



Annex for BT

Test Report No.: CTL2410242082-WF01

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FCCID: 2A8SL-T13L

1. Bandwidth

1.1 Test Result

1.1.1 OBW

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.892	/	Pass
		2441	DH5	1	0.891	/	Pass
		2480	DH5	1	0.890	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.177	/	Pass
		2441	2DH5	1	1.173	/	Pass
		2480	2DH5	1	1.173	/	Pass
8DPSK	SISO	2402	3DH5	1	0.892	/	Pass
		2441	3DH5	1	0.894	/	Pass
		2480	3DH5	1	0.896	/	Pass

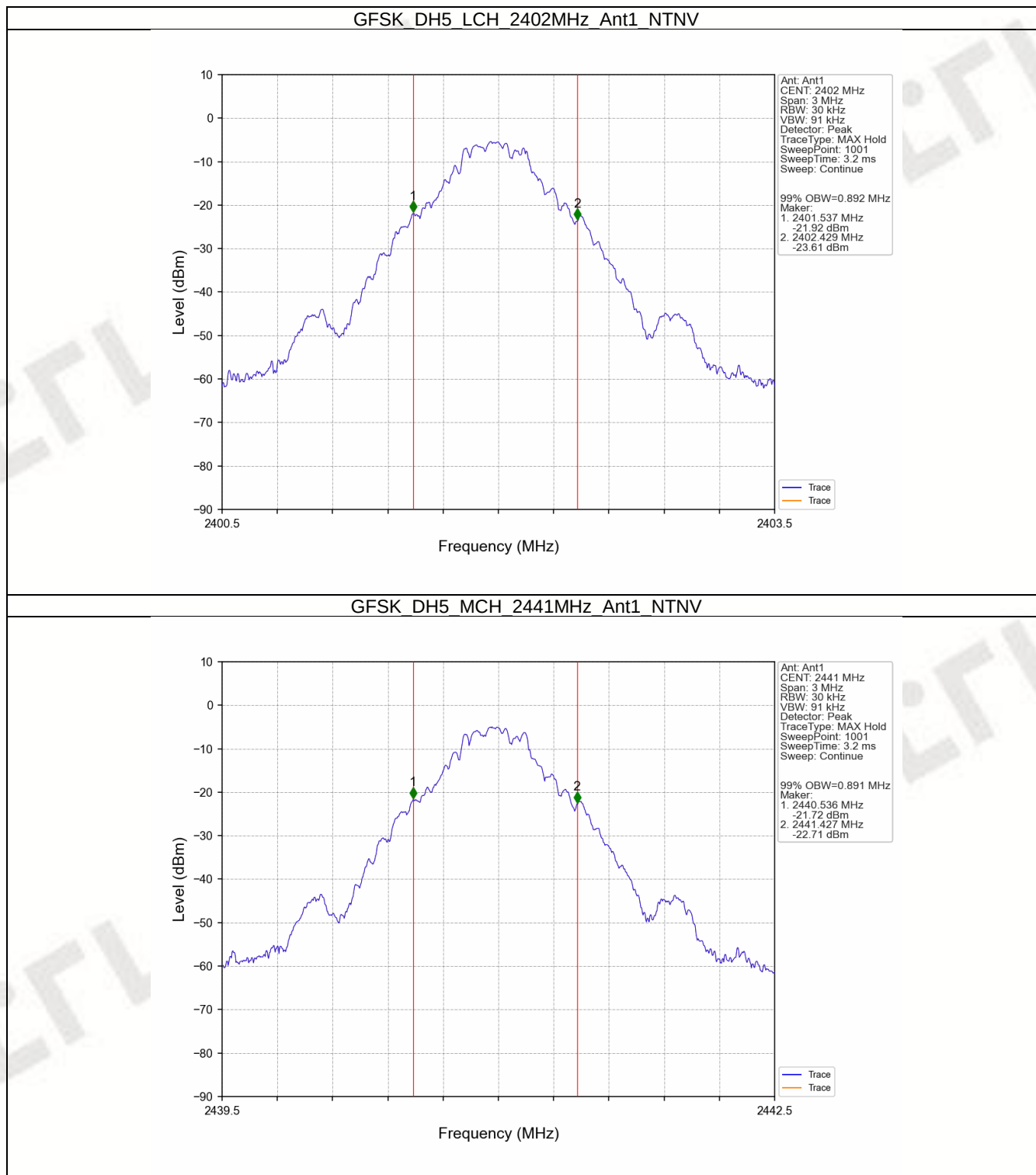
1.1.2 20dB BW

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	1.021	/	Pass
		2441	DH5	1	1.020	/	Pass
		2480	DH5	1	1.012	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.311	/	Pass
		2441	2DH5	1	1.289	/	Pass
		2480	2DH5	1	1.294	/	Pass
8DPSK	SISO	2402	3DH5	1	1.035	/	Pass
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		2480	3DH5	1	1.031	/	Pass

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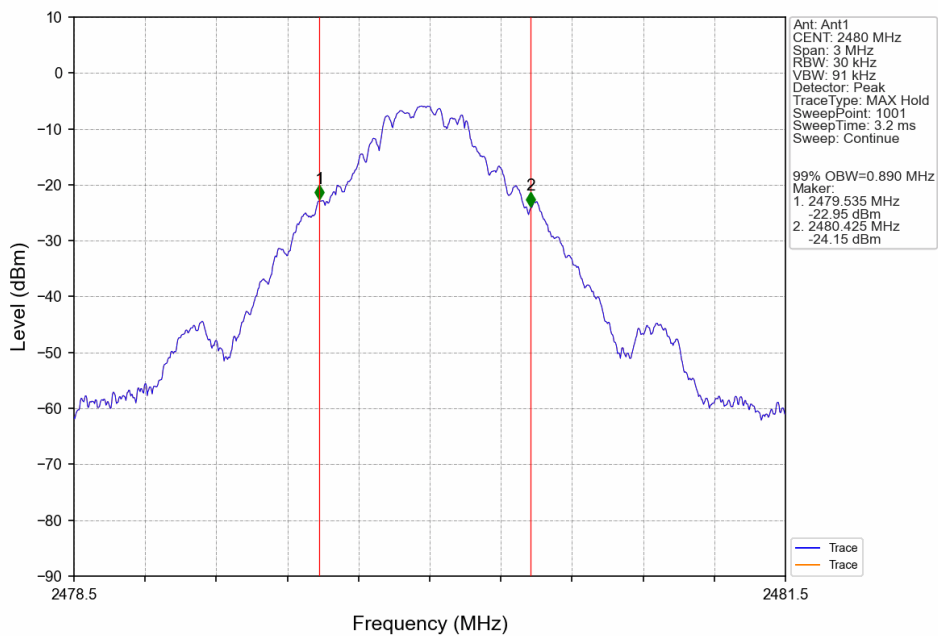
1.2 Test Graph

1.2.1 OBW

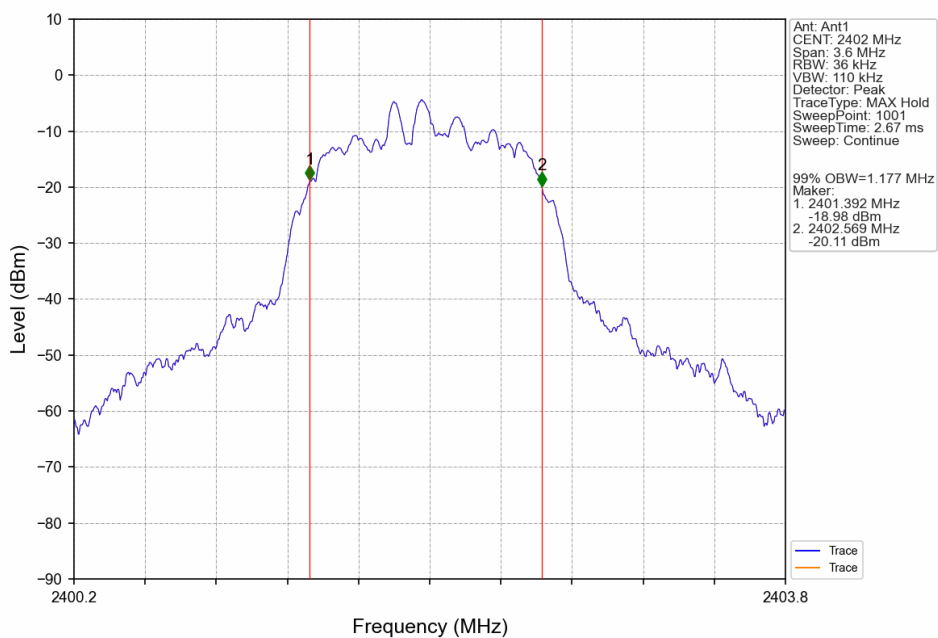


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GFSK DH5 HCH 2480MHz Ant1 NTNV

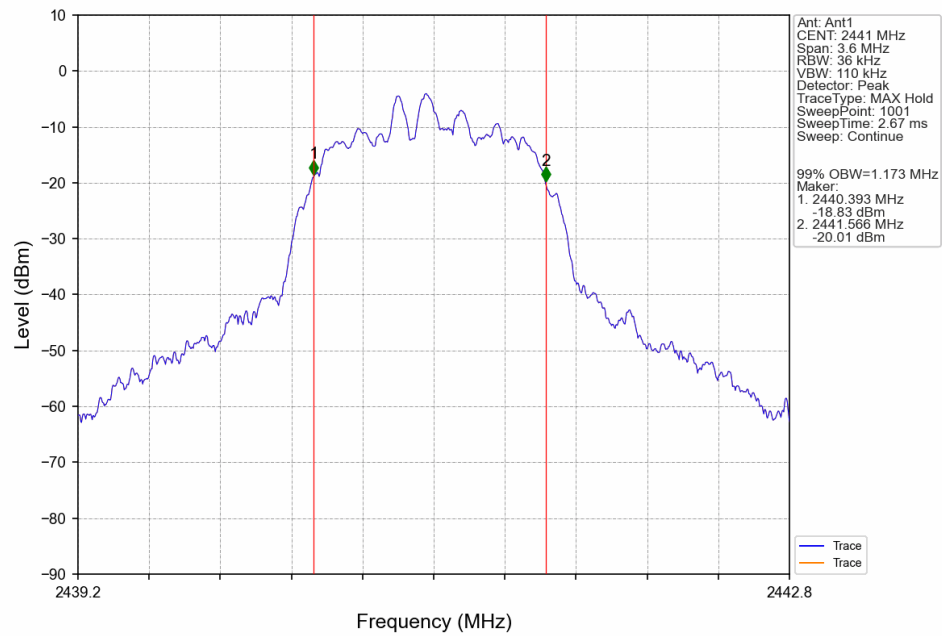


Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTNV

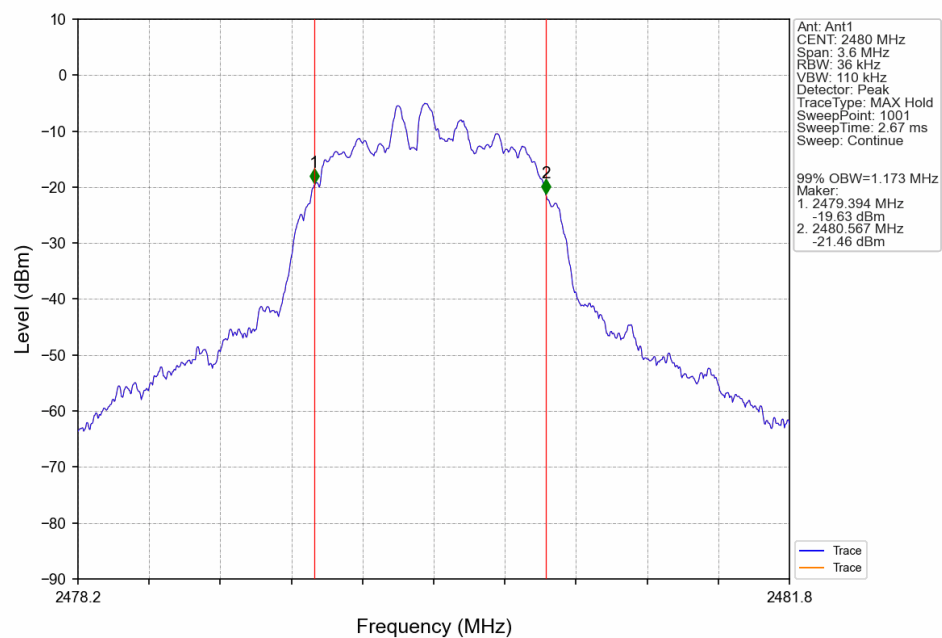


FCCID: 2A8SL-T13L

Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTN

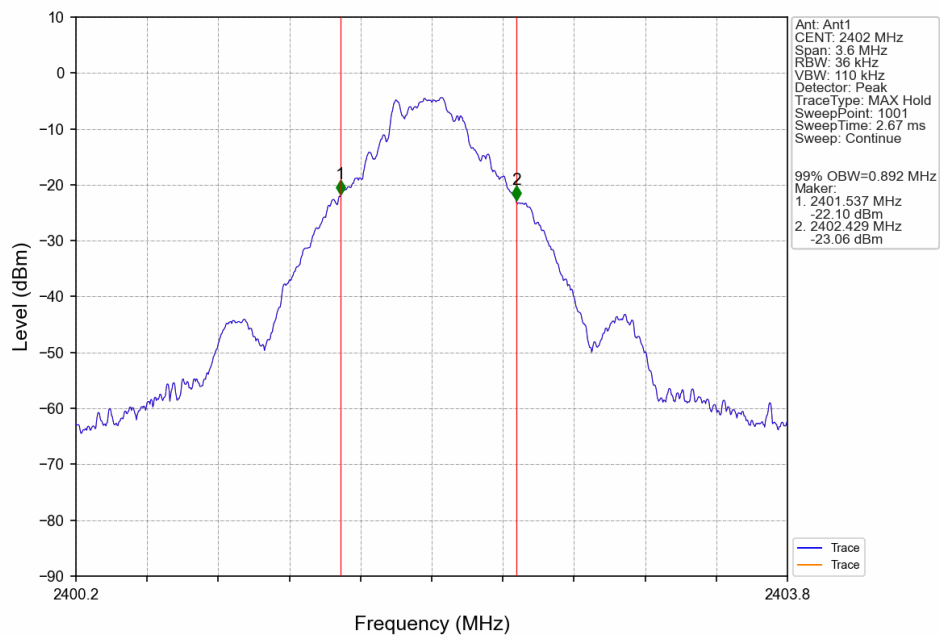


Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN

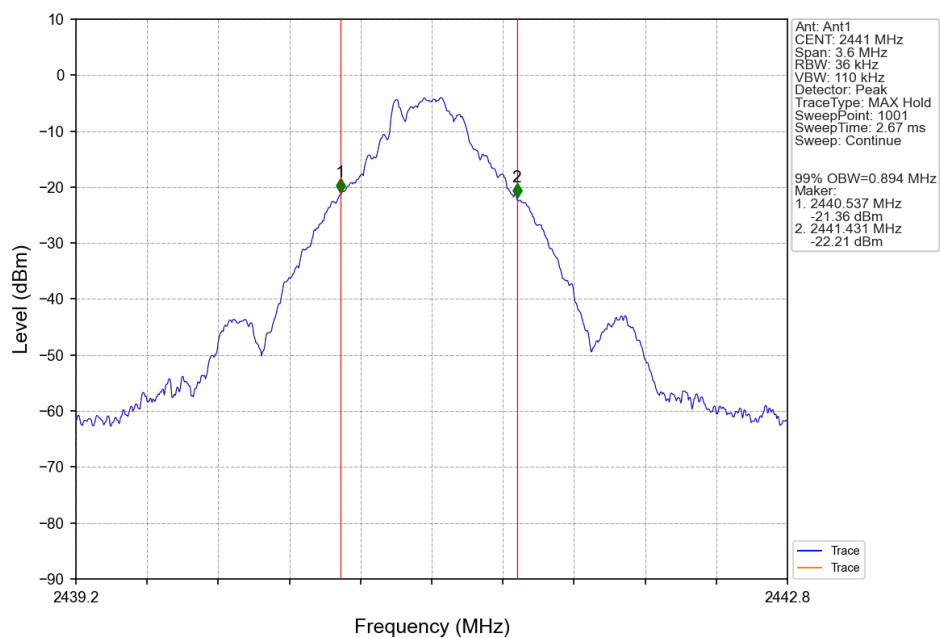


FCCID: 2A8SL-T13L

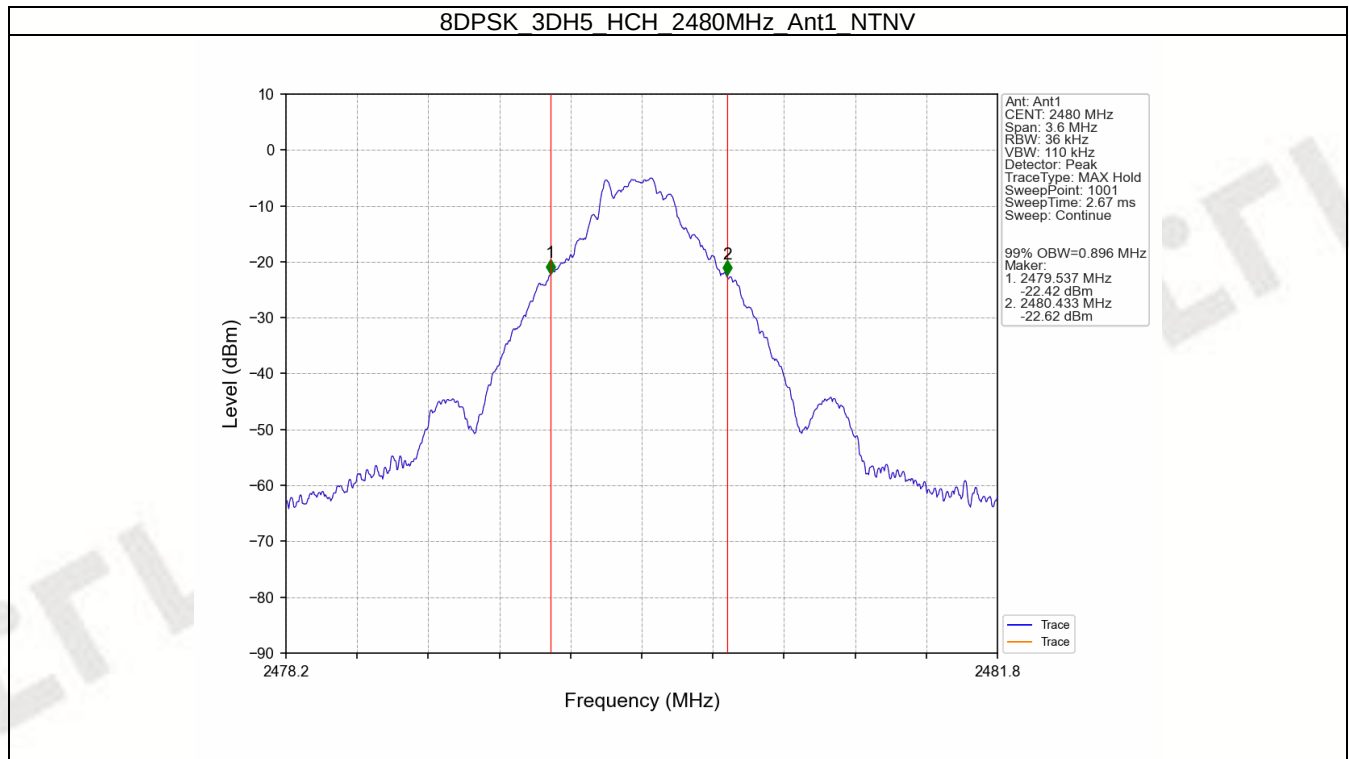
8DPSK 3DH5 LCH 2402MHz Ant1 NTN



8DPSK 3DH5 MCH 2441MHz Ant1 NTN

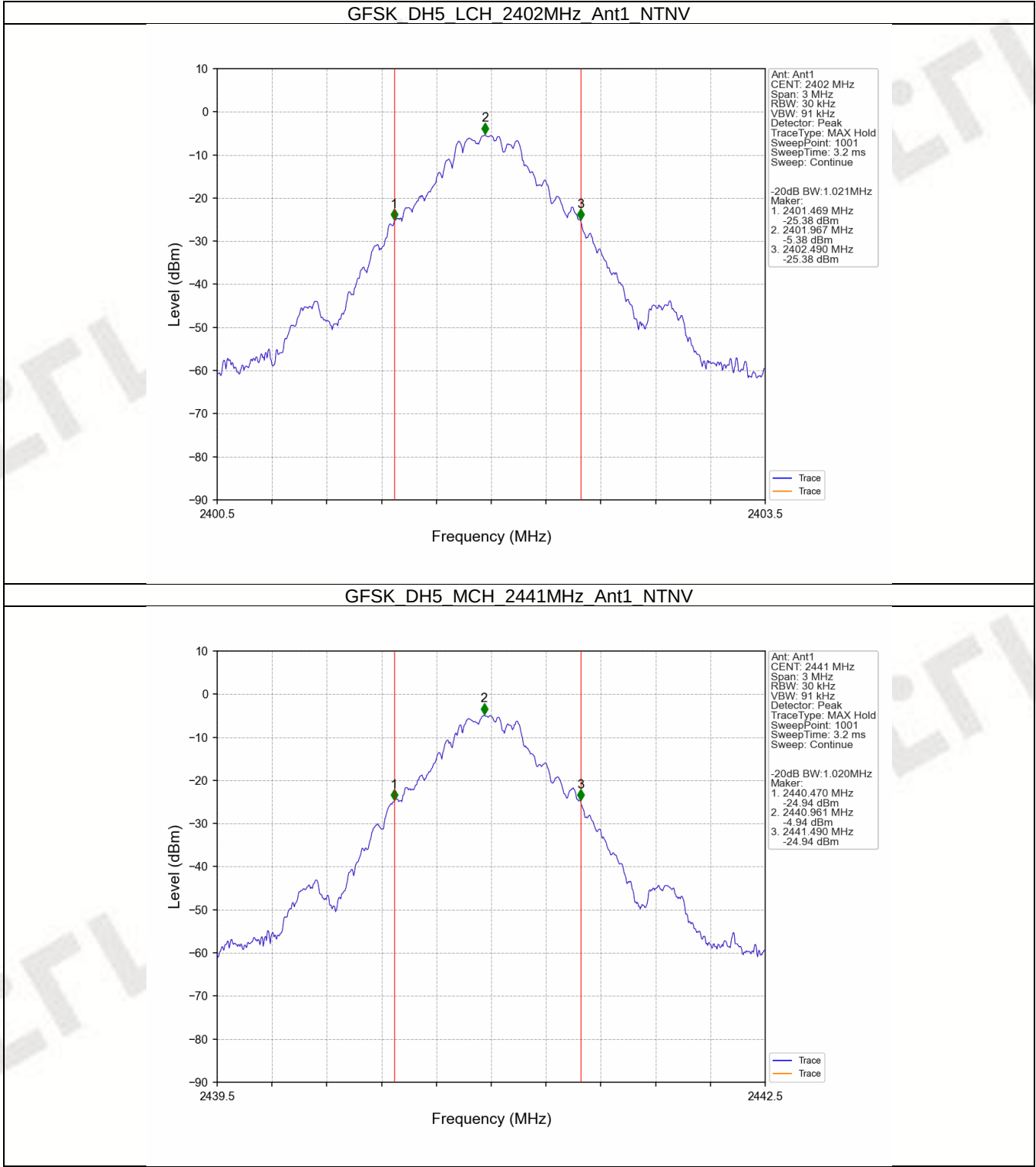


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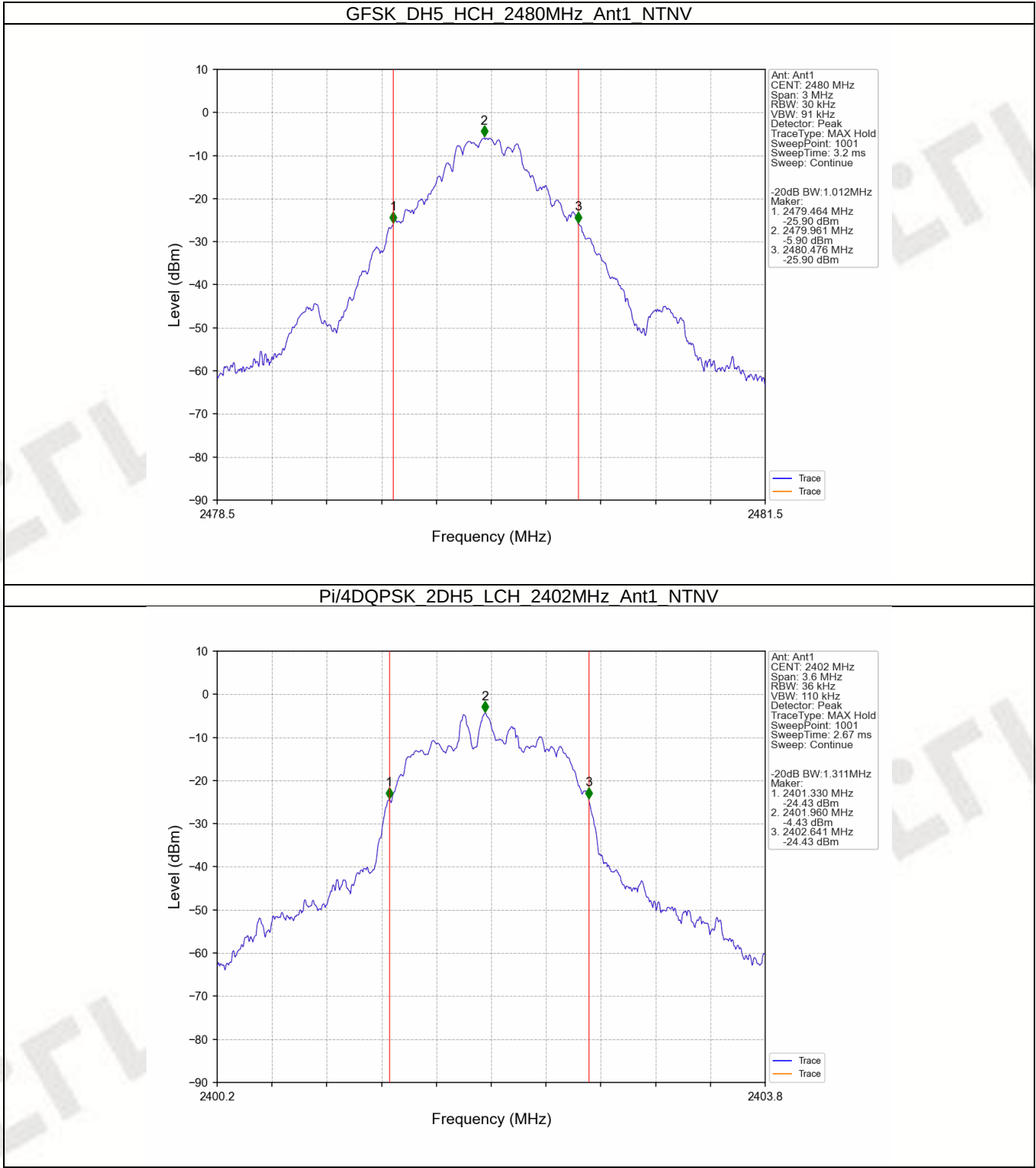


FCCID: 2A8SL-T13L

1.2.2 20dB BW

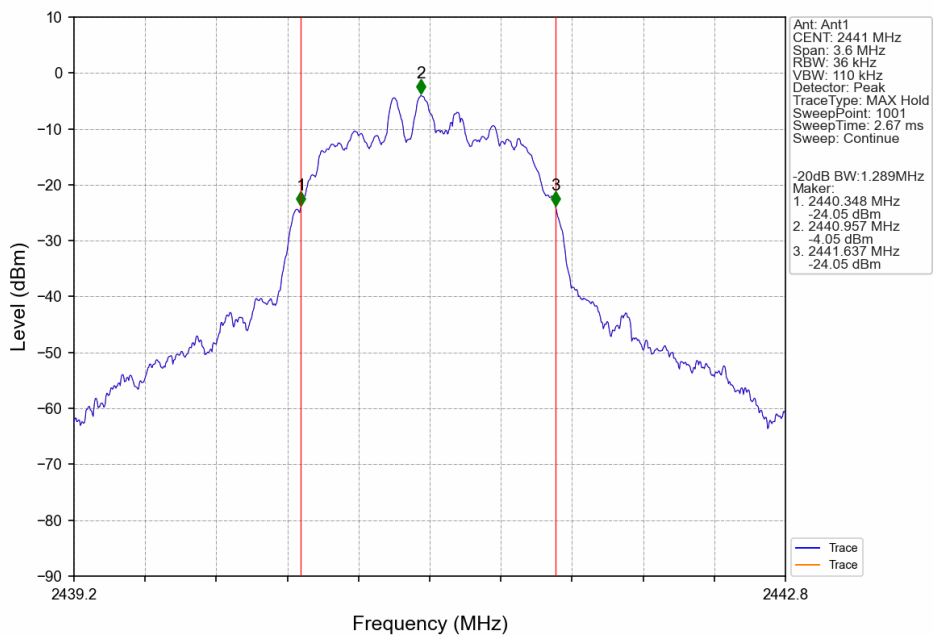


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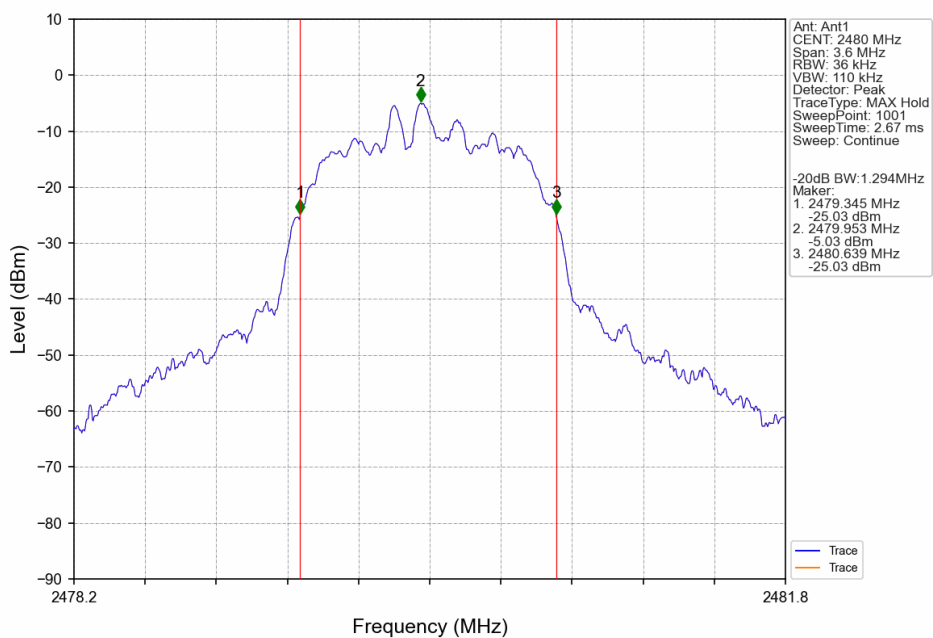


FCCID: 2A8SL-T13L

Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTN

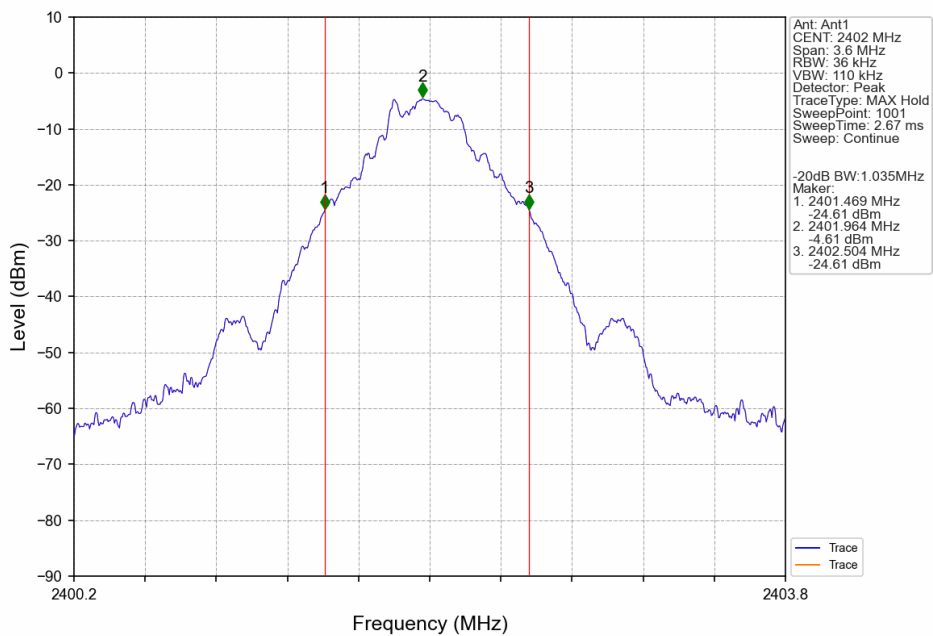


Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN

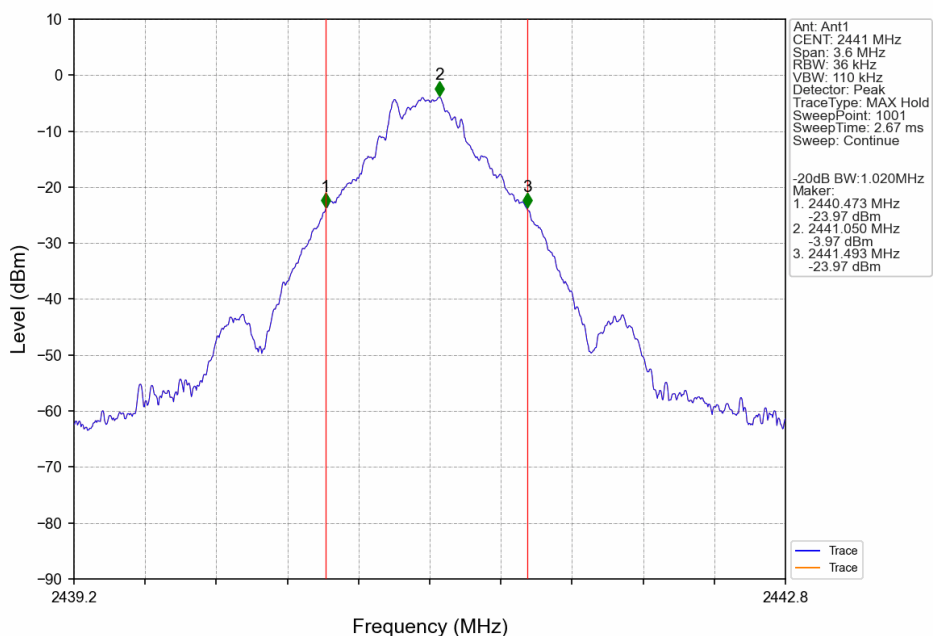


FCCID: 2A8SL-T13L

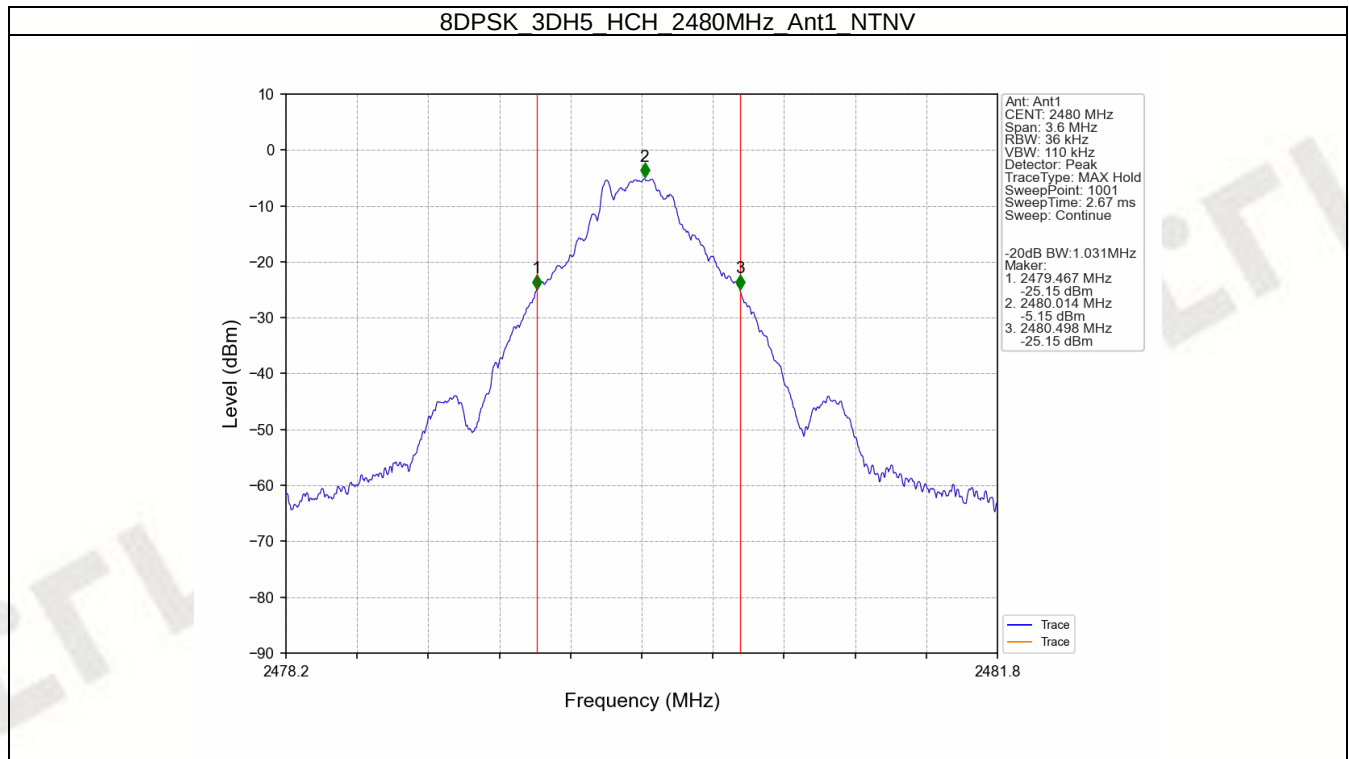
8DPSK 3DH5 LCH 2402MHz Ant1 NTN



8DPSK 3DH5 MCH 2441MHz Ant1 NTN



FCCID: 2A8SL-T13L



FCCID: 2A8SL-T13L

2. Maximum Conducted Output Power

2.1 Test Result

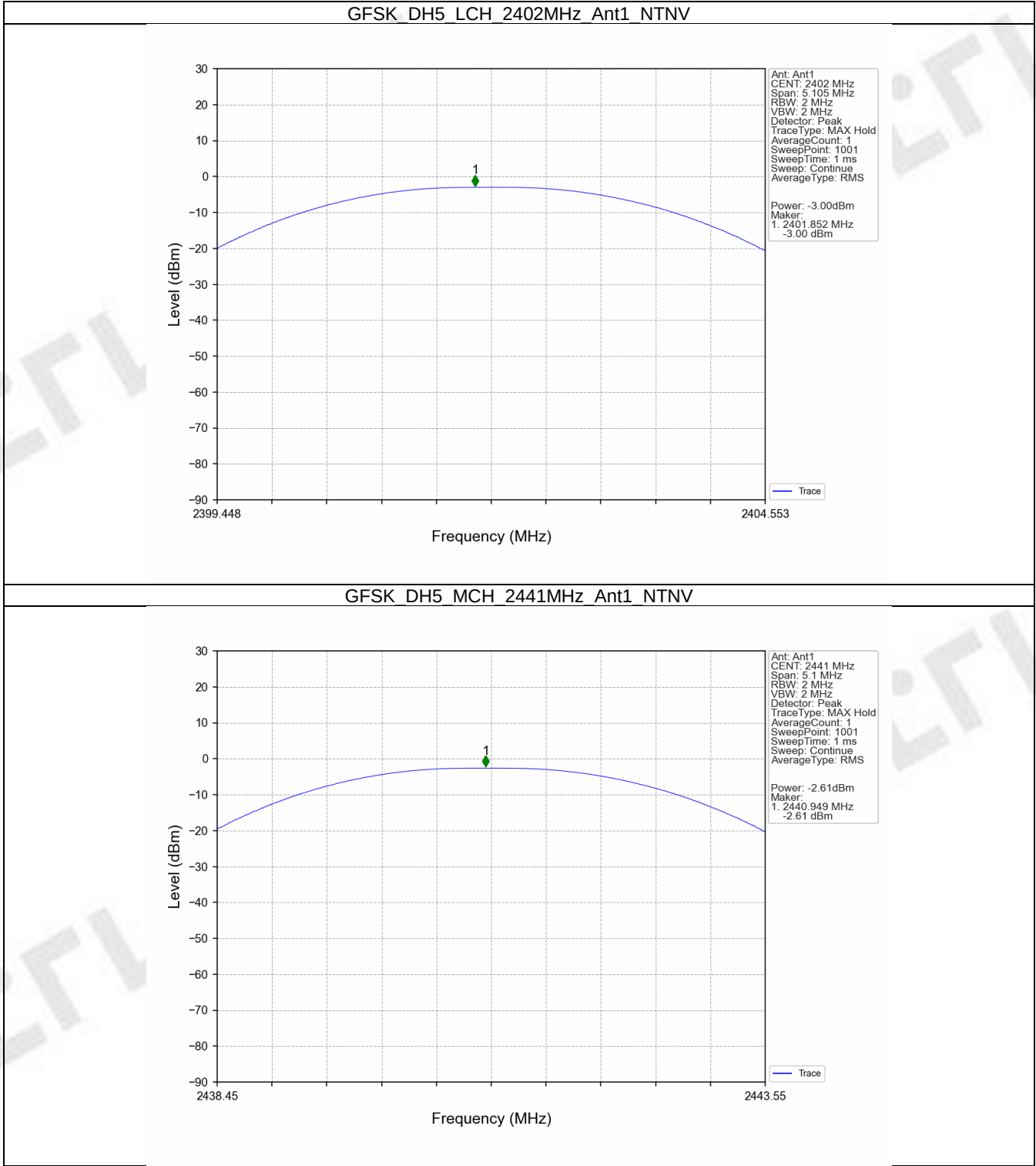
2.1.1 Power

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-3.00	<=30	Pass
		2441	DH5	-2.61	<=30	Pass
		2480	DH5	-3.57	<=30	Pass
Pi/4DQPSK	SISO	2402	2DH5	-2.03	<=20.97	Pass
		2441	2DH5	-1.69	<=20.97	Pass
		2480	2DH5	-2.65	<=20.97	Pass
8DPSK	SISO	2402	3DH5	-2.97	<=20.97	Pass
		2441	3DH5	-2.55	<=20.97	Pass
		2480	3DH5	-3.51	<=20.97	Pass
Note1: Antenna Gain: Ant1: 2.78dBi;						

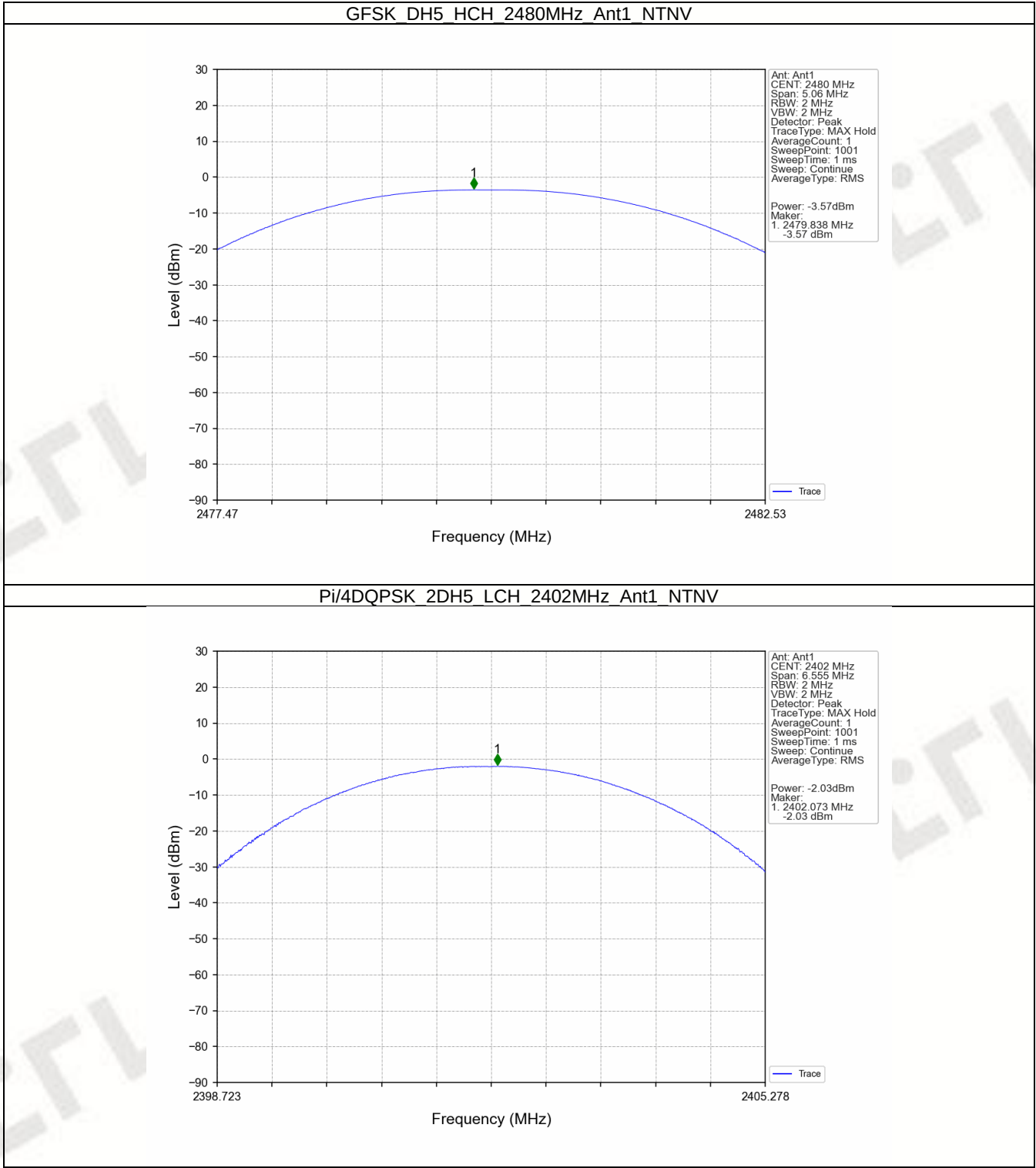
FCCID: 2A8SL-T13L

2.2 Test Graph

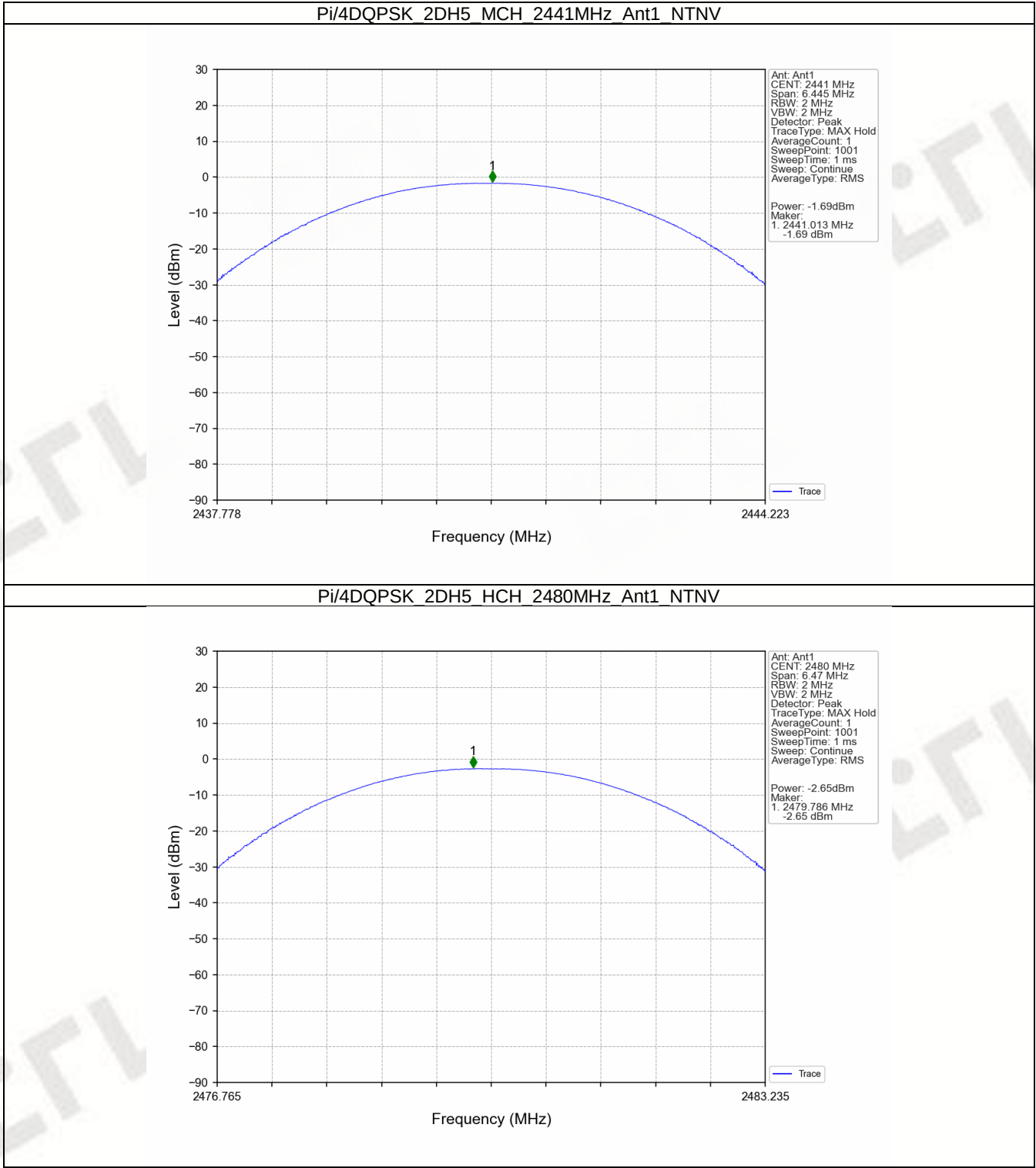
2.2.1 Power



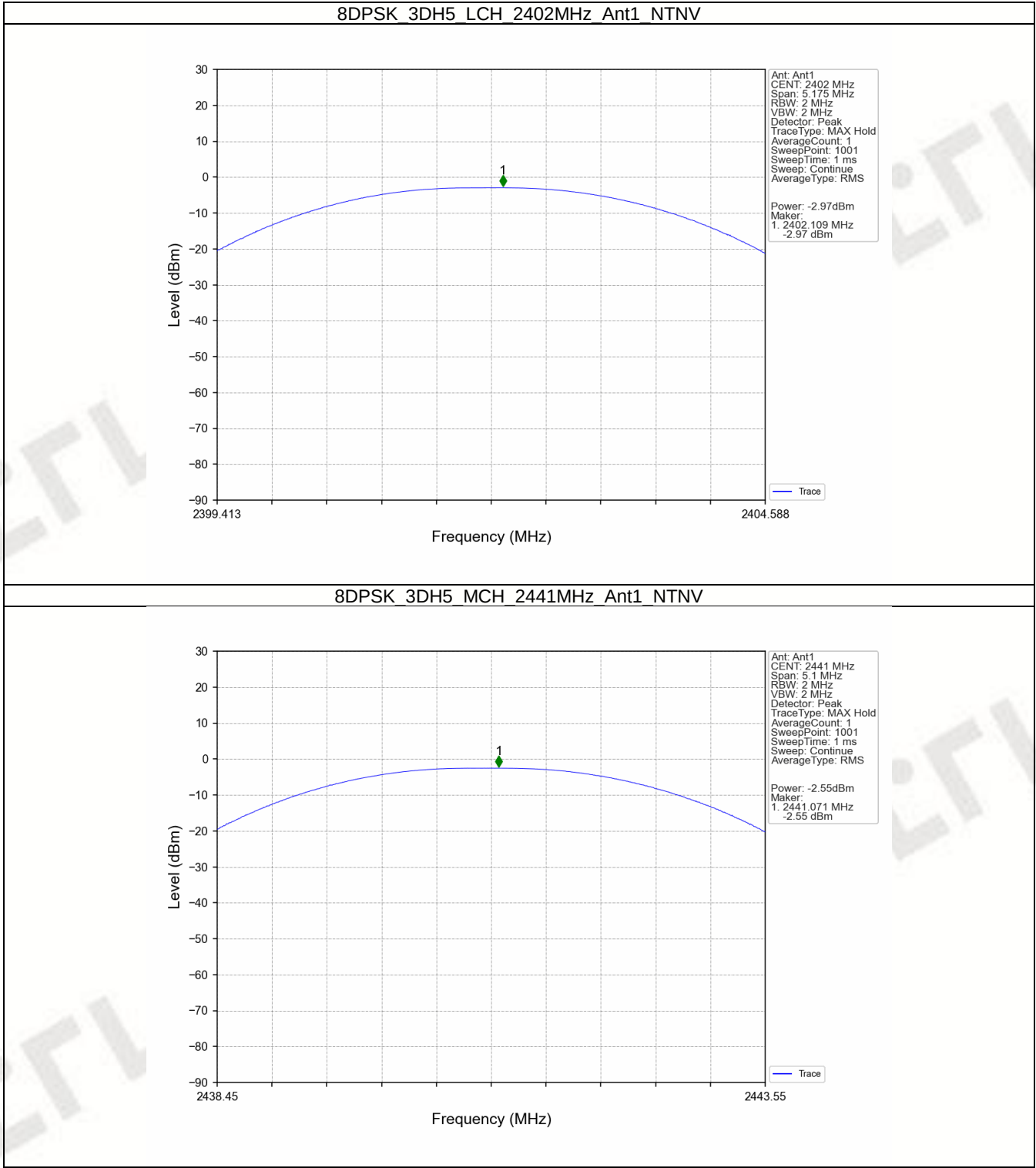
FCCID: 2A8SL-T13L



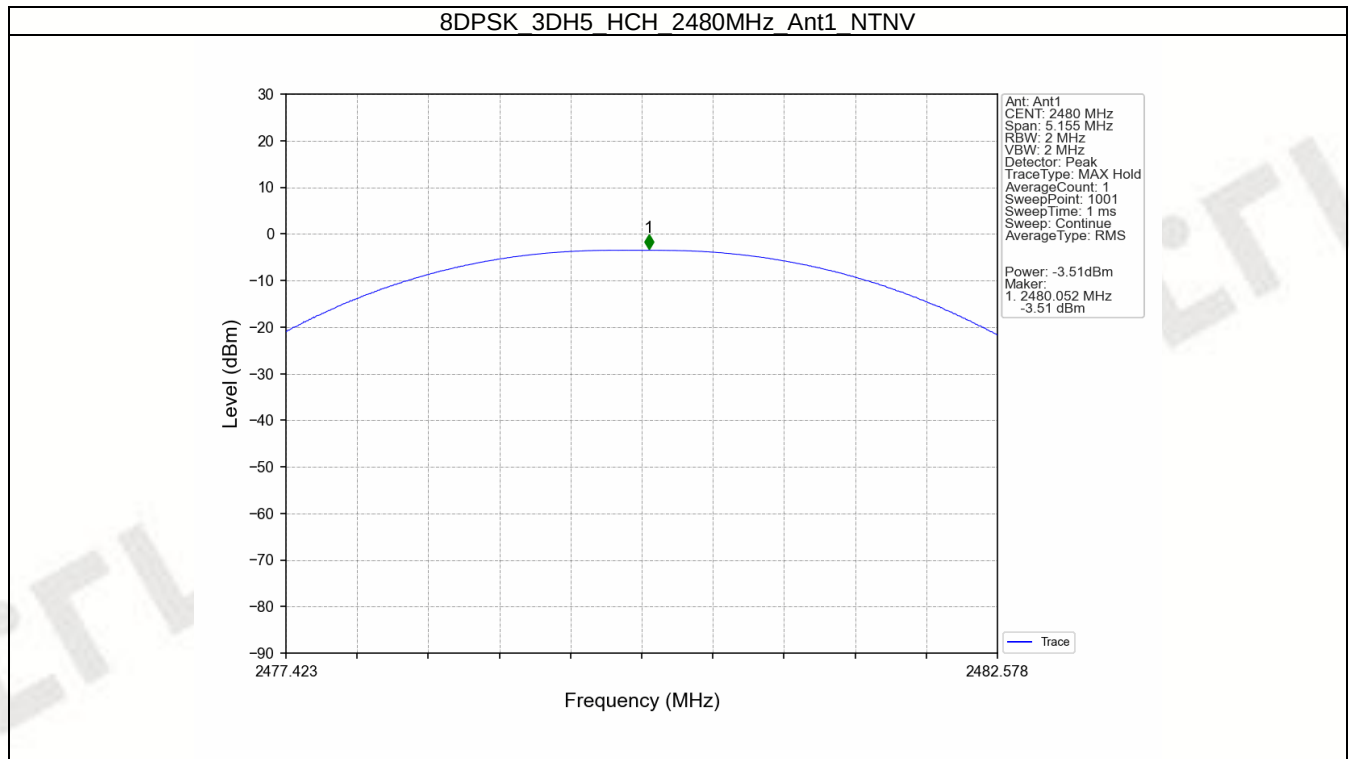
FCCID: 2A8SL-T13L



FCCID: 2A8SL-T13L



FCCID: 2A8SL-T13L



FCCID: 2A8SL-T13L

3. Carrier Frequency Separation

3.1 Test Result

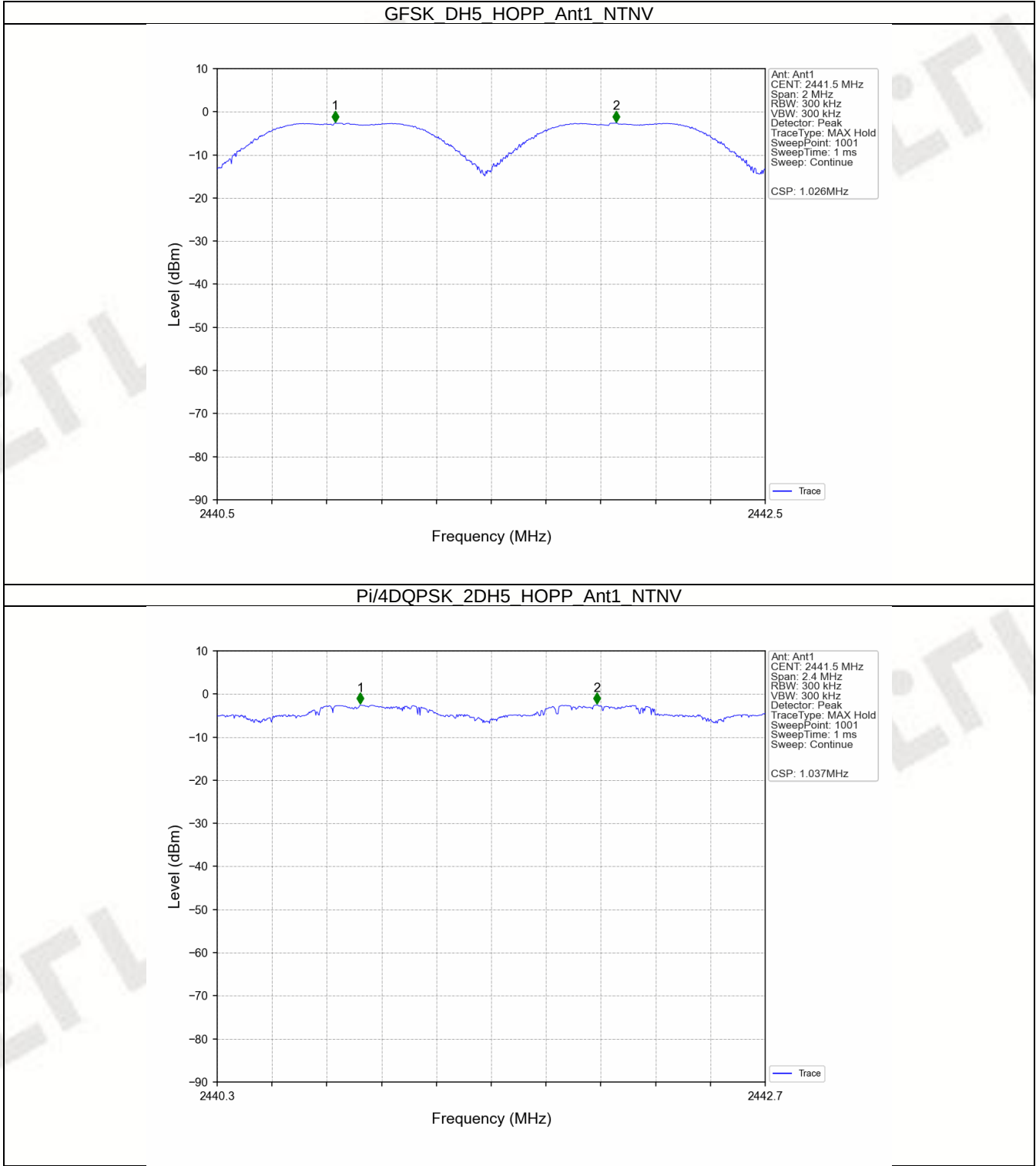
3.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.026	1.021	≥ 1.021	Pass
PI/4DQPSK	SISO	HOPP	2DH5	1.037	1.311	≥ 0.874	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.035	≥ 0.69	Pass

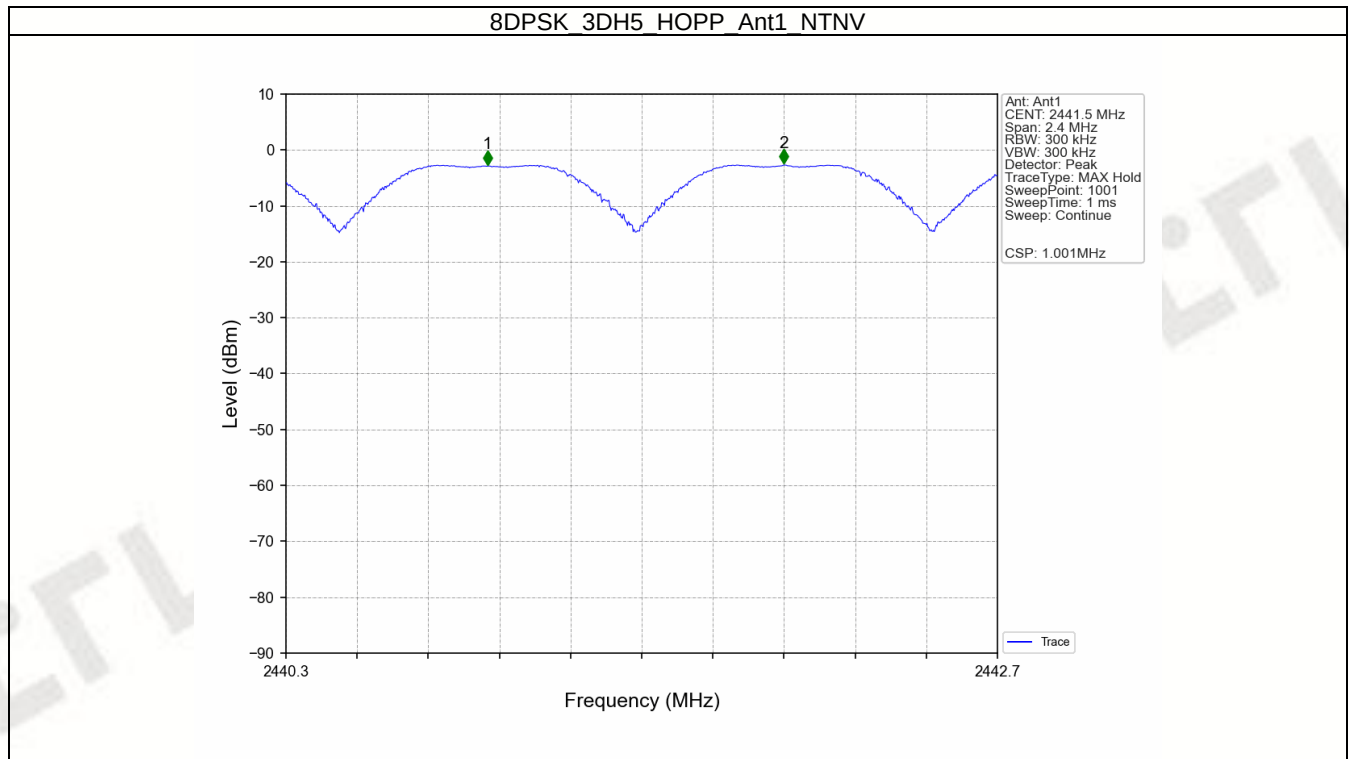
FCCID: 2A8SL-T13L

3.2 Test Graph

3.2.1 Ant1



FCCID: 2A8SL-T13L



FCCID: 2A8SL-T13L

4. Number of Hopping Frequencies

4.1 Test Result

4.1.1 HoppNum

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

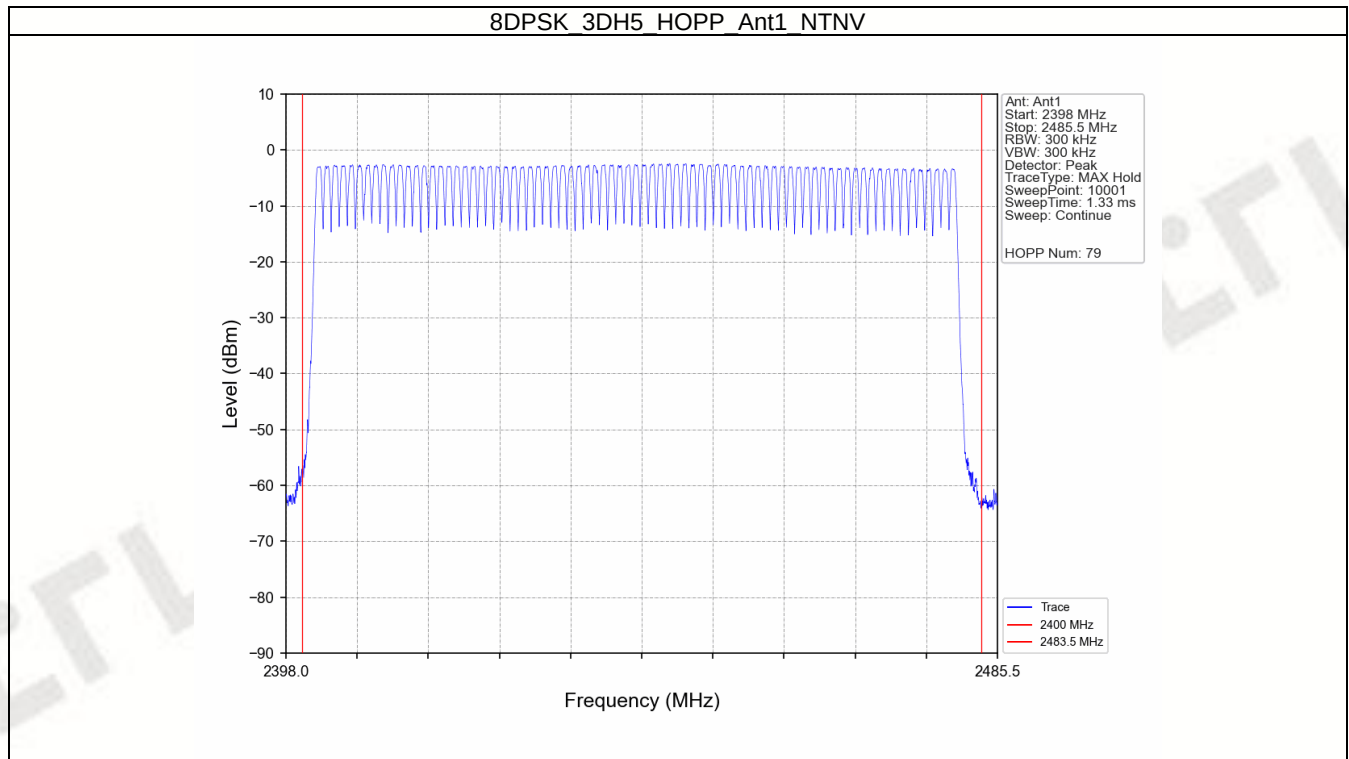
FCCID: 2A8SL-T13L

4.2 Test Graph

4.2.1 HoppNum



FCCID: 2A8SL-T13L



FCCID: 2A8SL-T13L

5. Time of Occupancy (Dwell Time)

5.1 Test Result

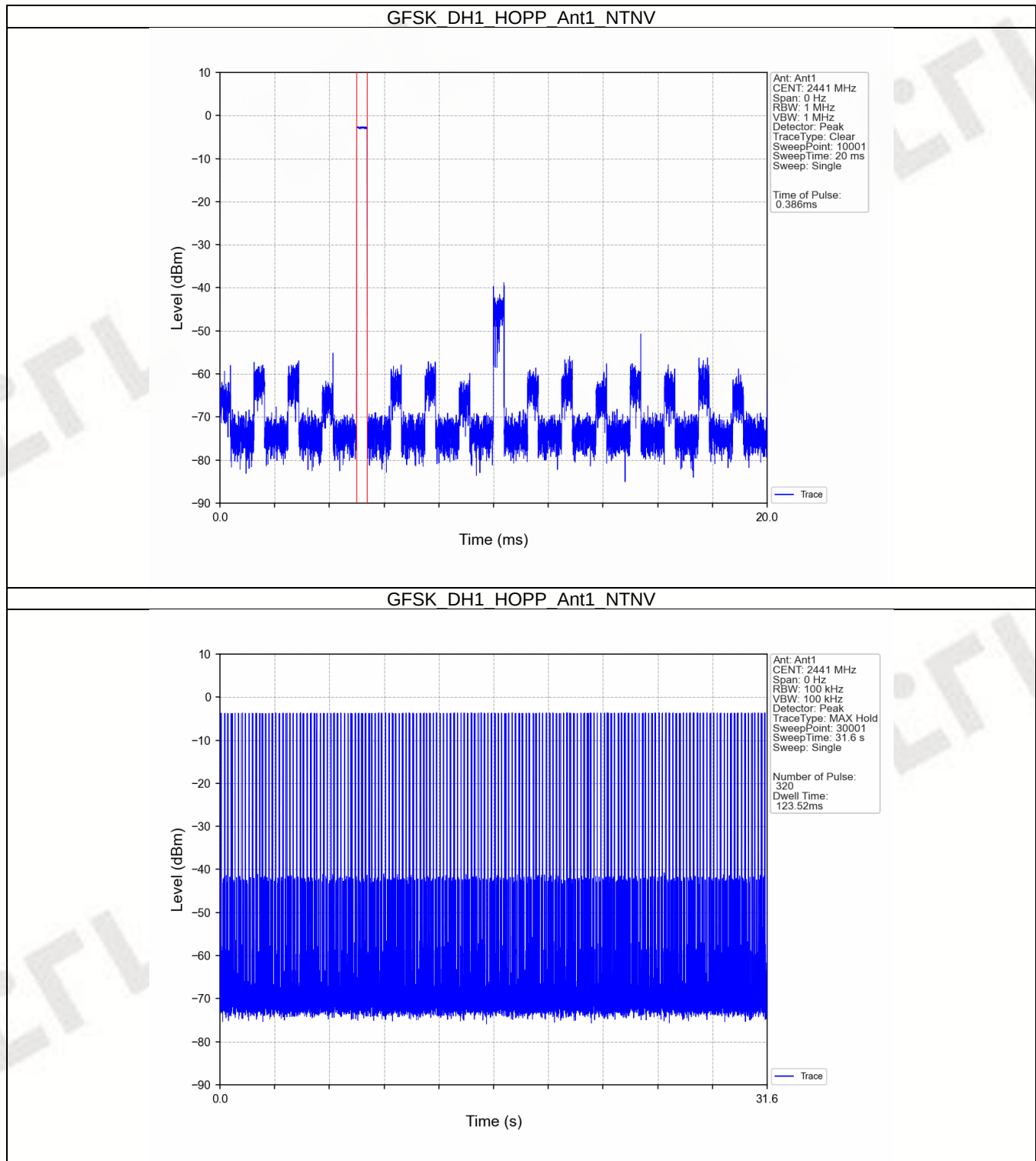
5.1.1 Ant1

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	0.386	31.600	320	123.520	<=400	Pass
			DH3	1.648	31.600	163	268.624	<=400	Pass
			DH5	2.892	31.600	109	315.228	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.394	31.600	319	125.686	<=400	Pass
			2DH3	1.652	31.600	160	264.320	<=400	Pass
			2DH5	2.902	31.600	96	278.592	<=400	Pass
8DPSK	SISO	HOPP	3DH1	6.678	31.600	56	373.968	<=400	Pass
			3DH3	1.622	31.600	152	246.544	<=400	Pass
			3DH5	2.372	31.600	103	244.316	<=400	Pass

FCCID: 2A8SL-T13L

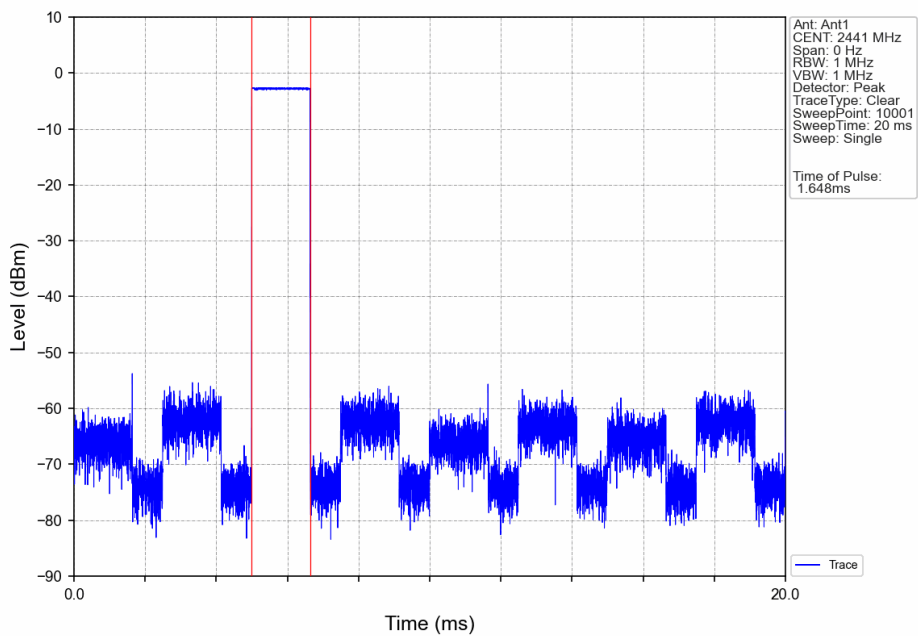
5.2 Test Graph

5.2.1 Ant1

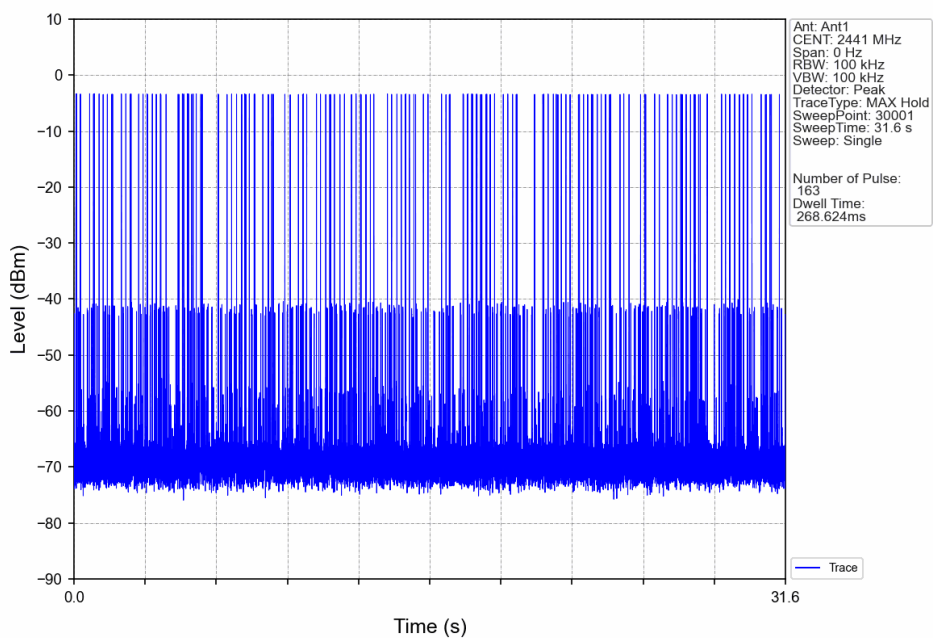


FCCID: 2A8SL-T13L

GFSK DH3 HOPP Ant1 NTN

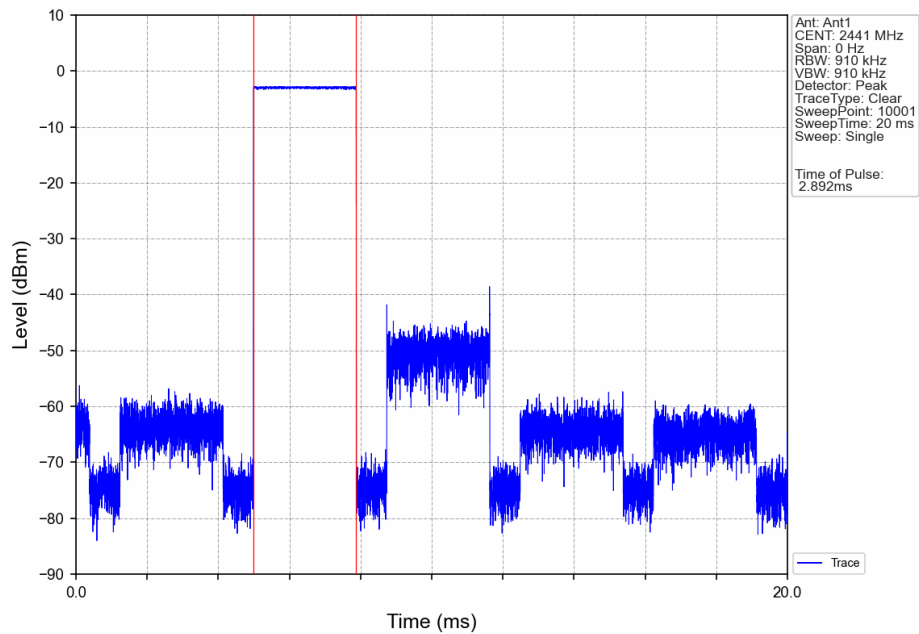


GFSK DH3 HOPP Ant1 NTN

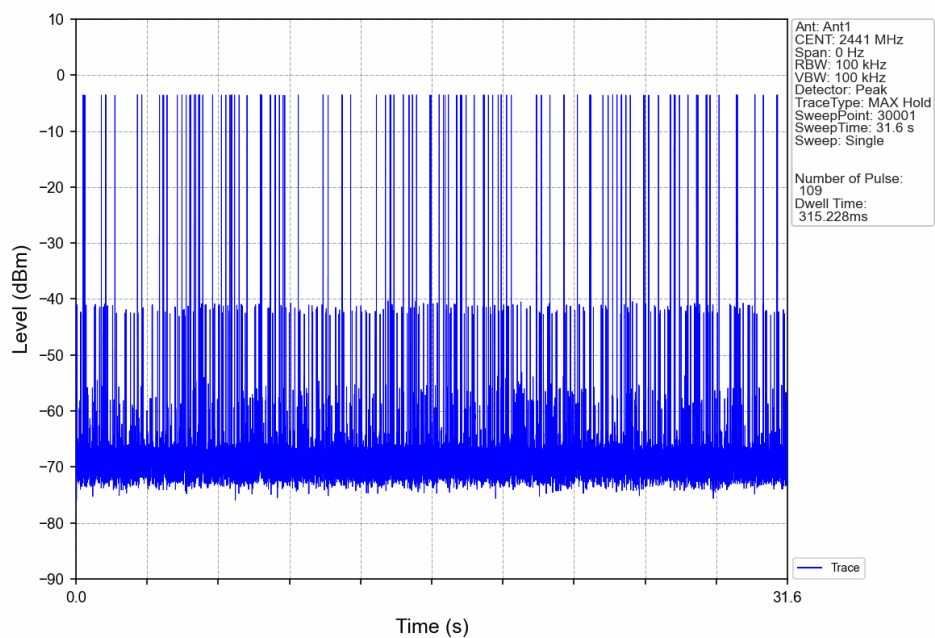


FCCID: 2A8SL-T13L

GFSK DH5 HOPP Ant1 NTN

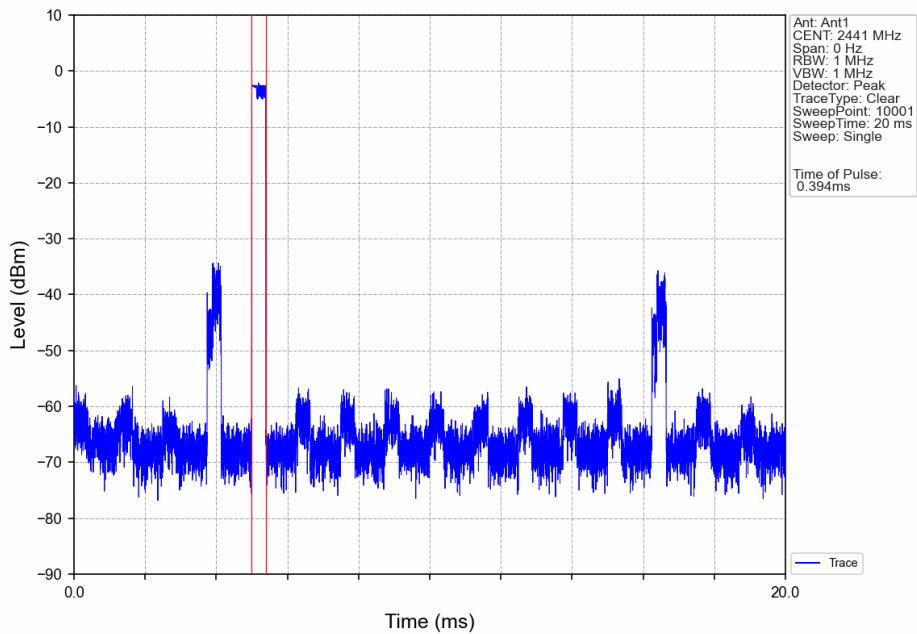


GFSK DH5 HOPP Ant1 NTN

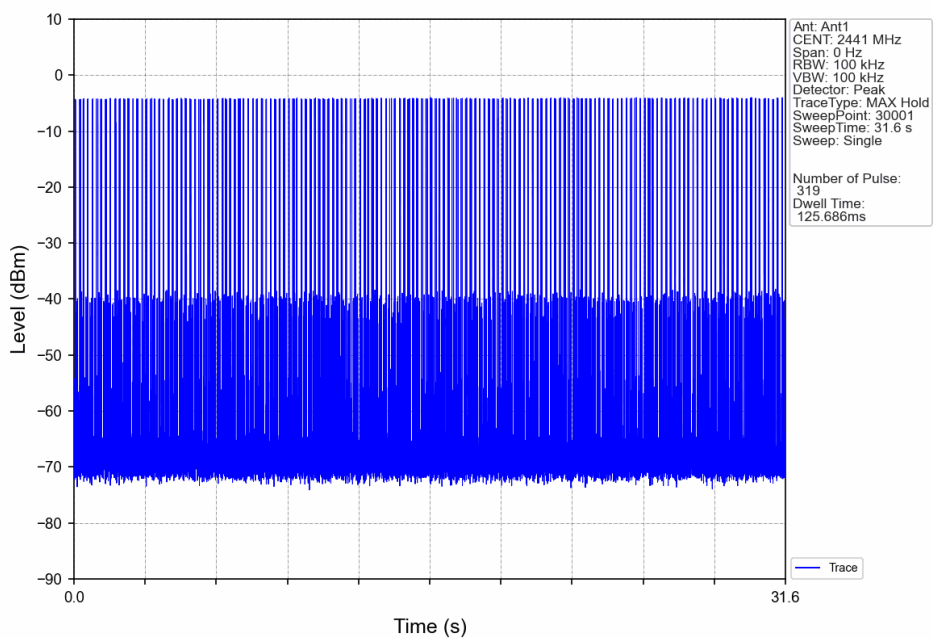


FCCID: 2A8SL-T13L

Pi/4DQPSK 2DH1 HOPP Ant1 NTN

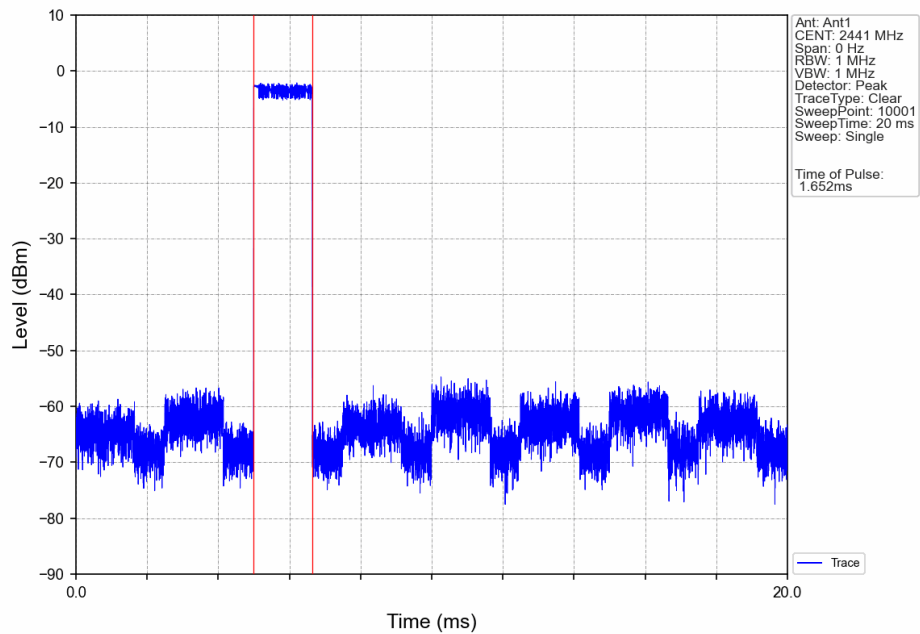


Pi/4DQPSK 2DH1 HOPP Ant1 NTN

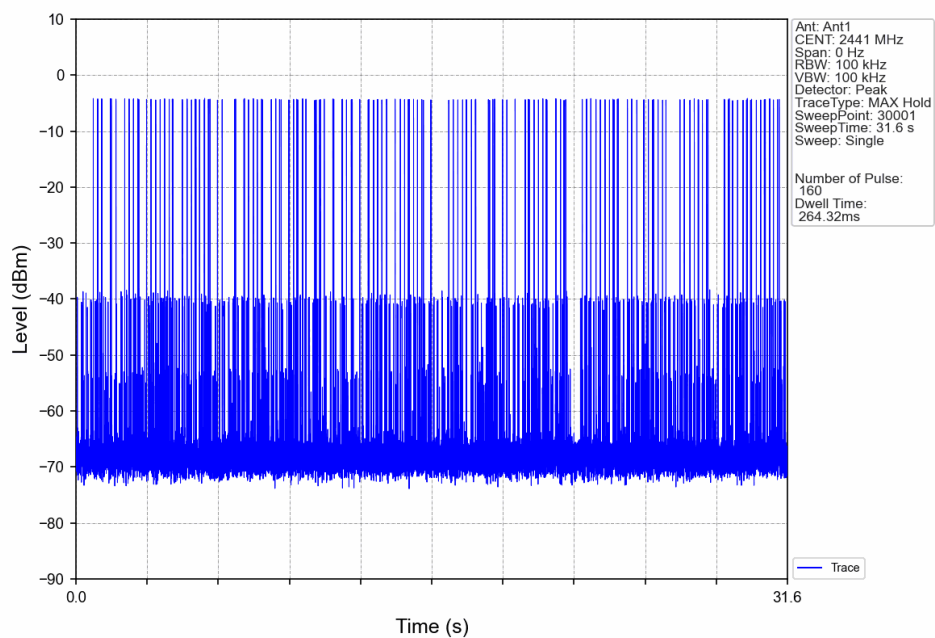


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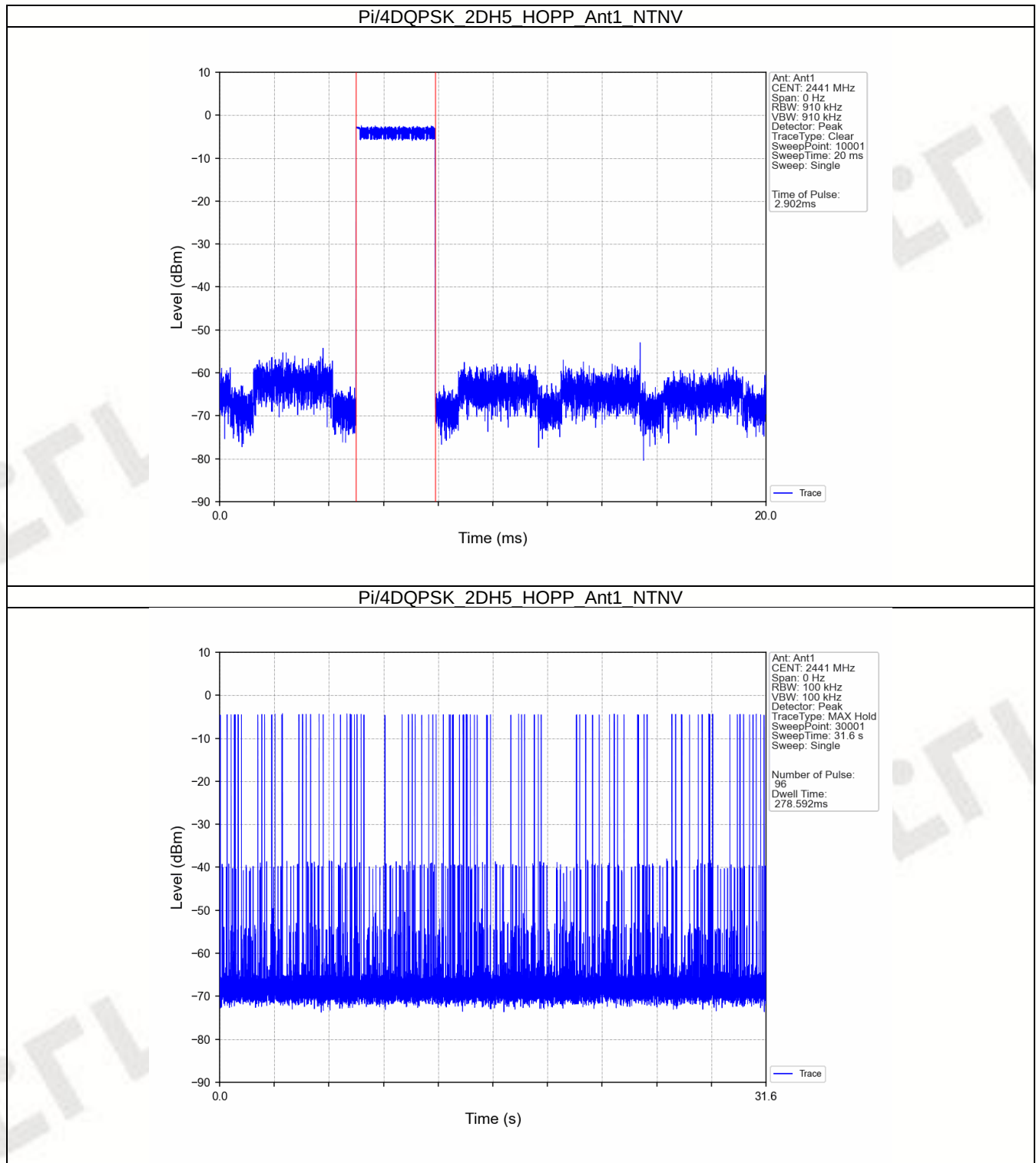
Pi/4DQPSK 2DH3 HOPP Ant1 NTN



Pi/4DQPSK 2DH3 HOPP Ant1 NTN

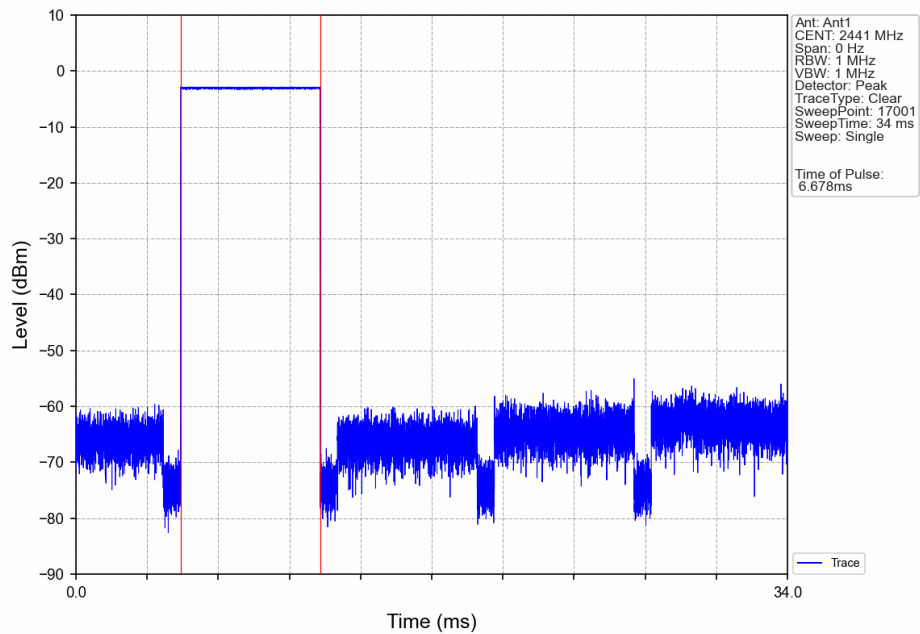


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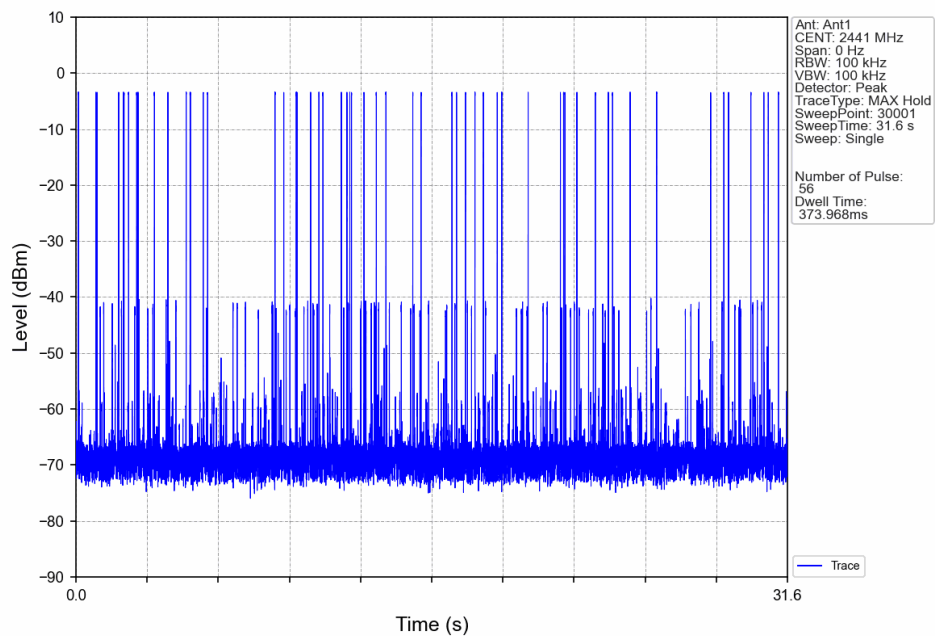


FCCID: 2A8SL-T13L

8DPSK 3DH1 HOPP Ant1 NTN

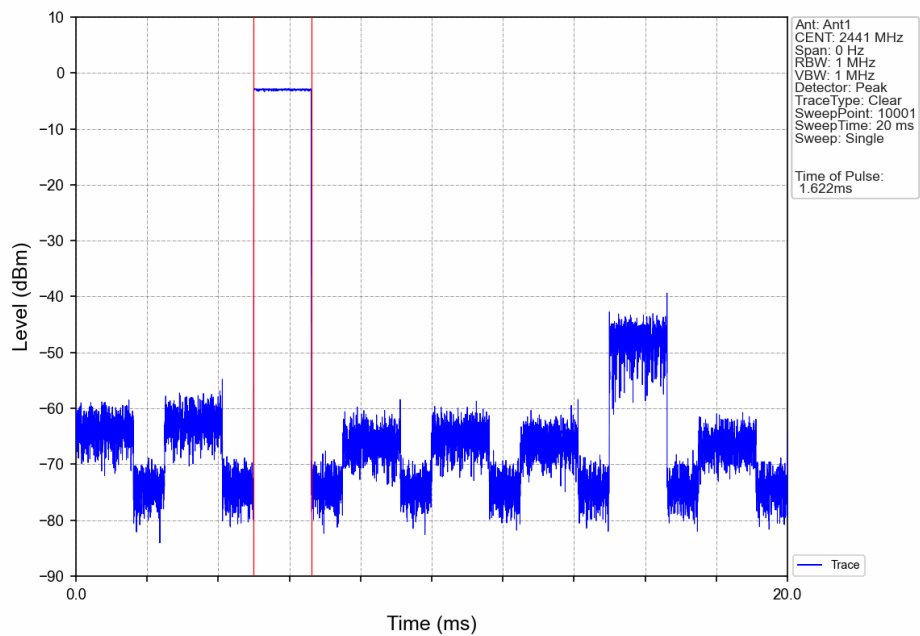


8DPSK 3DH1 HOPP Ant1 NTN

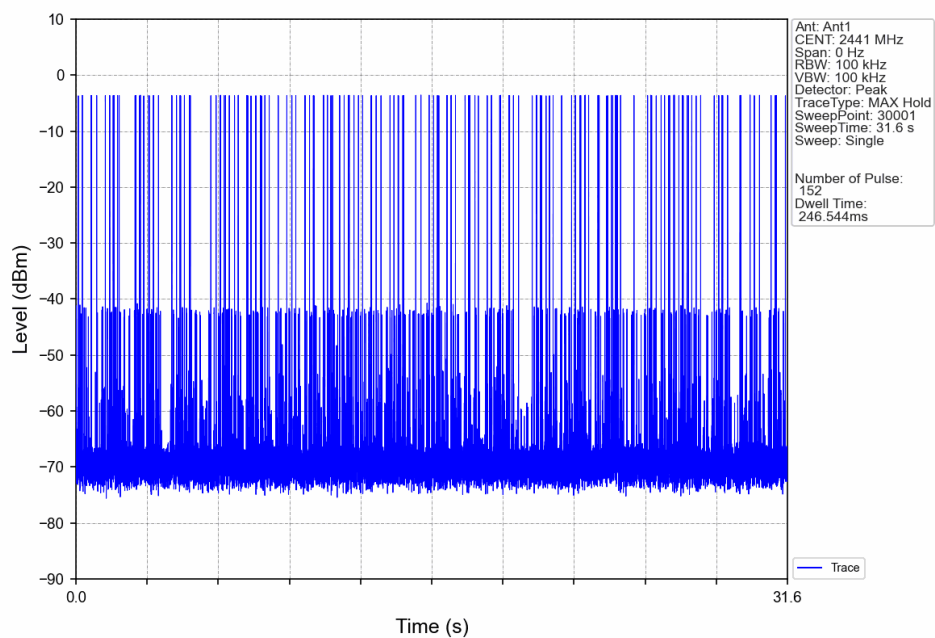


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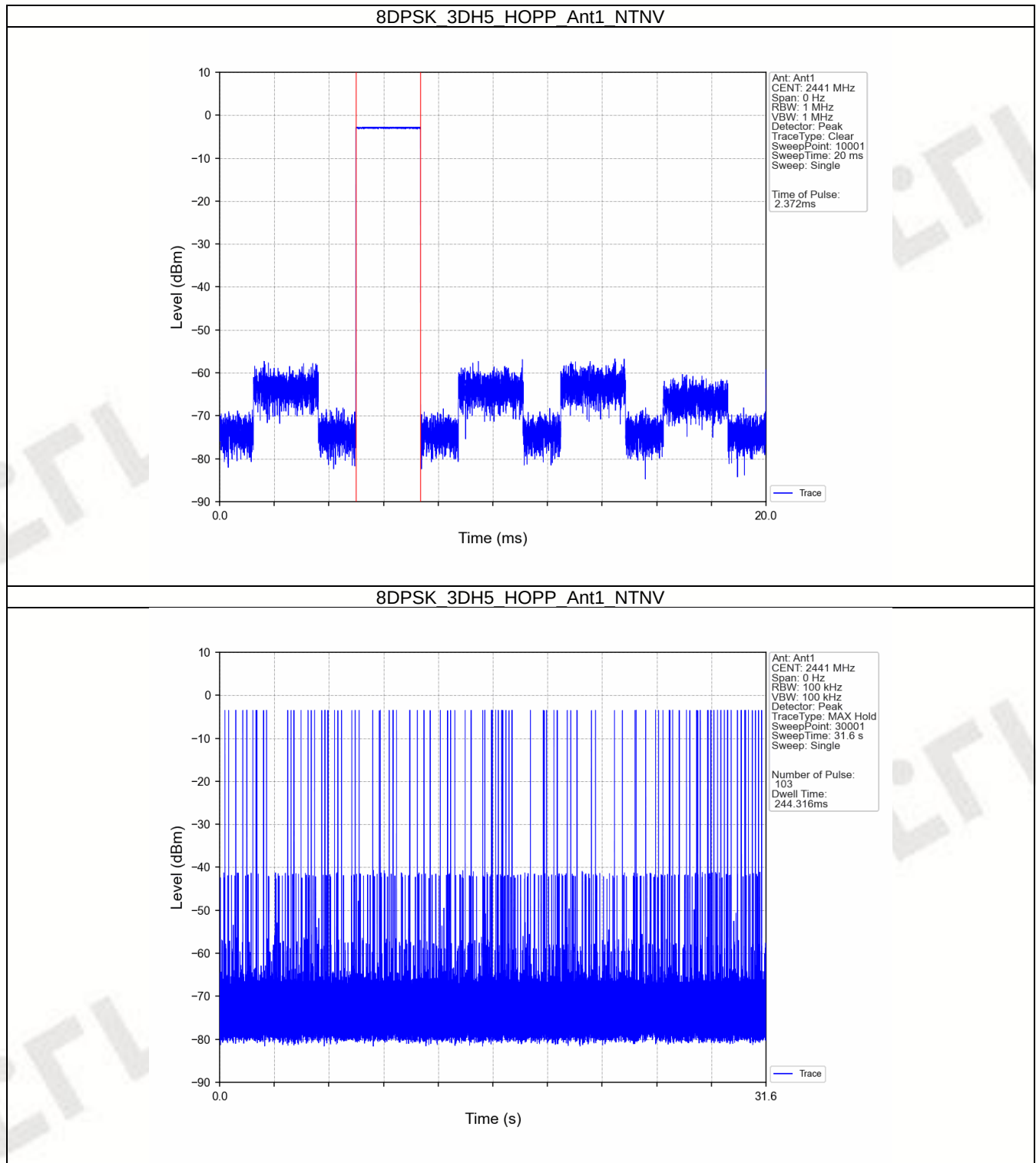
8DPSK 3DH3 HOPP Ant1 NTNV



8DPSK 3DH3 HOPP Ant1 NTNV



FCCID: 2A8SL-T13L



FCCID: 2A8SL-T13L

6. Unwanted Emissions In Non-restricted Frequency Bands

6.1 Test Result

6.1.1 Ref

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	-3.12
		2441	DH5	1	-2.71
		2480	DH5	1	-3.74
Pi/4DQPSK	SISO	2402	2DH5	1	-3.03
		2441	2DH5	1	-2.76
		2480	2DH5	1	-3.74
8DPSK	SISO	2402	3DH5	1	-3.06
		2441	3DH5	1	-2.74
		2480	3DH5	1	-3.68

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 CSE

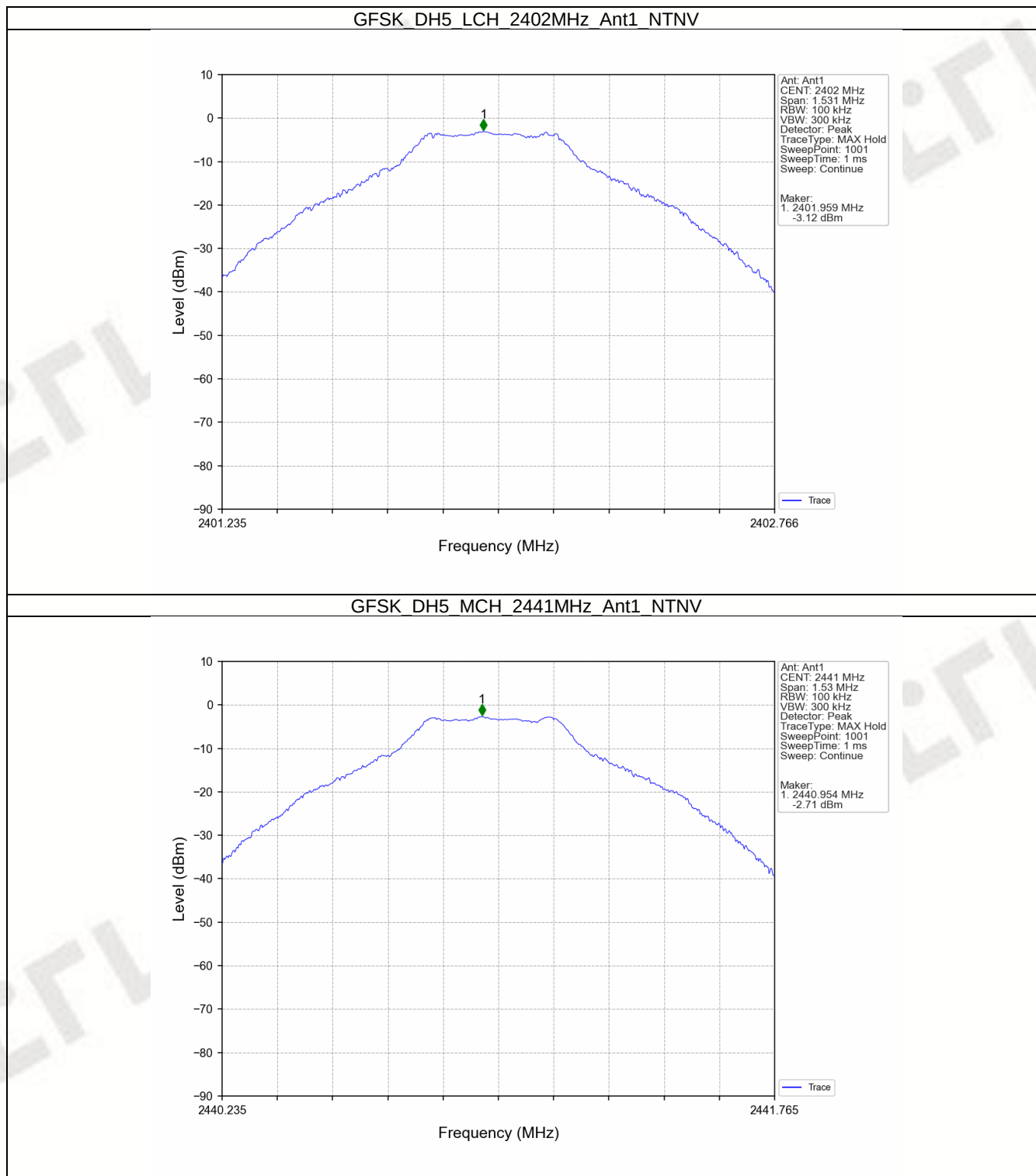
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-2.71	-22.71	Pass
		2441	DH5	1	-2.71	-22.71	Pass
		2480	DH5	1	-2.71	-22.71	Pass
		HOPP	DH5	1	-2.71	-22.71	Pass
					-2.71	-22.71	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	-2.76	-22.76	Pass
		2441	2DH5	1	-2.76	-22.76	Pass
		2480	2DH5	1	-2.76	-22.76	Pass
		HOPP	2DH5	1	-2.76	-22.76	Pass
					-2.76	-22.76	Pass
8DPSK	SISO	2402	3DH5	1	-2.74	-22.74	Pass
		2441	3DH5	1	-2.74	-22.74	Pass
		2480	3DH5	1	-2.74	-22.74	Pass
		HOPP	3DH5	1	-2.74	-22.74	Pass
					-2.74	-22.74	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.

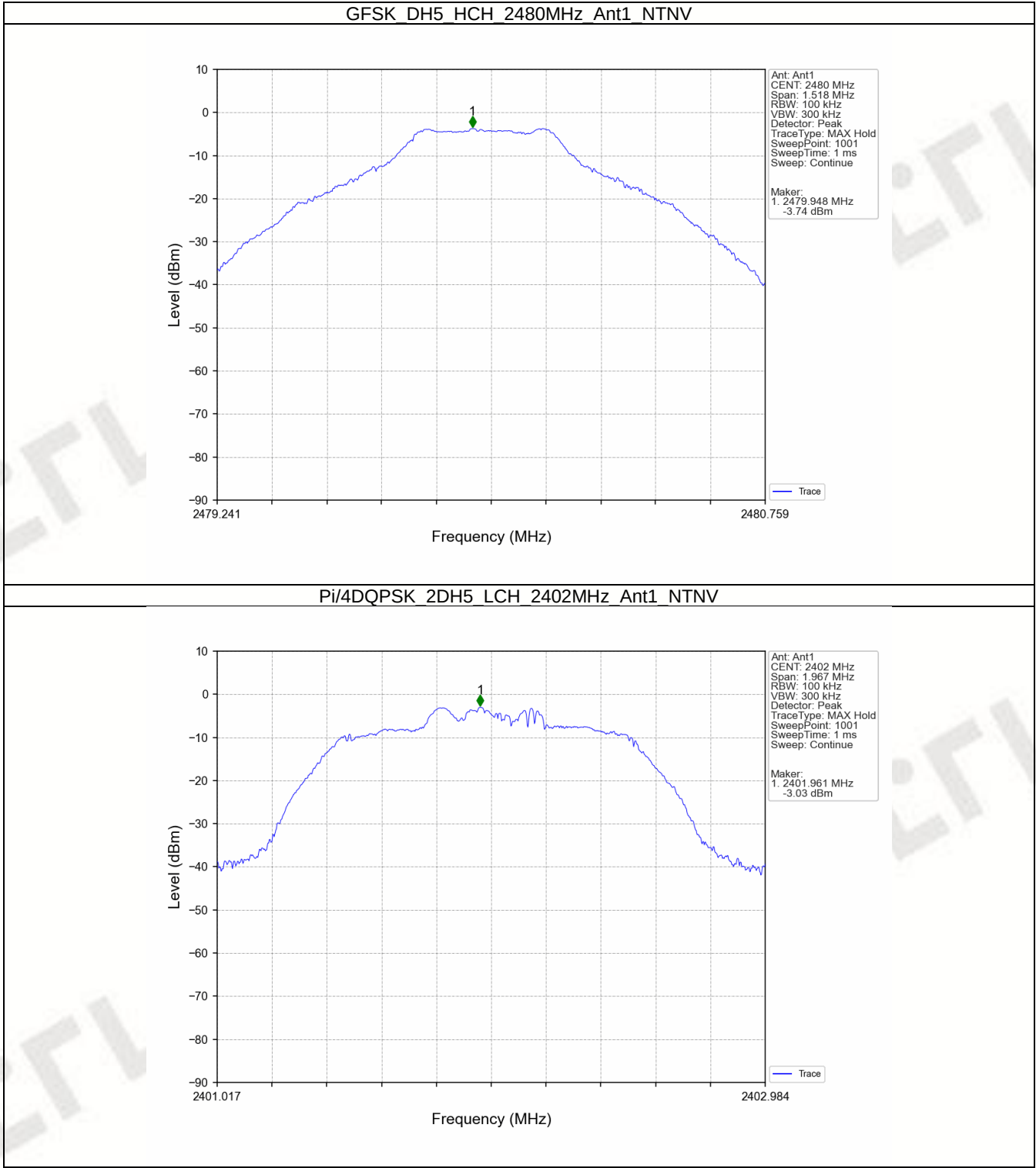
FCCID: 2A8SL-T13L

6.2 Test Graph

6.2.1 Ref

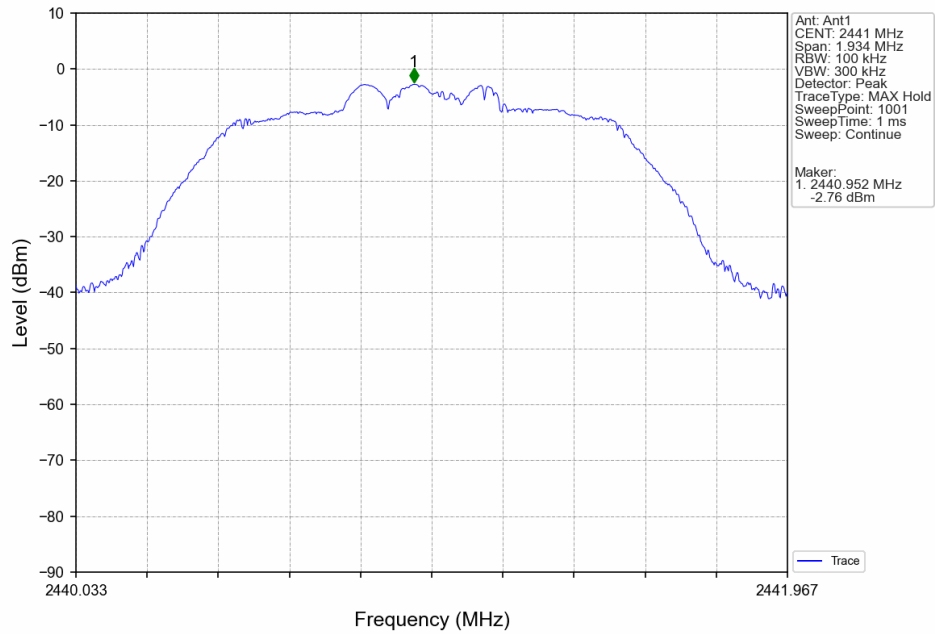


FCCID: 2A8SL-T13L

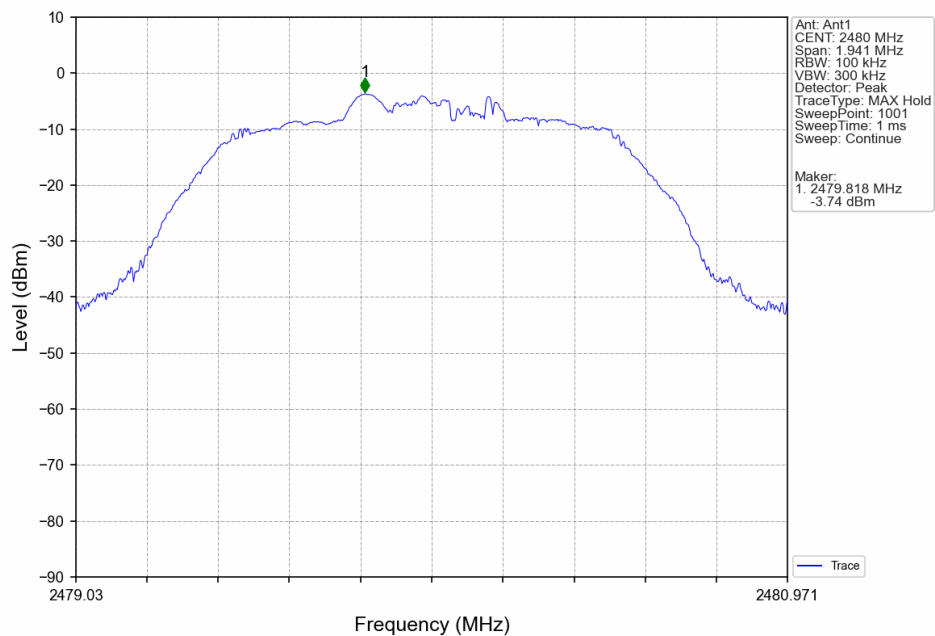


FCCID: 2A8SL-T13L

Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTN

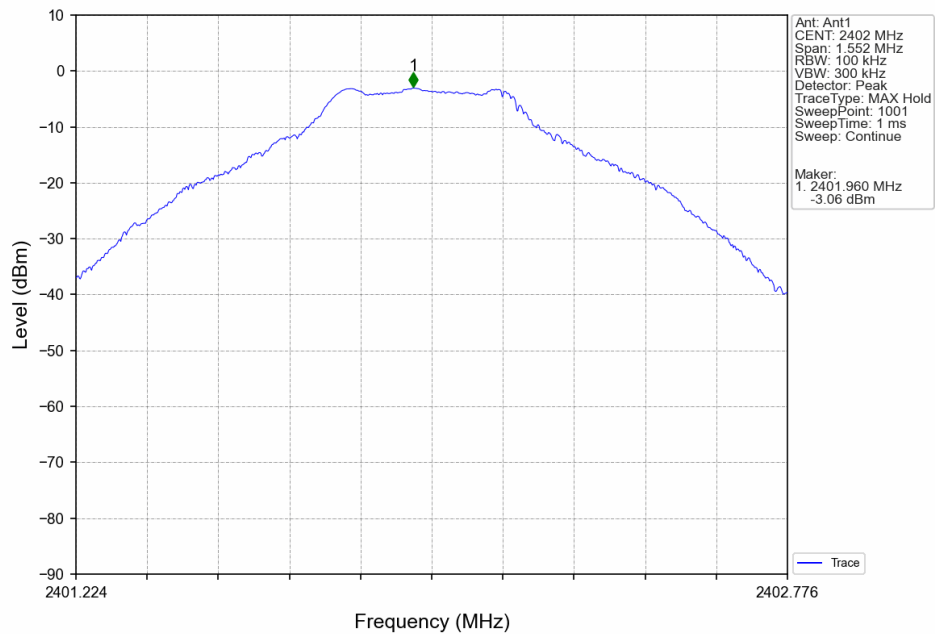


Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN

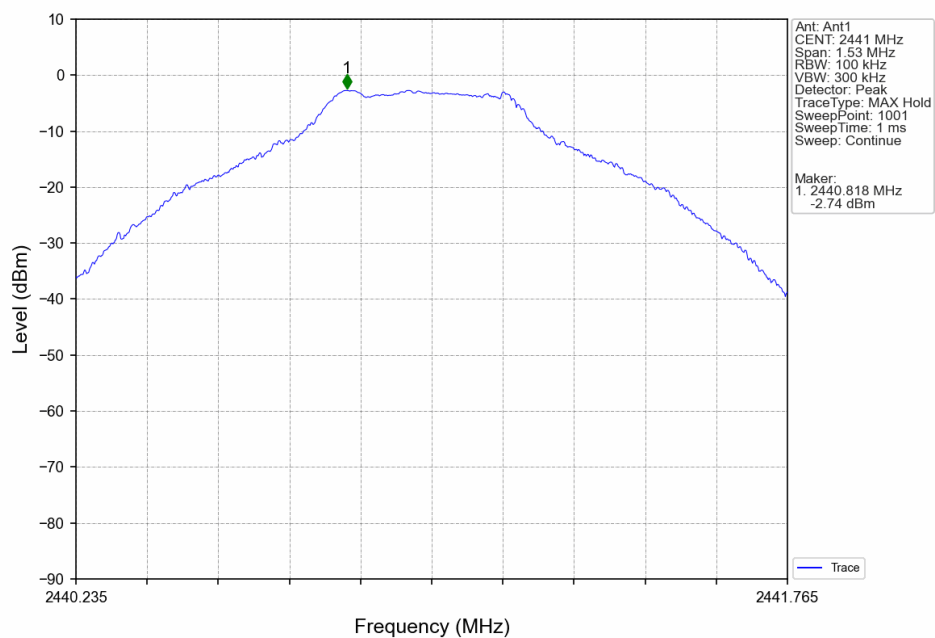


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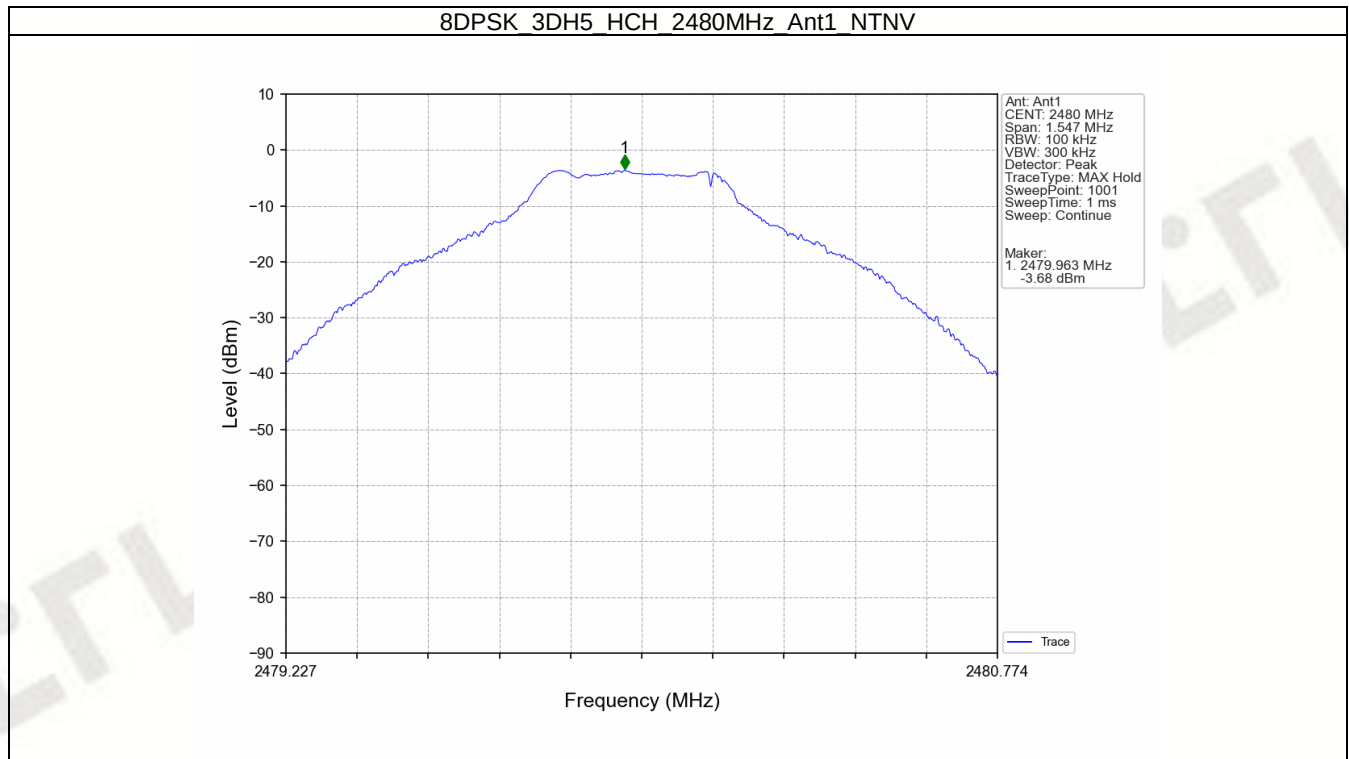
8DPSK 3DH5 LCH 2402MHz Ant1 NTN



8DPSK 3DH5 MCH 2441MHz Ant1 NTN

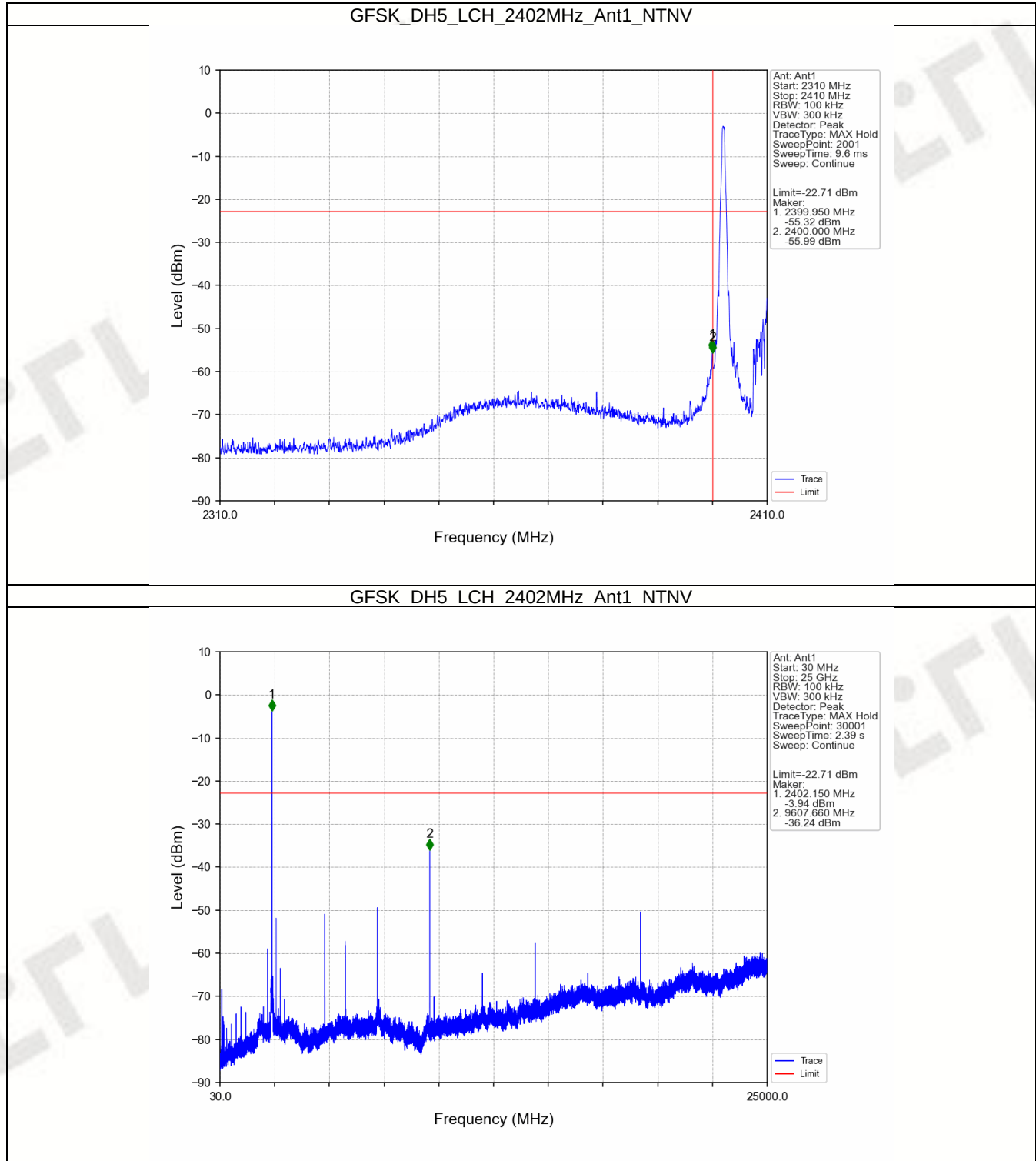


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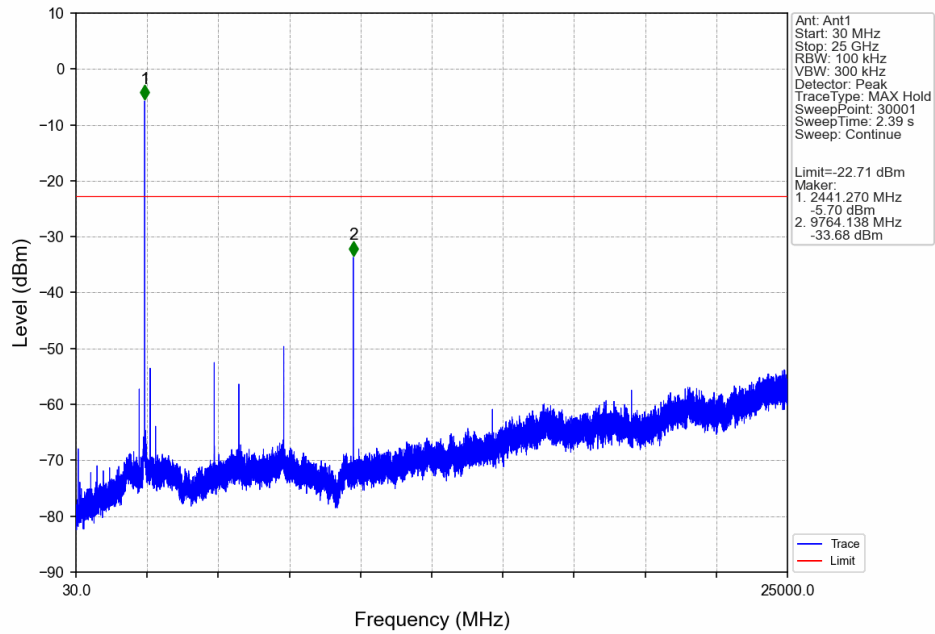
FCCID: 2A8SL-T13L

6.2.2 CSE

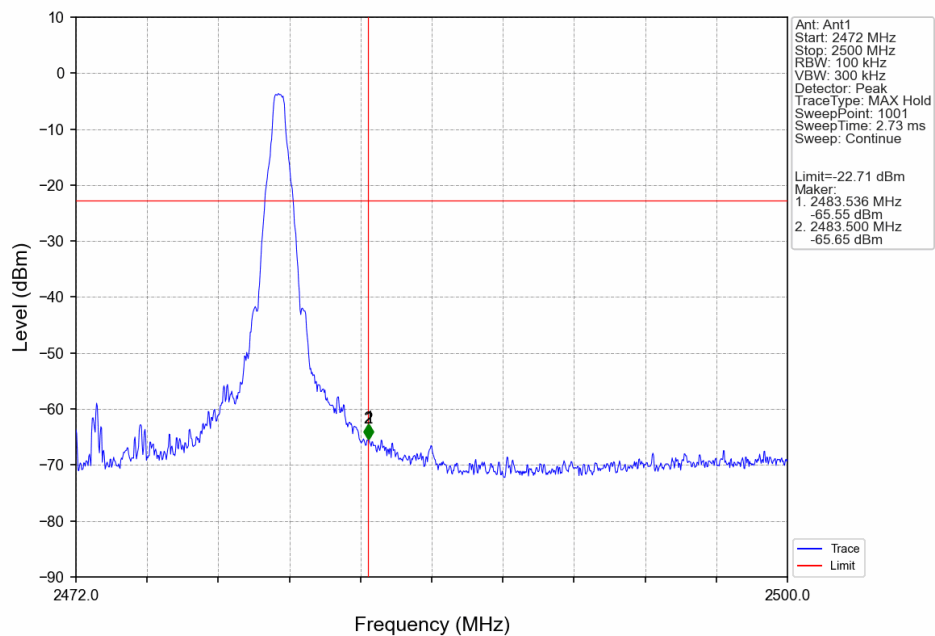


FCCID: 2A8SL-T13L

GFSK DH5 MCH 2441MHz Ant1 NTNV

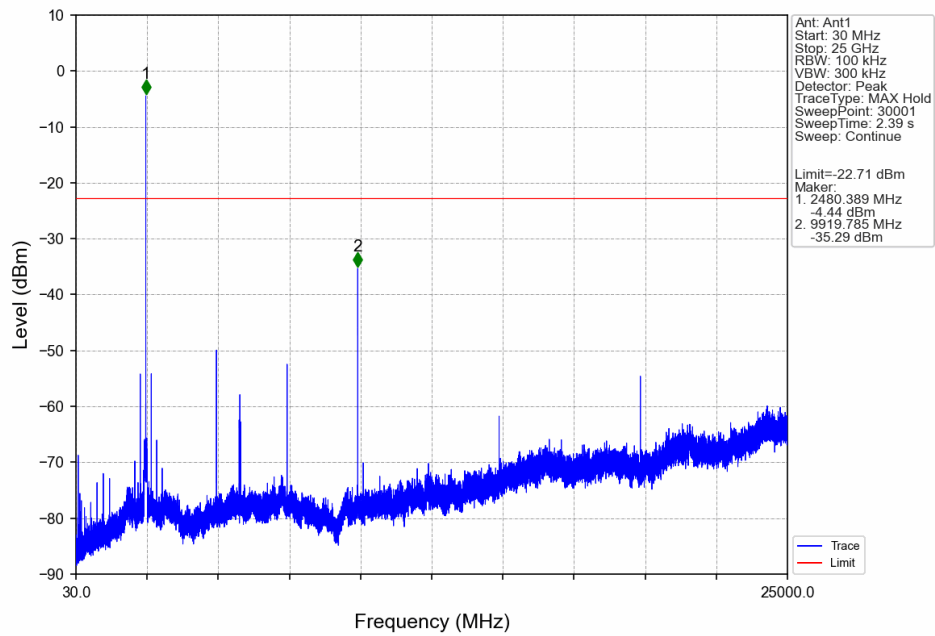


GFSK DH5 HCH 2480MHz Ant1 NTNV

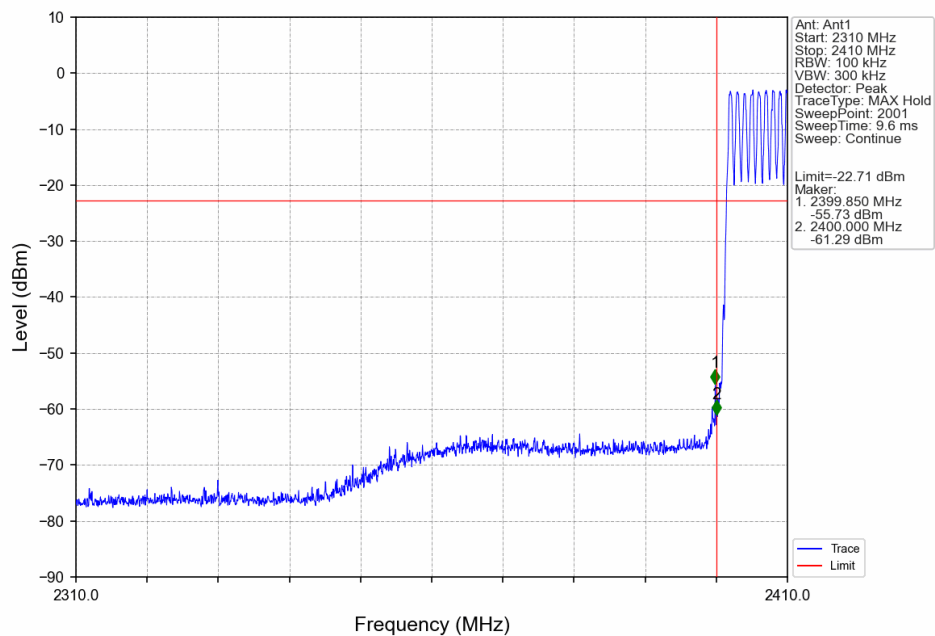


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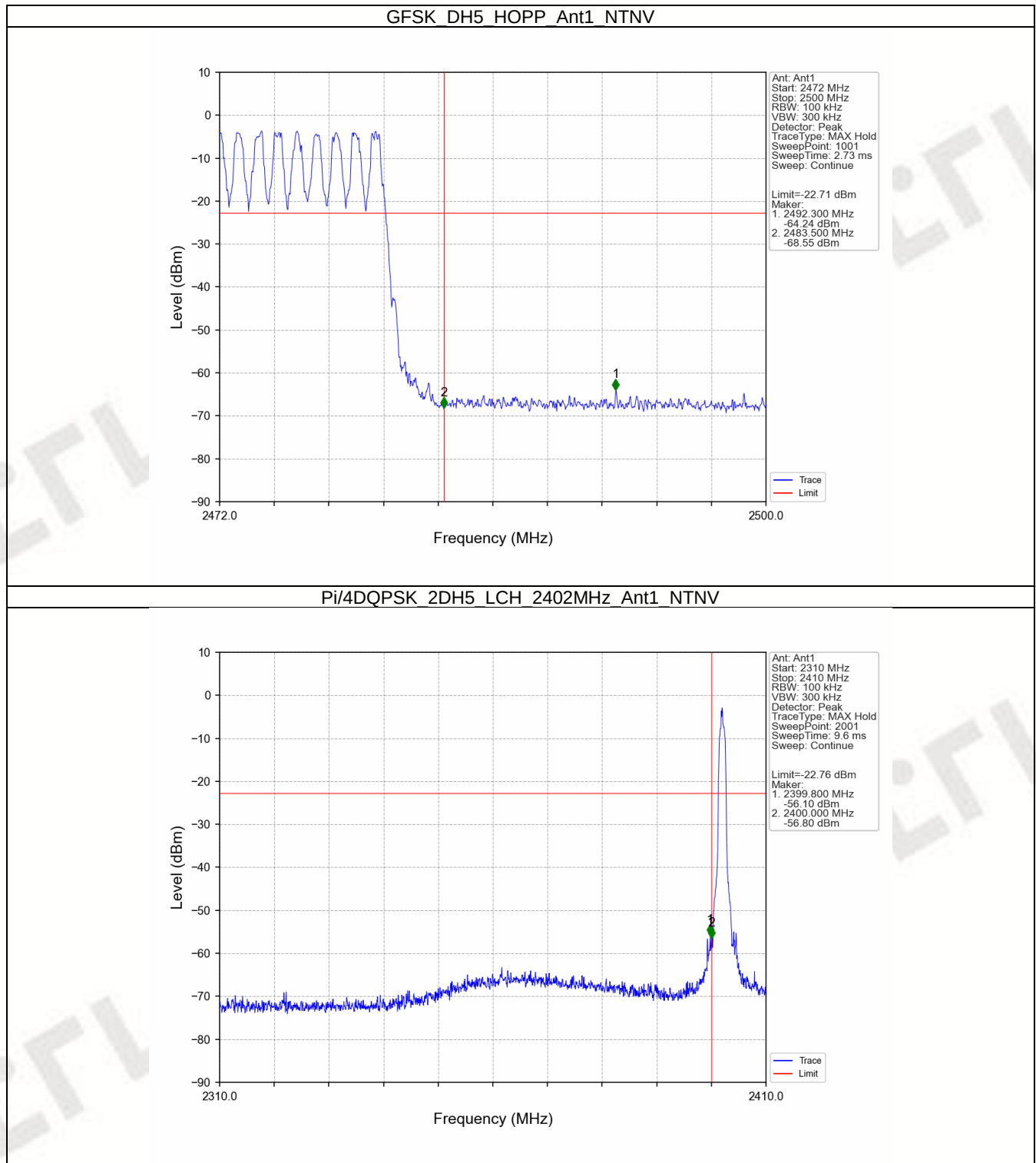
GFSK DH5 HCH 2480MHz Ant1 NTNV



GFSK DH5 HOPP Ant1 NTNV

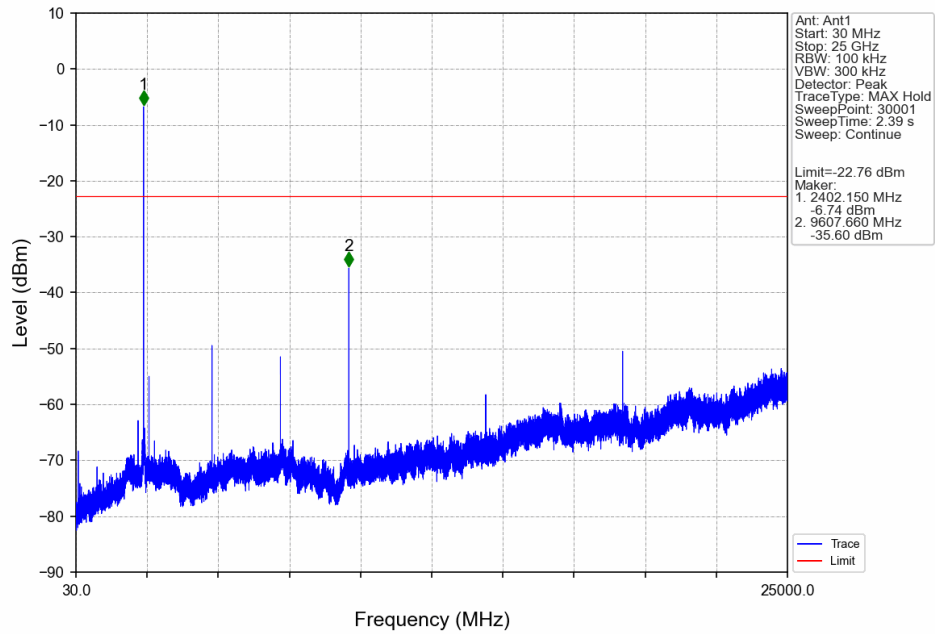


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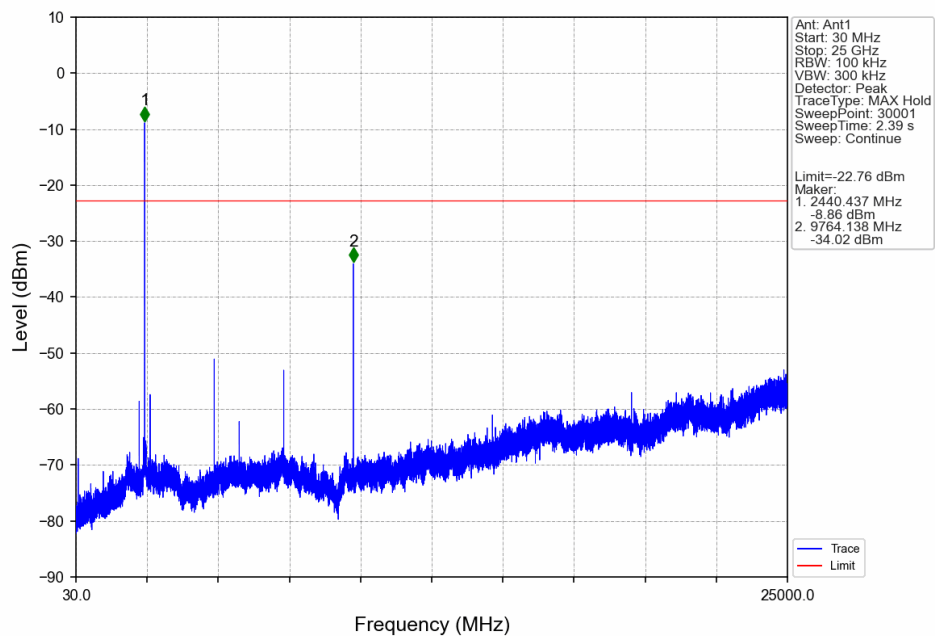


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Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN

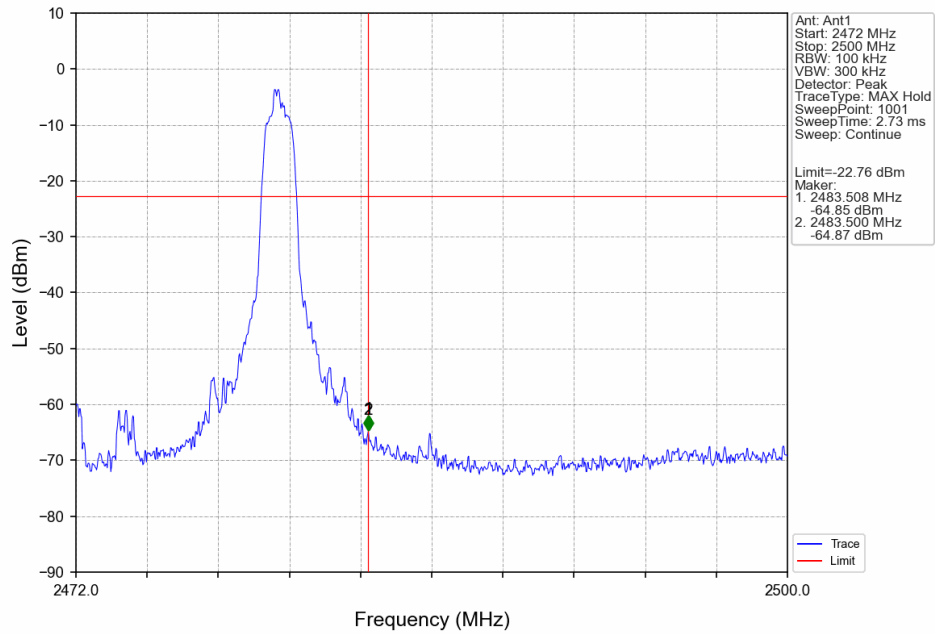


Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTN

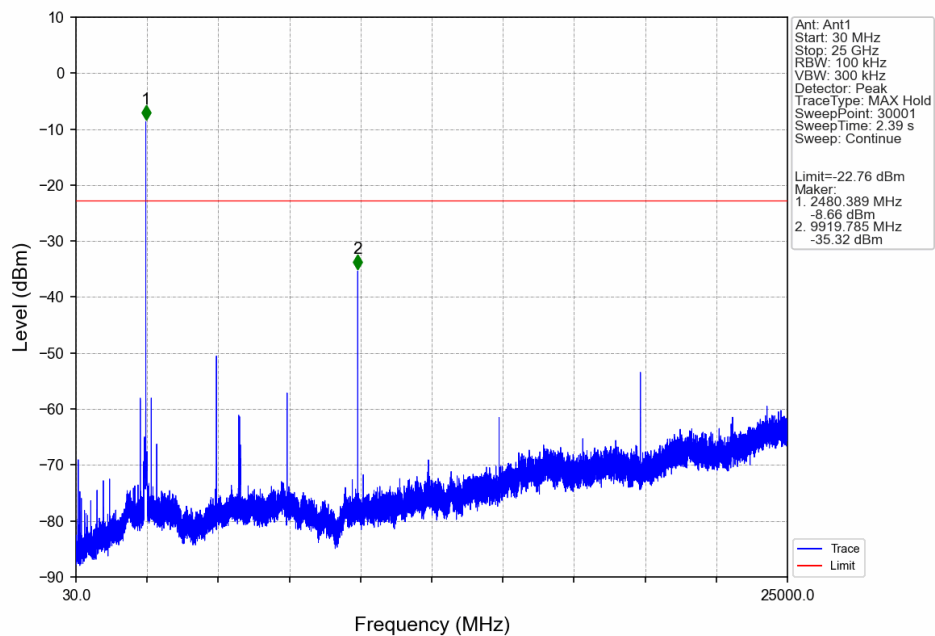


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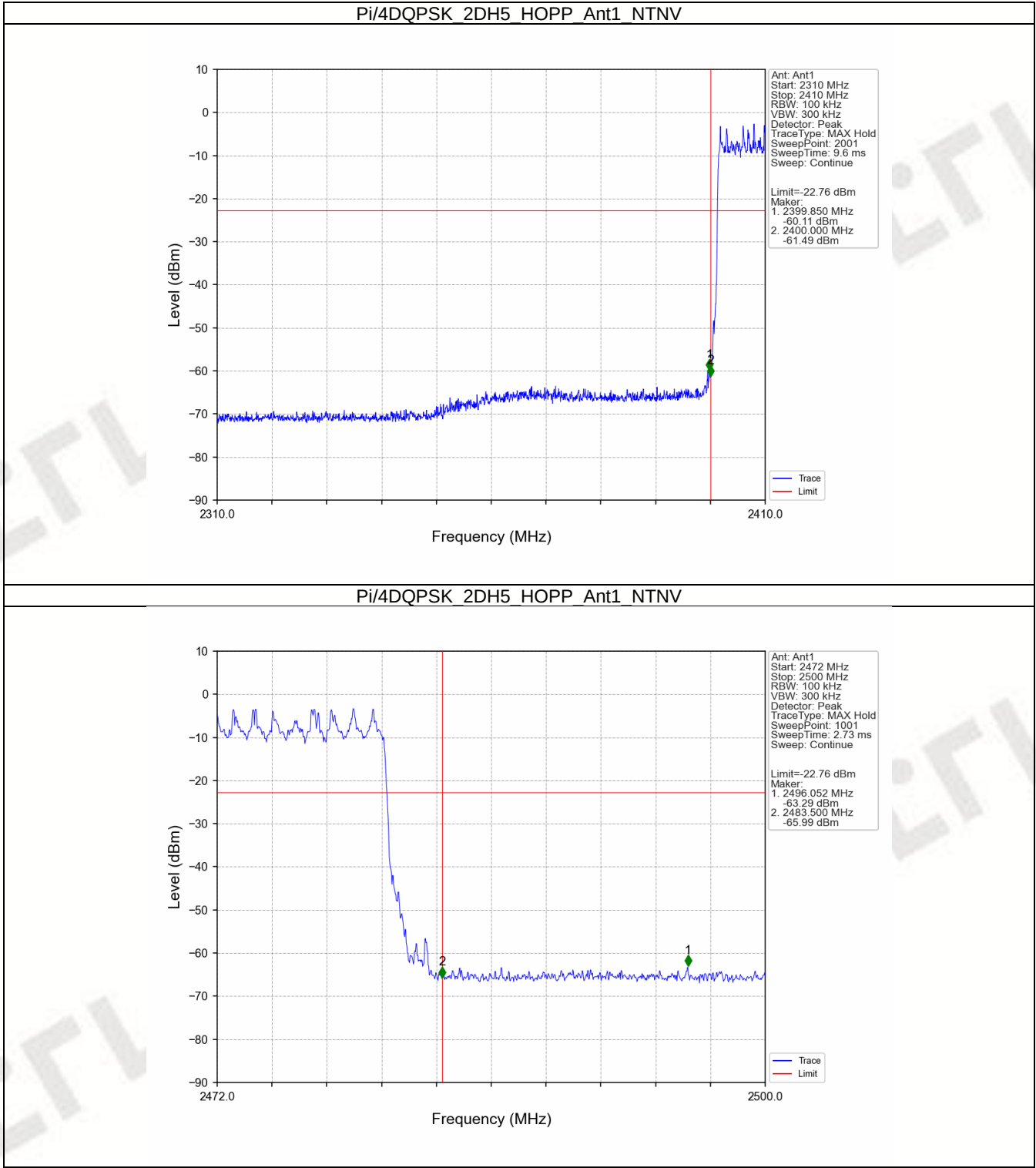
Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN



Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN

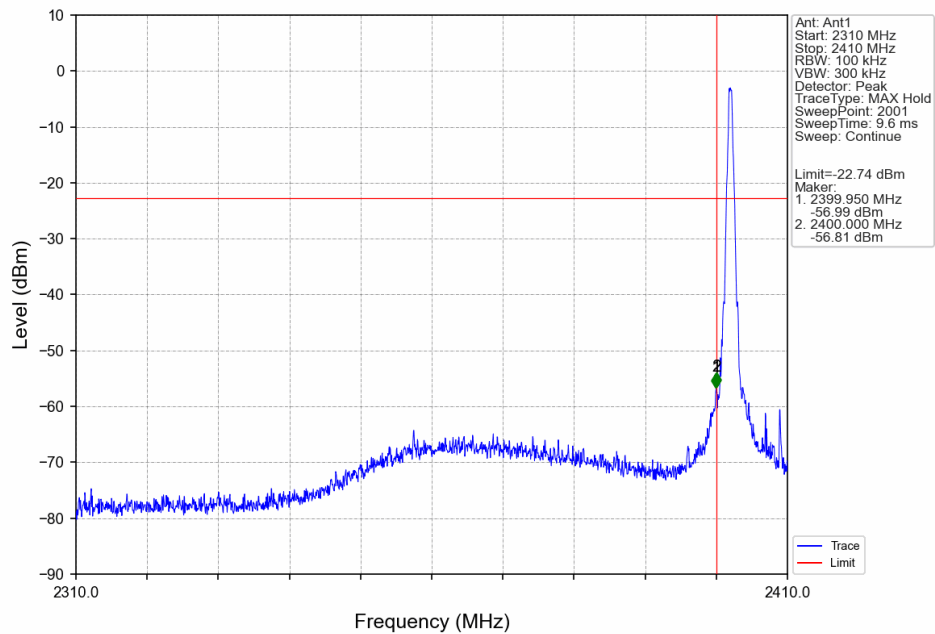


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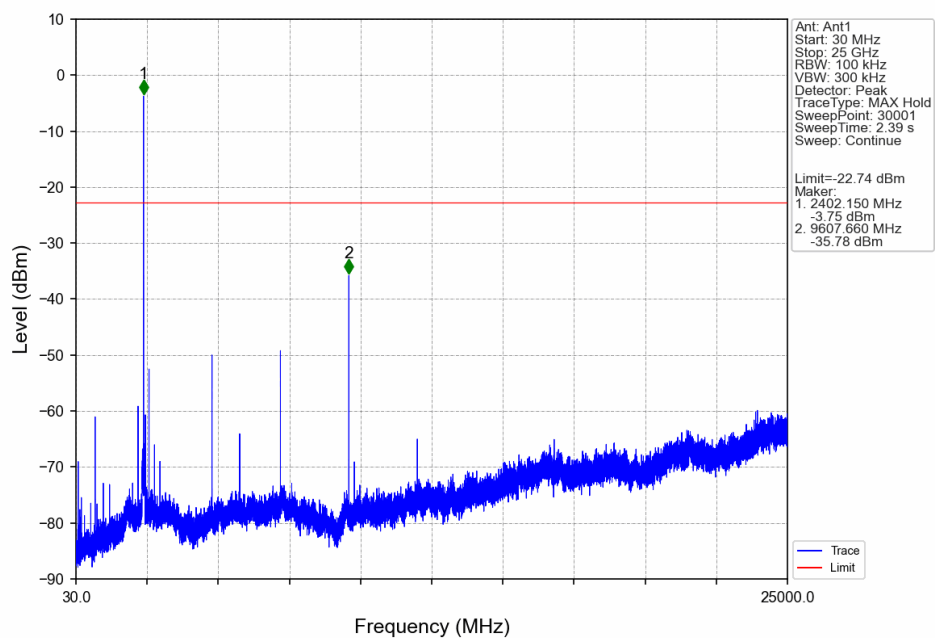


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8DPSK 3DH5 LCH 2402MHz Ant1 NTNV

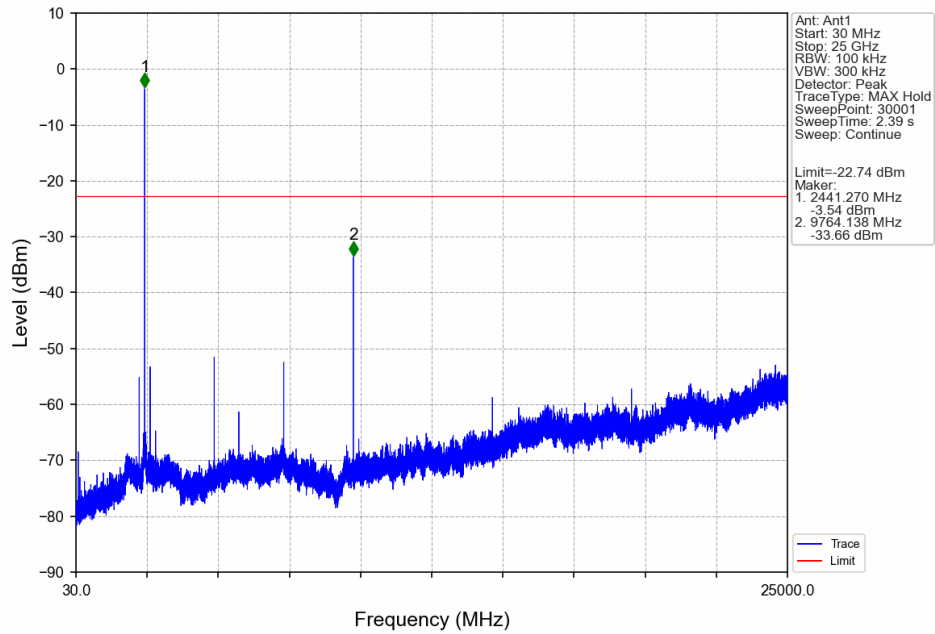


8DPSK 3DH5 LCH 2402MHz Ant1 NTNV

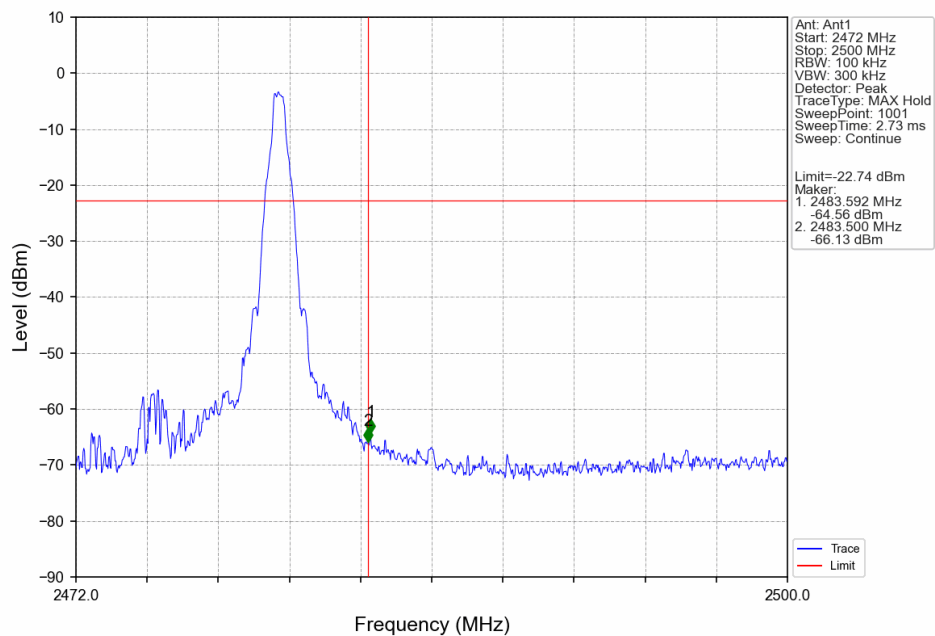


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8DPSK 3DH5 MCH 2441MHz Ant1 NTN

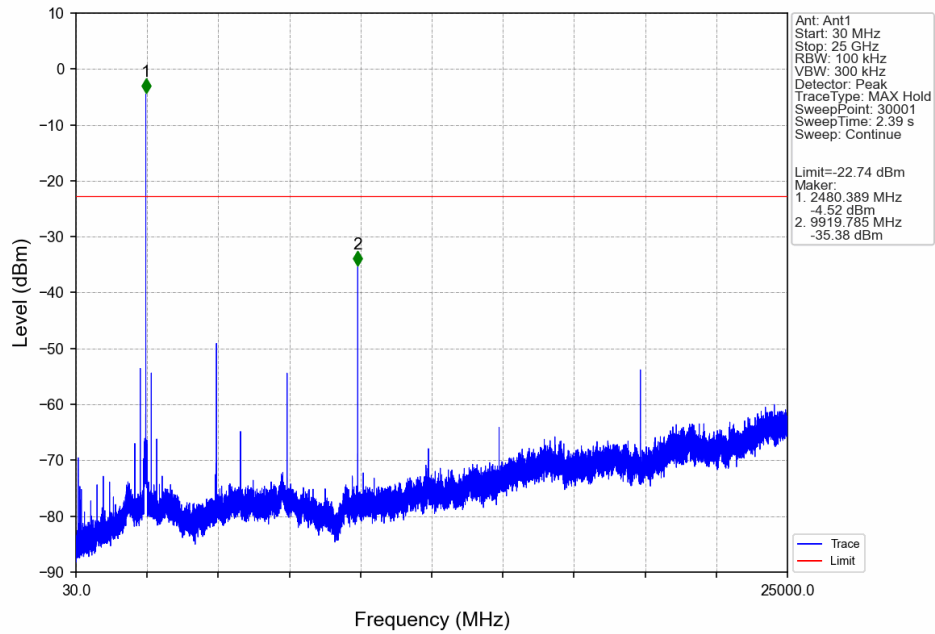


8DPSK 3DH5 HCH 2480MHz Ant1 NTN

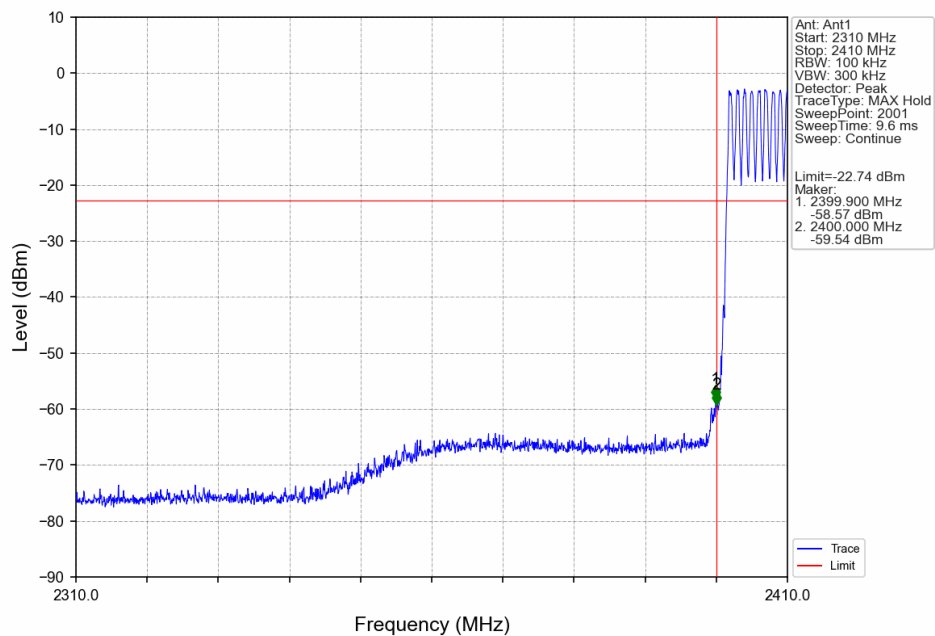


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8DPSK 3DH5 HCH 2480MHz Ant1 NTN



8DPSK 3DH5 HOPP Ant1 NTN



FCCID: 2A8SL-T13L

