

ANNEX D

Test Report

For

Project No.:	8134EU010604W
Client:	Hong Kong Etech Groups Ltd.
Manufacturer:	Hong Kong Etech Groups Ltd.
Product Description:	TWS Earbuds / EBT4-21554
Test Engineer:	<i>Mikey zhu</i>
Test Date:	2023-11-16

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

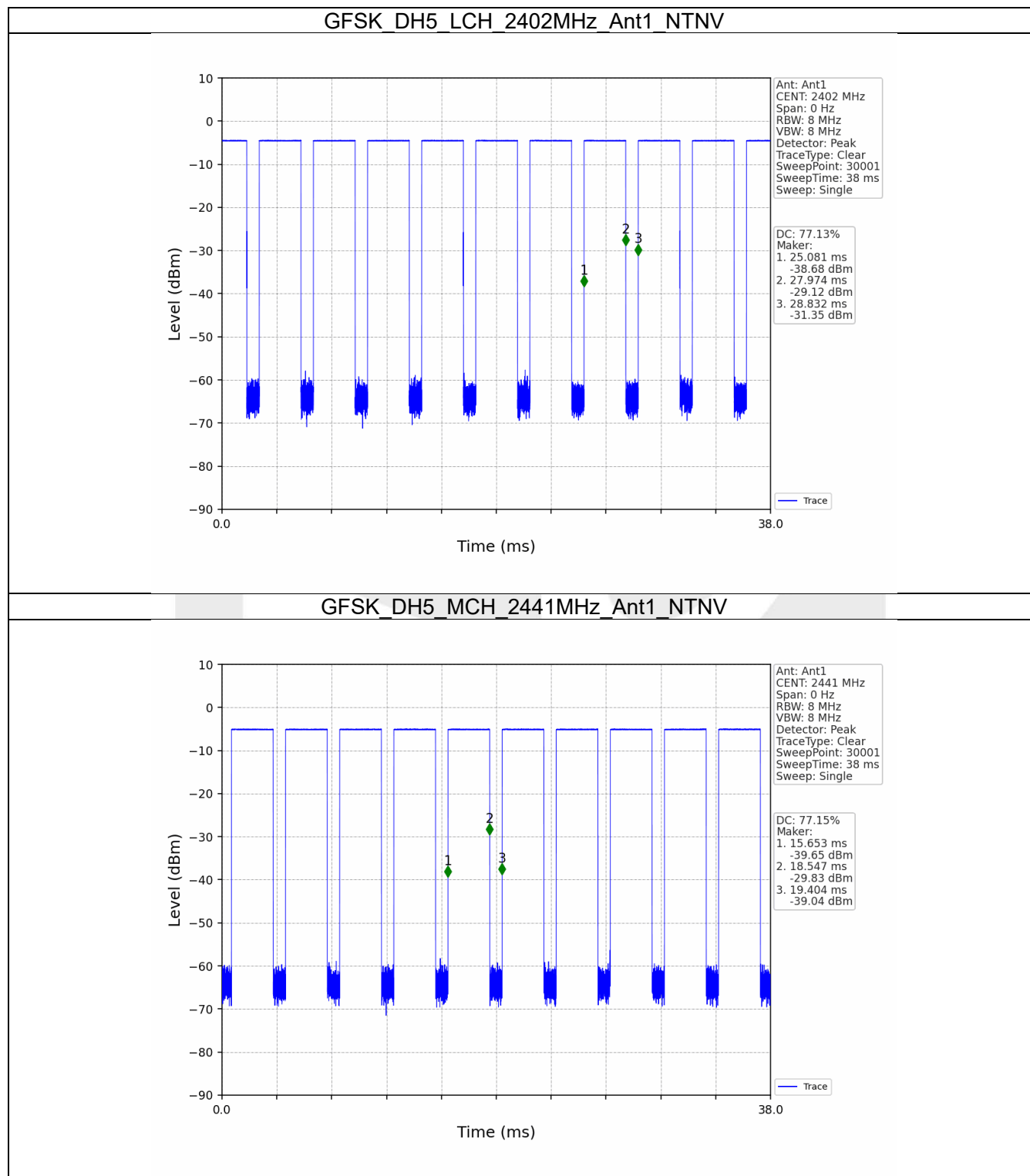
1. Duty Cycle

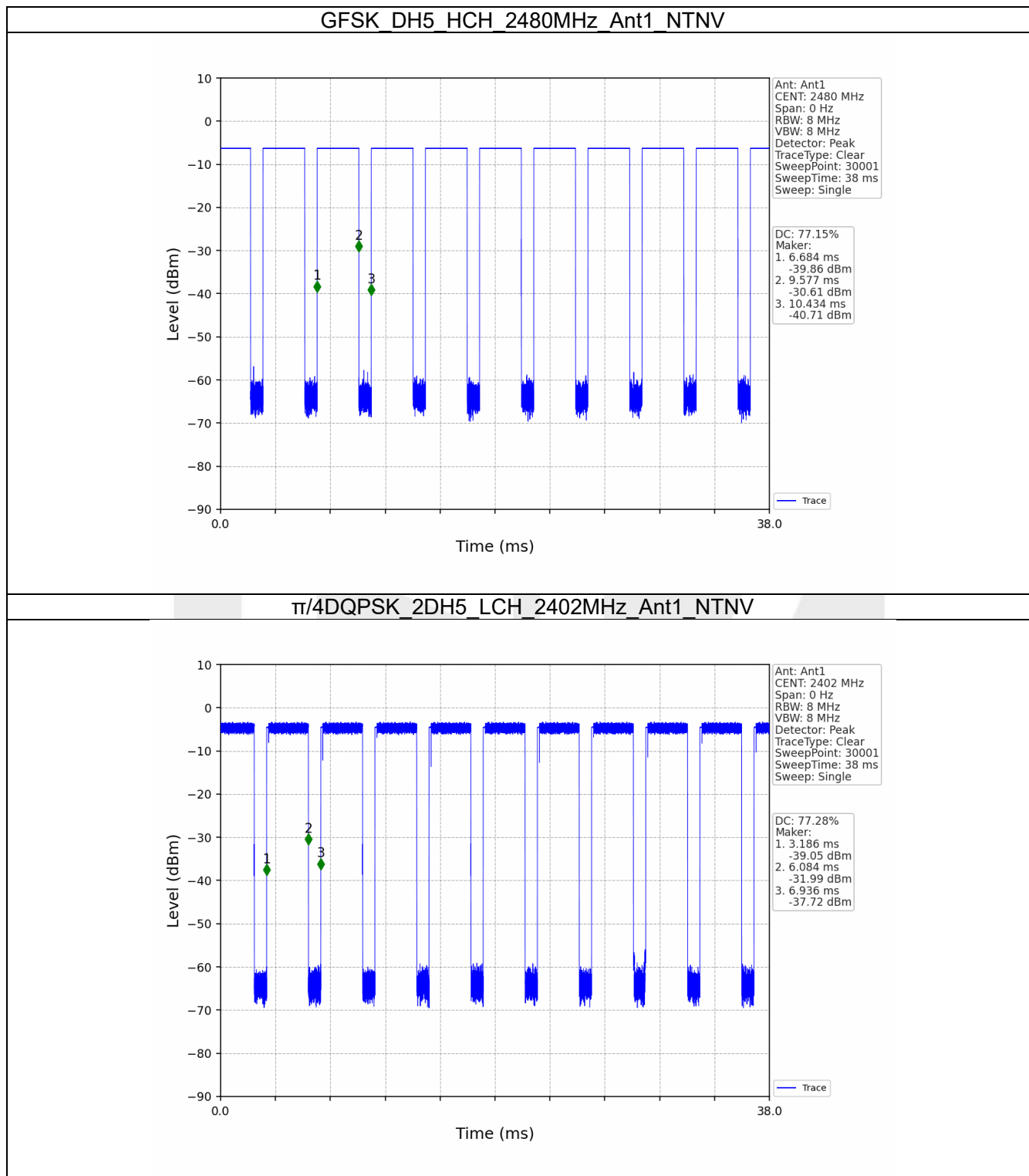
1.1 Ant1

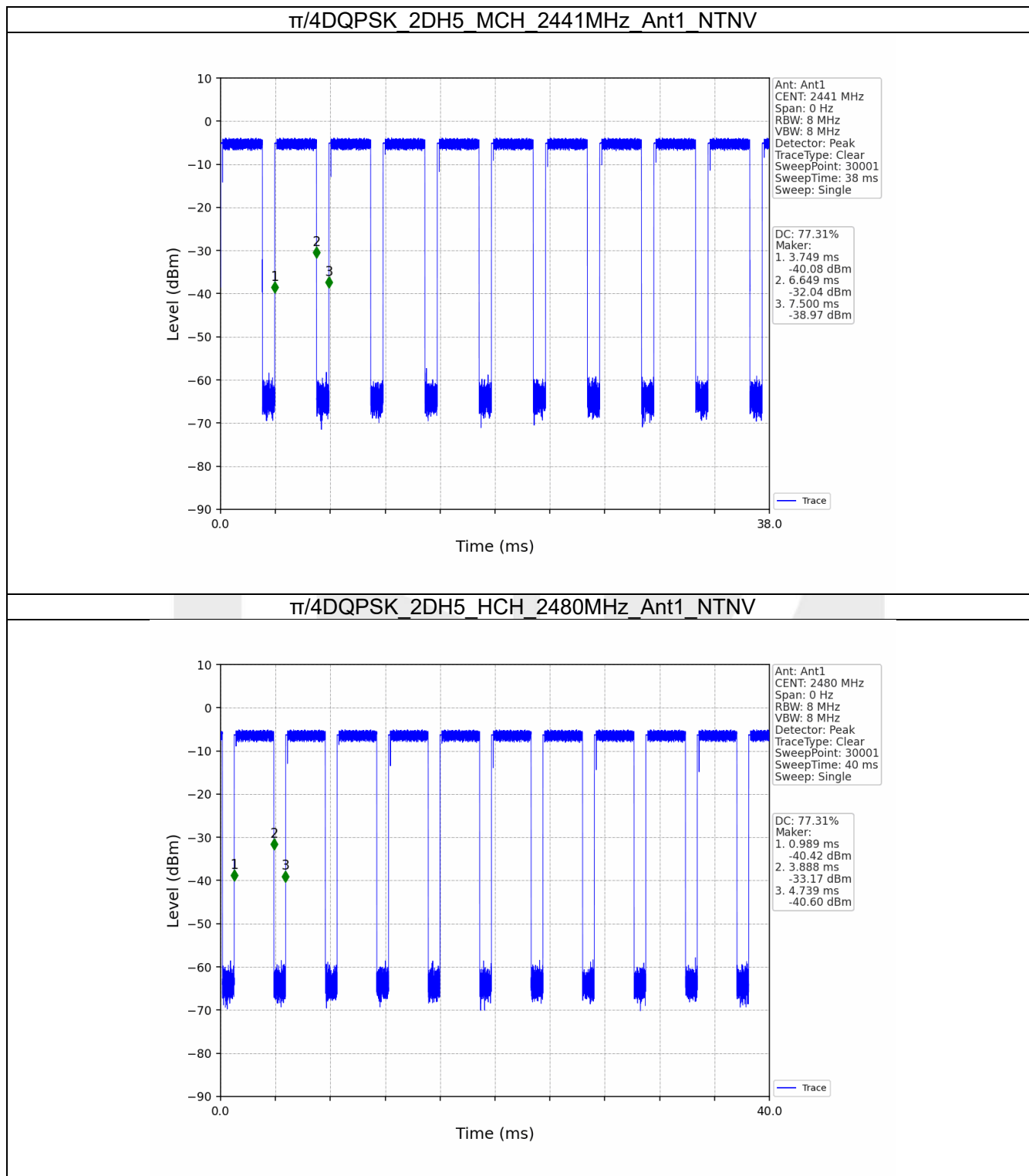
1.1.1 Test Result

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	2.893	3.751	77.13	1.13	0.03
		2441	DH5	2.894	3.751	77.15	1.13	0.03
		2480	DH5	2.893	3.750	77.15	1.13	0.01
$\pi/4$ DQPSK	SISO	2402	2DH5	2.898	3.750	77.28	1.12	0.06
		2441	2DH5	2.900	3.751	77.31	1.12	0.03
		2480	2DH5	2.899	3.750	77.31	1.12	0.01

1.1.2 Test Graph







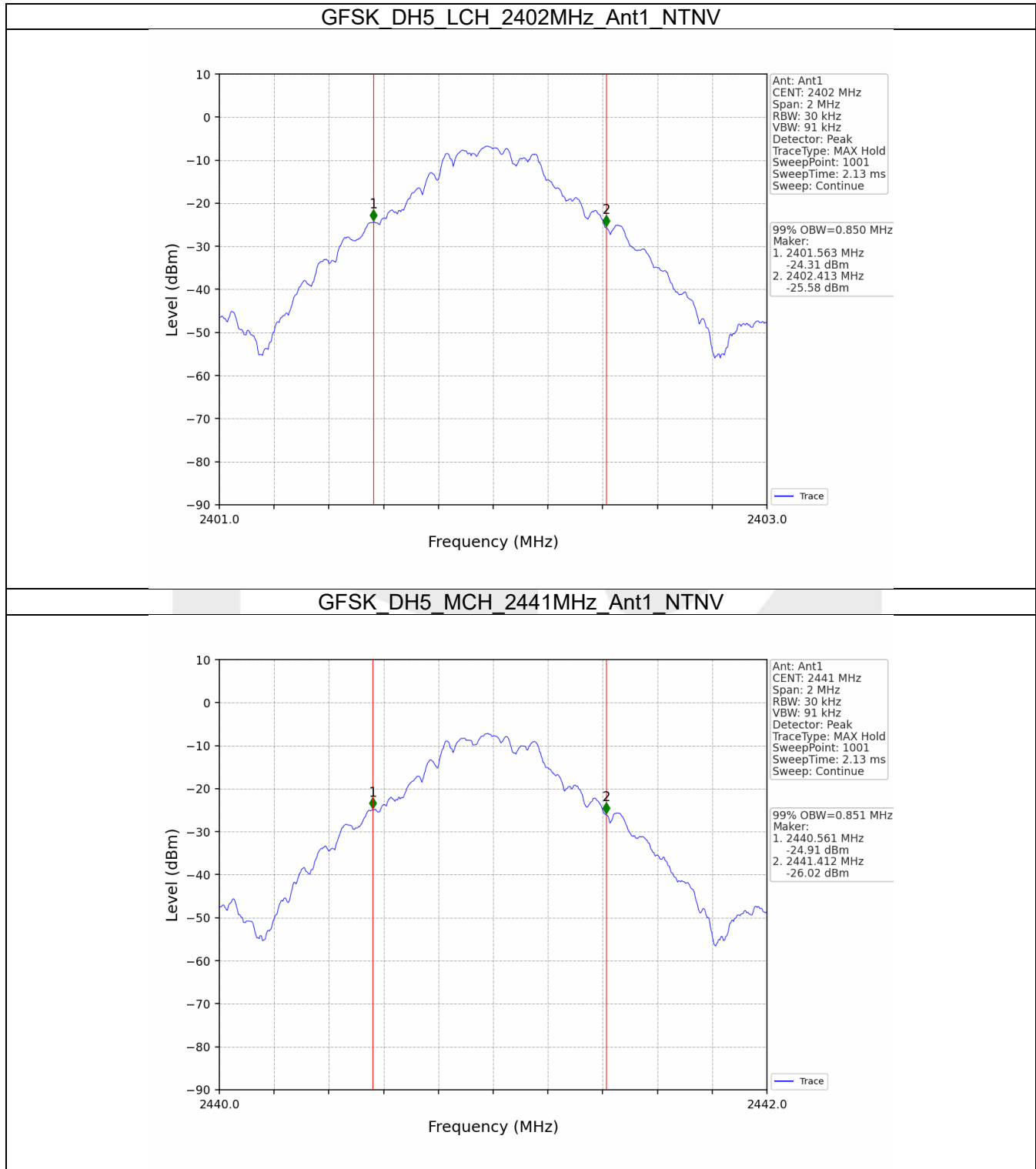
2. Bandwidth

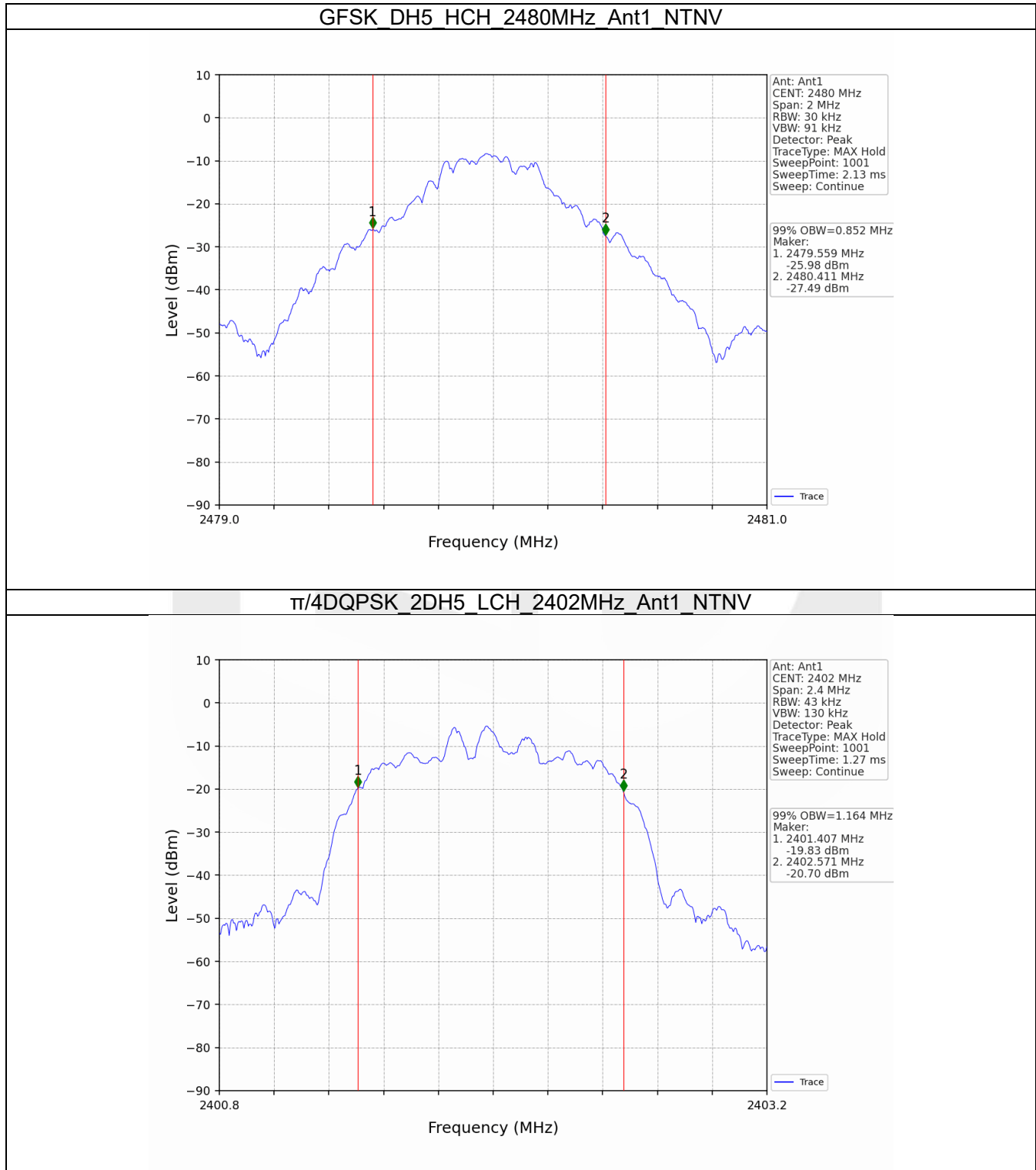
2.1 OBW

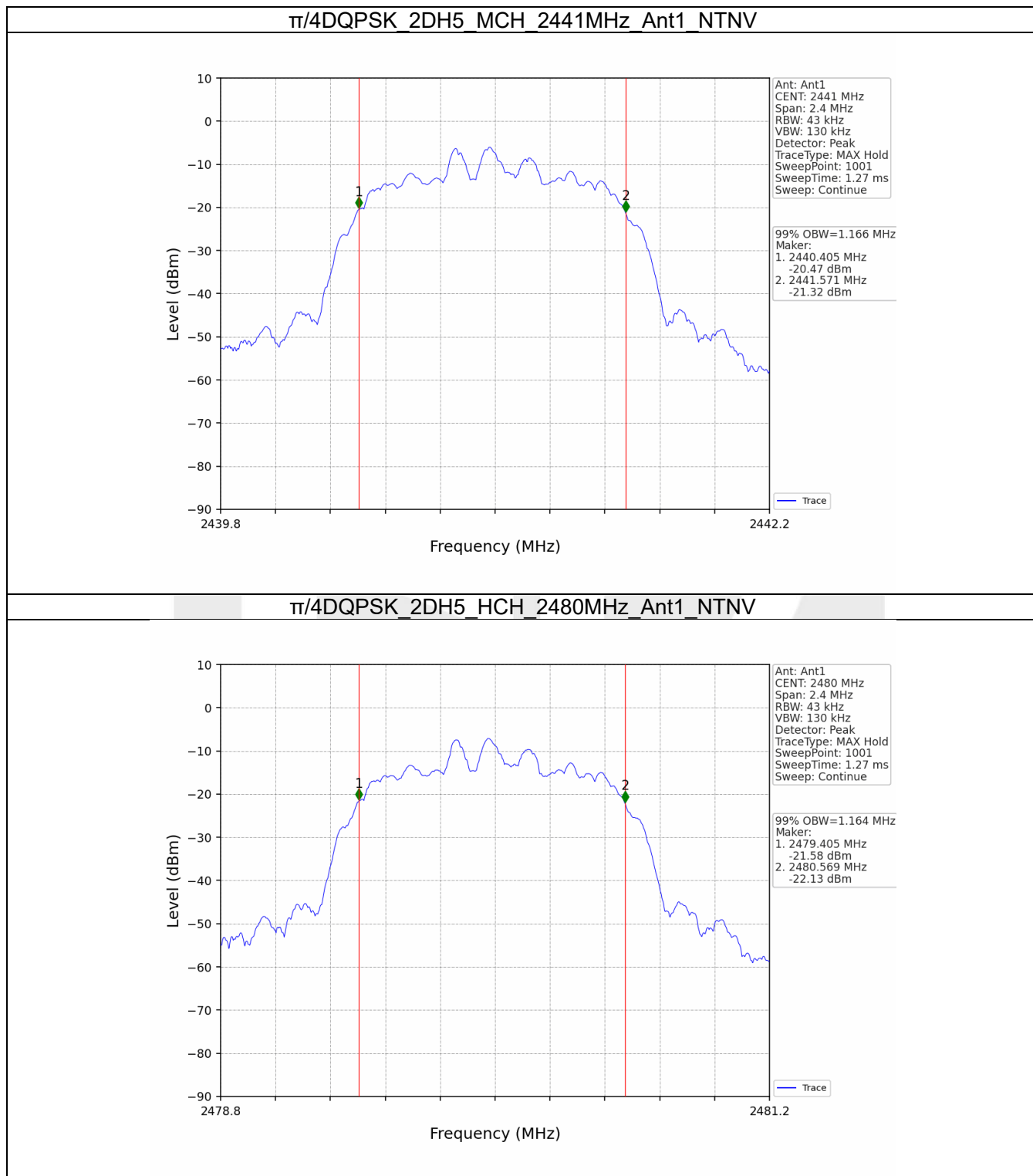
2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.850	Pass
		2441	DH5	1	0.851	Pass
		2480	DH5	1	0.852	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	1.164	Pass
		2441	2DH5	1	1.166	Pass
		2480	2DH5	1	1.164	Pass

2.1.2 Test Graph





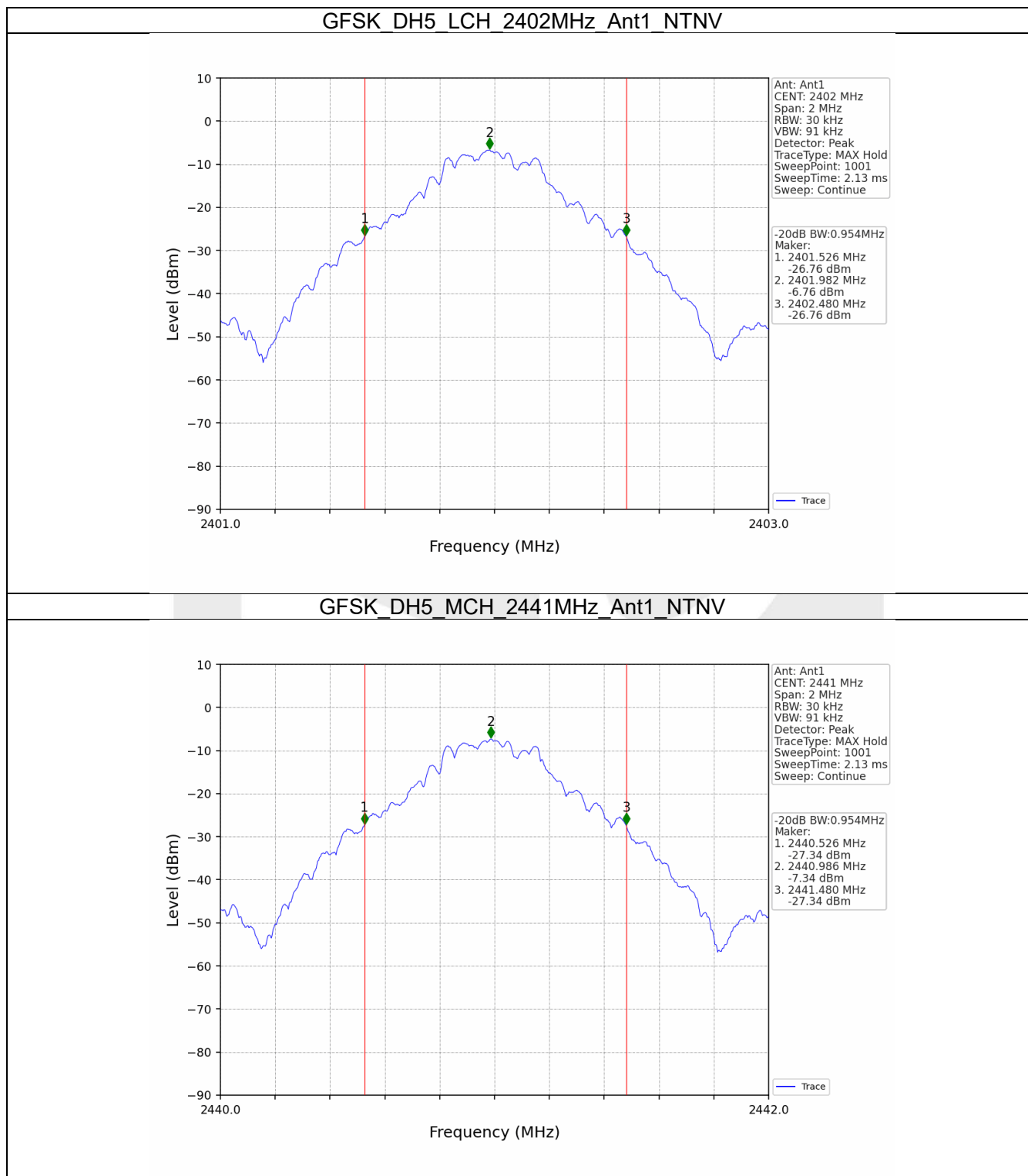


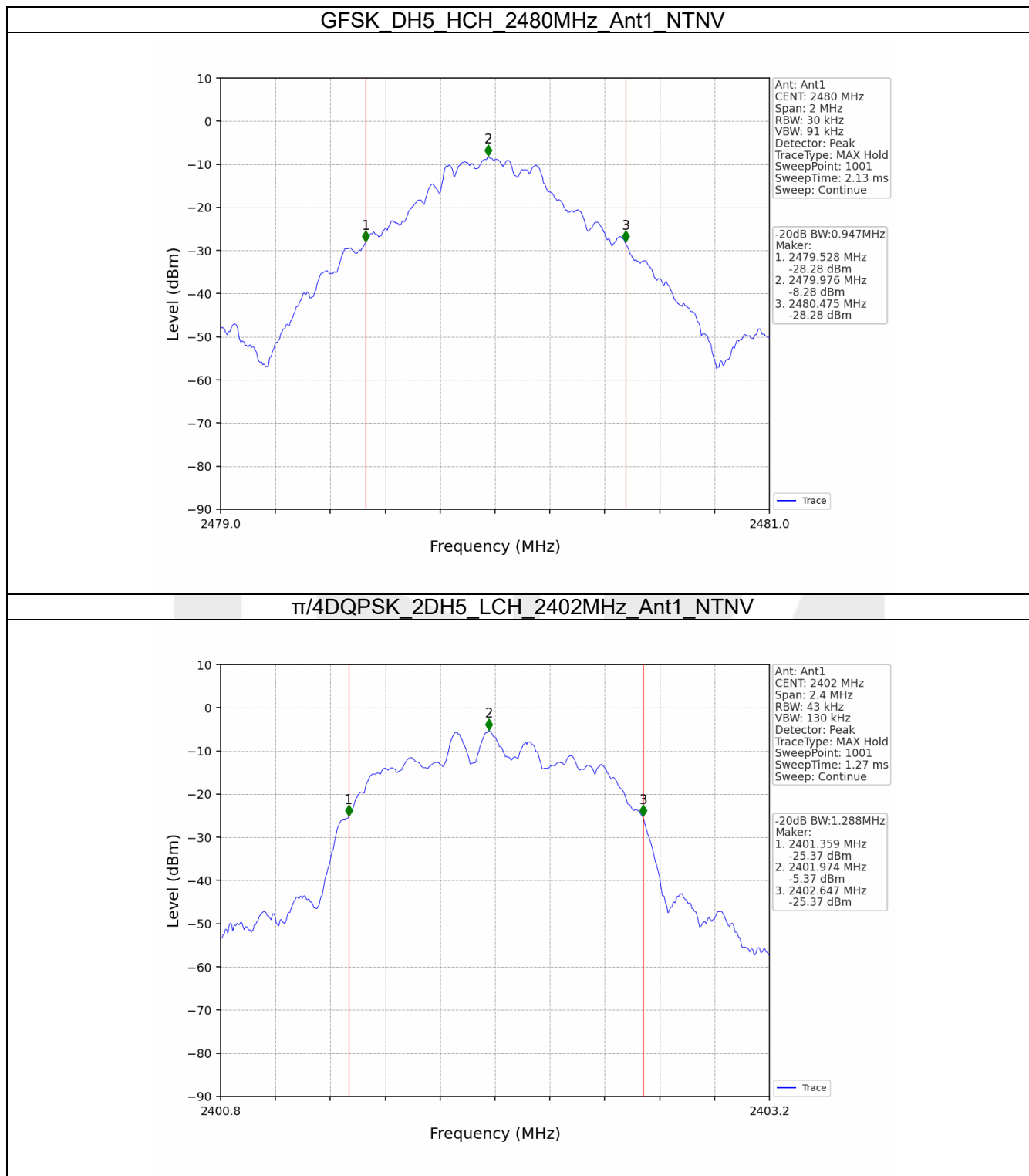
2.2 20dB BW

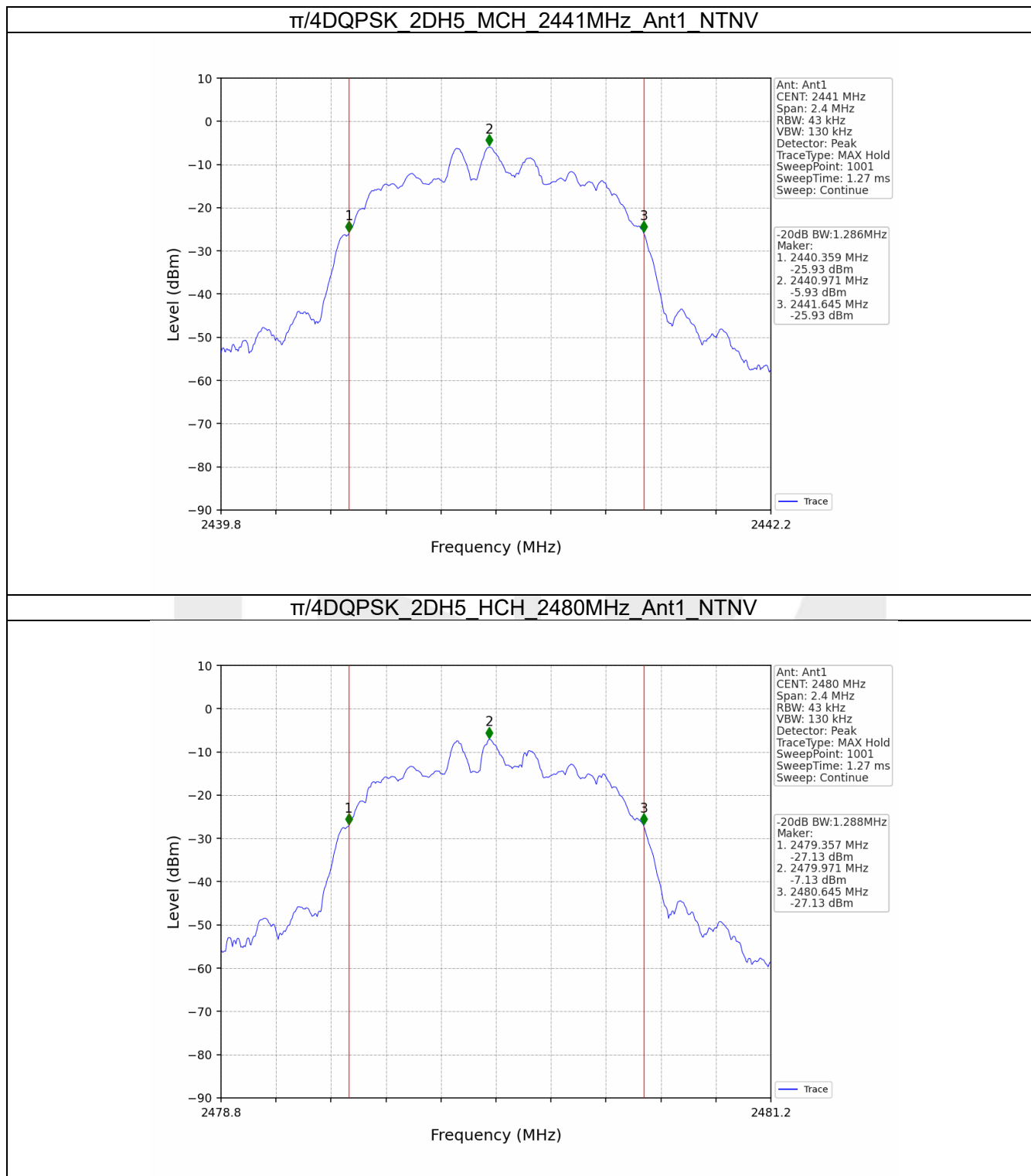
2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.954	Pass
		2441	DH5	1	0.954	Pass
		2480	DH5	1	0.947	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	1.288	Pass
		2441	2DH5	1	1.286	Pass
		2480	2DH5	1	1.288	Pass

2.2.2 Test Graph







3. Maximum Conducted Output Power

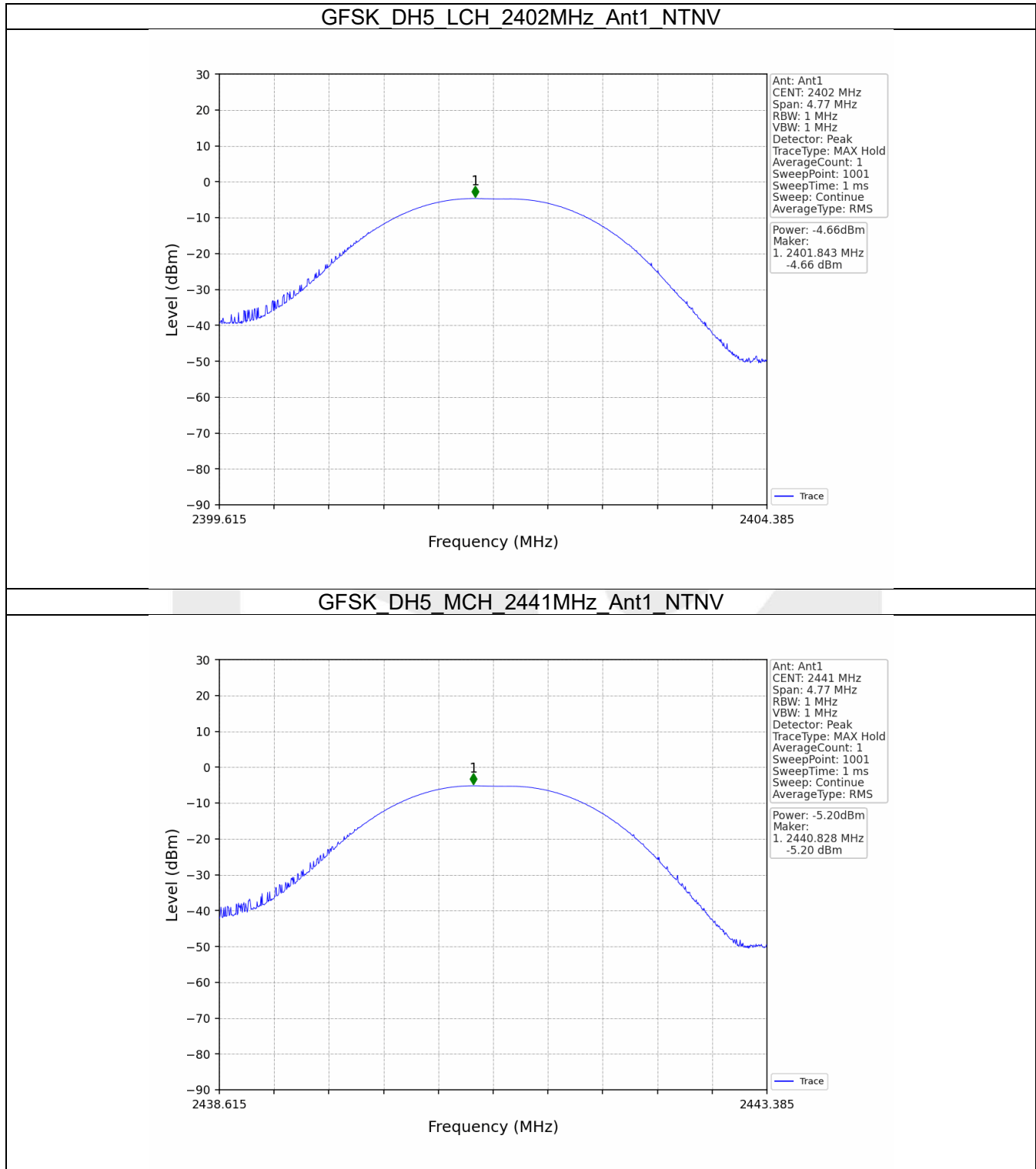
3.1 Power

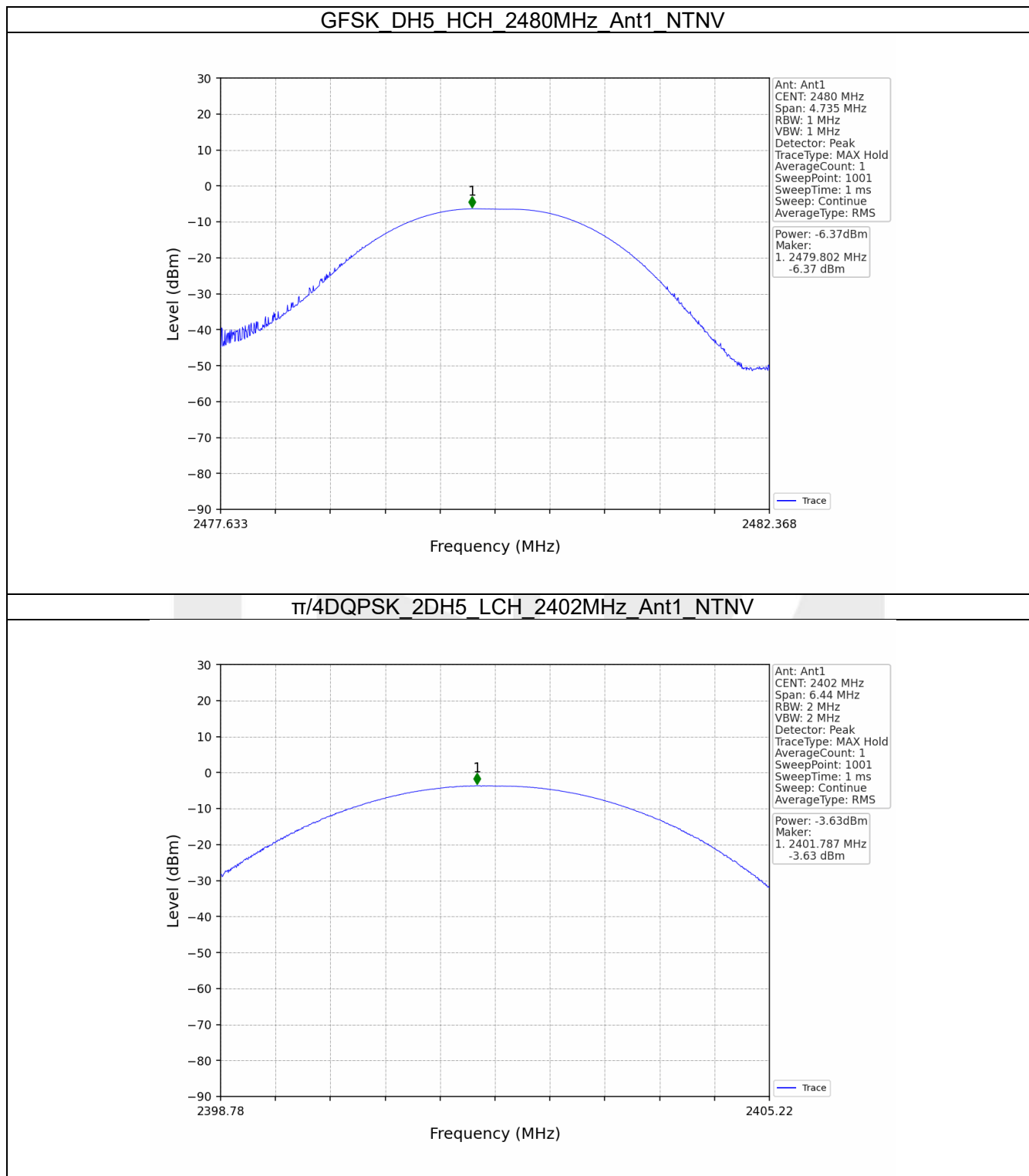
3.1.1 Test Result

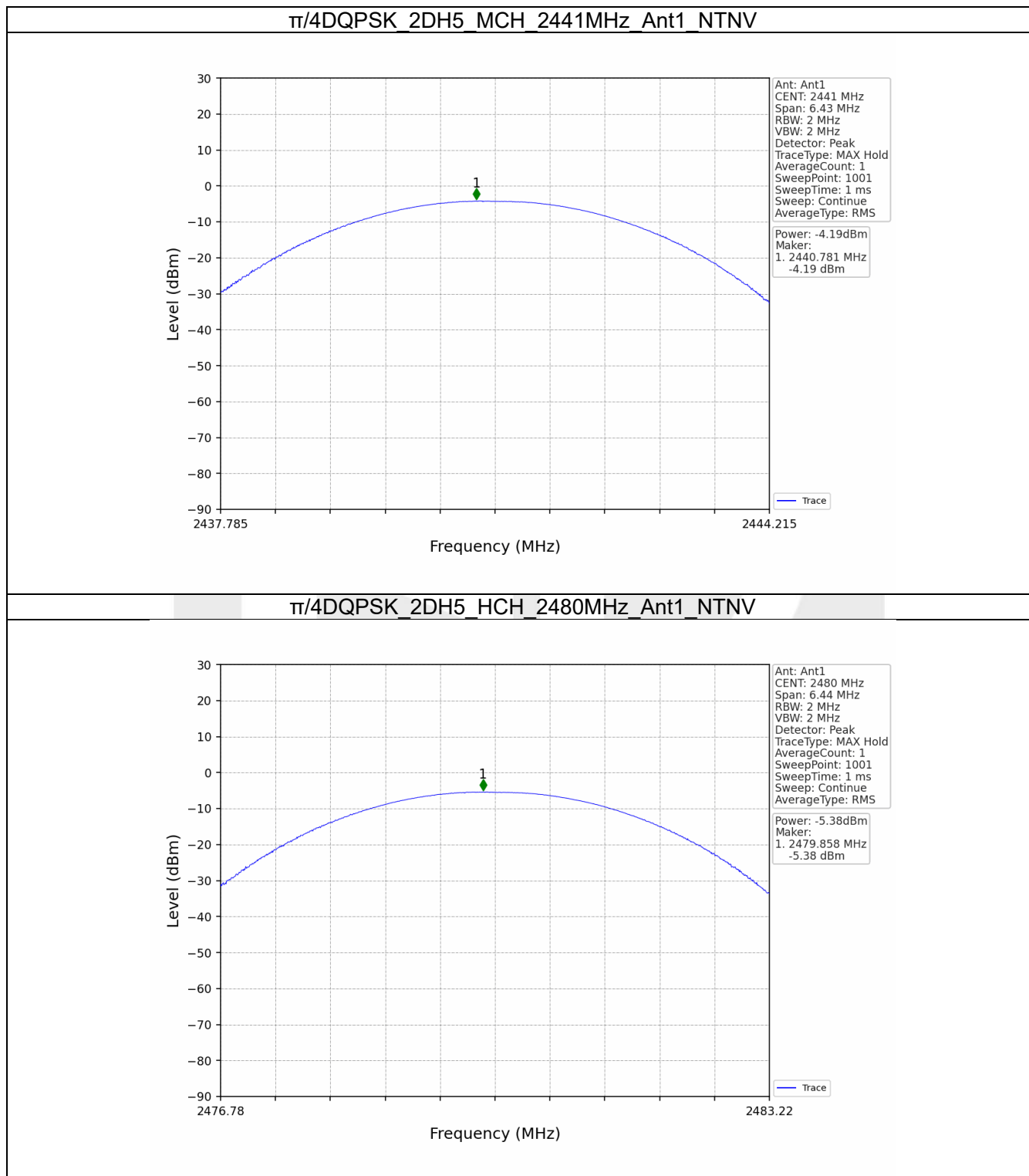
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-4.66	≤ 30	Pass
		2441	DH5	-5.20	≤ 30	Pass
		2480	DH5	-6.37	≤ 30	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	-3.63	≤ 20.97	Pass
		2441	2DH5	-4.19	≤ 20.97	Pass
		2480	2DH5	-5.38	≤ 20.97	Pass

Note1: Antenna Gain: Ant1: 2.67dBi;

3.1.2 Test Graph







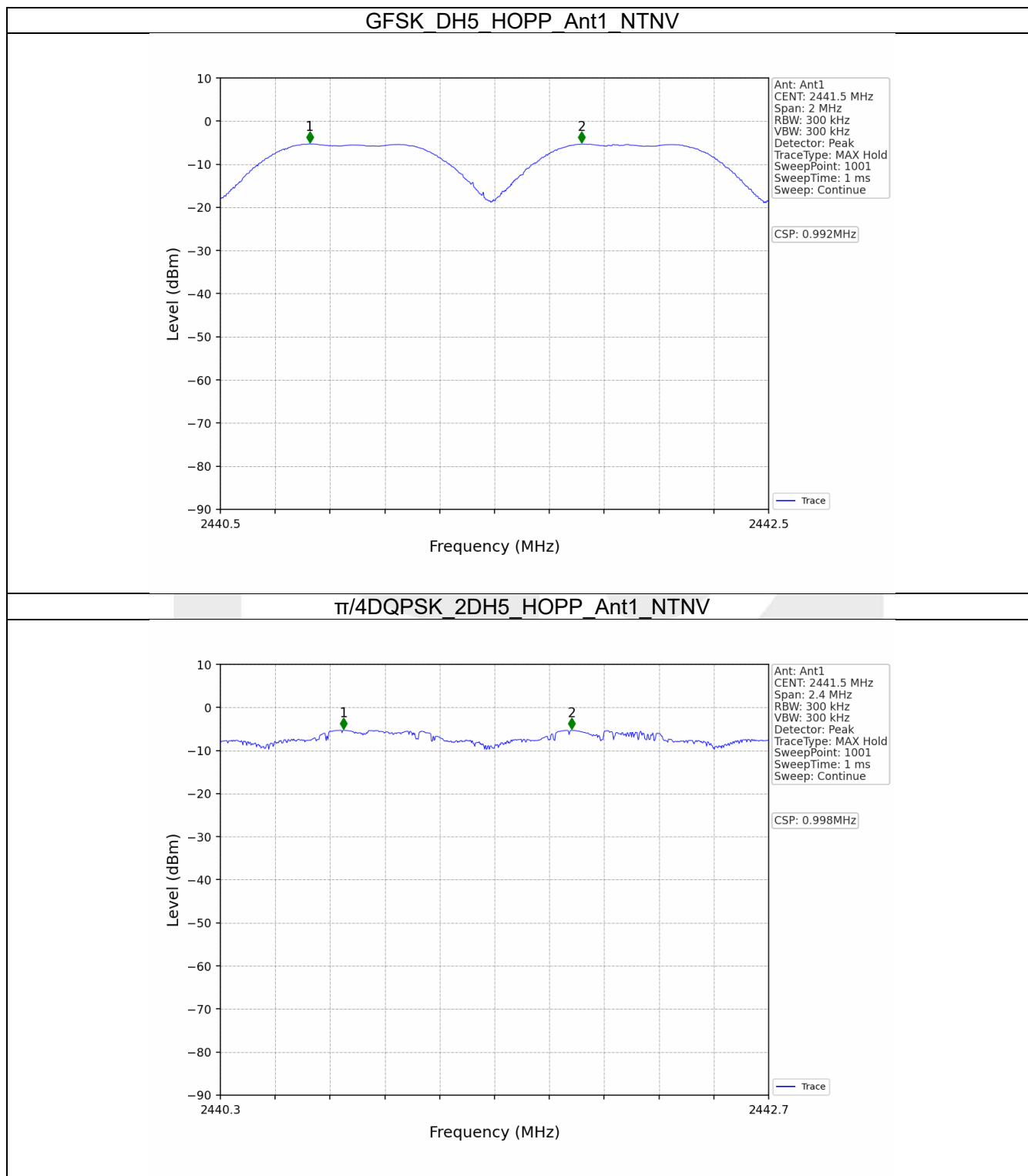
4. Carrier Frequency Separation

4.1 Ant1

4.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	0.992	0.954	≥ 0.954	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH5	0.998	1.288	≥ 0.859	Pass

4.1.2 Test Graph



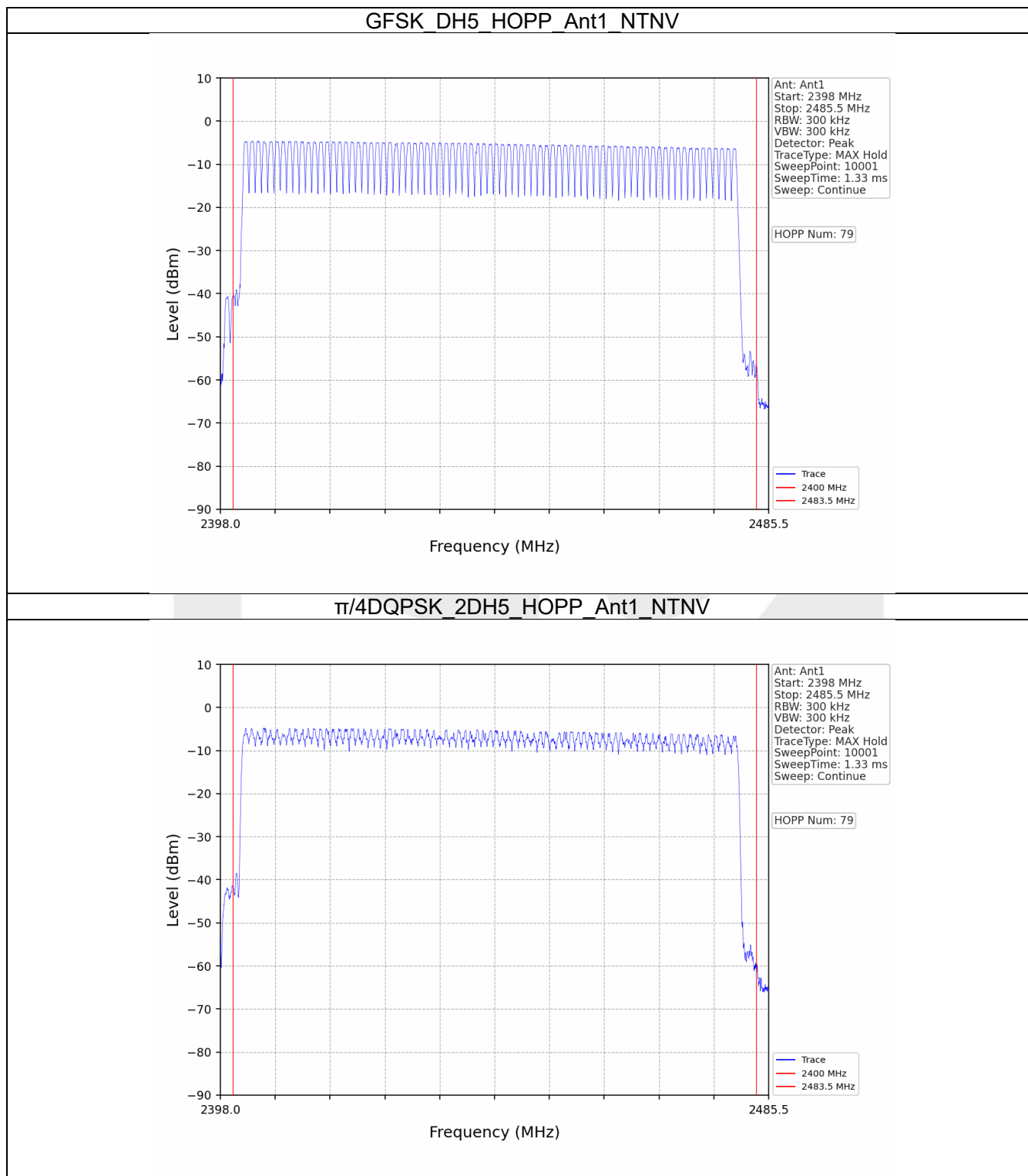
5. Number of Hopping Frequencies

5.1 HoppNum

5.1.1 Test Result

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

5.1.2 Test Graph



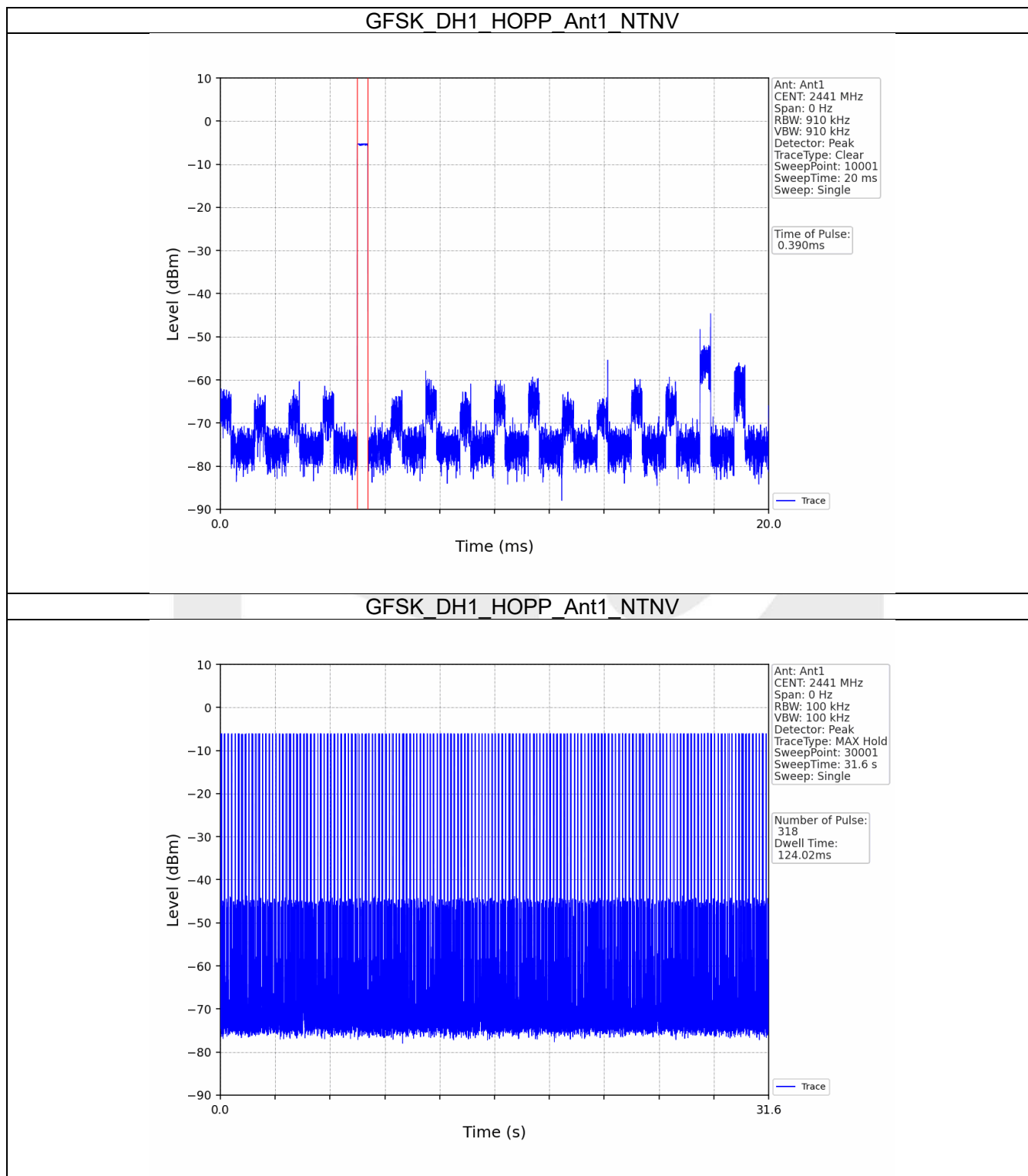
6. Time of Occupancy (Dwell Time)

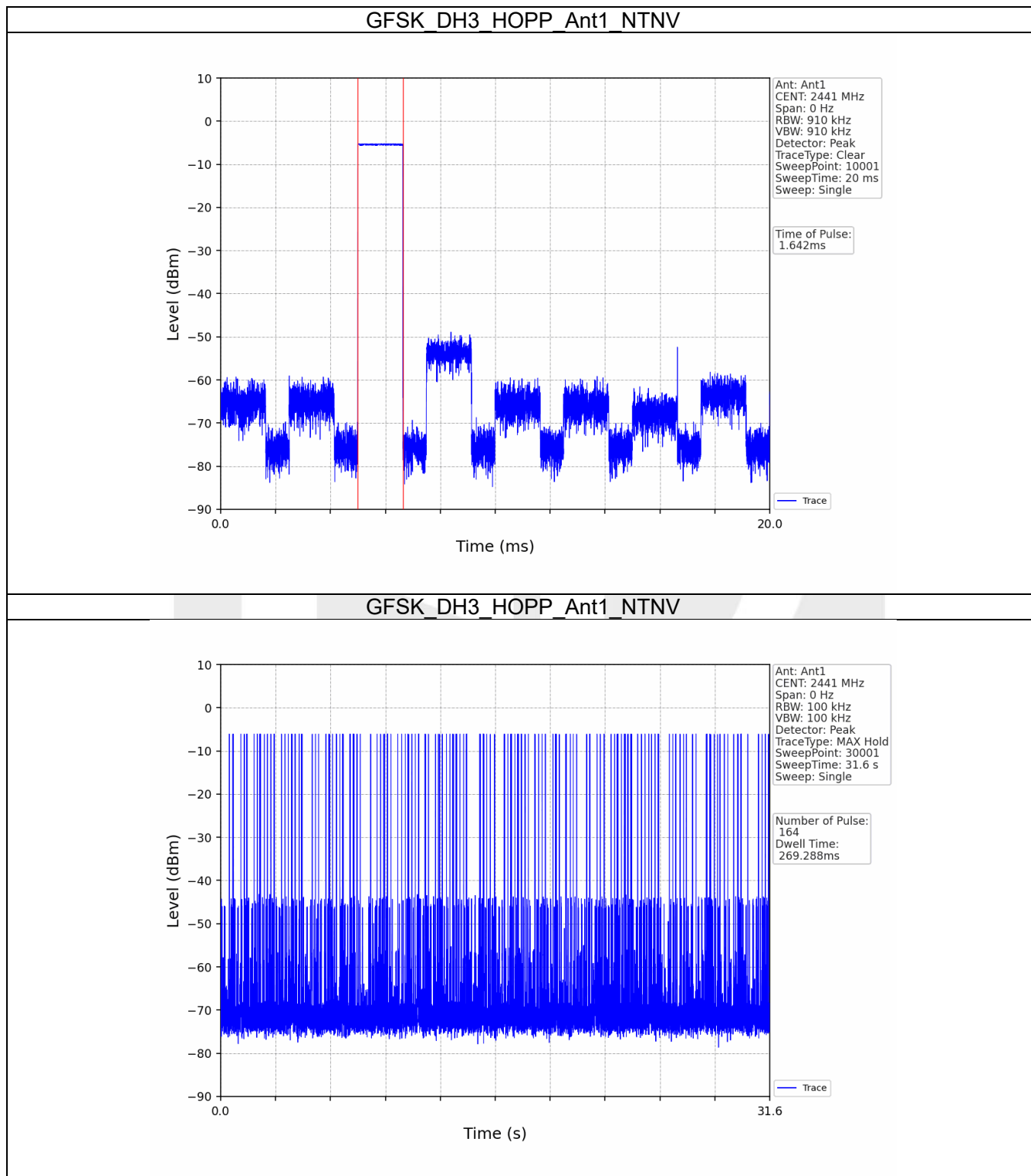
6.1 Ant1

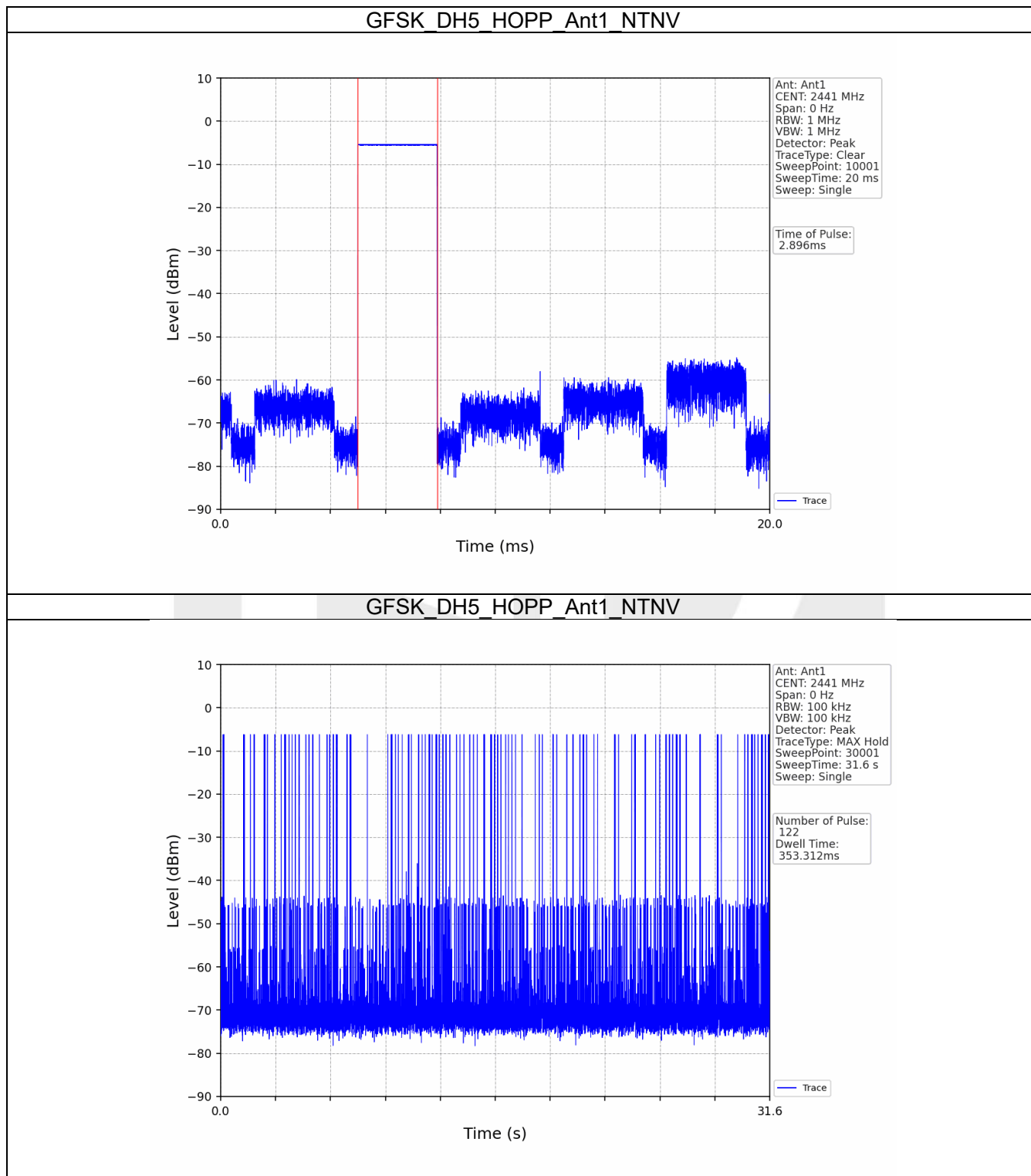
6.1.1 Test Result

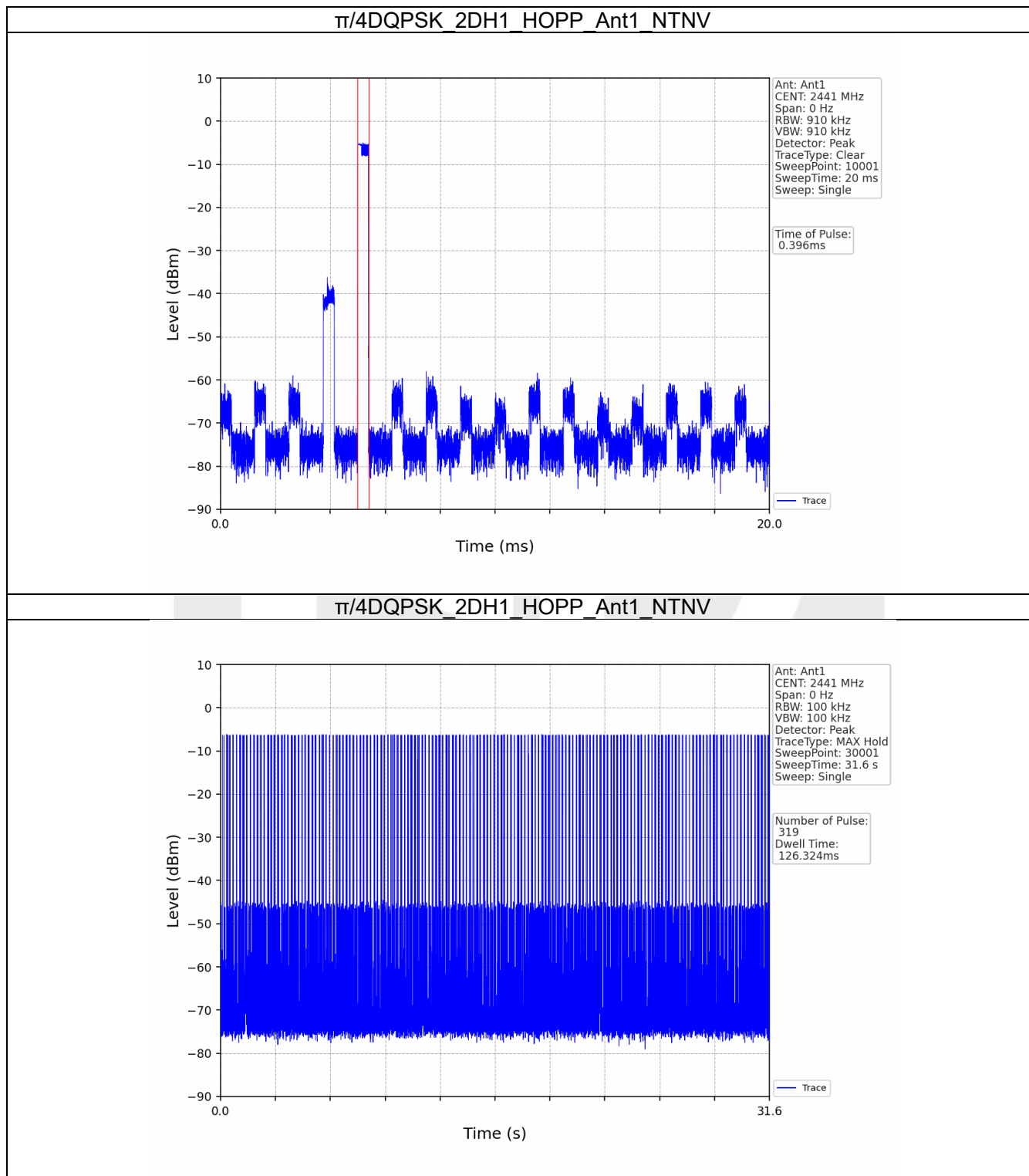
Ant1									
Mode	Tx Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.390	31.600	318	124.020	<=400	Pass
			DH3	1.642	31.600	164	269.288	<=400	Pass
			DH5	2.896	31.600	122	353.312	<=400	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH1	0.396	31.600	319	126.324	<=400	Pass
			2DH3	1.650	31.600	150	247.500	<=400	Pass
			2DH5	2.896	31.600	99	286.704	<=400	Pass

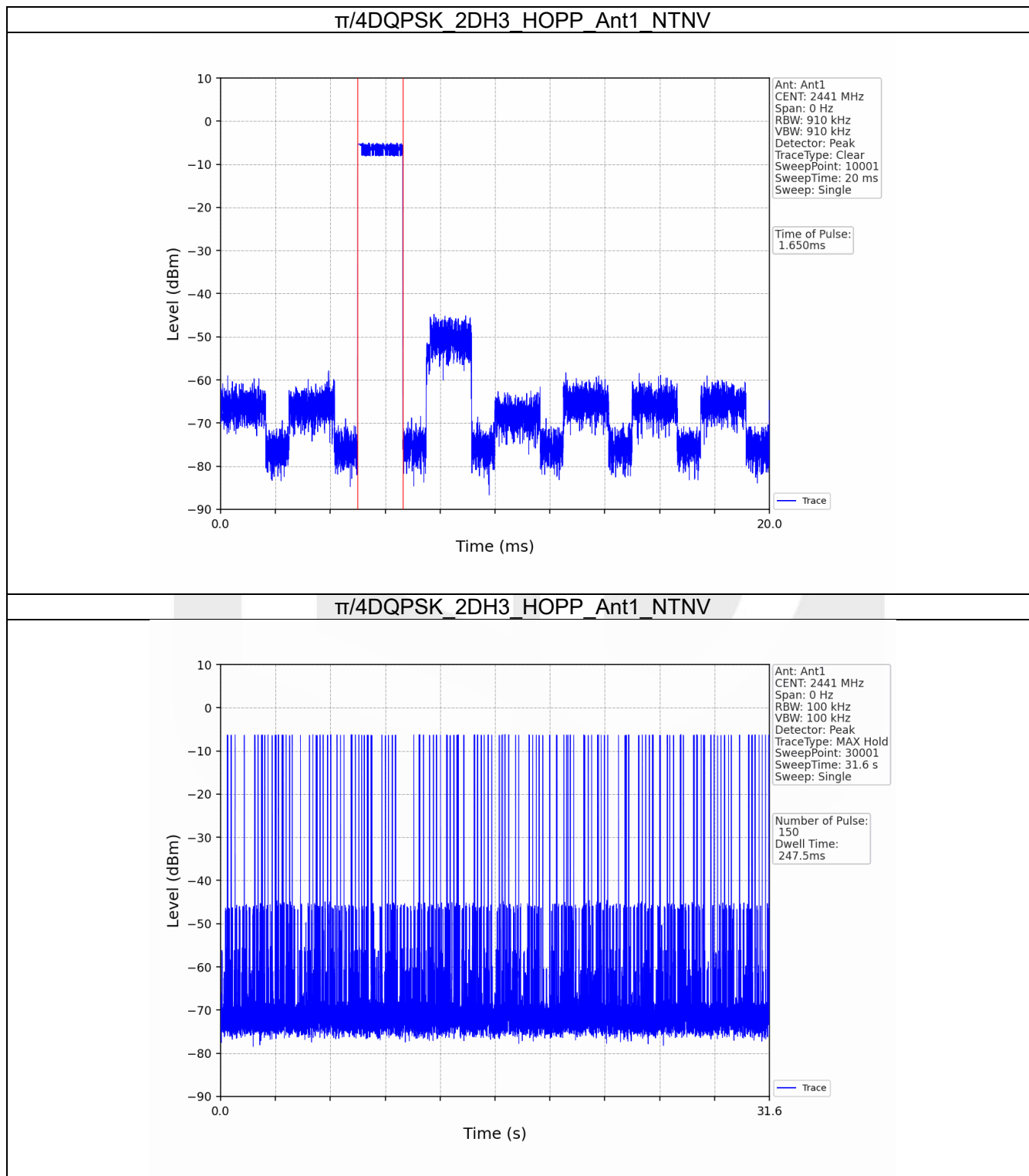
6.1.2 Test Graph

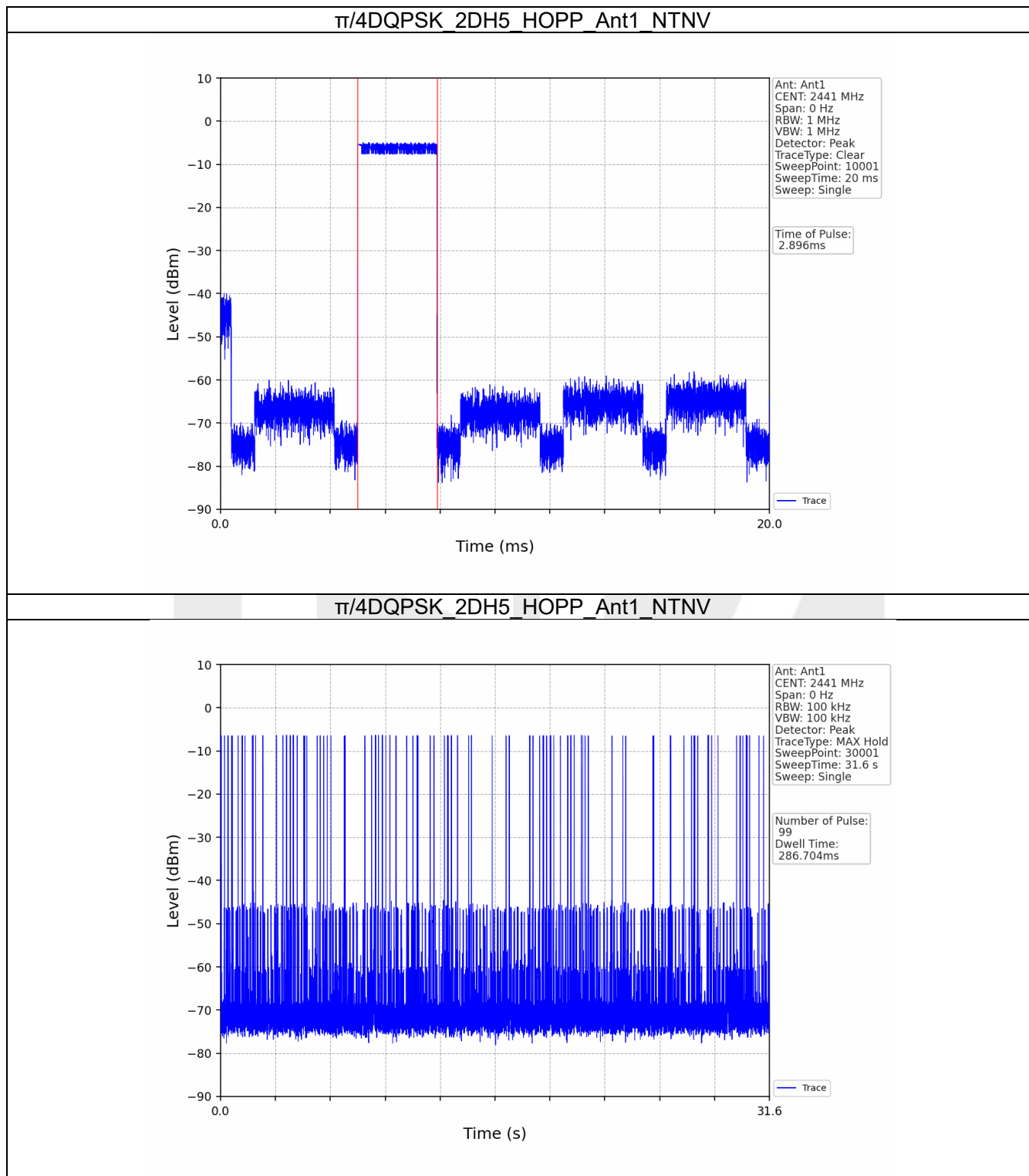












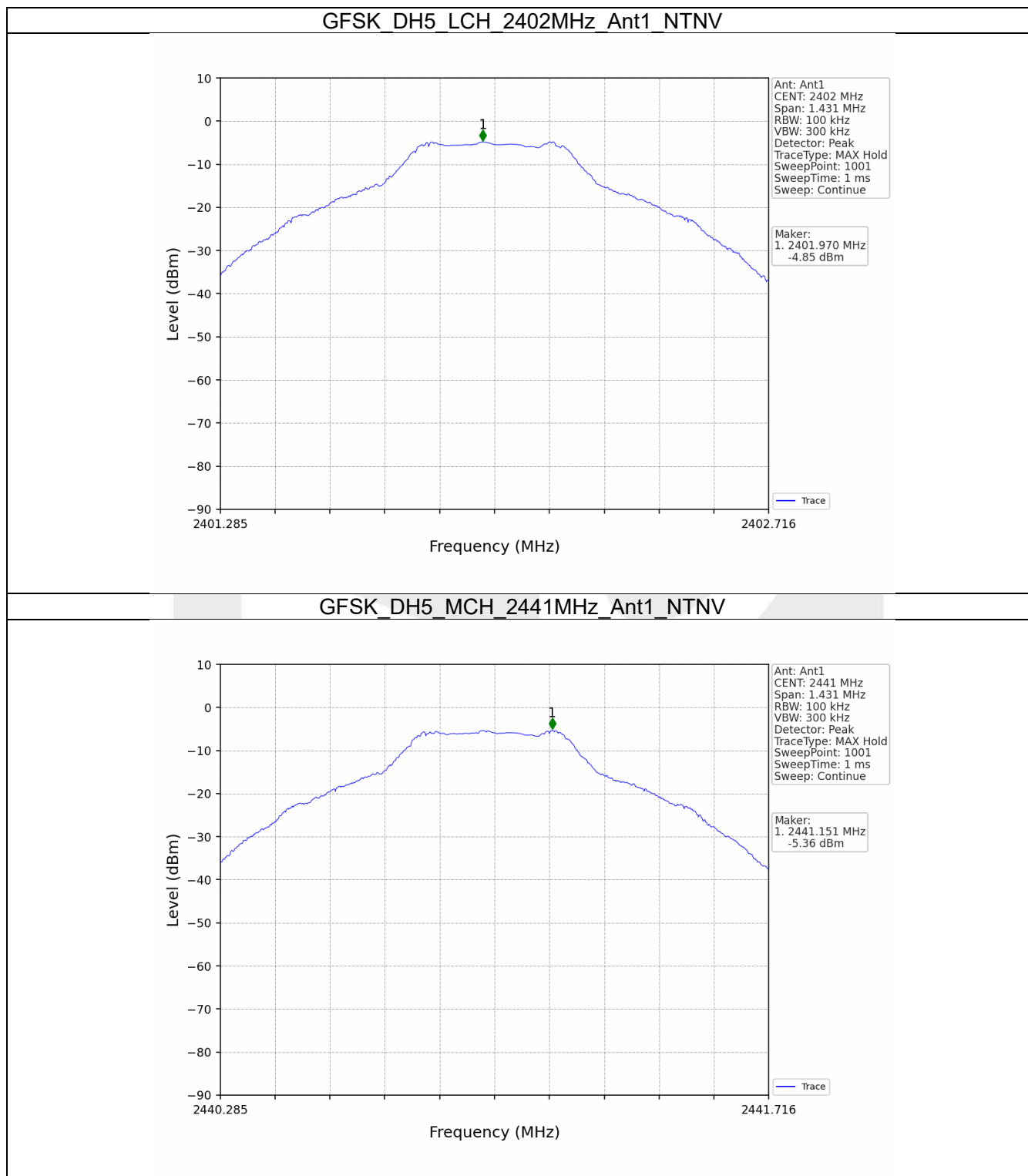
7. Unwanted Emissions In Non-restricted Frequency Bands

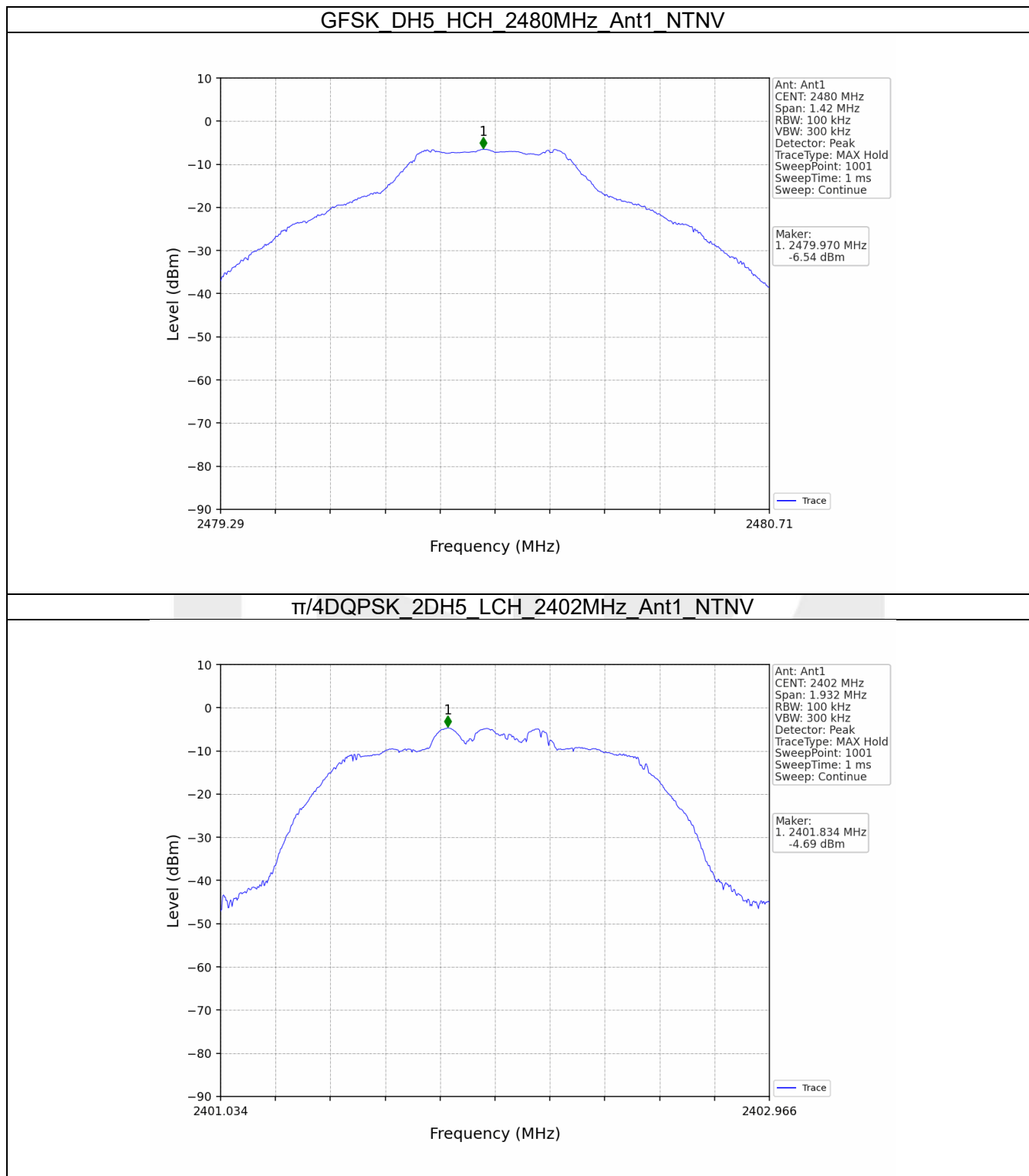
7.1 Ref

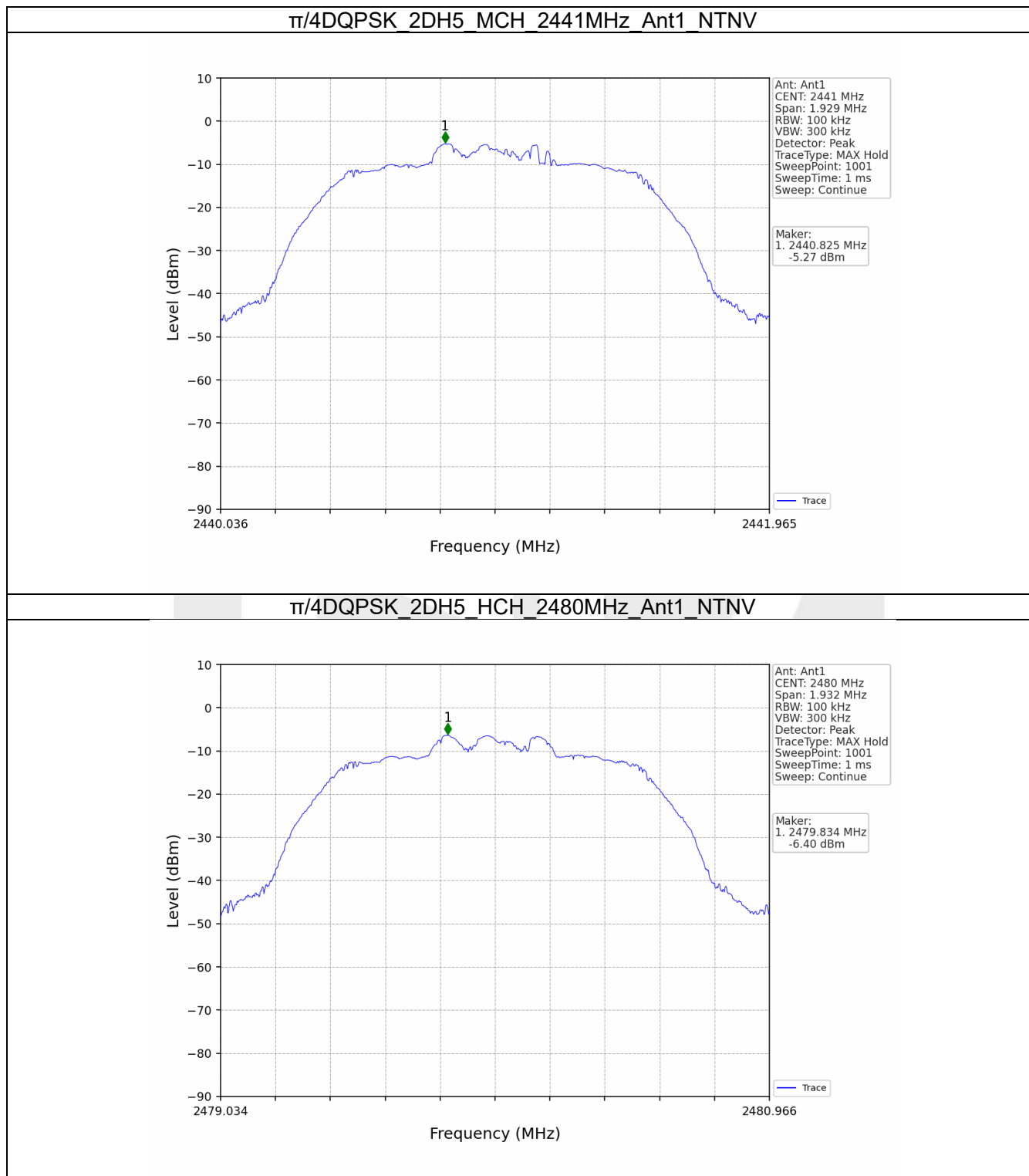
7.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	-4.85
		2441	DH5	1	-5.36
		2480	DH5	1	-6.54
$\pi/4$ DQPSK	SISO	2402	2DH5	1	-4.69
		2441	2DH5	1	-5.27
		2480	2DH5	1	-6.40
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 Test Graph







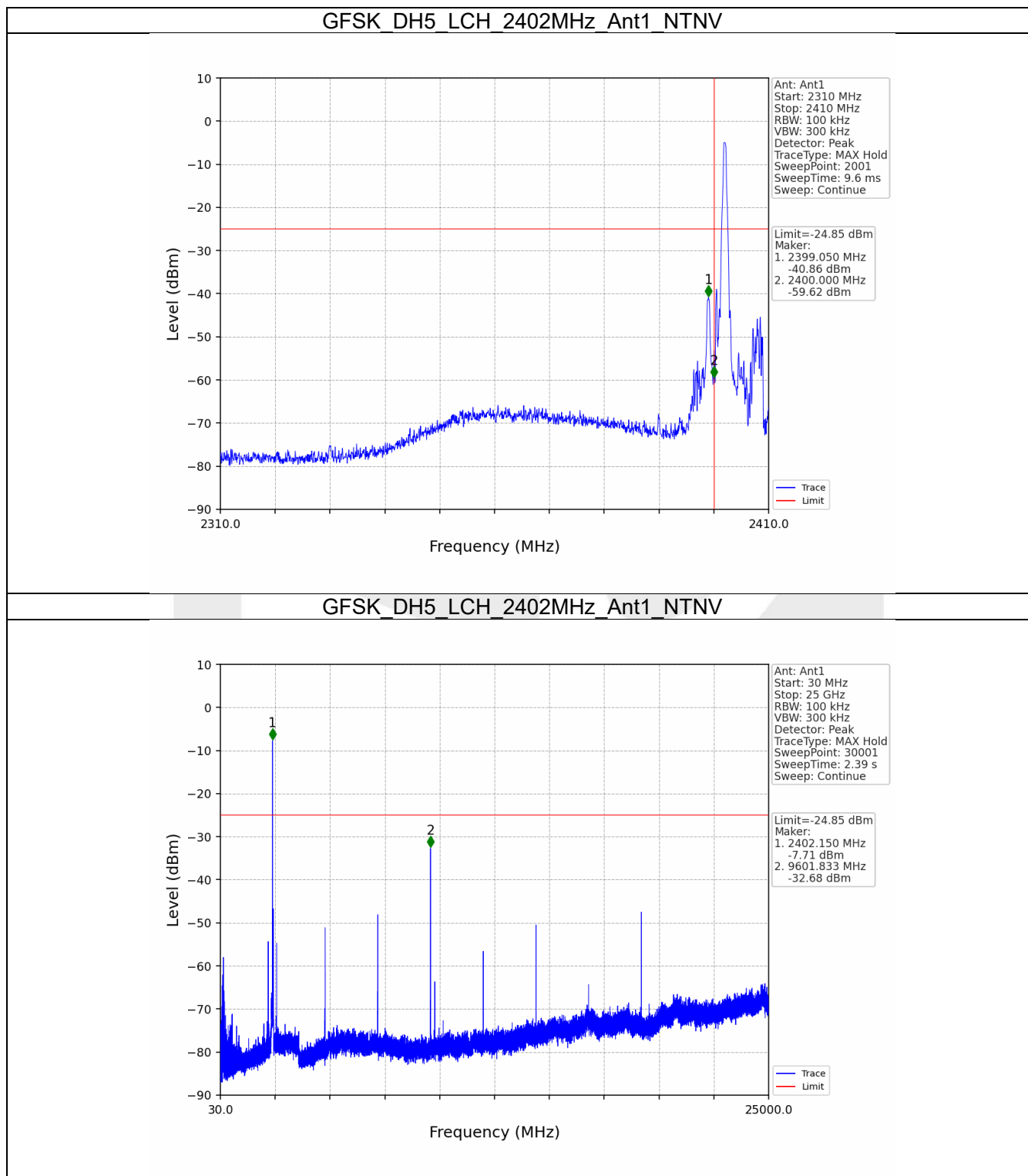
7.2 CSE

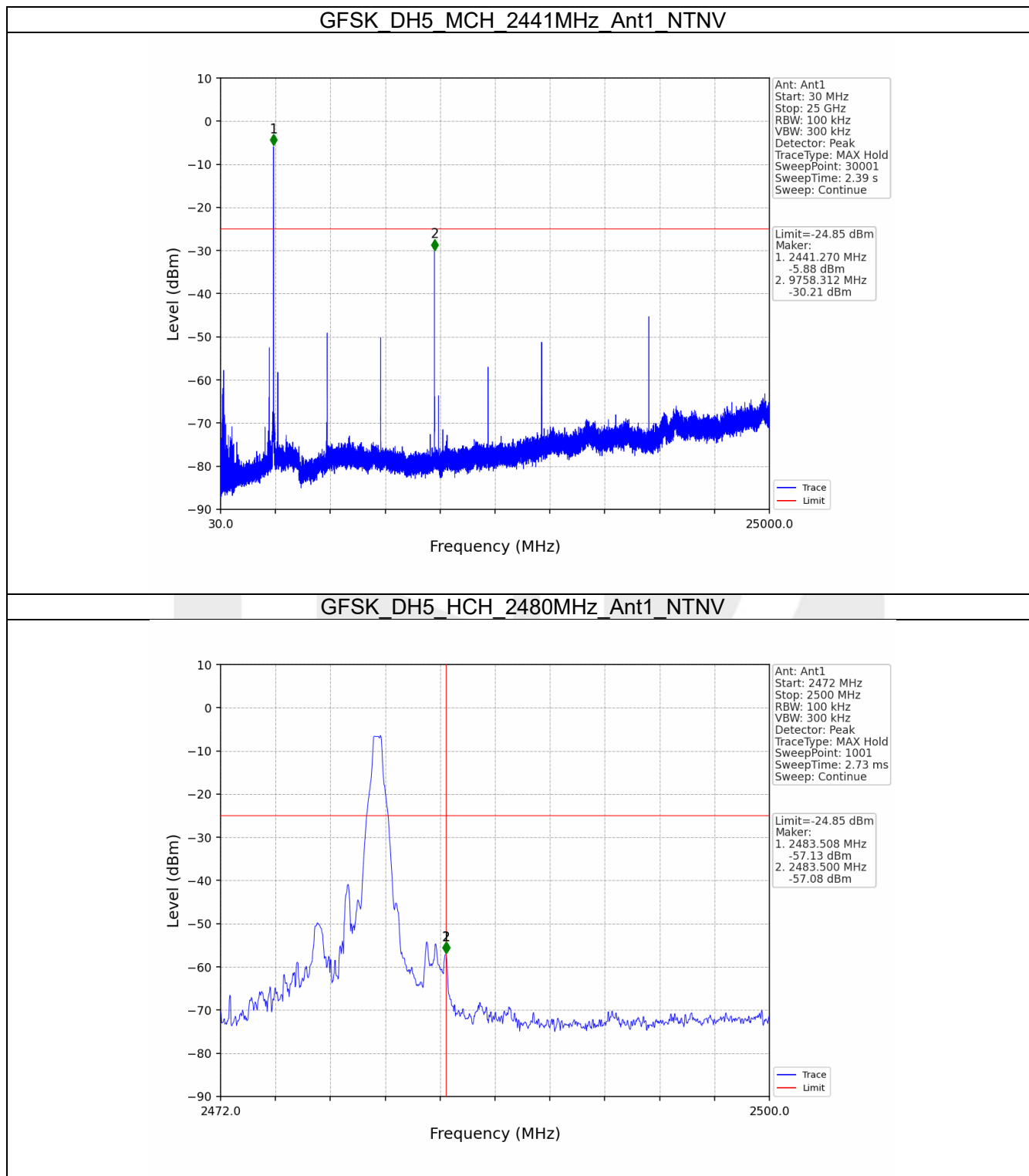
7.2.1 Test Result

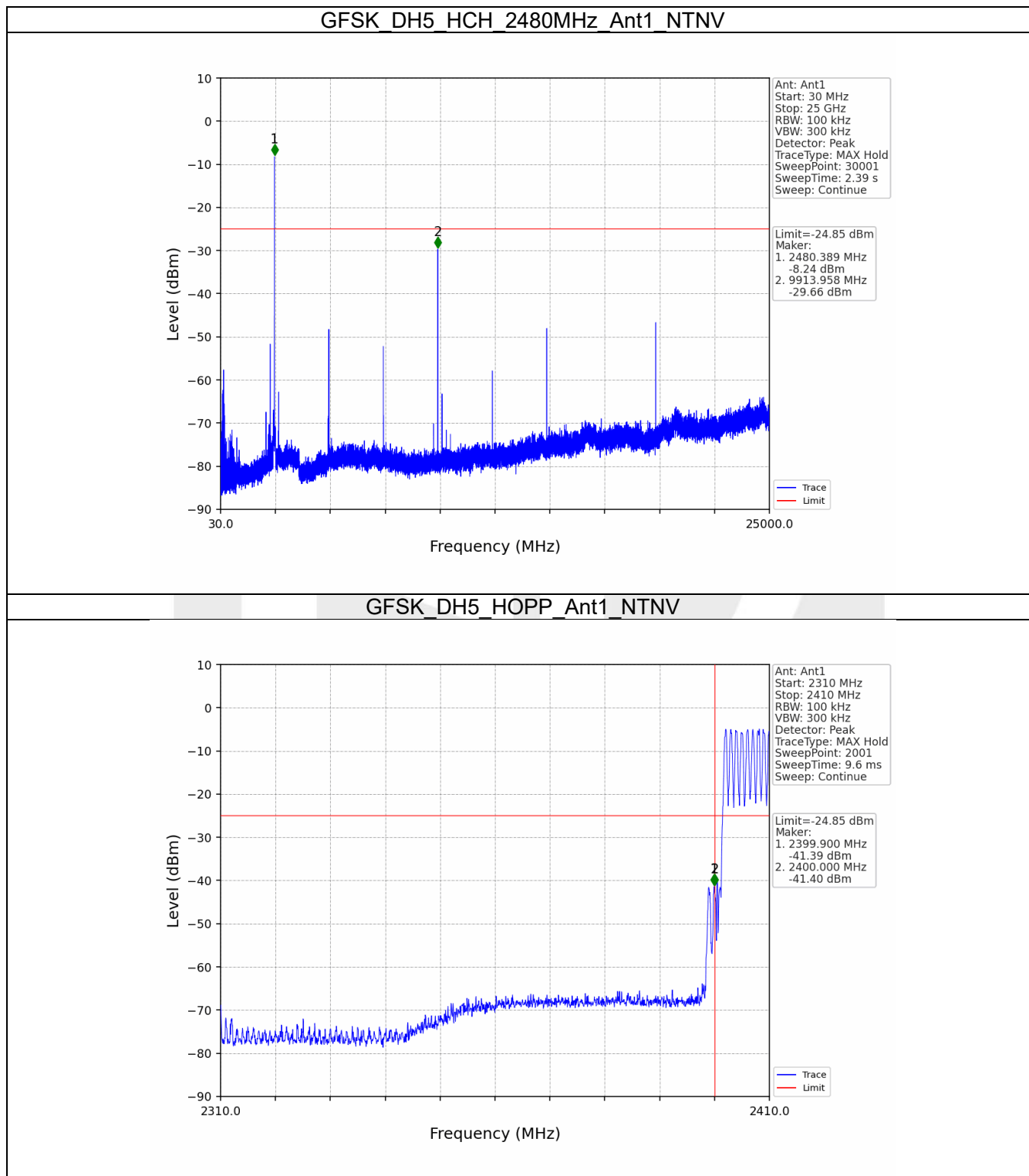
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-4.85	-24.85	Pass
		2441	DH5	1	-4.85	-24.85	Pass
		2480	DH5	1	-4.85	-24.85	Pass
		HOPP	DH5	1	-4.85	-24.85	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	-4.69	-24.69	Pass
		2441	2DH5	1	-4.69	-24.69	Pass
		2480	2DH5	1	-4.69	-24.69	Pass
		HOPP	2DH5	1	-4.69	-24.69	Pass

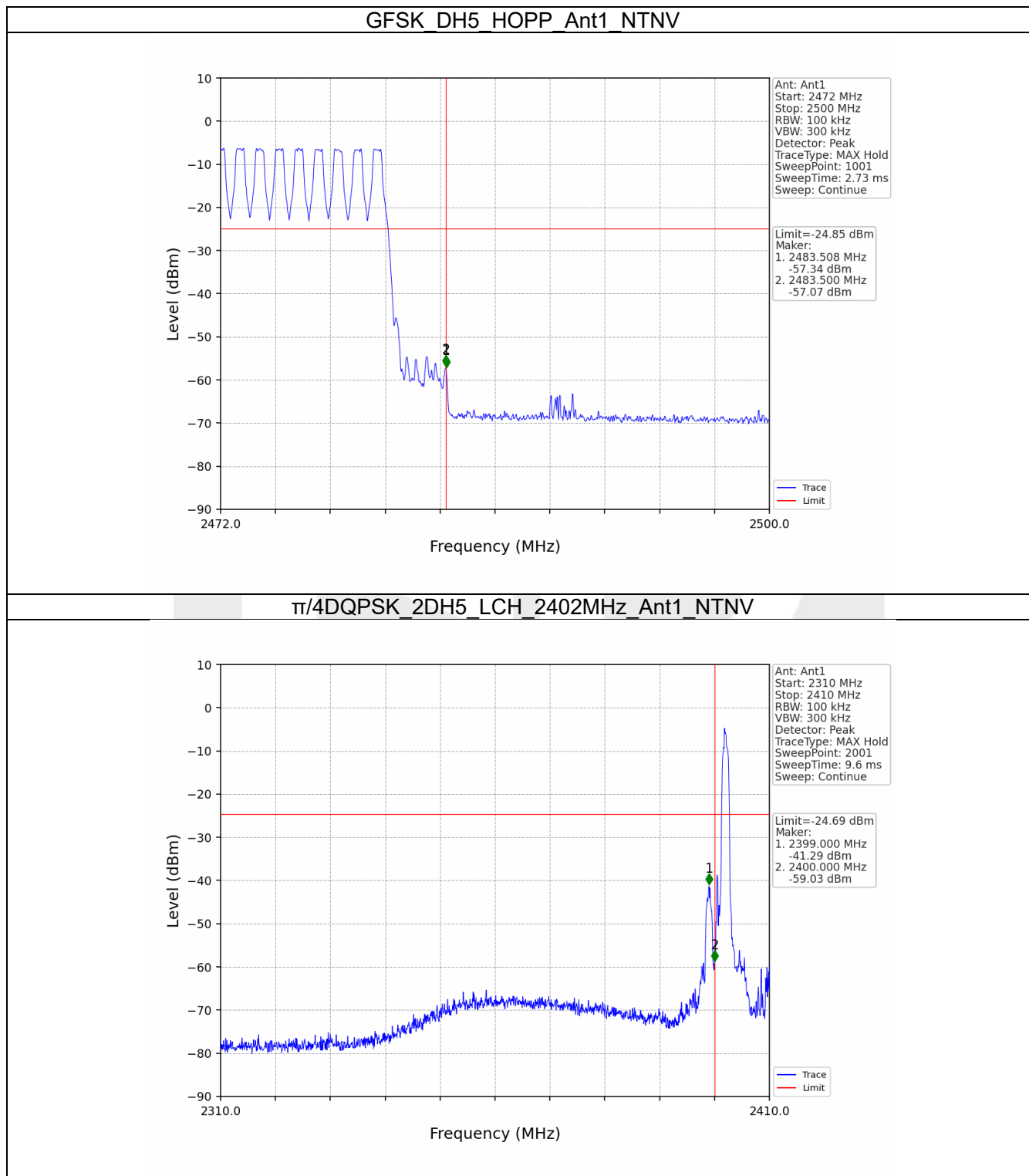
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

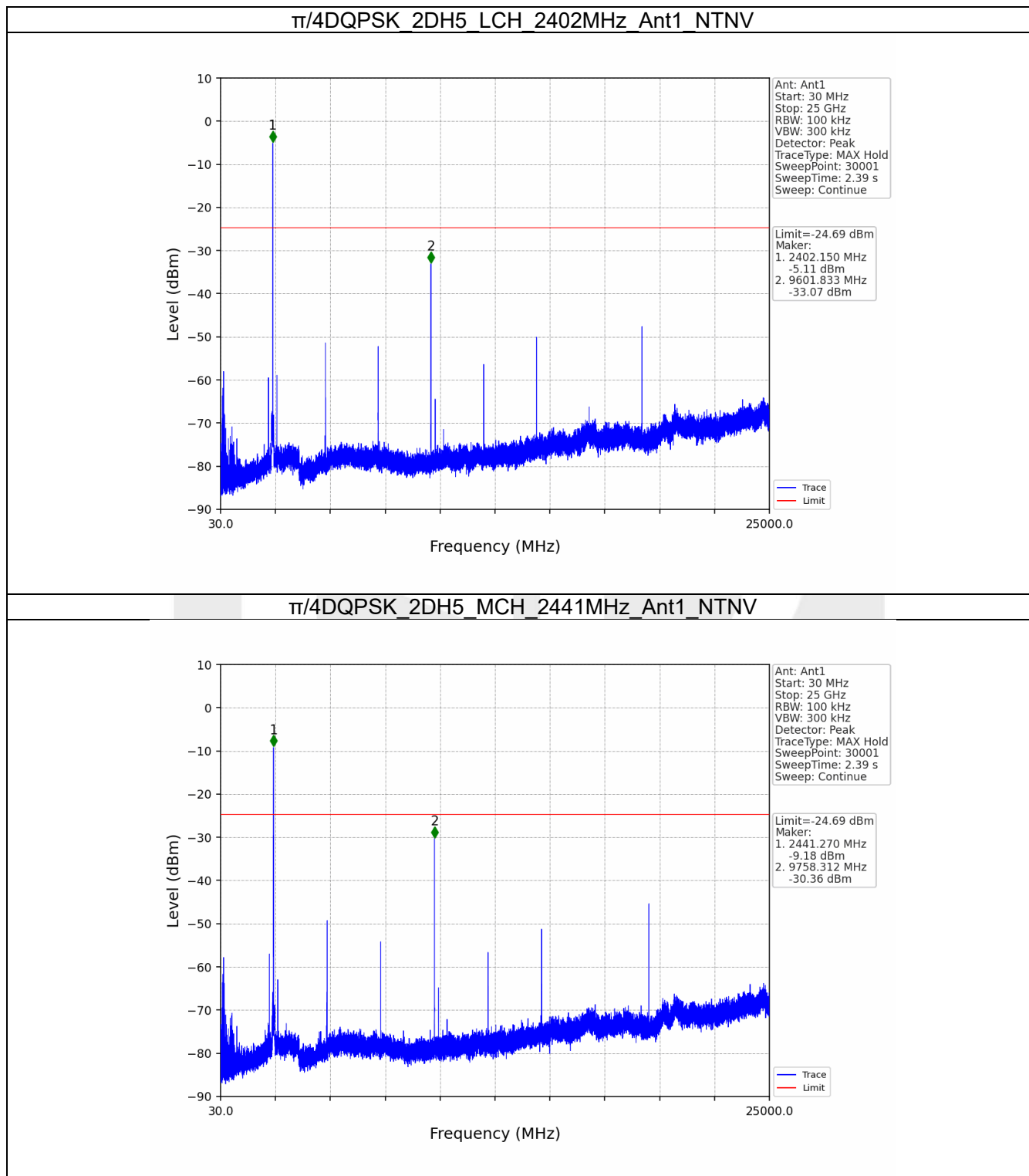
7.2.2 Test Graph

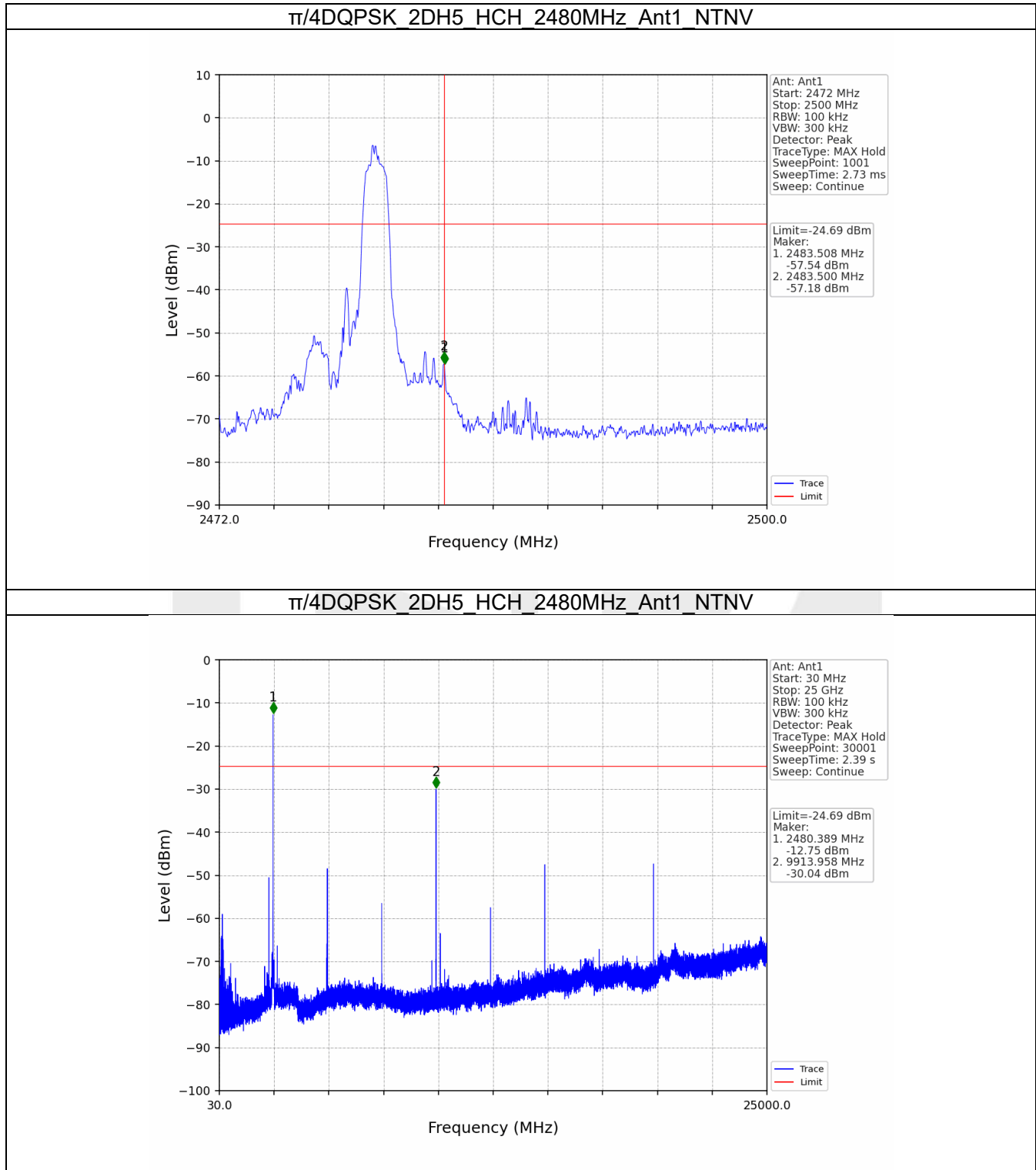


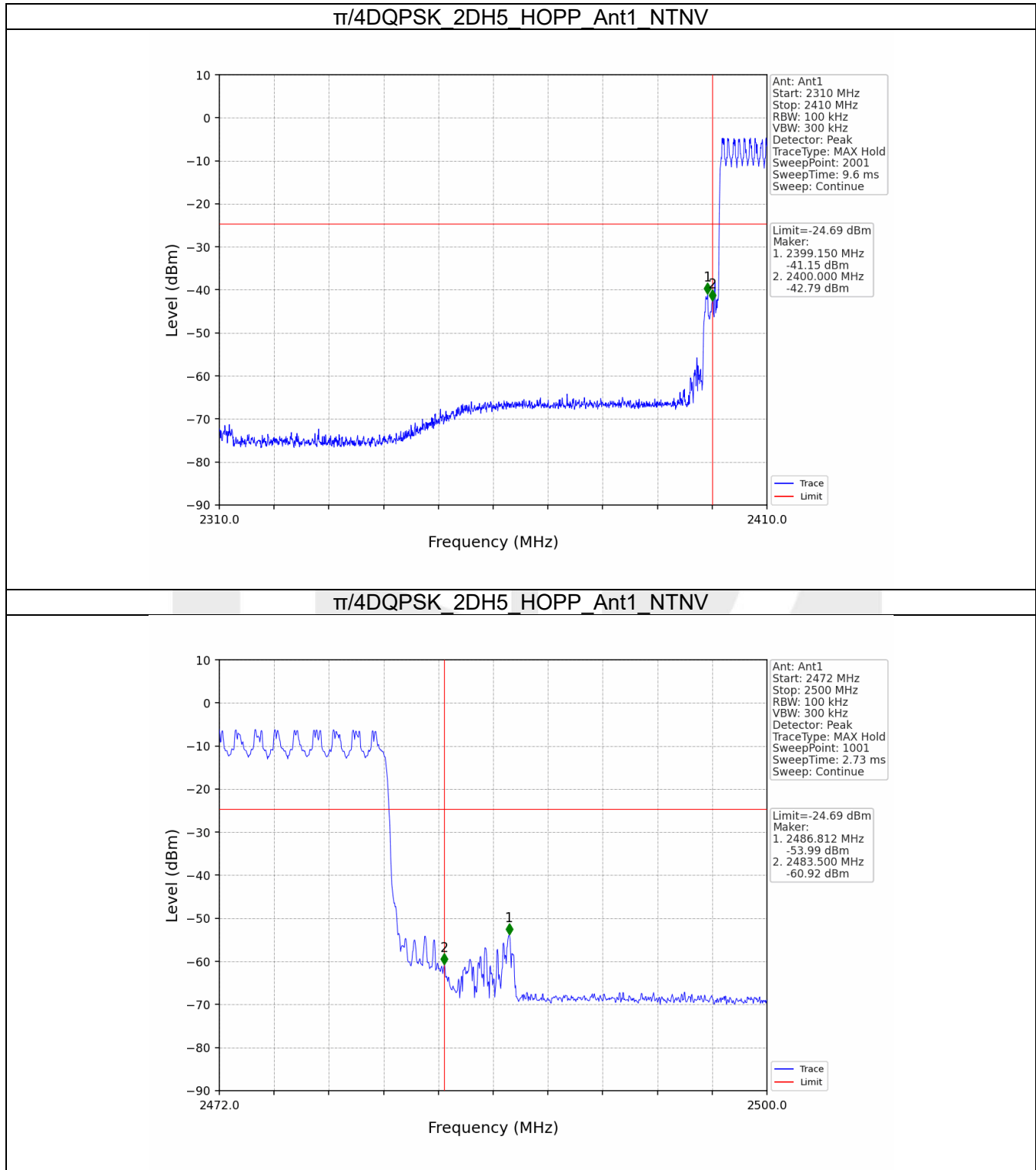












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