



Shenzhen CTL Testing Technology Co., Ltd.

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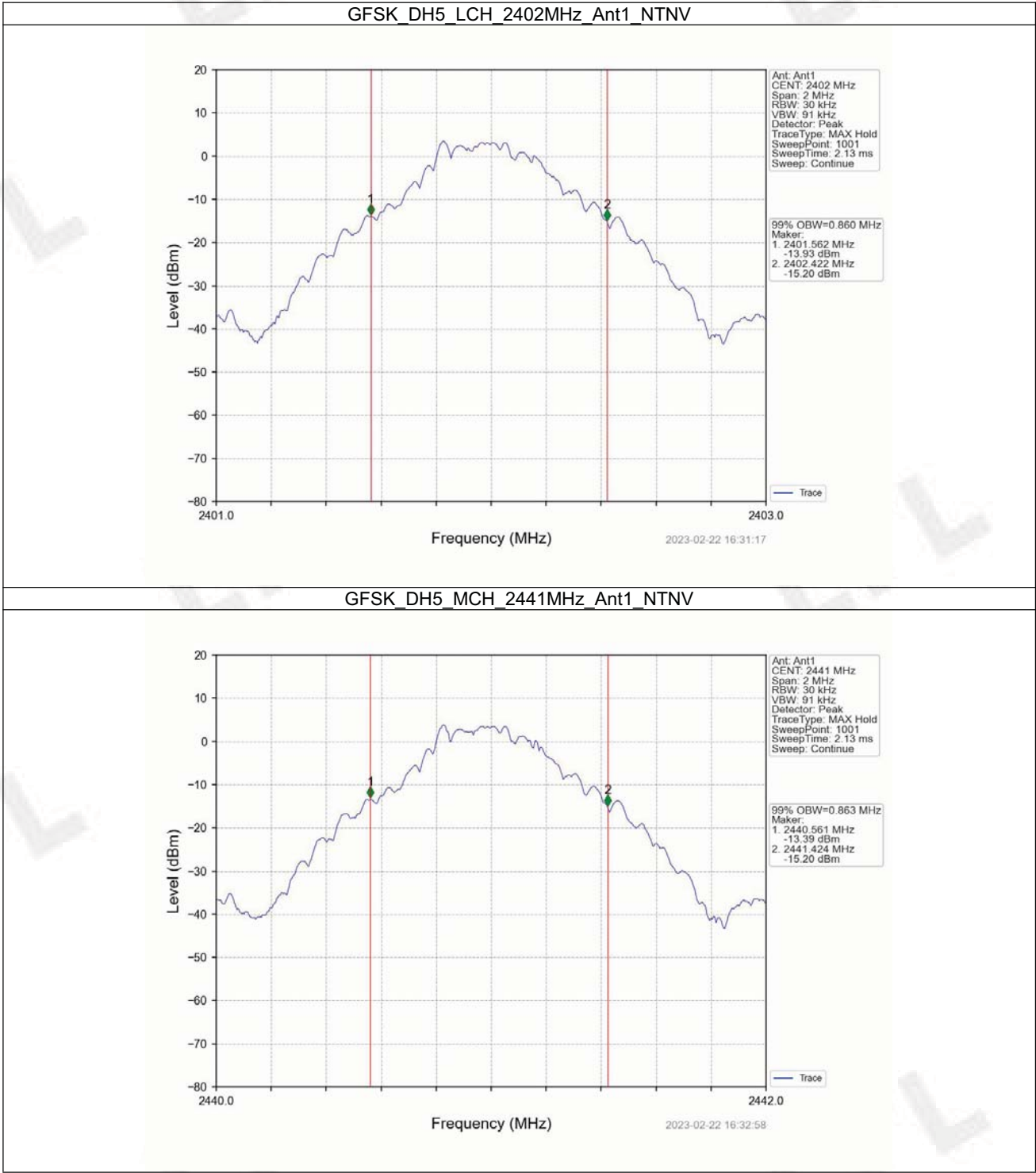
1. Bandwidth

1.1 OBW

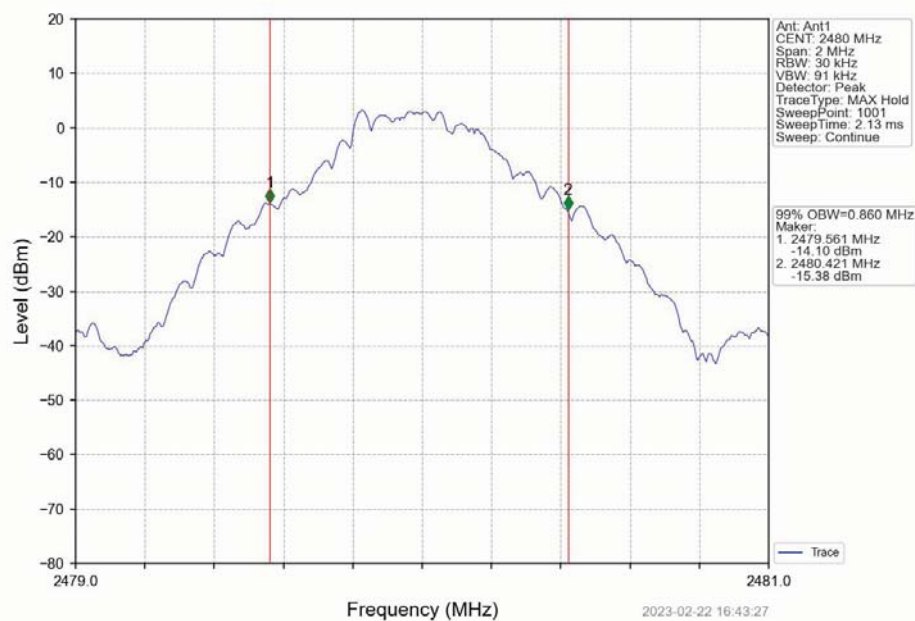
1.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.860	Pass
		2441	DH5	1	0.863	Pass
		2480	DH5	1	0.860	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.138	Pass
		2441	2DH5	1	1.135	Pass
		2480	2DH5	1	1.134	Pass
8DPSK	SISO	2402	3DH5	1	1.147	Pass
		2441	3DH5	1	1.147	Pass
		2480	3DH5	1	1.146	Pass

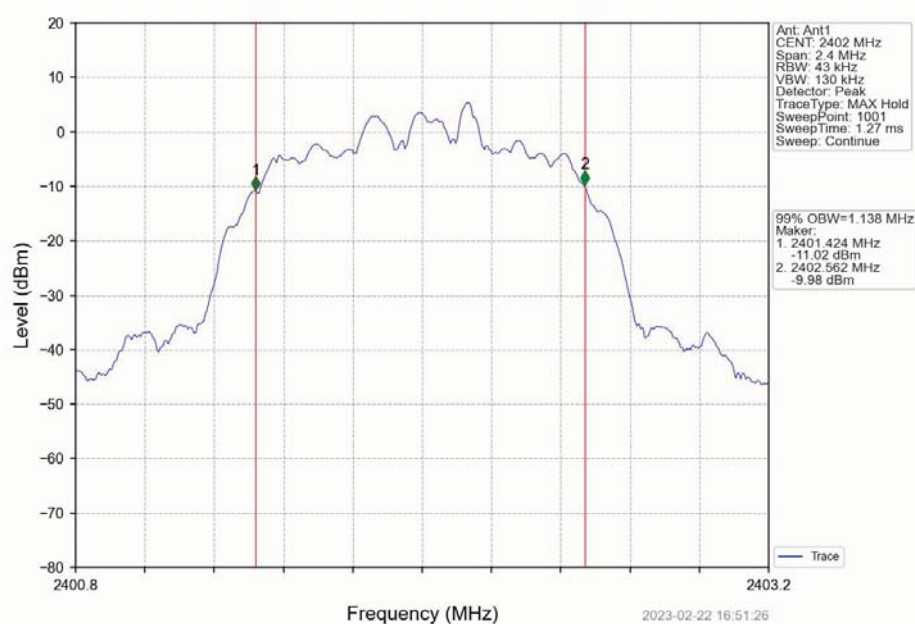
1.1.2 Test Graph



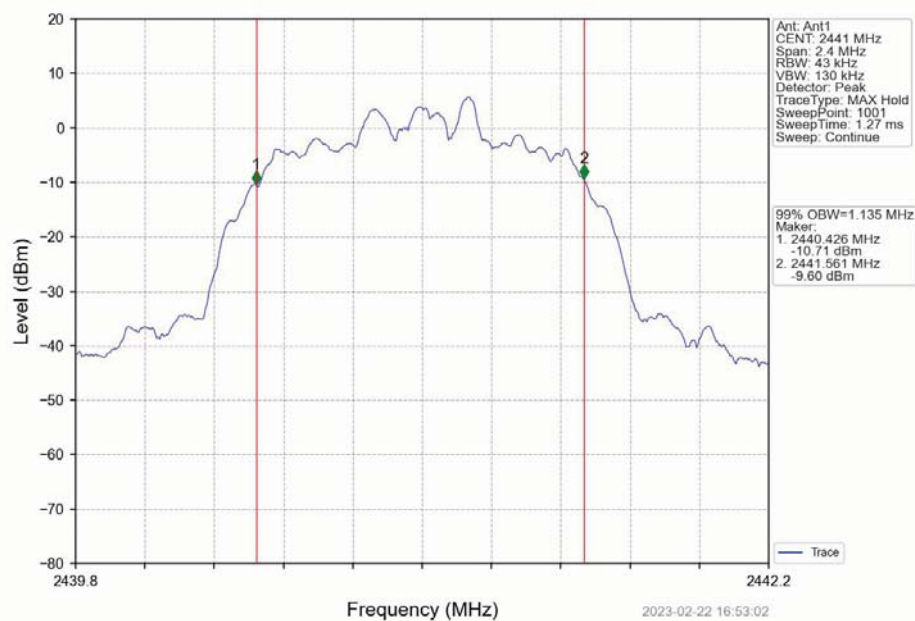
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



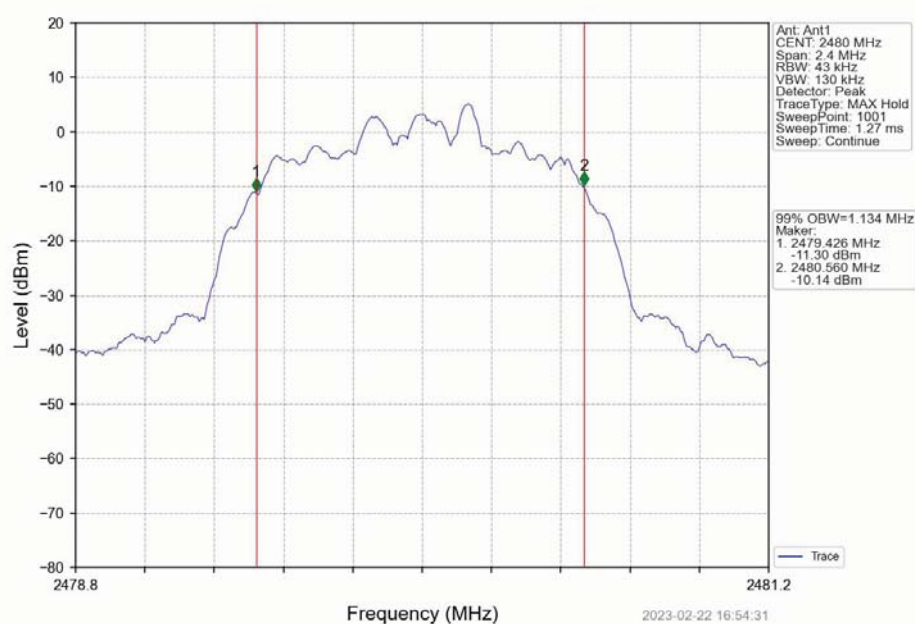
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



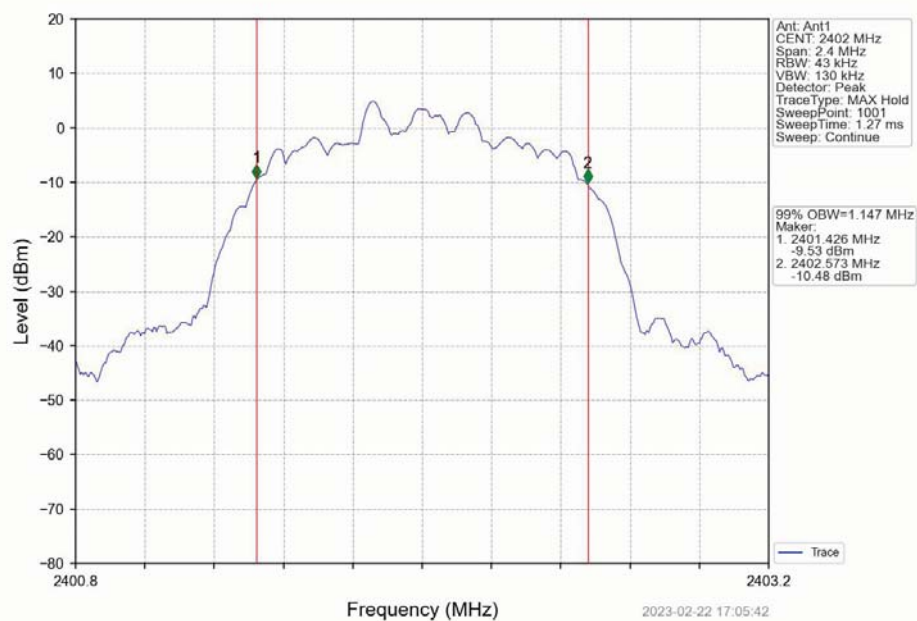
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



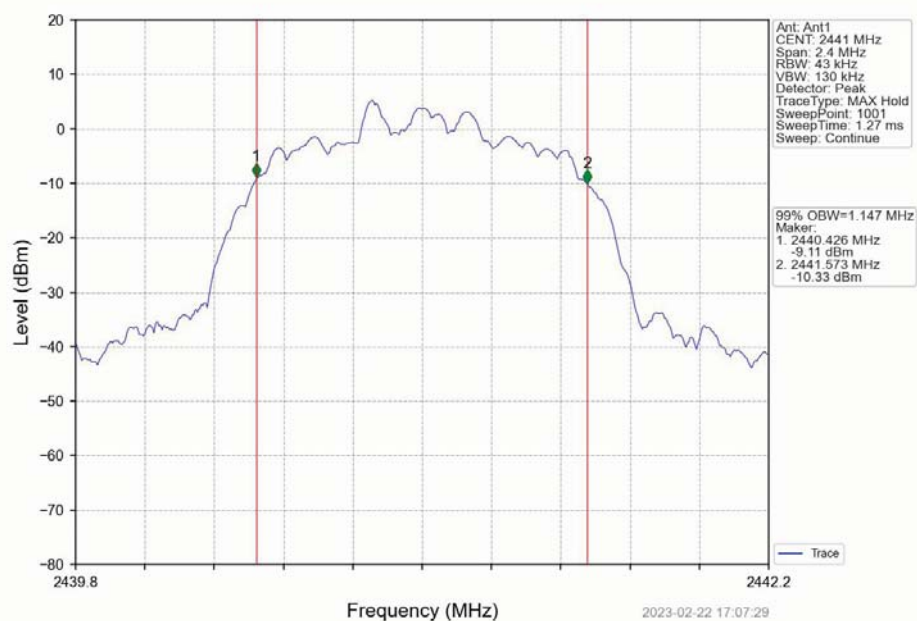
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

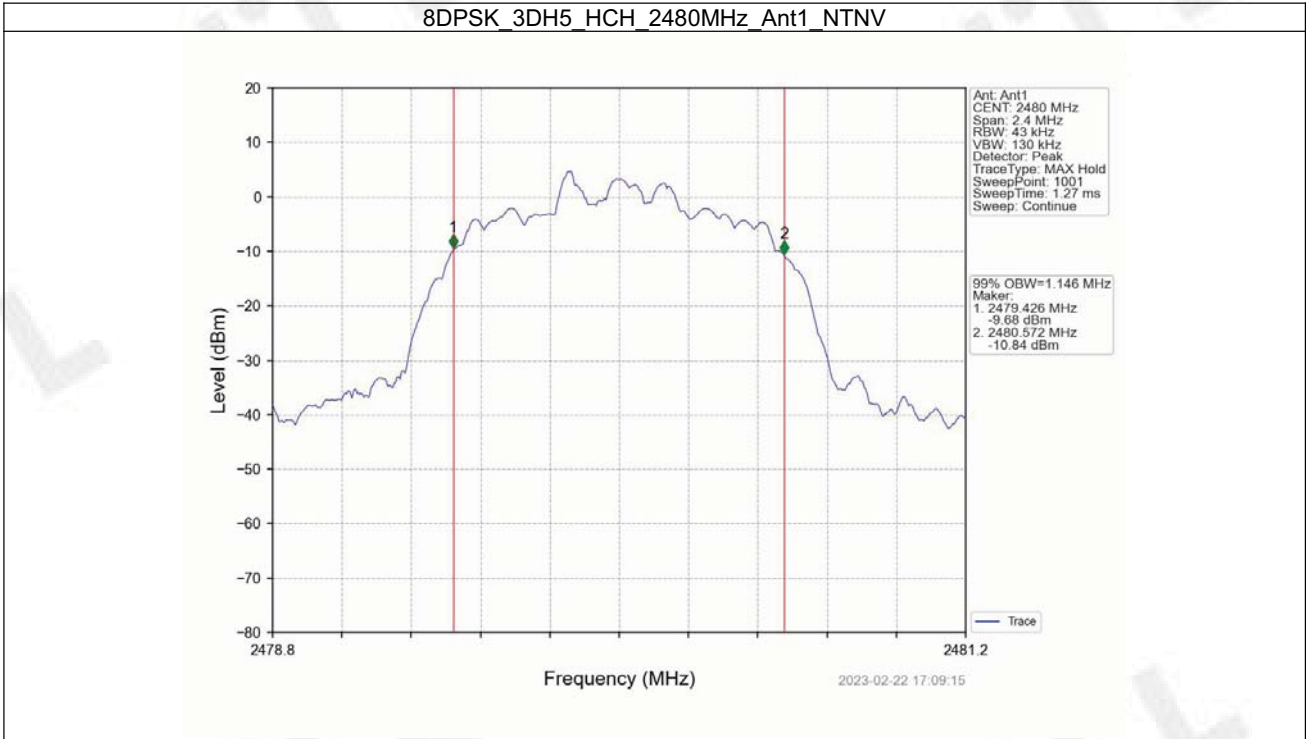


8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



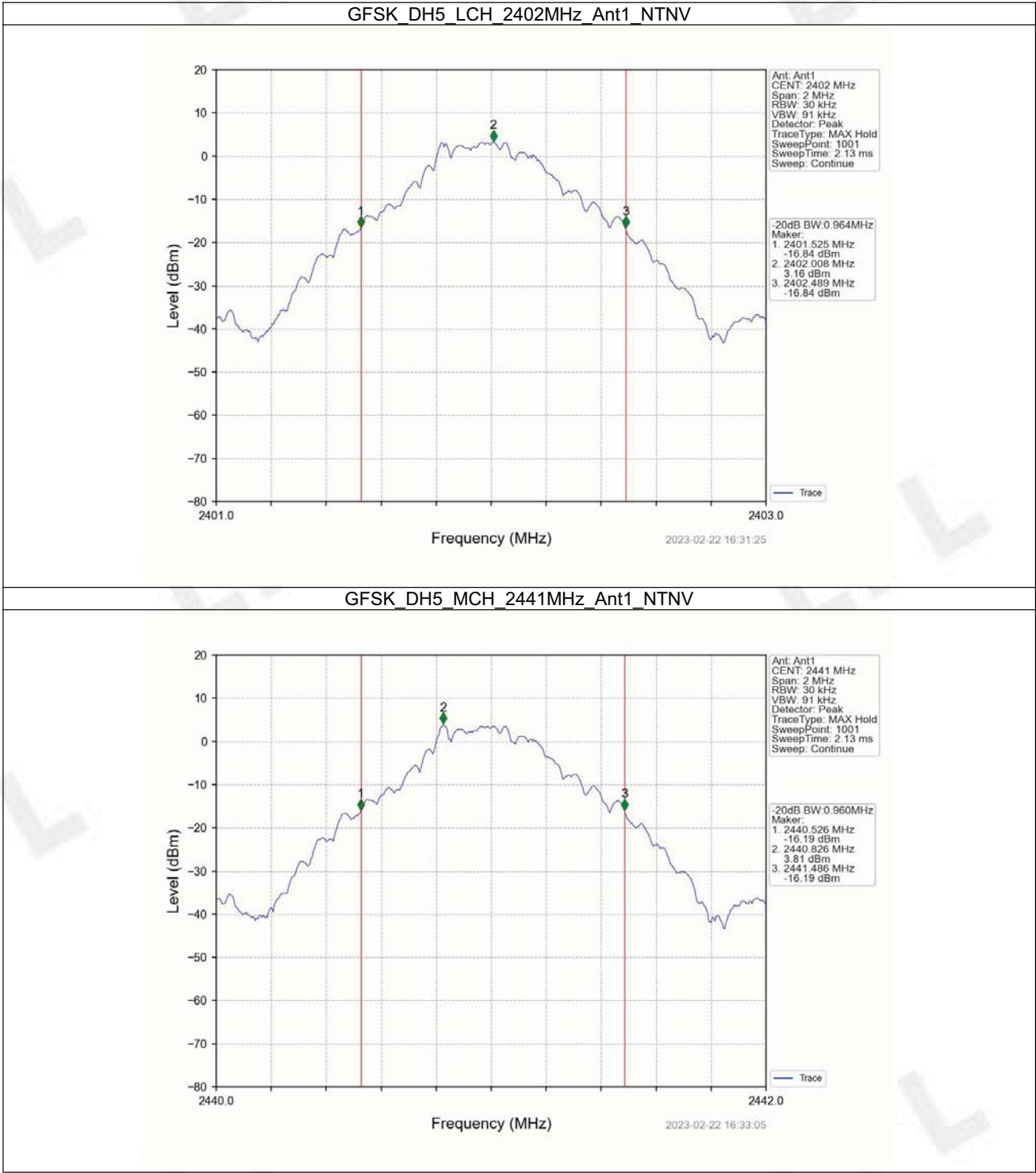


1.2 20dB BW

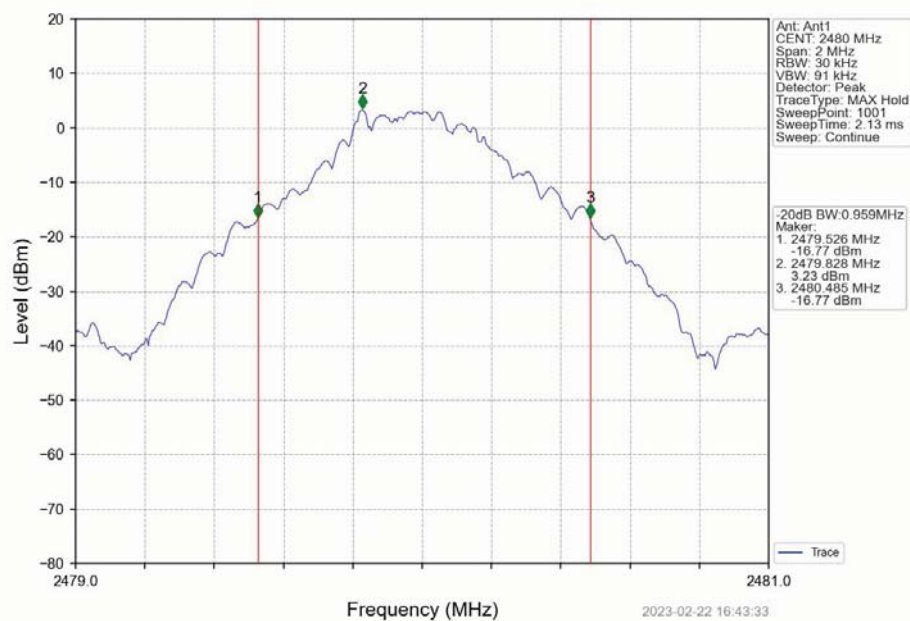
1.2.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.964	Pass
		2441	DH5	1	0.960	Pass
		2480	DH5	1	0.959	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.246	Pass
		2441	2DH5	1	1.225	Pass
		2480	2DH5	1	1.223	Pass
8DPSK	SISO	2402	3DH5	1	1.284	Pass
		2441	3DH5	1	1.283	Pass
		2480	3DH5	1	1.277	Pass

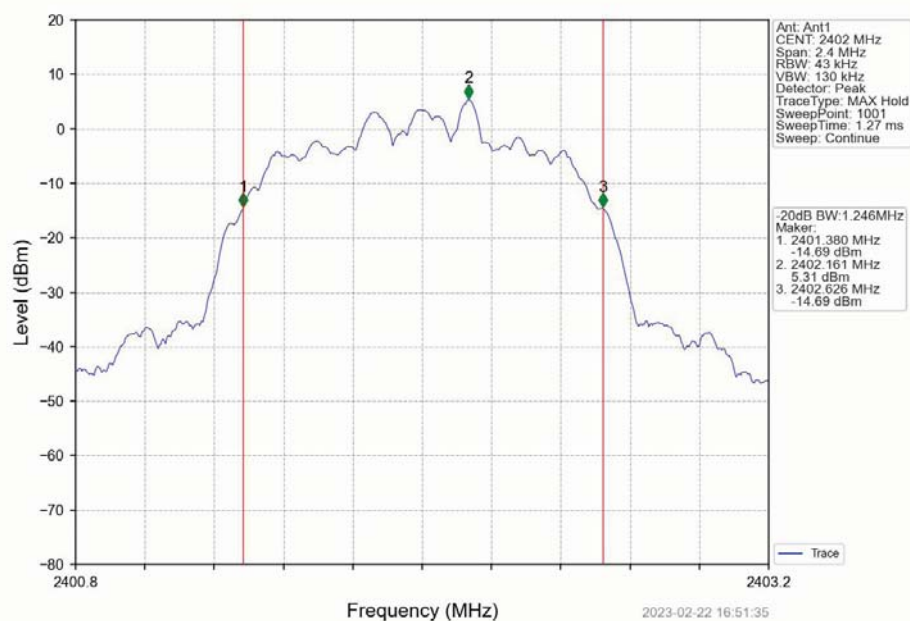
1.2.2 Test Graph



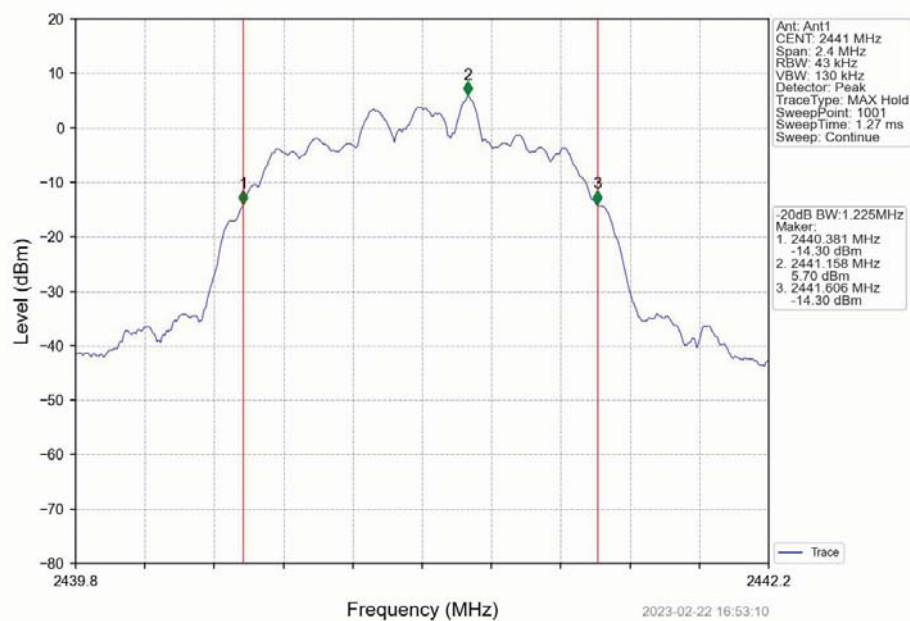
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



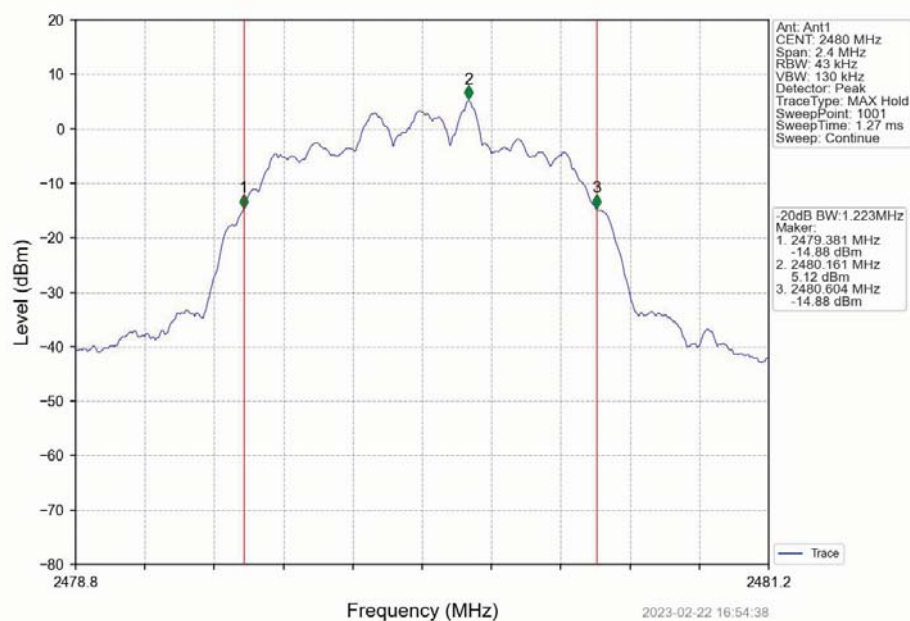
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



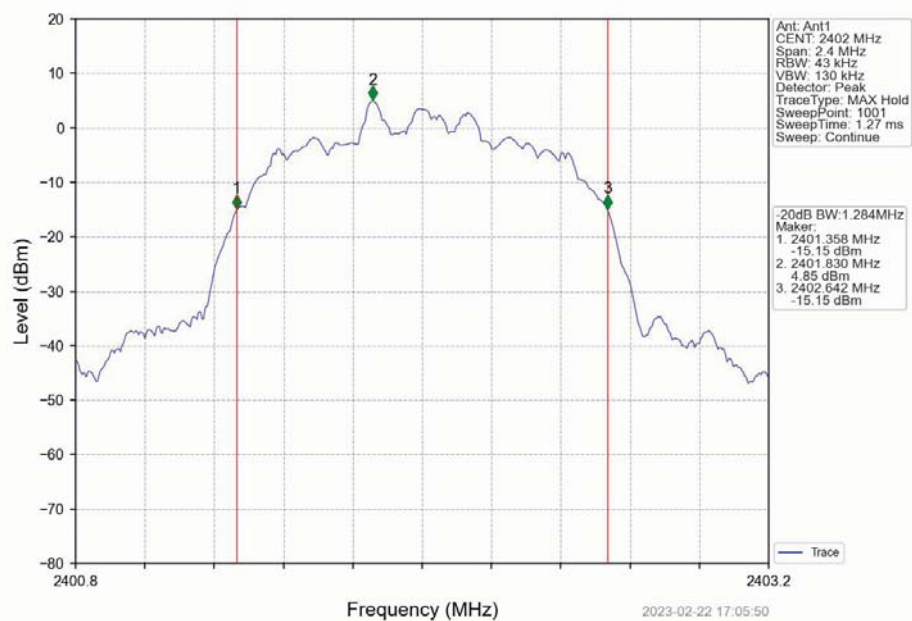
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



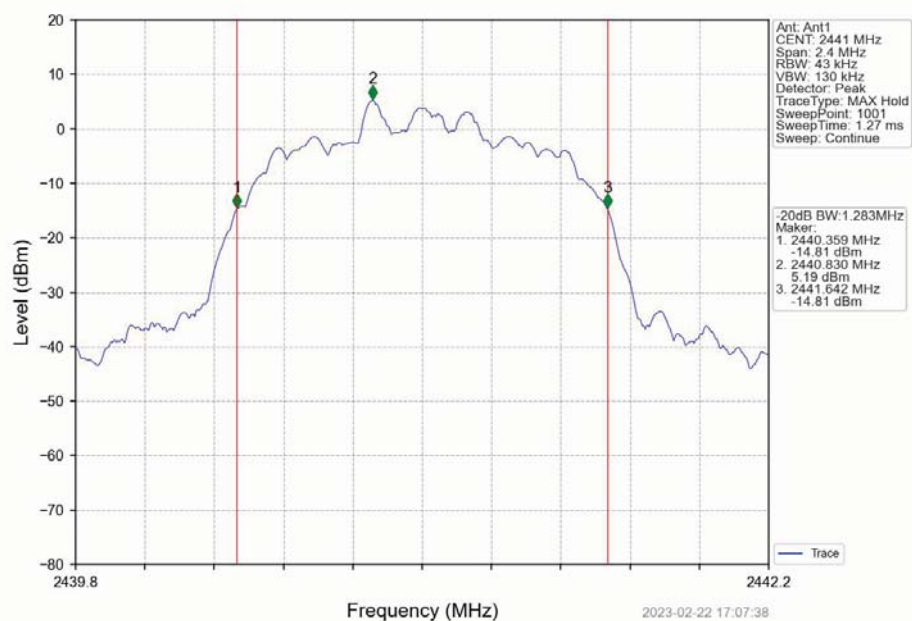
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

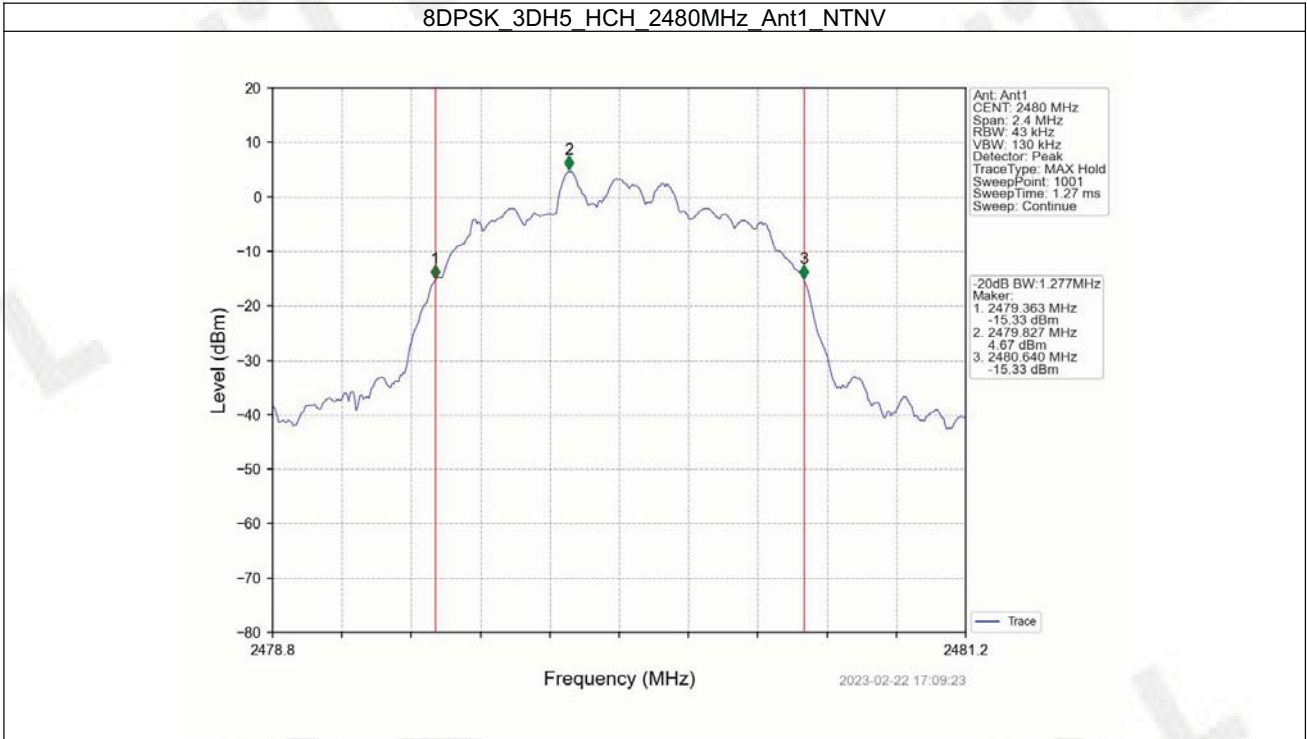


8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV





2. Maximum Conducted Output Power

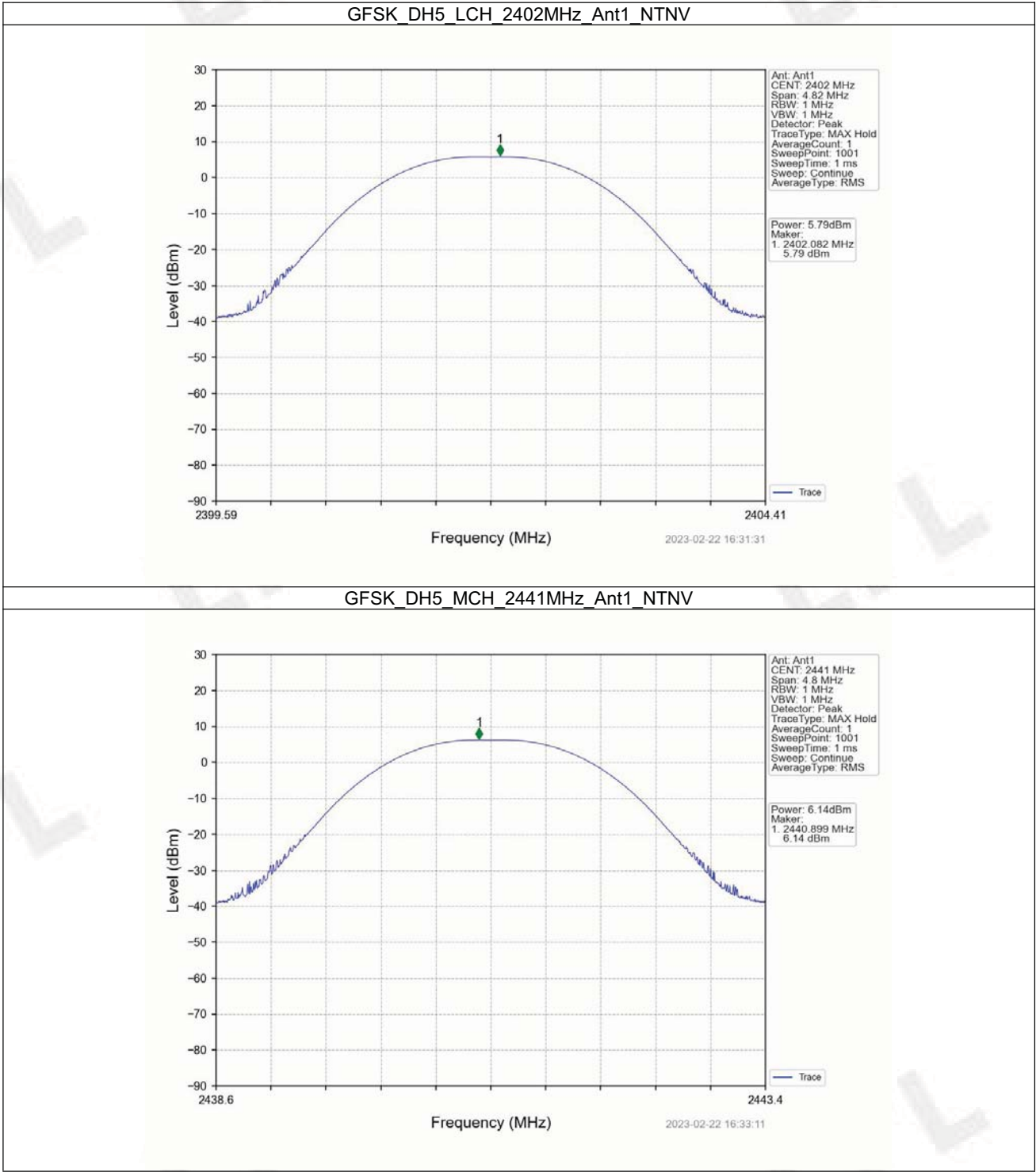
2.1 Power

2.1.1 Test Result

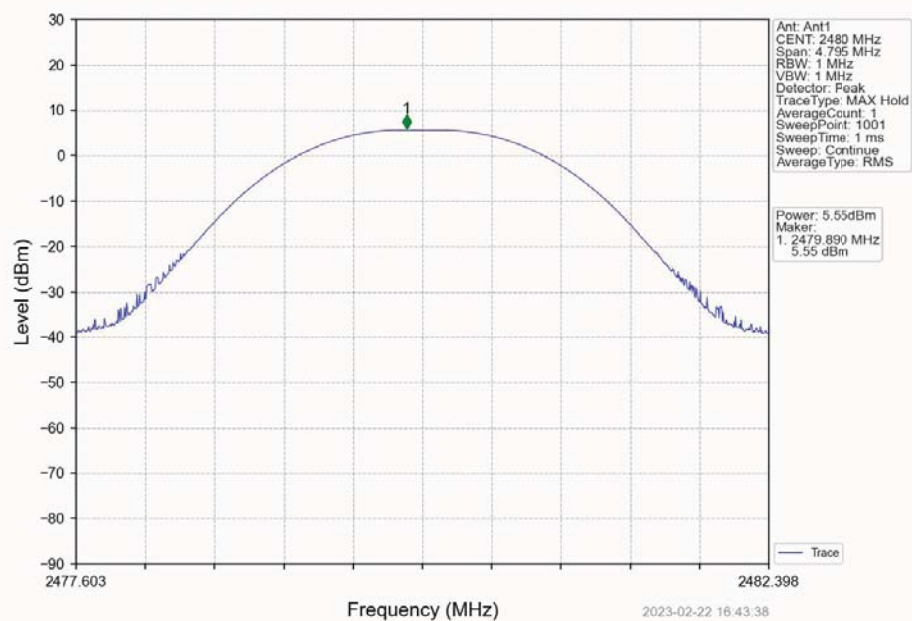
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	5.79	<=30	Pass
		2441	DH5	6.14	<=30	Pass
		2480	DH5	5.55	<=30	Pass
Pi/4DQPSK	SISO	2402	2DH5	5.95	<=20.97	Pass
		2441	2DH5	6.31	<=20.97	Pass
		2480	2DH5	5.74	<=20.97	Pass
8DPSK	SISO	2402	3DH5	6.31	<=20.97	Pass
		2441	3DH5	6.71	<=20.97	Pass
		2480	3DH5	6.20	<=20.97	Pass

Note1: Antenna Gain: Ant1: 1.41dBi;

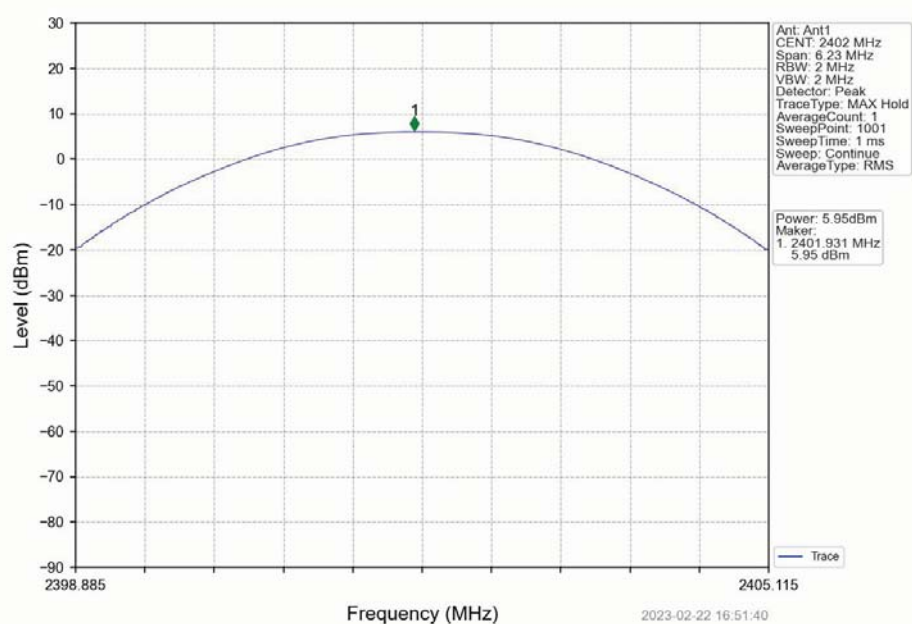
2.1.2 Test Graph



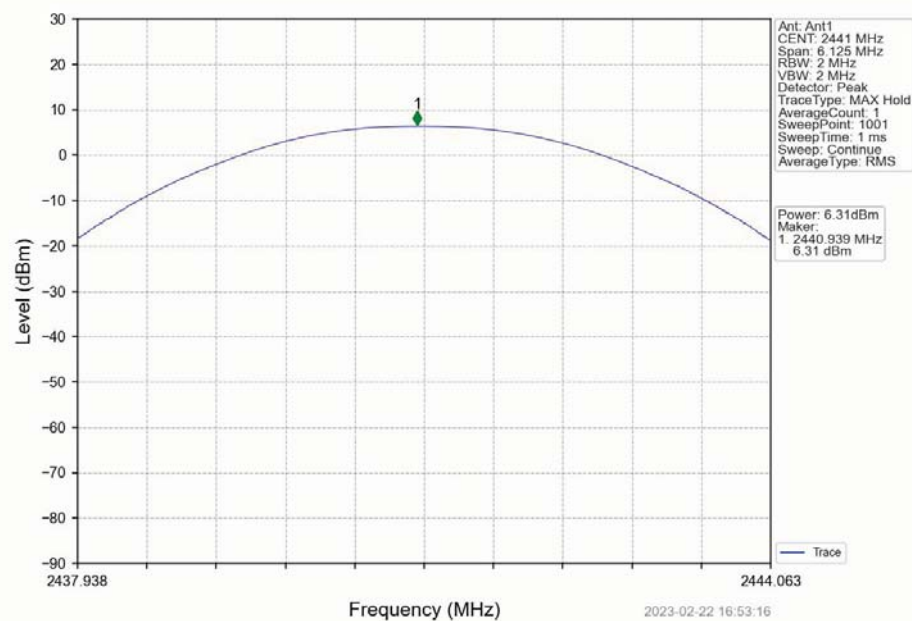
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



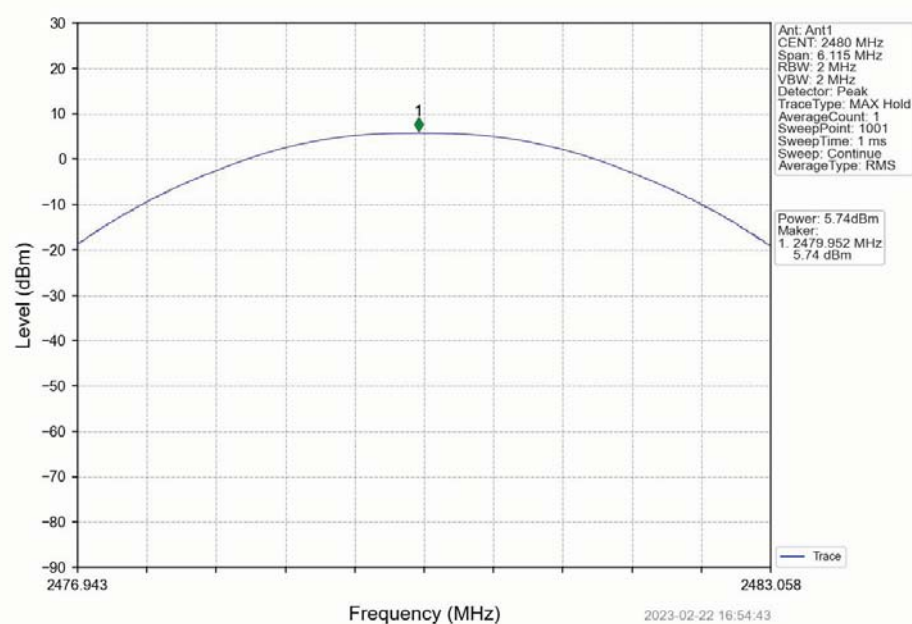
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



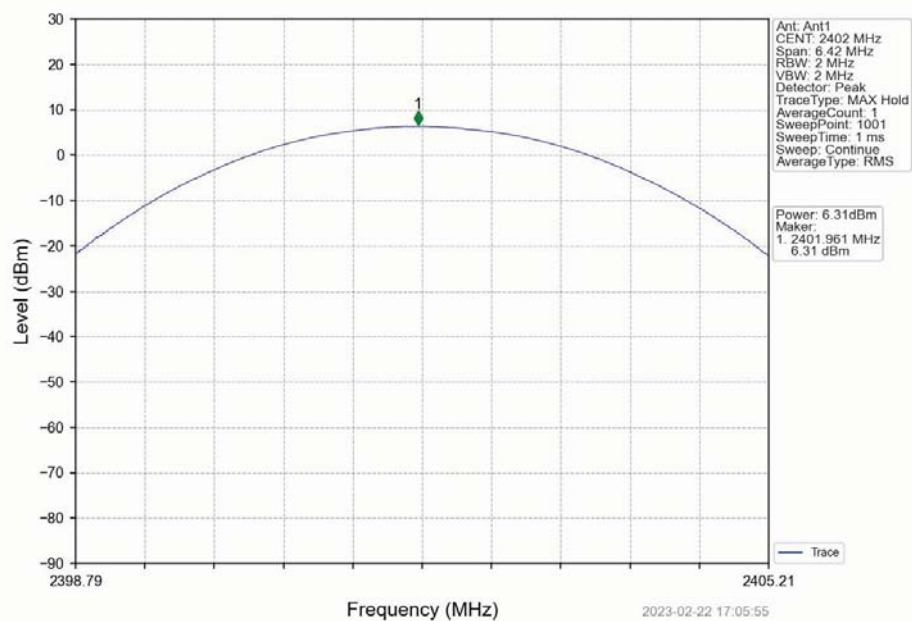
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



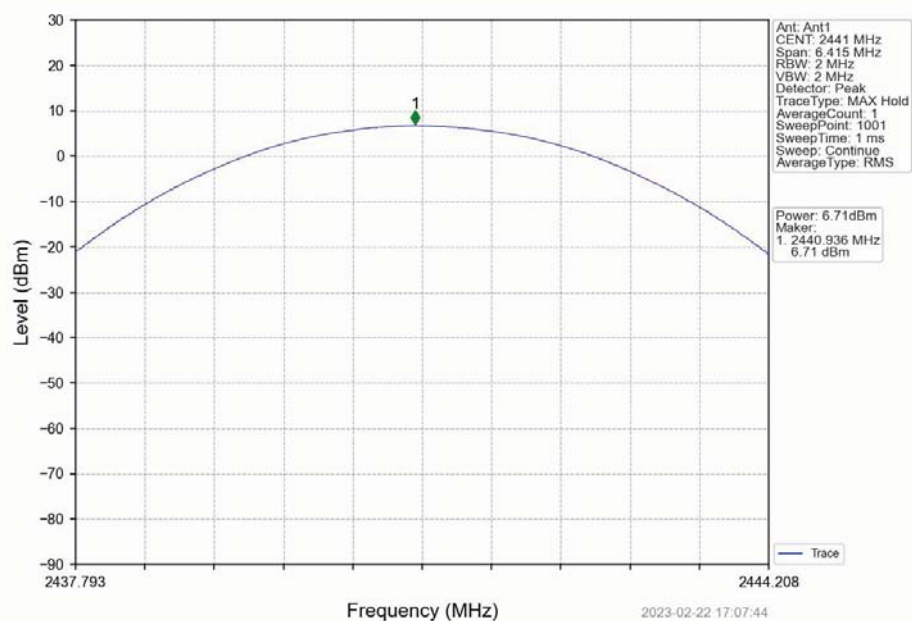
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

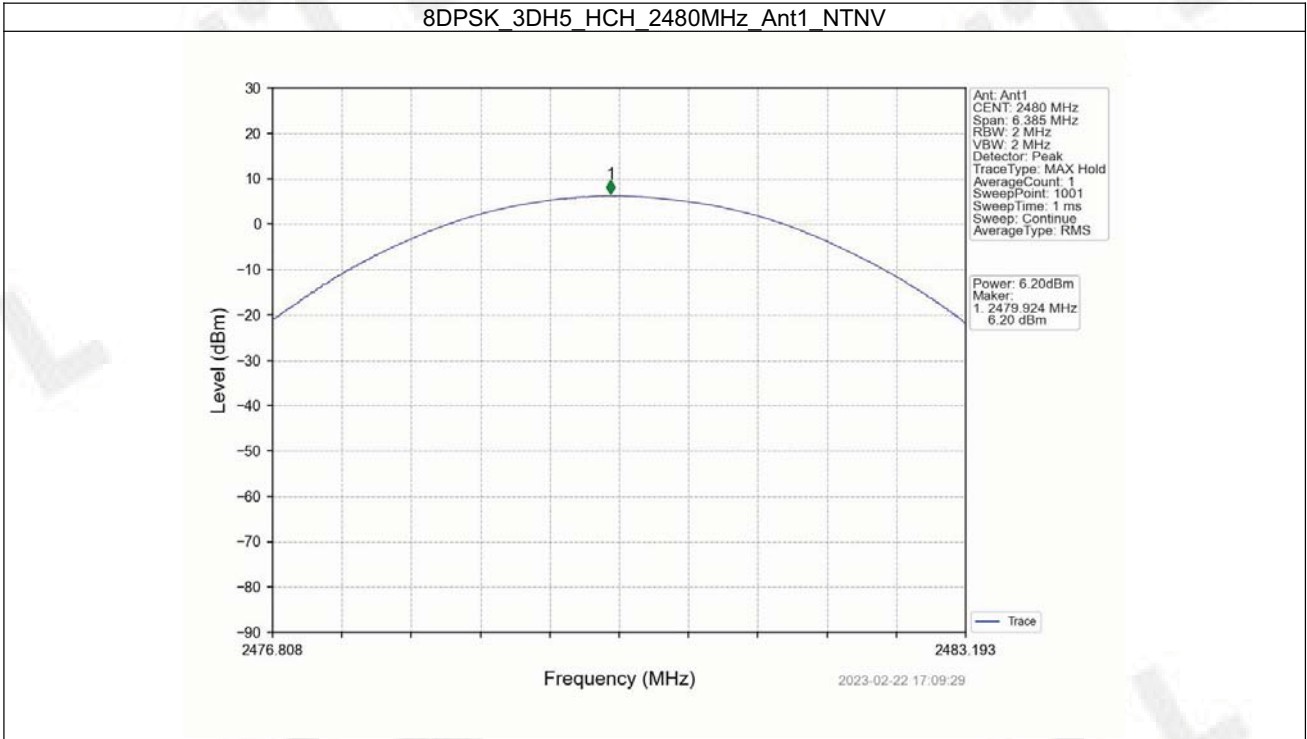


8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV





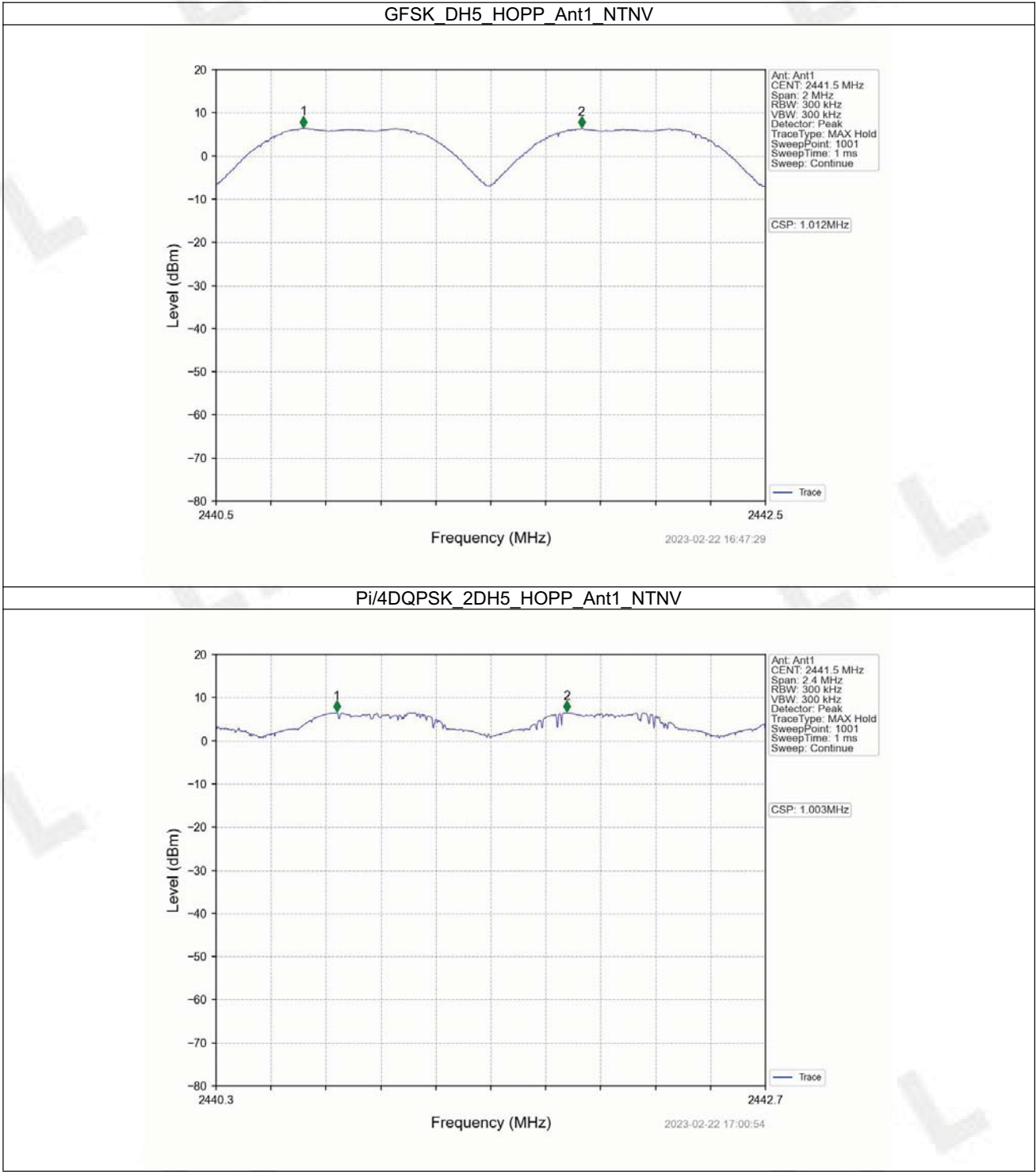
3. Carrier Frequency Separation

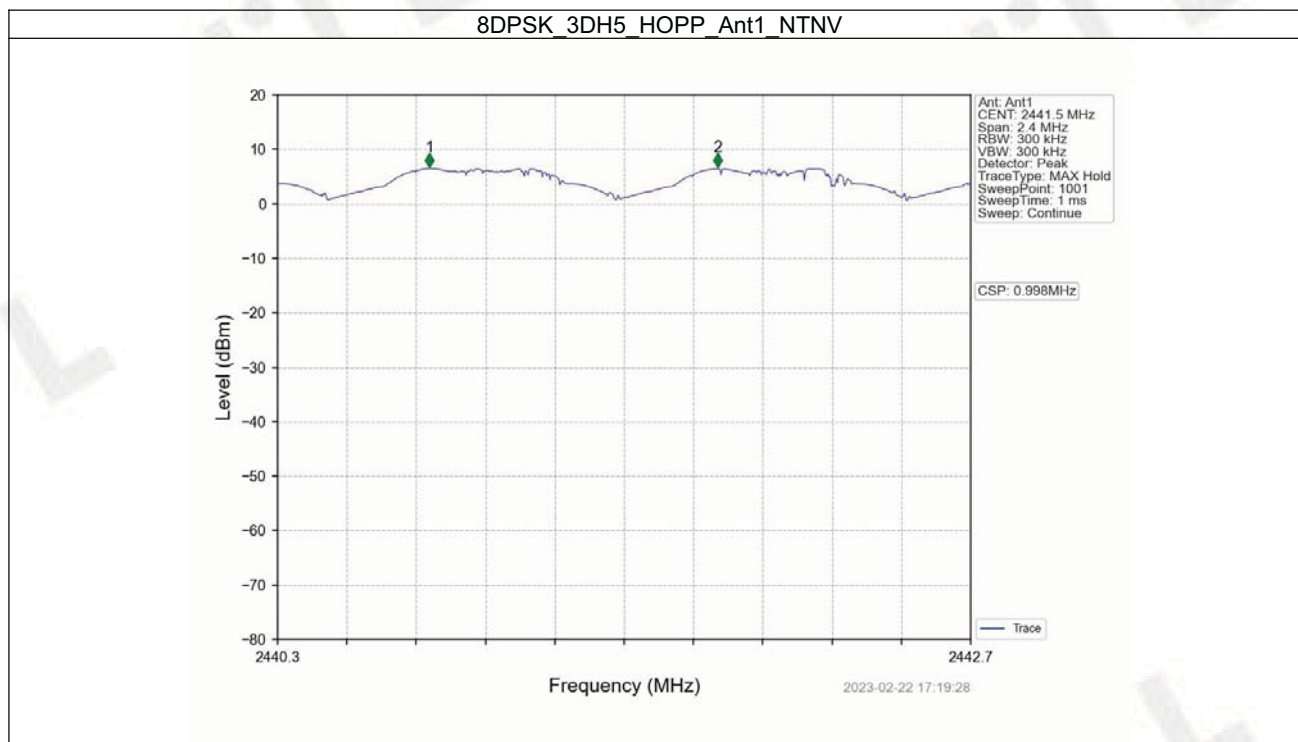
3.1 Ant1

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	1.012	0.964	≥ 0.964	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	1.003	1.246	≥ 0.831	Pass
8DPSK	SISO	HOPP	3DH5	0.998	1.284	≥ 0.856	Pass

3.1.2 Test Graph





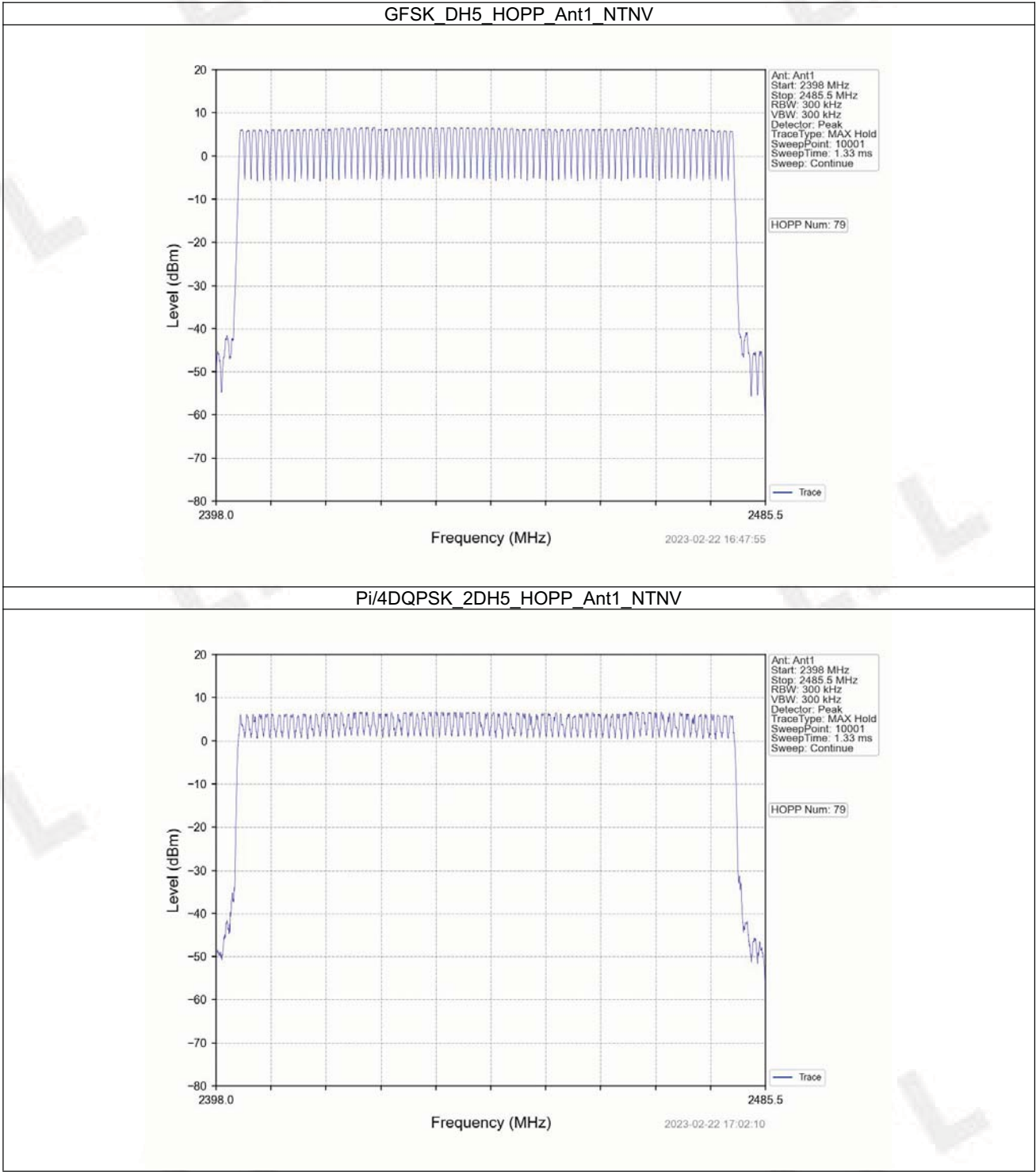
4. Number of Hopping Frequencies

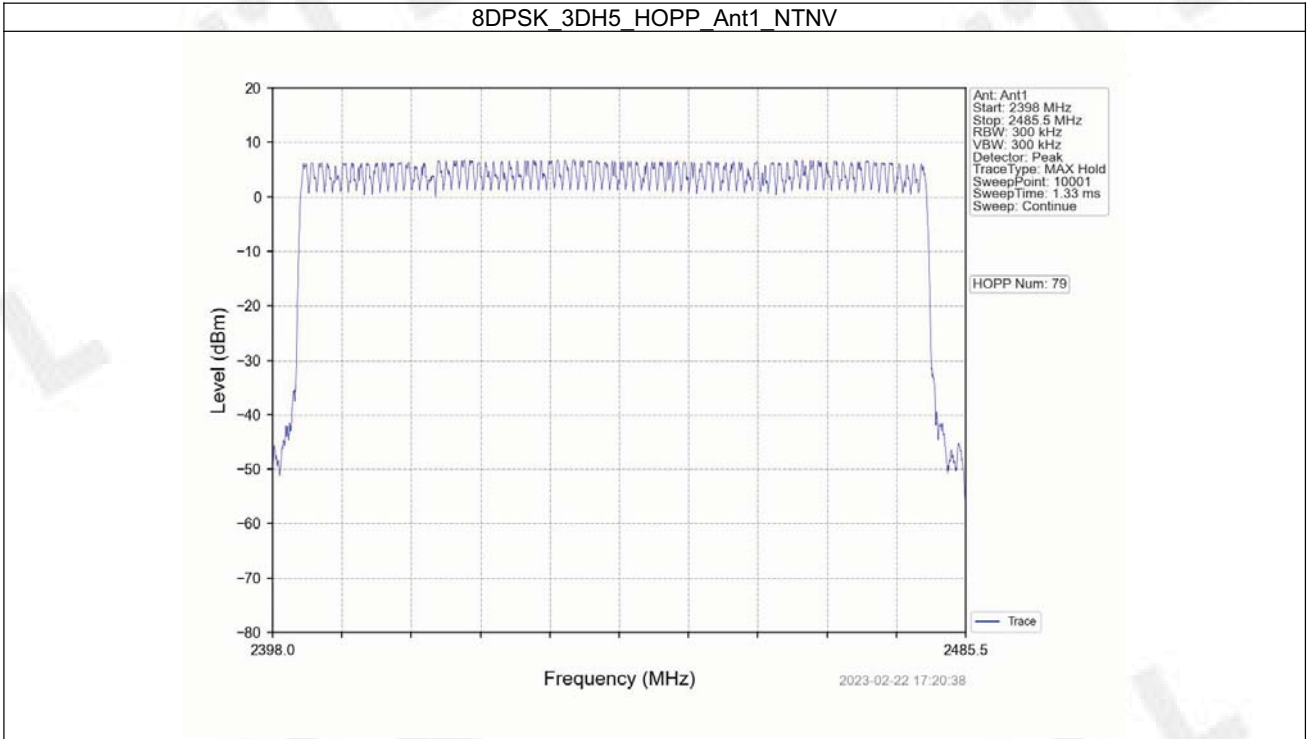
4.1 HoppNum

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





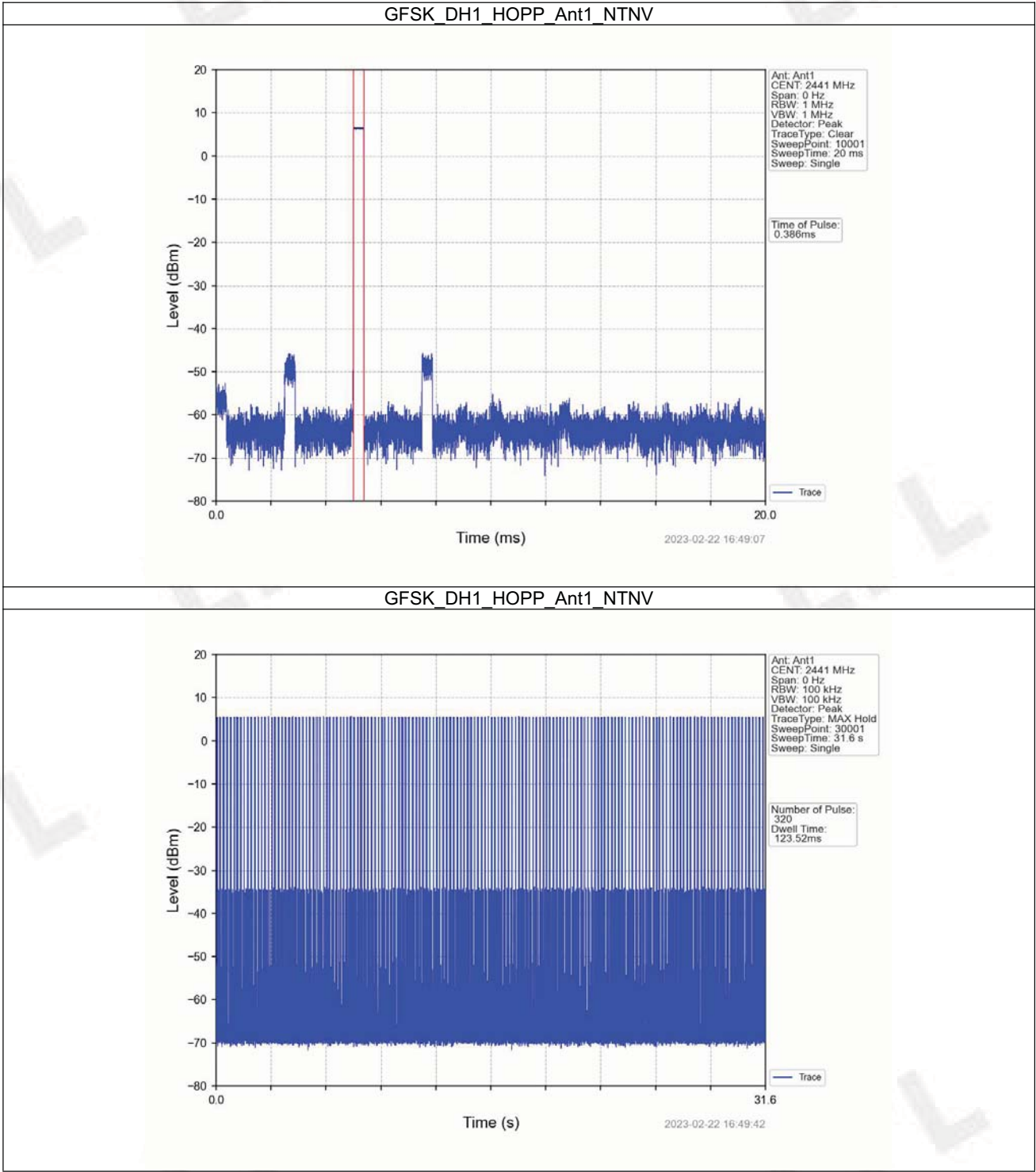
5. Time of Occupancy (Dwell Time)

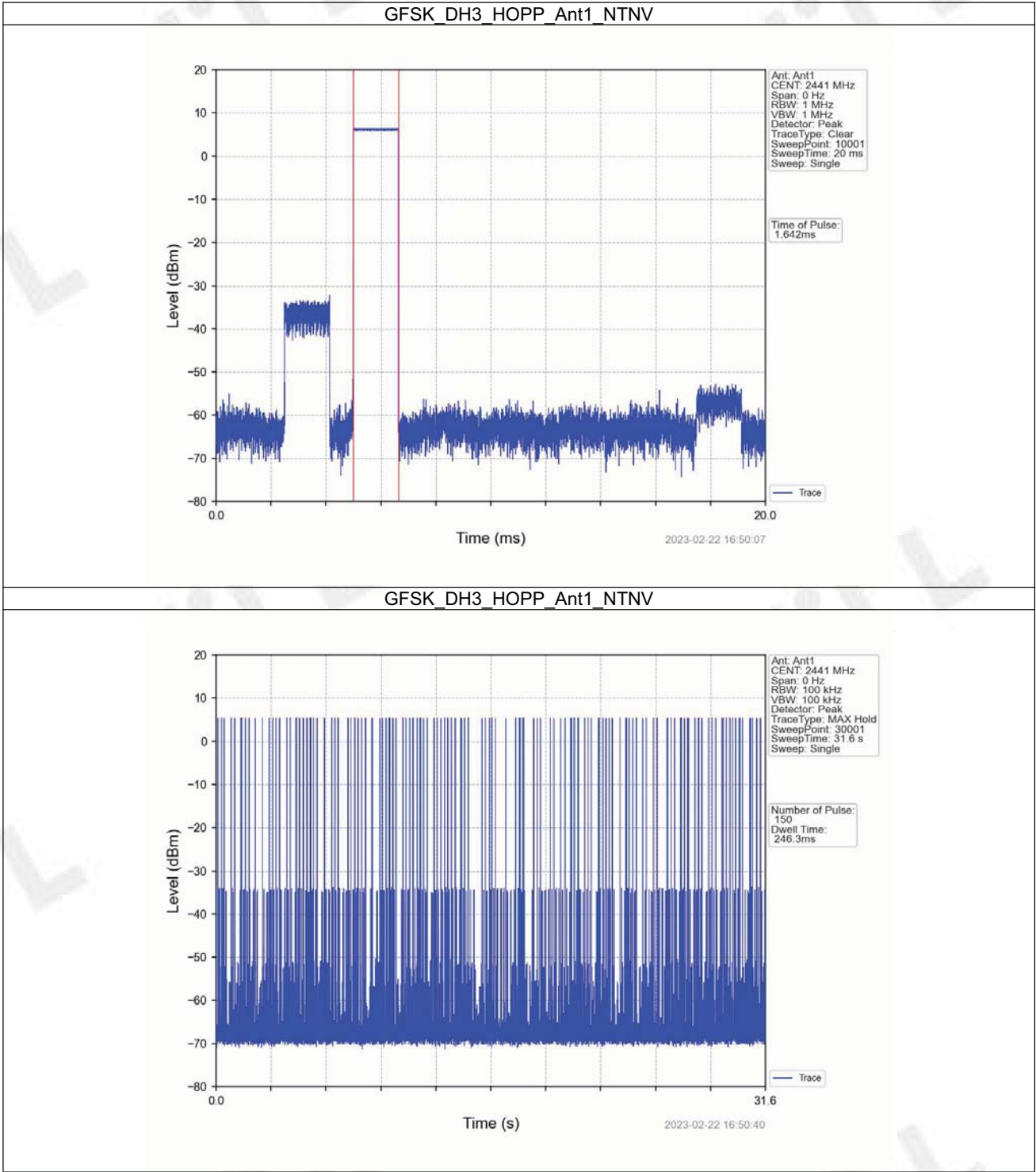
5.1 Ant1

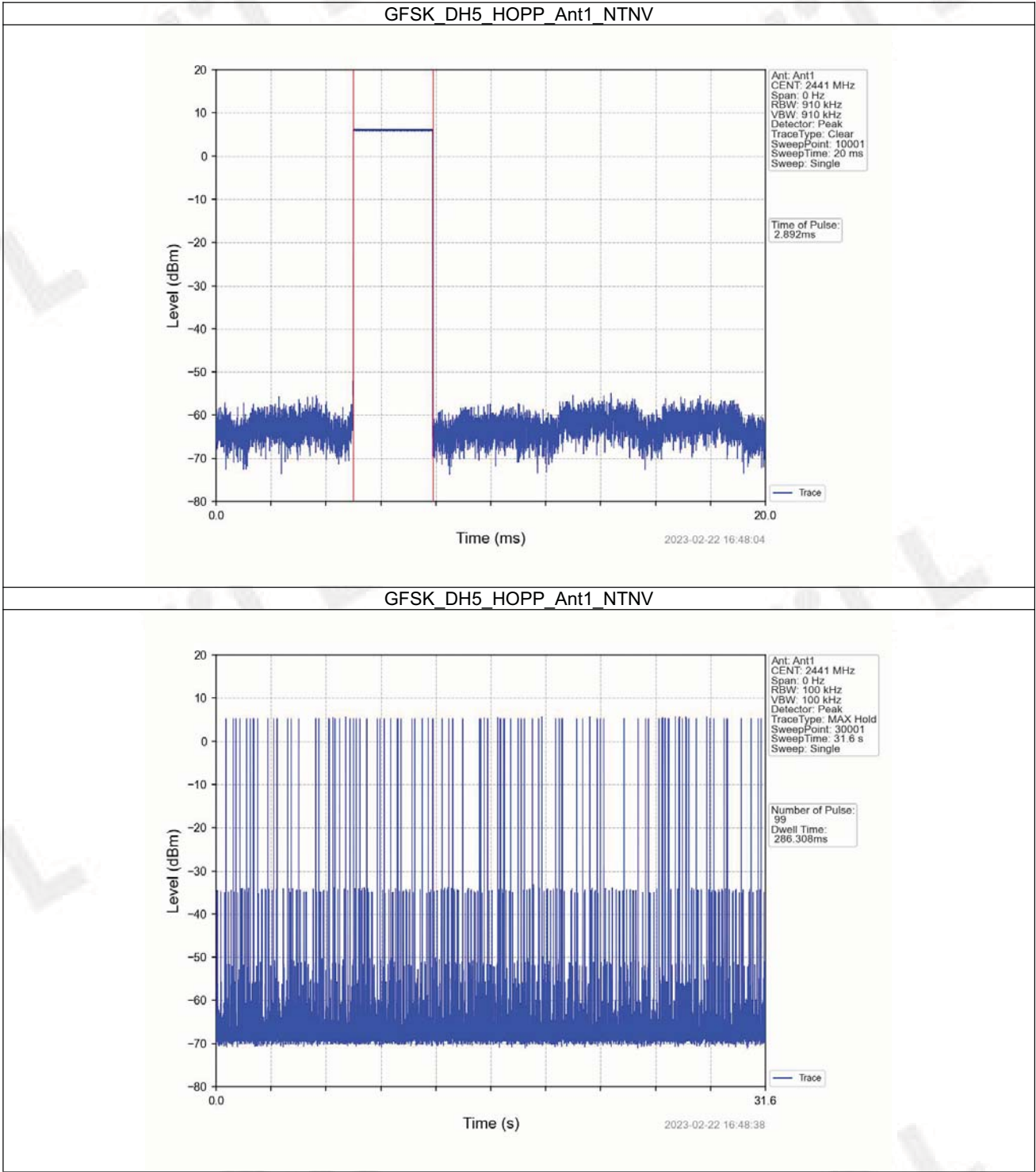
5.1.1 Test Result

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	0.386	31.600	320	123.520	<=400	Pass
			DH3	1.642	31.600	150	246.300	<=400	Pass
			DH5	2.892	31.600	99	286.308	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.394	31.600	320	126.080	<=400	Pass
			2DH3	1.646	31.600	164	269.944	<=400	Pass
			2DH5	2.898	31.600	111	321.678	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.394	31.600	320	126.080	<=400	Pass
			3DH3	1.648	31.600	158	260.384	<=400	Pass
			3DH5	2.898	31.600	90	260.820	<=400	Pass

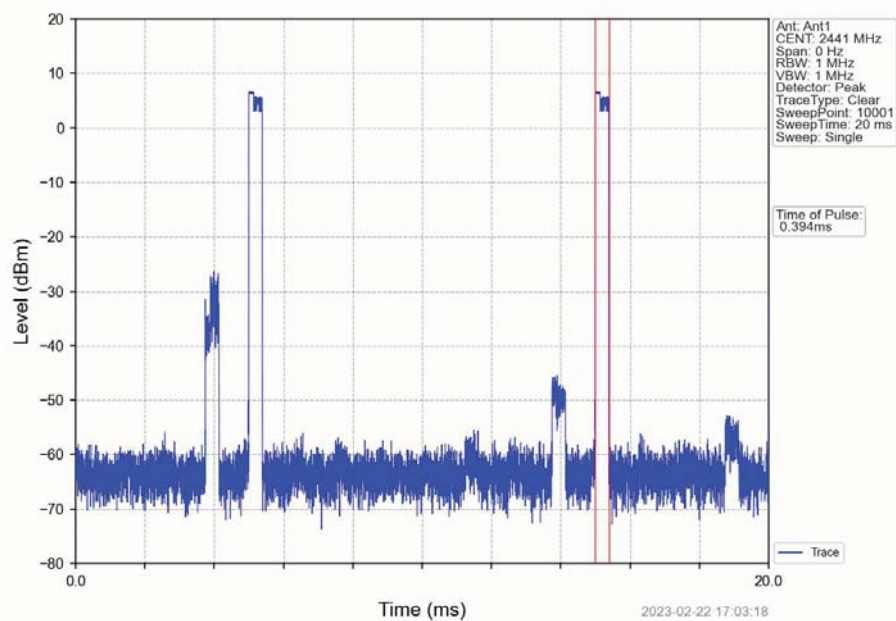
5.1.2 Test Graph



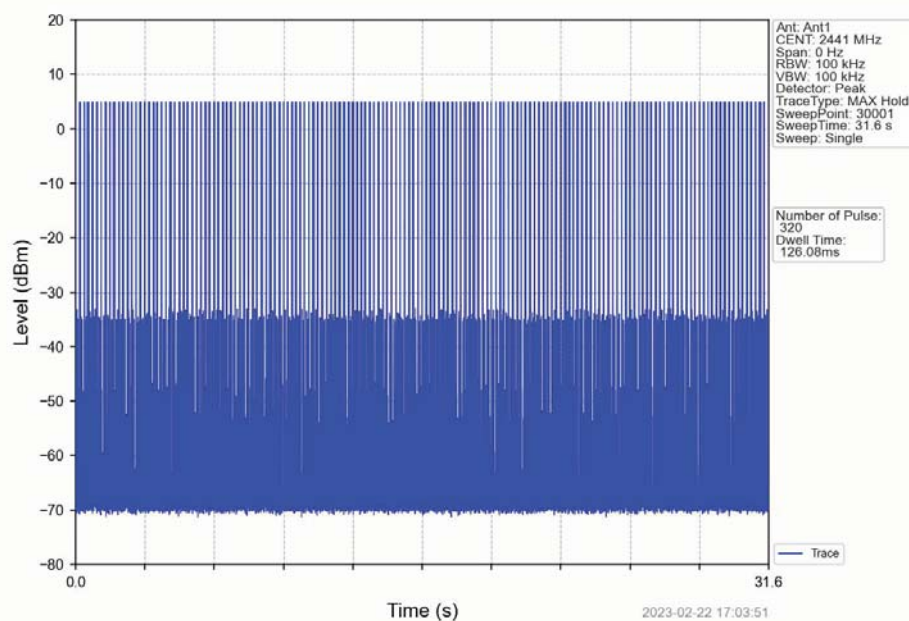




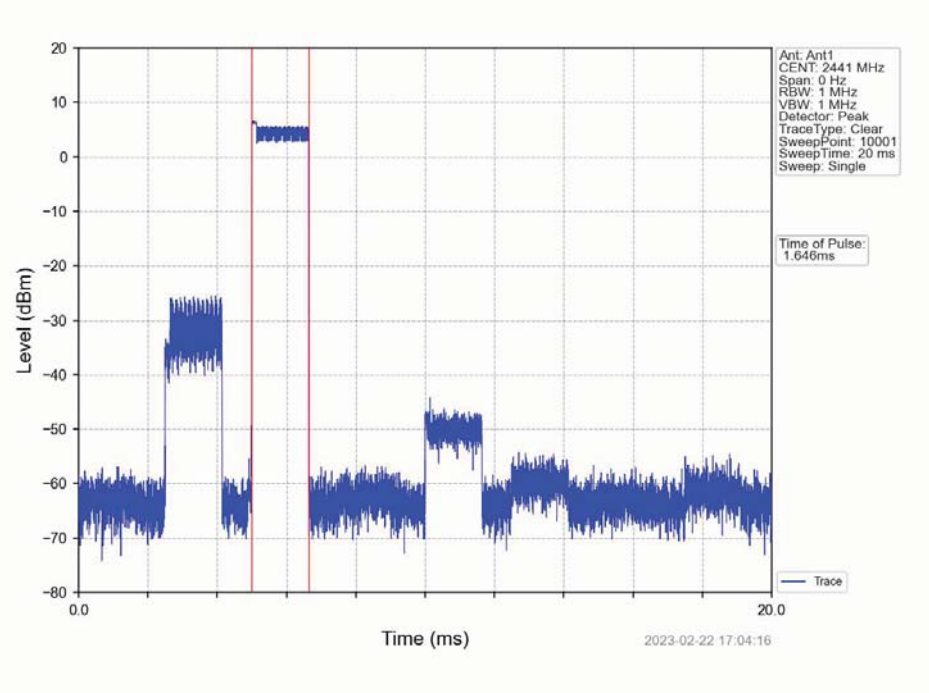
Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



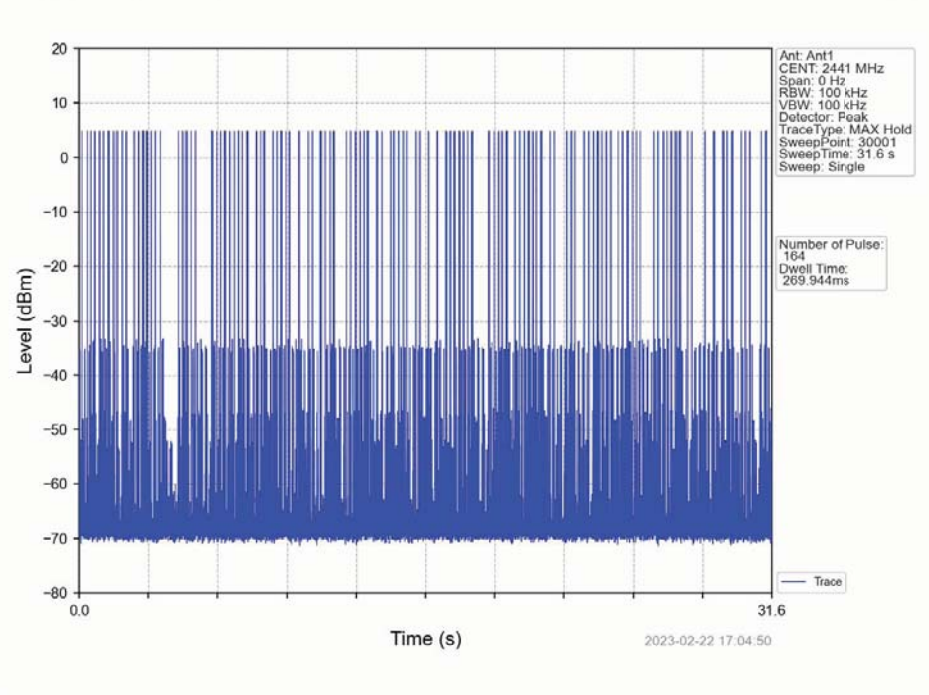
Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



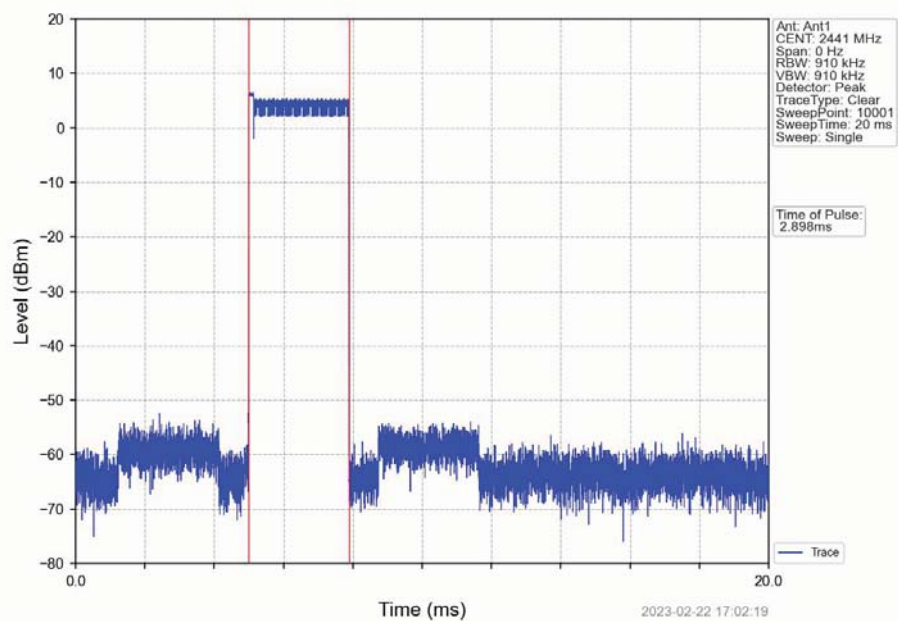
Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV



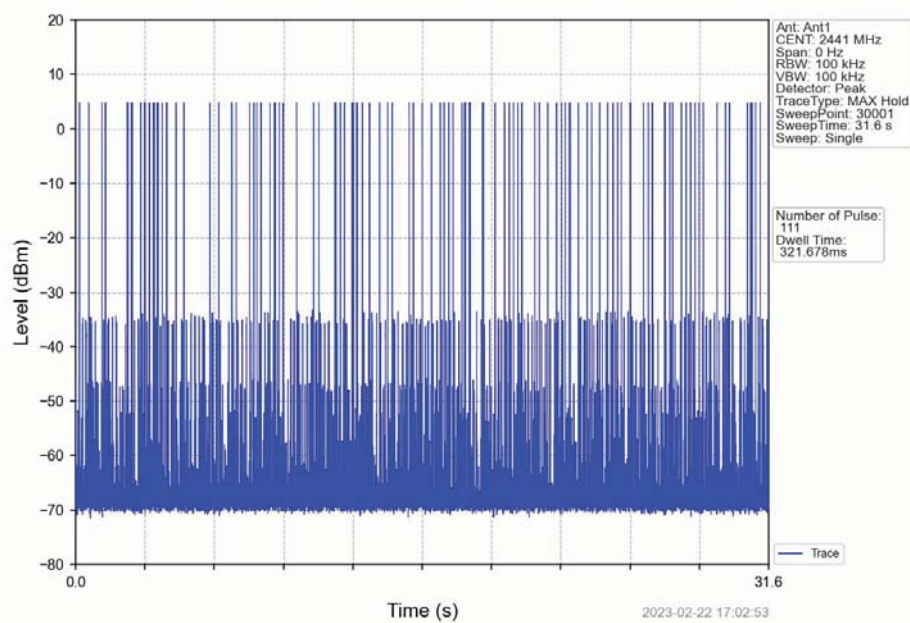
Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV



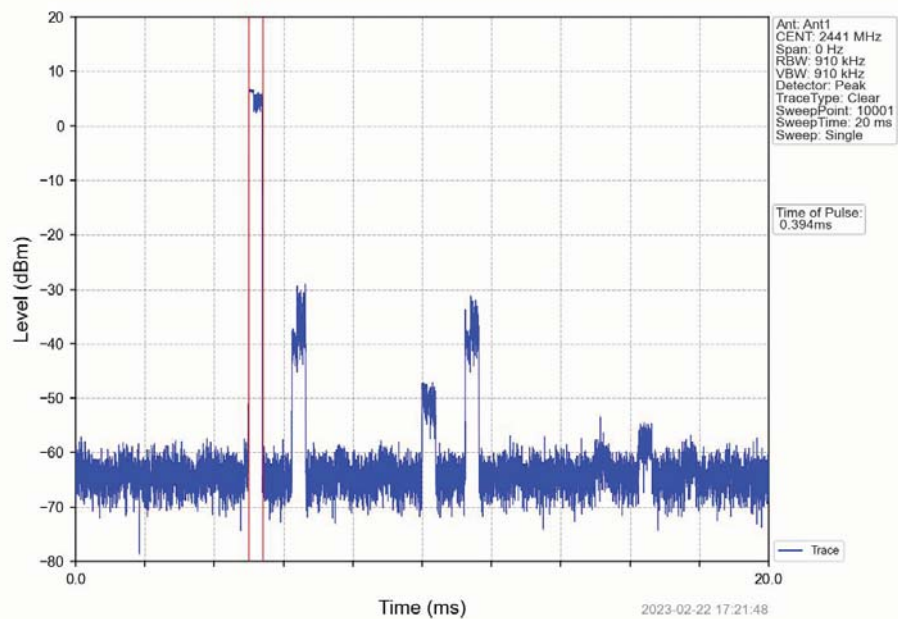
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



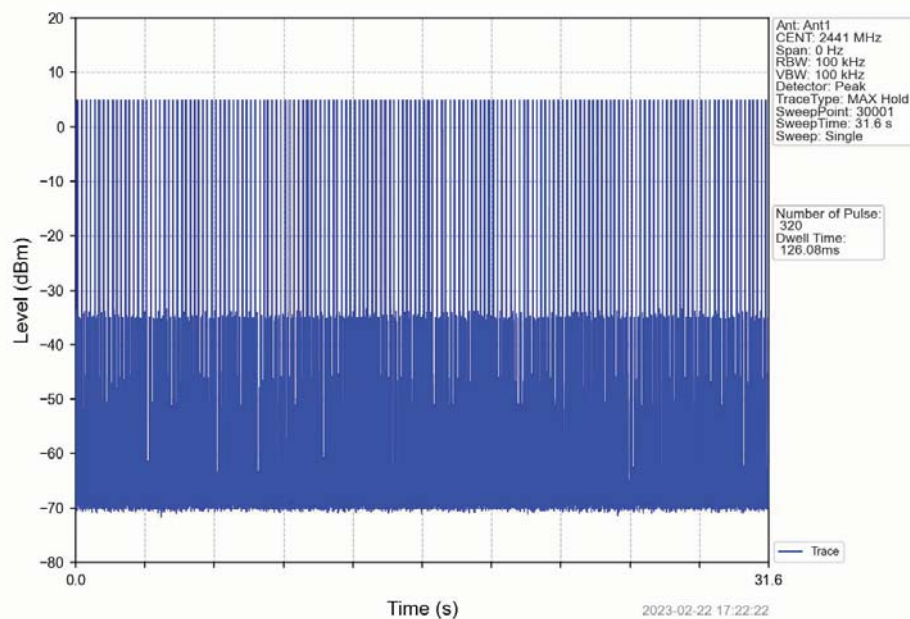
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

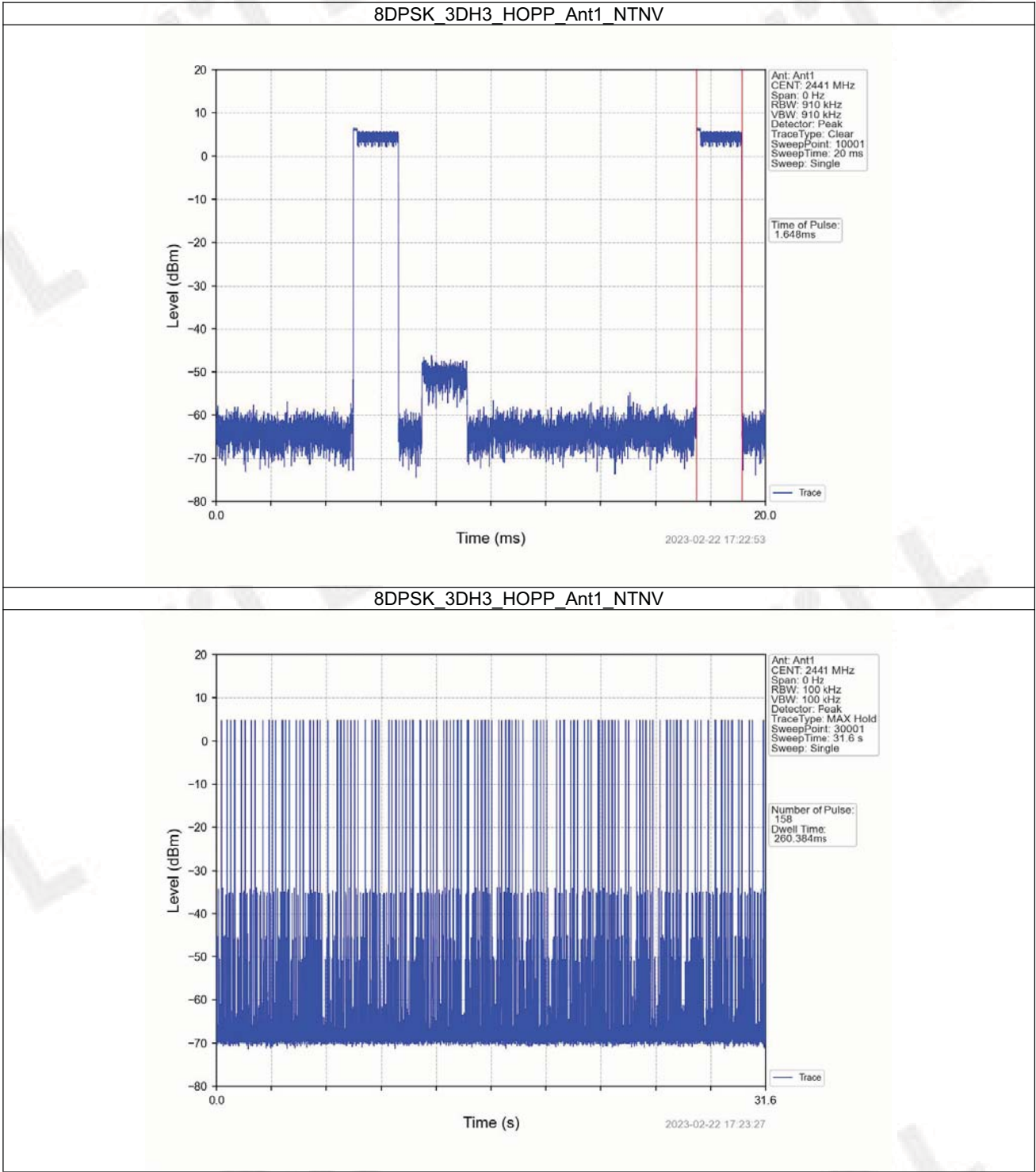


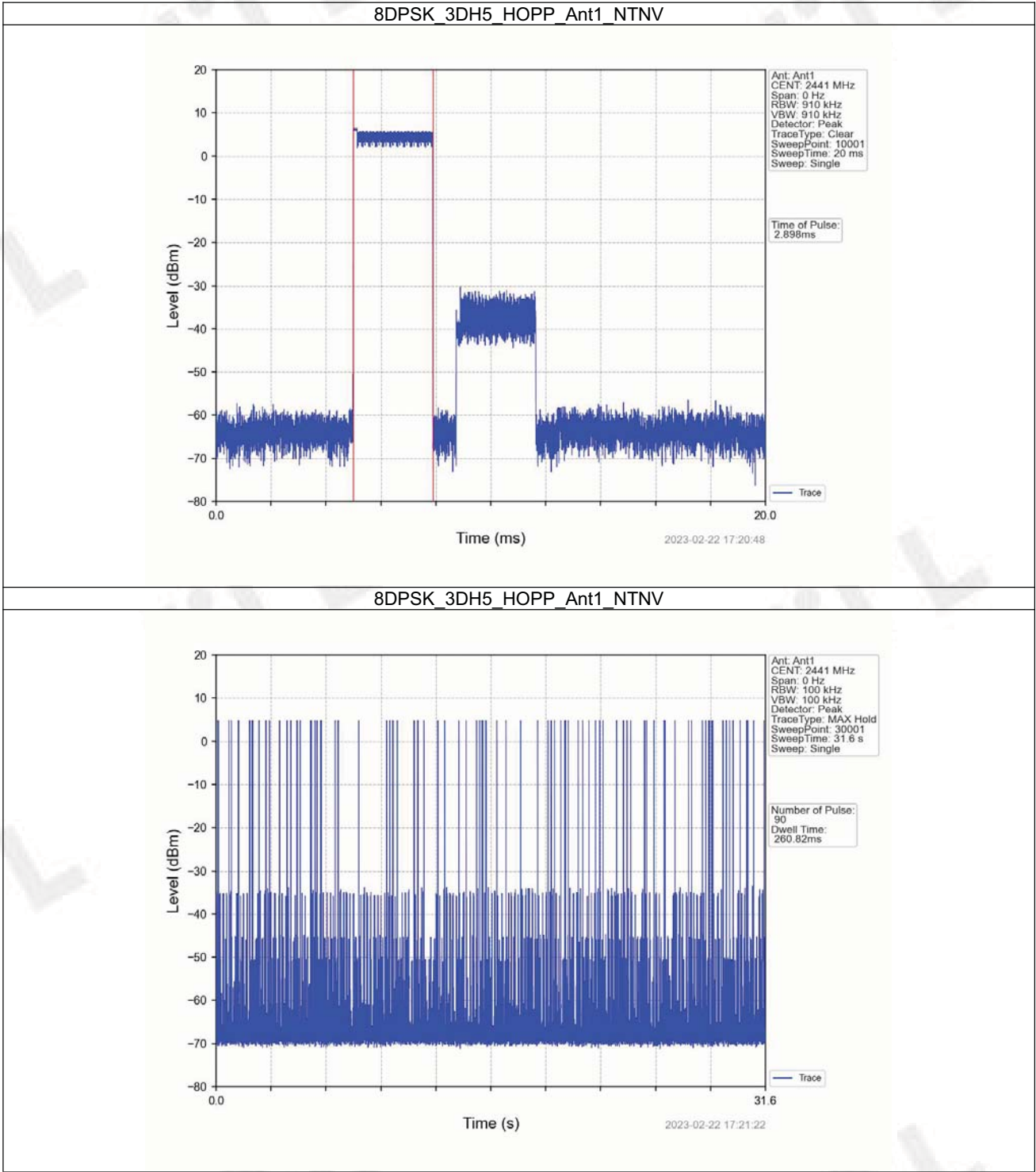
8DPSK_3DH1_HOPP_Ant1_NTNV



8DPSK_3DH1_HOPP_Ant1_NTNV







6. Unwanted Emissions In Non-restricted Frequency Bands

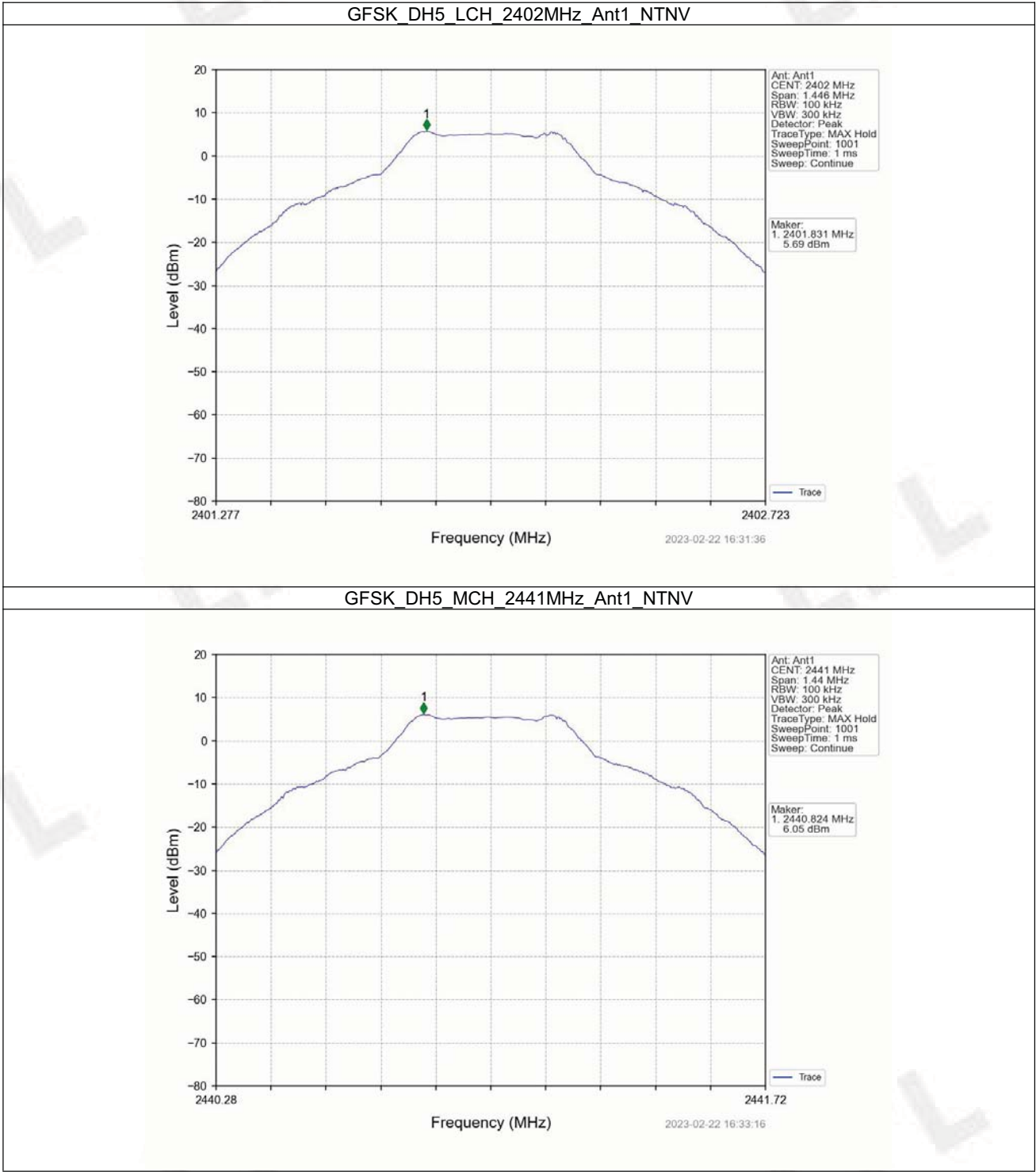
6.1 Ref

6.1.1 Test Result

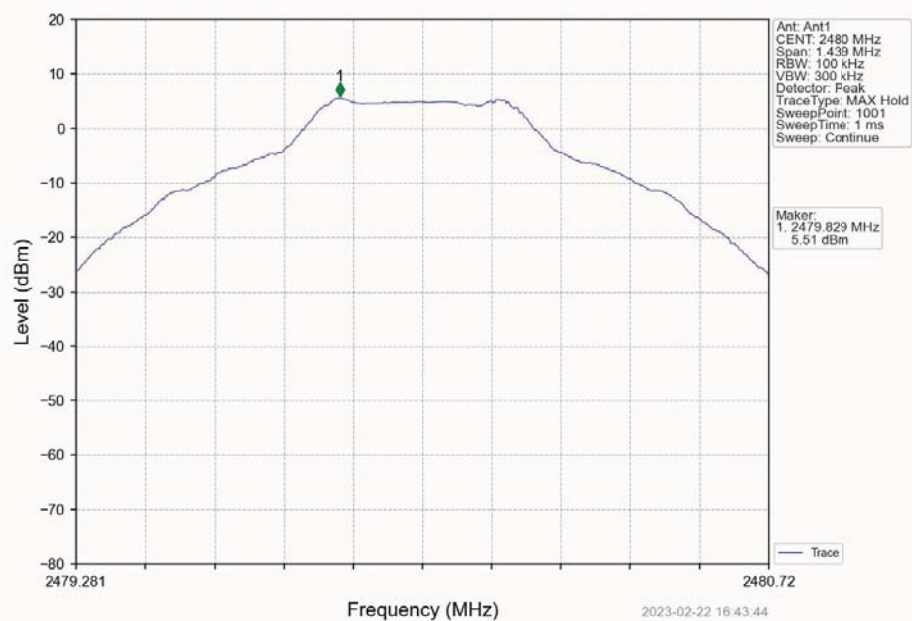
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	5.69
		2441	DH5	1	6.05
		2480	DH5	1	5.51
Pi/4DQPSK	SISO	2402	2DH5	1	5.80
		2441	2DH5	1	6.12
		2480	2DH5	1	5.60
8DPSK	SISO	2402	3DH5	1	5.83
		2441	3DH5	1	6.17
		2480	3DH5	1	5.64

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.

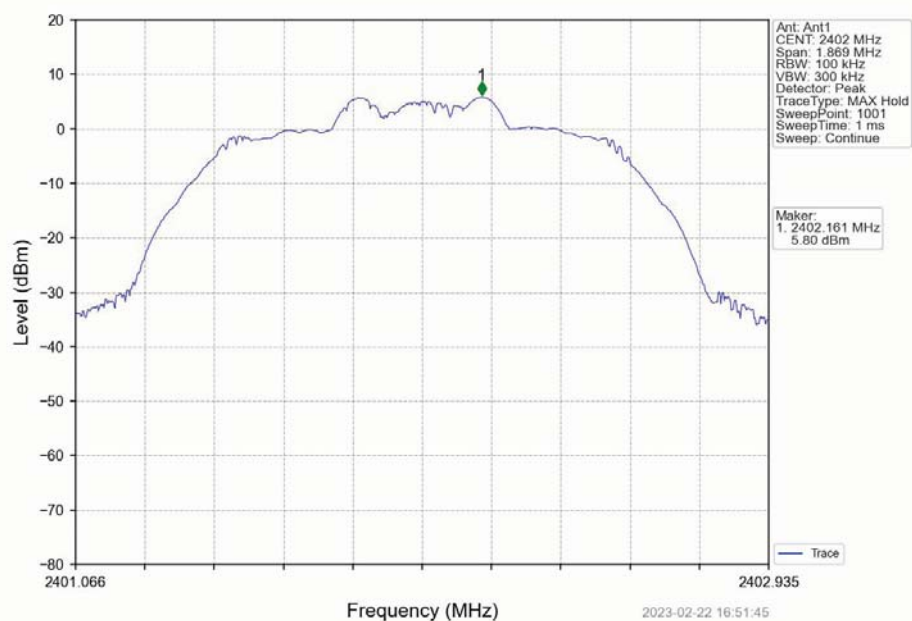
6.1.2 Test Graph



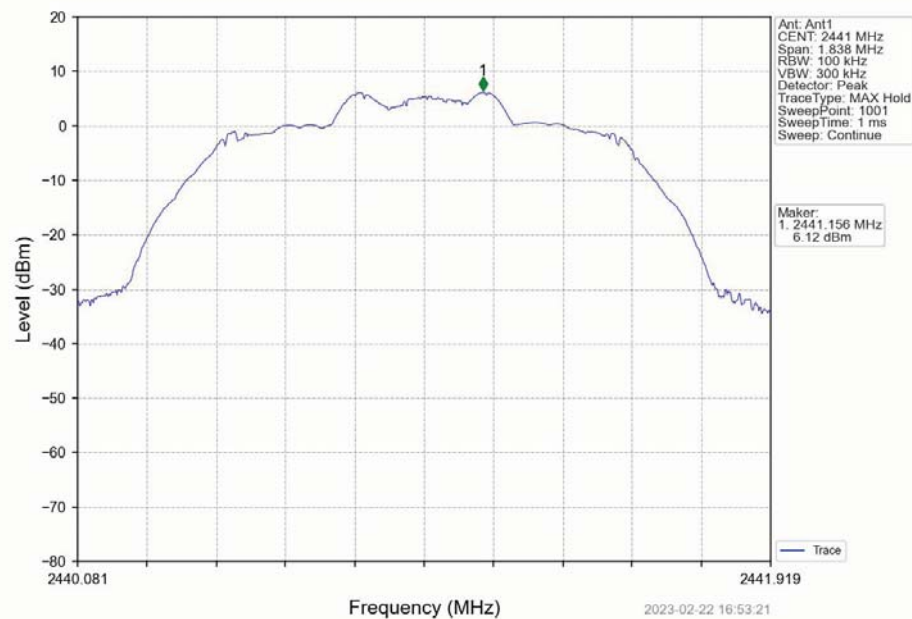
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



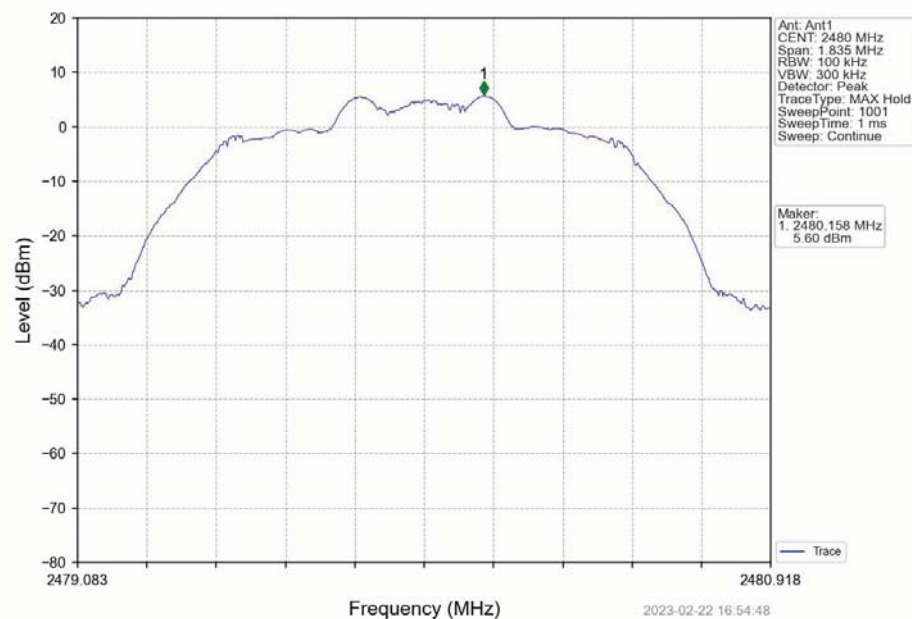
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



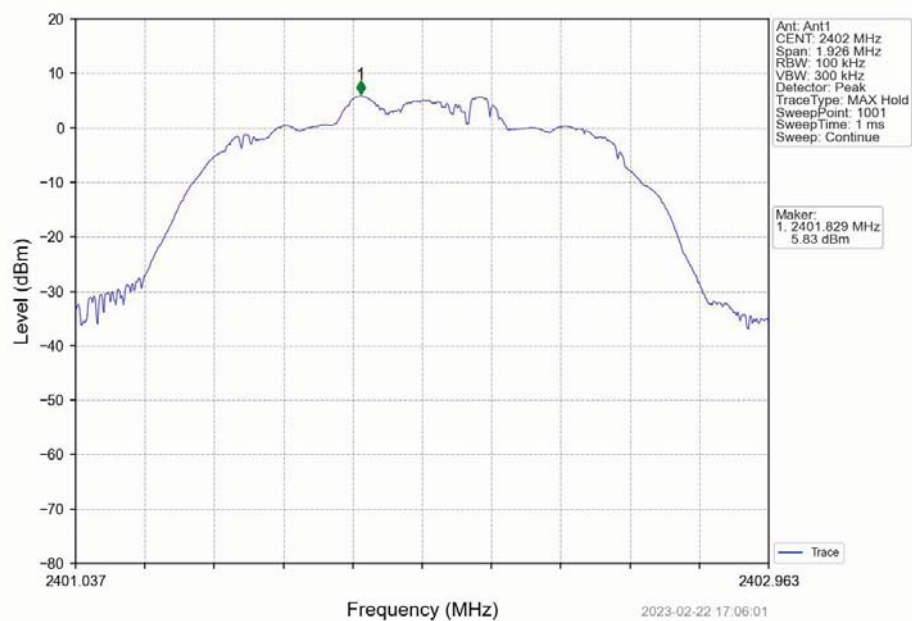
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



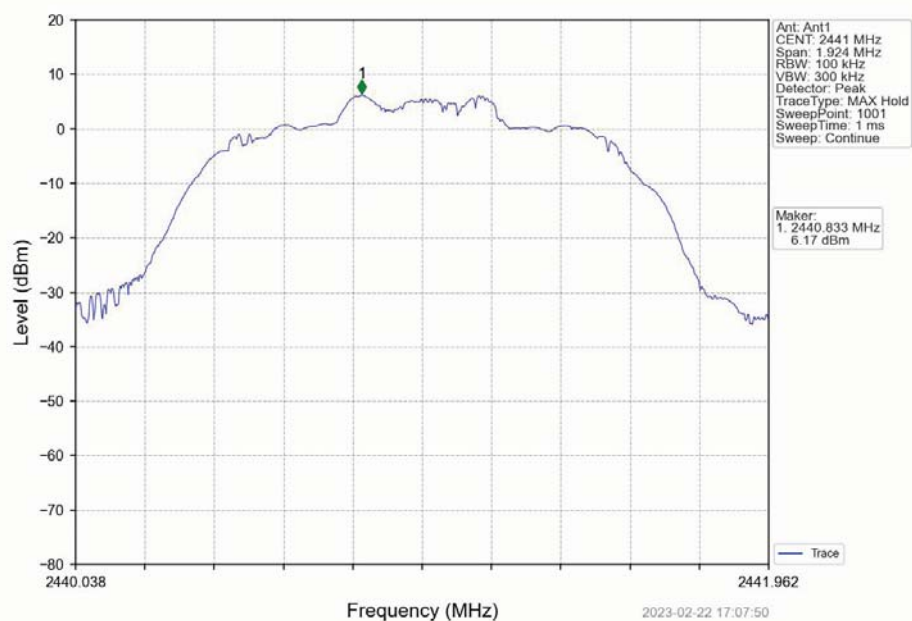
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

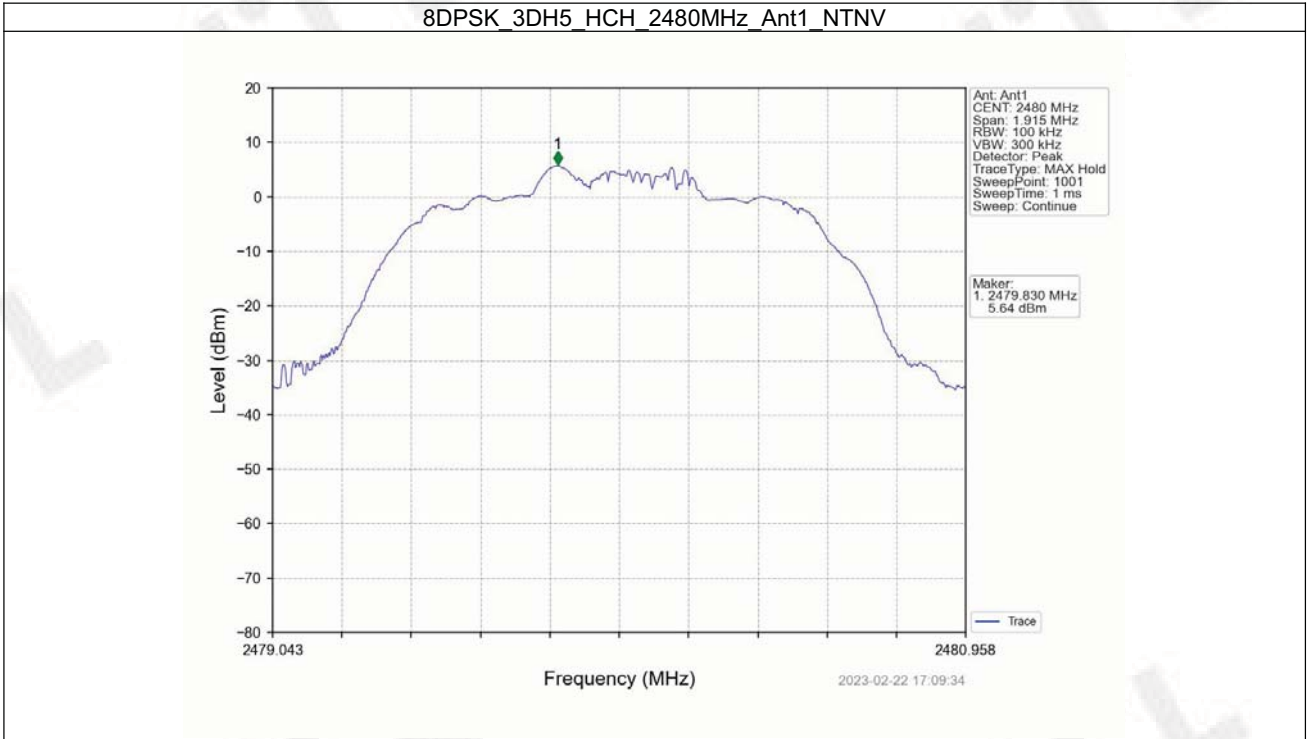


8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV





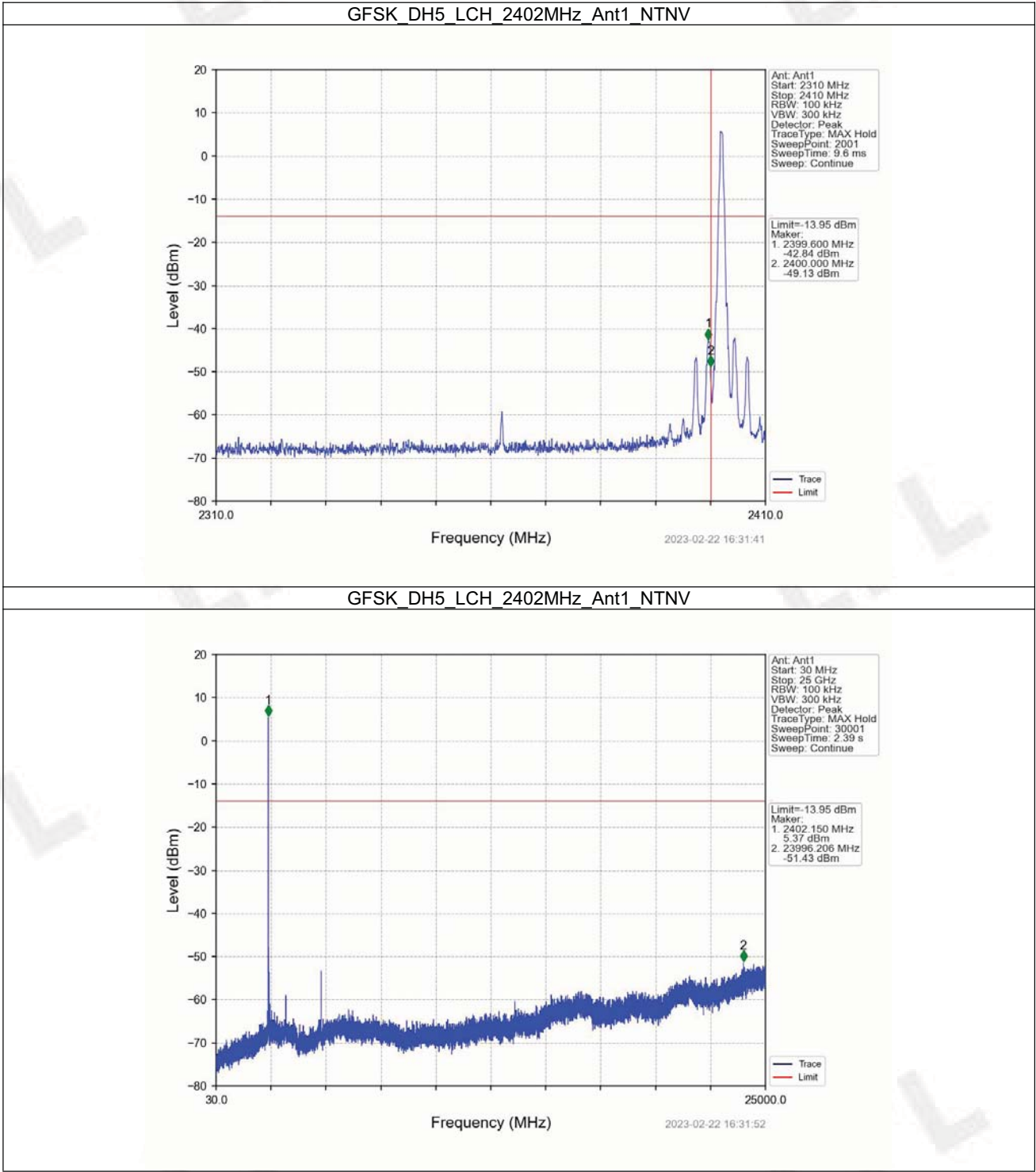
6.2 CSE

6.2.1 Test Result

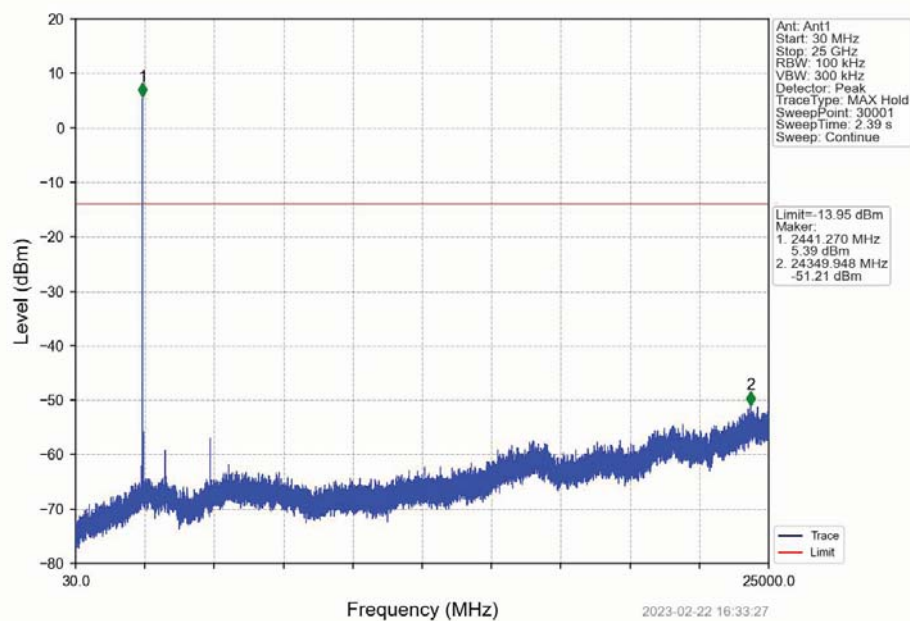
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	6.05	-13.95	Pass
		2441	DH5	1	6.05	-13.95	Pass
		2480	DH5	1	6.05	-13.95	Pass
		HOPP	DH5	1	6.05	-13.95	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	6.12	-13.88	Pass
		2441	2DH5	1	6.12	-13.88	Pass
		2480	2DH5	1	6.12	-13.88	Pass
		HOPP	2DH5	1	6.12	-13.88	Pass
8DPSK	SISO	2402	3DH5	1	6.17	-13.83	Pass
		2441	3DH5	1	6.17	-13.83	Pass
		2480	3DH5	1	6.17	-13.83	Pass
		HOPP	3DH5	1	6.17	-13.83	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.

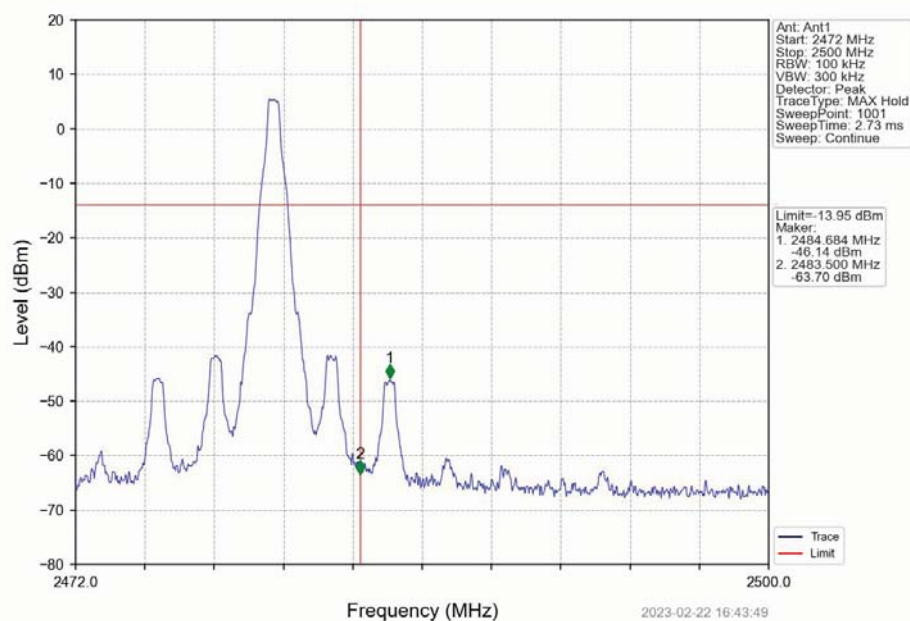
6.2.2 Test Graph



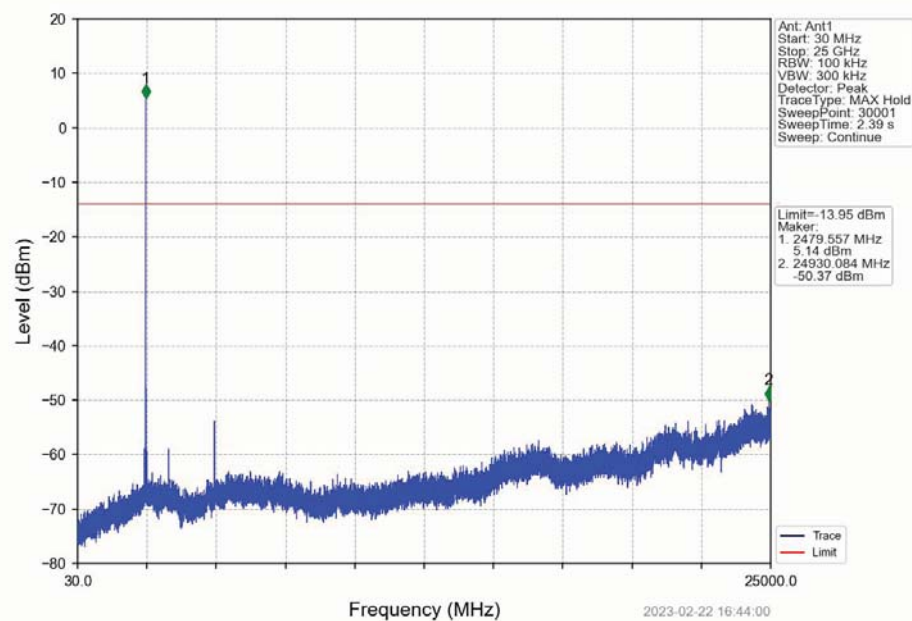
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



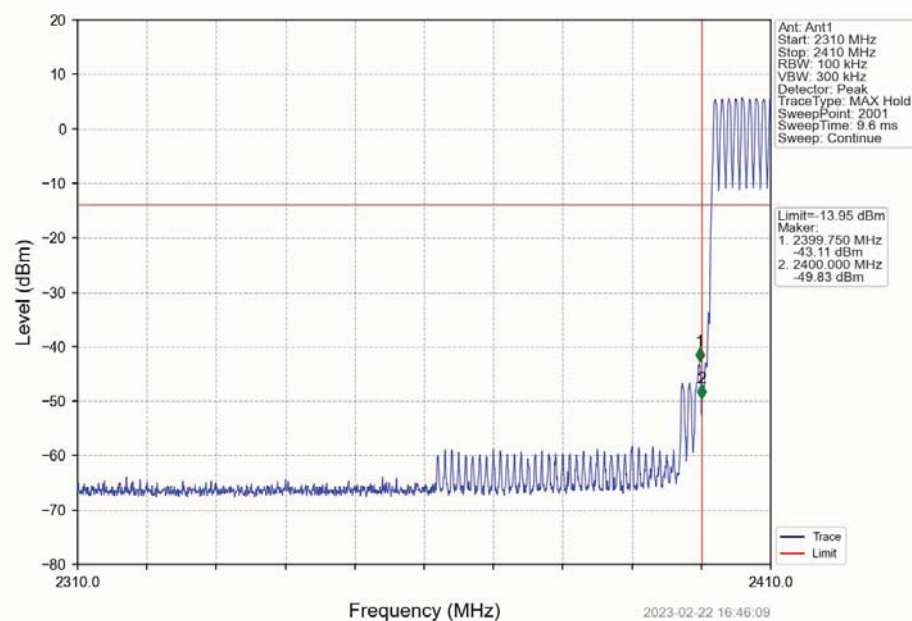
GFSK_DH5_HCH_2480MHz_Ant1_NTNV

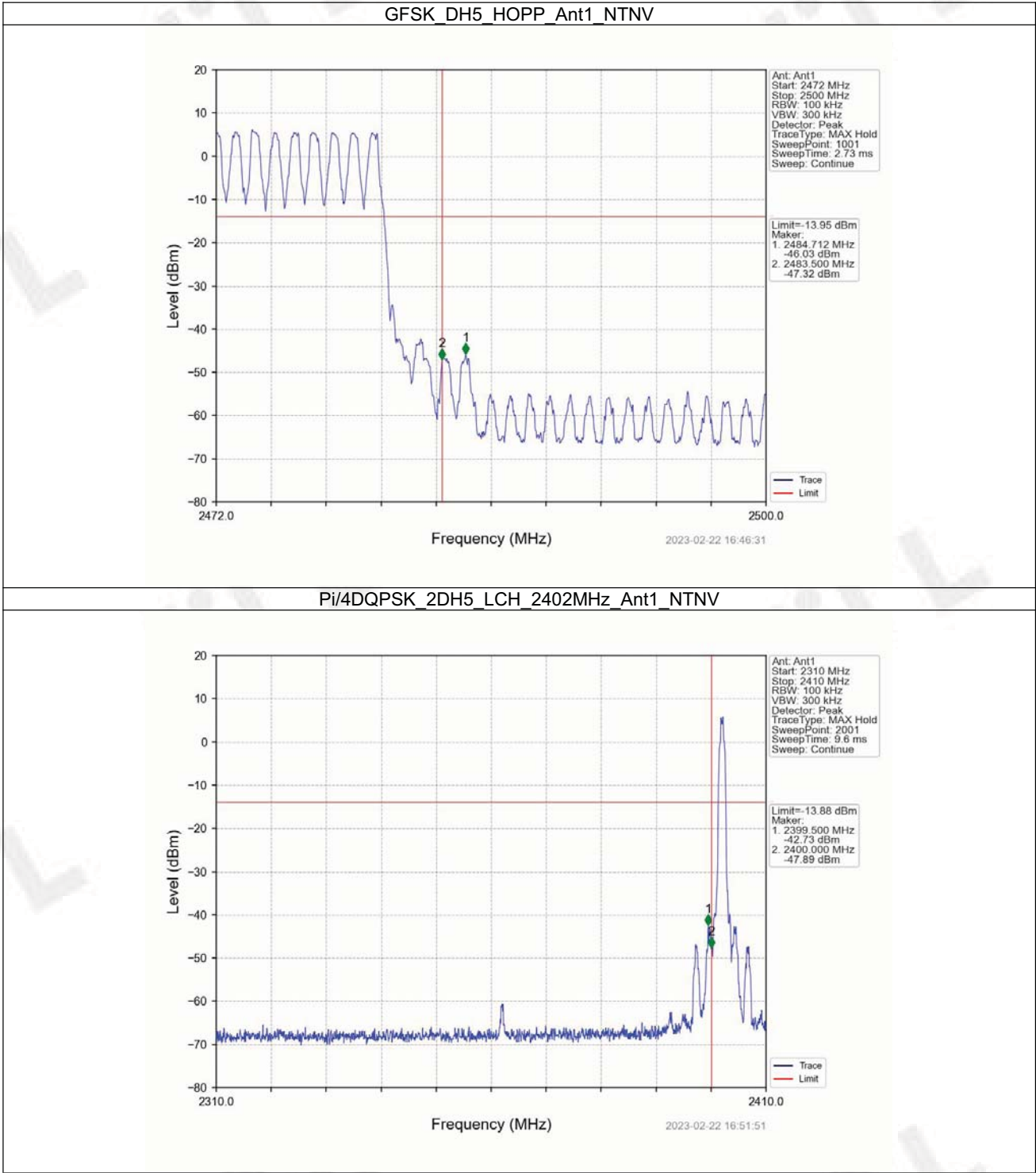


GFSK_DH5_HCH_2480MHz_Ant1_NTNV

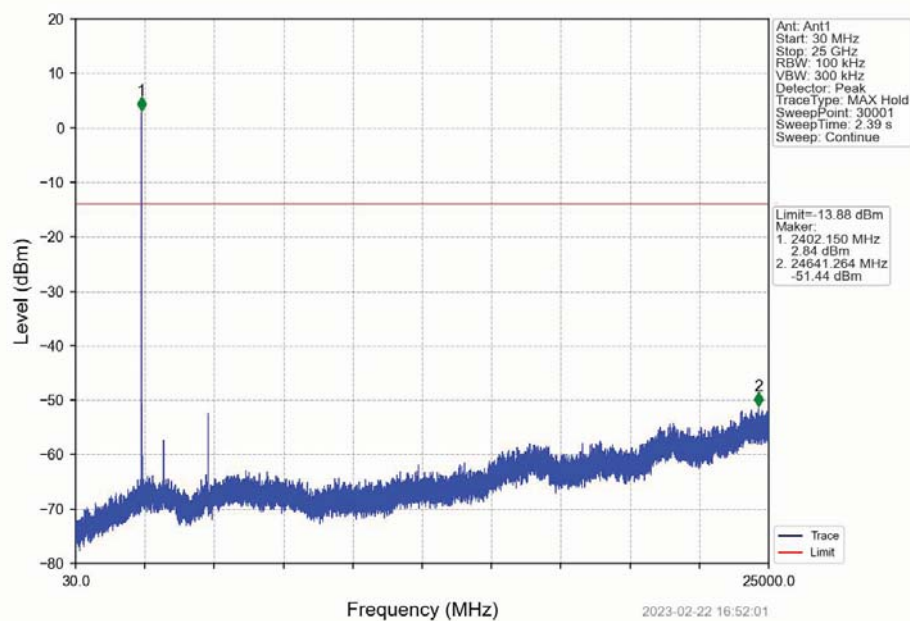


GFSK_DH5_HOPP_Ant1_NTNV

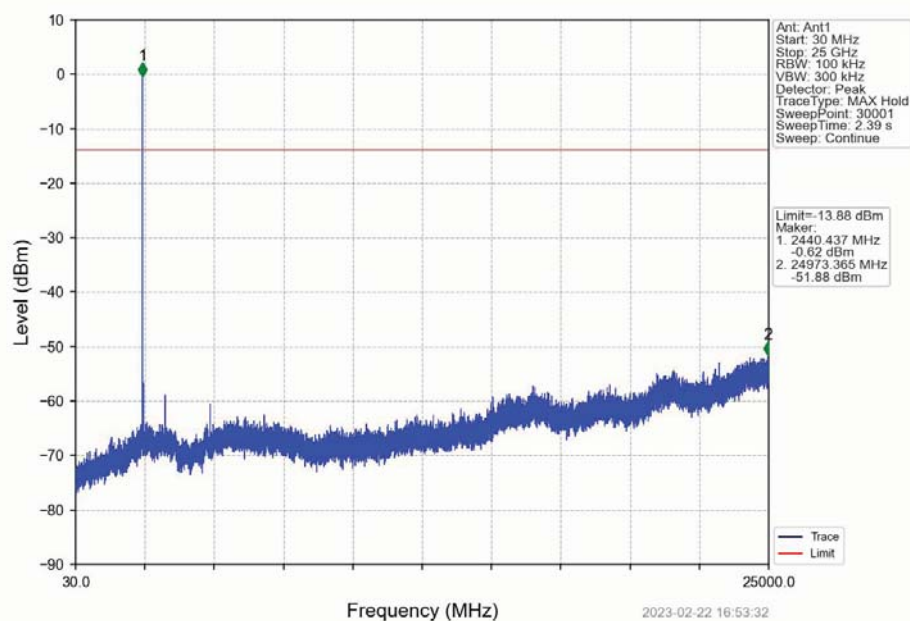




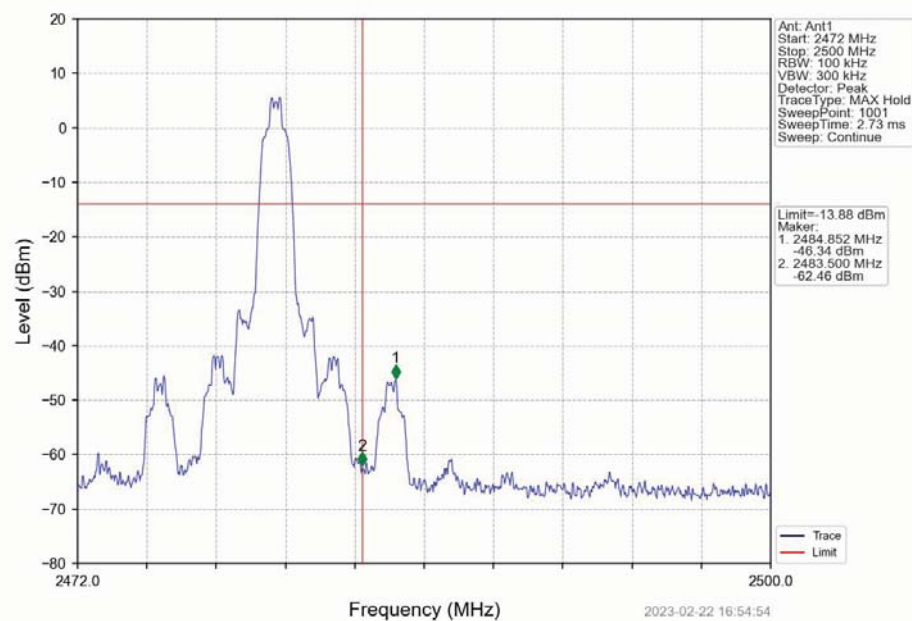
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



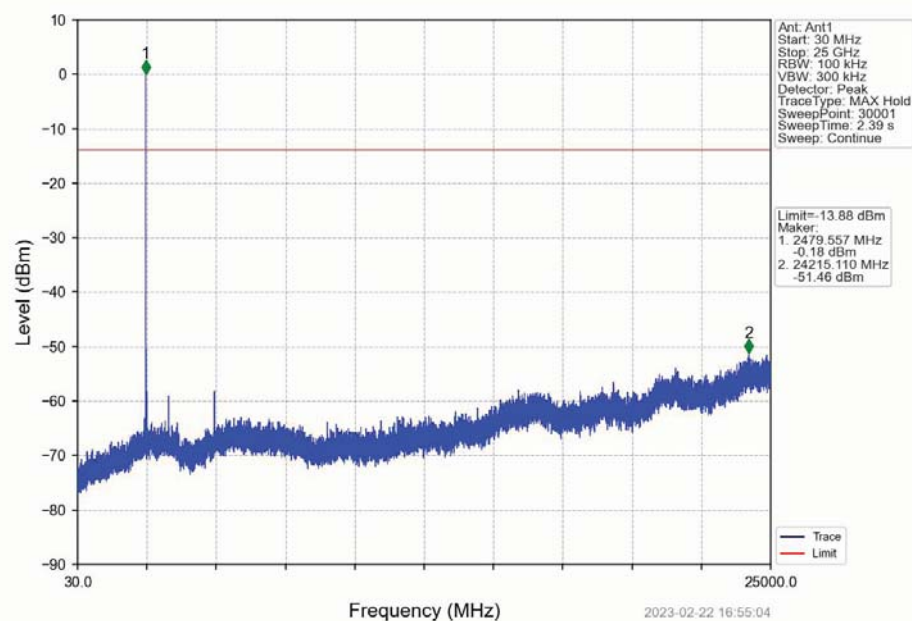
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



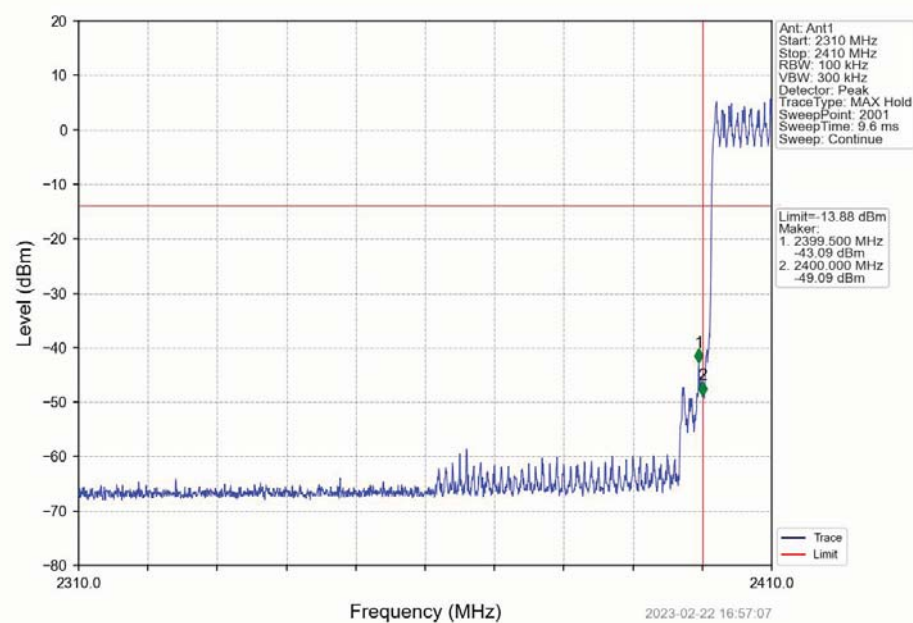
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



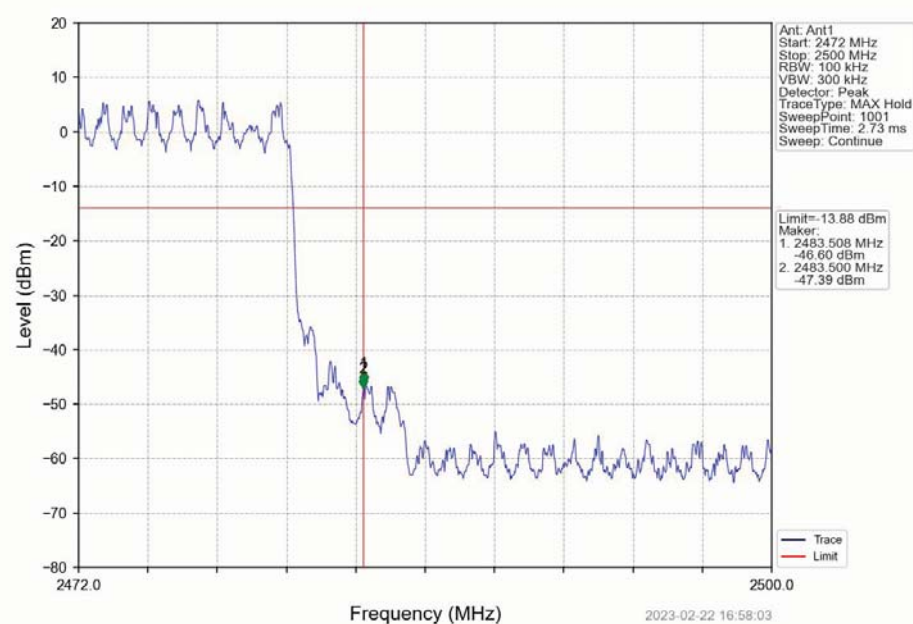
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



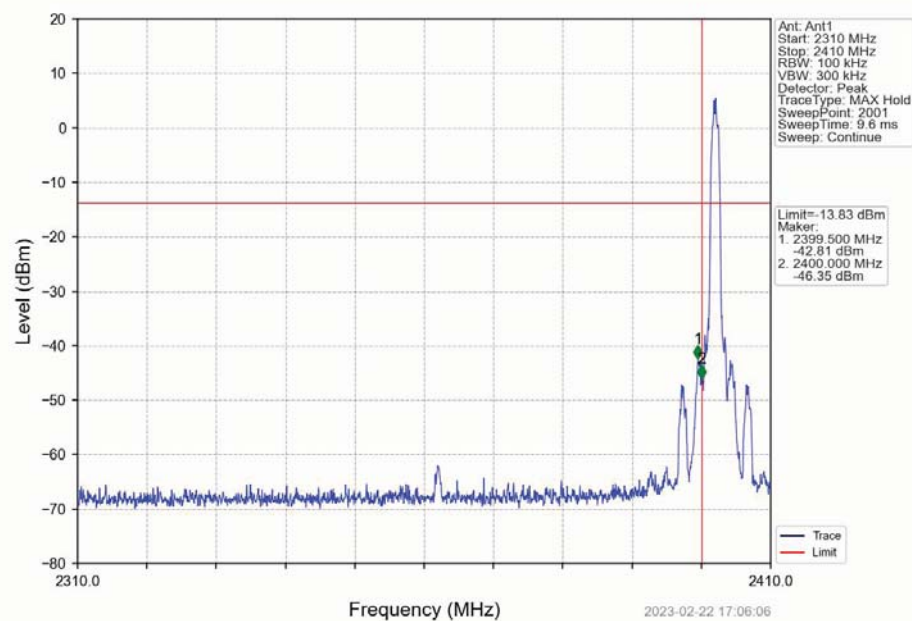
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



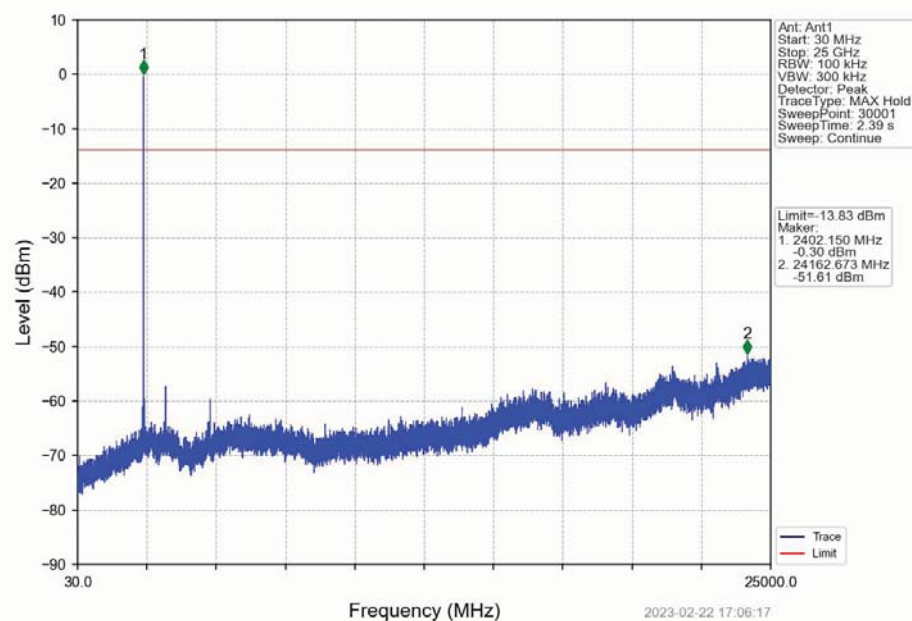
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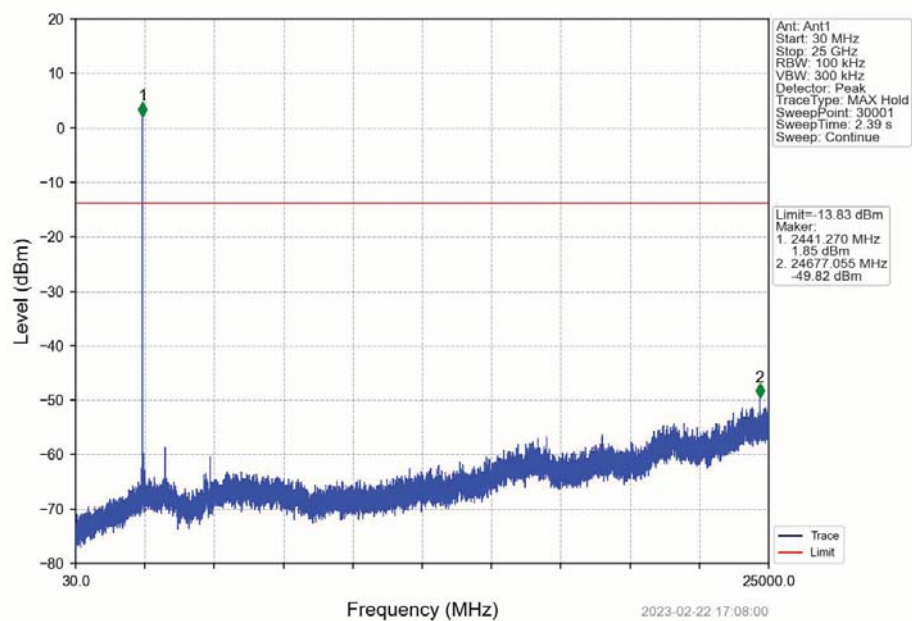
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV

