



Annex for BT

Test Report No.: CTL2410312051-WF01

TABLE OF CONTENTS

1. Bandwidth.....	3
1.1 Test Result	3
1.1.1 OBW	3
1.1.2 20dB BW	3
1.2 Test Graph.....	4
1.2.1 OBW	4
1.2.2 20dB BW	10
2. Maximum Conducted Output Power	16
2.1 Test Result	16
2.1.1 Power	16
2.2 Test Graph.....	17
2.2.1 Power	17
3. Carrier Frequency Separation.....	23
3.1 Test Result	23
3.1.1 Ant1	23
3.2 Test Graph.....	24
3.2.1 Ant1	24
4. Number of Hopping Frequencies	27
4.1 Test Result	27
4.1.1 HoppNum	27



4.2 Test Graph.....	28
4.2.1 HoppNum	28
5. Time of Occupancy (Dwell Time)	31
5.1 Test Result	31
5.1.1 Ant1	31
5.2 Test Graph.....	32
5.2.1 Ant1	32
6. Unwanted Emissions In Non-restricted Frequency Bands.....	42
6.1 Test Result	42
6.1.1 Ref.....	42
6.1.2 CSE	42
6.2 Test Graph.....	43
6.2.1 Ref.....	43
6.2.2 CSE	49

FCCID: 2A8SL-T13R

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	0.890	/	Pass
		2441	DH5	1	0.889	/	Pass
		2480	DH5	1	0.888	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.172	/	Pass
		2441	2DH5	1	1.173	/	Pass
		2480	2DH5	1	1.174	/	Pass
8DPSK	SISO	2402	3DH5	1	1.172	/	Pass
		2441	3DH5	1	1.172	/	Pass
		2480	3DH5	1	1.172	/	Pass

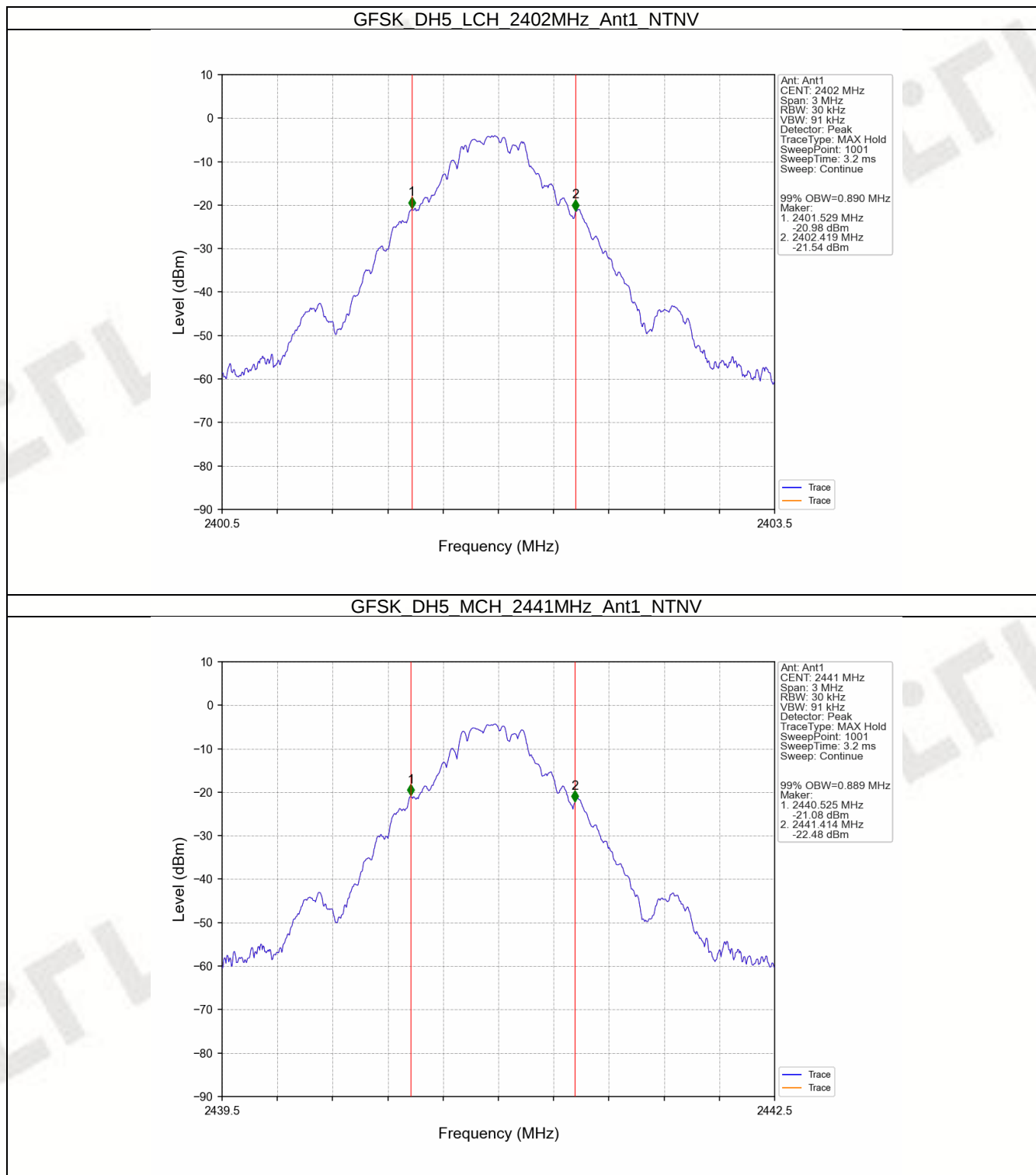
1.1.2 20dB BW

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	1.013	/	Pass
		2441	DH5	1	1.020	/	Pass
		2480	DH5	1	1.014	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.293	/	Pass
		2441	2DH5	1	1.296	/	Pass
		2480	2DH5	1	1.290	/	Pass
8DPSK	SISO	2402	3DH5	1	1.315	/	Pass
		2441	3DH5	1	1.295	/	Pass
		2480	3DH5	1	1.316	/	Pass

FCCID: 2A8SL-T13R

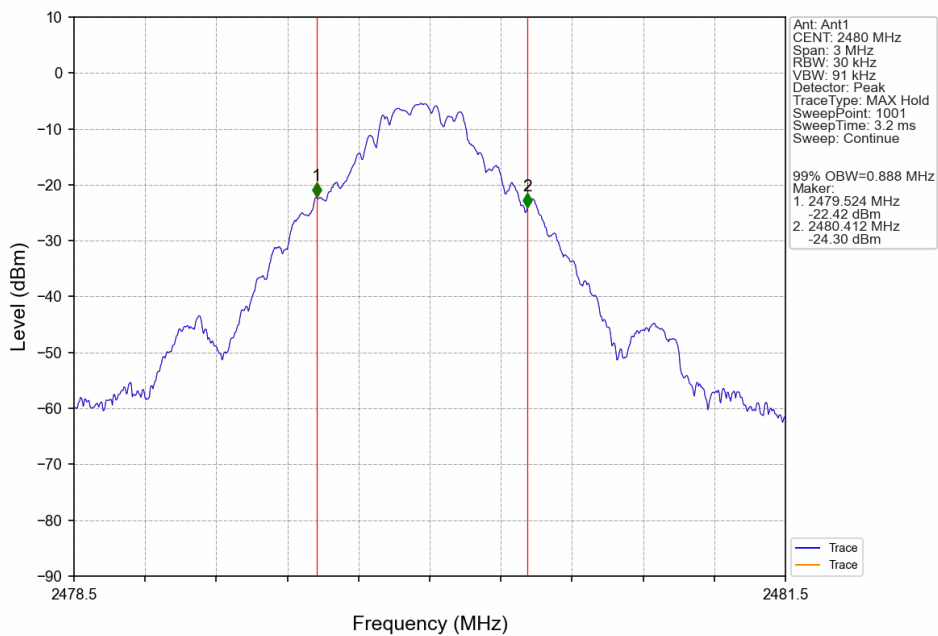
1.2 Test Graph

1.2.1 OBW

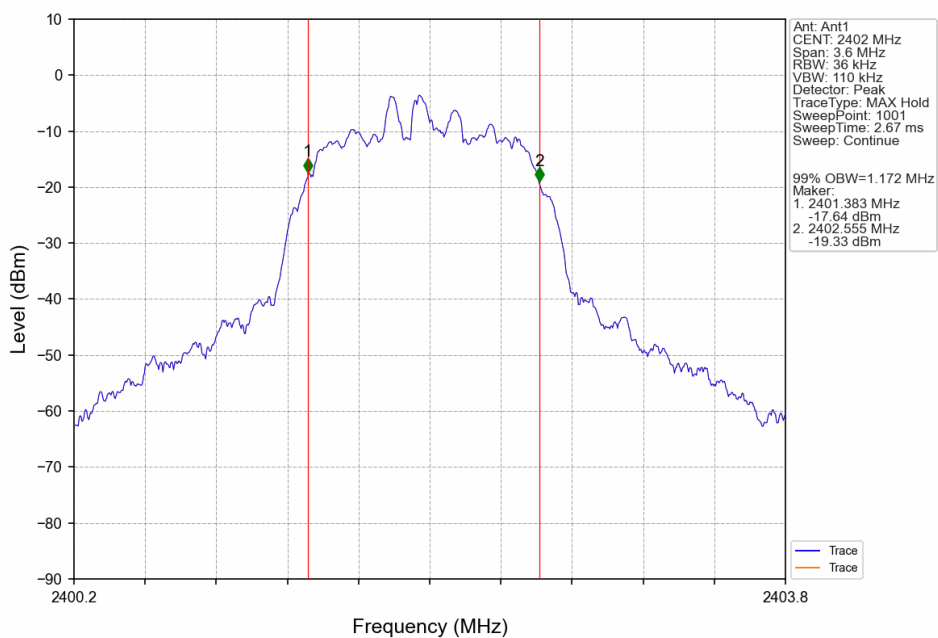


FCCID: 2A8SL-T13R

GFSK DH5 HCH 2480MHz Ant1 NTN

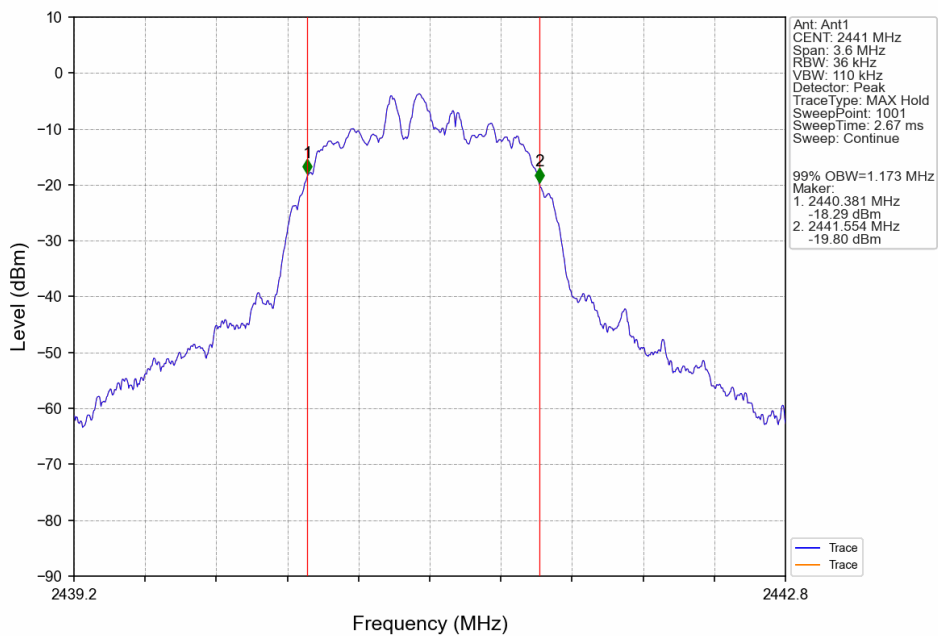


Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN

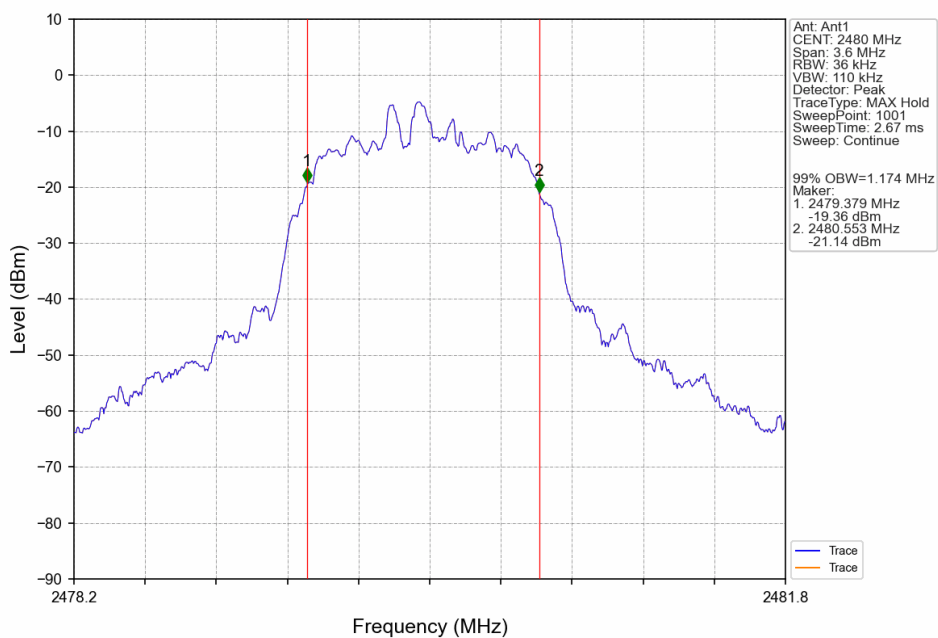


FCCID: 2A8SL-T13R

Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTN

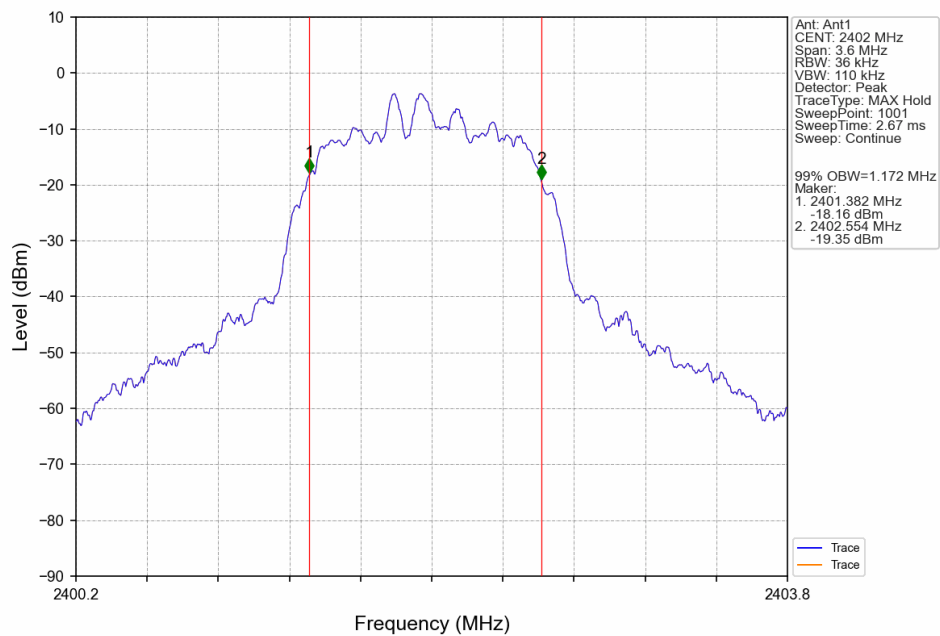


Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN

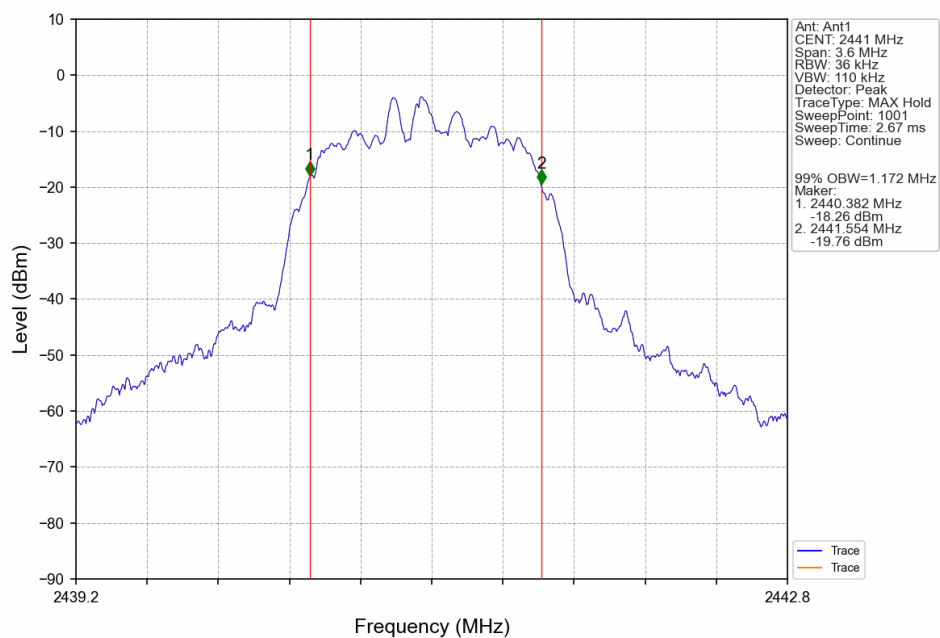


FCCID: 2A8SL-T13R

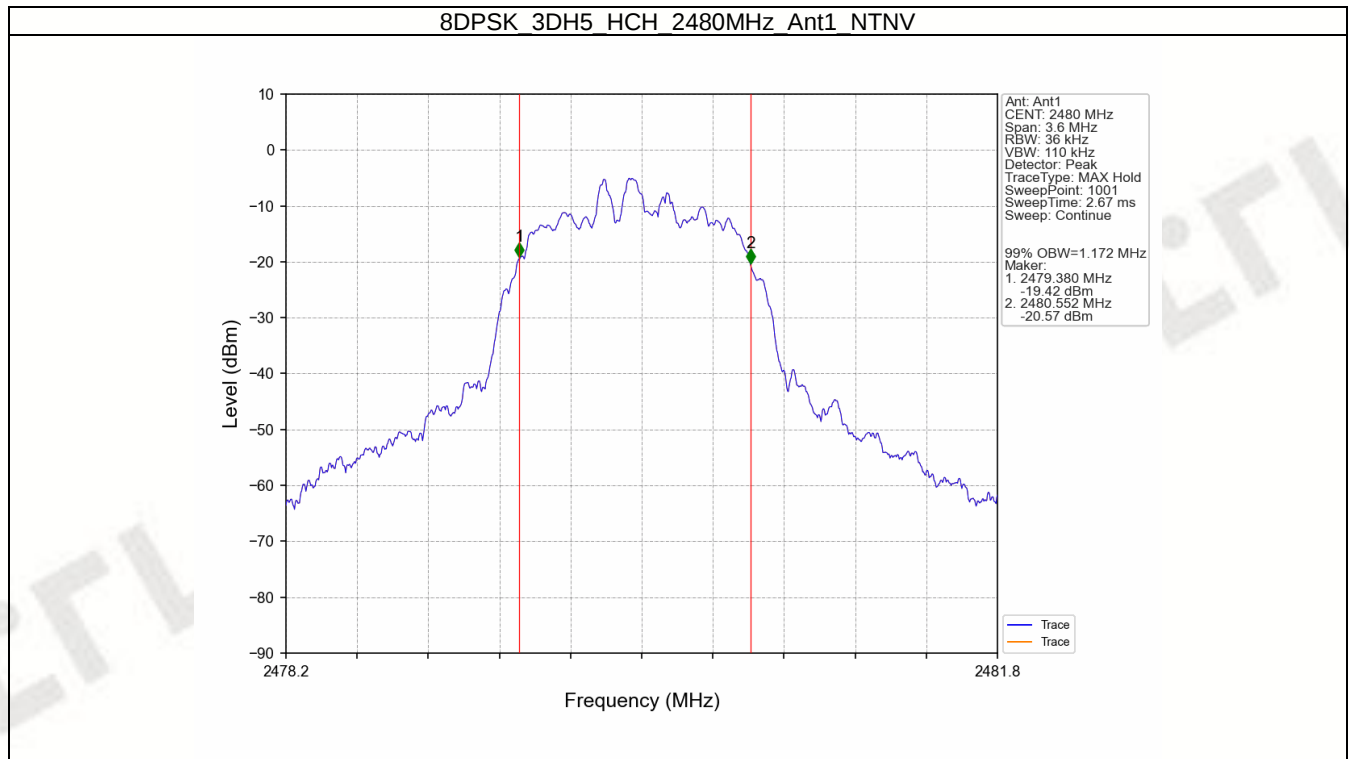
8DPSK 3DH5 LCH 2402MHz Ant1 NTN



8DPSK 3DH5 MCH 2441MHz Ant1 NTN

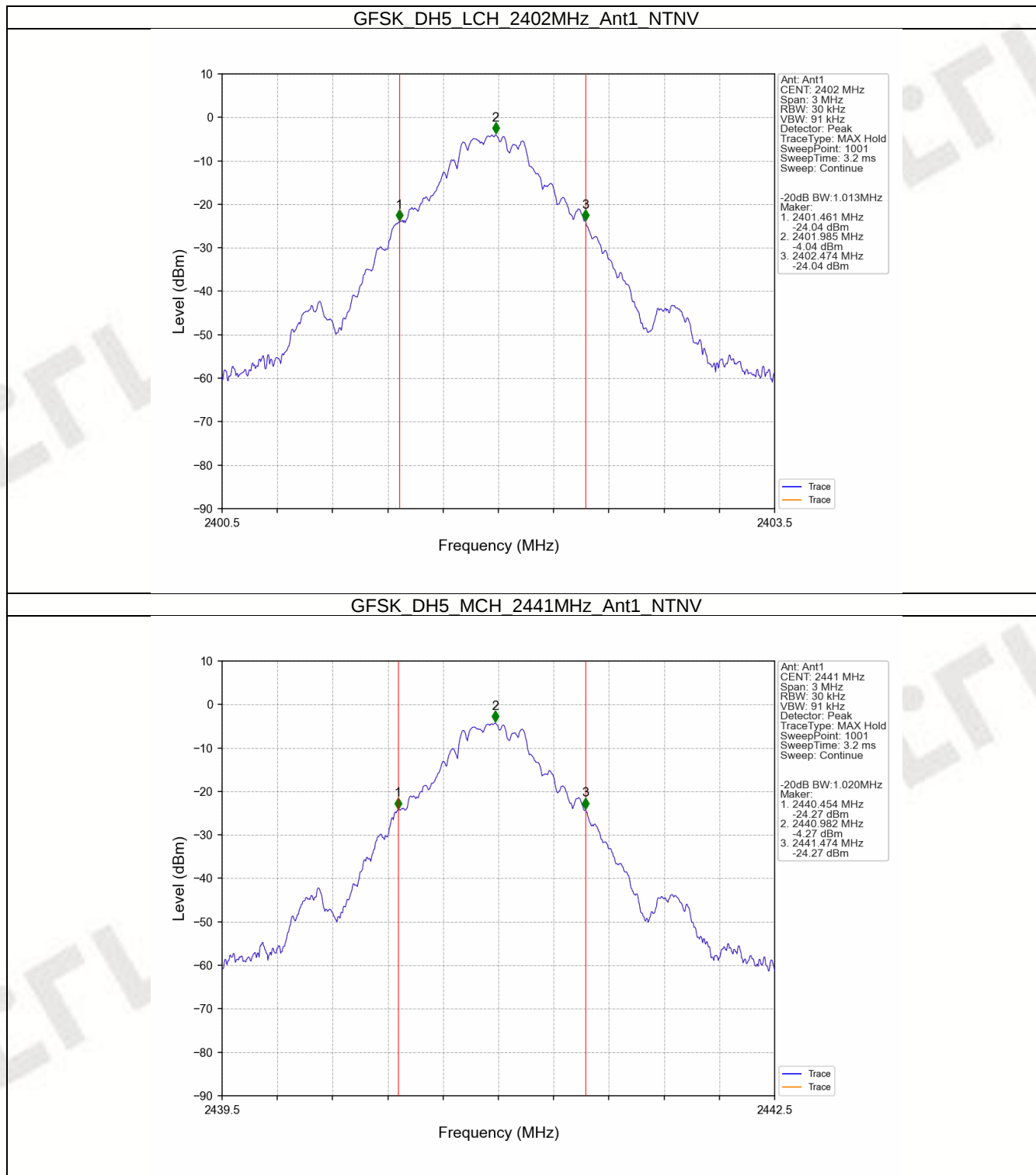


FCCID: 2A8SL-T13R



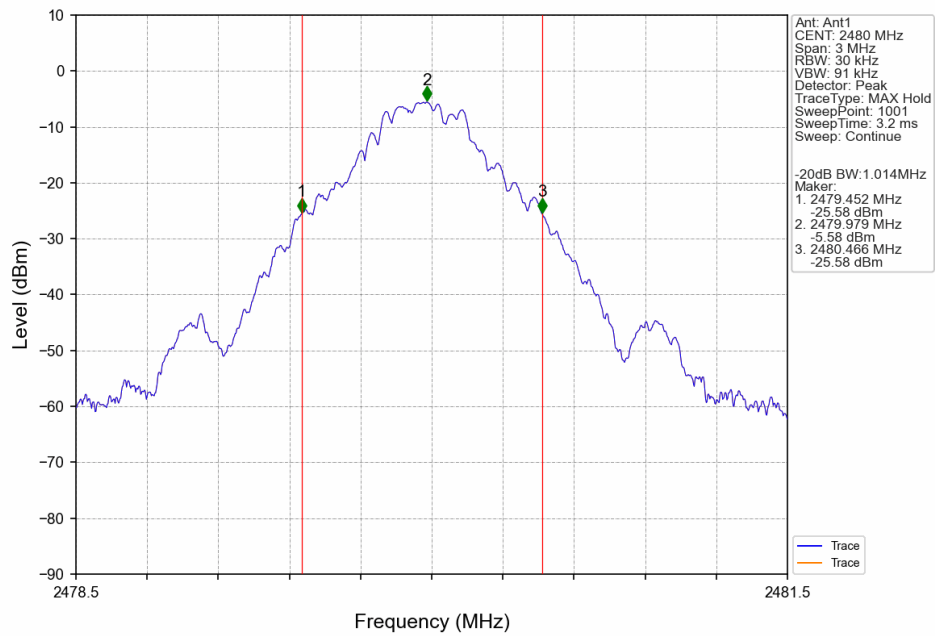
FCCID: 2A8SL-T13R

1.2.2 20dB BW

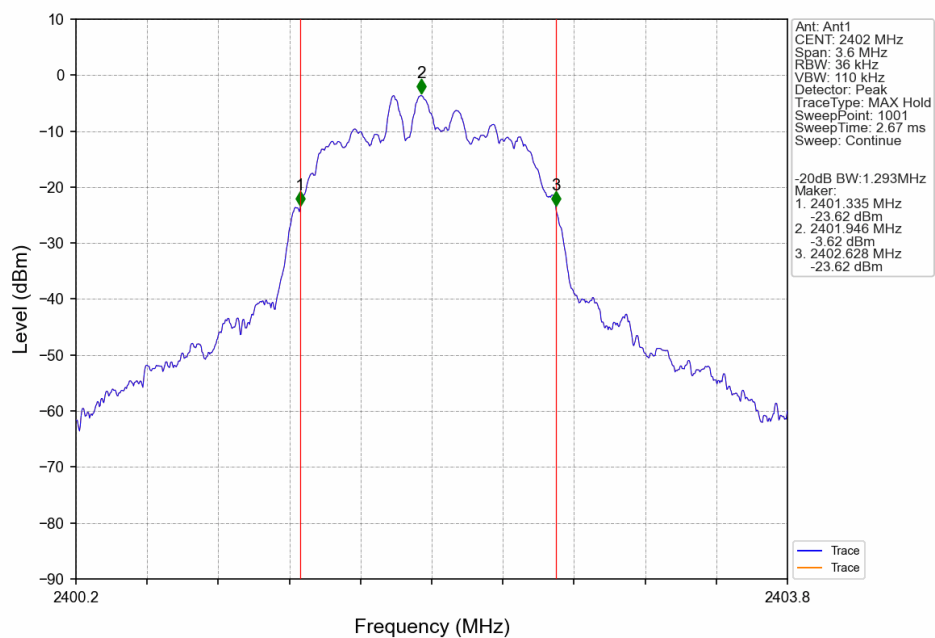


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GFSK DH5 HCH 2480MHz Ant1 NTN

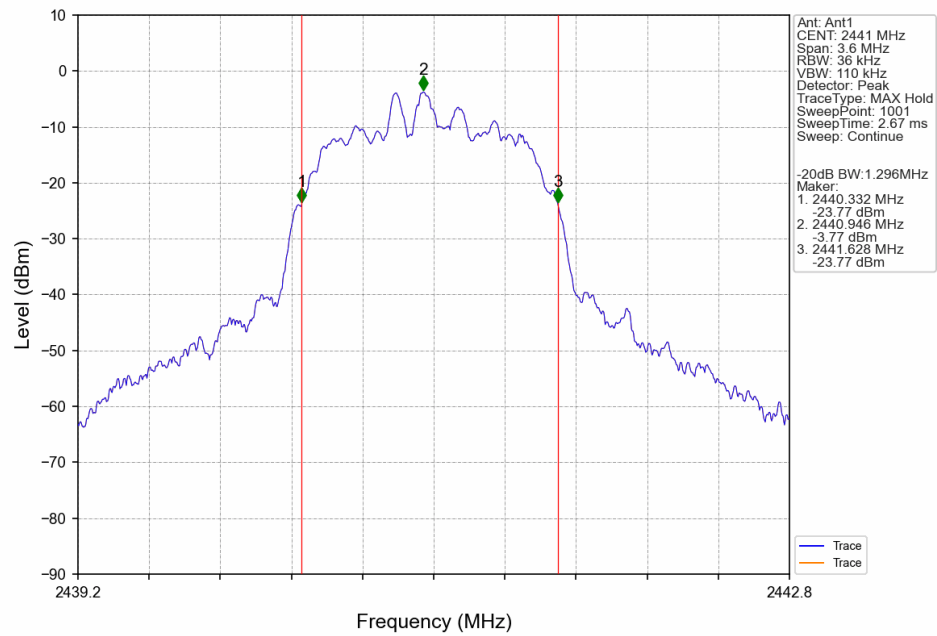


Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN

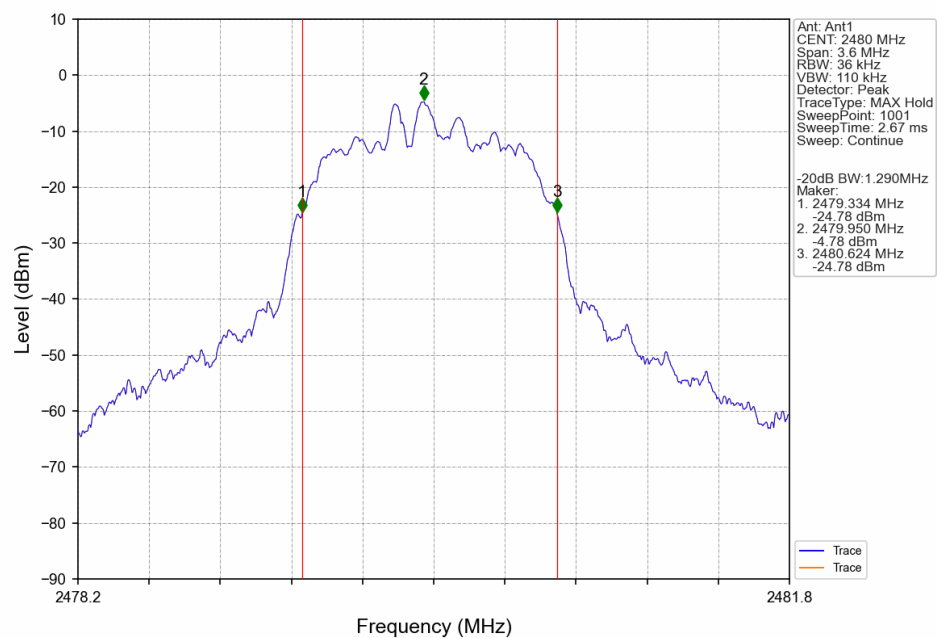


FCCID: 2A8SL-T13R

Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTN

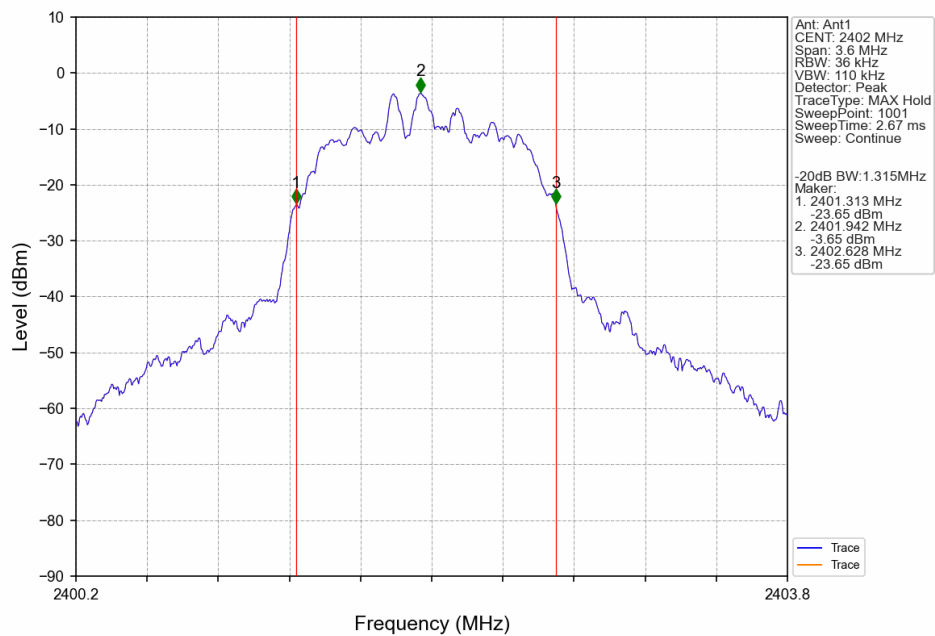


Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTN

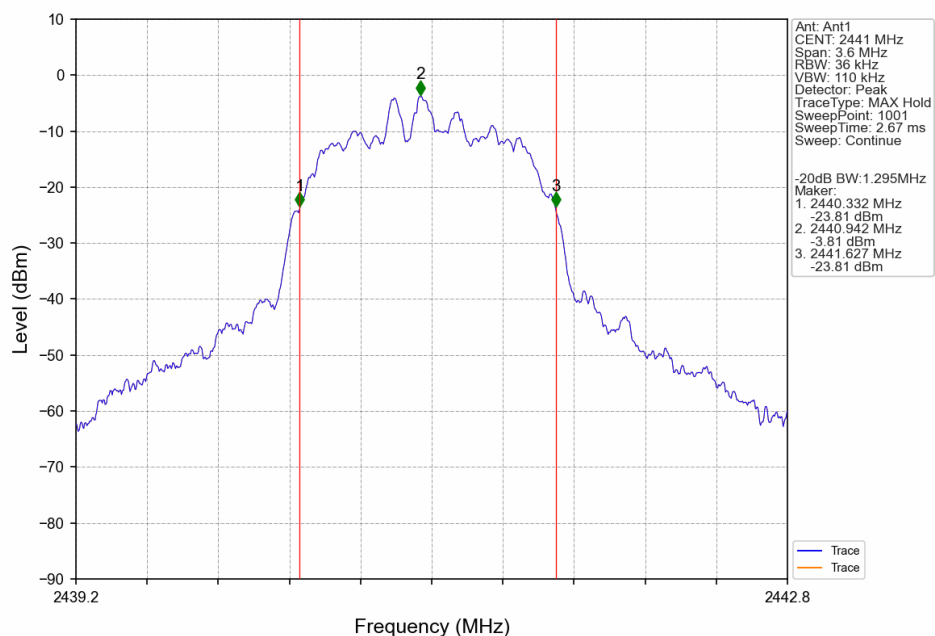


FCCID: 2A8SL-T13R

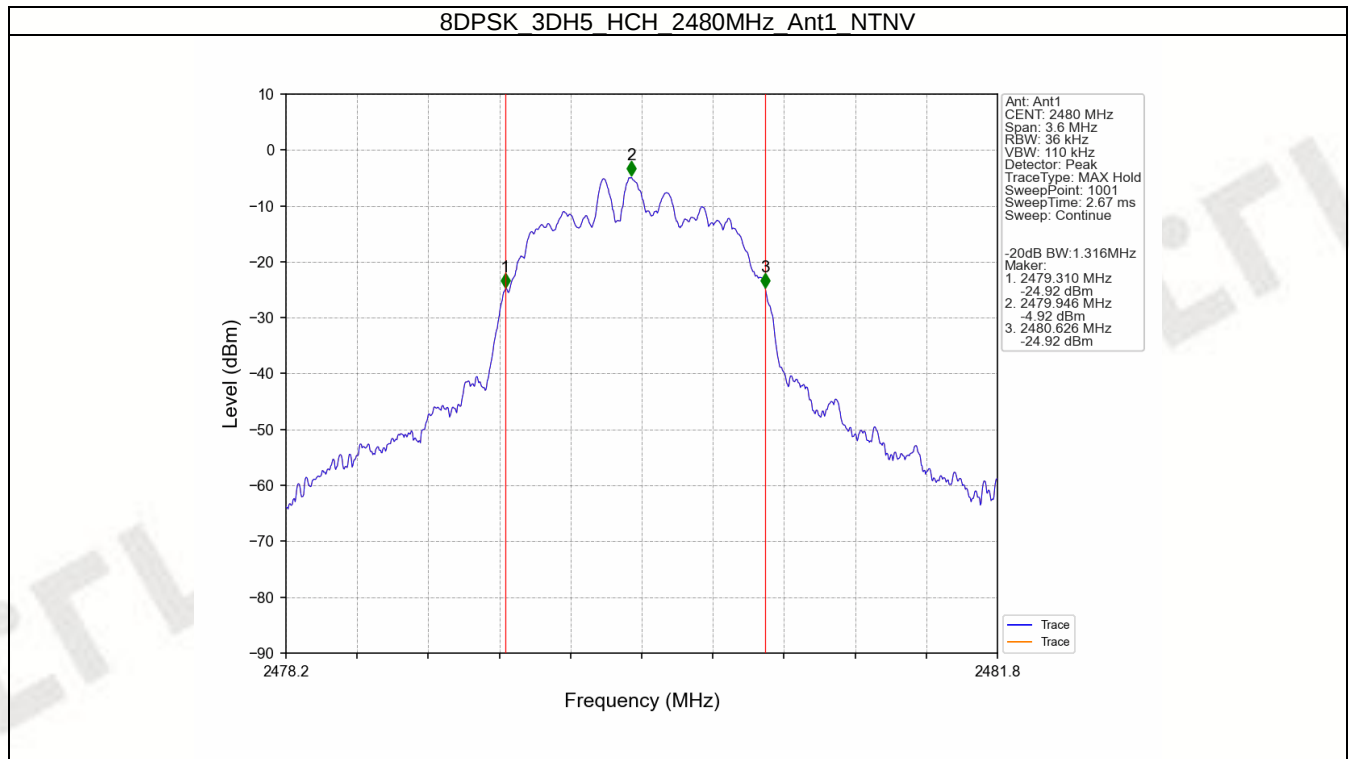
8DPSK 3DH5 LCH 2402MHz Ant1 NTN



8DPSK 3DH5 MCH 2441MHz Ant1 NTN



FCCID: 2A8SL-T13R



2. Maximum Conducted Output Power

2.1 Test Result

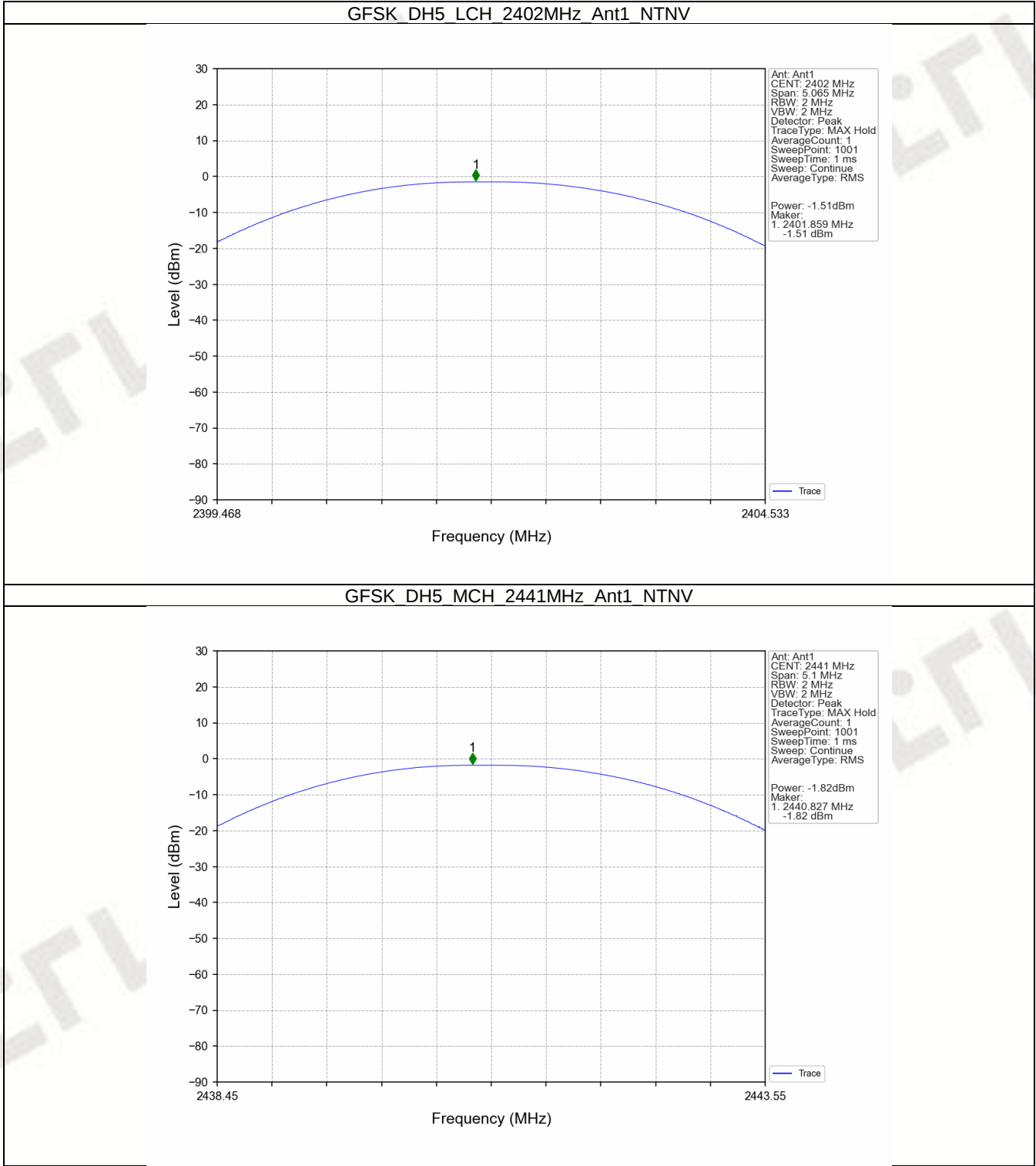
2.1.1 Power

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-1.51	<=20.97	Pass
		2441	DH5	-1.82	<=20.97	Pass
		2480	DH5	-3.01	<=20.97	Pass
Pi/4DQPSK	SISO	2402	2DH5	-0.74	<=20.97	Pass
		2441	2DH5	-0.97	<=20.97	Pass
		2480	2DH5	-2.09	<=20.97	Pass
8DPSK	SISO	2402	3DH5	-0.77	<=20.97	Pass
		2441	3DH5	-1.05	<=20.97	Pass
		2480	3DH5	-2.14	<=20.97	Pass
Note1: Antenna Gain: Ant1: 2.78dBi;						

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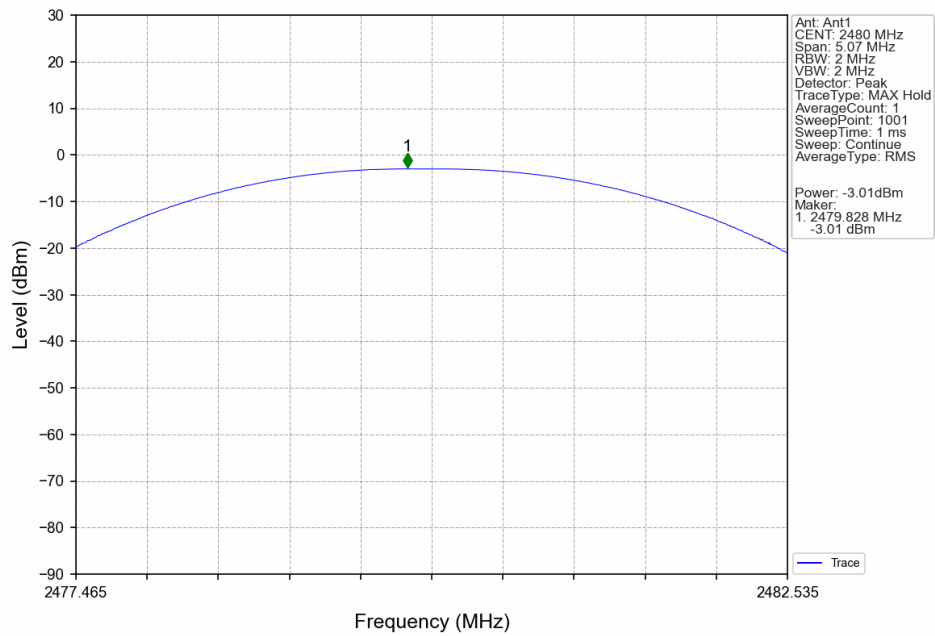
2.2 Test Graph

2.2.1 Power

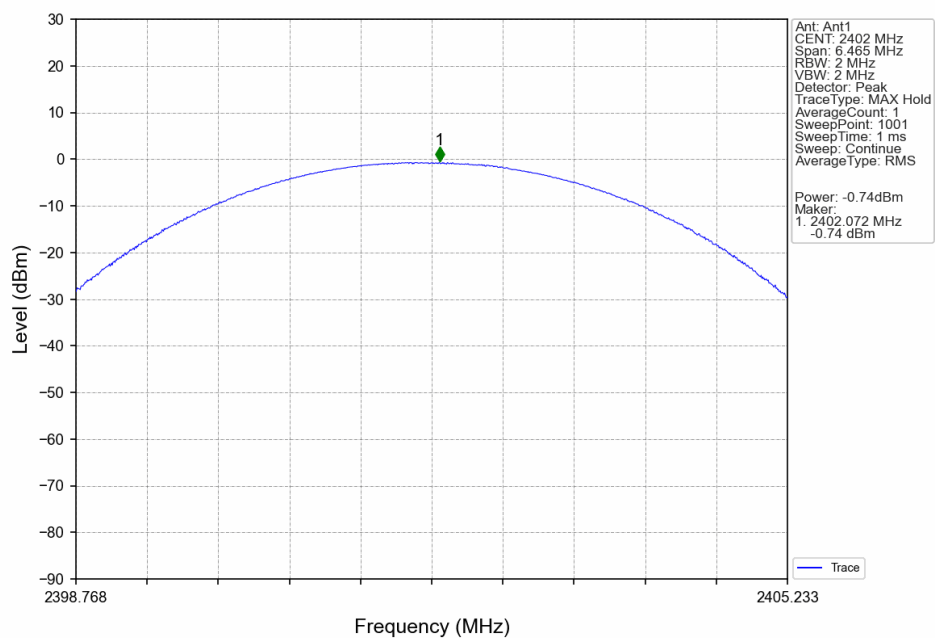


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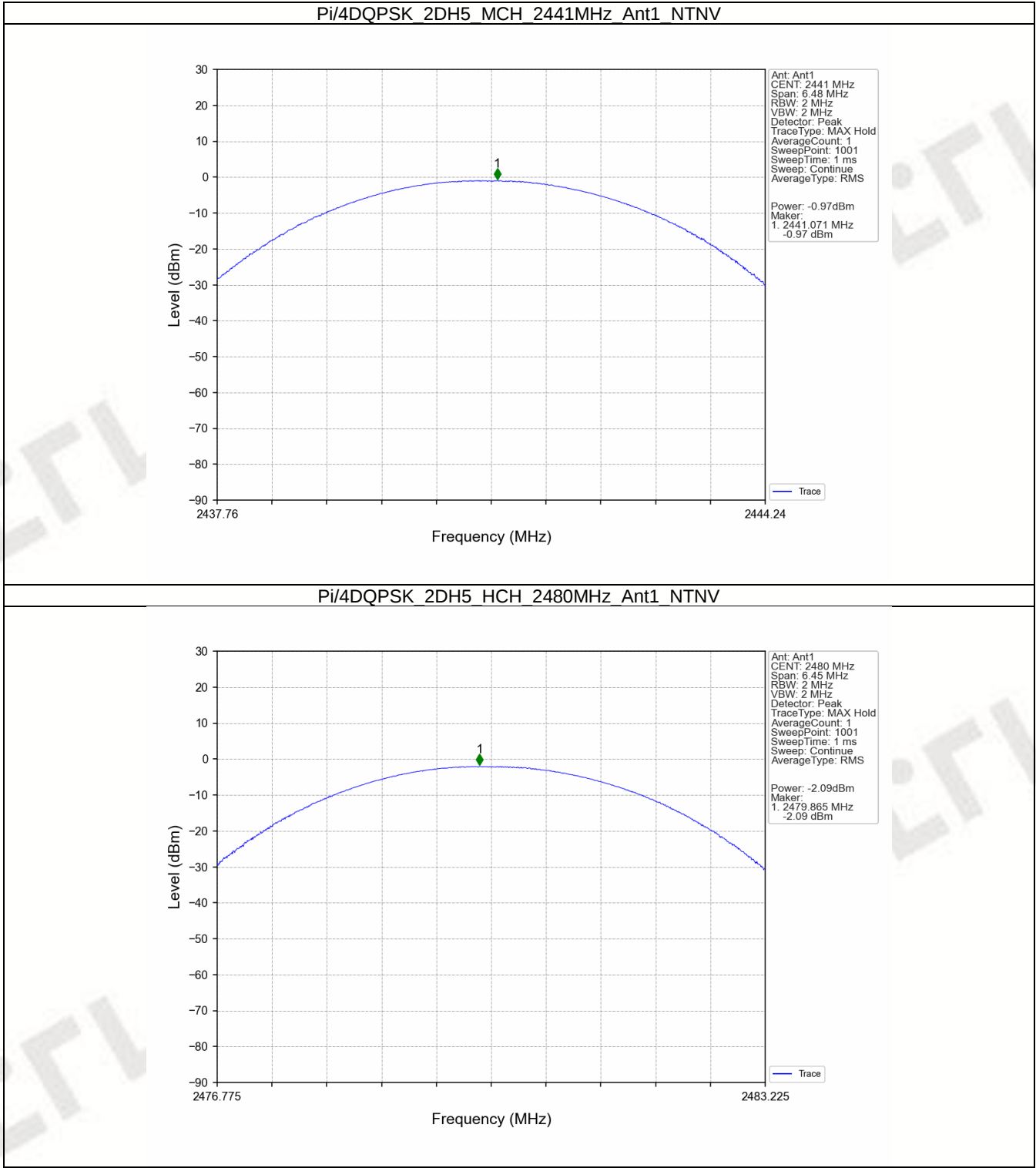
GFSK DH5 HCH 2480MHz Ant1 NTN



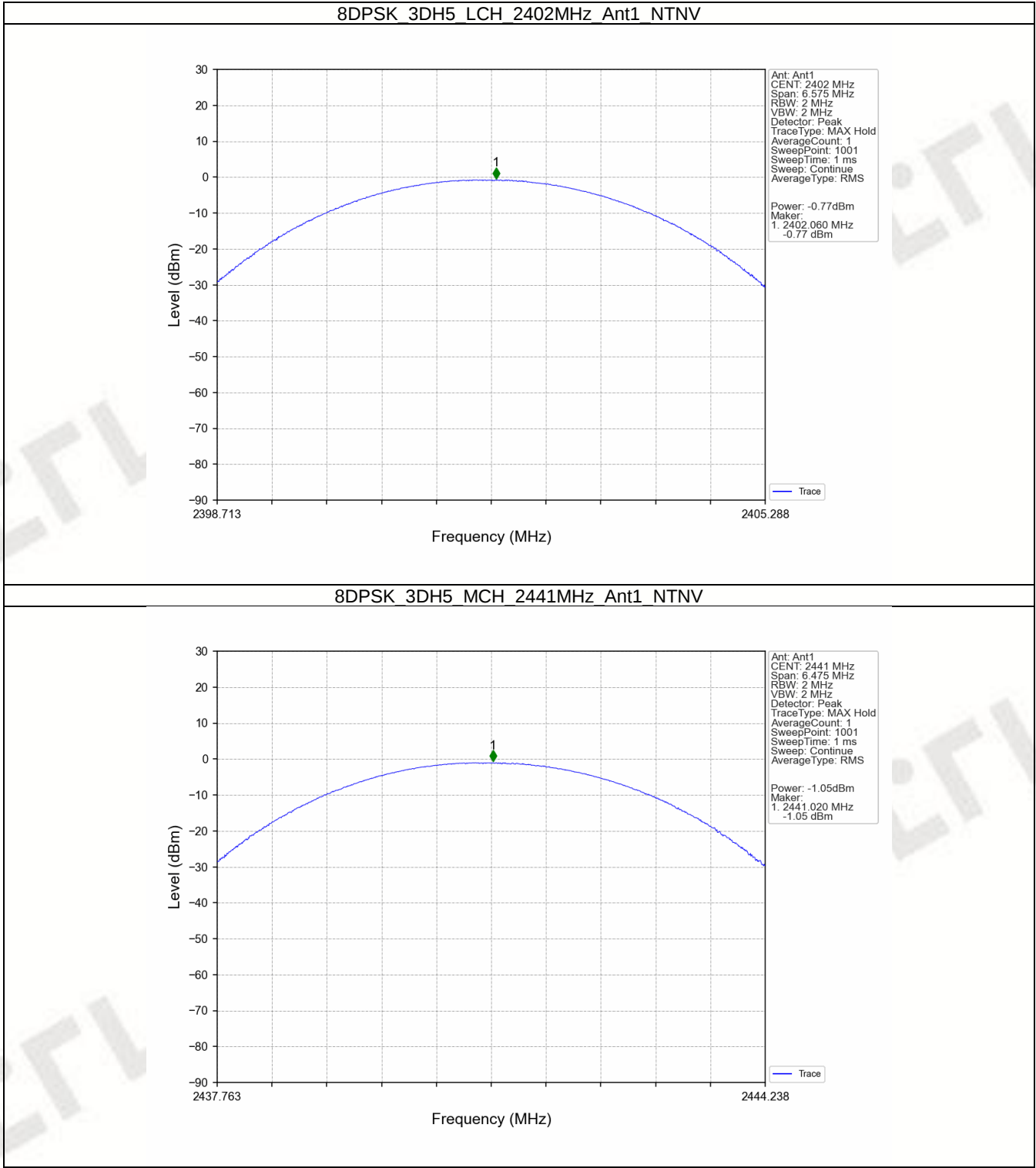
Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN



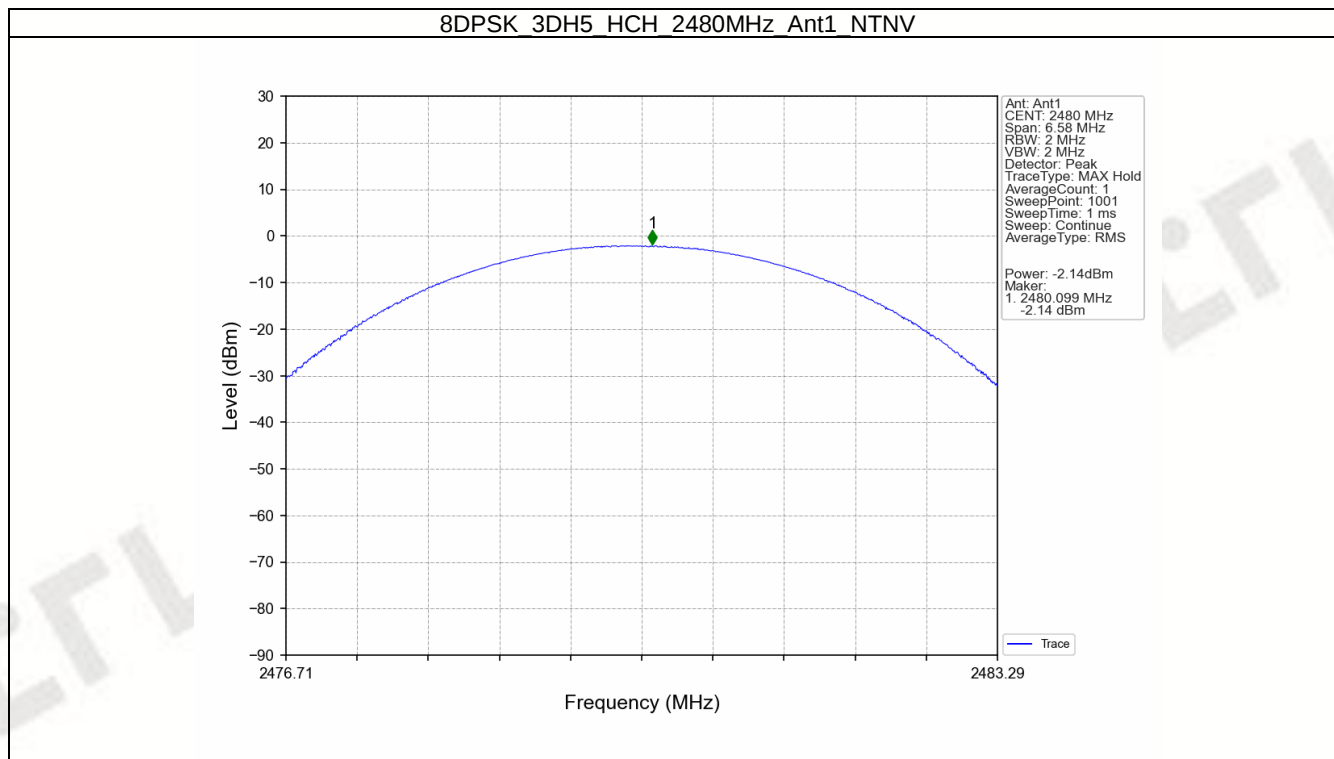
FCCID: 2A8SL-T13R



FCCID: 2A8SL-T13R



FCCID: 2A8SL-T13R



FCCID: 2A8SL-T13R

3. Carrier Frequency Separation

3.1 Test Result

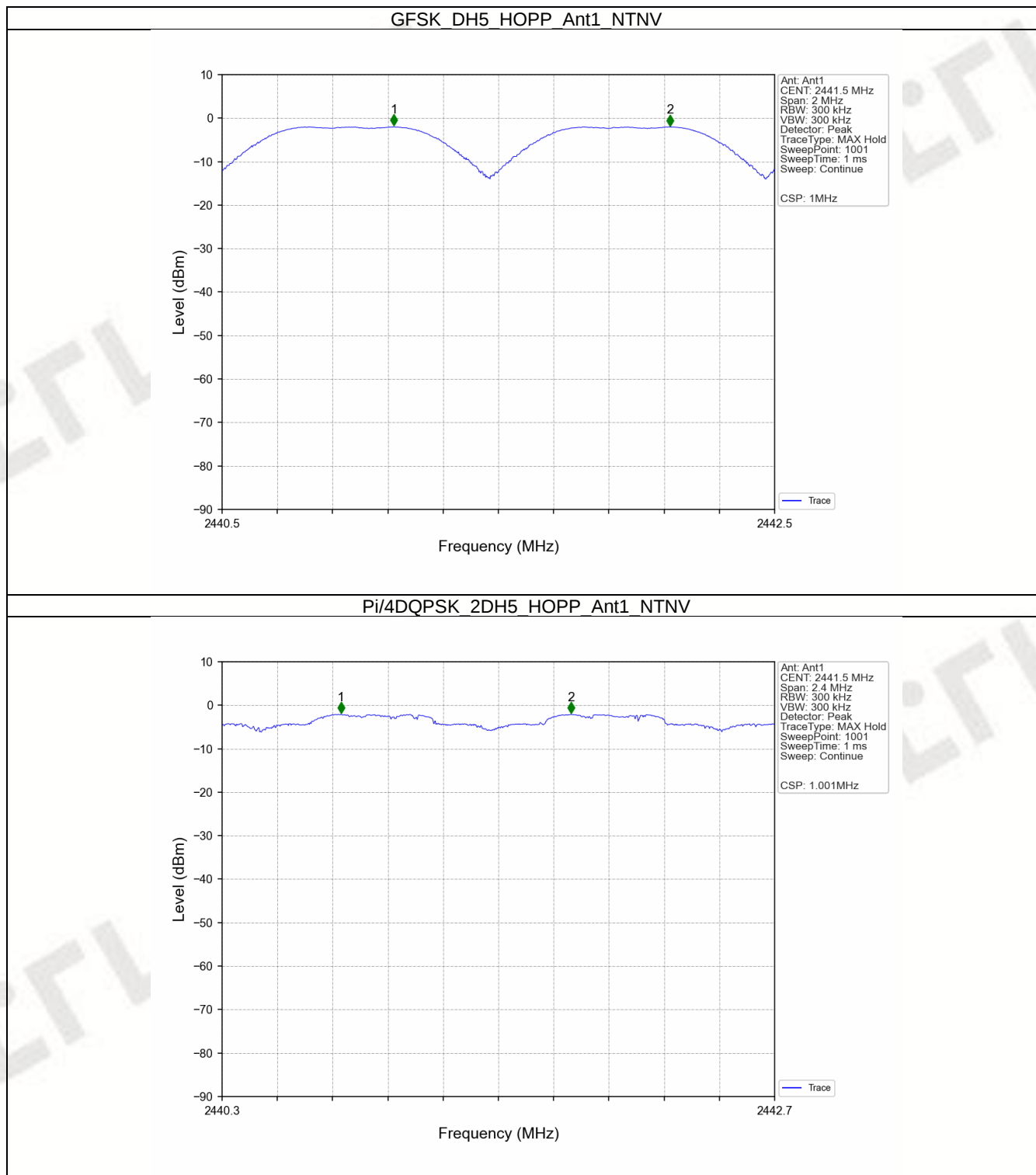
3.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.000	1.020	≥ 0.68	Pass
PI/4DQPSK	SISO	HOPP	2DH5	1.001	1.296	≥ 0.864	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.316	≥ 0.877	Pass

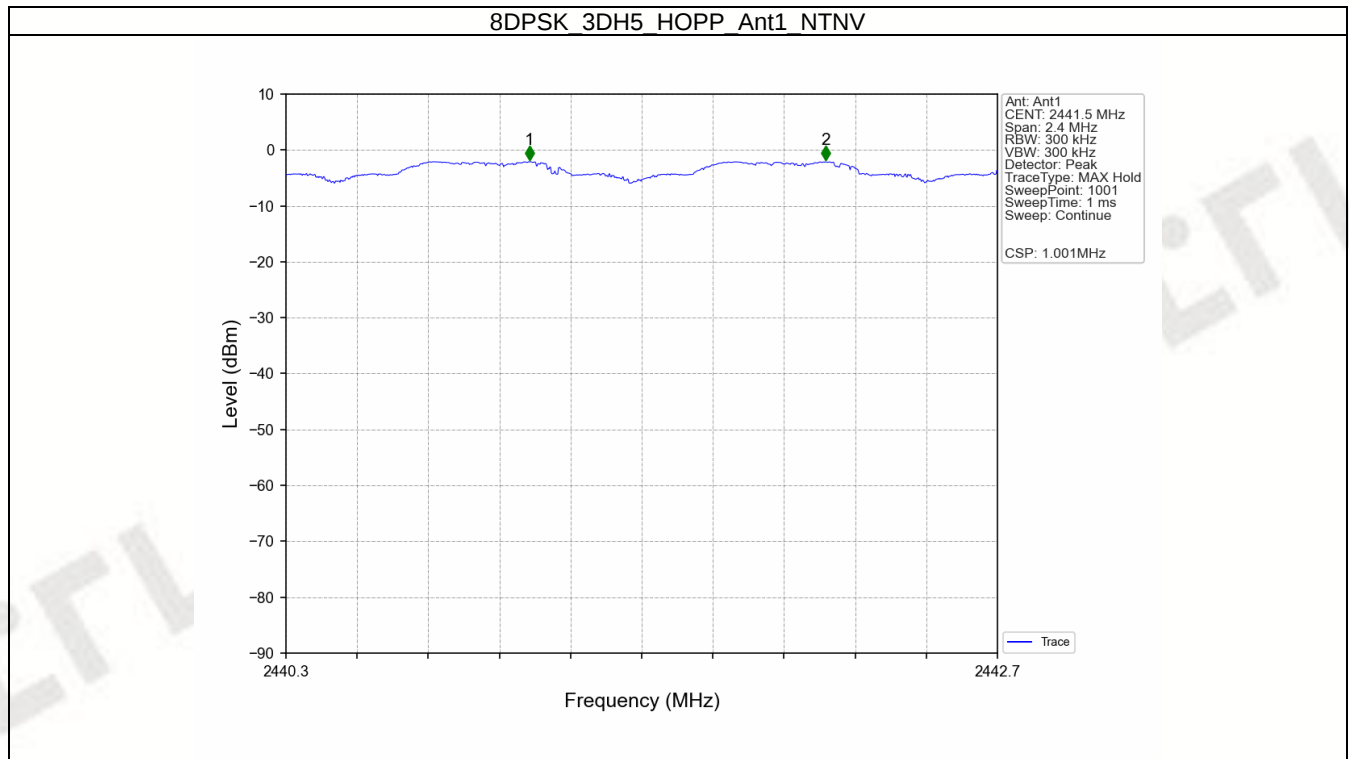
FCCID: 2A8SL-T13R

3.2 Test Graph

3.2.1 Ant1



FCCID: 2A8SL-T13R



FCCID: 2A8SL-T13R

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

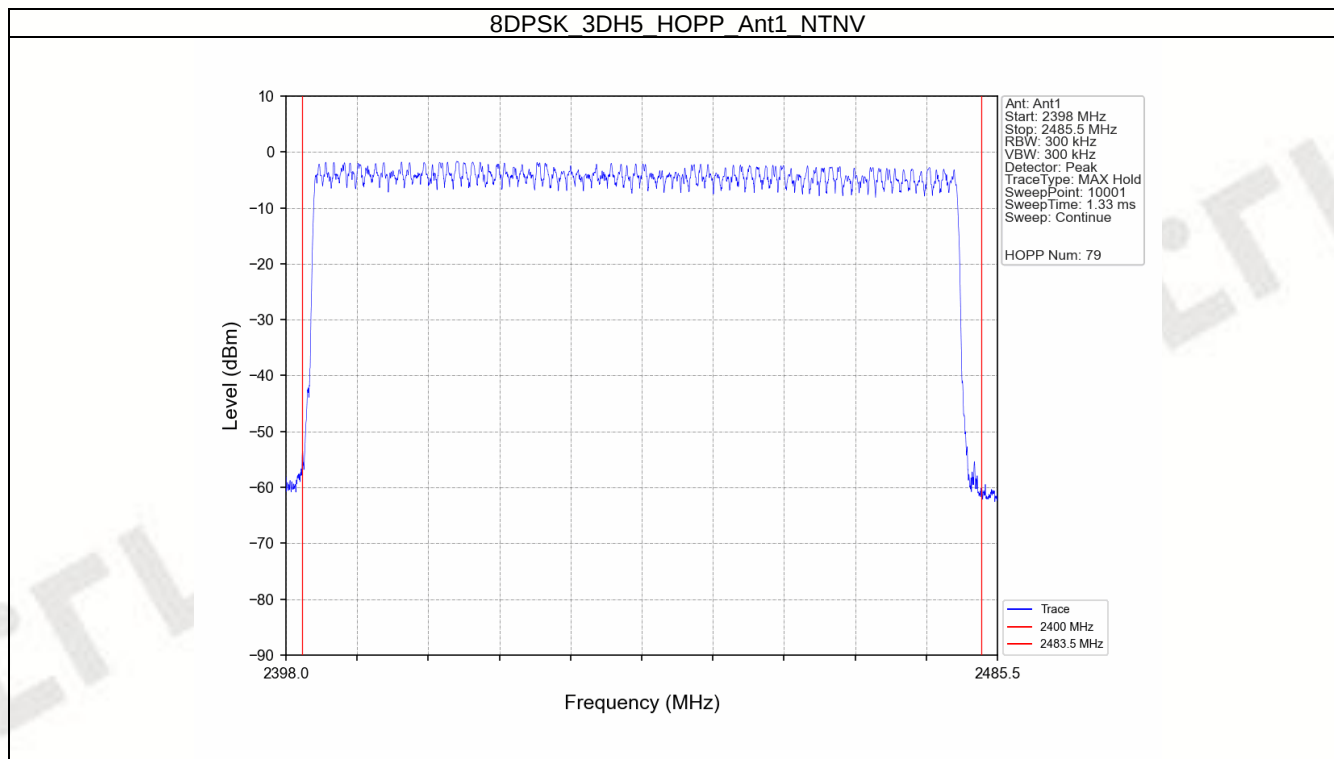
FCCID: 2A8SL-T13R

4.2 Test Graph

4.2.1 HoppNum



FCCID: 2A8SL-T13R



FCCID: 2A8SL-T13R

5. Time of Occupancy (Dwell Time)

5.1 Test Result

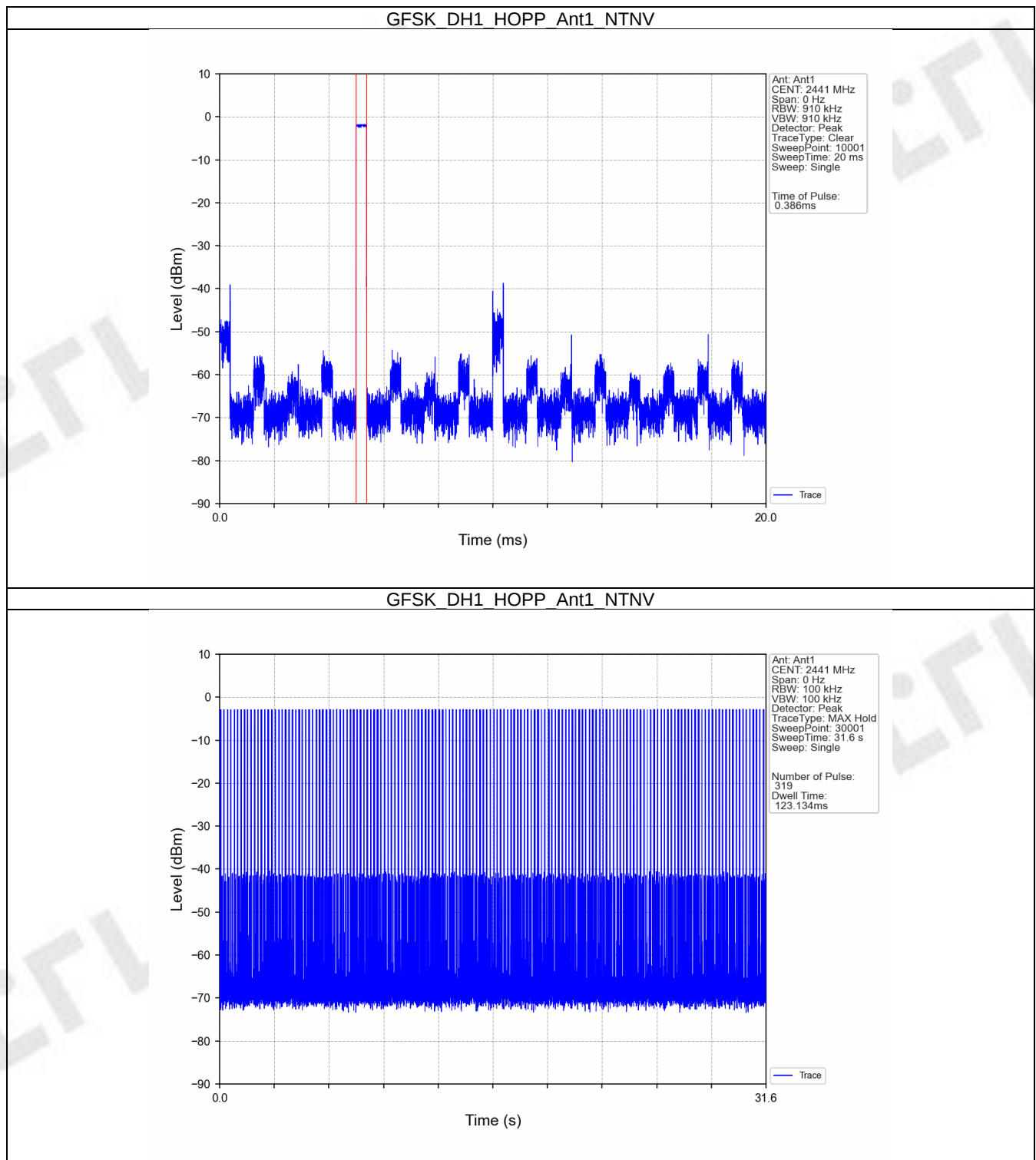
5.1.1 Ant1

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	319	123.134	<=400	Pass
			DH3	1.646	31.600	159	261.714	<=400	Pass
			DH5	2.896	31.600	112	324.352	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.402	31.600	318	127.836	<=400	Pass
			2DH3	1.652	31.600	159	262.668	<=400	Pass
			2DH5	2.902	31.600	110	319.220	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.396	31.600	320	126.720	<=400	Pass
			3DH3	1.648	31.600	163	268.624	<=400	Pass
			3DH5	2.894	31.600	100	289.400	<=400	Pass

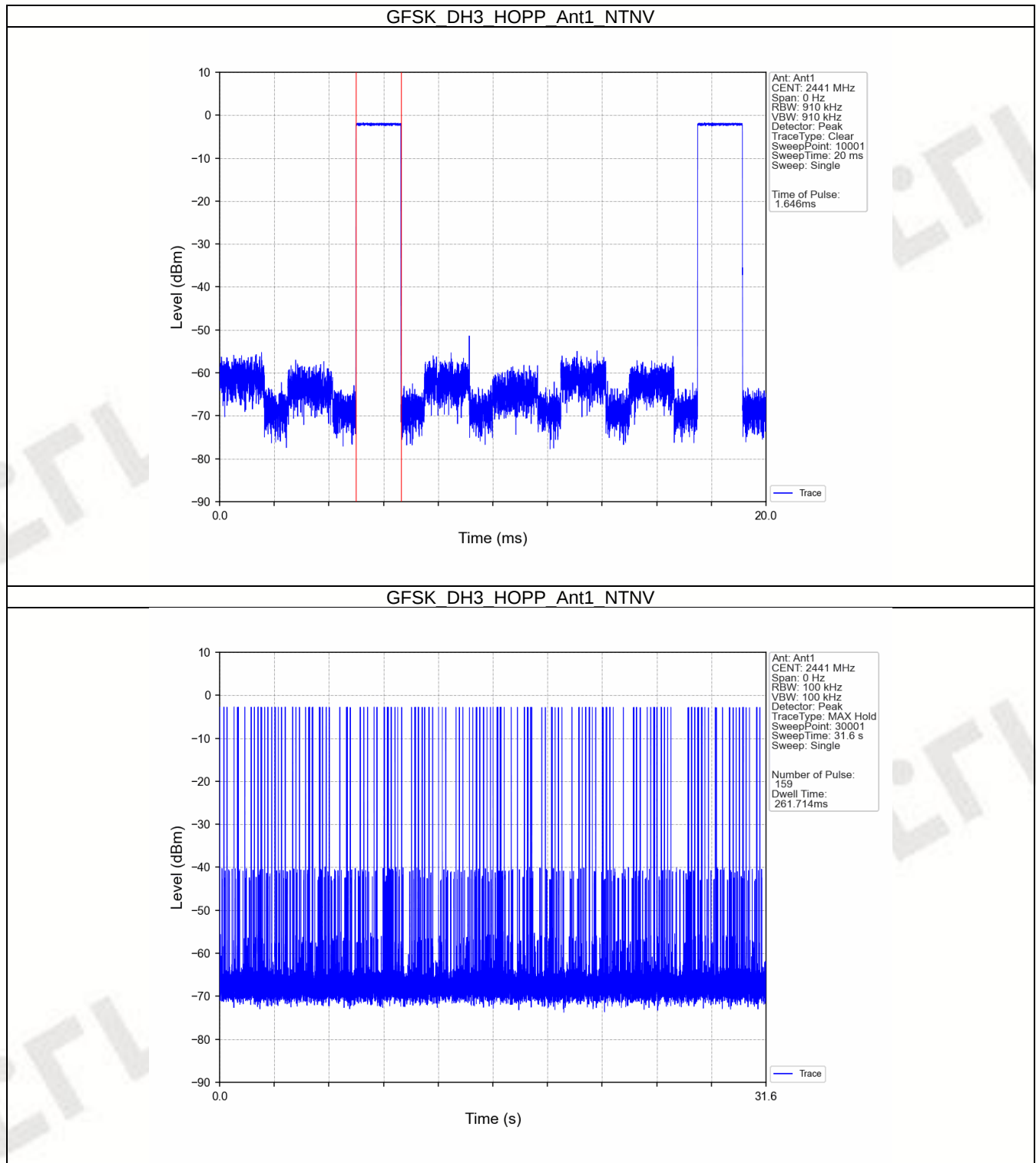
FCCID: 2A8SL-T13R

5.2 Test Graph

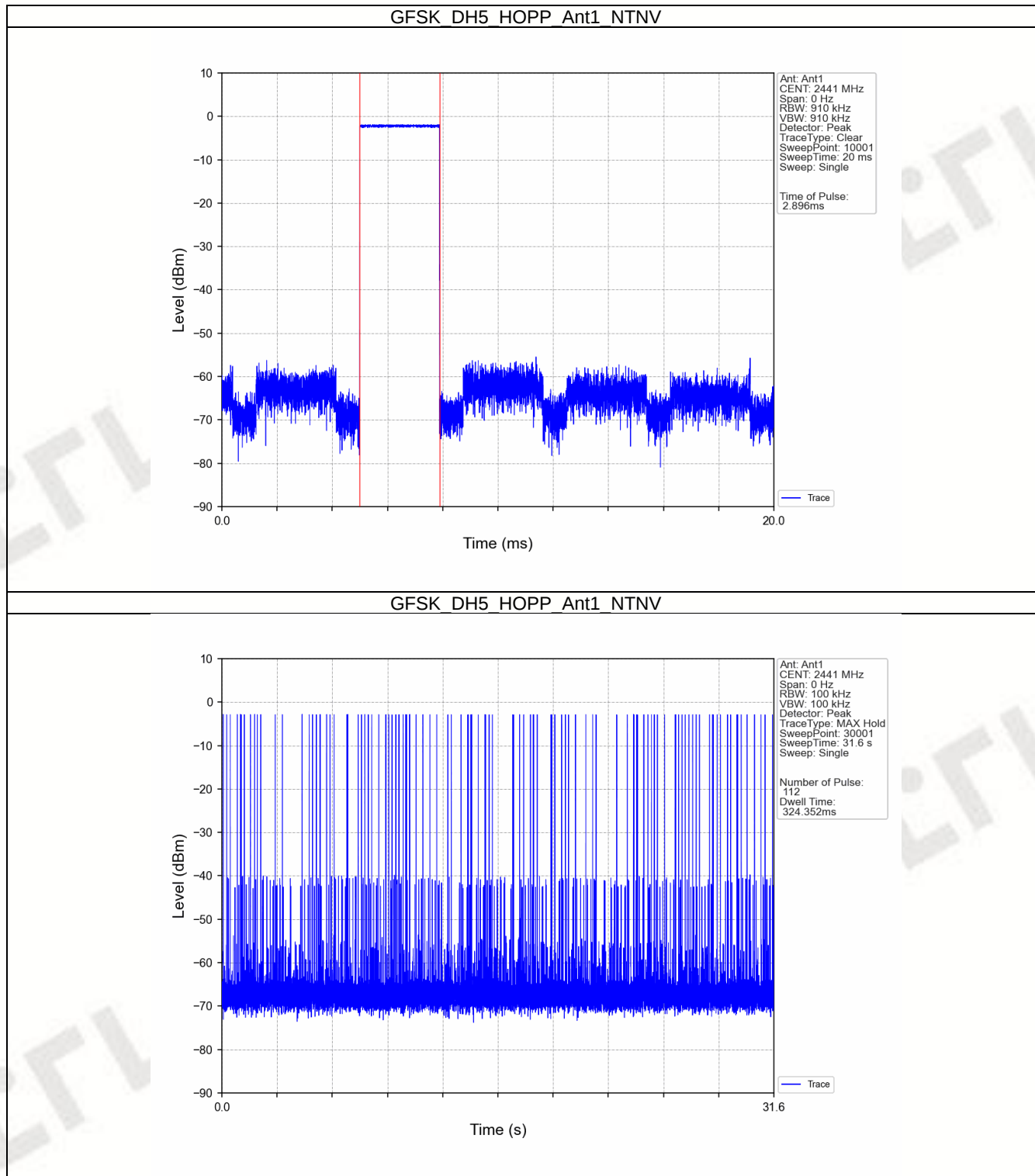
5.2.1 Ant1



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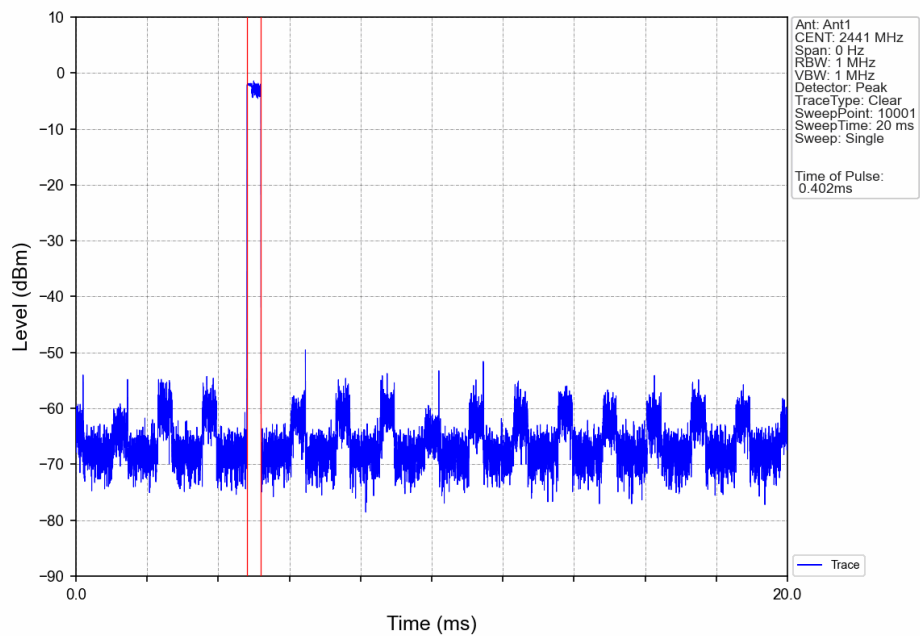


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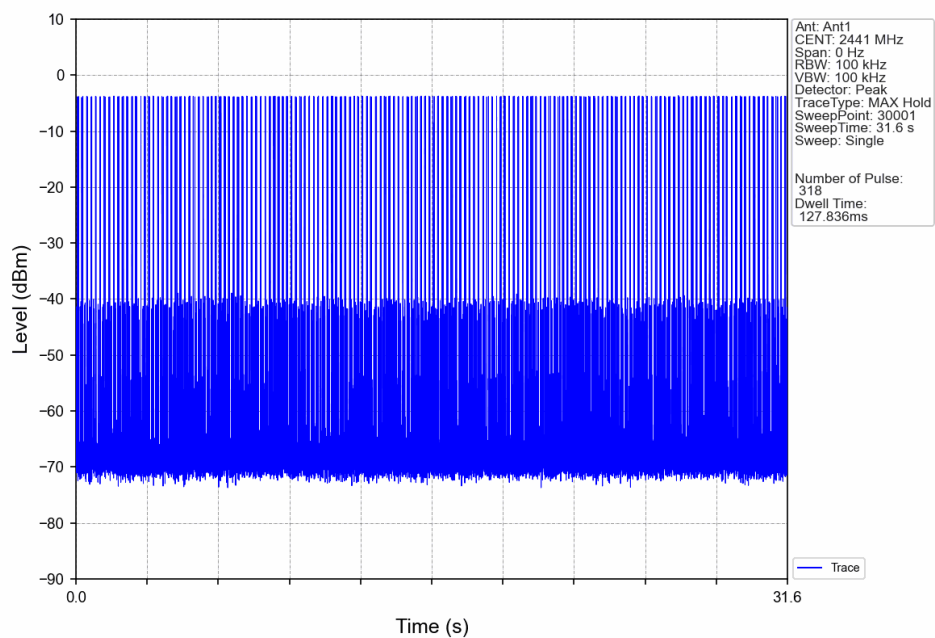


FCCID: 2A8SL-T13R

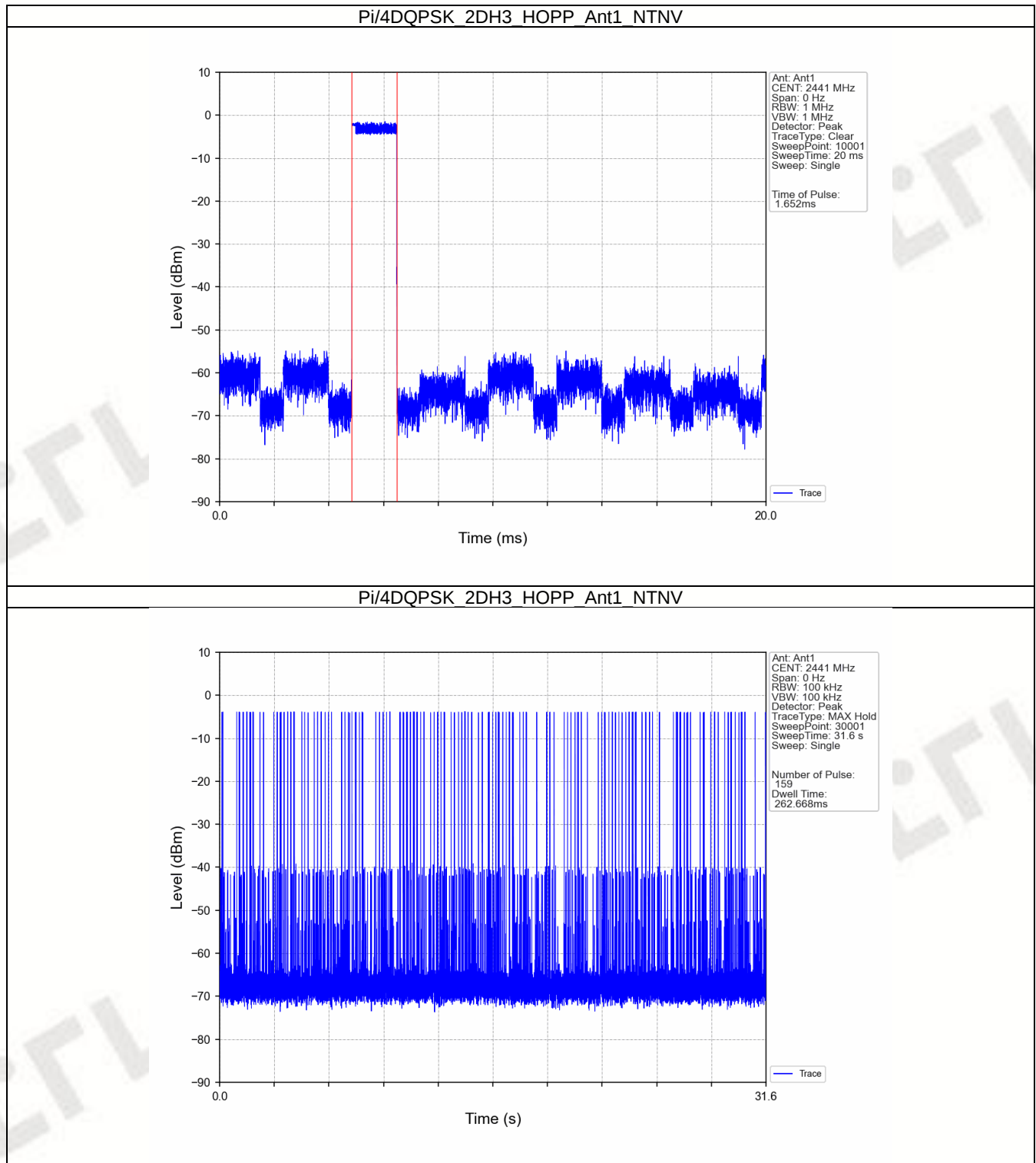
Pi/4DQPSK 2DH1 HOPP Ant1 NTN



Pi/4DQPSK 2DH1 HOPP Ant1 NTN

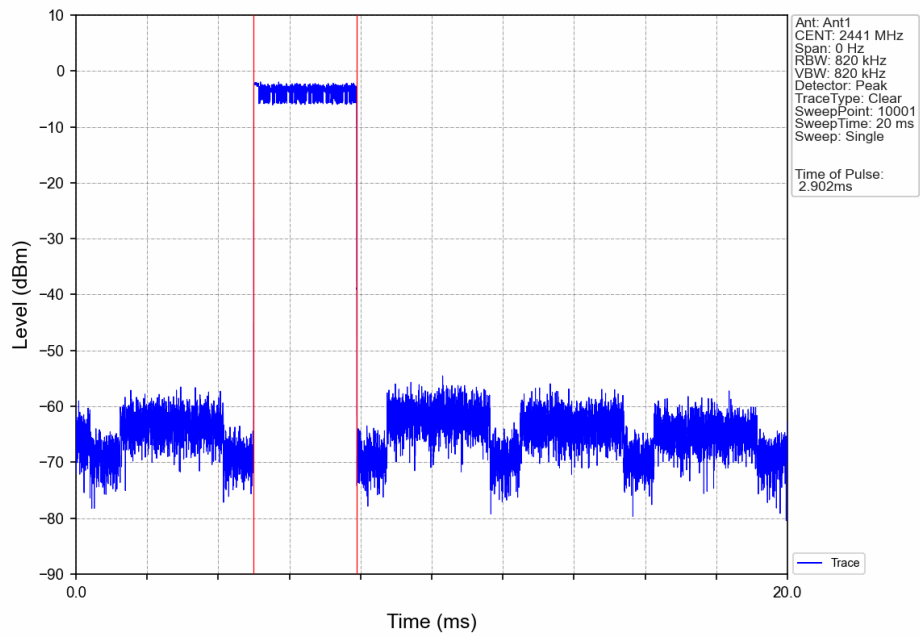


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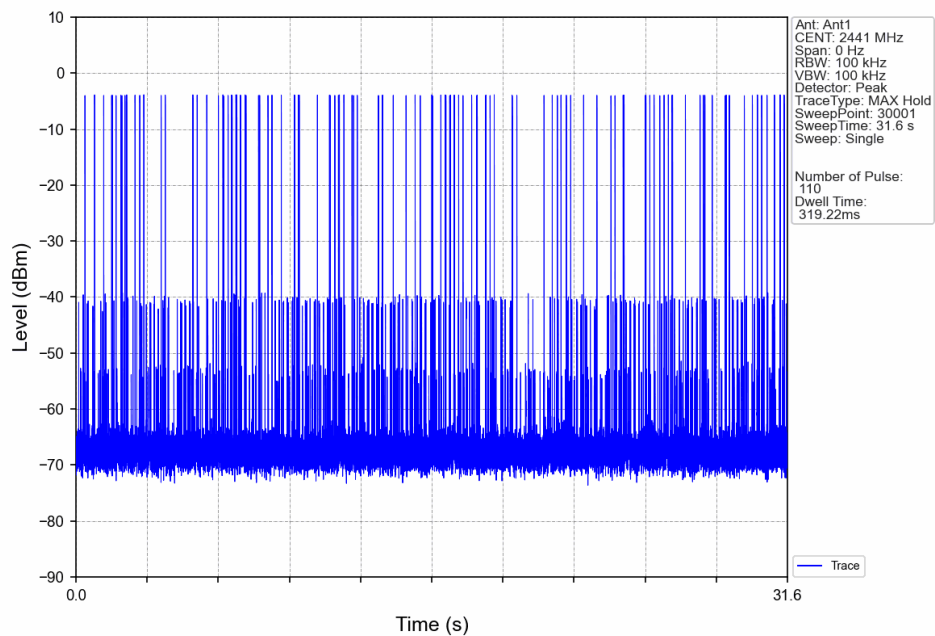


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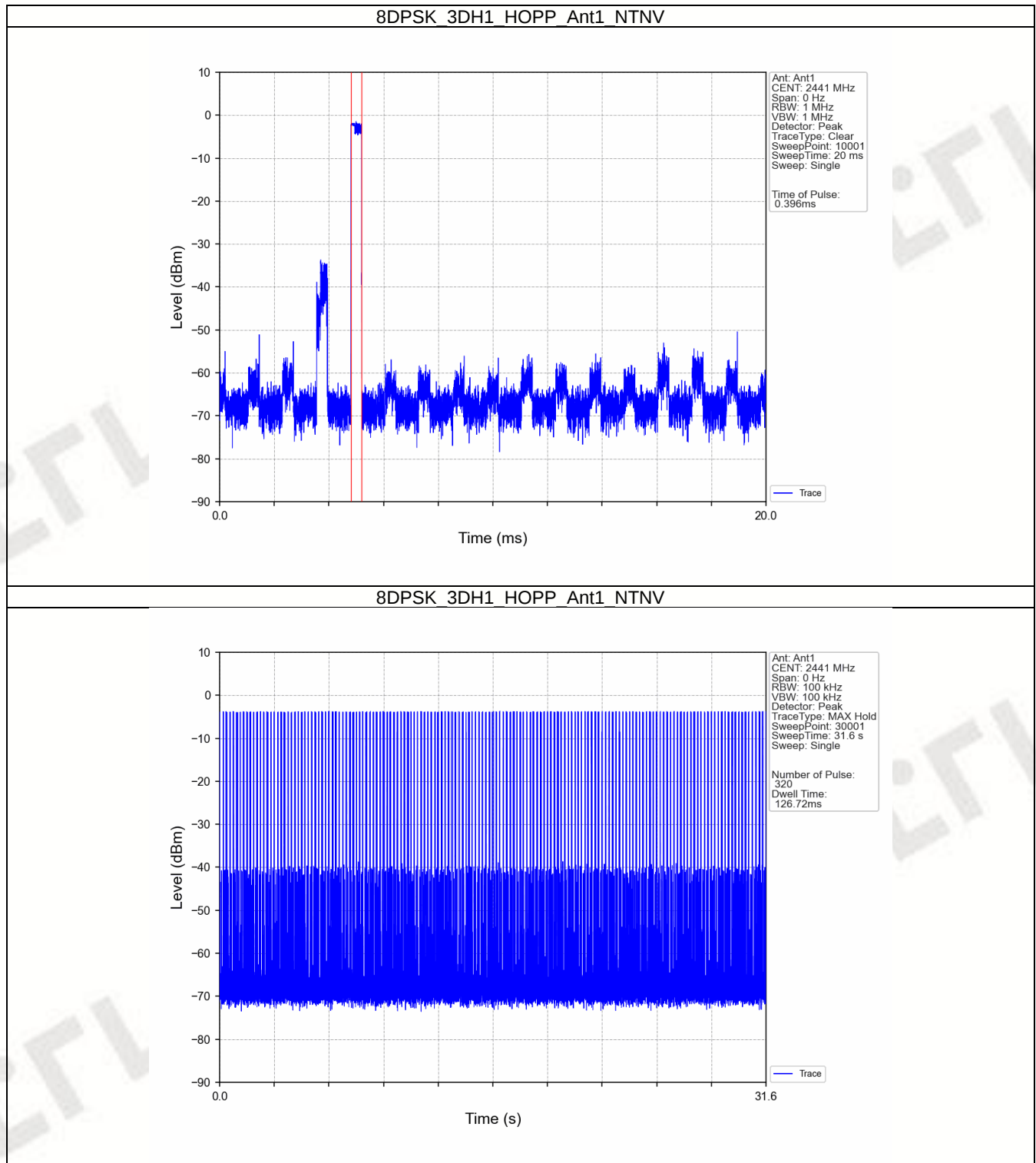
Pi/4DQPSK 2DH5 HOPP Ant1 NTN



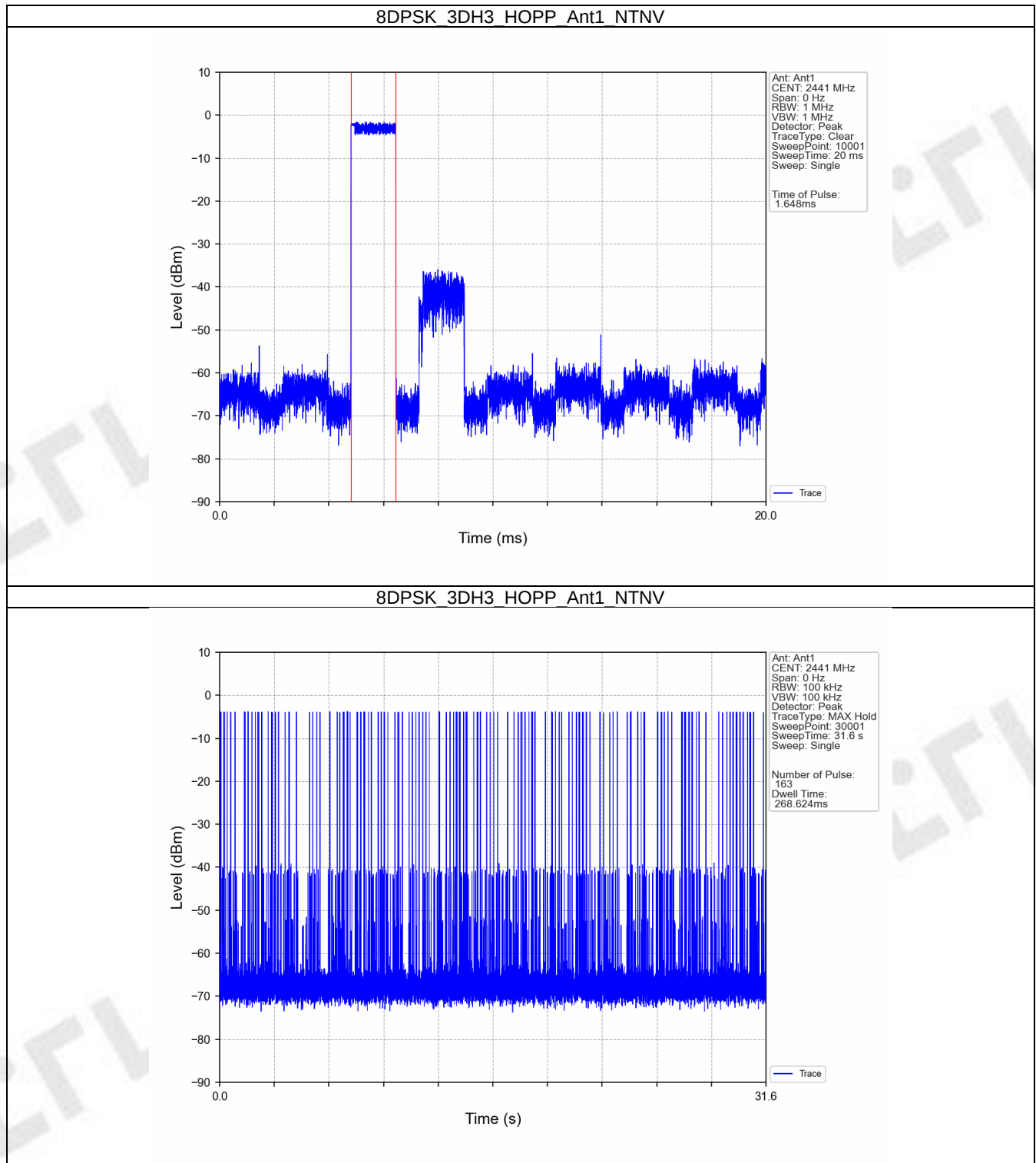
Pi/4DQPSK 2DH5 HOPP Ant1 NTN



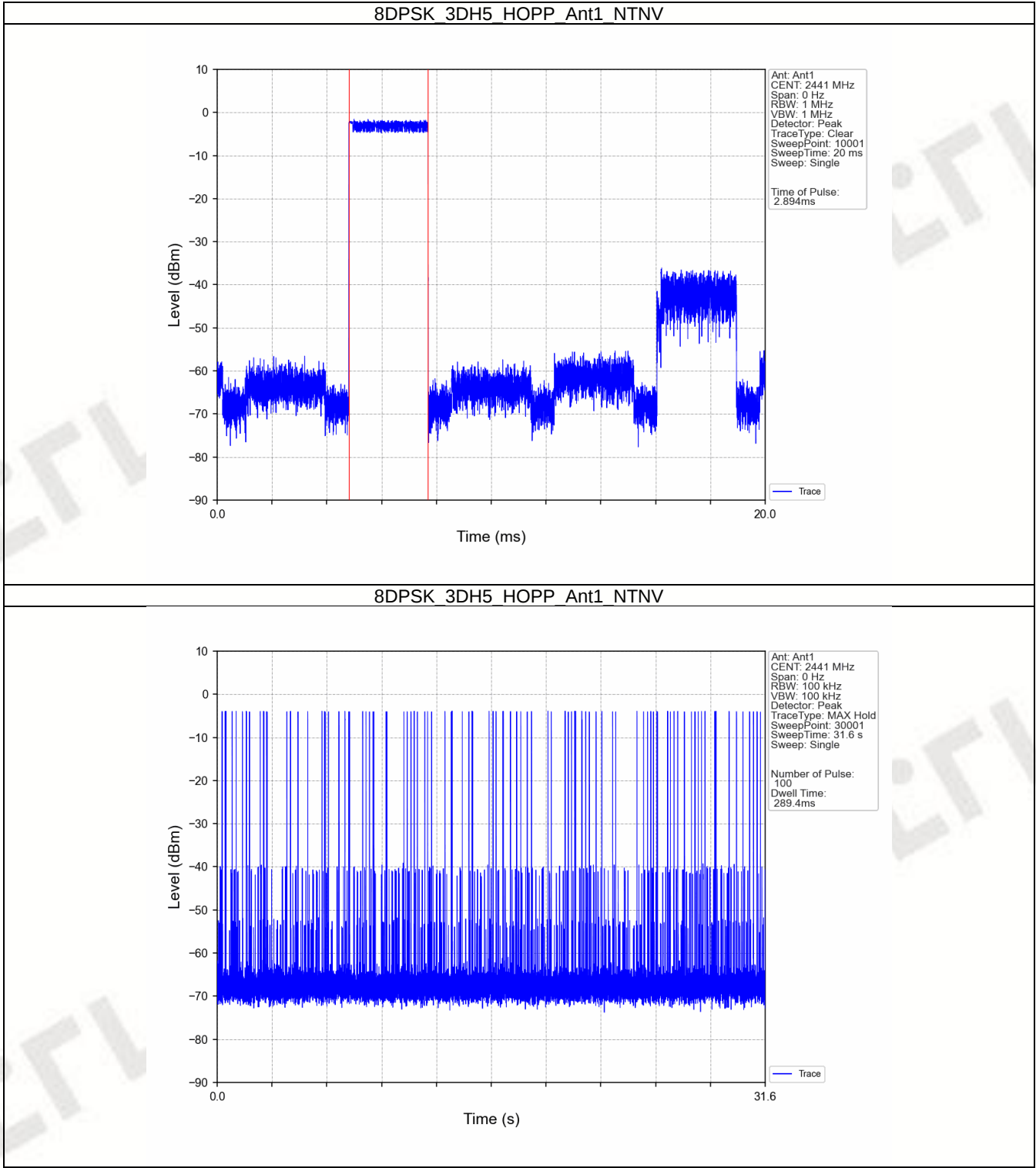
FCCID: 2A8SL-T13R



FCCID: 2A8SL-T13R



FCCID: 2A8SL-T13R



FCCID: 2A8SL-T13R

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	-1.88
		2441	DH5	1	-2.19
		2480	DH5	1	-3.36
Pi/4DQPSK	SISO	2402	2DH5	1	-2.05
		2441	2DH5	1	-2.25
		2480	2DH5	1	-3.36
8DPSK	SISO	2402	3DH5	1	-2.09
		2441	3DH5	1	-2.32
		2480	3DH5	1	-3.40

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

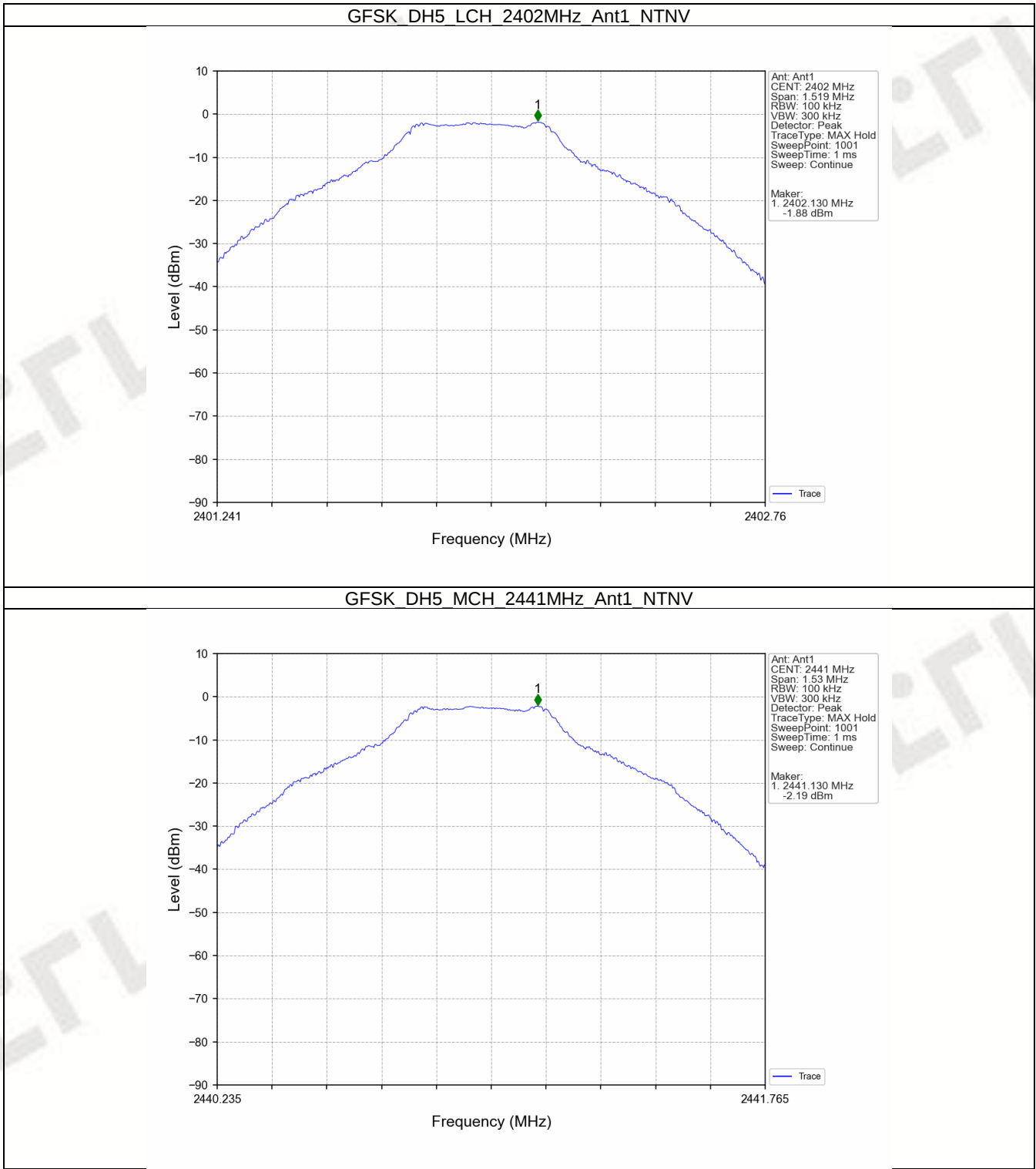
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-1.88	-21.88	Pass
		2441	DH5	1	-1.88	-21.88	Pass
		2480	DH5	1	-1.88	-21.88	Pass
		HOPP	DH5	1	-1.88	-21.88	Pass
					-1.88	-21.88	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	-2.05	-22.05	Pass
		2441	2DH5	1	-2.05	-22.05	Pass
		2480	2DH5	1	-2.05	-22.05	Pass
		HOPP	2DH5	1	-2.05	-22.05	Pass
					-2.05	-22.05	Pass
8DPSK	SISO	2402	3DH5	1	-2.09	-22.09	Pass
		2441	3DH5	1	-2.09	-22.09	Pass
		2480	3DH5	1	-2.09	-22.09	Pass
		HOPP	3DH5	1	-2.09	-22.09	Pass
					-2.09	-22.09	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-T13R

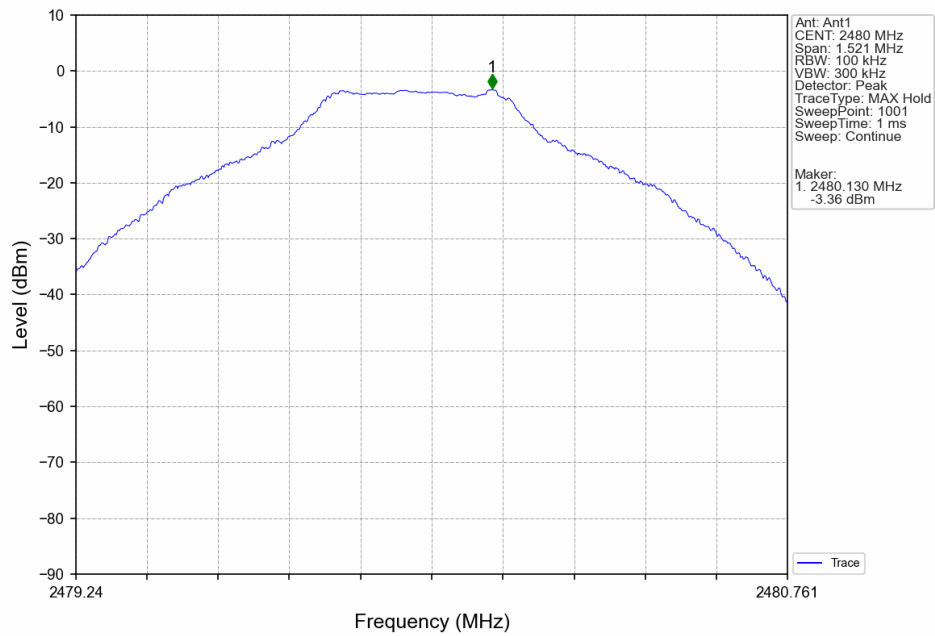
6.2 Test Graph

6.2.1 Ref

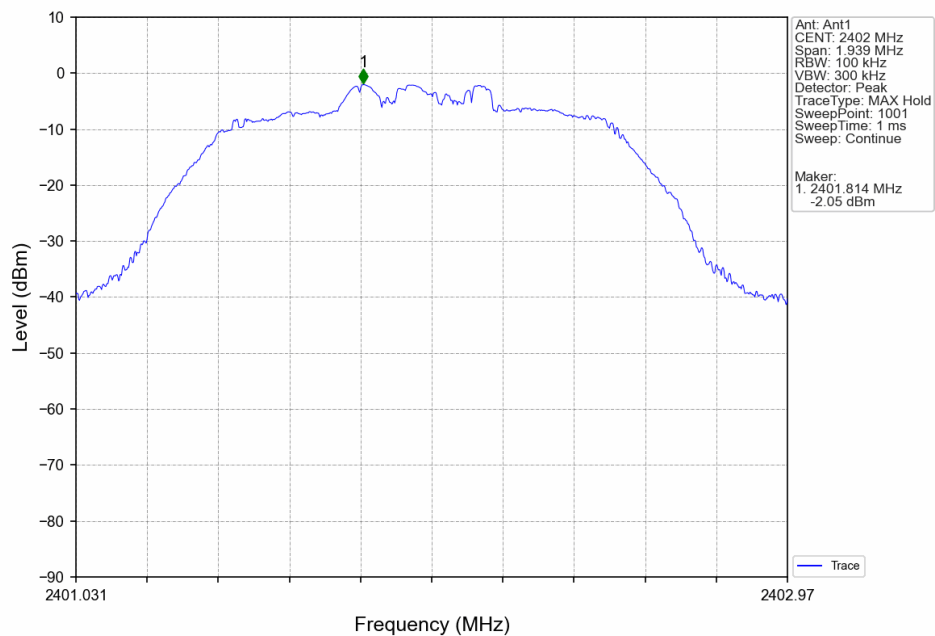


FCCID: 2A8SL-T13R

GFSK DH5 HCH 2480MHz Ant1 NTNV

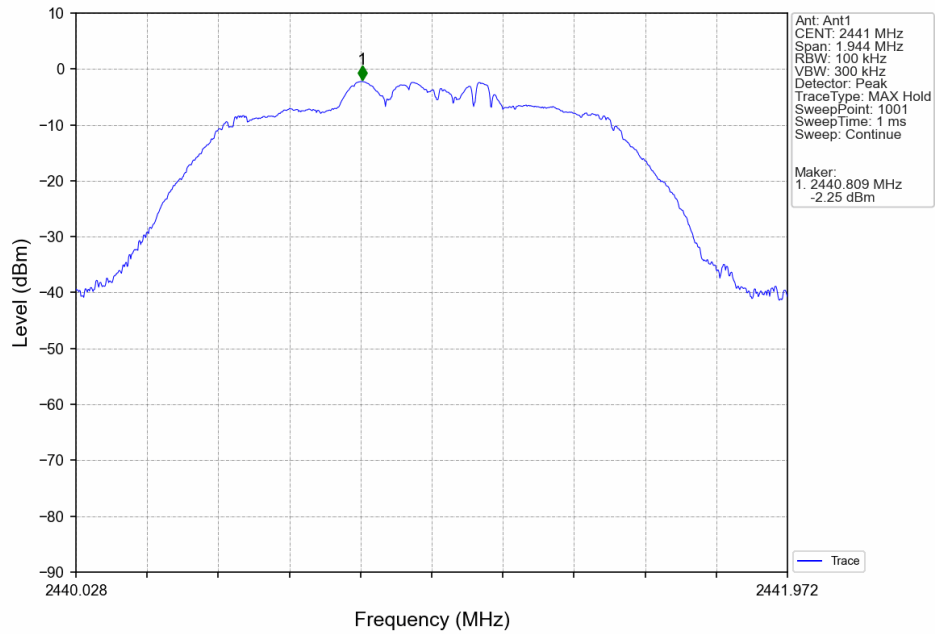


Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTNV

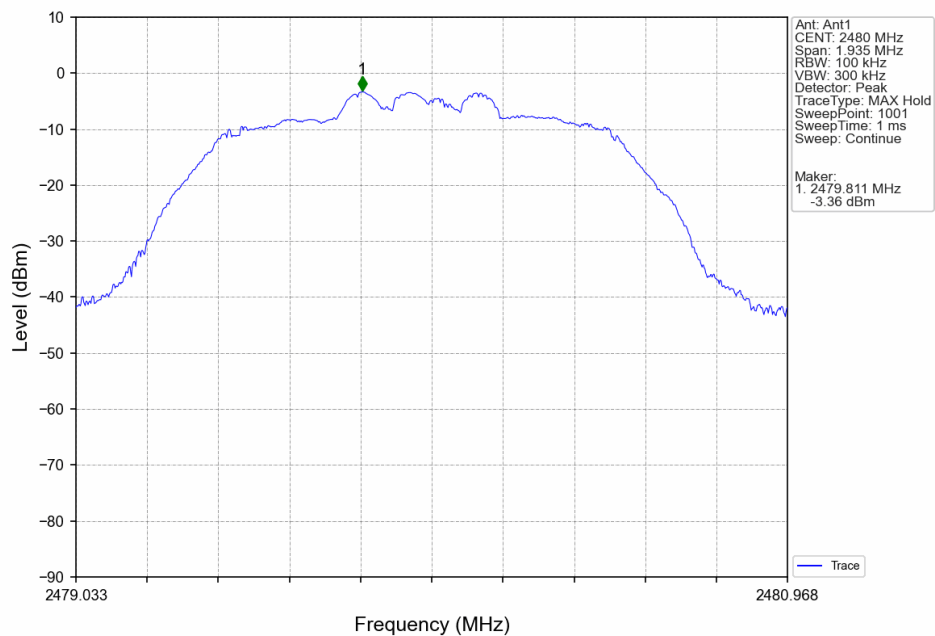


FCCID: 2A8SL-T13R

Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTNV

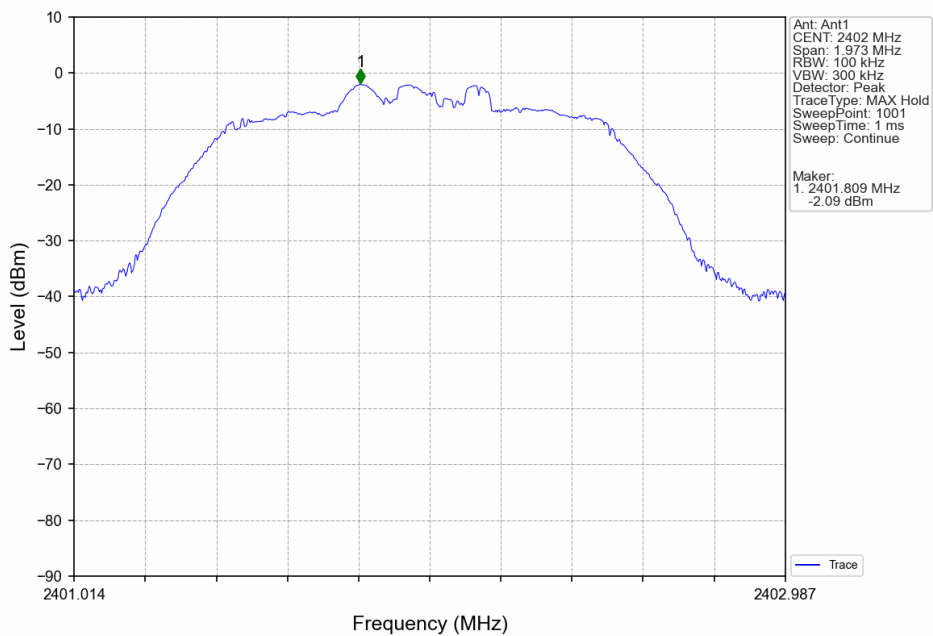


Pi/4DQPSK 2DH5 HCH 2480MHz Ant1 NTNV

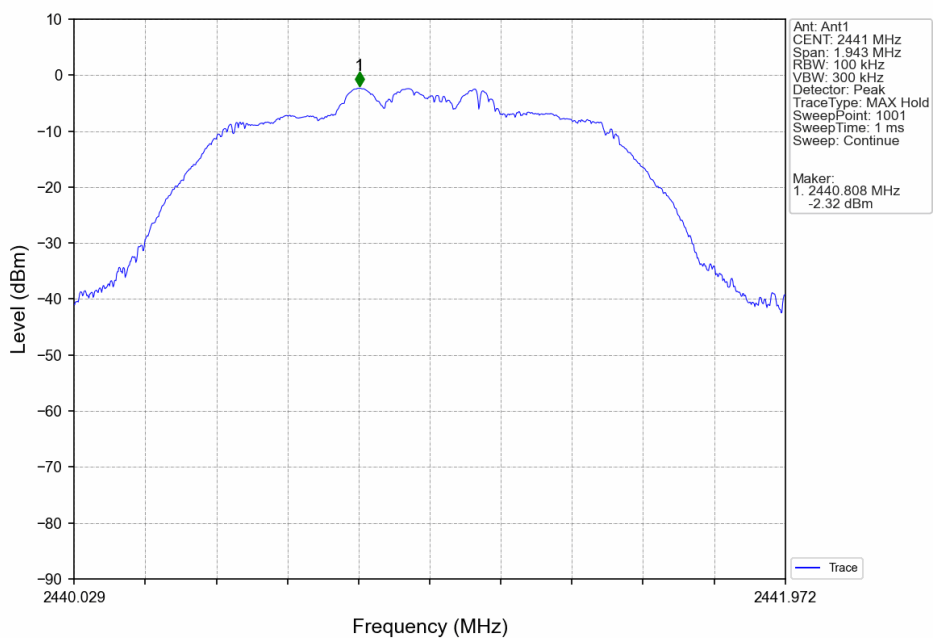


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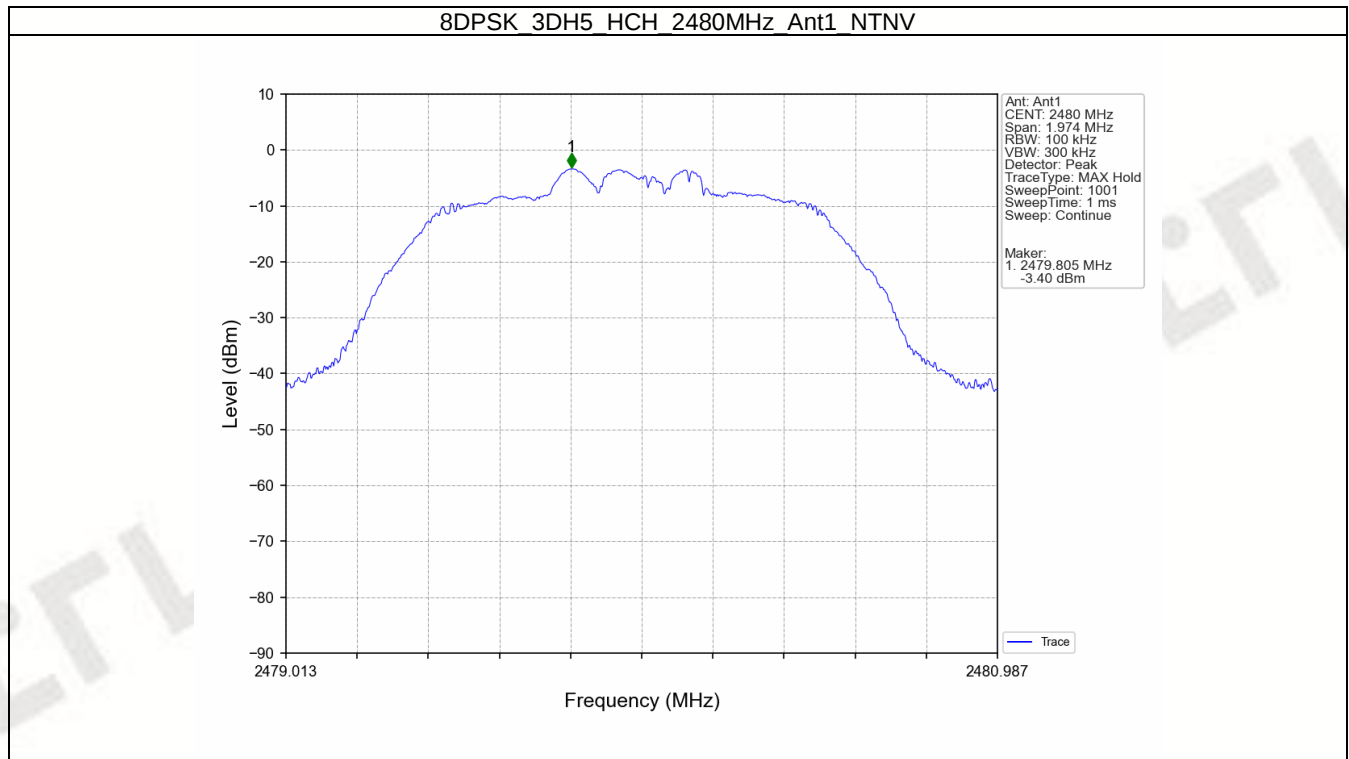
8DPSK 3DH5 LCH 2402MHz Ant1 NTN



8DPSK 3DH5 MCH 2441MHz Ant1 NTN

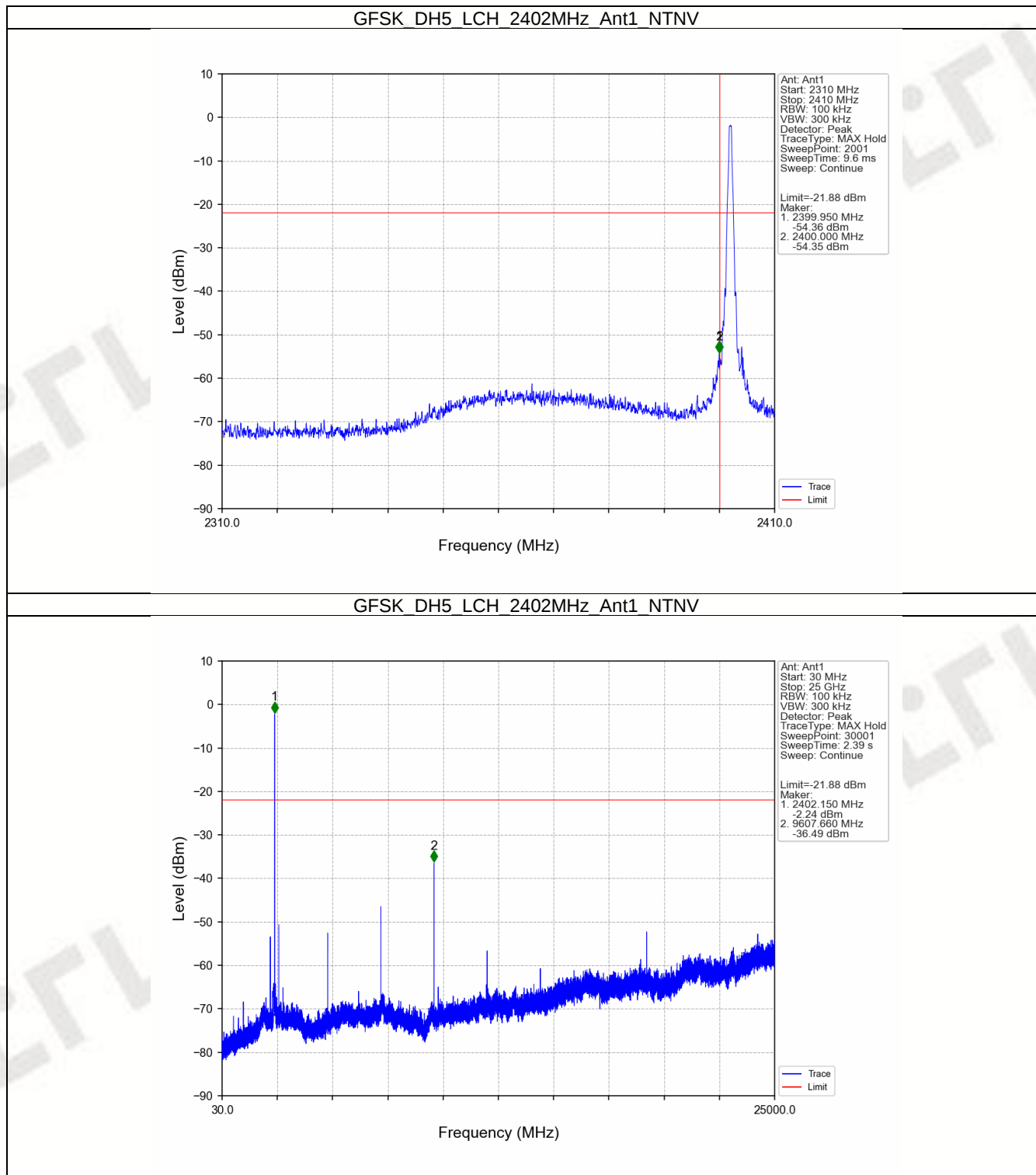


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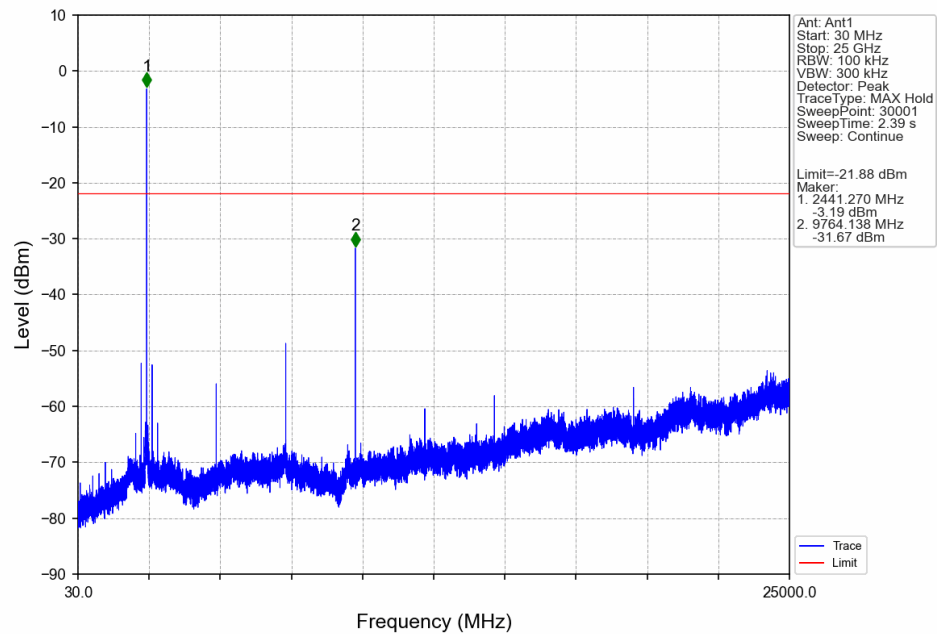
FCCID: 2A8SL-T13R

6.2.2 CSE

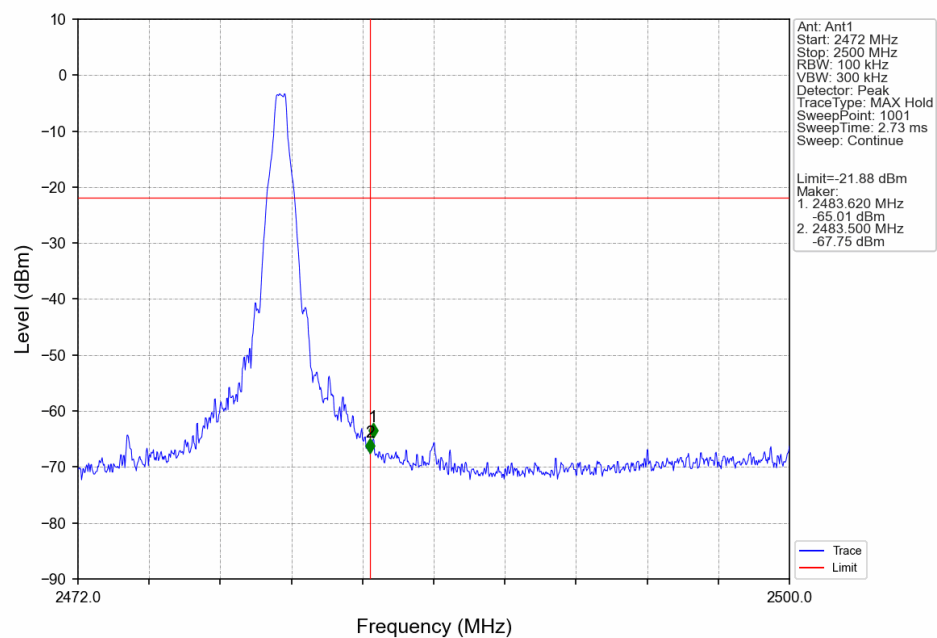


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GFSK DH5 MCH 2441MHz Ant1 NTNV

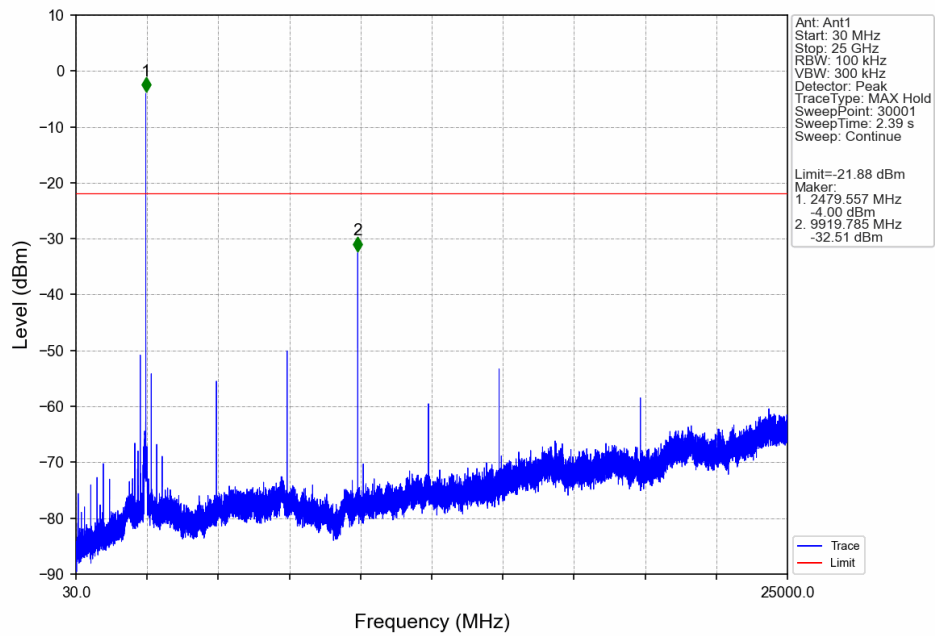


GFSK DH5 HCH 2480MHz Ant1 NTNV

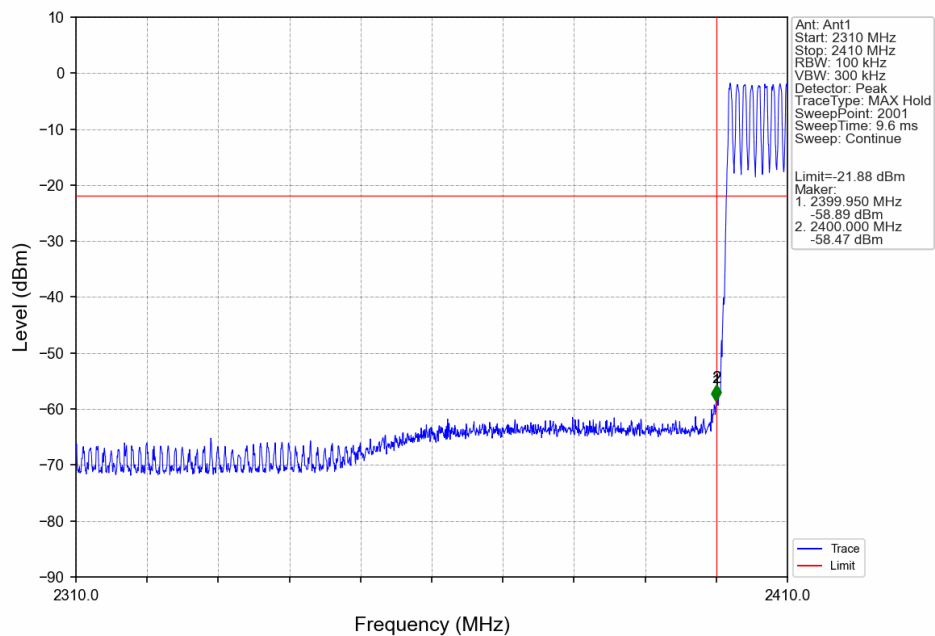


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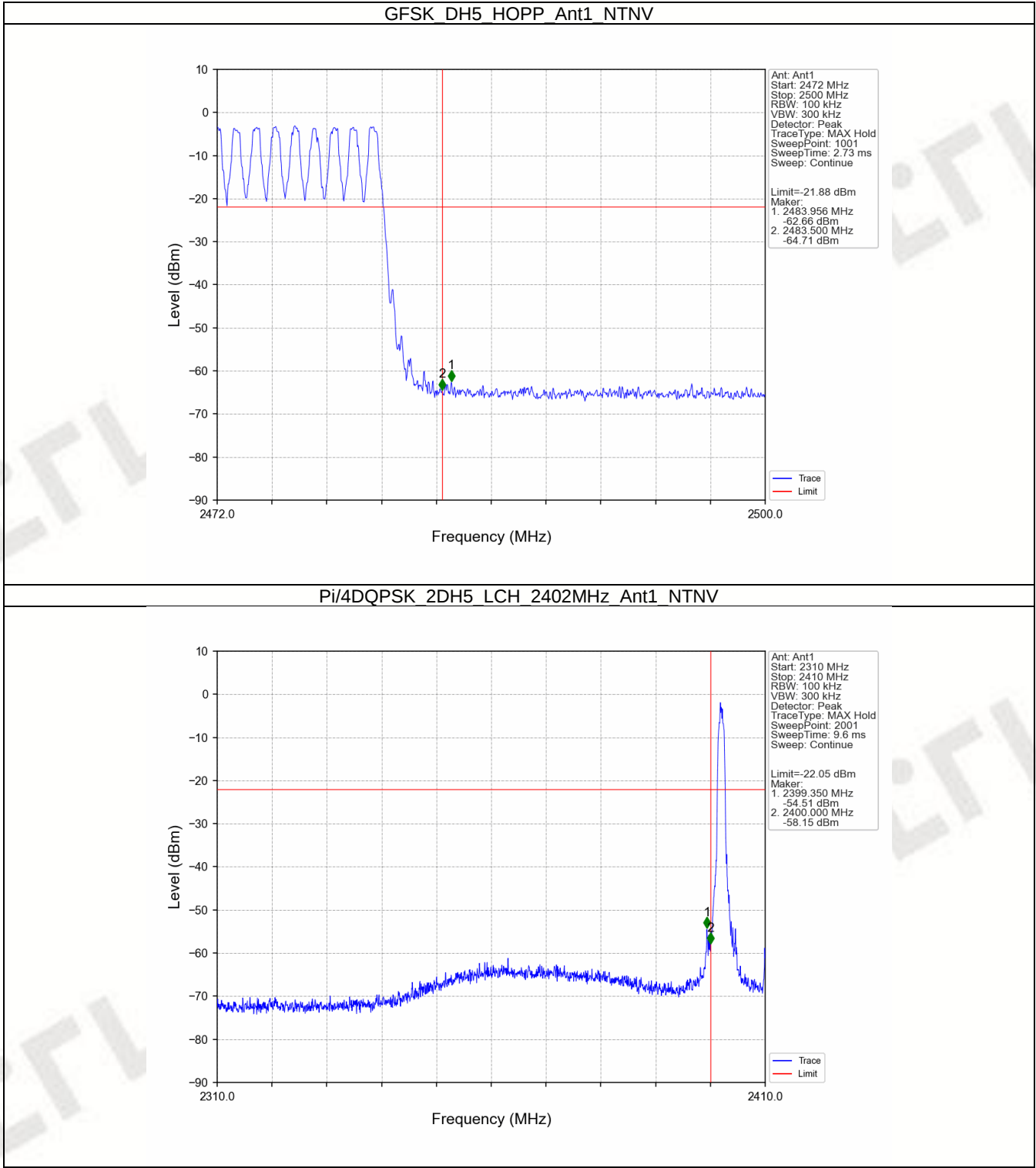
GFSK DH5 HCH 2480MHz Ant1 NTV



GFSK DH5 HOPP Ant1 NTV

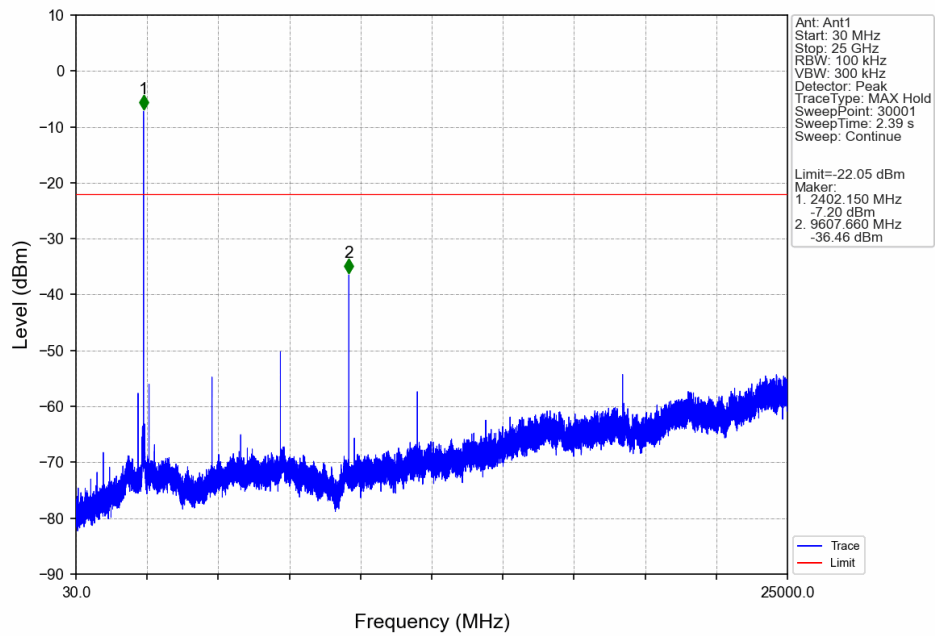


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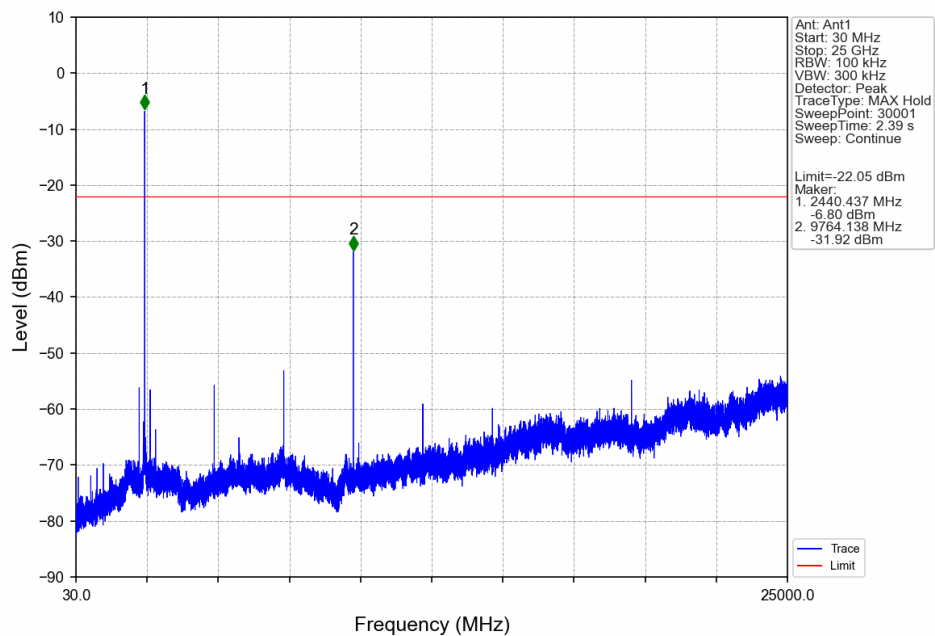


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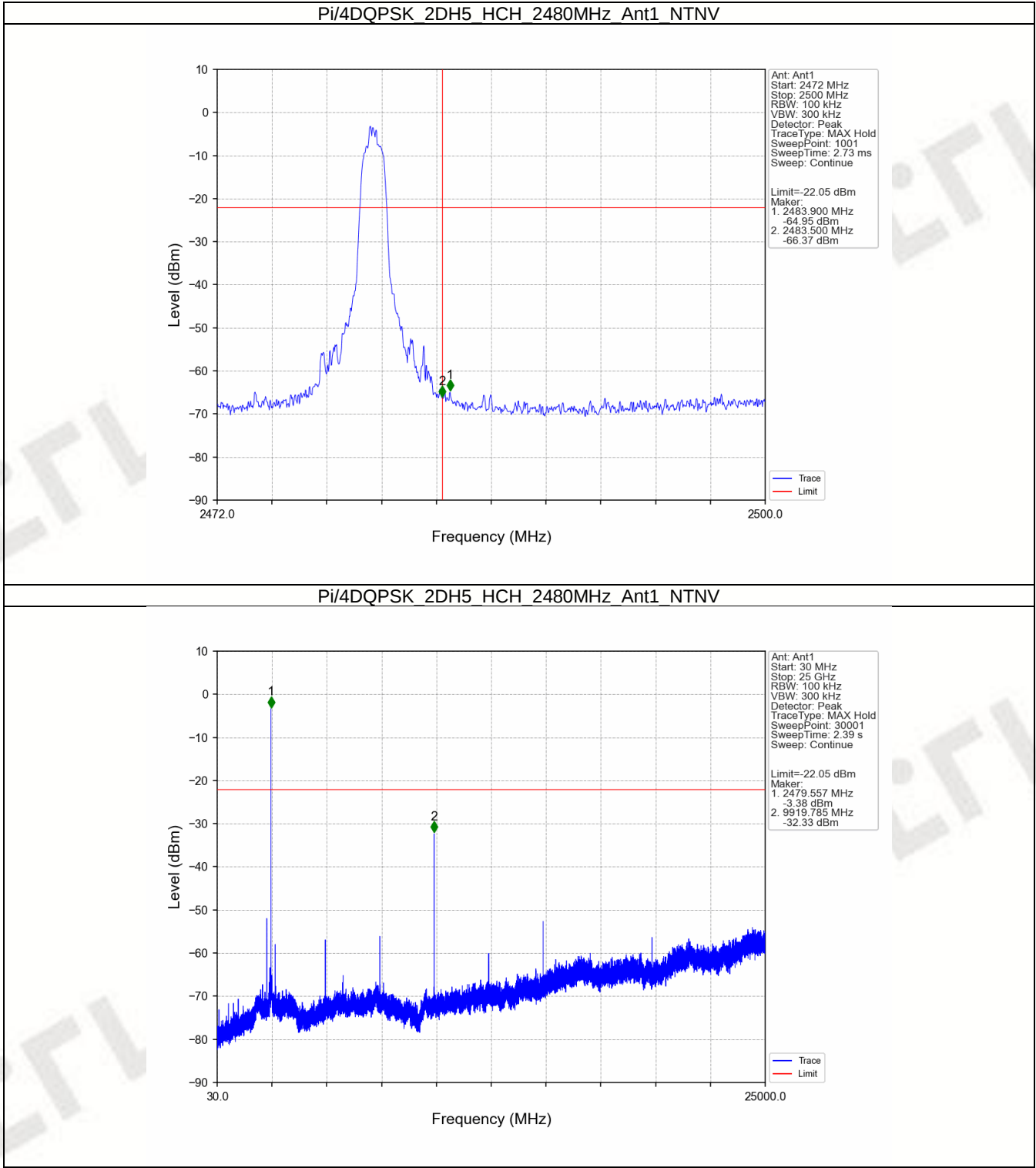
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Pi/4DQPSK 2DH5 MCH 2441MHz Ant1 NTN

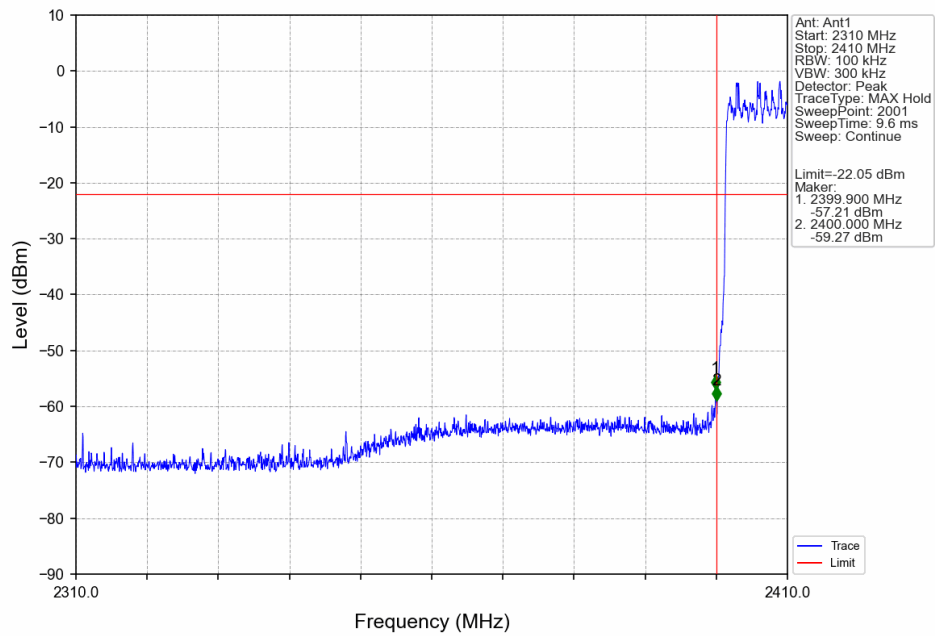


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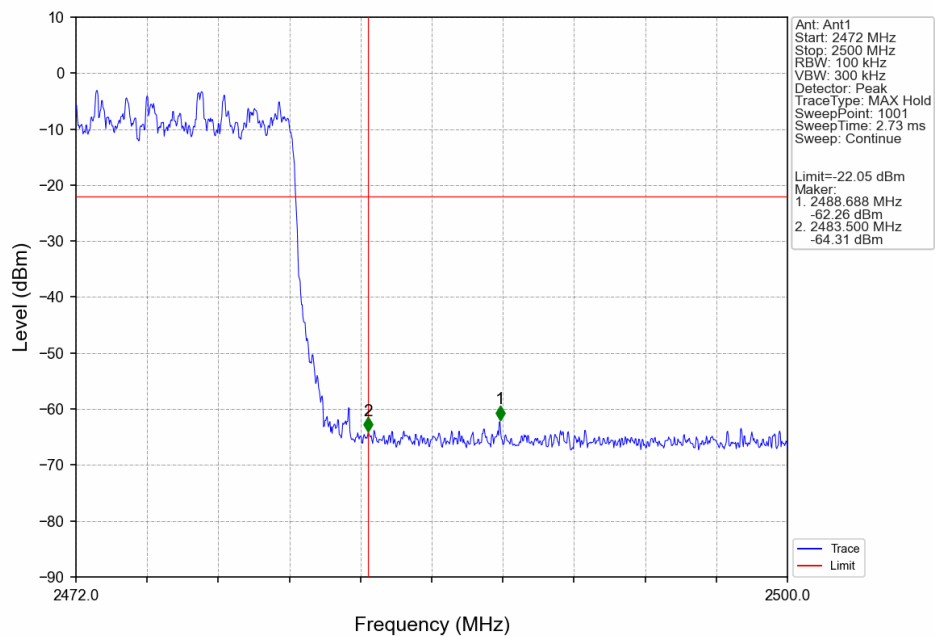


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Pi/4DQPSK 2DH5 HOPP Ant1 NTN

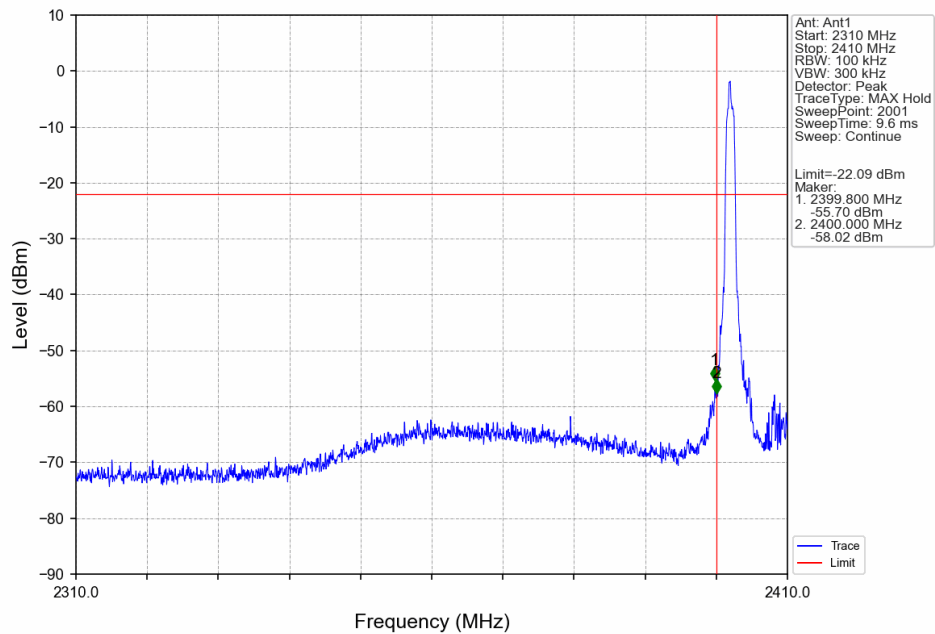


Pi/4DQPSK 2DH5 HOPP Ant1 NTN

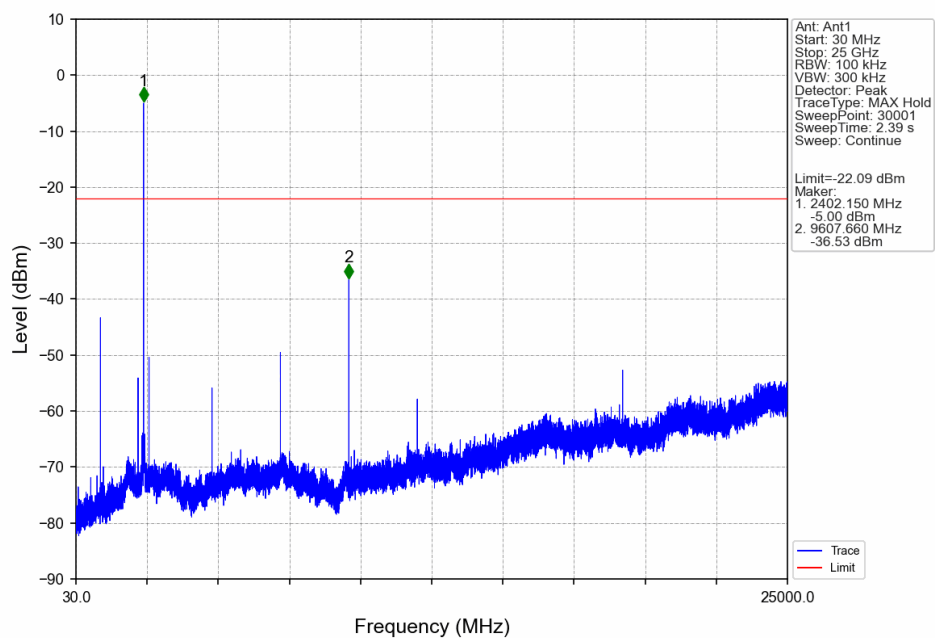


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8DPSK 3DH5 LCH 2402MHz Ant1 NTV

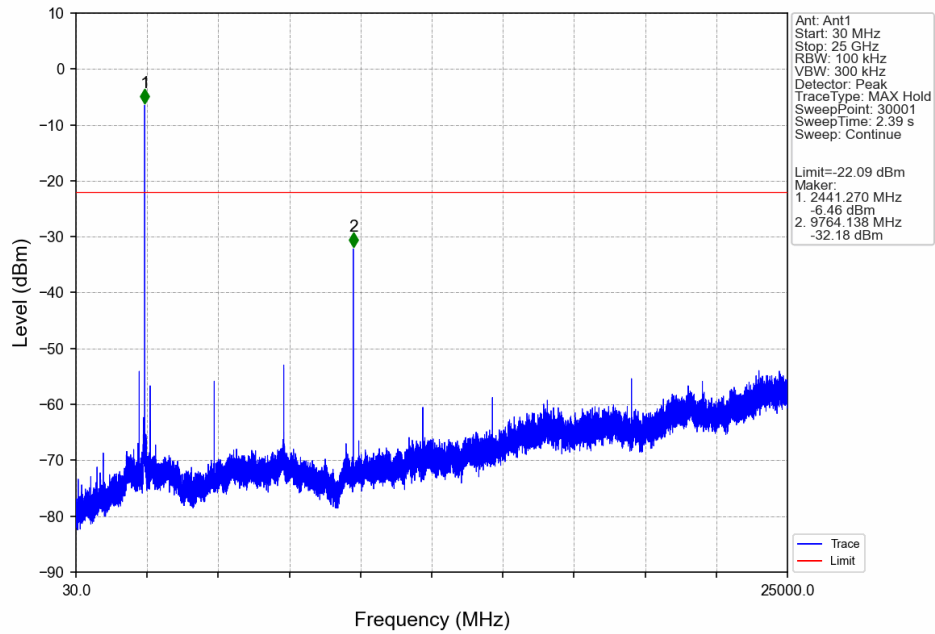


8DPSK 3DH5 LCH 2402MHz Ant1 NTV

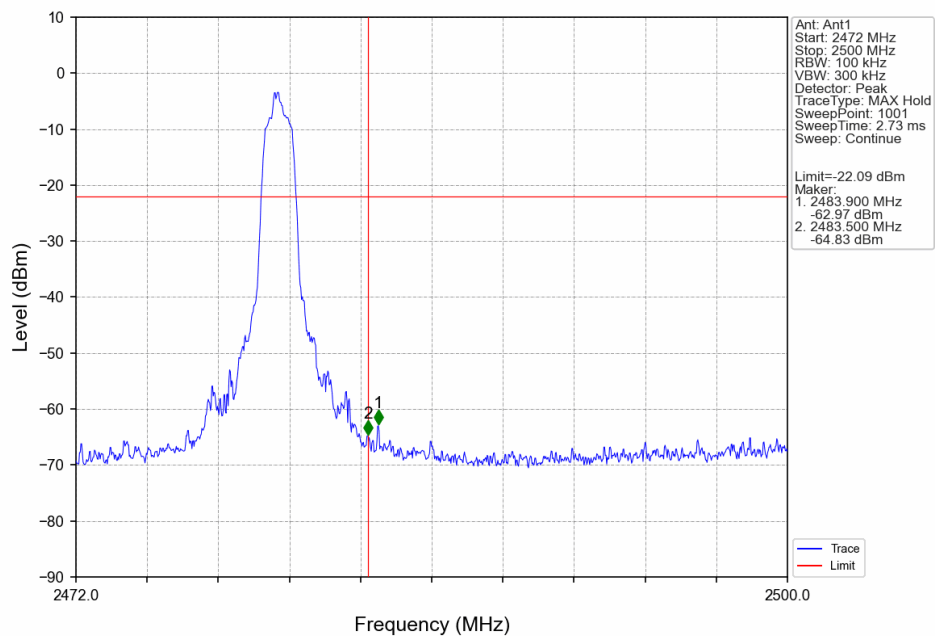


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8DPSK 3DH5 MCH 2441MHz Ant1 NTN

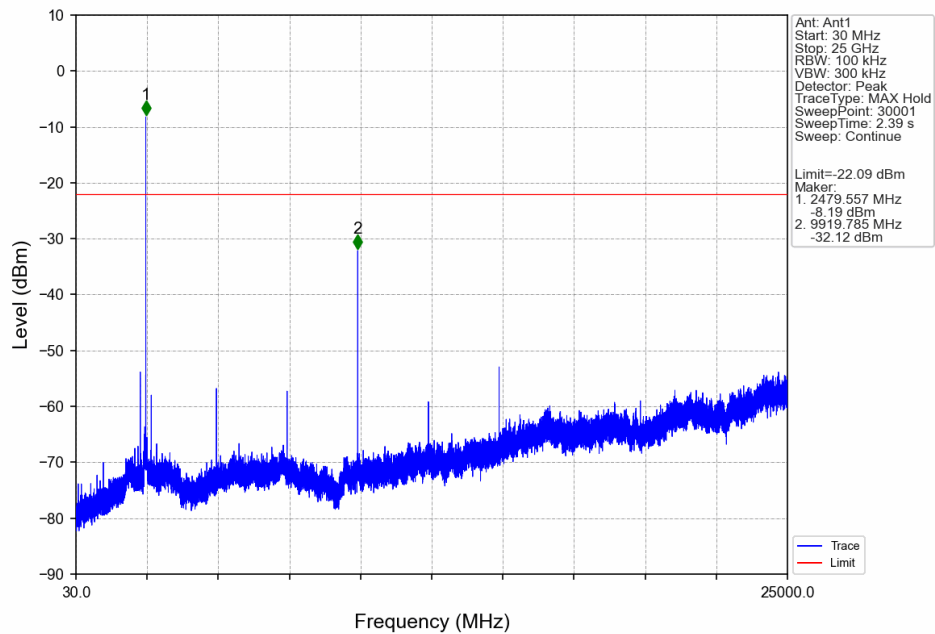


8DPSK 3DH5 HCH 2480MHz Ant1 NTN

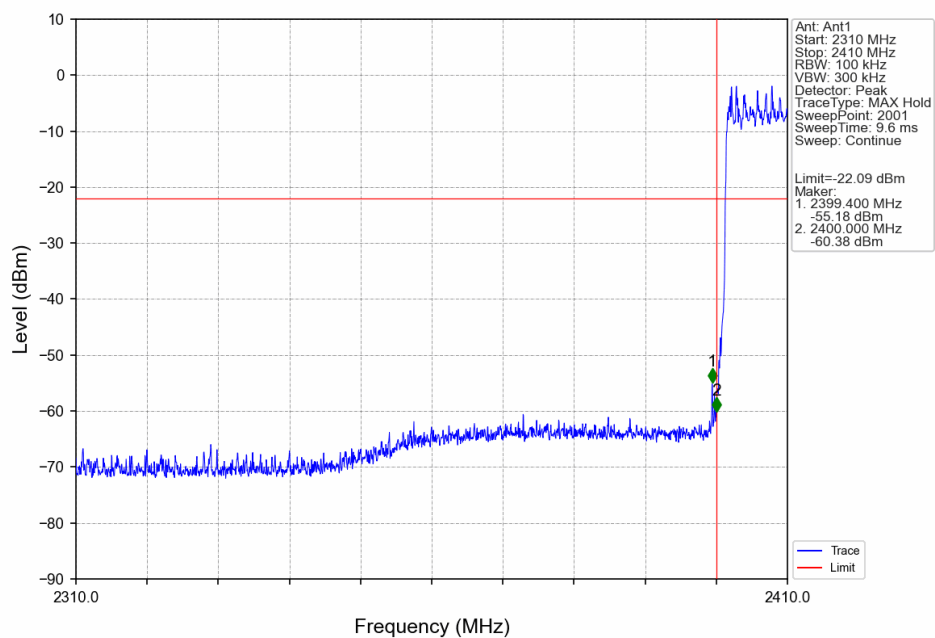


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8DPSK 3DH5 HCH 2480MHz Ant1 NTN



8DPSK 3DH5 HOPP Ant1 NTN



FCCID: 2A8SL-T13R

