Appendix B for SHEM200400259602

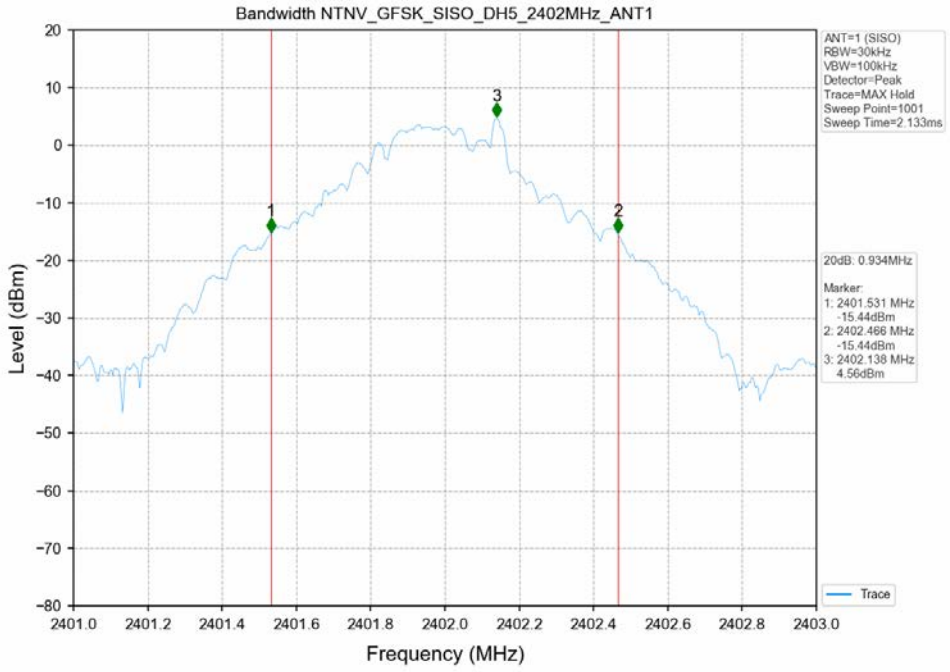
1. Bandwidth

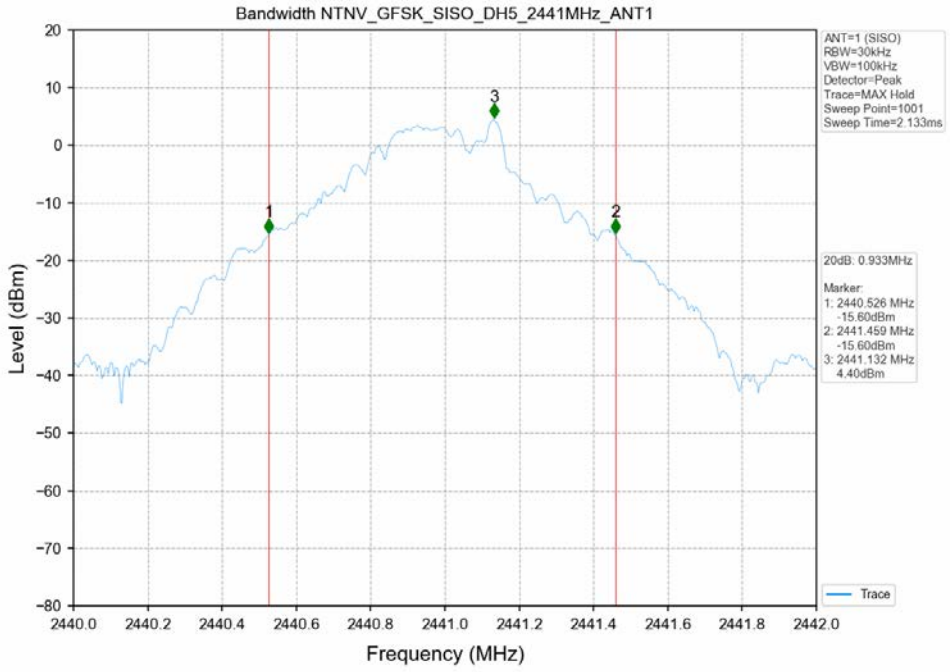
1.1 Test Result

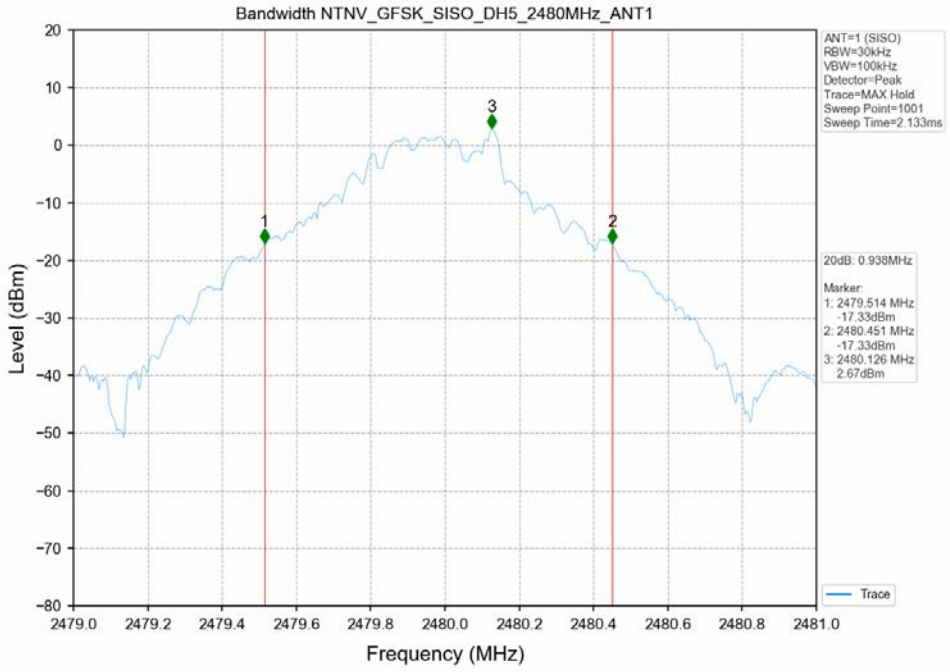
Test Mode	Frequency (MHz)	TX Type	ANT No.	20dB Bandwidth Test Result (MHz)	Verdict
GFSK	2402	SISO	1	0.934	PASS
	2441	SISO	1	0.933	PASS
	2480	SISO	1	0.938	PASS
Pi/4DQPSK	2402	SISO	1	1.342	PASS
	2441	SISO	1	1.345	PASS
	2480	SISO	1	1.344	PASS
8DPSK	2402	SISO	1	1.309	PASS
	2441	SISO	1	1.311	PASS
	2480	SISO	1	1.315	PASS

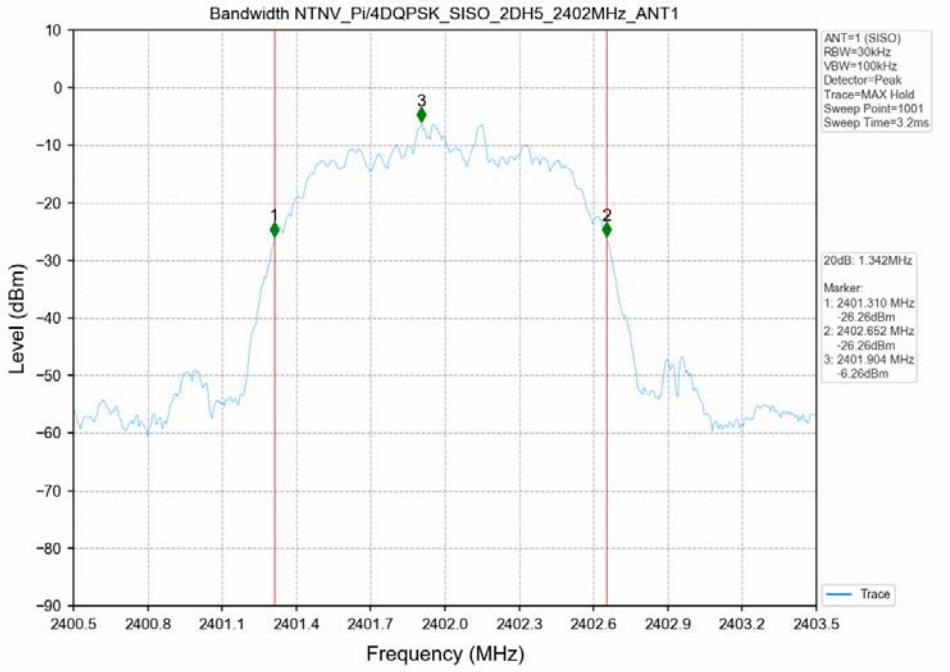
Test Mode	Frequency (MHz)	TX Type	ANT No.	99% Occupied Bandwidth Test Result (MHz)	
GFSK	2402	SISO	1	0.857	Only for Report Use
	2441	SISO	1	0.863	Only for Report Use
	2480	SISO	1	0.856	Only for Report Use
Pi/4DQPSK	2402	SISO	1	1.189	Only for Report Use
	2441	SISO	1	1.189	Only for Report Use
	2480	SISO	1	1.187	Only for Report Use
8DPSK	2402	SISO	1	1.196	Only for Report Use
	2441	SISO	1	1.192	Only for Report Use
	2480	SISO	1	1.195	Only for Report Use

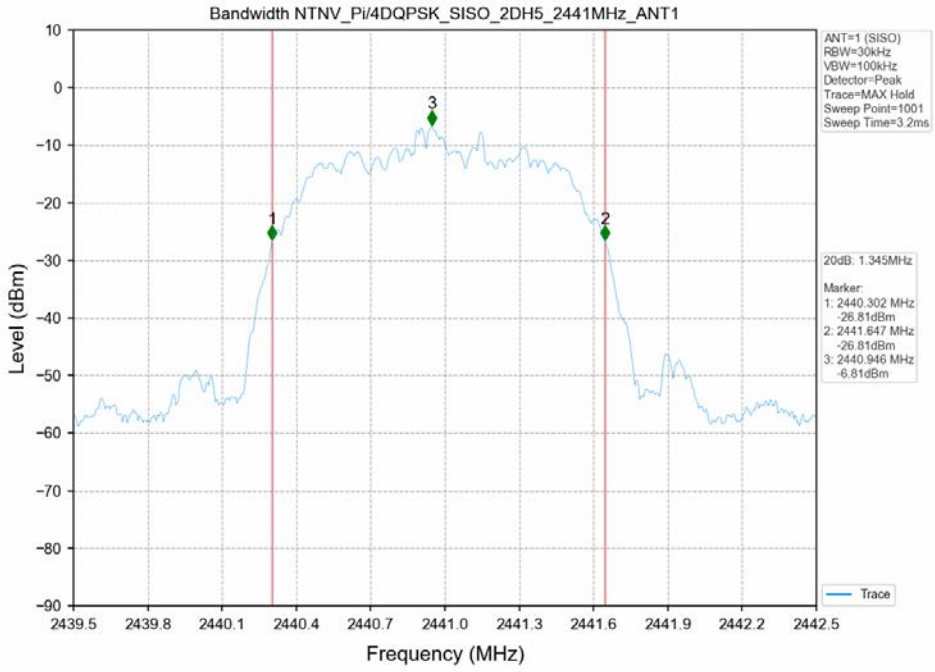
1.2 Test Graph - 20dB Bandwidth

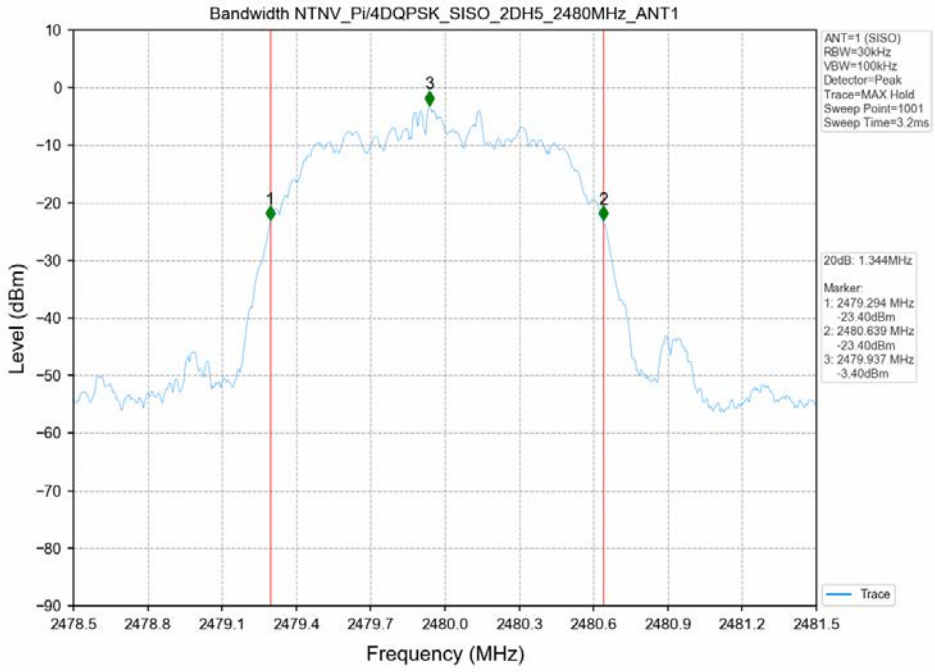

Bandwidth NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.934MHz
Marker:
1: 2401.531 MHz
-15.44dBm
2: 2402.466 MHz
-15.44dBm
3: 2402.138 MHz
4.56dBm
Trace
Level (dBm)
Frequency (MHz)

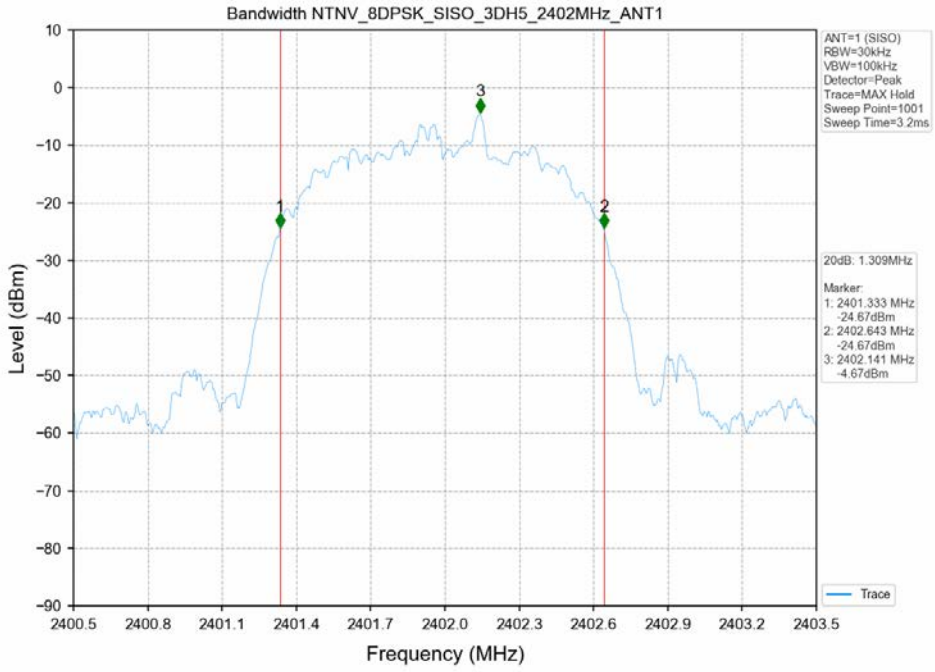

Bandwidth NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.933MHz
Marker:
1: 2440.526 MHz
-15.60dBm
2: 2441.459 MHz
-15.60dBm
3: 2441.132 MHz
4.40dBm
Trace
Level (dBm)
Frequency (MHz)

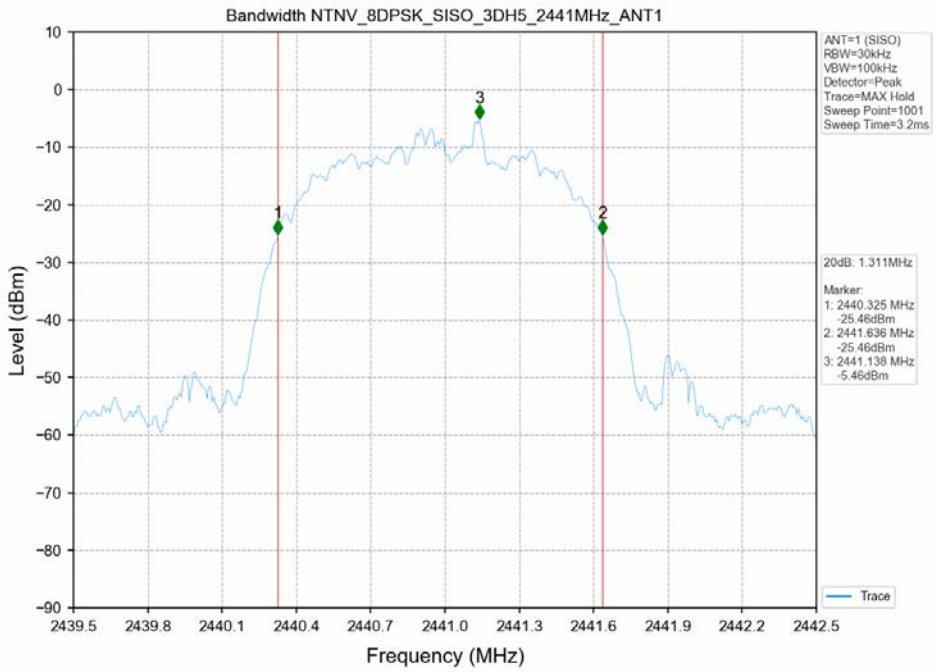

Bandwidth NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.938MHz
Marker:
1: 2479.514 MHz
-17.33dBm
2: 2480.451 MHz
-17.33dBm
3: 2480.126 MHz
2.67dBm
Trace
Level (dBm)
Frequency (MHz)

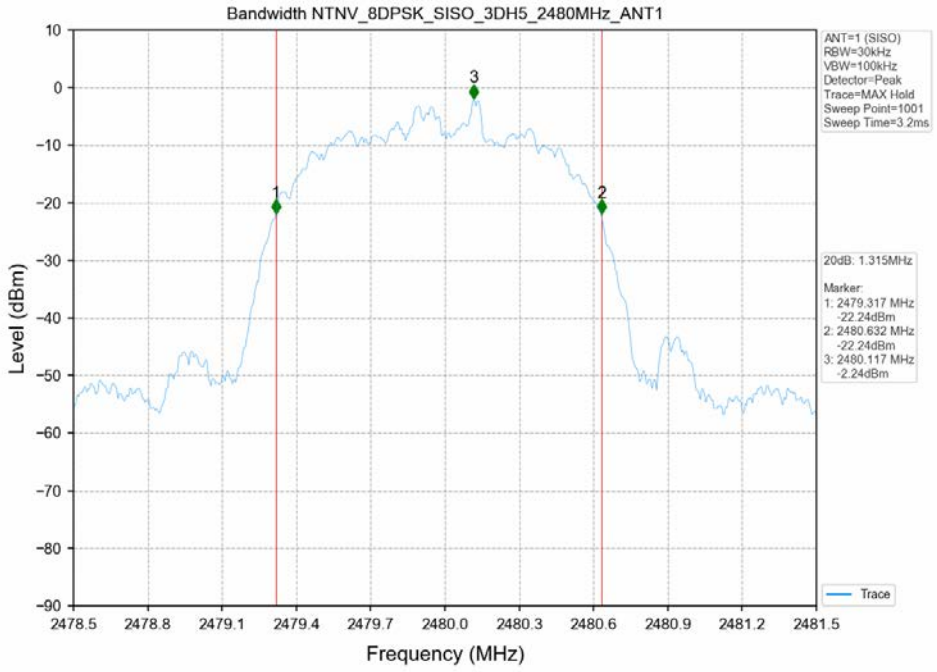

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
20dB: 1.342MHz
Marker:
1: 2401.310 MHz
-26.26dBm
2: 2402.652 MHz
-26.26dBm
3: 2401.904 MHz
-6.26dBm
Trace
Level (dBm)
Frequency (MHz)


Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
20dB: 1.345MHz
Marker:
1: 2440.302 MHz
-26.81dBm
2: 2441.647 MHz
-26.81dBm
3: 2440.946 MHz
-6.81dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2439.5
2439.8
2440.1
2440.4
2440.7
2441.0
2441.3
2441.6
2441.9
2442.2
2442.5

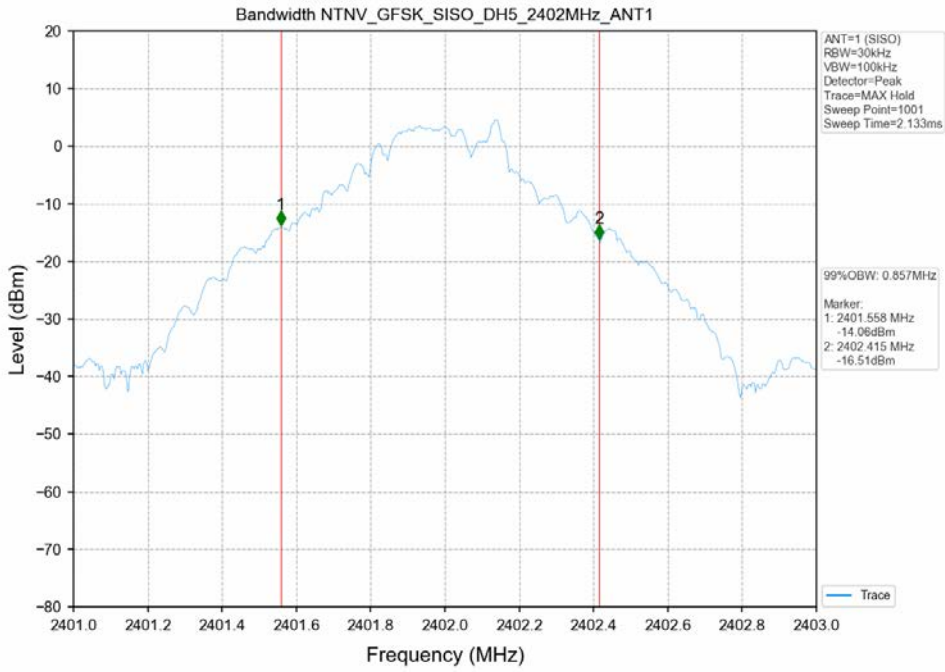

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
20dB: 1.344MHz
Marker:
1: 2479.294 MHz
-23.40dBm
2: 2480.639 MHz
-23.40dBm
3: 2479.937 MHz
-3.40dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2478.5
2478.8
2479.1
2479.4
2479.7
2480.0
2480.3
2480.6
2480.9
2481.2
2481.5

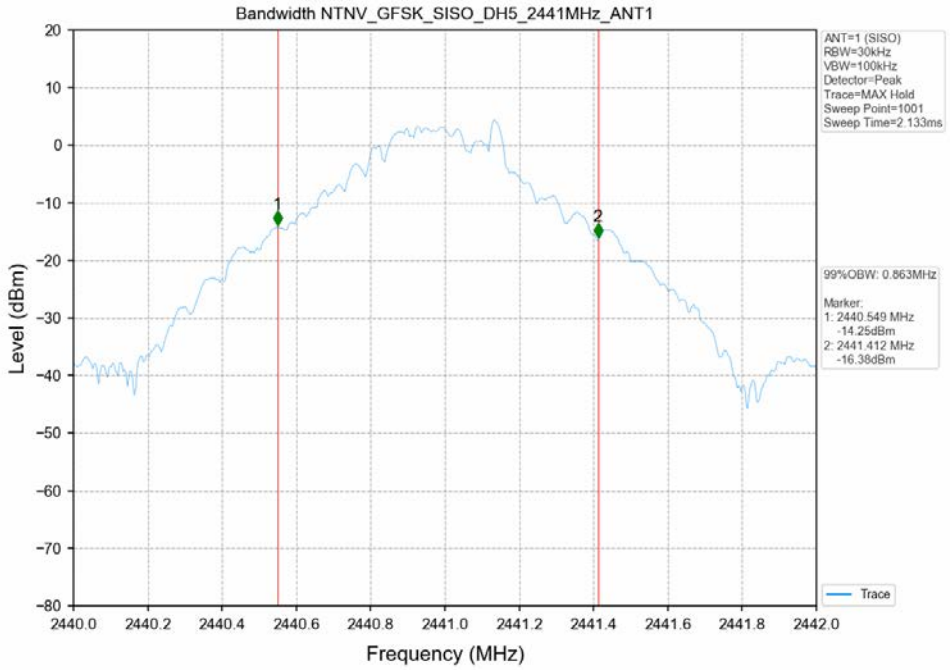

Bandwidth NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
20dB: 1.309MHz
Marker:
1: 2401.333 MHz
-24.67dBm
2: 2402.643 MHz
-24.67dBm
3: 2402.141 MHz
-4.67dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2400.5
2400.8
2401.1
2401.4
2401.7
2402.0
2402.3
2402.6
2402.9
2403.2
2403.5

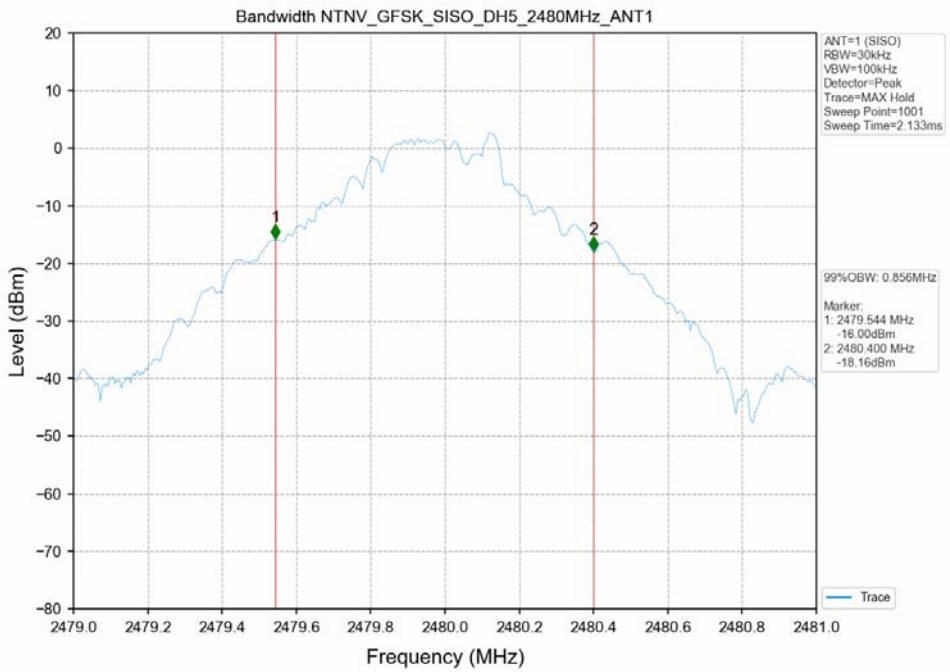

Bandwidth NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
20dB: 1.311MHz
Marker:
1: 2440.325 MHz
-25.46dBm
2: 2441.636 MHz
-25.46dBm
3: 2441.138 MHz
-5.46dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2439.5
2439.8
2440.1
2440.4
2440.7
2441.0
2441.3
2441.6
2441.9
2442.2
2442.5

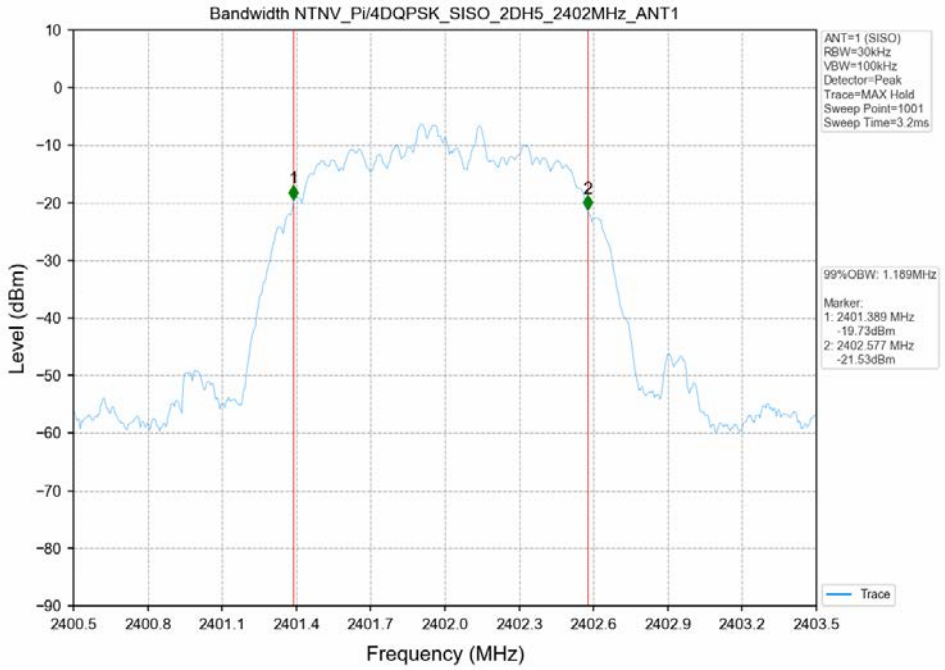


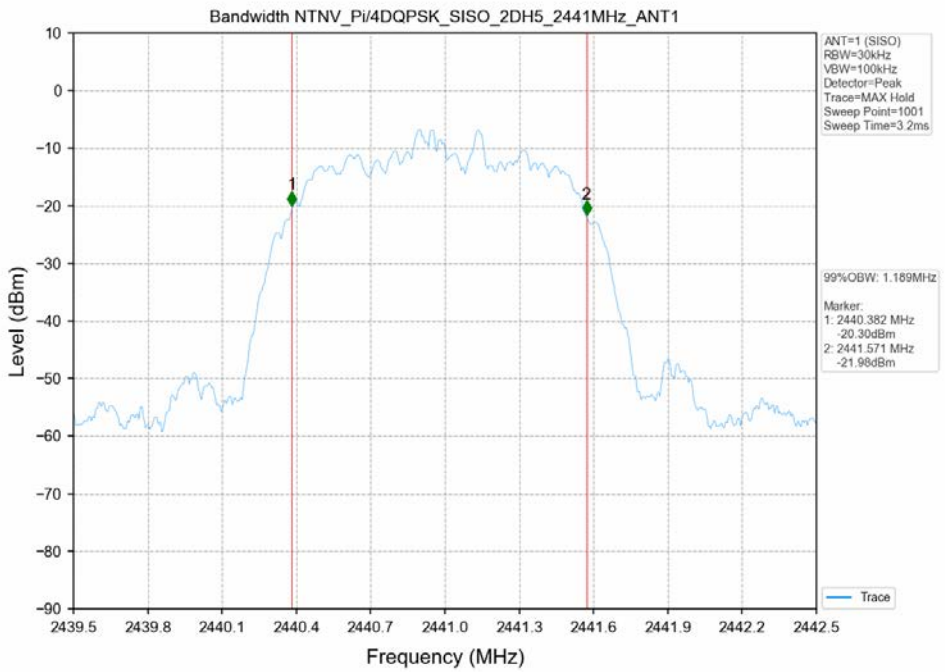
1.3 Test Graph - 99% Occupied Bandwidth

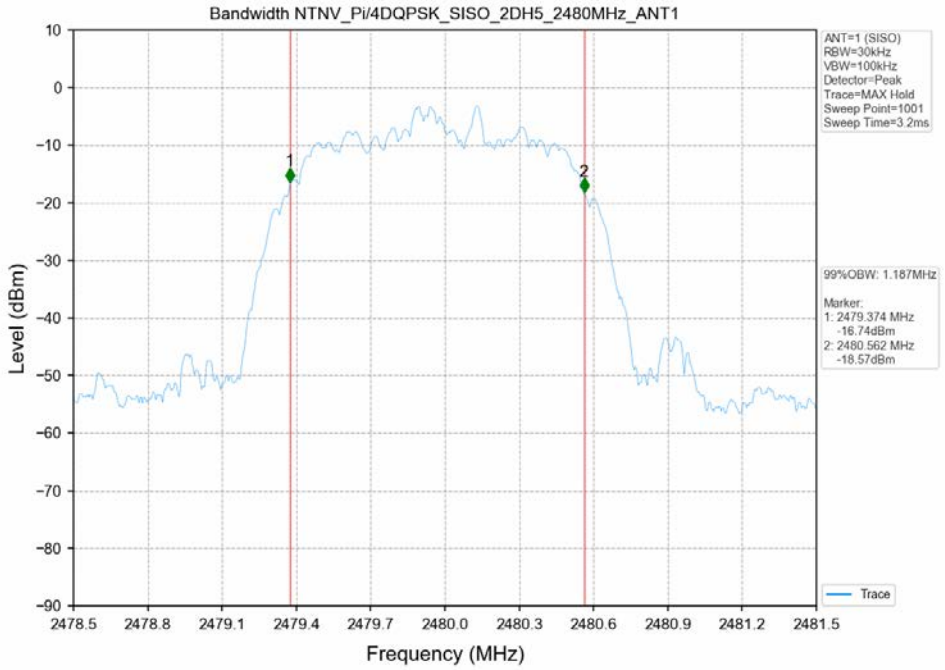


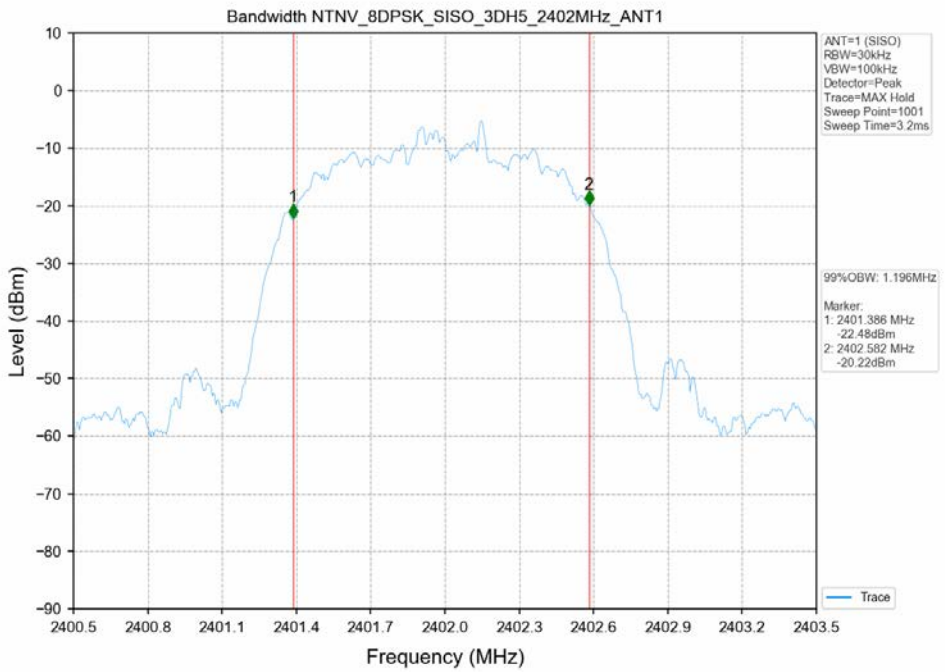

Bandwidth NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
99%OBW: 0.863MHz
Marker:
1: 2440.549 MHz
-14.25dBm
2: 2441.412 MHz
-16.38dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
2440.0
2440.2
2440.4
2440.6
2440.8
2441.0
2441.2
2441.4
2441.6
2441.8
2442.0

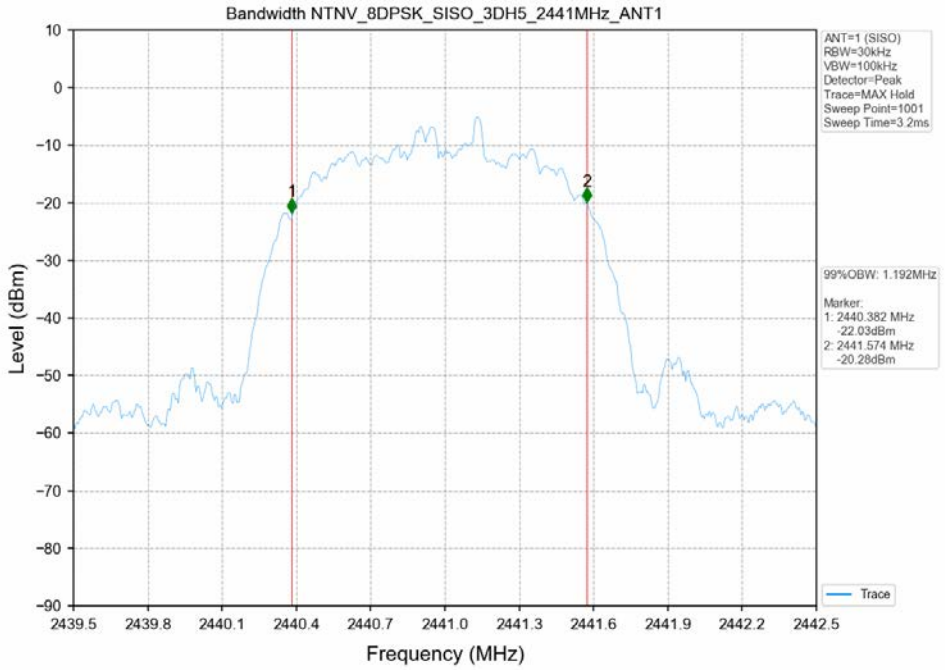

Bandwidth NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
99%OBW: 0.856MHz
Marker:
1: 2479.544 MHz
-16.00dBm
2: 2480.400 MHz
-18.16dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
2479.0
2479.2
2479.4
2479.6
2479.8
2480.0
2480.2
2480.4
2480.6
2480.8
2481.0

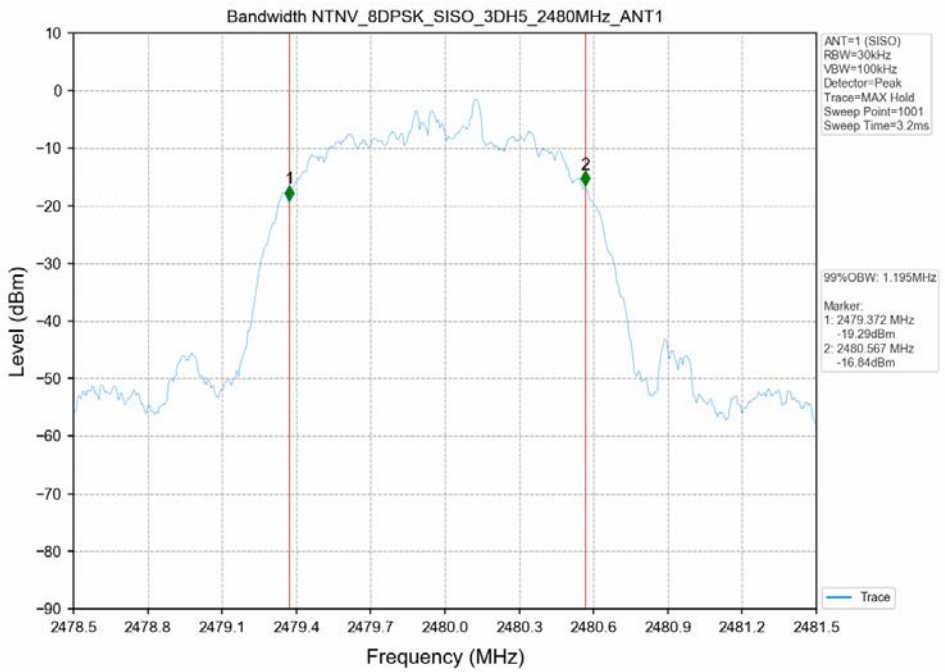

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
99%OBW: 1.189MHz
Marker:
1: 2401.389 MHz
-19.73dBm
2: 2402.577 MHz
-21.53dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2400.5
2400.8
2401.1
2401.4
2401.7
2402.0
2402.3
2402.6
2402.9
2403.2
2403.5


Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
99%OBW: 1.189MHz
Marker:
1: 2440.382 MHz
-20.30dBm
2: 2441.571 MHz
-21.98dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2439.5
2439.8
2440.1
2440.4
2440.7
2441.0
2441.3
2441.6
2441.9
2442.2
2442.5


Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
99%OBW: 1.187MHz
Marker:
1: 2479.374 MHz
-16.74dBm
2: 2480.562 MHz
-18.57dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2478.5
2478.8
2479.1
2479.4
2479.7
2480.0
2480.3
2480.6
2480.9
2481.2
2481.5


Bandwidth NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
99%OBW: 1.196MHz
Marker:
1: 2401.386 MHz
-22.48dBm
2: 2402.582 MHz
-20.22dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2400.5
2400.8
2401.1
2401.4
2401.7
2402.0
2402.3
2402.6
2402.9
2403.2
2403.5


Bandwidth NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
99%OBW: 1.192MHz
Marker:
1: 2440.382 MHz
-22.03dBm
2: 2441.574 MHz
-20.28dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2439.5
2439.8
2440.1
2440.4
2440.7
2441.0
2441.3
2441.6
2441.9
2442.2
2442.5

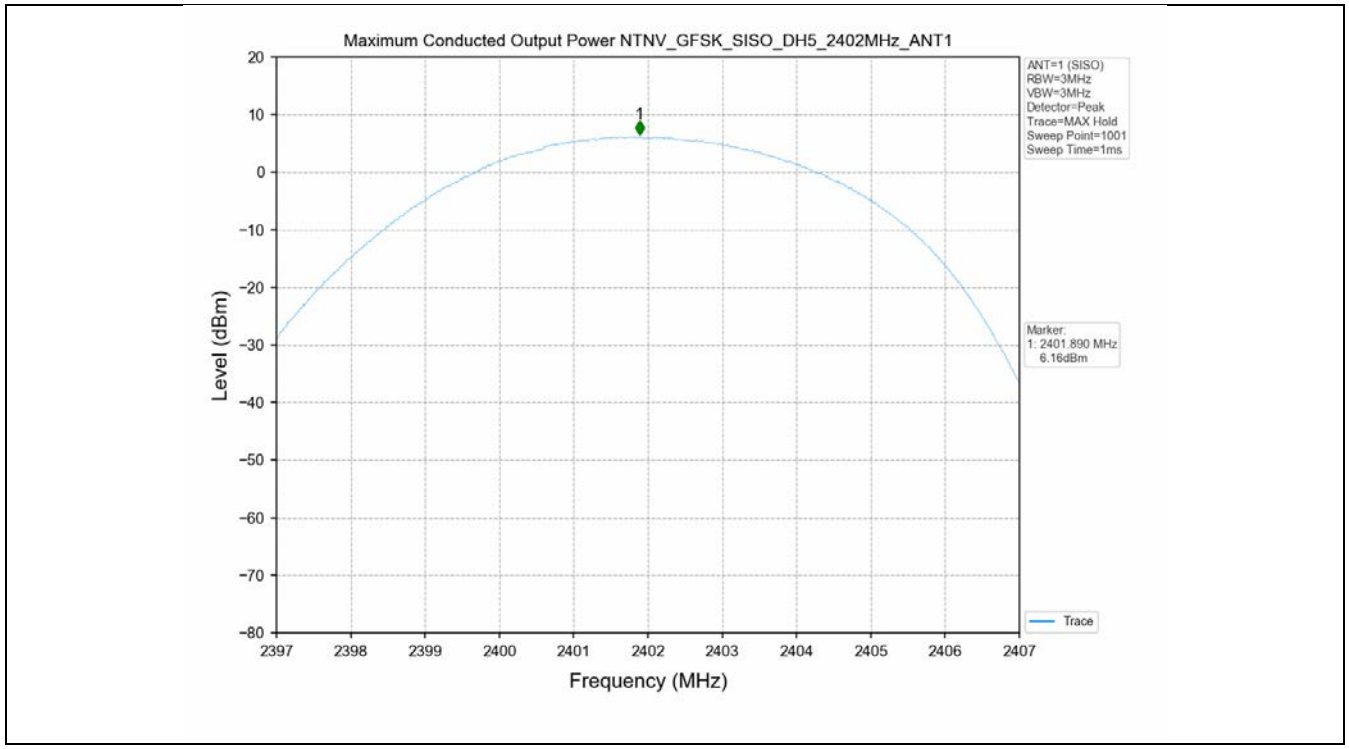

Bandwidth NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
99%OBW: 1.195MHz
Marker:
1: 2479.372 MHz
-19.29dBm
2: 2480.567 MHz
-16.84dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2478.5
2478.8
2479.1
2479.4
2479.7
2480.0
2480.3
2480.6
2480.9
2481.2
2481.5

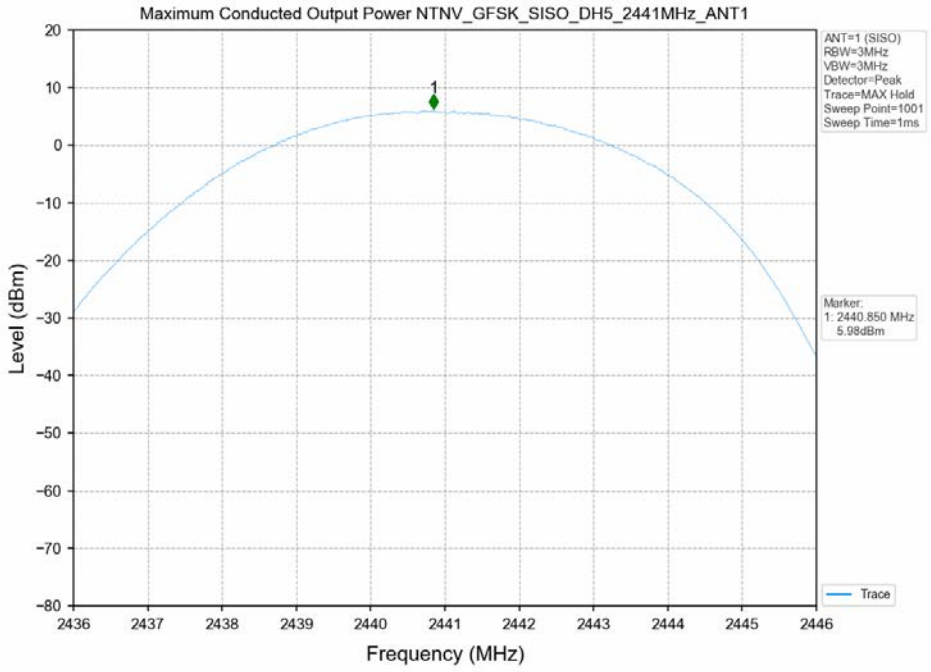
2. Maximum Conducted Output Power

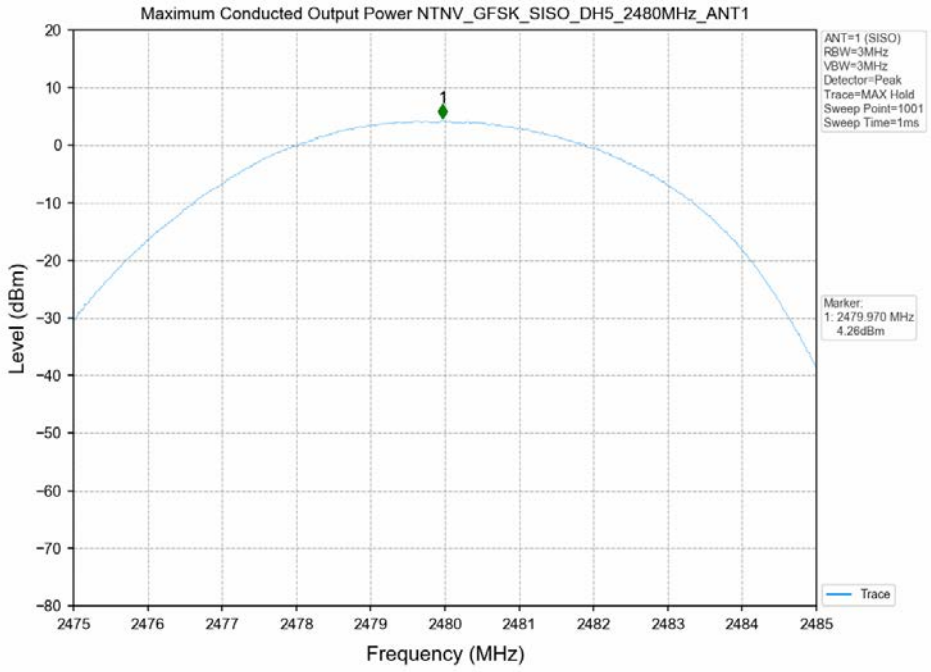
2.1 Test Result

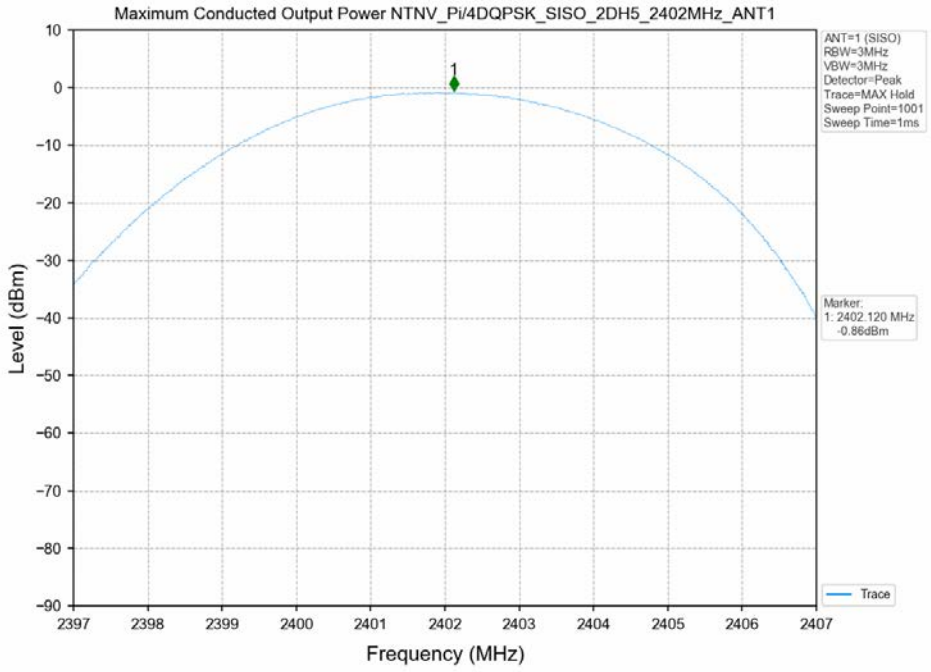
Test Mode	Frequency (MHz)	Tx Type	Measured Peak Output Power (dBm)	Limits (dBm)	Verdict
			Ant 1		
GFSK	2402	SISO	6.16	30	PASS
	2441	SISO	5.98	30	PASS
	2480	SISO	4.26	30	PASS
Pi/4DQPSK	2402	SISO	-0.86	20.97	PASS
	2441	SISO	-1.27	20.97	PASS
	2480	SISO	2.22	20.97	PASS
8DPSK	2402	SISO	-0.28	20.97	PASS
	2441	SISO	-0.76	20.97	PASS
	2480	SISO	2.81	20.97	PASS

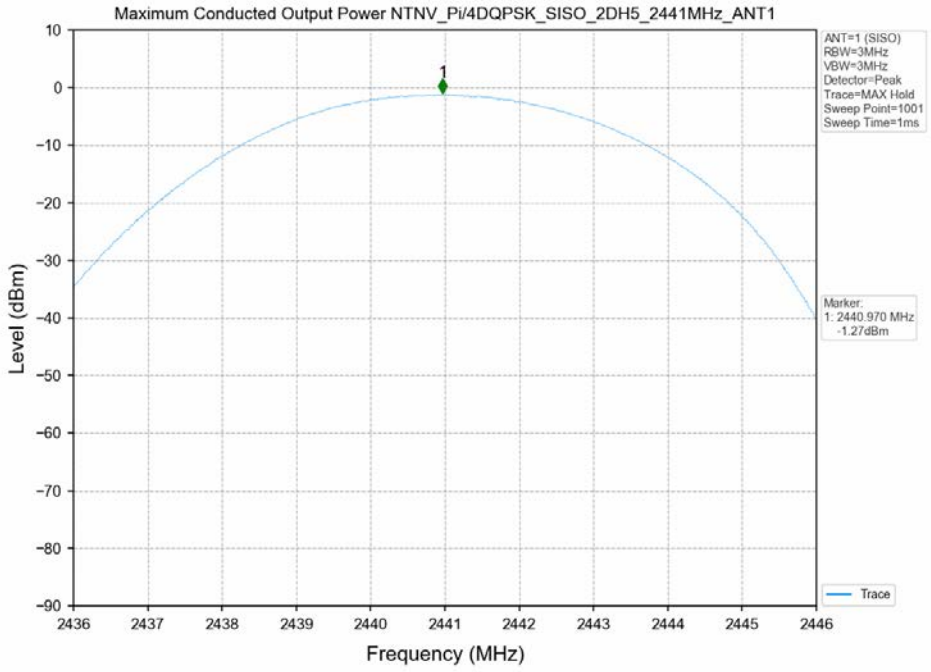
2.2 Test Graph

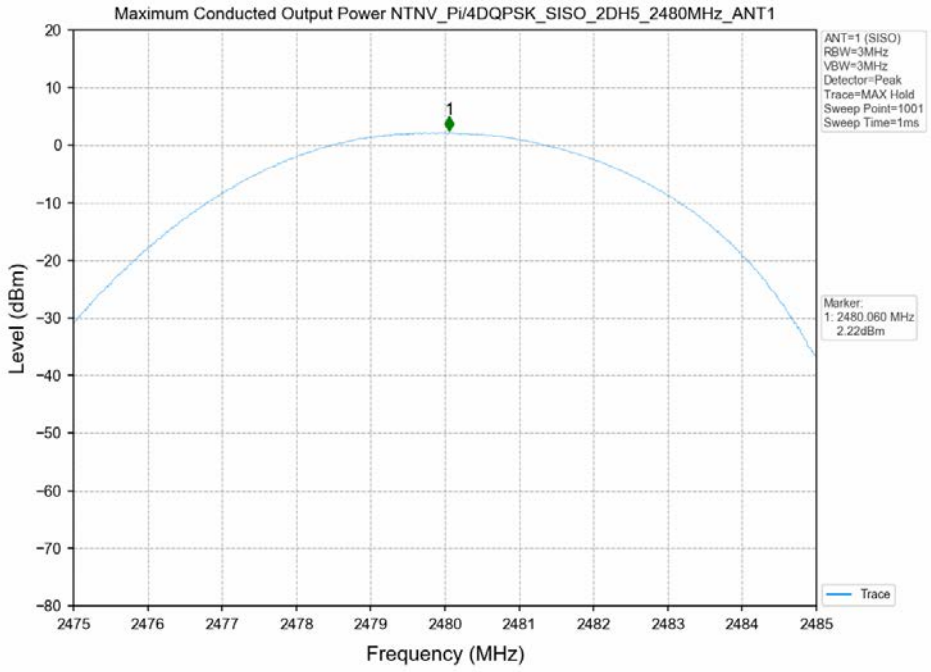


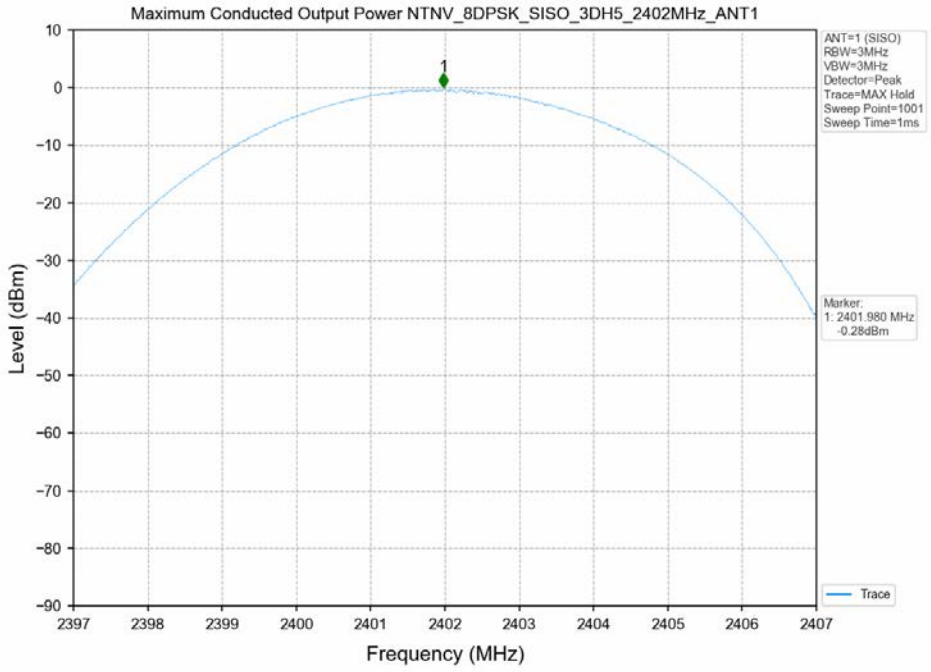

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2440.850 MHz
5.98dBm
Trace
Level (dBm)
Frequency (MHz)

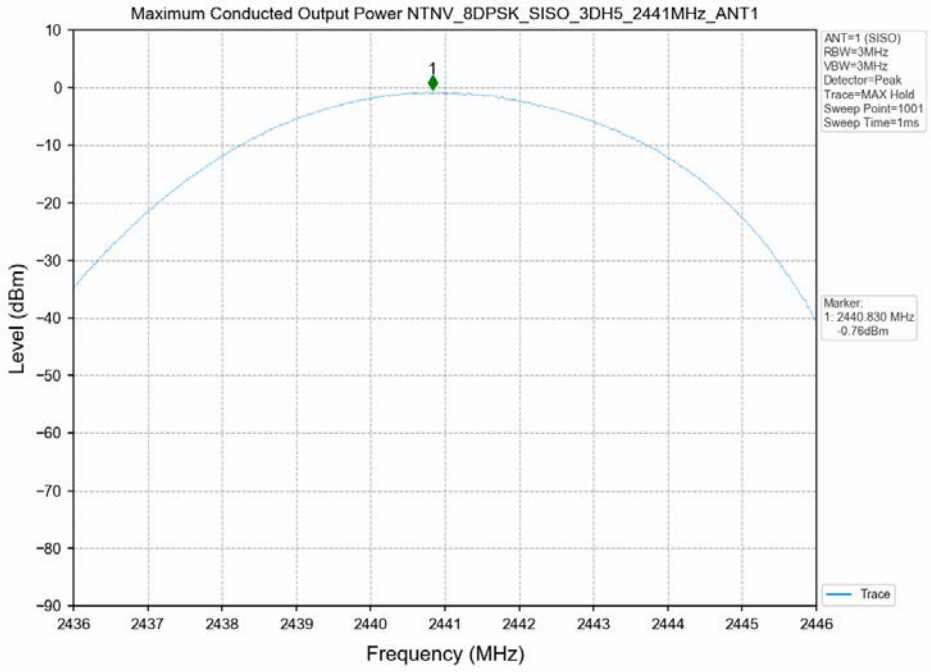

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2479.970 MHz
4.26dBm
Trace
Level (dBm)
Frequency (MHz)

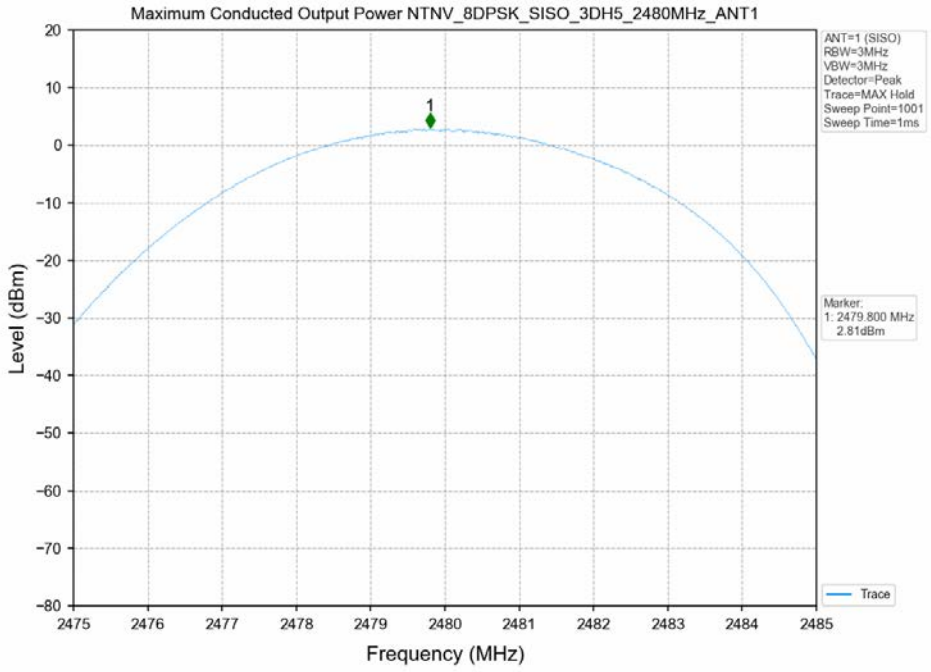

Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2402.120 MHz
-0.86dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2397
2398
2399
2400
2401
2402
2403
2404
2405
2406
2407


Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2440.970 MHz
-1.27dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2436
2437
2438
2439
2440
2441
2442
2443
2444
2445
2446


Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2480.060 MHz
2.22dBm
Trace
Level (dBm)
Frequency (MHz)


Maximum Conducted Output Power NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2401.980 MHz
-0.28dBm
Trace
Level (dBm)
Frequency (MHz)


Maximum Conducted Output Power NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2440.830 MHz
-0.76dBm
Trace
Level (dBm)
Frequency (MHz)

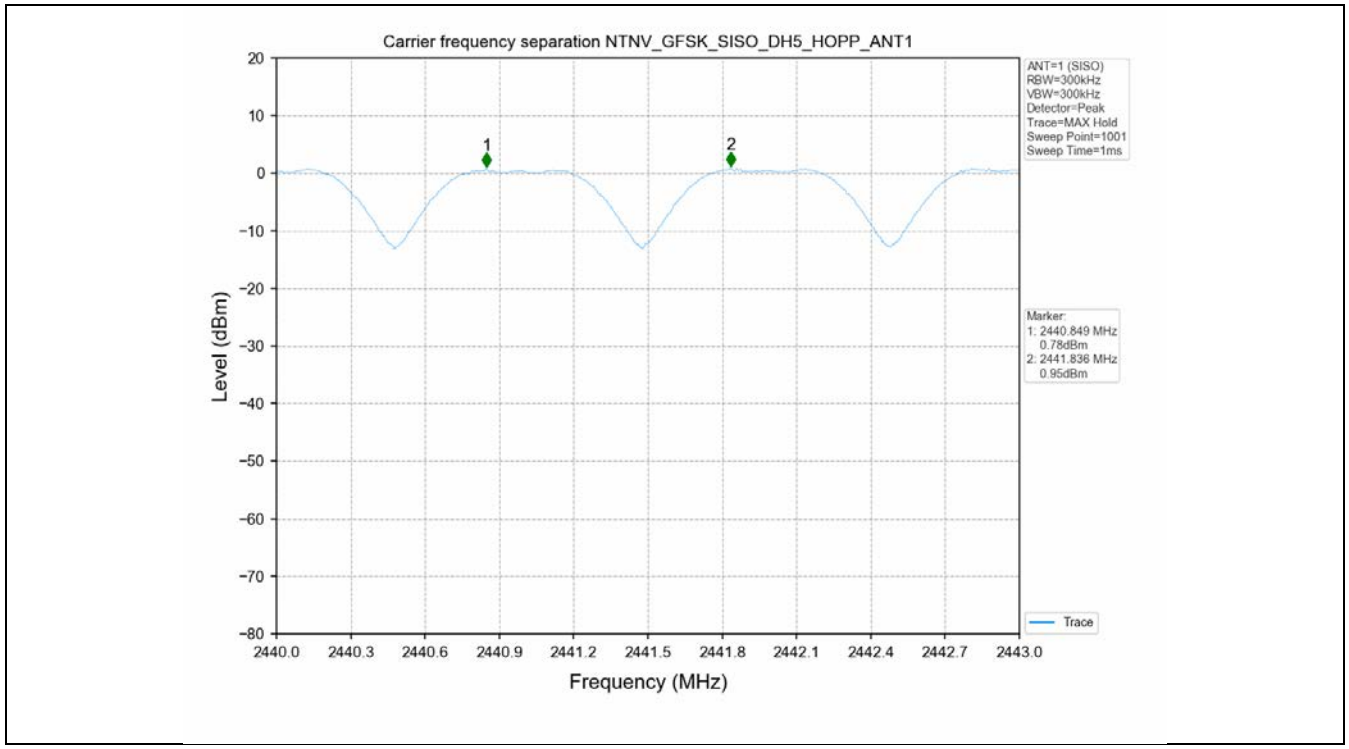

Maximum Conducted Output Power NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2479.800 MHz
2.81dBm
Trace
Level (dBm)
Frequency (MHz)

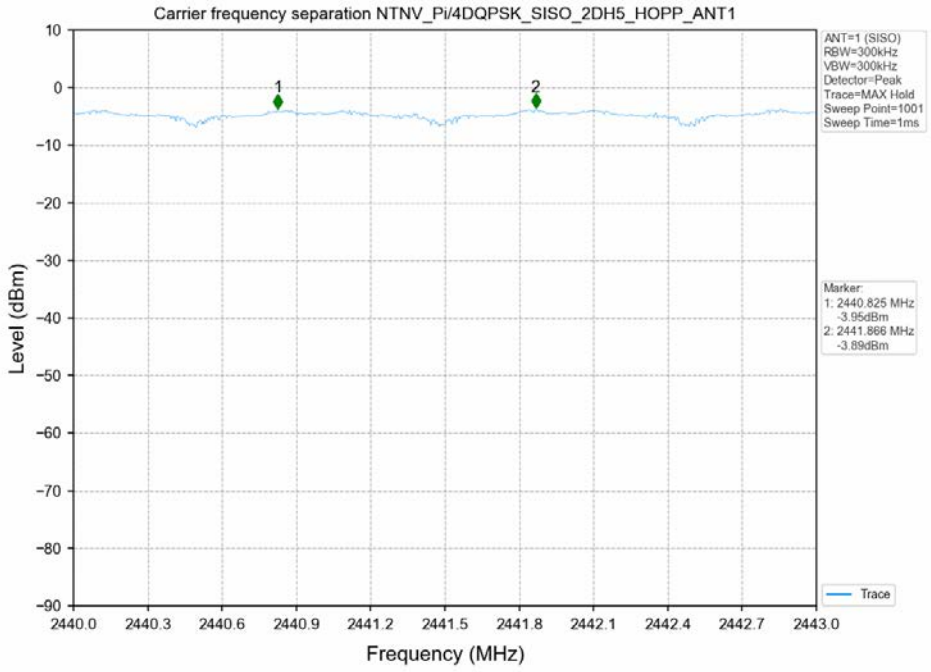
3. Carrier frequency separation

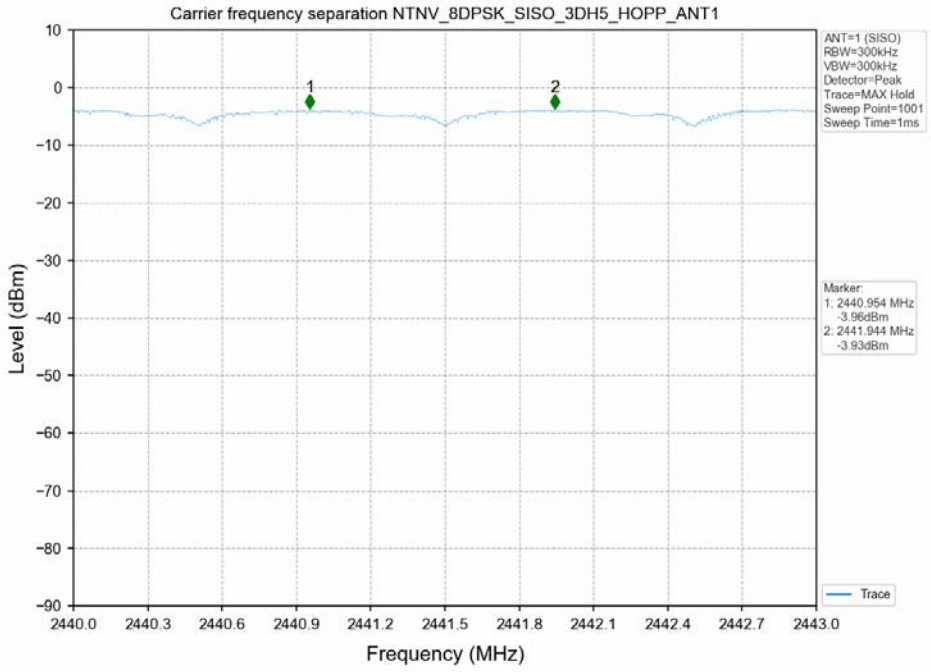
3.1 Test Result

Test Mode	TX Type	ANT No.	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limits (MHz)	Verdict
GFSK	SISO	1	0.987	0.938	≥0.938	PASS
Pi/4DQPSK	SISO	1	1.041	1.345	≥0.897	PASS
8DPSK	SISO	1	0.990	1.315	≥0.877	PASS

3.2 Test Graph




Carrier frequency separation NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2440.825 MHz
-3.95dBm
2: 2441.866 MHz
-3.89dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2440.0
2440.3
2440.6
2440.9
2441.2
2441.5
2441.8
2442.1
2442.4
2442.7
2443.0

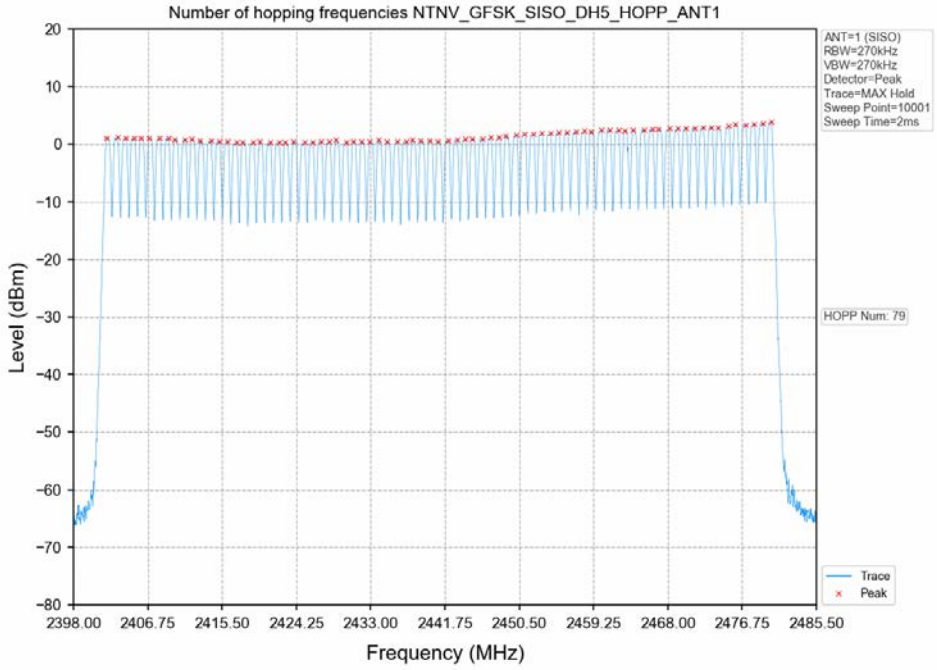

Carrier frequency separation NTNV_8DPSK_SISO_3DH5_HOPP_ANT1
ANT=1 (SISO)
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2440.954 MHz
-3.96dBm
2: 2441.944 MHz
-3.93dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2440.0
2440.3
2440.6
2440.9
2441.2
2441.5
2441.8
2442.1
2442.4
2442.7
2443.0

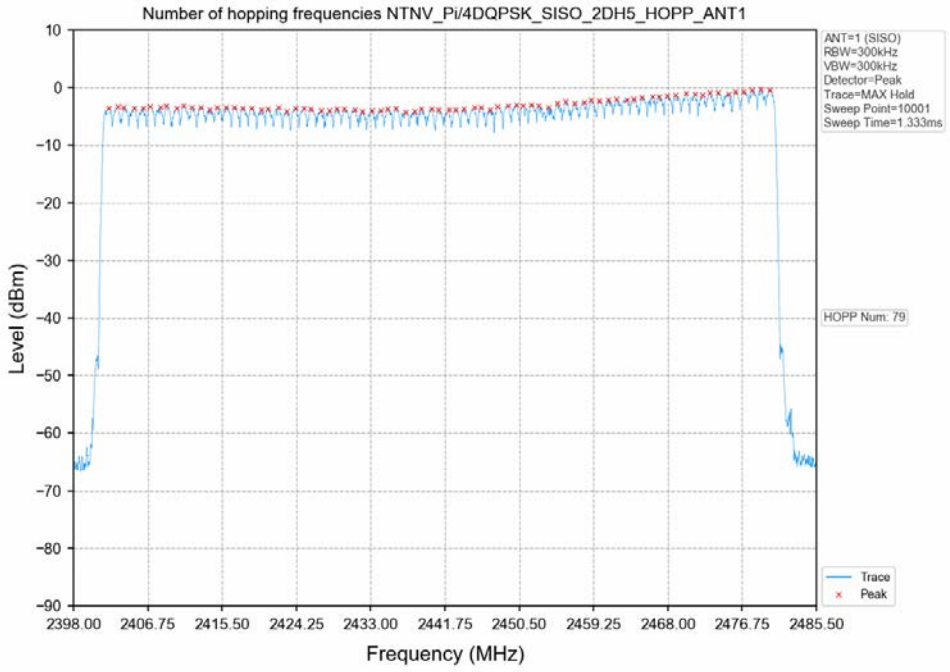
4. Number of hopping frequencies

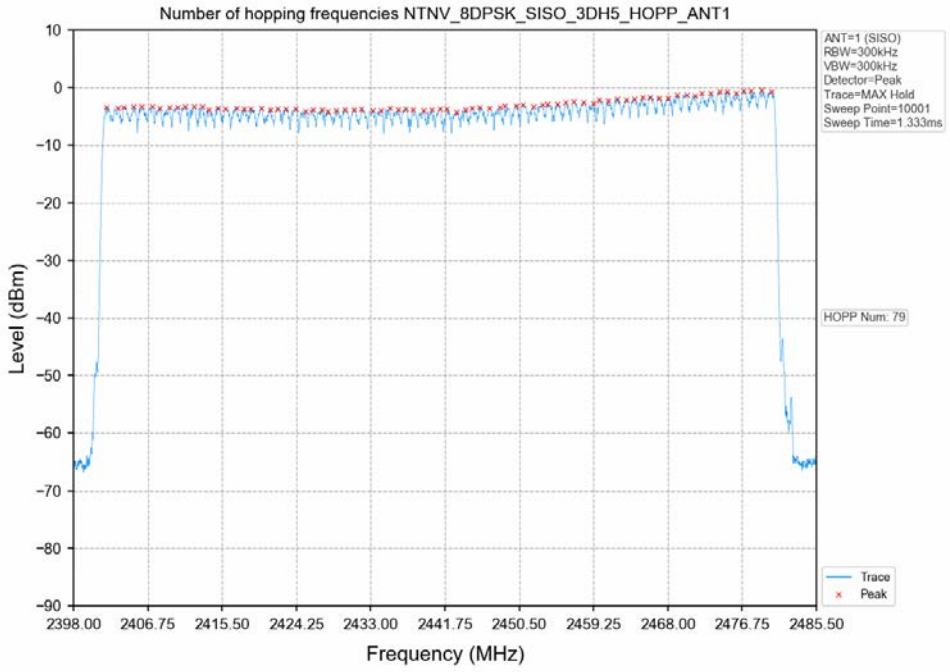
4.1 Test Result

Test Mode	TX Type	ANT No.	Num of Hopping Frequencies	Limits	Verdict
GFSK	SISO	1	79	≥15	PASS
Pi/4DQPSK	SISO	1	79	≥15	PASS
8DPSK	SISO	1	79	≥15	PASS

4.2 Test Graph




Number of hopping frequencies NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=1.333ms
HOPP Num: 79
Trace
Peak
Level (dBm)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2398.00
2406.75
2415.50
2424.25
2433.00
2441.75
2450.50
2459.25
2468.00
2476.75
2485.50
Frequency (MHz)

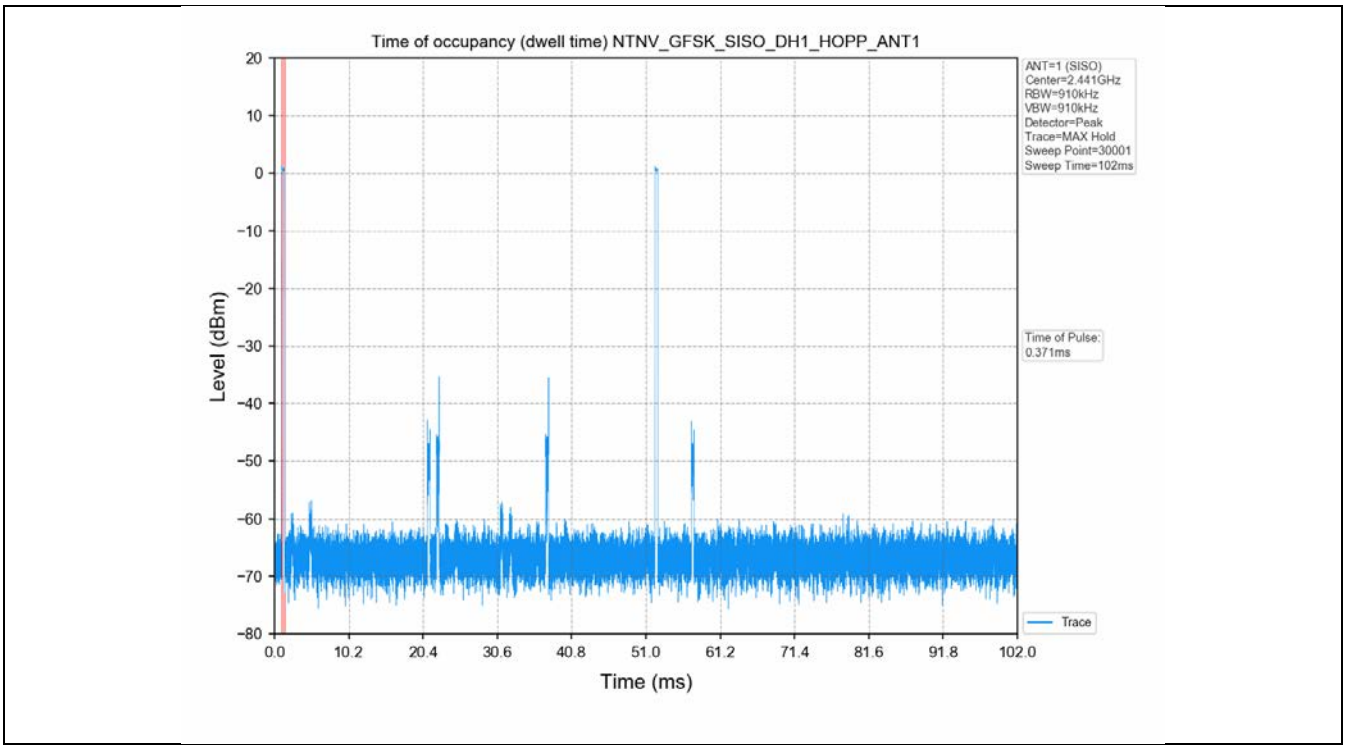

Number of hopping frequencies NTNV_8DPSK_SISO_3DH5_HOPP_ANT1
ANT=1 (SISO)
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=1.333ms
HOPP Num: 79
Trace
Peak
Level (dBm)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2398.00
2406.75
2415.50
2424.25
2433.00
2441.75
2450.50
2459.25
2468.00
2476.75
2485.50
Frequency (MHz)

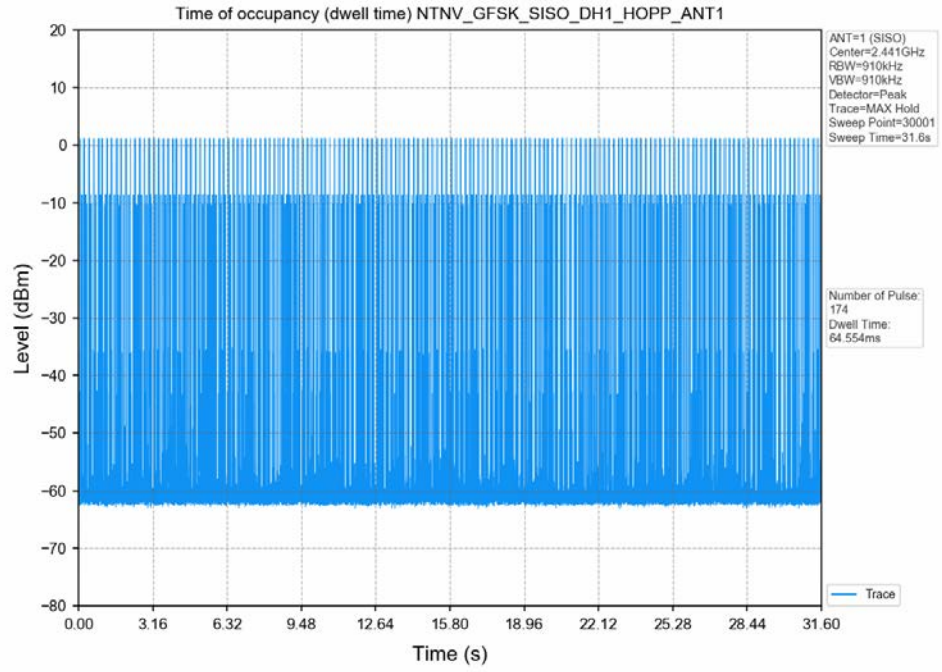
5. Time of occupancy (dwell time)

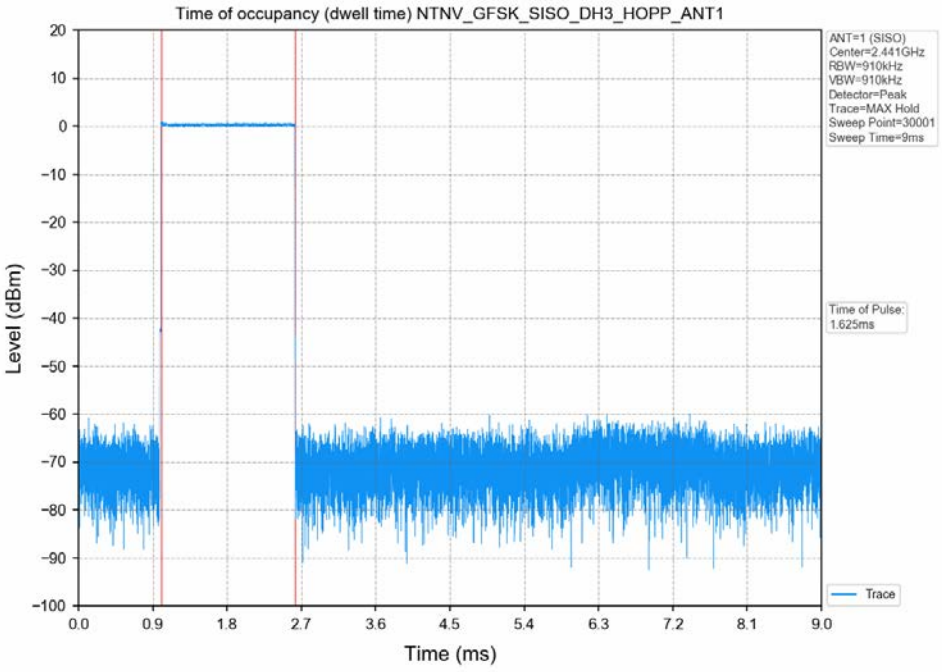
5.1 Test Result

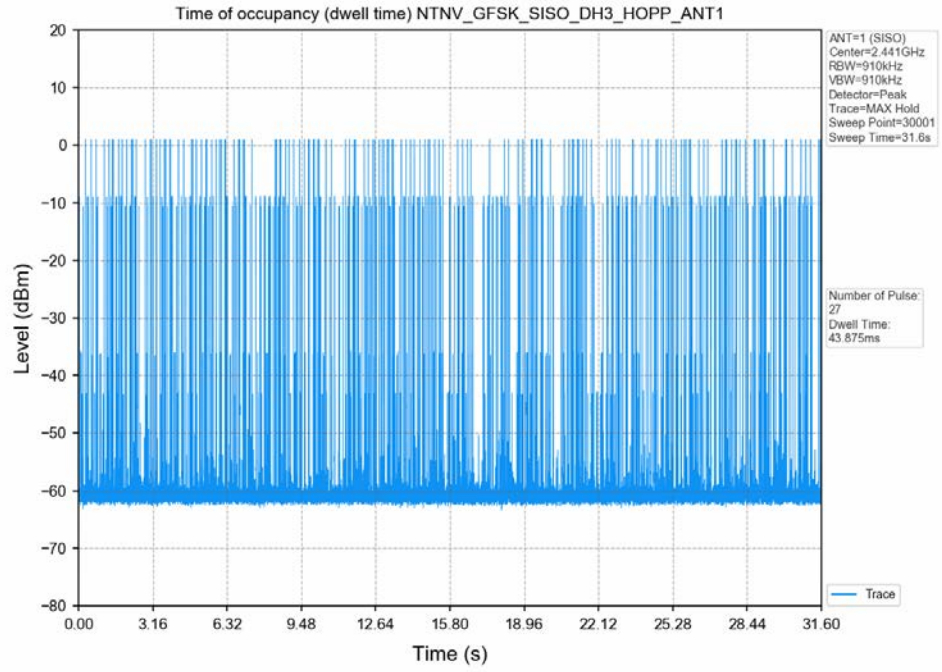
Test Mode	Packet Type	TX Type	ANT No.	Duration of Single Pulse (ms)	Obeservation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limits (ms)	Verdict
GFSK	DH1	SISO	1	0.371	31.6	174	64.554	≤400	PASS
	DH3	SISO	1	1.625	31.6	27	43.875	≤400	PASS
	DH5	SISO	1	2.874	31.6	13	37.362	≤400	PASS
Pi/4DQPSK	2DH1	SISO	1	0.386	31.6	174	67.164	≤400	PASS
	2DH3	SISO	1	1.628	31.6	29	47.212	≤400	PASS
	2DH5	SISO	1	2.876	31.6	7	20.132	≤400	PASS
8DPSK	3DH1	SISO	1	0.380	31.6	183	69.540	≤400	PASS
	3DH3	SISO	1	1.553	31.6	88	136.664	≤400	PASS
	3DH5	SISO	1	2.878	31.6	30	86.340	≤400	PASS

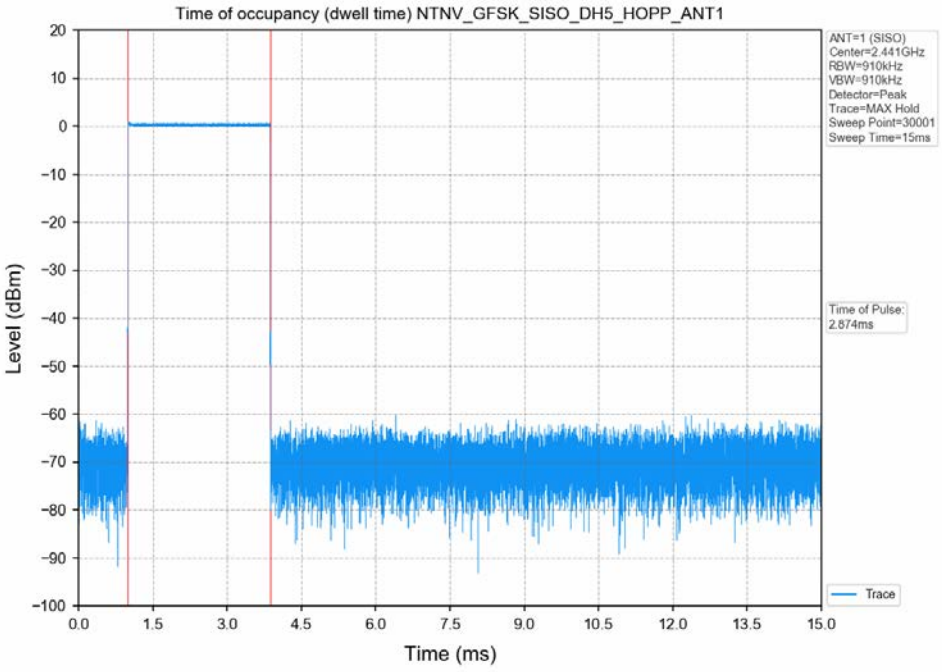
5.2 Test Graph

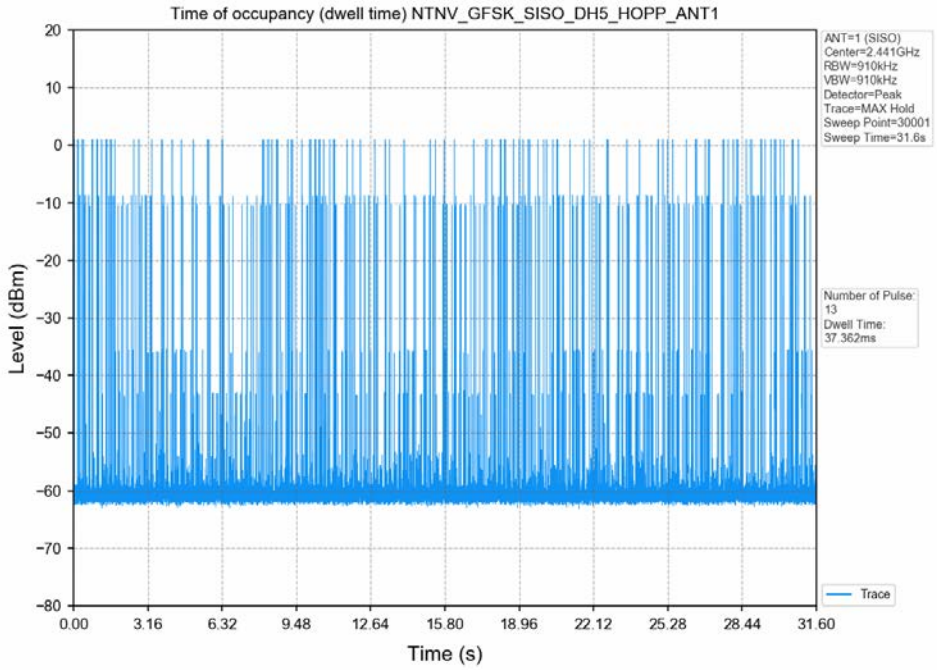


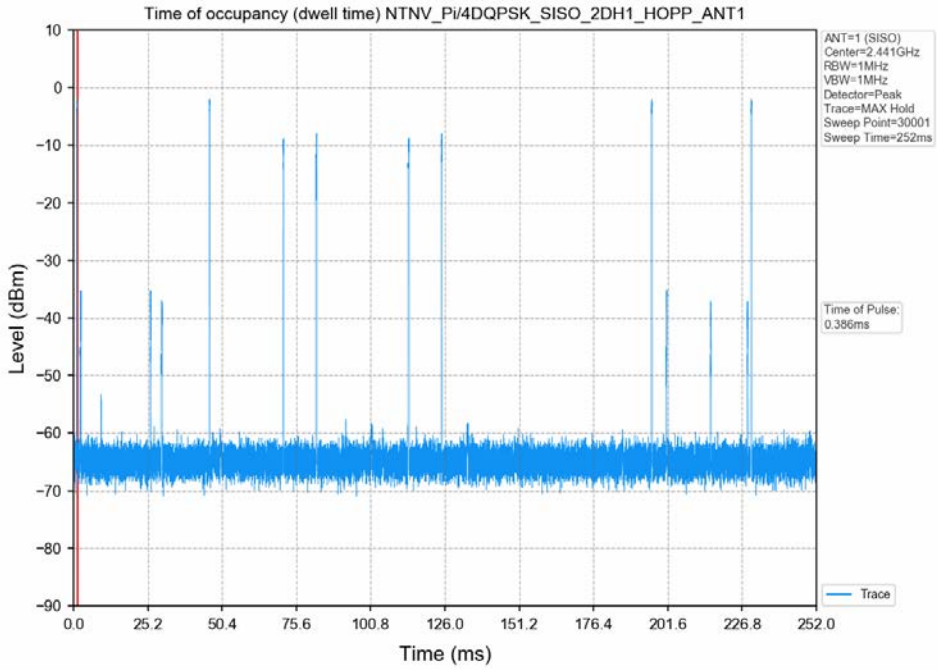

Time of occupancy (dwell time) NTNV_GFSK_SISO_DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
174
Dwell Time:
64.554ms
Trace
Level (dBm)
Time (s)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
0.00
3.16
6.32
9.48
12.64
15.80
18.96
22.12
25.28
28.44
31.60

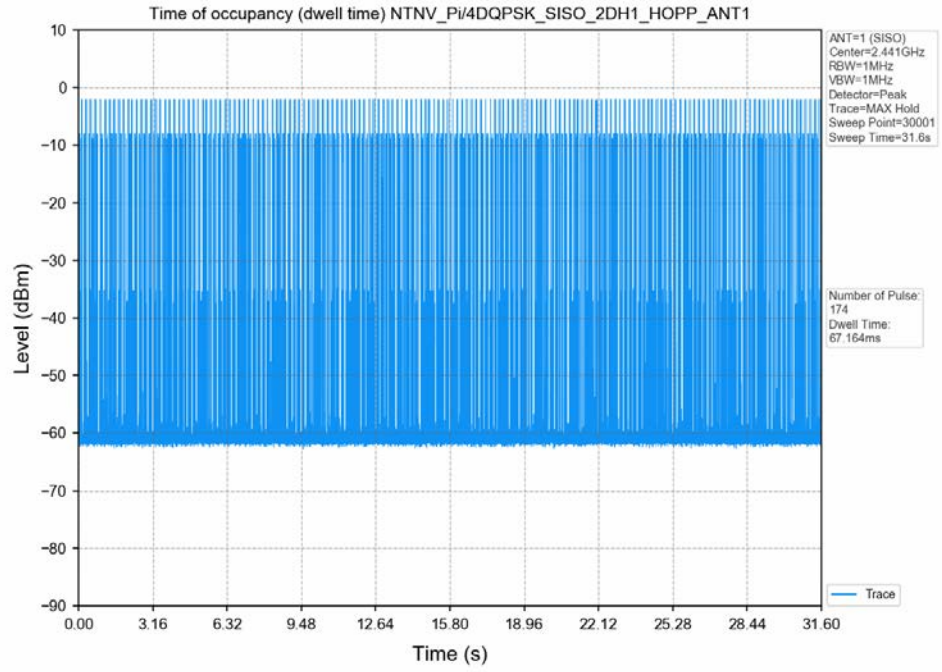

Time of occupancy (dwell time) NTNV_GFSK_SISO_DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=9ms
Time of Pulse:
1.625ms
Trace
Level (dBm)
Time (ms)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0.0
0.9
1.8
2.7
3.6
4.5
5.4
6.3
7.2
8.1
9.0

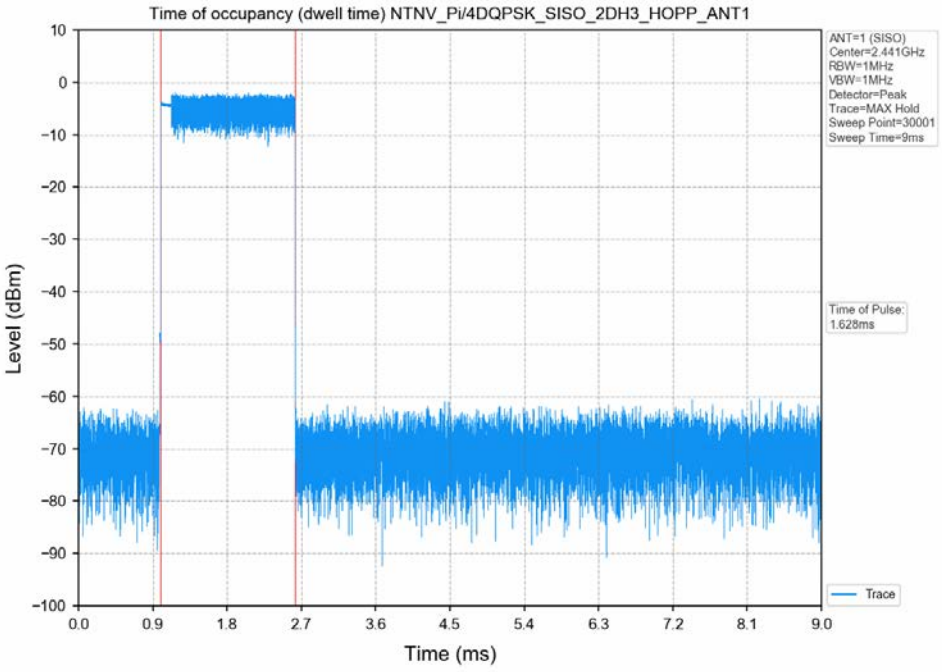

Time of occupancy (dwell time) NTNV_GFSK_SISO_DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
27
Dwell Time:
43.875ms
Trace
Level (dBm)
Time (s)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
0.00
3.16
6.32
9.48
12.64
15.80
18.96
22.12
25.28
28.44
31.60

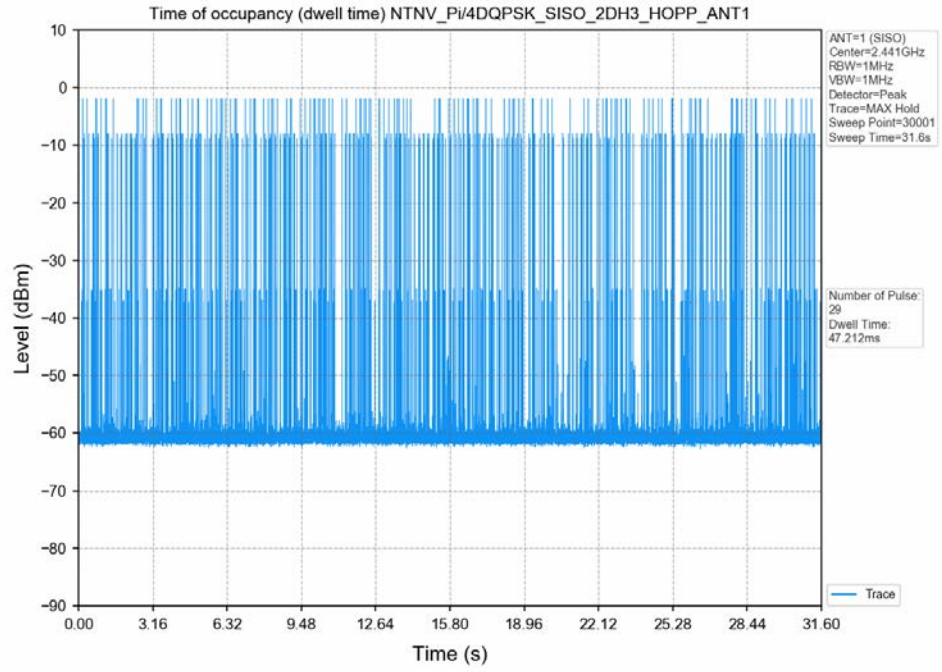

Time of occupancy (dwell time) NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=15ms
Time of Pulse:
2.874ms
Trace
Level (dBm)
Time (ms)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0.0
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
15.0

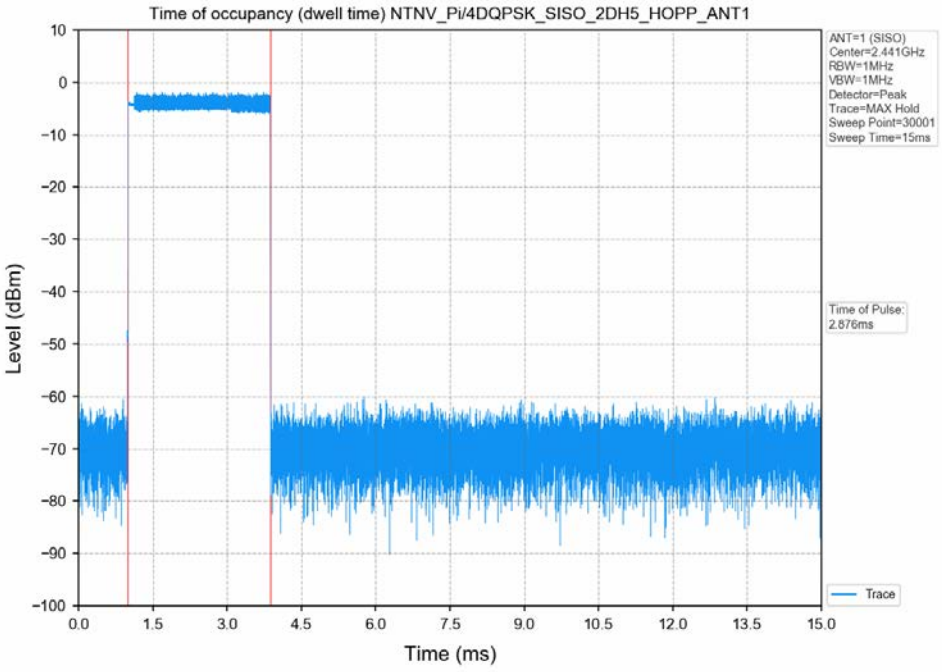

Time of occupancy (dwell time) NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
13
Dwell Time:
37.362ms
Trace
Level (dBm)
Time (s)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
0.00
3.16
6.32
9.48
12.64
15.80
18.96
22.12
25.28
28.44
31.60

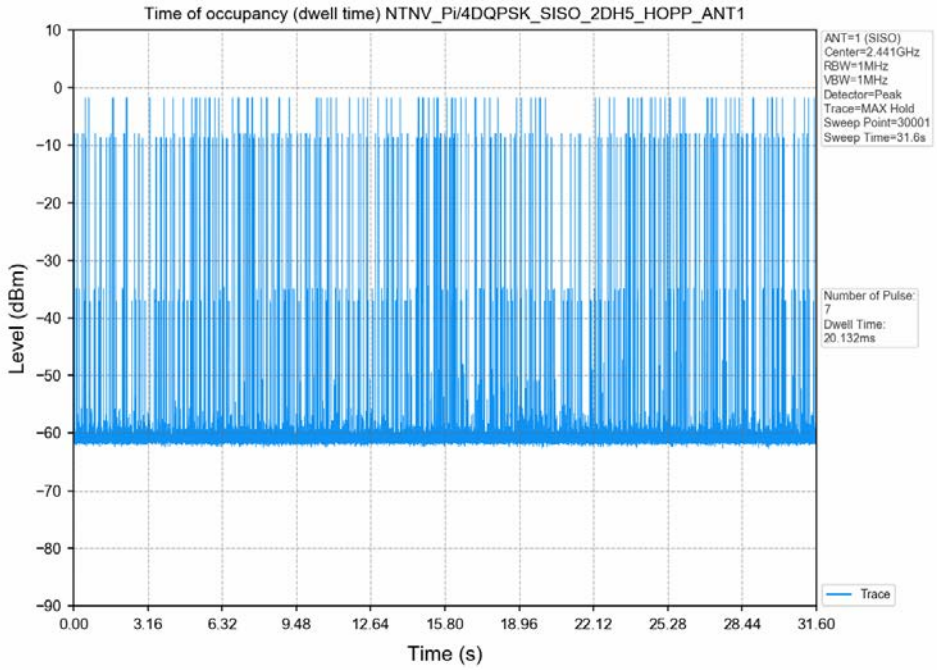

Time of occupancy (dwell time) NTNV_Pi/4DQPSK_SISO_2DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=252ms
Time of Pulse:
0.386ms
Trace
Level (dBm)
Time (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.0
25.2
50.4
75.6
100.8
126.0
151.2
176.4
201.6
226.8
252.0

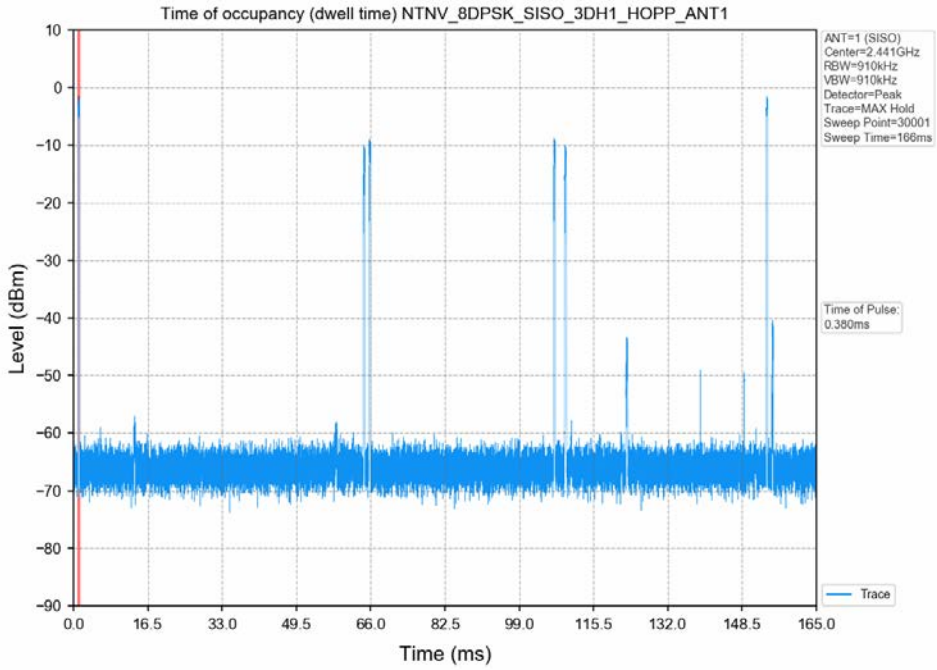

Time of occupancy (dwell time) NTNV_Pi/4DQPSK_SISO_2DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
174
Dwell Time:
67.164ms
Trace
Level (dBm)
Time (s)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.00
3.16
6.32
9.48
12.64
15.80
18.96
22.12
25.28
28.44
31.60

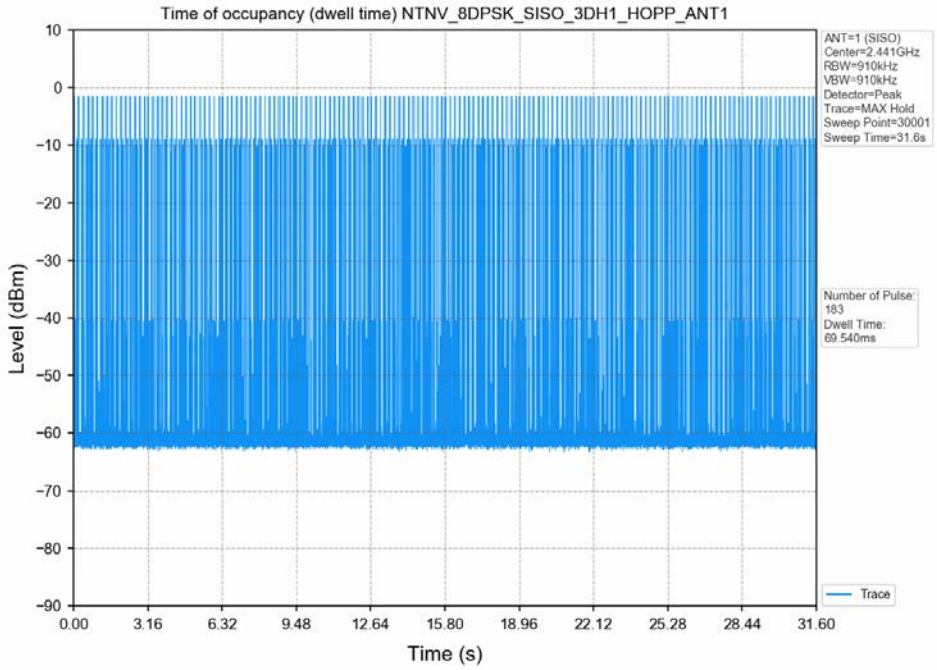

Time of occupancy (dwell time) NTNV_Pi/4DQPSK_SISO_2DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=9ms
Time of Pulse:
1.628ms
Trace
Level (dBm)
Time (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0.0
0.9
1.8
2.7
3.6
4.5
5.4
6.3
7.2
8.1
9.0

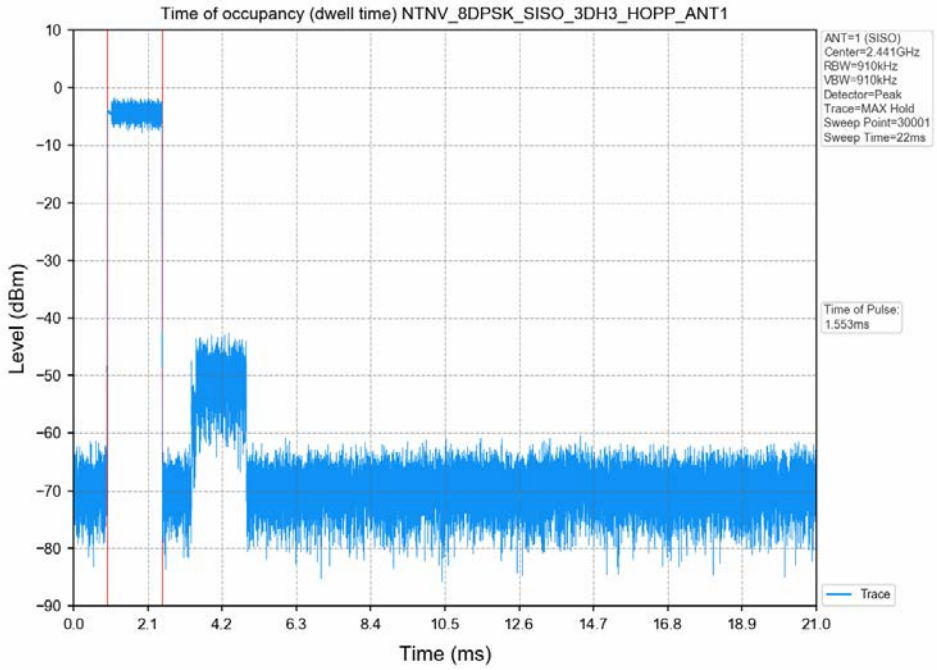

Time of occupancy (dwell time) NTNV_Pi/4DQPSK_SISO_2DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
29
Dwell Time:
47.212ms
Trace
Level (dBm)
Time (s)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.00
3.16
6.32
9.48
12.64
15.80
18.96
22.12
25.28
28.44
31.60

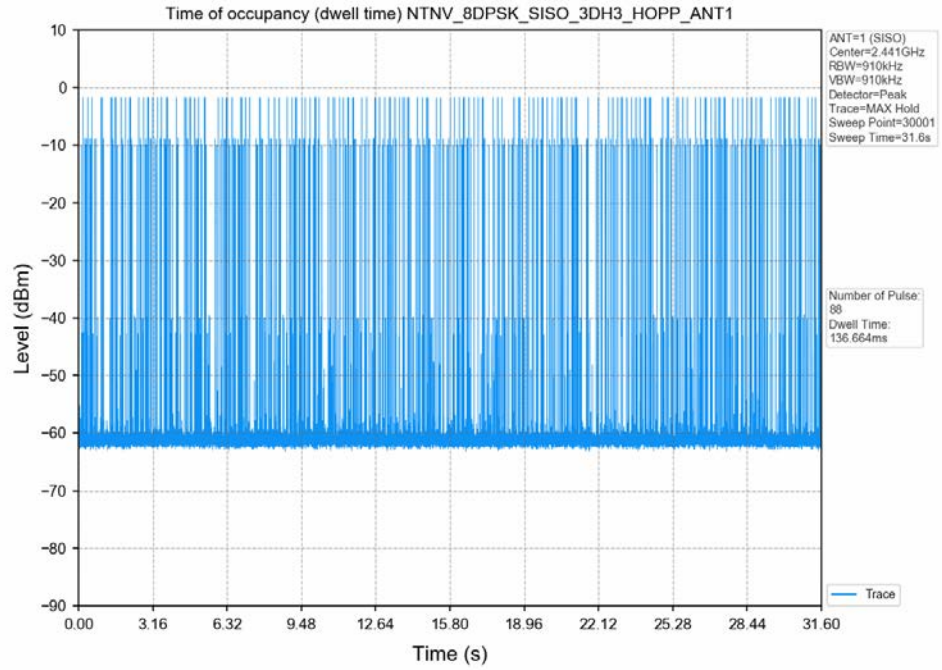

Time of occupancy (dwell time) NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=15ms
Time of Pulse:
2.876ms
Trace
Level (dBm)
Time (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0.0
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
15.0

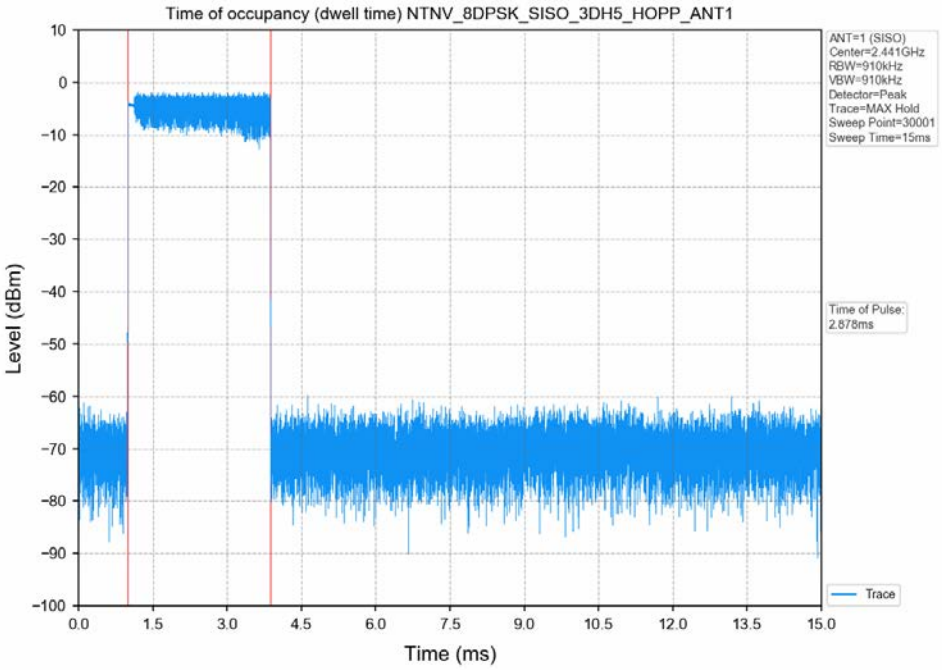

Time of occupancy (dwell time) NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
7
Dwell Time:
20.132ms
Trace
Level (dBm)
Time (s)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.00
3.16
6.32
9.48
12.64
15.80
18.96
22.12
25.28
28.44
31.60

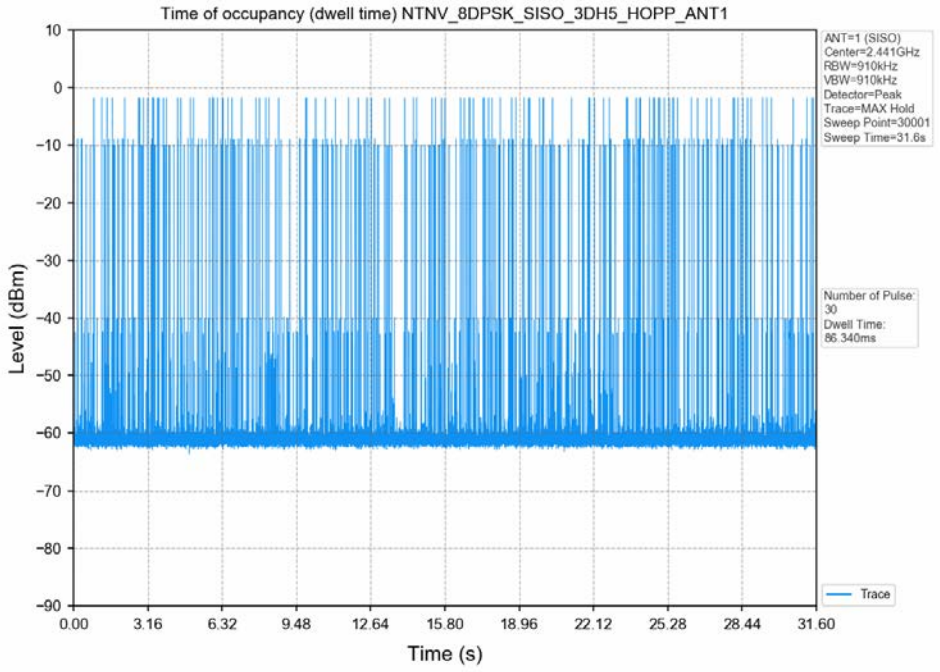

Time of occupancy (dwell time) NTNV_8DPSK_SISO_3DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=166ms
Time of Pulse:
0.380ms
Trace
Level (dBm)
Time (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.0
16.5
33.0
49.5
66.0
82.5
99.0
115.5
132.0
148.5
165.0


Time of occupancy (dwell time) NTNV_8DPSK_SISO_3DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
183
Dwell Time:
69.540ms
Trace
Level (dBm)
Time (s)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.00
3.16
6.32
9.48
12.64
15.80
18.96
22.12
25.28
28.44
31.60


Time of occupancy (dwell time) NTNV_8DPSK_SISO_3DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=22ms
Time of Pulse:
1.553ms
Trace
Level (dBm)
Time (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.0
2.1
4.2
6.3
8.4
10.5
12.6
14.7
16.8
18.9
21.0


Time of occupancy (dwell time) NTNV_8DPSK_SISO_3DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
88
Dwell Time:
136.664ms
Trace
Level (dBm)
Time (s)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0.00
3.16
6.32
9.48
12.64
15.80
18.96
22.12
25.28
28.44
31.60


Time of occupancy (dwell time) NTNV_8DPSK_SISO_3DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=15ms
Time of Pulse:
2.878ms
Trace
Level (dBm)
Time (ms)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0.0
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
15.0

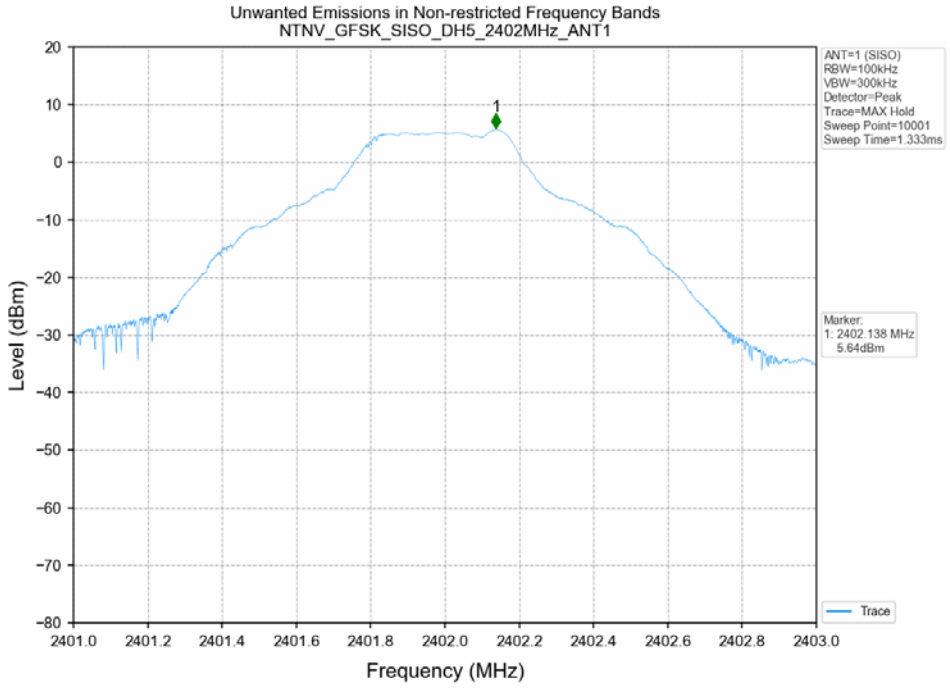


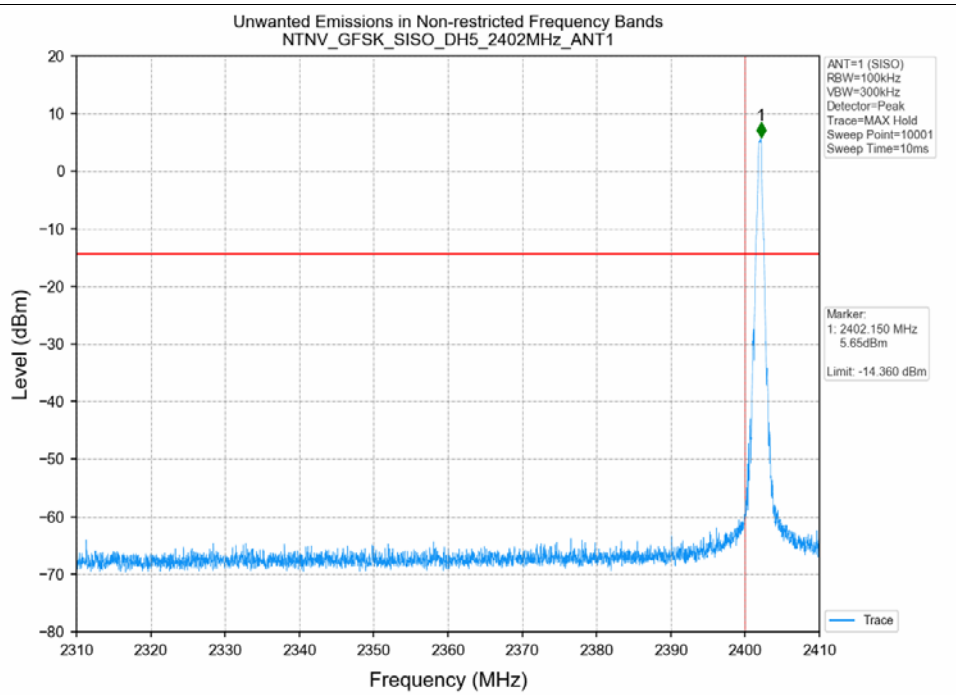
6. Unwanted Emissions in Non-restricted Frequency Bands

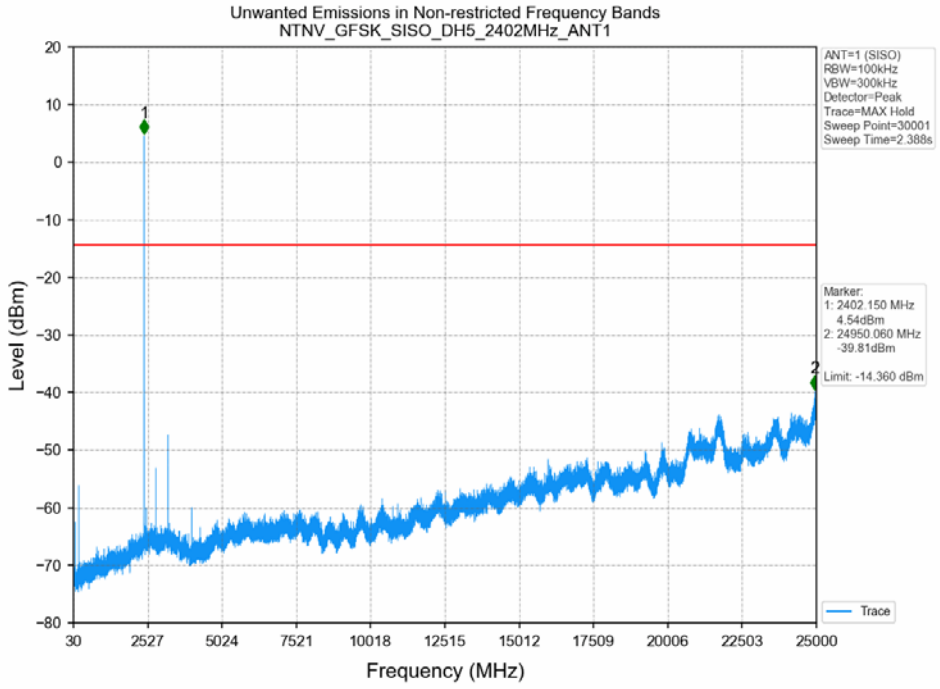
6.1 Test Result

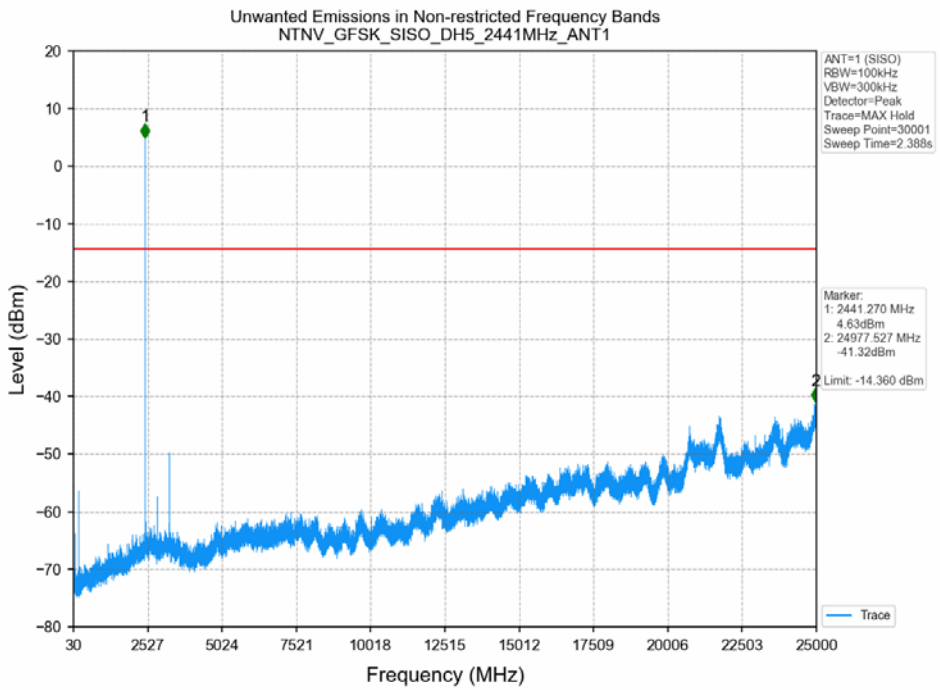
Test Mode	Frequency (MHz)	TX Type	ANT No.	Spurious Conducted Emission (dBm)	Limits (dBc)	Verdict
GFSK	2402	SISO	1	Refer to test graph	-20	PASS
	2441	SISO	1	Refer to test graph	-20	PASS
	2480	SISO	1	Refer to test graph	-20	PASS
	Hopping	SISO	1	Refer to test graph	-20	PASS
Pi/4DQPSK	2402	SISO	1	Refer to test graph	-20	PASS
	2441	SISO	1	Refer to test graph	-20	PASS
	2480	SISO	1	Refer to test graph	-20	PASS
	Hopping	SISO	1	Refer to test graph	-20	PASS
8DPSK	2402	SISO	1	Refer to test graph	-20	PASS
	2441	SISO	1	Refer to test graph	-20	PASS
	2480	SISO	1	Refer to test graph	-20	PASS
	Hopping	SISO	1	Refer to test graph	-20	PASS

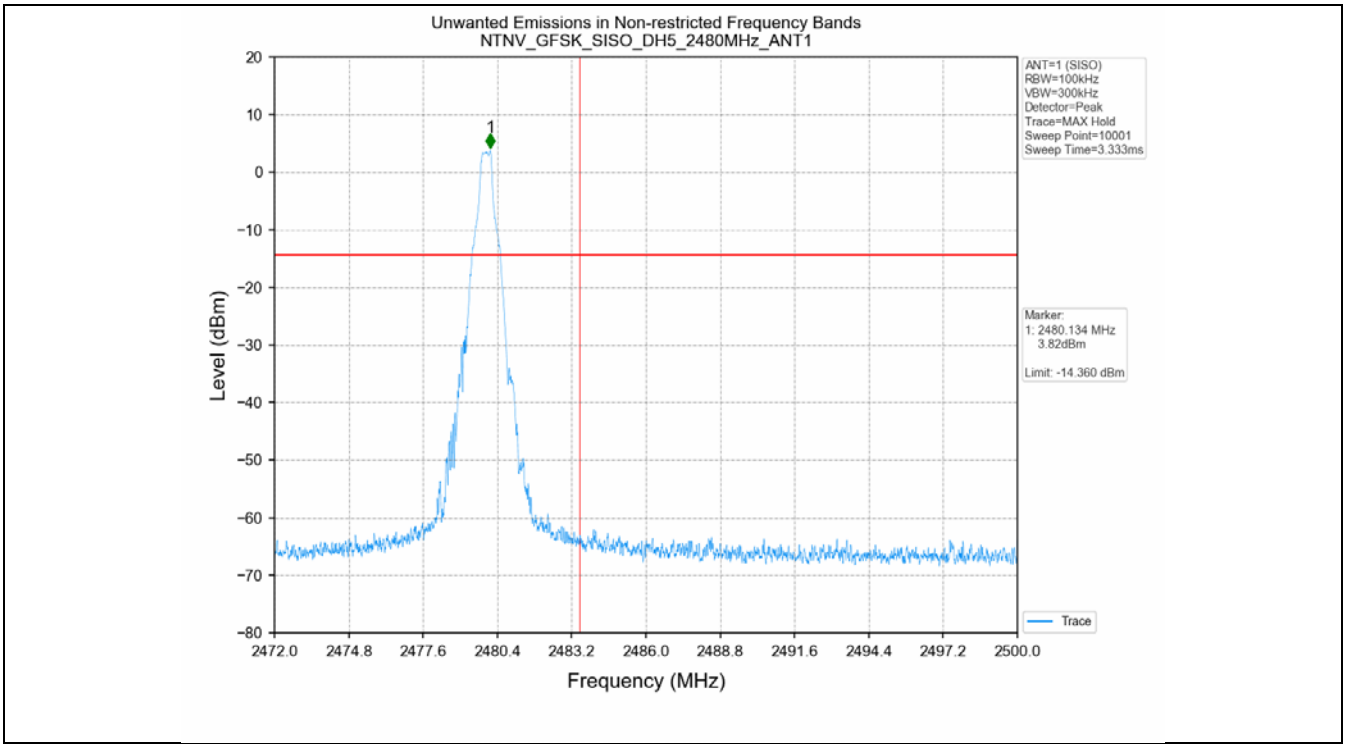
6.2 Test Graph

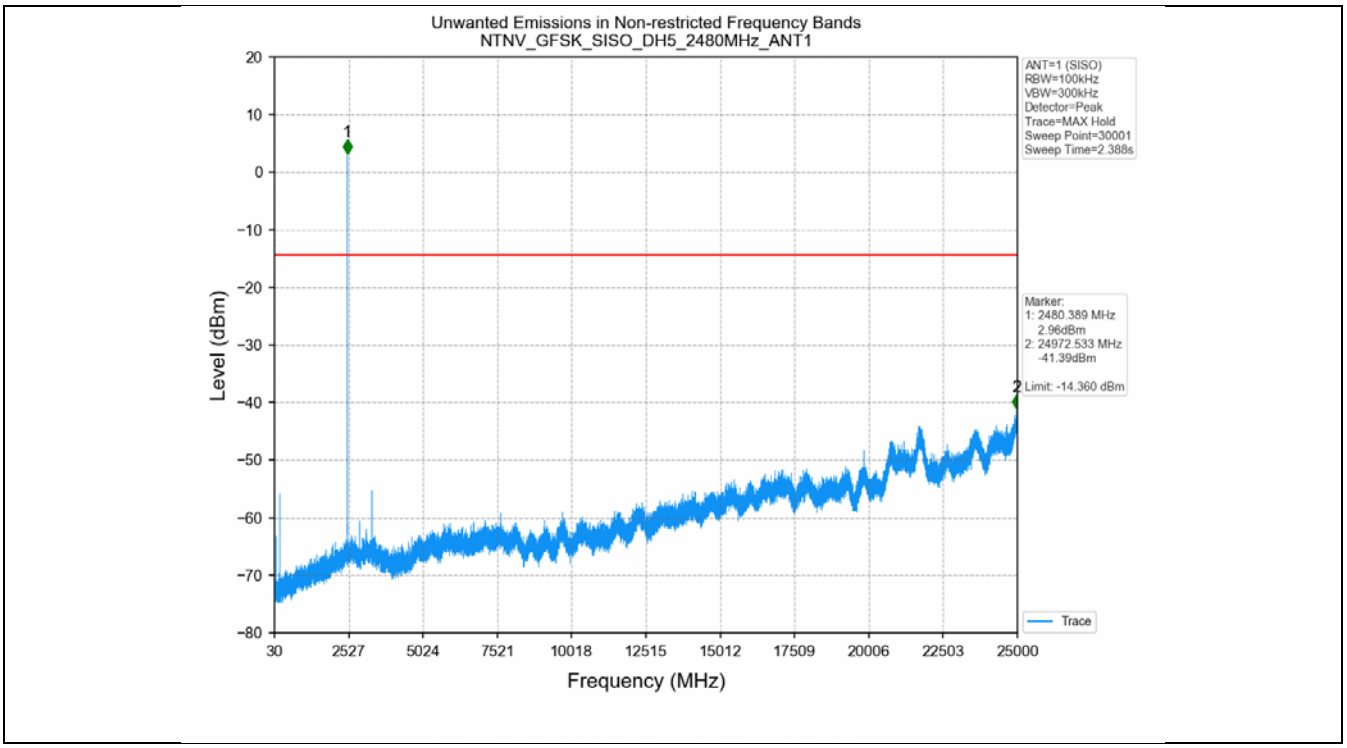

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=1.333ms
Marker:
1: 2402.138 MHz
5.64dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
2401.0
2401.2
2401.4
2401.6
2401.8
2402.0
2402.2
2402.4
2402.6
2402.8
2403.0

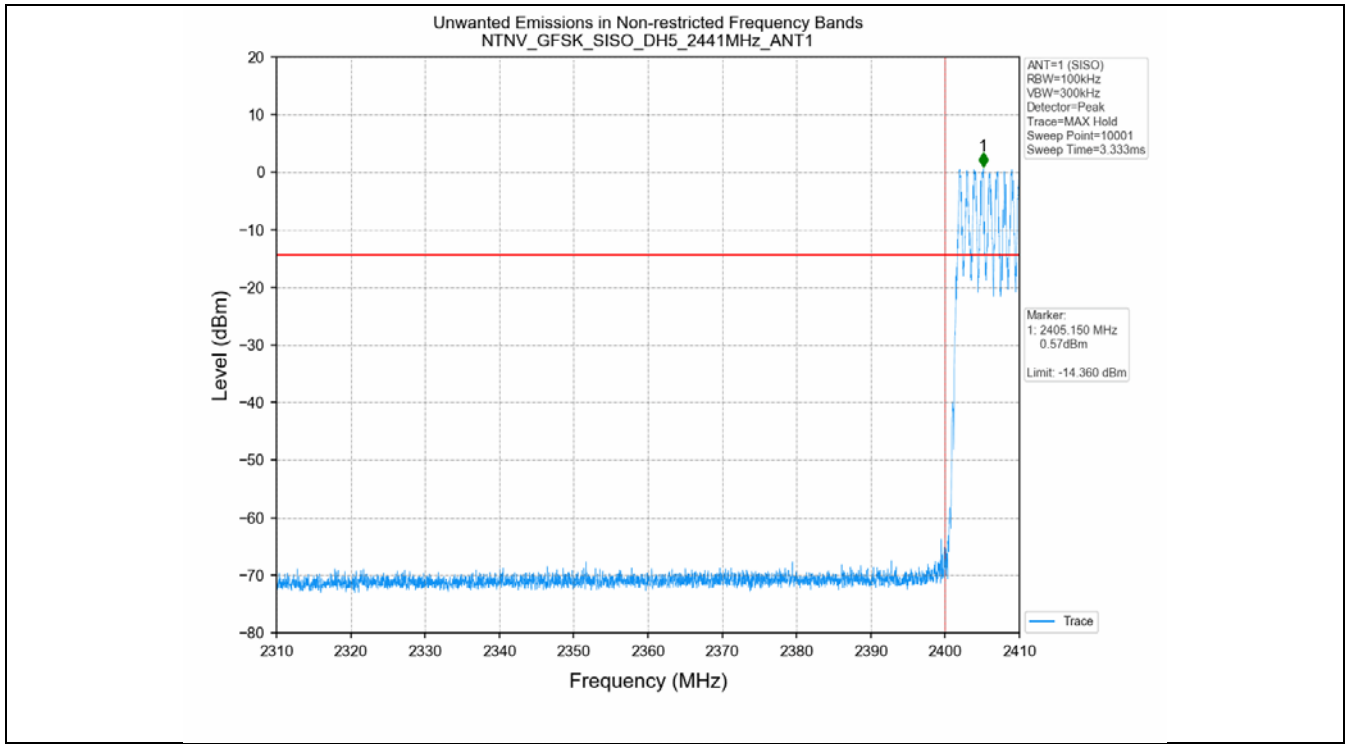

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=10ms
Marker:
1: 2402.150 MHz
5.65dBm
Limit: -14.360 dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410

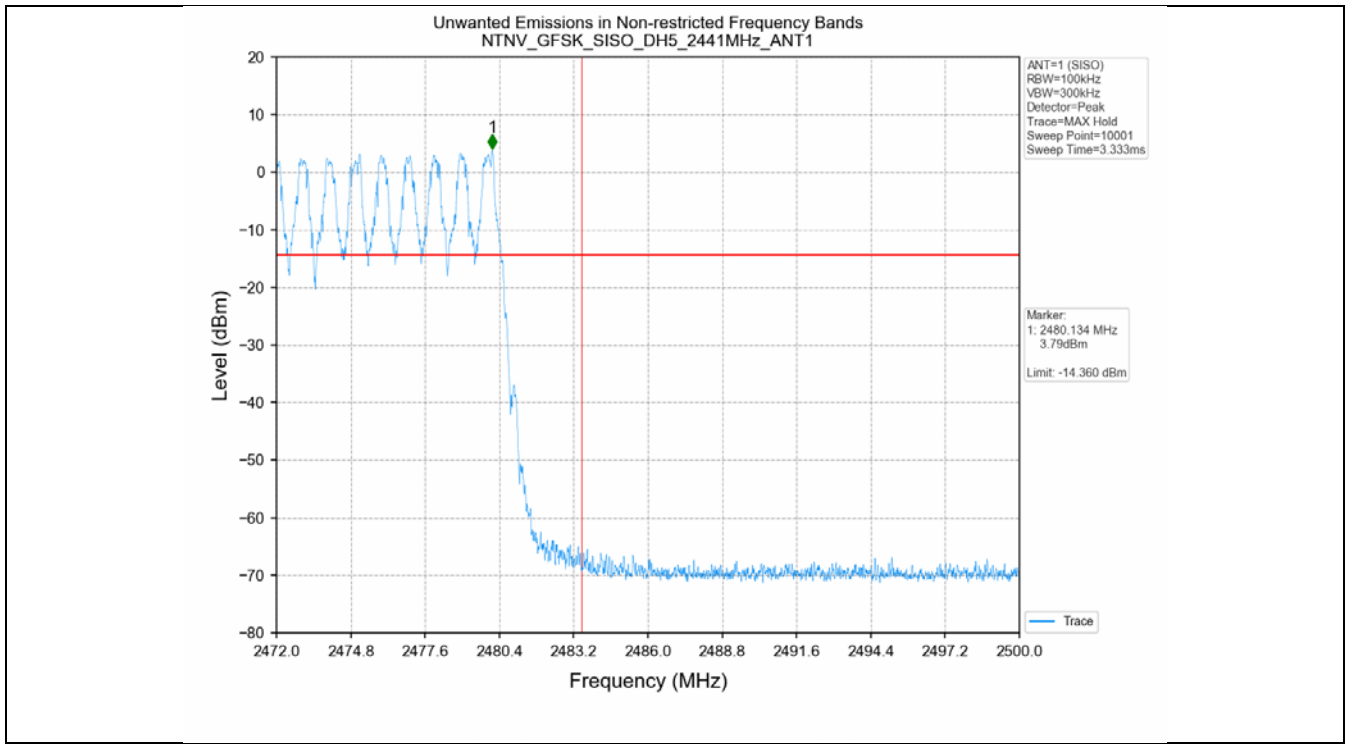

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2402.150 MHz
4.54dBm
2: 24950.060 MHz
-39.81dBm
Limit: -14.360 dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000

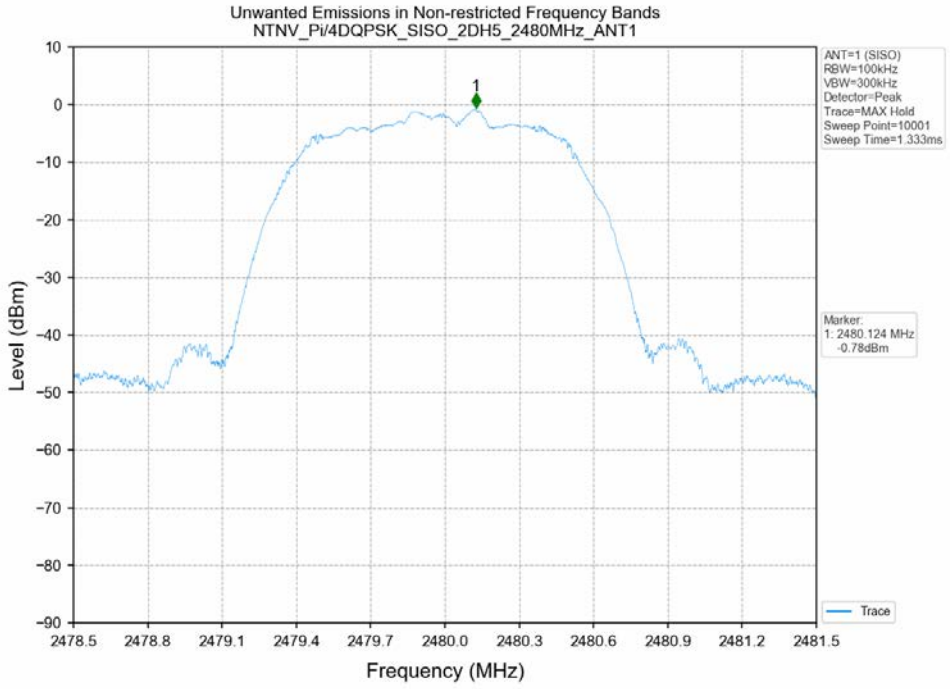

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2441.270 MHz
4.63dBm
2: 24977.527 MHz
-41.32dBm
Limit: -14.360 dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000

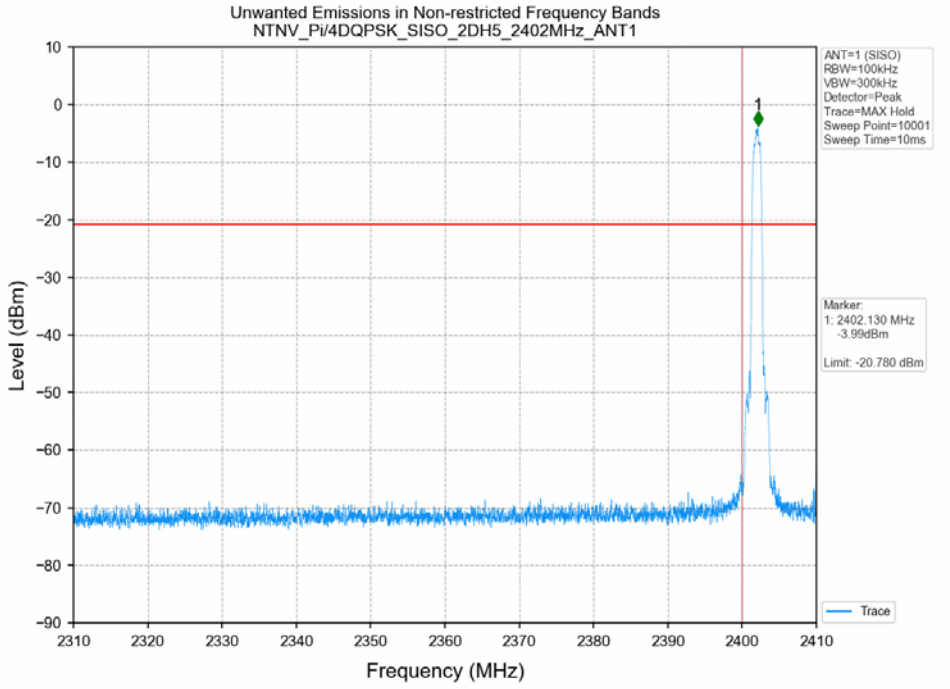

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2480.134 MHz
3.82dBm
Limit: -14.360 dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
2472.0
2474.8
2477.6
2480.4
2483.2
2486.0
2488.8
2491.6
2494.4
2497.2
2500.0

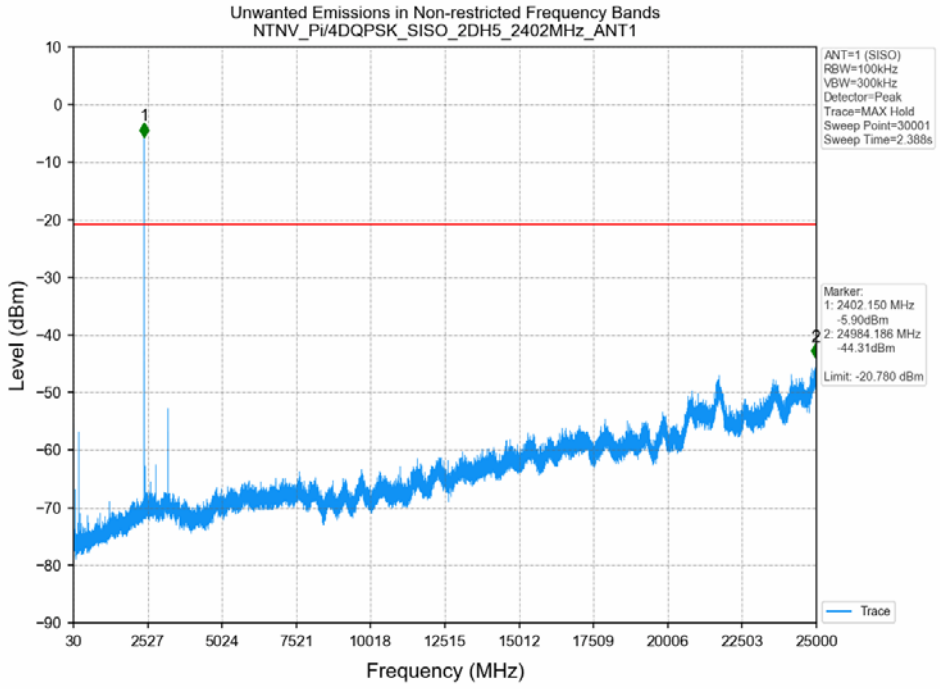

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2480.389 MHz
2.96dBm
2: 24972.533 MHz
-41.39dBm
Limit: -14.360 dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000

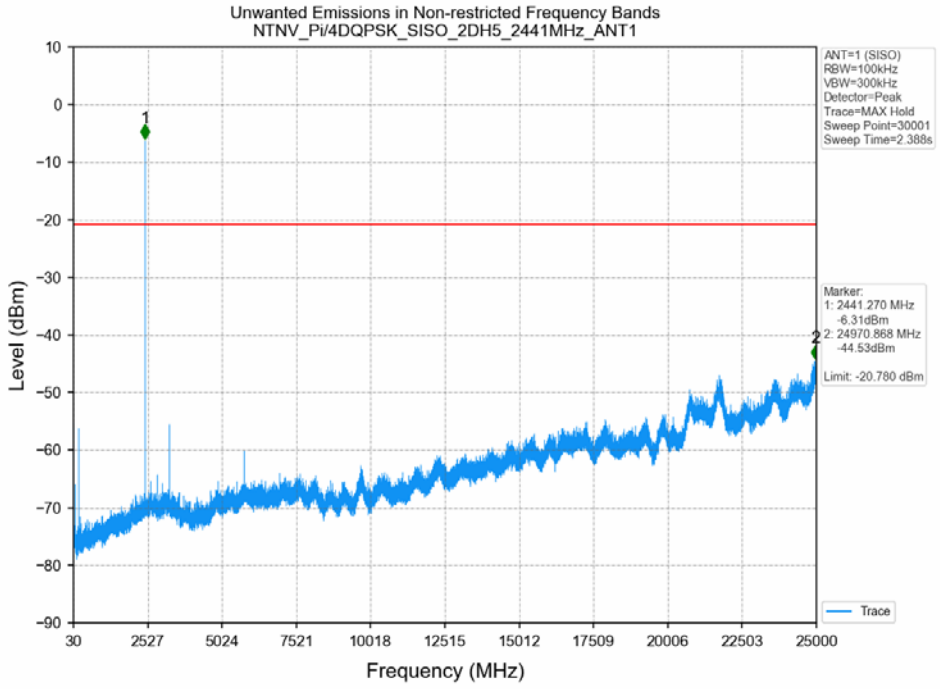

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2405.150 MHz
0.57dBm
Limit: -14.360 dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410

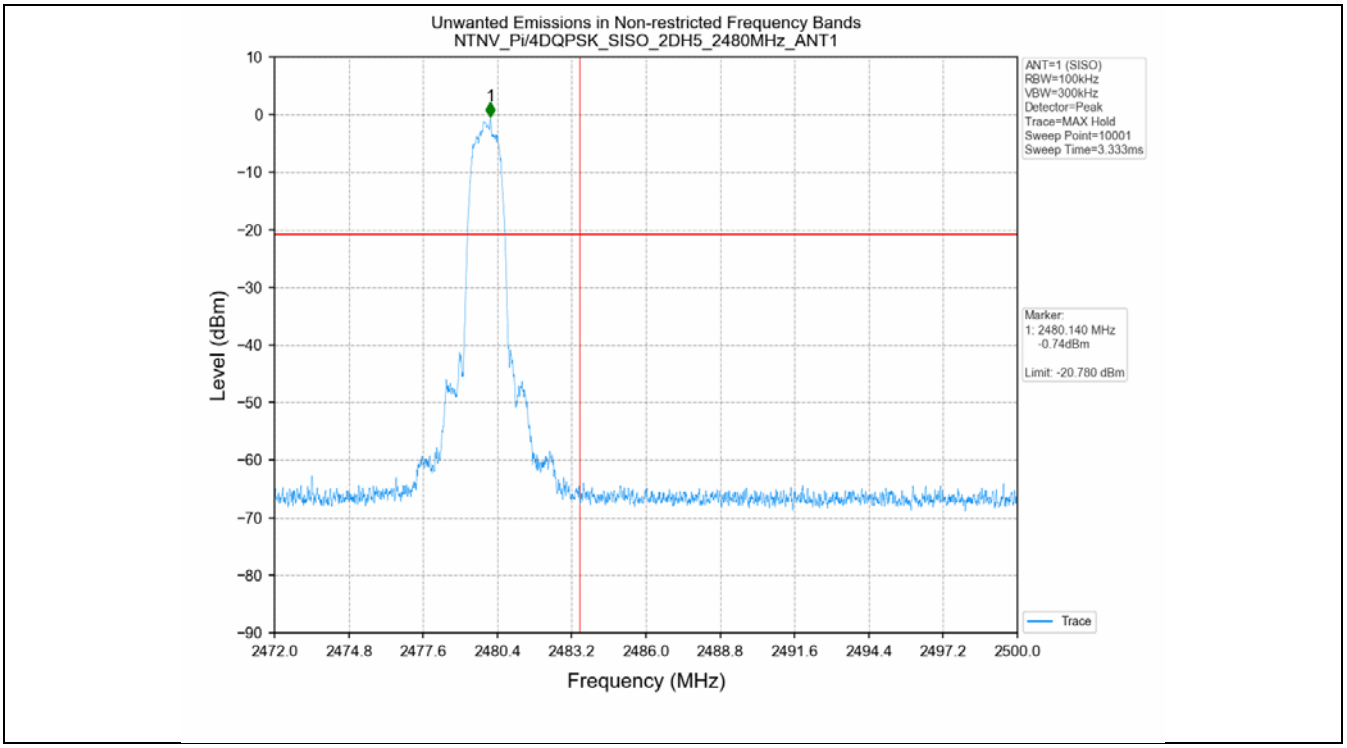

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2480.134 MHz
3.79dBm
Limit: -14.360 dBm
Trace
Level (dBm)
Frequency (MHz)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
2472.0
2474.8
2477.6
2480.4
2483.2
2486.0
2488.8
2491.6
2494.4
2497.2
2500.0

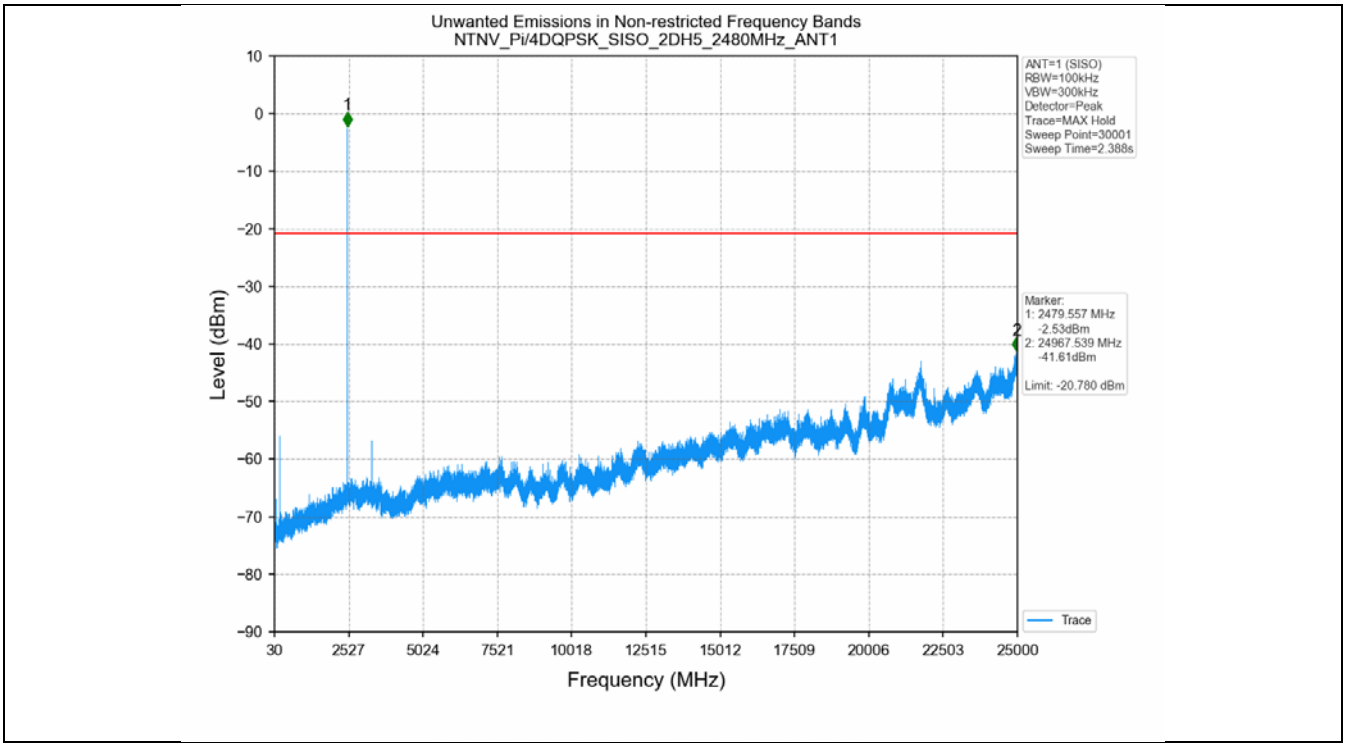

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=1.333ms
Marker:
1: 2480.124 MHz
-0.78dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2478.5
2478.8
2479.1
2479.4
2479.7
2480.0
2480.3
2480.6
2480.9
2481.2
2481.5

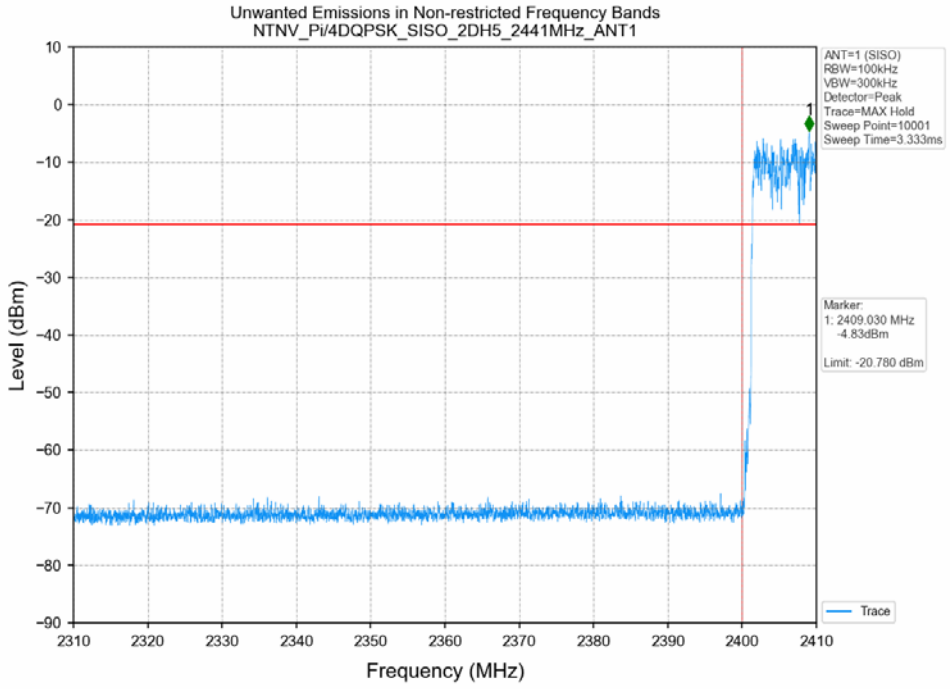

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=10ms
Marker:
1: 2402.130 MHz
-3.99dBm
Limit: -20.780 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410

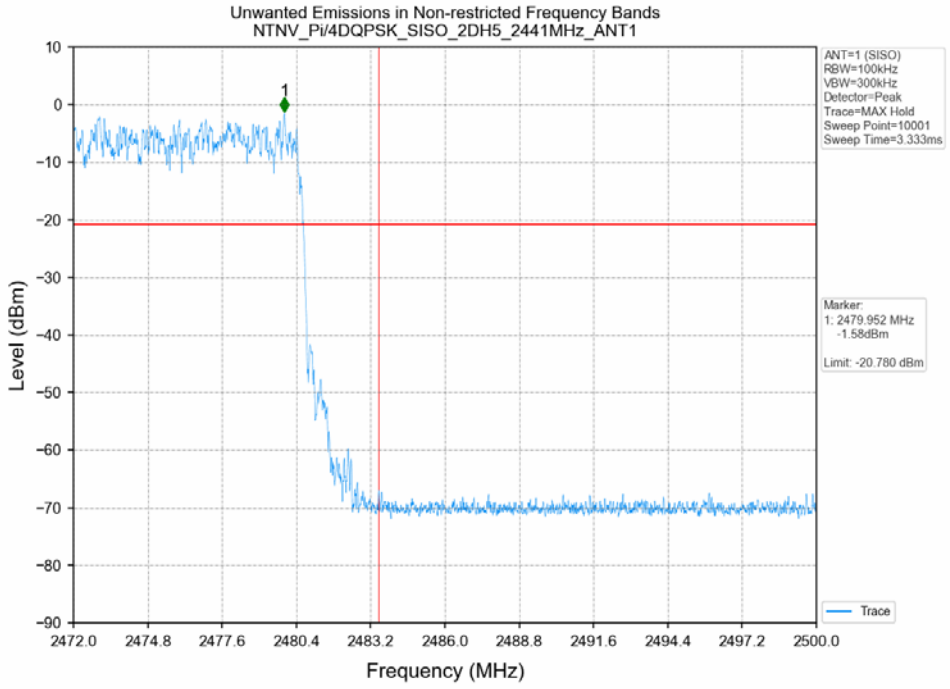

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2402.150 MHz
-5.90dBm
2: 24984.186 MHz
-44.31dBm
Limit: -20.780 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000

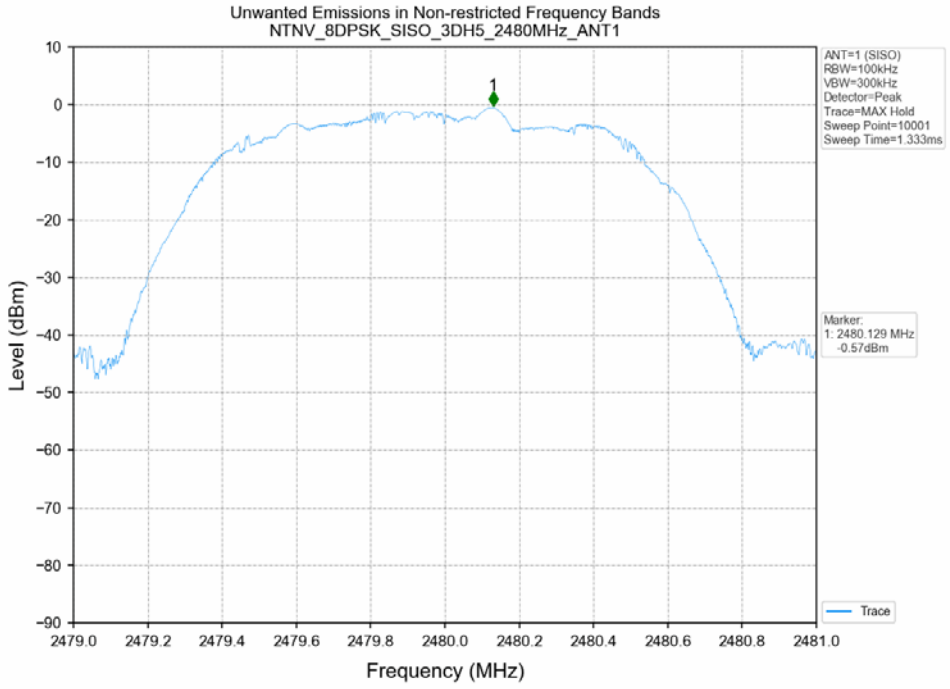

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2441.270 MHz
-6.31dBm
2: 24970.868 MHz
-44.53dBm
Limit: -20.780 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000

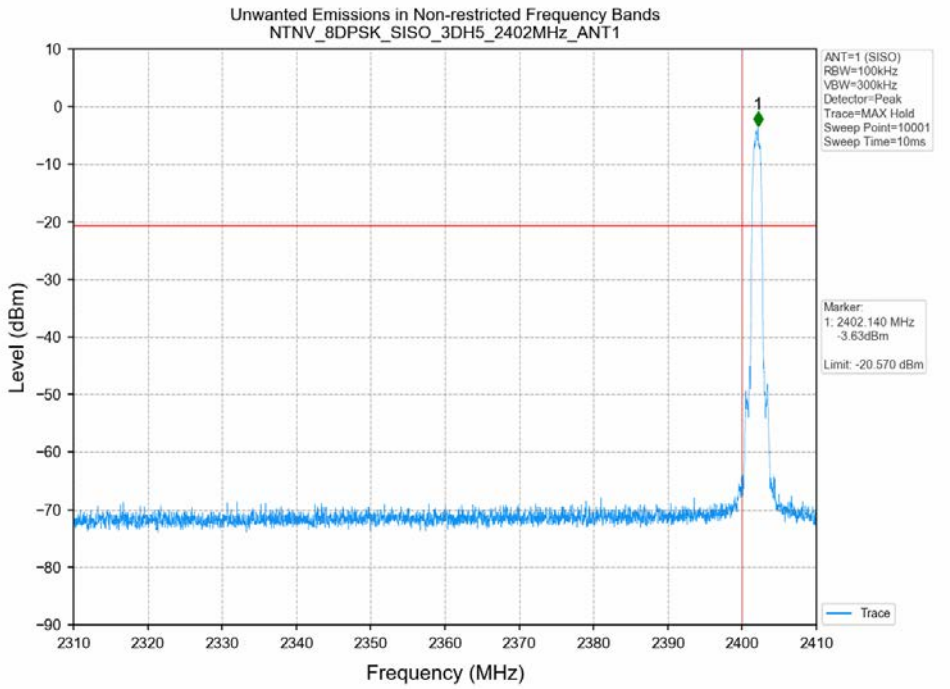

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2480.140 MHz
-0.74dBm
Limit: -20.780 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2472.0
2474.8
2477.6
2480.4
2483.2
2486.0
2488.8
2491.6
2494.4
2497.2
2500.0

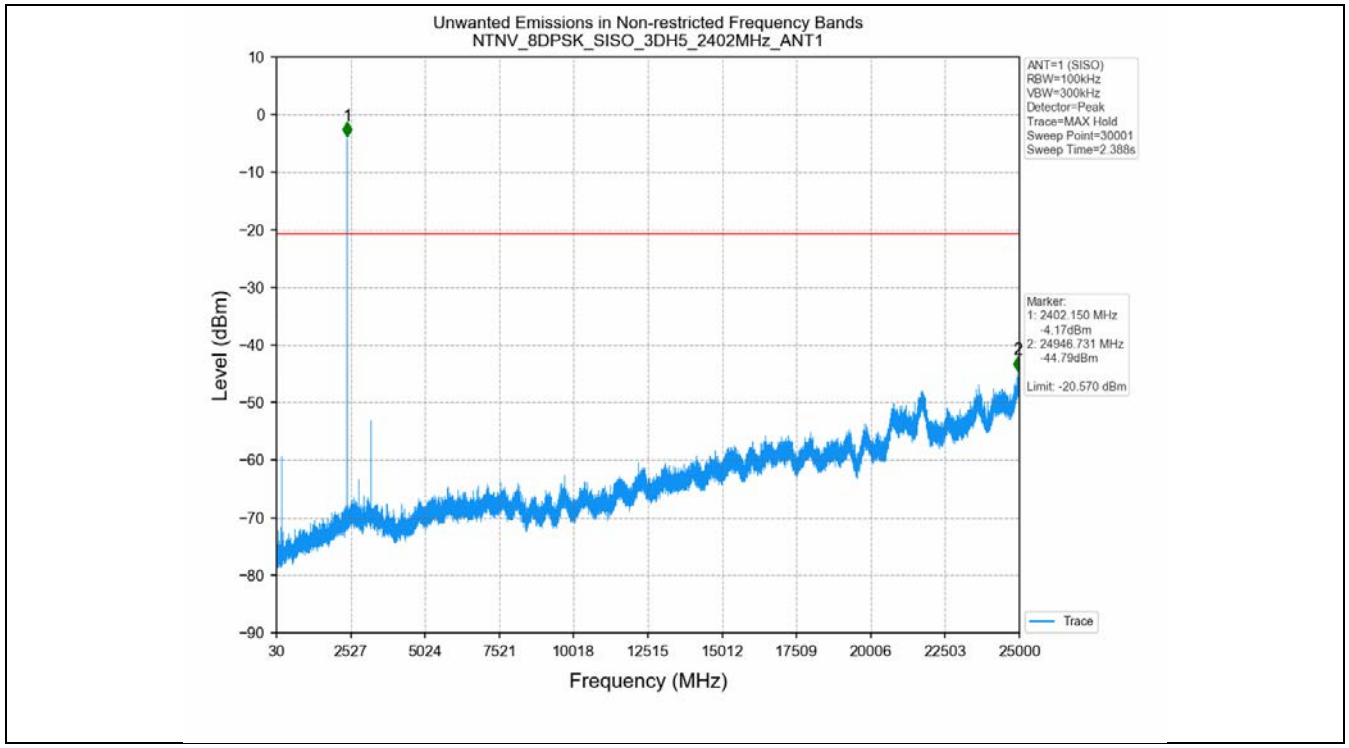

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2479.557 MHz
-2.53dBm
2: 24967.539 MHz
-41.61dBm
Limit: -20.780 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000

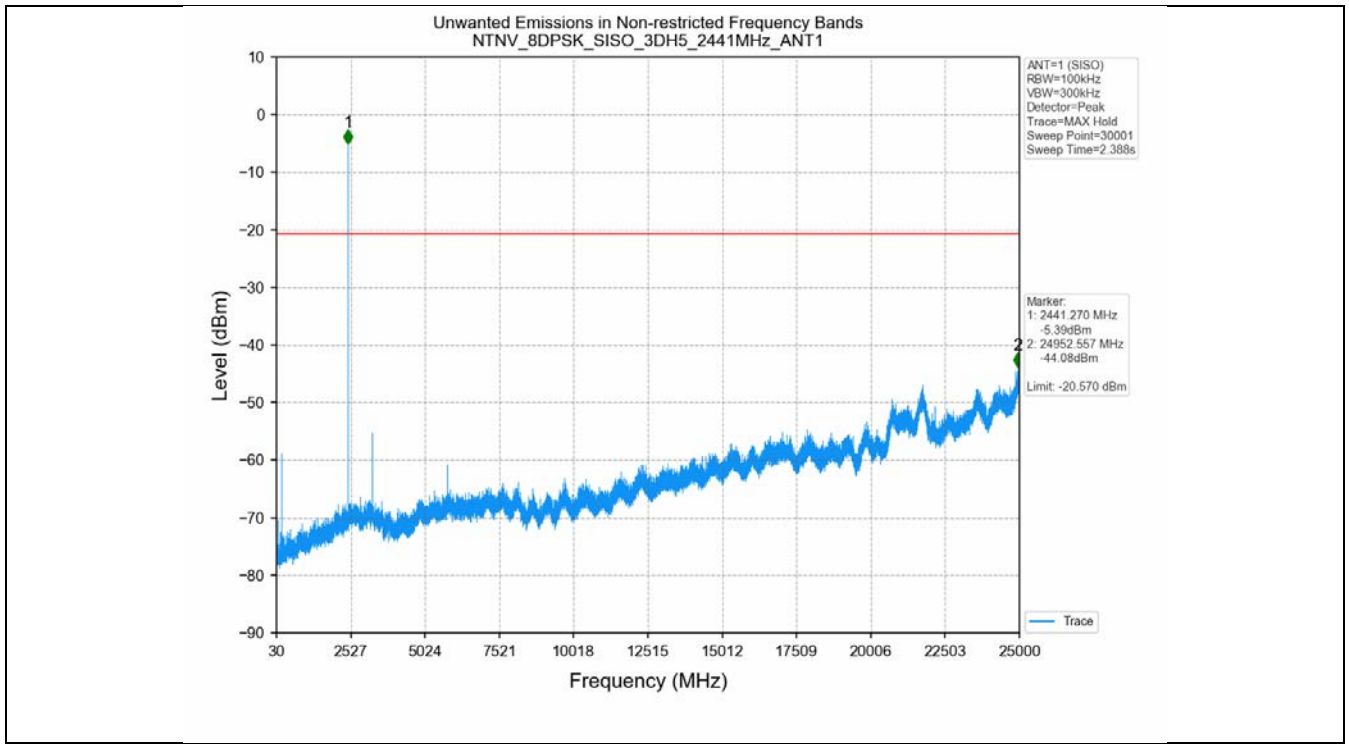

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2409.030 MHz
-4.83dBm
Limit: -20.780 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410

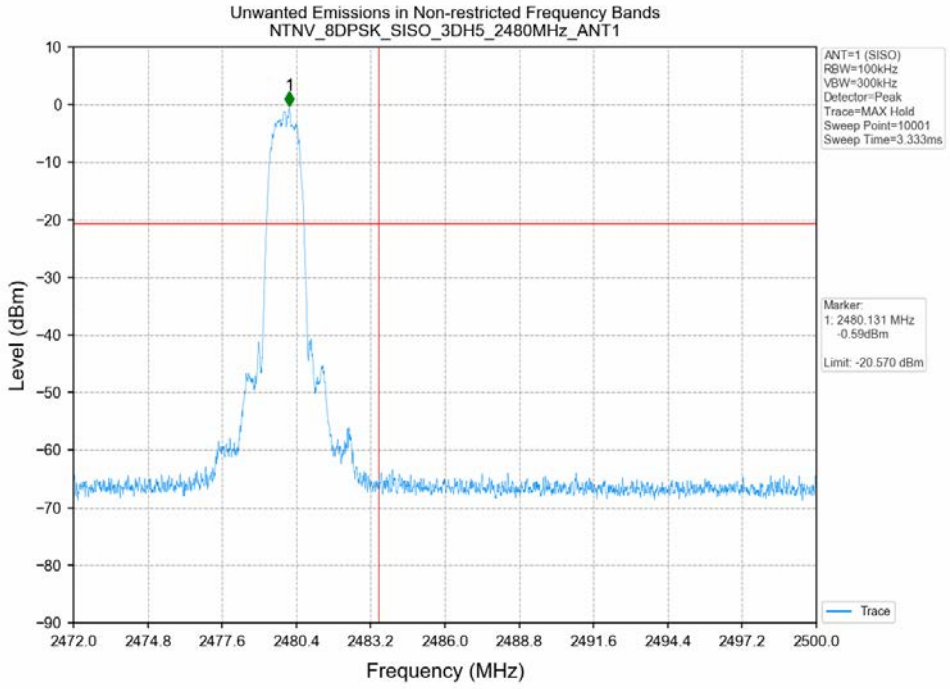

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2479.952 MHz
-1.58dBm
Limit: -20.780 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2472.0
2474.8
2477.6
2480.4
2483.2
2486.0
2488.8
2491.6
2494.4
2497.2
2500.0

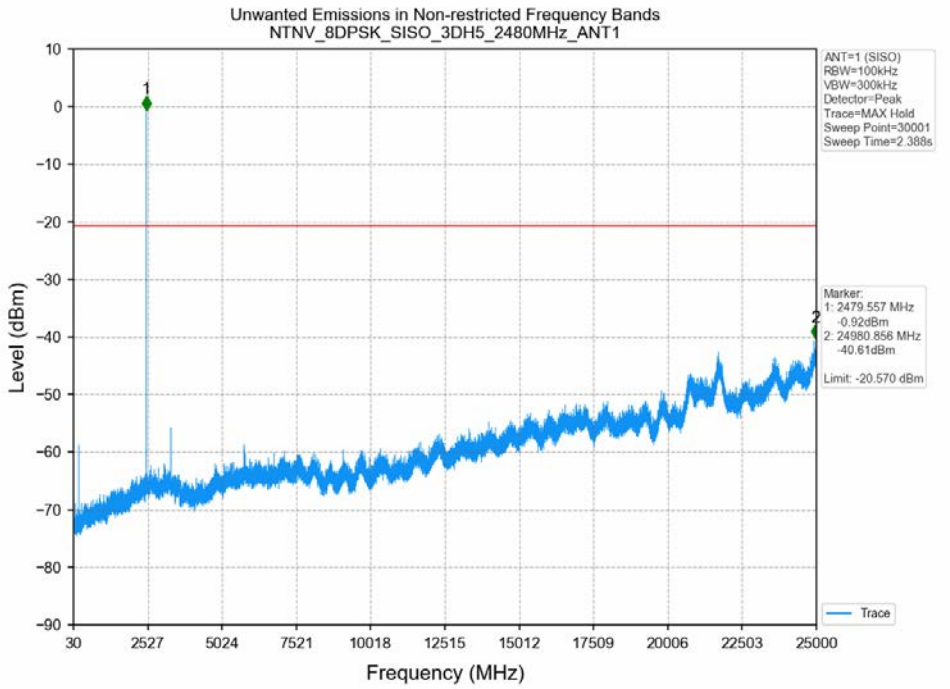

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=1.333ms
Marker:
1: 2480.129 MHz
-0.57dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2479.0
2479.2
2479.4
2479.6
2479.8
2480.0
2480.2
2480.4
2480.6
2480.8
2481.0

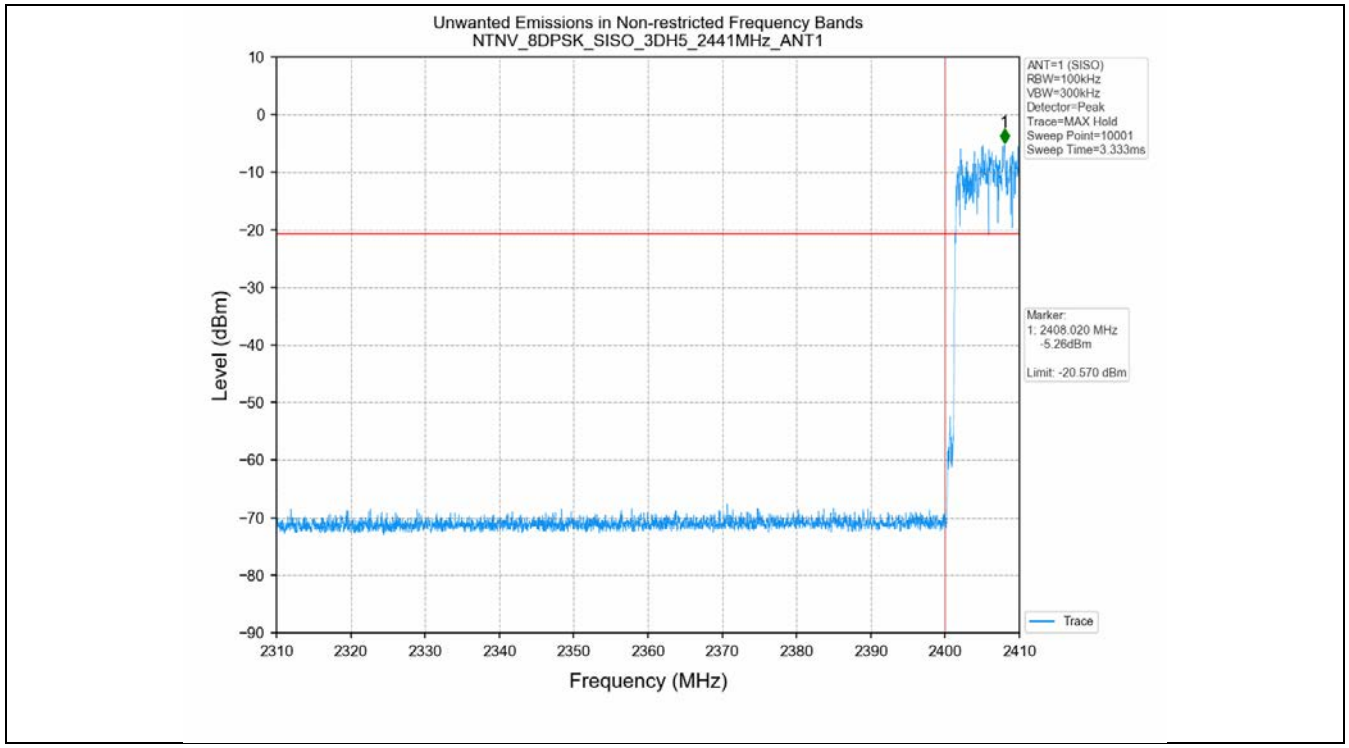

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=10ms
Marker:
1: 2402.140 MHz
-3.63dBm
Limit: -20.570 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410

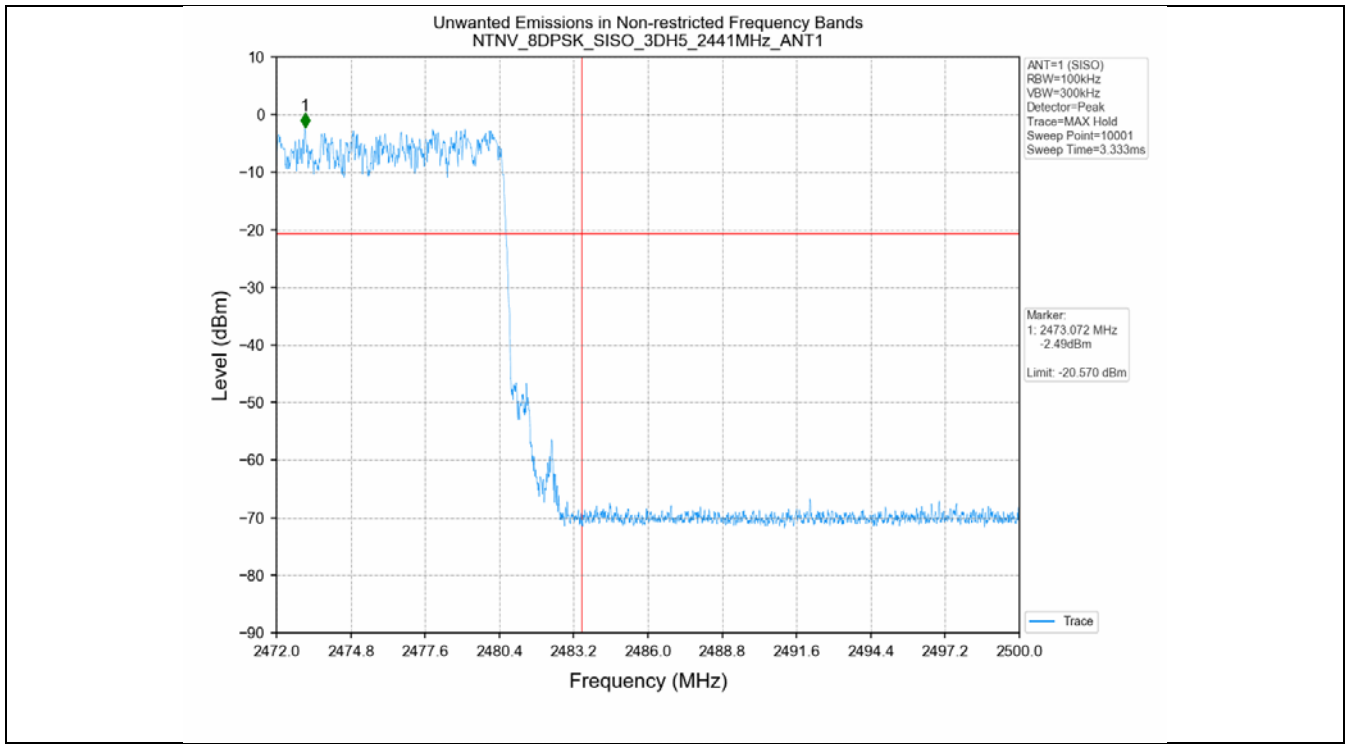

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2402.150 MHz
-4.17dBm
2: 24946.731 MHz
-44.79dBm
Limit: -20.570 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2441.270 MHz
-5.39dBm
2: 24952.557 MHz
-44.08dBm
Limit: -20.570 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2480.131 MHz
-0.59dBm
Limit: -20.570 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2472.0
2474.8
2477.6
2480.4
2483.2
2486.0
2488.8
2491.6
2494.4
2497.2
2500.0


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=2.388s
Marker:
1: 2479.557 MHz
-0.92dBm
2: 24980.856 MHz
-40.61dBm
Limit: -20.570 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
30
2527
5024
7521
10018
12515
15012
17509
20006
22503
25000


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2408.020 MHz
-5.26dBm
Limit: -20.570 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=3.333ms
Marker:
1: 2473.072 MHz
-2.49dBm
Limit: -20.570 dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
2472.0
2474.8
2477.6
2480.4
2483.2
2486.0
2488.8
2491.6
2494.4
2497.2
2500.0