



Shenzhen CTL Testing Technology Co., Ltd.

Tel: +86-755-89486194 E-mail: [ctl@ctl-lab.com](mailto:ctl@ctl-lab.com)

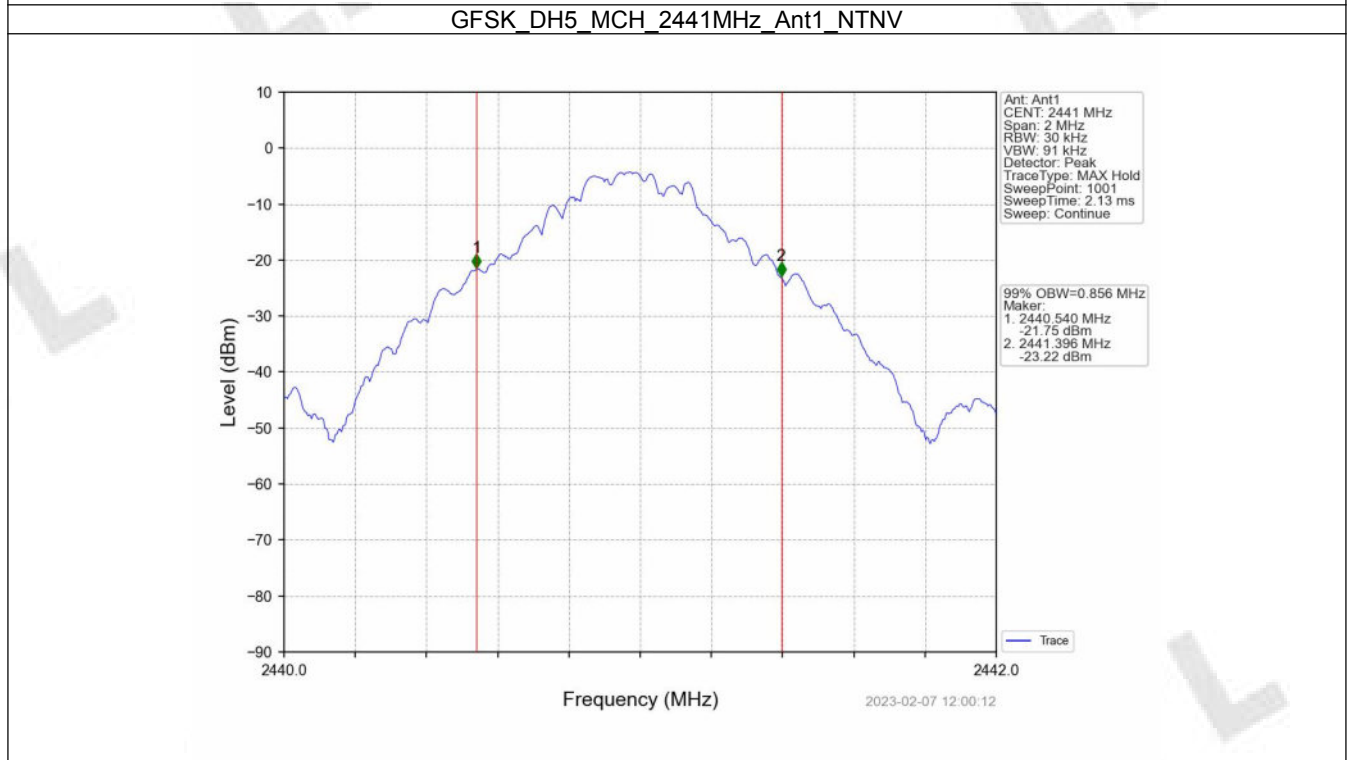
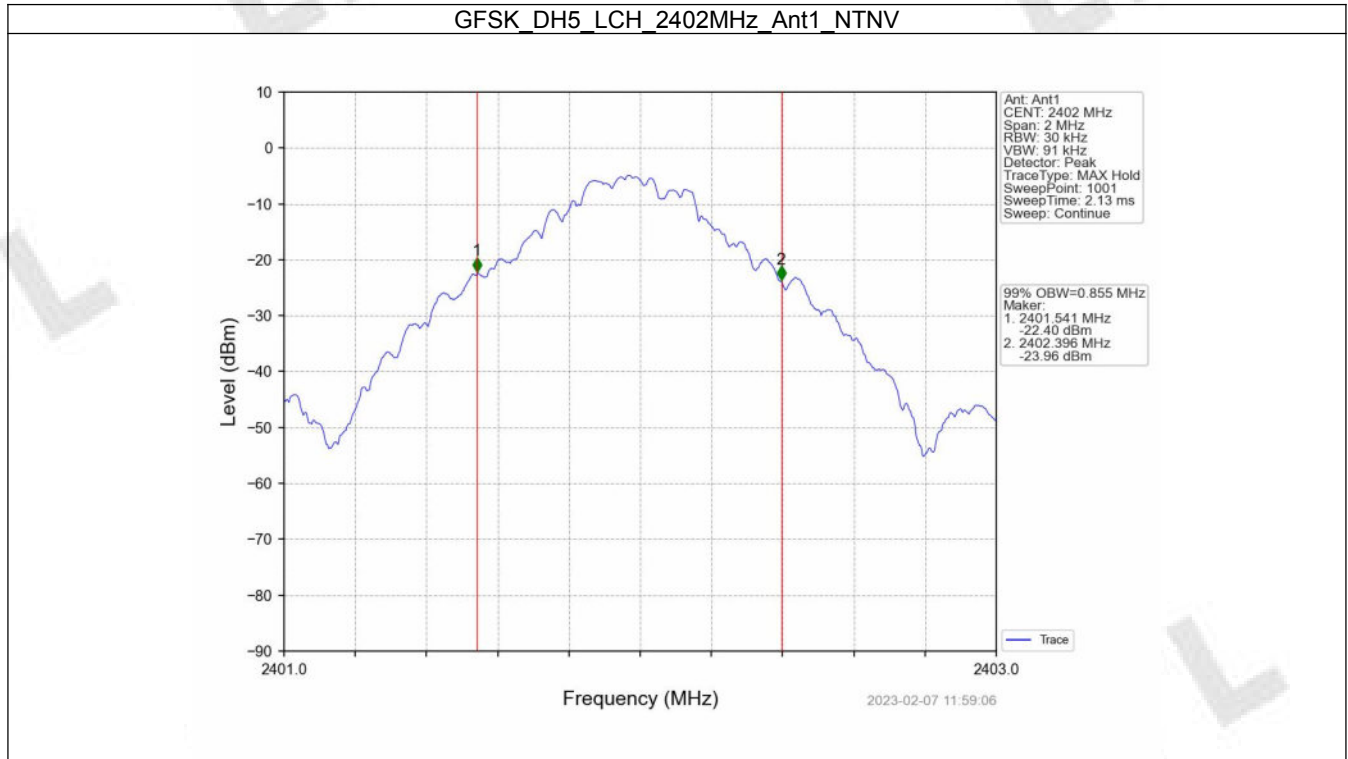
## 1. Bandwidth

### 1.1 OBW

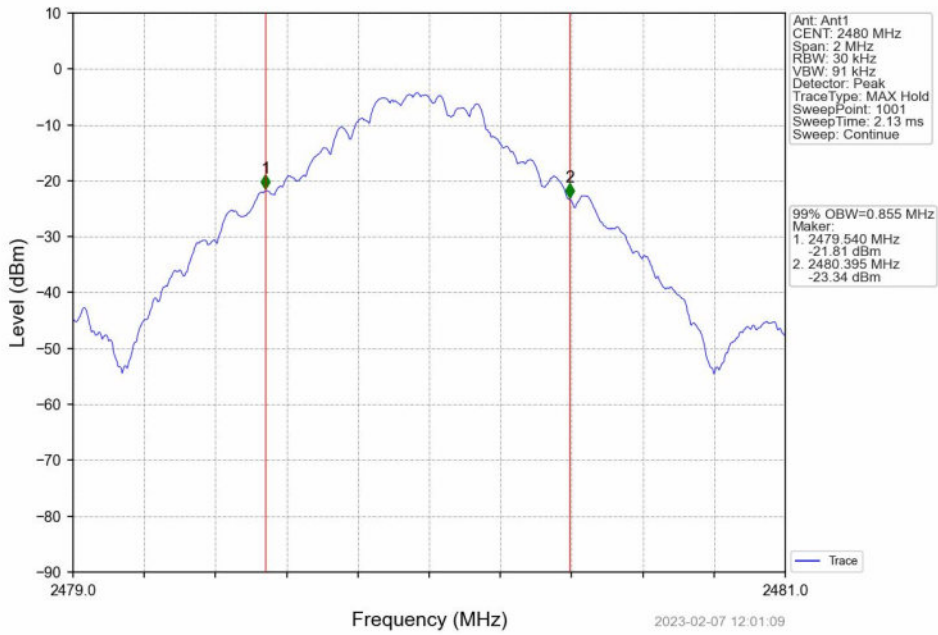
#### 1.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.855	Pass
		2441	DH5	1	0.856	Pass
		2480	DH5	1	0.855	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.182	Pass
		2441	2DH5	1	1.187	Pass
		2480	2DH5	1	1.188	Pass
8DPSK	SISO	2402	3DH5	1	1.182	Pass
		2441	3DH5	1	1.188	Pass
		2480	3DH5	1	1.185	Pass

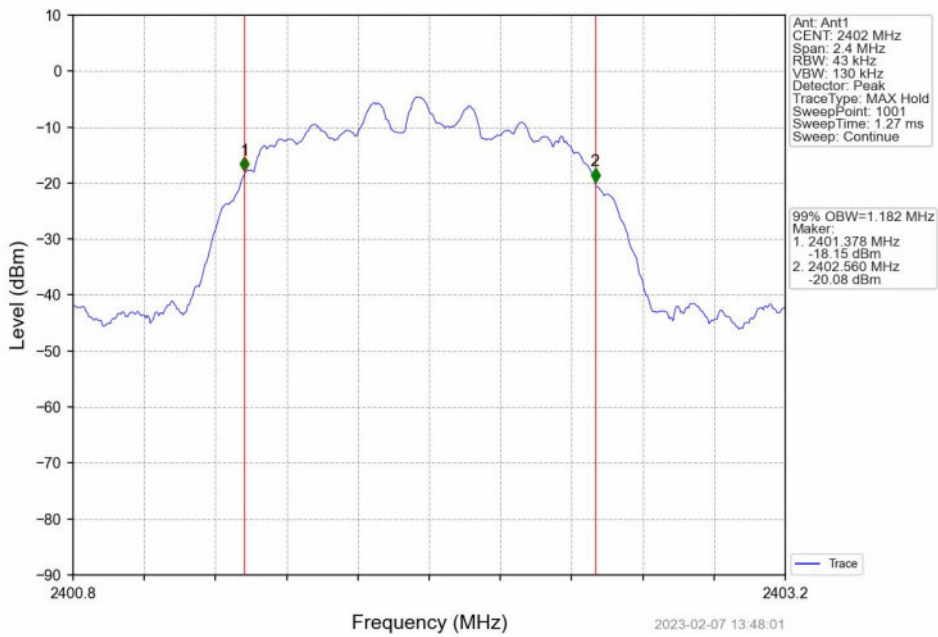
1.1.2 Test Graph



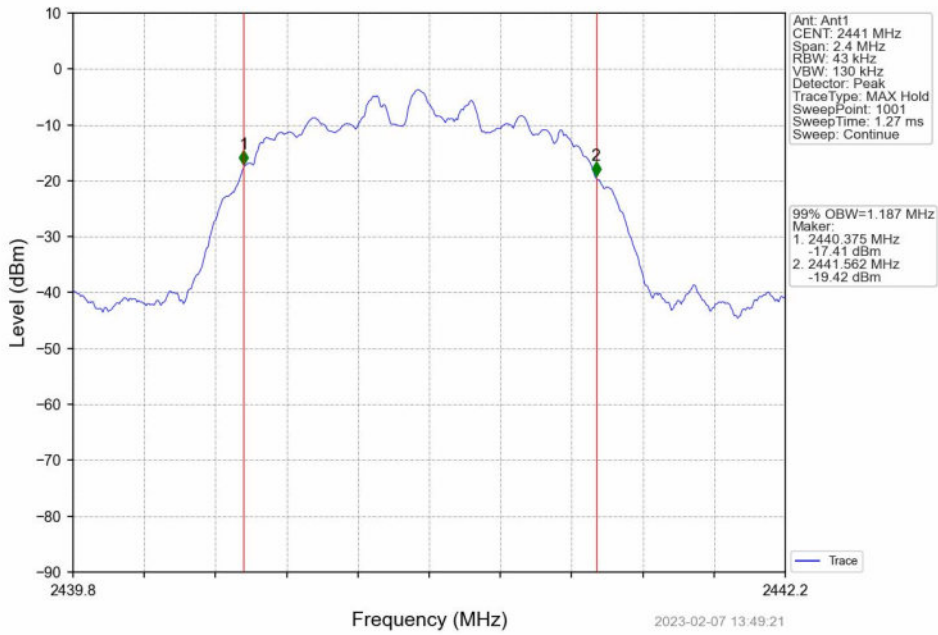
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



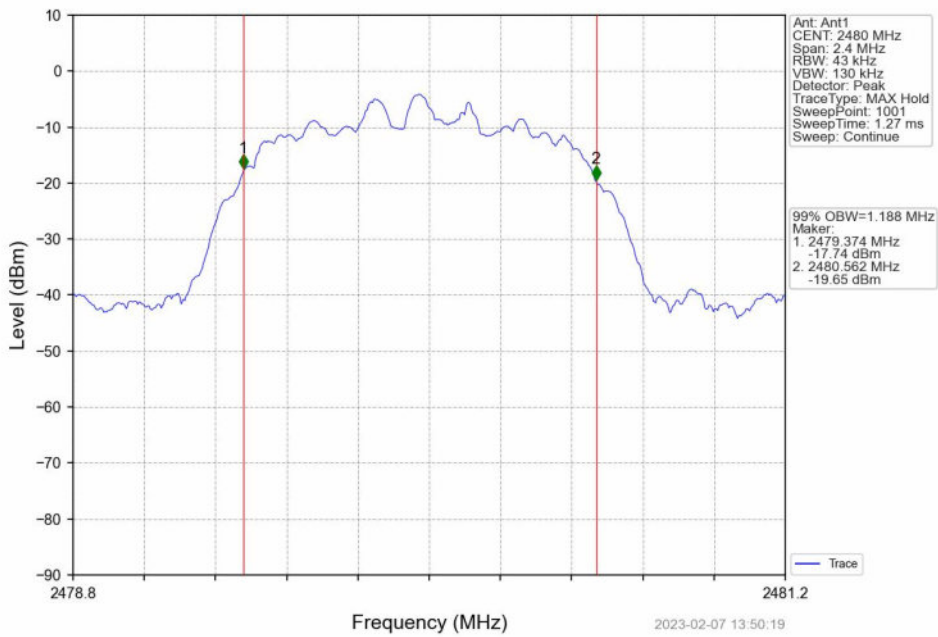
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



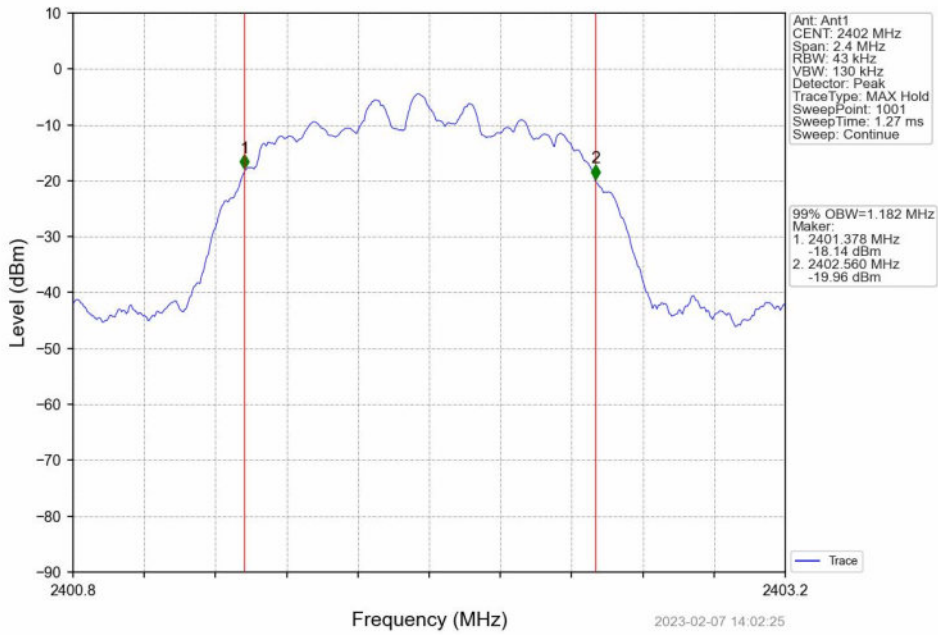
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



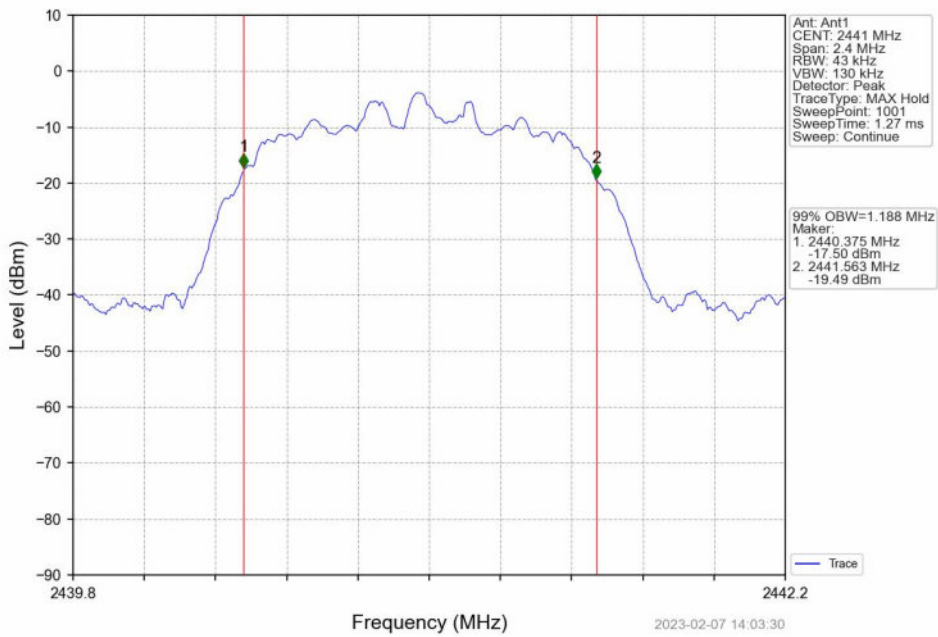
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

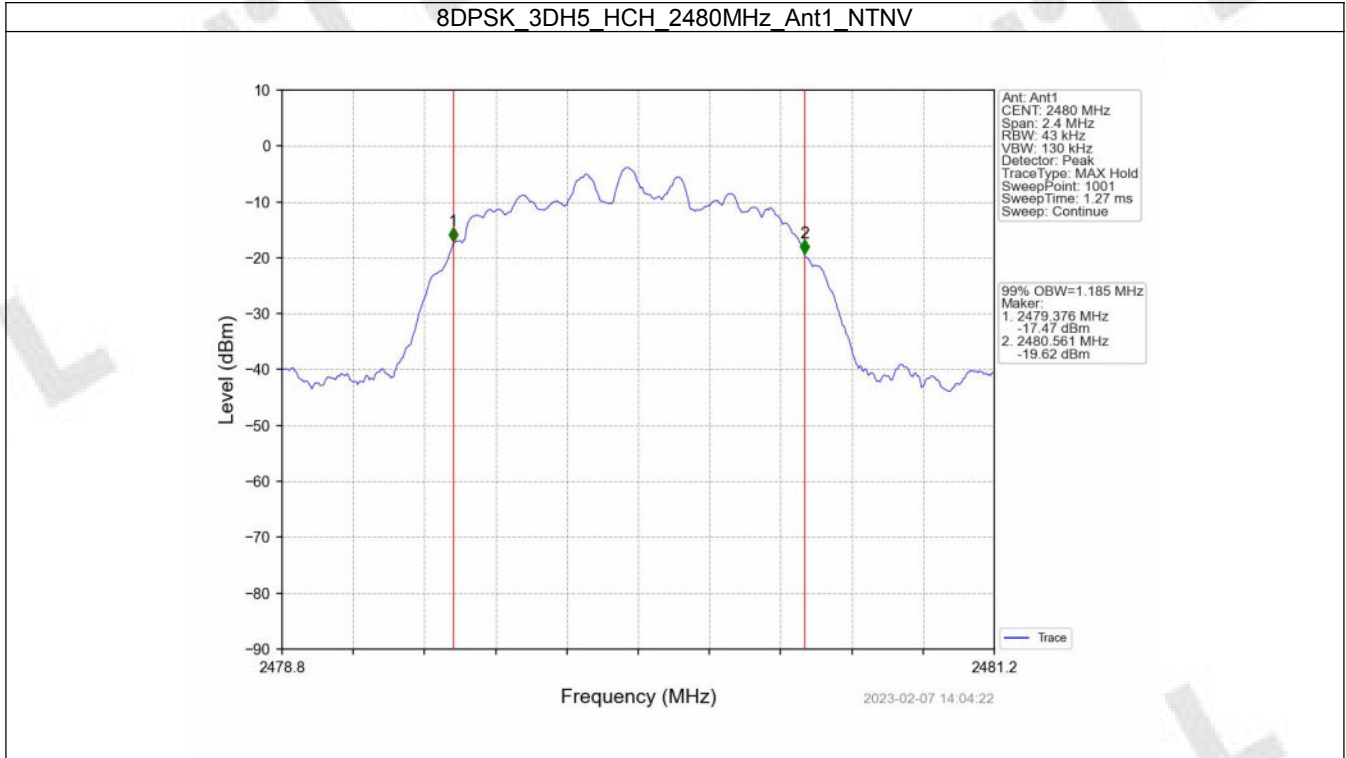


8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



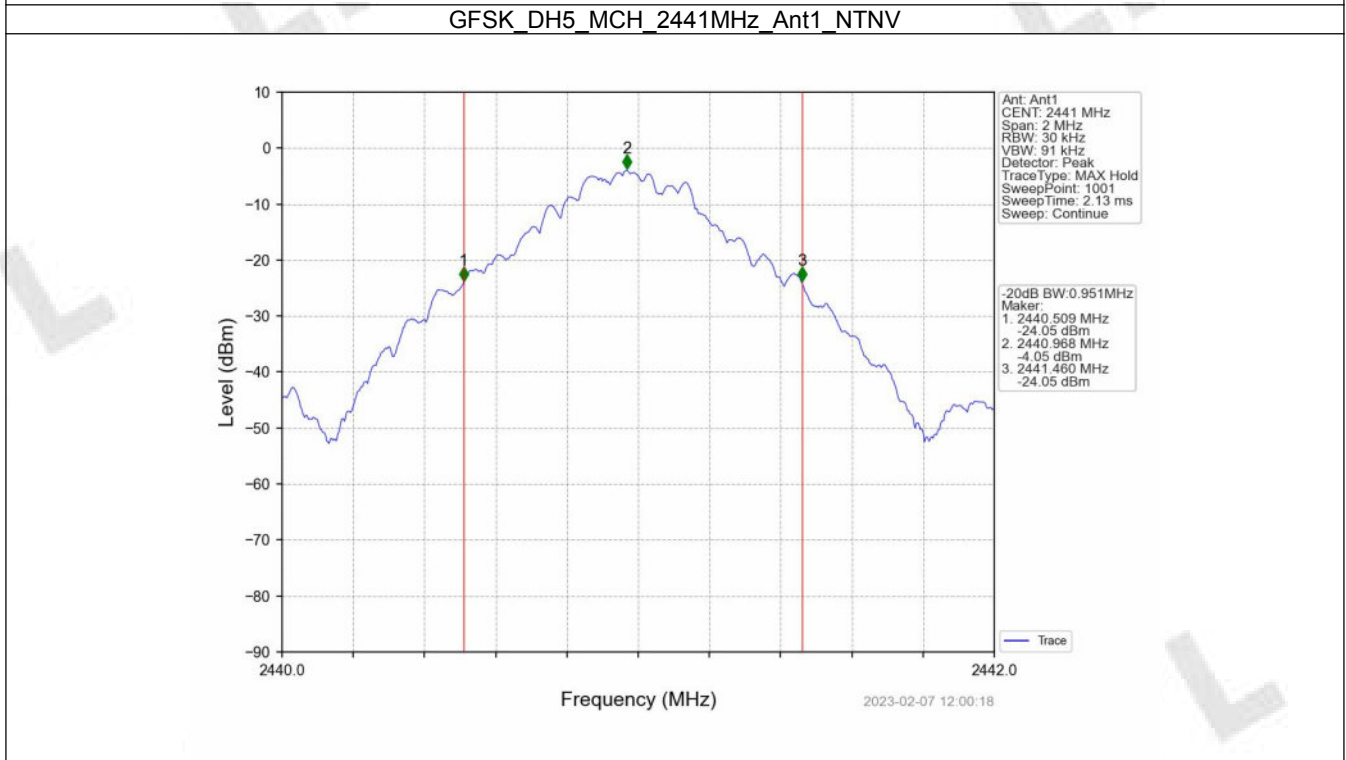
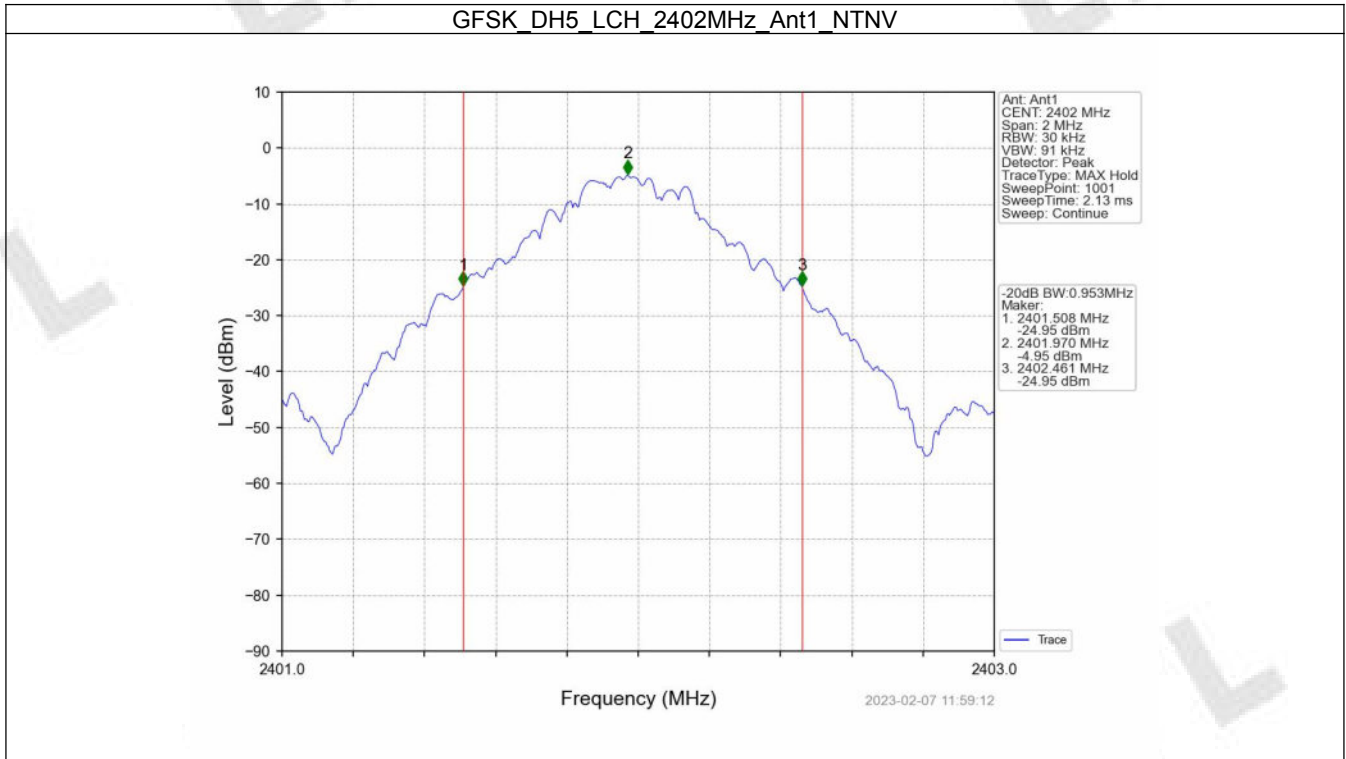


## 1.2 20dB BW

## 1.2.1 Test Result

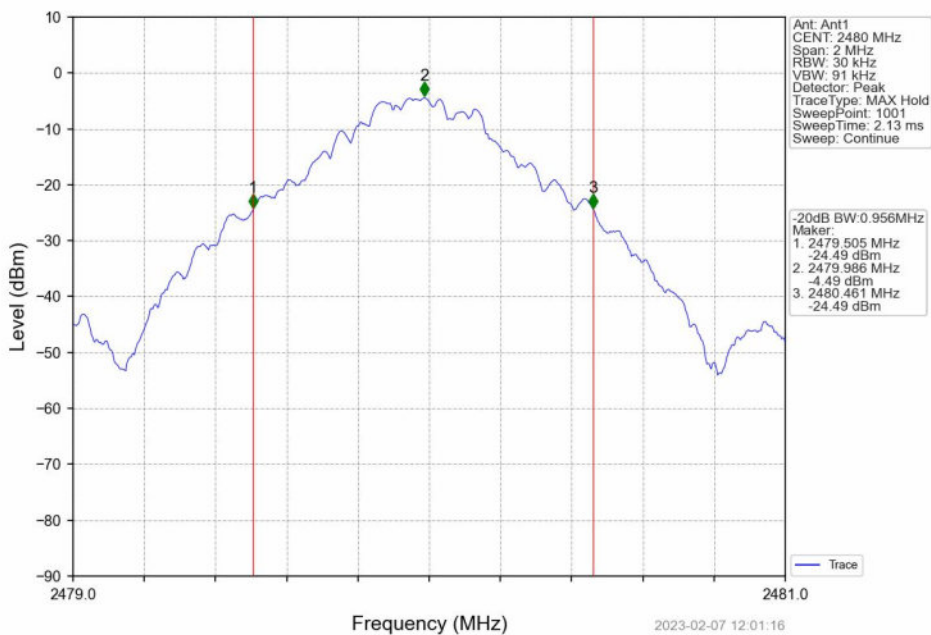
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.953	Pass
		2441	DH5	1	0.951	Pass
		2480	DH5	1	0.956	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.335	Pass
		2441	2DH5	1	1.334	Pass
		2480	2DH5	1	1.332	Pass
8DPSK	SISO	2402	3DH5	1	1.333	Pass
		2441	3DH5	1	1.332	Pass
		2480	3DH5	1	1.332	Pass

1.2.2 Test Graph

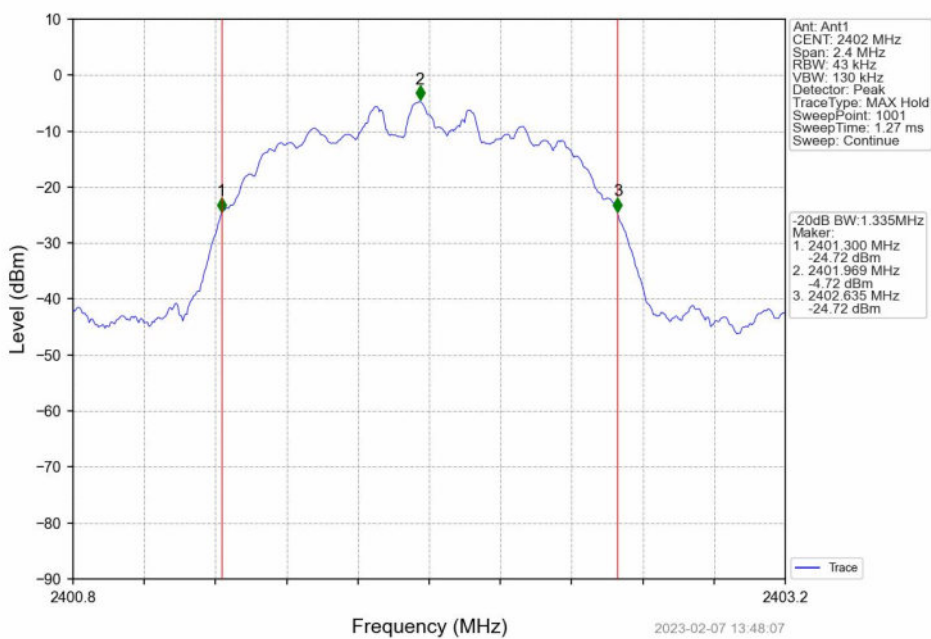




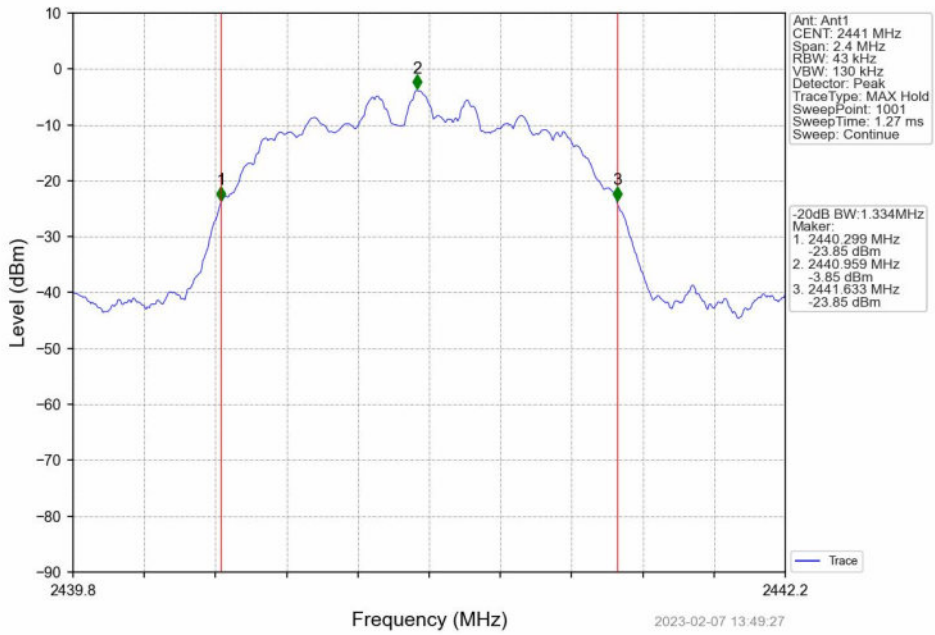
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



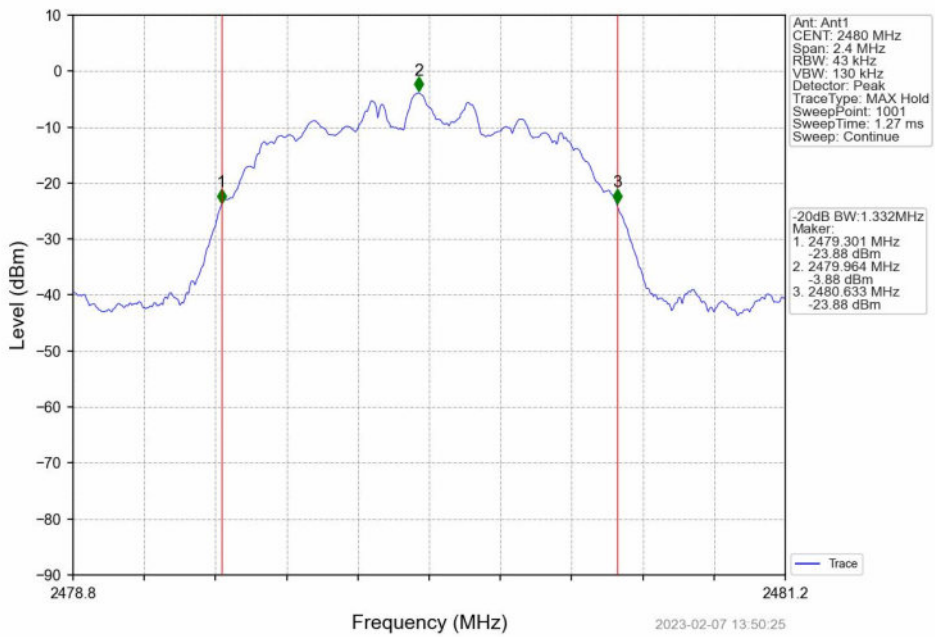
PI/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



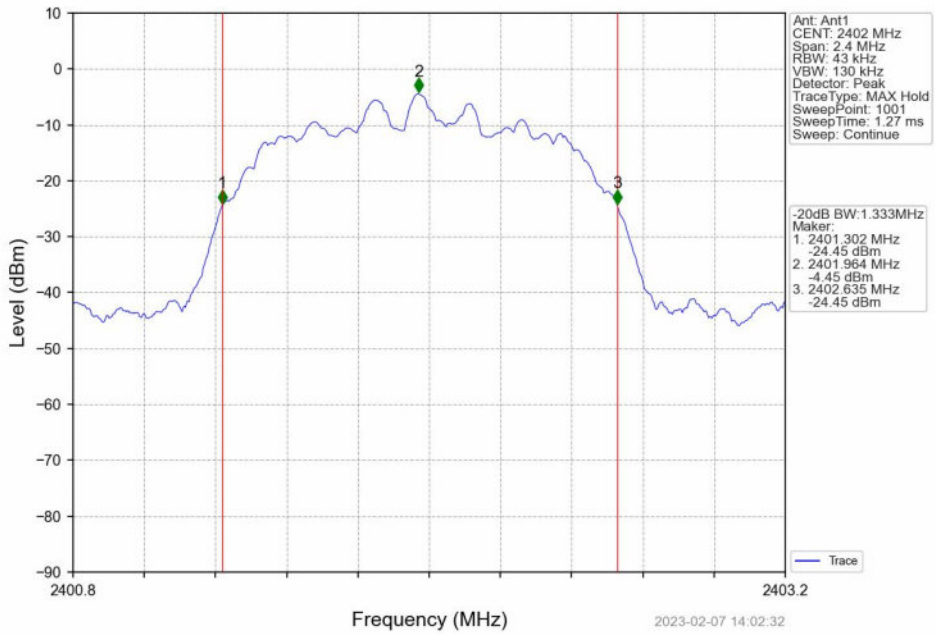
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



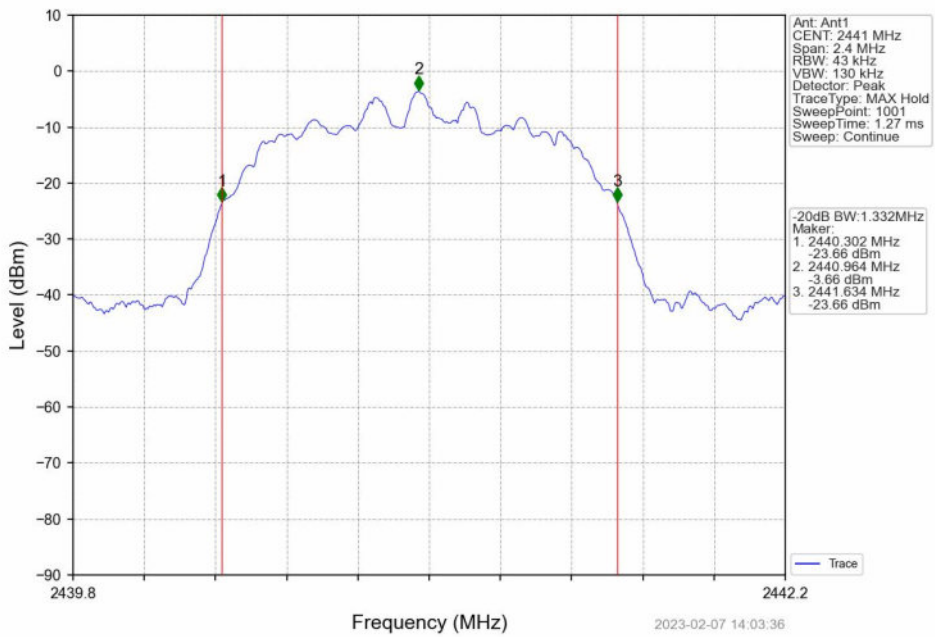
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

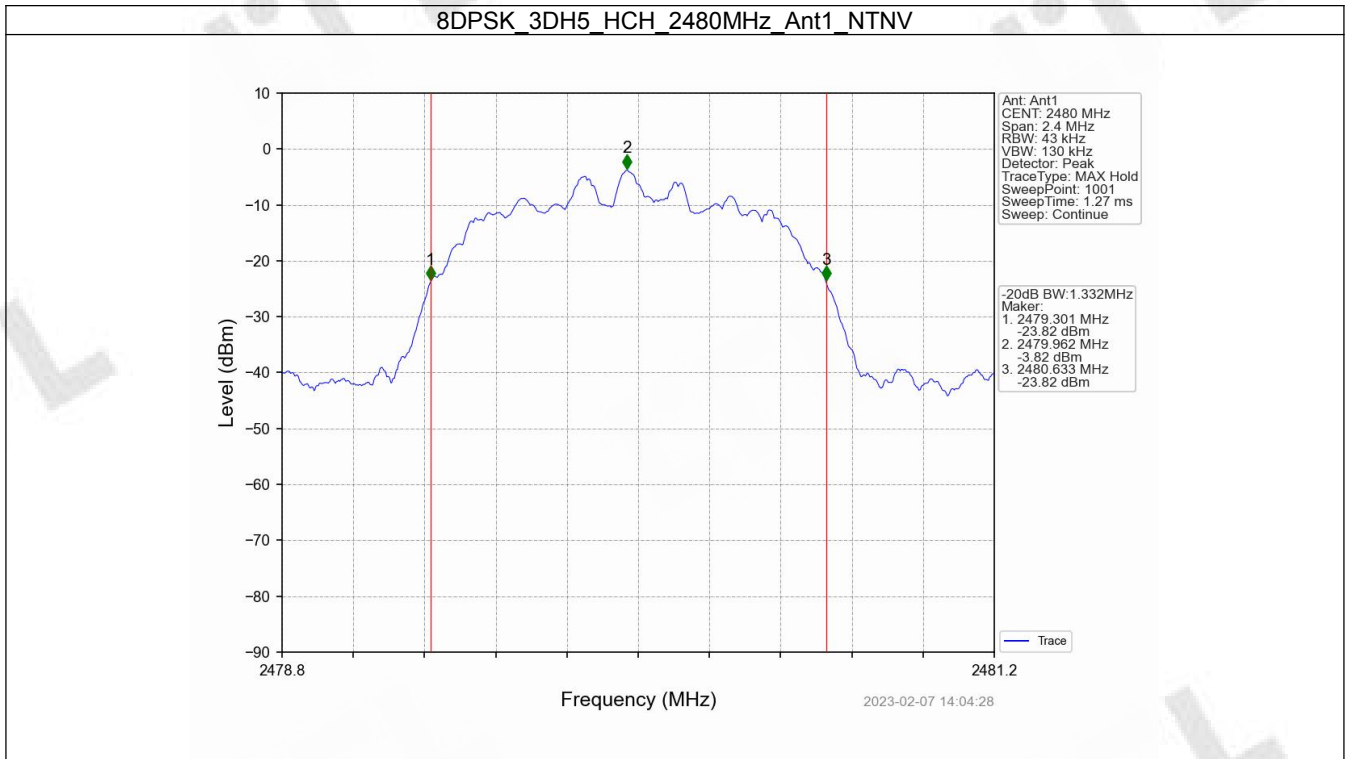


8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV





## 2. Maximum Conducted Output Power

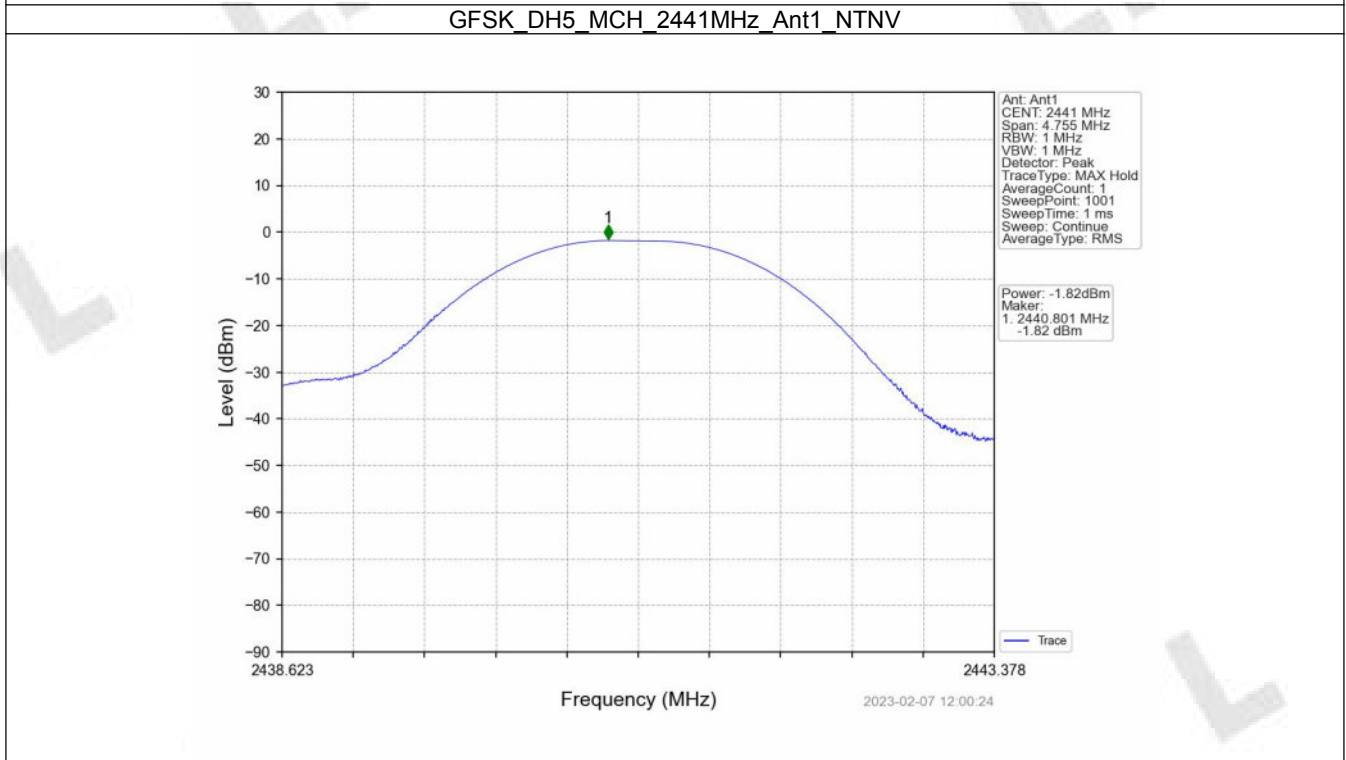
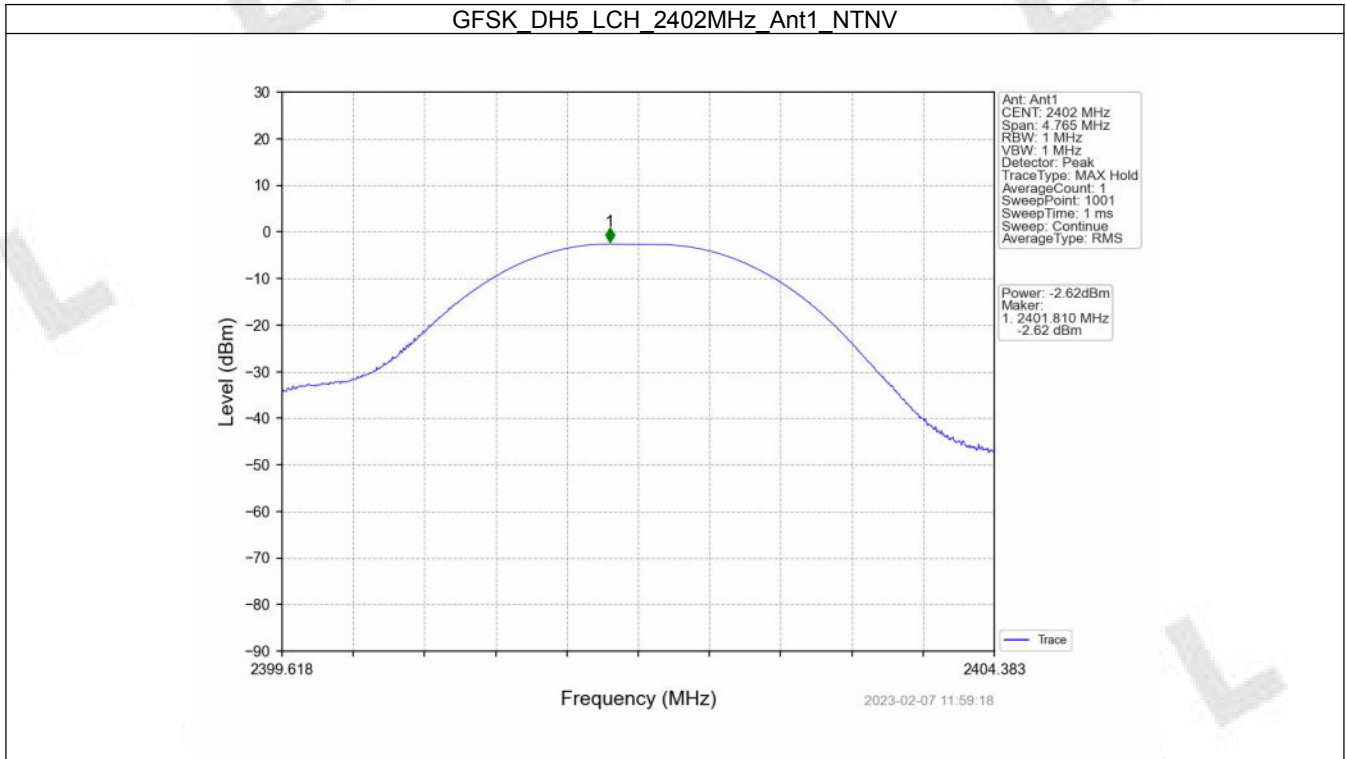
### 2.1 Power

#### 2.1.1 Test Result

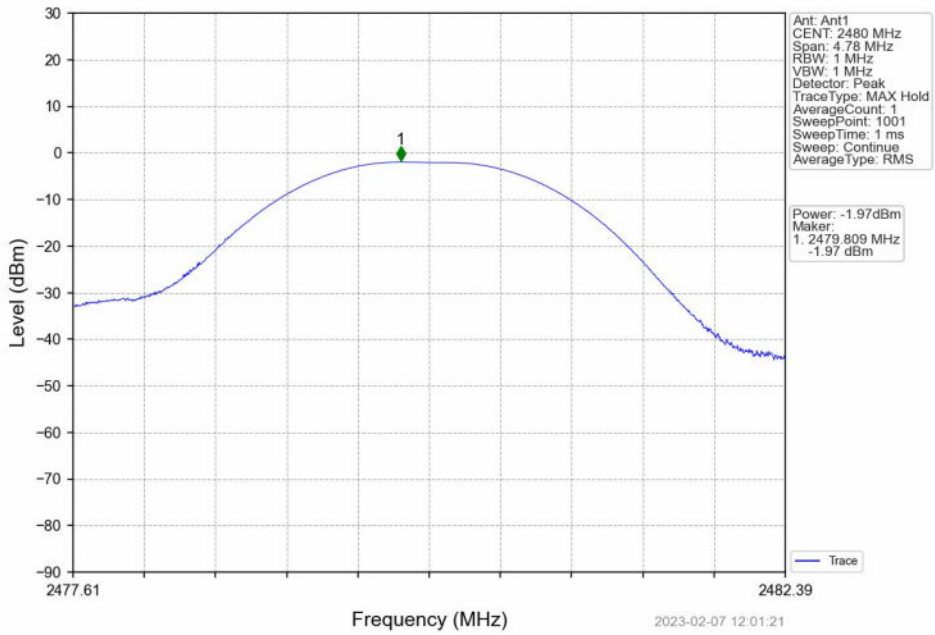
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-2.62	<=30	Pass
		2441	DH5	-1.82	<=30	Pass
		2480	DH5	-1.97	<=30	Pass
Pi/4DQPSK	SISO	2402	2DH5	-1.95	<=20.97	Pass
		2441	2DH5	-1.19	<=20.97	Pass
		2480	2DH5	-1.37	<=20.97	Pass
8DPSK	SISO	2402	3DH5	-1.89	<=20.97	Pass
		2441	3DH5	-1.14	<=20.97	Pass
		2480	3DH5	-1.32	<=20.97	Pass

Note1: Antenna Gain: Ant1: -0.68dBi;

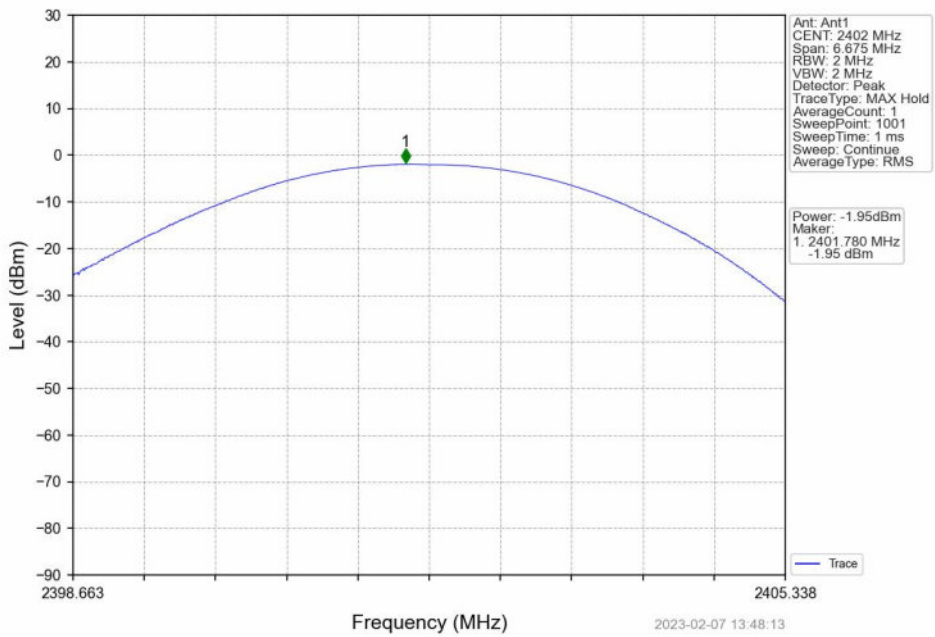
2.1.2 Test Graph



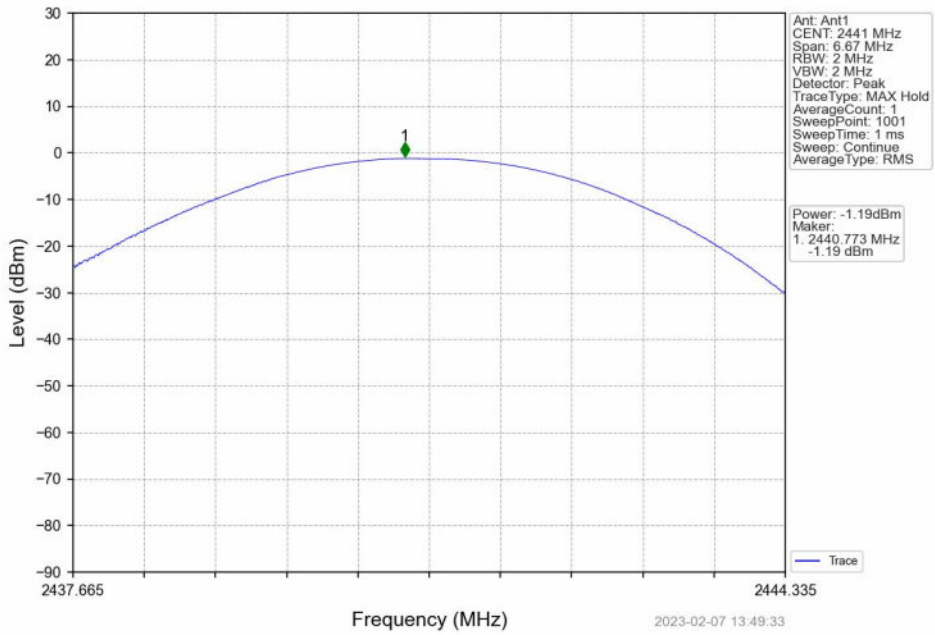
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



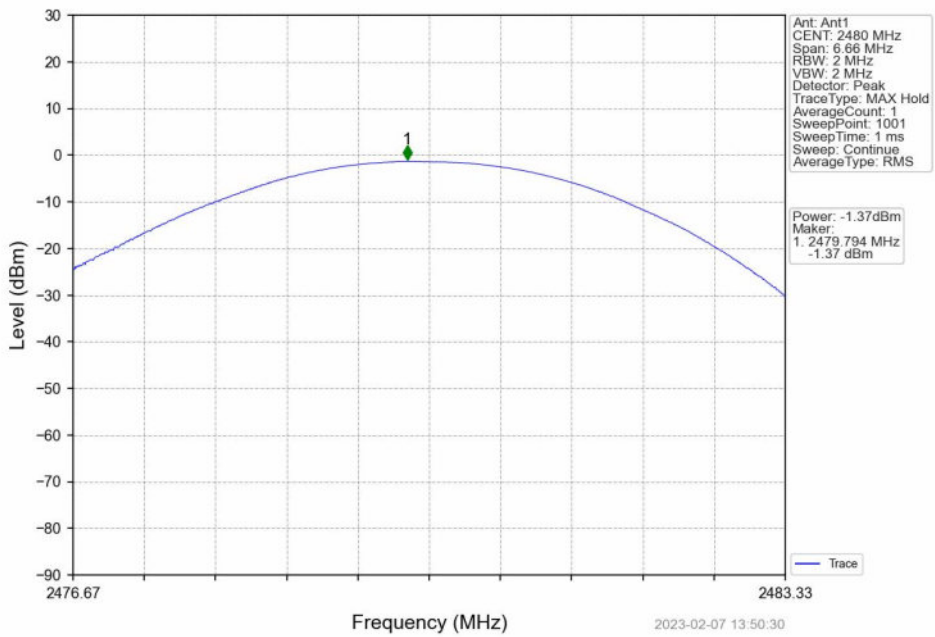
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV

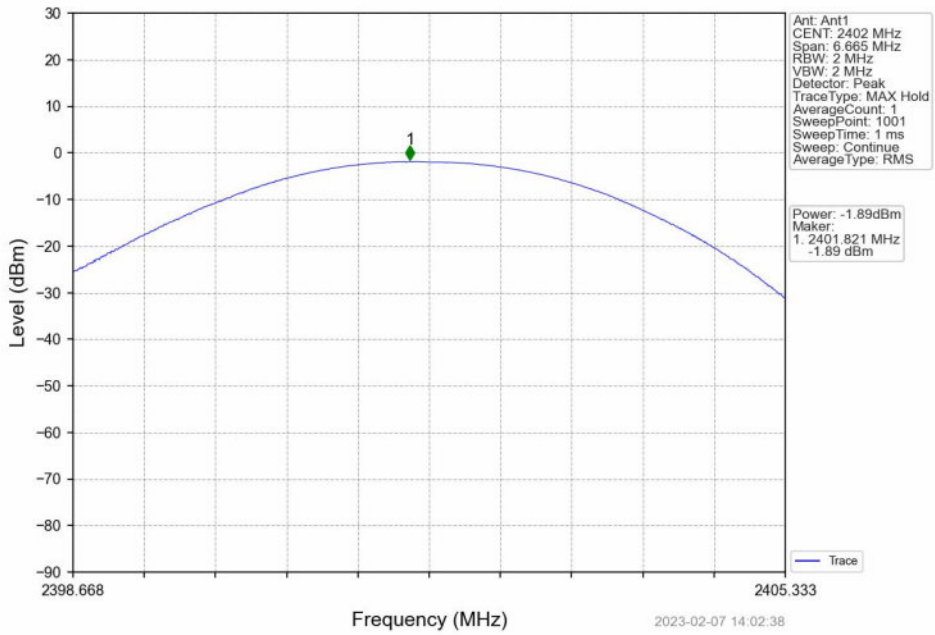


Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

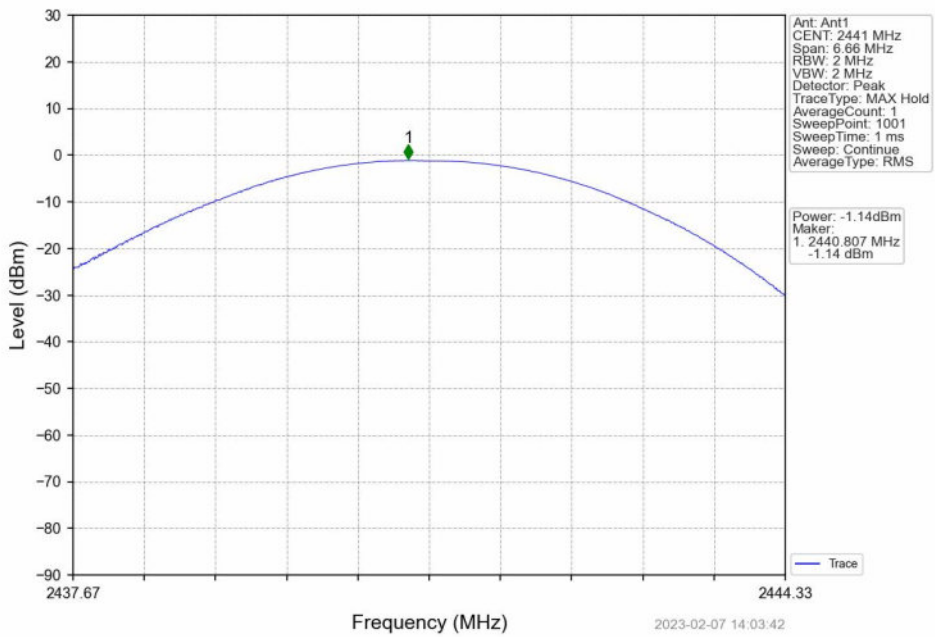




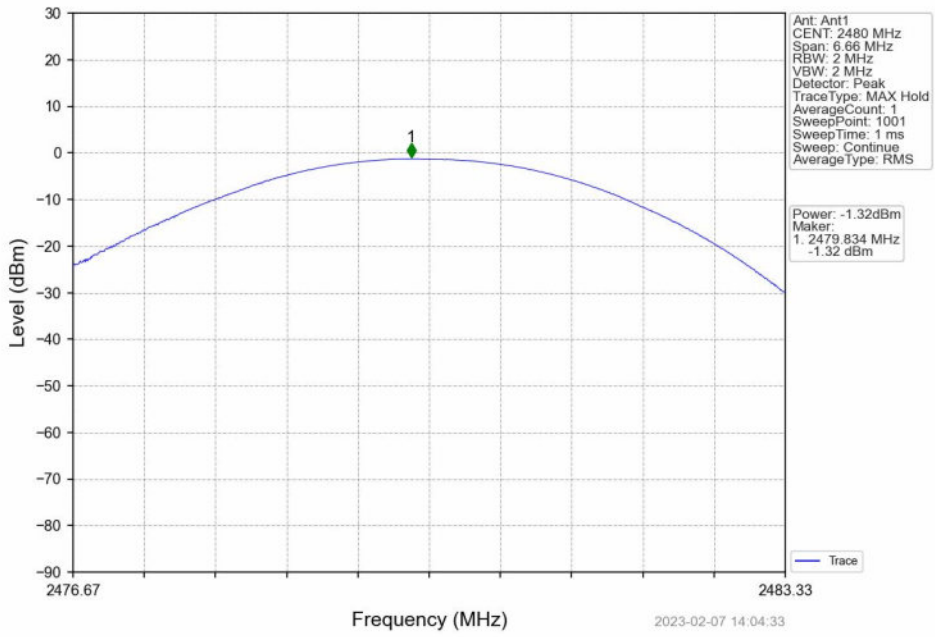
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



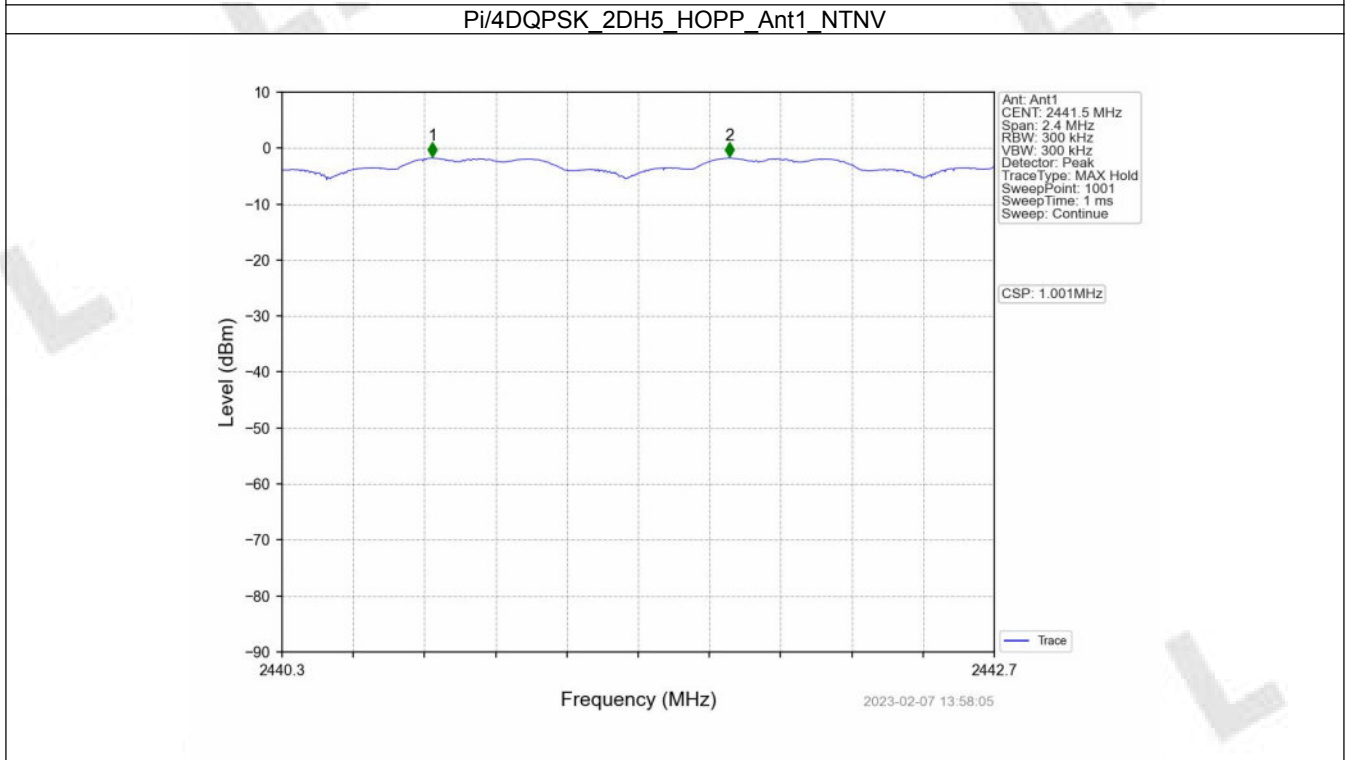
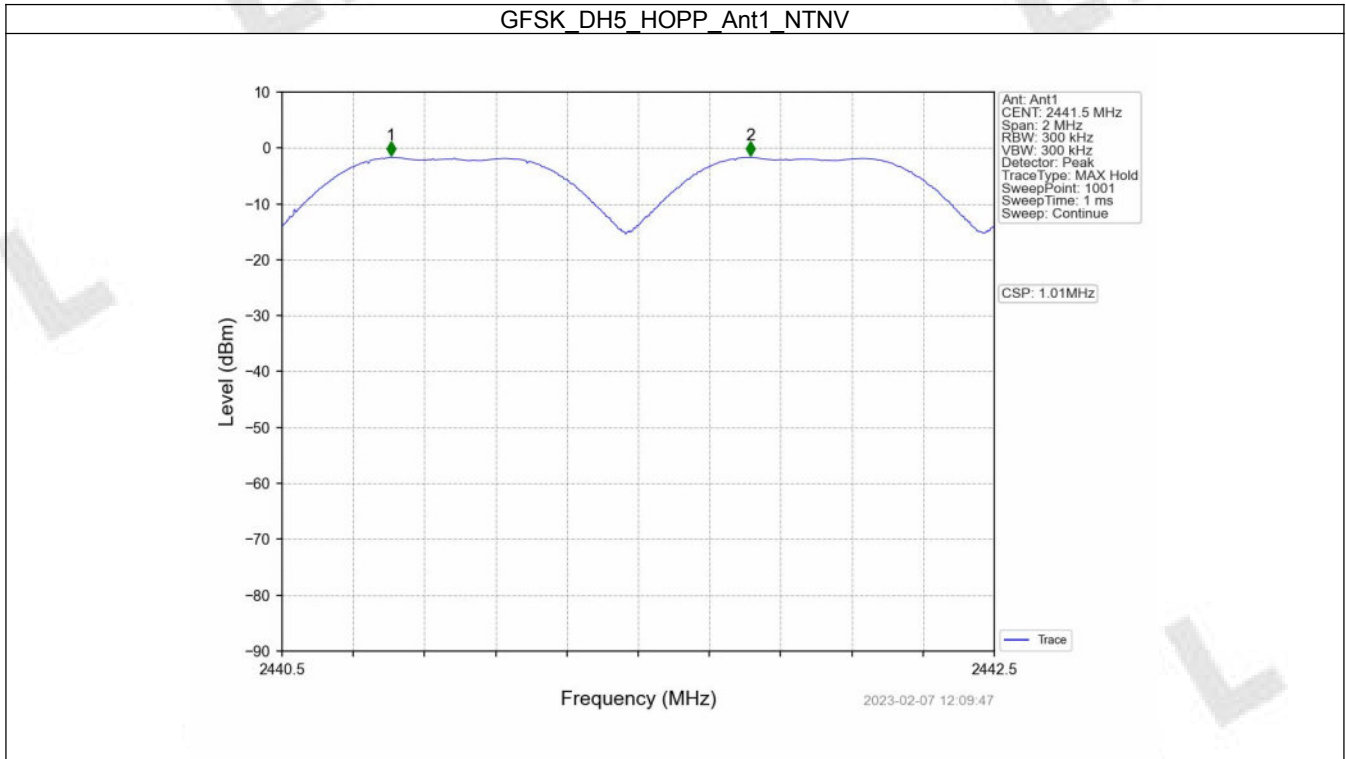
### 3. Carrier Frequency Separation

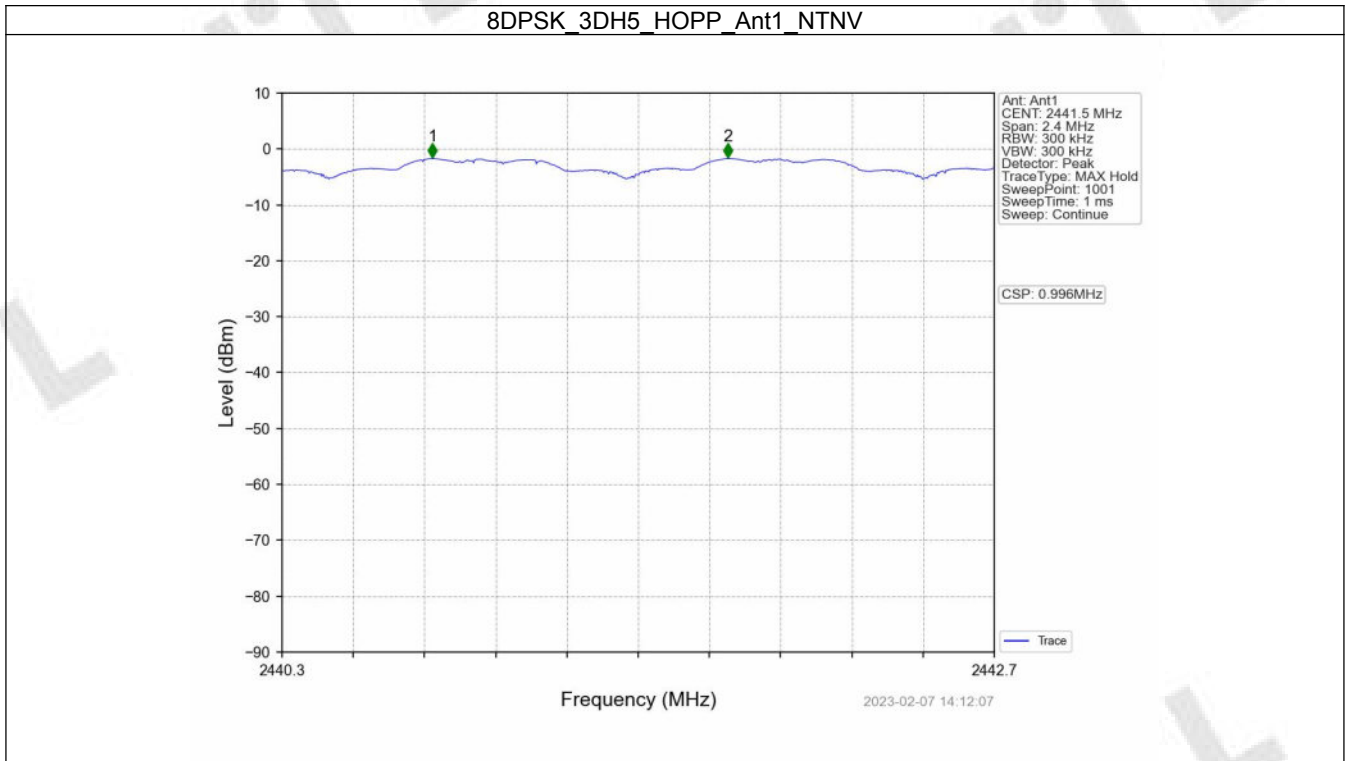
#### 3.1 Ant1

##### 3.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.010	0.956	$\geq 0.956$	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	1.001	1.335	$\geq 0.89$	Pass
8DPSK	SISO	HOPP	3DH5	0.996	1.333	$\geq 0.889$	Pass

3.1.2 Test Graph





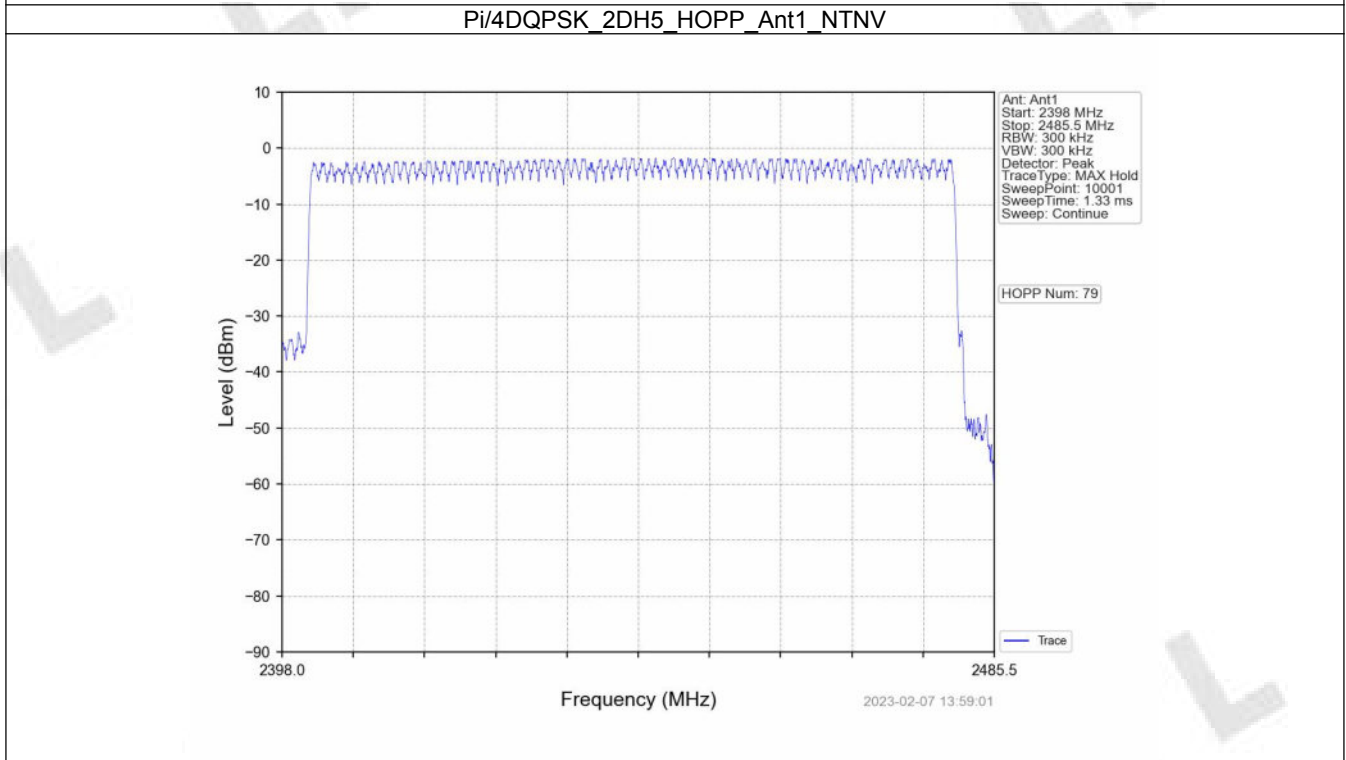
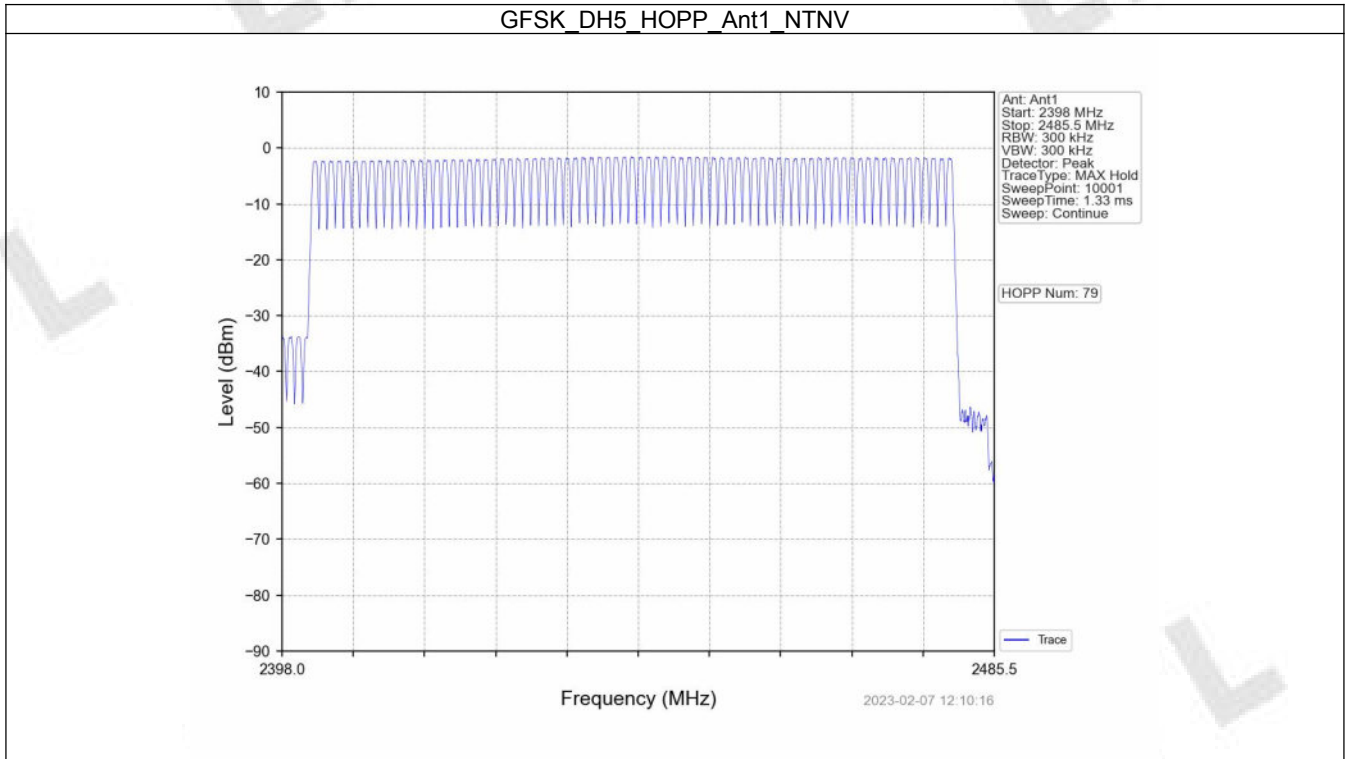
## 4. Number of Hopping Frequencies

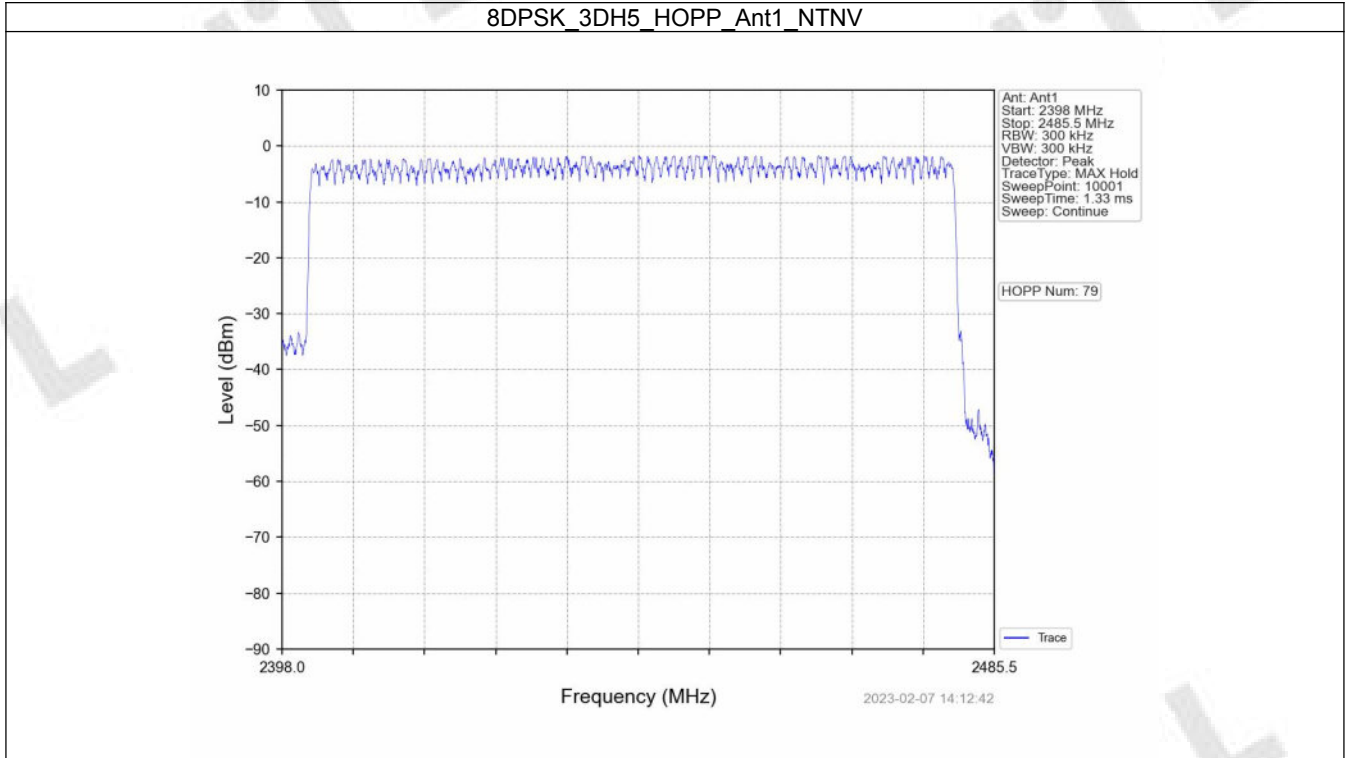
### 4.1 HoppNum

#### 4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	Num of Hopping Frequencies		Verdict
				ANT1	Limit	
GFSK	SISO	HOPP	DH5	79	>=15	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	79	>=15	Pass
8DPSK	SISO	HOPP	3DH5	79	>=15	Pass

4.1.2 Test Graph







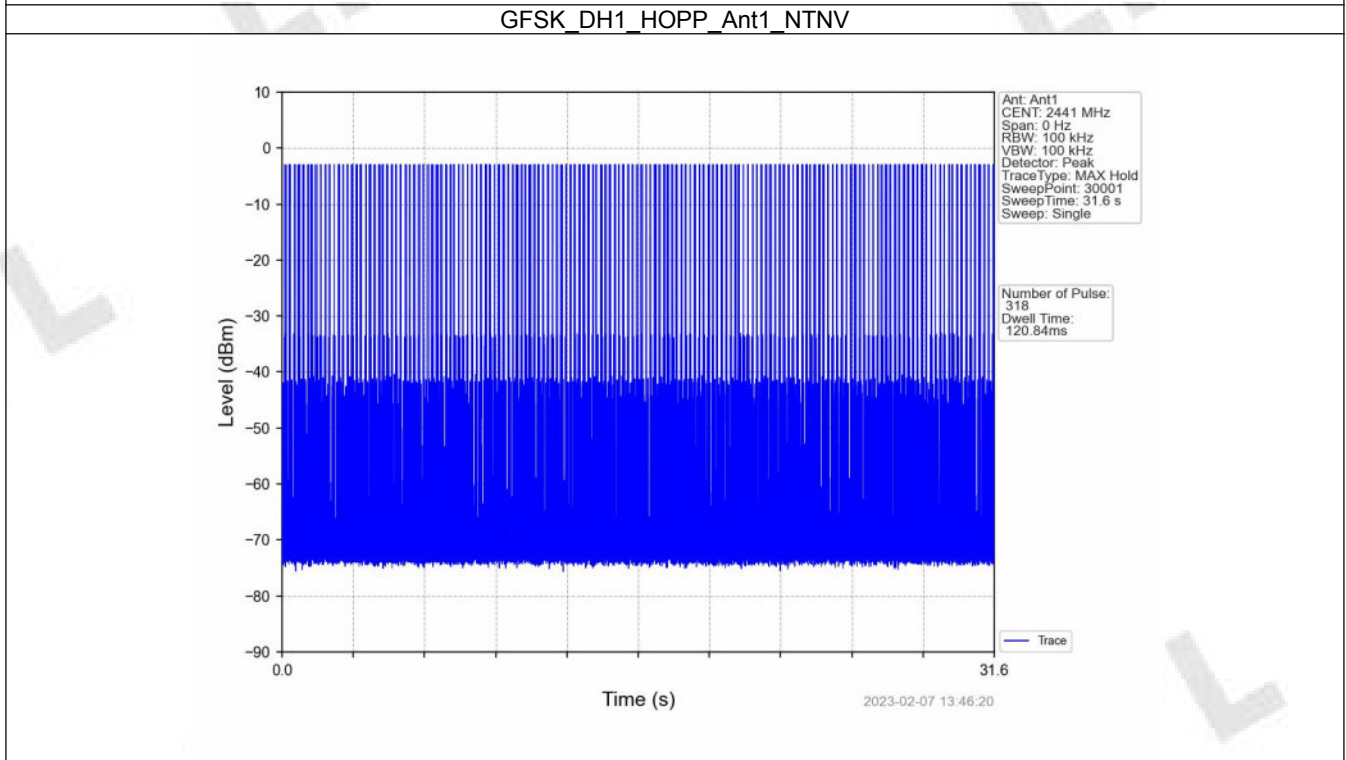
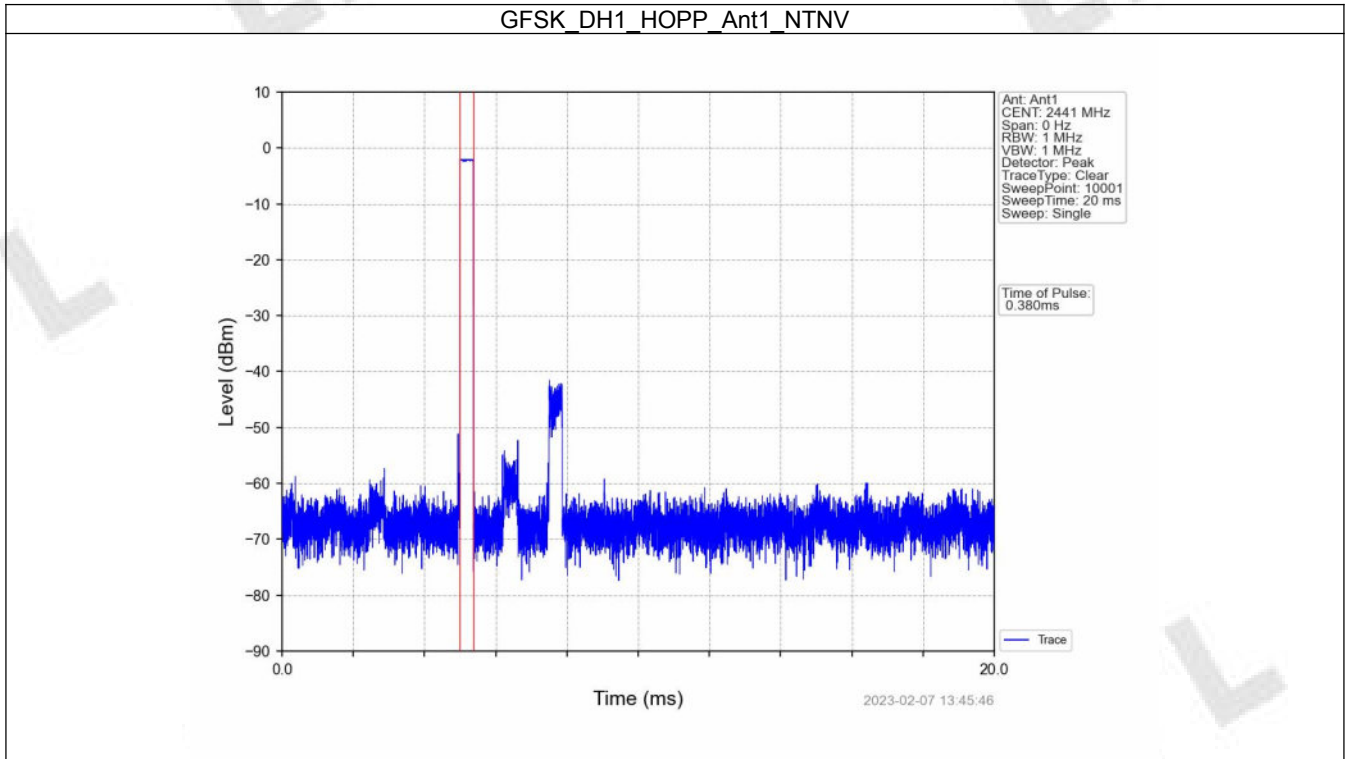
## 5. Time of Occupancy (Dwell Time)

### 5.1 Ant1

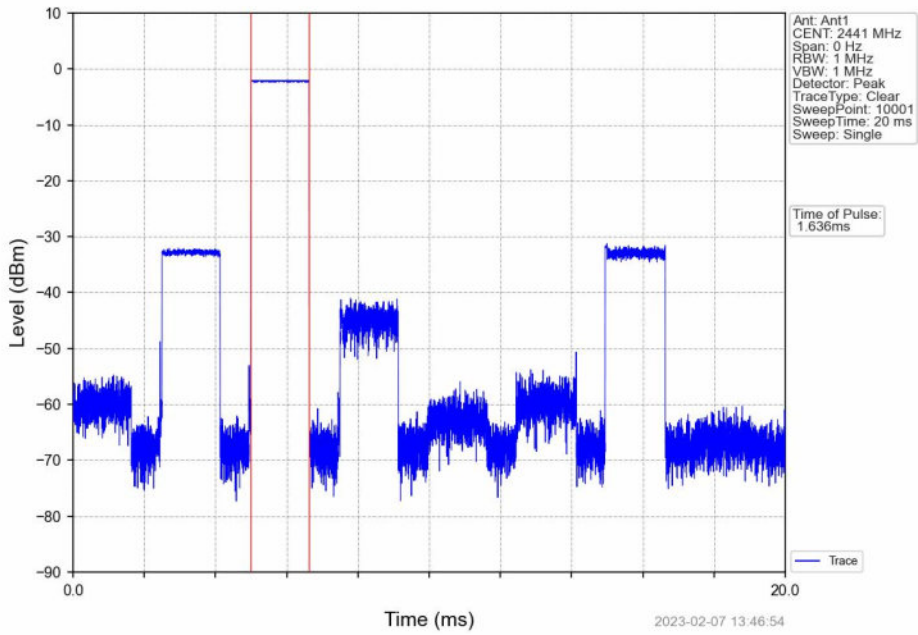
#### 5.1.1 Test Result

Ant1									
Mode	TX Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.380	31.600	318	120.840	<=400	Pass
			DH3	1.636	31.600	158	258.488	<=400	Pass
			DH5	2.884	31.600	103	297.052	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.390	31.600	319	124.410	<=400	Pass
			2DH3	1.642	31.600	159	261.078	<=400	Pass
			2DH5	2.890	31.600	106	306.340	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.390	31.600	320	124.800	<=400	Pass
			3DH3	1.642	31.600	158	259.436	<=400	Pass
			3DH5	2.890	31.600	110	317.900	<=400	Pass

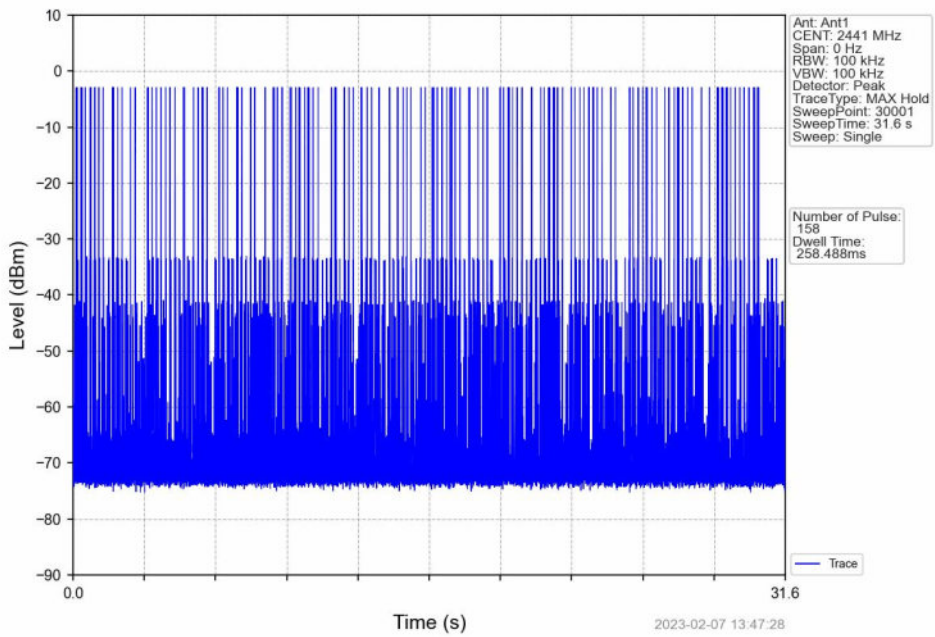
5.1.2 Test Graph



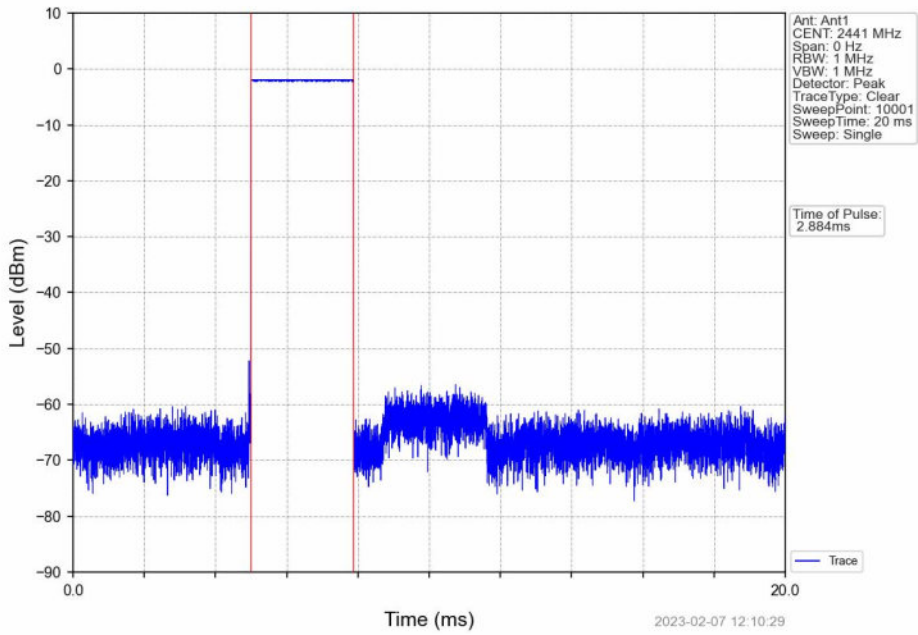
GFSK\_DH3\_HOPP\_Ant1\_NTNV



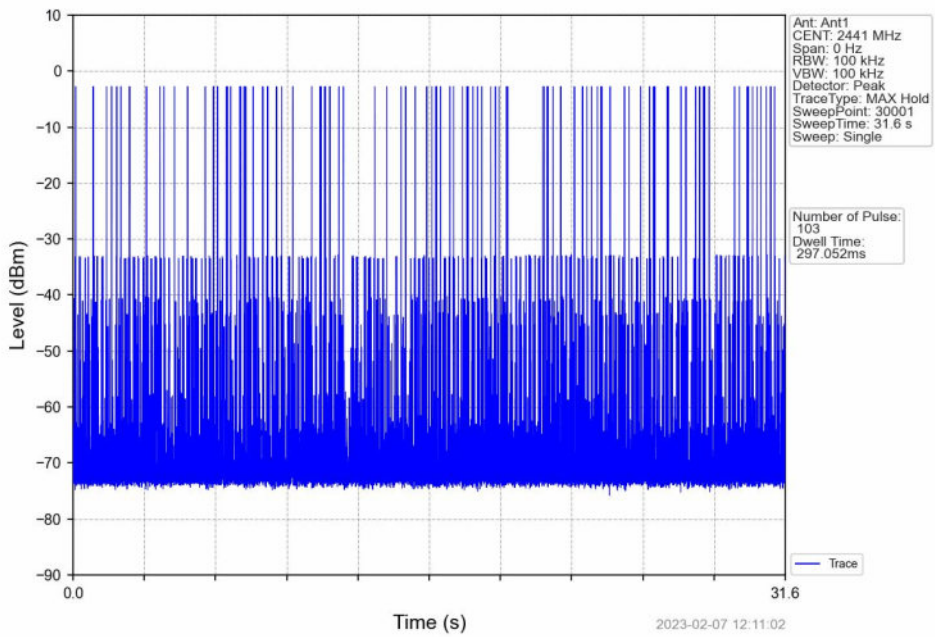
GFSK\_DH3\_HOPP\_Ant1\_NTNV



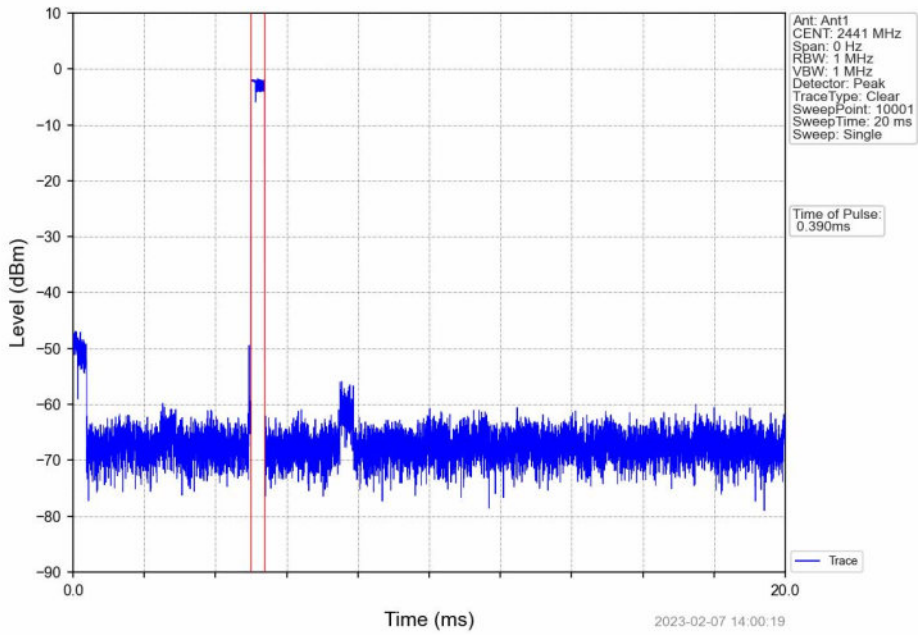
GFSK\_DH5\_HOPP\_Ant1\_NTNV



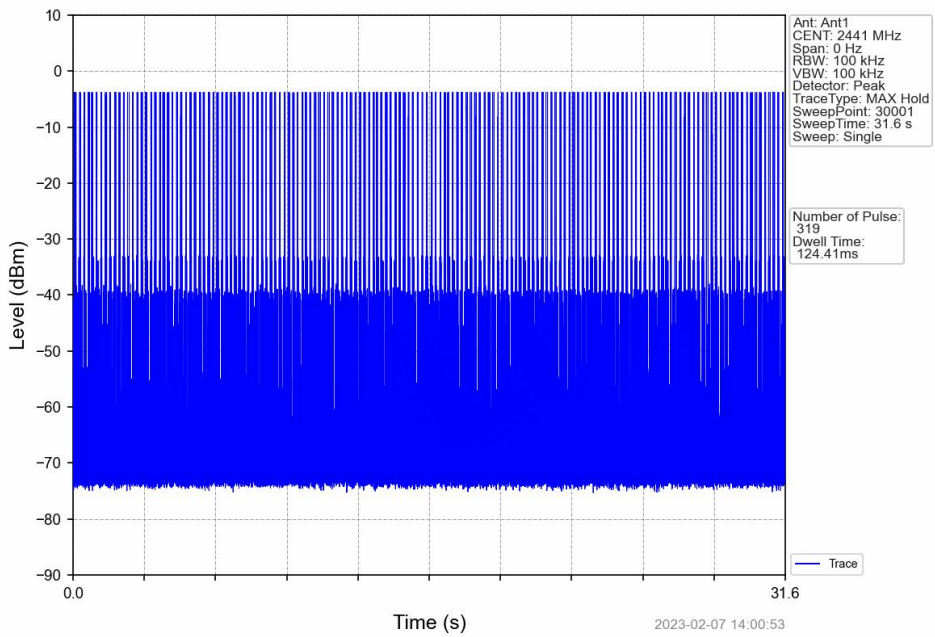
GFSK\_DH5\_HOPP\_Ant1\_NTNV



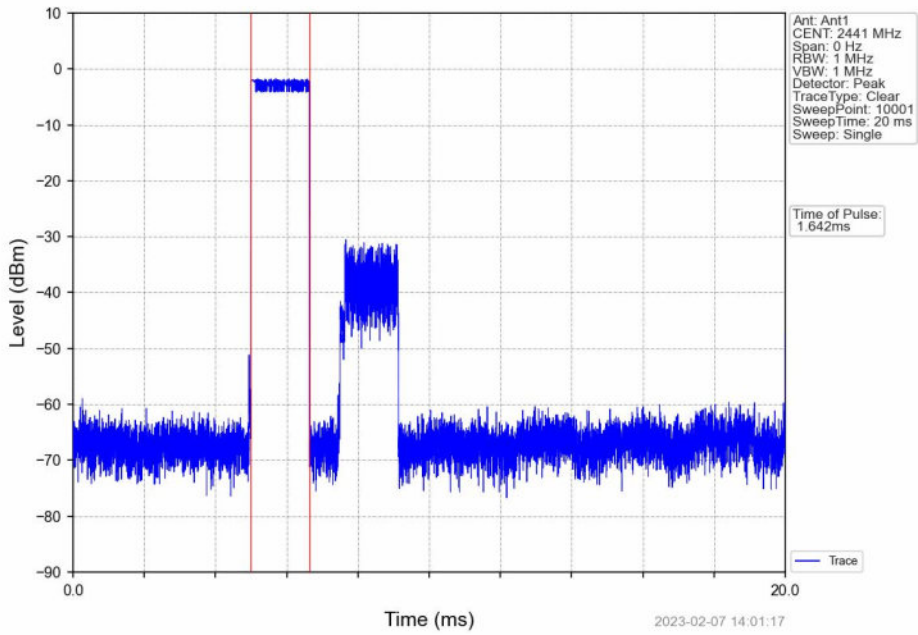
Pi/4DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



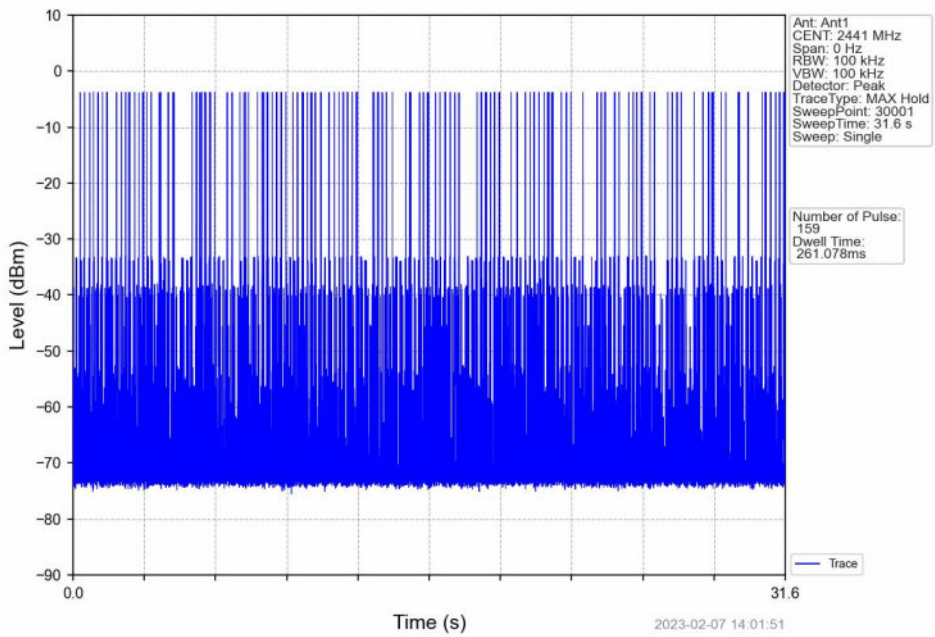
Pi/4DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



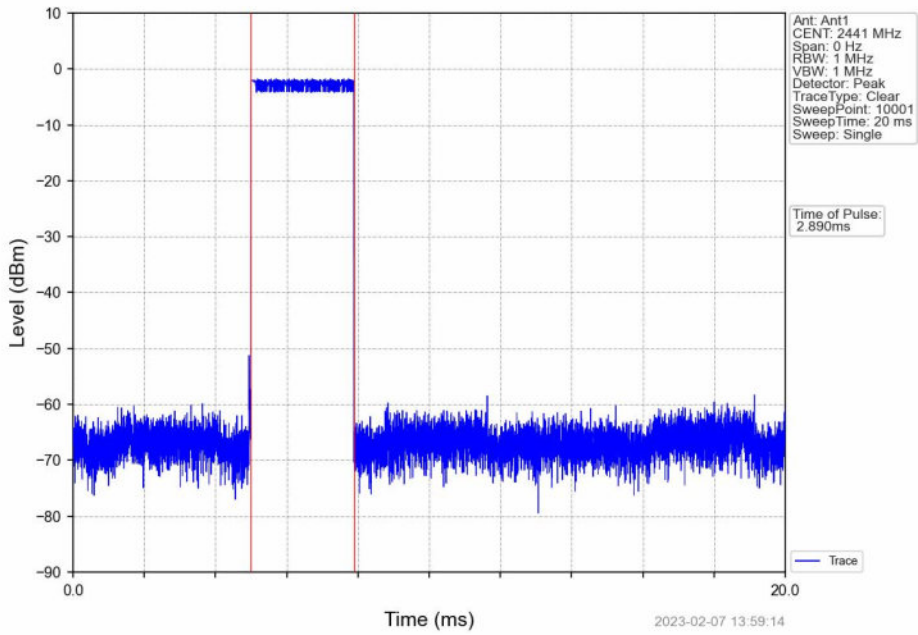
Pi/4DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



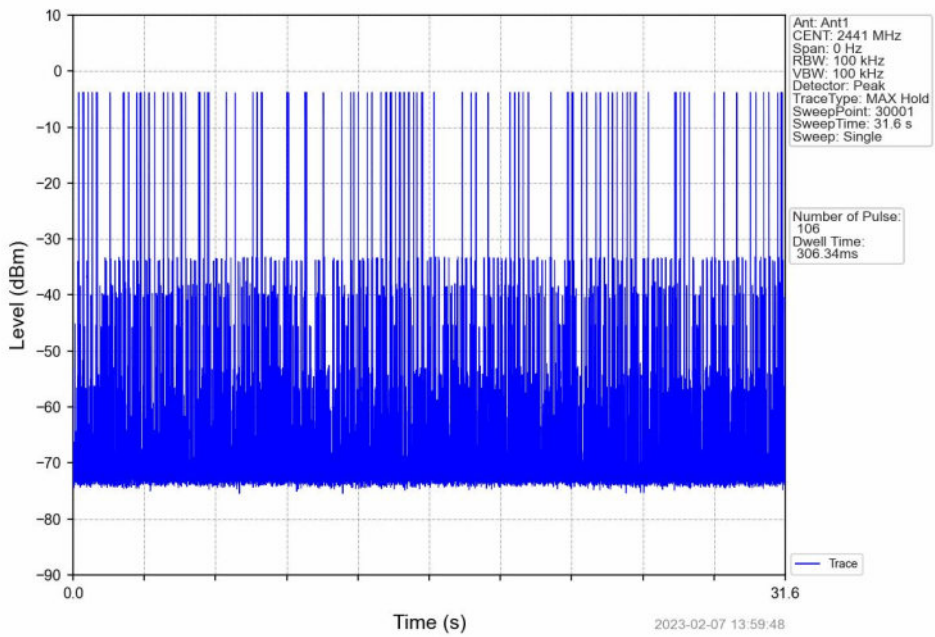
Pi/4DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



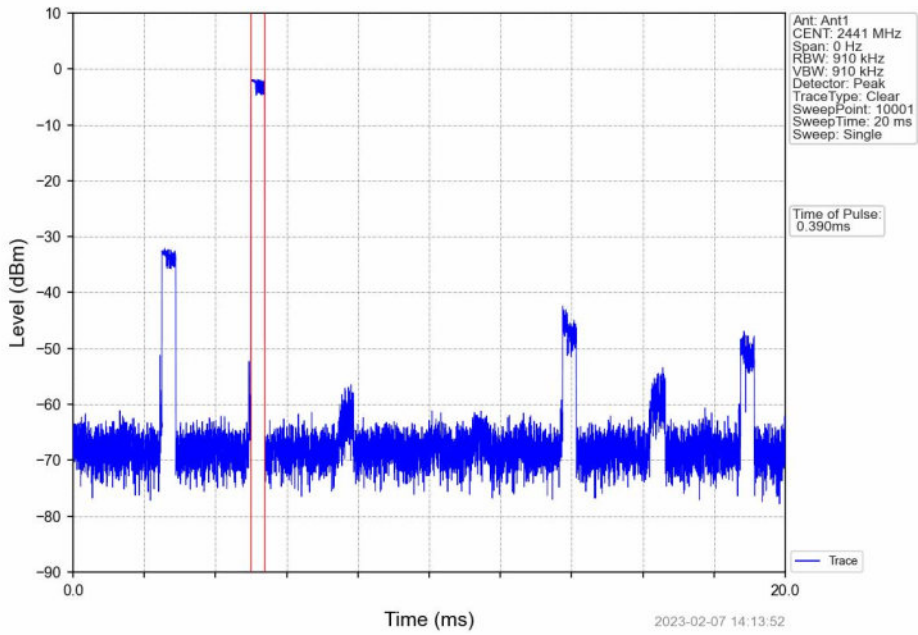
Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



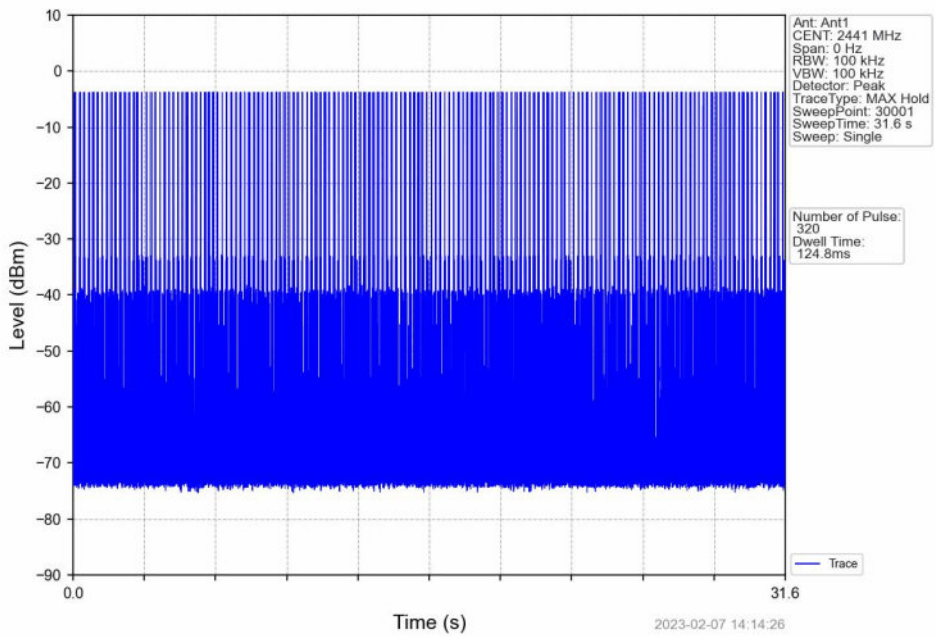
Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



8DPSK\_3DH1\_HOPP\_Ant1\_NTNV

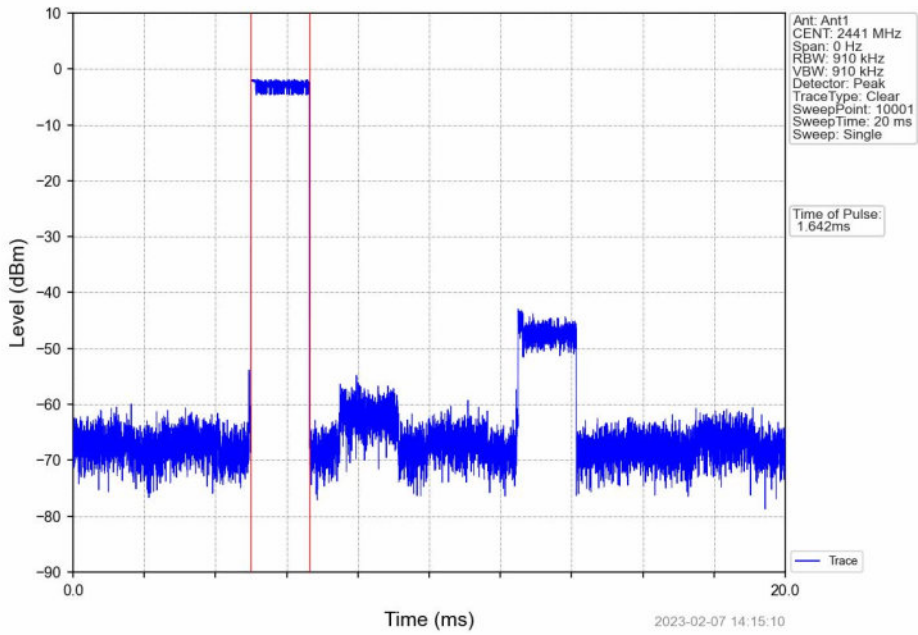


8DPSK\_3DH1\_HOPP\_Ant1\_NTNV

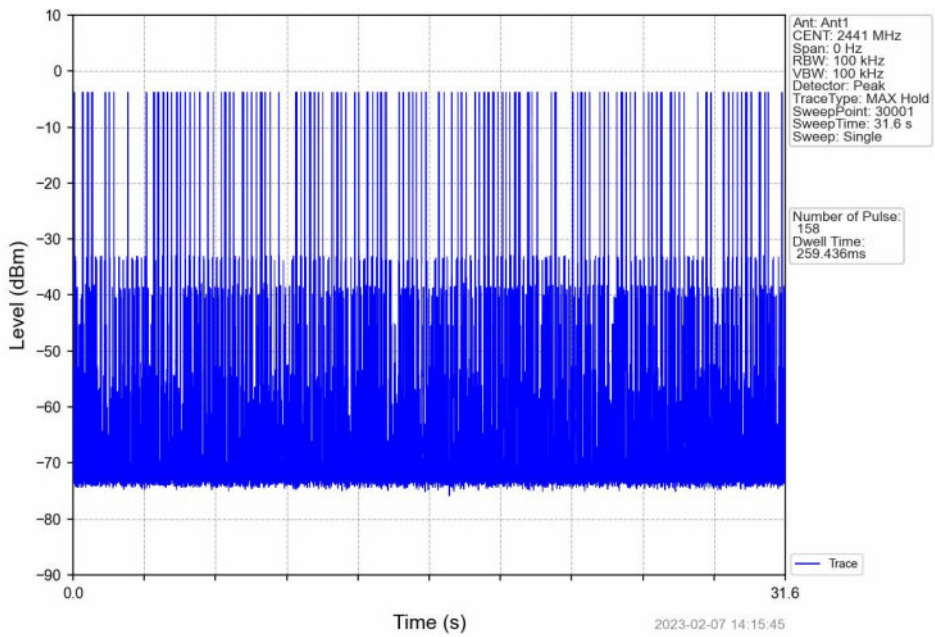




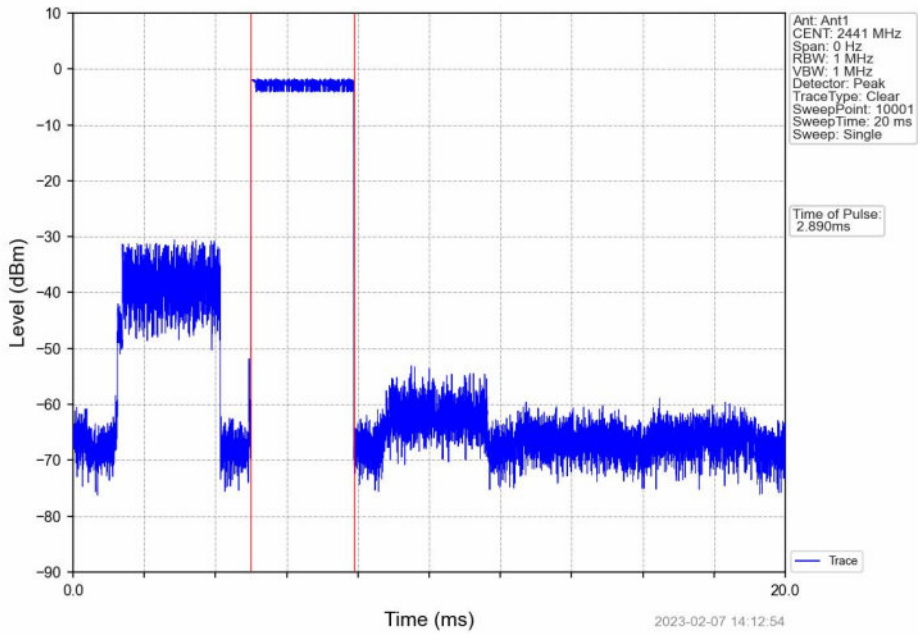
8DPSK\_3DH3\_HOPP\_Ant1\_NTNV



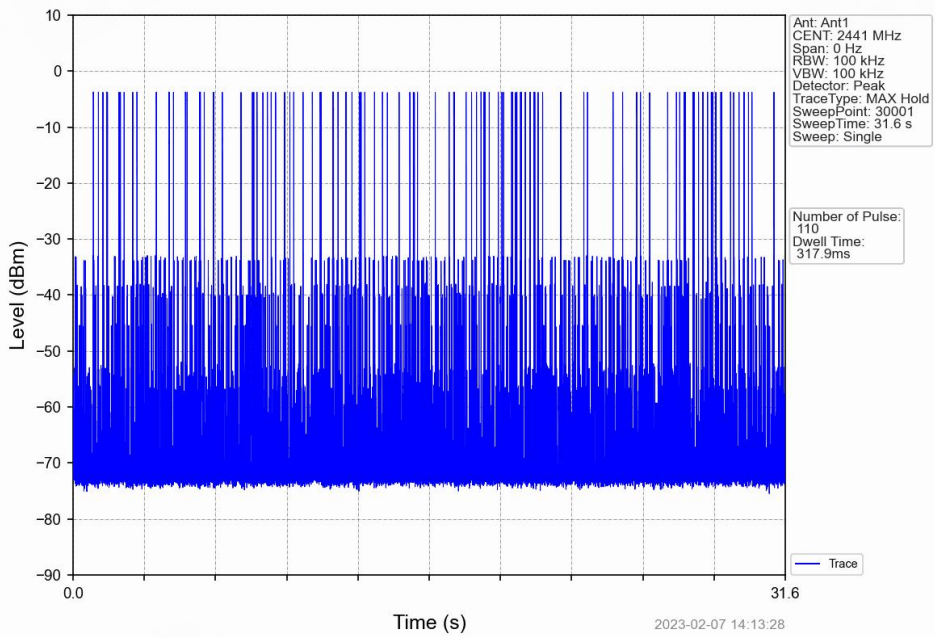
8DPSK\_3DH3\_HOPP\_Ant1\_NTNV



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



## 6. Unwanted Emissions In Non-restricted Frequency Bands

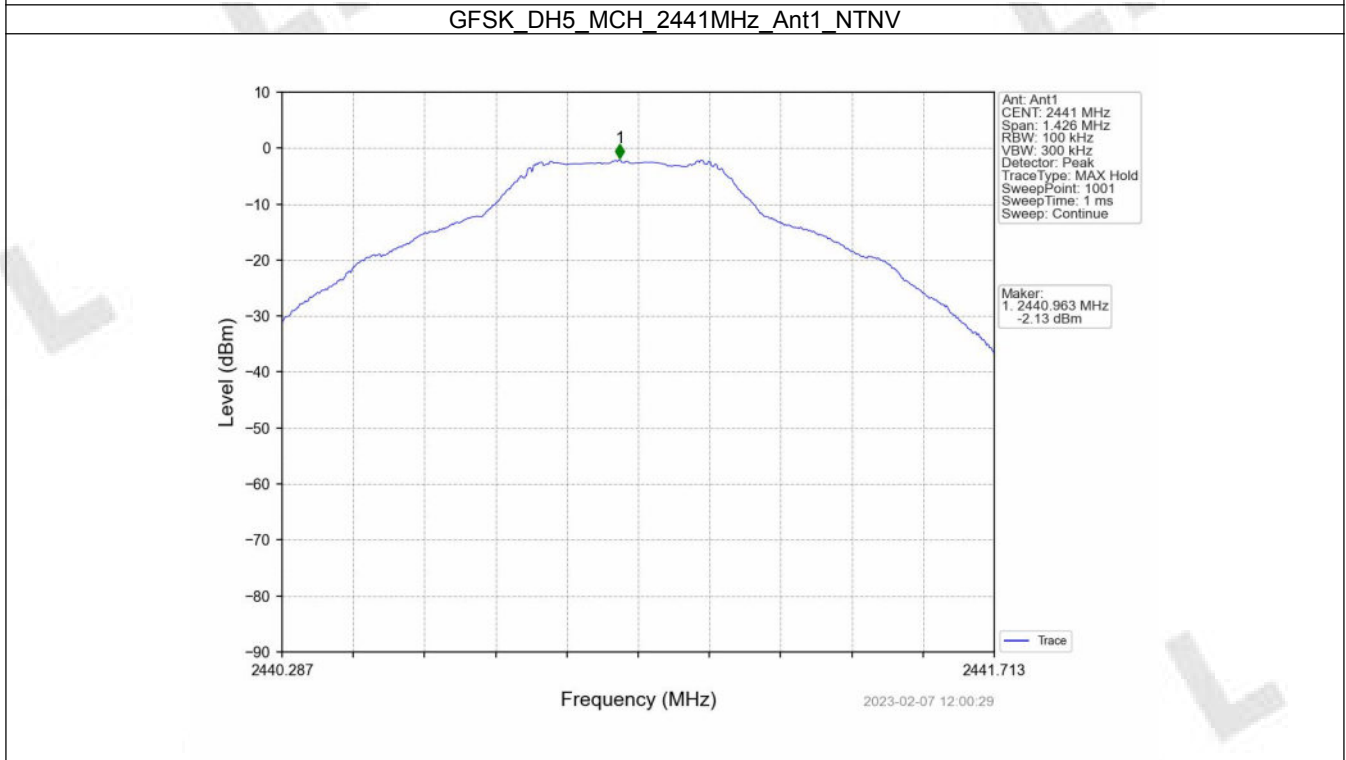
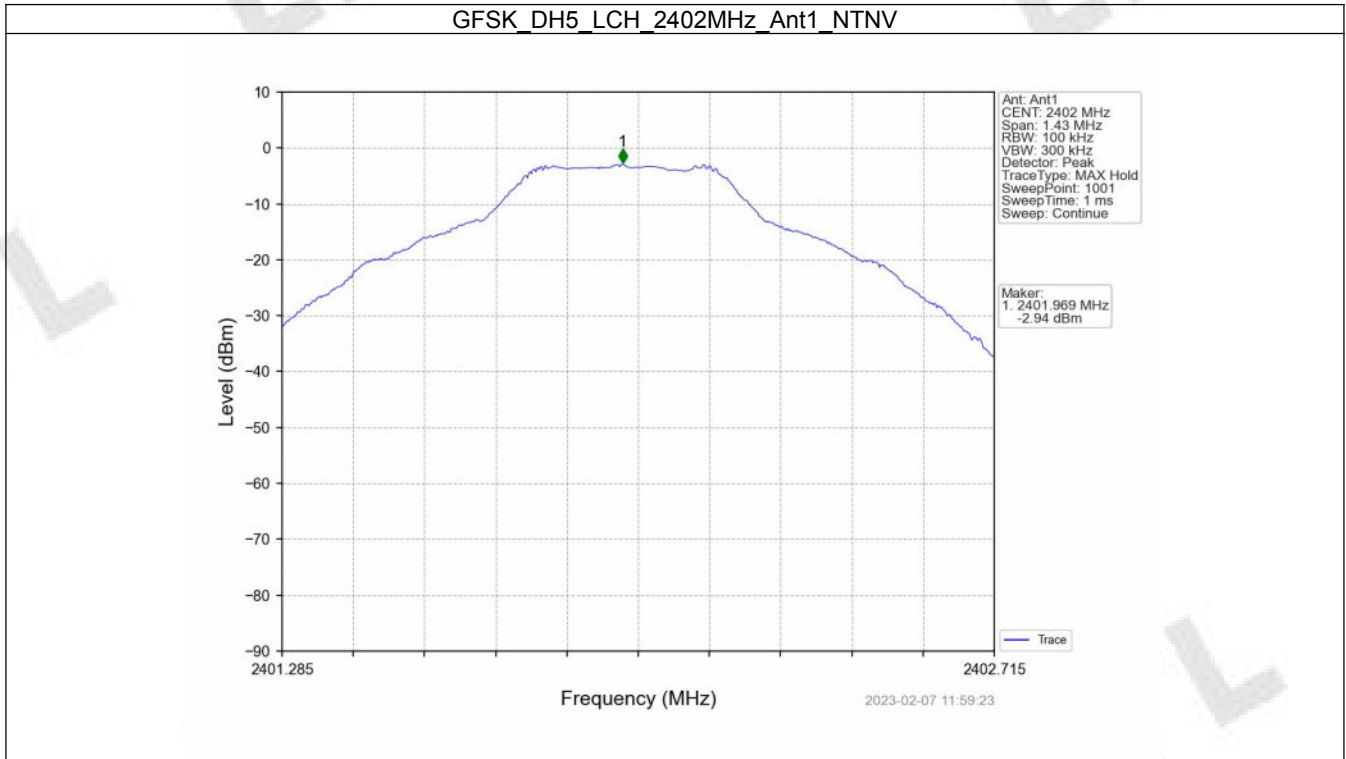
### 6.1 Ref

#### 6.1.1 Test Result

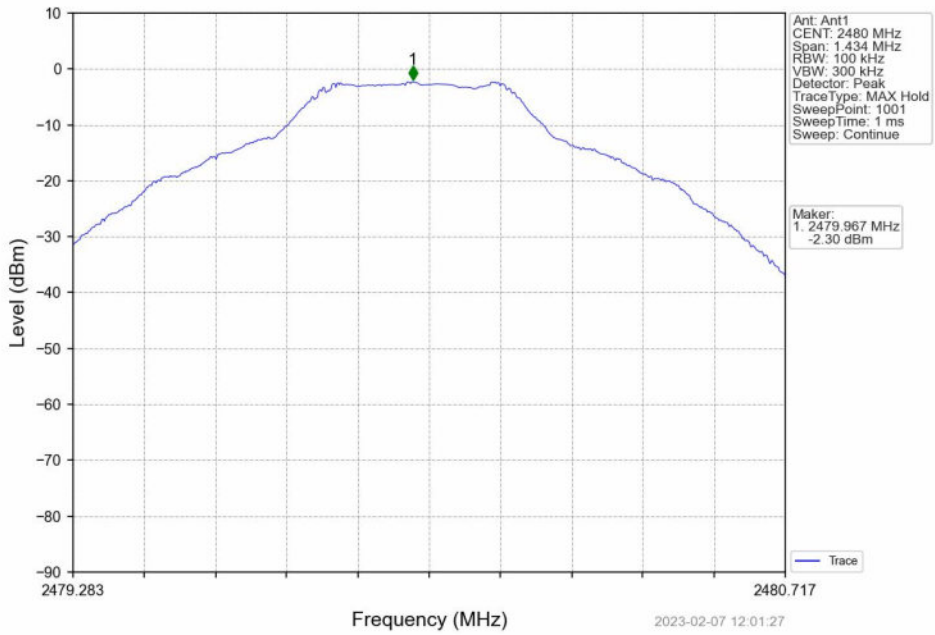
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	-2.94
		2441	DH5	1	<b>-2.13</b>
		2480	DH5	1	-2.30
Pi/4DQPSK	SISO	2402	2DH5	1	-2.93
		2441	2DH5	1	<b>-2.13</b>
		2480	2DH5	1	-2.29
8DPSK	SISO	2402	3DH5	1	-2.89
		2441	3DH5	1	<b>-2.06</b>
		2480	3DH5	1	-2.27

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.

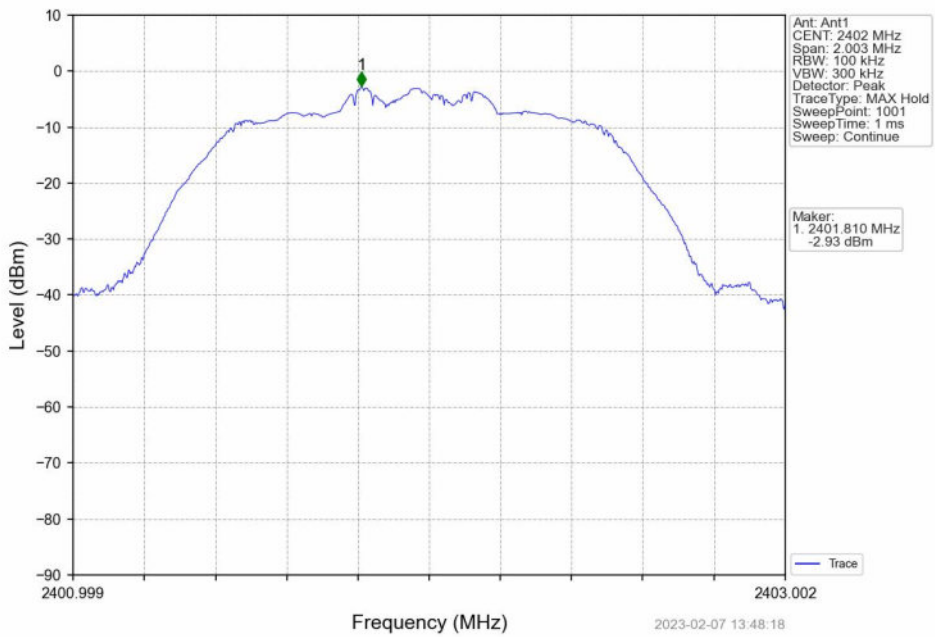
6.1.2 Test Graph



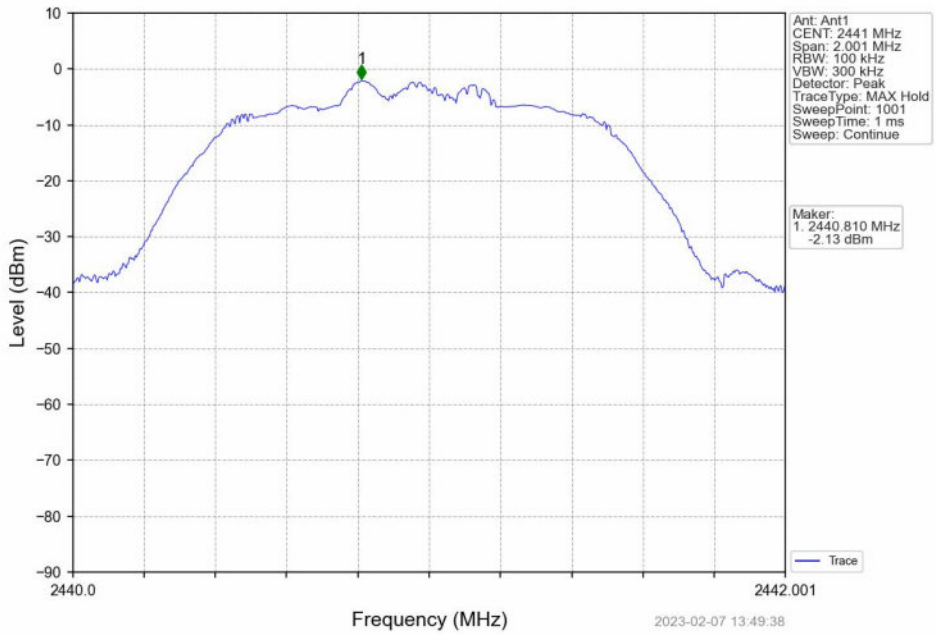
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



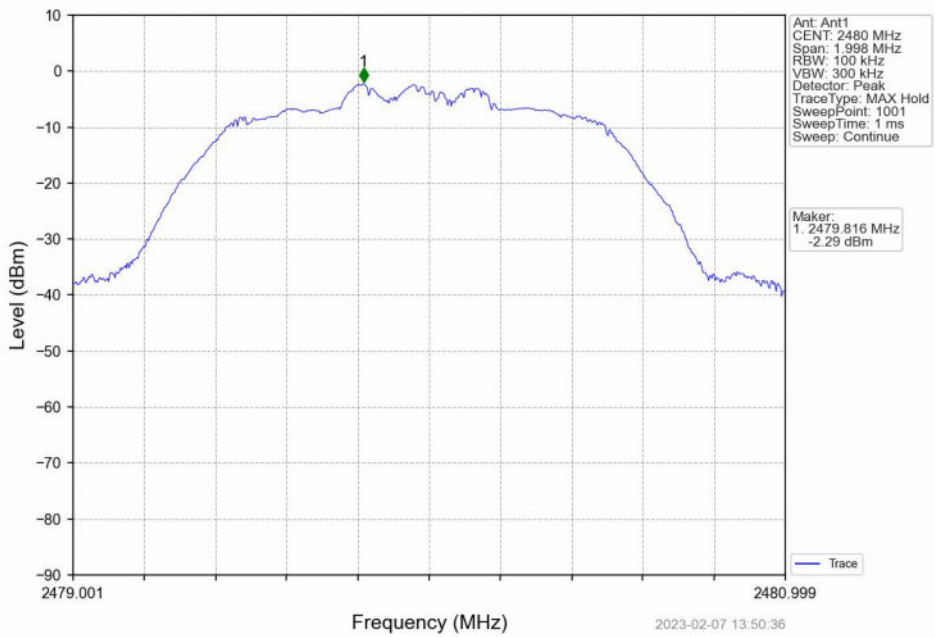
PI/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



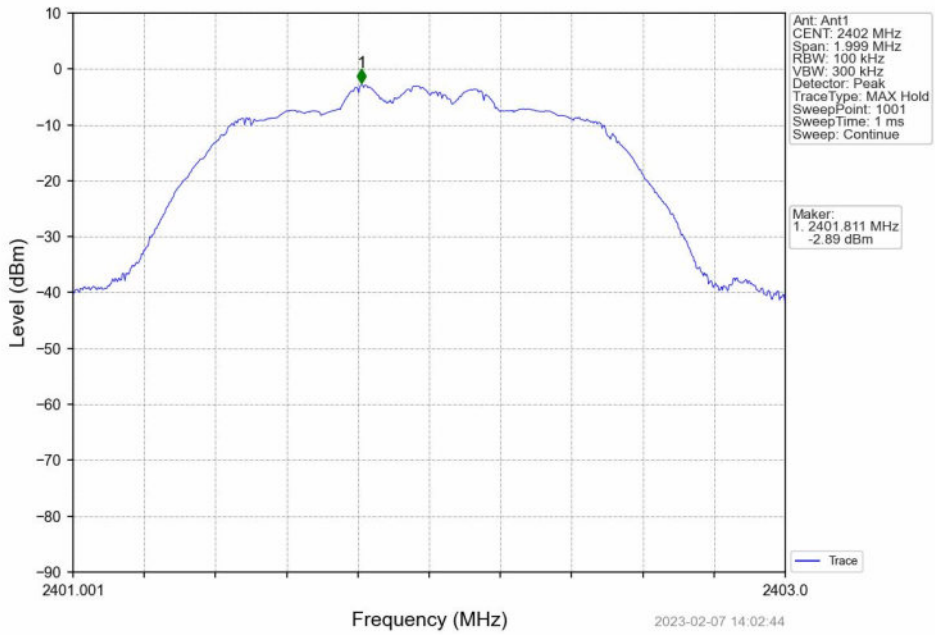
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



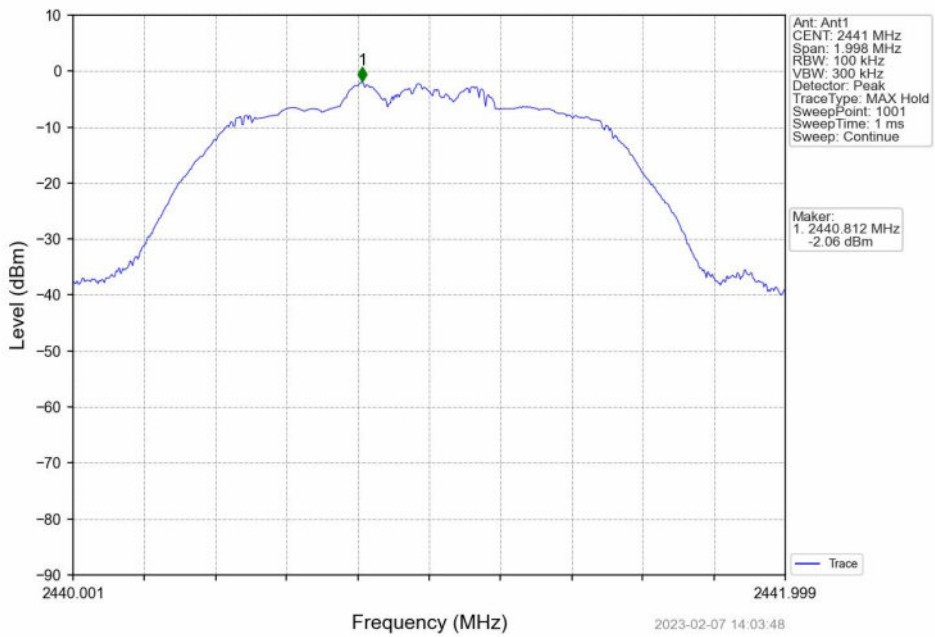
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

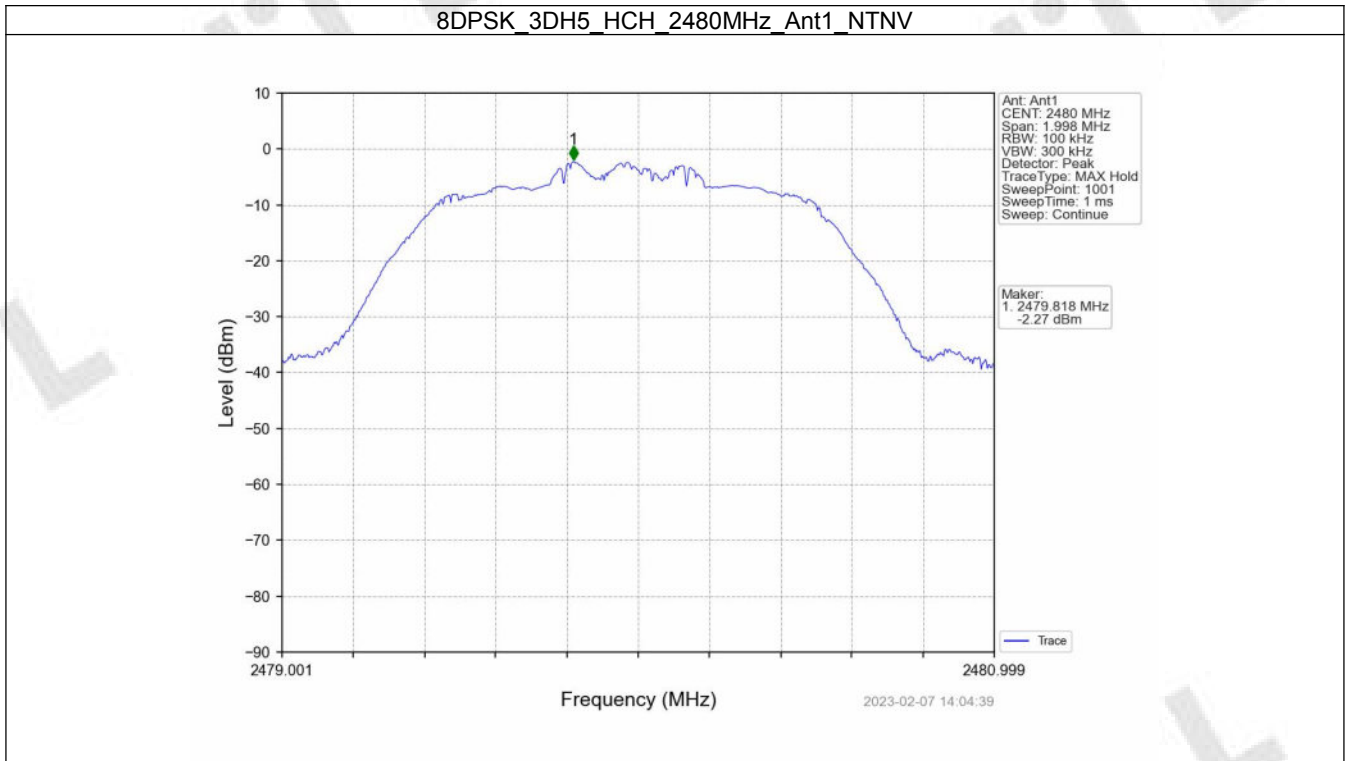


8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV







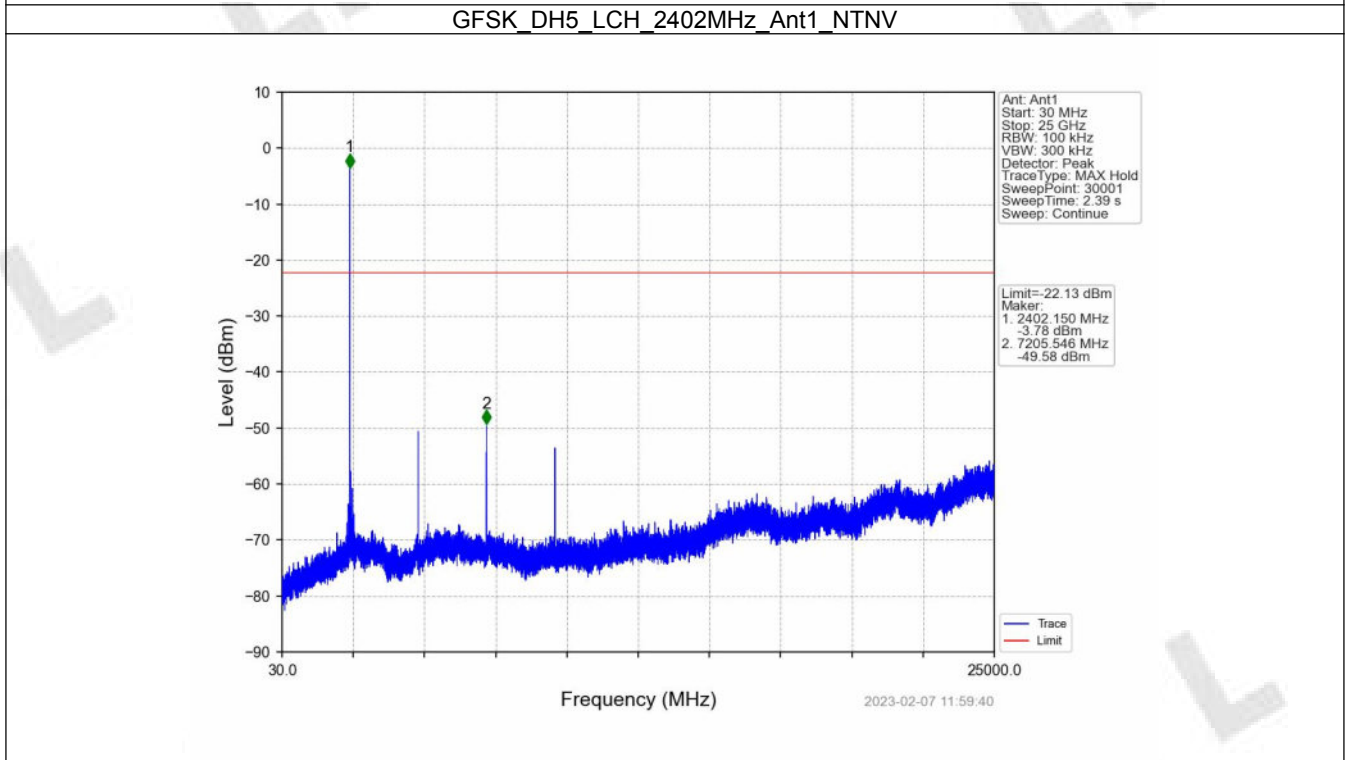
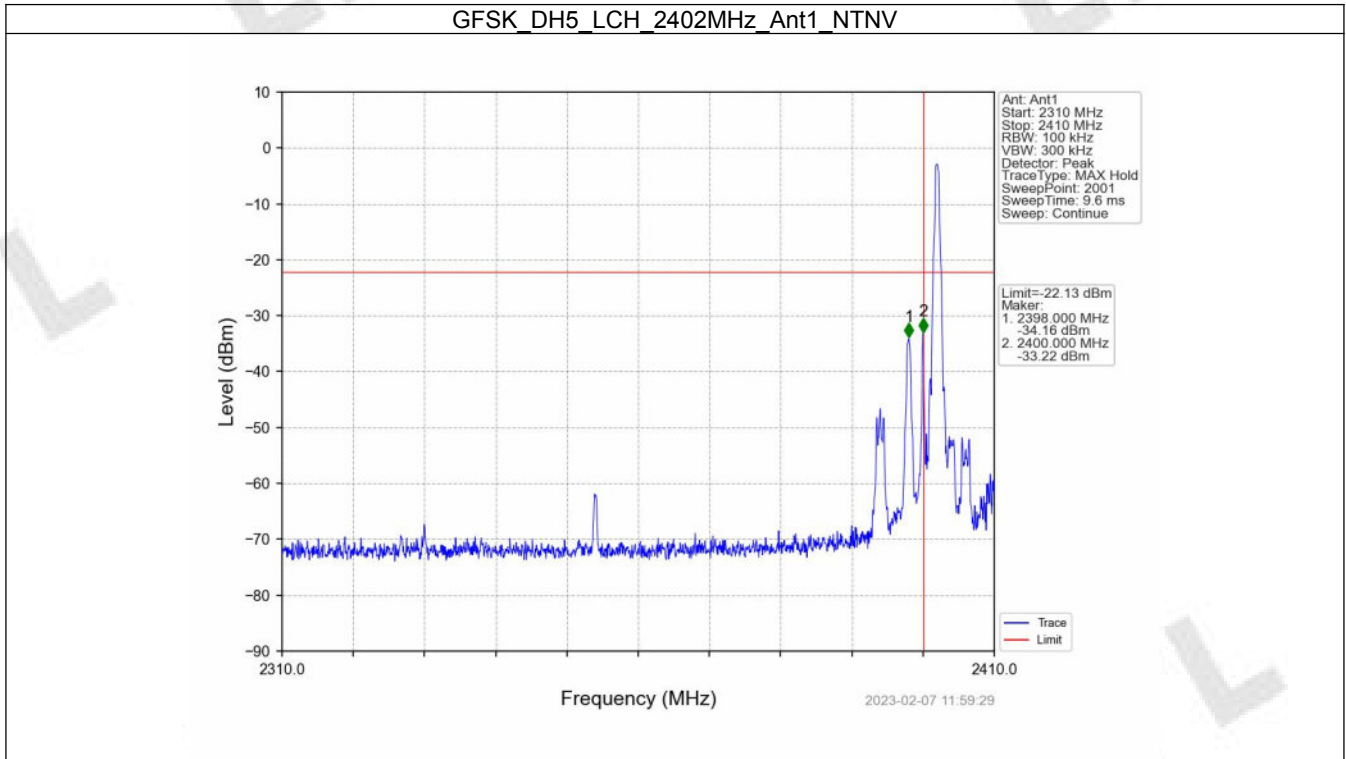
## 6.2 CSE

## 6.2.1 Test Result

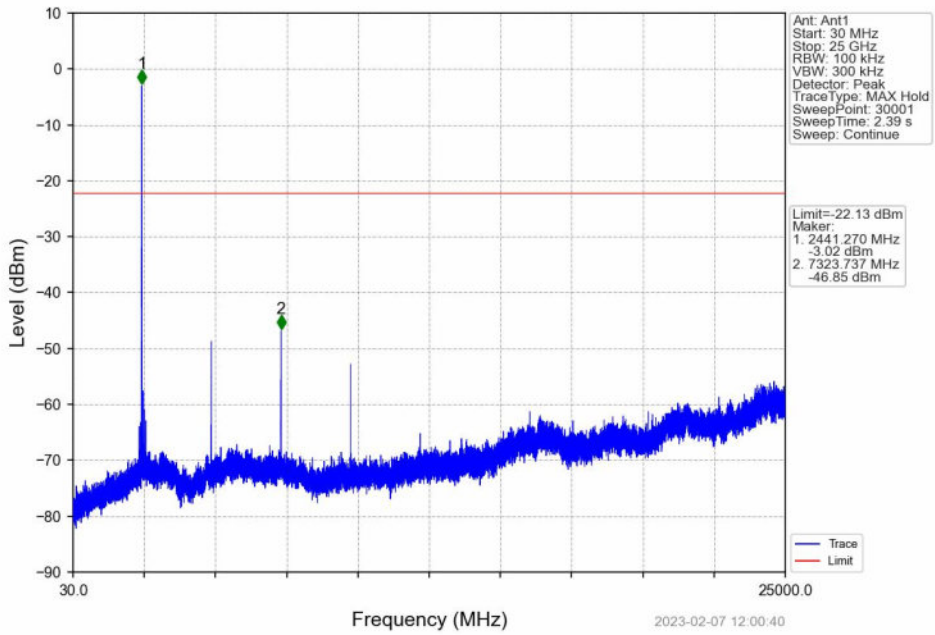
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-2.13	-22.13	Pass
		2441	DH5	1	-2.13	-22.13	Pass
		2480	DH5	1	-2.13	-22.13	Pass
		HOPP	DH5	1	-2.13	-22.13	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	-2.13	-22.13	Pass
		2441	2DH5	1	-2.13	-22.13	Pass
		2480	2DH5	1	-2.13	-22.13	Pass
		HOPP	2DH5	1	-2.13	-22.13	Pass
8DPSK	SISO	2402	3DH5	1	-2.06	-22.06	Pass
		2441	3DH5	1	-2.06	-22.06	Pass
		2480	3DH5	1	-2.06	-22.06	Pass
		HOPP	3DH5	1	-2.06	-22.06	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.

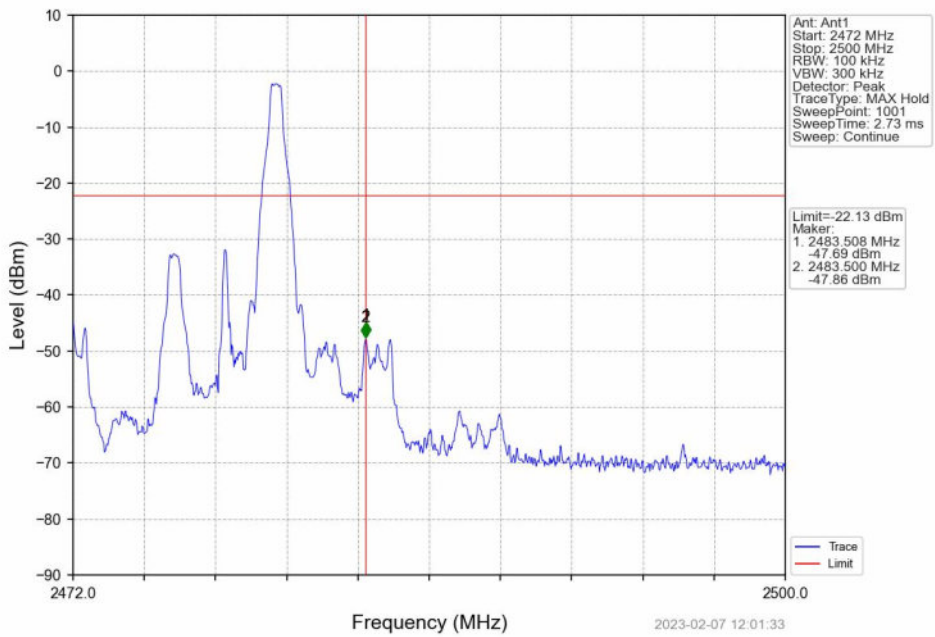
6.2.2 Test Graph



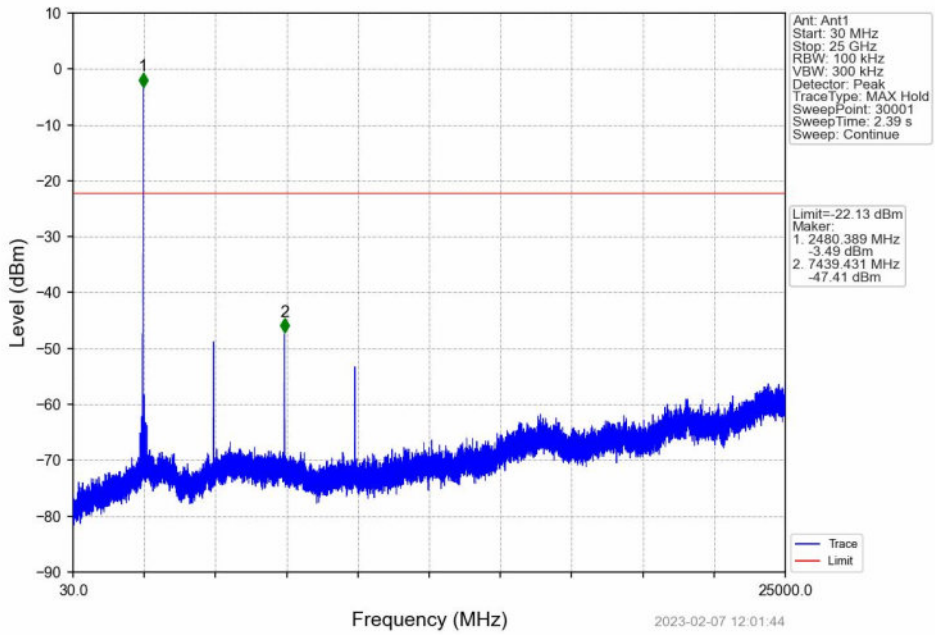
GFSK\_DH5\_MCH\_2441MHz\_Ant1\_NTNV



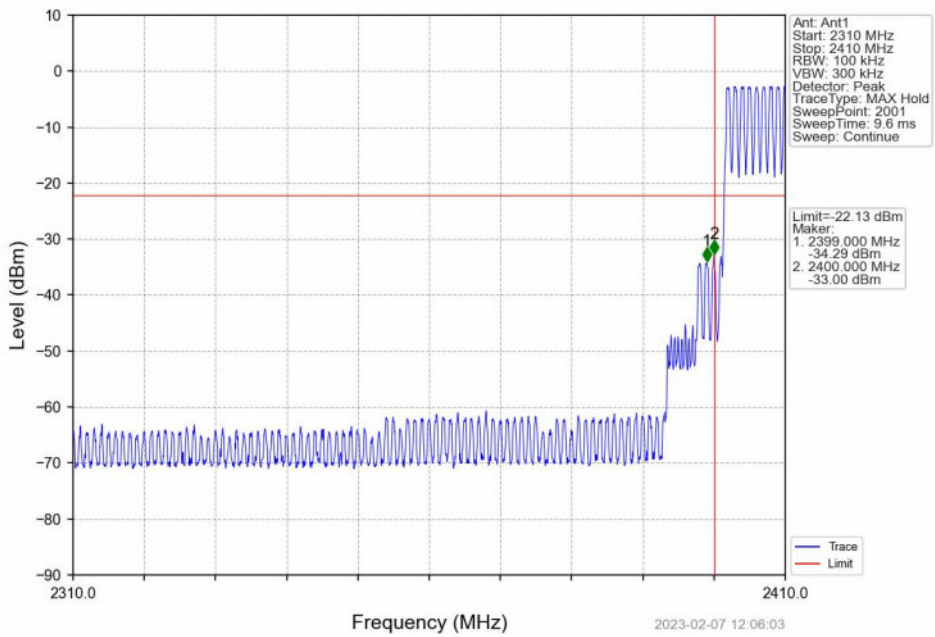
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



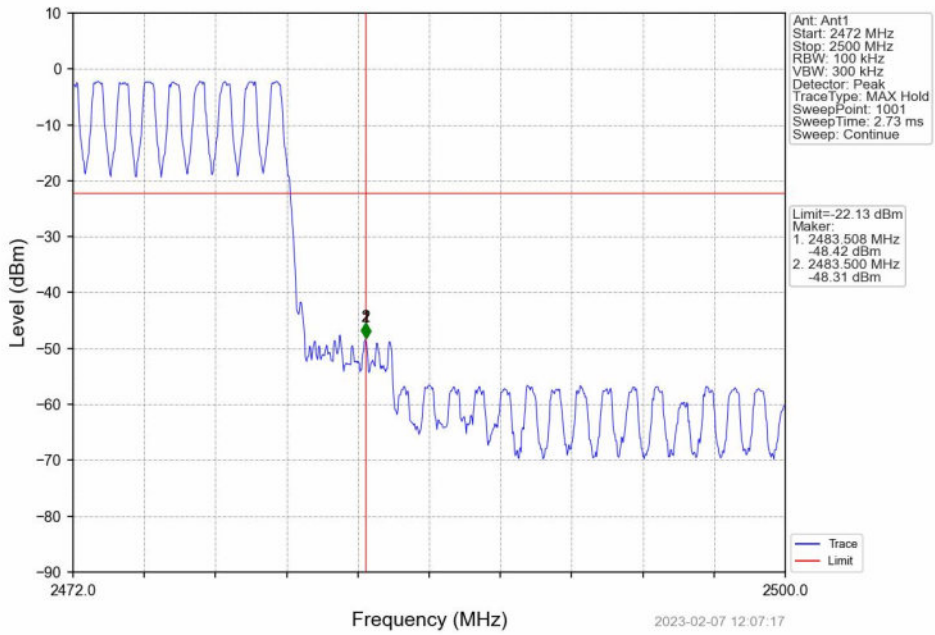
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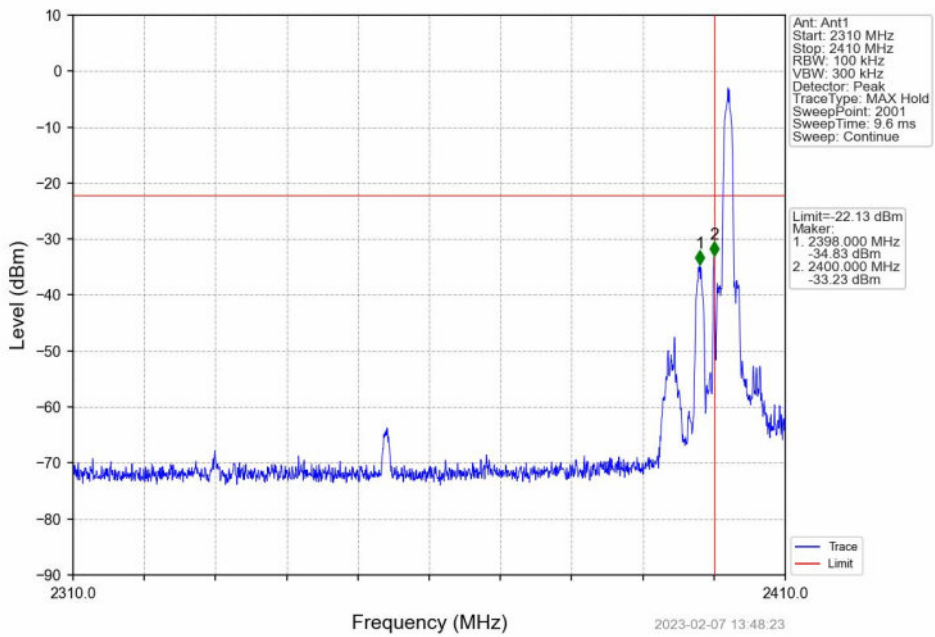
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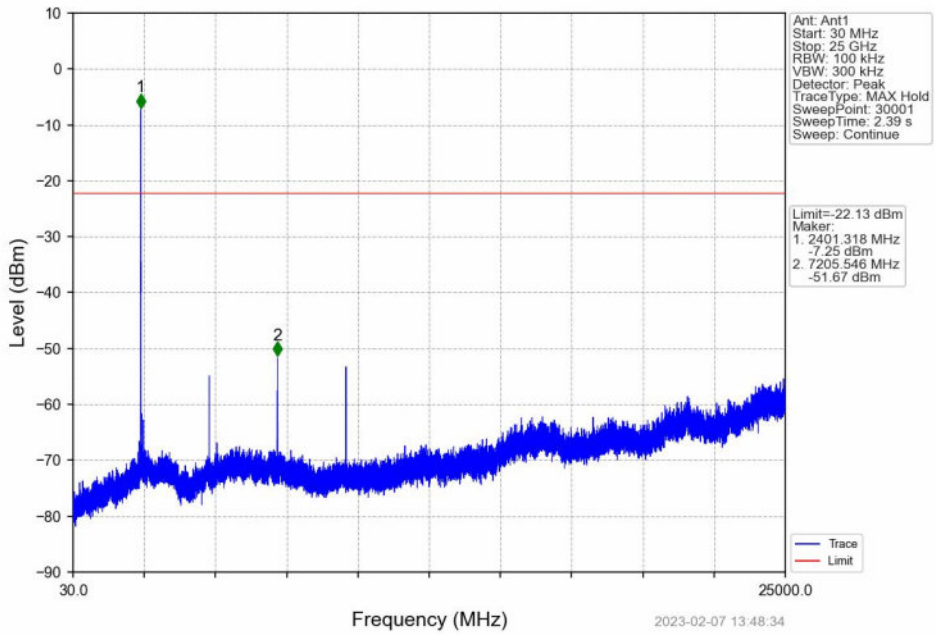
GFSK\_DH5\_HOPP\_Ant1\_NTNV



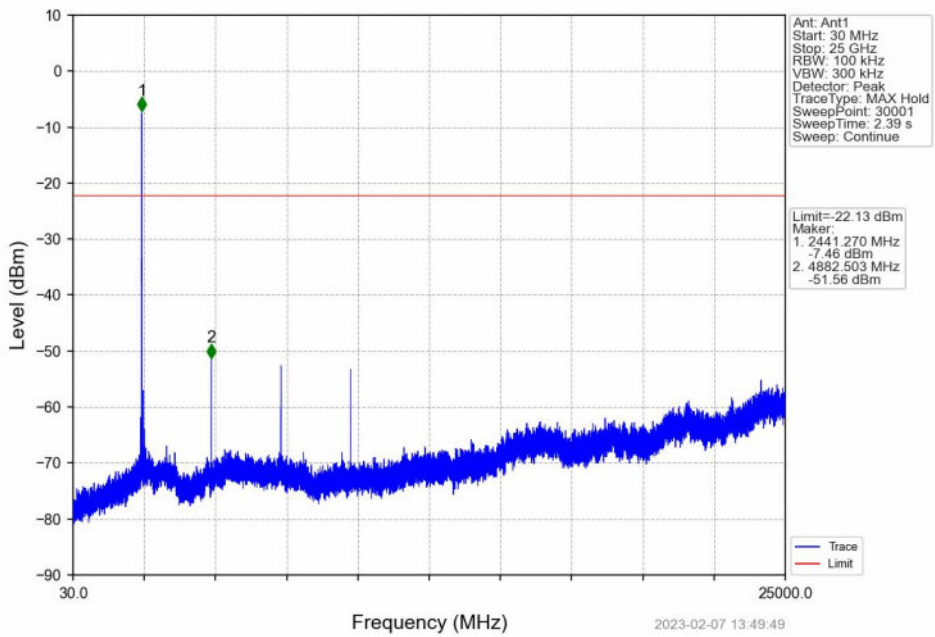
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



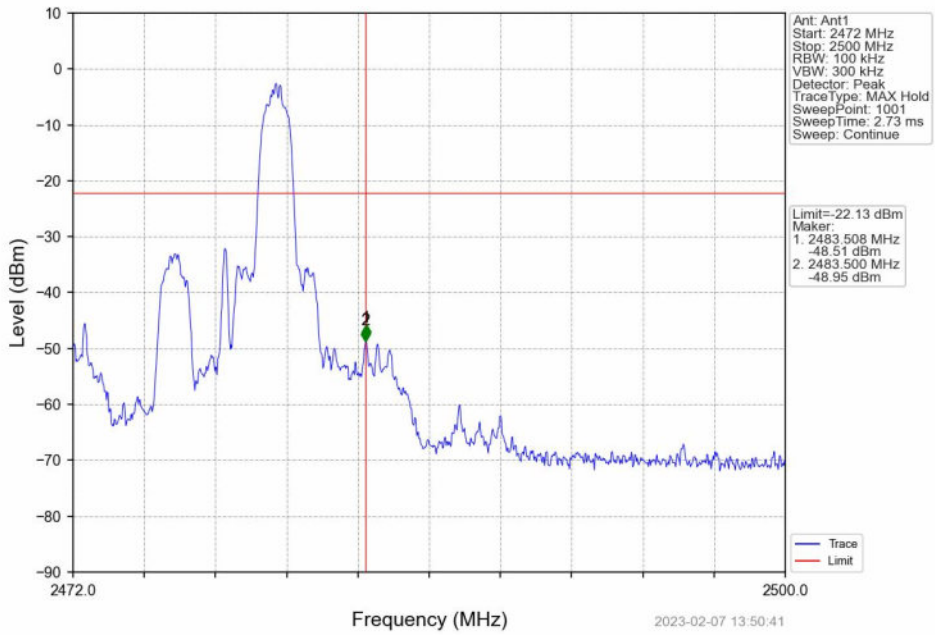
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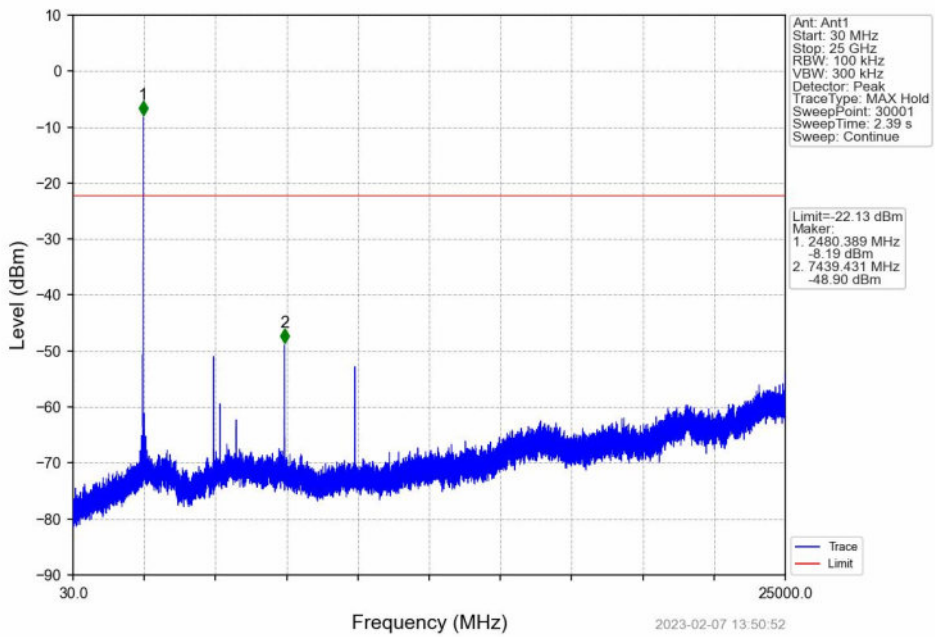
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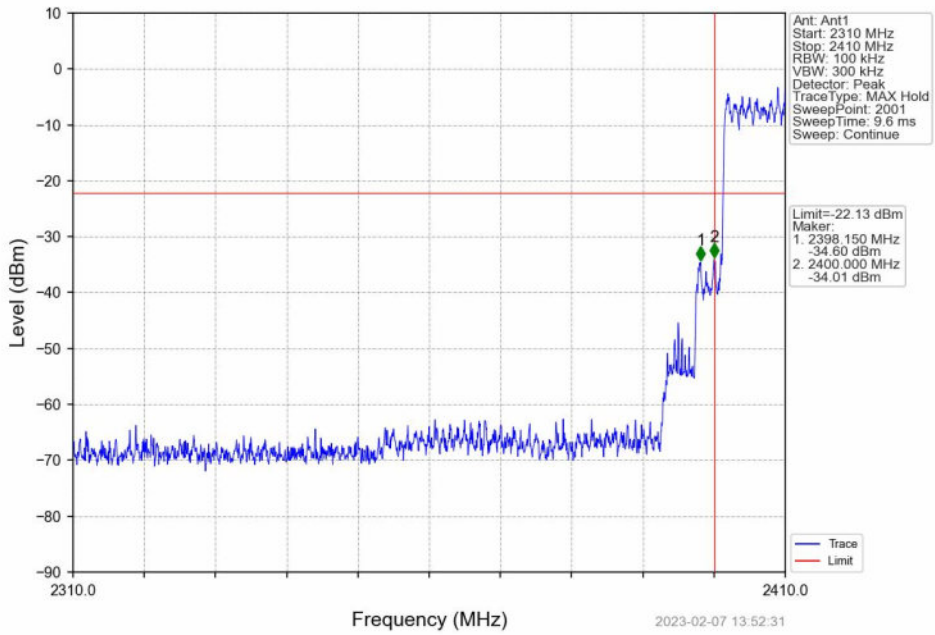
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



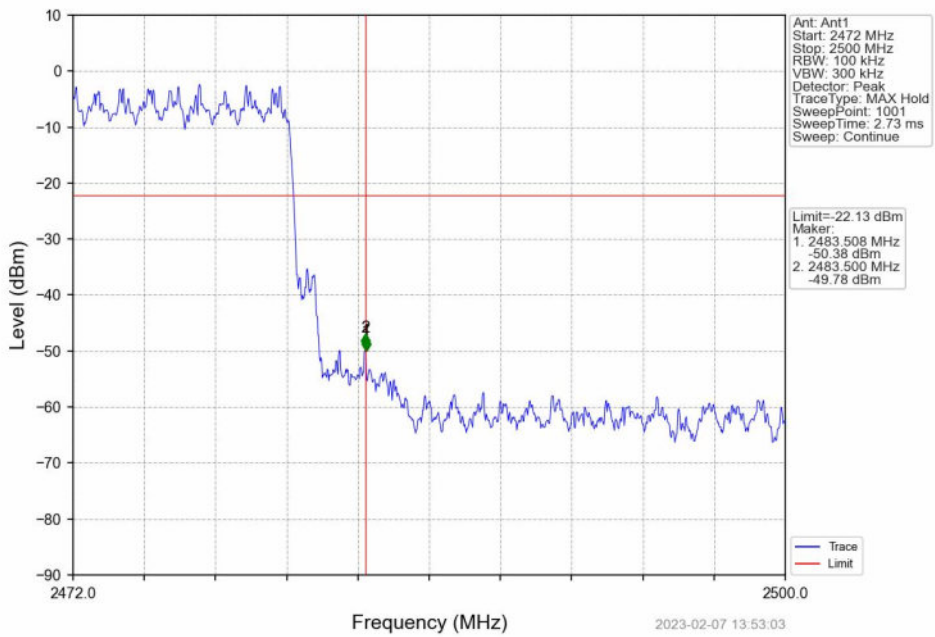
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV

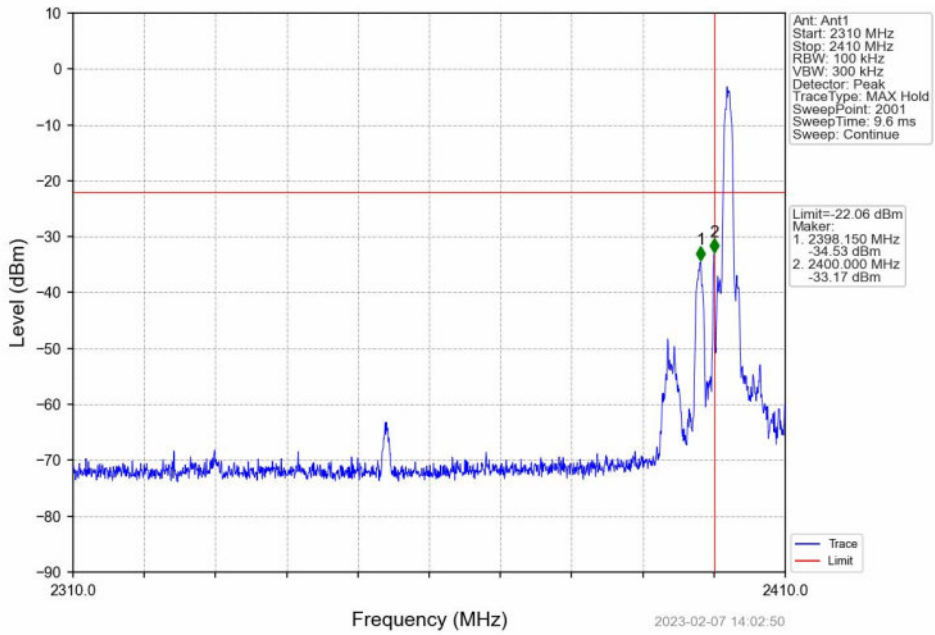


Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV

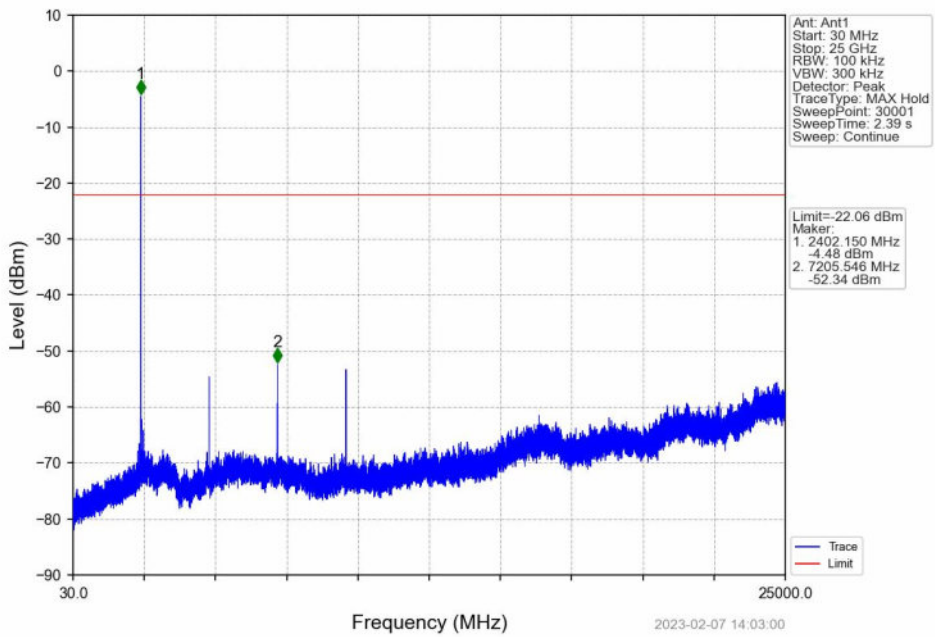




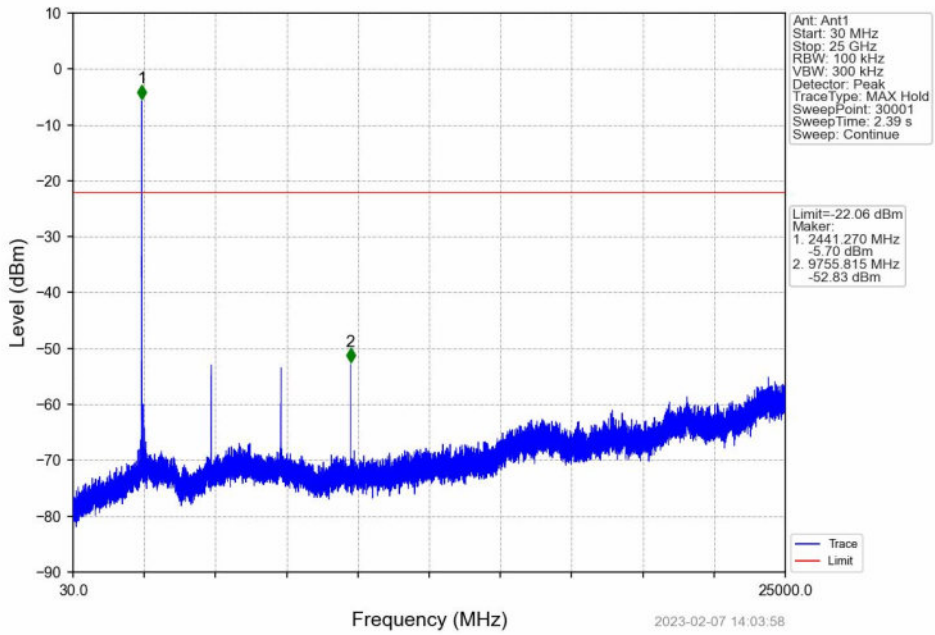
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



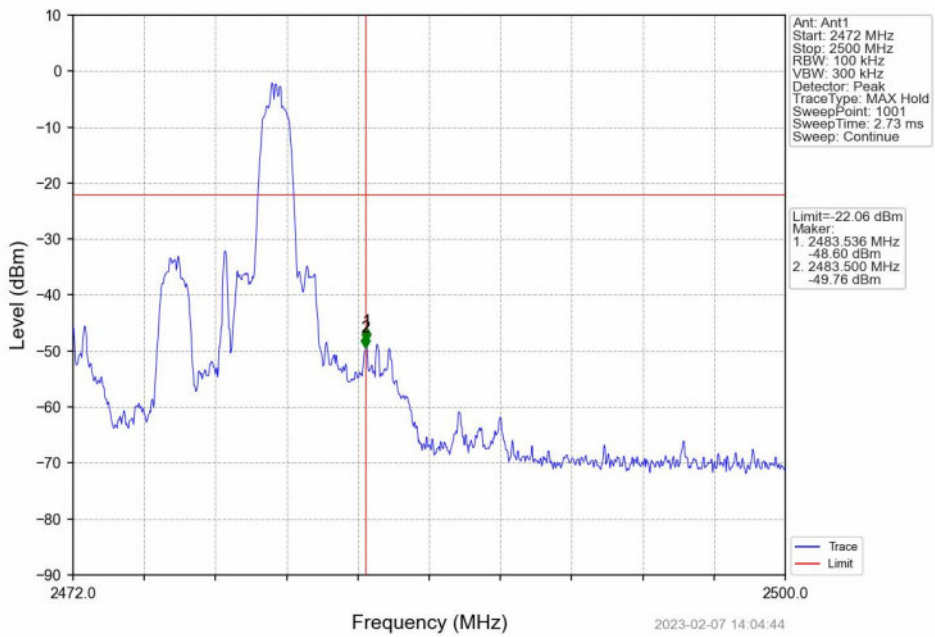
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



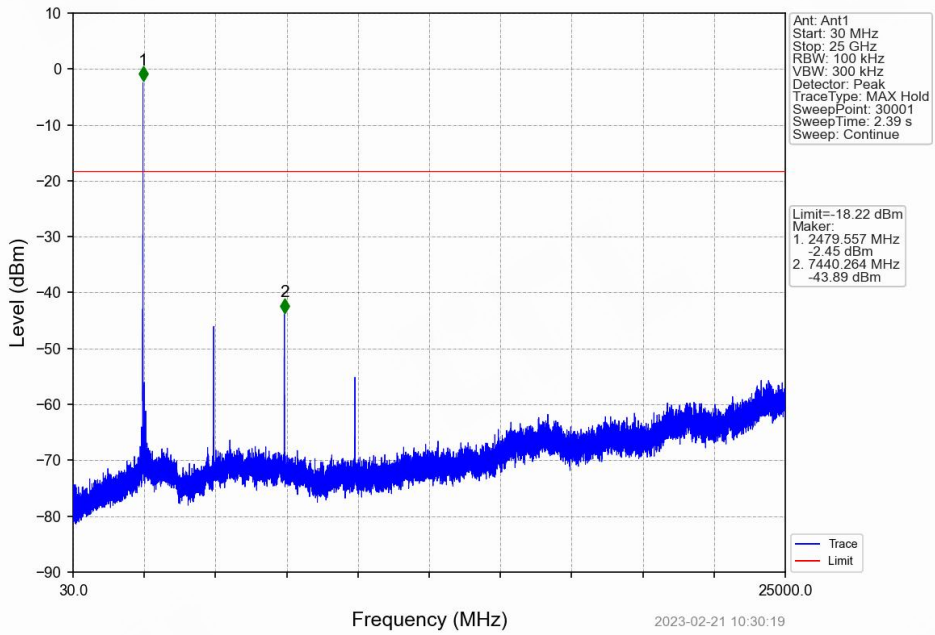
8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV

