

Appendix A

RF Test Data for BR_EDR(Conducted Measurement)

Product Name: roof speaker system

Trade Mark: N/A

Test Model: KM-RWS-XP1

Environmental Conditions

Temperature:	24.6°C
Relative Humidity:	51.4%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen



Test Summary

Item	Result
Duty Cycle	Pass
Bandwidth	Pass
Maximum Conducted Output Power	Pass
Carrier Frequency Separation	Pass
Number of Hopping Frequencies	Pass
Time of Occupancy (Dwell Time)	Pass
Unwanted Emissions In Non-restricted Frequency Bands	Pass

1. Duty Cycle

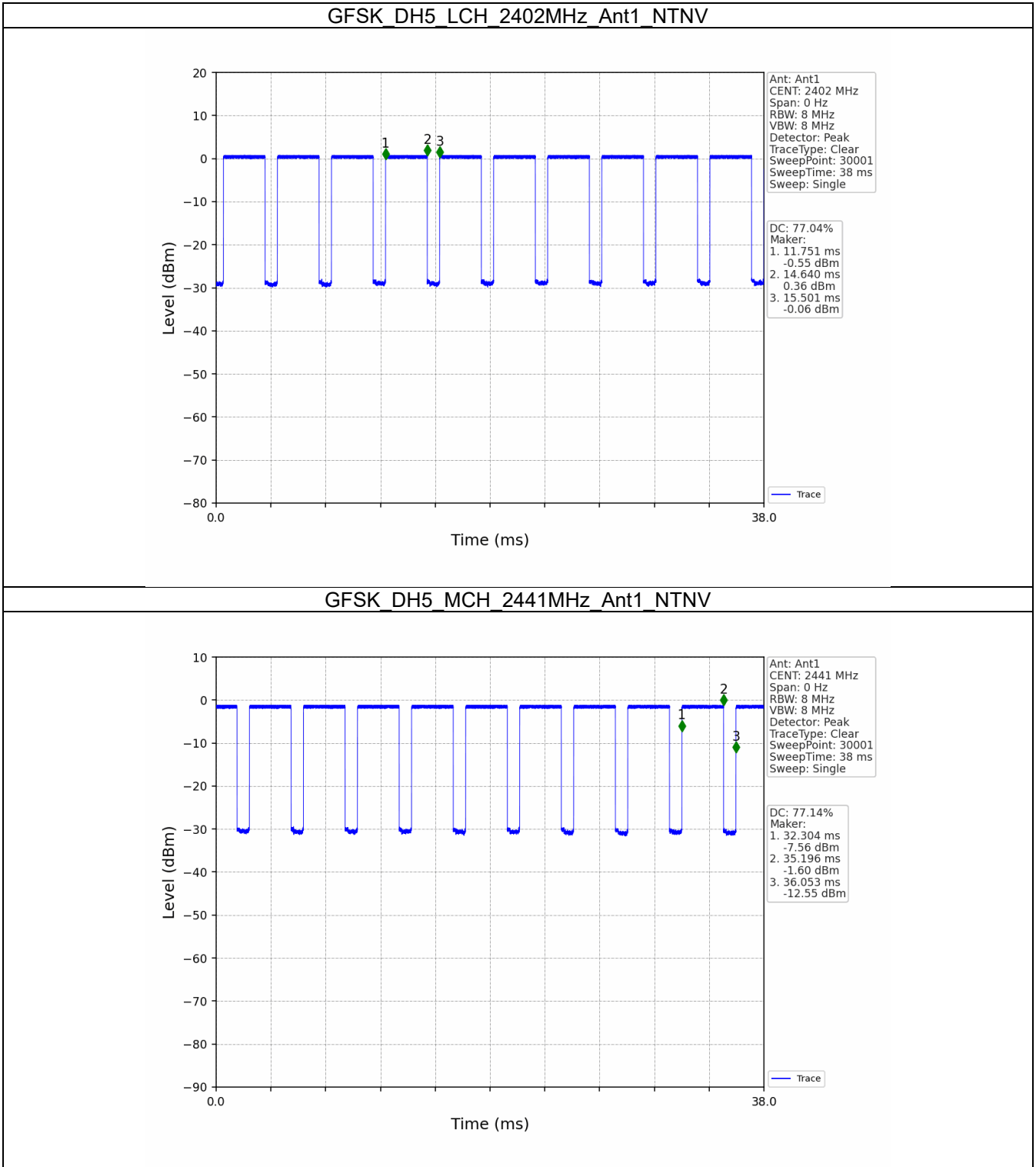
1.1 Test Result

1.1.1 Ant1

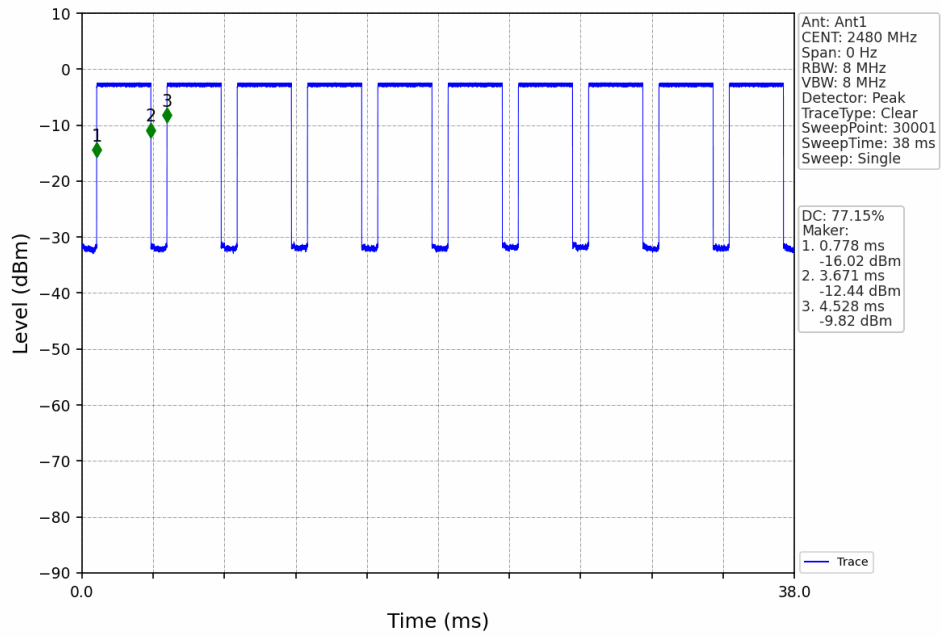
Ant1								
Mode	TX Type	Frequency (MHz)	Packet Type	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
GFSK	SISO	2402	DH5	2.889	3.750	77.04	1.13	0.03
		2441	DH5	2.892	3.749	77.14	1.13	0.03
		2480	DH5	2.893	3.750	77.15	1.13	0.03
$\pi/4$ -DQPSK	SISO	2402	2DH5	2.888	3.750	77.01	1.13	0.03
		2441	2DH5	2.889	3.751	77.02	1.13	0.03
		2480	2DH5	2.888	3.750	77.01	1.13	0.01
8DPSK	SISO	2402	3DH5	2.889	3.750	77.04	1.13	0.03
		2441	3DH5	2.889	3.751	77.02	1.13	0.03
		2480	3DH5	2.889	3.750	77.04	1.13	0.03

1.2 Test Graph

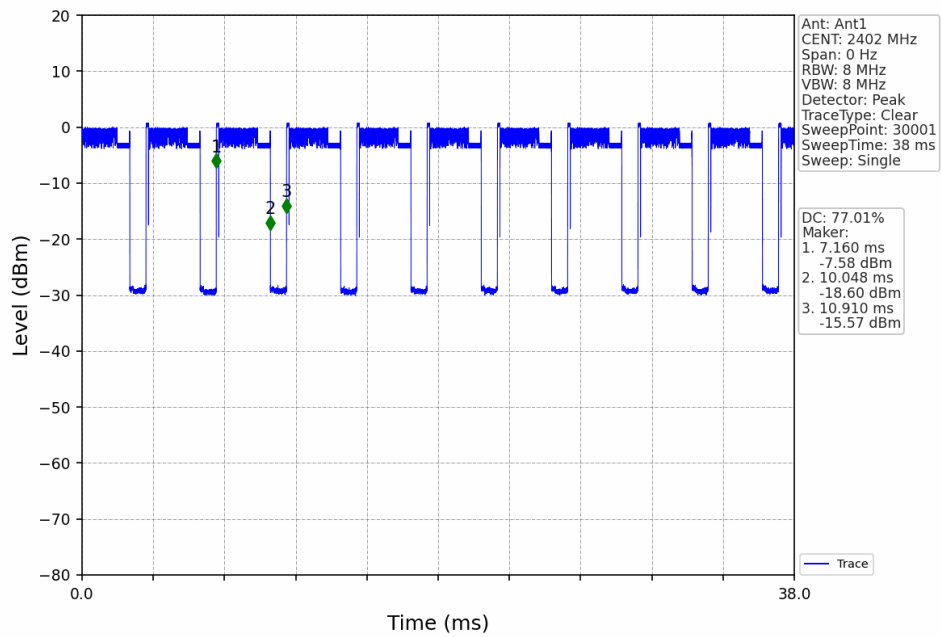
1.2.1 Ant1



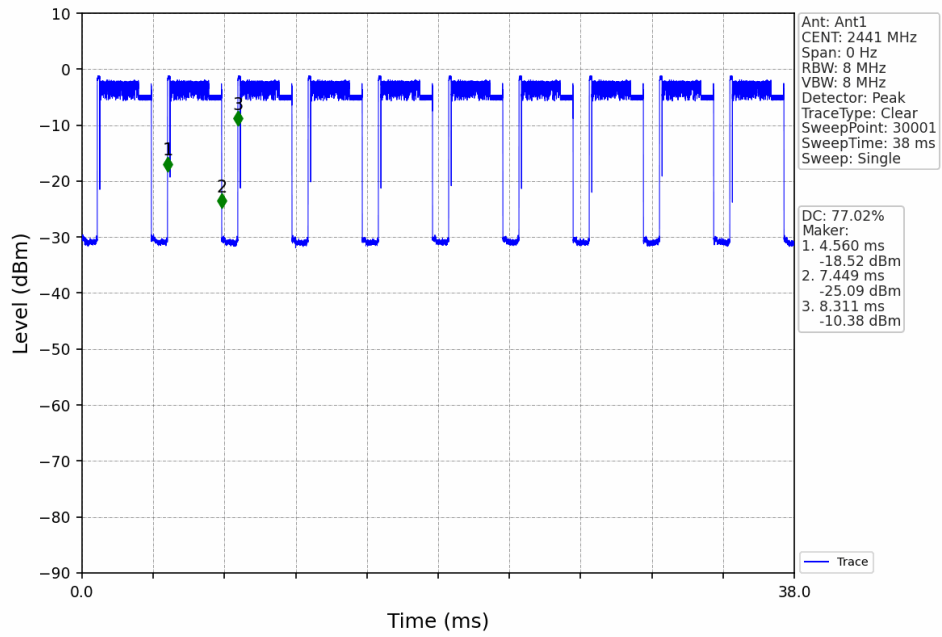
GFSK DH5 HCH 2480MHz Ant1 NTN



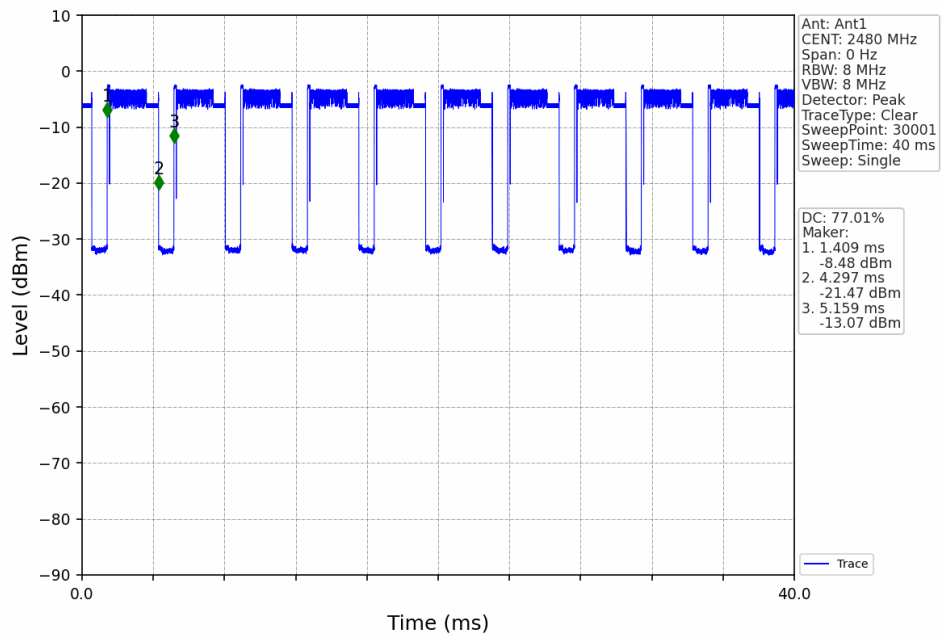
$\pi/4$ -DQPSK 2DH5 LCH 2402MHz Ant1 NTN



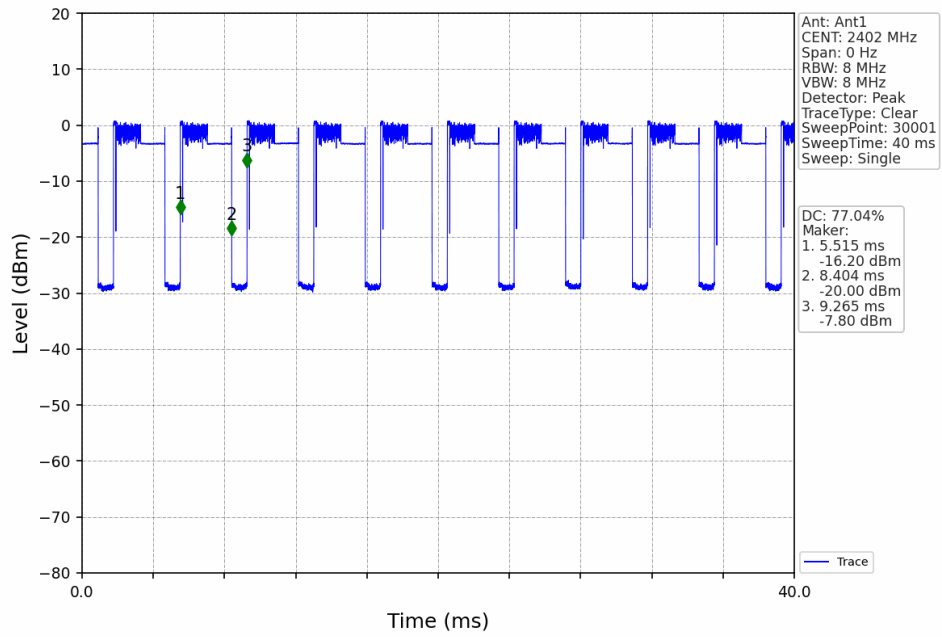
$\pi/4$ -DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



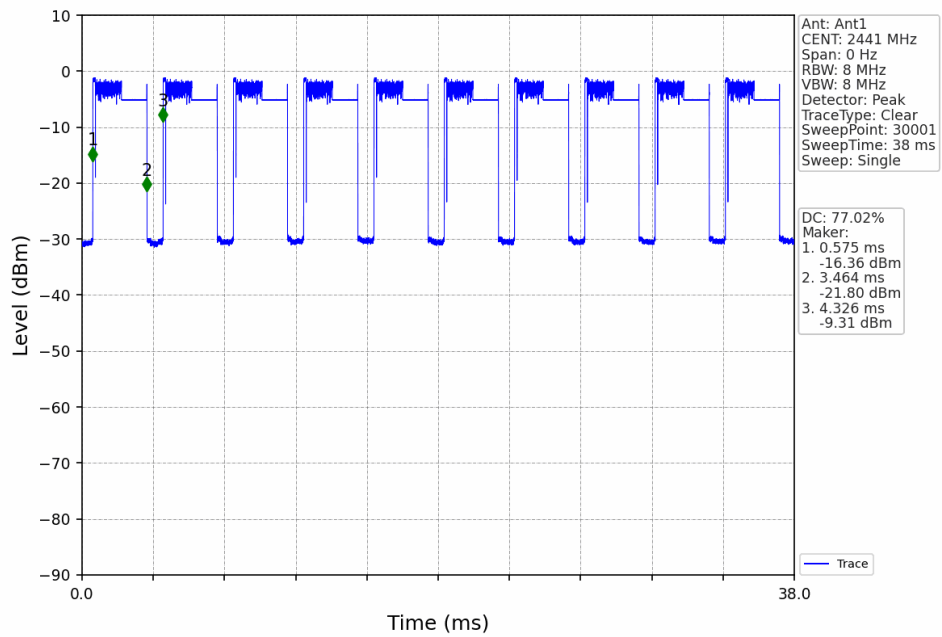
$\pi/4$ -DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

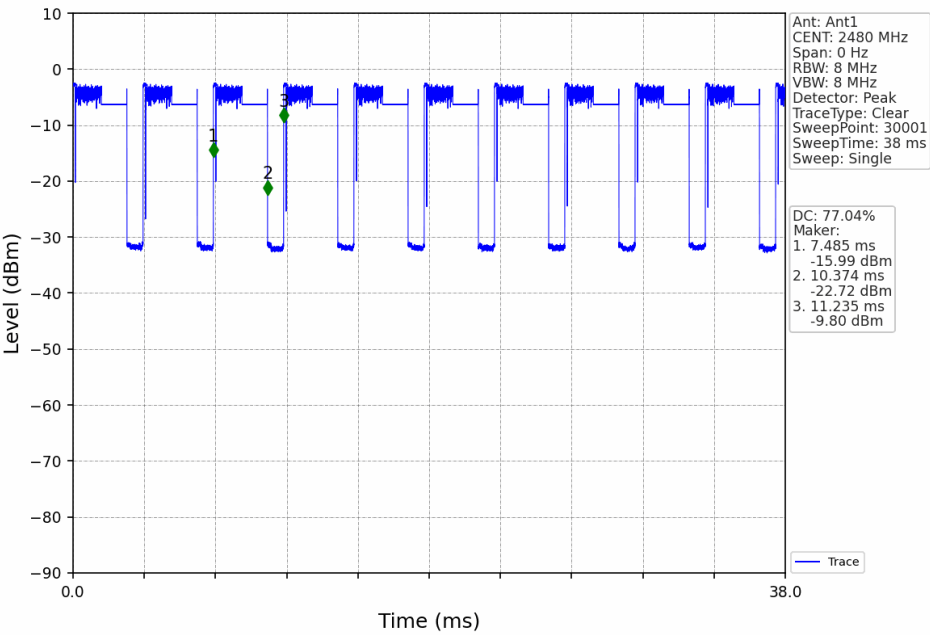


8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV





8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



2. Bandwidth

2.1 Test Result

2.1.1 OBW

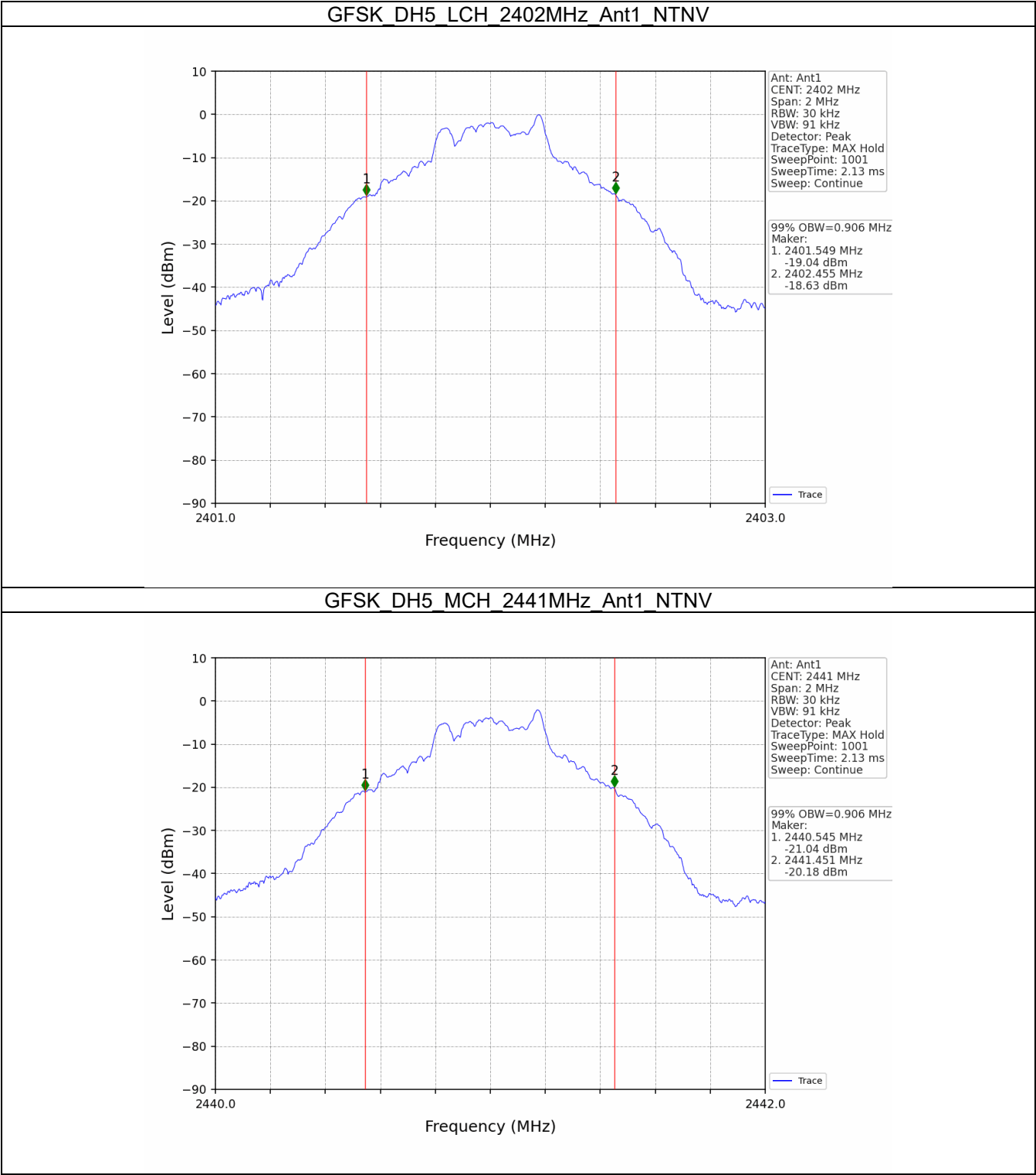
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.906	/	Pass
		2441	DH5	1	0.906	/	Pass
		2480	DH5	1	0.904	/	Pass
$\pi/4$ -DQPSK	SISO	2402	2DH5	1	1.188	/	Pass
		2441	2DH5	1	1.190	/	Pass
		2480	2DH5	1	1.189	/	Pass
8DPSK	SISO	2402	3DH5	1	1.179	/	Pass
		2441	3DH5	1	1.181	/	Pass
		2480	3DH5	1	1.182	/	Pass

2.1.2 20dB BW

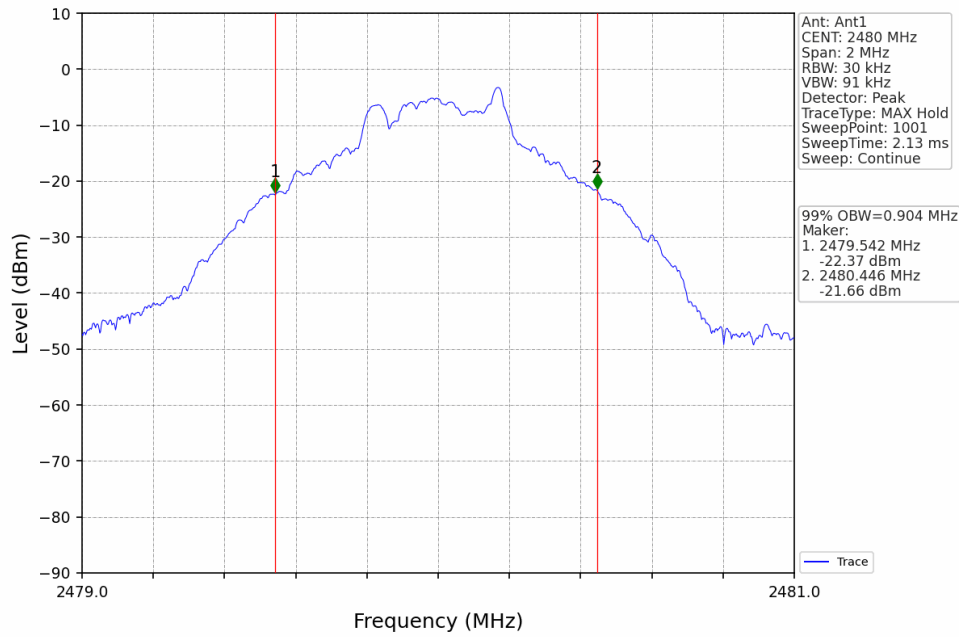
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.981	/	Pass
		2441	DH5	1	0.980	/	Pass
		2480	DH5	1	0.969	/	Pass
$\pi/4$ -DQPSK	SISO	2402	2DH5	1	1.317	/	Pass
		2441	2DH5	1	1.323	/	Pass
		2480	2DH5	1	1.322	/	Pass
8DPSK	SISO	2402	3DH5	1	1.311	/	Pass
		2441	3DH5	1	1.314	/	Pass
		2480	3DH5	1	1.313	/	Pass

2.2 Test Graph

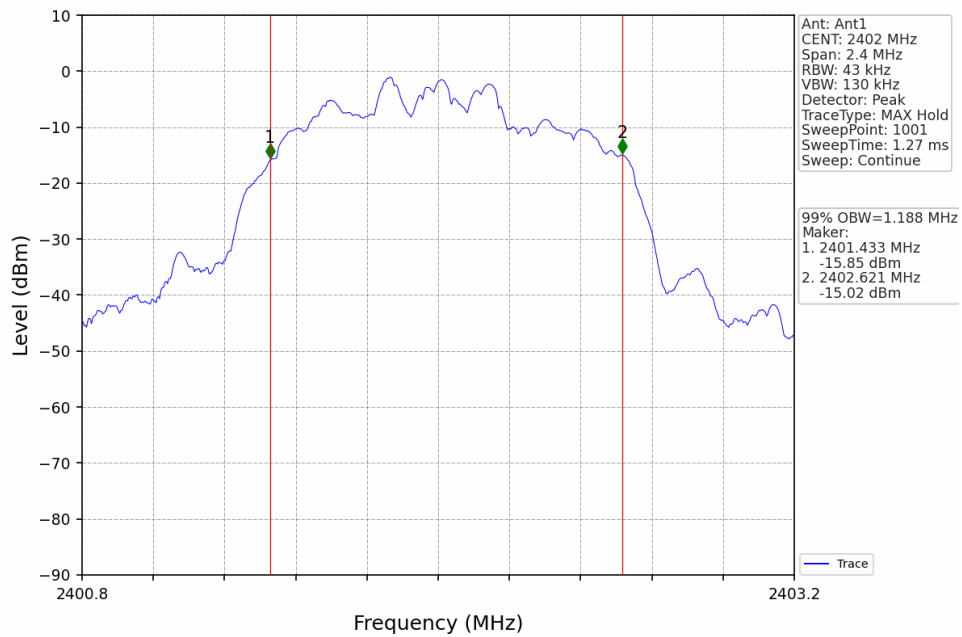
2.2.1 OBW



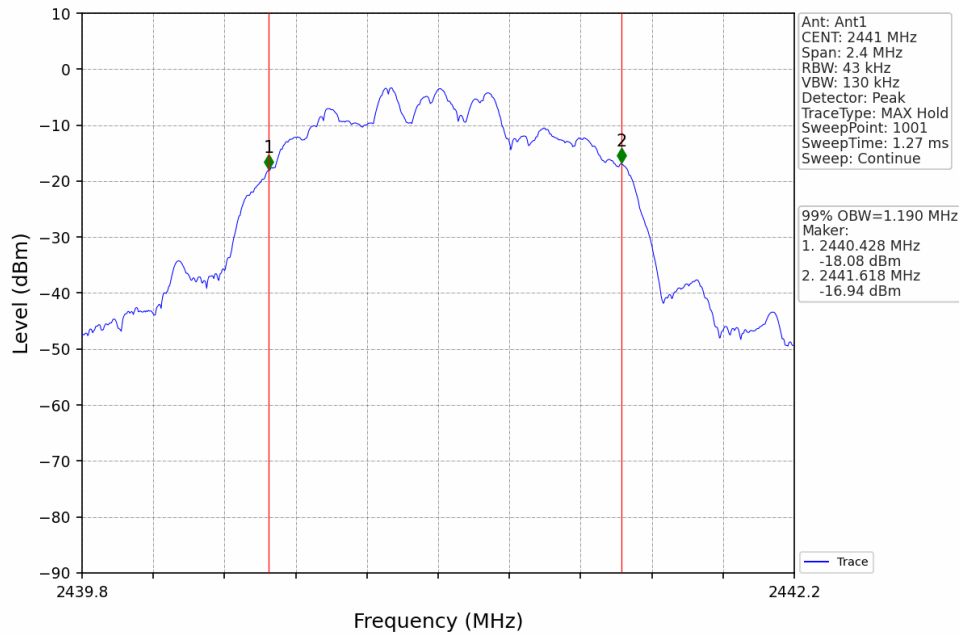
GFSK DH5 HCH 2480MHz Ant1 NTN



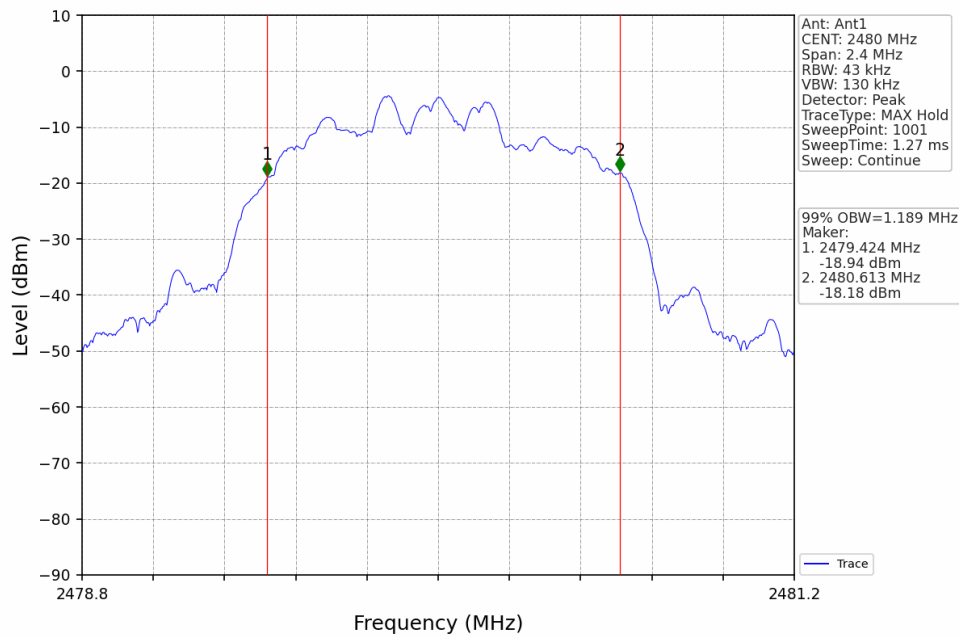
$\pi/4$ -DQPSK 2DH5 LCH 2402MHz Ant1 NTN



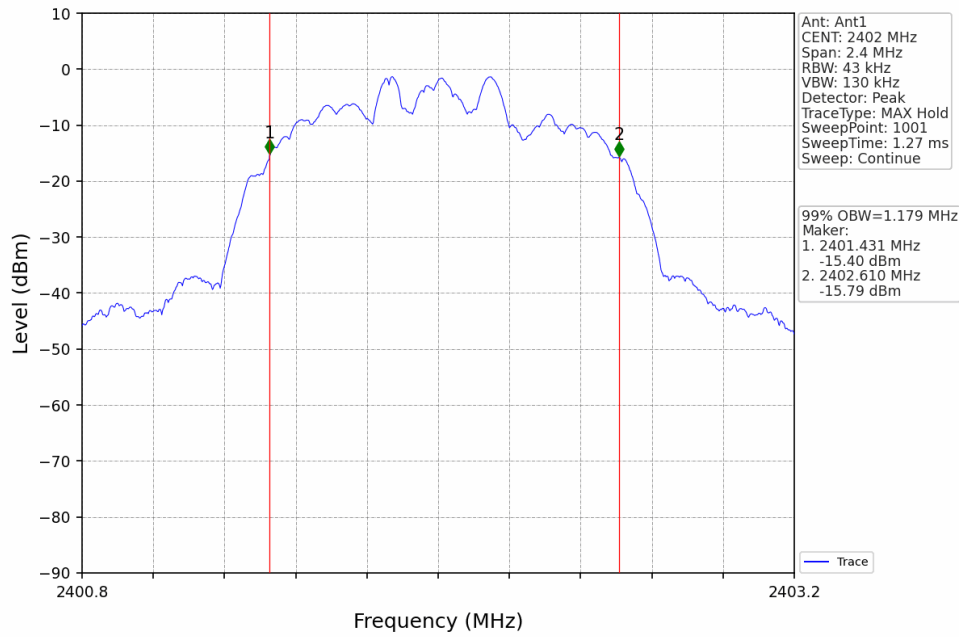
$\pi/4$ -DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



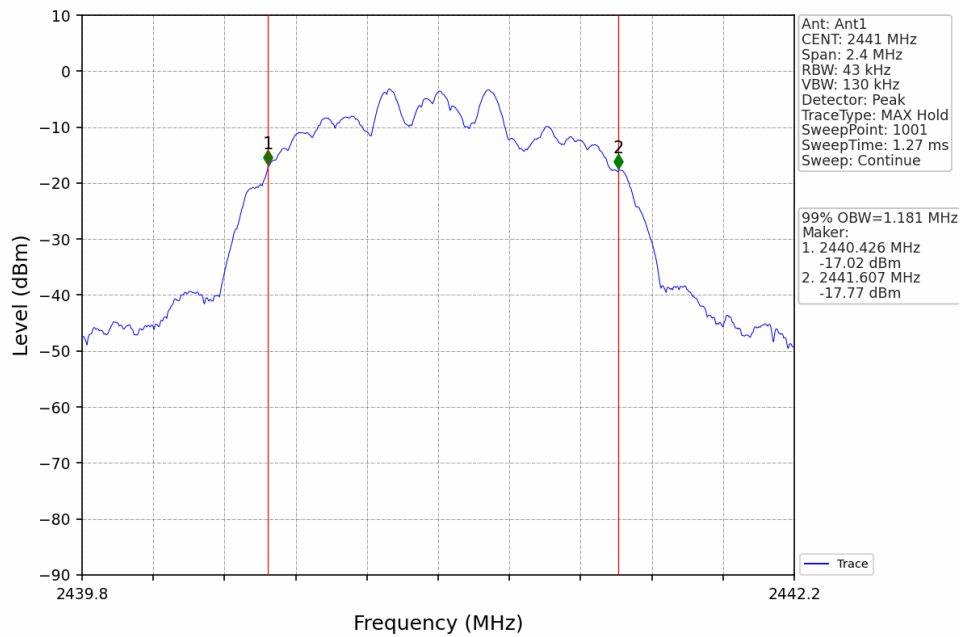
$\pi/4$ -DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

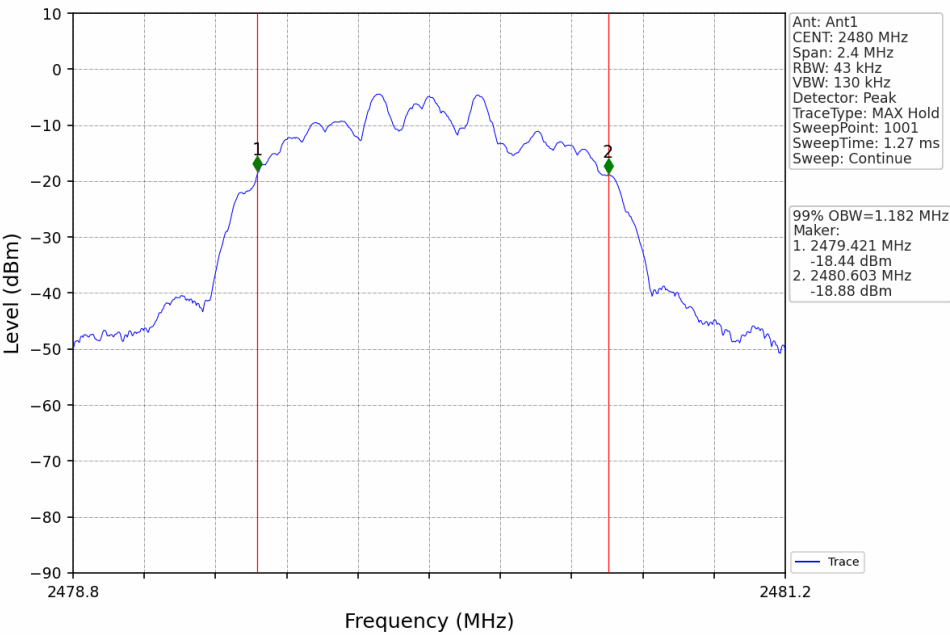


8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV

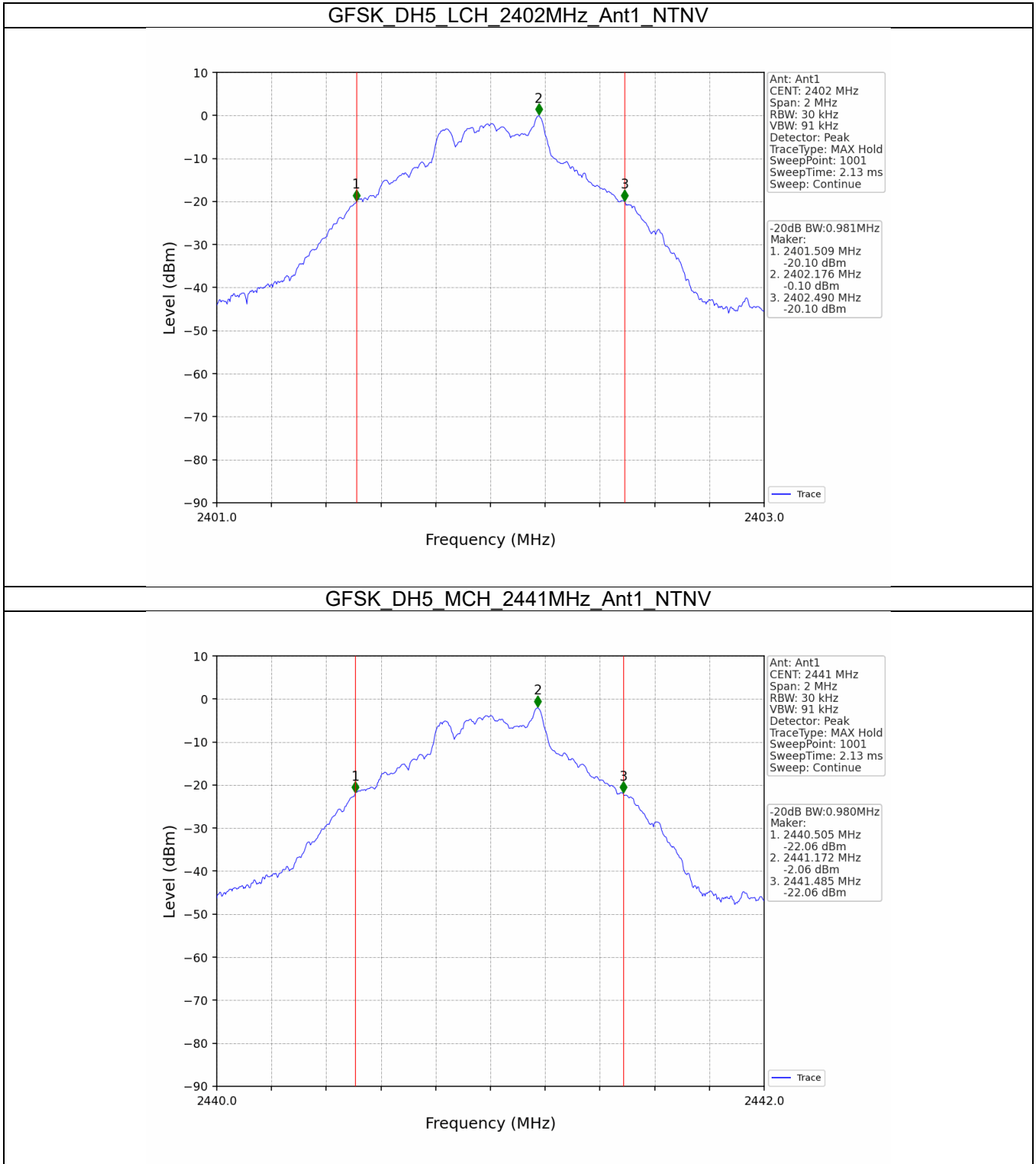




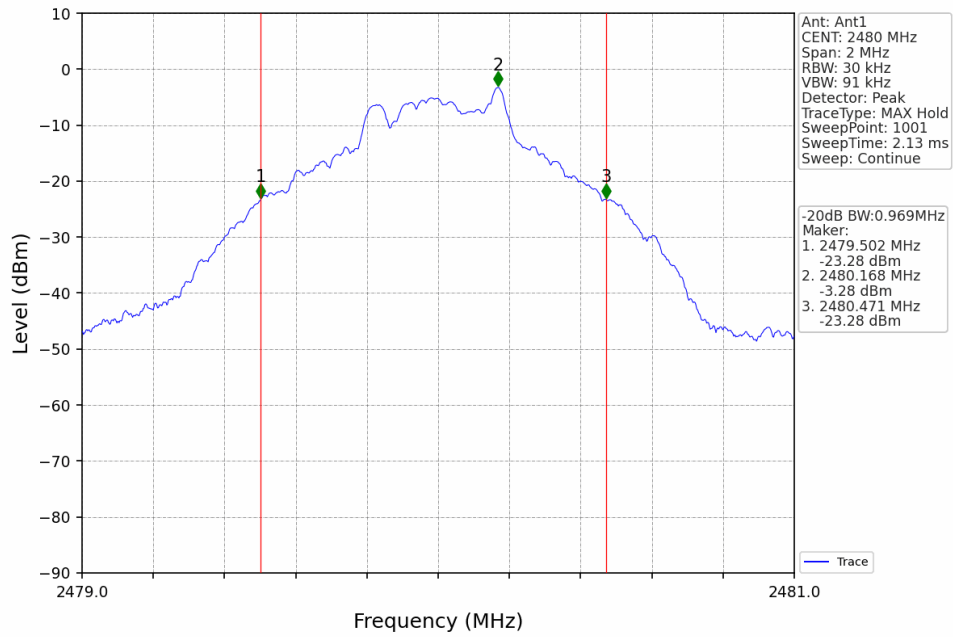
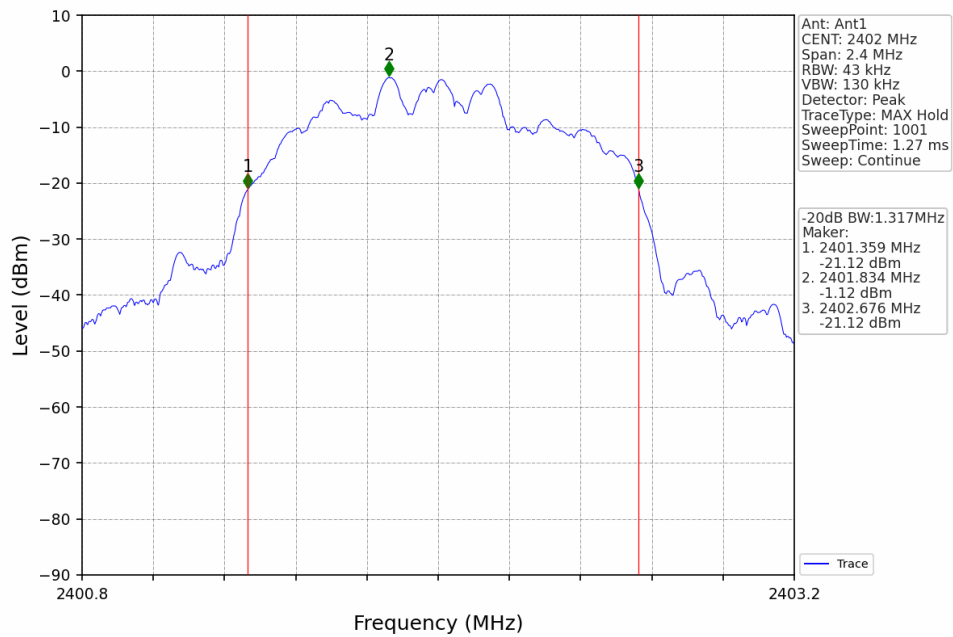
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



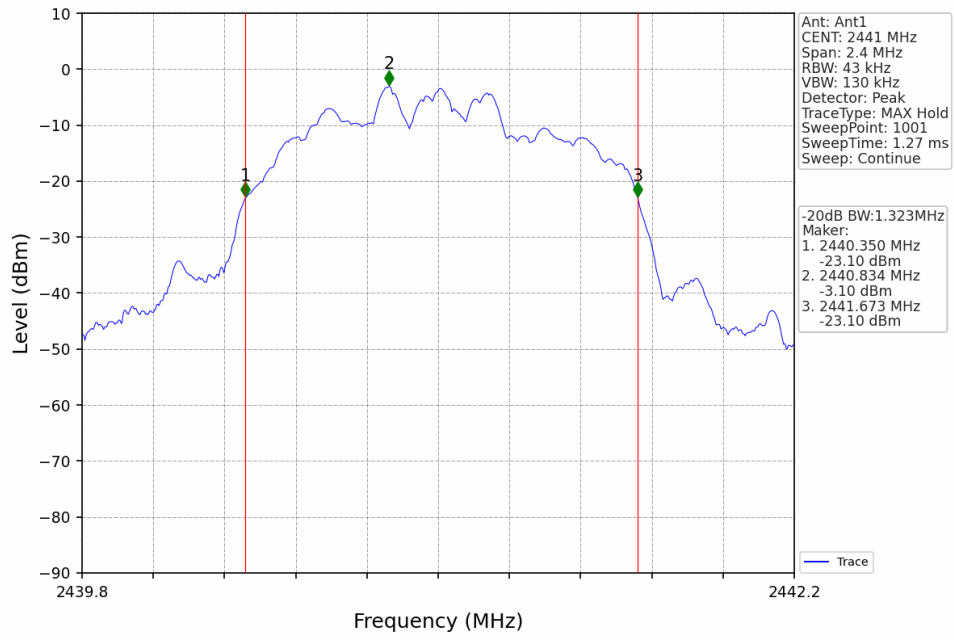
2.2.2 20dB BW



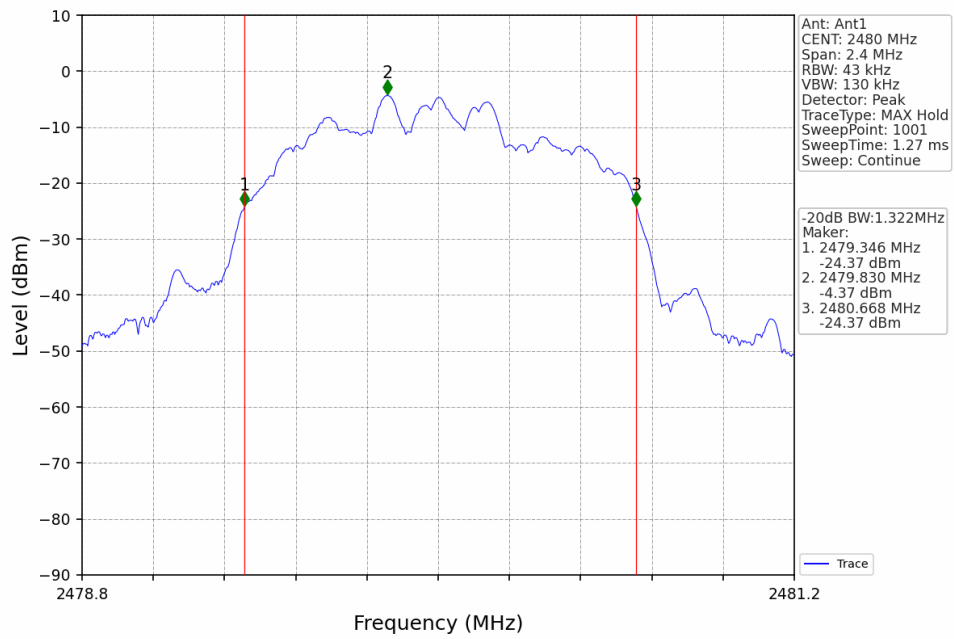
GFSK_DH5_HCH_2480MHz_Ant1_NTNV


 $\pi/4$ -DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV


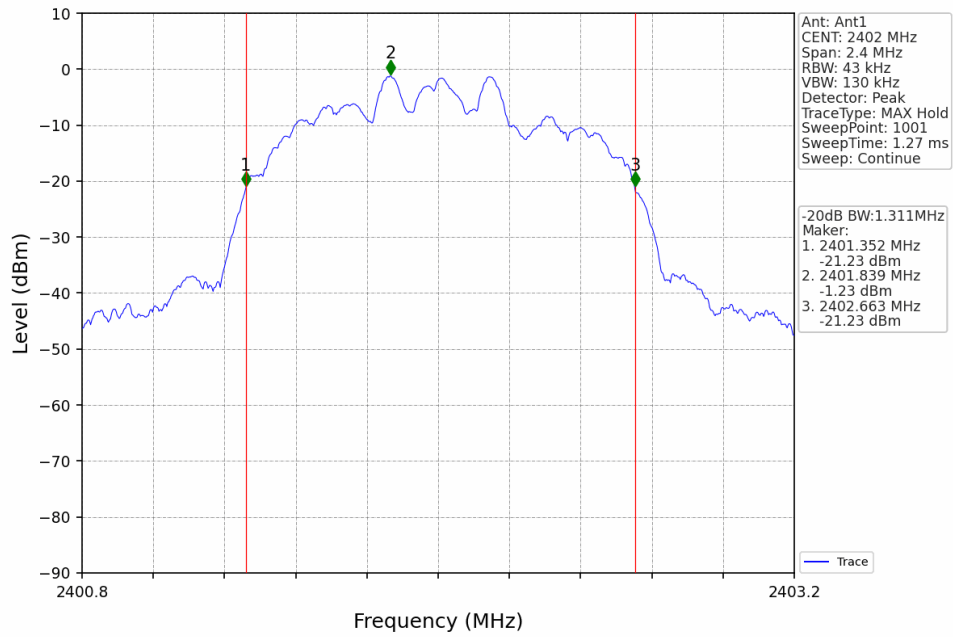
$\pi/4$ -DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



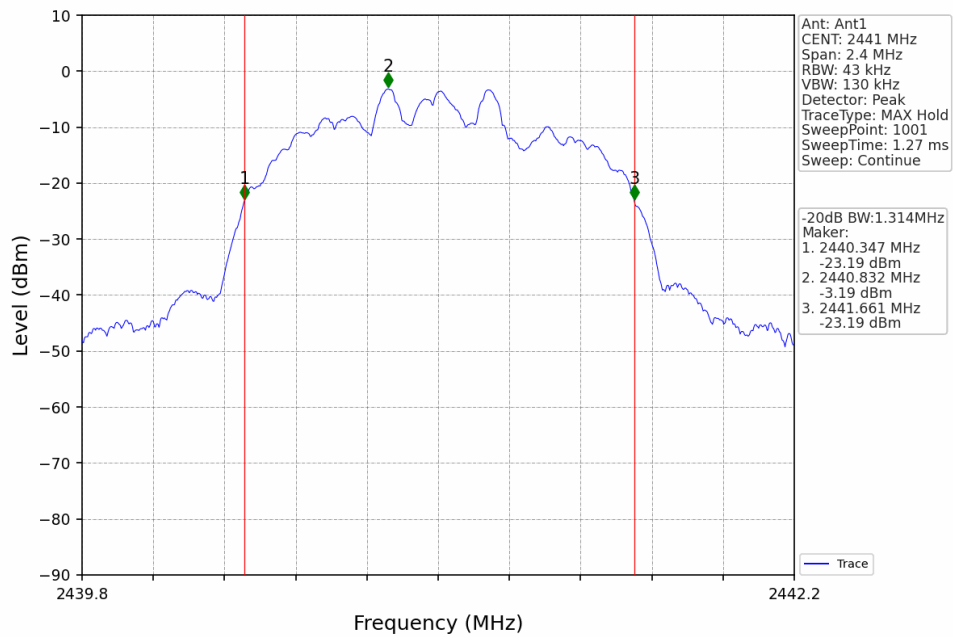
$\pi/4$ -DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



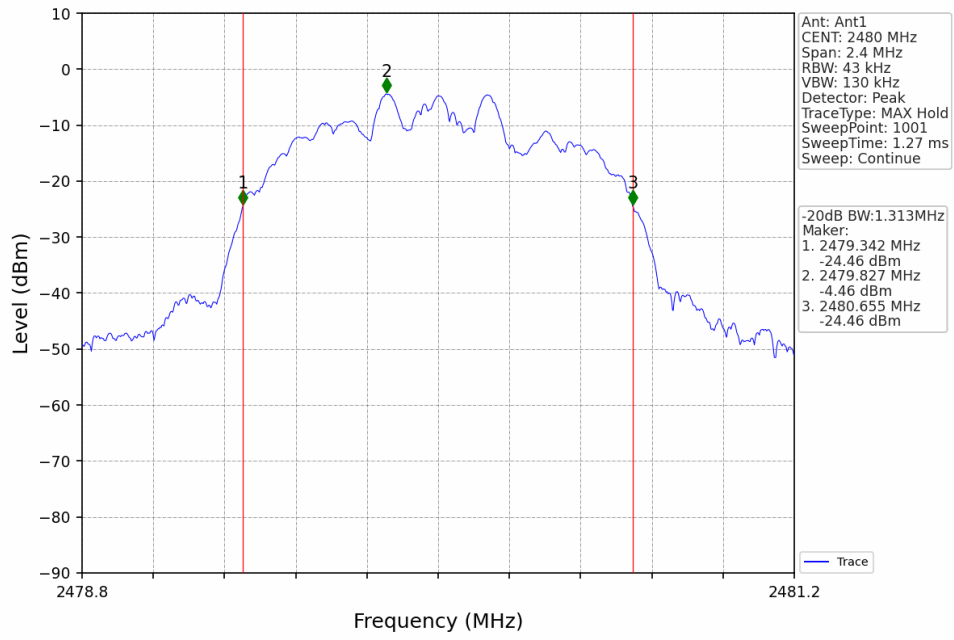
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



3. Maximum Conducted Output Power

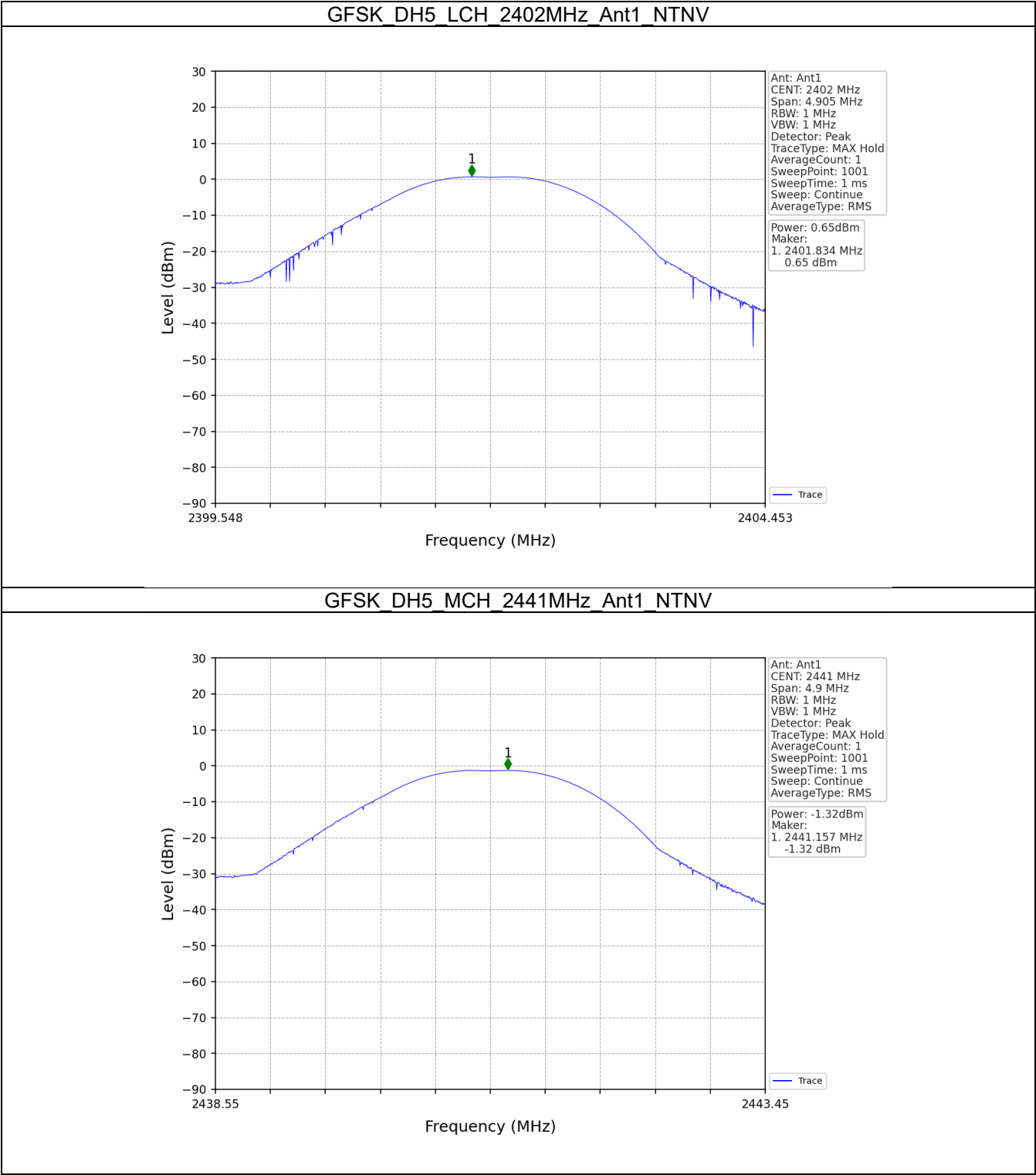
3.1 Test Result

3.1.1 Power

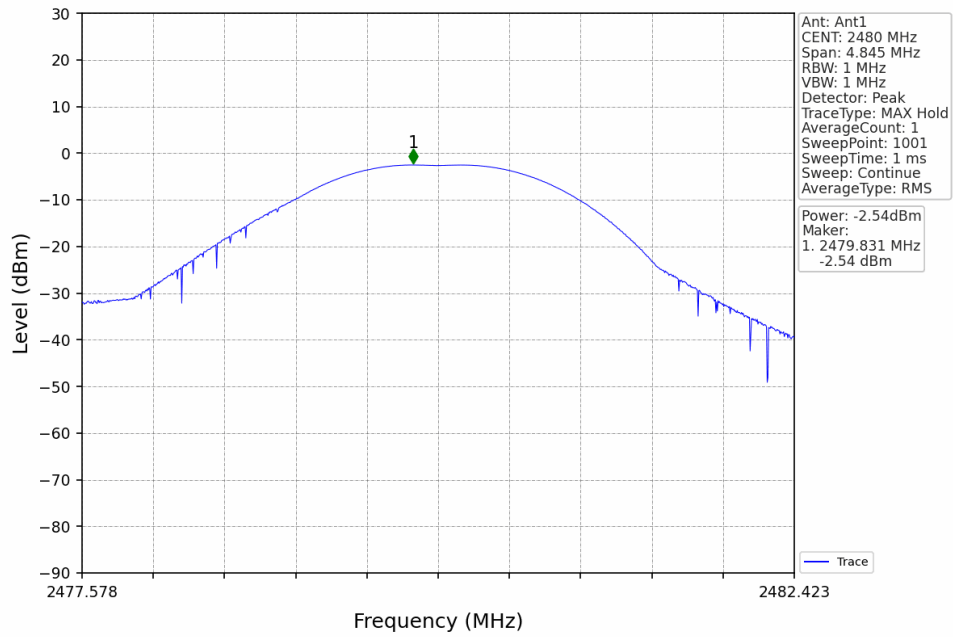
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	0.65	<=30	Pass
		2441	DH5	-1.32	<=30	Pass
		2480	DH5	-2.54	<=30	Pass
$\pi/4$ -DQPSK	SISO	2402	2DH5	0.80	<=20.97	Pass
		2441	2DH5	-1.21	<=20.97	Pass
		2480	2DH5	-2.43	<=20.97	Pass
8DPSK	SISO	2402	3DH5	0.72	<=20.97	Pass
		2441	3DH5	-1.30	<=20.97	Pass
		2480	3DH5	-2.52	<=20.97	Pass

3.2 Test Graph

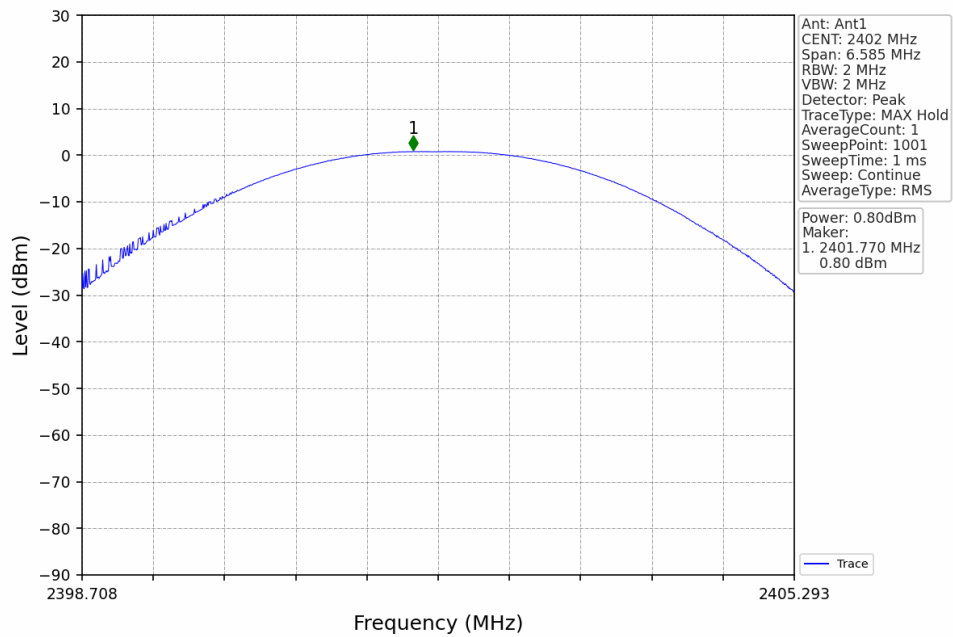
3.2.1 Power



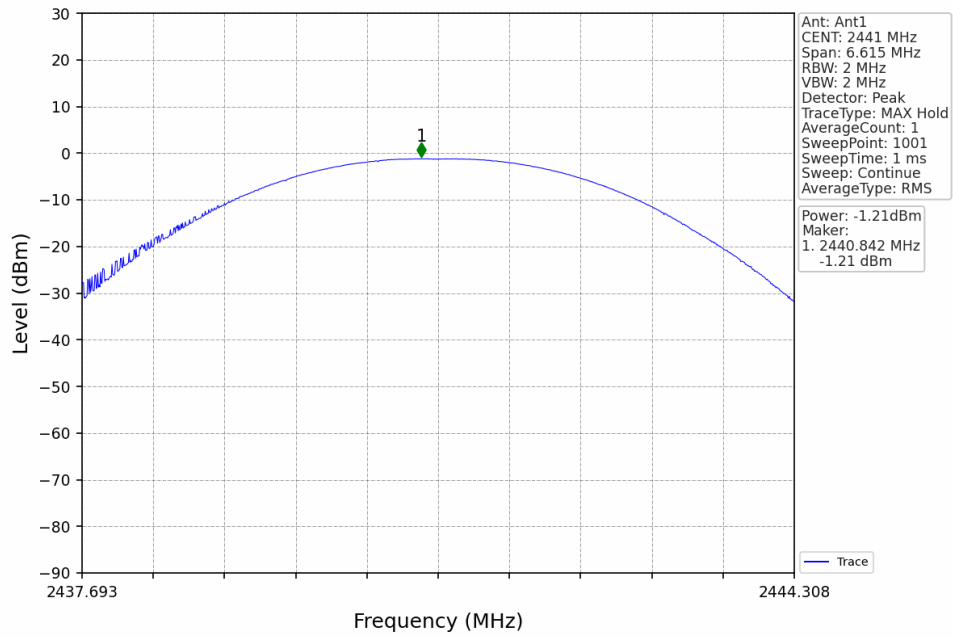
GFSK DH5 HCH 2480MHz Ant1 NTV



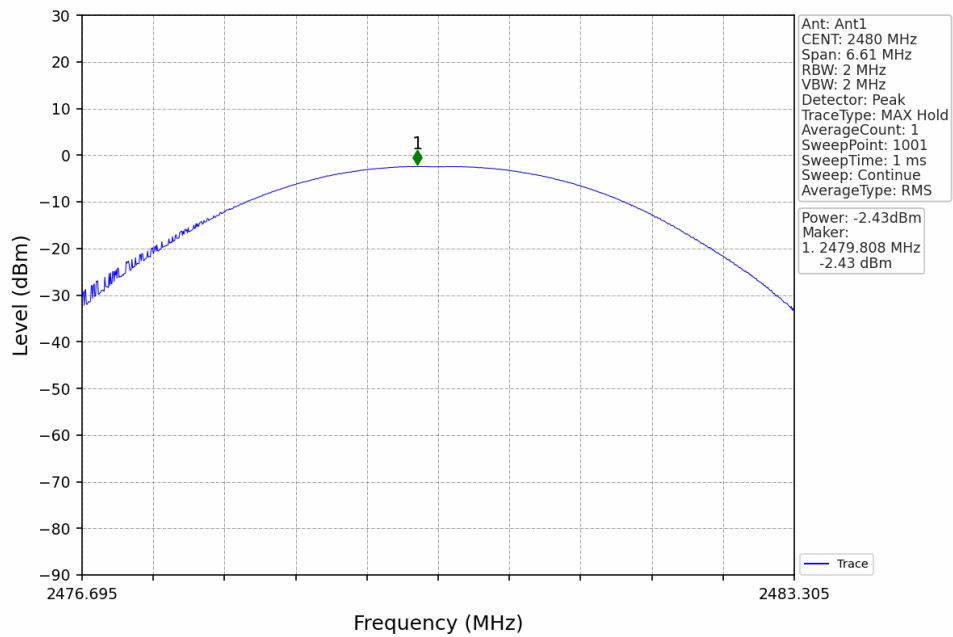
$\pi/4$ -DQPSK 2DH5 LCH 2402MHz Ant1 NTV



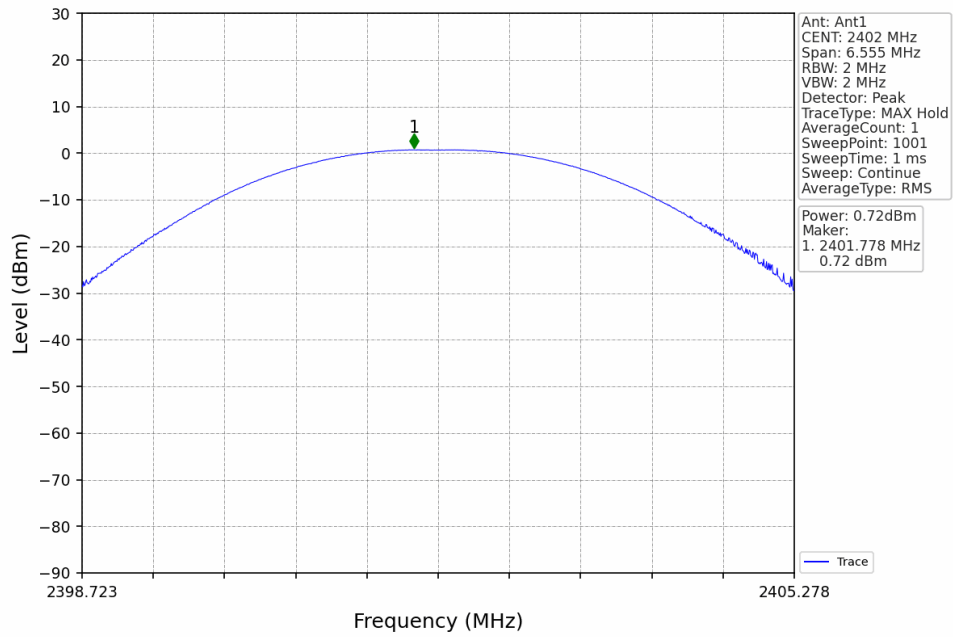
$\pi/4$ -DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



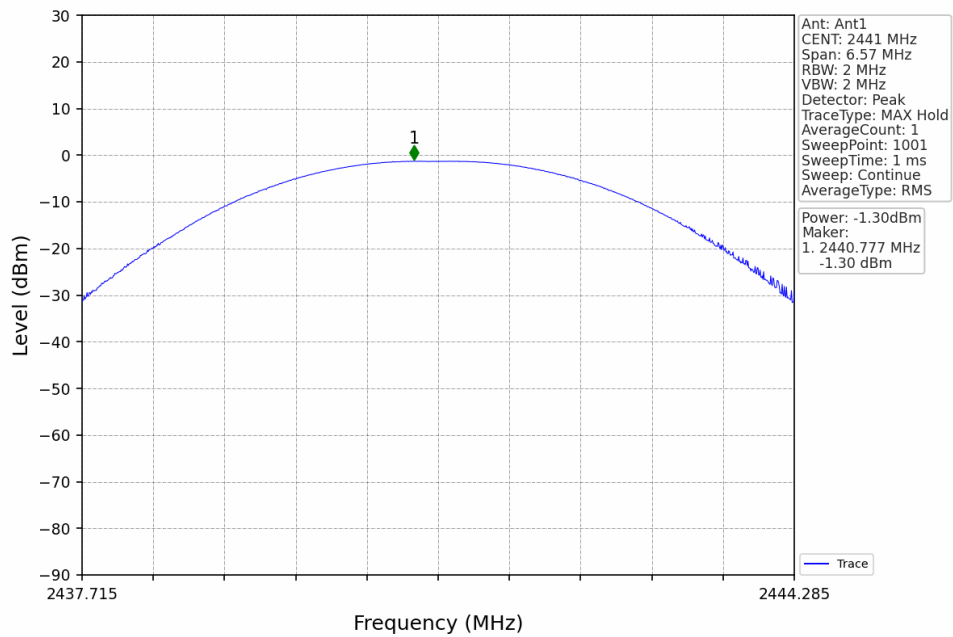
$\pi/4$ -DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

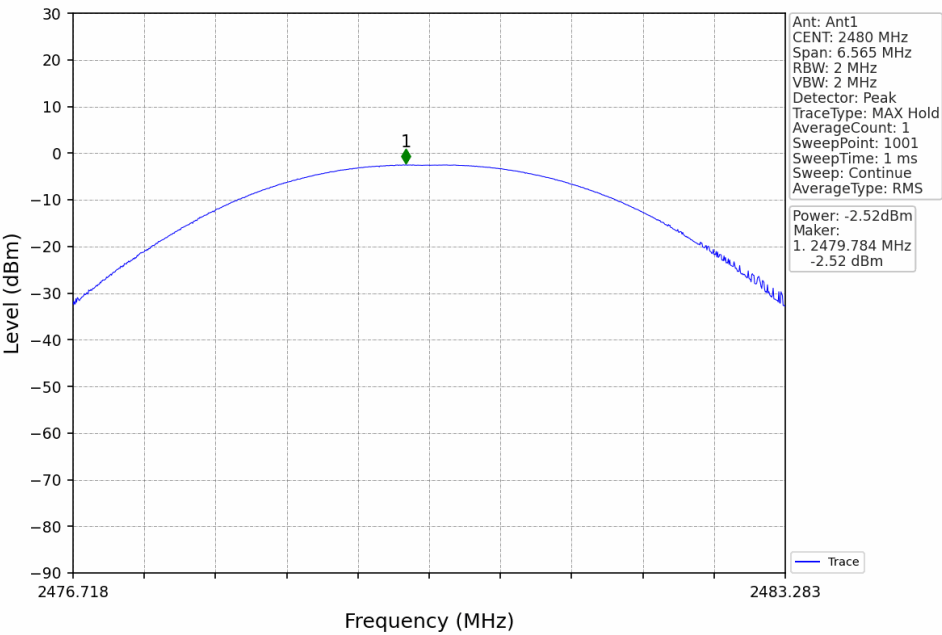


8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV





8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



4. Carrier Frequency Separation

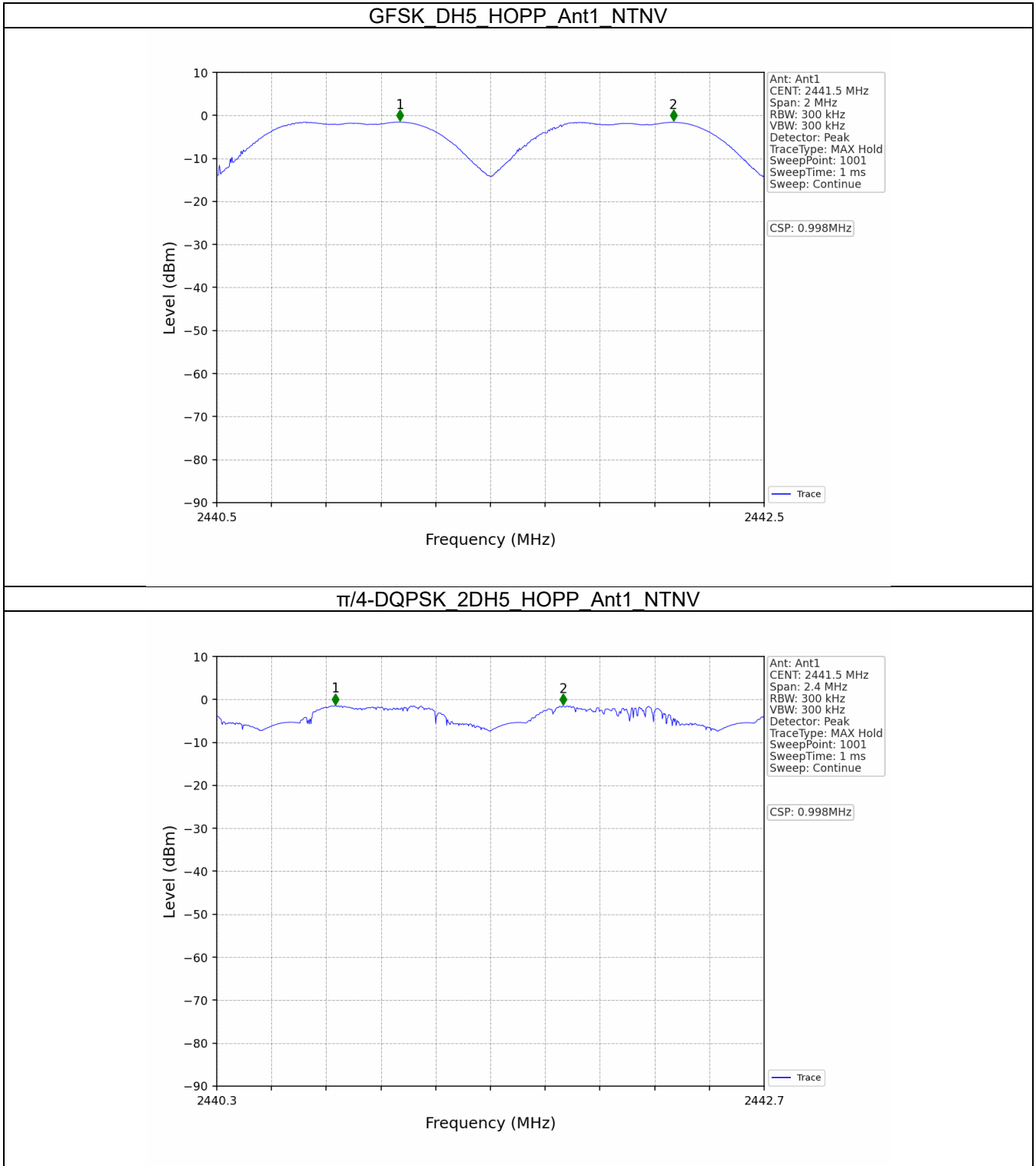
4.1 Test Result

4.1.1 Ant1

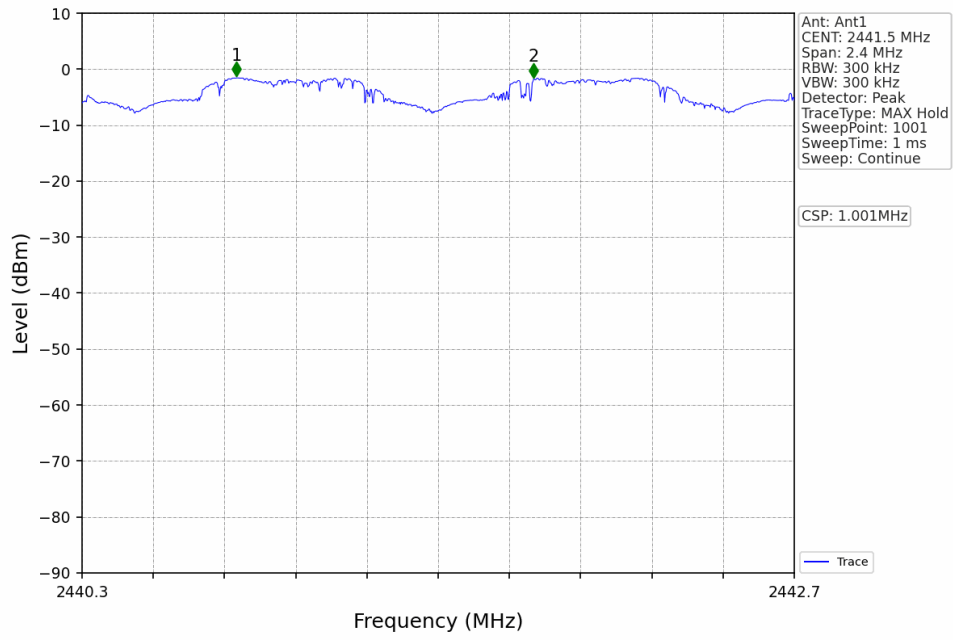
Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	0.998	0.981	≥ 0.981	Pass
$\pi/4$ -DQPSK	SISO	HOPP	2DH5	0.998	1.323	≥ 0.882	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.314	≥ 0.876	Pass

4.2 Test Graph

4.2.1 Ant1



8DPSK_3DH5_HOPP_Ant1_NTNV



5. Number of Hopping Frequencies

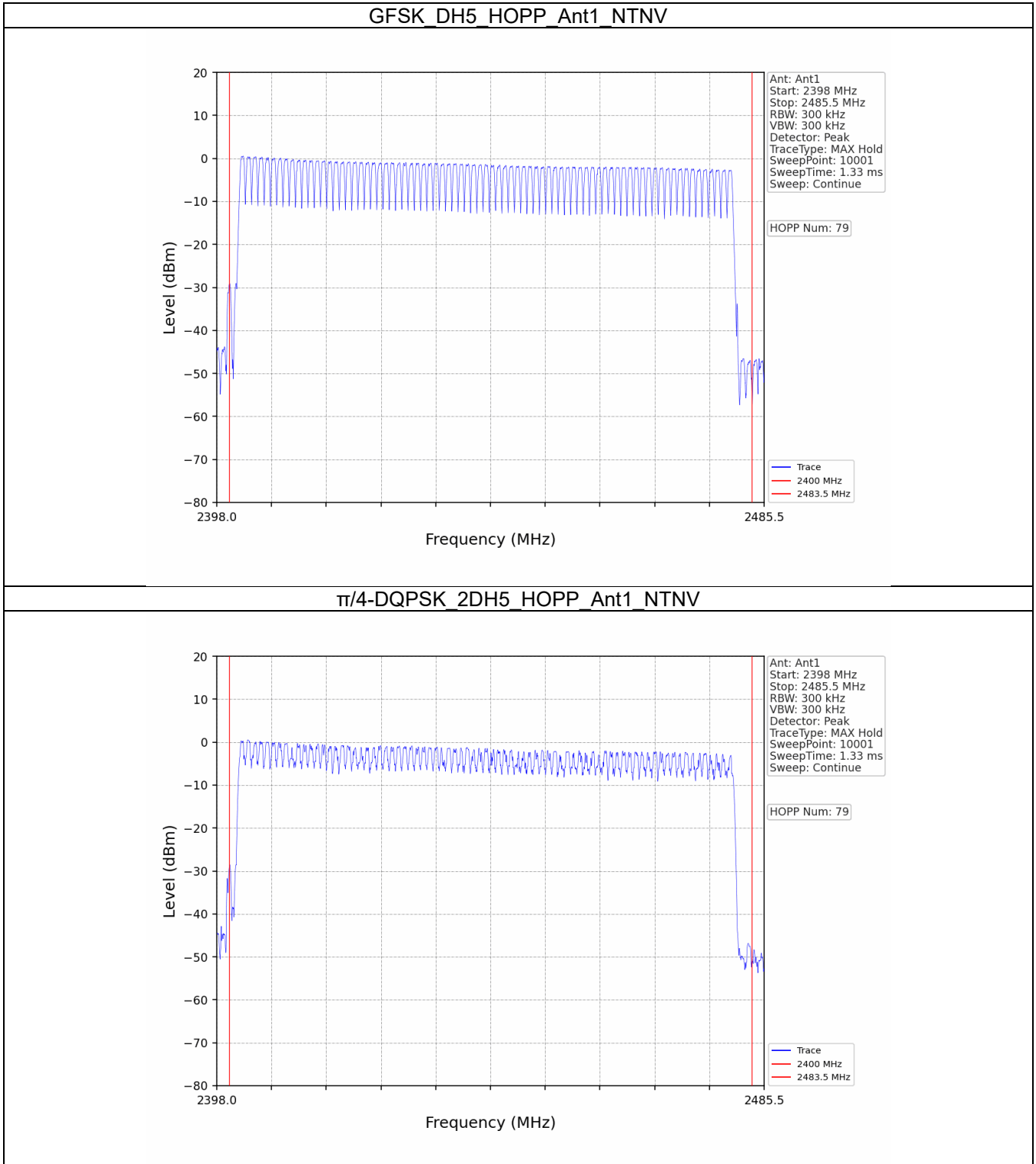
5.1 Test Result

5.1.1 HoppNum

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
8DPSK	SISO	HOPP	3DH5	79	≥ 15	Pass

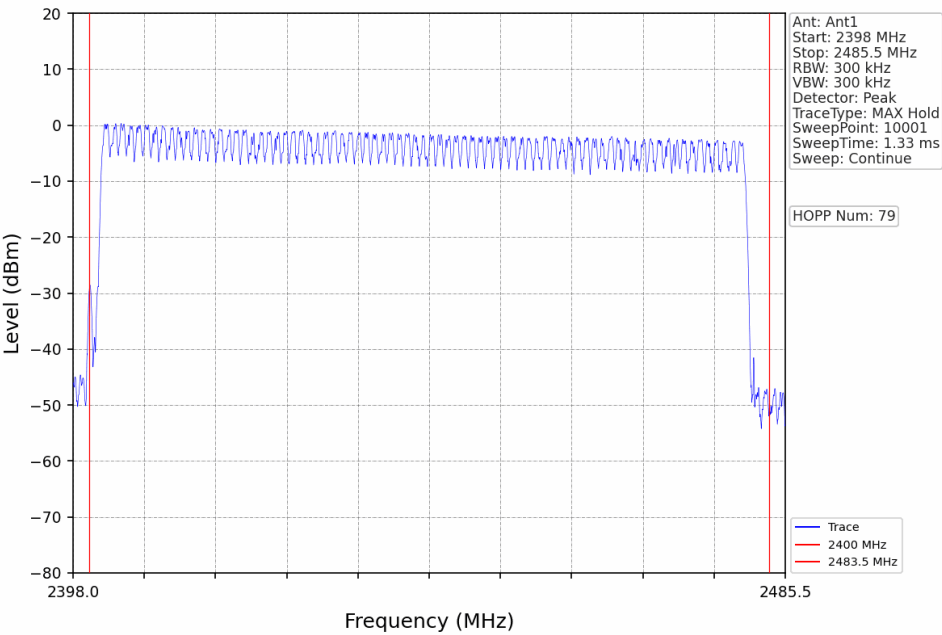
5.2 Test Graph

5.2.1 HoppNum





8DPSK_3DH5_HOPP_Ant1_NTNV



6. Time of Occupancy (Dwell Time)

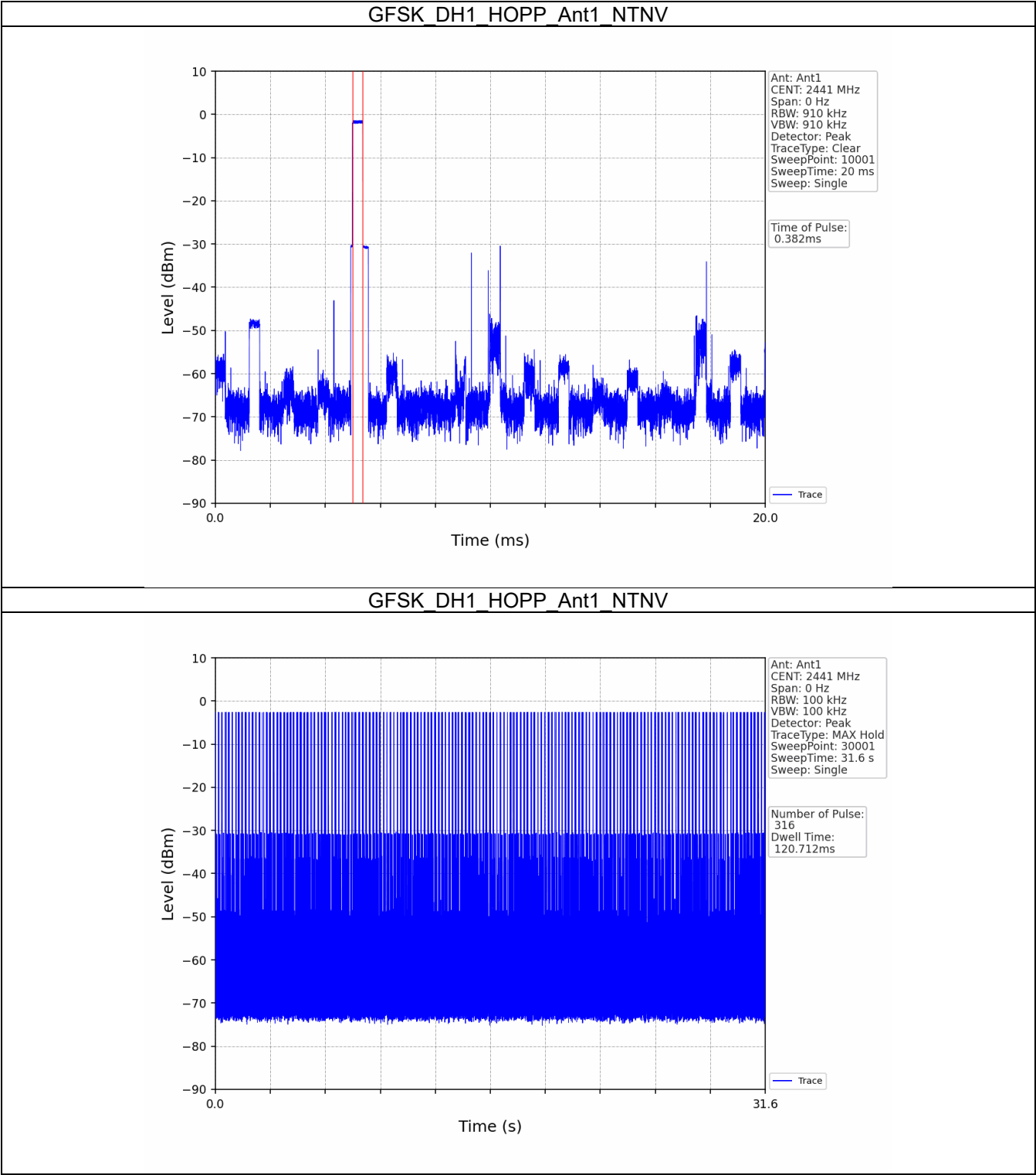
6.1 Test Result

6.1.1 Ant1

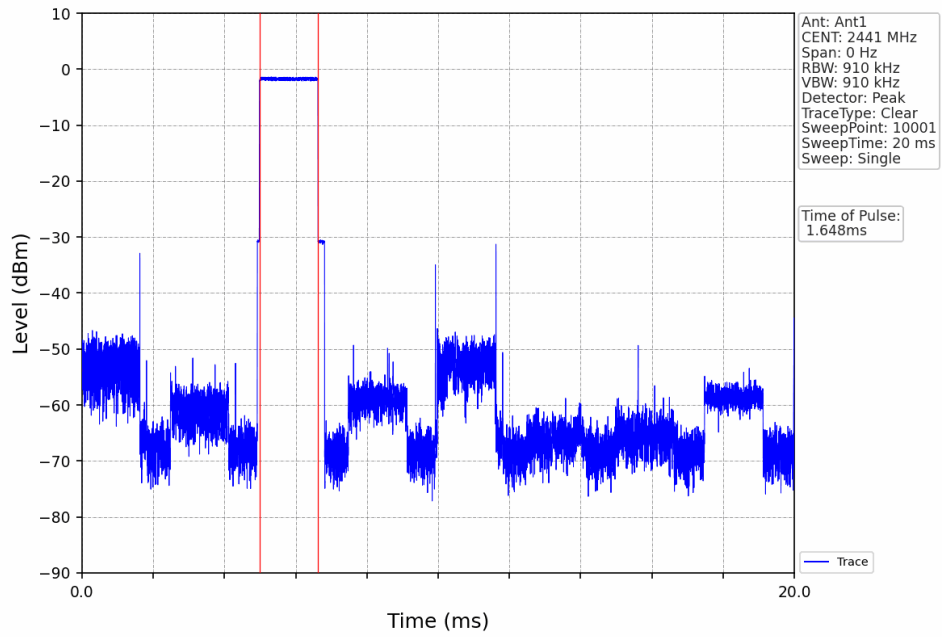
Ant1									
Mode	TX Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.382	31.600	316	120.712	<=400	Pass
			DH3	1.648	31.600	172	283.456	<=400	Pass
			DH5	3.138	31.600	108	338.904	<=400	Pass
$\pi/4$ -DQPSK	SISO	HOPP	2DH1	0.392	31.600	315	123.480	<=400	Pass
			2DH3	1.642	31.600	170	279.140	<=400	Pass
			2DH5	3.140	31.600	105	329.700	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.390	31.600	315	122.850	<=400	Pass
			3DH3	1.892	31.600	173	327.316	<=400	Pass
			3DH5	3.140	31.600	114	357.960	<=400	Pass

6.2 Test Graph

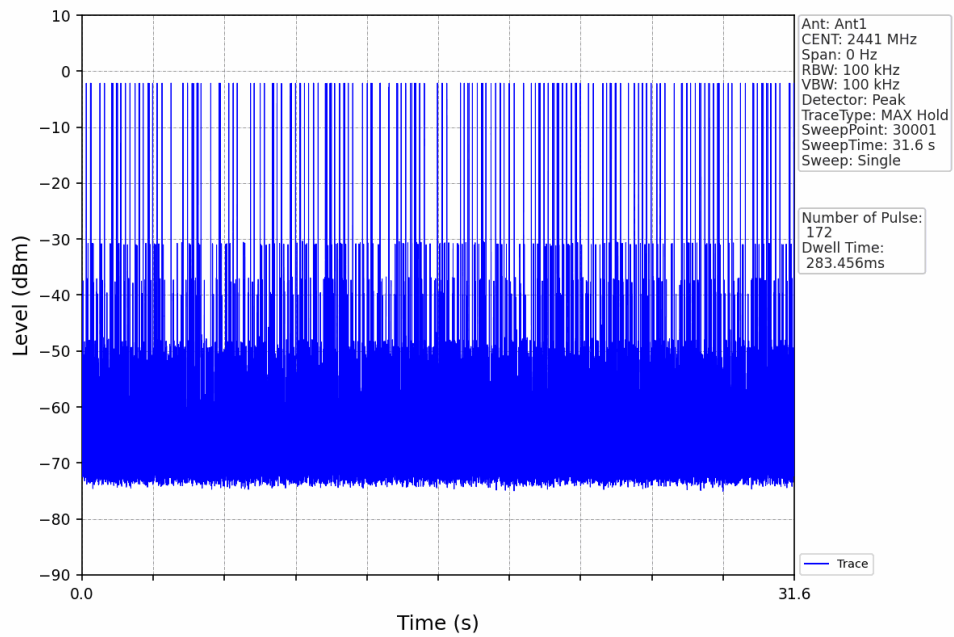
6.2.1 Ant1



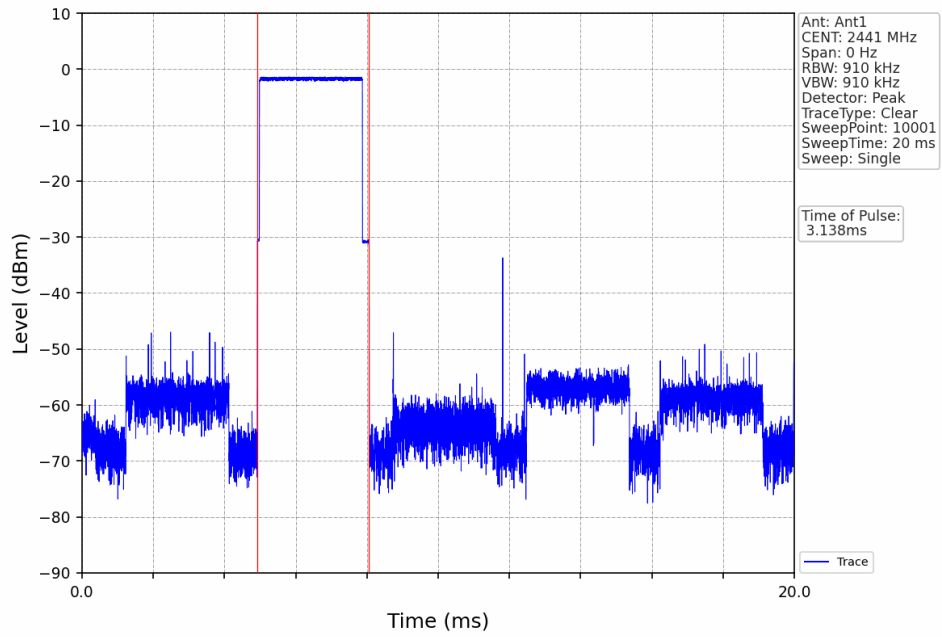
GFSK_DH3_HOPP_Ant1_NTNV



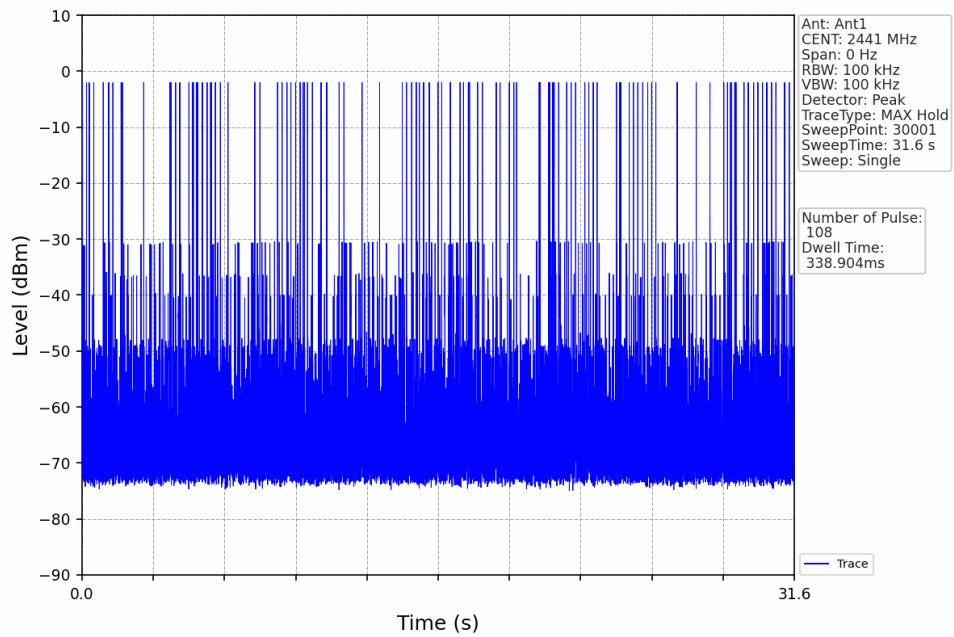
GFSK_DH3_HOPP_Ant1_NTNV



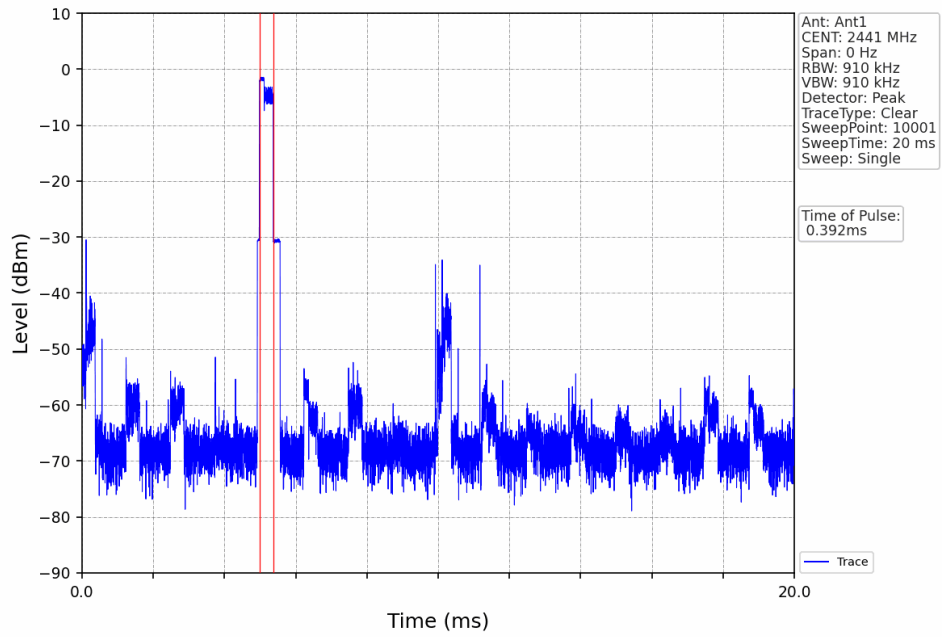
GFSK_DH5_HOPP_Ant1_NTNV



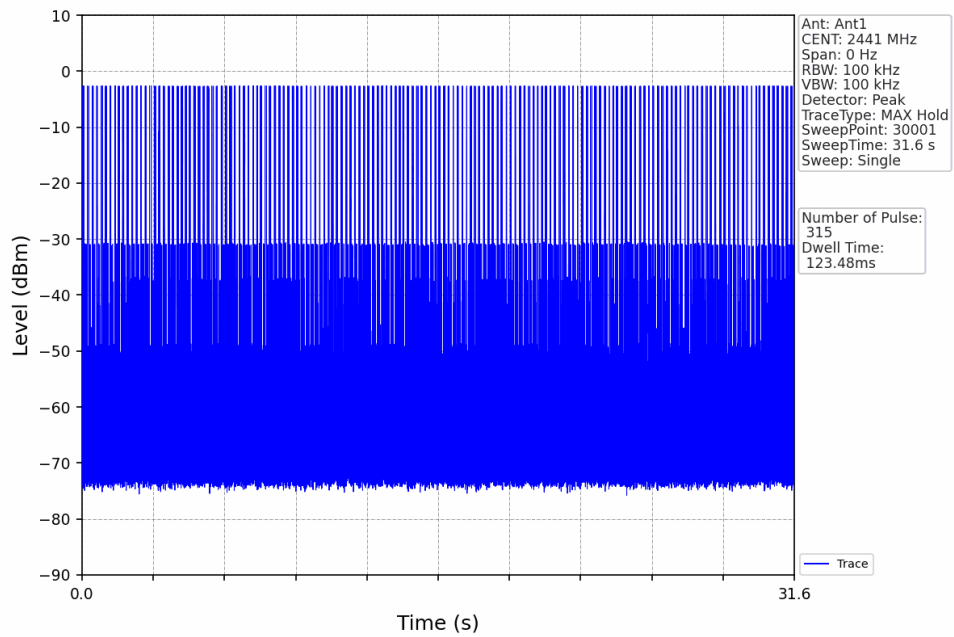
GFSK_DH5_HOPP_Ant1_NTNV



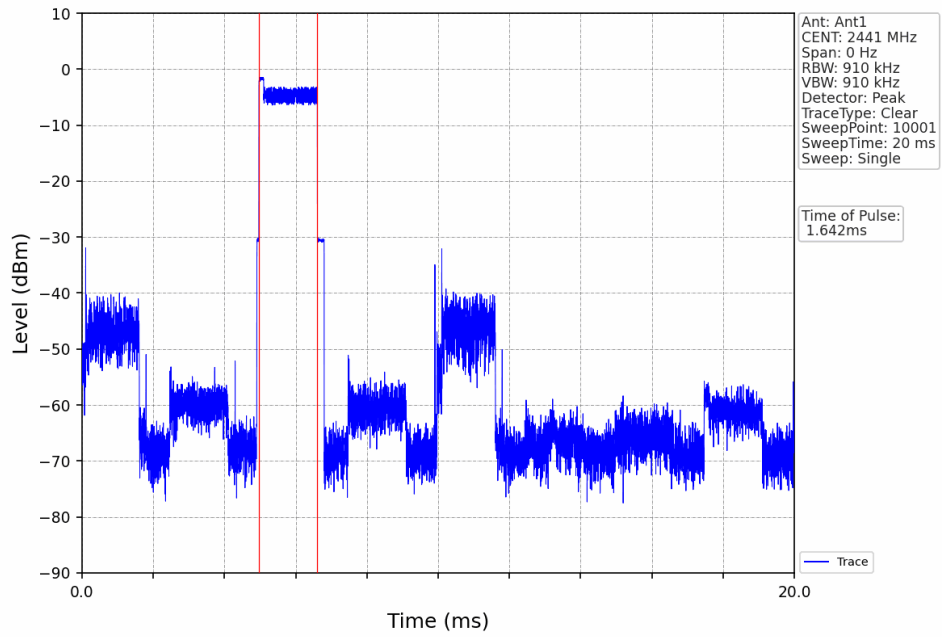
$\pi/4$ -DQPSK 2DH1_HOPP_Ant1_NTNV



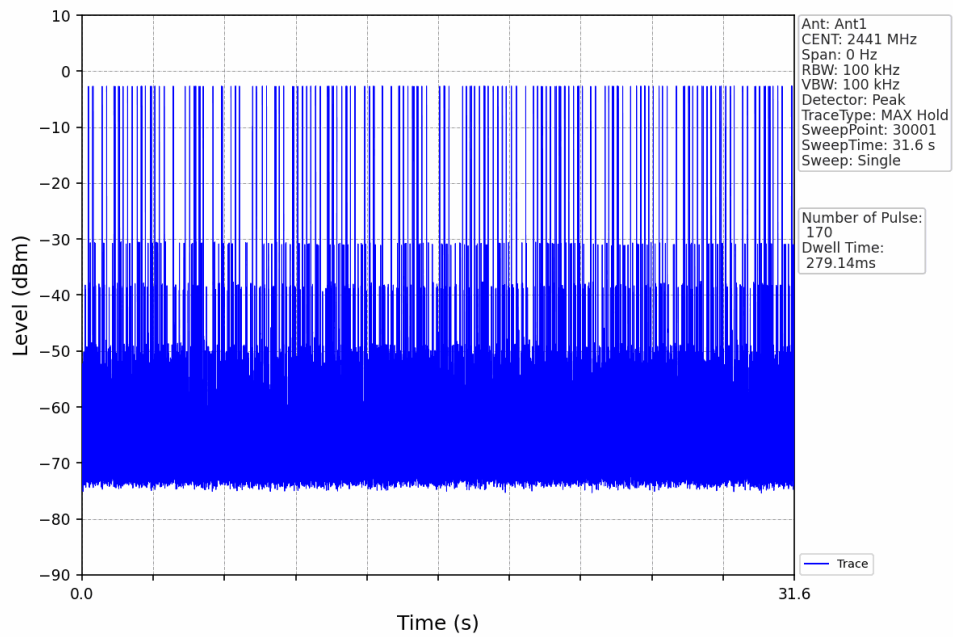
$\pi/4$ -DQPSK 2DH1_HOPP_Ant1_NTNV



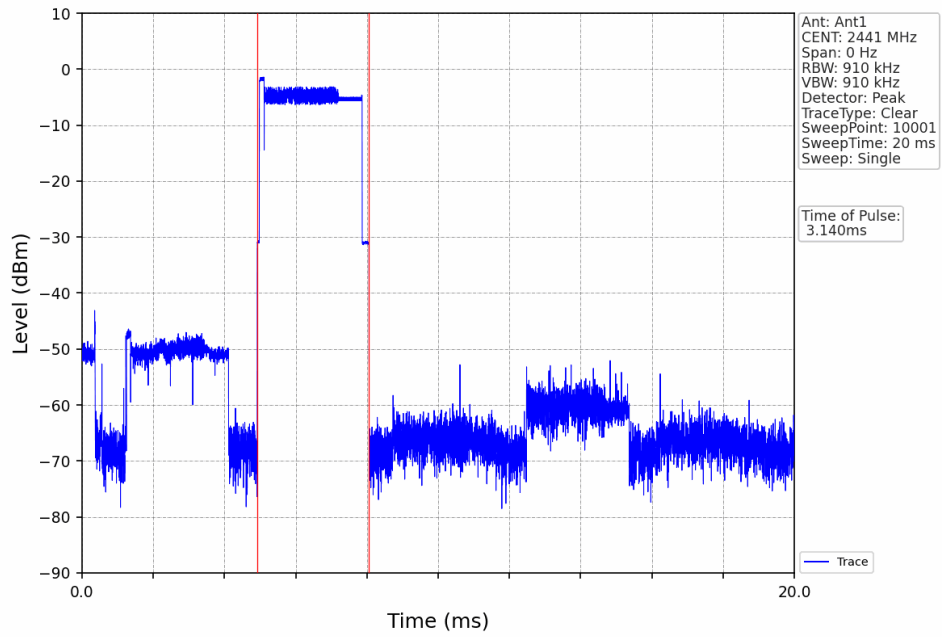
$\pi/4$ -DQPSK 2DH3_HOPP_Ant1_NTNV



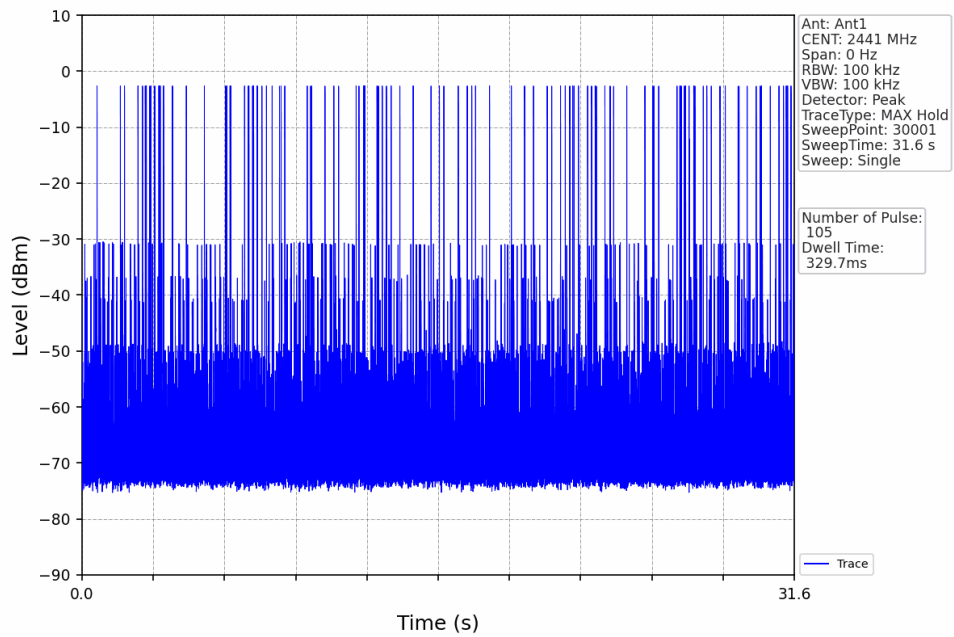
$\pi/4$ -DQPSK 2DH3_HOPP_Ant1_NTNV



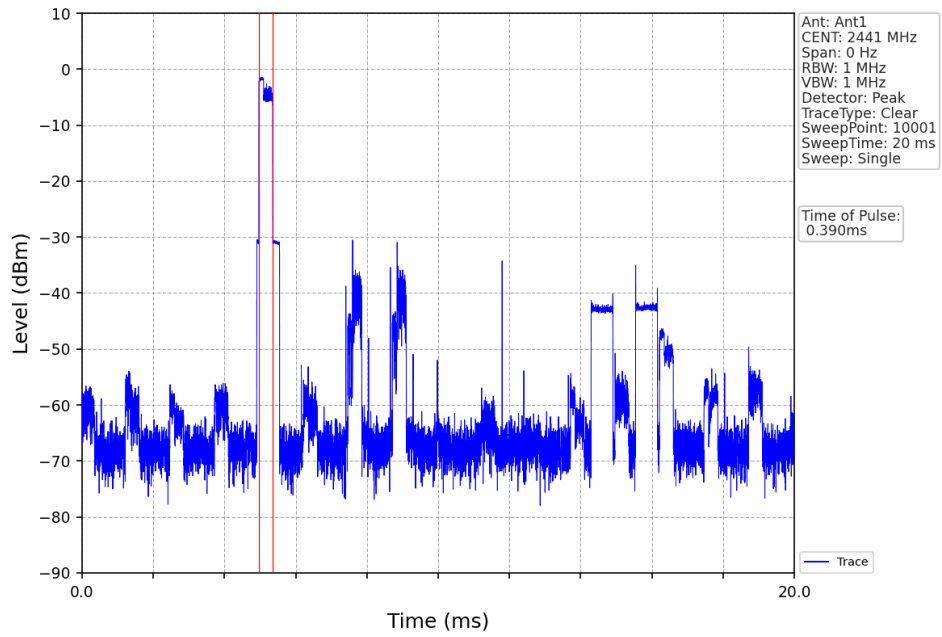
$\pi/4$ -DQPSK 2DH5_HOPP_Ant1_NTNV



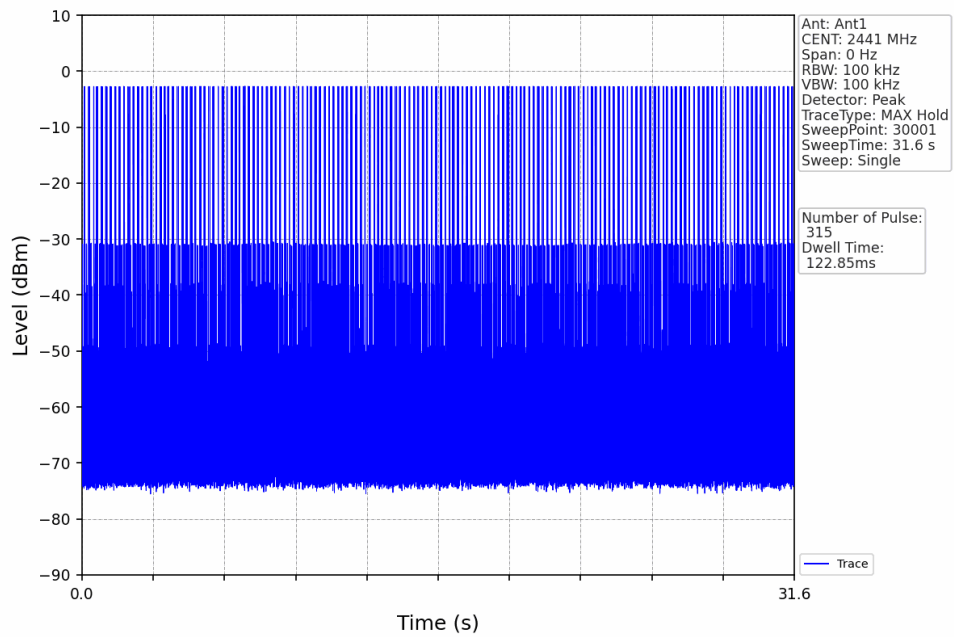
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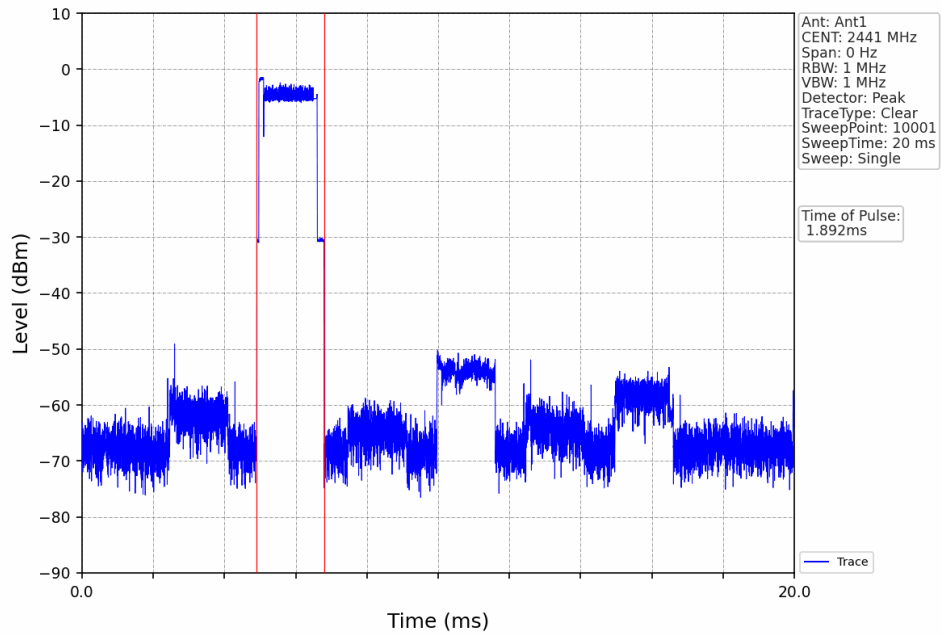
8DPSK_3DH1_HOPP_Ant1_NTNV



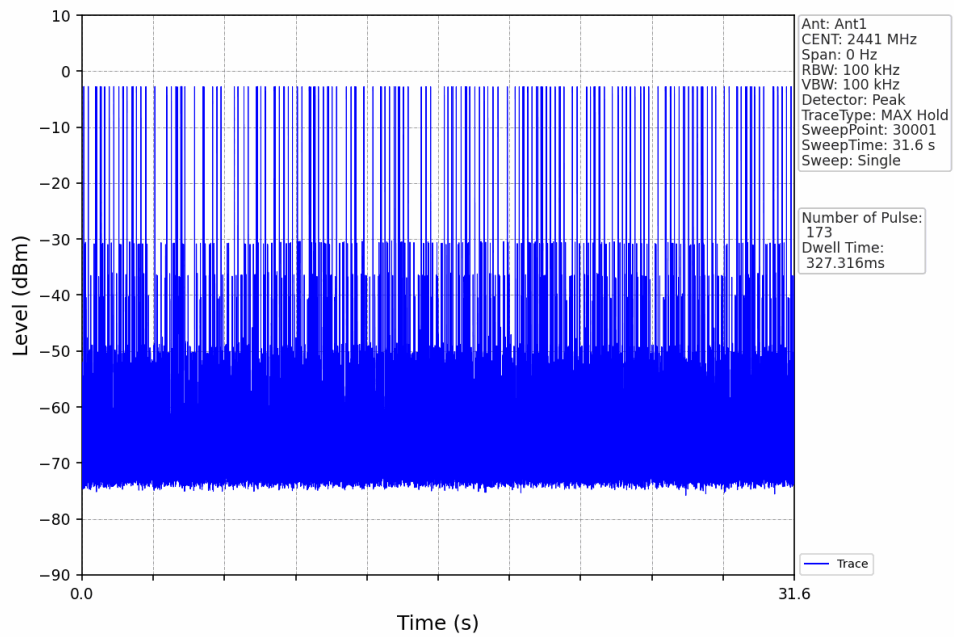
8DPSK_3DH1_HOPP_Ant1_NTNV



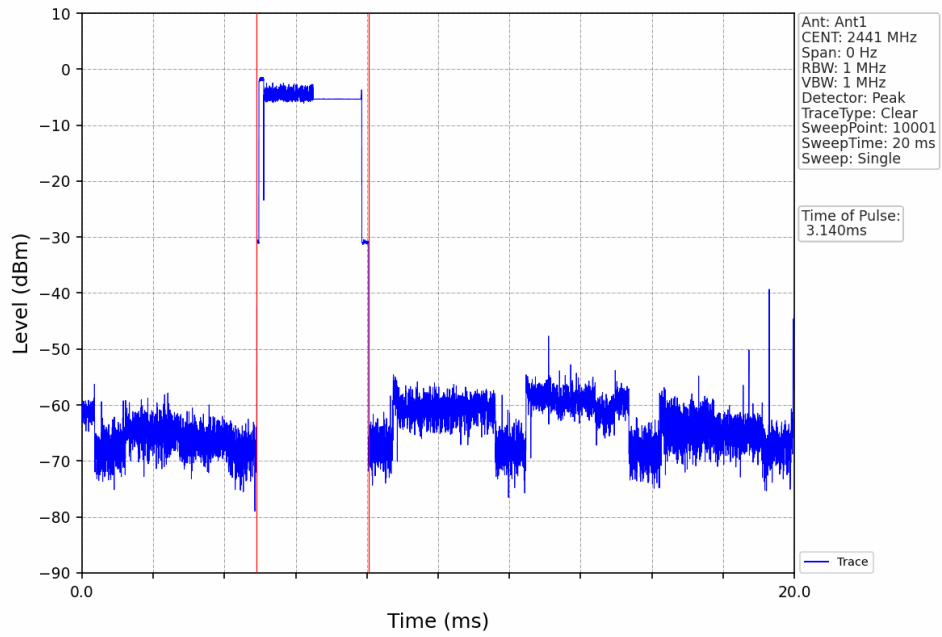
8DPSK_3DH3_HOPP_Ant1_NTNV



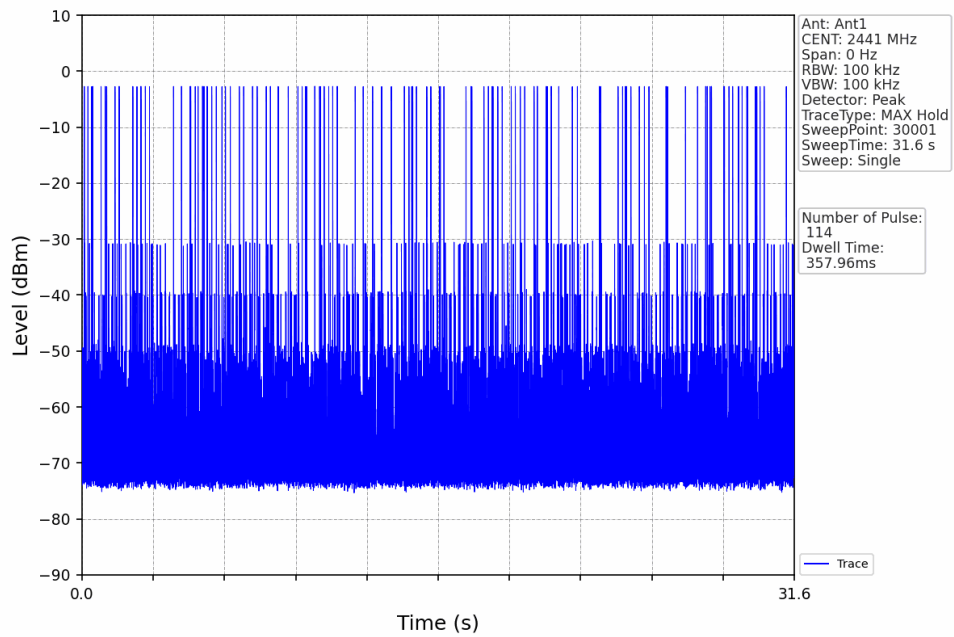
8DPSK_3DH3_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



7. Unwanted Emissions In Non-restricted Frequency Bands

7.1 Test Result

7.1.1 Ref

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	0.31
		2441	DH5	1	-1.63
		2480	DH5	1	-2.85
		HOPP	DH5	1	-0.01
					-0.01
$\pi/4$ -DQPSK	SISO	2402	2DH5	1	0.33
		2441	2DH5	1	-1.66
		2480	2DH5	1	-2.90
		HOPP	2DH5	1	-0.51
					-0.51
8DPSK	SISO	2402	3DH5	1	0.18
		2441	3DH5	1	-1.74
		2480	3DH5	1	-3.07
		HOPP	3DH5	1	-0.71
					-0.71

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

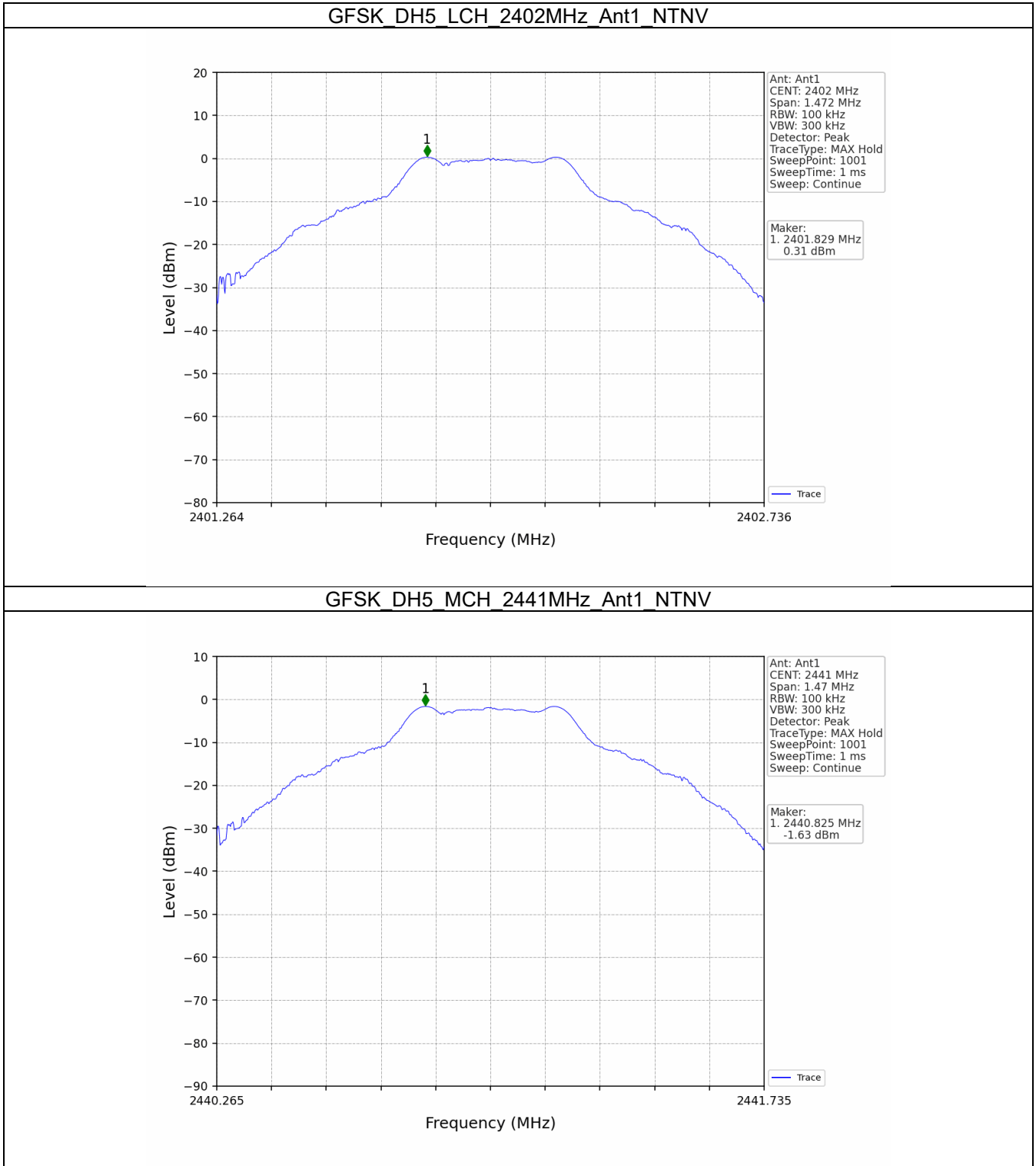
7.1.2 CSE

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	0.31	-19.69	Pass
		2441	DH5	1	-1.63	-21.63	Pass
		2480	DH5	1	-2.85	-22.85	Pass
		HOPP	DH5	1	-0.01	-20.01	Pass
					-0.01	-20.01	Pass
$\pi/4$ -DQPSK	SISO	2402	2DH5	1	0.33	-19.67	Pass
		2441	2DH5	1	-1.66	-21.66	Pass
		2480	2DH5	1	-2.90	-22.90	Pass
		HOPP	2DH5	1	-0.51	-20.51	Pass
					-0.51	-20.51	Pass
8DPSK	SISO	2402	3DH5	1	0.18	-19.82	Pass
		2441	3DH5	1	-1.74	-21.74	Pass
		2480	3DH5	1	-3.07	-23.07	Pass
		HOPP	3DH5	1	-0.71	-20.71	Pass
					-0.71	-20.71	Pass

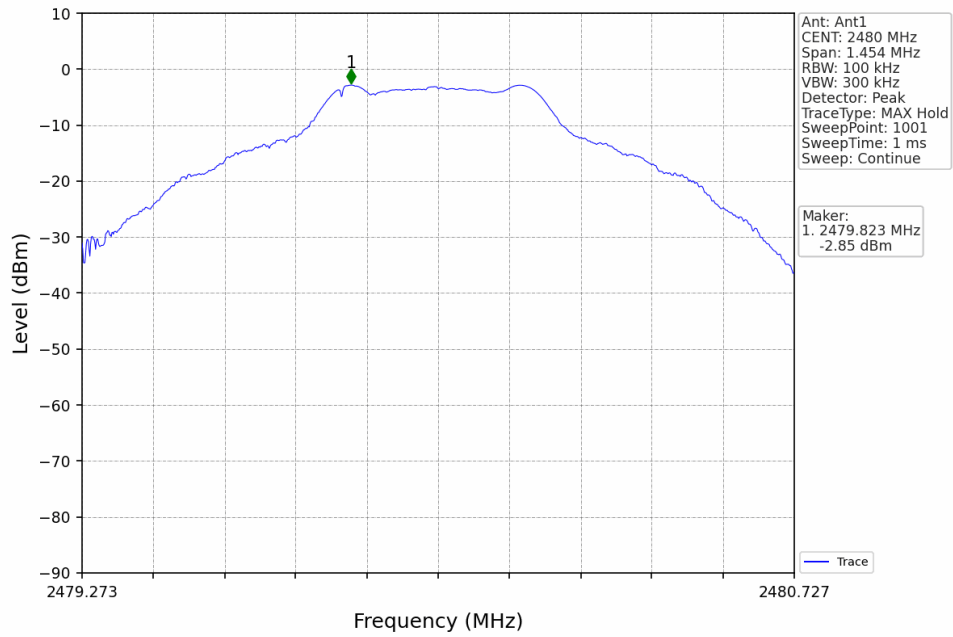
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

7.2 Test Graph

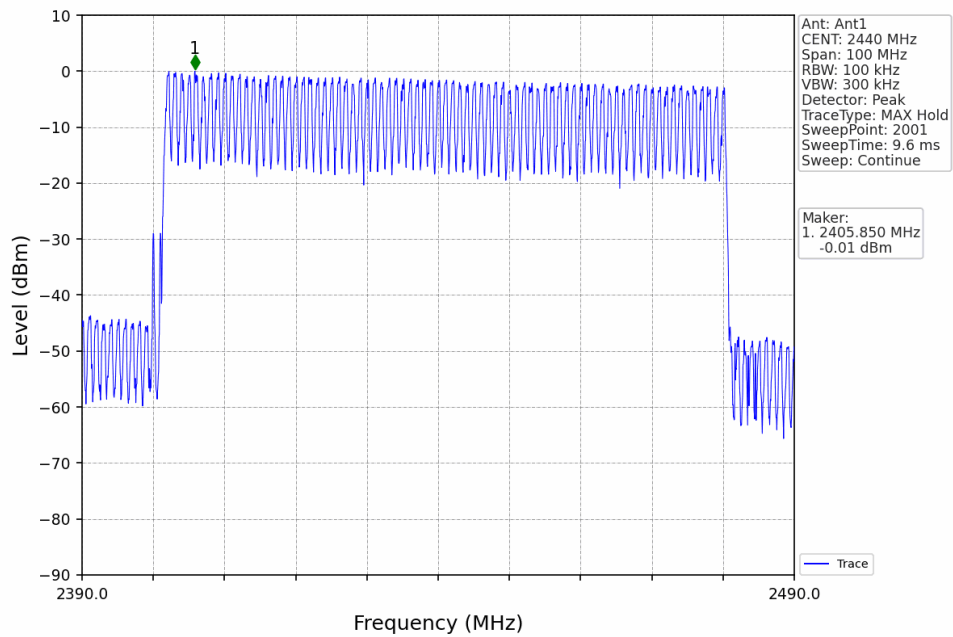
7.2.1 Ref



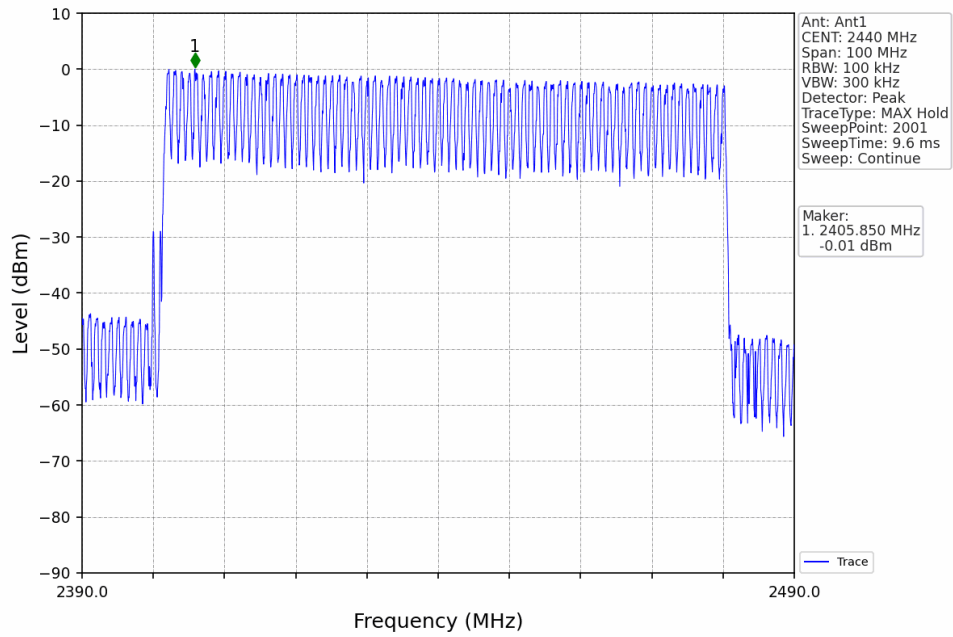
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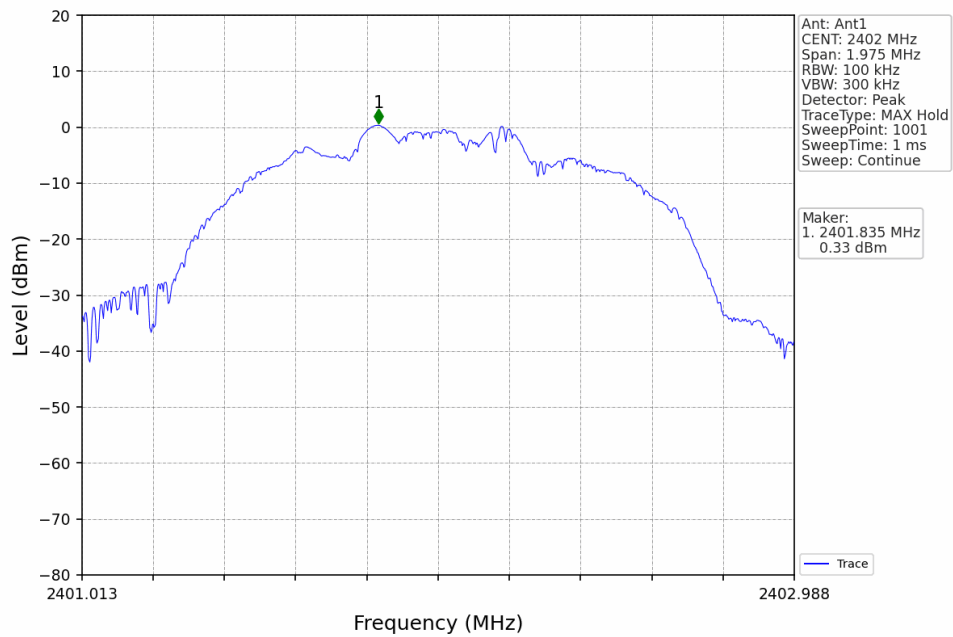
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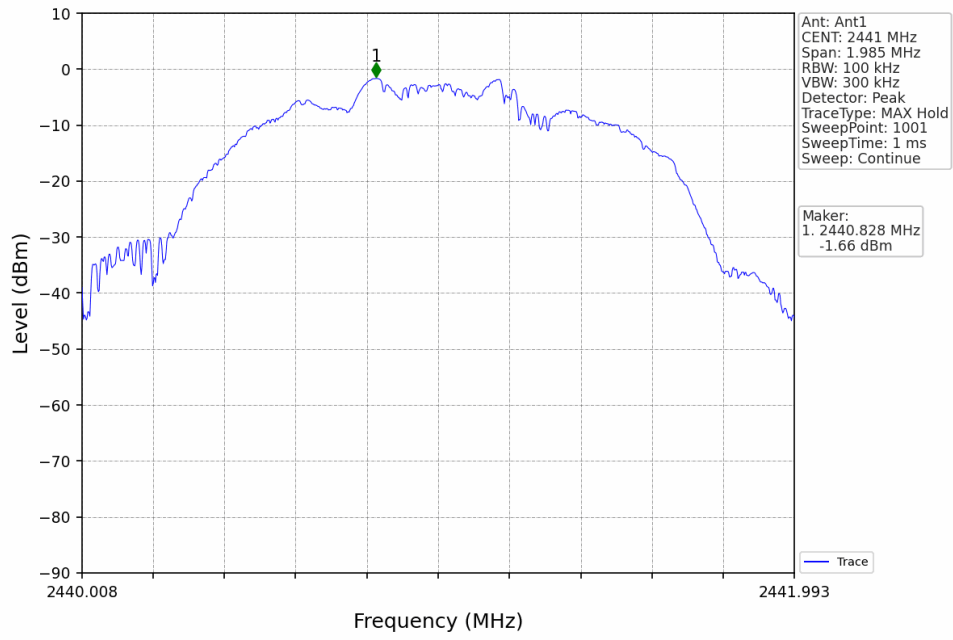
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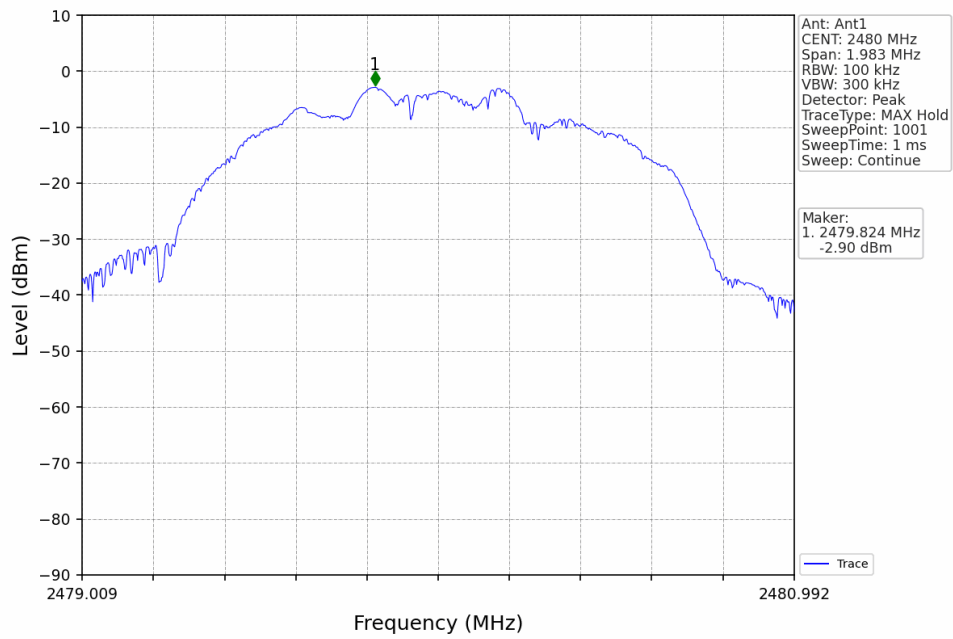
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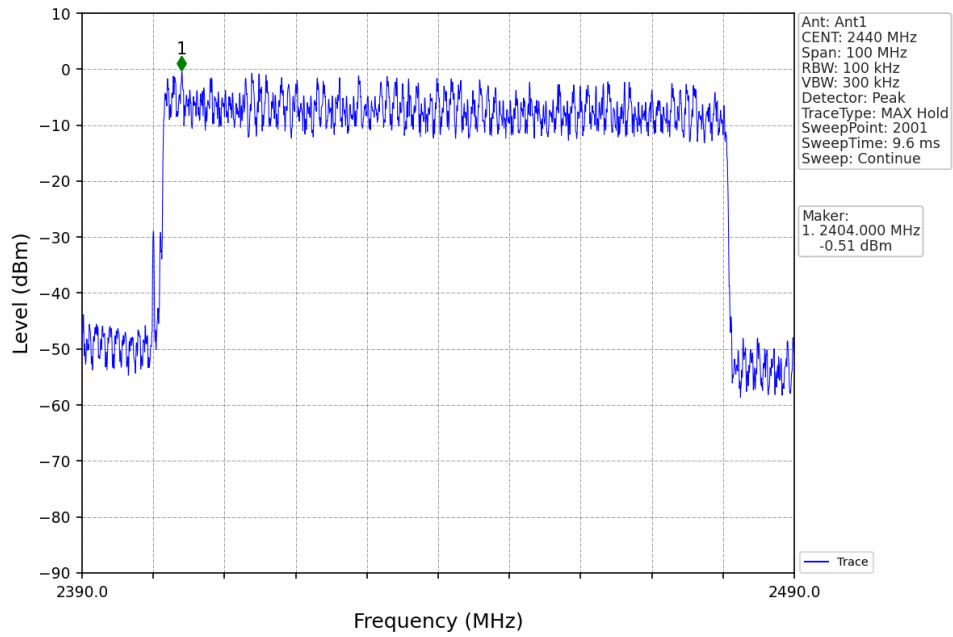
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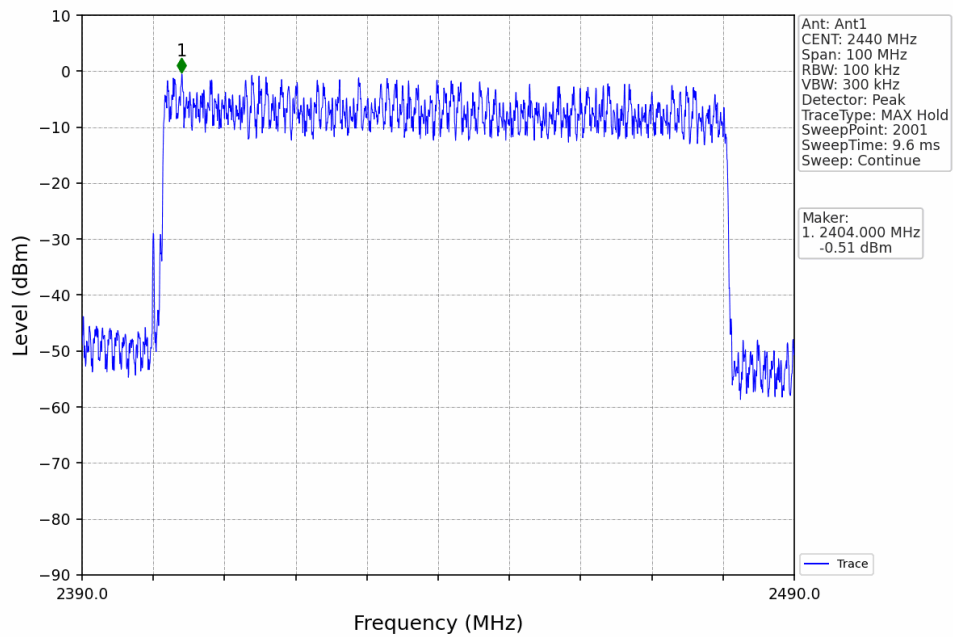
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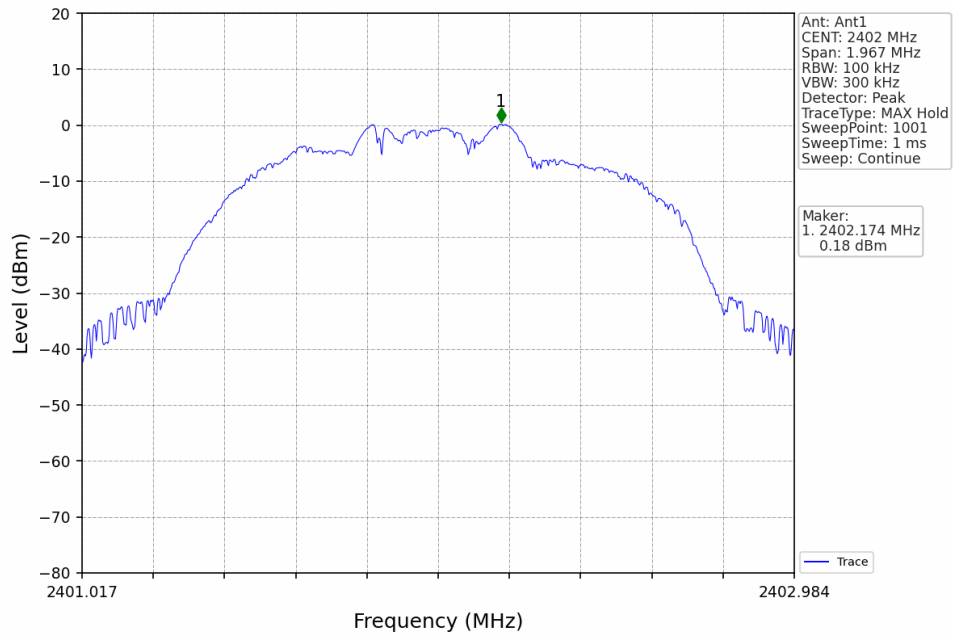
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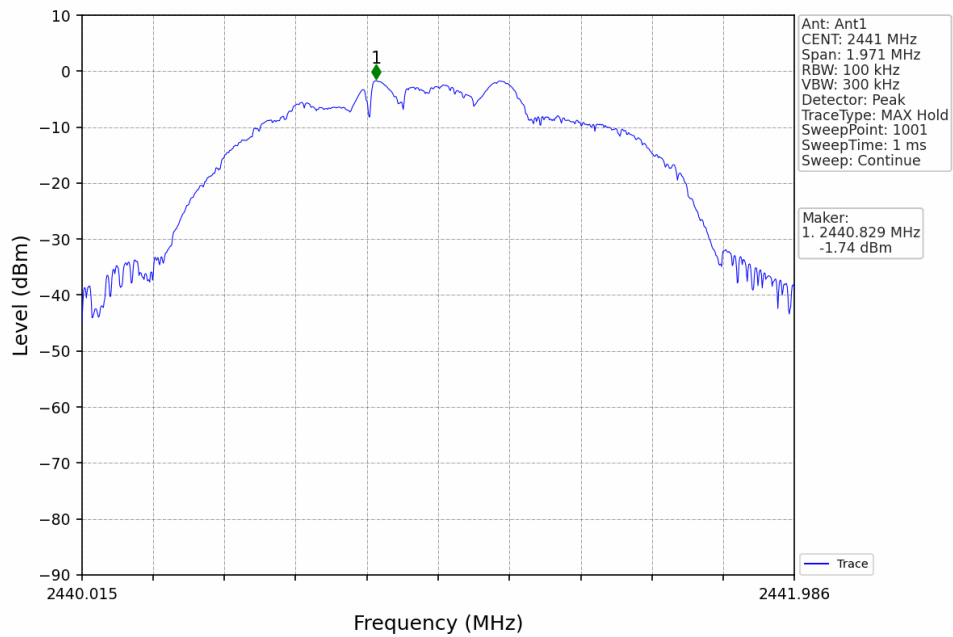
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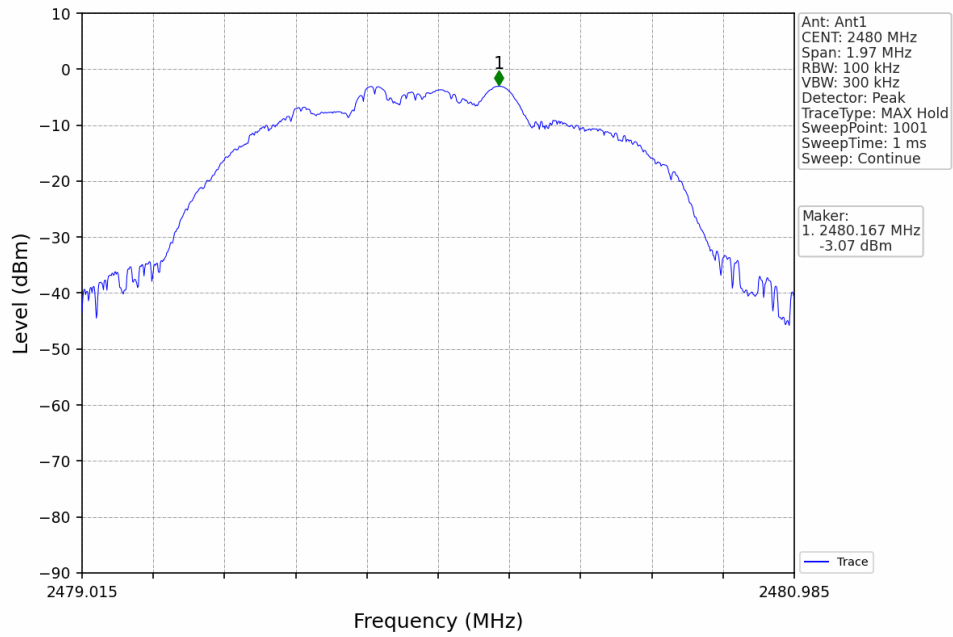
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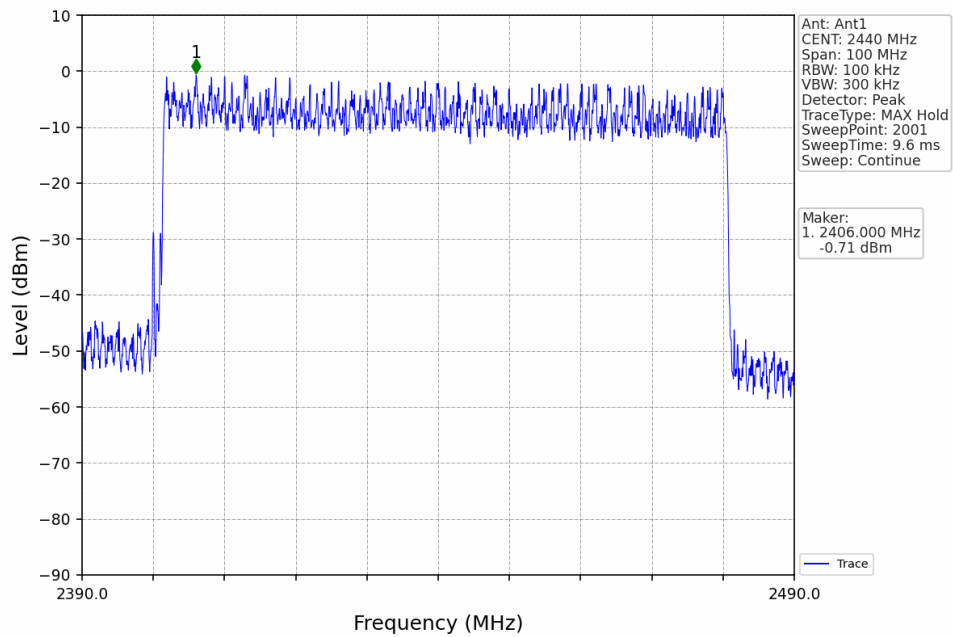
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8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV

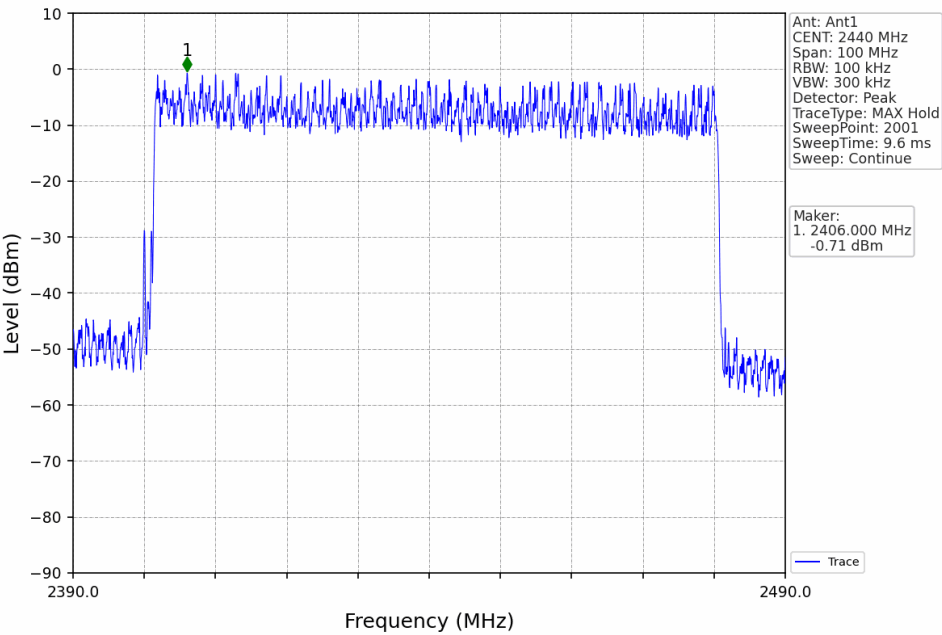


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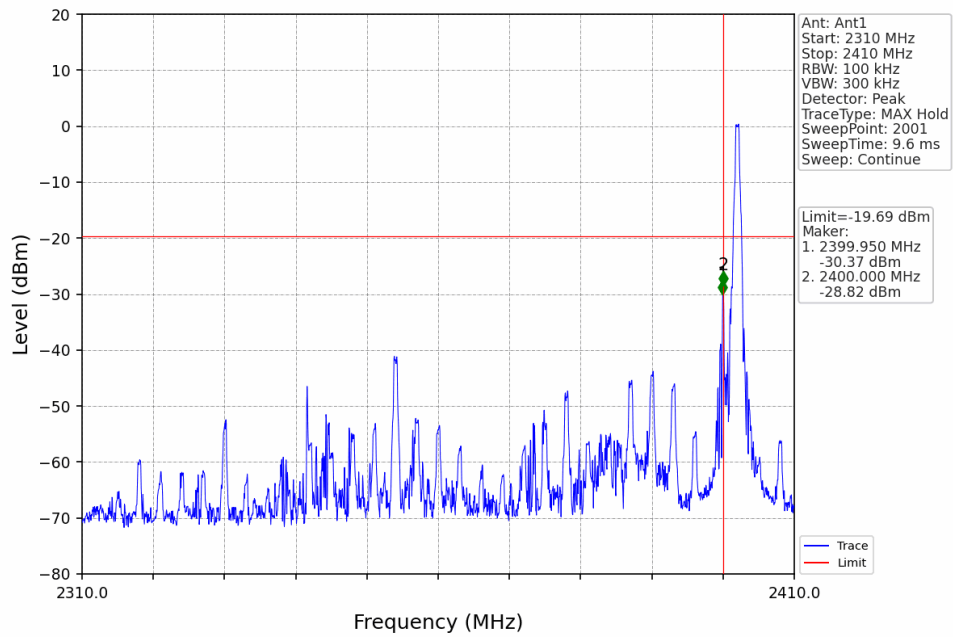


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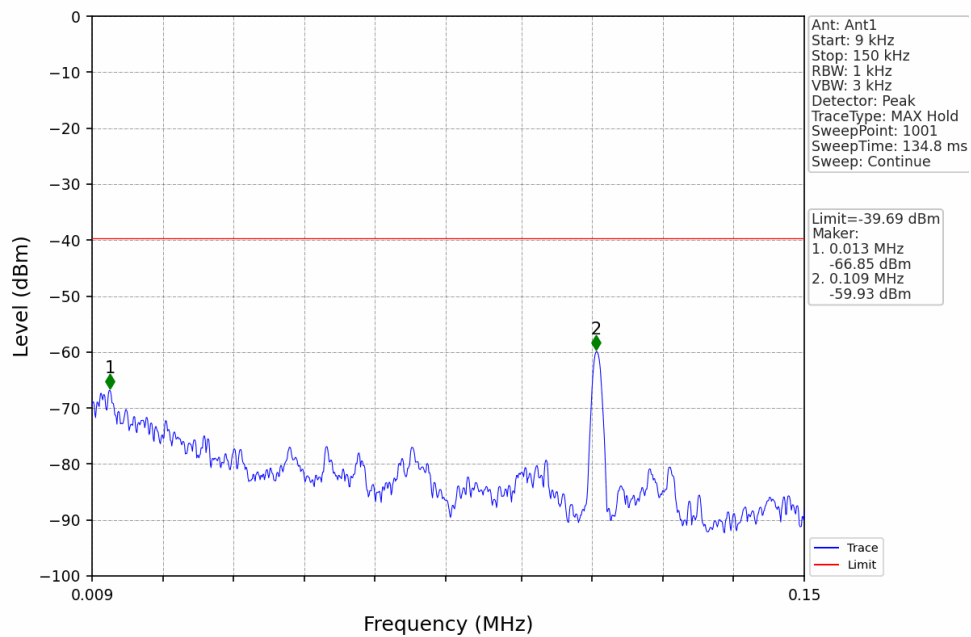


7.2.2 CSE

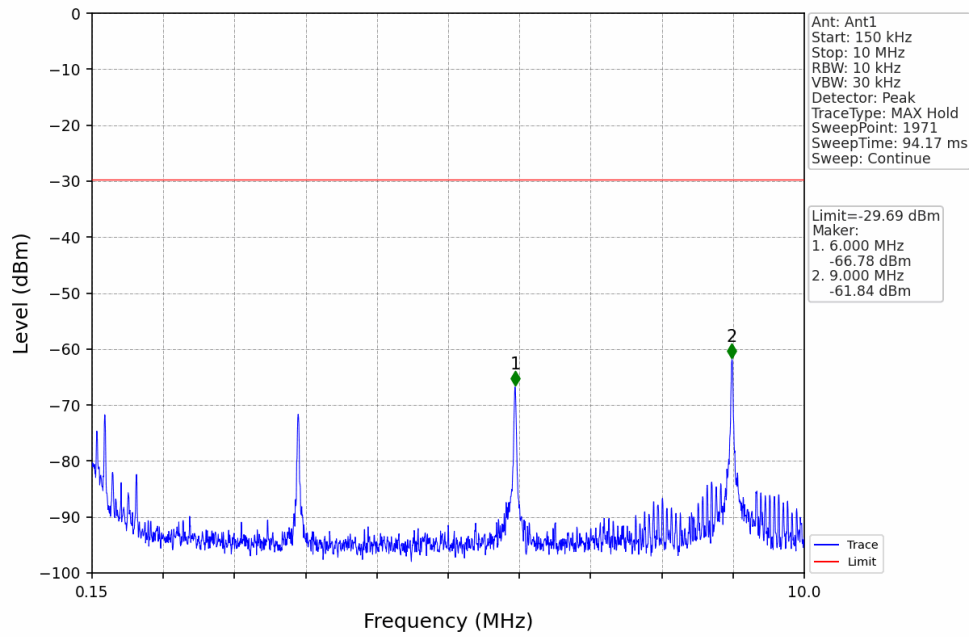
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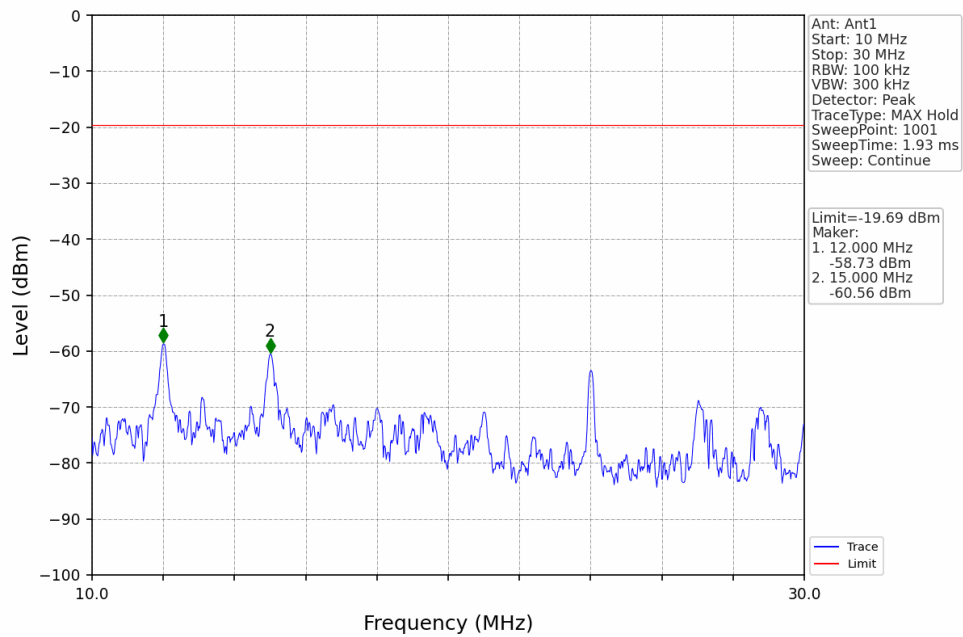
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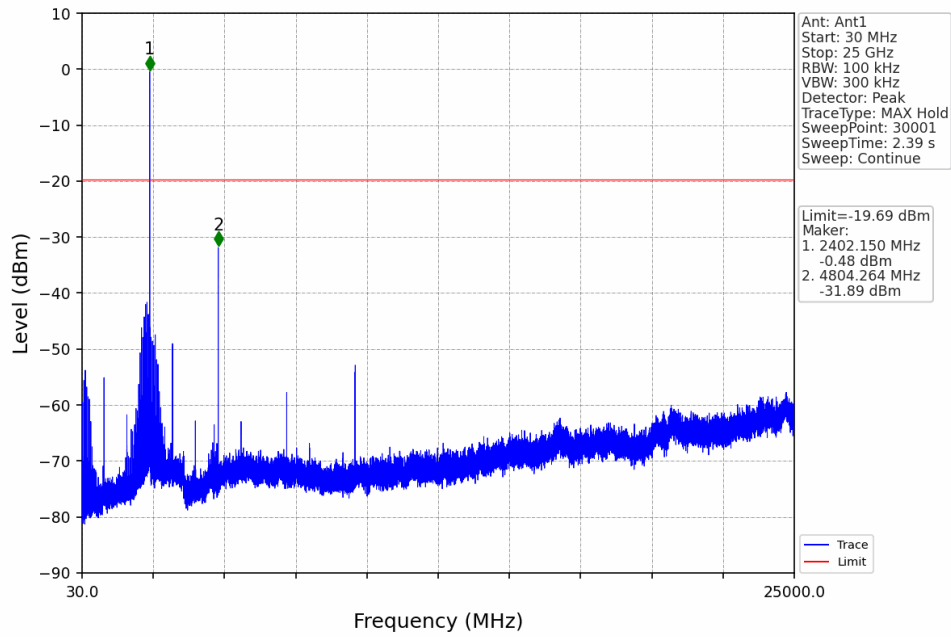
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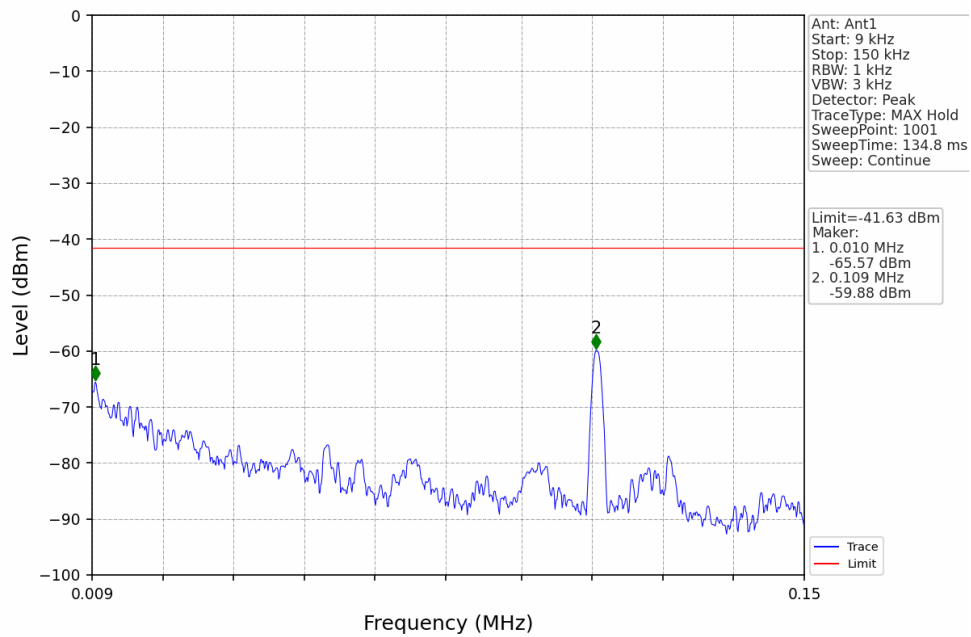
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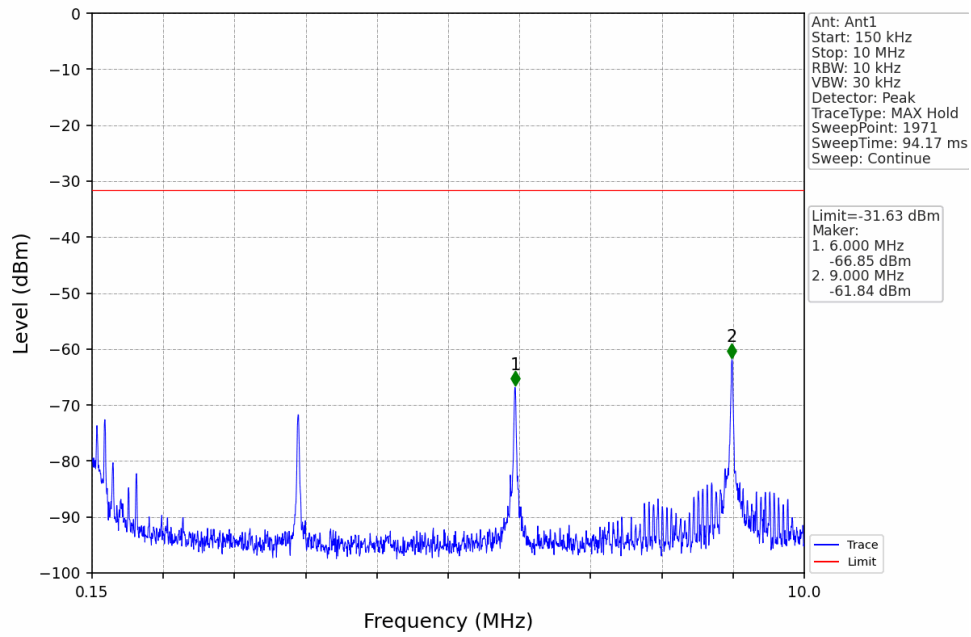
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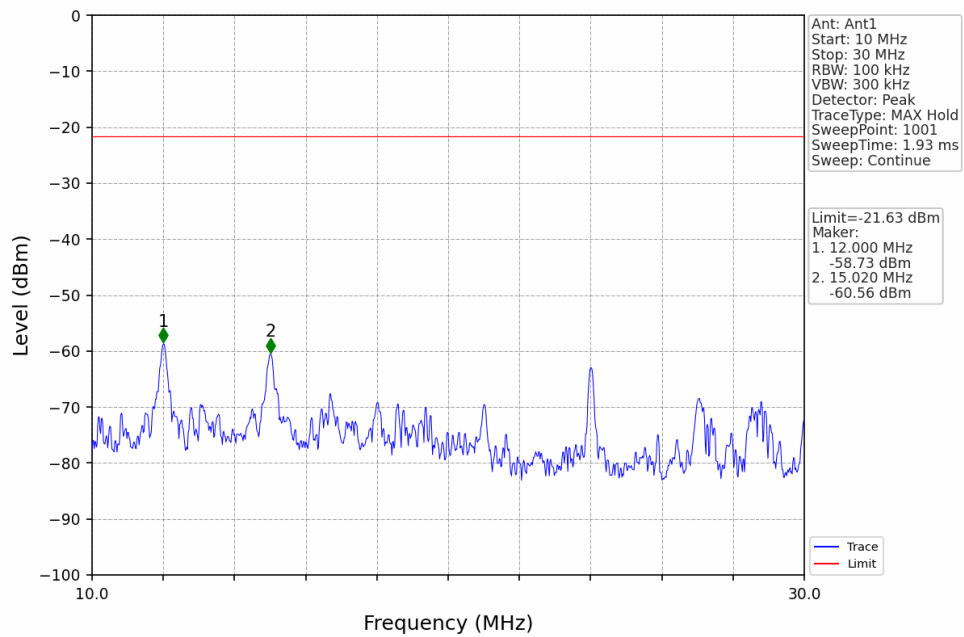
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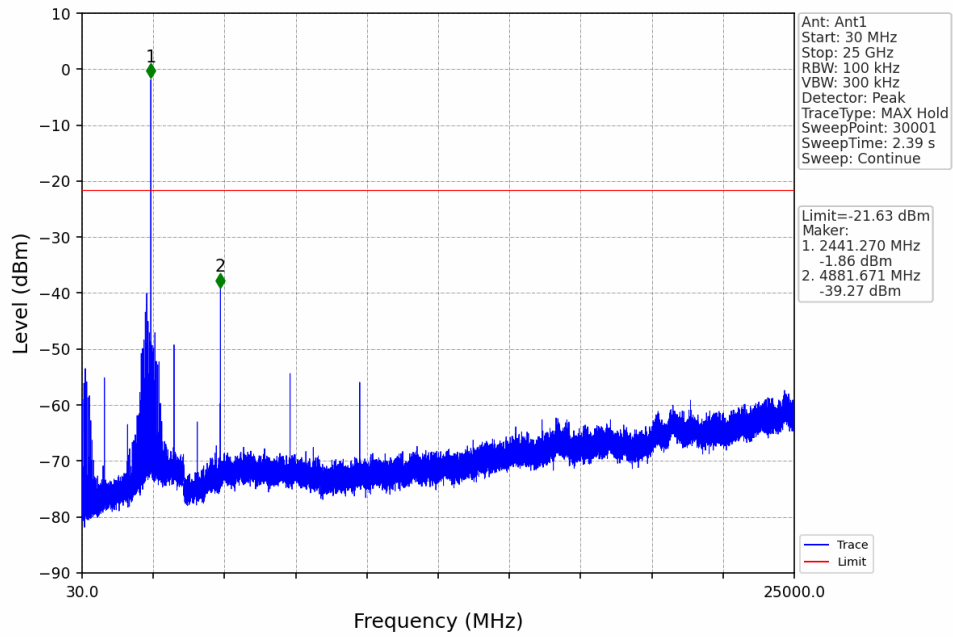
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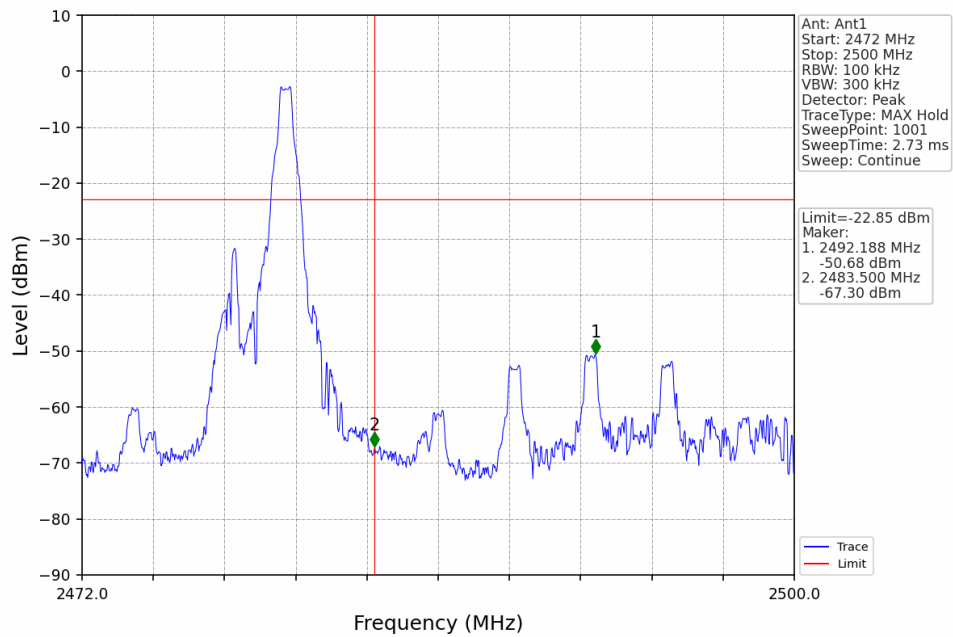
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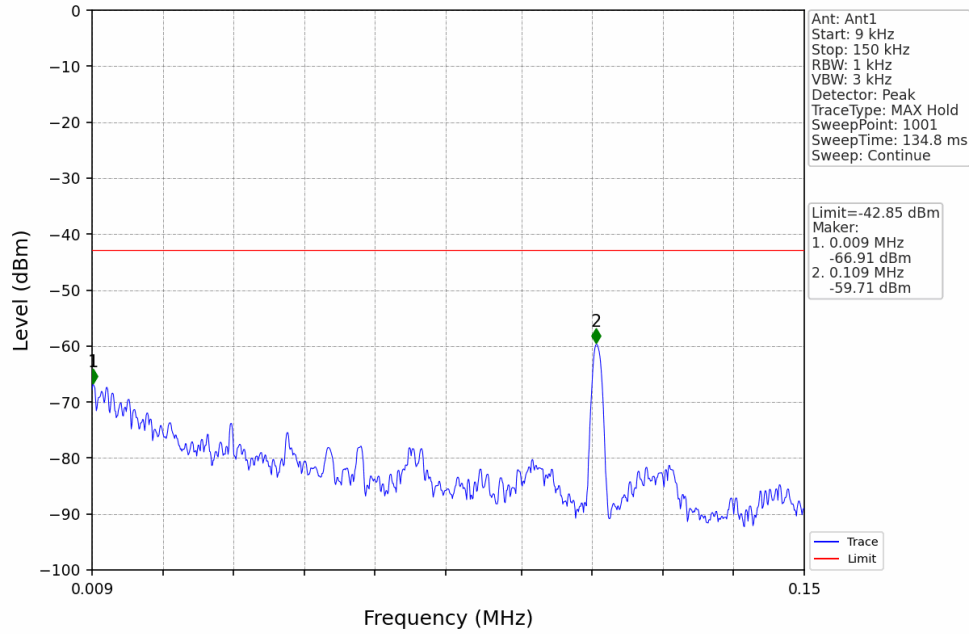
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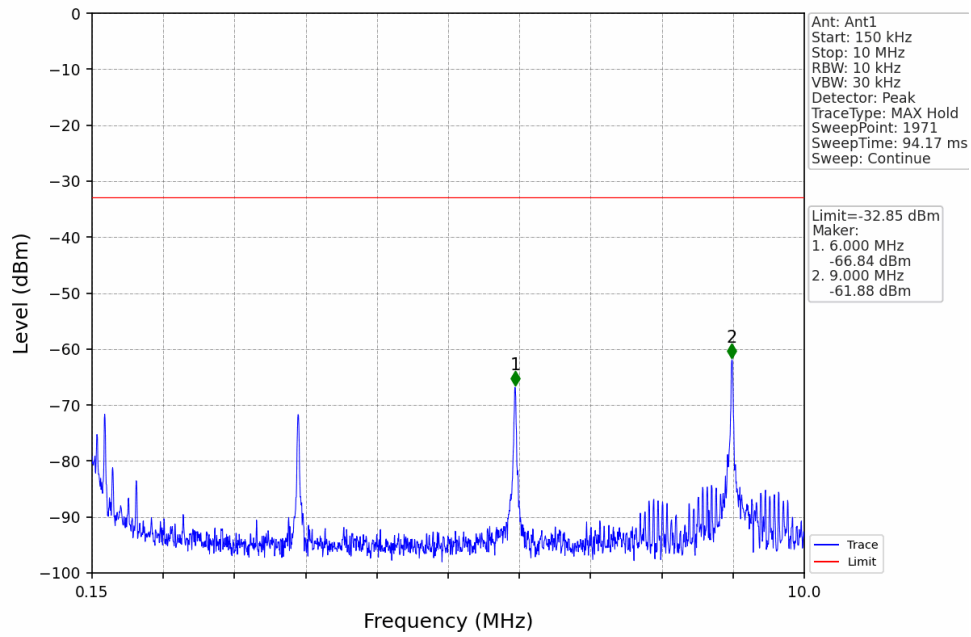
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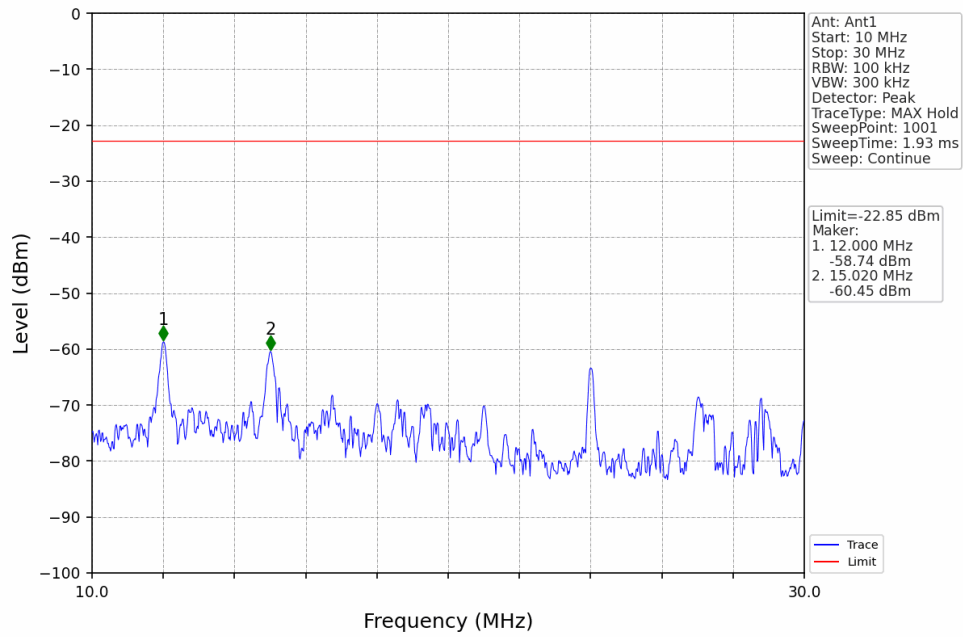
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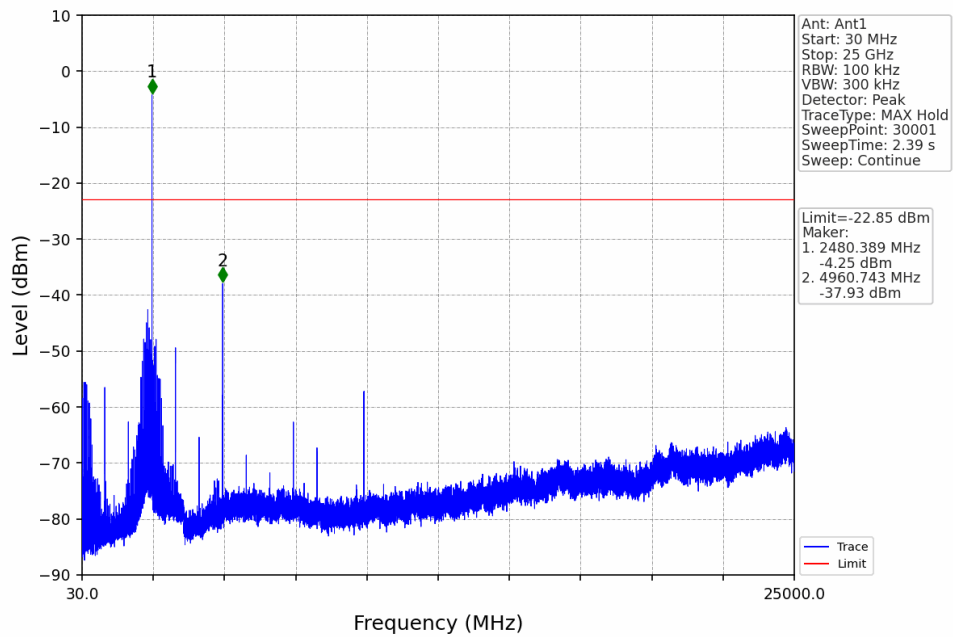
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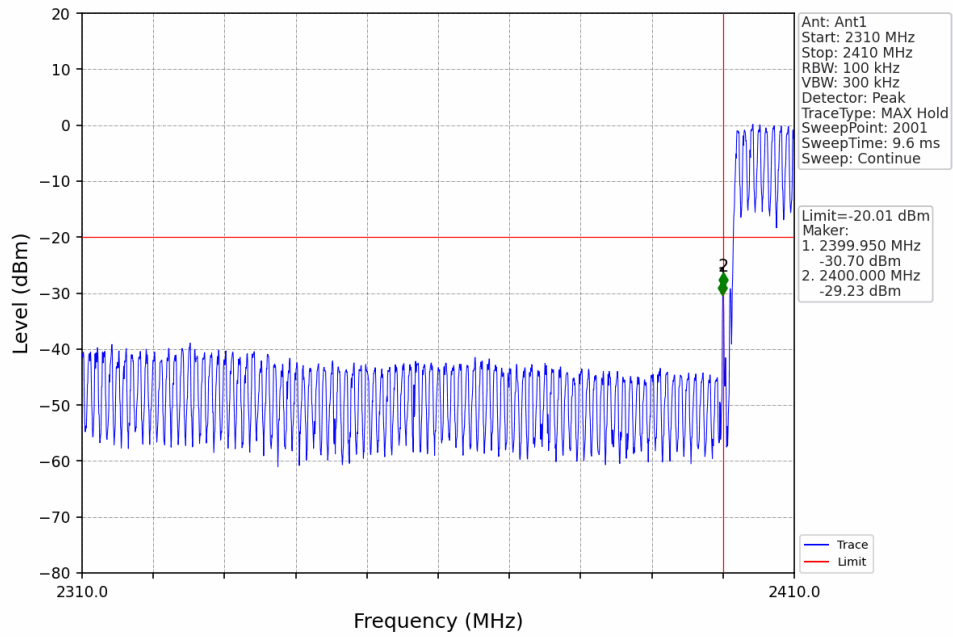
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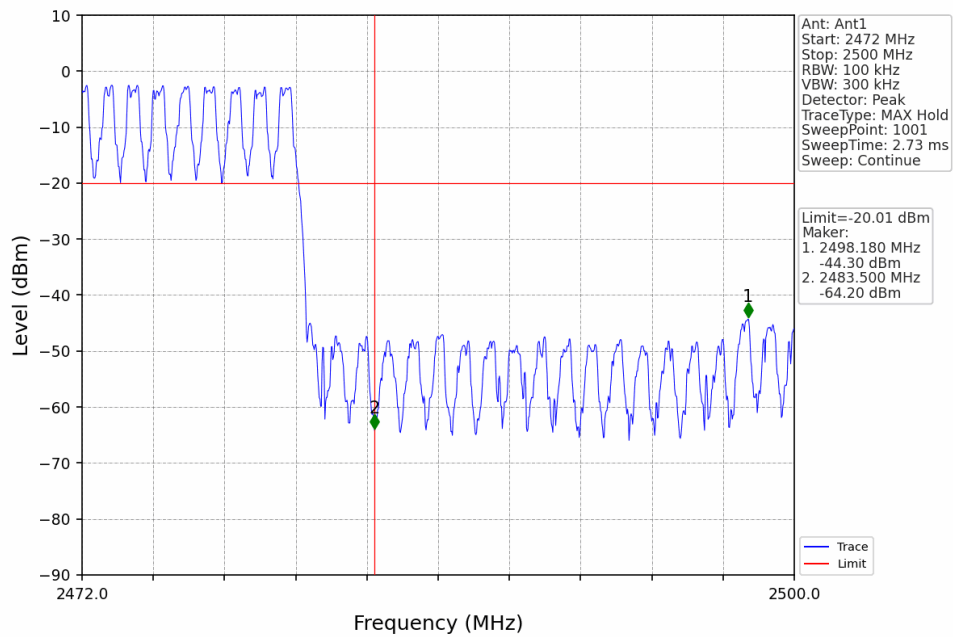
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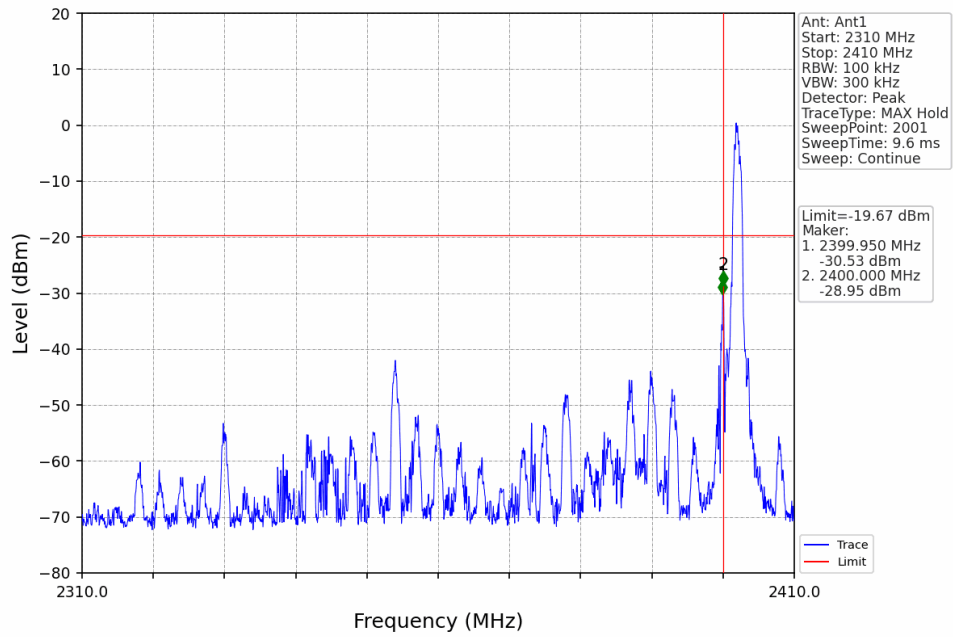
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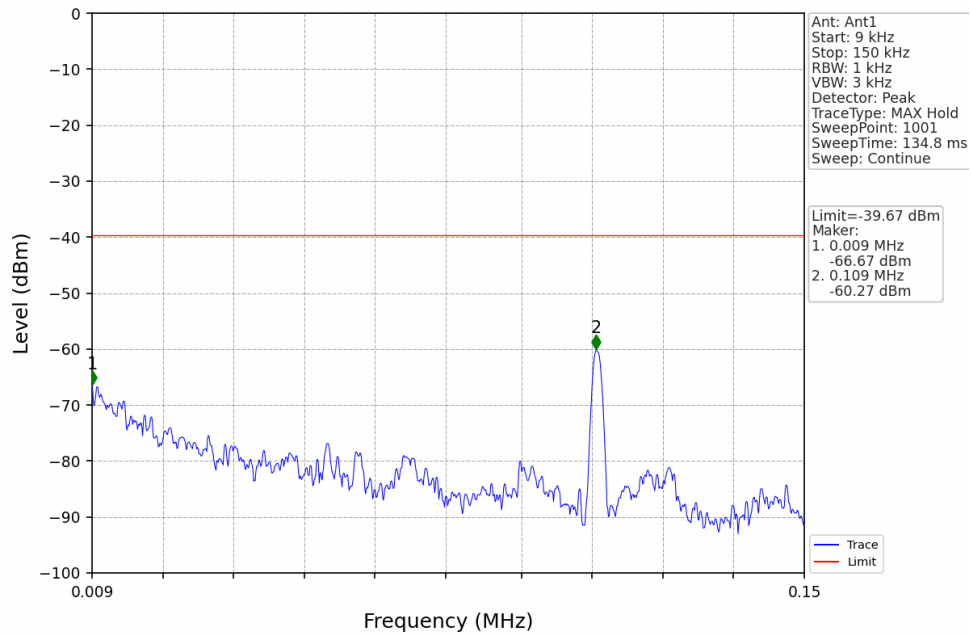
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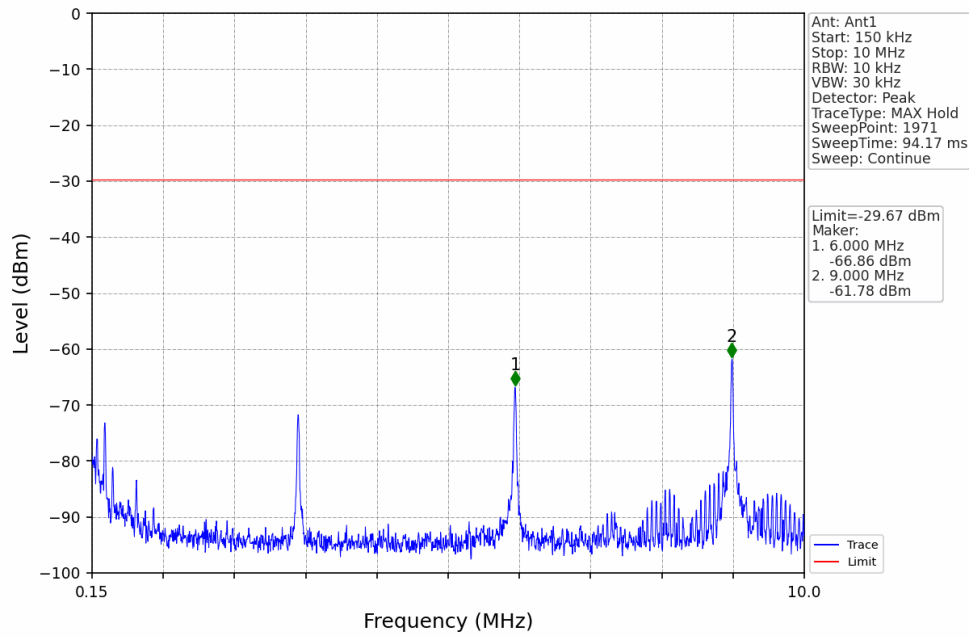
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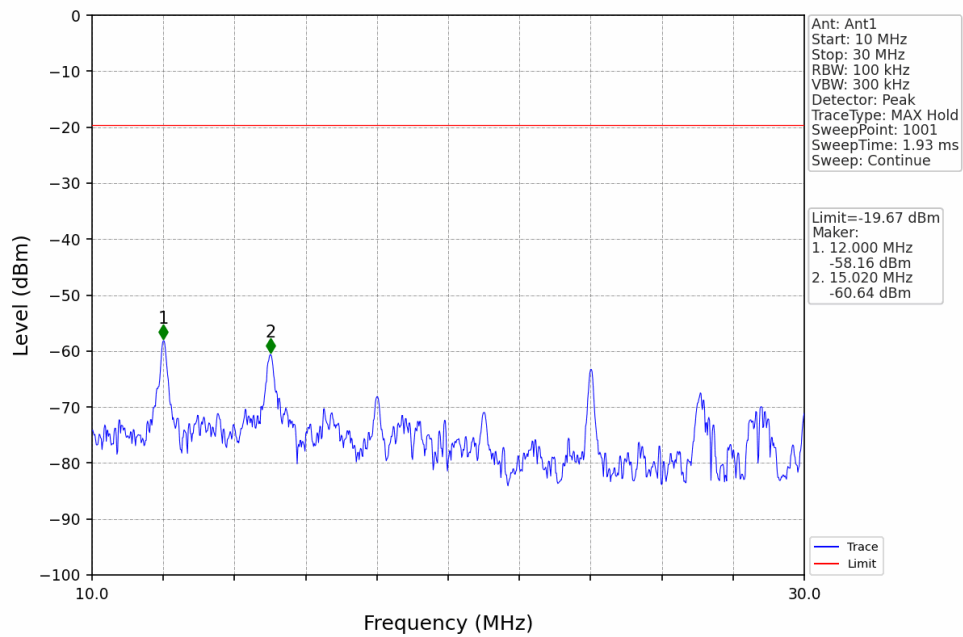
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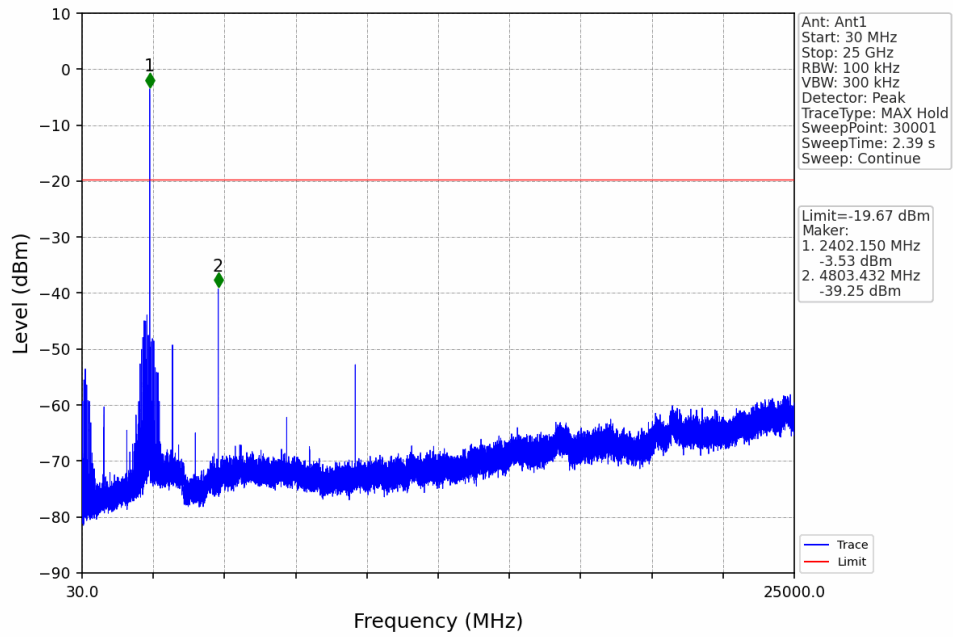
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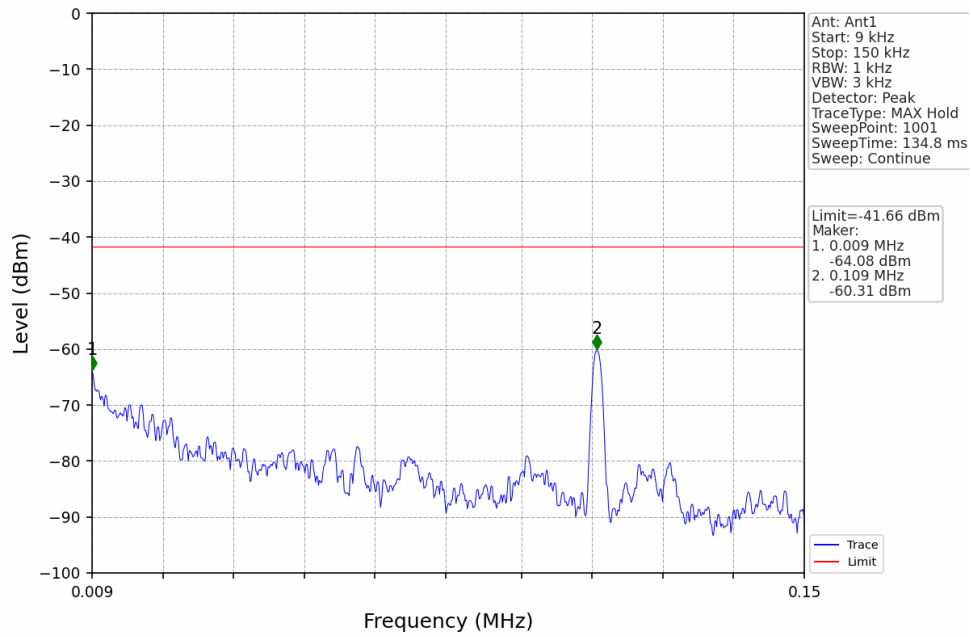
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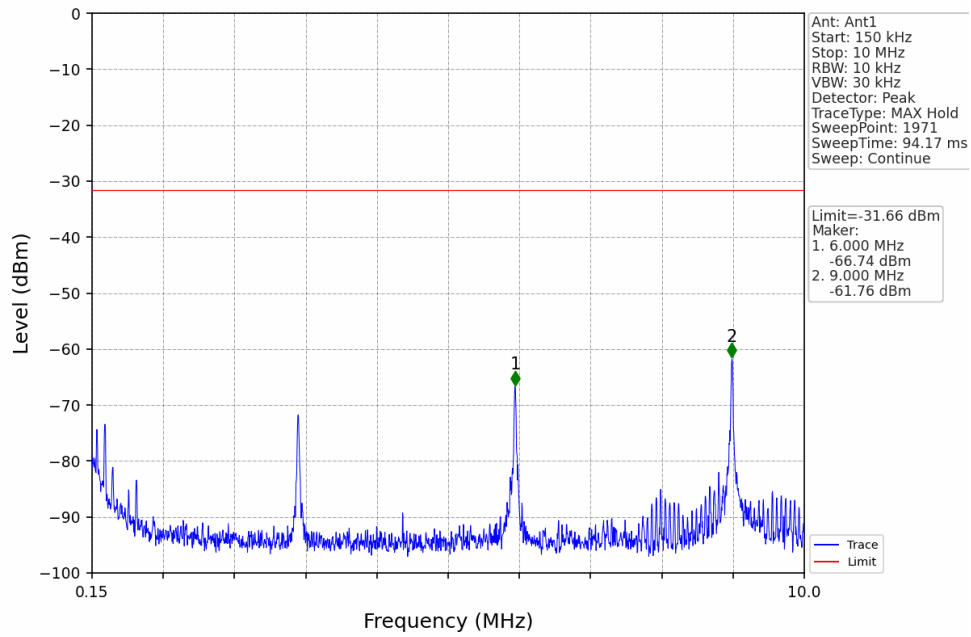
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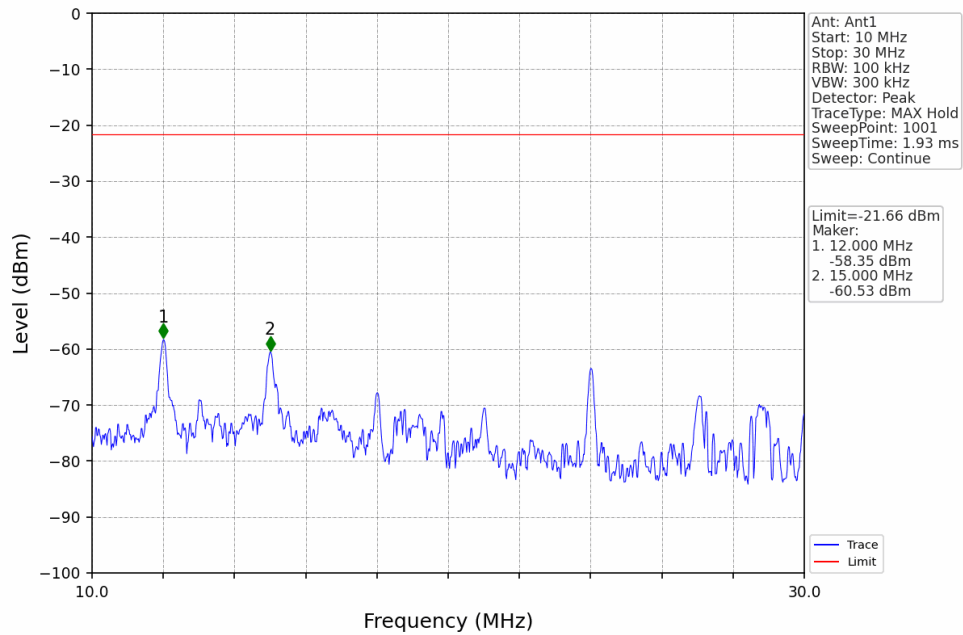
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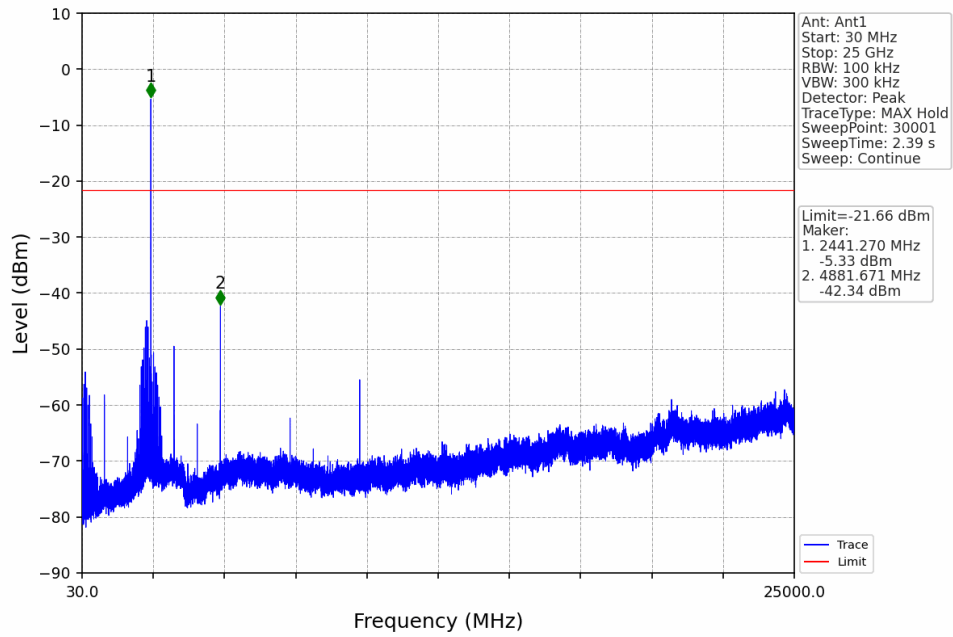
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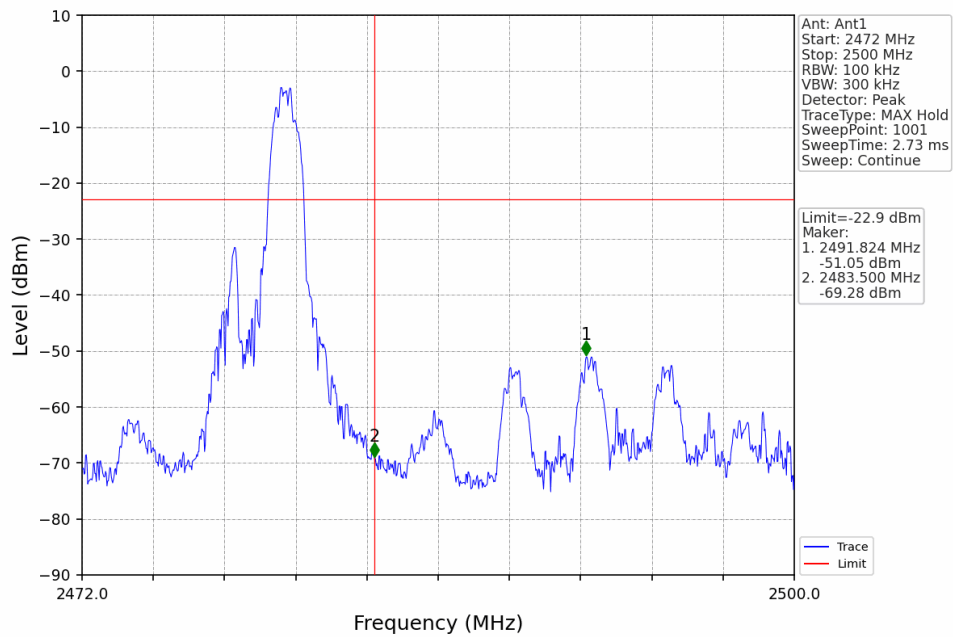
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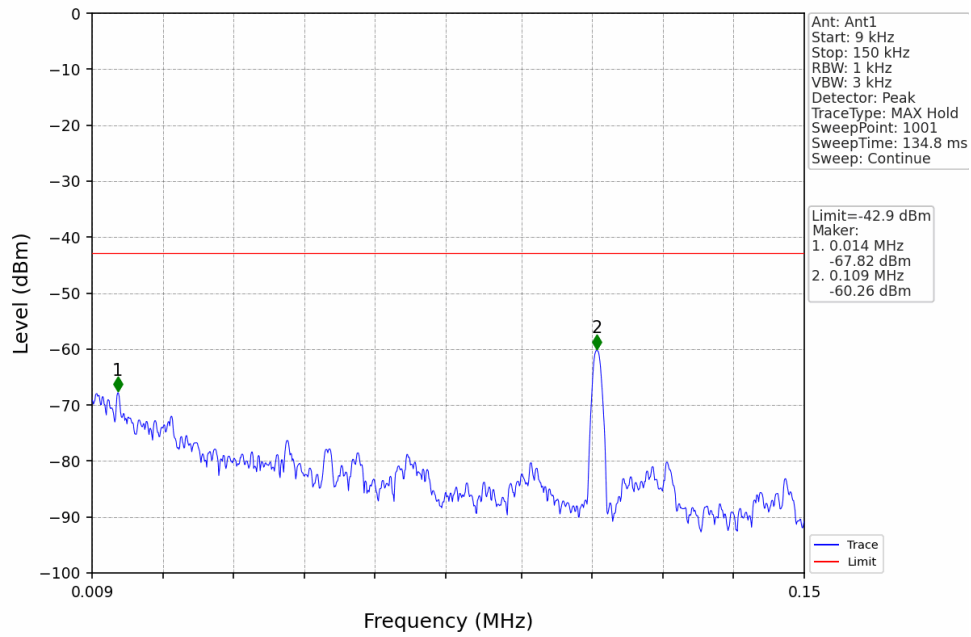
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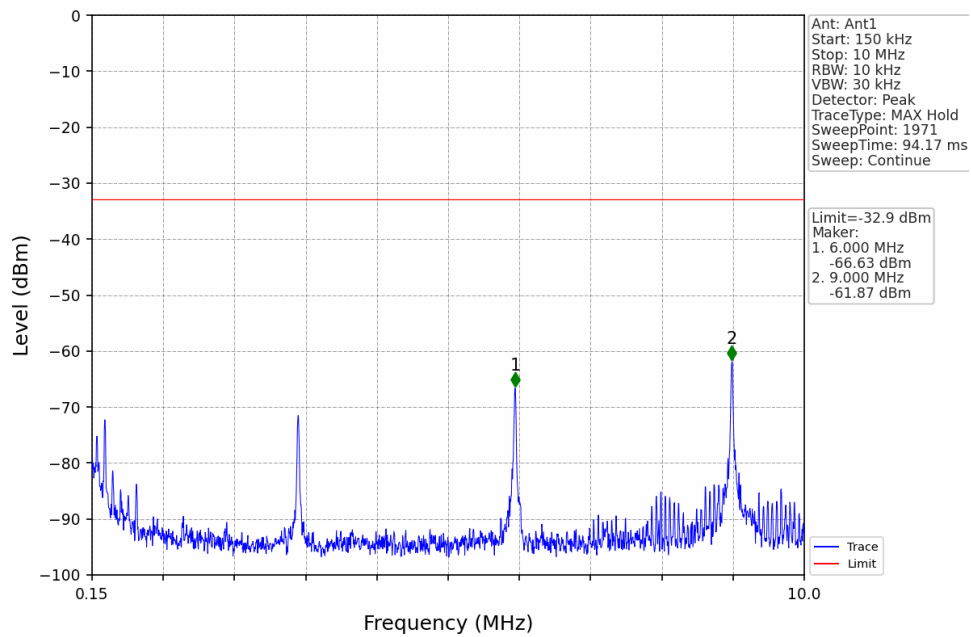
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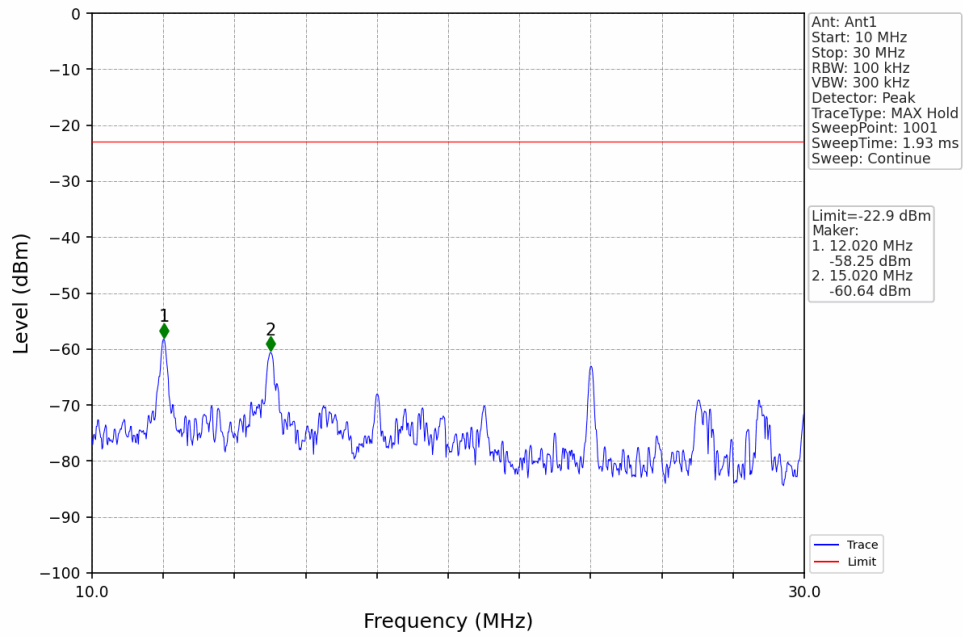
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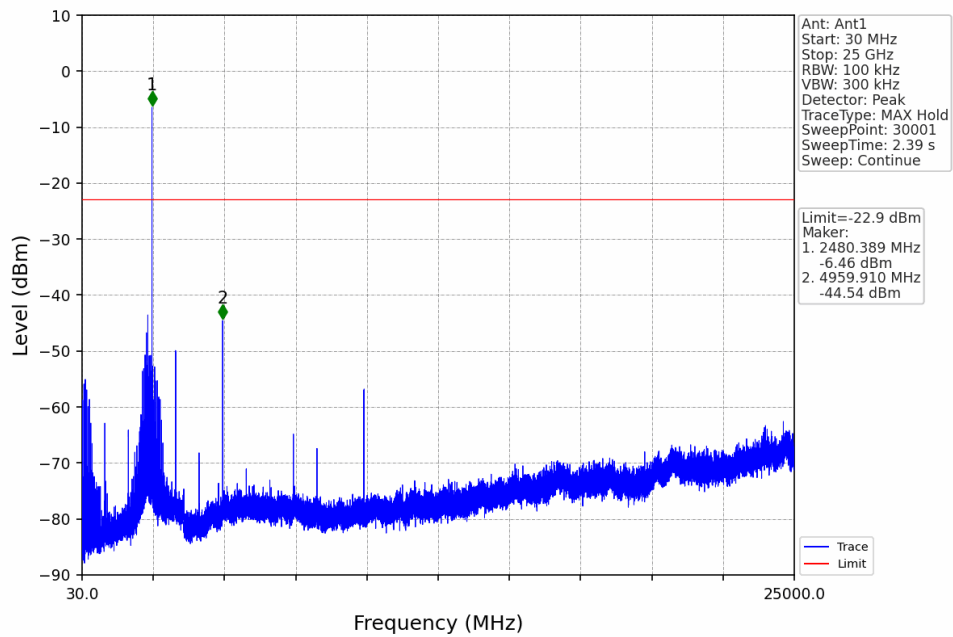
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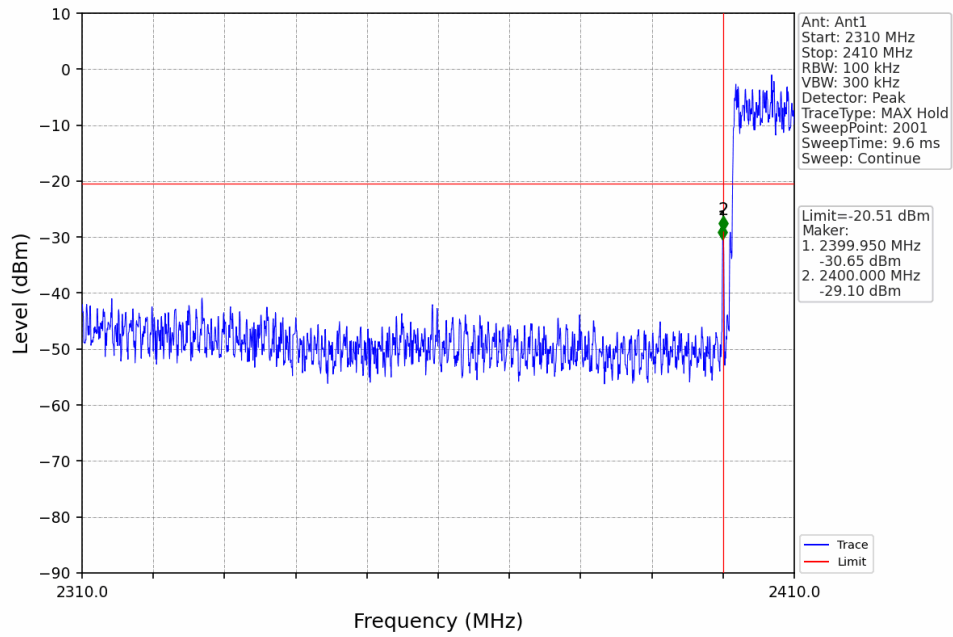
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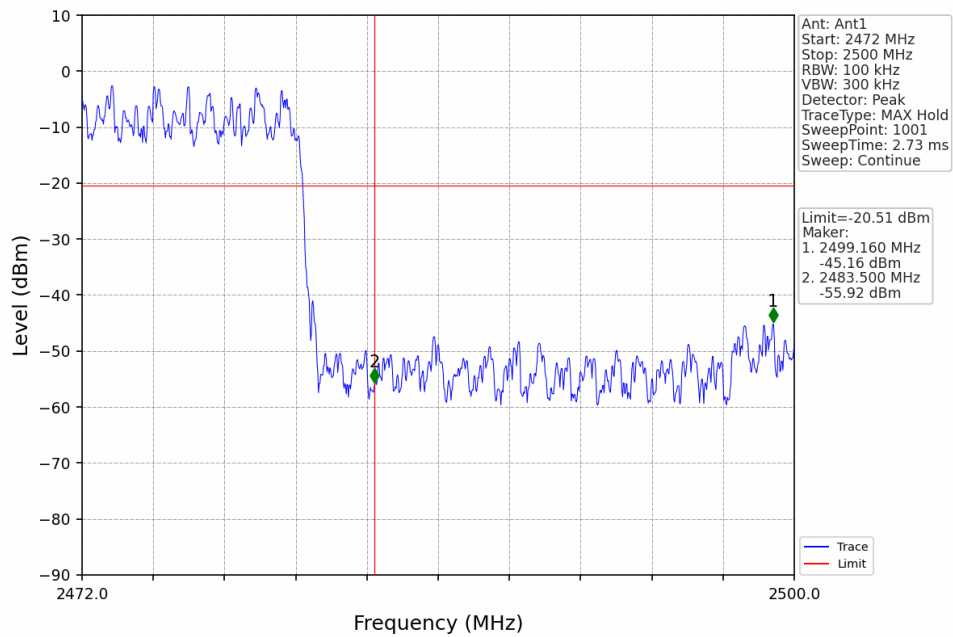
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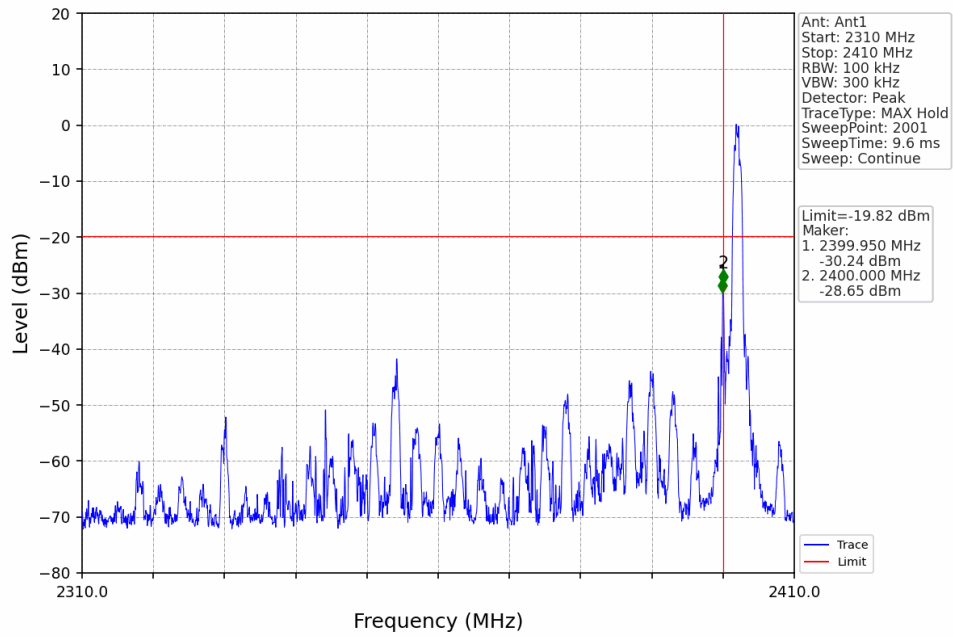
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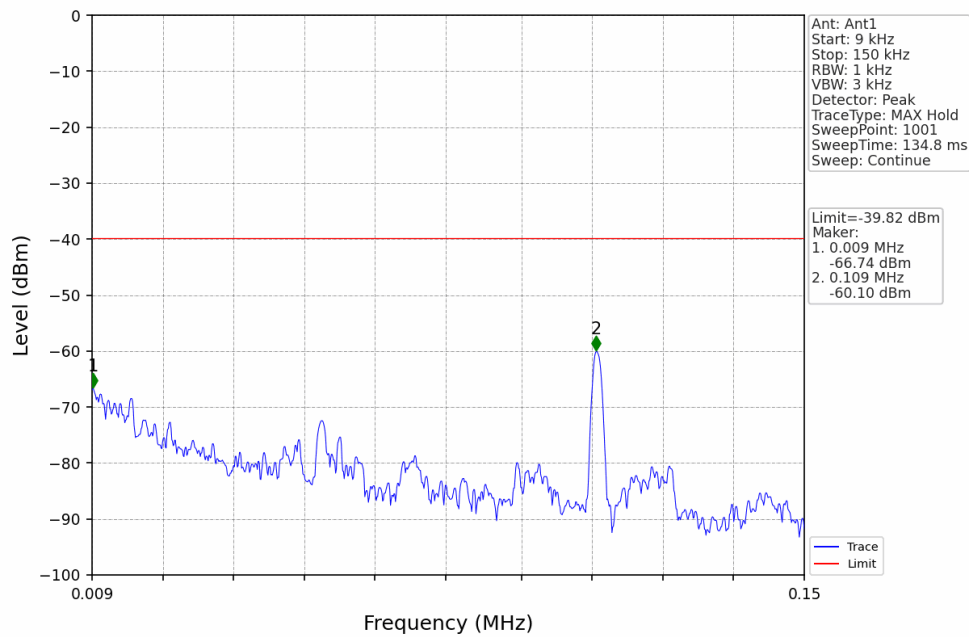
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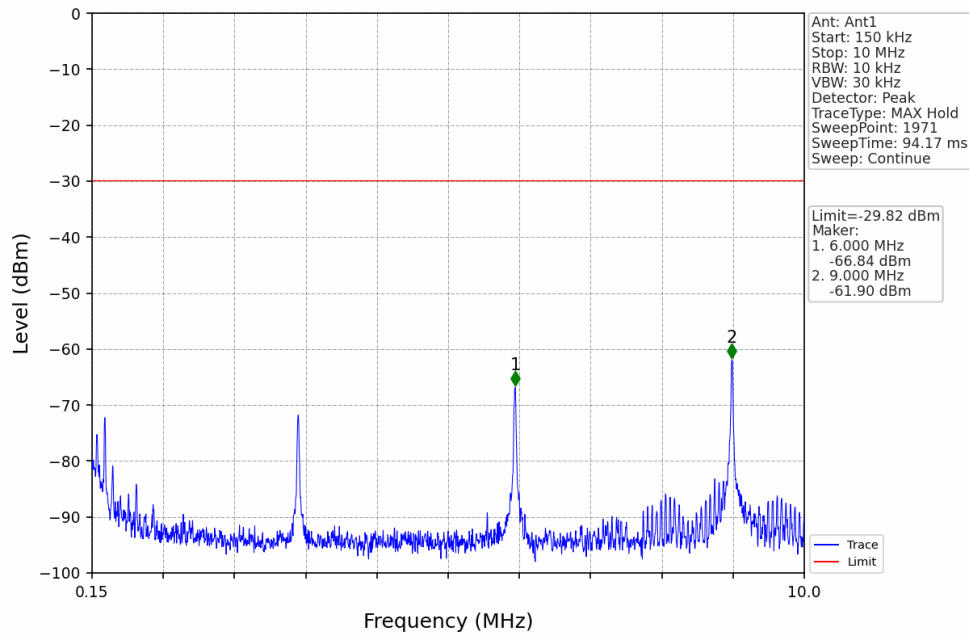
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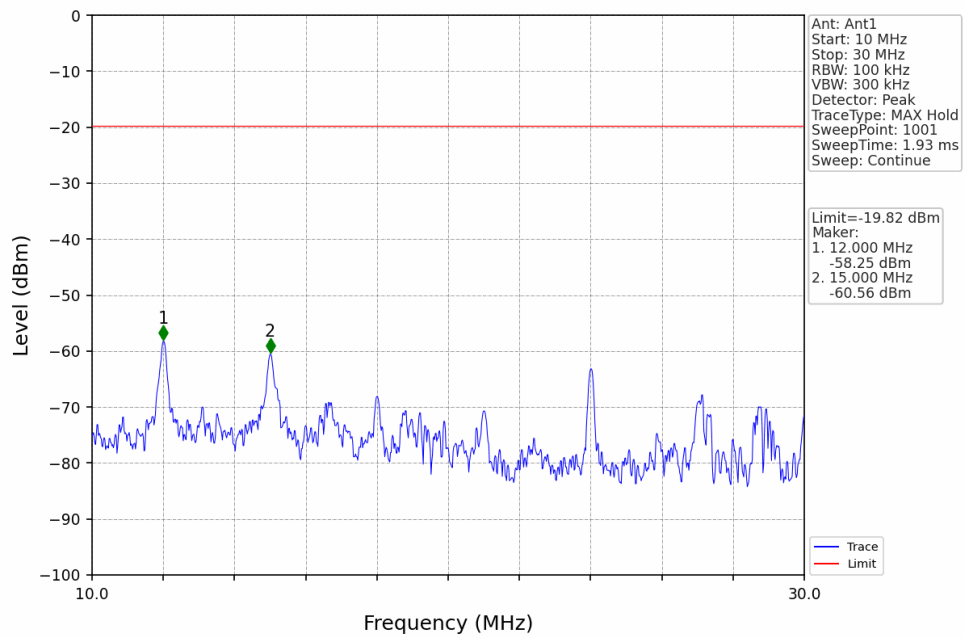
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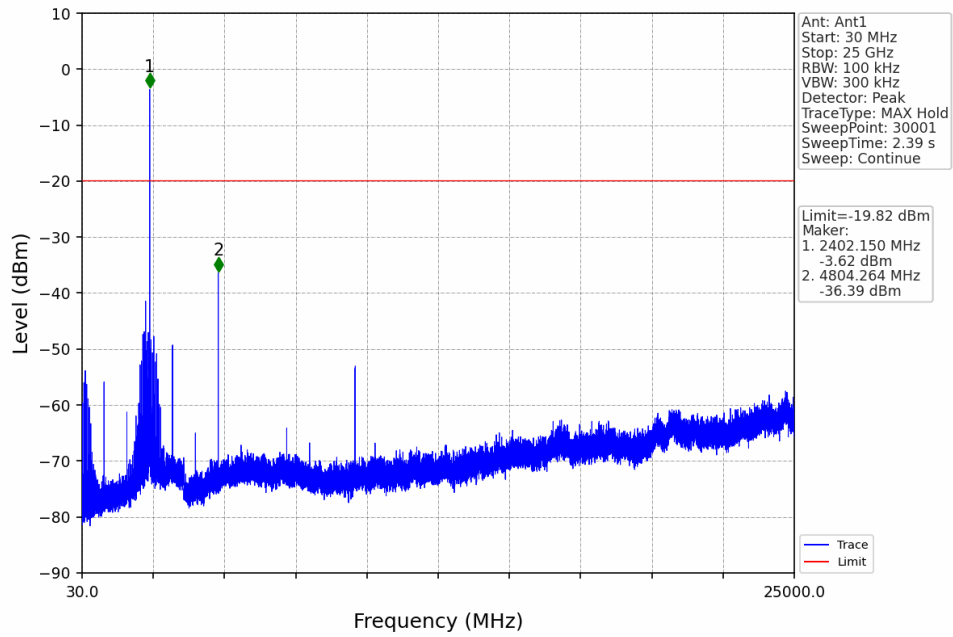
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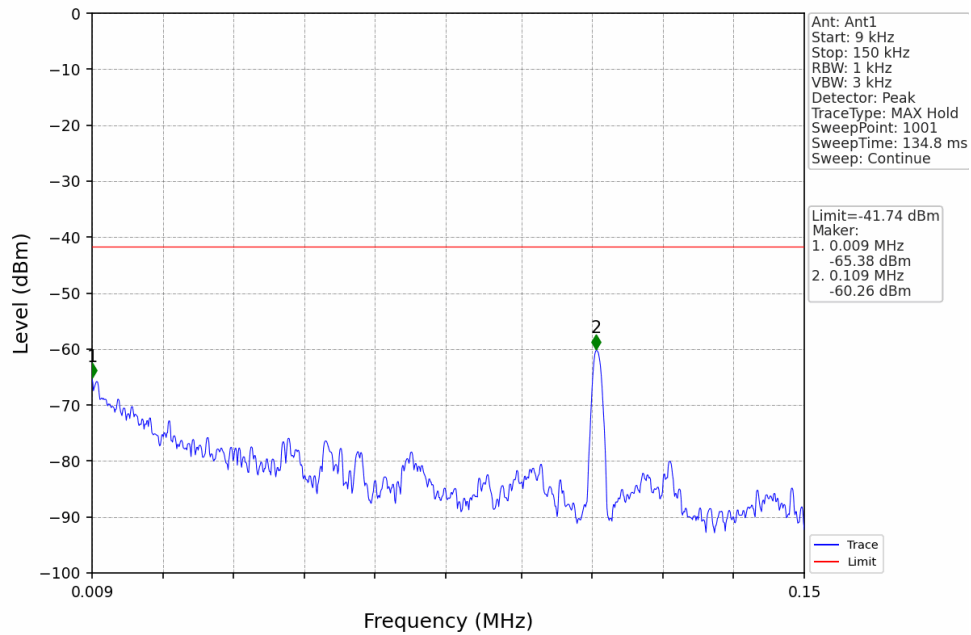
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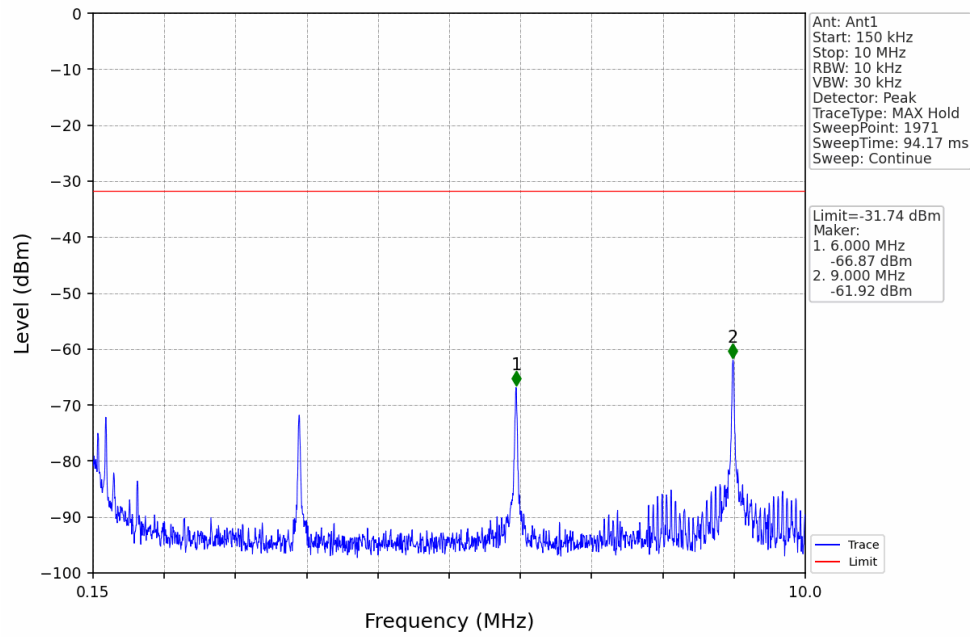
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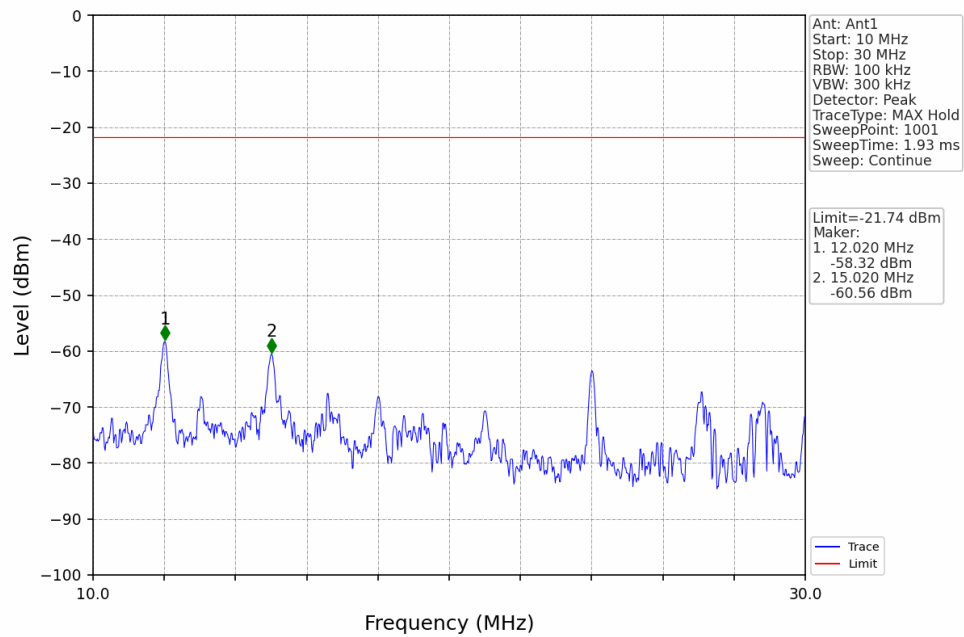
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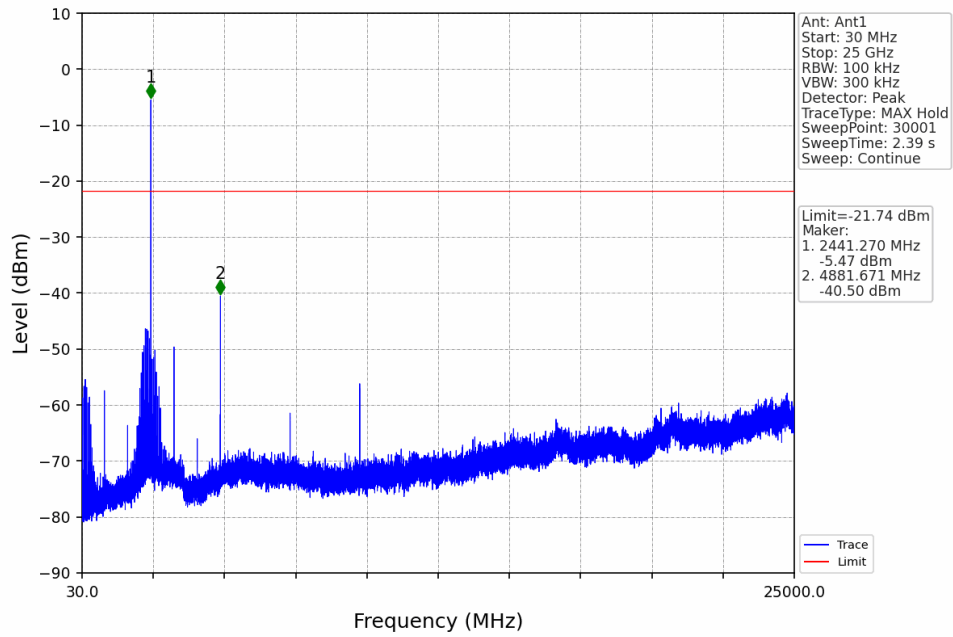
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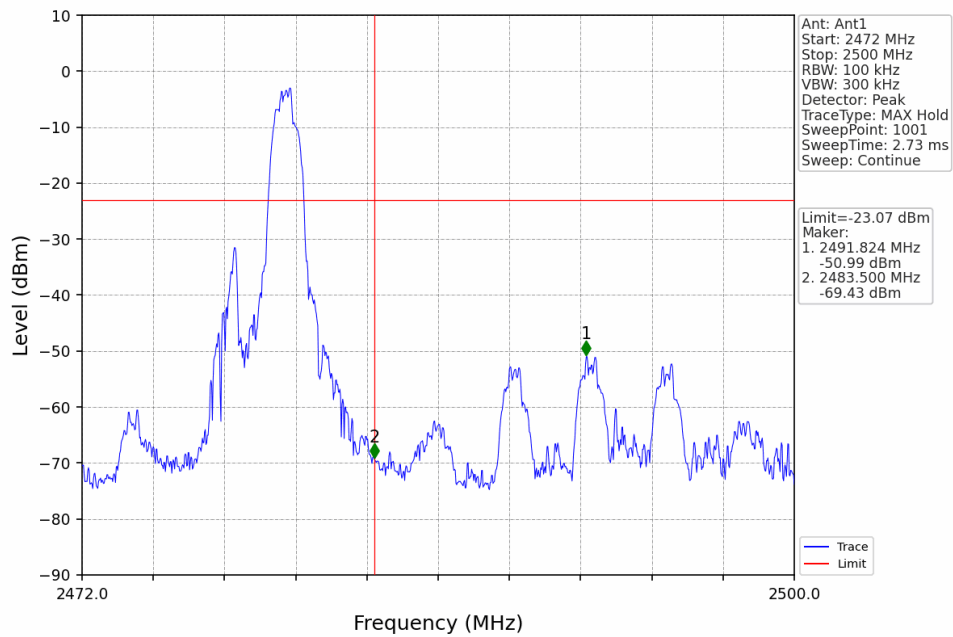
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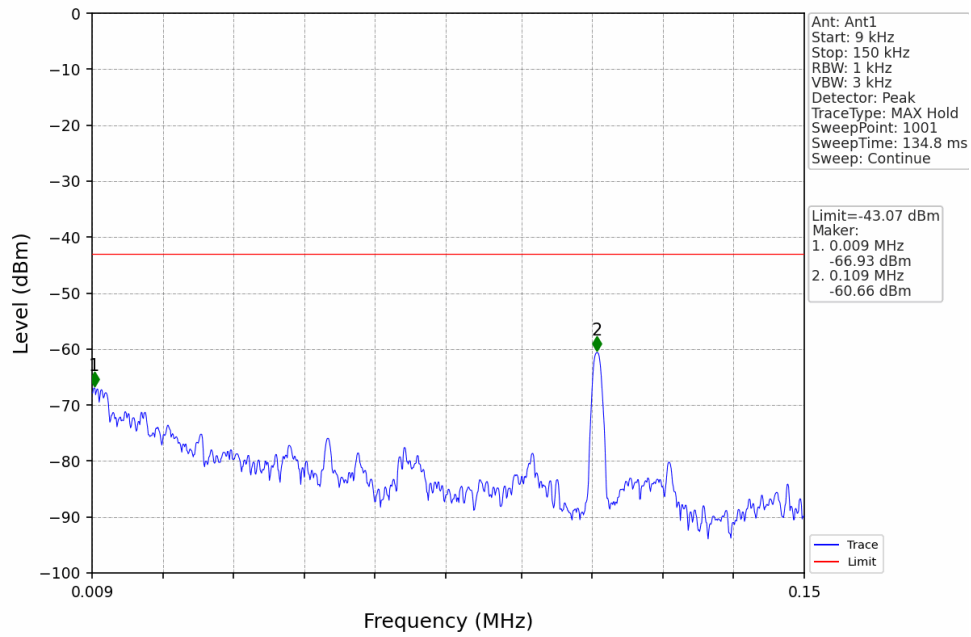
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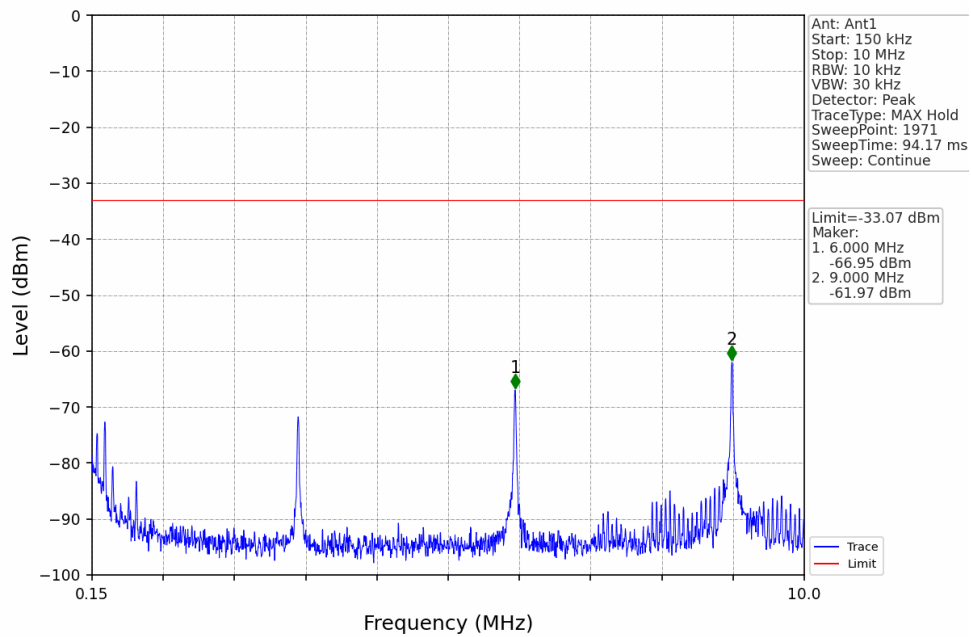
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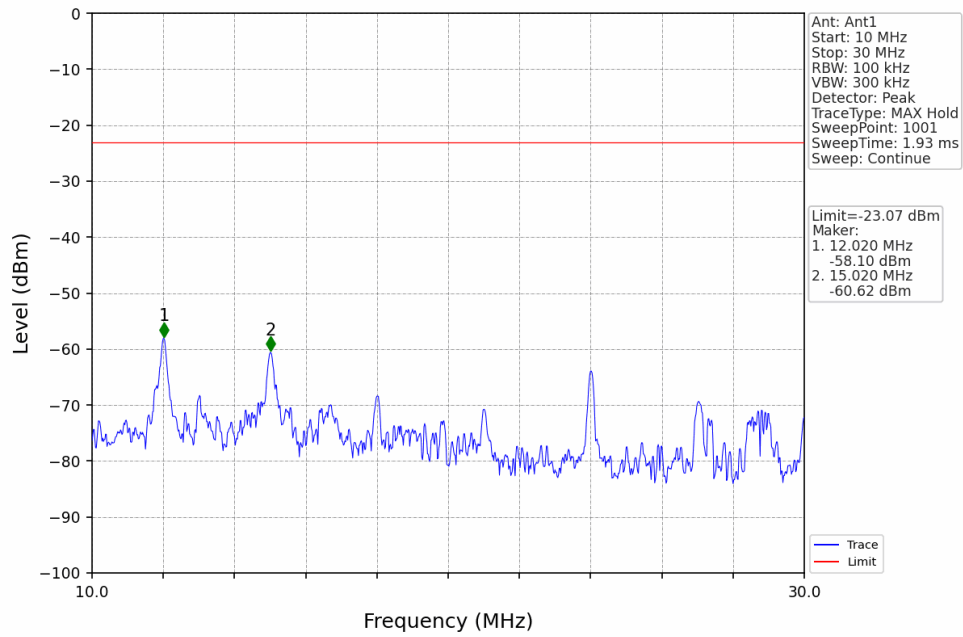
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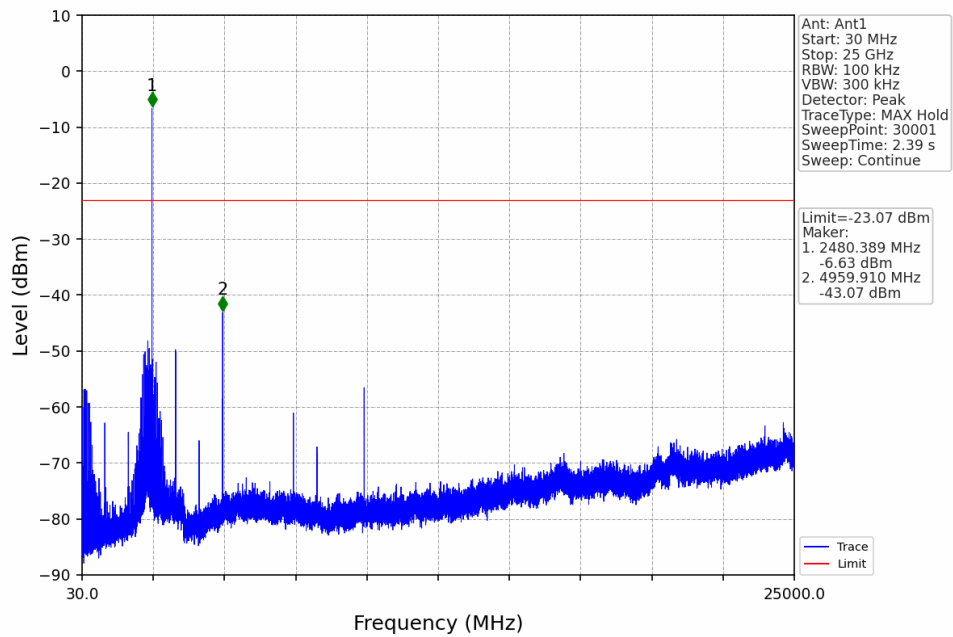
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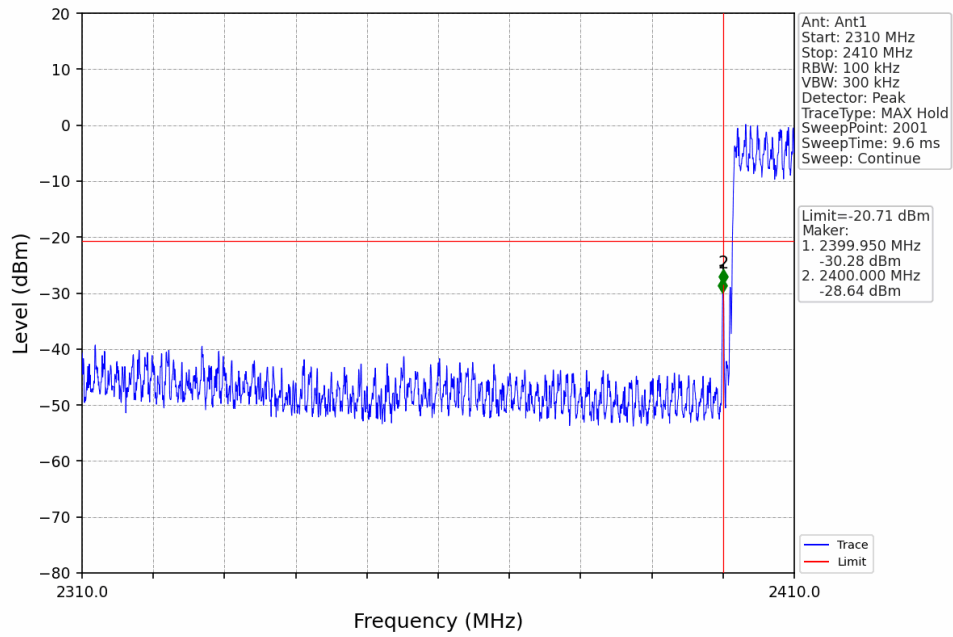
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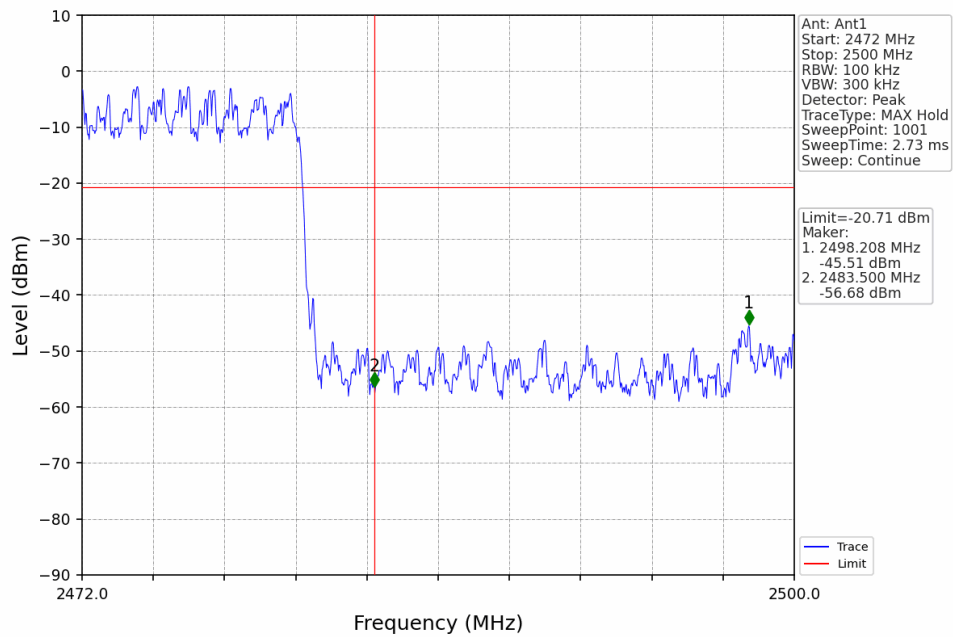
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8DPSK_3DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



8.Restrict-band Band-edge Test

8.1Test Result

Test Mode: GFSK					CH Low: 2402 MHz			
Pol.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type	Result
H	2310.00	44.92	-2.81	42.11	74.00	-31.89	PK	PASS
H	2390.00	49.12	-2.69	46.43	74.00	-27.57	PK	PASS
H	**2400.00	64.96	-2.68	62.28	74.00	-11.72	PK	PASS
V	2310.00	46.49	-2.81	43.68	74.00	-30.32	PK	PASS
V	2390.00	47.79	-2.69	45.10	74.00	-28.90	PK	PASS
V	**2400.00	63.73	-2.68	61.05	74.00	-12.95	PK	PASS
H	2310.00	33.27	-2.81	30.46	54.00	-23.54	AV	PASS
H	2390.00	35.86	-2.69	33.17	54.00	-20.83	AV	PASS
H	**2400.00	47.58	-2.68	44.90	54.00	-9.10	AV	PASS
V	2310.00	32.62	-2.81	29.81	54.00	-24.19	AV	PASS
V	2390.00	36.11	-2.69	33.42	54.00	-20.58	AV	PASS
V	**2400.00	50.59	-2.68	47.91	54.00	-6.09	AV	PASS

Test Mode: GFSK					CH High: 2480 MHz			
Pol.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type	Result
H	**2483.50	48.19	-2.56	45.63	74.00	-28.37	PK	PASS
H	2500.00	50.28	-2.54	47.74	74.00	-26.26	PK	PASS
V	**2483.50	47.29	-2.56	44.73	74.00	-29.27	PK	PASS
V	2500.00	52.24	-2.54	49.70	74.00	-24.30	PK	PASS
H	**2483.50	37.77	-2.56	35.21	54.00	-18.79	AV	PASS
H	2500.00	39.22	-2.54	36.68	54.00	-17.32	AV	PASS
V	**2483.50	39.89	-2.56	37.33	54.00	-16.67	AV	PASS
V	2500.00	39.49	-2.54	36.95	54.00	-17.05	AV	PASS

Remark:

1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.

.....End.....