Appendix for 15.247

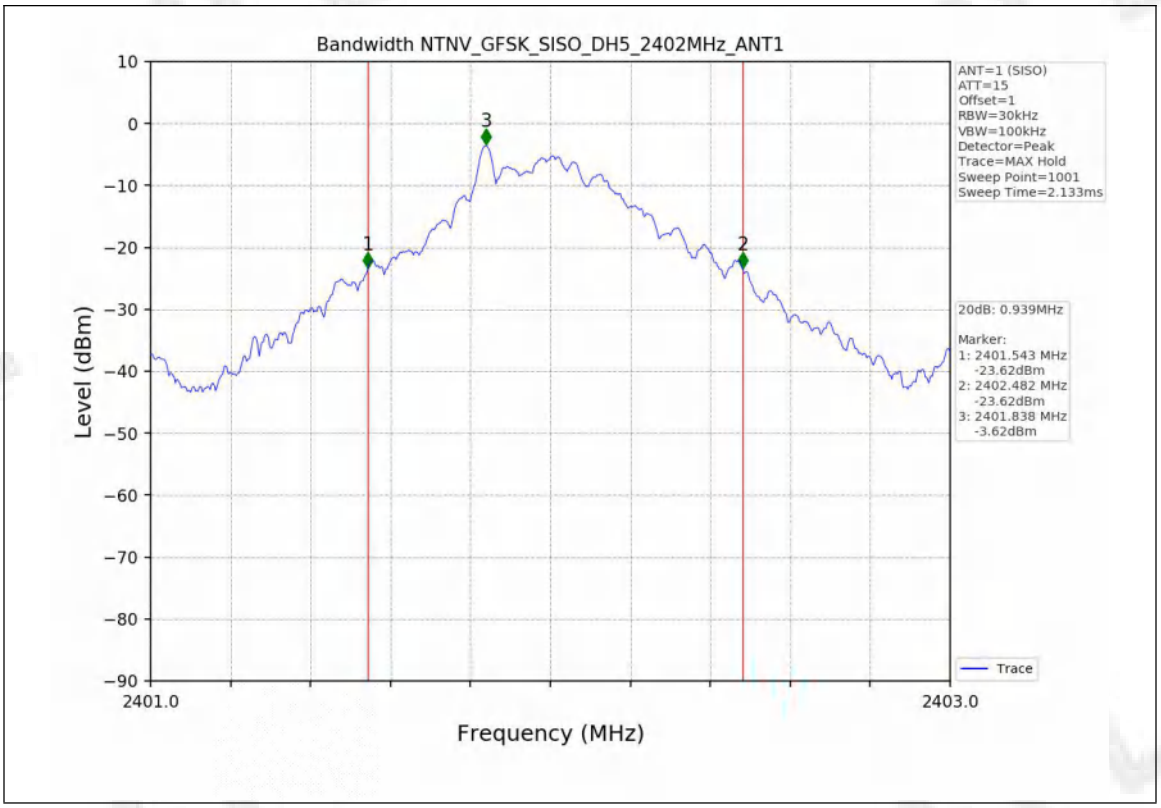
1. Bandwidth

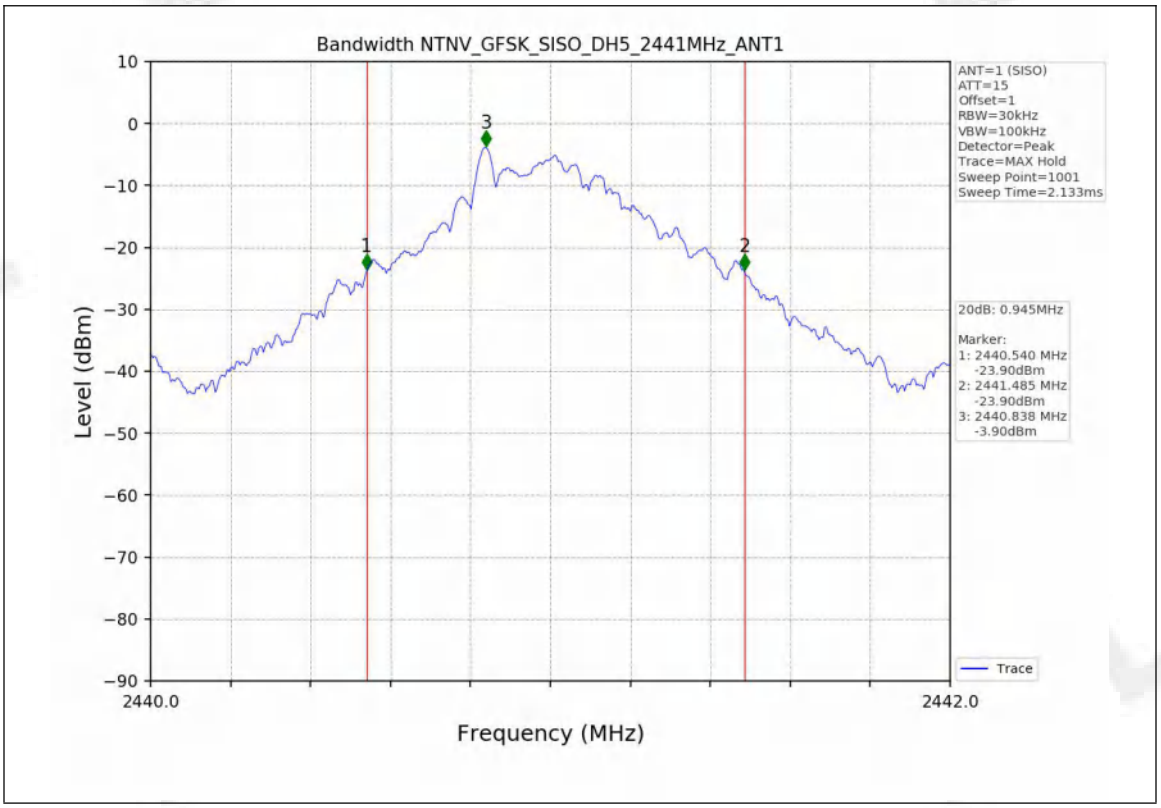
1.1 Test Result

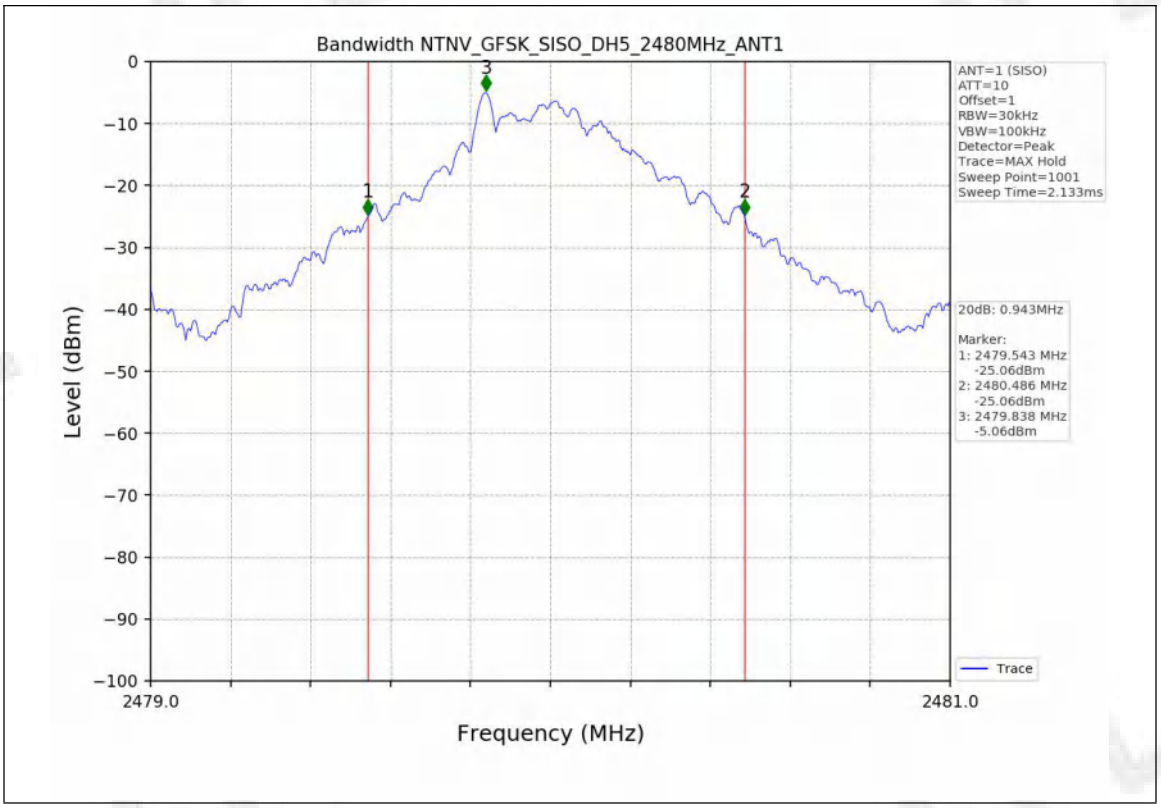
Test Mode	Frequency (MHz)	TX Type	ANT No.	20dB Bandwidth Test Result (MHz)	Verdict
GFSK	2402	SISO	1	0.939	PASS
	2441	SISO	1	0.945	PASS
	2480	SISO	1	0.943	PASS
Pi/4DQPSK	2402	SISO	1	1.271	PASS
	2441	SISO	1	1.268	PASS
	2480	SISO	1	1.273	PASS
8DPSK	2402	SISO	1	1.250	PASS
	2441	SISO	1	1.256	PASS
	2480	SISO	1	1.257	PASS

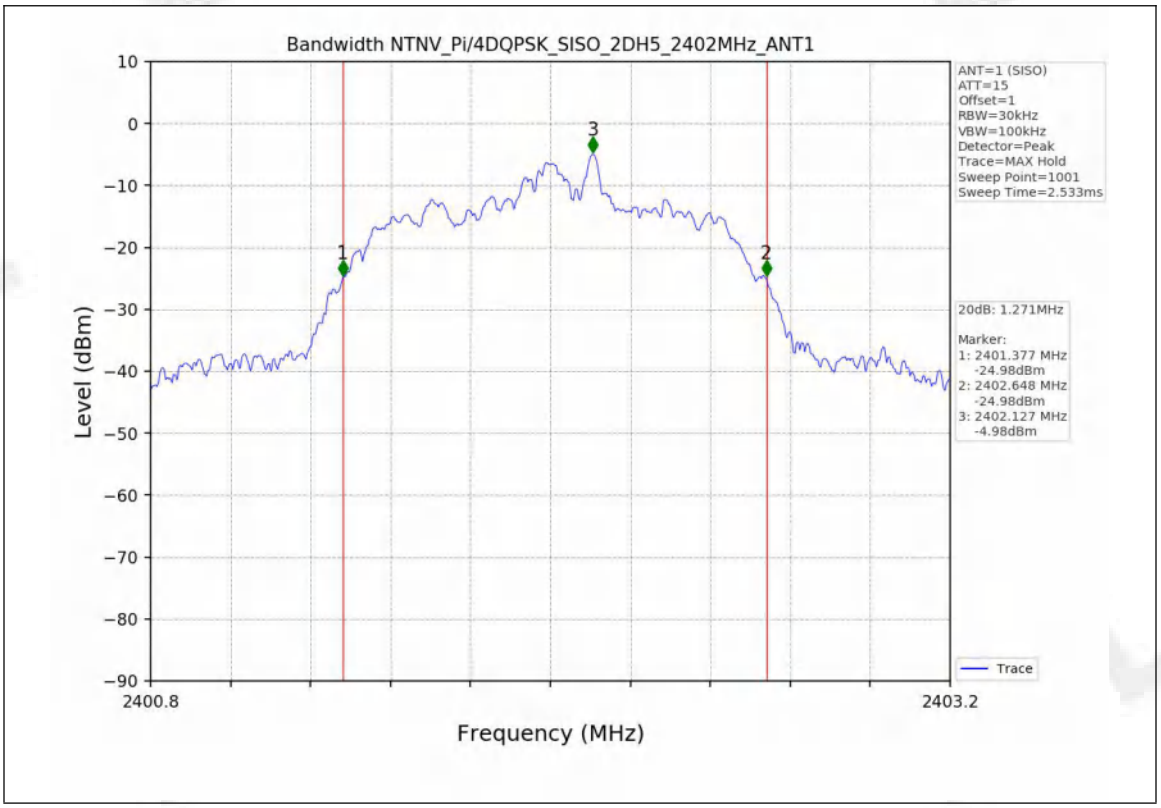
Test Mode	Frequency (MHz)	TX Type	ANT No.	99% Occupied Bandwidth Test Result (MHz)	
GFSK	2402	SISO	1	0.921	Only for Report Use
	2441	SISO	1	0.923	Only for Report Use
	2480	SISO	1	0.922	Only for Report Use
Pi/4DQPSK	2402	SISO	1	1.180	Only for Report Use
	2441	SISO	1	1.173	Only for Report Use
	2480	SISO	1	1.177	Only for Report Use
8DPSK	2402	SISO	1	1.181	Only for Report Use
	2441	SISO	1	1.193	Only for Report Use
	2480	SISO	1	1.185	Only for Report Use

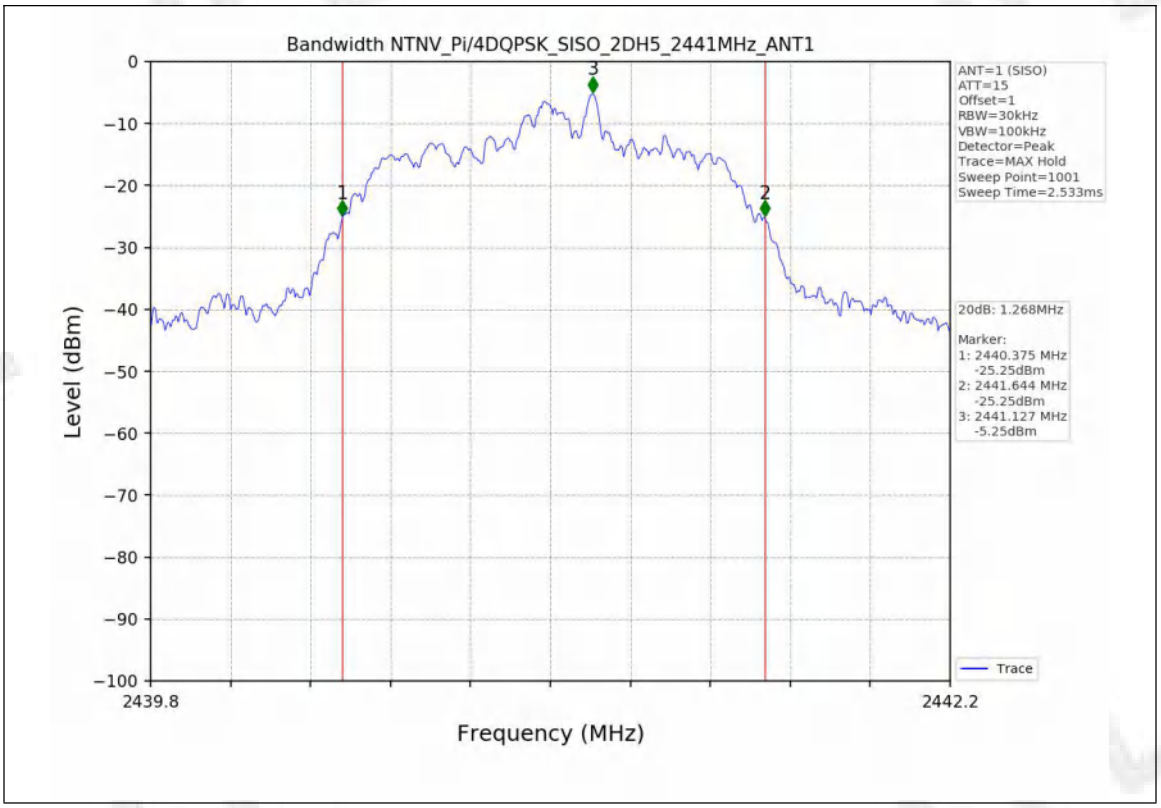
1.2 Test Graph - 20dB Bandwidth

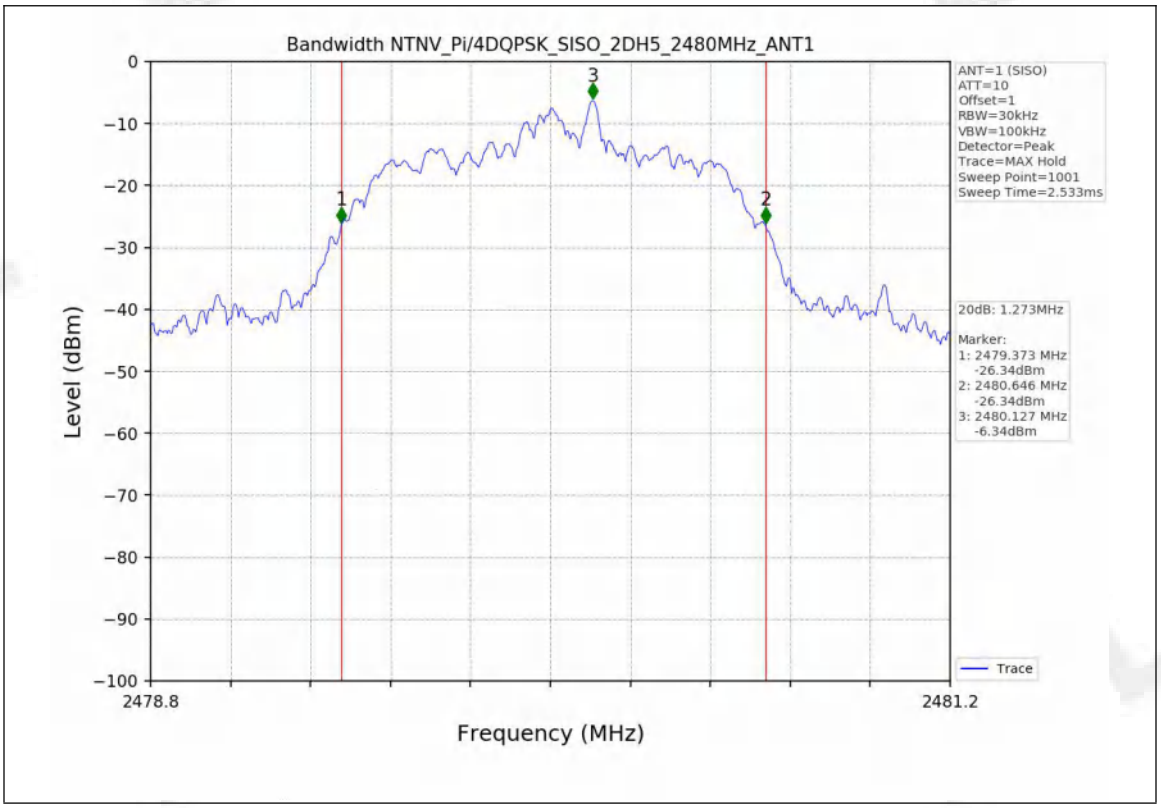

Bandwidth NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.939MHz
Marker:
1: 2401.543 MHz
-23.62dBm
2: 2402.482 MHz
-23.62dBm
3: 2401.838 MHz
-3.62dBm
Trace
Level (dBm)
Frequency (MHz)
2401.0
2403.0

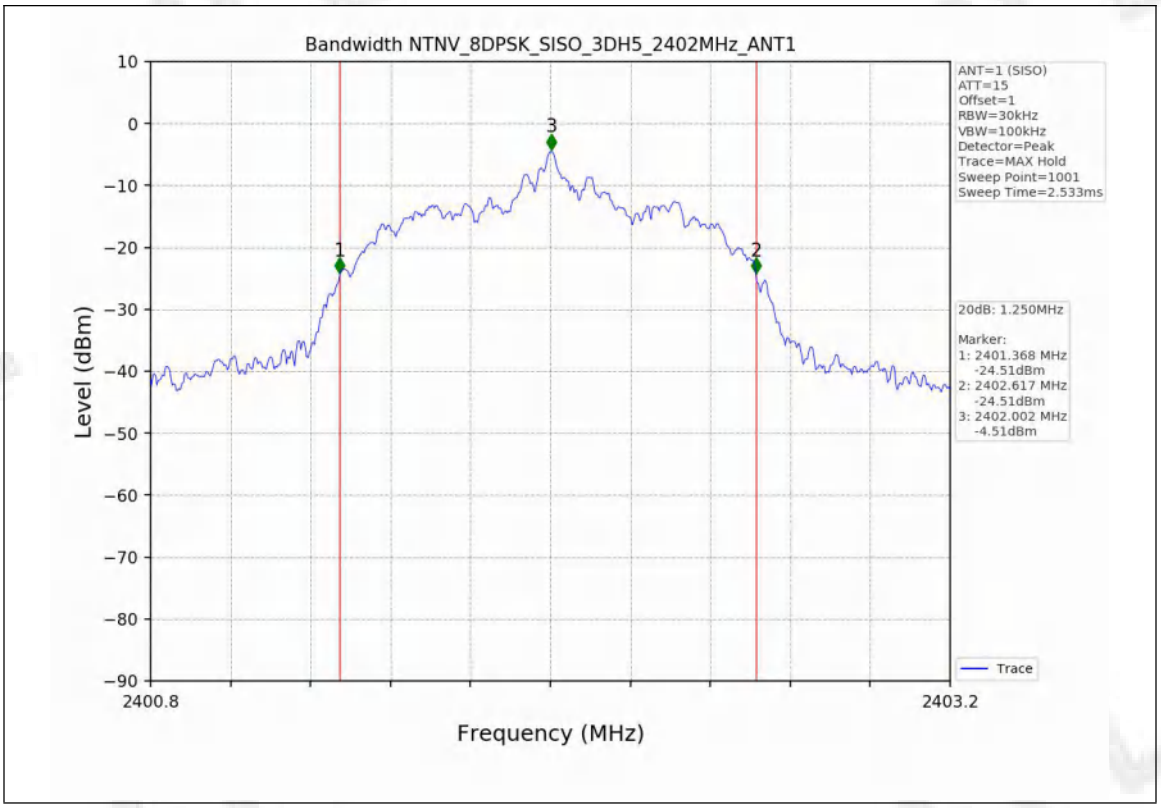

Bandwidth NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.945MHz
Marker:
1: 2440.540 MHz
-23.90dBm
2: 2441.485 MHz
-23.90dBm
3: 2440.838 MHz
-3.90dBm
Trace
Level (dBm)
Frequency (MHz)
2440.0
2442.0

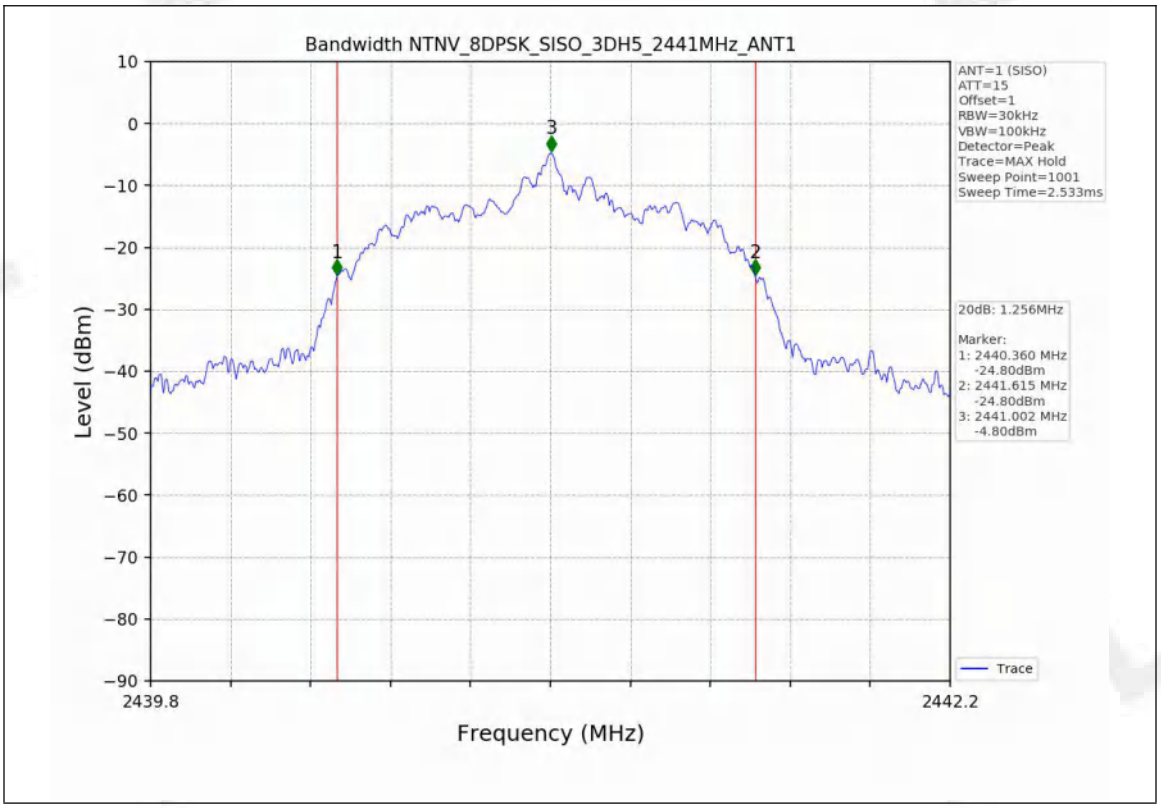

Bandwidth NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.943MHz
Marker:
1: 2479.543 MHz
-25.06dBm
2: 2480.486 MHz
-25.06dBm
3: 2479.838 MHz
-5.06dBm
Trace
Level (dBm)
Frequency (MHz)
2479.0
2481.0

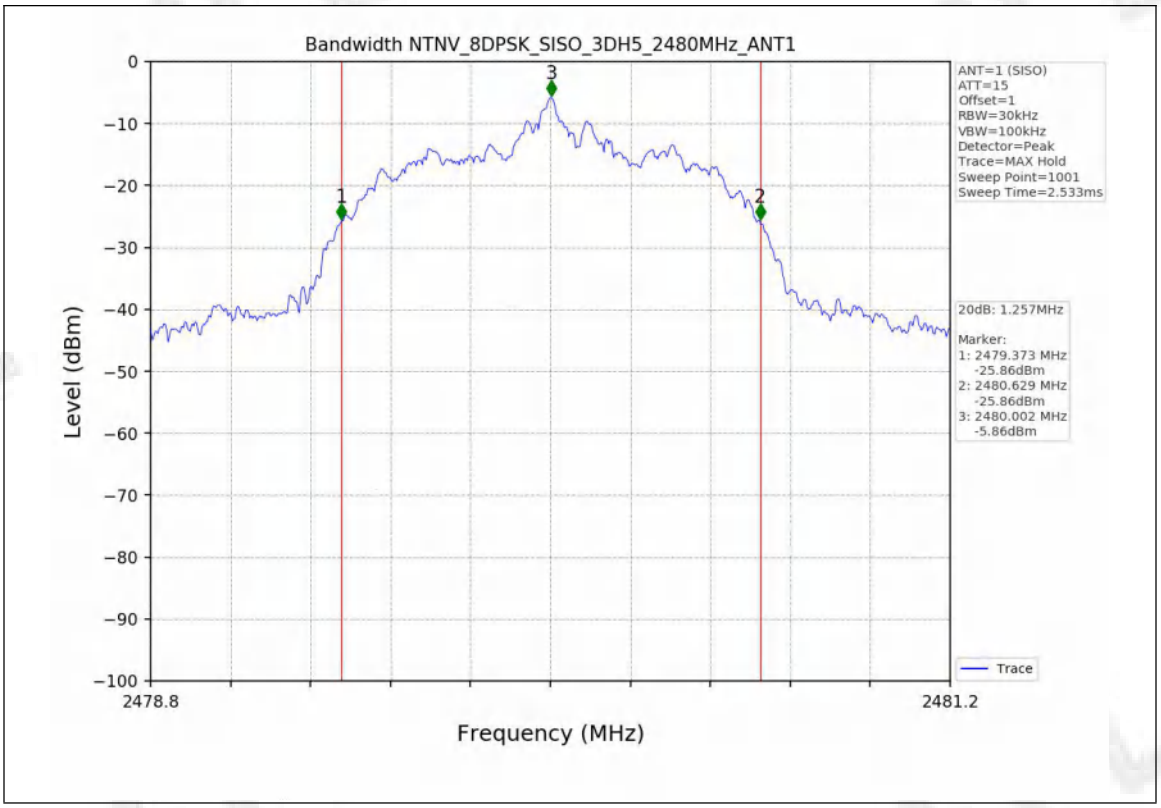

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.271MHz
Marker:
1: 2401.377 MHz
-24.98dBm
2: 2402.648 MHz
-24.98dBm
3: 2402.127 MHz
-4.98dBm
Trace
Level (dBm)
Frequency (MHz)
2400.8
2403.2


Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.268MHz
Marker:
1: 2440.375 MHz
-25.25dBm
2: 2441.644 MHz
-25.25dBm
3: 2441.127 MHz
-5.25dBm
Trace
Level (dBm)
Frequency (MHz)
2439.8
2442.2

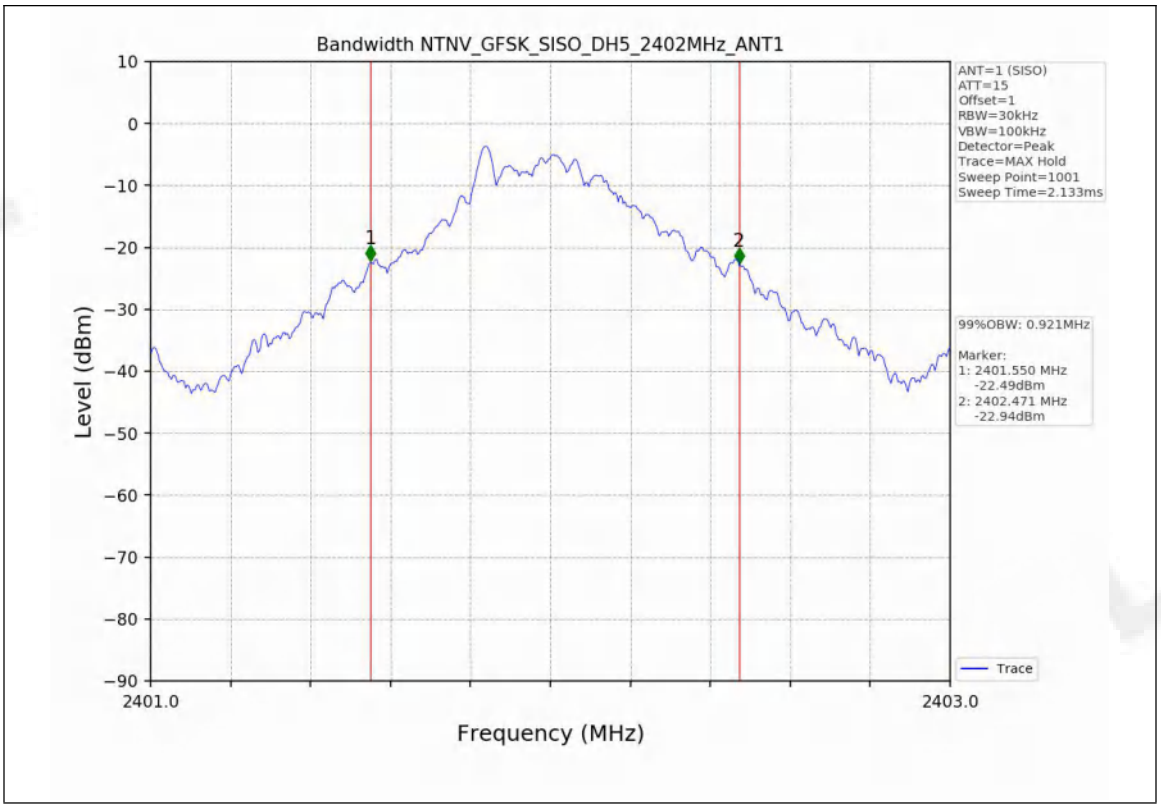

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.273MHz
Marker:
1: 2479.373 MHz
-26.34dBm
2: 2480.646 MHz
-26.34dBm
3: 2480.127 MHz
-6.34dBm
Trace
Level (dBm)
Frequency (MHz)
2478.8
2481.2

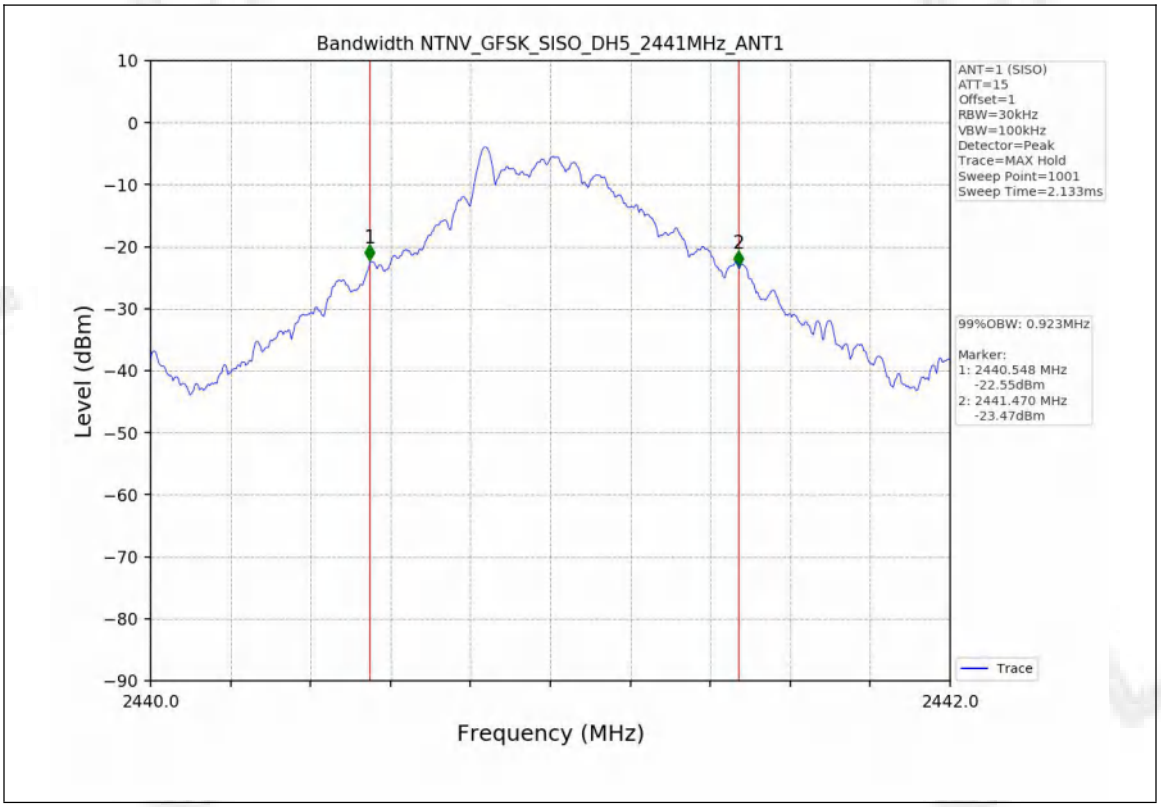

Bandwidth NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.250MHz
Marker:
1: 2401.368 MHz
-24.51dBm
2: 2402.617 MHz
-24.51dBm
3: 2402.002 MHz
-4.51dBm
Trace
Level (dBm)
Frequency (MHz)
2400.8
2403.2

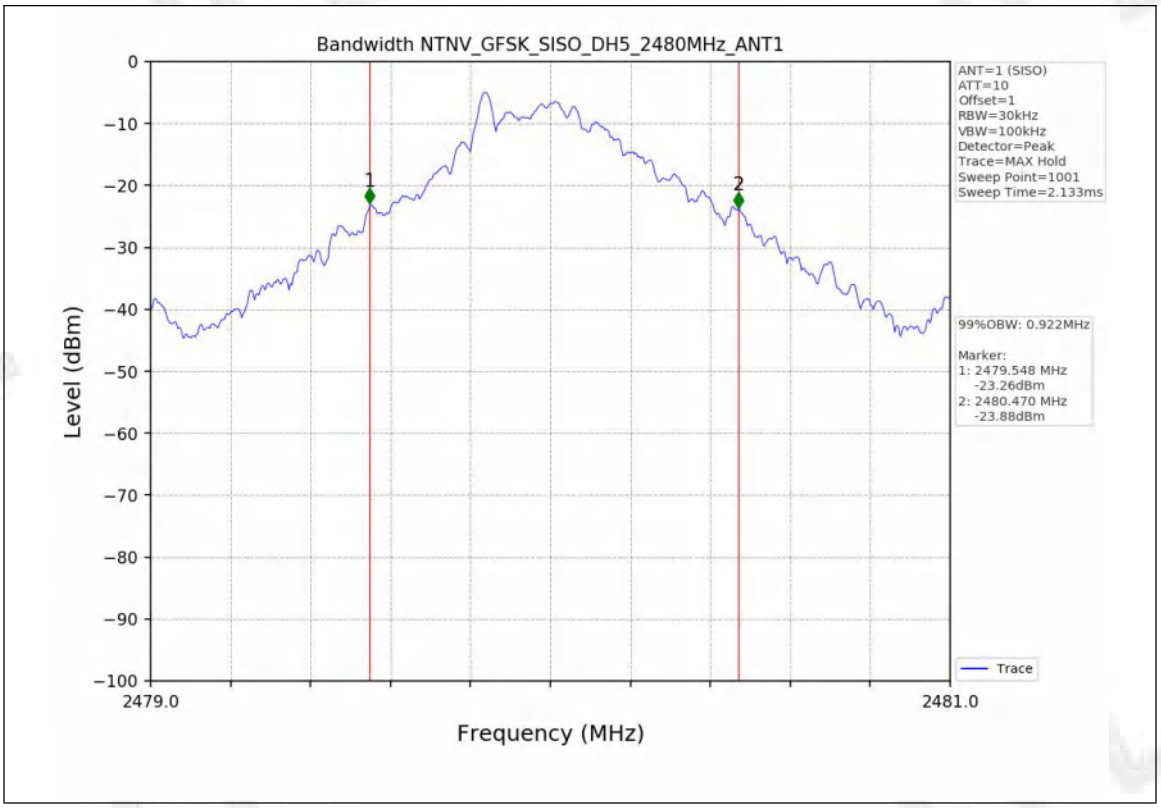

Bandwidth NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.256MHz
Marker:
1: 2440.360 MHz
-24.80dBm
2: 2441.615 MHz
-24.80dBm
3: 2441.002 MHz
-4.80dBm
Trace
Level (dBm)
Frequency (MHz)
2439.8
2442.2

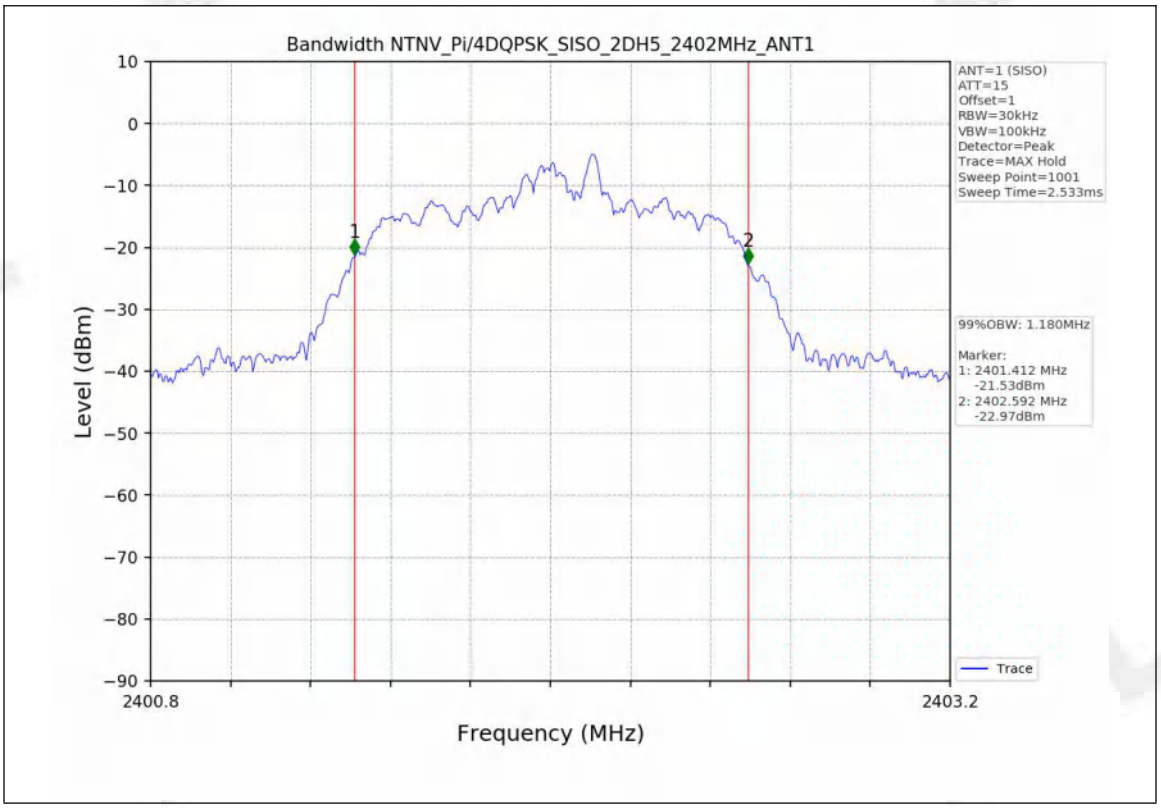


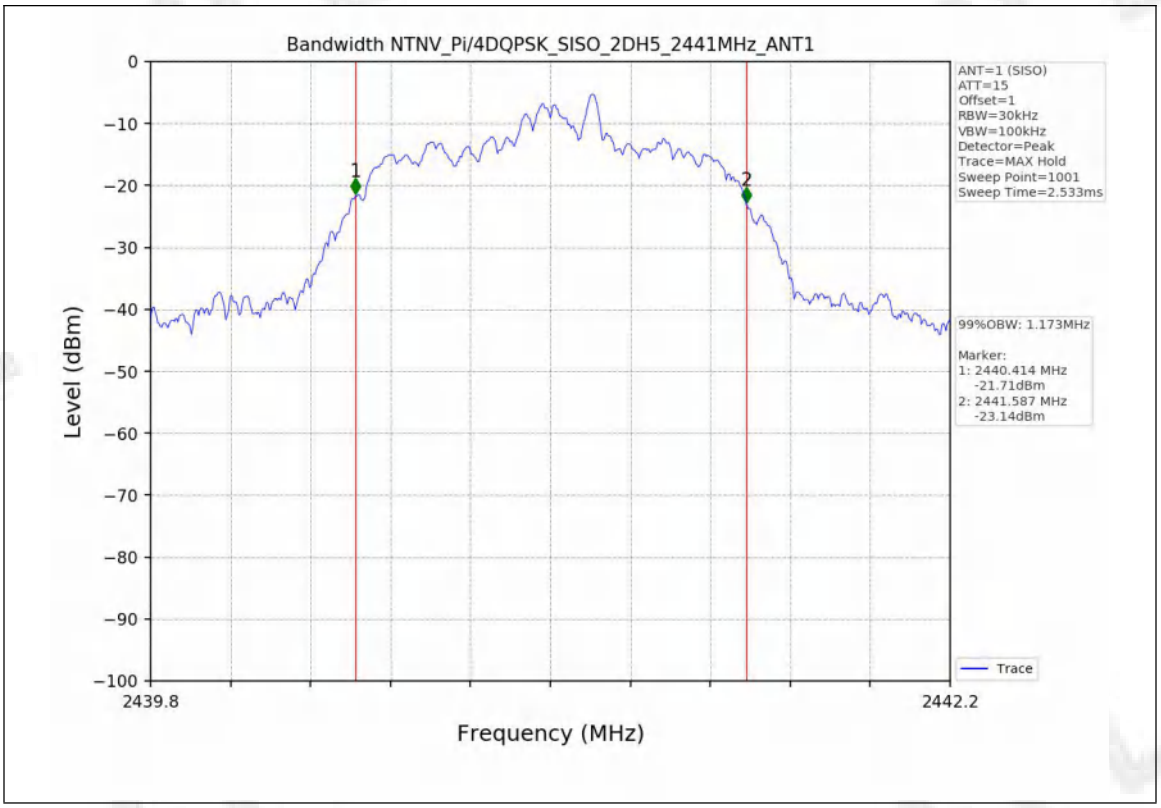
1.3 Test Graph - 99% Occupied Bandwidth

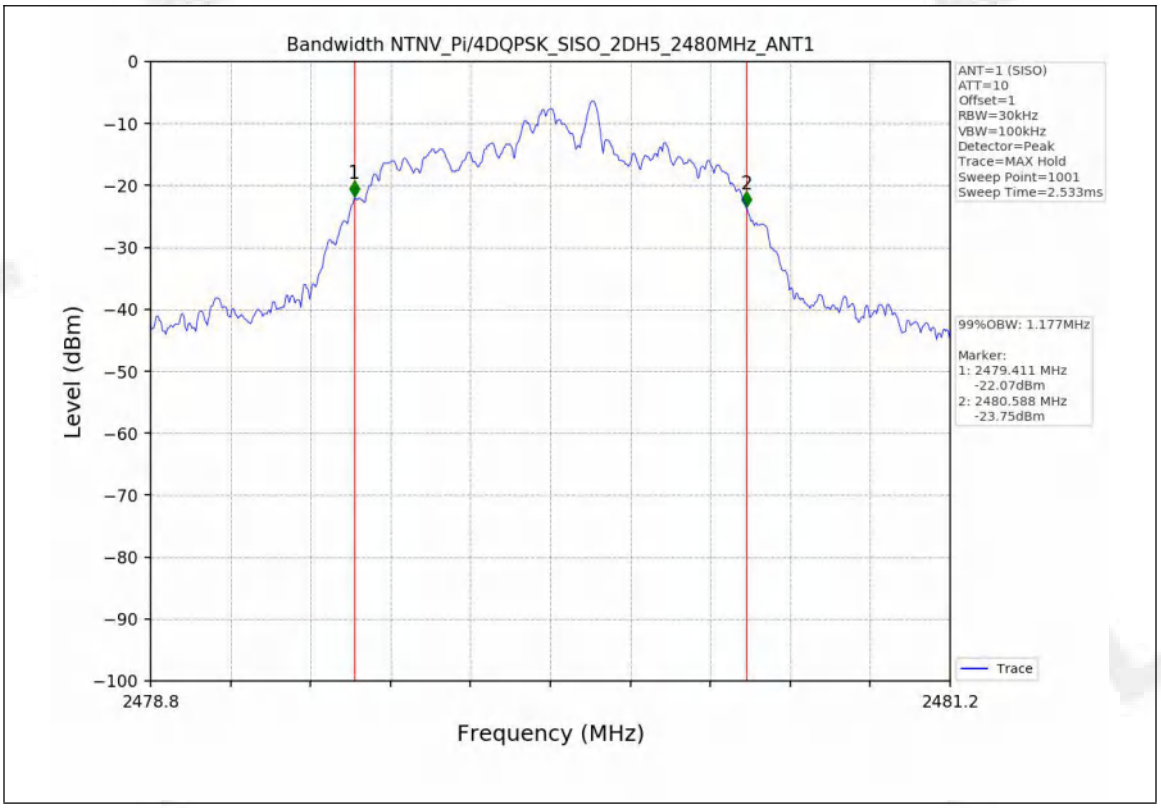


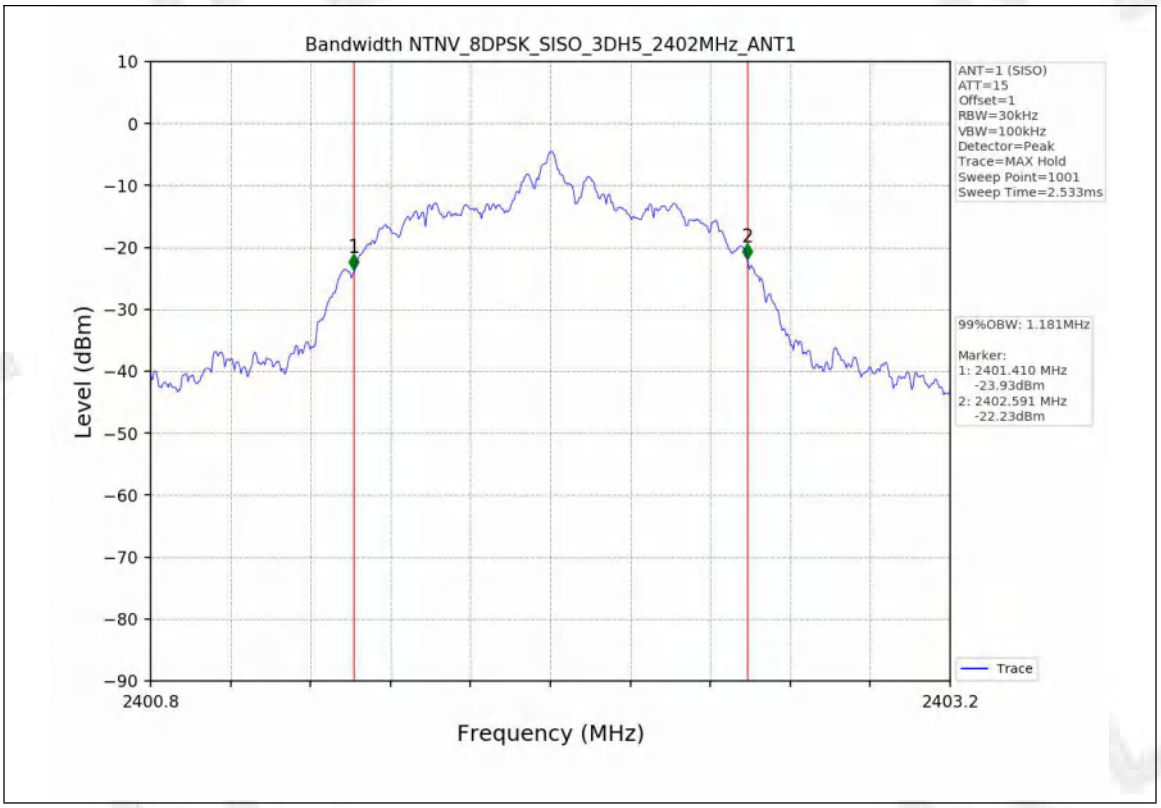

Bandwidth NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
99%OBW: 0.923MHz
Marker:
1: 2440.548 MHz
-22.55dBm
2: 2441.470 MHz
-23.47dBm
Trace
Level (dBm)
Frequency (MHz)
2440.0
2442.0

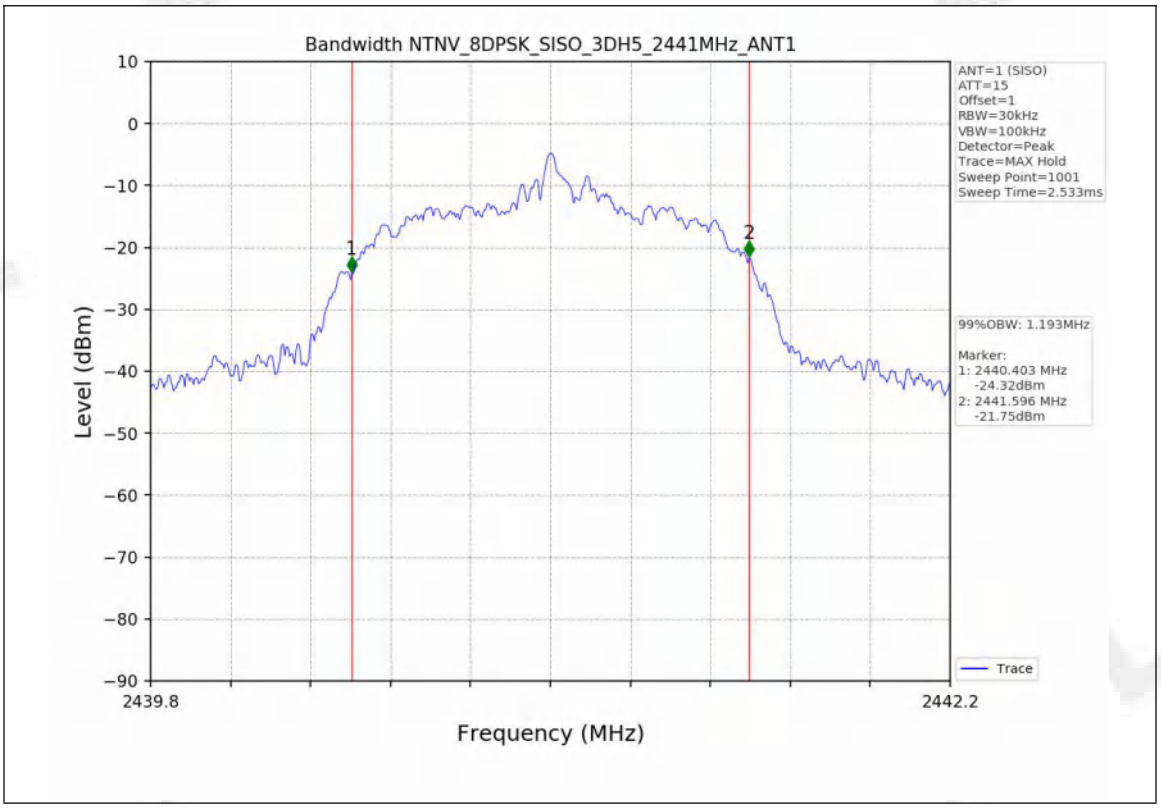

Bandwidth NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
99%OBW: 0.922MHz
Marker:
1: 2479.548 MHz
-23.26dBm
2: 2480.470 MHz
-23.88dBm
Trace
Level (dBm)
Frequency (MHz)
2479.0
2481.0

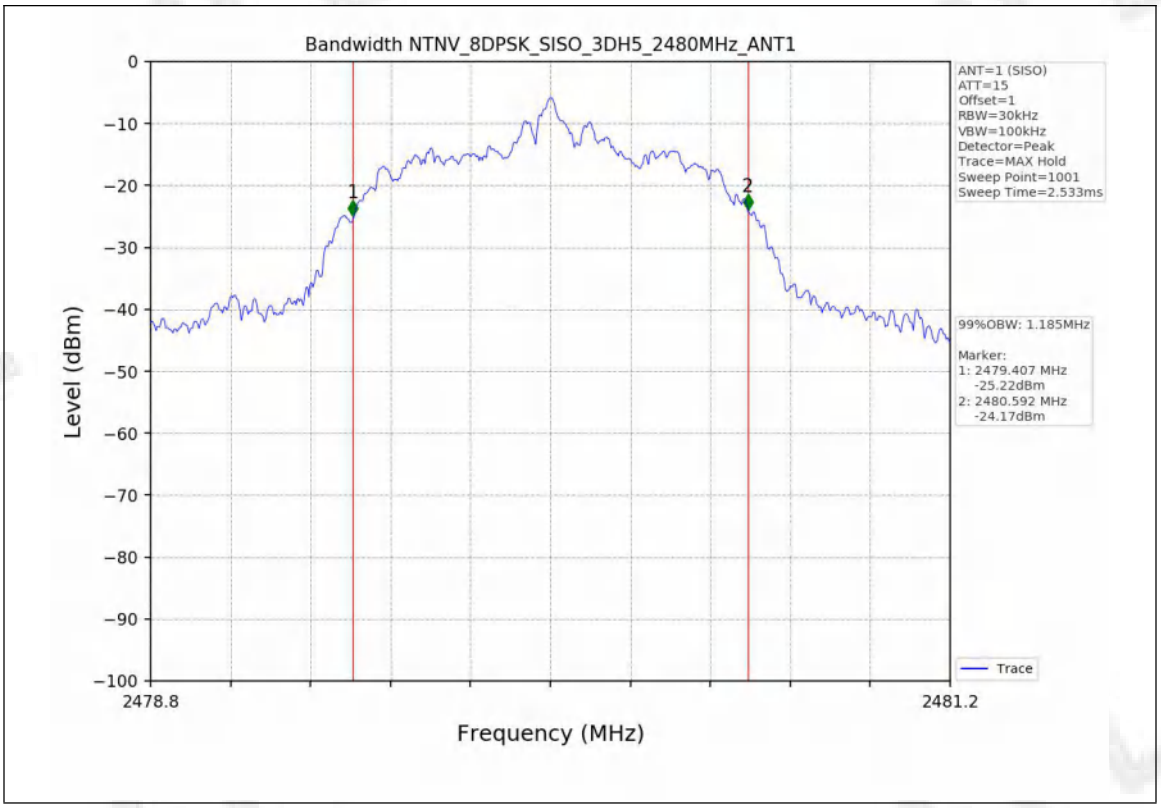

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
99%OBW: 1.180MHz
Marker:
1: 2401.412 MHz
-21.53dBm
2: 2402.592 MHz
-22.97dBm
Trace
Level (dBm)
Frequency (MHz)
2400.8
2403.2


Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
99%OBW: 1.173MHz
Marker:
1: 2440.414 MHz
-21.71dBm
2: 2441.587 MHz
-23.14dBm
Trace
Level (dBm)
Frequency (MHz)
2439.8
2442.2


Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
99%OBW: 1.177MHz
Marker:
1: 2479.411 MHz
-22.07dBm
2: 2480.588 MHz
-23.75dBm
Trace
Level (dBm)
Frequency (MHz)
2478.8
2481.2


Bandwidth NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
99%OBW: 1.181MHz
Marker:
1: 2401.410 MHz
-23.93dBm
2: 2402.591 MHz
-22.23dBm
Trace
Level (dBm)
Frequency (MHz)
2400.8
2403.2


Bandwidth NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
99%OBW: 1.193MHz
Marker:
1: 2440.403 MHz
-24.32dBm
2: 2441.596 MHz
-21.75dBm
Trace
Level (dBm)
Frequency (MHz)
2439.8
2442.2

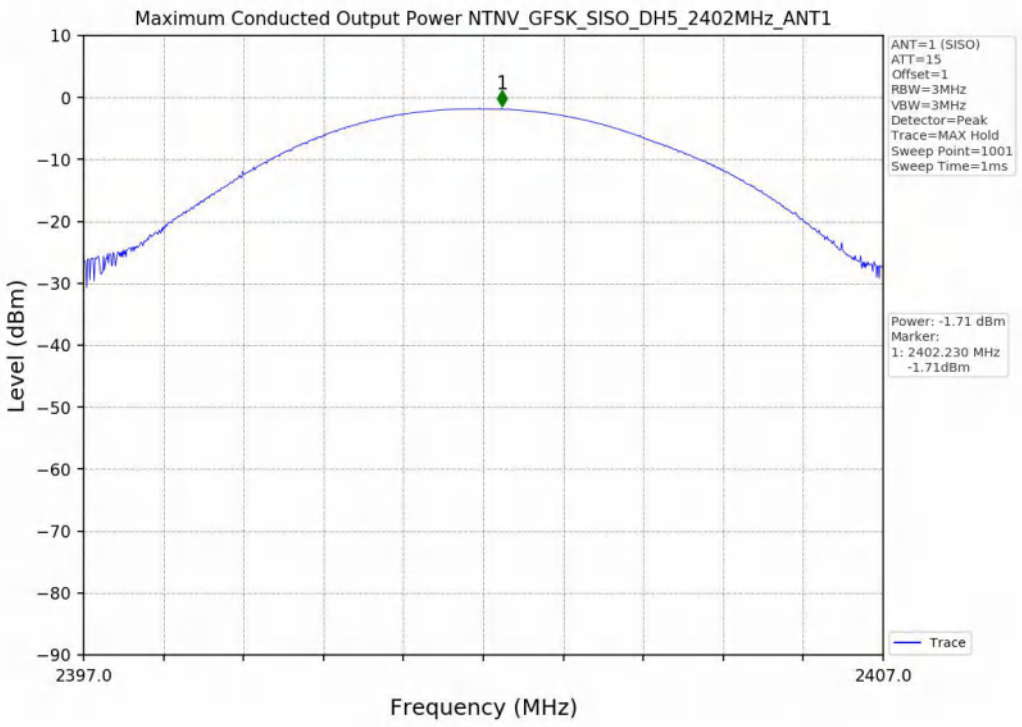


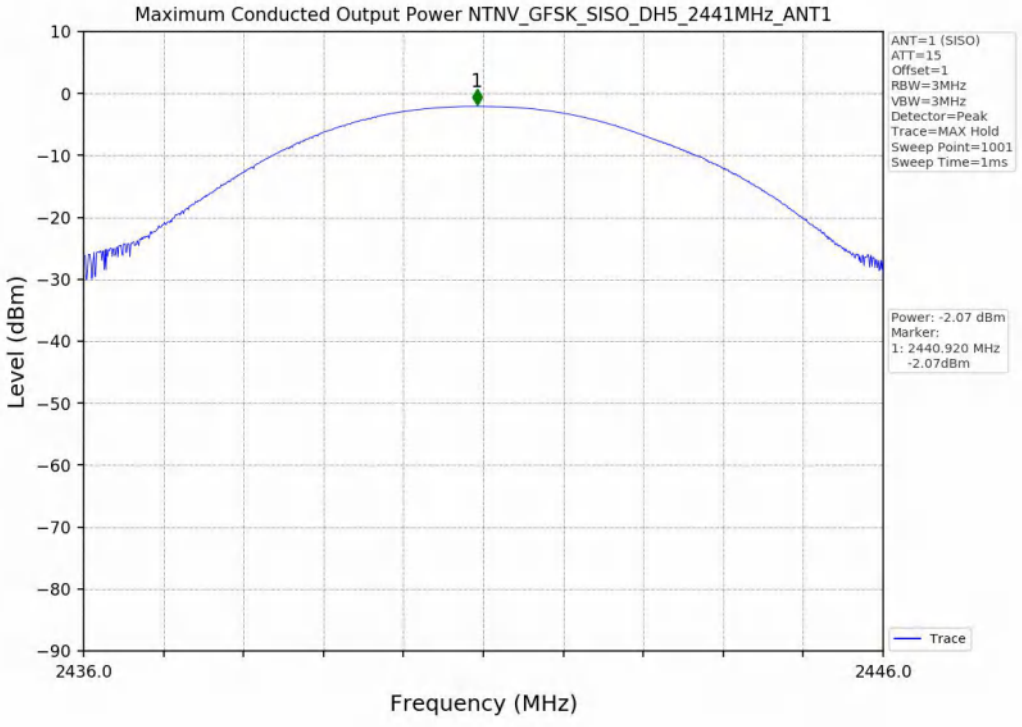
2. Maximum Conducted Output Power

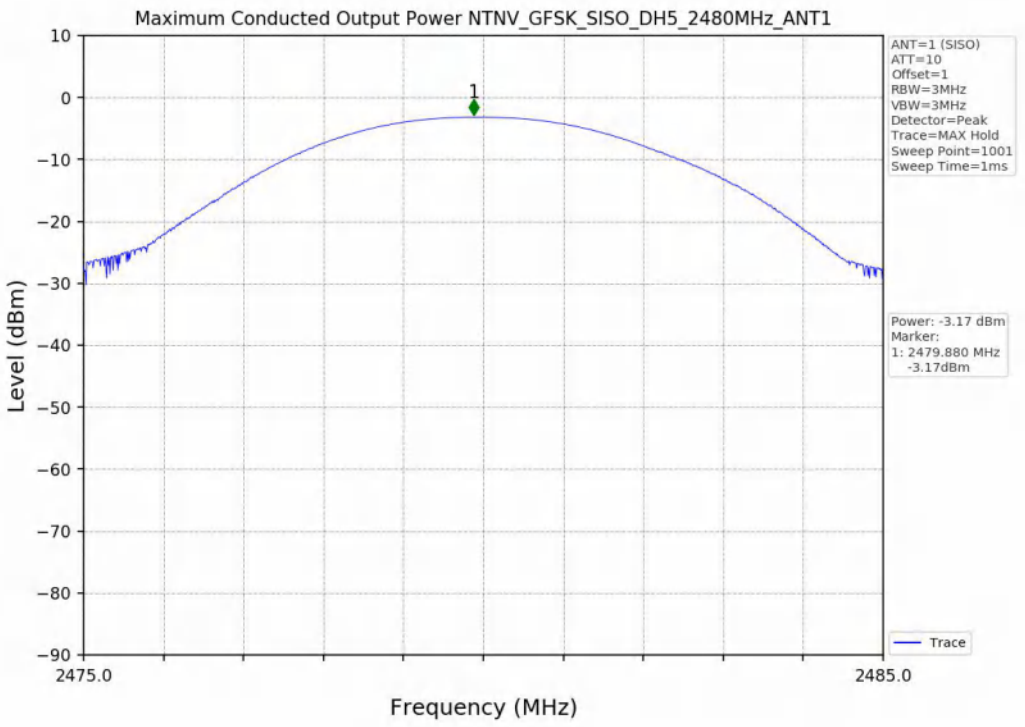
2.1 Test Result

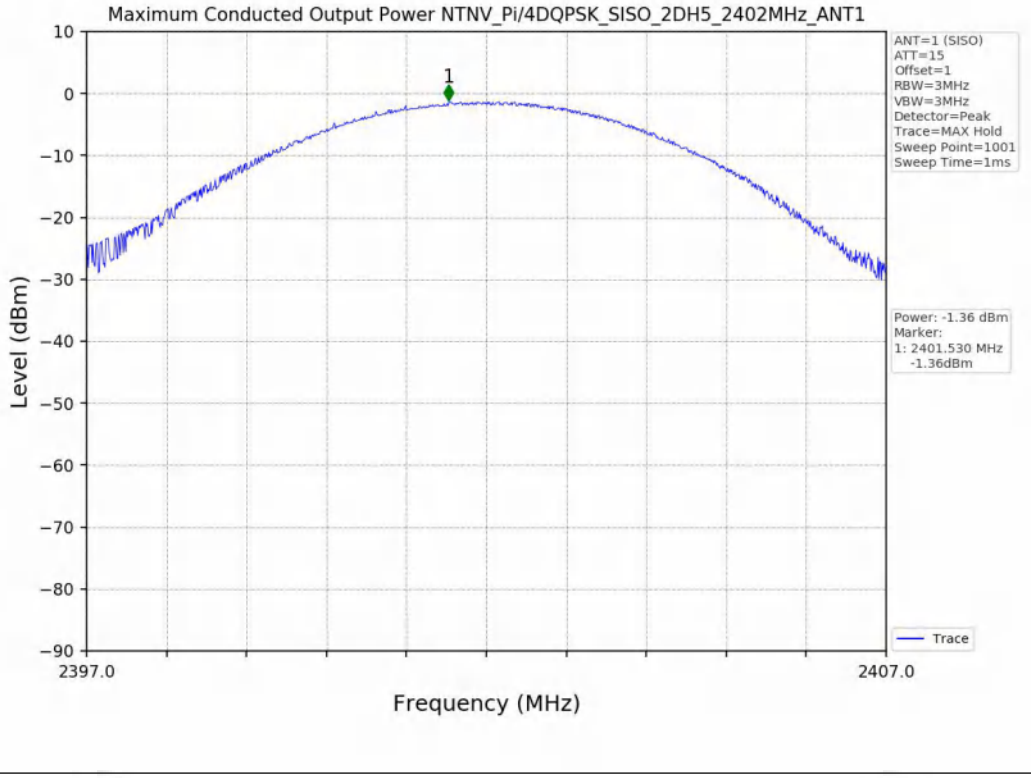
Test Mode	Frequency (MHz)	Tx Type	Measured Peak Output Power (dBm)	Limits (dBm)	Verdict
			Ant 1		
GFSK	2402	SISO	-1.71	30	PASS
	2441	SISO	-2.07	30	PASS
	2480	SISO	-3.17	30	PASS
Pi/4DQPSK	2402	SISO	-1.36	20.97	PASS
	2441	SISO	-1.55	20.97	PASS
	2480	SISO	-2.58	20.97	PASS
8DPSK	2402	SISO	0.00	20.97	PASS
	2441	SISO	-0.53	20.97	PASS
	2480	SISO	-1.25	20.97	PASS

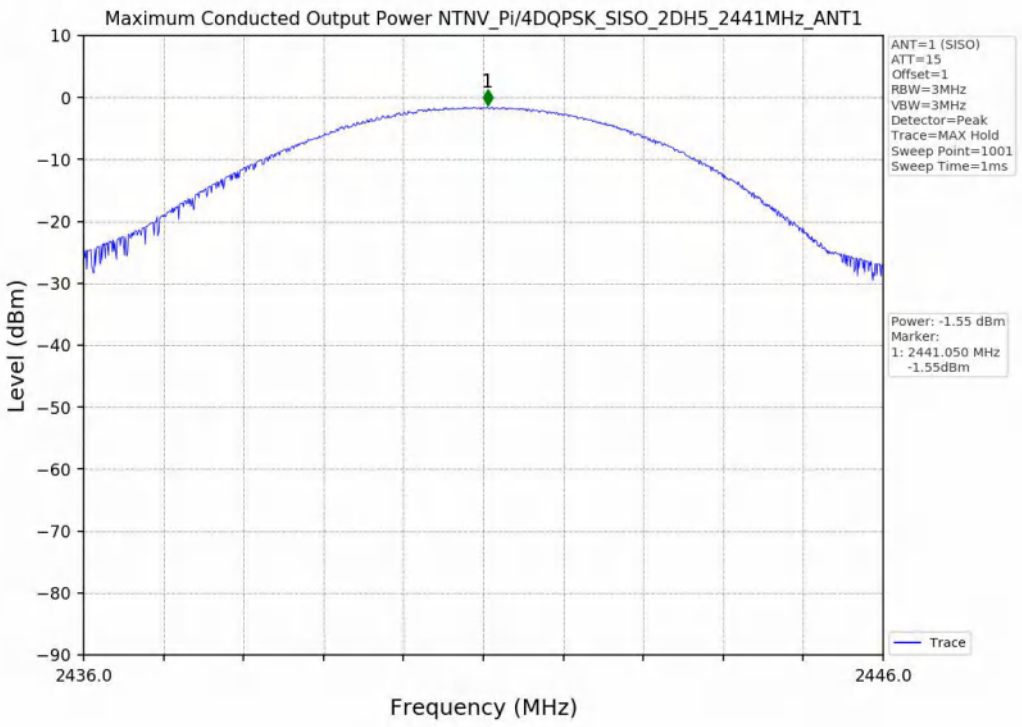
2.2 Test Graph

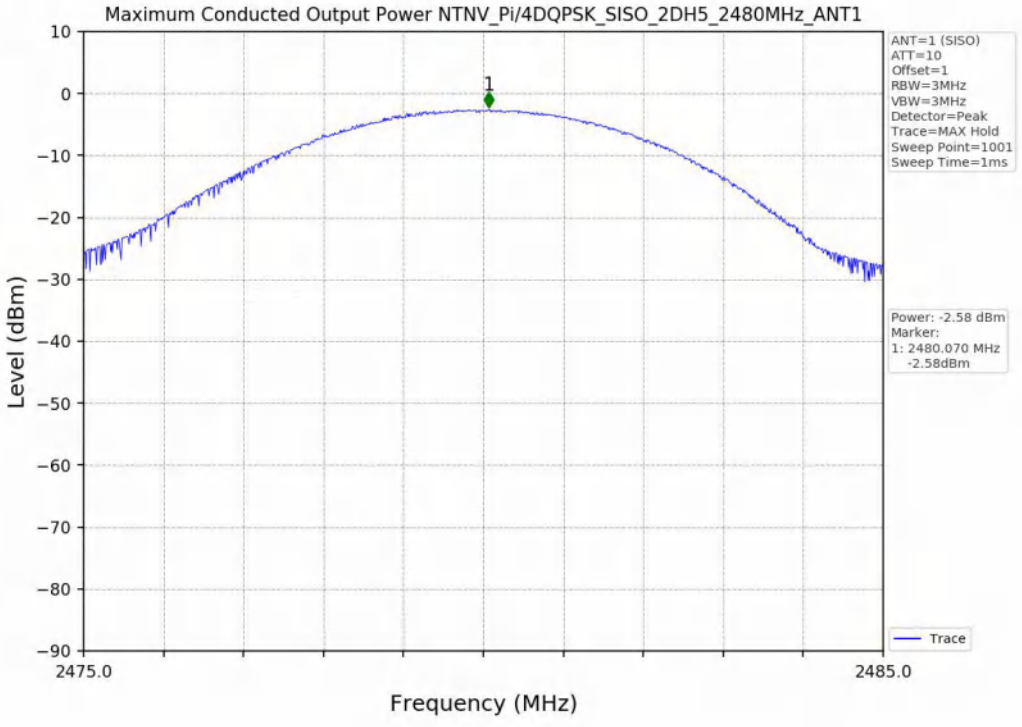

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: -1.71 dBm
Marker:
1: 2402.230 MHz
-1.71dBm
Trace
Level (dBm)
Frequency (MHz)
2397.0
2407.0

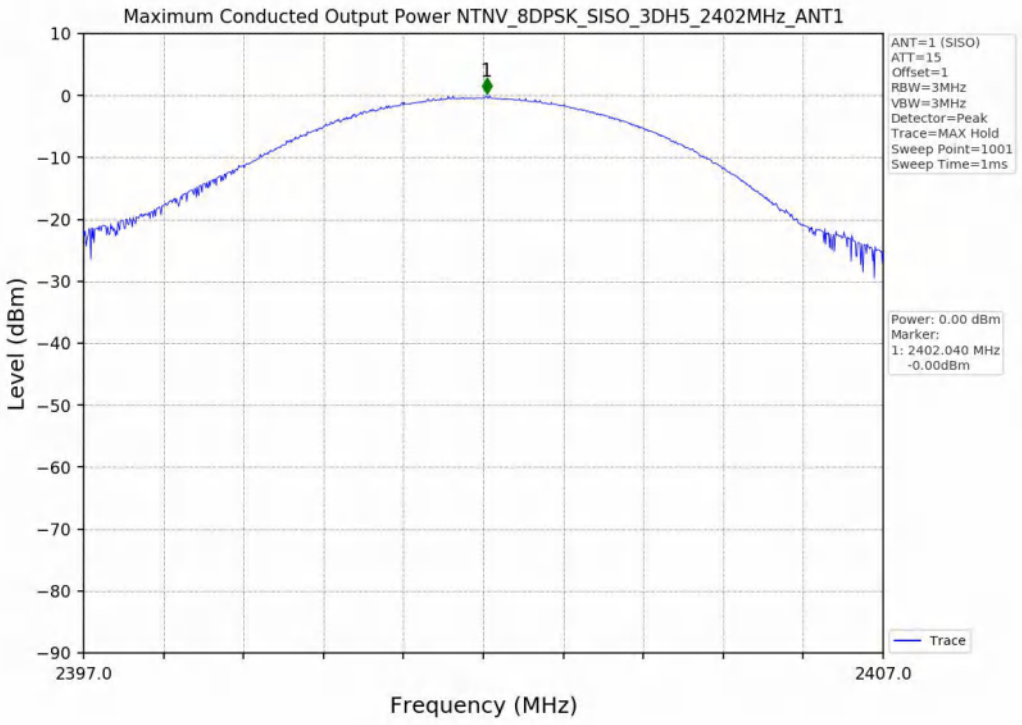

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: -2.07 dBm
Marker:
1: 2440.920 MHz
-2.07dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0

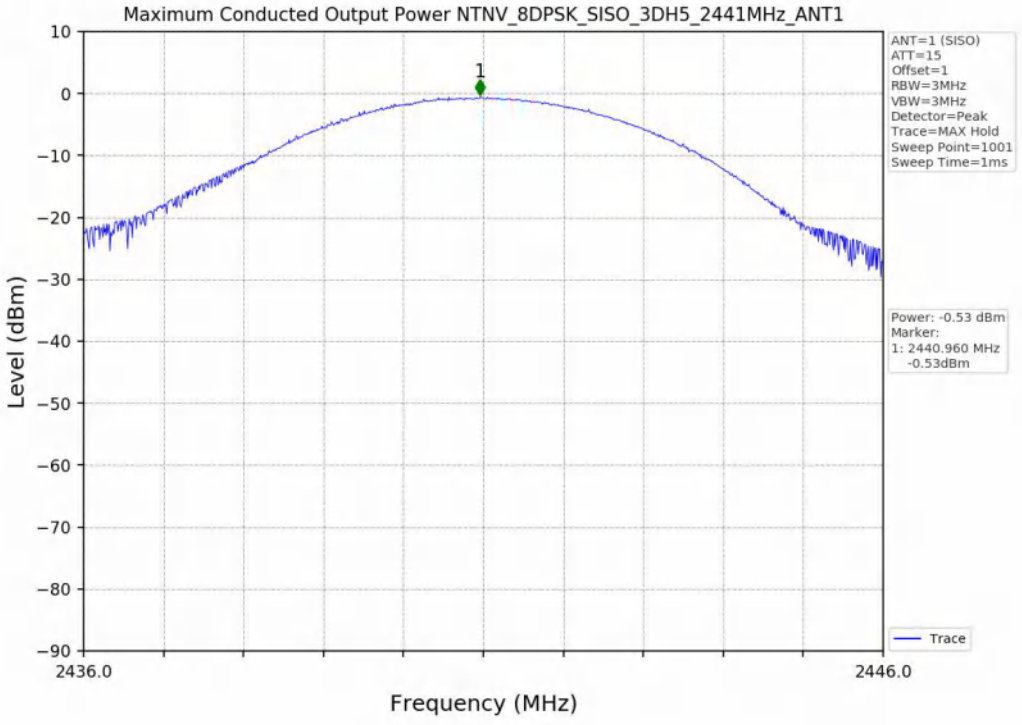

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: -3.17 dBm
Marker:
1: 2479.880 MHz
-3.17dBm
Trace
Level (dBm)
Frequency (MHz)
2475.0
2485.0

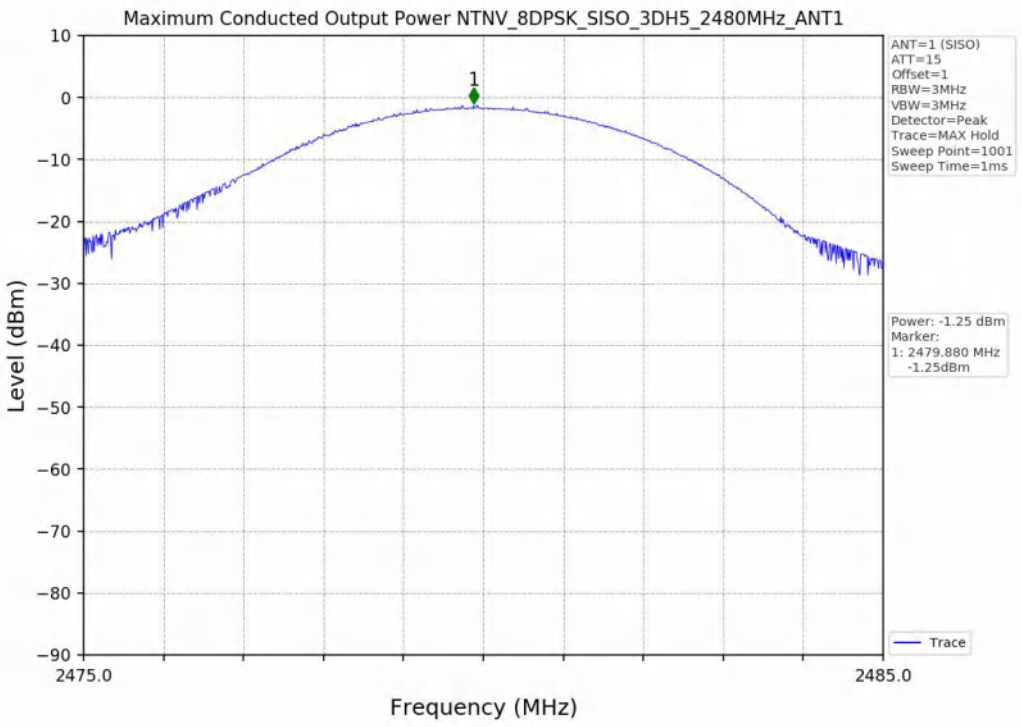

Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: -1.36 dBm
Marker:
1: 2401.530 MHz
-1.36dBm
Trace
Level (dBm)
Frequency (MHz)
2397.0
2407.0


Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: -1.55 dBm
Marker:
1: 2441.050 MHz
-1.55dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0


Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: -2.58 dBm
Marker:
1: 2480.070 MHz
-2.58dBm
Trace
Level (dBm)
Frequency (MHz)
2475.0
2485.0


Maximum Conducted Output Power NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 0.00 dBm
Marker:
1: 2402.040 MHz
-0.00dBm
Trace
Level (dBm)
Frequency (MHz)
2397.0
2407.0


Maximum Conducted Output Power NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: -0.53 dBm
Marker:
1: 2440.960 MHz
-0.53dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0

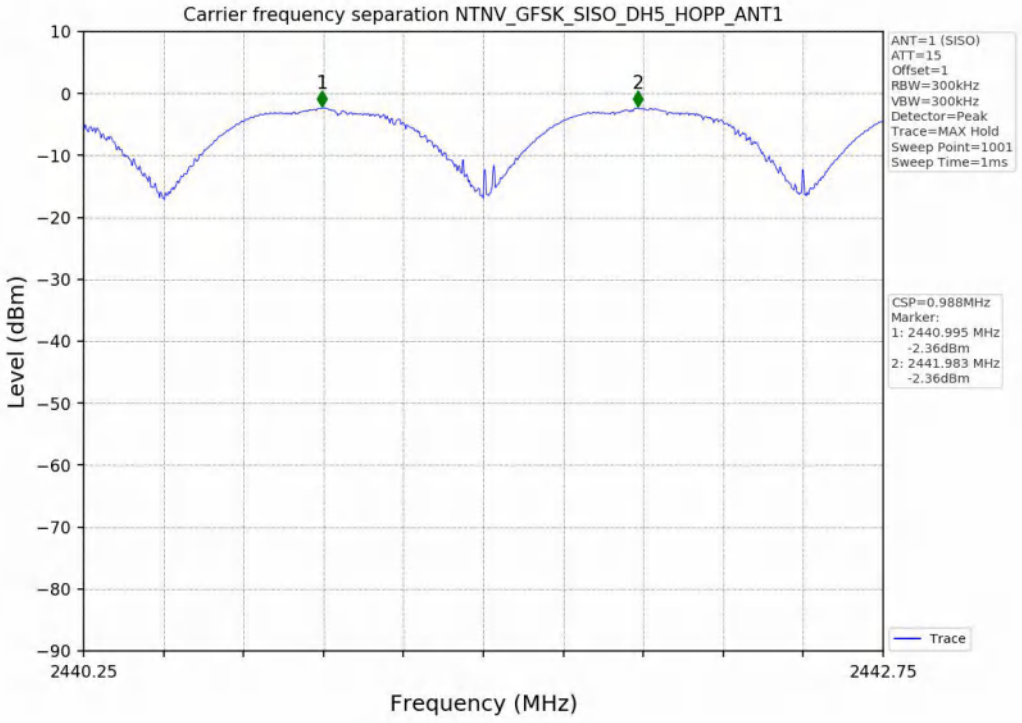


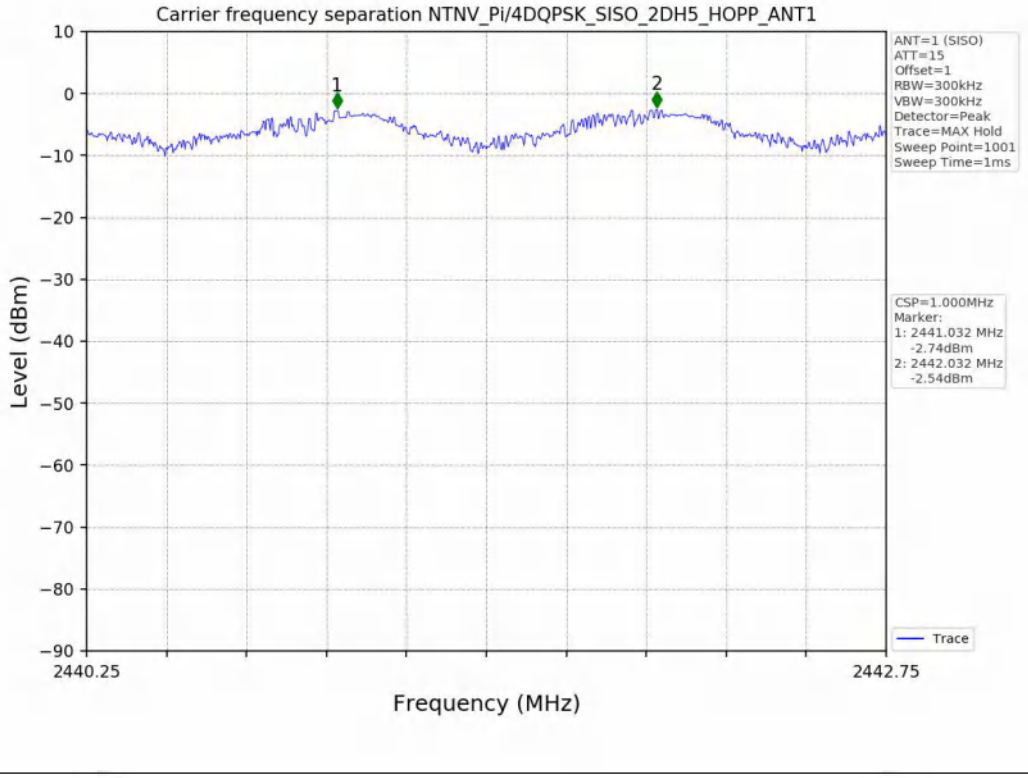
3. Carrier frequency separation

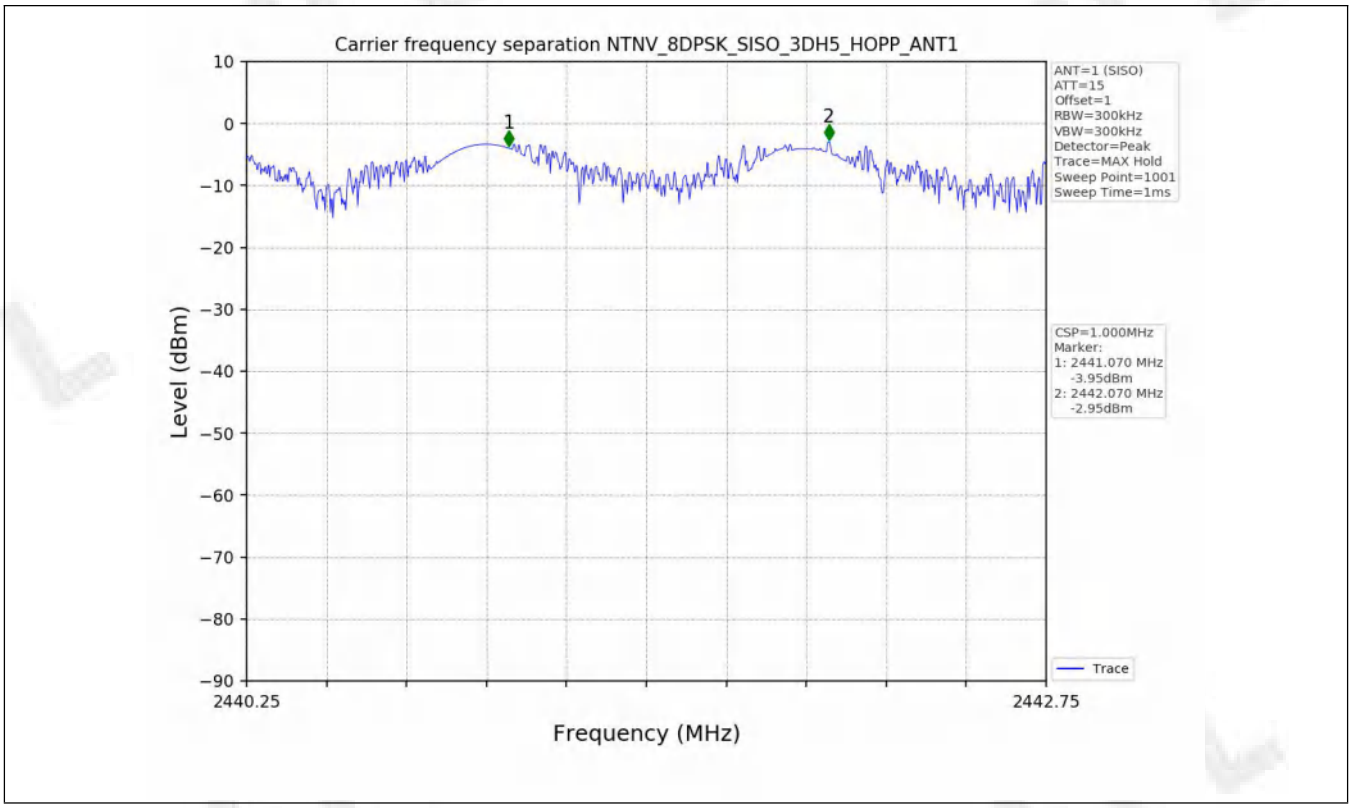
3.1 Test Result

Test Mode	TX Type	ANT No.	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limits (MHz)	Verdict
GFSK	SISO	1	0.988	0.945	≥0.945	PASS
Pi/4DQPSK	SISO	1	1.000	1.273	≥0.849	PASS
8DPSK	SISO	1	1.000	1.257	≥0.838	PASS

3.2 Test Graph


Carrier frequency separation NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
CSP=0.988MHz
Marker:
1: 2440.995 MHz
-2.36dBm
2: 2441.983 MHz
-2.36dBm
Trace
Level (dBm)
Frequency (MHz)
2440.25
2442.75


Carrier frequency separation NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
CSP=1.000MHz
Marker:
1: 2441.032 MHz
-2.74dBm
2: 2442.032 MHz
-2.54dBm
Trace
Level (dBm)
Frequency (MHz)
2440.25
2442.75

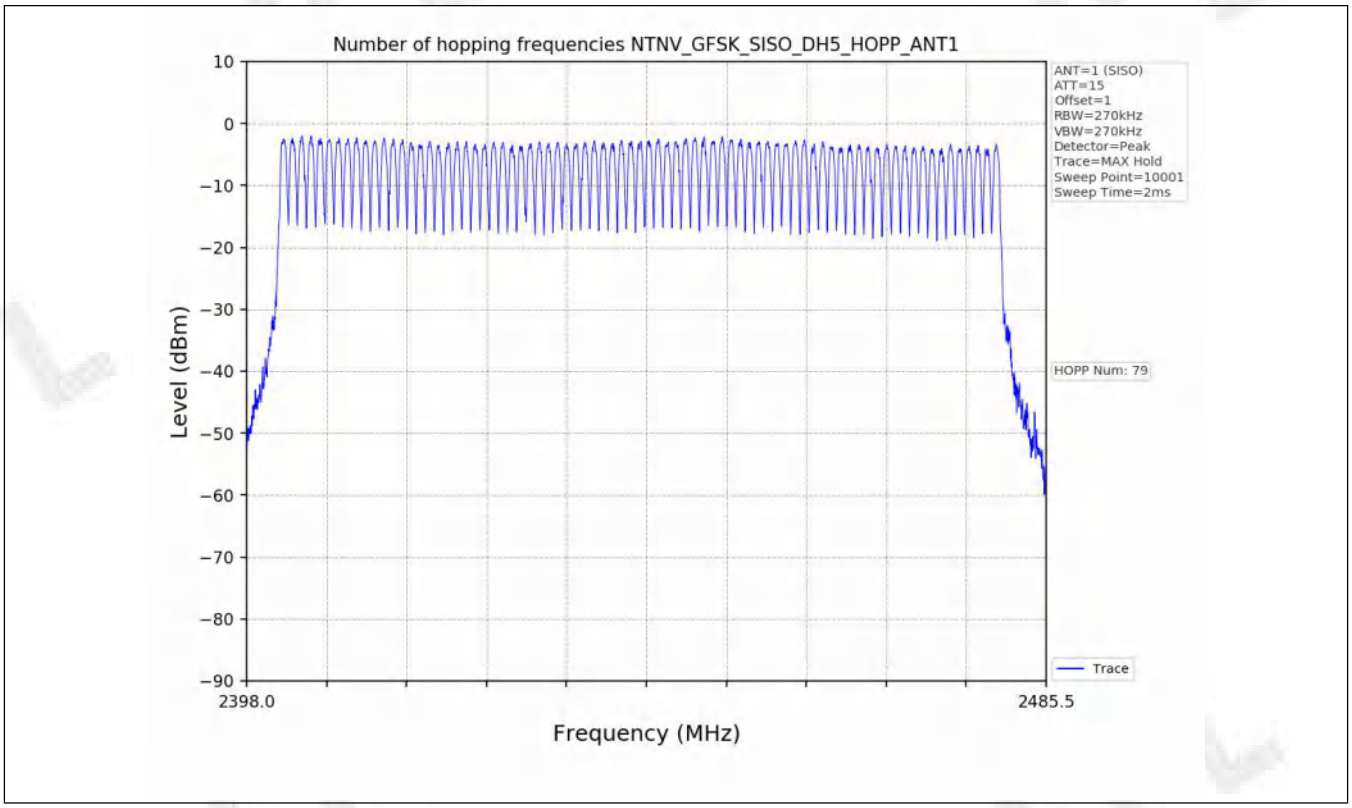


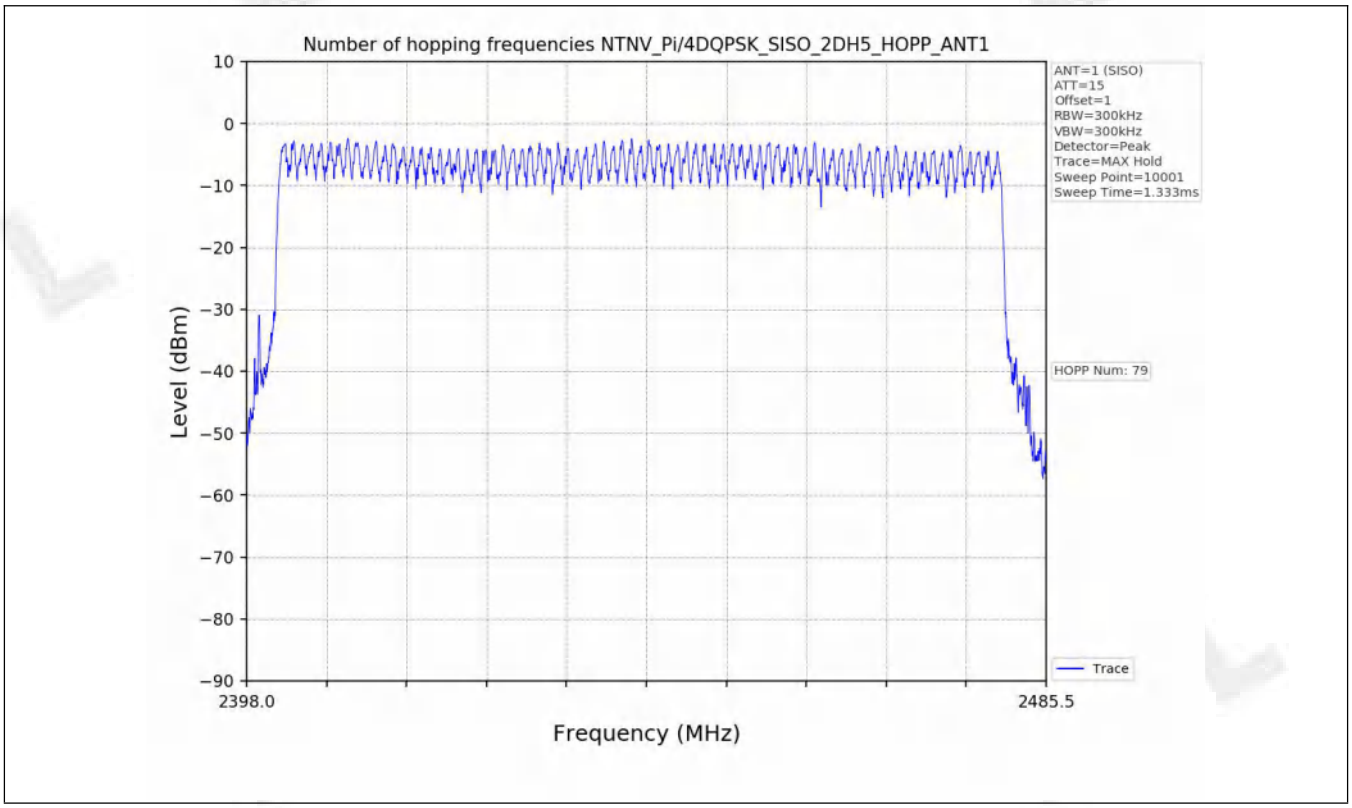
4. Number of hopping frequencies

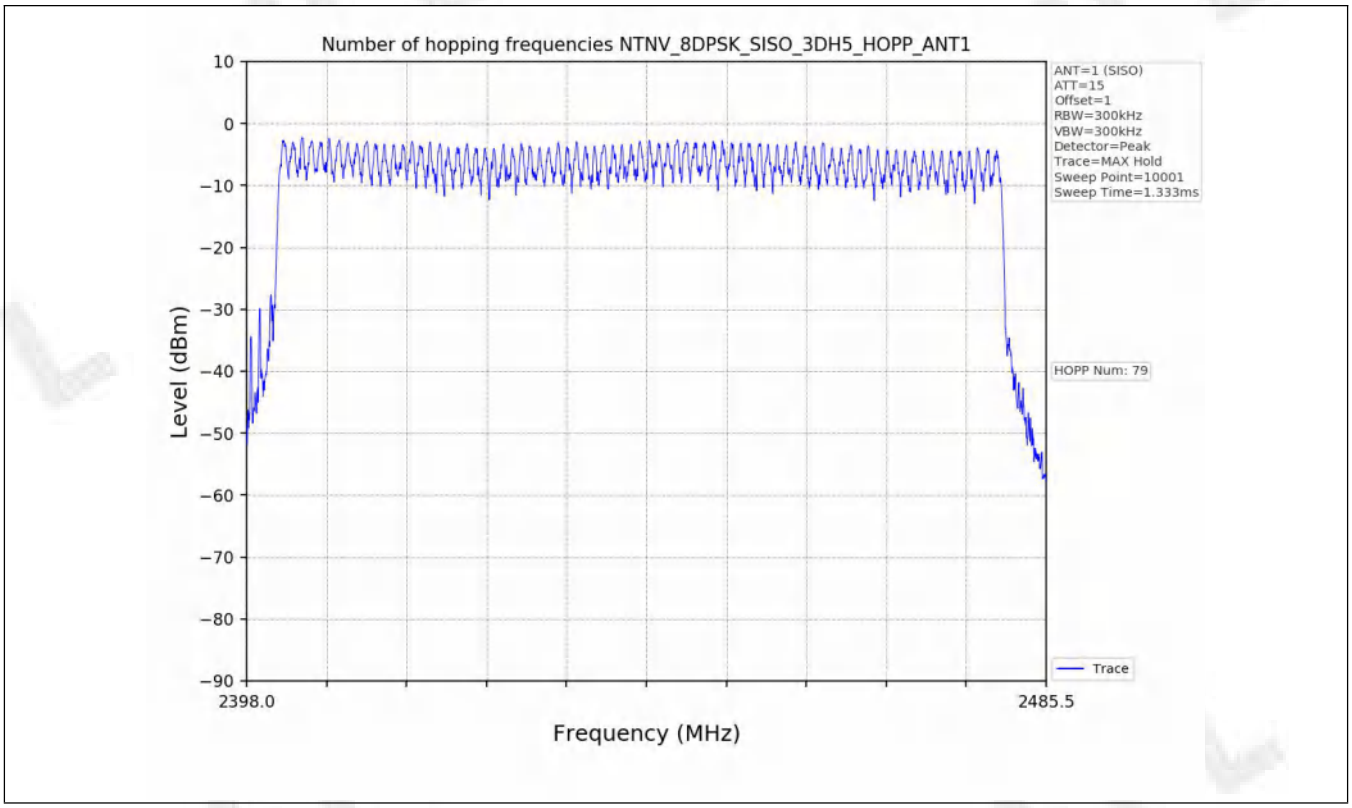
4.1 Test Result

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_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=270kHz
VBW=270kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=2ms
HOPP Num: 79
Trace
Level (dBm)
Frequency (MHz)
2398.0
2485.5


Number of hopping frequencies NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=1.333ms
HOPP Num: 79
Trace
Level (dBm)
Frequency (MHz)
2398.0
2485.5

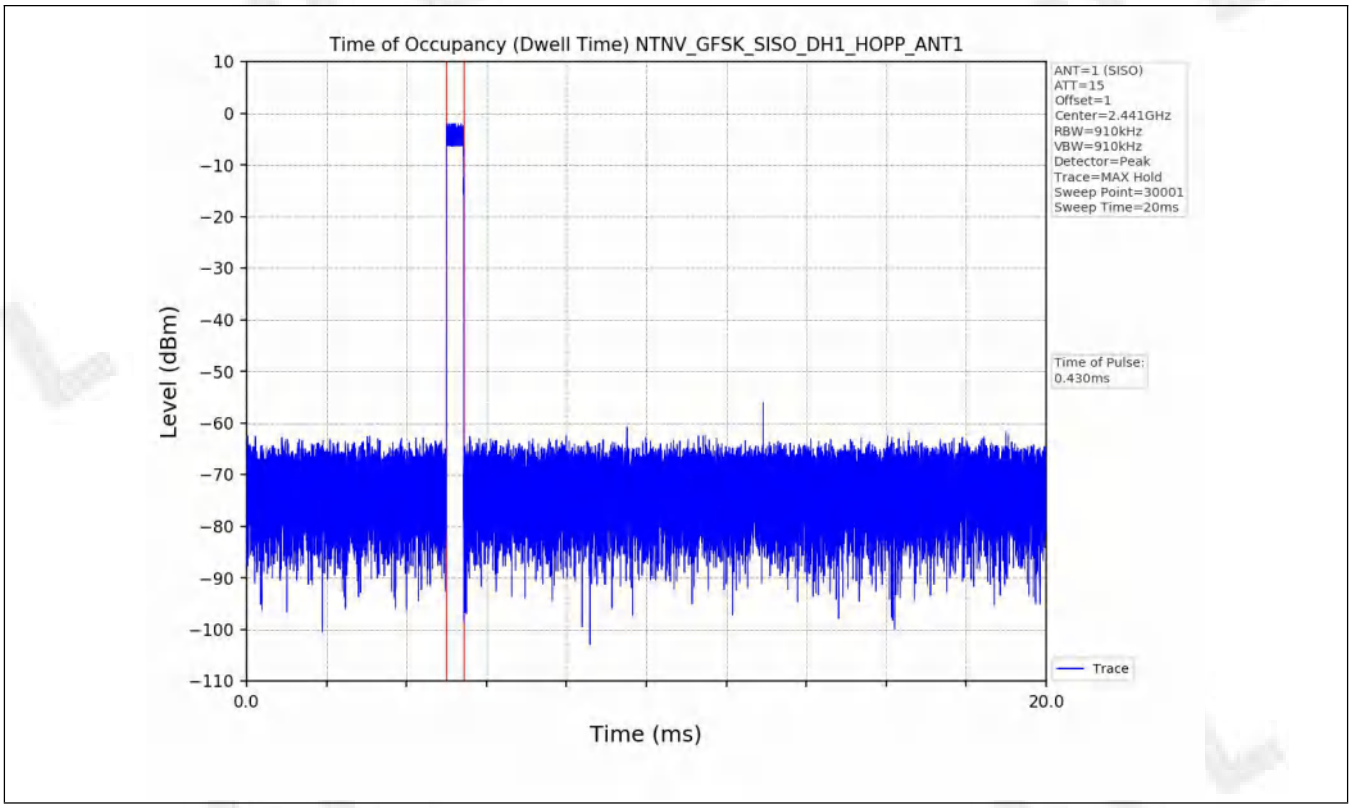


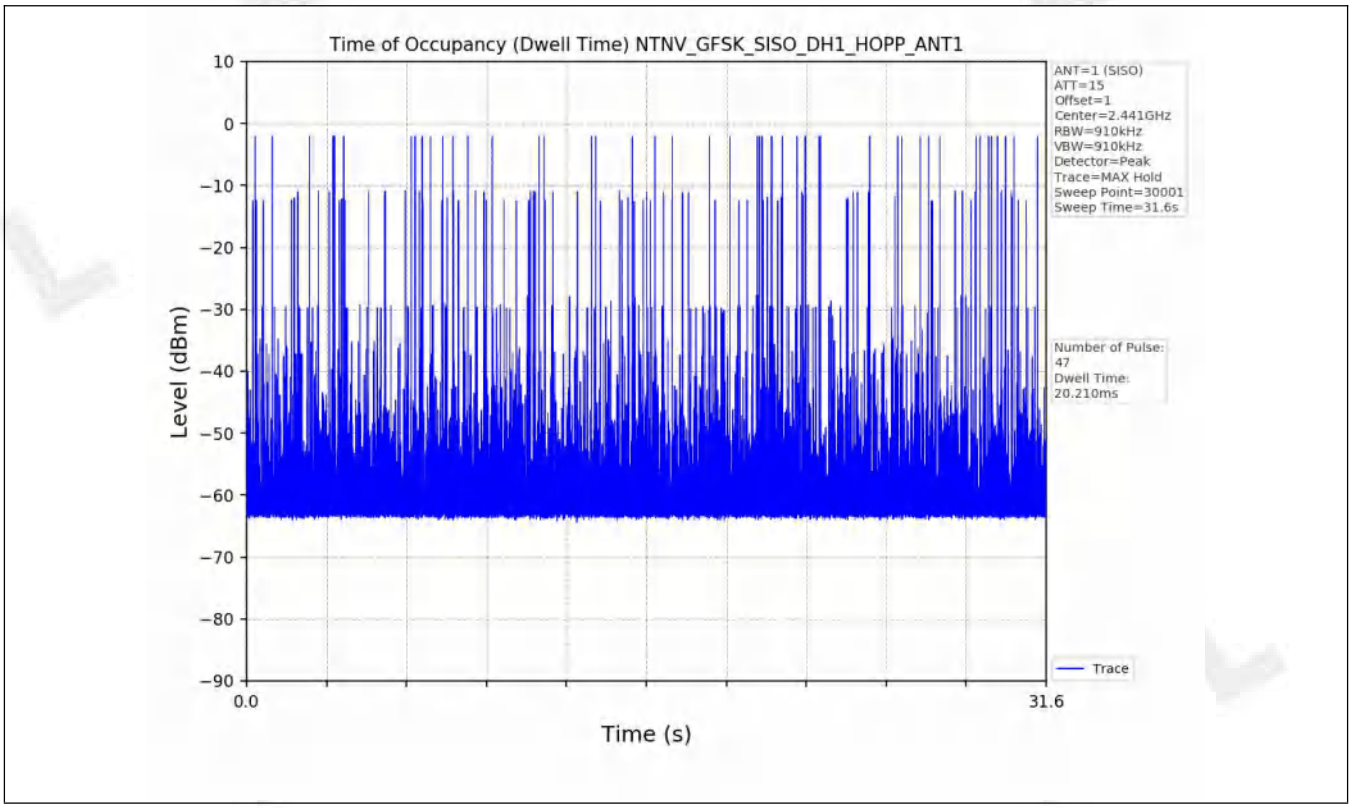
5. Time of Occupancy (Dwell Time)

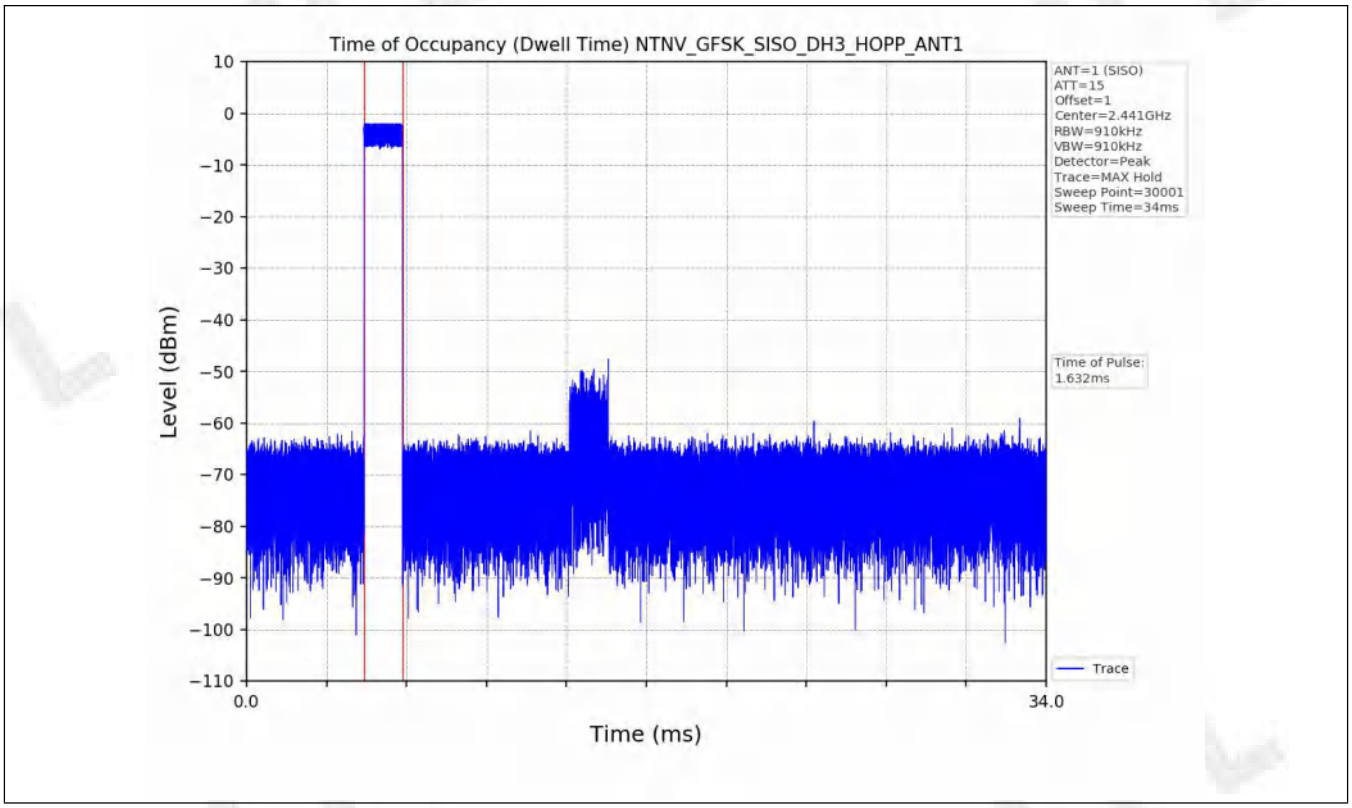
5.1 Test Result

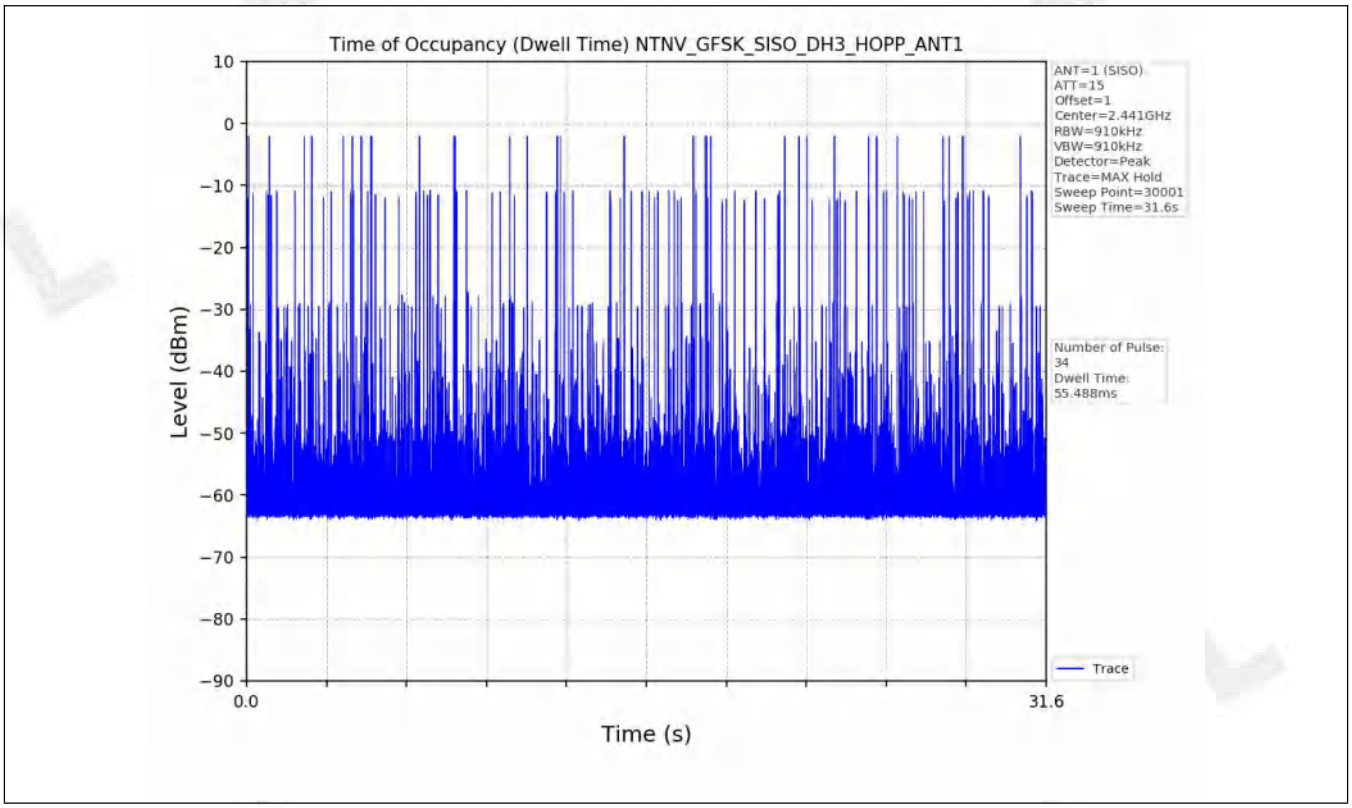
Test Mode	Packet Type	TX Type	ANT No.	Duration of Single Pulse (ms)	Obeservation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limits (ms)	Verdict
GFSK	DH1	SISO	1	0.430	31.6	47	20.210	≤400	PASS
	DH3	SISO	1	1.632	31.6	34	55.488	≤400	PASS
	DH5	SISO	1	2.835	31.6	54	153.090	≤400	PASS
Pi/4DQPSK	2DH1	SISO	1	0.495	31.6	49	24.255	≤400	PASS
	2DH3	SISO	1	1.694	31.6	35	59.290	≤400	PASS
	2DH5	SISO	1	2.825	31.6	23	64.975	≤400	PASS
8DPSK	3DH1	SISO	1	0.421	31.6	52	21.892	≤400	PASS
	3DH3	SISO	1	1.674	31.6	41	68.634	≤400	PASS
	3DH5	SISO	1	2.767	31.6	46	127.282	≤400	PASS

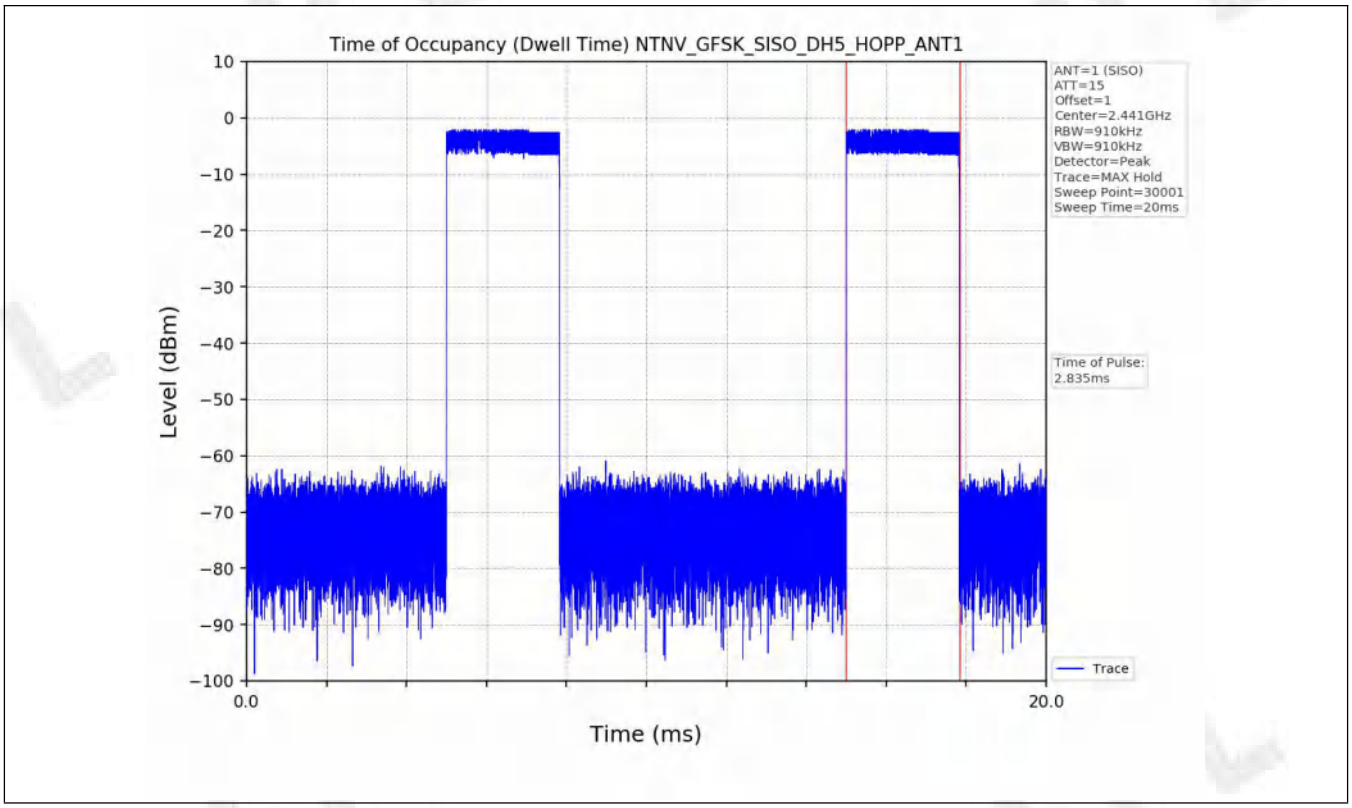
5.2 Test Graph

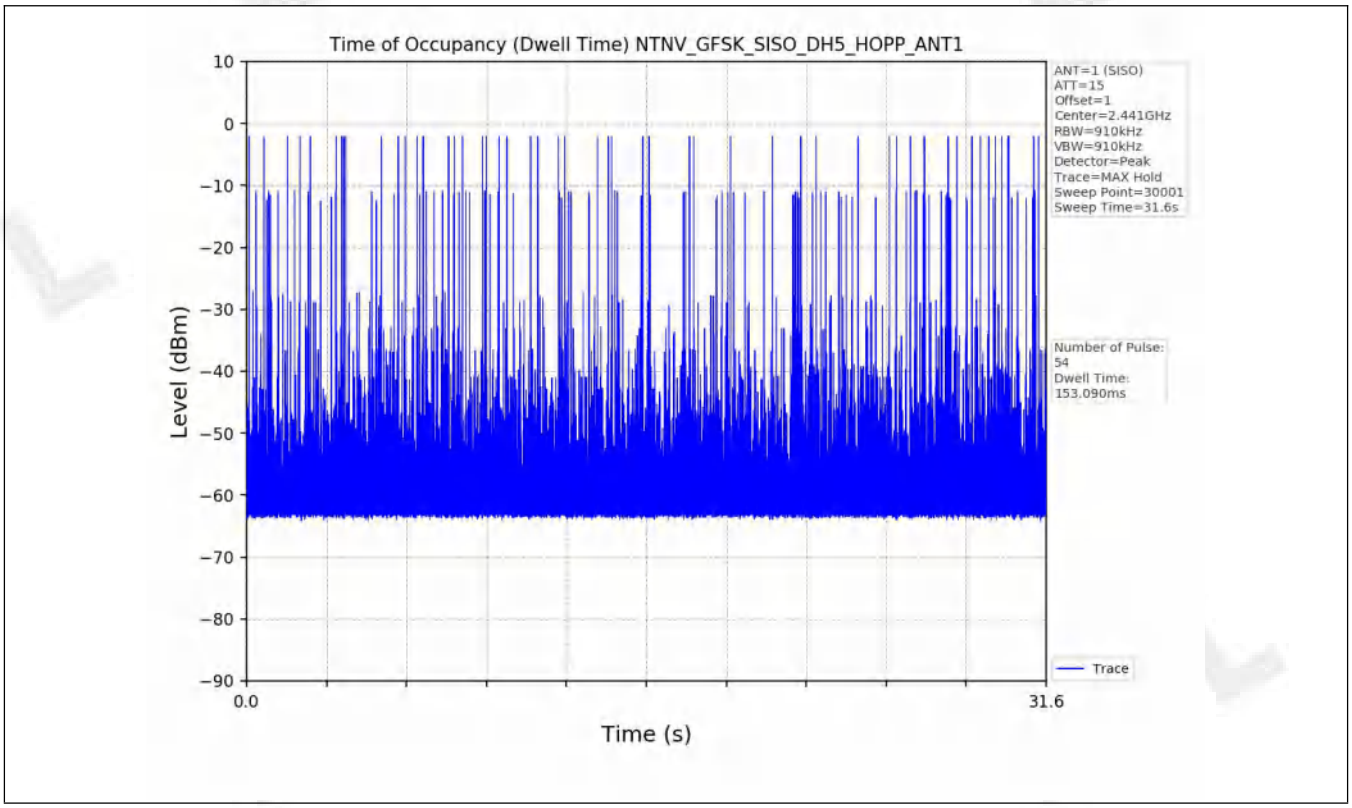

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
0.430ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
20.0

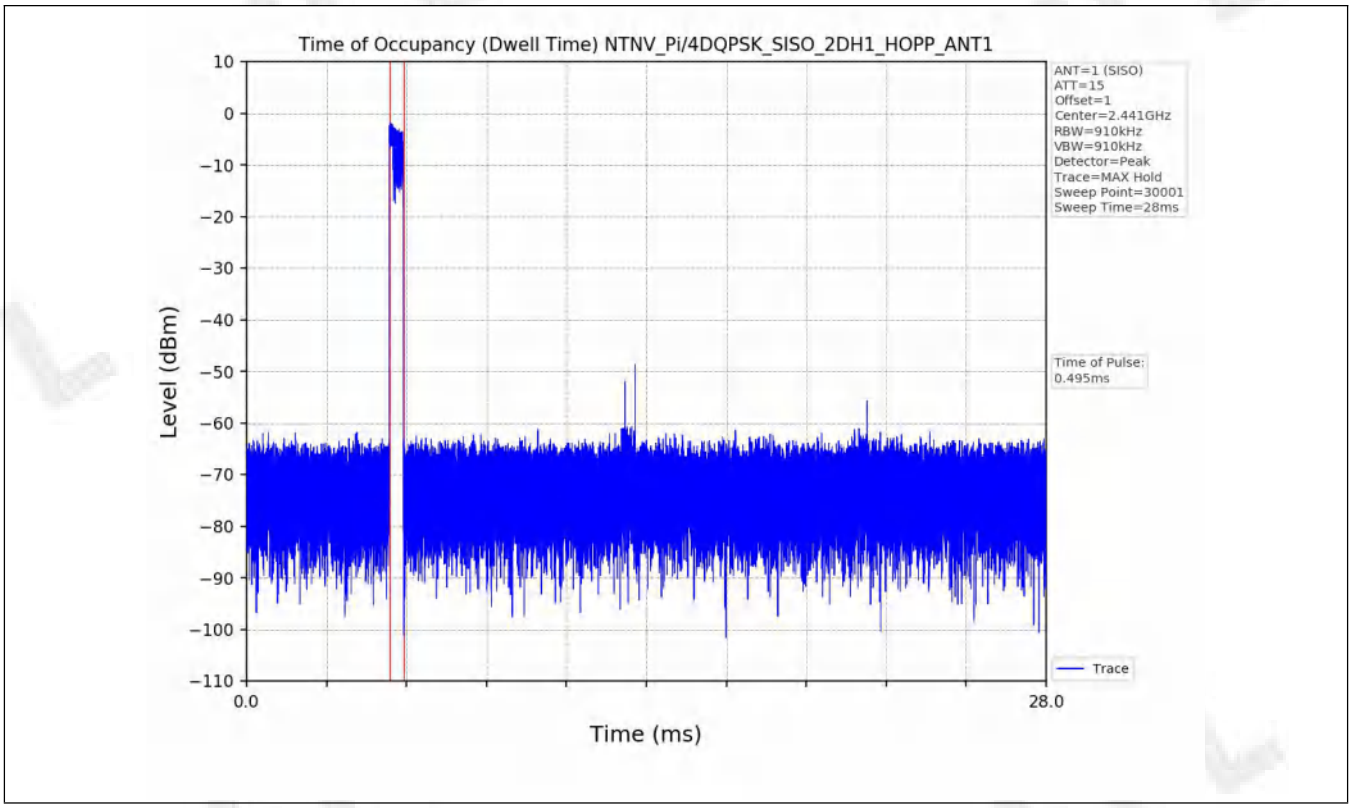

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
47
Dwell Time:
20.210ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

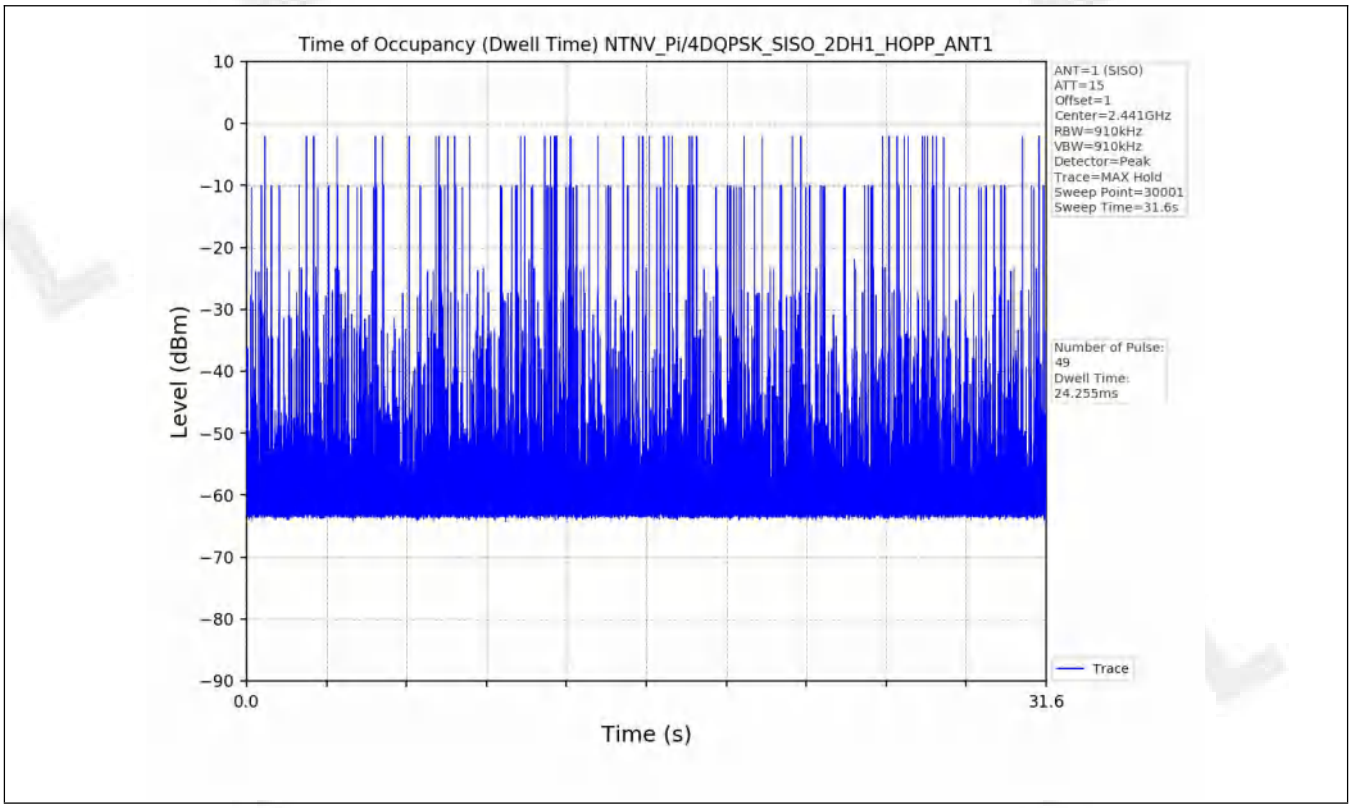

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=34ms
Time of Pulse:
1.632ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
34.0

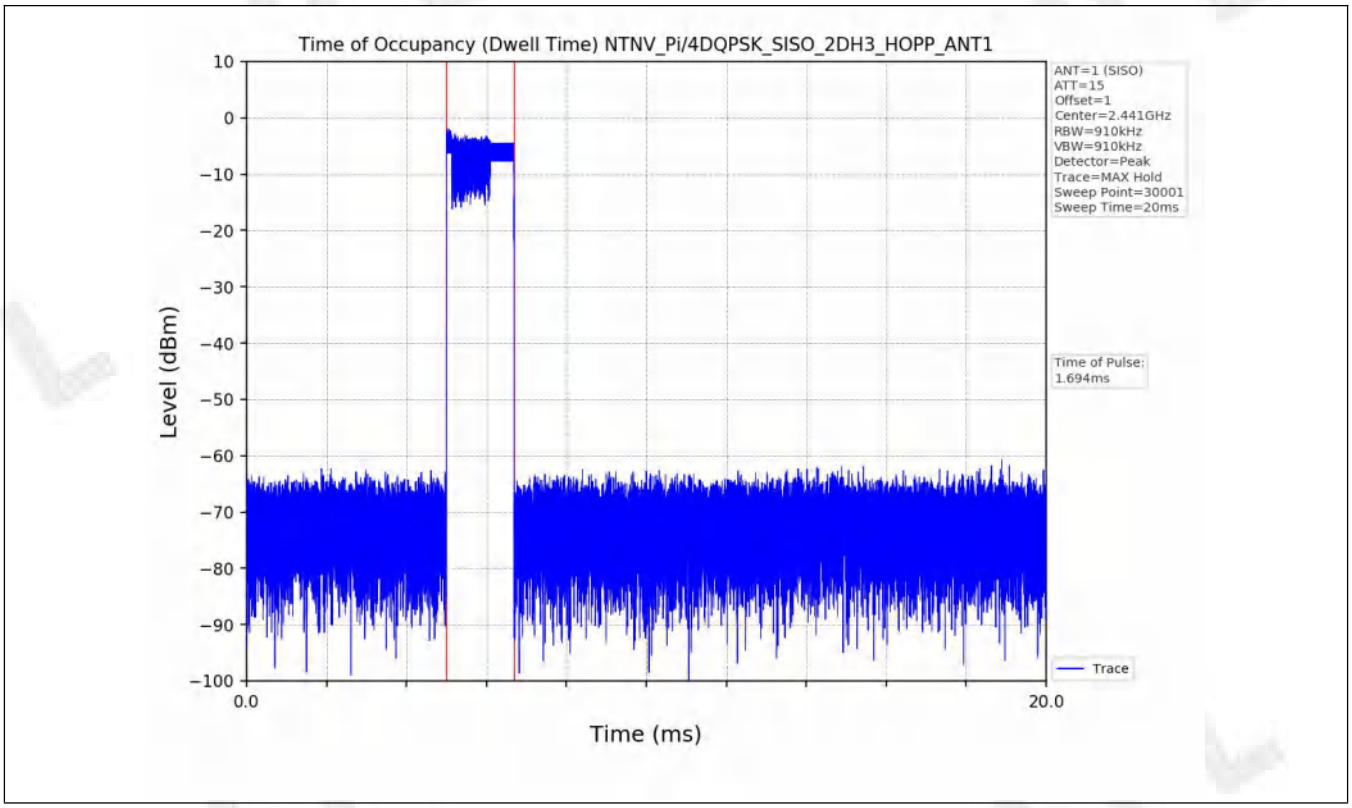

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
34
Dwell Time:
55.488ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

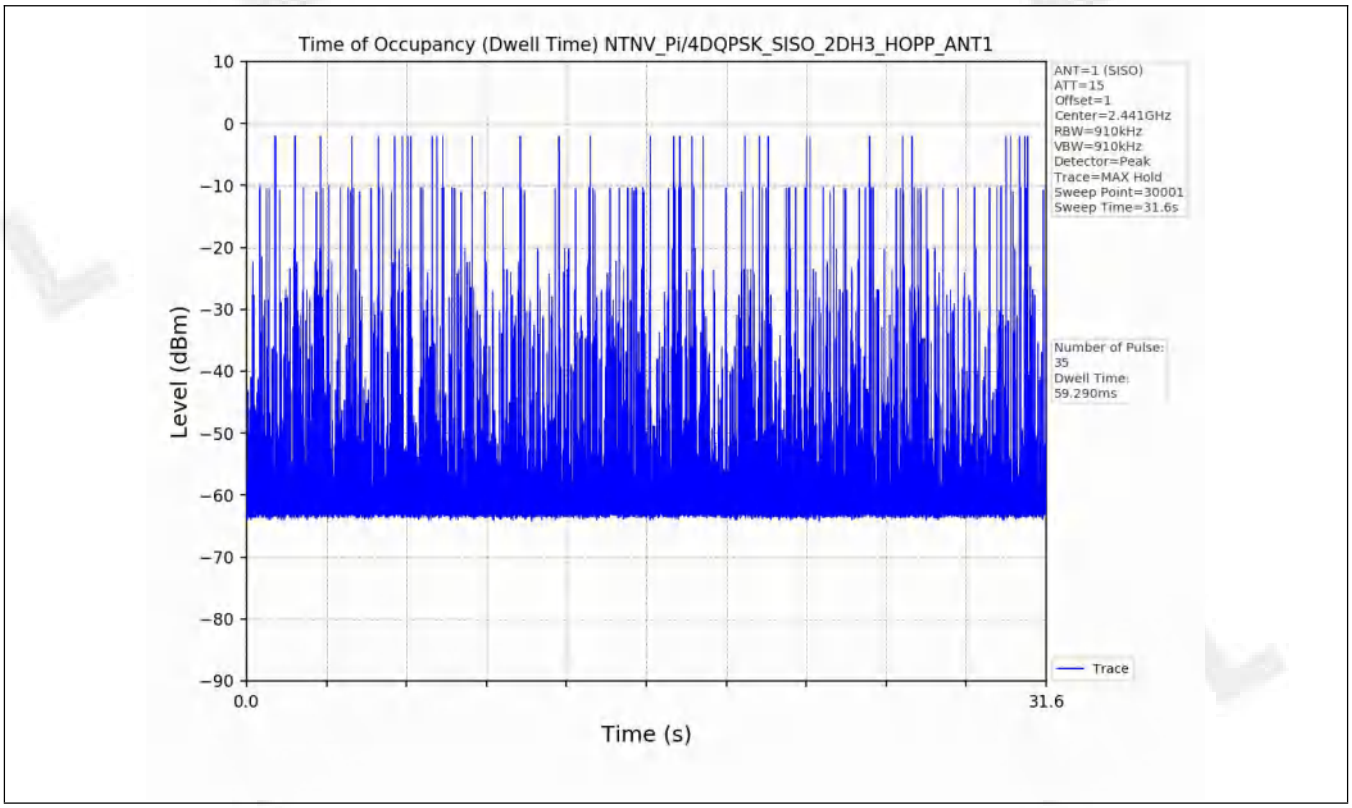

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
2.835ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
20.0

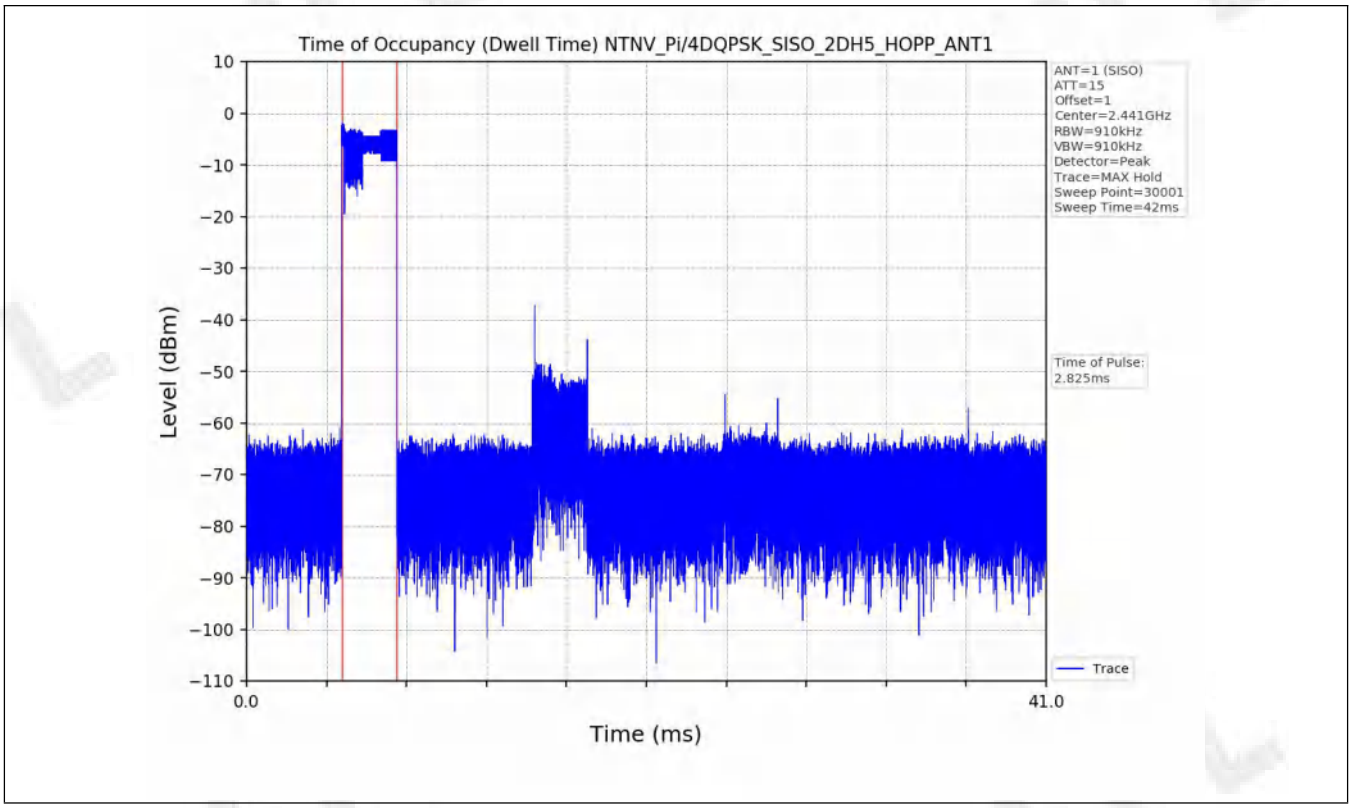

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
54
Dwell Time:
153.090ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

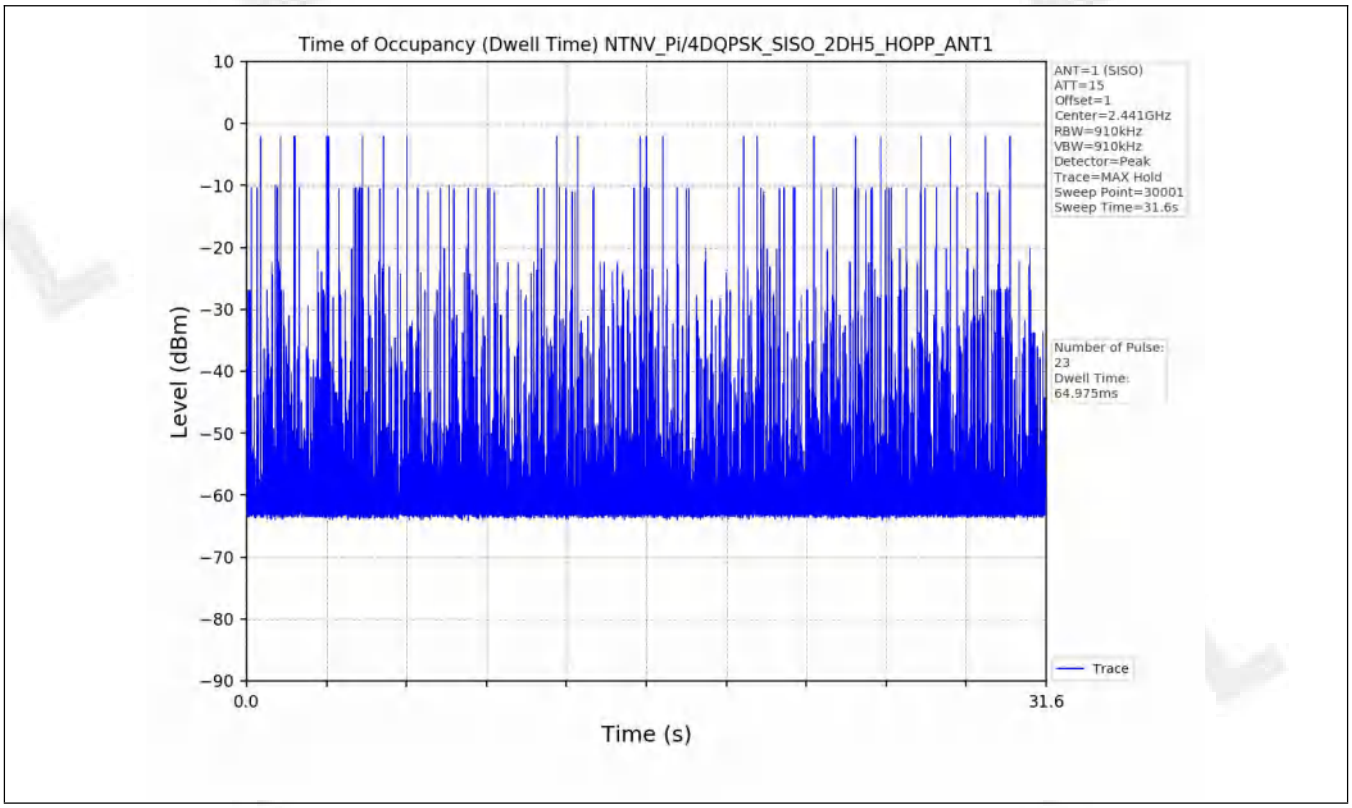

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=28ms
Time of Pulse:
0.495ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
28.0

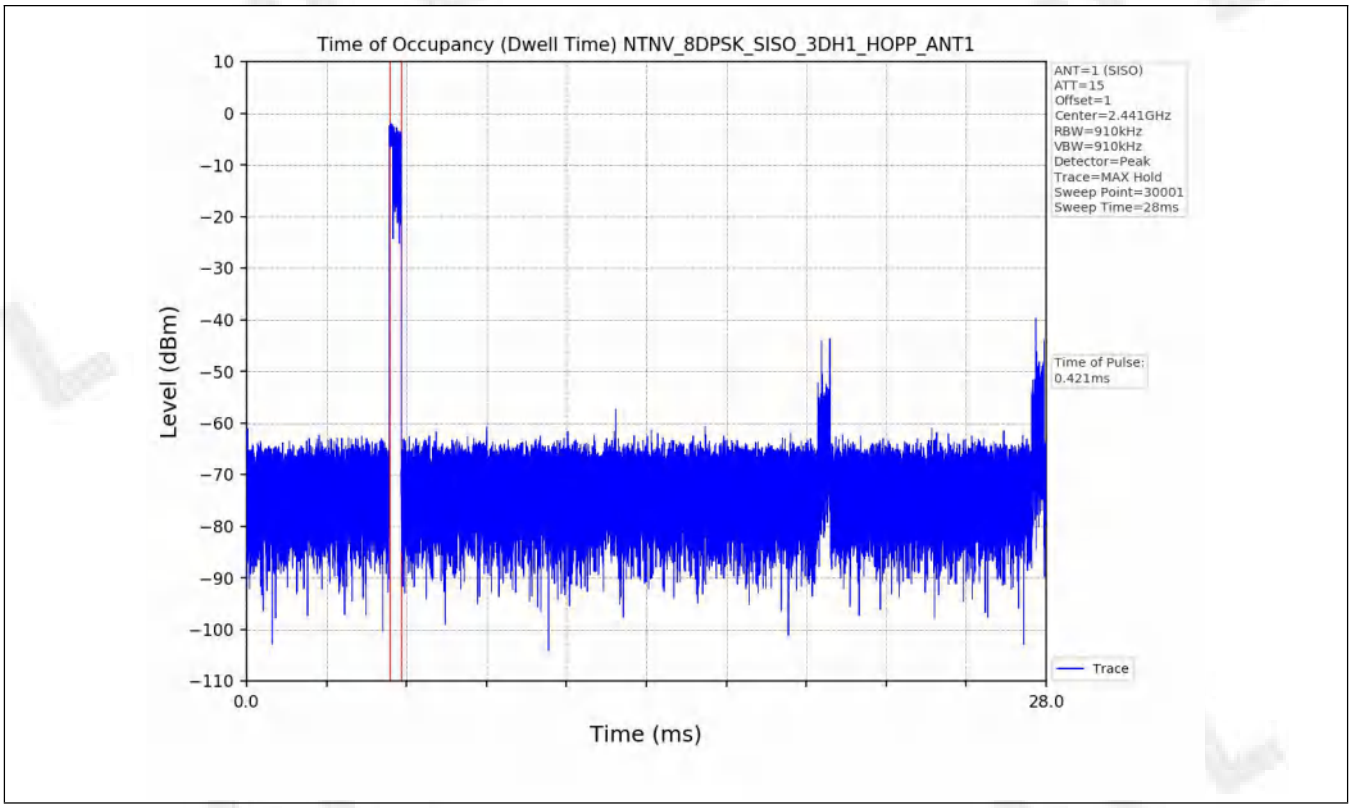

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
49
Dwell Time:
24.255ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

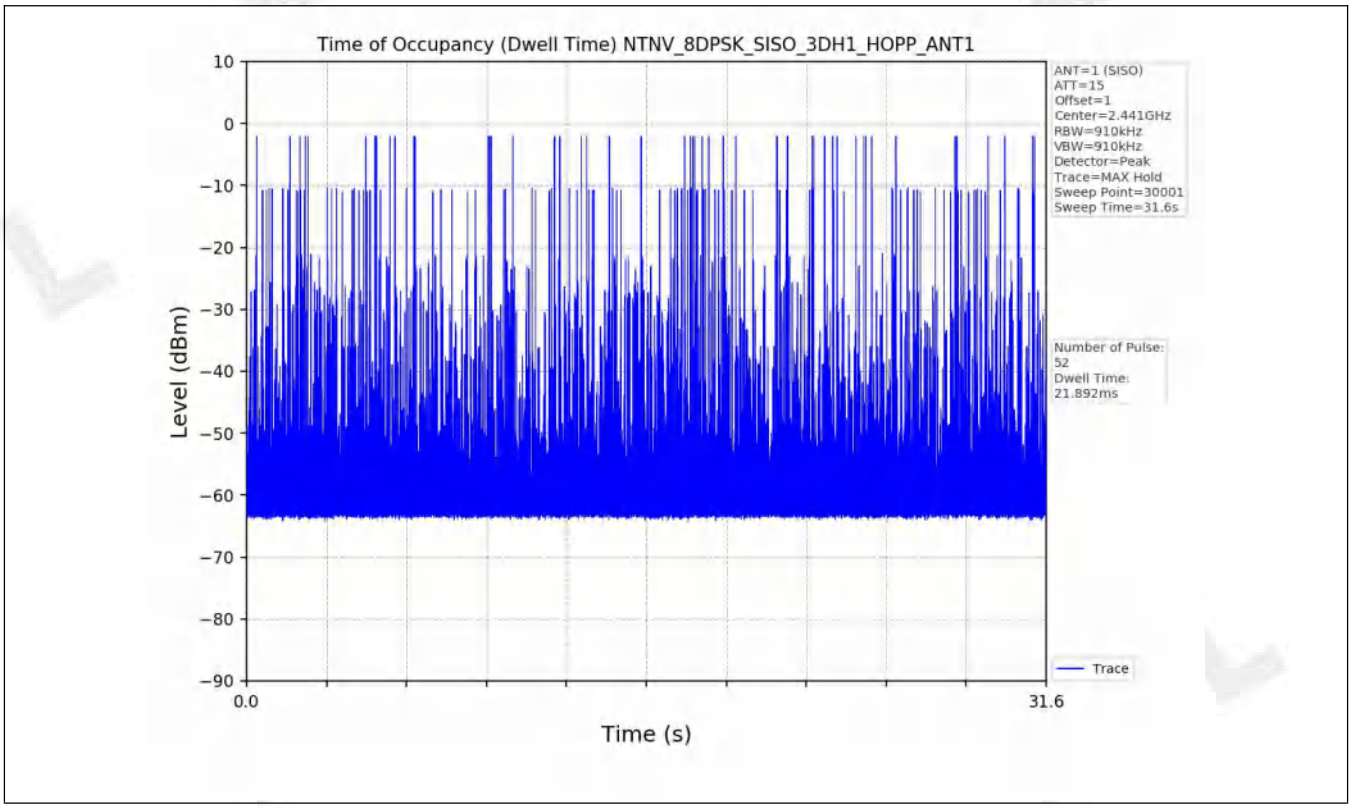

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
1.694ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
20.0

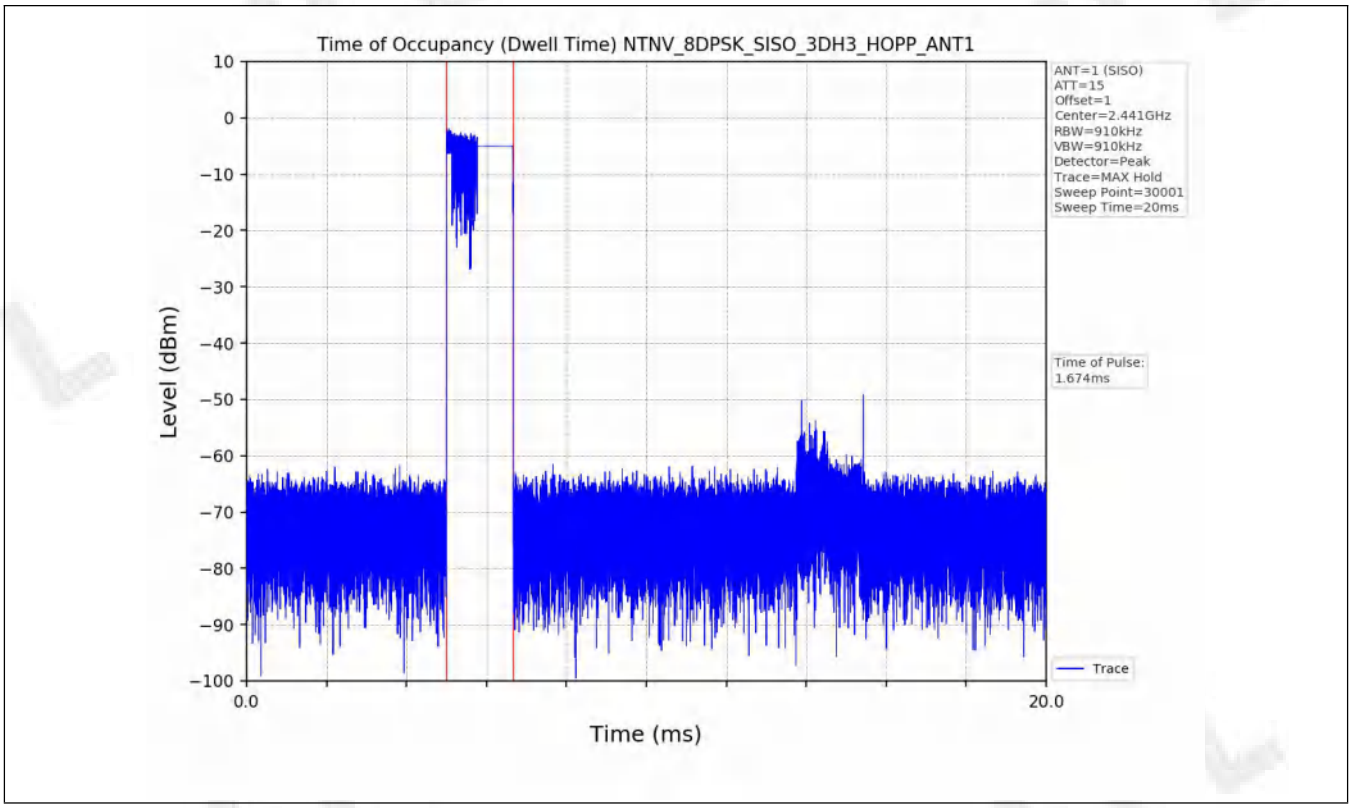

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
35
Dwell Time:
59.290ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

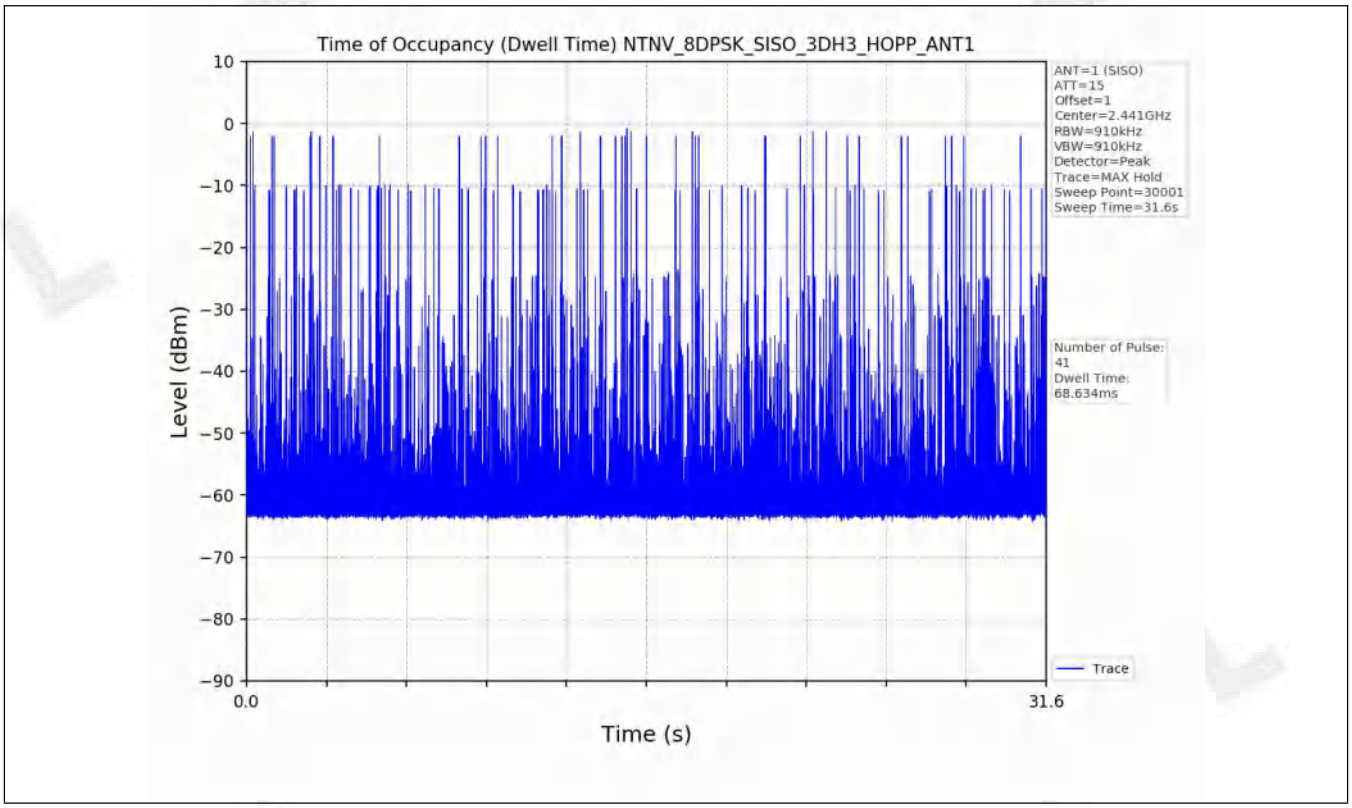

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=42ms
Time of Pulse:
2.825ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
41.0

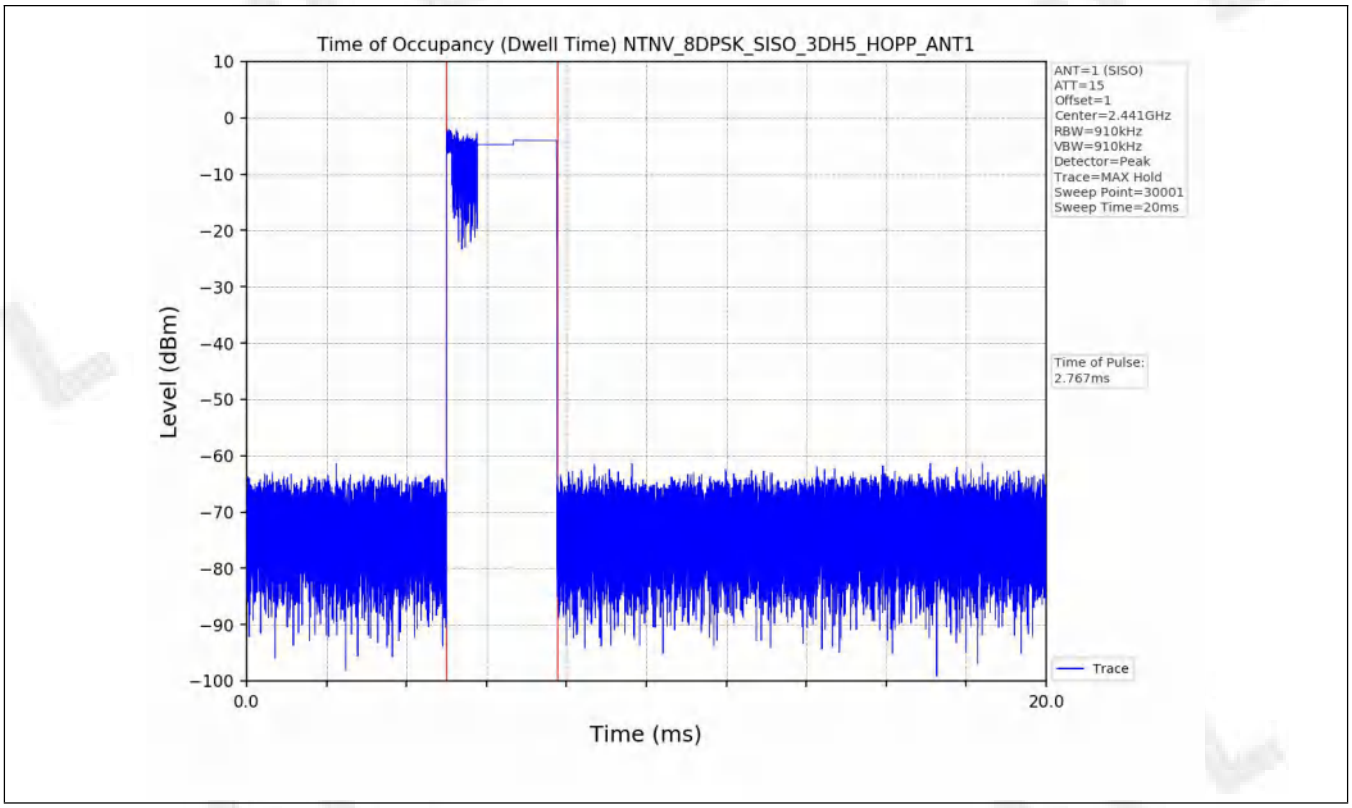

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
23
Dwell Time:
64.975ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

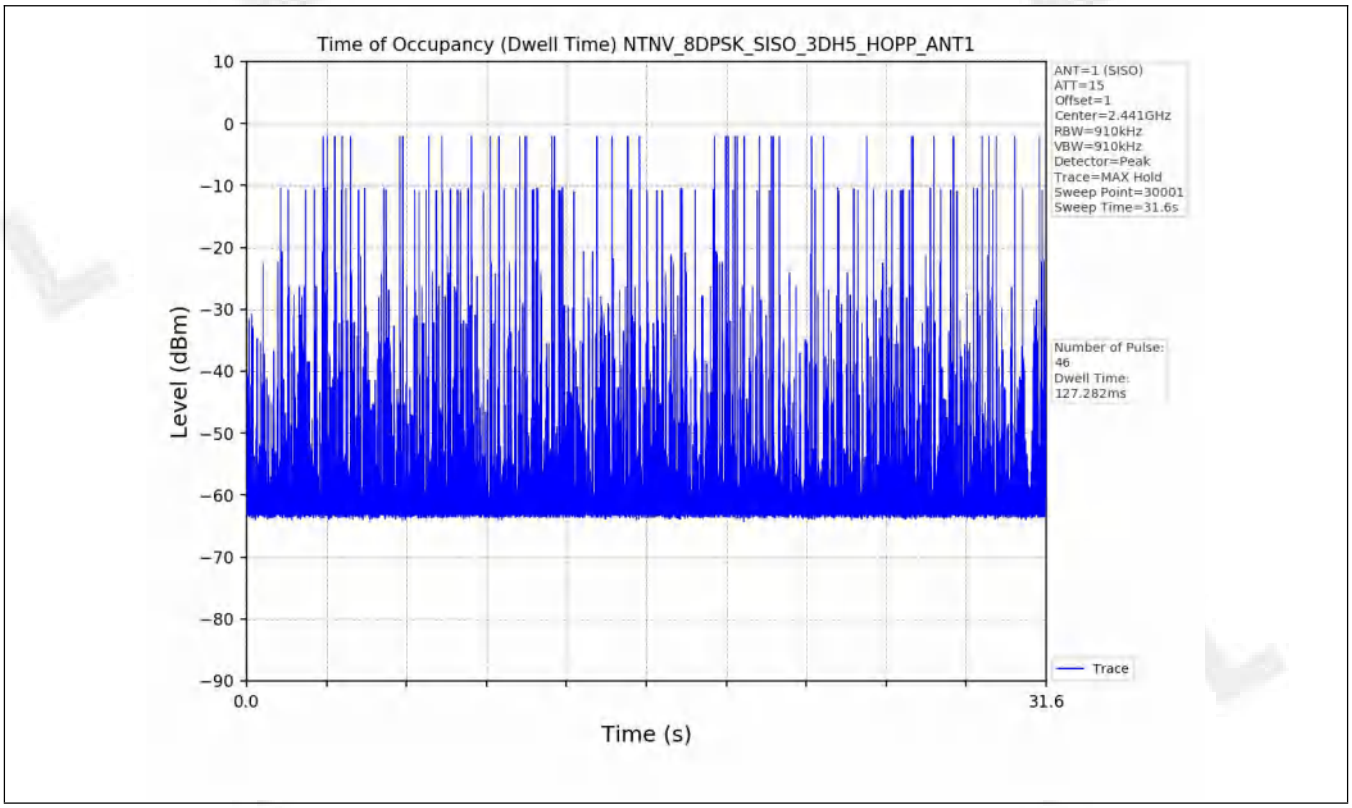

Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=28ms
Time of Pulse:
0.421ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
28.0


Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
52
Dwell Time:
21.892ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6


Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
1.674ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
20.0


Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
41
Dwell Time:
68.634ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6


Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
2.767ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
20.0

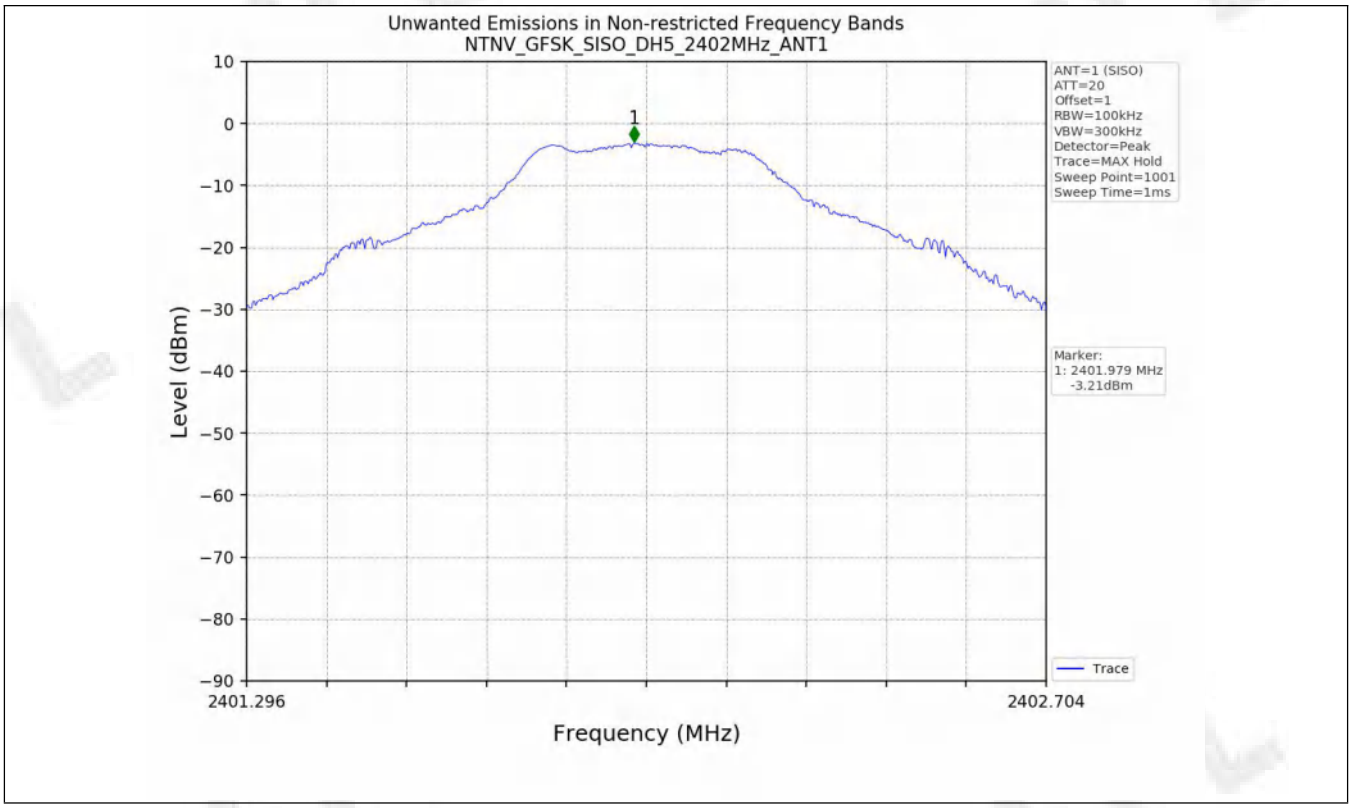

Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
46
Dwell Time:
127.282ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

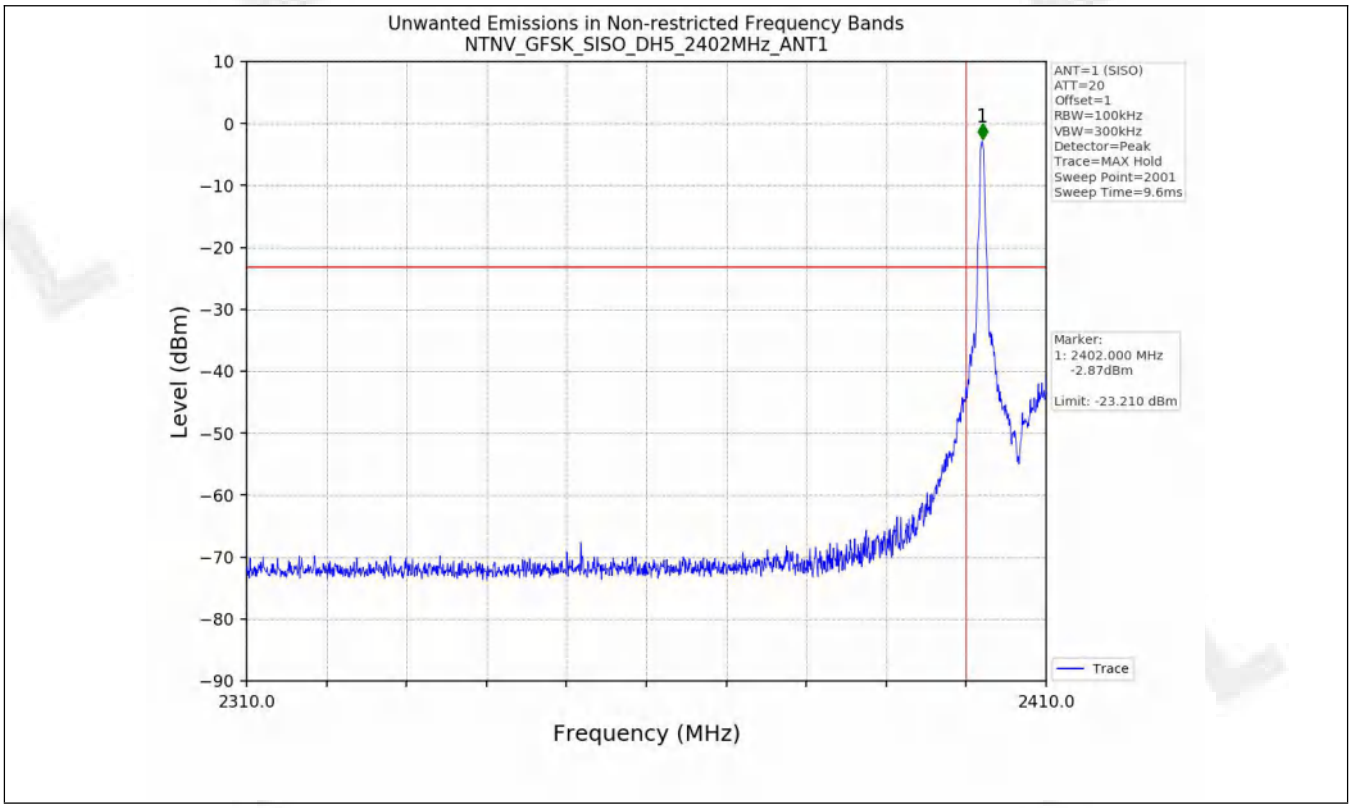
6. Unwanted Emissions in Non-restricted Frequency Bands

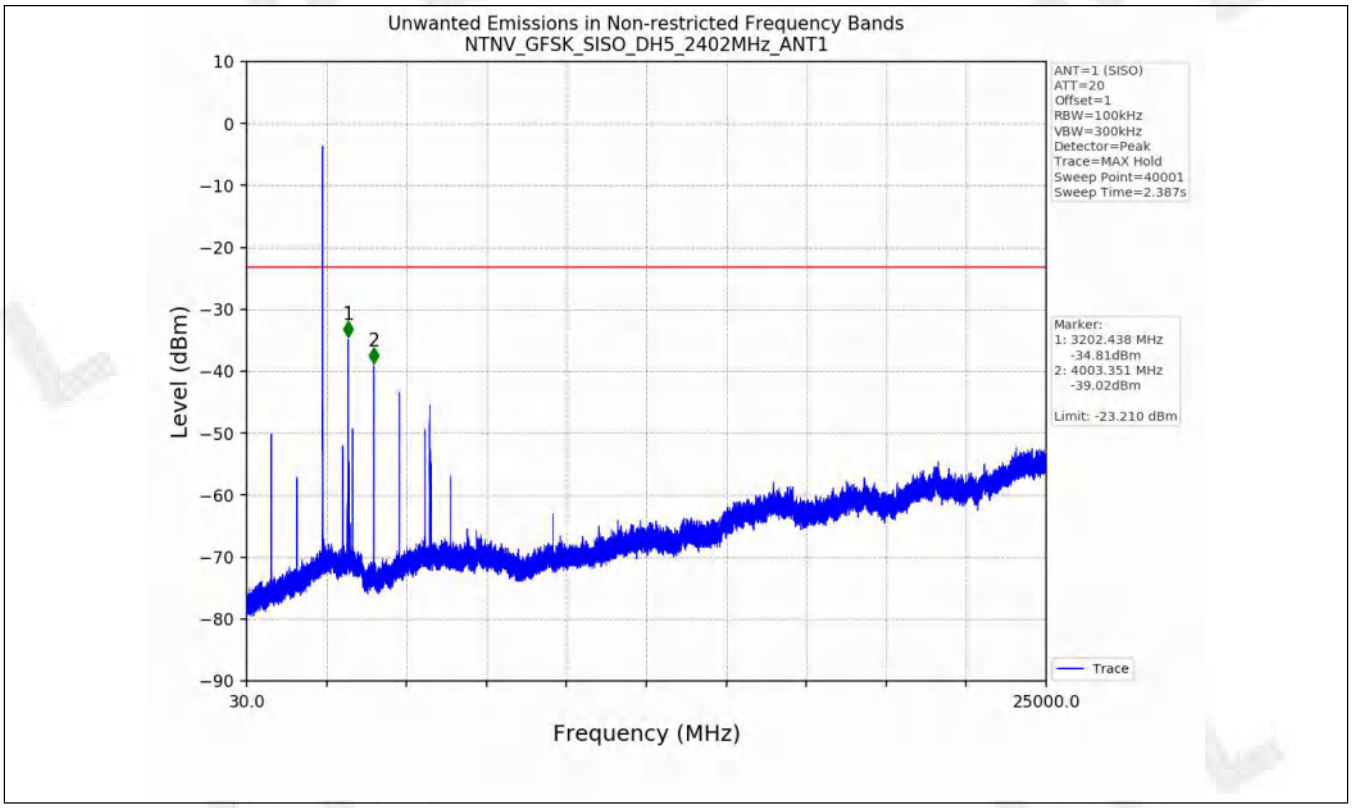
6.1 Test Result

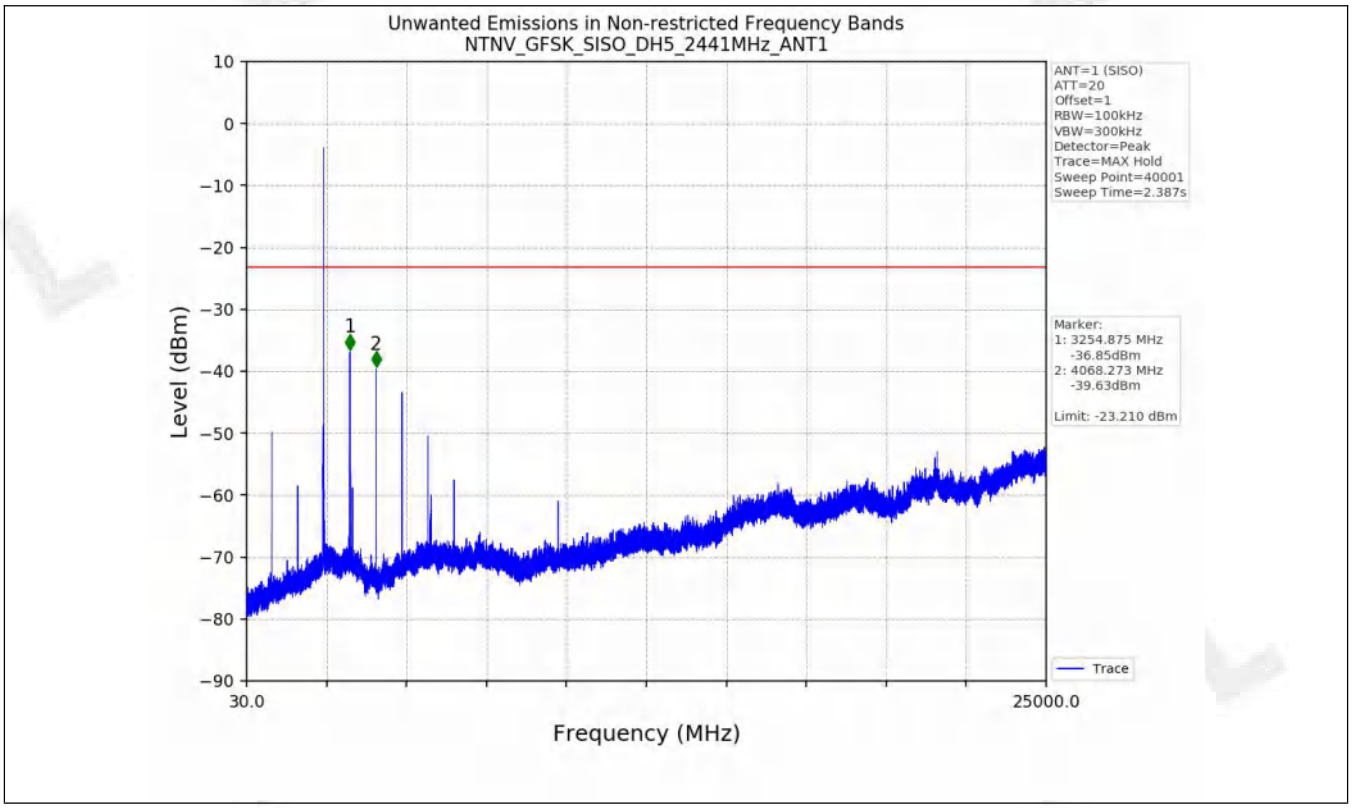
Test Mode	Frequency (MHz)	TX Type	ANT No.	Spurious Conducted Emission (dBm)	Limits (dBm)	Verdict
GFSK	2402	SISO	1	Refer to test graph	-23.21	PASS
	2441	SISO	1	Refer to test graph	-23.21	PASS
	2480	SISO	1	Refer to test graph	-23.21	PASS
	Hopping	SISO	1	Refer to test graph	-23.21	PASS
Pi/4DQPSK	2402	SISO	1	Refer to test graph	-23.53	PASS
	2441	SISO	1	Refer to test graph	-23.53	PASS
	2480	SISO	1	Refer to test graph	-23.53	PASS
	Hopping	SISO	1	Refer to test graph	-23.53	PASS
8DPSK	2402	SISO	1	Refer to test graph	-23.44	PASS
	2441	SISO	1	Refer to test graph	-23.44	PASS
	2480	SISO	1	Refer to test graph	-23.44	PASS
	Hopping	SISO	1	Refer to test graph	-23.44	PASS

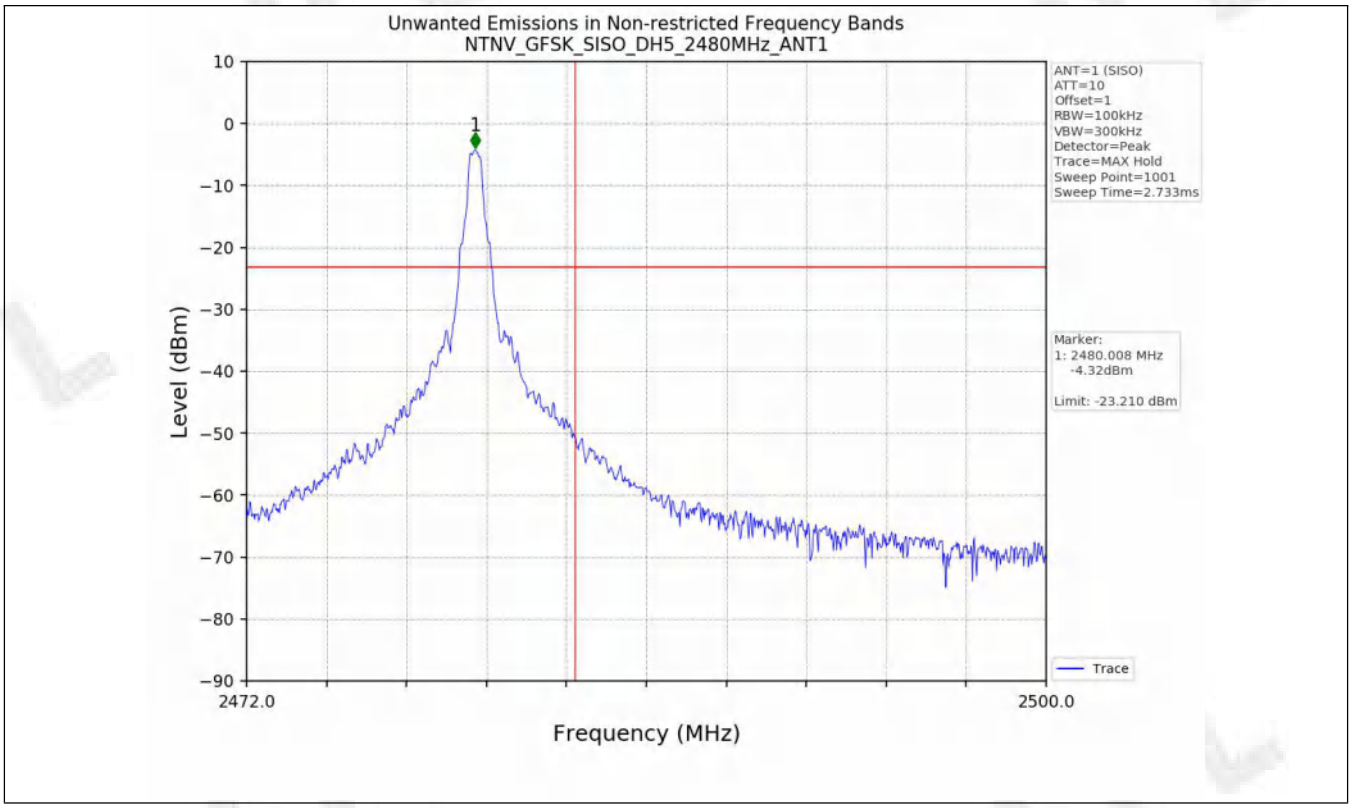
6.2 Test Graph

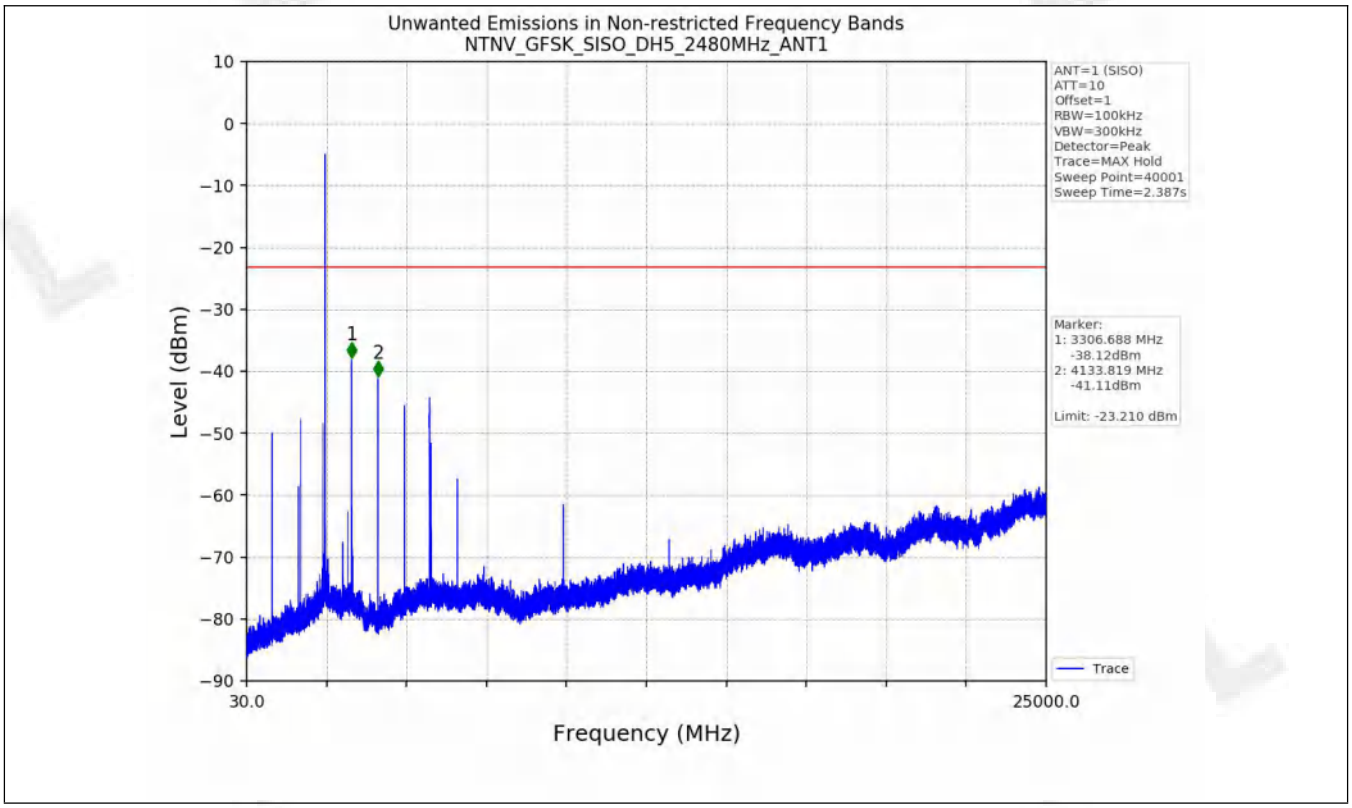

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2401.979 MHz
-3.21dBm
Trace
Level (dBm)
Frequency (MHz)
2401.296
2402.704

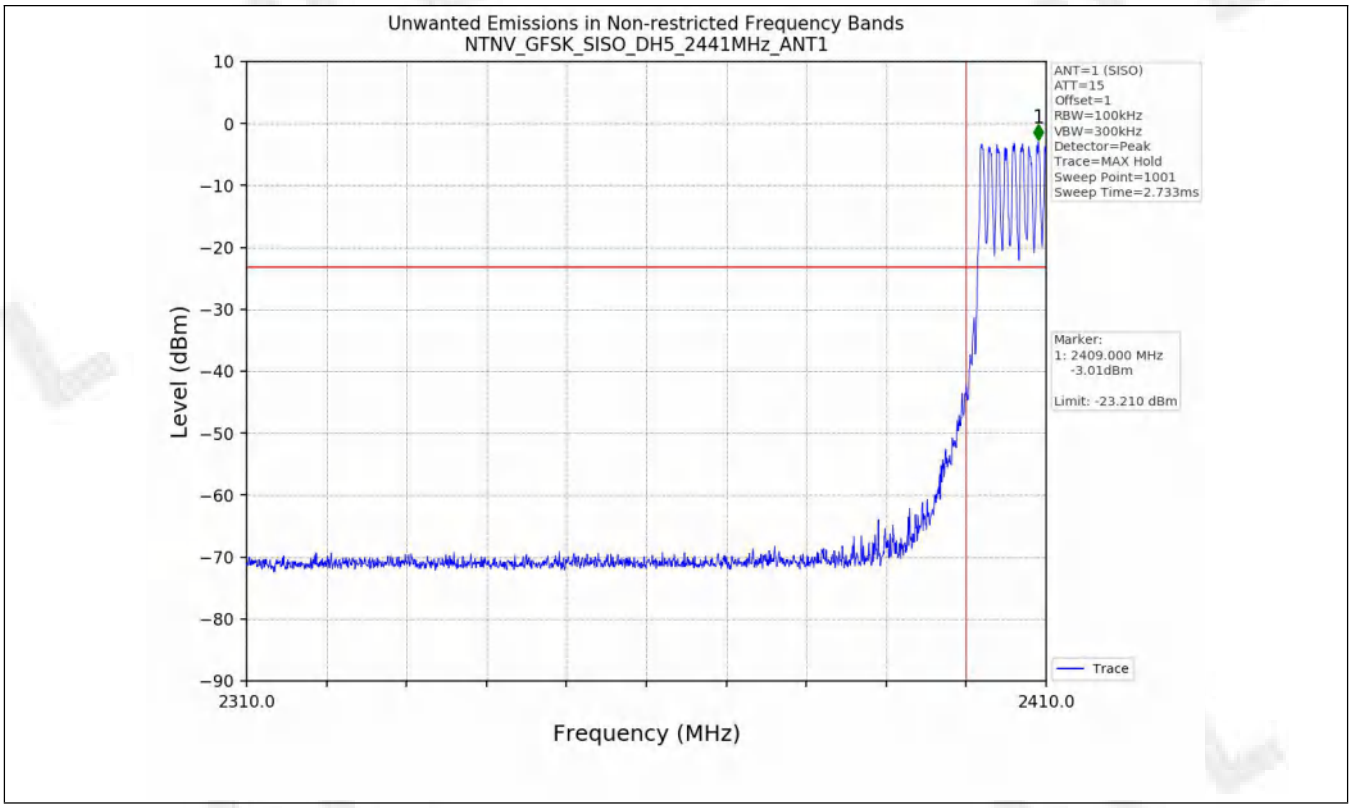

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.000 MHz
-2.87dBm
Limit: -23.210 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

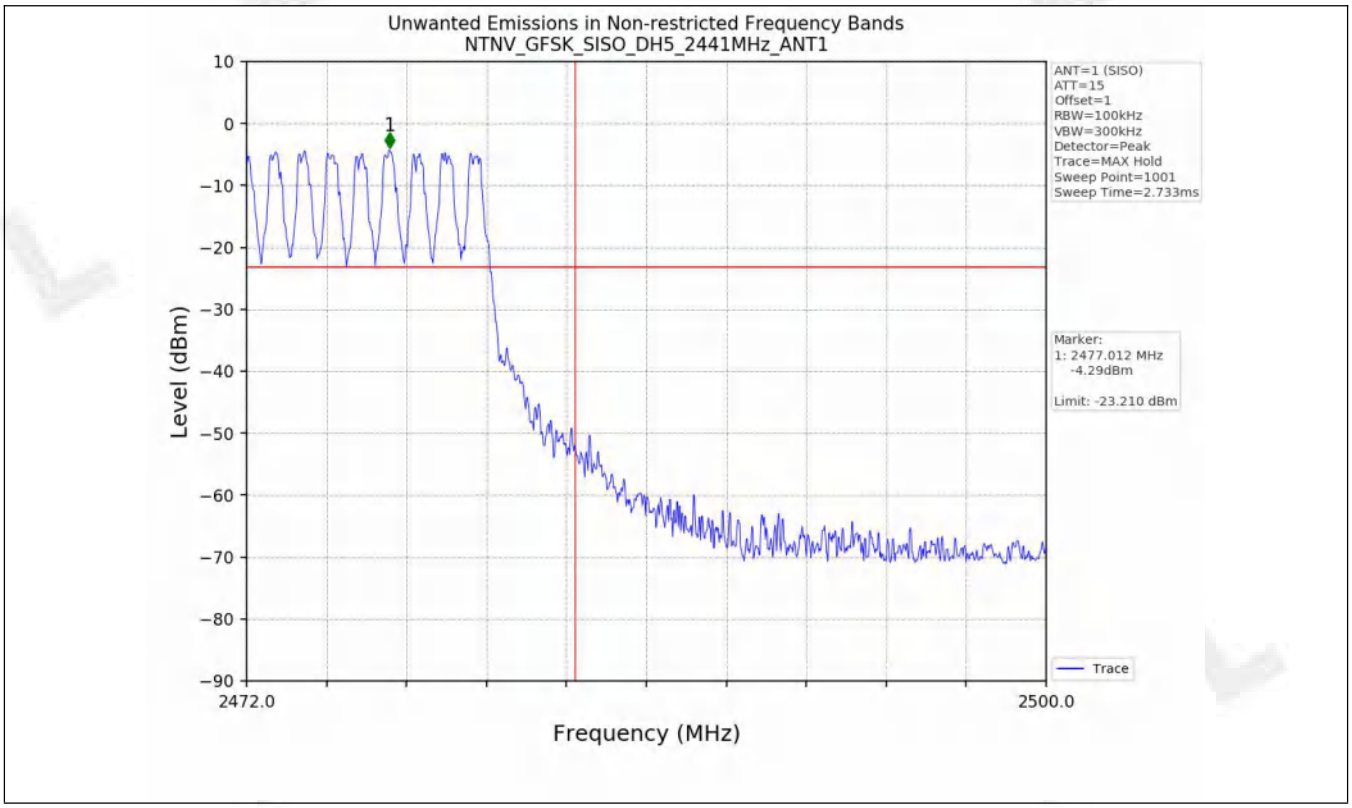

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3202.438 MHz
-34.81dBm
2: 4003.351 MHz
-39.02dBm
Limit: -23.210 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

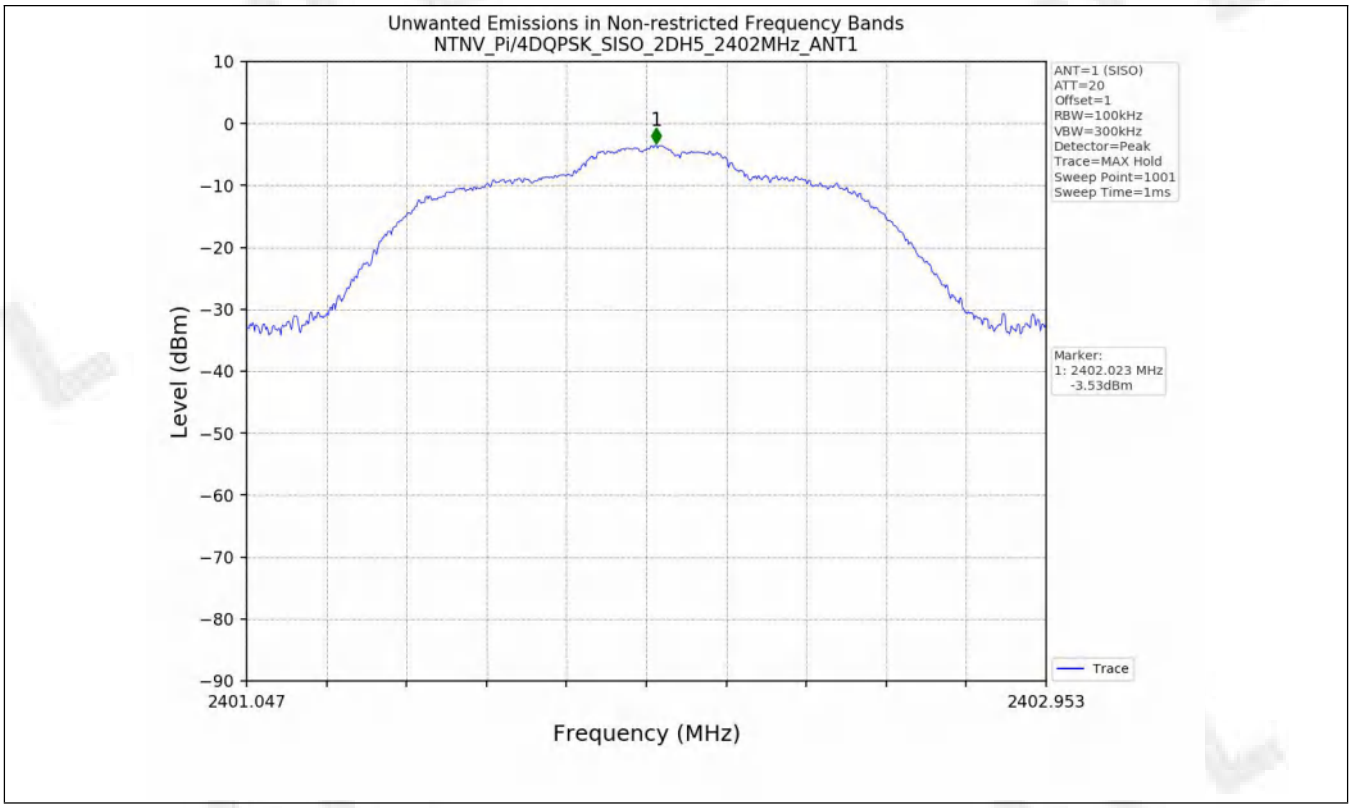

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3254.875 MHz
-36.85dBm
2: 4068.273 MHz
-39.63dBm
Limit: -23.210 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

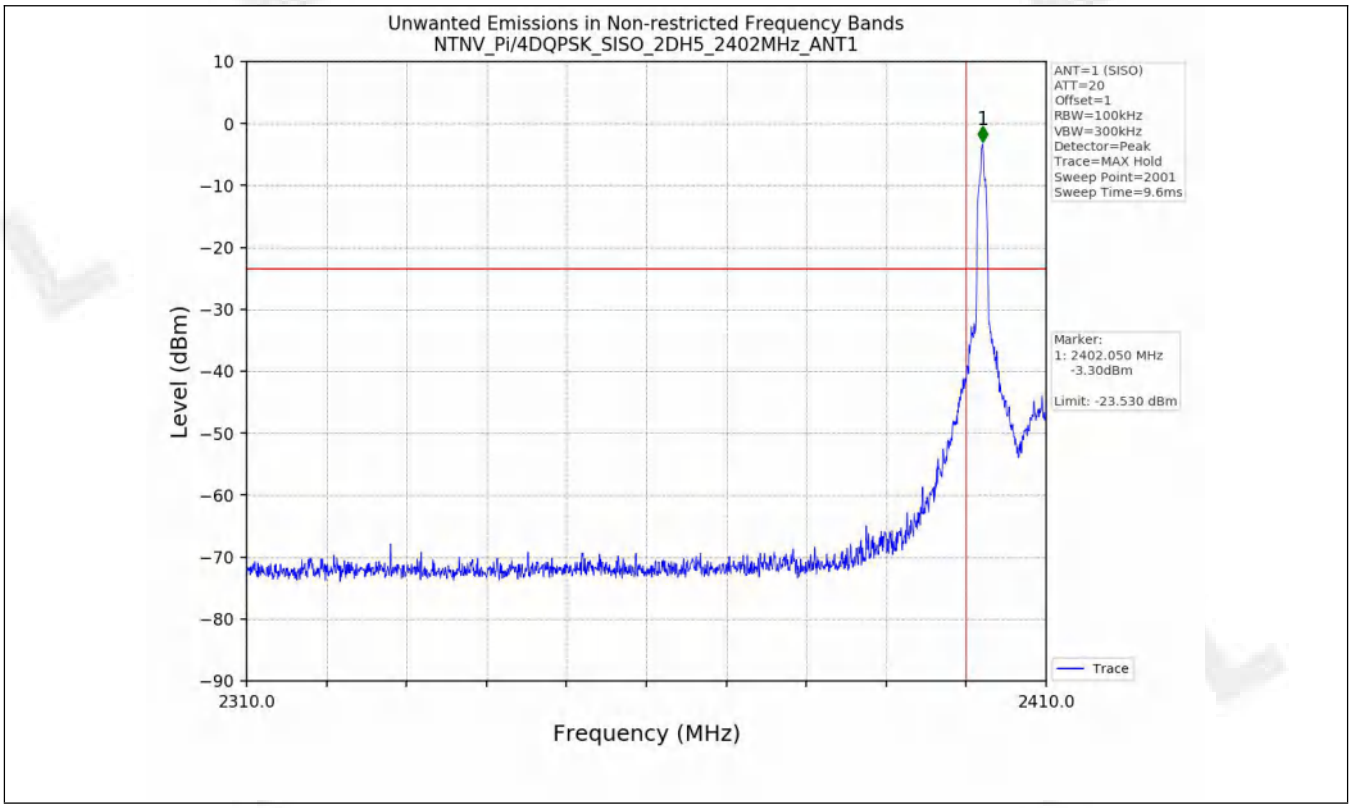

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2480.008 MHz
-4.32dBm
Limit: -23.210 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

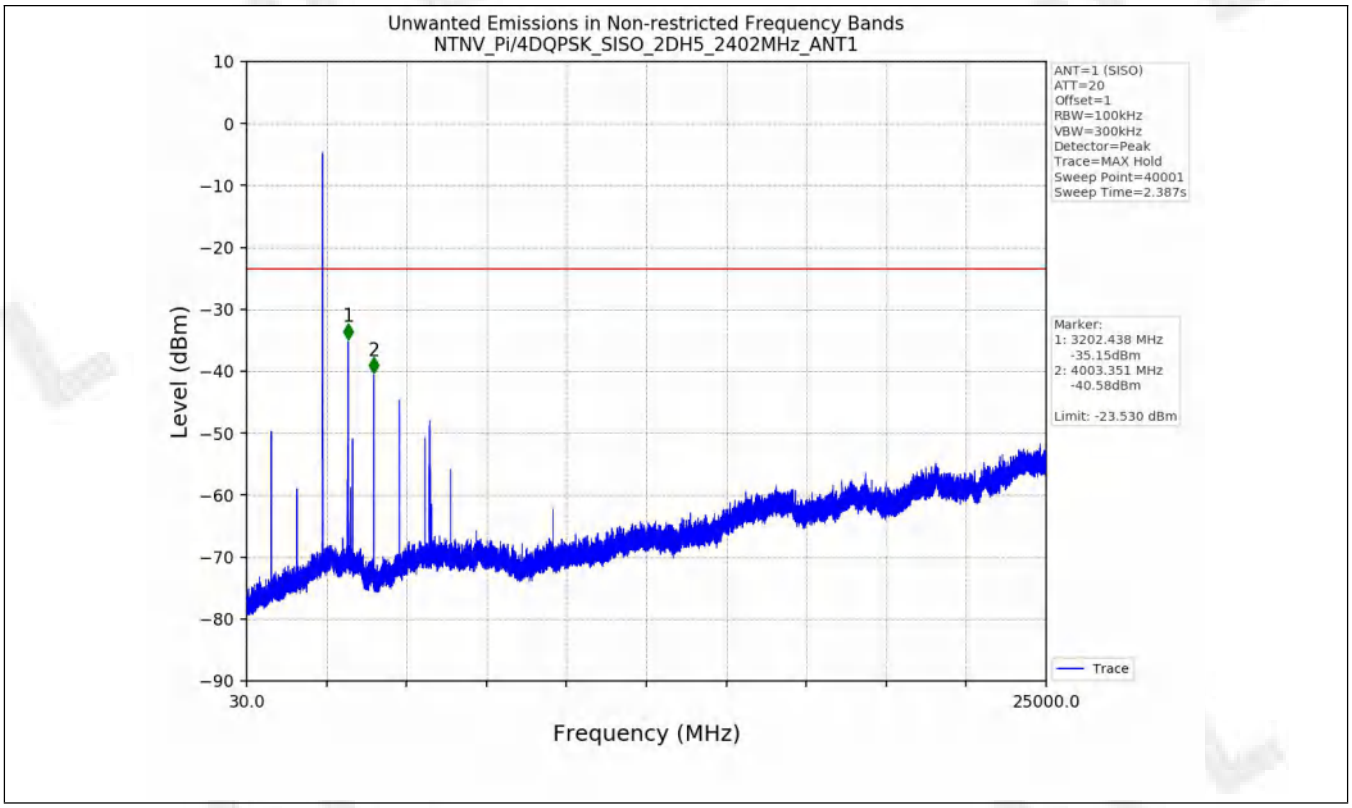

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3306.688 MHz
-38.12dBm
2: 4133.819 MHz
-41.11dBm
Limit: -23.210 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

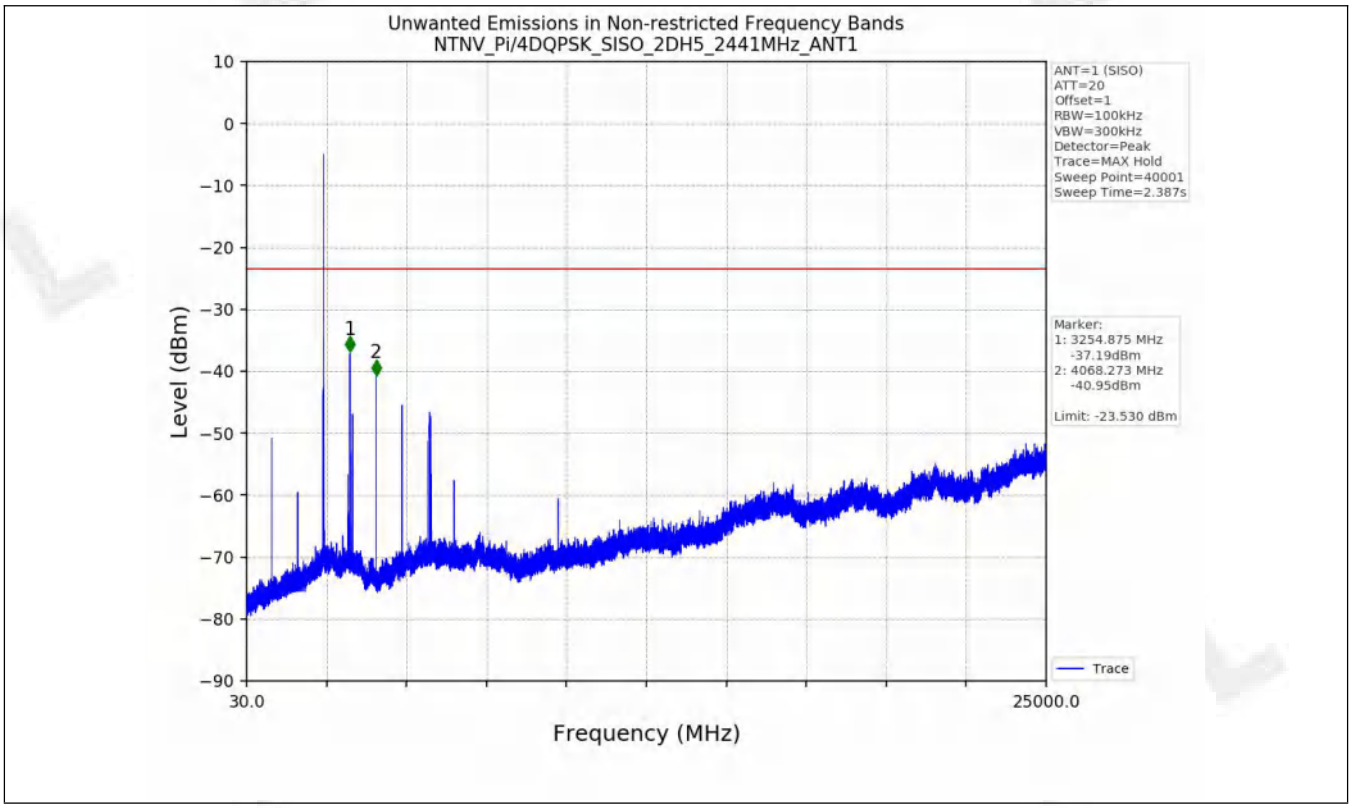

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2409.000 MHz
-3.01dBm
Limit: -23.210 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

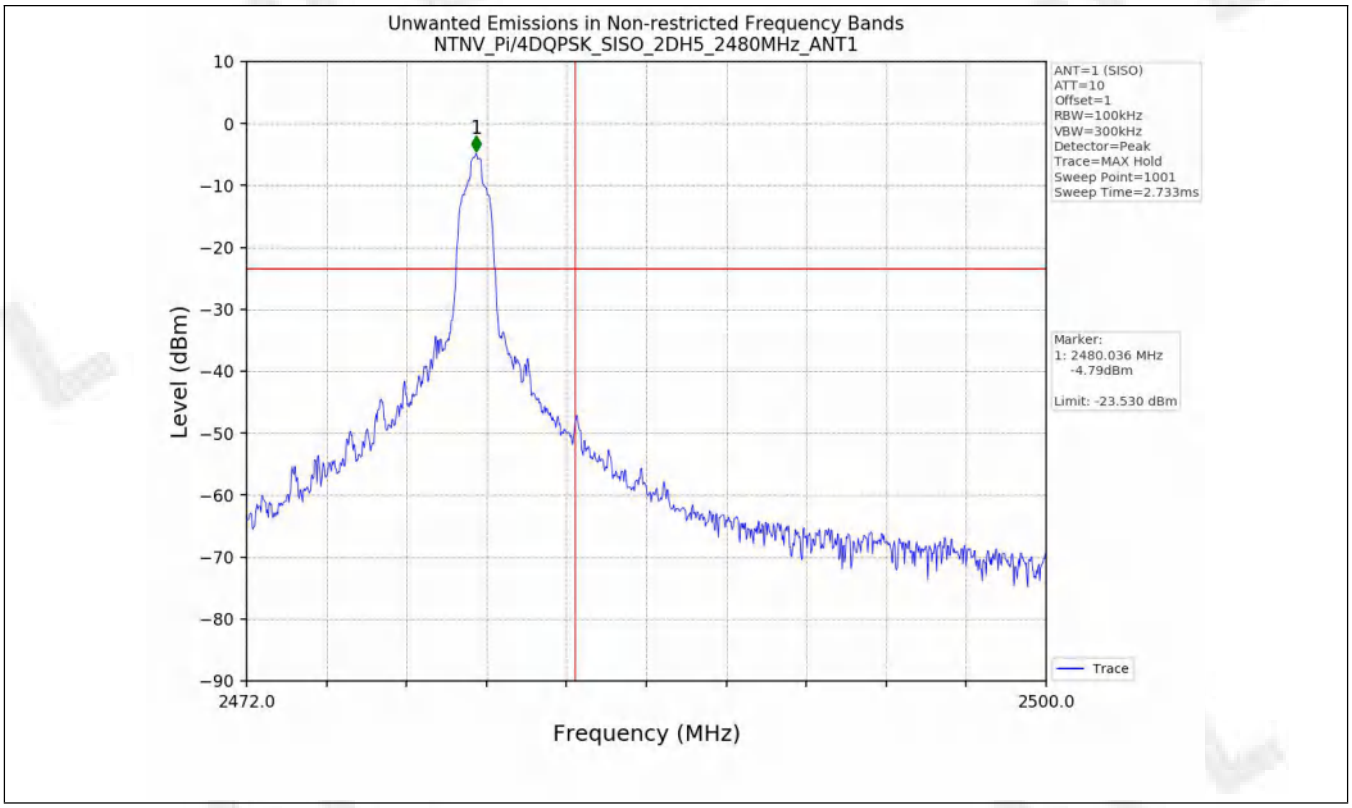

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2477.012 MHz
-4.29dBm
Limit: -23.210 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

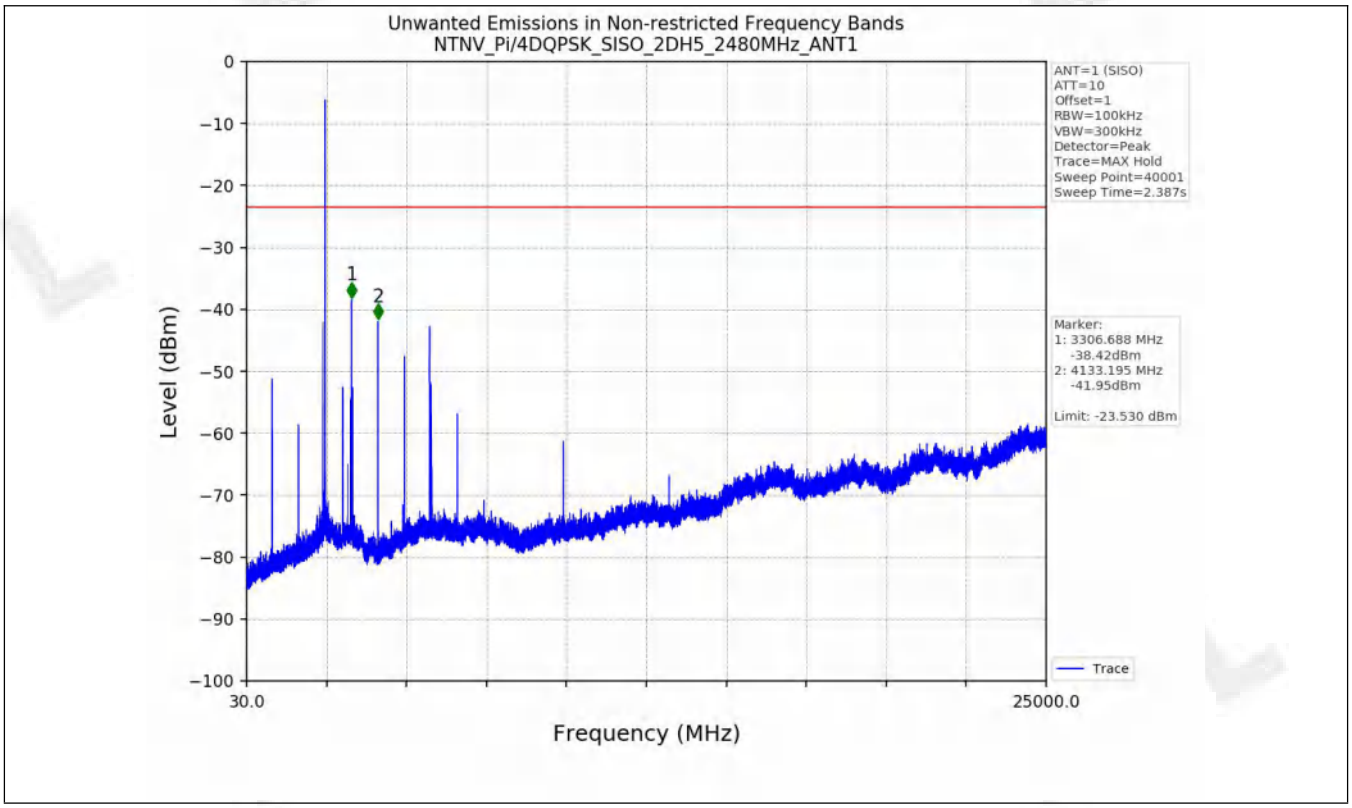

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2402.023 MHz
-3.53dBm
Trace
Level (dBm)
Frequency (MHz)
2401.047
2402.953

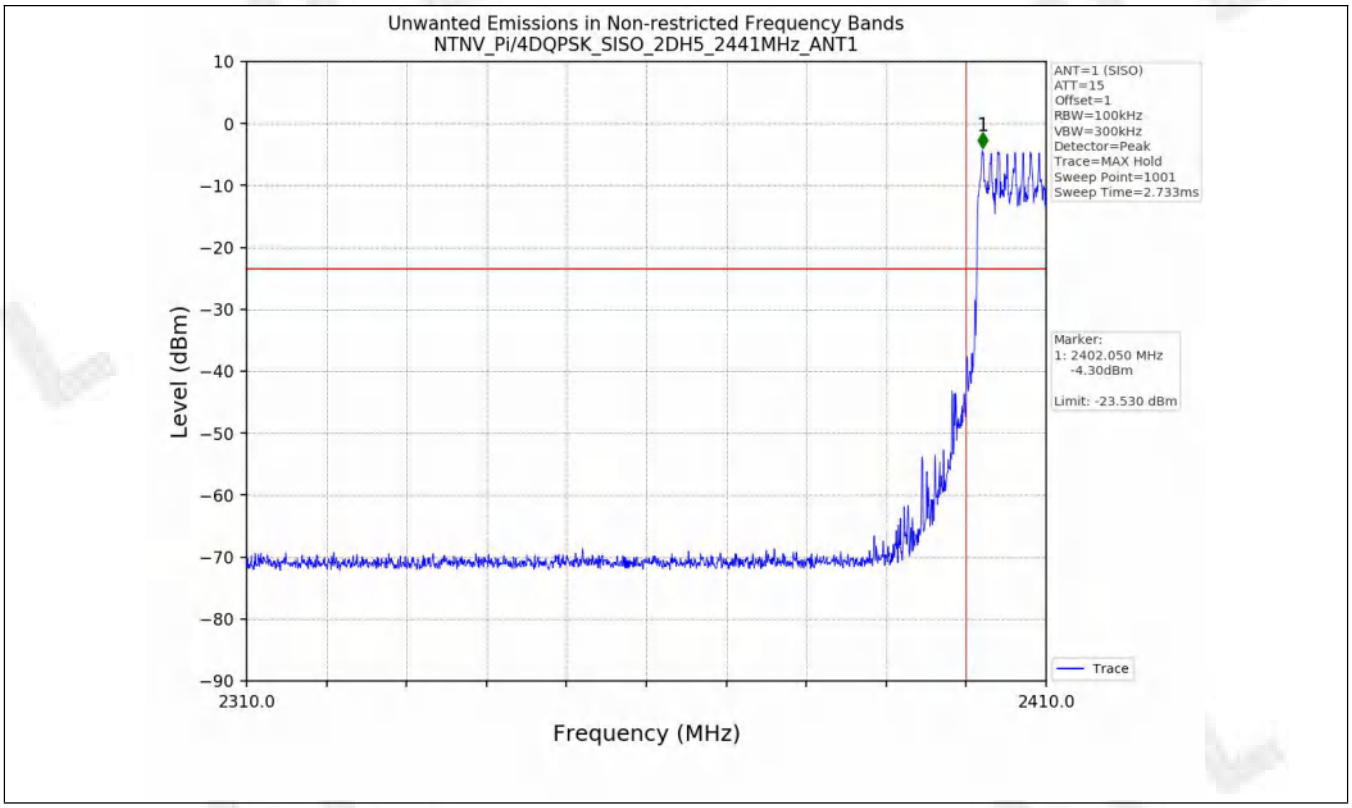

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.050 MHz
-3.30dBm
Limit: -23.530 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

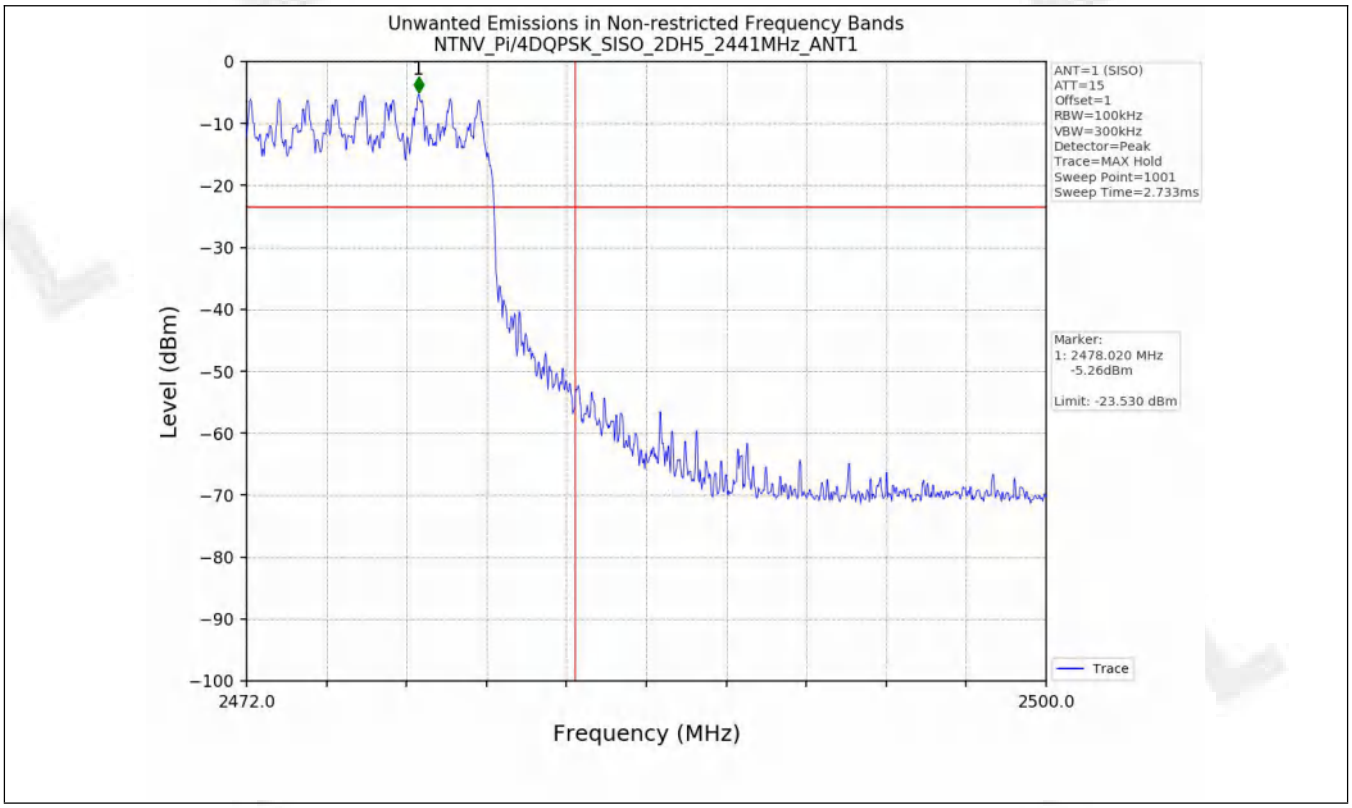

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3202.438 MHz
-35.15dBm
2: 4003.351 MHz
-40.58dBm
Limit: -23.530 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

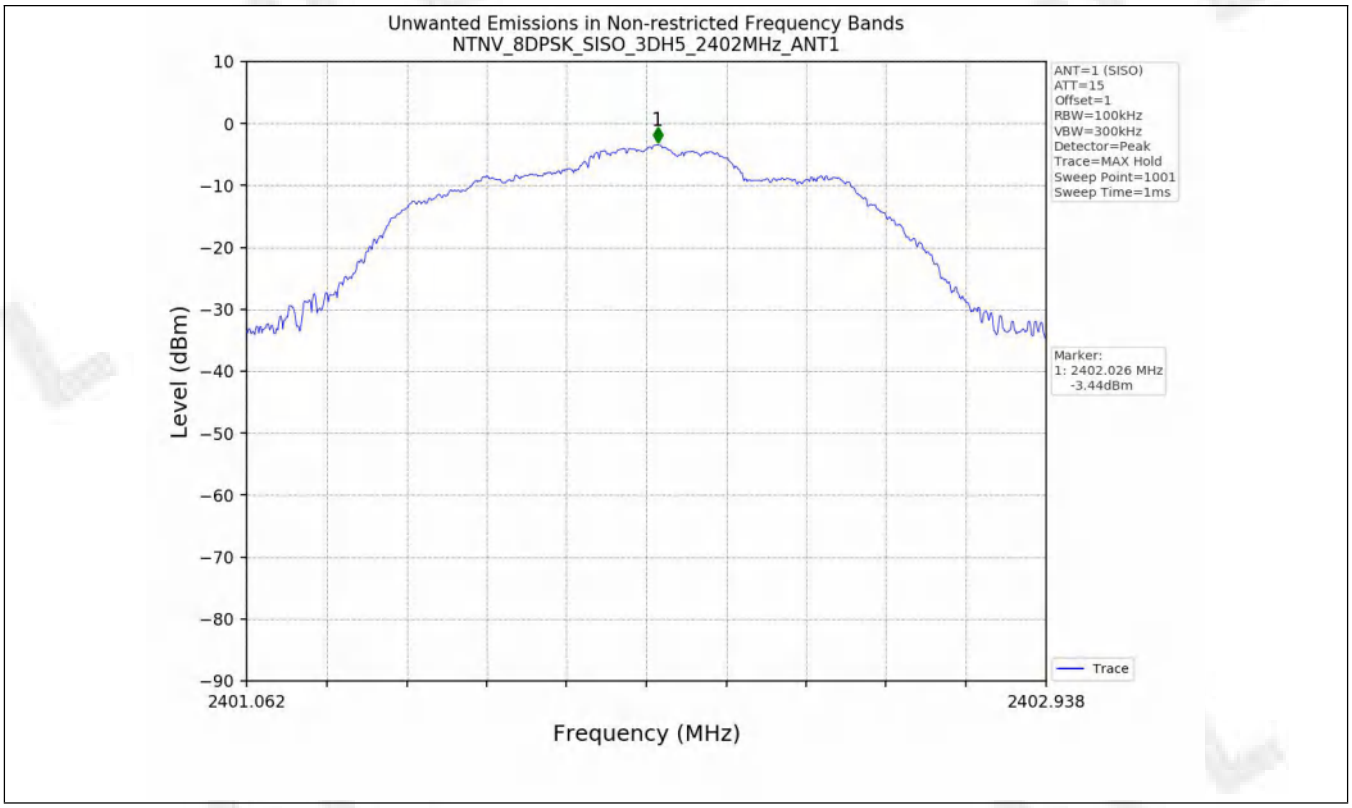

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3254.875 MHz
-37.19dBm
2: 4068.273 MHz
-40.95dBm
Limit: -23.530 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

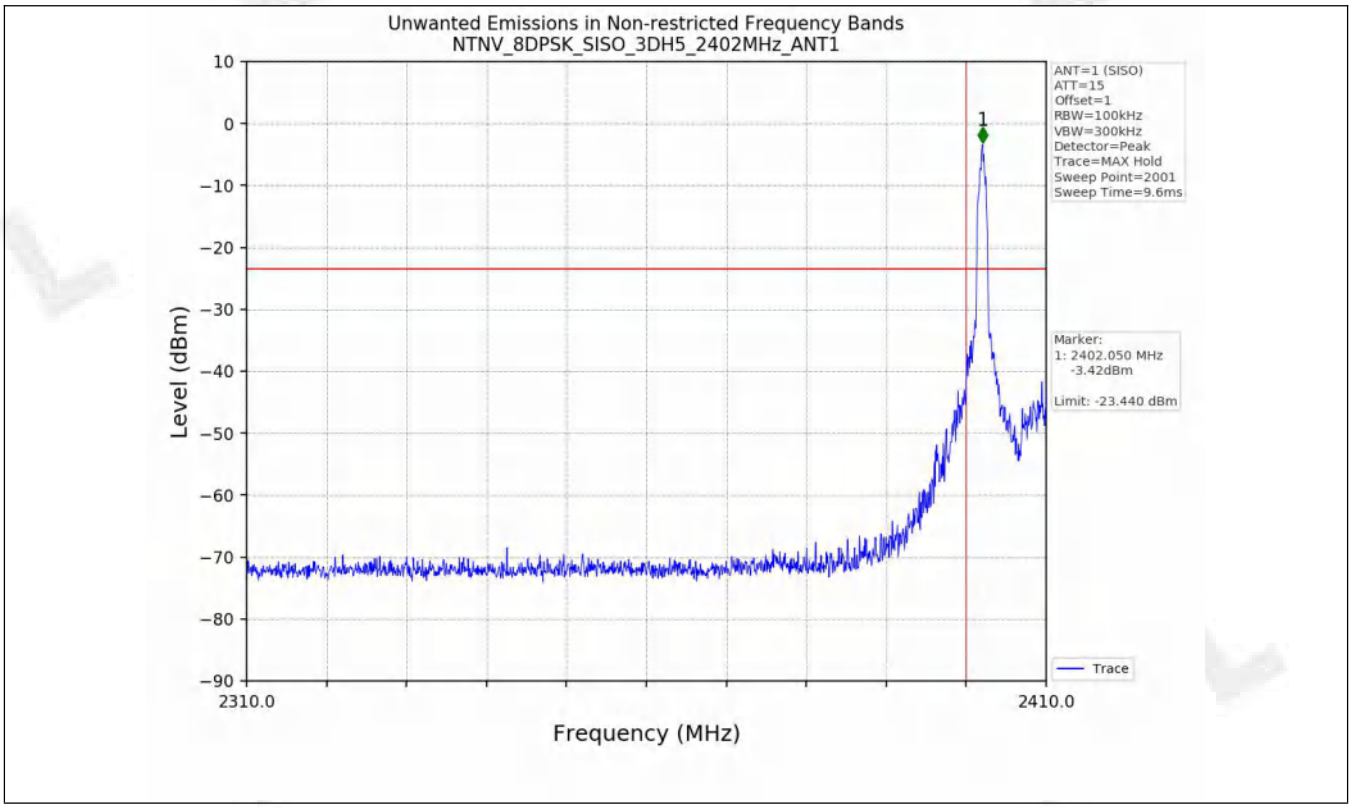

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2480.036 MHz
-4.79dBm
Limit: -23.530 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

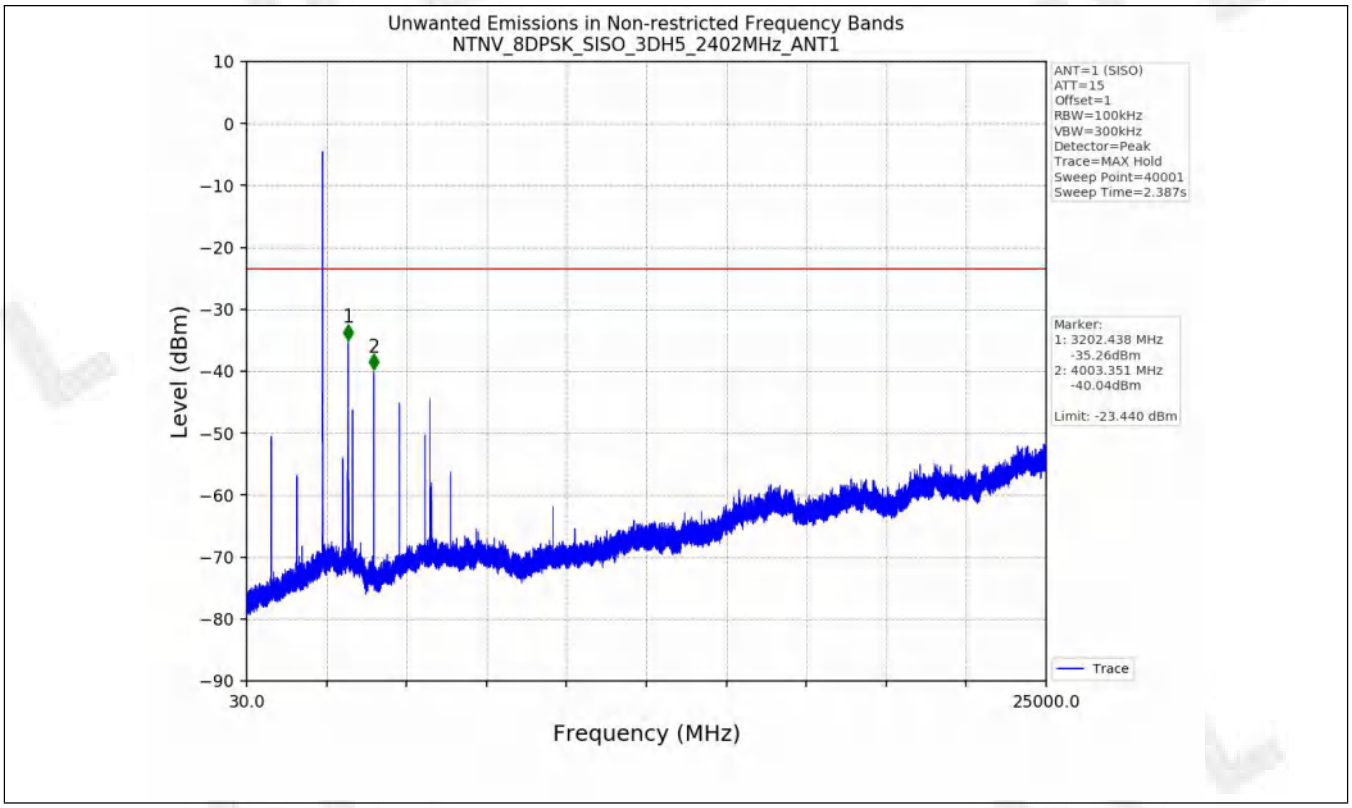

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=10
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3306.688 MHz
-38.42dBm
2: 4133.195 MHz
-41.95dBm
Limit: -23.530 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

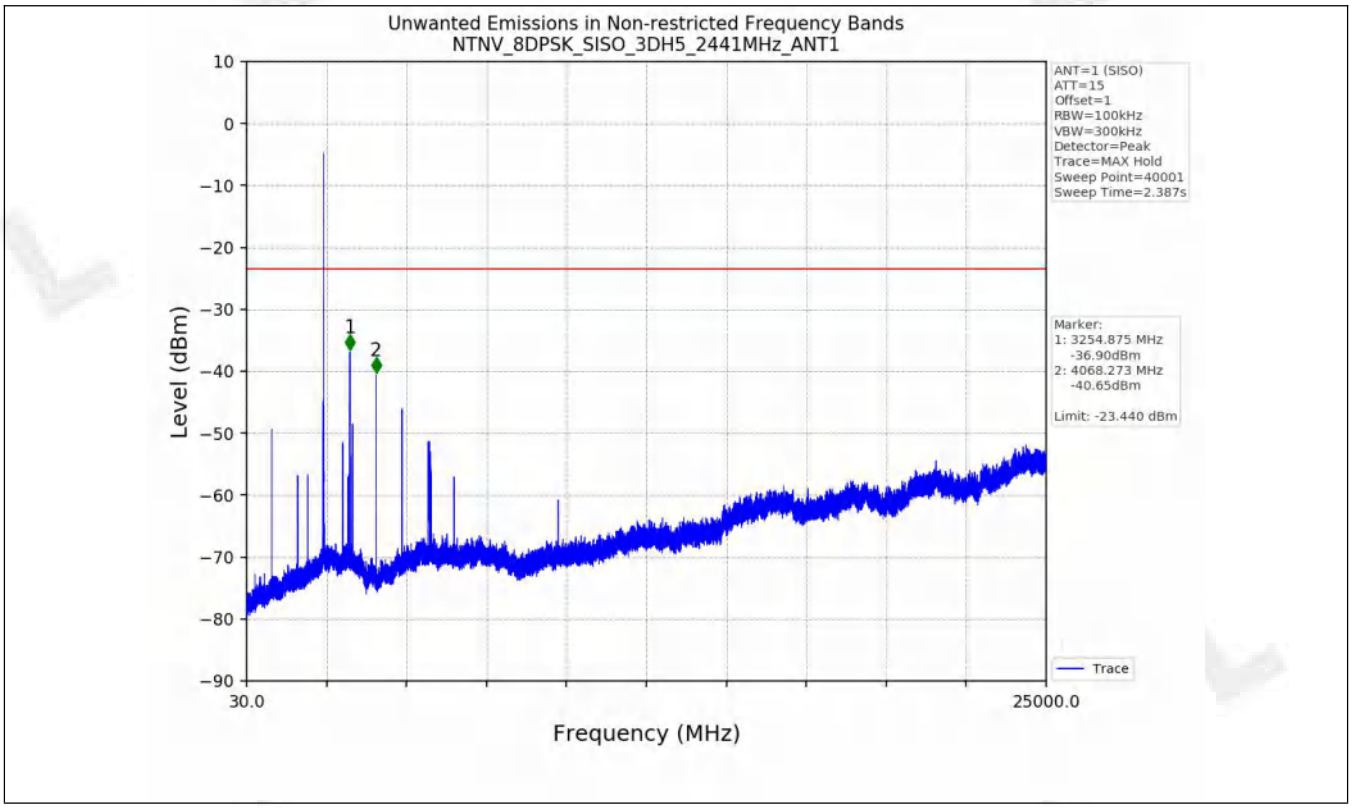

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2402.050 MHz
-4.30dBm
Limit: -23.530 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

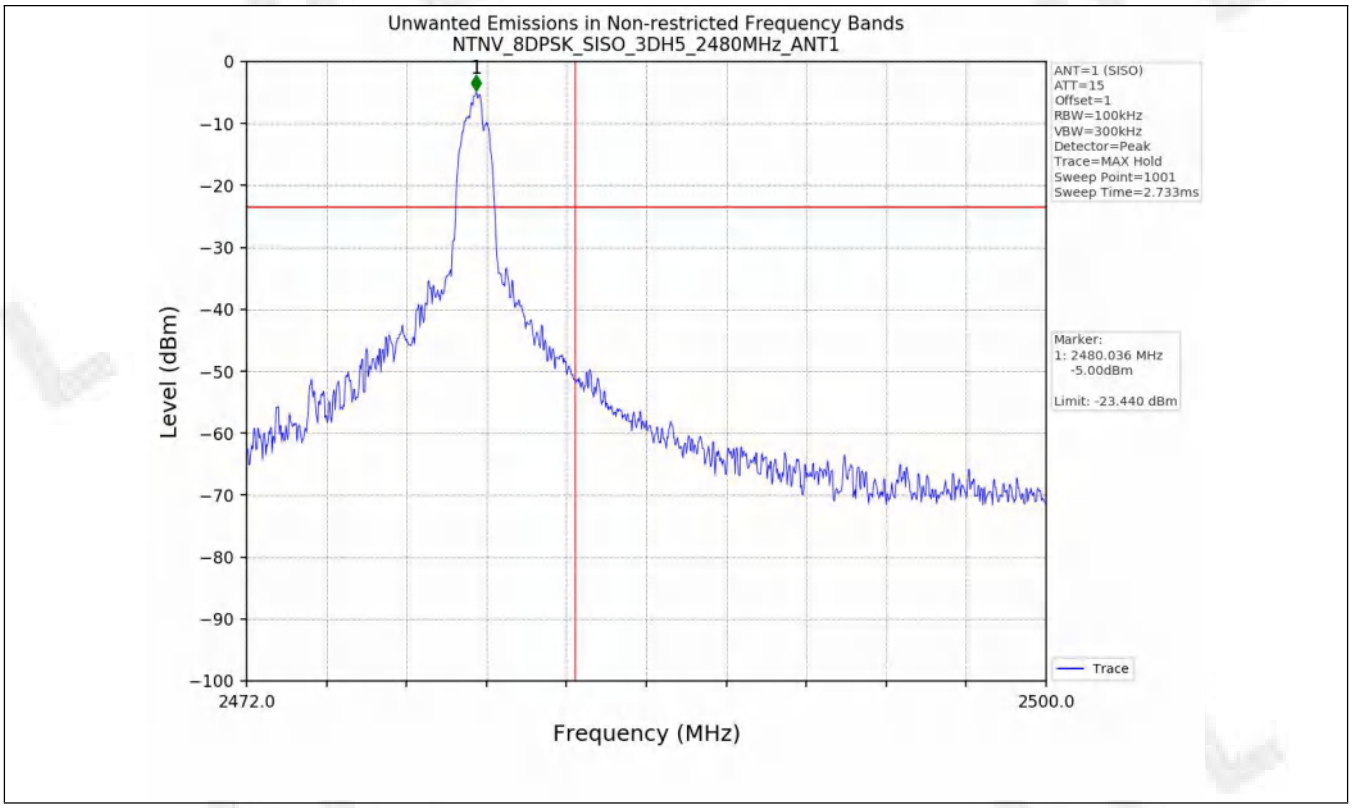

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2478.020 MHz
-5.26dBm
Limit: -23.530 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

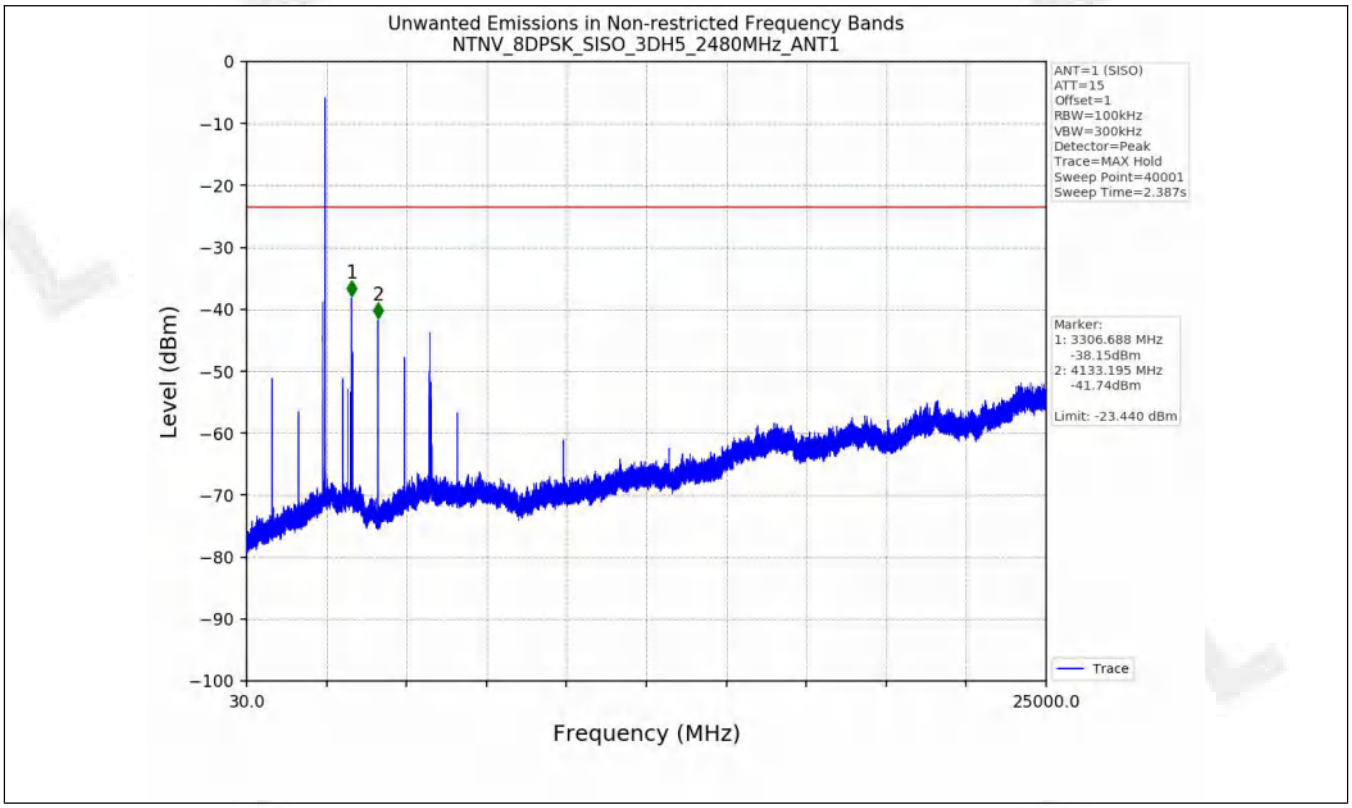

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2402.026 MHz
-3.44dBm
Trace
Level (dBm)
Frequency (MHz)
2401.062
2402.938

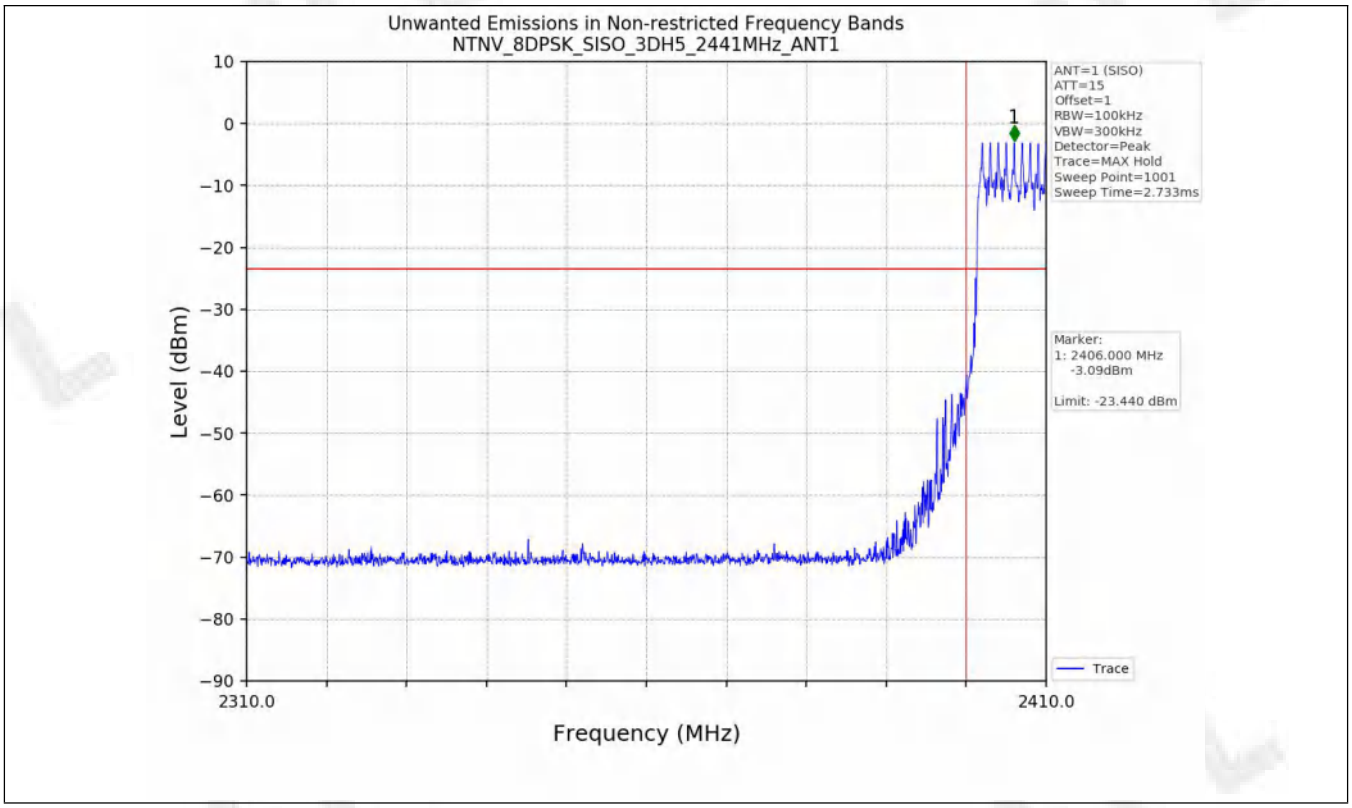

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.050 MHz
-3.42dBm
Limit: -23.440 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

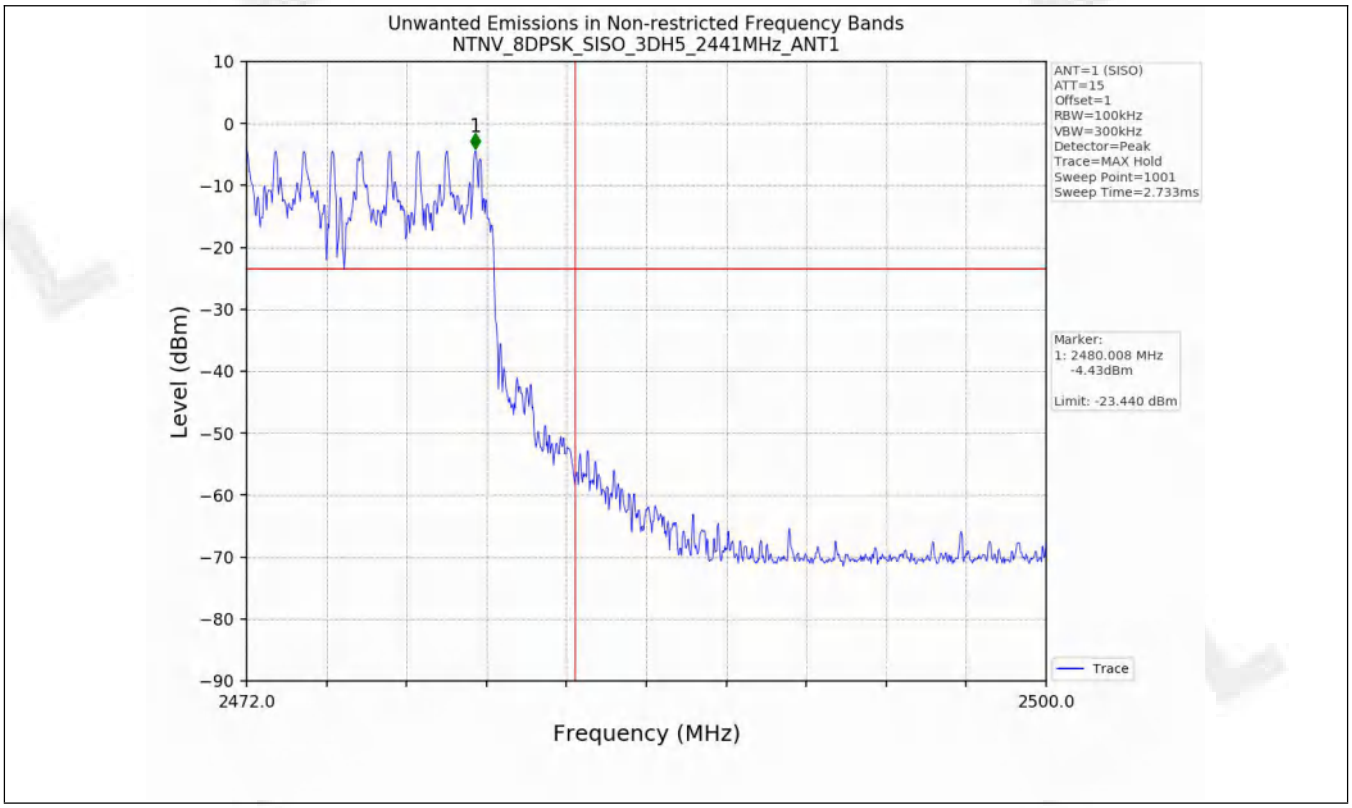

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3202.438 MHz
-35.26dBm
2: 4003.351 MHz
-40.04dBm
Limit: -23.440 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3254.875 MHz
-36.90dBm
2: 4068.273 MHz
-40.65dBm
Limit: -23.440 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2480.036 MHz
-5.00dBm
Limit: -23.440 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 3306.688 MHz
-38.15dBm
2: 4133.195 MHz
-41.74dBm
Limit: -23.440 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2406.000 MHz
-3.09dBm
Limit: -23.440 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2480.008 MHz
-4.43dBm
Limit: -23.440 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0