

ANNEX D

Test Report

For

Project No.:	8134EU012901W
Client:	Hong Kong Etech Groups Ltd.
Product Name:	TWS Earbuds
Model No.:	EBT4-21766
FCC ID:	2A3ZO-21766
Test Engineer:	<i>Mikoy zhu</i>
Test Date:	2023-11-30

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



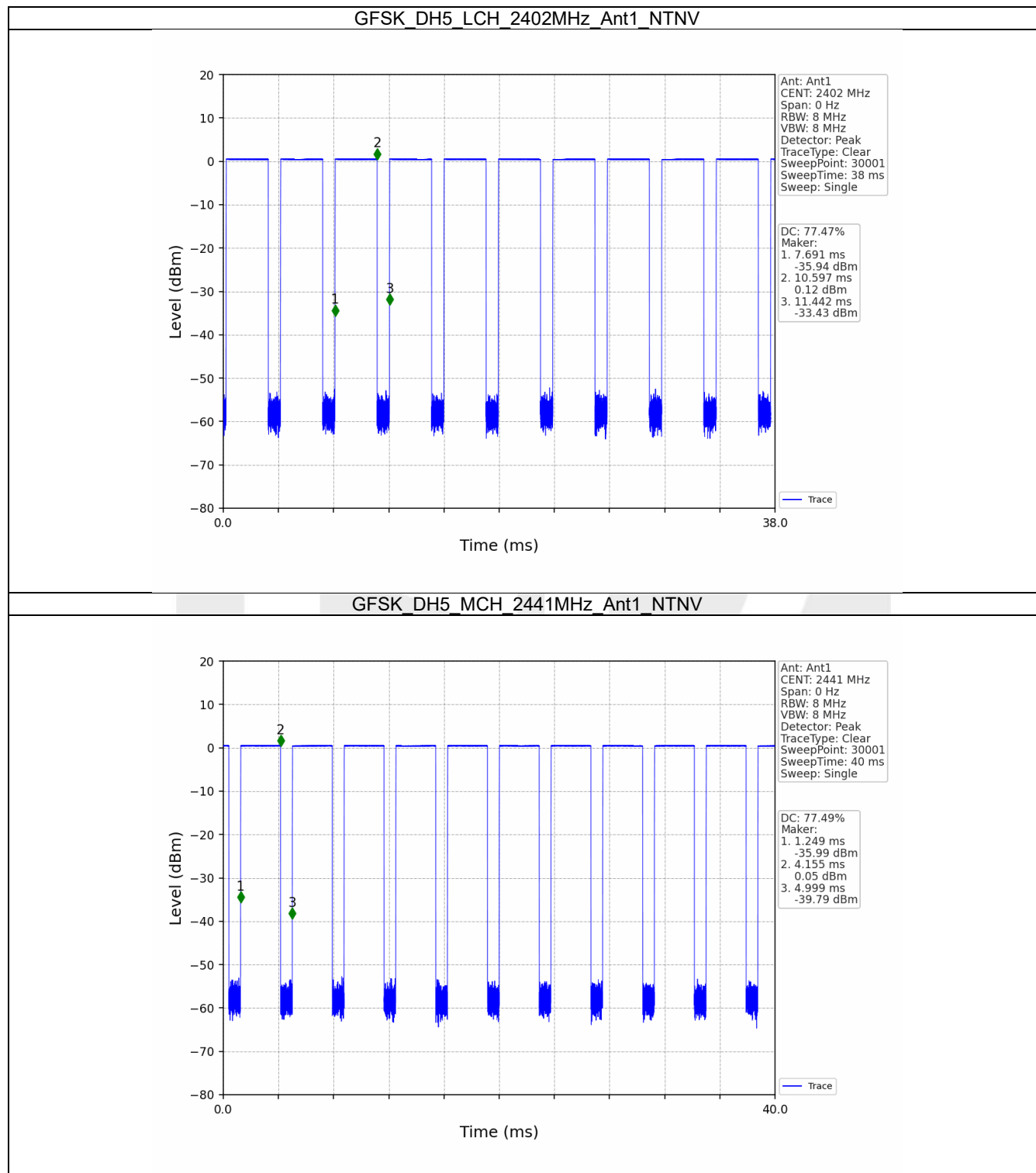
1. Duty Cycle

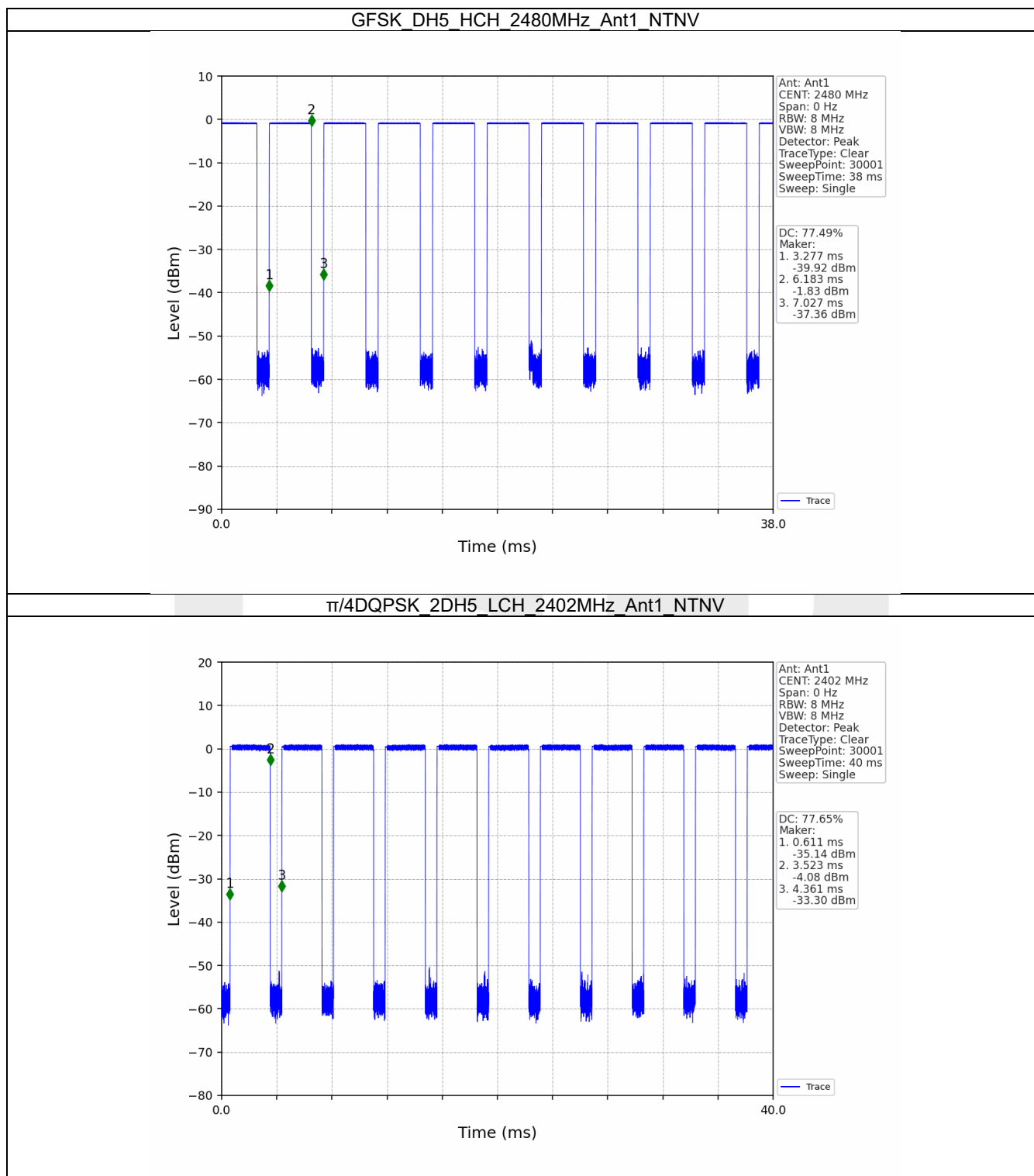
1.1 Ant1

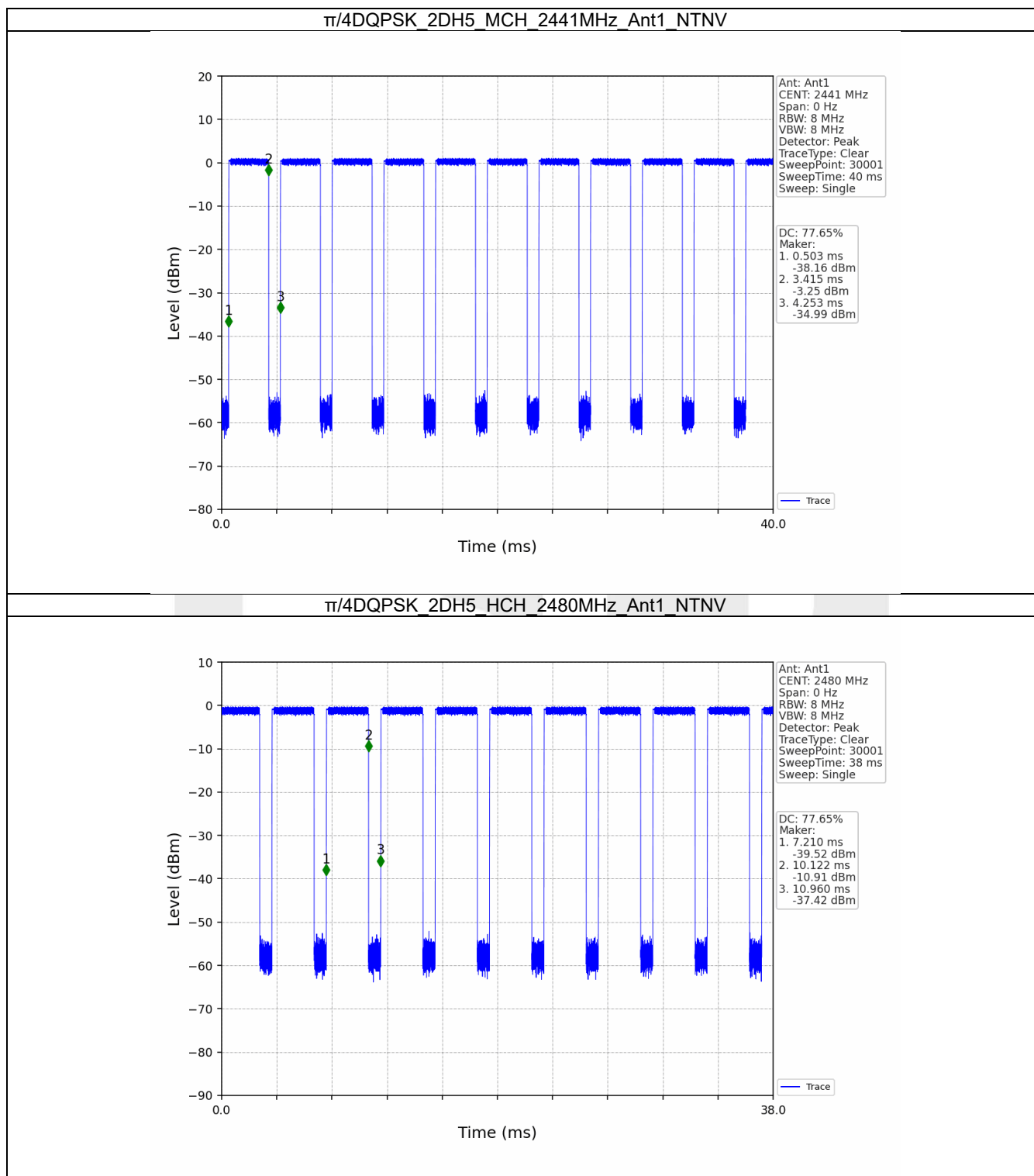
1.1.1 Test Result

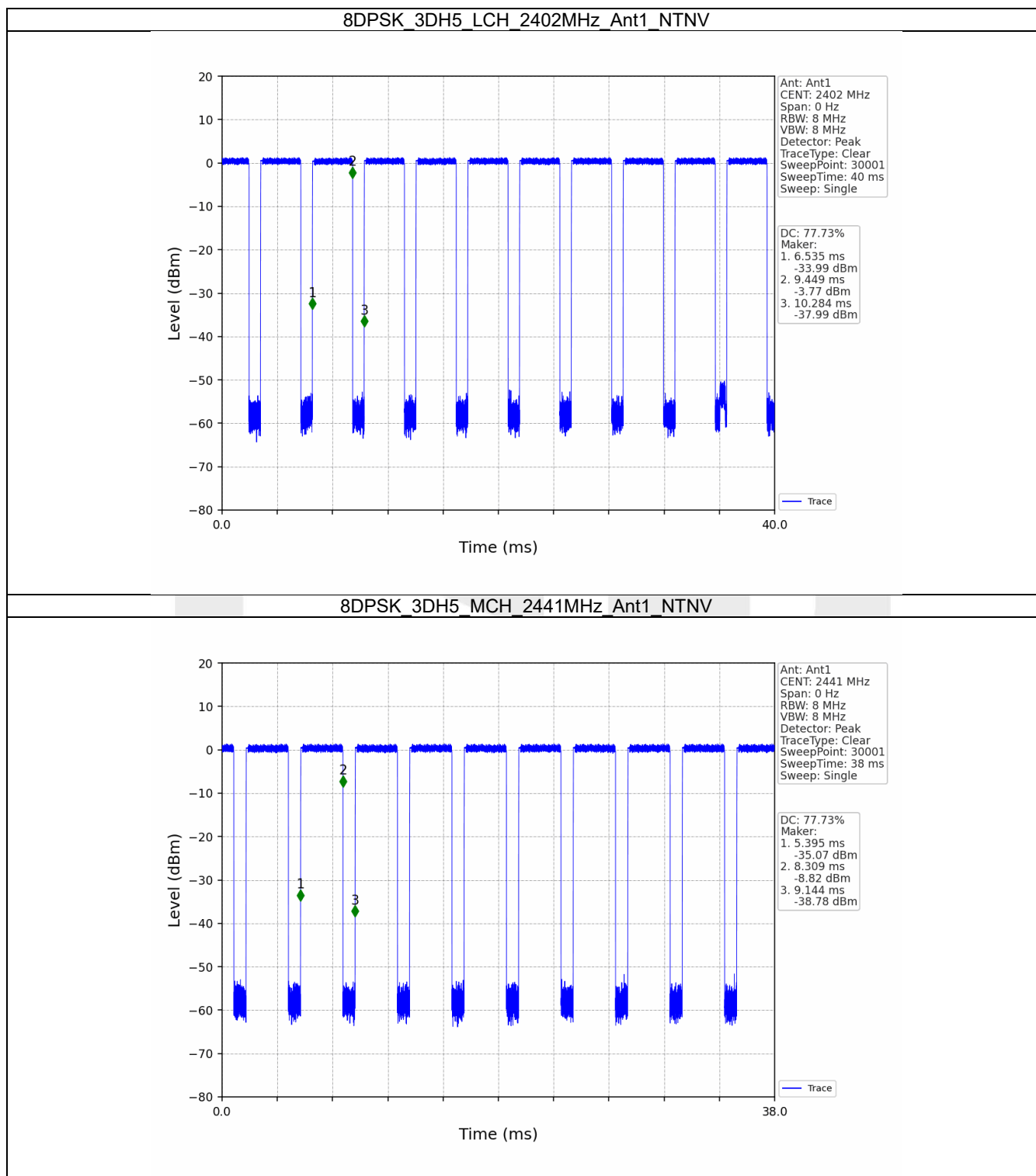
Ant1								
Mode	TX Type	Frequency (MHz)	Packet Type	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
GFSK	SISO	2402	DH5	2.906	3.751	77.47	1.11	0.03
		2441	DH5	2.906	3.750	77.49	1.11	0.01
		2480	DH5	2.906	3.750	77.49	1.11	0.03
$\pi/4$ DQPSK	SISO	2402	2DH5	2.912	3.750	77.65	1.10	0.03
		2441	2DH5	2.912	3.750	77.65	1.10	0.03
		2480	2DH5	2.912	3.750	77.65	1.10	0.03
8DPSK	SISO	2402	3DH5	2.914	3.749	77.73	1.09	0.01
		2441	3DH5	2.914	3.749	77.73	1.09	0.01
		2480	3DH5	2.915	3.750	77.73	1.09	0.01

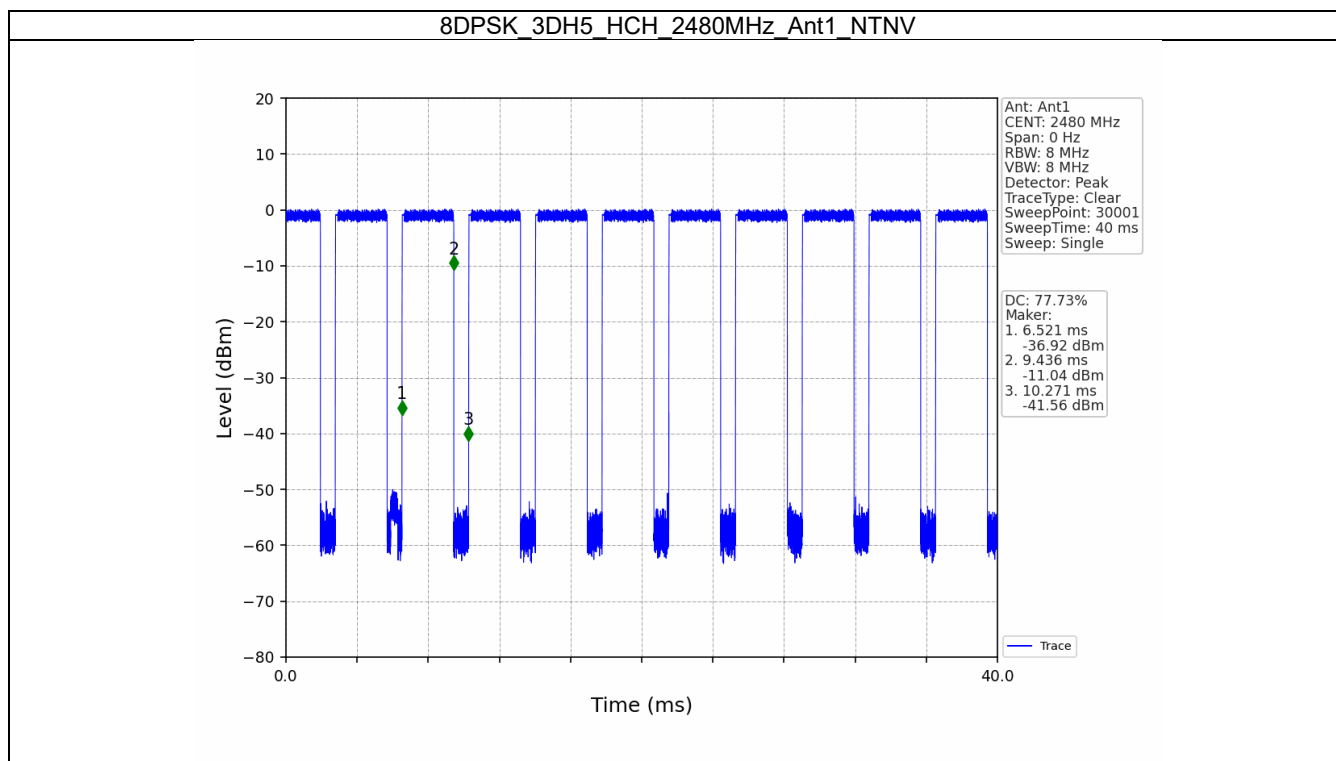
1.1.2 Test Graph











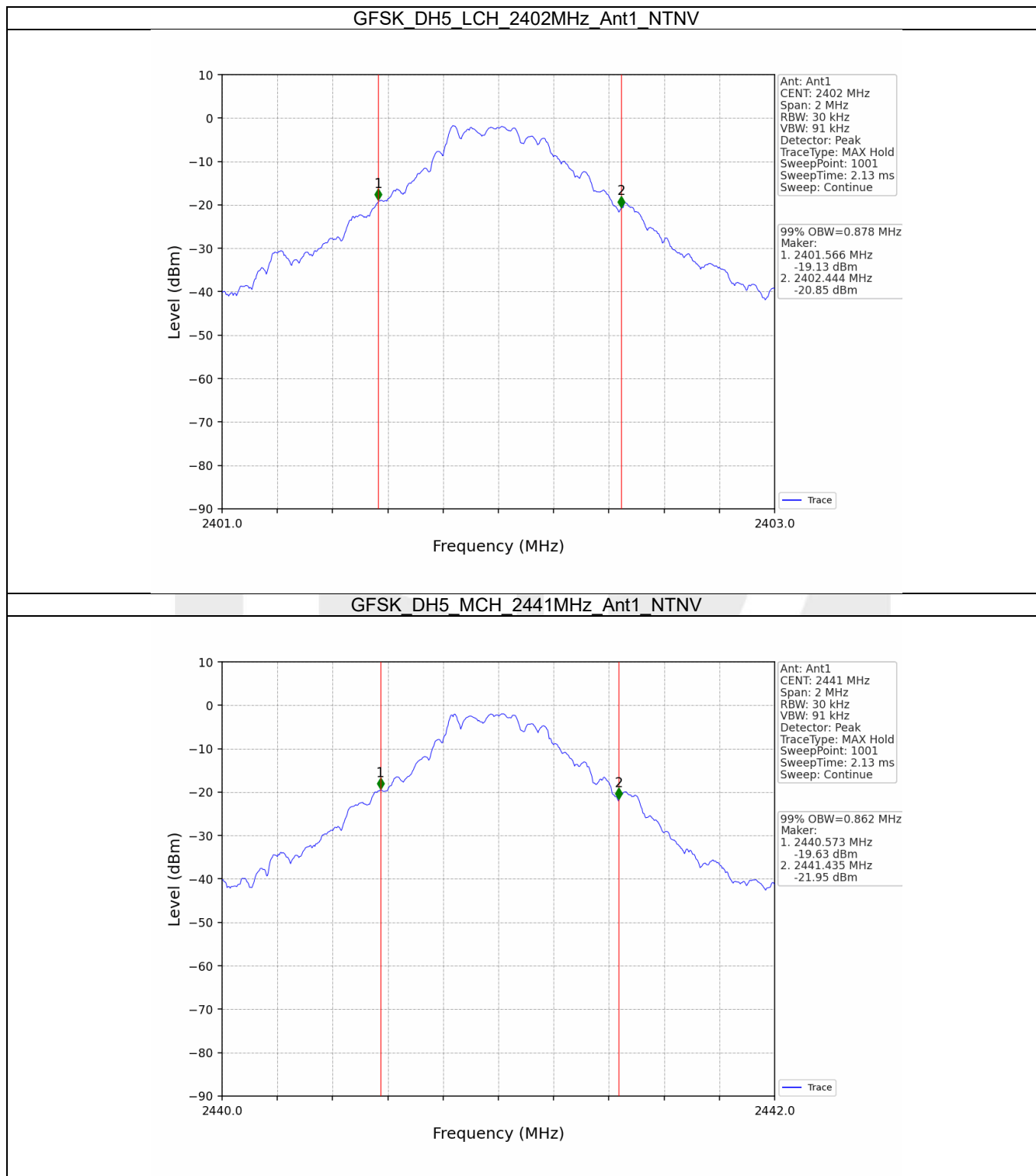
2. Bandwidth

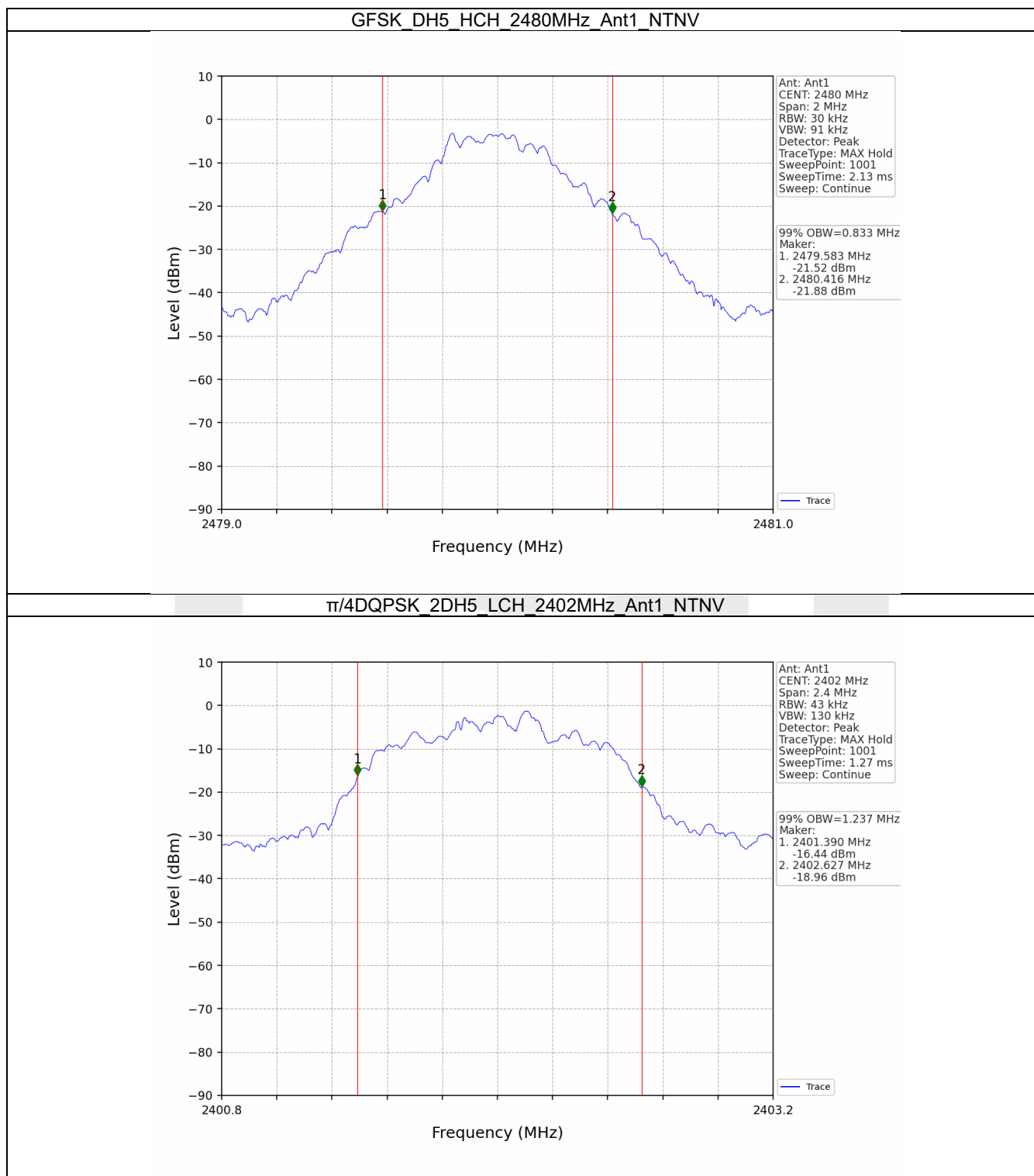
2.1 OBW

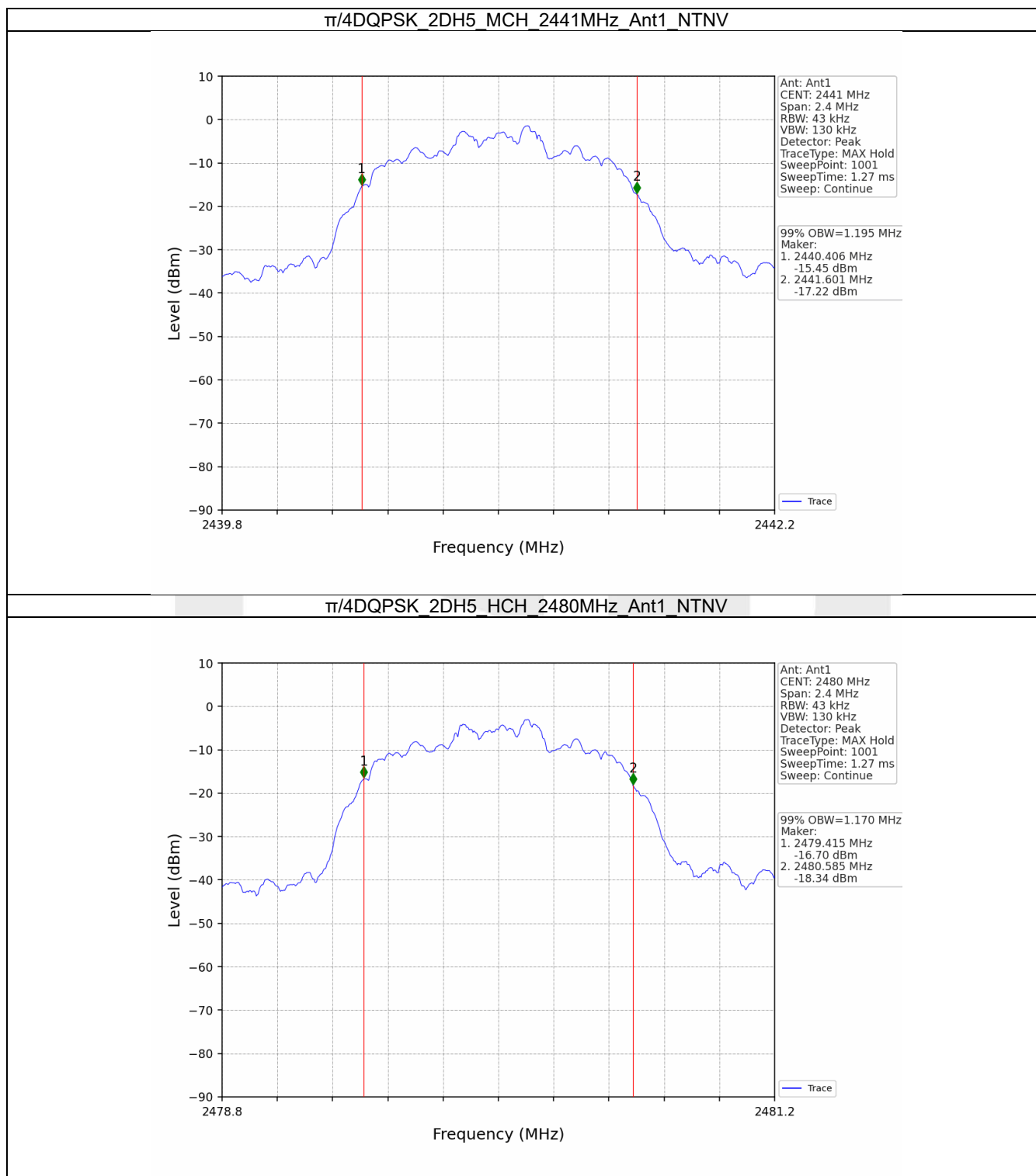
2.1.1 Test Result

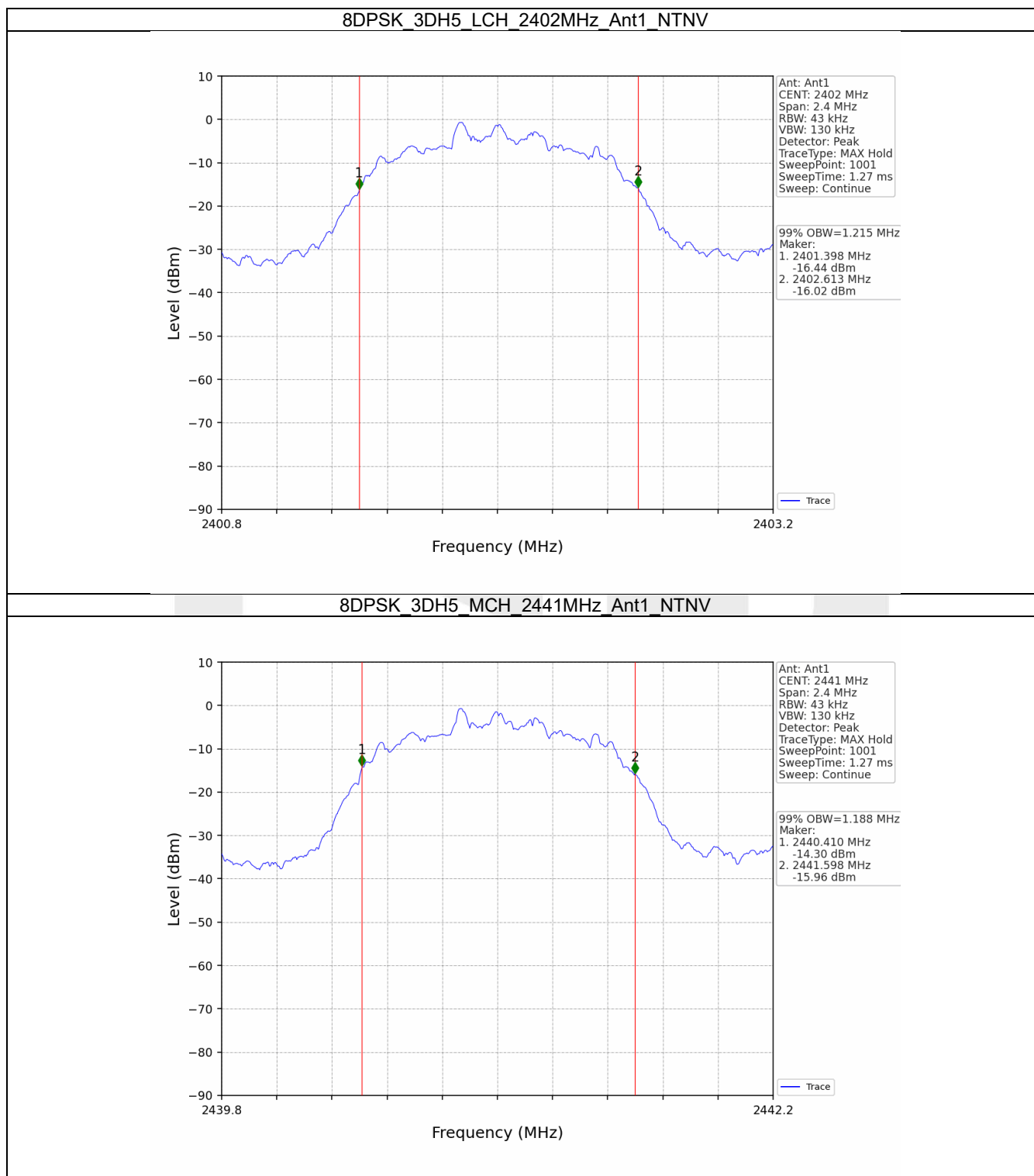
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.878	Pass
		2441	DH5	1	0.862	Pass
		2480	DH5	1	0.833	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	1.237	Pass
		2441	2DH5	1	1.195	Pass
		2480	2DH5	1	1.170	Pass
8DPSK	SISO	2402	3DH5	1	1.215	Pass
		2441	3DH5	1	1.188	Pass
		2480	3DH5	1	1.170	Pass

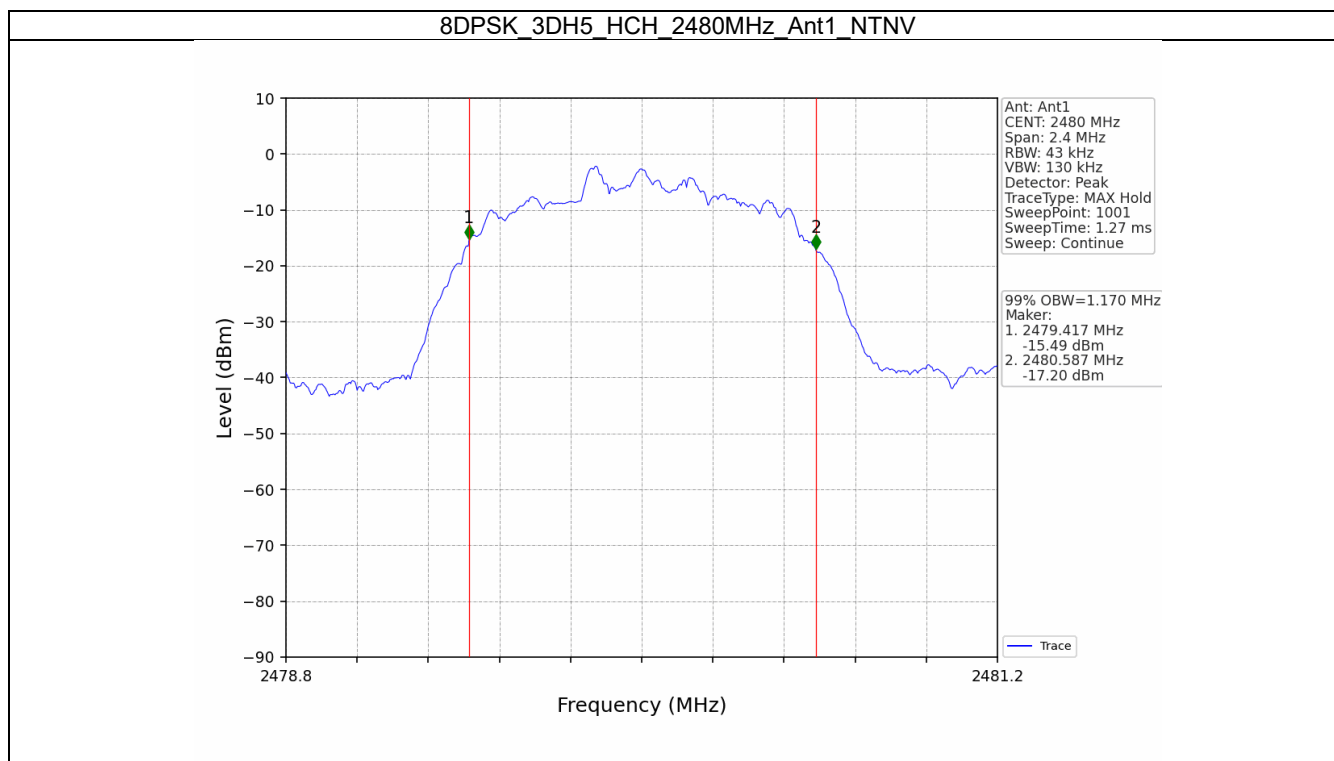
2.1.2 Test Graph









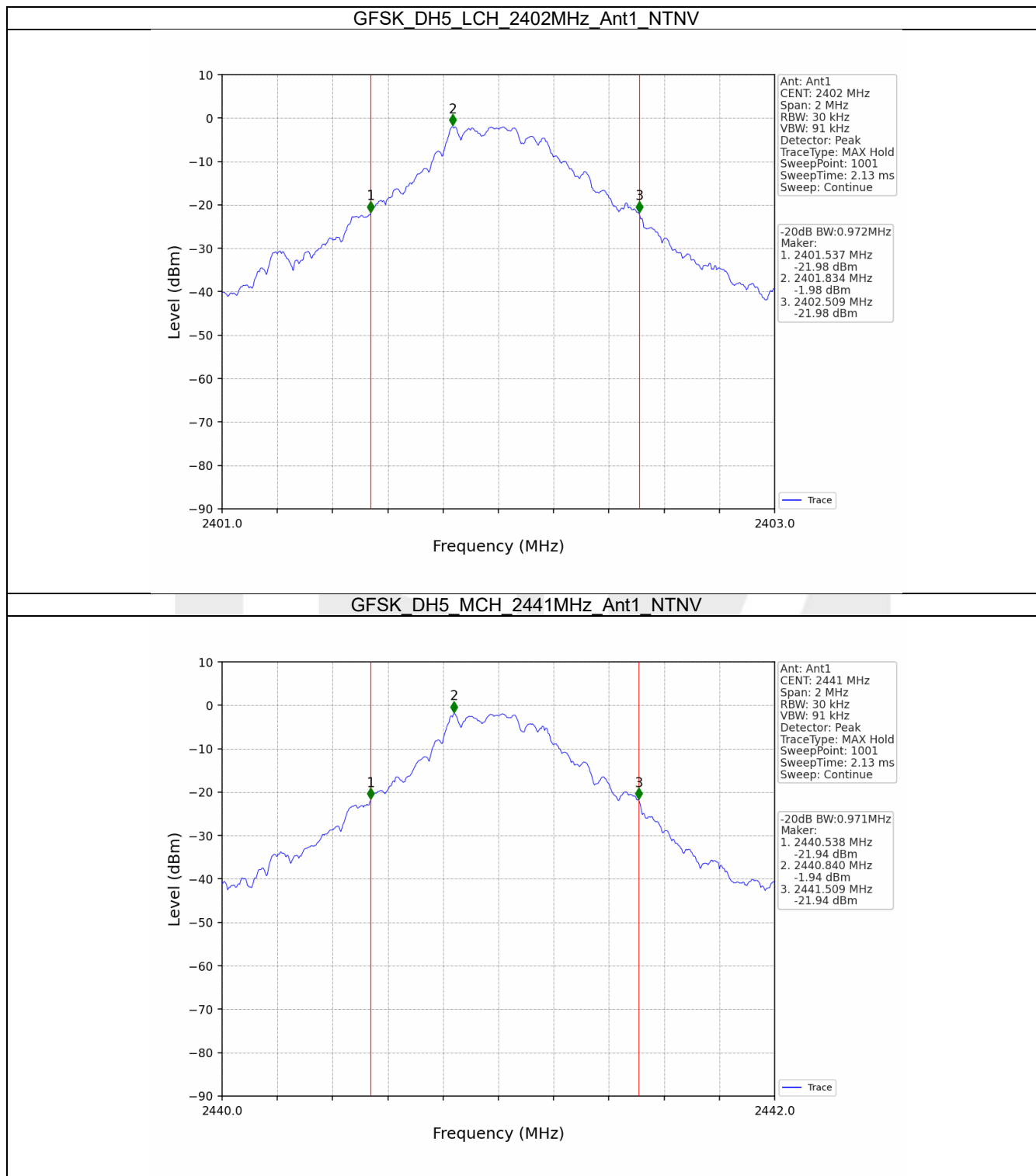


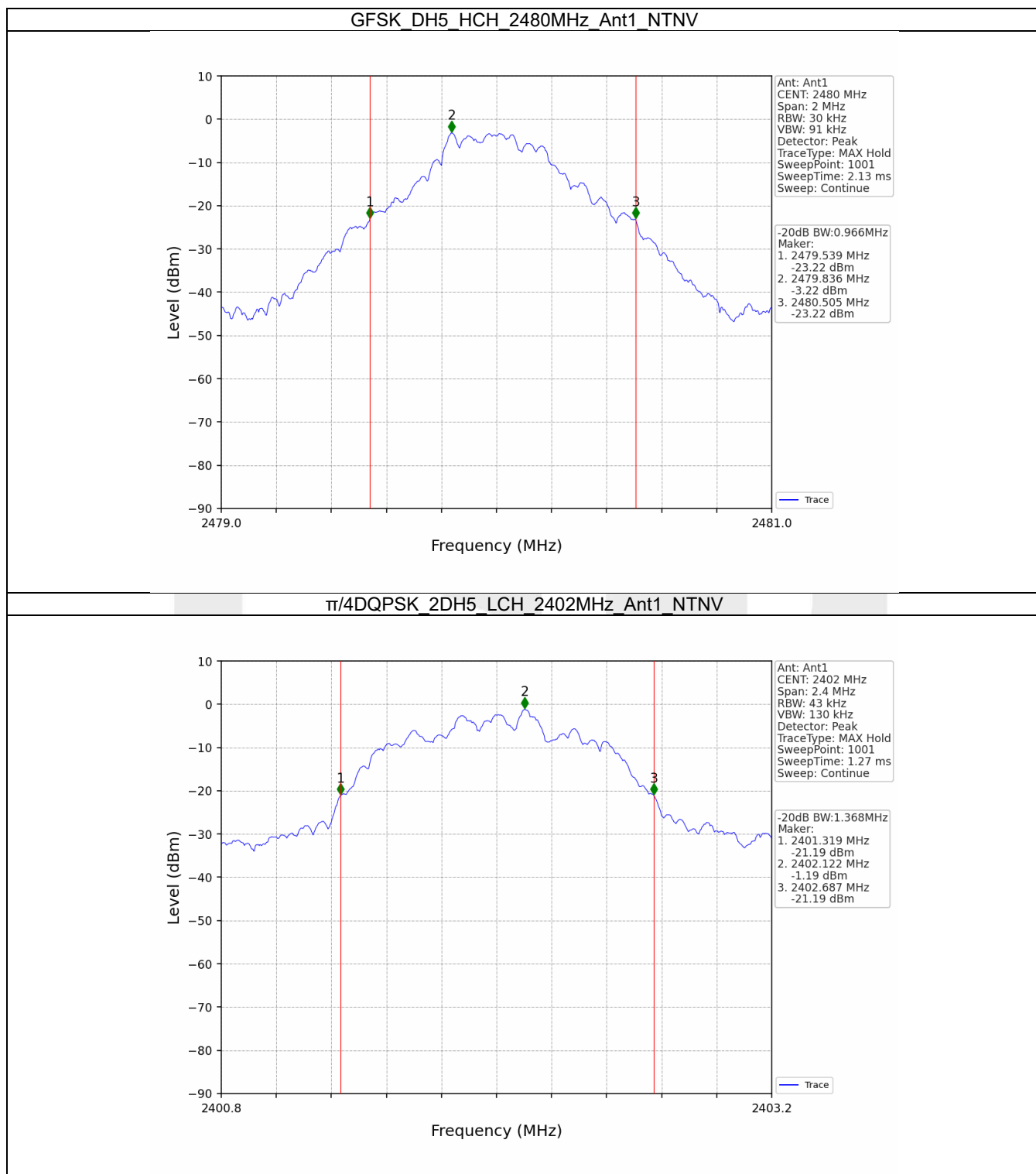
2.2 20dB BW

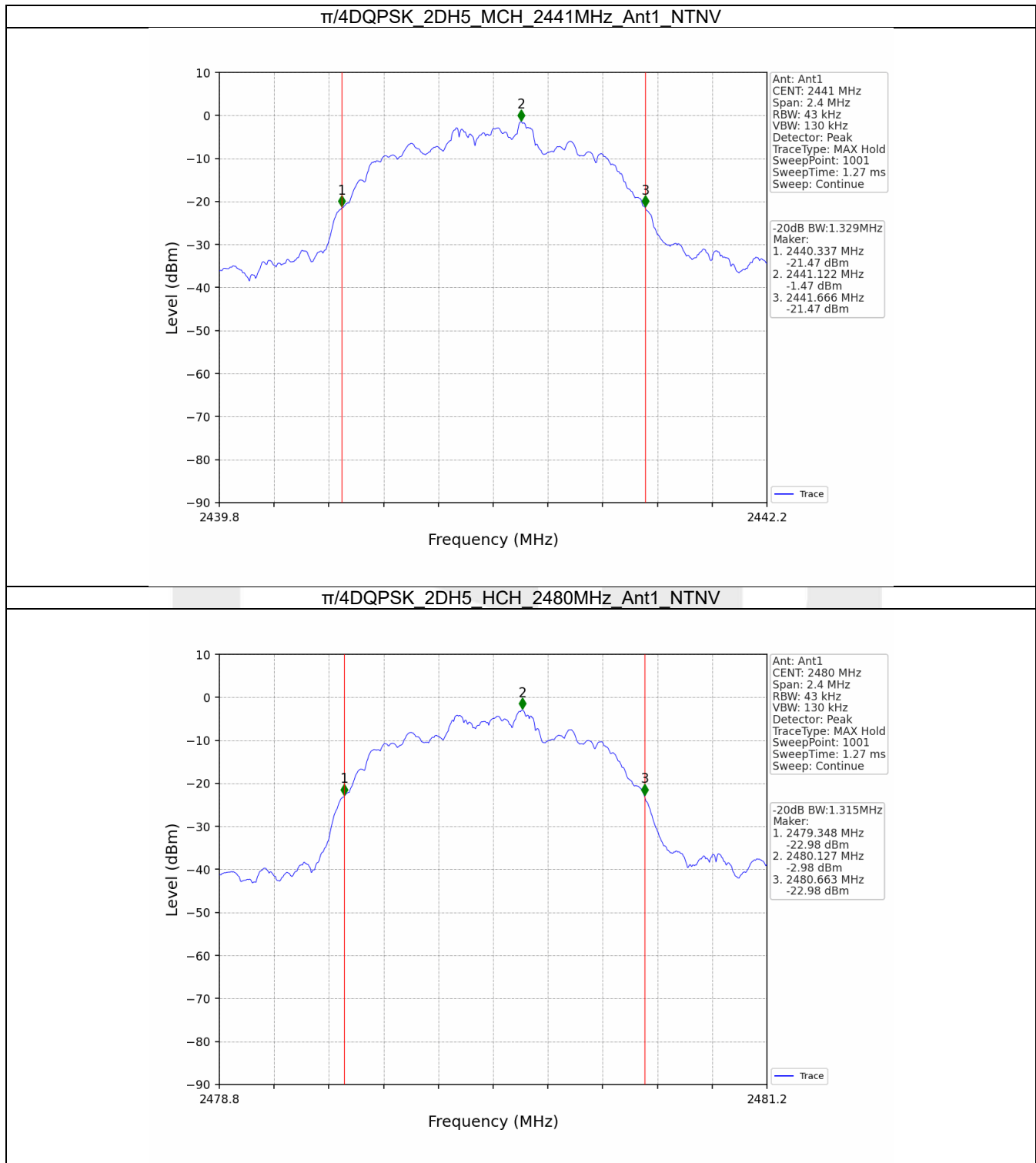
2.2.1 Test Result

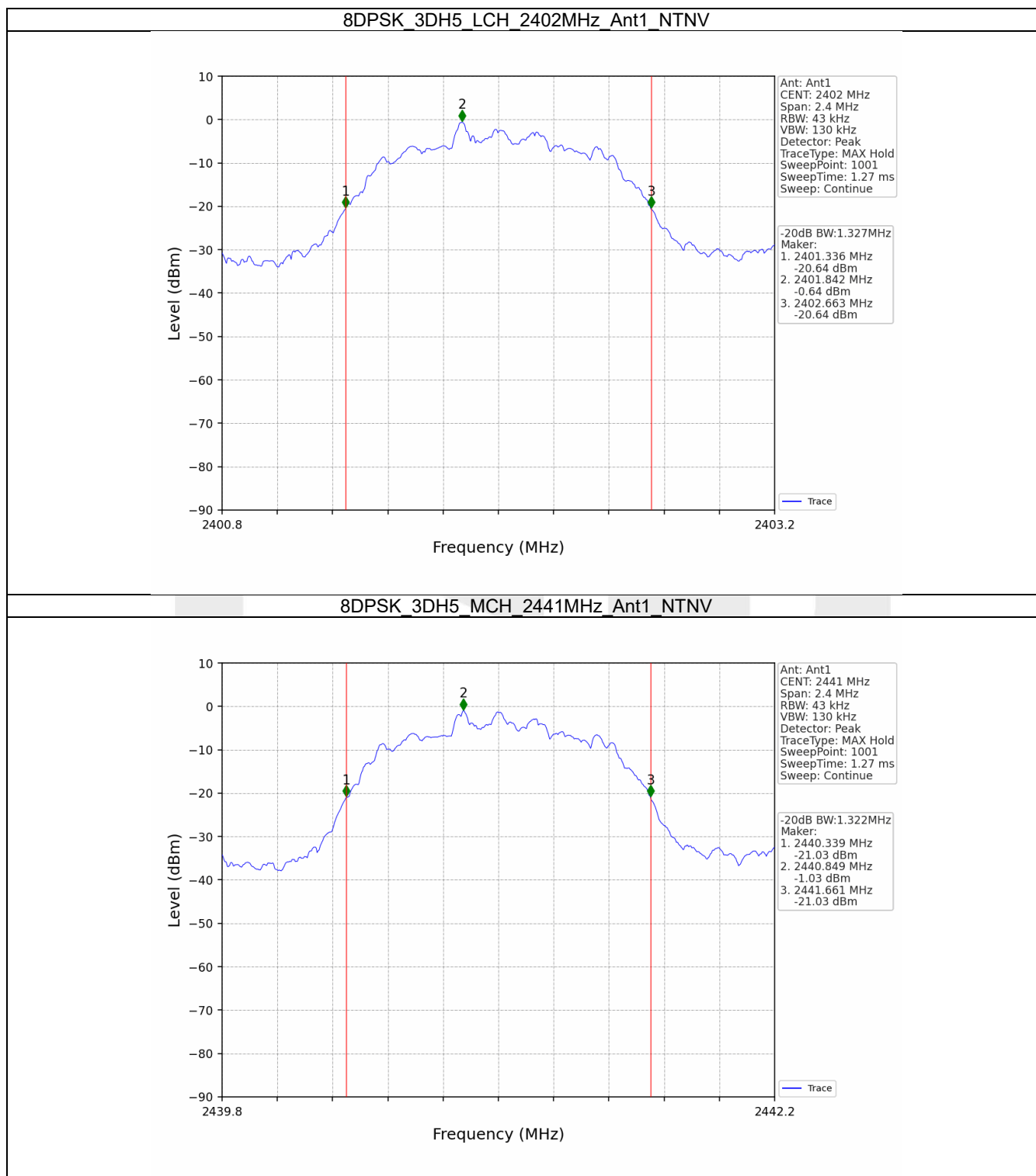
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.972	Pass
		2441	DH5	1	0.971	Pass
		2480	DH5	1	0.966	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	1.368	Pass
		2441	2DH5	1	1.329	Pass
		2480	2DH5	1	1.315	Pass
8DPSK	SISO	2402	3DH5	1	1.327	Pass
		2441	3DH5	1	1.322	Pass
		2480	3DH5	1	1.302	Pass

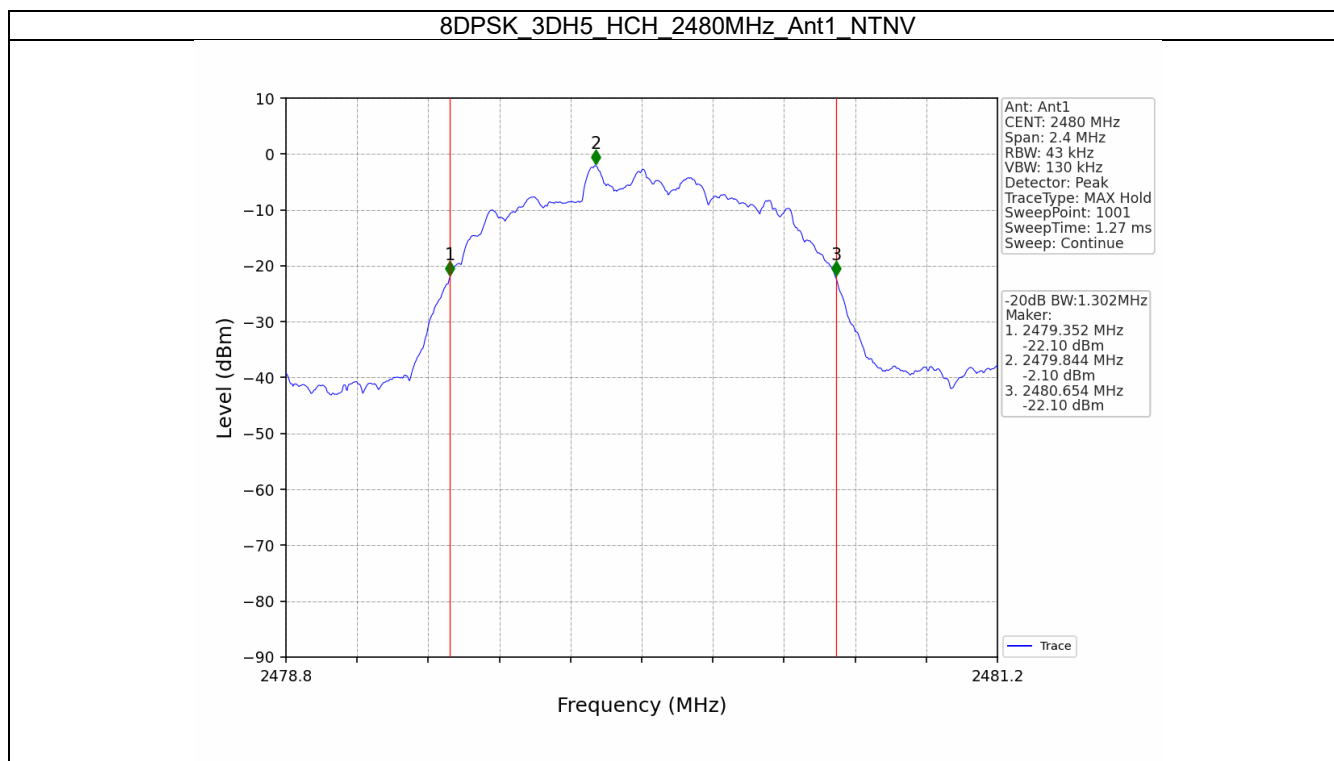
2.2.2 Test Graph











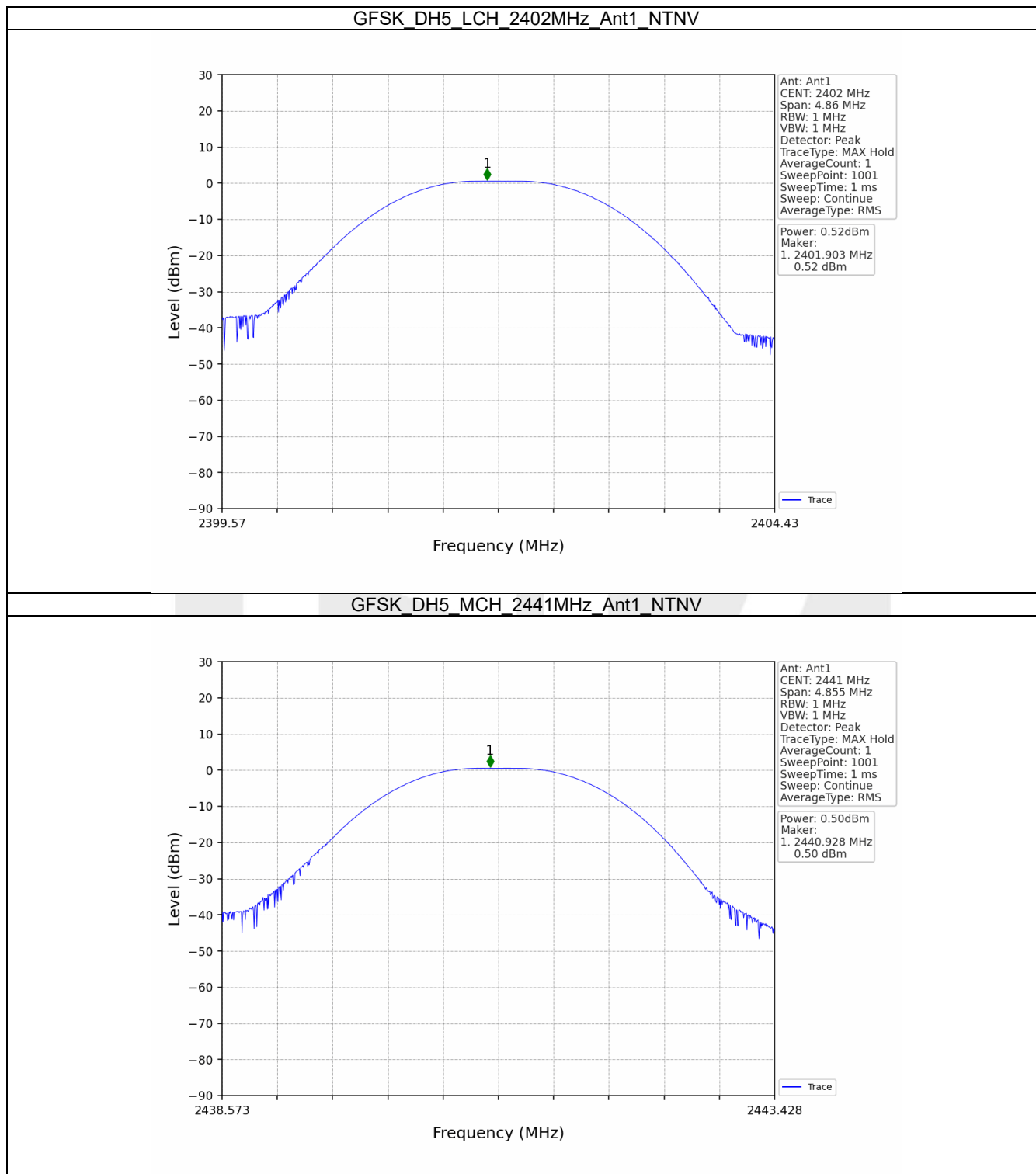
3. Maximum Conducted Output Power

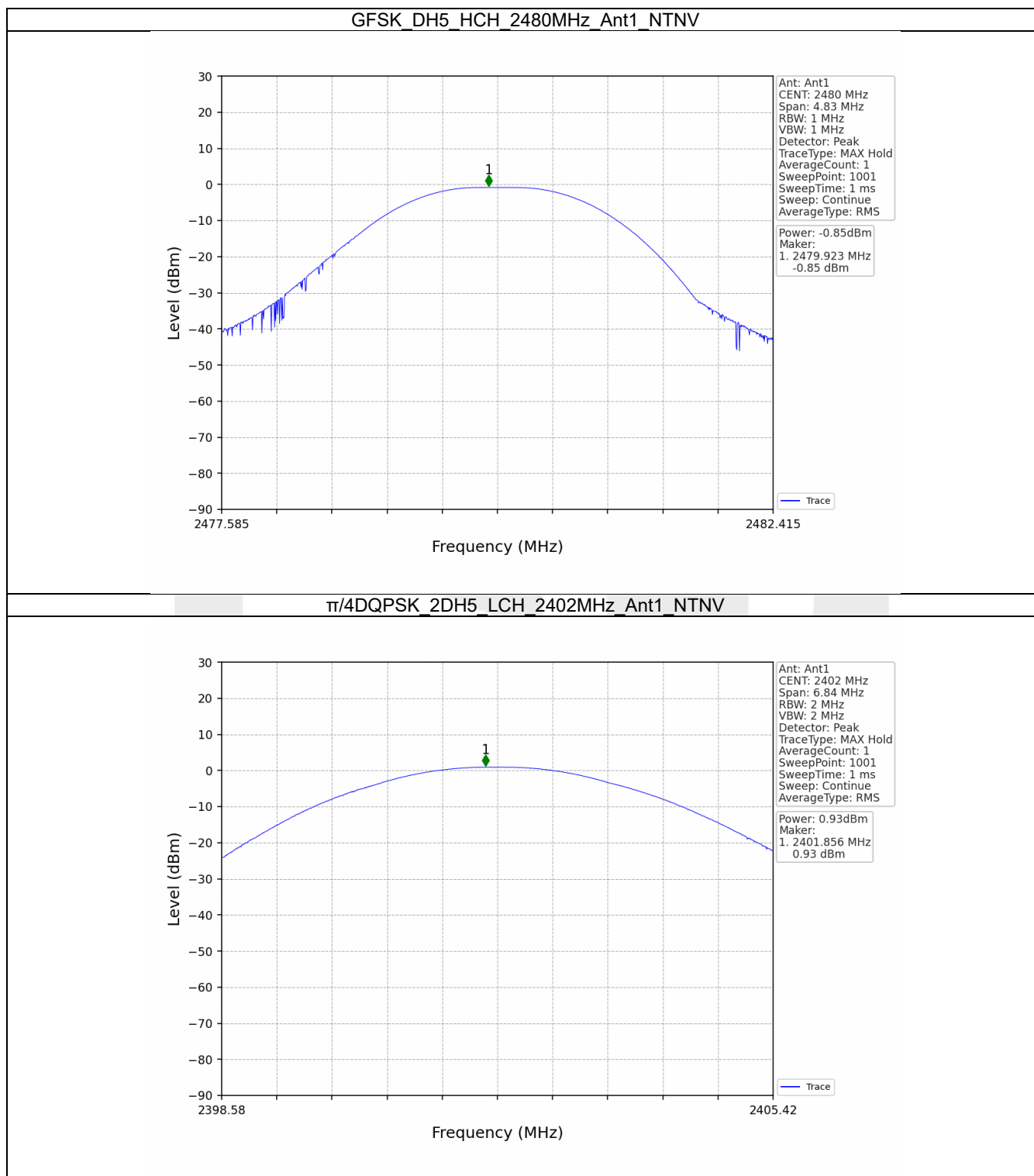
3.1 Power

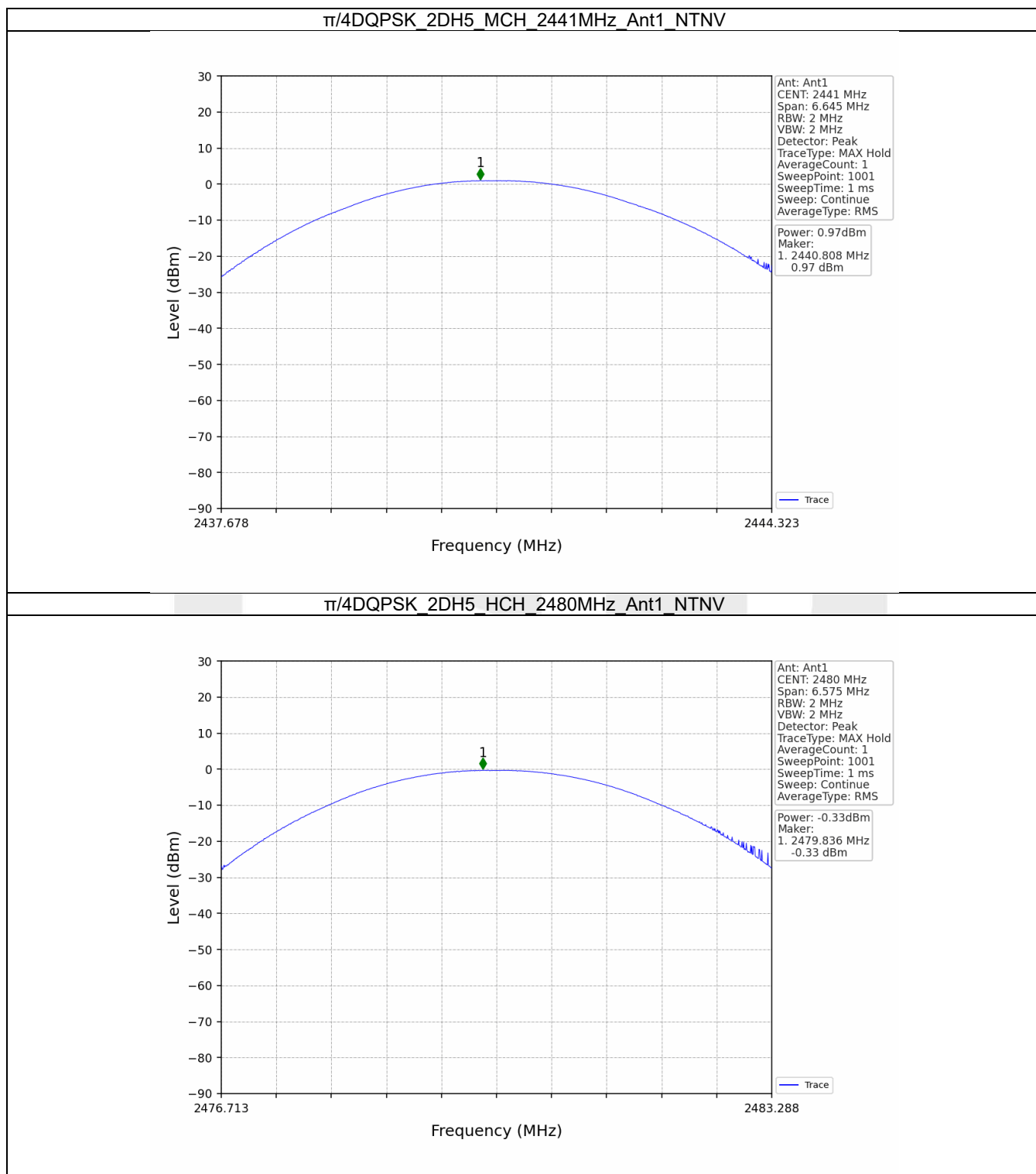
3.1.1 Test Result

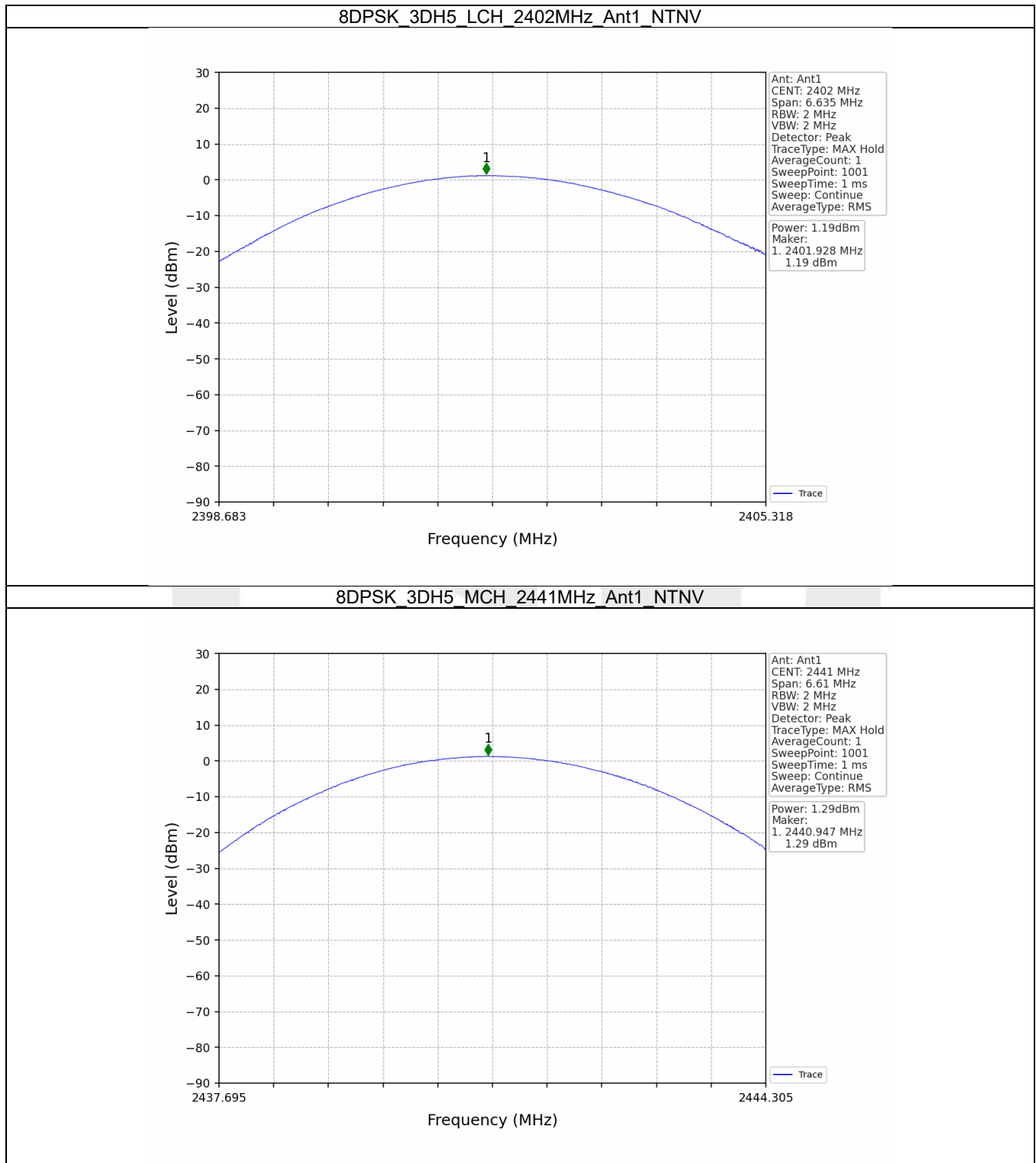
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	0.52	≤ 30	Pass
		2441	DH5	0.50	≤ 30	Pass
		2480	DH5	-0.85	≤ 30	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	0.93	≤ 20.97	Pass
		2441	2DH5	0.97	≤ 20.97	Pass
		2480	2DH5	-0.33	≤ 20.97	Pass
8DPSK	SISO	2402	3DH5	1.19	≤ 20.97	Pass
		2441	3DH5	1.29	≤ 20.97	Pass
		2480	3DH5	0.05	≤ 20.97	Pass

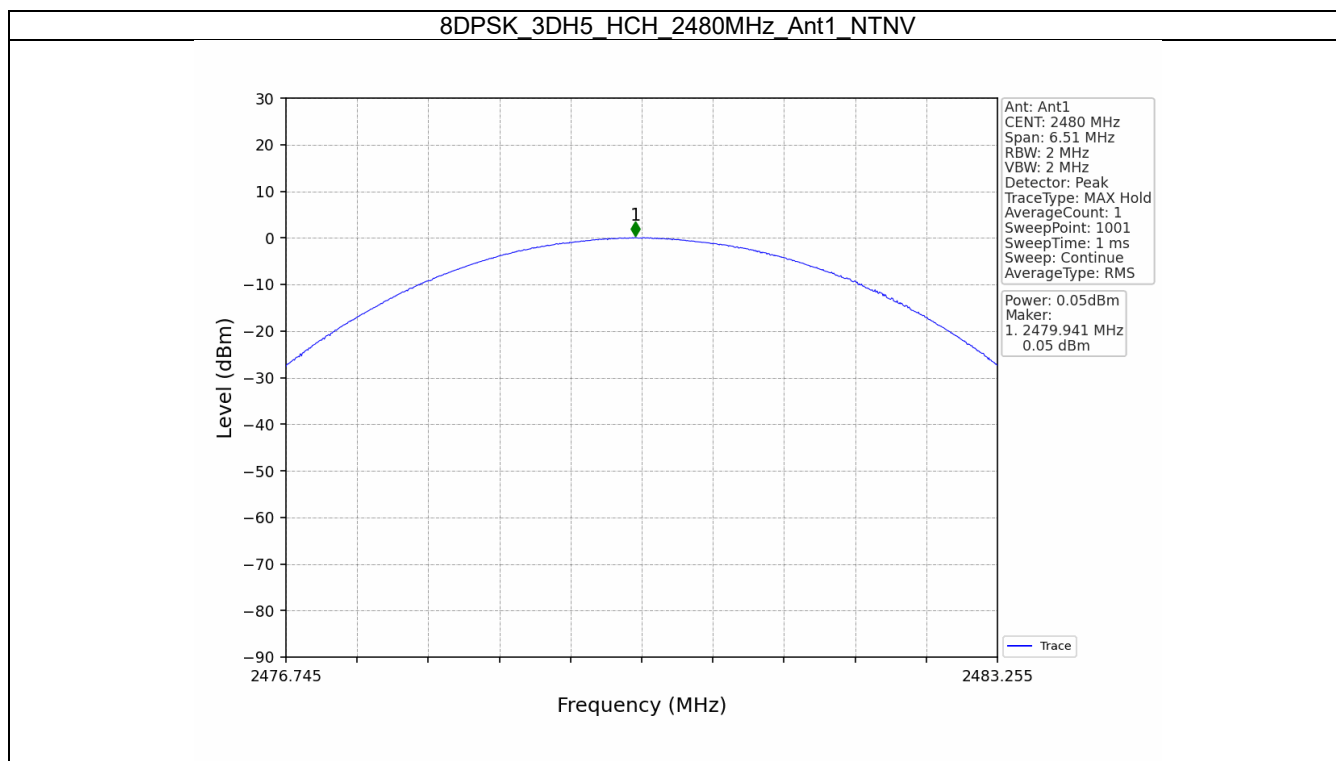
3.1.2 Test Graph











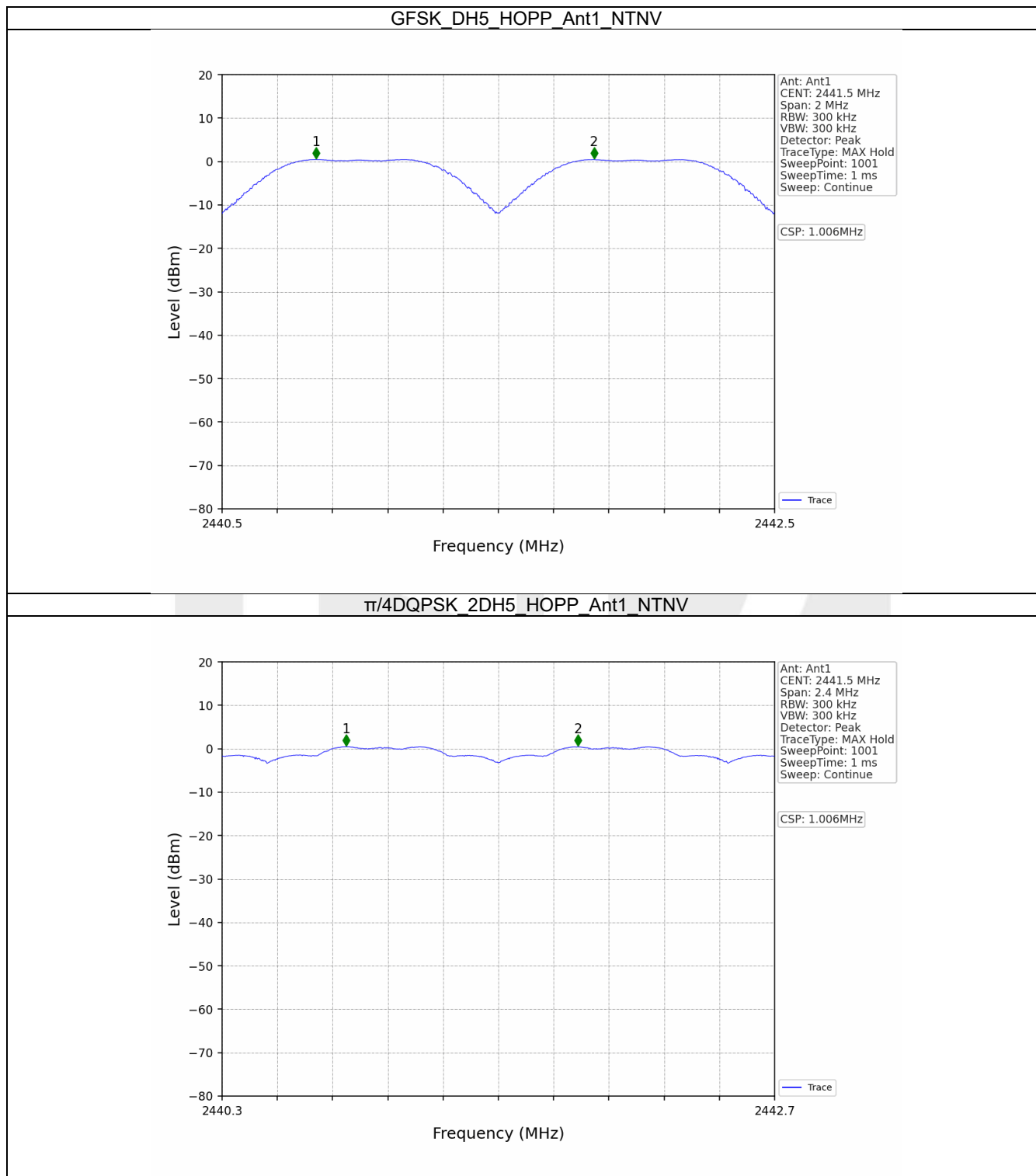
4. Carrier Frequency Separation

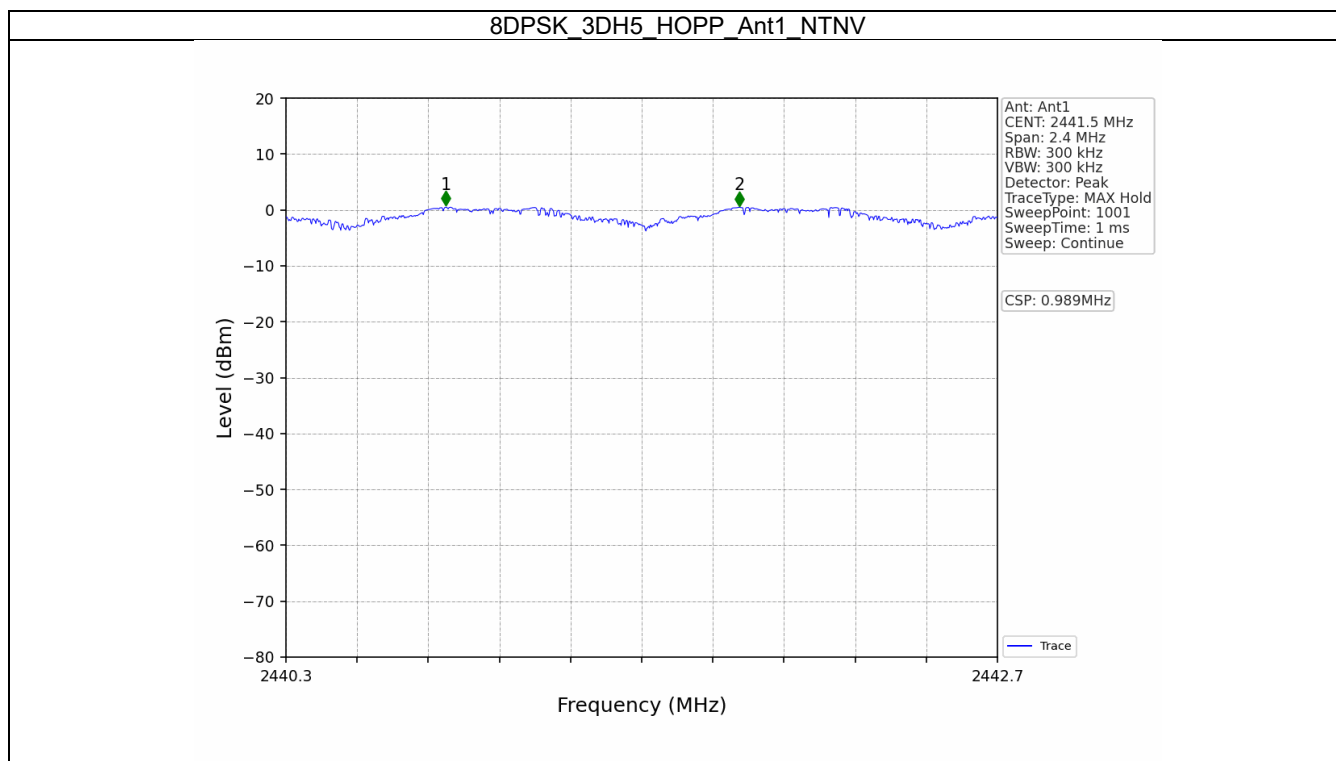
4.1 Ant1

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	1.006	0.972	≥ 0.972	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH5	1.006	1.368	≥ 0.912	Pass
8DPSK	SISO	HOPP	3DH5	0.989	1.327	≥ 0.885	Pass

4.1.2 Test Graph





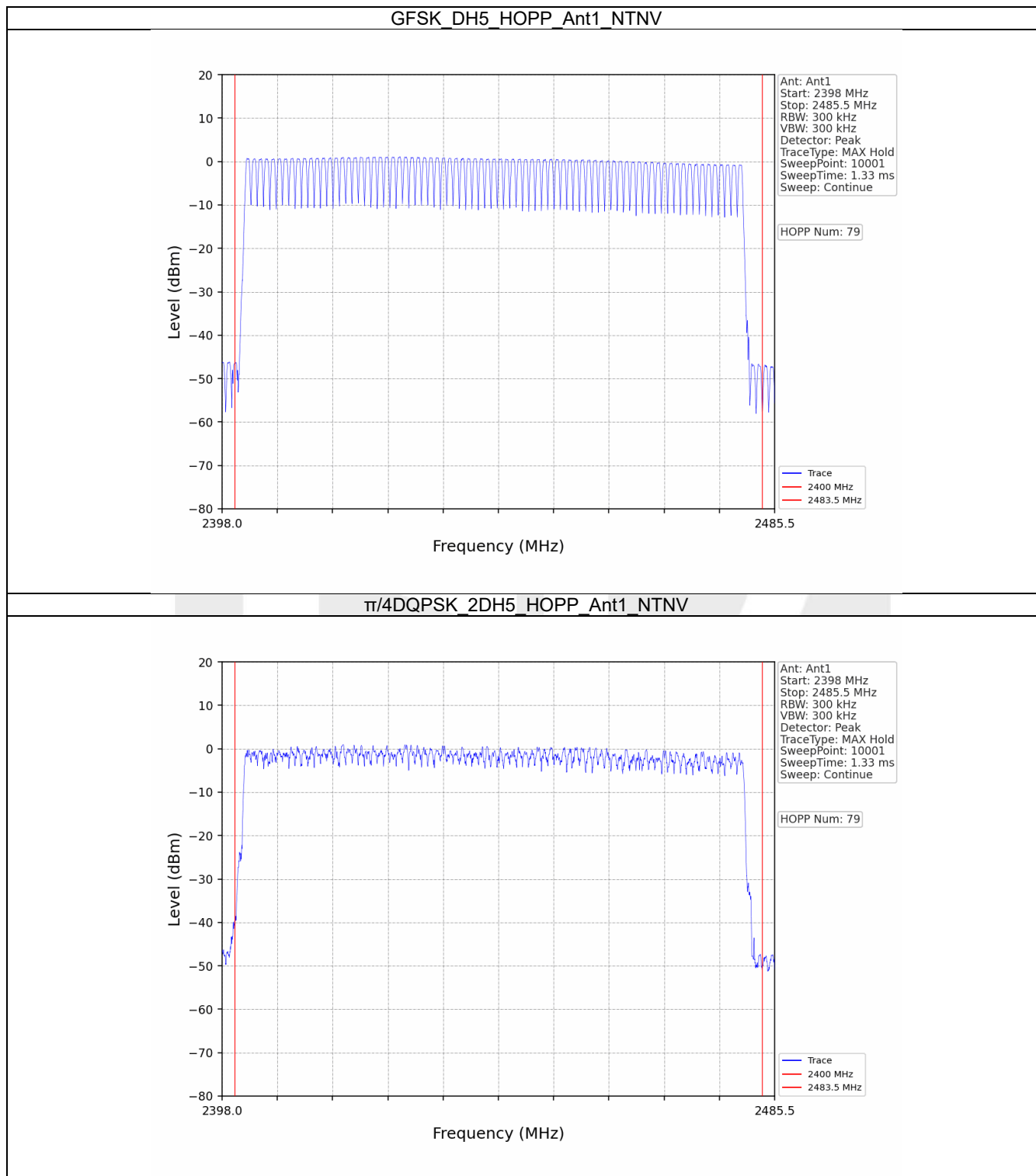
5. Number of Hopping Frequencies

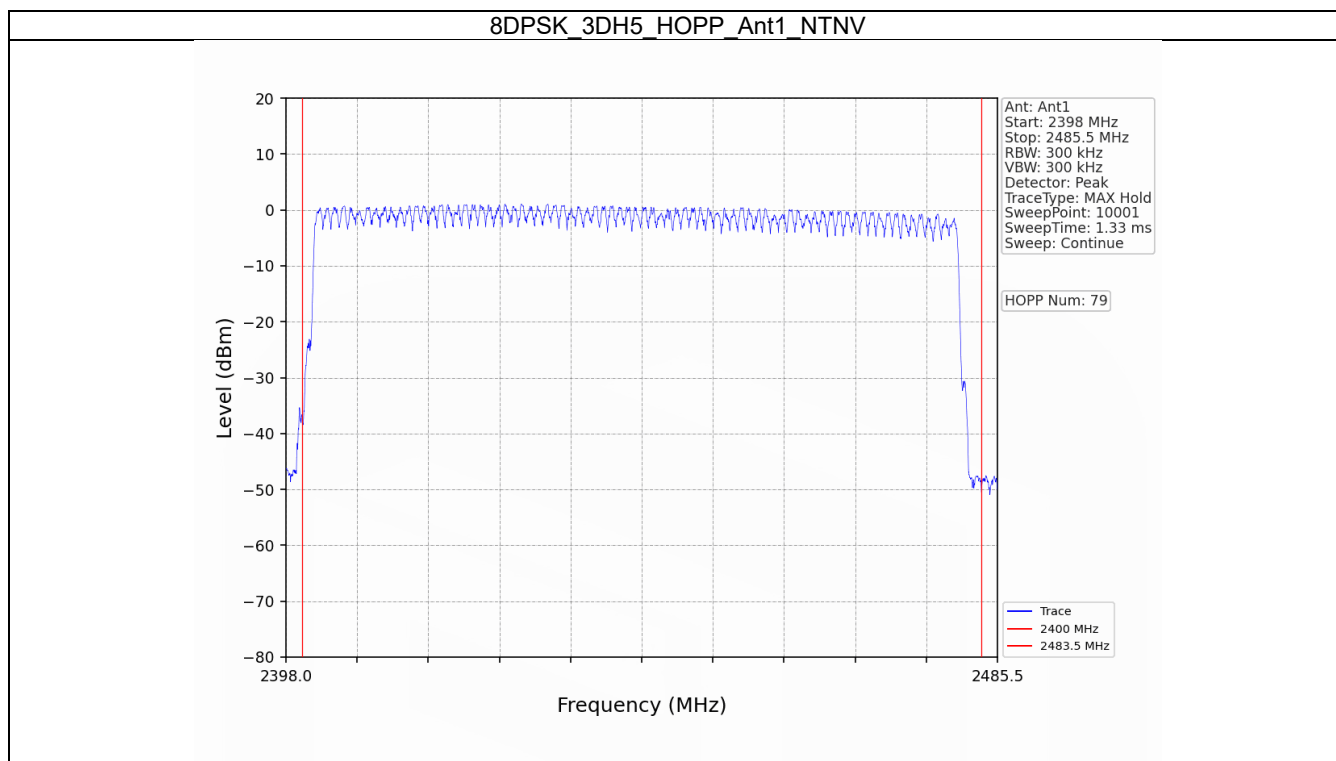
5.1 HoppNum

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
8DPSK	SISO	HOPP	3DH5	79	≥ 15	Pass

5.1.2 Test Graph





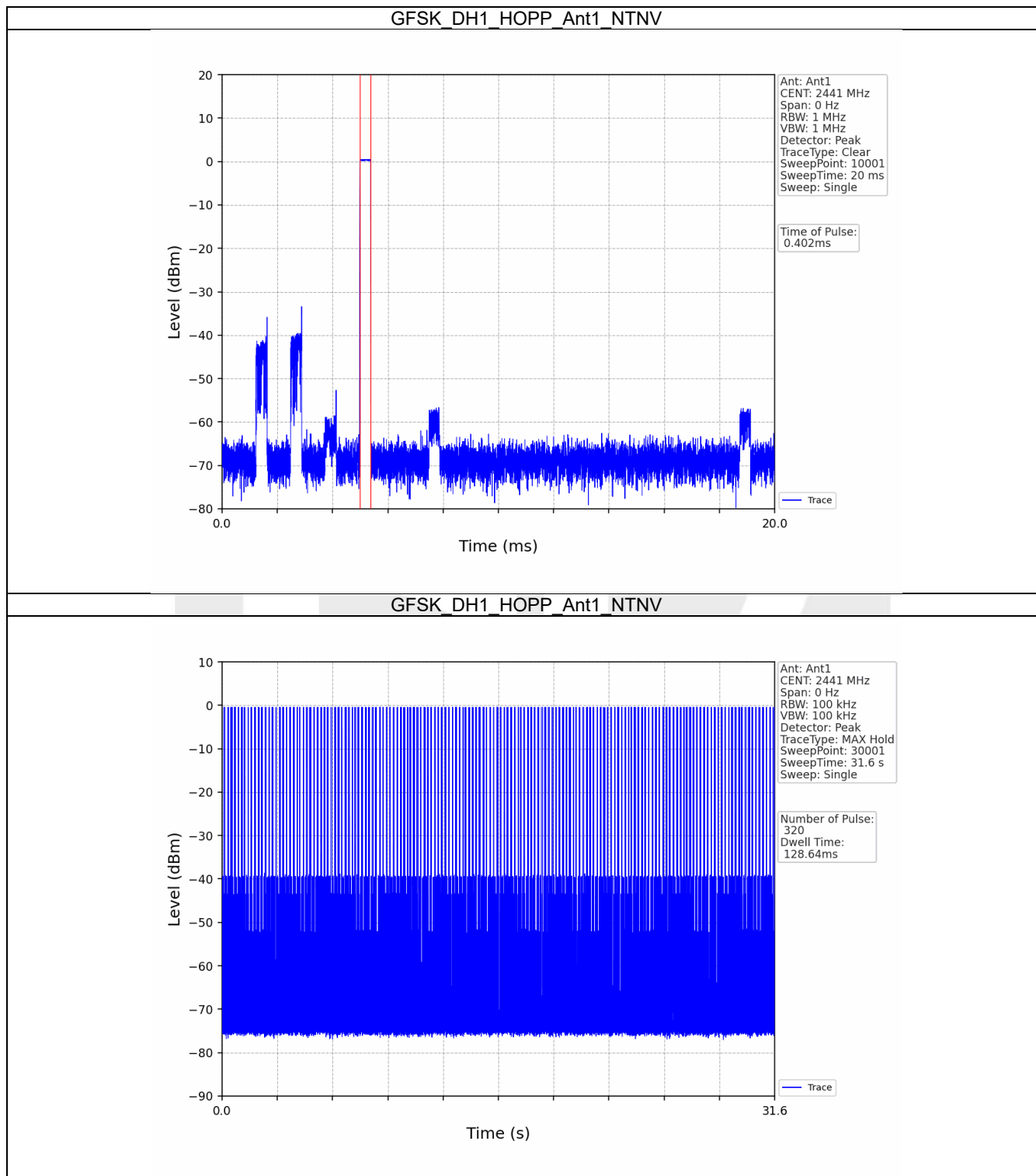
6. Time of Occupancy (Dwell Time)

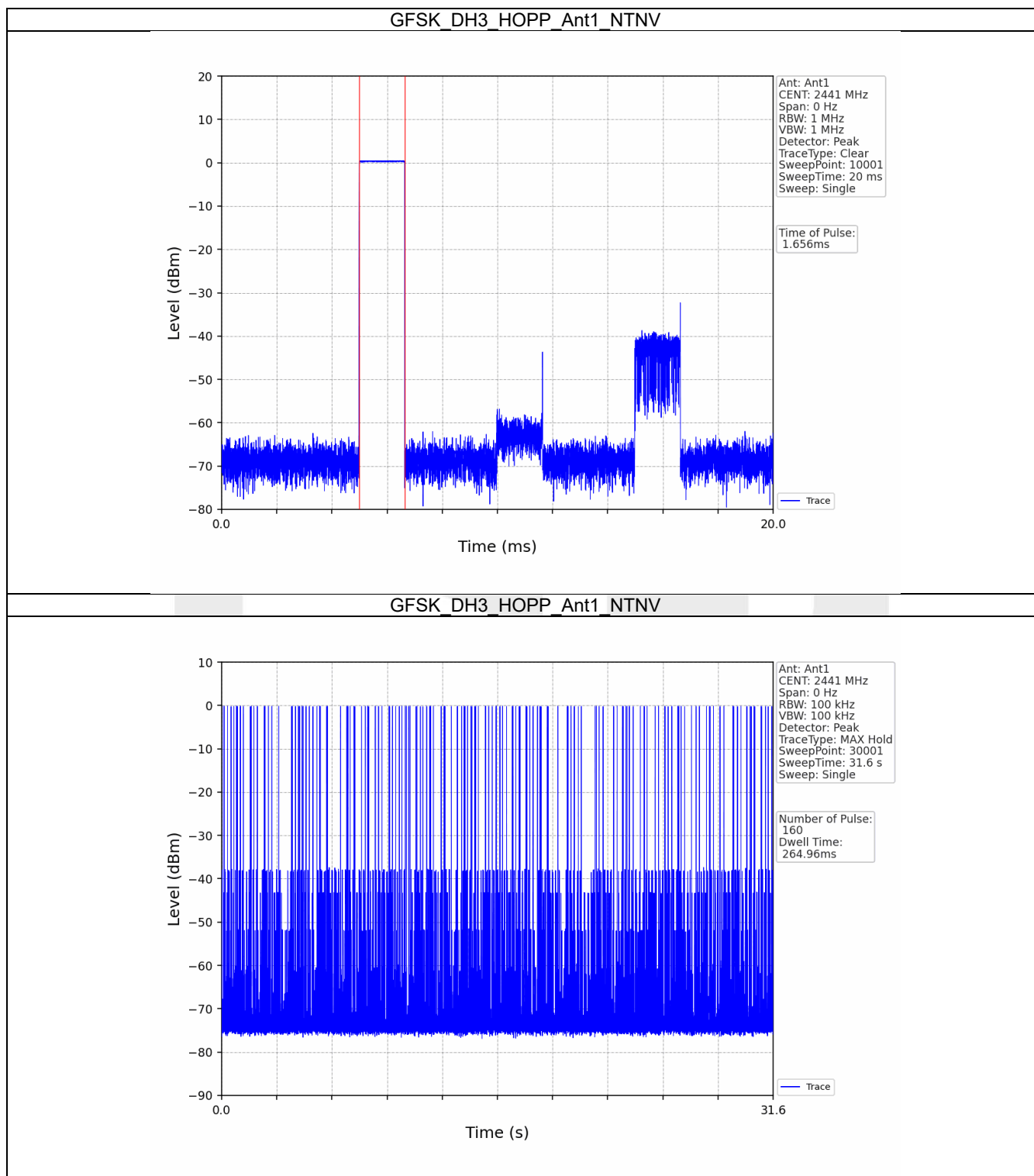
6.1 Ant1

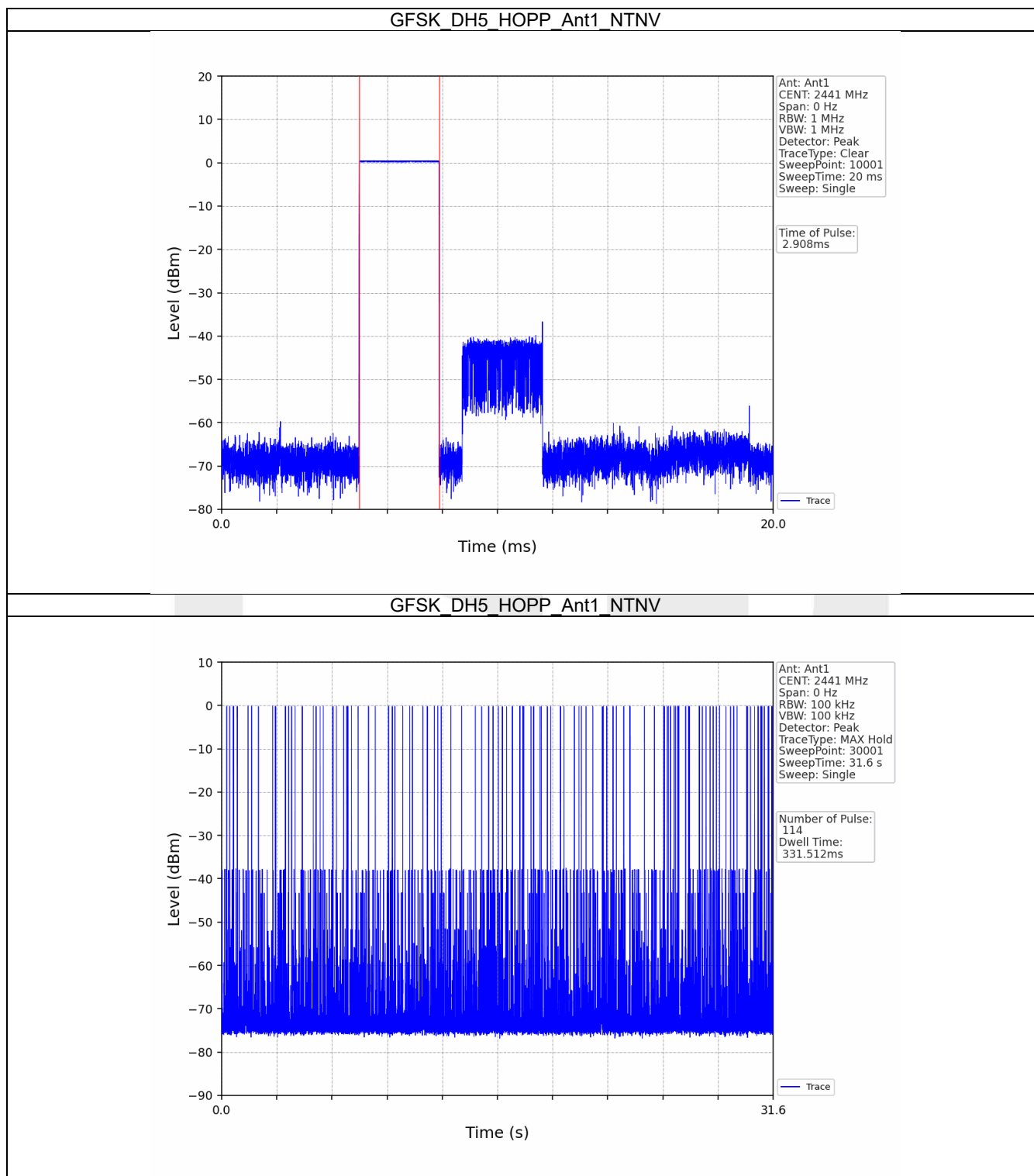
6.1.1 Test Result

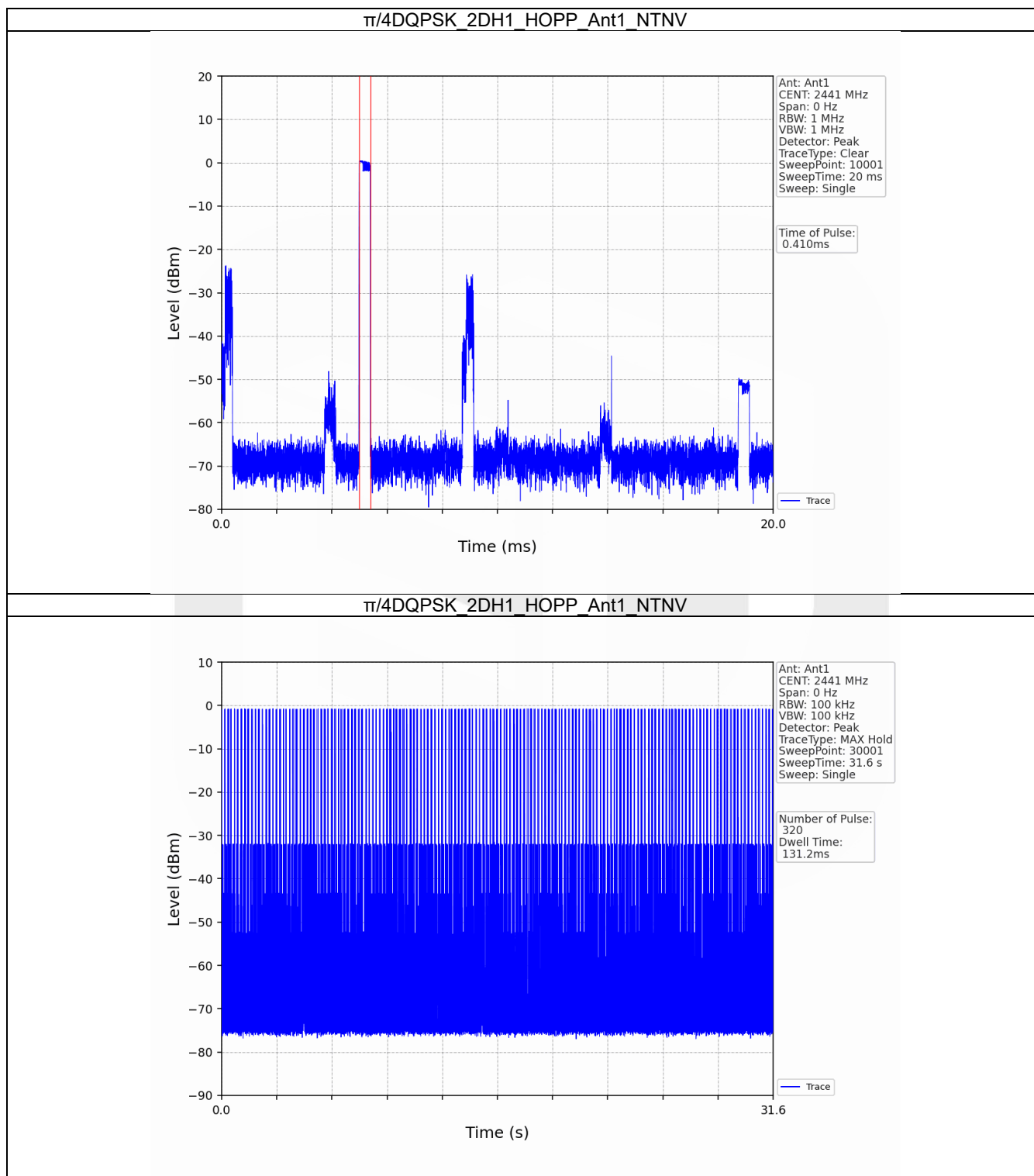
Ant1									
Mode	TX Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.402	31.600	320	128.640	<=400	Pass
			DH3	1.656	31.600	160	264.960	<=400	Pass
			DH5	2.908	31.600	114	331.512	<=400	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH1	0.410	31.600	320	131.200	<=400	Pass
			2DH3	1.662	31.600	160	265.920	<=400	Pass
			2DH5	2.916	31.600	92	268.272	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.412	31.600	320	131.840	<=400	Pass
			3DH3	1.668	31.600	162	270.216	<=400	Pass
			3DH5	2.914	31.600	105	305.970	<=400	Pass

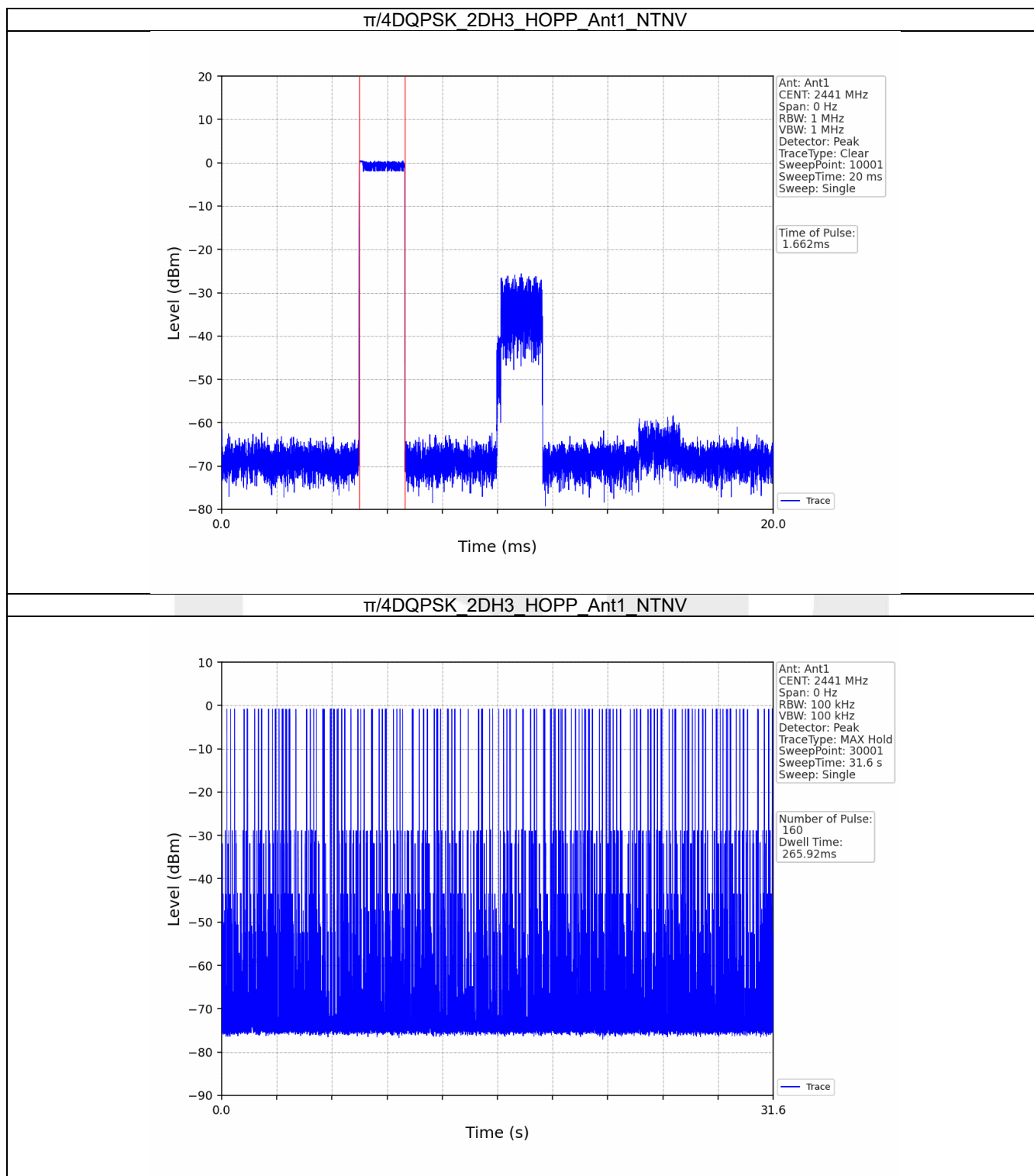
6.1.2 Test Graph

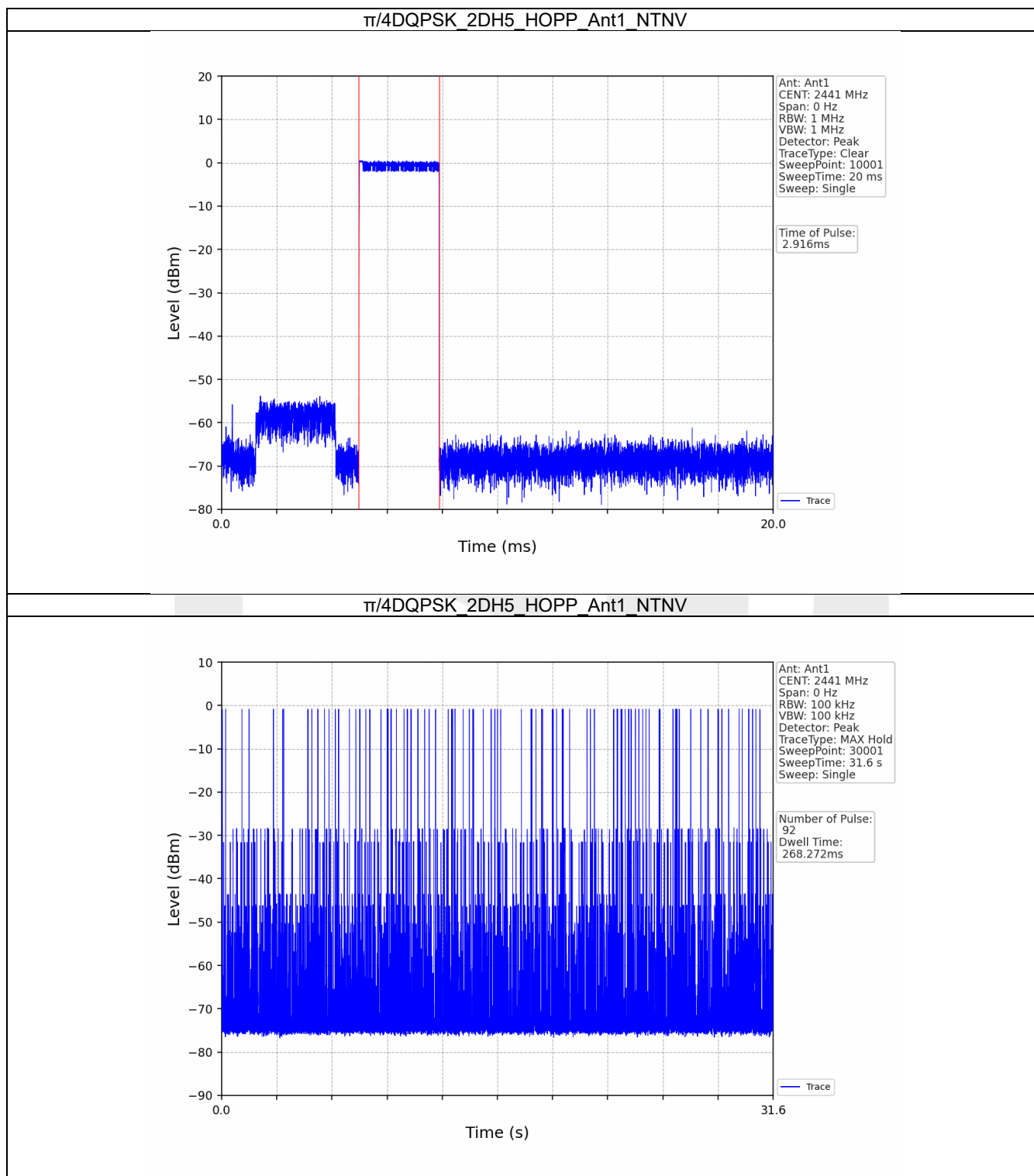


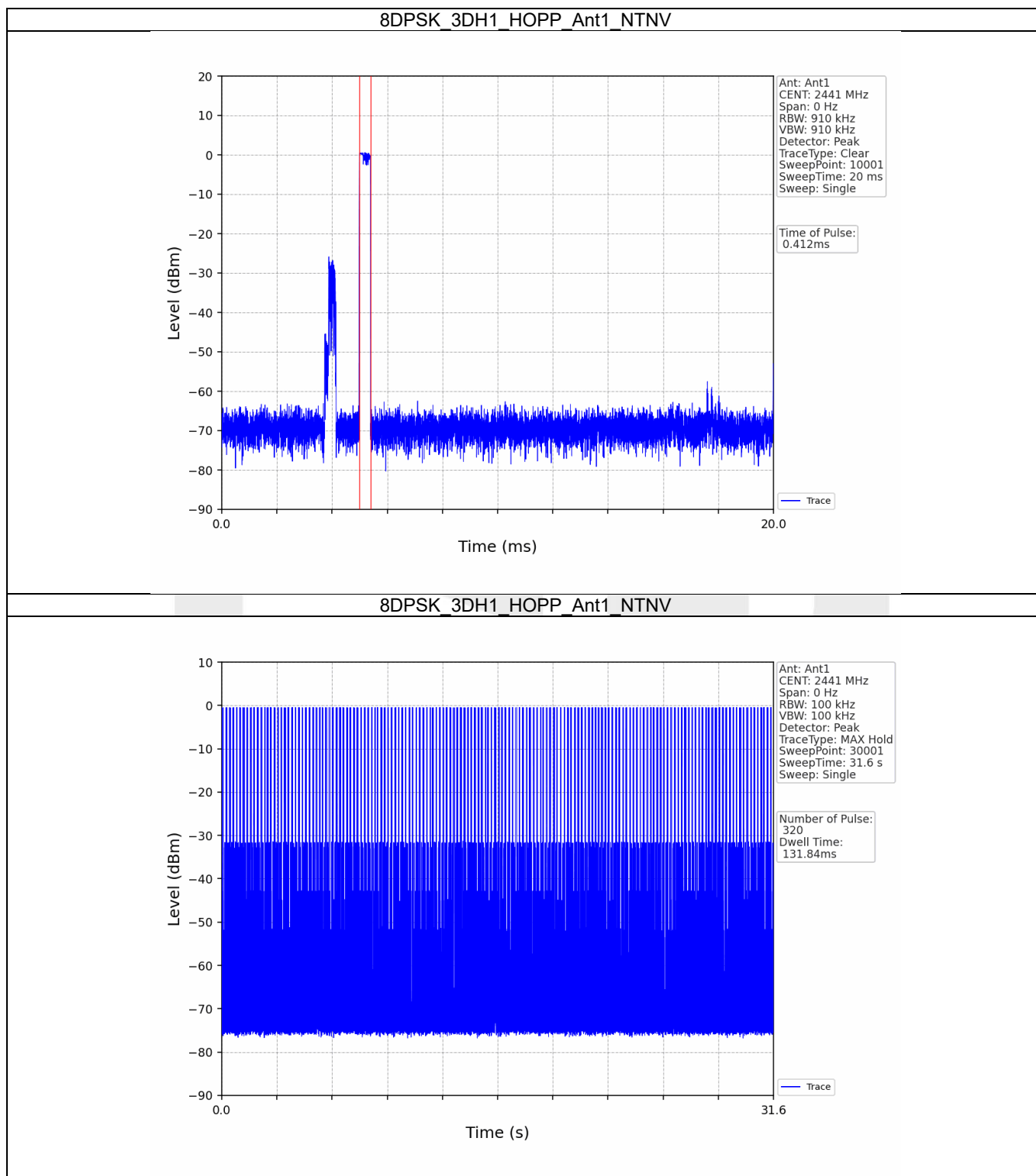


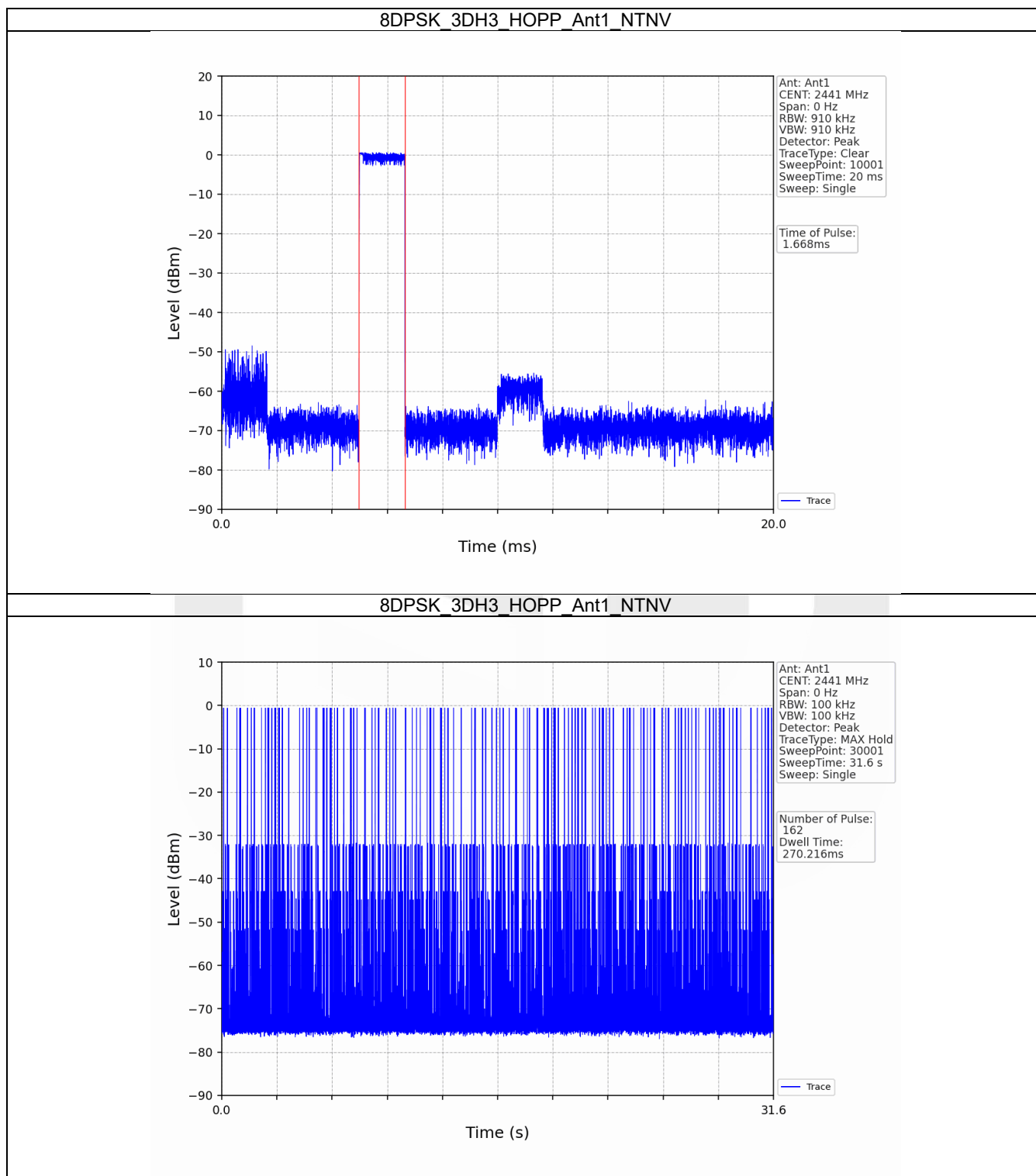


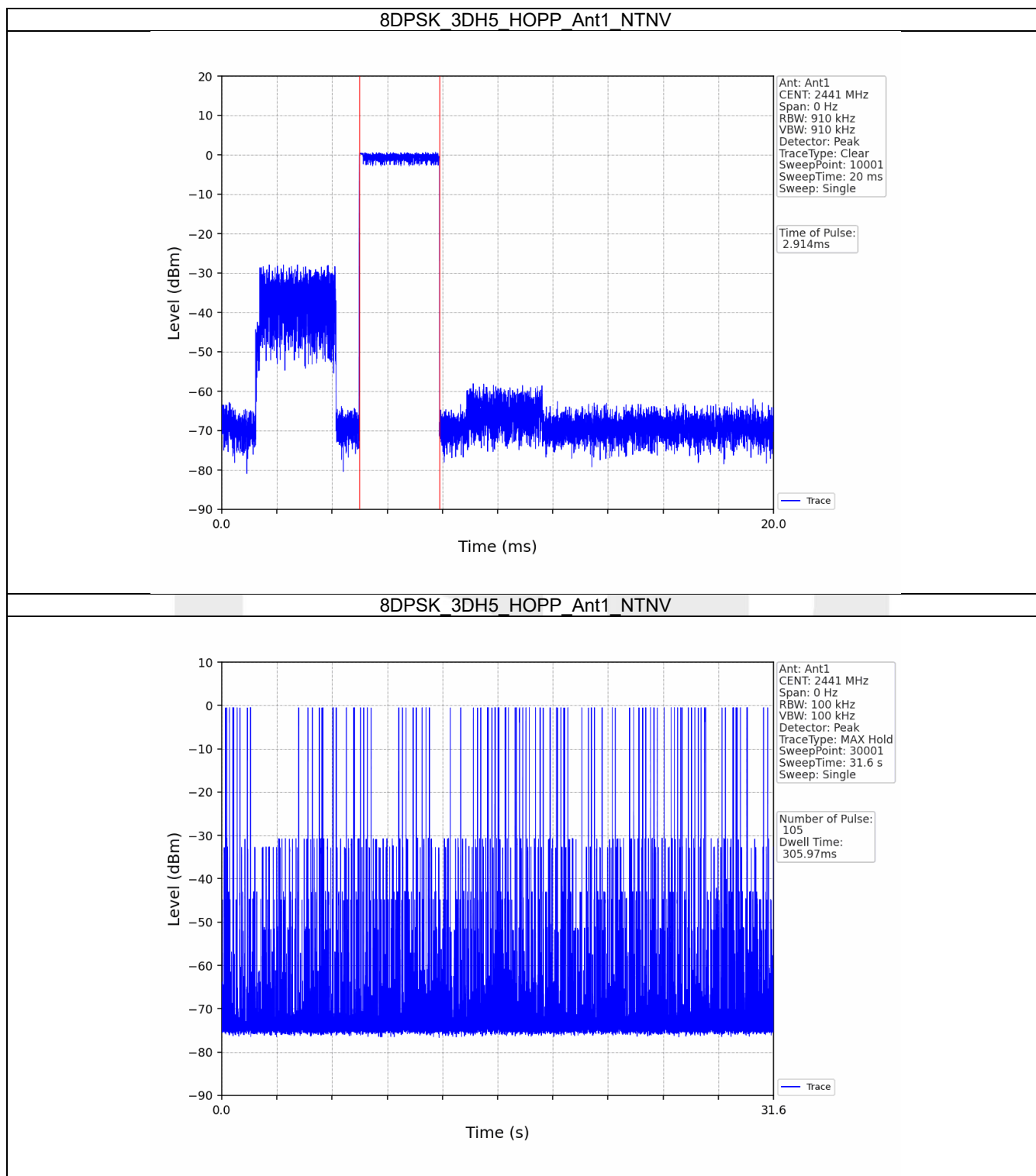












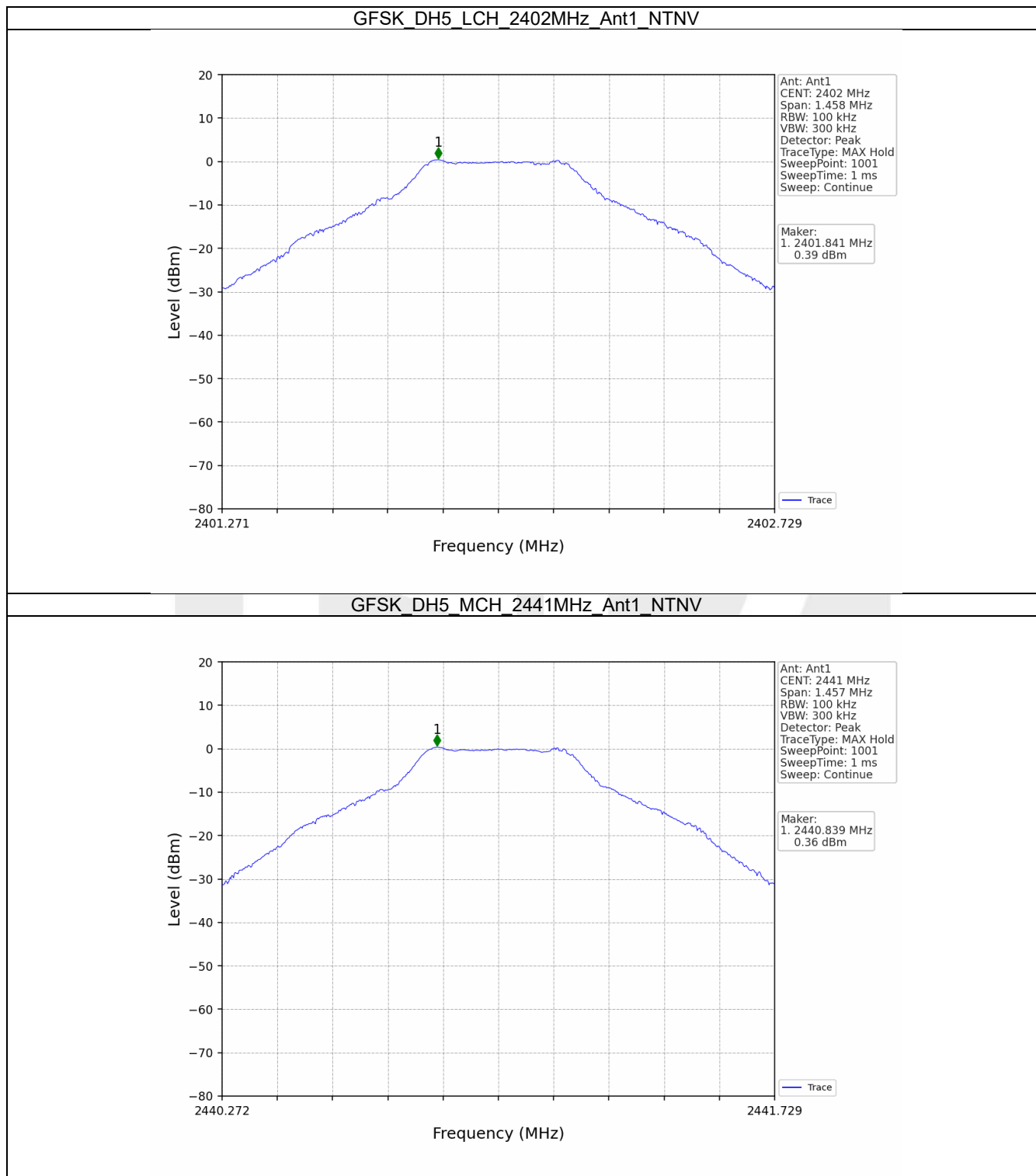
7. Unwanted Emissions In Non-restricted Frequency Bands

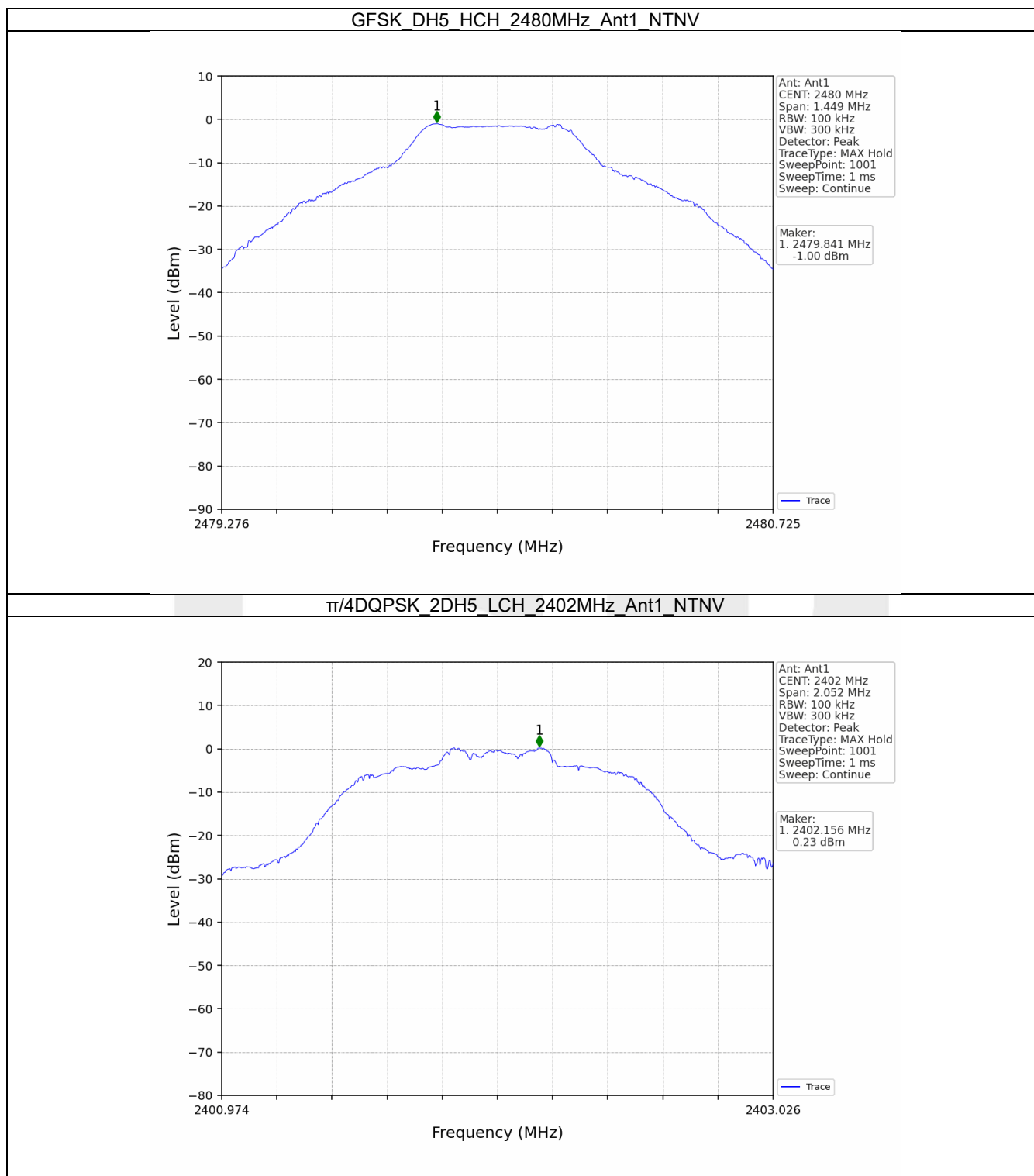
7.1 Ref

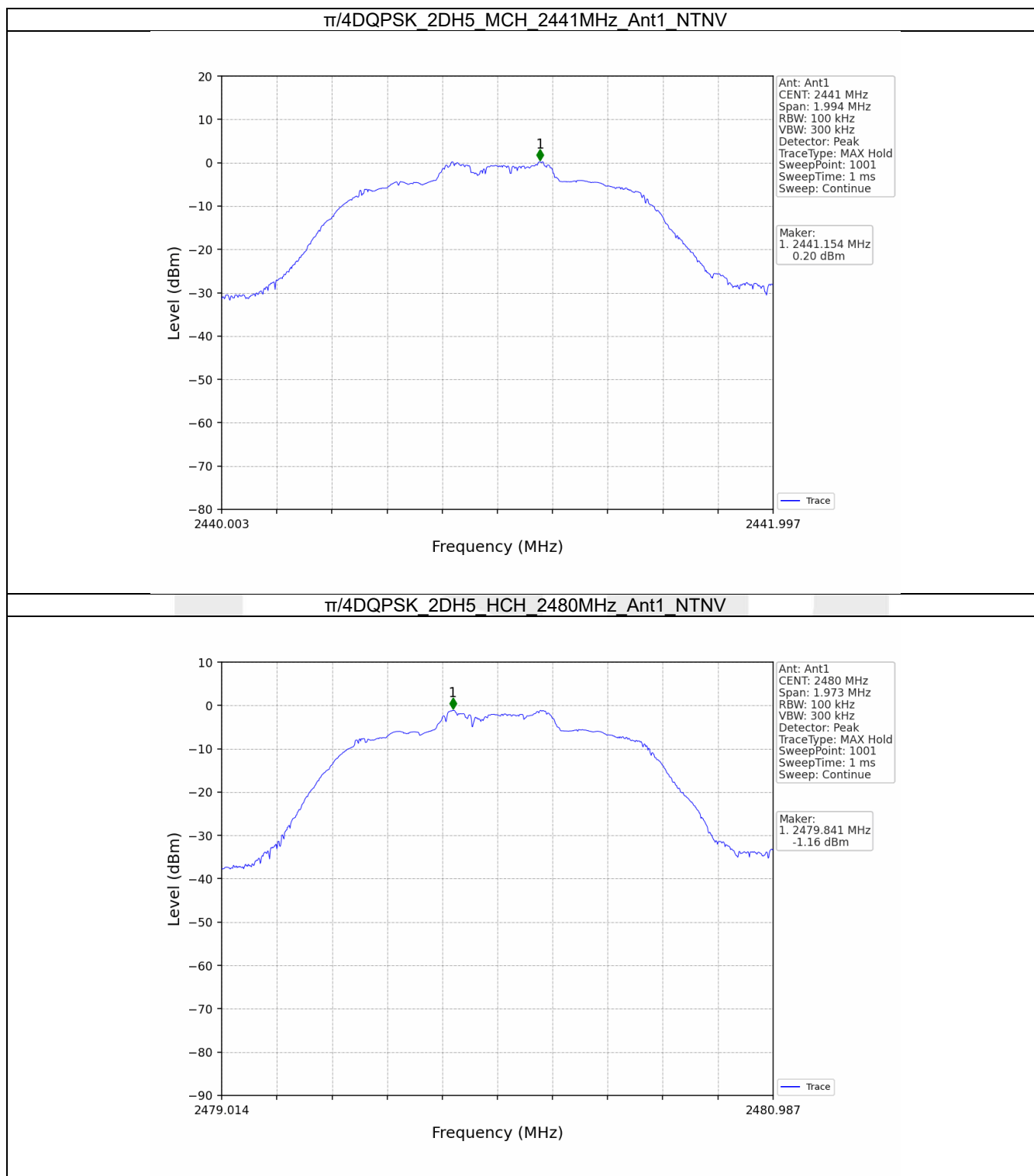
7.1.1 Test Result

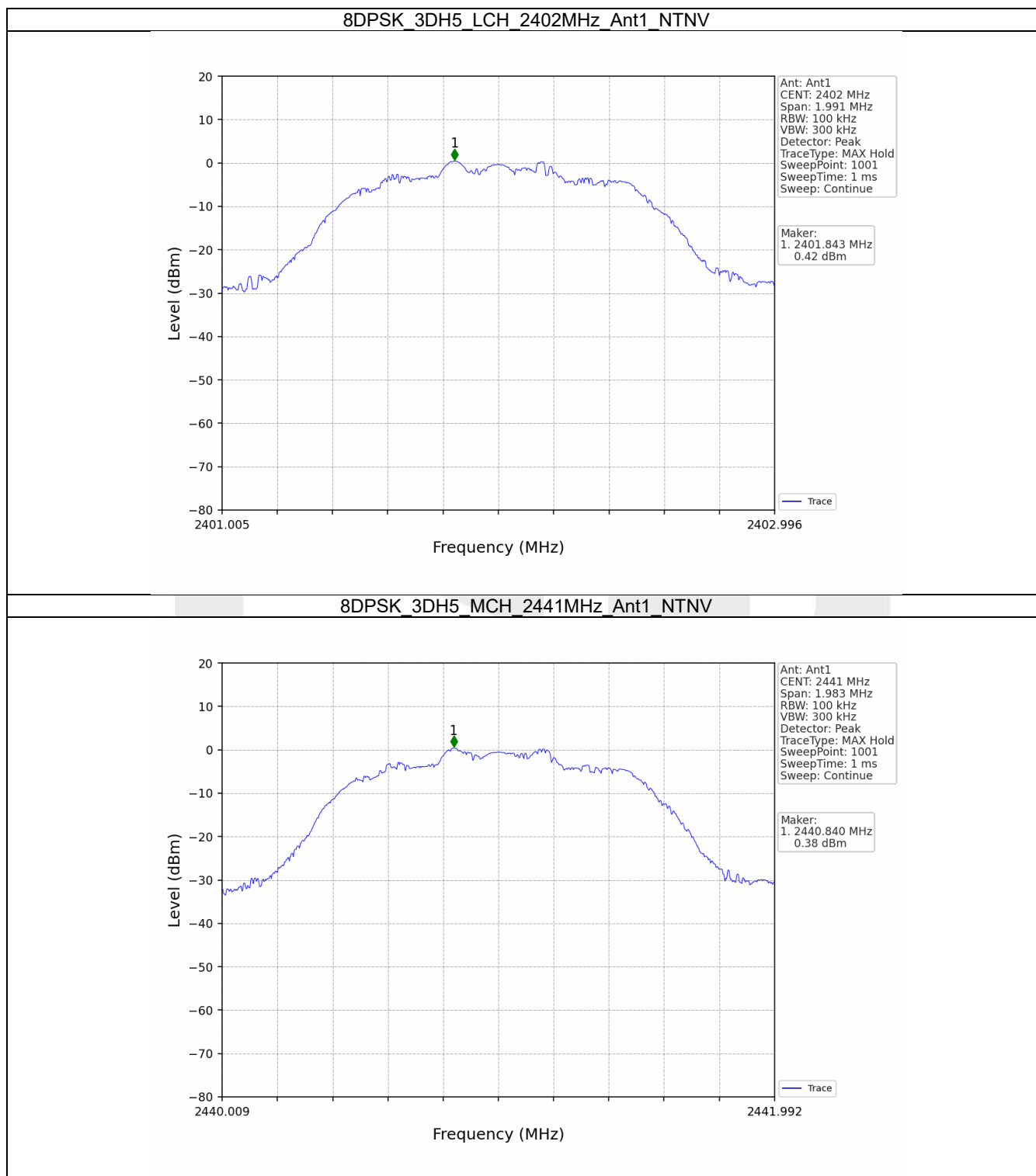
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	0.39
		2441	DH5	1	0.36
		2480	DH5	1	-1.00
π/4DQPSK	SISO	2402	2DH5	1	0.23
		2441	2DH5	1	0.20
		2480	2DH5	1	-1.16
8DPSK	SISO	2402	3DH5	1	0.42
		2441	3DH5	1	0.38
		2480	3DH5	1	-0.99
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.					

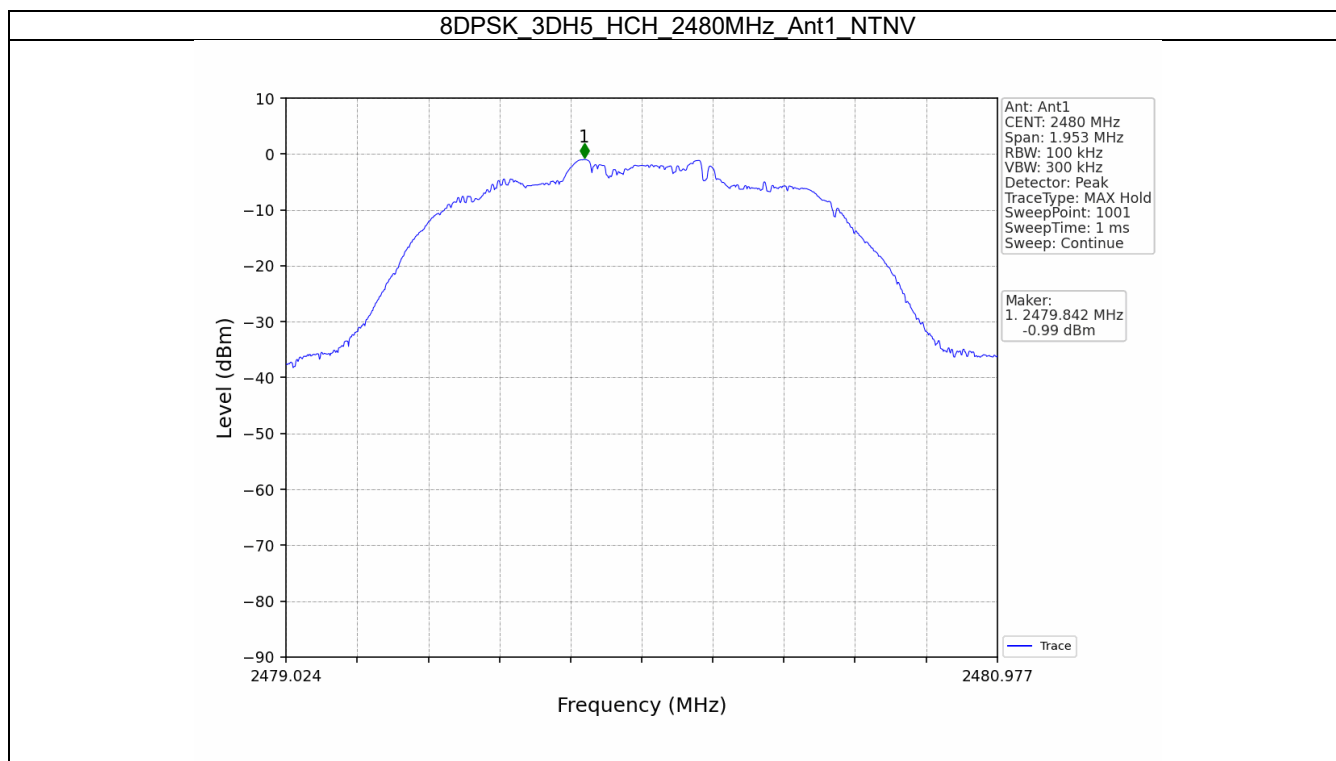
7.1.2 Test Graph











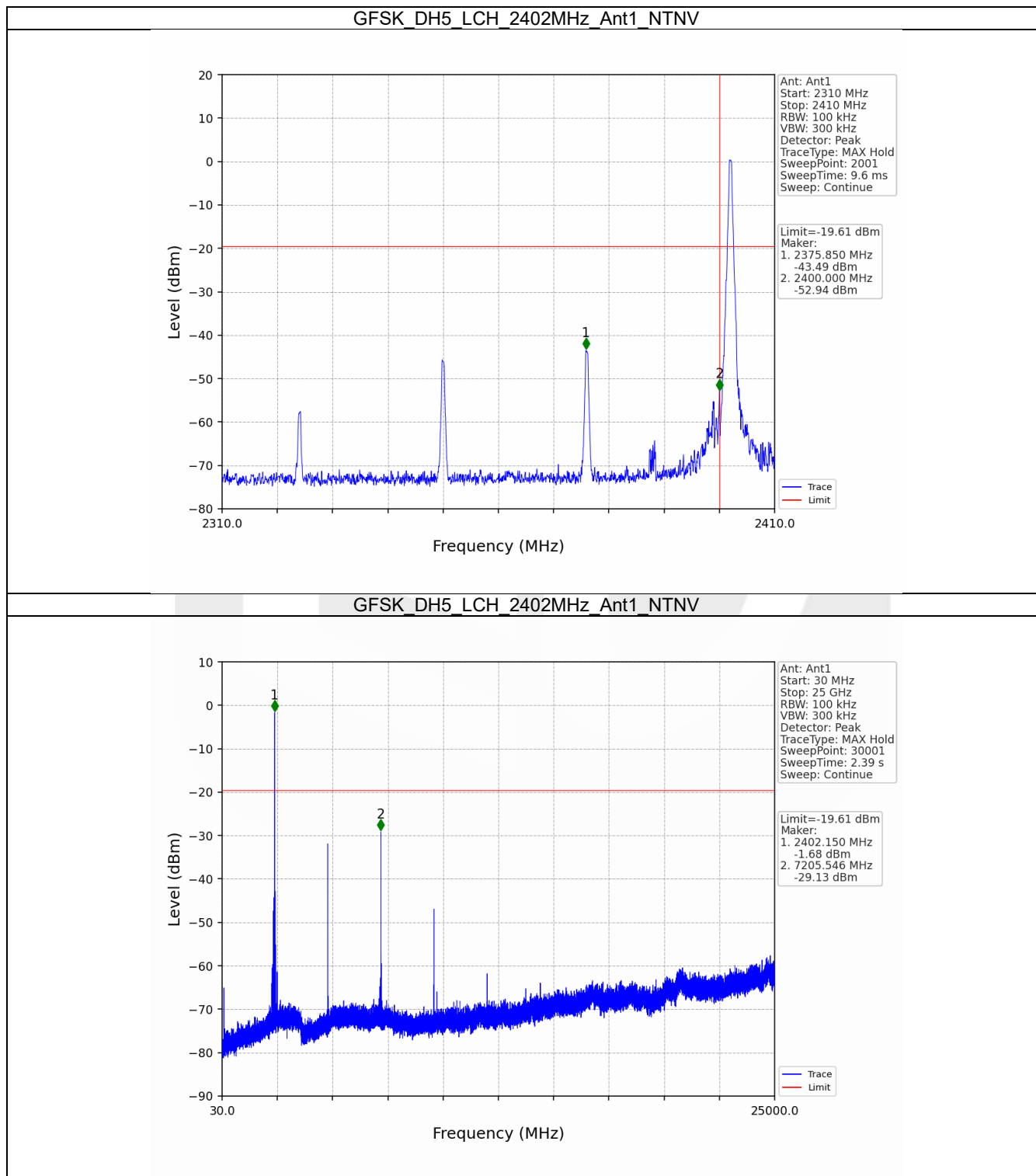
7.2 CSE

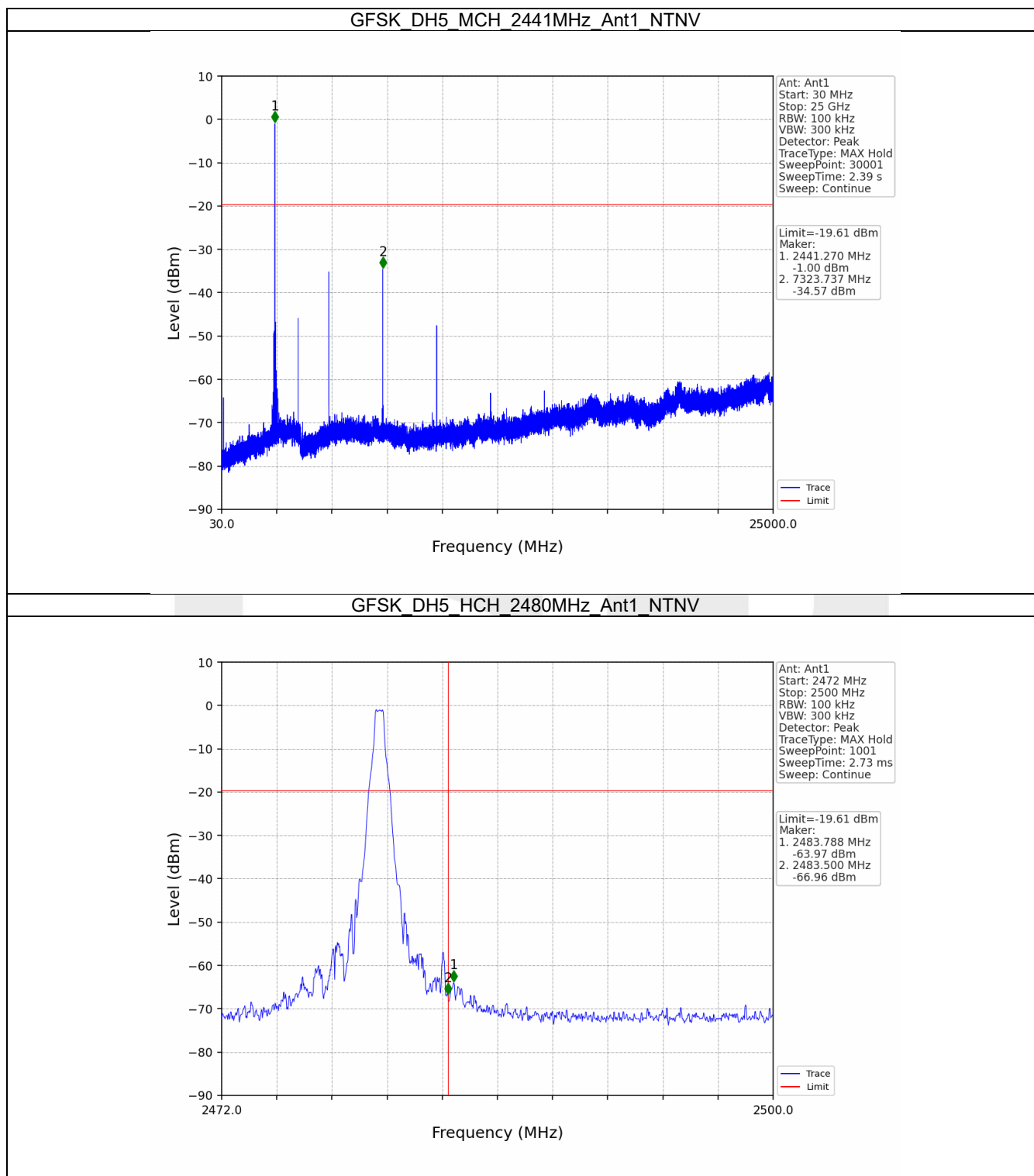
7.2.1 Test Result

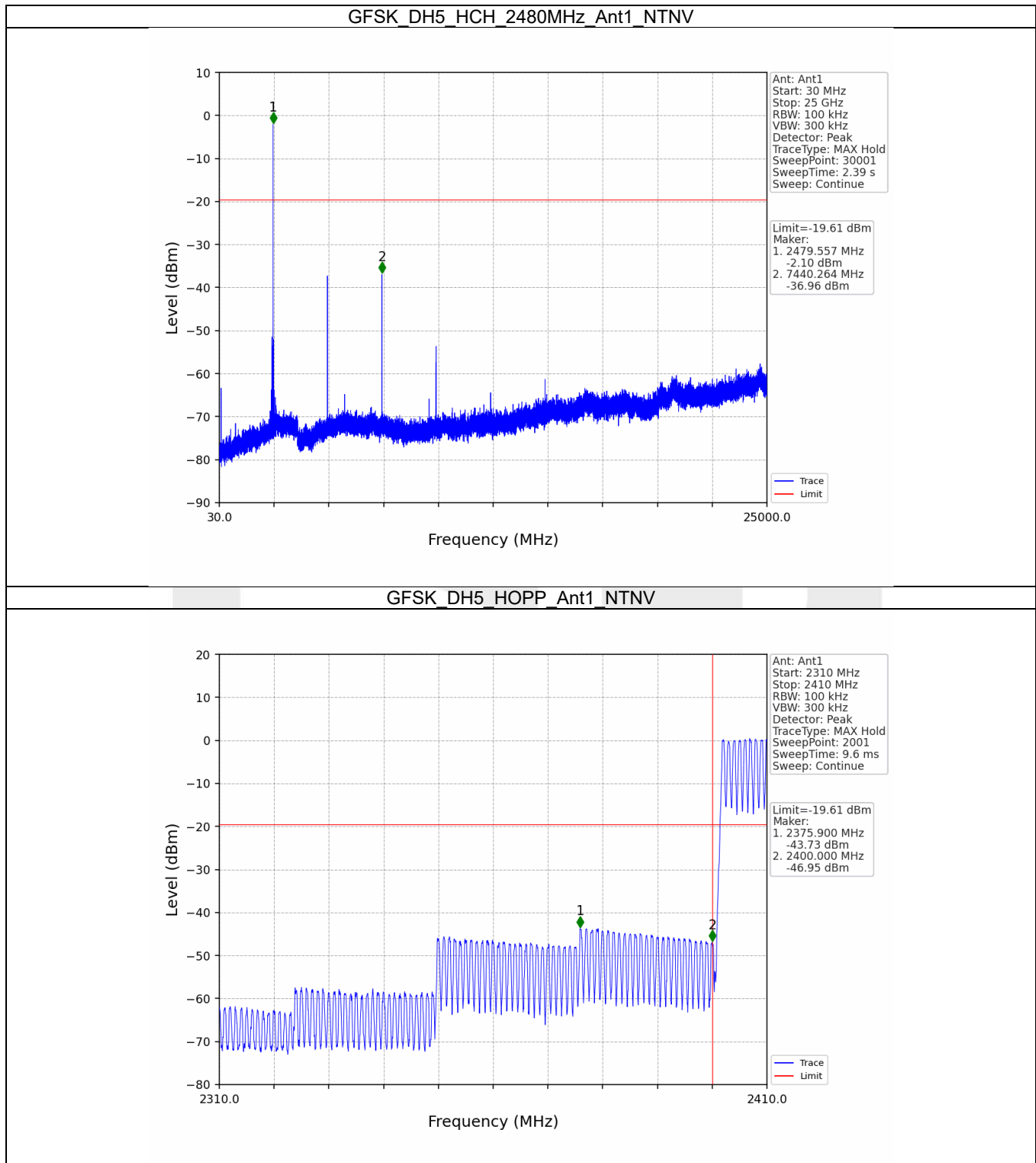
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	0.39	-19.61	Pass
		2441	DH5	1	0.39	-19.61	Pass
		2480	DH5	1	0.39	-19.61	Pass
		HOPP	DH5	1	0.39	-19.61	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	0.23	-19.77	Pass
		2441	2DH5	1	0.23	-19.77	Pass
		2480	2DH5	1	0.23	-19.77	Pass
		HOPP	2DH5	1	0.23	-19.77	Pass
8DPSK	SISO	2402	3DH5	1	0.42	-19.58	Pass
		2441	3DH5	1	0.42	-19.58	Pass
		2480	3DH5	1	0.42	-19.58	Pass
		HOPP	3DH5	1	0.42	-19.58	Pass

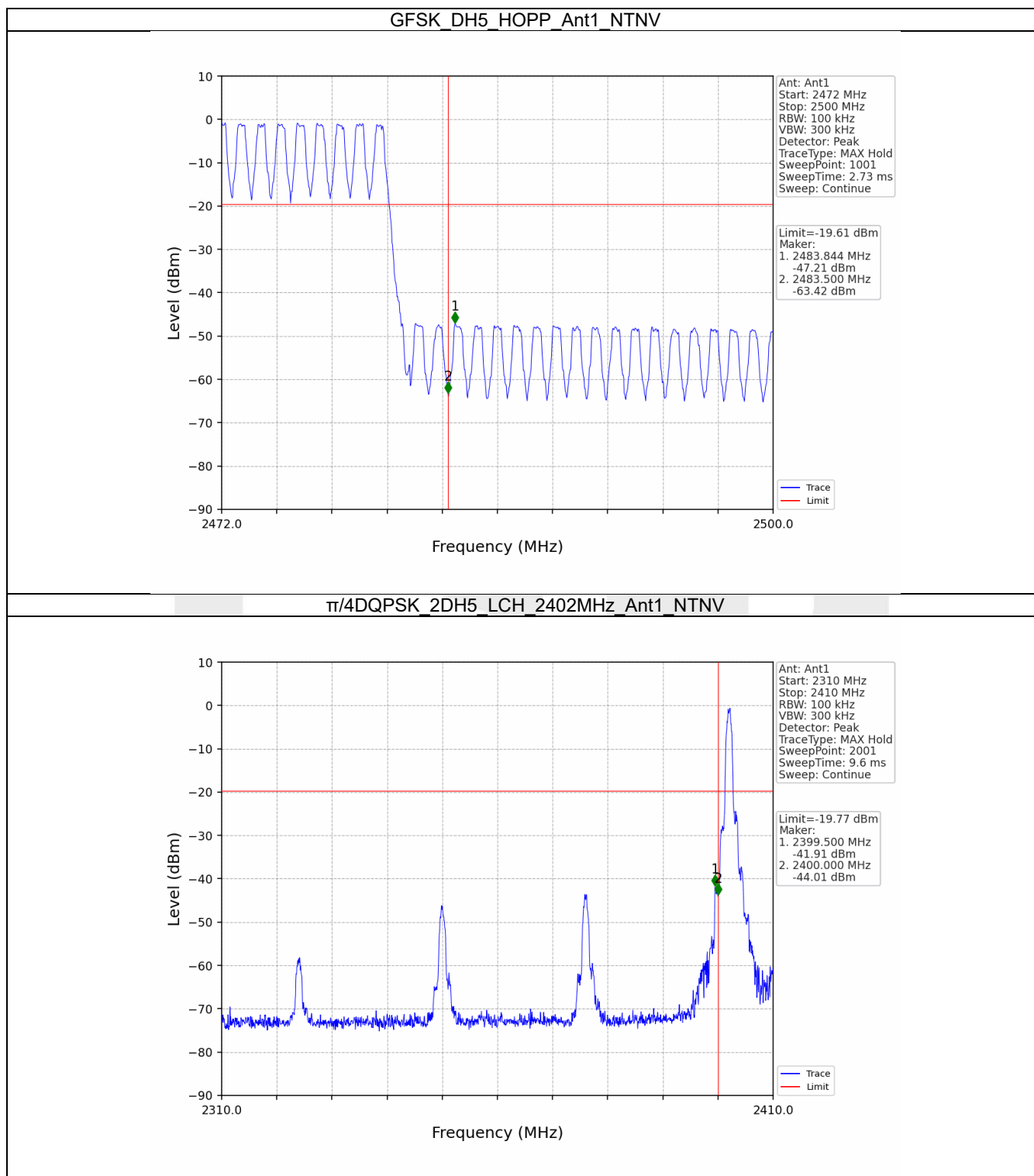
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

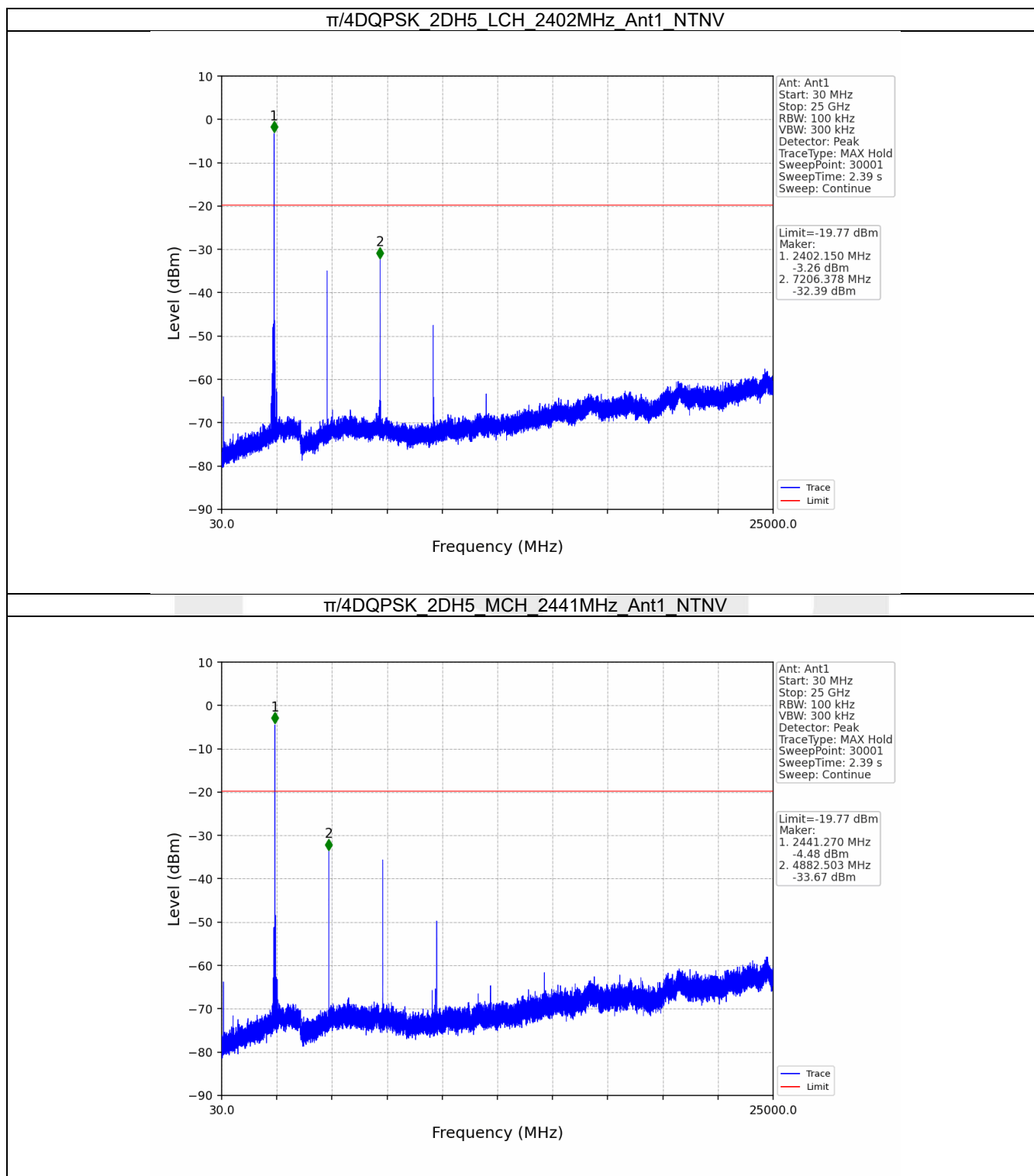
7.2.2 Test Graph

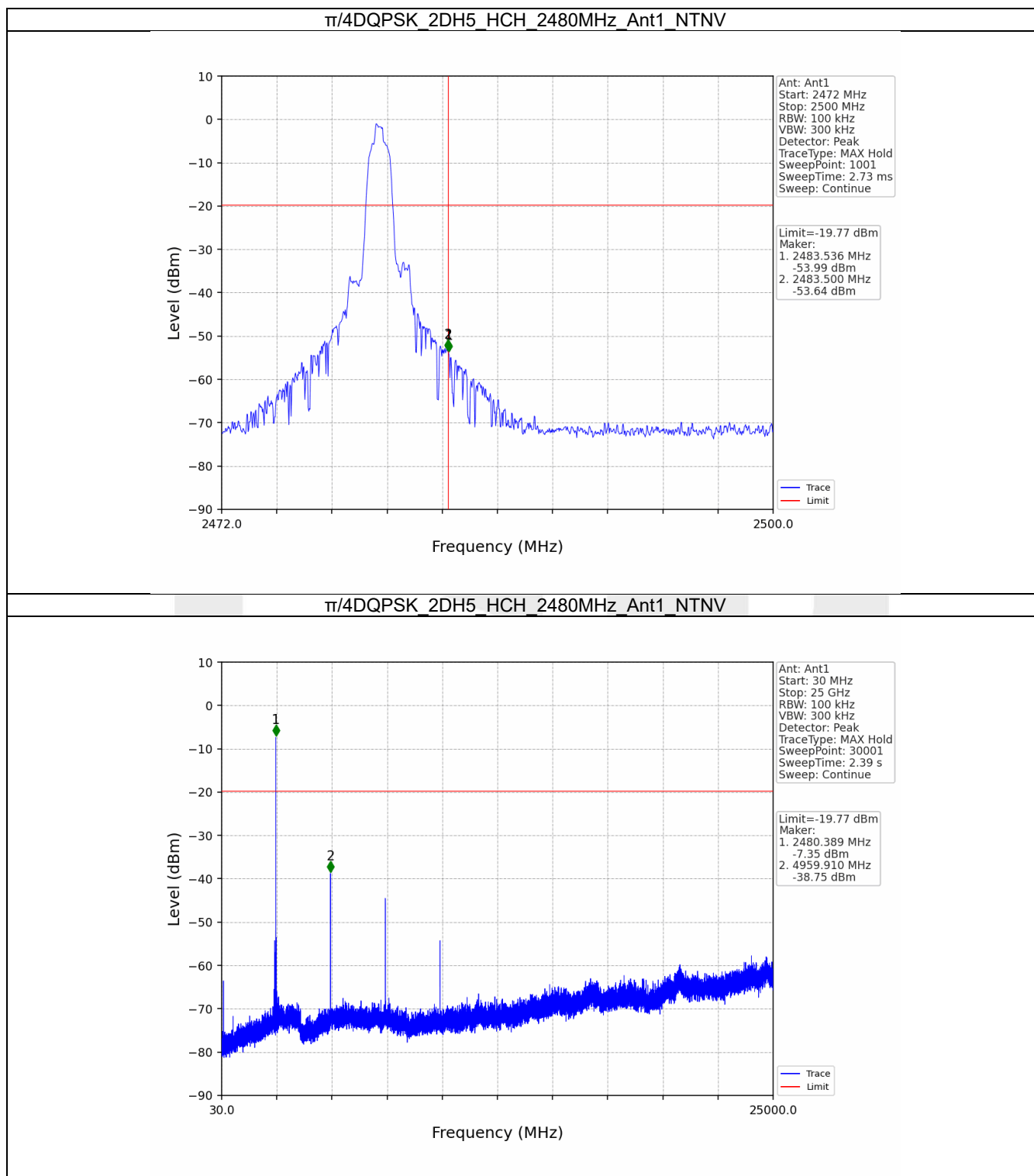


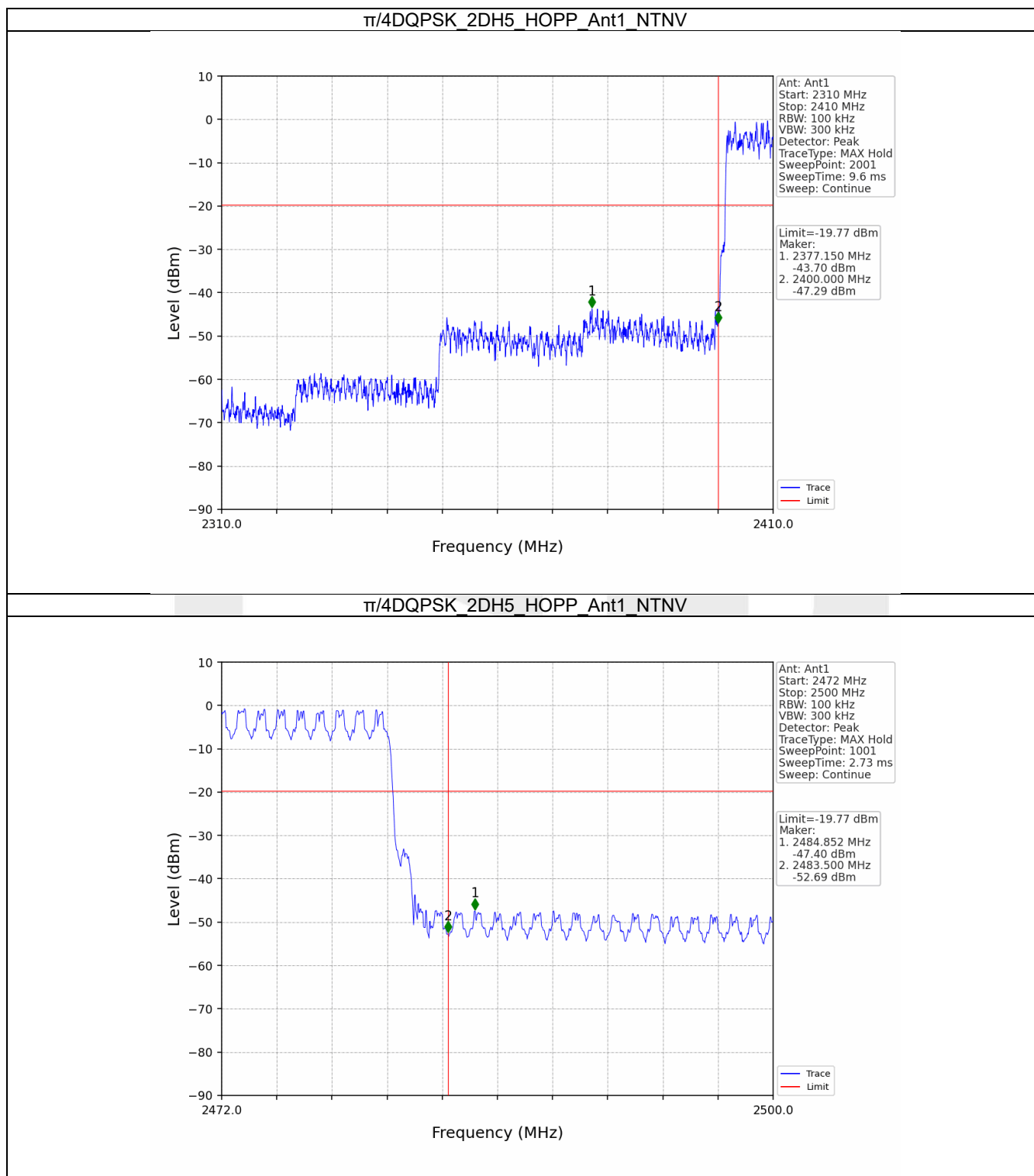


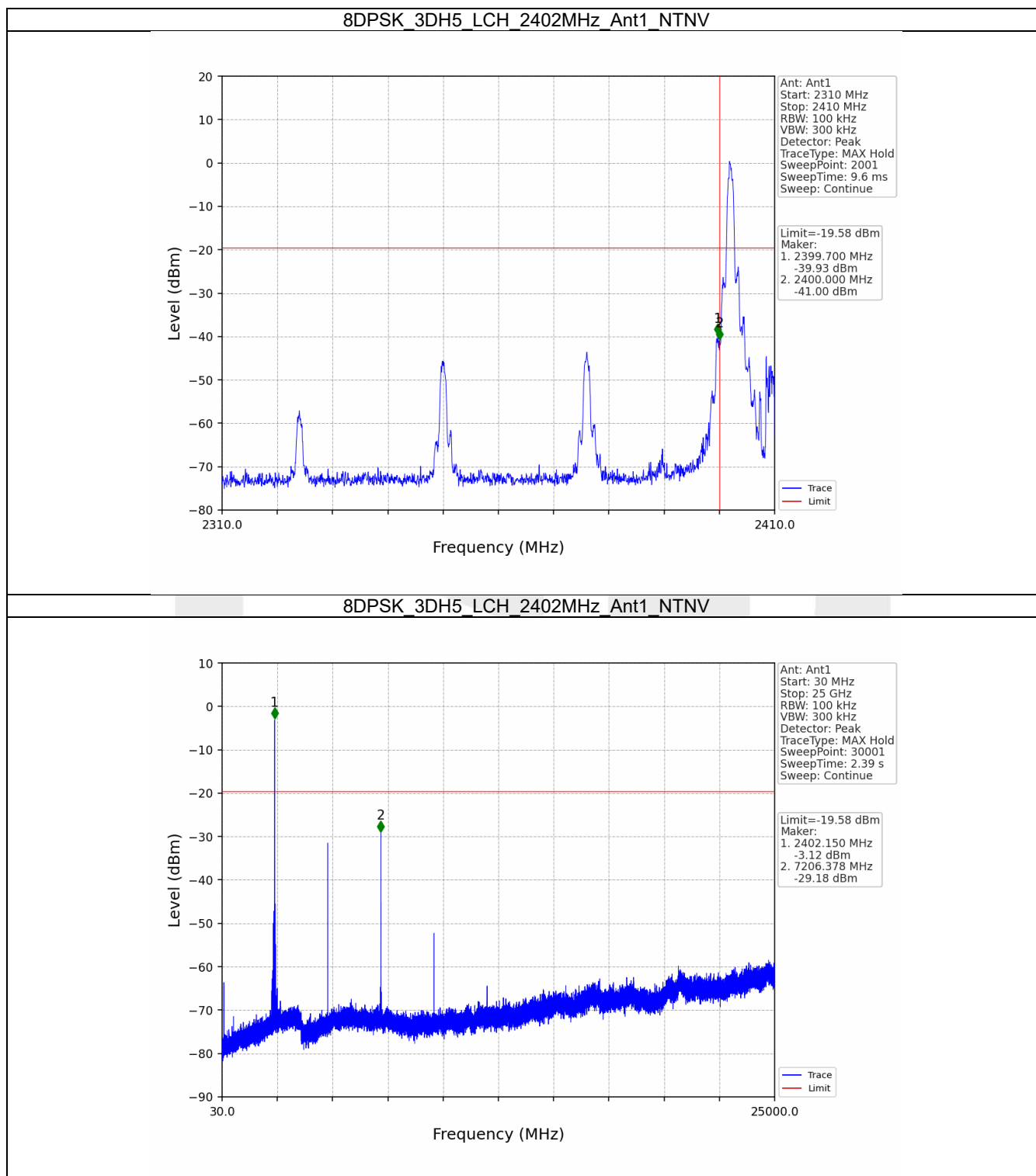


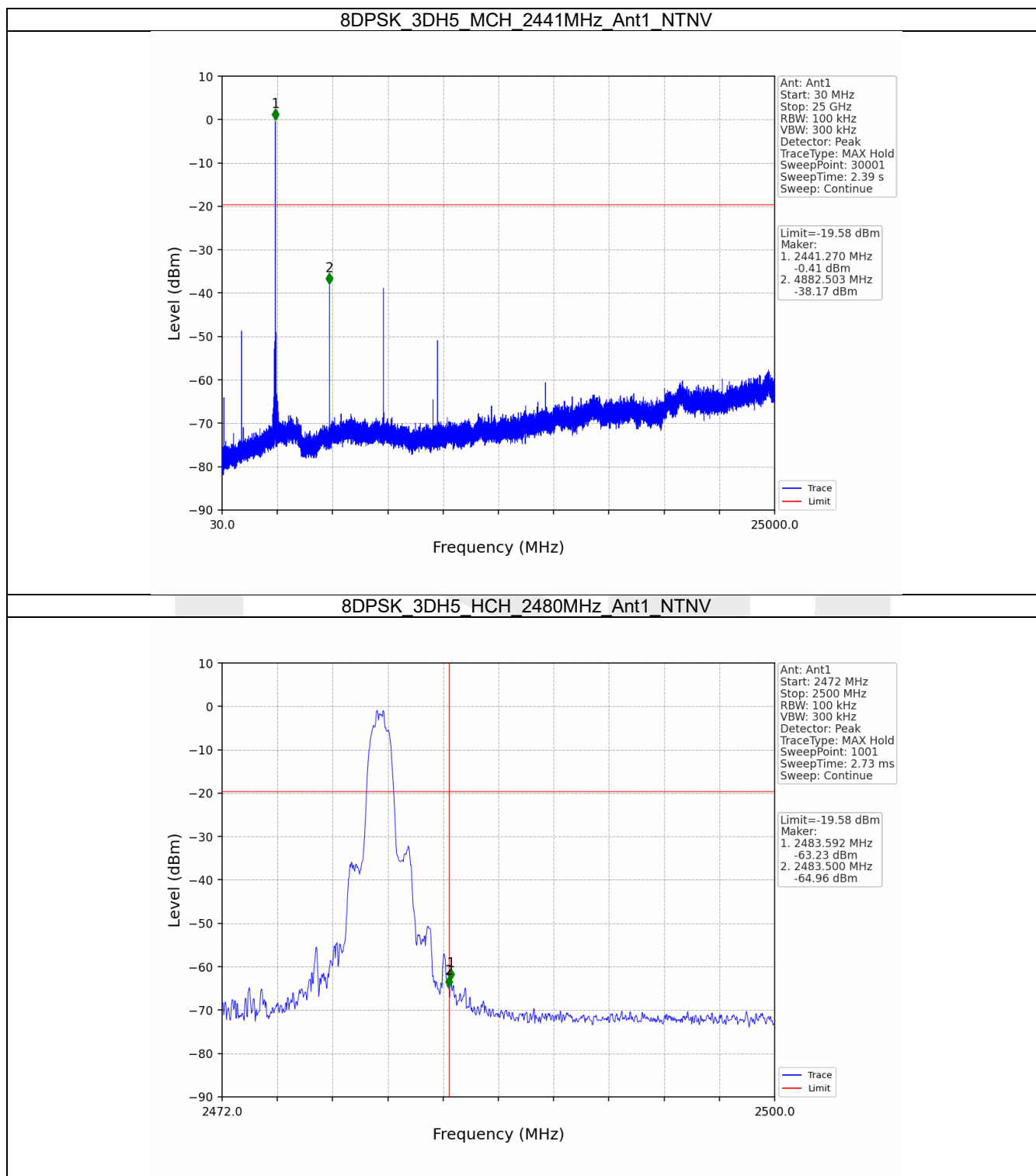


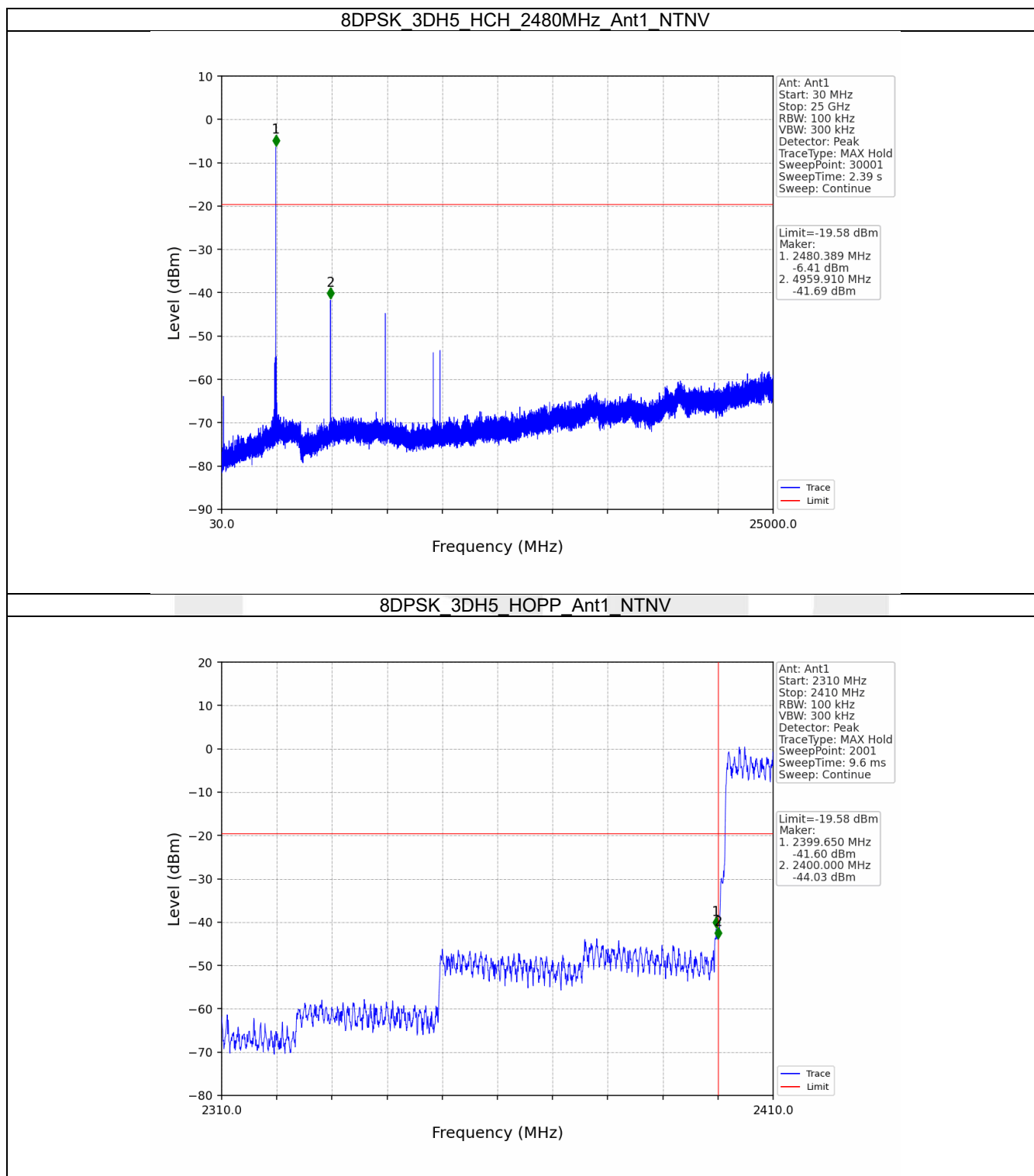


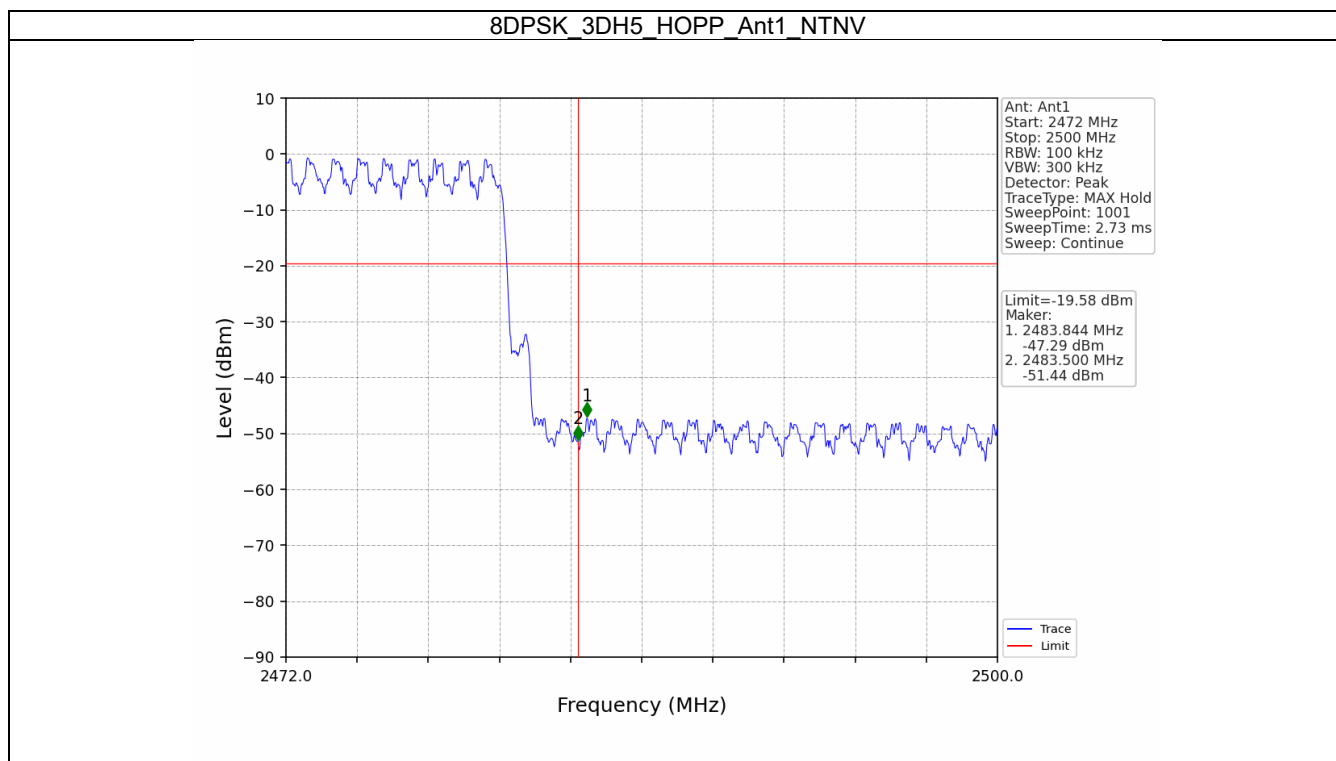












----- End of Report -----