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Annex for Bluetooth

Test Report No.: CTL2512302011-WF01

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FCCID: 2BCBND0C10

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	0.851	/	Pass
		2441	DH5	1	0.857	/	Pass
		2480	DH5	1	0.856	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.172	/	Pass
		2441	2DH5	1	1.171	/	Pass
		2480	2DH5	1	1.174	/	Pass
8DPSK	SISO	2402	3DH5	1	1.179	/	Pass
		2441	3DH5	1	1.185	/	Pass
		2480	3DH5	1	1.182	/	Pass

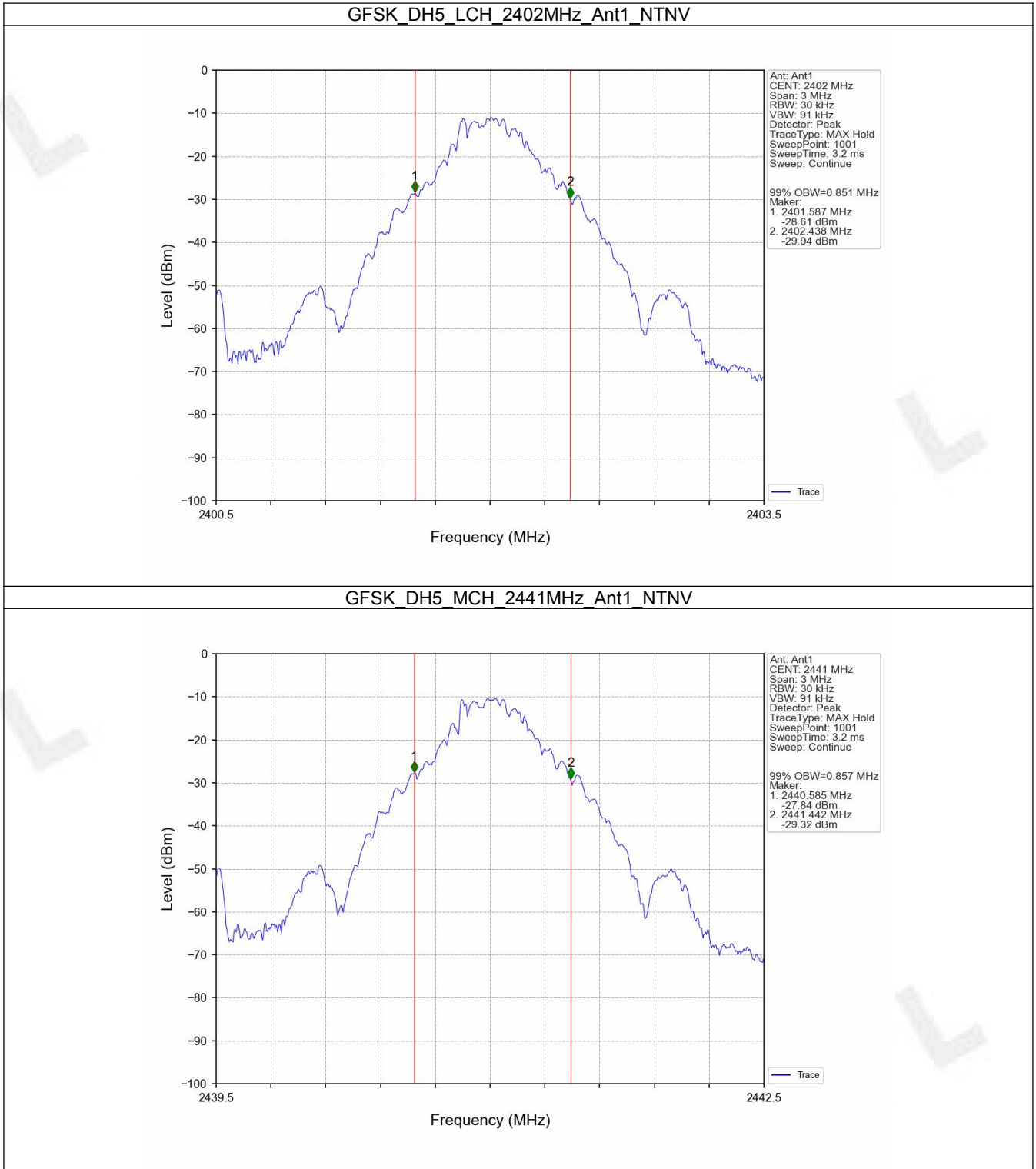
1.1.2 20dB BW

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.957	/	Pass
		2441	DH5	1	0.956	/	Pass
		2480	DH5	1	0.957	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.286	/	Pass
		2441	2DH5	1	1.282	/	Pass
		2480	2DH5	1	1.283	/	Pass
8DPSK	SISO	2402	3DH5	1	1.307	/	Pass
		2441	3DH5	1	1.310	/	Pass
		2480	3DH5	1	1.306	/	Pass

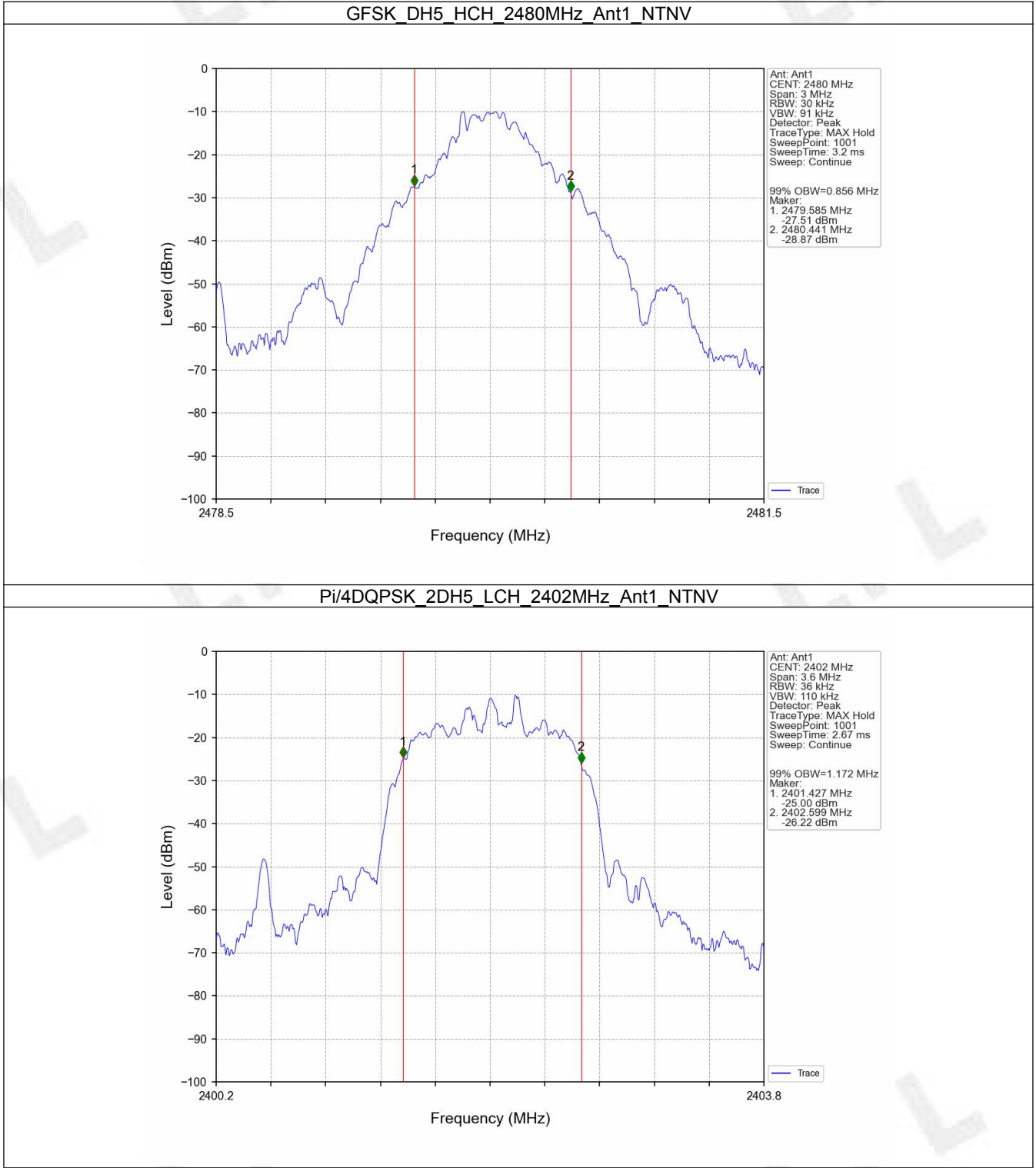
FCCID: 2BCBND0C10

1.2 Test Graph

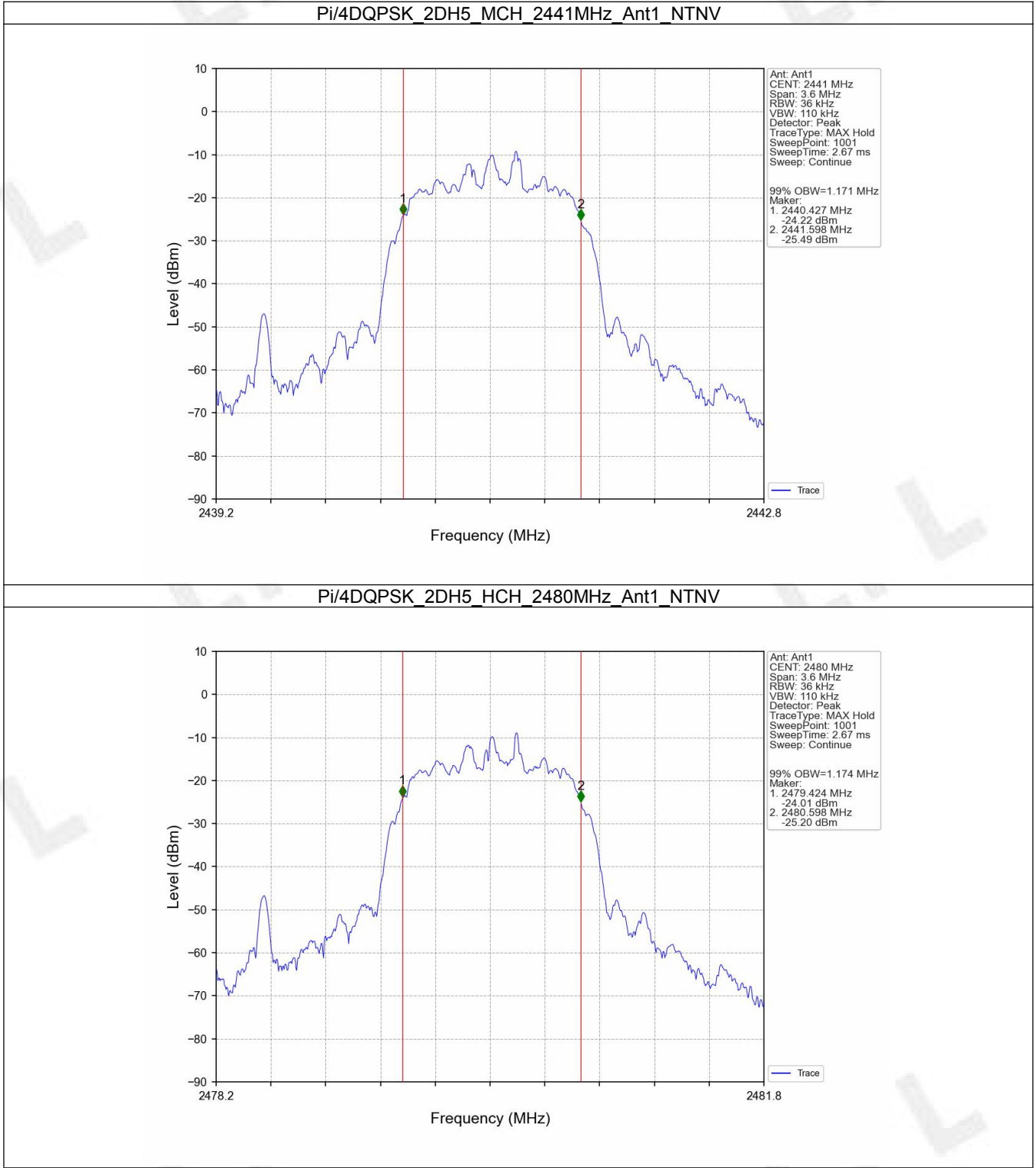
1.2.1 OBW



FCCID: 2BCBND0C10

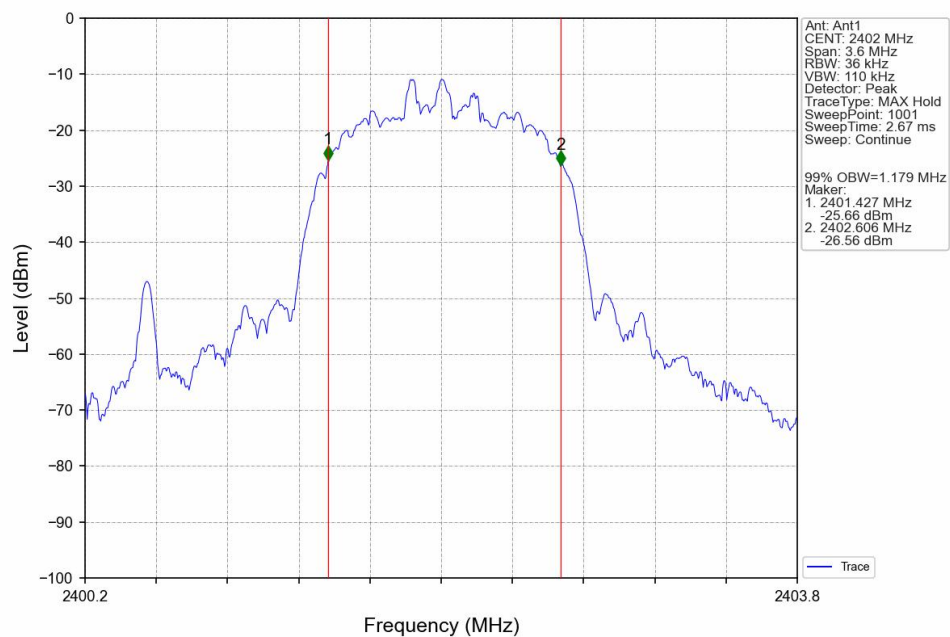


FCCID: 2BCBND0C10

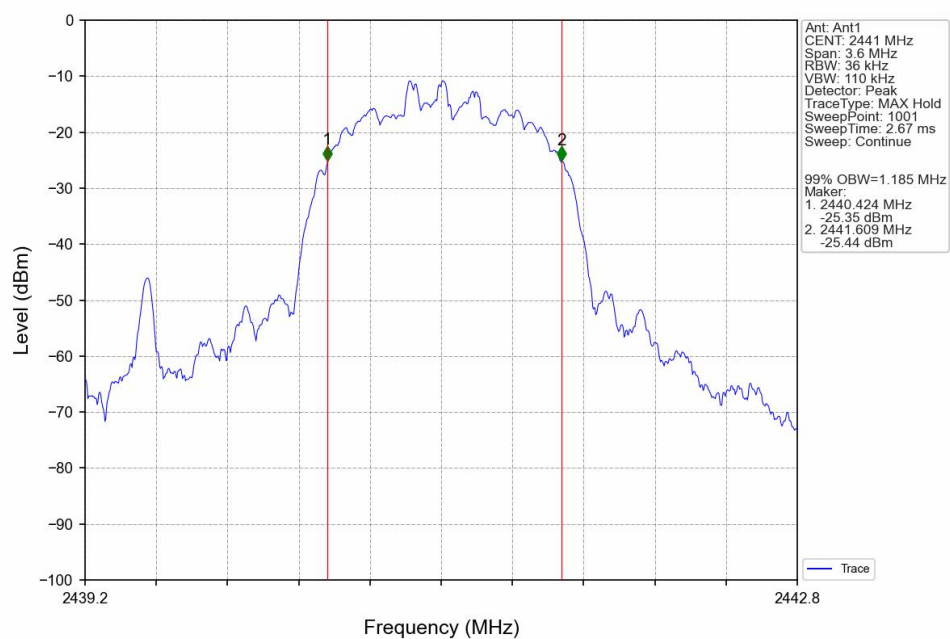


FCCID: 2BCBND0C10

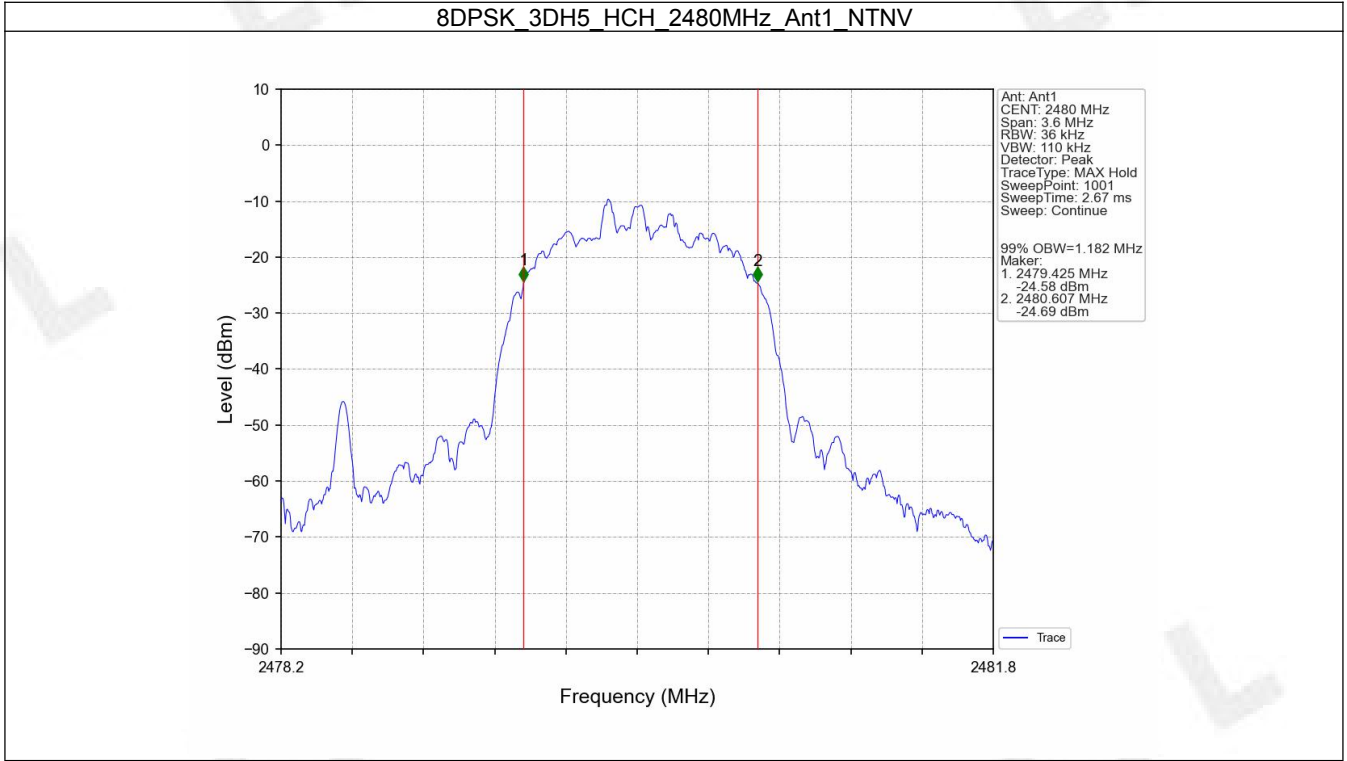
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV

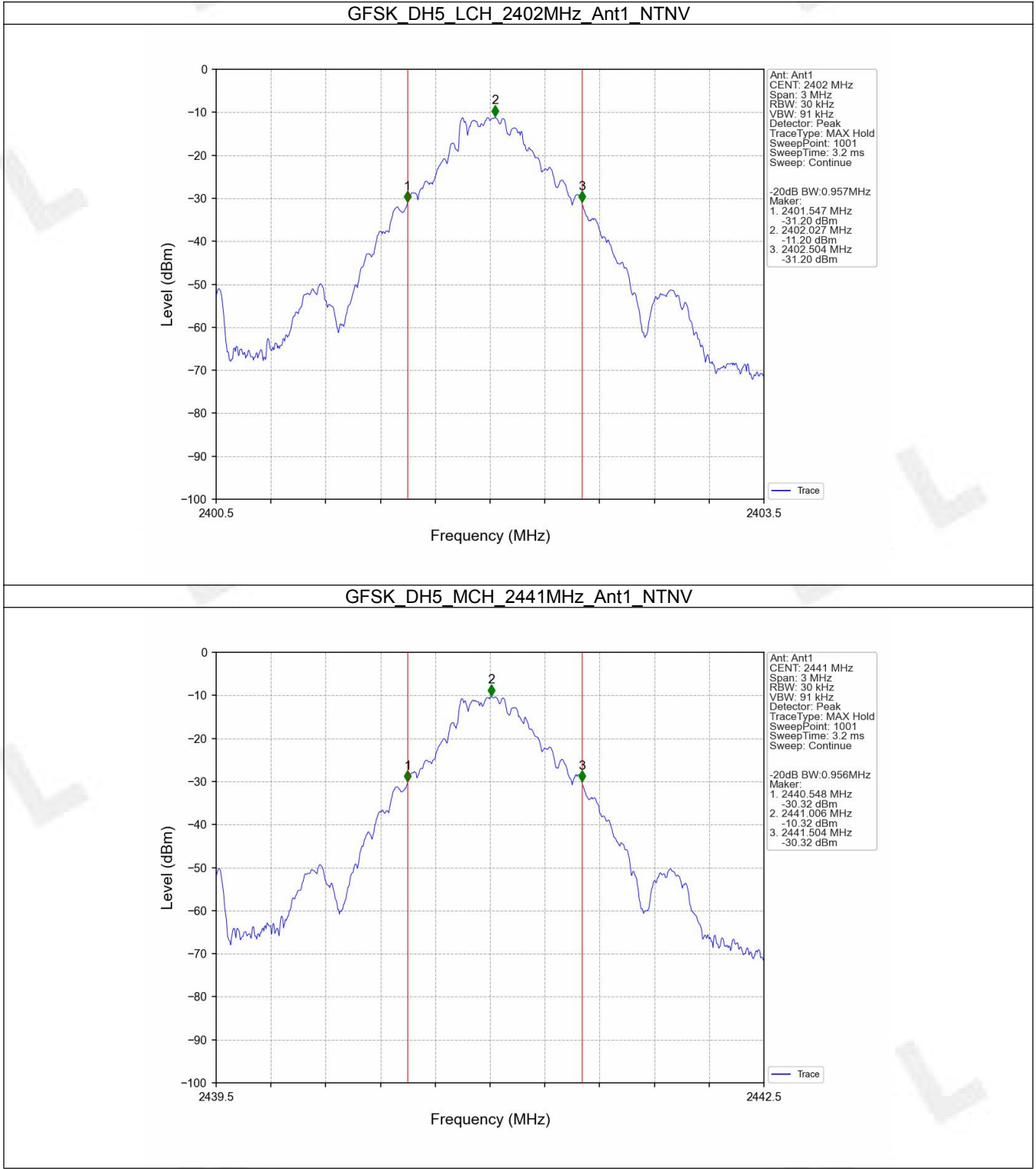


FCCID: 2BCBND0C10

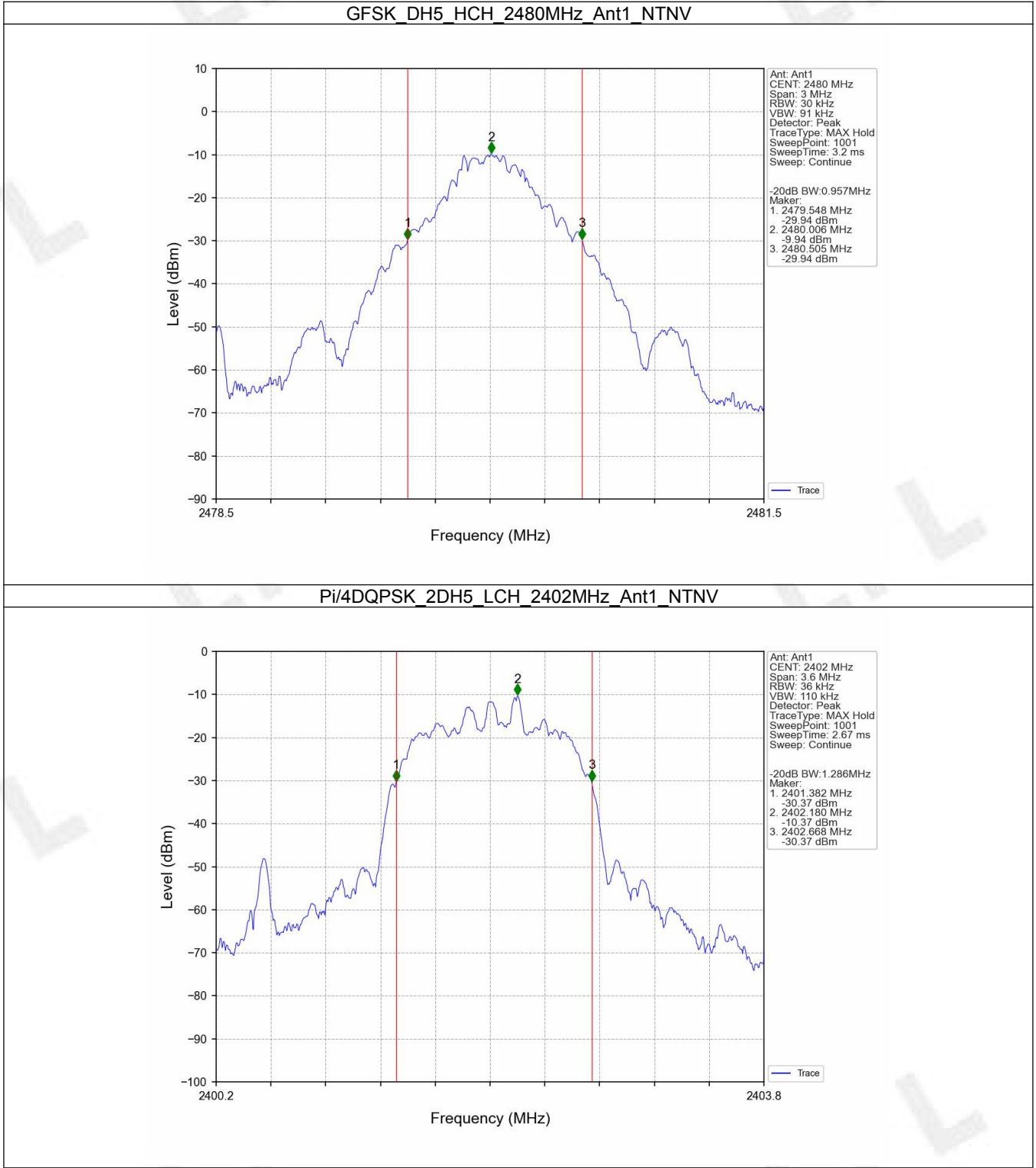


FCCID: 2BCBND0C10

1.2.2 20dB BW

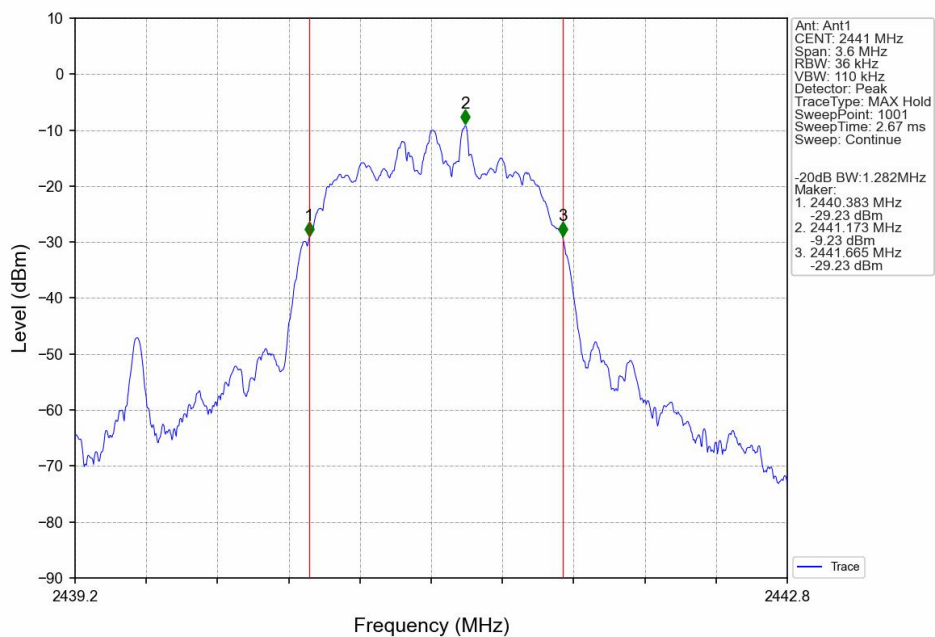


FCCID: 2BCBND0C10

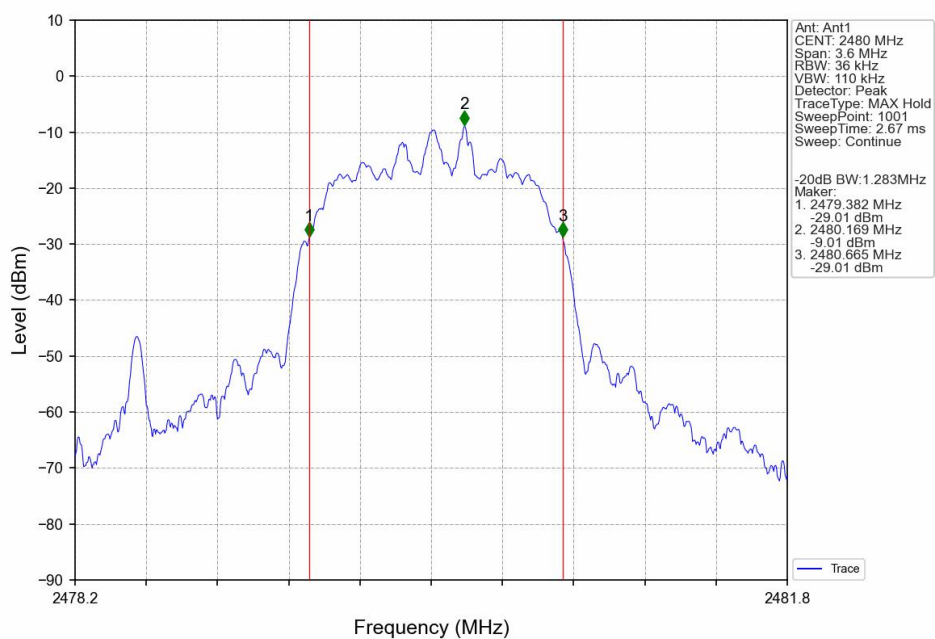


FCCID: 2BCBND0C10

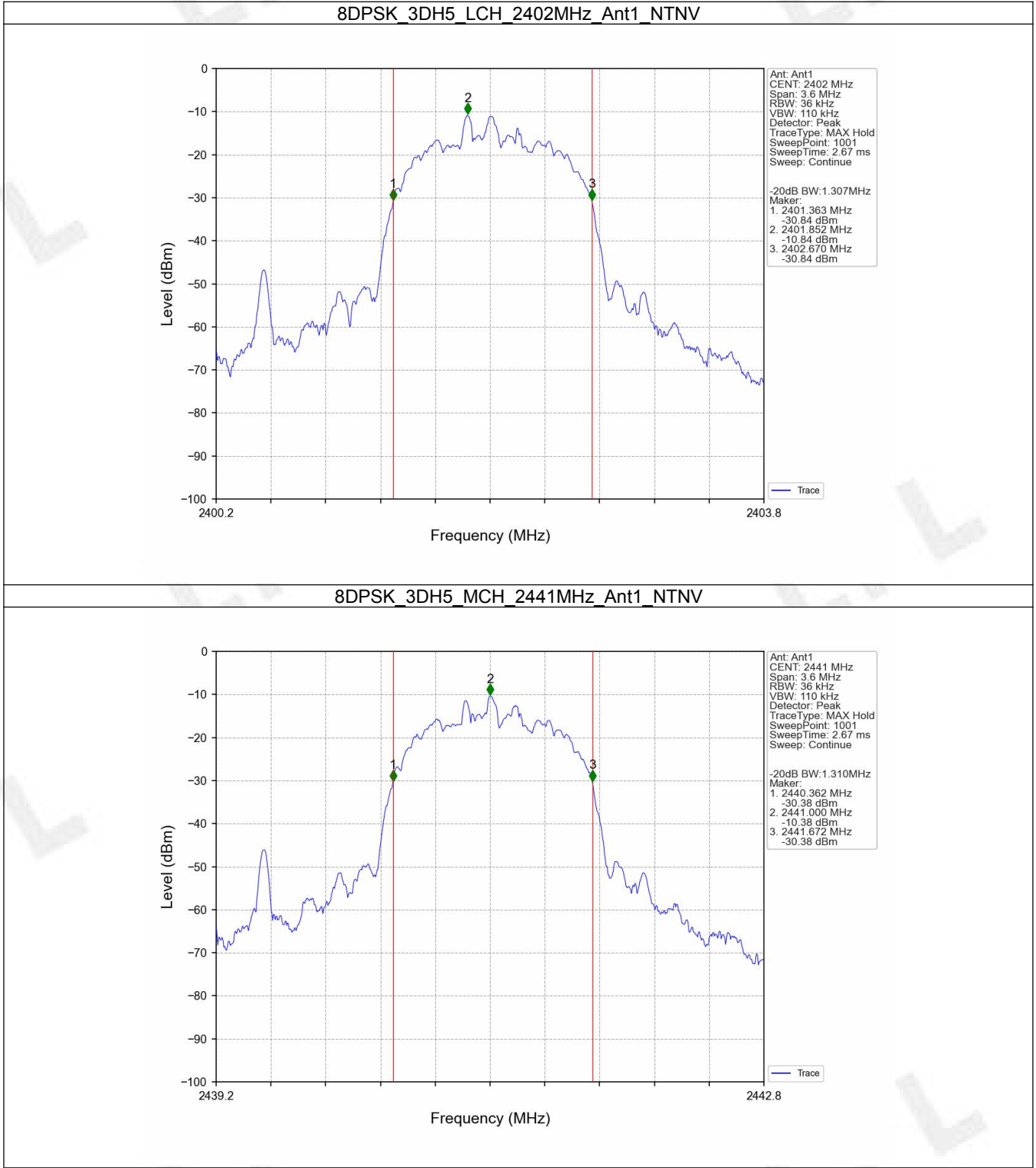
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



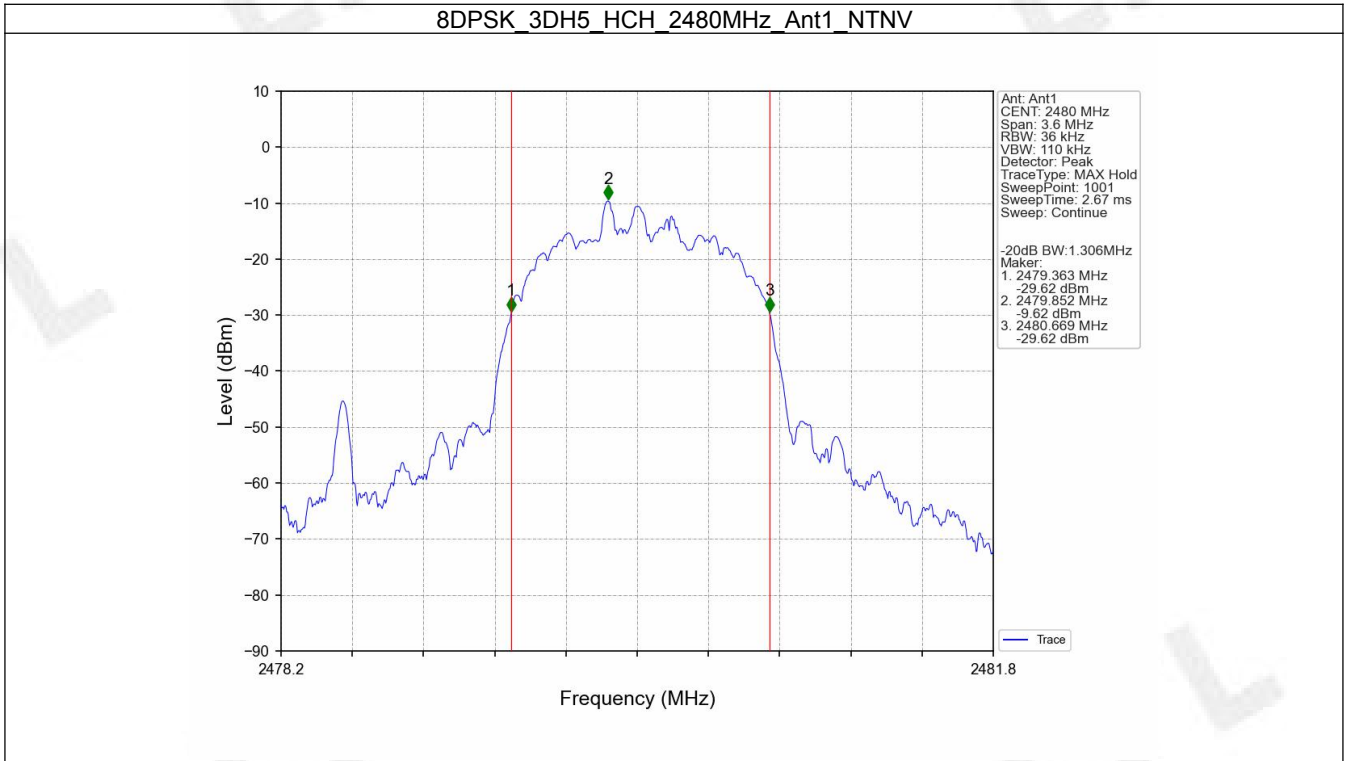
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



FCCID: 2BCBND0C10



FCCID: 2BCBND0C10



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2. Maximum Conducted Output Power

2.1 Test Result

2.1.1 Power

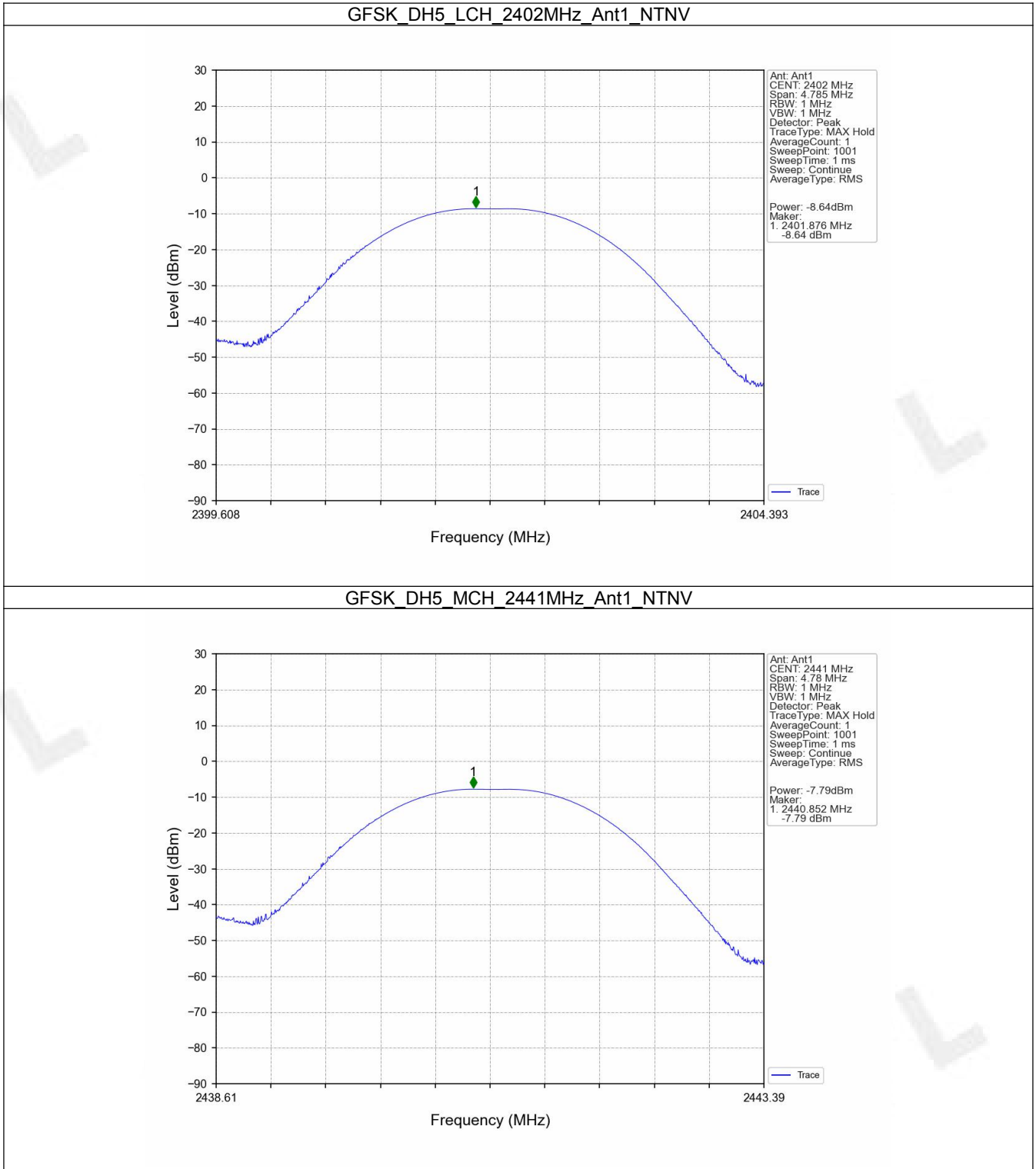
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-8.64	<=30	Pass
		2441	DH5	-7.79	<=30	Pass
		2480	DH5	-7.44	<=30	Pass
Pi/4DQPSK	SISO	2402	2DH5	-7.76	<=20.97	Pass
		2441	2DH5	-6.92	<=20.97	Pass
		2480	2DH5	-6.58	<=20.97	Pass
8DPSK	SISO	2402	3DH5	-7.46	<=20.97	Pass
		2441	3DH5	-6.61	<=20.97	Pass
		2480	3DH5	-6.31	<=20.97	Pass

Note1: Antenna Gain: Ant1: 2.08dBi;

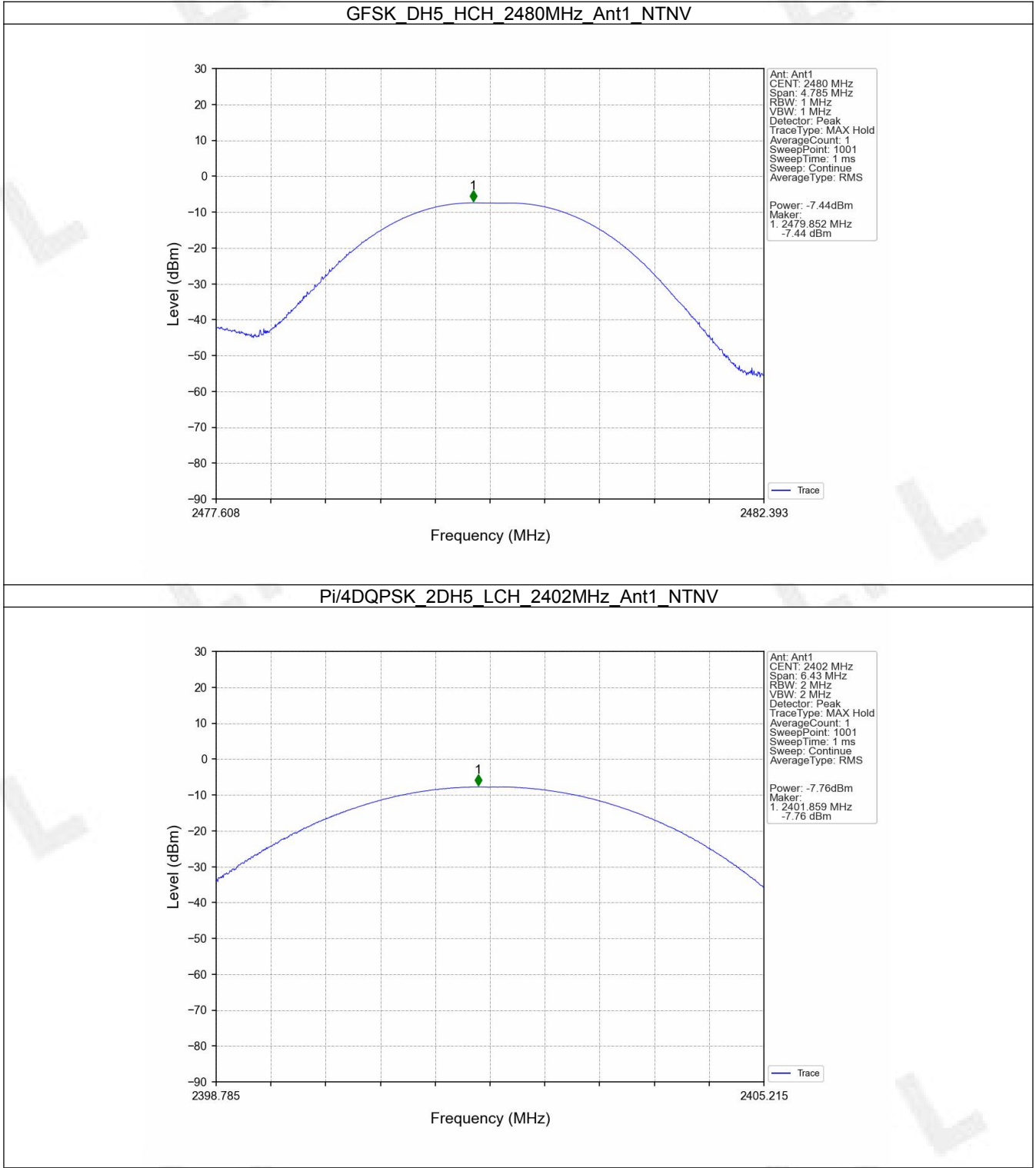
FCCID: 2BCBND0C10

2.2 Test Graph

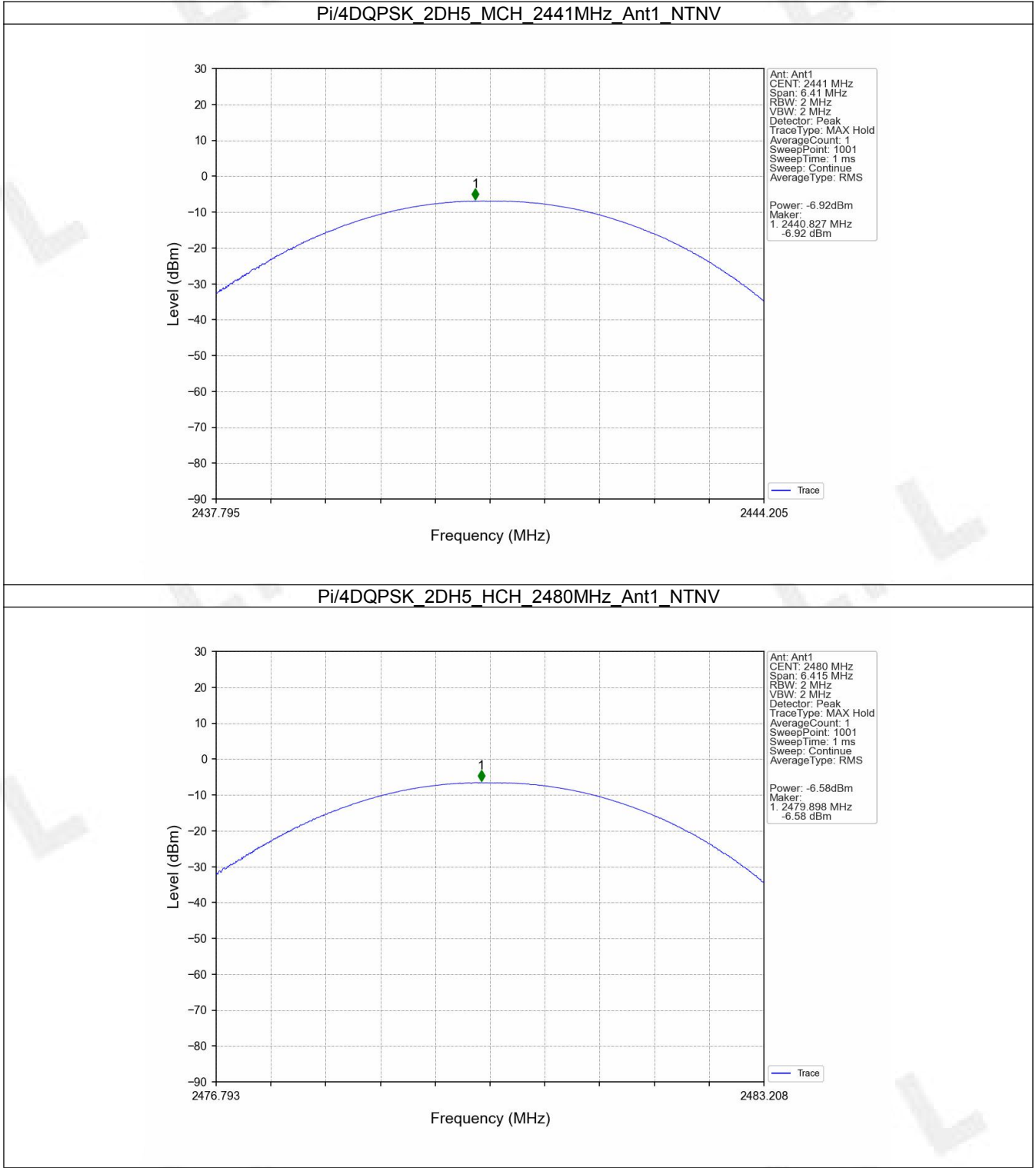
2.2.1 Power



FCCID: 2BCBND0C10

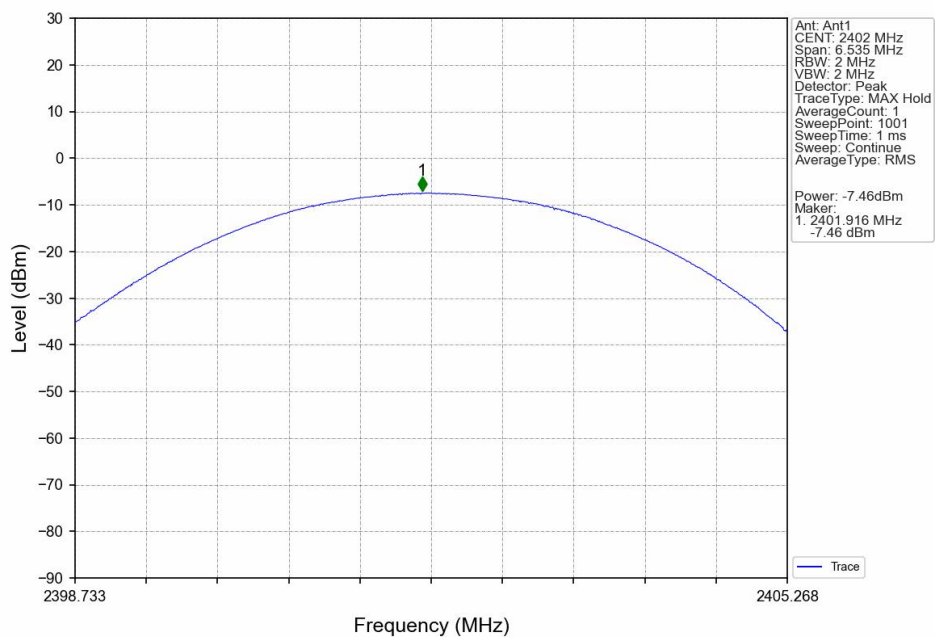


FCCID: 2BCBND0C10

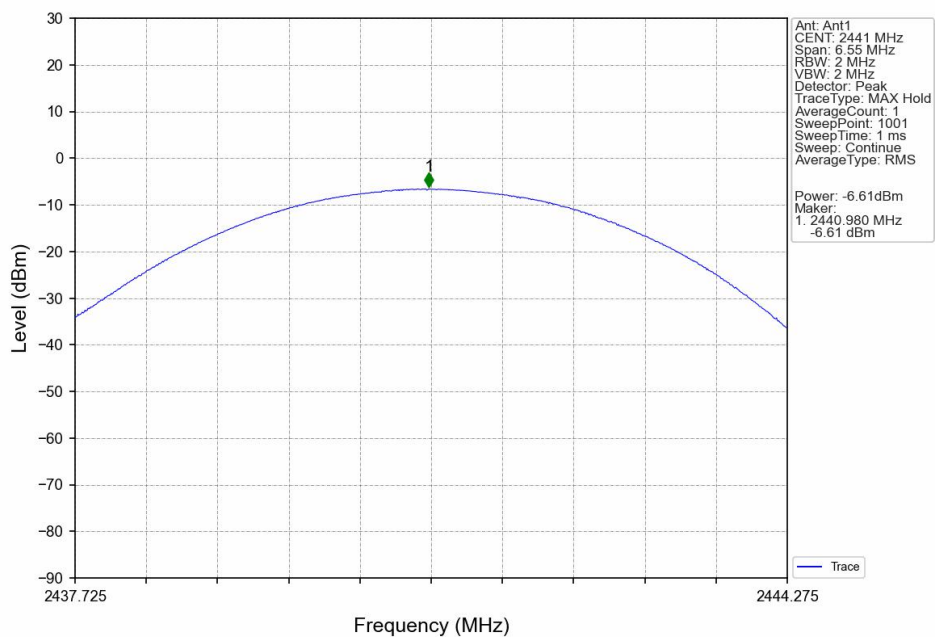


FCCID: 2BCBND0C10

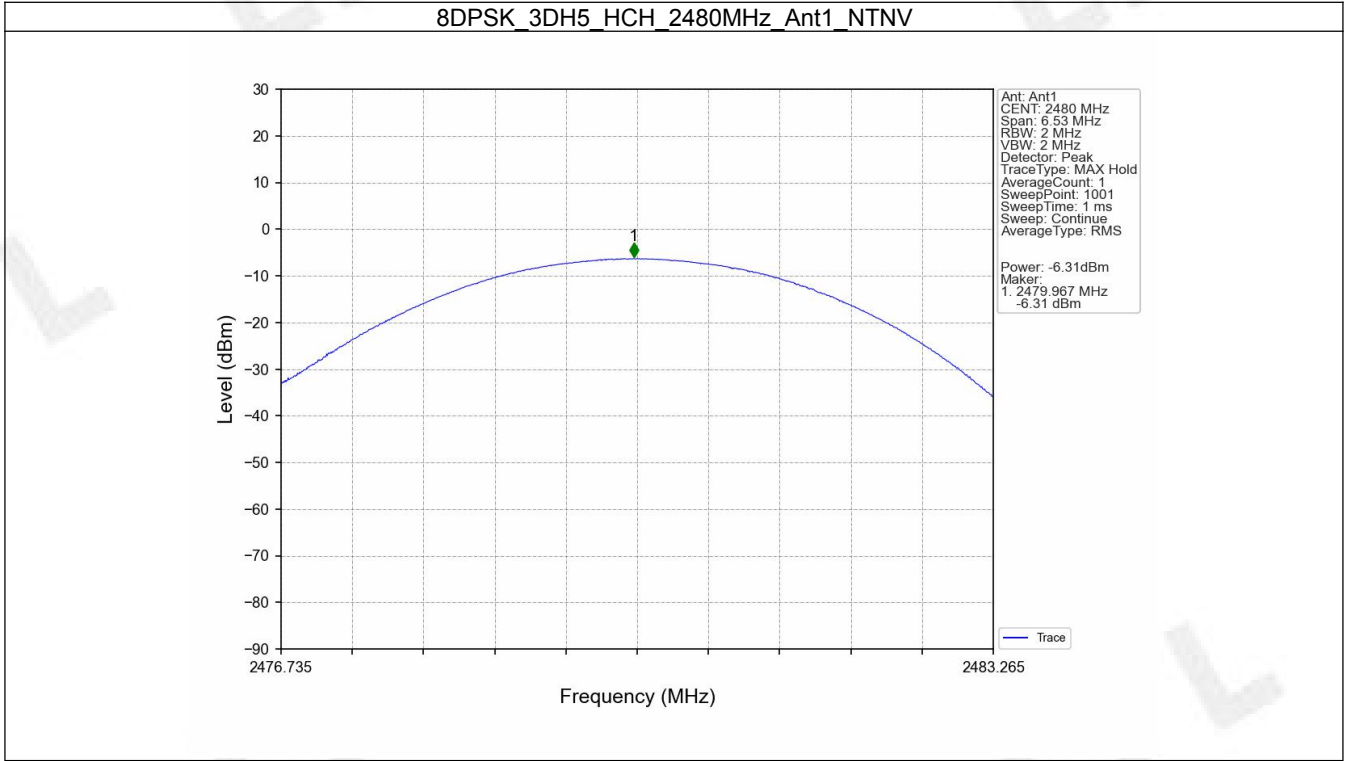
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



FCCID: 2BCBND0C10



FCCID: 2BCBND0C10

3. Carrier Frequency Separation

3.1 Test Result

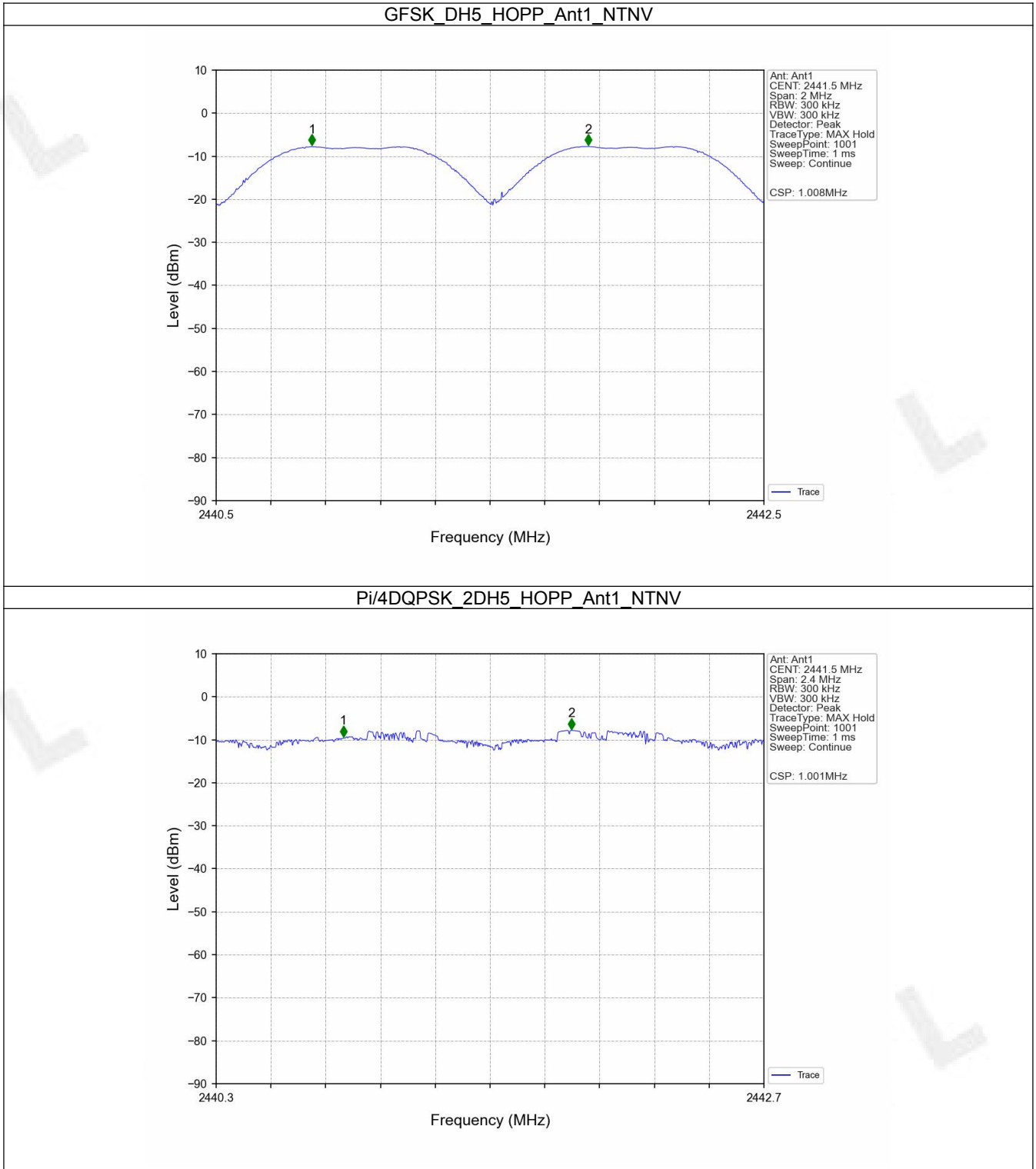
3.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.008	0.957	≥ 0.957	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	1.001	1.286	≥ 0.857	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.310	≥ 0.873	Pass

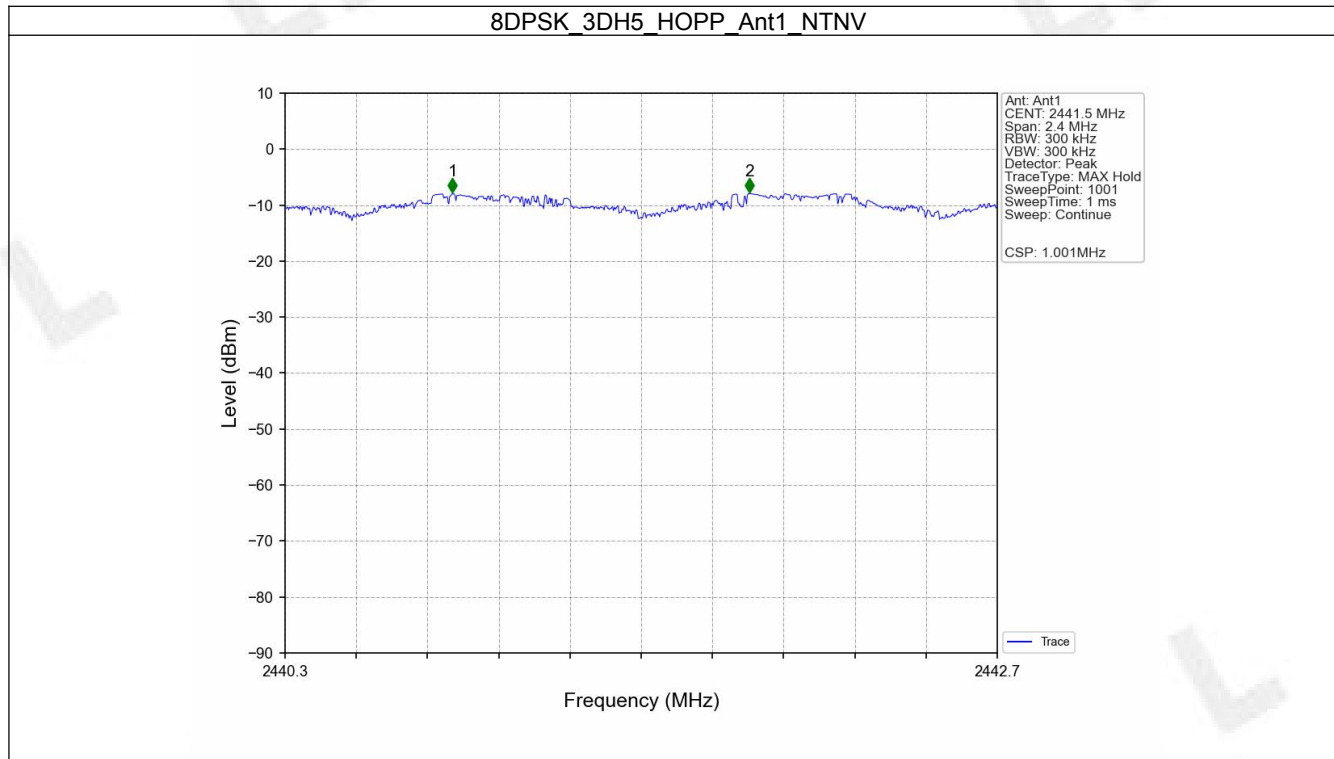
FCCID: 2BCBND0C10

3.2 Test Graph

3.2.1 Ant1



FCCID: 2BCBND0C10



FCCID: 2BCBND0C10

4. Number of Hopping Frequencies

4.1 Test Result

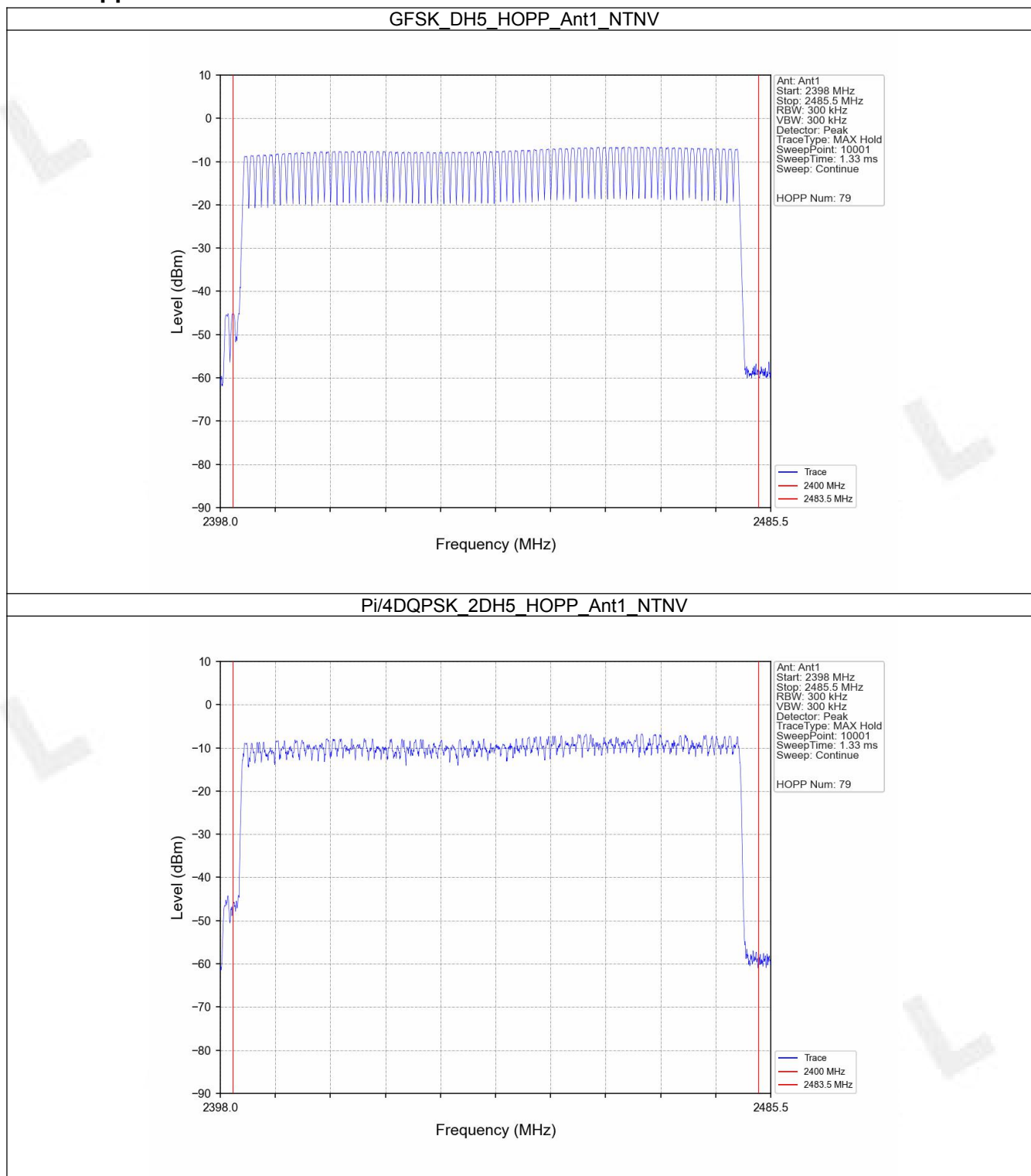
4.1.1 HoppNum

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

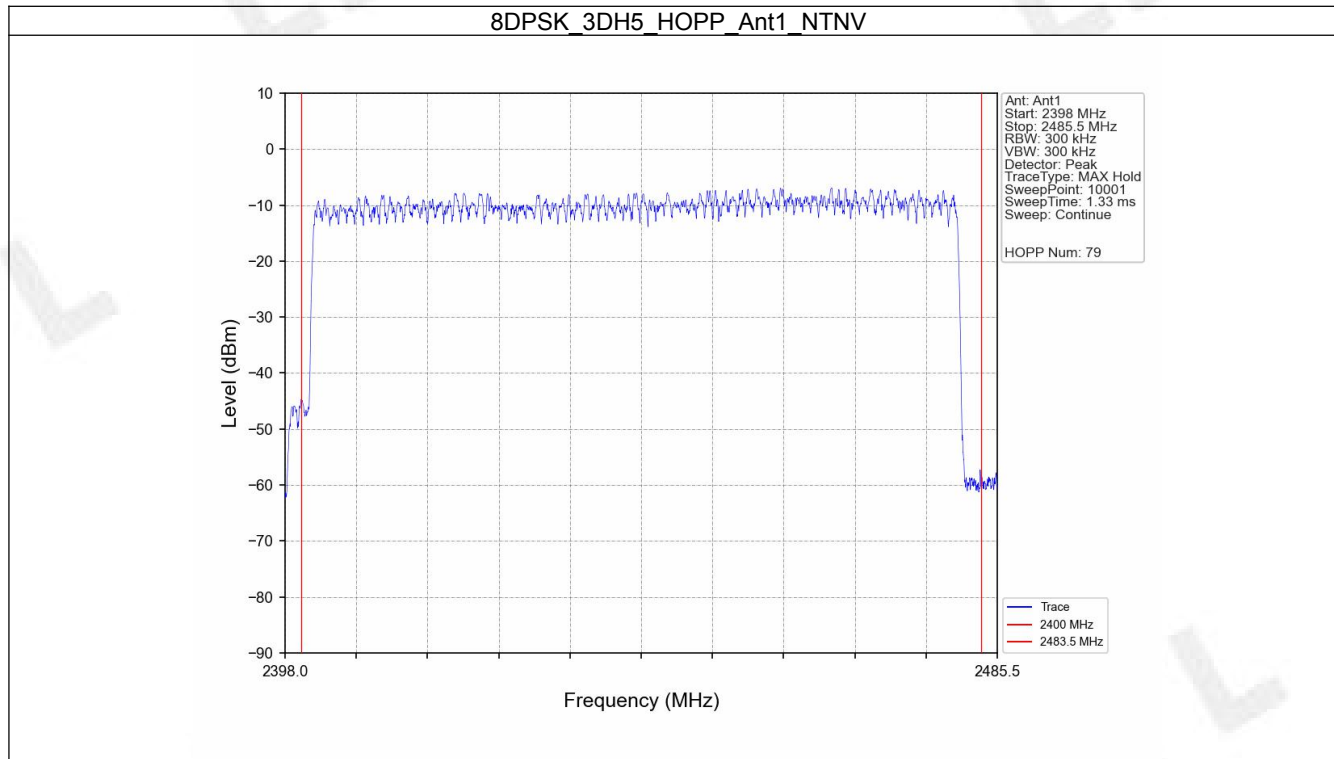
FCCID: 2BCBND0C10

4.2 Test Graph

4.2.1 HoppNum



FCCID: 2BCBND0C10



FCCID: 2BCBND0C10

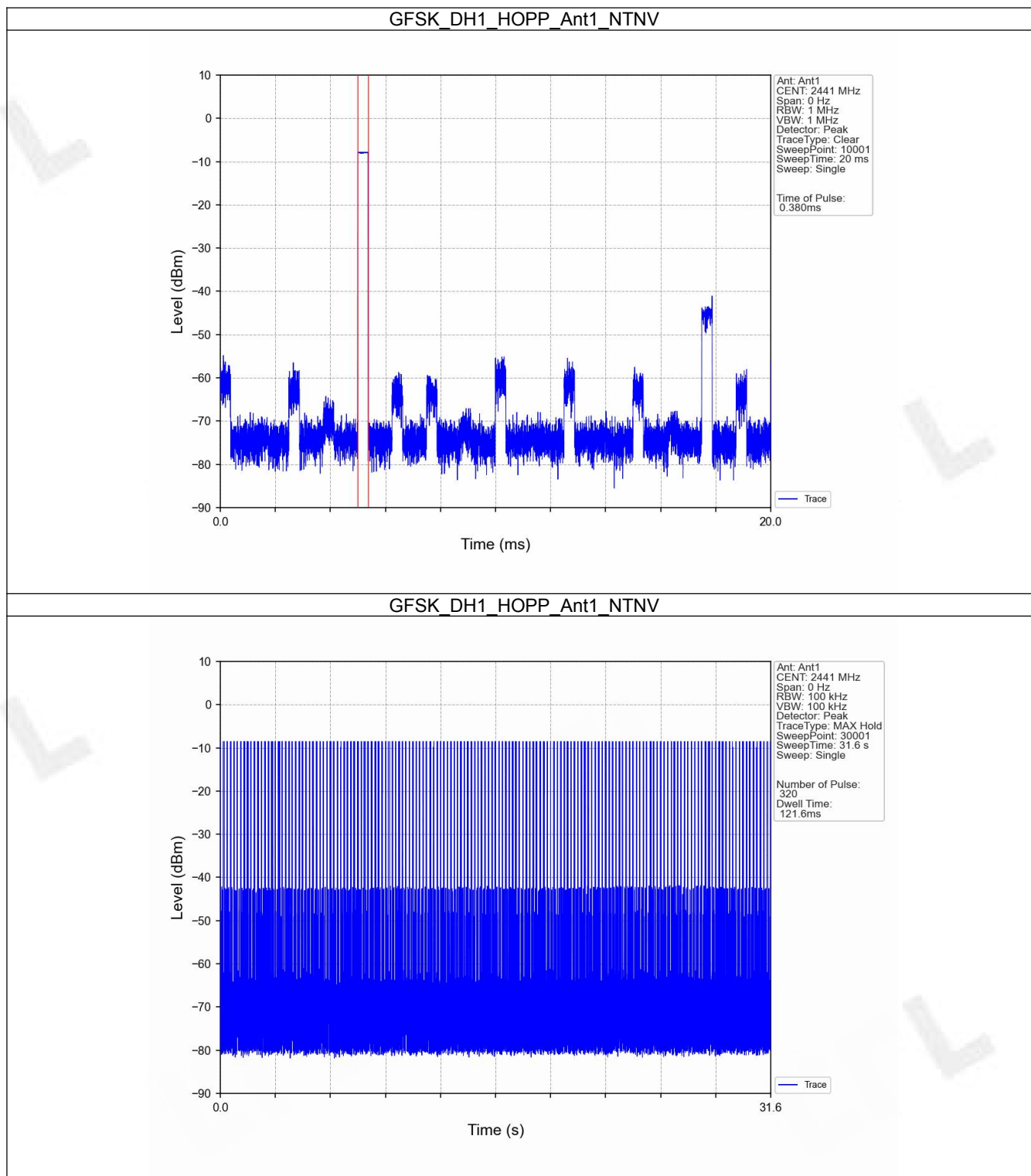
5. Time of Occupancy (Dwell Time)**5.1 Test Result****5.1.1 Ant1**

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	0.380	31.600	320	121.600	<=400	Pass
			DH3	1.636	31.600	154	251.944	<=400	Pass
			DH5	2.888	31.600	118	340.784	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.390	31.600	319	124.410	<=400	Pass
			2DH3	1.642	31.600	148	243.016	<=400	Pass
			2DH5	2.890	31.600	105	303.450	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.390	31.600	319	124.410	<=400	Pass
			3DH3	1.640	31.600	166	272.240	<=400	Pass
			3DH5	2.896	31.600	112	324.352	<=400	Pass

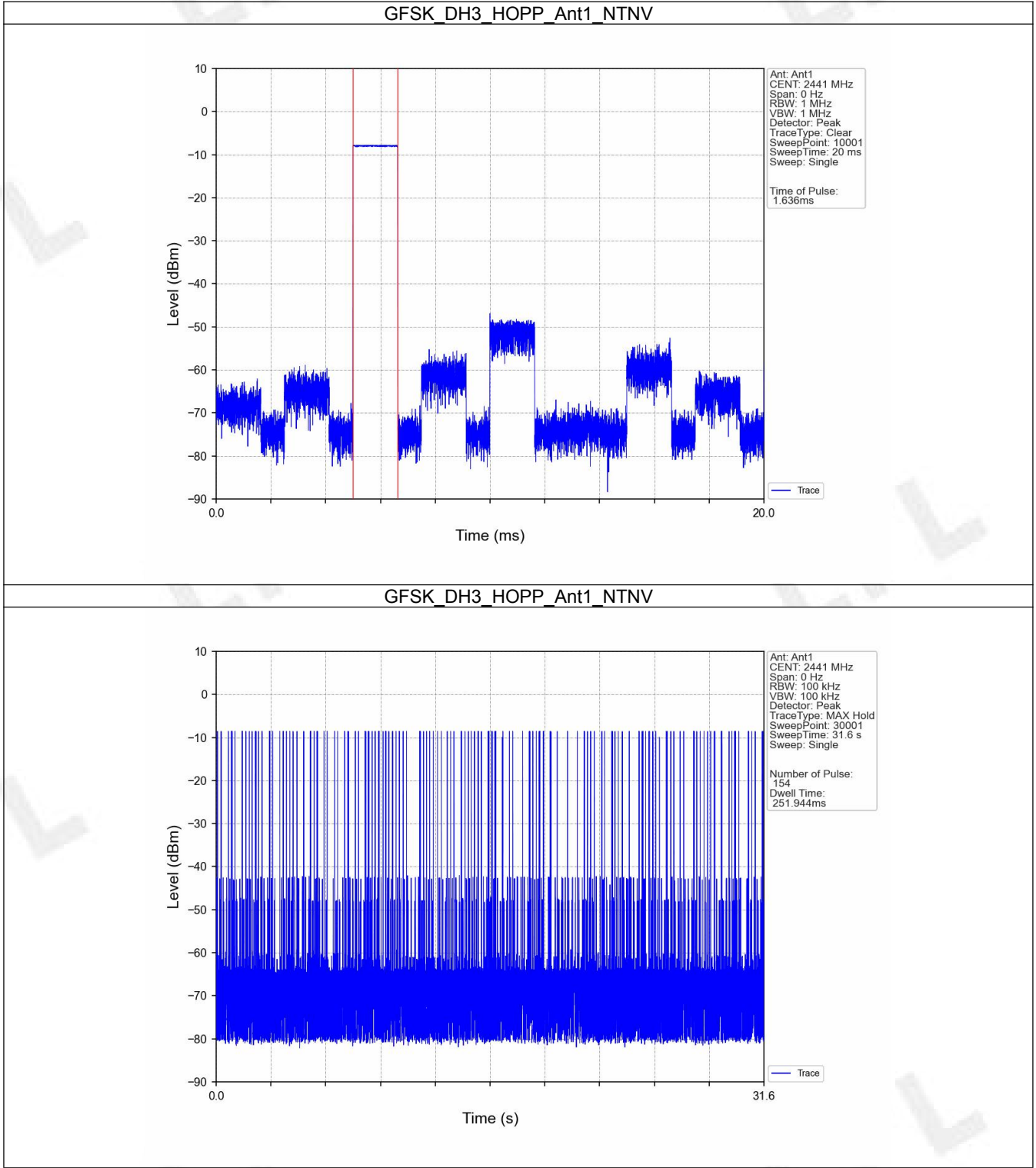
FCCID: 2BCBND0C10

5.2 Test Graph

5.2.1 Ant1

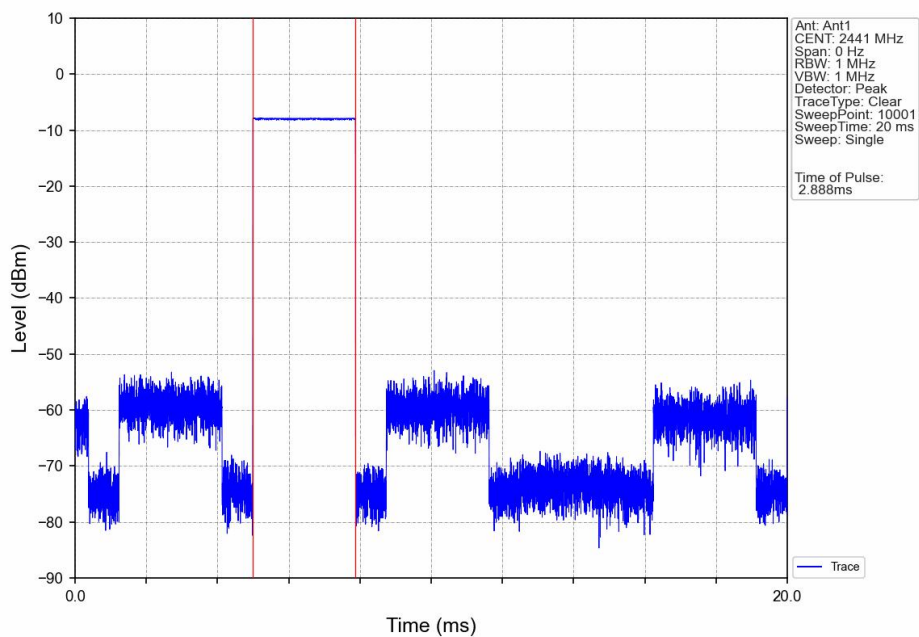


FCCID: 2BCBND0C10

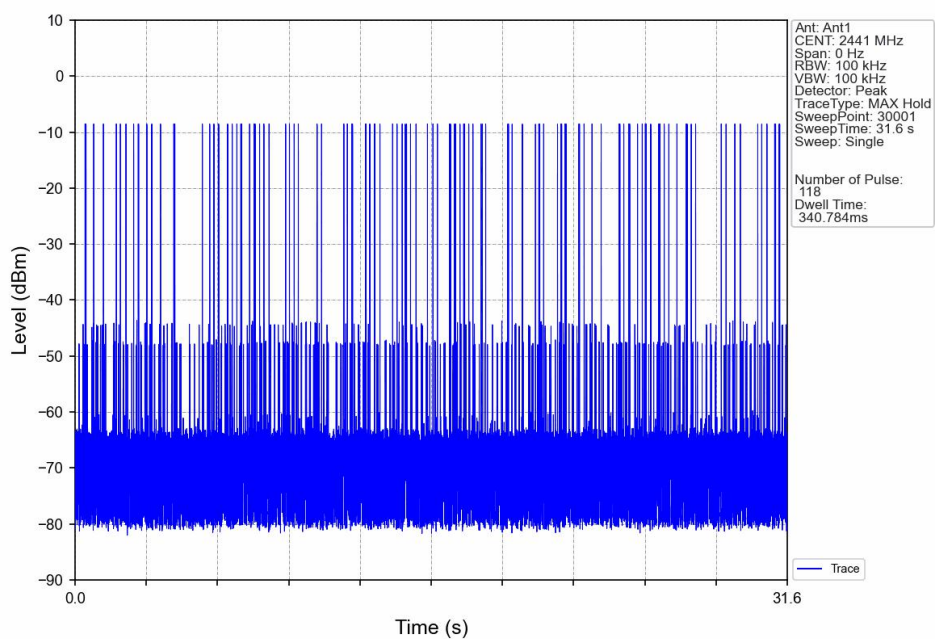


FCCID: 2BCBND0C10

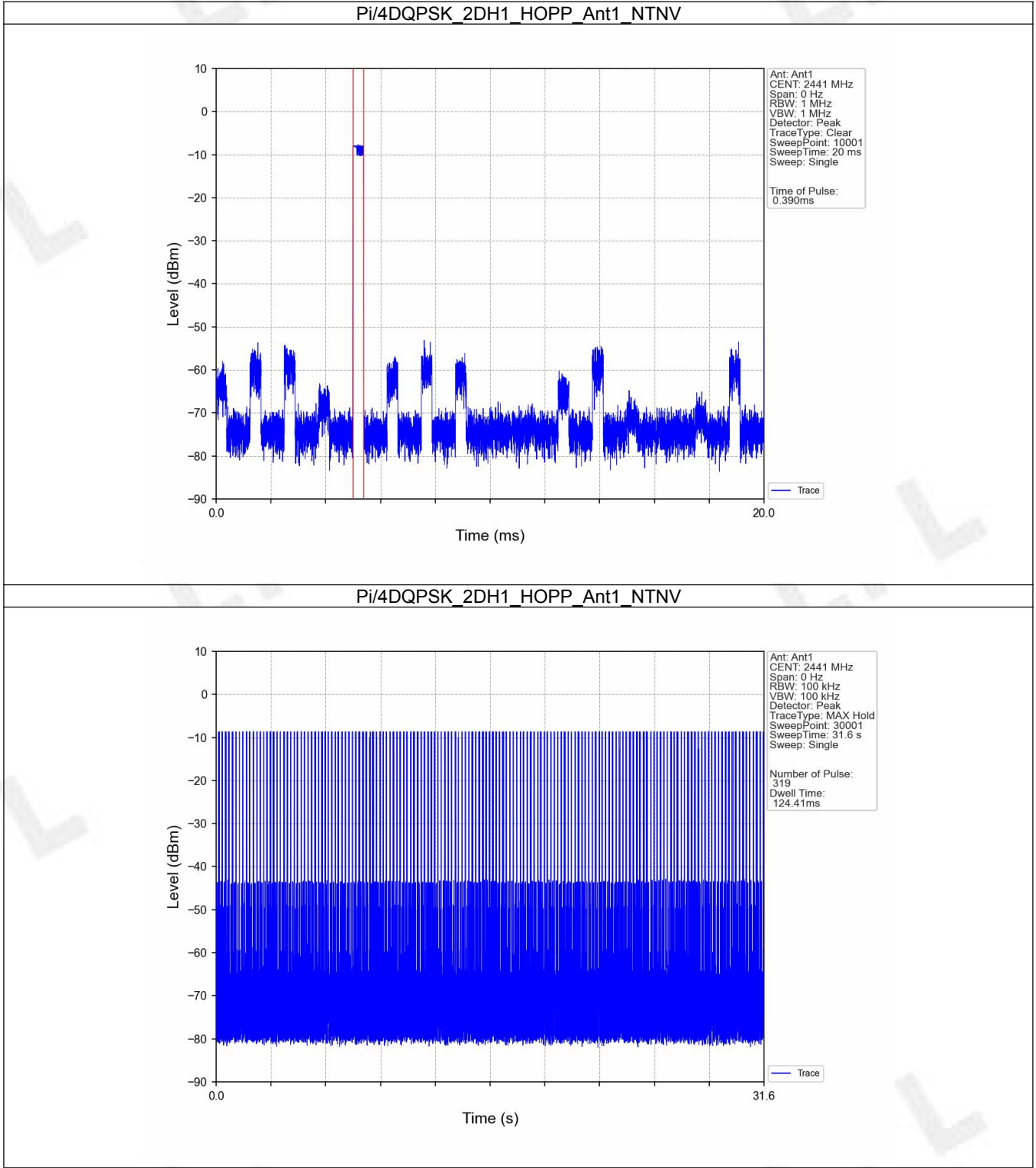
GFSK_DH5_HOPP_Ant1_NTNV



GFSK_DH5_HOPP_Ant1_NTNV

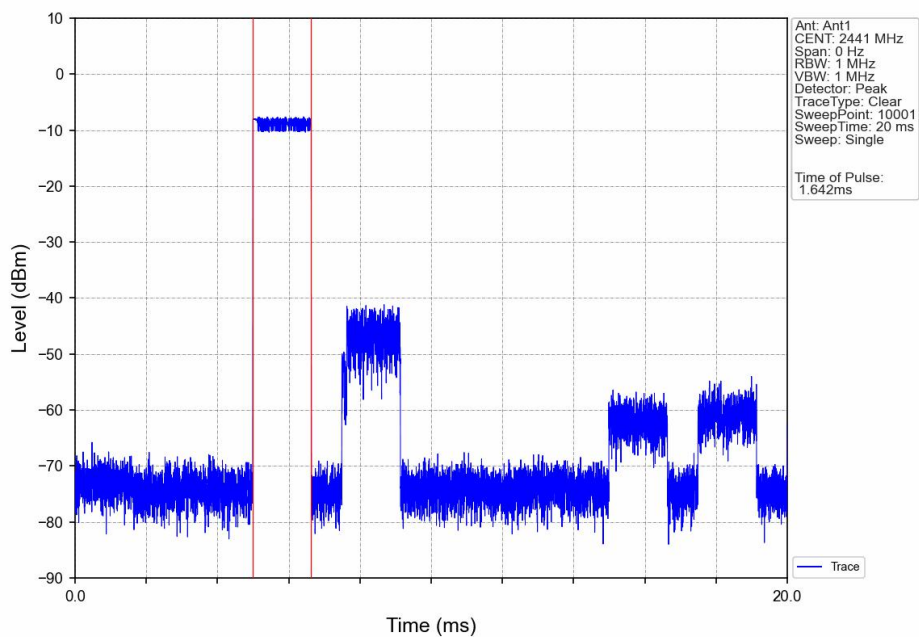


FCCID: 2BCBND0C10

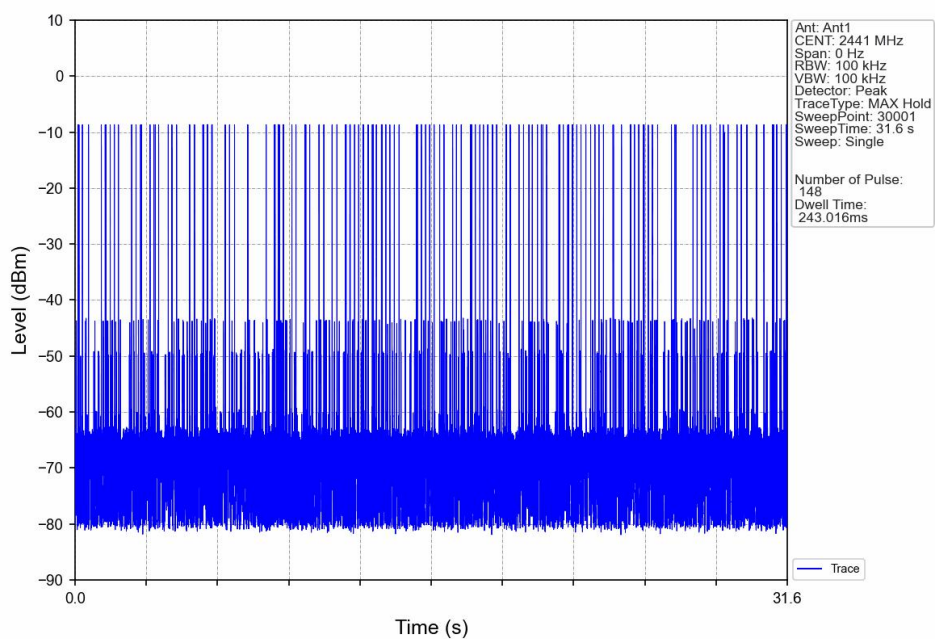


FCCID: 2BCBND0C10

Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV

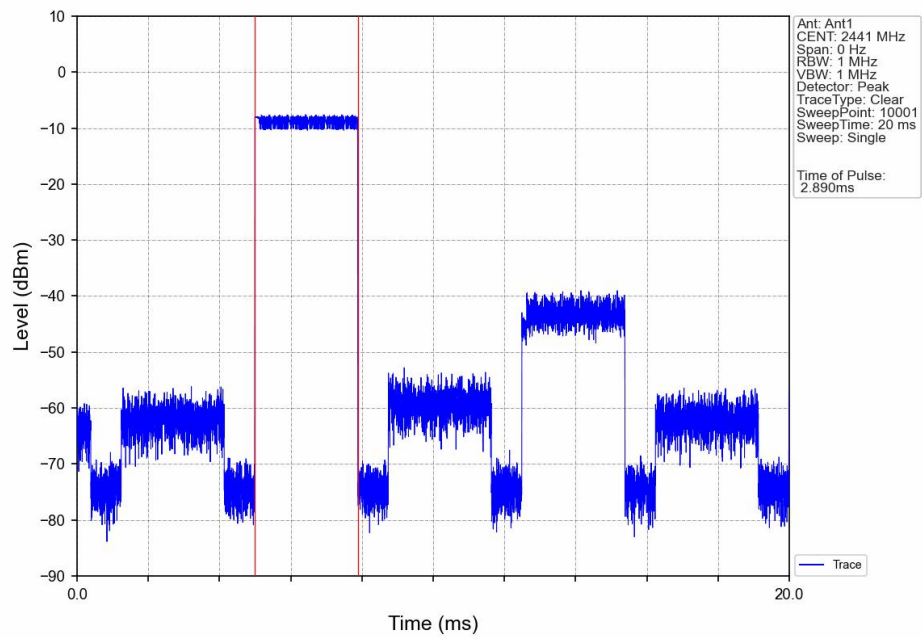


Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV

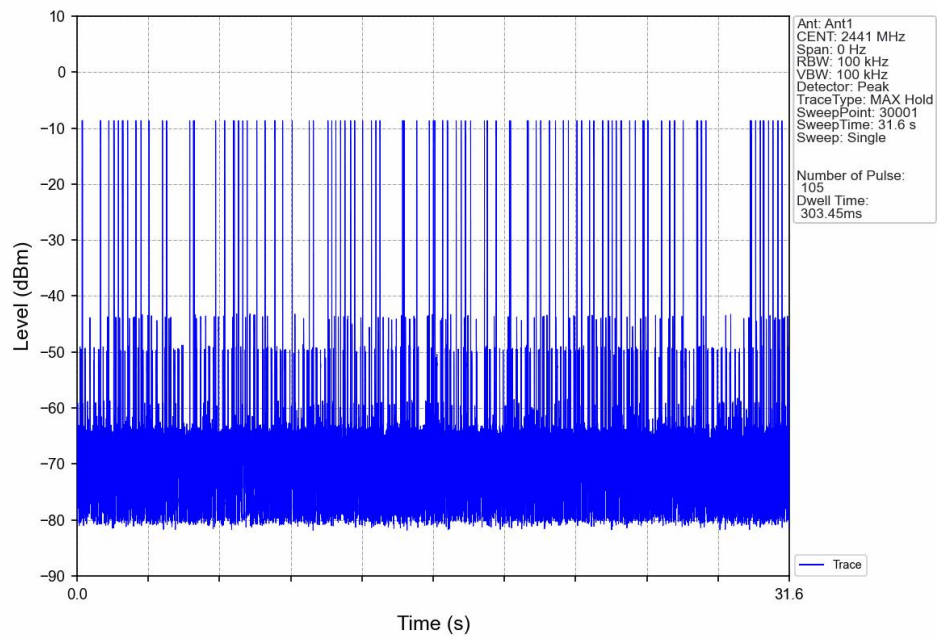


FCCID: 2BCBND0C10

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

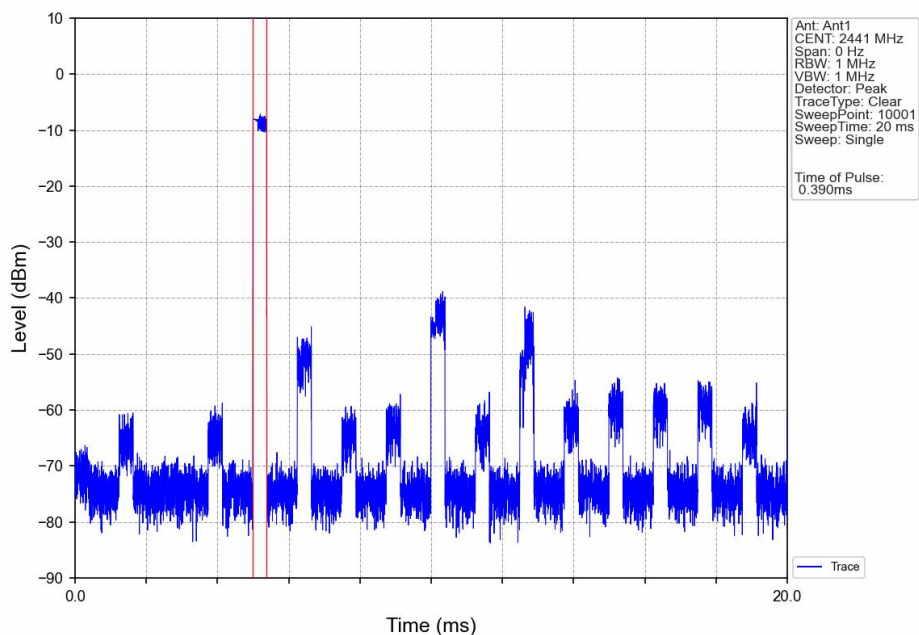


Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV

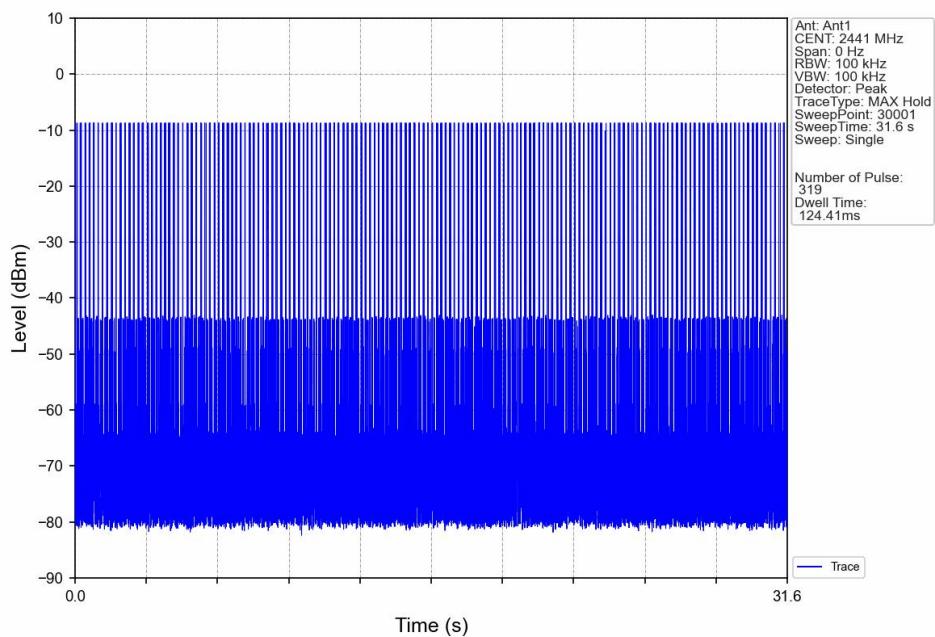


FCCID: 2BCBND0C10

8DPSK_3DH1_HOPP_Ant1_NTNV

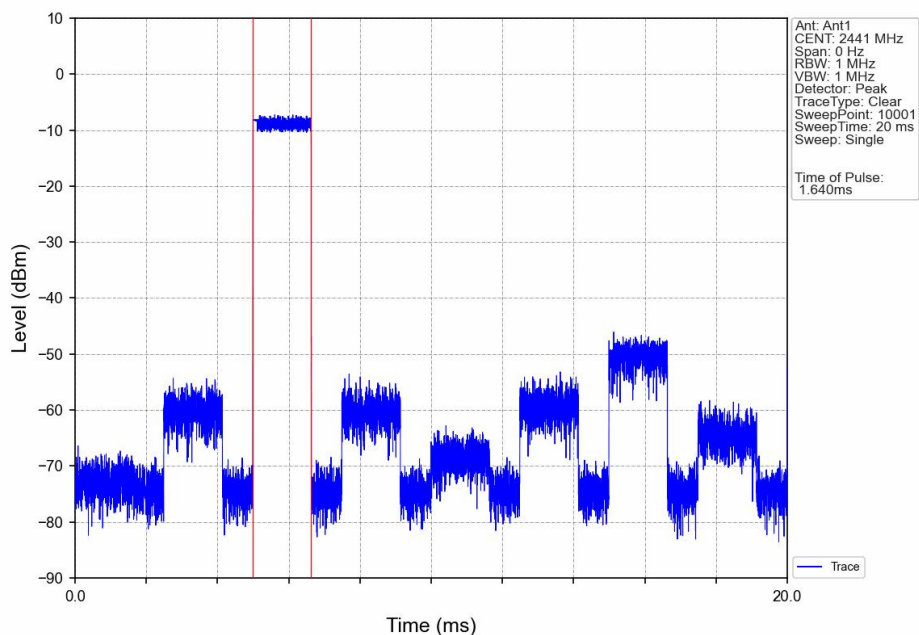


8DPSK_3DH1_HOPP_Ant1_NTNV

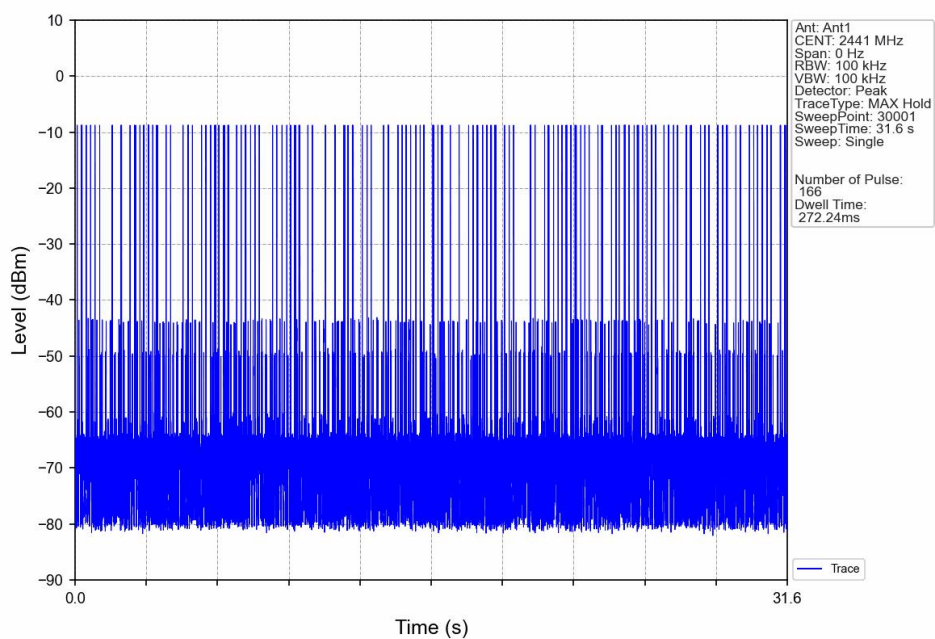


FCCID: 2BCBND0C10

8DPSK_3DH3_HOPP_Ant1_NTNV

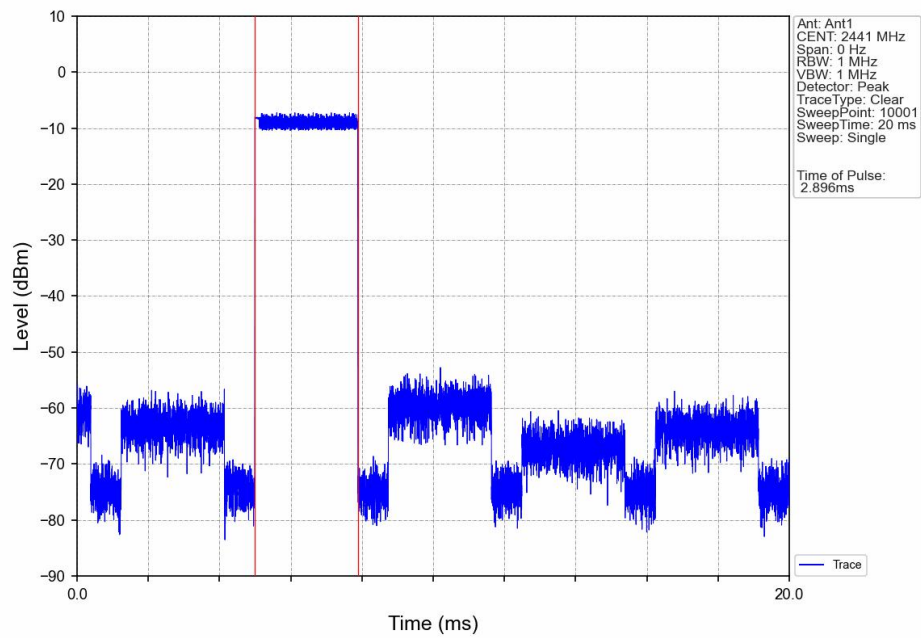


8DPSK_3DH3_HOPP_Ant1_NTNV

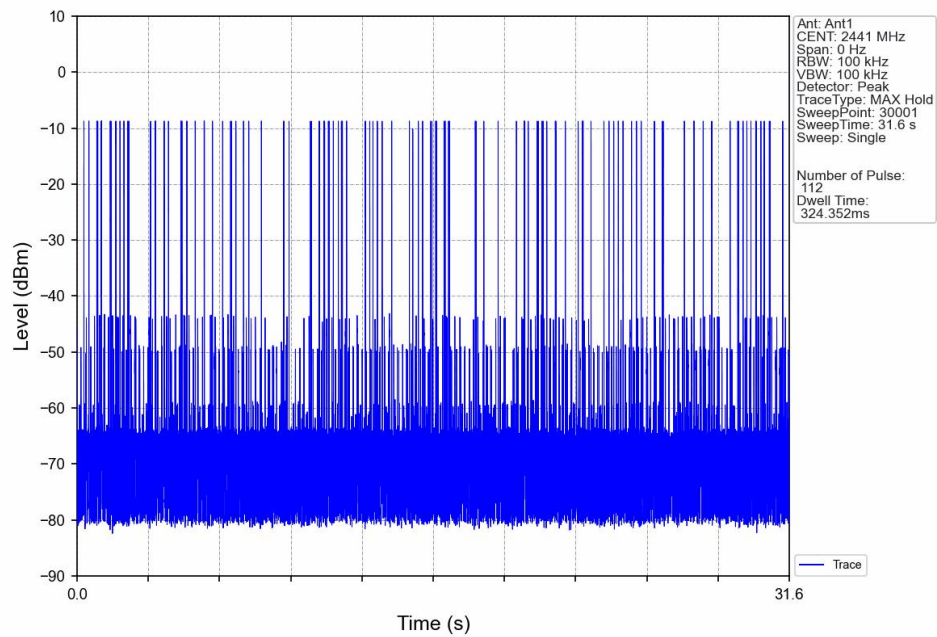


FCCID: 2BCBND0C10

8DPSK_3DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



FCCID: 2BCBND0C10

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	-8.84
		2441	DH5	1	-7.95
		2480	DH5	1	-7.64
Pi/4DQPSK	SISO	2402	2DH5	1	-8.88
		2441	2DH5	1	-8.09
		2480	2DH5	1	-7.74
8DPSK	SISO	2402	3DH5	1	-9.01
		2441	3DH5	1	-8.37
		2480	3DH5	1	-7.84

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.

6.1.2 CSE

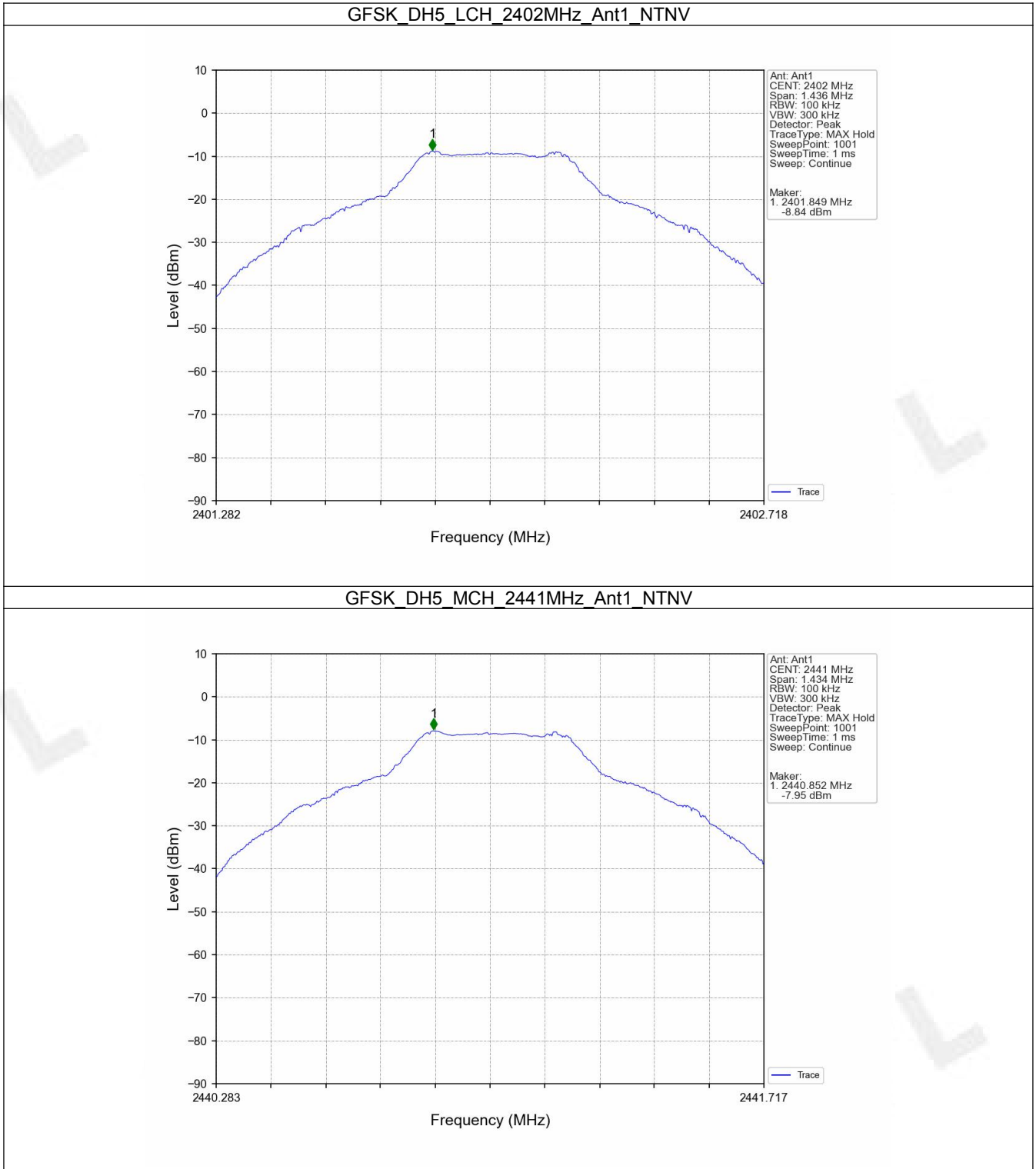
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-7.64	-27.64	Pass
		2441	DH5	1	-7.64	-27.64	Pass
		2480	DH5	1	-7.64	-27.64	Pass
		HOPP	DH5	1	-7.64	-27.64	Pass
					-7.64	-27.64	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	-7.74	-27.74	Pass
		2441	2DH5	1	-7.74	-27.74	Pass
		2480	2DH5	1	-7.74	-27.74	Pass
		HOPP	2DH5	1	-7.74	-27.74	Pass
					-7.74	-27.74	Pass
8DPSK	SISO	2402	3DH5	1	-7.84	-27.84	Pass
		2441	3DH5	1	-7.84	-27.84	Pass
		2480	3DH5	1	-7.84	-27.84	Pass
		HOPP	3DH5	1	-7.84	-27.84	Pass
					-7.84	-27.84	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.

FCCID: 2BCBND0C10

6.2 Test Graph

6.2.1 Ref



FCCID: 2BCBND0C10

