

Appendix for 15.247

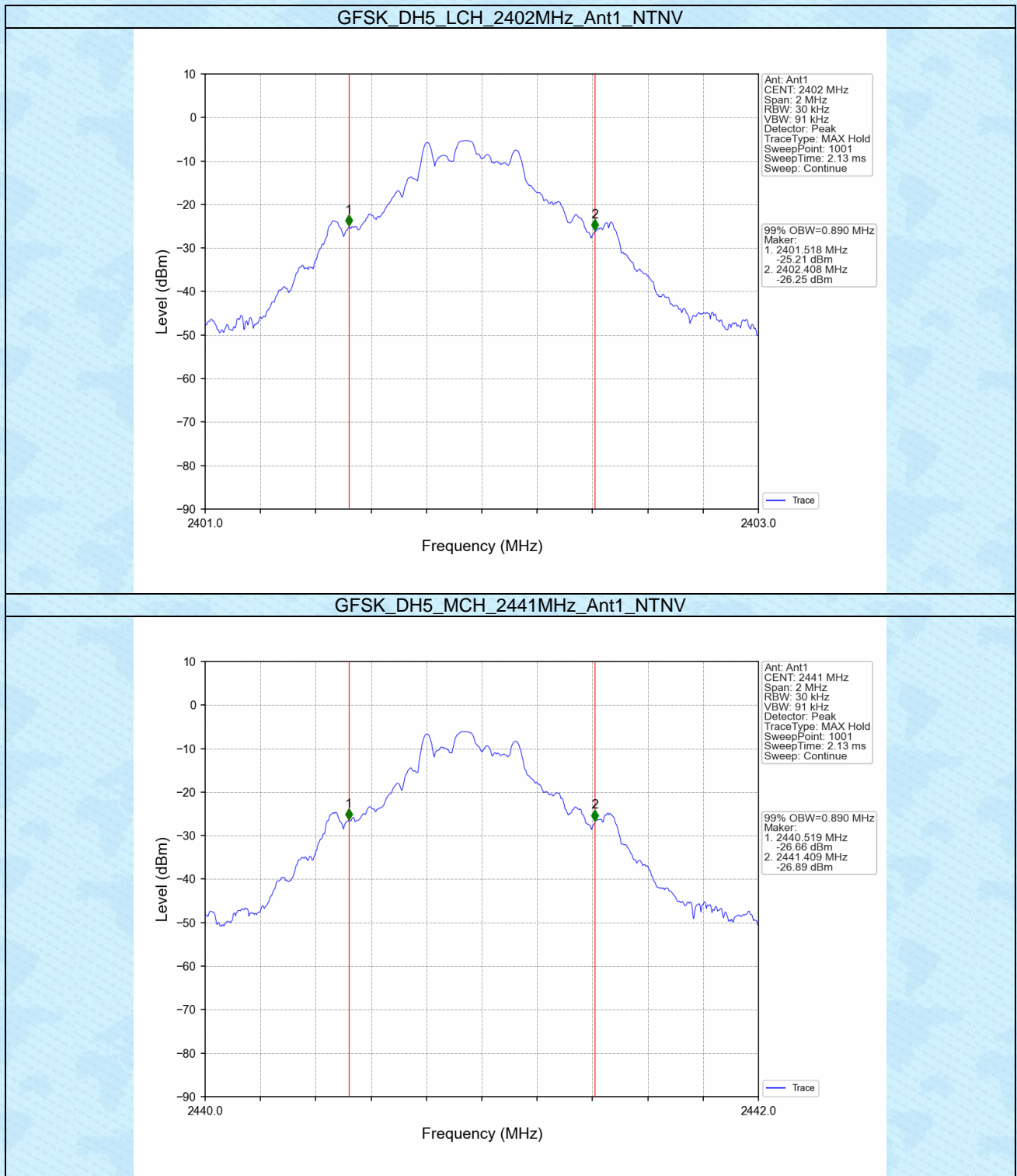
1. Bandwidth

1.1 OBW

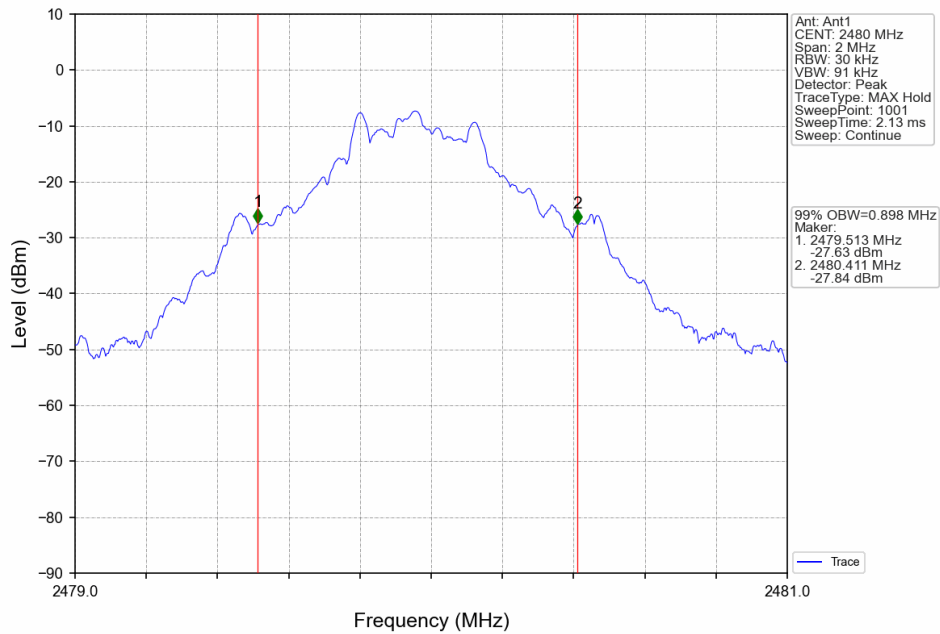
1.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.890	Pass
		2441	DH5	1	0.890	Pass
		2480	DH5	1	0.898	Pass
$\pi/4$ -DQPSK	SISO	2402	2DH5	1	1.146	Pass
		2441	2DH5	1	1.145	Pass
		2480	2DH5	1	1.146	Pass
8-DPSK	SISO	2402	3DH5	1	1.150	Pass
		2441	3DH5	1	1.151	Pass
		2480	3DH5	1	1.152	Pass

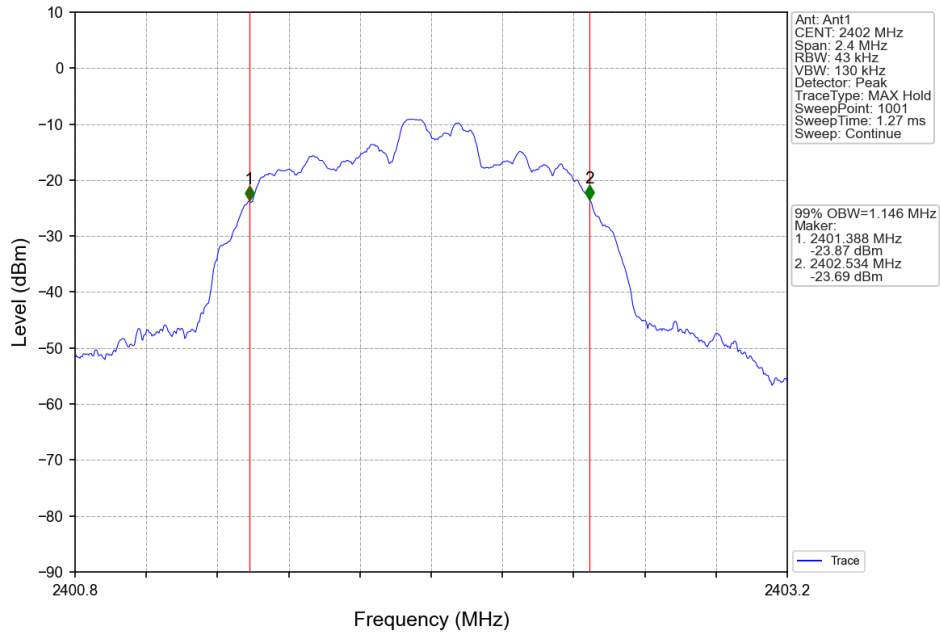
1.1.2 Test Graph



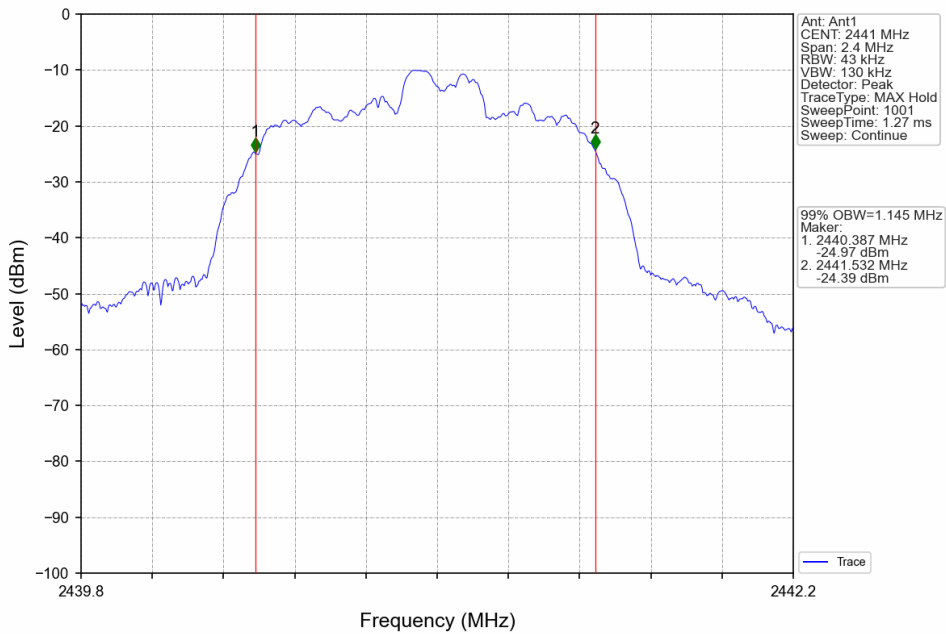
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



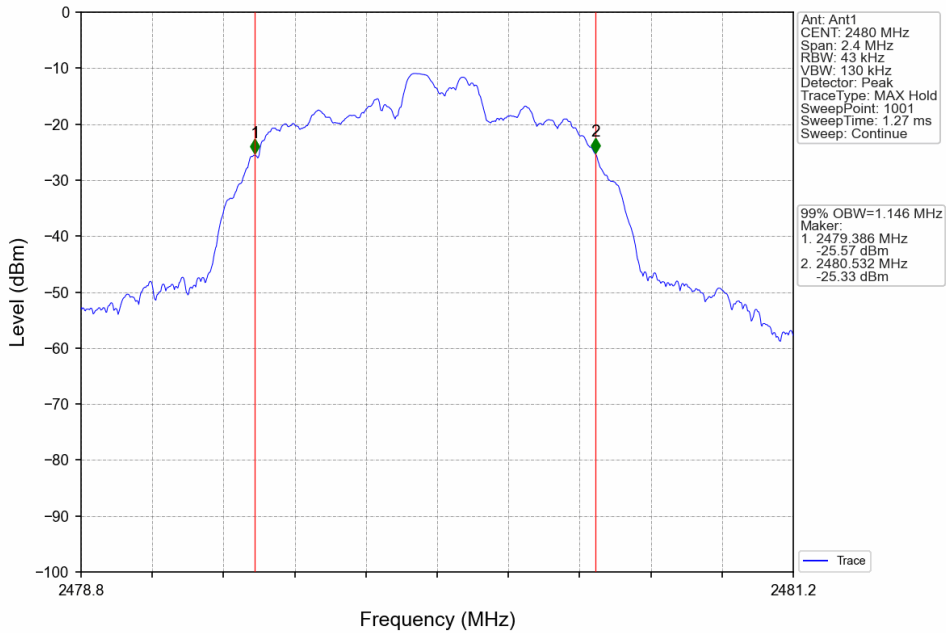
$\pi/4$ -DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



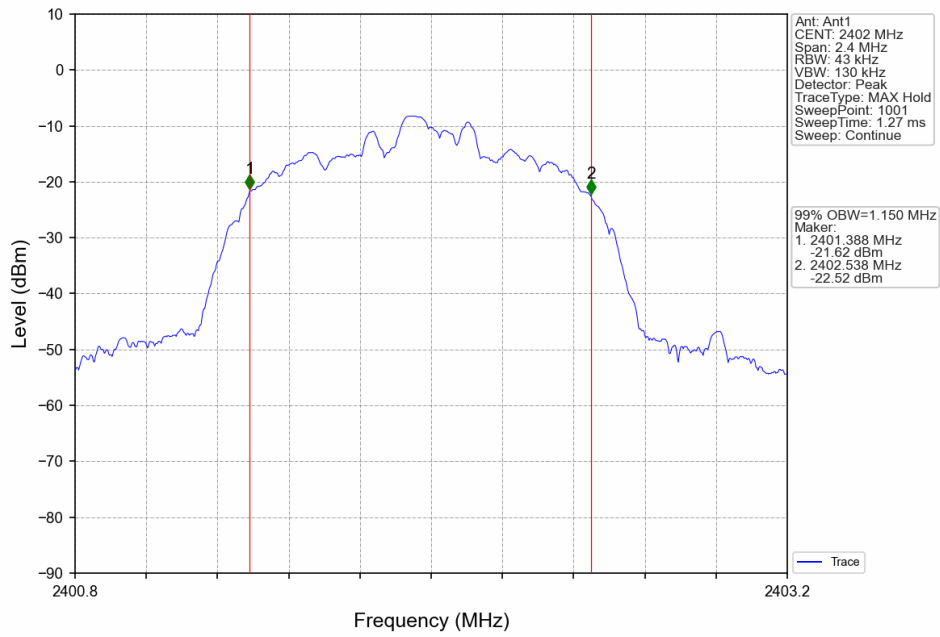
$\pi/4$ -DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



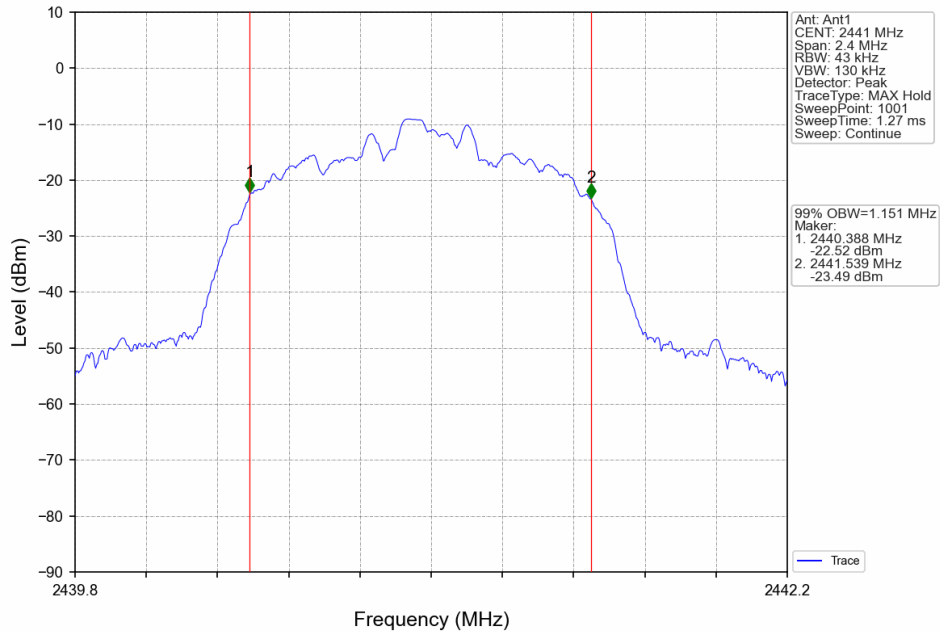
$\pi/4$ -DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

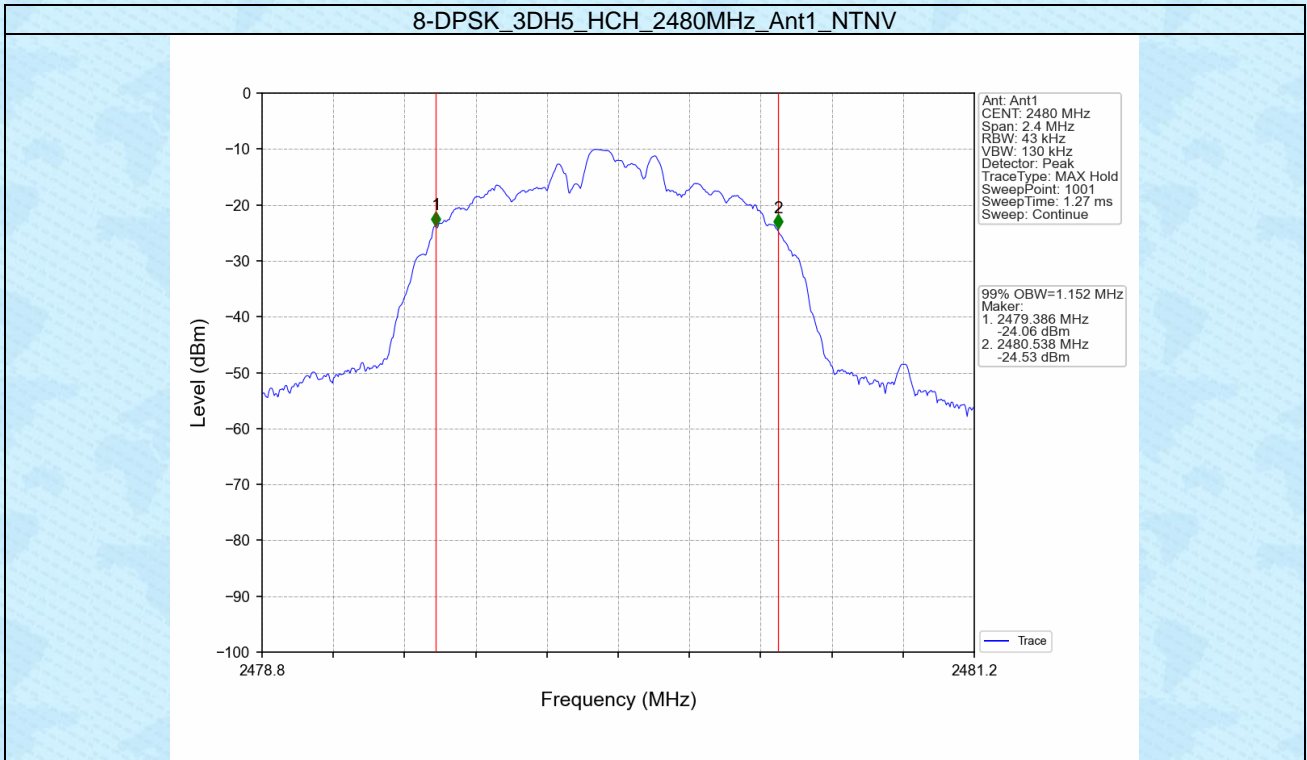


8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



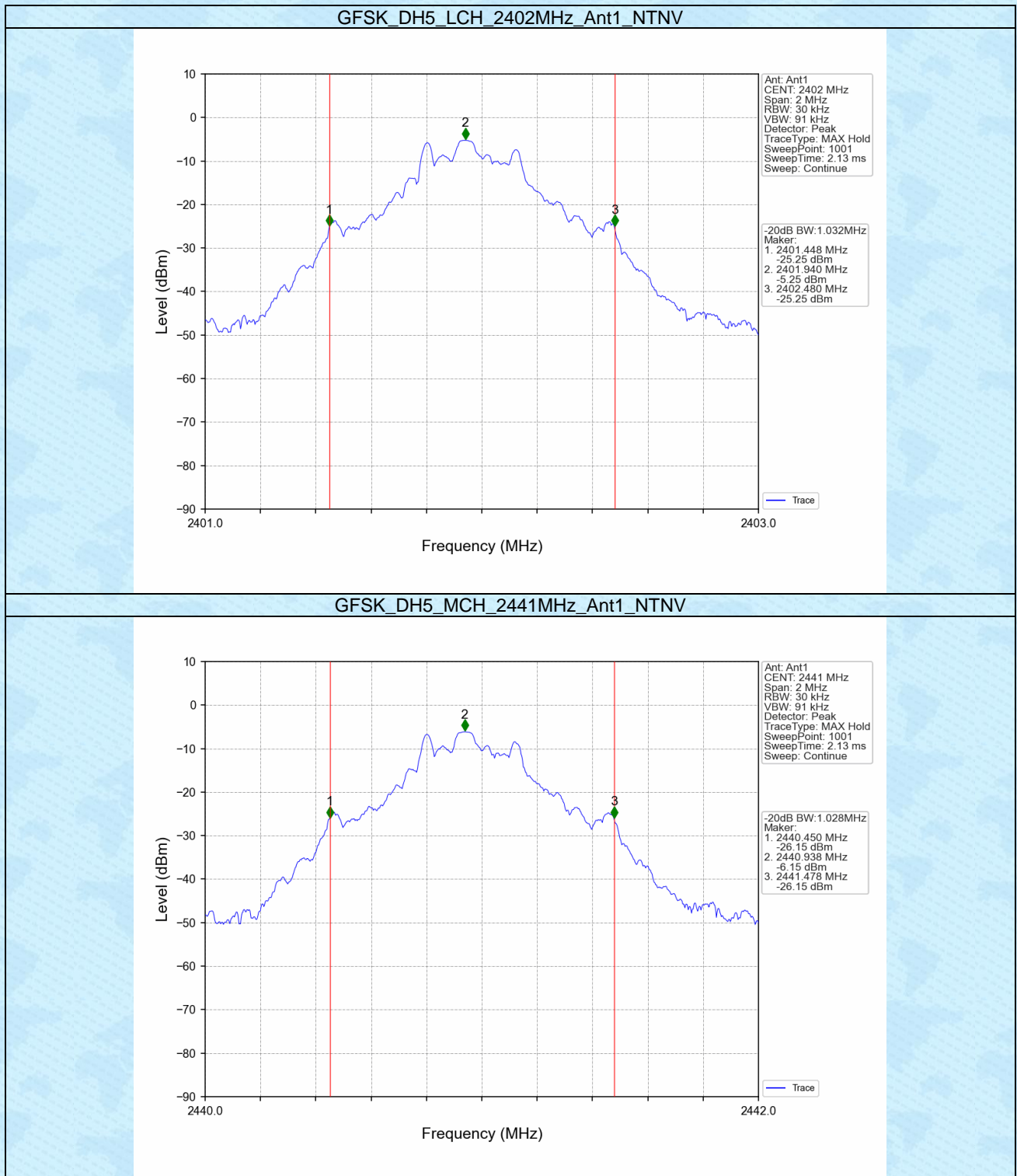


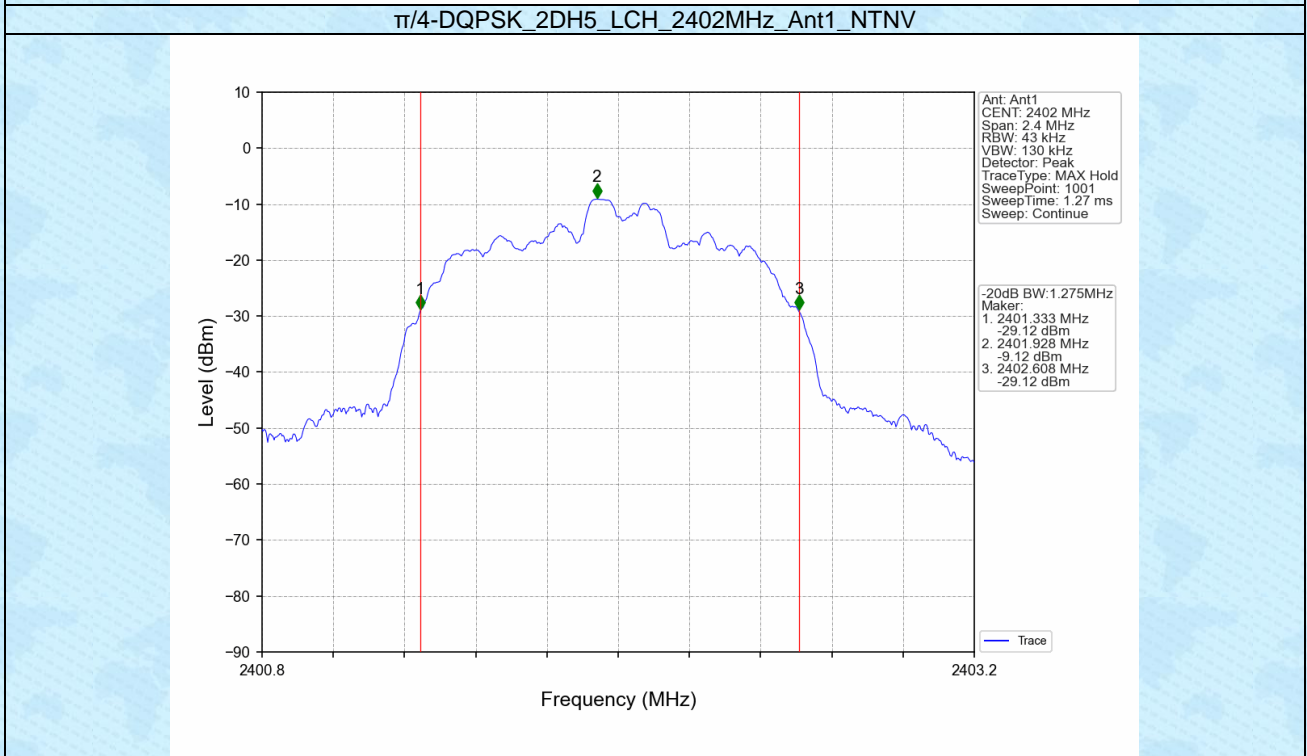
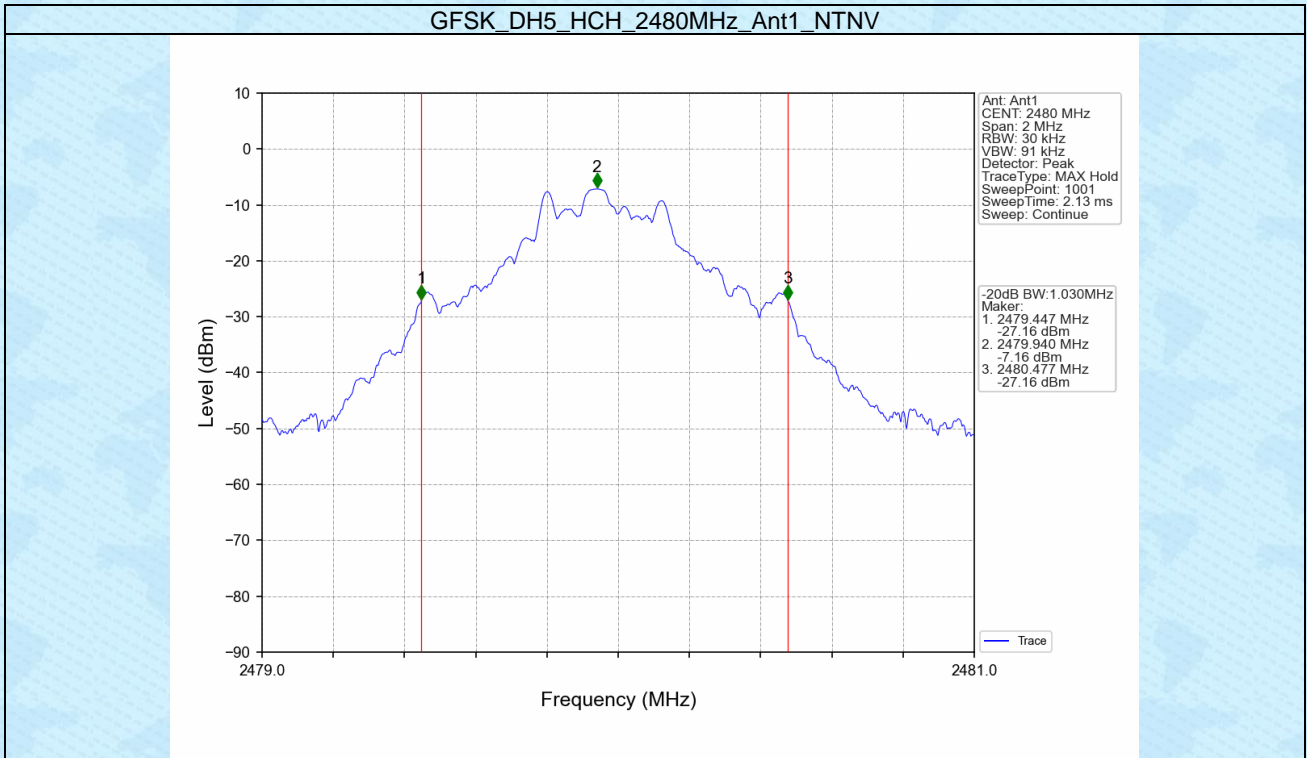
1.2 20dB BW

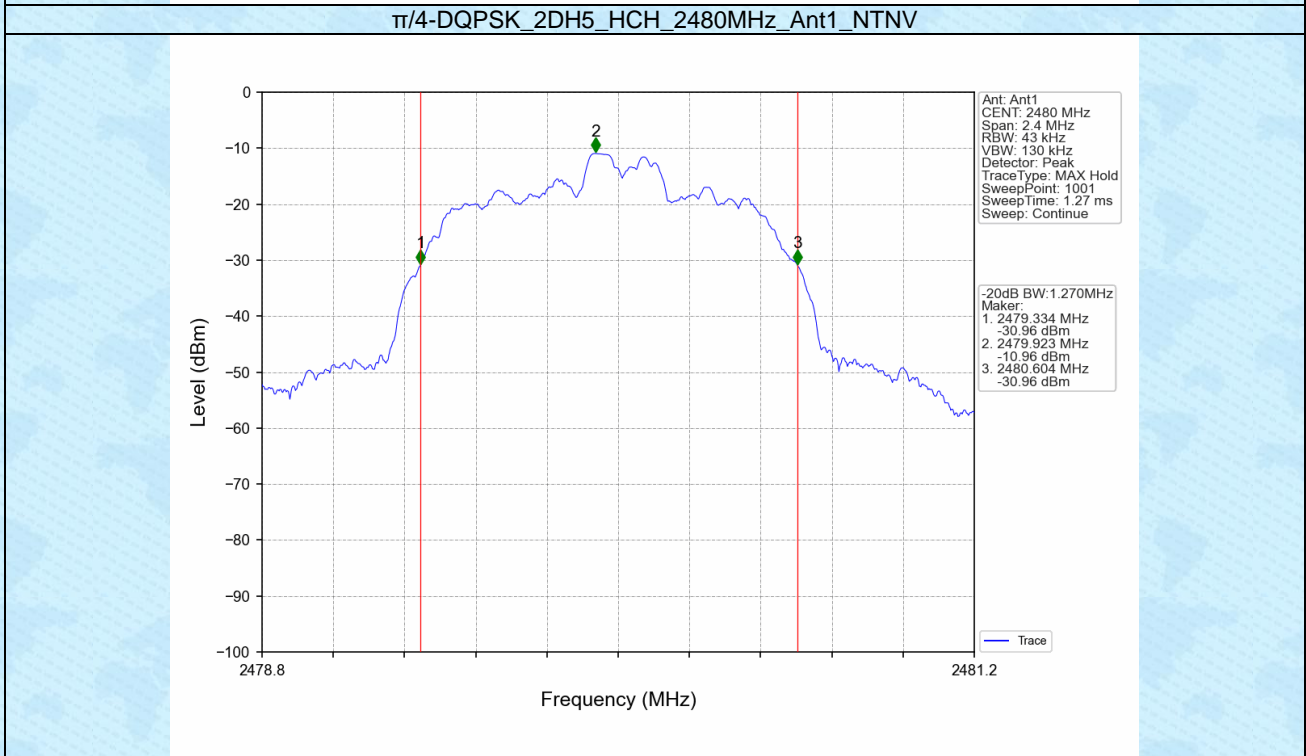
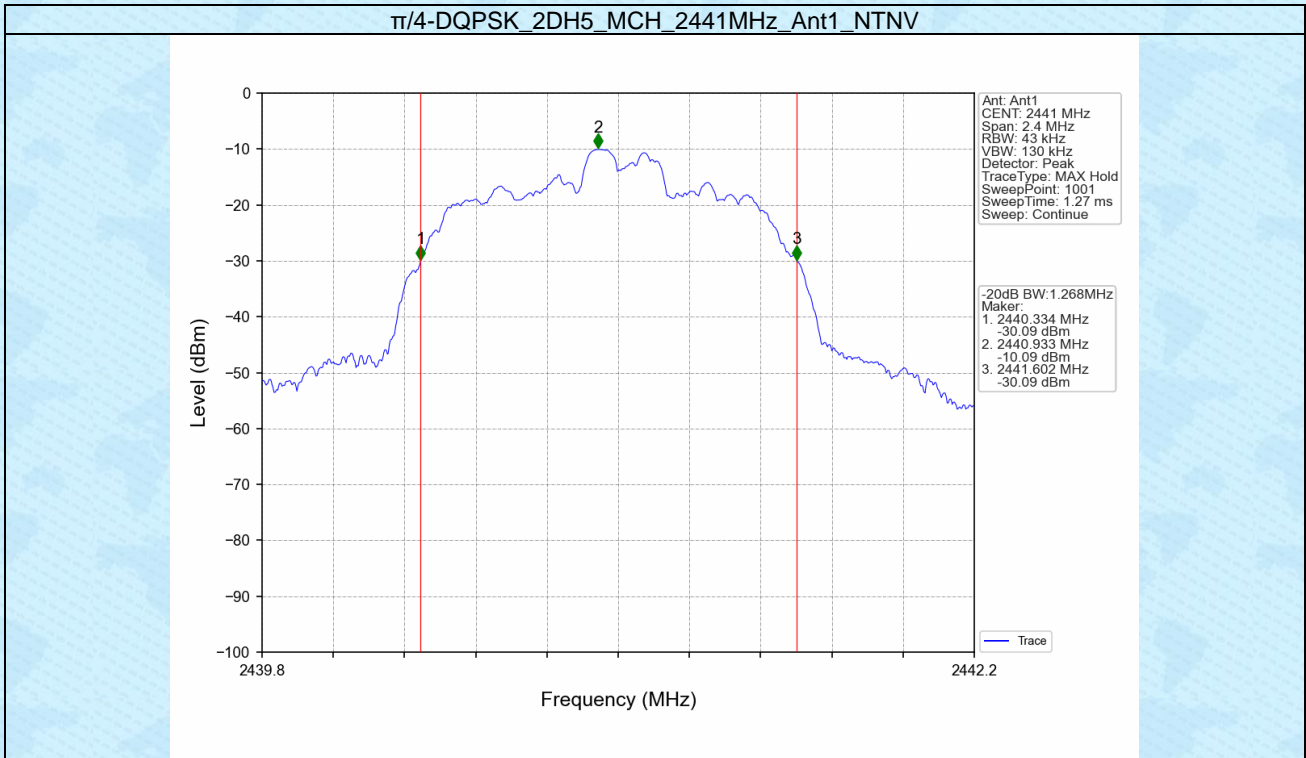
1.2.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	1.032	Pass
		2441	DH5	1	1.028	Pass
		2480	DH5	1	1.030	Pass
$\pi/4$ -DQPSK	SISO	2402	2DH5	1	1.275	Pass
		2441	2DH5	1	1.268	Pass
		2480	2DH5	1	1.270	Pass
8-DPSK	SISO	2402	3DH5	1	1.289	Pass
		2441	3DH5	1	1.293	Pass
		2480	3DH5	1	1.285	Pass

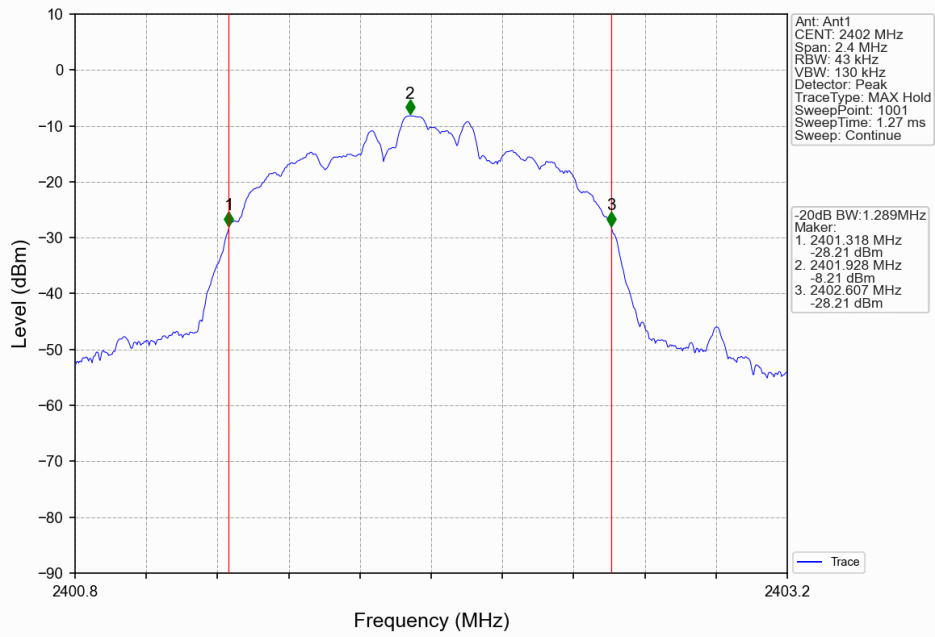
1.2.2 Test Graph



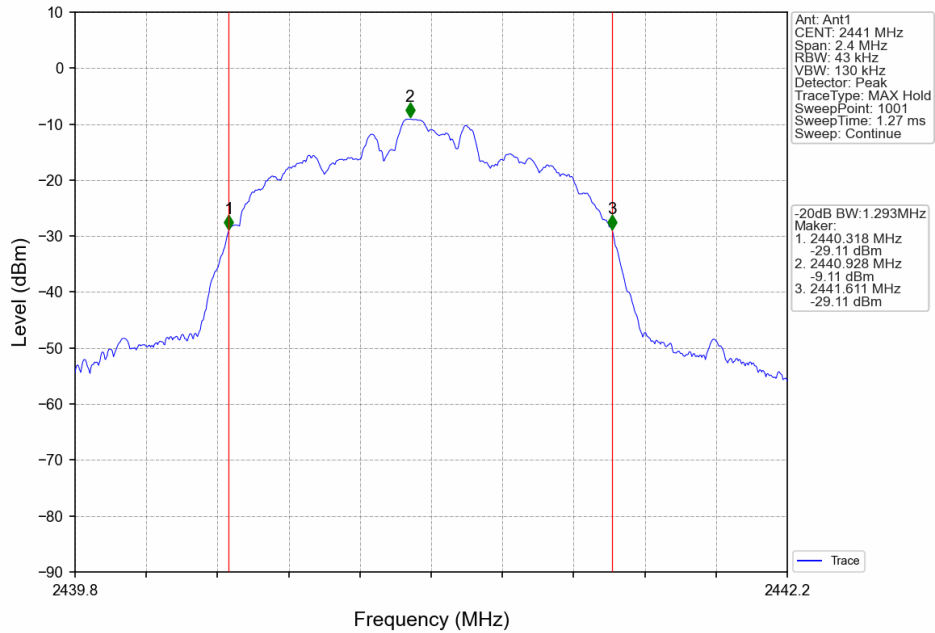


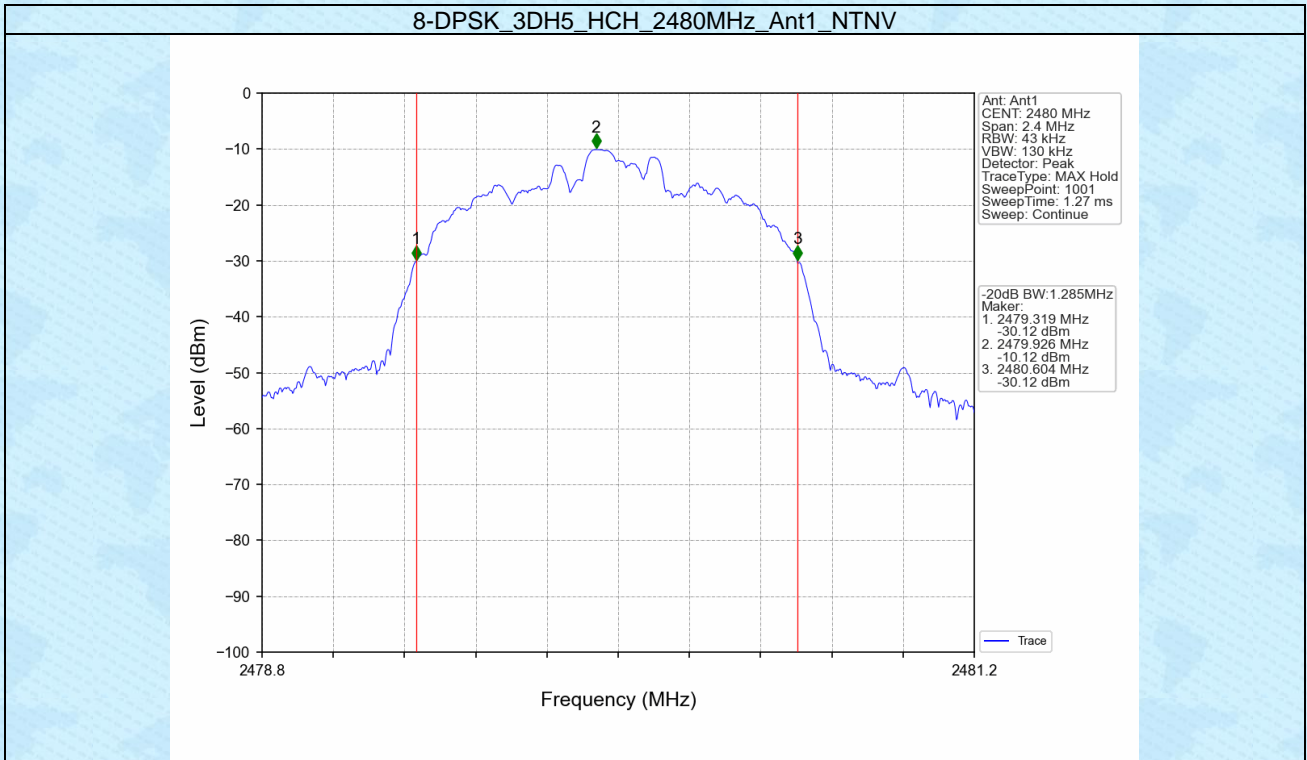


8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



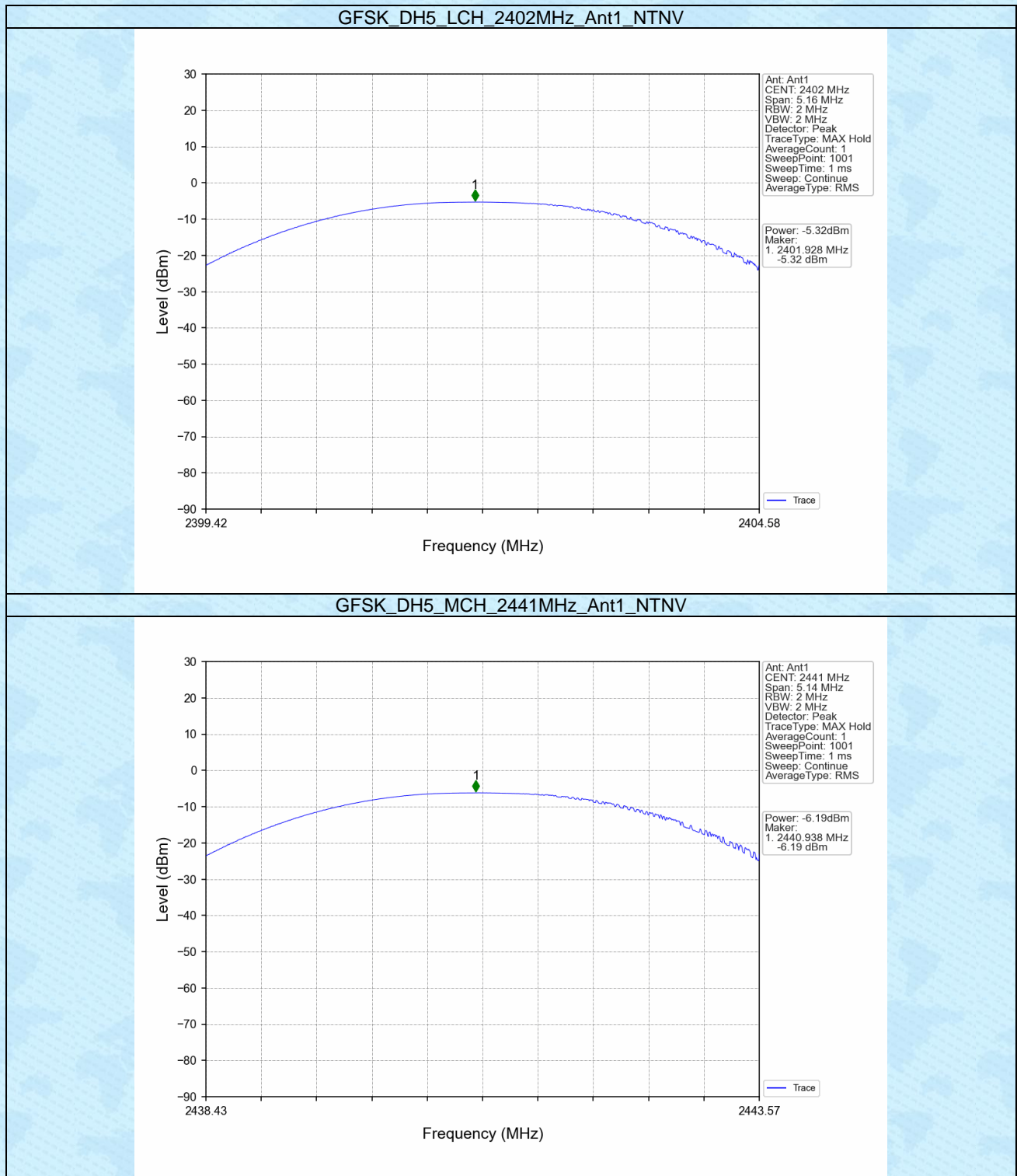


2. Maximum Conducted Output Power

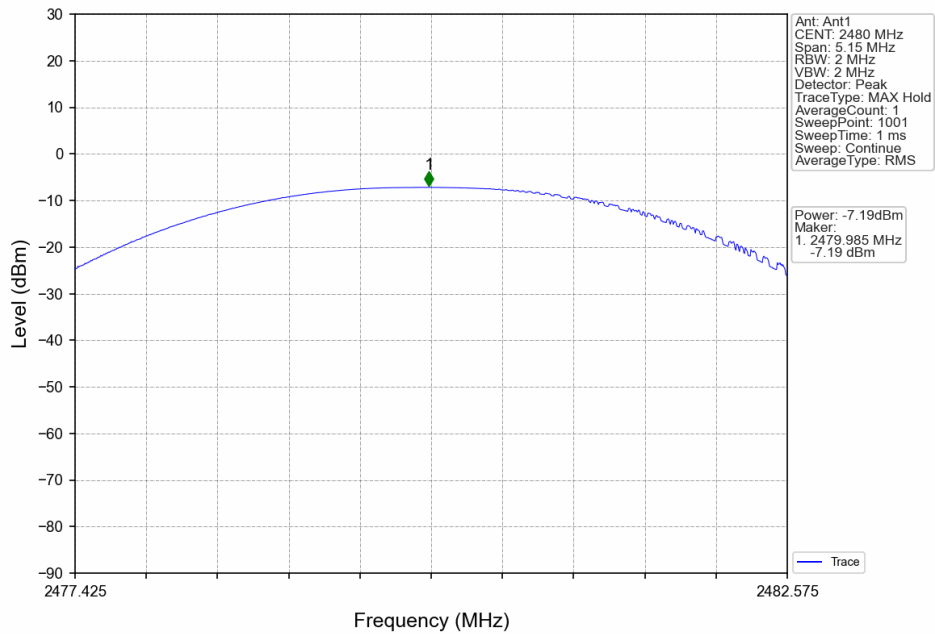
2.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-5.32	<=20.97	Pass
		2441	DH5	-6.19	<=20.97	Pass
		2480	DH5	-7.19	<=20.97	Pass
$\pi/4$ -DQPSK	SISO	2402	2DH5	-7.23	<=20.97	Pass
		2441	2DH5	-8.12	<=20.97	Pass
		2480	2DH5	-8.99	<=20.97	Pass
8-DPSK	SISO	2402	3DH5	-5.97	<=20.97	Pass
		2441	3DH5	-6.86	<=20.97	Pass
		2480	3DH5	-7.85	<=20.97	Pass

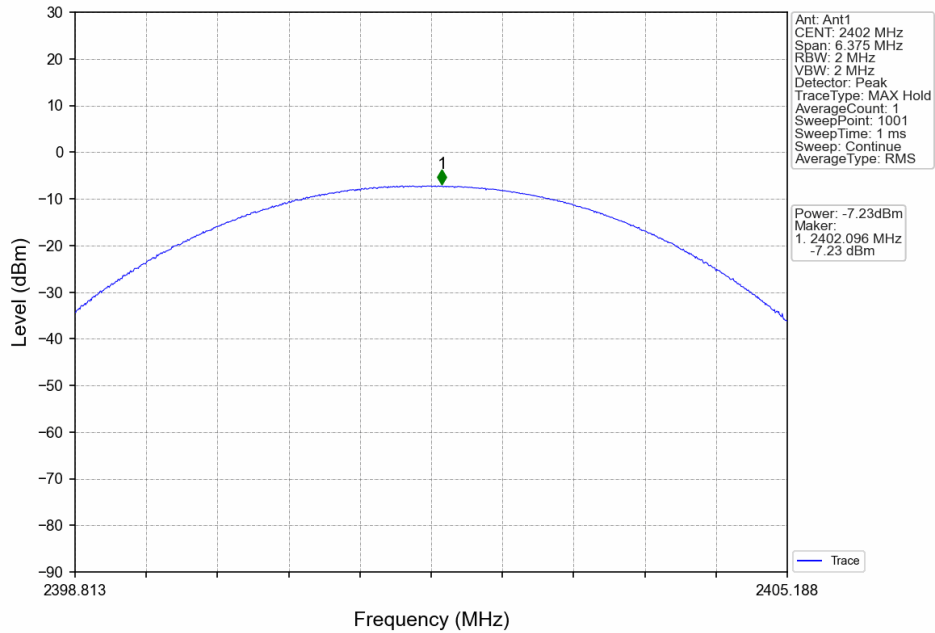
2.2 Test Graph



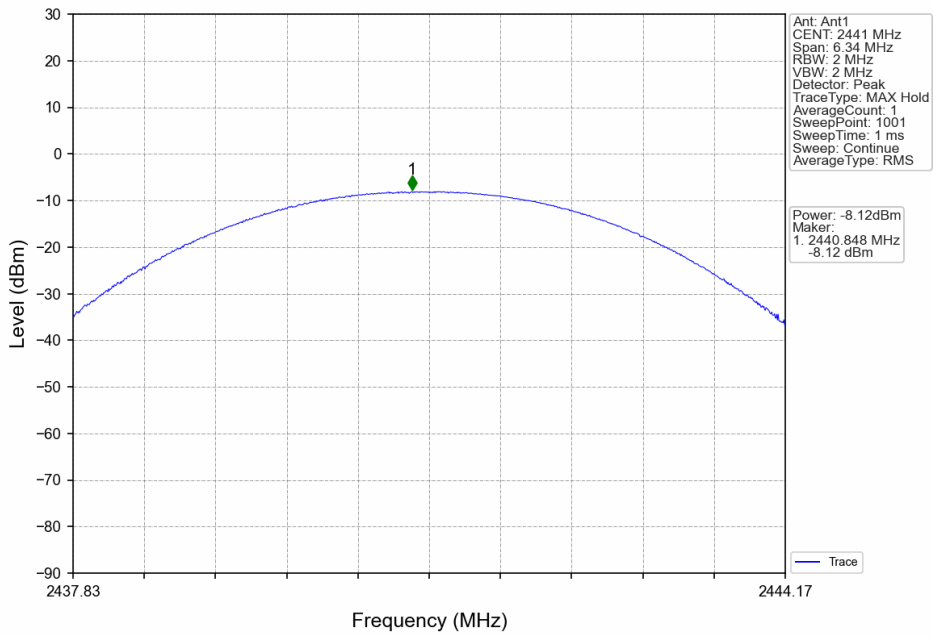
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



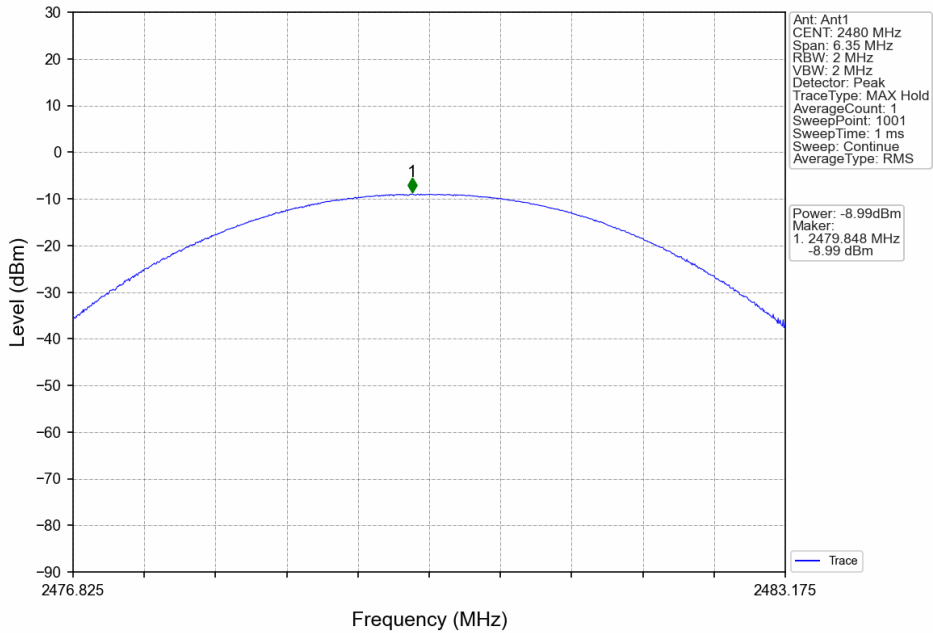
$\pi/4$ -DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



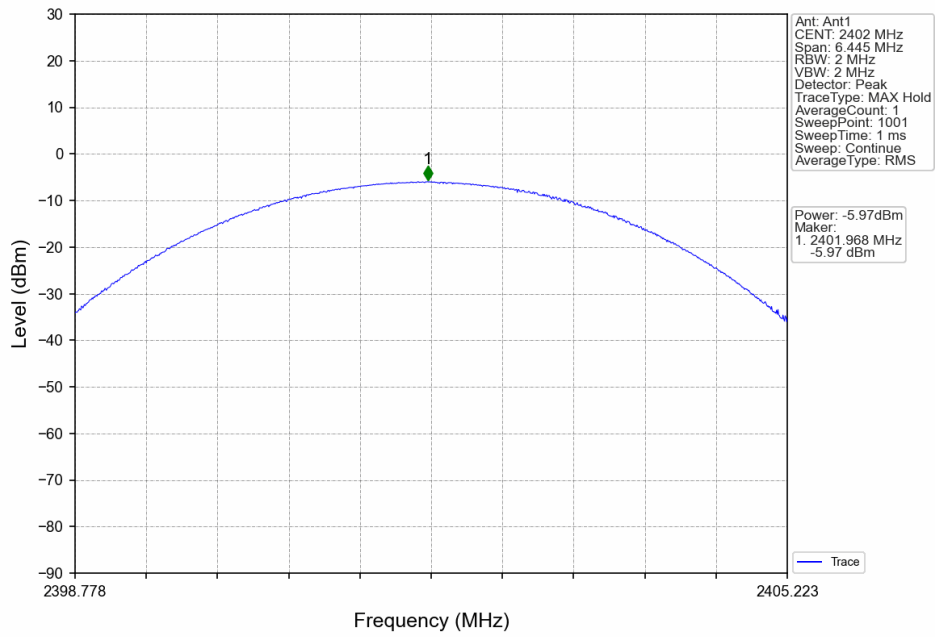
$\pi/4$ -DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



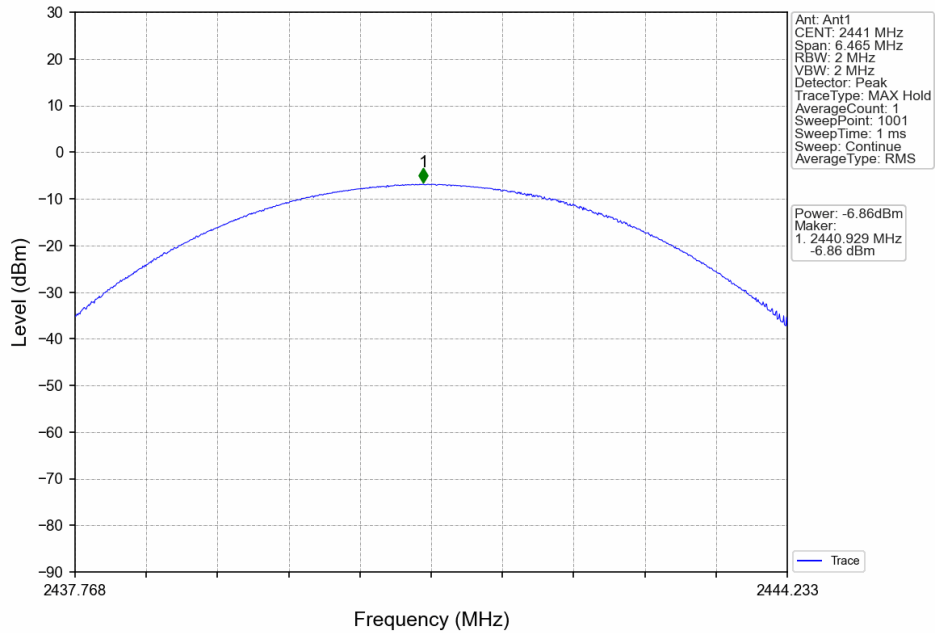
$\pi/4$ -DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

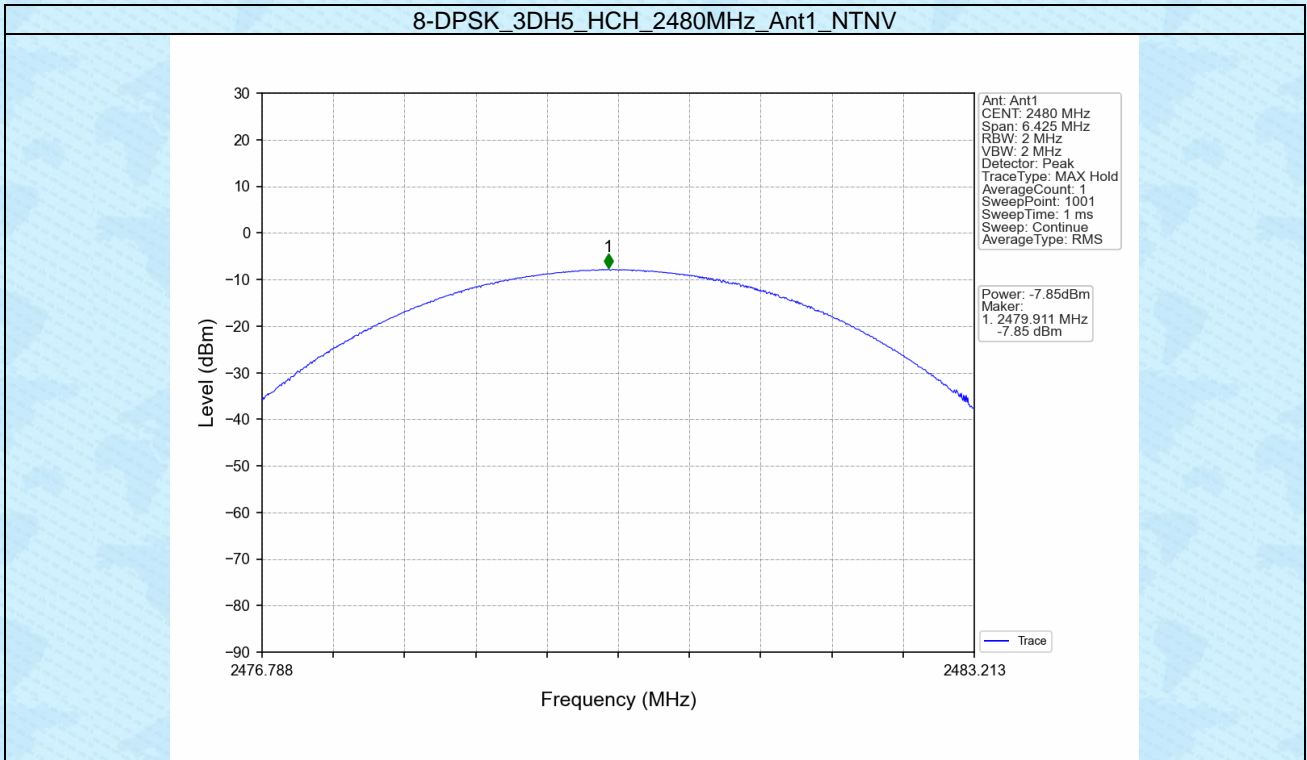


8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



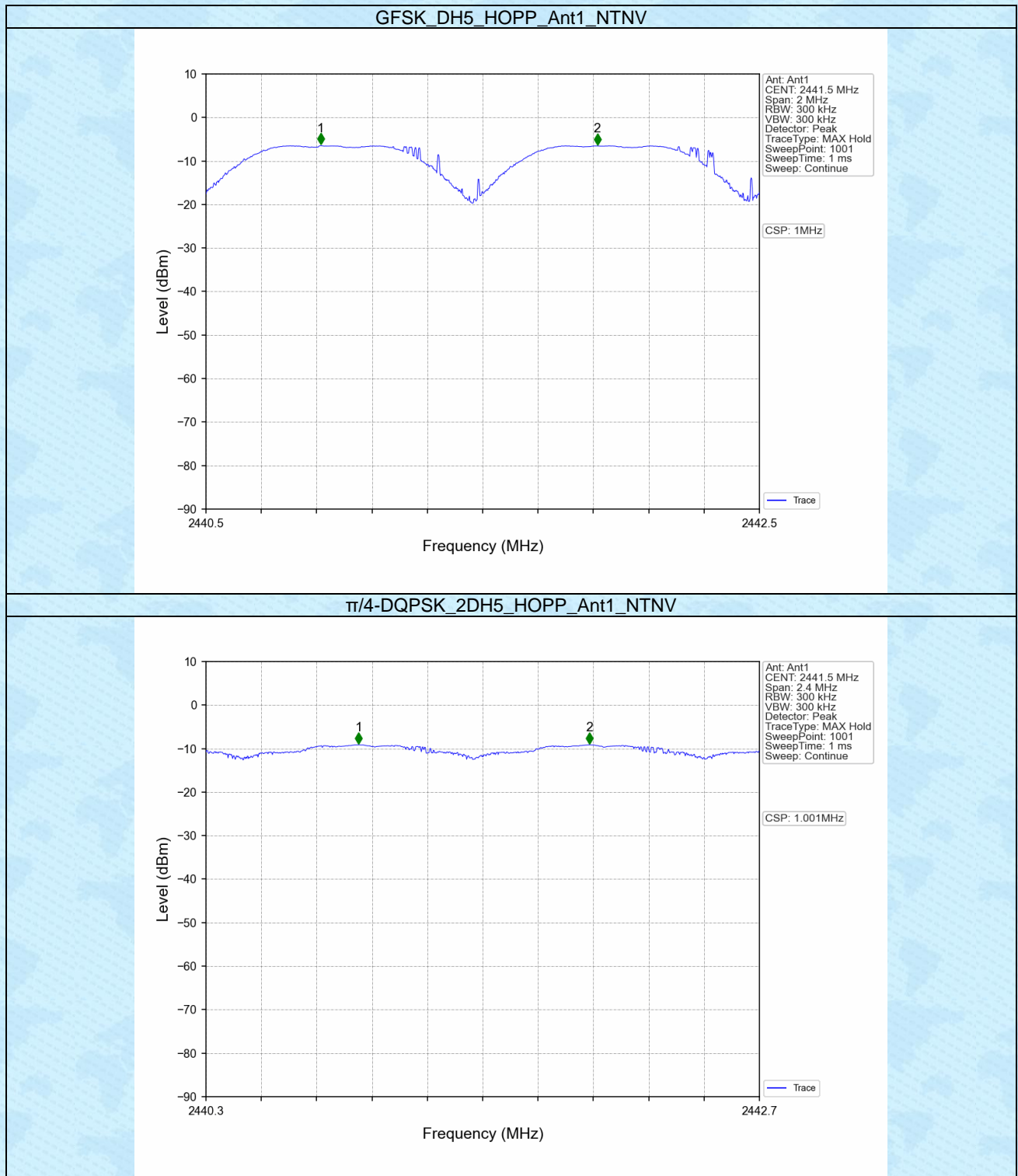


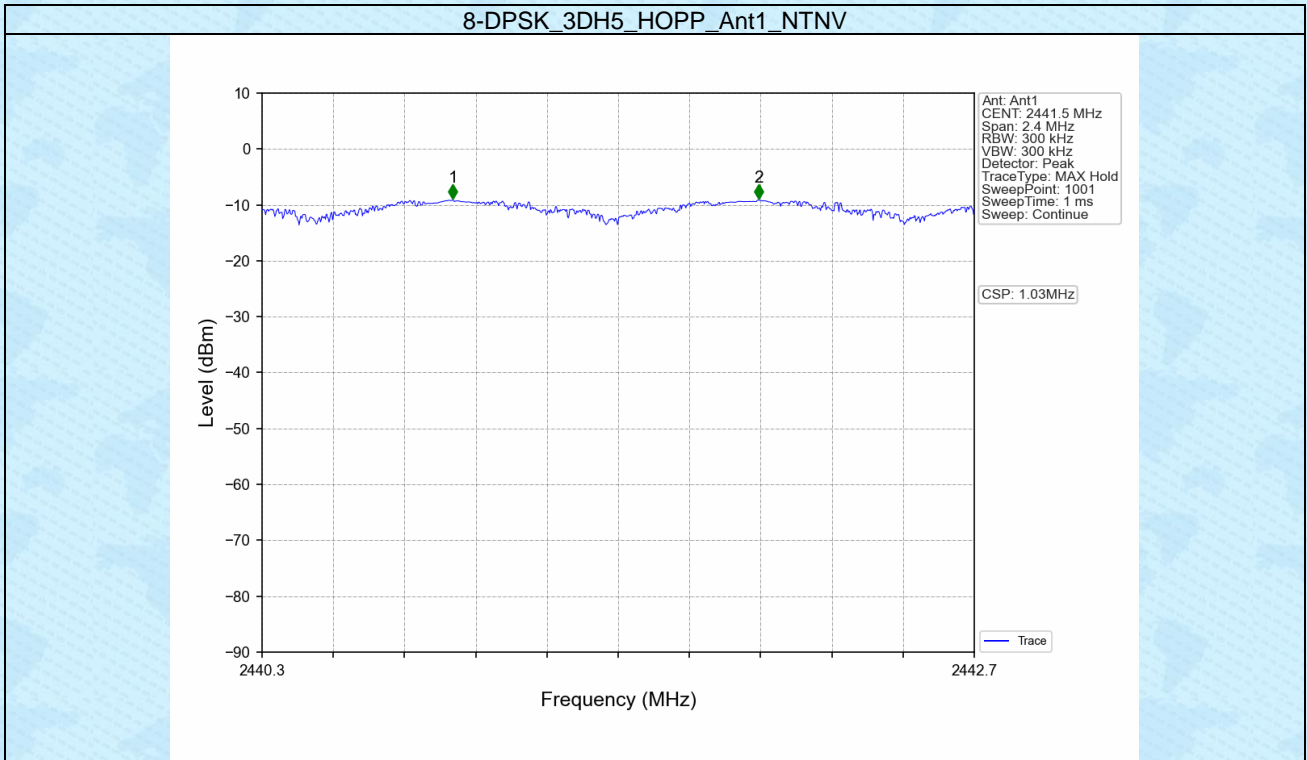
3. Carrier Frequency Separation

3.1 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	1.032	≥ 0.688	Pass
$\pi/4$ -DQPSK	SISO	HOPP	2DH5	1.001	1.008	≥ 0.672	Pass
8-DPSK	SISO	HOPP	3DH5	1.030	1.293	≥ 0.862	Pass

3.2 Test Graph



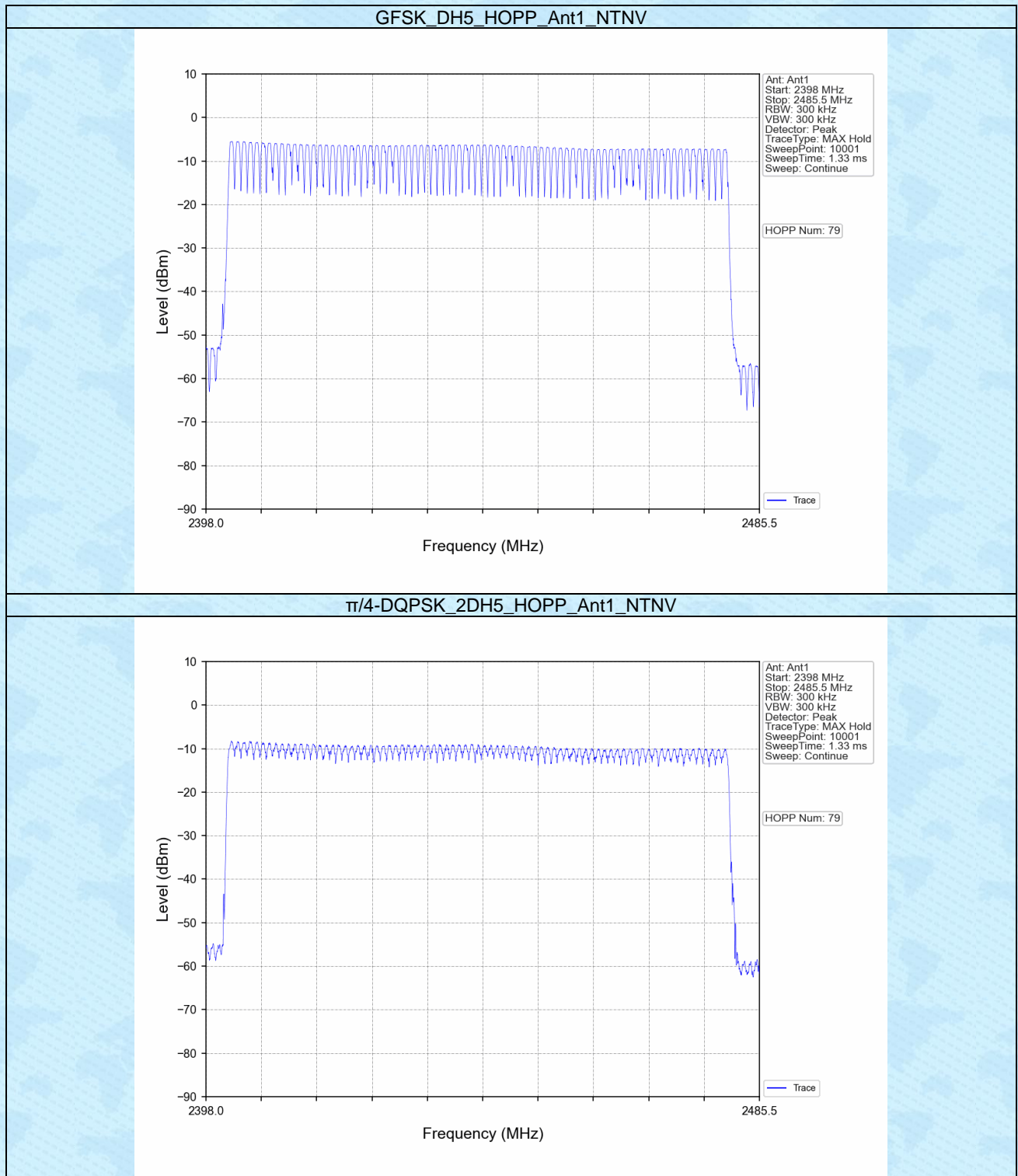


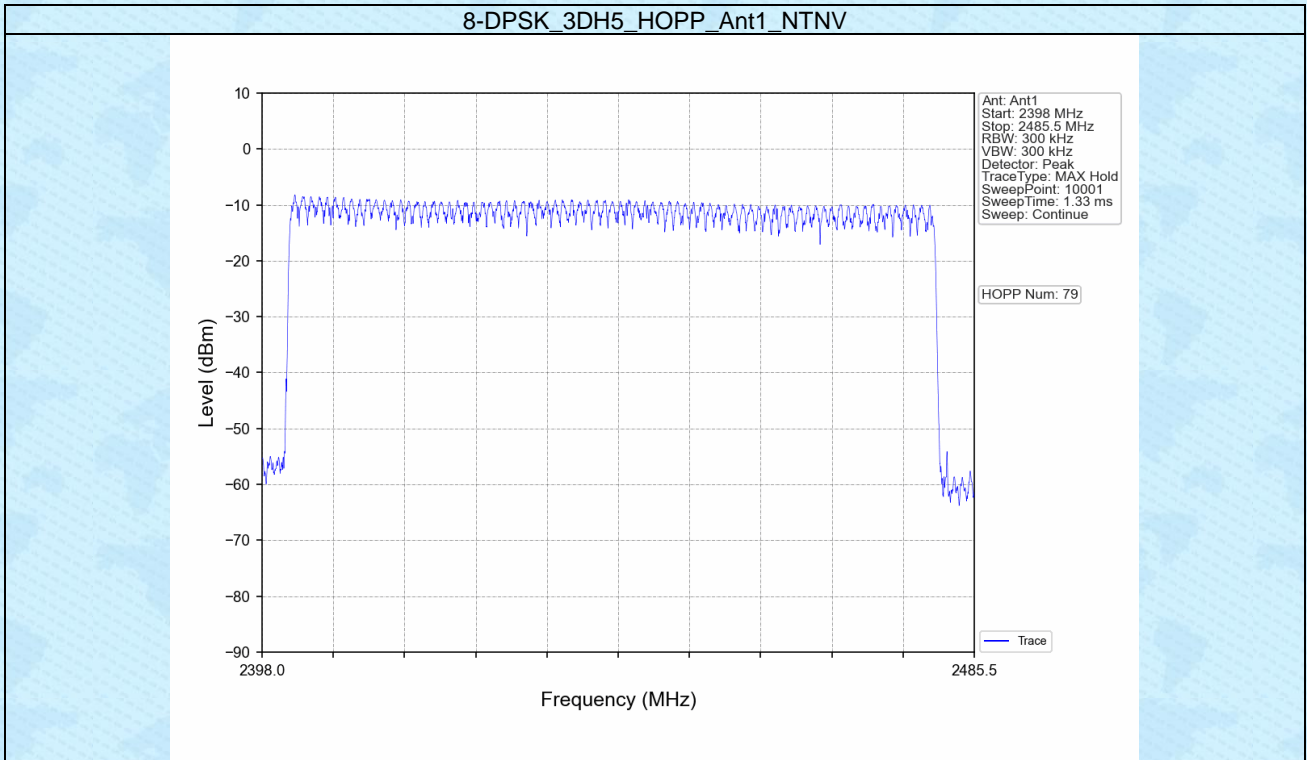
4. Number of Hopping Frequencies

4.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	Num of Hopping Frequencies		Verdict
				ANT1	Limit	
GFSK	SISO	HOPP	DH5	79	≥ 15	Pass
$\pi/4$ -DQPSK	SISO	HOPP	2DH5	79	≥ 15	Pass
8-DPSK	SISO	HOPP	3DH5	79	≥ 15	Pass

4.2 Test Graph



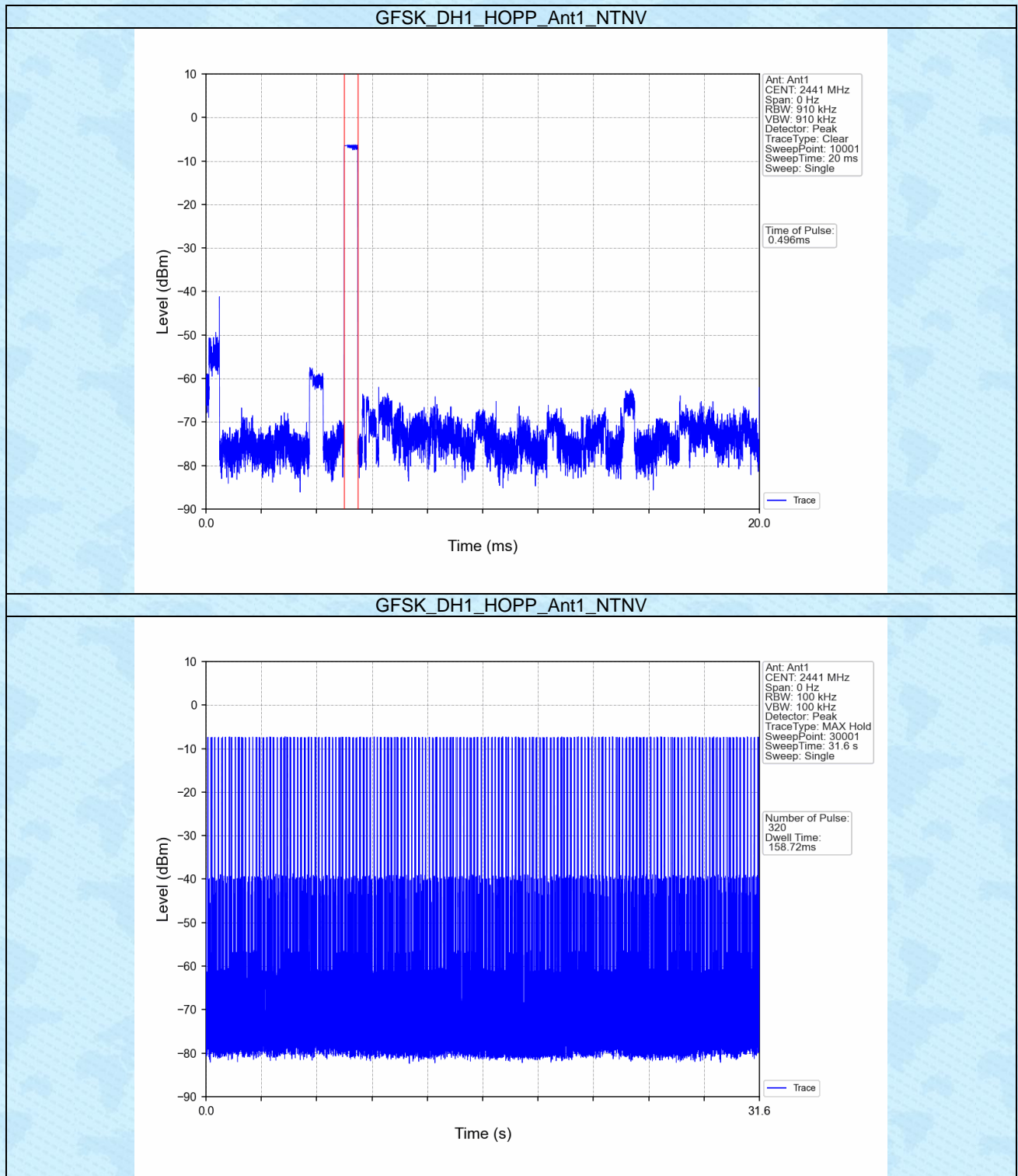


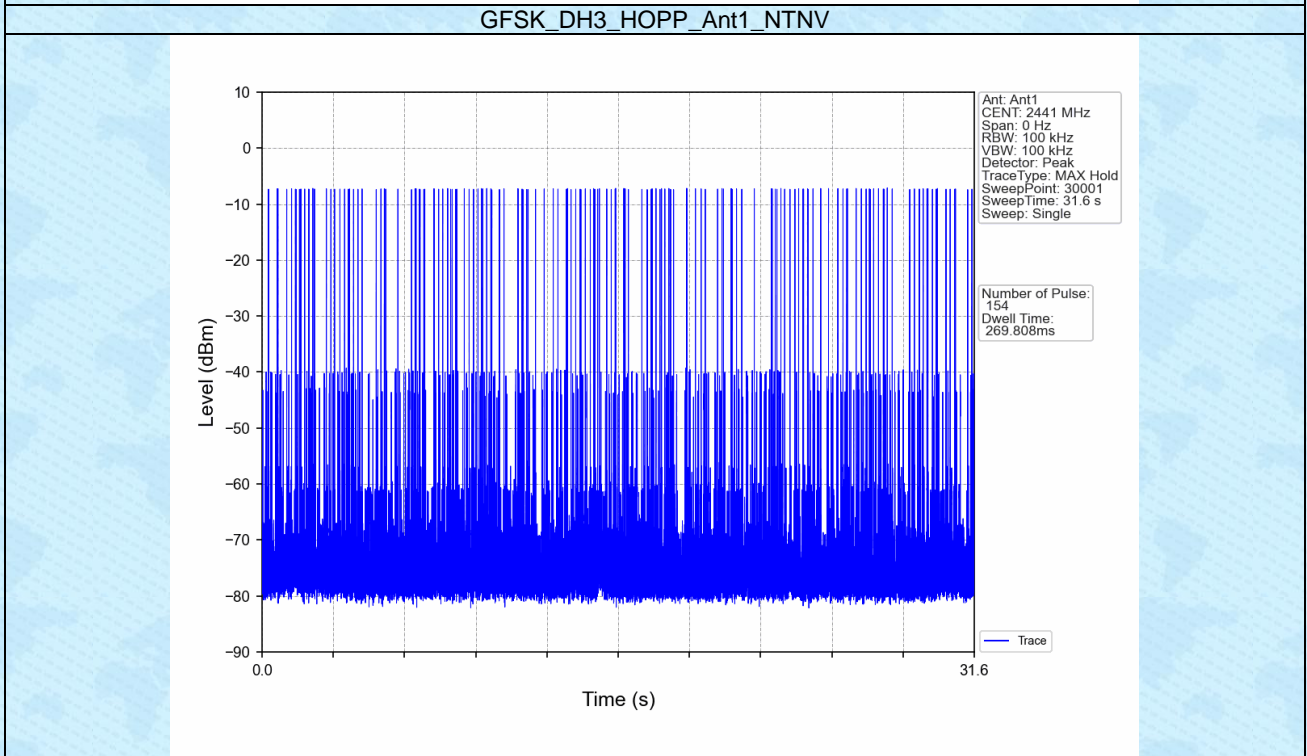
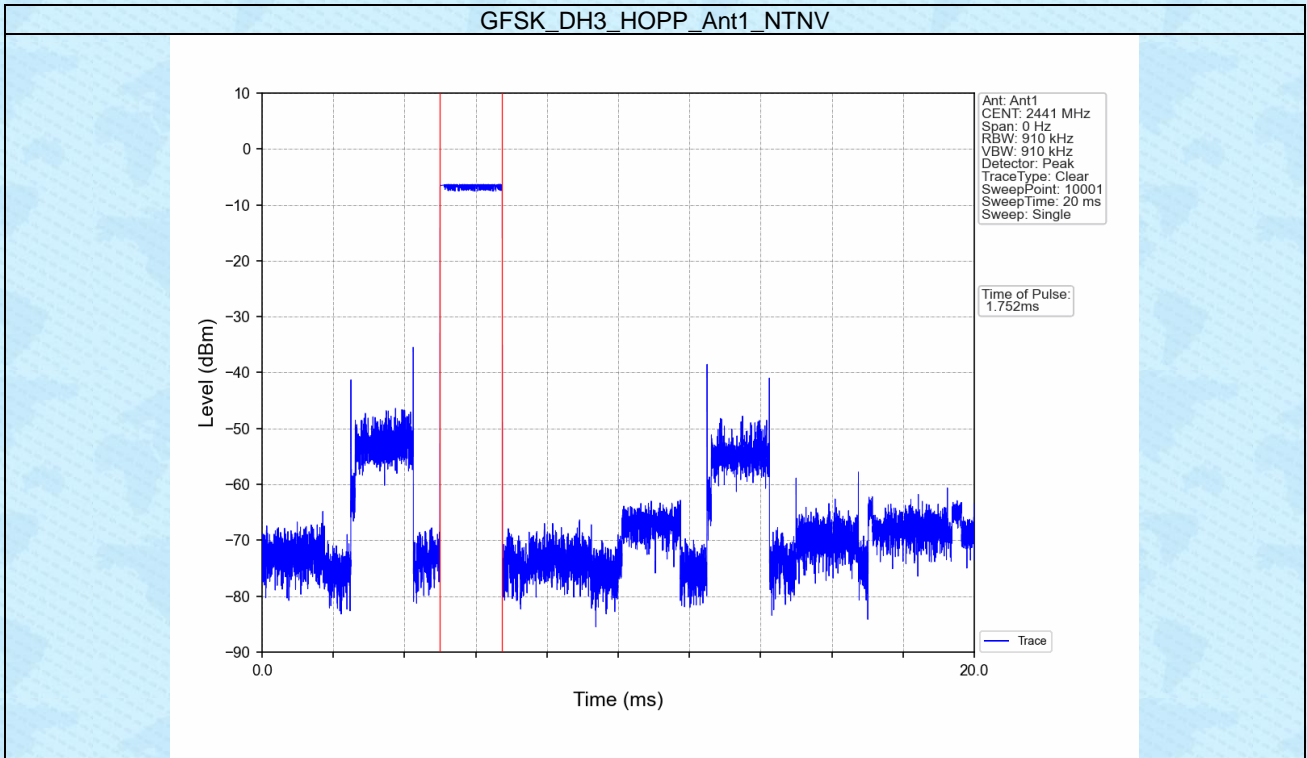
5. Time of Occupancy (Dwell Time)

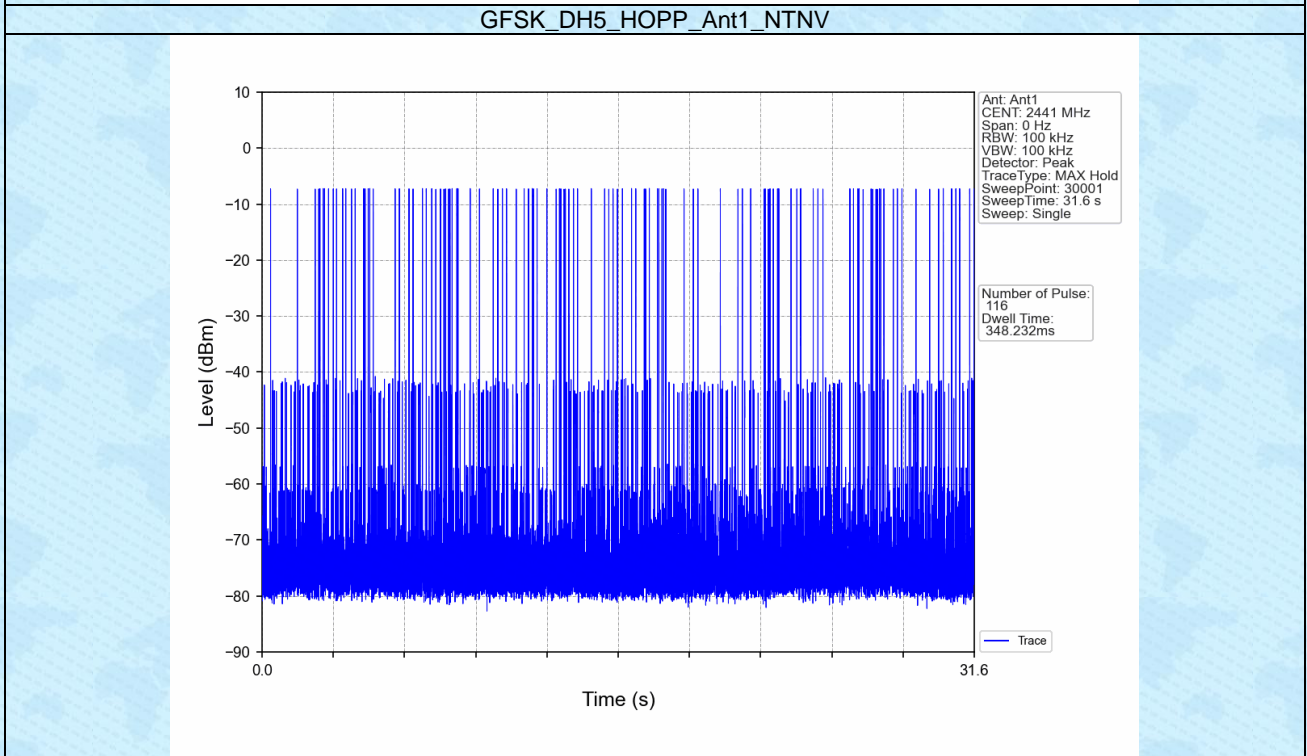
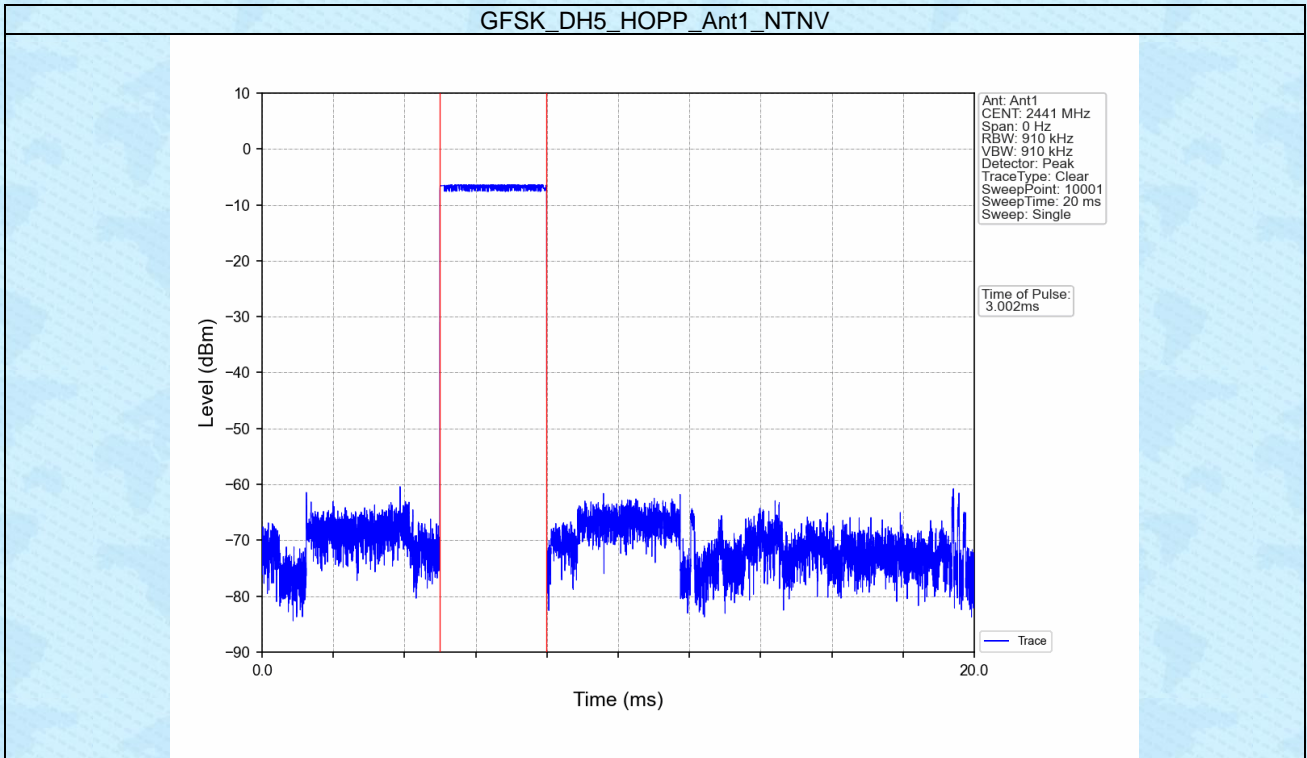
5.1 Test Result

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	0.496	31.600	320	158.720	<=400	Pass
			DH3	1.752	31.600	154	269.808	<=400	Pass
			DH5	3.002	31.600	116	348.232	<=400	Pass
π/4-DQPSK	SISO	HOPP	2DH1	0.506	31.600	320	161.920	<=400	Pass
			2DH3	1.758	31.600	156	274.248	<=400	Pass
			2DH5	3.008	31.600	111	333.888	<=400	Pass
8-DPSK	SISO	HOPP	3DH1	0.508	31.600	320	162.560	<=400	Pass
			3DH3	1.756	31.600	169	296.764	<=400	Pass
			3DH5	3.010	31.600	109	328.090	<=400	Pass

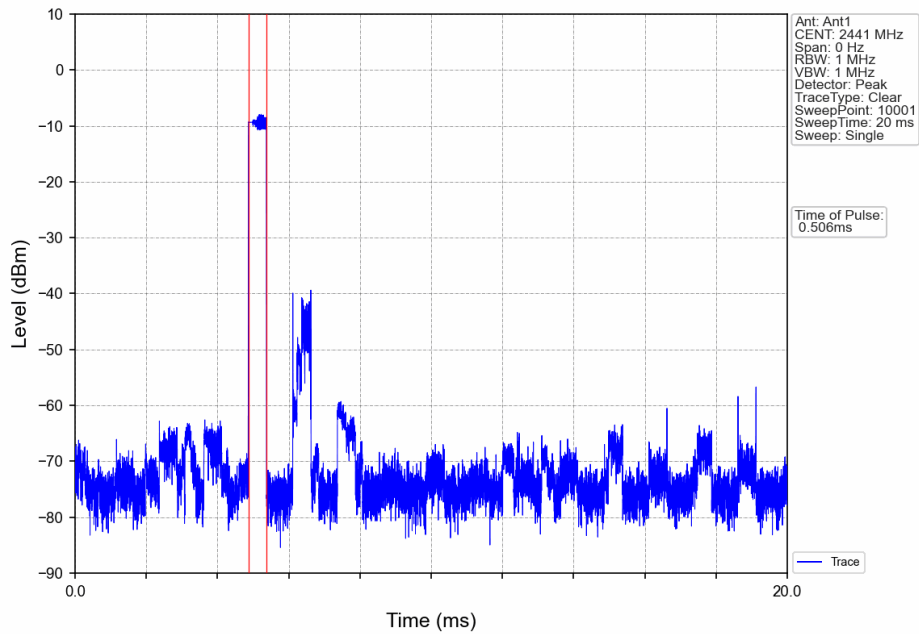
5.2 Test Graph



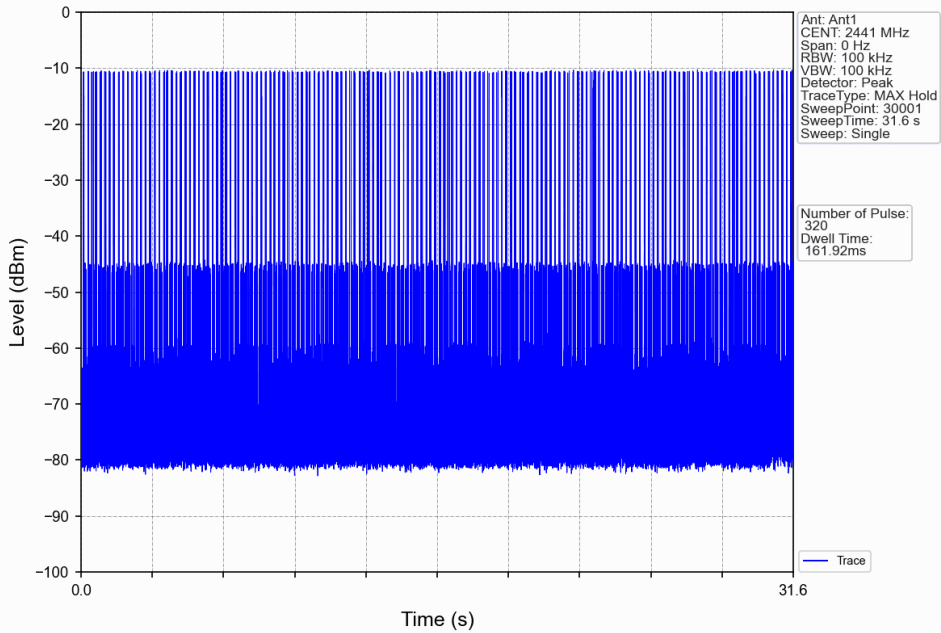


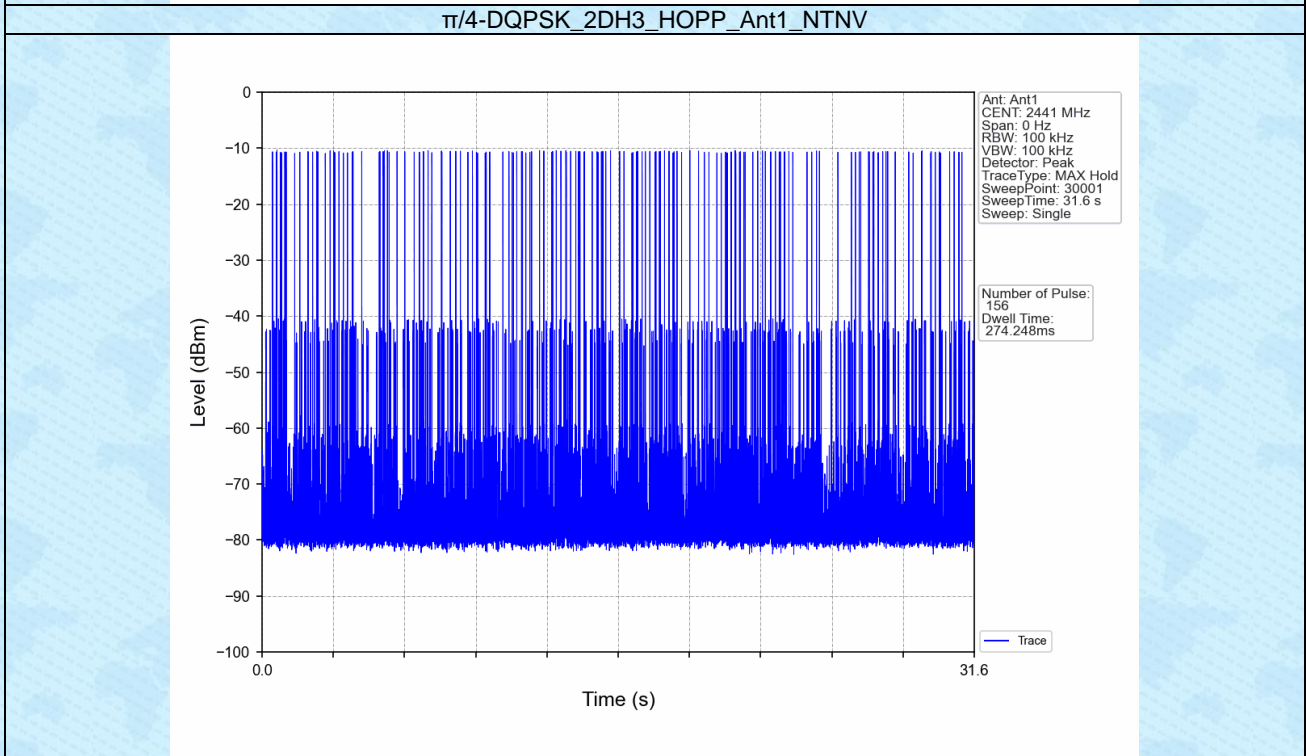
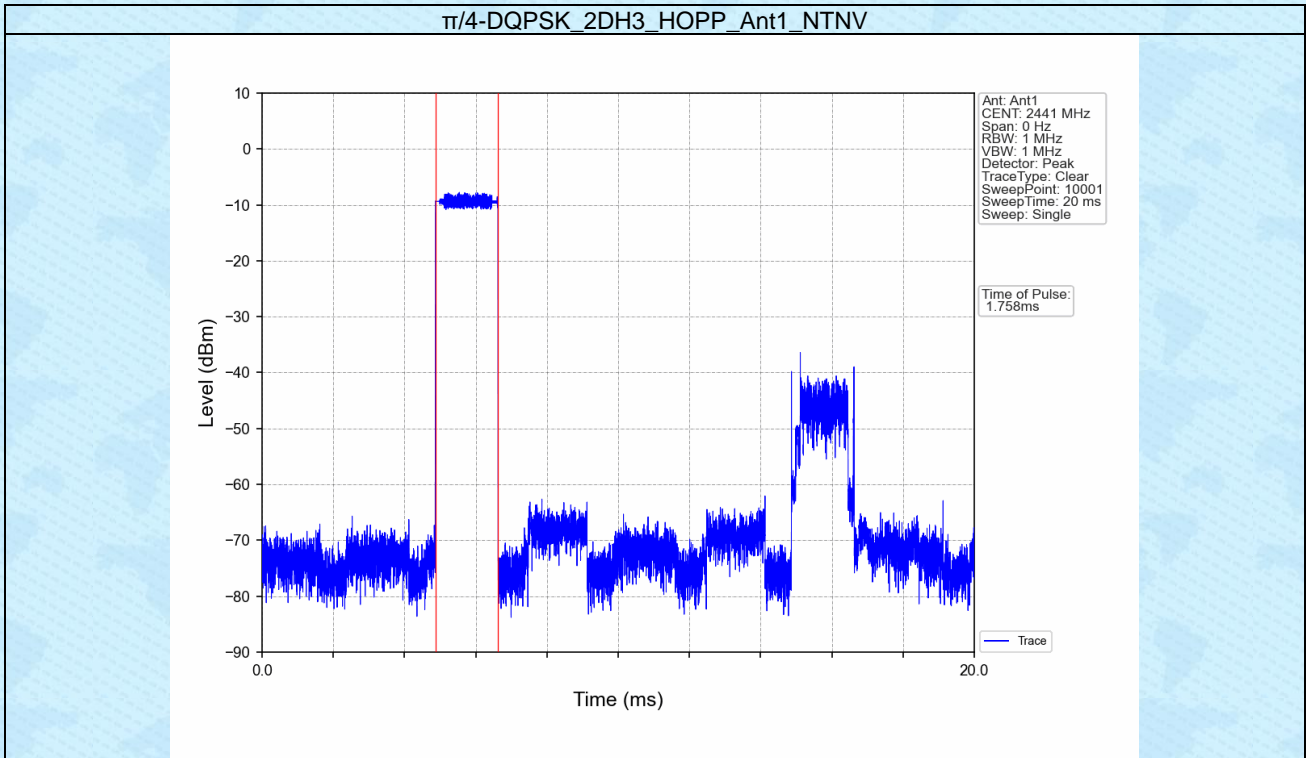


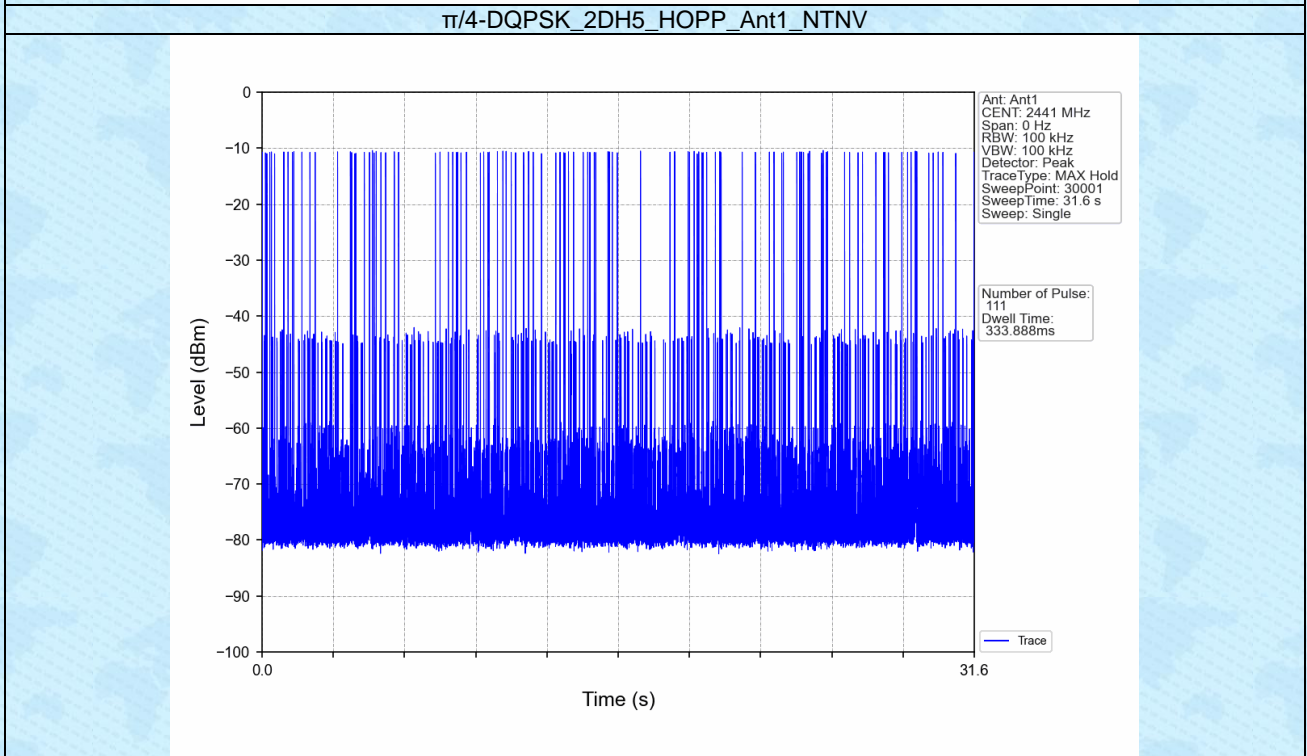
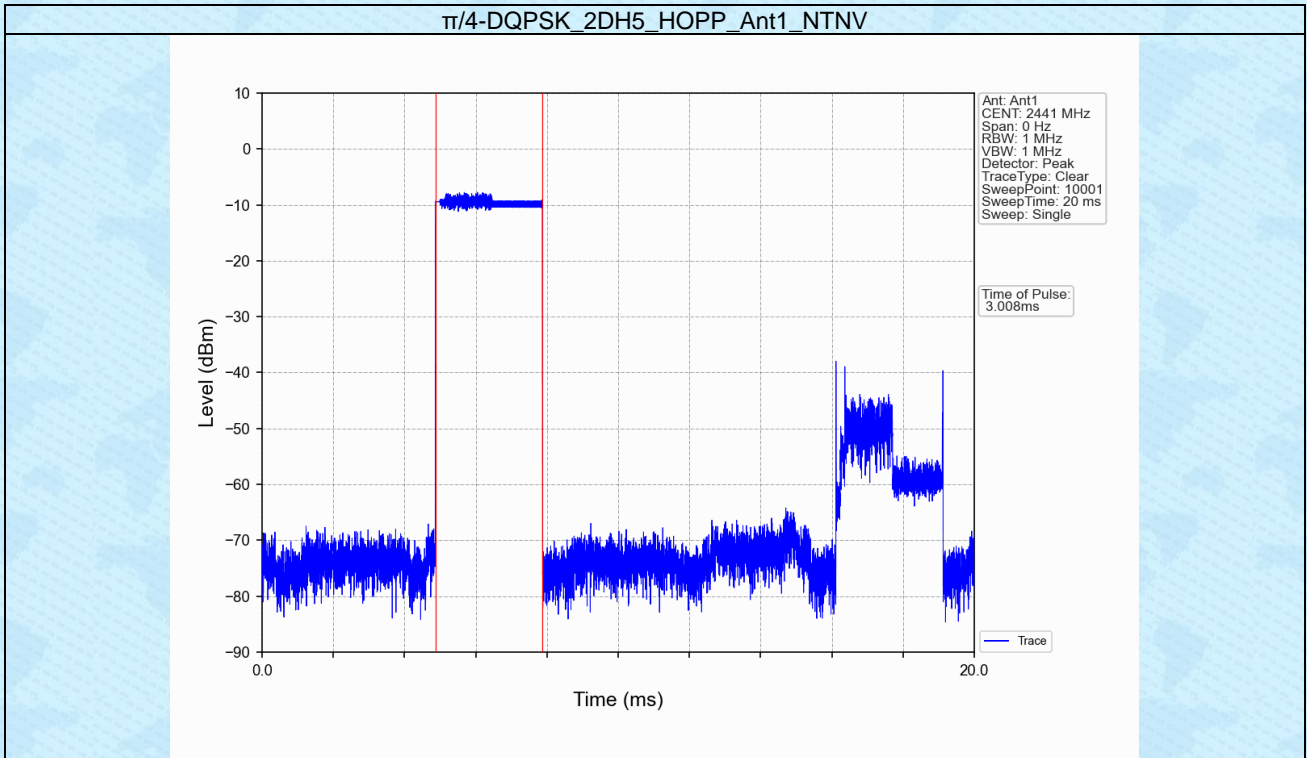
$\pi/4$ -DQPSK_2DH1_HOPP_Ant1_NTNV



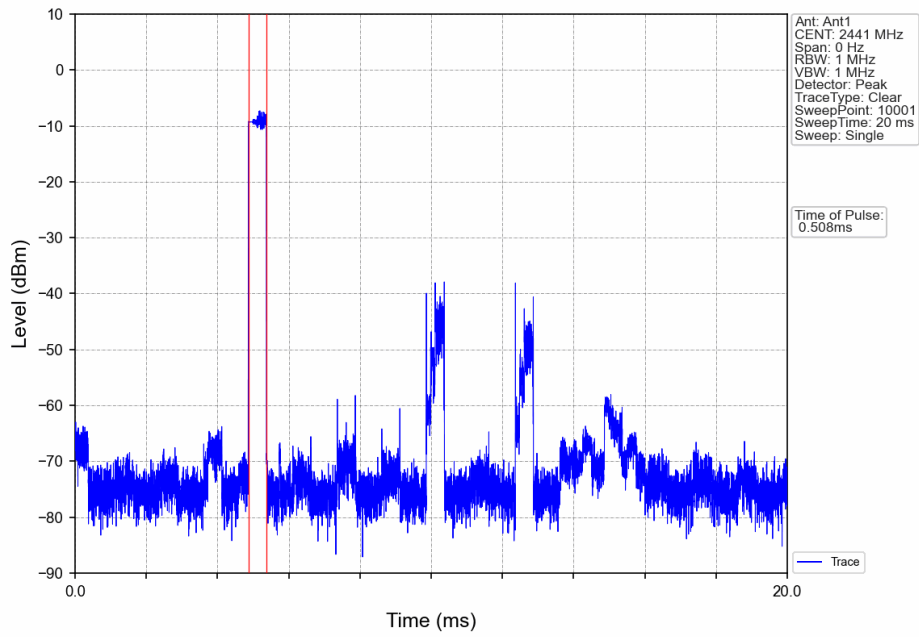
$\pi/4$ -DQPSK_2DH1_HOPP_Ant1_NTNV



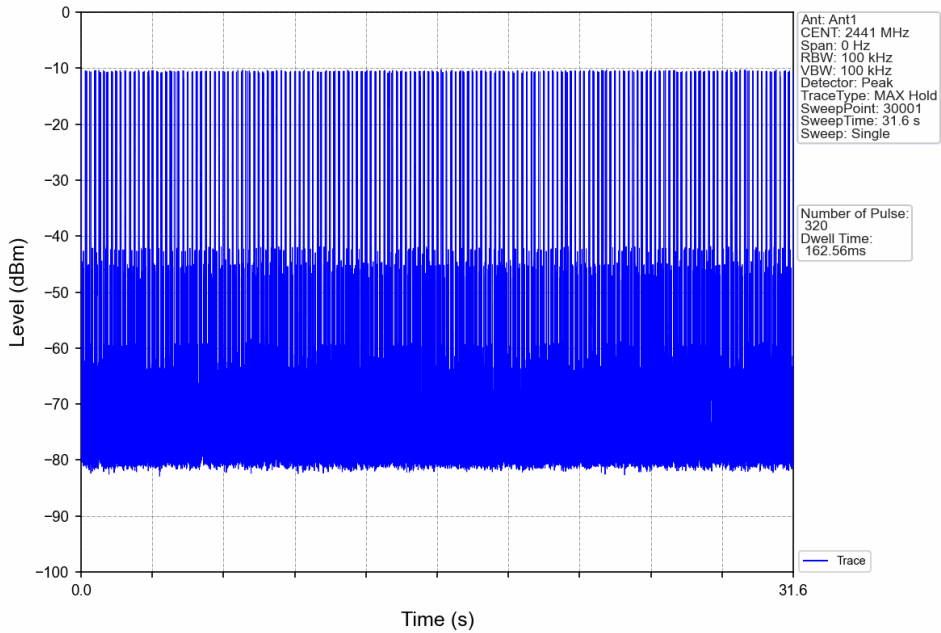




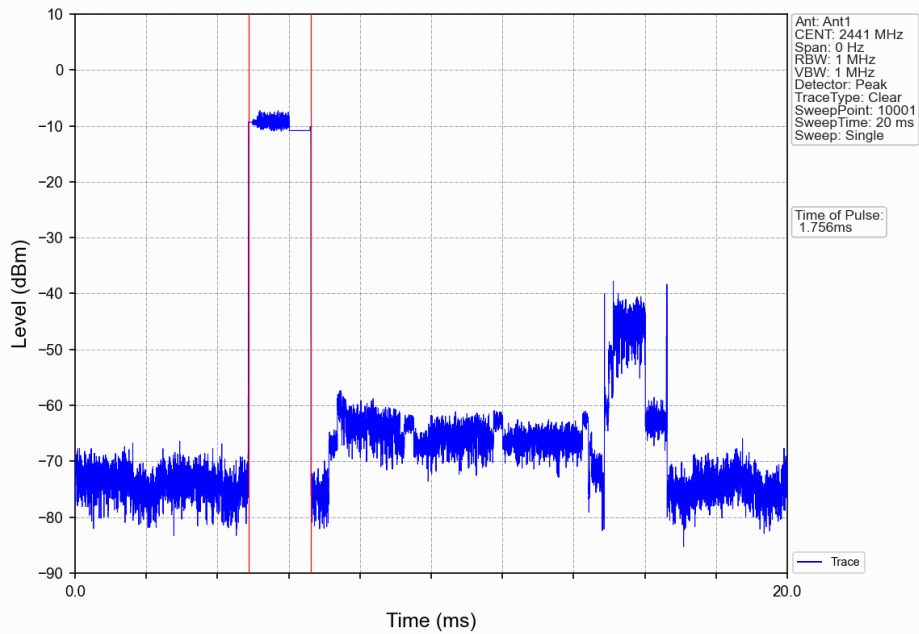
8-DPSK_3DH1_HOPP_Ant1_NTNV



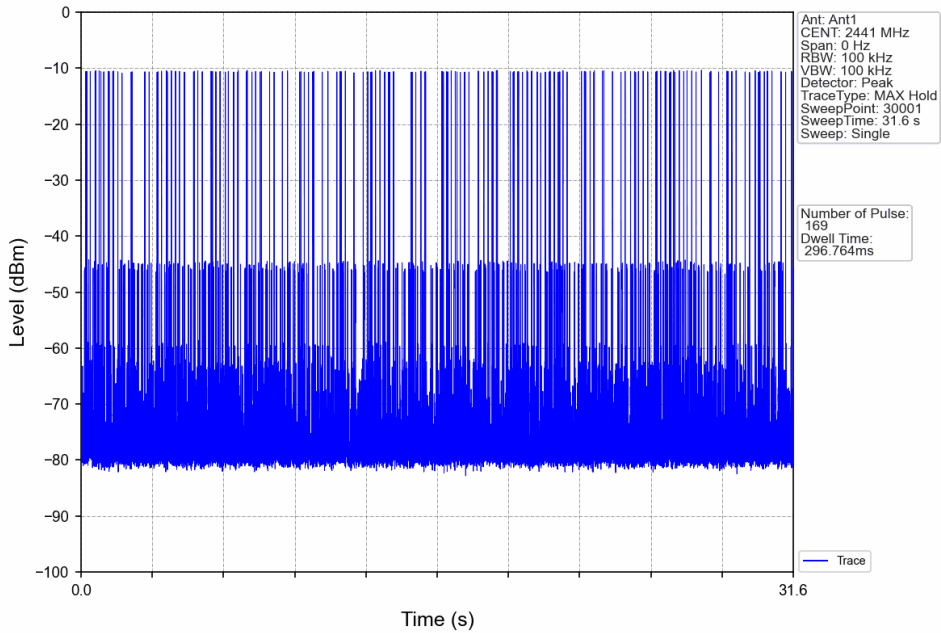
8-DPSK_3DH1_HOPP_Ant1_NTNV



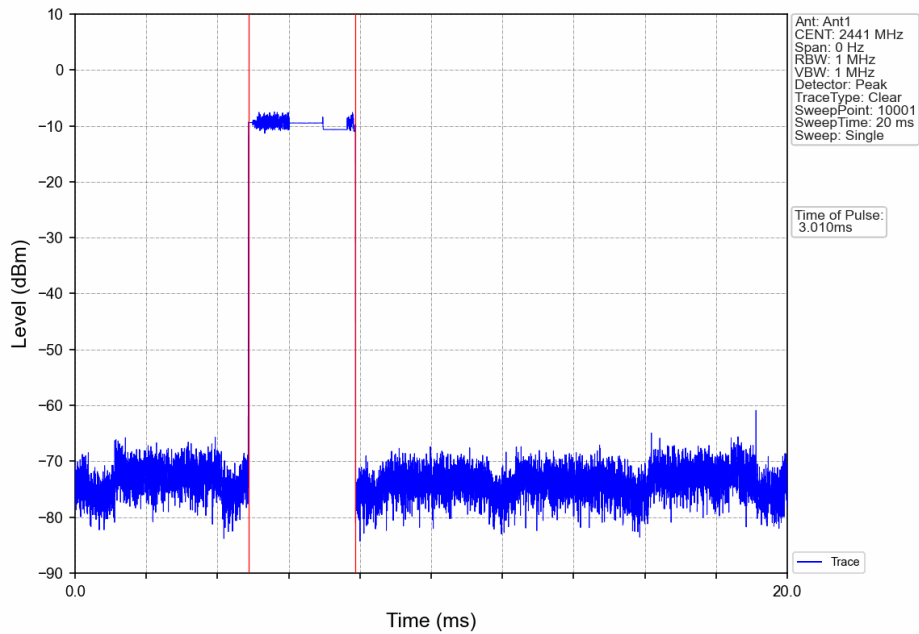
8-DPSK_3DH3_HOPP_Ant1_NTNV



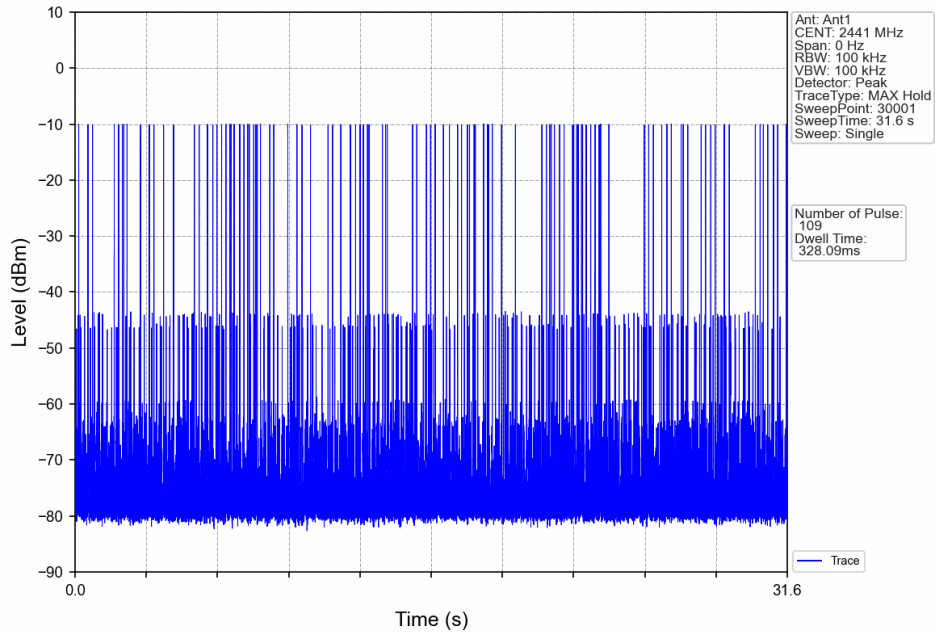
8-DPSK_3DH3_HOPP_Ant1_NTNV



8-DPSK_3DH5_HOPP_Ant1_NTNV



8-DPSK_3DH5_HOPP_Ant1_NTNV



6. Unwanted Emissions In Non-restricted Frequency Bands

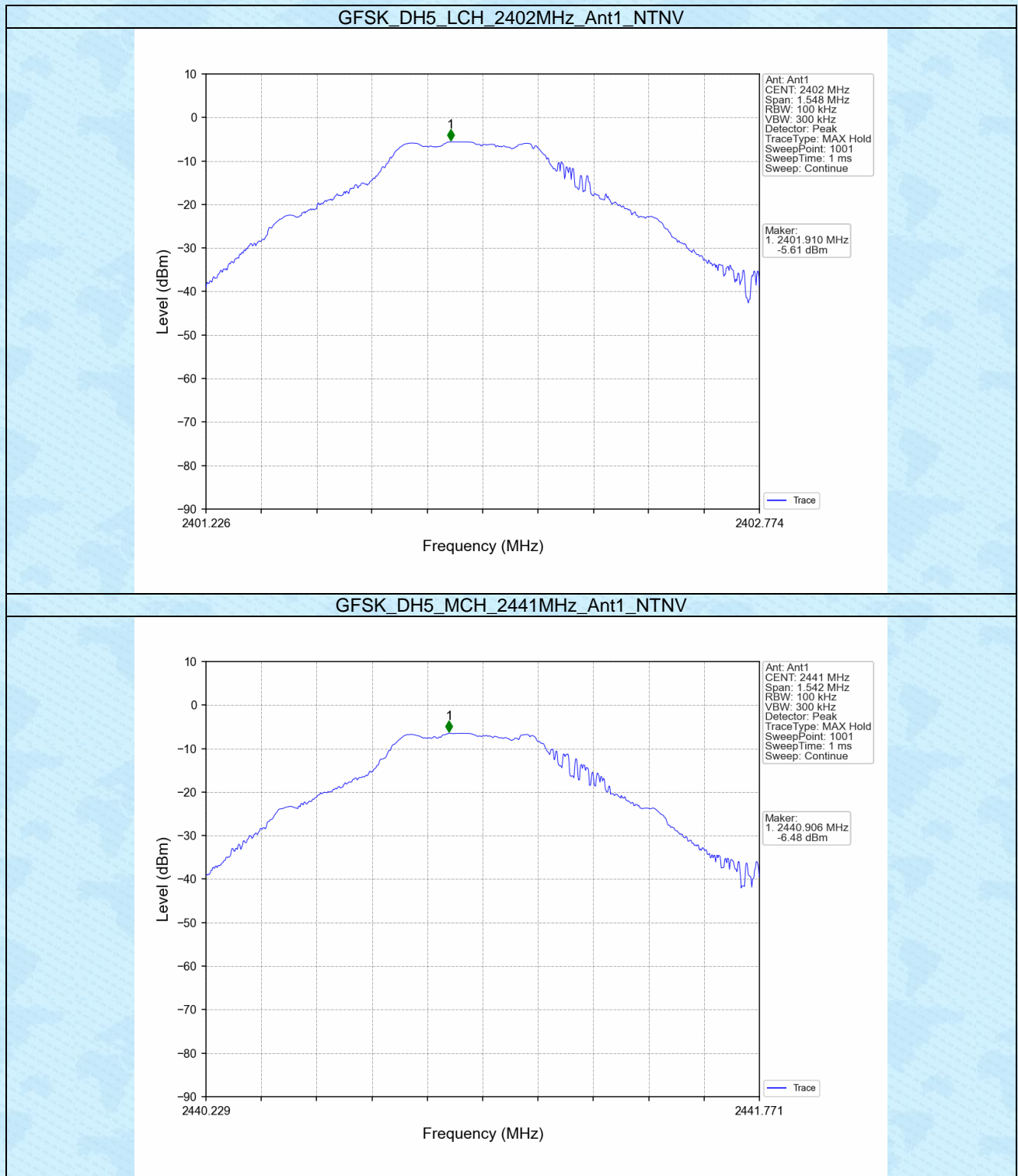
6.1 Ref

6.1.1 Test Result

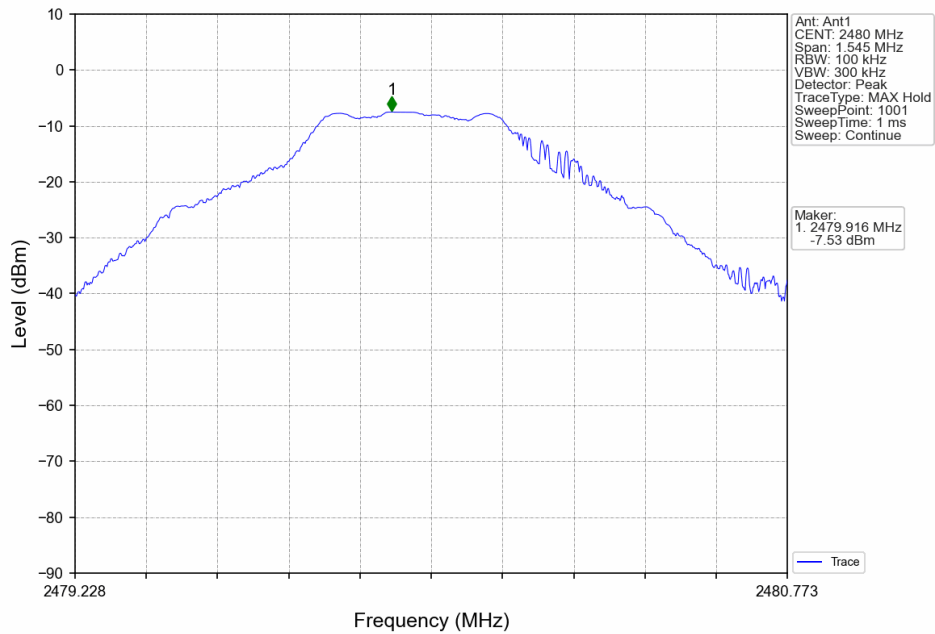
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	-5.61
		2441	DH5	1	-6.48
		2480	DH5	1	-7.53
$\pi/4$ -DQPSK	SISO	2402	2DH5	1	-9.19
		2441	2DH5	1	-8.52
		2480	2DH5	1	-9.48
8-DPSK	SISO	2402	3DH5	1	-8.31
		2441	3DH5	1	-9.13
		2480	3DH5	1	-10.12

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.

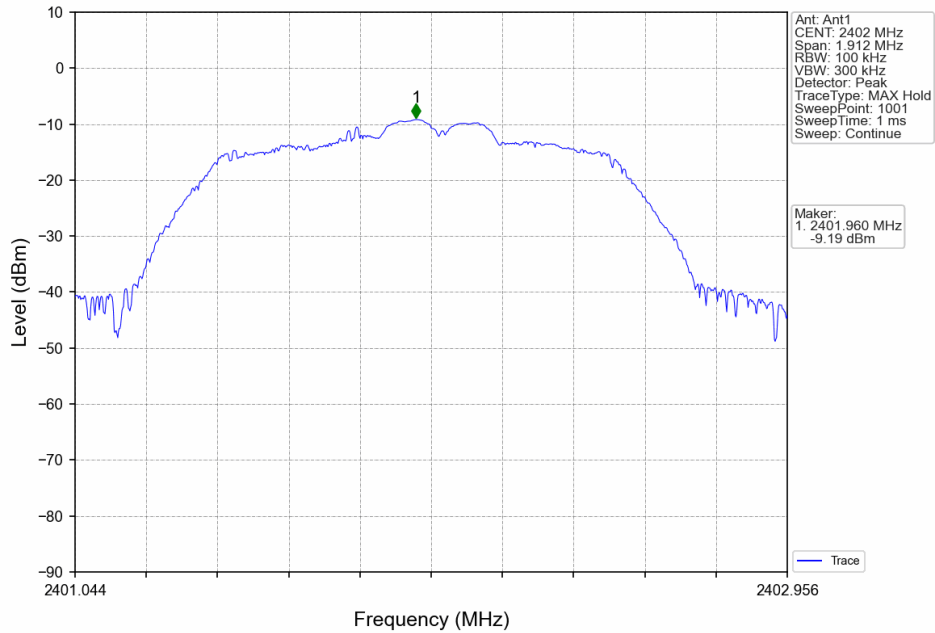
6.1.2 Test Graph



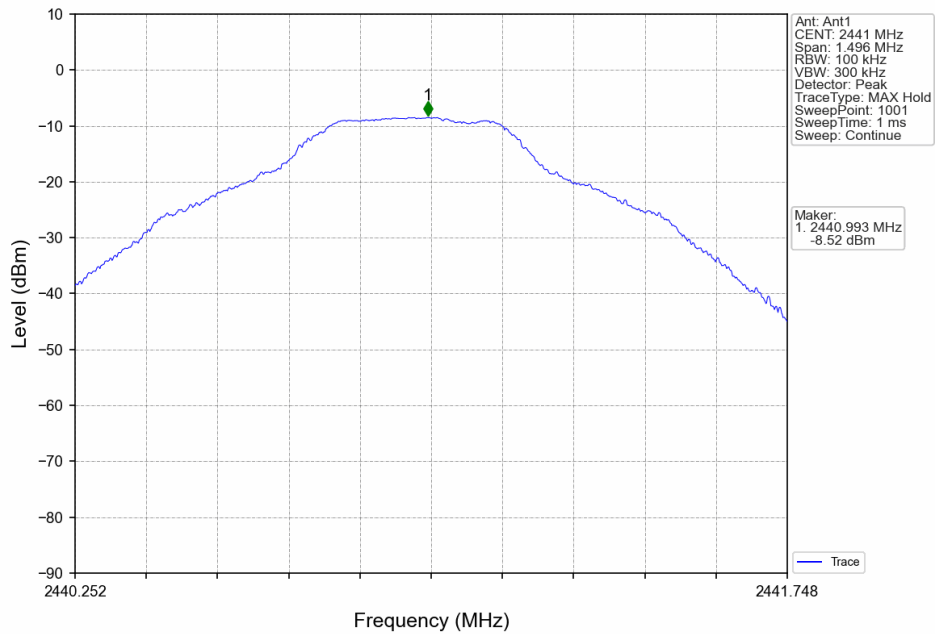
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



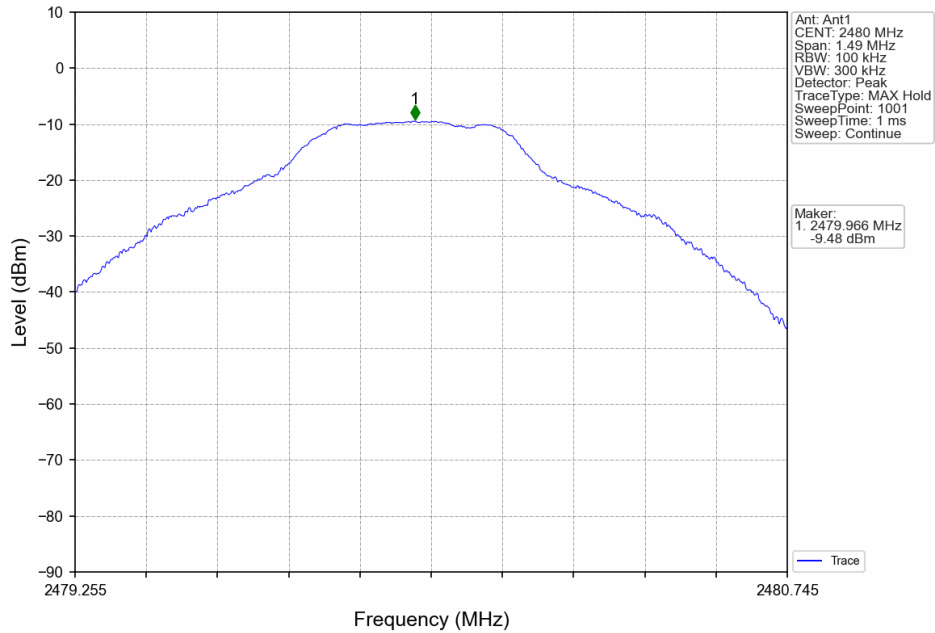
$\pi/4$ -DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



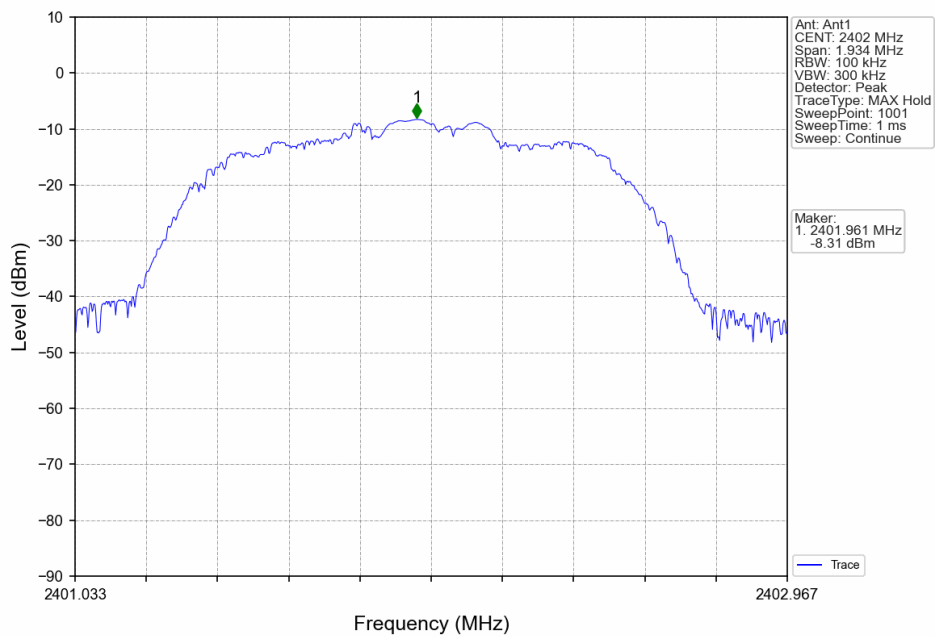
$\pi/4$ -DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



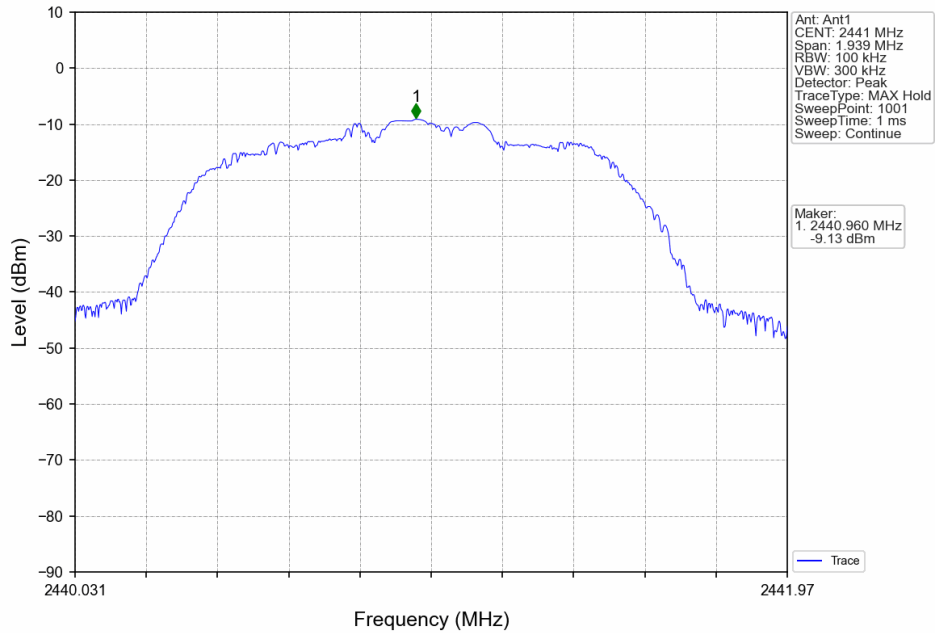
$\pi/4$ -DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

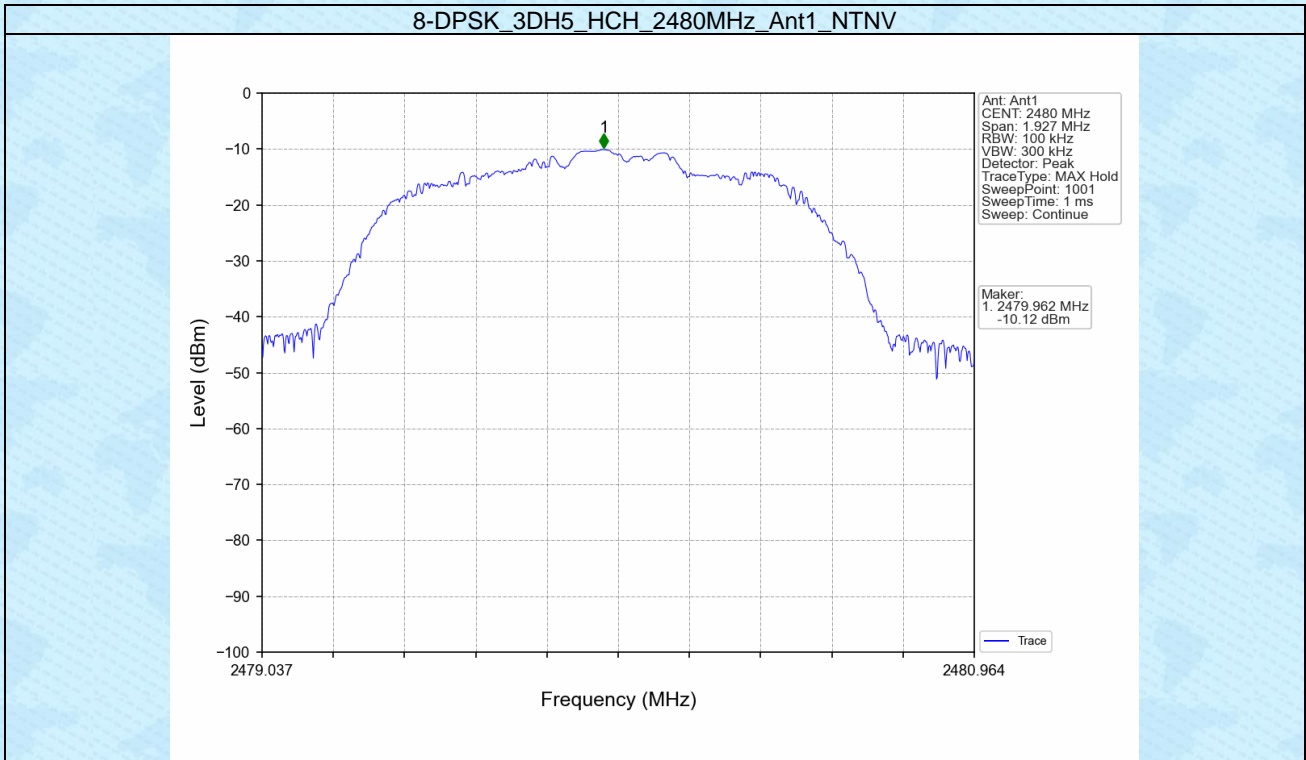


8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV





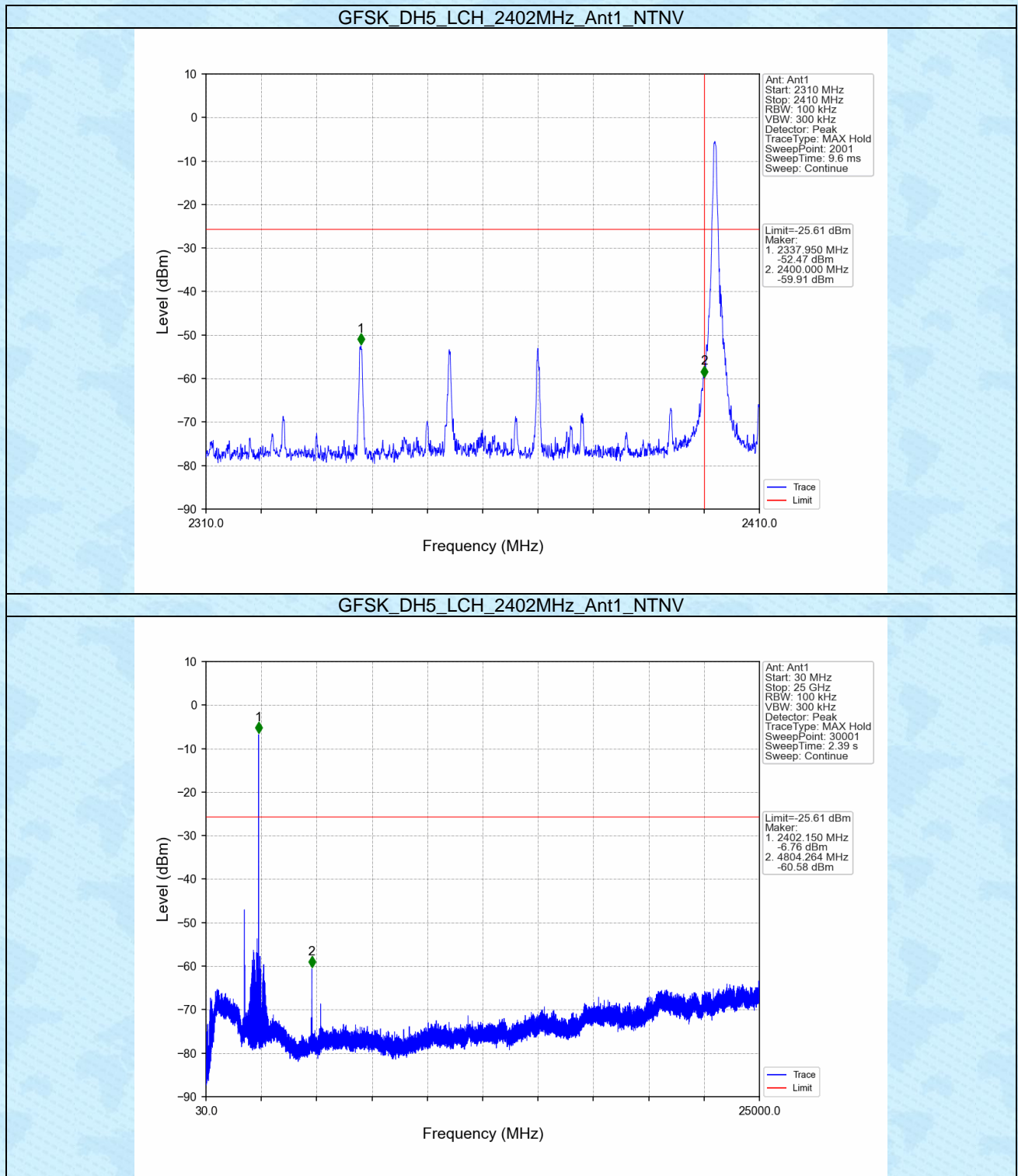
6.2 CSE

6.2.1 Test Result

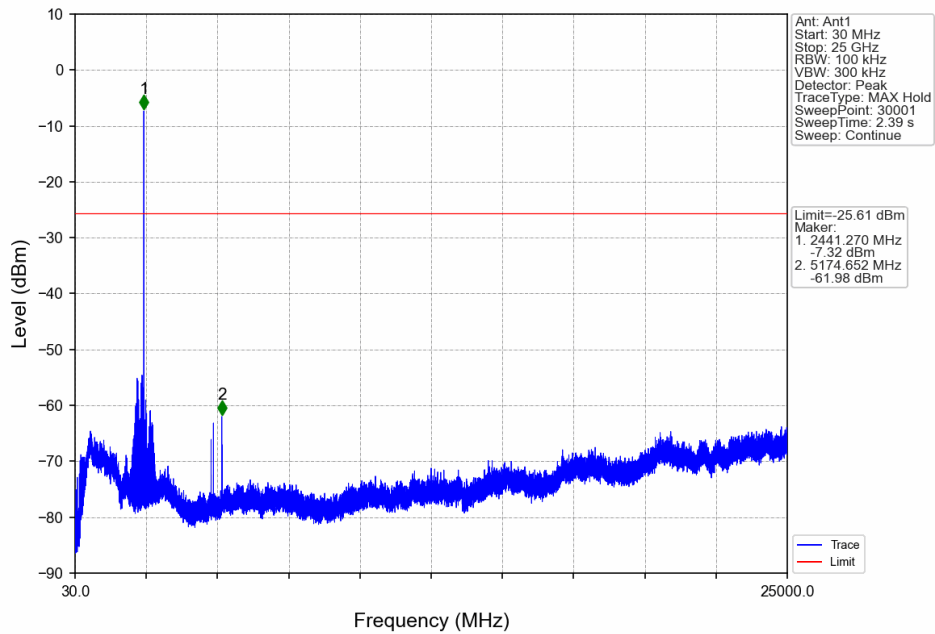
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-5.61	-25.61	Pass
		2441	DH5	1	-5.61	-25.61	Pass
		2480	DH5	1	-5.61	-25.61	Pass
		HOPP	DH5	1	-5.61	-25.61	Pass
$\pi/4$ -DQPSK	SISO	2402	2DH5	1	-8.52	-28.52	Pass
		2441	2DH5	1	-8.52	-28.52	Pass
		2480	2DH5	1	-8.52	-28.52	Pass
		HOPP	2DH5	1	-8.52	-28.52	Pass
8-DPSK	SISO	2402	3DH5	1	-8.31	-28.31	Pass
		2441	3DH5	1	-8.31	-28.31	Pass
		2480	3DH5	1	-8.31	-28.31	Pass
		HOPP	3DH5	1	-8.31	-28.31	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.

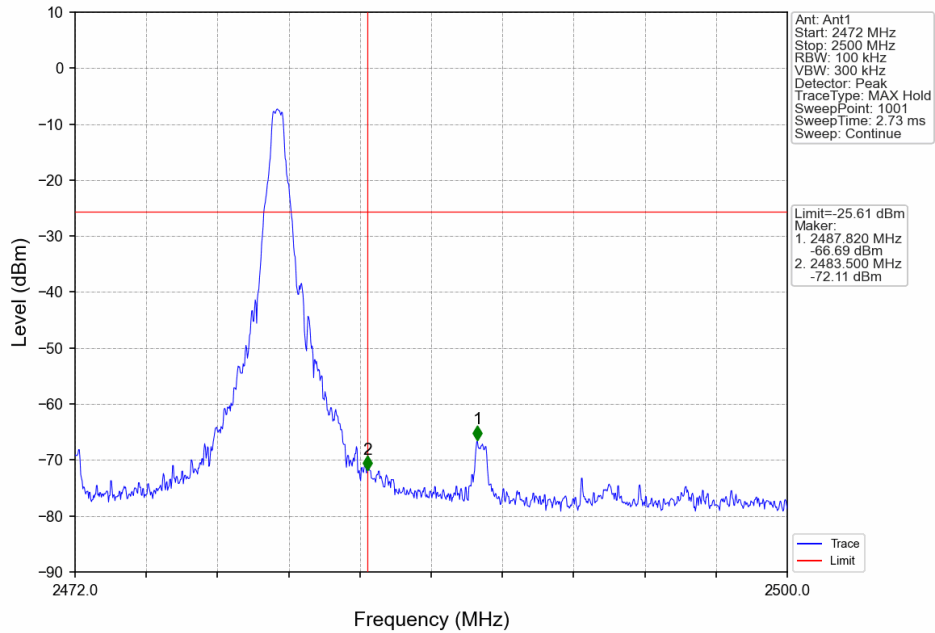
6.2.2 Test Graph



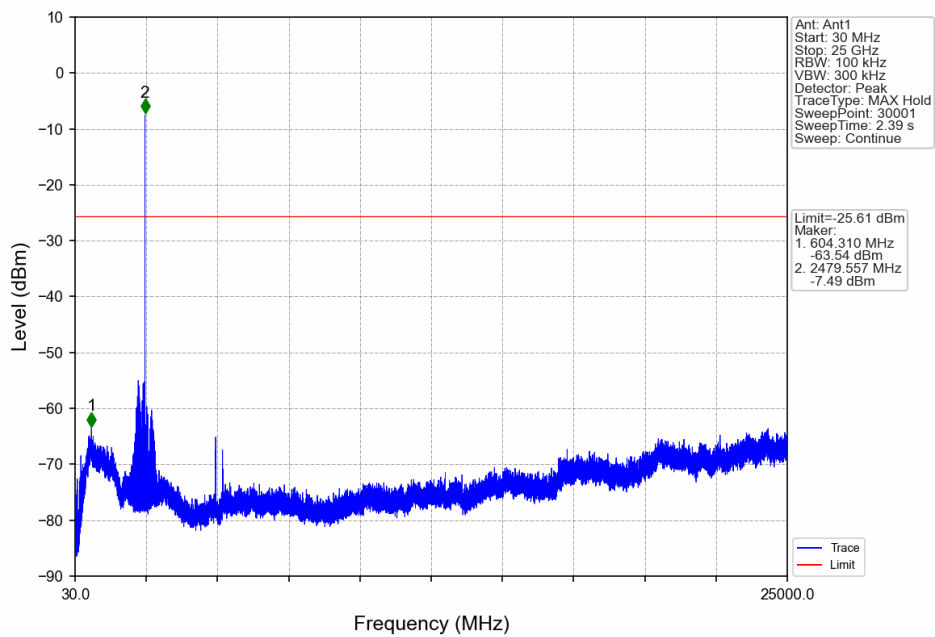
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



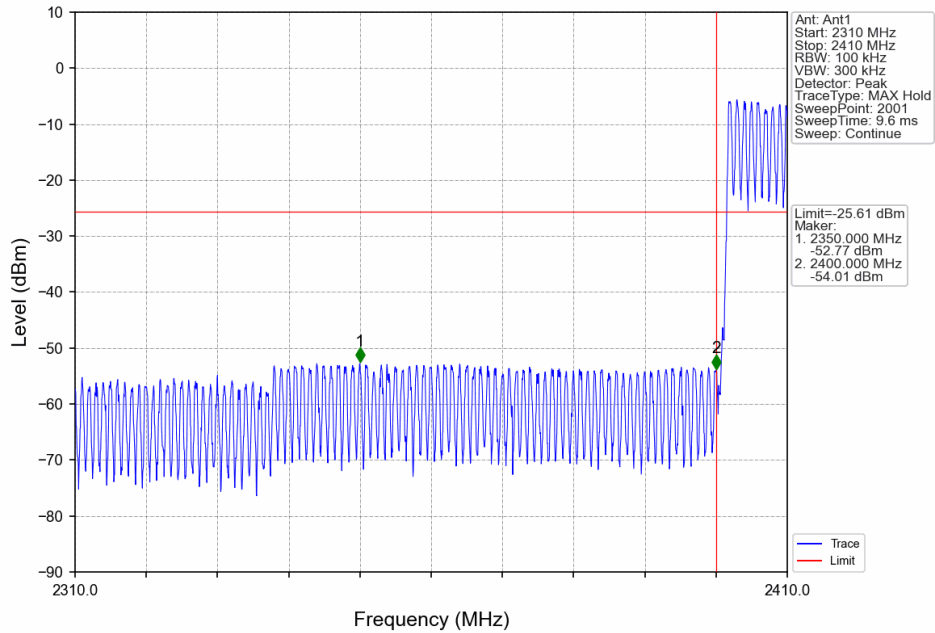
GFSK_DH5_HCH_2480MHz_Ant1_NTNV

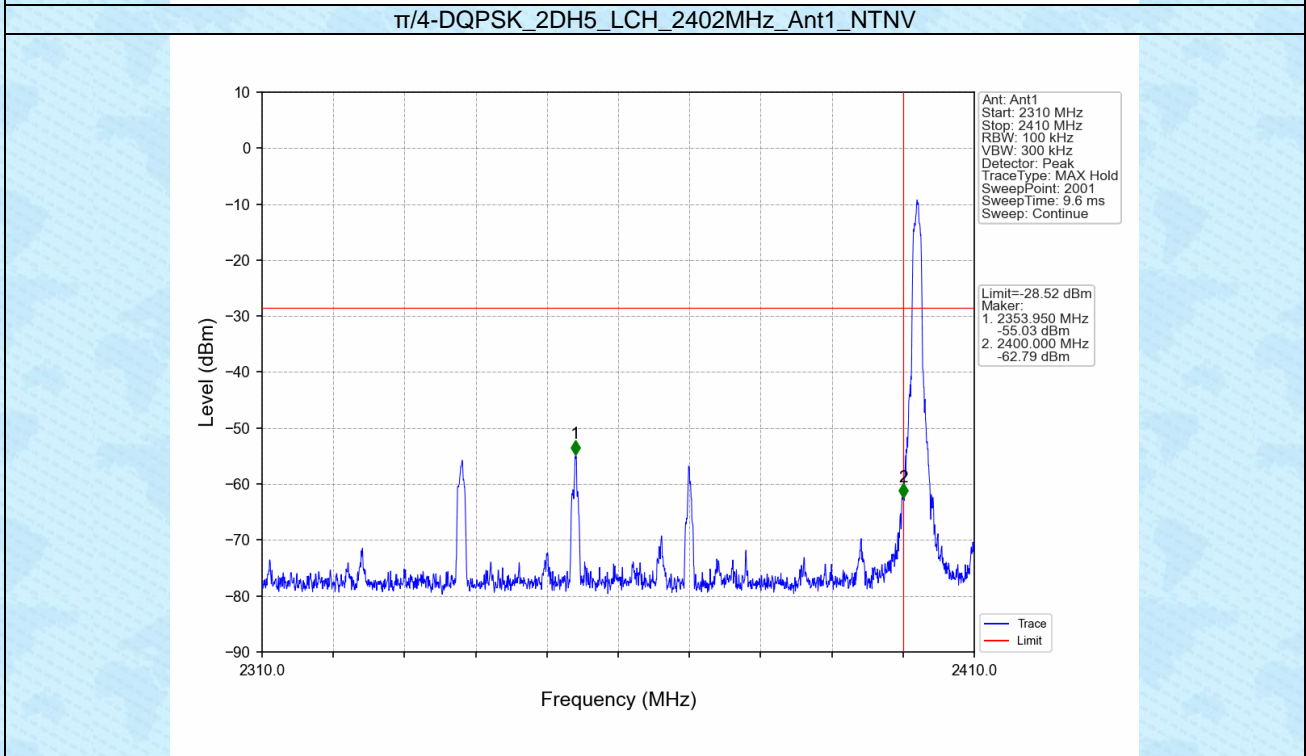
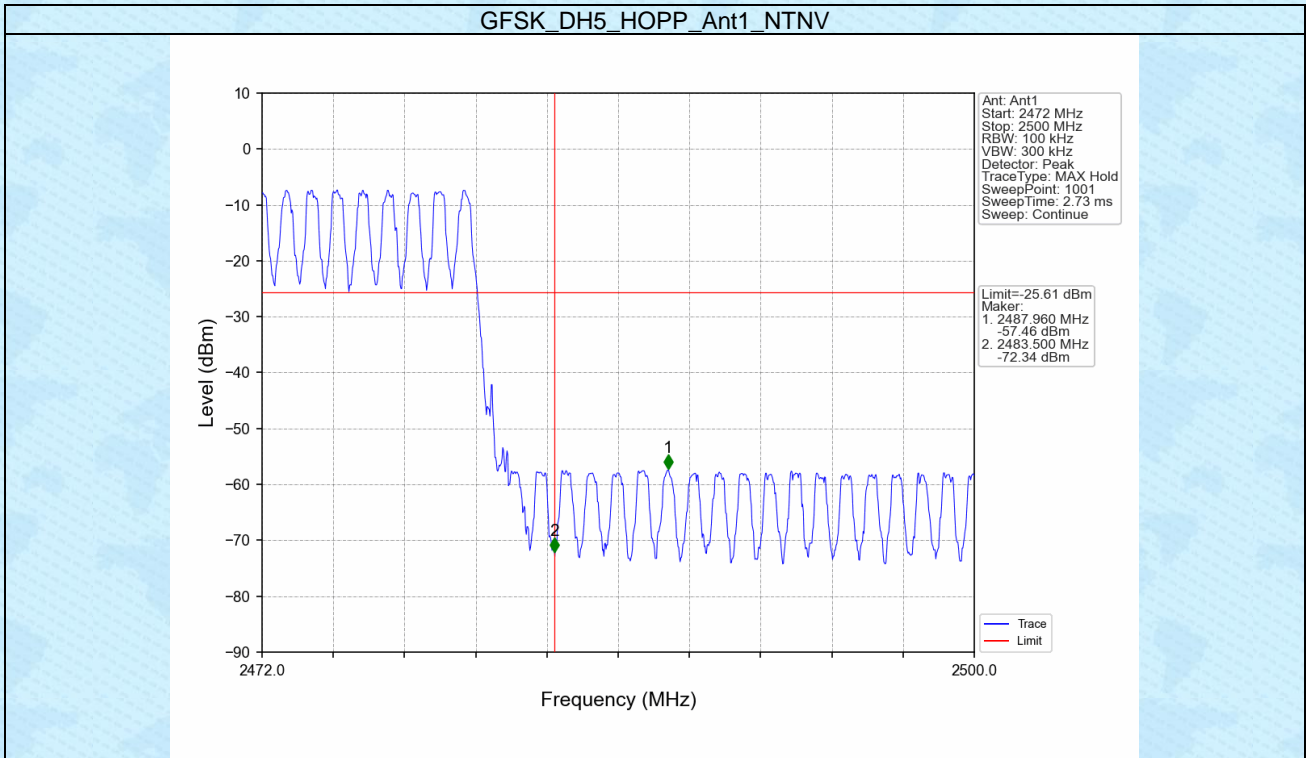


GFSK_DH5_HCH_2480MHz_Ant1_NTNV

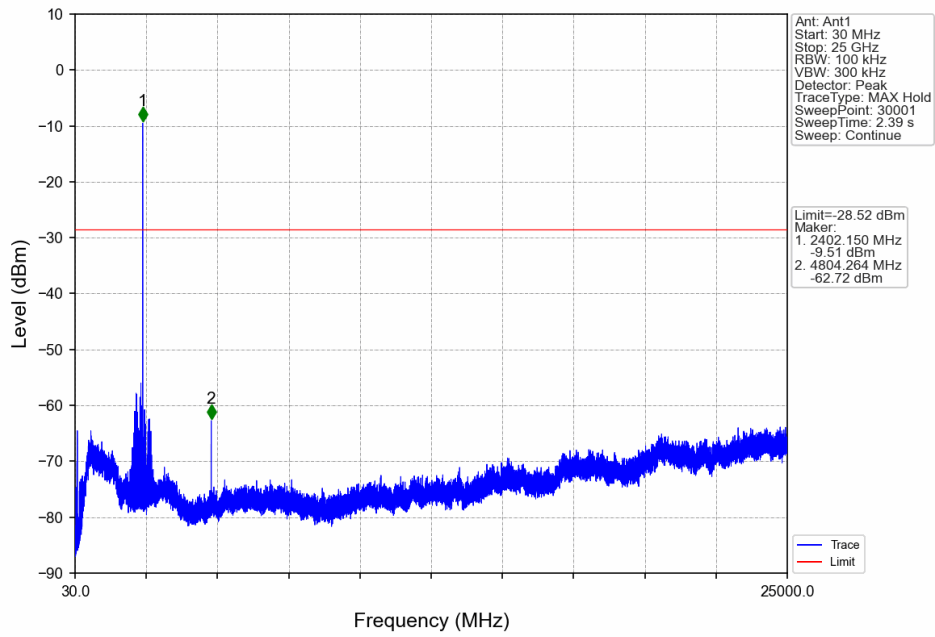


GFSK_DH5_HOPP_Ant1_NTNV

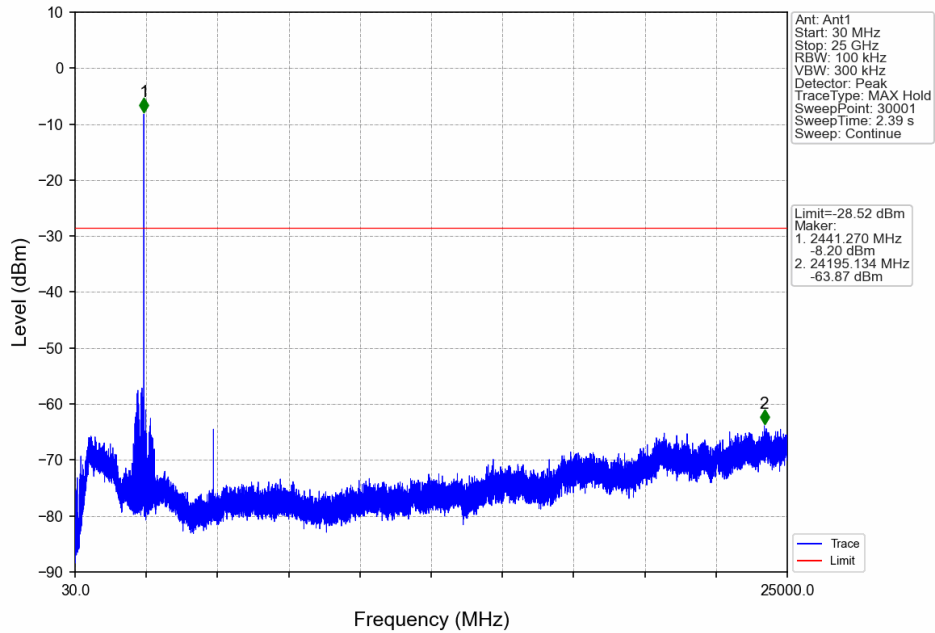




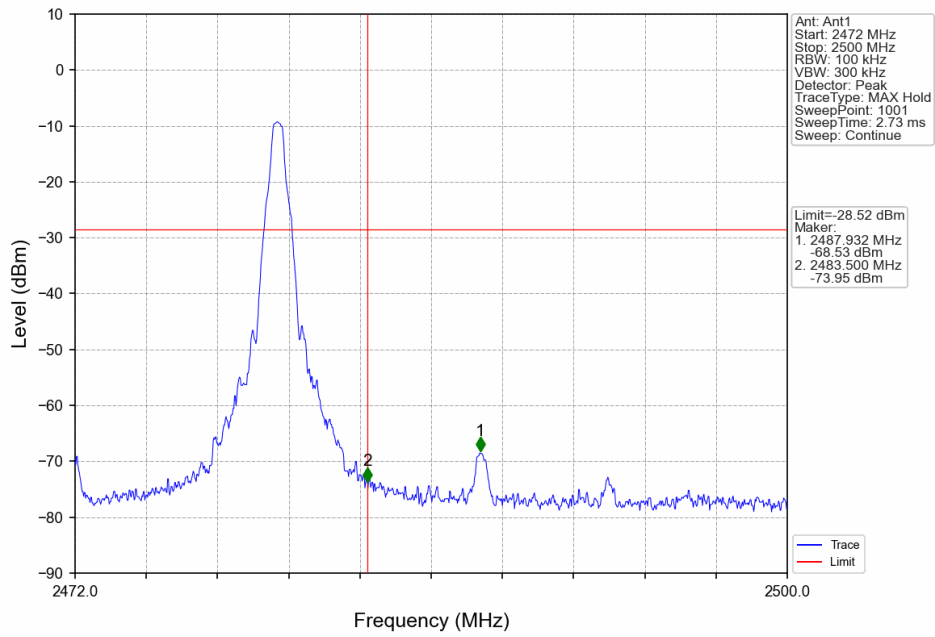
$\pi/4$ -DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



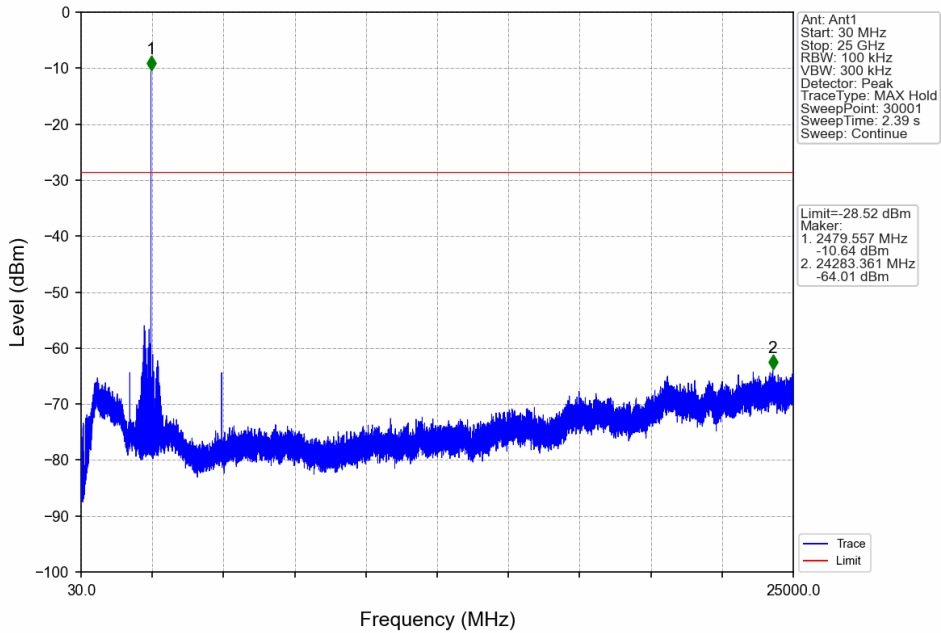
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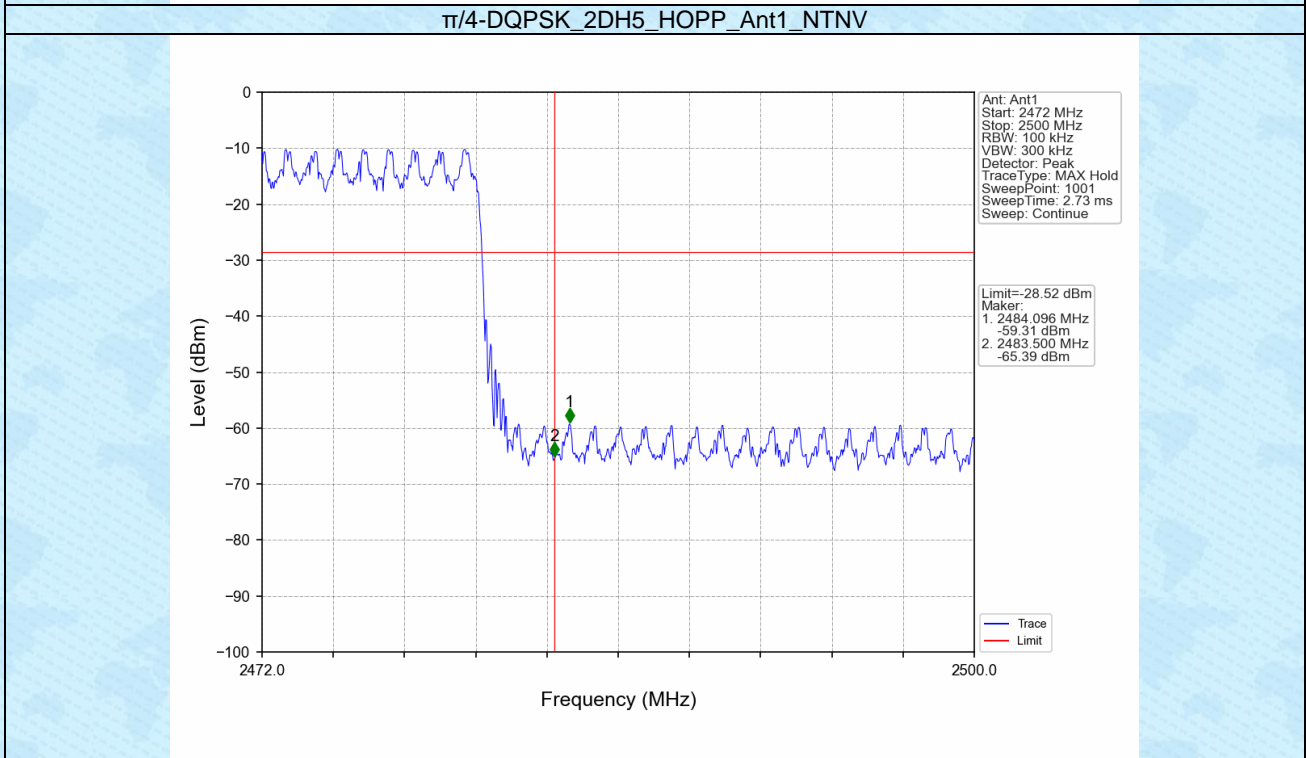
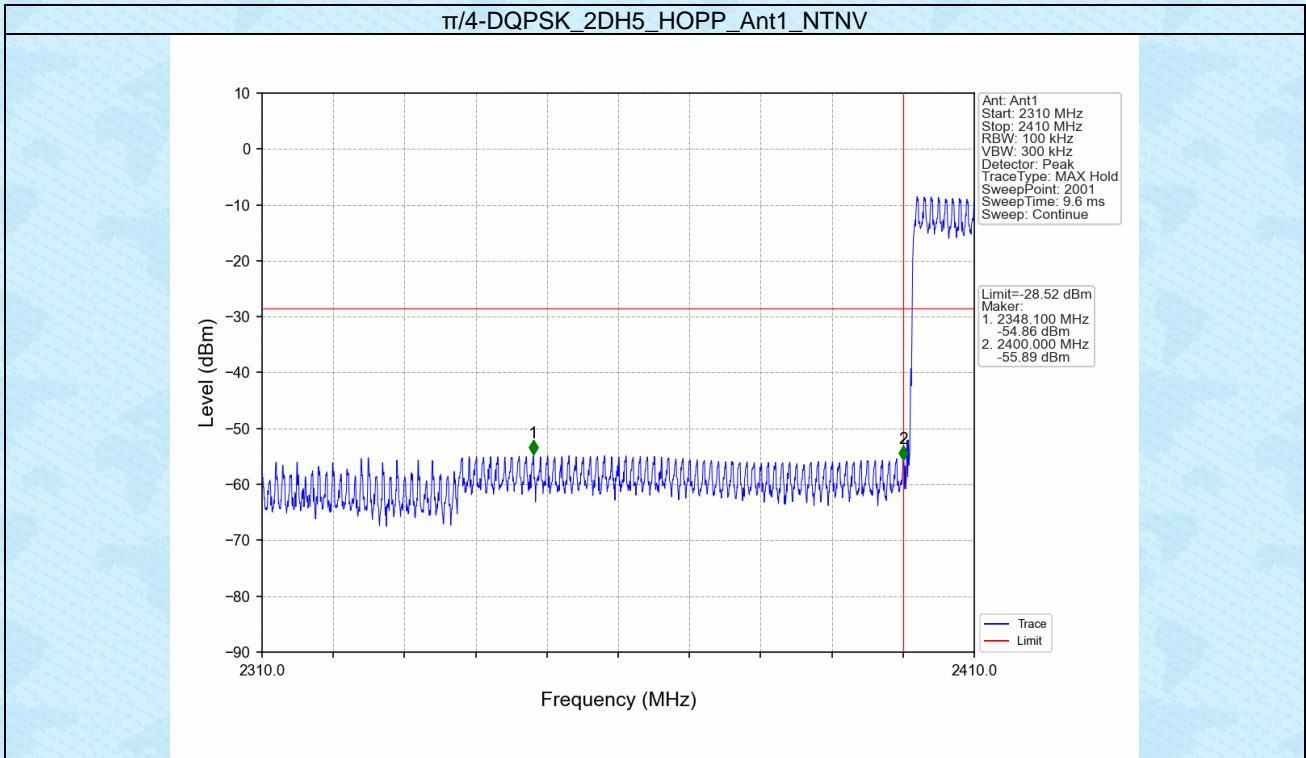


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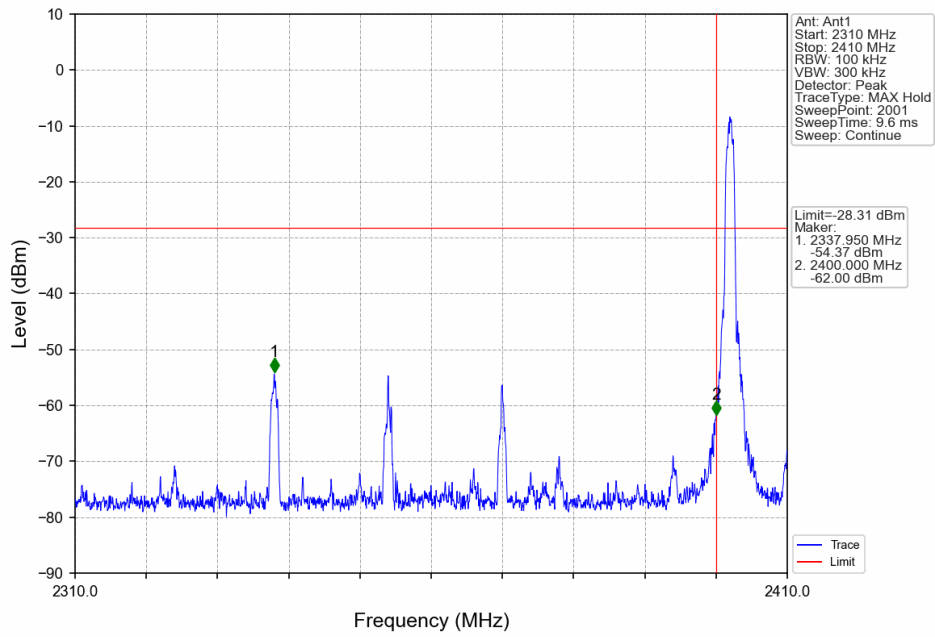


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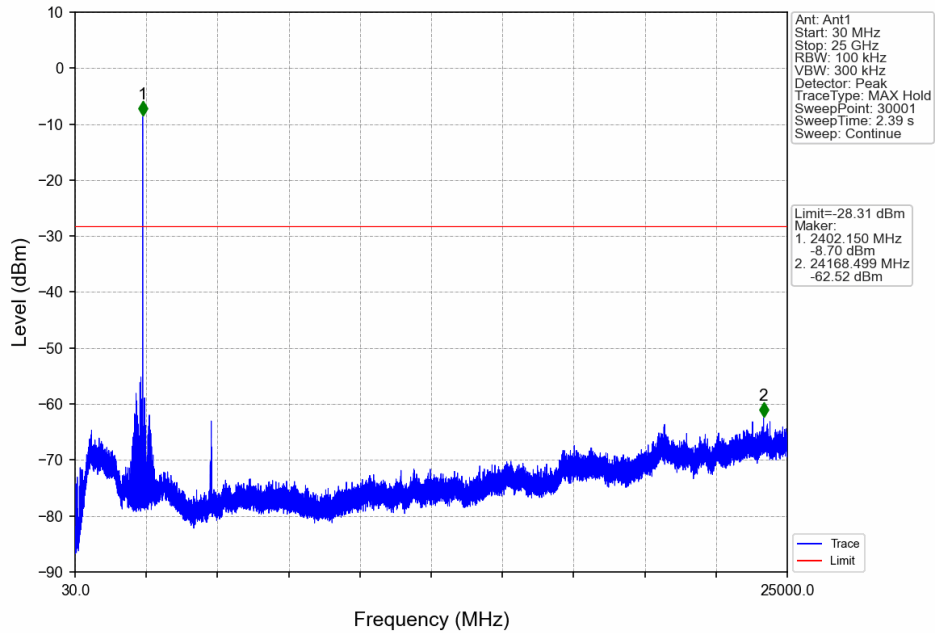




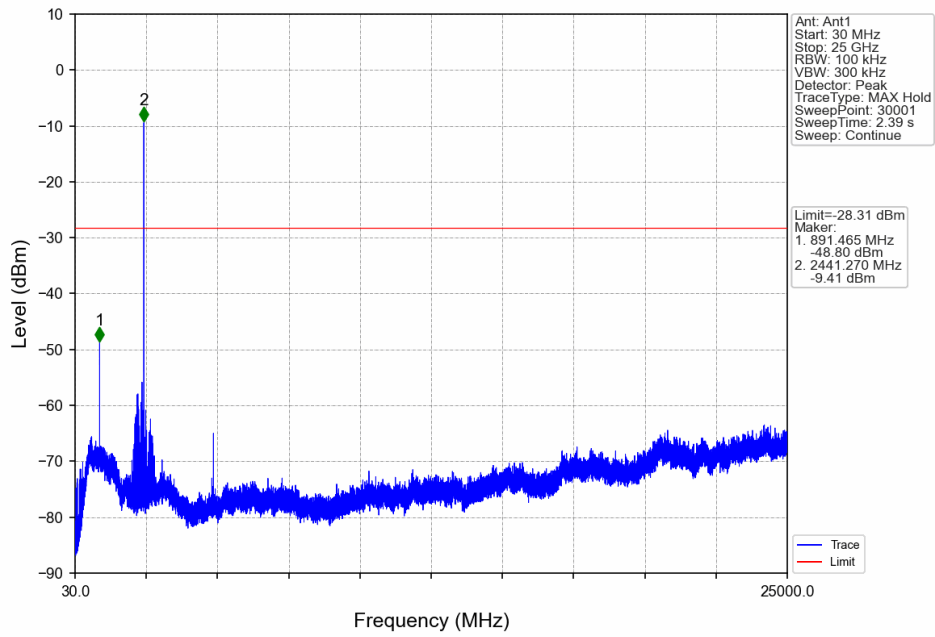
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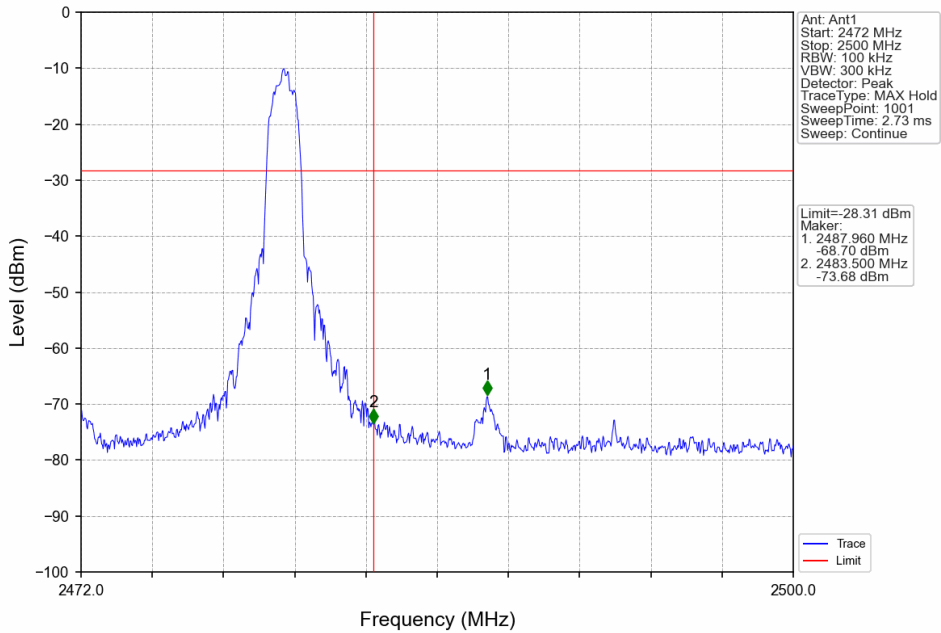
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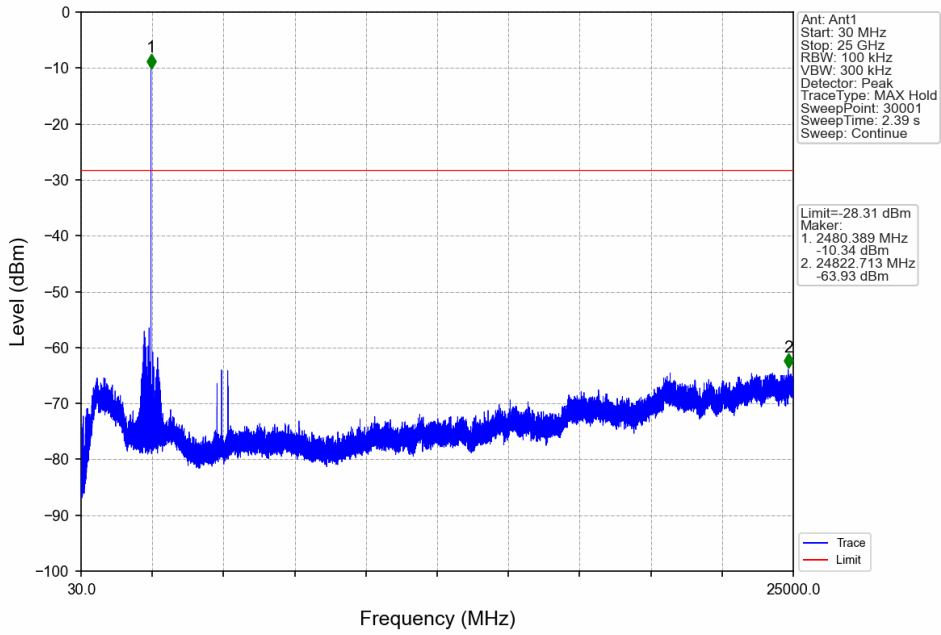
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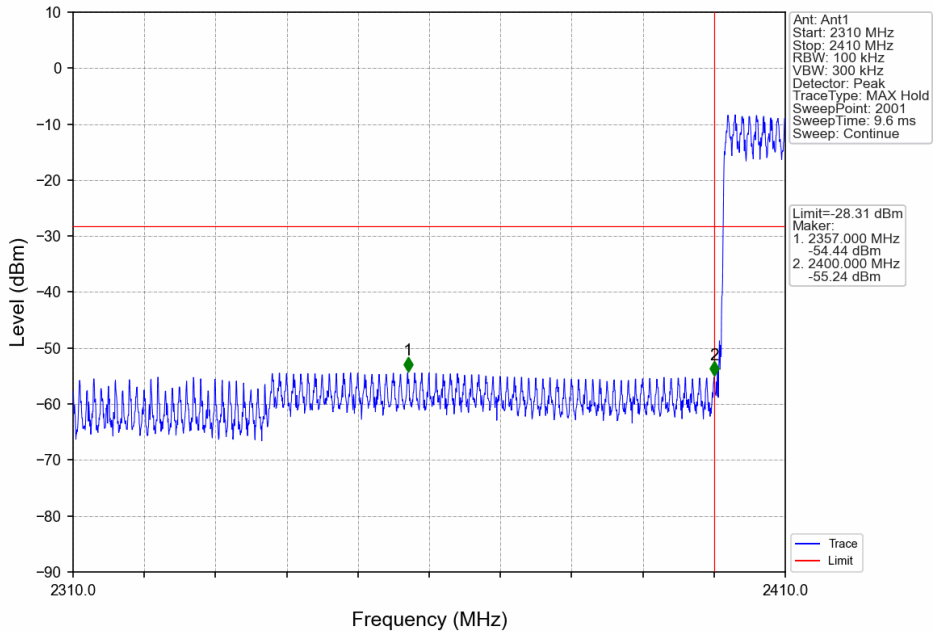
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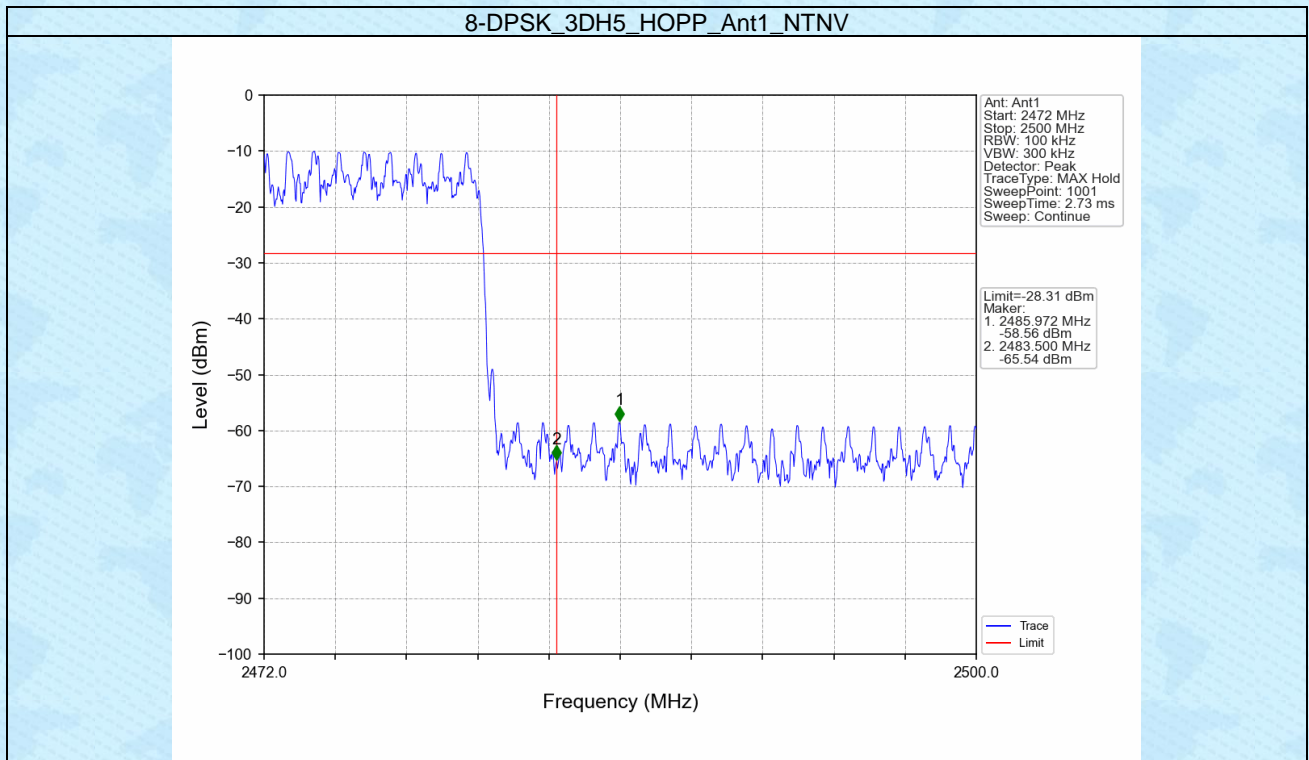


8-DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



8-DPSK_3DH5_HOPP_Ant1_NTNV





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