



Shenzhen CTL Testing Technology Co., Ltd.

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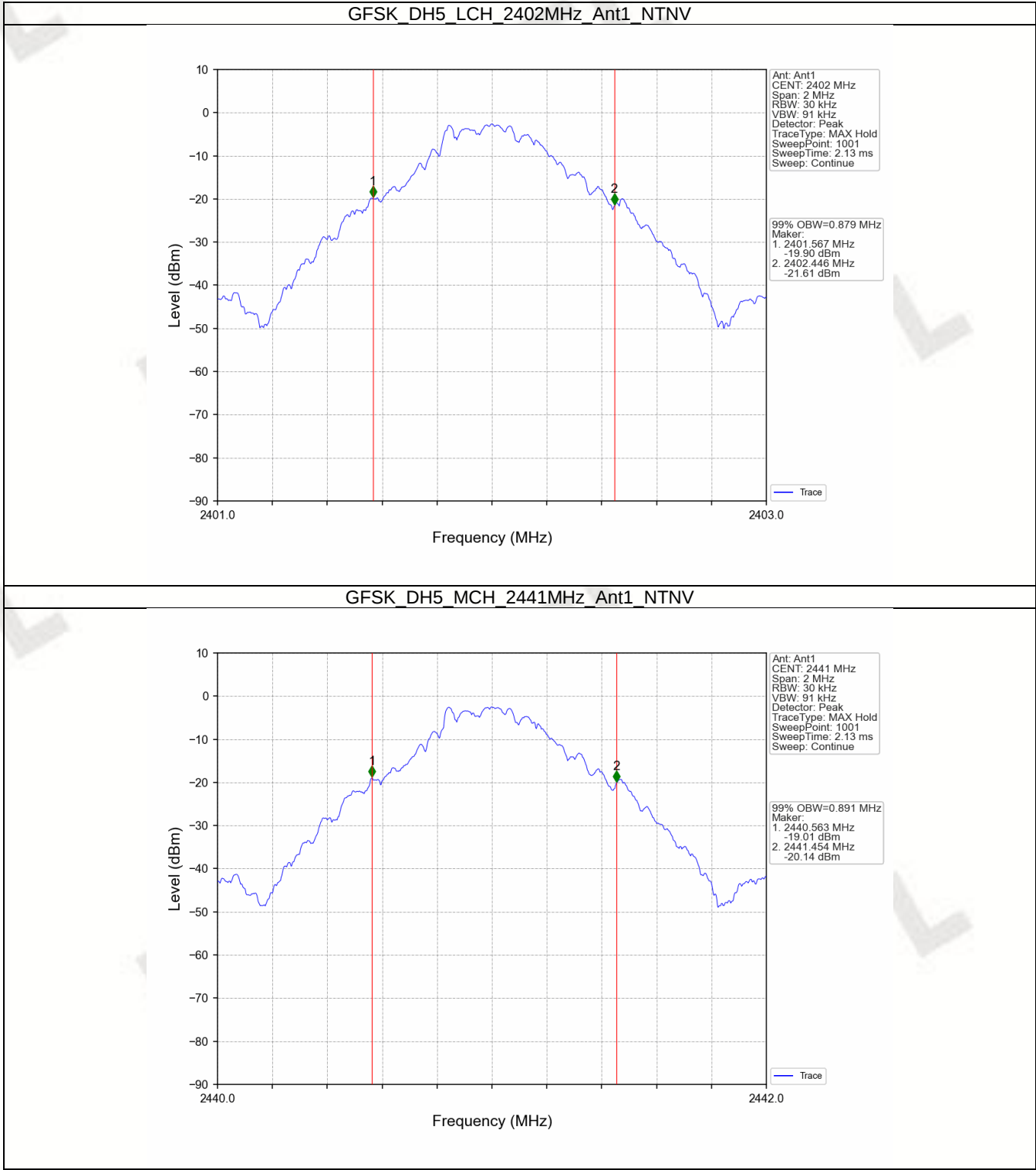
1. Bandwidth

1.1 OBW

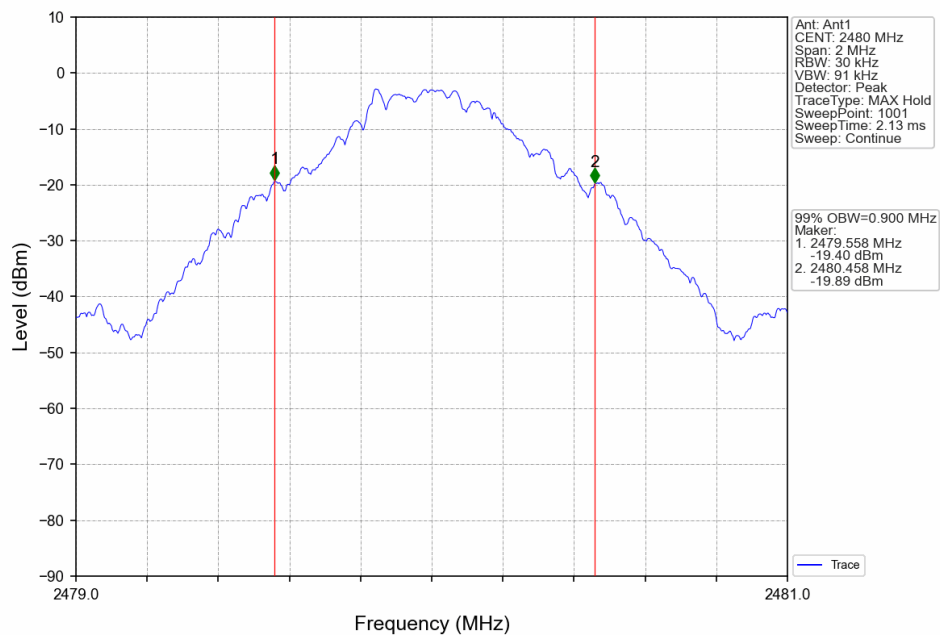
1.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.879	Pass
		2441	DH5	1	0.891	Pass
		2480	DH5	1	0.900	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.174	Pass
		2441	2DH5	1	1.184	Pass
		2480	2DH5	1	1.182	Pass
8DPSK	SISO	2402	3DH5	1	1.182	Pass
		2441	3DH5	1	1.184	Pass
		2480	3DH5	1	1.185	Pass

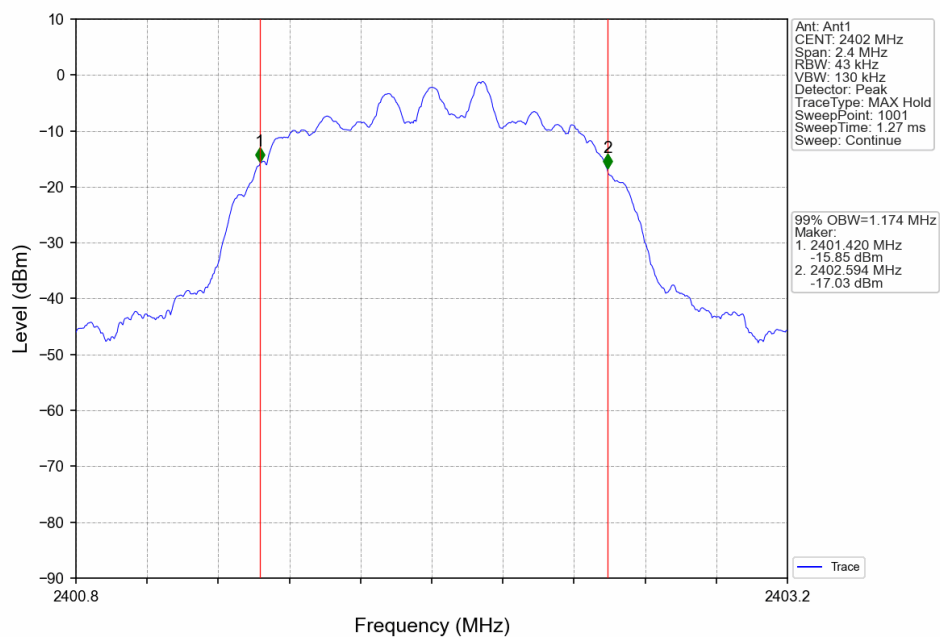
1.1.2 Test Graph

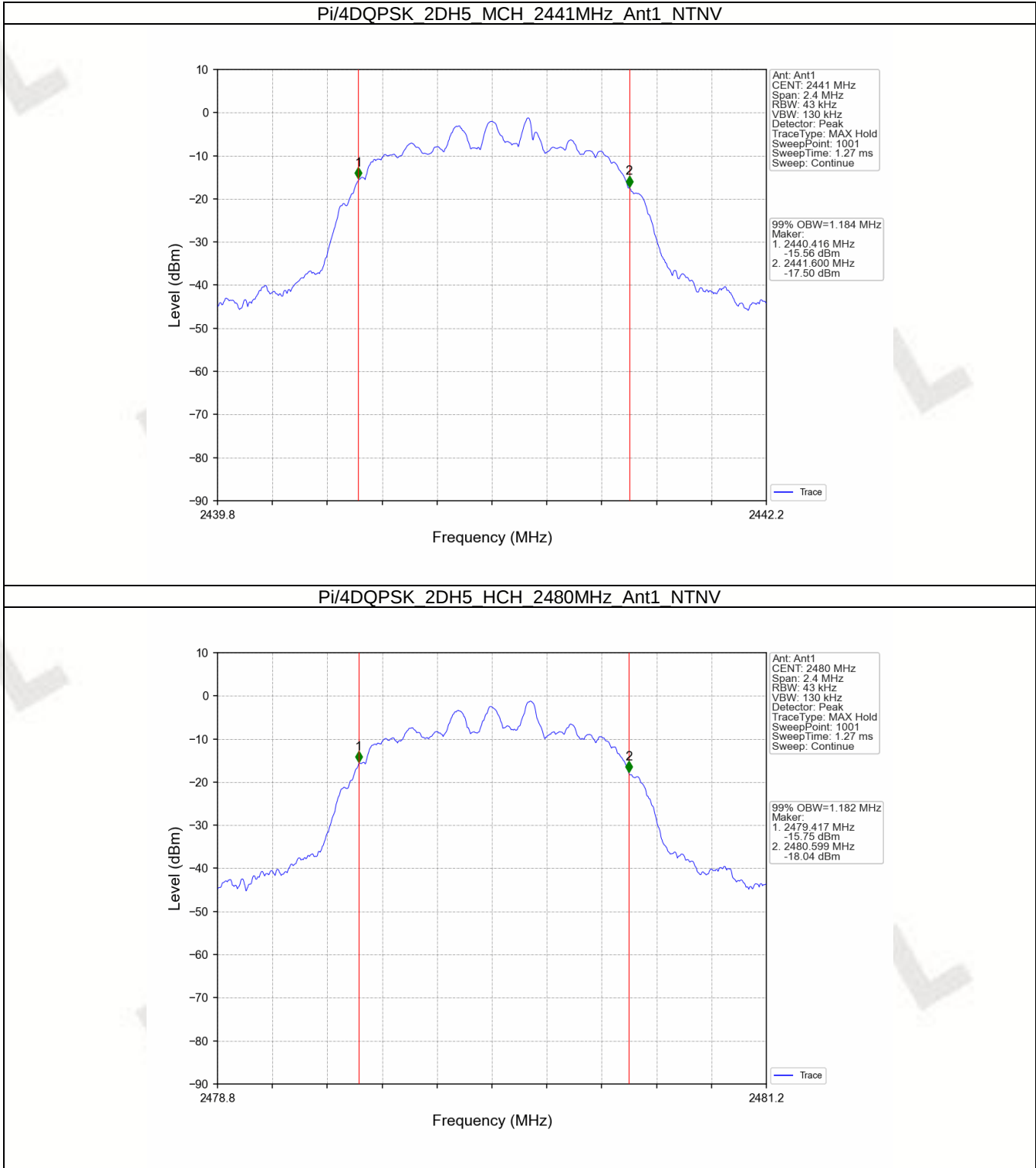


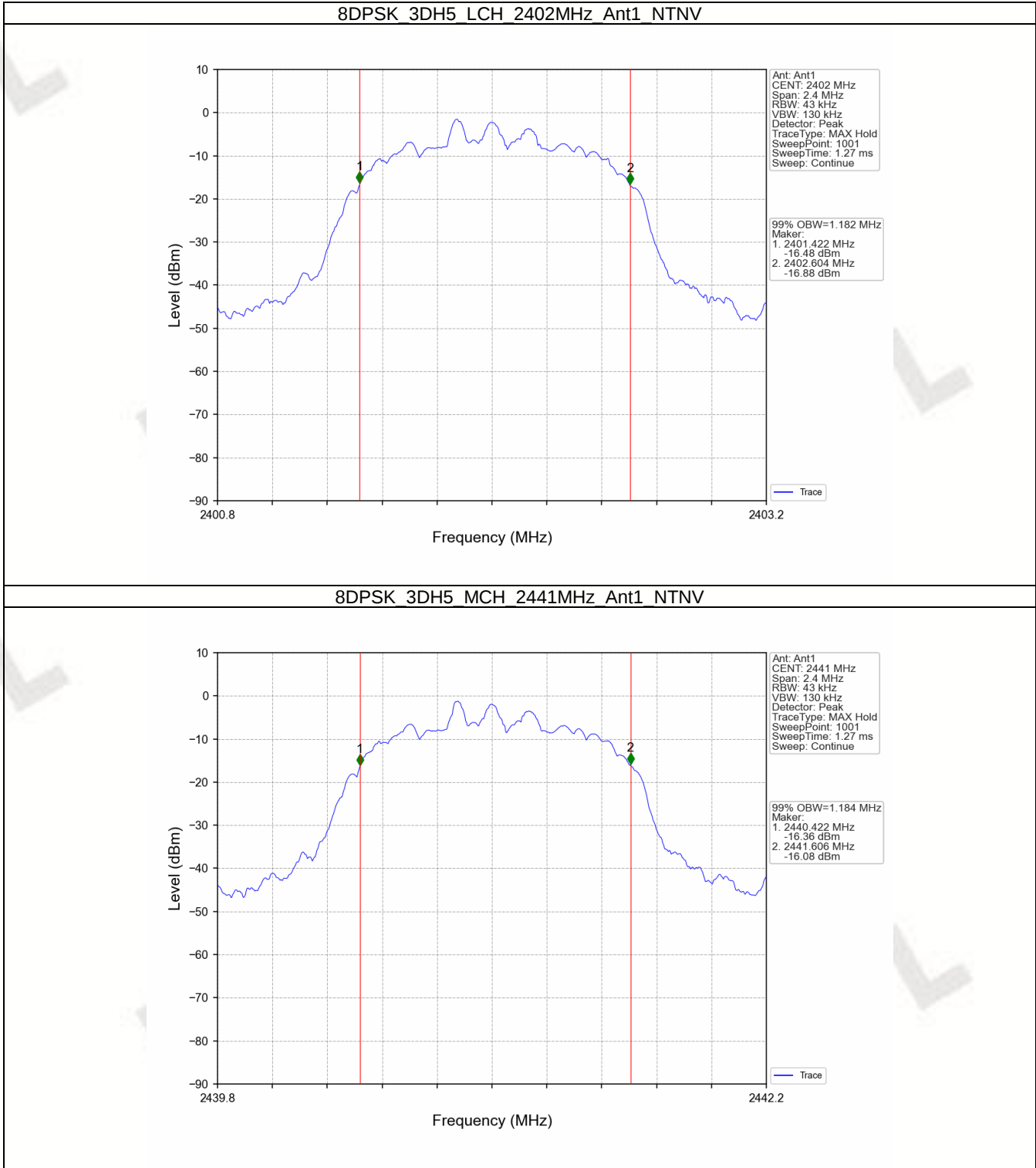
GFSK DH5 HCH 2480MHz Ant1 NTNV

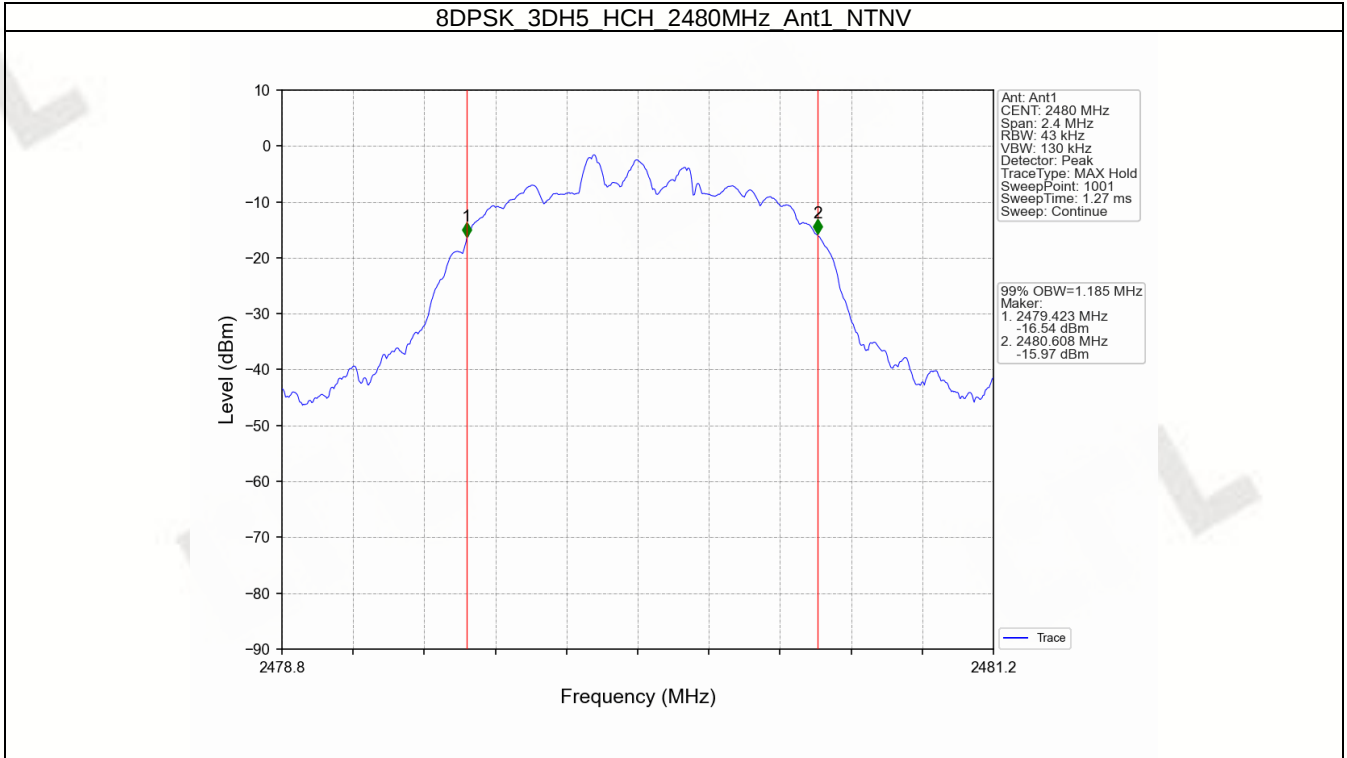


Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTNV







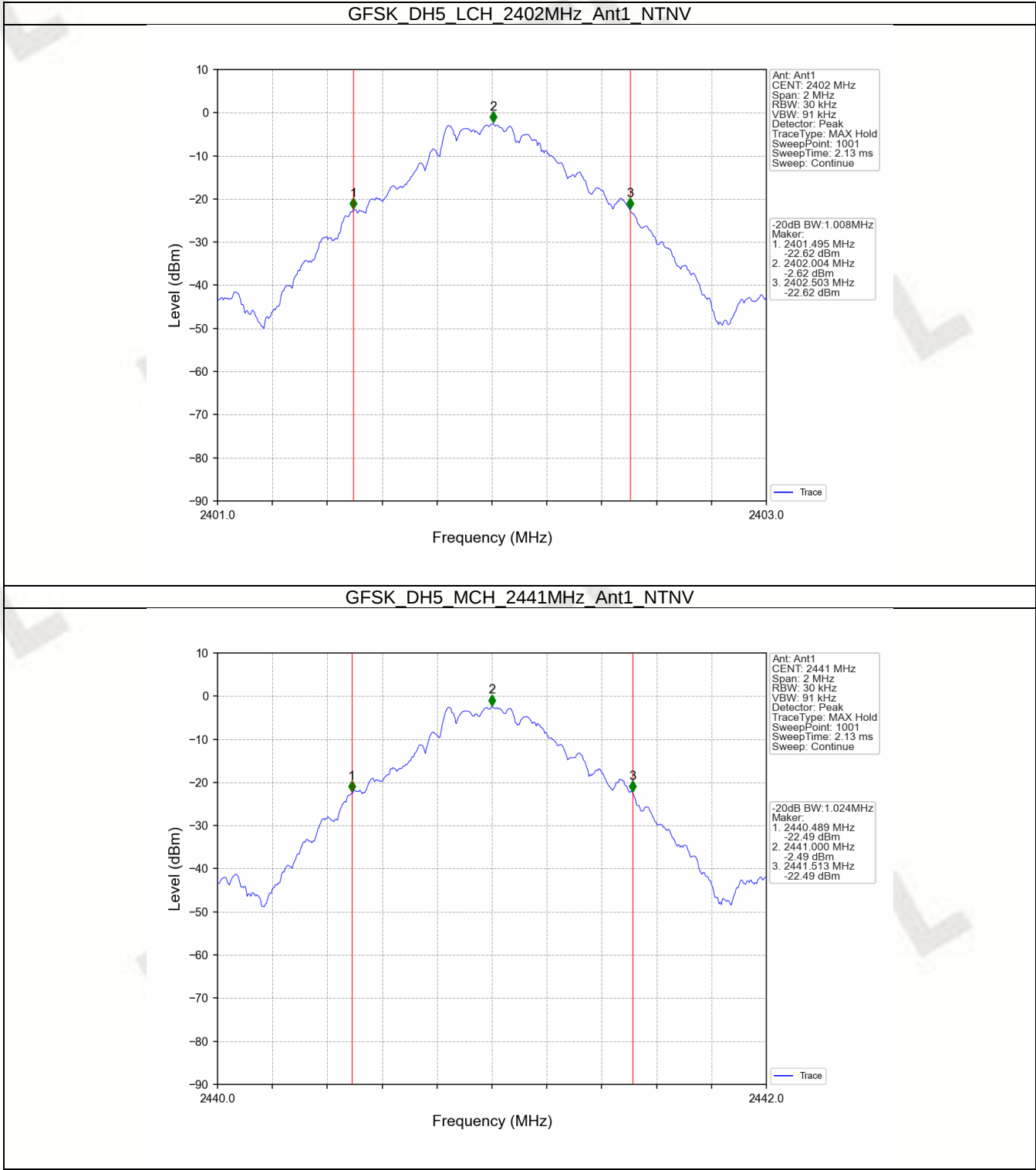


1.2 20dB BW

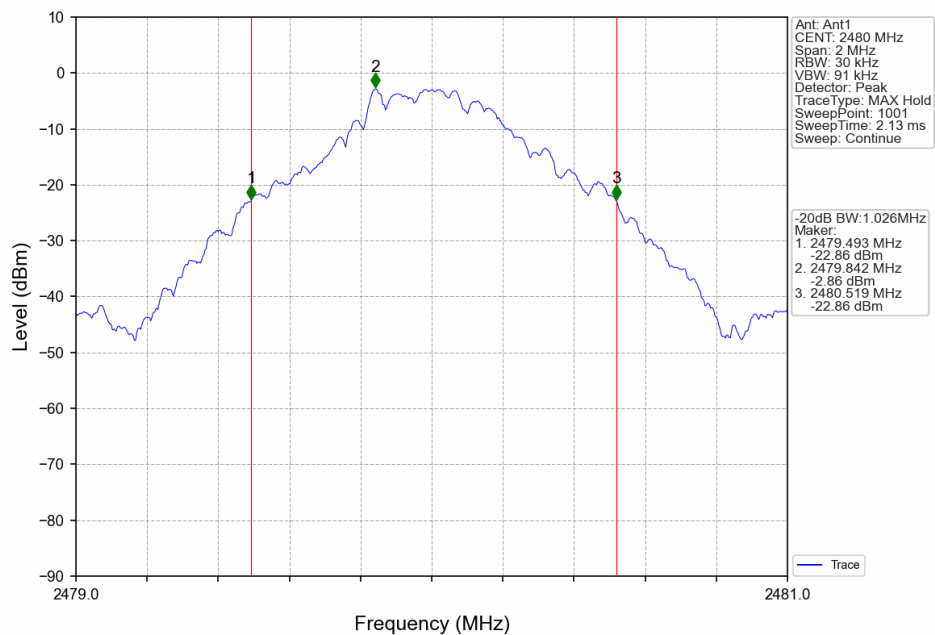
1.2.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	1.008	Pass
		2441	DH5	1	1.024	Pass
		2480	DH5	1	1.026	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.297	Pass
		2441	2DH5	1	1.295	Pass
		2480	2DH5	1	1.319	Pass
8DPSK	SISO	2402	3DH5	1	1.314	Pass
		2441	3DH5	1	1.313	Pass
		2480	3DH5	1	1.310	Pass

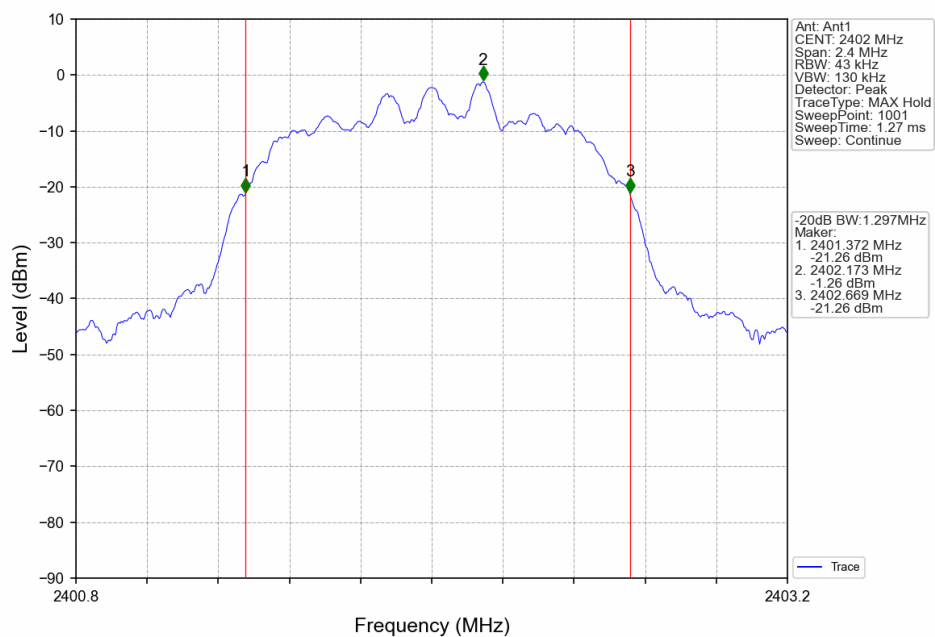
1.2.2 Test Graph



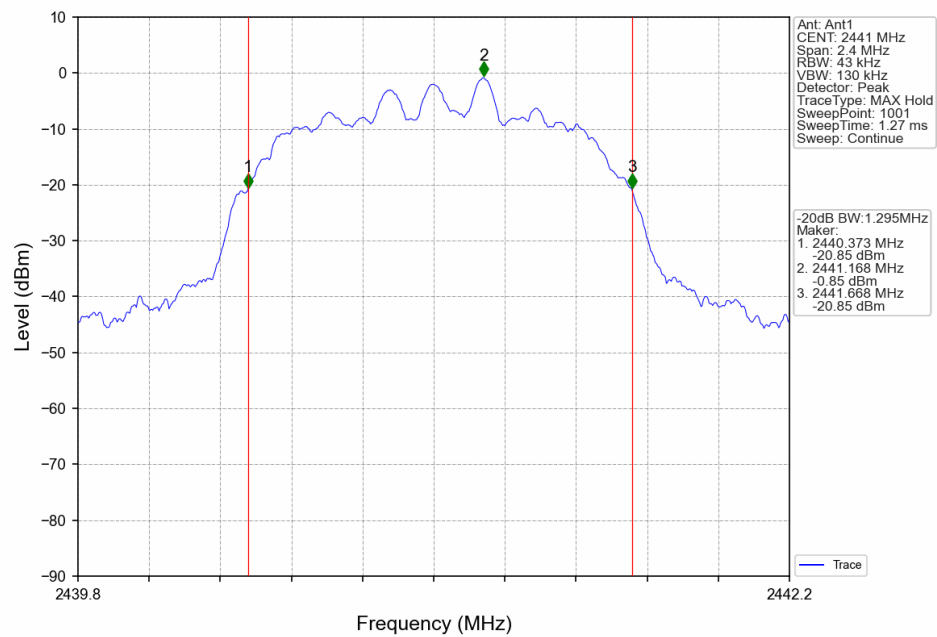
GFSK DH5 HCH 2480MHz Ant1 NTNV



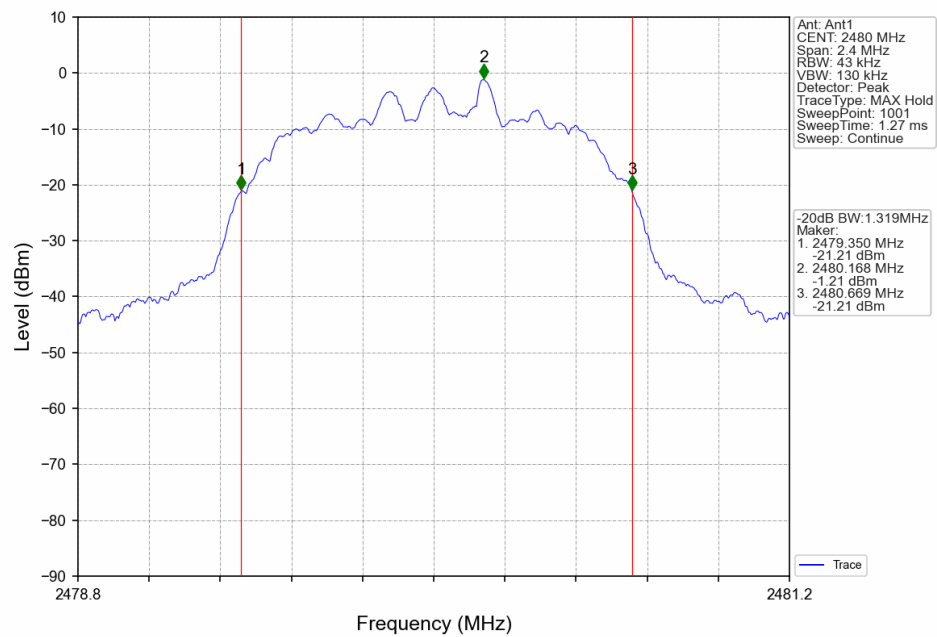
Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTNV



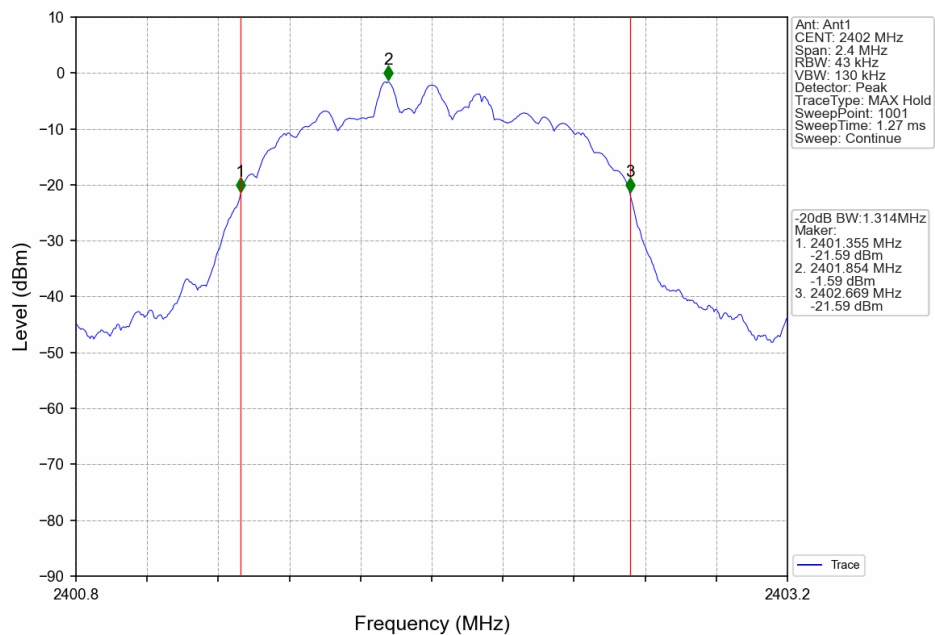
Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTNV



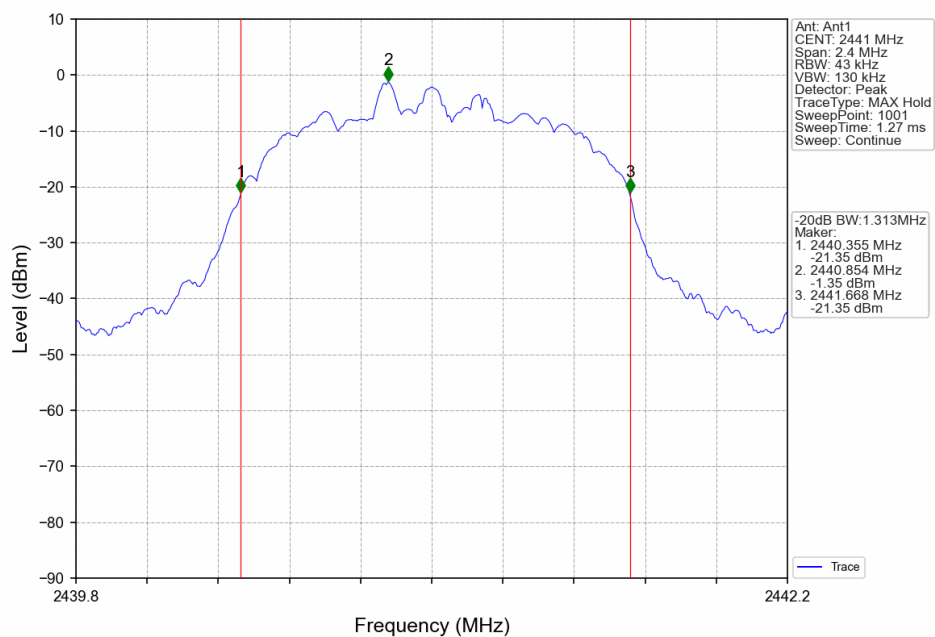
Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTNV

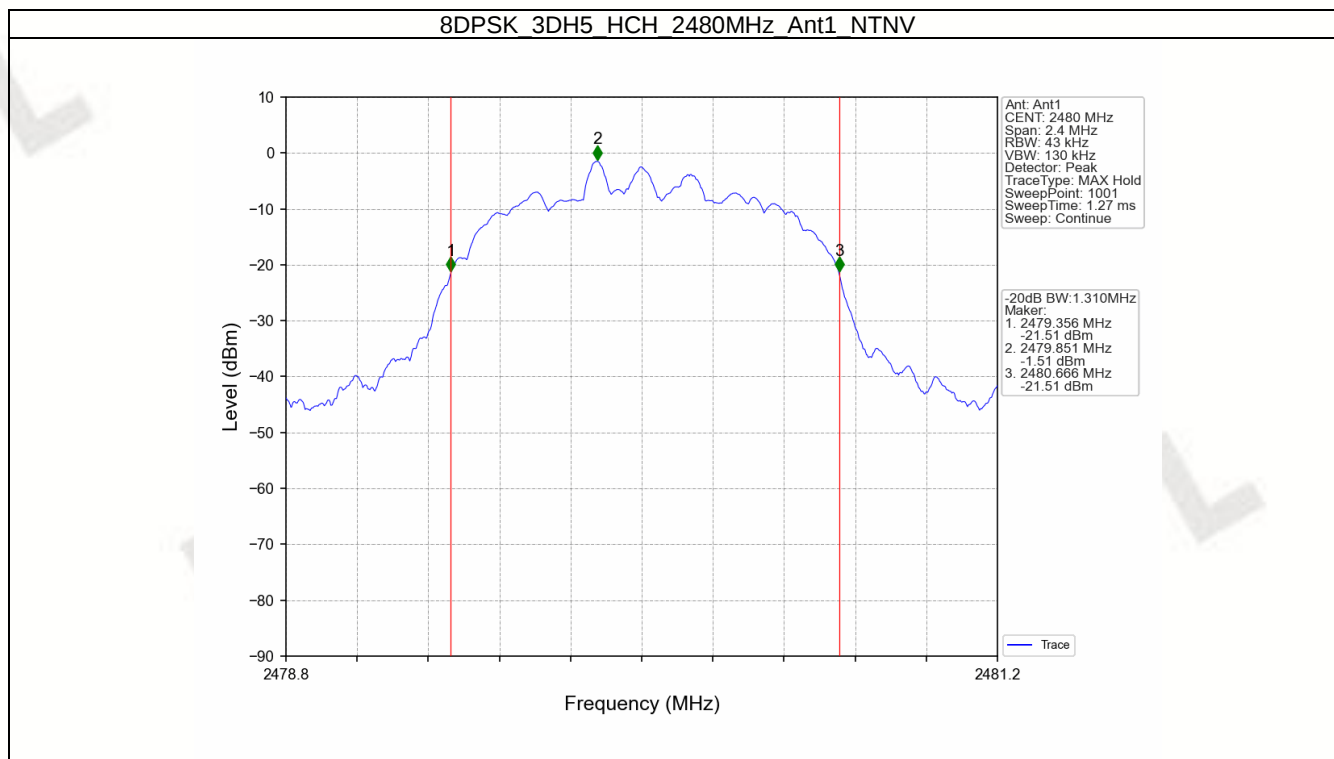


8DPSK 3DH5 LCH 2402MHz Ant1 NTV



8DPSK 3DH5 MCH 2441MHz Ant1 NTV





2. Maximum Conducted Output Power

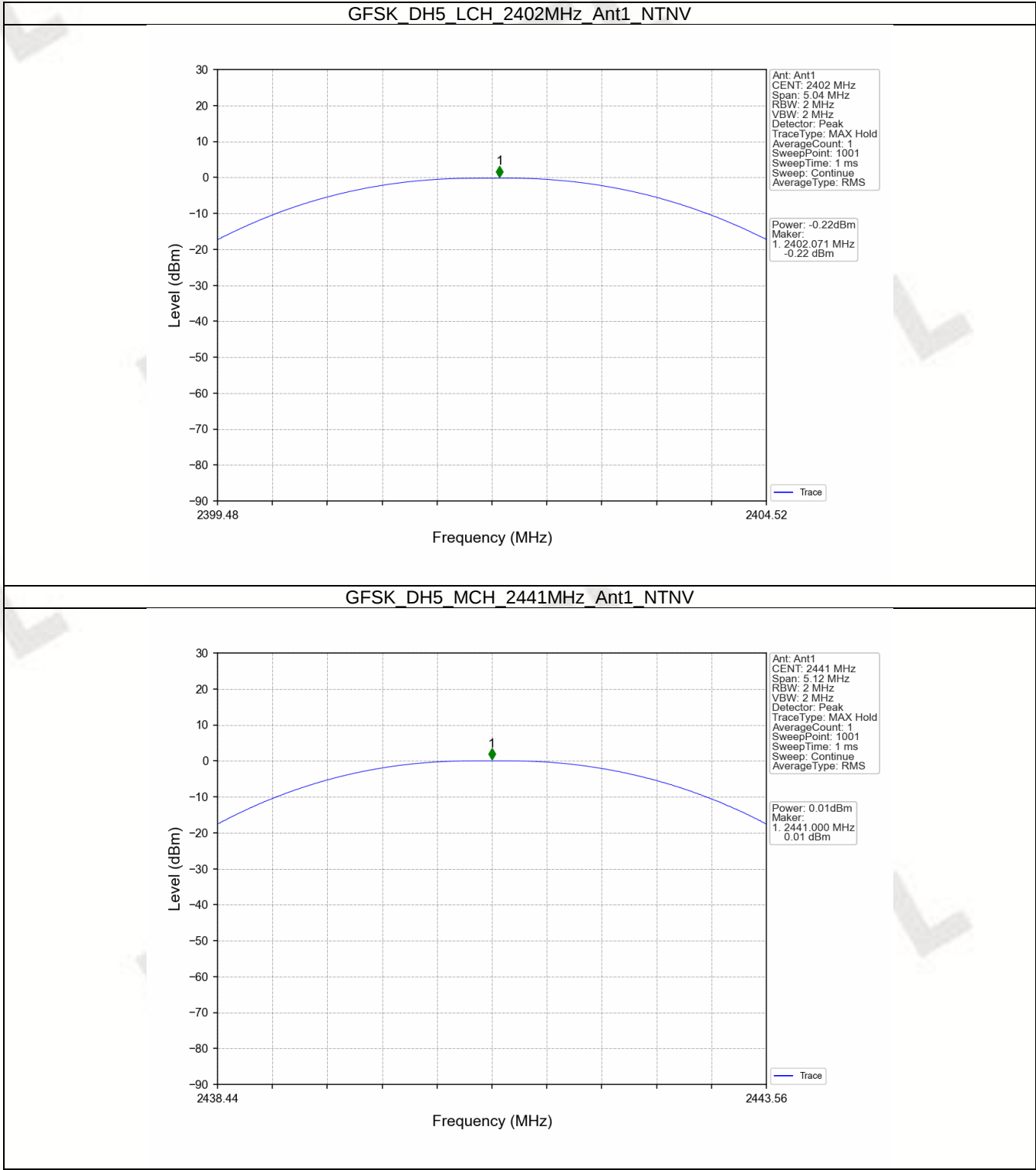
2.1 Power

2.1.1 Test Result

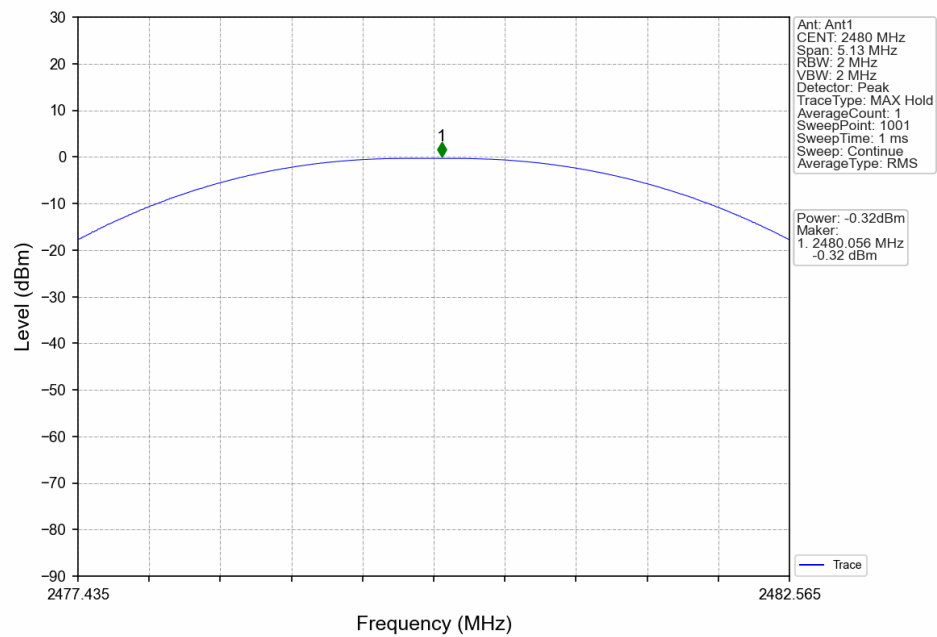
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-0.22	≤ 20.97	Pass
		2441	DH5	0.01	≤ 20.97	Pass
		2480	DH5	-0.32	≤ 20.97	Pass
PI/4DQPSK	SISO	2402	2DH5	0.64	≤ 20.97	Pass
		2441	2DH5	0.84	≤ 20.97	Pass
		2480	2DH5	0.53	≤ 20.97	Pass
8DPSK	SISO	2402	3DH5	0.97	≤ 20.97	Pass
		2441	3DH5	1.20	≤ 20.97	Pass
		2480	3DH5	0.86	≤ 20.97	Pass

Note1: Antenna Gain: Ant1: 1.08dBi;

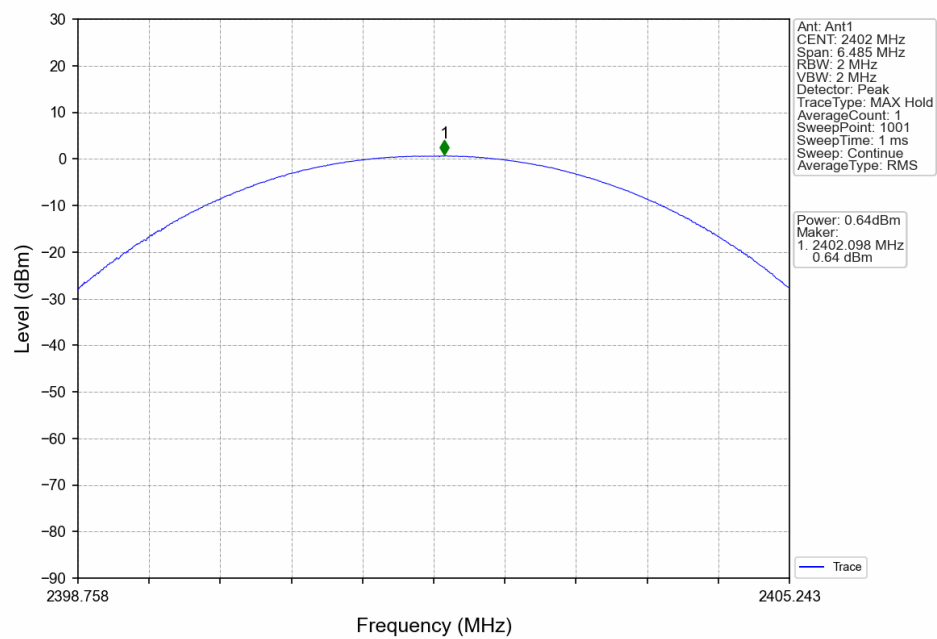
2.1.1.2 Test Graph



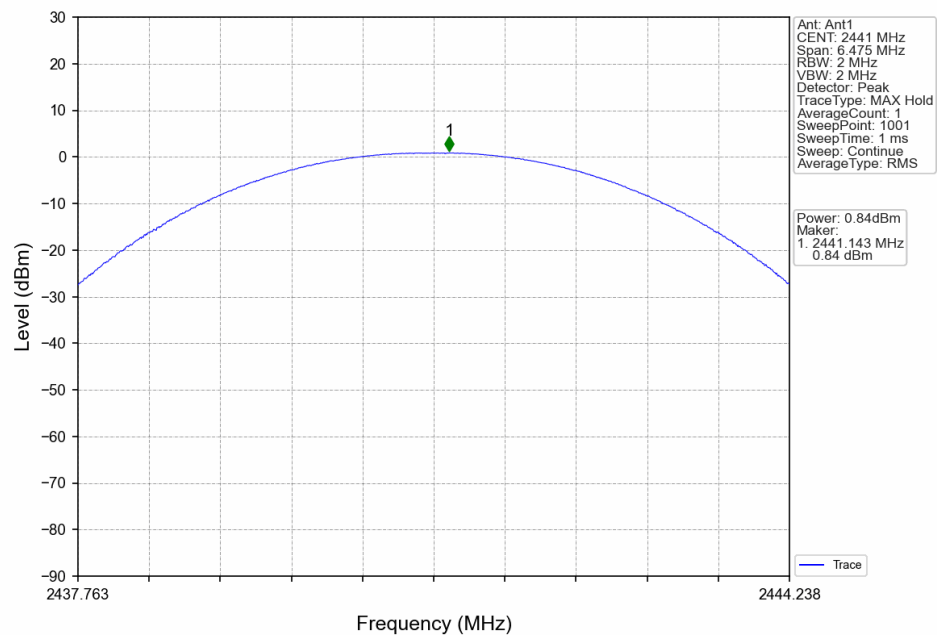
GFSK DH5 HCH 2480MHz Ant1 NTN



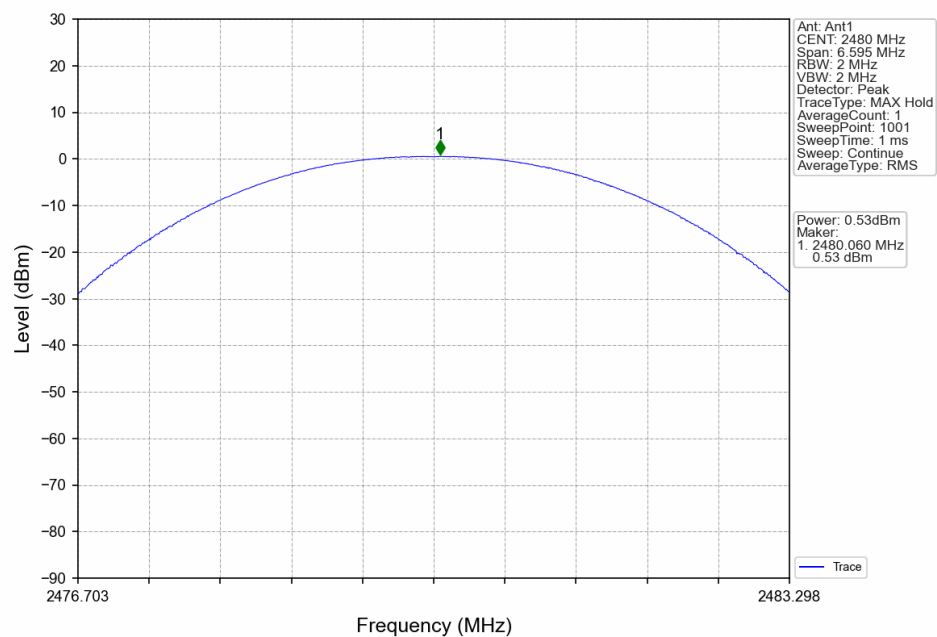
Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN



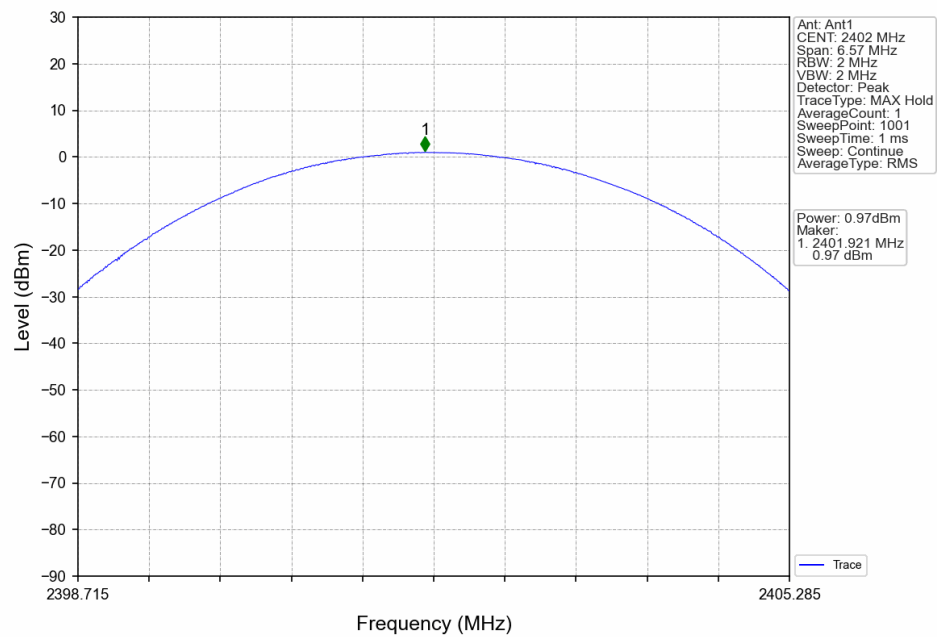
Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTNV



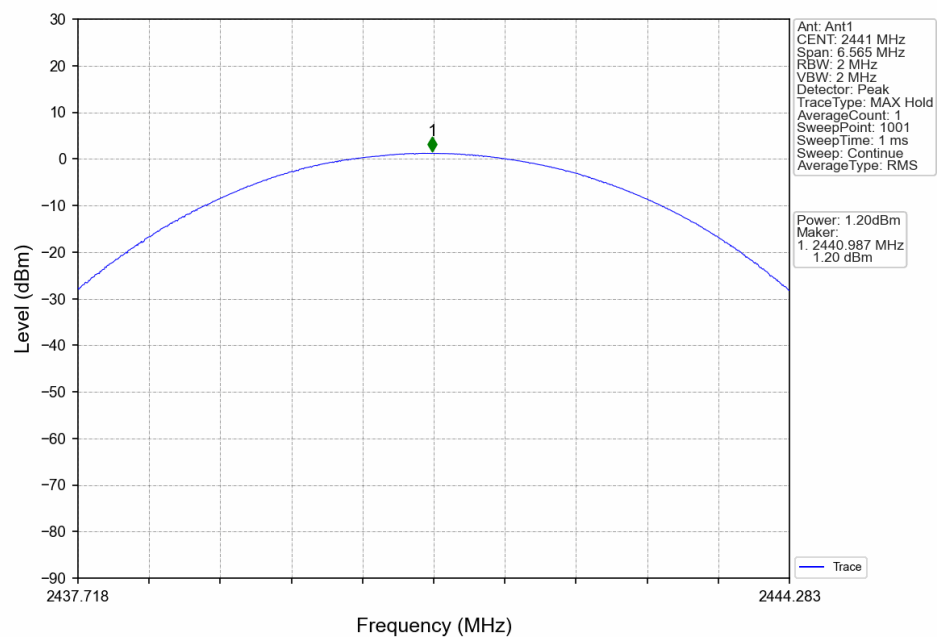
Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTNV

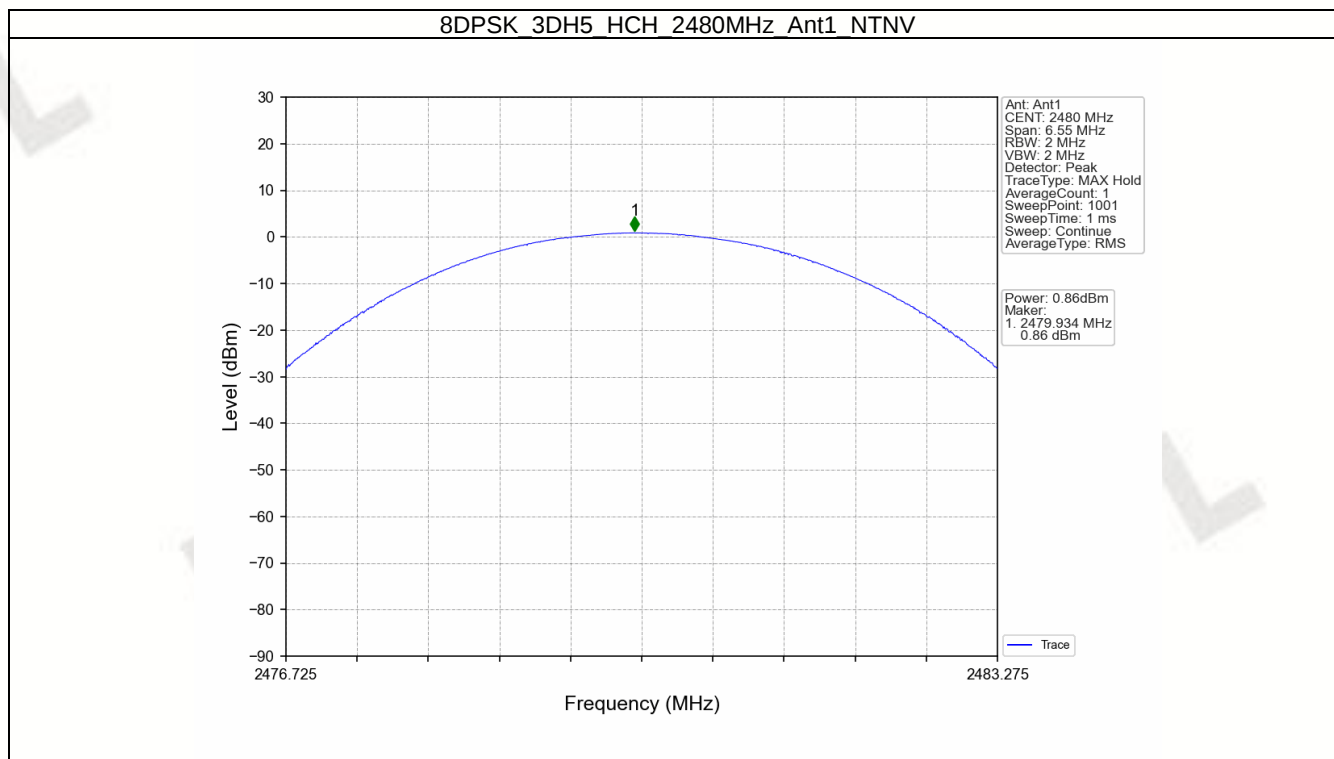


8DPSK 3DH5 LCH 2402MHz Ant1 NTN



8DPSK 3DH5 MCH 2441MHz Ant1 NTN





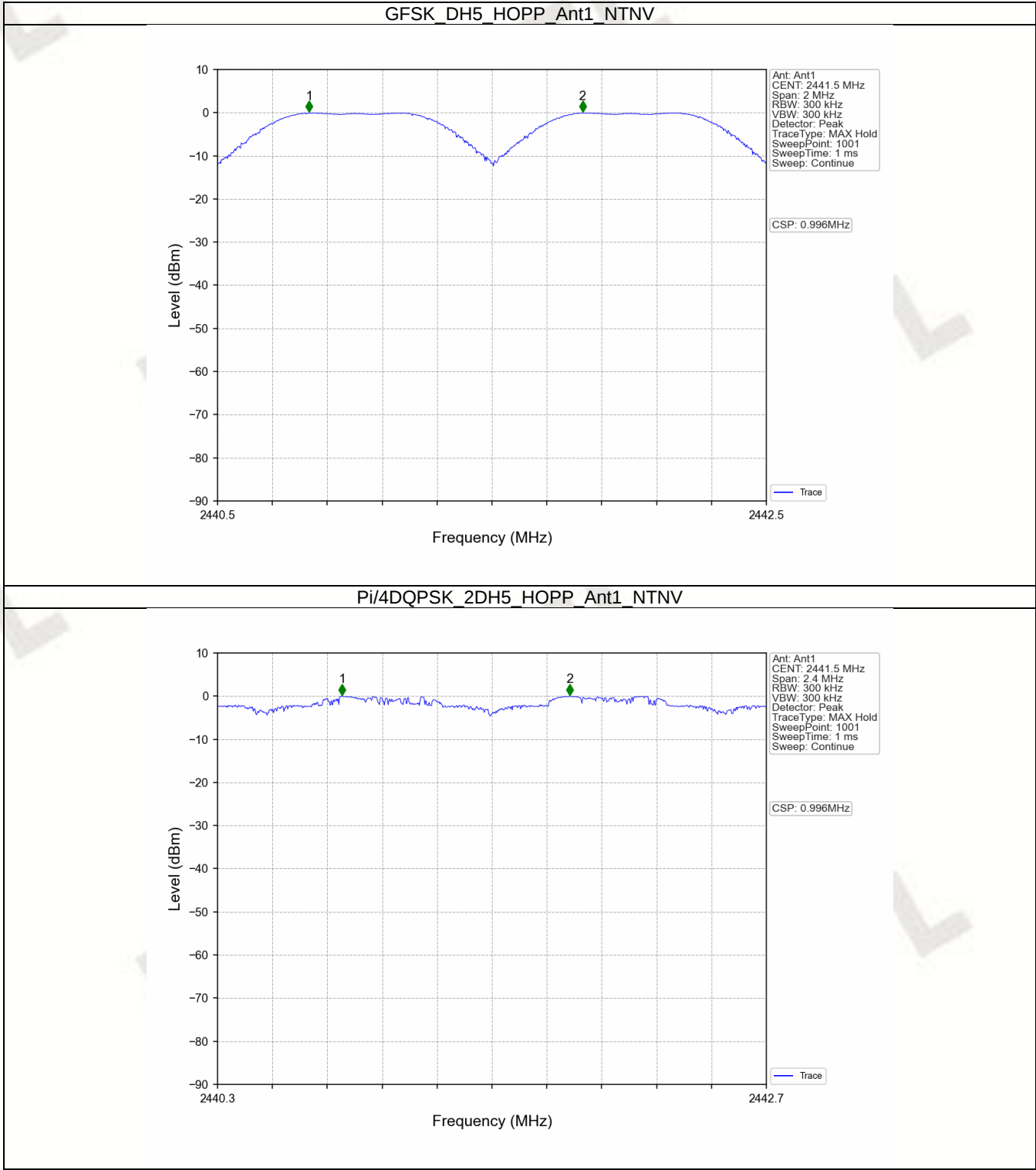
3. Carrier Frequency Separation

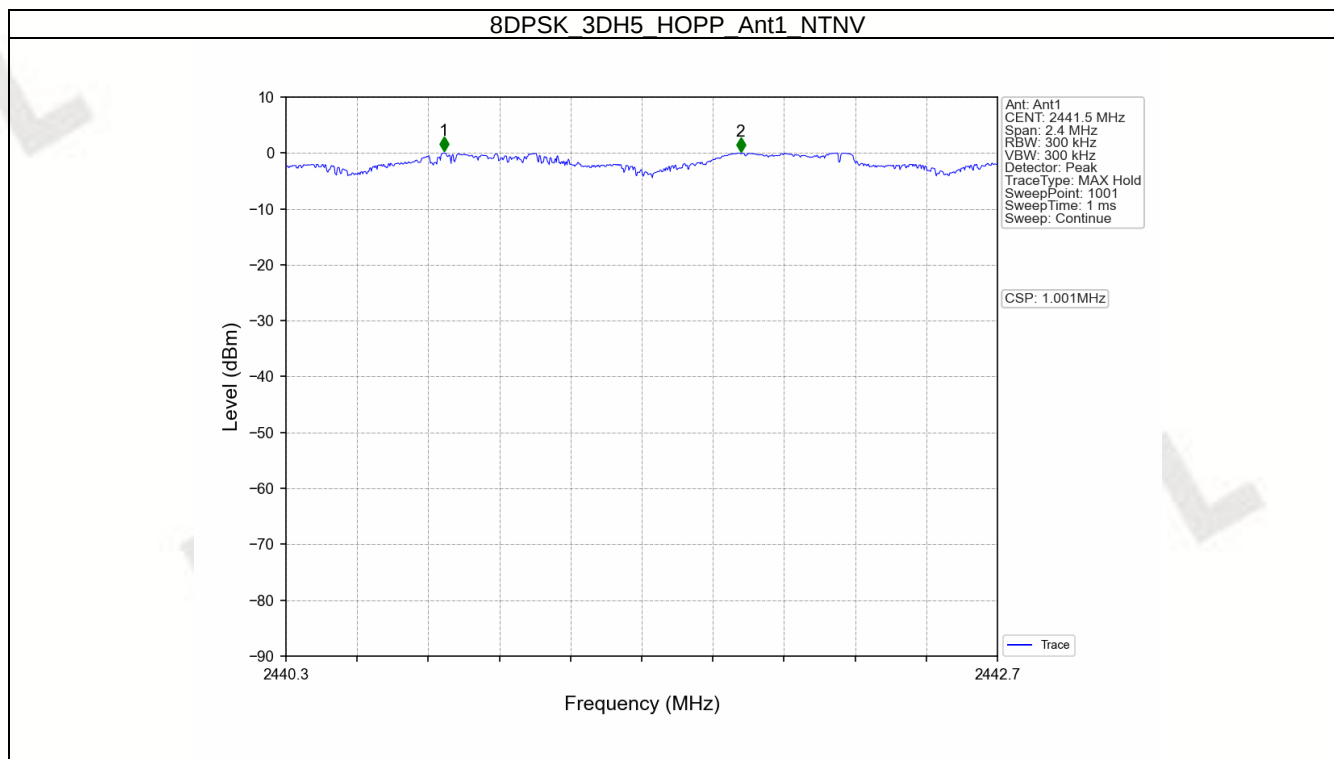
3.1 Ant1

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	0.996	1.026	≥ 0.684	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	0.996	1.319	≥ 0.879	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.314	≥ 0.876	Pass

3.1.2 Test Graph





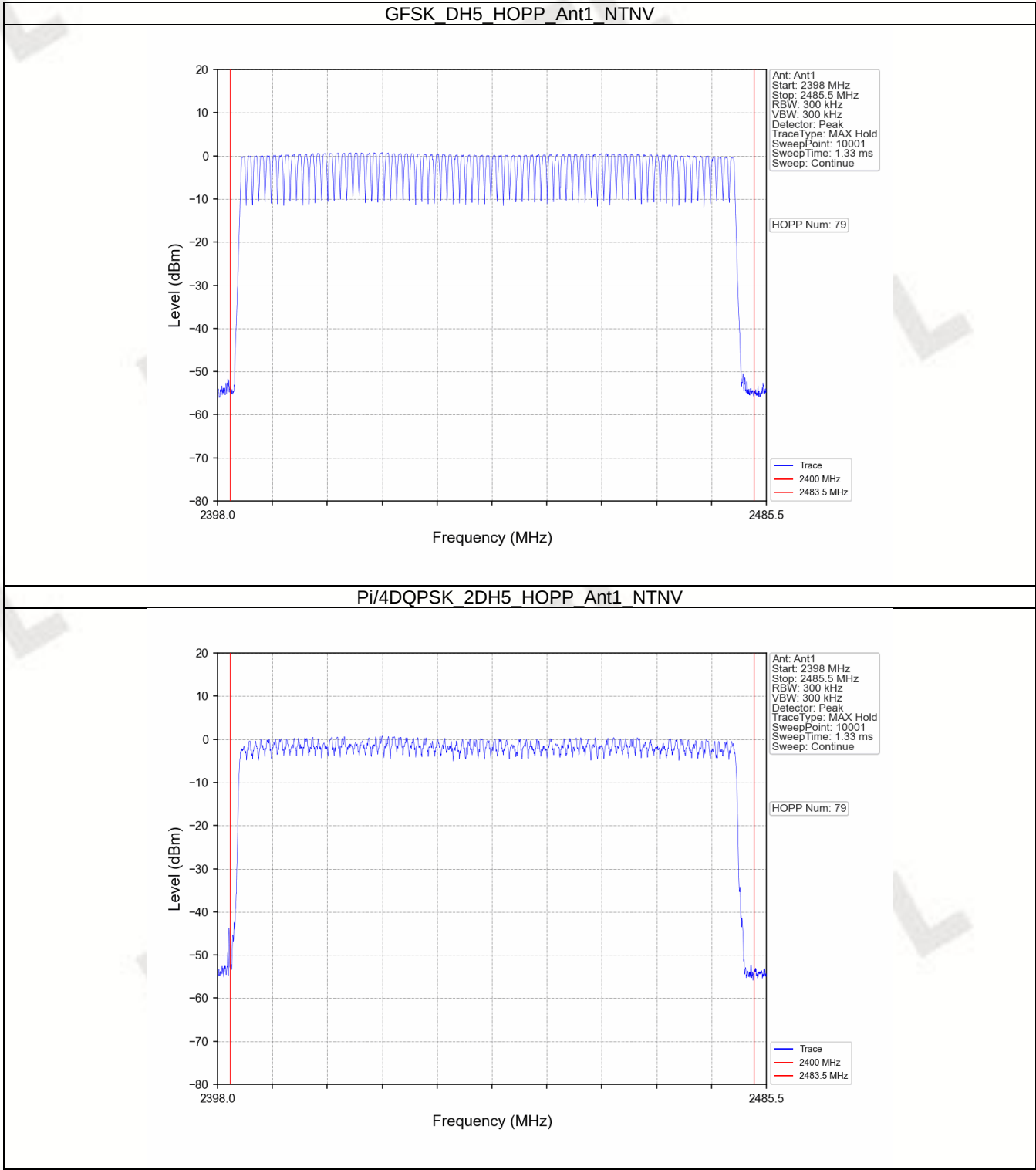
4. Number of Hopping Frequencies

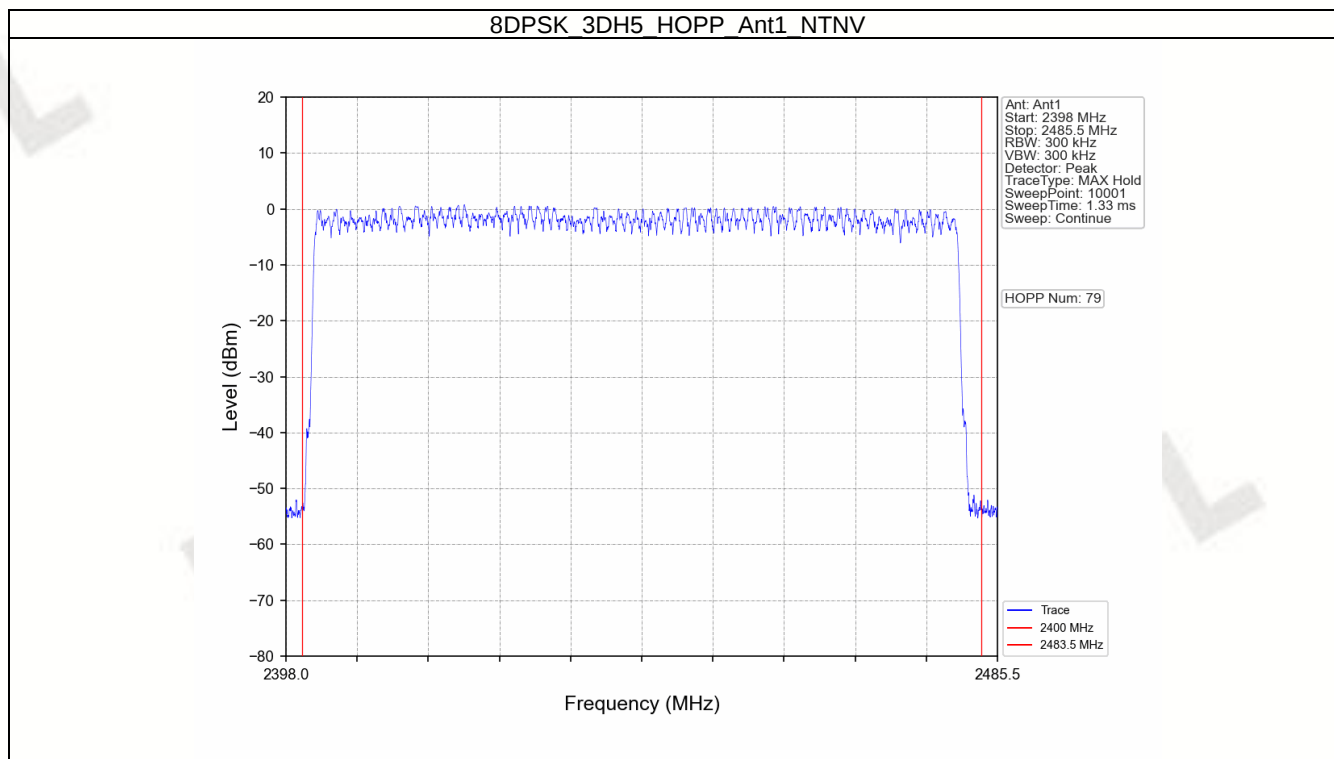
4.1 HoppNum

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





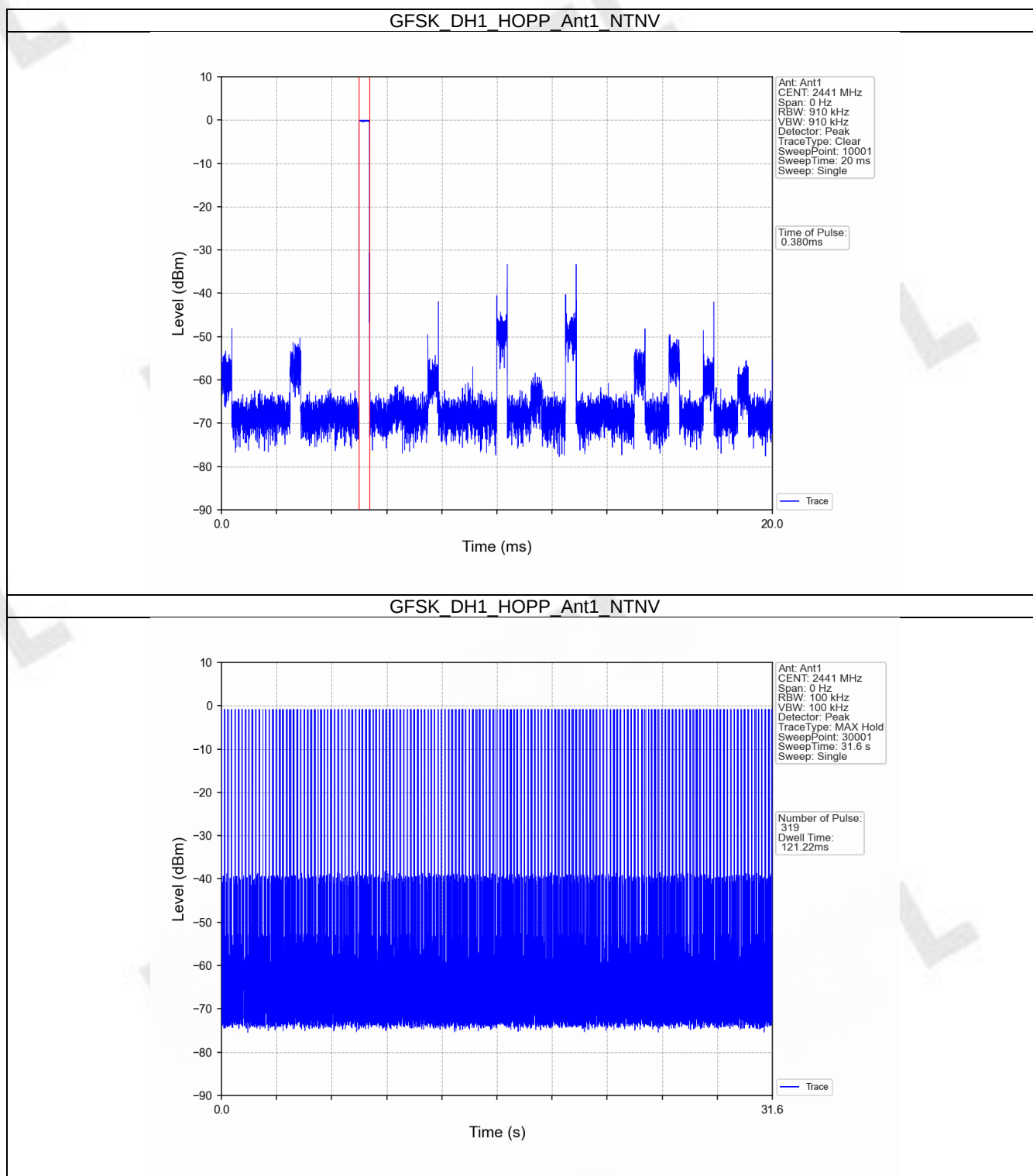
5. Time of Occupancy (Dwell Time)

5.1 Ant1

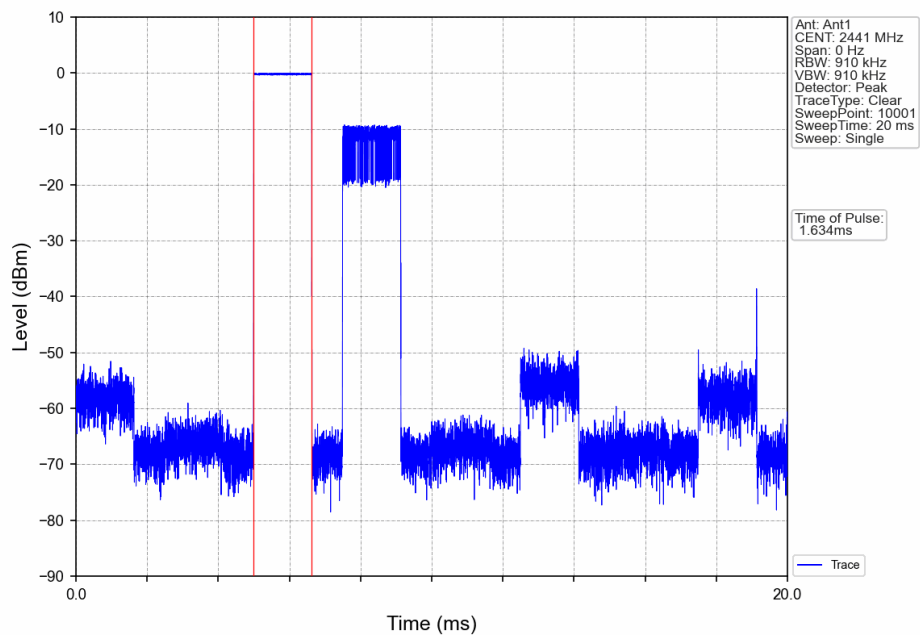
5.1.1 Test Result

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	319	121.220	<=400	Pass
			DH3	1.634	31.600	159	259.806	<=400	Pass
			DH5	2.886	31.600	101	291.486	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.396	31.600	320	126.720	<=400	Pass
			2DH3	1.648	31.600	155	255.440	<=400	Pass
			2DH5	2.890	31.600	102	294.780	<=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	2.898	31.600	104	301.392	<=400	Pass

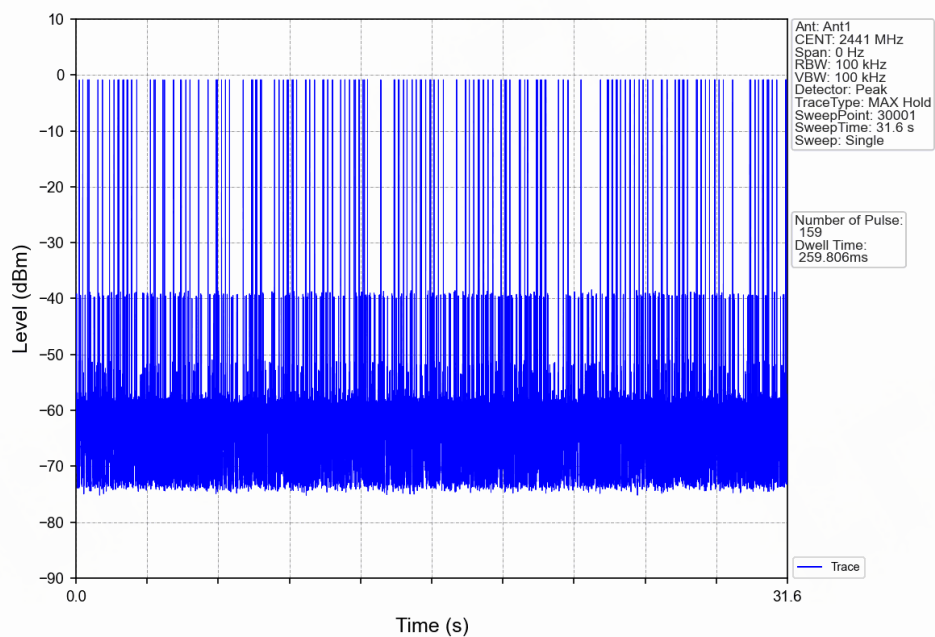
5.1.2 Test Graph

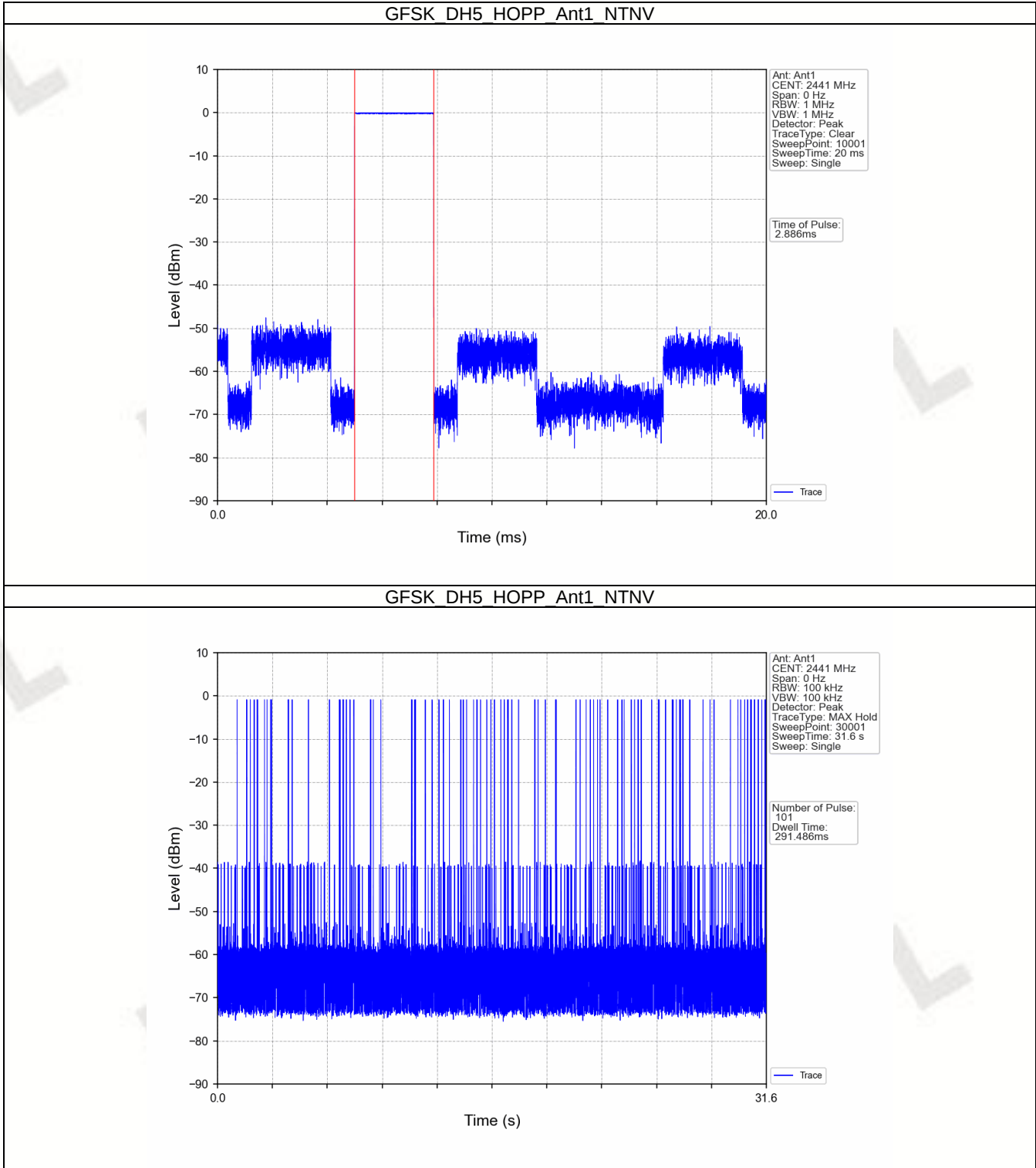


GFSK DH3 HOPP Ant1 NTN

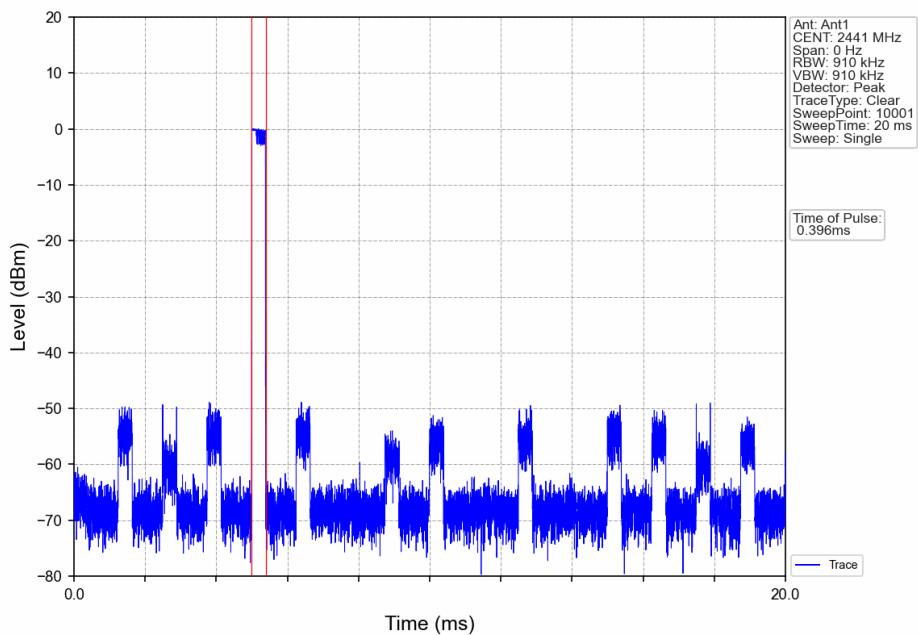


GFSK DH3 HOPP Ant1 NTN

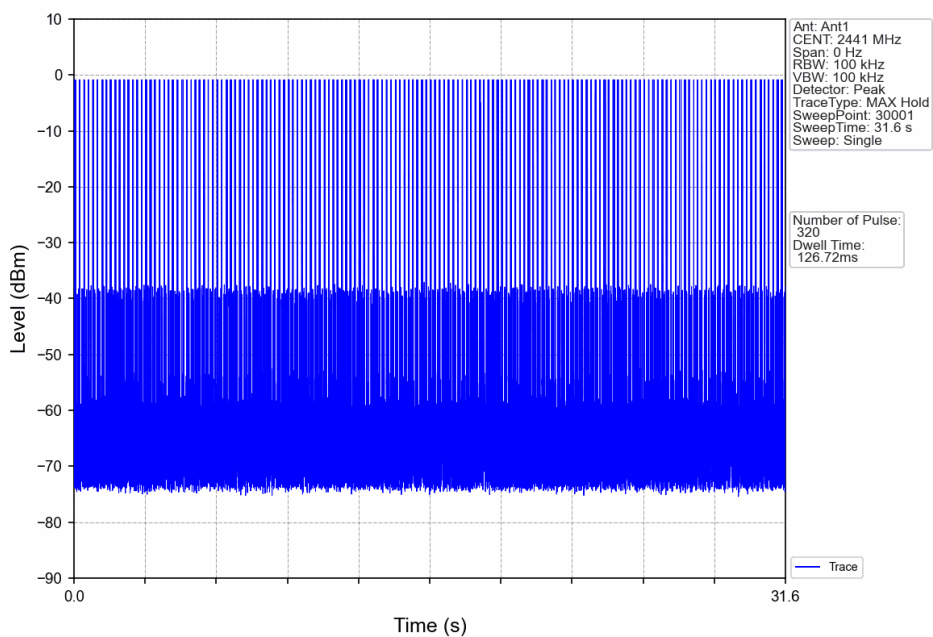




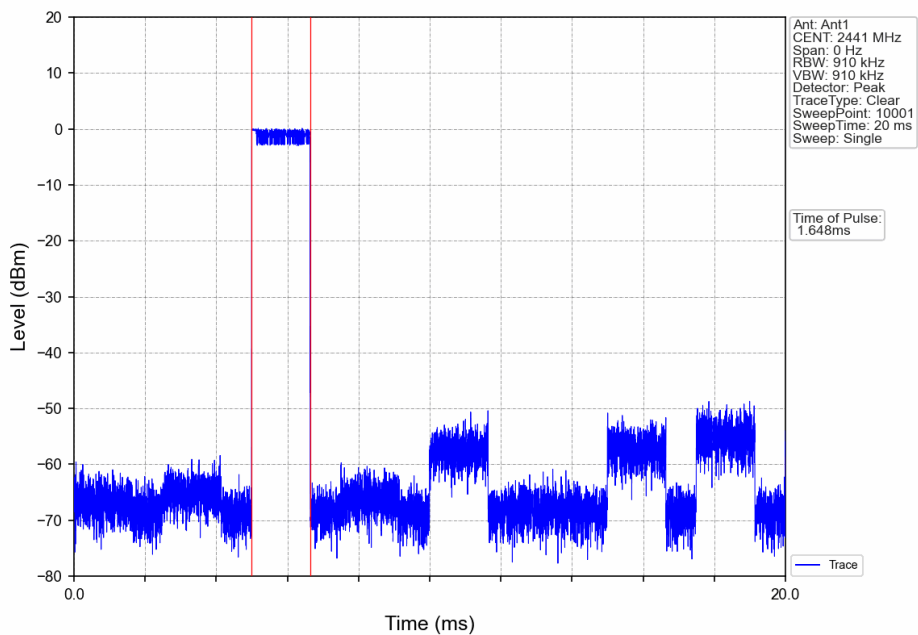
Pi/4DQPSK 2DH1 HOPP Ant1 NTN



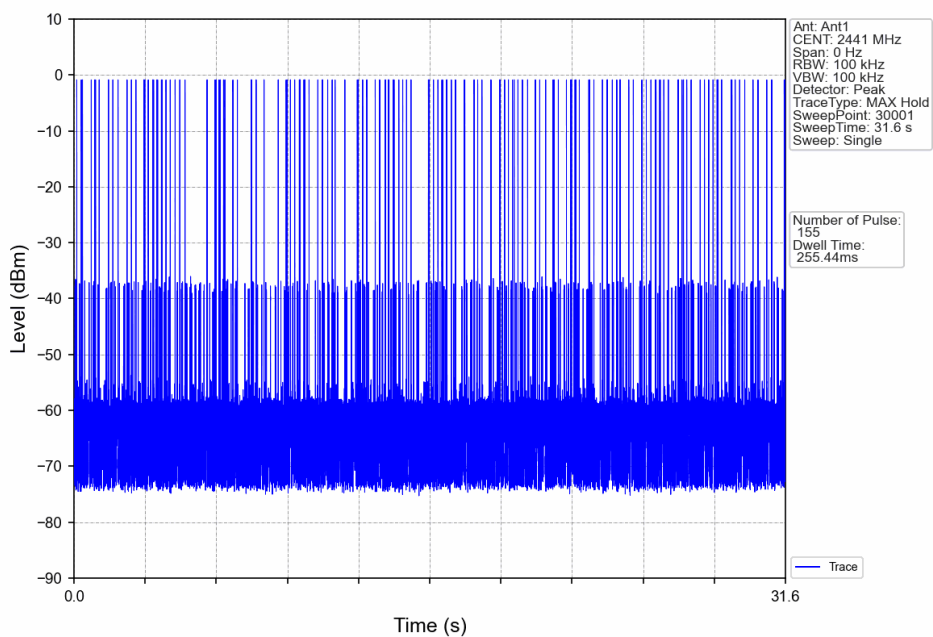
Pi/4DQPSK 2DH1 HOPP Ant1 NTN



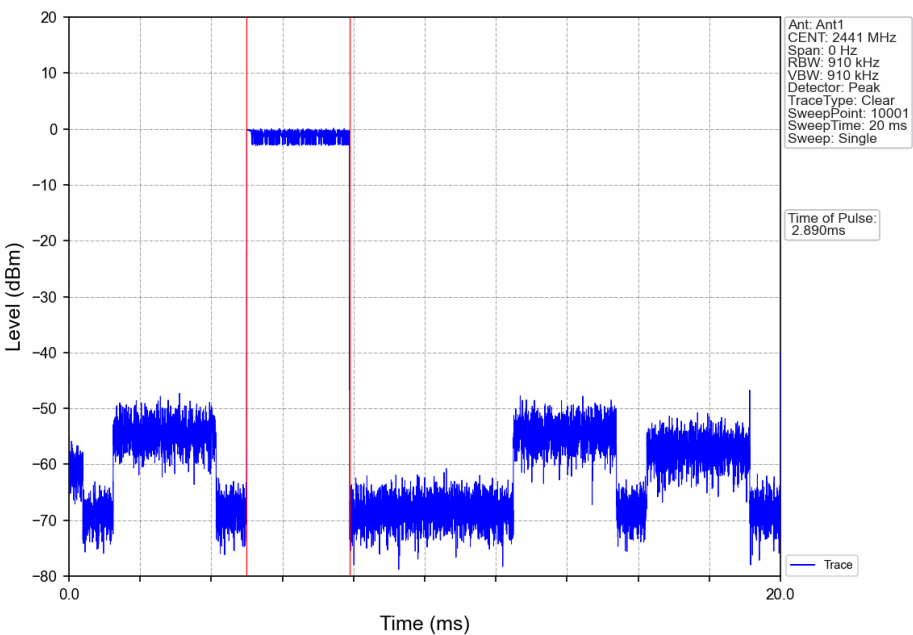
Pi/4DQPSK 2DH3 HOPP Ant1 NTN



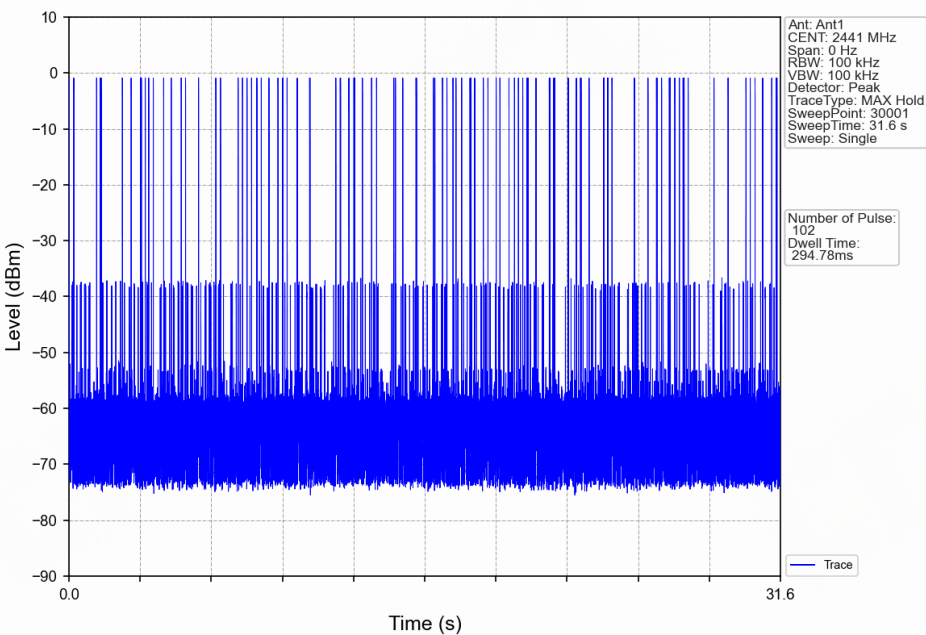
Pi/4DQPSK 2DH3 HOPP Ant1 NTN



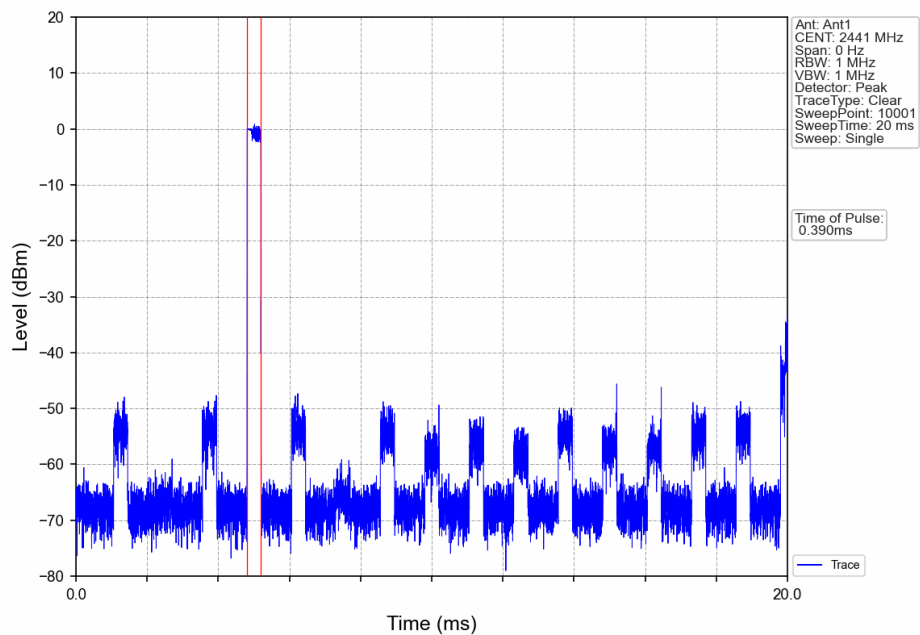
Pi/4DQPSK 2DH5 HOPP Ant1 NTN



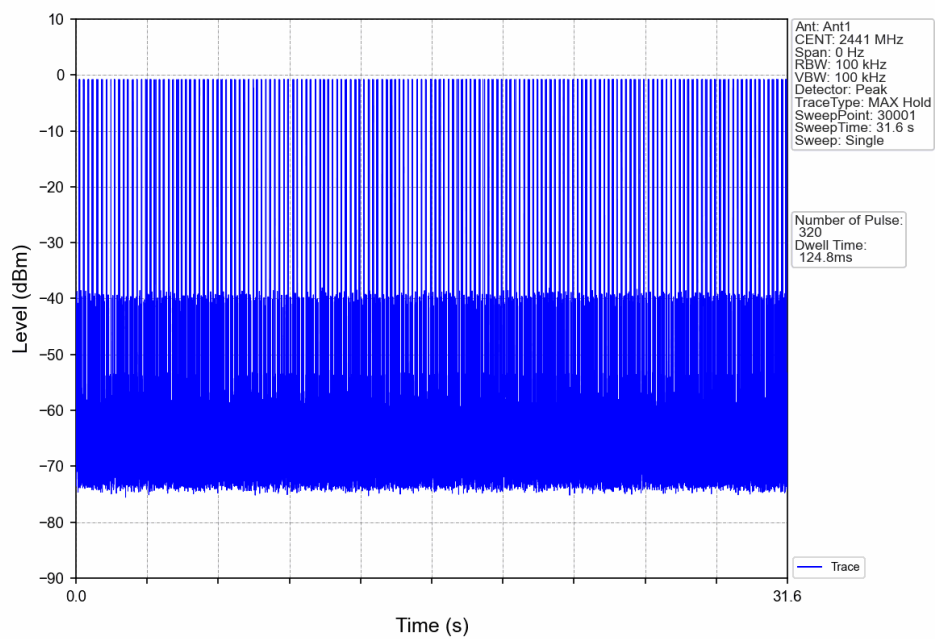
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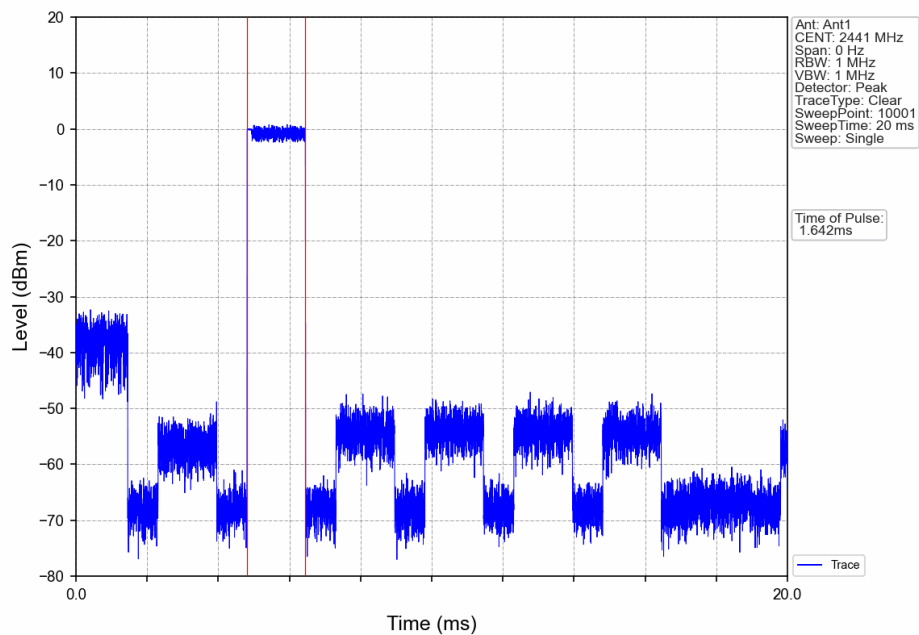
8DPSK 3DH1 HOPP Ant1 NTNV



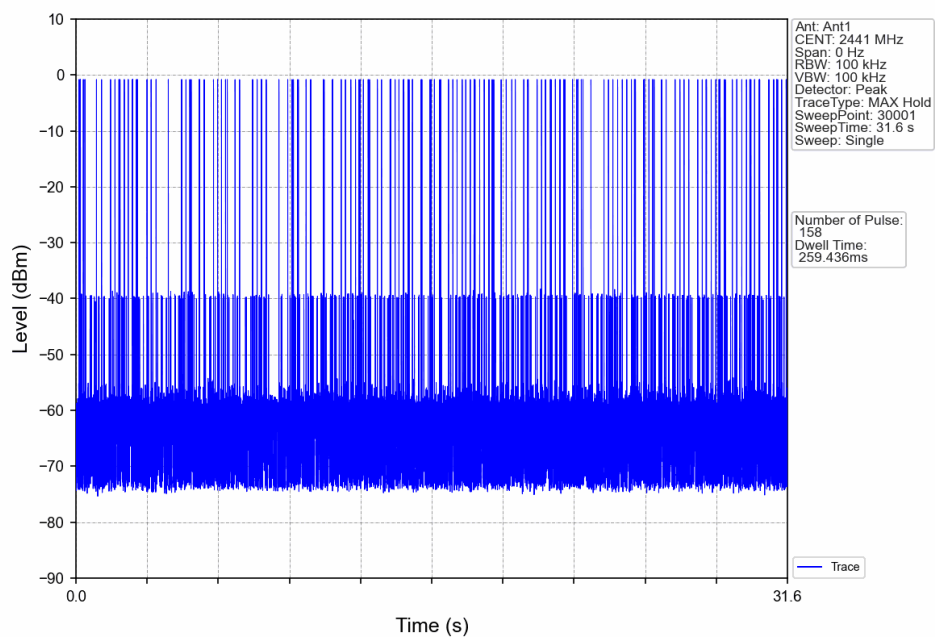
8DPSK 3DH1 HOPP Ant1 NTNV



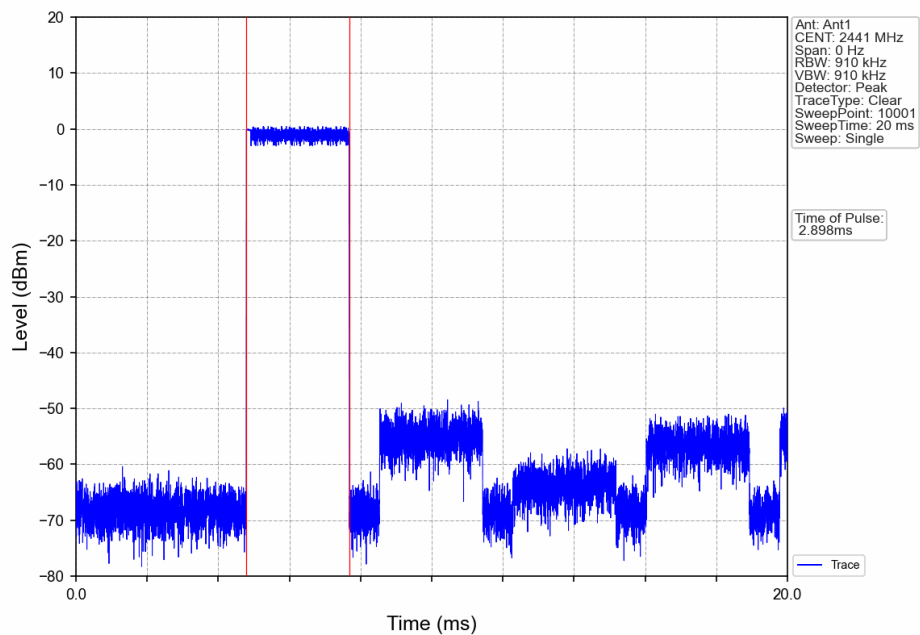
8DPSK 3DH3 HOPP Ant1 NTN



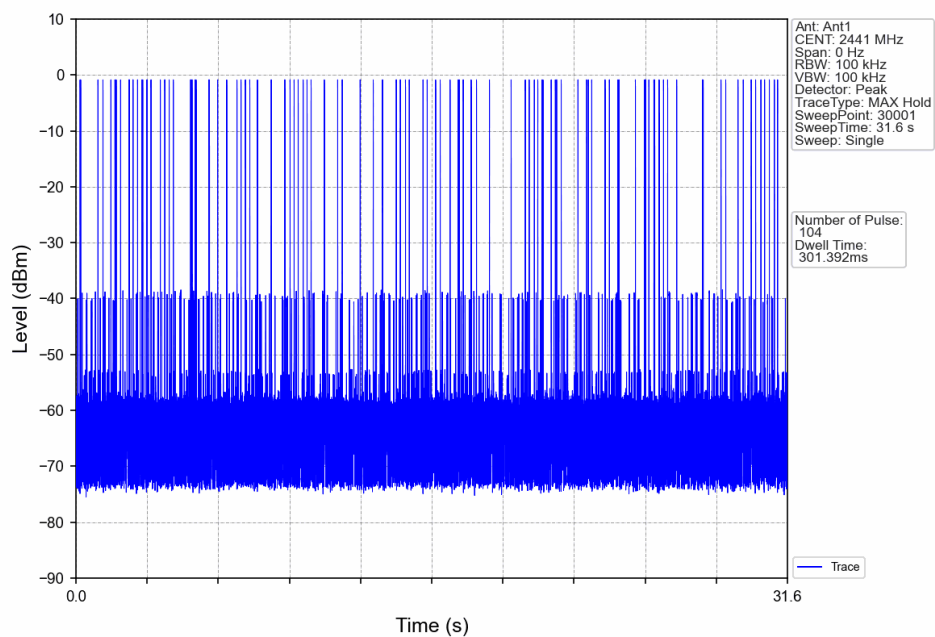
8DPSK 3DH3 HOPP Ant1 NTN



8DPSK 3DH5 HOPP Ant1 NTNV



8DPSK 3DH5 HOPP Ant1 NTNV



6. Unwanted Emissions In Non-restricted Frequency Bands

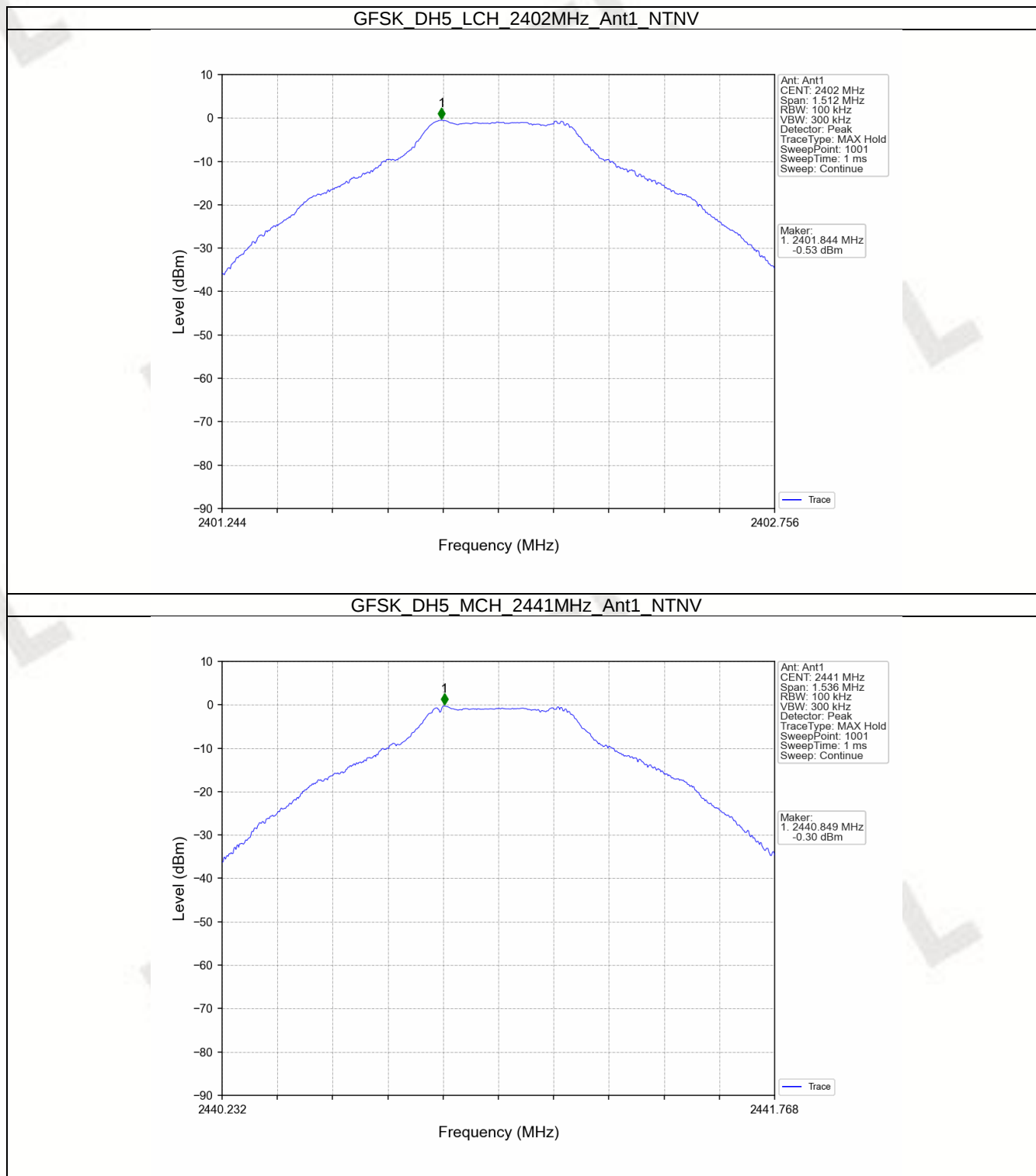
6.1 Ref

6.1.1 Test Result

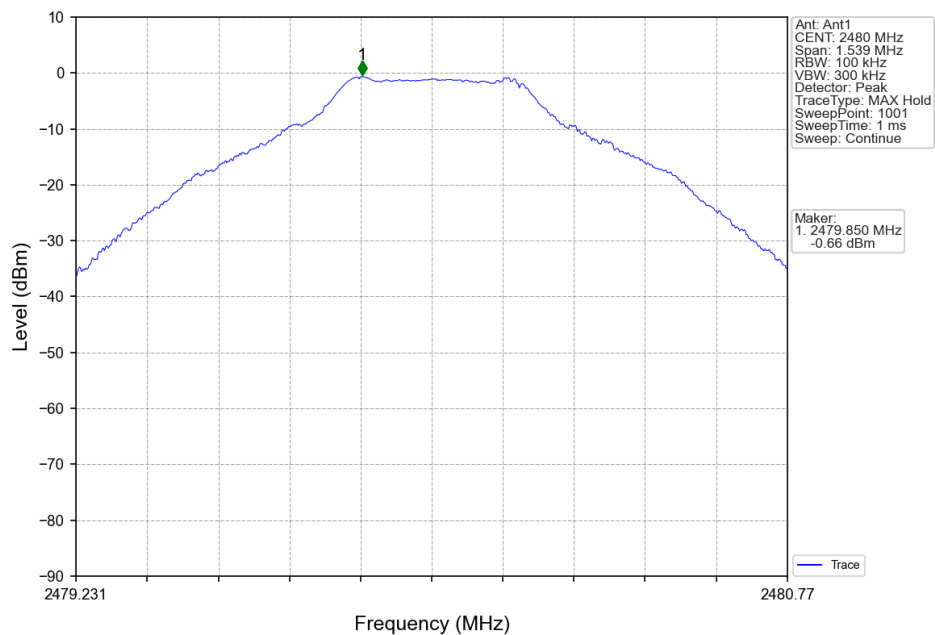
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	-0.53
		2441	DH5	1	-0.30
		2480	DH5	1	-0.66
Pi/4DQPSK	SISO	2402	2DH5	1	-0.49
		2441	2DH5	1	-0.26
		2480	2DH5	1	-0.59
8DPSK	SISO	2402	3DH5	1	-0.43
		2441	3DH5	1	-0.43
		2480	3DH5	1	-0.55

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.

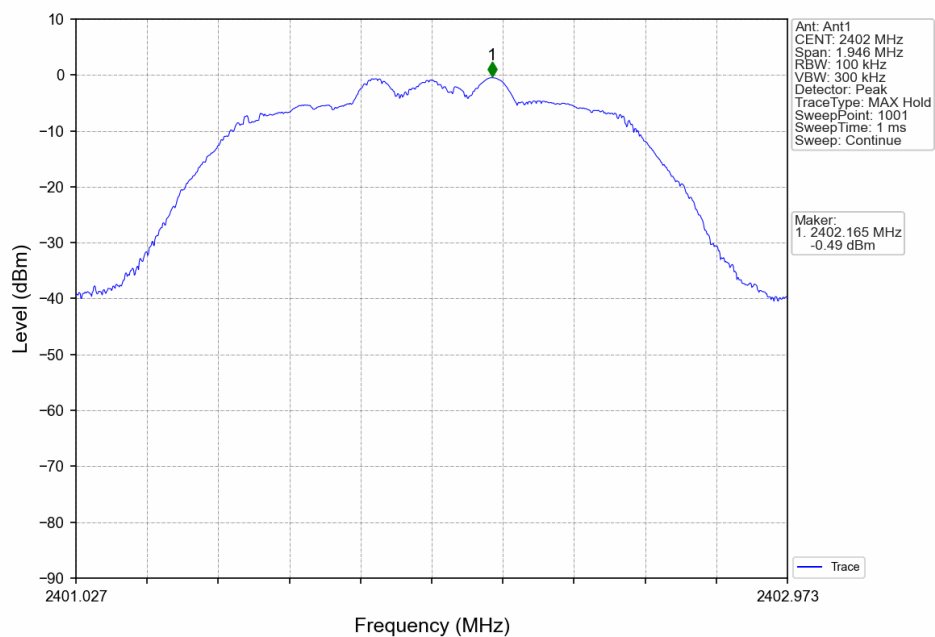
6.1.2 Test Graph



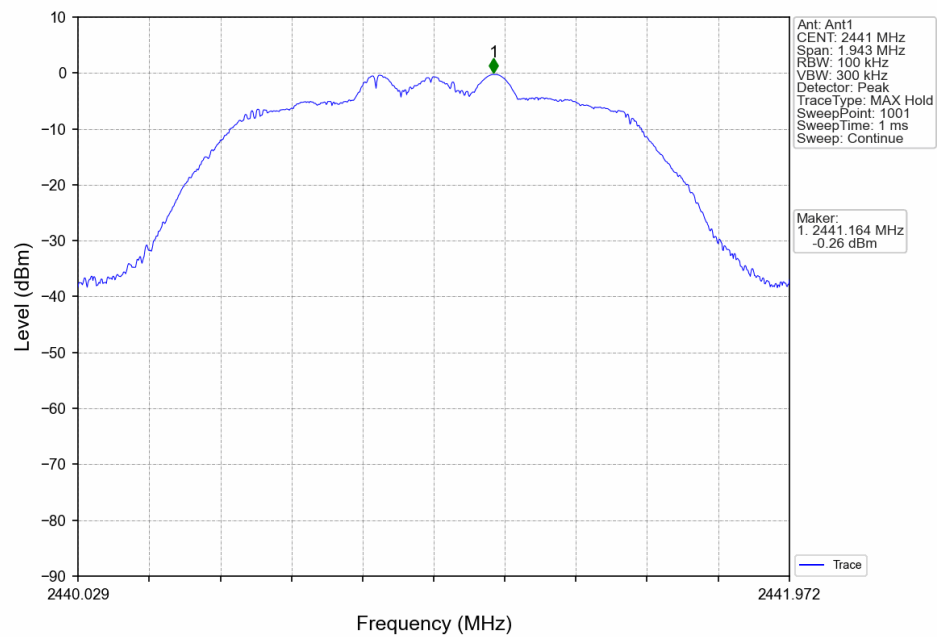
GFSK DH5 HCH 2480MHz Ant1 NTV



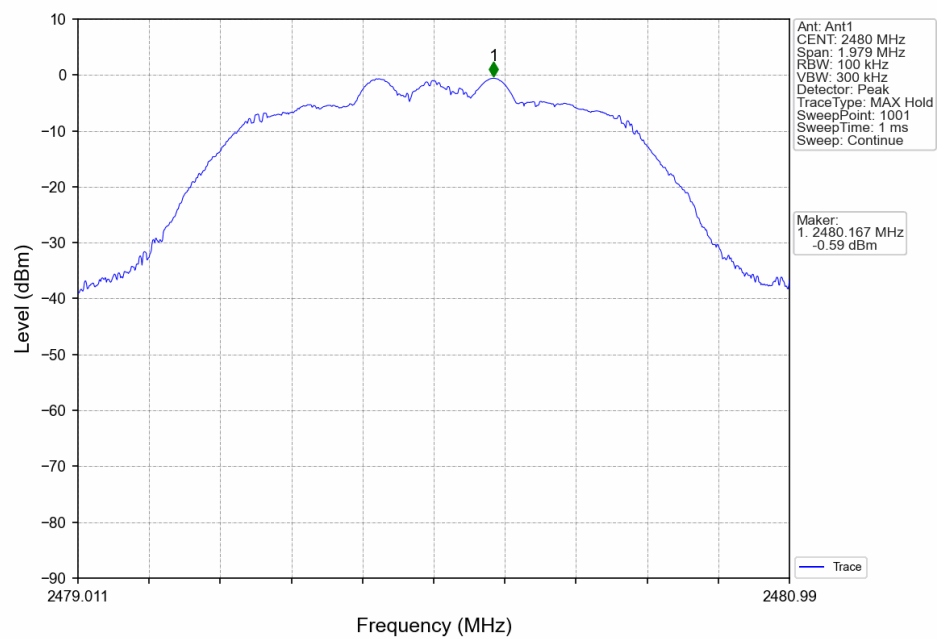
Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTV



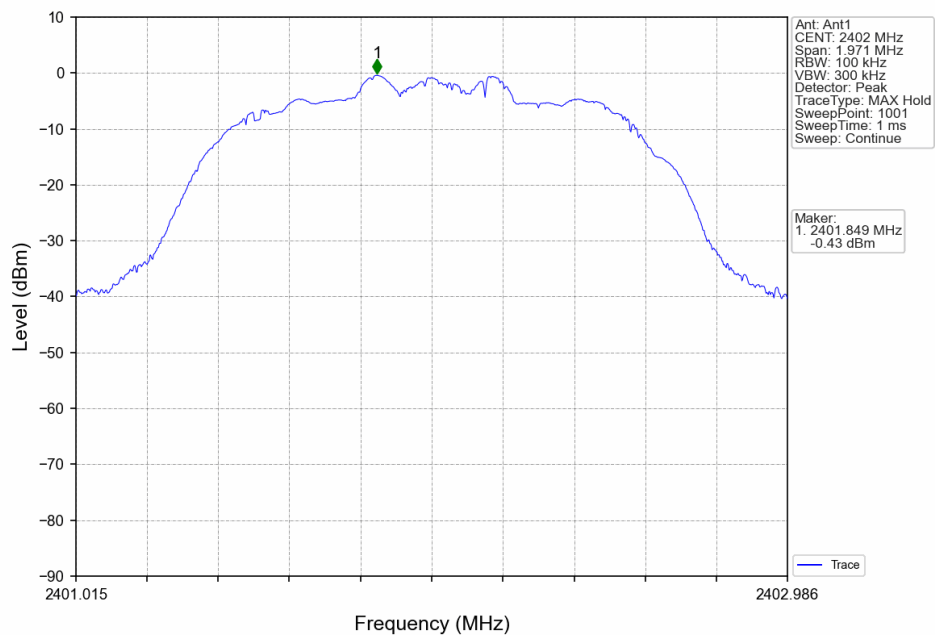
Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTNV



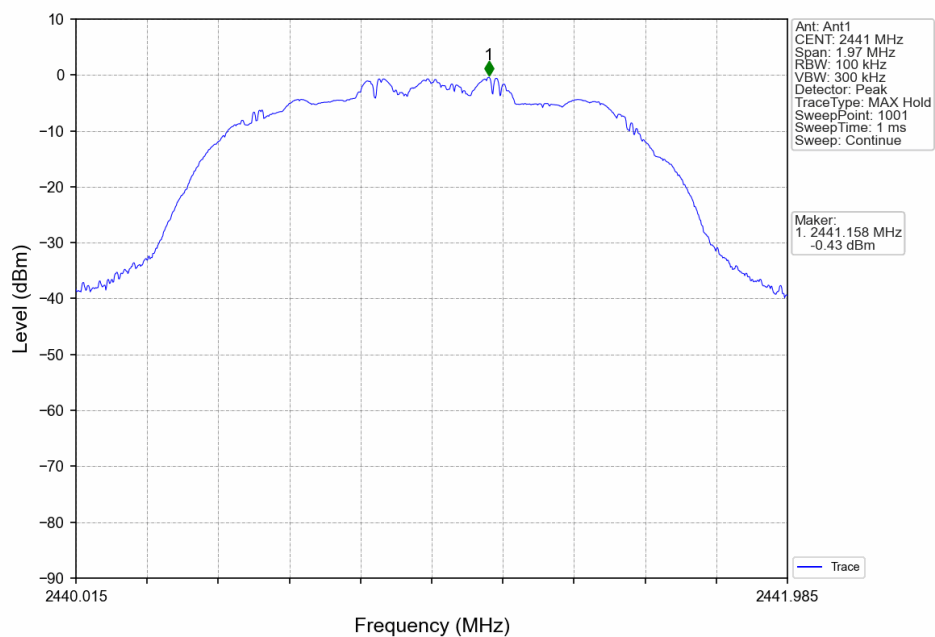
Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTNV

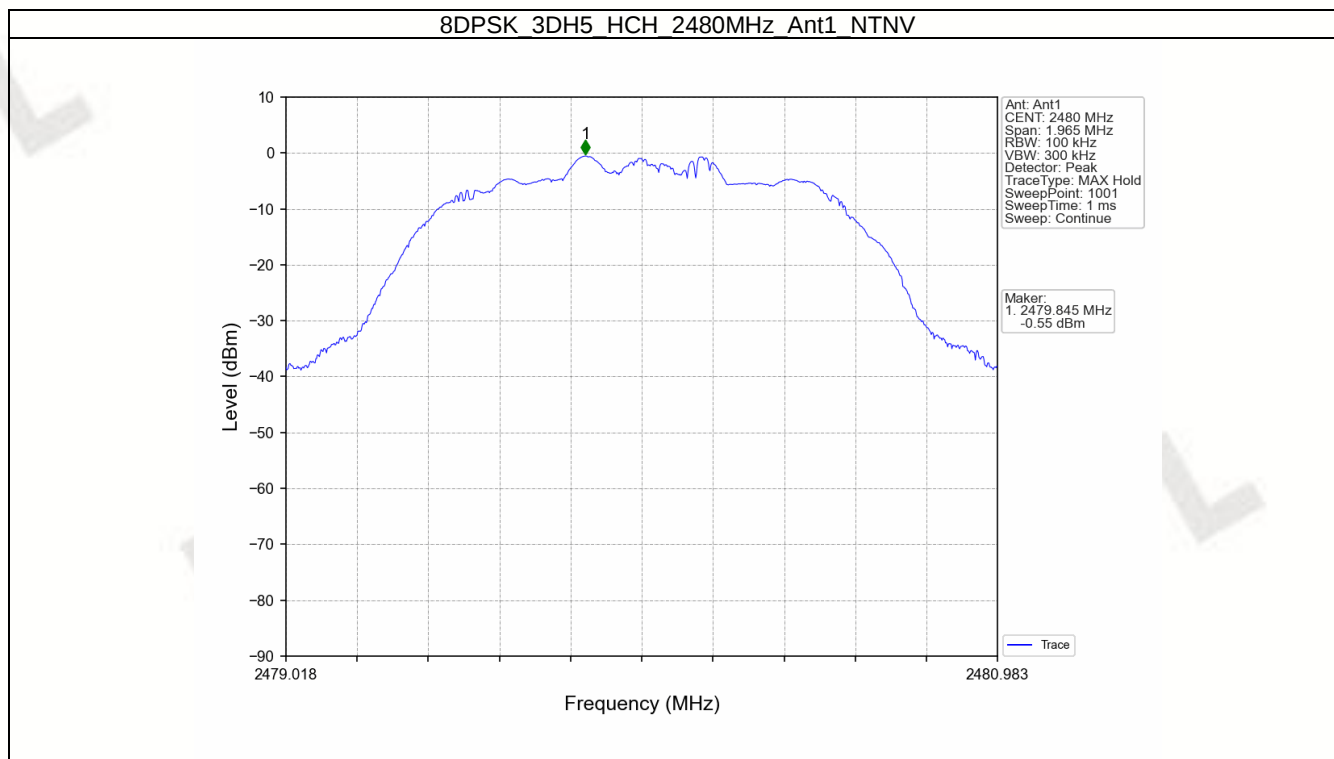


8DPSK 3DH5 LCH 2402MHz Ant1 NTV



8DPSK 3DH5 MCH 2441MHz Ant1 NTV





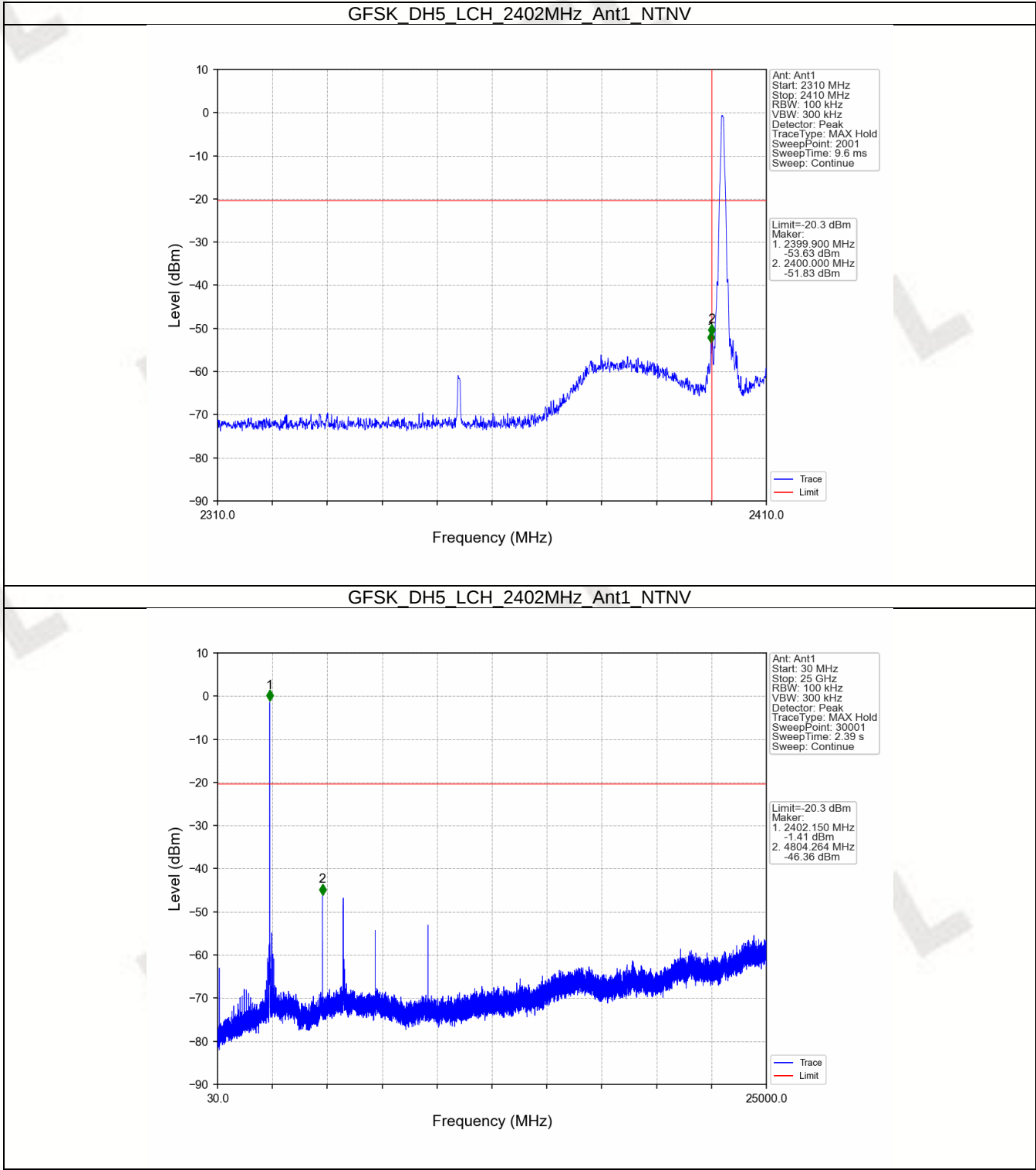
6.2 CSE

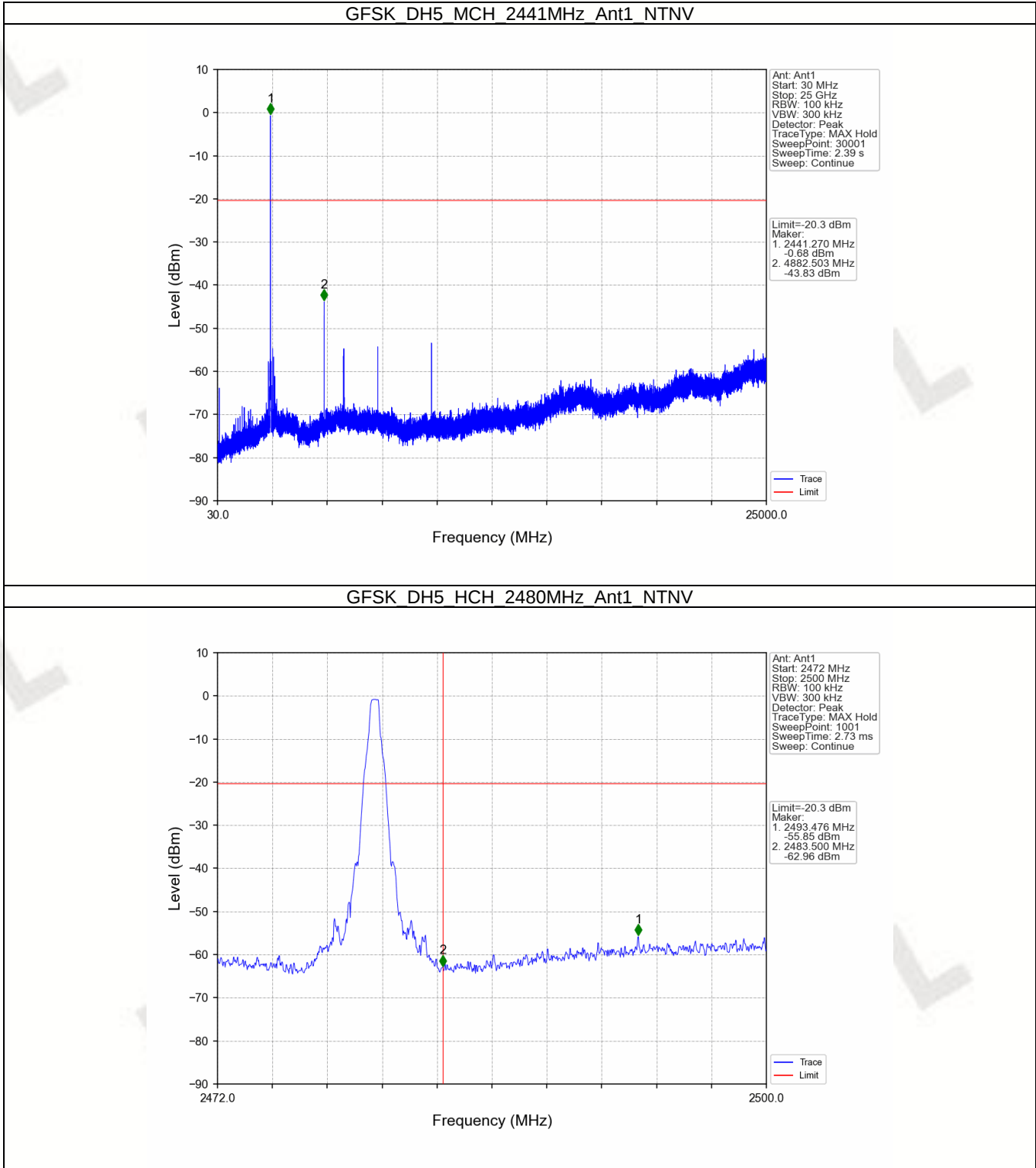
6.2.1 Test Result

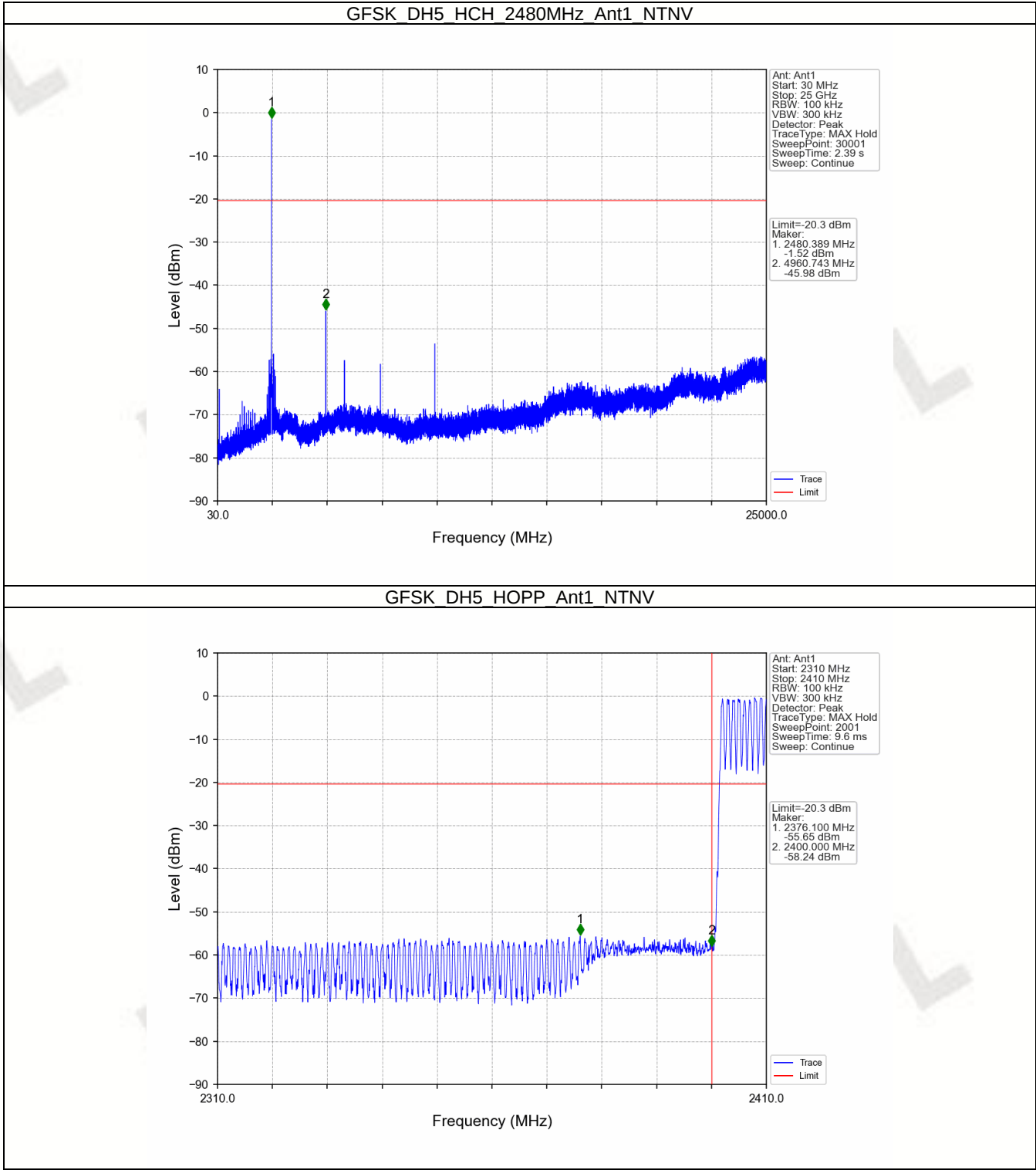
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-0.30	-20.30	Pass
		2441	DH5	1	-0.30	-20.30	Pass
		2480	DH5	1	-0.30	-20.30	Pass
		HOPP	DH5	1	-0.30	-20.30	Pass
PI/4DQPSK	SISO	2402	2DH5	1	-0.26	-20.26	Pass
		2441	2DH5	1	-0.26	-20.26	Pass
		2480	2DH5	1	-0.26	-20.26	Pass
		HOPP	2DH5	1	-0.26	-20.26	Pass
8DPSK	SISO	2402	3DH5	1	-0.43	-20.43	Pass
		2441	3DH5	1	-0.43	-20.43	Pass
		2480	3DH5	1	-0.43	-20.43	Pass
		HOPP	3DH5	1	-0.43	-20.43	Pass

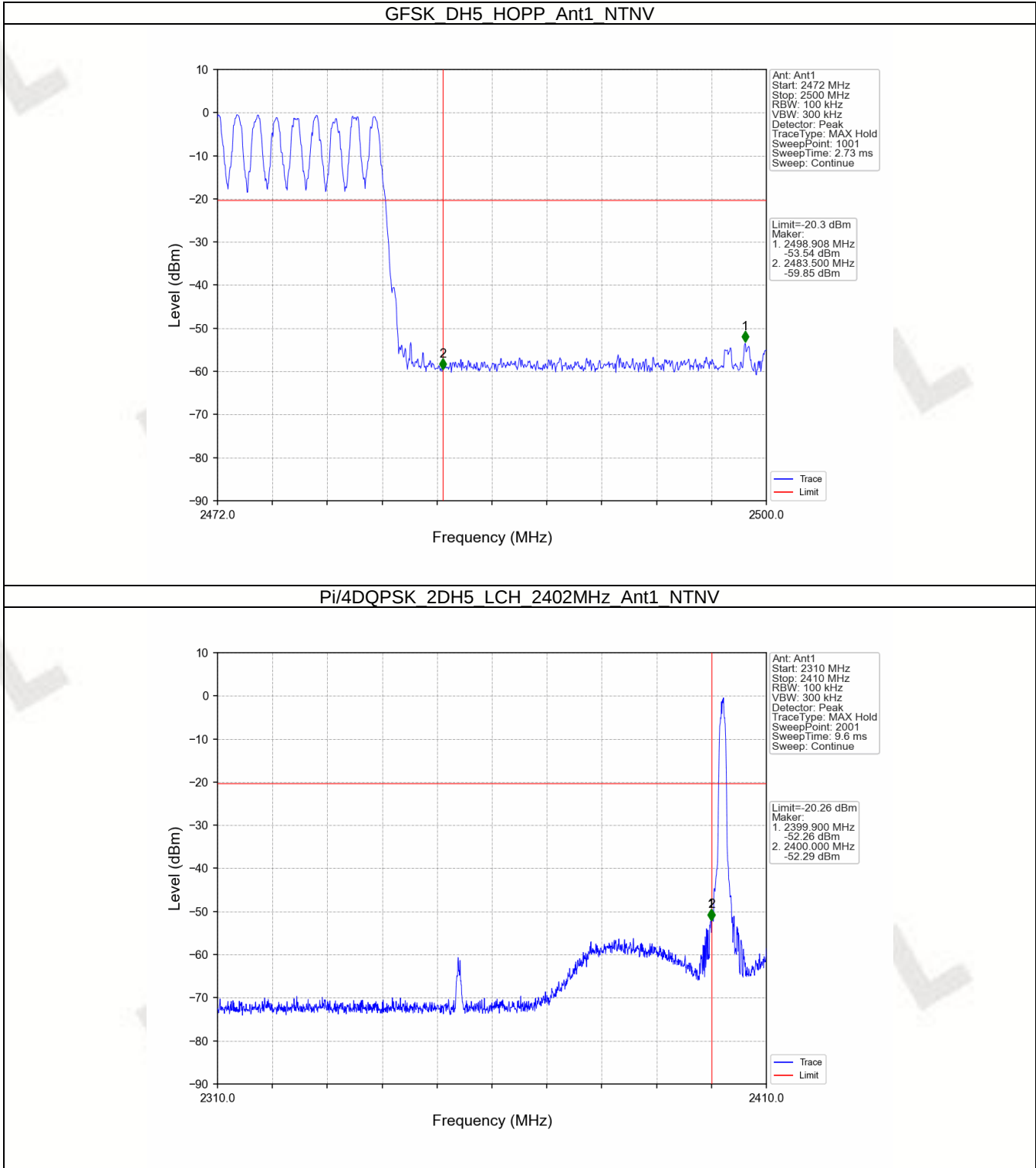
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

6.2.2 Test Graph

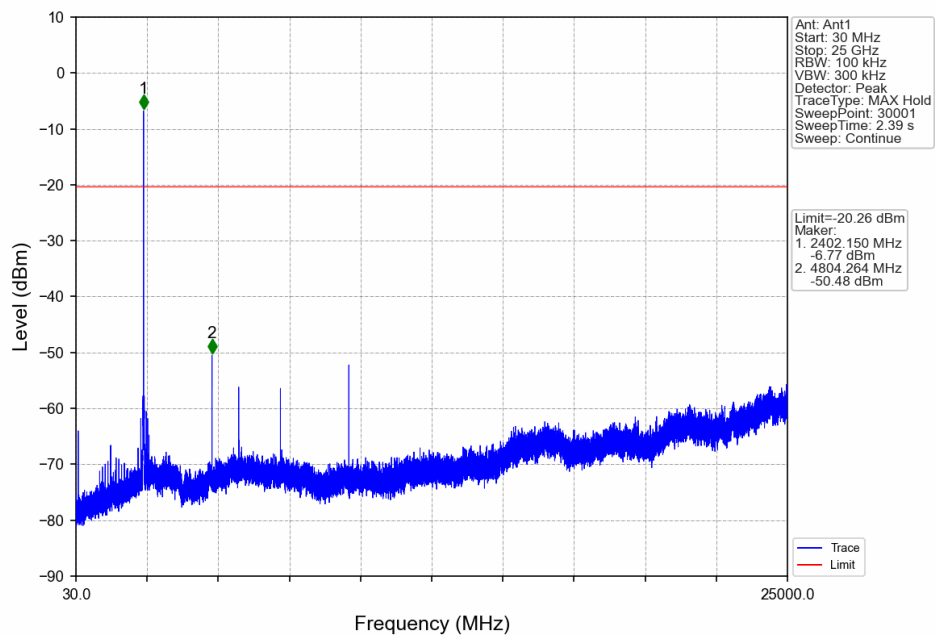




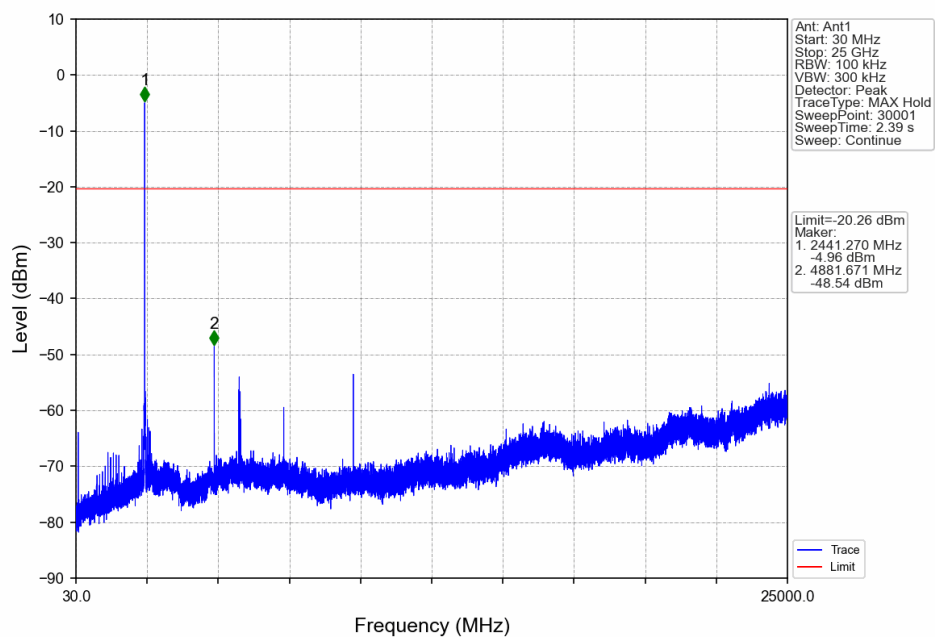




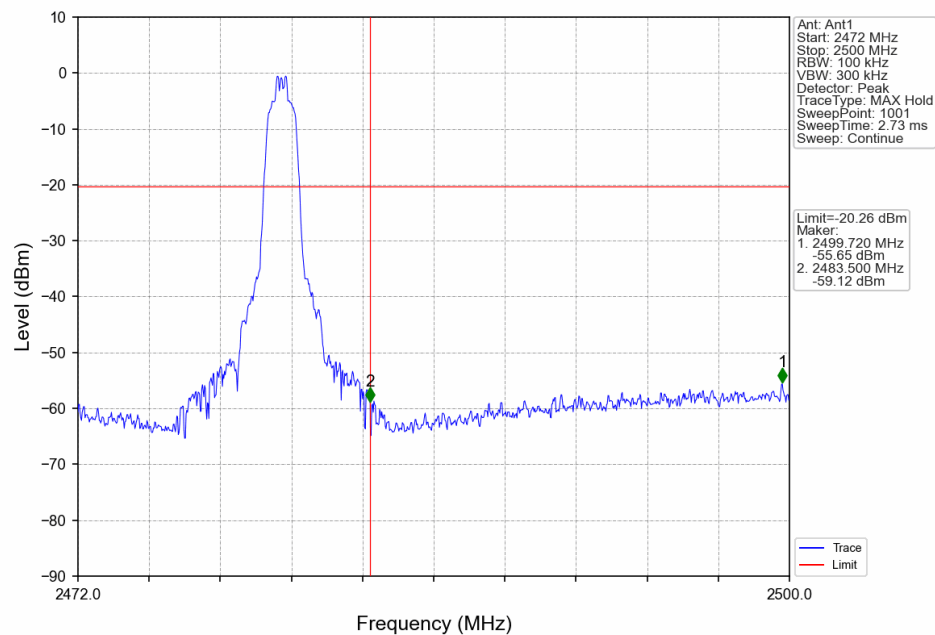
Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN



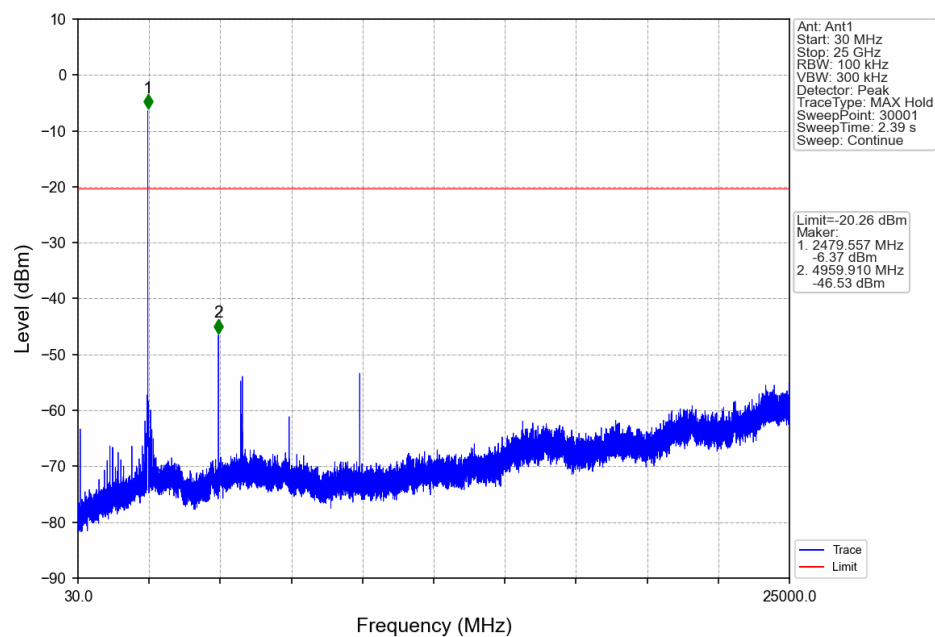
Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTN

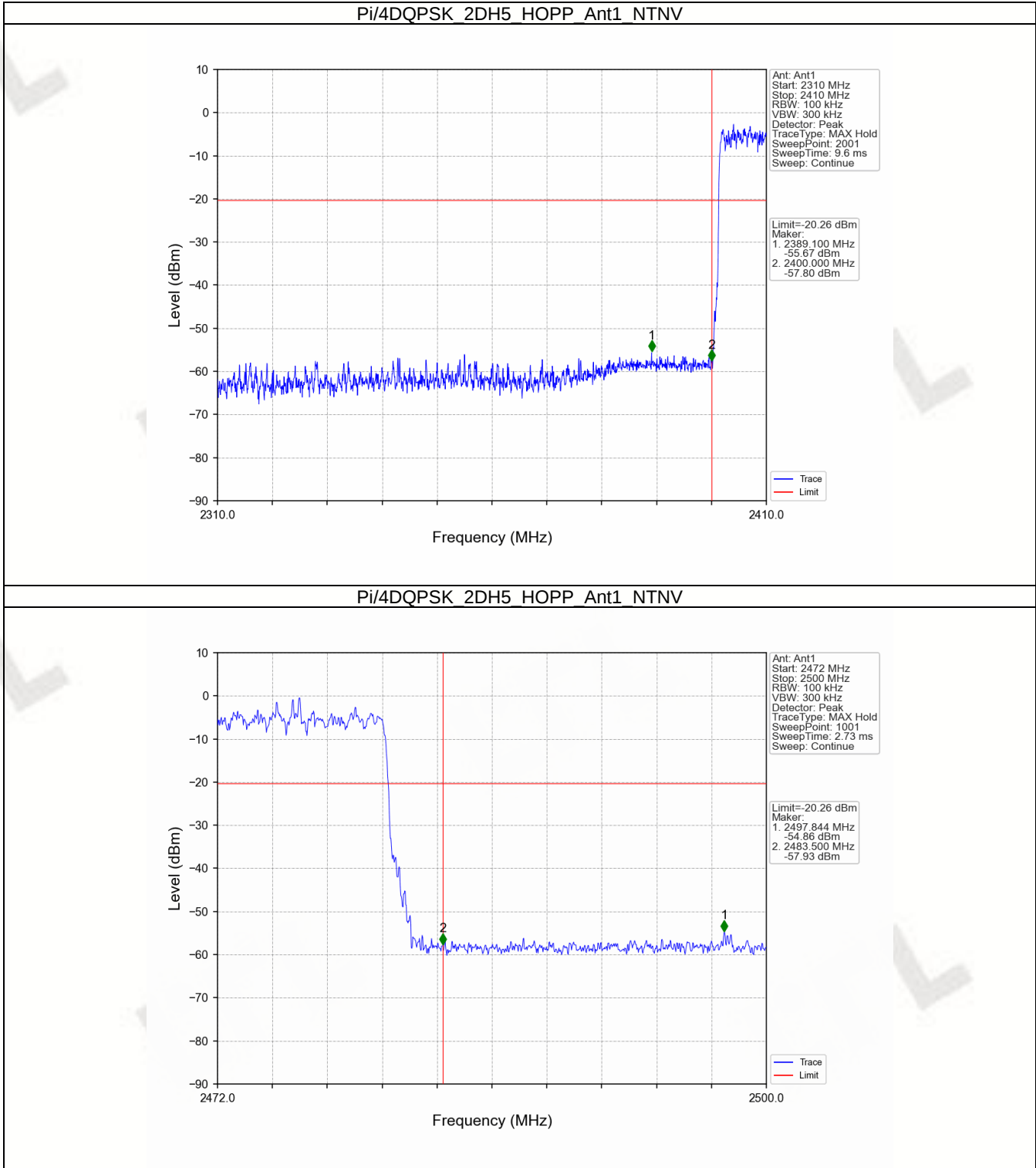


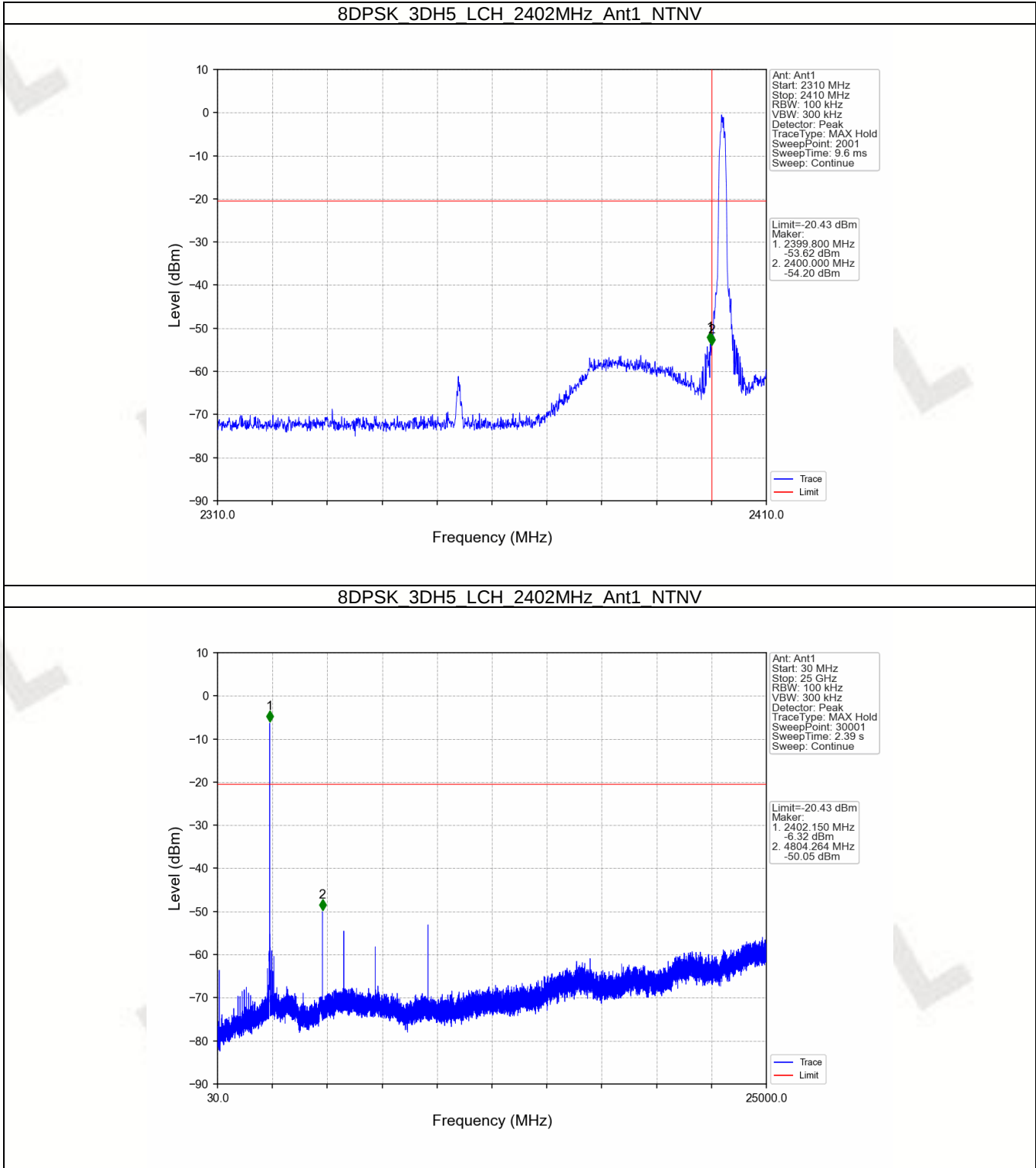
Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN



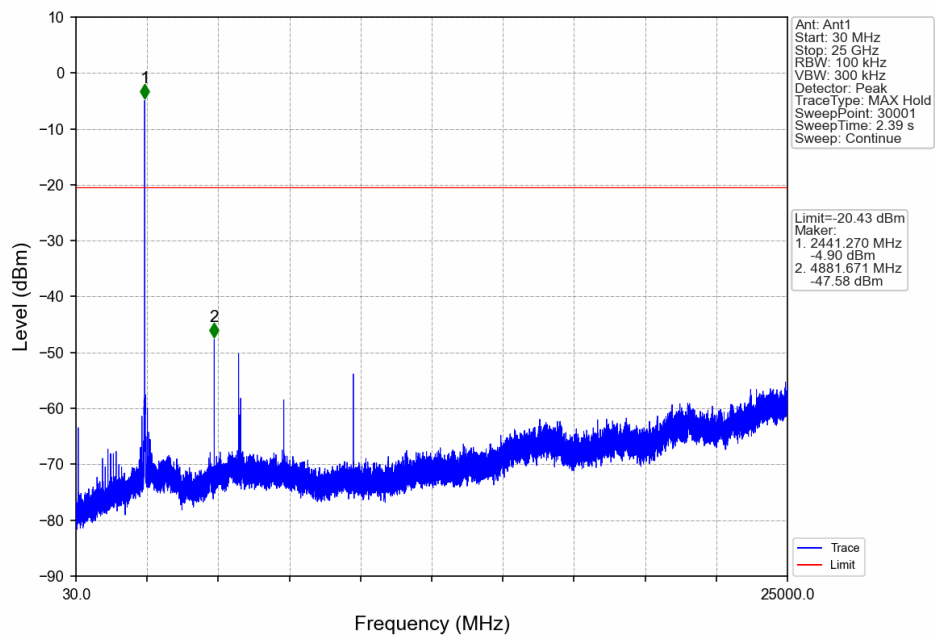
Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN



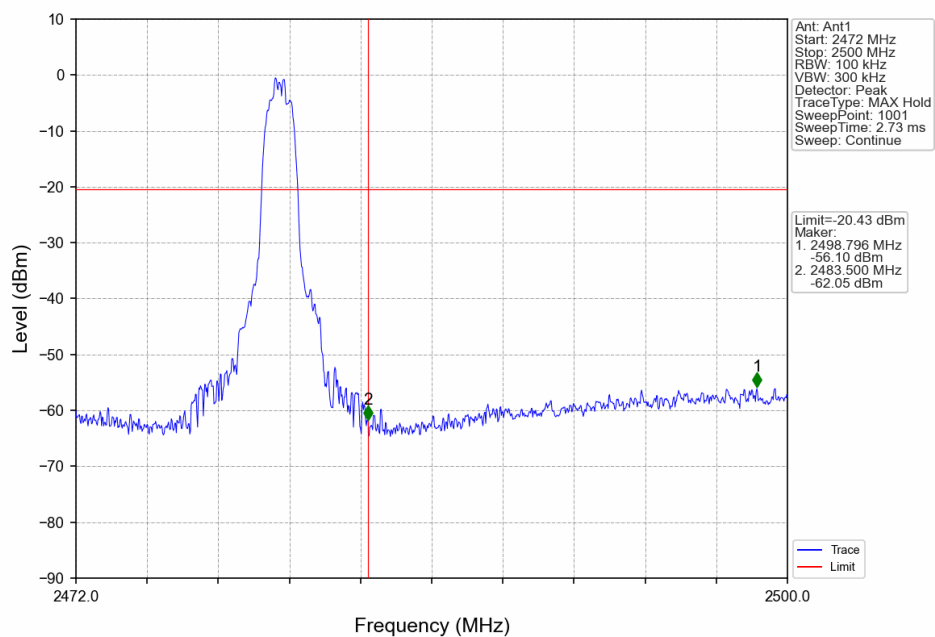




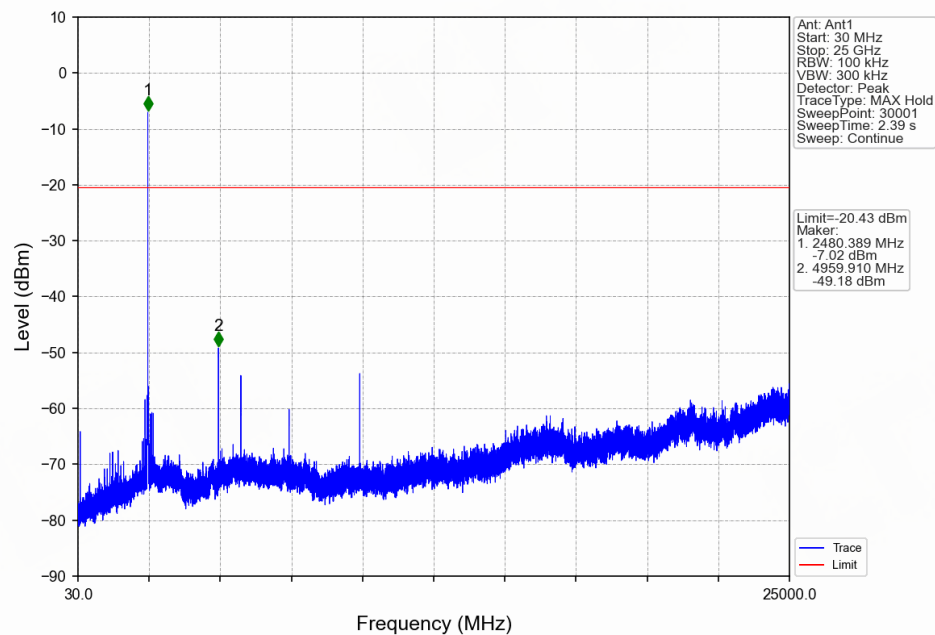
8DPSK 3DH5 MCH 2441MHz Ant1 NTN



8DPSK 3DH5 HCH 2480MHz Ant1 NTN



8DPSK 3DH5 HCH 2480MHz Ant1 NTN



8DPSK 3DH5 HOPP Ant1 NTN

