



Shenzhen CTL Testing Technology Co., Ltd.

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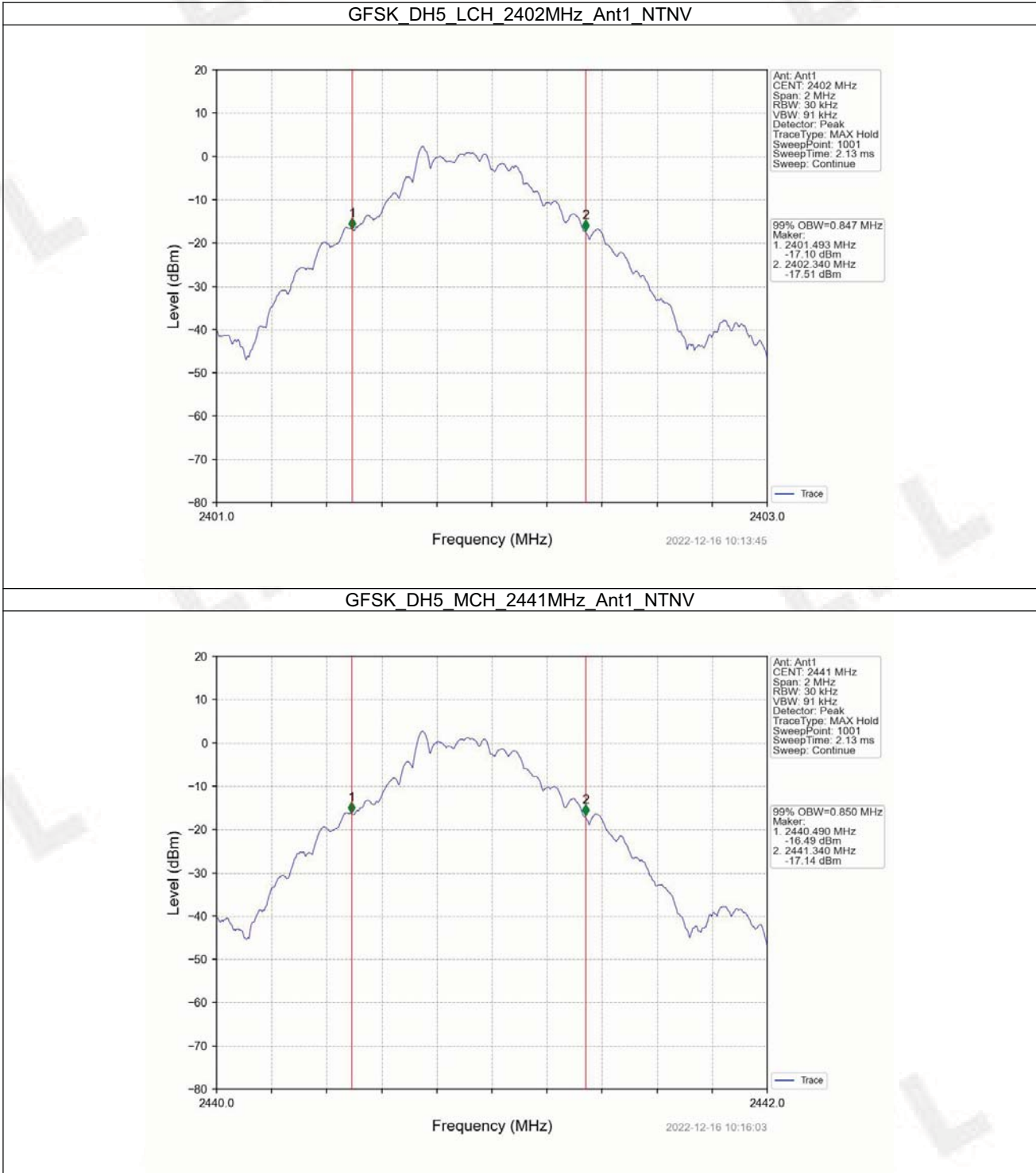
1. Bandwidth

1.1 OBW

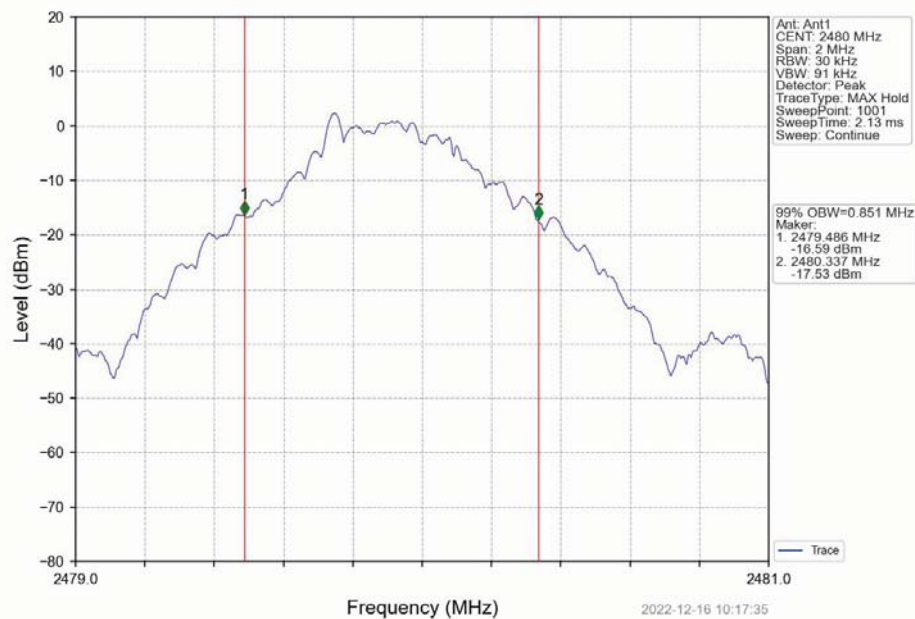
1.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.847	Pass
		2441	DH5	1	0.850	Pass
		2480	DH5	1	0.851	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.164	Pass
		2441	2DH5	1	1.164	Pass
		2480	2DH5	1	1.164	Pass
8DPSK	SISO	2402	3DH5	1	1.158	Pass
		2441	3DH5	1	1.159	Pass
		2480	3DH5	1	1.157	Pass

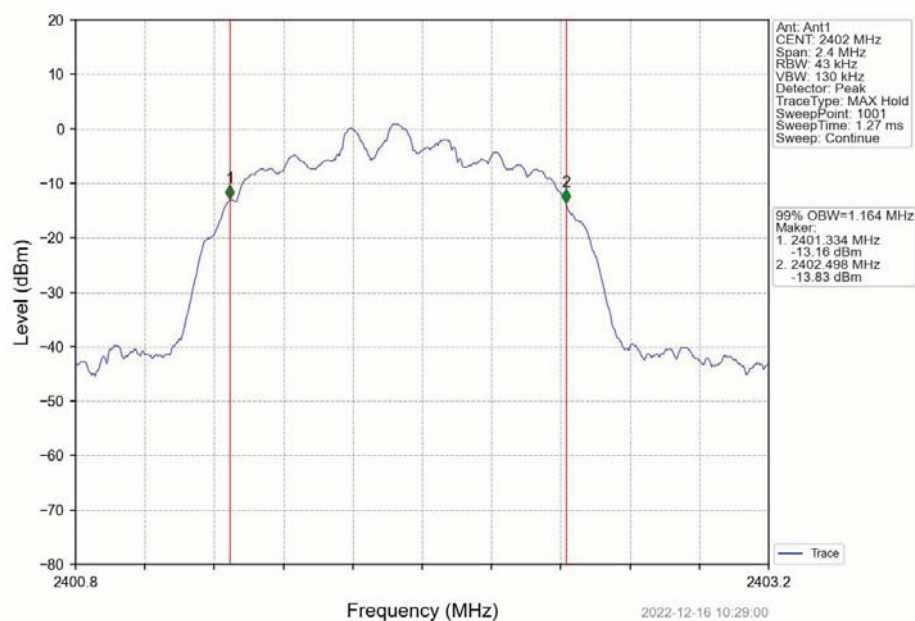
1.1.2 Test Graph



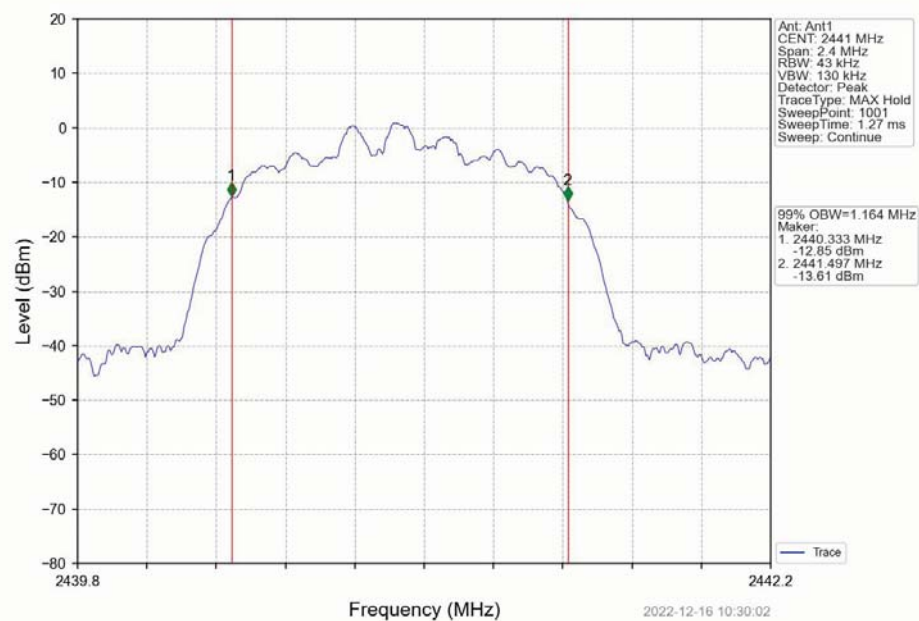
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



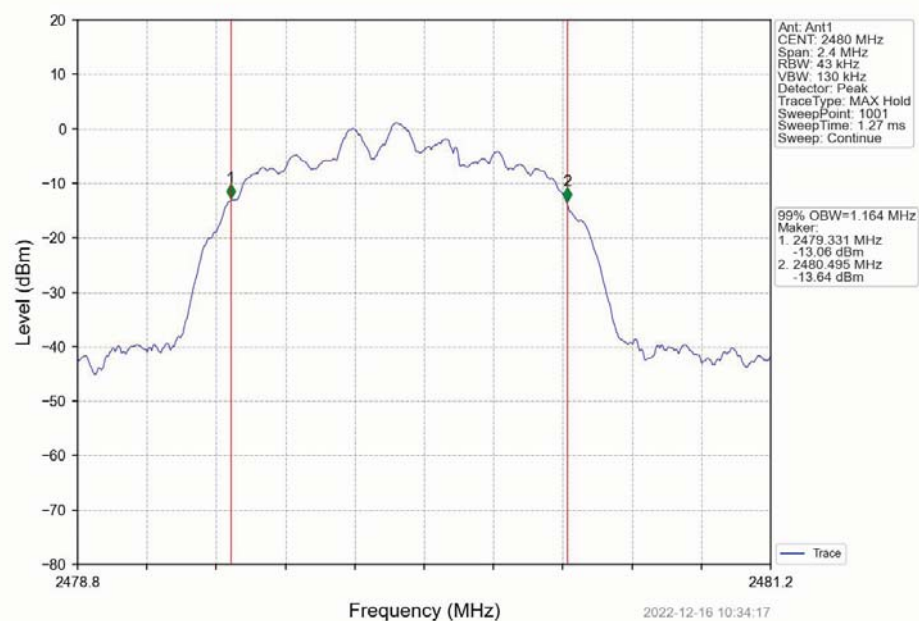
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



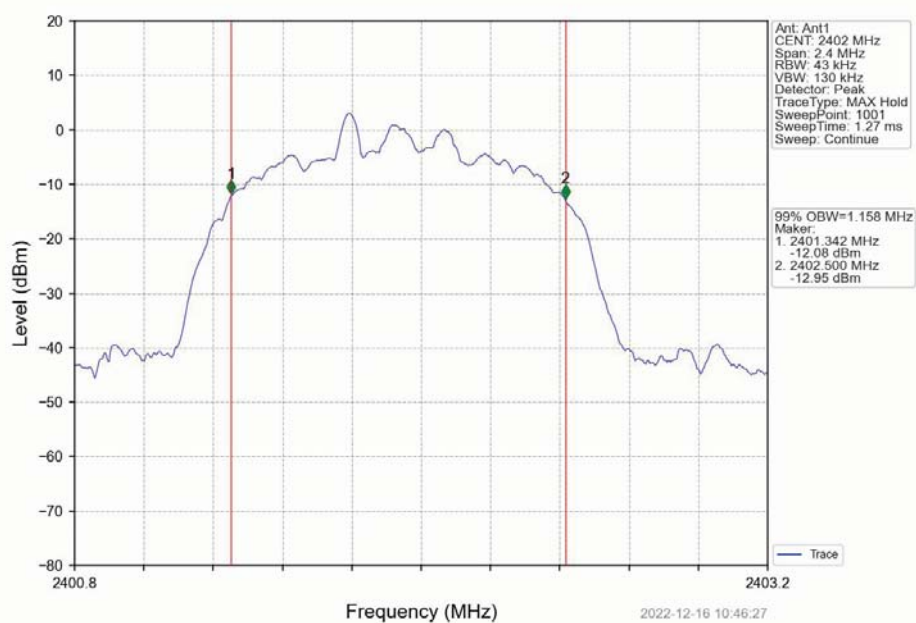
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



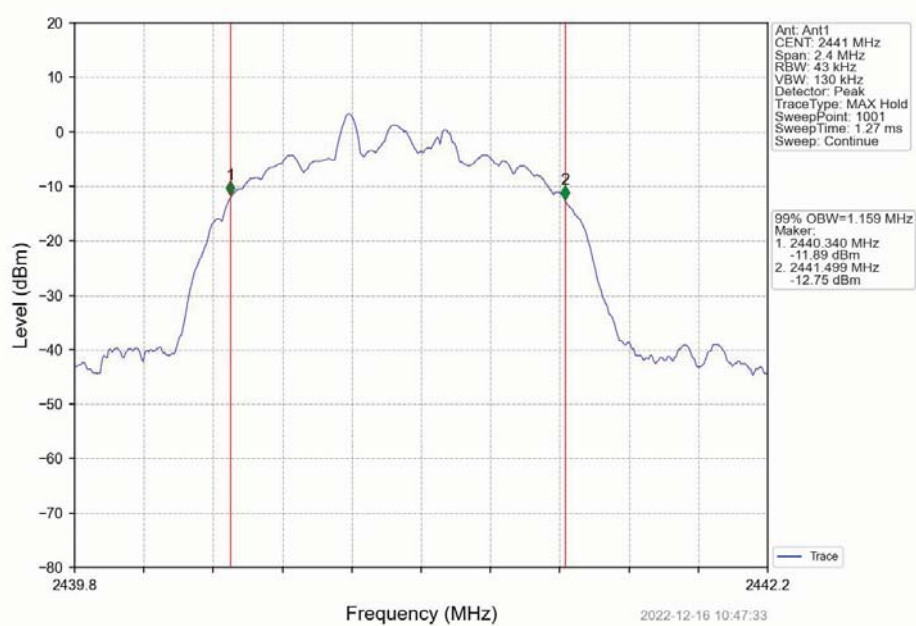
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

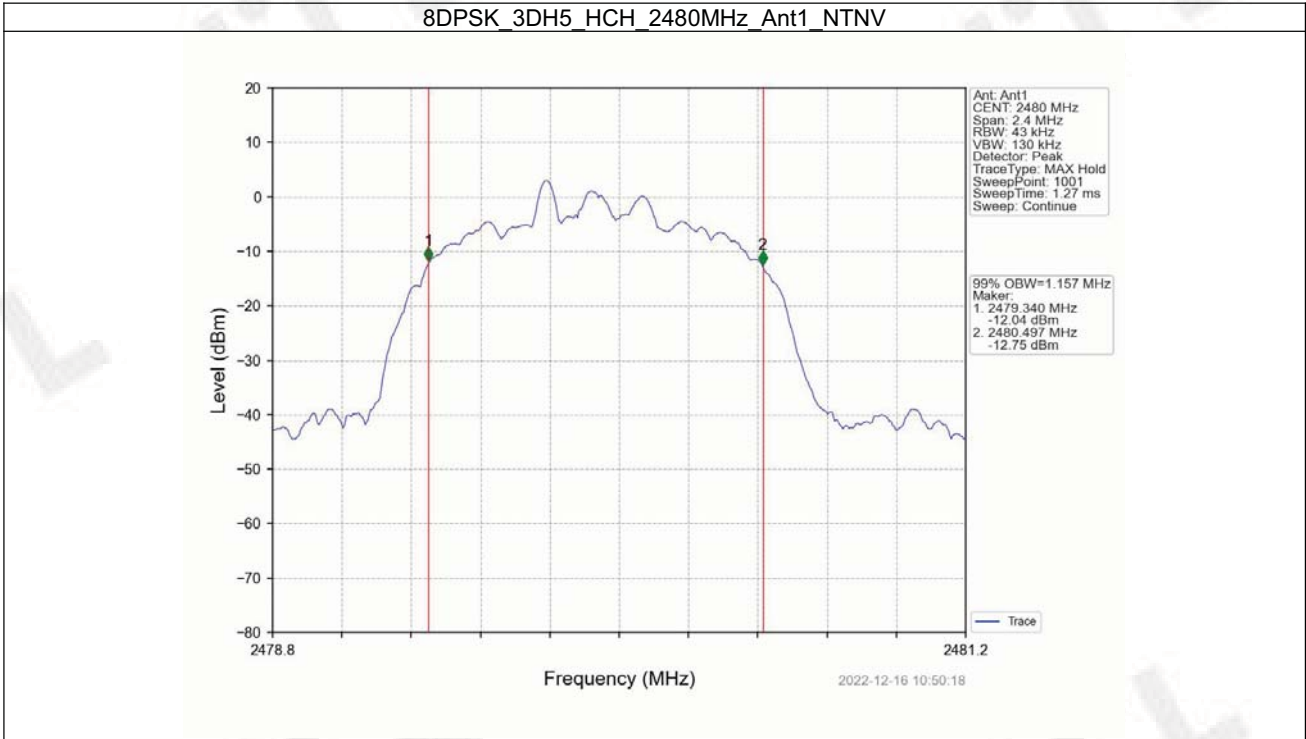


8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



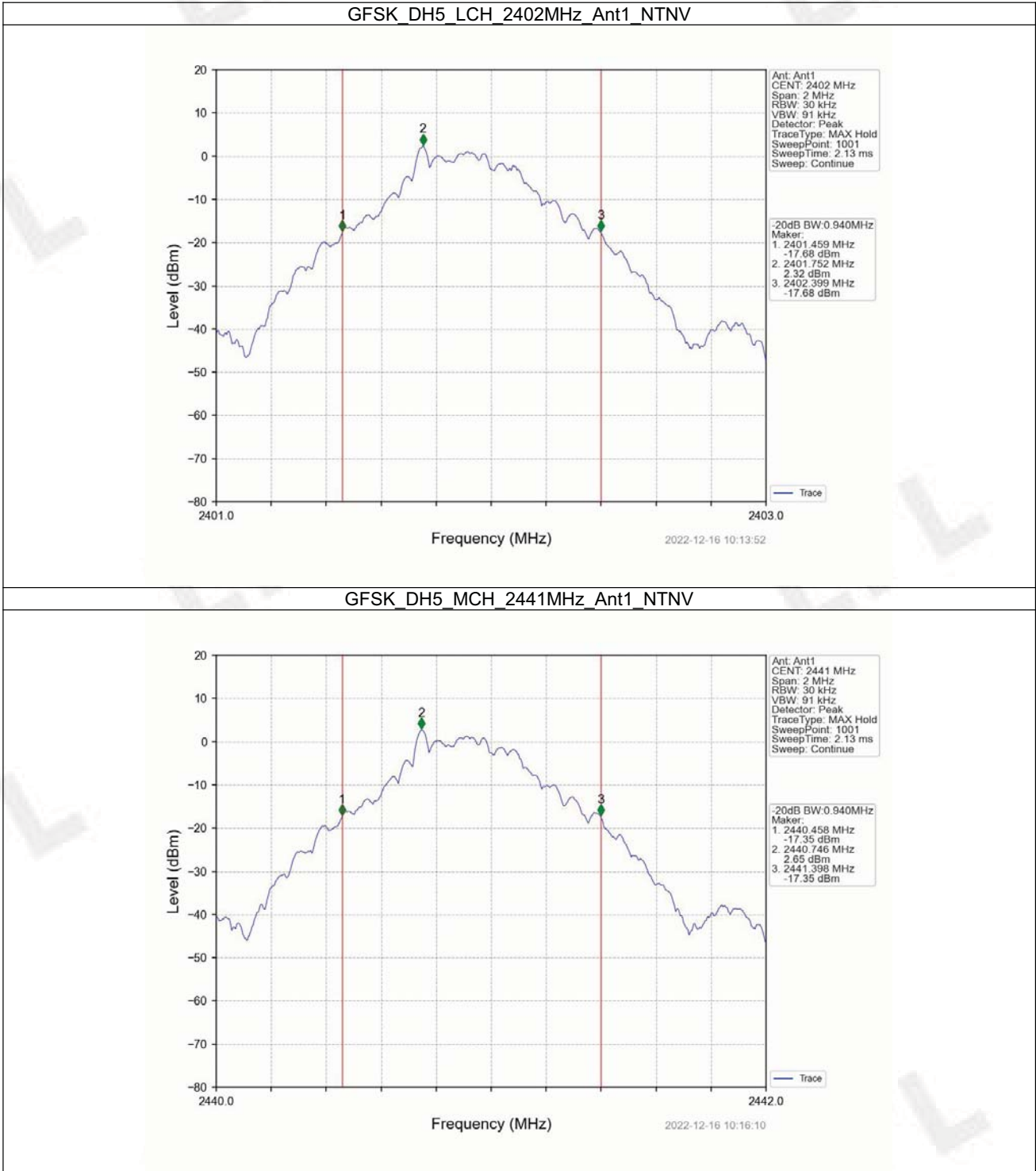


1.2 20dB BW

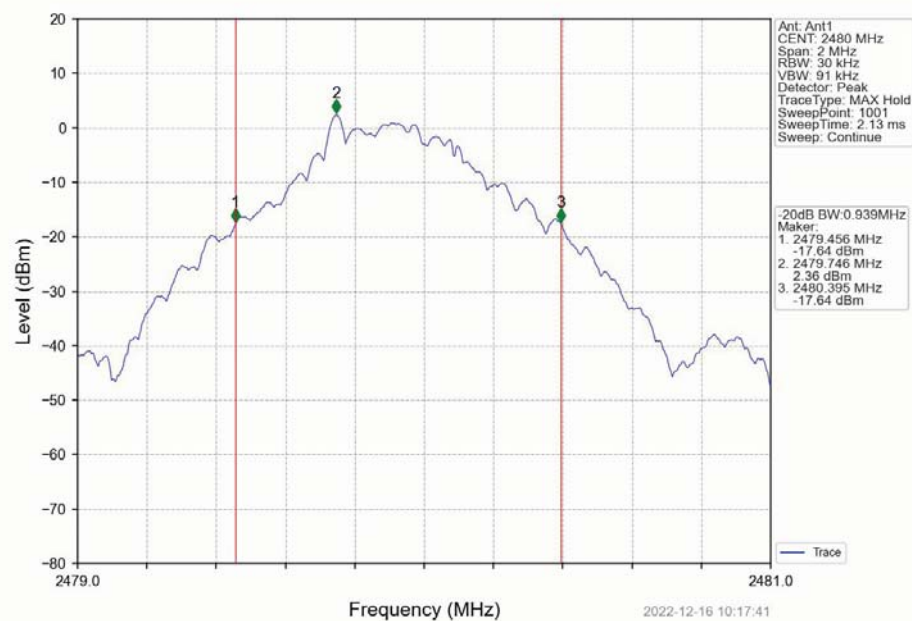
1.2.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.940	Pass
		2441	DH5	1	0.940	Pass
		2480	DH5	1	0.939	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.292	Pass
		2441	2DH5	1	1.289	Pass
		2480	2DH5	1	1.301	Pass
8DPSK	SISO	2402	3DH5	1	1.275	Pass
		2441	3DH5	1	1.278	Pass
		2480	3DH5	1	1.276	Pass

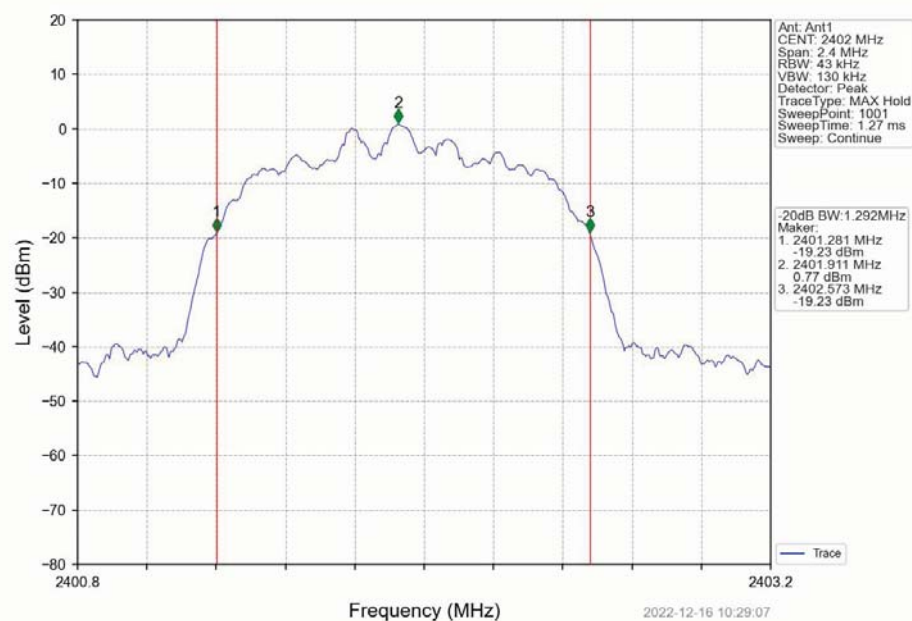
1.2.2 Test Graph



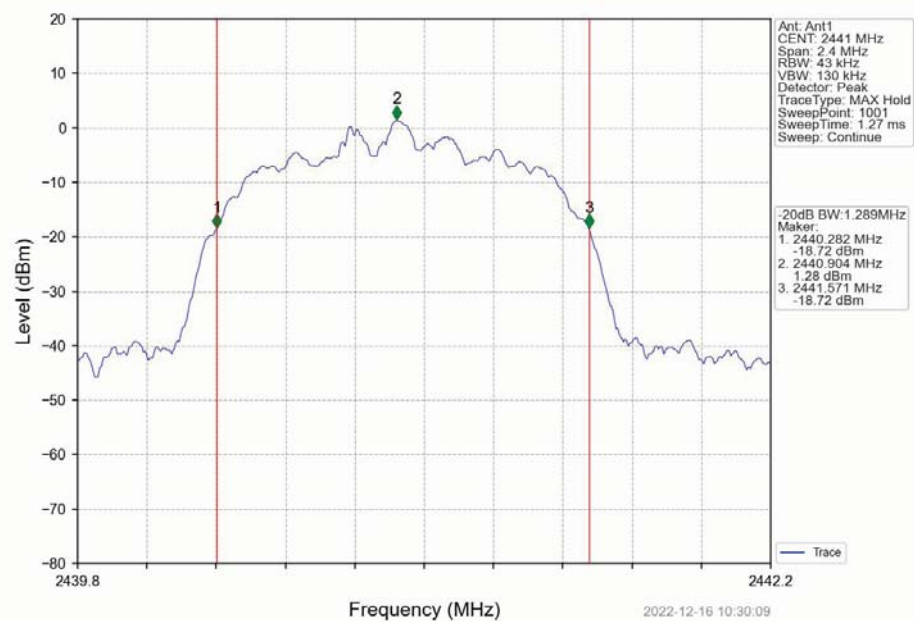
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



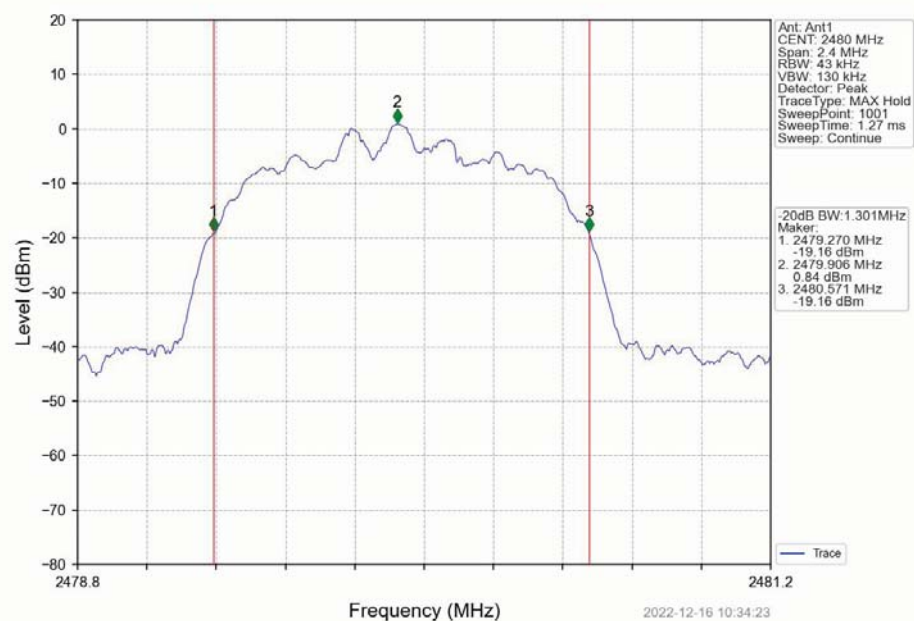
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

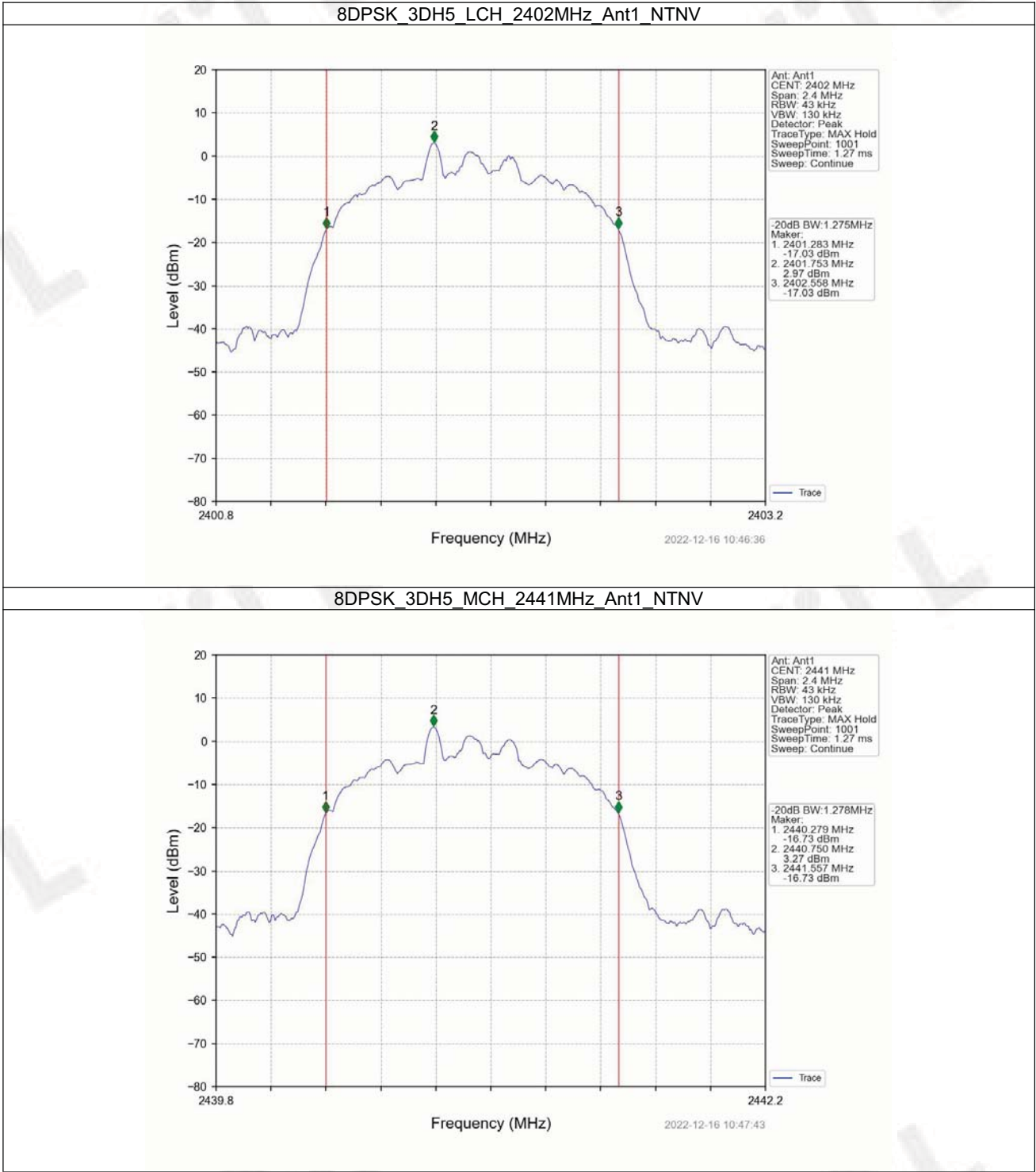


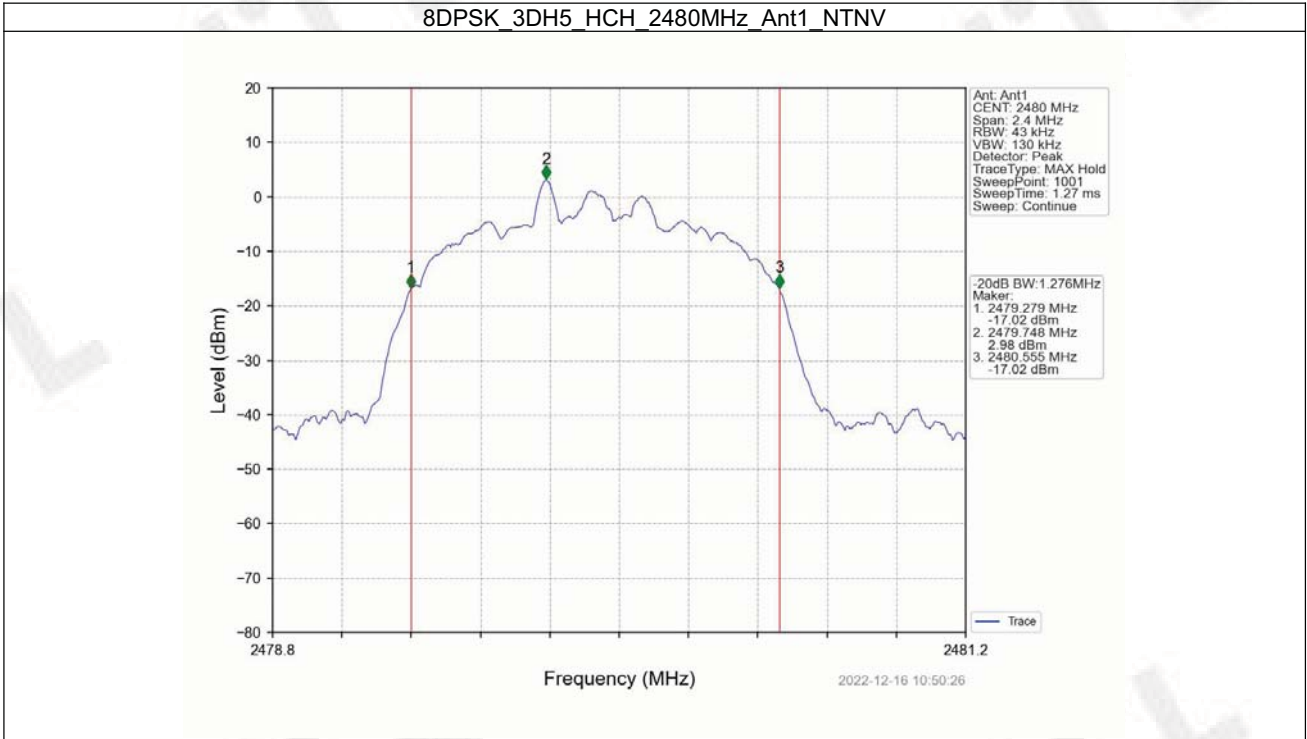
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV







2. Maximum Conducted Output Power

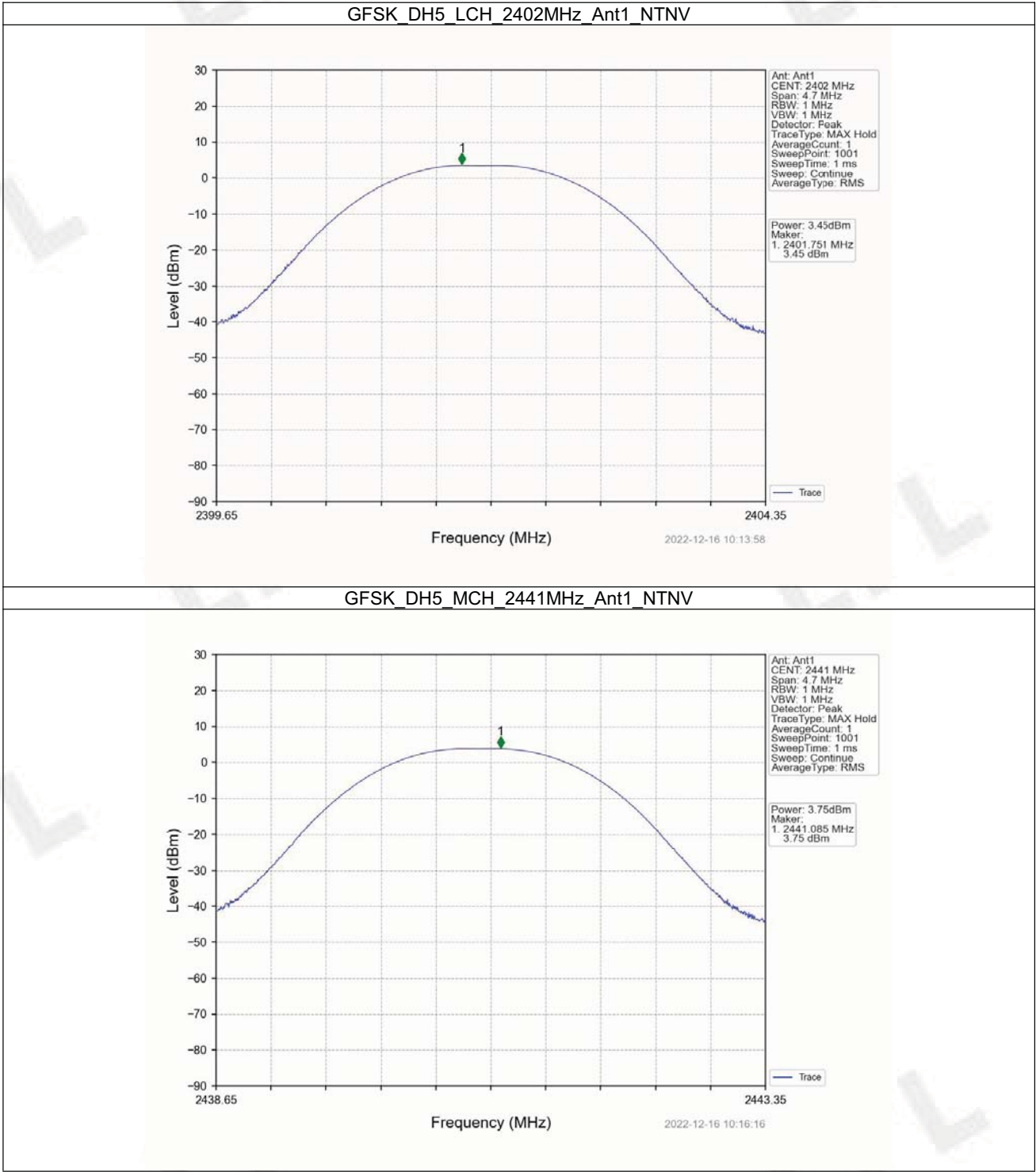
2.1 Power

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	3.45	<=30	Pass
		2441	DH5	3.75	<=30	Pass
		2480	DH5	3.48	<=30	Pass
Pi/4DQPSK	SISO	2402	2DH5	3.43	<=20.97	Pass
		2441	2DH5	3.73	<=20.97	Pass
		2480	2DH5	3.44	<=20.97	Pass
8DPSK	SISO	2402	3DH5	3.57	<=20.97	Pass
		2441	3DH5	3.85	<=20.97	Pass
		2480	3DH5	3.56	<=20.97	Pass

Note1: Antenna Gain: Ant1: 0.00dBi;

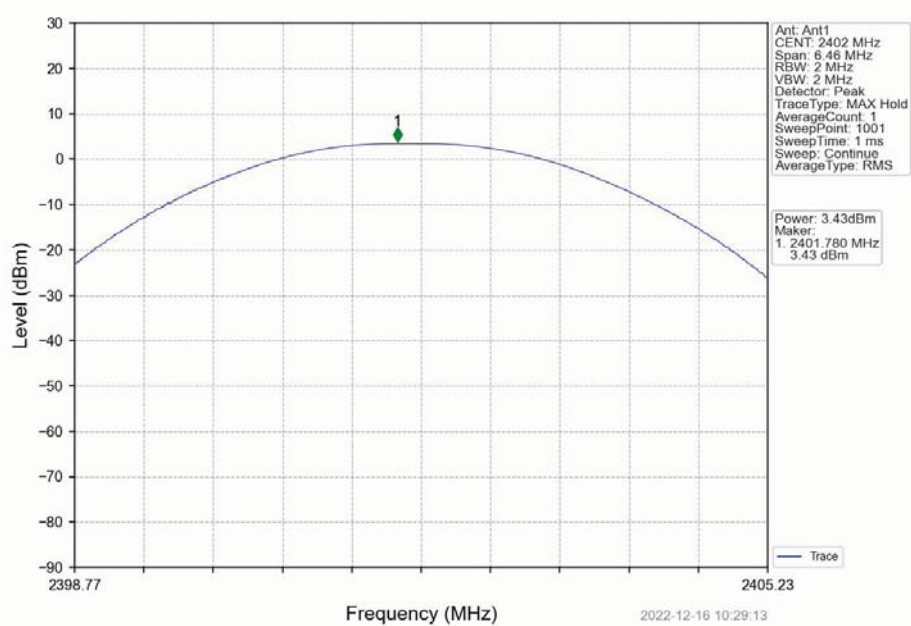
2.1.2 Test Graph



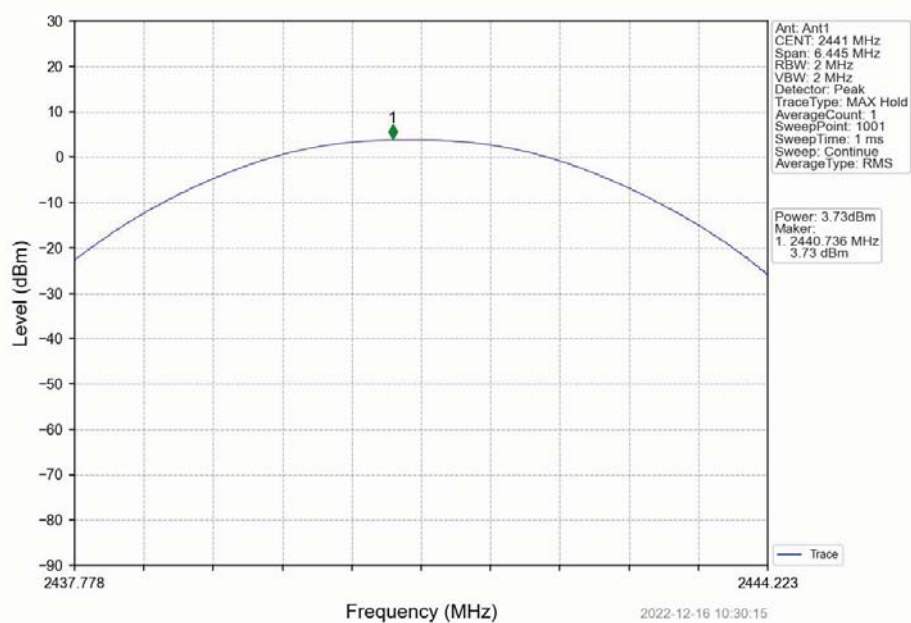
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



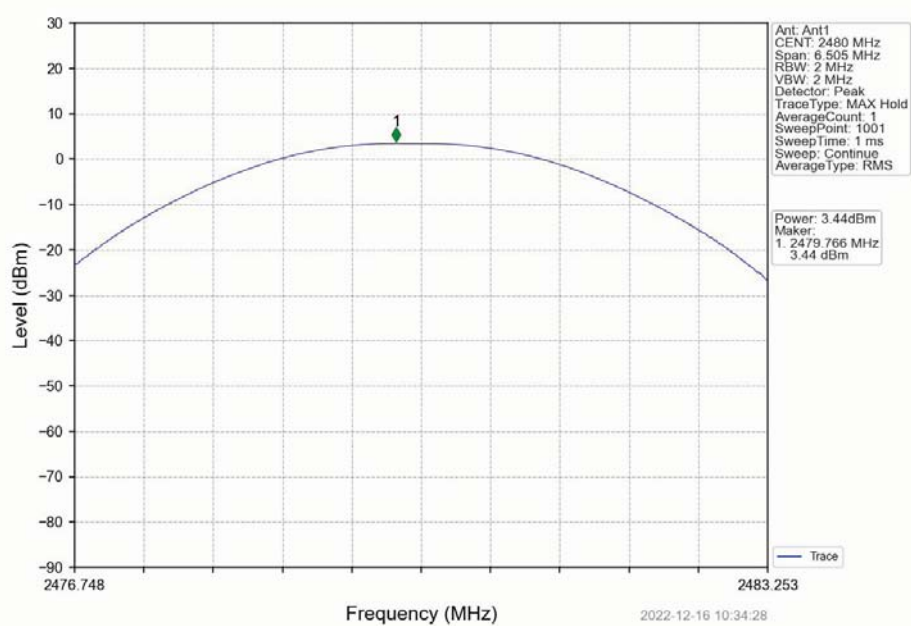
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

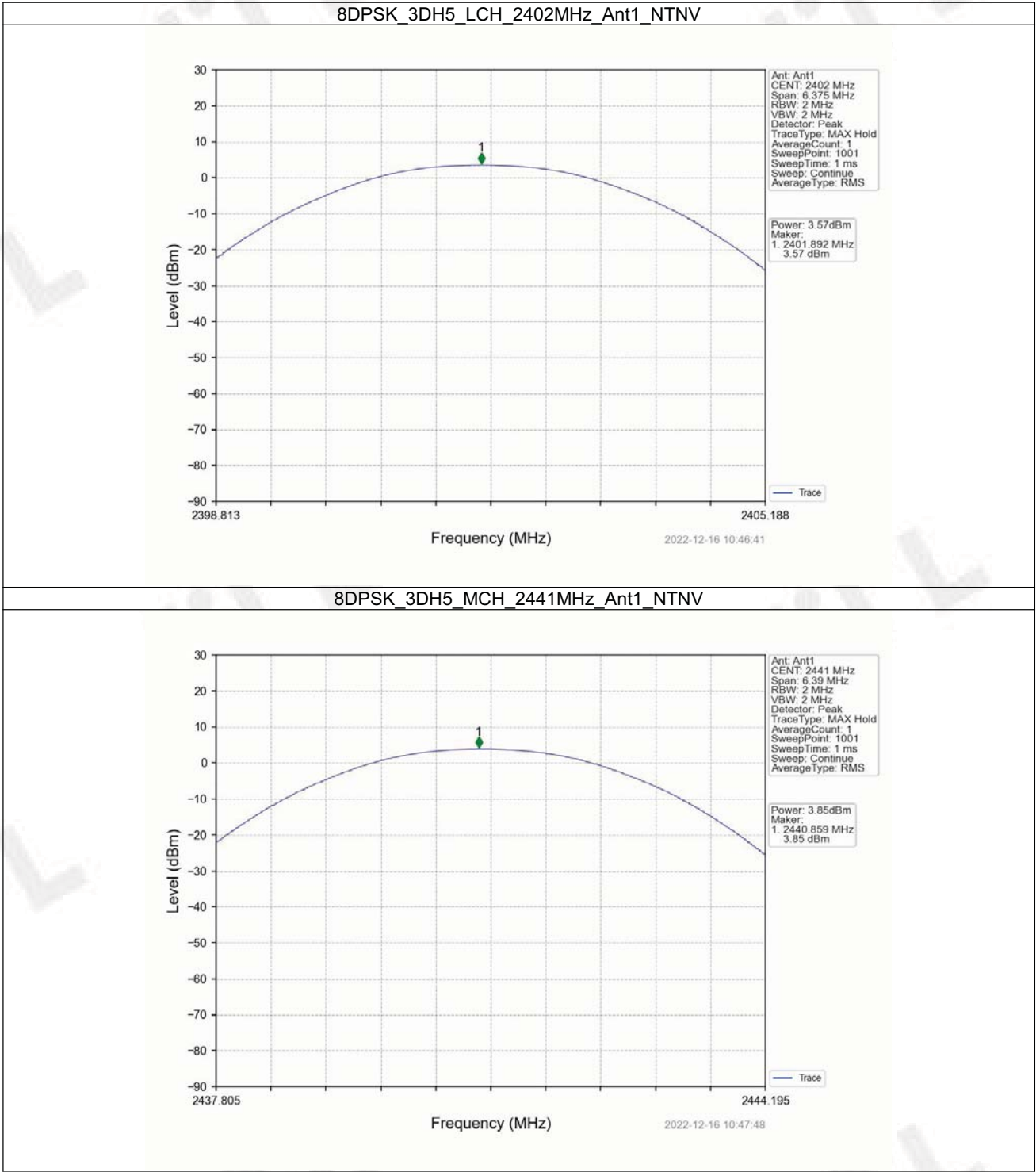


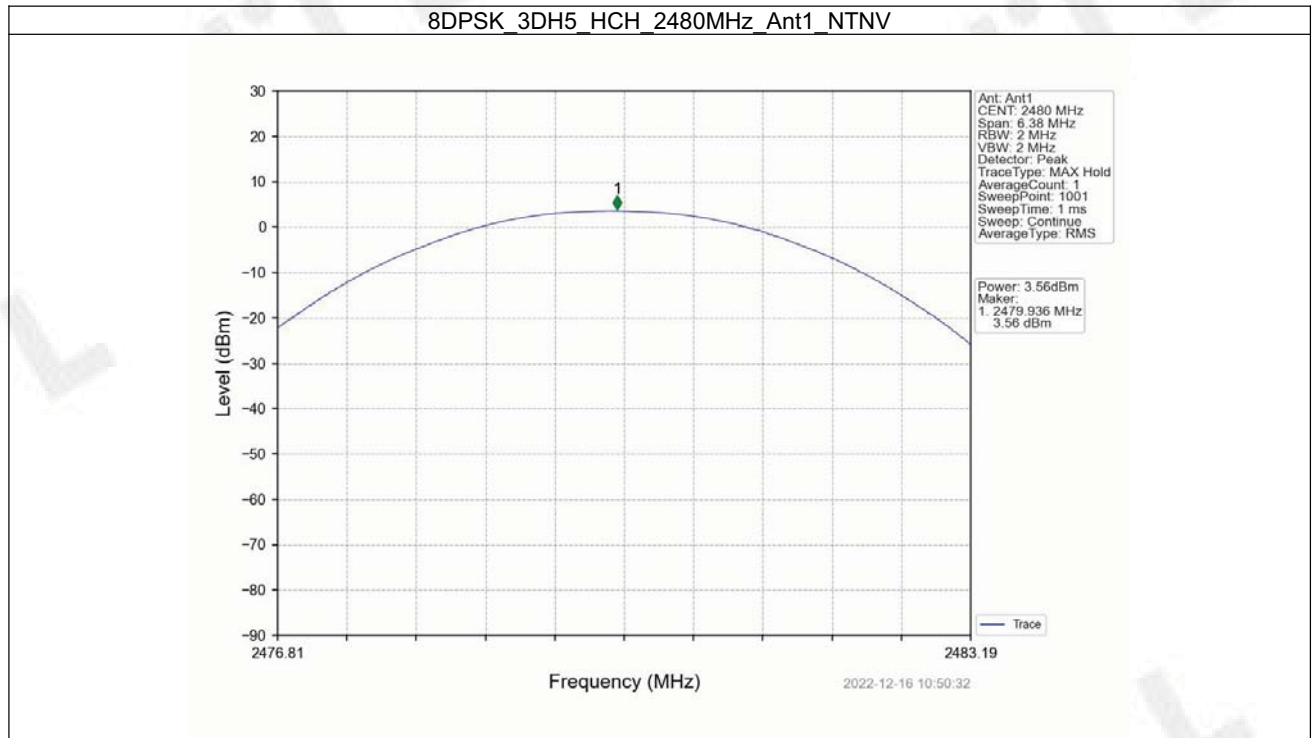
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV







2.2 EIRP

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	E.I.R.P (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	3.45	<=36.02	Pass
		2441	DH5	3.75	<=36.02	Pass
		2480	DH5	3.48	<=36.02	Pass
Pi/4DQPSK	SISO	2402	2DH5	3.43	<=36.02	Pass
		2441	2DH5	3.73	<=36.02	Pass
		2480	2DH5	3.44	<=36.02	Pass
8DPSK	SISO	2402	3DH5	3.57	<=36.02	Pass
		2441	3DH5	3.85	<=36.02	Pass
		2480	3DH5	3.56	<=36.02	Pass

Note1: Antenna Gain: Ant1: 0.00dBi;
Note2: E.I.R.P = Measured Power + Antenna Gain

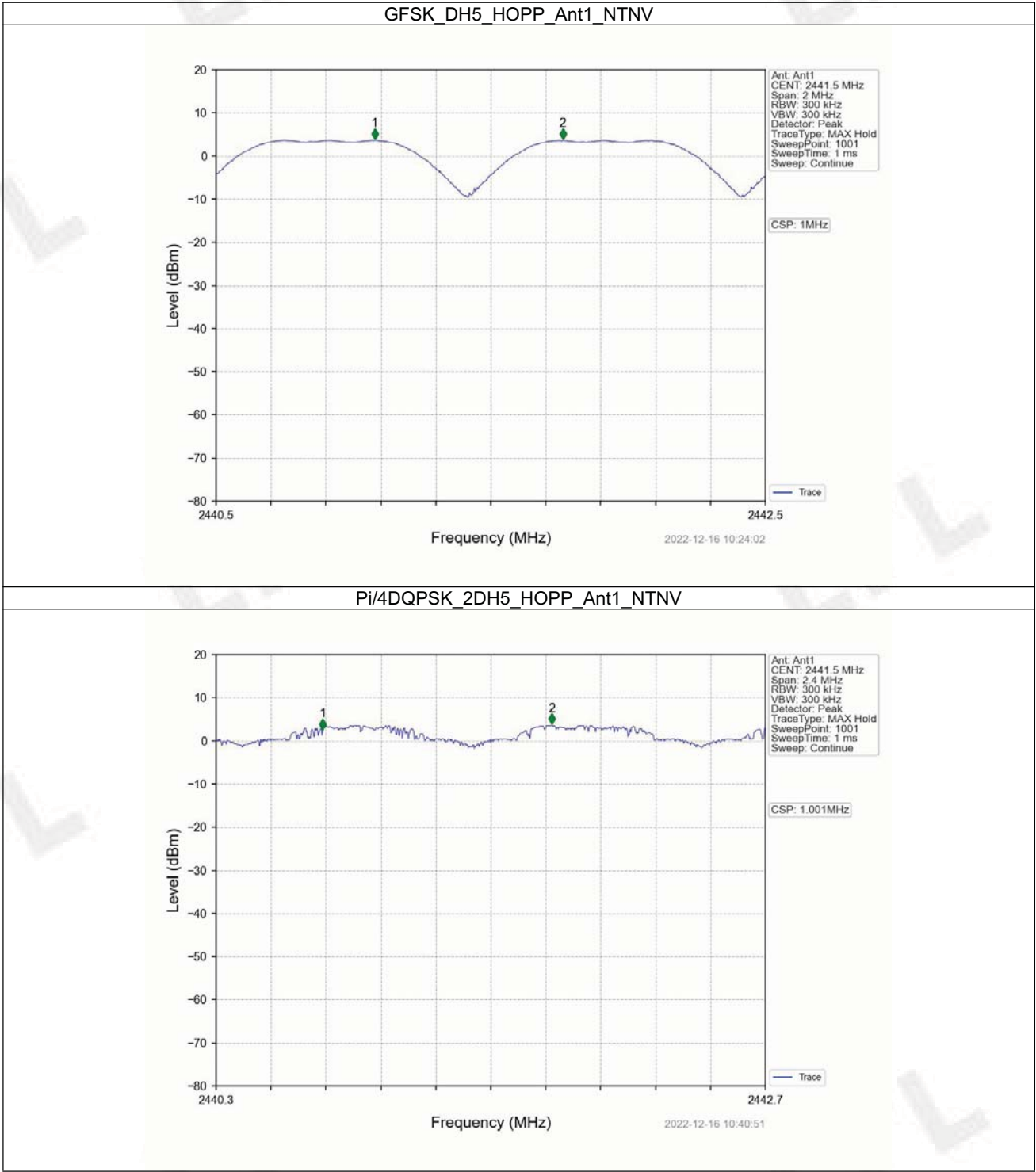
3. Carrier Frequency Separation

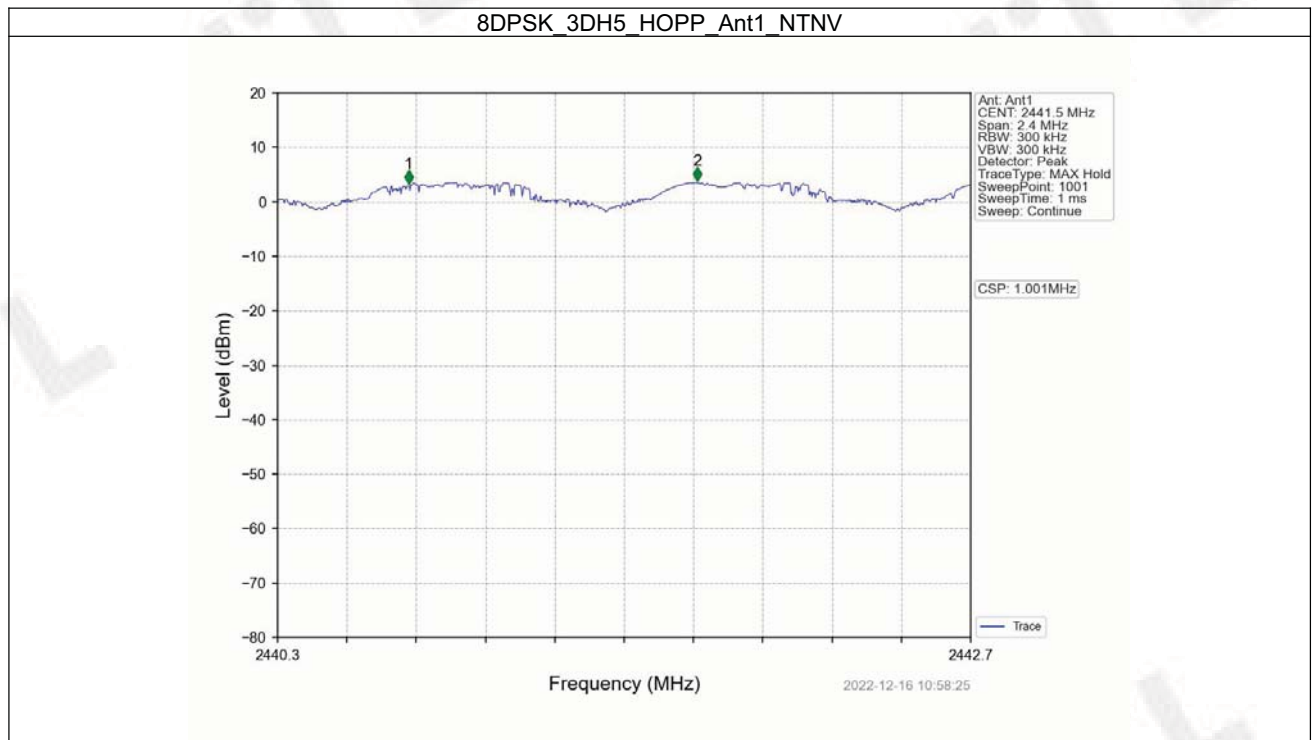
3.1 Ant1

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	1.000	0.940	>=0.94	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	1.001	1.301	>=0.867	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.278	>=0.852	Pass

3.1.2 Test Graph





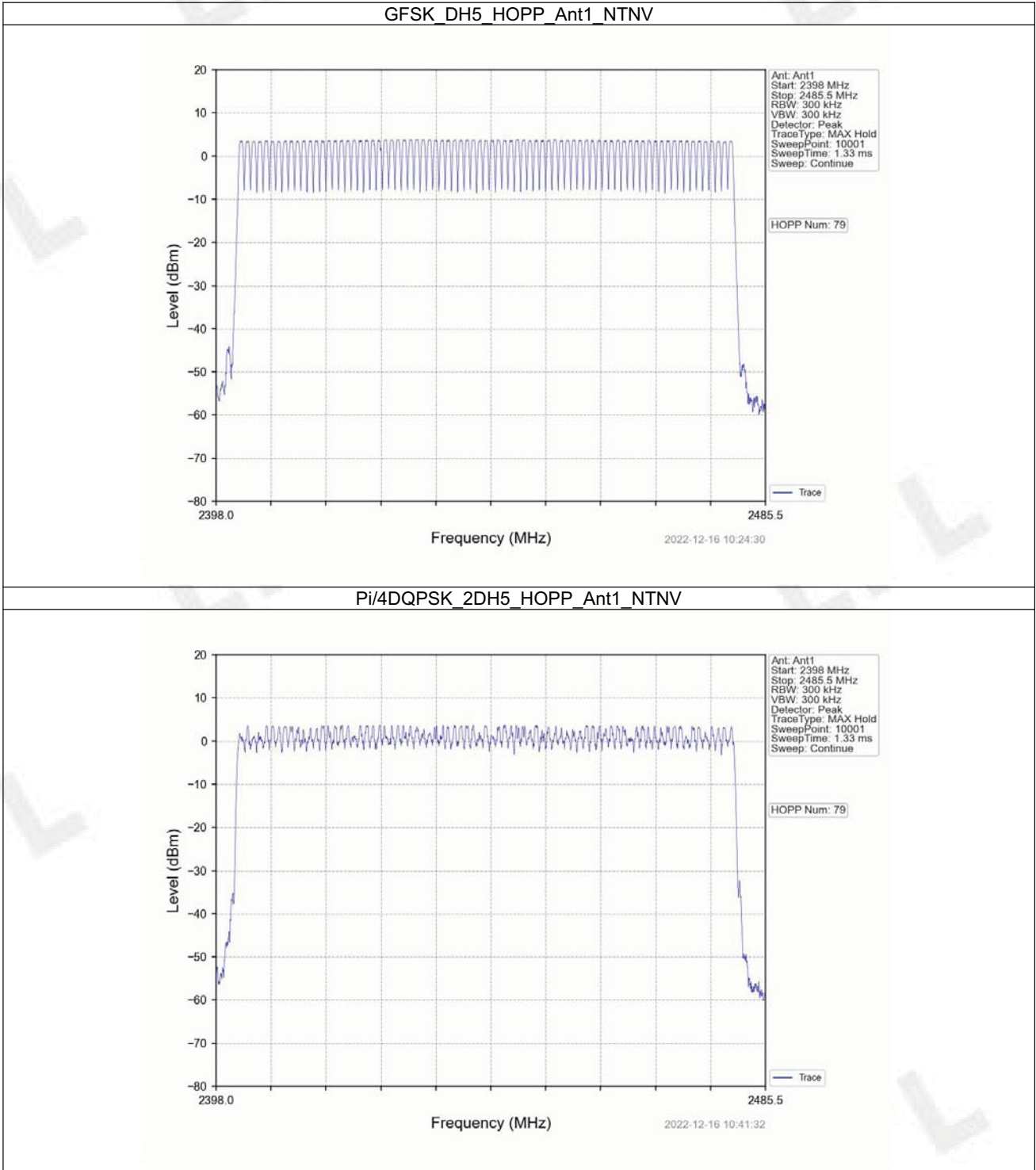
4. Number of Hopping Frequencies

4.1 HoppNum

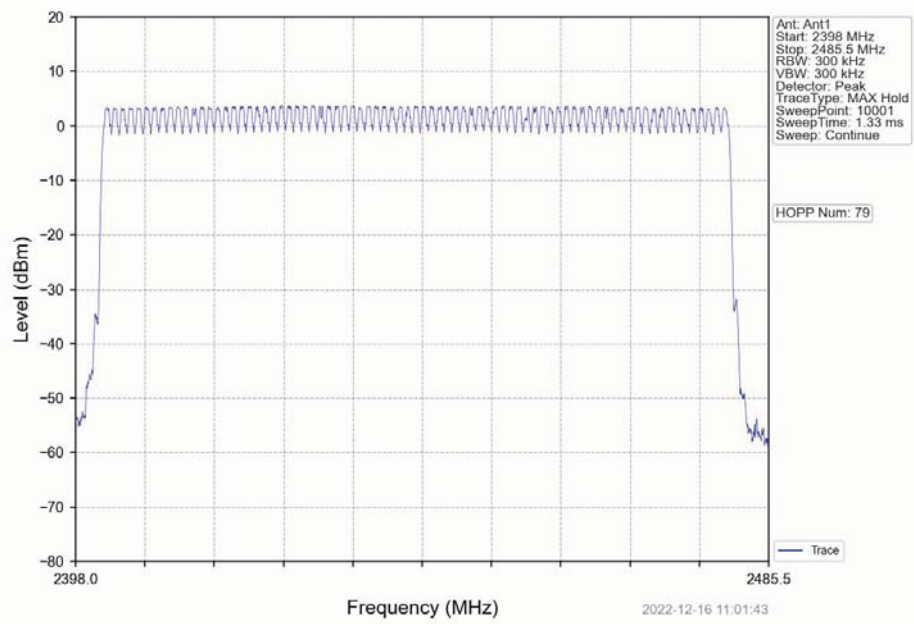
4.1.1 Test Result

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



8DPSK_3DH5_HOPP_Ant1_NTNV



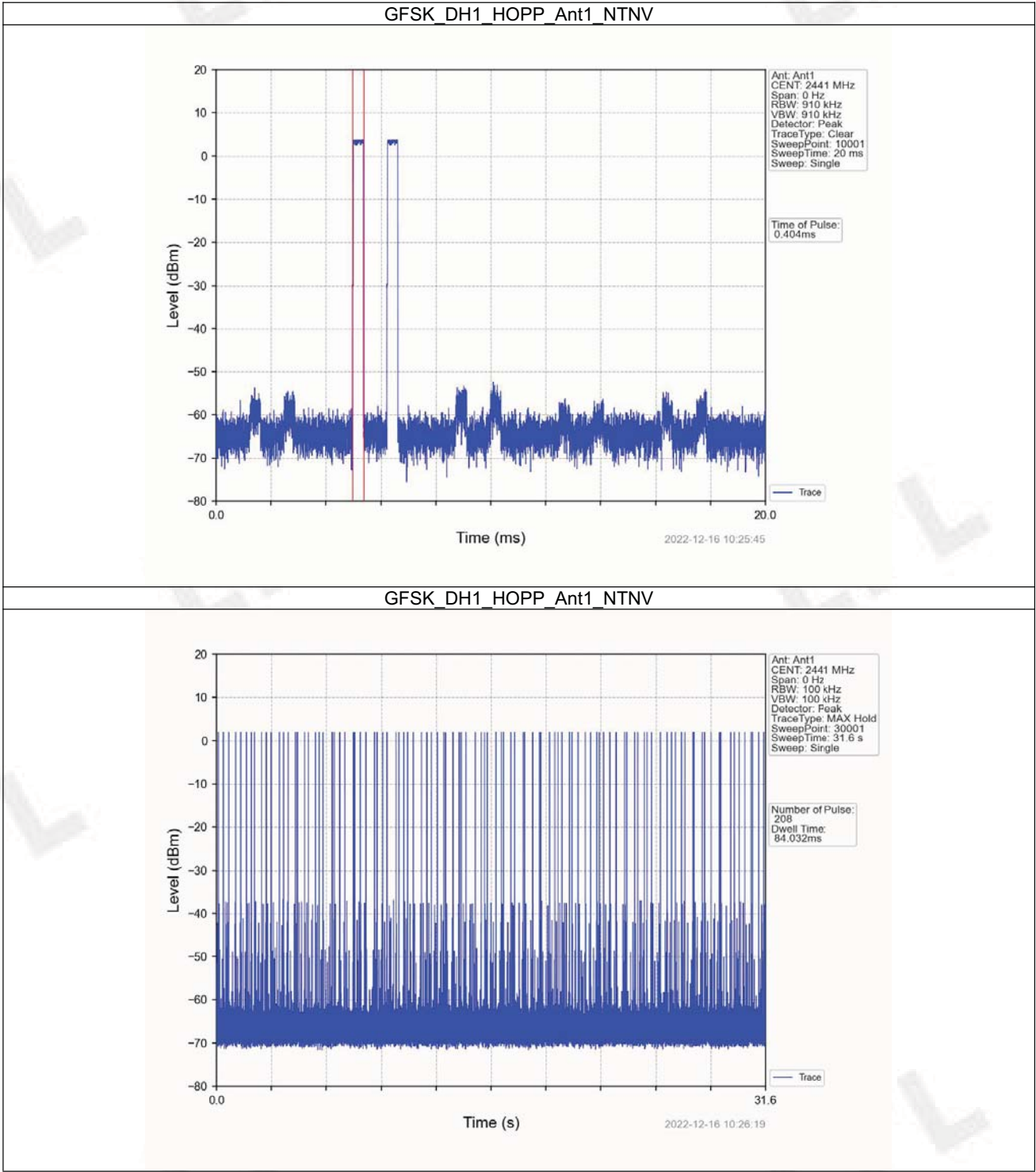
5. Time of Occupancy (Dwell Time)

5.1 Ant1

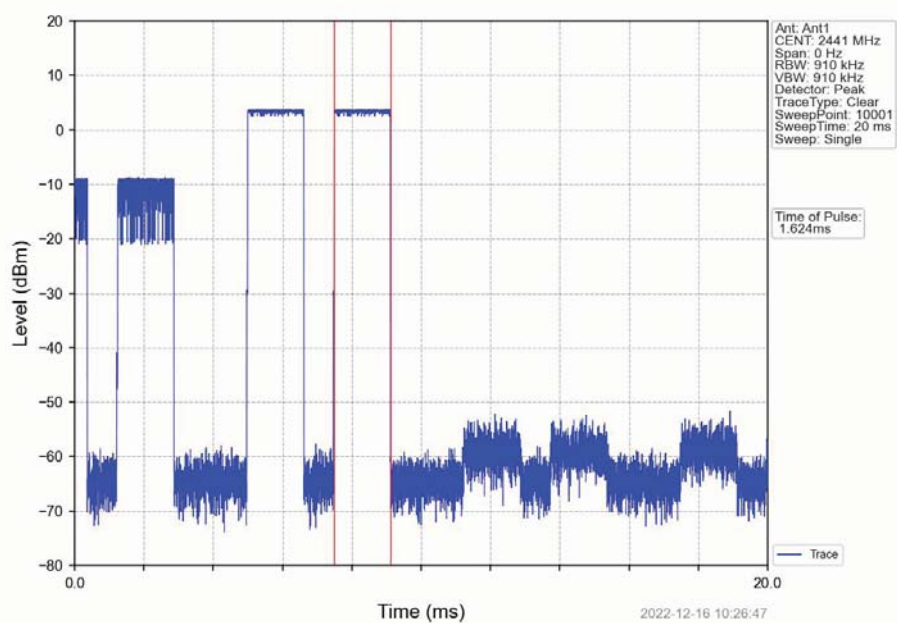
5.1.1 Test Result

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	0.404	31.600	208	84.032	<=400	Pass
			DH3	1.624	31.600	122	198.128	<=400	Pass
			DH5	2.900	31.600	90	261.000	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.382	31.600	208	79.456	<=400	Pass
			2DH3	1.662	31.600	124	206.088	<=400	Pass
			2DH5	2.910	31.600	88	256.080	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.410	31.600	204	83.640	<=400	Pass
			3DH3	1.660	31.600	124	205.840	<=400	Pass
			3DH5	2.912	31.600	90	262.080	<=400	Pass

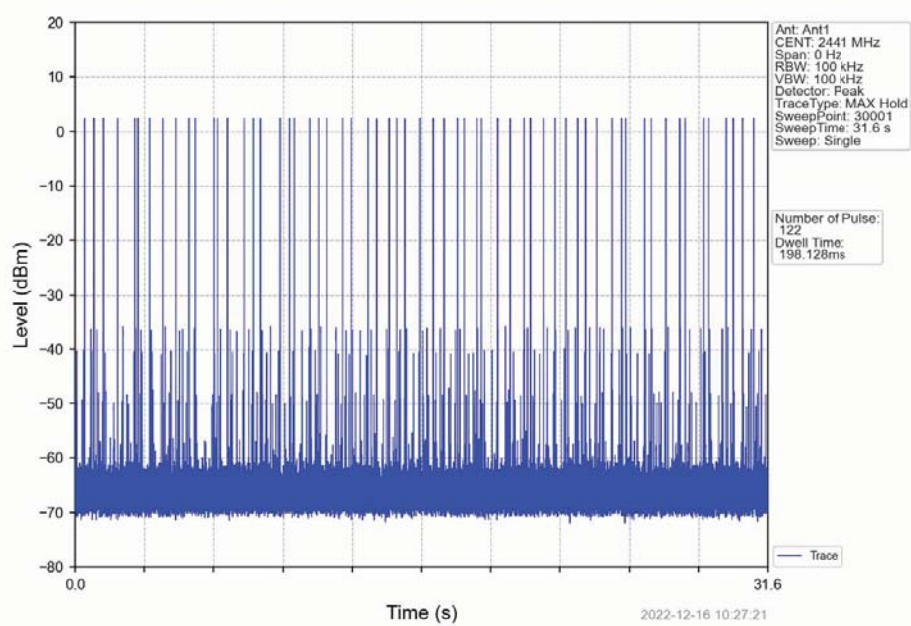
5.1.2 Test Graph



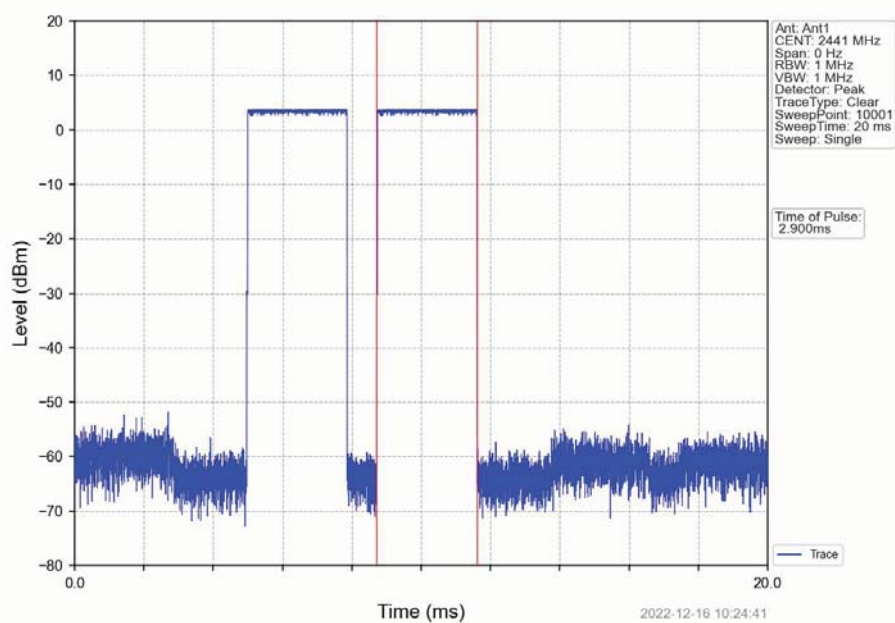
GFSK_DH3_HOPP_Ant1_NTNV



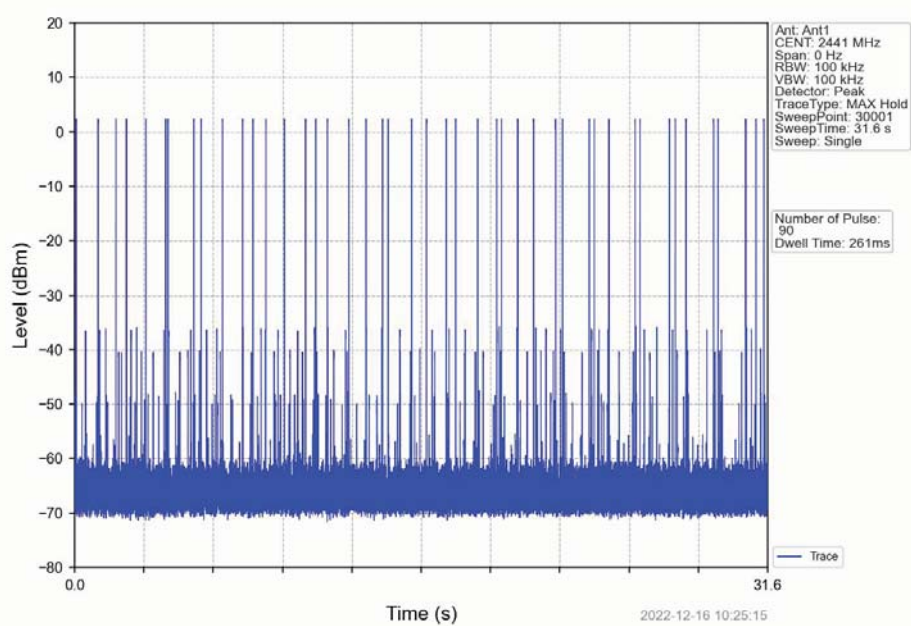
GFSK_DH3_HOPP_Ant1_NTNV



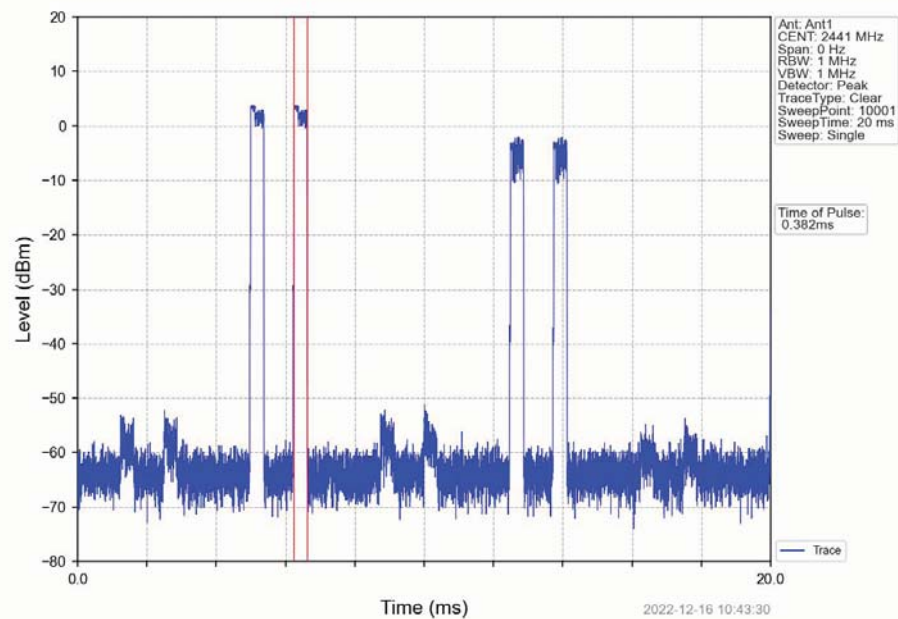
GFSK_DH5_HOPP_Ant1_NTNV



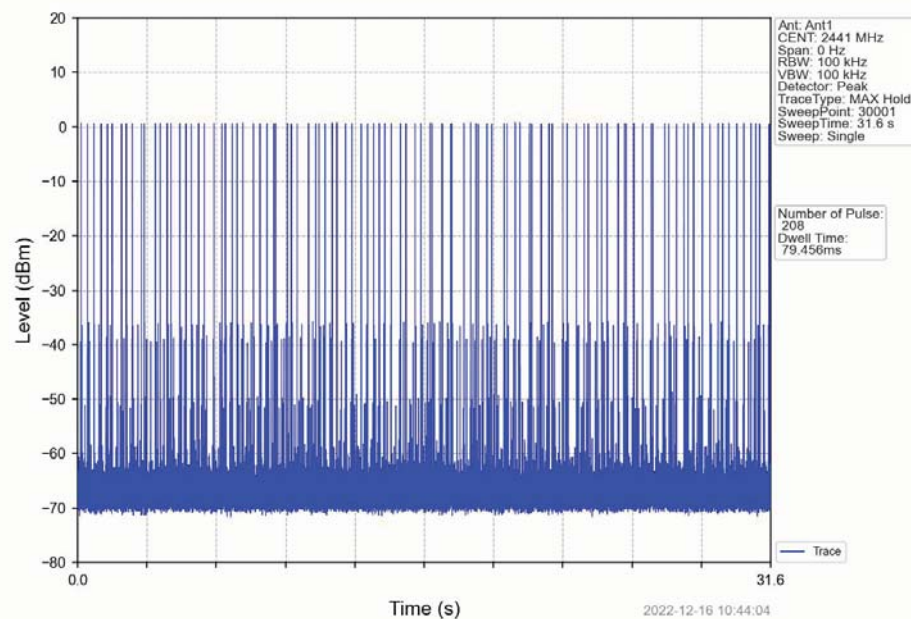
GFSK_DH5_HOPP_Ant1_NTNV



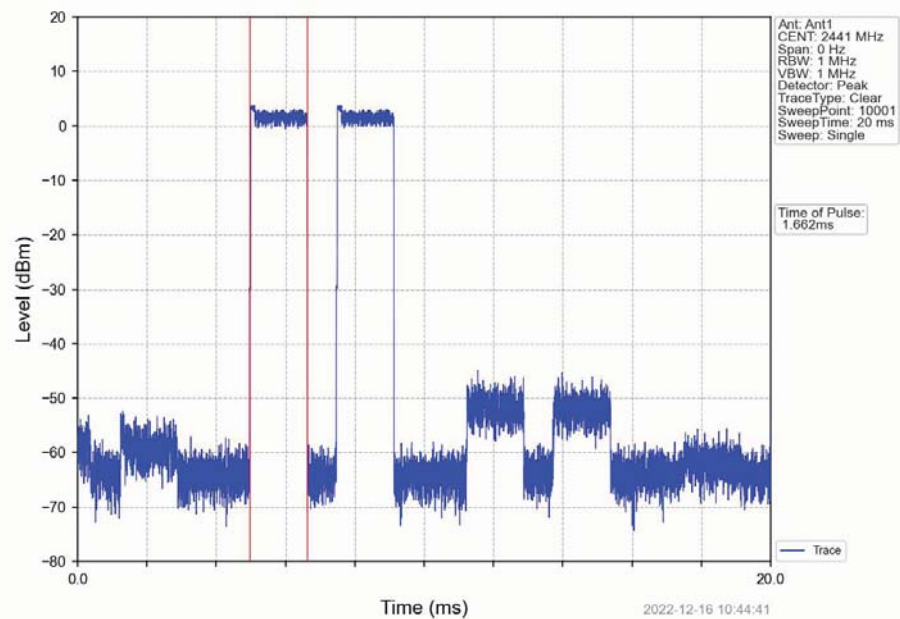
Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



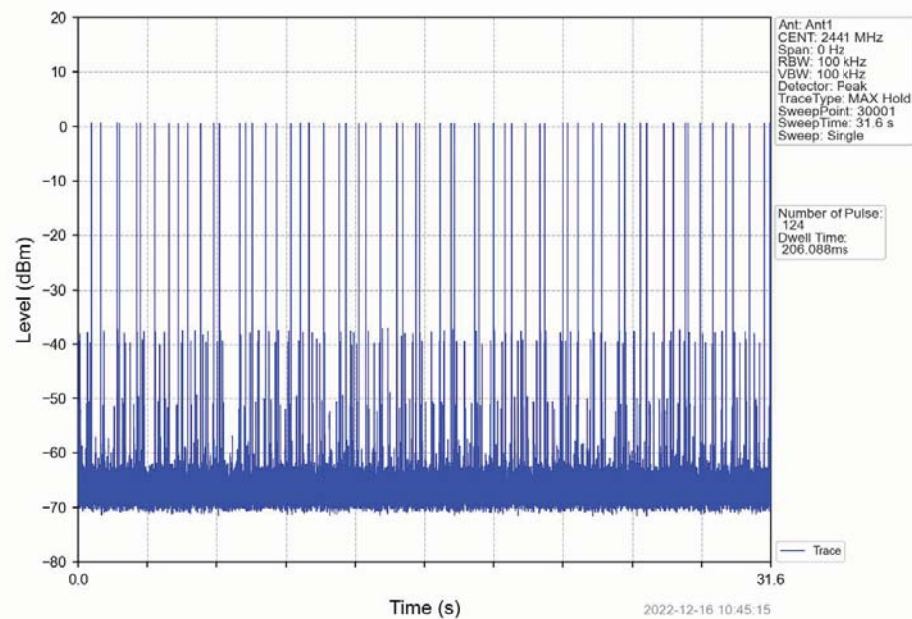
Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



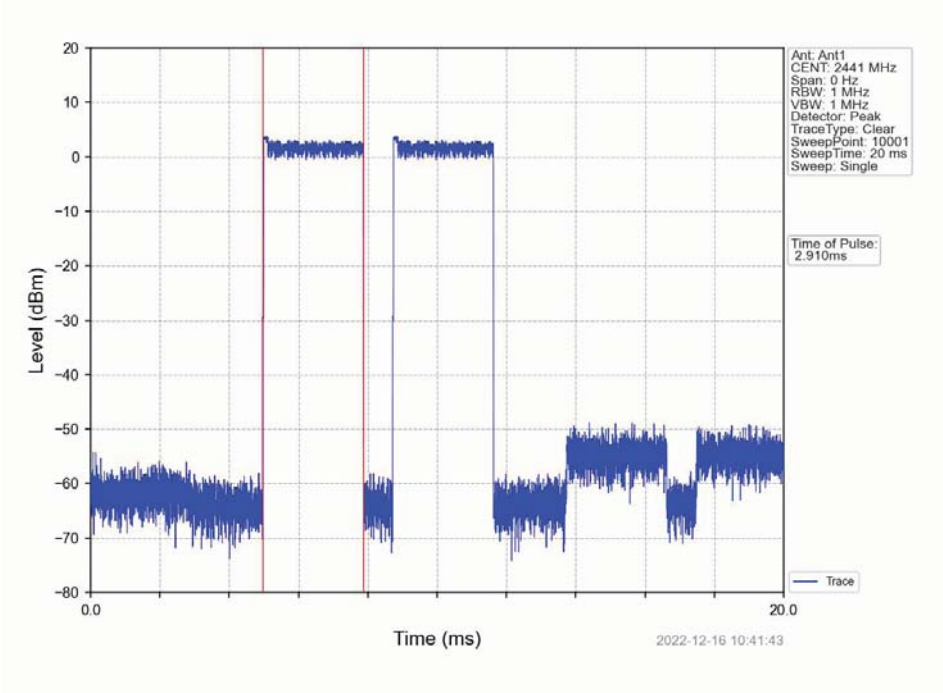
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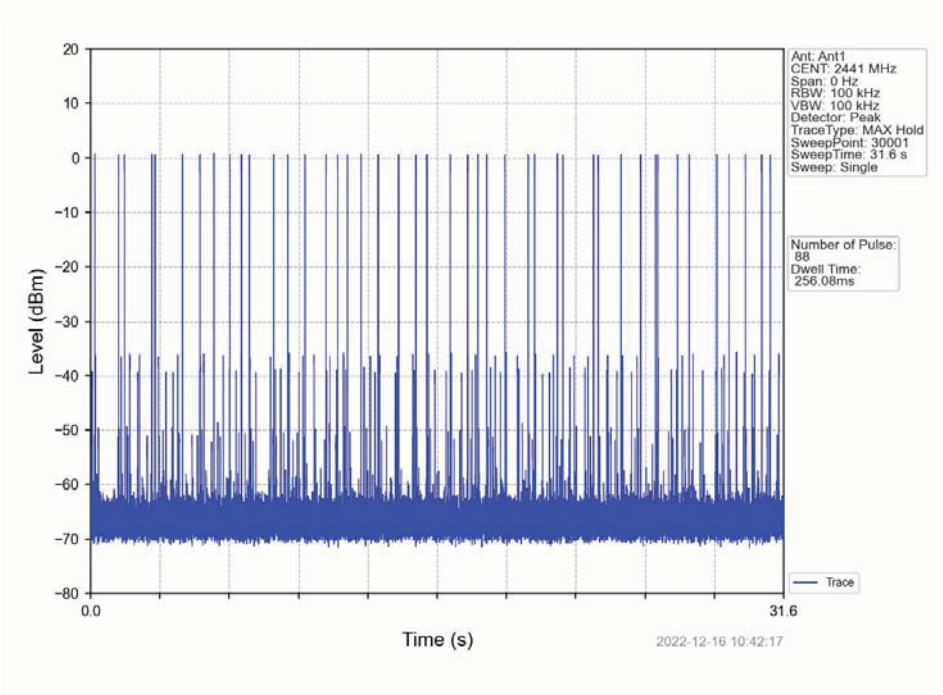
Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV



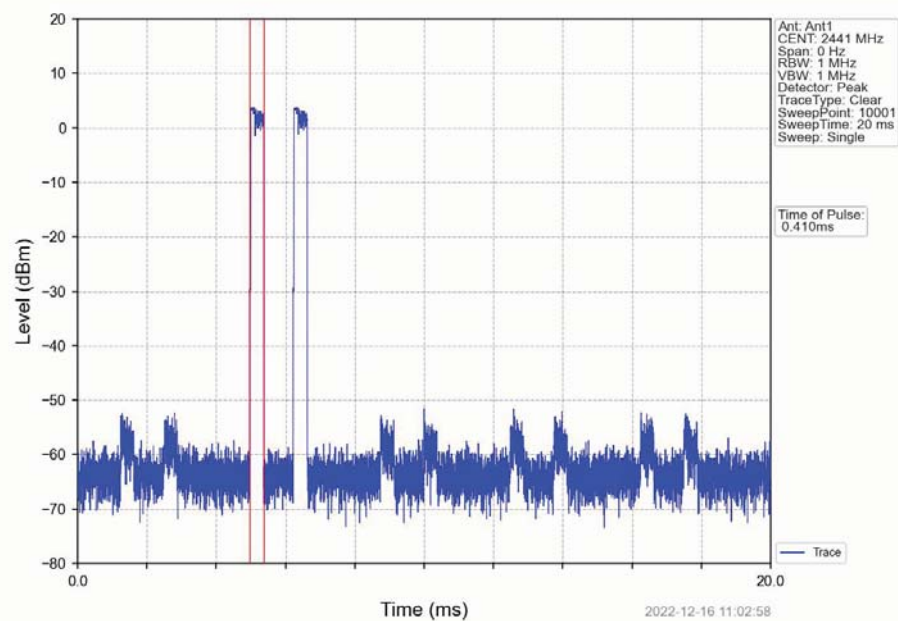
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



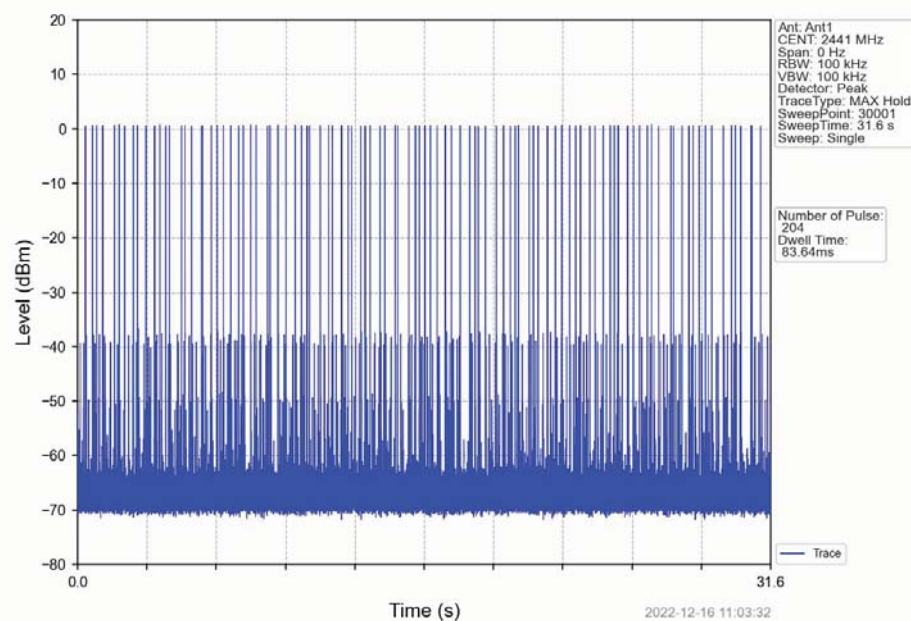
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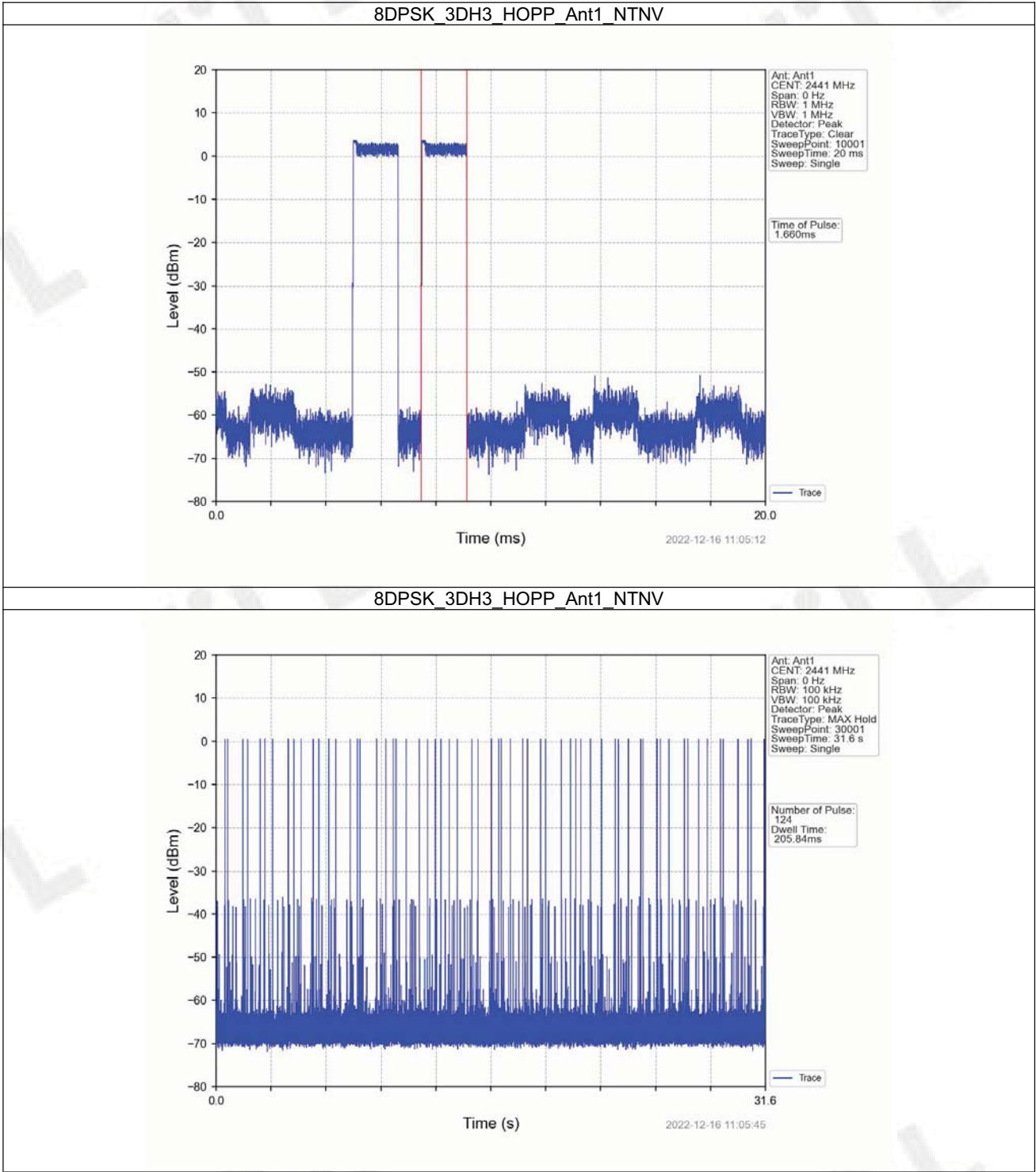


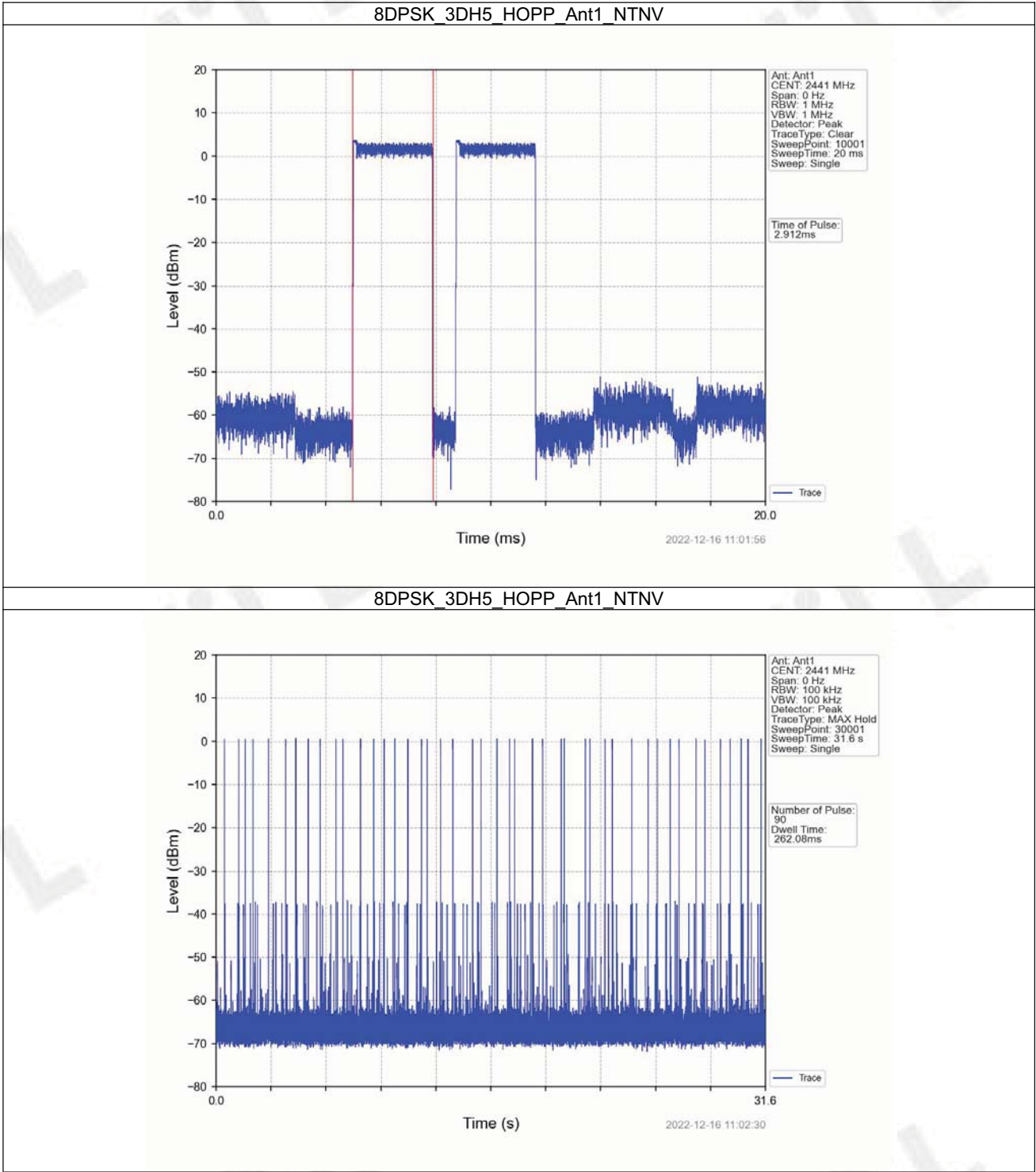
8DPSK_3DH1_HOPP_Ant1_NTNV



8DPSK_3DH1_HOPP_Ant1_NTNV







6. Unwanted Emissions In Non-restricted Frequency Bands

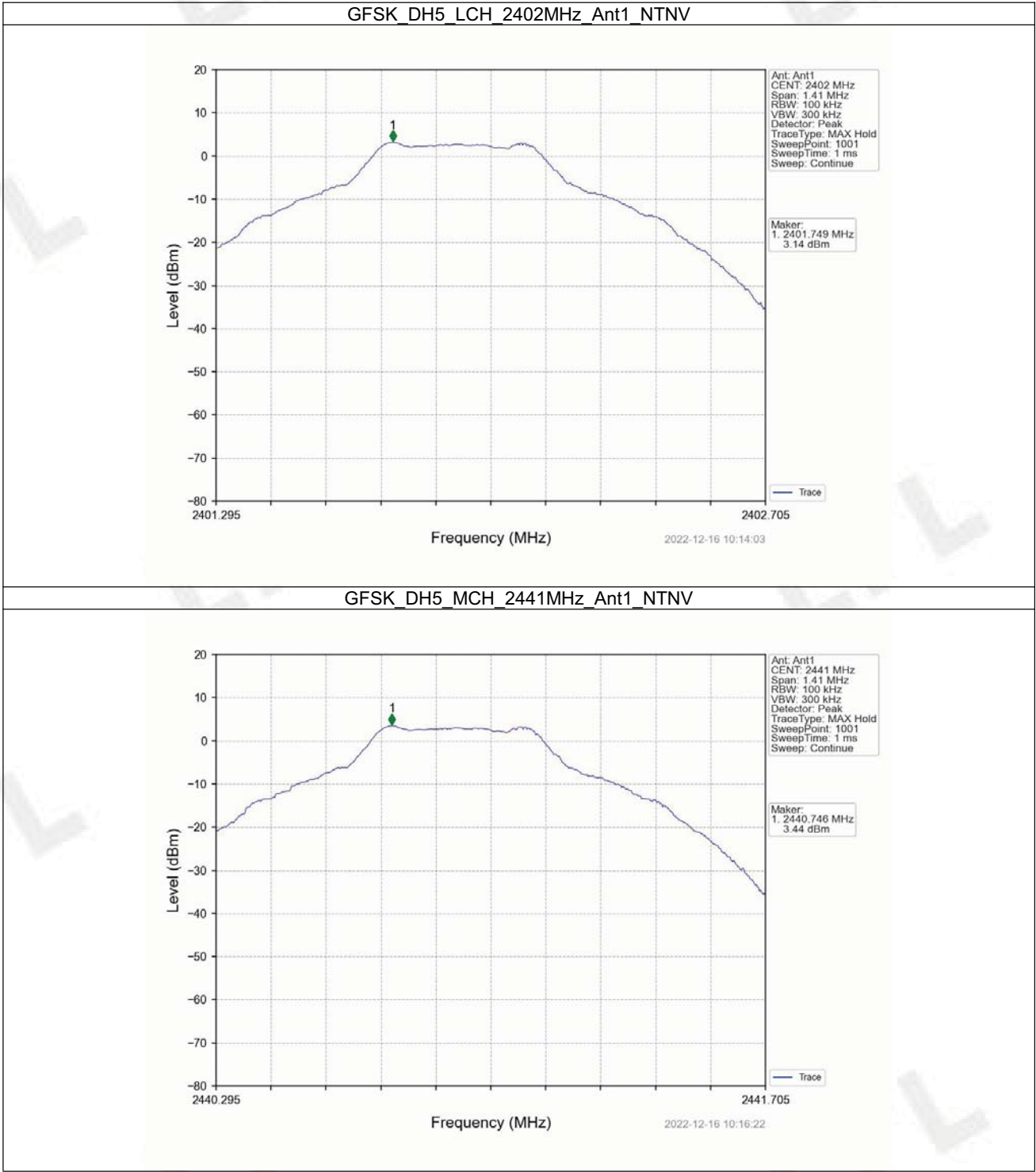
6.1 Ref

6.1.1 Test Result

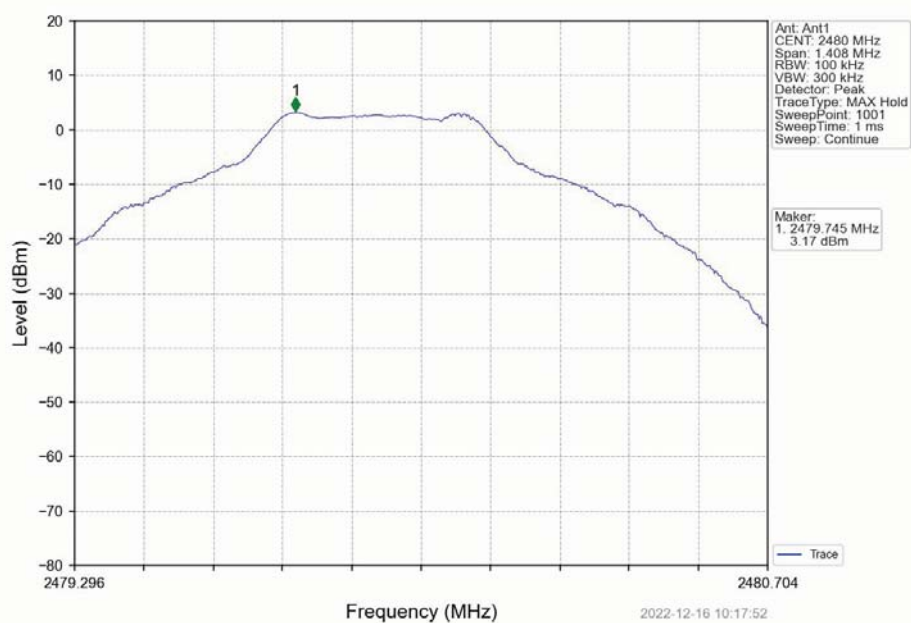
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	3.14
		2441	DH5	1	3.44
		2480	DH5	1	3.17
Pi/4DQPSK	SISO	2402	2DH5	1	2.91
		2441	2DH5	1	3.23
		2480	2DH5	1	2.96
8DPSK	SISO	2402	3DH5	1	3.10
		2441	3DH5	1	3.40
		2480	3DH5	1	3.12

Note1: Refer to RSS-247 Issue 2 section 5.5 and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

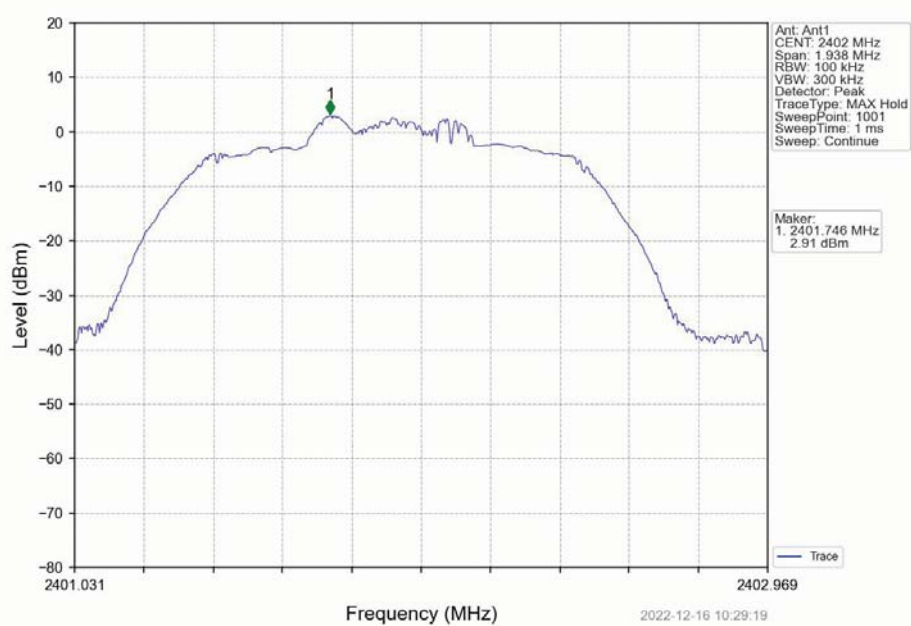
6.1.2 Test Graph



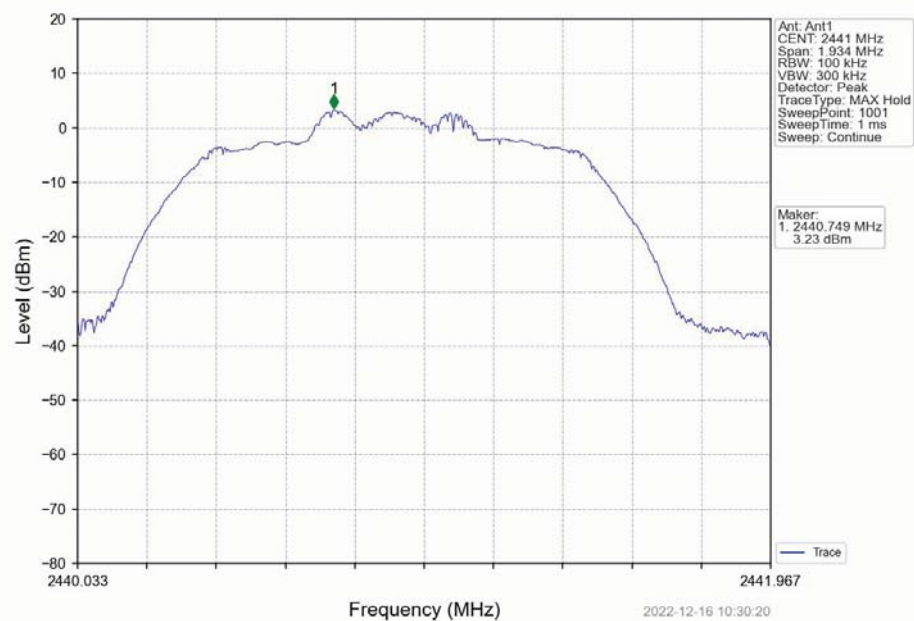
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



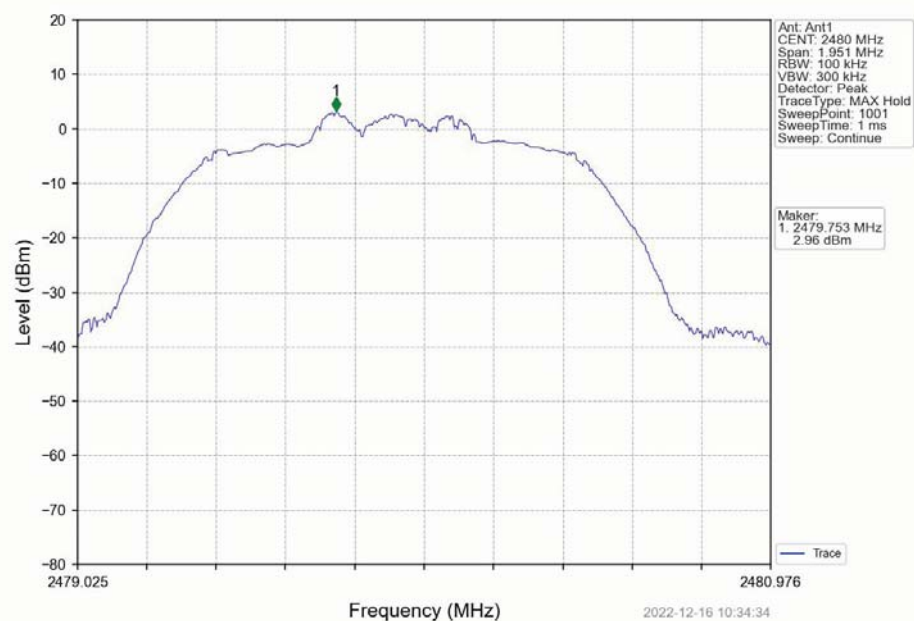
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



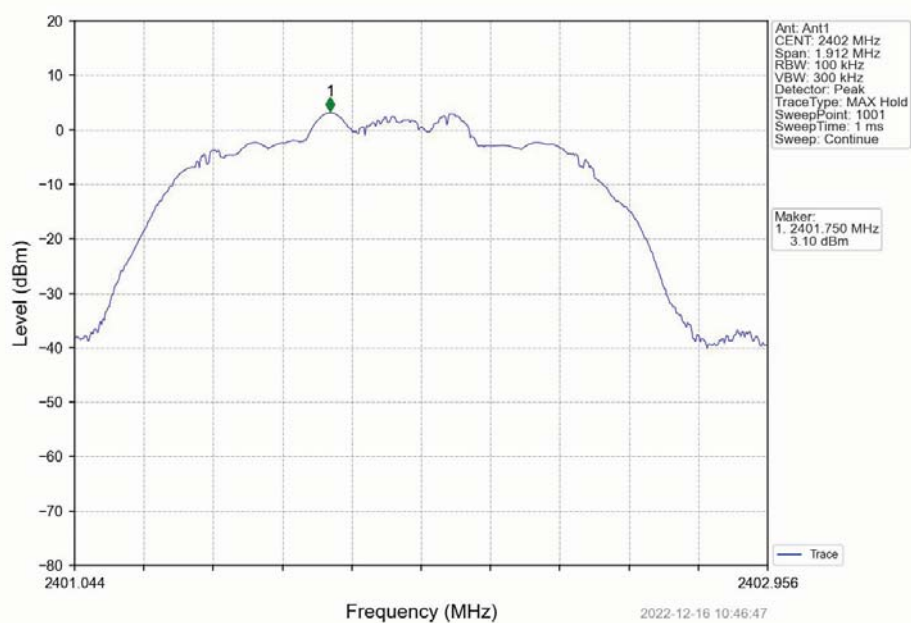
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



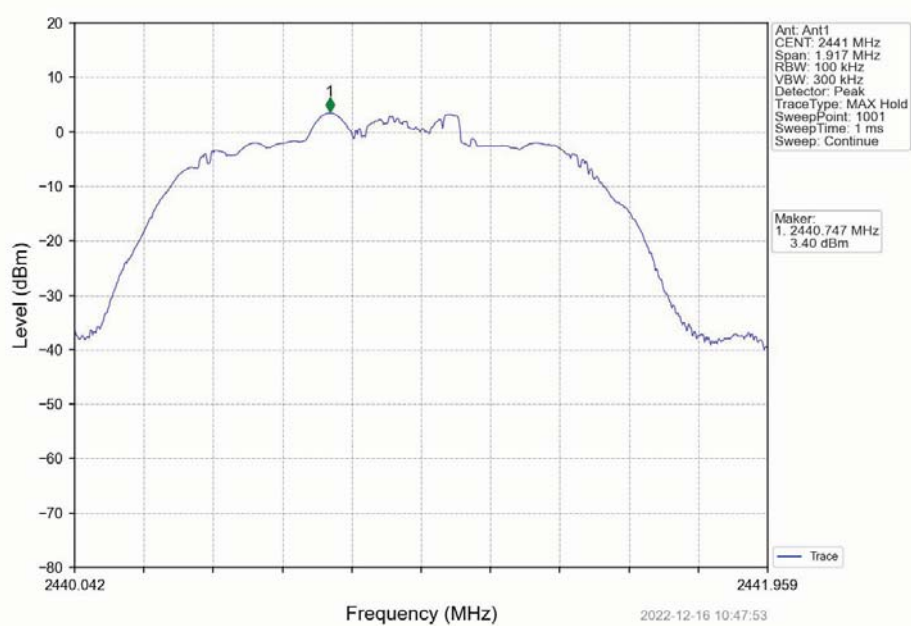
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

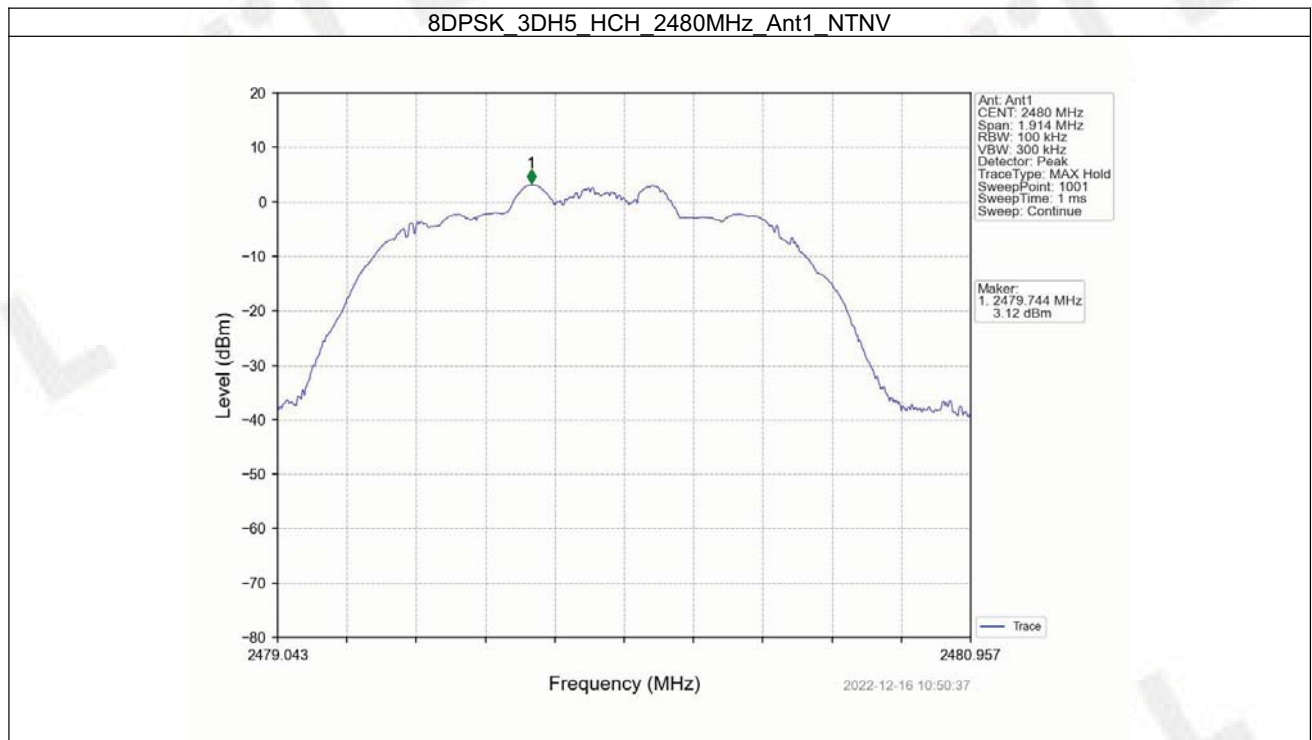


8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV





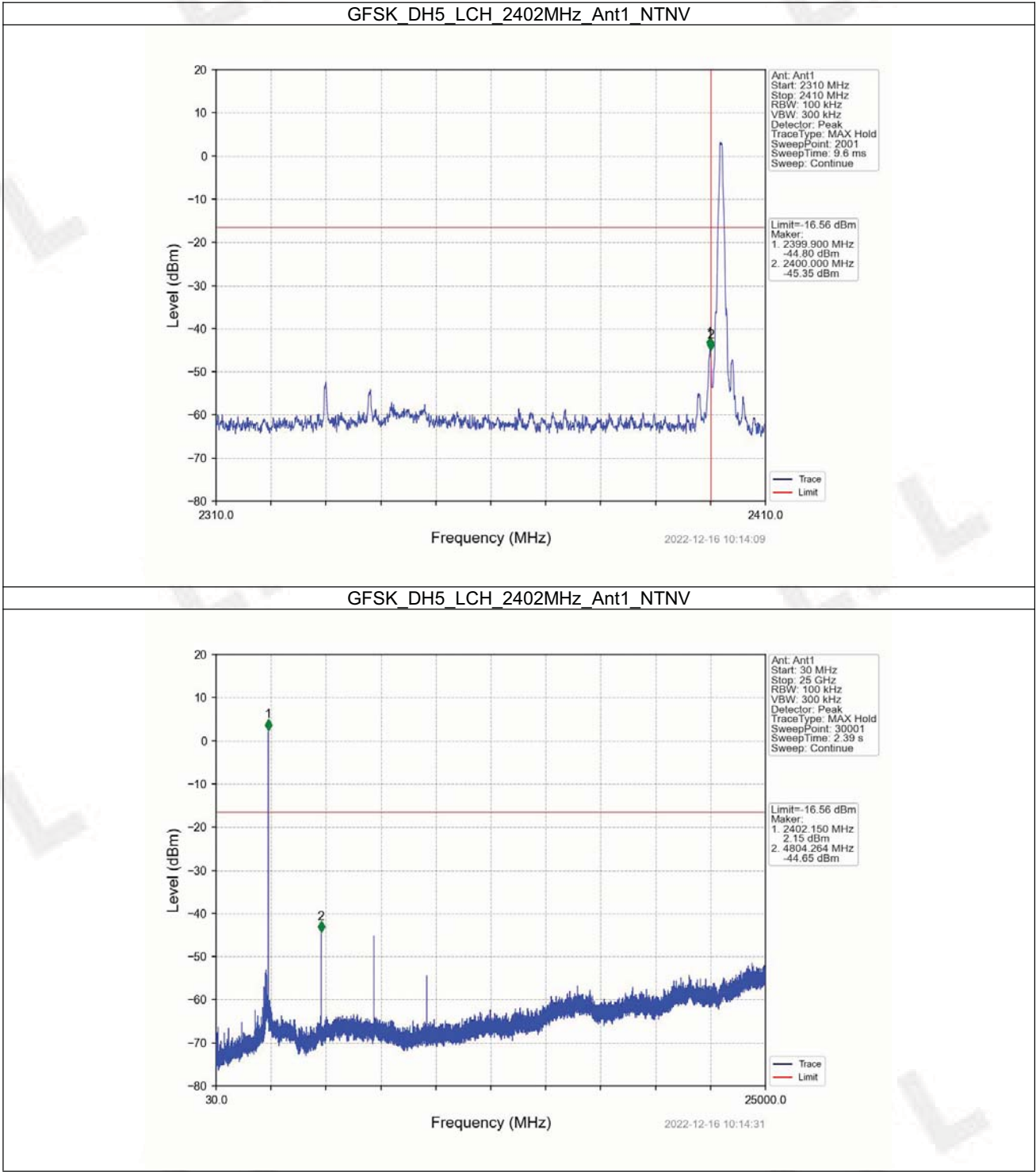
6.2 CSE

6.2.1 Test Result

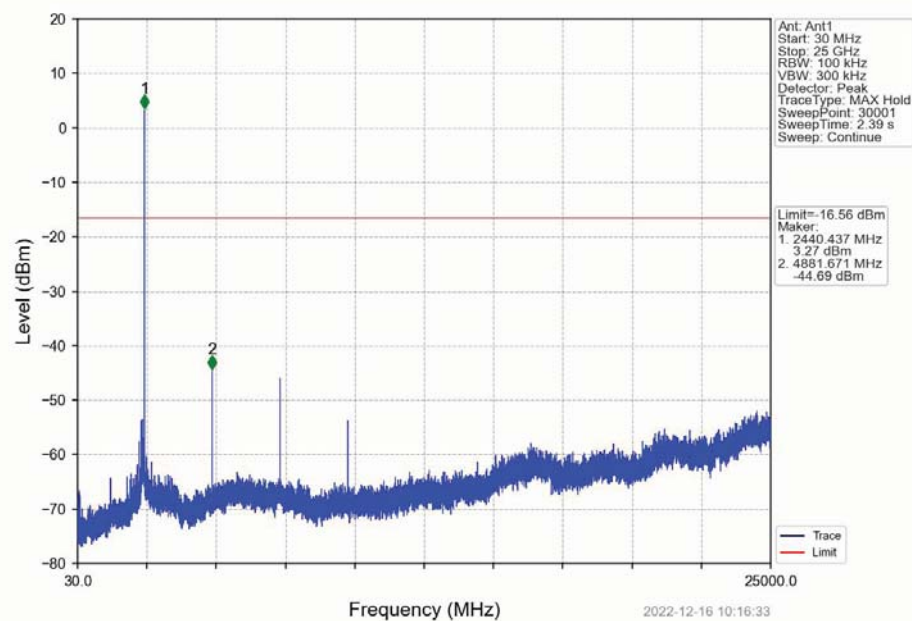
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	3.44	-16.56	Pass
		2441	DH5	1	3.44	-16.56	Pass
		2480	DH5	1	3.44	-16.56	Pass
		HOPP	DH5	1	3.44	-16.56	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	3.23	-16.77	Pass
		2441	2DH5	1	3.23	-16.77	Pass
		2480	2DH5	1	3.23	-16.77	Pass
		HOPP	2DH5	1	3.23	-16.77	Pass
8DPSK	SISO	2402	3DH5	1	3.40	-16.60	Pass
		2441	3DH5	1	3.40	-16.60	Pass
		2480	3DH5	1	3.40	-16.60	Pass
		HOPP	3DH5	1	3.40	-16.60	Pass

Note1: Refer to RSS-247 Issue 2 section 5.5 and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

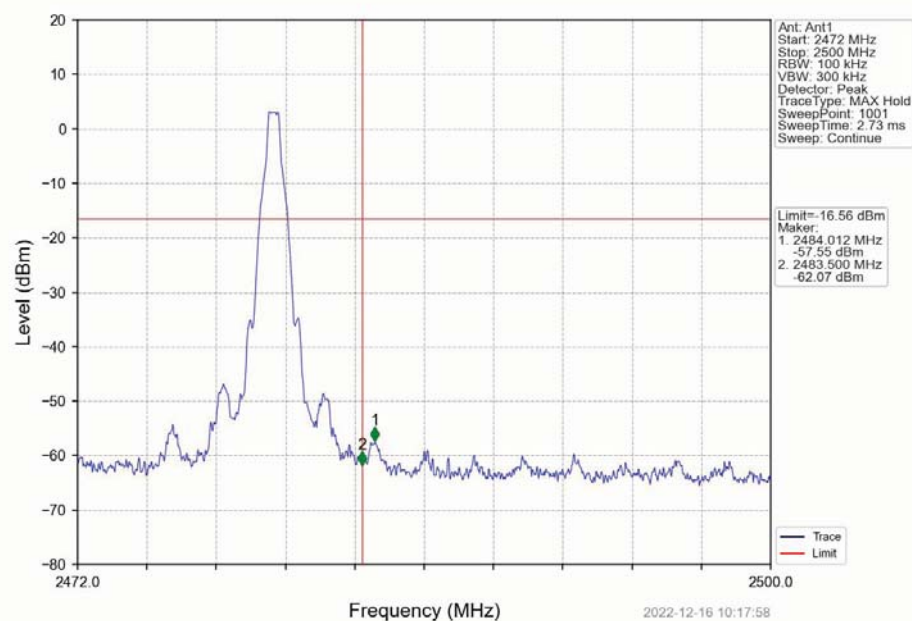
6.2.2 Test Graph



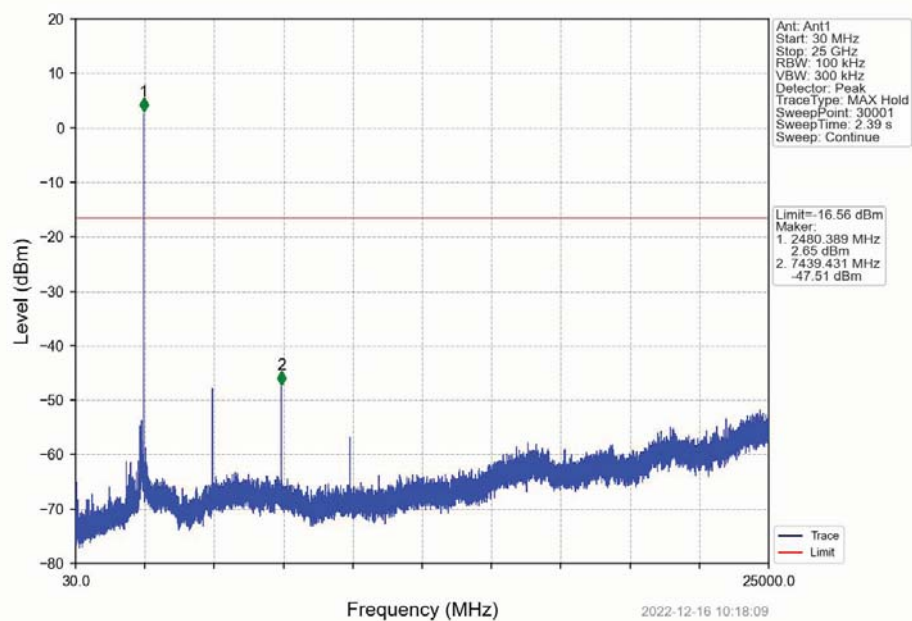
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



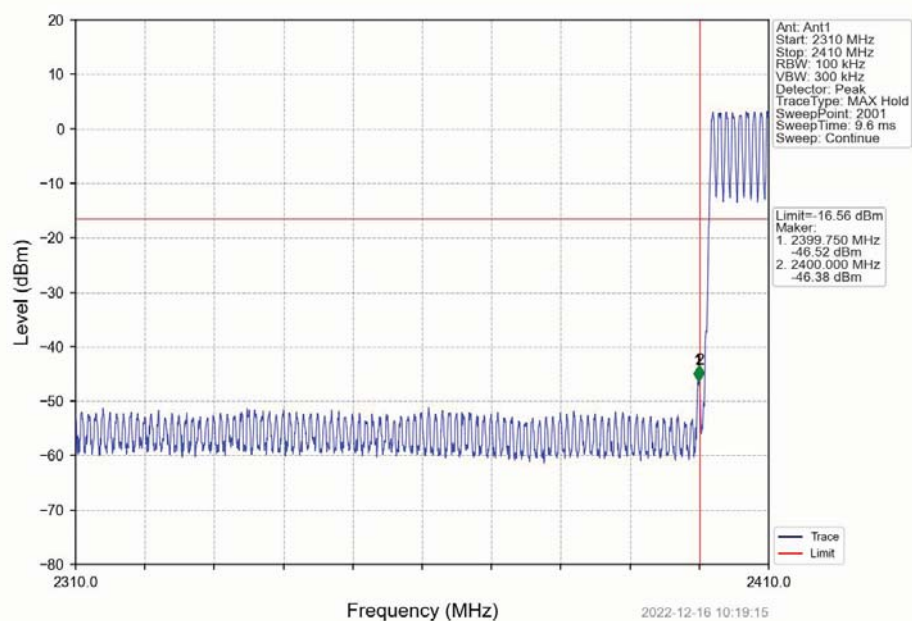
GFSK_DH5_HCH_2480MHz_Ant1_NTNV

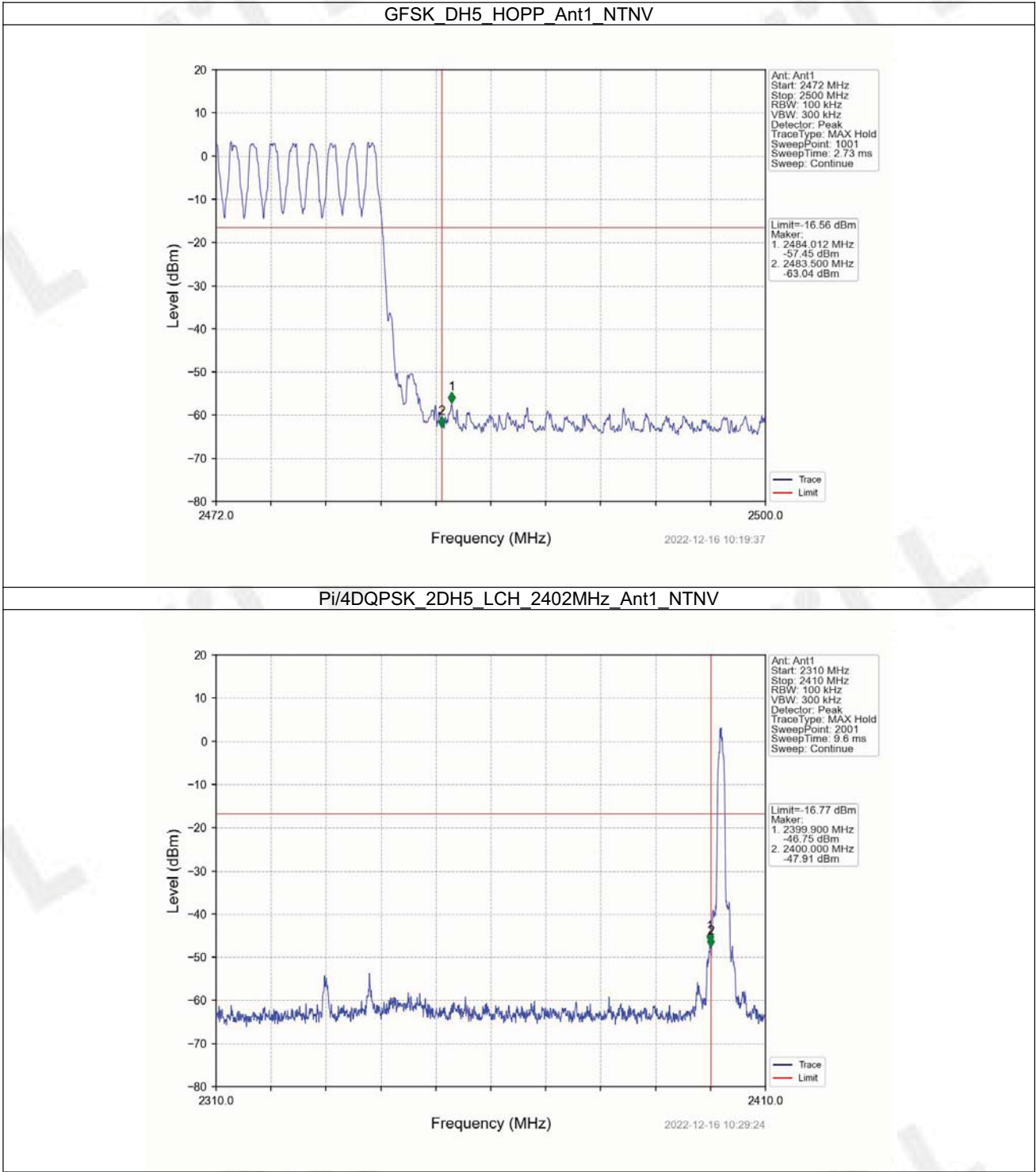


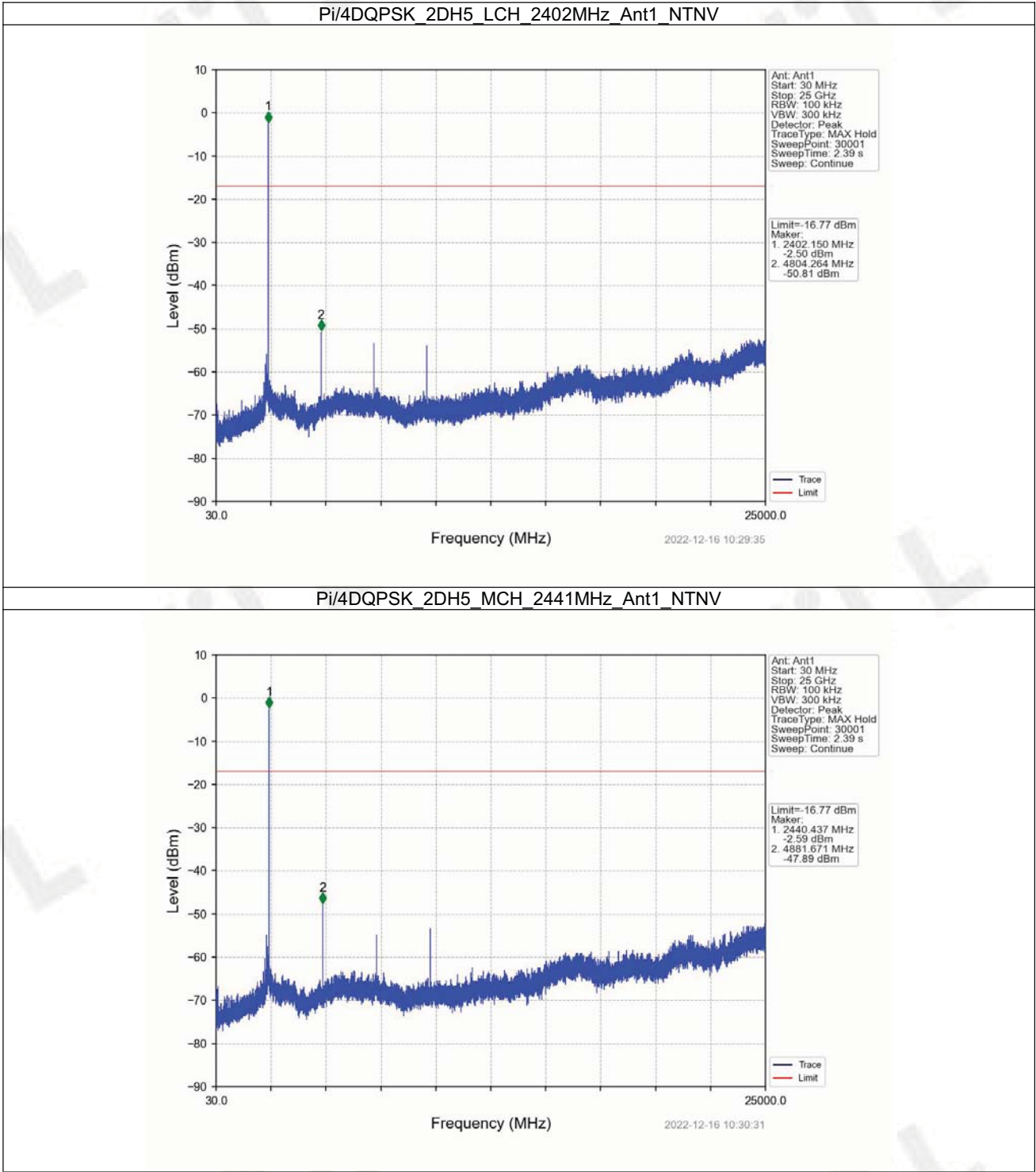
GFSK_DH5_HCH_2480MHz_Ant1_NTNV

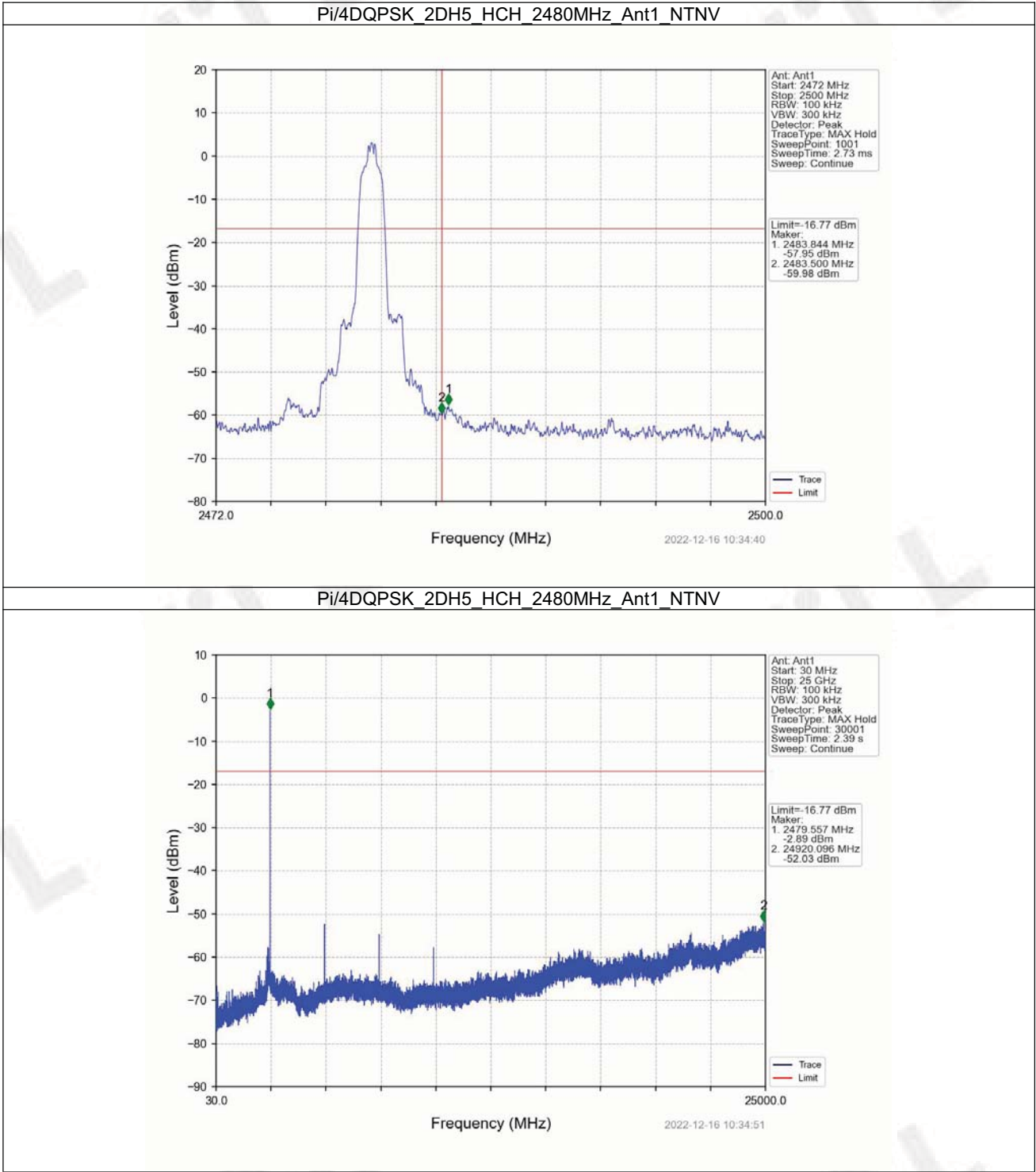


GFSK_DH5_HOPP_Ant1_NTNV

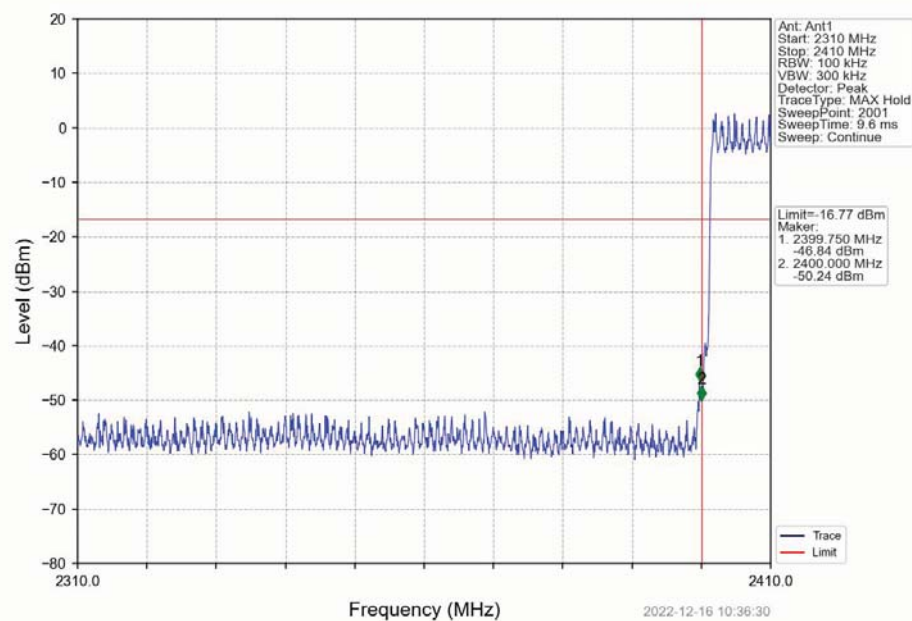




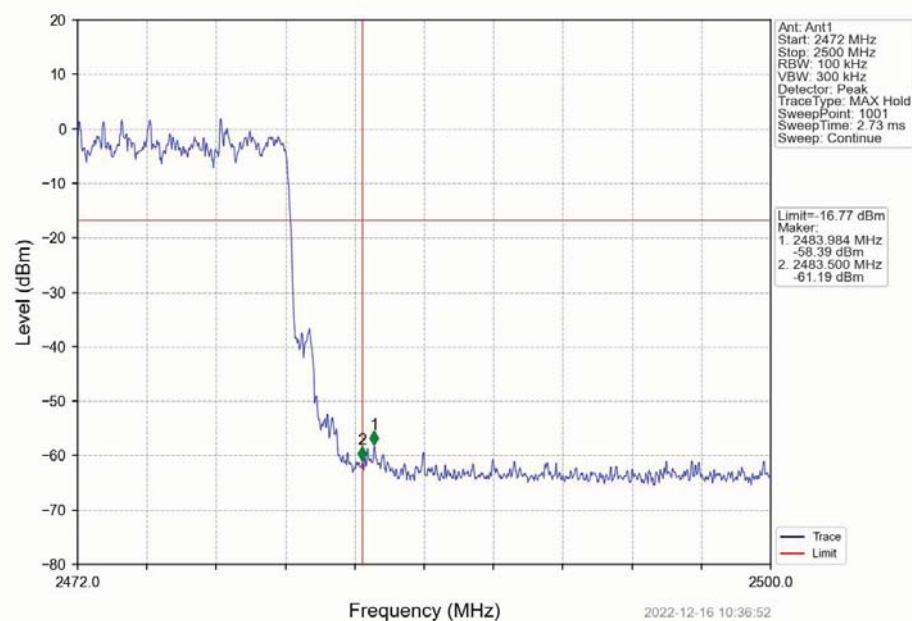


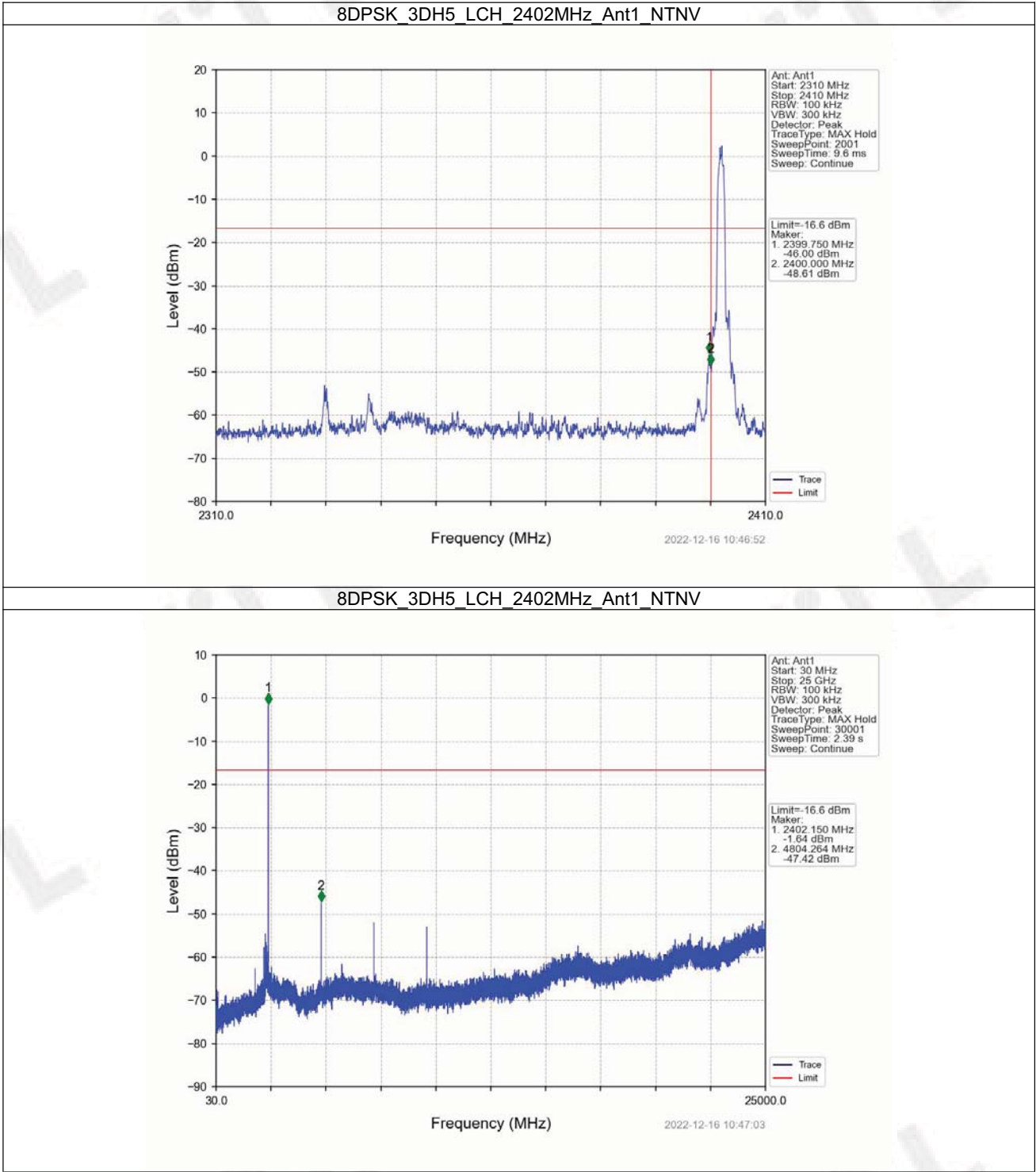


Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

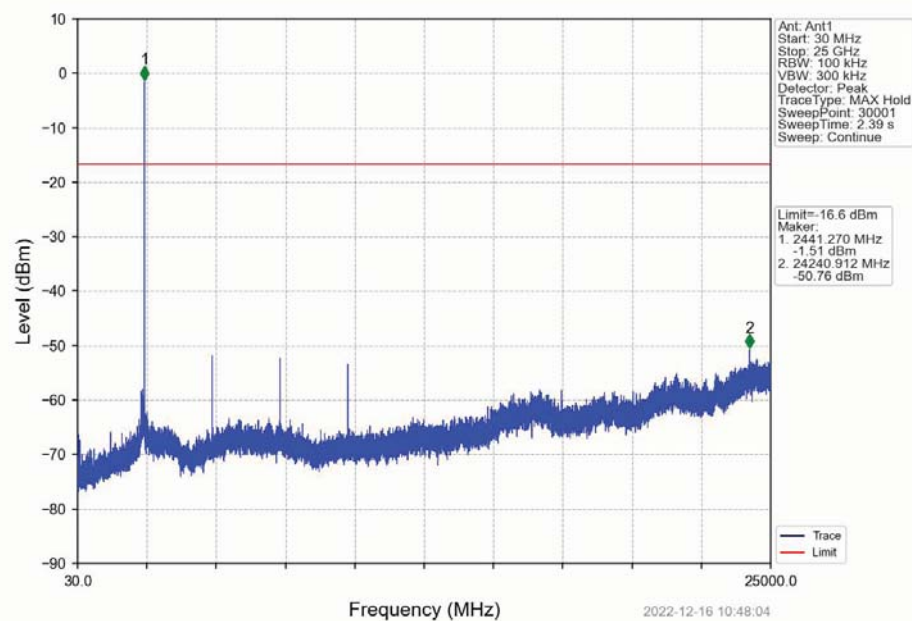


Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

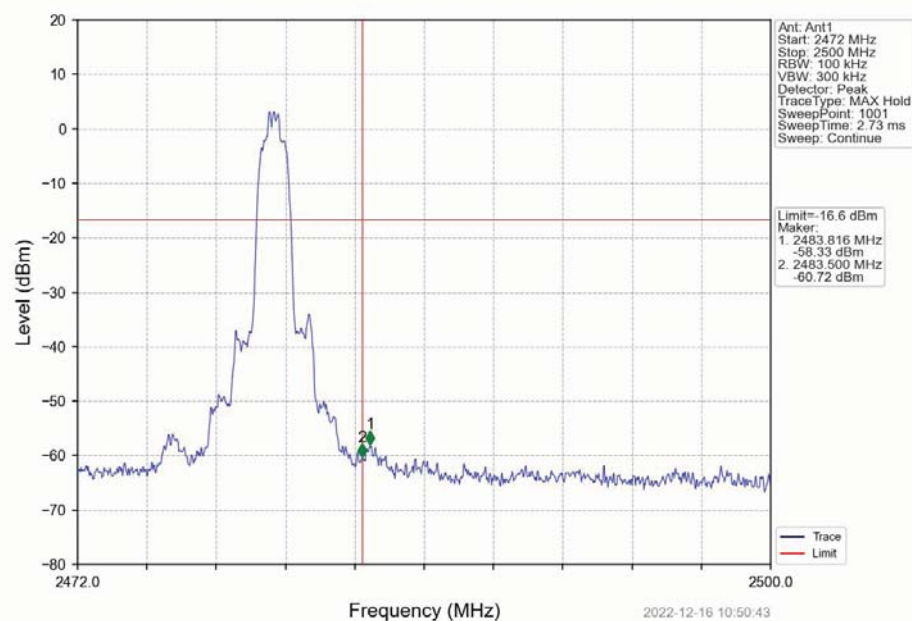




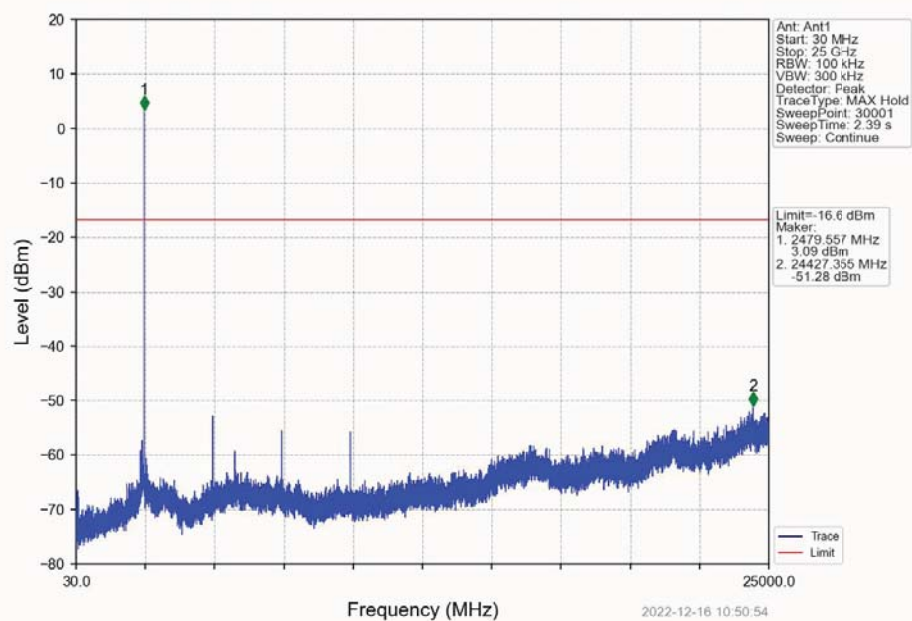
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8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV

