Appendix for 15.247

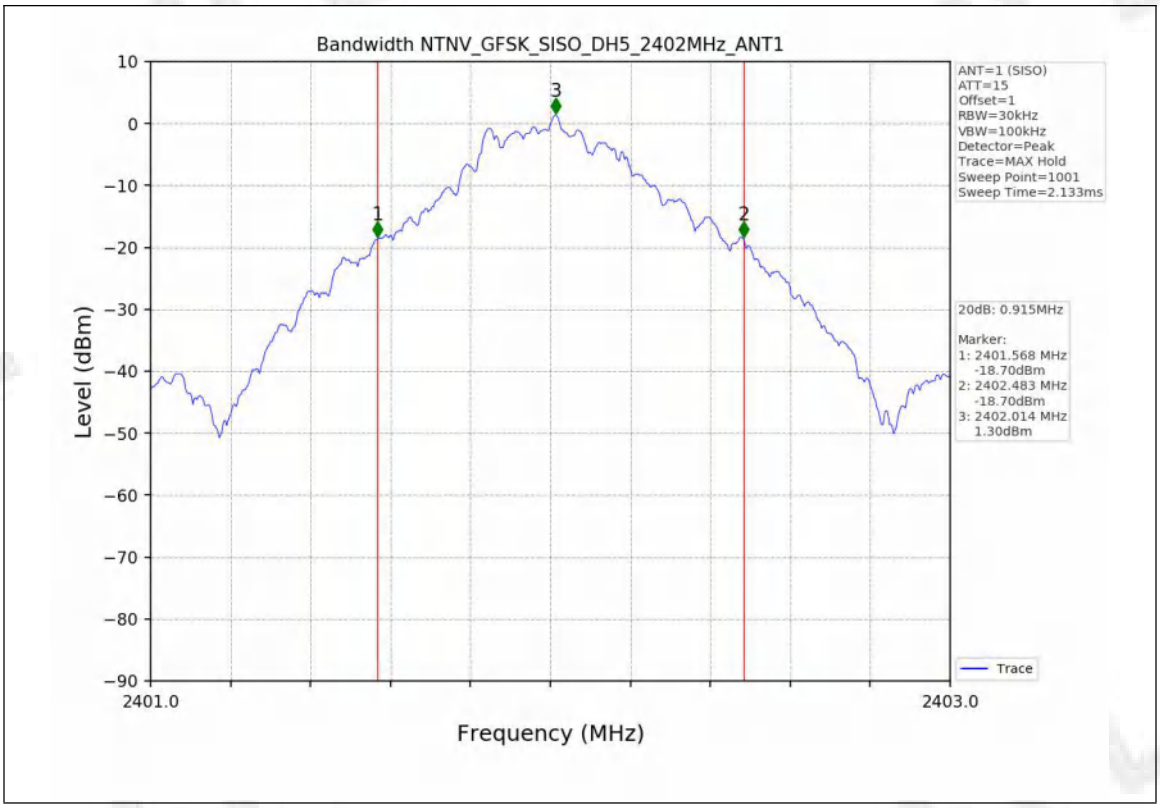
1. Bandwidth

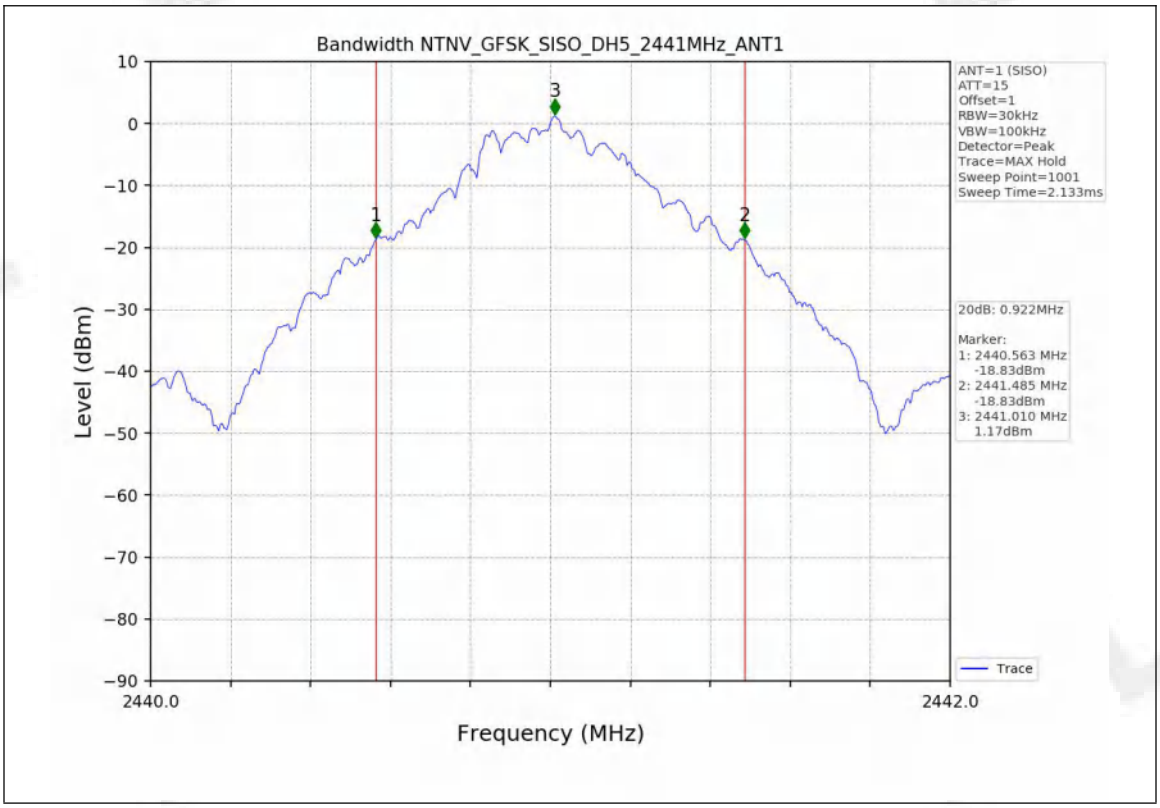
1.1 Test Result

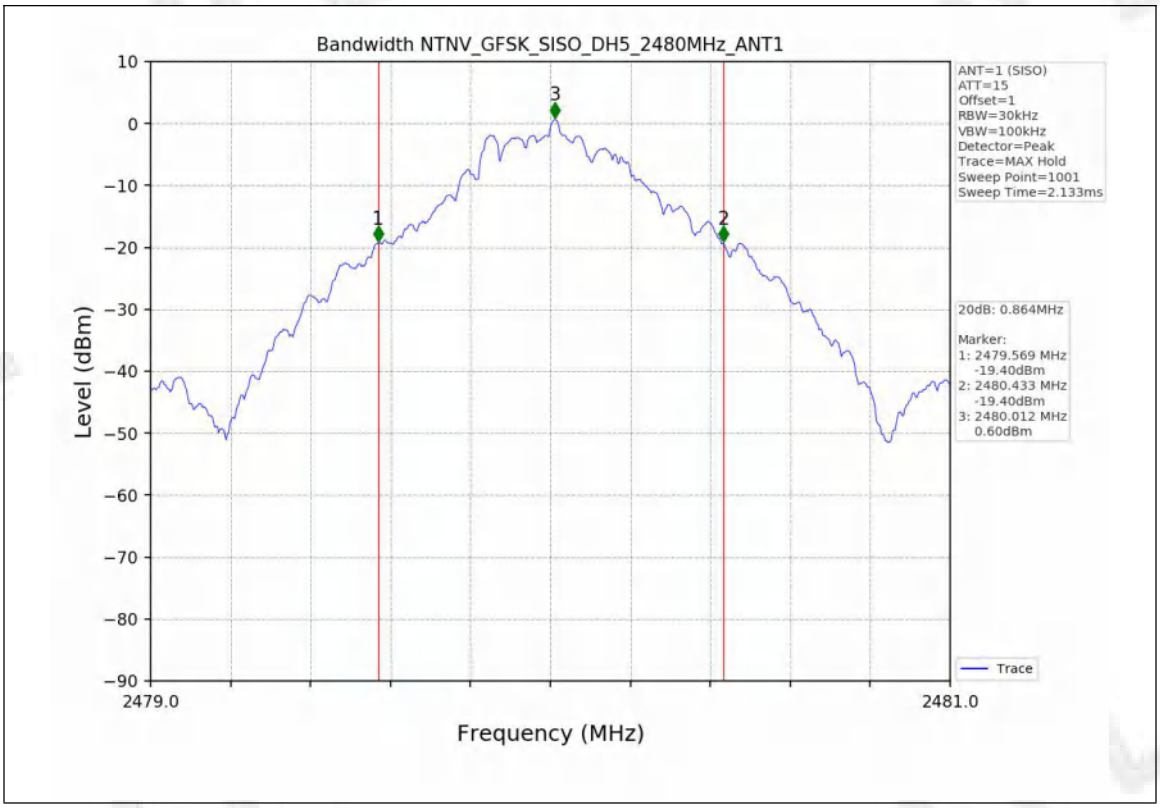
Test Mode	Frequency (MHz)	TX Type	ANT No.	20dB Bandwidth Test Result (MHz)	Verdict
GFSK	2402	SISO	1	0.915	PASS
	2441	SISO	1	0.922	PASS
	2480	SISO	1	0.864	PASS
Pi/4DQPSK	2402	SISO	1	1.253	PASS
	2441	SISO	1	1.228	PASS
	2480	SISO	1	1.257	PASS
8DPSK	2402	SISO	1	1.233	PASS
	2441	SISO	1	1.239	PASS
	2480	SISO	1	1.230	PASS

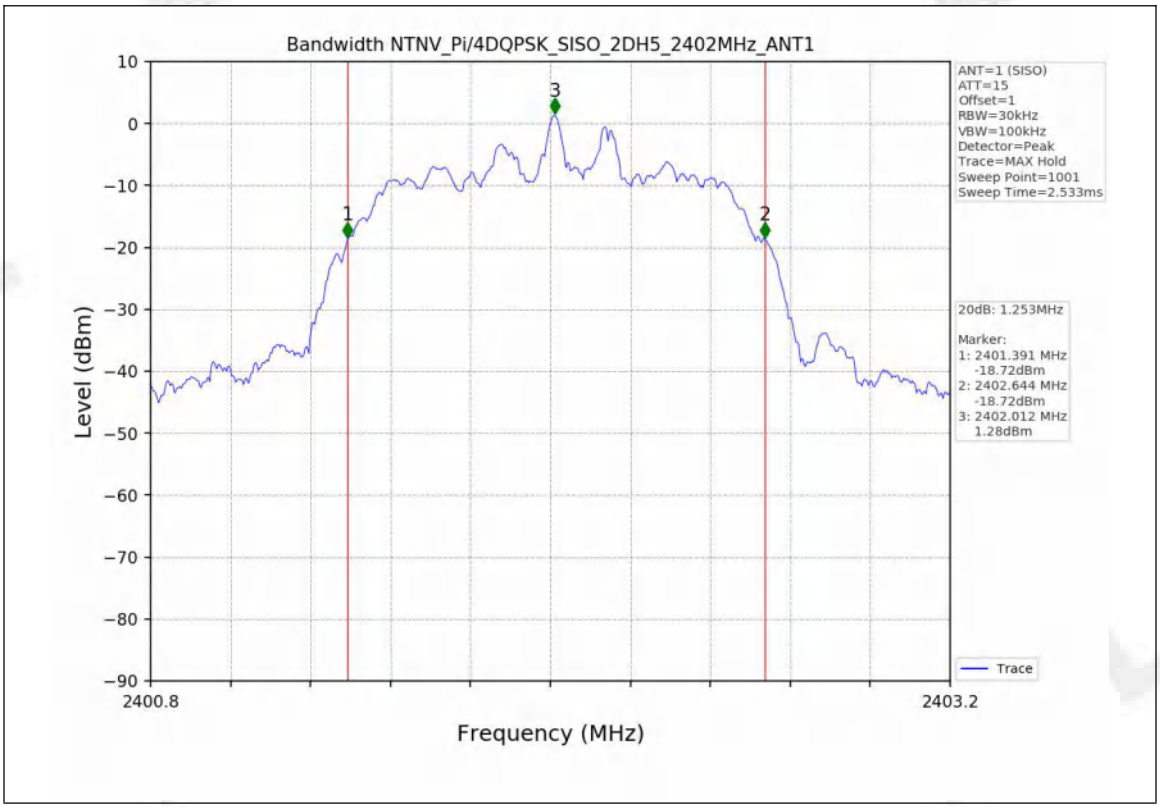
Test Mode	Frequency (MHz)	TX Type	ANT No.	99% Occupied Bandwidth Test Result (MHz)	
GFSK	2402	SISO	1	0.839	Only for Report Use
	2441	SISO	1	0.843	Only for Report Use
	2480	SISO	1	0.848	Only for Report Use
Pi/4DQPSK	2402	SISO	1	1.165	Only for Report Use
	2441	SISO	1	1.170	Only for Report Use
	2480	SISO	1	1.168	Only for Report Use
8DPSK	2402	SISO	1	1.164	Only for Report Use
	2441	SISO	1	1.168	Only for Report Use
	2480	SISO	1	1.167	Only for Report Use

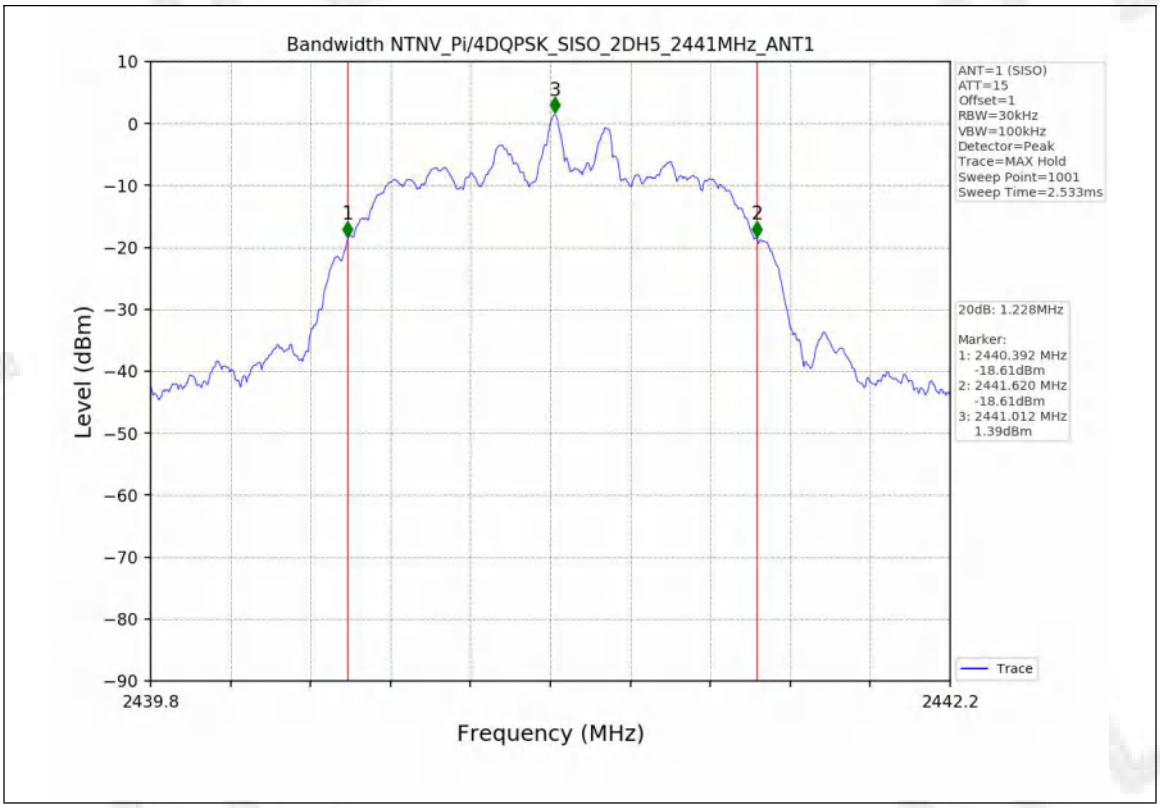
1.2 Test Graph - 20dB Bandwidth

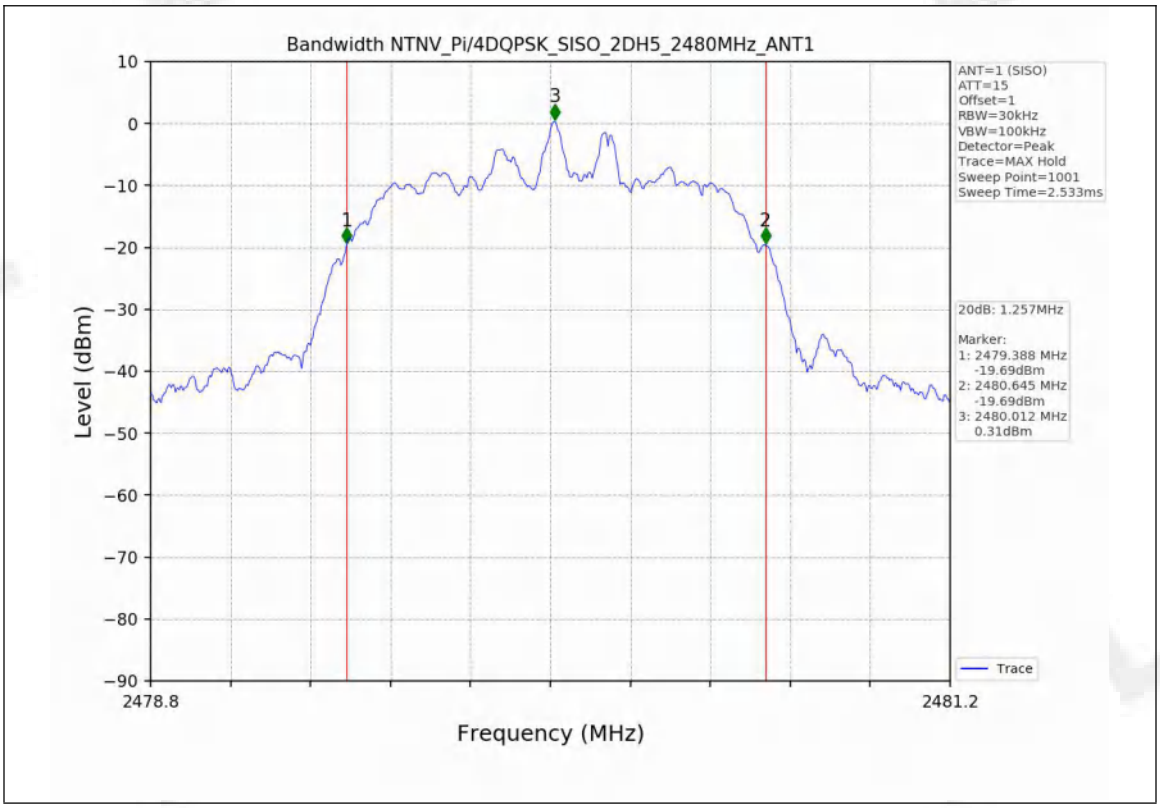

Bandwidth NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.915MHz
Marker:
1: 2401.568 MHz
-18.70dBm
2: 2402.483 MHz
-18.70dBm
3: 2402.014 MHz
1.30dBm
Trace
Level (dBm)
Frequency (MHz)
2401.0
2403.0

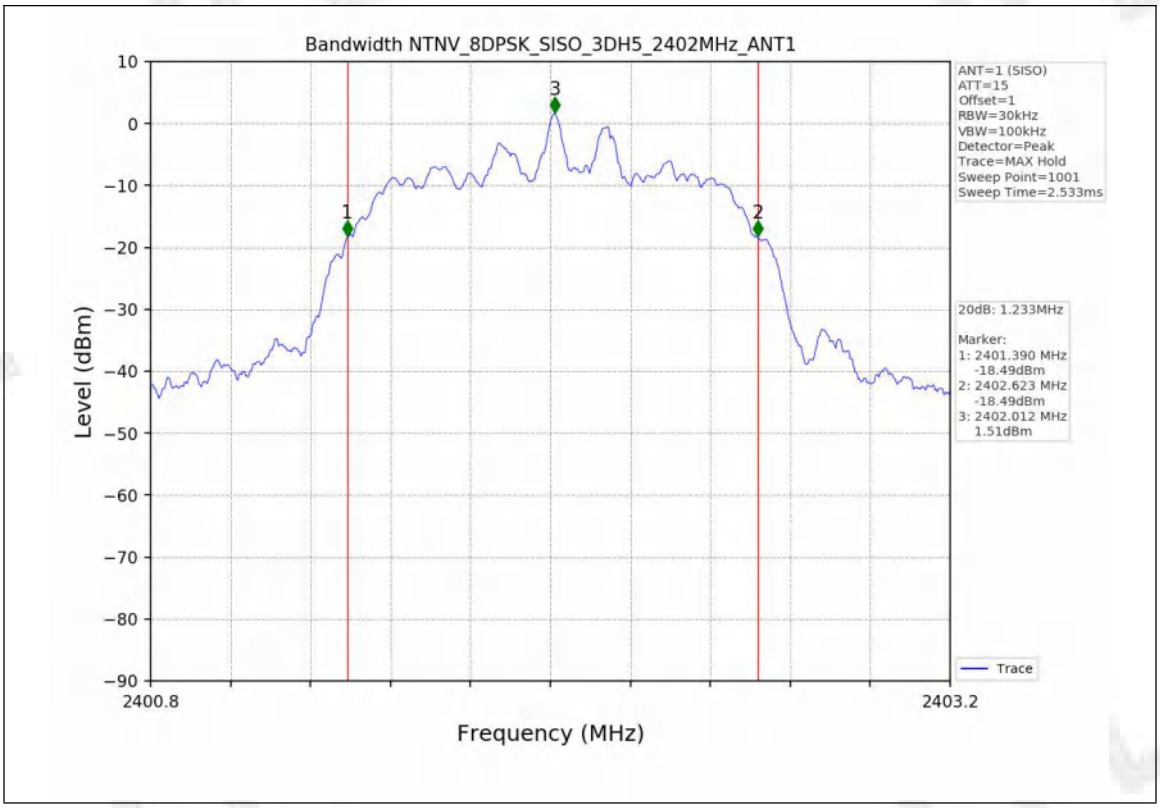

Bandwidth NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.922MHz
Marker:
1: 2440.563 MHz
-18.83dBm
2: 2441.485 MHz
-18.83dBm
3: 2441.010 MHz
1.17dBm
Trace
Level (dBm)
Frequency (MHz)
2440.0
2442.0

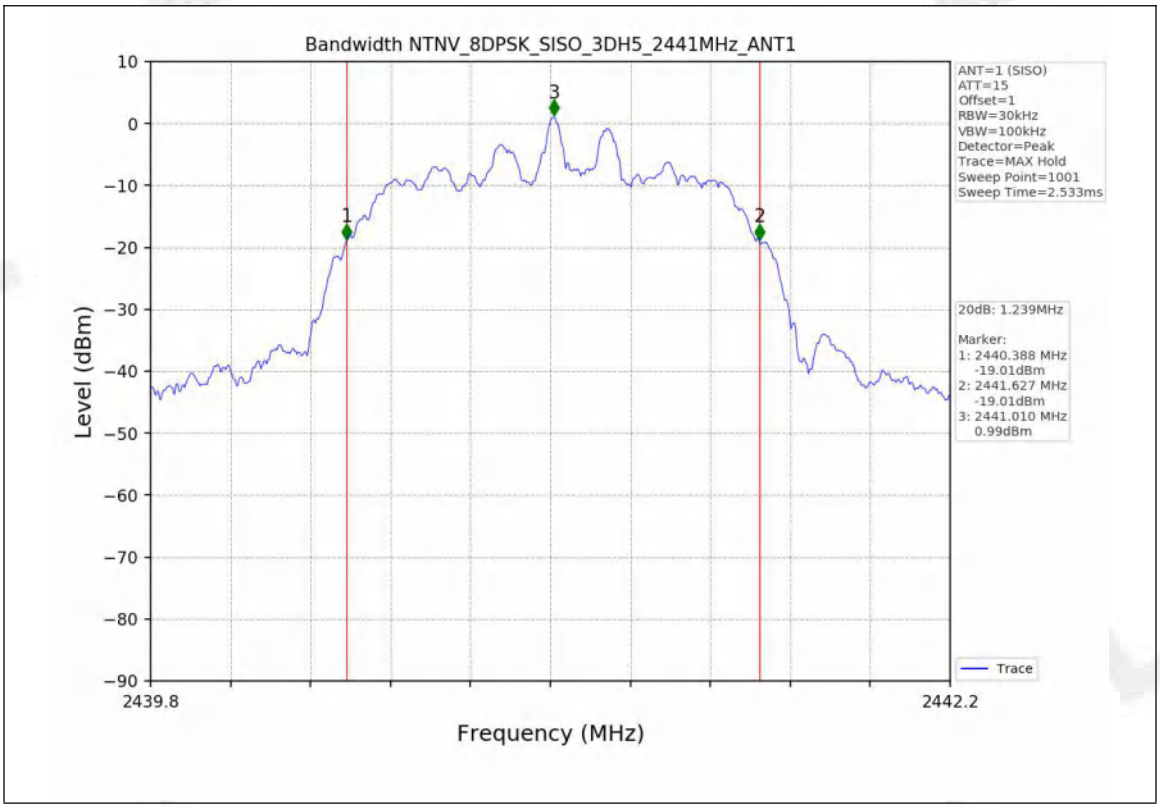

Bandwidth NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.864MHz
Marker:
1: 2479.569 MHz
-19.40dBm
2: 2480.433 MHz
-19.40dBm
3: 2480.012 MHz
0.60dBm
Trace
Level (dBm)
Frequency (MHz)
2479.0
2481.0

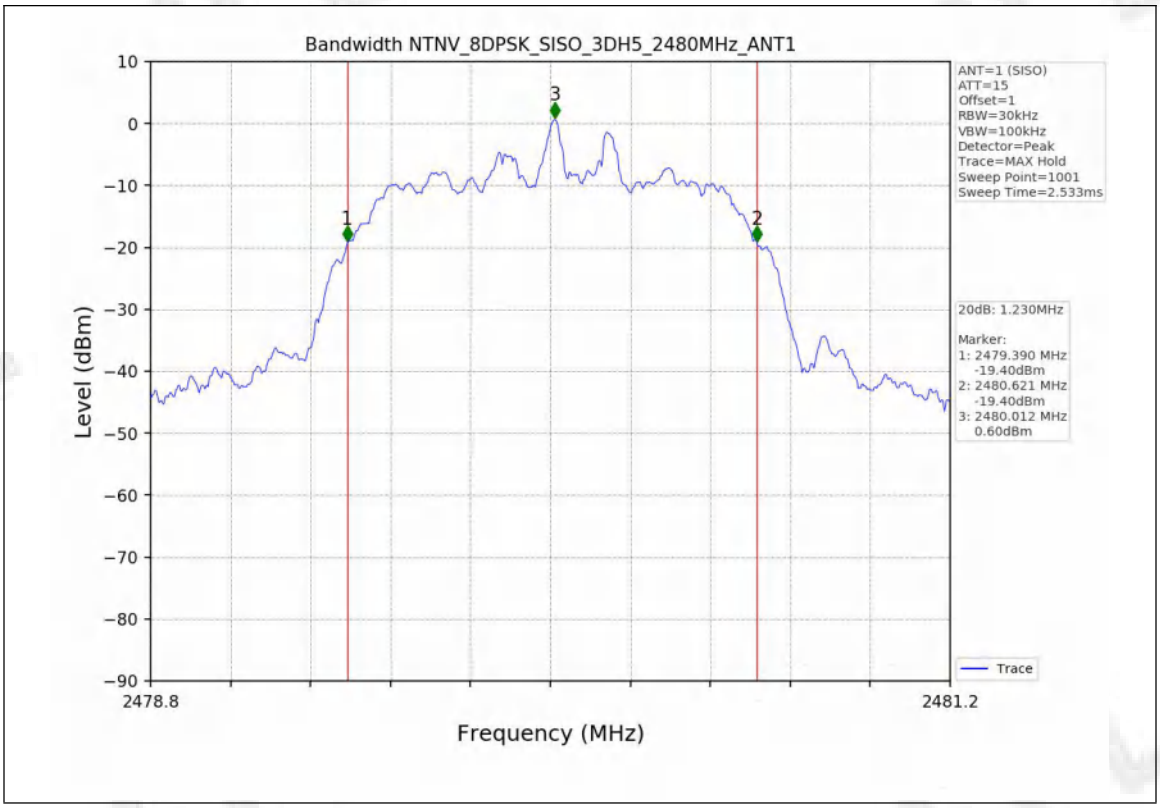

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.253MHz
Marker:
1: 2401.391 MHz
-18.72dBm
2: 2402.644 MHz
-18.72dBm
3: 2402.012 MHz
1.28dBm
Trace
Level (dBm)
Frequency (MHz)
2400.8
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: 1.228MHz
Marker:
1: 2440.392 MHz
-18.61dBm
2: 2441.620 MHz
-18.61dBm
3: 2441.012 MHz
1.39dBm
Trace
Level (dBm)
Frequency (MHz)
2439.8
2442.2

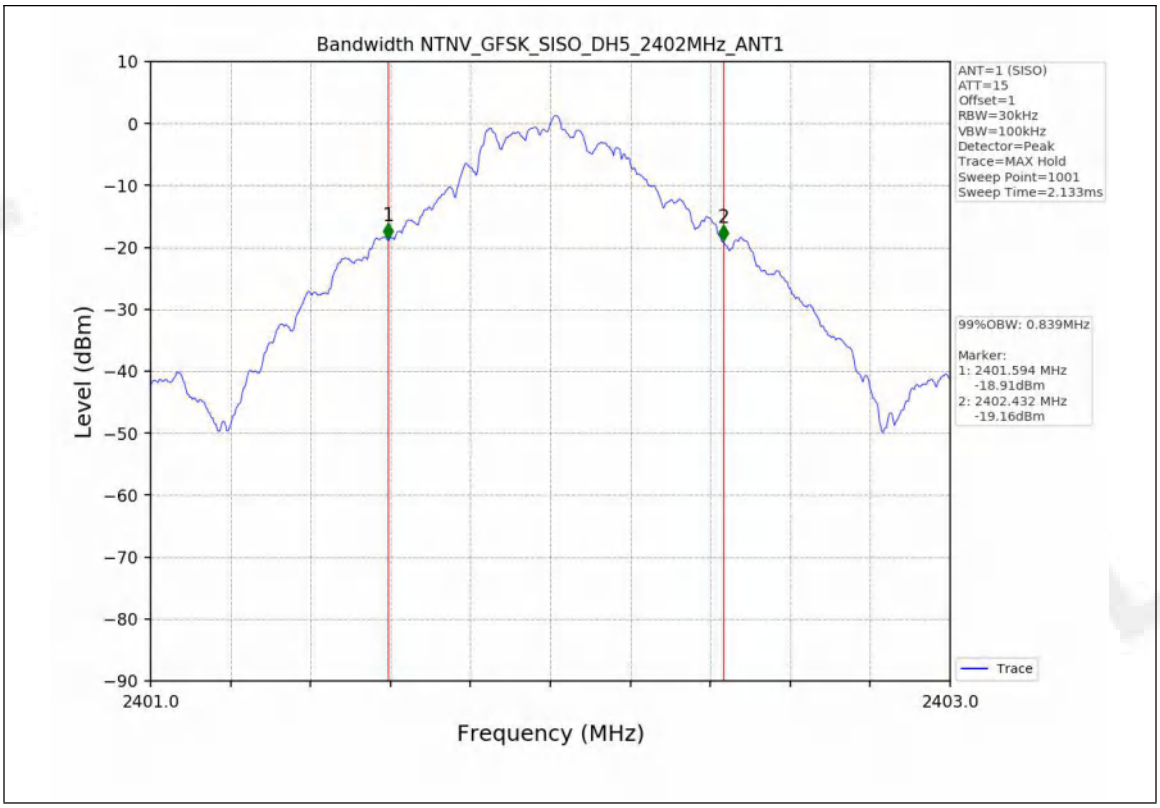

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.257MHz
Marker:
1: 2479.388 MHz
-19.69dBm
2: 2480.645 MHz
-19.69dBm
3: 2480.012 MHz
0.31dBm
Trace
Level (dBm)
Frequency (MHz)
2478.8
2481.2

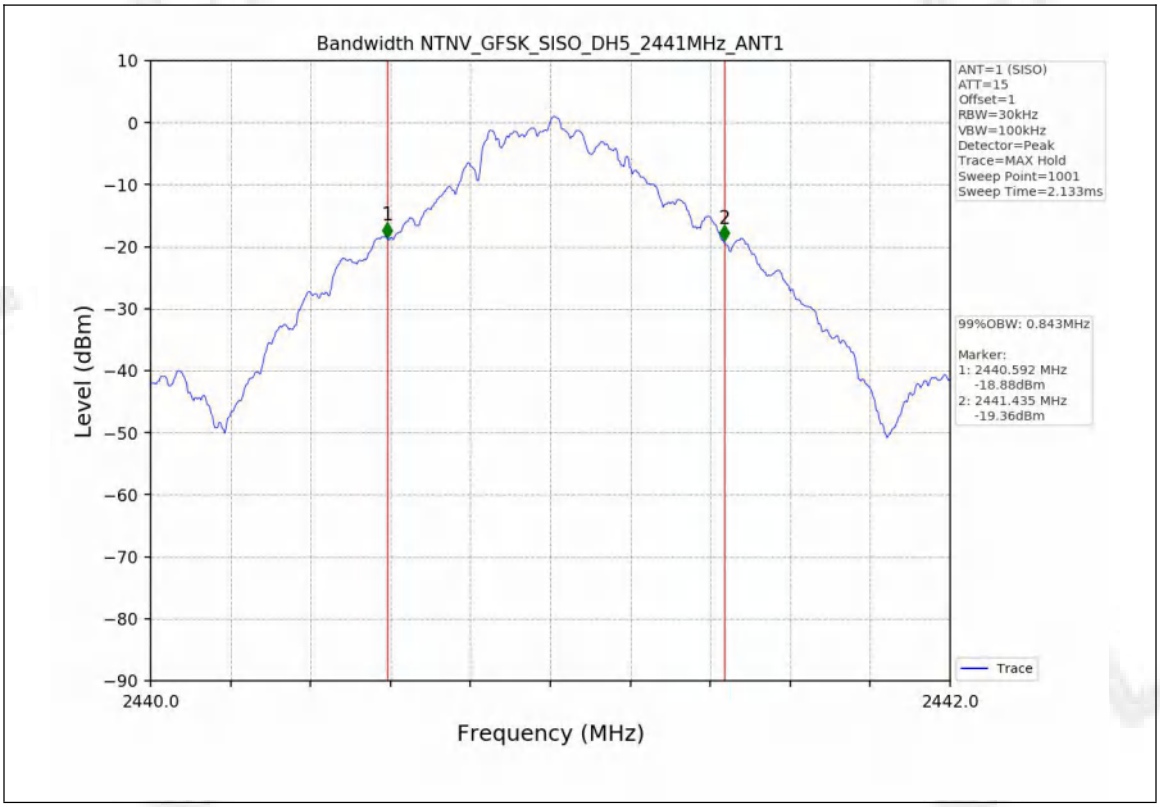

Bandwidth NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.233MHz
Marker:
1: 2401.390 MHz
-18.49dBm
2: 2402.623 MHz
-18.49dBm
3: 2402.012 MHz
1.51dBm
Trace
Level (dBm)
Frequency (MHz)
2400.8
2403.2

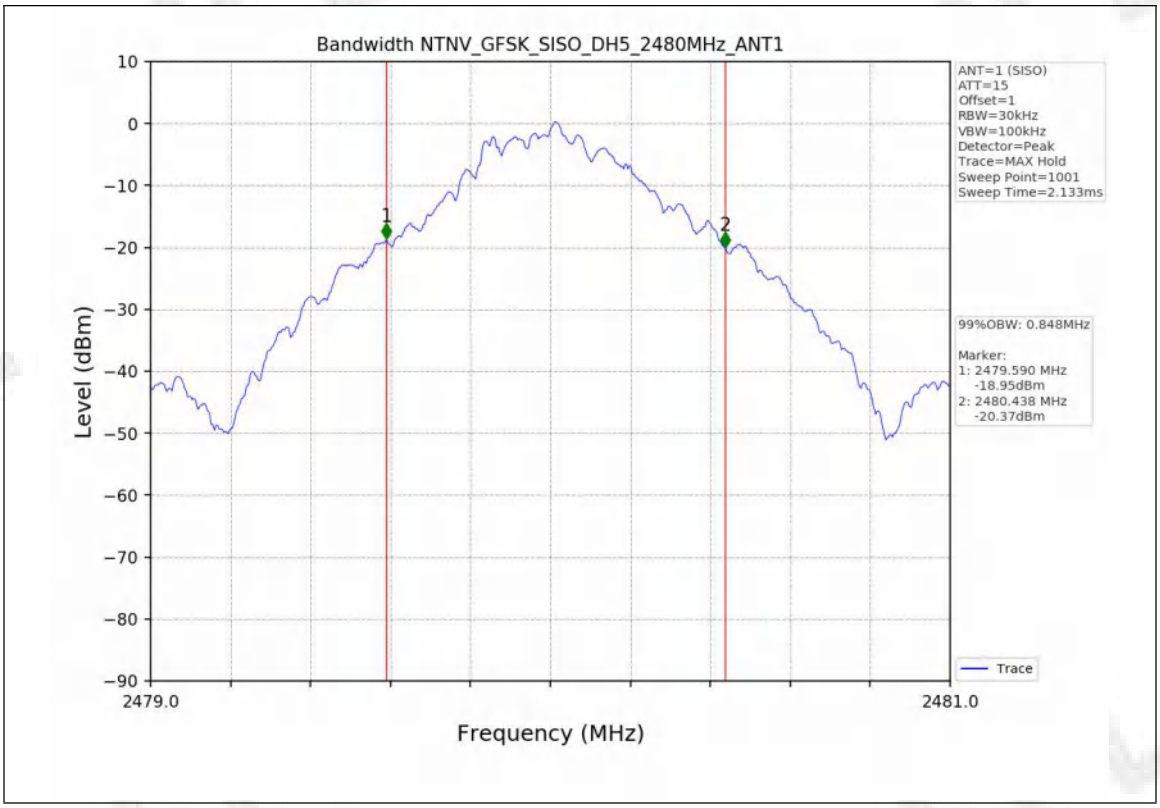

Bandwidth NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
20dB: 1.239MHz
Marker:
1: 2440.388 MHz
-19.01dBm
2: 2441.627 MHz
-19.01dBm
3: 2441.010 MHz
0.99dBm
Trace
Level (dBm)
Frequency (MHz)
2439.8
2442.2

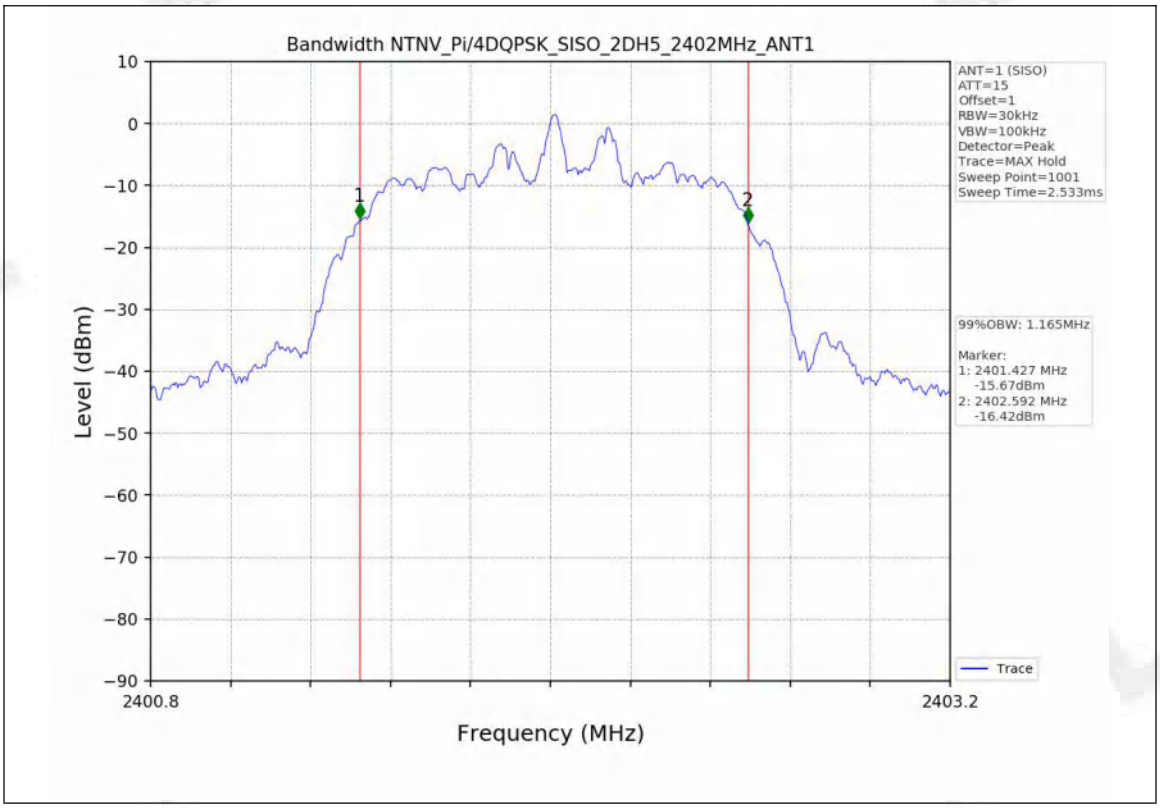


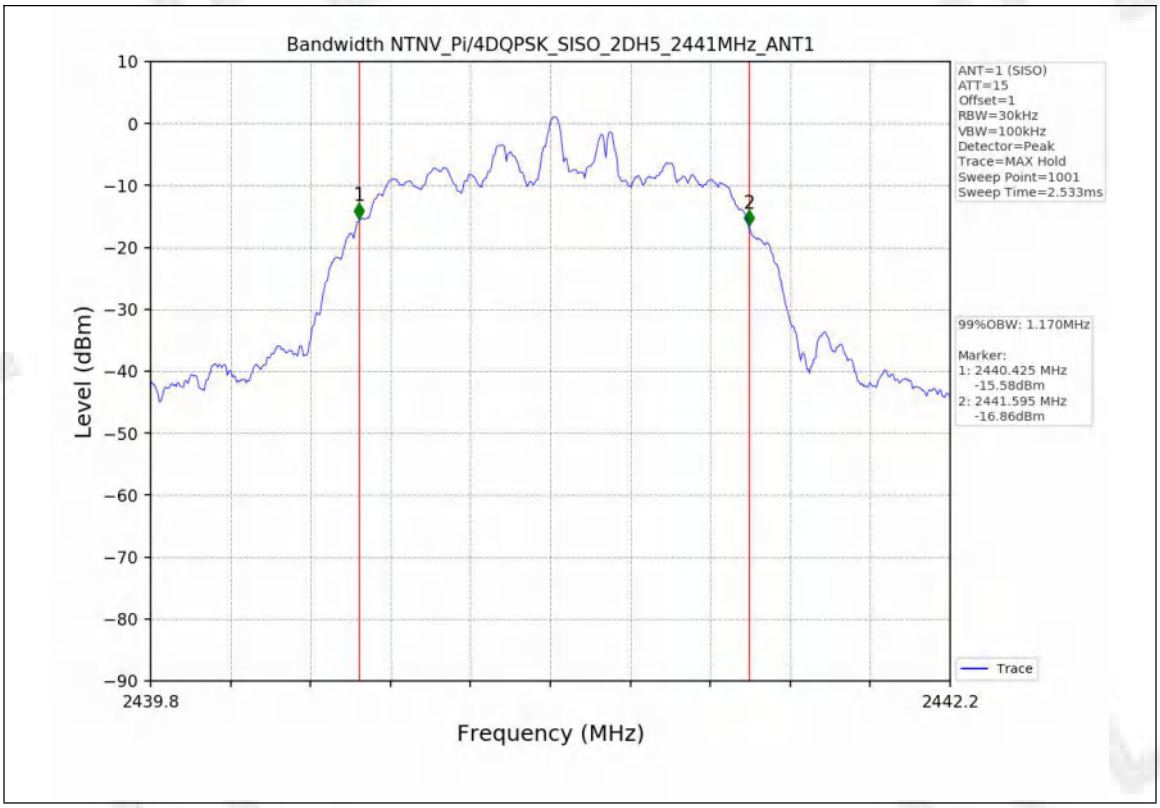
1.3 Test Graph - 99% Occupied Bandwidth

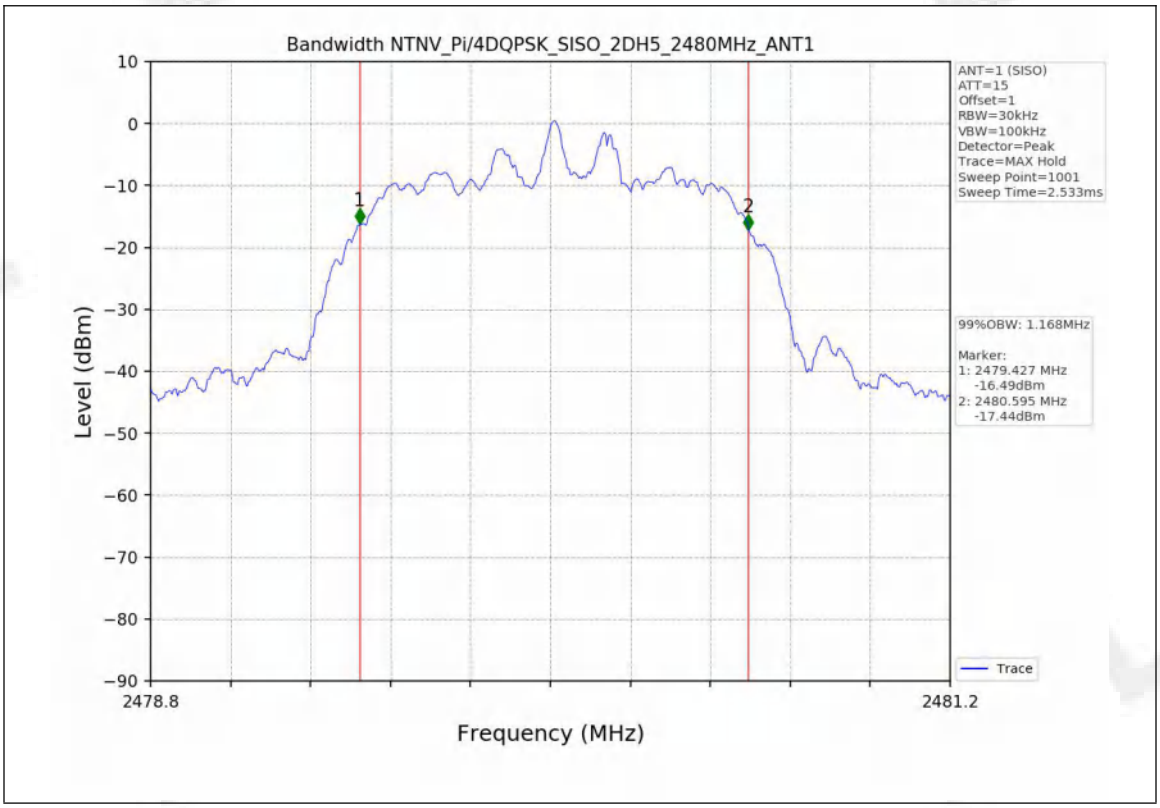


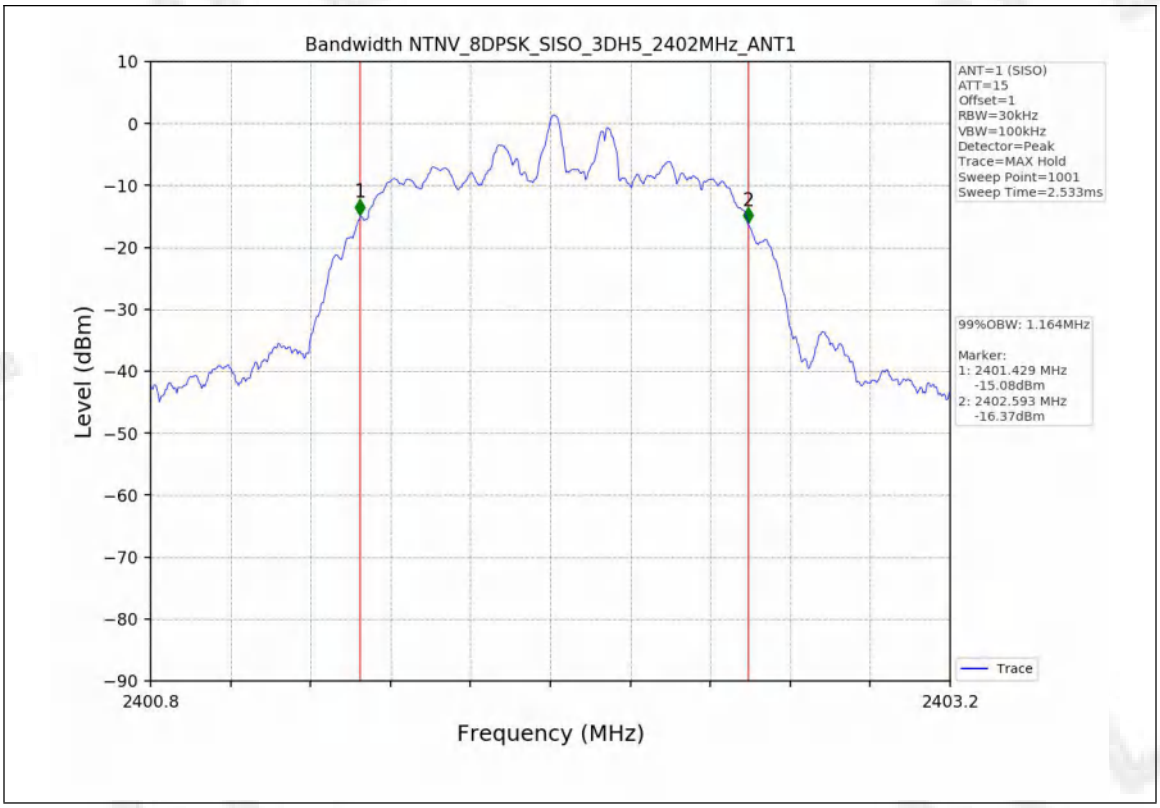

Bandwidth NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
99%OBW: 0.843MHz
Marker:
1: 2440.592 MHz
-18.88dBm
2: 2441.435 MHz
-19.36dBm
Trace
Level (dBm)
Frequency (MHz)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
2440.0
2442.0
1
2

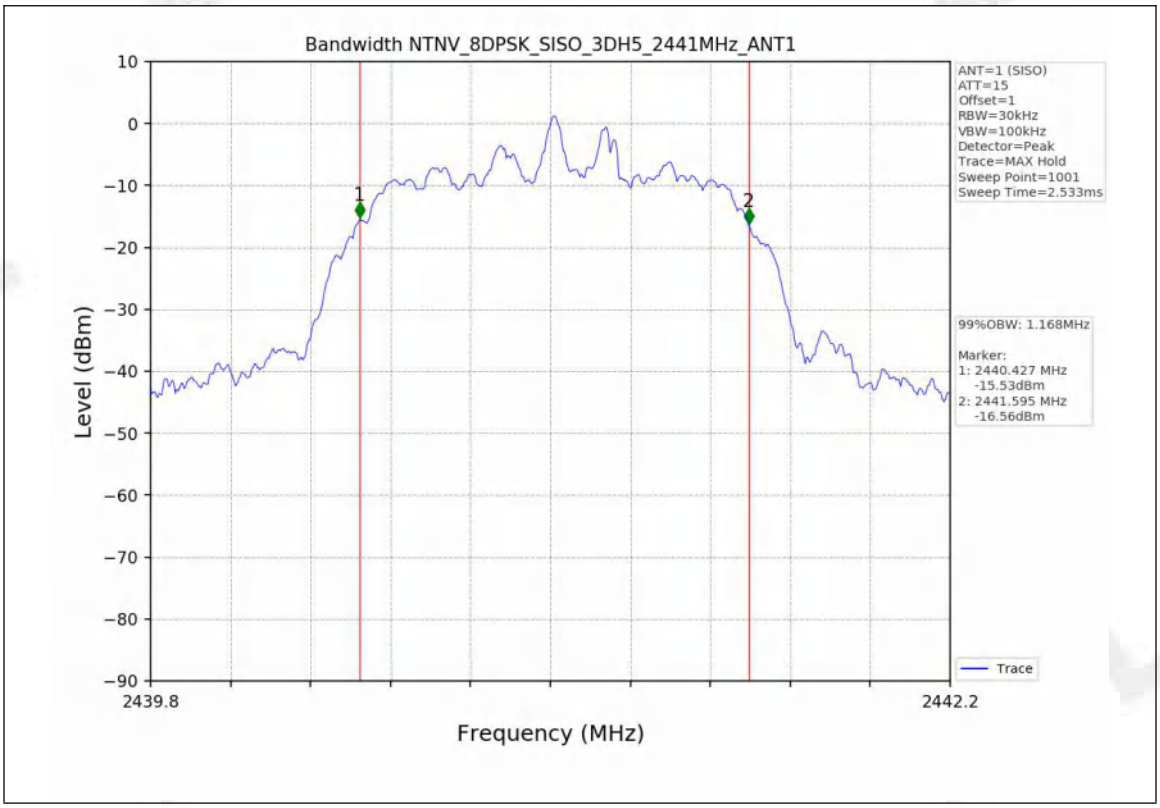

Bandwidth NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
99%OBW: 0.848MHz
Marker:
1: 2479.590 MHz
-18.95dBm
2: 2480.438 MHz
-20.37dBm
Trace
Level (dBm)
Frequency (MHz)
2479.0
2481.0

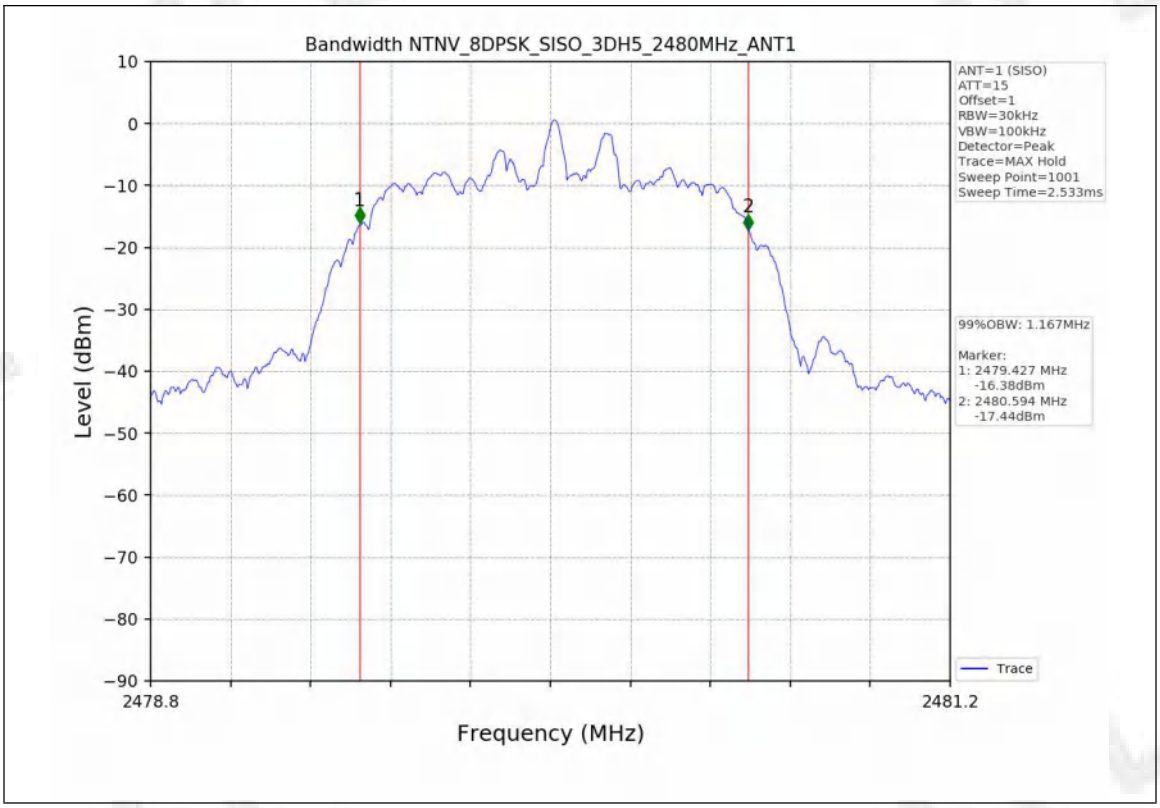

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.533ms
99%OBW: 1.165MHz
Marker:
1: 2401.427 MHz
-15.67dBm
2: 2402.592 MHz
-16.42dBm
Trace
Level (dBm)
Frequency (MHz)
2400.8
2403.2


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: 1.170MHz
Marker:
1: 2440.425 MHz
-15.58dBm
2: 2441.595 MHz
-16.86dBm
Trace
Level (dBm)
Frequency (MHz)
2439.8
2442.2


Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_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: 1.168MHz
Marker:
1: 2479.427 MHz
-16.49dBm
2: 2480.595 MHz
-17.44dBm
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: 1.164MHz
Marker:
1: 2401.429 MHz
-15.08dBm
2: 2402.593 MHz
-16.37dBm
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: 1.168MHz
Marker:
1: 2440.427 MHz
-15.53dBm
2: 2441.595 MHz
-16.56dBm
Trace
Level (dBm)
Frequency (MHz)
2439.8
2442.2

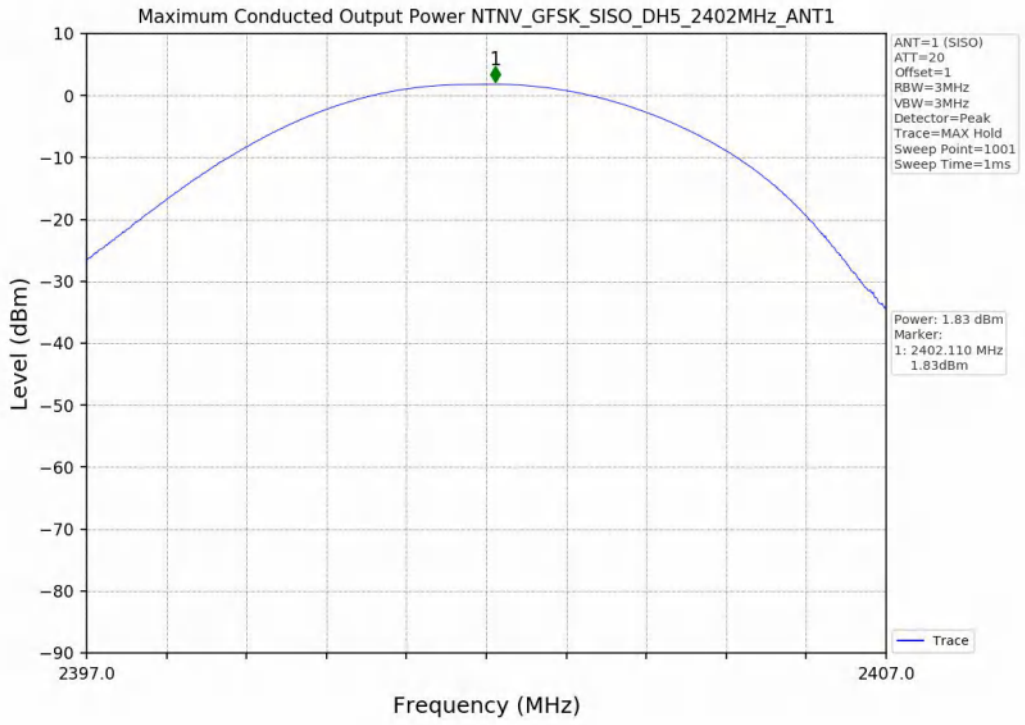


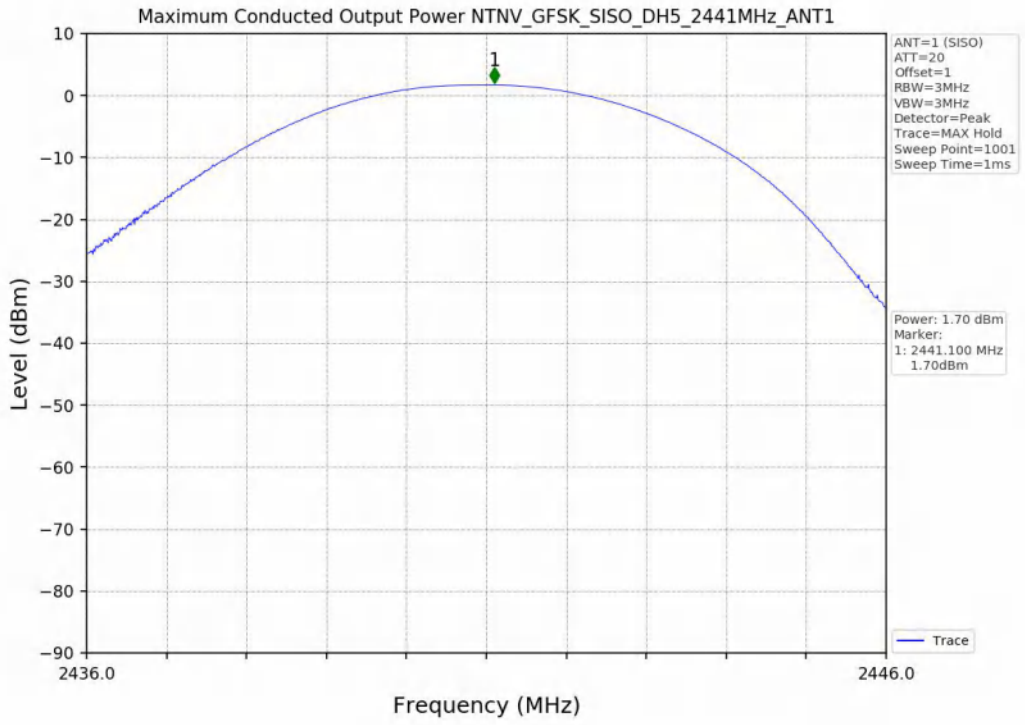
2. Maximum Conducted Output Power

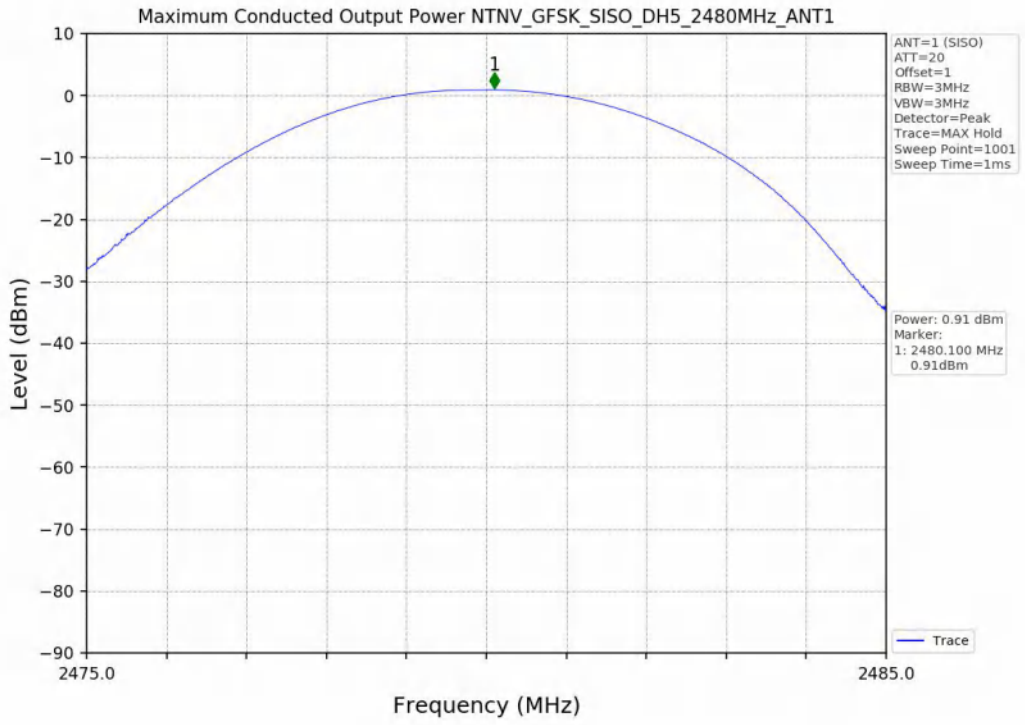
2.1 Test Result

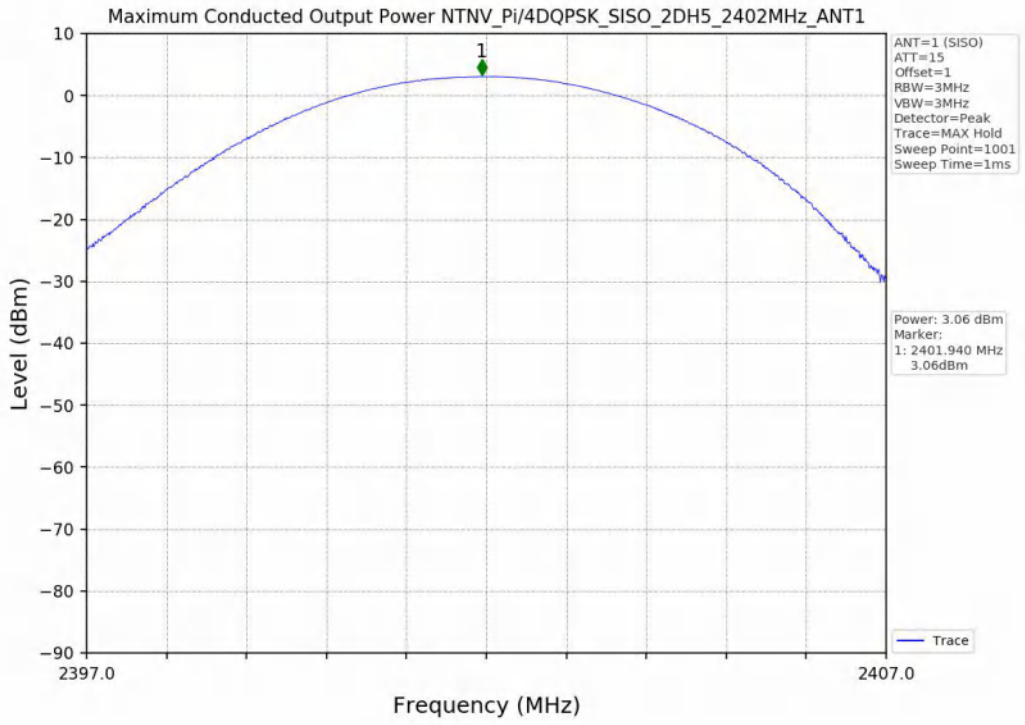
Test Mode	Frequency (MHz)	Tx Type	Measured Peak Output Power (dBm)	Limits (dBm)	Verdict
			Ant 1		
GFSK	2402	SISO	1.83	30	PASS
	2441	SISO	1.70	30	PASS
	2480	SISO	0.91	30	PASS
Pi/4DQPSK	2402	SISO	3.06	20.97	PASS
	2441	SISO	2.93	20.97	PASS
	2480	SISO	2.18	20.97	PASS
8DPSK	2402	SISO	3.07	20.97	PASS
	2441	SISO	2.93	20.97	PASS
	2480	SISO	2.18	20.97	PASS

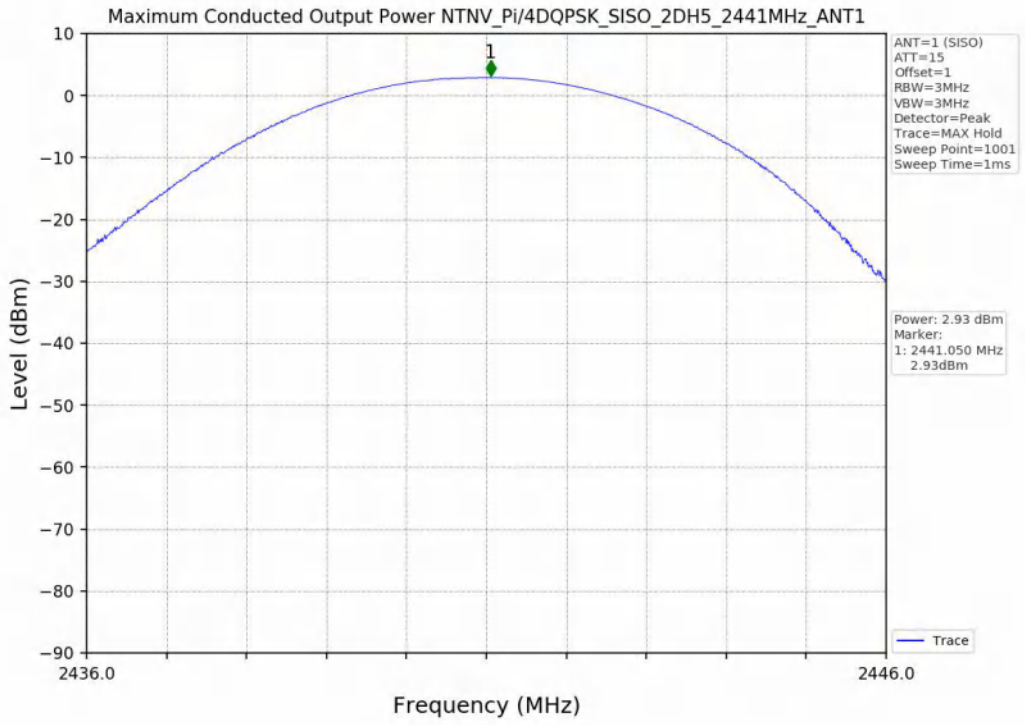
2.2 Test Graph

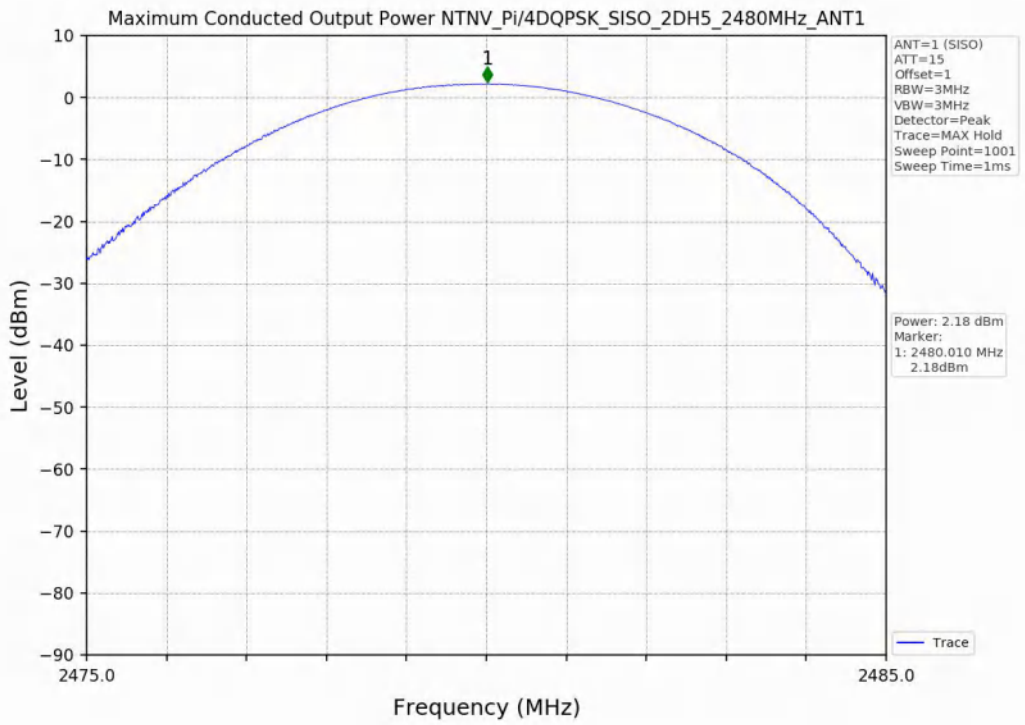

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 1.83 dBm
Marker:
1: 2402.110 MHz
1.83dBm
Trace
Level (dBm)
Frequency (MHz)
2397.0
2407.0

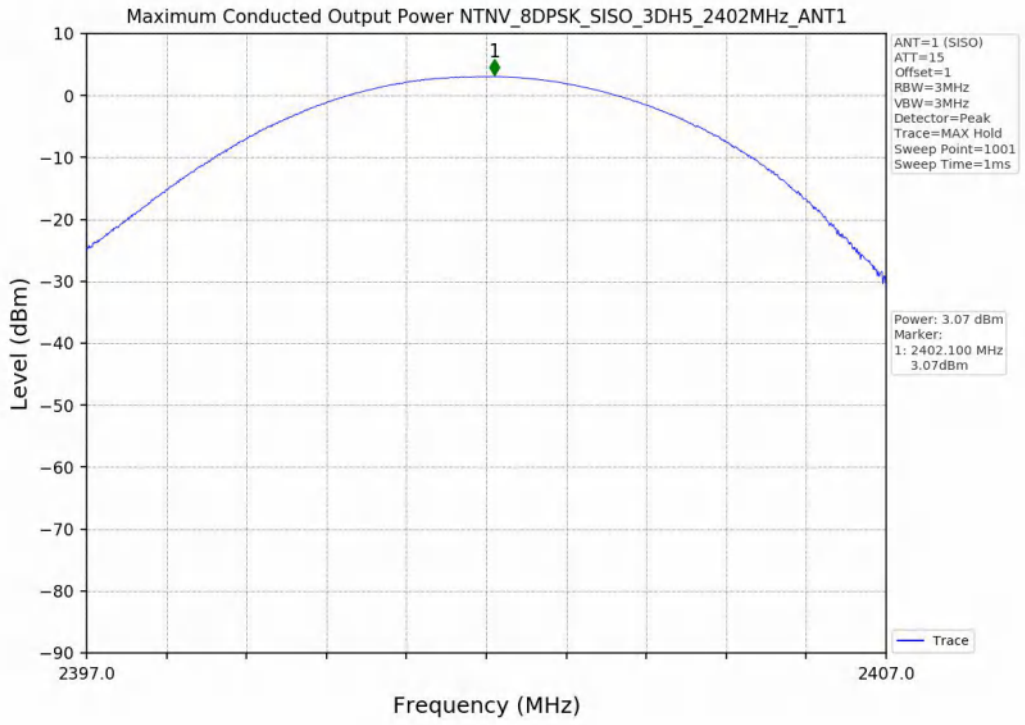

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 1.70 dBm
Marker:
1: 2441.100 MHz
1.70dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0

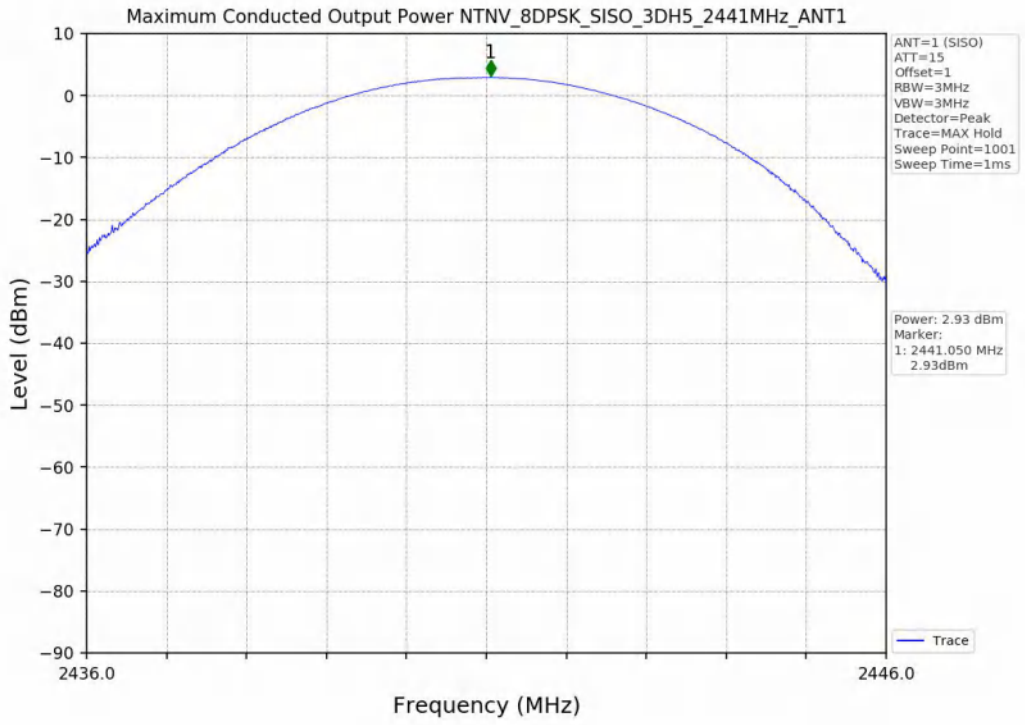

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 0.91 dBm
Marker:
1: 2480.100 MHz
0.91dBm
Trace
Level (dBm)
Frequency (MHz)
2475.0
2485.0

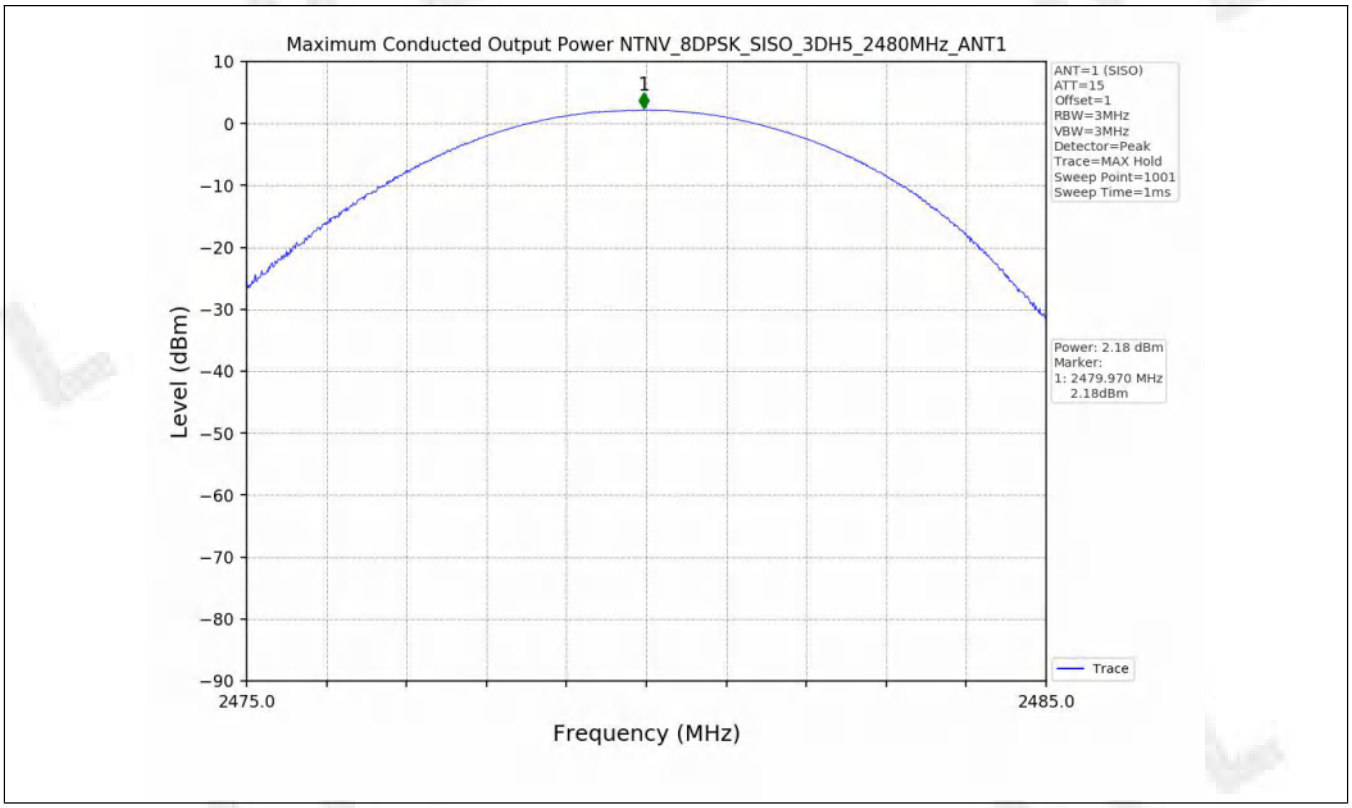

Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 3.06 dBm
Marker:
1: 2401.940 MHz
3.06dBm
Trace
Level (dBm)
Frequency (MHz)
2397.0
2407.0


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: 2.93 dBm
Marker:
1: 2441.050 MHz
2.93dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0


Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 2.18 dBm
Marker:
1: 2480.010 MHz
2.18dBm
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: 3.07 dBm
Marker:
1: 2402.100 MHz
3.07dBm
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: 2.93 dBm
Marker:
1: 2441.050 MHz
2.93dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0

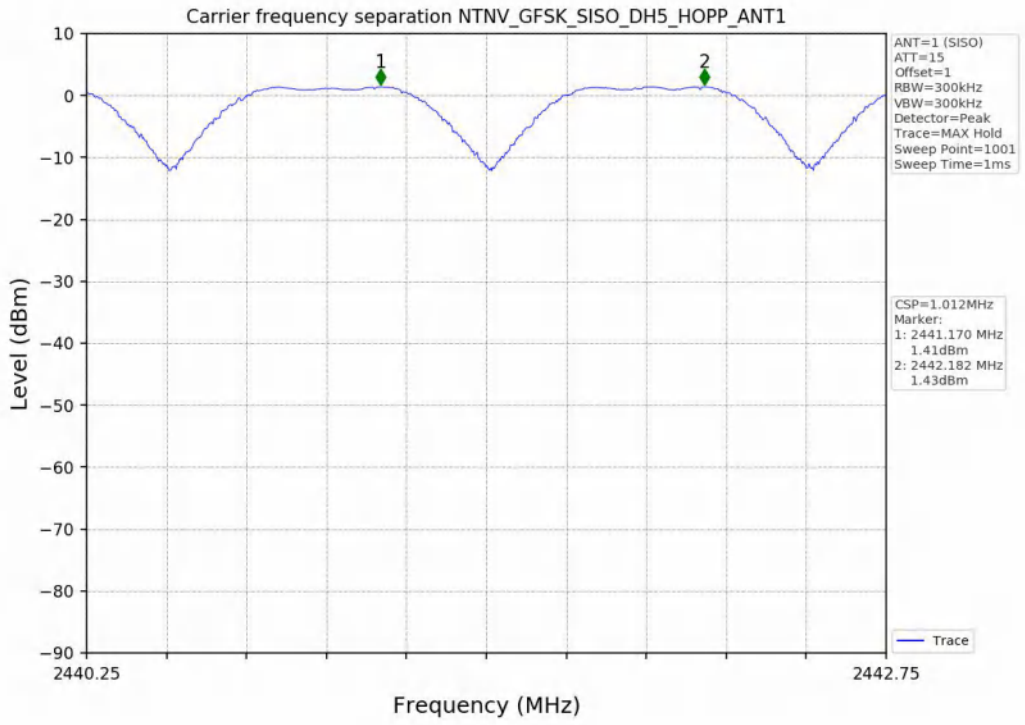


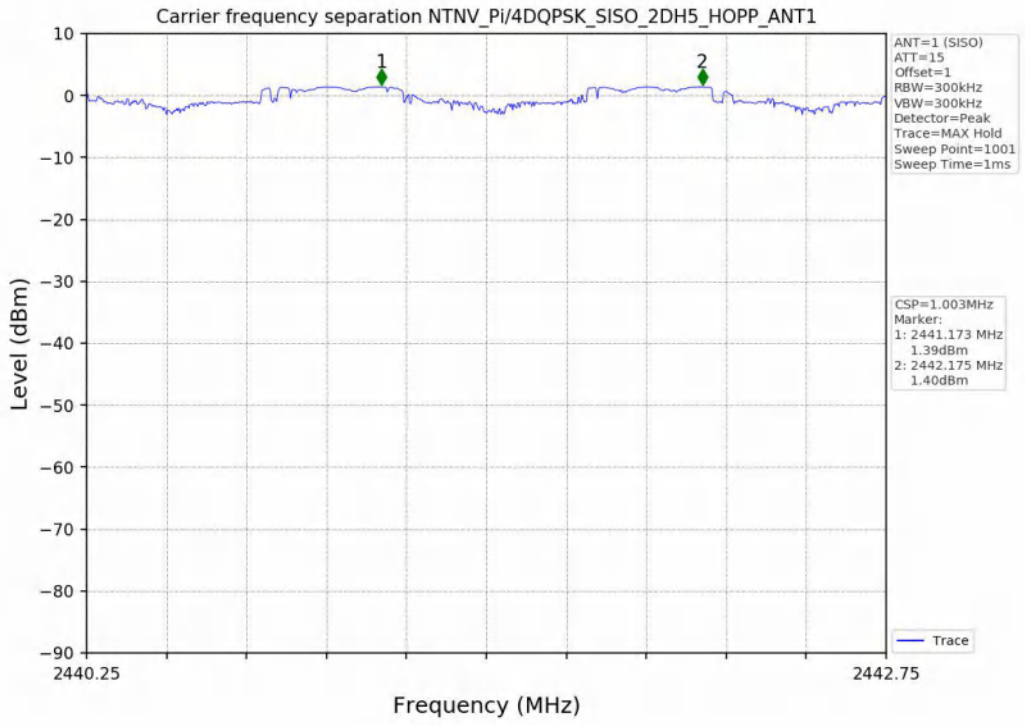
3. Carrier frequency separation

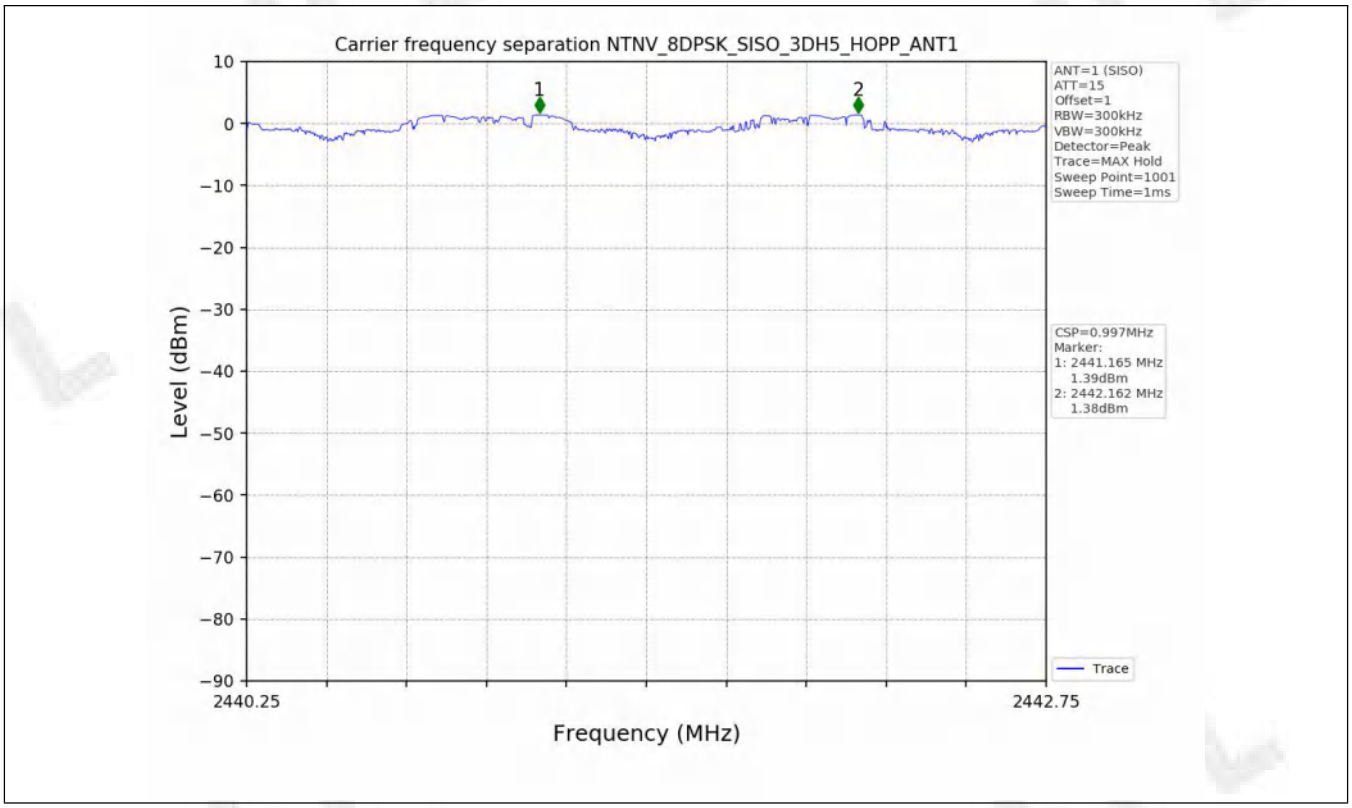
3.1 Test Result

Test Mode	TX Type	ANT No.	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limits (MHz)	Verdict
GFSK	SISO	1	1.012	0.922	≥0.922	PASS
Pi/4DQPSK	SISO	1	1.003	1.257	≥0.838	PASS
8DPSK	SISO	1	0.997	1.239	≥0.826	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=1.012MHz
Marker:
1: 2441.170 MHz
1.41dBm
2: 2442.182 MHz
1.43dBm
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=1.003MHz
Marker:
1: 2441.173 MHz
1.39dBm
2: 2442.175 MHz
1.40dBm
Trace
Level (dBm)
Frequency (MHz)
2440.25
2442.75

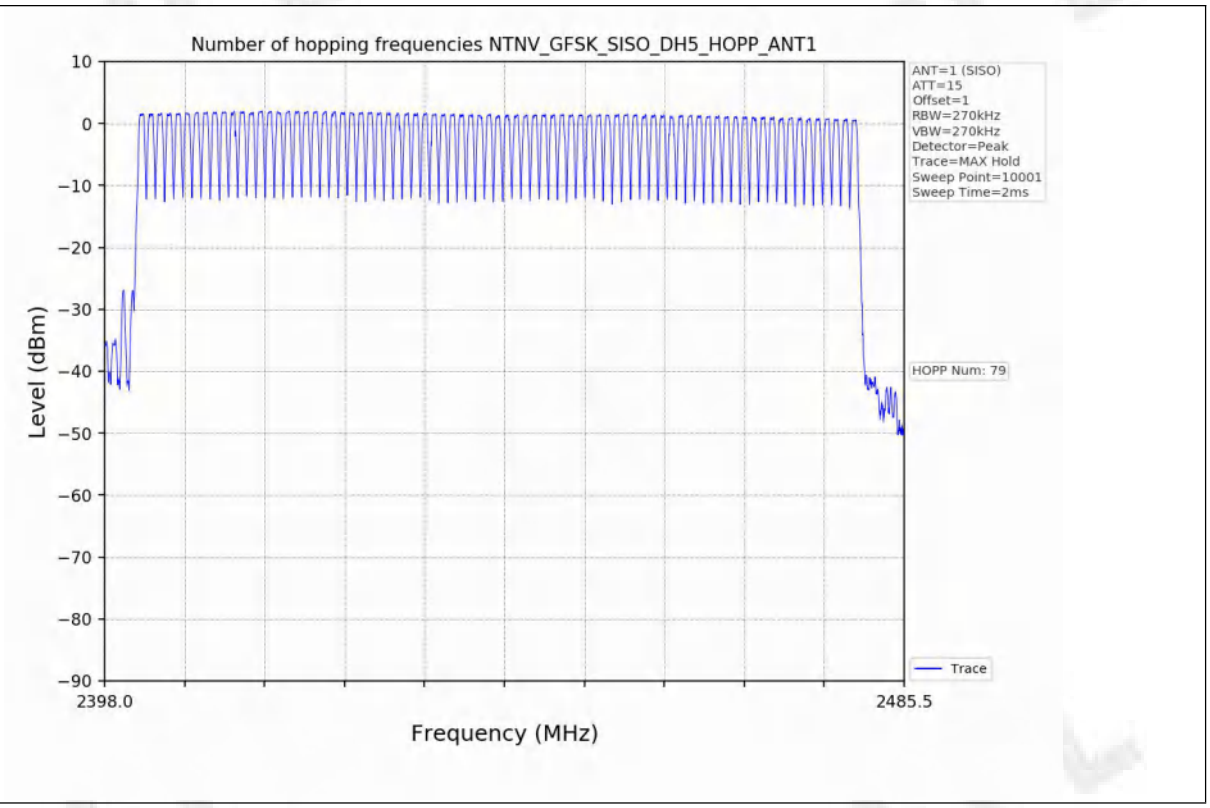


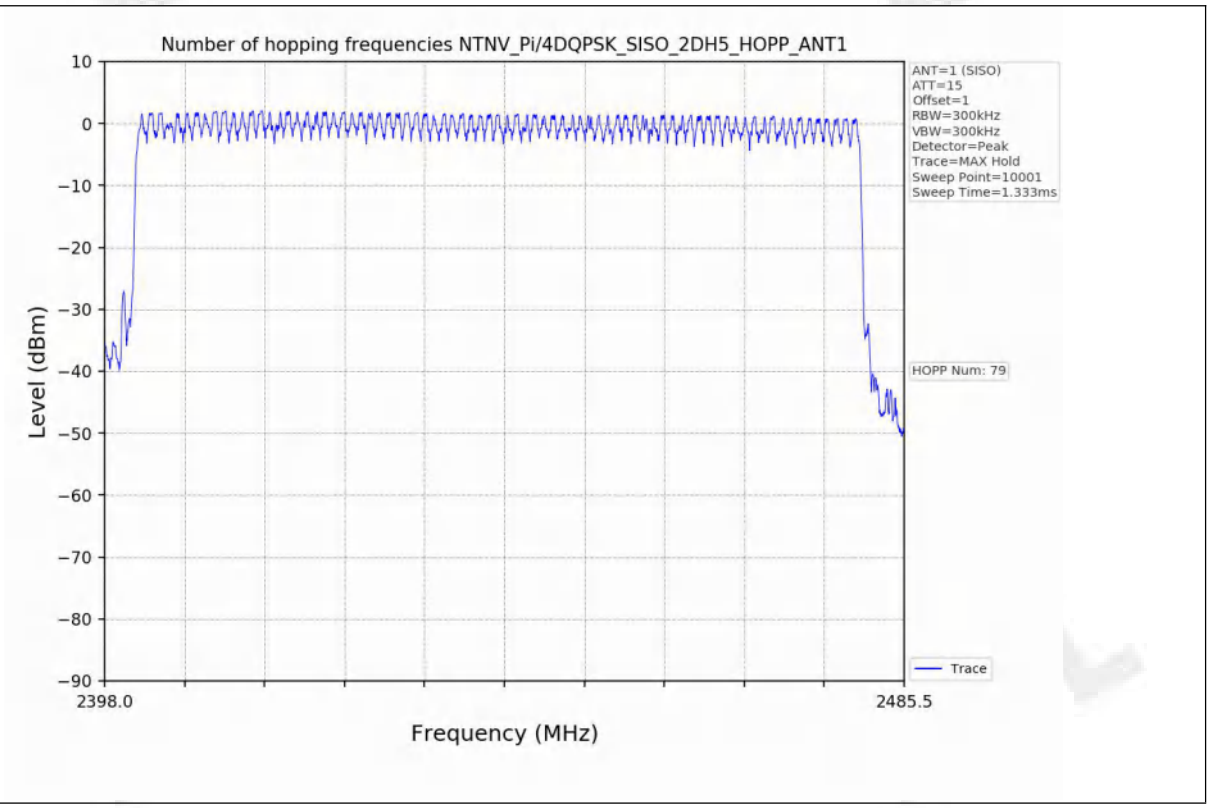
4. Number of hopping frequencies

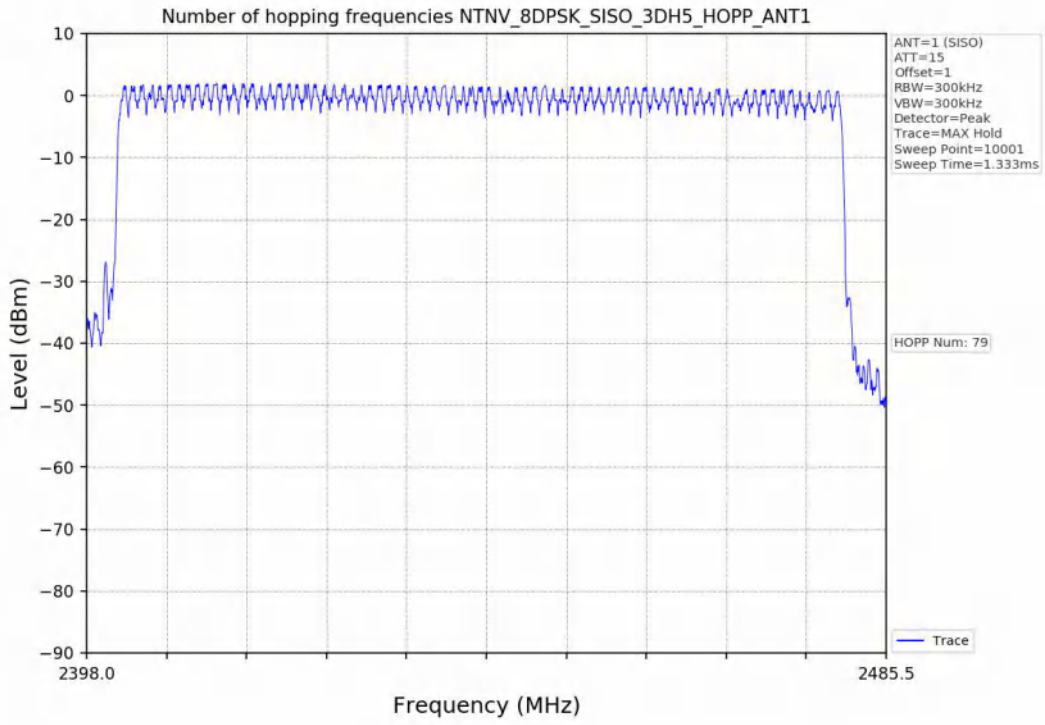
4.1 Test Result

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)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
2398.0
2485.5
Frequency (MHz)


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)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
2398.0
2485.5
Frequency (MHz)

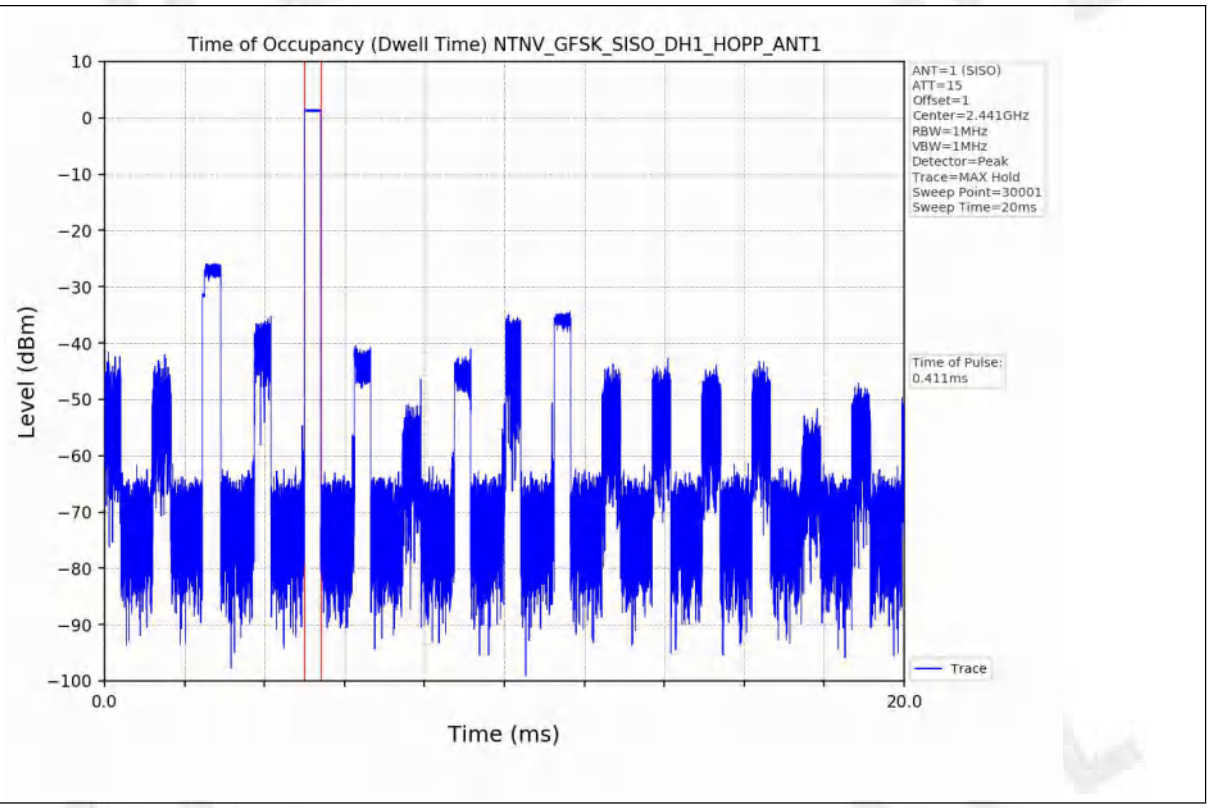


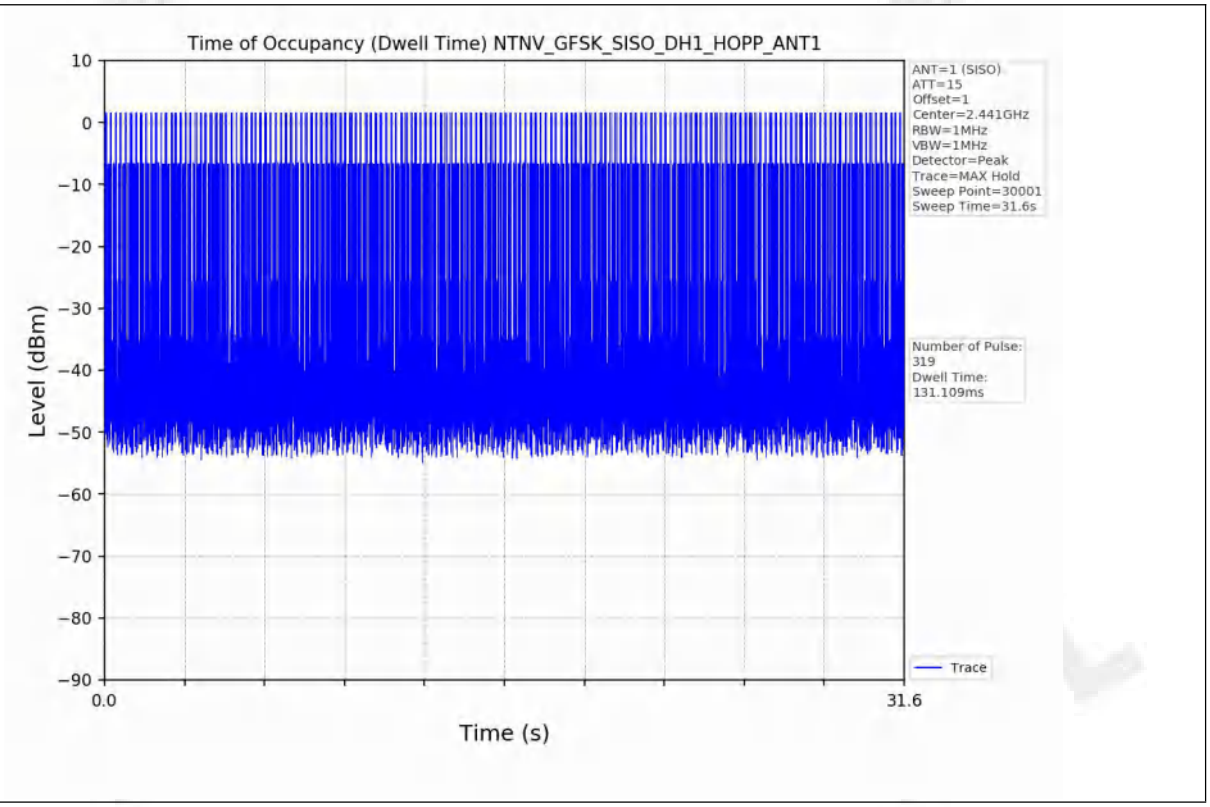
5. Time of occupancy (dwell time)

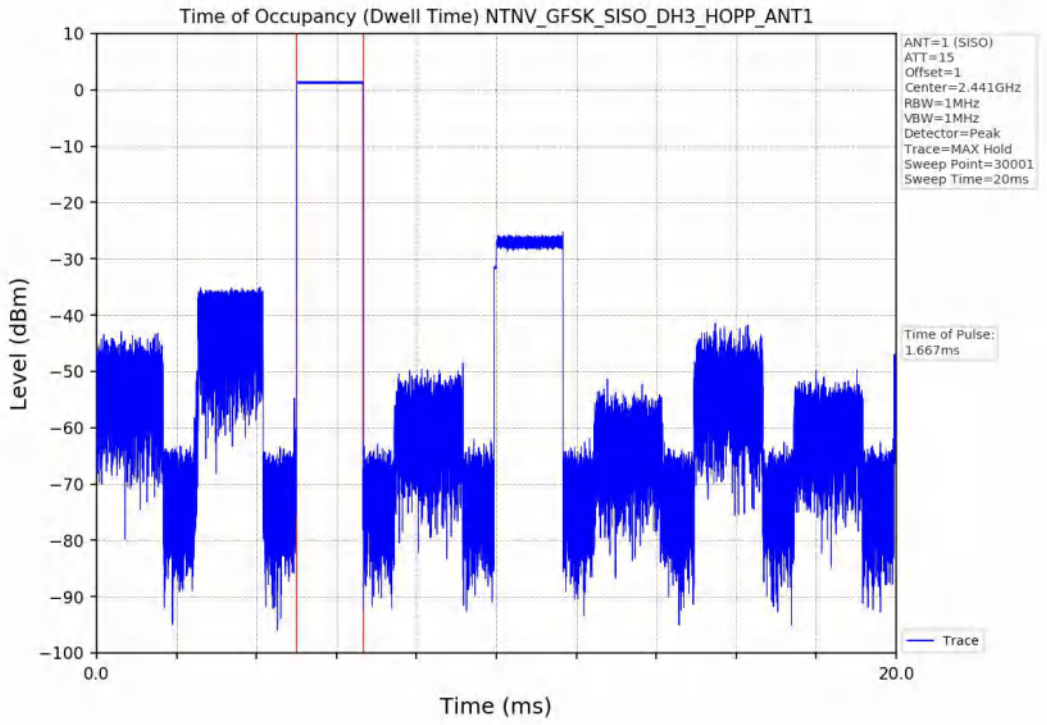
5.1 Test Result

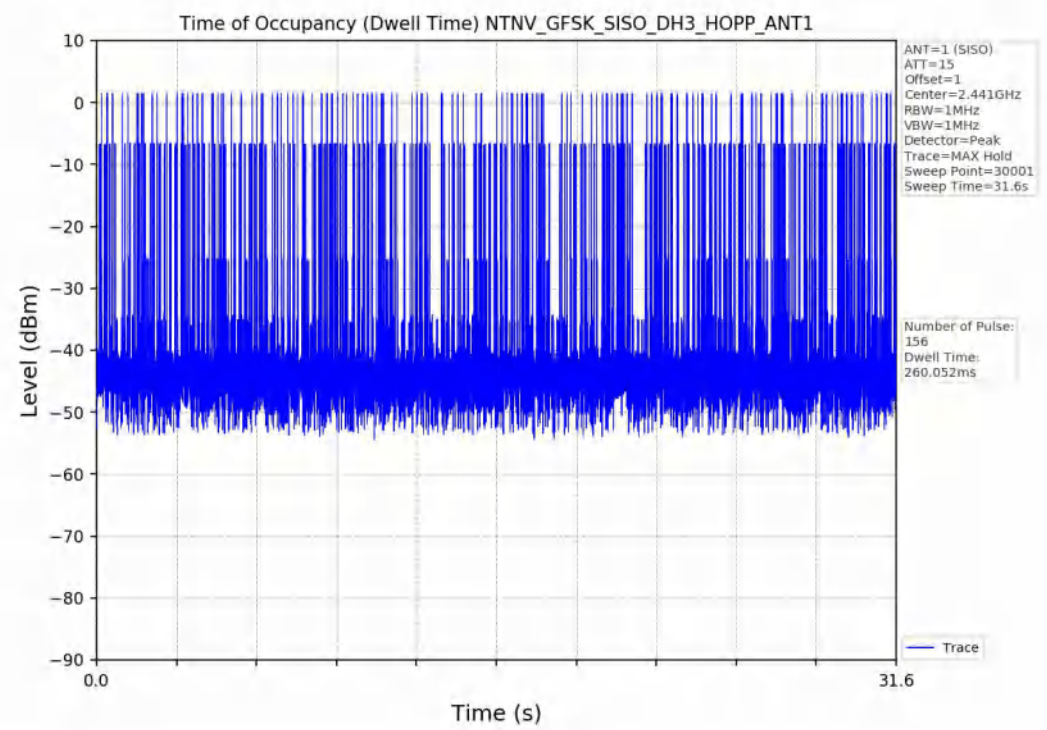
Test Mode	Packet Type	TX Type	ANT No.	Duration of Single Pulse (ms)	Obeservation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limits (ms)	Verdict
GFSK	DH1	SISO	1	0.411	31.6	319	131.109	≤400	PASS
	DH3	SISO	1	1.667	31.6	156	260.052	≤400	PASS
	DH5	SISO	1	2.913	31.6	105	305.865	≤400	PASS
Pi/4DQPSK	2DH1	SISO	1	0.421	31.6	319	134.299	≤400	PASS
	2DH3	SISO	1	1.608	31.6	163	262.104	≤400	PASS
	2DH5	SISO	1	2.921	31.6	105	306.705	≤400	PASS
8DPSK	3DH1	SISO	1	0.421	31.6	320	134.720	≤400	PASS
	3DH3	SISO	1	1.673	31.6	161	269.353	≤400	PASS
	3DH5	SISO	1	2.919	31.6	113	329.847	≤400	PASS

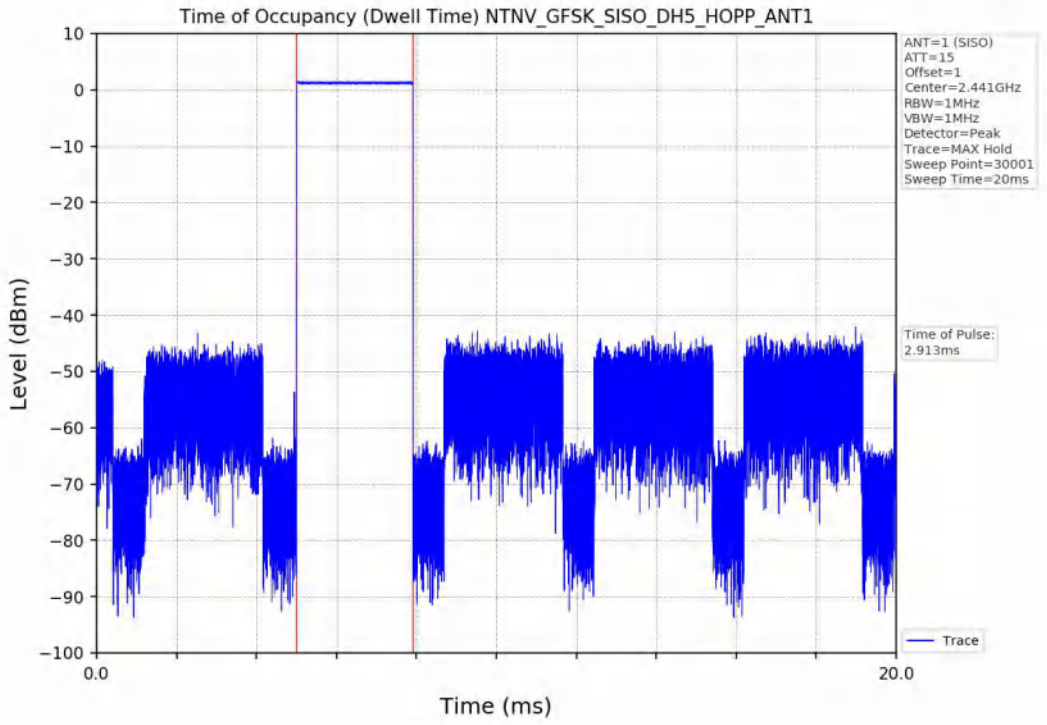
5.2 Test Graph

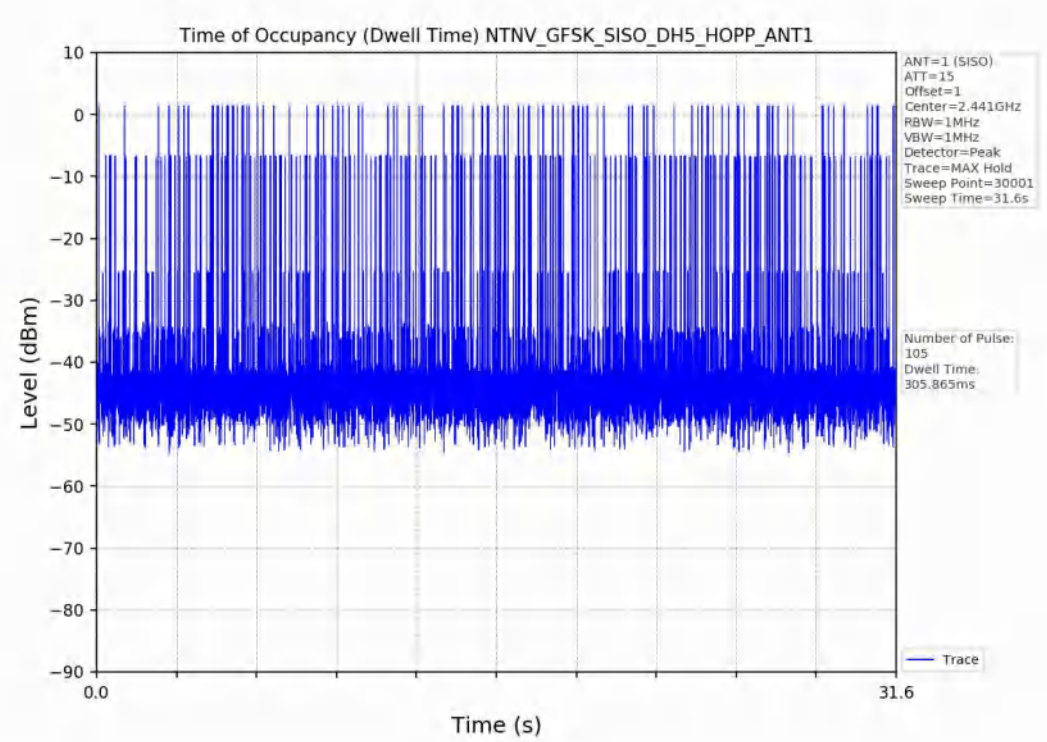

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
0.411ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
20.0

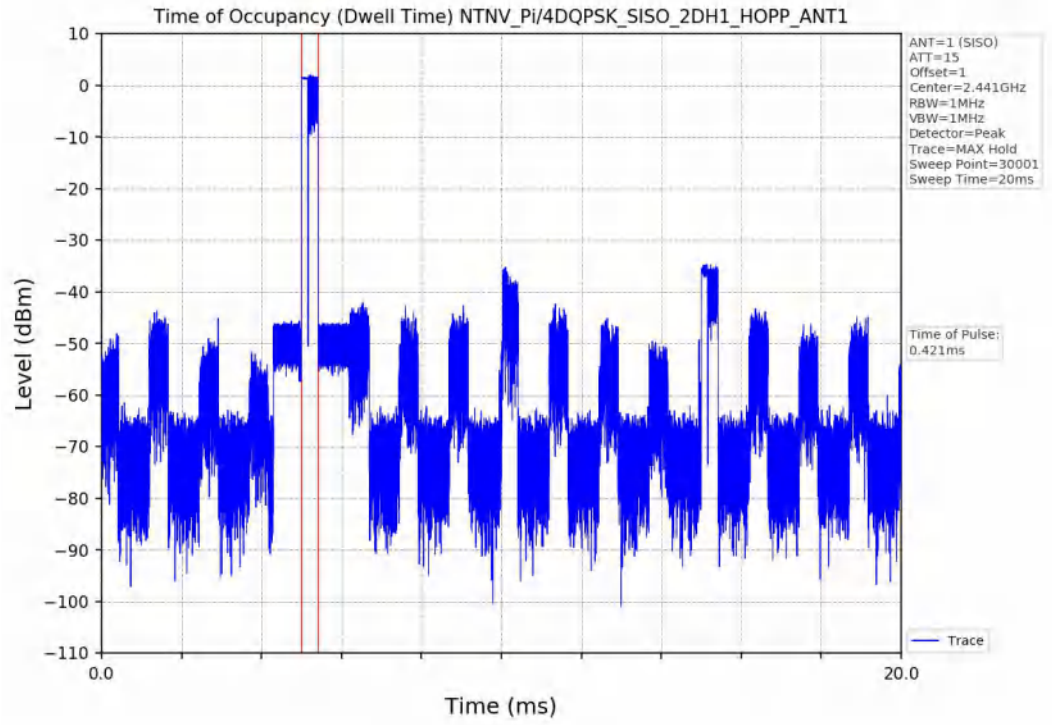

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
319
Dwell Time:
131.109ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

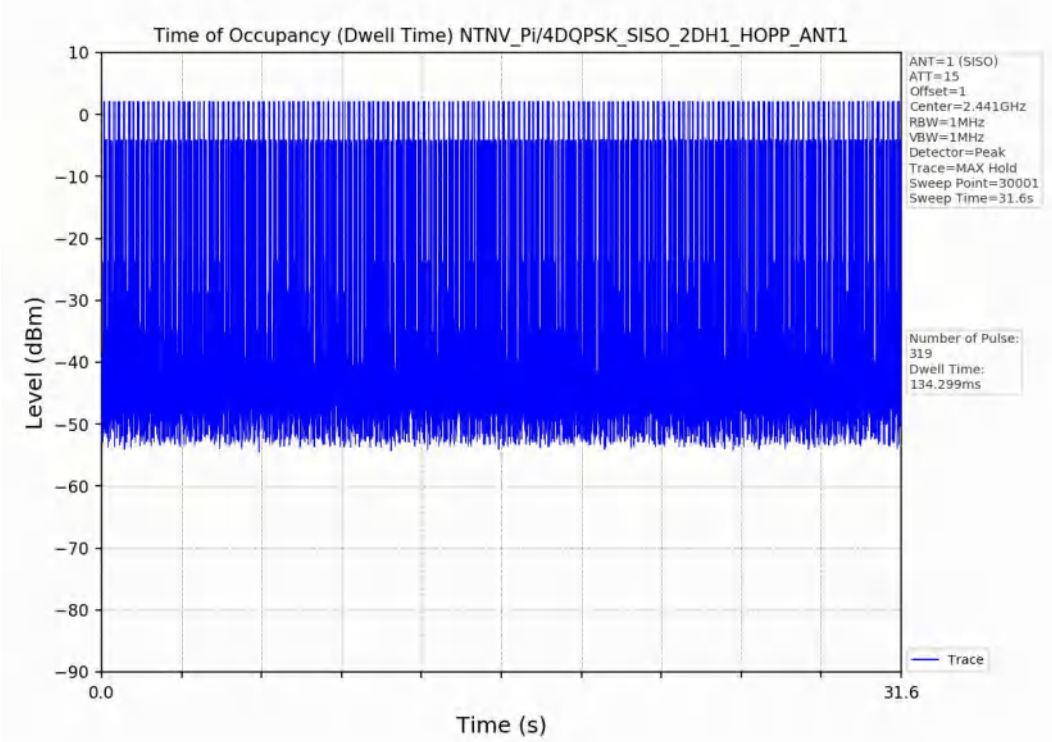

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
1.667ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
20.0

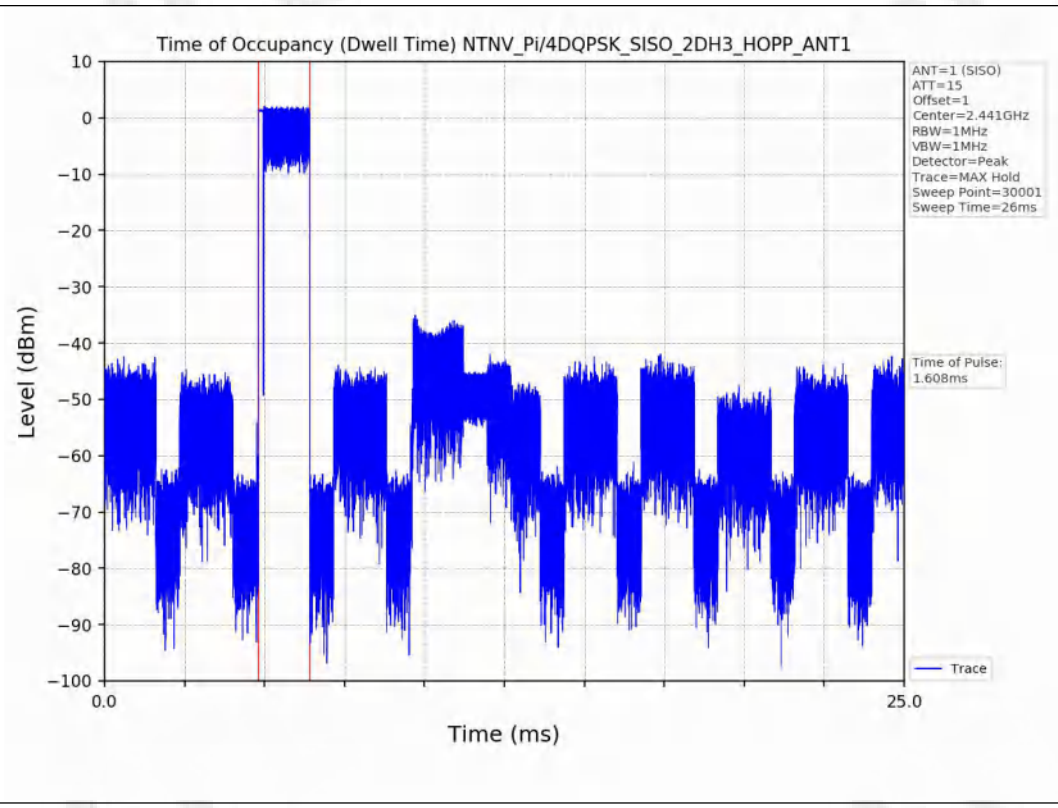

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
156
Dwell Time:
260.052ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

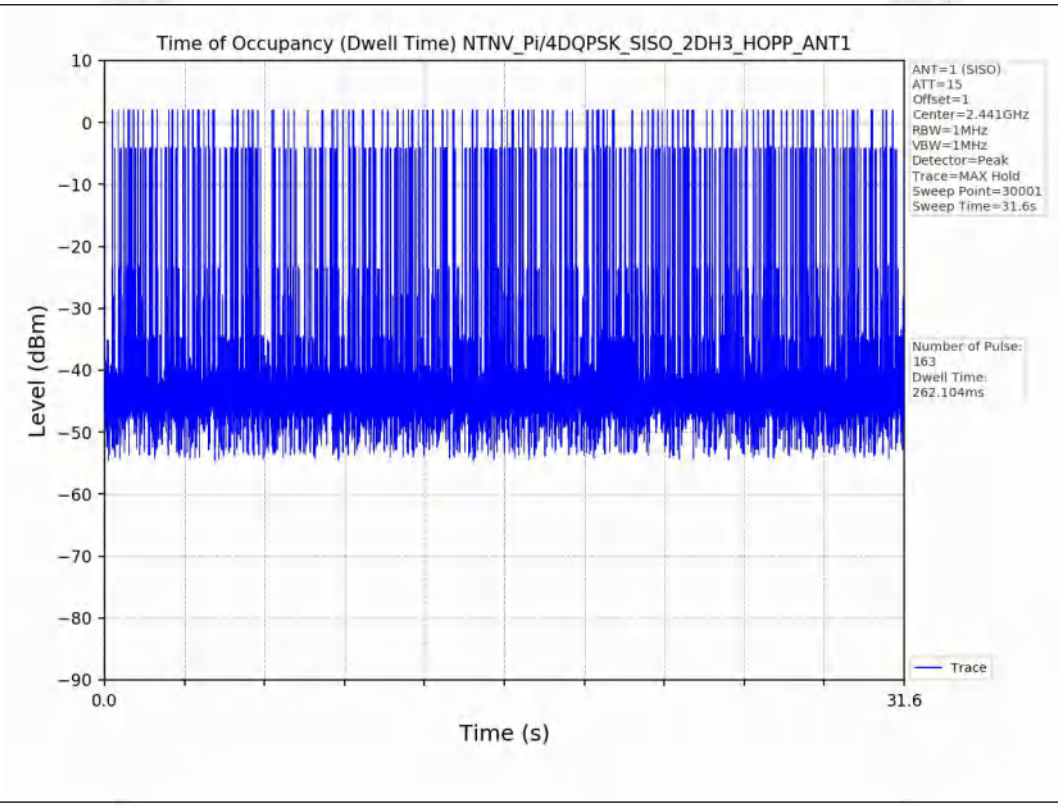

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
2.913ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
20.0

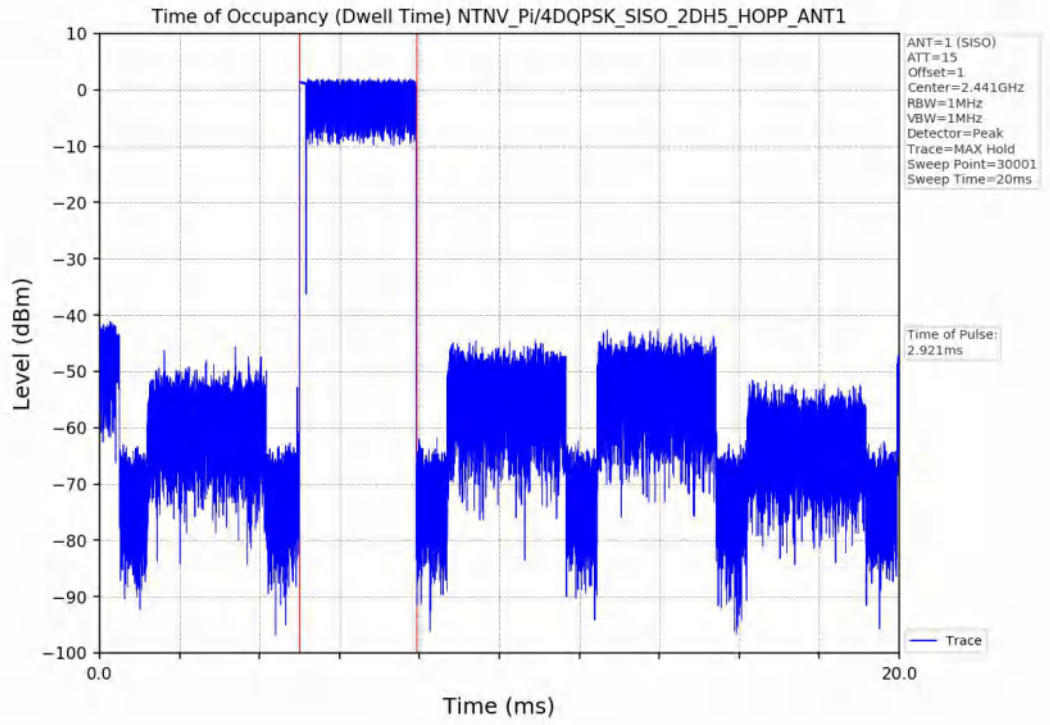

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
105
Dwell Time:
305.865ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

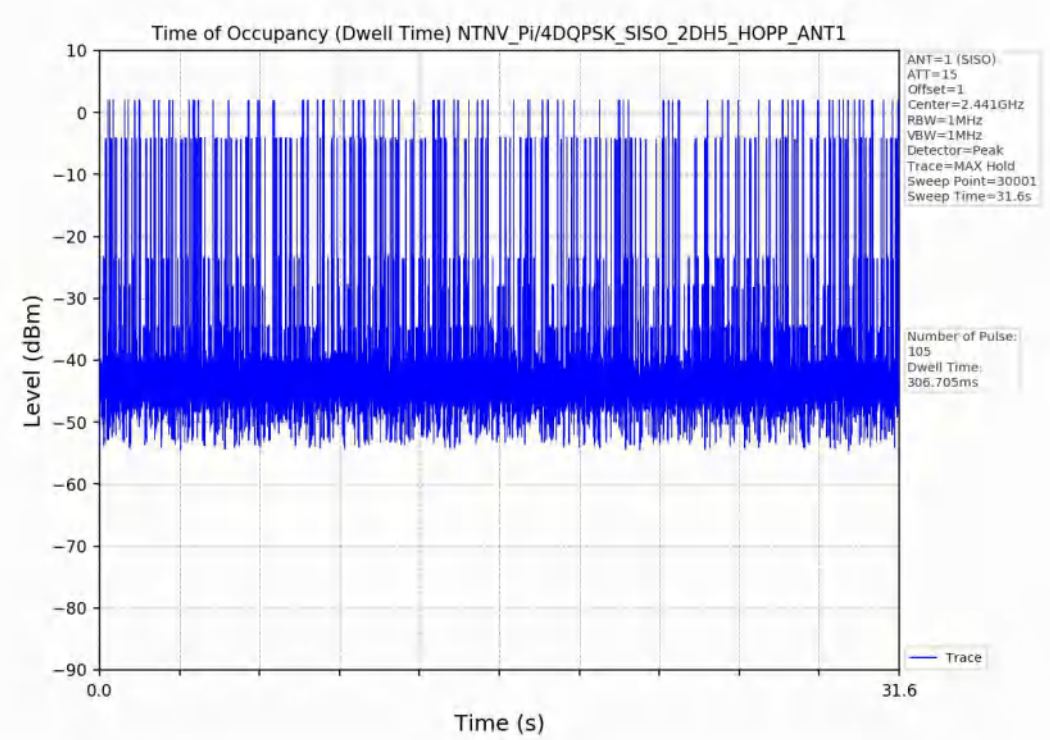

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
0.421ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
20.0

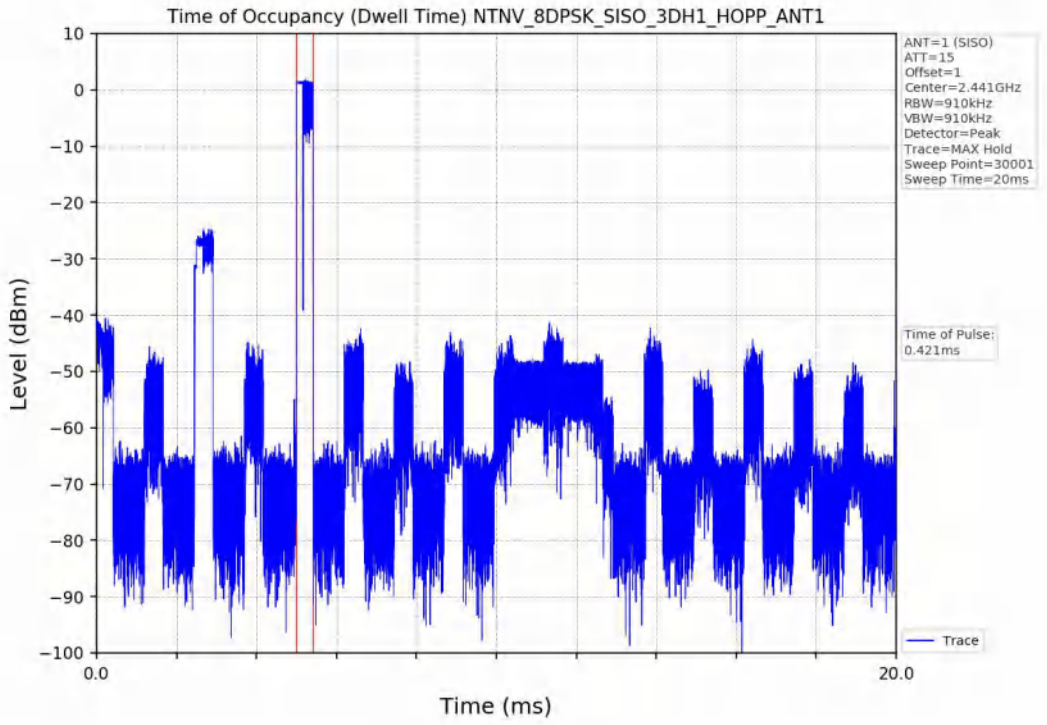

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH1_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
319
Dwell Time:
134.299ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

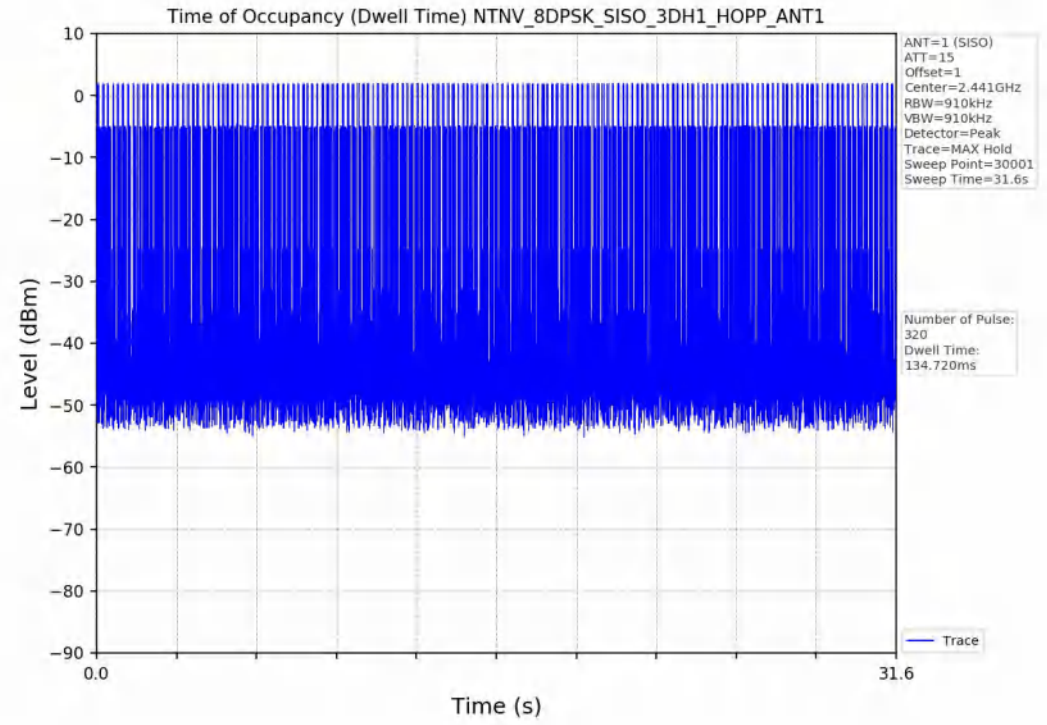

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=26ms
Time of Pulse:
1.608ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
25.0

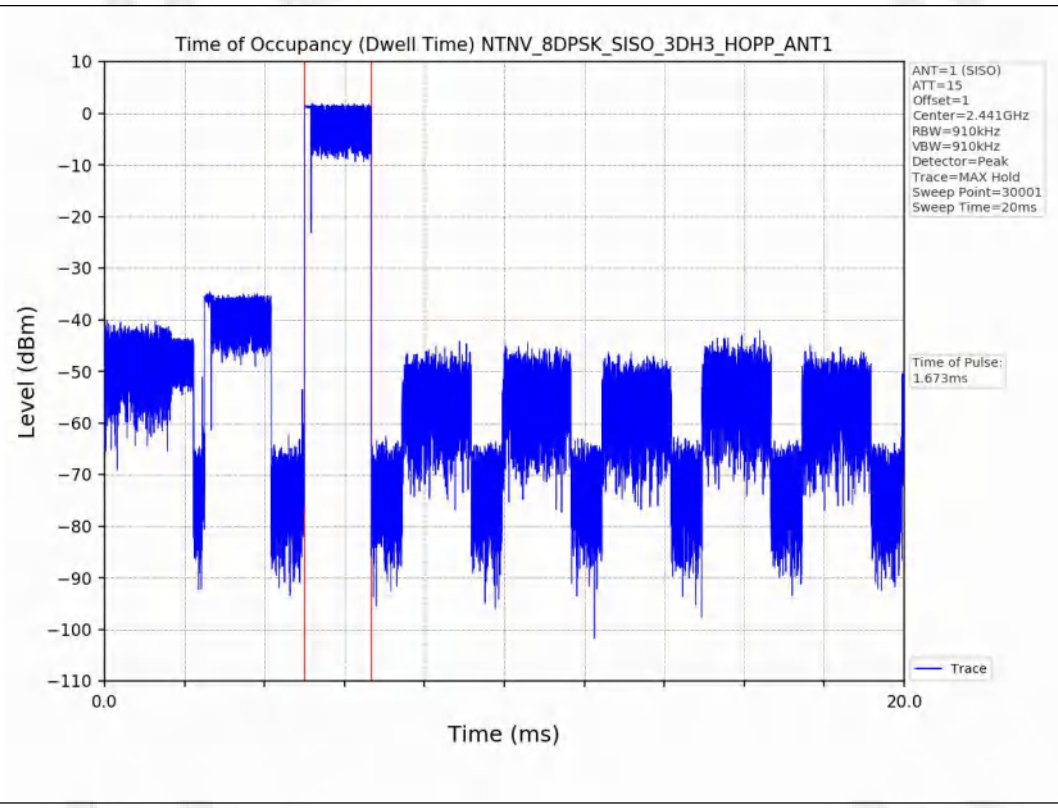

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH3_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
163
Dwell Time:
262.104ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

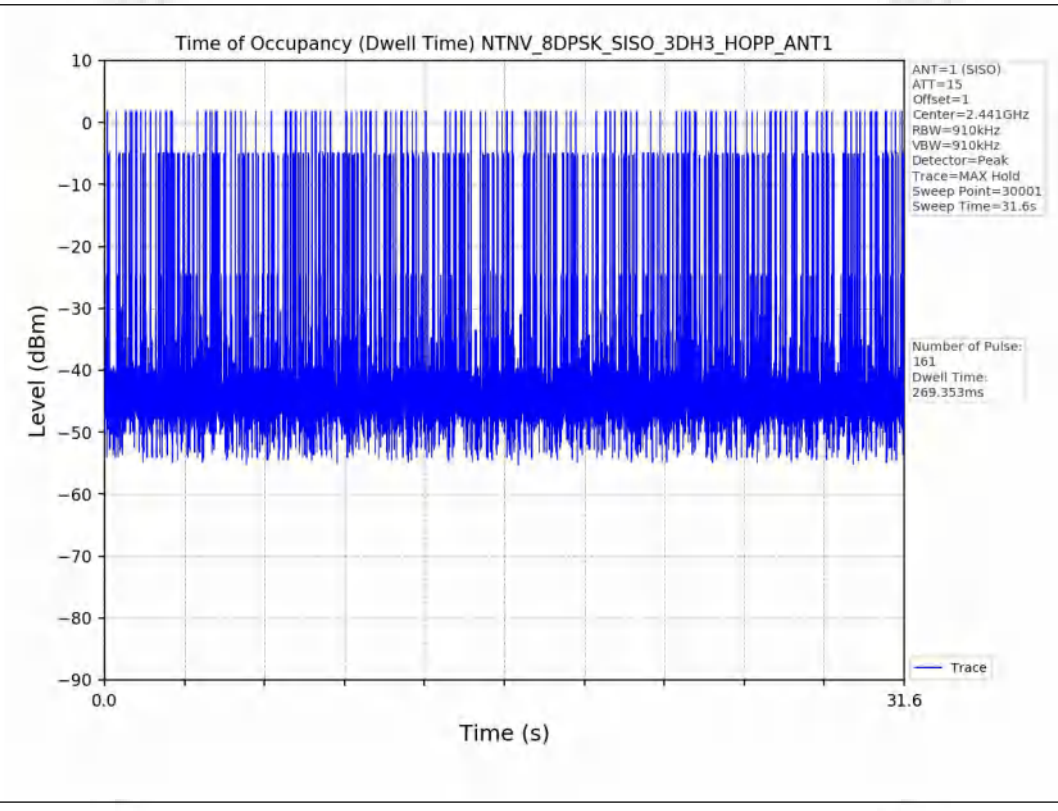

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
2.921ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
0.0
20.0

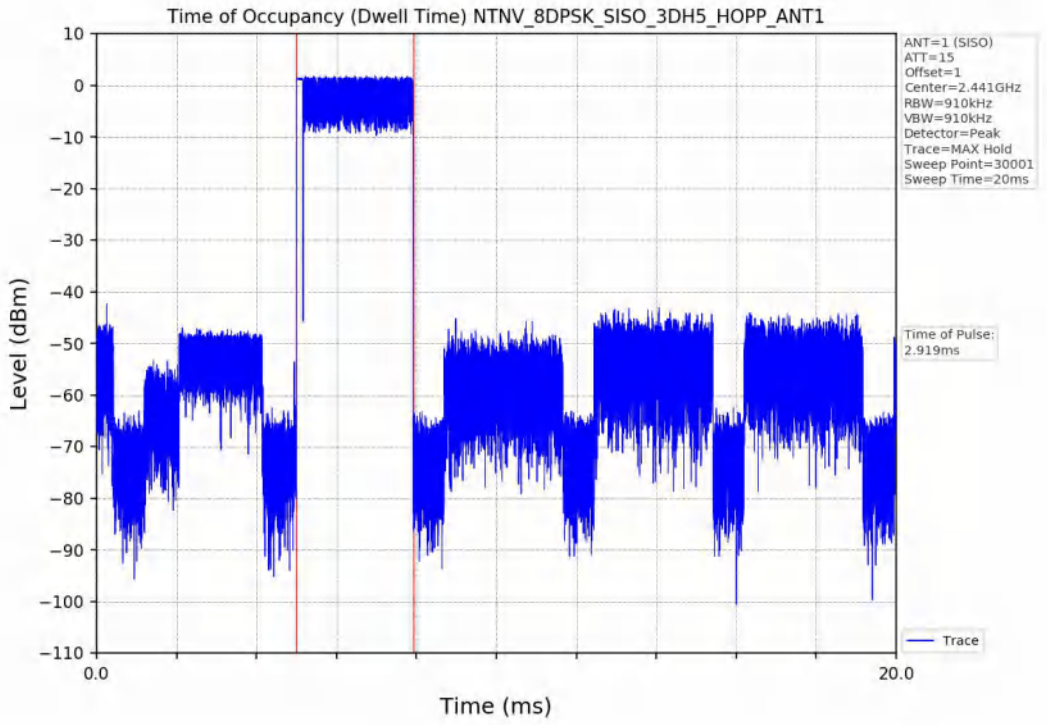

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=1MHz
VBW=1MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
105
Dwell Time:
306.705ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

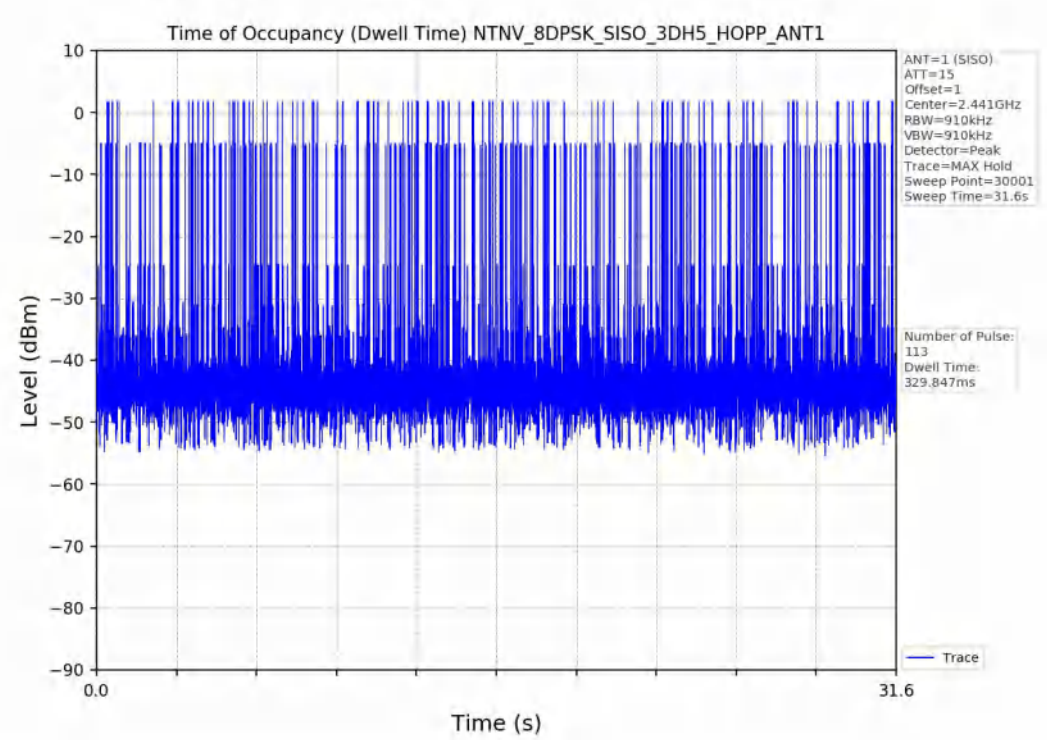

Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH1_HOPP_ANT1
Level (dBm)
Time (ms)
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=20ms
Time of Pulse:
0.421ms
Trace


Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH1_HOPP_ANT1
Level (dBm)
Time (s)
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:
320
Dwell Time:
134.720ms
Trace


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:
1.673ms
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_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:
161
Dwell Time:
269.353ms
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:
2.919ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
20.0

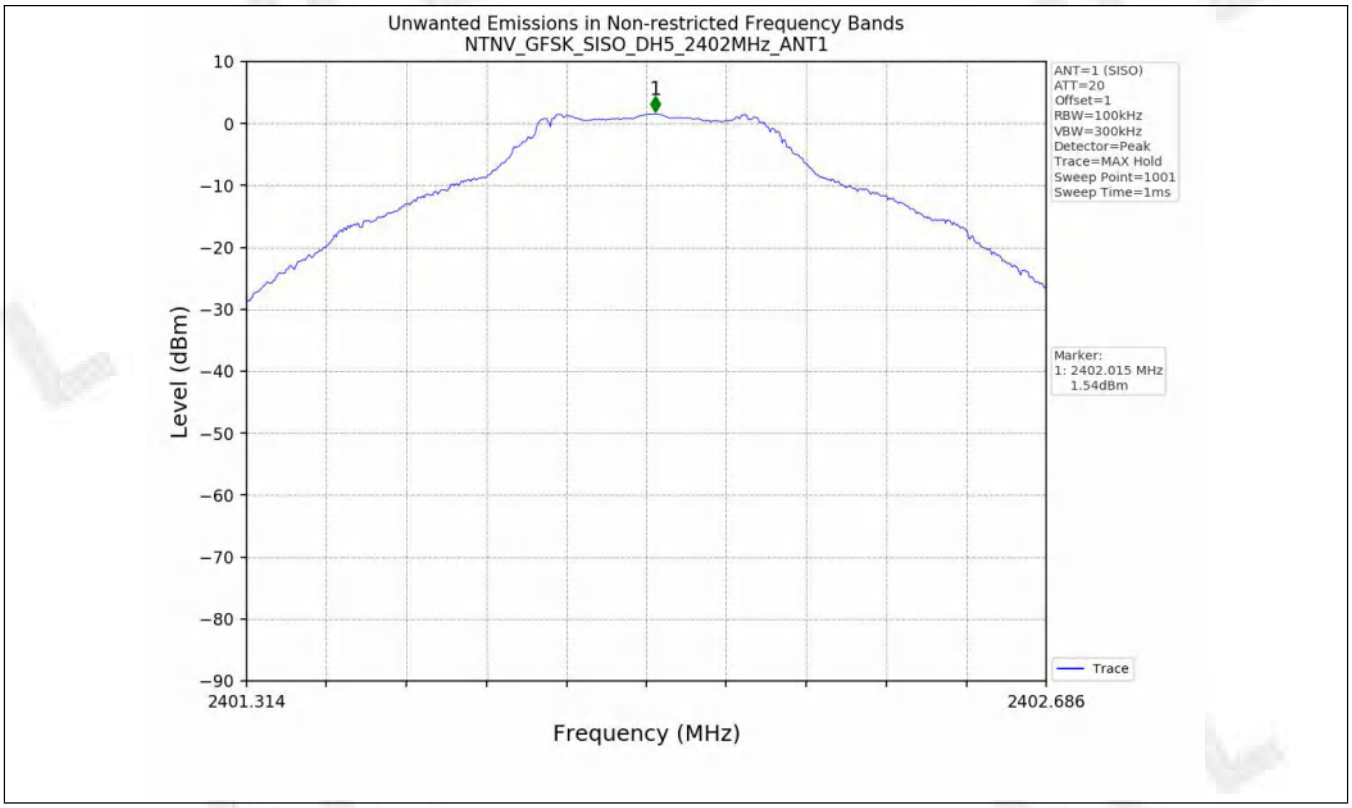

Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH5_HOPP_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
113
Dwell Time:
329.847ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

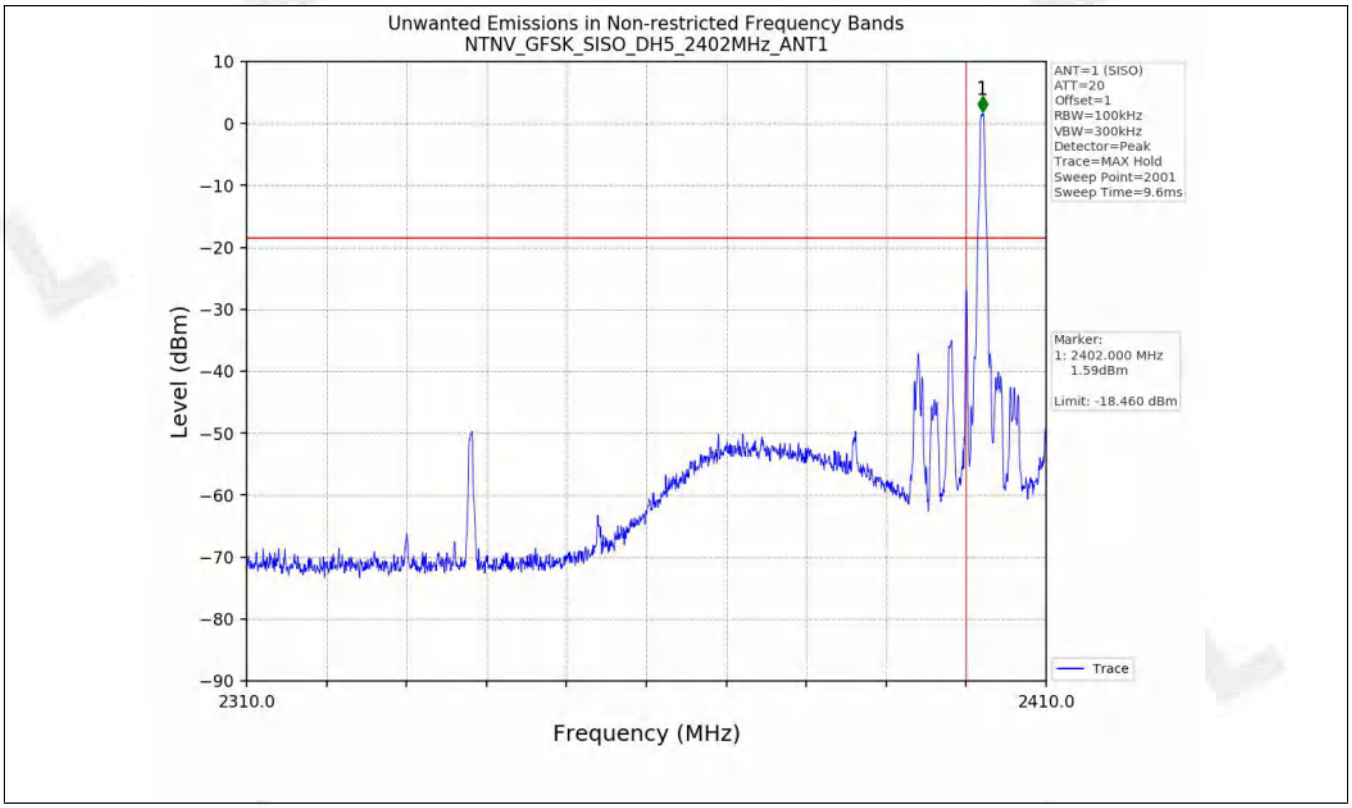
6. Unwanted Emissions in Non-restricted Frequency Bands

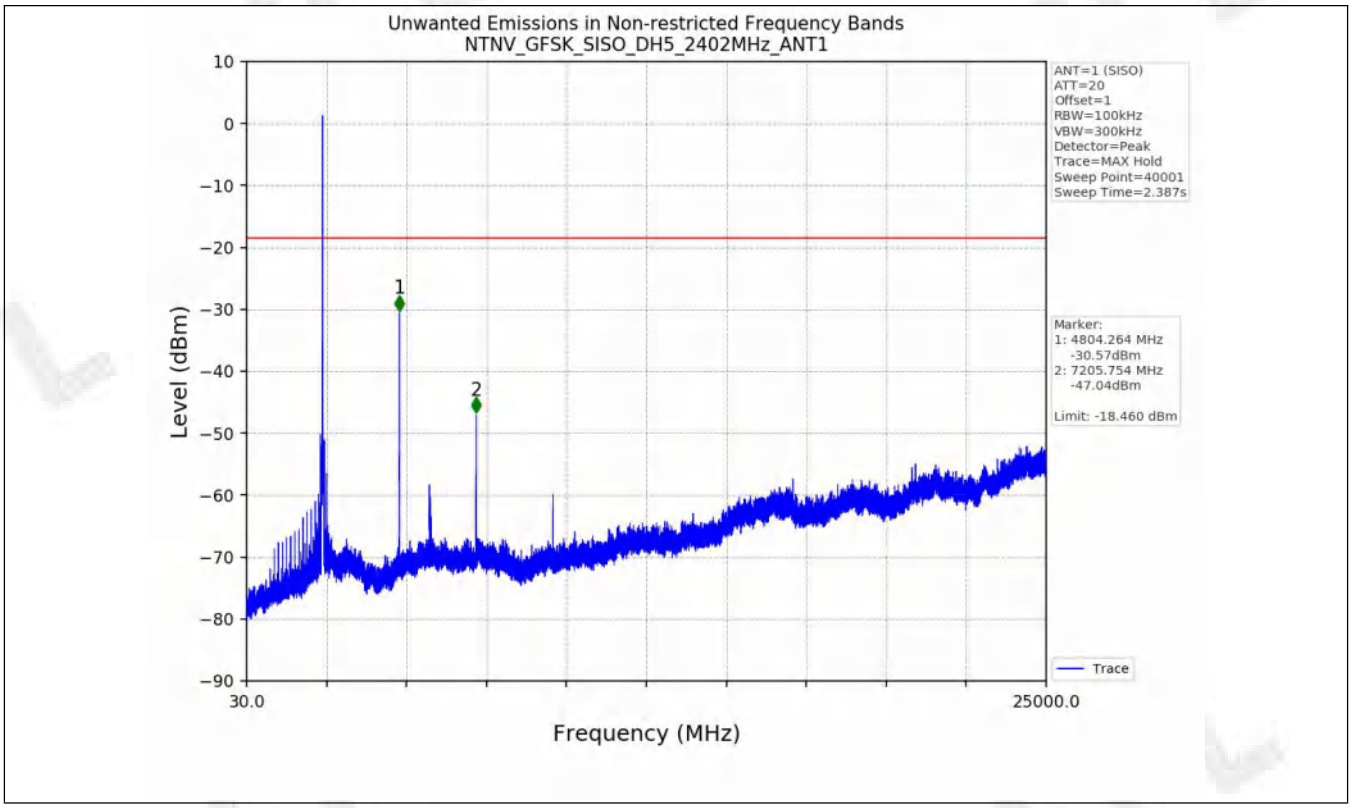
6.1 Test Result

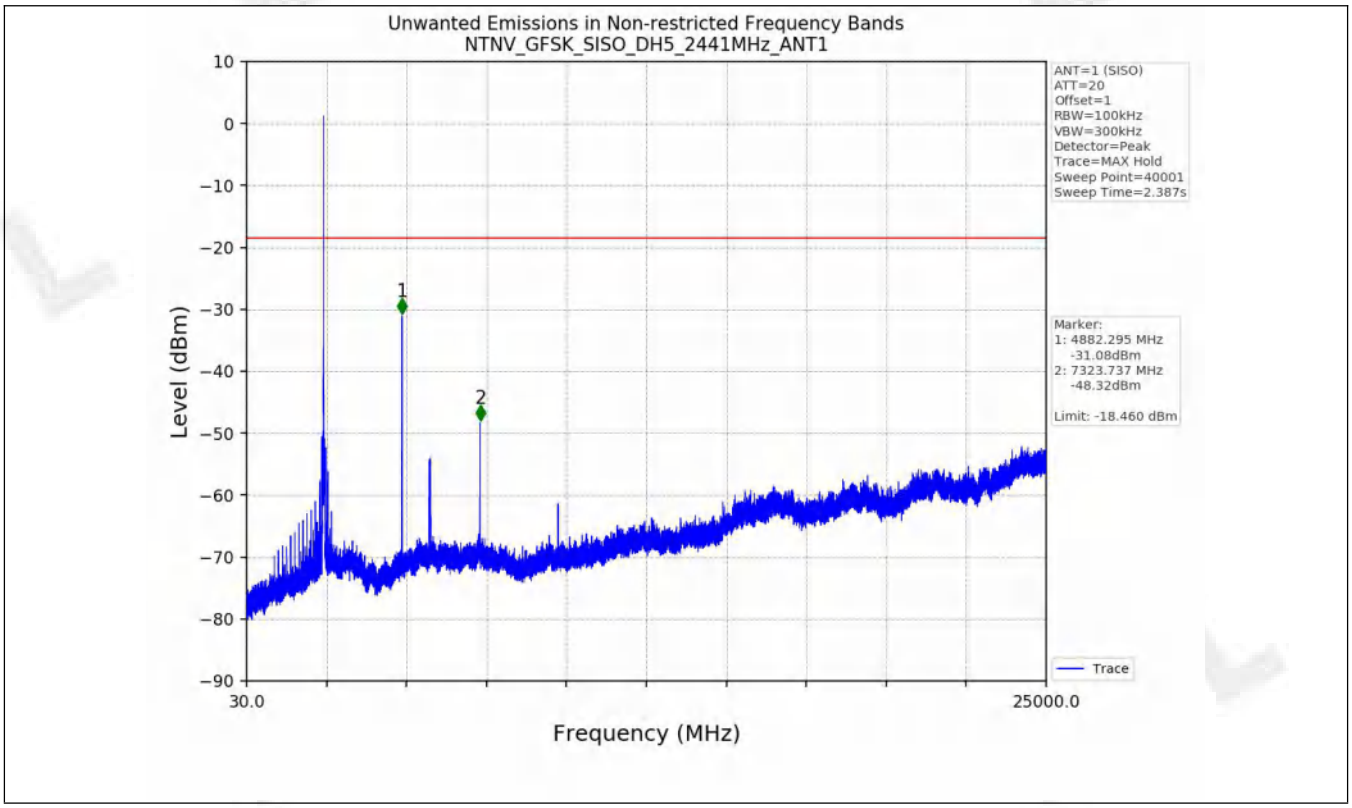
Test Mode	Frequency (MHz)	TX Type	ANT No.	Spurious Conducted Emission (dBm)	Limits (dBm)	Verdict
GFSK	2402	SISO	1	Refer to test graph	-18.46	PASS
	2441	SISO	1	Refer to test graph	-18.46	PASS
	2480	SISO	1	Refer to test graph	-18.46	PASS
	Hopping	SISO	1	Refer to test graph	-18.46	PASS
Pi/4DQPSK	2402	SISO	1	Refer to test graph	-18.43	PASS
	2441	SISO	1	Refer to test graph	-18.43	PASS
	2480	SISO	1	Refer to test graph	-18.43	PASS
	Hopping	SISO	1	Refer to test graph	-18.43	PASS
8DPSK	2402	SISO	1	Refer to test graph	-18.43	PASS
	2441	SISO	1	Refer to test graph	-18.43	PASS
	2480	SISO	1	Refer to test graph	-18.43	PASS
	Hopping	SISO	1	Refer to test graph	-18.43	PASS

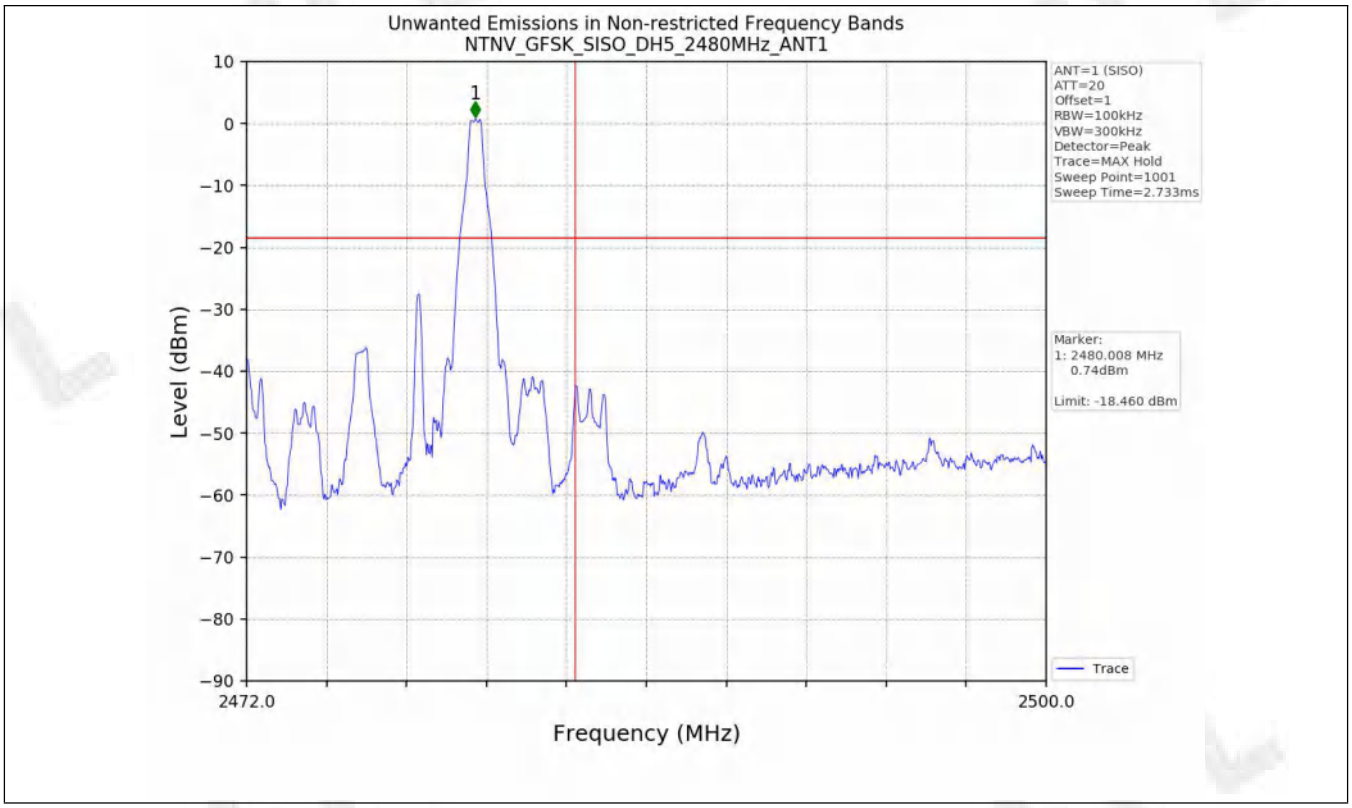
6.2 Test Graph

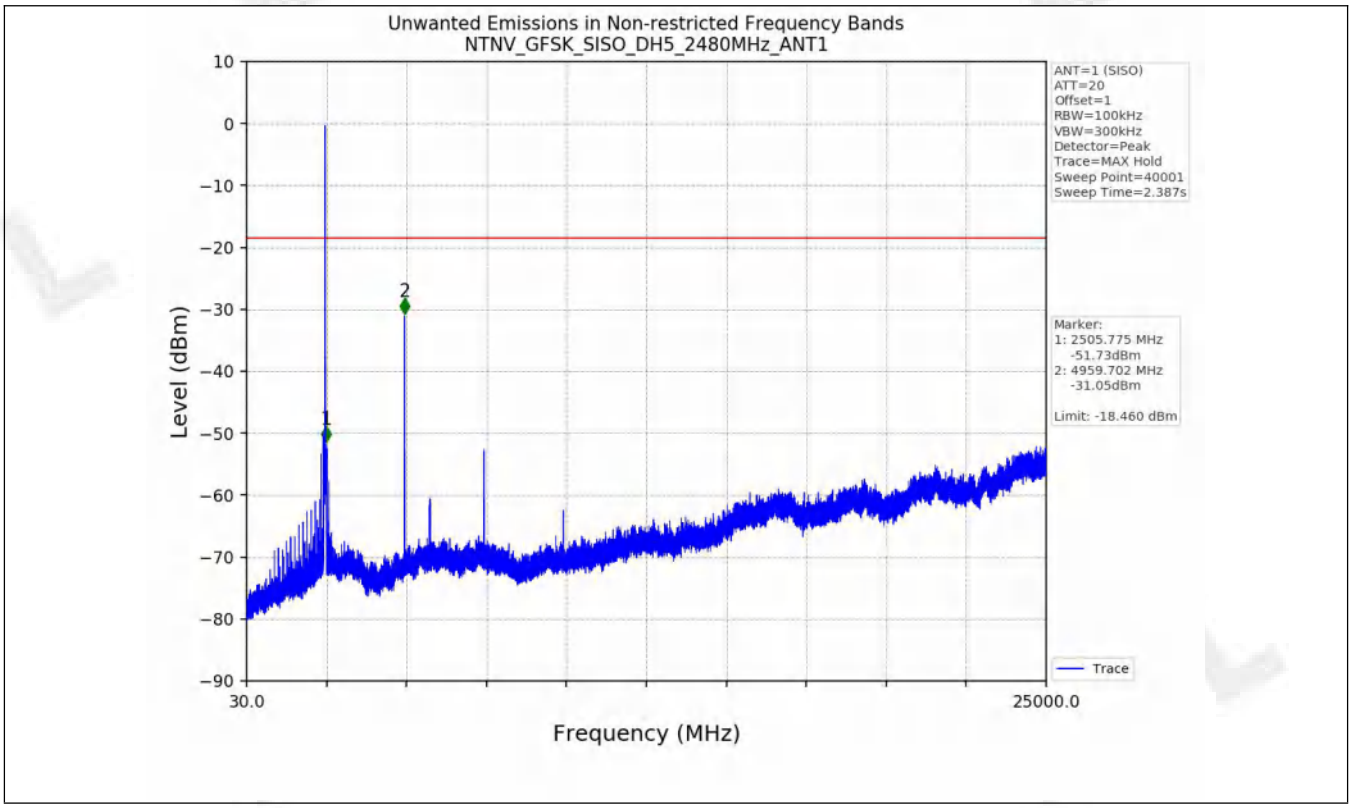

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2402.015 MHz
1.54dBm
Trace
Level (dBm)
Frequency (MHz)
2401.314
2402.686

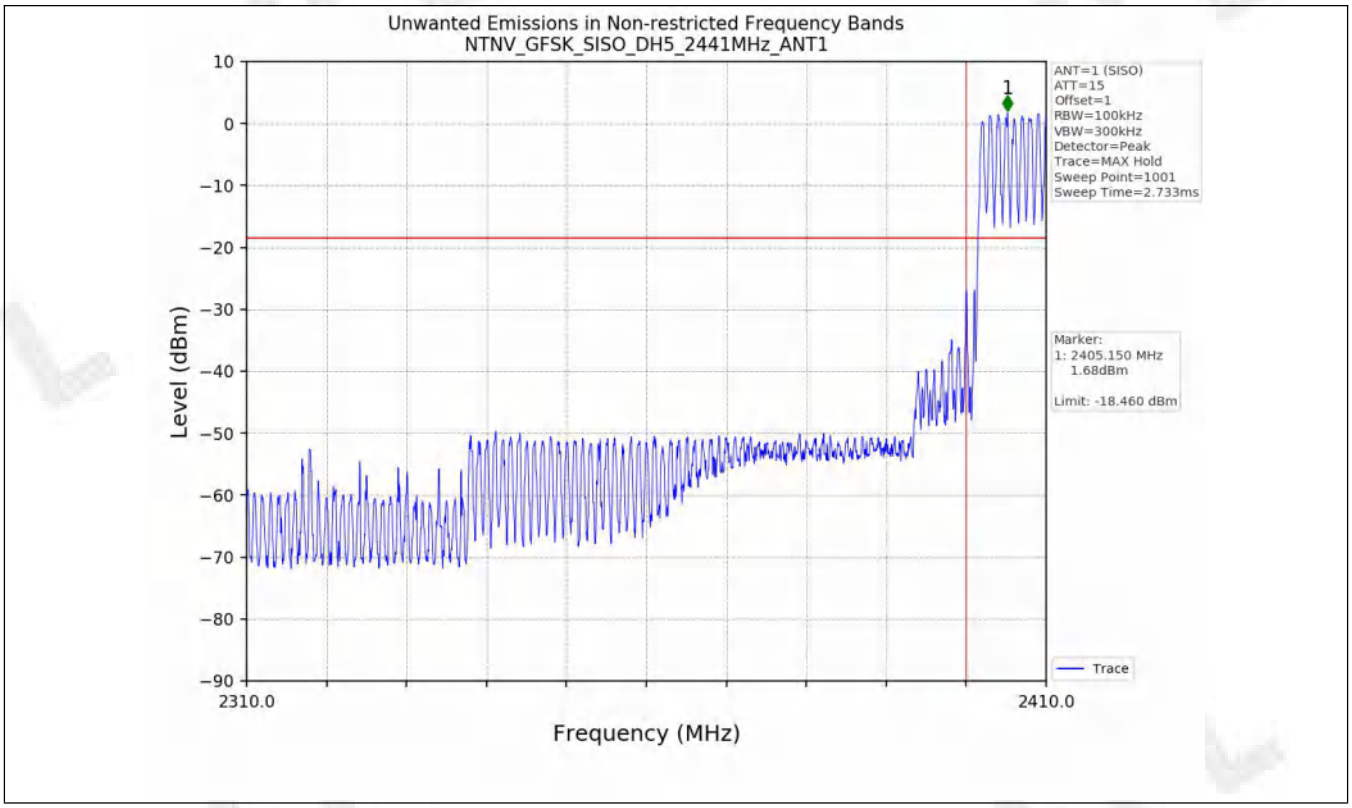

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.000 MHz
1.59dBm
Limit: -18.460 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

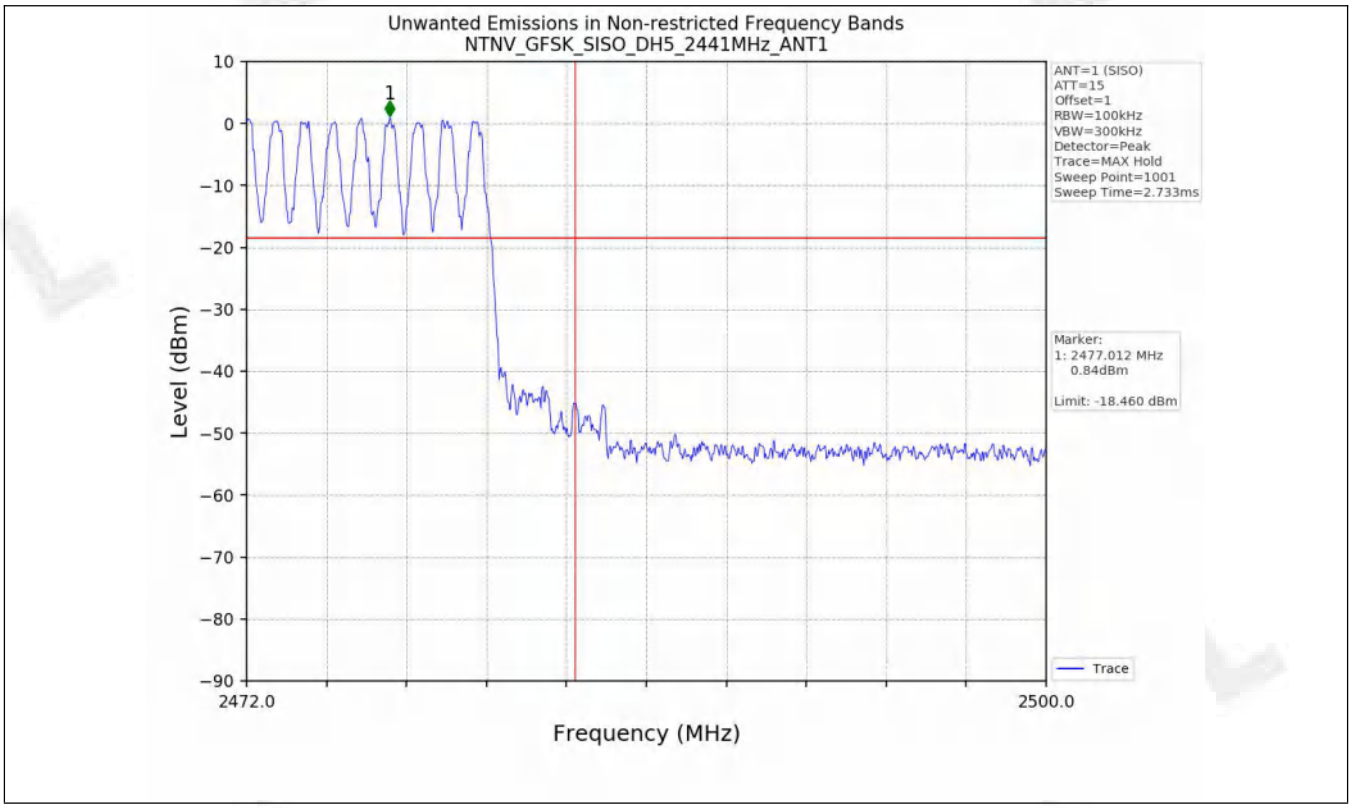

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 4804.264 MHz
-30.57dBm
2: 7205.754 MHz
-47.04dBm
Limit: -18.460 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

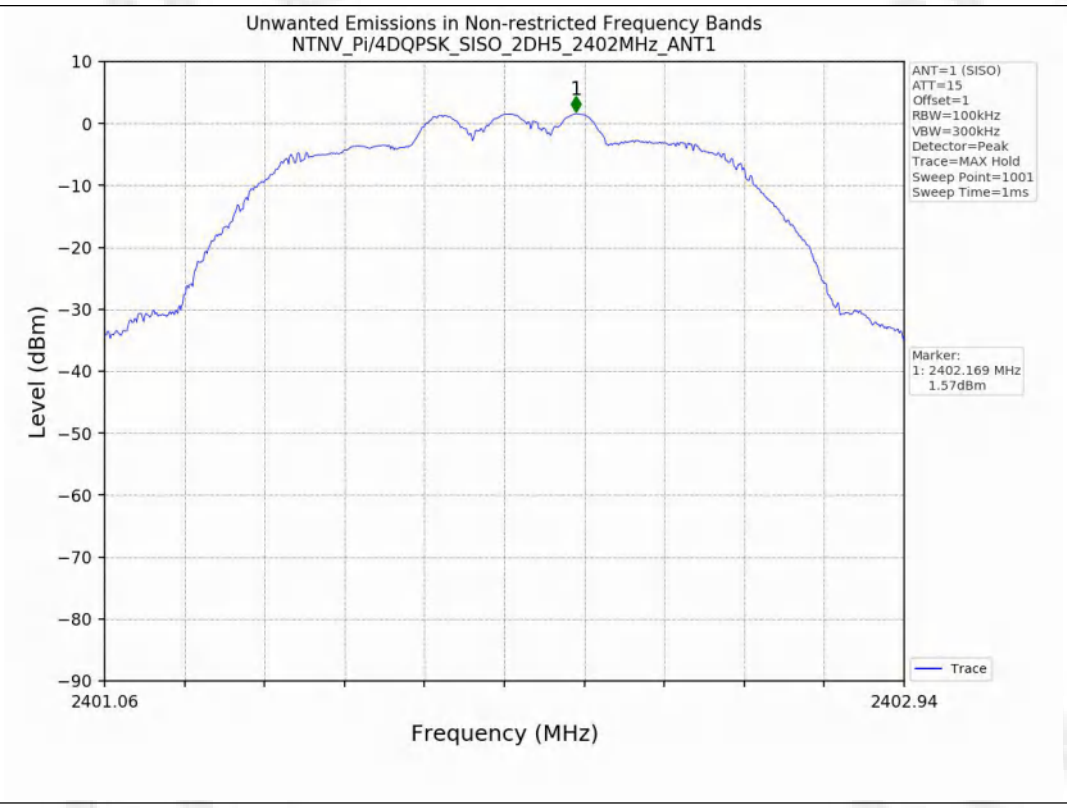

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 4882.295 MHz
-31.08dBm
2: 7323.737 MHz
-48.32dBm
Limit: -18.460 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

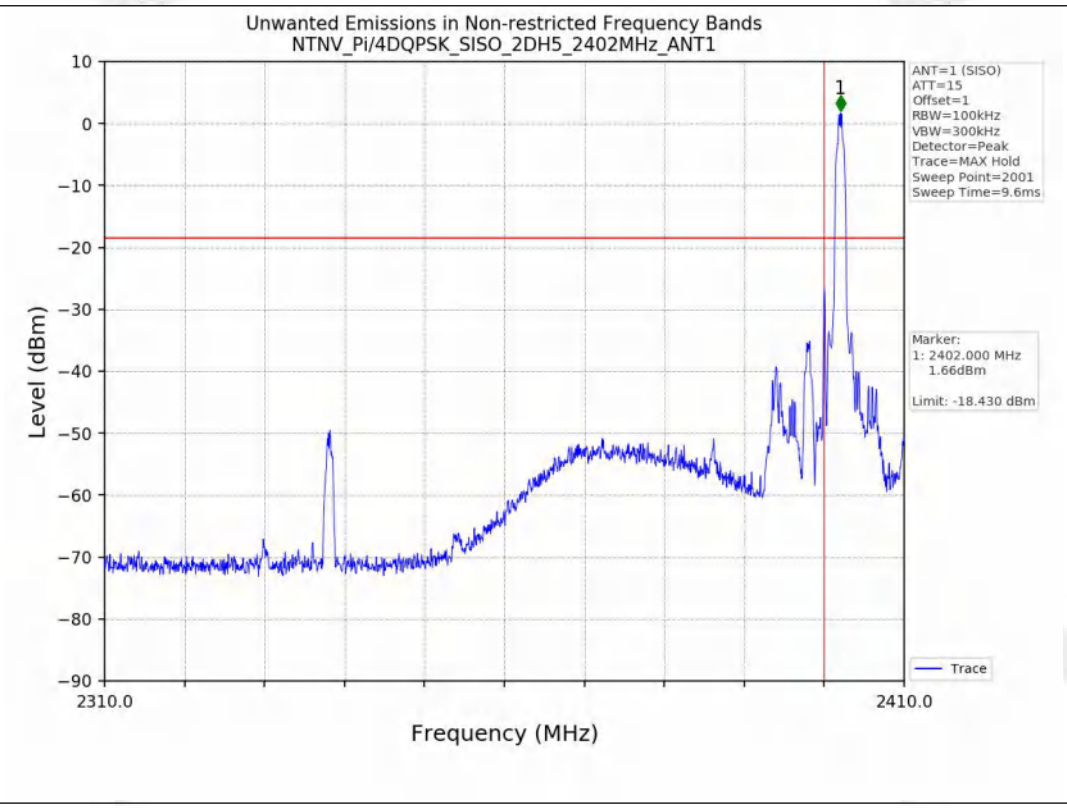

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2480.008 MHz
0.74dBm
Limit: -18.460 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

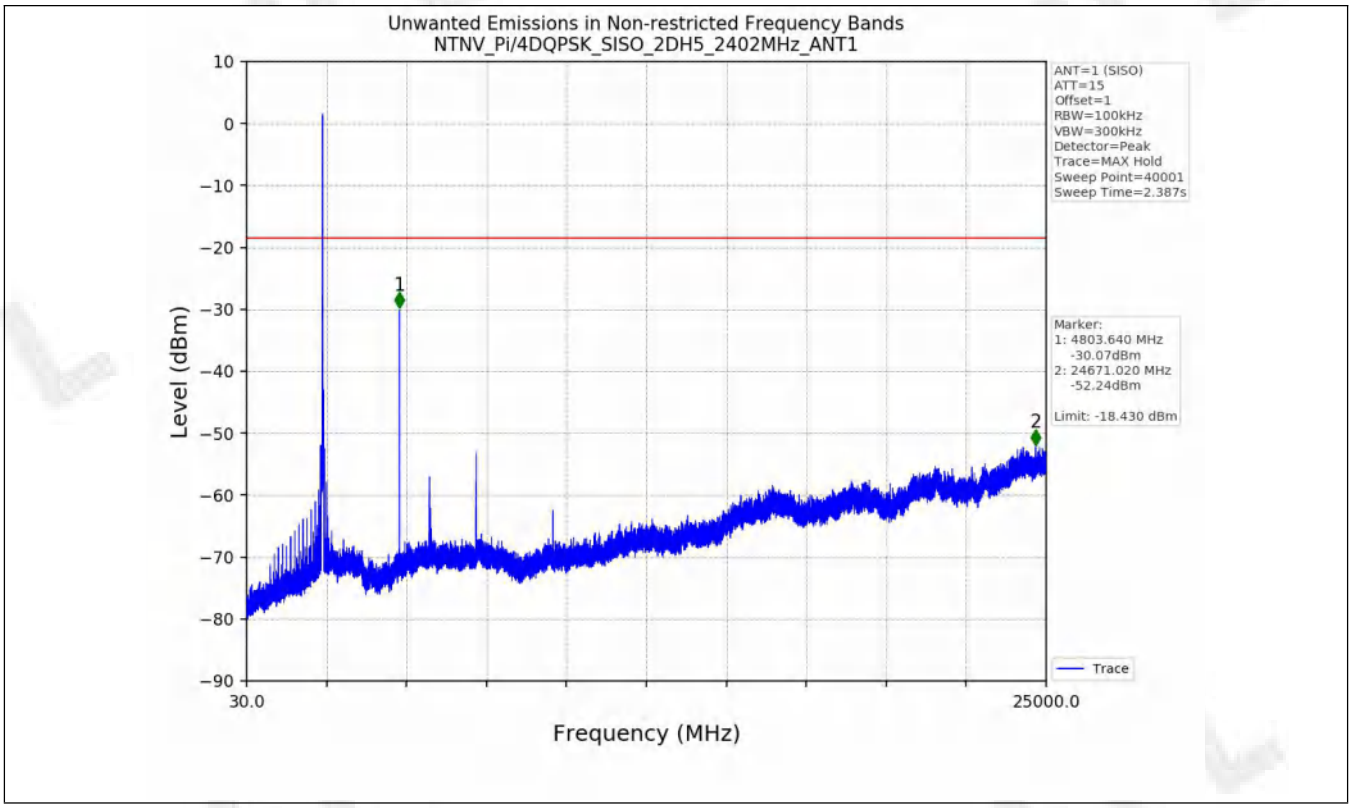

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=20
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 2505.775 MHz
-51.73dBm
2: 4959.702 MHz
-31.05dBm
Limit: -18.460 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

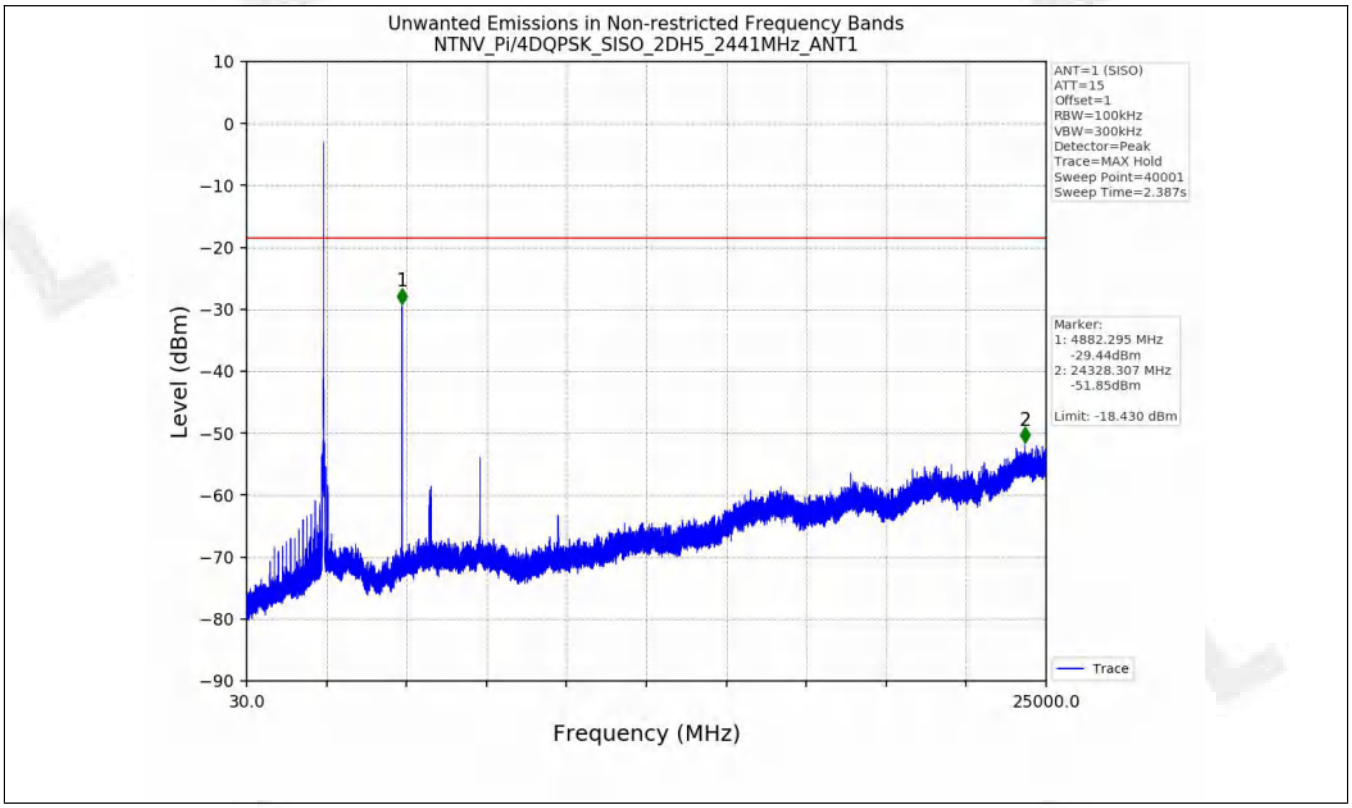

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2405.150 MHz
1.68dBm
Limit: -18.460 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

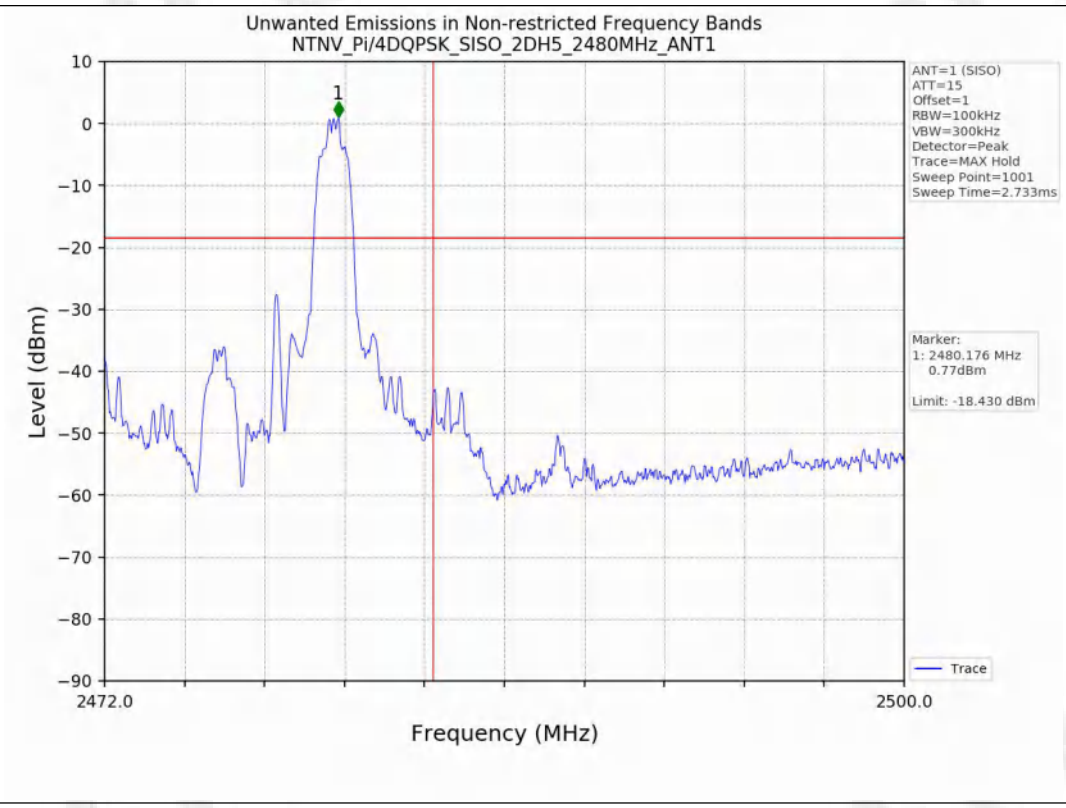

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2477.012 MHz
0.84dBm
Limit: -18.460 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

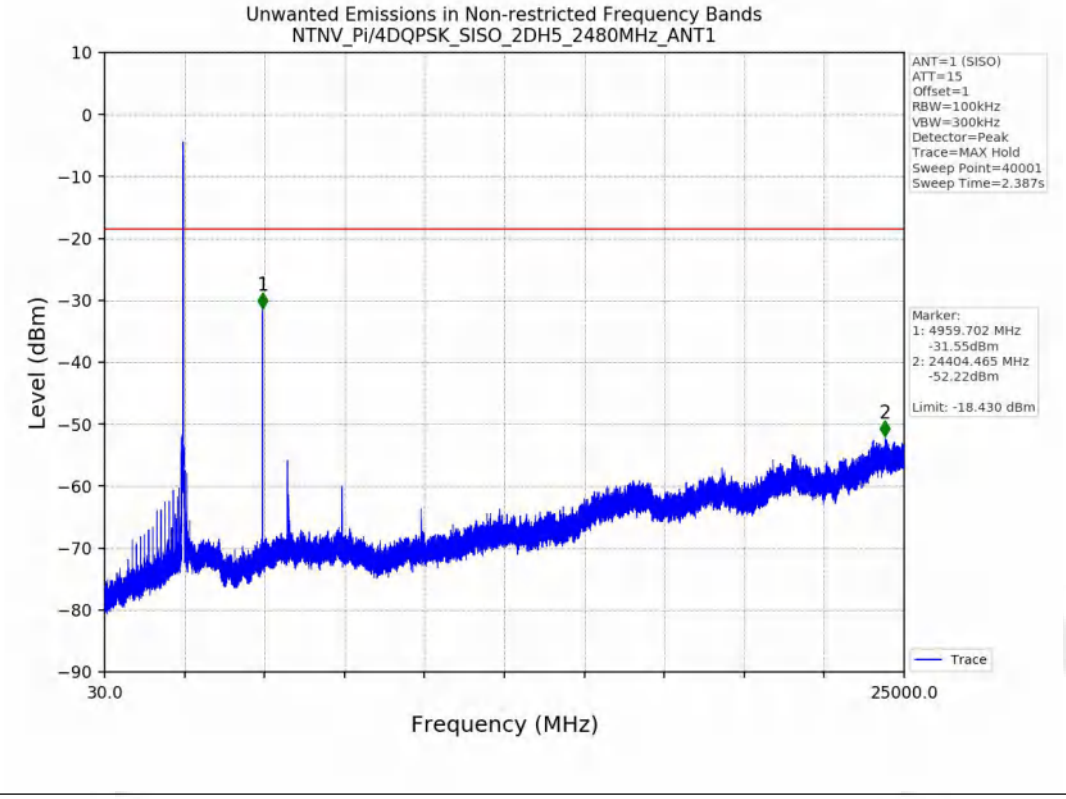

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2402.169 MHz
1.57dBm
Trace
Level (dBm)
Frequency (MHz)
2401.06
2402.94

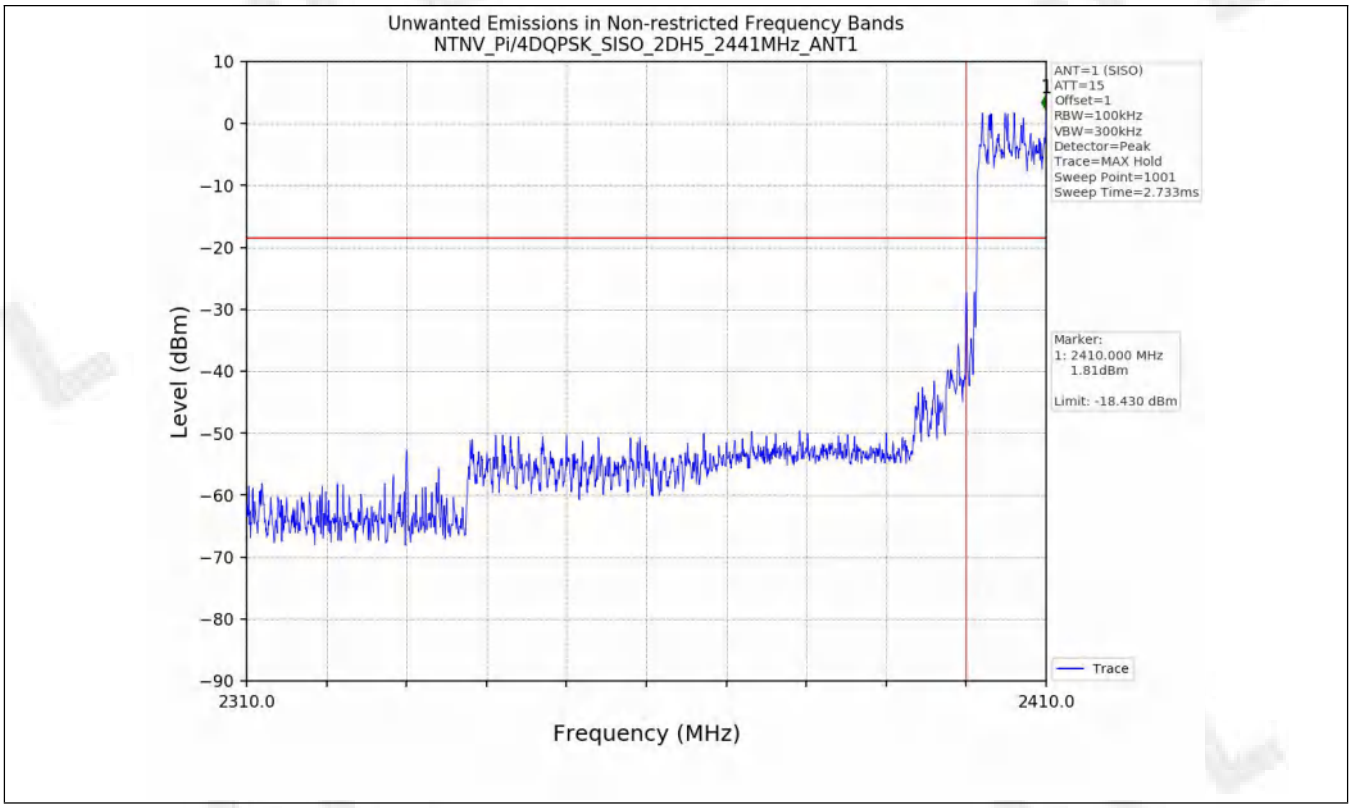

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.000 MHz
1.66dBm
Limit: -18.430 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

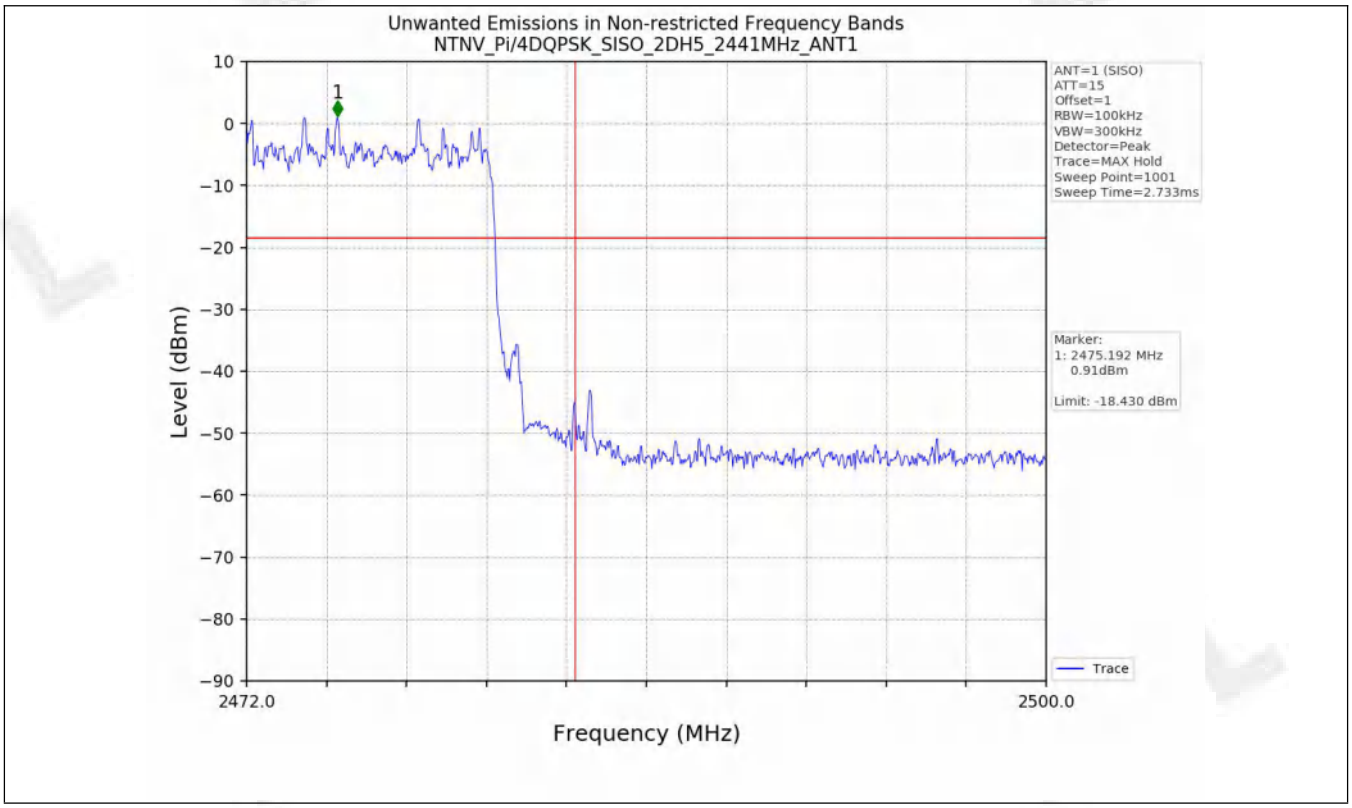

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 4803.640 MHz
-30.07dBm
2: 24671.020 MHz
-52.24dBm
Limit: -18.430 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

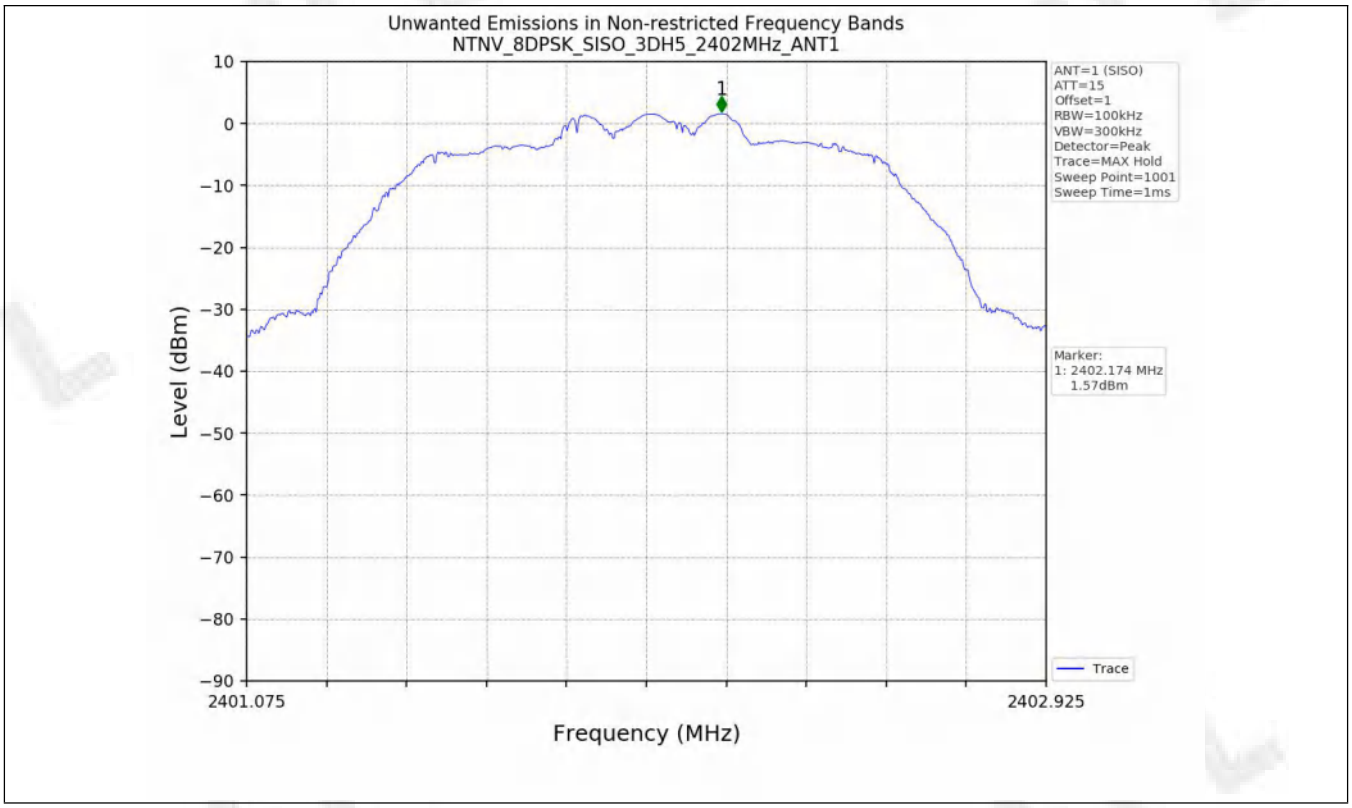

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 4882.295 MHz
-29.44dBm
2: 24328.307 MHz
-51.85dBm
Limit: -18.430 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

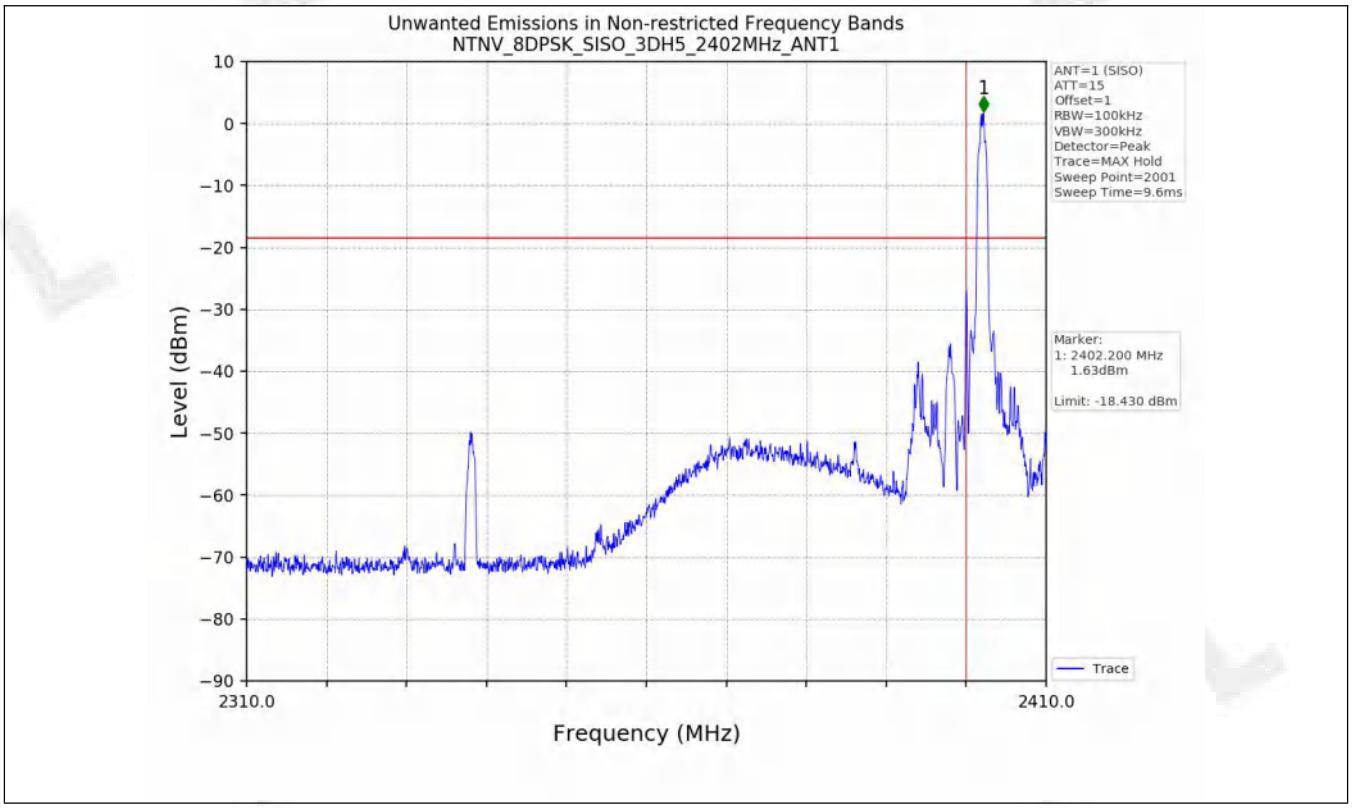

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2480.176 MHz
0.77dBm
Limit: -18.430 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

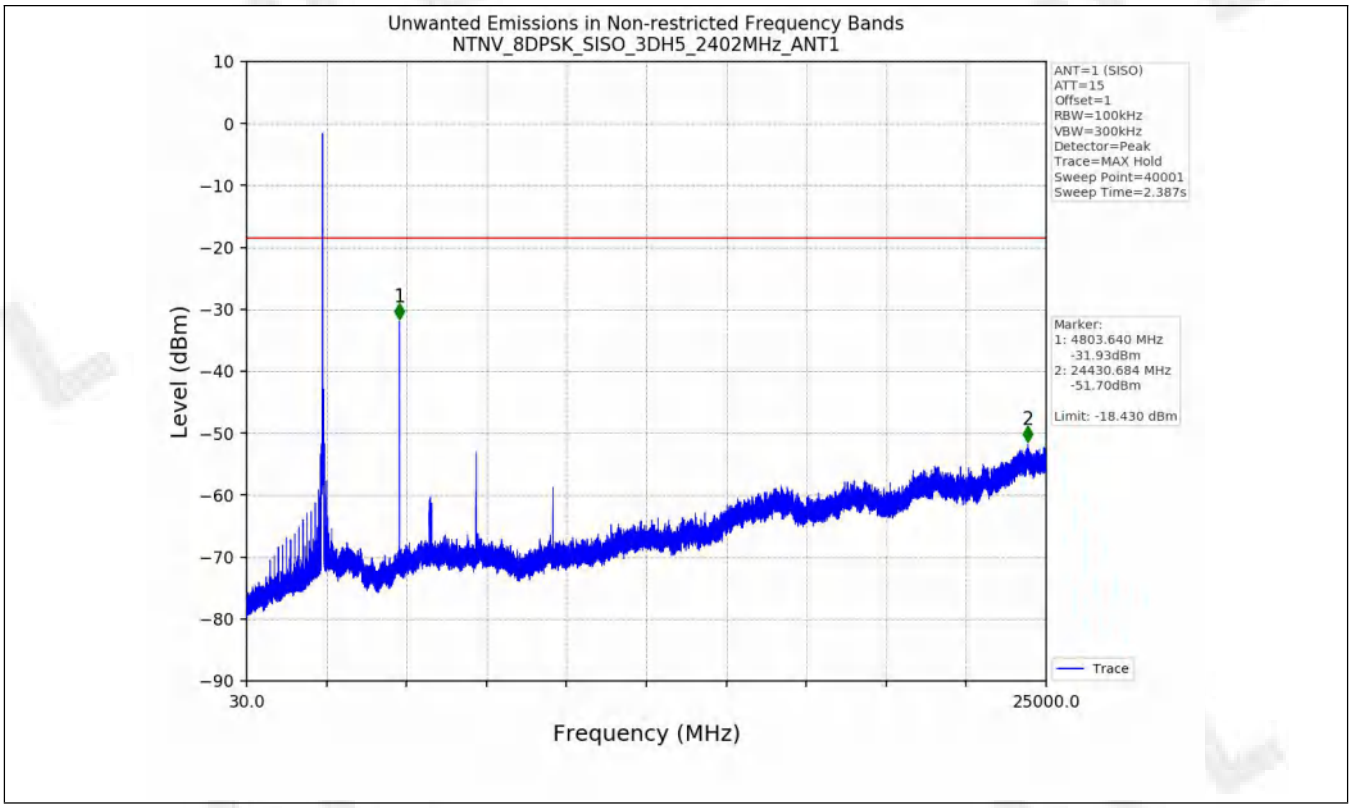

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 4959.702 MHz
-31.55dBm
2: 24404.465 MHz
-52.22dBm
Limit: -18.430 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

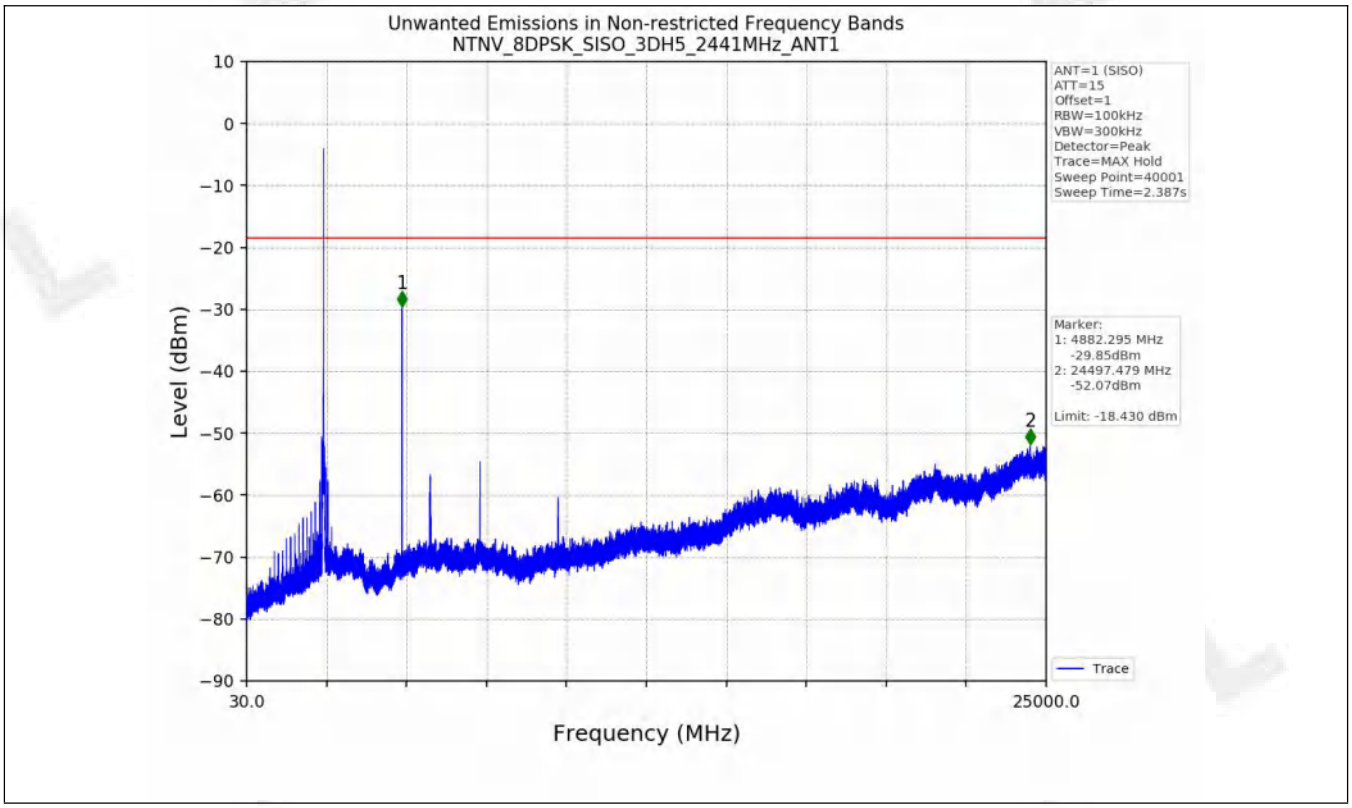

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
Level (dBm)
Frequency (MHz)
2310.0
2410.0
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2410.000 MHz
1.81dBm
Limit: -18.430 dBm
Trace

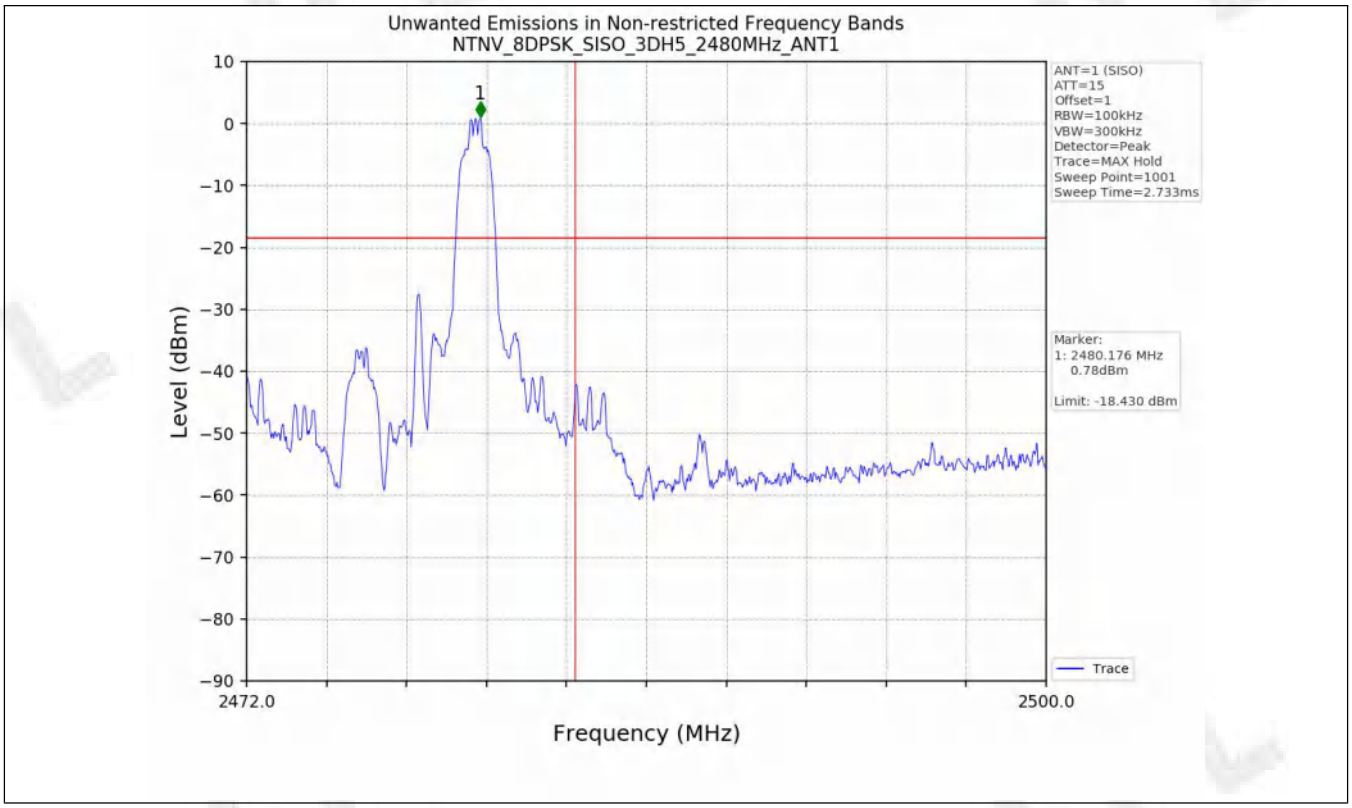

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
Level (dBm)
Frequency (MHz)
2472.0
2500.0
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2475.192 MHz
0.91dBm
Limit: -18.430 dBm
Trace

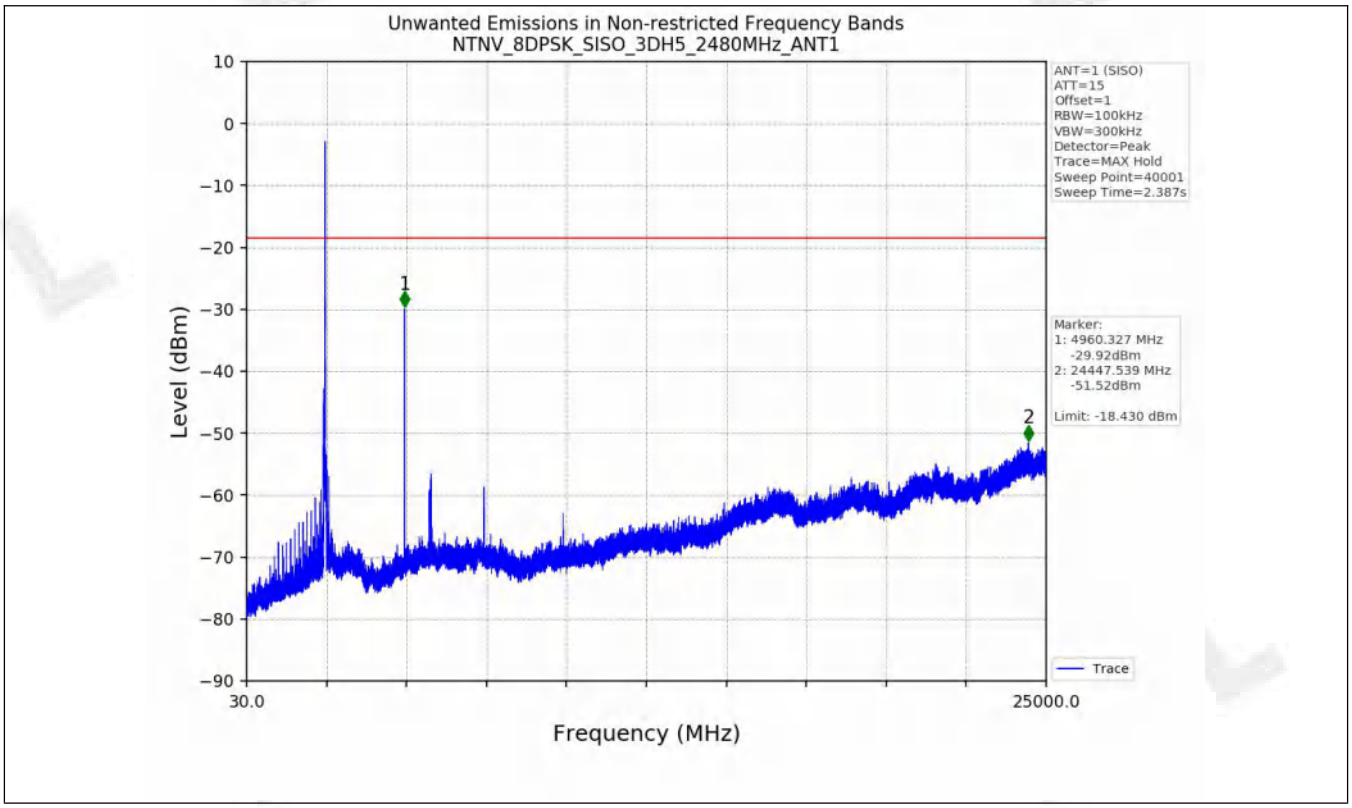

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2402.174 MHz
1.57dBm
Trace
Level (dBm)
Frequency (MHz)
2401.075
2402.925

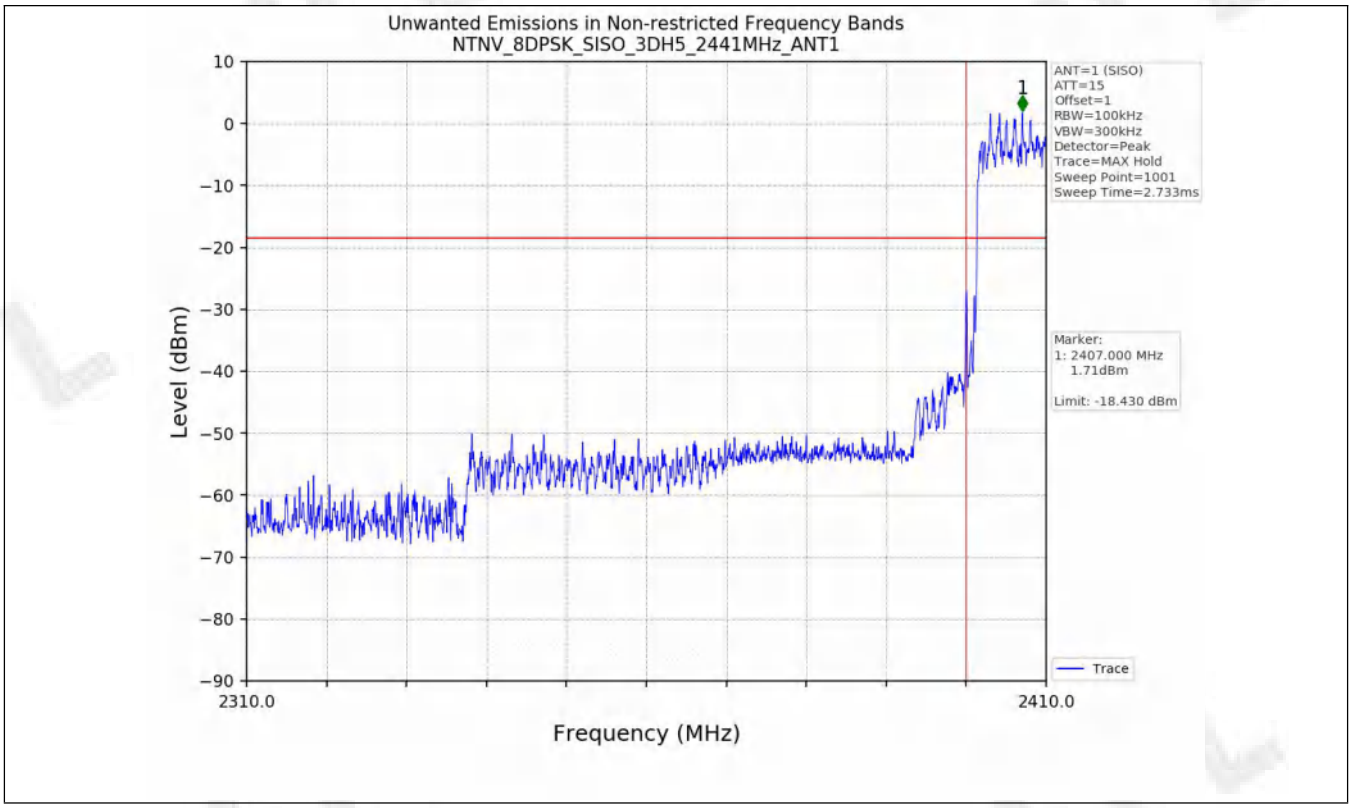

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.200 MHz
1.63dBm
Limit: -18.430 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

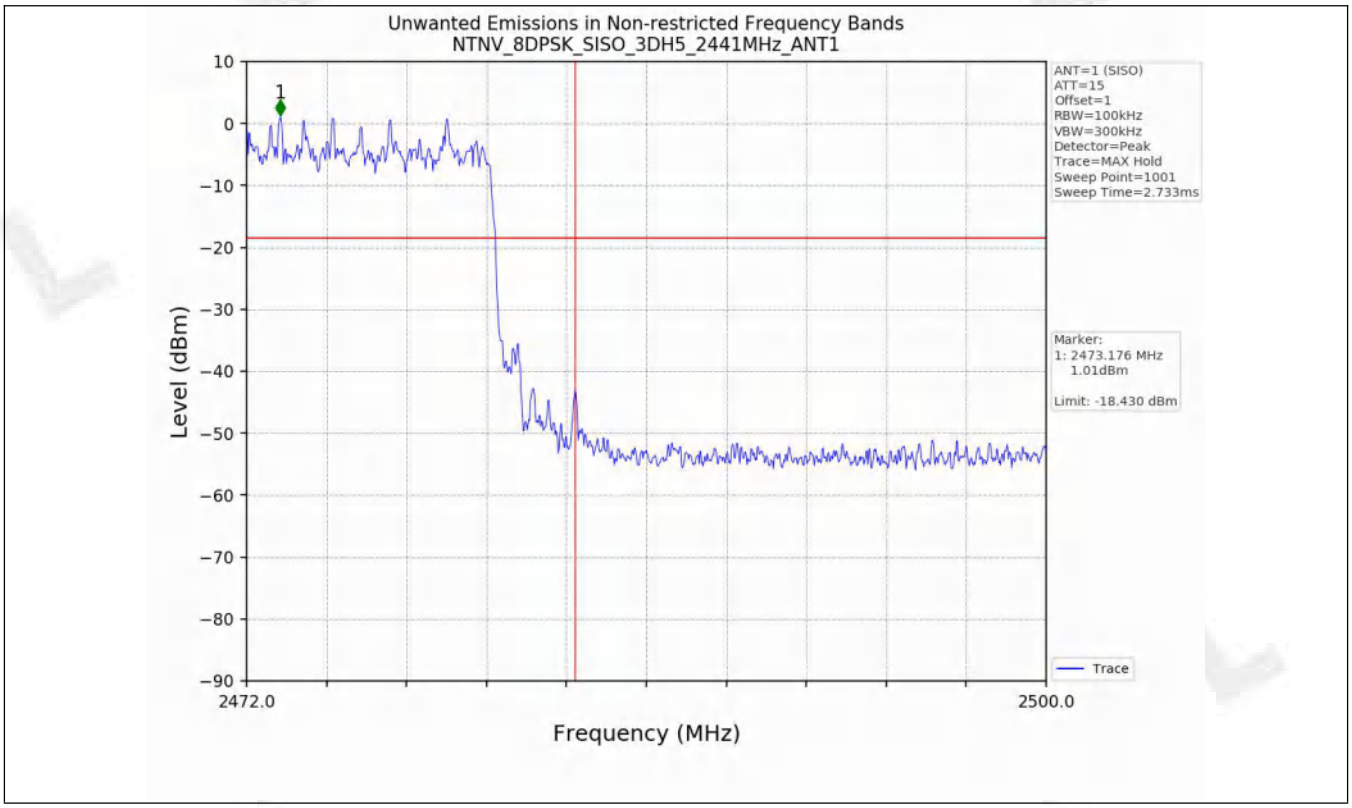

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
ATT=15
Offset=1
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 4803.640 MHz
-31.93dBm
2: 24430.684 MHz
-51.70dBm
Limit: -18.430 dBm
Trace
Level (dBm)
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: 4882.295 MHz
-29.85dBm
2: 24497.479 MHz
-52.07dBm
Limit: -18.430 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: 2480.176 MHz
0.78dBm
Limit: -18.430 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: 4960.327 MHz
-29.92dBm
2: 24447.539 MHz
-51.52dBm
Limit: -18.430 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: 2407.000 MHz
1.71dBm
Limit: -18.430 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: 2473.176 MHz
1.01dBm
Limit: -18.430 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0