FCC Part 15C Test Report
FCC ID: 2BCSS-EXPLORER

Applicant:	Chengdu Rose Technics Co., Ltd.
Address:	No. 1204, 12th Floor, Building 7, 188 Jinhe West 1st Street, High-tech Zone, Chengdu, China (Sichuan) Pilot Free Trade Zone
Manufacturer:	Chengdu Rose Technics Co., Ltd.
Address:	No. 1204, 12th Floor, Building 7, 188 Jinhe West 1st Street, High-tech Zone, Chengdu, China (Sichuan) Pilot Free Trade Zone
EUT:	EXPLORER wireless earbuds
Trade Mark:	ROSESELSA
Model Number:	EXPLORER, EXPLORER X, EXPLORER GAMING, EXPLORER MAX, EXPLORER PRO, EXPLORER 2, EXPLORER 3
Date of Receipt:	Jan. 06, 2025
Test Date:	Jan. 07, 2025- Jan. 16, 2025
Date of Report:	Jan. 17, 2025
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China
Applicable Standards:	FCC PART 15 C 15.247 ANSI C63.10:2013
Test Result:	Pass
Report Number:	DL-250106034ER

Prepared (Test Engineer):	Pxing Huang	Pxing Huang
Reviewer (Supervisor):	Jack Bu	Jack Bu
Approved (Manager):	Jade Yang	Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247(c)	Radiated Spurious Emission	PASS	
15.205	Band Edge Emission	PASS	
15.247(b)(1)	Peak Output Power	PASS	
15.247(a)(iii)	Number of Hopping Frequency	PASS	
15.247(a)(iii)	Dwell Time	PASS	
15.247(a)(1)	Bandwidth	PASS	
15.247(a)(1)	Hopping Channel Separation	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1) ” N/A” denotes test is not applicable in this Test Report
(2) Left and right ear have been tested, only the worst case left ear results in this report.

FCC Test Firm Registration Number: 854456
Designation Number: CN1307
IC Registered No.: 27485
CAB ID.: CN0118

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2** ·providing a level of confidence of approximately **95** % 。

No.	Item	Uncertainty
1	Conducted Emission Test	±2.56dB
2	RF power,conducted	±0.42dB
3	Spurious emissions,conducted	±2.76dB
4	All emissions,radiated(<1G)	±3.65dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

GENERAL DESCRIPTION OF EUT

Product Name:	EXPLORER wireless earbuds
Trademark	ROSESELSA
Model No.:	EXPLORER, EXPLORER X, EXPLORER GAMING, EXPLORER MAX, EXPLORER PRO, EXPLORER 2, EXPLORER 3
Model Difference	Only different exterior colors and names
BT Version:	5.0
Operation Frequency:	2402~2480MHz
Channel numbers:	79 Channels
Channel separation:	1/2/3M
Modulation technology:	GFSK , π/4 DQPSK, 8DPSK
Antenna Type:	FPC Antenna
Antenna gain:	-2.1dBi
Power supply:	Charge voltage:DC 5V by adapter Charge case battery:DC 3.7V Headset battery:DC 3.7V 40mAh
Test sample(s) ID:	DL-250106034

Note:

1.For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.The EUT's all information provided by client.

2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
~	~	~	~	~	~
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
~	~	~	~	~	~
14	2416	41	2443	68	2470
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

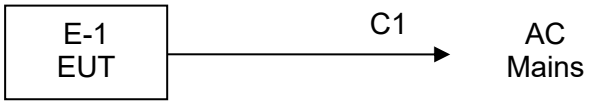
Pretest Mode	Description	
Mode 1	CH00	GFSK, π /4 DQPSK,8DPSK
Mode 2	CH39	
Mode 3	CH78	
Mode 4	Link Mode	
For Conducted & Radiated Emission		
Final Test Mode	Description	
Mode 1	CH00	GFSK, π /4 DQPSK,8DPSK
Mode 2	CH39	
Mode 3	CH78	
Mode 4	Link Mode	

Note:

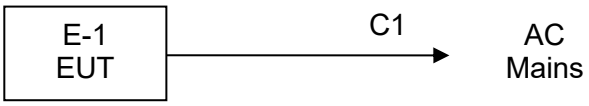
(1) The measurements are performed at the highest, middle, lowest available channels.

BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Spurious Emission Test



DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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	Model/Type No.	Series No.	Note
E-1	EXPLORER wireless earbuds	EXPLORER	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

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

TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the end product.

Test software Version	Test program: AXDN-0002.0		
Frequency	2402 MHz	2441 MHz	2480 MHz
Power Setting of Softwave	Default	Default	Default

EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 01, 2024	Oct. 31, 2025
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 01, 2024	Oct. 31, 2025
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 01, 2024	Oct. 31, 2025
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 01, 2024	Oct. 31, 2025
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 01, 2024	Oct. 31, 2025
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 01, 2024	Oct. 31, 2025
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 01, 2024	Oct. 31, 2025
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 01, 2024	Oct. 31, 2025
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 01, 2024	Oct. 31, 2025
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 01, 2024	Oct. 31, 2025
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 01, 2024	Oct. 31, 2025
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 01, 2024	Oct. 31, 2025
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 01, 2024	Oct. 31, 2025
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 01, 2024	Oct. 31, 2025
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 01, 2024	Oct. 31, 2025
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 01, 2024	Oct. 31, 2025

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	ChengYu	843 Room	843	Nov. 01, 2024	Oct. 31, 2025
2	EMI Receiver	R&S	ESR	101421	Nov. 01, 2024	Oct. 31, 2025
3	LISN	R&S	ENV216	102417	Nov. 01, 2024	Oct. 31, 2025
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 01, 2024	Oct. 31, 2025

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0

3. EMC EMISSION TEST

CONDUCTED EMISSION MEASUREMENT

POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

TEST PROCEDURE

a. The EUT was placed 0.1 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

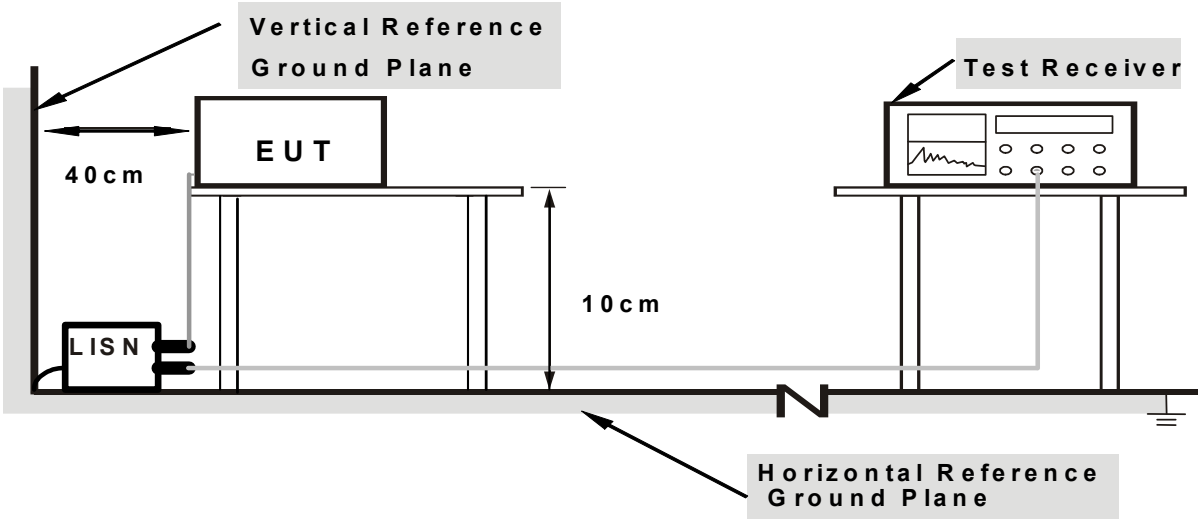
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

DEVIATION FROM TEST STANDARD

No deviation

TEST SETUP



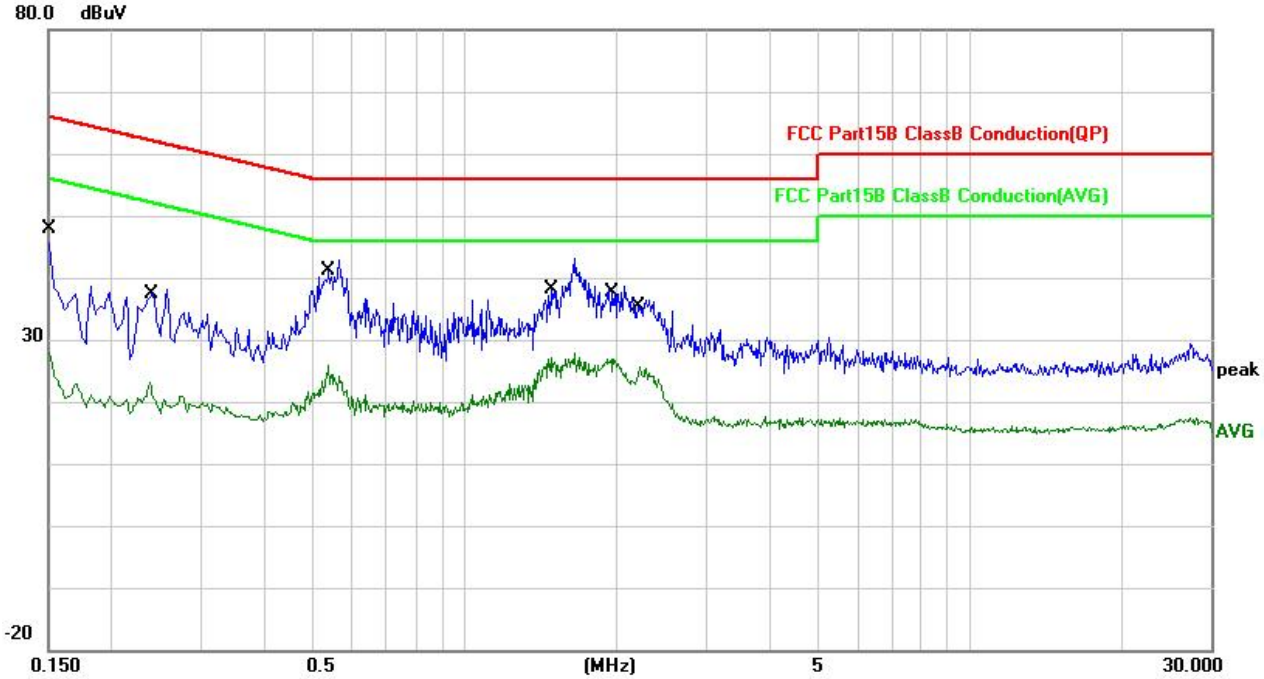
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage :	DC 3.7V	Test Mode:	Mode 4

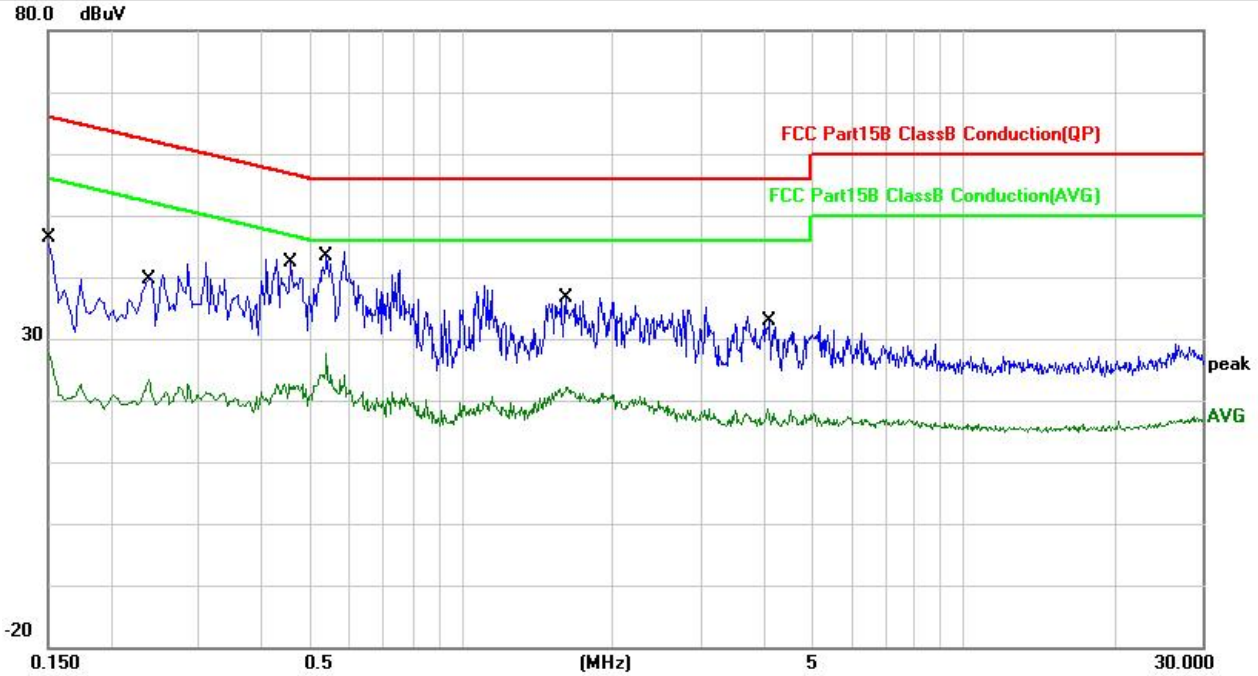


Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	27.51	20.35	47.86	66.00	-18.14	QP
2		0.1500	8.57	20.35	28.92	56.00	-27.08	AVG
3		0.2380	16.78	20.16	36.94	62.17	-25.23	QP
4		0.2380	2.95	20.16	23.11	52.17	-29.06	AVG
5	*	0.5380	20.93	20.10	41.03	56.00	-14.97	QP
6		0.5380	5.83	20.10	25.93	46.00	-20.07	AVG
7		1.4860	17.82	20.35	38.17	56.00	-17.83	QP
8		1.4860	6.88	20.35	27.23	46.00	-18.77	AVG
9		1.9700	15.31	20.37	35.68	56.00	-20.32	QP
10		1.9700	6.44	20.37	26.81	46.00	-19.19	AVG
11		2.2340	14.53	20.31	34.84	56.00	-21.16	QP
12		2.2340	5.24	20.31	25.55	46.00	-20.45	AVG

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	DC 3.7V	Test Mode:	Mode 4



Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	26.19	20.08	46.27	66.00	-19.73	QP
2		0.1500	8.51	20.08	28.59	56.00	-27.41	AVG
3		0.2380	19.74	20.01	39.75	62.17	-22.42	QP
4		0.2380	3.35	20.01	23.36	52.17	-28.81	AVG
5		0.4540	17.76	20.28	38.04	56.80	-18.76	QP
6		0.4540	2.31	20.28	22.59	46.80	-24.21	AVG
7	*	0.5380	23.28	20.13	43.41	56.00	-12.59	QP
8		0.5380	7.56	20.13	27.69	46.00	-18.31	AVG
9		1.6220	14.05	20.06	34.11	56.00	-21.89	QP
10		1.6220	2.16	20.06	22.22	46.00	-23.78	AVG
11		4.0860	11.78	20.03	31.81	56.00	-24.19	QP
12		4.0860	-1.32	20.03	18.71	46.00	-27.29	AVG

RADIATED EMISSION MEASUREMENT

RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	25GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

TEST PROCEDURE

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. 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 from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.1 metre to 0.1 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

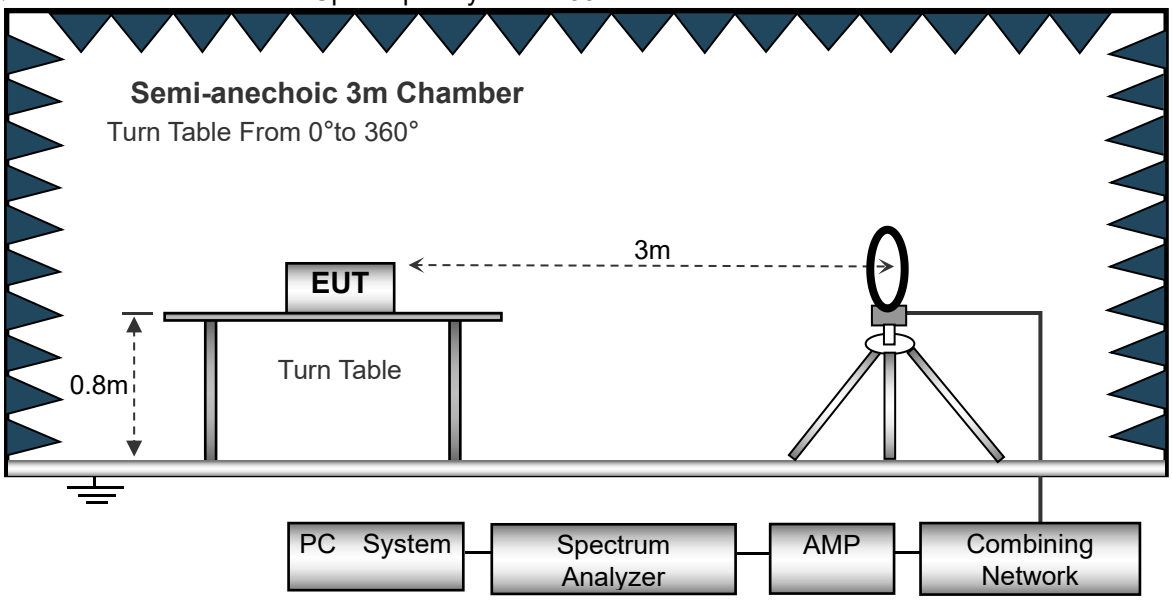
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

DEVIATION FROM TEST STANDARD

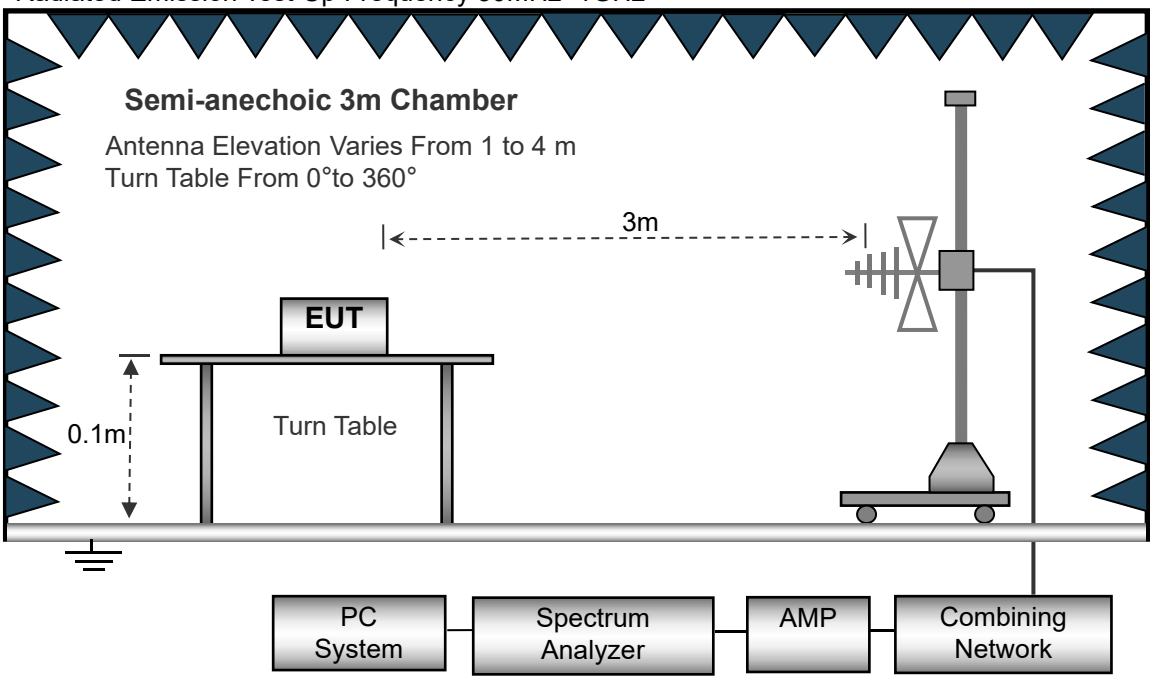
No deviation

TEST SETUP

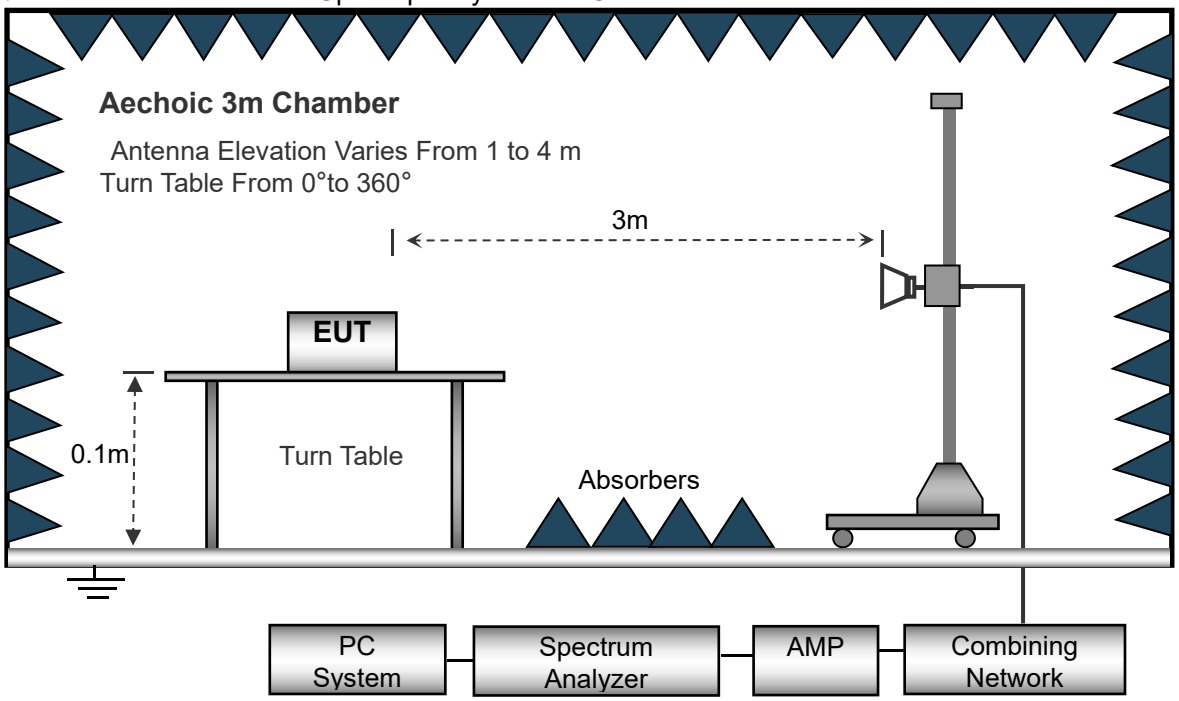
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

Temperature:	20℃	Relative Humidtity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 4	Polarization :	--

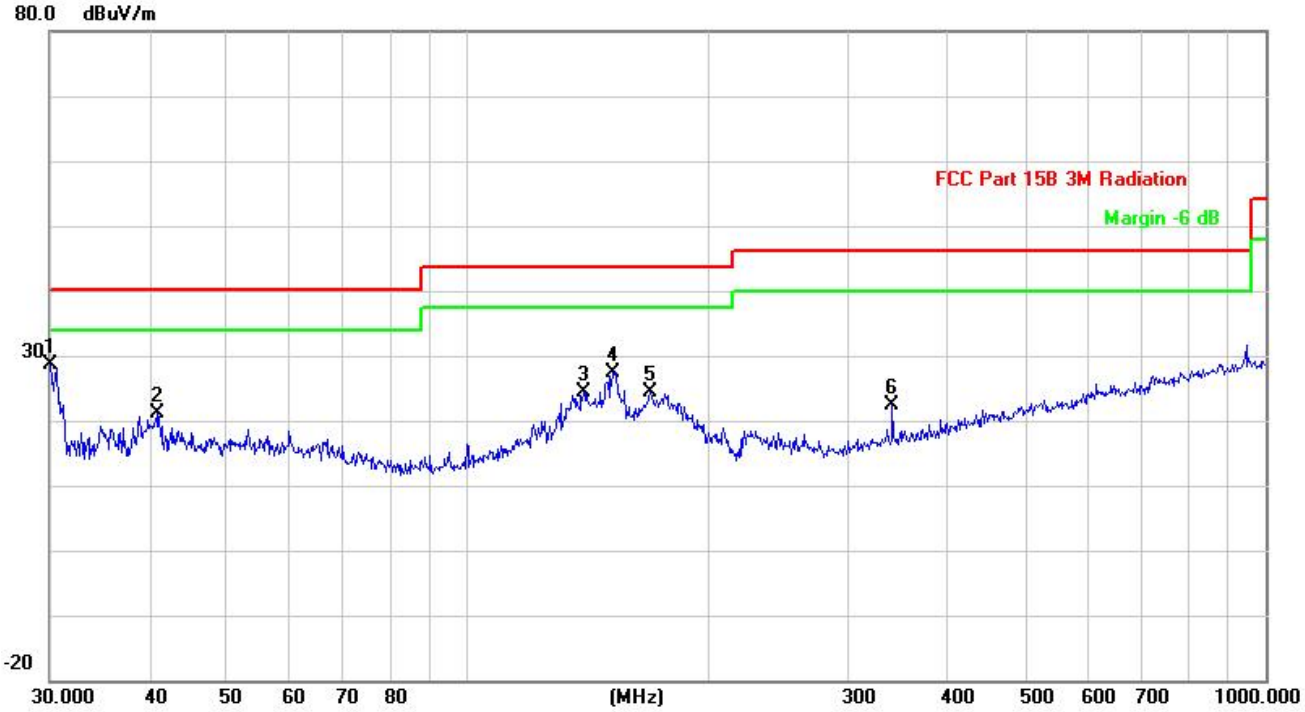
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 3.7V		
Test Mode :	Mode 4		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	30.1053	39.59	-11.06	28.53	40.00	-11.47	QP
2		40.9880	30.79	-9.72	21.07	40.00	-18.93	QP
3		139.8508	33.46	-9.10	24.36	43.50	-19.14	QP
4		152.1297	36.12	-8.70	27.42	43.50	-16.08	QP
5		169.5990	33.99	-9.71	24.28	43.50	-19.22	QP
6		340.7816	31.34	-8.93	22.41	46.00	-23.59	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Limit – Level;

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 3.7V		
Test Mode :	Mode 4		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		30.7454	40.25	-11.00	29.25	40.00	-10.75	QP
2		51.1210	38.19	-9.46	28.73	40.00	-11.27	QP
3		96.0985	43.37	-13.70	29.67	43.50	-13.83	QP
4		133.1510	41.94	-9.59	32.35	43.50	-11.15	QP
5	*	151.5972	41.52	-8.67	32.85	43.50	-10.65	QP
6		175.0367	39.10	-10.65	28.45	43.50	-15.05	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Limit – Level;

TEST RESULTS (1GHZ~25GHZ)

GFSK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2402									
V	4804.00	67.77	50.64	6.78	31.25	55.16	74.00	-18.84	PK
V	4804.00	55.35	50.64	6.78	31.25	42.74	54.00	-11.26	AV
V	7206.00	66.56	49.95	7.11	36.53	60.25	74.00	-13.75	PK
V	7206.00	54.81	49.95	7.11	36.53	48.5	54.00	-5.50	AV
V	16132.00	48.98	51.56	11.36	41.57	50.35	74.00	-23.65	PK
H	4804.00	66.73	50.64	6.78	31.25	54.12	74.00	-19.88	PK
H	4804.00	55.34	50.64	6.78	31.25	42.73	54.00	-11.27	AV
H	7206.00	69.66	49.95	7.11	36.53	63.35	74.00	-10.65	PK
H	7206.00	53.57	49.95	7.11	36.53	47.26	54.00	-6.74	AV
H	16132.00	48.83	51.56	11.36	41.57	50.2	74.00	-23.80	PK
operation frequency:2441									
V	4882.00	67.63	50.69	6.83	31.37	55.14	74.00	-18.86	PK
V	4882.00	55.25	50.69	6.83	31.37	42.76	54.00	-11.24	AV
V	7323.00	69.51	49.99	7.22	36.53	63.27	74.00	-10.73	PK
V	7323.00	53.56	49.99	7.22	31.25	42.04	54.00	-11.96	AV
V	16132.00	48.9	51.56	11.36	41.57	50.27	74.00	-23.73	PK
H	4882.00	66.51	50.69	6.83	31.37	54.02	74.00	-19.98	PK
H	4882.00	55.15	50.69	6.83	31.37	42.66	54.00	-11.34	AV
H	7323.00	69.4	49.99	7.22	36.53	63.16	74.00	-10.84	PK
H	7323.00	53.47	49.99	7.22	31.25	41.95	54.00	-12.05	AV
H	16132.00	48.66	51.56	11.36	41.57	50.03	74.00	-23.97	PK
operation frequency:2480									
V	4960.00	68.11	50.86	6.86	31.41	55.52	74.00	-18.48	PK
V	4960.00	55.65	50.86	6.86	31.41	43.06	54.00	-10.94	AV
V	7440.00	69.29	50.14	7.27	36.58	63.00	74.00	-11.00	PK
V	7440.00	53.44	50.14	7.27	31.28	41.85	54.00	-12.15	AV
V	16132.00	49.26	51.56	11.36	41.57	50.63	74.00	-23.37	PK
H	4960.00	66.98	50.86	6.86	31.41	54.39	74.00	-19.61	PK
H	4960.00	55.55	50.86	6.86	31.41	42.96	54.00	-11.04	AV
H	7440.00	67.33	50.14	7.27	36.58	61.04	74.00	-12.96	PK
H	7440.00	55.27	50.14	7.27	31.28	43.68	54.00	-10.32	AV
H	16132.00	49.02	51.56	11.36	41.57	50.39	74.00	-23.61	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

π /4 DQPSK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2402									
V	4804.00	67.46	50.64	6.78	31.25	54.85	74.00	-19.15	PK
V	4804.00	55.75	50.64	6.78	31.25	43.14	54.00	-10.86	AV
V	7206.00	66.36	49.95	7.11	36.53	60.05	74.00	-13.95	PK
V	7206.00	53.44	49.95	7.11	36.53	47.13	54.00	-6.87	AV
V	16132.00	49.42	51.56	11.36	41.57	50.79	74.00	-23.21	PK
H	4804.00	69.46	50.64	6.78	31.25	56.85	74.00	-17.15	PK
H	4804.00	56.37	50.64	6.78	31.25	43.76	54.00	-10.24	AV
H	7206.00	66.31	49.95	7.11	36.53	60	74.00	-14.00	PK
H	7206.00	54.65	49.95	7.11	36.53	48.34	54.00	-5.66	AV
H	16132.00	47.75	51.56	11.36	41.57	49.12	74.00	-24.88	PK
operation frequency:2441									
V	4882.00	67.18	50.69	6.83	31.37	54.69	74.00	-19.31	PK
V	4882.00	55.39	50.69	6.83	31.37	42.9	54.00	-11.10	AV
V	7323.00	66.91	49.99	7.22	36.53	60.67	74.00	-13.33	PK
V	7323.00	55.93	49.99	7.22	31.25	44.41	54.00	-9.59	AV
V	16132.00	48.96	51.56	11.36	41.57	50.33	74.00	-23.67	PK
H	4882.00	66.57	50.69	6.83	31.37	54.08	74.00	-19.92	PK
H	4882.00	55.67	50.69	6.83	31.37	43.18	54.00	-10.82	AV
H	7323.00	65.01	49.99	7.22	36.53	58.77	74.00	-15.23	PK
H	7323.00	53.35	49.99	7.22	31.25	41.83	54.00	-12.17	AV
H	16132.00	48.29	51.56	11.36	41.57	49.66	74.00	-24.34	PK
operation frequency:2480									
V	4960.00	67.57	50.86	6.86	31.41	54.98	74.00	-19.02	PK
V	4960.00	55.14	50.86	6.86	31.41	42.55	54.00	-11.45	AV
V	7440.00	66.25	50.14	7.27	36.58	59.96	74.00	-14.04	PK
V	7440.00	54.85	50.14	7.27	31.28	43.26	54.00	-10.74	AV
V	16132.00	46.77	51.56	11.36	41.57	48.14	74.00	-25.86	PK
H	4960.00	66.35	50.86	6.86	31.41	53.76	74.00	-20.24	PK
H	4960.00	54.22	50.86	6.86	31.41	41.63	54.00	-12.37	AV
H	7440.00	65.27	50.14	7.27	36.58	58.98	74.00	-15.02	PK
H	7440.00	55.61	50.14	7.27	31.28	44.02	54.00	-9.98	AV
H	16132.00	47.88	51.56	11.36	41.57	49.25	74.00	-24.75	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

8DPSK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2402									
V	4804.00	66.9	50.64	6.78	31.25	54.29	74.00	-19.71	PK
V	4804.00	55.73	50.64	6.78	31.25	43.12	54.00	-10.88	AV
V	7206.00	66.24	49.95	7.11	36.53	59.93	74.00	-14.07	PK
V	7206.00	53.4	49.95	7.11	36.53	47.09	54.00	-6.91	AV
V	16132.00	46.68	51.56	11.36	41.57	48.05	74.00	-25.95	PK
H	4804.00	66.52	50.64	6.78	31.25	53.91	74.00	-20.09	PK
H	4804.00	55.57	50.64	6.78	31.25	42.96	54.00	-11.04	AV
H	7206.00	64.48	49.95	7.11	36.53	58.17	74.00	-15.83	PK
H	7206.00	54.29	49.95	7.11	36.53	47.98	54.00	-6.02	AV
H	16132.00	47.38	51.56	11.36	41.57	48.75	74.00	-25.25	PK
operation frequency:2441									
V	4882.00	66.79	50.69	6.83	31.37	54.3	74.00	-19.70	PK
V	4882.00	54.96	50.69	6.83	31.37	42.47	54.00	-11.53	AV
V	7323.00	65.63	49.99	7.22	36.53	59.39	74.00	-14.61	PK
V	7323.00	53.46	49.99	7.22	31.25	41.94	54.00	-12.06	AV
V	16132.00	47.9	51.56	11.36	41.57	49.27	74.00	-24.73	PK
H	4882.00	65.28	50.69	6.83	31.37	52.79	74.00	-21.21	PK
H	4882.00	53.58	50.69	6.83	31.37	41.09	54.00	-12.91	AV
H	7323.00	64.98	49.99	7.22	36.53	58.74	74.00	-15.26	PK
H	7323.00	53.36	49.99	7.22	31.25	41.84	54.00	-12.16	AV
H	16132.00	46.68	51.56	11.36	41.57	48.05	74.00	-25.95	PK
operation frequency:2480									
V	4960.00	67.64	50.86	6.86	31.41	55.05	74.00	-18.95	PK
V	4960.00	54.69	50.86	6.86	31.41	42.1	54.00	-11.90	AV
V	7440.00	64.91	50.14	7.27	36.58	58.62	74.00	-15.38	PK
V	7440.00	53.47	50.14	7.27	31.28	41.88	54.00	-12.12	AV
V	16132.00	48.55	51.56	11.36	41.57	49.92	74.00	-24.08	PK
H	4960.00	67.45	50.86	6.86	31.41	54.86	74.00	-19.14	PK
H	4960.00	54.69	50.86	6.86	31.41	42.1	54.00	-11.90	AV
H	7440.00	65.23	50.14	7.27	36.58	58.94	74.00	-15.06	PK
H	7440.00	53.98	50.14	7.27	31.28	42.39	54.00	-11.61	AV
H	16132.00	47.79	51.56	11.36	41.57	49.16	74.00	-24.84	PK

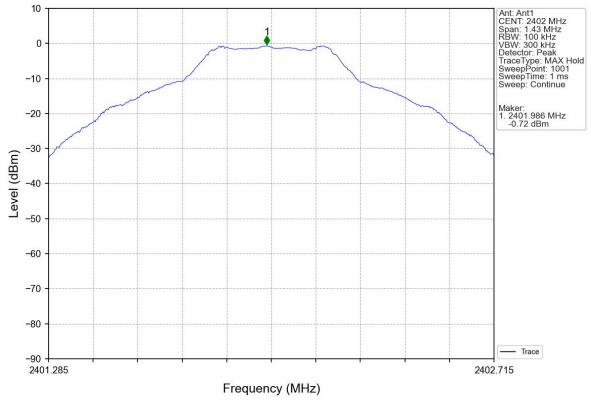
Remark:

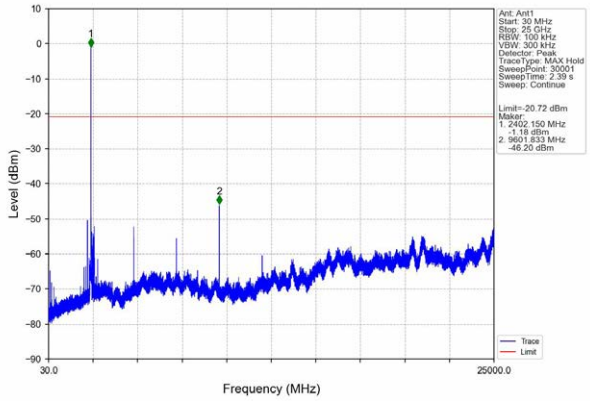
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For Conducted

During the test, pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case.

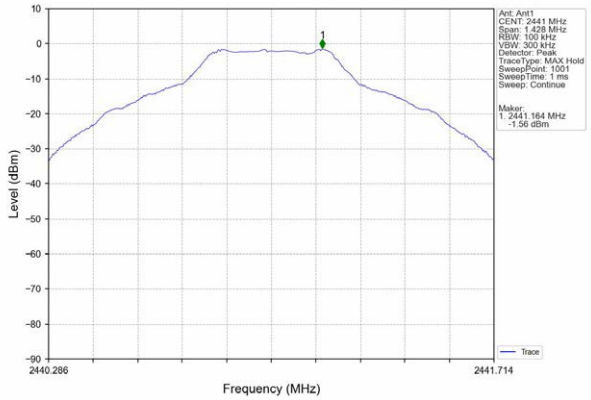
Test channel:	Lowest channel

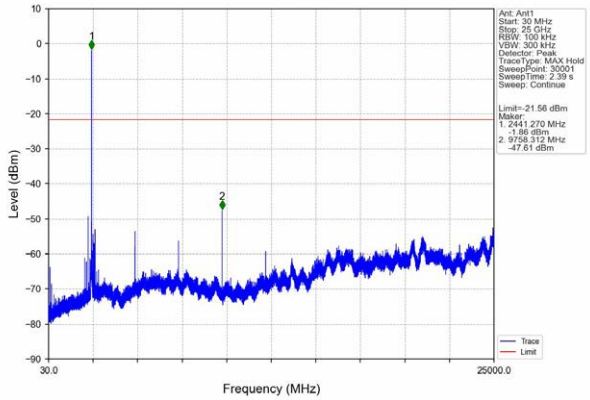




10GHz~25GHz

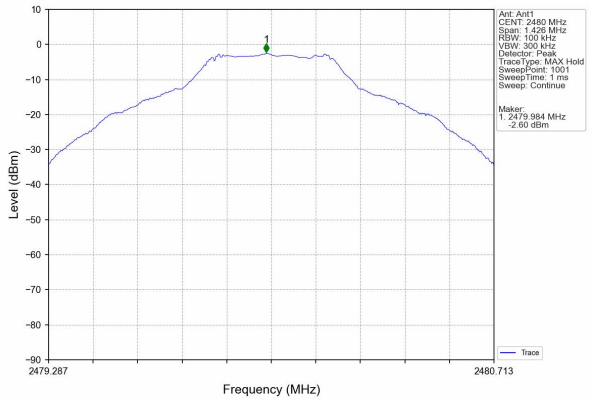
Test channel:	Middle channel

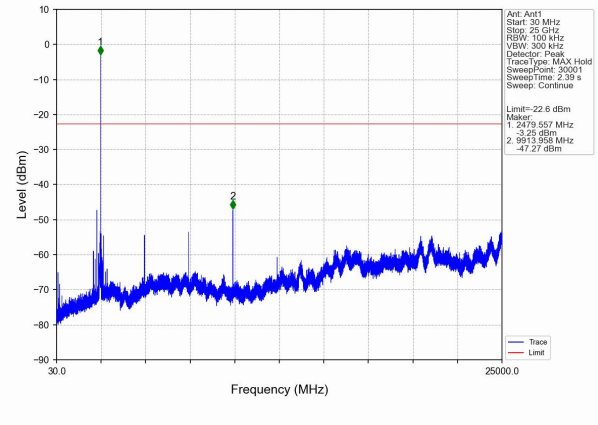




10GHz~25GHz

Test channel:	Highest channel





10GHz~25GHz

3.3 RADIATED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.205

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

3.3.2 TEST PROCEDURE

Above 1GHz test procedure as below:

a. 1. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. 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 from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel,the Highest channel

Note:

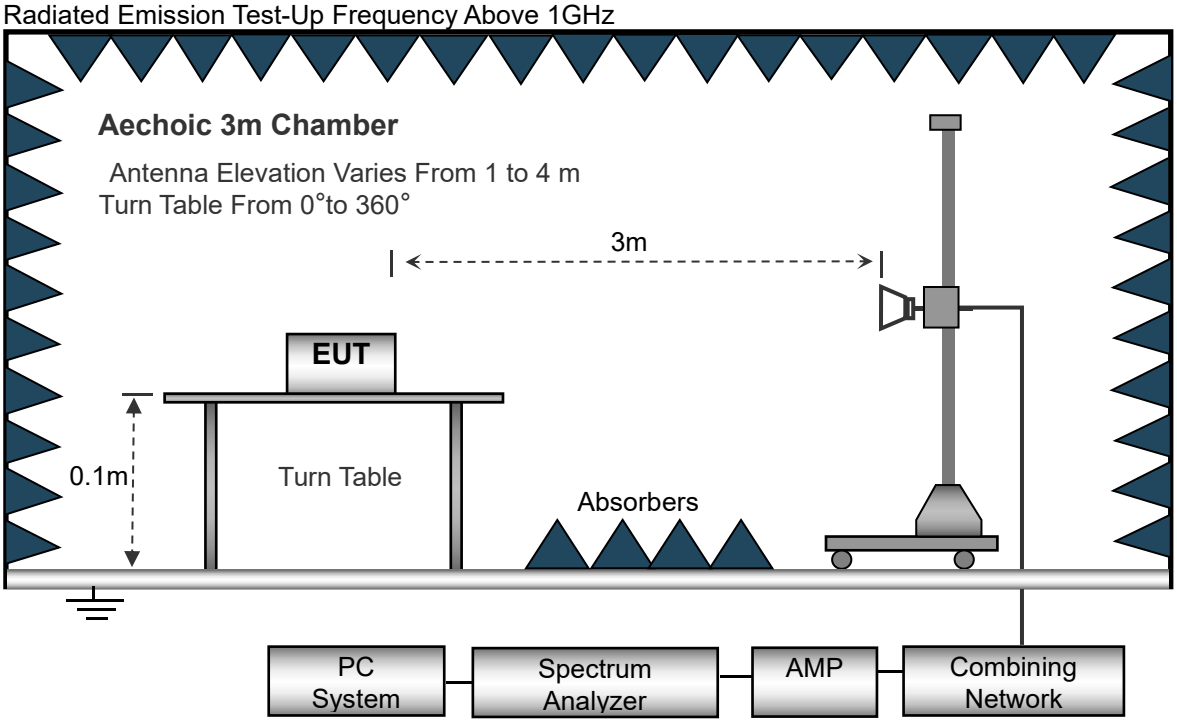
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



3.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.6 TEST RESULT

GFSK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2402									
V	2390.00	76.54	52.12	2.73	27.38	54.53	74.00	-19.47	PK
V	2390.00	65.29	52.12	2.73	27.38	43.28	54.00	-10.72	AV
V	2400.00	76.75	52.16	2.78	27.41	54.78	74.00	-19.22	PK
V	2400.00	64.88	52.16	2.78	27.41	42.91	54.00	-11.09	AV
H	2390.00	76.63	52.12	2.73	27.38	54.62	74.00	-19.38	PK
H	2390.00	65.12	52.12	2.73	27.38	43.11	54.00	-10.89	AV
H	2400.00	76.50	52.16	2.78	27.41	54.53	74.00	-19.47	PK
H	2400.00	65.06	52.16	2.78	27.41	43.09	54.00	-10.91	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2480									
V	2483.50	76.75	52.23	2.86	27.44	54.82	74.00	-19.18	PK
V	2483.50	65.53	52.23	2.86	27.44	43.6	54.00	-10.40	AV
V	2500.00	76.69	52.26	2.88	27.49	54.8	74.00	-19.20	PK
V	2500.00	64.99	52.26	2.88	27.49	43.1	54.00	-10.90	AV
H	2483.50	76.67	52.23	2.86	27.44	54.74	74.00	-19.26	PK
H	2483.50	65.37	52.23	2.86	27.44	43.44	54.00	-10.56	AV
H	2500.00	76.29	52.26	2.88	27.49	54.4	74.00	-19.60	PK
H	2500.00	65.63	52.26	2.88	27.49	43.74	54.00	-10.26	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

π /4 DQPSK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2402									
V	2390.00	76.70	52.12	2.73	27.38	54.69	74.00	-19.31	PK
V	2390.00	65.42	52.12	2.73	27.38	43.41	54.00	-10.59	AV
V	2400.00	76.91	52.16	2.78	27.41	54.94	74.00	-19.06	PK
V	2400.00	65.01	52.16	2.78	27.41	43.04	54.00	-10.96	AV
H	2390.00	76.79	52.12	2.73	27.38	54.78	74.00	-19.22	PK
H	2390.00	65.25	52.12	2.73	27.38	43.24	54.00	-10.76	AV
H	2400.00	76.66	52.16	2.78	27.41	54.69	74.00	-19.31	PK
H	2400.00	65.19	52.16	2.78	27.41	43.22	54.00	-10.78	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2480									
V	2483.50	76.91	52.23	2.86	27.44	54.98	74.00	-19.02	PK
V	2483.50	65.67	52.23	2.86	27.44	43.74	54.00	-10.26	AV
V	2500.00	76.85	52.26	2.88	27.49	54.96	74.00	-19.04	PK
V	2500.00	65.12	52.26	2.88	27.49	43.23	54.00	-10.77	AV
H	2483.50	76.83	52.23	2.86	27.44	54.9	74.00	-19.10	PK
H	2483.50	65.52	52.23	2.86	27.44	43.59	54.00	-10.41	AV
H	2500.00	76.45	52.26	2.88	27.49	54.56	74.00	-19.44	PK
H	2500.00	65.77	52.26	2.88	27.49	43.88	54.00	-10.12	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

8DPSK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2402									
V	2390.00	76.88	52.12	2.73	27.38	54.87	74.00	-19.13	PK
V	2390.00	65.59	52.12	2.73	27.38	43.58	54.00	-10.42	AV
V	2400.00	77.10	52.16	2.78	27.41	55.13	74.00	-18.87	PK
V	2400.00	65.16	52.16	2.78	27.41	43.19	54.00	-10.81	AV
H	2390.00	76.97	52.12	2.73	27.38	54.96	74.00	-19.04	PK
H	2390.00	65.42	52.12	2.73	27.38	43.41	54.00	-10.59	AV
H	2400.00	76.84	52.16	2.78	27.41	54.87	74.00	-19.13	PK
H	2400.00	65.35	52.16	2.78	27.41	43.38	54.00	-10.62	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2480									
V	2483.50	77.10	52.23	2.86	27.44	55.17	74.00	-18.83	PK
V	2483.50	65.83	52.23	2.86	27.44	43.9	54.00	-10.10	AV
V	2500.00	77.03	52.26	2.88	27.49	55.14	74.00	-18.86	PK
V	2500.00	65.26	52.26	2.88	27.49	43.37	54.00	-10.63	AV
H	2483.50	77.01	52.23	2.86	27.44	55.08	74.00	-18.92	PK
H	2483.50	65.67	52.23	2.86	27.44	43.74	54.00	-10.26	AV
H	2500.00	76.63	52.26	2.88	27.49	54.74	74.00	-19.26	PK
H	2500.00	65.92	52.26	2.88	27.49	44.03	54.00	-9.97	AV

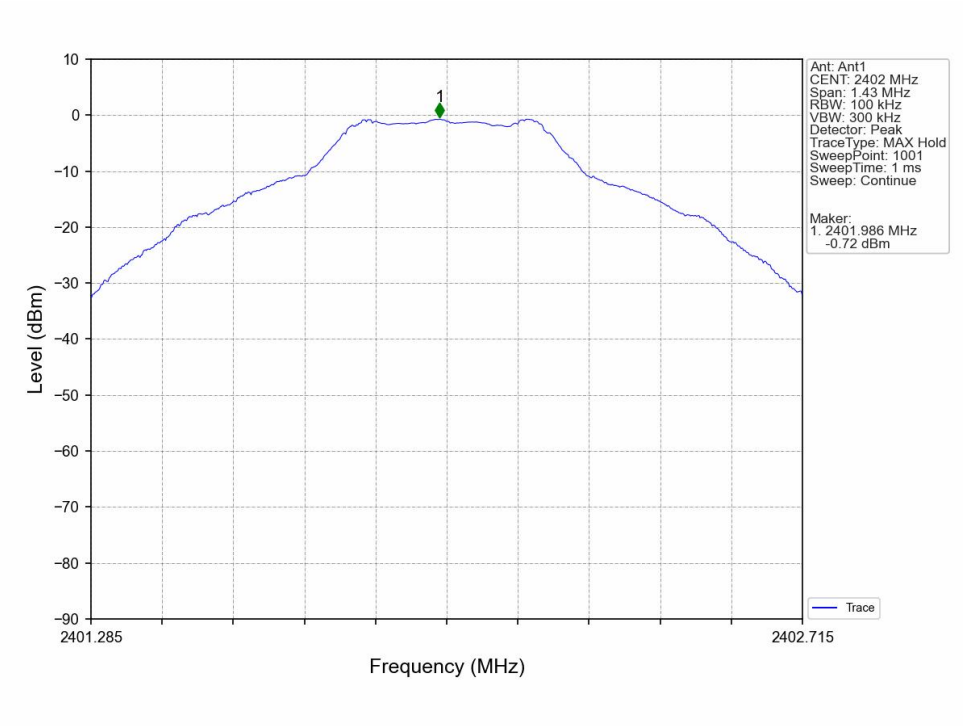
Remark:

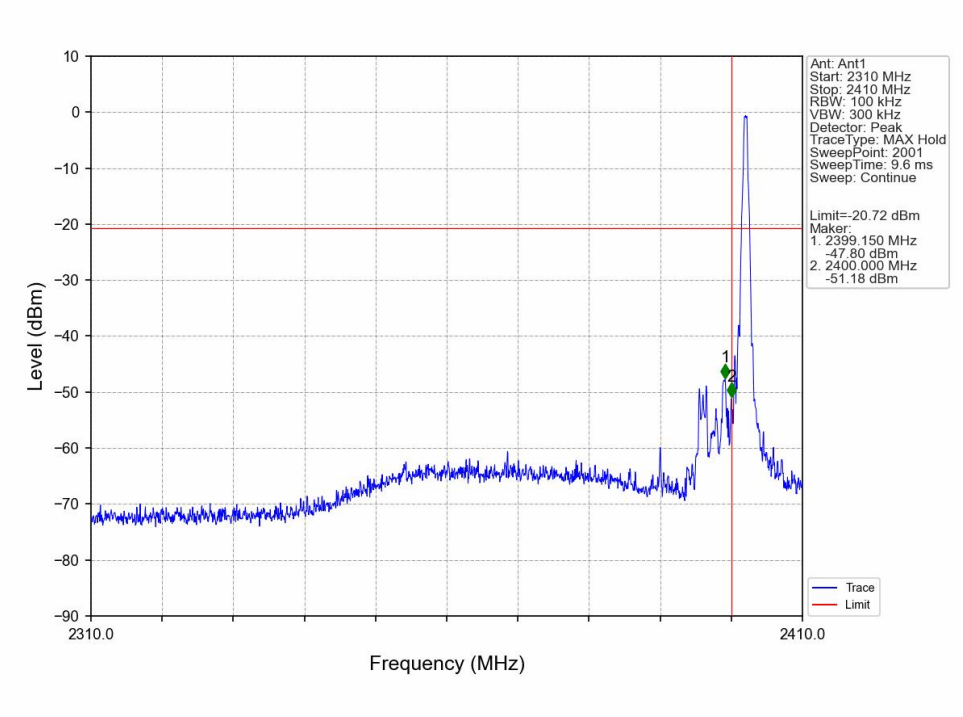
1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

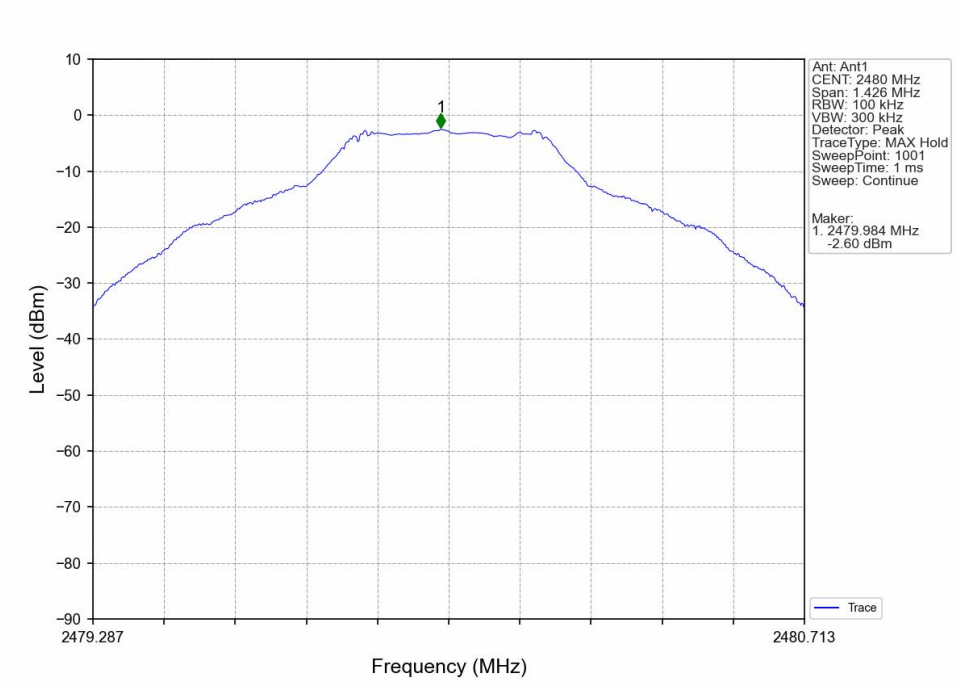
For Conducted

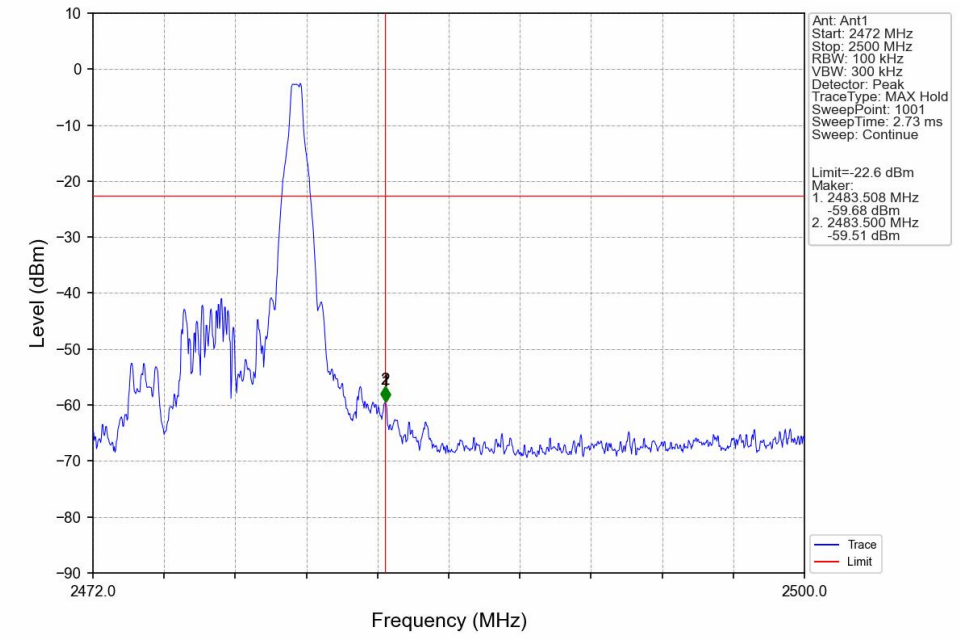
Unhopping

GFSK

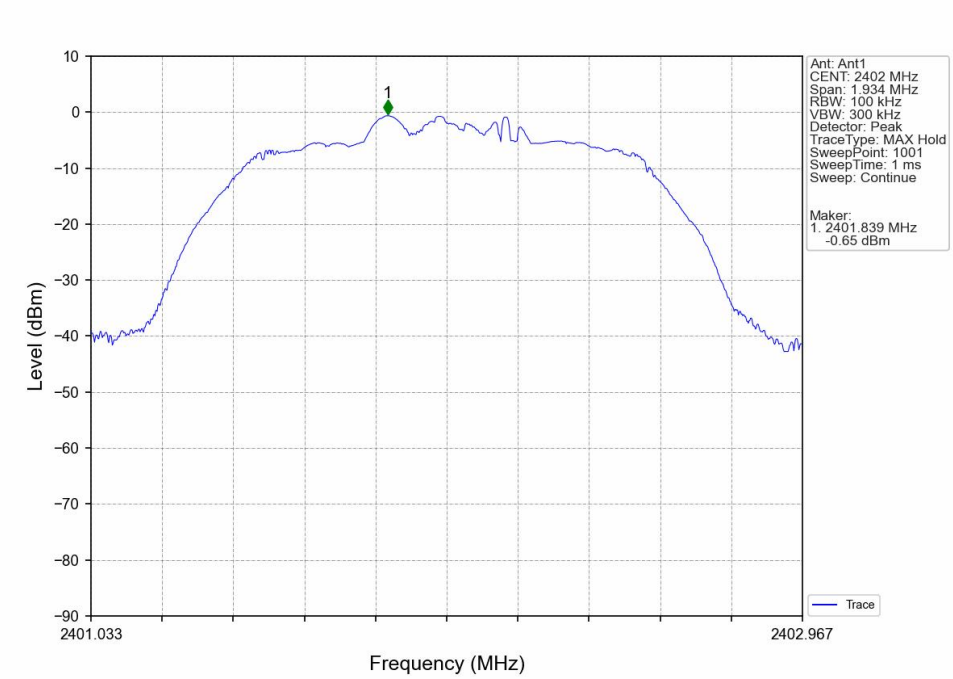


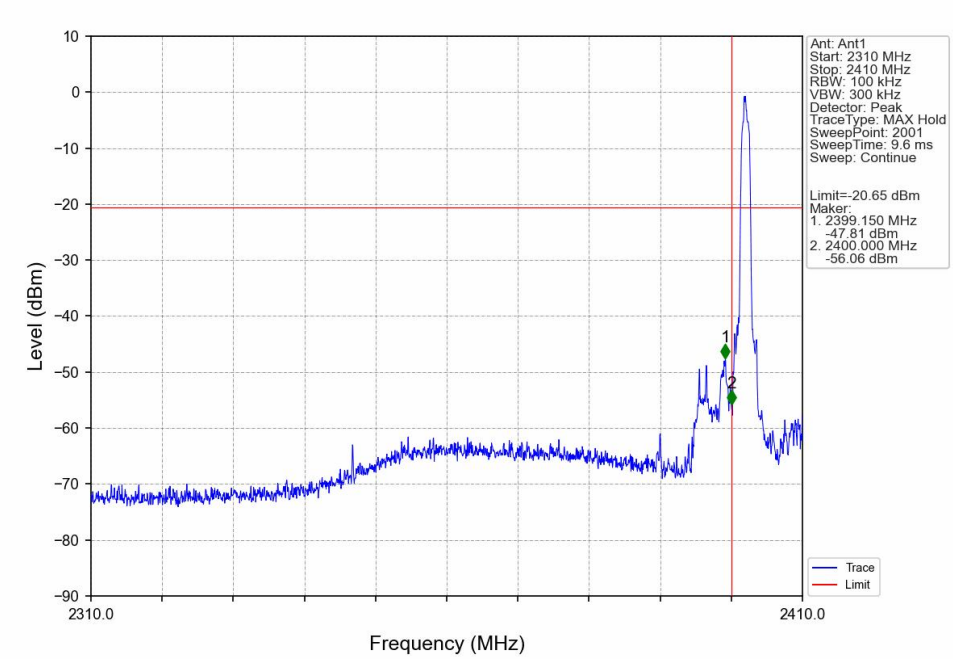


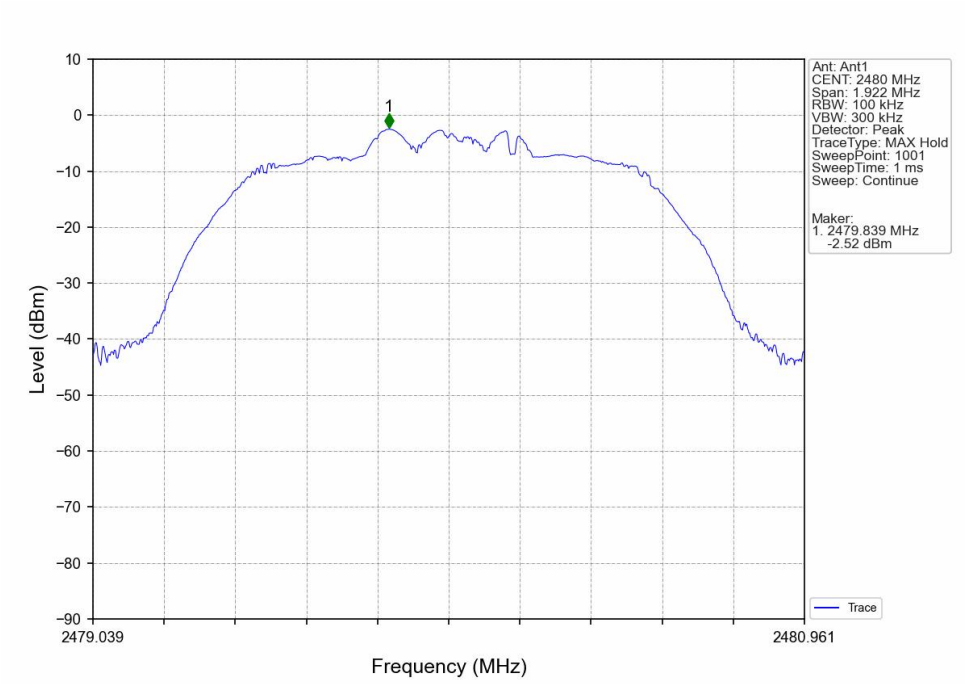

Ant: Ant1
CENT: 2480 MHz
Span: 1.426 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1 ms
Sweep: Continue
Maker:
1. 2479.984 MHz
-2.60 dBm
Trace
Level (dBm)
Frequency (MHz)
2479.287
2480.713

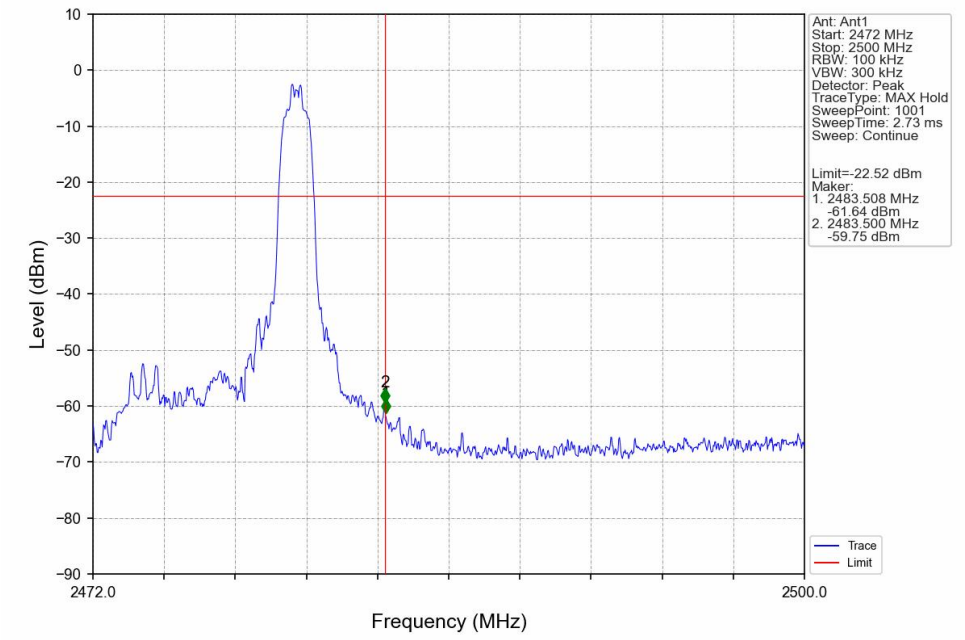

Ant: Ant1
Start: 2472 MHz
Stop: 2500 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 2.73 ms
Sweep: Continue
Limit=-22.6 dBm
Maker:
1. 2483.508 MHz
-59.68 dBm
2. 2483.500 MHz
-59.51 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2472.0
2500.0

π /4 DQPSK

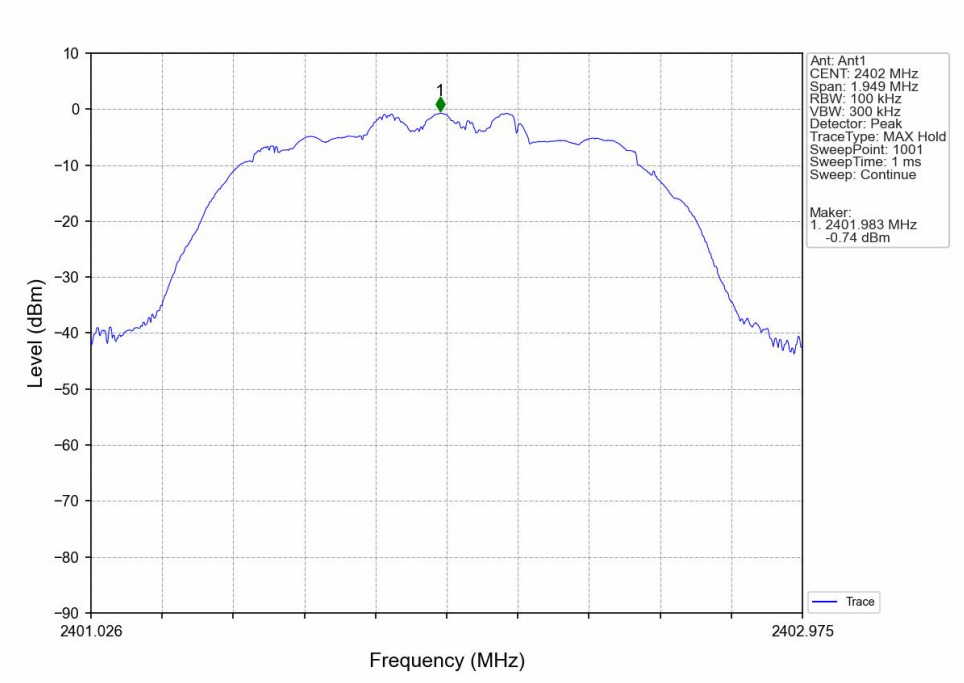

Ant: Ant1
CENT: 2402 MHz
Span: 1.934 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1 ms
Sweep: Continue
Maker:
1. 2401.839 MHz
-0.65 dBm
Level (dBm)
Frequency (MHz)
2401.033
2402.967
Trace

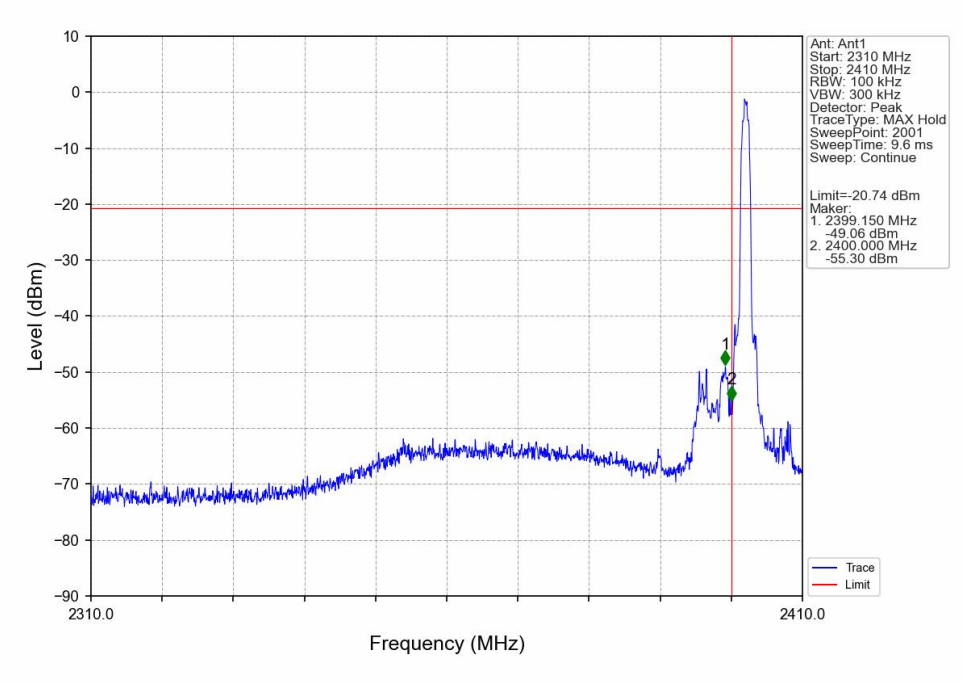

Ant: Ant1
Start: 2310 MHz
Stop: 2410 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 2001
SweepTime: 9.6 ms
Sweep: Continue
Limit=-20.65 dBm
Maker:
1. 2399.150 MHz
-47.81 dBm
2. 2400.000 MHz
-56.06 dBm
Level (dBm)
Frequency (MHz)
2310.0
2410.0
Trace
Limit

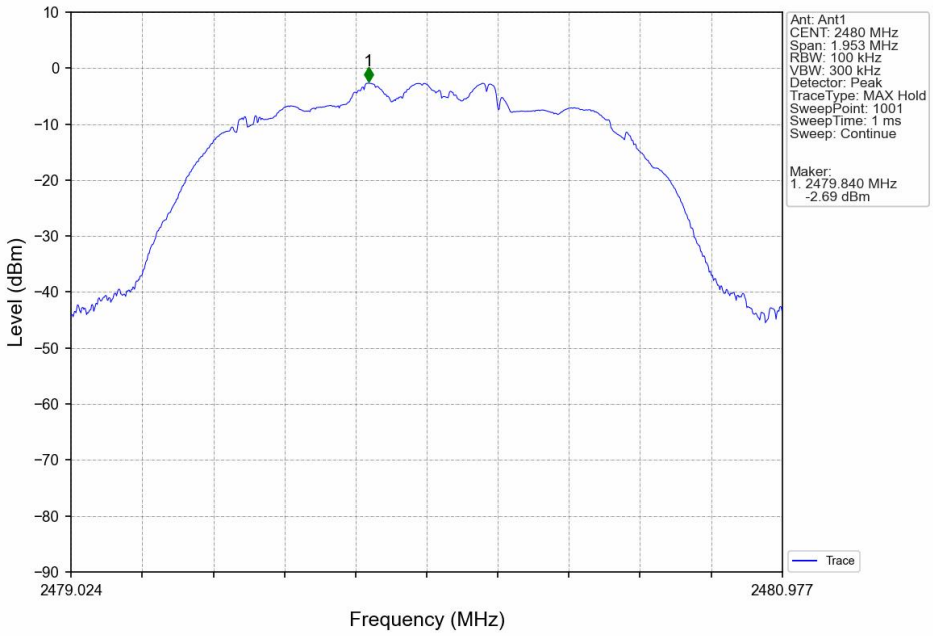

Ant: Ant1
CENT: 2480 MHz
Span: 1.922 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1 ms
Sweep: Continue
Maker:
1. 2479.839 MHz
-2.52 dBm
Trace
Level (dBm)
Frequency (MHz)
2479.039
2480.961

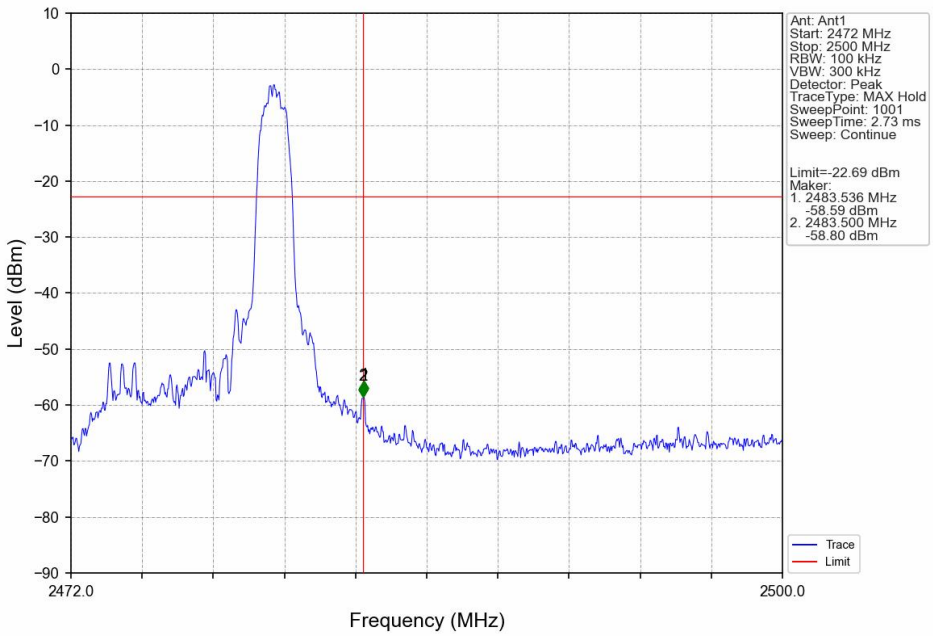

Ant: Ant1
Start: 2472 MHz
Stop: 2500 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 2.73 ms
Sweep: Continue
Limit=-22.52 dBm
Maker:
1. 2483.508 MHz
-61.64 dBm
2. 2483.500 MHz
-59.75 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2472.0
2500.0

8DPSK

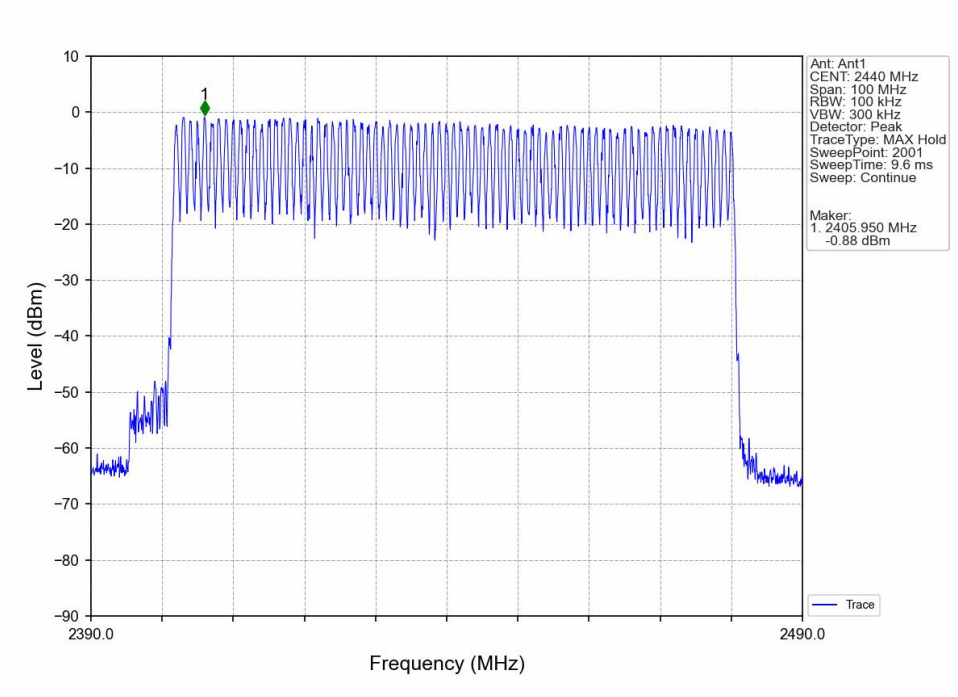

Ant: Ant1
CENT: 2402 MHz
Span: 1.949 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1 ms
Sweep: Continue
Maker:
1. 2401.983 MHz
-0.74 dBm
Trace
Level (dBm)
Frequency (MHz)
2401.026
2402.975

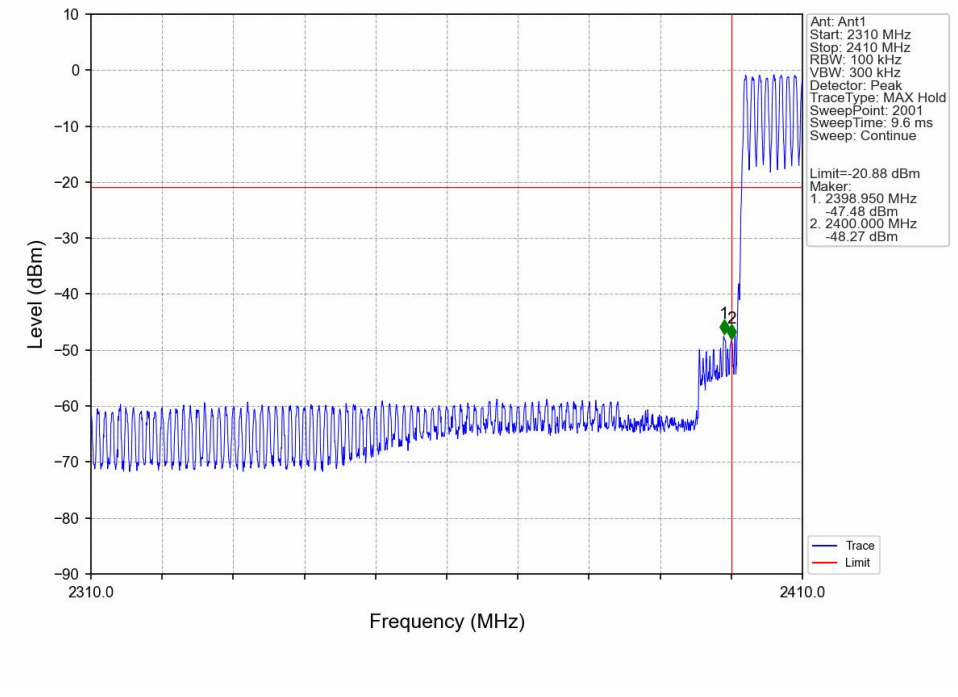

Ant: Ant1
Start: 2310 MHz
Stop: 2410 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 2001
SweepTime: 9.6 ms
Sweep: Continue
Limit=-20.74 dBm
Maker:
1. 2399.150 MHz
-49.06 dBm
2. 2400.000 MHz
-55.30 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2310.0
2410.0

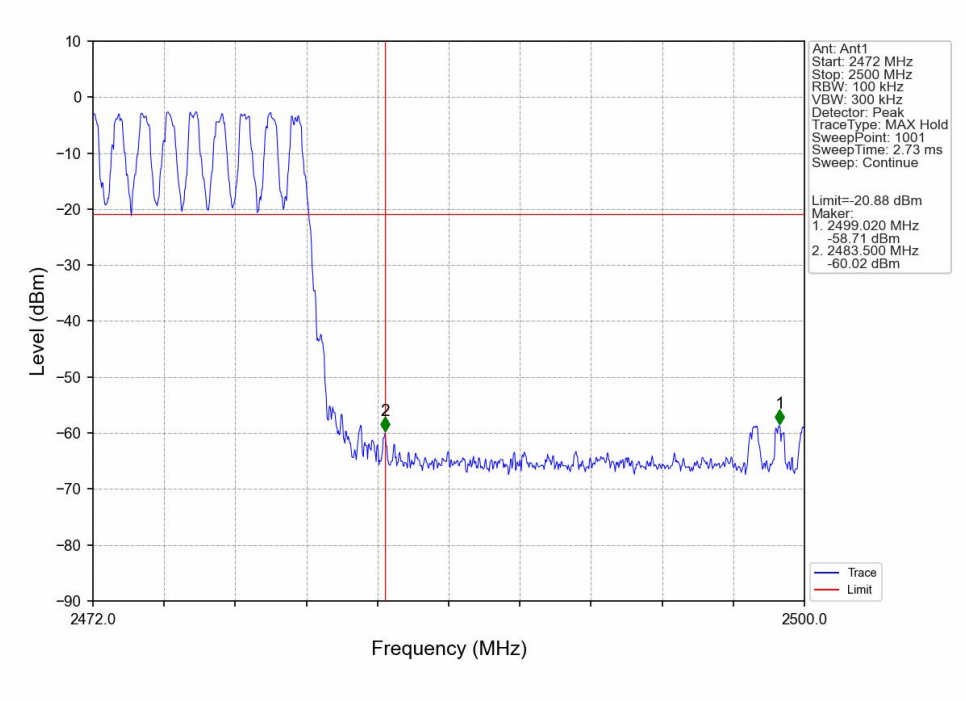

Ant: Ant1
CENT: 2480 MHz
Span: 1.953 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1 ms
Sweep: Continue
Maker:
1. 2479.840 MHz
-2.69 dBm
Trace
Level (dBm)
Frequency (MHz)
2479.024
2480.977


Ant: Ant1
Start: 2472 MHz
Stop: 2500 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 2.73 ms
Sweep: Continue
Limit=-22.69 dBm
Maker:
1. 2483.536 MHz
-58.59 dBm
2. 2483.500 MHz
-58.80 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2472.0
2500.0

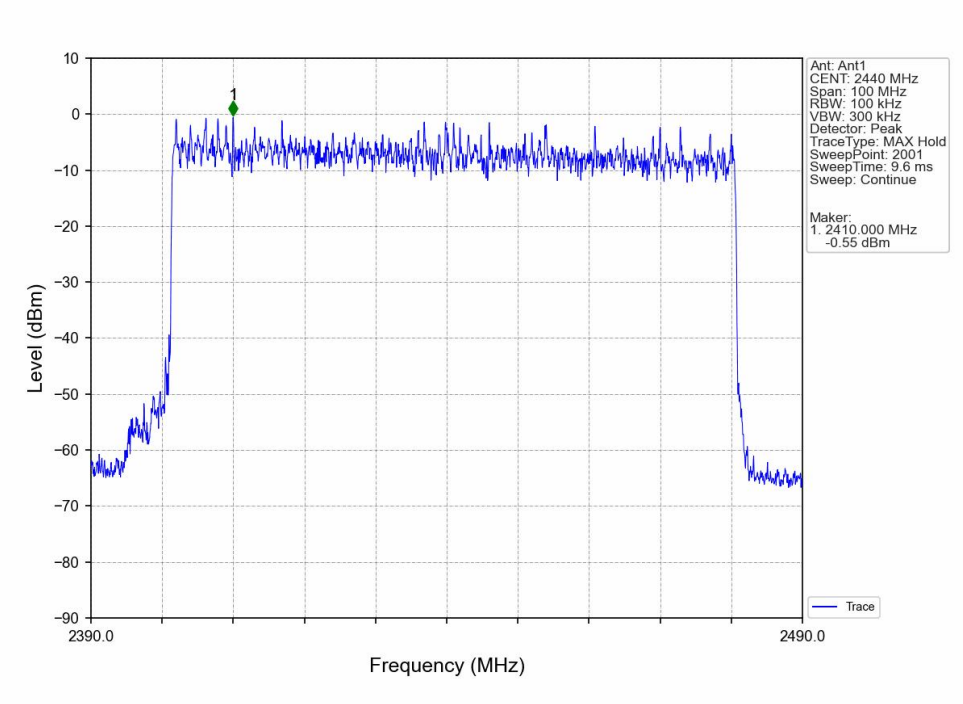
Hopping Mode
GFSK

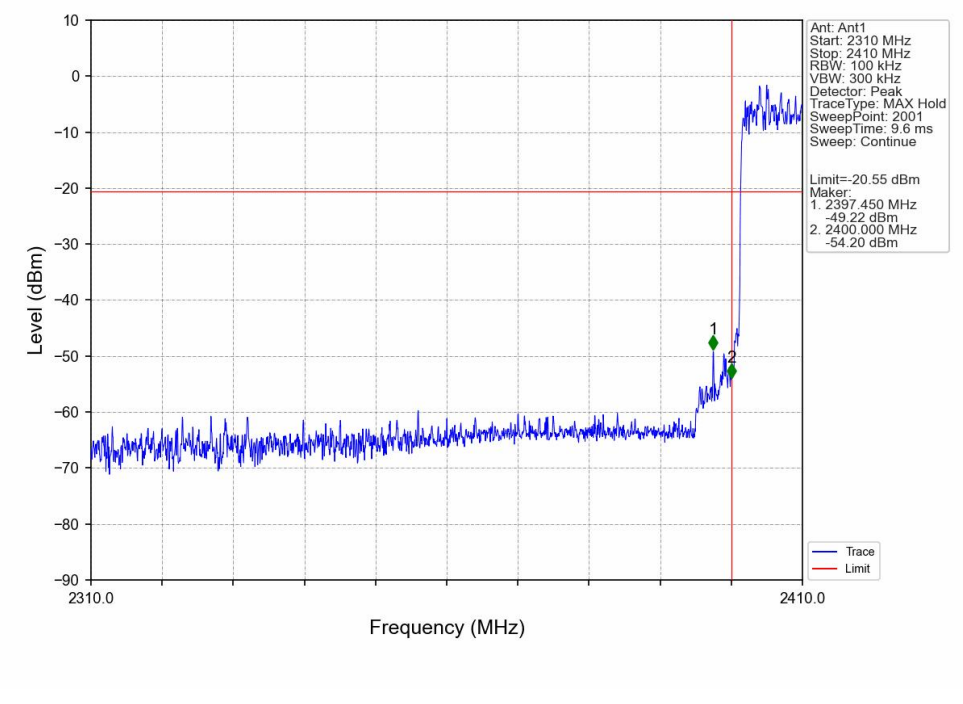


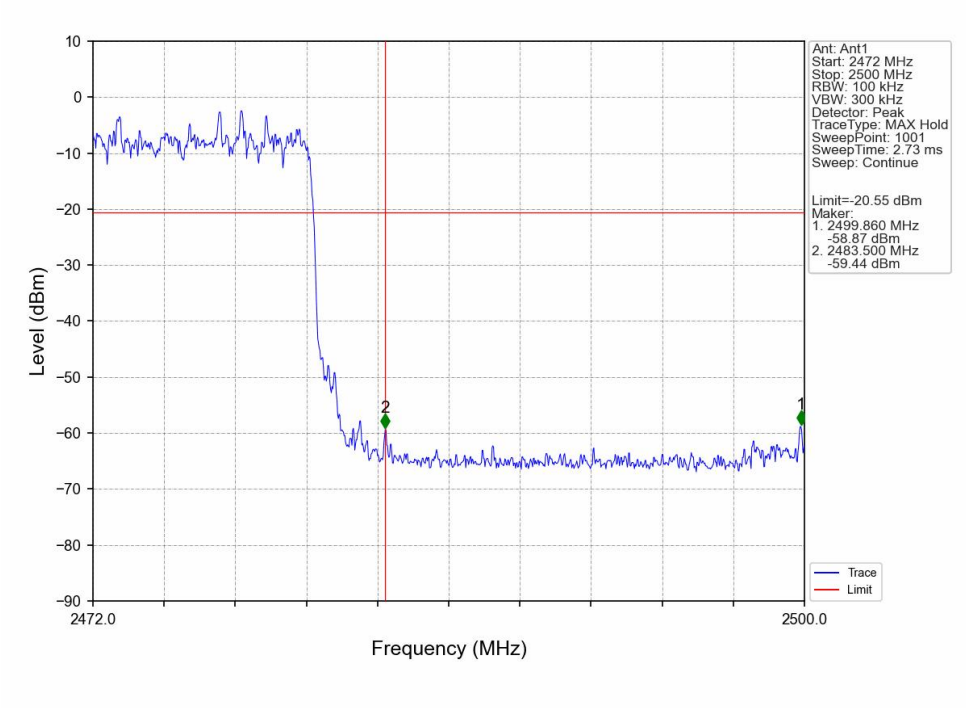



Ant: Ant1
Start: 2472 MHz
Stop: 2500 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 2.73 ms
Sweep: Continue
Limit=-20.88 dBm
Maker:
1. 2499.020 MHz
-58.71 dBm
2. 2483.500 MHz
-60.02 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2472.0
2500.0
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
1
2

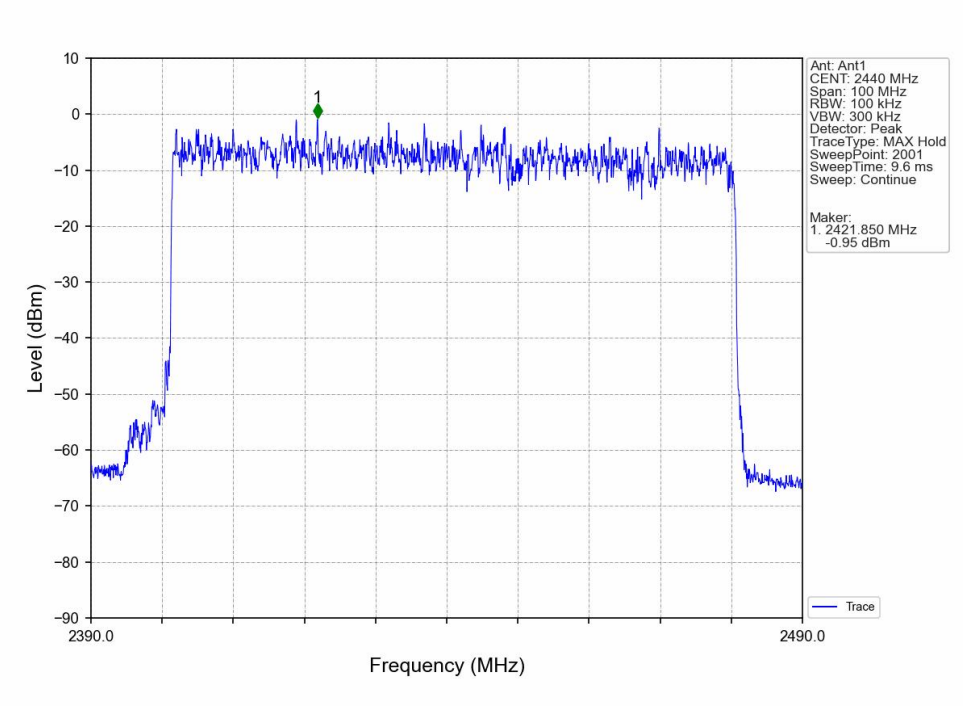
Pi/4DQPSK

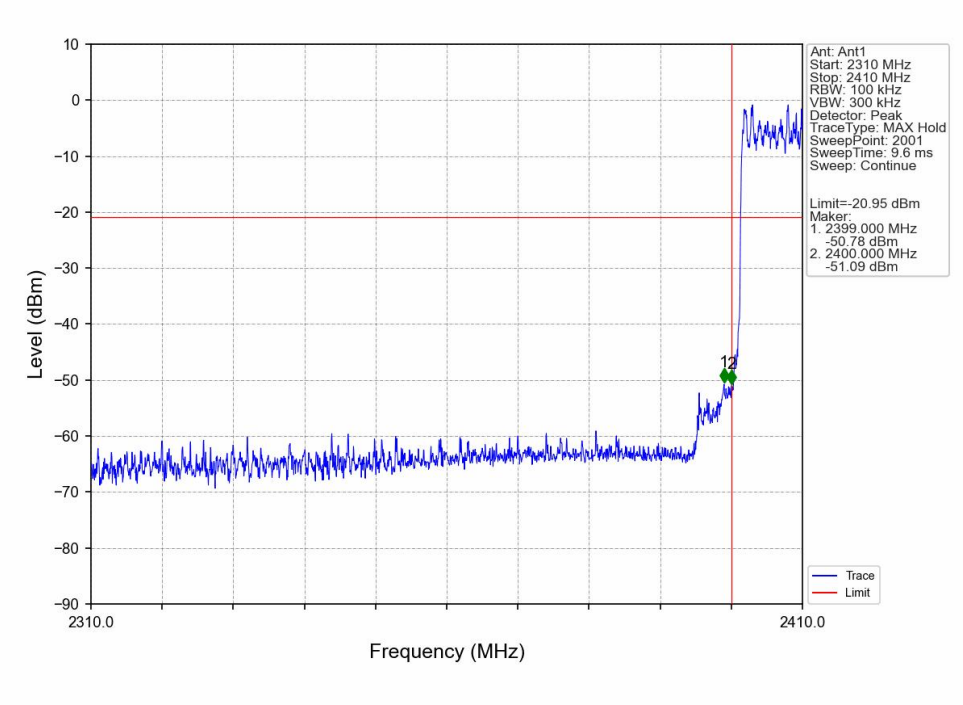

Ant: Ant1
CENT: 2440 MHz
Span: 100 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 2001
SweepTime: 9.6 ms
Sweep: Continue
Maker:
1. 2410.000 MHz
-0.55 dBm
Trace
Level (dBm)
Frequency (MHz)
2390.0
2490.0

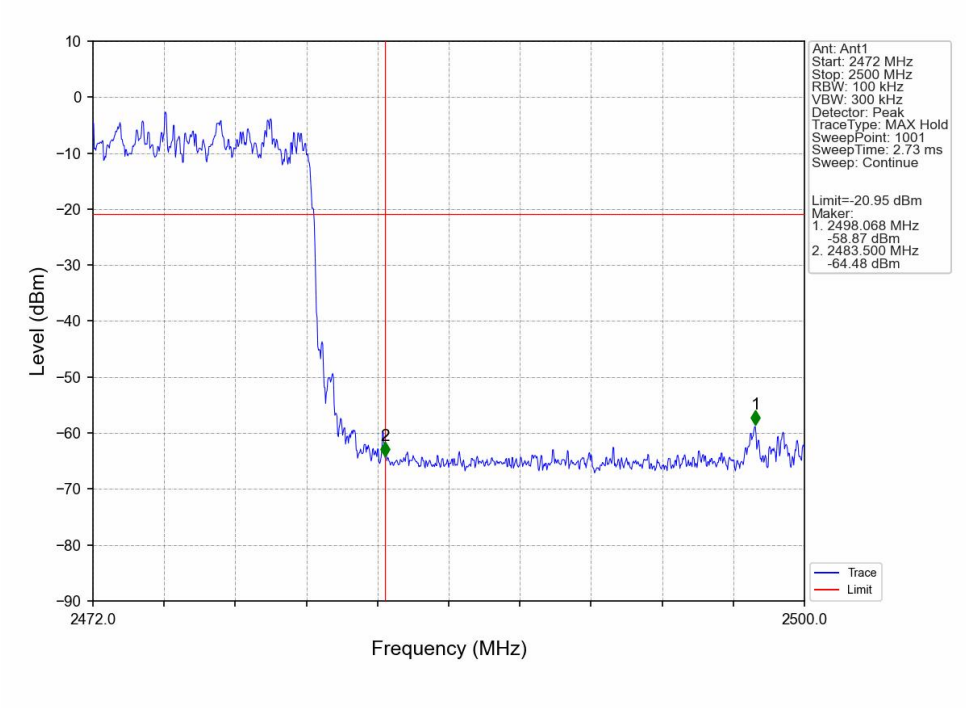

Ant: Ant1
Start: 2310 MHz
Stop: 2410 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 2001
SweepTime: 9.6 ms
Sweep: Continue
Limit=-20.55 dBm
Maker:
1. 2397.450 MHz
-49.22 dBm
2. 2400.000 MHz
-54.20 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2310.0
2410.0


Ant: Ant1
Start: 2472 MHz
Stop: 2500 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 2.73 ms
Sweep: Continue
Limit=-20.55 dBm
Maker:
1. 2499.860 MHz
-58.87 dBm
2. 2483.500 MHz
-59.44 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2472.0
2500.0
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
1
2

8DPSK


Ant: Ant1
CENT: 2440 MHz
Span: 100 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 2001
SweepTime: 9.6 ms
Sweep: Continue
Maker:
1. 2421.850 MHz
-0.95 dBm
Trace
Level (dBm)
Frequency (MHz)
2390.0
2490.0


Ant: Ant1
Start: 2310 MHz
Stop: 2410 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 2001
SweepTime: 9.6 ms
Sweep: Continue
Limit=-20.95 dBm
Maker:
1. 2399.000 MHz
-50.78 dBm
2. 2400.000 MHz
-51.09 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2310.0
2410.0


Ant: Ant1
Start: 2472 MHz
Stop: 2500 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 2.73 ms
Sweep: Continue
Limit=-20.95 dBm
Maker:
1. 2498.068 MHz
-58.87 dBm
2. 2483.500 MHz
-64.48 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2472.0
2500.0
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
1
2

4. PEAK OUTPUT POWER

APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (b)(i)	Peak Output Power	30Bm or 20.96dBm	2400-2483.5	PASS

TEST PROCEDURE

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

b. Spectrum Setting : RBW > the 20 dB bandwidth of the emission being measured

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

DEVIATION FROM STANDARD

No deviation.

TEST SETUP

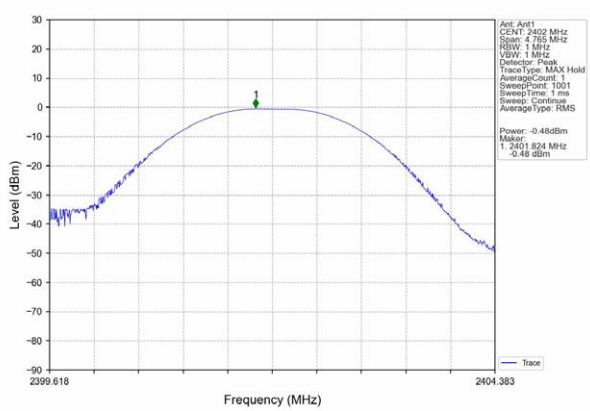
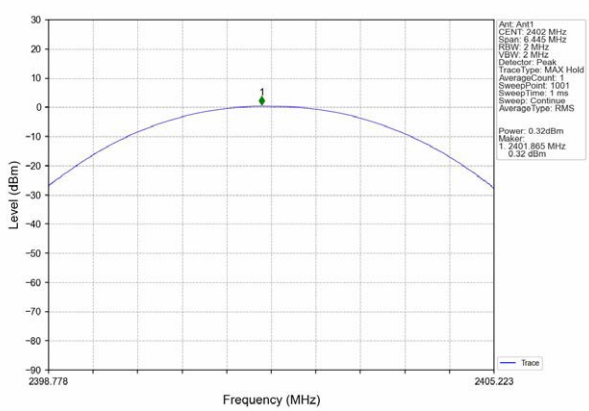
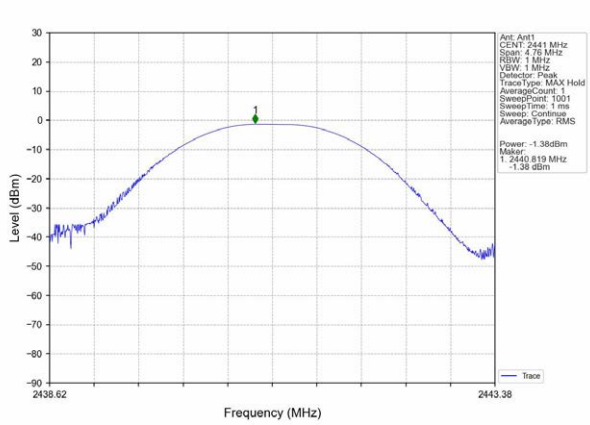
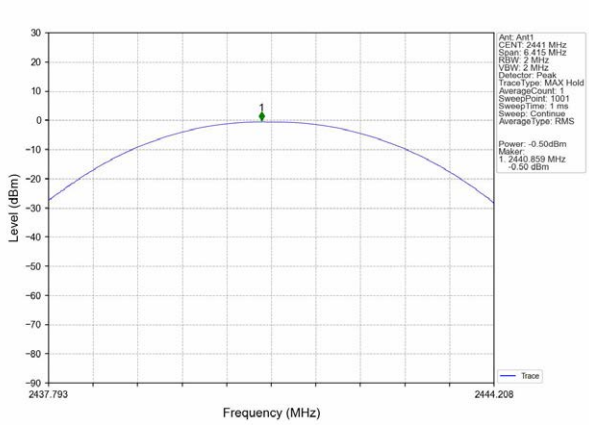
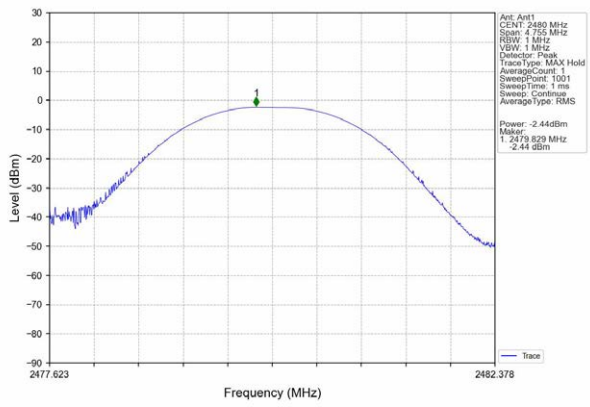
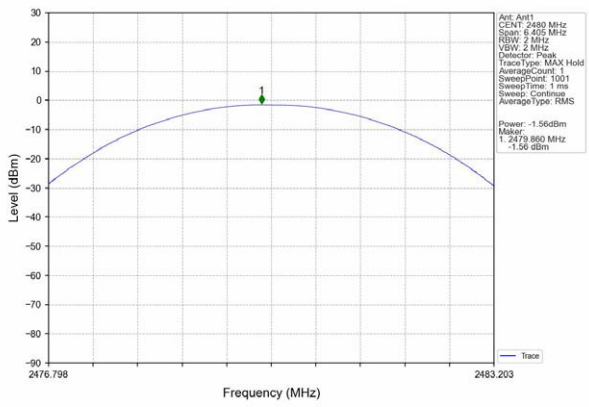
EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

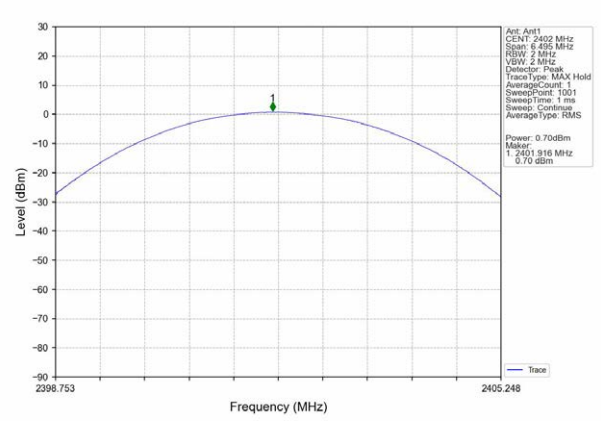
TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 (1M/2M/3Mbps Mode)		

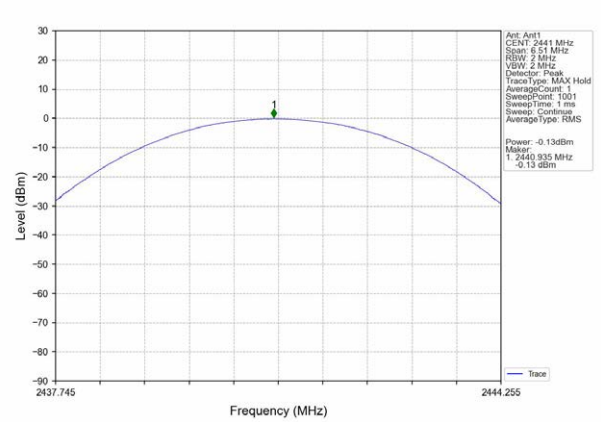
Mode	Test Channel	Peak Output Power (dBm)	LIMIT (dBm)
GFSK	CH00	-0.48	<=30
	CH39	-1.38	<=30
	CH78	-2.44	<=30
π /4 DQPSK	CH00	0.32	<=20.97
	CH39	-0.50	<=20.97
	CH78	-1.56	<=20.97
8DPSK	CH00	0.70	<=20.97
	CH39	-0.13	<=20.97
	CH78	-1.20	<=20.97

GFSK	π /4 DQPSK
	
2402MHz	2402MHz
	
2441MHz	2441MHz
	
2480MHz	2480MHz

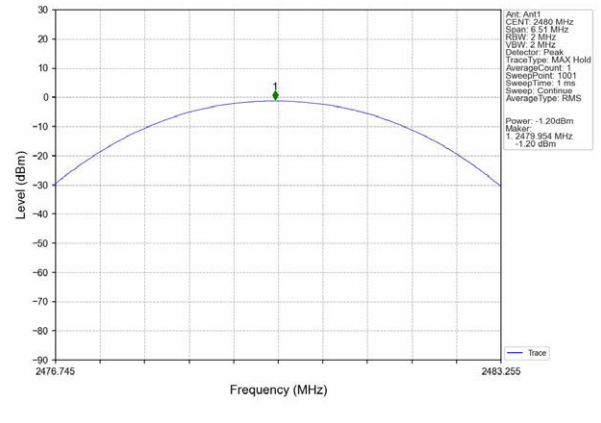
8DPSK



2402MHz



2441MHz



2480MHz

5. NUMBER OF HOPPING CHANNEL

APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW ≥ 1% of the span
VB	VBW ≥ RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

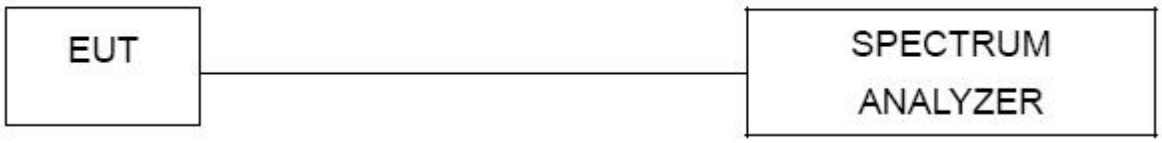
TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

DEVIATION FROM STANDARD

No deviation.

TEST SETUP



EUT OPERATION CONDITIONS

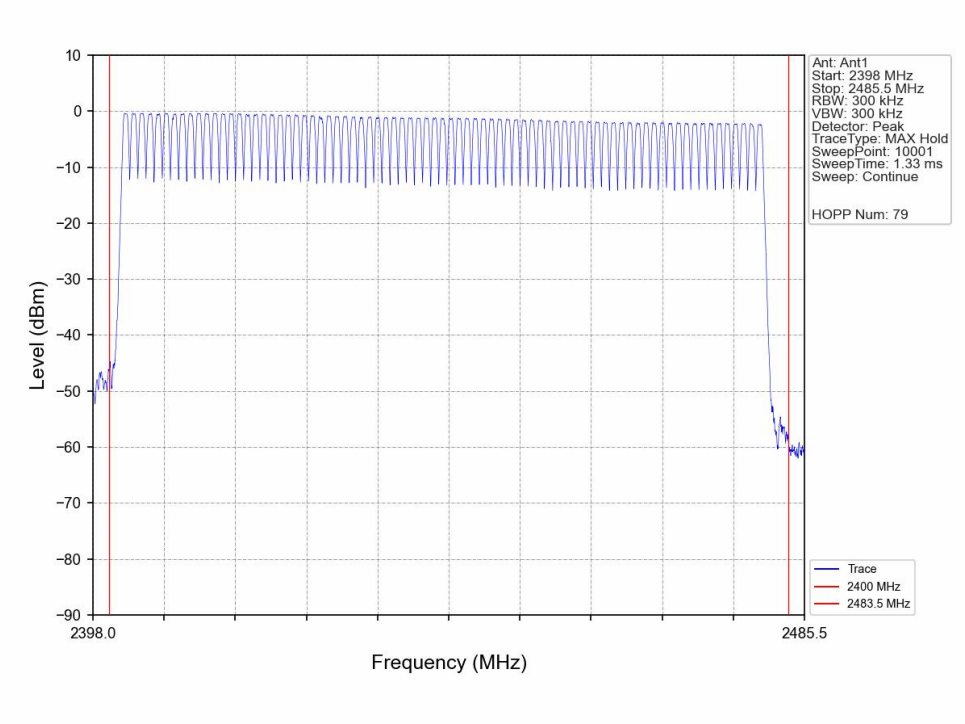
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

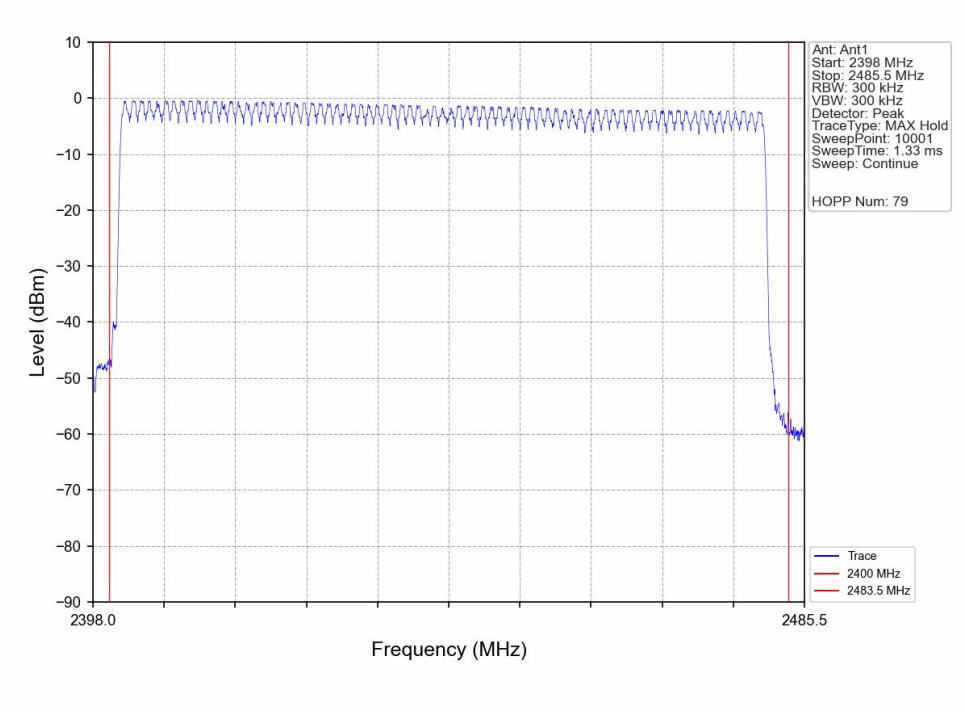
Test Mode :	Hopping Mode

Number of Hopping Channel	GFSK	79
	π /4 DQPSK	79
	8DPSK	79

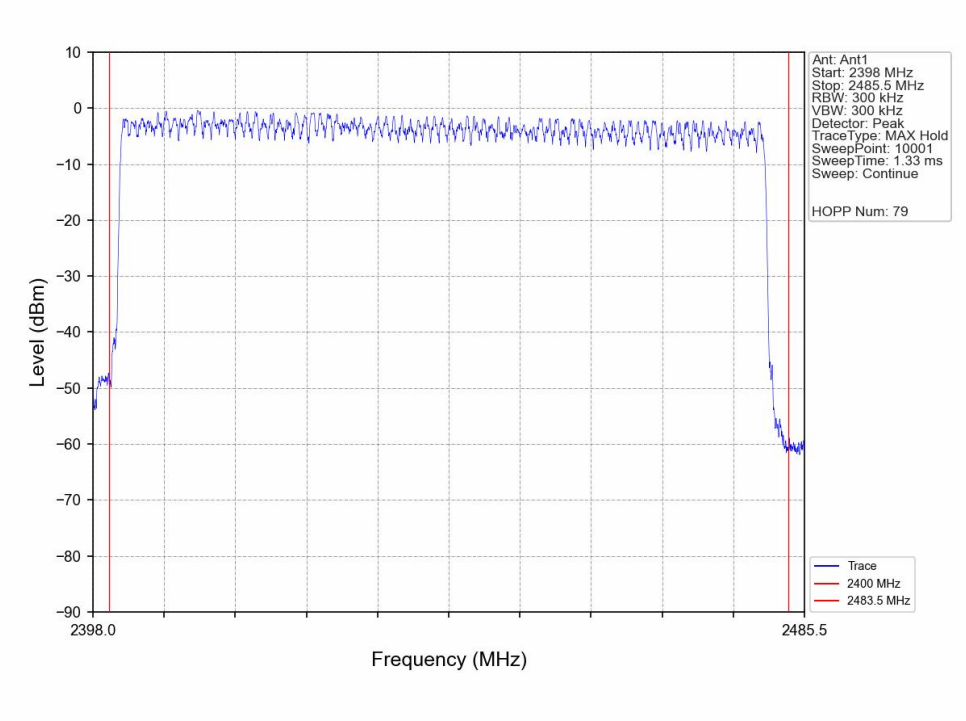
GFSK



π /4 DQPSK



8DPSK


Ant: Ant1
Start: 2398 MHz
Stop: 2485.5 MHz
RBW: 300 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 10001
SweepTime: 1.33 ms
Sweep: Continue
HOPP Num: 79
Trace
2400 MHz
2483.5 MHz
Level (dBm)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
2398.0
2485.5
Frequency (MHz)

6. BANDWIDTH TEST

APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C	
Section	Test Item
15.247(a)(2)	Bandwidth

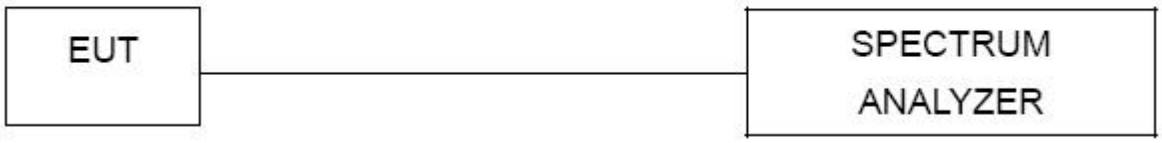
TEST PROCEDURE

1. Set RBW = 30 kHz.
2. Set the video bandwidth (VBW) ≥3RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

DEVIATION FROM STANDARD

No deviation.

TEST SETUP

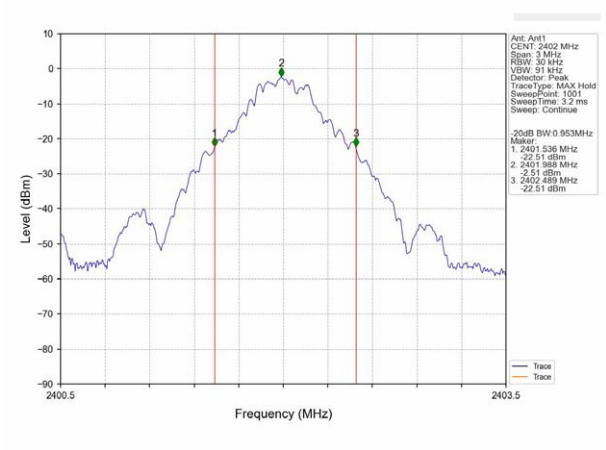
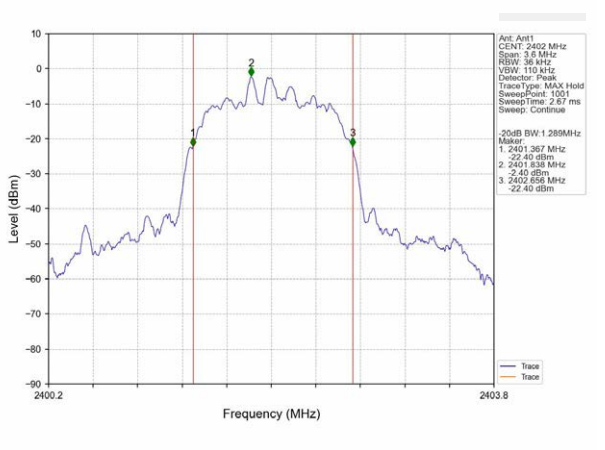
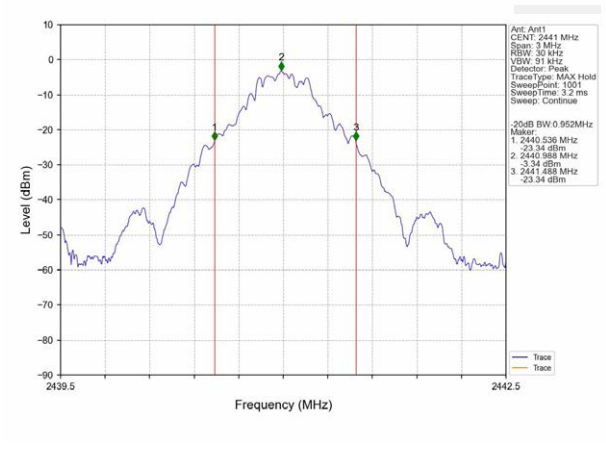
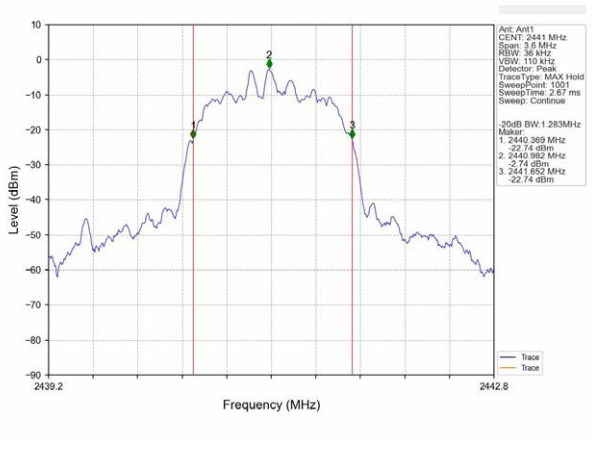
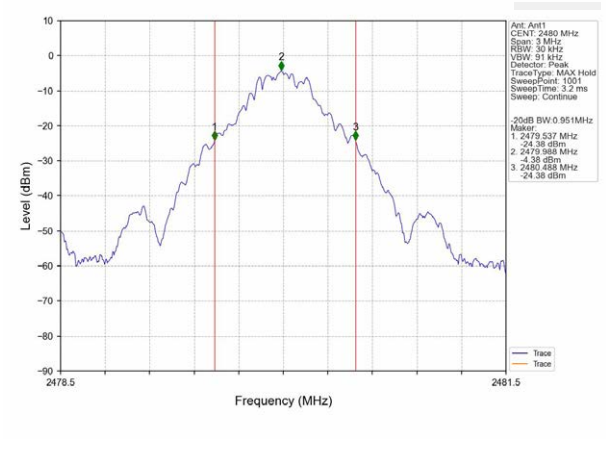
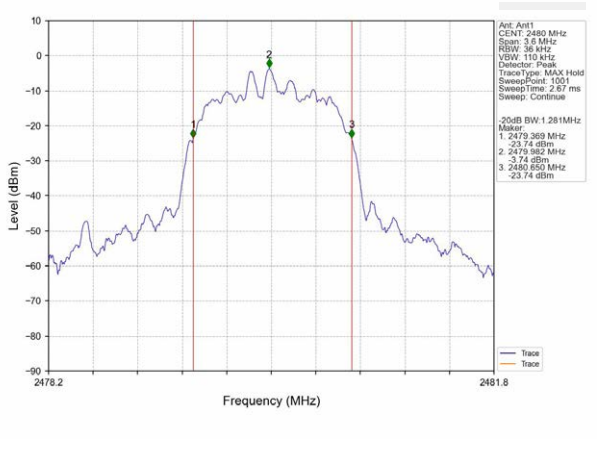


EUT OPERATION CONDITIONS

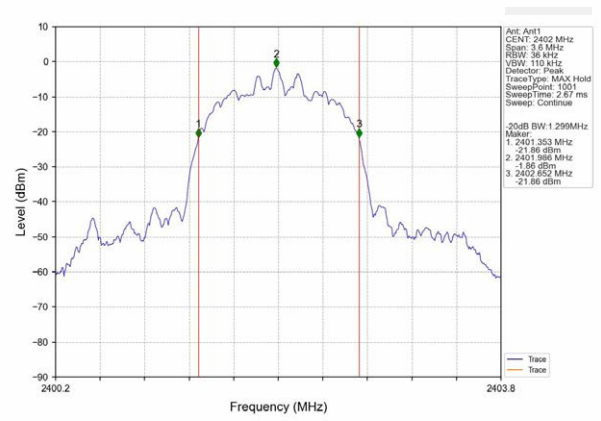
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

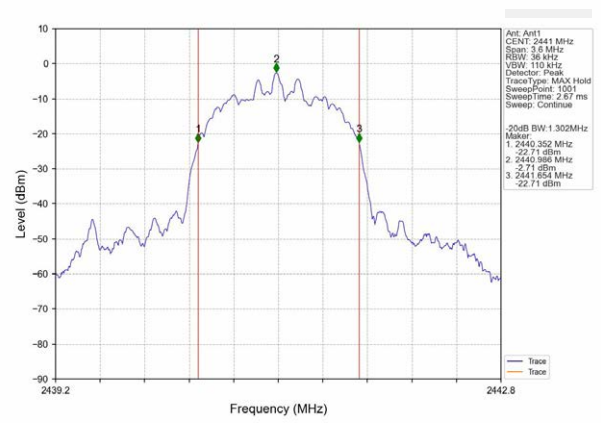
	Frequency (MHz)	20dB Bandwidth (MHz)	Result
GFSK	2402	0.953	Pass
	2441	0.952	Pass
	2480	0.951	Pass
π /4 DQPSK	2402	1.289	Pass
	2441	1.283	Pass
	2480	1.281	Pass
8DPSK	2402	1.299	Pass
	2441	1.302	Pass
	2480	1.302	Pass

GFSK	π /4 DQPSK
	
2402MHz	2402MHz
	
2441MHz	2441MHz
	
2480MHz	2480MHz

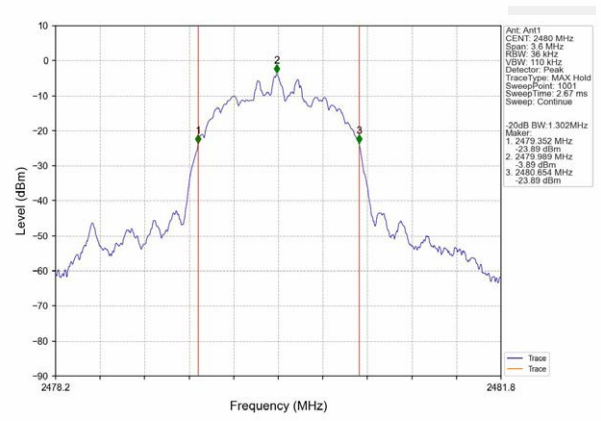
8DPSK



2402MHz



2441MHz



2480MHz

7. HOPPING CHANNEL SEPARATION MEASUREMENT

APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100 kHz (Channel Separation)
VB	300 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

TEST PROCEDURE

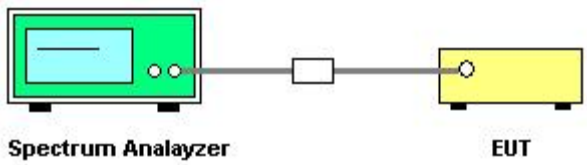
a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.

b. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised for channel separation measurement.

DEVIATION FROM STANDARD

No deviation.

TEST SETUP



EUT OPERATION CONDITIONS

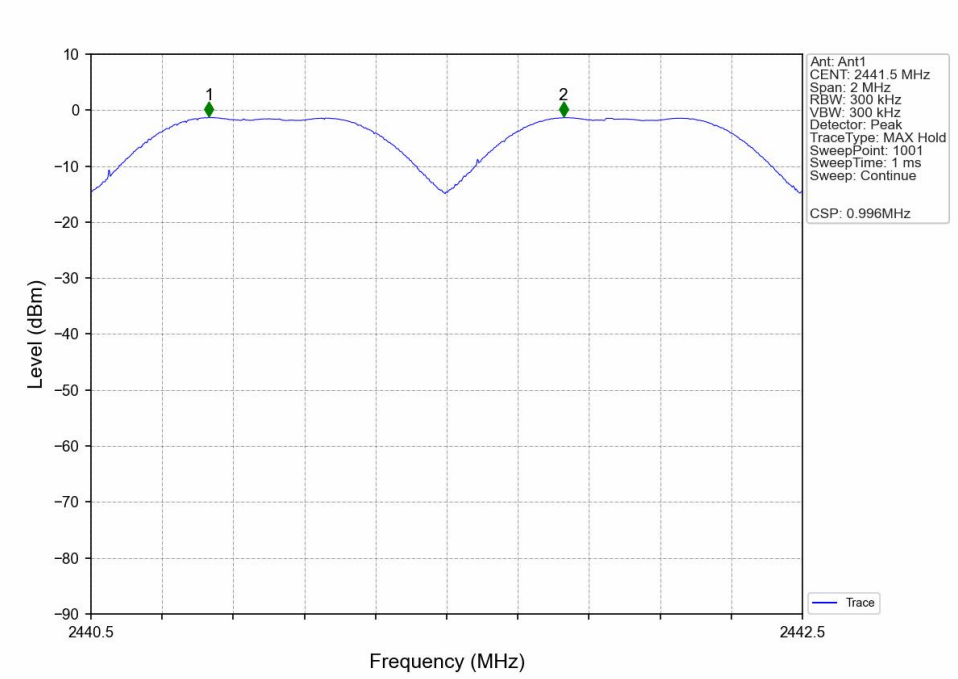
The EUT was programmed to be in continuously transmitting mode.

TEST RESULTS

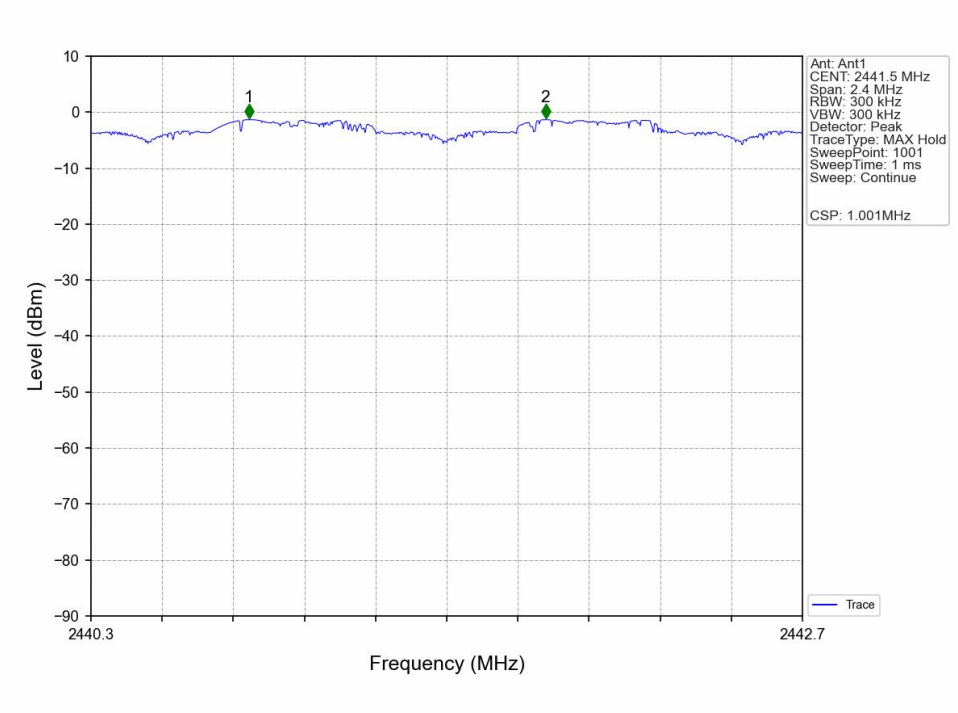
Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V

Test Mode	Ch. Separation (MHz)	Limit (MHz)	Result
GFSK	0.996	>=0.953	Complies
π /4 DQPSK	1.001	>=0.859	Complies
8DPSK	1.001	>=0.868	Complies

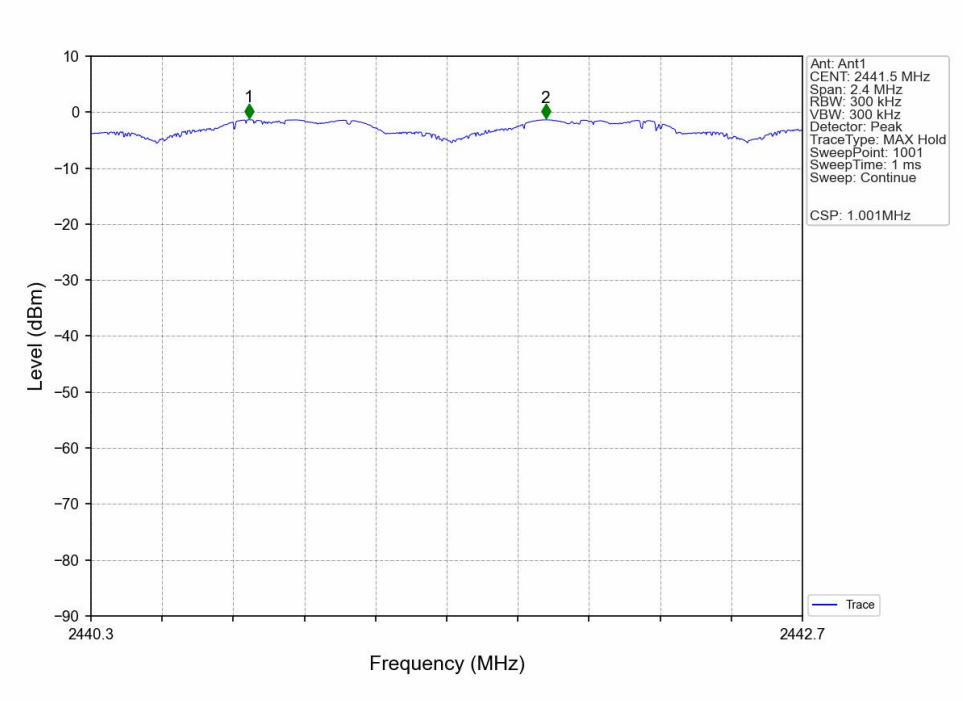
GFSK


Ant: Ant1
CENT: 2441.5 MHz
Span: 2 MHz
RBW: 300 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1 ms
Sweep: Continue
CSP: 0.996MHz
Trace
Level (dBm)
Frequency (MHz)
2440.5
2442.5

π /4DPSK


Ant: Ant1
CENT: 2441.5 MHz
Span: 2.4 MHz
RBW: 300 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1 ms
Sweep: Continue
CSP: 1.001MHz
Trace
Level (dBm)
Frequency (MHz)
2440.3
2442.7

8DPSK


Ant: Ant1
CENT: 2441.5 MHz
Span: 2.4 MHz
RBW: 300 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1 ms
Sweep: Continue
CSP: 1.001MHz
Trace
Level (dBm)
Frequency (MHz)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
2440.3
2442.7
1
2

8. DWELL TIME OF OCCUPANCY

APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.
i. A Period Time = (channel number)*0.4
DH1 Time Slot: Reading * (1600/2)*31.6/(channel number)
DH3 Time Slot: Reading * (1600/4)*31.6/(channel number)
DH5 Time Slot: Reading * (1600/6)*31.6/(channel number)

DEVIATION FROM STANDARD

No deviation.

TEST SETUP

EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

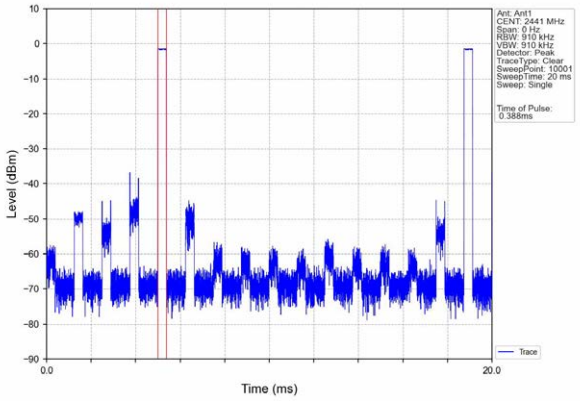
TEST RESULTS

Test Mode :	CH39-DH5, 2DH5, 3DH5

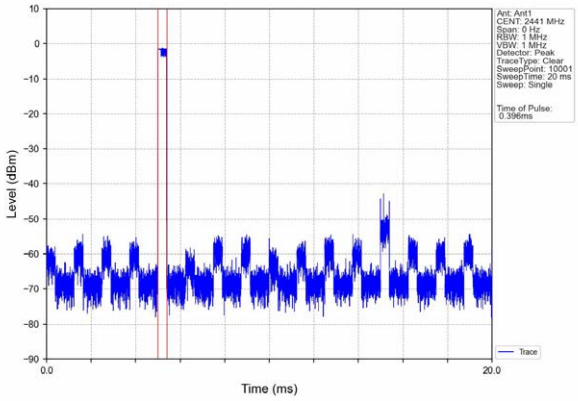
Frequency	Packet	Pulse time (ms)	Dwell time(ms)	Limit(ms)	Result
2441MHz	DH1	0.388	124.160	400	Pass
	DH3	1.648	263.680	400	Pass
	DH5	2.894	308.693	400	Pass
2441MHz	2-DH1	0.396	126.720	400	Pass
	2-DH3	1.648	263.680	400	Pass
	2-DH5	2.896	308.907	400	Pass
2441MHz	3-DH1	0.396	126.720	400	Pass
	3-DH3	1.648	263.680	400	Pass
	3-DH5	2.904	309.760	400	Pass

Dwell time=Pulse time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second for DH1, 2-DH1
Dwell time=Pulse time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second for DH3, 2-DH3
Dwell time=Pulse time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second for DH5, 2-DH5

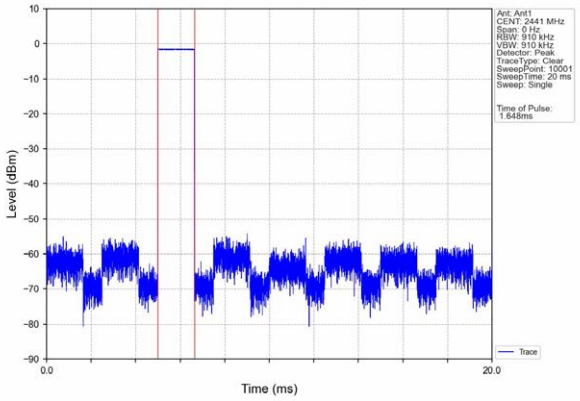
Test channel: 2441MHz



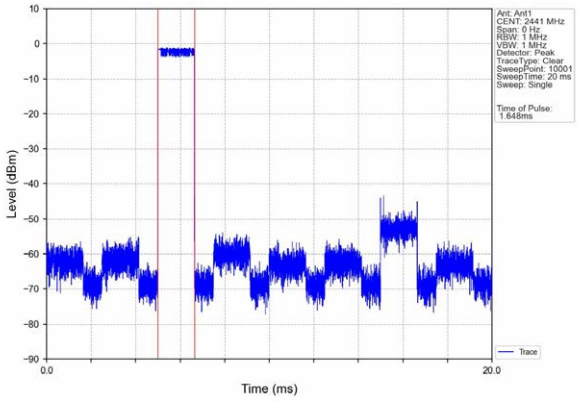
DH1



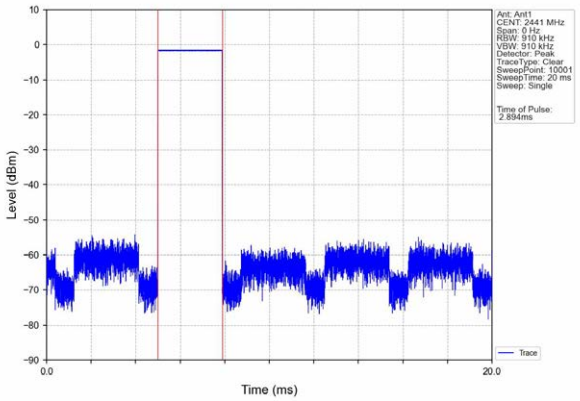
2-DH1



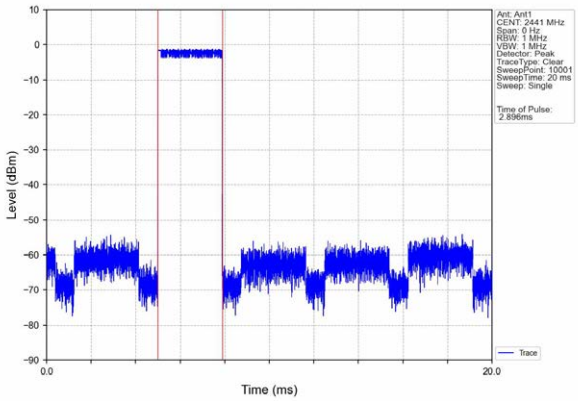
DH3



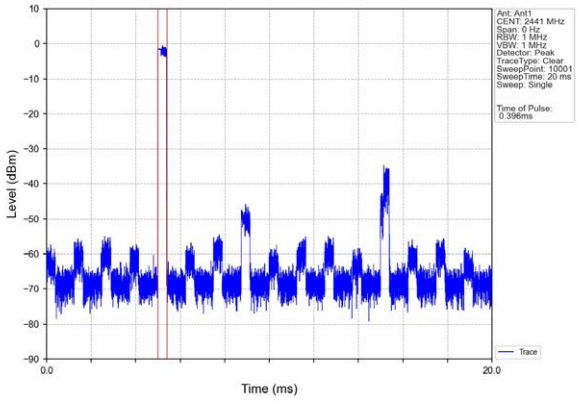
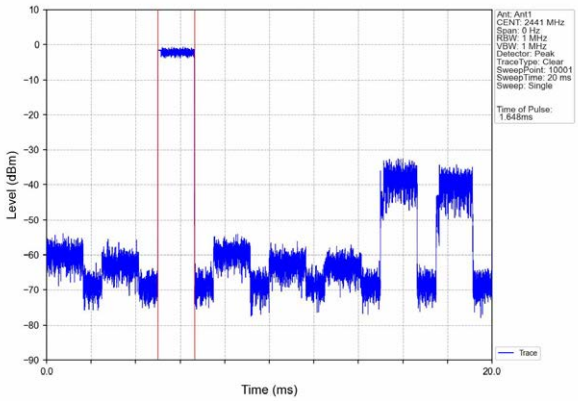
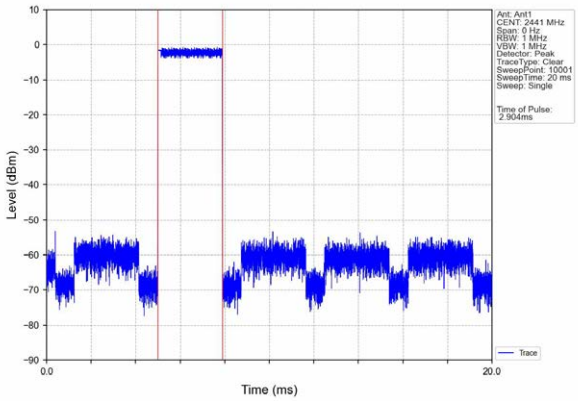
2-DH3



DH5



2-DH5

Test channel: 2441MHz	
	
3-DH1	
	
3-DH3	
	
3-DH5	

9. ANTENNA REQUIREMENT

STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: 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.

EUT ANTENNA

The EUT antenna is FPC antenna,. It comply with the standard requirement.

10. TEST SEUUP PHOTO

Reference to the appendix I for details

11. EUT PHOTO

Reference to the appendix II for details

※※※※※ **END OF REPORT** ※※※※※