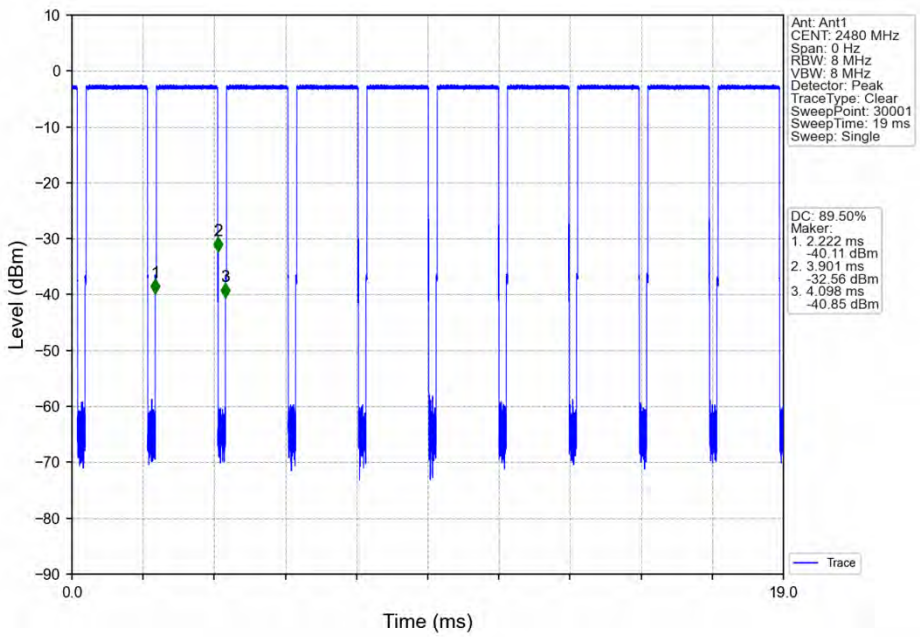
1.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1M	SISO	2402	1.678	1.875	89.49	0.48	0.03
		2440	1.679	1.876	89.50	0.48	0.03
		2480	1.679	1.876	89.50	0.48	0.03
2M	SISO	2402	0.825	1.251	65.95	1.81	0.03
		2440	0.824	1.250	65.92	1.81	0.02
		2480	0.825	1.250	66.00	1.80	0.03

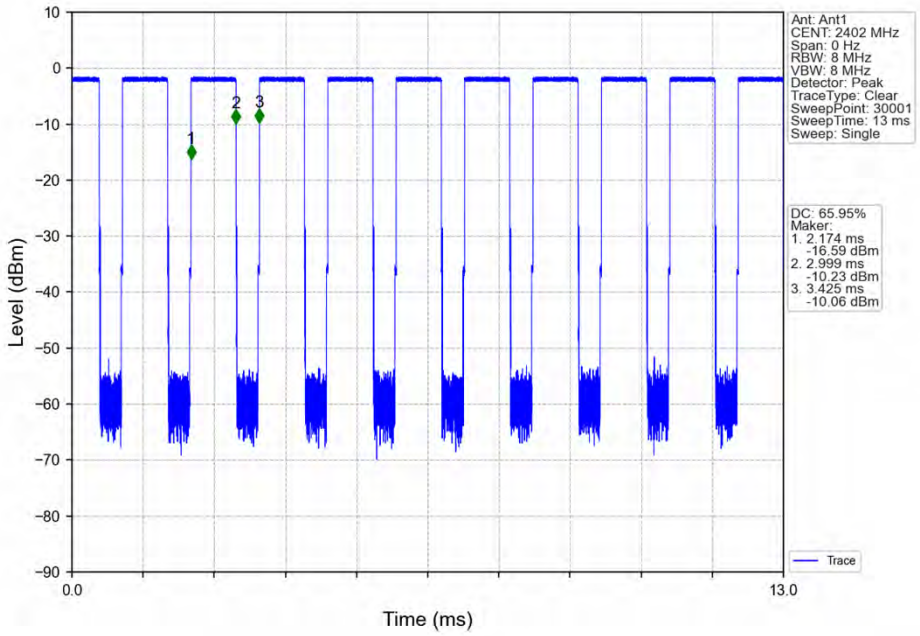
1.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV

1M_MCH_2440MHz_Ant1_NTNV


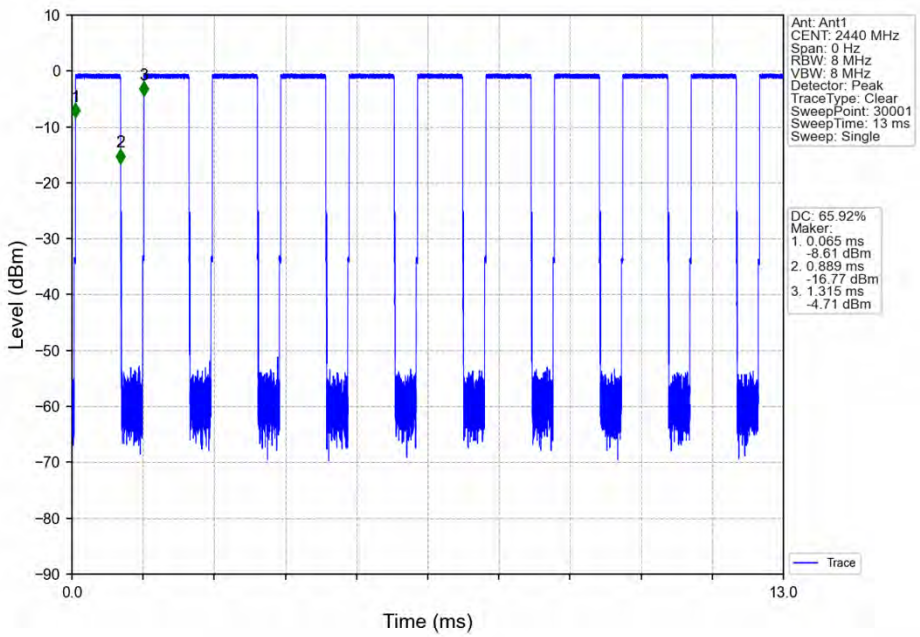
1M_HCH_2480MHz_Ant1_NTNV



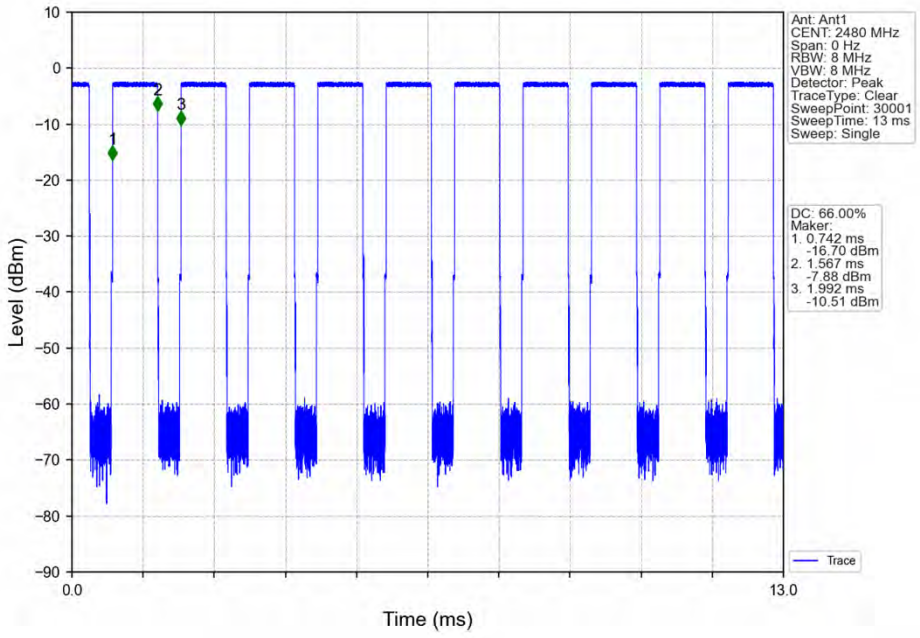
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



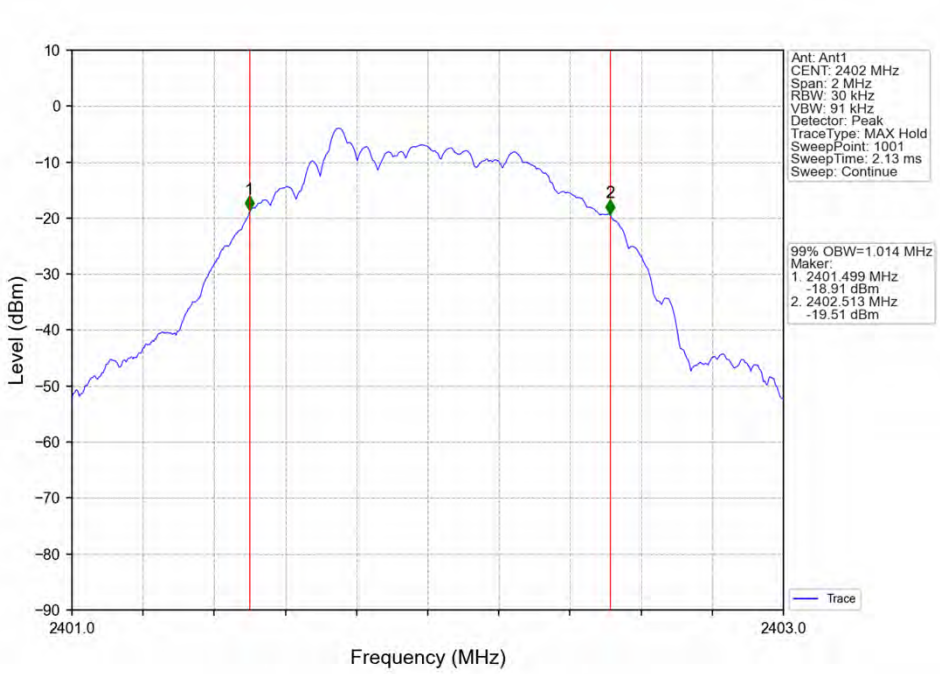
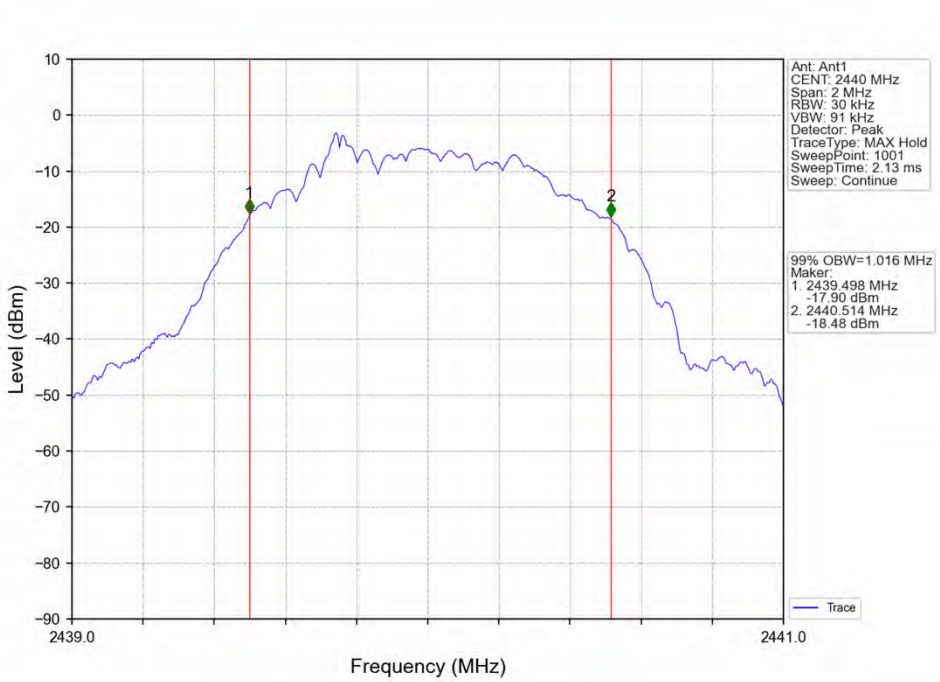
2. Bandwidth

2.1 OBW

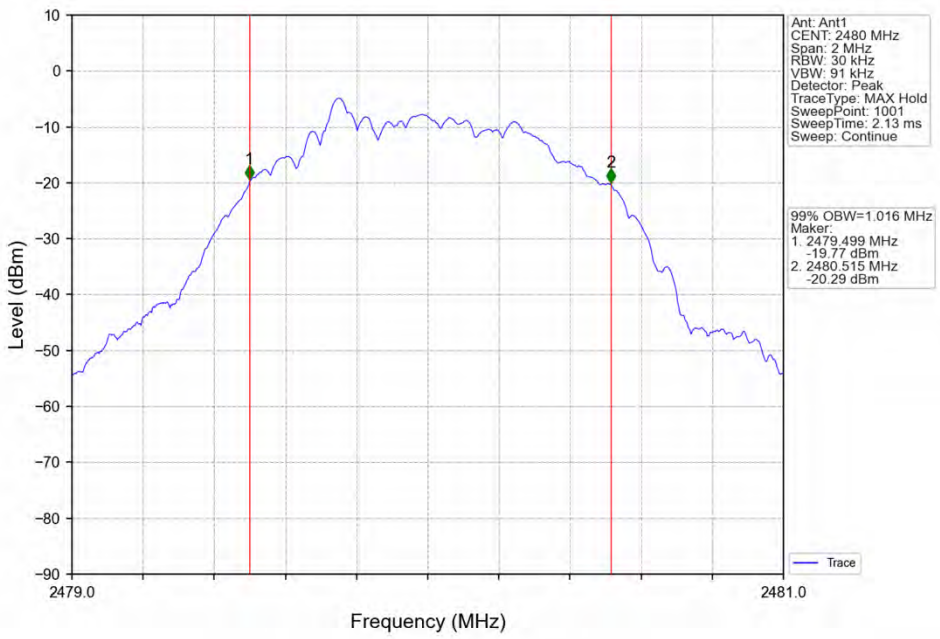
2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz) Result	Verdict
1M	SISO	2402	1	1.014	Pass
		2440	1	1.016	Pass
		2480	1	1.016	Pass
2M	SISO	2402	1	2.034	Pass
		2440	1	2.035	Pass
		2480	1	2.031	Pass

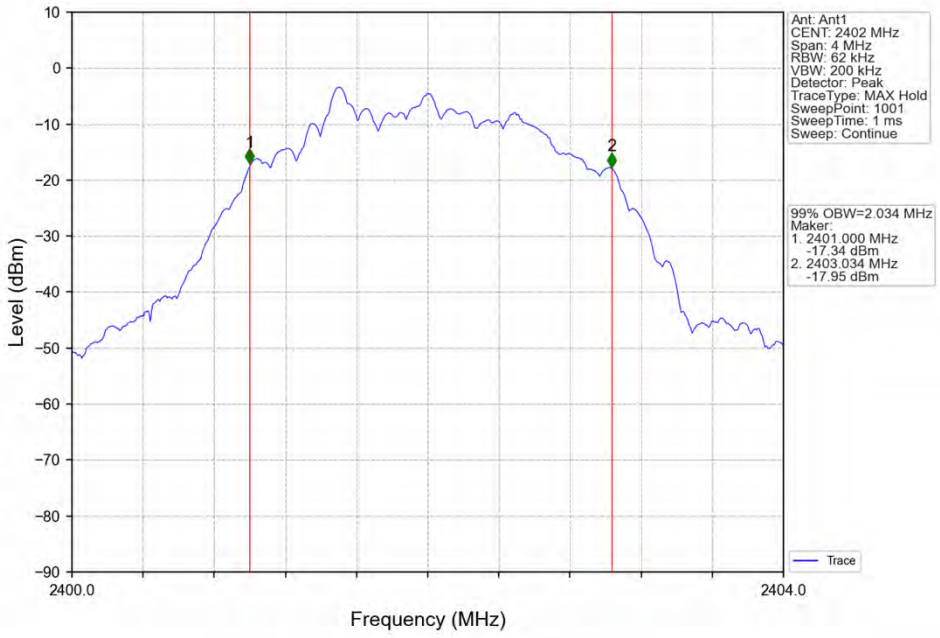
2.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV

1M_MCH_2440MHz_Ant1_NTNV


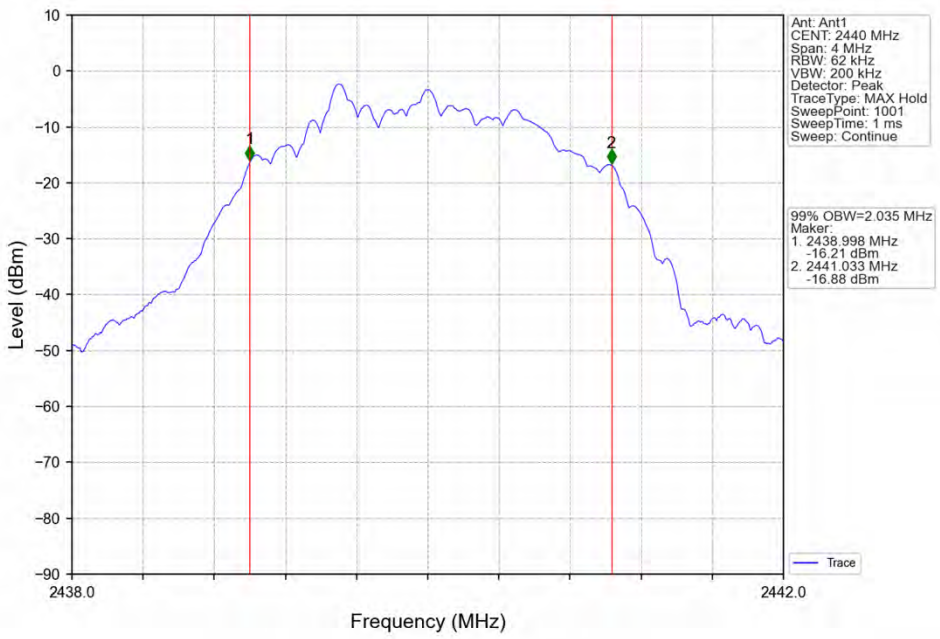
1M_HCH_2480MHz_Ant1_NTNV



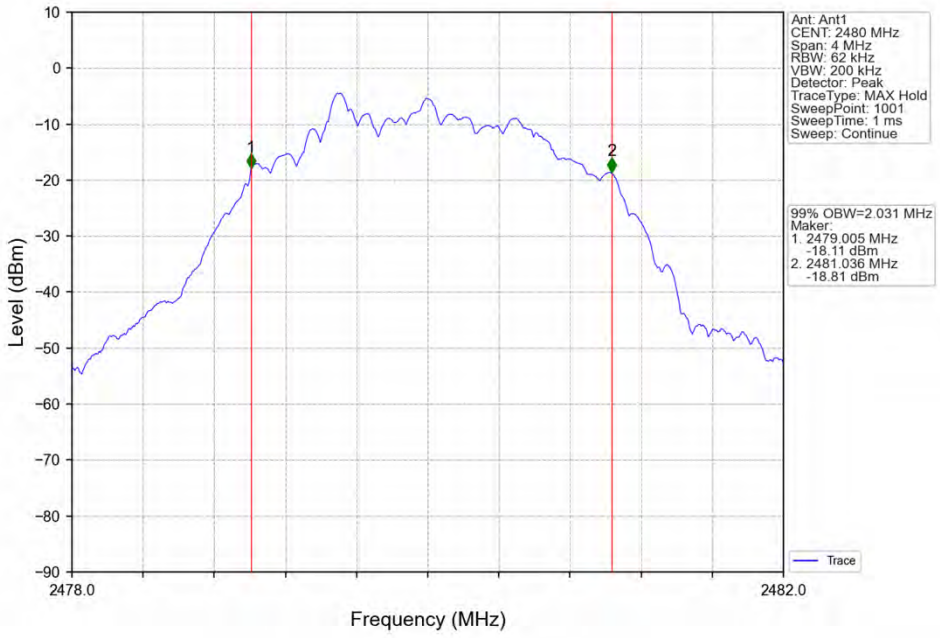
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV

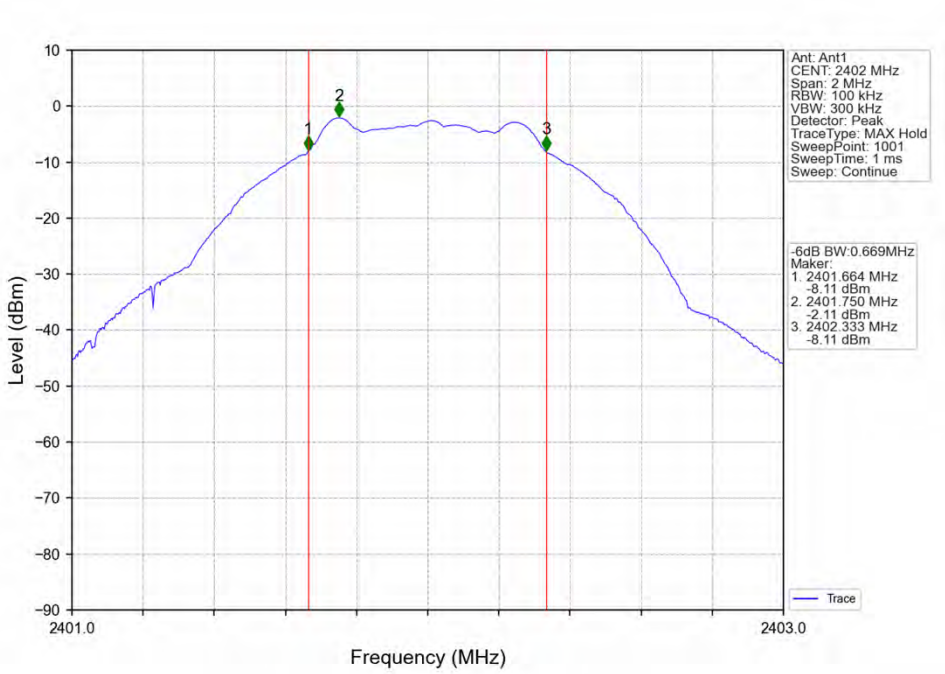
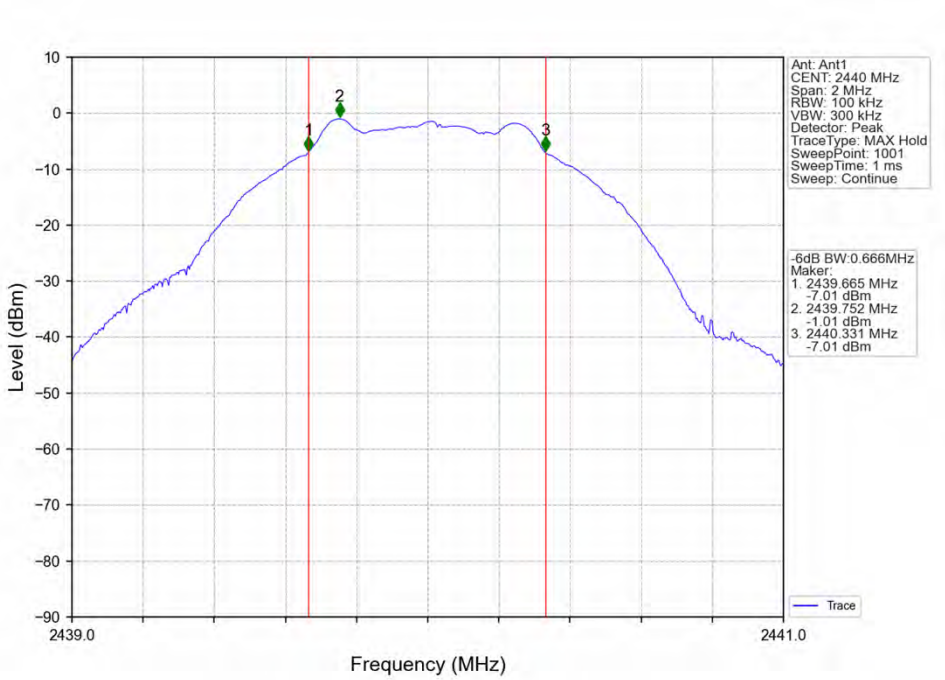


2.2 6dB BW

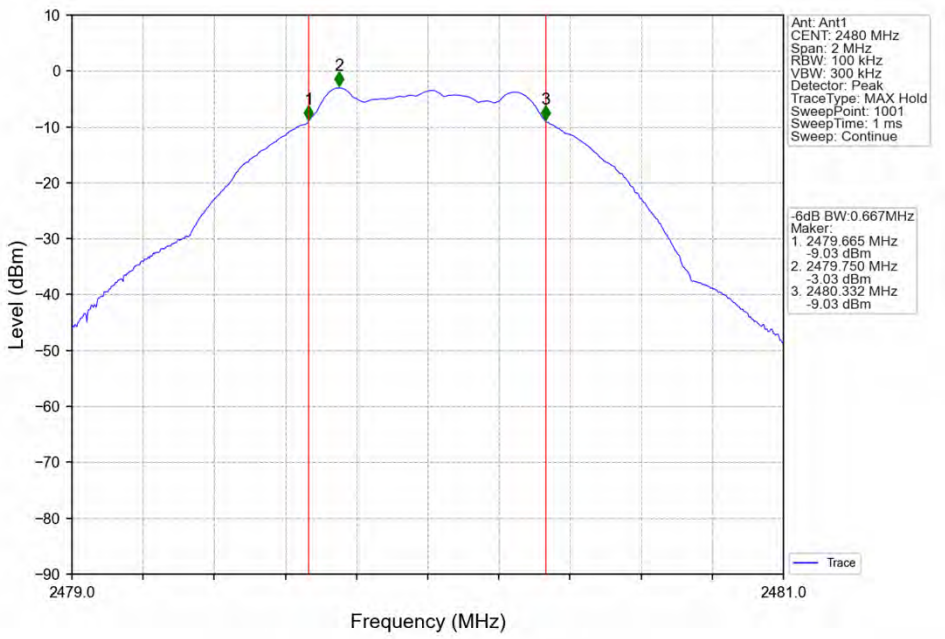
2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.669	>=0.5	Pass
		2440	1	0.666	>=0.5	Pass
		2480	1	0.667	>=0.5	Pass
2M	SISO	2402	1	1.175	>=0.5	Pass
		2440	1	1.171	>=0.5	Pass
		2480	1	1.174	>=0.5	Pass

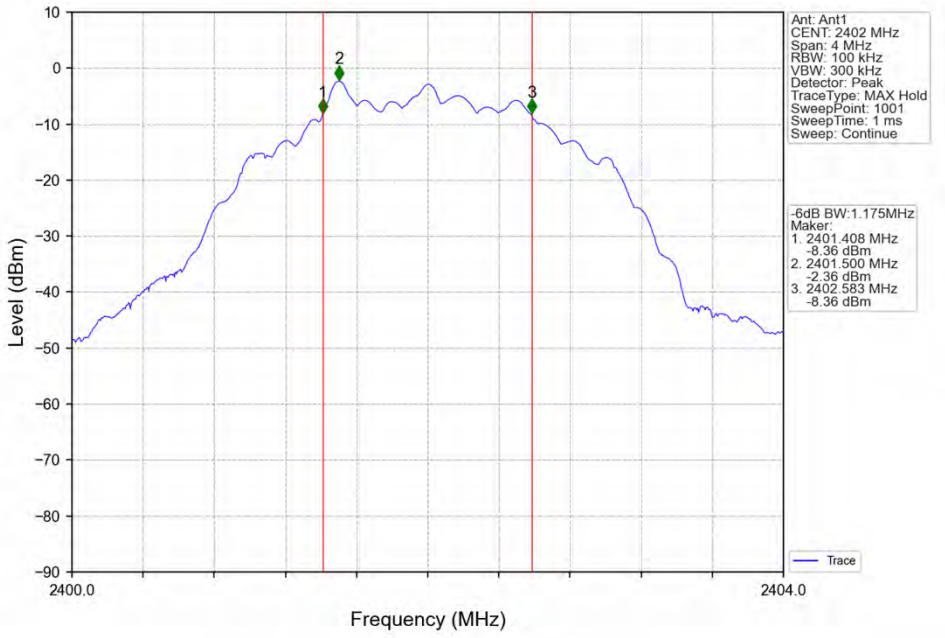
2.2.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV

1M_MCH_2440MHz_Ant1_NTNV


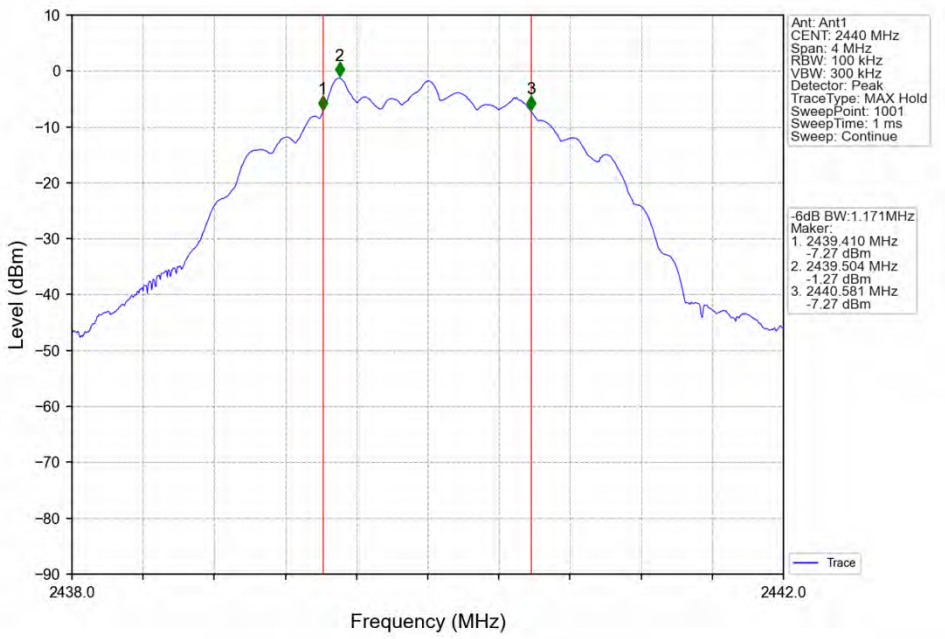
1M_HCH_2480MHz_Ant1_NTNV



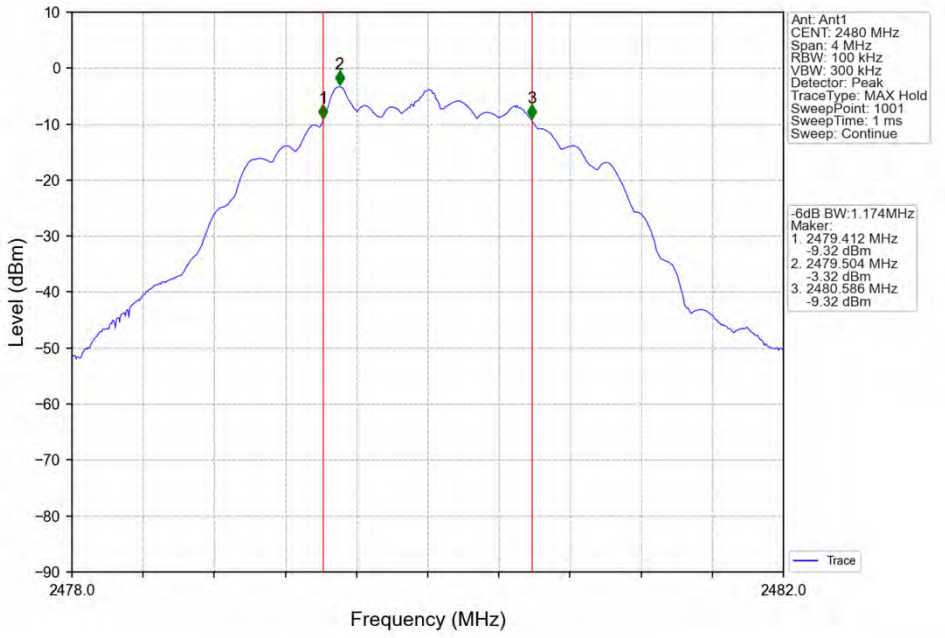
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



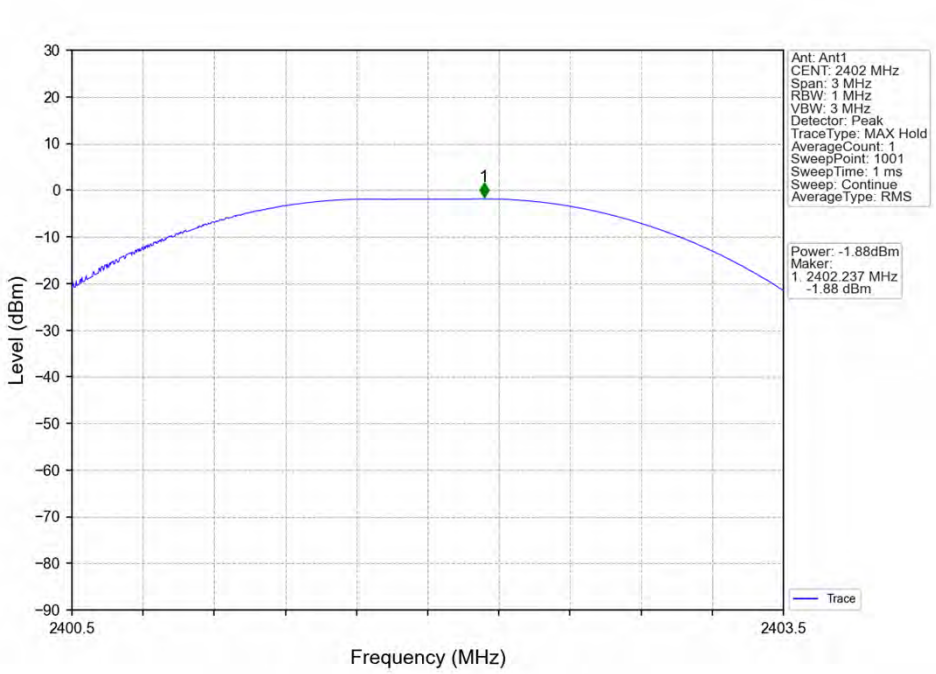
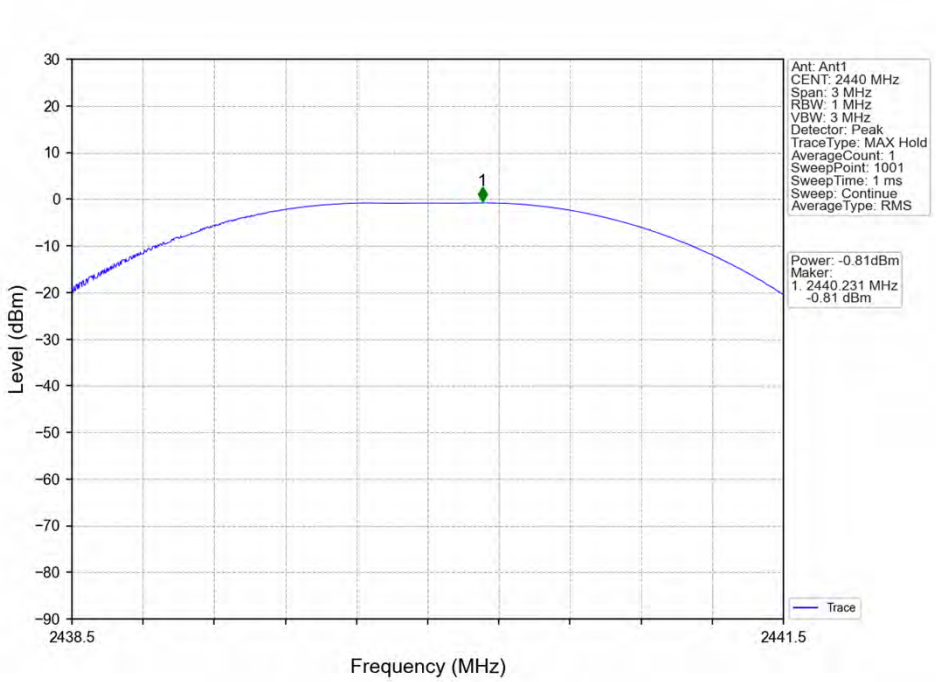
3. Maximum Conducted Output Power

3.1 Power

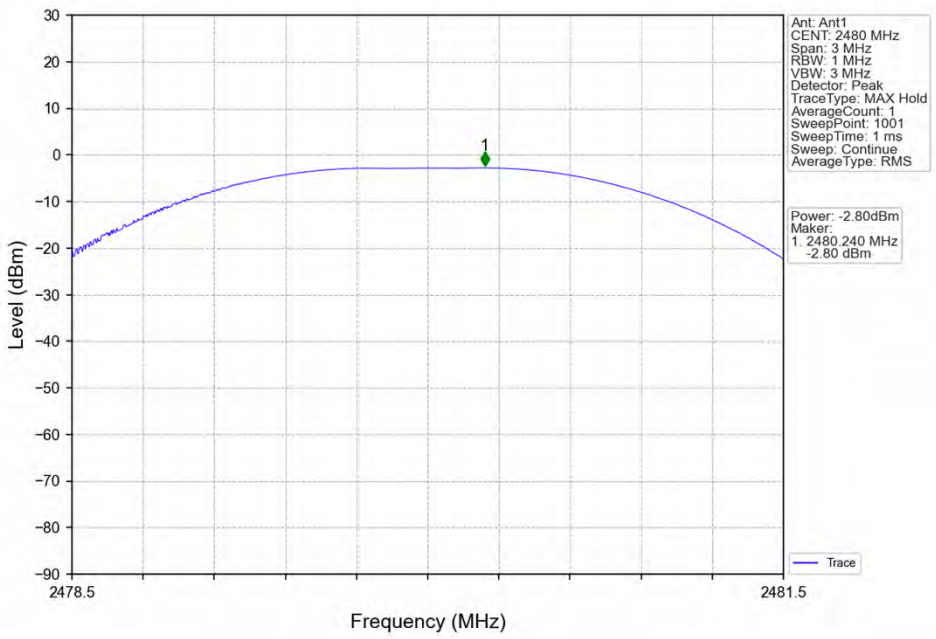
3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	-1.88	<=30	Pass
		2440	-0.81	<=30	Pass
		2480	-2.80	<=30	Pass
2M	SISO	2402	-1.85	<=30	Pass
		2440	-0.81	<=30	Pass
		2480	-2.79	<=30	Pass
Note1: Antenna Gain: Ant1: 0.36dBi;					

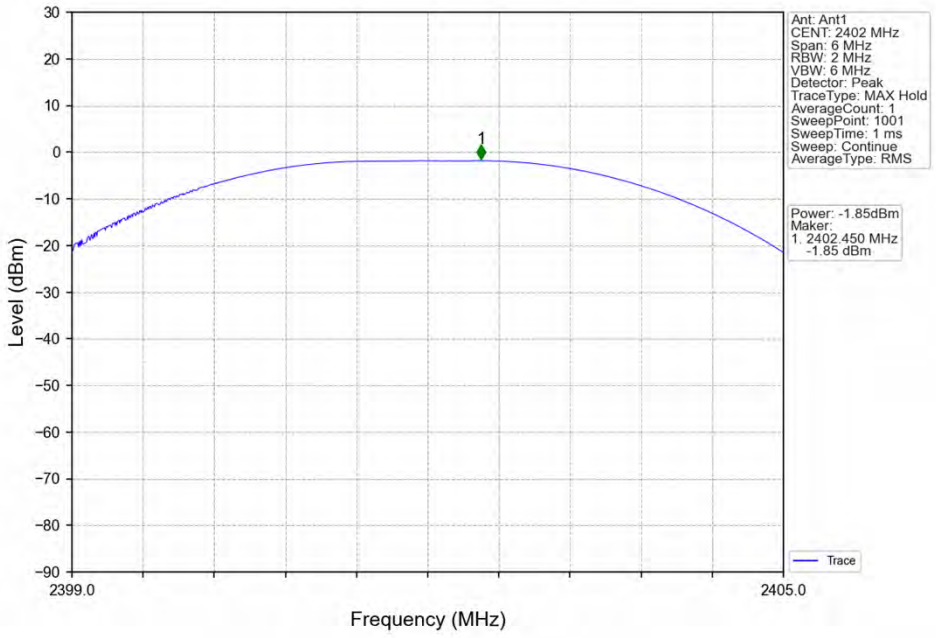
3.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV

1M_MCH_2440MHz_Ant1_NTNV


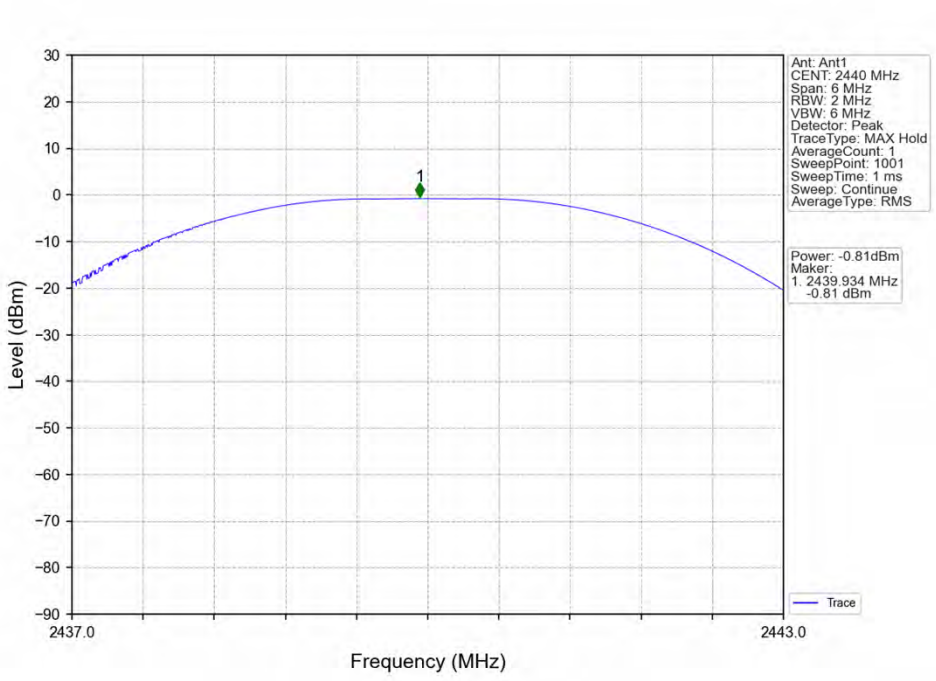
1M_HCH_2480MHz_Ant1_NTNV



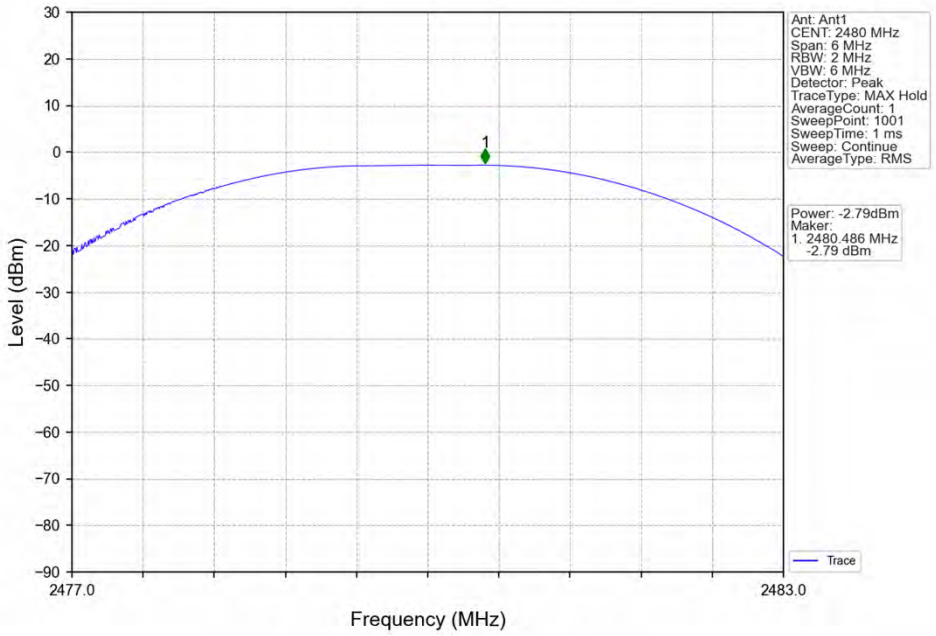
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



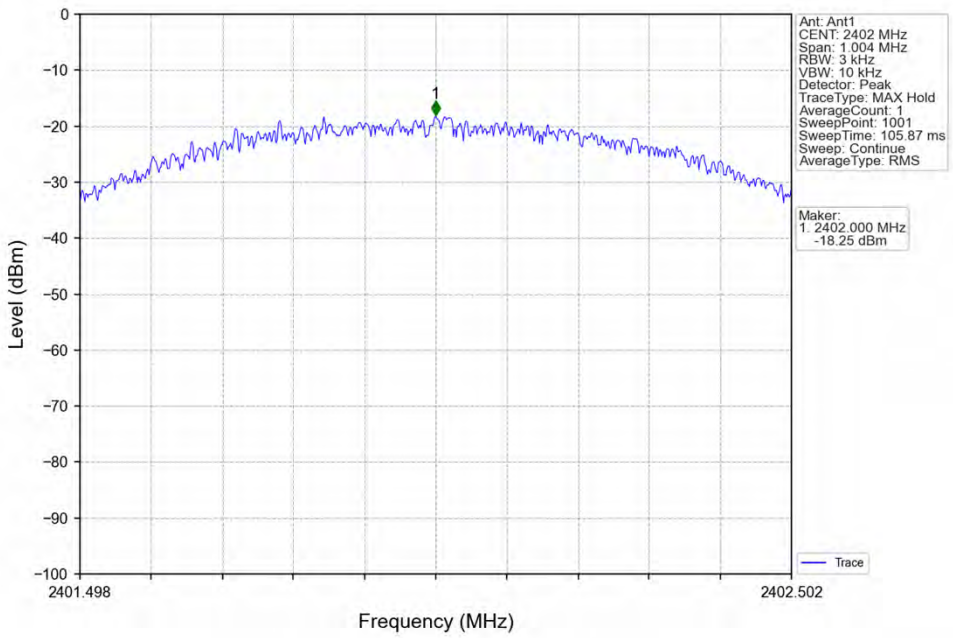
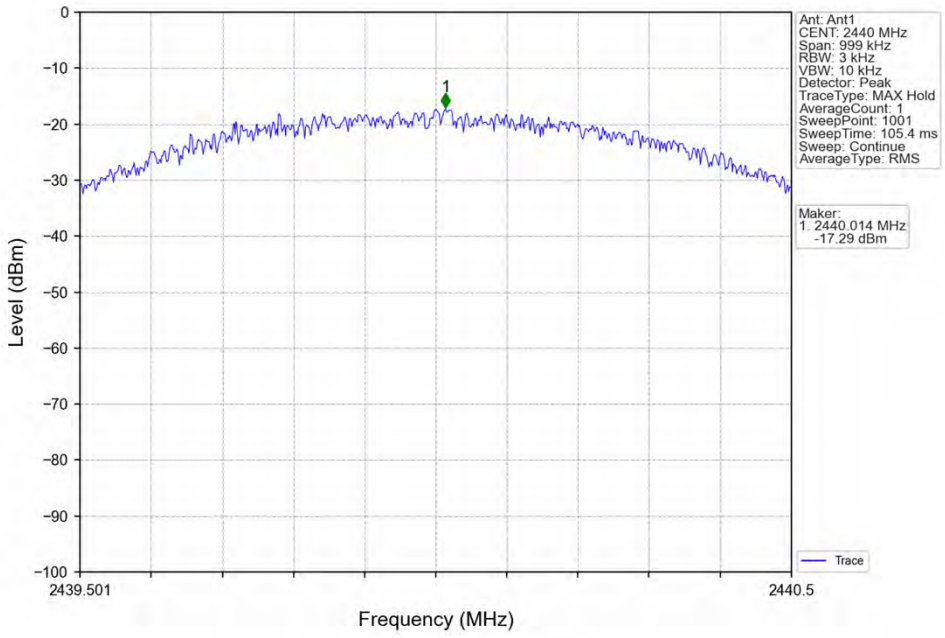
4. Maximum Power Spectral Density

4.1 PSD

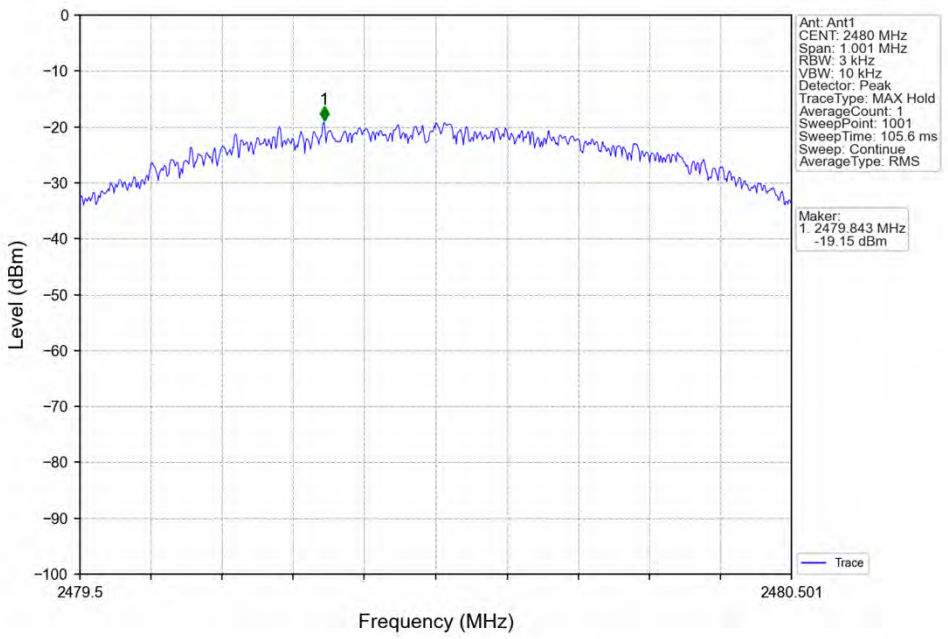
4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
1M	SISO	2402	-18.25	<=8	Pass
		2440	-17.29	<=8	Pass
		2480	-19.15	<=8	Pass
2M	SISO	2402	-21.67	<=8	Pass
		2440	-20.74	<=8	Pass
		2480	-22.54	<=8	Pass
Note1: Antenna Gain: Ant1: 0.36dBi;					

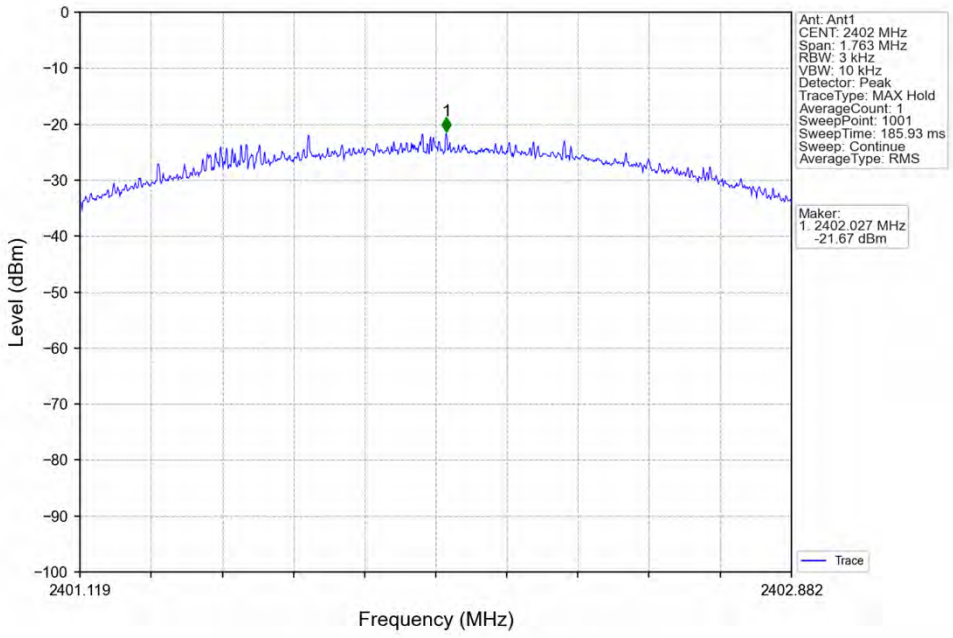
4.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV

1M_MCH_2440MHz_Ant1_NTNV


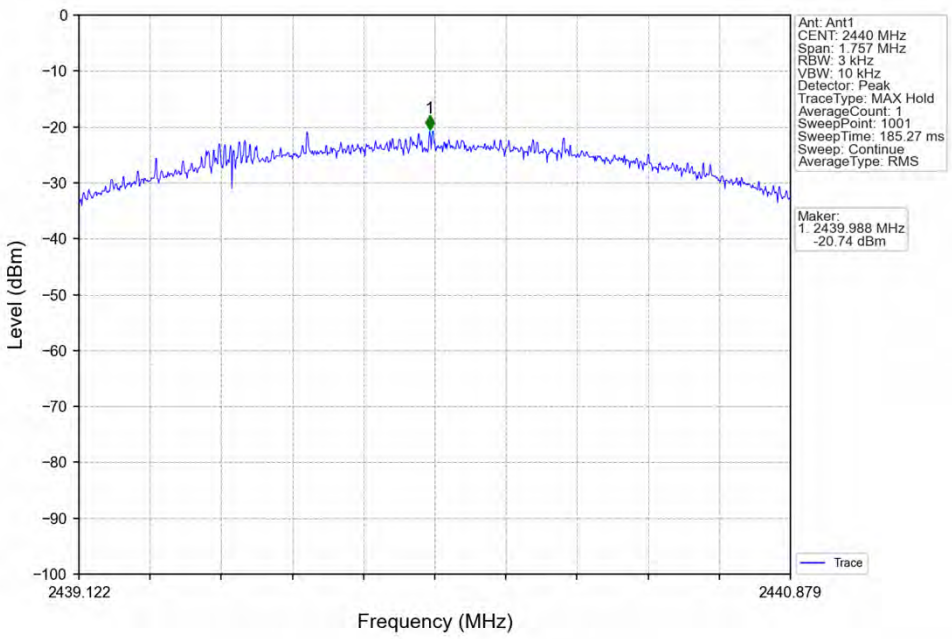
1M_HCH_2480MHz_Ant1_NTNV



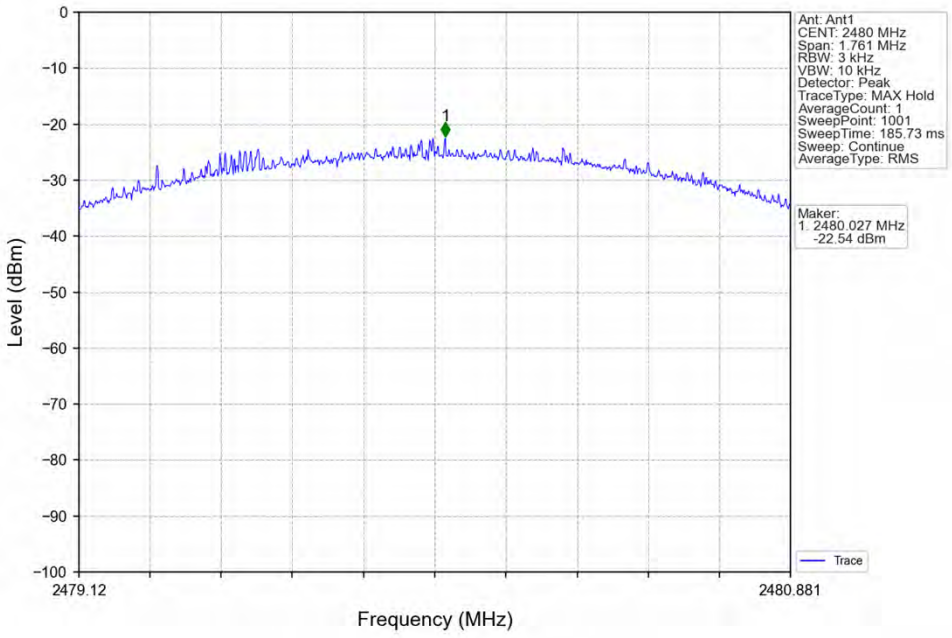
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



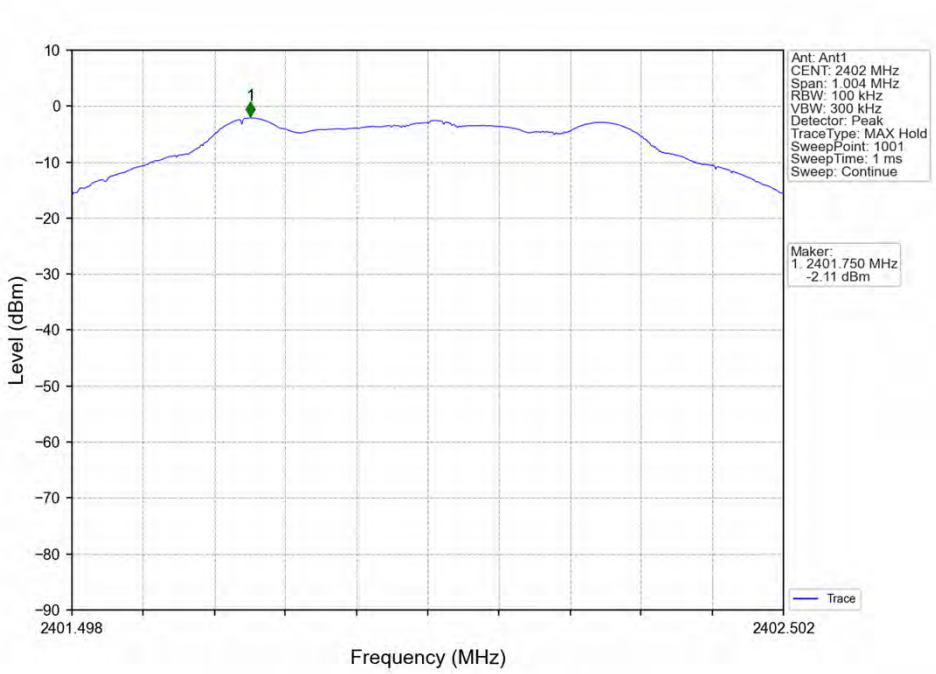
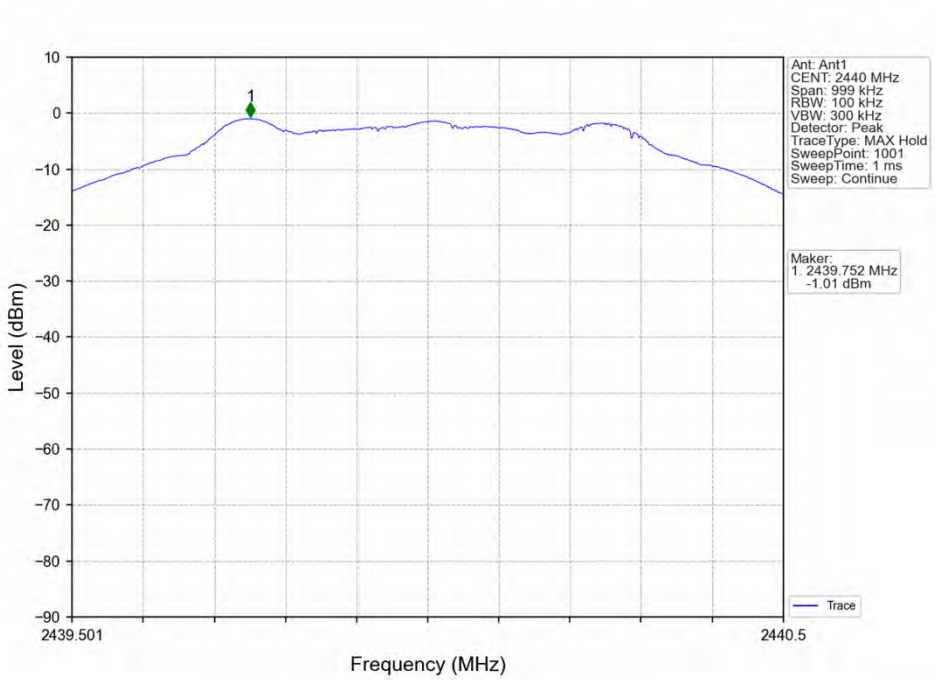
5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Ref

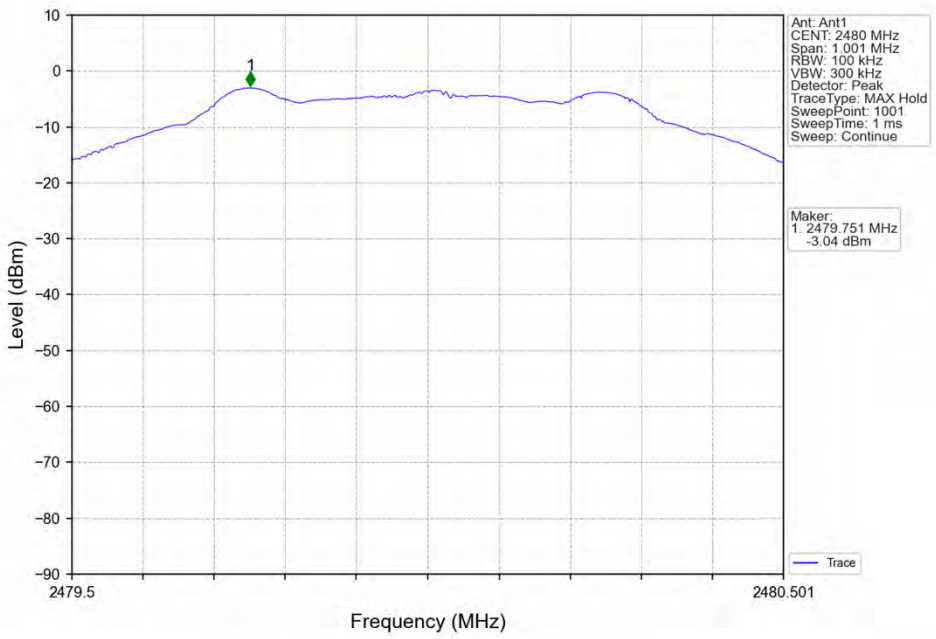
5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
1M	SISO	2402	1	-2.11
		2440	1	**-1.01**
		2480	1	-3.04
2M	SISO	2402	1	-2.39
		2440	1	**-1.28**
		2480	1	-3.34
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.				

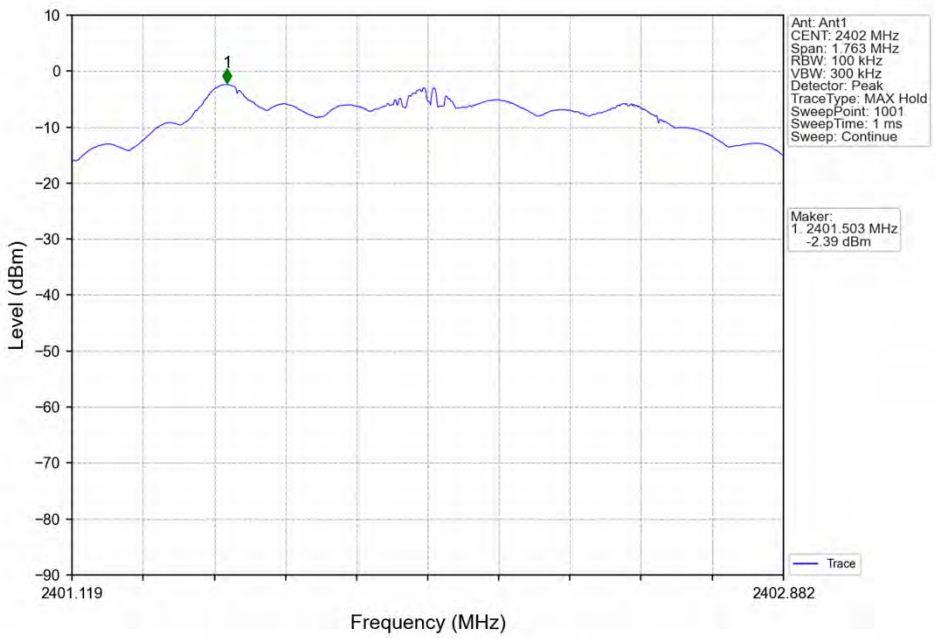
5.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV

1M_MCH_2440MHz_Ant1_NTNV


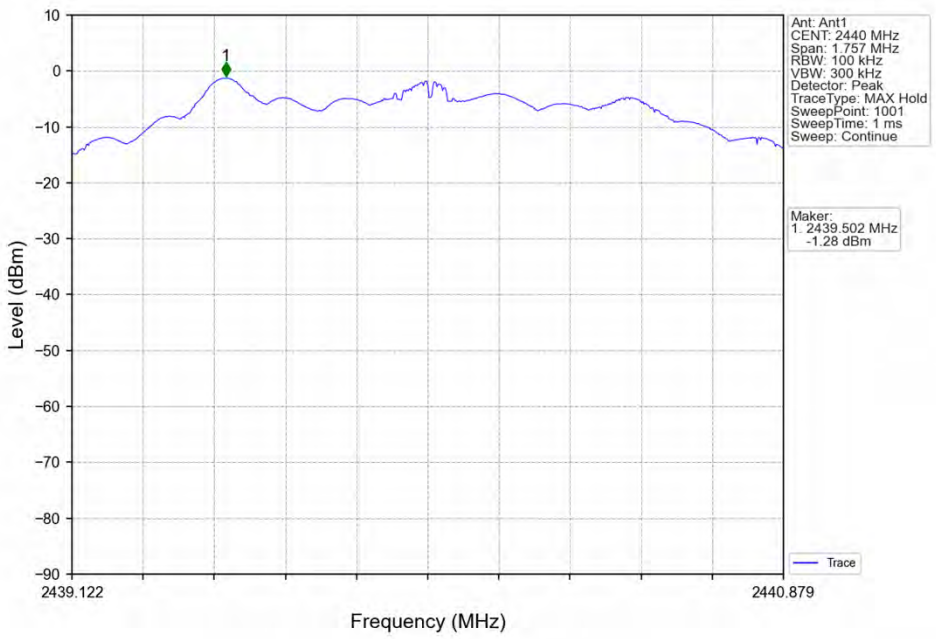
1M_HCH_2480MHz_Ant1_NTNV



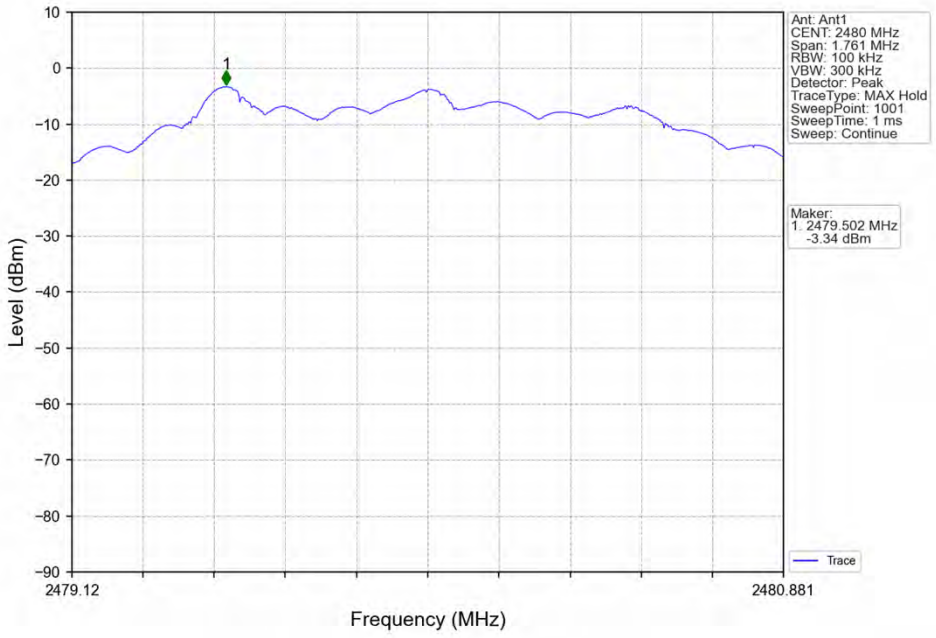
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV

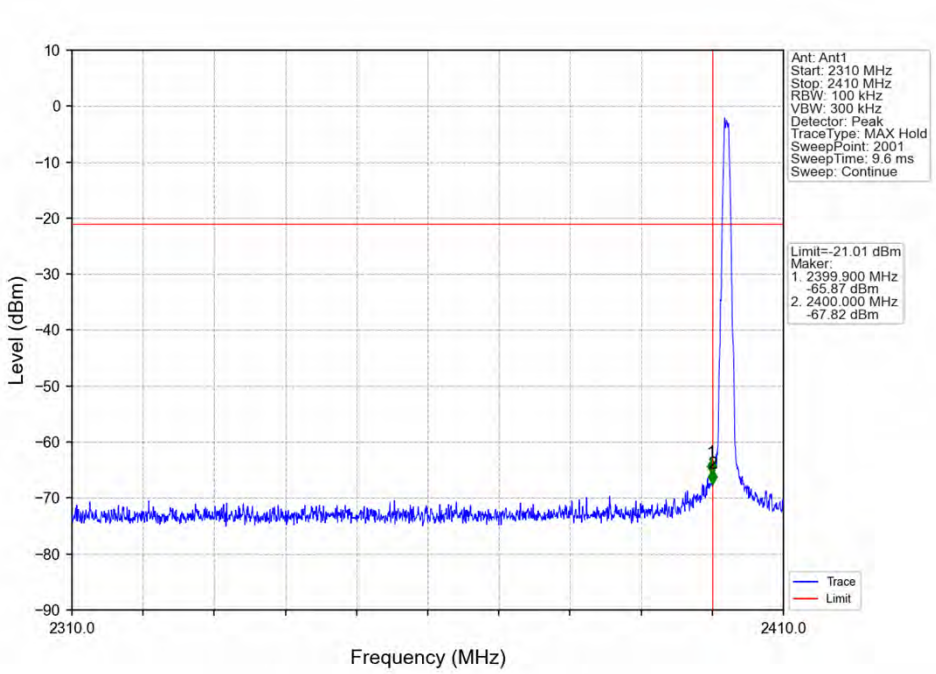
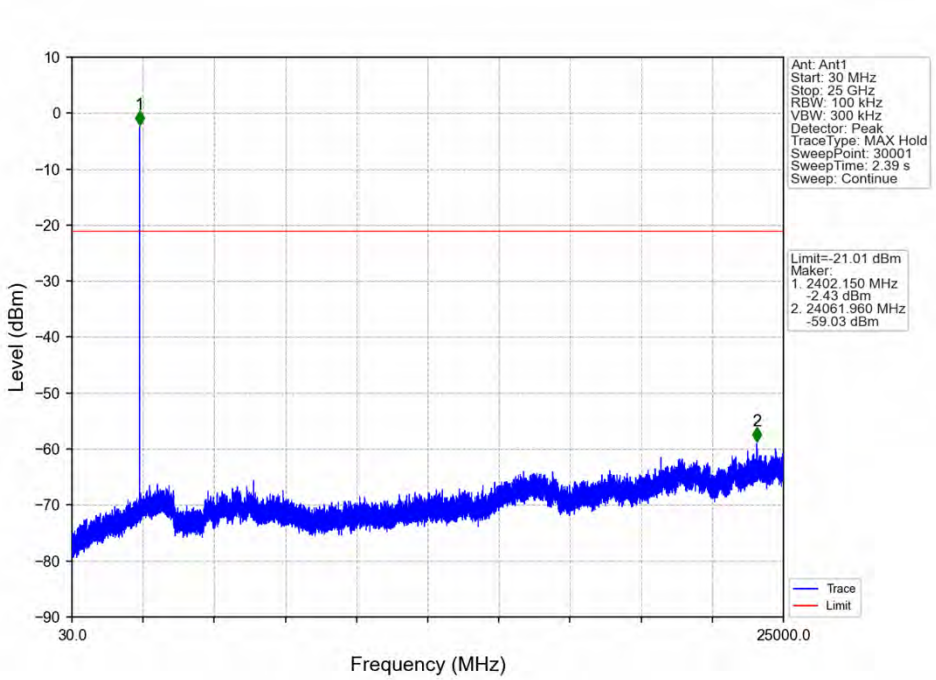


5.2 CSE

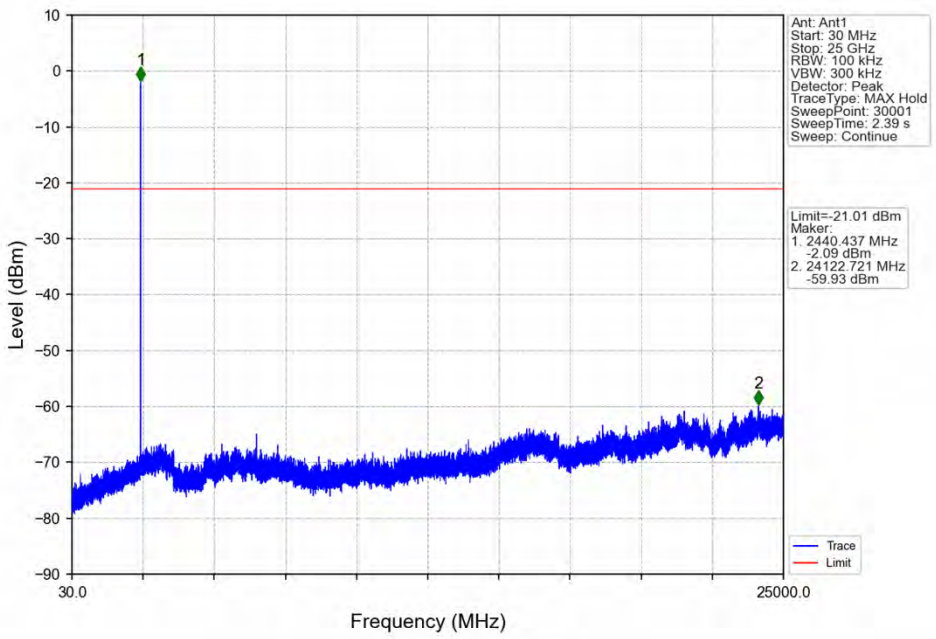
5.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	-1.01	-21.01	Pass
		2440	1	-1.01	-21.01	Pass
		2480	1	-1.01	-21.01	Pass
2M	SISO	2402	1	-1.28	-21.28	Pass
		2440	1	-1.28	-21.28	Pass
		2480	1	-1.28	-21.28	Pass
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.						

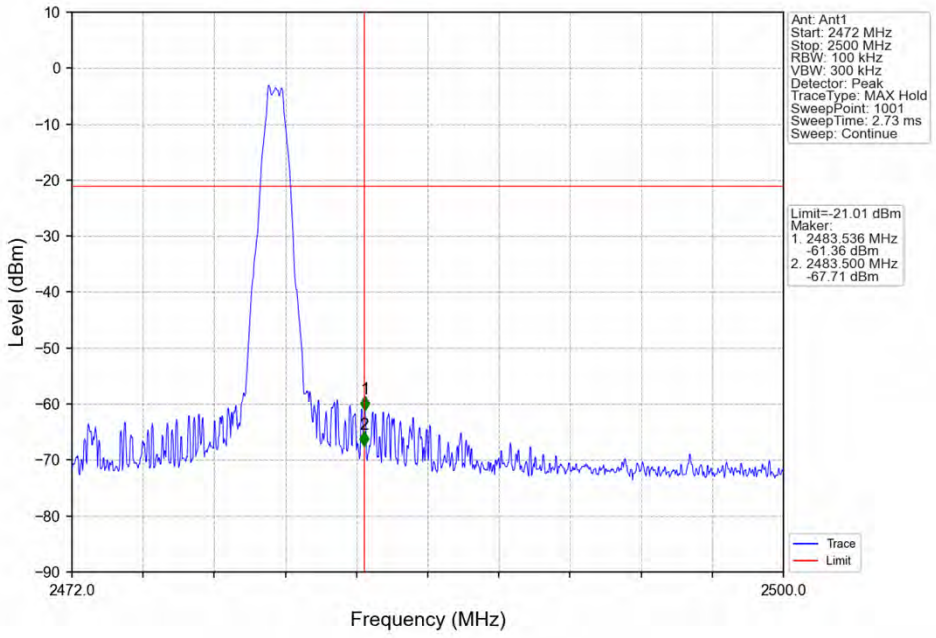
5.2.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV

1M_LCH_2402MHz_Ant1_NTNV


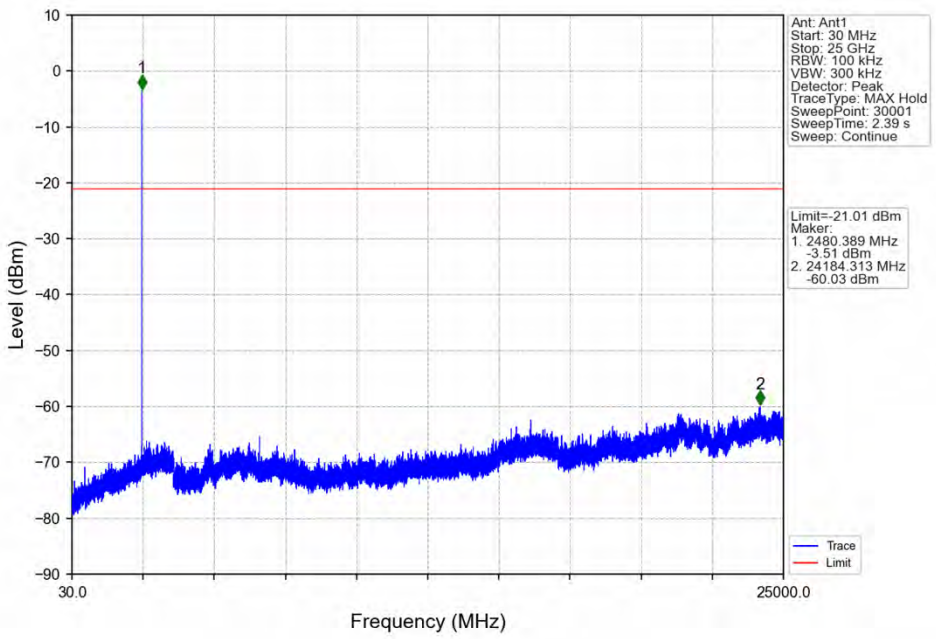
1M_MCH_2440MHz_Ant1_NTNV



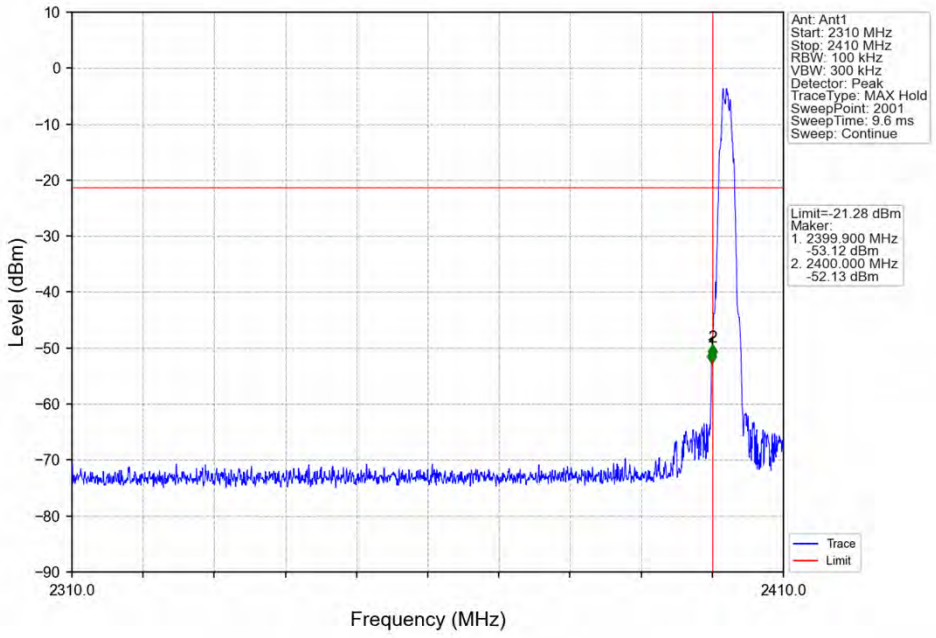
1M_HCH_2480MHz_Ant1_NTNV



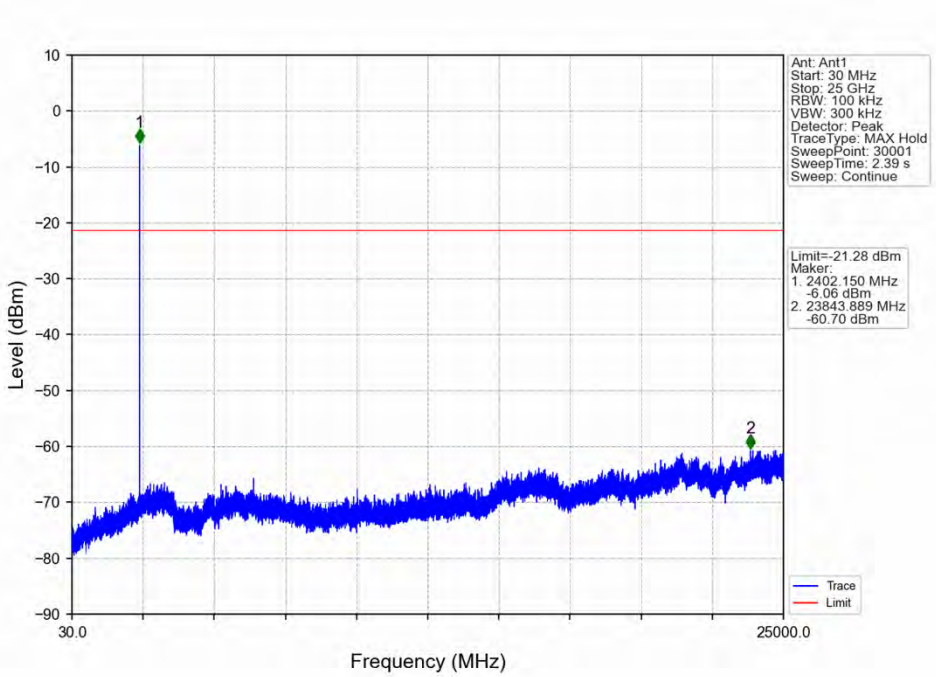
1M_HCH_2480MHz_Ant1_NTNV



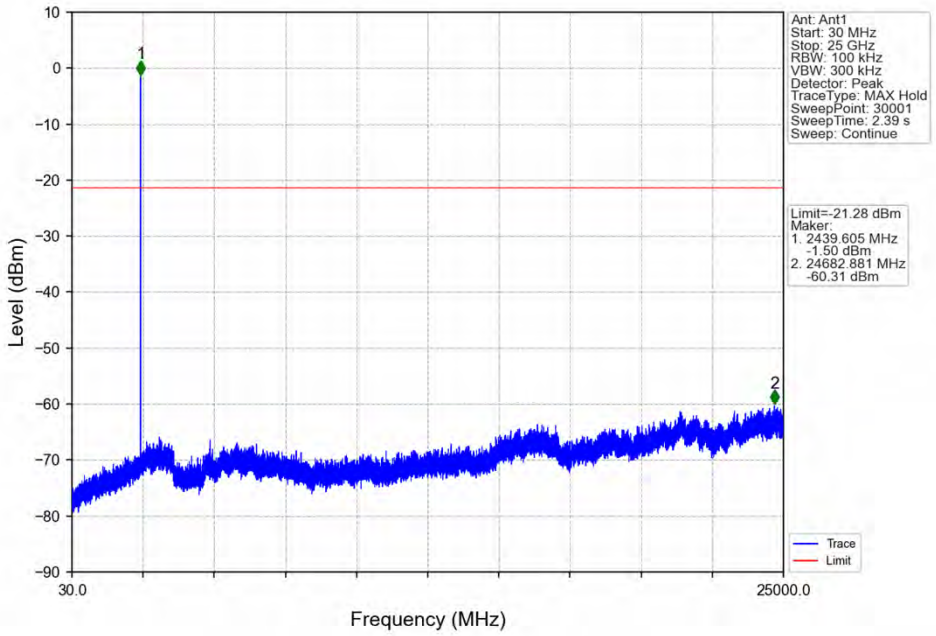
2M_LCH_2402MHz_Ant1_NTNV



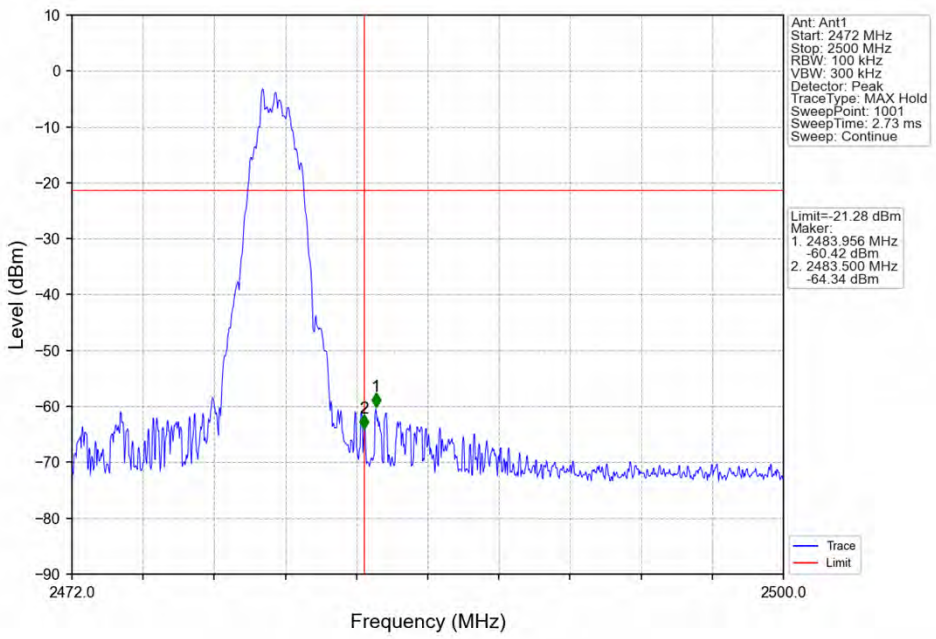
2M_LCH_2402MHz_Ant1_NTNV



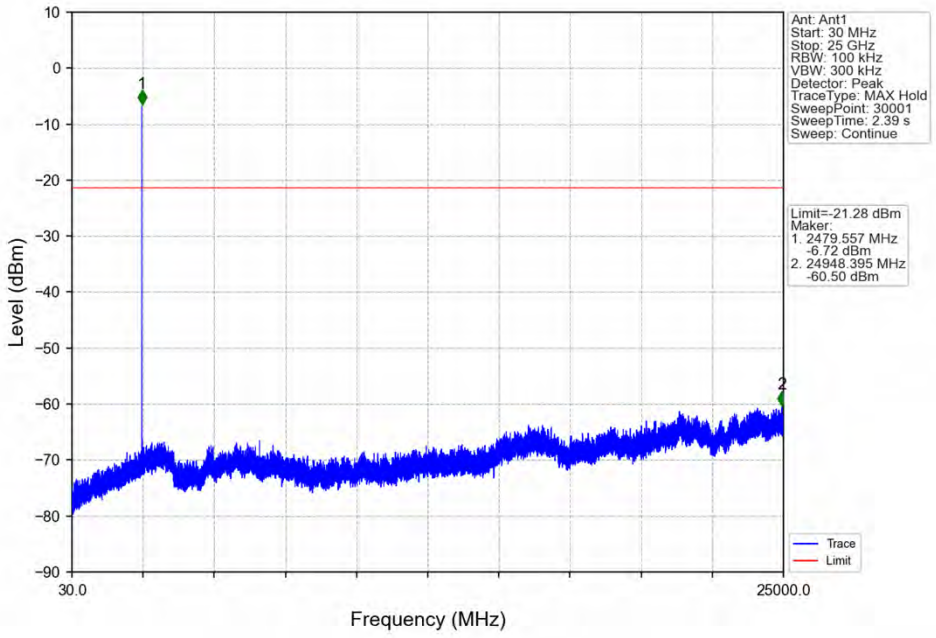
2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



6. Form731

6.1 Form731

6.1.1 Test Result

Lower Freq (MHz)	High Freq (MHz)	MAX Power (W)	MAX Power (dBm)
2402	2480	0.0008	-0.81

（END OF REPORT）