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Annex for Bluetooth

Test Report No.: CTL2604152052-WF01

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FCC ID: 2A94J-CP027

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	0.868	/	Pass
		2441	DH5	1	0.869	/	Pass
		2480	DH5	1	0.869	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.168	/	Pass
		2441	2DH5	1	1.169	/	Pass
		2480	2DH5	1	1.171	/	Pass
8DPSK	SISO	2402	3DH5	1	1.177	/	Pass
		2441	3DH5	1	1.175	/	Pass
		2480	3DH5	1	1.177	/	Pass

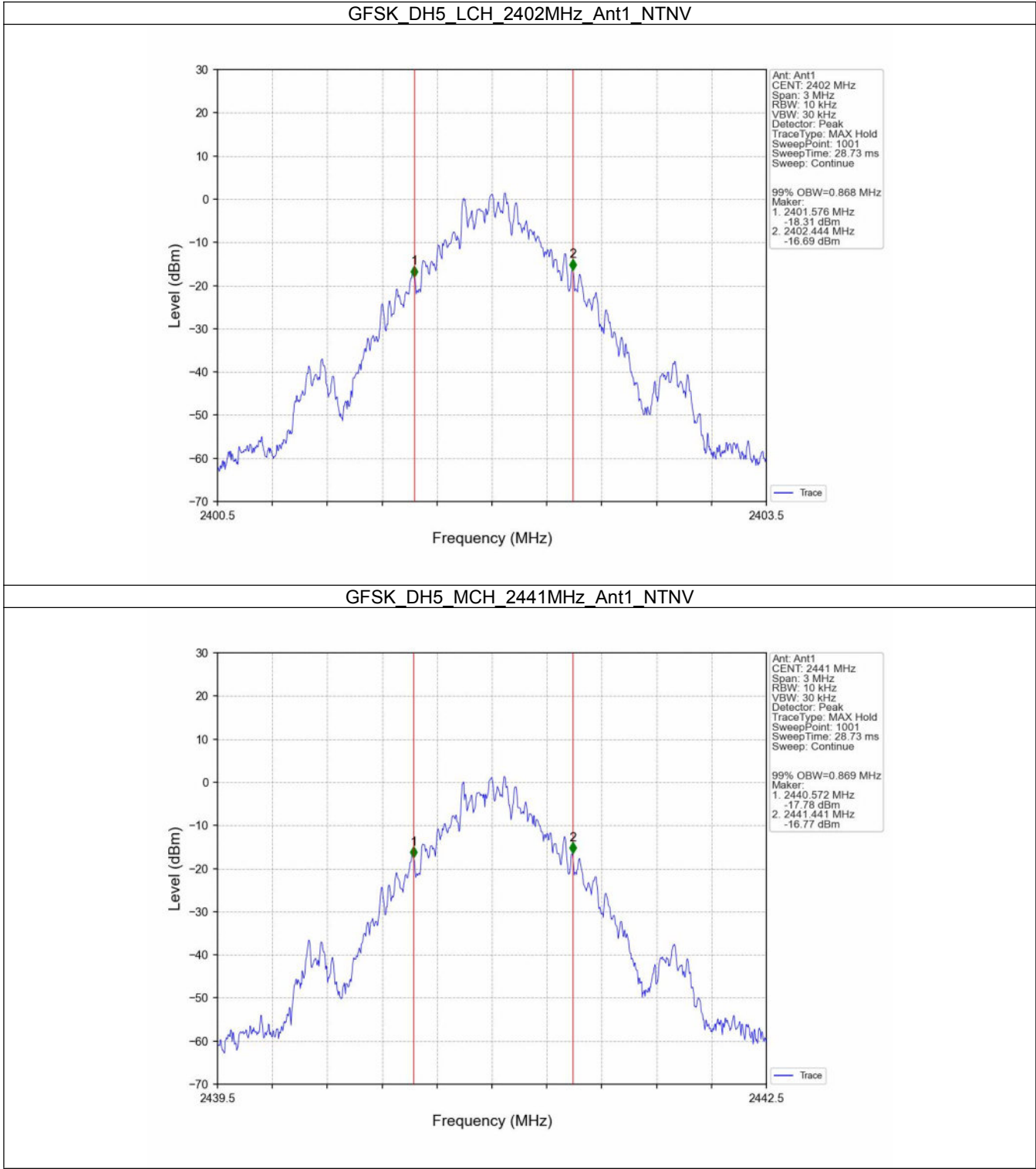
1.1.2 20dB BW

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	1.107	/	Pass
		2441	DH5	1	1.108	/	Pass
		2480	DH5	1	1.108	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.366	/	Pass
		2441	2DH5	1	1.366	/	Pass
		2480	2DH5	1	1.363	/	Pass
8DPSK	SISO	2402	3DH5	1	1.371	/	Pass
		2441	3DH5	1	1.371	/	Pass
		2480	3DH5	1	1.364	/	Pass

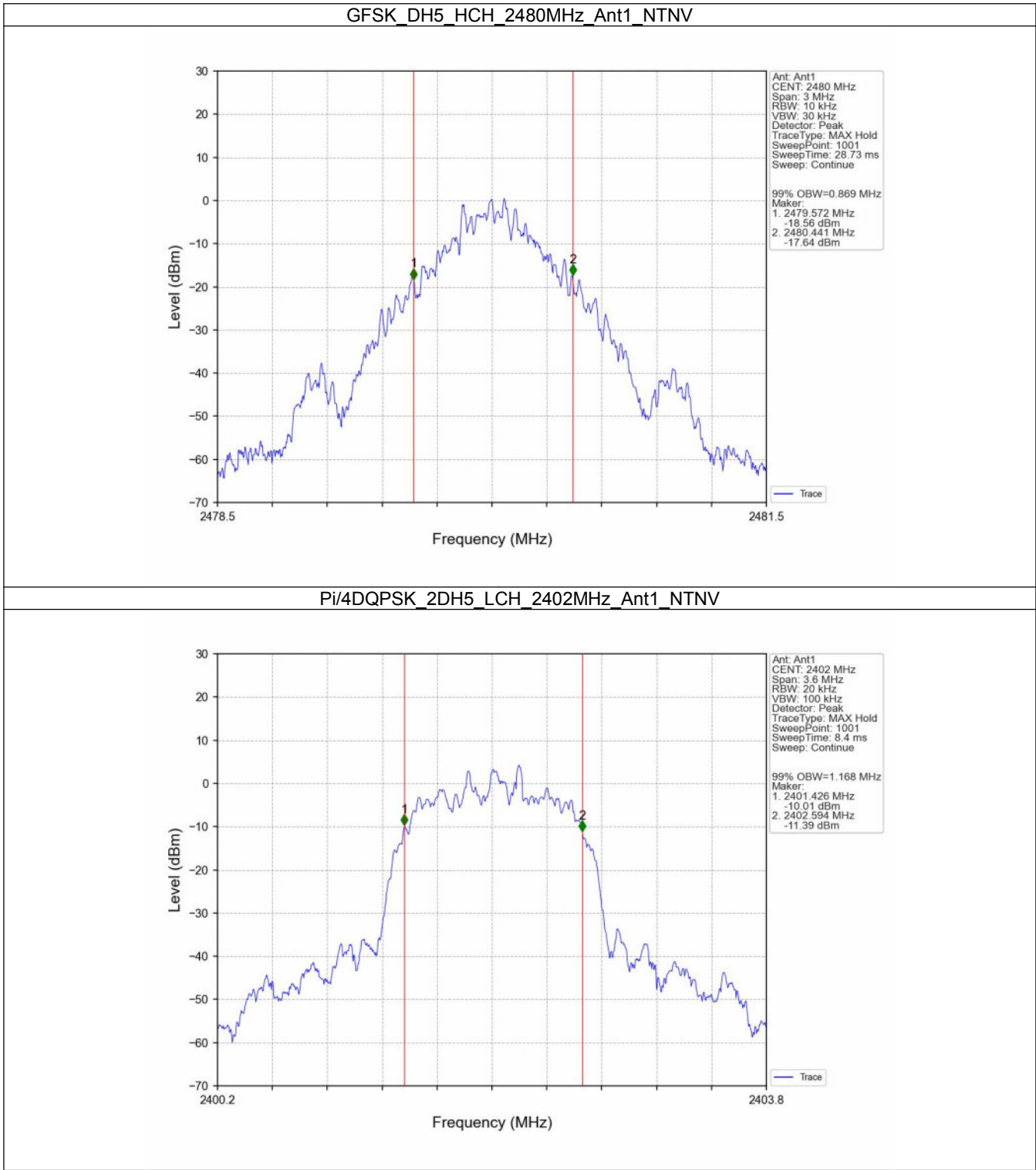
FCC ID: 2A94J-CP027

1.2 Test Graph

1.2.1 OBW

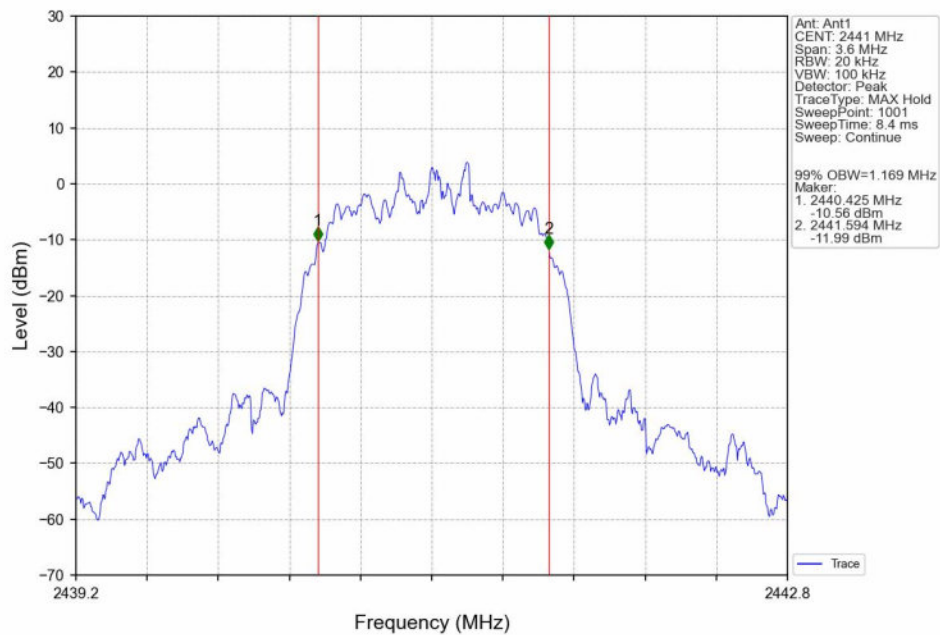


FCC ID: 2A94J-CP027

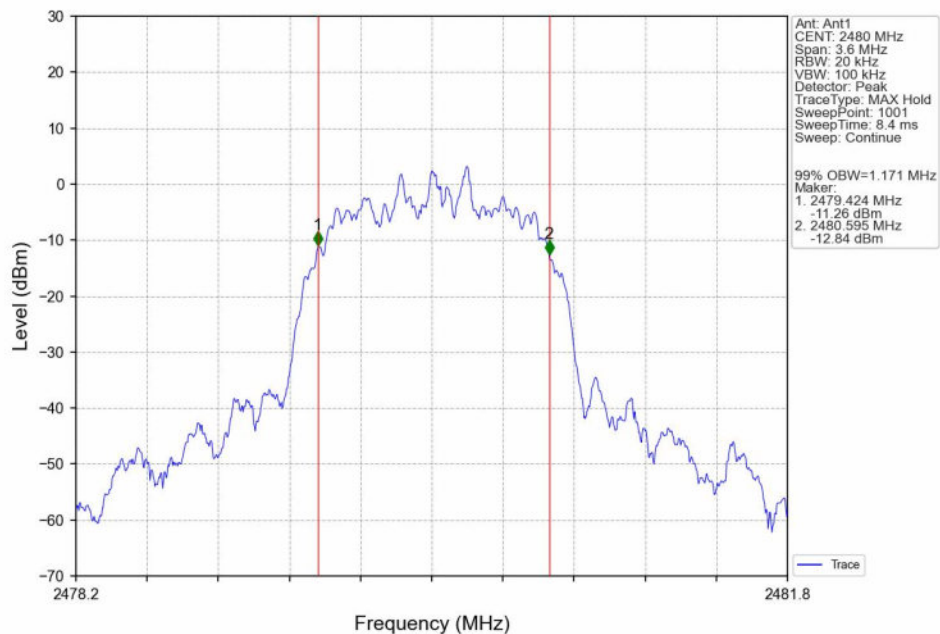


FCC ID: 2A94J-CP027

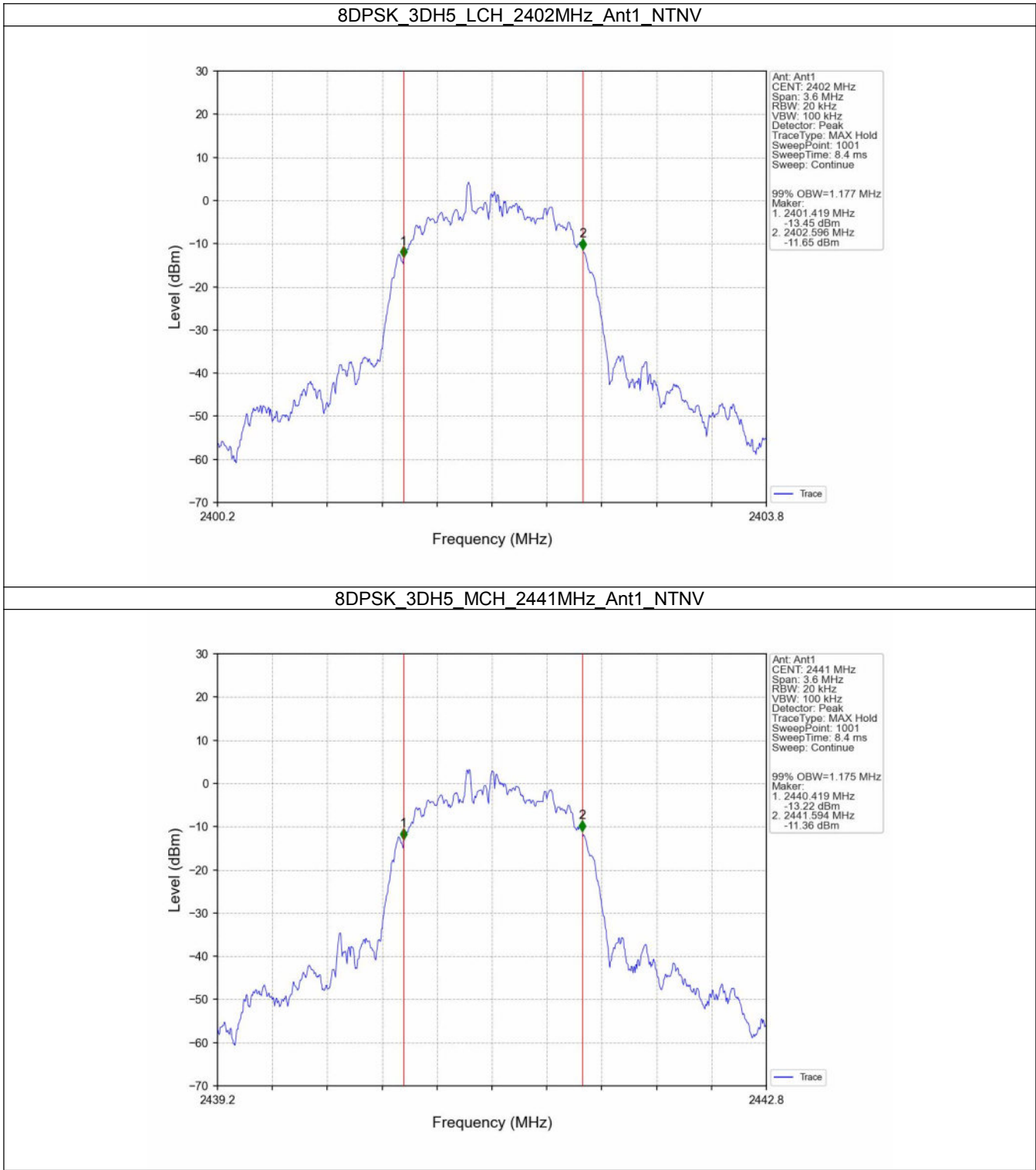
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



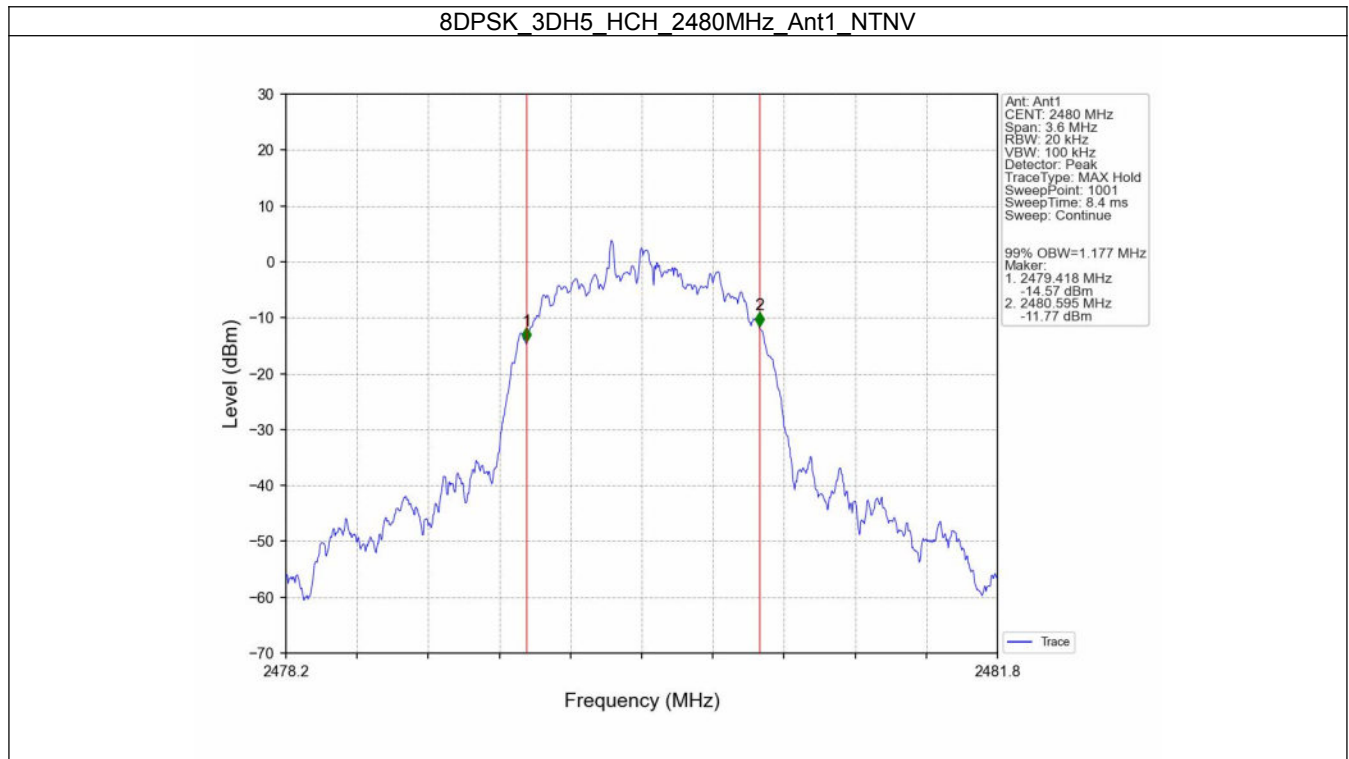
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



FCC ID: 2A94J-CP027

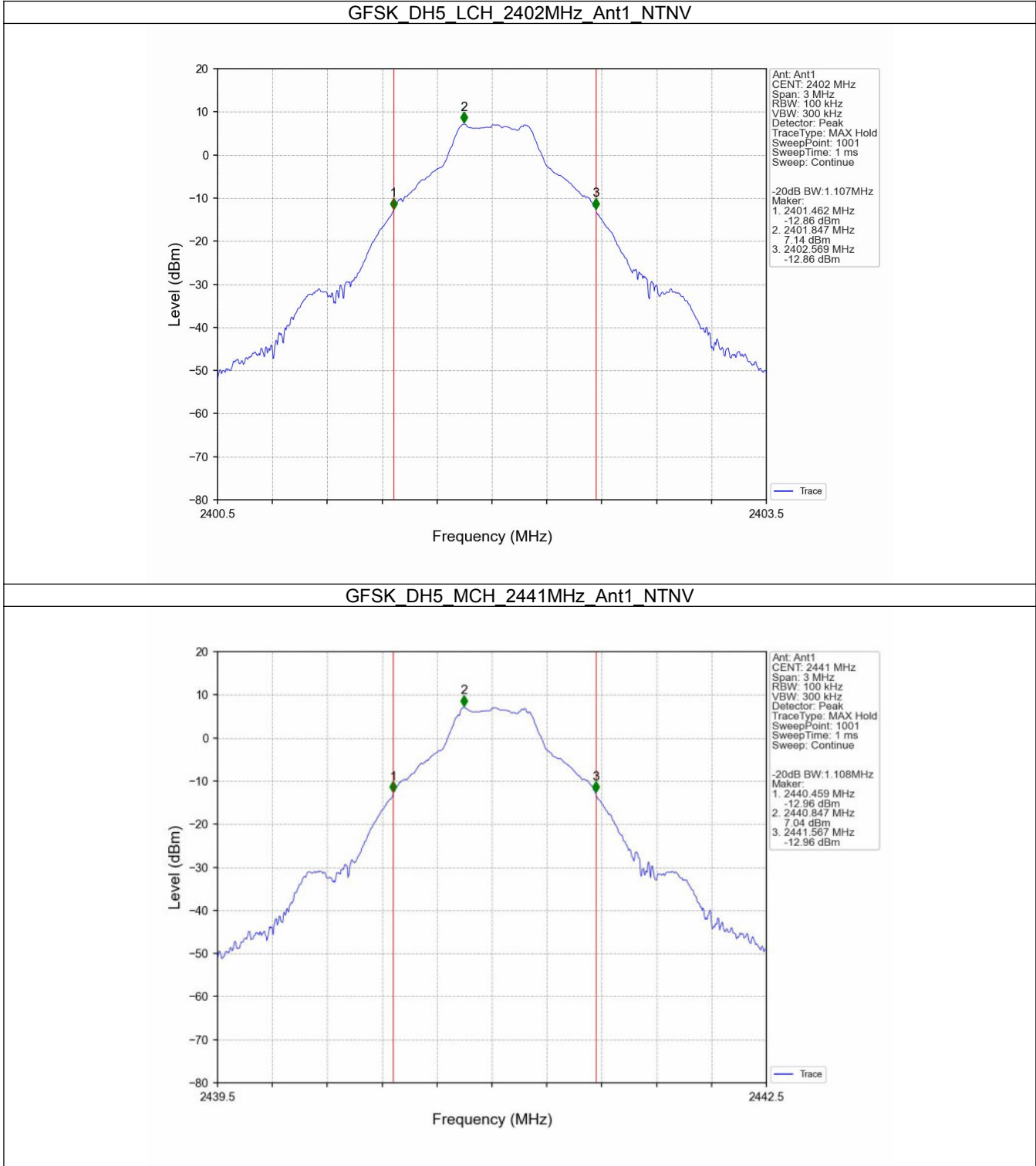


FCC ID: 2A94J-CP027



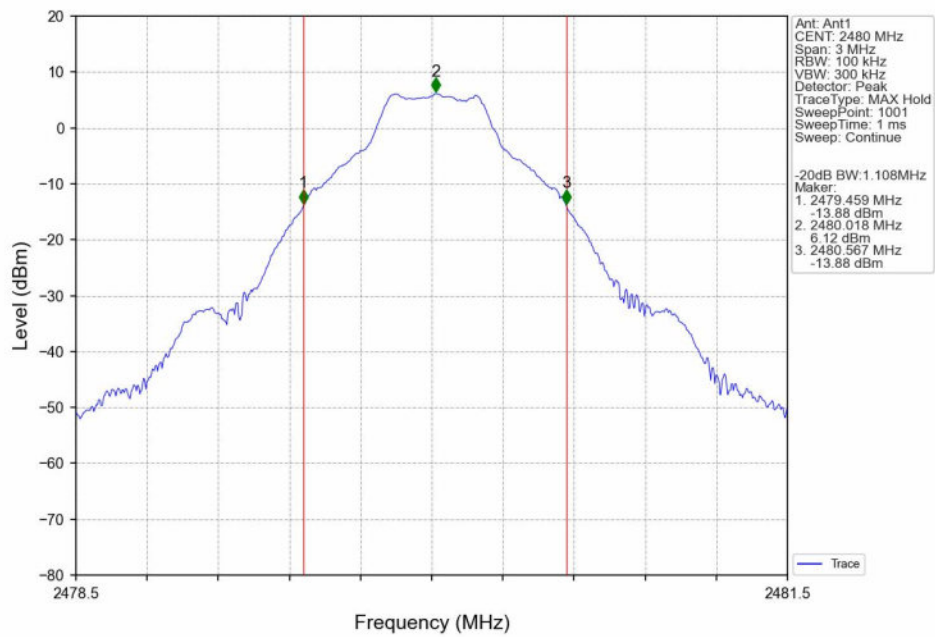
FCC ID: 2A94J-CP027

1.2.2 20dB BW

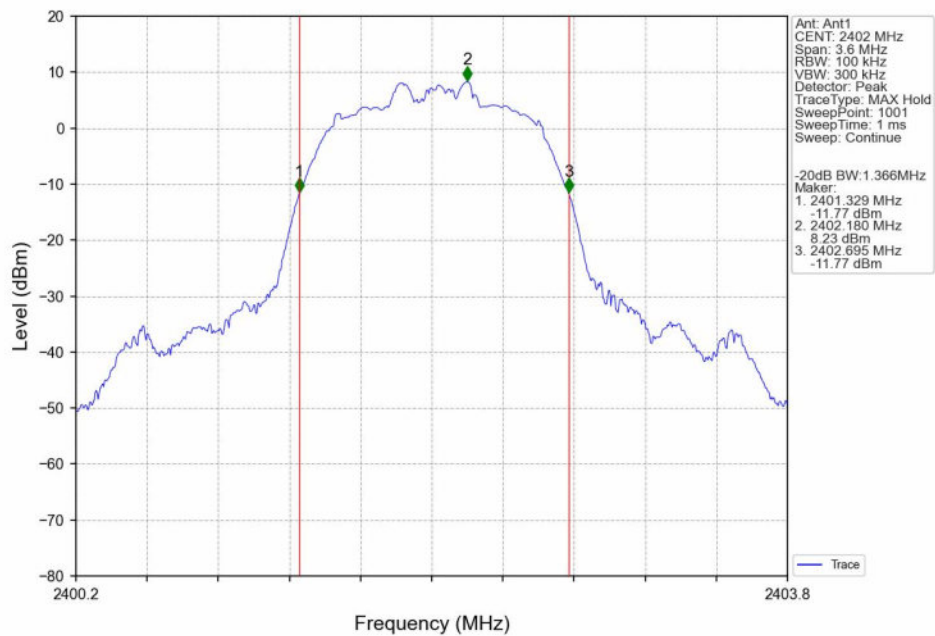


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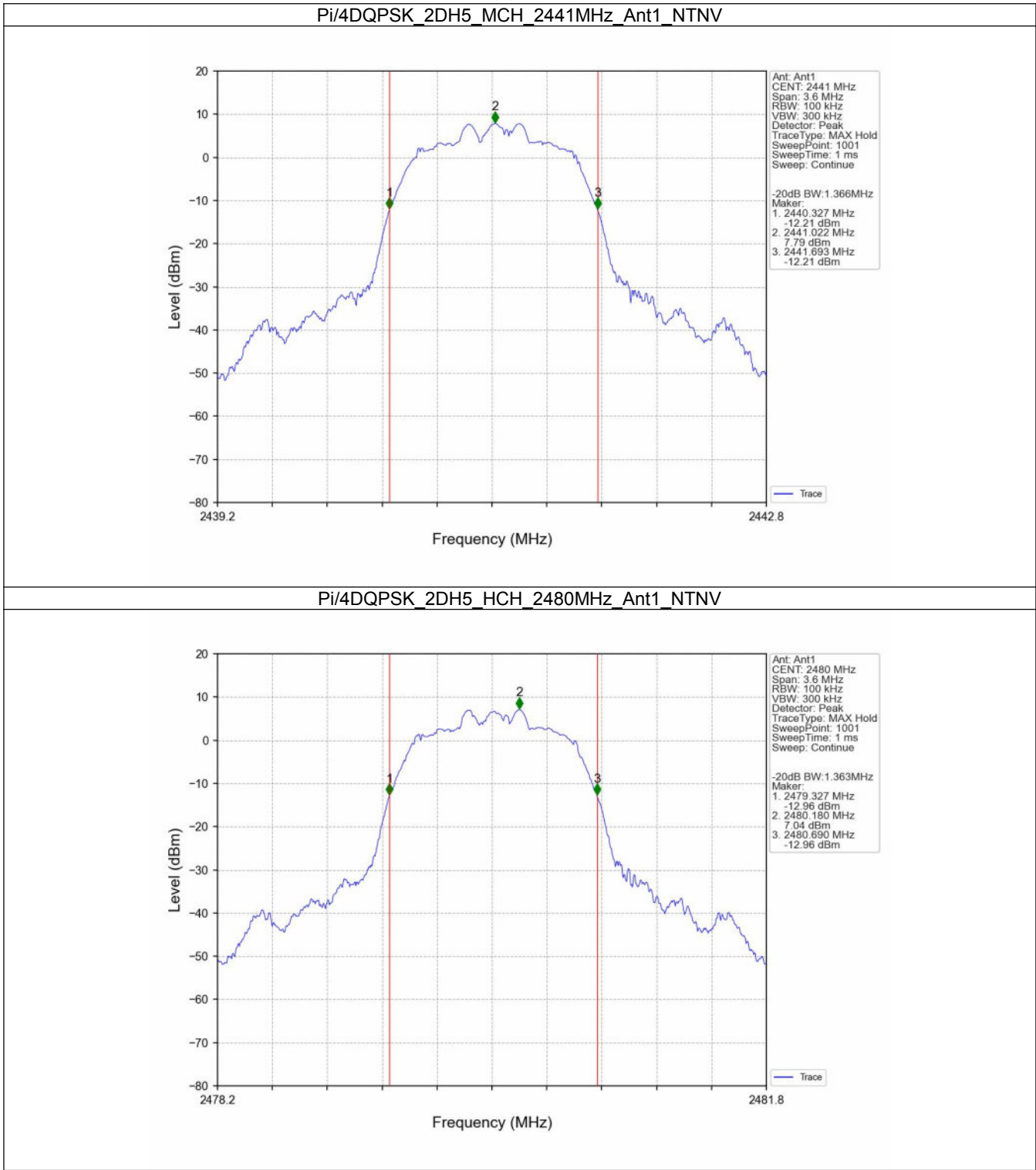
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



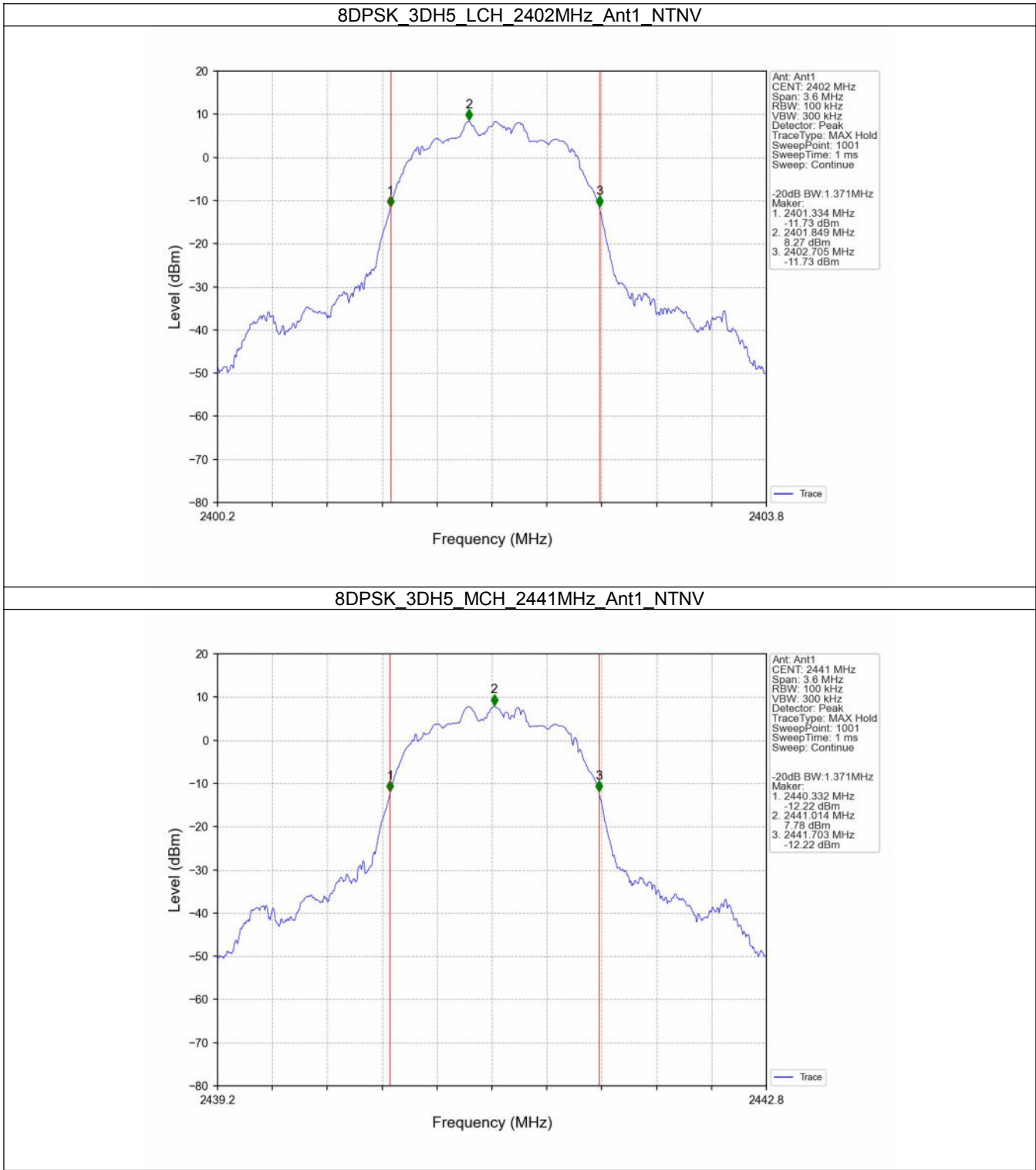
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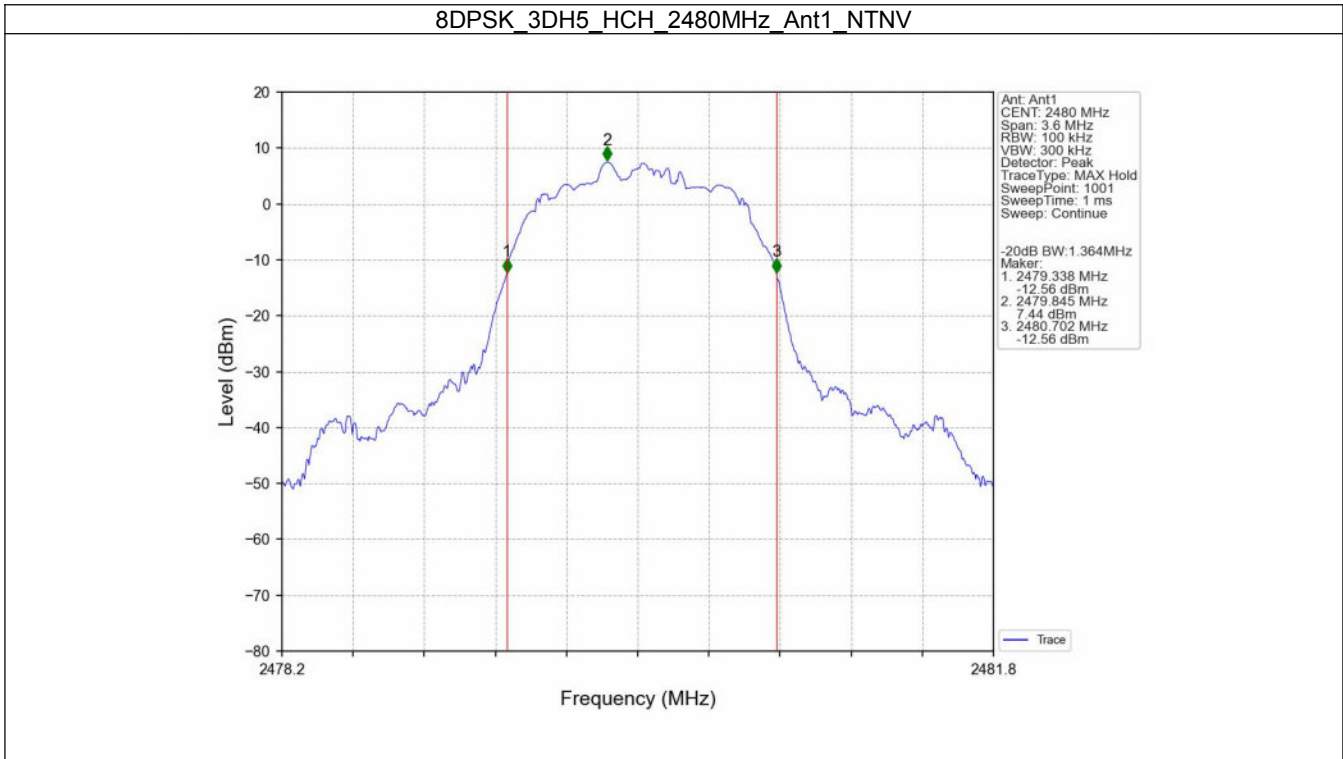
FCC ID: 2A94J-CP027



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2. Maximum Conducted Output Power

2.1 Test Result

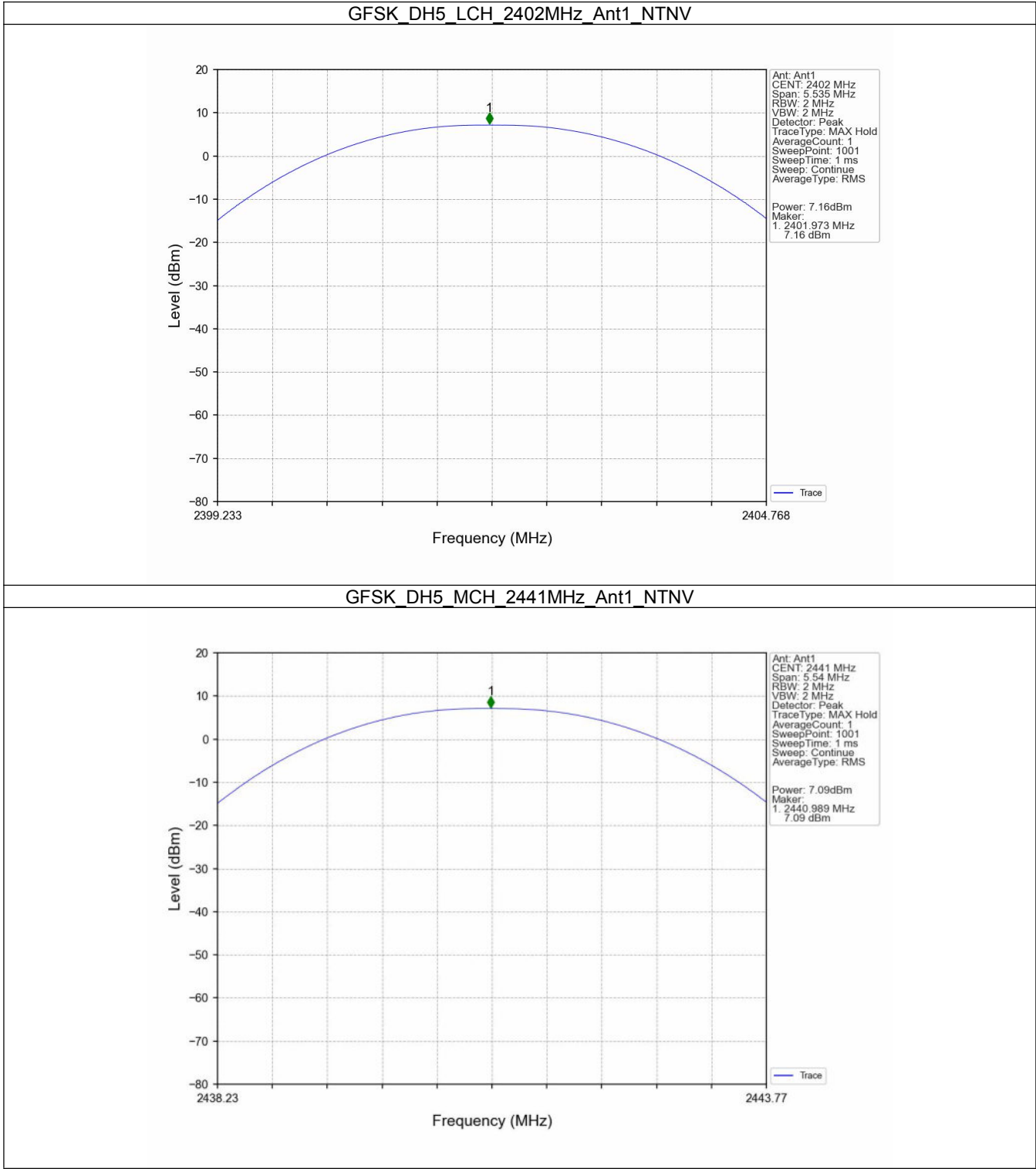
2.1.1 Power

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	7.16	<=20.97	Pass
		2441	DH5	7.09	<=20.97	Pass
		2480	DH5	6.18	<=20.97	Pass
Pi/4DQPSK	SISO	2402	2DH5	9.60	<=20.97	Pass
		2441	2DH5	9.15	<=20.97	Pass
		2480	2DH5	8.44	<=20.97	Pass
8DPSK	SISO	2402	3DH5	10.14	<=20.97	Pass
		2441	3DH5	9.63	<=20.97	Pass
		2480	3DH5	9.29	<=20.97	Pass
Note1: Antenna Gain: Ant1: -3.68dBi; Note2: RF Cable loss=0.5dB Note3: The test results include RF Cable loss.						

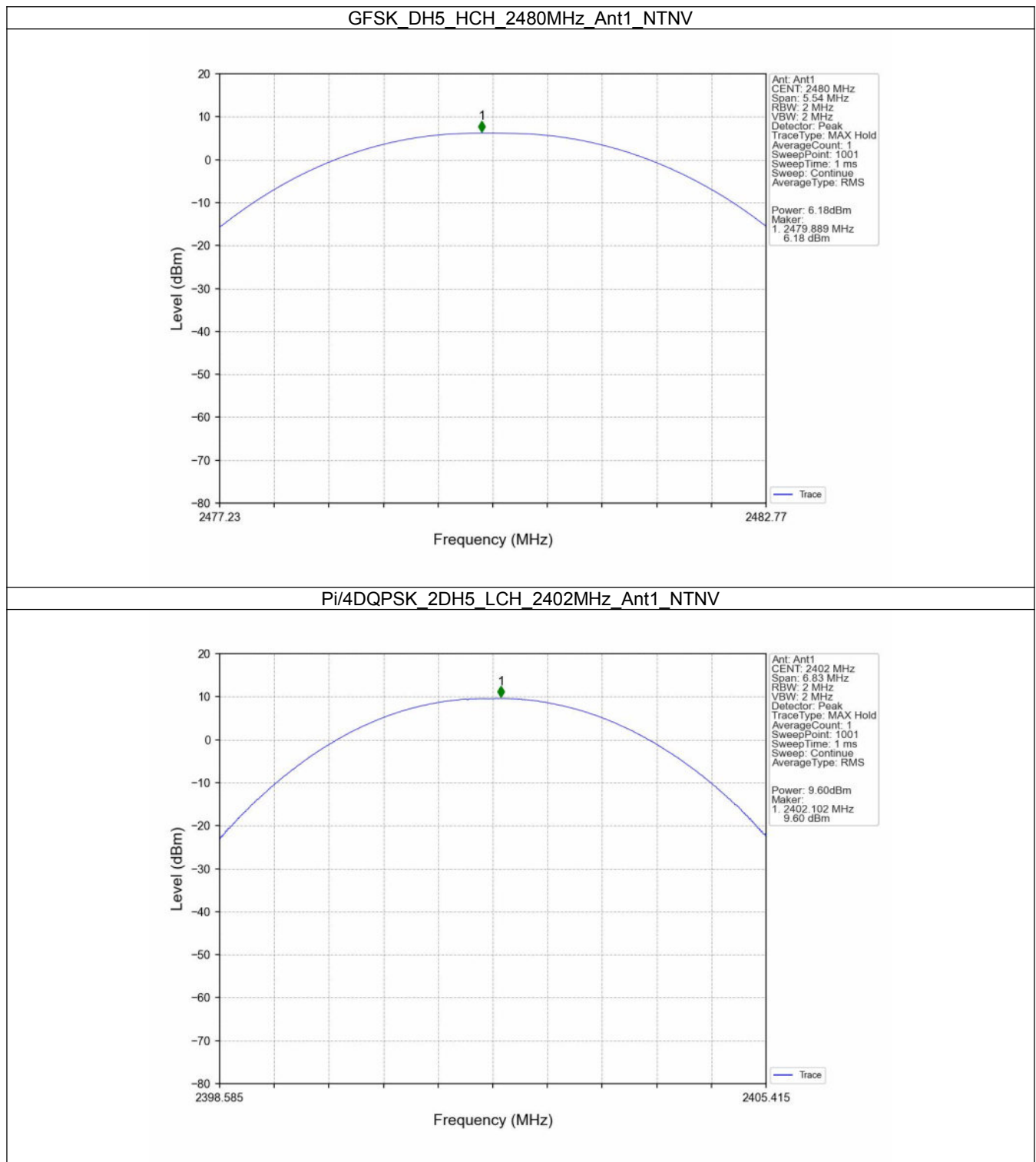
FCC ID: 2A94J-CP027

2.2 Test Graph

2.2.1 Power

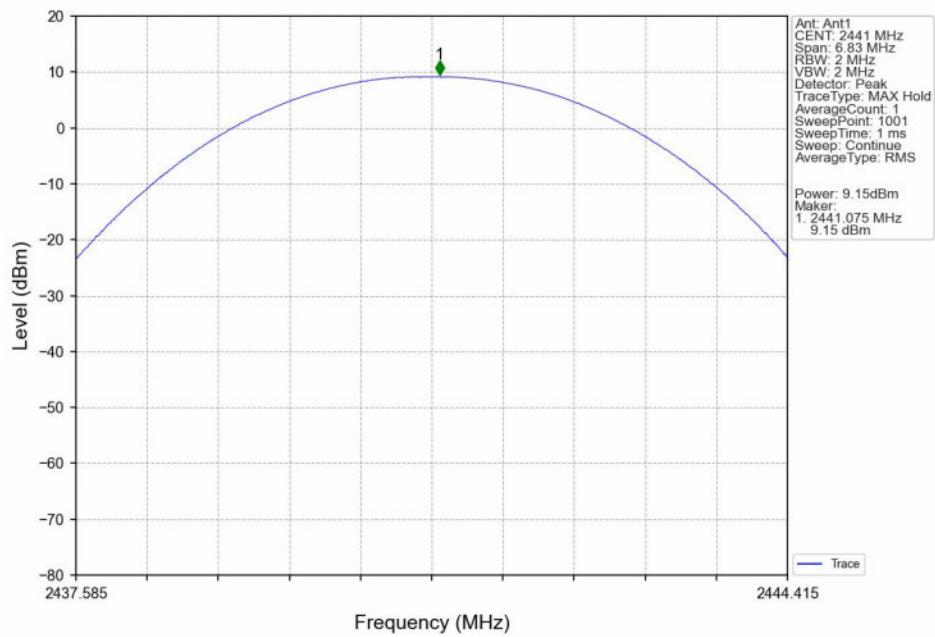


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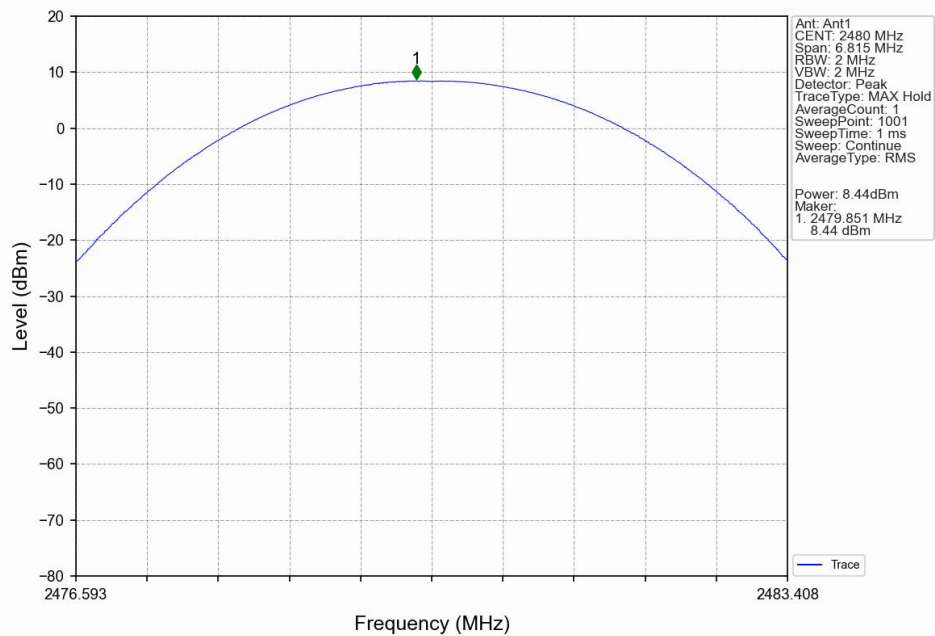


FCC ID: 2A94J-CP027

Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV

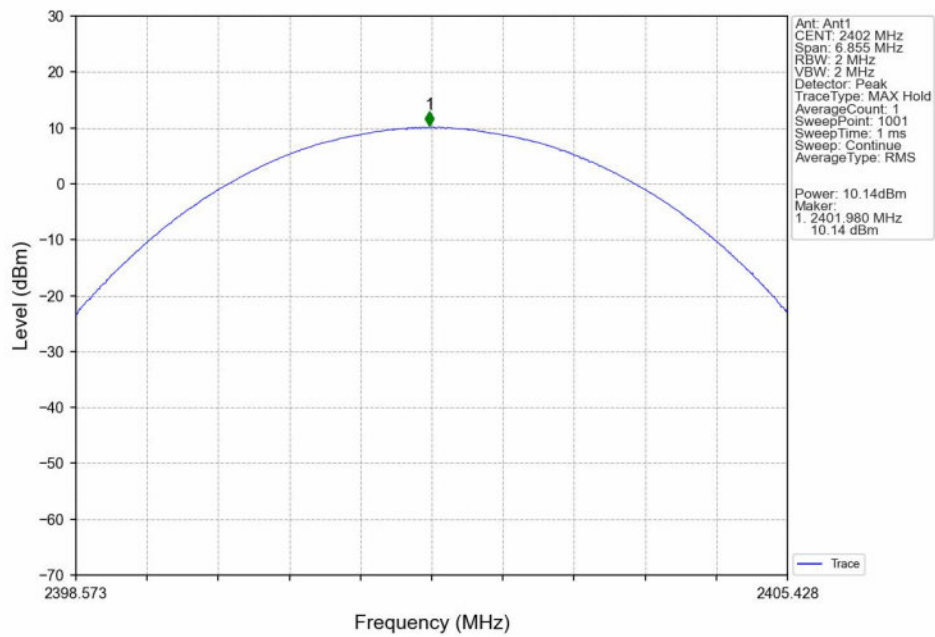


Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV

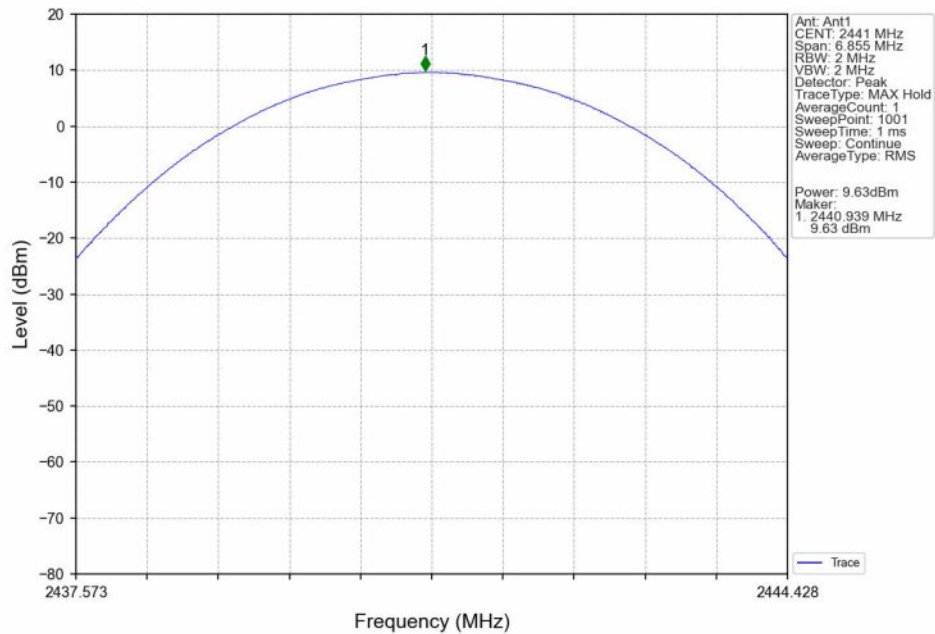


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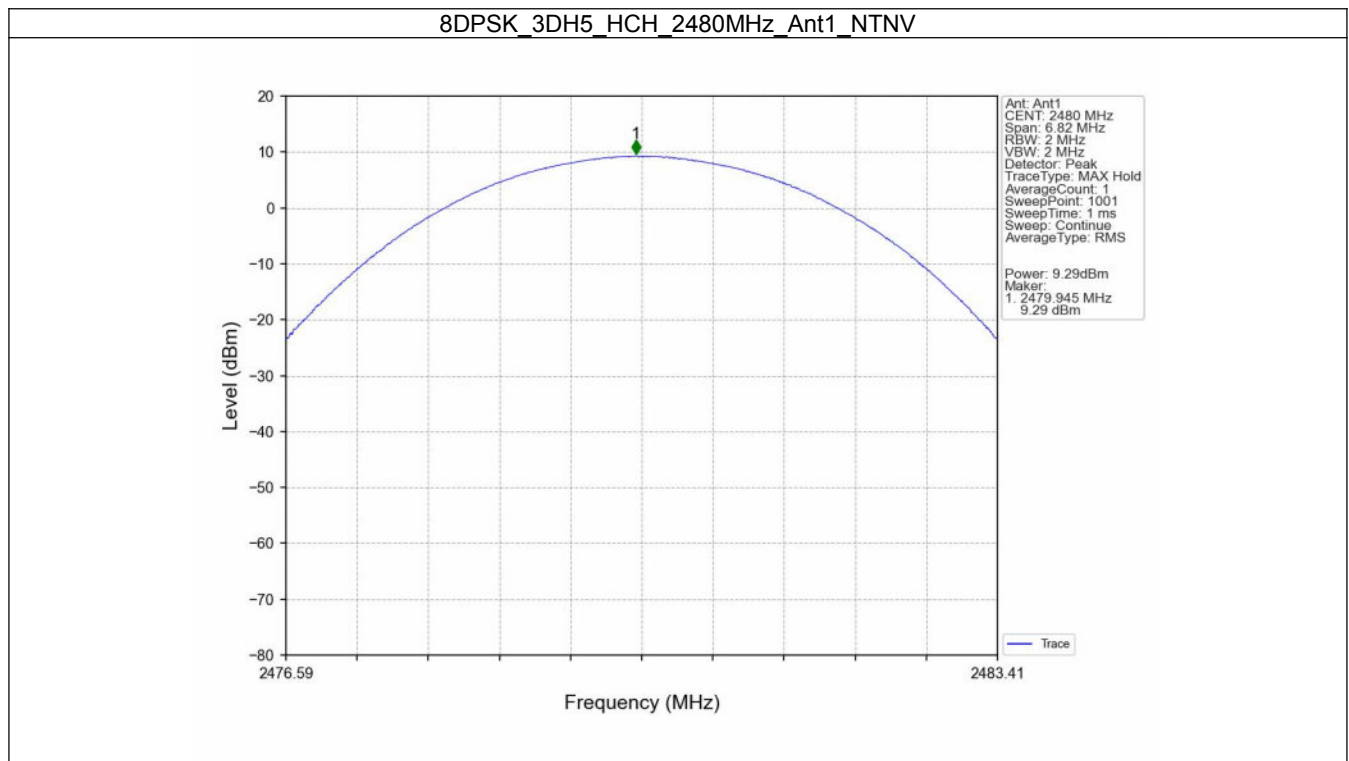
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



FCC ID: 2A94J-CP027



FCC ID: 2A94J-CP027

3. Carrier Frequency Separation

3.1 Test Result

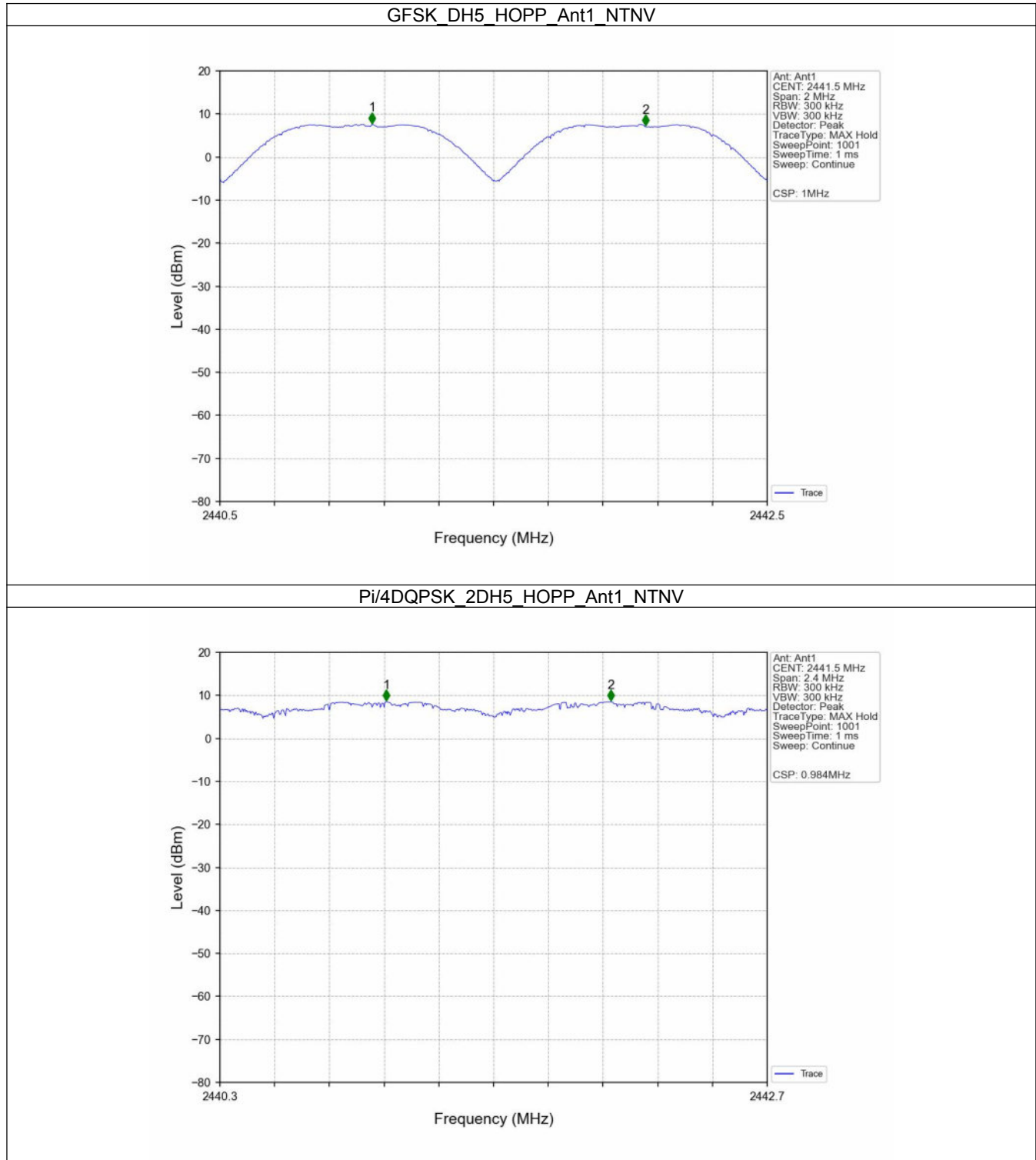
3.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.000	1.108	≥ 0.739	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	0.984	1.366	≥ 0.911	Pass
8DPSK	SISO	HOPP	3DH5	0.962	1.371	≥ 0.914	Pass

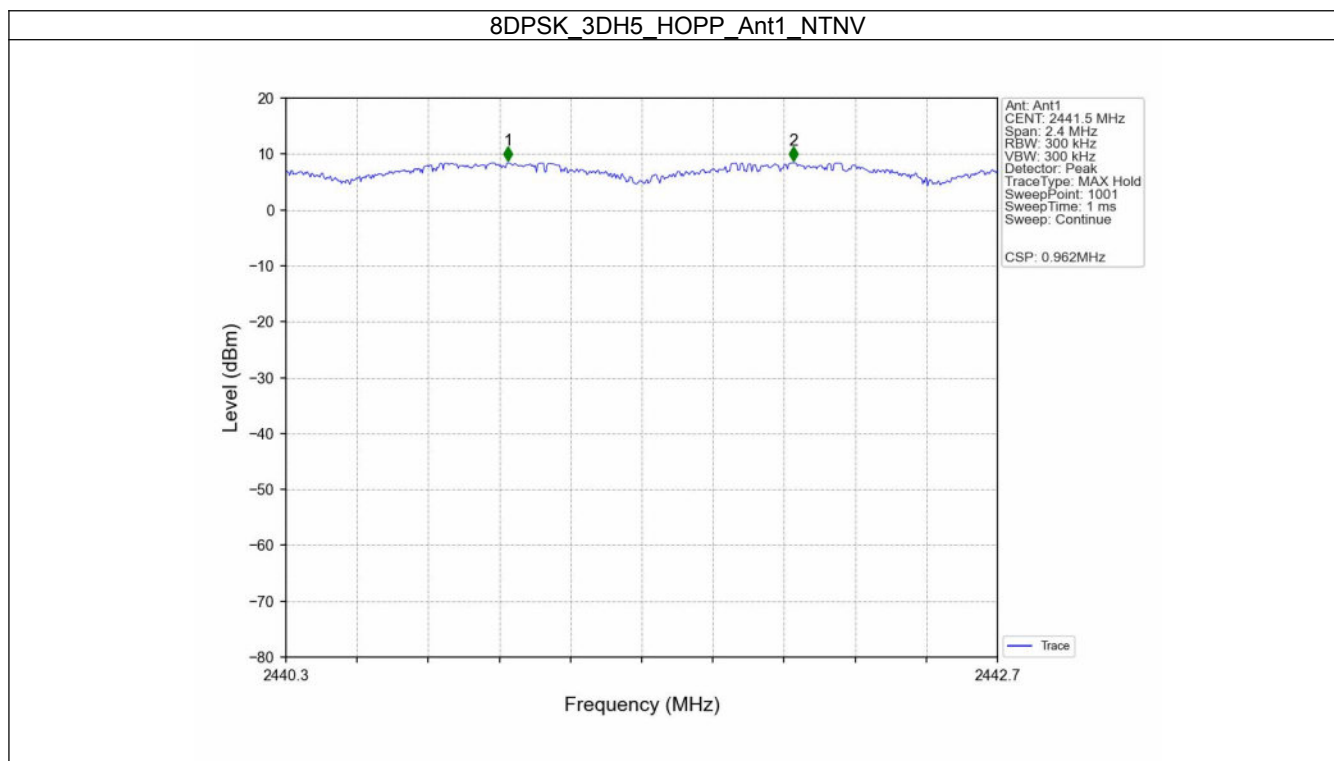
FCC ID: 2A94J-CP027

3.2 Test Graph

3.2.1 Ant1



FCC ID: 2A94J-CP027



FCC ID: 2A94J-CP027

4. Number of Hopping Frequencies

4.1 Test Result

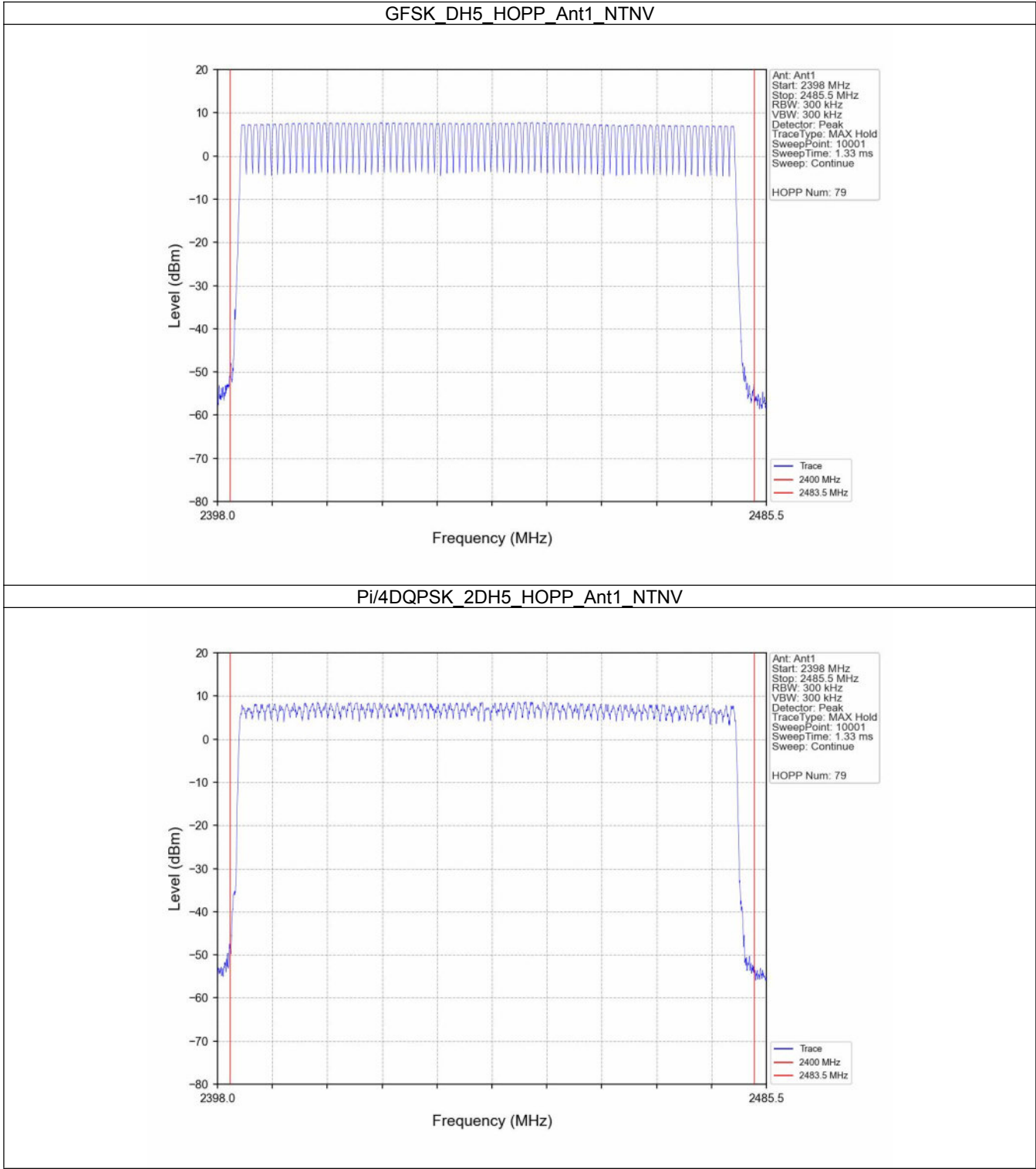
4.1.1 HoppNum

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

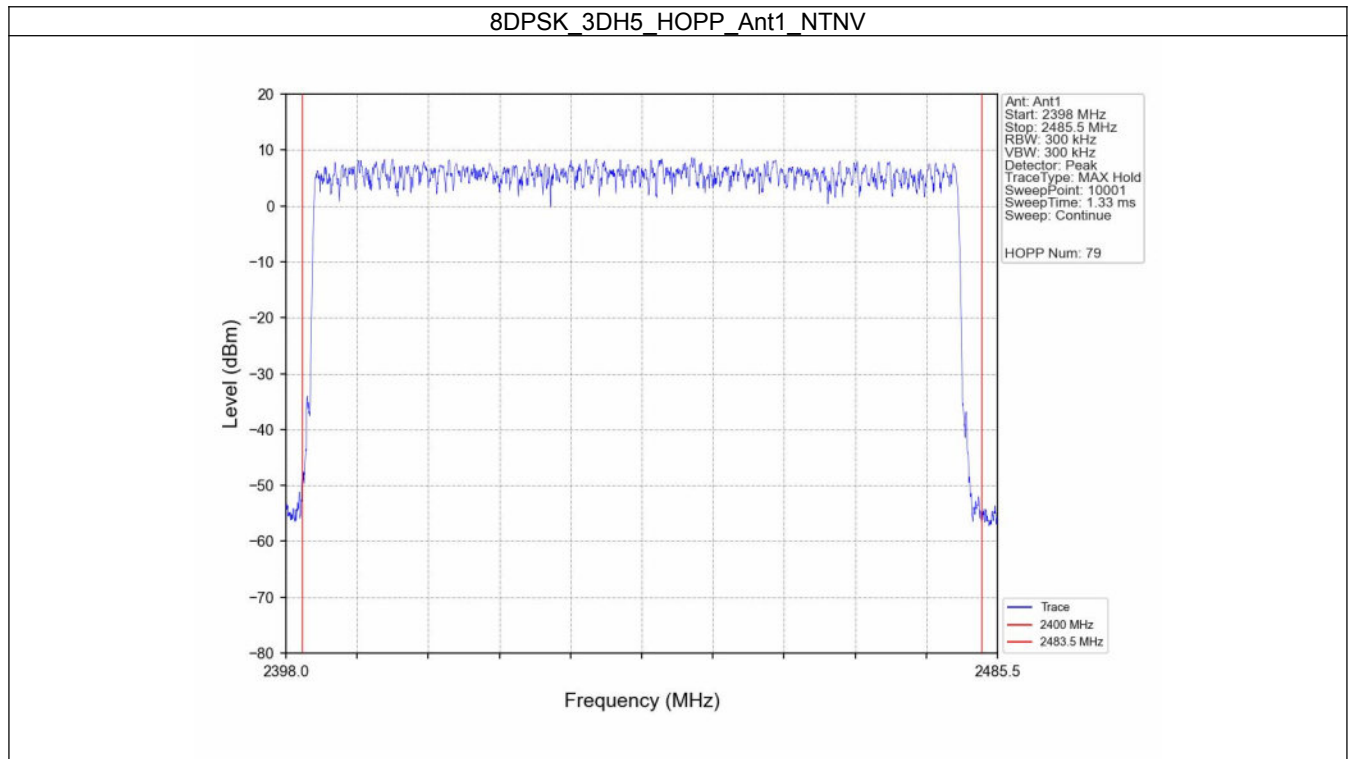
FCC ID: 2A94J-CP027

4.2 Test Graph

4.2.1 HoppNum



FCC ID: 2A94J-CP027



FCC ID: 2A94J-CP027

5. Time of Occupancy (Dwell Time)

5.1 Test Result

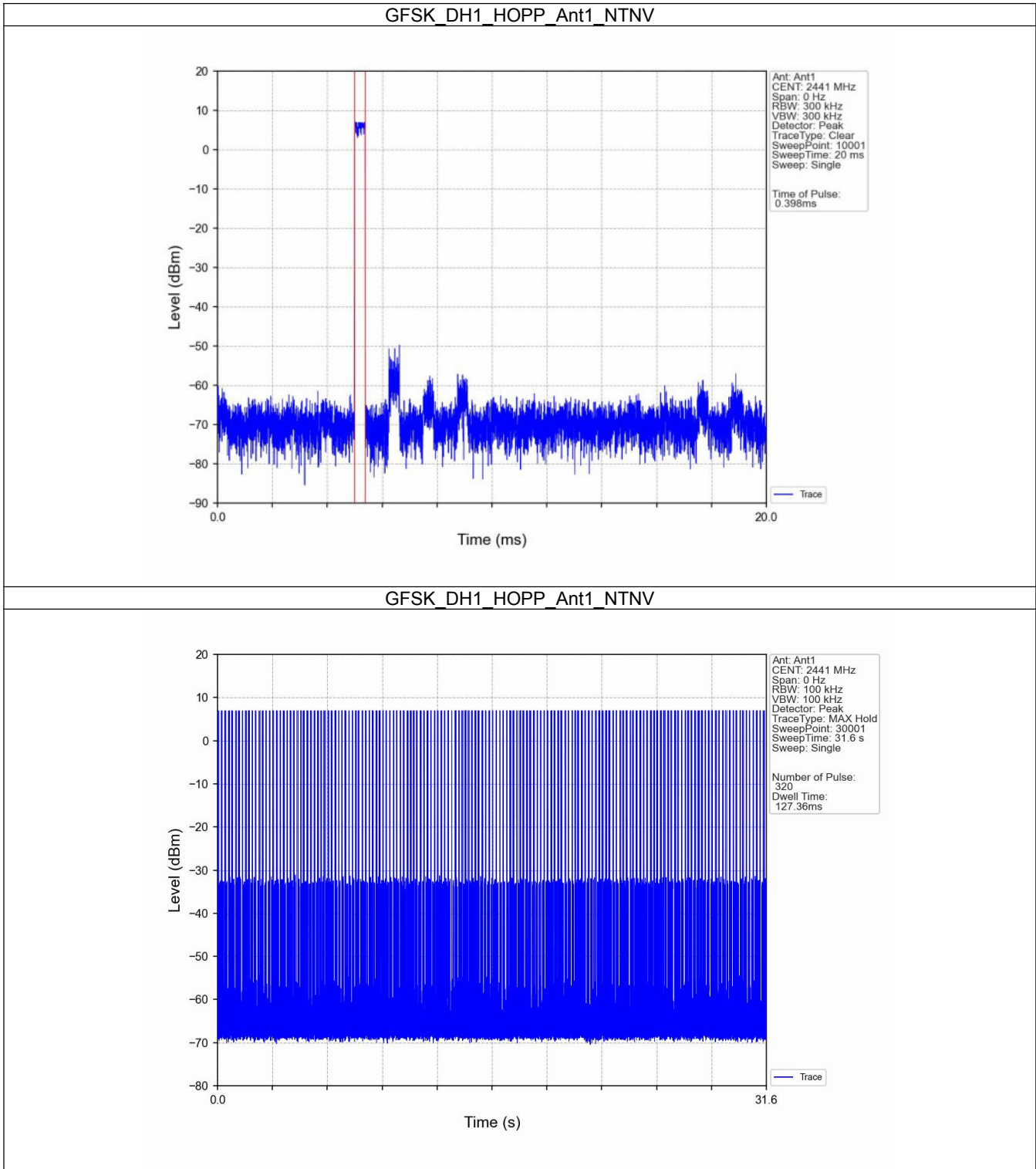
5.1.1 Ant1

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	0.398	31.600	320	127.360	<=400	Pass
			DH3	1.652	31.600	163	269.276	<=400	Pass
			DH5	2.904	31.600	109	316.536	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.408	31.600	320	130.560	<=400	Pass
			2DH3	1.658	31.600	152	252.016	<=400	Pass
			2DH5	2.908	31.600	107	311.156	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.406	31.600	320	129.920	<=400	Pass
			3DH3	1.656	31.600	165	273.240	<=400	Pass
			3DH5	2.910	31.600	107	311.370	<=400	Pass

FCC ID: 2A94J-CP027

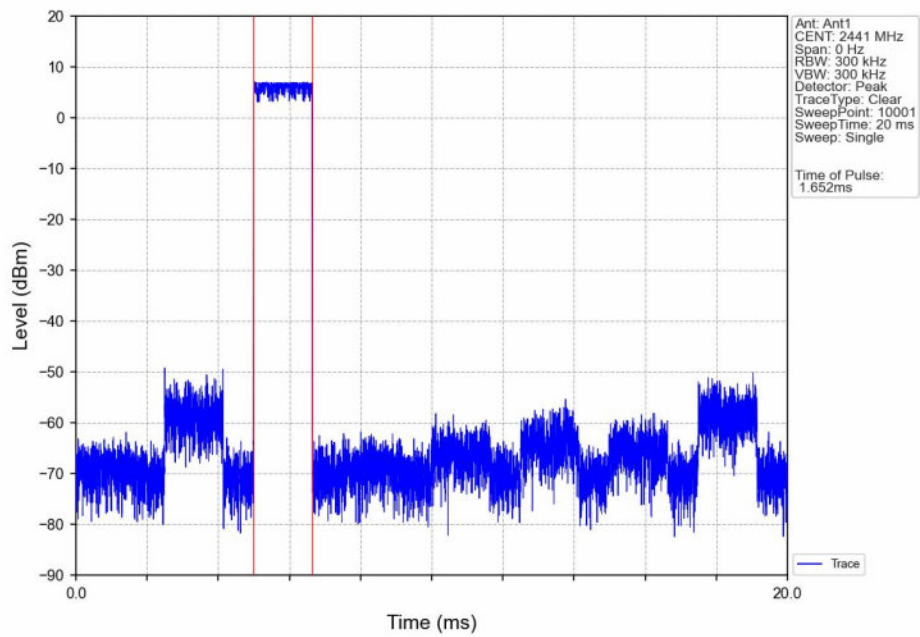
5.2 Test Graph

5.2.1 Ant1

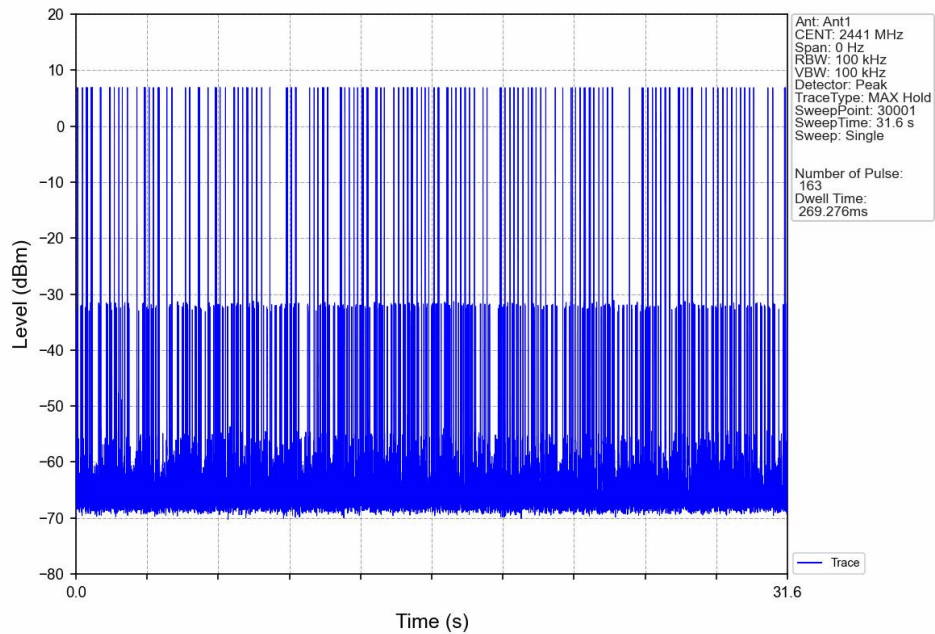


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GFSK_DH3_HOPP_Ant1_NTNV

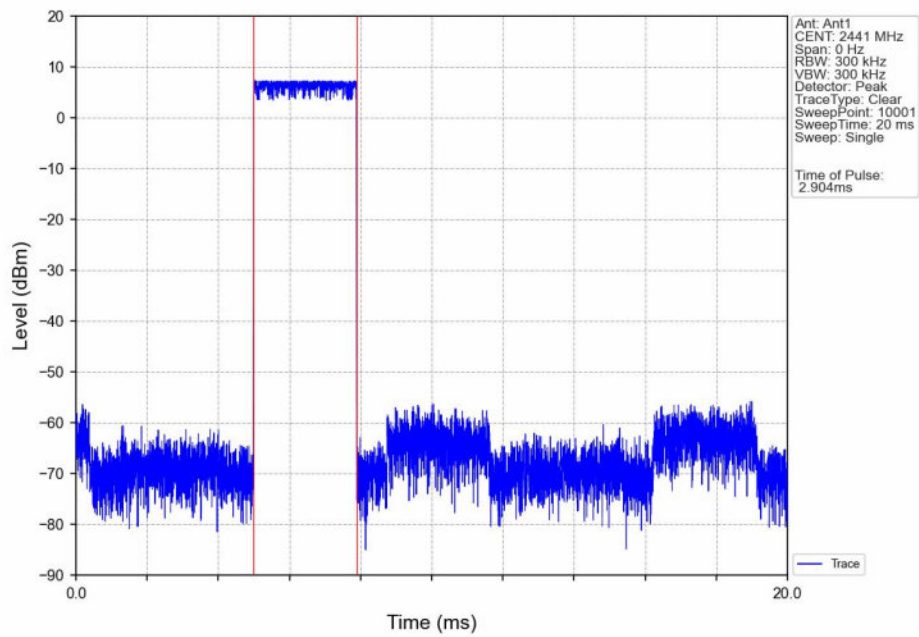


GFSK_DH3_HOPP_Ant1_NTNV

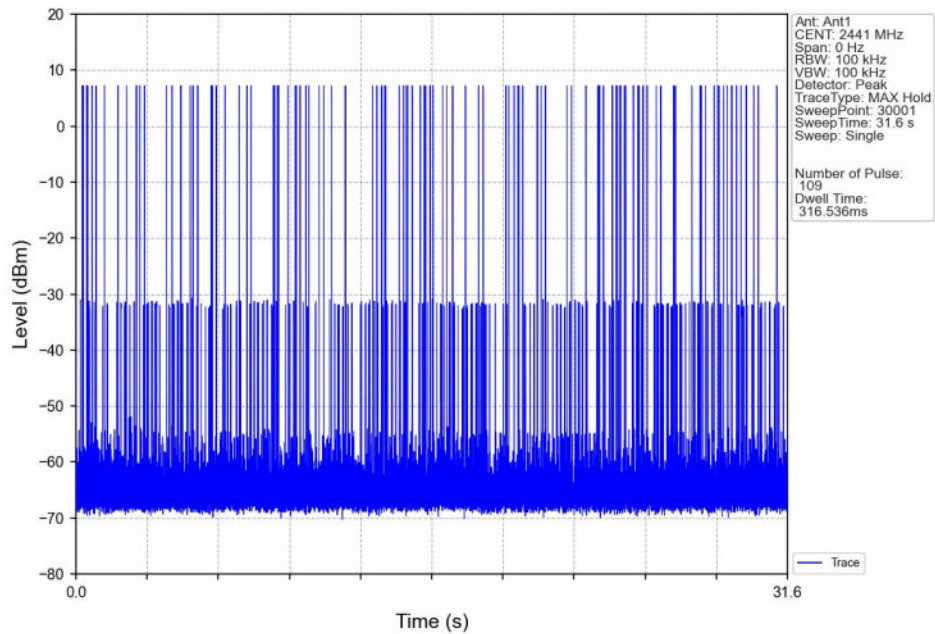


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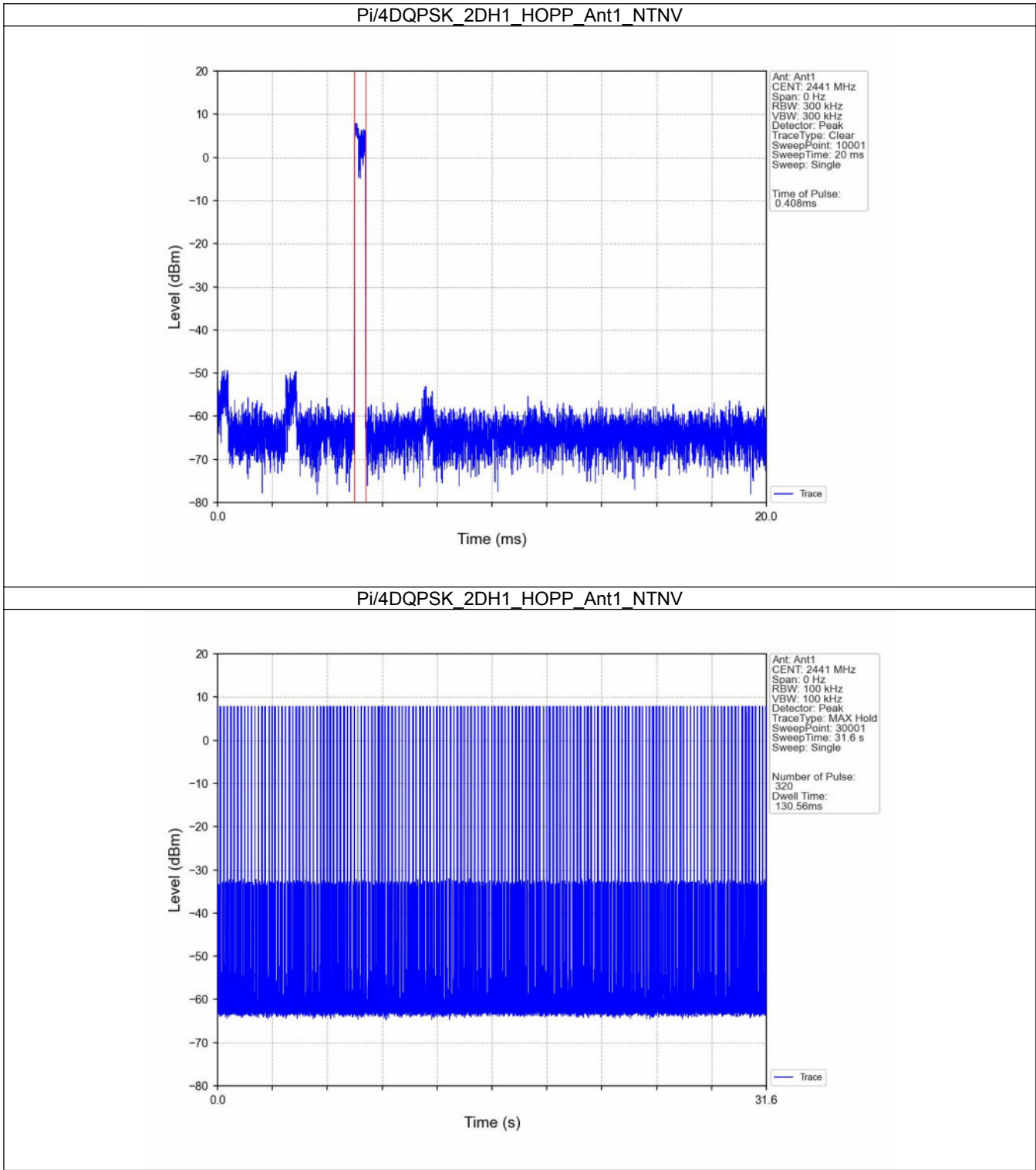
GFSK_DH5_HOPP_Ant1_NTNV



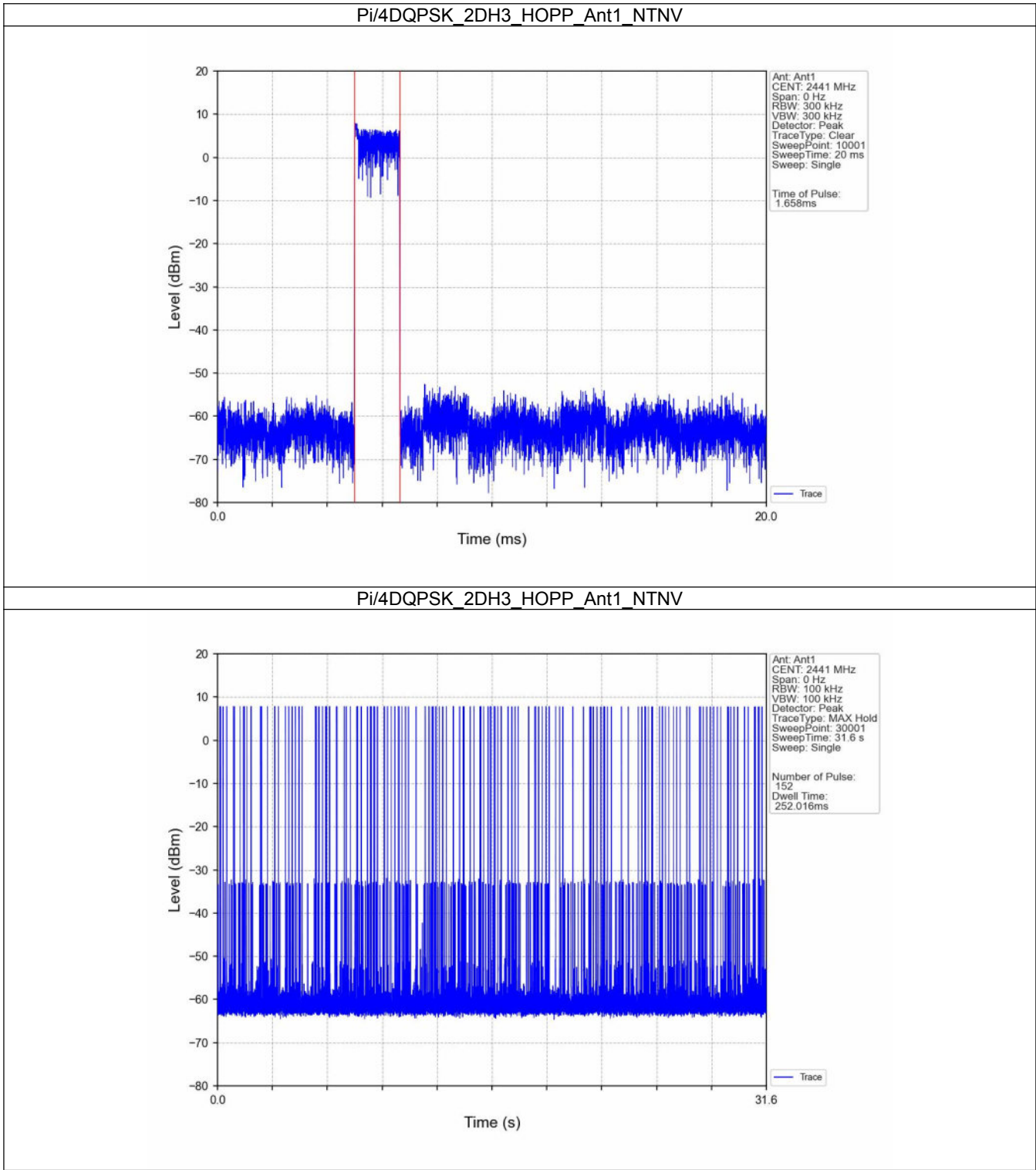
GFSK_DH5_HOPP_Ant1_NTNV



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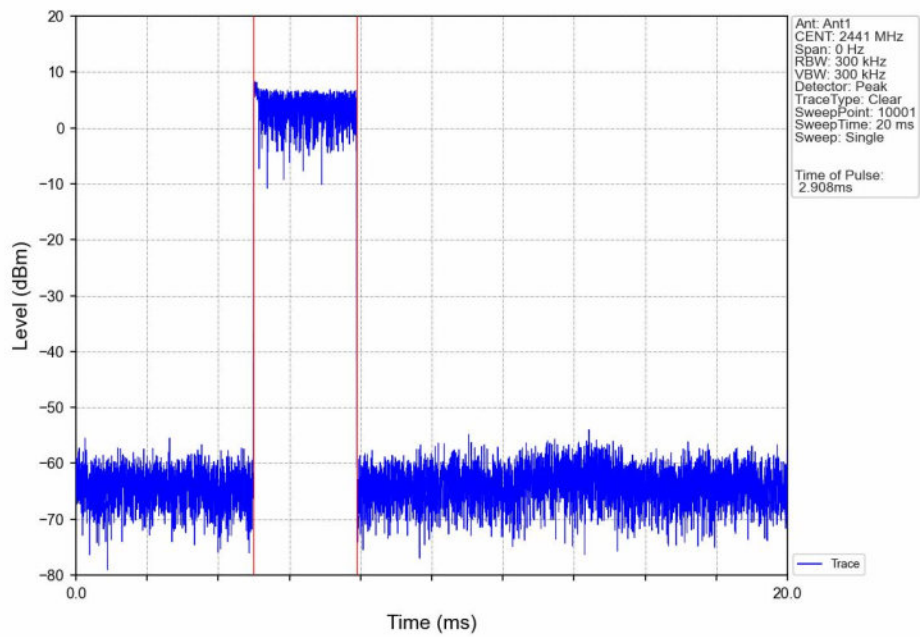


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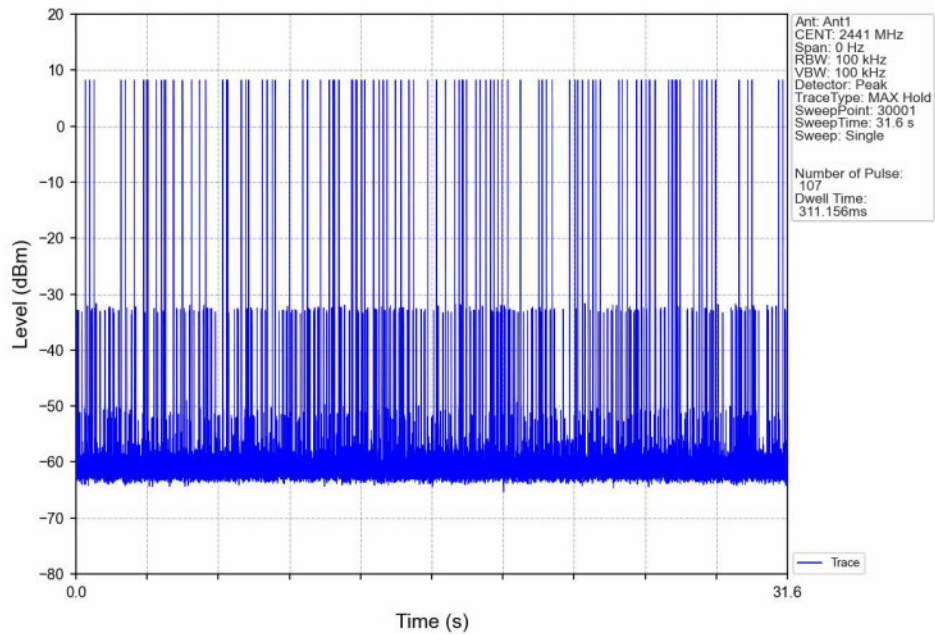


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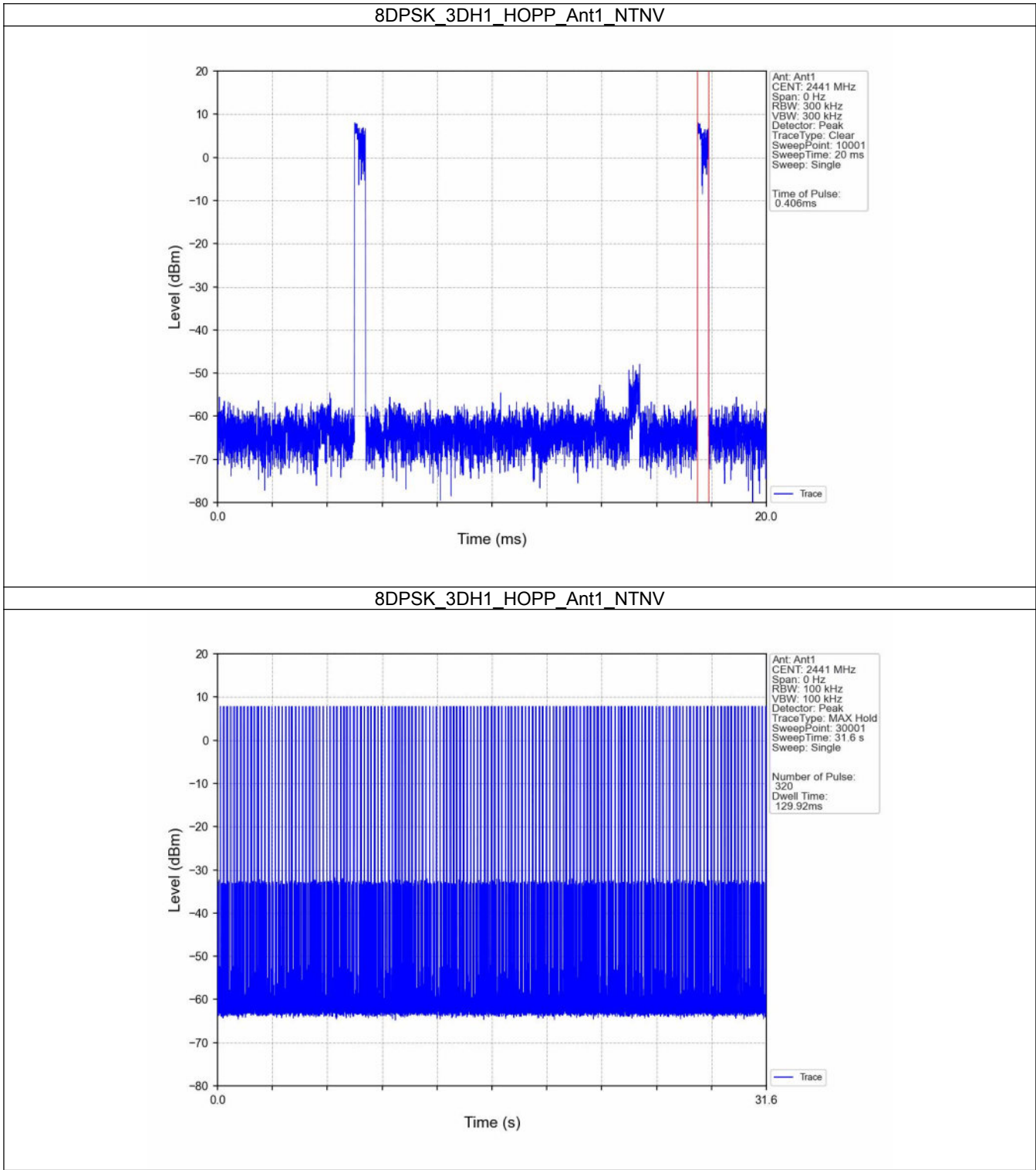
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

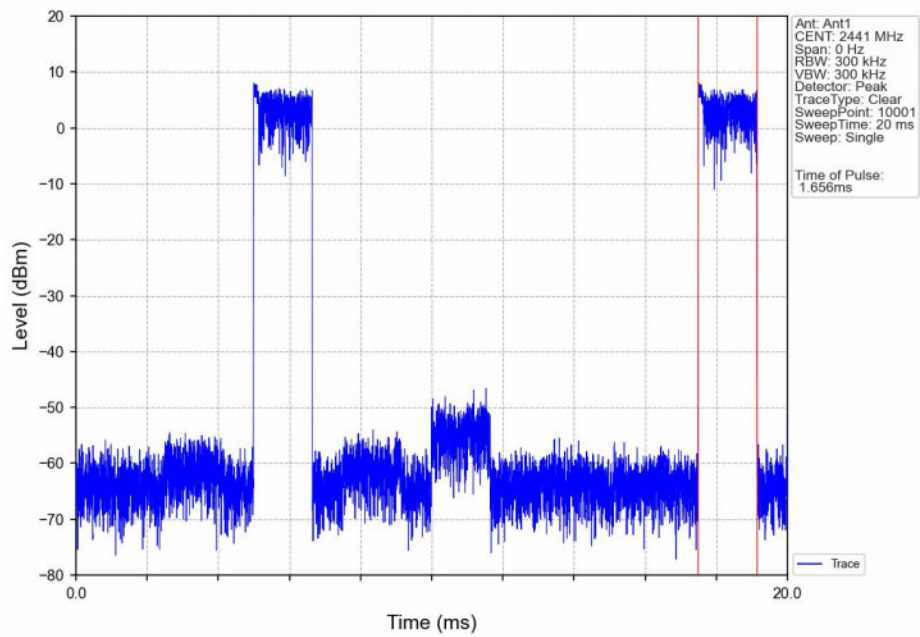


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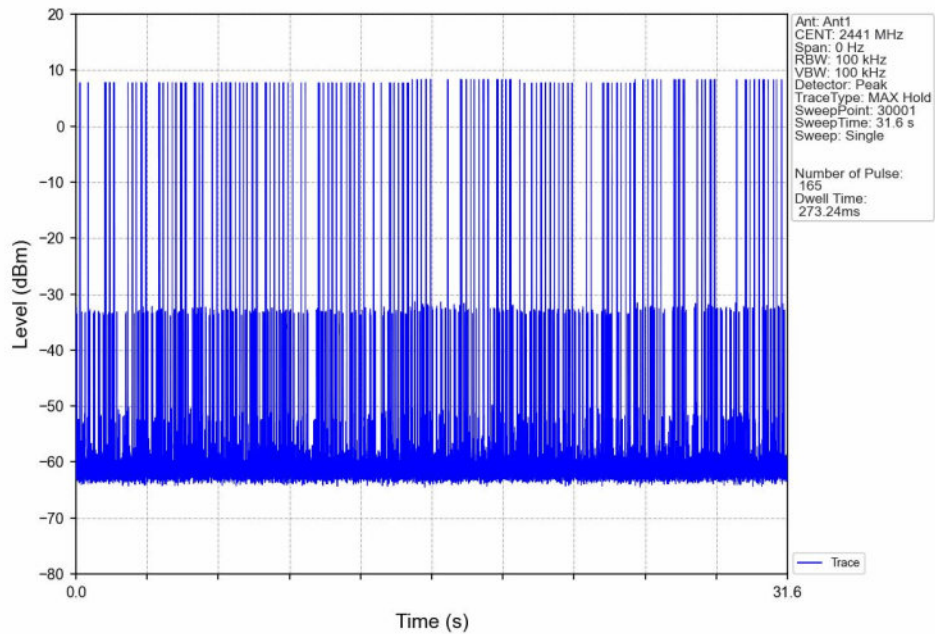


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8DPSK_3DH3_HOPP_Ant1_NTNV

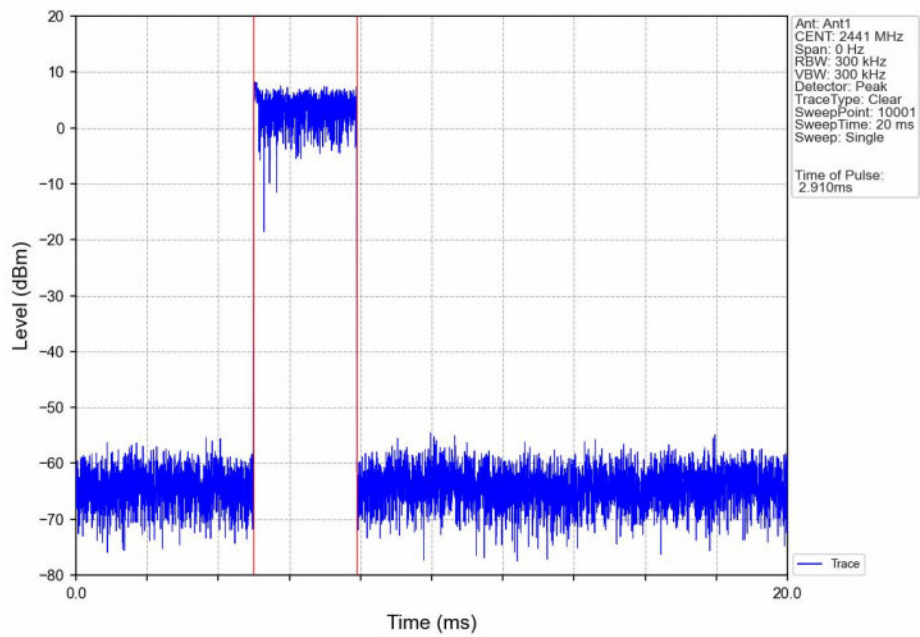


8DPSK_3DH3_HOPP_Ant1_NTNV

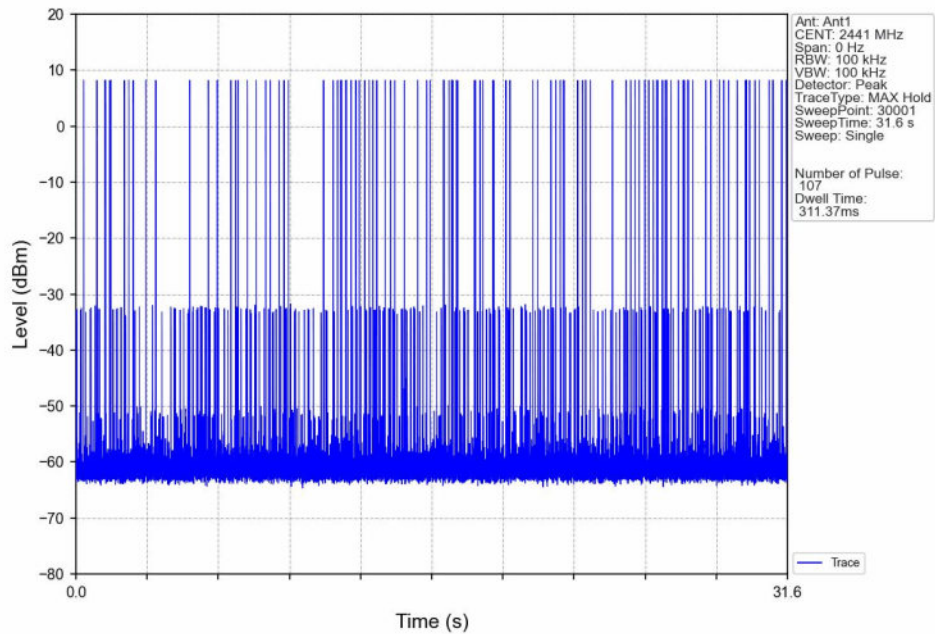


FCC ID: 2A94J-CP027

8DPSK_3DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



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	7.04
		2441	DH5	1	6.97
		2480	DH5	1	6.09
		HOPP	DH5	1	7.44
					7.44
Pi/4DQPSK	SISO	2402	2DH5	1	8.27
		2441	2DH5	1	7.78
		2480	2DH5	1	7.01
		HOPP	2DH5	1	8.30
					8.30
8DPSK	SISO	2402	3DH5	1	8.27
		2441	3DH5	1	7.72
		2480	3DH5	1	7.40
		HOPP	3DH5	1	8.49
					8.49

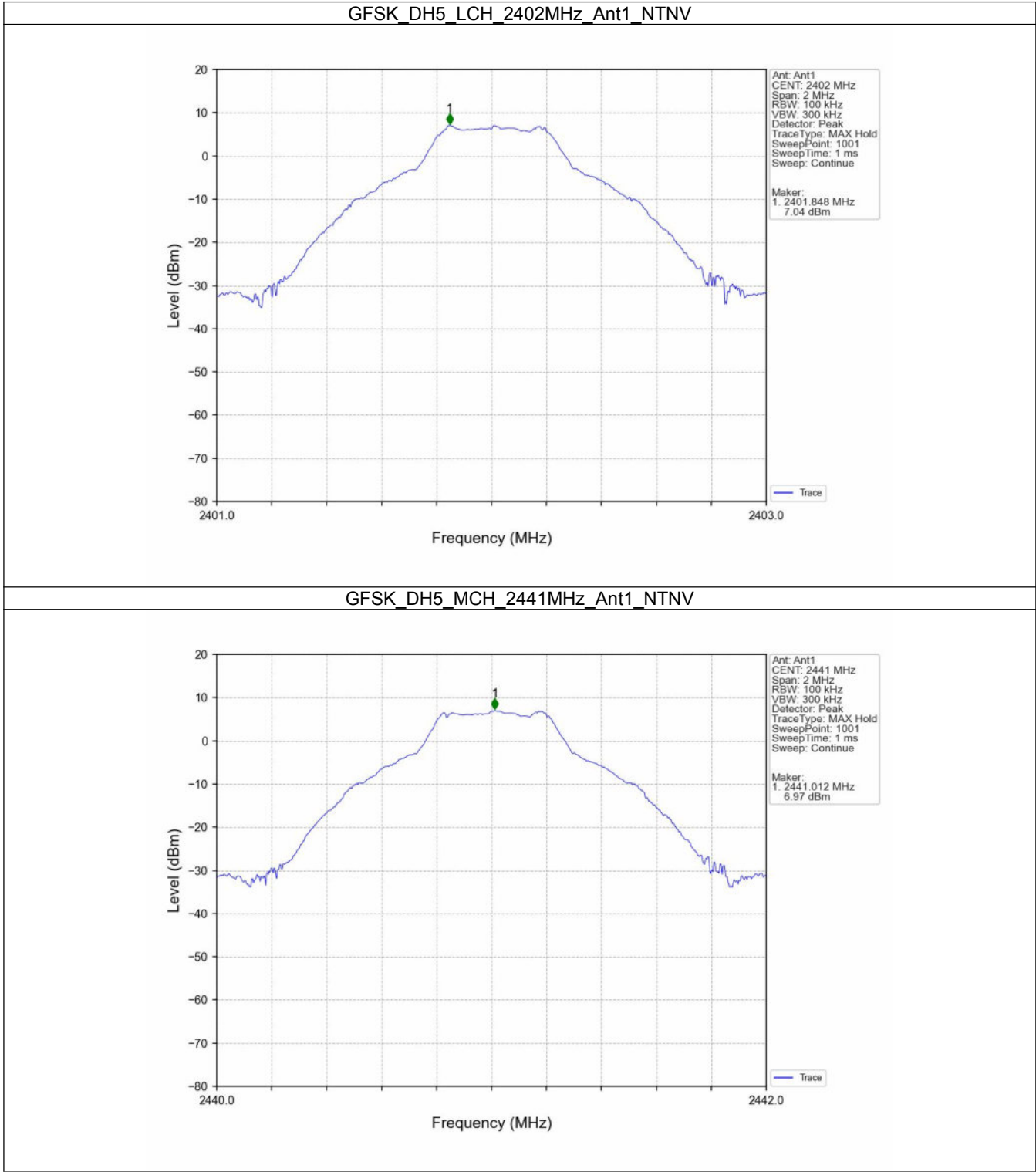
6.1.2 CSE

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	7.04	-12.96	Pass
		2441	DH5	1	6.97	-13.03	Pass
		2480	DH5	1	6.09	-13.91	Pass
		HOPP	DH5	1	7.44	-12.56	Pass
					7.44	-12.56	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	8.27	-11.73	Pass
		2441	2DH5	1	7.78	-12.22	Pass
		2480	2DH5	1	7.01	-12.99	Pass
		HOPP	2DH5	1	8.30	-11.70	Pass
					8.30	-11.70	Pass
8DPSK	SISO	2402	3DH5	1	8.27	-11.73	Pass
		2441	3DH5	1	7.72	-12.28	Pass
		2480	3DH5	1	7.40	-12.60	Pass
		HOPP	3DH5	1	8.49	-11.51	Pass
					8.49	-11.51	Pass

FCC ID: 2A94J-CP027

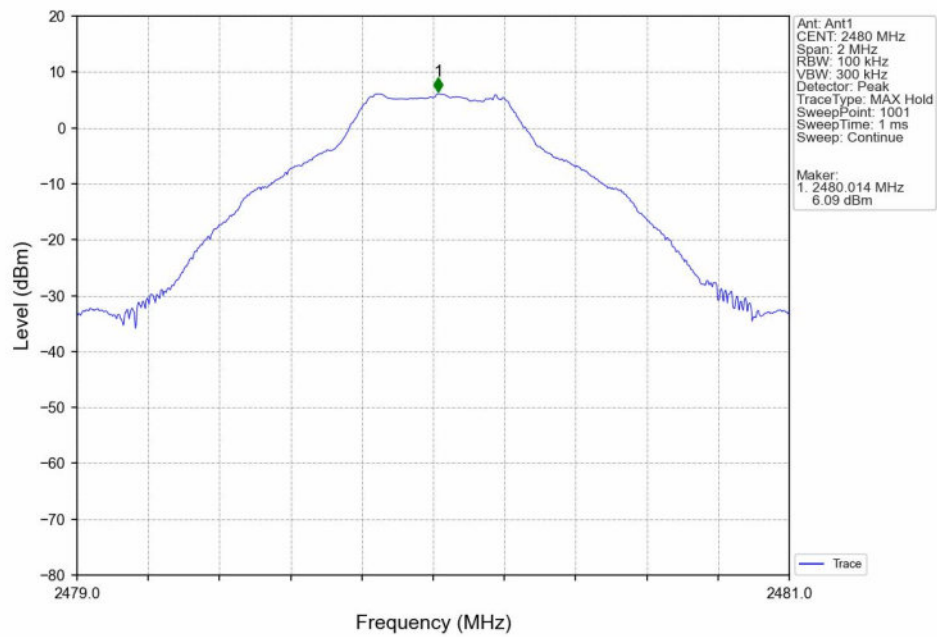
6.2 Test Graph

6.2.1 Ref

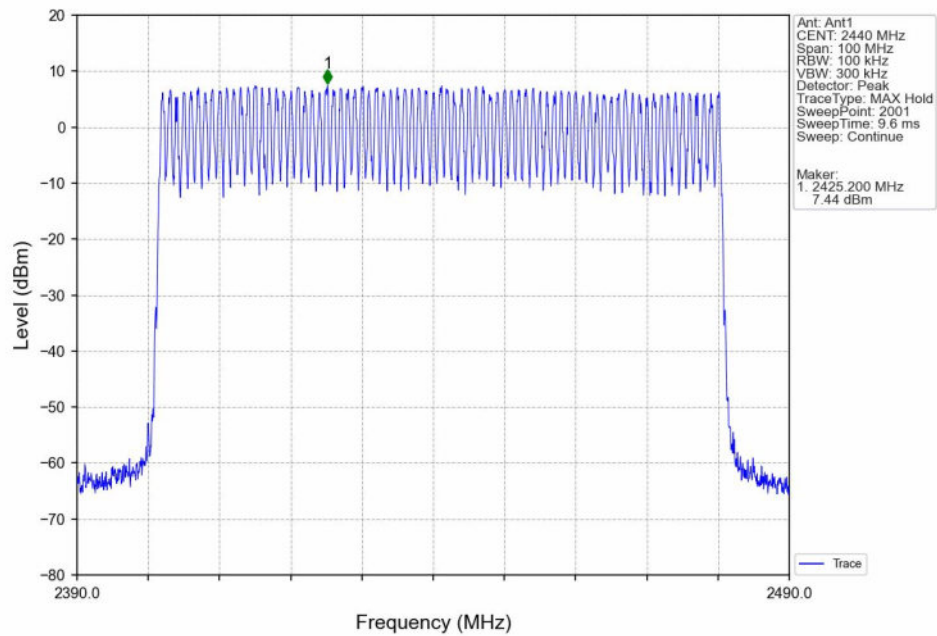


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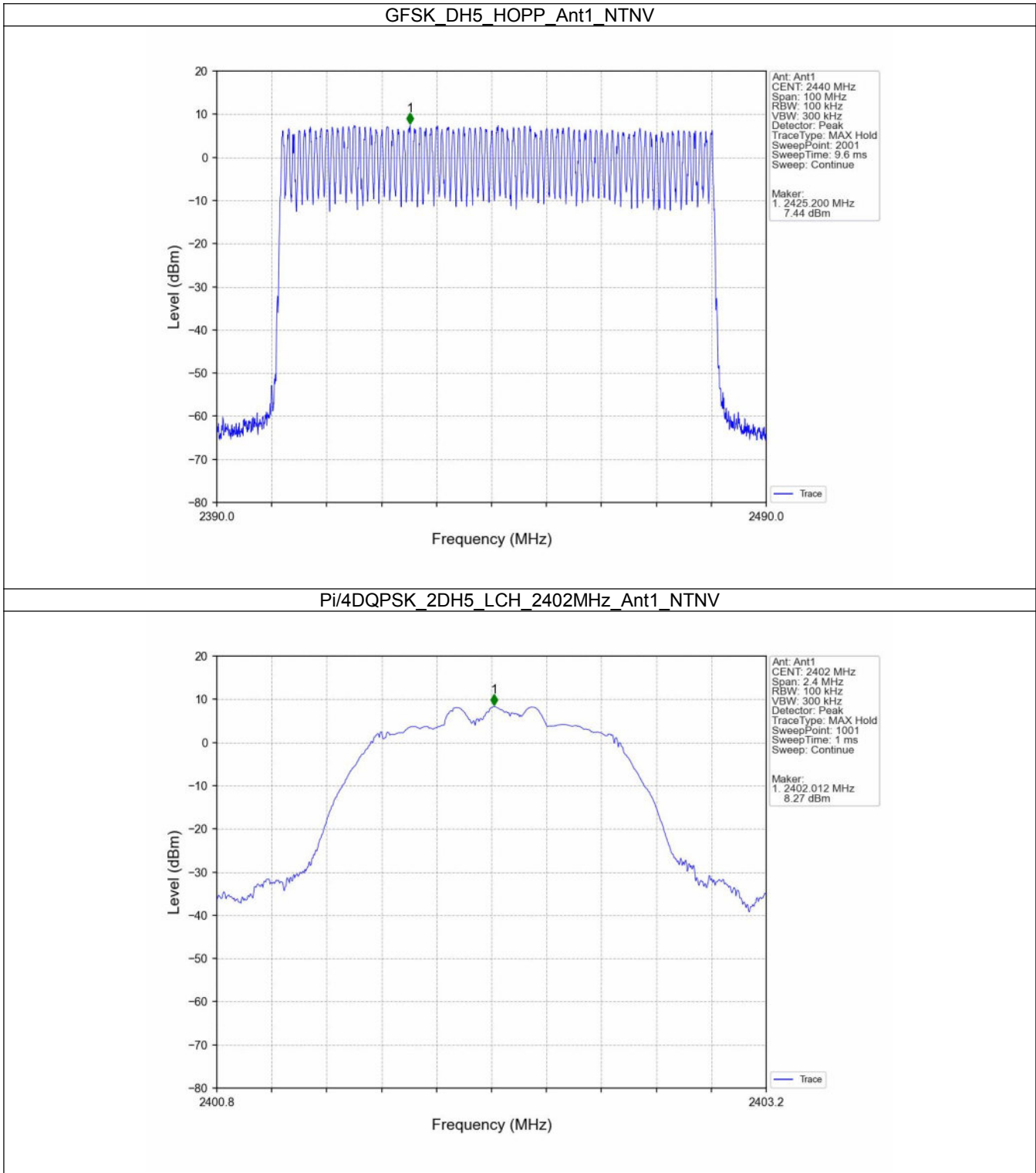
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GFSK_DH5_HOPP_Ant1_NTNV

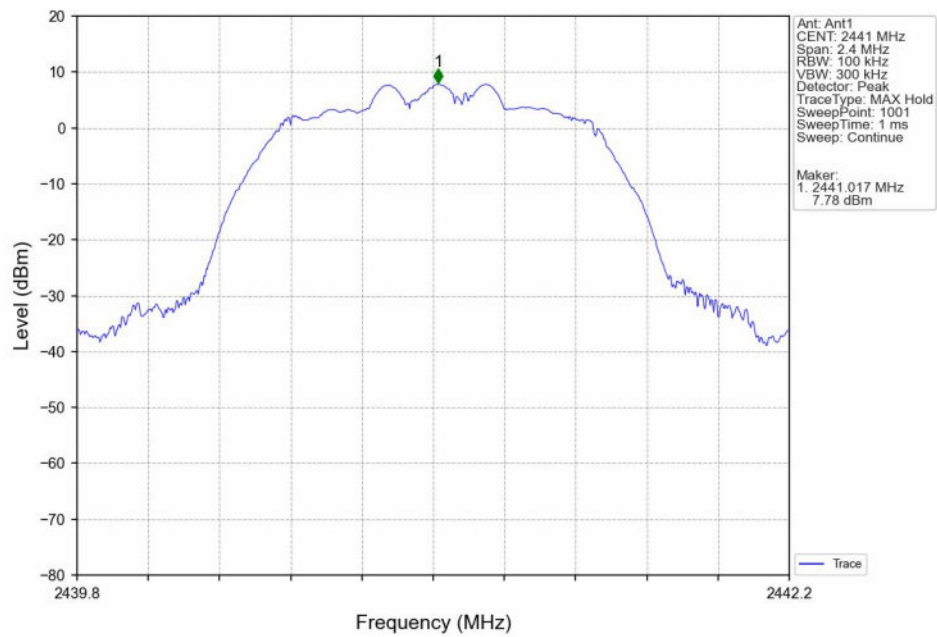


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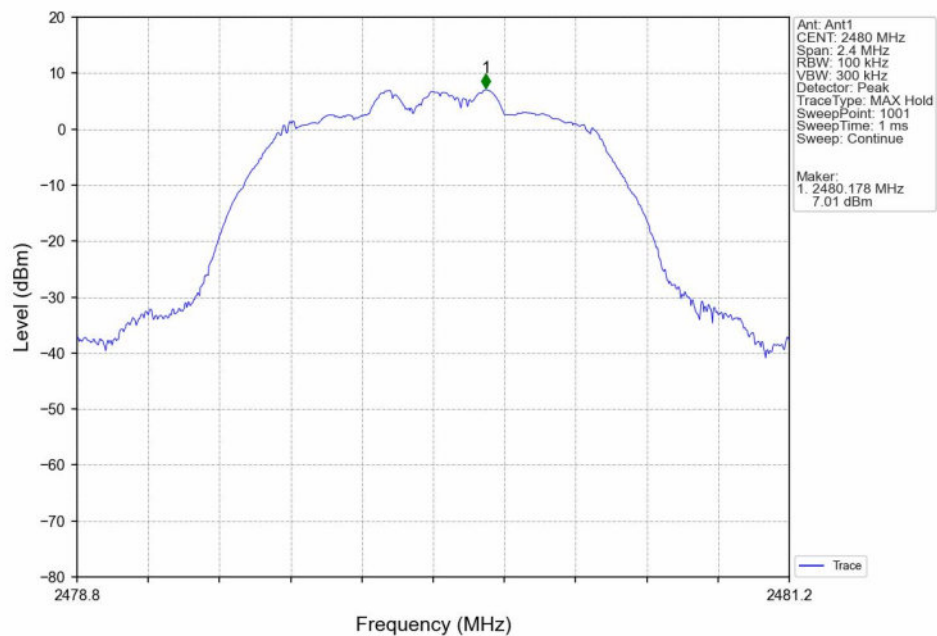


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Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV

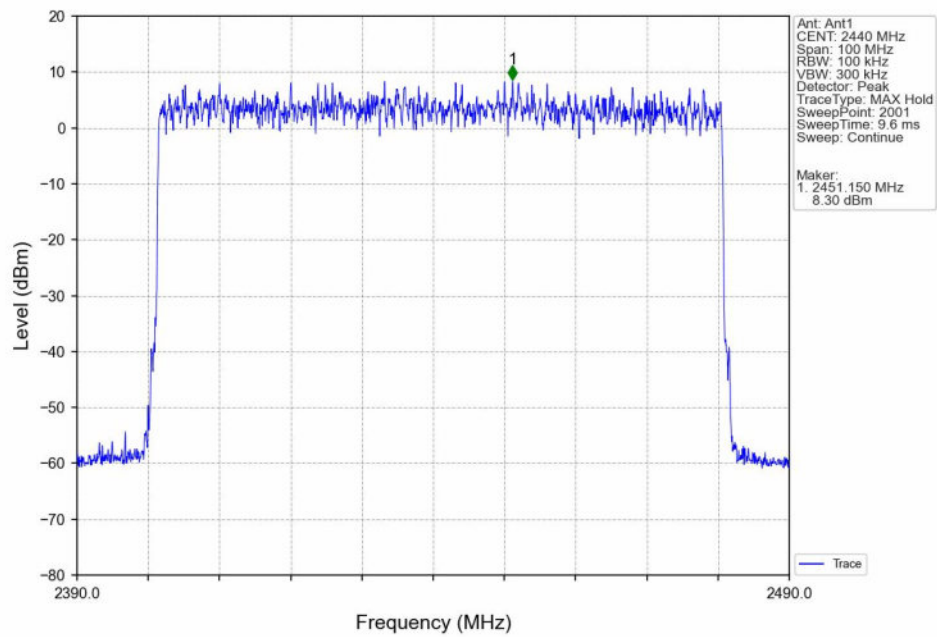


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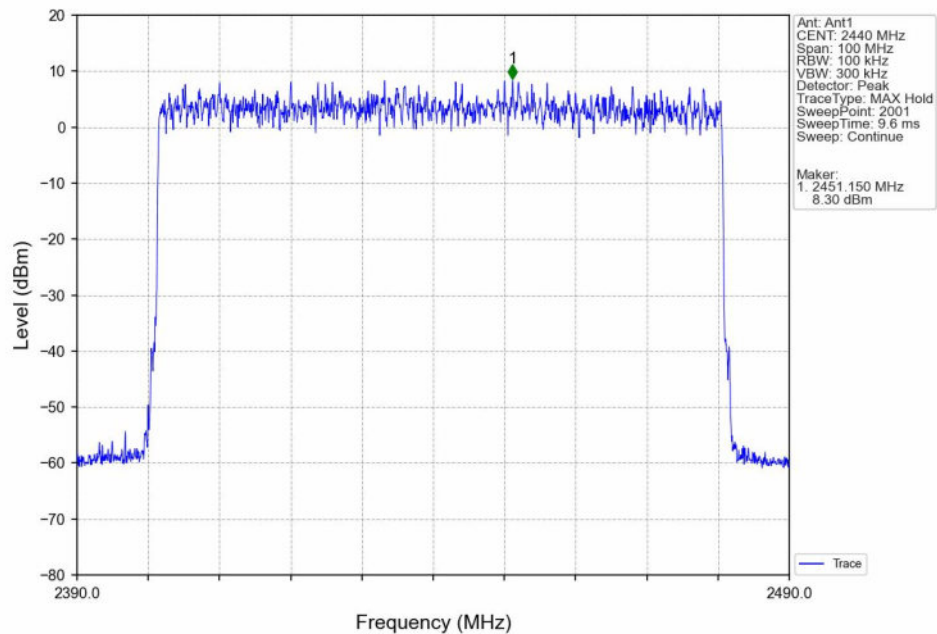


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Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

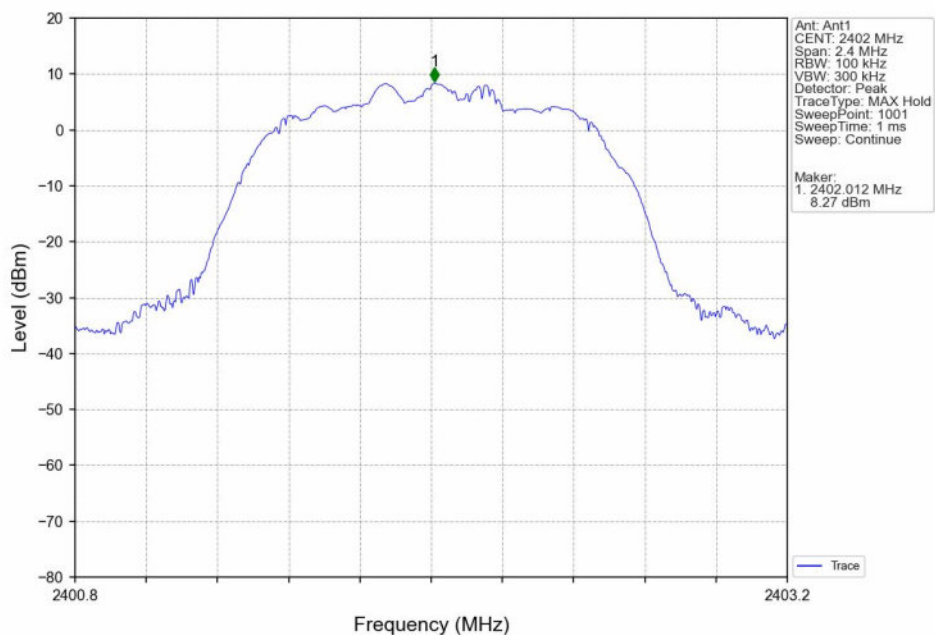


Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

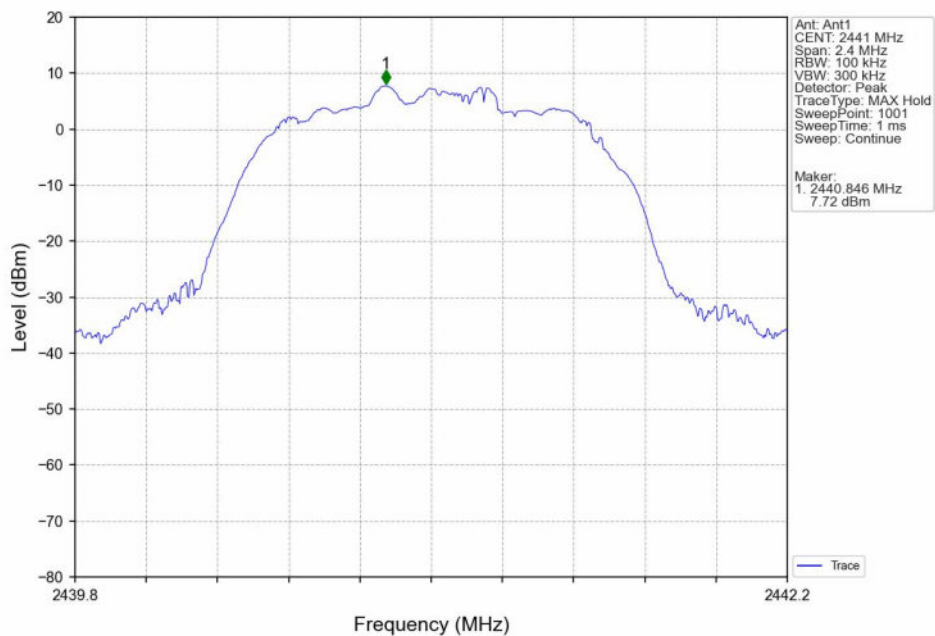


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8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

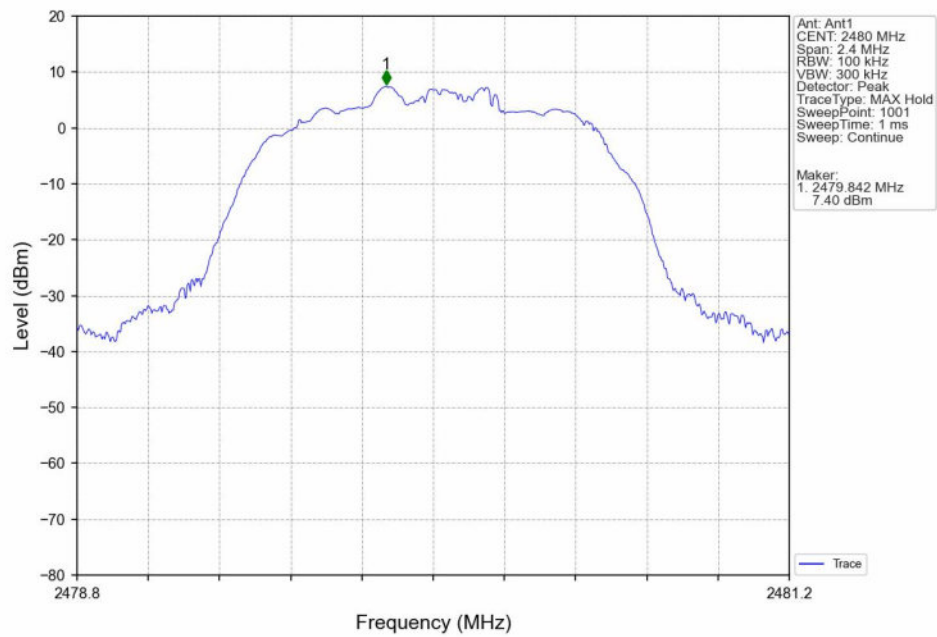


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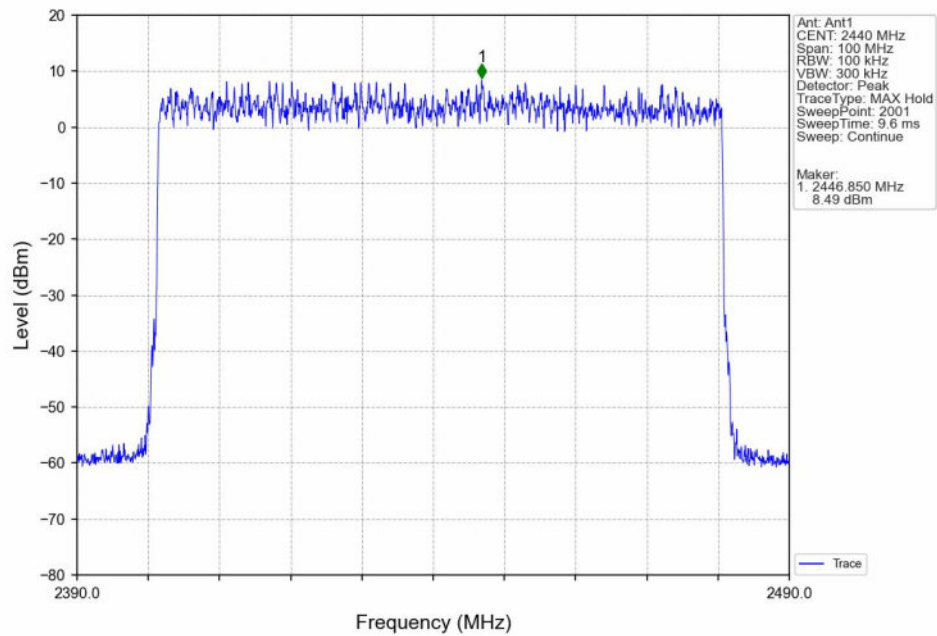


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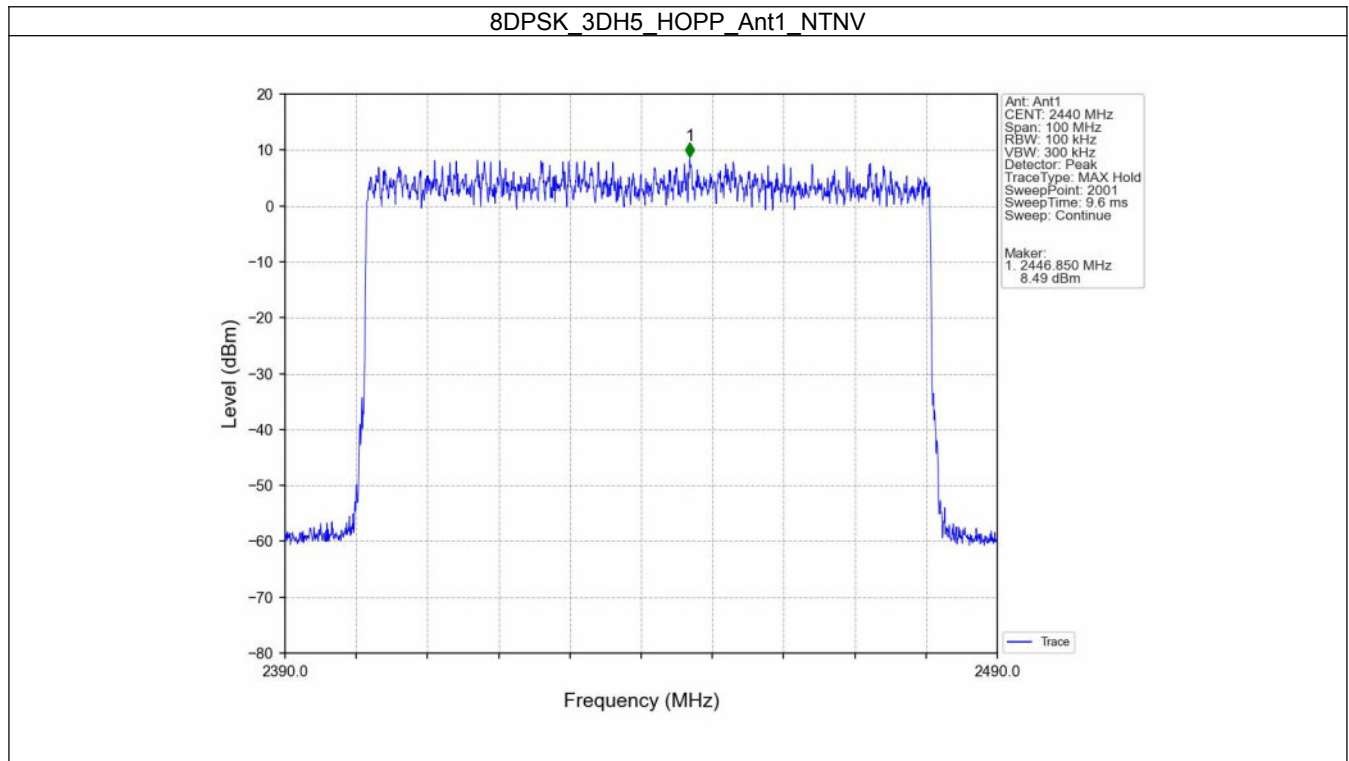
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8DPSK_3DH5_HOPP_Ant1_NTNV

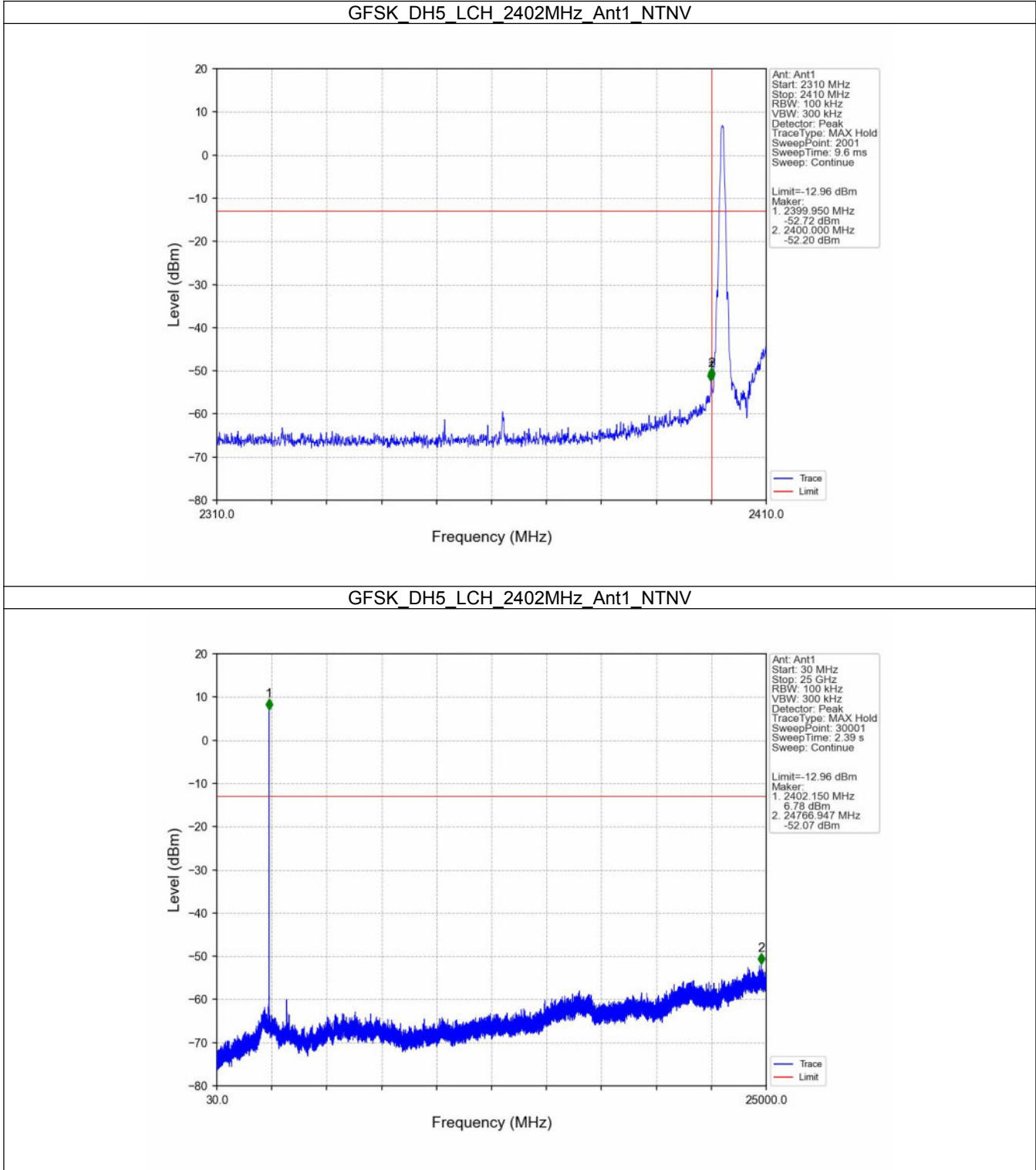


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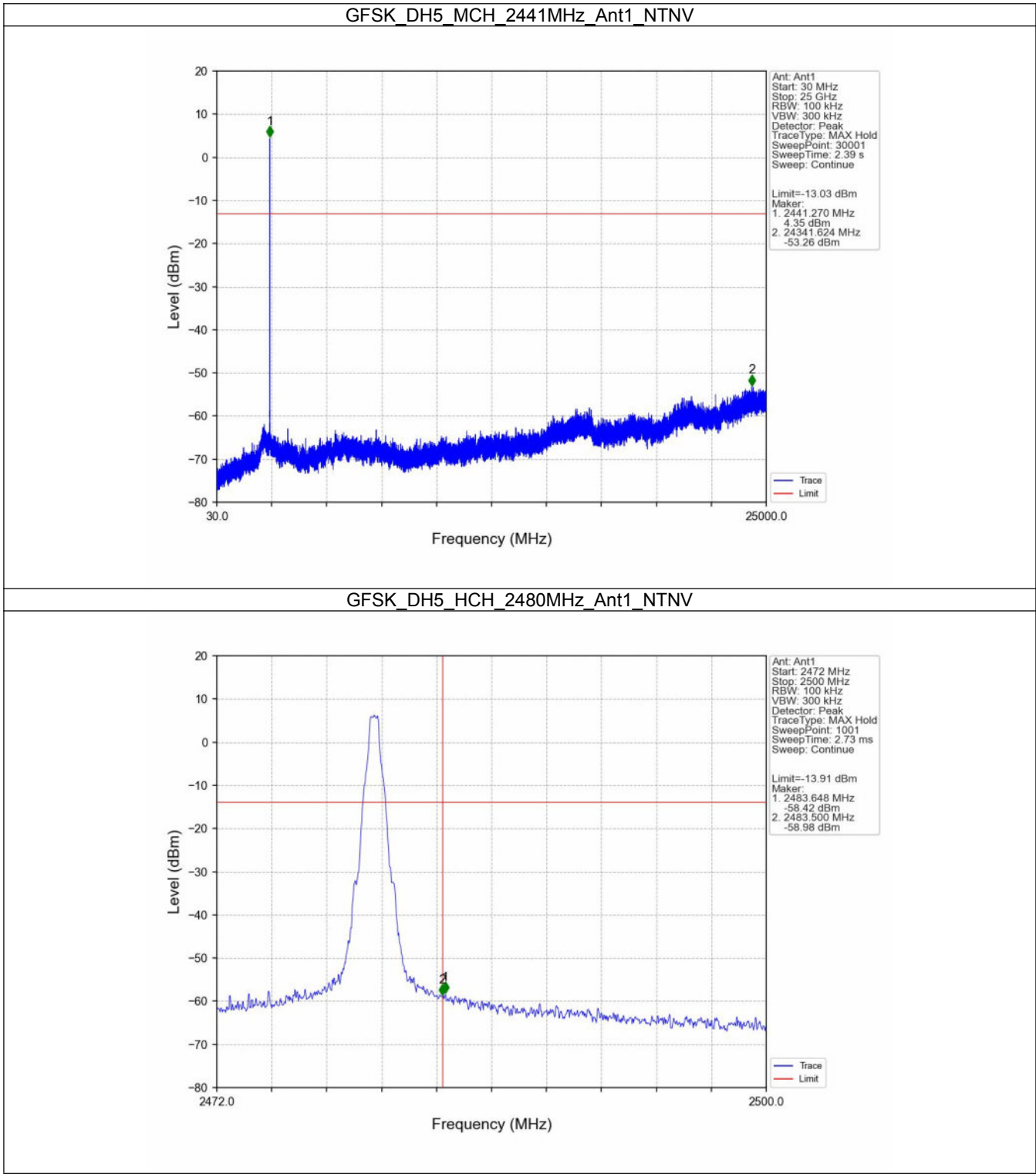


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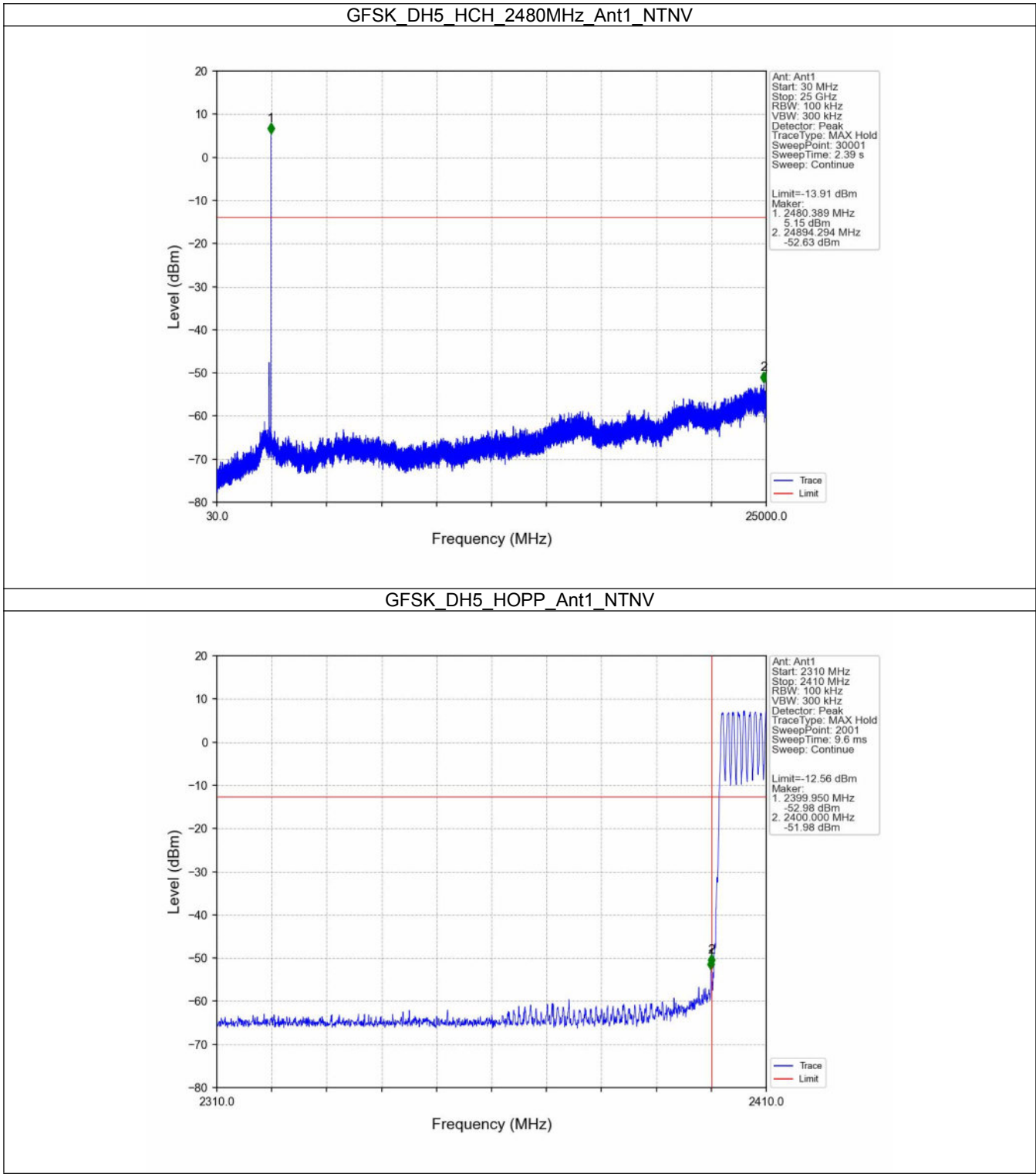
6.2.2 CSE



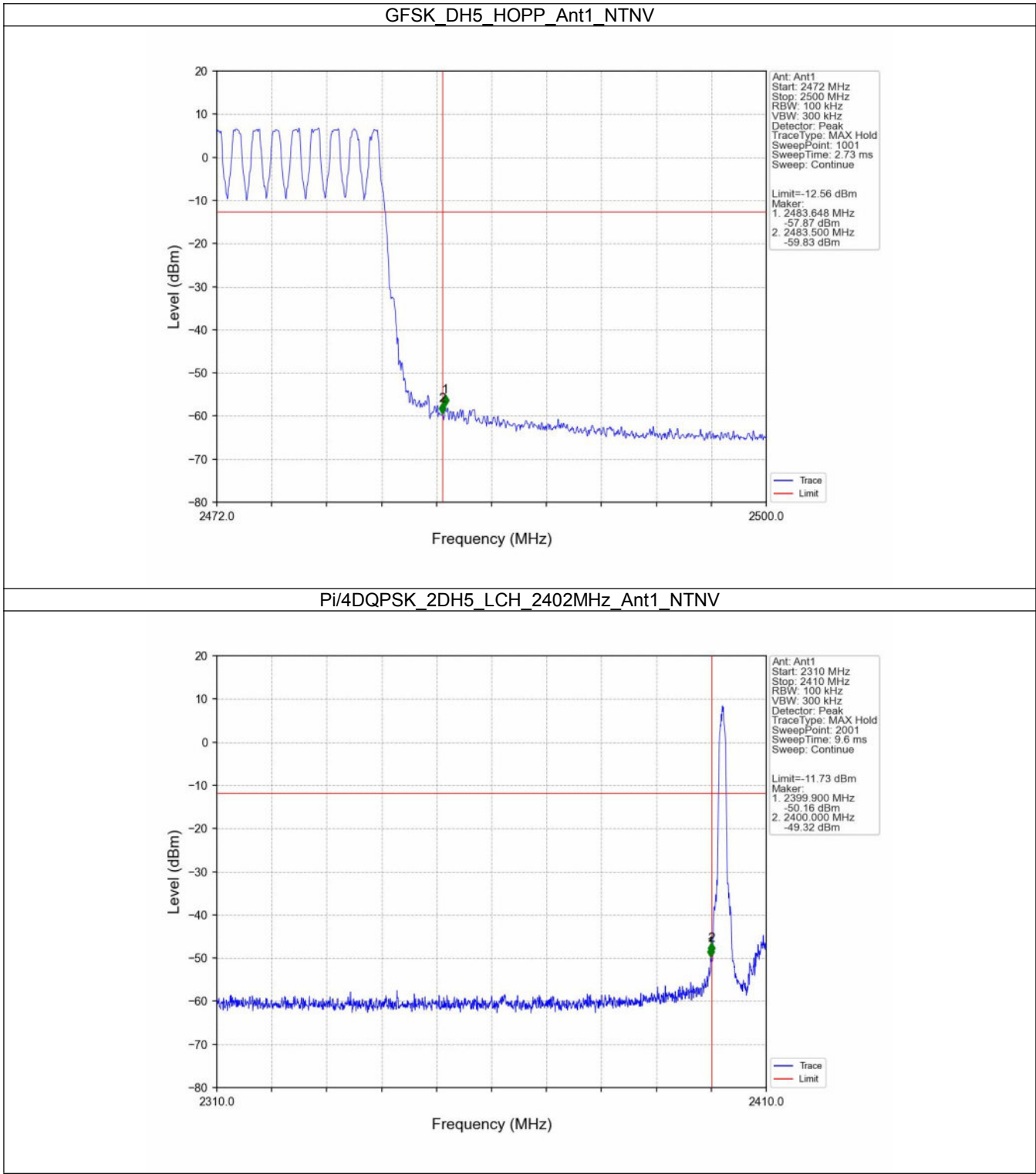
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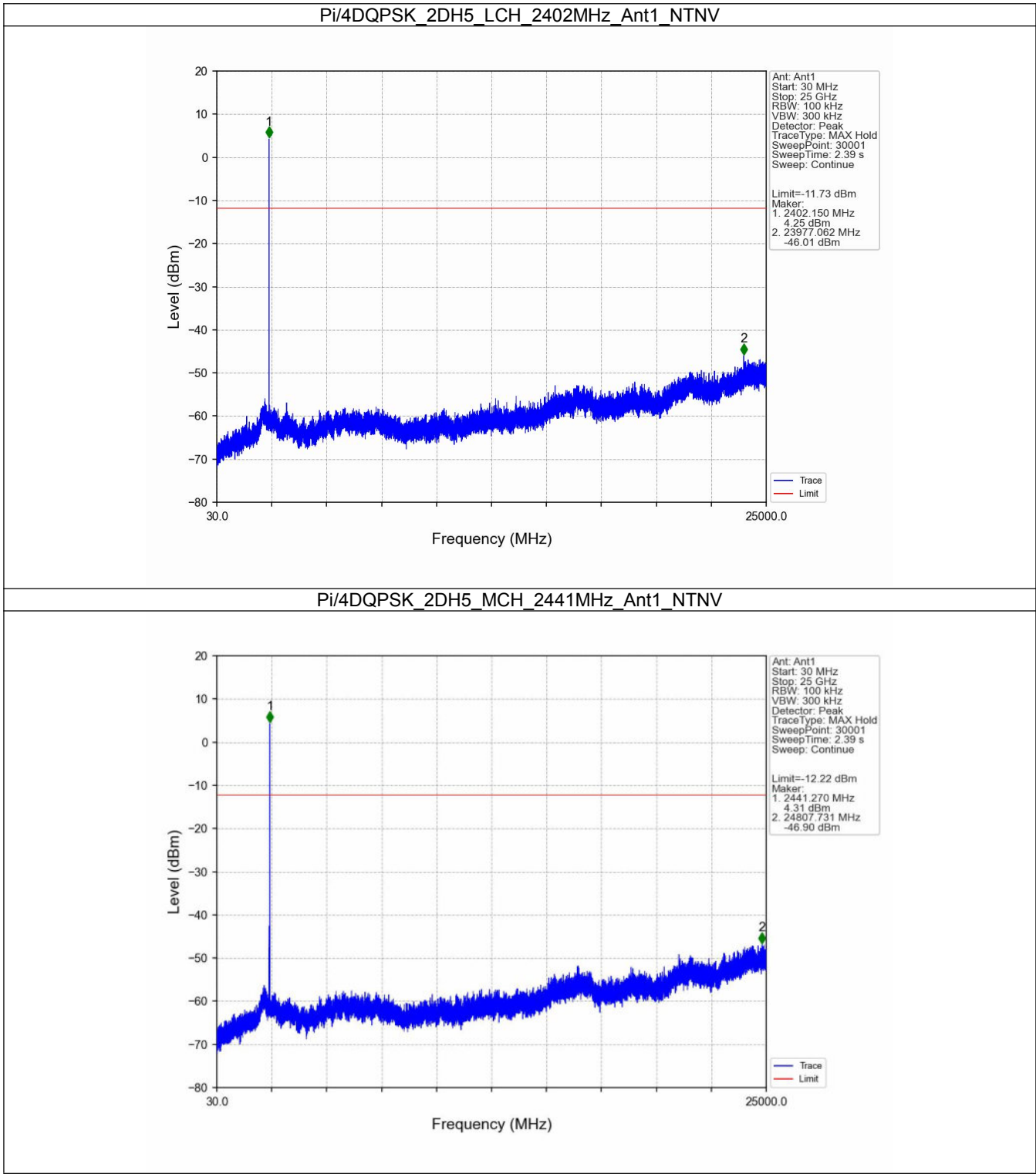
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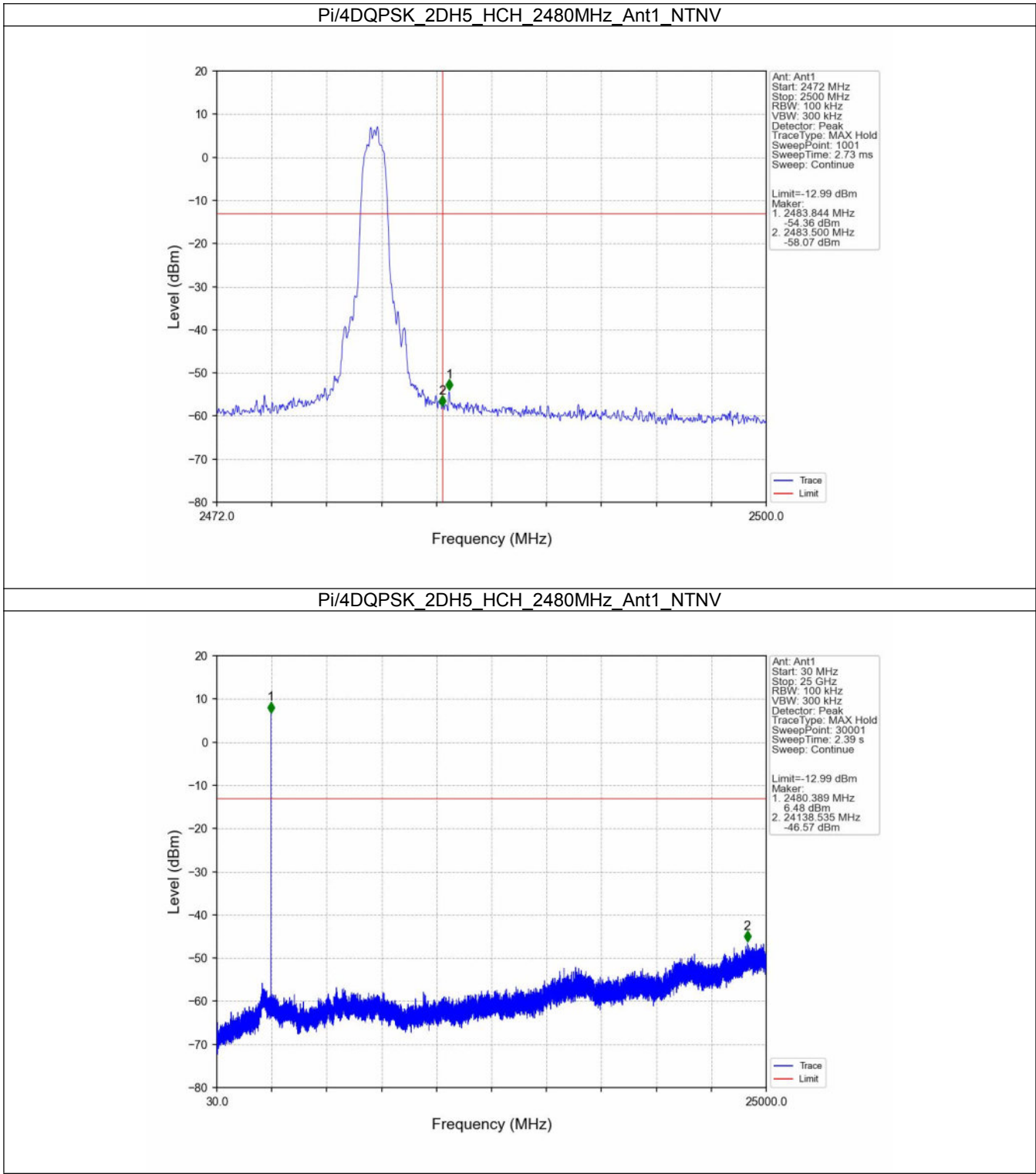
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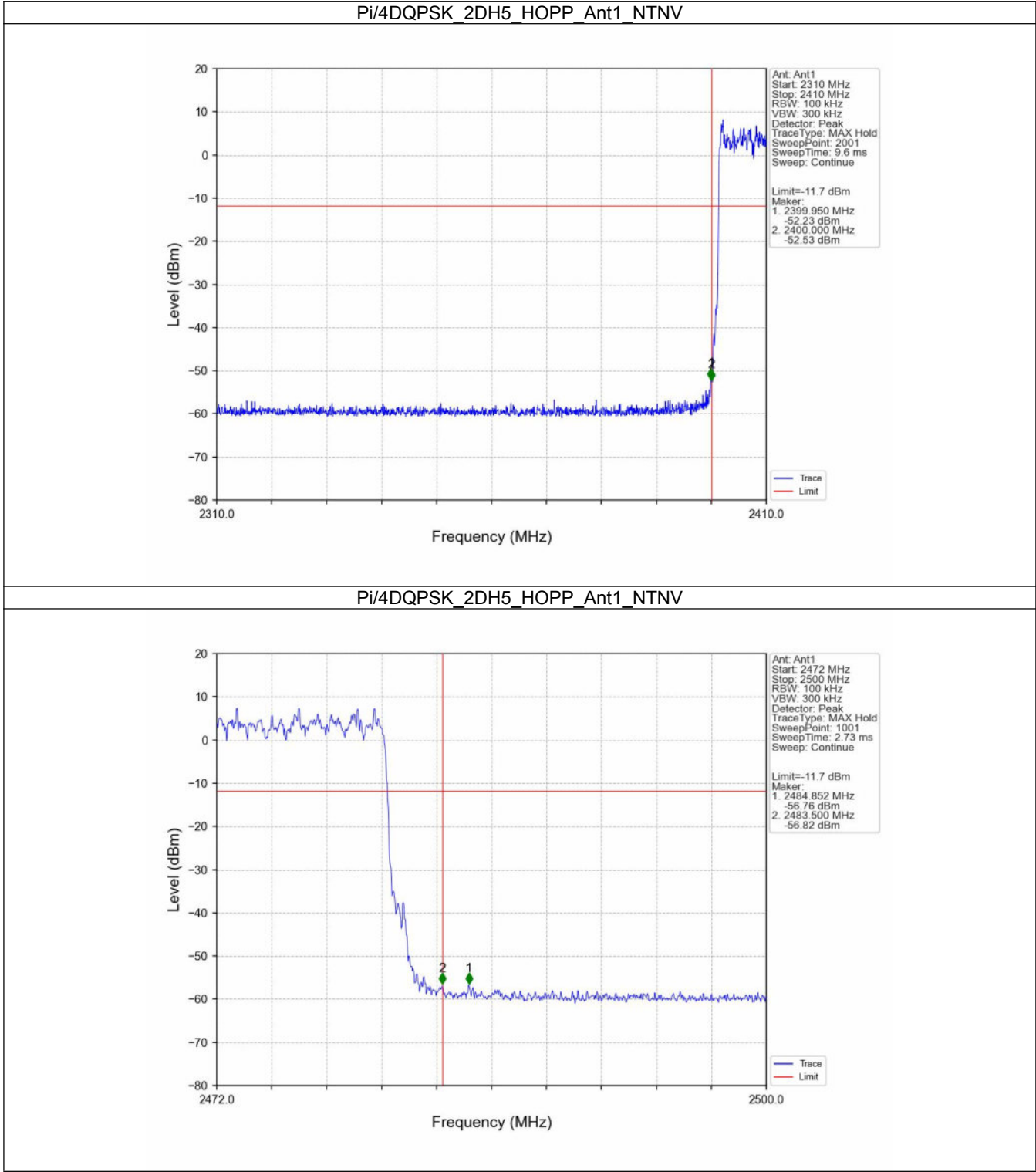
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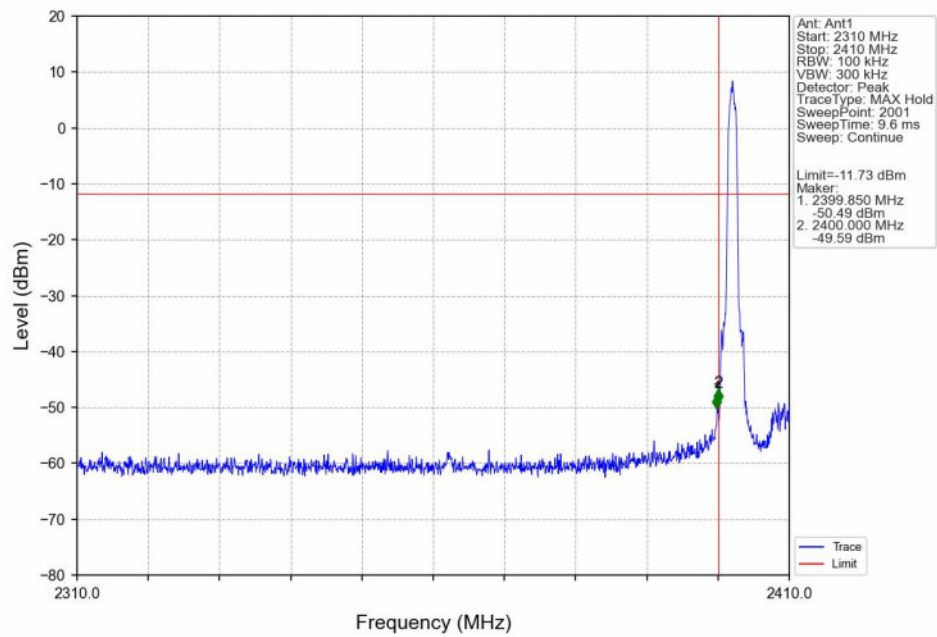


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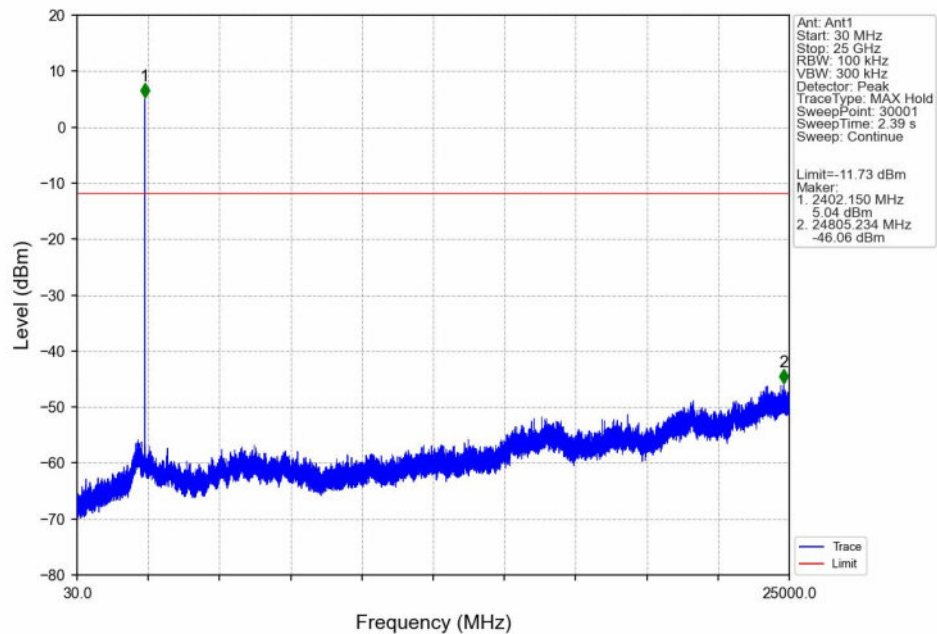


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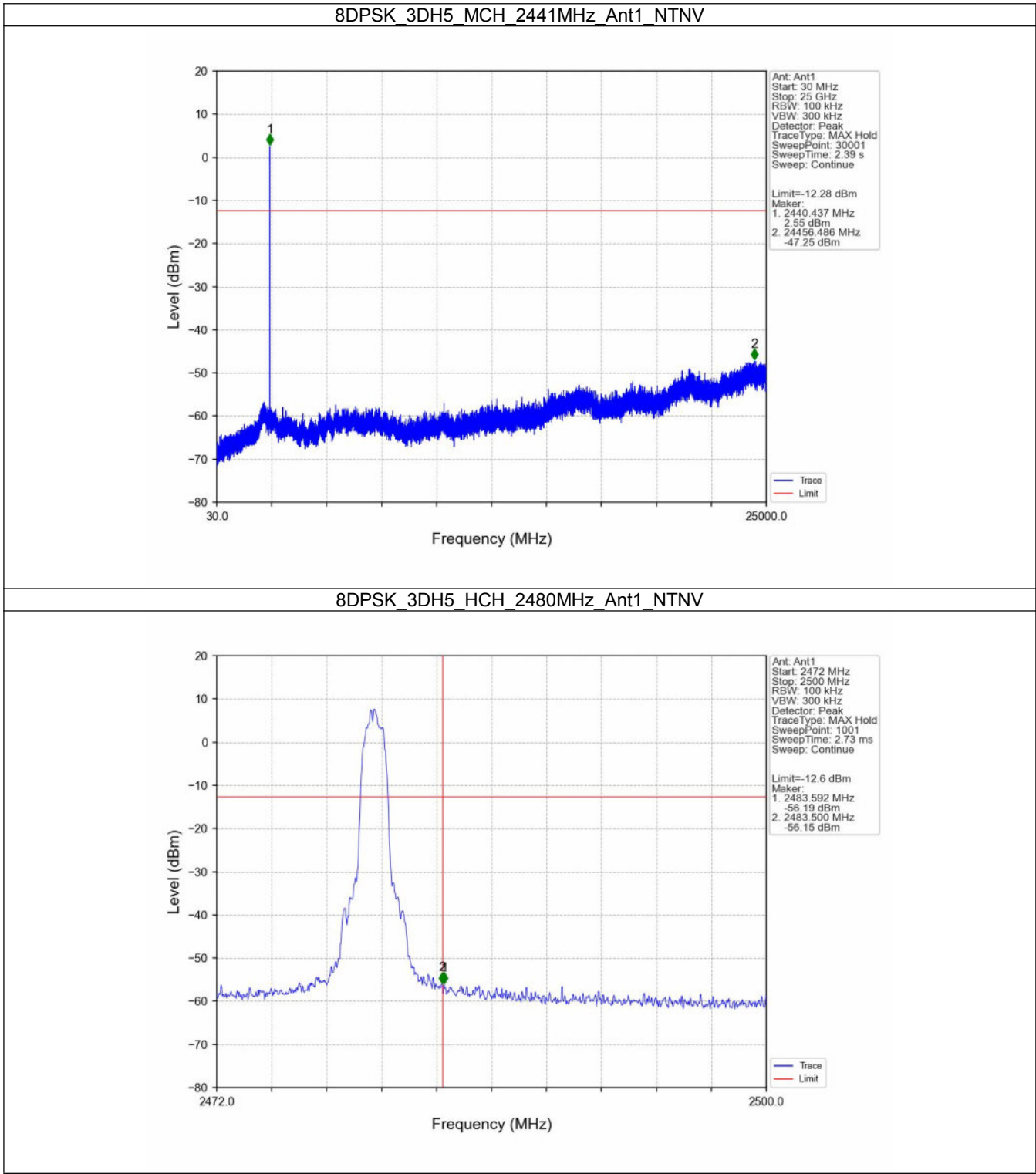
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

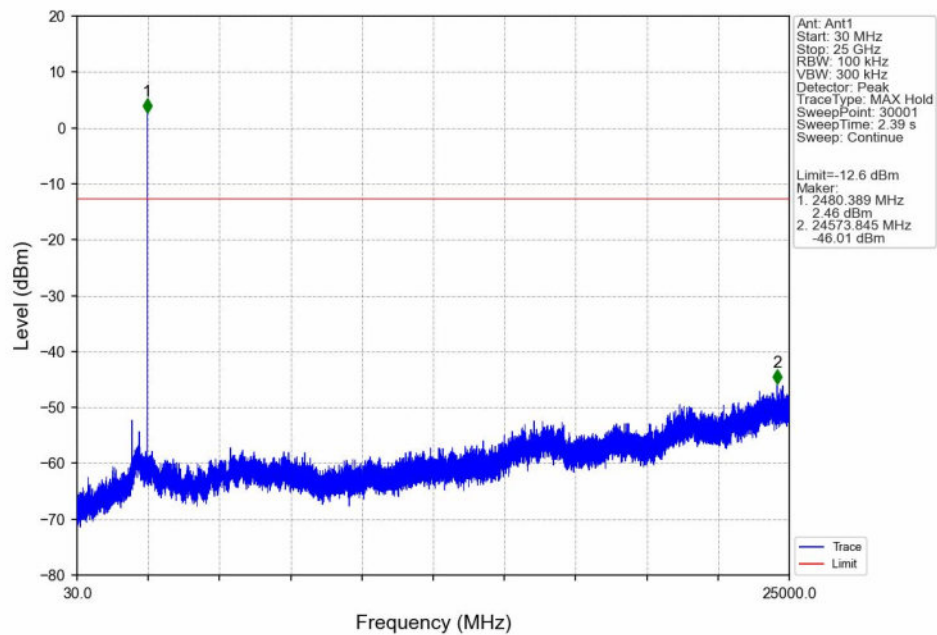


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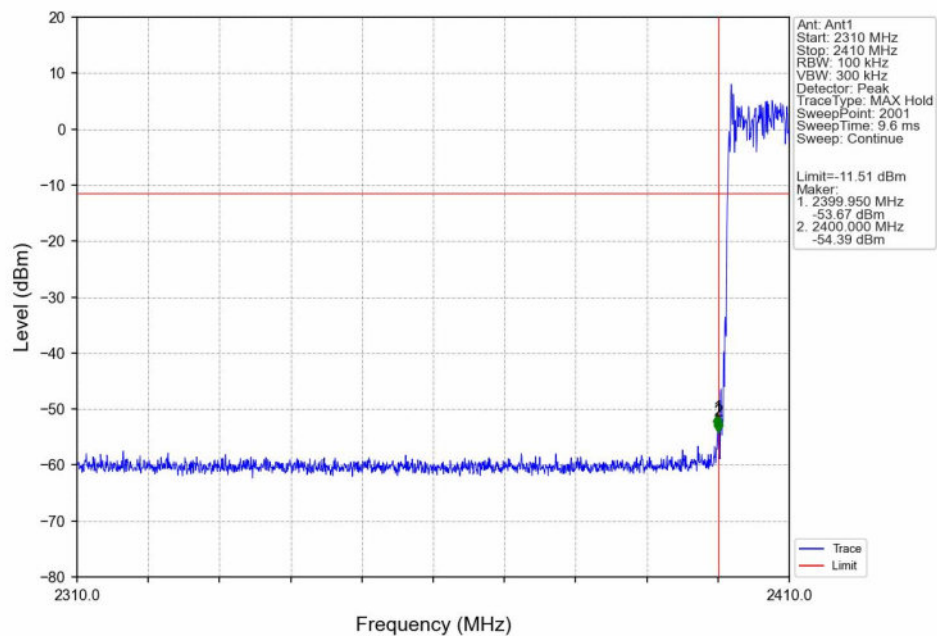


FCC ID: 2A94J-CP027

8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



FCC ID: 2A94J-CP027

