

RF Test Data

For

Project No.:	DLE-251128011R
Client:	Hubei province zuan ma zhi kong technology co., ltd
Manufacturer:	Hubei province zuan ma zhi kong technology co., ltd
Product Description:	Wireless controller
Model Number:	SW-01
Test Engineer:	Alisa Song
Test Date:	2025-12-05

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

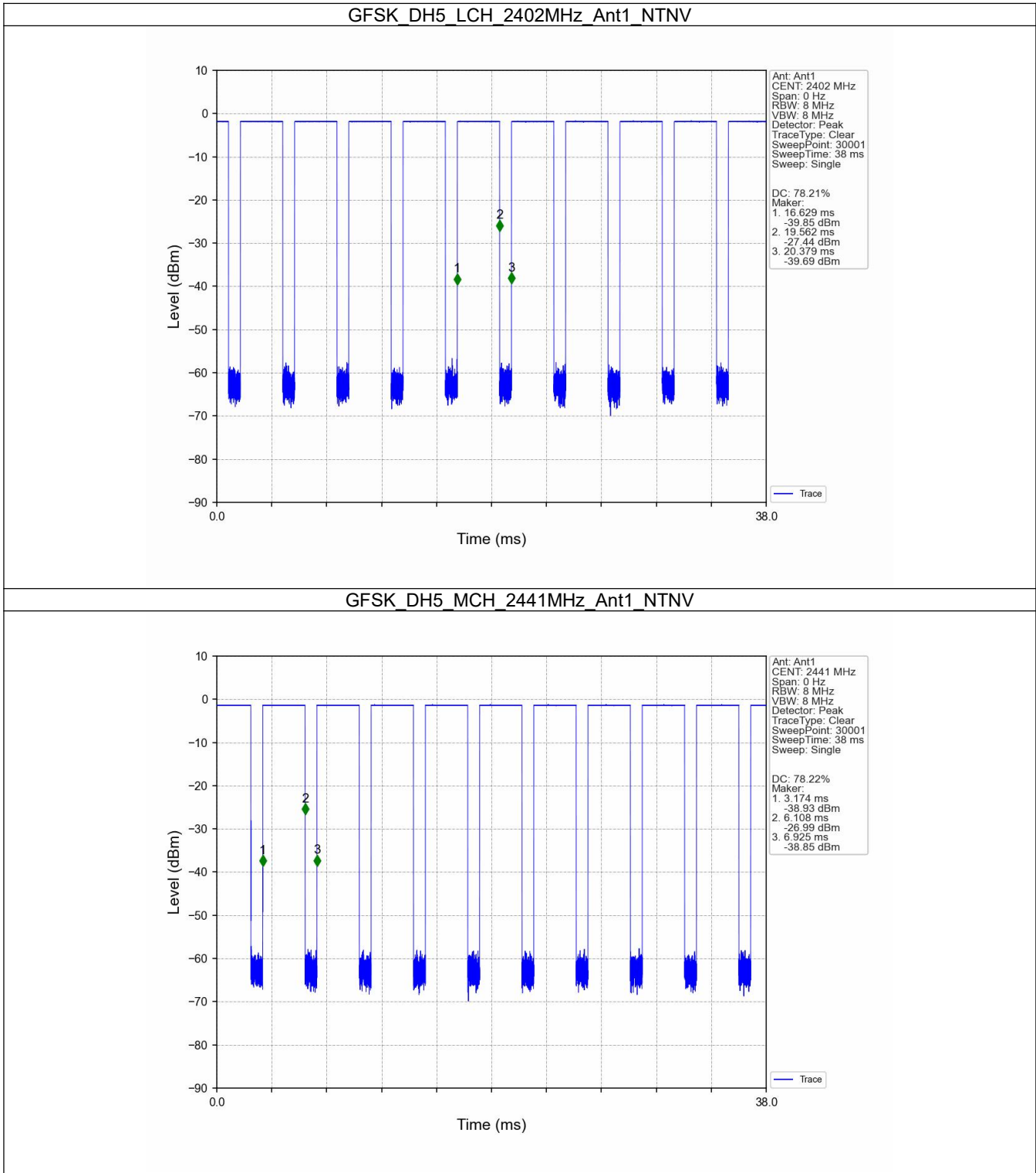
1.1 Test Result

1.1.1 Ant1

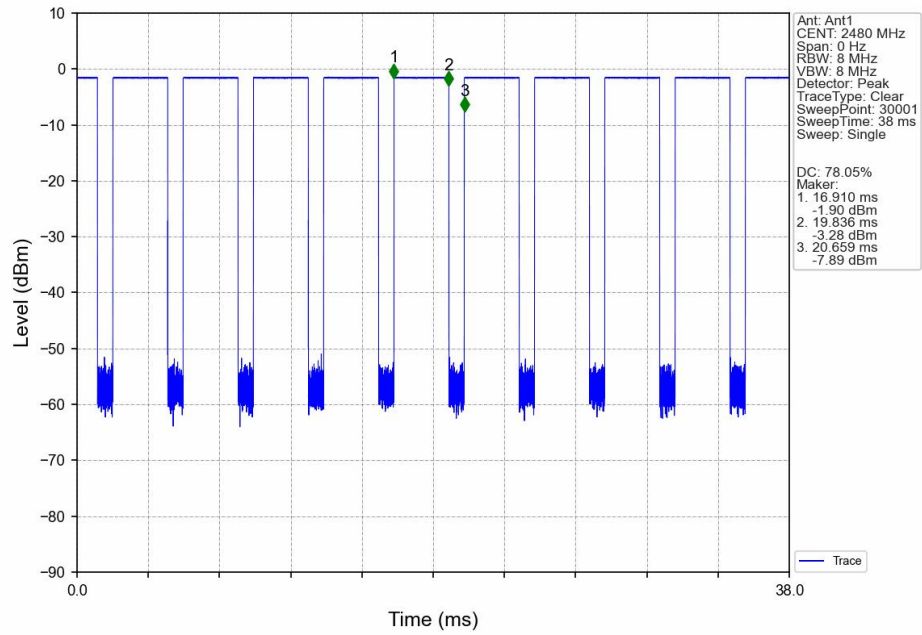
Ant1								
Mode	Tx Type	Frequency (MHz)	Packet Type	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
GFSK	SISO	2402	DH5	2.933	3.750	78.21	1.07	0.03
		2441	DH5	2.934	3.751	78.22	1.07	0.03
		2480	DH5	2.926	3.749	78.05	1.08	0.03
Pi/4DQPSK	SISO	2402	2DH5	2.932	3.749	78.21	1.07	0.03
		2441	2DH5	2.933	3.750	78.21	1.07	0.01
		2480	2DH5	2.939	3.749	78.39	1.06	0.01

1.2 Test Graph

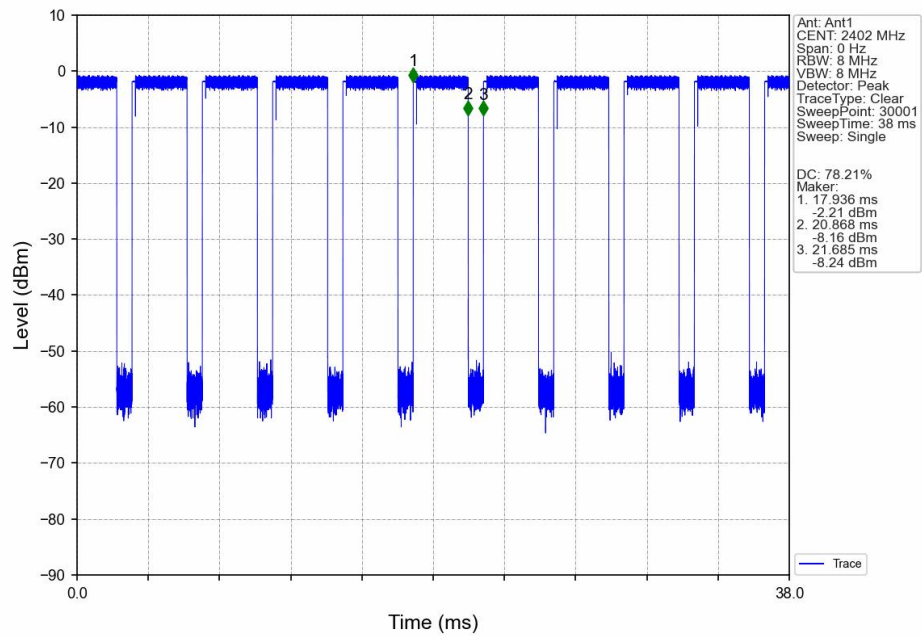
1.2.1 Ant1



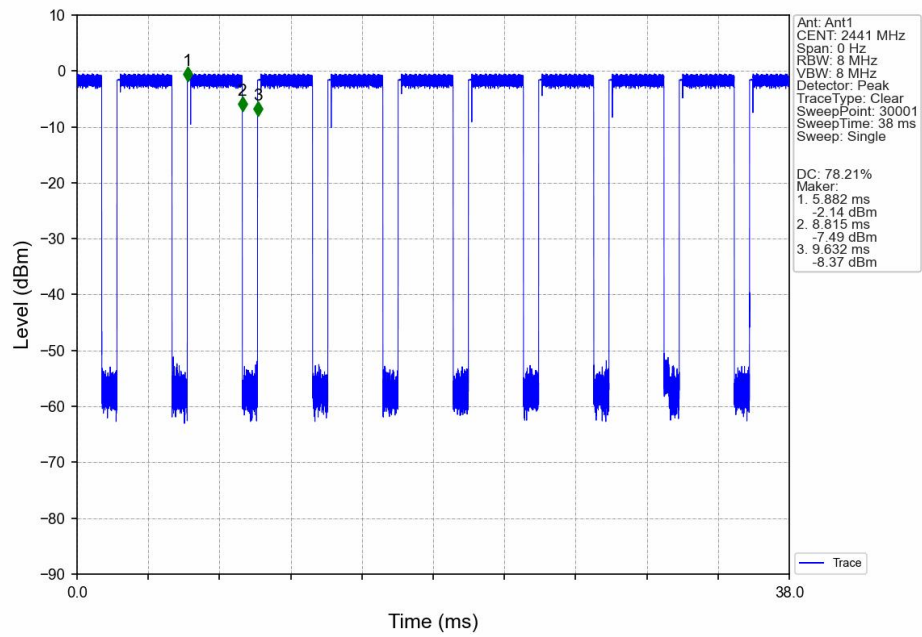
GFSK DH5_HCH_2480MHz_Ant1_NTNV



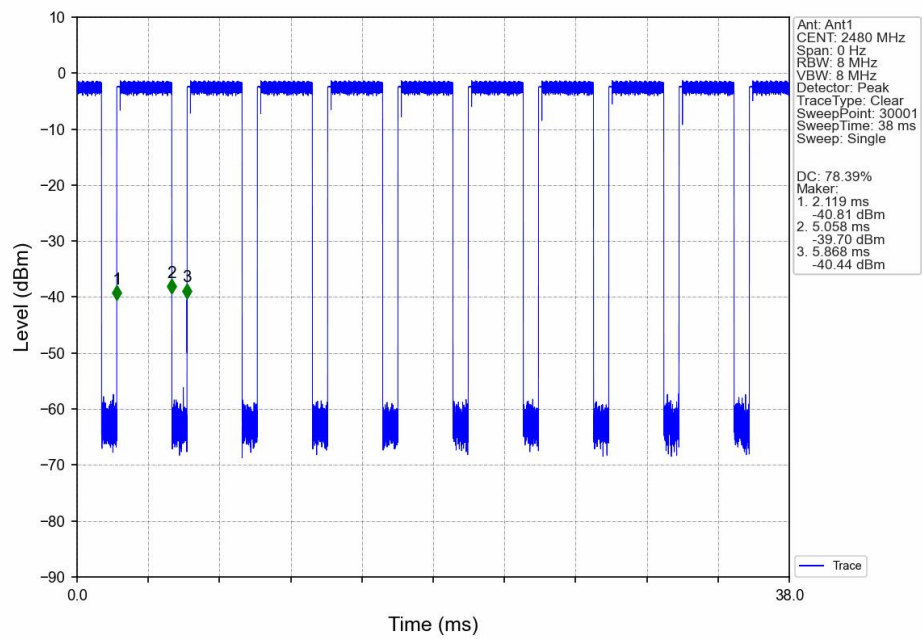
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



2. Bandwidth

2.1 Test Result

2.1.1 OBW

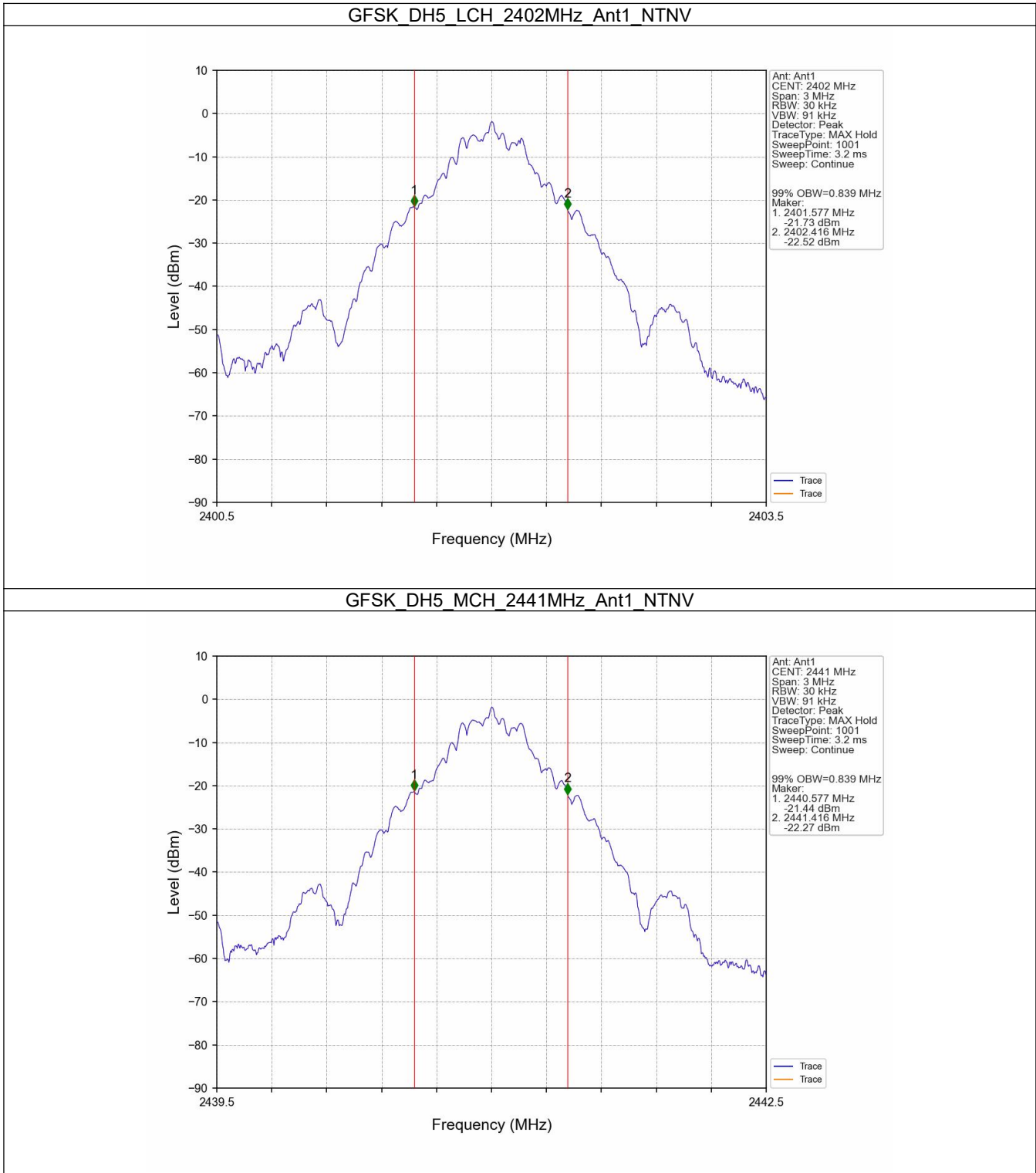
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.839	/	Pass
		2441	DH5	1	0.839	/	Pass
		2480	DH5	1	0.839	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.166	/	Pass
		2441	2DH5	1	1.166	/	Pass
		2480	2DH5	1	1.168	/	Pass

2.1.2 20dB BW

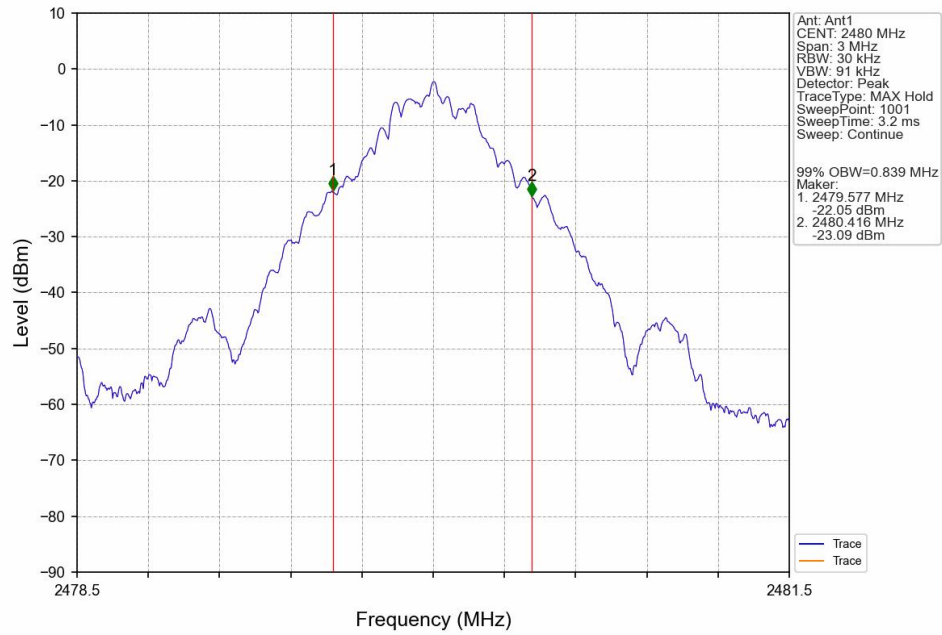
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.858	/	Pass
		2441	DH5	1	0.858	/	Pass
		2480	DH5	1	0.861	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.245	/	Pass
		2441	2DH5	1	1.256	/	Pass
		2480	2DH5	1	1.256	/	Pass

2.2 Test Graph

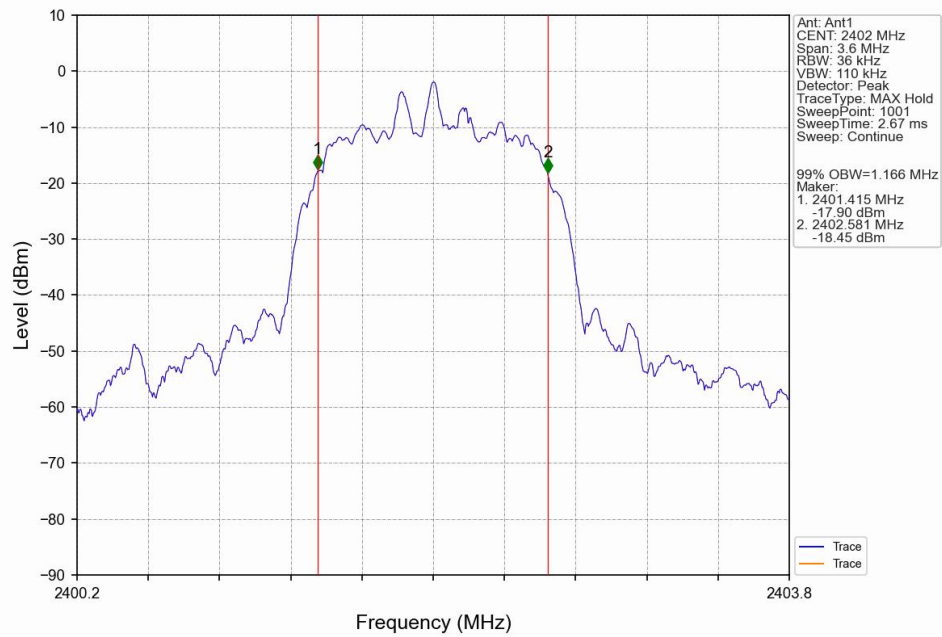
2.2.1 OBW



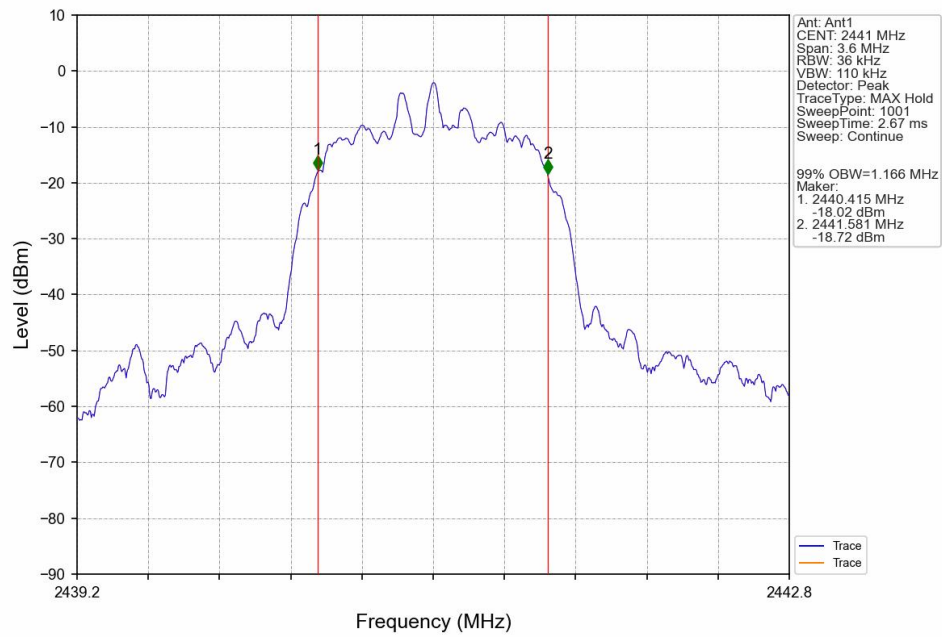
GFSK DH5 HCH 2480MHz Ant1_NTNV



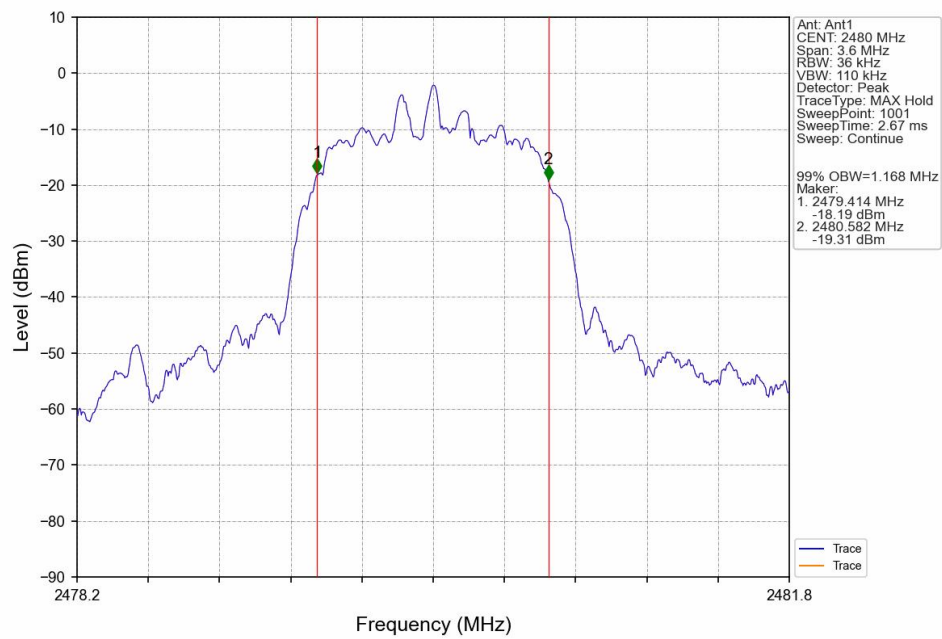
PI/4DQPSK 2DH5 LCH 2402MHz Ant1_NTNV



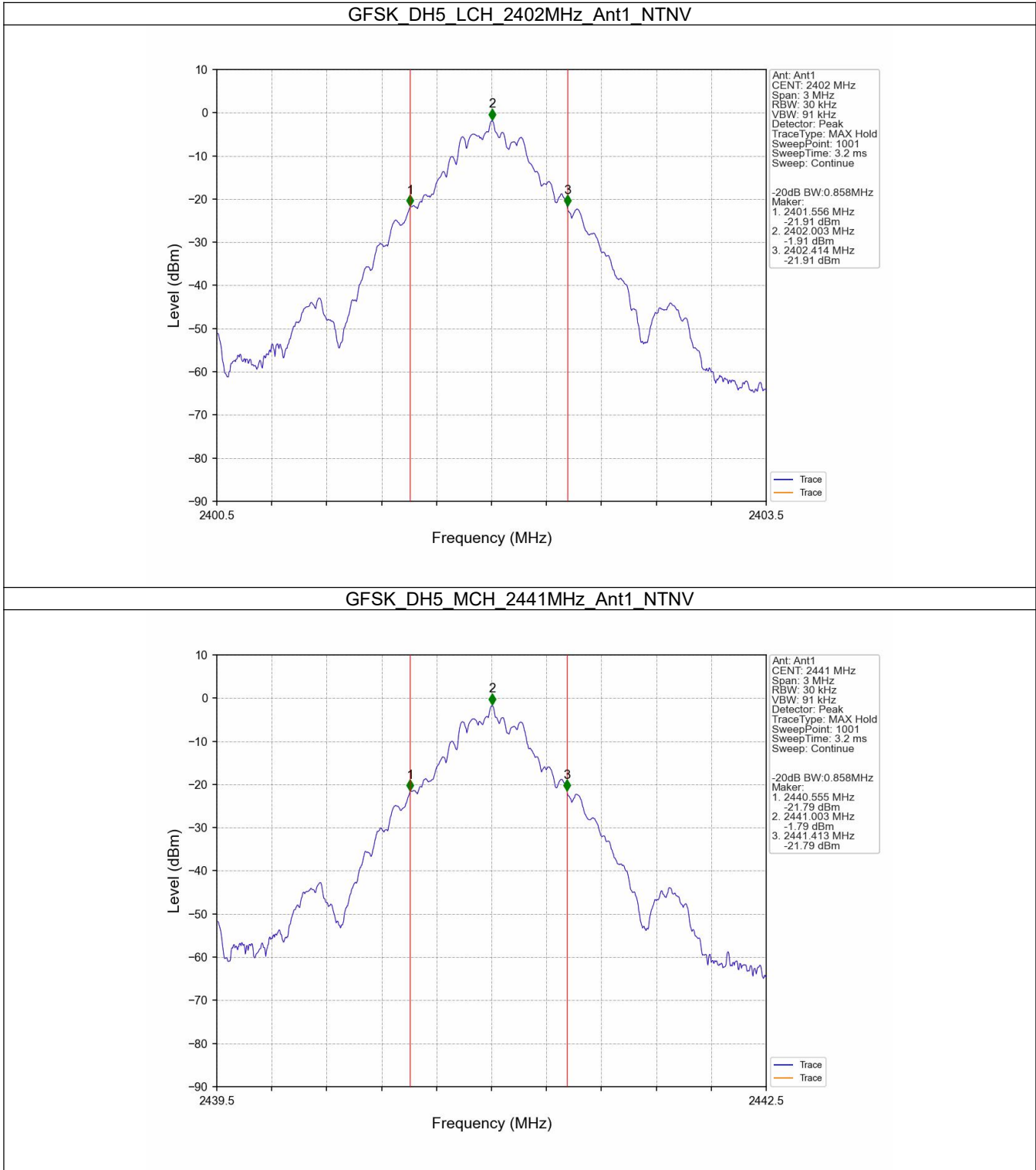
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



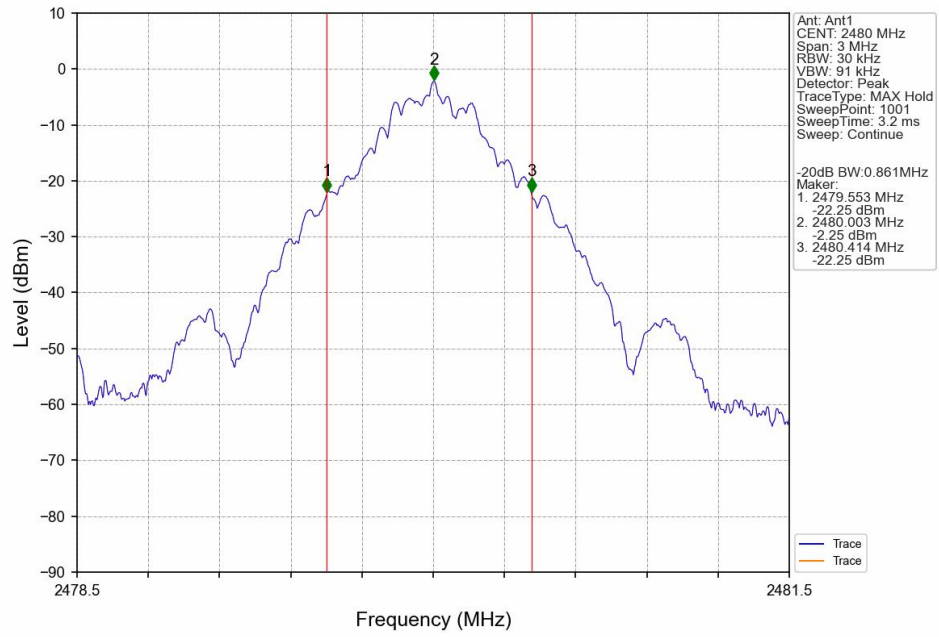
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



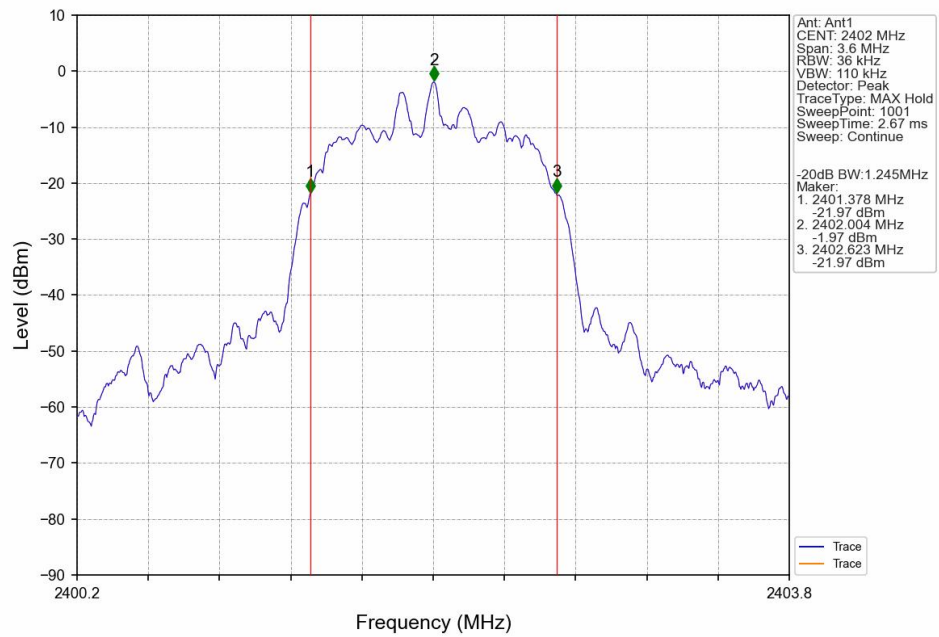
2.2.2 20dB BW



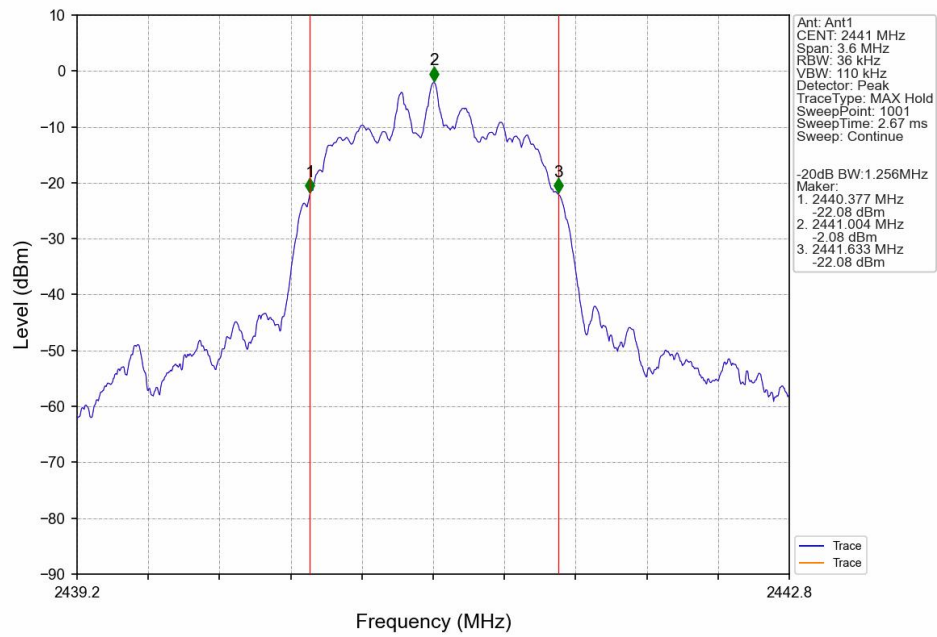
GFSK DH5 HCH 2480MHz Ant1 NTN



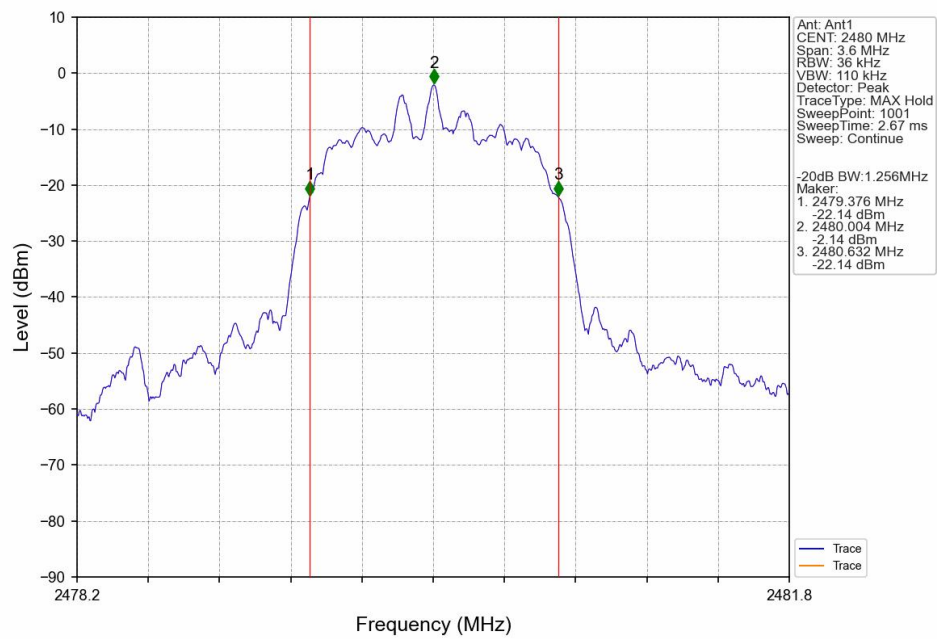
Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN



Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



3. Maximum Conducted Output Power

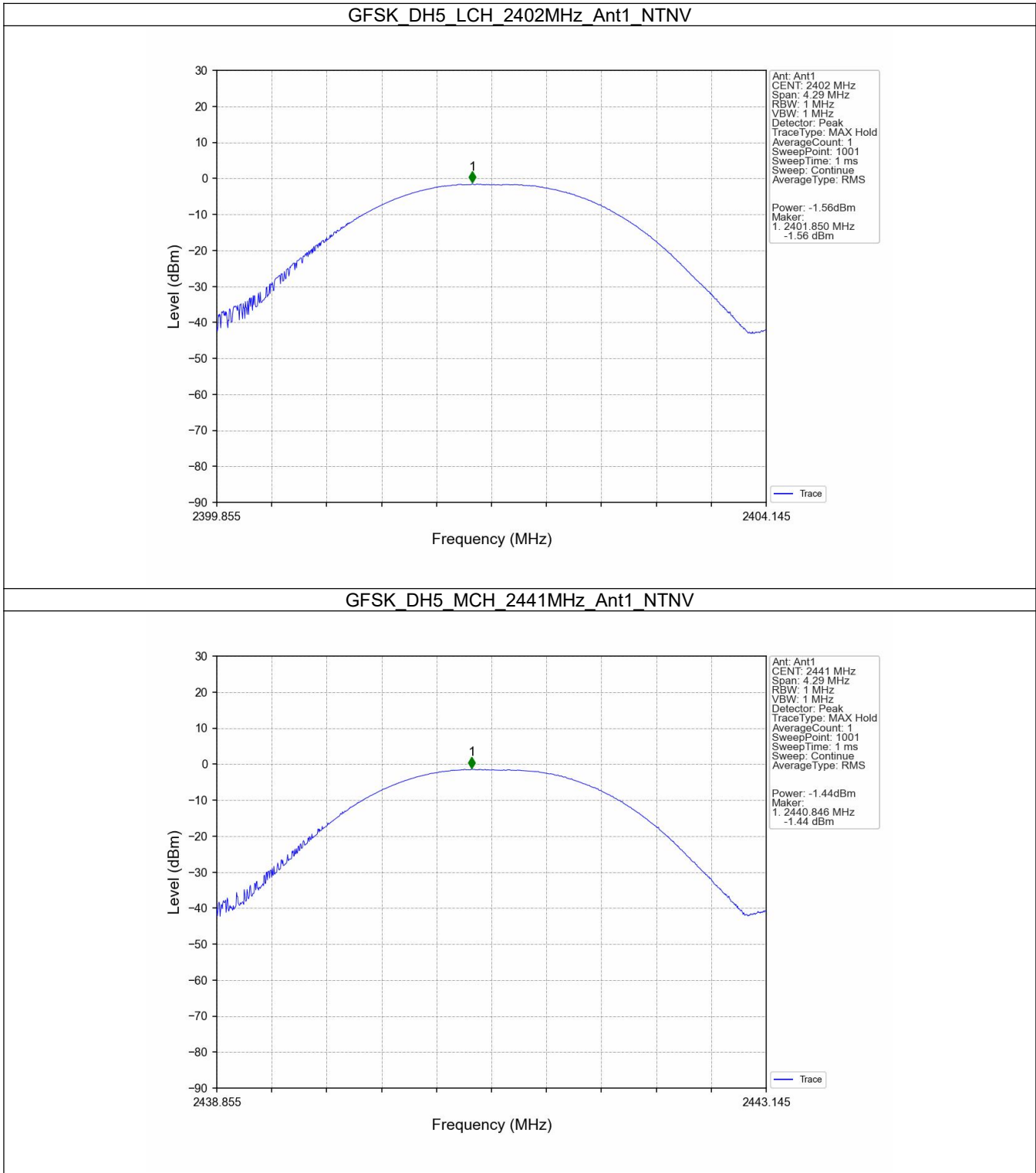
3.1 Test Result

3.1.1 Power

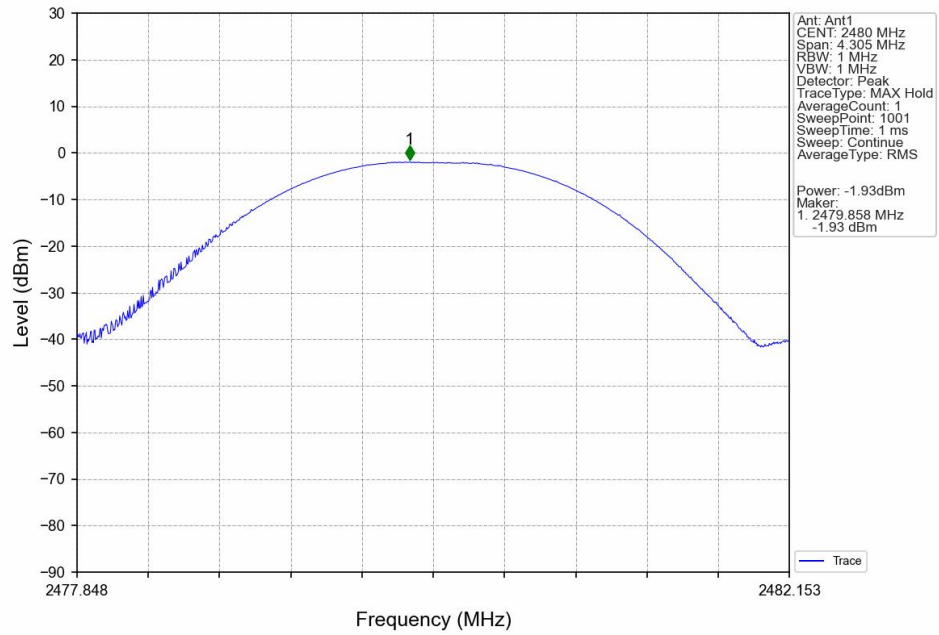
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-1.56	<=30	Pass
		2441	DH5	-1.44	<=30	Pass
		2480	DH5	-1.93	<=30	Pass
Pi/4DQPSK	SISO	2402	2DH5	-0.92	<=20.97	Pass
		2441	2DH5	-1.05	<=20.97	Pass
		2480	2DH5	-1.13	<=20.97	Pass
Note1: Antenna Gain: Ant1: -0.58dBi;						

3.2 Test Graph

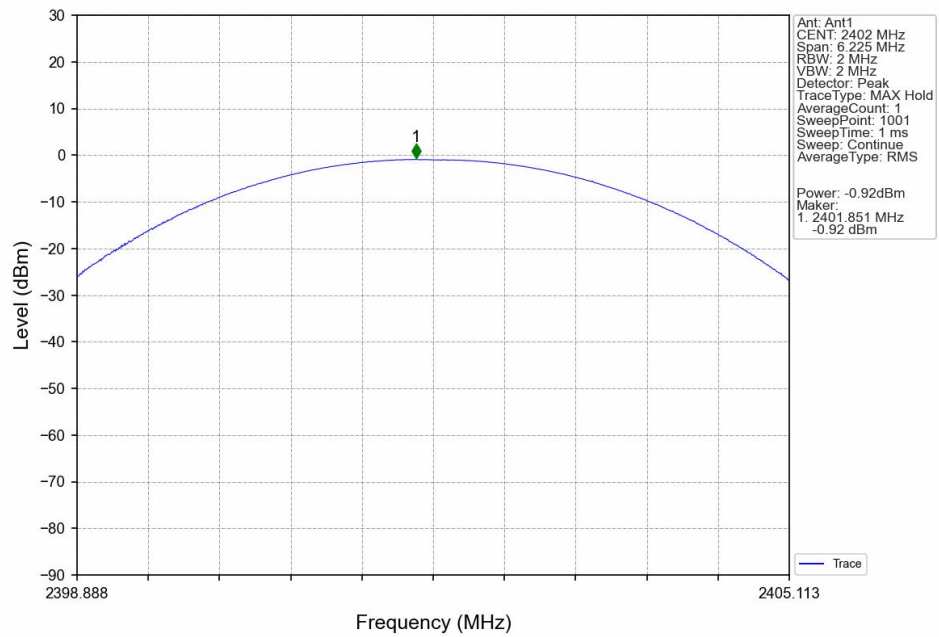
3.2.1 Power



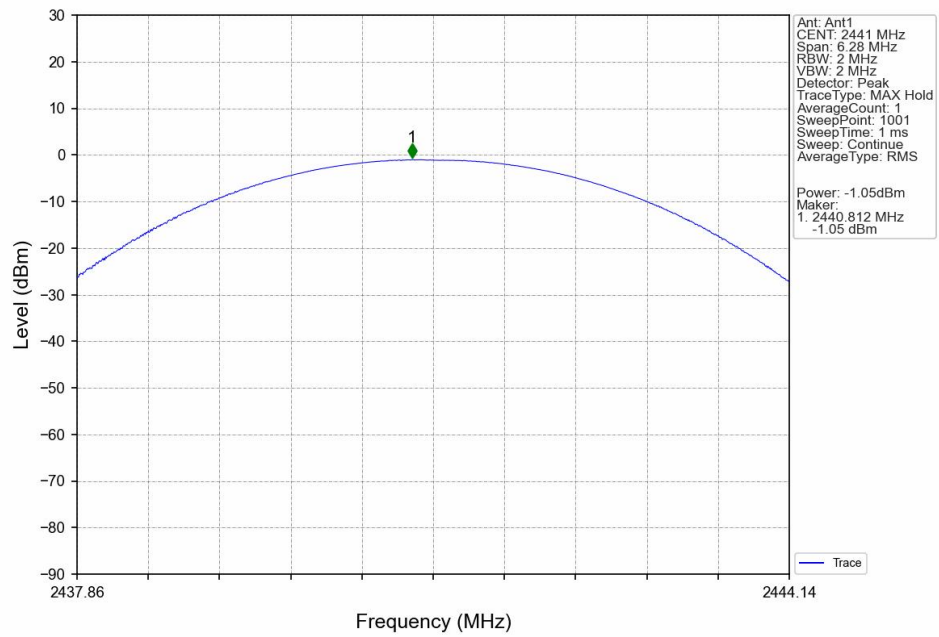
GFSK DH5 HCH 2480MHz Ant1 NTN



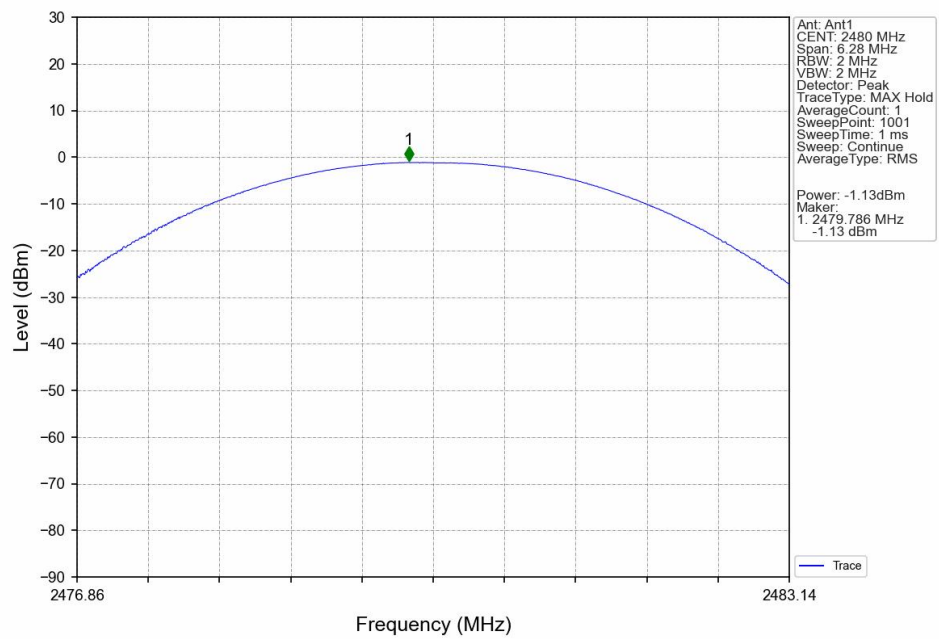
Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN



Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



4. Carrier Frequency Separation

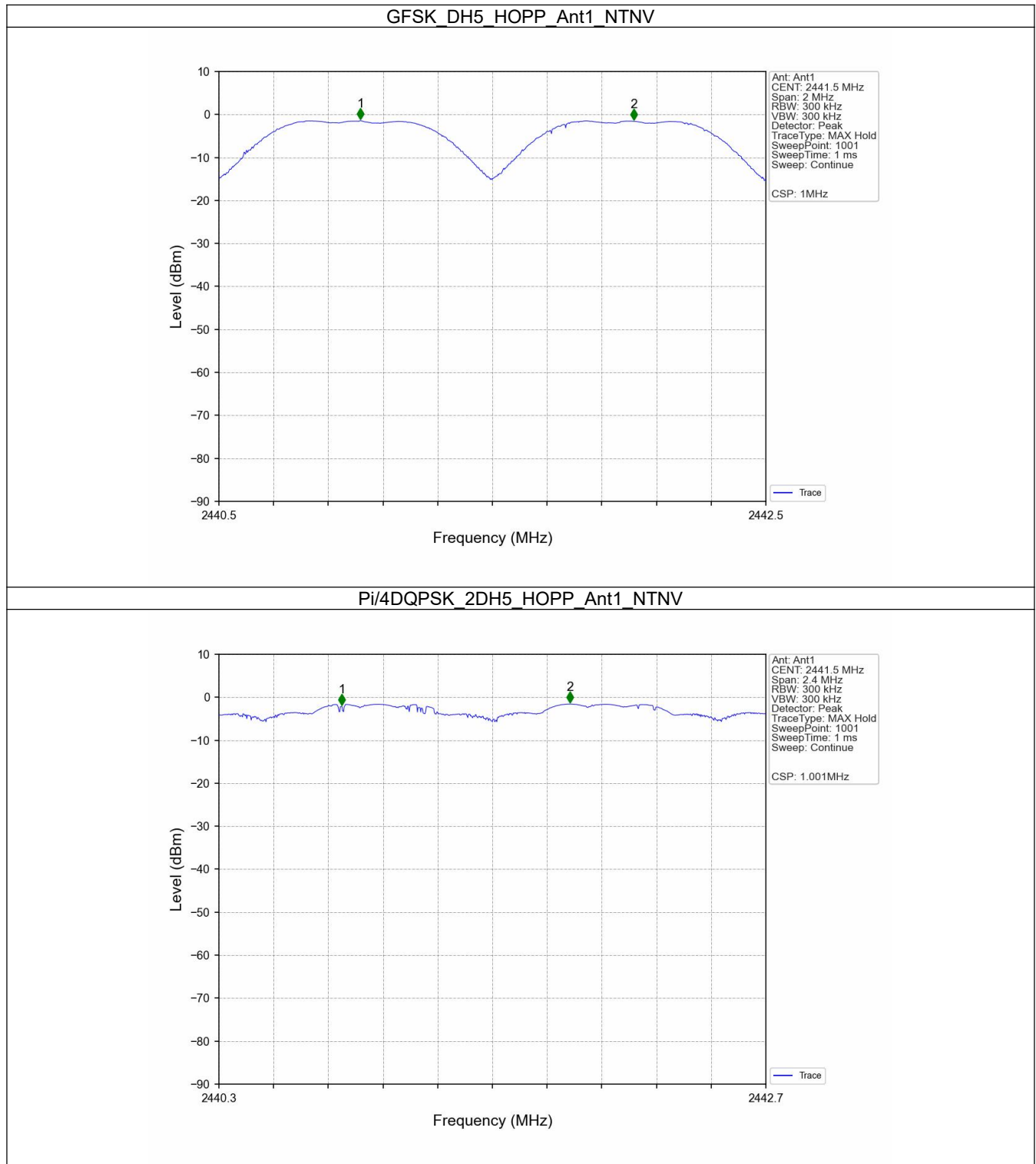
4.1 Test Result

4.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.000	0.861	≥ 0.861	Pass
PI/4DQPSK	SISO	HOPP	2DH5	1.001	1.256	≥ 0.837	Pass

4.2 Test Graph

4.2.1 Ant1



5. Number of Hopping Frequencies

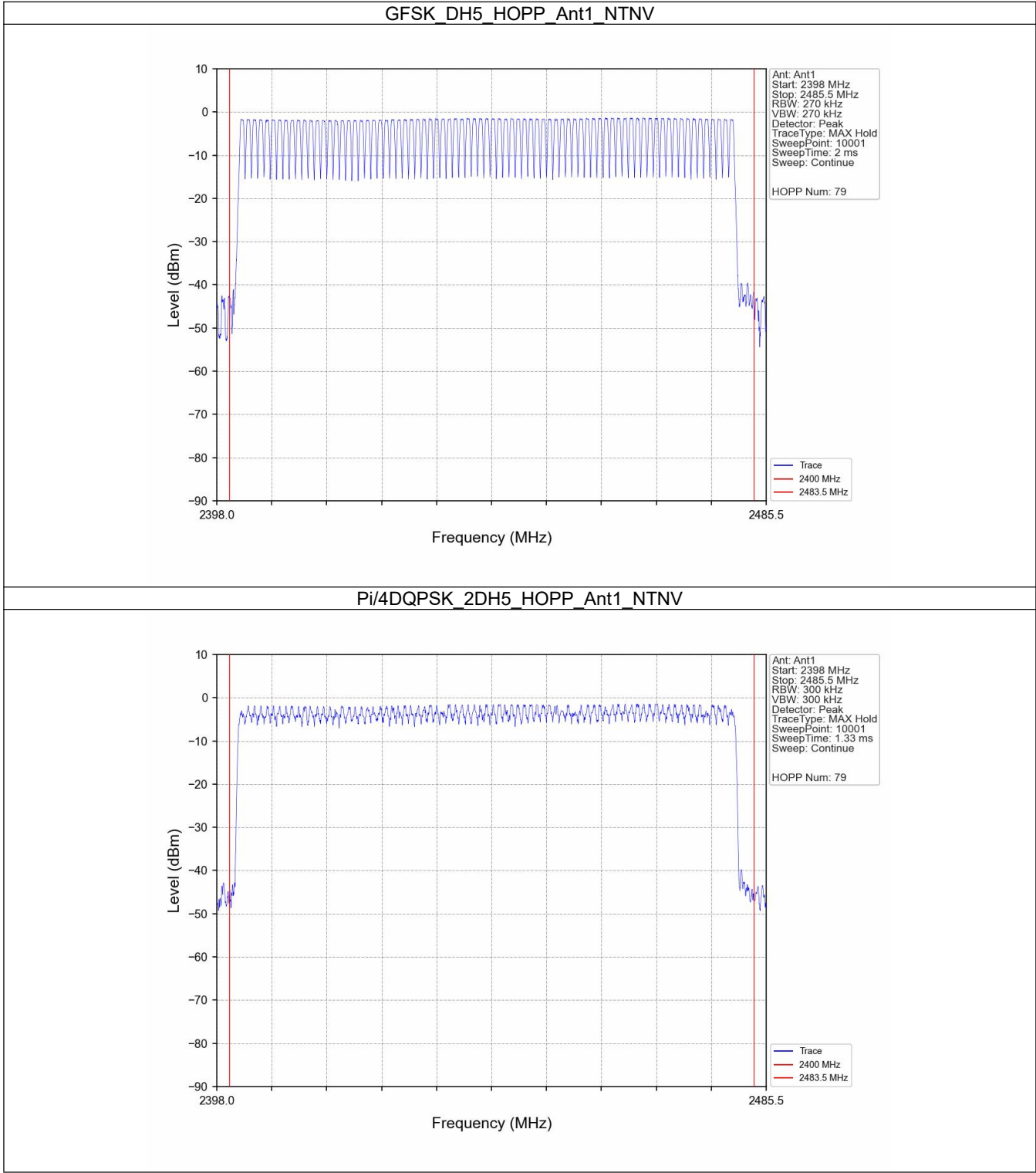
5.1 Test Result

5.1.1 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

5.2 Test Graph

5.2.1 HoppNum



6. Time of Occupancy (Dwell Time)

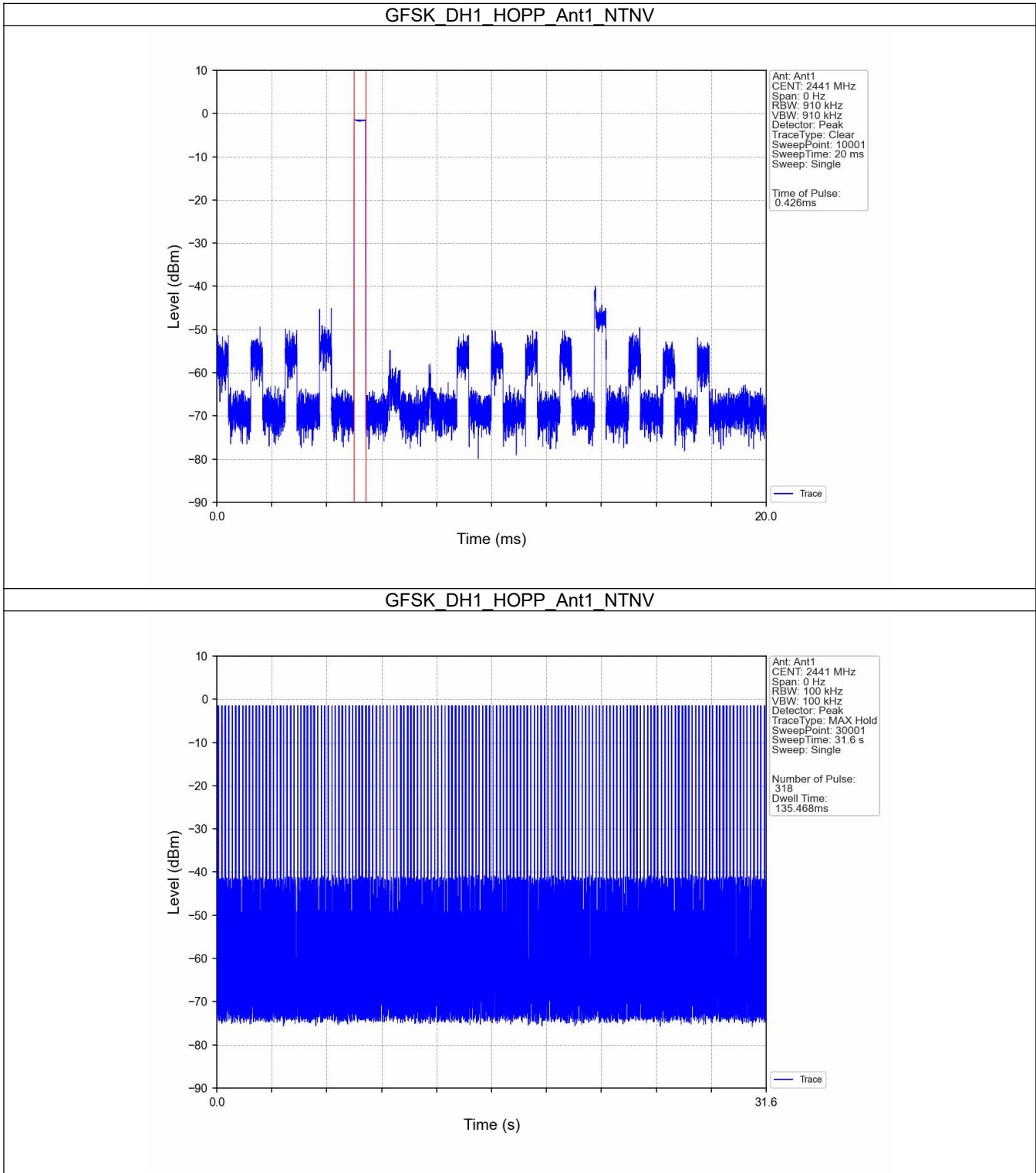
6.1 Test Result

6.1.1 Ant1

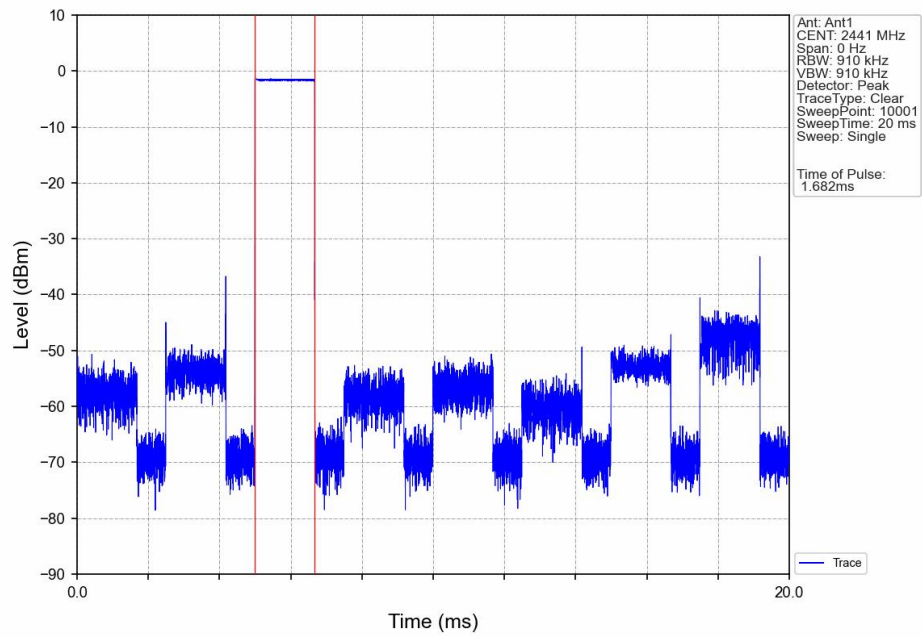
Ant1									
Mode	Tx Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.426	31.600	318	135.468	<=400	Pass
			DH3	1.682	31.600	173	290.986	<=400	Pass
			DH5	2.930	31.600	97	284.210	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.426	31.600	320	136.320	<=400	Pass
			2DH3	1.682	31.600	169	284.258	<=400	Pass
			2DH5	2.936	31.600	101	296.536	<=400	Pass

6.2 Test Graph

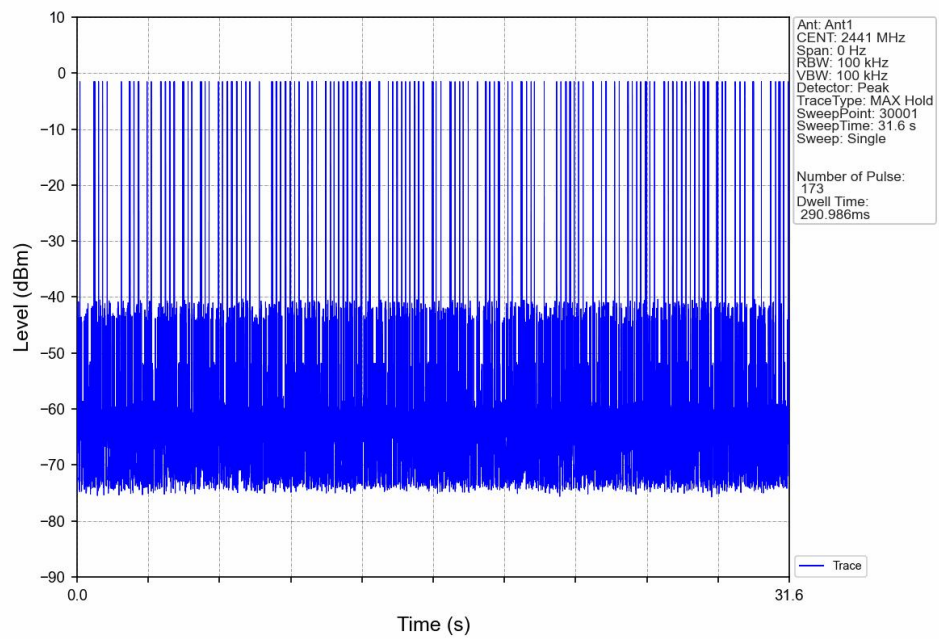
6.2.1 Ant1



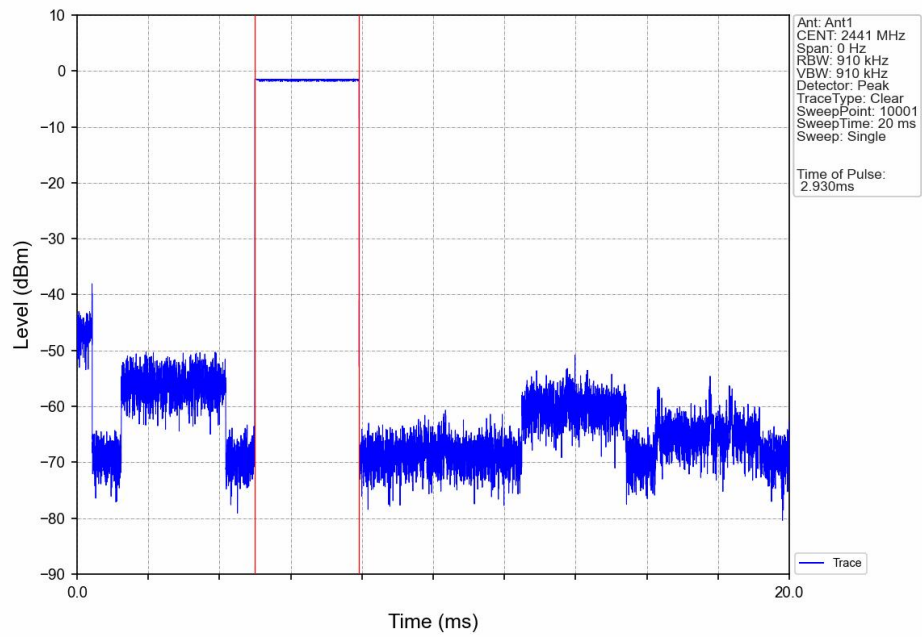
GFSK_DH3_HOPP_Ant1_NTNV



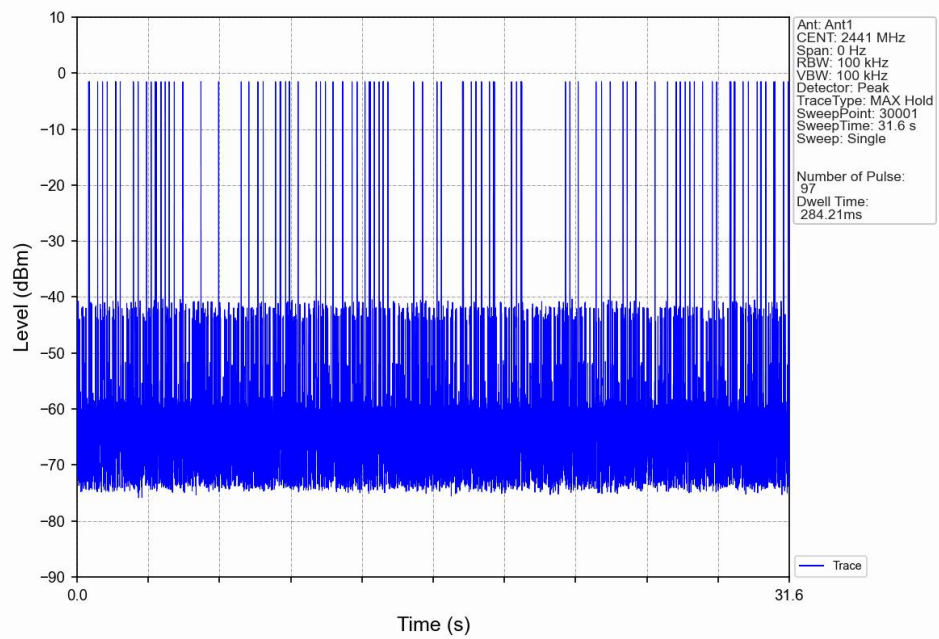
GFSK_DH3_HOPP_Ant1_NTNV



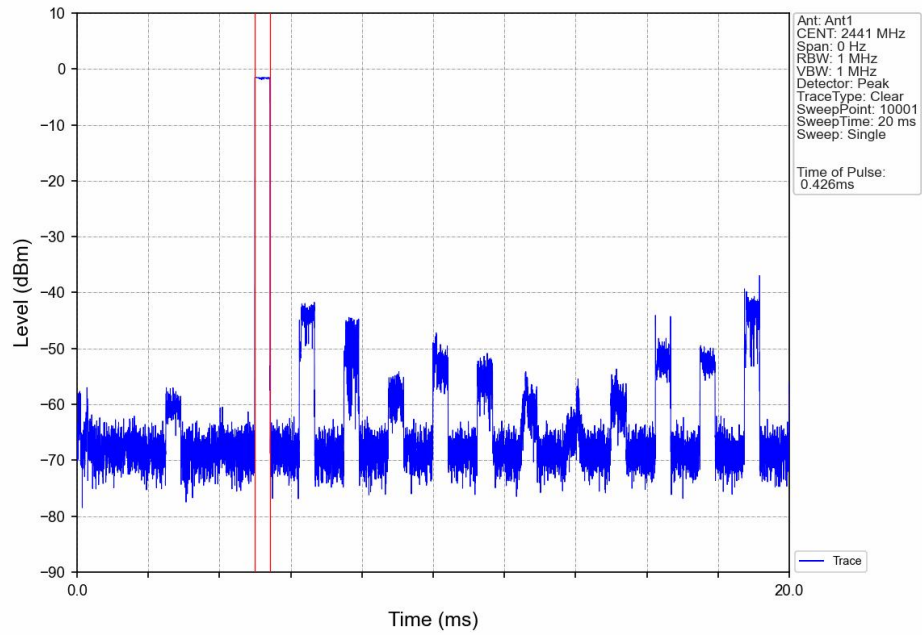
GFSK_DH5_HOPP_Ant1_NTNV



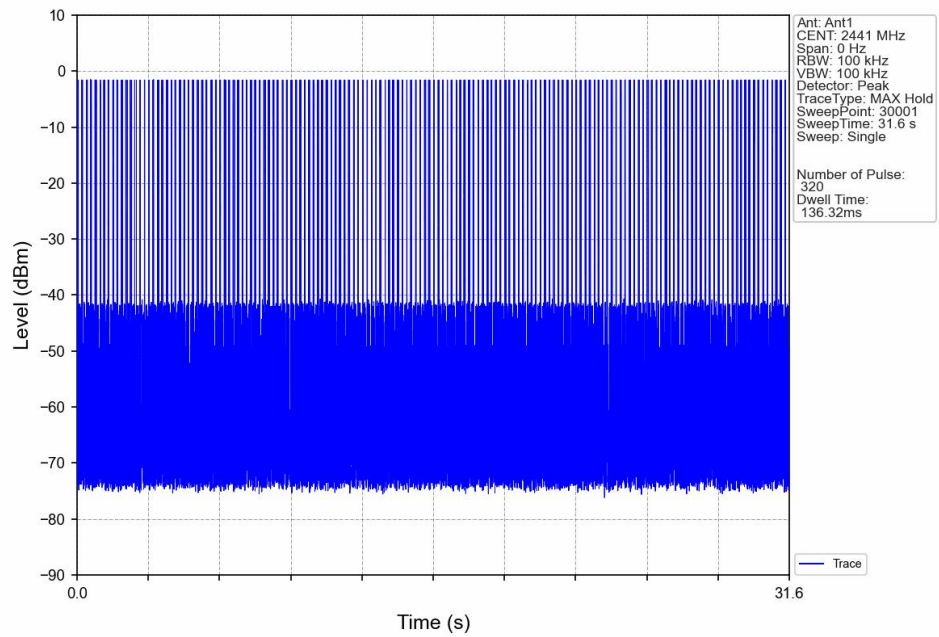
GFSK_DH5_HOPP_Ant1_NTNV



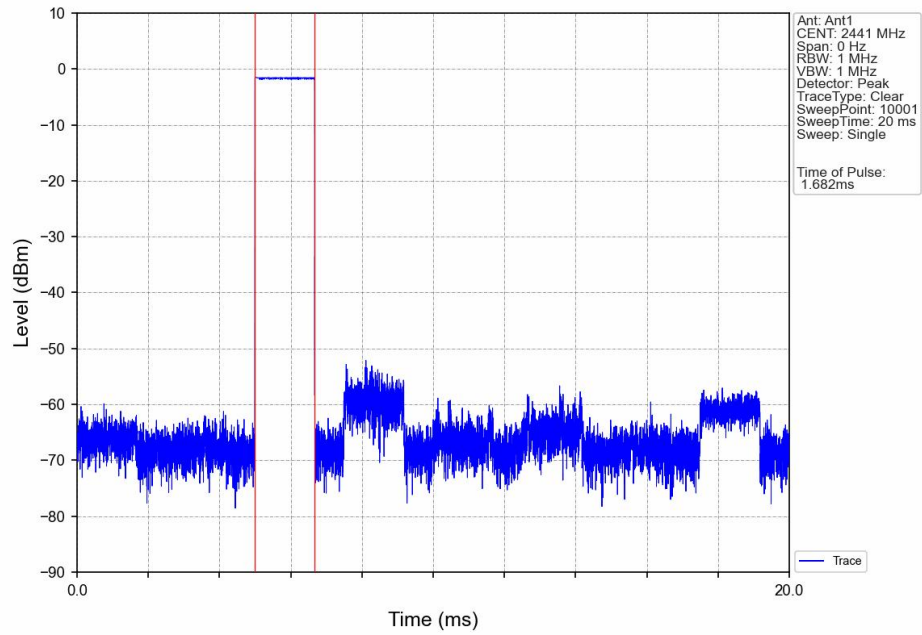
Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



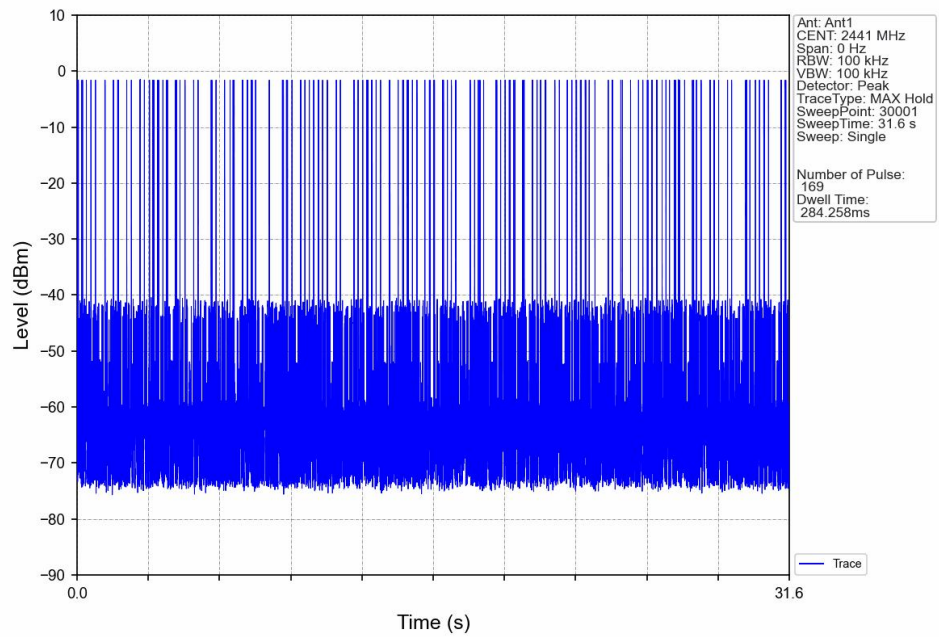
Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



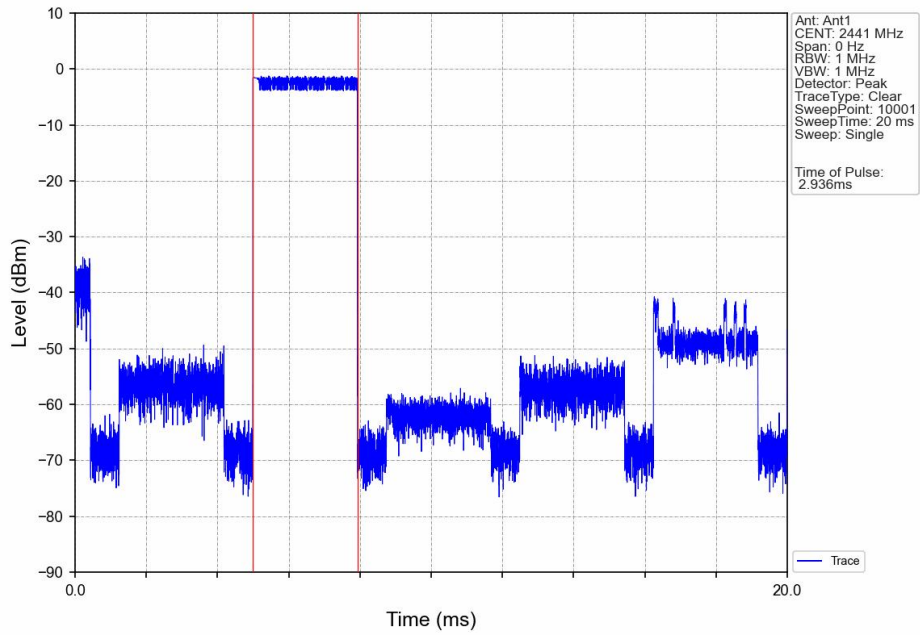
Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV



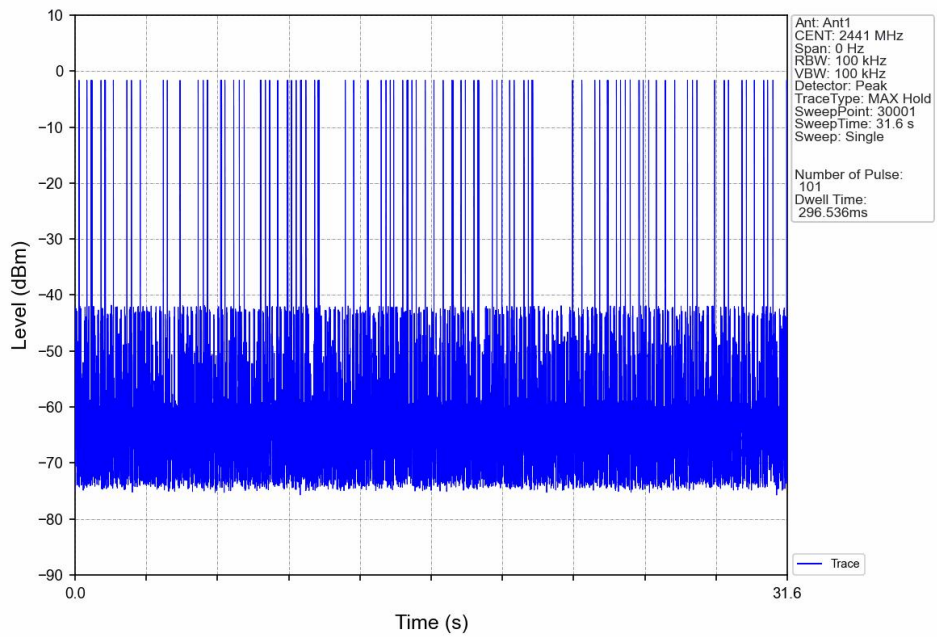
Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



7. Unwanted Emissions In Non-restricted Frequency Bands

7.1 Test Result

7.1.1 Ref

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	-1.89
		2441	DH5	1	-1.74
		2480	DH5	1	-2.22
		HOPP	DH5	1	-1.43
					-1.43
Pi/4DQPSK	SISO	2402	2DH5	1	-1.93
		2441	2DH5	1	-2.03
		2480	2DH5	1	-2.15
		HOPP	2DH5	1	-1.49
					-1.49

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.

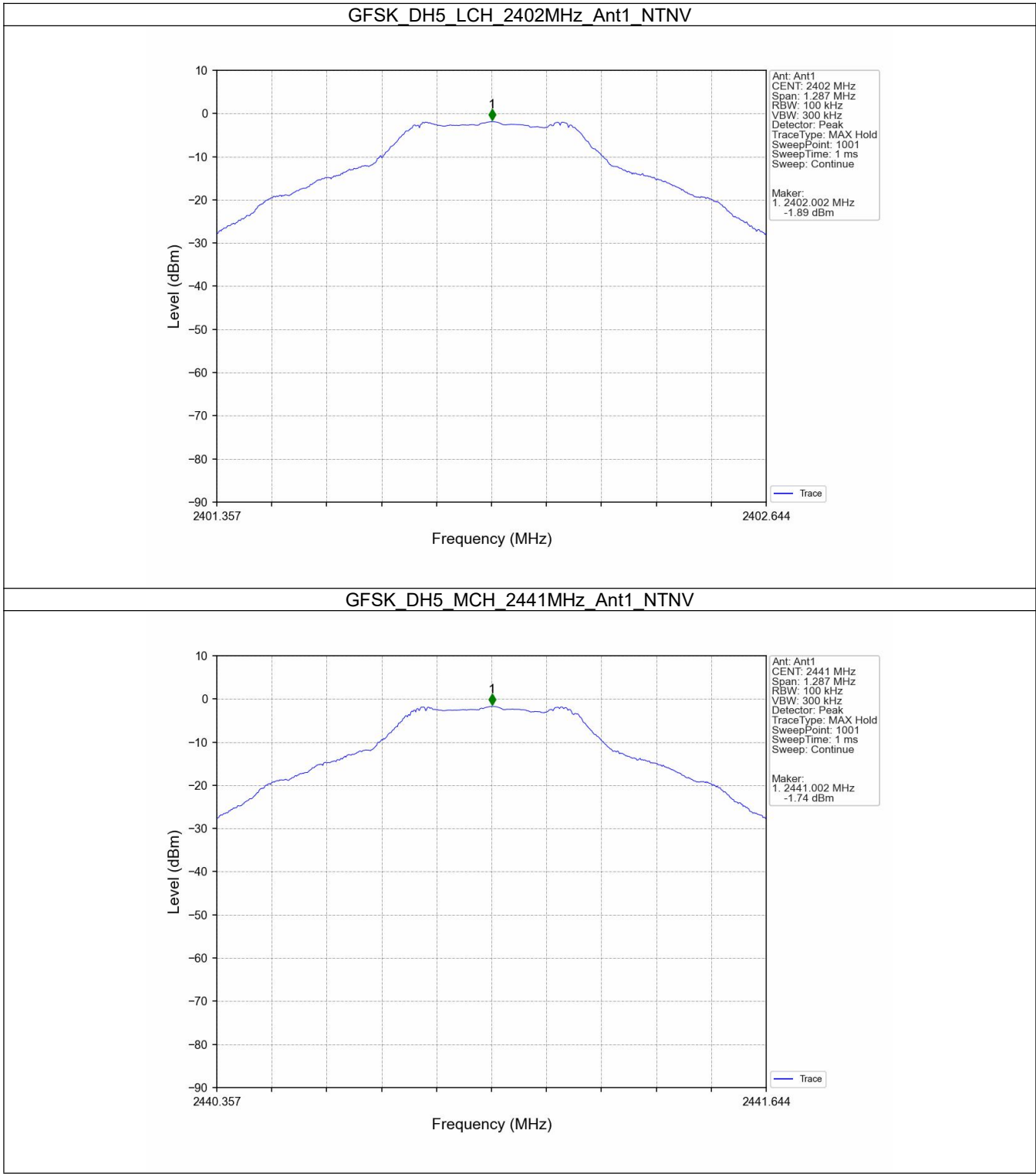
7.1.2 CSE

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-1.89	-21.89	Pass
		2441	DH5	1	-1.74	-21.74	Pass
		2480	DH5	1	-2.22	-22.22	Pass
		HOPP	DH5	1	-1.43	-21.43	Pass
					-1.43	-21.43	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	-1.93	-21.93	Pass
		2441	2DH5	1	-2.03	-22.03	Pass
		2480	2DH5	1	-2.15	-22.15	Pass
		HOPP	2DH5	1	-1.49	-21.49	Pass
					-1.49	-21.49	Pass

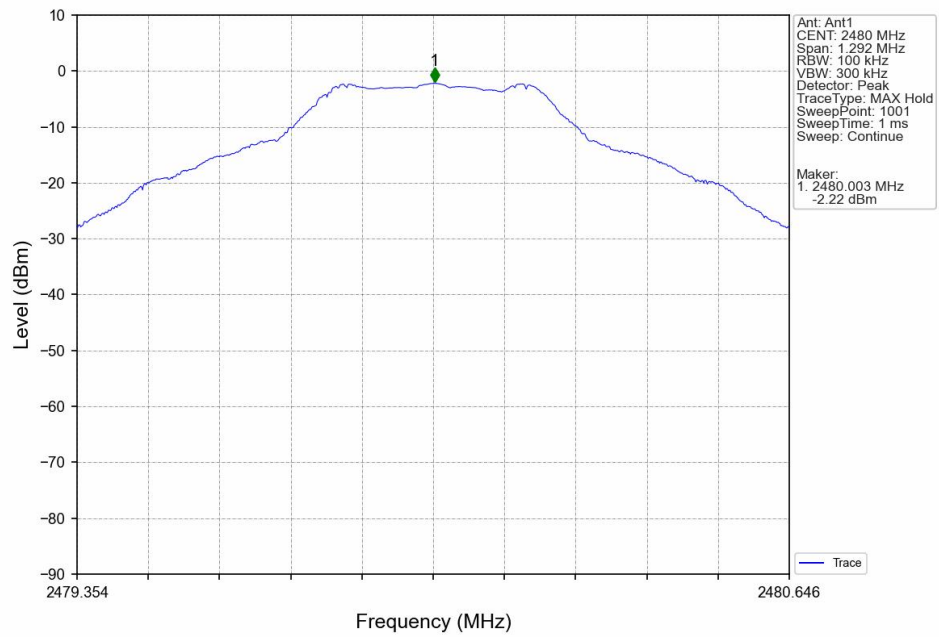
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

7.2 Test Graph

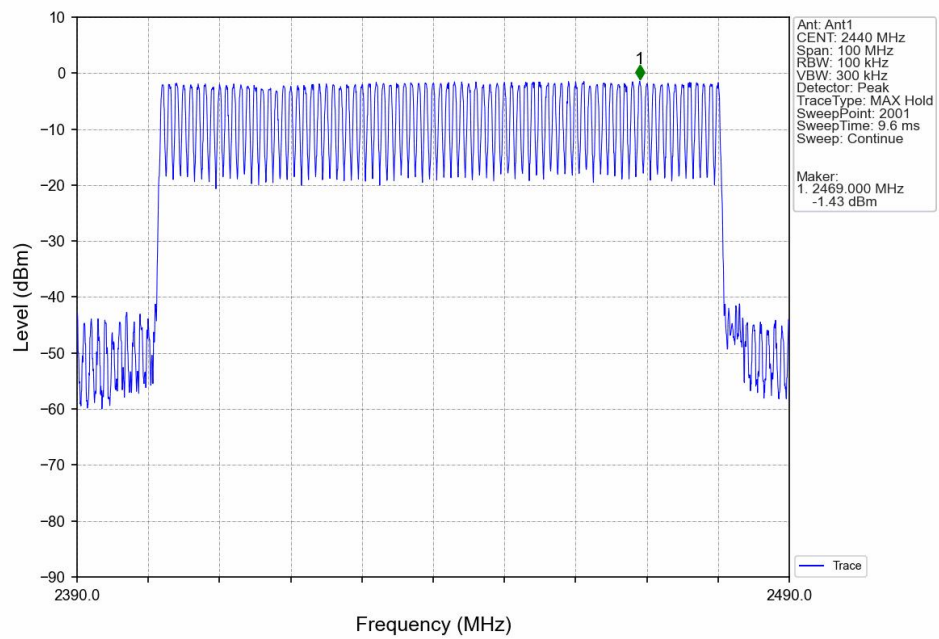
7.2.1 Ref



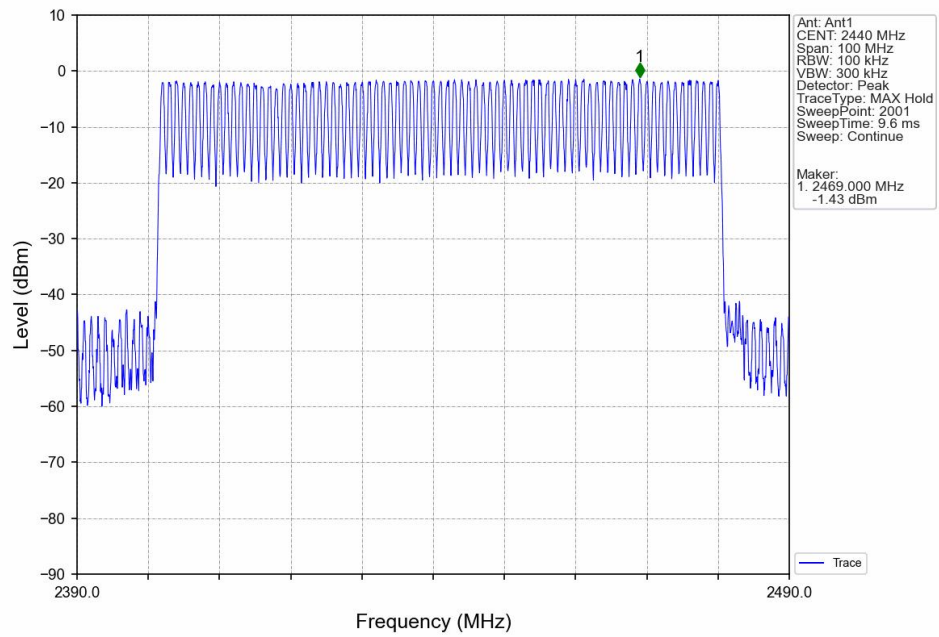
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



GFSK_DH5_HOPP_Ant1_NTNV



GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

