Appendix Test Data

Report No.:	18220WC10103801	Test Date:	2021.5.31
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	24.3℃	Relative Humidity:	57 %
Pressure:	1012 hPa		

1. Bandwidth

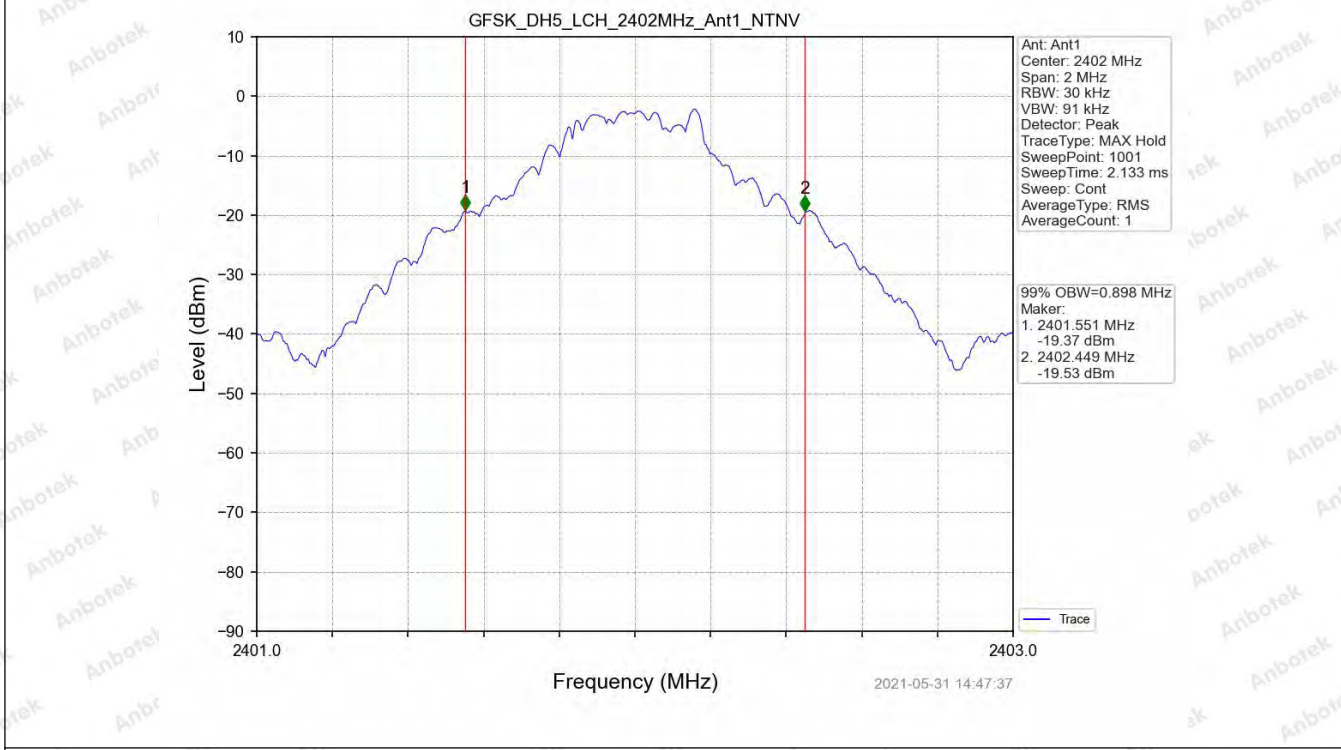
1.1 OBW

1.1.1 Test Result

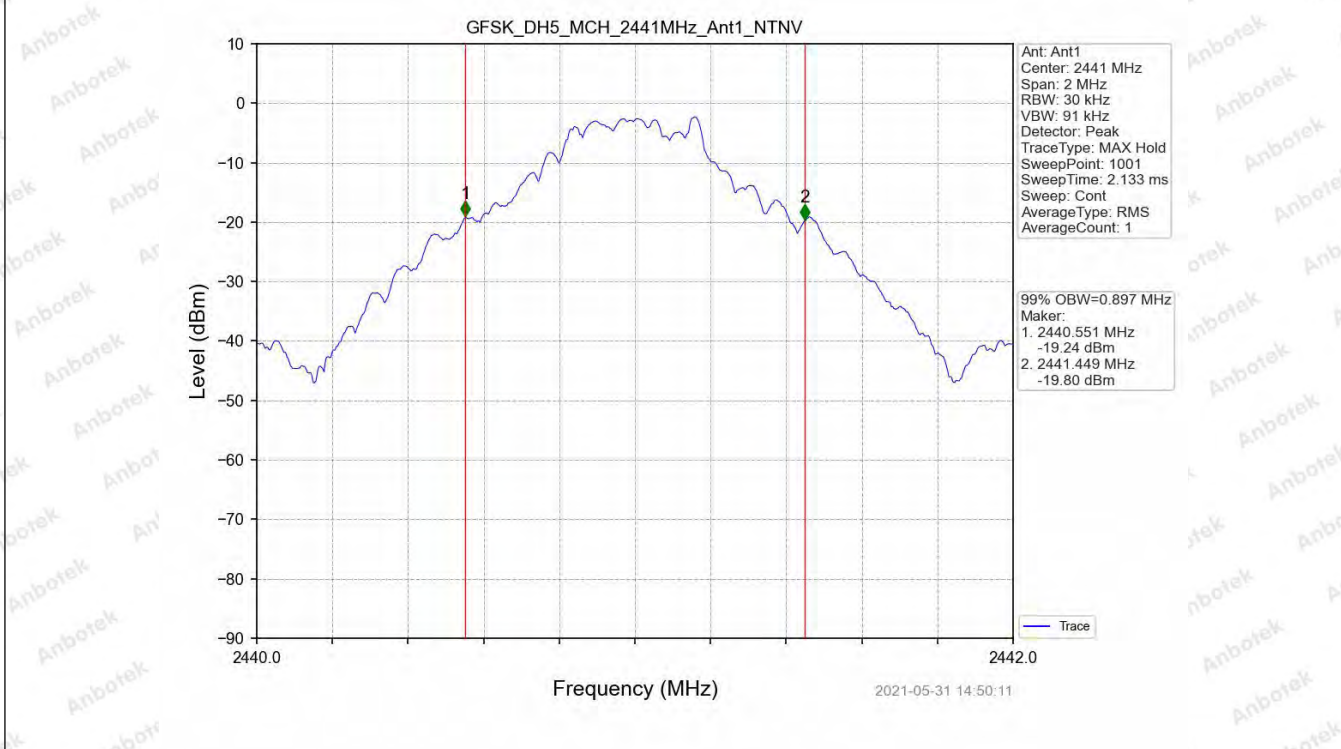
Mode	TX Type	Frequency (MHz)	Packet Type	99% Occupied Bandwidth (MHz) Ant1	Limit (MHz)	Verdict
GFSK	SISO	2402	DH5	0.898	/	Note1
		2441	DH5	0.897	/	Note1
		2480	DH5	0.899	/	Note1
Pi/4DQPSK	SISO	2402	2DH5	1.179	/	Note1
		2441	2DH5	1.172	/	Note1
		2480	2DH5	1.168	/	Note1
8DPSK	SISO	2402	3DH5	1.189	/	Note1
		2441	3DH5	1.183	/	Note1
		2480	3DH5	1.180	/	Note1
Note1: Only for Report Use						

1.1.2 Test Graph

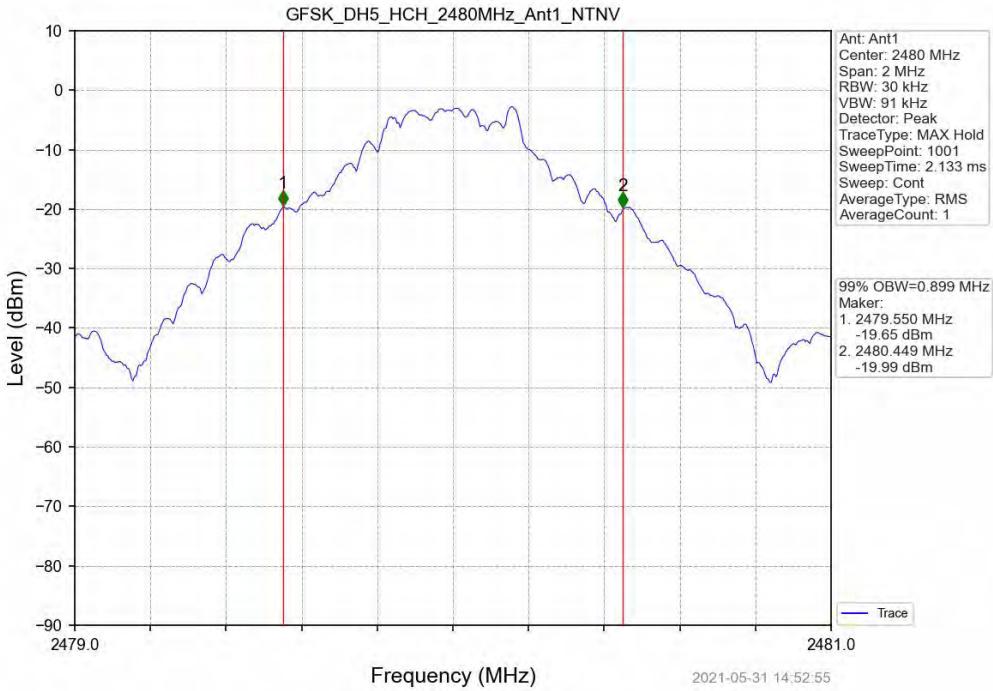
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



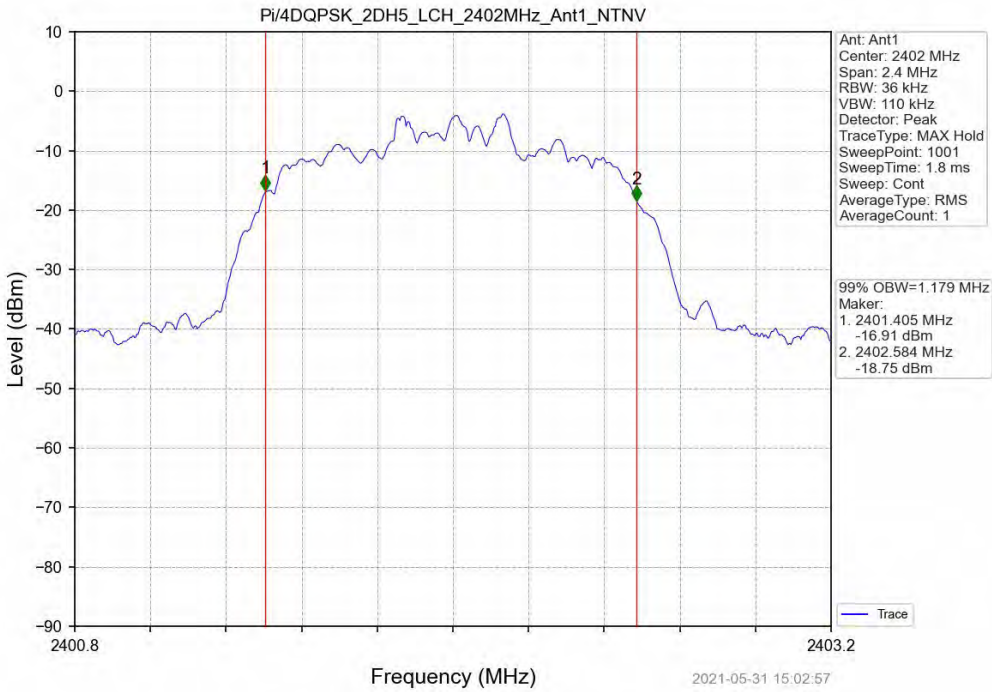
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



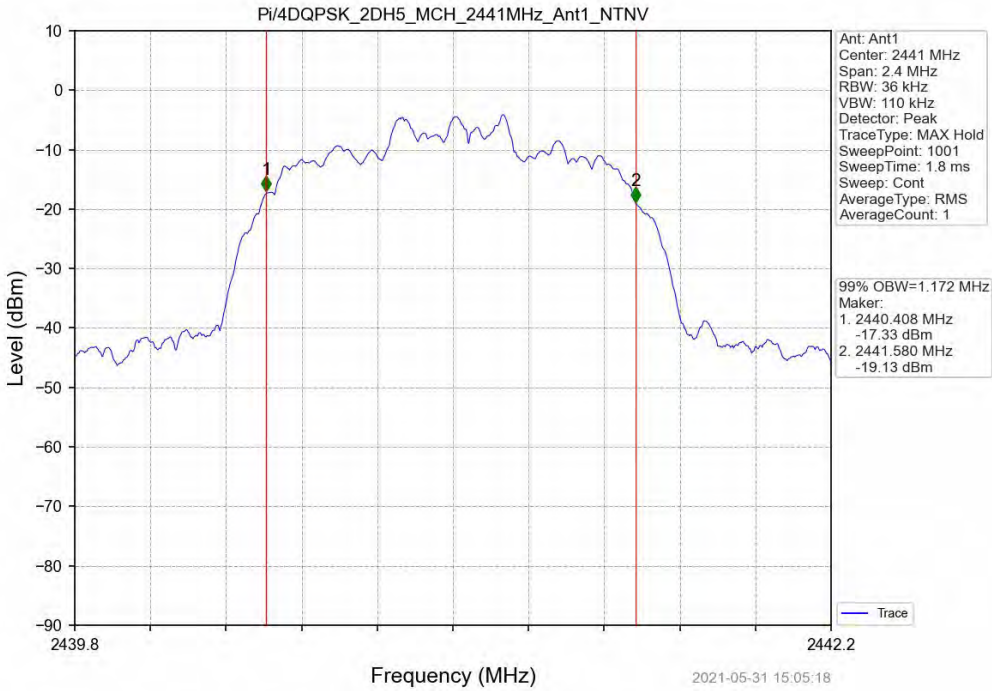
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



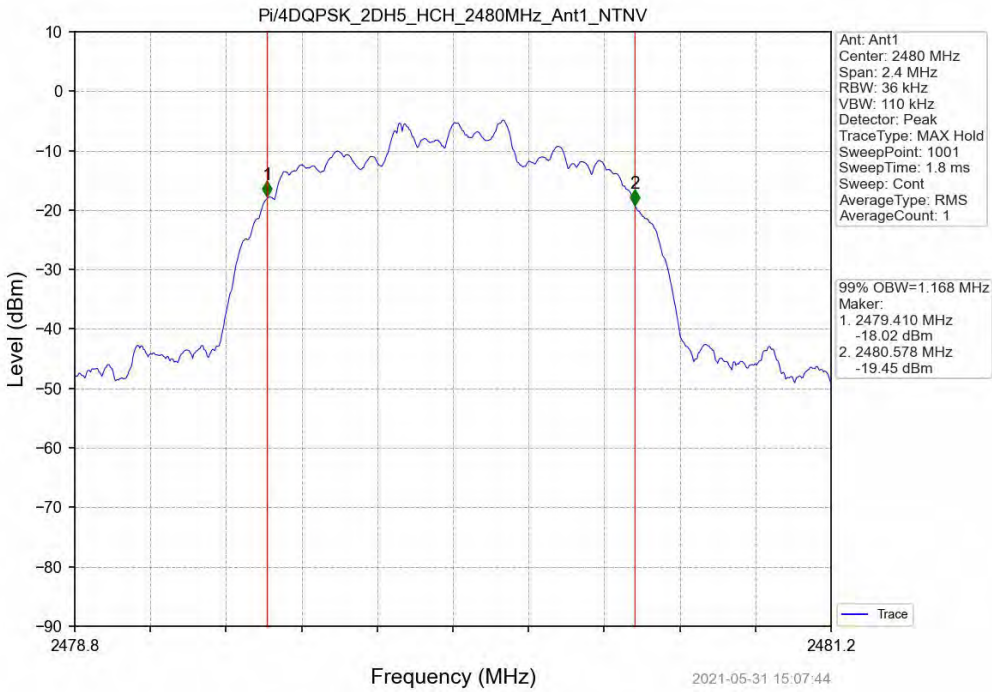
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



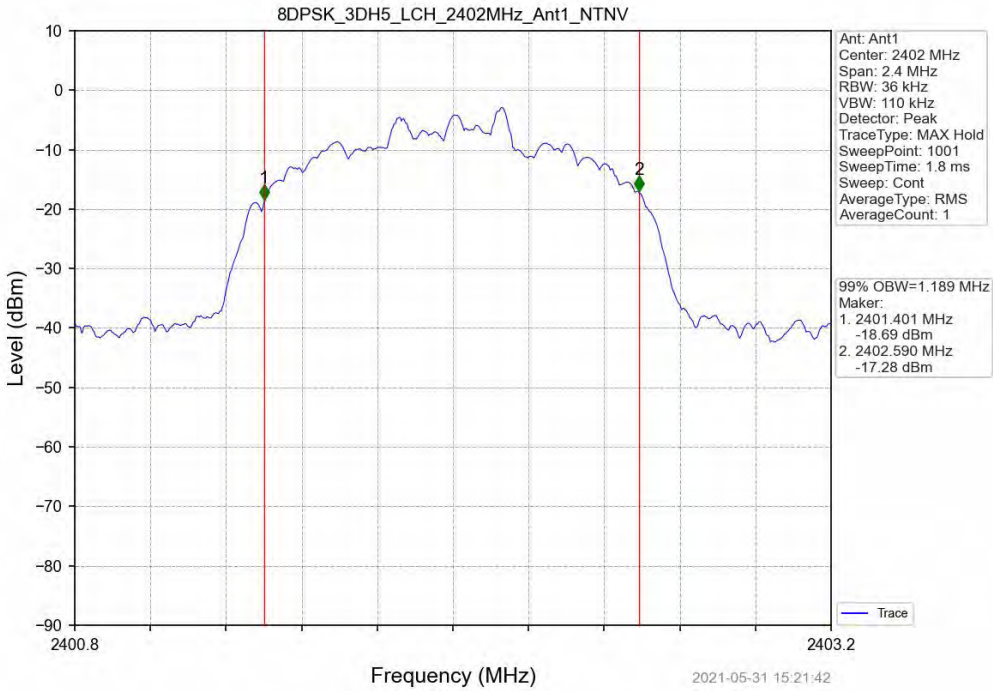
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



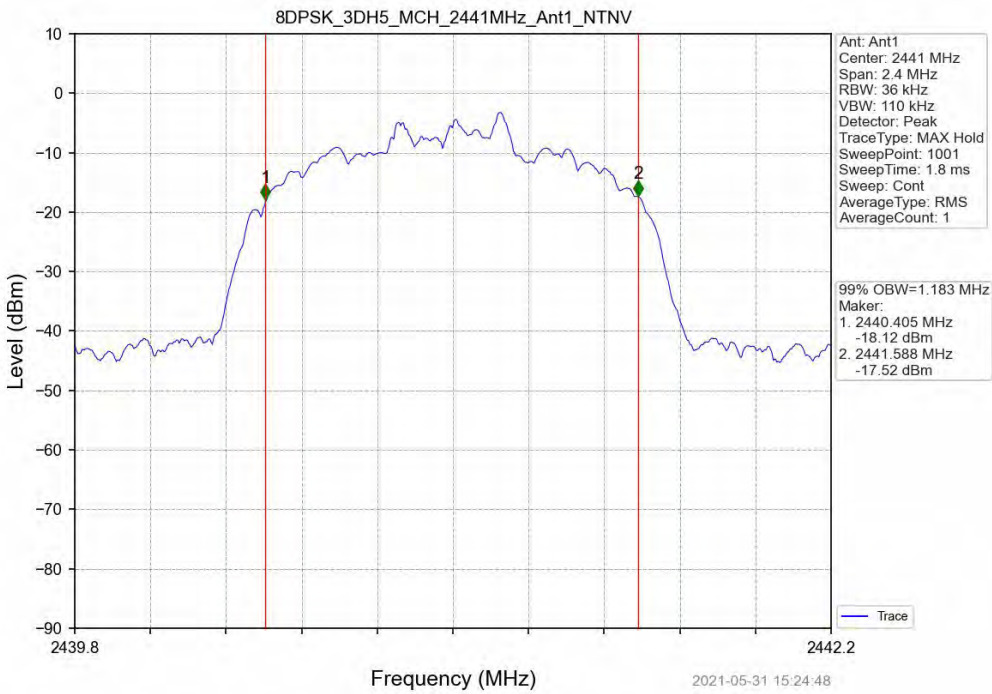
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



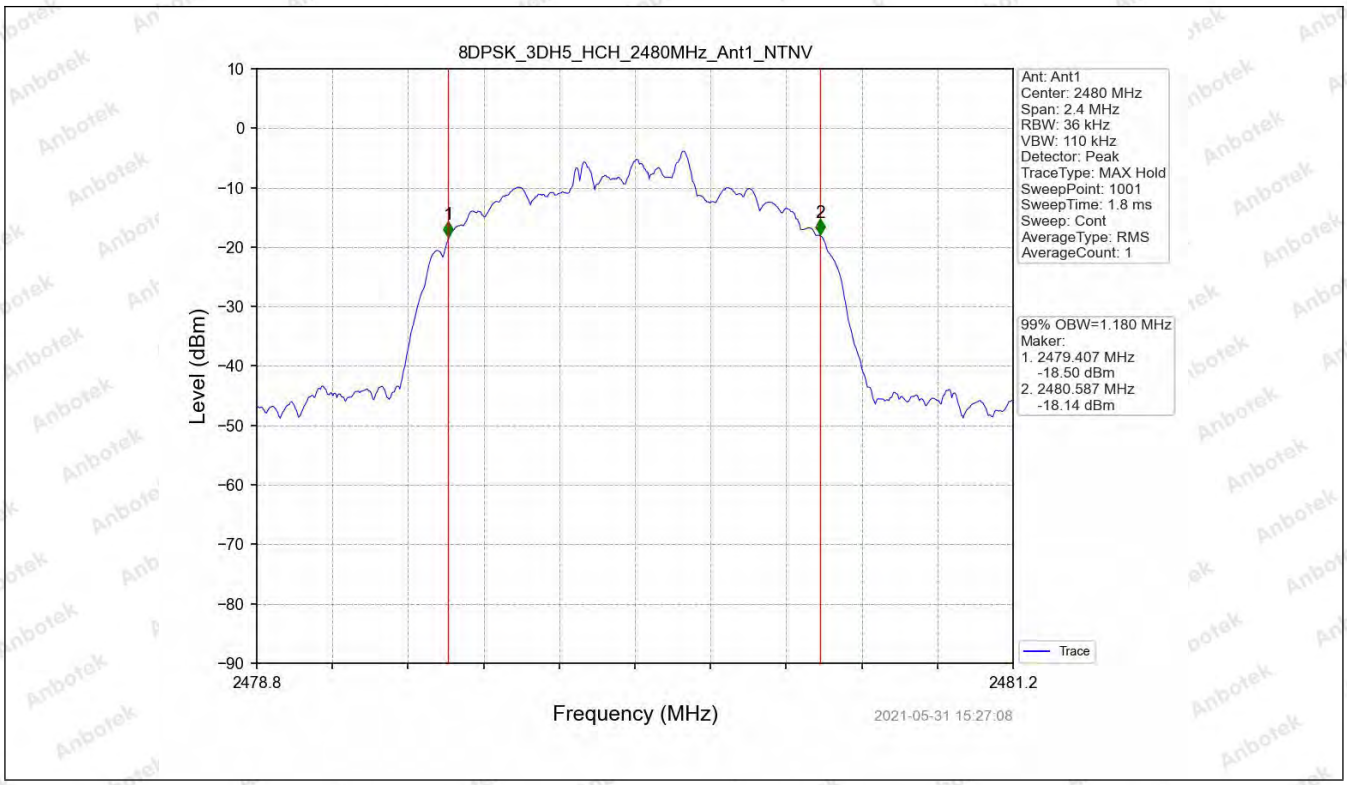
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV


8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV
Ant: Ant1
Center: 2480 MHz
Span: 2.4 MHz
RBW: 36 kHz
VBW: 110 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 1001
SweepTime: 1.8 ms
Sweep: Cont
AverageType: RMS
AverageCount: 1
99% OBW=1.180 MHz
Maker:
1. 2479.407 MHz
-18.50 dBm
2. 2480.587 MHz
-18.14 dBm
Trace
Level (dBm)
Frequency (MHz)
2478.8
2481.2
2021-05-31 15:27:08

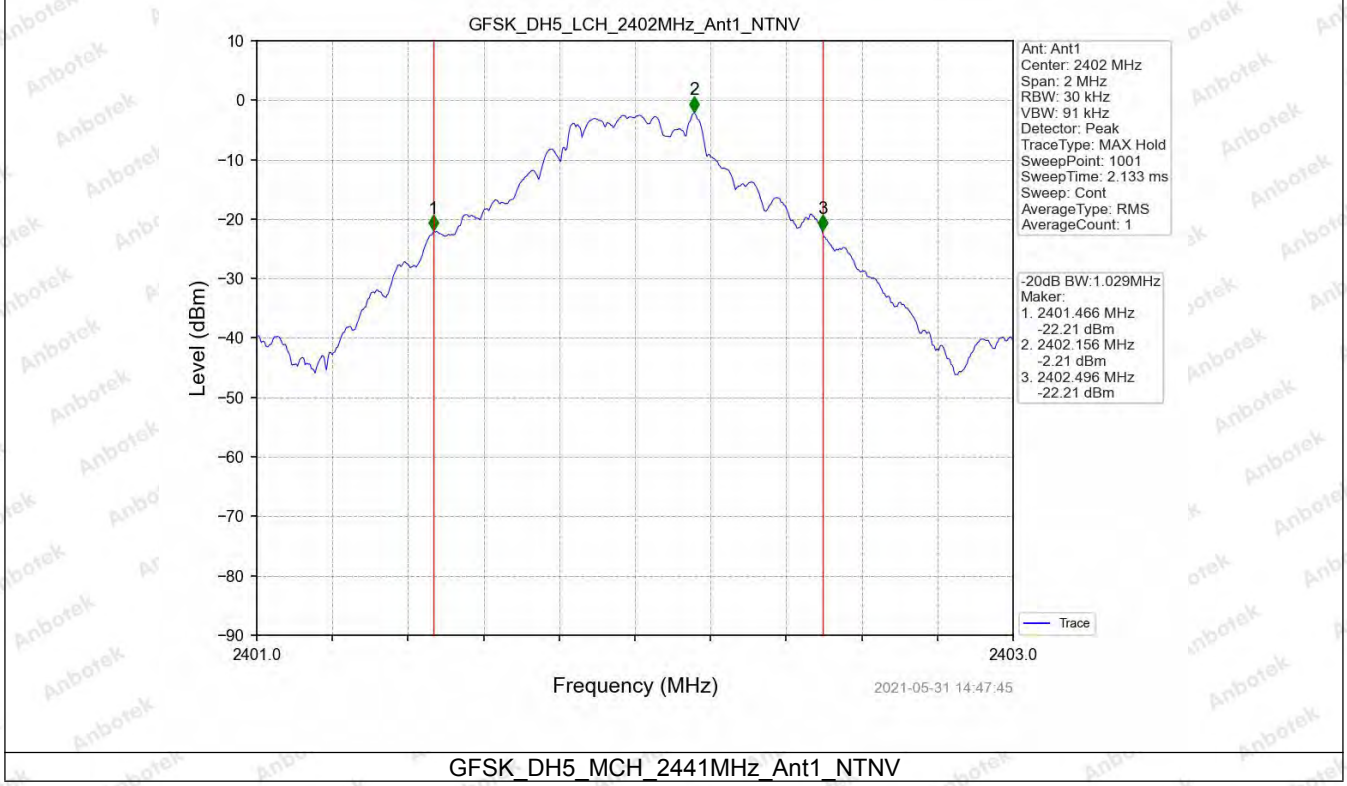
1.2 XDB

1.2.1 Test Result

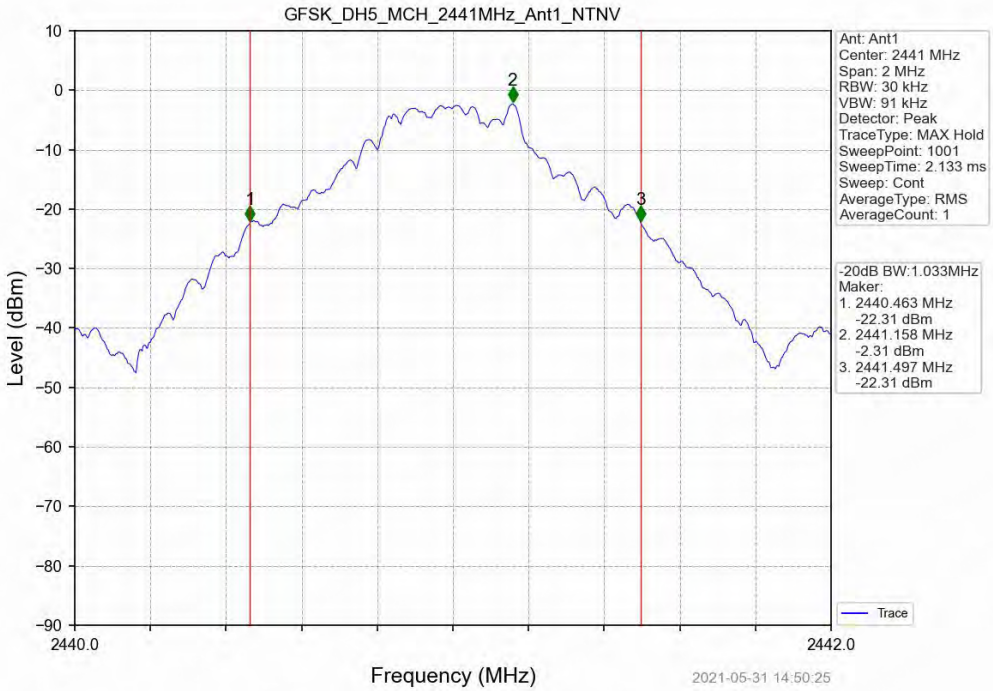
Mode	TX Type	Frequency (MHz)	Packet Type	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
				Ant1		
GFSK	SISO	2402	DH5	1.029	/	Note1
		2441	DH5	1.033	/	Note1
		2480	DH5	1.035	/	Note1
Pi/4DQPSK	SISO	2402	2DH5	1.321	/	Note1
		2441	2DH5	1.321	/	Note1
		2480	2DH5	1.302	/	Note1
8DPSK	SISO	2402	3DH5	1.314	/	Note1
		2441	3DH5	1.305	/	Note1
		2480	3DH5	1.303	/	Note1
Note1: Only for Report Use						

1.2.2 Test Graph

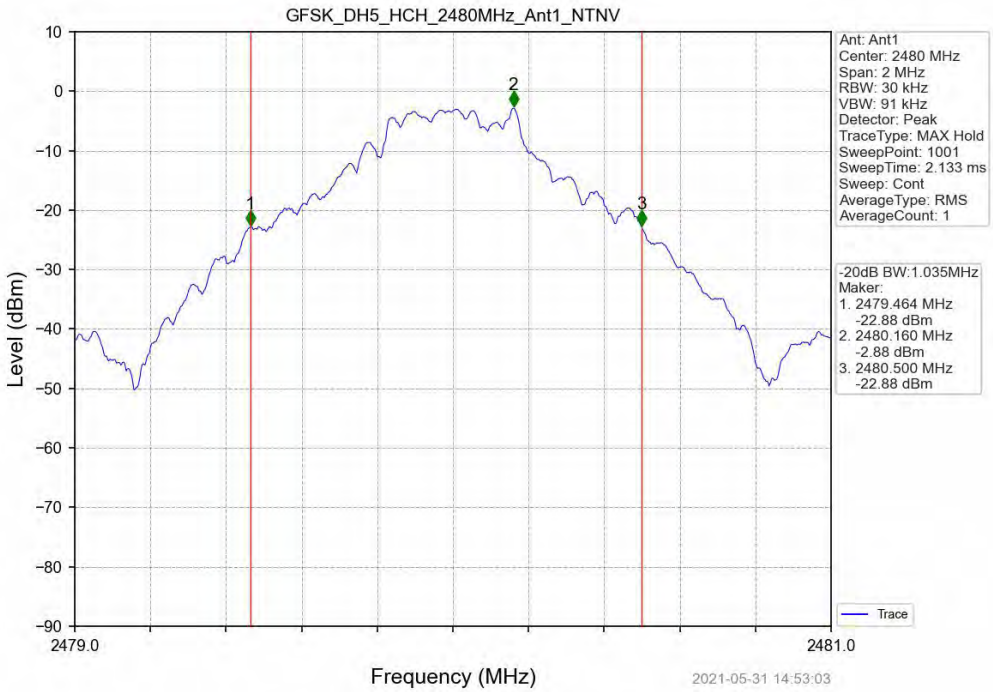
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



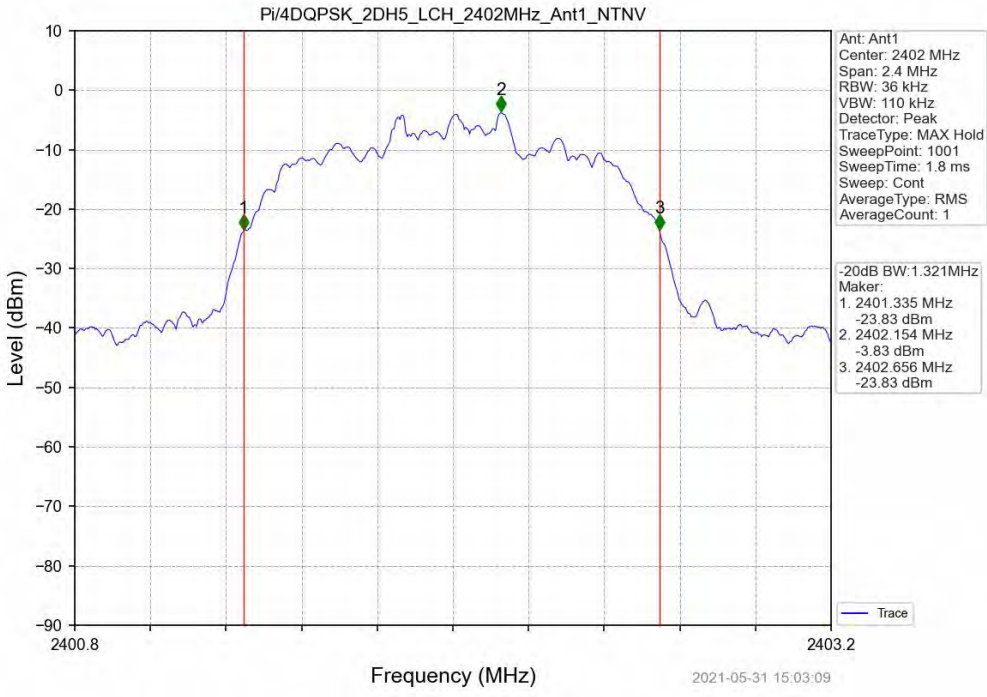
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



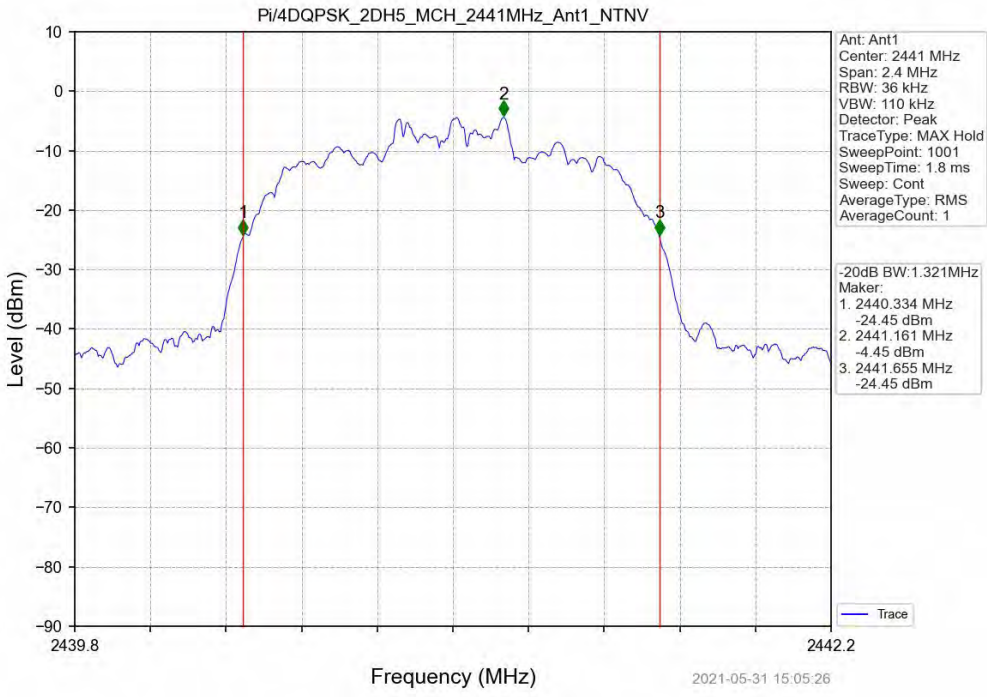
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



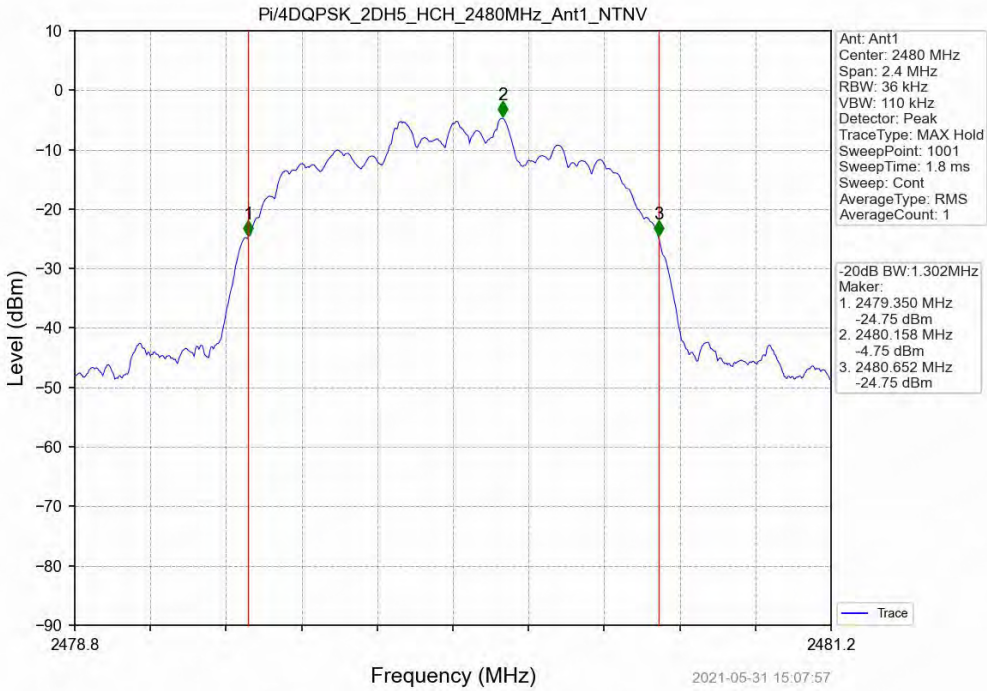
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



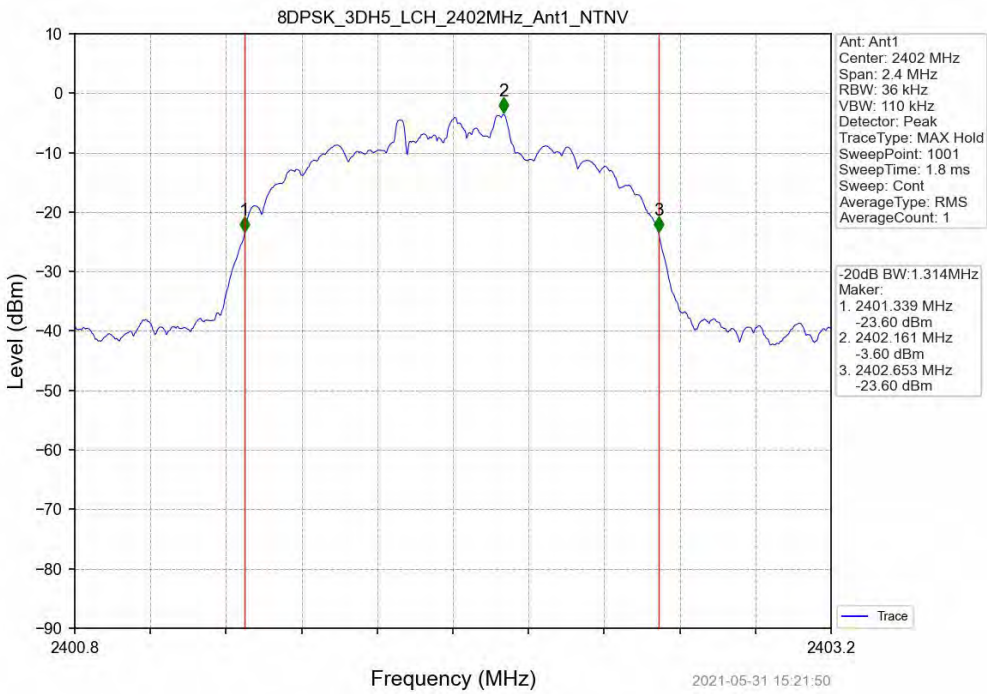
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



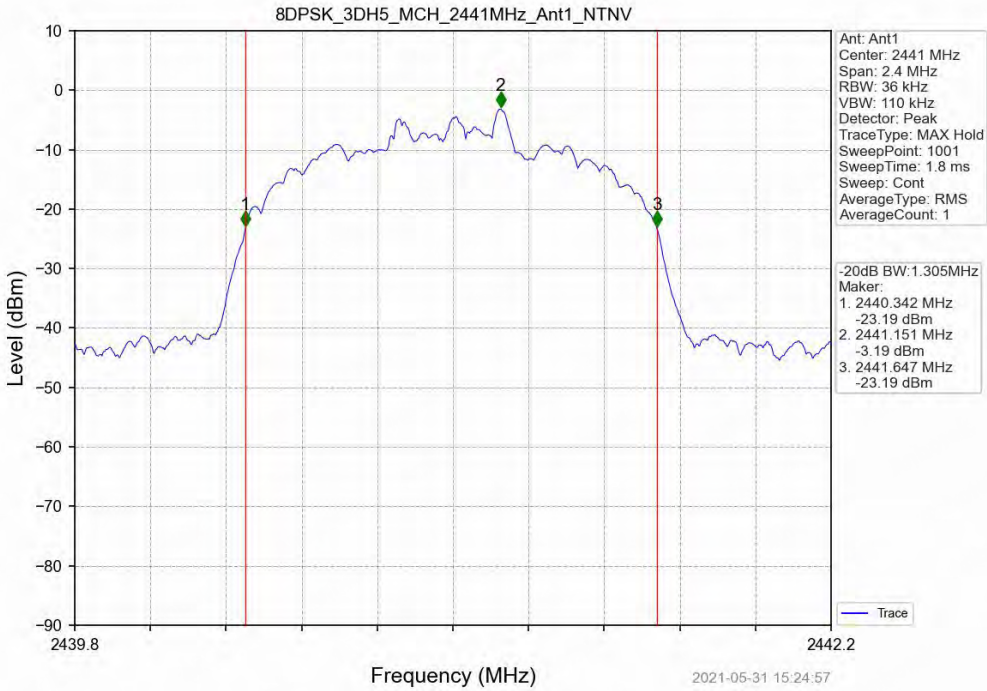
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



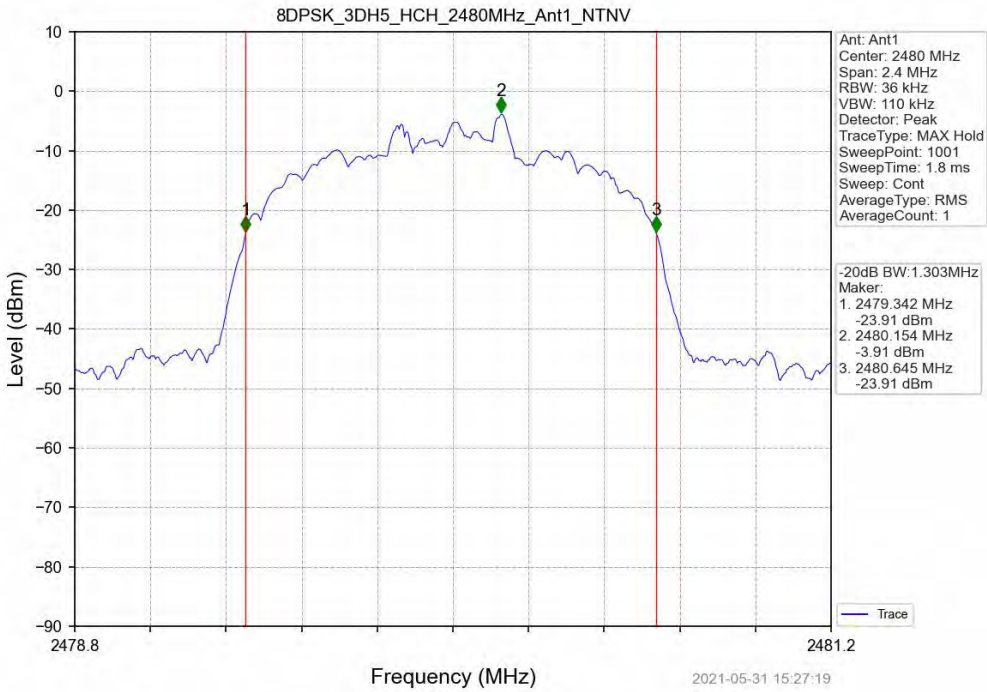
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



2. Maximum Conducted Output Power

2.1 Power

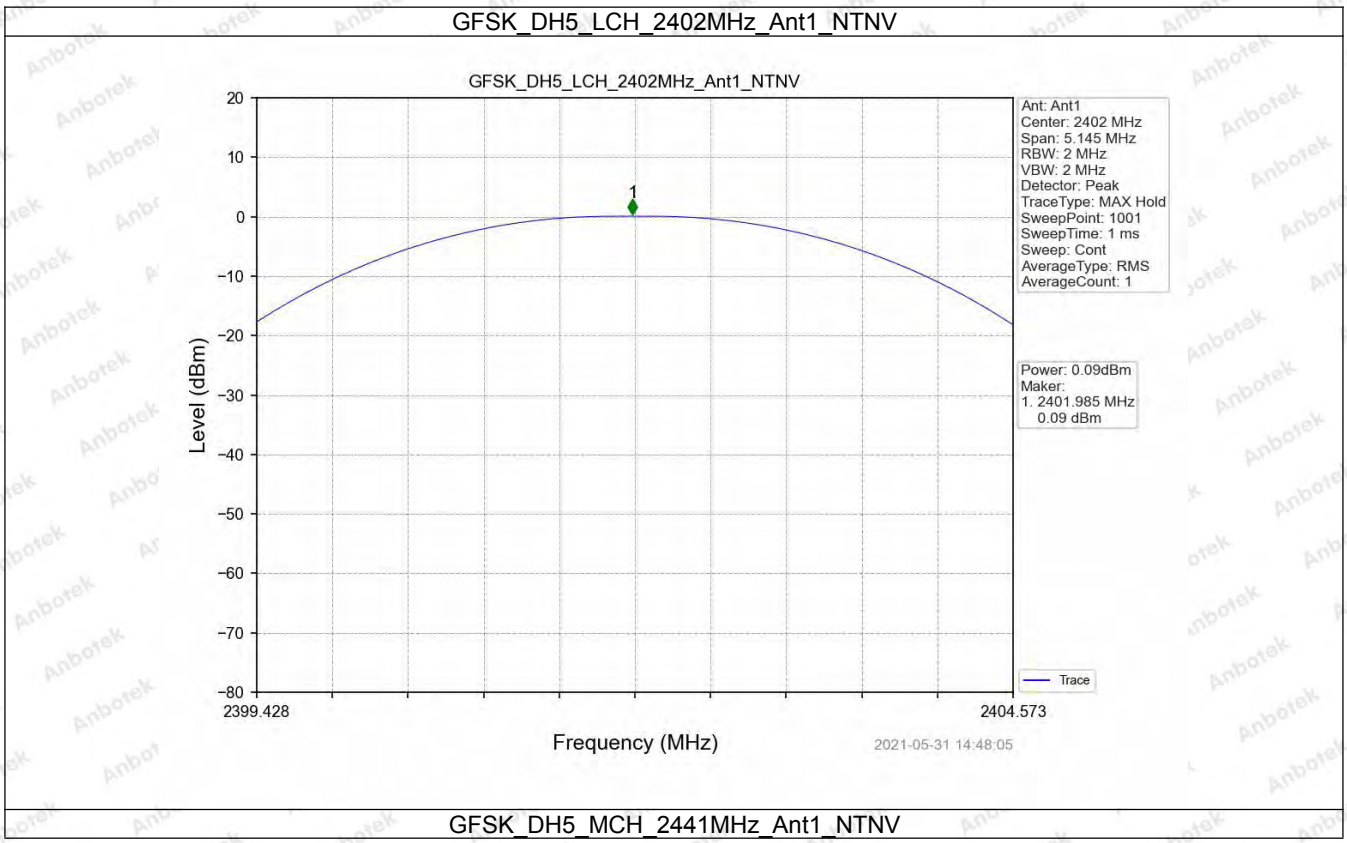
2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	Measured Peak Output Power (dBm)	Limit (dBm)	Verdict
				Ant1		
GFSK	SISO	2402	DH5	0.09	<=20.97	Pass
		2441	DH5	0.03	<=20.97	Pass
		2480	DH5	-0.40	<=20.97	Pass
Pi/4DQPSK	SISO	2402	2DH5	-0.46	<=20.97	Pass
		2441	2DH5	-0.69	<=20.97	Pass
		2480	2DH5	-1.25	<=20.97	Pass
8DPSK	SISO	2402	3DH5	-0.29	<=20.97	Pass
		2441	3DH5	-0.46	<=20.97	Pass
		2480	3DH5	-1.04	<=20.97	Pass

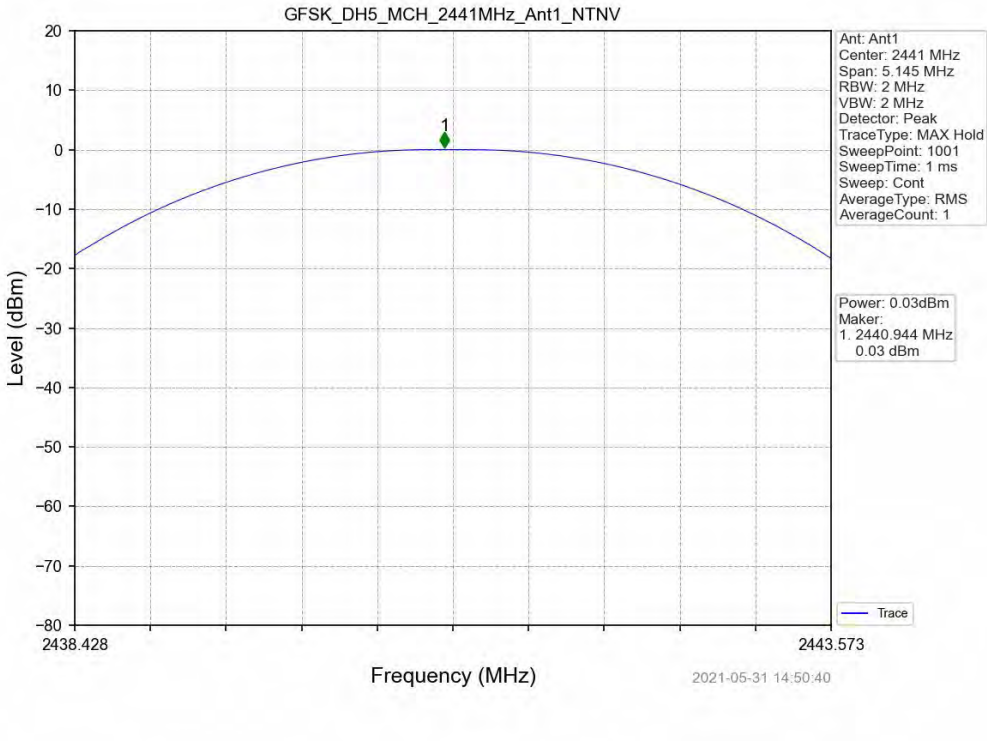
Note1: Antenna Gain: 1:1dBi;

2.1.2 Test Graph

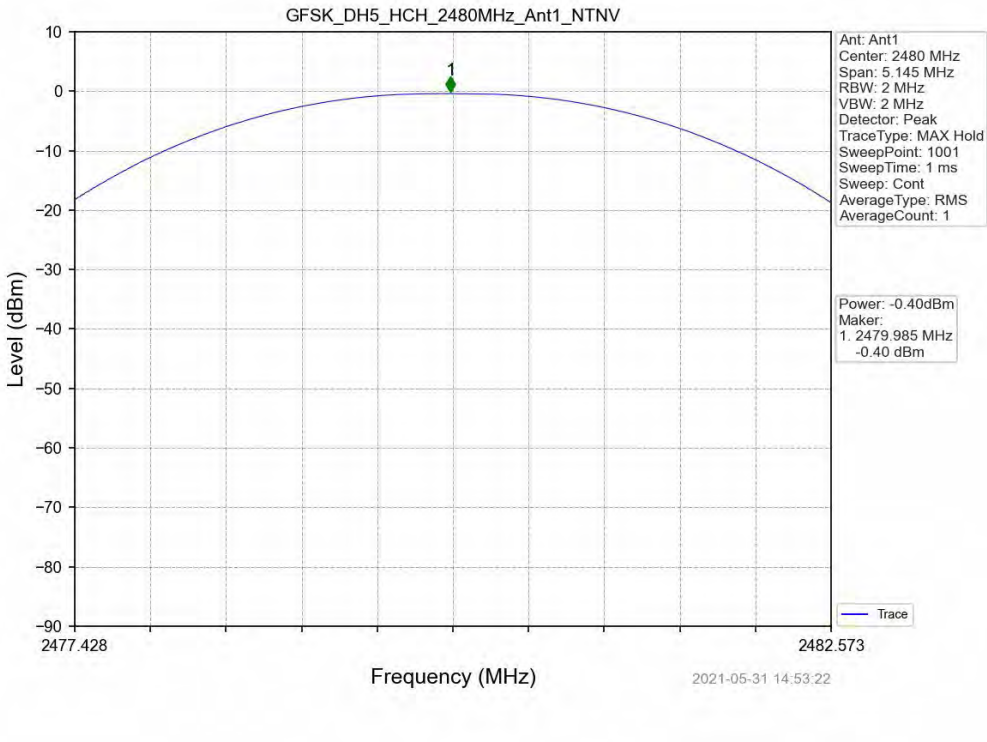
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



GFSK_DH5_MCH_2441MHz_Ant1_NTNV



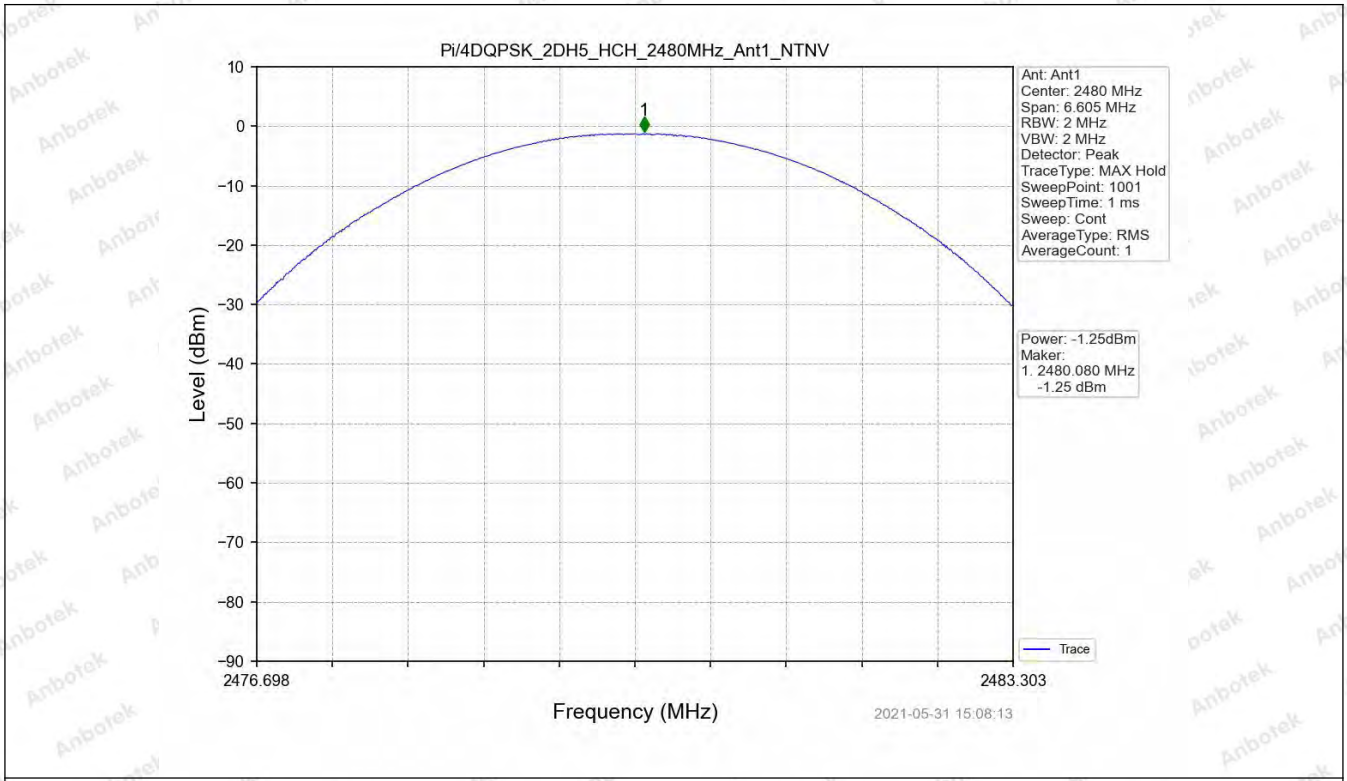
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



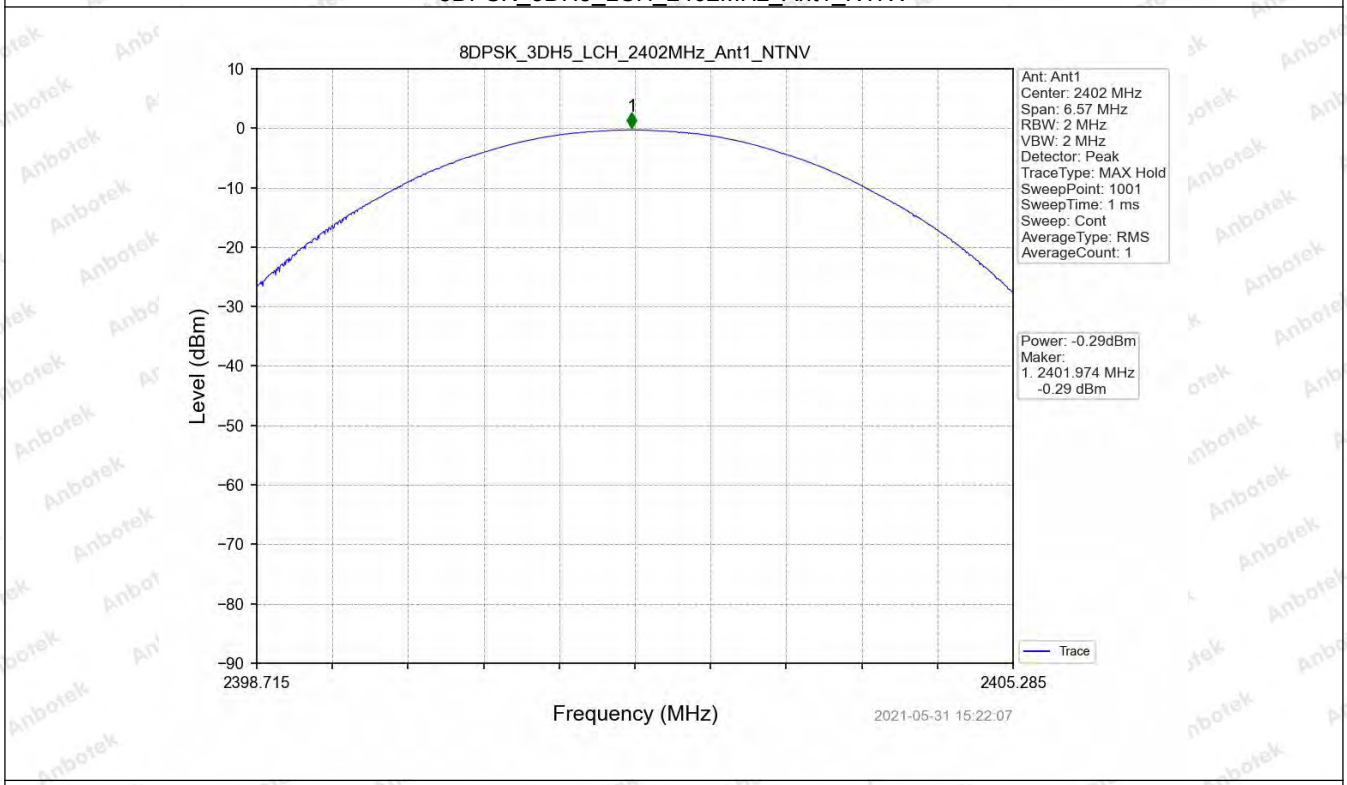
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV

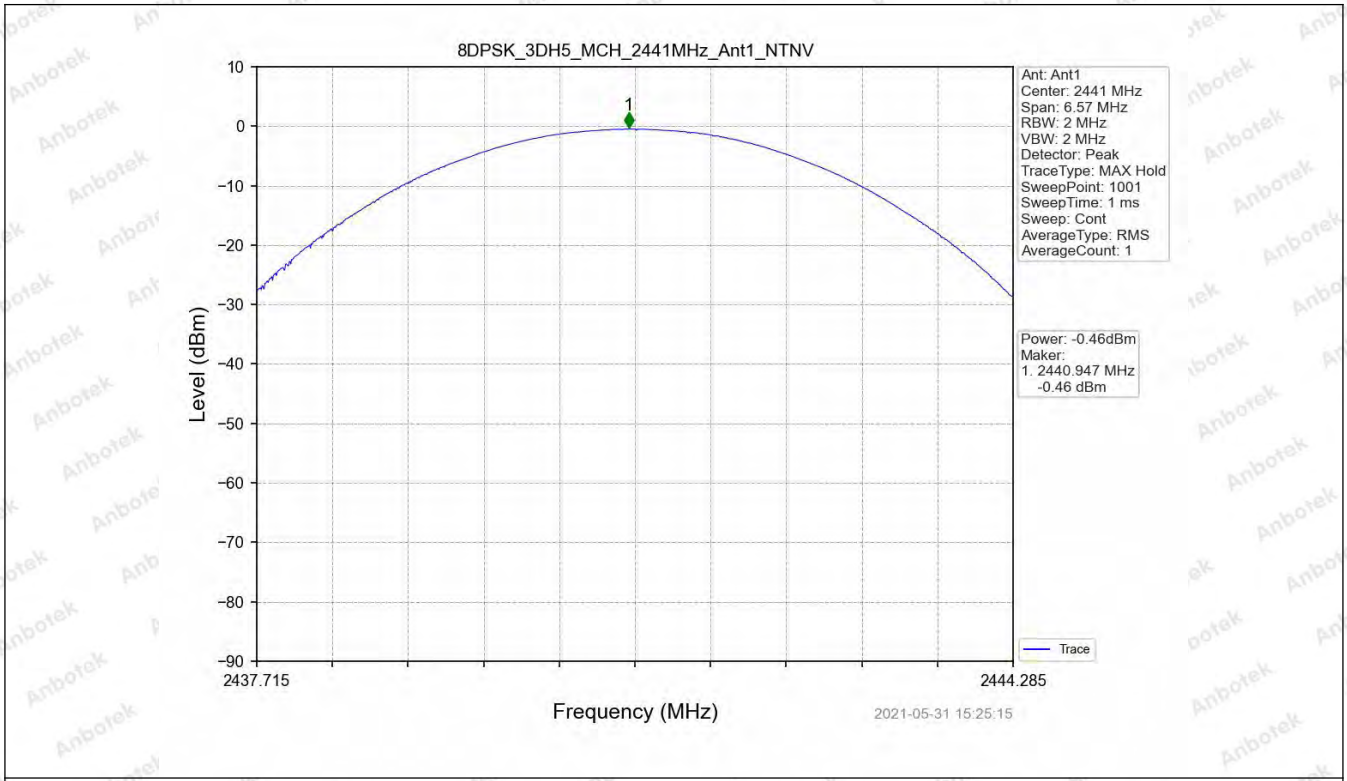
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV

3. Carrier Frequency Separation

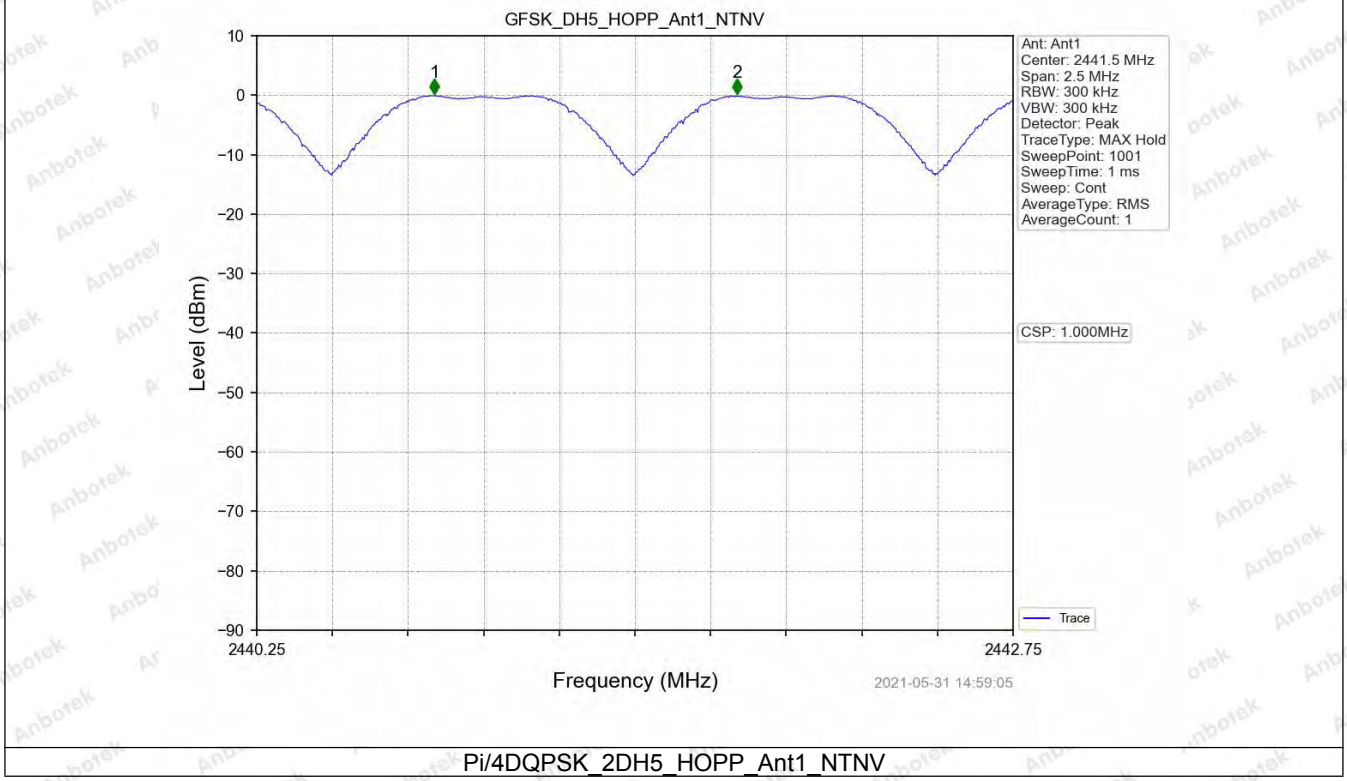
3.1 Ant1

3.1.1 Test Result

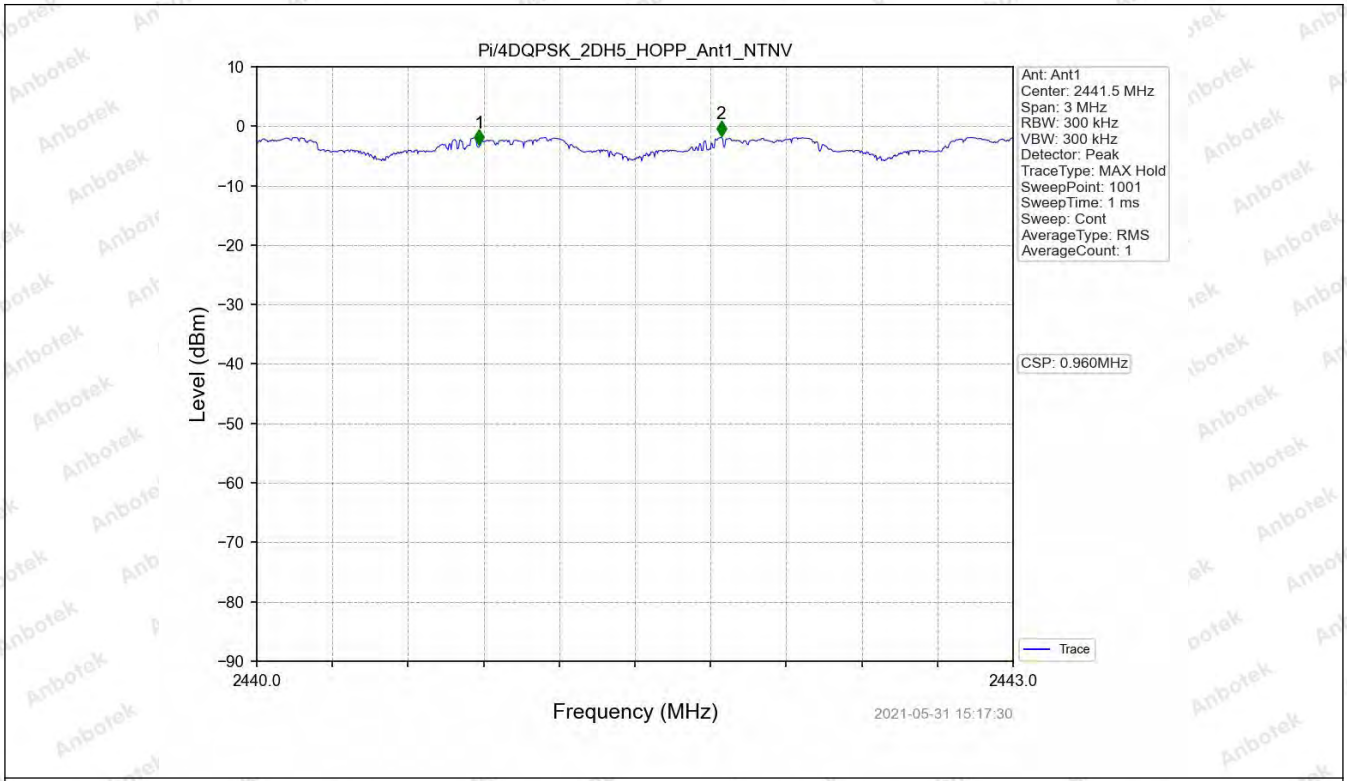
Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	2441	DH5	1.00	1.03	>=0.686	Pass
Pi/4DQPSK	SISO	2441	2DH5	0.96	1.32	>=0.881	Pass
8DPSK	SISO	2441	3DH5	1.00	1.31	>=0.876	Pass

3.1.2 Test Graph

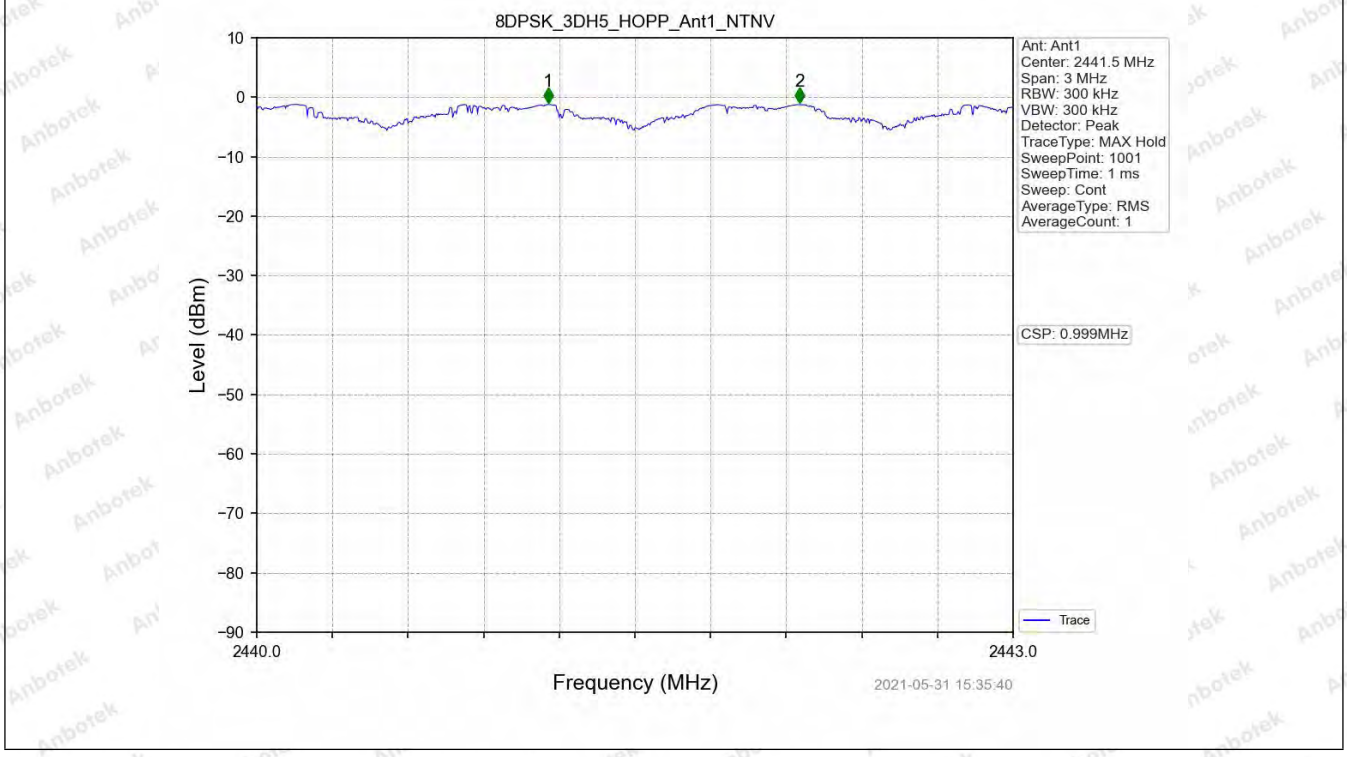
GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



4. Number of Hopping Frequencies

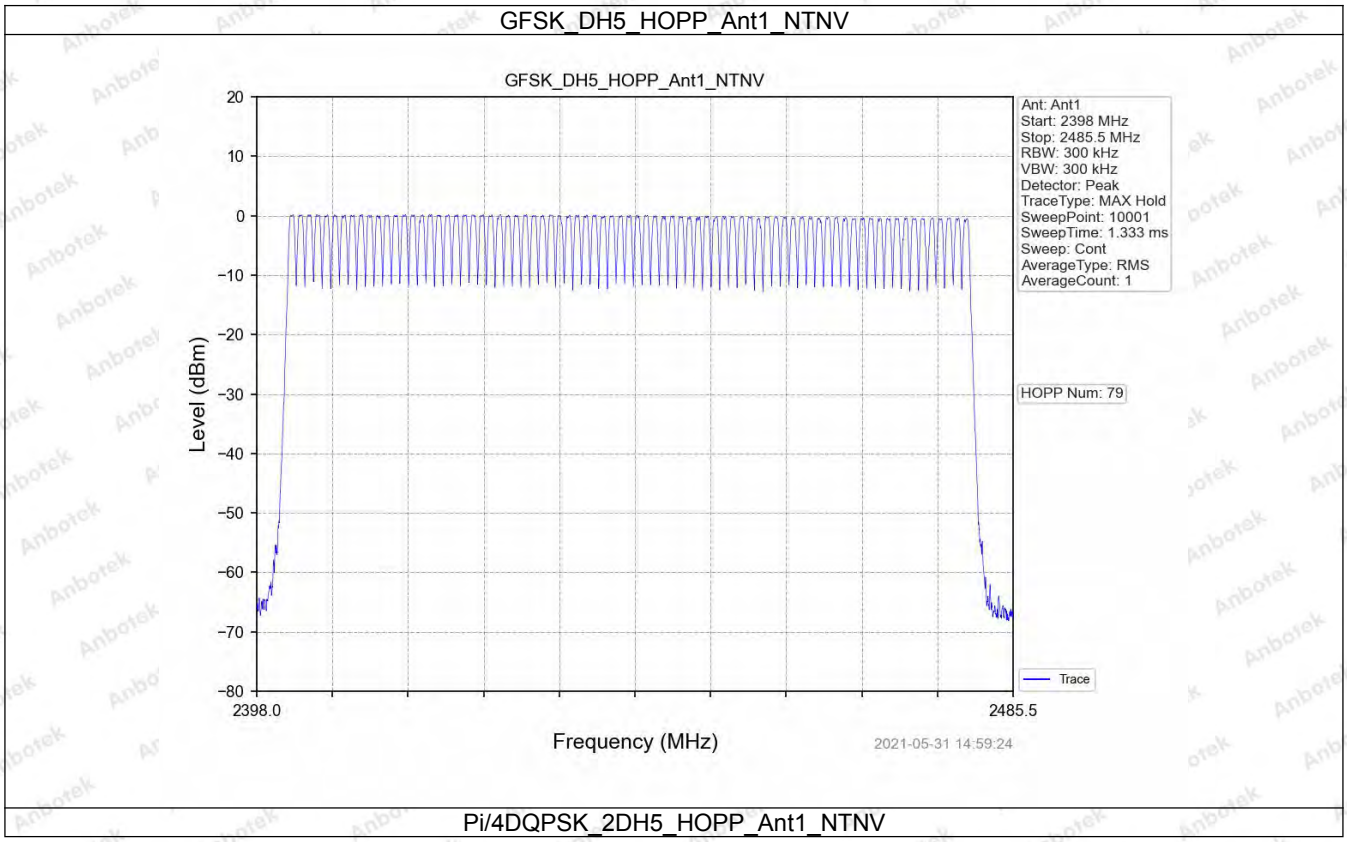
4.1 HoppNum

4.1.1 Test Result

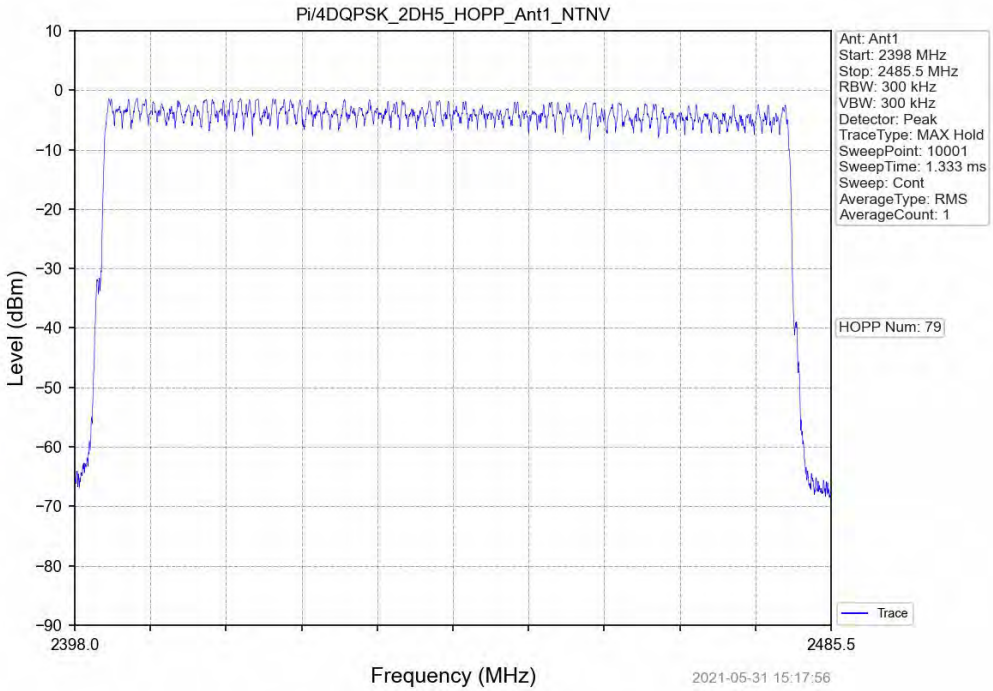
Mode	TX Type	Frequency (MHz)	Packet Type	Num of Hopping Frequencies	Limit	Verdict
				Ant1		
GFSK	SISO	2441	DH5	79	>=15	Pass
Pi/4DQPSK	SISO	2441	2DH5	79	>=15	Pass
8DPSK	SISO	2441	3DH5	79	>=15	Pass

4.1.2 Test Graph

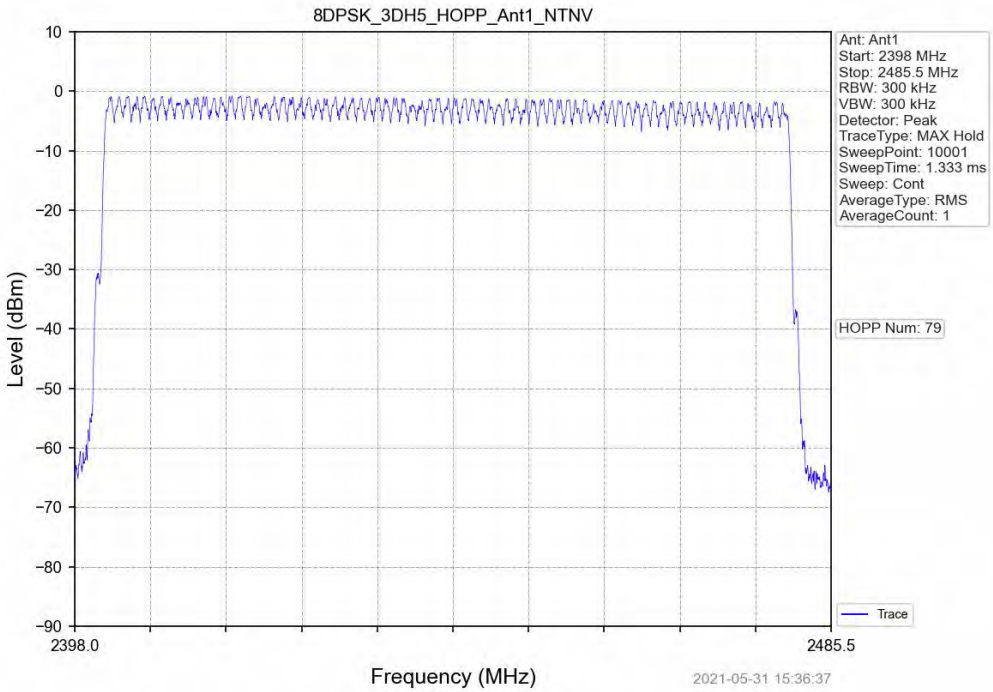
GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



5. Time of Occupancy (Dwell Time)

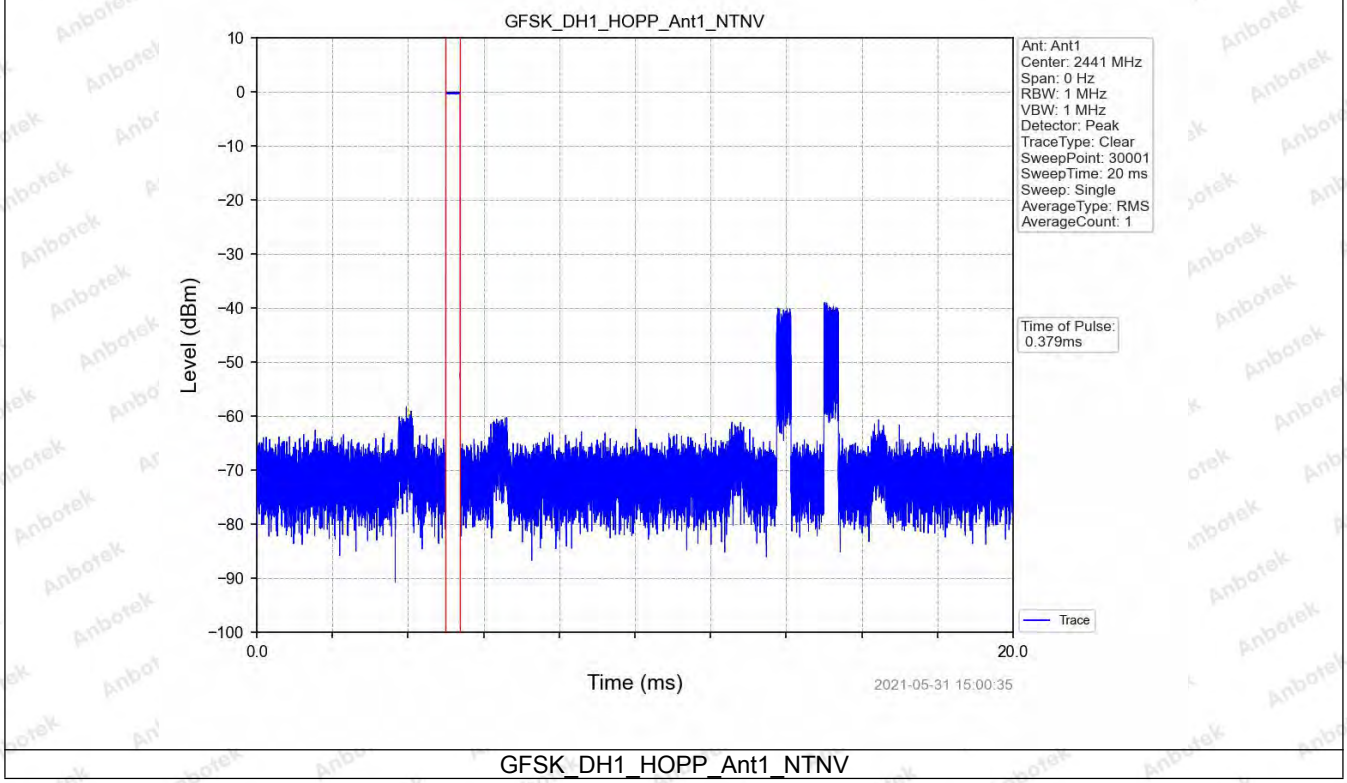
5.1 Ant1

5.1.1 Test Result

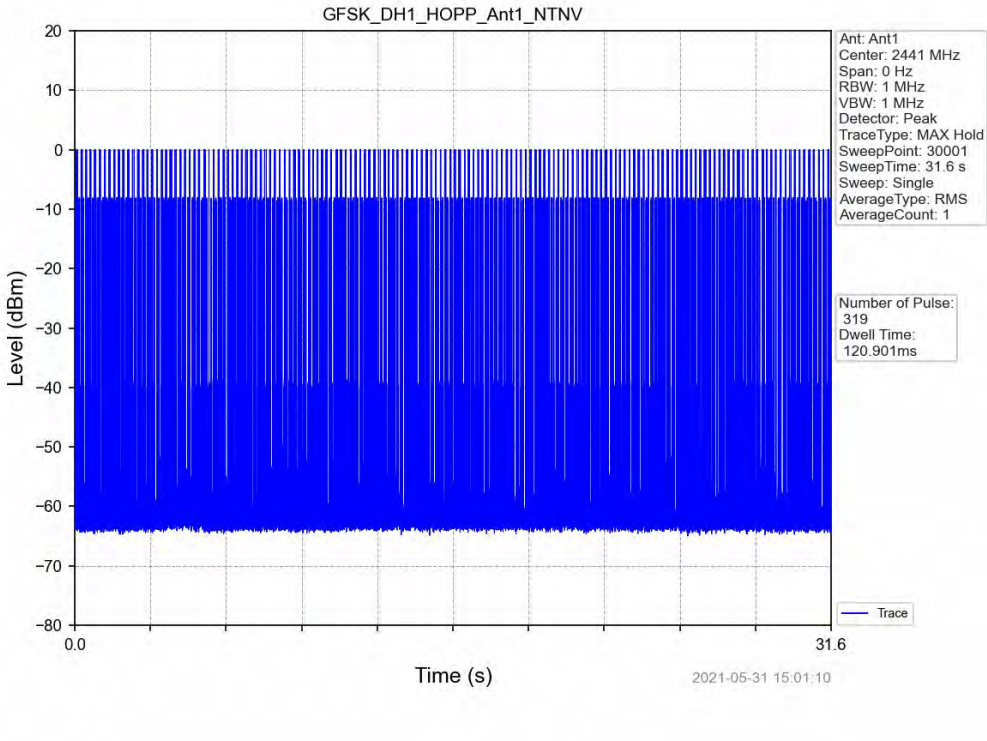
Ant1									
Mode	TX Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	2441	DH1	0.38	31.60	319	120.90	<=400	Pass
			DH3	1.64	31.60	158	258.33	<=400	Pass
			DH5	2.88	31.60	107	308.37	<=400	Pass
Pi/4DQPSK	SISO	2441	2DH1	0.39	31.60	319	123.45	<=400	Pass
			2DH3	1.64	31.60	158	258.80	<=400	Pass
			2DH5	2.89	31.60	110	317.57	<=400	Pass
8DPSK	SISO	2441	3DH1	0.39	31.60	318	123.38	<=400	Pass
			3DH3	1.64	31.60	160	261.92	<=400	Pass
			3DH5	2.89	31.60	107	308.91	<=400	Pass

5.1.2 Test Graph

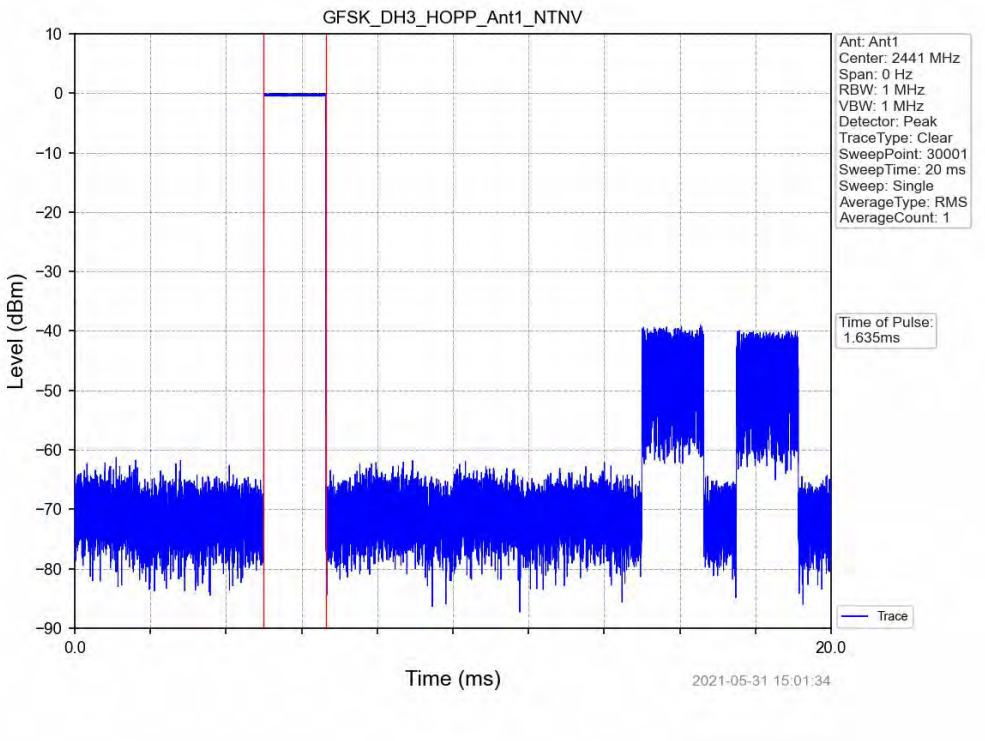
GFSK_DH1_HOPP_Ant1_NTNV



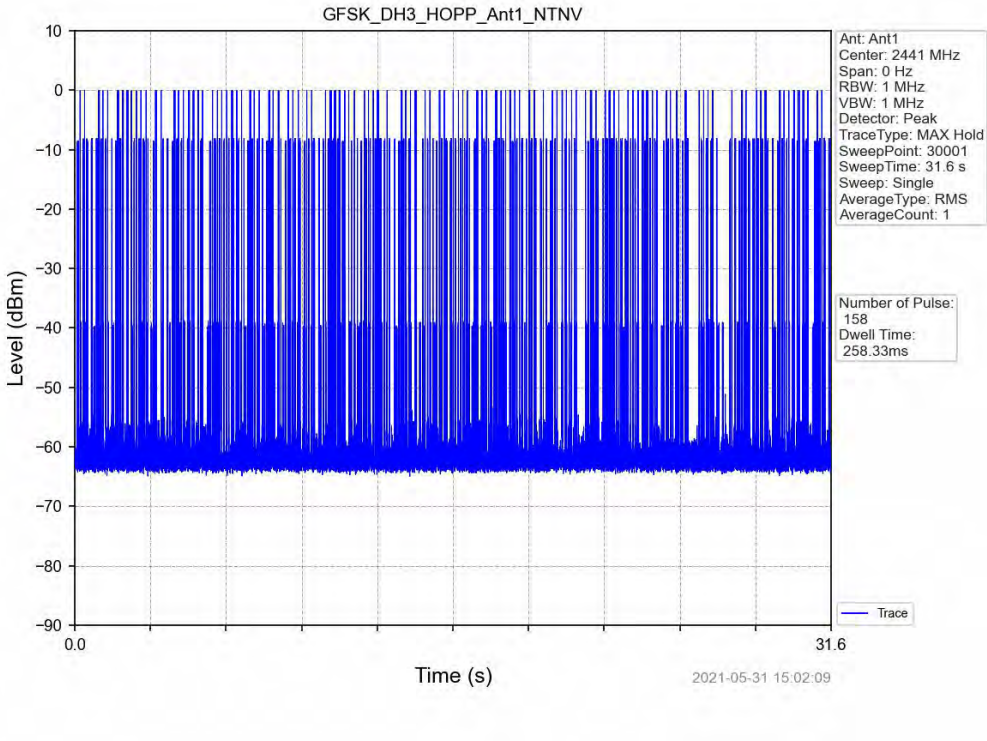
GFSK_DH1_HOPP_Ant1_NTNV



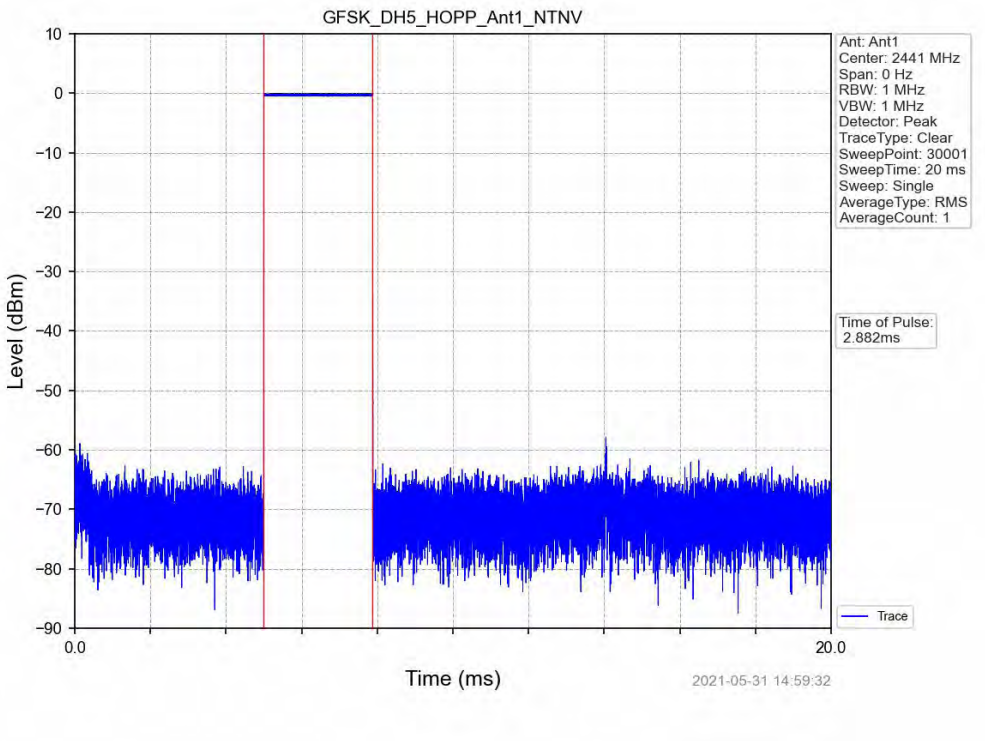
GFSK_DH3_HOPP_Ant1_NTNV



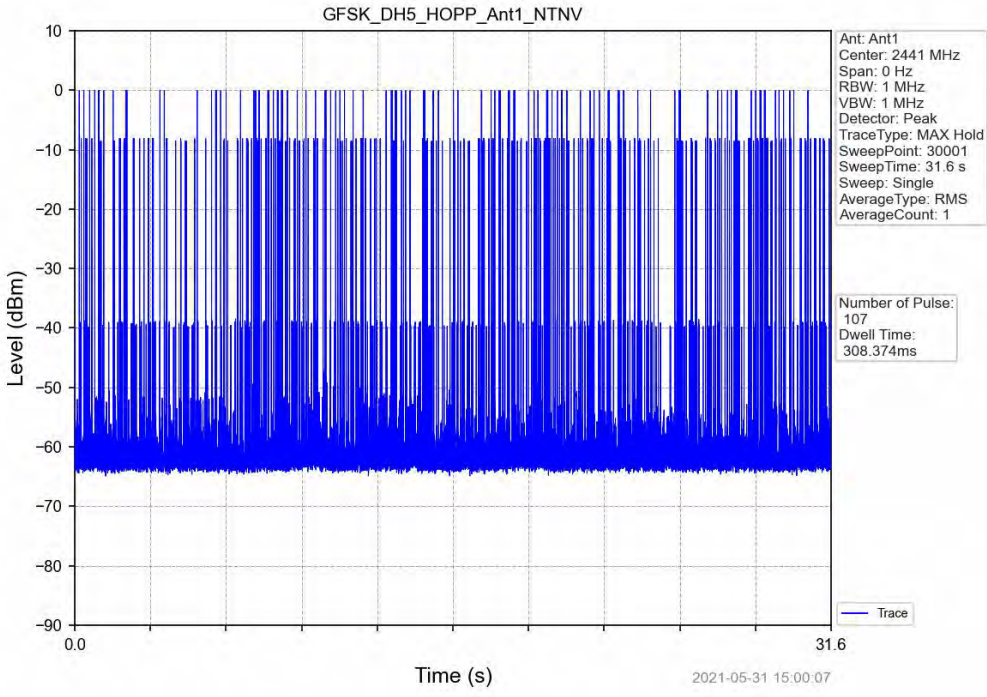
GFSK_DH3_HOPP_Ant1_NTNV



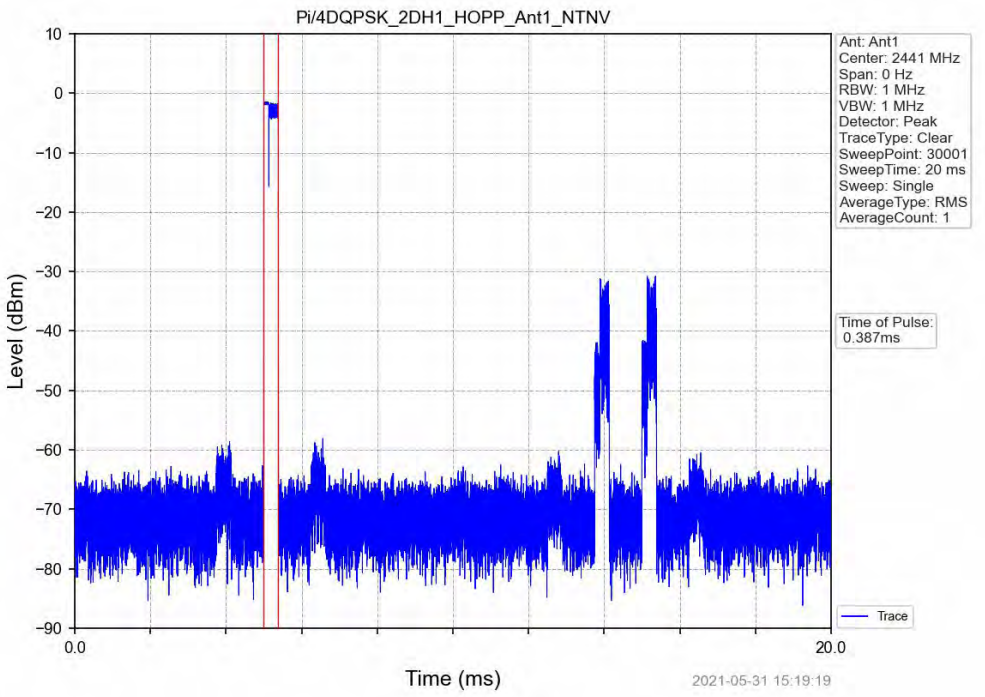
GFSK_DH5_HOPP_Ant1_NTNV



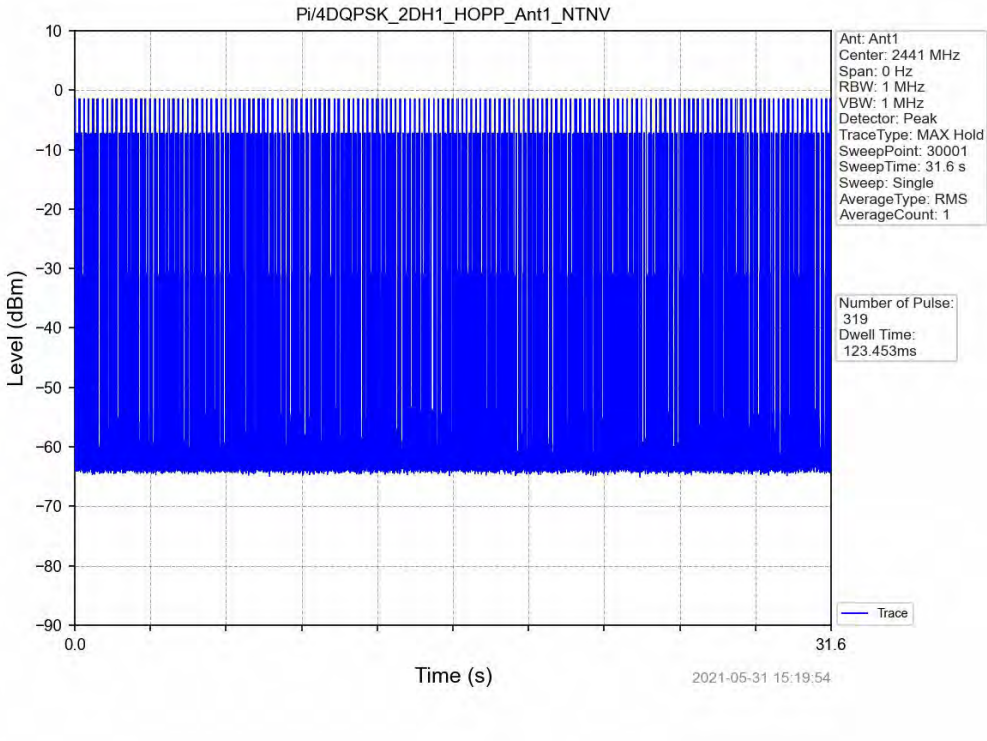
GFSK_DH5_HOPP_Ant1_NTNV



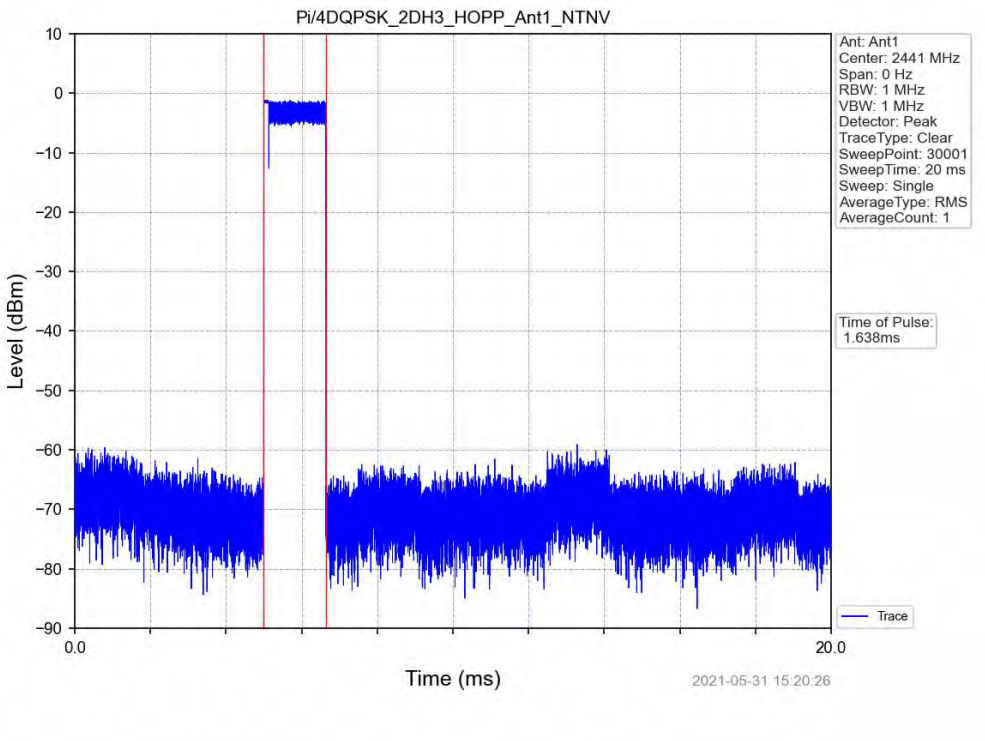
Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



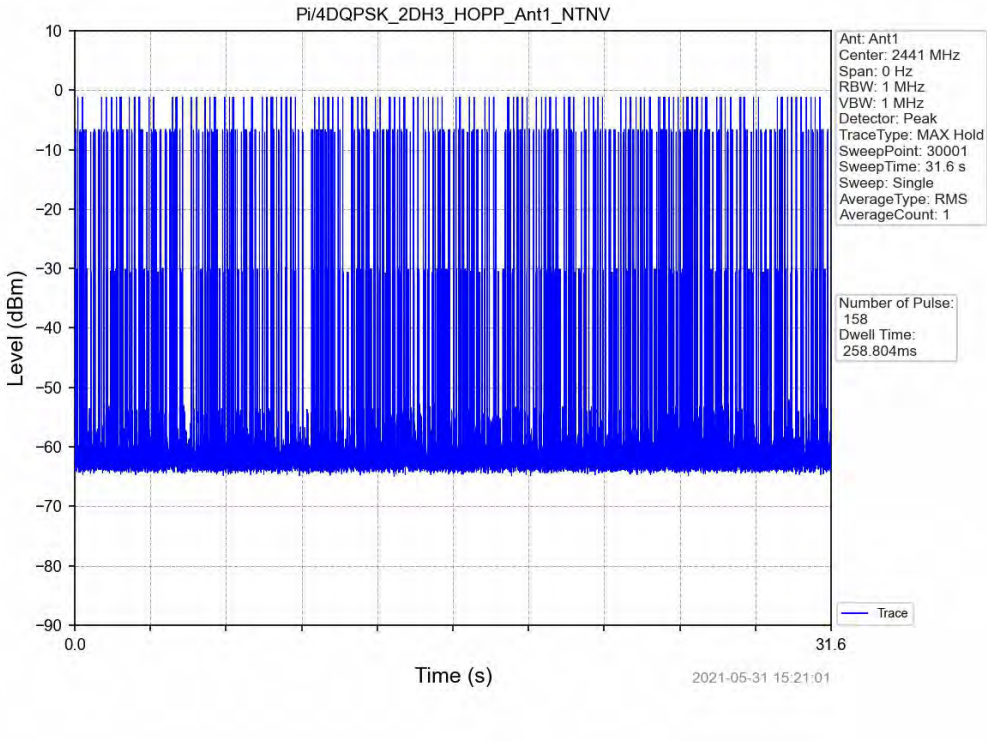
Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



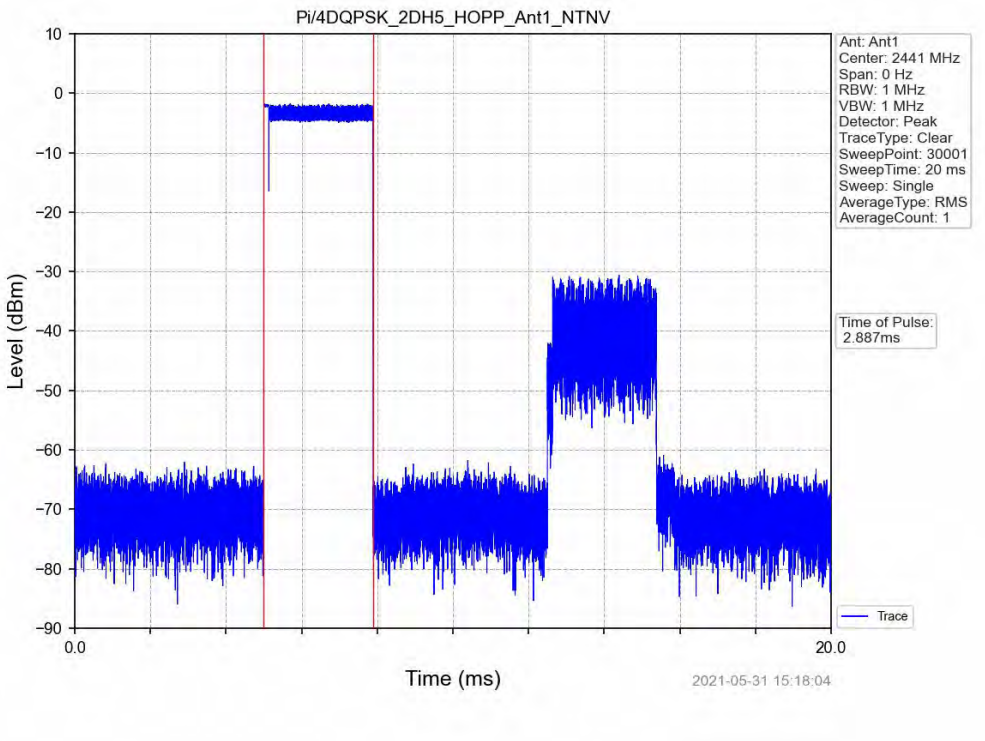
Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV



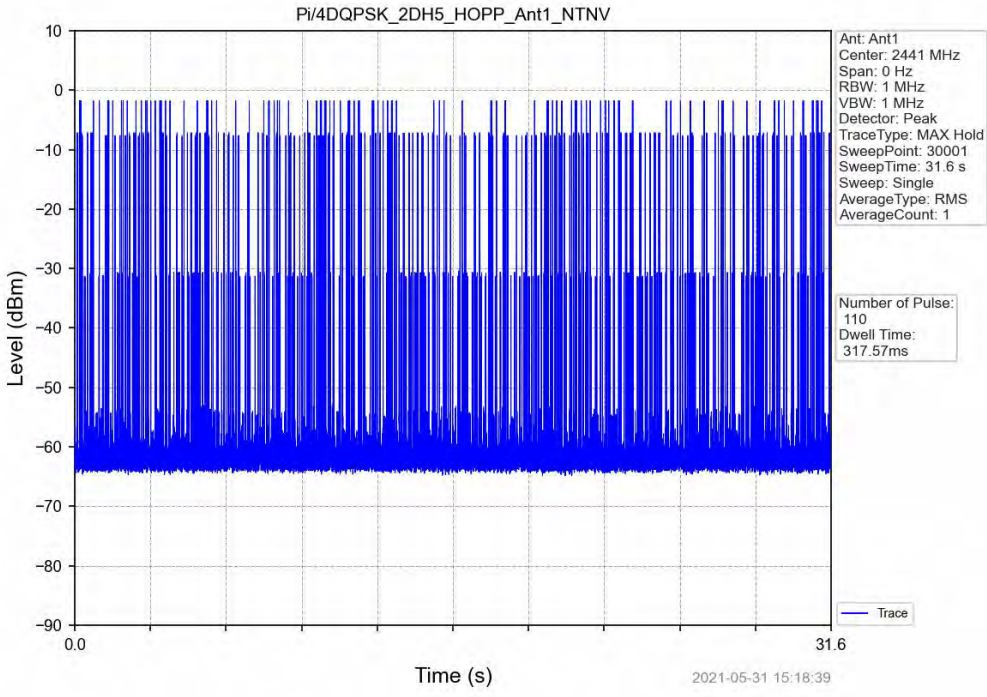
Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV



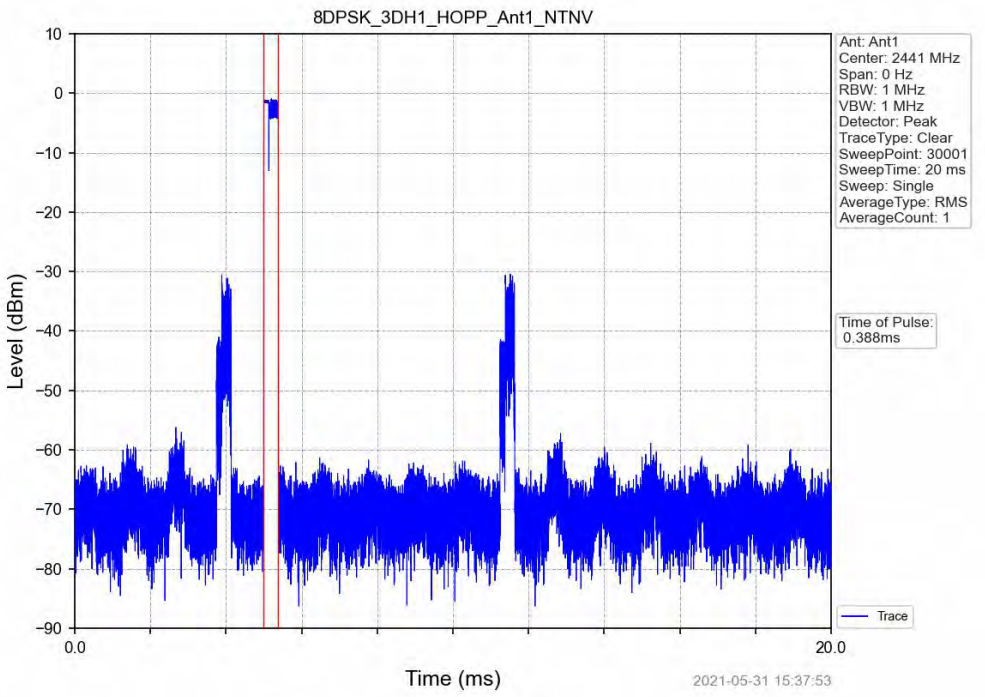
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



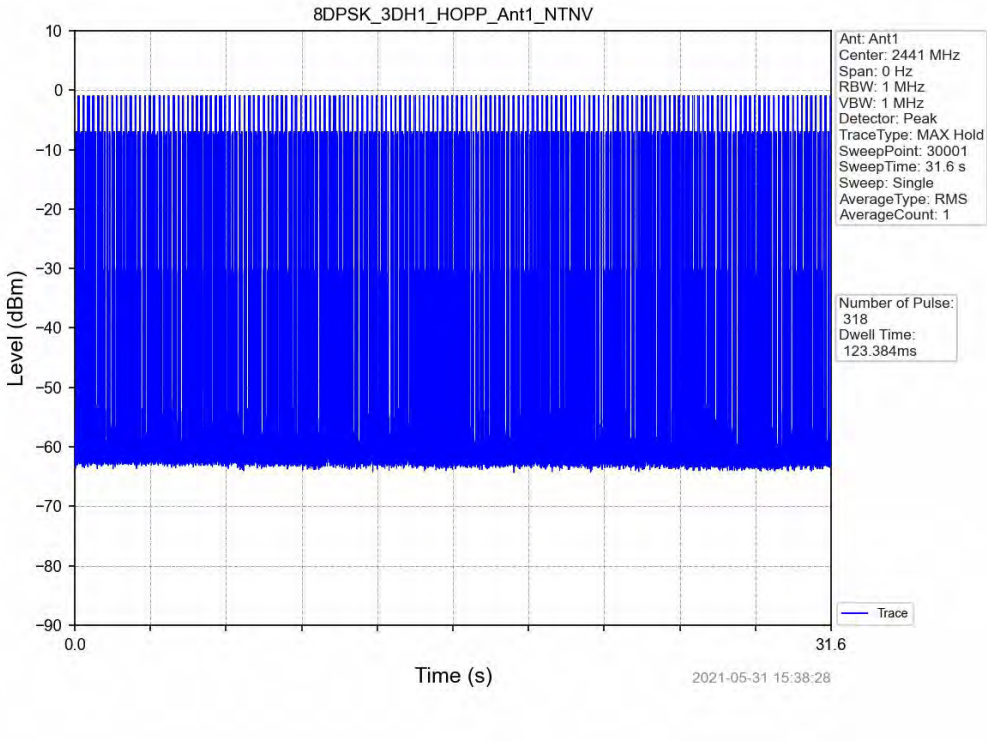
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



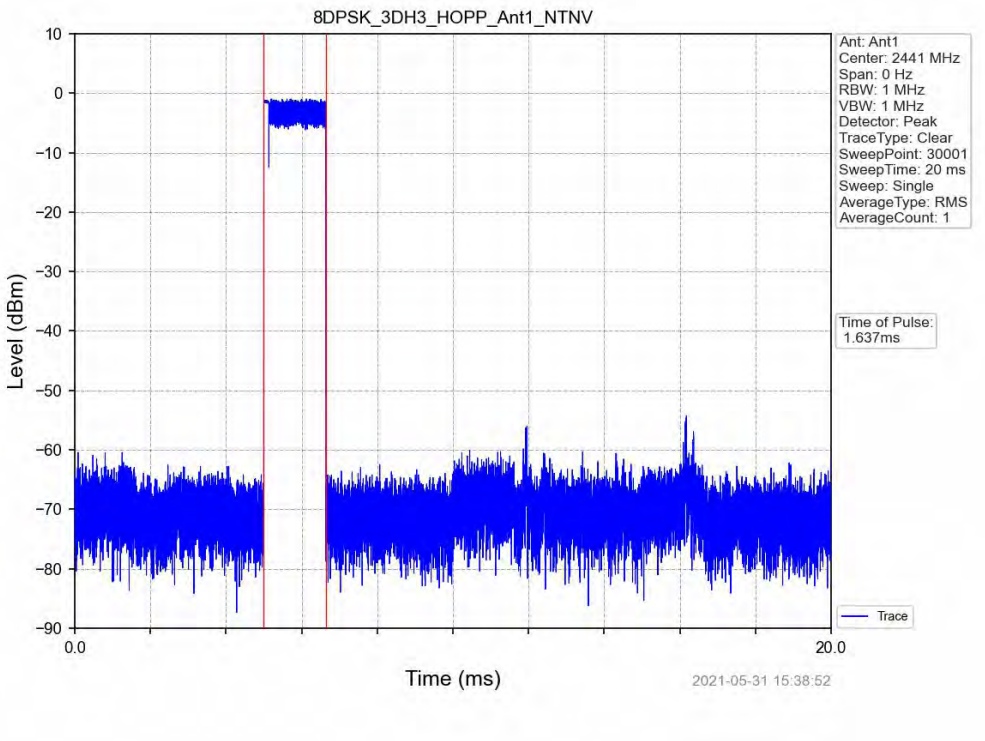
8DPSK_3DH1_HOPP_Ant1_NTNV



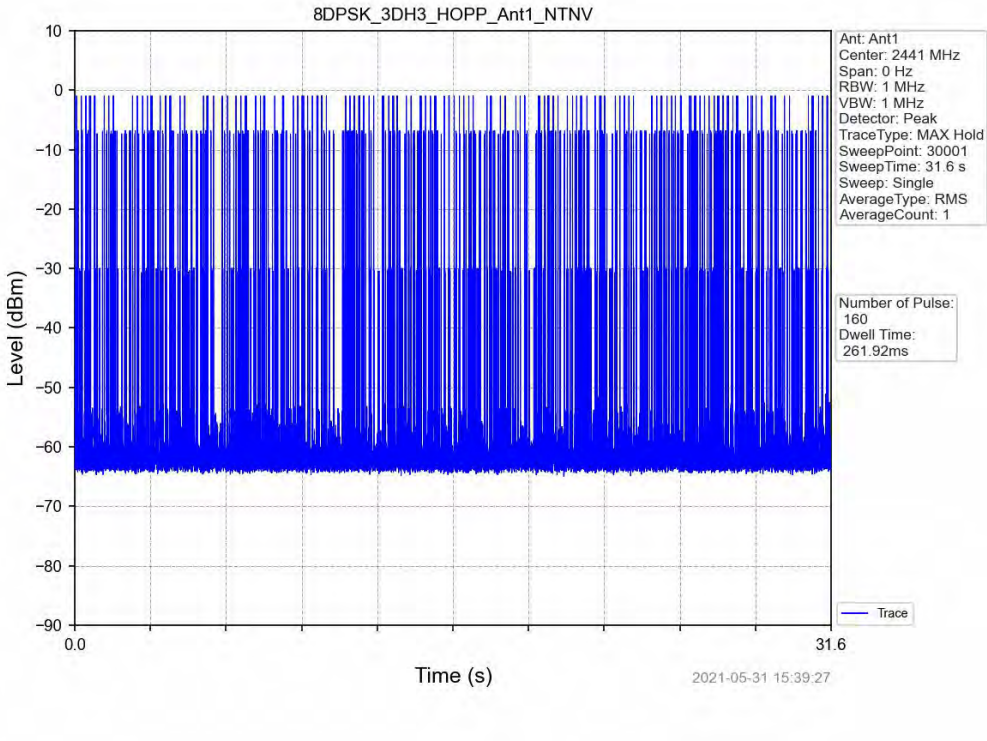
8DPSK_3DH1_HOPP_Ant1_NTNV



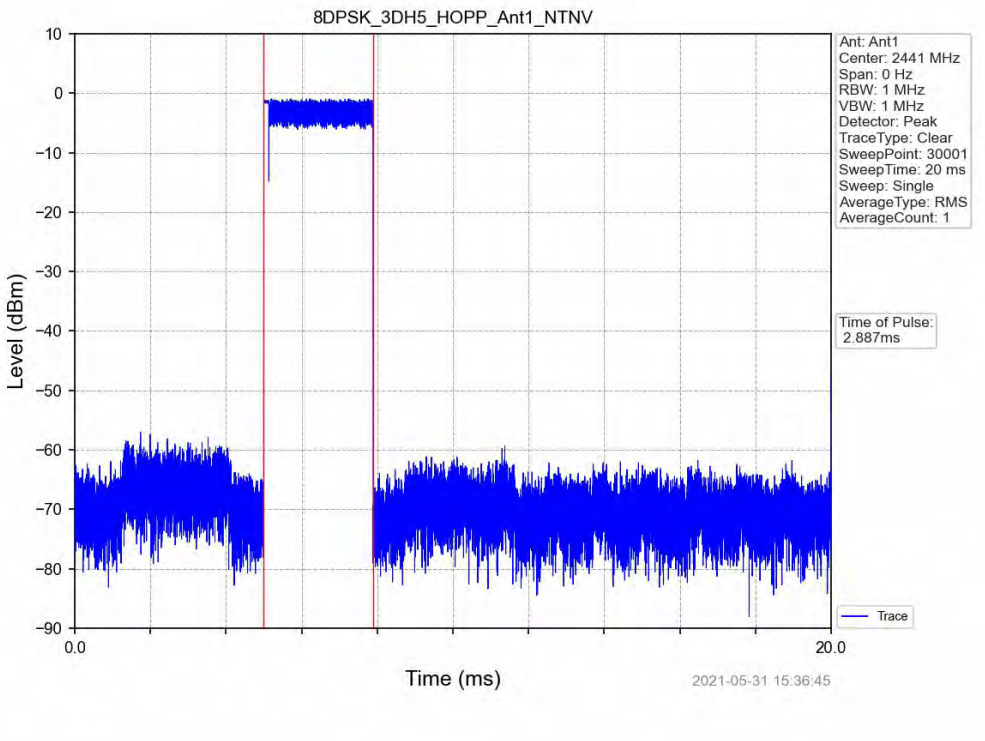
8DPSK_3DH3_HOPP_Ant1_NTNV



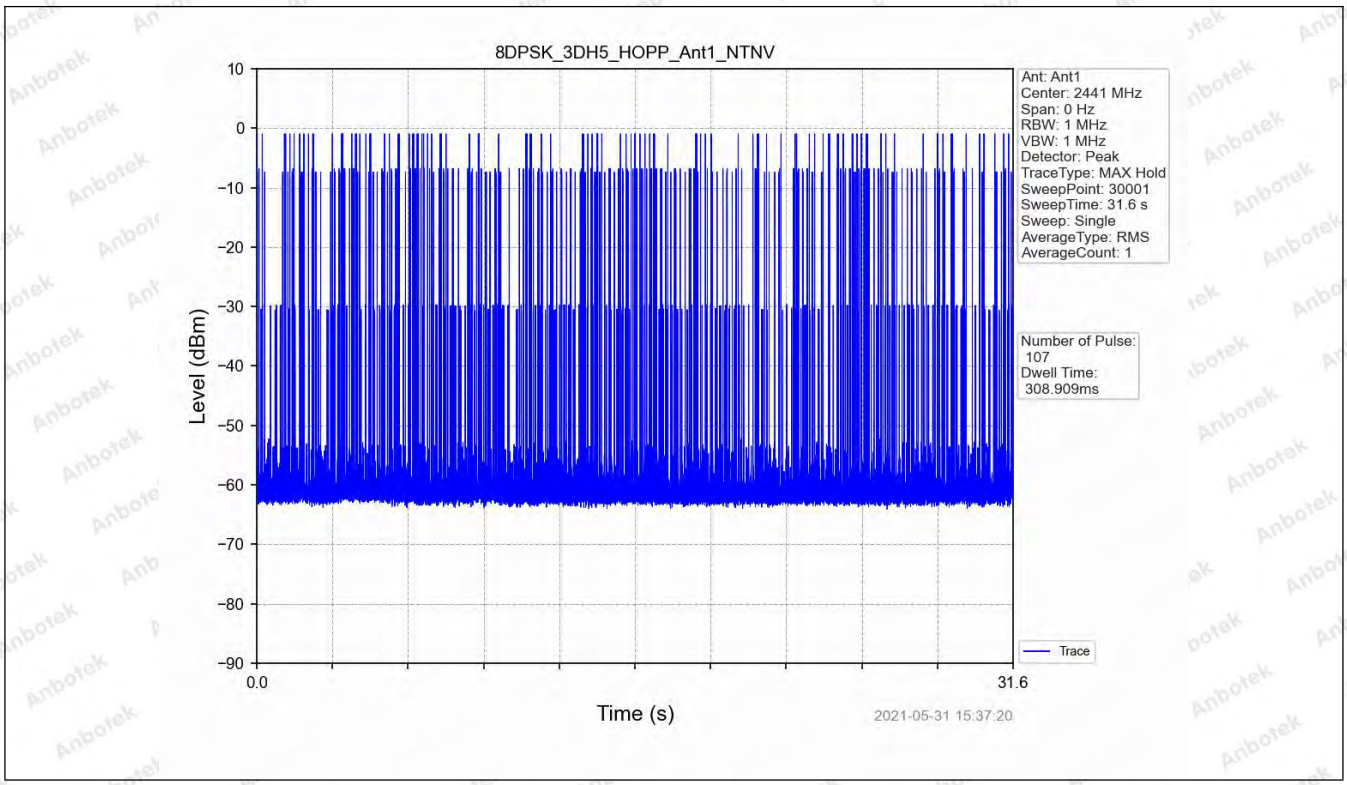
8DPSK_3DH3_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV


8DPSK_3DH5_HOPP_Ant1_NTNV
Ant: Ant1
Center: 2441 MHz
Span: 0 Hz
RBW: 1 MHz
VBW: 1 MHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 30001
SweepTime: 31.6 s
Sweep: Single
AverageType: RMS
AverageCount: 1
Number of Pulse:
107
Dwell Time:
308.909ms
Trace
Level (dBm)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.0
31.6
Time (s)
2021-05-31 15:37:20

6. Unwanted Emissions In Non-restricted Frequency Bands

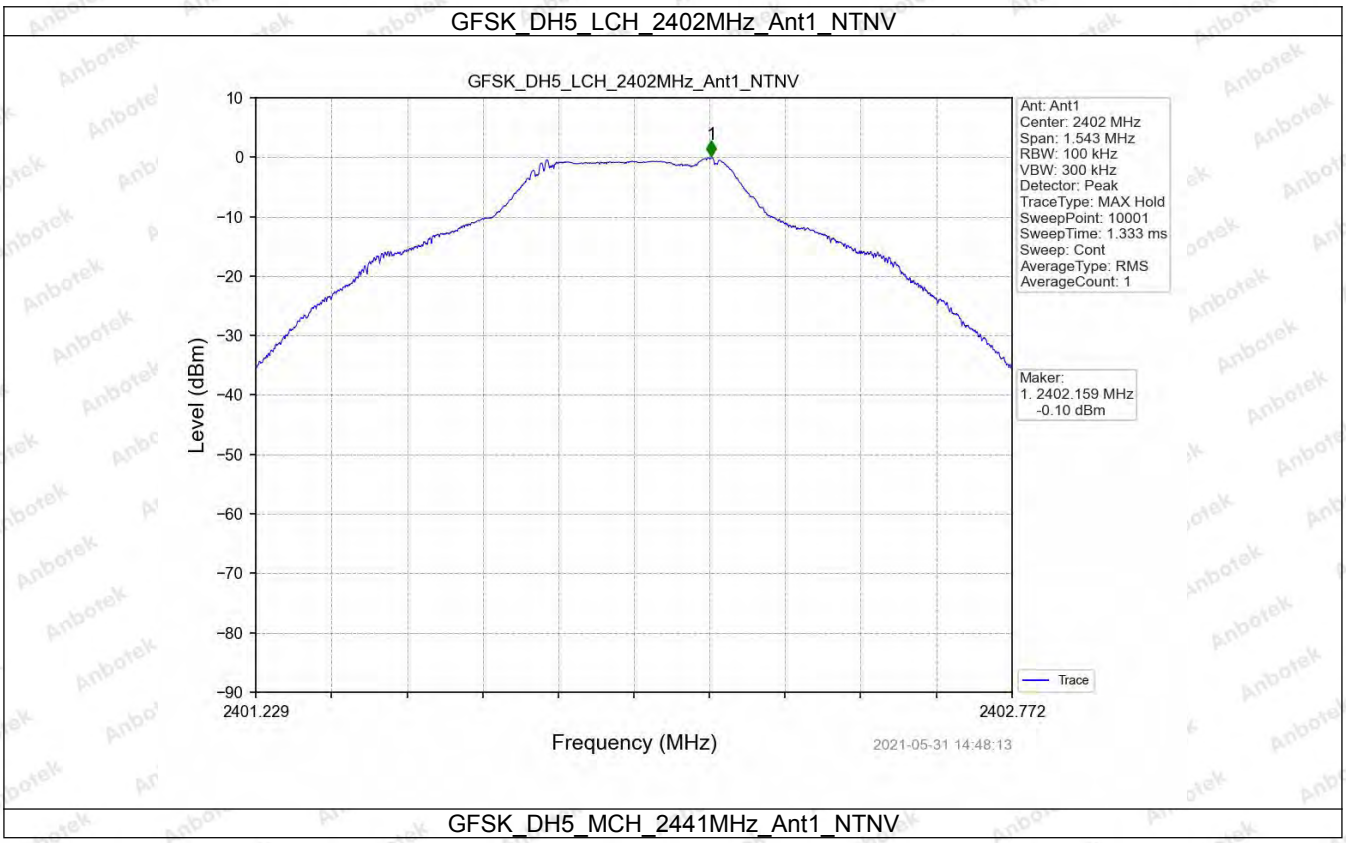
6.1 Ref

6.1.1 Test Result

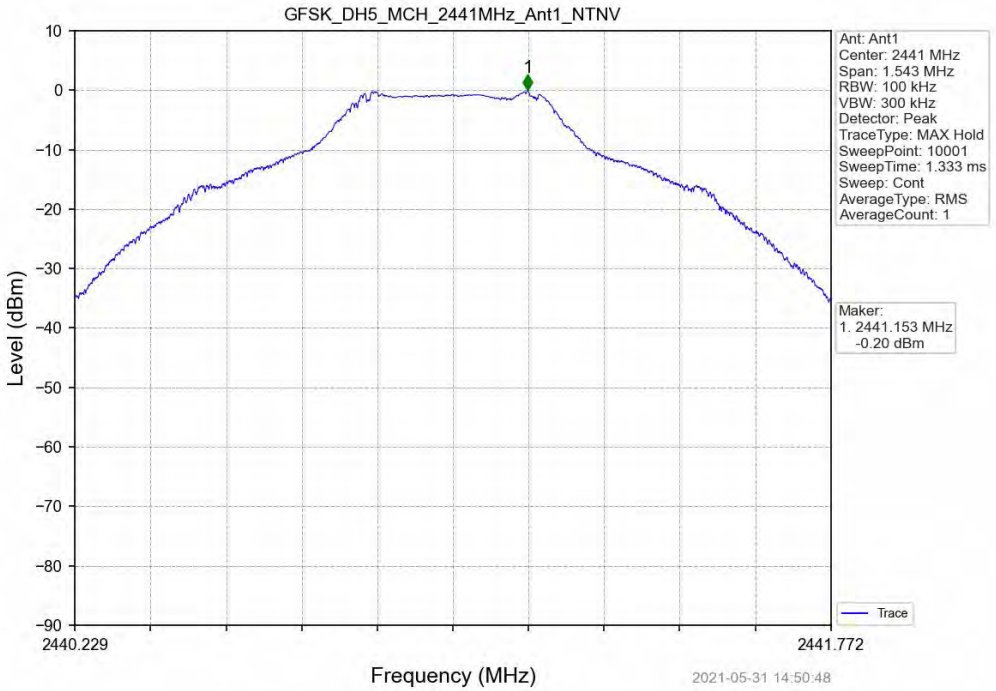
Mode	TX Type	Frequency (MHz)	Packet Type	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	-0.10	/	/
		2441	DH5	-0.20	/	/
		2480	DH5	-0.73	/	/
Pi/4DQPSK	SISO	2402	2DH5	-1.13	/	/
		2441	2DH5	-1.49	/	/
		2480	2DH5	-2.38	/	/
8DPSK	SISO	2402	3DH5	-1.07	/	/
		2441	3DH5	-1.39	/	/
		2480	3DH5	-2.10	/	/
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 Test Graph

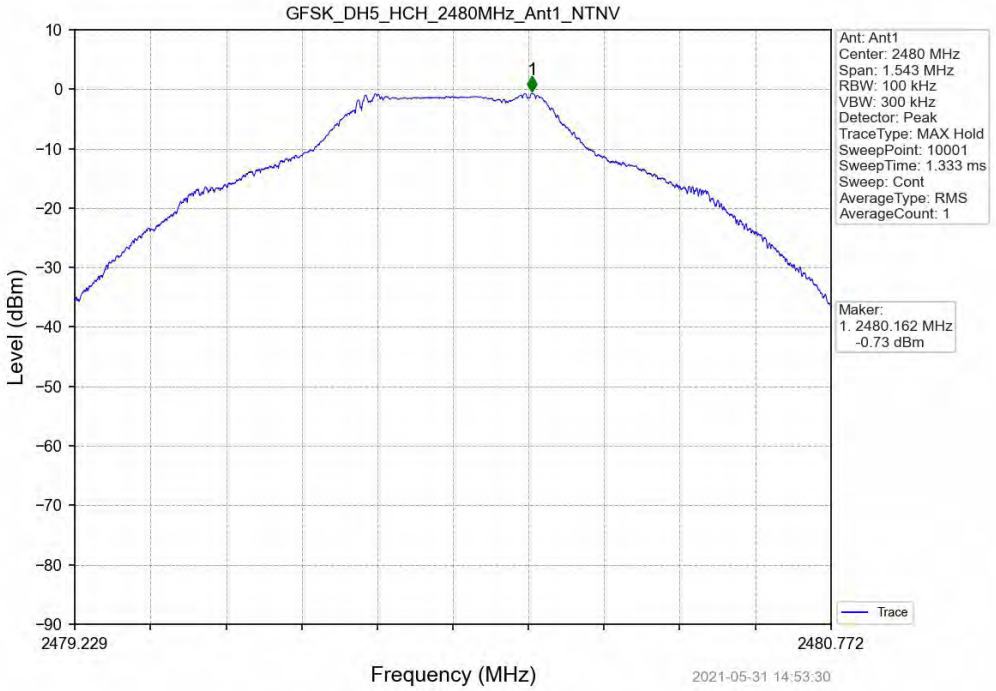
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



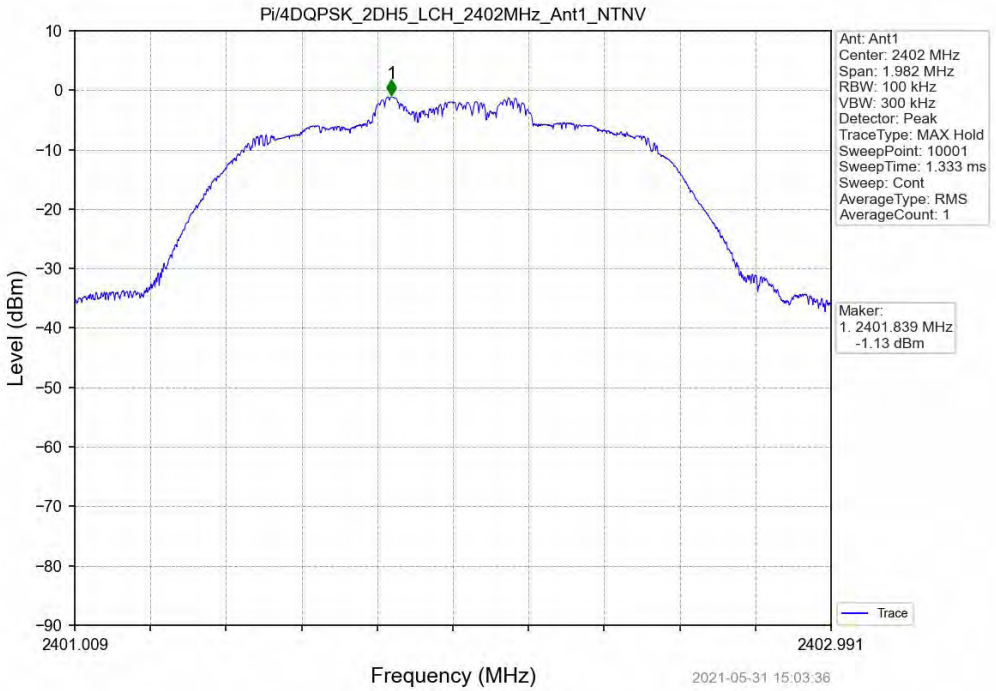
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



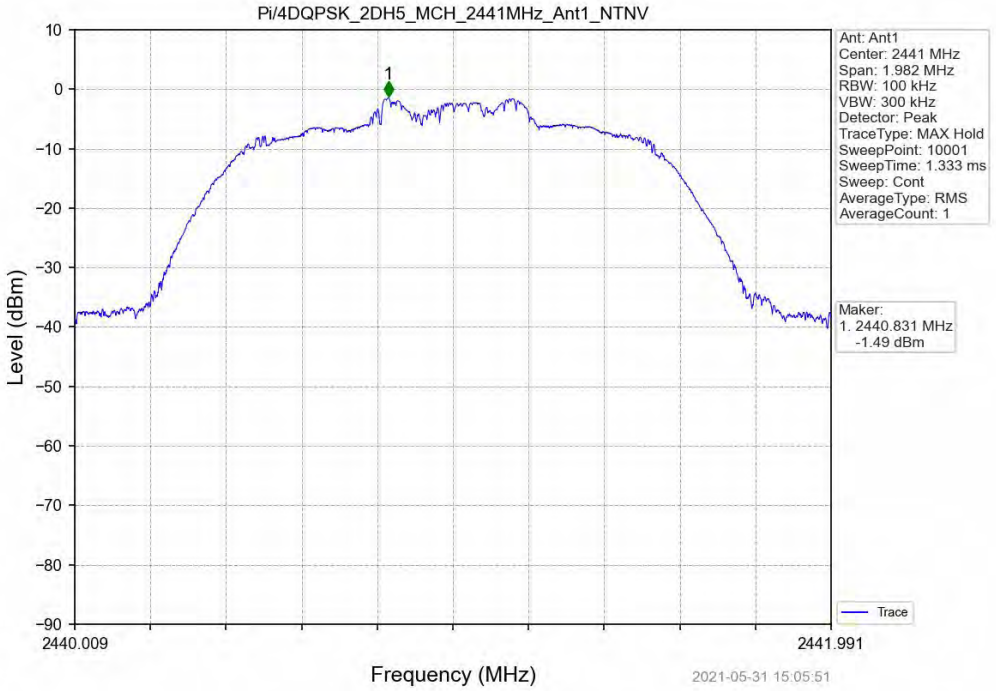
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



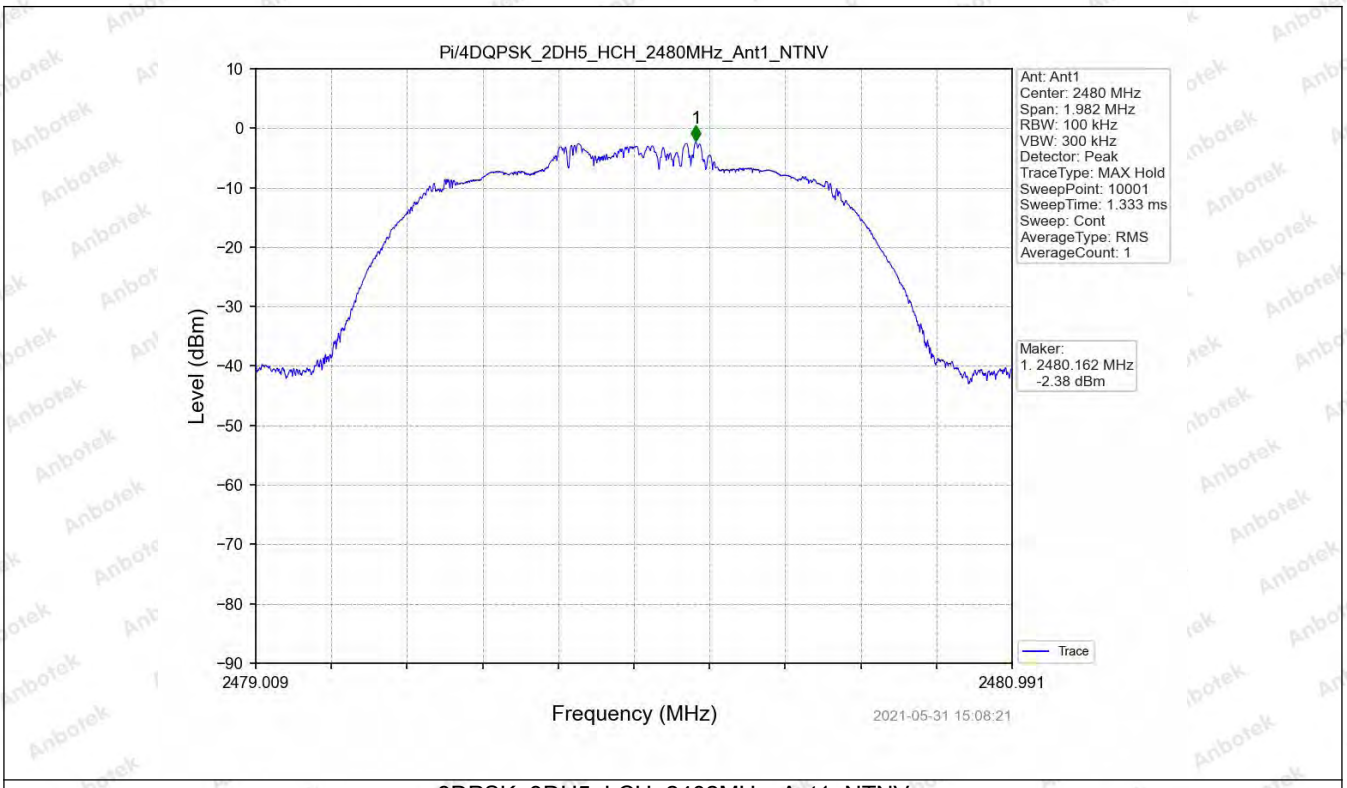
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



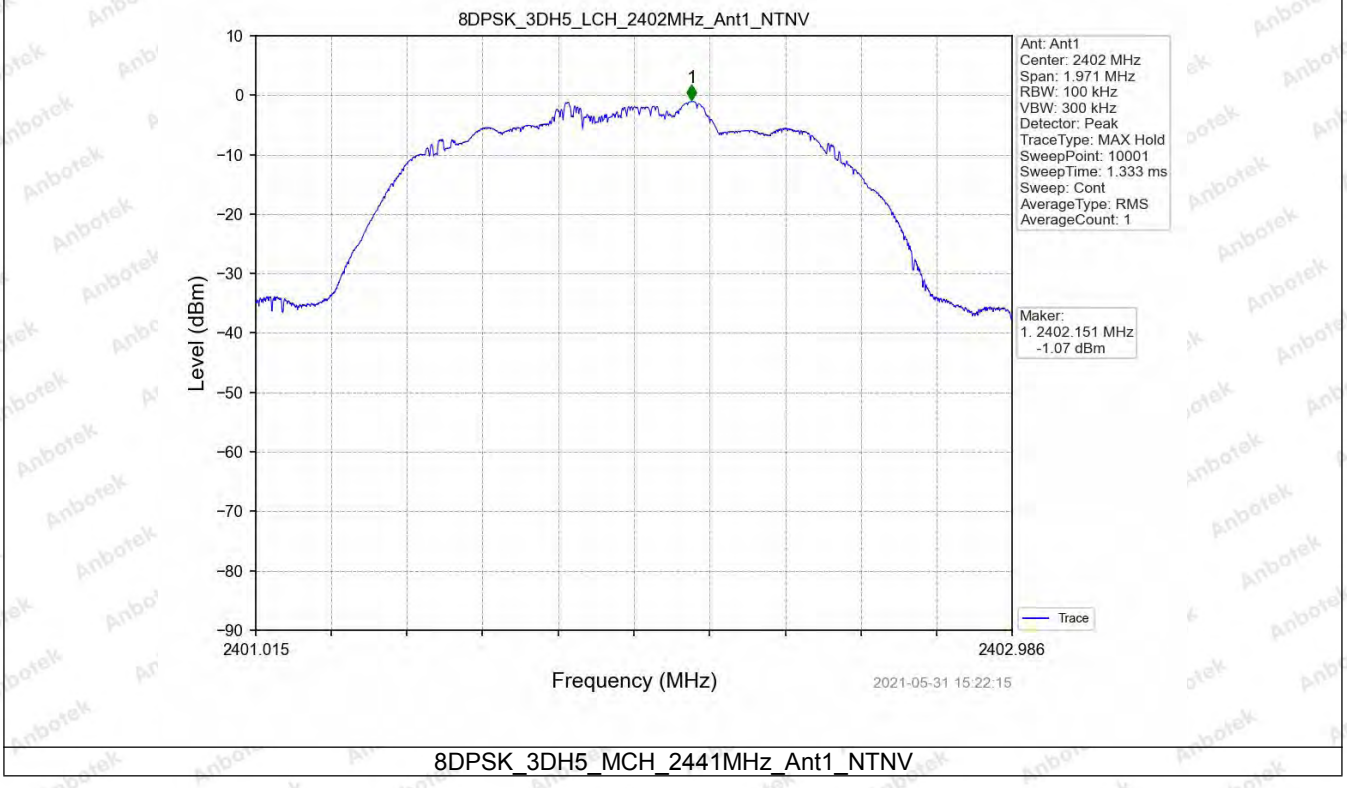
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



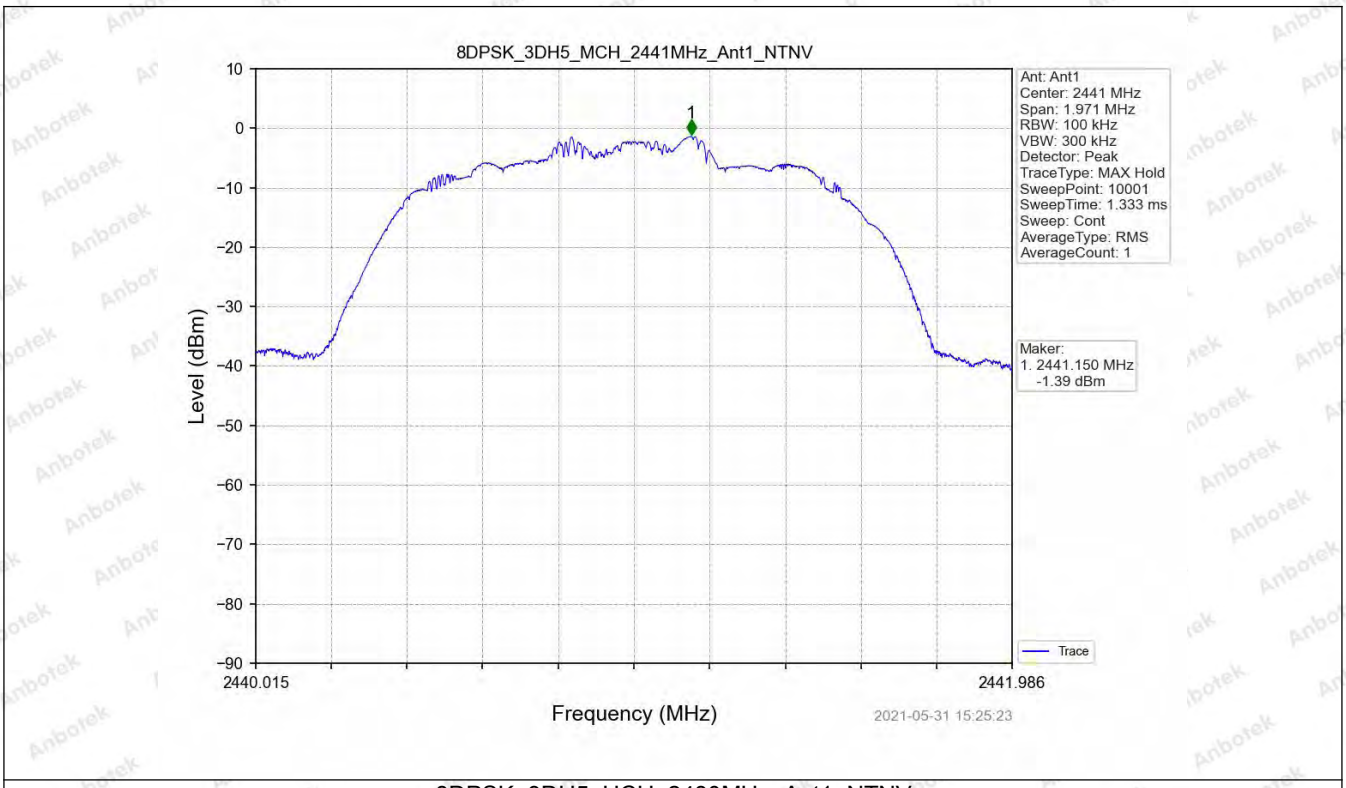
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



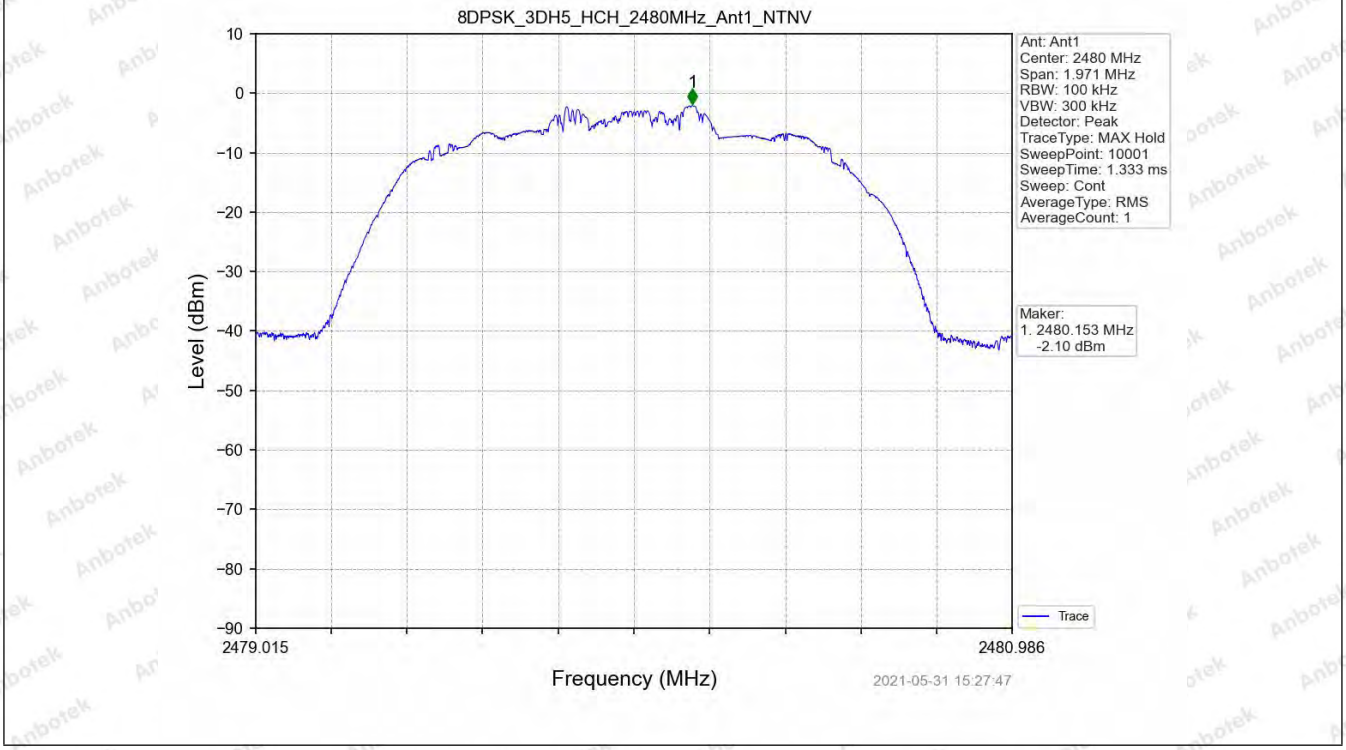
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



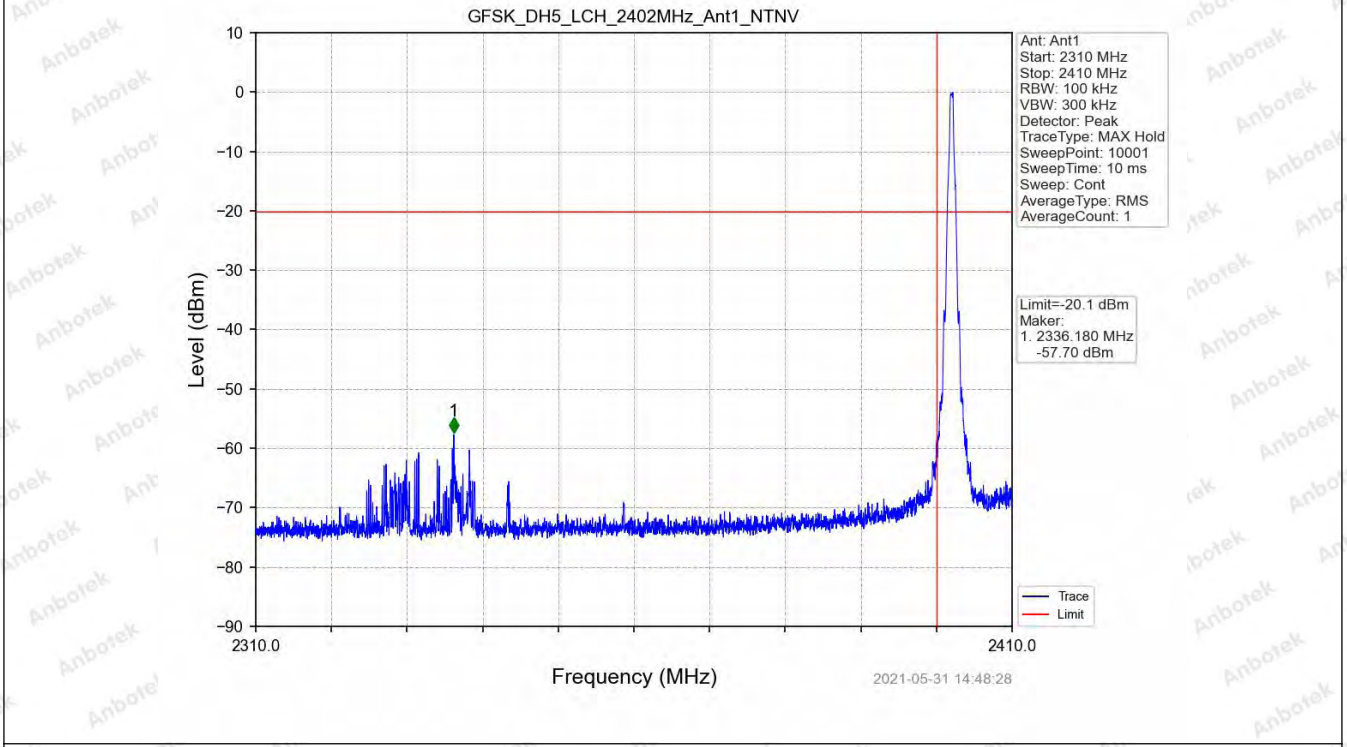
6.2 CSE

6.2.1 Test Result

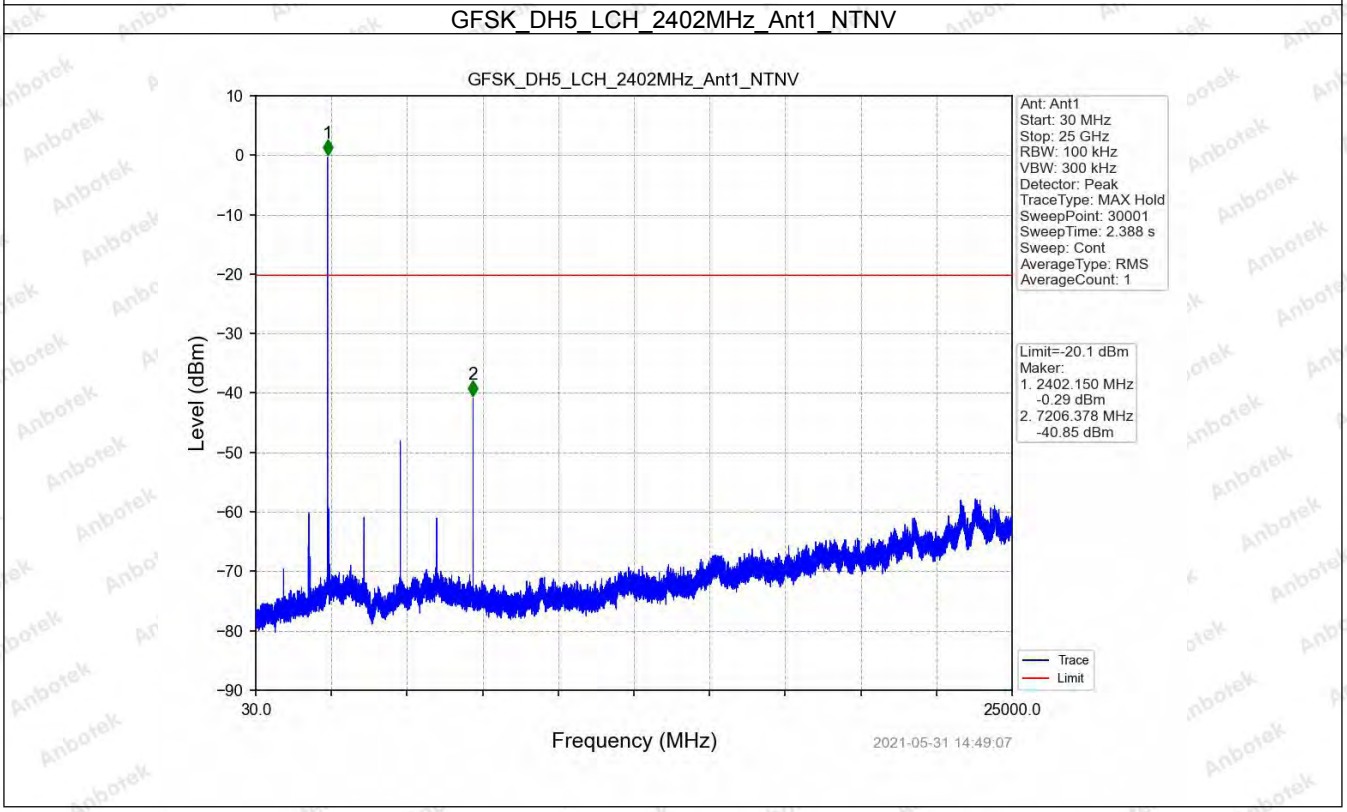
Mode	TX Type	Frequency (MHz)	Packet Type	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	Refer To Test Graph	<=-20.1	Pass
		2441	DH5	Refer To Test Graph	<=-20.1	Pass
		2480	DH5	Refer To Test Graph	<=-20.1	Pass
		2441	DH5	Refer To Test Graph	<=-20.1	Pass
Pi/4DQPSK	SISO	2402	2DH5	Refer To Test Graph	<=-21.13	Pass
		2441	2DH5	Refer To Test Graph	<=-21.13	Pass
		2480	2DH5	Refer To Test Graph	<=-21.13	Pass
		2441	2DH5	Refer To Test Graph	<=-21.13	Pass
8DPSK	SISO	2402	3DH5	Refer To Test Graph	<=-21.07	Pass
		2441	3DH5	Refer To Test Graph	<=-21.07	Pass
		2480	3DH5	Refer To Test Graph	<=-21.07	Pass
		2441	3DH5	Refer To Test Graph	<=-21.07	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.						

6.2.2 Test Graph

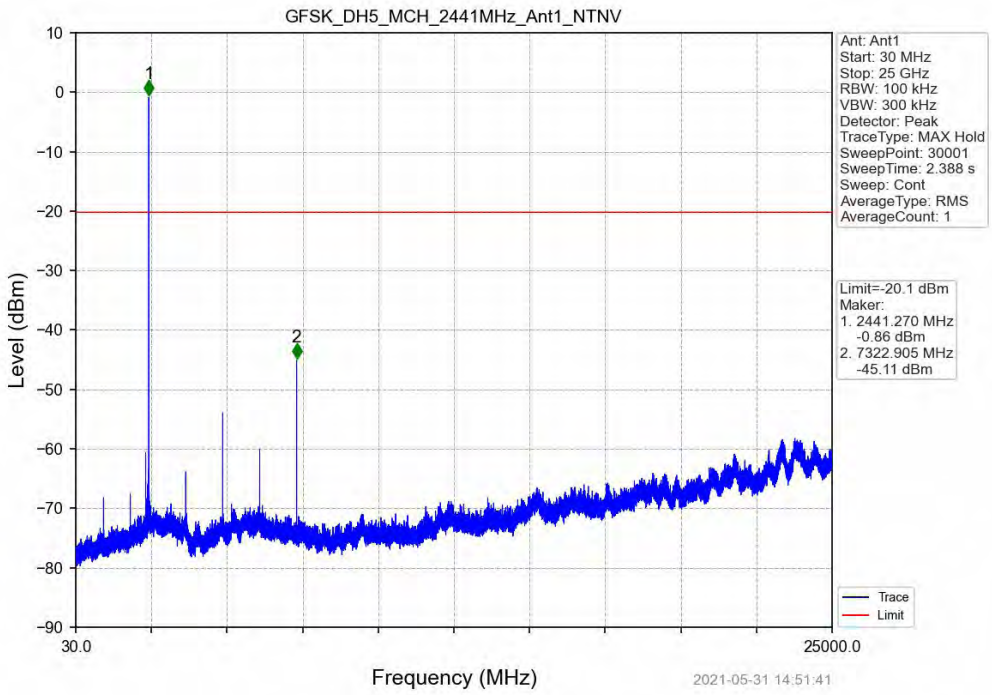
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



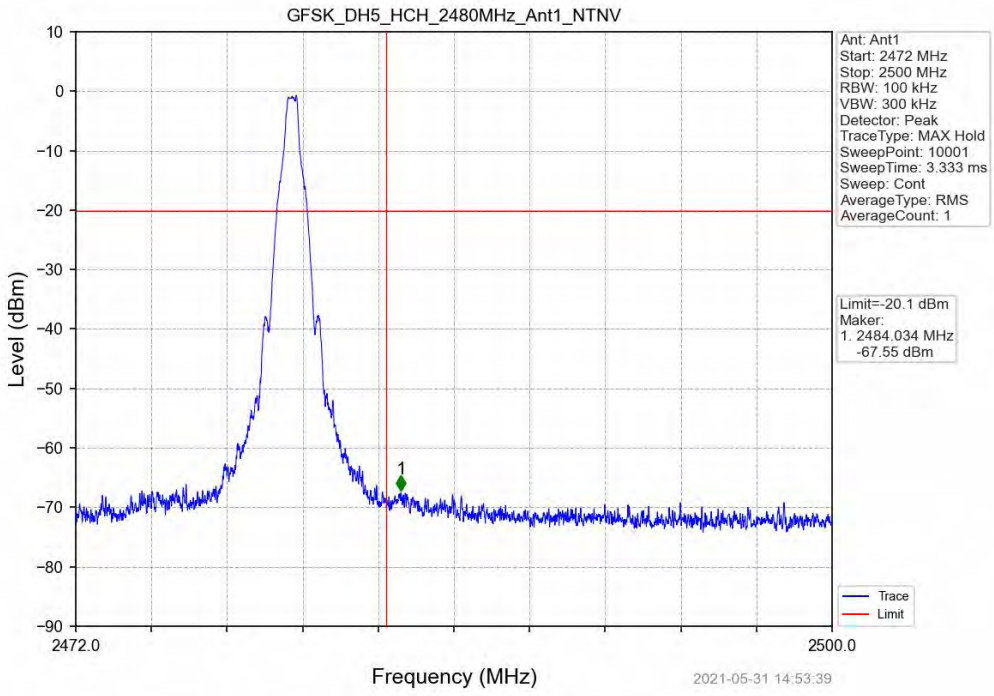
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



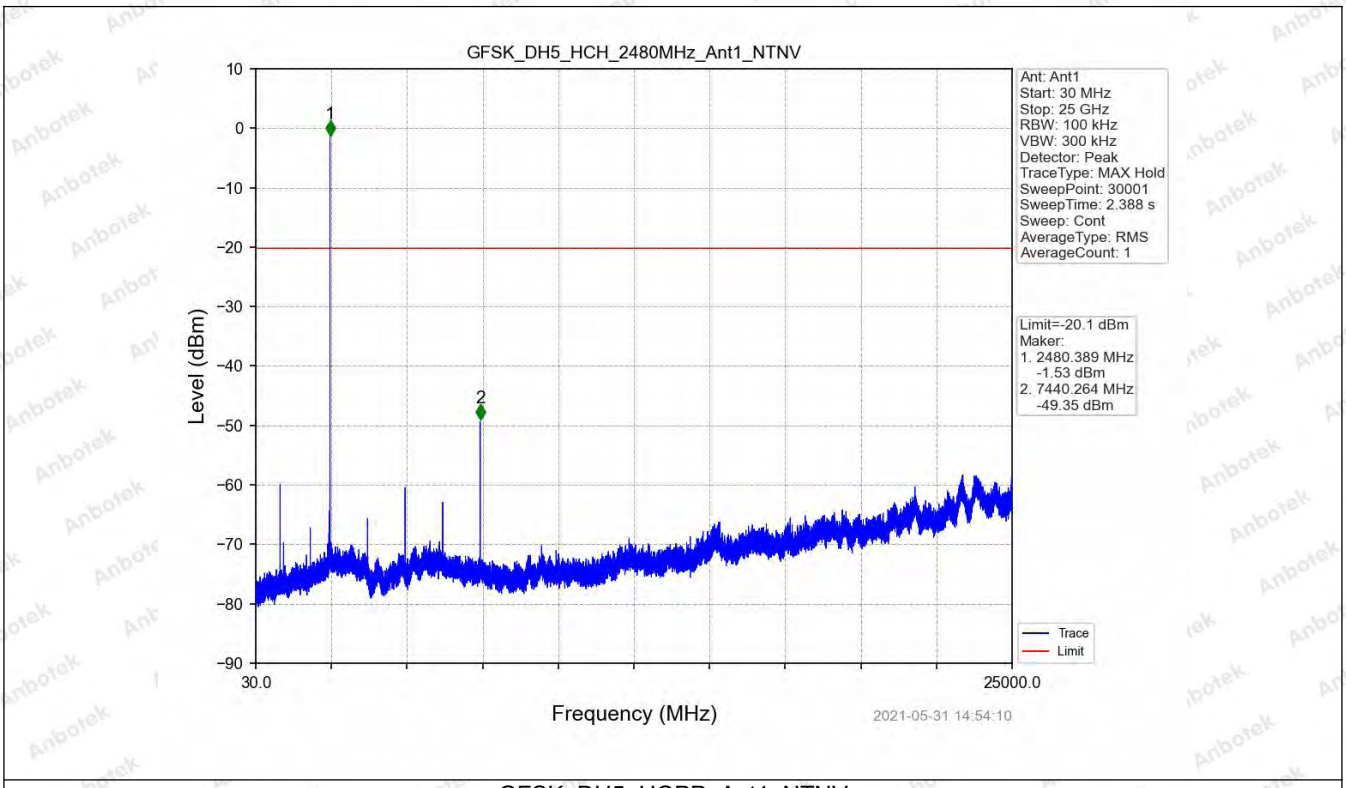
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



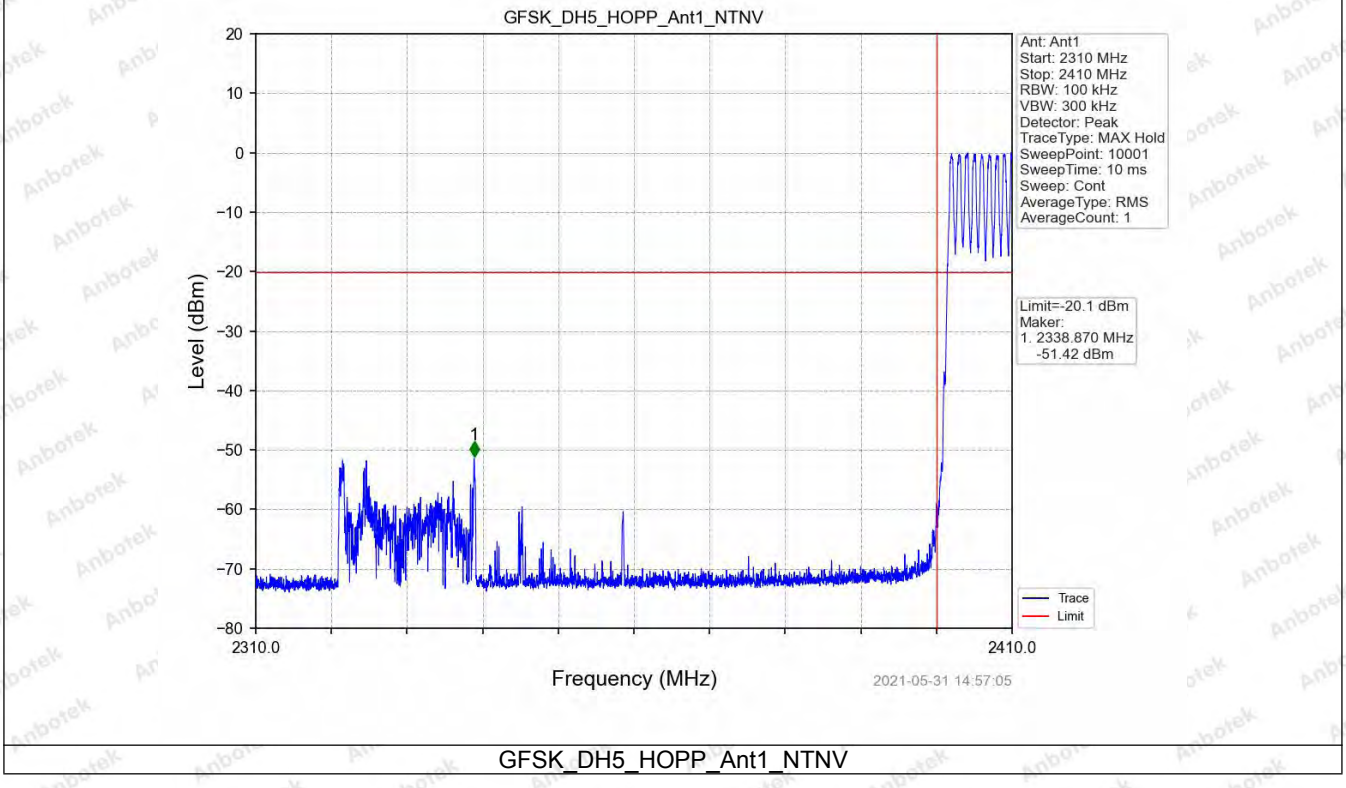
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



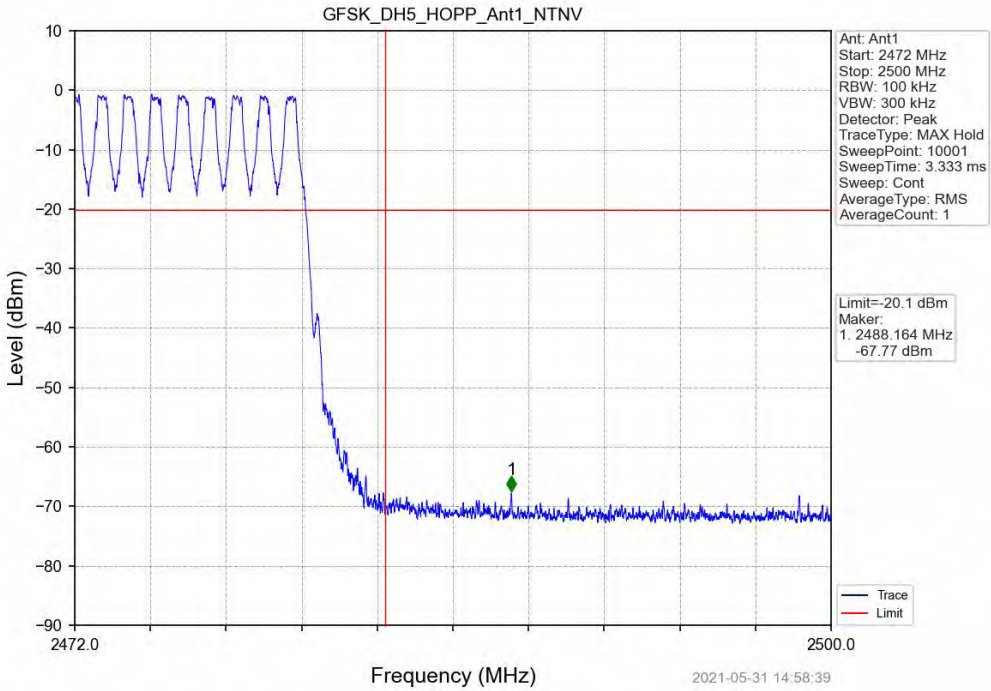
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



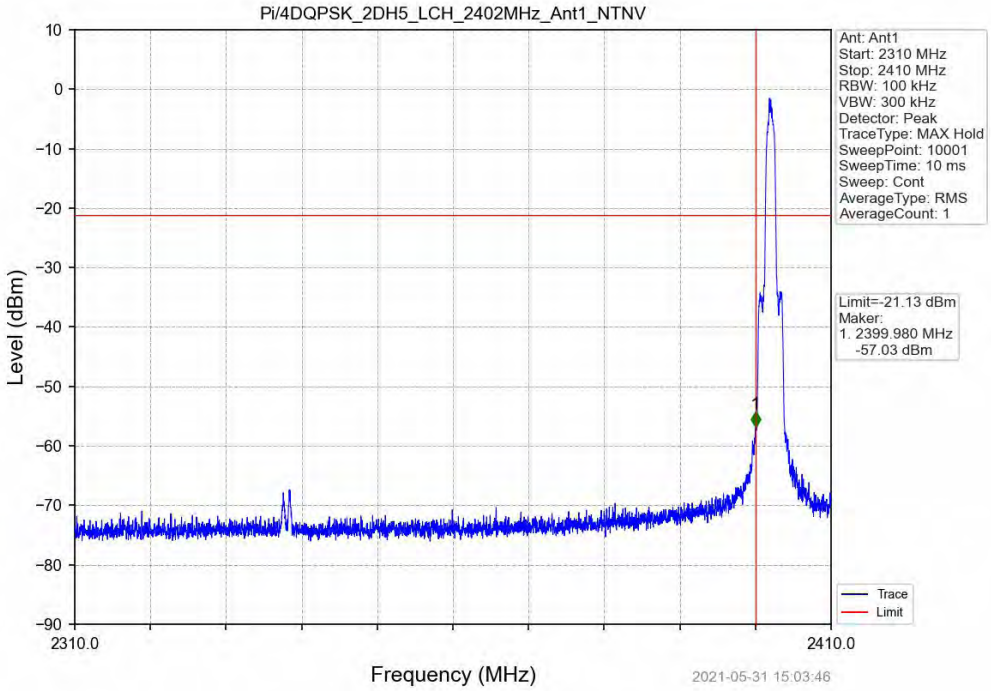
GFSK_DH5_HOPP_Ant1_NTNV



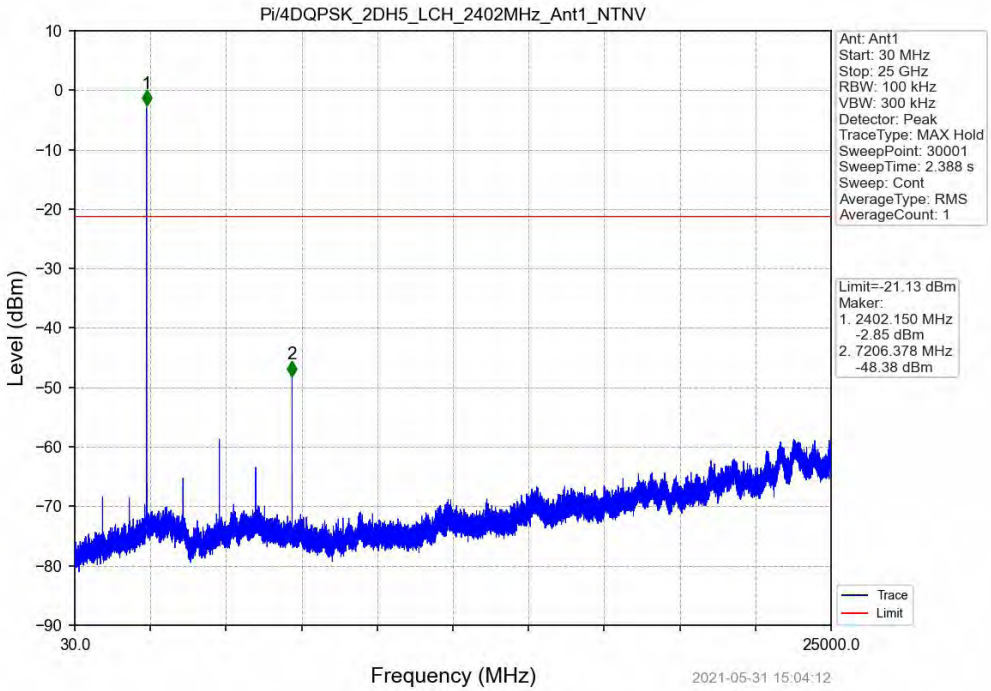
GFSK_DH5_HOPP_Ant1_NTNV



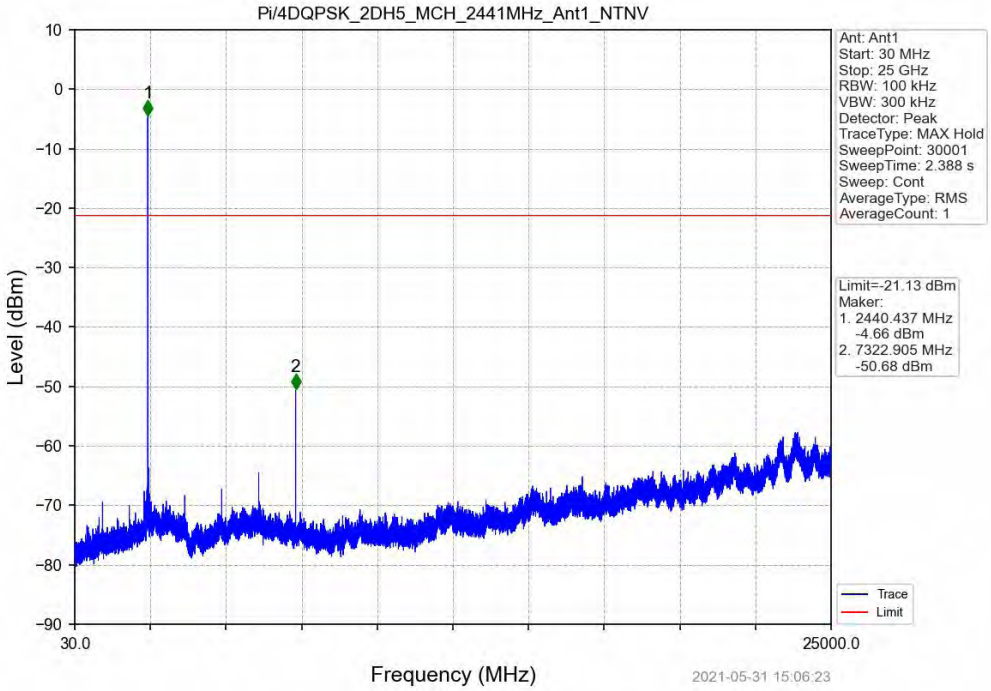
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



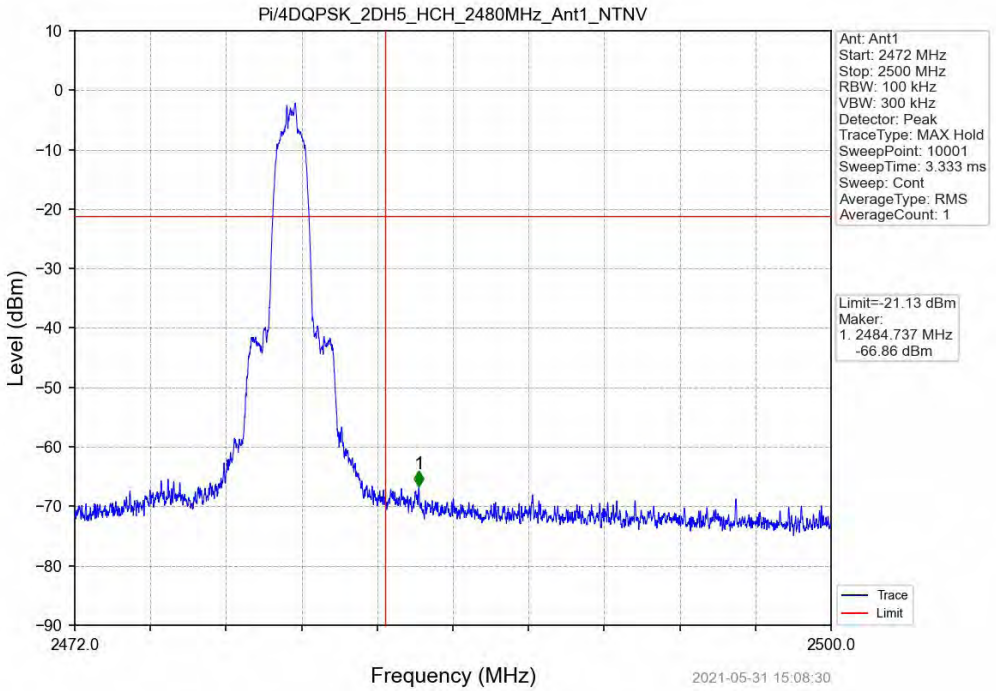
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



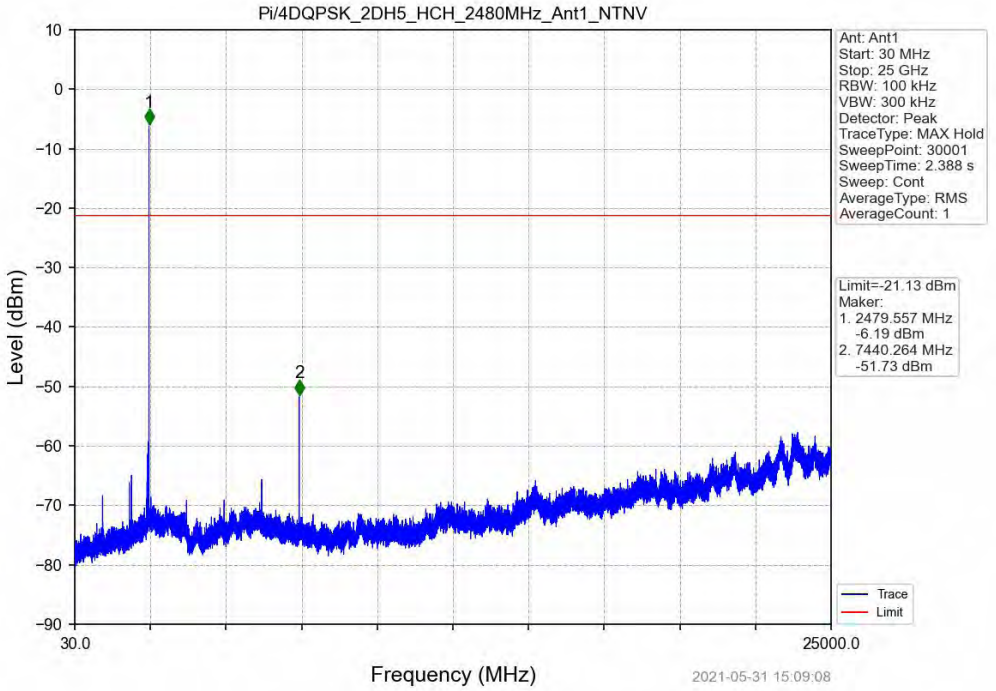
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



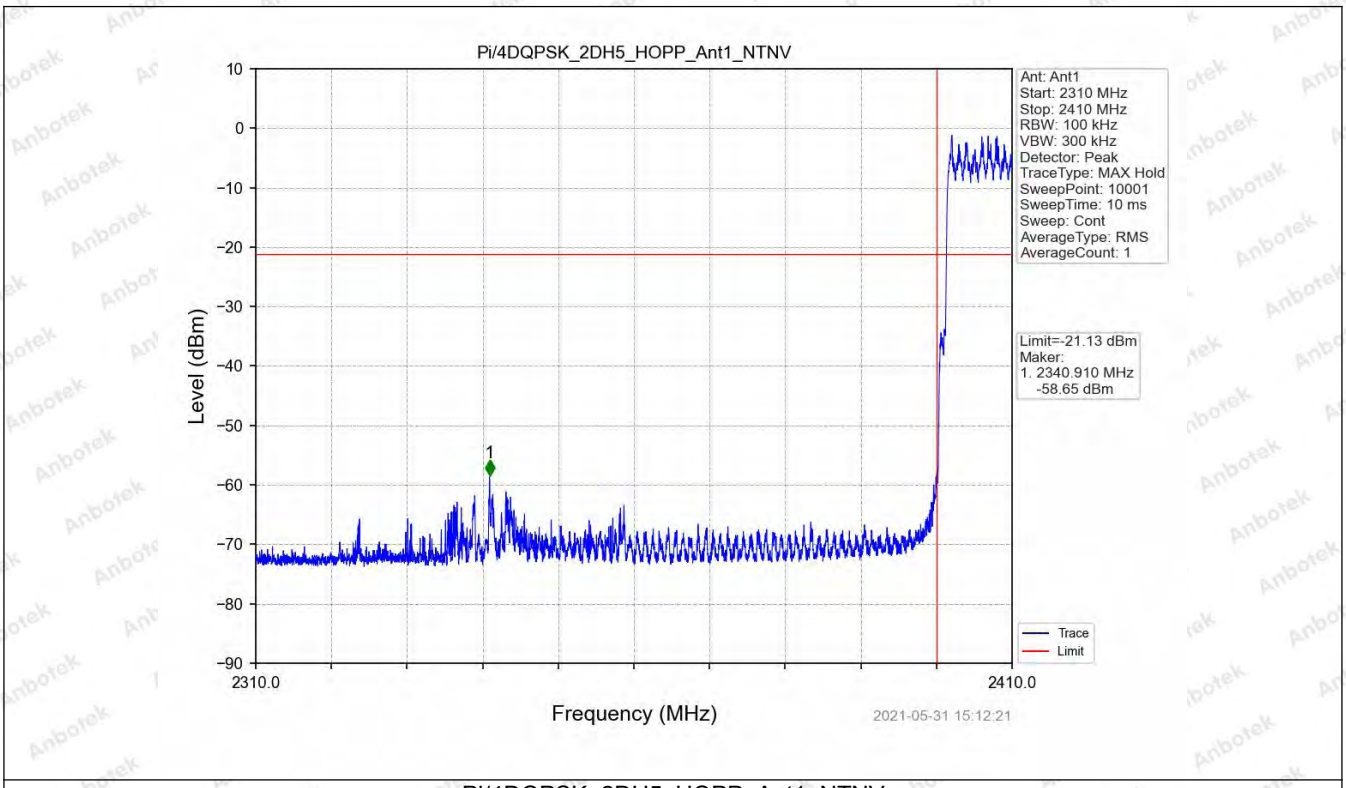
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



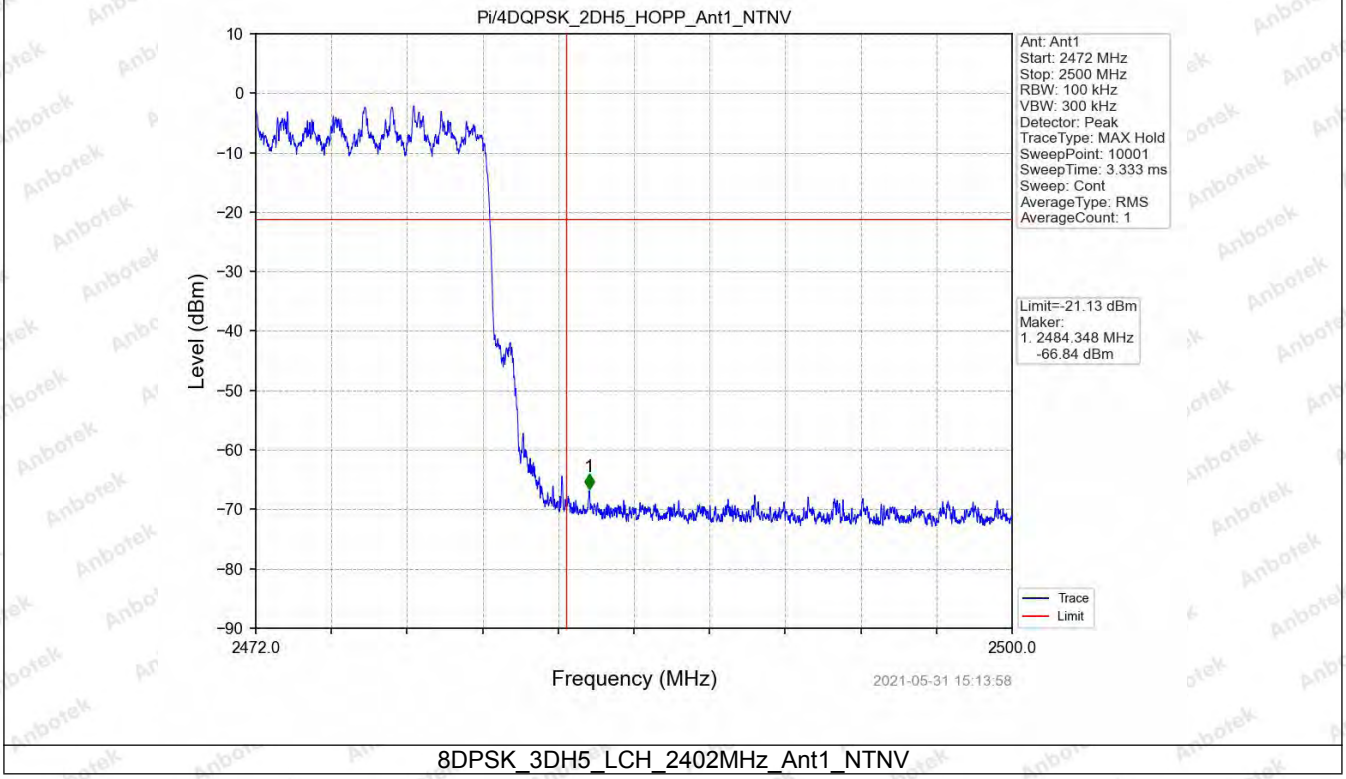
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



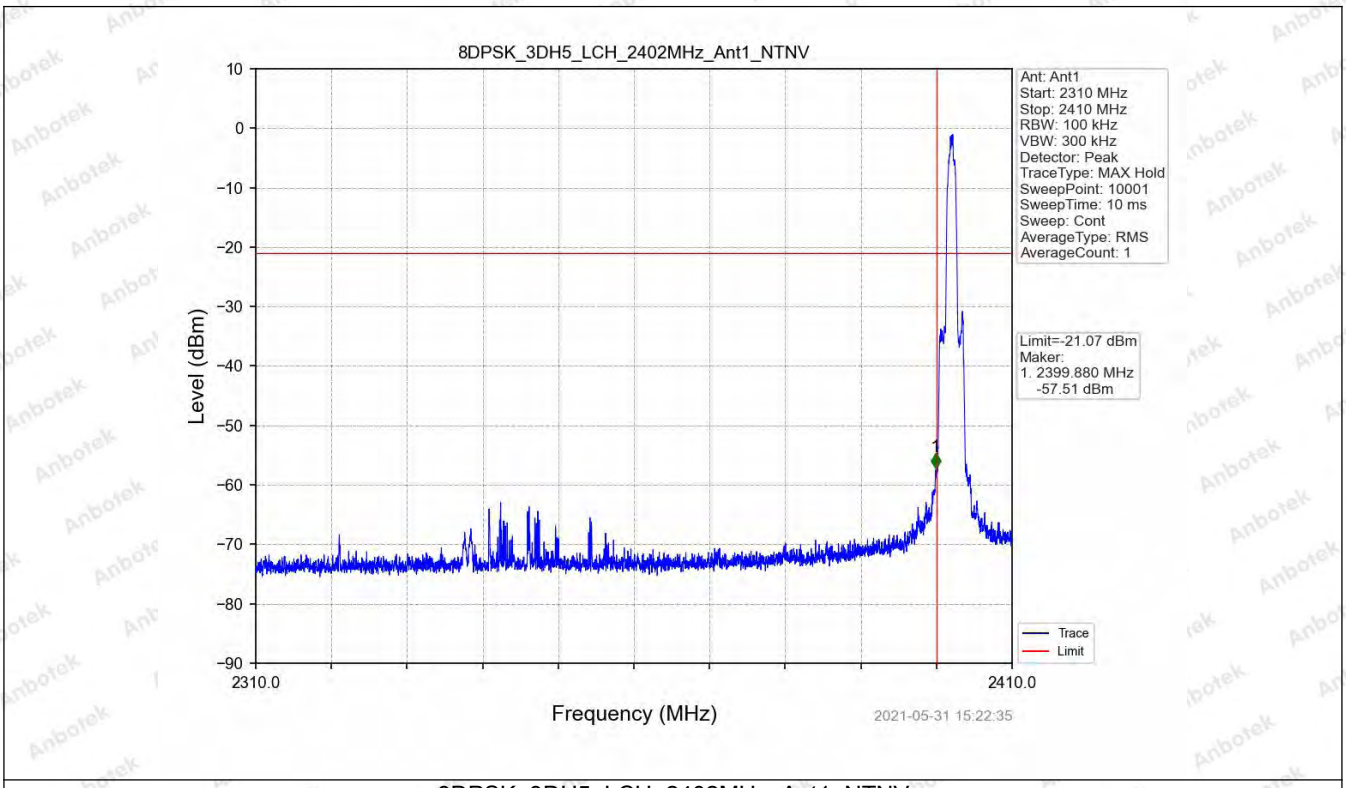
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



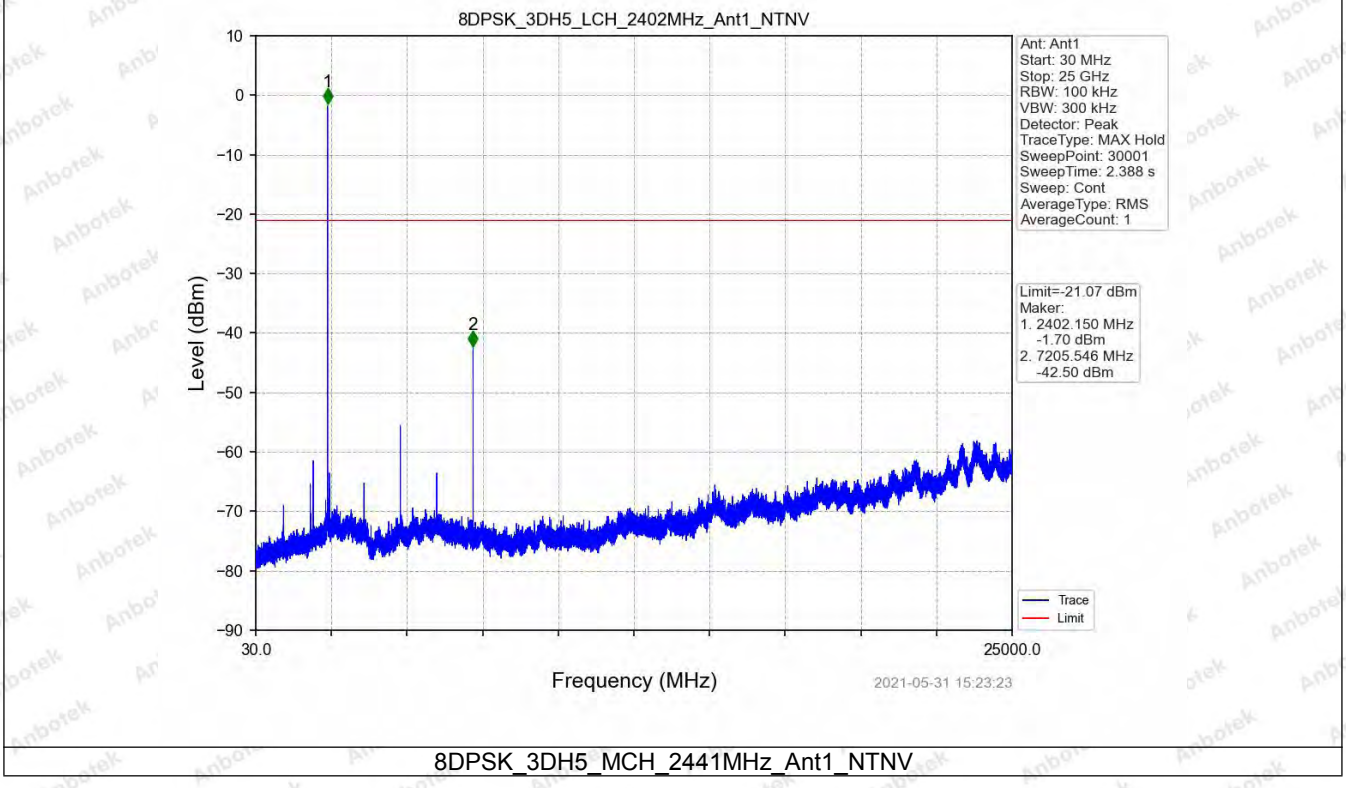
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



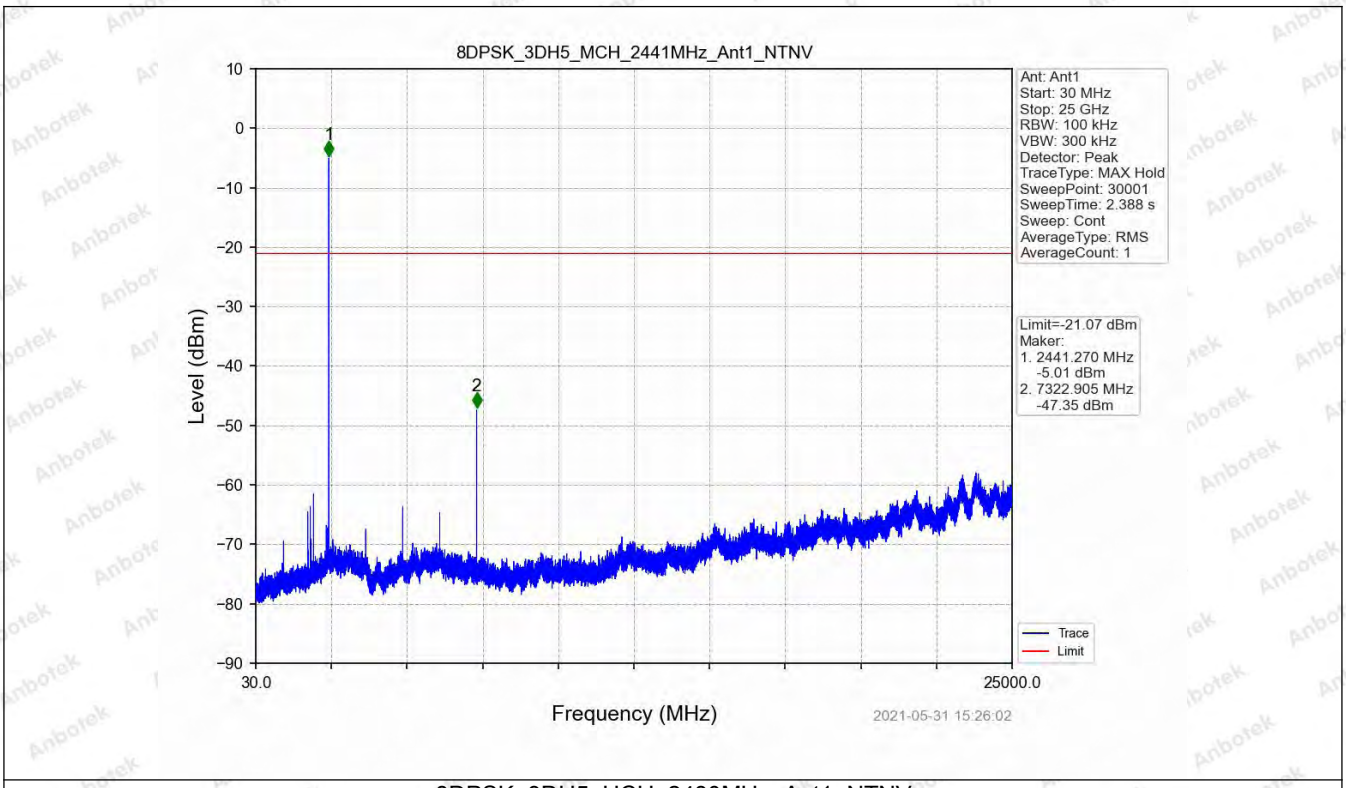
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



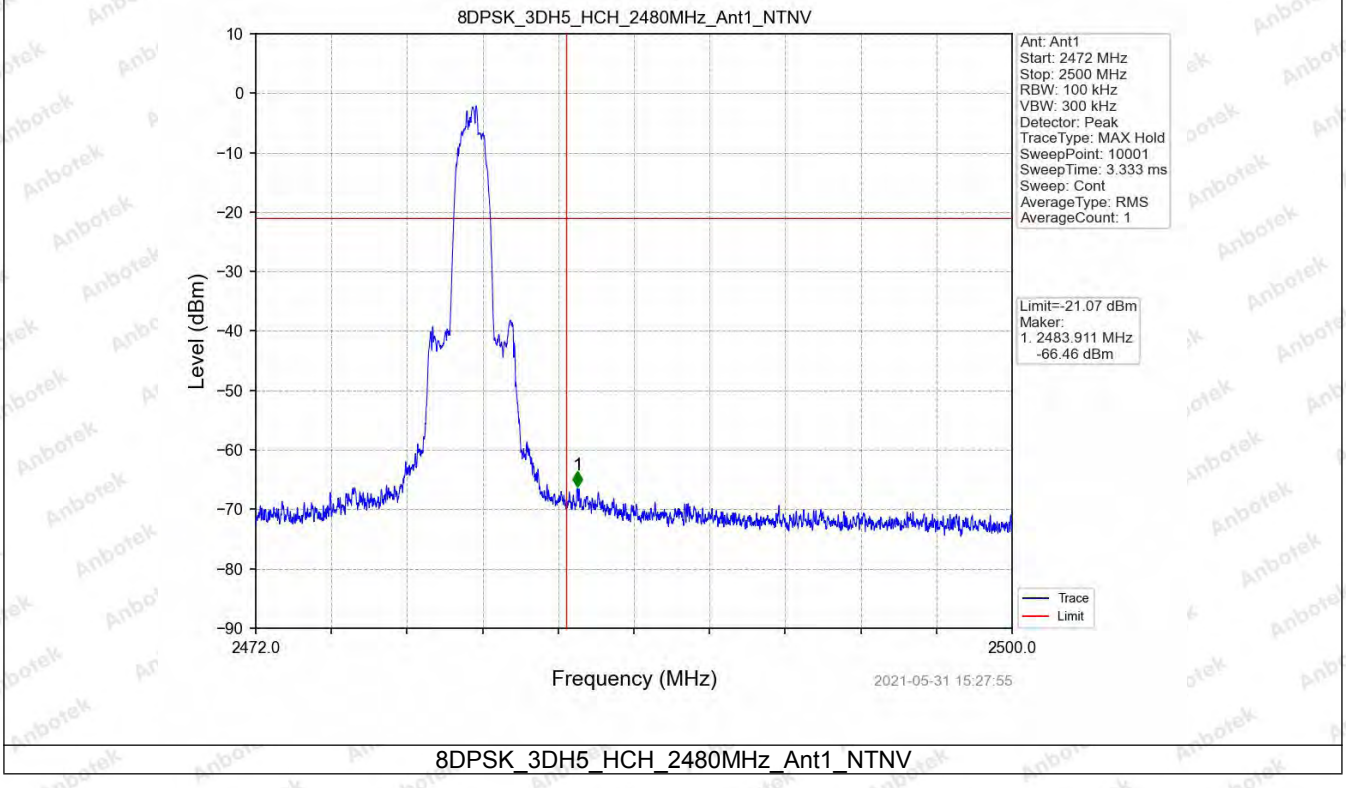
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



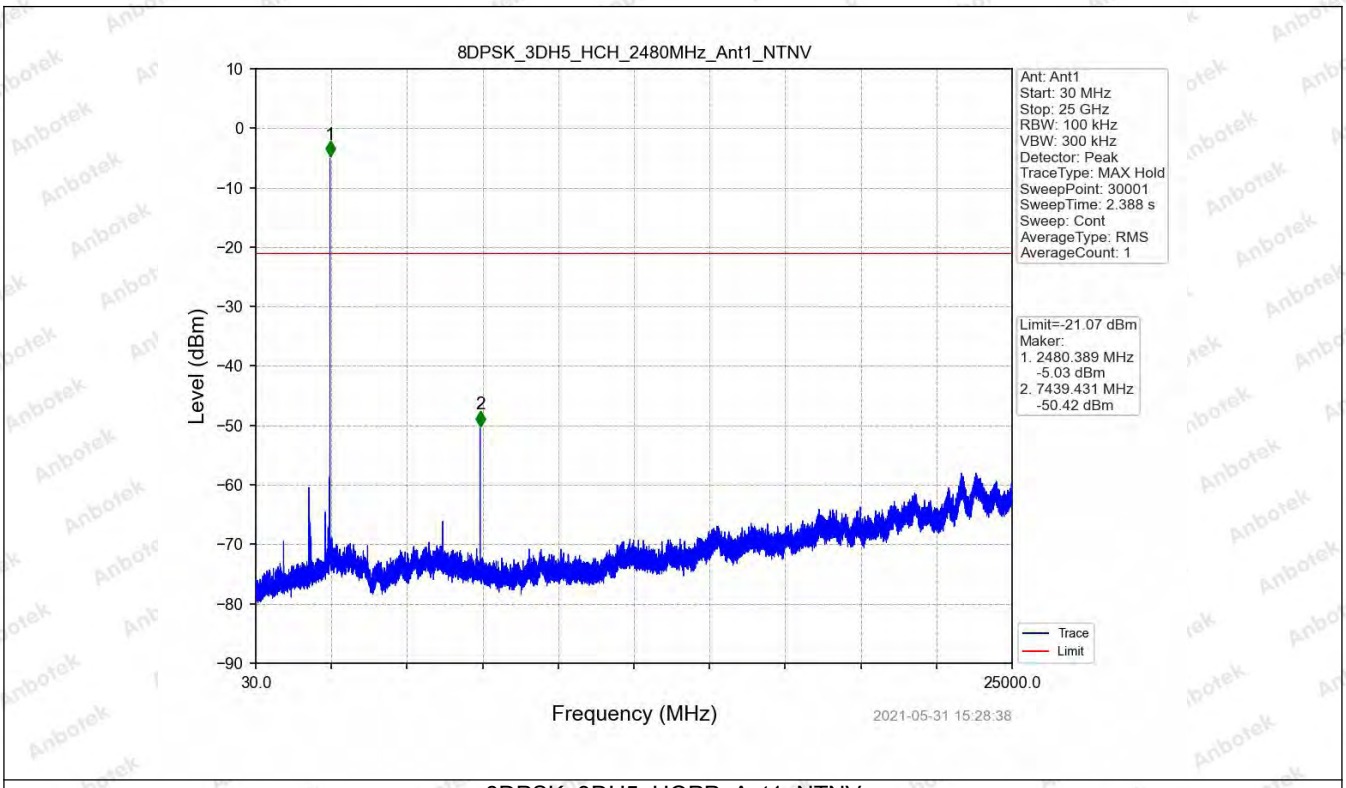
8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



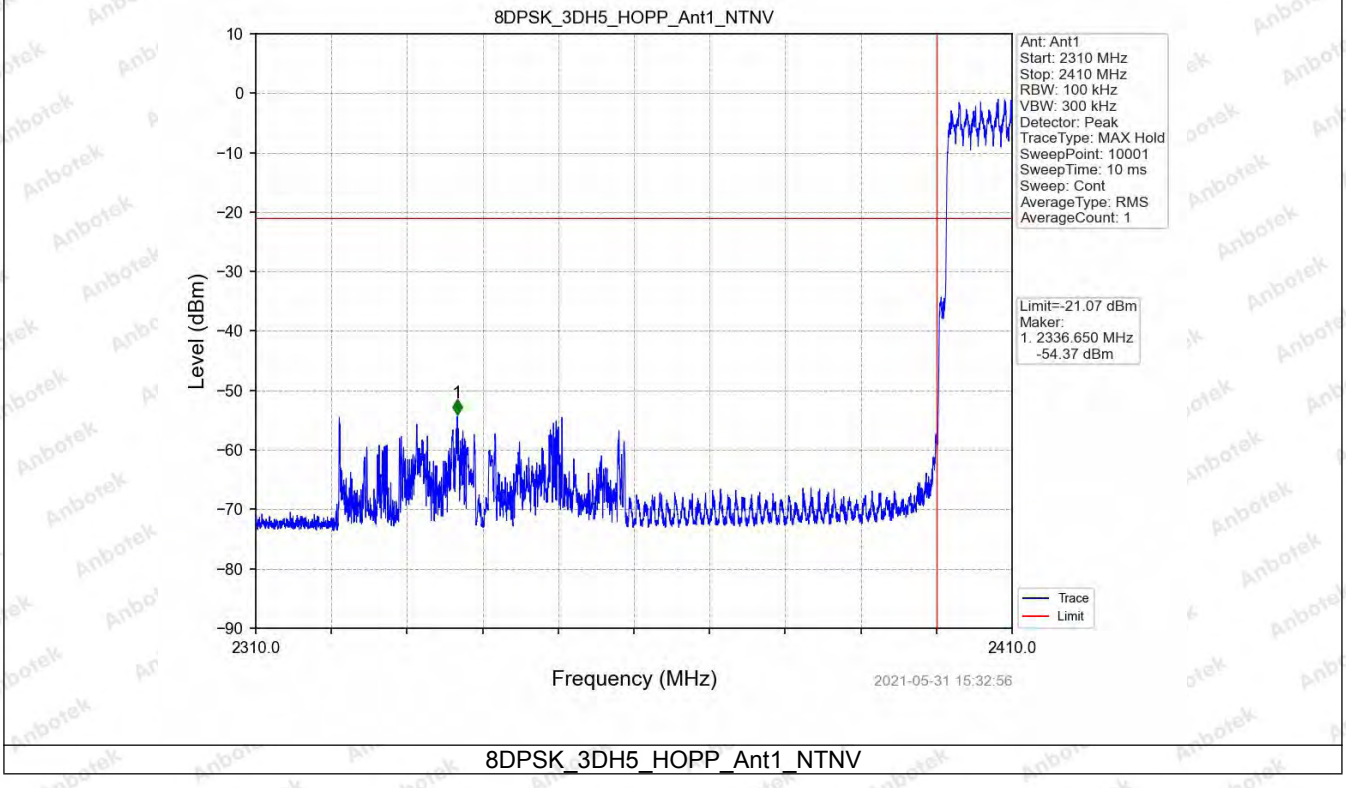
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



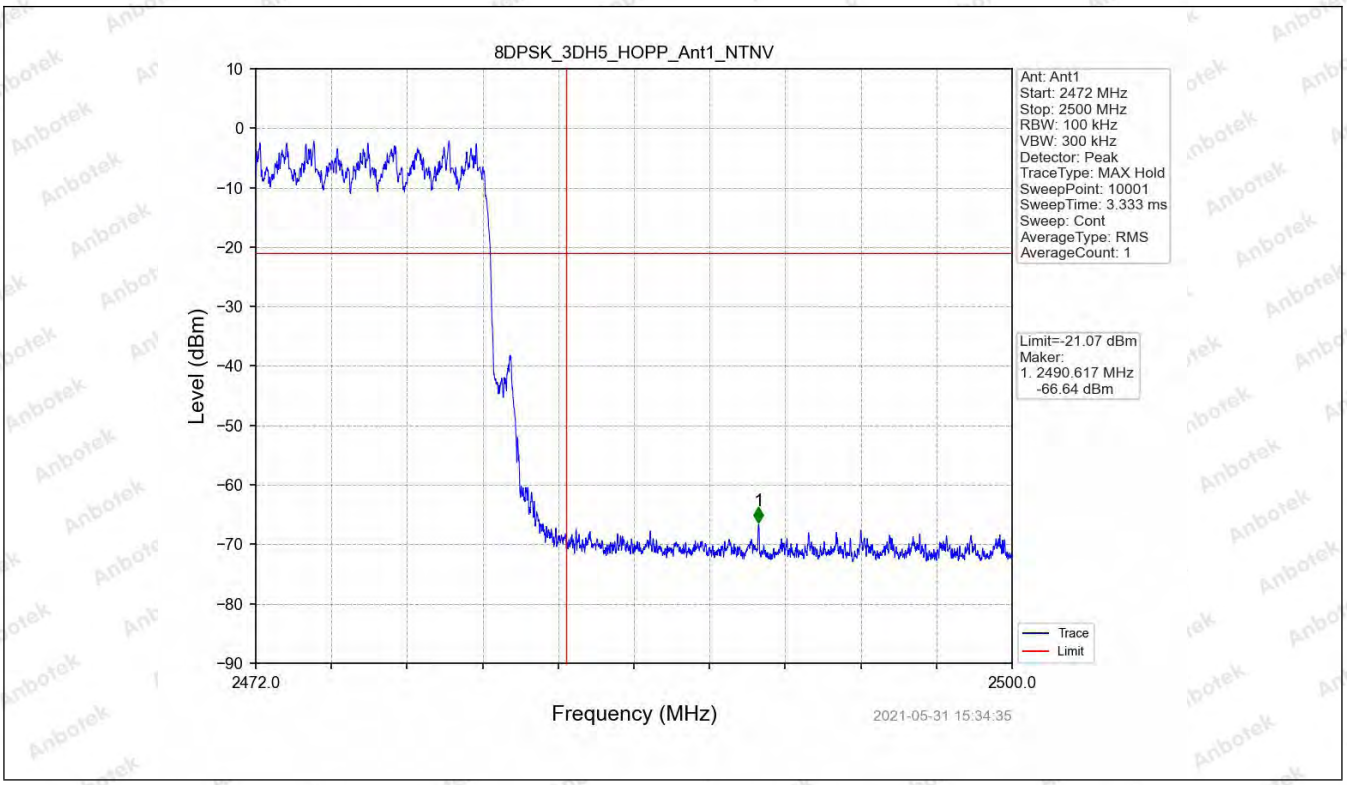
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV


8DPSK_3DH5_HOPP_Ant1_NTNV
Ant: Ant1
Start: 2472 MHz
Stop: 2500 MHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 10001
SweepTime: 3.333 ms
Sweep: Cont
AverageType: RMS
AverageCount: 1
Limit=-21.07 dBm
Maker:
1. 2490.617 MHz
-66.64 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
2472.0
2500.0
2021-05-31 15:34:35

---End---