Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Bluetooth Speaker

Test Model: Onforu SK03

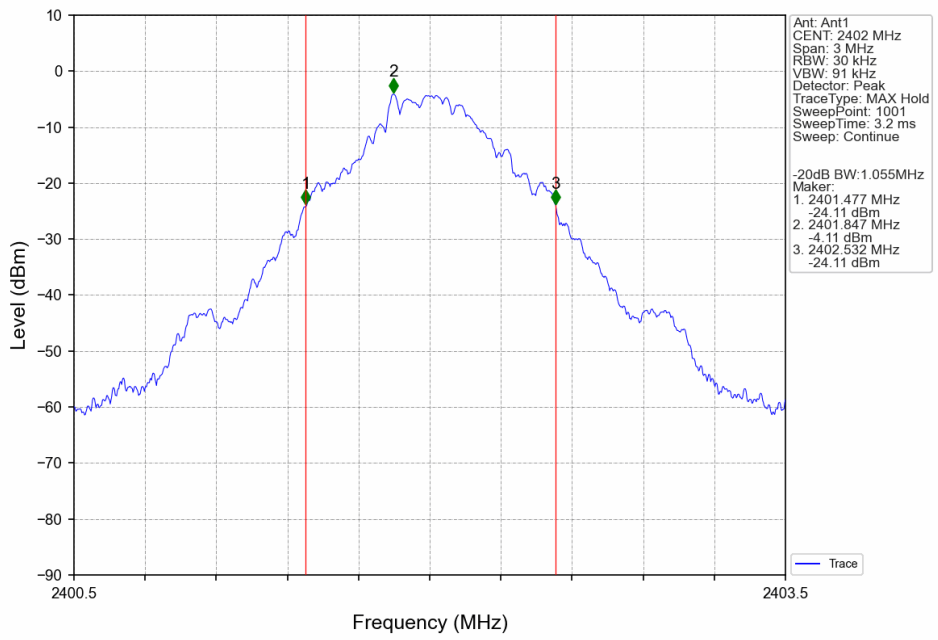
Environmental Conditions

Temperature:	23.8°C
Relative Humidity:	52.5%
ATM Pressure:	100.0 kPa
Test Engineer:	Jerry Chu
Supervised by:	Nick Peng

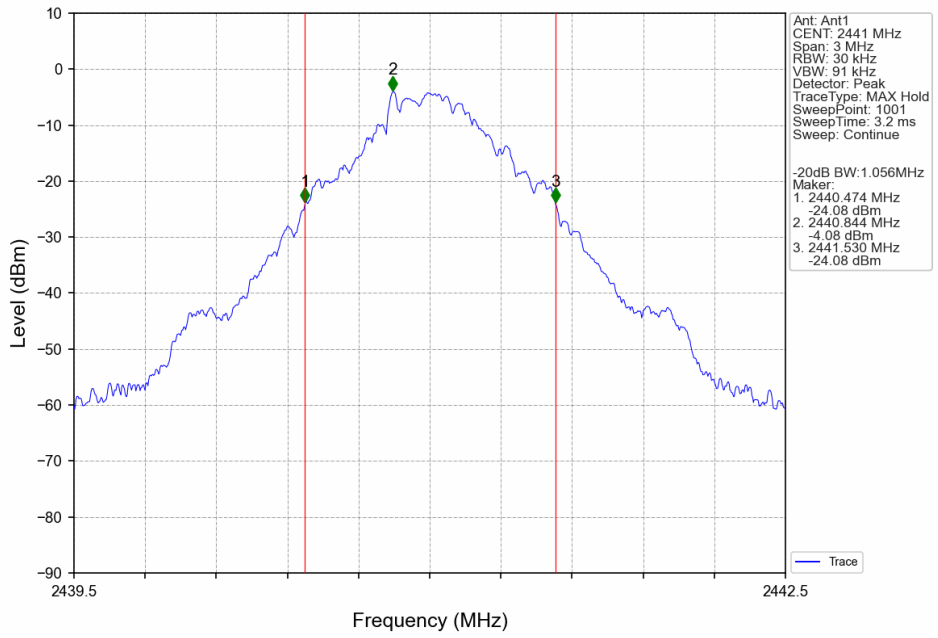
A.1 -20dB Bandwidth

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	1.055	/	Pass
		2441	DH5	1	1.056	/	Pass
		2480	DH5	1	1.067	/	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.338	/	Pass
		2441	2DH5	1	1.342	/	Pass
		2480	2DH5	1	1.341	/	Pass
8DPSK	SISO	2402	3DH5	1	1.313	/	Pass
		2441	3DH5	1	1.306	/	Pass
		2480	3DH5	1	1.302	/	Pass

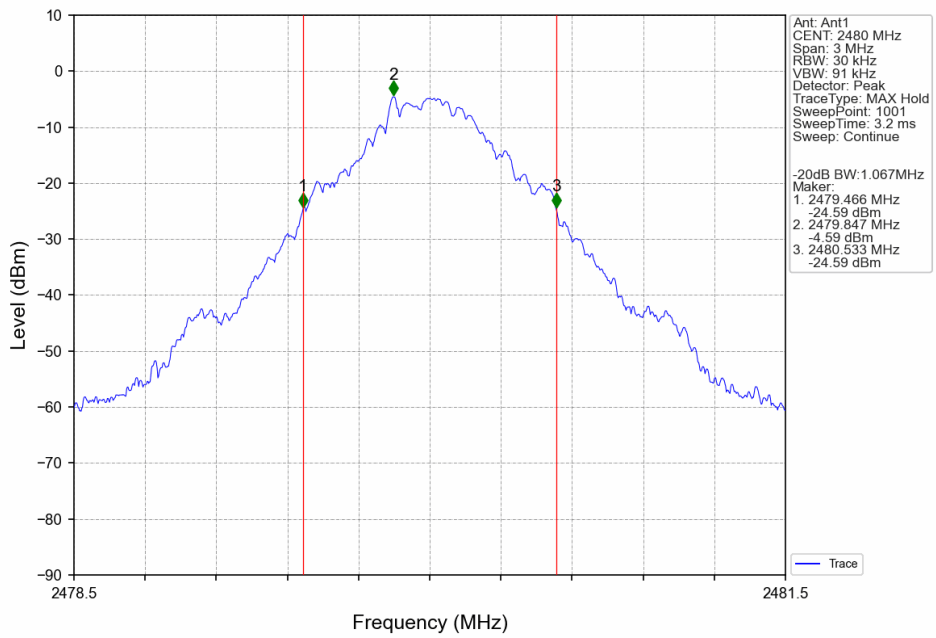
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



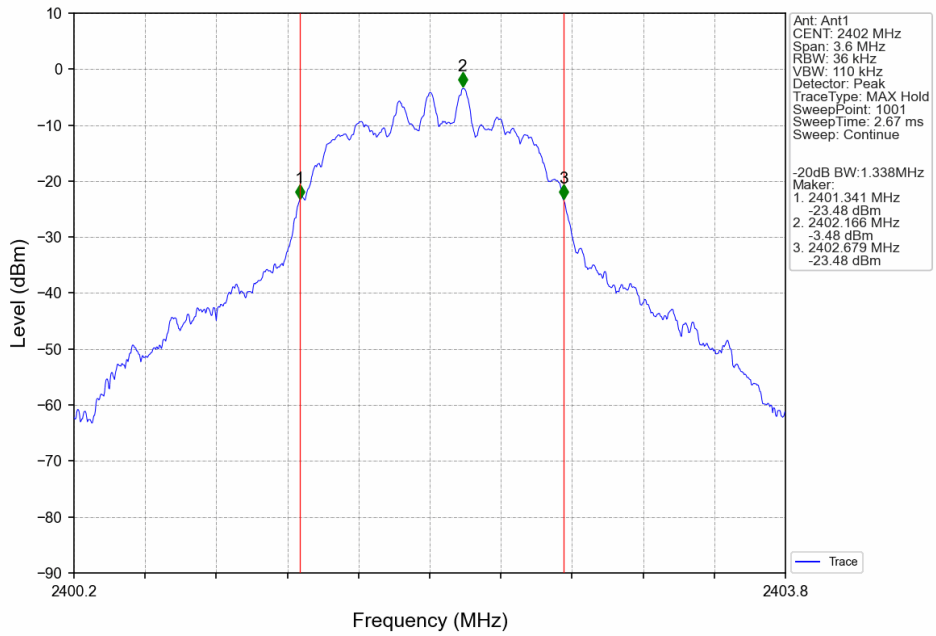
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



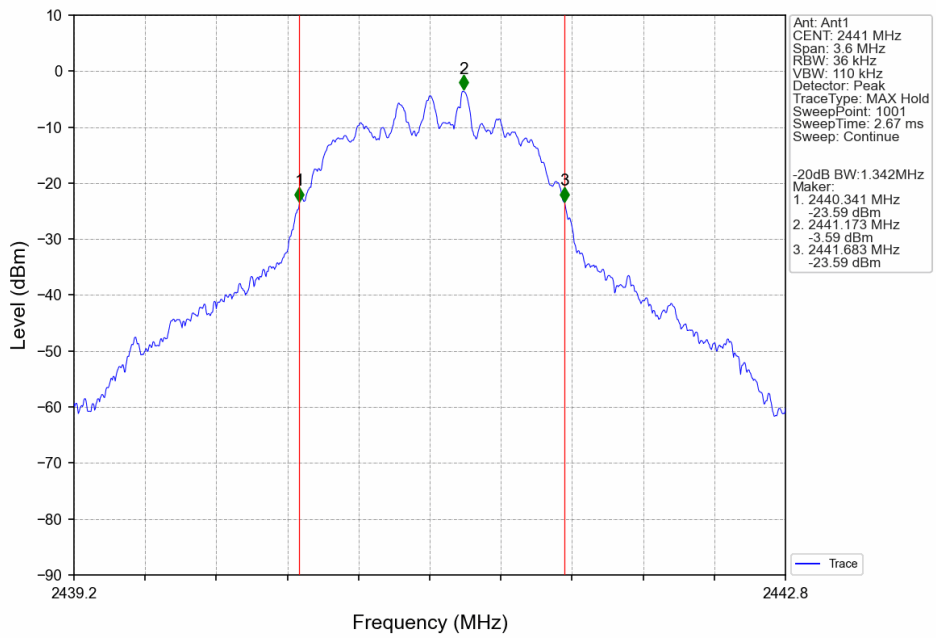
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



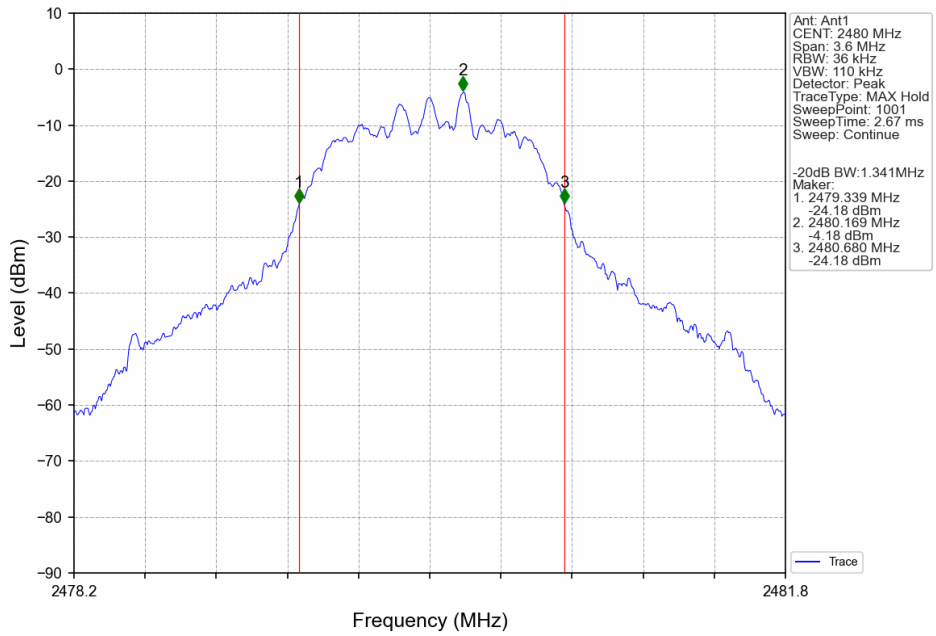
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



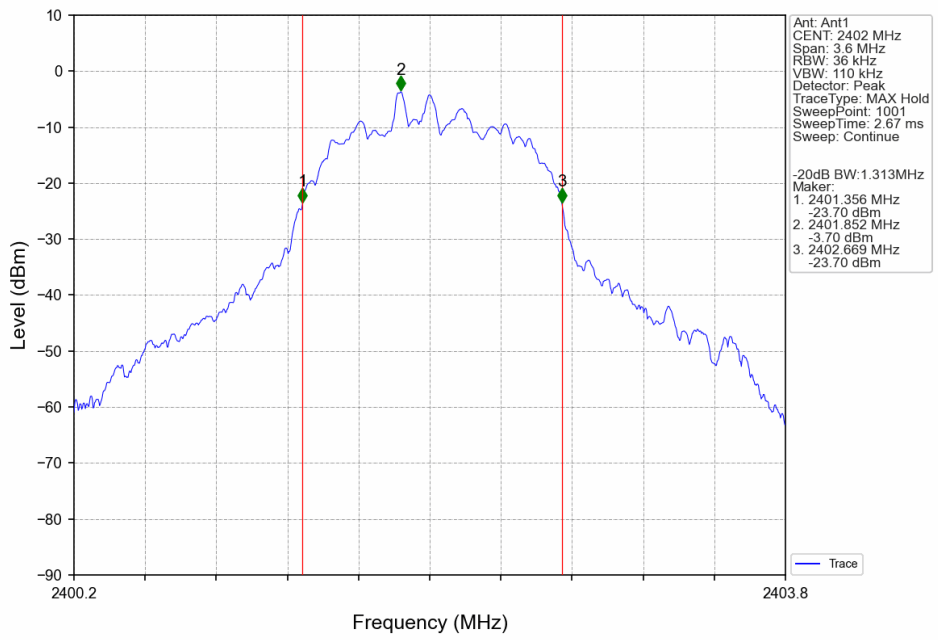
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



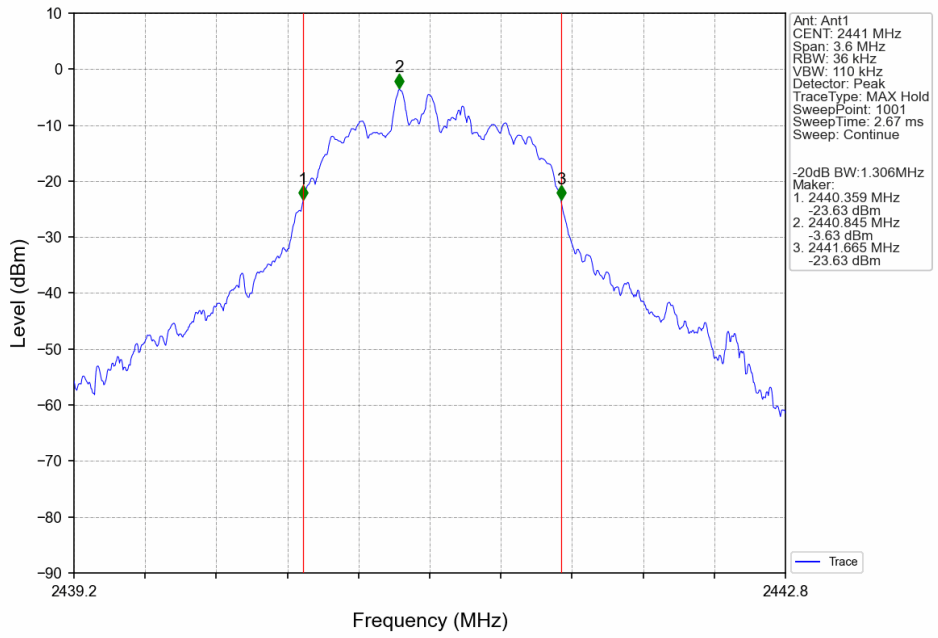
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



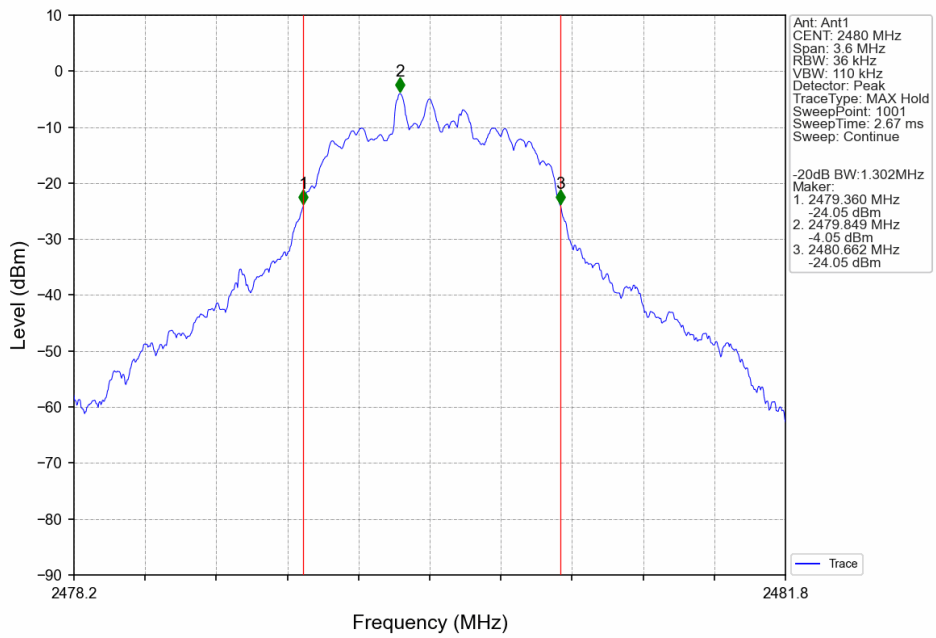
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



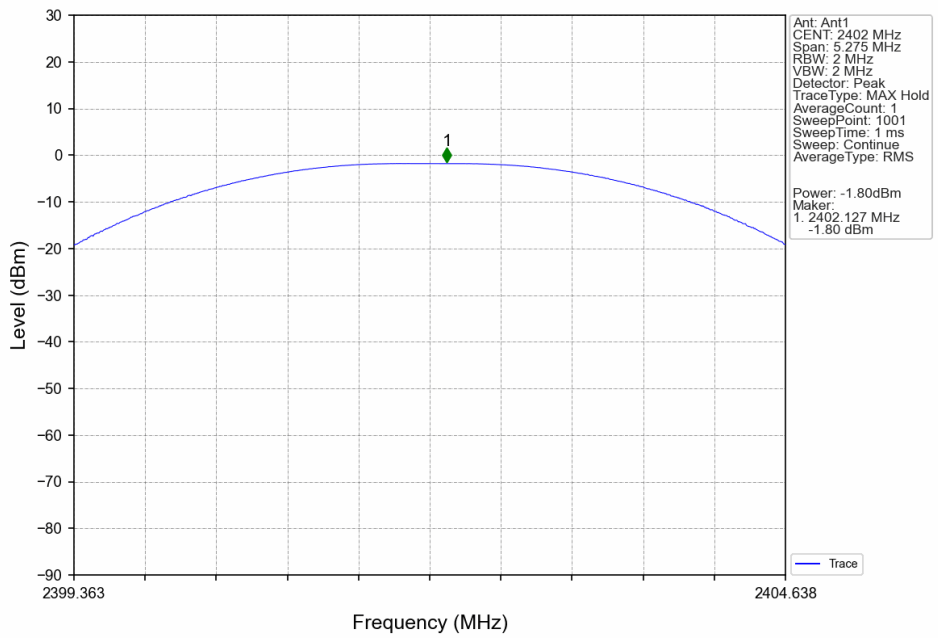
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



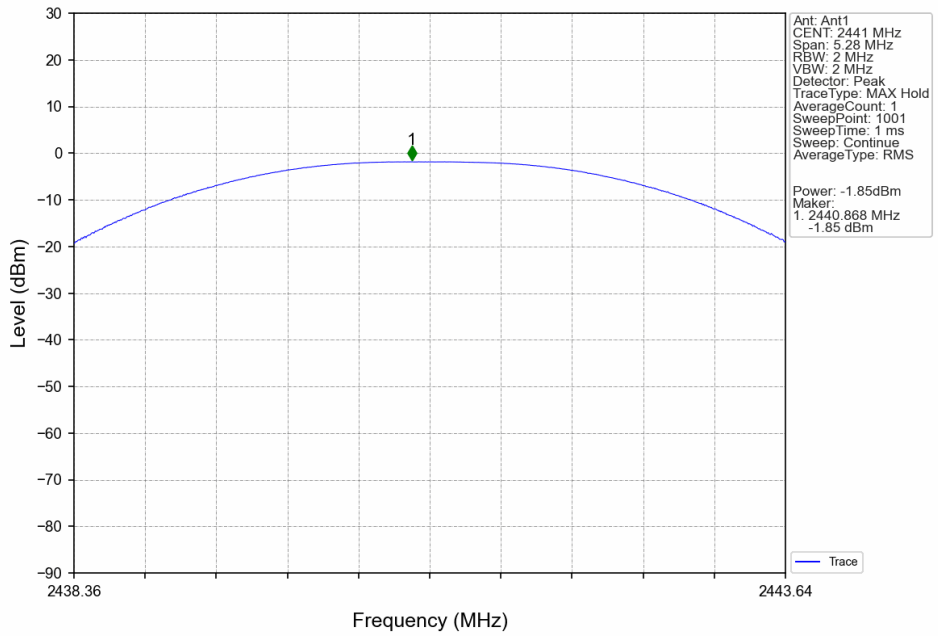
A.2 Maximum Peak Conducted Output Power

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-1.80	<=20.97	Pass
		2441	DH5	-1.85	<=20.97	Pass
		2480	DH5	-2.34	<=20.97	Pass
Pi/4DQPSK	SISO	2402	2DH5	-0.99	<=20.97	Pass
		2441	2DH5	-1.06	<=20.97	Pass
		2480	2DH5	-1.52	<=20.97	Pass
8DPSK	SISO	2402	3DH5	-0.56	<=20.97	Pass
		2441	3DH5	-0.62	<=20.97	Pass
		2480	3DH5	-1.08	<=20.97	Pass

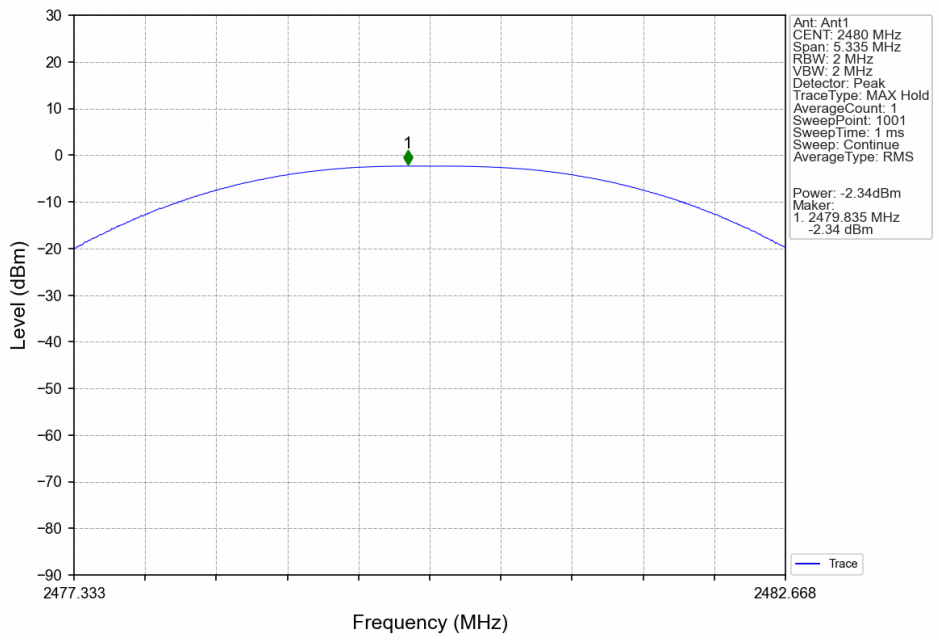
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



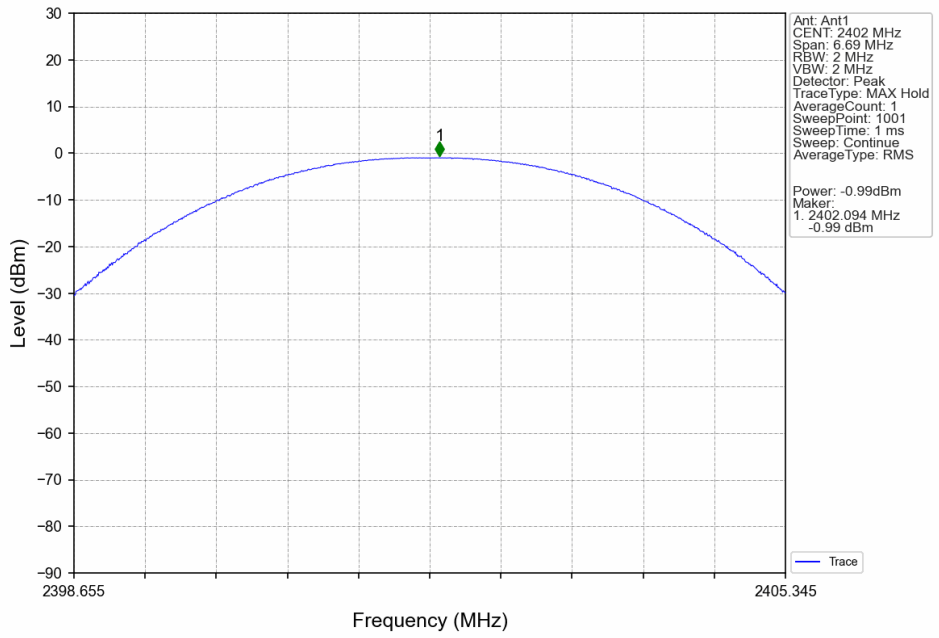
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



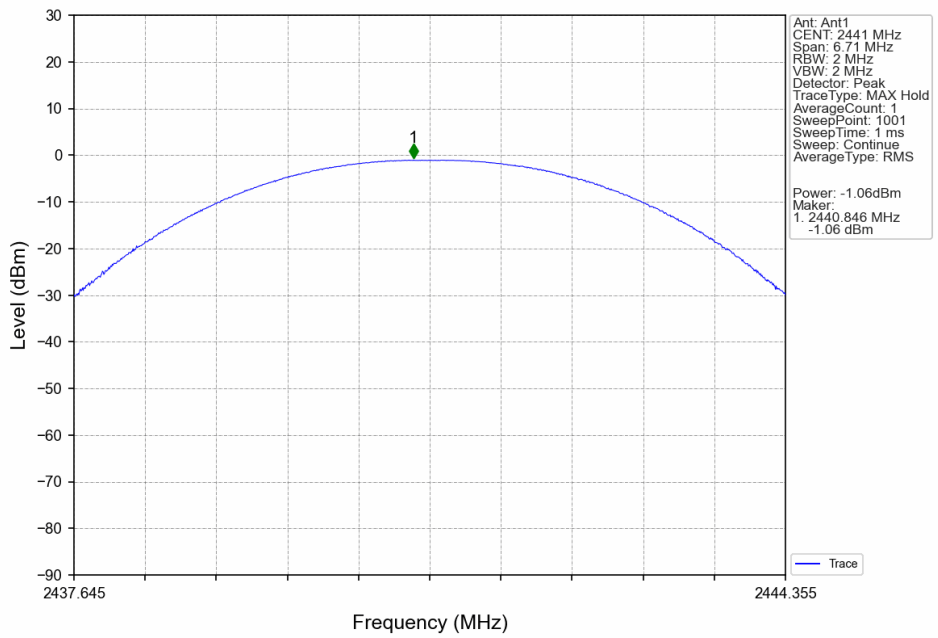
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



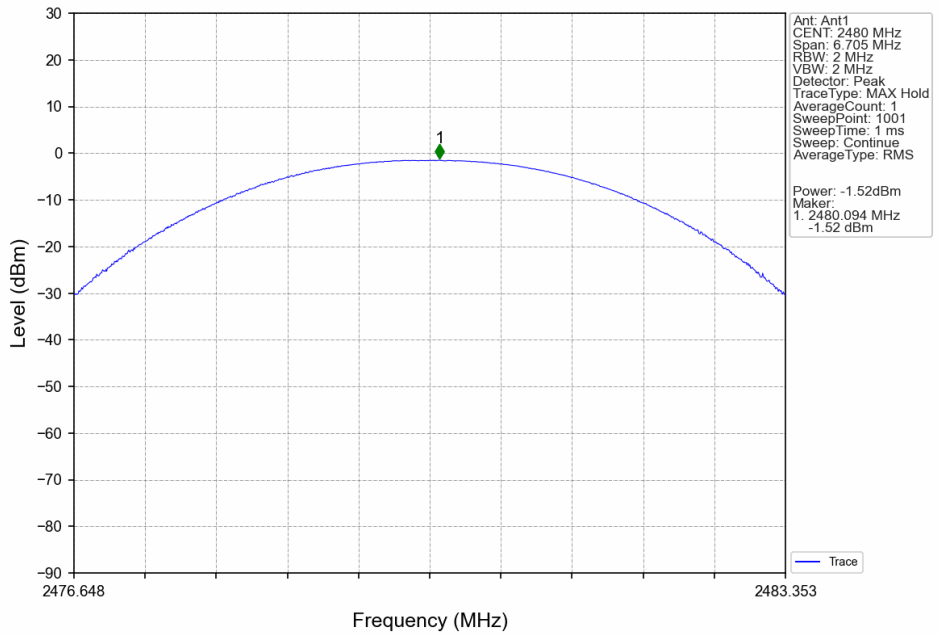
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



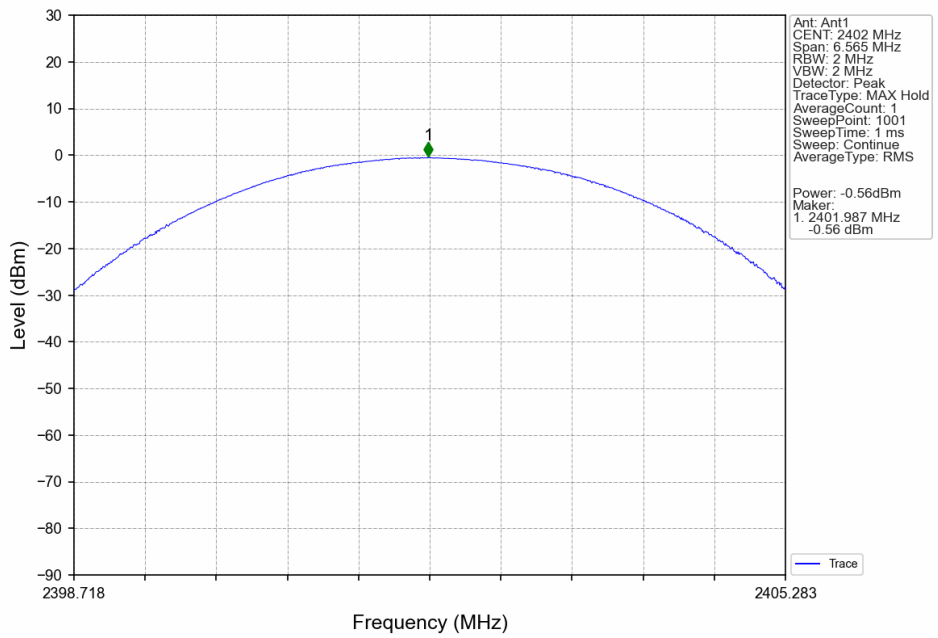
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



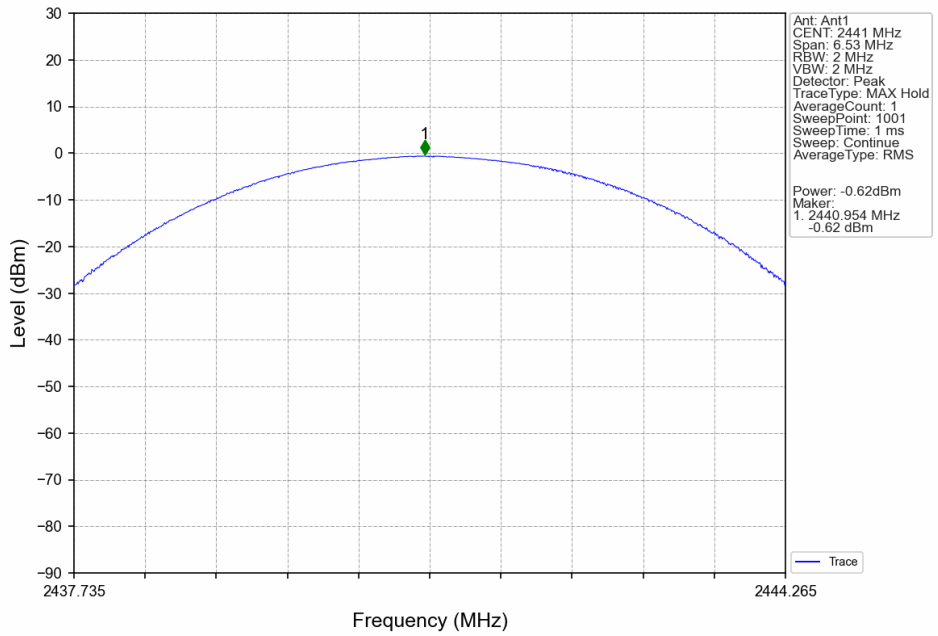
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



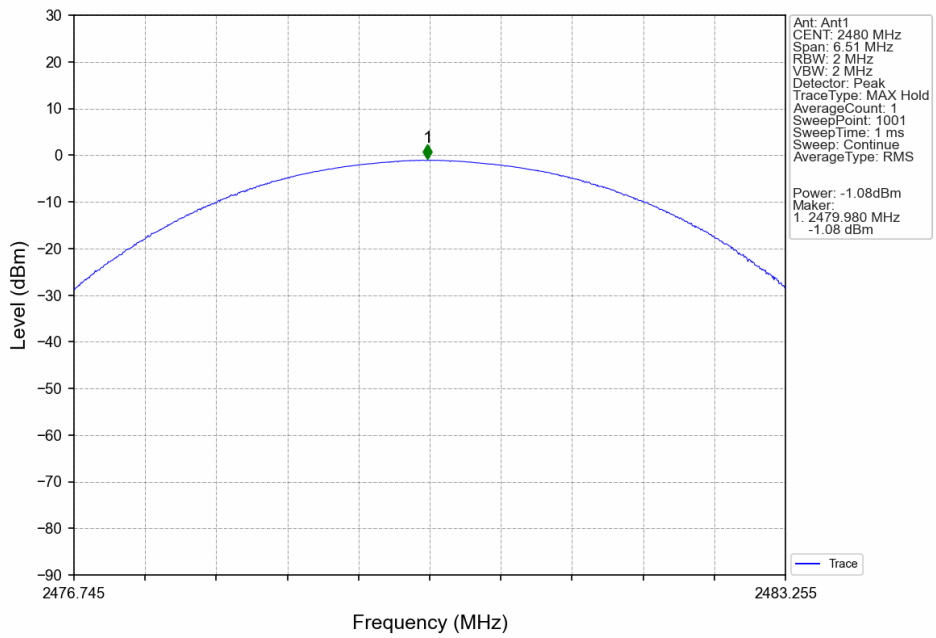
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



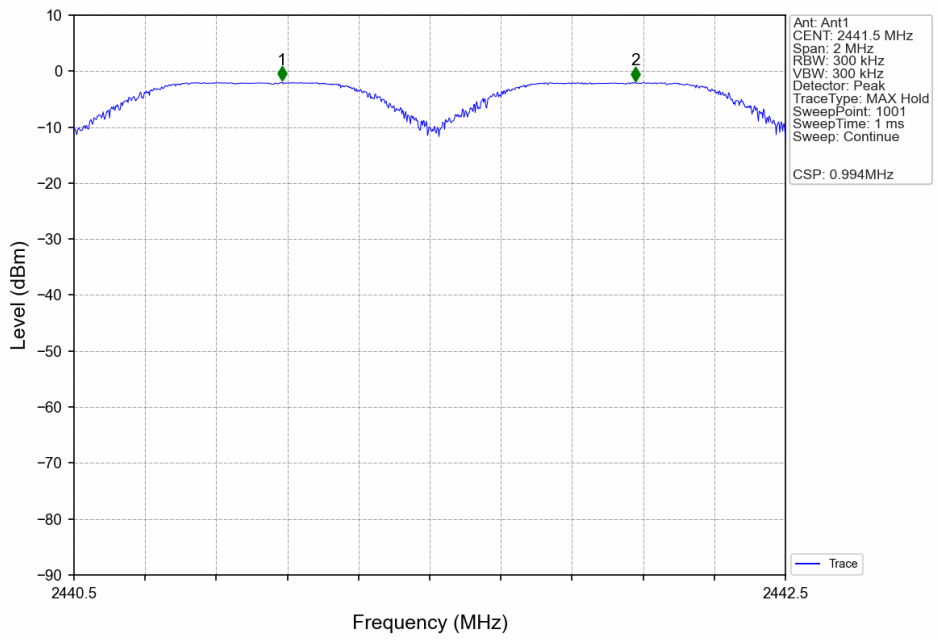
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



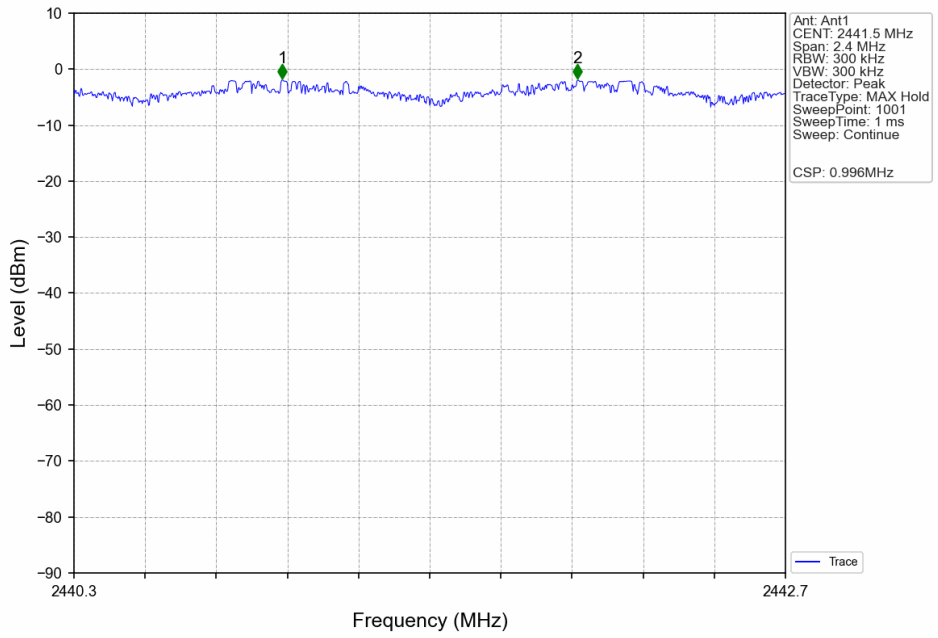
A.3 Carrier Frequencies Separation

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	0.994	1.067	>=0.711	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	0.996	1.342	>=0.895	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.313	>=0.875	Pass

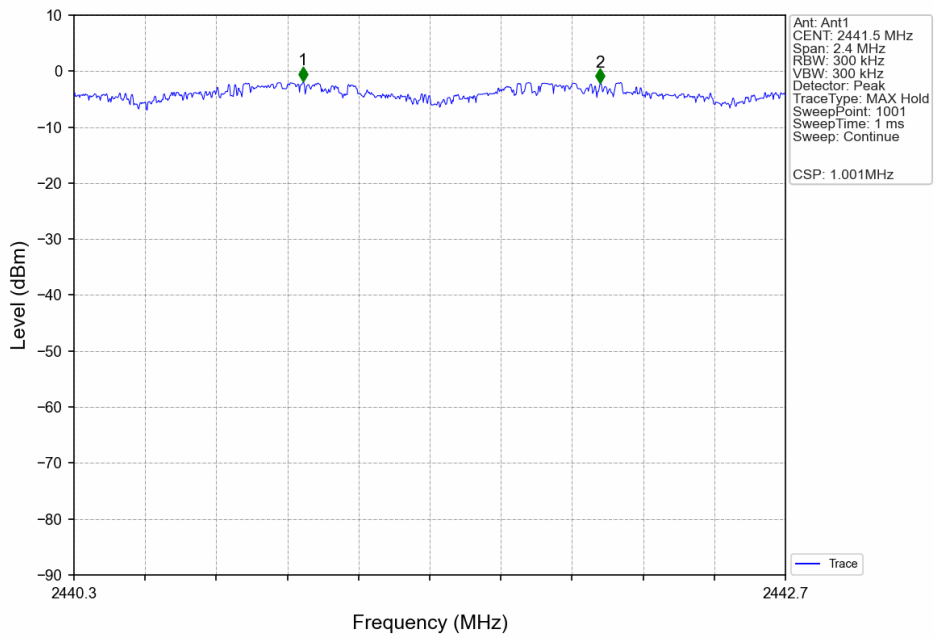
GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



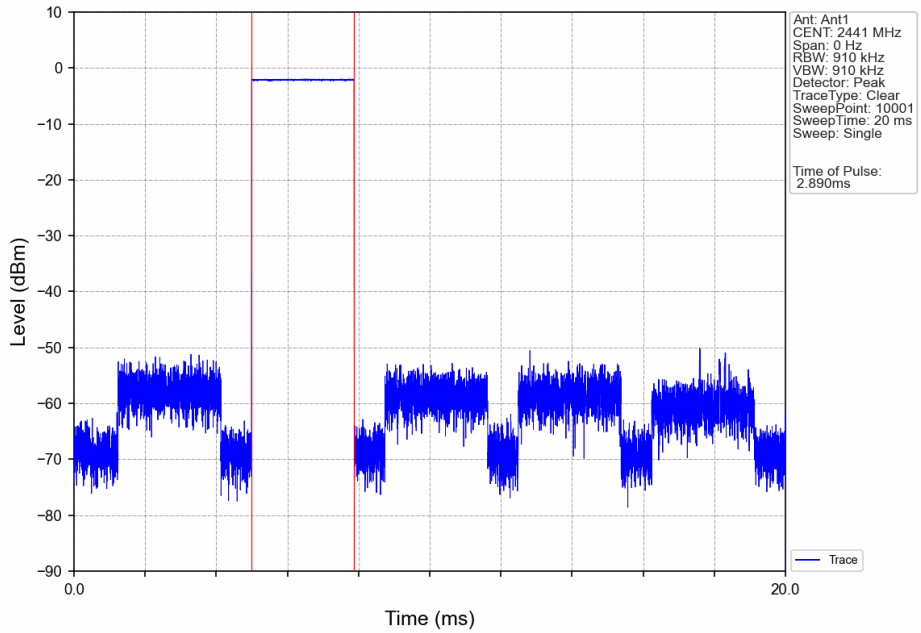
A.4 Dwell Time

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	DH5	2.890	31.600	94	271.660	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	2.890	31.600	101	291.890	<=400	Pass
8DPSK	SISO	HOPP	3DH5	2.890	31.600	122	352.580	<=400	Pass

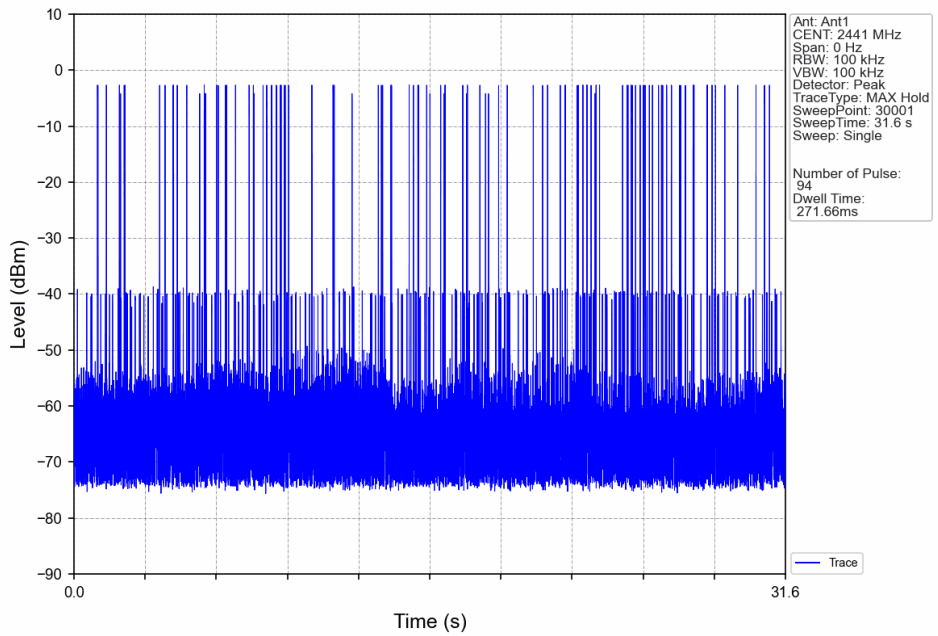
6.2 Test Graph

6.2.1 Ant1

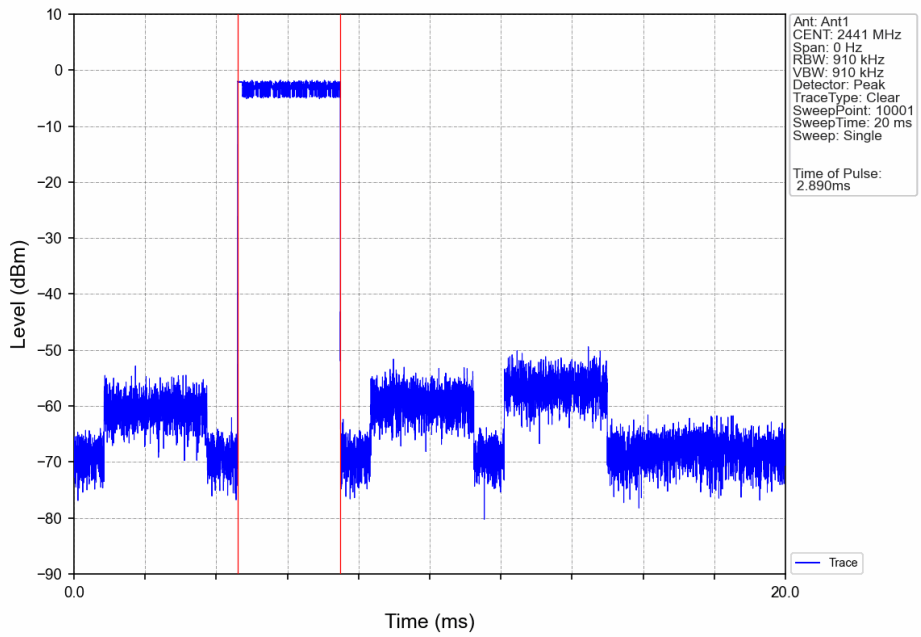
GFSK_DH5_HOPP_Ant1_NTNV



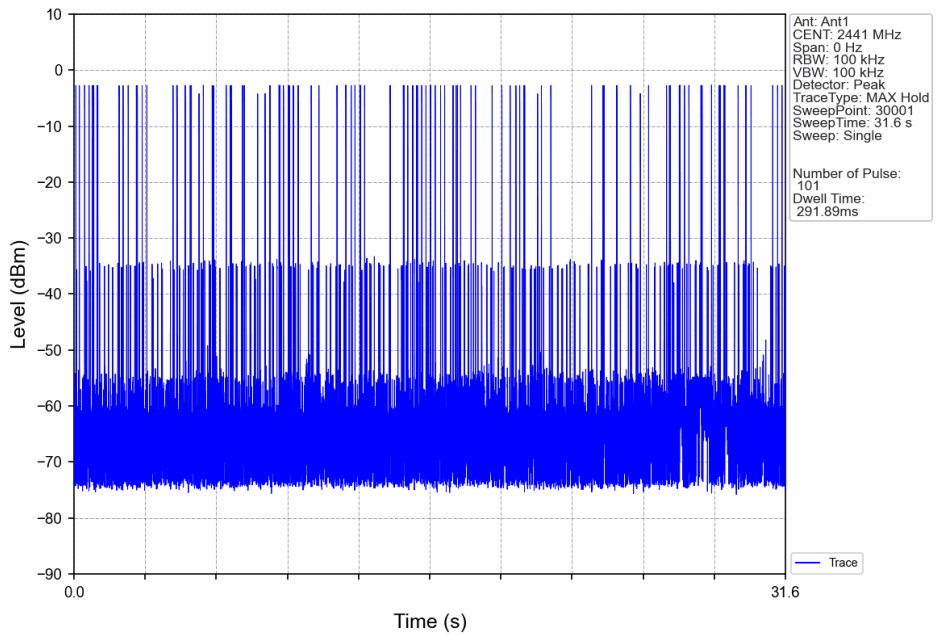
GFSK_DH5_HOPP_Ant1_NTNV



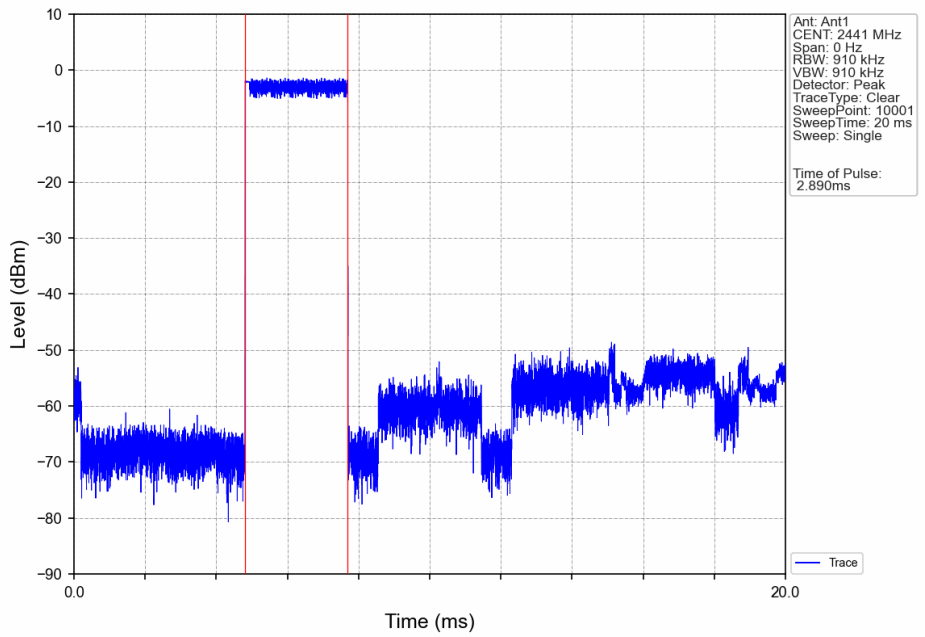
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



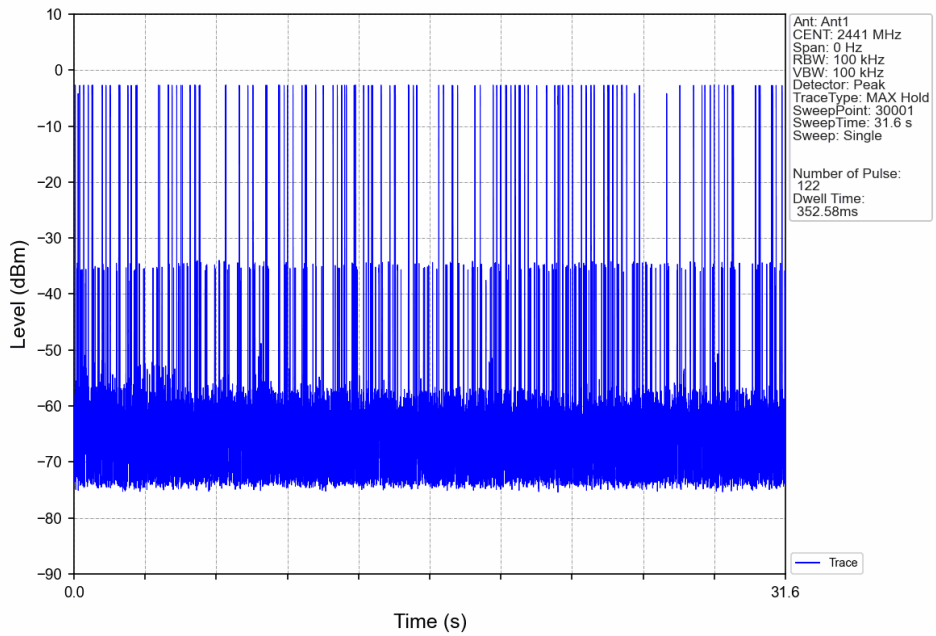
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



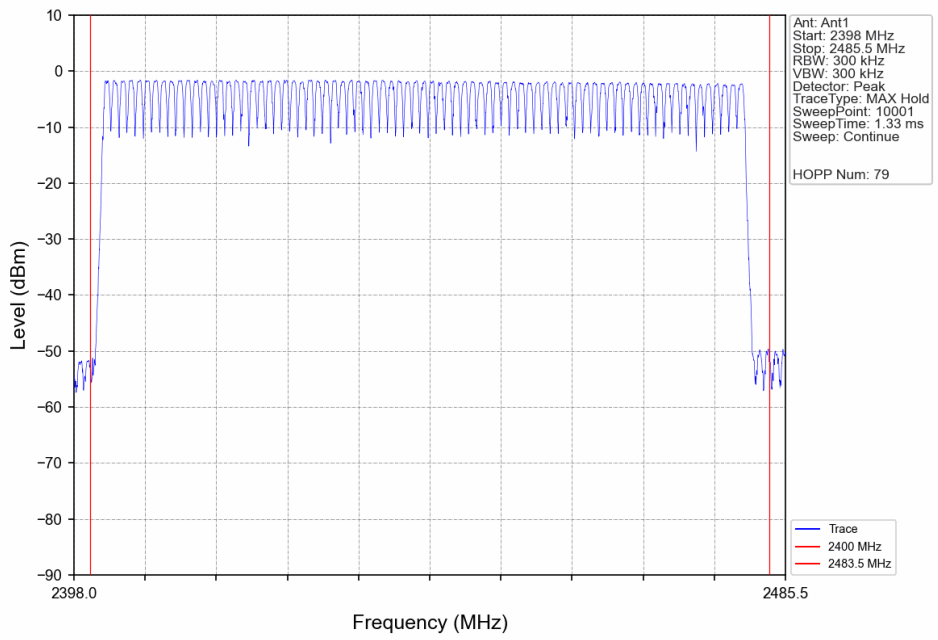
8DPSK_3DH5_HOPP_Ant1_NTNV


Ant: Ant1
CENT: 2441 MHz
Span: 0 Hz
RBW: 100 kHz
VBW: 100 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 30001
SweepTime: 31.6 s
Sweep: Single
Number of Pulse:
122
Dwell Time:
352.58ms
Trace
Level (dBm)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6
Time (s)

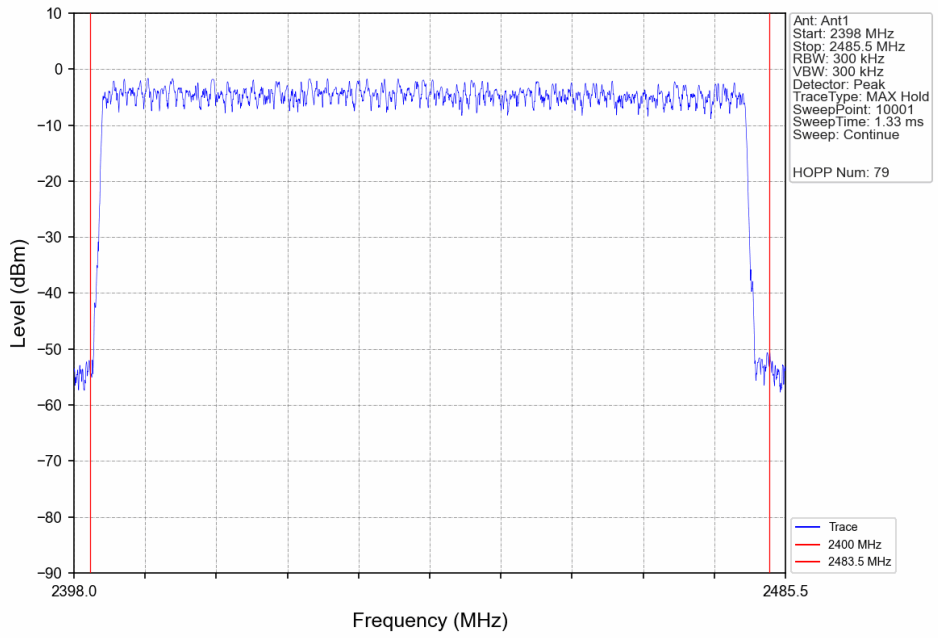
A.5 Number of Hopping Channel

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

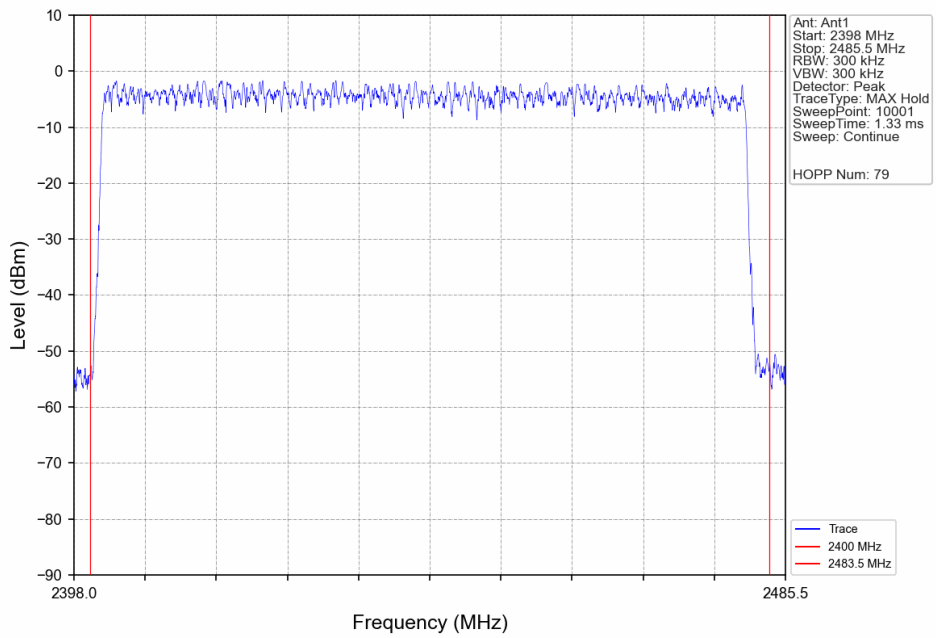
GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV

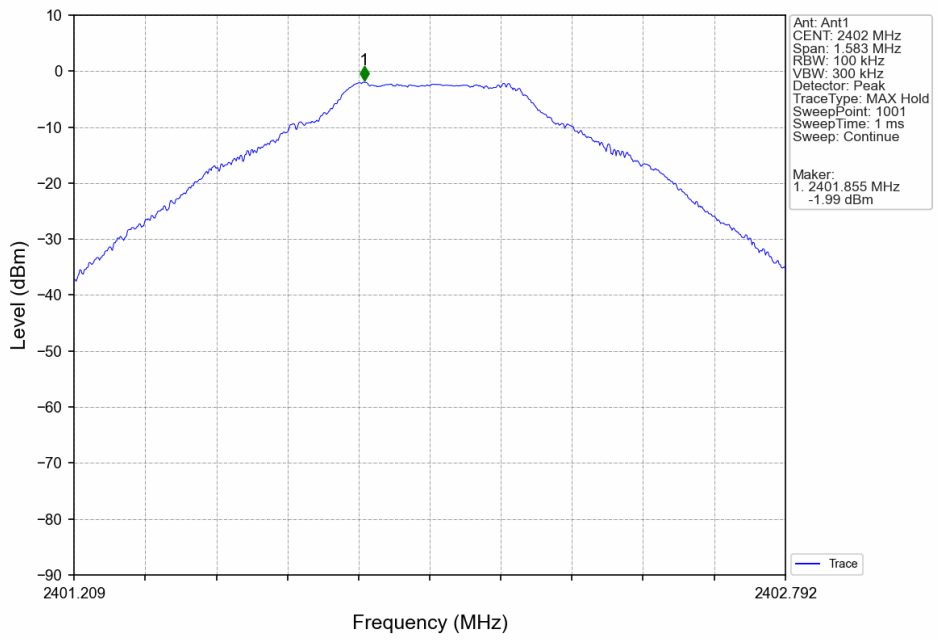


A.6 Band Edge

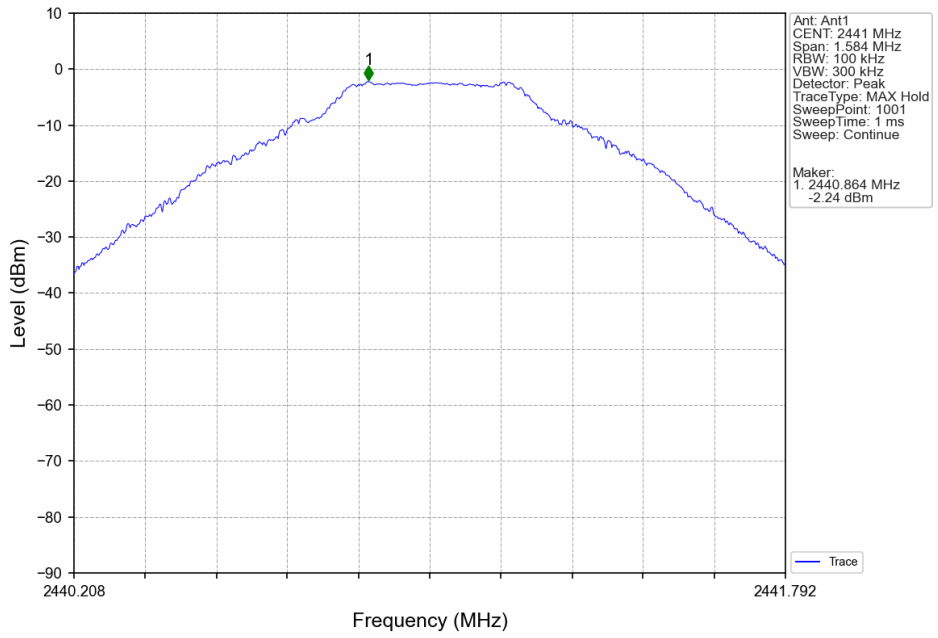
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-1.99	-21.99	Pass
		2441	DH5	1	-1.99	-21.99	Pass
		2480	DH5	1	-1.99	-21.99	Pass
		HOPP	DH5	1	-1.99	-21.99	Pass
					-1.99	-21.99	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	-2.04	-22.04	Pass
		2441	2DH5	1	-2.04	-22.04	Pass
		2480	2DH5	1	-2.04	-22.04	Pass
		HOPP	2DH5	1	-2.04	-22.04	Pass
					-2.04	-22.04	Pass
8DPSK	SISO	2402	3DH5	1	-2.02	-22.02	Pass
		2441	3DH5	1	-2.02	-22.02	Pass
		2480	3DH5	1	-2.02	-22.02	Pass
		HOPP	3DH5	1	-2.02	-22.02	Pass
					-2.02	-22.02	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.

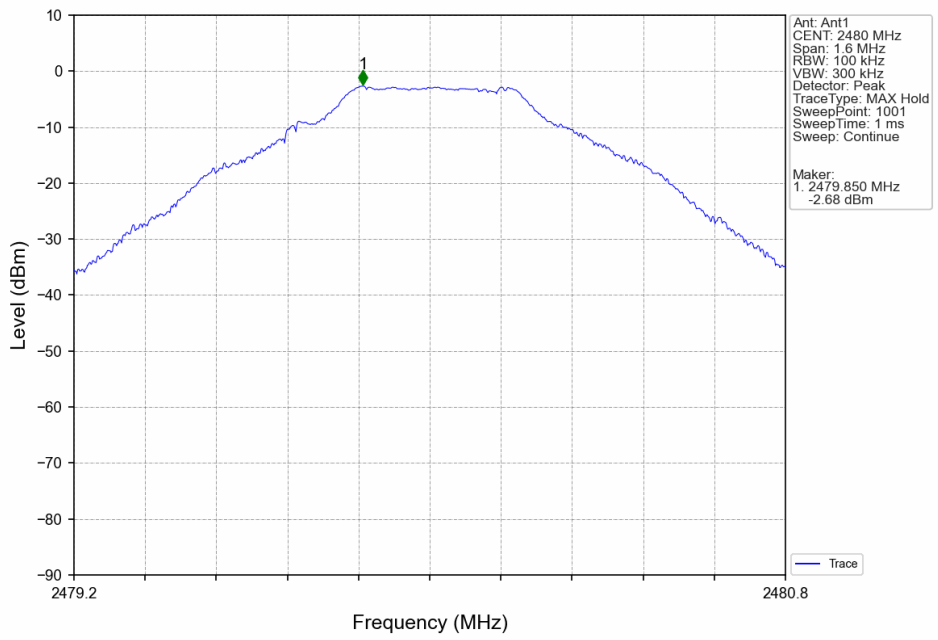
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



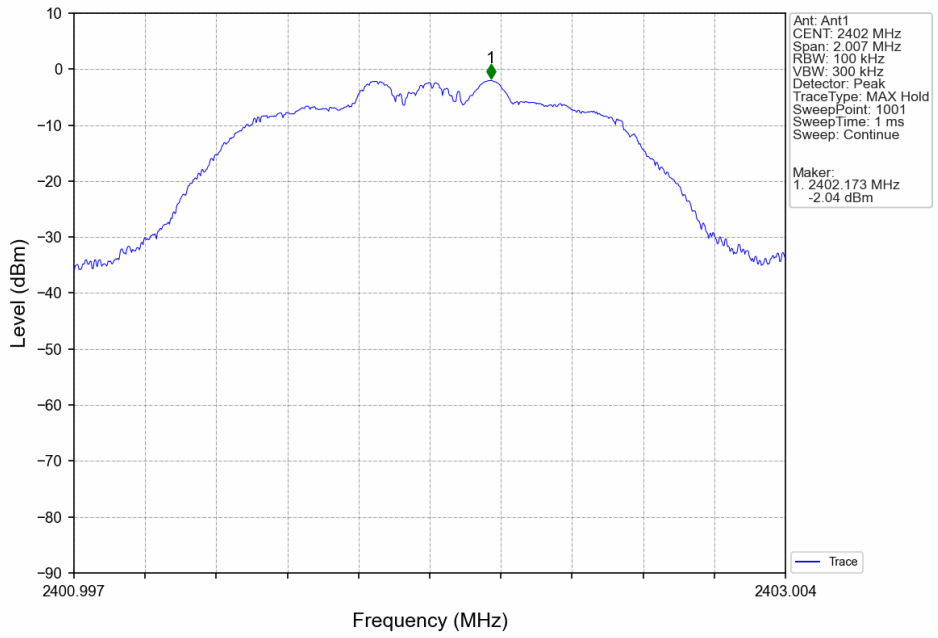
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



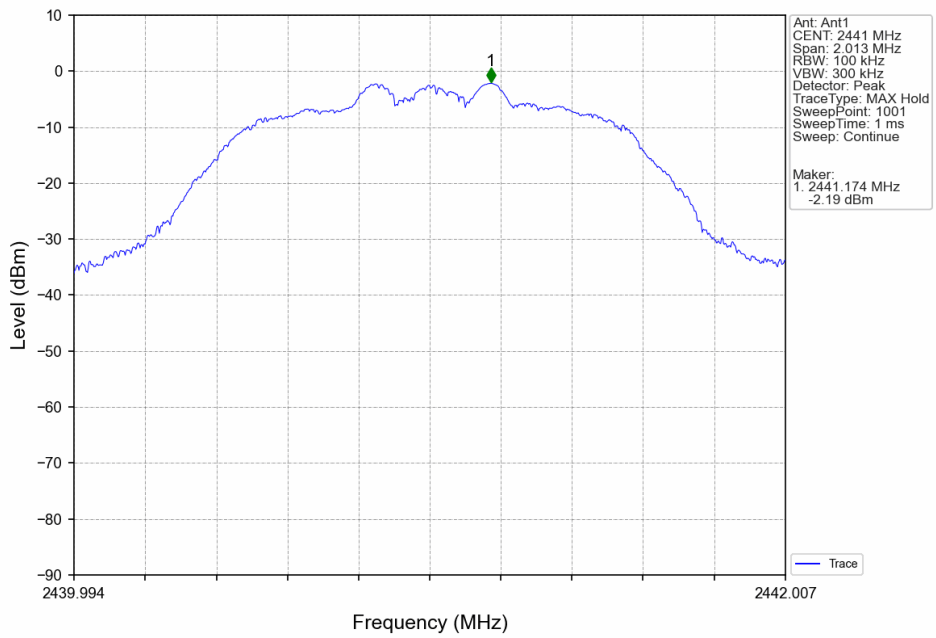
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



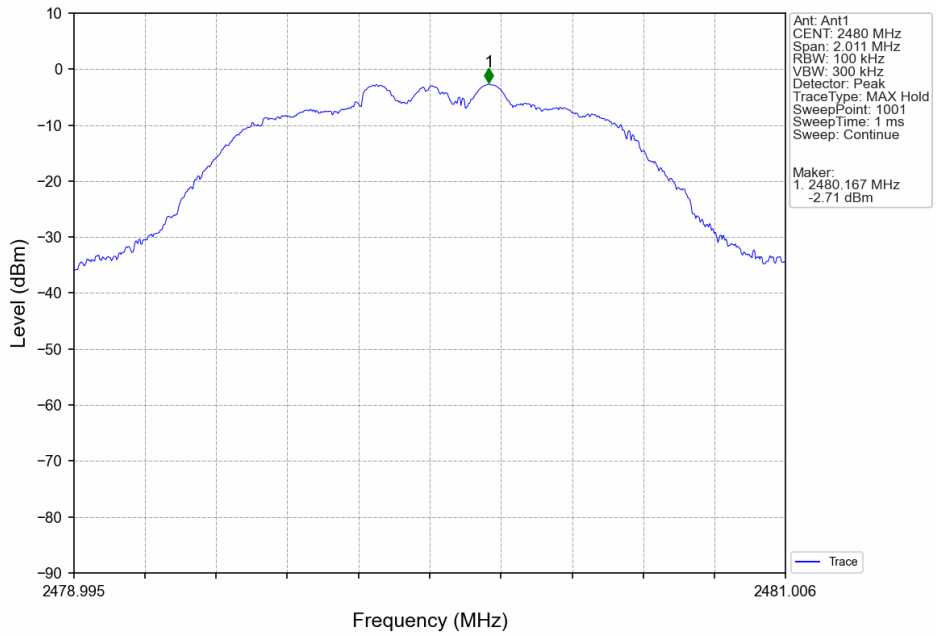
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



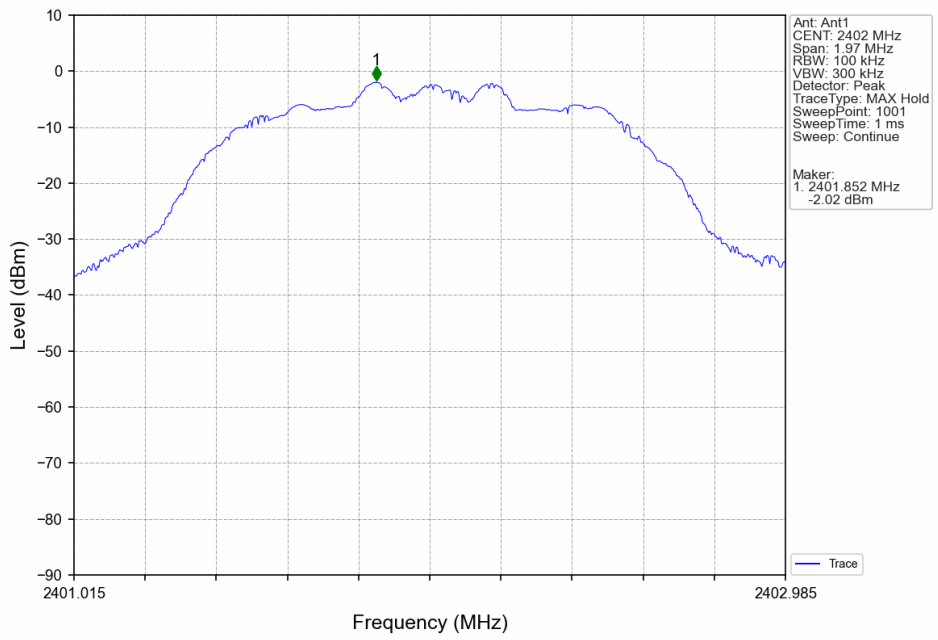
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



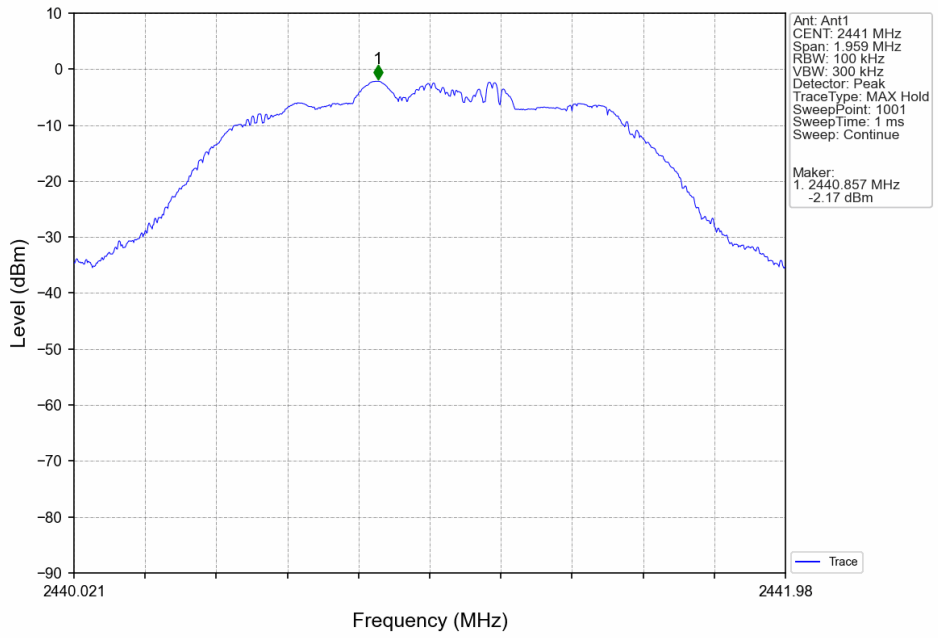
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



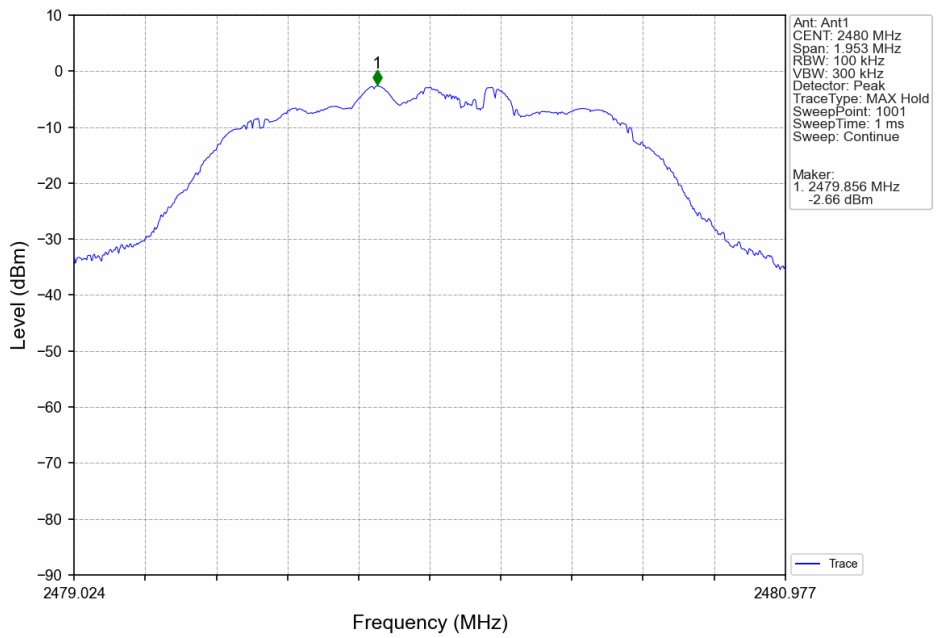
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



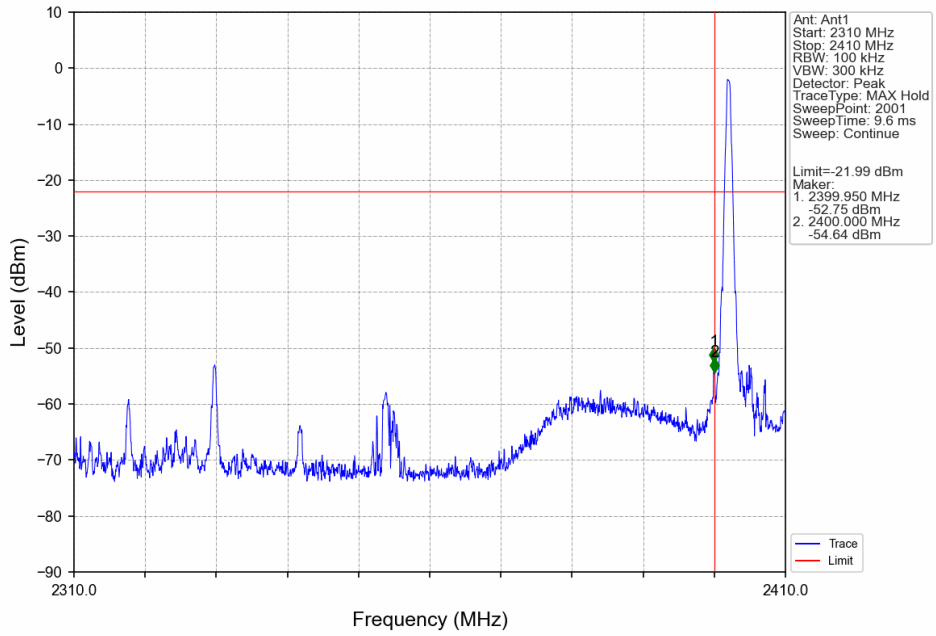
8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



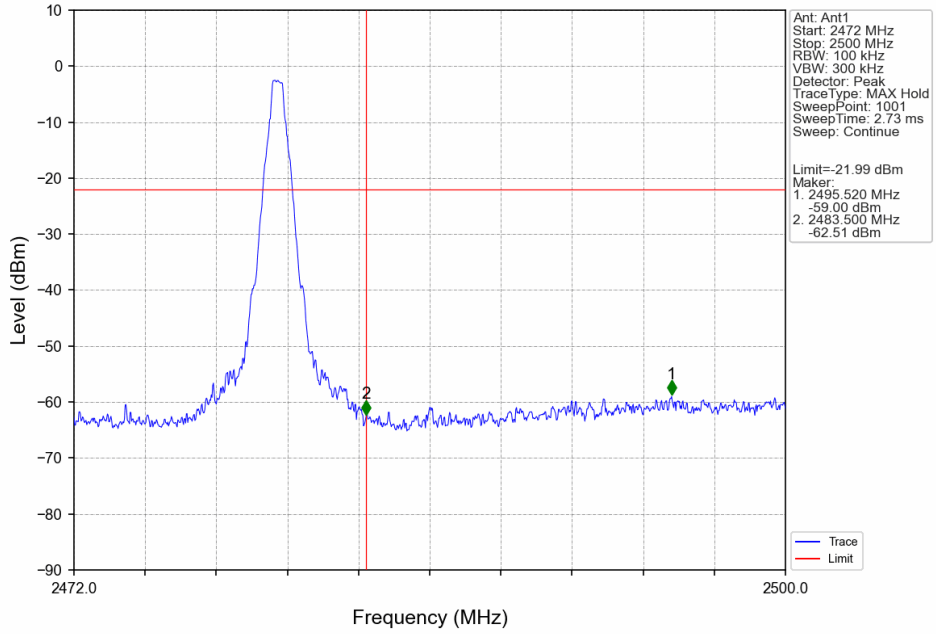
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



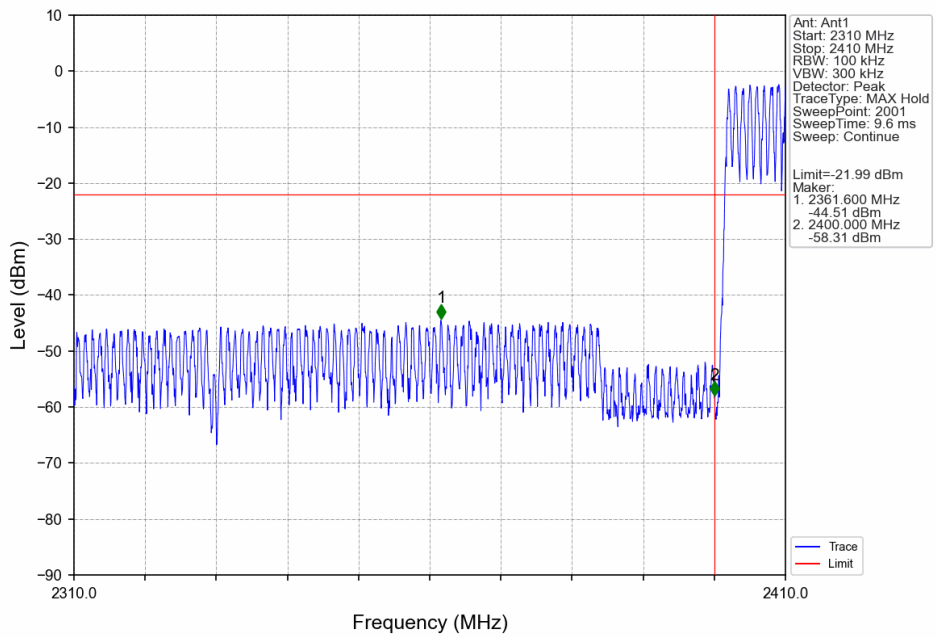
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



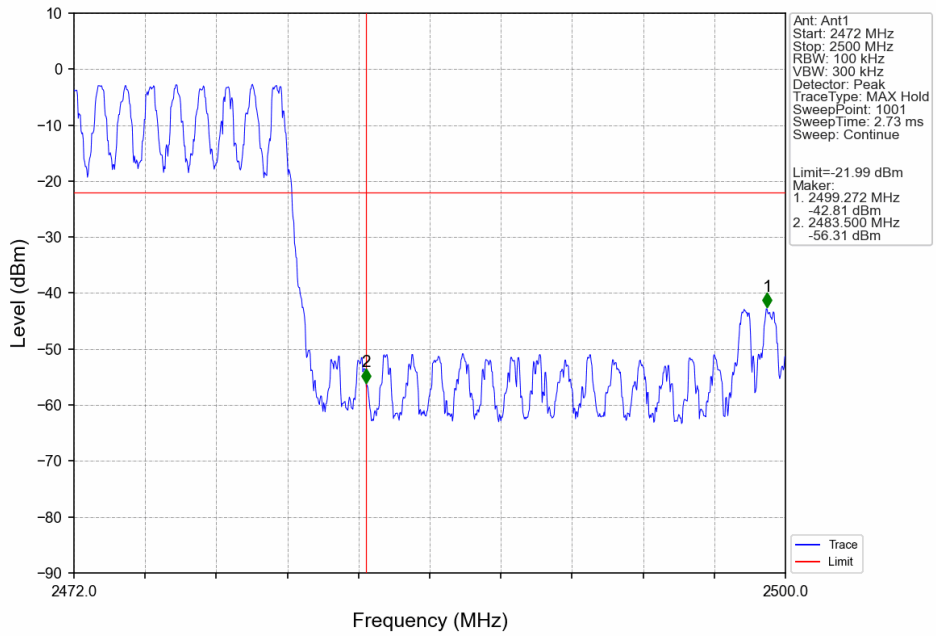
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



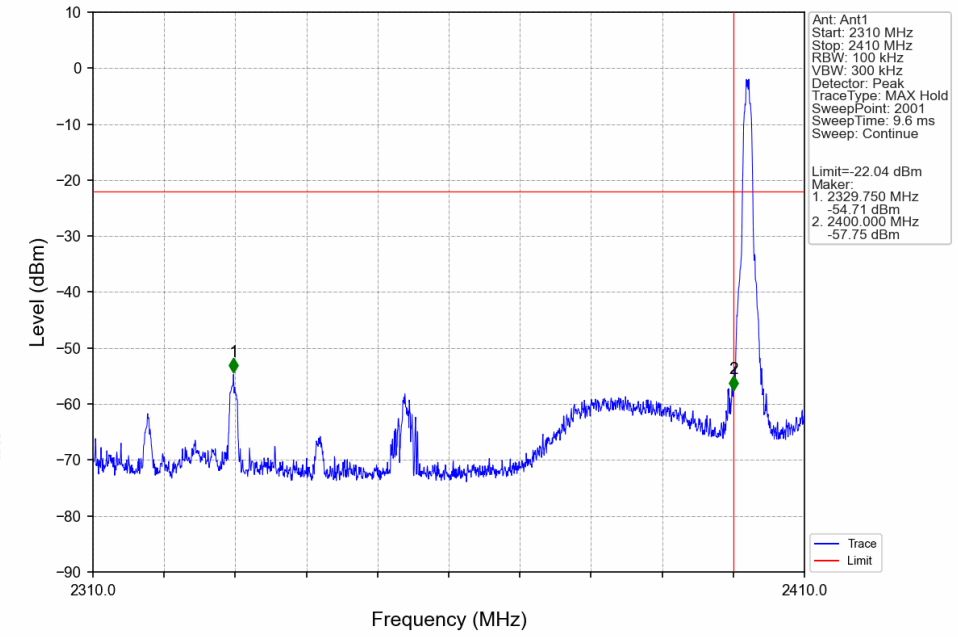
GFSK_DH5_HOPP_Ant1_NTNV



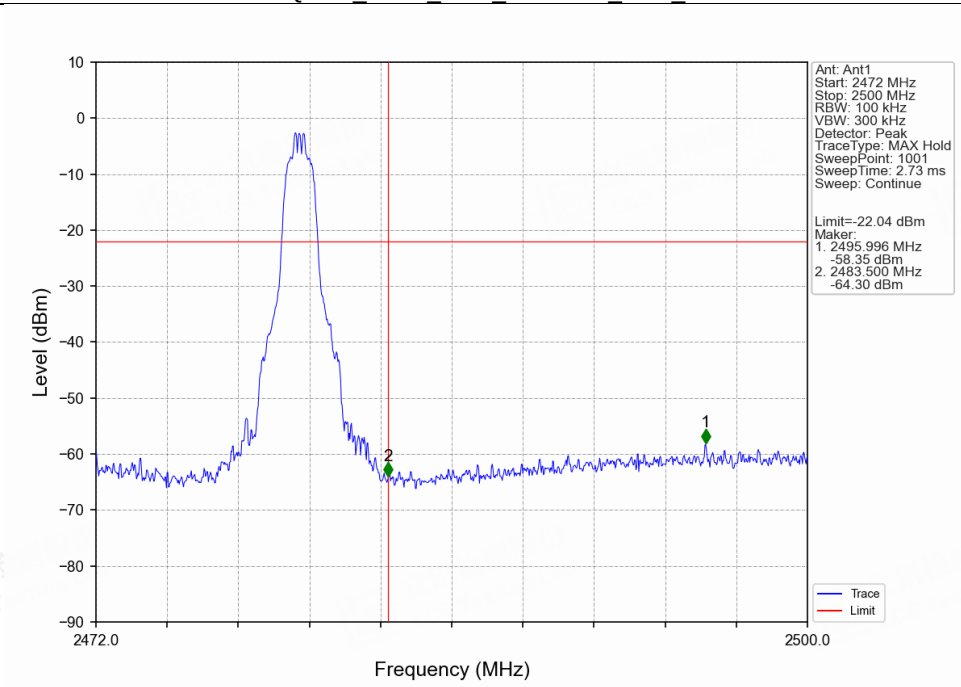
GFSK_DH5_HOPP_Ant1_NTNV



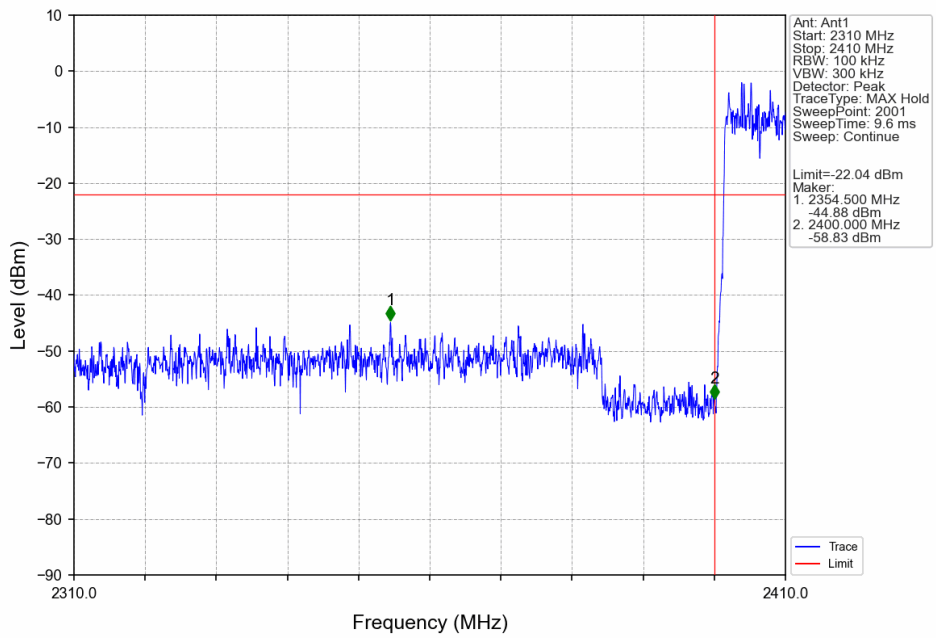
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



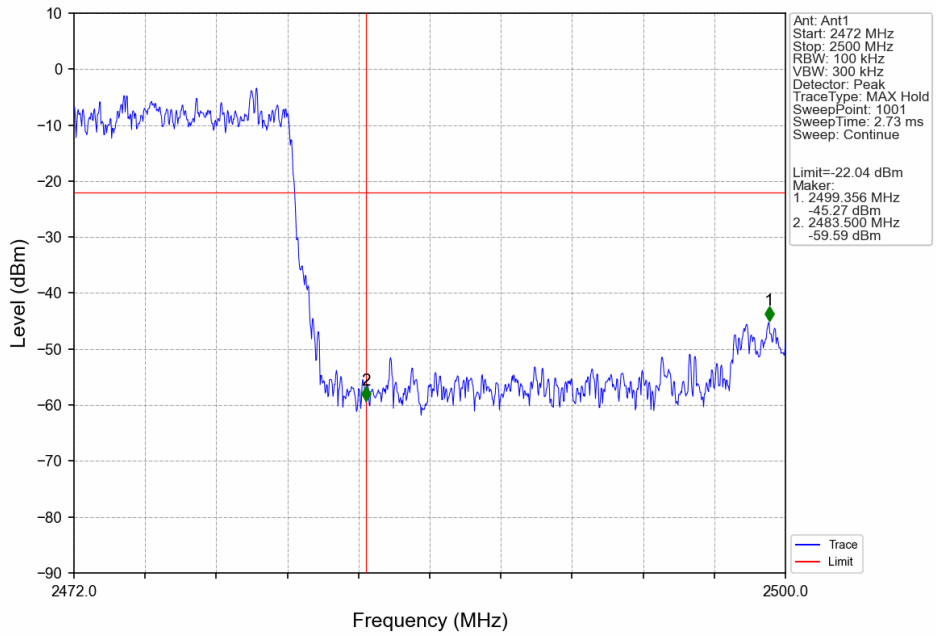
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



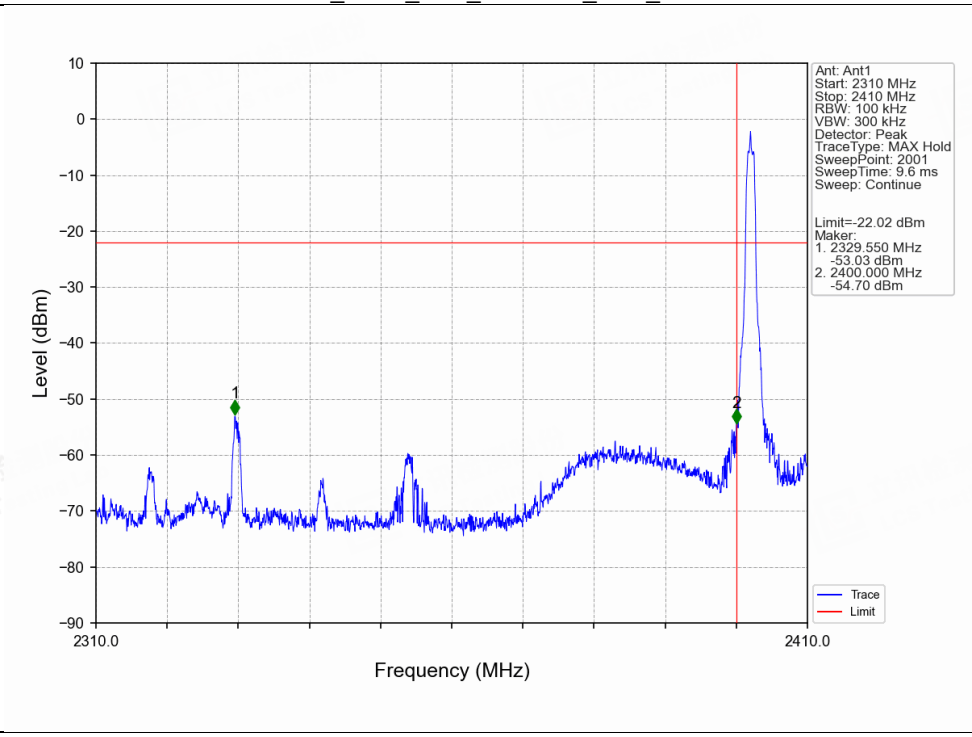
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



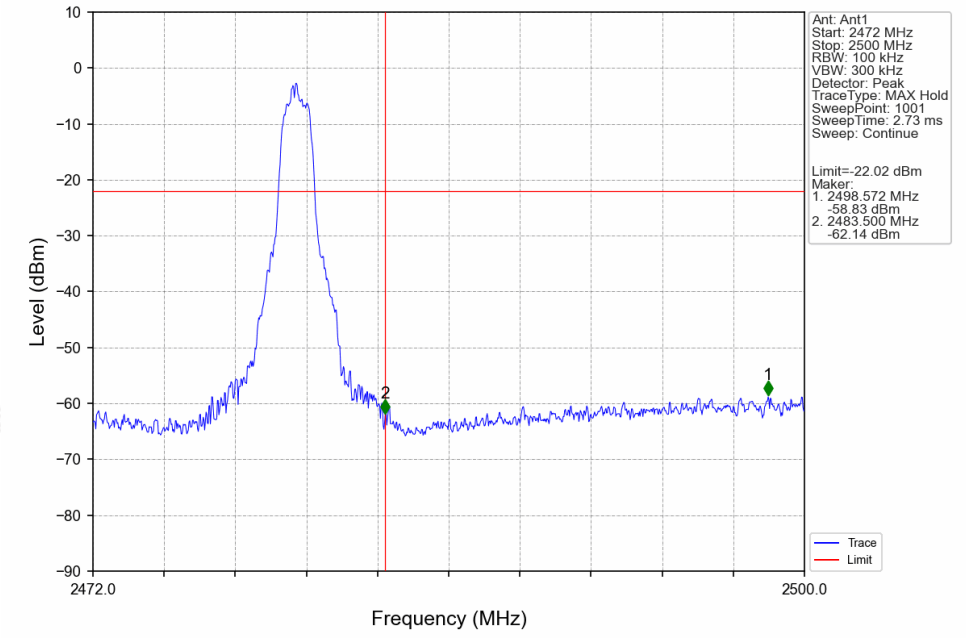
Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



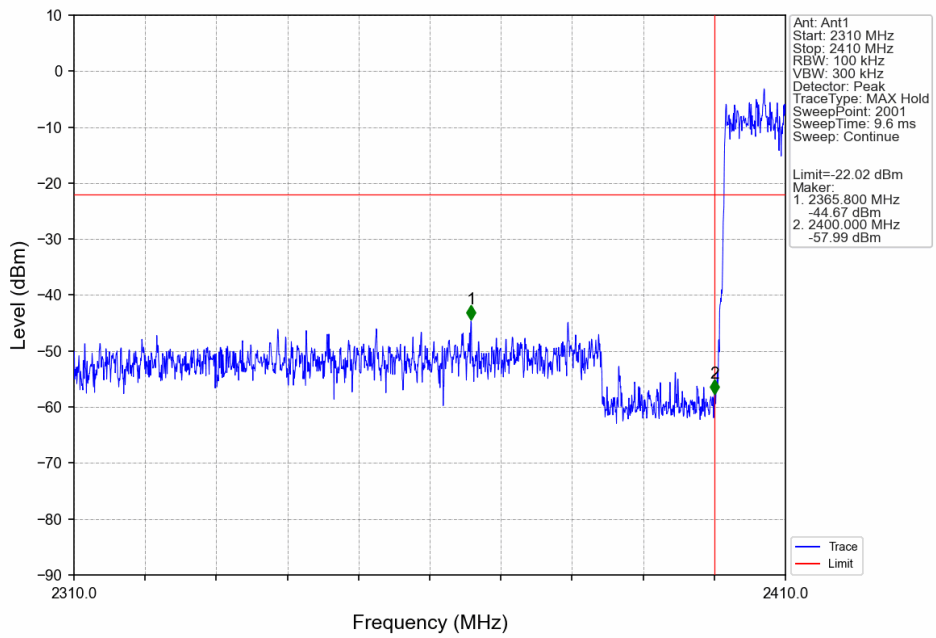
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



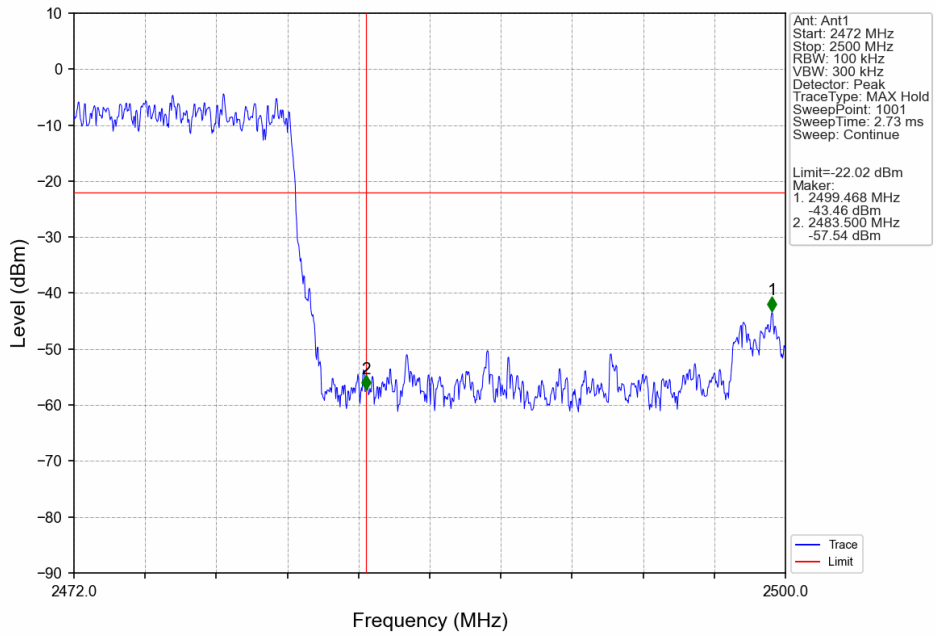
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



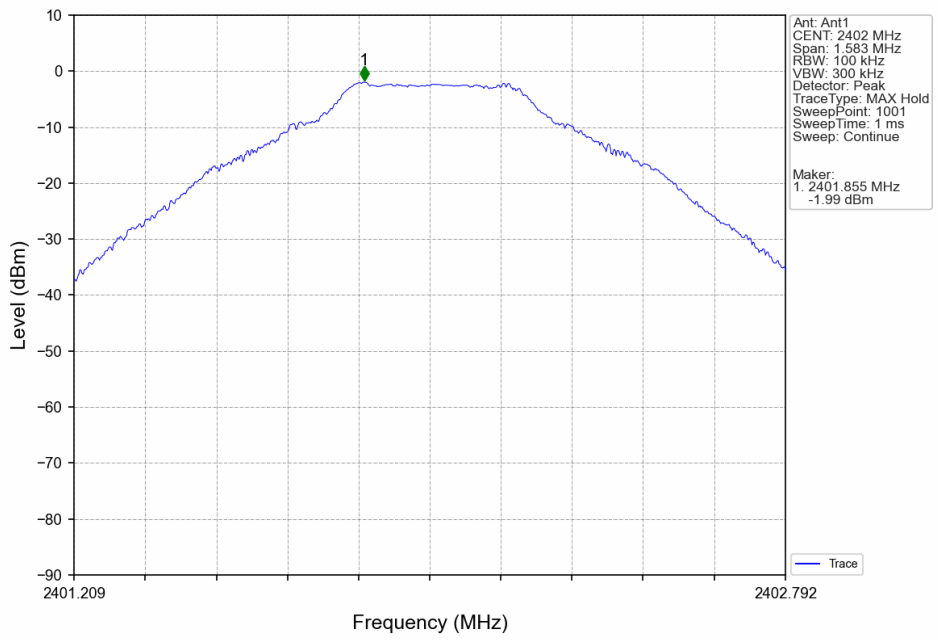
8DPSK_3DH5_HOPP_Ant1_NTNV



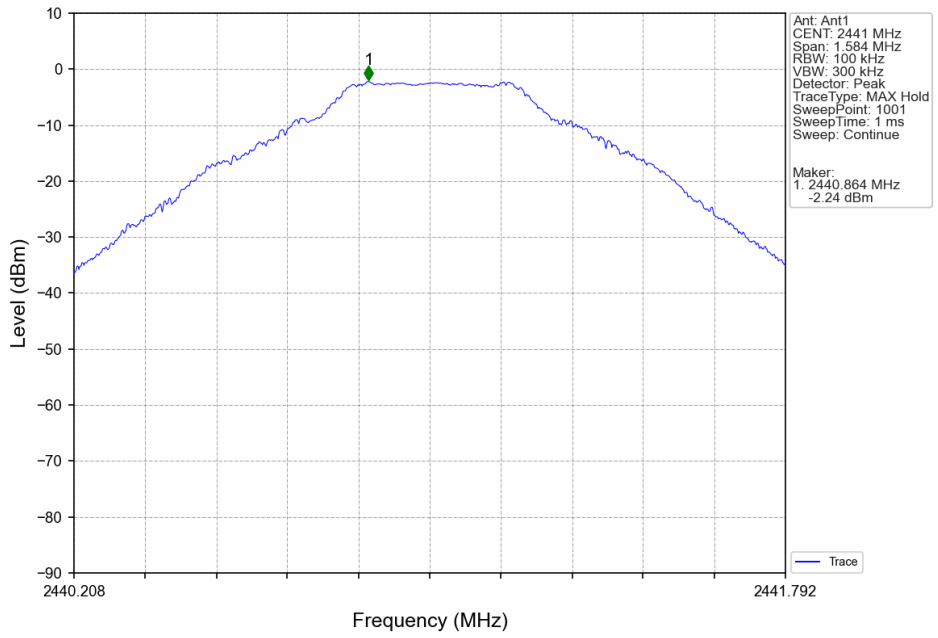
A.7 Conducted RF Spurious Emission

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	-1.99
		2441	DH5	1	-2.24
		2480	DH5	1	-2.68
Pi/4DQPSK	SISO	2402	2DH5	1	-2.04
		2441	2DH5	1	-2.19
		2480	2DH5	1	-2.71
8DPSK	SISO	2402	3DH5	1	-2.02
		2441	3DH5	1	-2.17
		2480	3DH5	1	-2.66
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.					

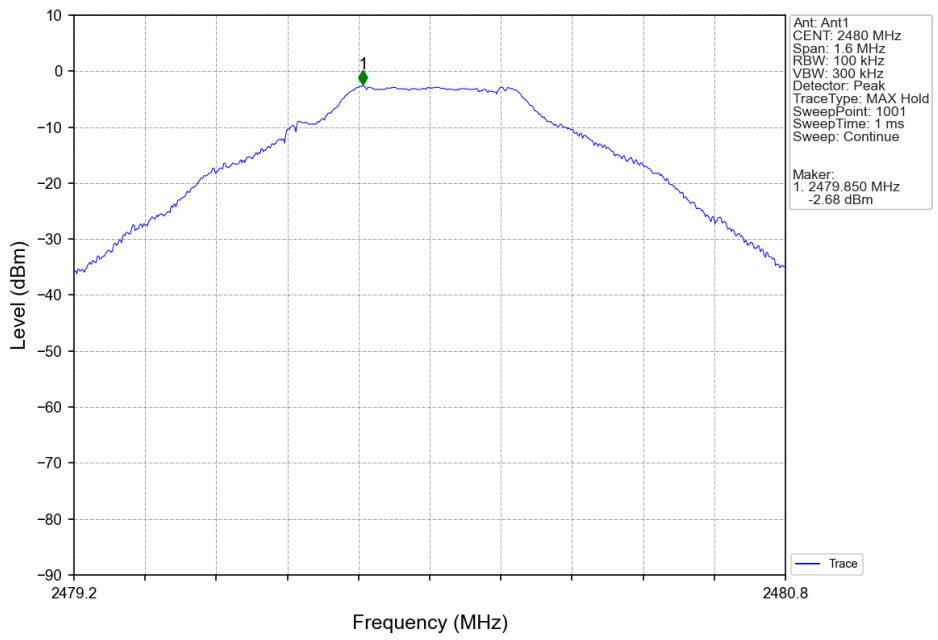
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



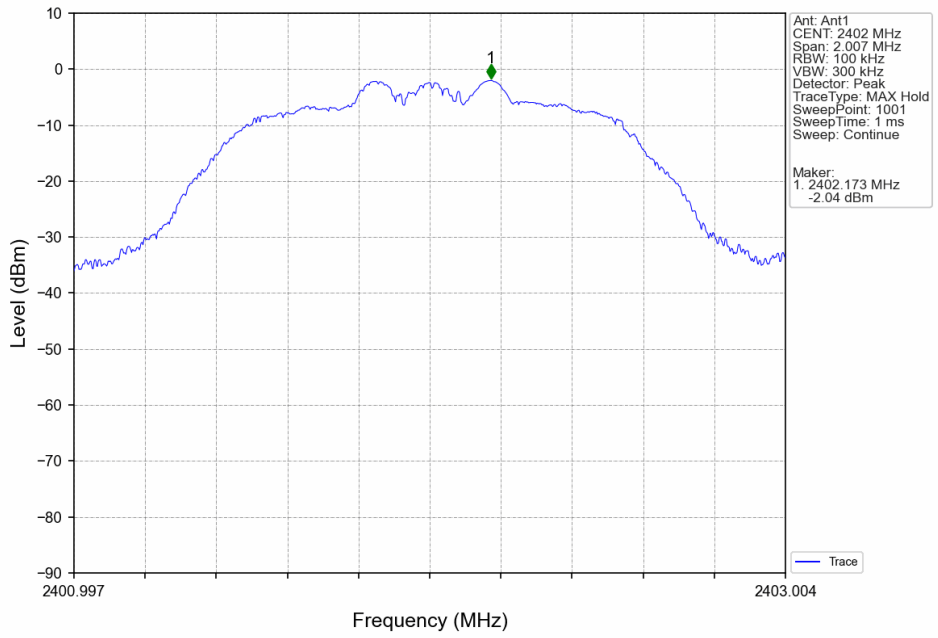
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



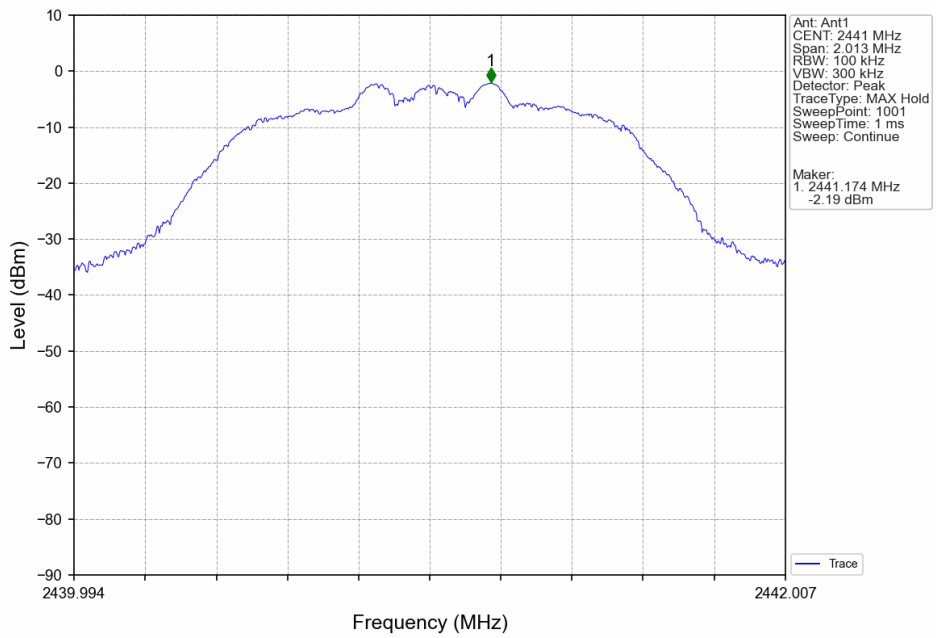
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



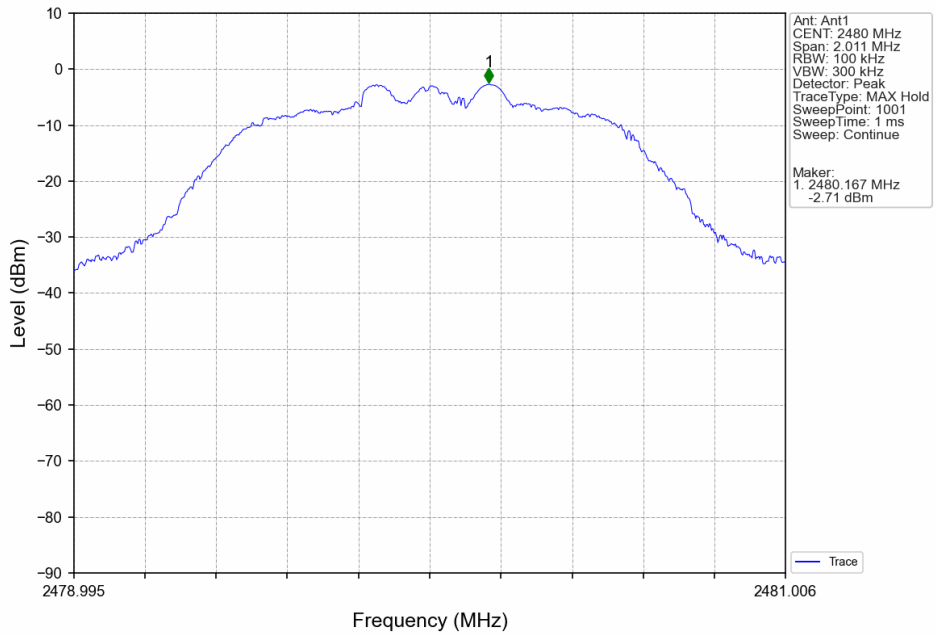
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



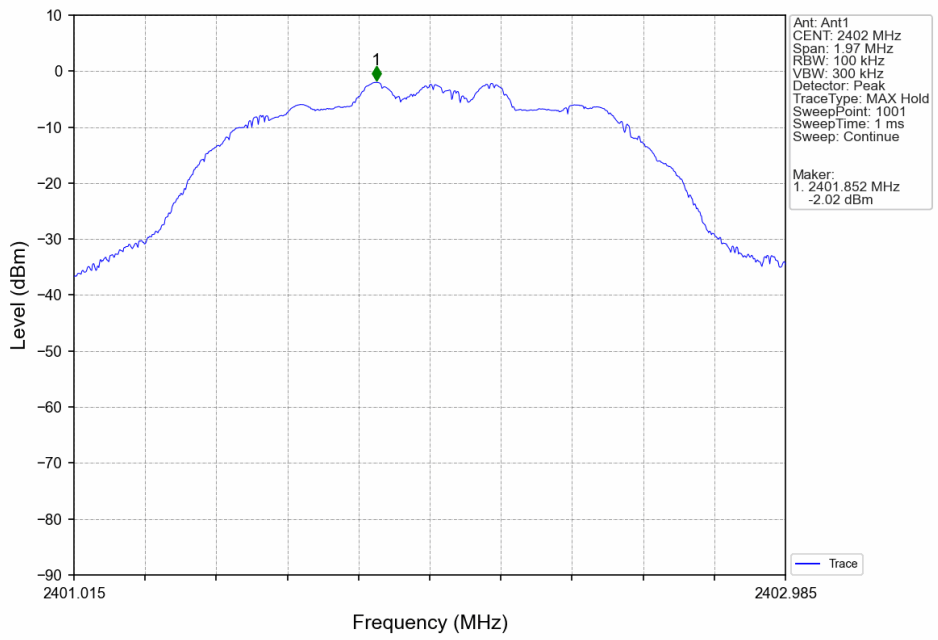
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



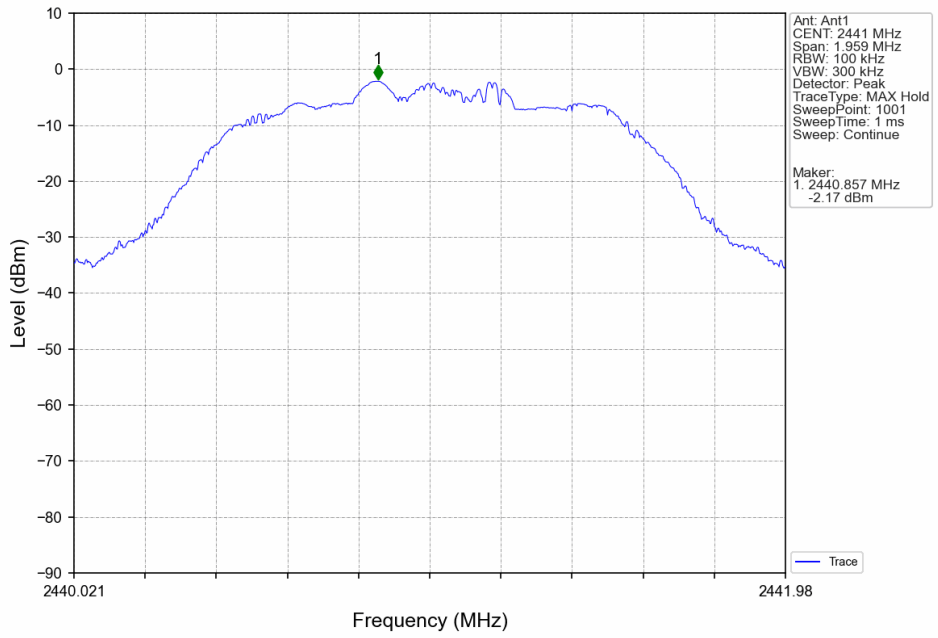
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



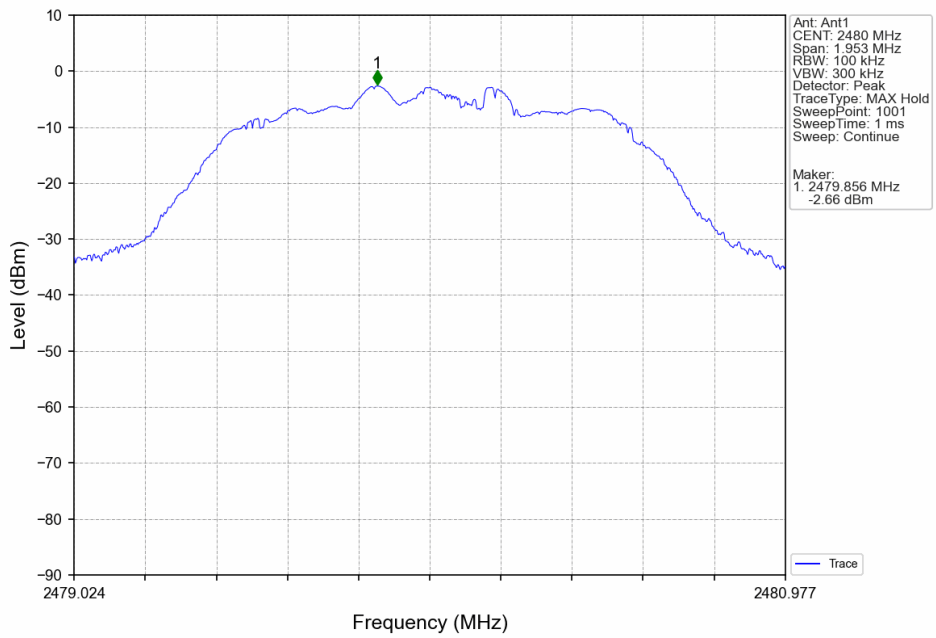
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



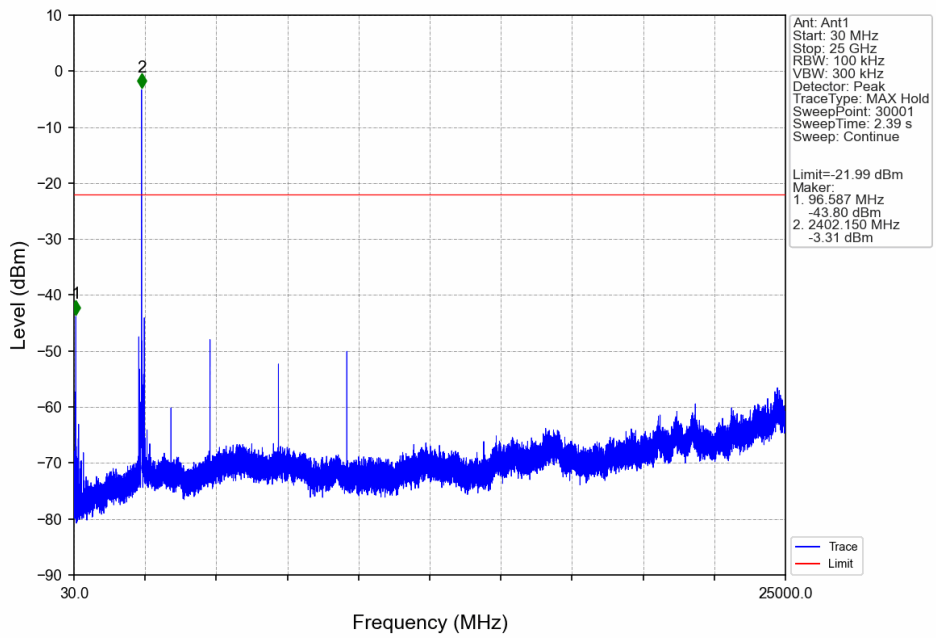
8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



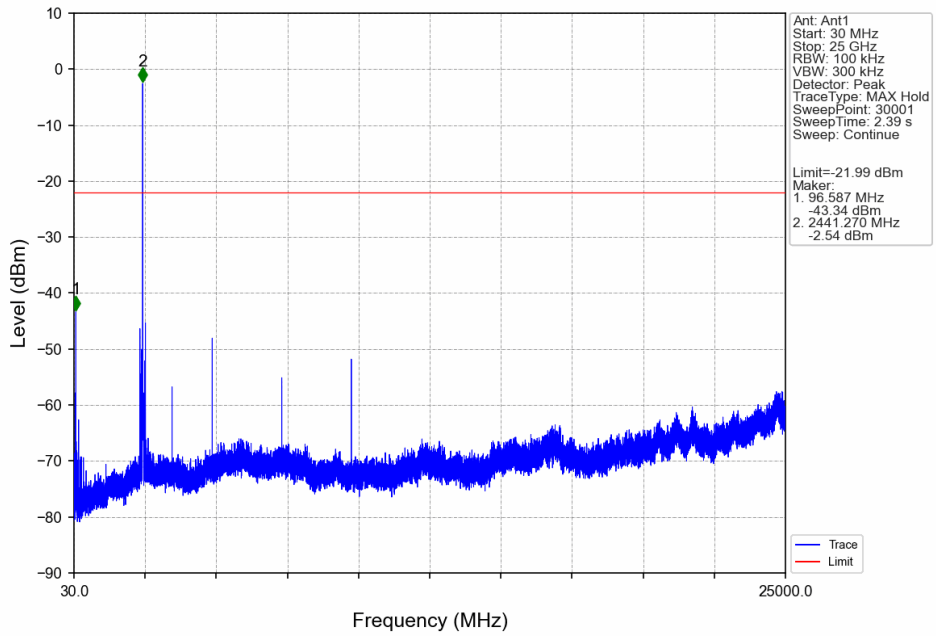
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



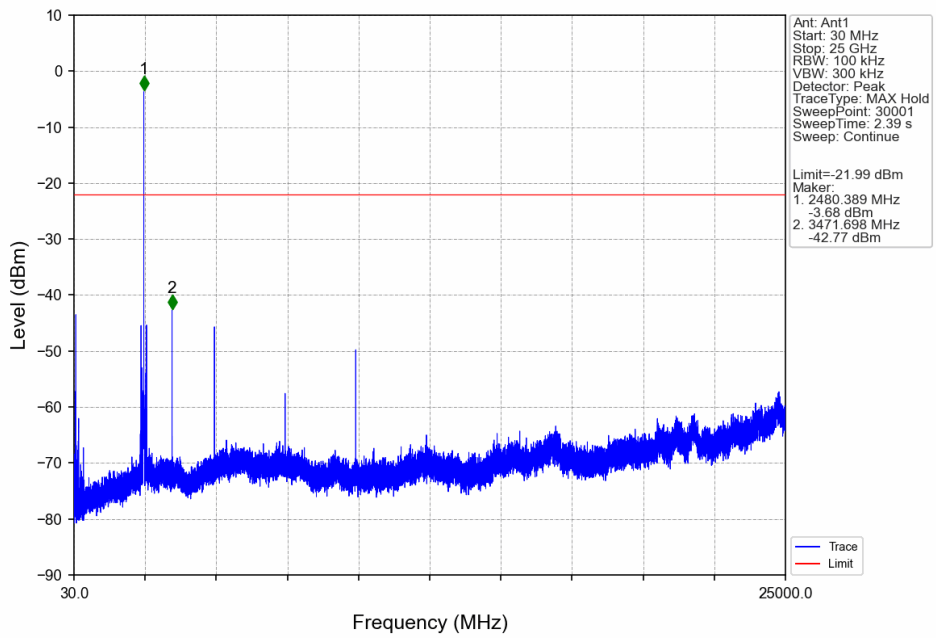
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



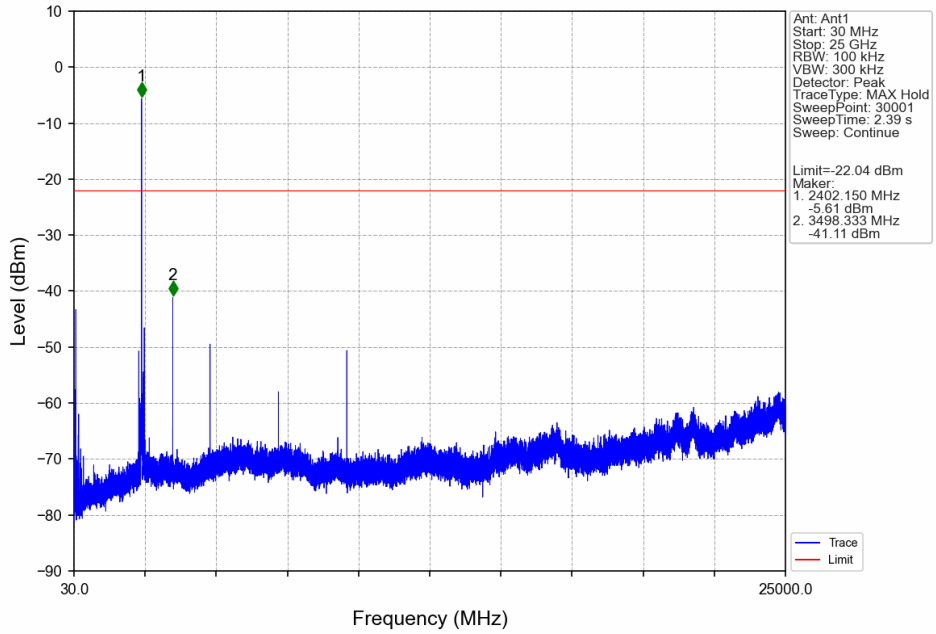
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



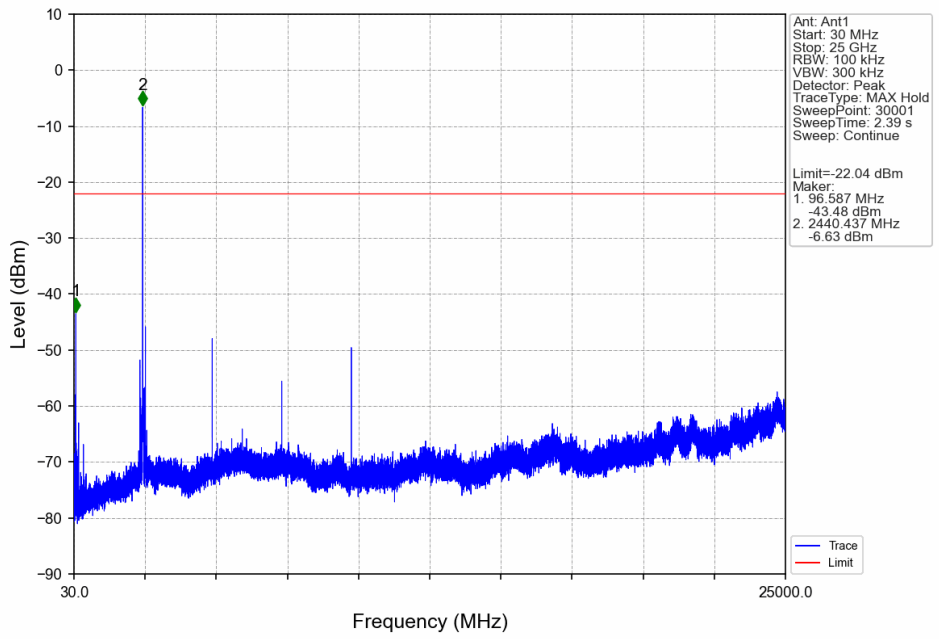
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



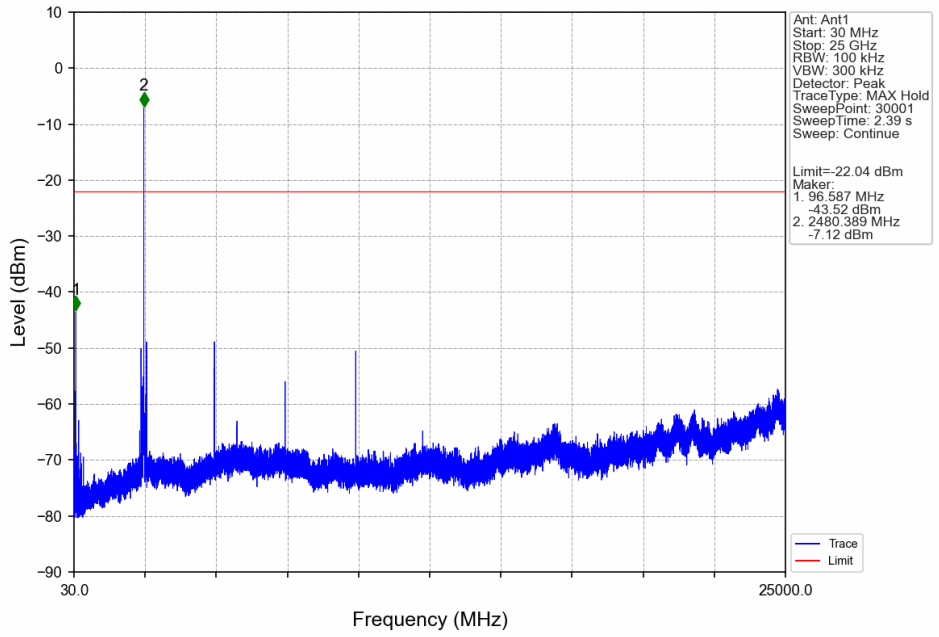
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



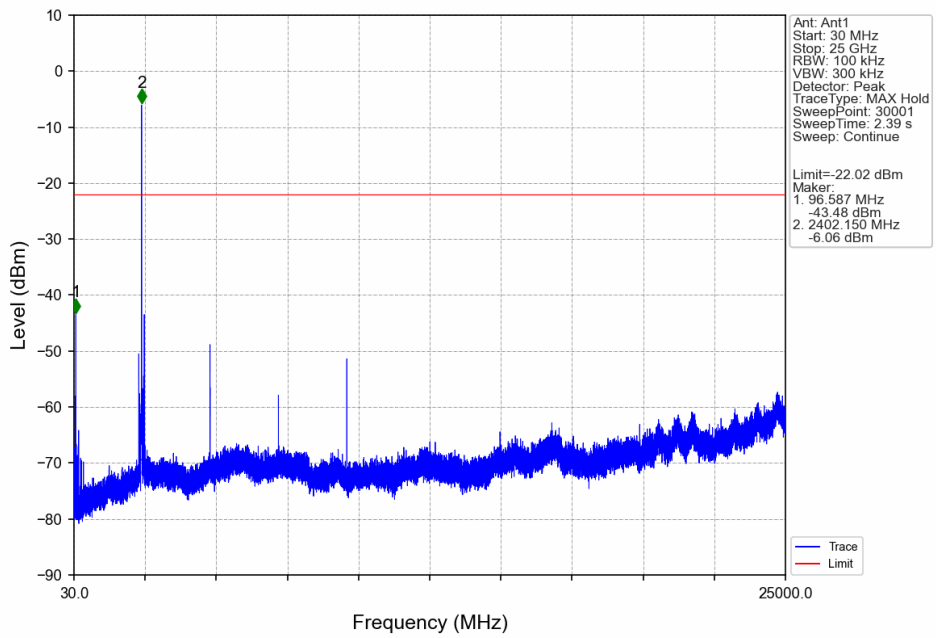
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



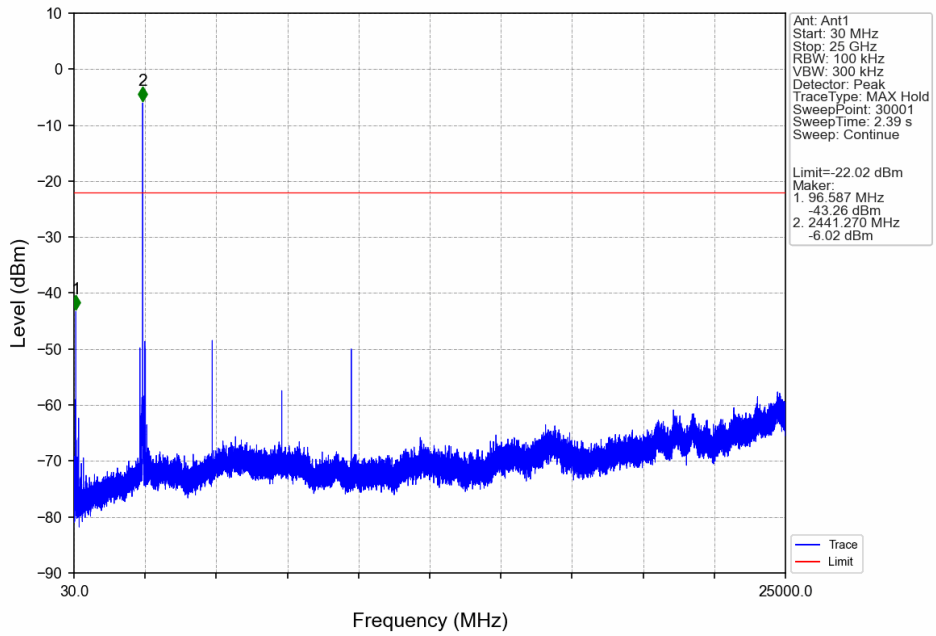
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



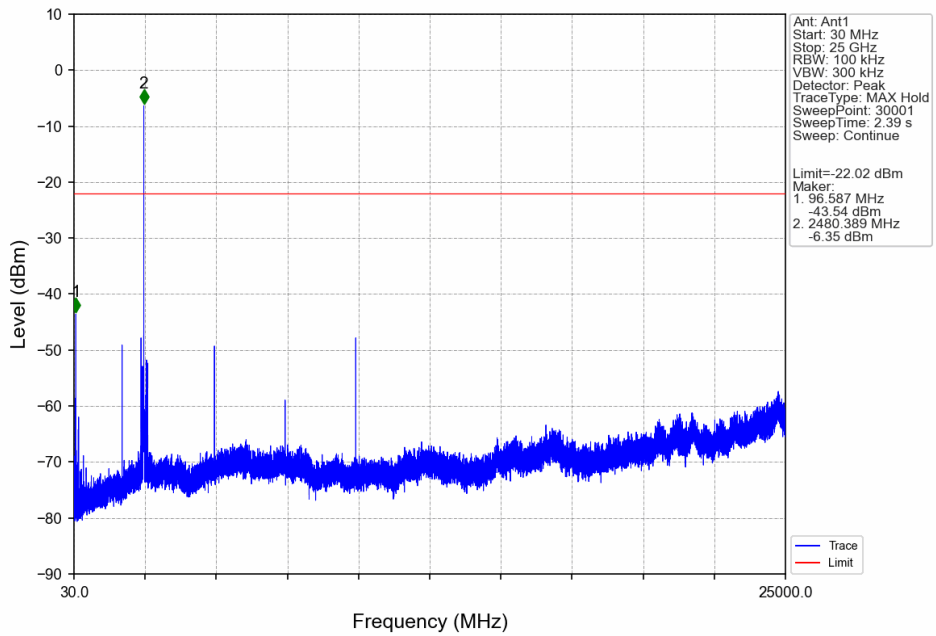
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



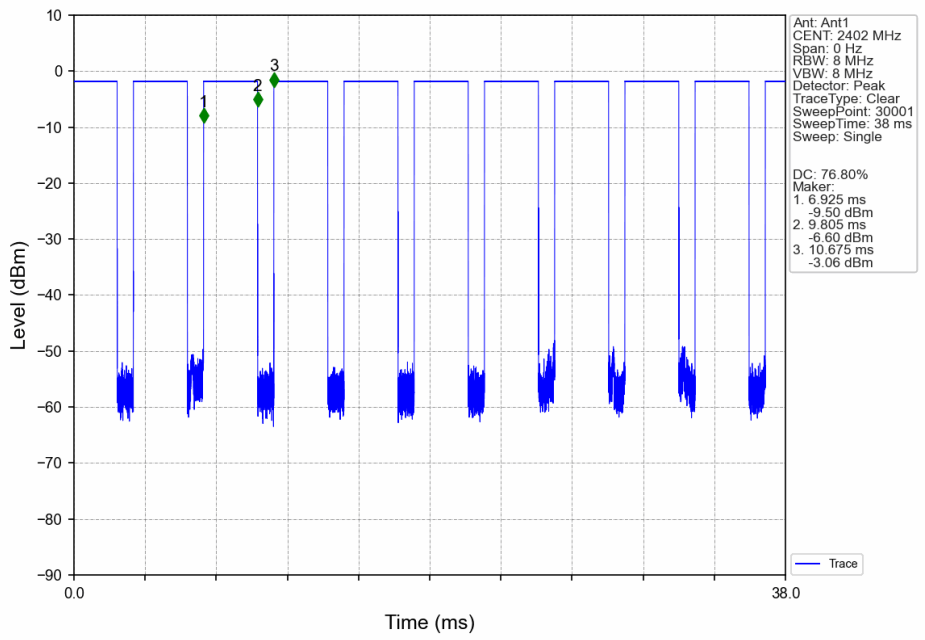
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV


Ant: Ant1
Start: 30 MHz
Stop: 25 GHz
RBW: 100 kHz
VBW: 300 kHz
Detector: Peak
TraceType: MAX Hold
SweepPoint: 30001
SweepTime: 2.39 s
Sweep: Continue
Limit=-22.02 dBm
Maker:
1. 96.587 MHz
-43.54 dBm
2. 2480.389 MHz
-6.35 dBm
Trace
Limit
Level (dBm)
Frequency (MHz)
30.0
25000.0
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
1
2

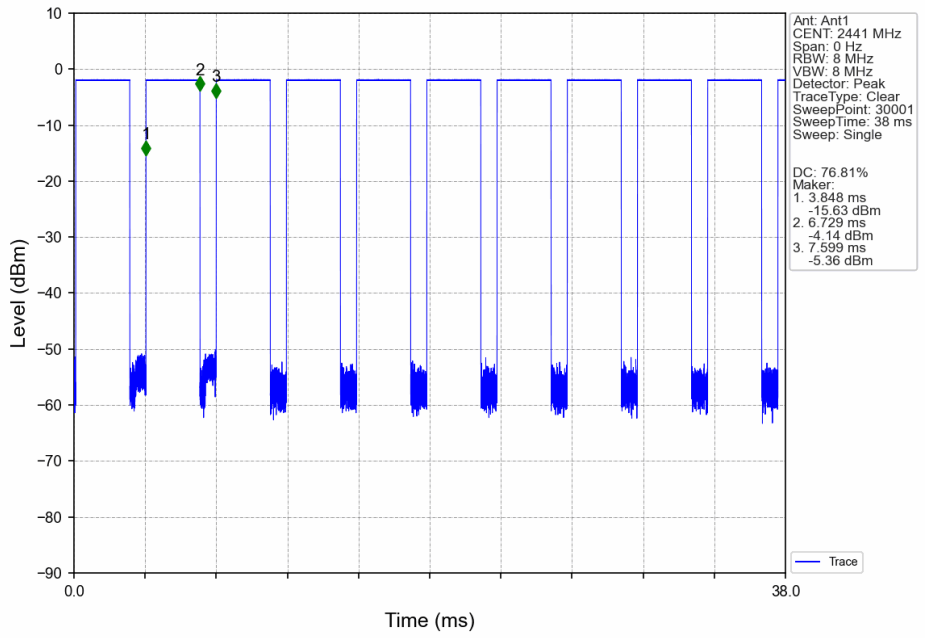
A.8 Duty Cycle

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	2.880	3.750	76.80	1.15	0.03
		2441	DH5	2.881	3.751	76.81	1.15	0.03
		2480	DH5	2.887	3.751	76.97	1.14	0.03
Pi/4DQPSK	SISO	2402	2DH5	2.885	3.749	76.95	1.14	0.01
		2441	2DH5	2.887	3.750	76.99	1.14	0.03
		2480	2DH5	2.885	3.749	76.95	1.14	0.03
8DPSK	SISO	2402	3DH5	2.888	3.751	76.99	1.14	0.03
		2441	3DH5	2.888	3.751	76.99	1.14	0.04
		2480	3DH5	2.888	3.751	76.99	1.14	0.03

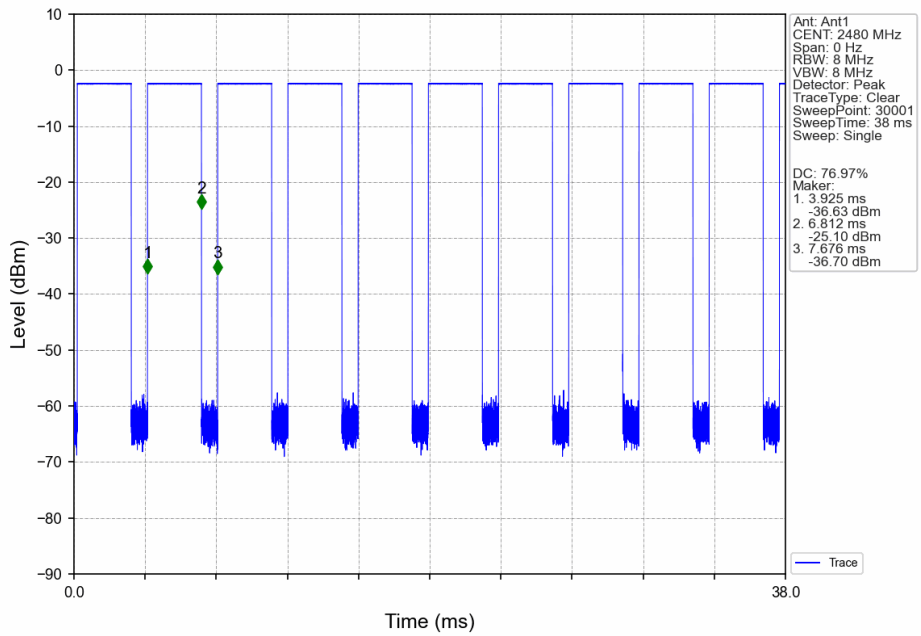
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



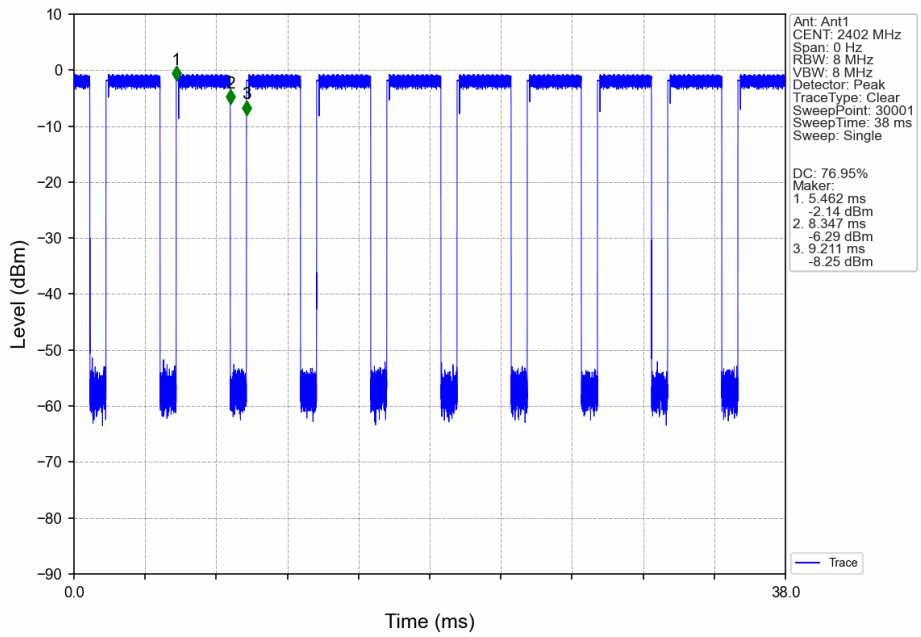
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



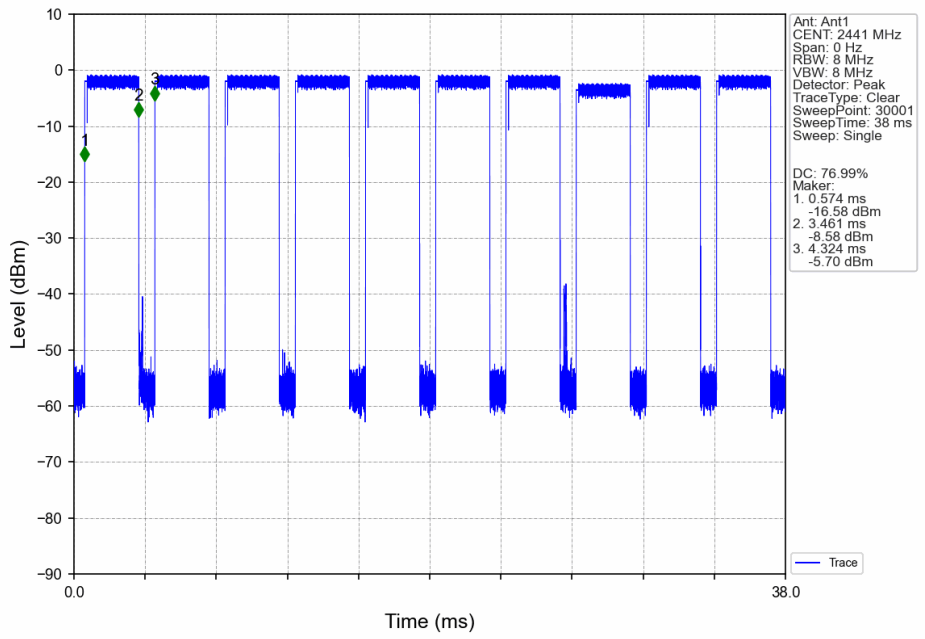
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



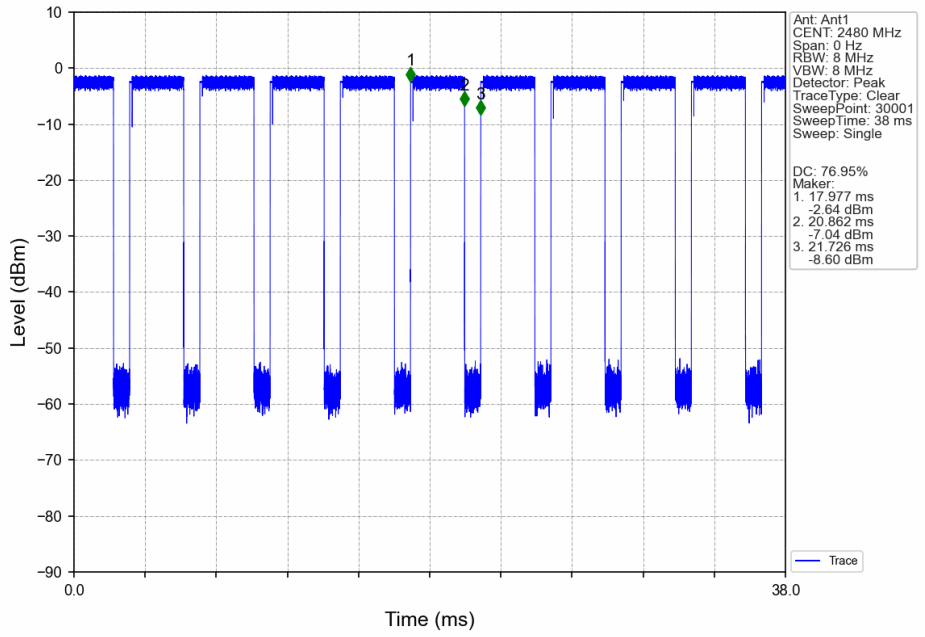
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



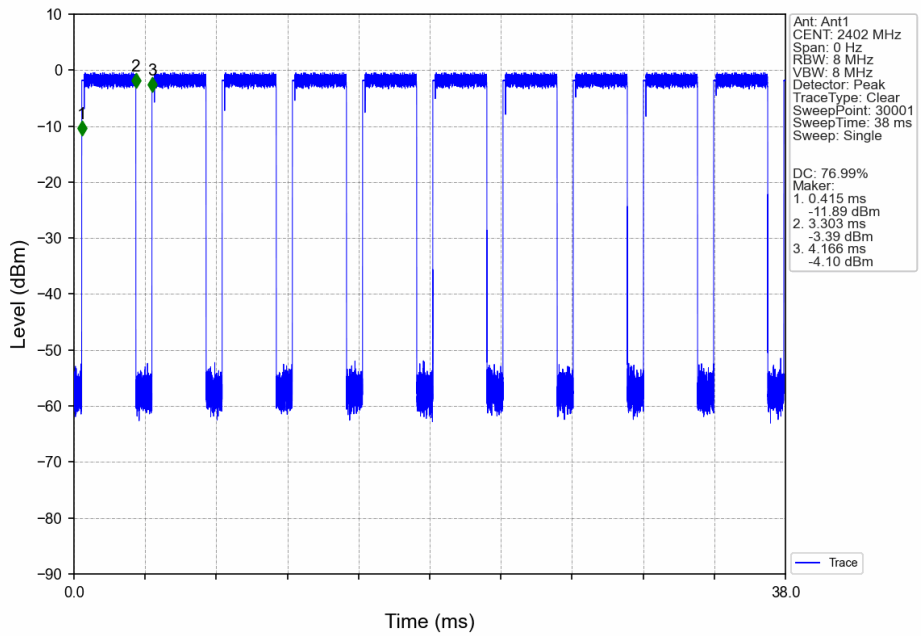
Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



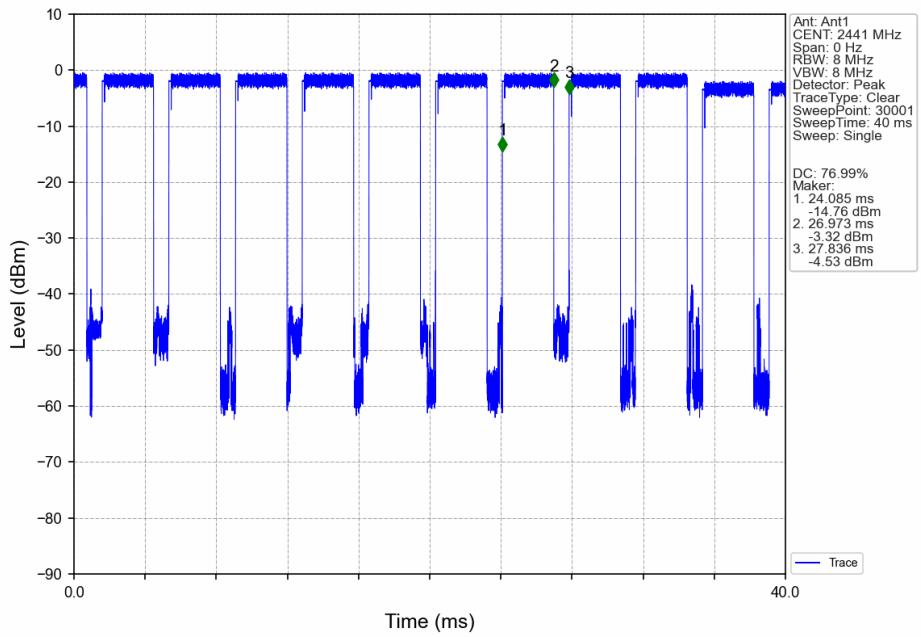
Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



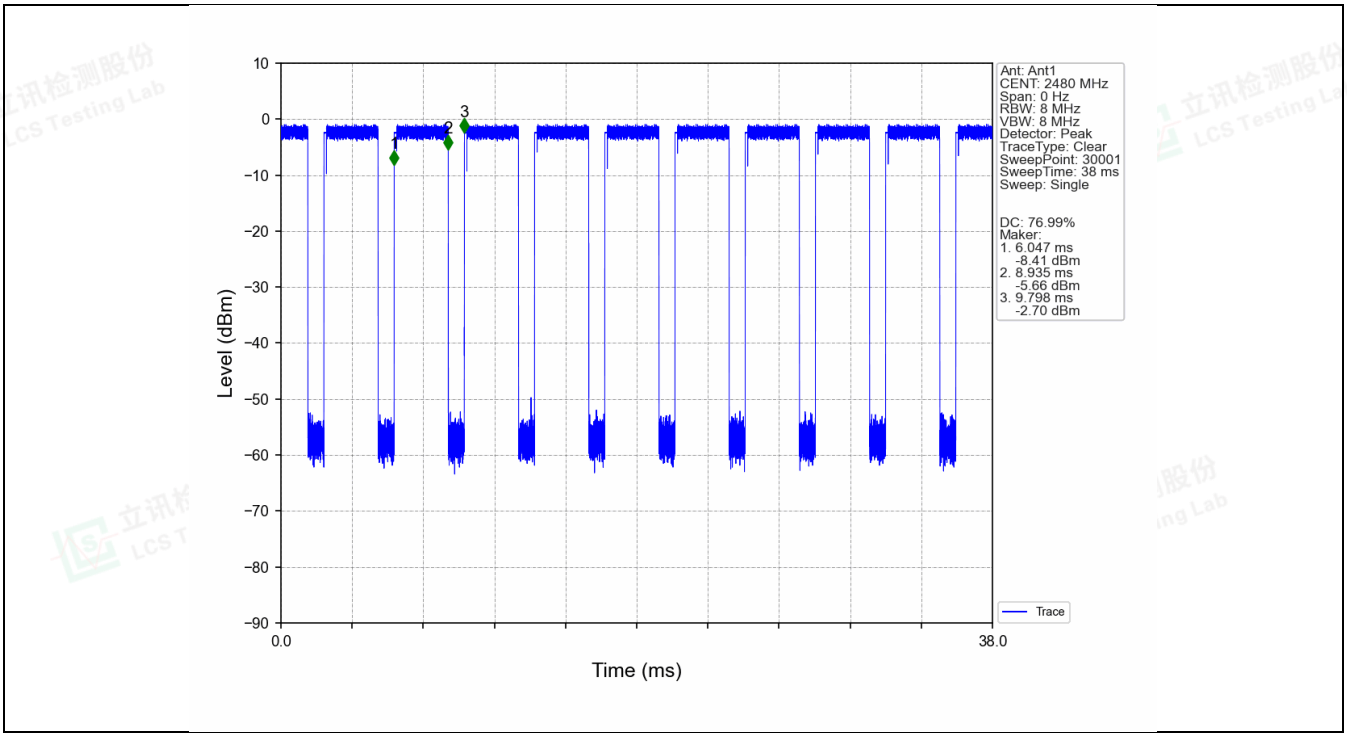
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV

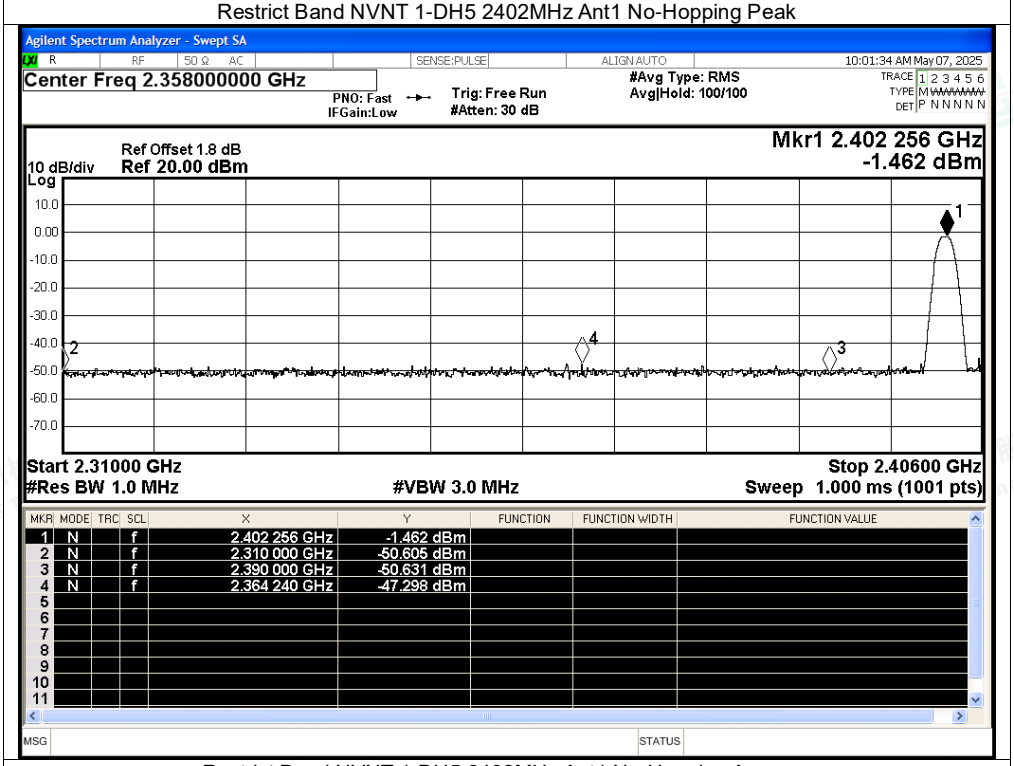

Ant: Ant1
CENT: 2480 MHz
Span: 0 Hz
RBW: 8 MHz
VBW: 8 MHz
Detector: Peak
TraceType: Clear
SweepPoint: 30001
SweepTime: 38 ms
Sweep: Single
DC: 76.99%
Maker:
1. 6.047 ms
-8.41 dBm
2. 8.935 ms
-5.66 dBm
3. 9.798 ms
-2.70 dBm
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
38.0
1
2
3

A.9 Restrict Band

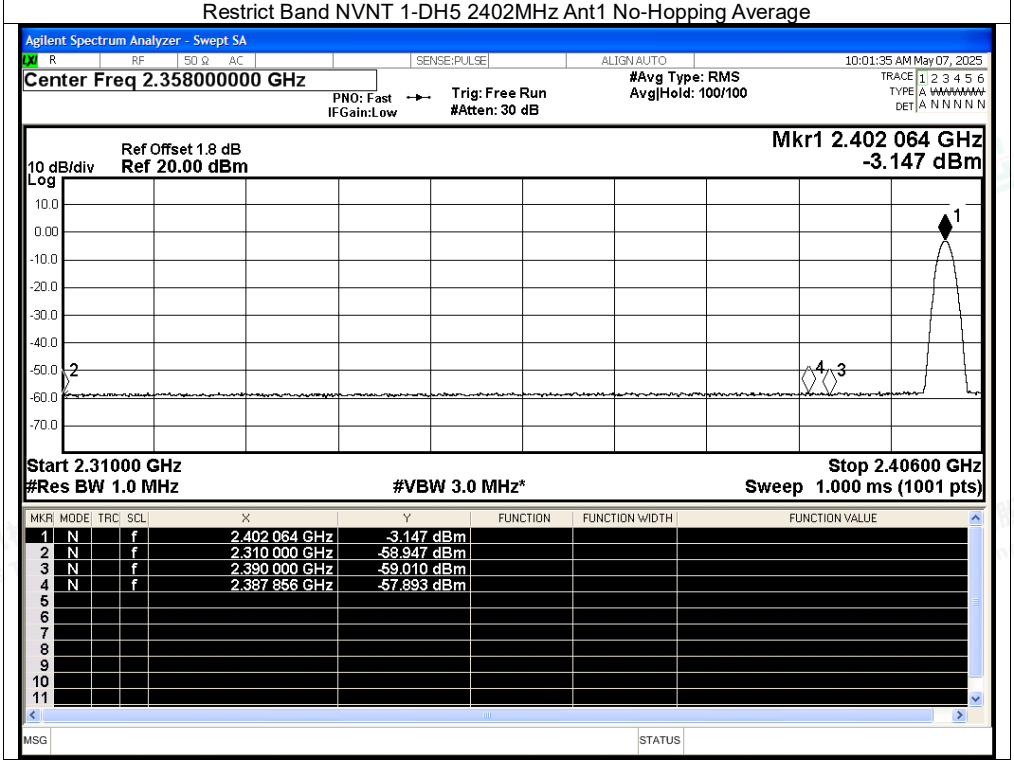
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-50.61	2	-	46.65	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-58.95	2	1.15	39.46	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2364.24	-47.3	2	-	49.96	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2387.856	-57.89	2	1.15	40.52	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-50.63	2	-	46.63	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-59.01	2	1.15	39.40	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-51.04	2	-	46.22	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-57.98	2	1.14	40.42	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2484.256	-44.52	2	-	52.74	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2484.784	-57.32	2	1.14	41.08	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-50.06	2	-	47.20	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-58.35	2	1.14	40.05	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-50.18	2	-	47.08	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-59.01	2	1.14	39.39	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2383.44	-46.17	2	-	51.09	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2360.784	-57.78	2	1.14	40.62	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-51.66	2	-	45.60	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-58.76	2	1.14	39.64	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-50.54	2	-	46.72	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-57.23	2	1.14	41.17	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2499.112	-47.47	2	-	49.79	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.608	-57.21	2	1.14	41.19	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-49.38	2	-	47.88	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-58.34	2	1.14	40.06	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-49.43	2	-	47.83	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-58.94	2	1.14	39.46	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2381.616	-46.69	2	-	50.57	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2384.496	-57.6	2	1.14	40.80	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-50.96	2	-	46.30	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-58.7	2	1.14	39.70	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-48.69	2	-	48.57	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-57.93	2	1.14	40.47	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2484.112	-47.06	2	-	50.20	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.536	-56.99	2	1.14	41.41	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-49.39	2	-	47.87	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-57.88	2	1.14	40.52	Average	54	Pass

Test Graphs

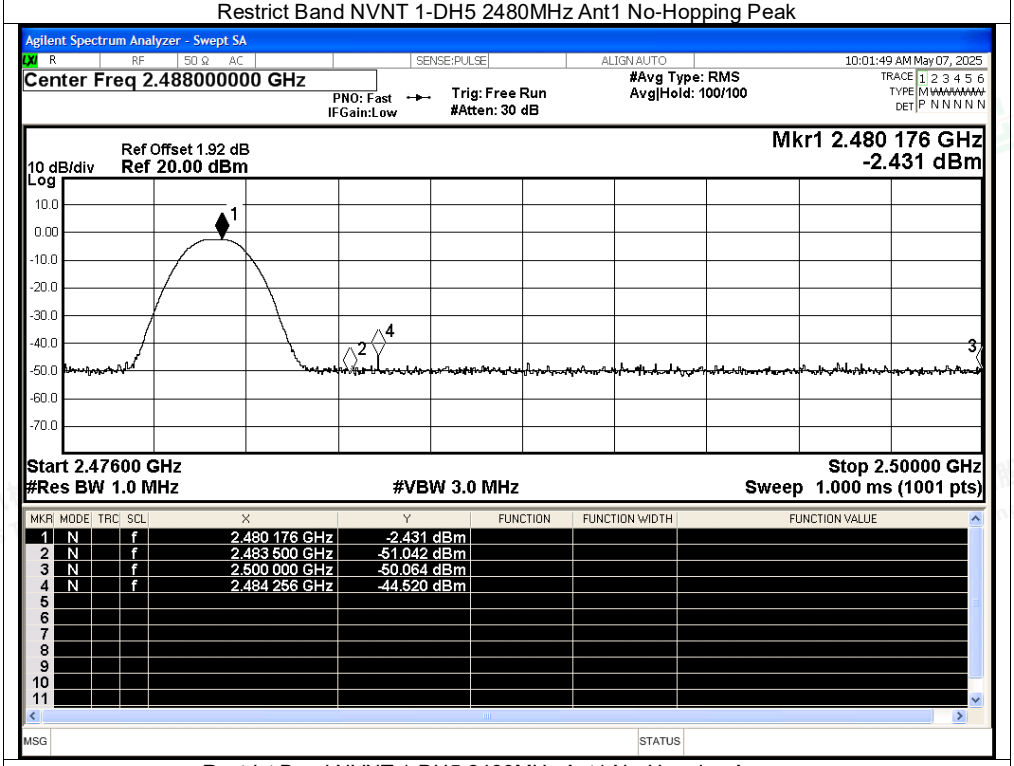
Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Peak



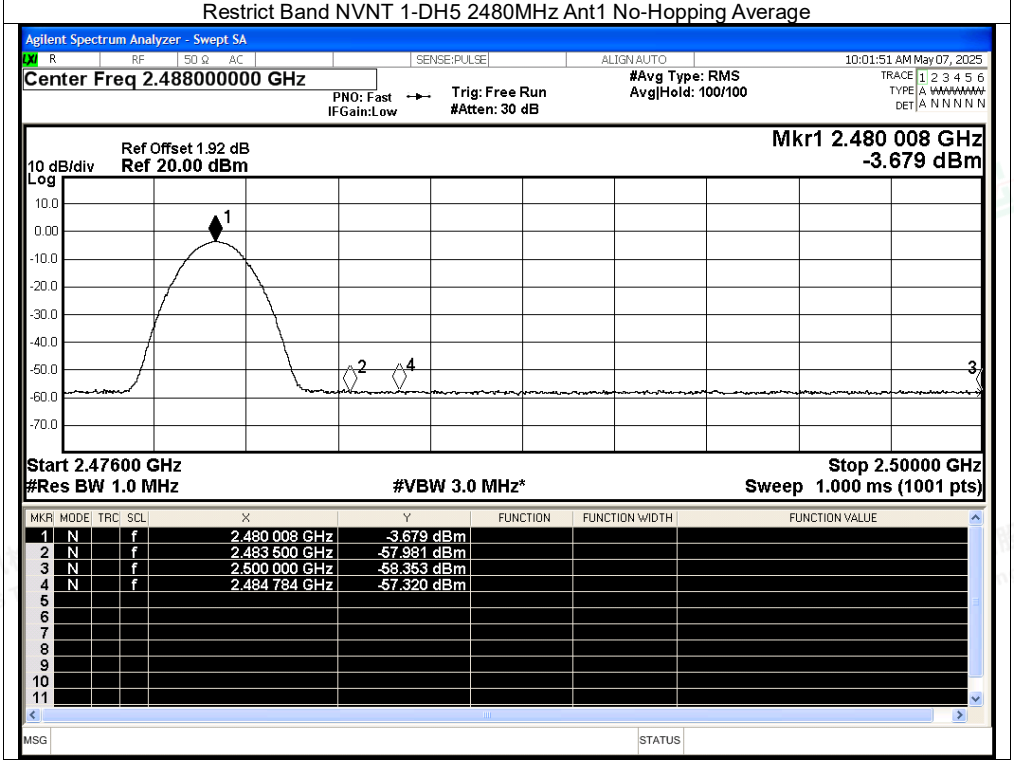
Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Average



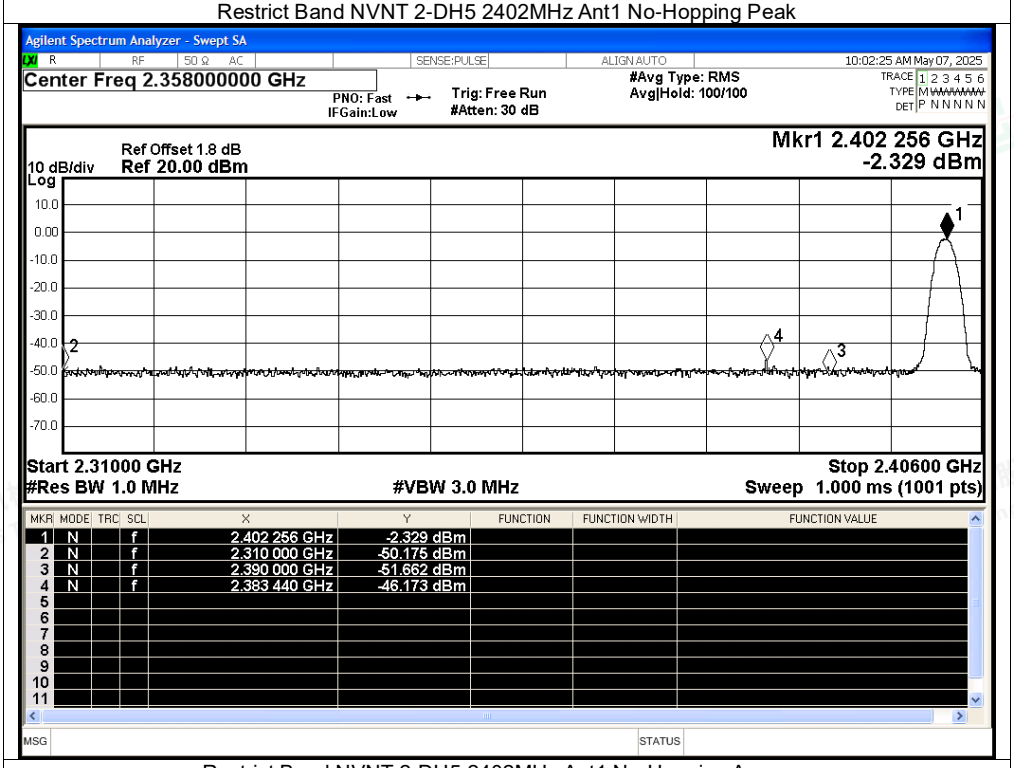
Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Peak



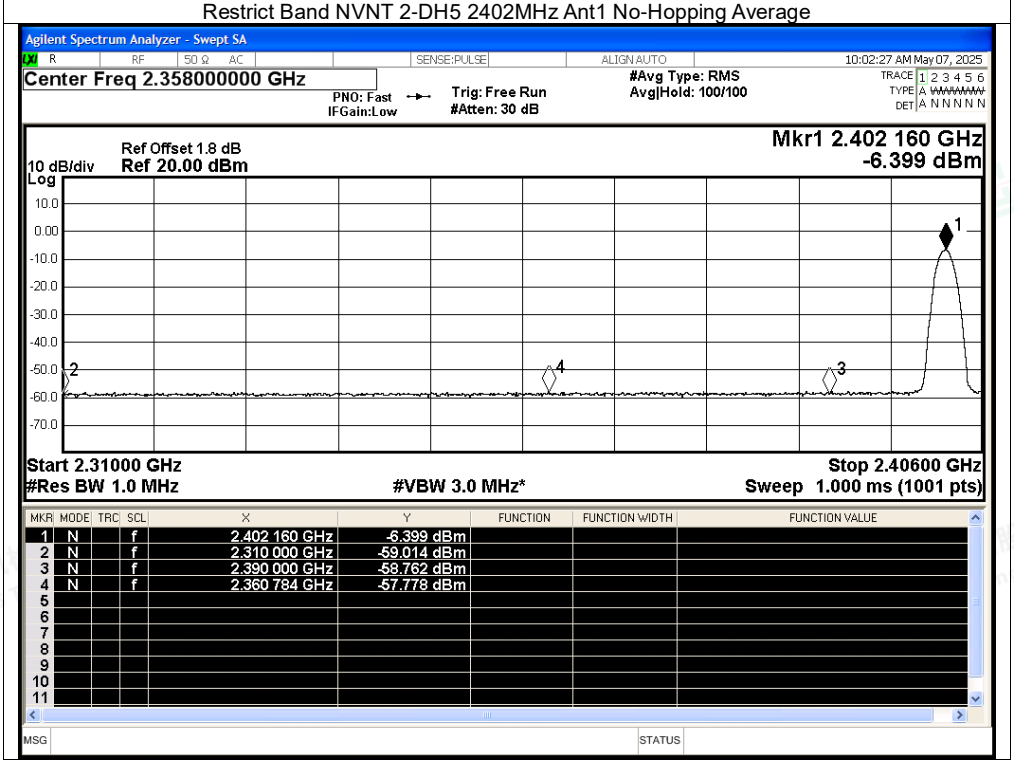
Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Average



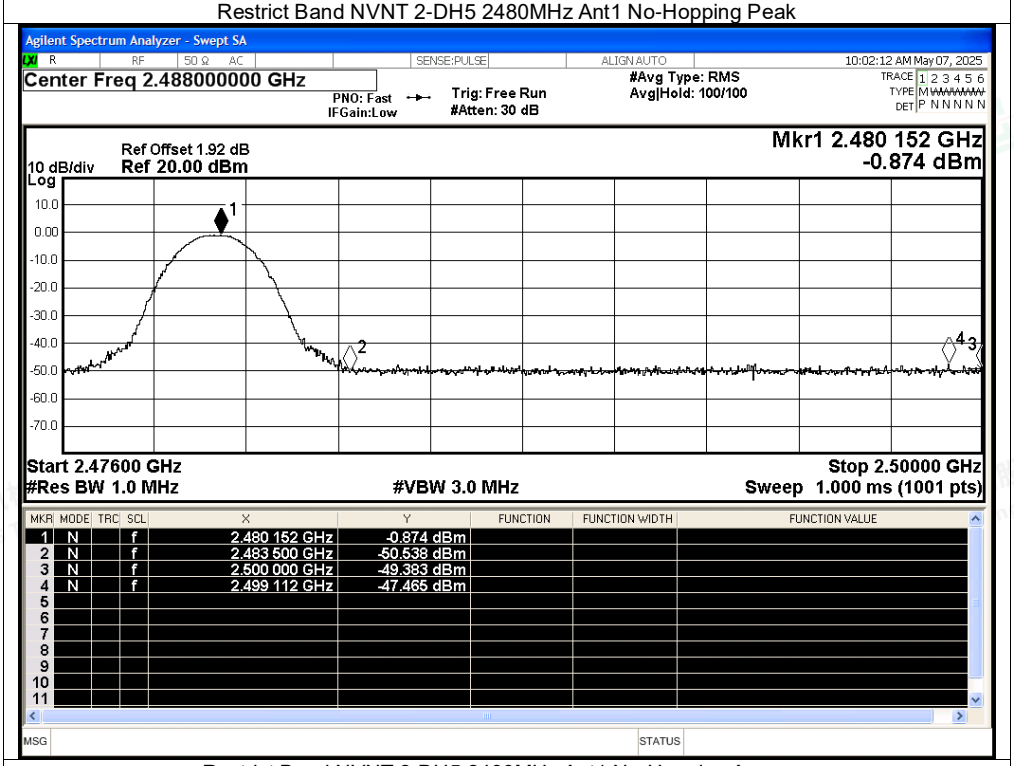
Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Peak



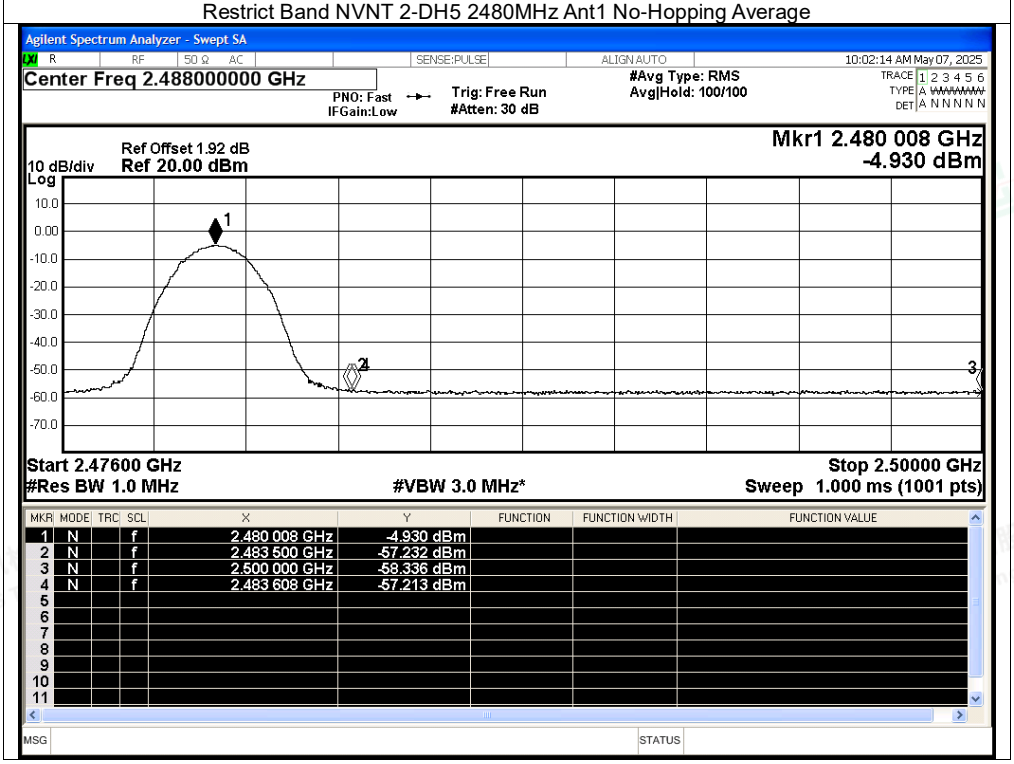
Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Average



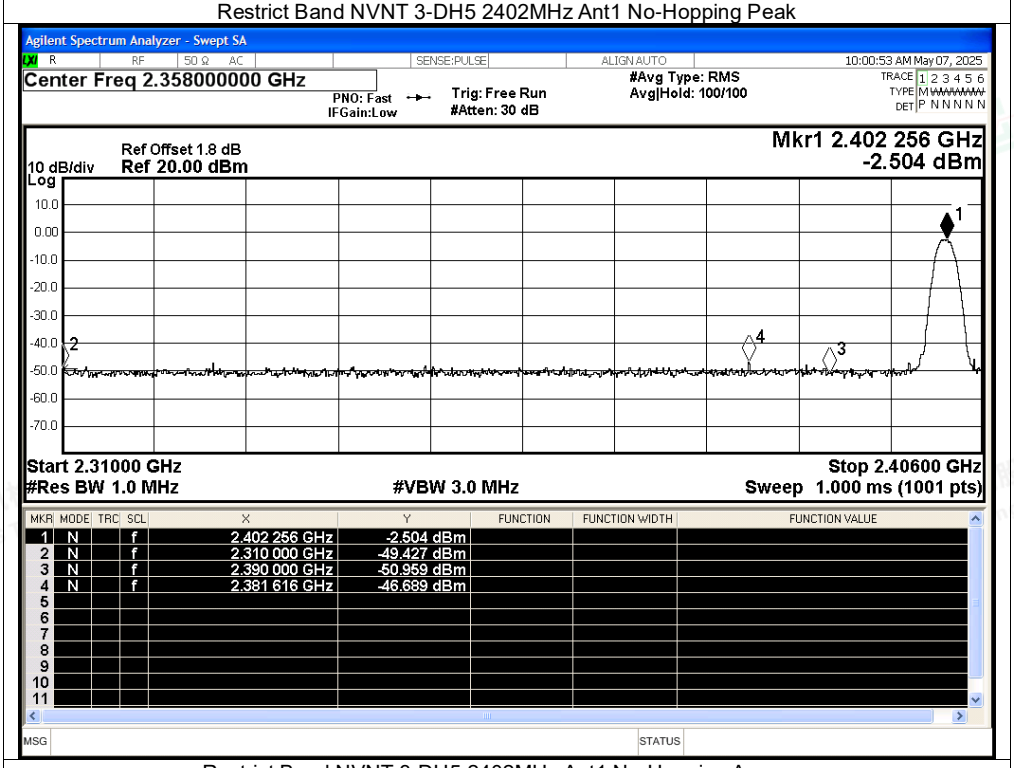
Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Peak



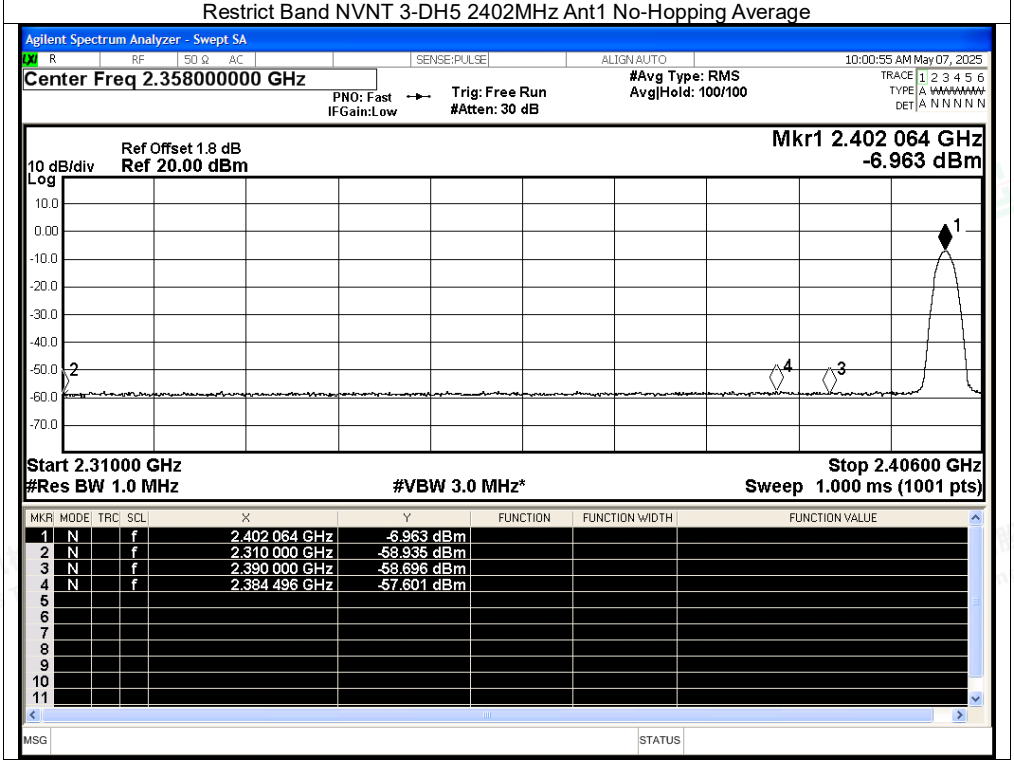
Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Average



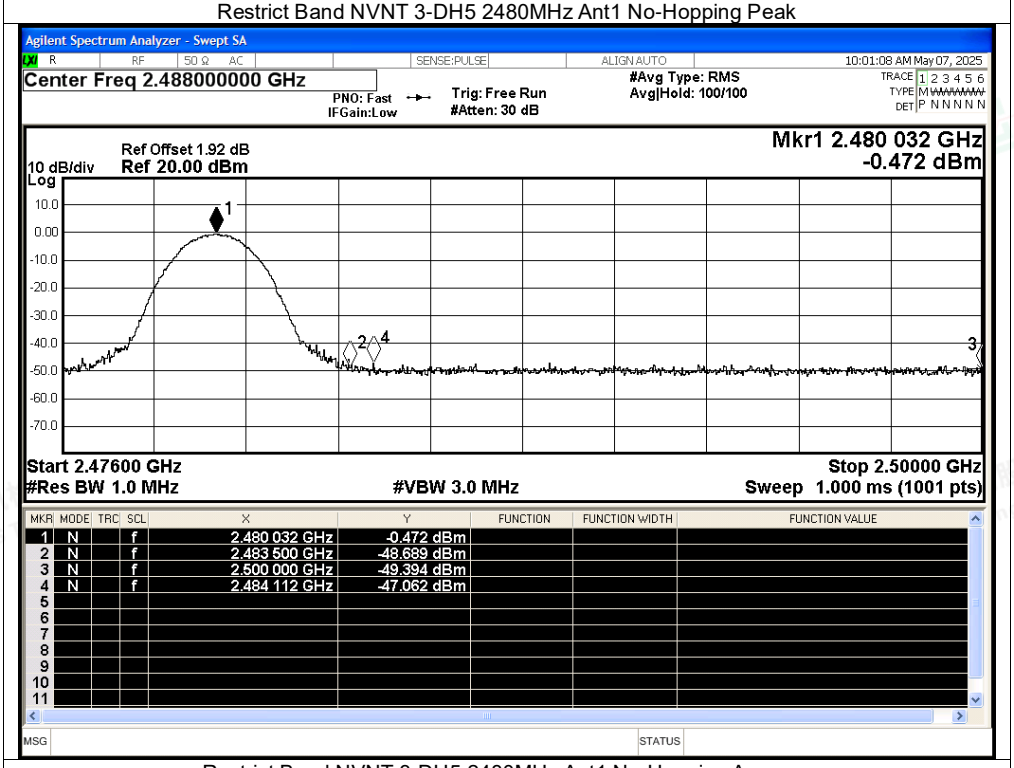
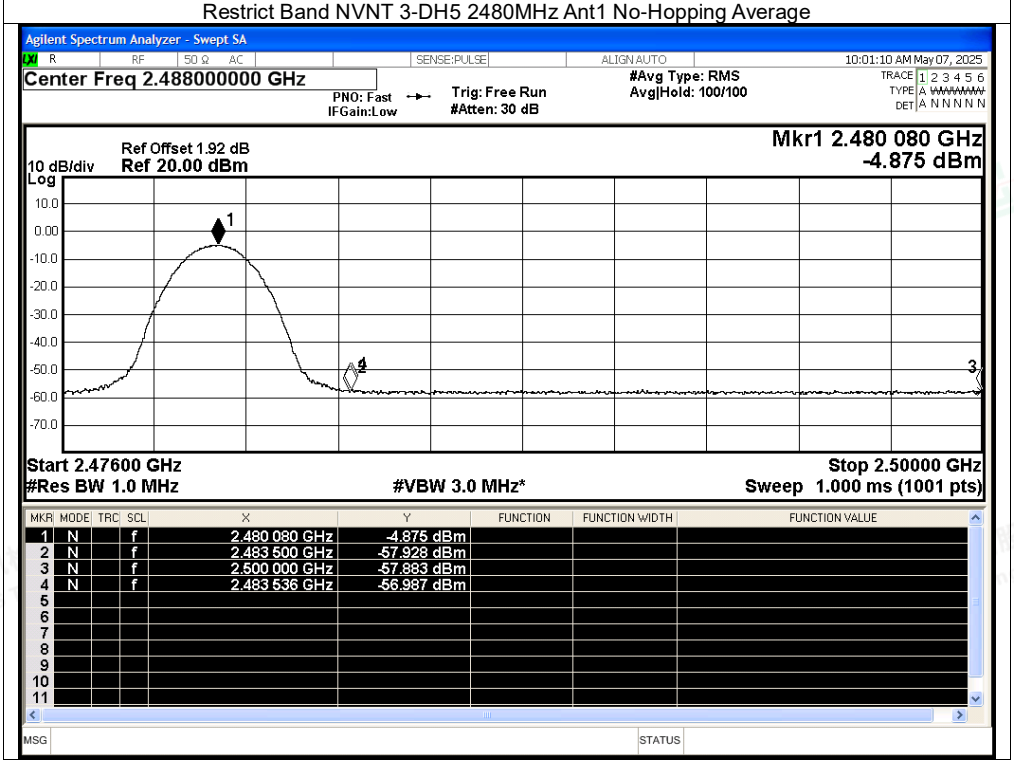
Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Peak



Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Average



Restrict Band NVNT 3-DH5 2480MHz Ant1 No-Hopping Peak



Restrict Band NVNT 3-DH5 2480MHz Ant1 No-Hopping Average