Appendix for 15.247

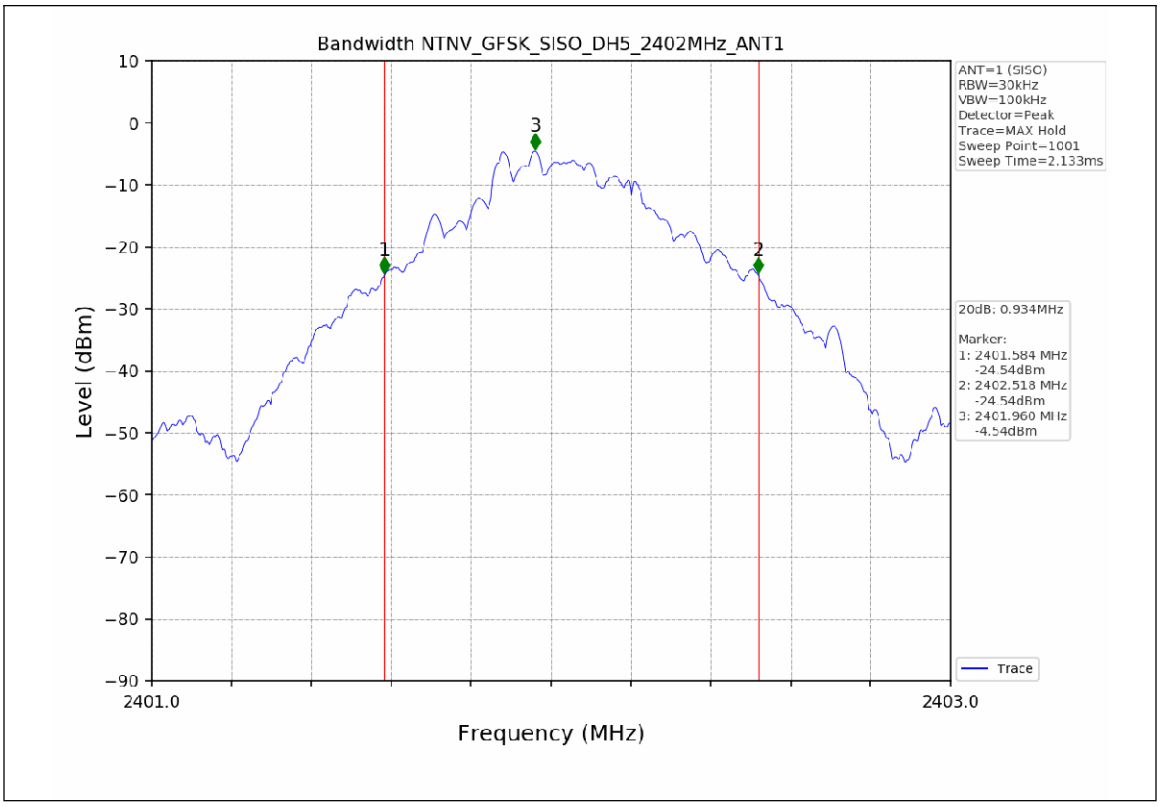
1. Bandwidth

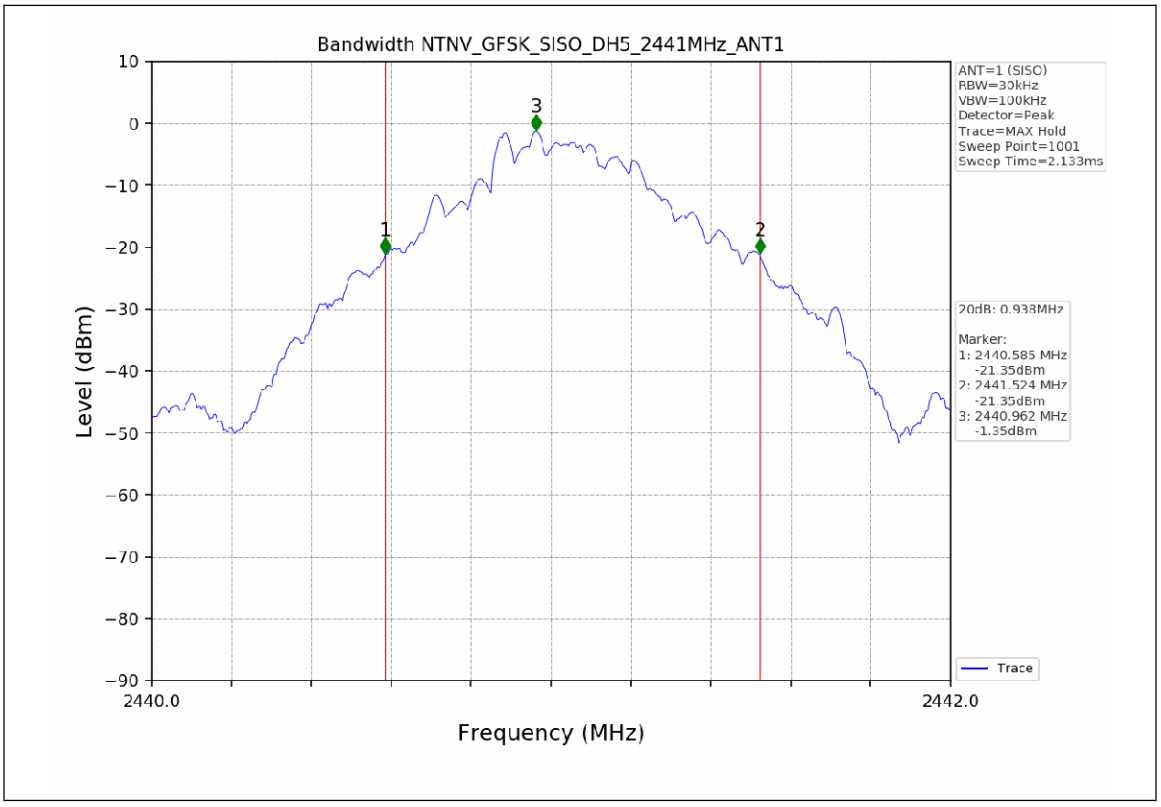
1.1 Test Result

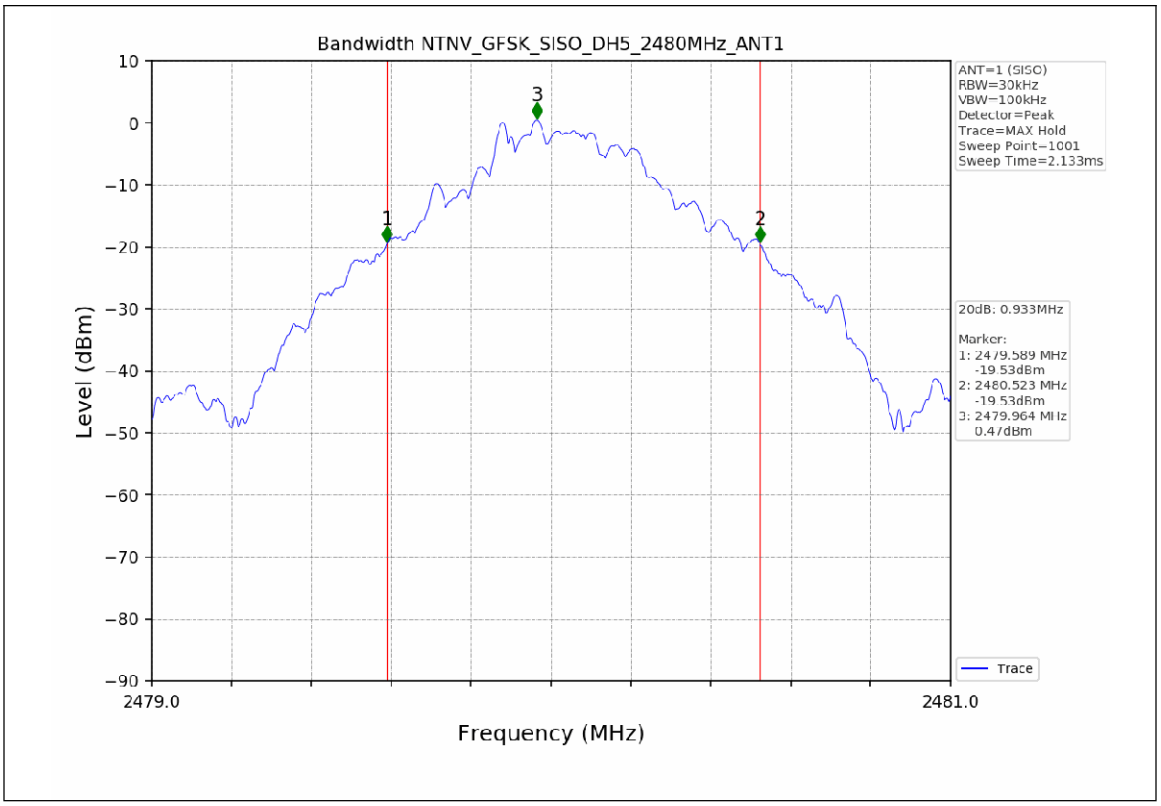
Test Mode	Frequency (MHz)	TX Type	ANT No.	20dB Bandwidth Test Result (MHz)	Verdict
GFSK	2402	SISO	1	0.934	PASS
	2441	SISO	1	0.938	PASS
	2480	SISO	1	0.933	PASS
Pi/4DQPSK	2402	SISO	1	1.282	PASS
	2441	SISO	1	1.282	PASS
	2480	SISO	1	1.284	PASS
8DPSK	2402	SISO	1	1.292	PASS
	2441	SISO	1	1.293	PASS
	2480	SISO	1	1.291	PASS

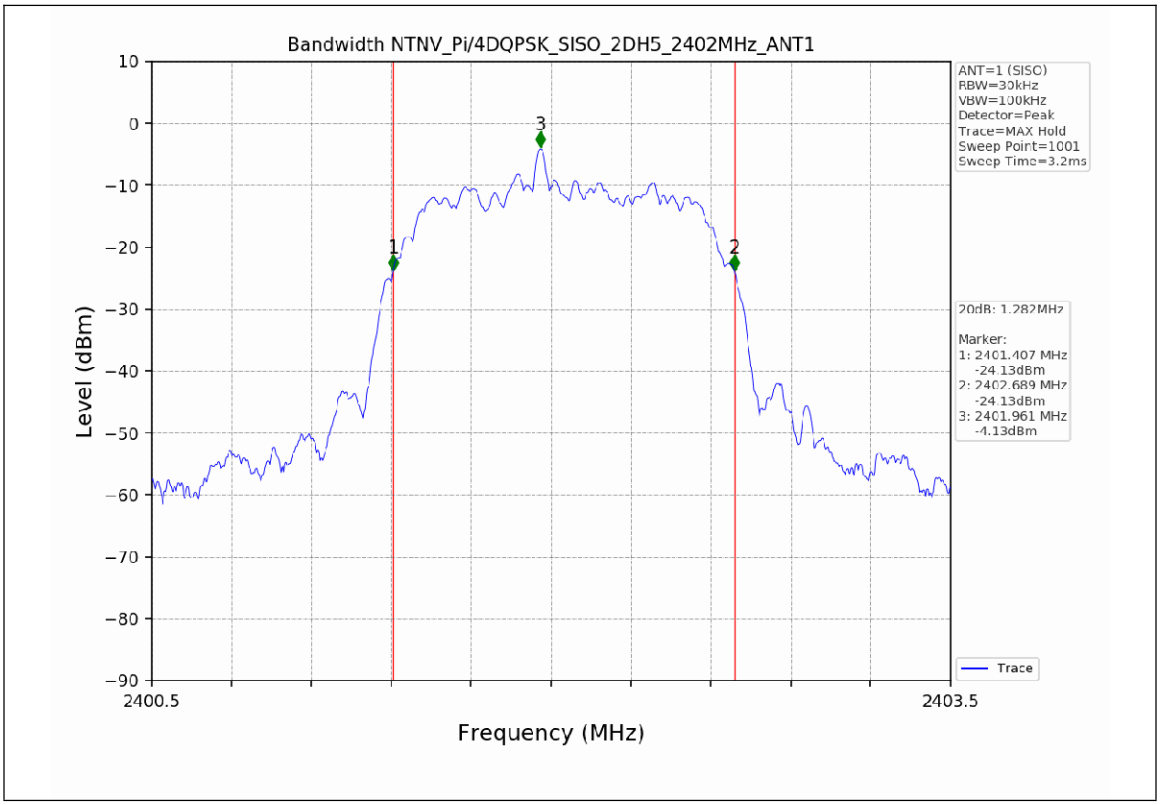
Test Mode	Frequency (MHz)	TX Type	ANT No.	99% Occupied Bandwidth Test Result (MHz)	
GFSK	2402	SISO	1	0.851	Only for Report Use
	2441	SISO	1	0.849	Only for Report Use
	2480	SISO	1	0.847	Only for Report Use
Pi/4DQPSK	2402	SISO	1	1.181	Only for Report Use
	2441	SISO	1	1.182	Only for Report Use
	2480	SISO	1	1.182	Only for Report Use
8DPSK	2402	SISO	1	1.180	Only for Report Use
	2441	SISO	1	1.181	Only for Report Use
	2480	SISO	1	1.181	Only for Report Use

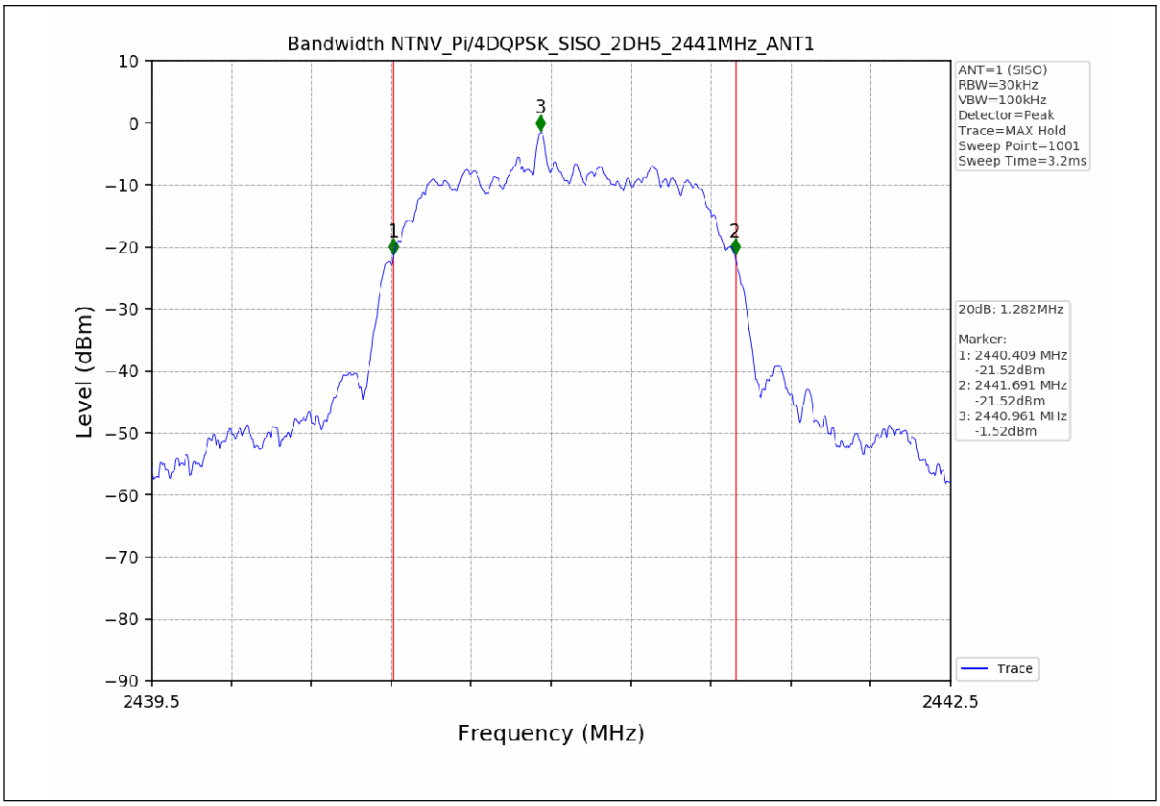
1.2 Test Graph - 20dB Bandwidth

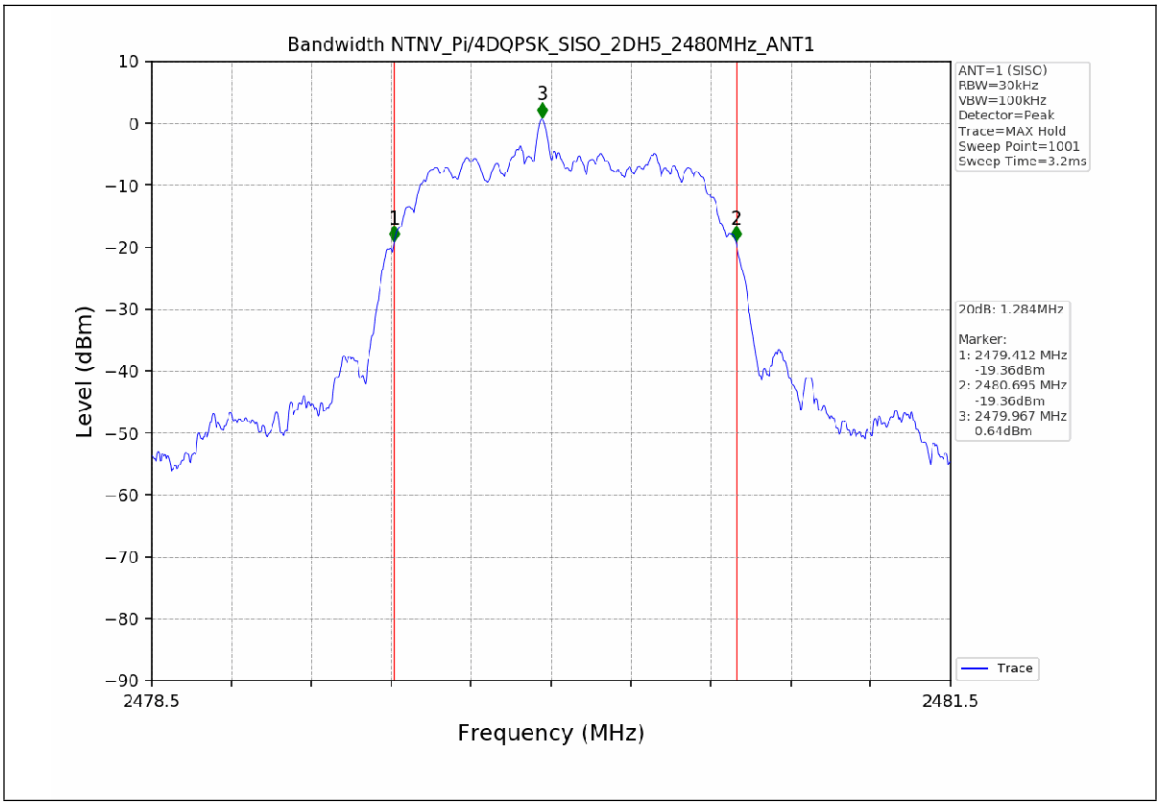

Bandwidth NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.934MHz
Marker:
1: 2401.584 MHz
-24.54dBm
2: 2402.518 MHz
-24.54dBm
3: 2401.960 MHz
-4.54dBm
Trace
Level (dBm)
Frequency (MHz)
2401.0
2403.0

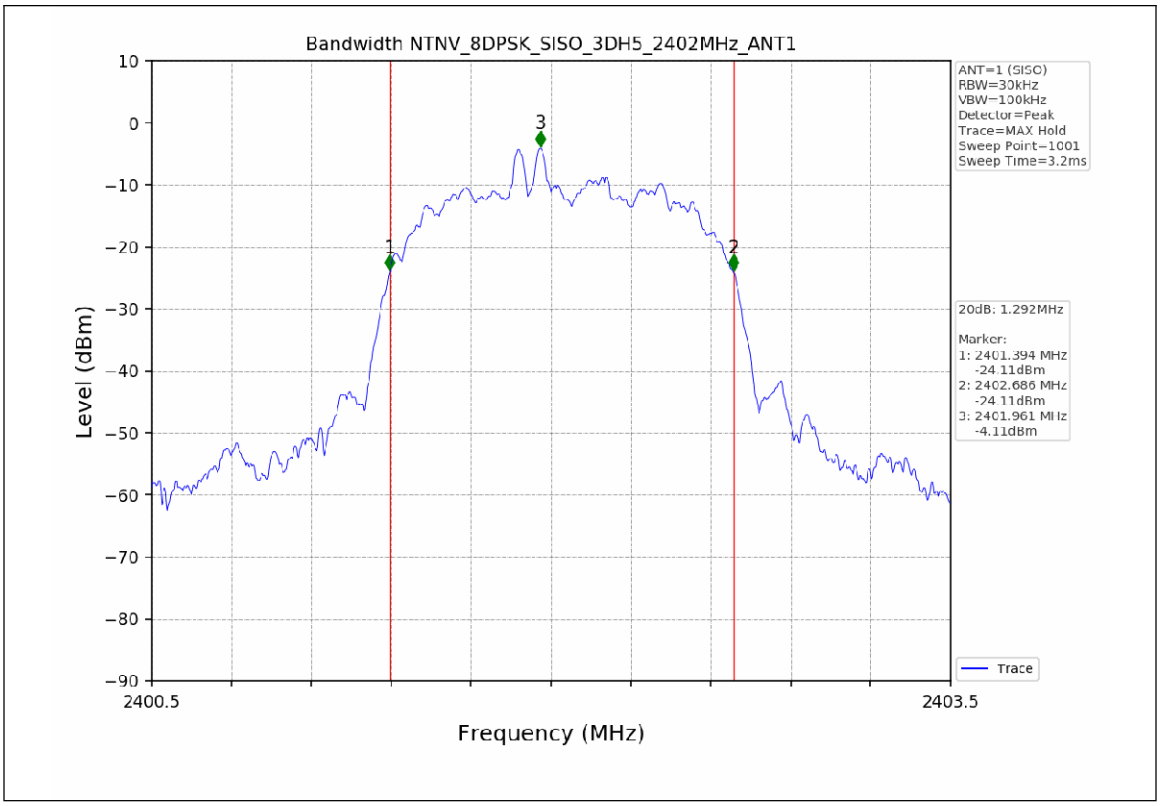

Bandwidth NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.938MHz
Marker:
1: 2440.585 MHz
-21.35dBm
2: 2441.524 MHz
-21.35dBm
3: 2440.962 MHz
-1.35dBm
Trace
Level (dBm)
Frequency (MHz)
2440.0
2442.0

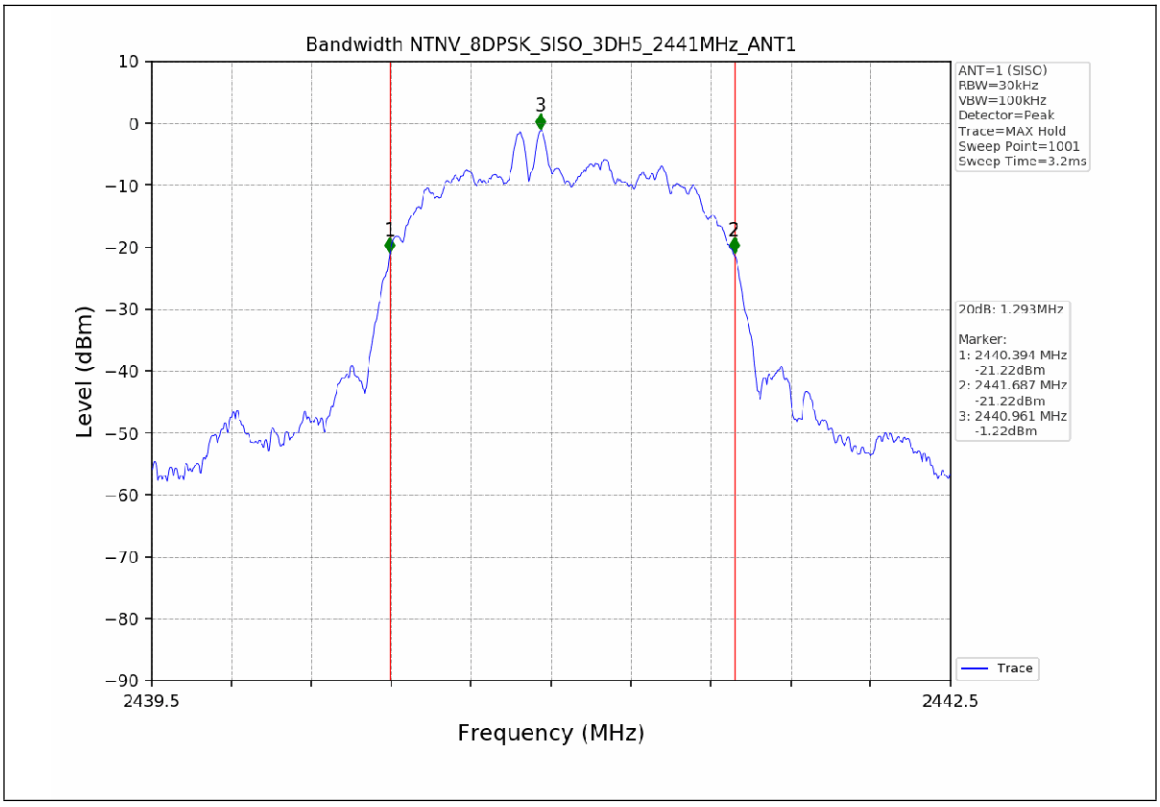

Bandwidth NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
20dB: 0.933MHz
Marker:
1: 2479.589 MHz
-19.53dBm
2: 2480.523 MHz
-19.53dBm
3: 2479.964 MHz
0.47dBm
Trace
Level (dBm)
Frequency (MHz)
2479.0
2481.0

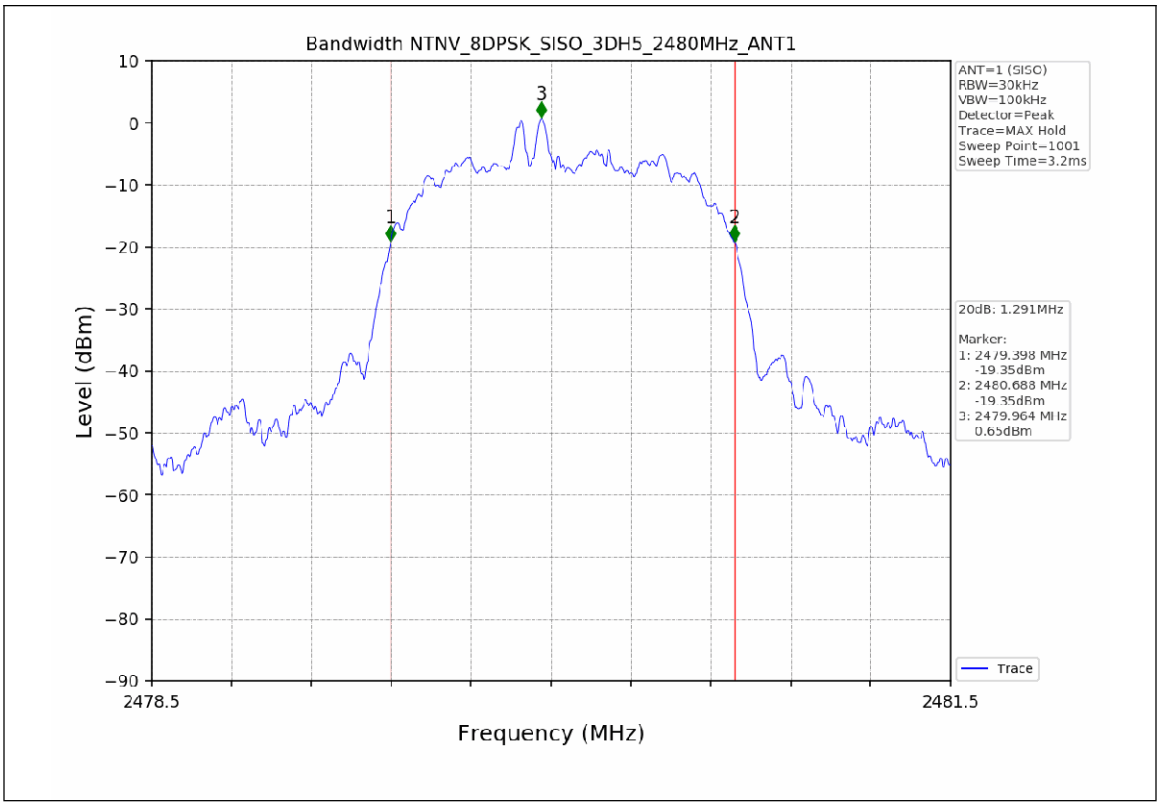

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
Marker:
1: 2401.407 MHz
-24.13dBm
2: 2402.689 MHz
-24.13dBm
3: 2401.961 MHz
-4.13dBm
Trace
Level (dBm)
Frequency (MHz)
2400.5
2403.5


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
20dB: 1.282MHz
Marker:
1: 2440.409 MHz
-21.52dBm
2: 2441.691 MHz
-21.52dBm
3: 2440.961 MHz
-1.52dBm
Trace
Level (dBm)
Frequency (MHz)
2439.5
2442.5

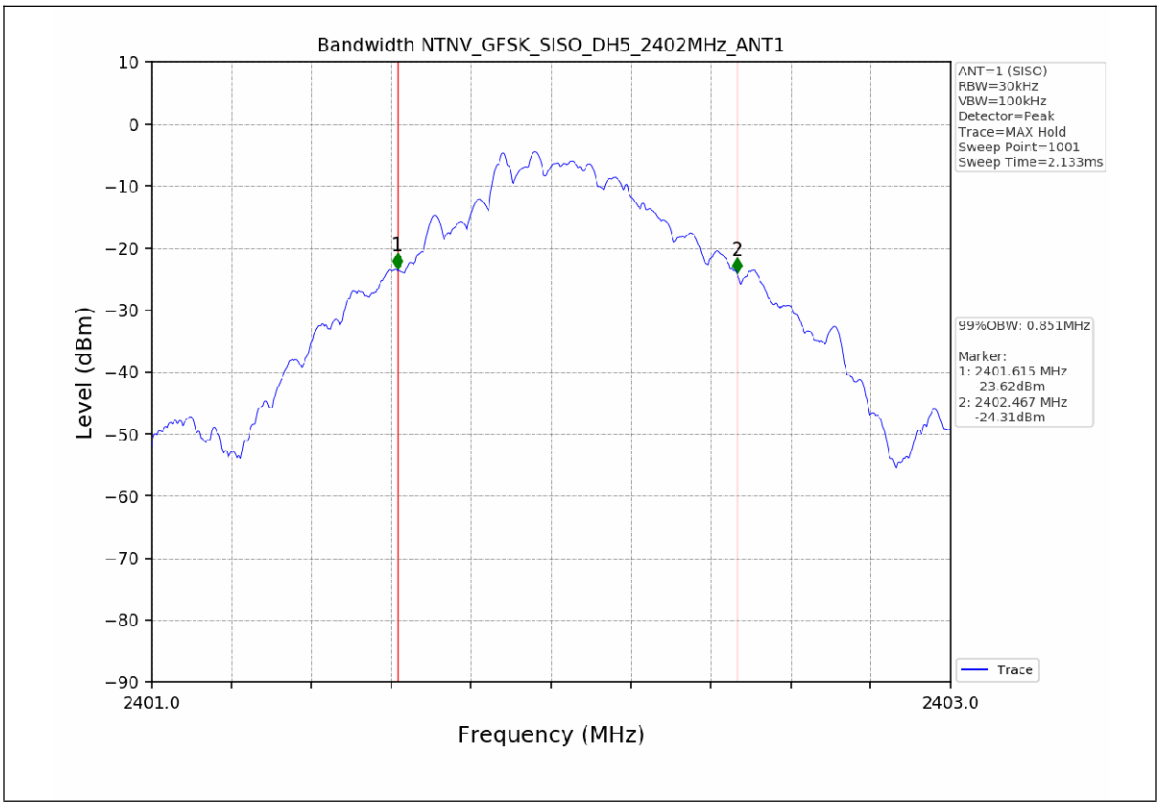

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
20dB: 1.284MHz
Marker:
1: 2479.412 MHz
-19.36dBm
2: 2480.695 MHz
-19.36dBm
3: 2479.967 MHz
0.64dBm
Trace
Level (dBm)
Frequency (MHz)
2478.5
2481.5

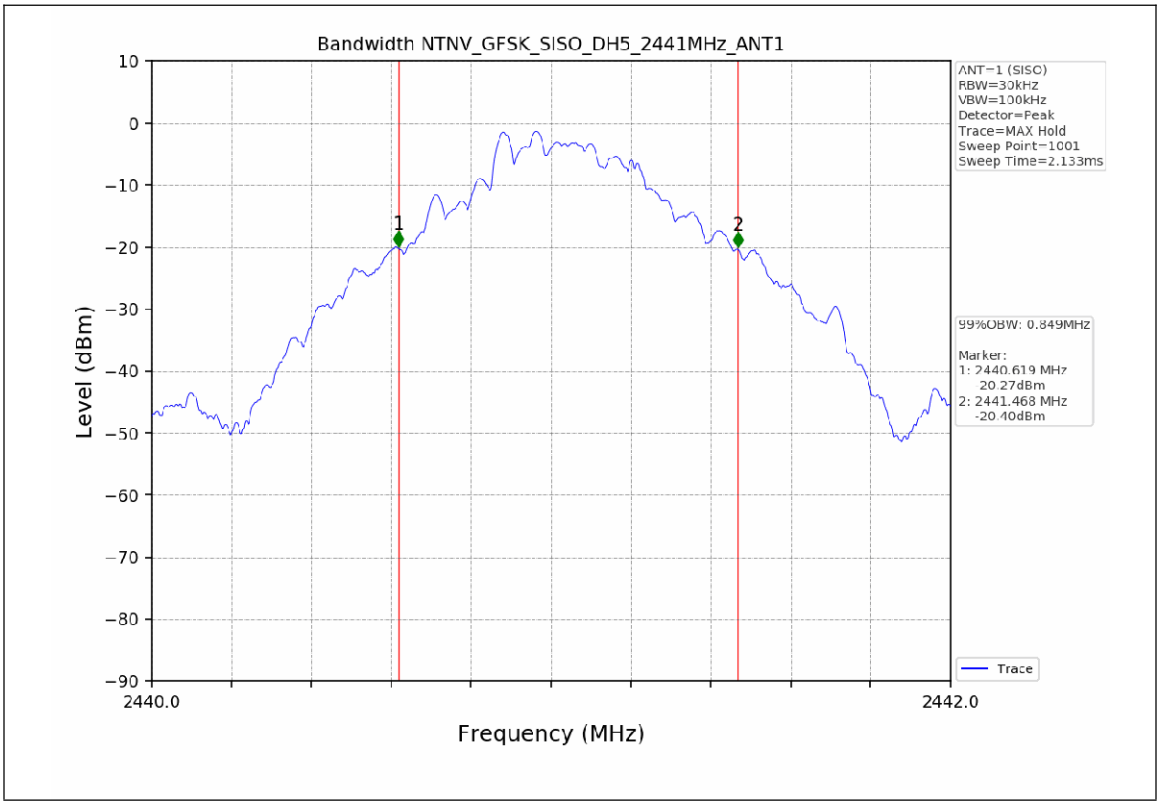

Bandwidth NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
20dB: 1.292MHz
Marker:
1: 2401.394 MHz
-24.11dBm
2: 2402.686 MHz
-24.11dBm
3: 2401.961 MHz
-4.11dBm
Trace
Level (dBm)
Frequency (MHz)
2400.5
2403.5

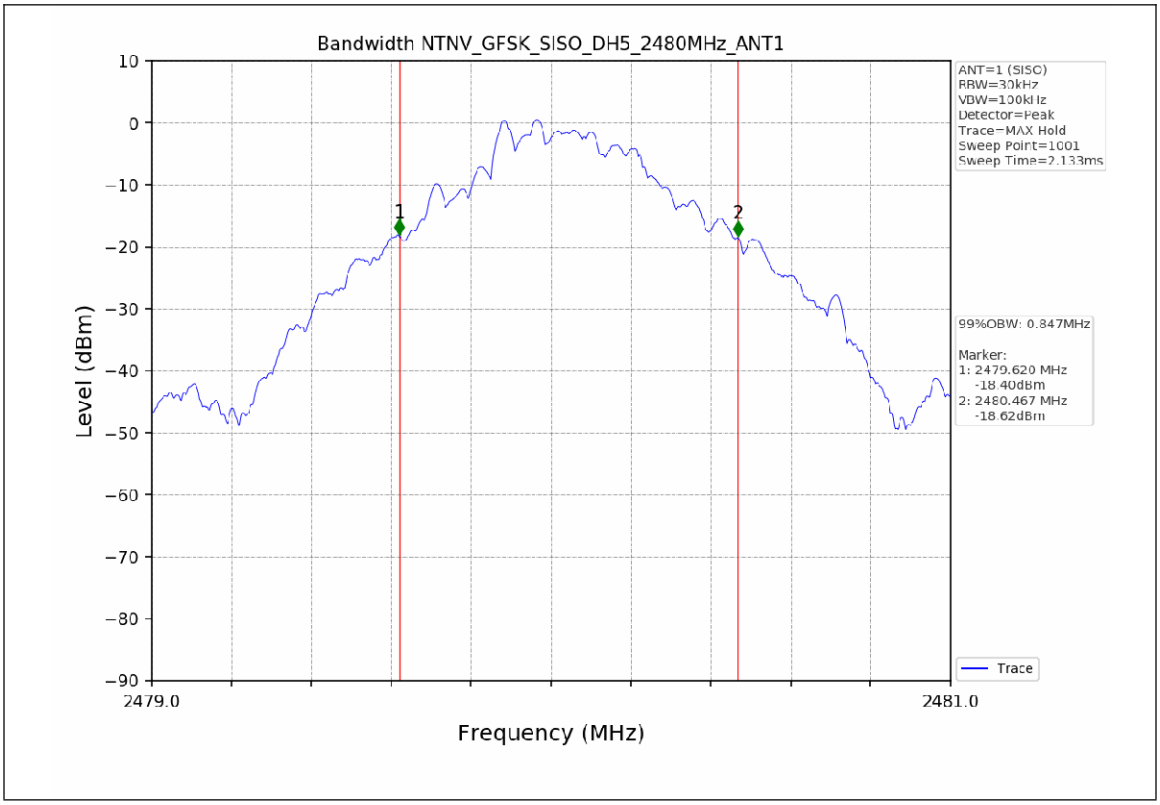

Bandwidth NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
20dB: 1.293MHz
Marker:
1: 2440.394 MHz
-21.22dBm
2: 2441.687 MHz
-21.22dBm
3: 2440.961 MHz
-1.22dBm
Trace
Level (dBm)
Frequency (MHz)
2439.5
2442.5

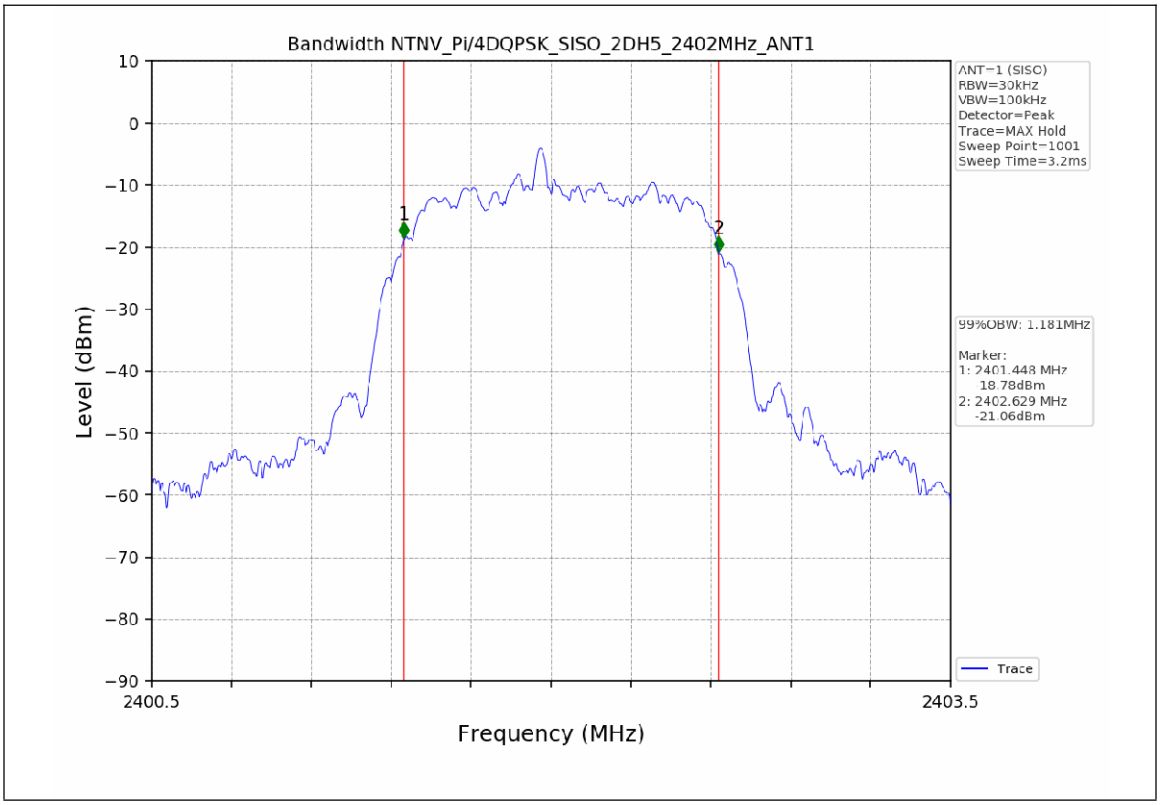


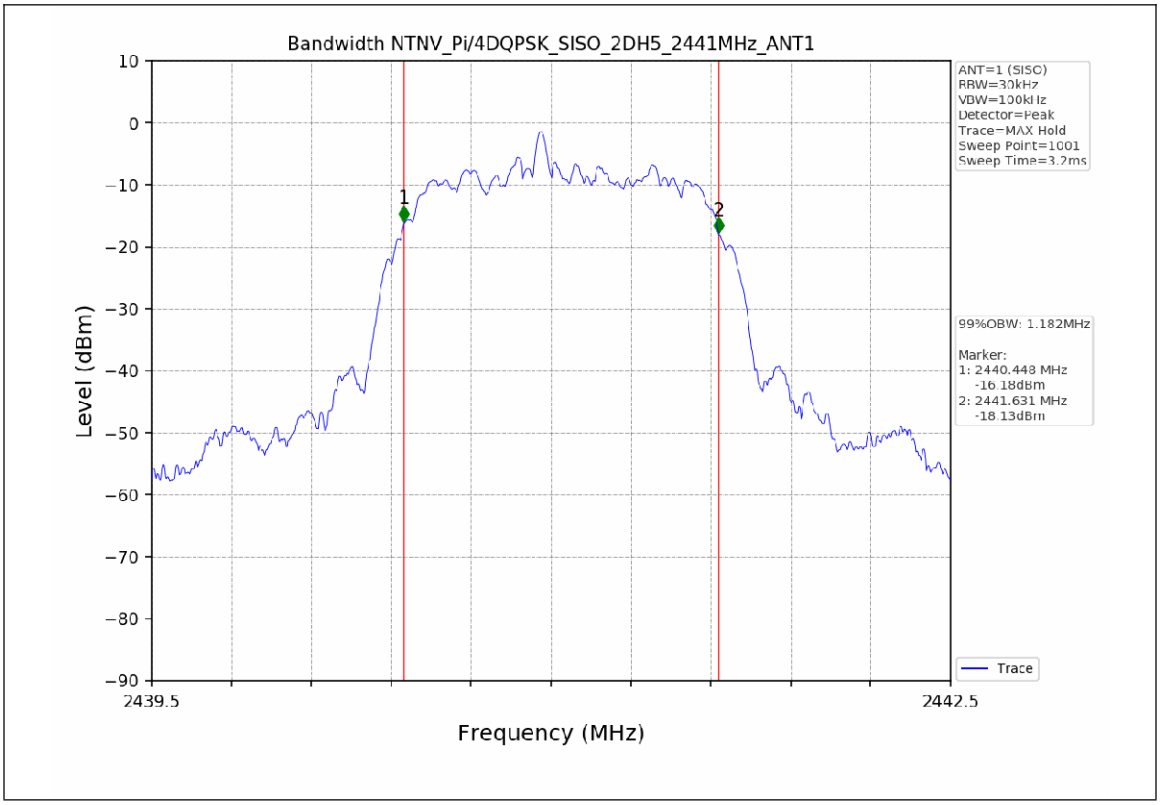
1.3 Test Graph - 99% Occupied Bandwidth

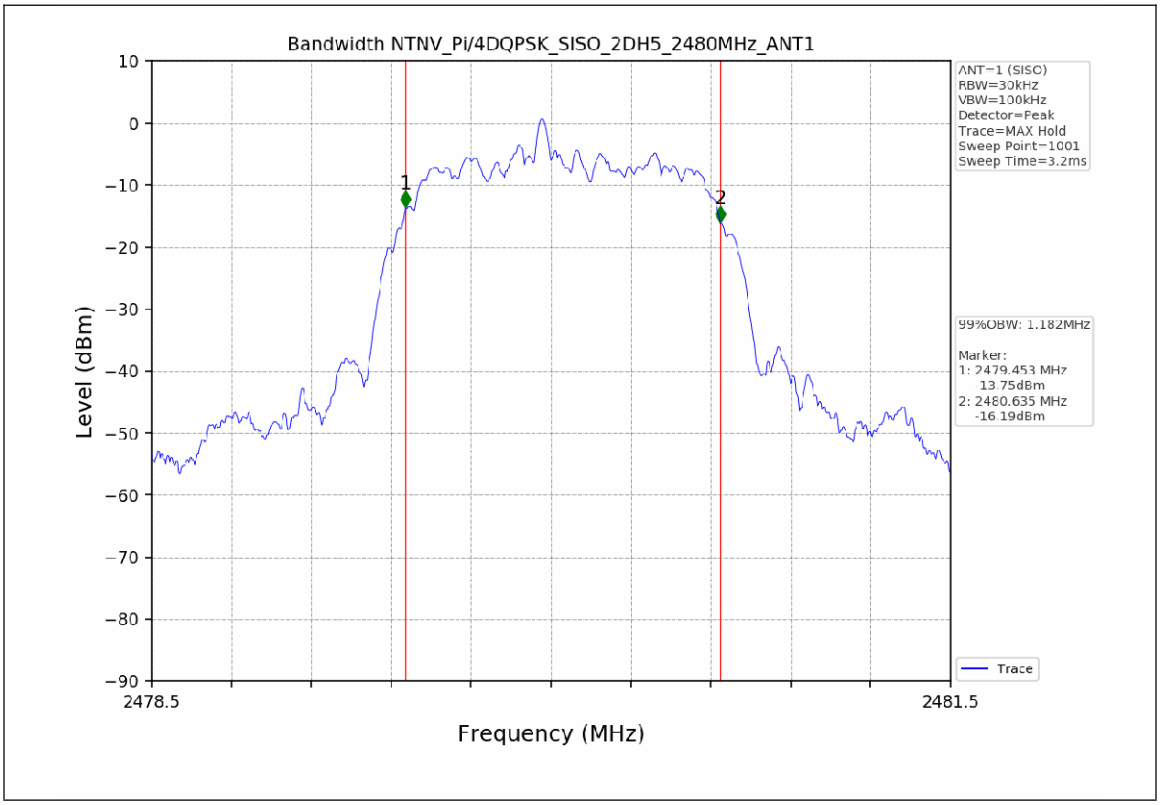


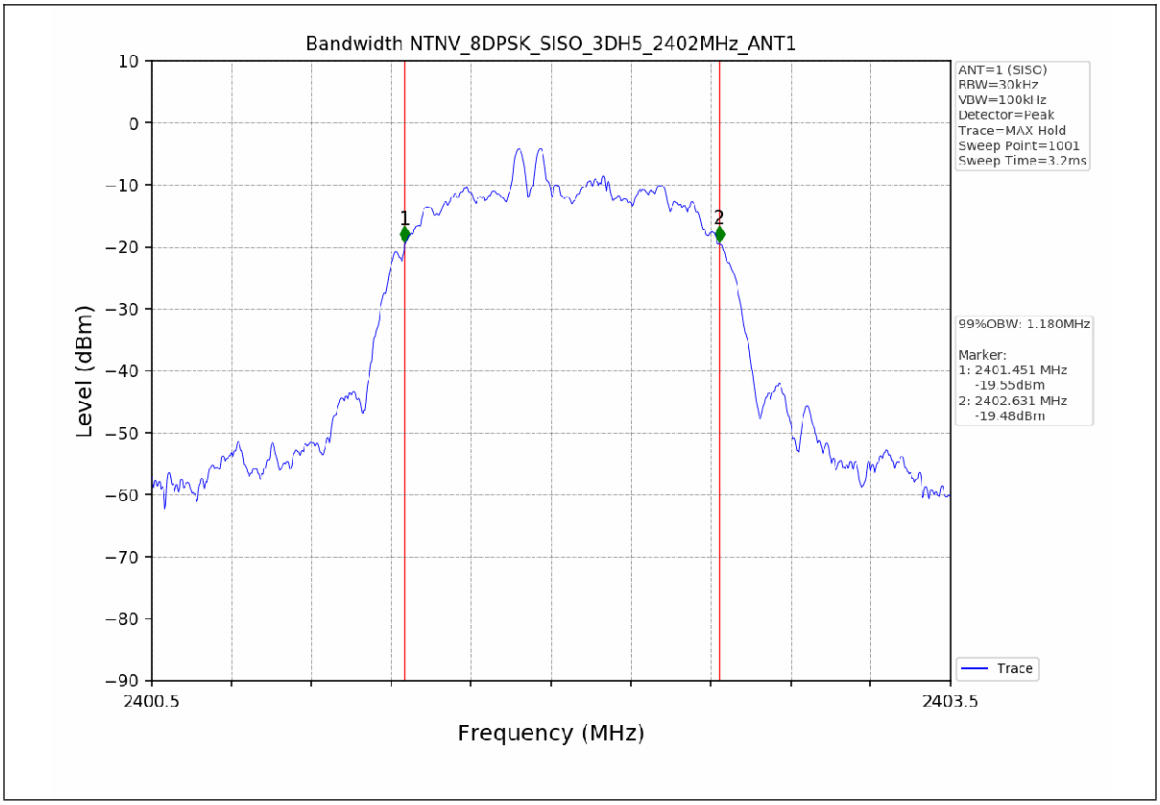

Bandwidth NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
99%OBW: 0.849MHz
Marker:
1: 2440.619 MHz
20.27dBm
2: 2441.468 MHz
-20.40dBm
Trace
Level (dBm)
Frequency (MHz)
2440.0
2442.0

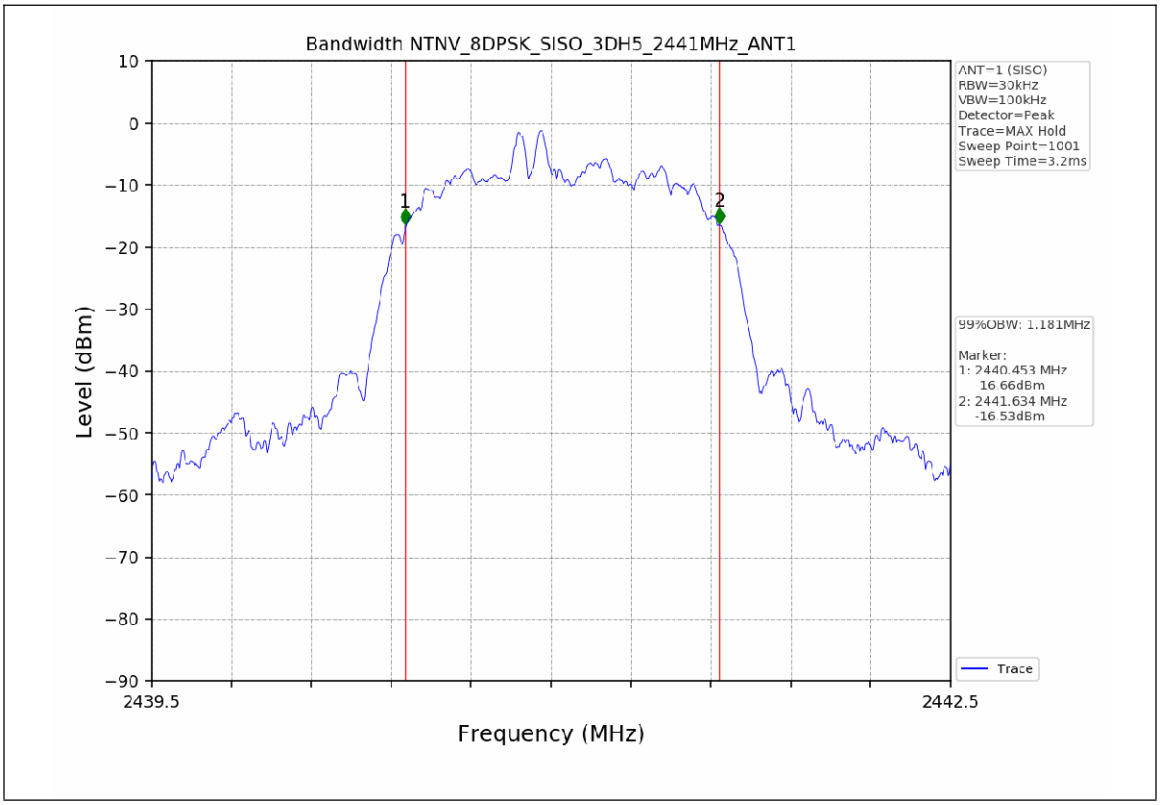

Bandwidth NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.133ms
99%OBW: 0.847MHz
Marker:
1: 2479.620 MHz
-18.40dBm
2: 2480.467 MHz
-18.62dBm
Trace
Level (dBm)
Frequency (MHz)
2479.0
2481.0

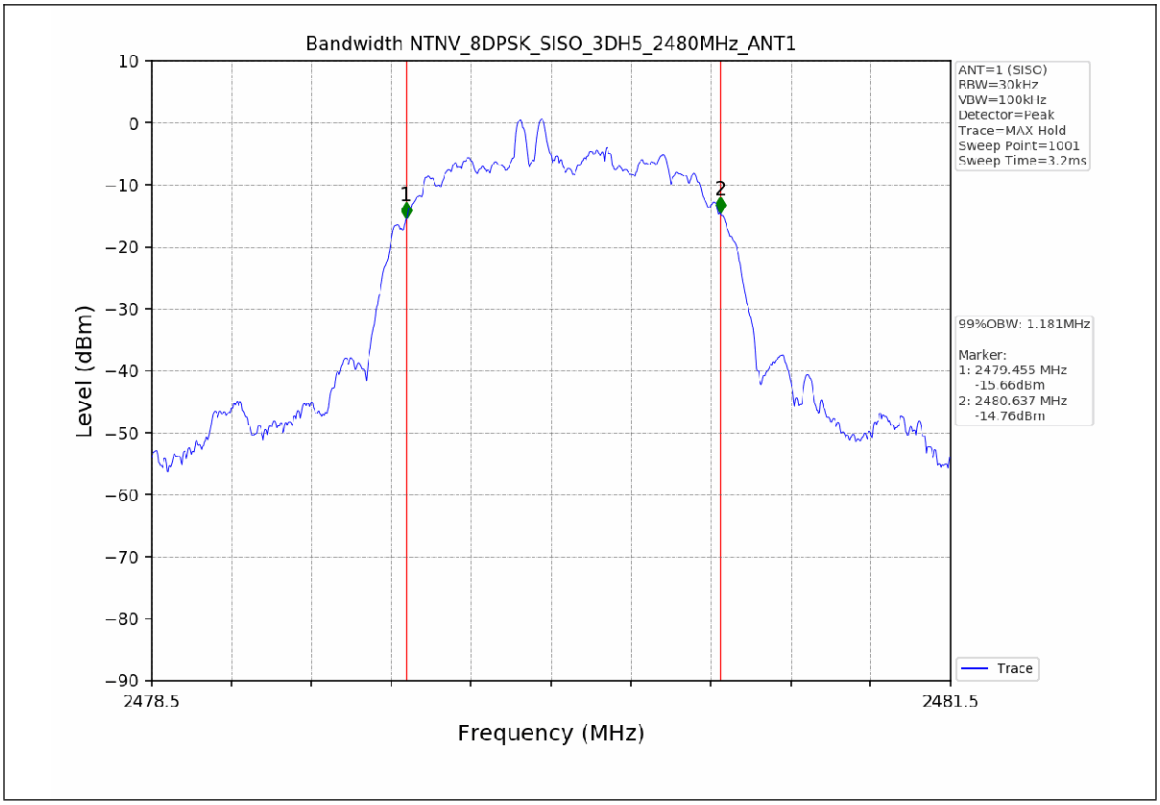

Bandwidth NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
99%OBW: 1.181MHz
Marker:
1: 2401.448 MHz
18.78dBm
2: 2402.629 MHz
-21.06dBm
Trace
Level (dBm)
Frequency (MHz)
2400.5
2403.5


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: 1.182MHz
Marker:
1: 2440.448 MHz
-16.18dBm
2: 2441.631 MHz
-18.13dBm
Trace
Level (dBm)
Frequency (MHz)
2439.5
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: 1.182MHz
Marker:
1: 2479.453 MHz
13.75dBm
2: 2480.635 MHz
-16.19dBm
Trace
Level (dBm)
Frequency (MHz)
2478.5
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: 1.180MHz
Marker:
1: 2401.451 MHz
-19.55dBm
2: 2402.631 MHz
-19.48dBm
Trace
Level (dBm)
Frequency (MHz)
2400.5
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: 1.181MHz
Marker:
1: 2440.453 MHz
16.66dBm
2: 2441.634 MHz
-16.53dBm
Trace
Level (dBm)
Frequency (MHz)
2439.5
2442.5

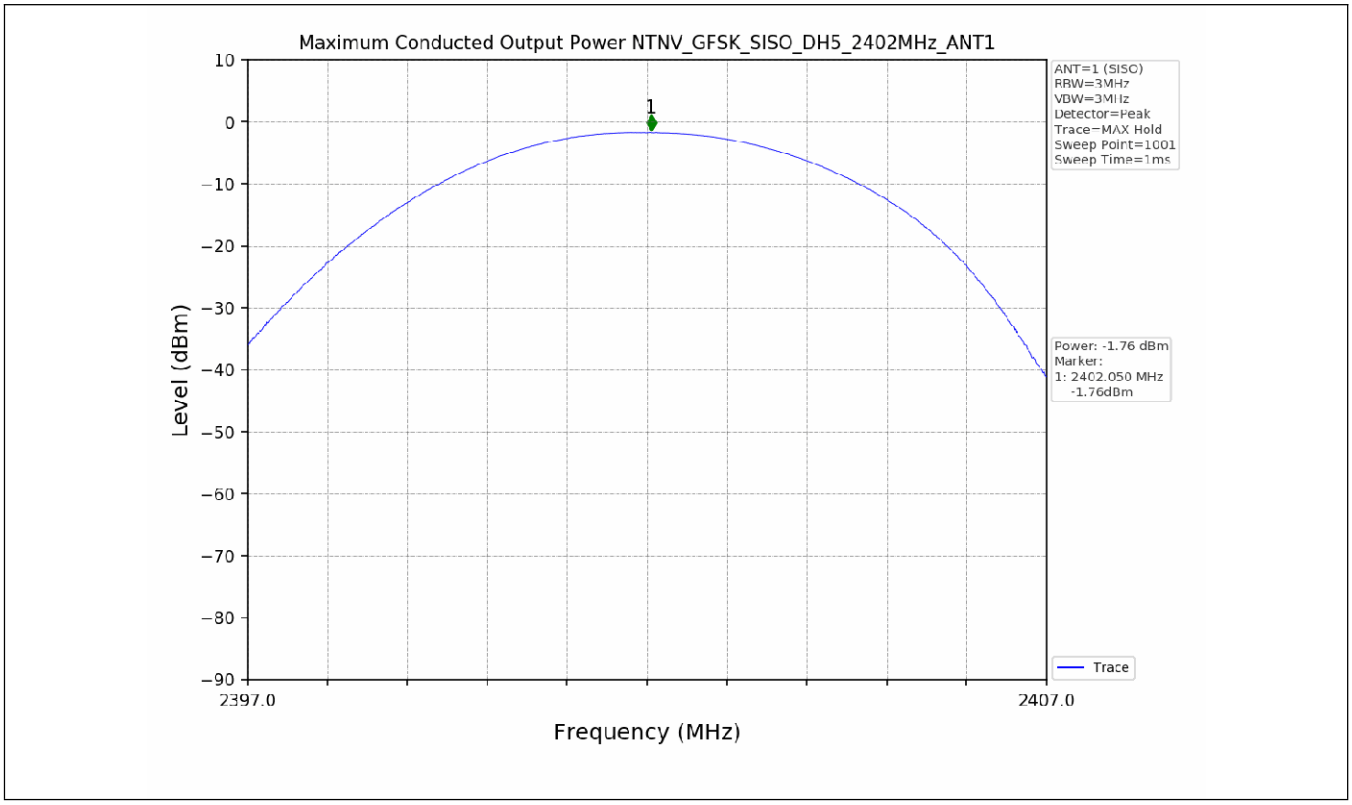

Bandwidth NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=30kHz
VBW=100kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=3.2ms
99%OBW: 1.181MHz
Marker:
1: 2479.455 MHz
-15.66dBm
2: 2480.637 MHz
-14.76dBm
Trace
Level (dBm)
Frequency (MHz)
2478.5
2481.5

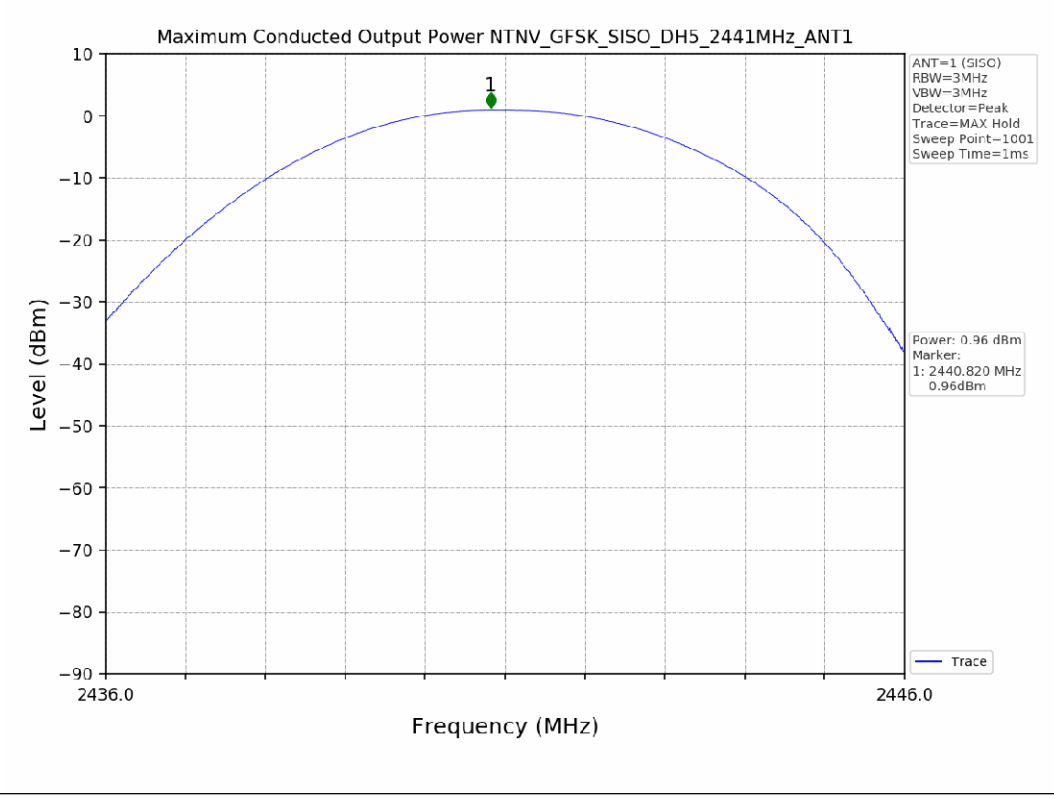
2. Maximum Conducted Output Power

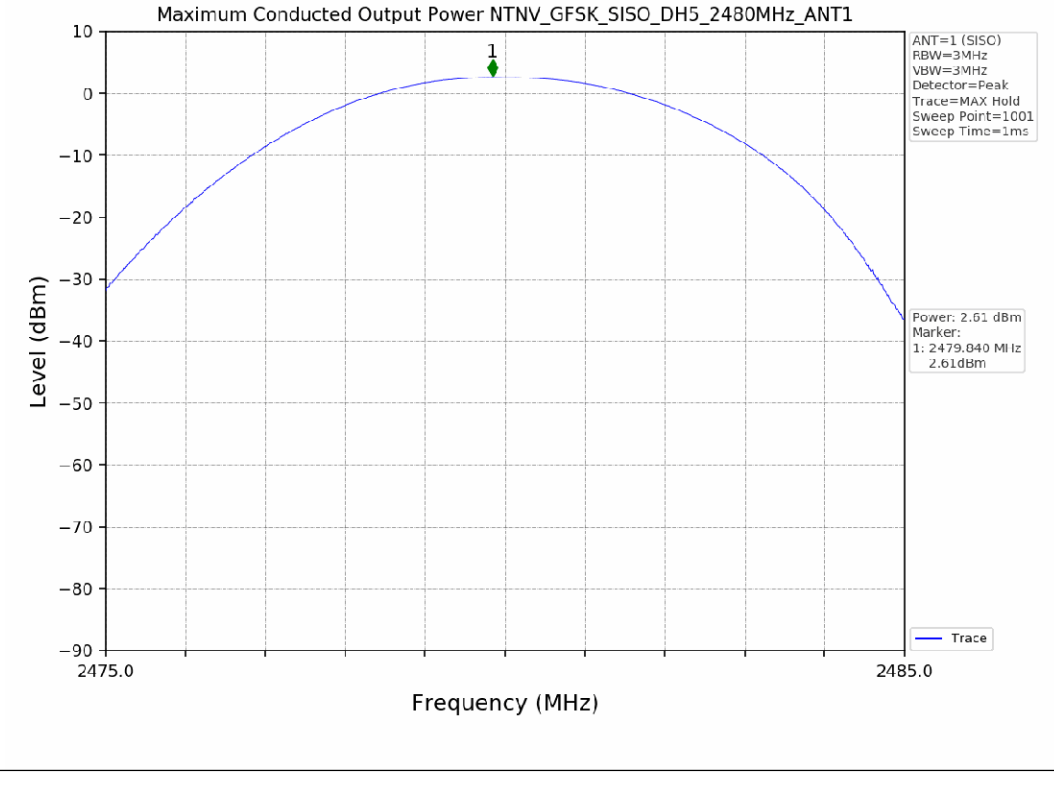
2.1 Test Result

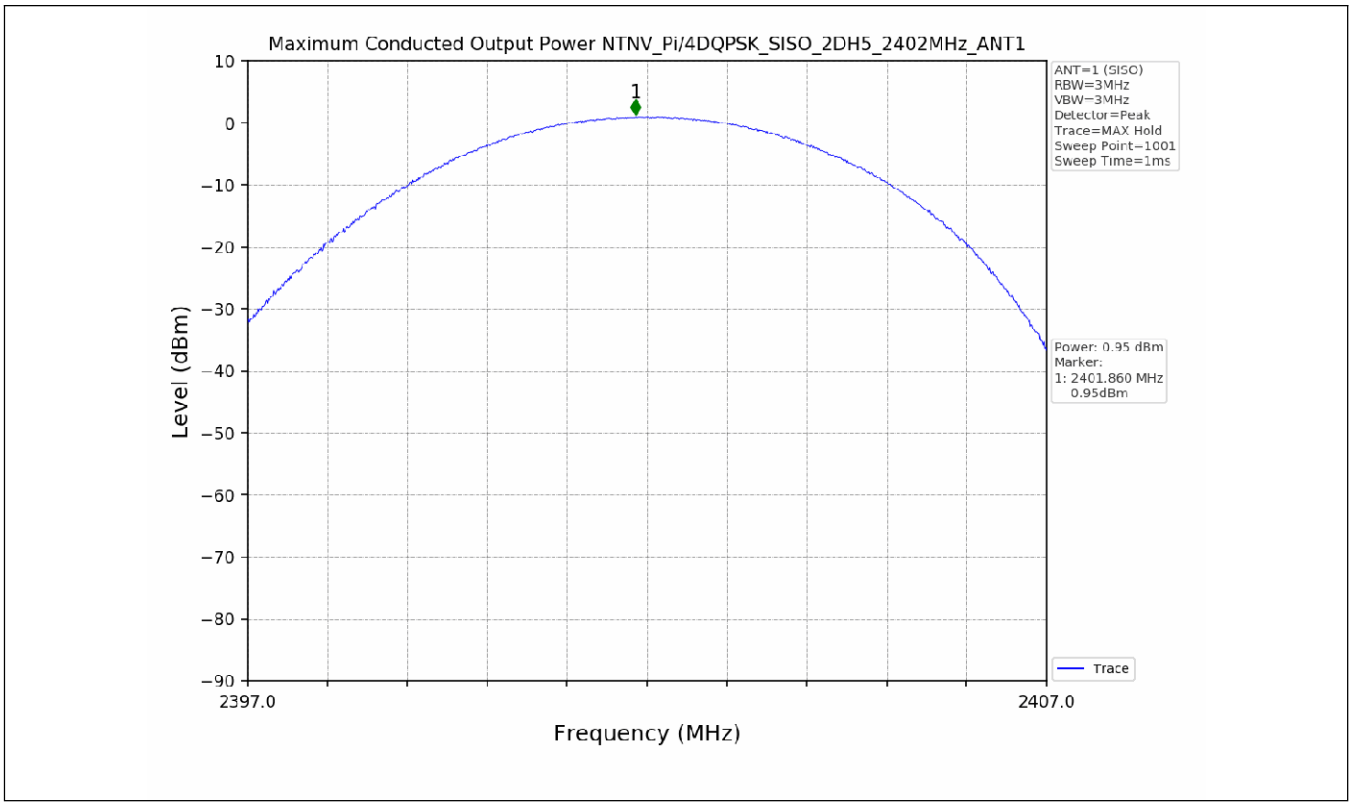
Test Mode	Frequency (MHz)	Tx Type	Measured Peak Output Power (dBm)	Limits (dBm)	Verdict
			Ant 1		
GFSK	2402	SISO	-1.76	30	PASS
	2441	SISO	0.96	30	PASS
	2480	SISO	2.61	30	PASS
Pi/4DQPSK	2402	SISO	0.95	20.97	PASS
	2441	SISO	3.82	20.97	PASS
	2480	SISO	5.45	20.97	PASS
8DPSK	2402	SISO	1.61	20.97	PASS
	2441	SISO	4.48	20.97	PASS
	2480	SISO	5.96	20.97	PASS

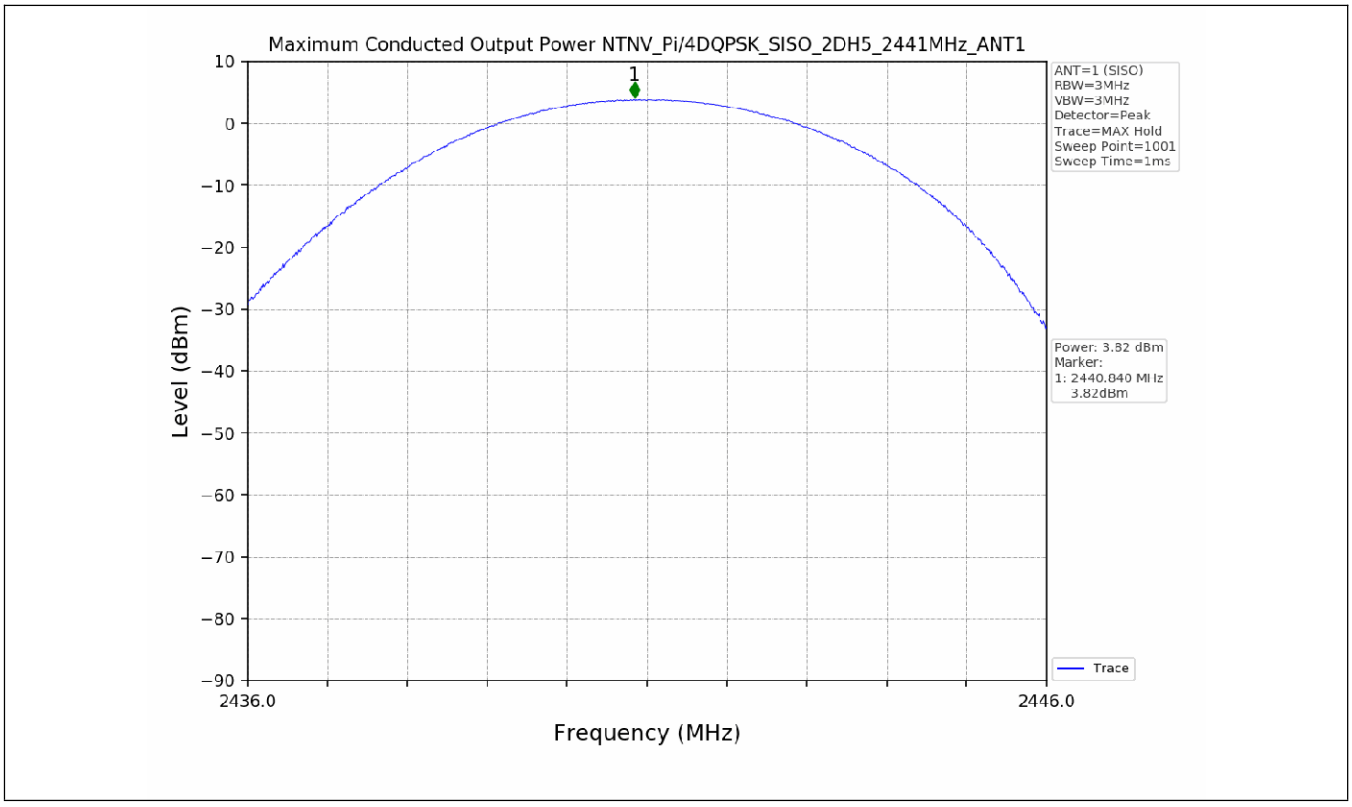
2.2 Test Graph

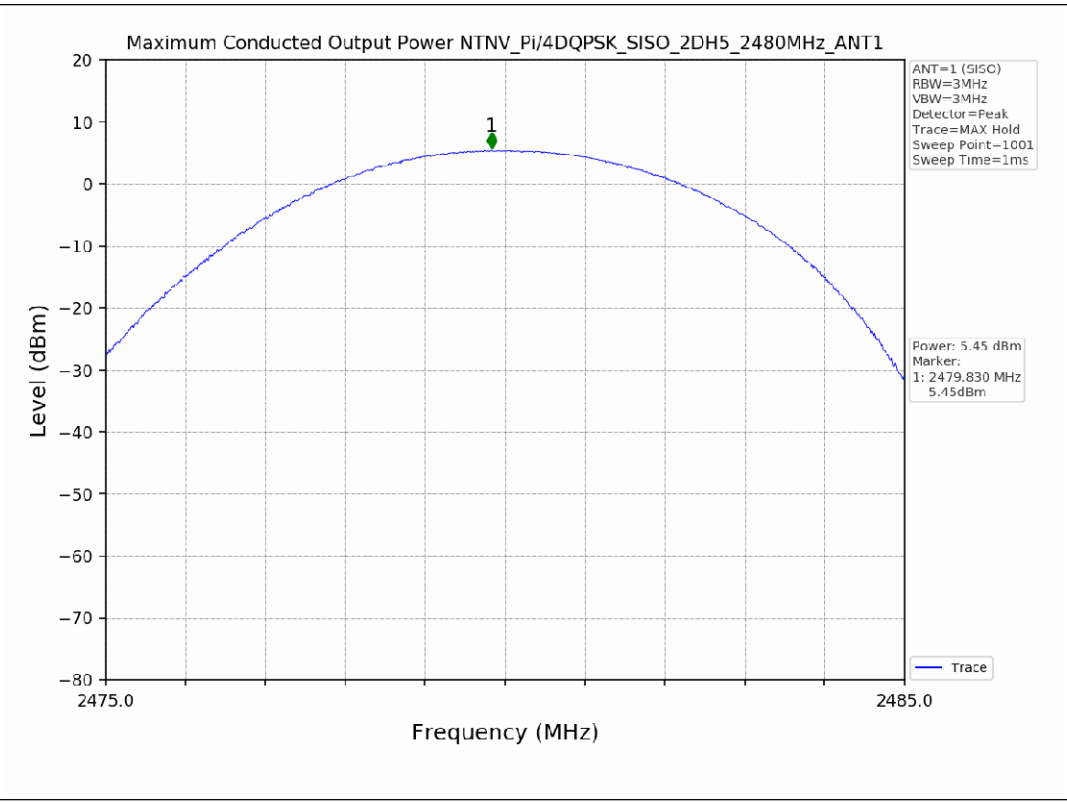


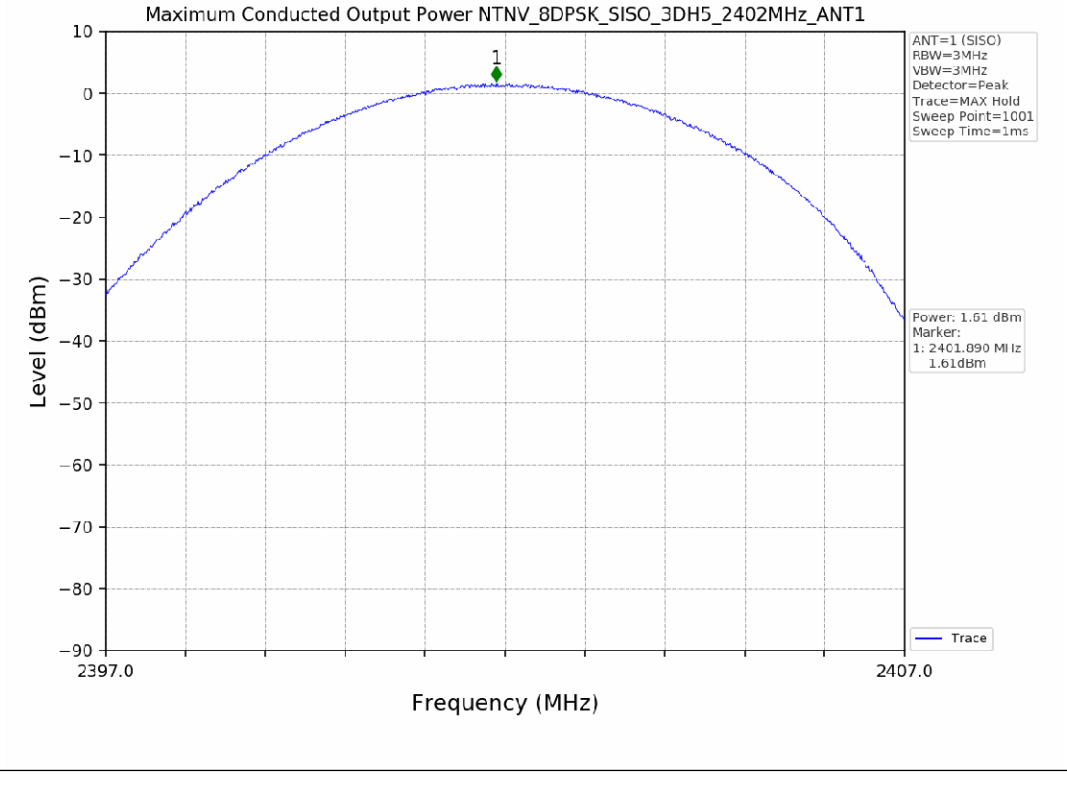

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 0.96 dBm
Marker:
1: 2440.820 MHz
0.96dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0

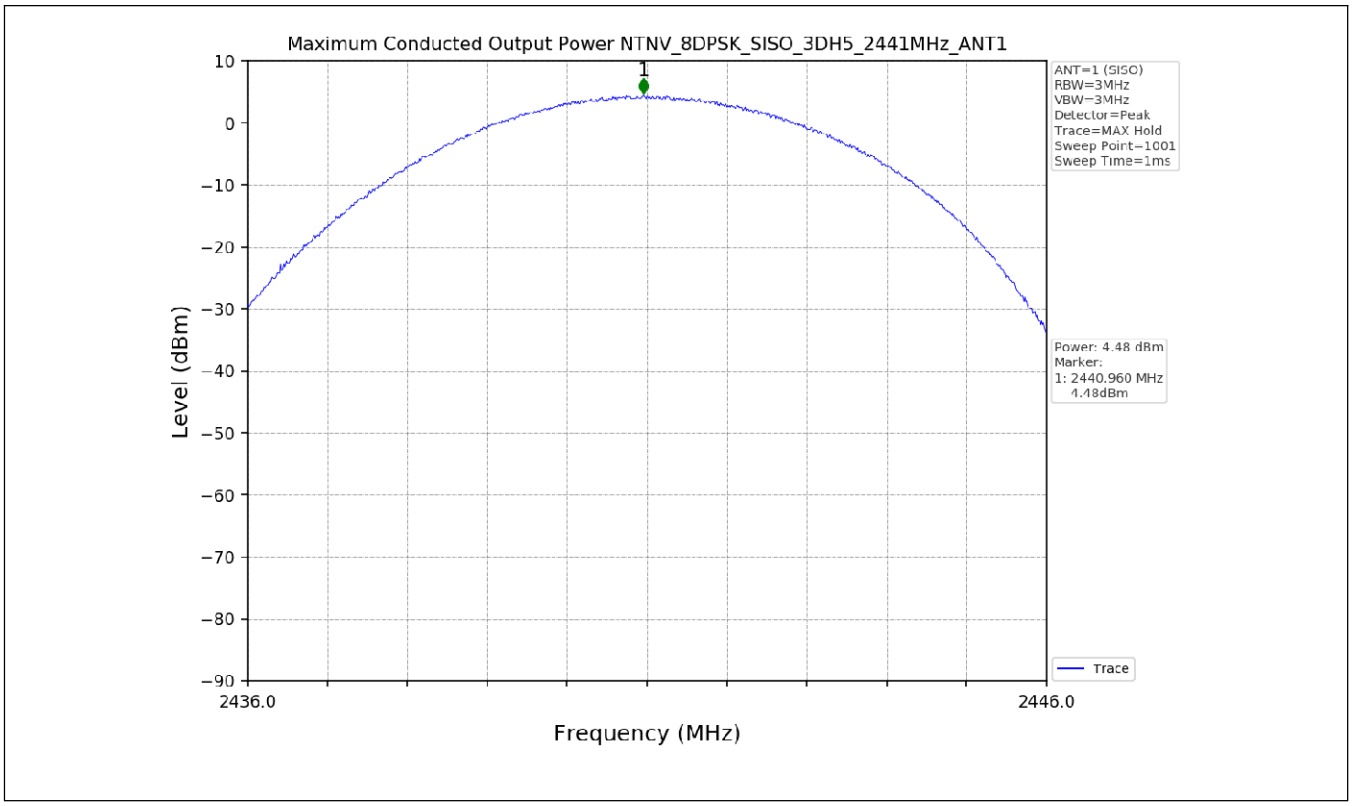

Maximum Conducted Output Power NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 2.61 dBm
Marker:
1: 2479.040 MHz
2.61dBm
Trace
Level (dBm)
Frequency (MHz)
2475.0
2485.0

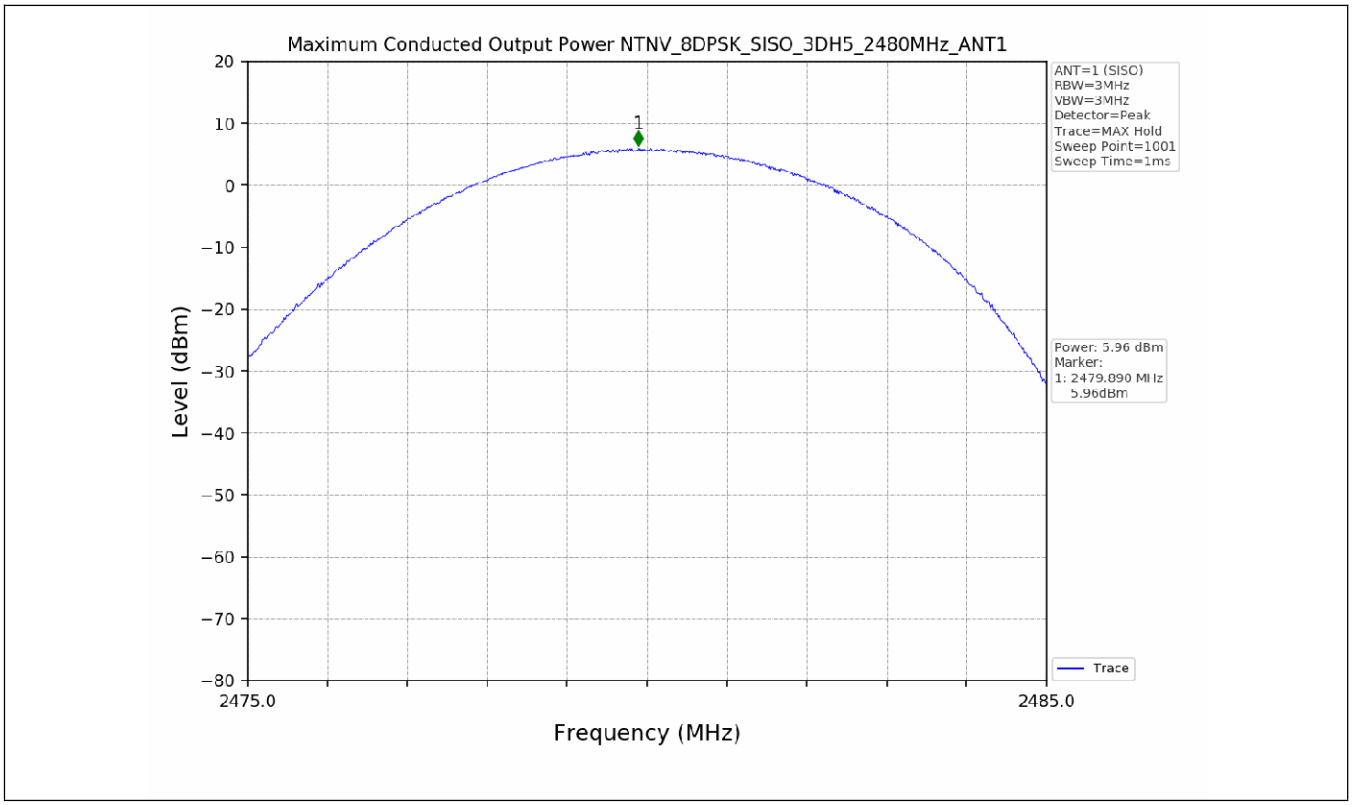

Maximum Conducted Output Power NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 0.95 dBm
Marker:
1: 2401.860 MHz
0.95dBm
Trace
Level (dBm)
Frequency (MHz)
2397.0
2407.0


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
Power: 3.82 dBm
Marker:
1: 2440.040 MHz
3.82dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0


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
Power: 5.45 dBm
Marker:
1: 2479.830 MHz
5.45dBm
Trace
Level (dBm)
Frequency (MHz)
2475.0
2485.0


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
Power: 1.61 dBm
Marker:
1: 2401.090 MHz
1.61dBm
Trace
Level (dBm)
Frequency (MHz)
2397.0
2407.0


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
Power: 4.48 dBm
Marker:
1: 2440.960 MHz
4.48dBm
Trace
Level (dBm)
Frequency (MHz)
2436.0
2446.0

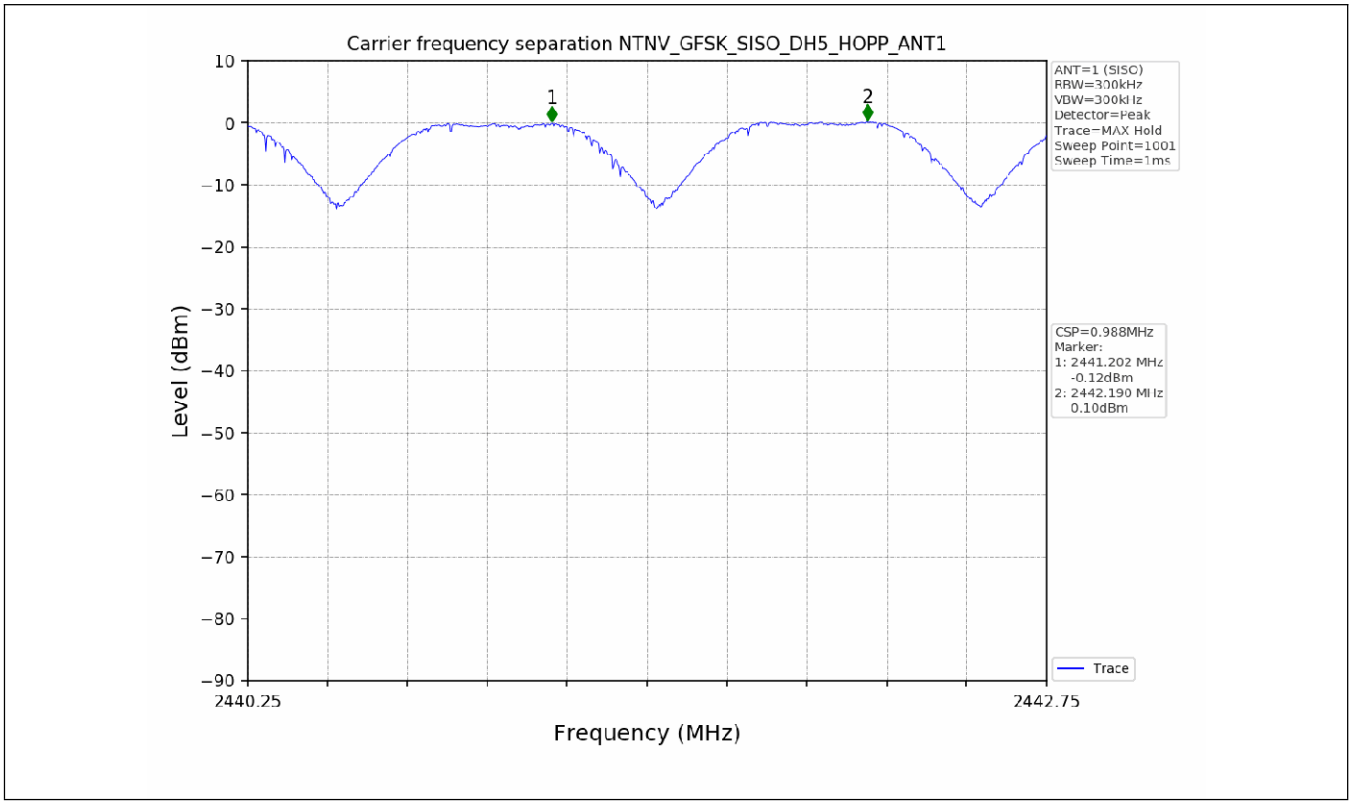

Maximum Conducted Output Power NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=3MHz
VBW=3MHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Power: 5.96 dBm
Marker:
1: 2479.090 MHz
5.96dBm
Trace
Level (dBm)
Frequency (MHz)
2475.0
2485.0

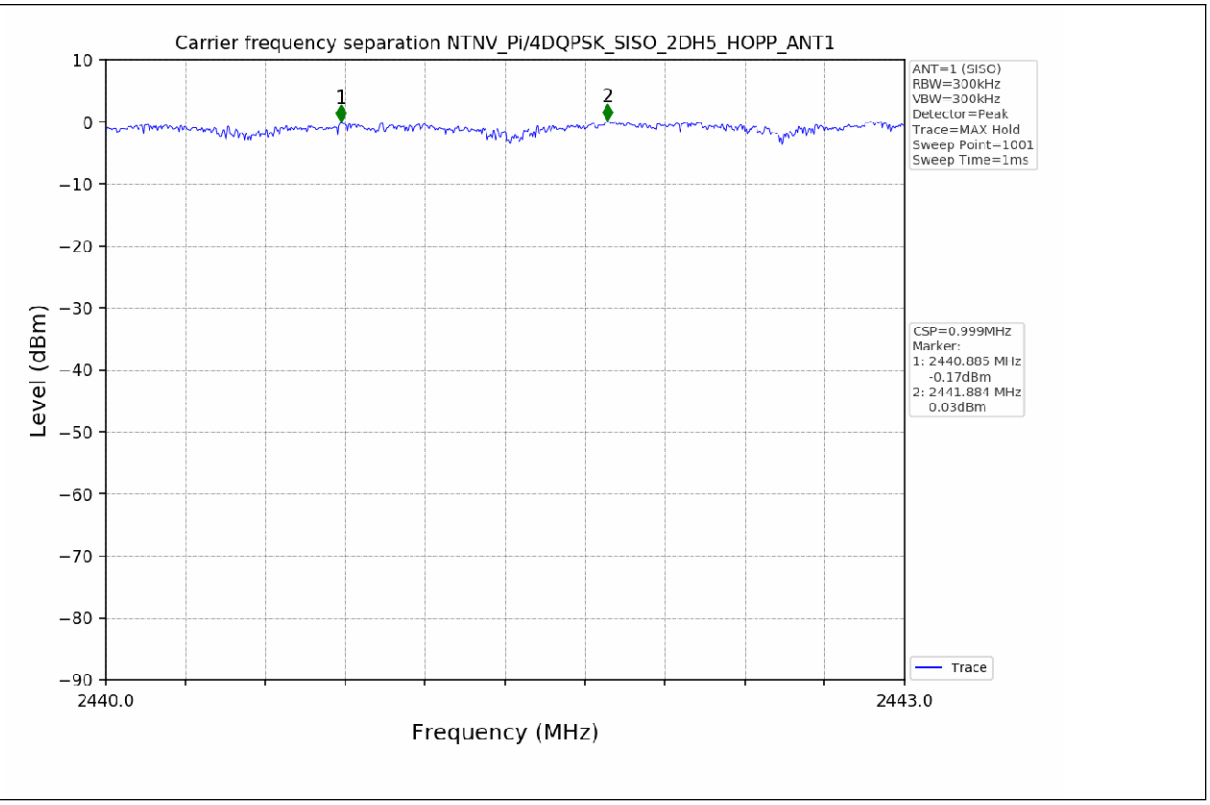
3. Carrier frequency separation

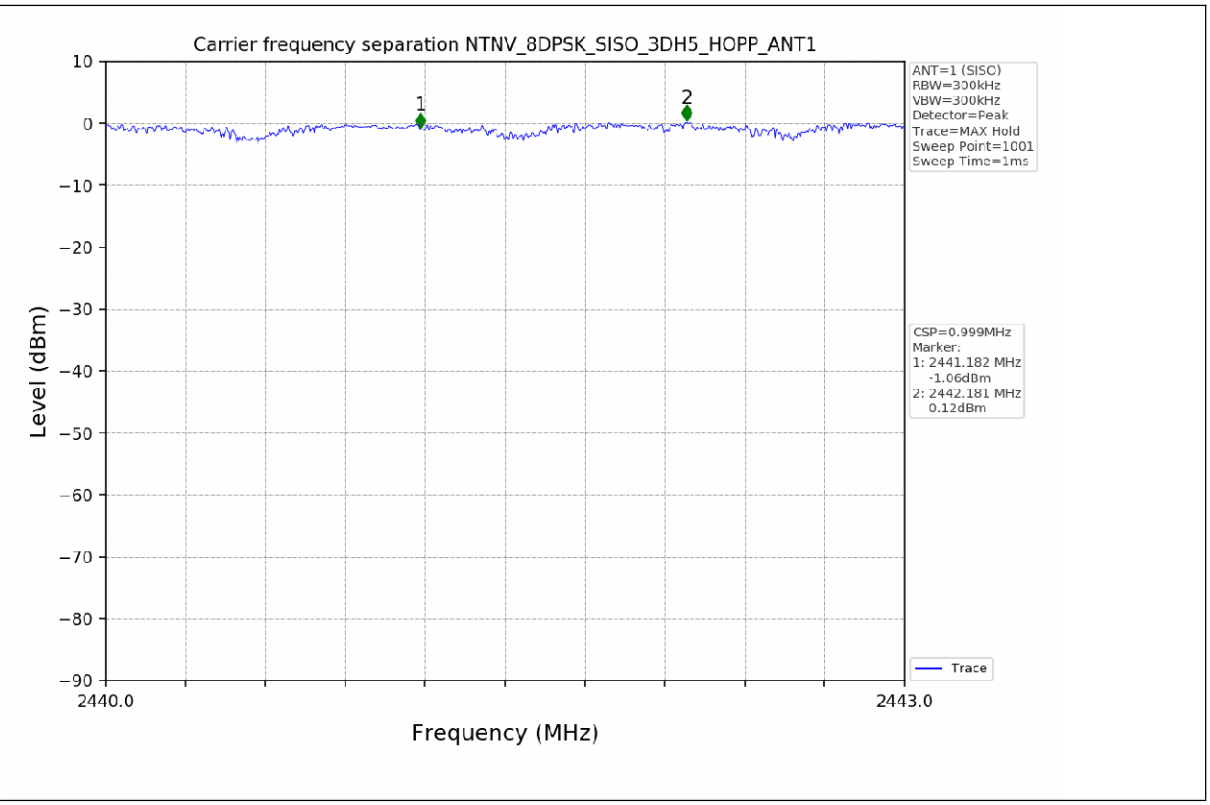
3.1 Test Result

Test Mode	TX Type	ANT No.	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limits (MHz)	Verdict
GFSK	SISO	1	0.988	0.938	≥0.938	PASS
Pi/4DQPSK	SISO	1	0.999	1.284	≥0.856	PASS
8DPSK	SISO	1	0.999	1.293	≥0.862	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
CSP=0.999MHz
Marker:
1: 2440.885 MHz
-0.17dBm
2: 2441.884 MHz
0.03dBm
Trace
Level (dBm)
Frequency (MHz)
2440.0
2443.0

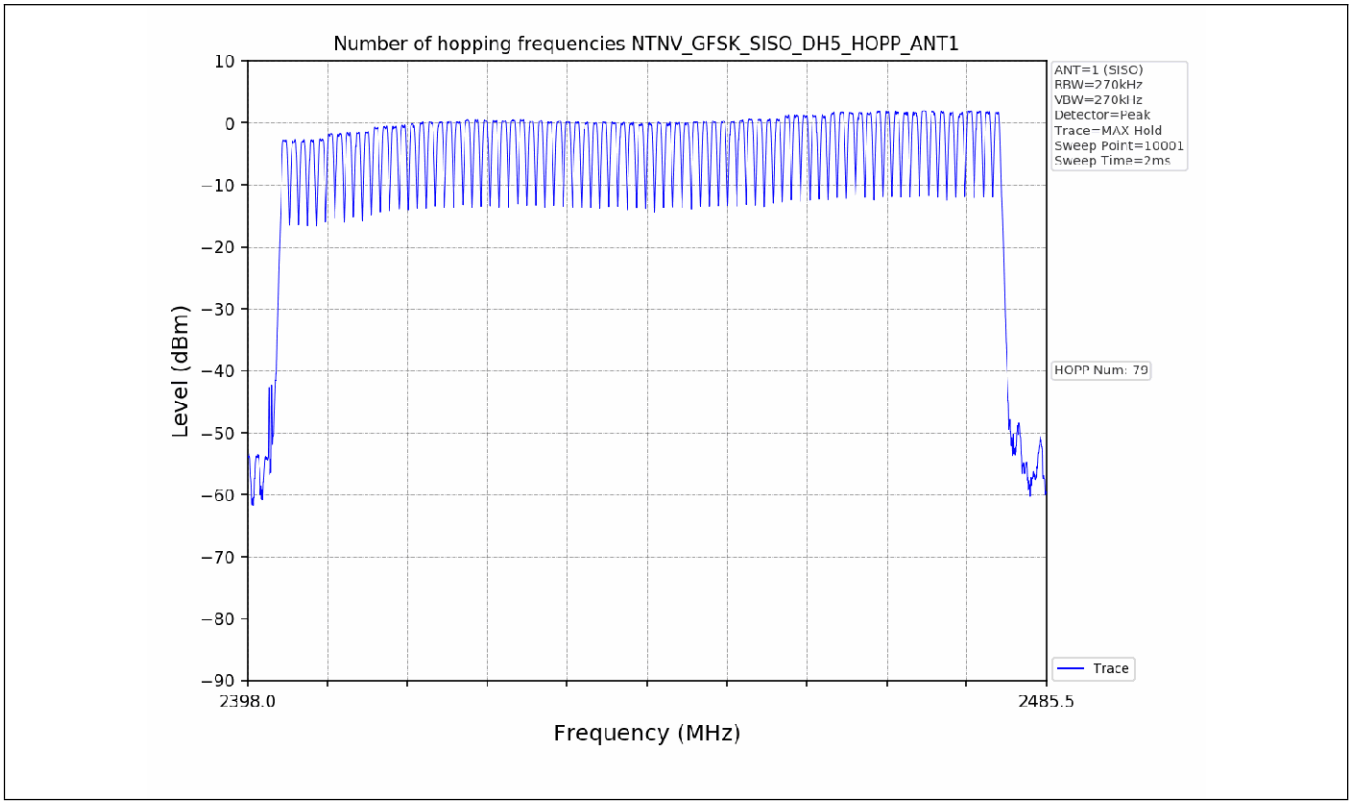

Carrier frequency separation NTNV_8DPSK_SISO_3DH5_HOPP_ANT1
ANT=1 (SISO)
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
CSP=0.999MHz
Marker:
1: 2441.182 MHz
-1.06dBm
2: 2442.181 MHz
0.12dBm
Trace
Level (dBm)
Frequency (MHz)
2440.0
2443.0

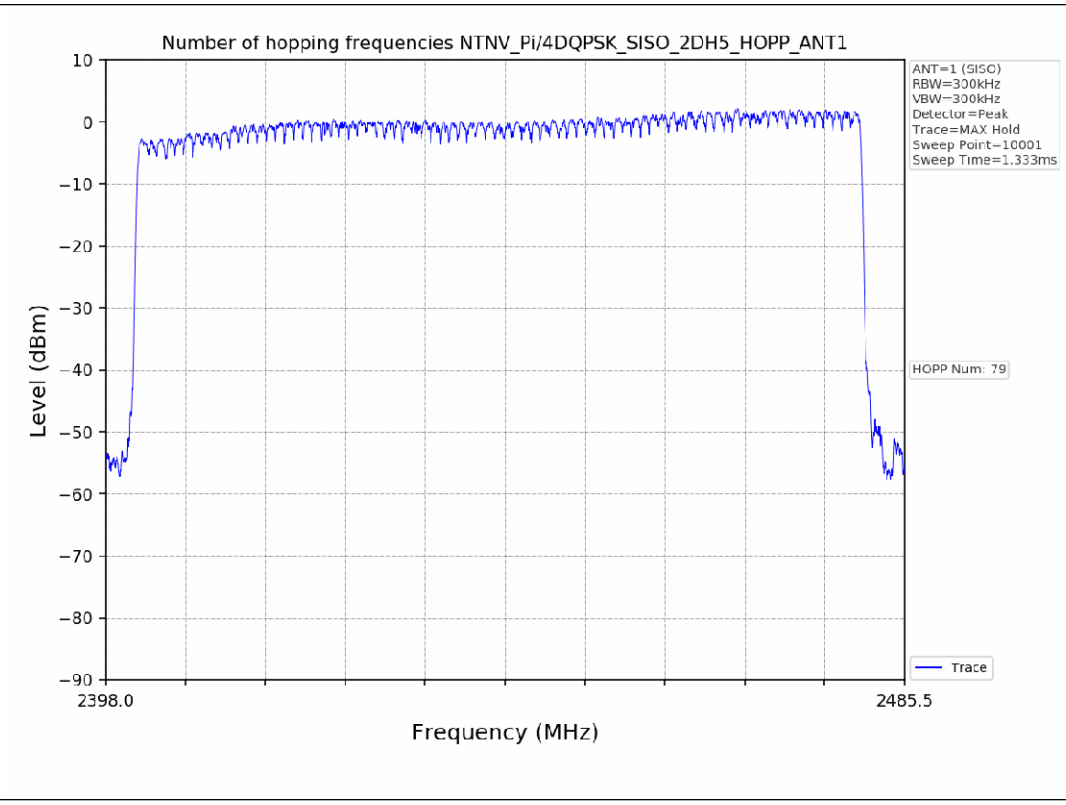
4. Number of hopping frequencies

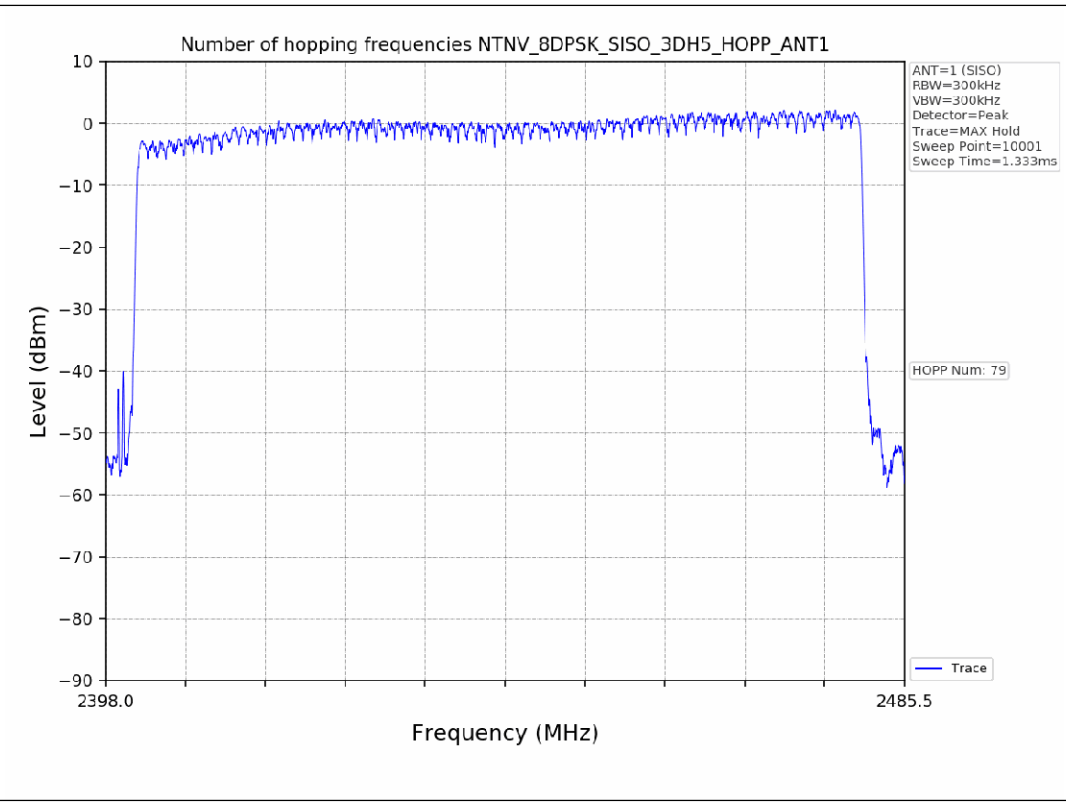
4.1 Test Result

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
Level (dBm)
Frequency (MHz)
2398.0
2485.5

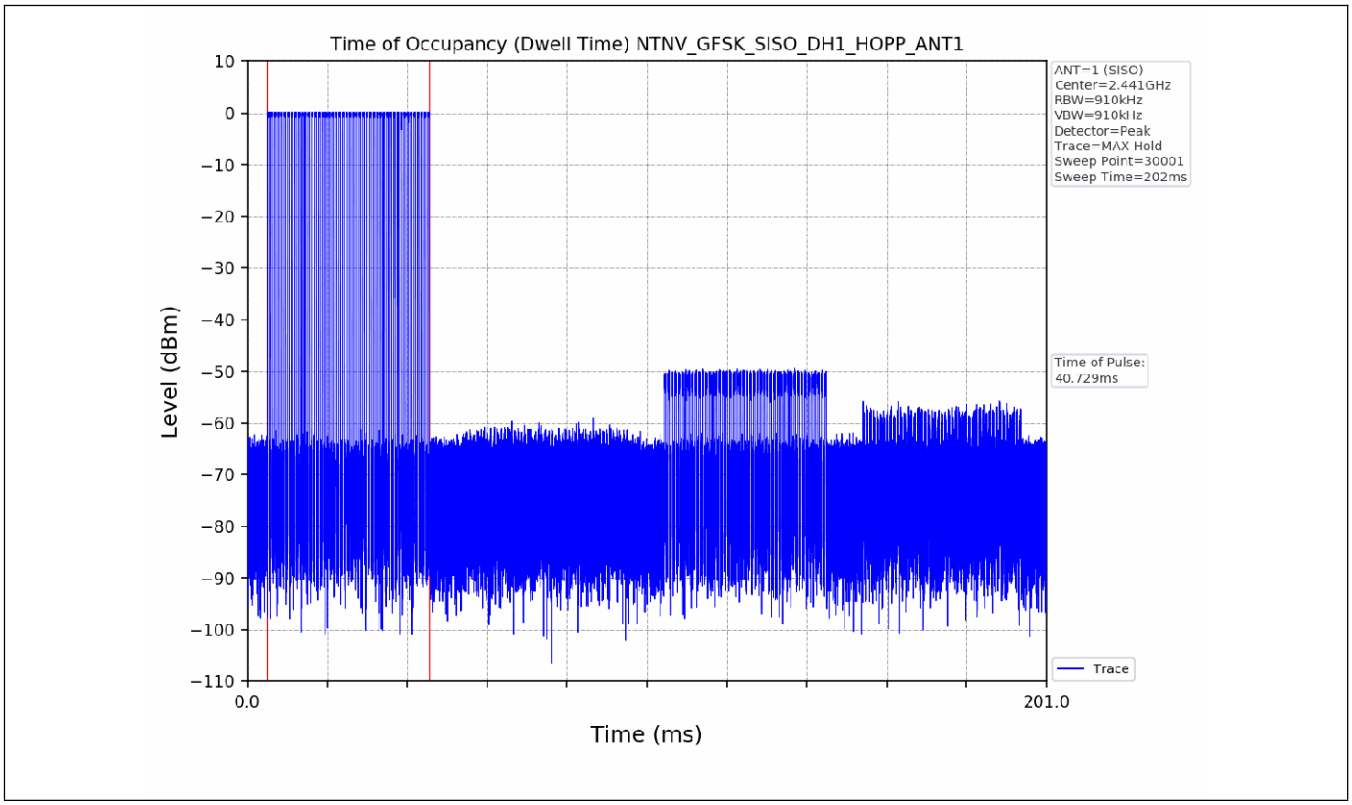

Number of hopping frequencies NTNV_8DPSK_SISO_3DH5_HOPP_ANT1
ANT=1 (SISO)
RBW=300kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=10001
Sweep Time=1.333ms
HOPP Num: 79
Trace
Level (dBm)
Frequency (MHz)
2398.0
2485.5

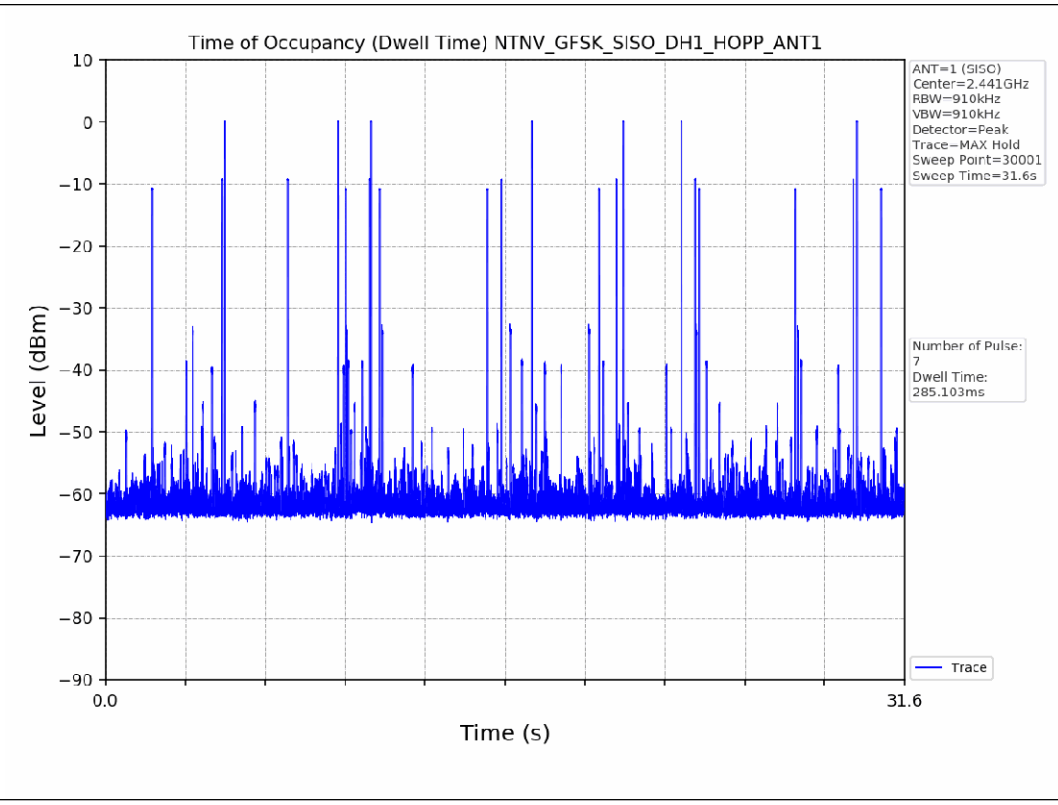
5. Time of Occupancy (Dwell Time)

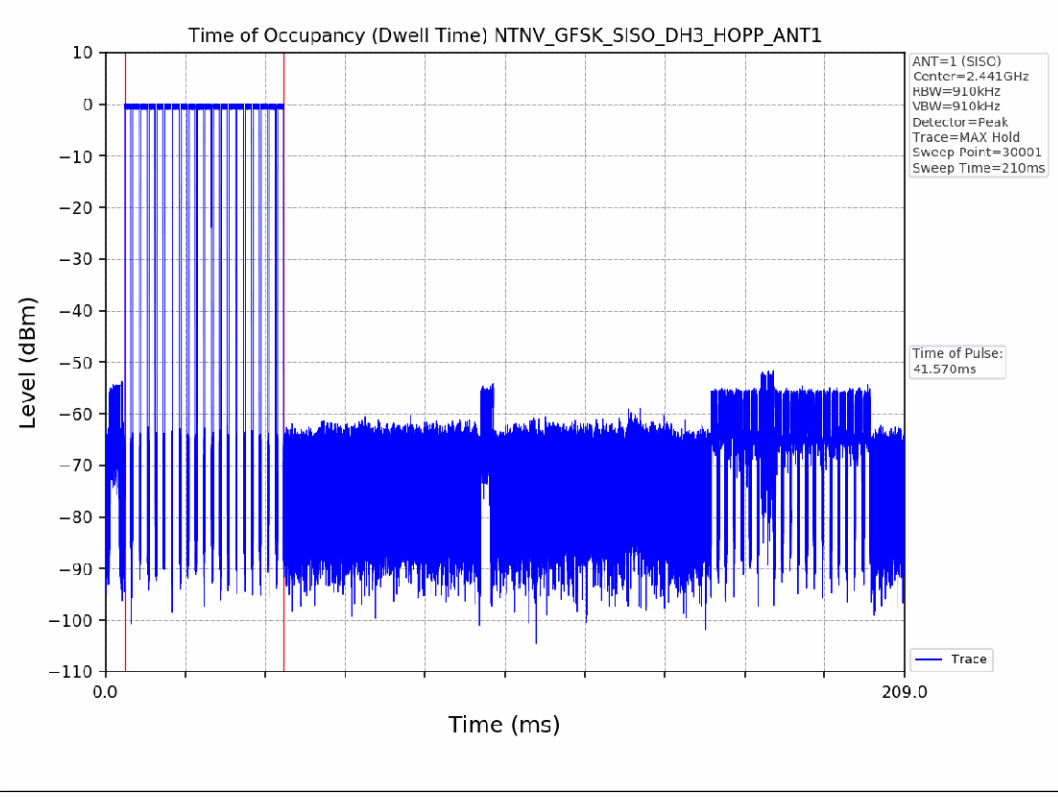
5.1 Test Result

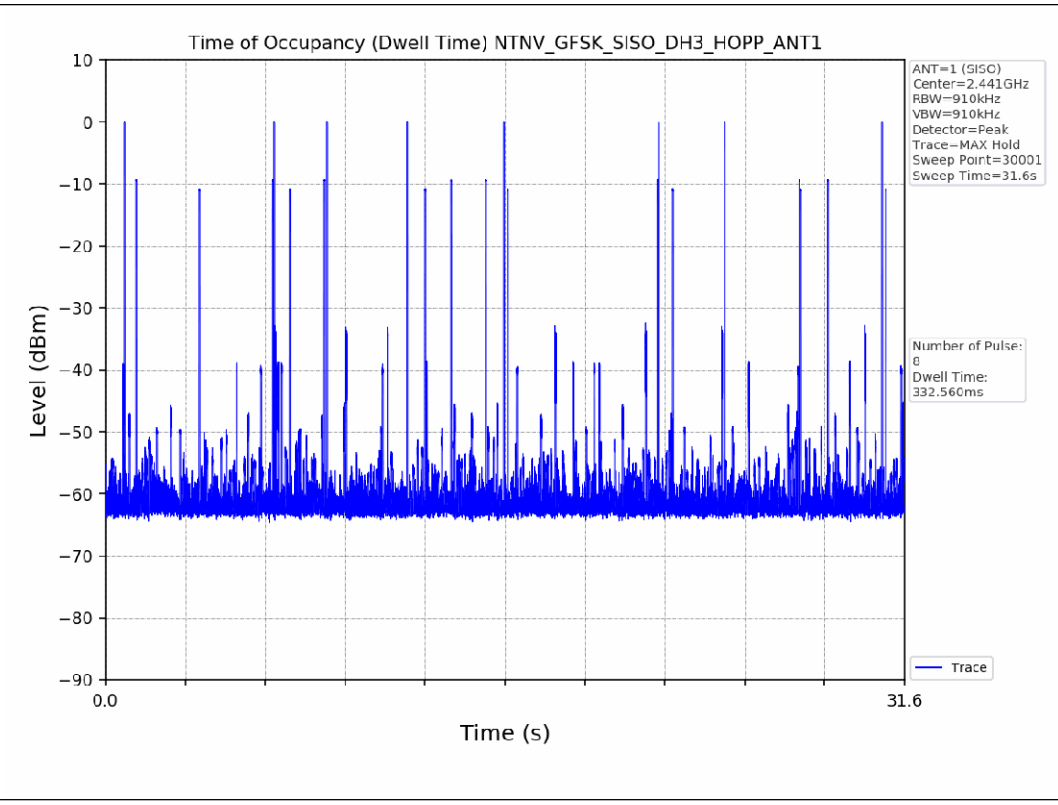
Test Mode	Packet Type	TX Type	ANT No.	Duration of Single Pulse (ms)	Obeservation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limits (ms)	Verdict
GFSK	DH1	SISO	1	40.729	31.6	7	285.103	≤400	PASS
	DH3	SISO	1	41.570	31.6	8	332.560	≤400	PASS
	DH5	SISO	1	43.031	31.6	7	301.217	≤400	PASS
Pi/4DQPSK	2DH1	SISO	1	39.618	31.6	8	316.944	≤400	PASS
	2DH3	SISO	1	41.042	31.6	8	328.336	≤400	PASS
	2DH5	SISO	1	40.725	31.6	7	285.075	≤400	PASS
8DPSK	3DH1	SISO	1	41.083	31.6	9	369.747	≤400	PASS
	3DH3	SISO	1	40.245	31.6	8	321.960	≤400	PASS
	3DH5	SISO	1	39.342	31.6	7	275.394	≤400	PASS

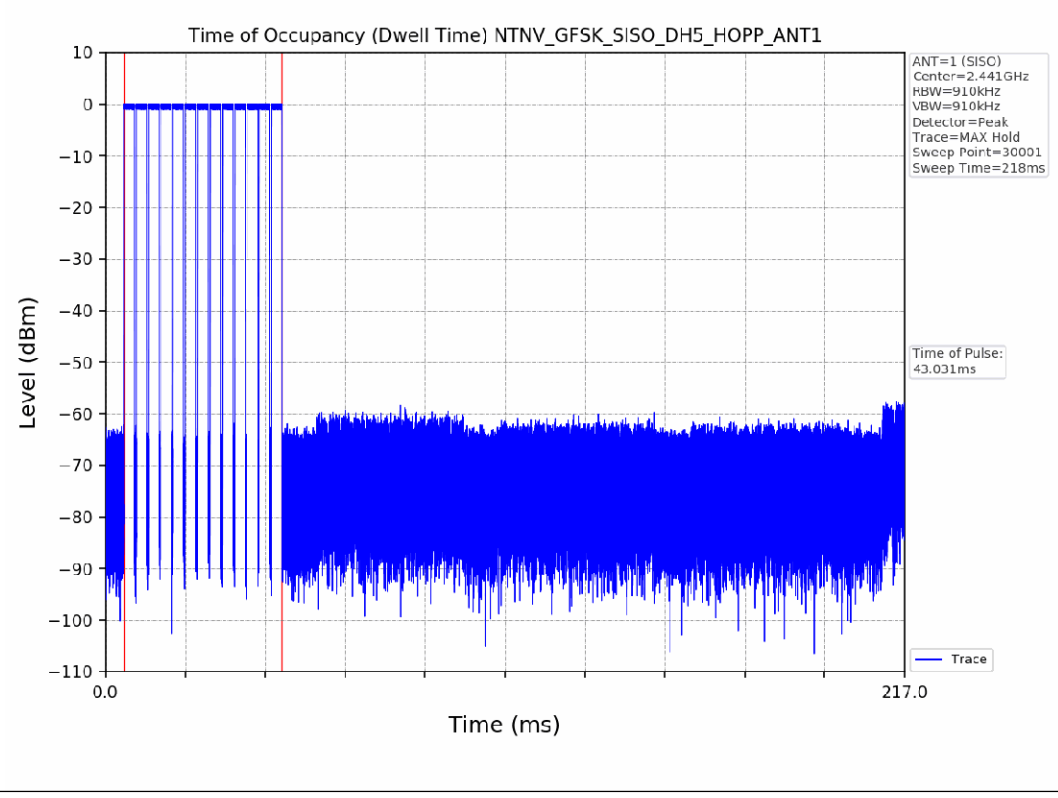
5.2 Test Graph

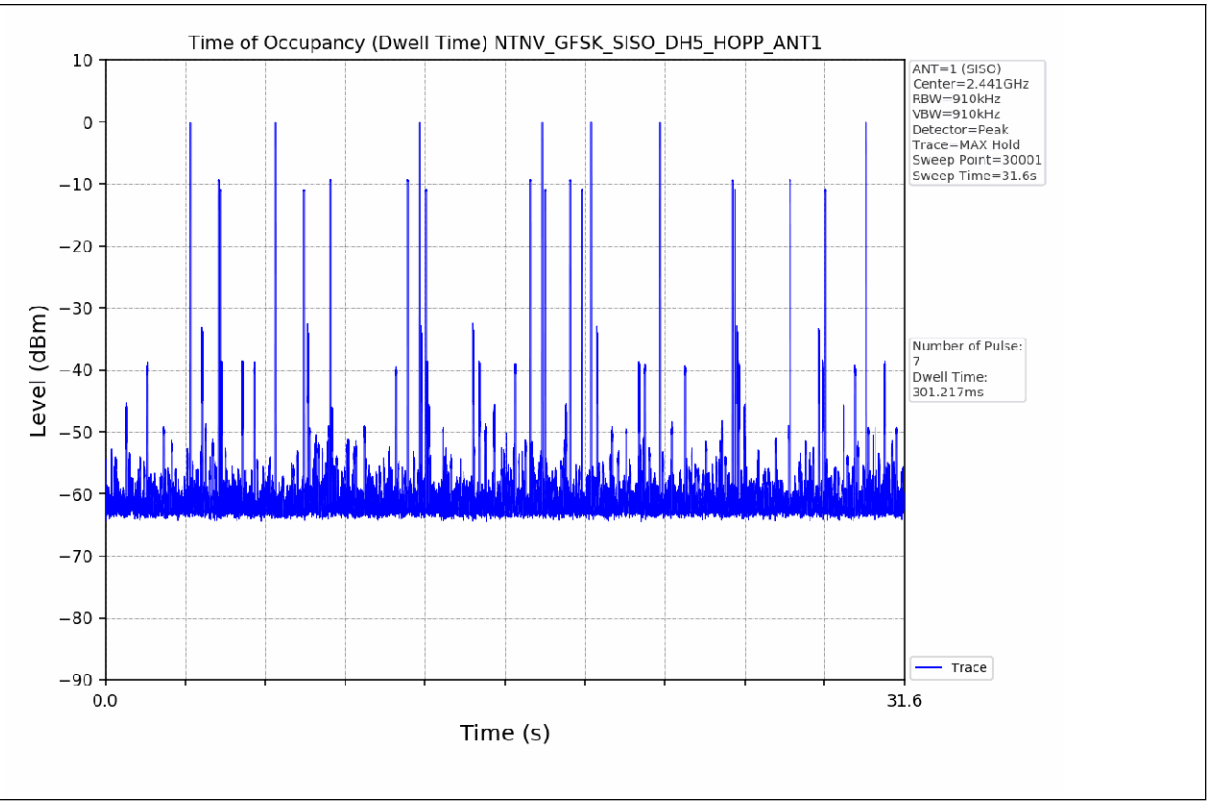


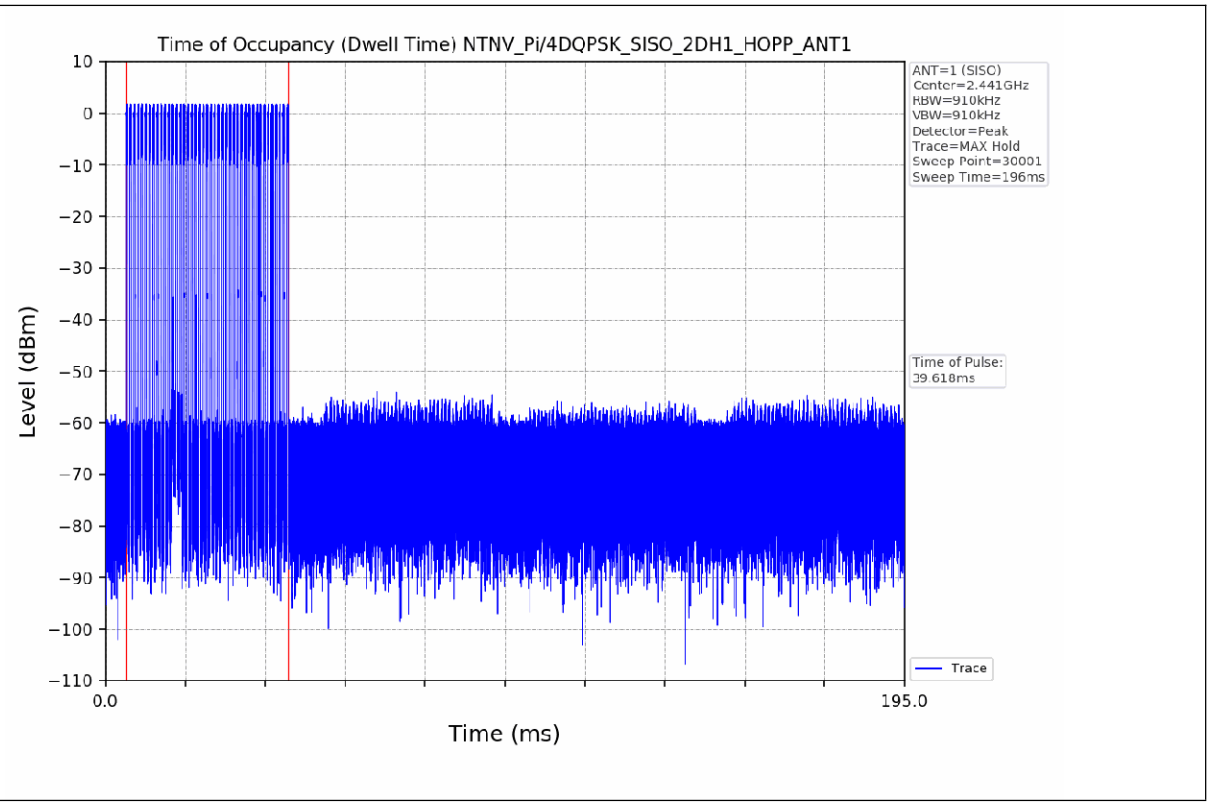

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
7
Dwell Time:
285.103ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

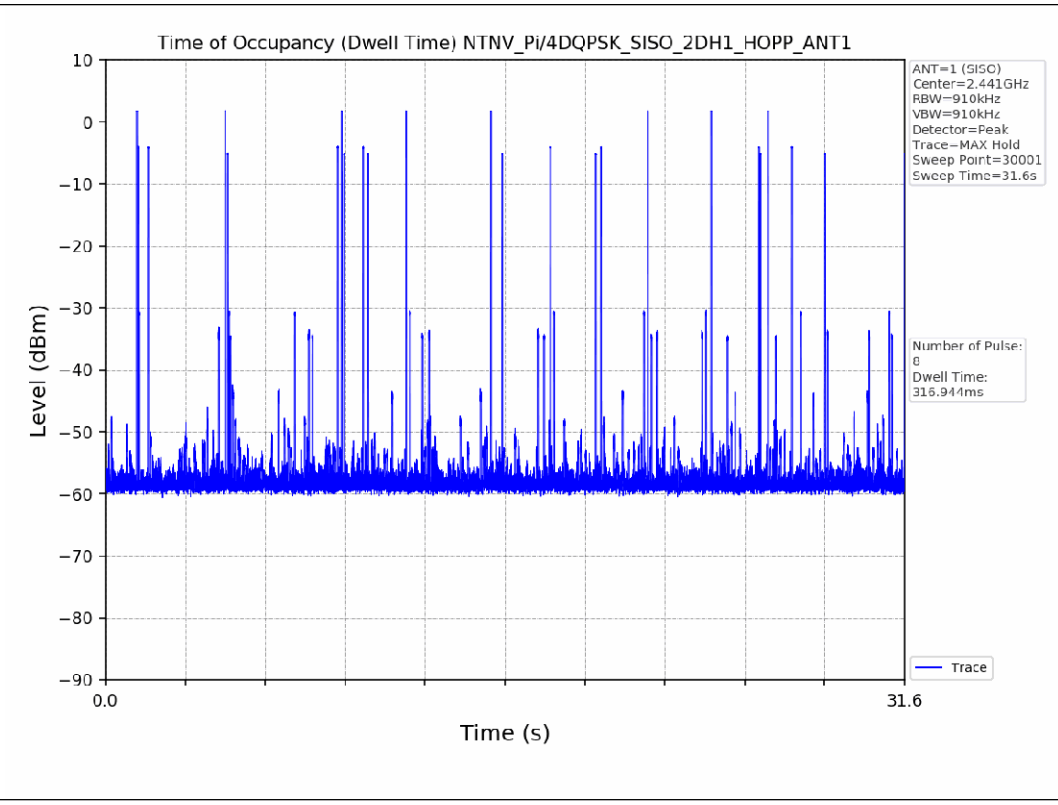

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=210ms
Time of Pulse:
41.570ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
209.0

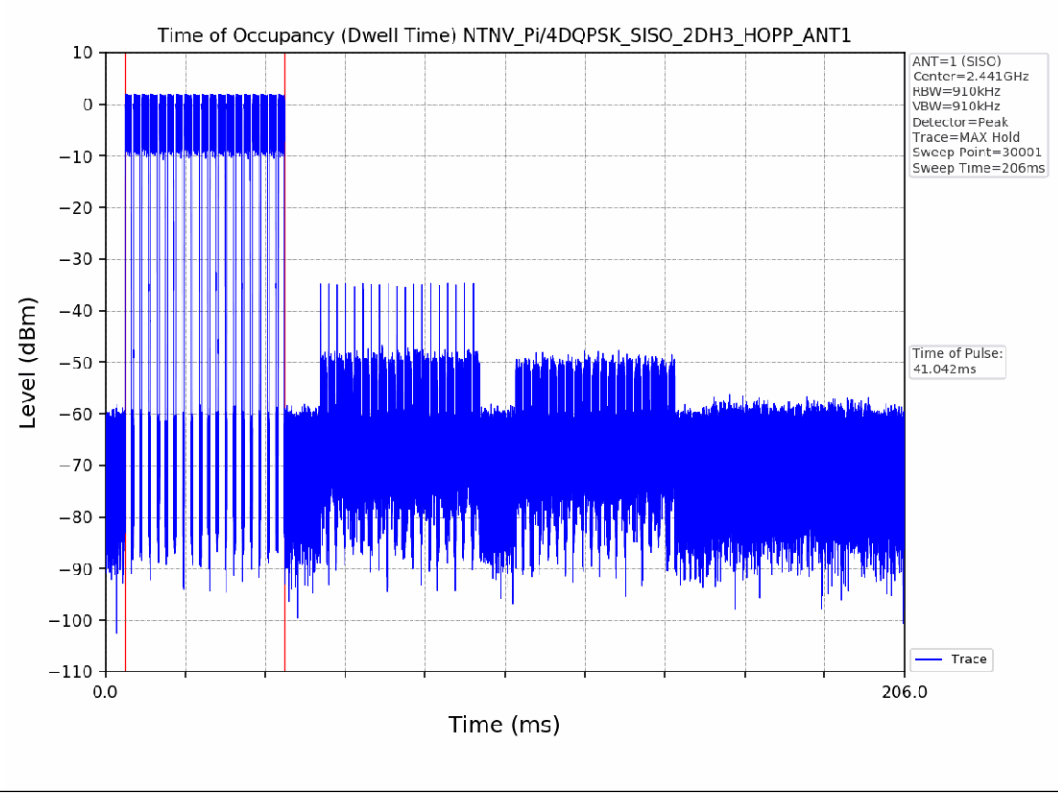

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
8
Dwell Time:
332.560ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

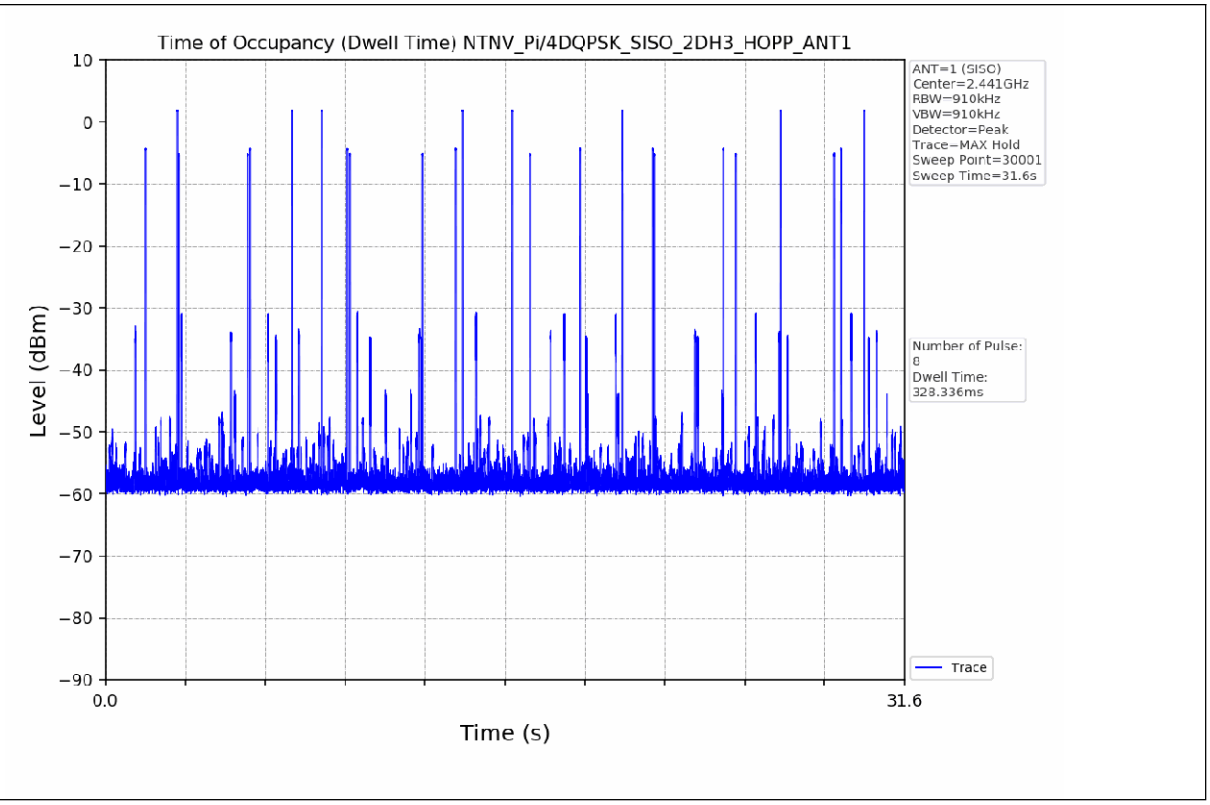

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=218ms
Time of Pulse:
43.031ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
217.0

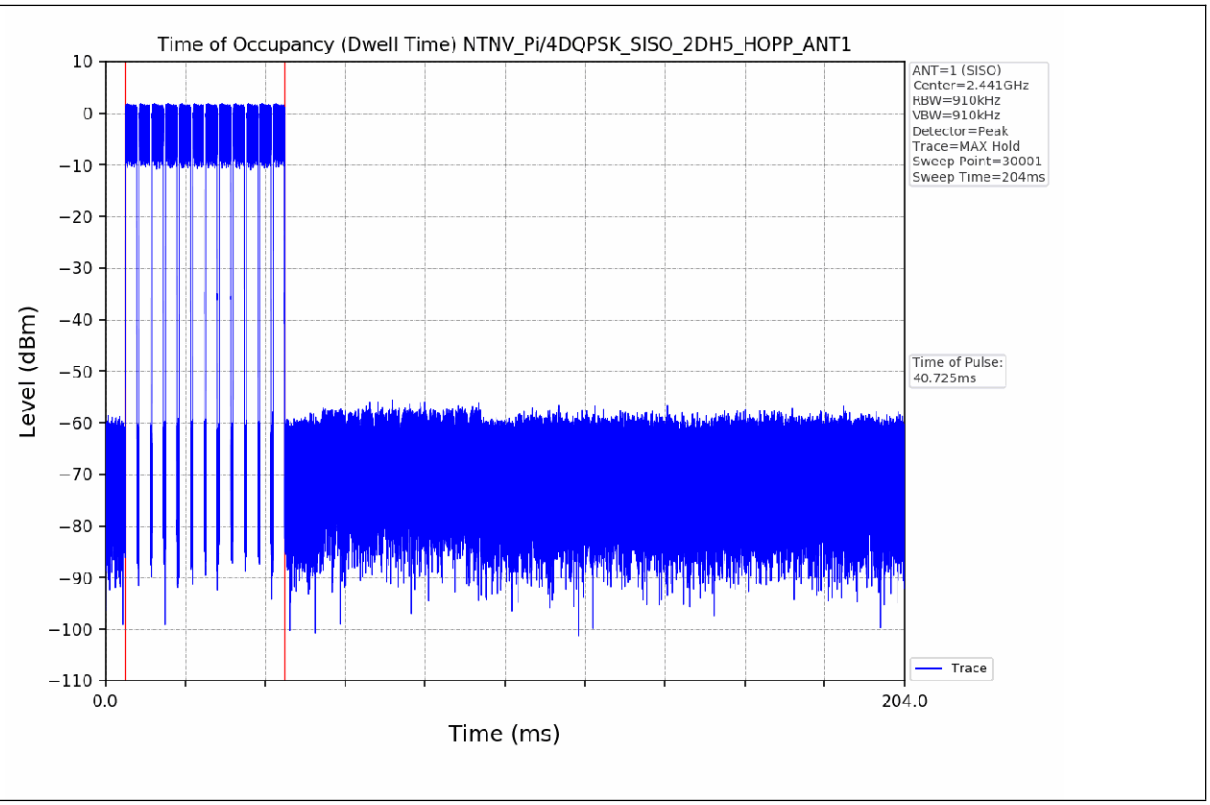

Time of Occupancy (Dwell Time) NTNV_GFSK_SISO_DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
7
Dwell Time:
301.217ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

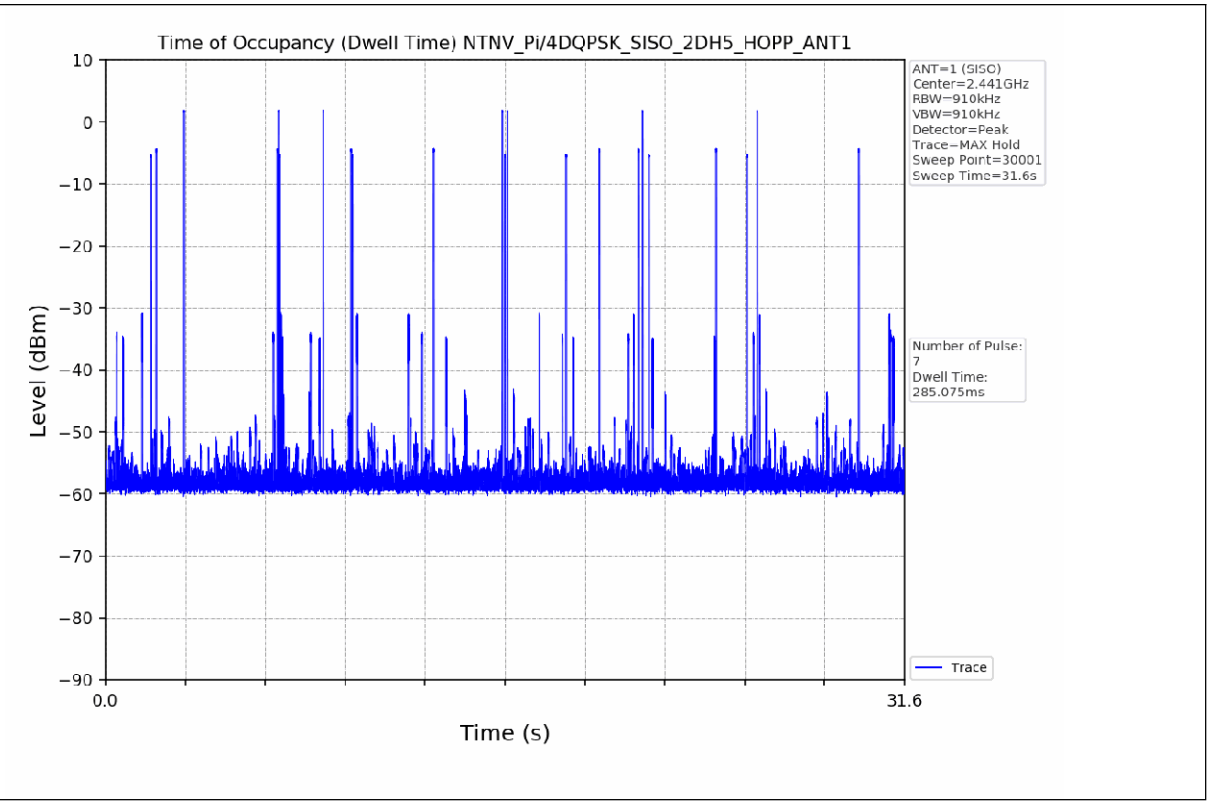

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=196ms
Time of Pulse:
39.618ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
195.0

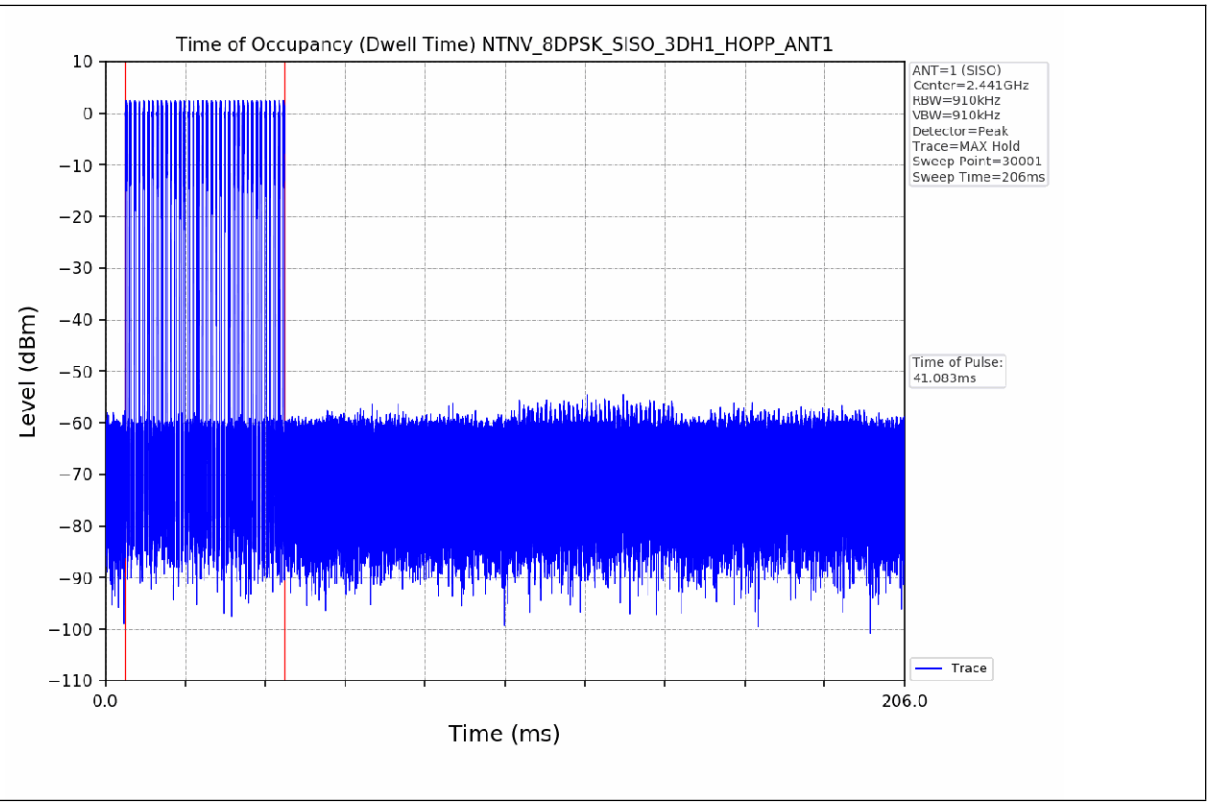

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
8
Dwell Time:
316.944ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

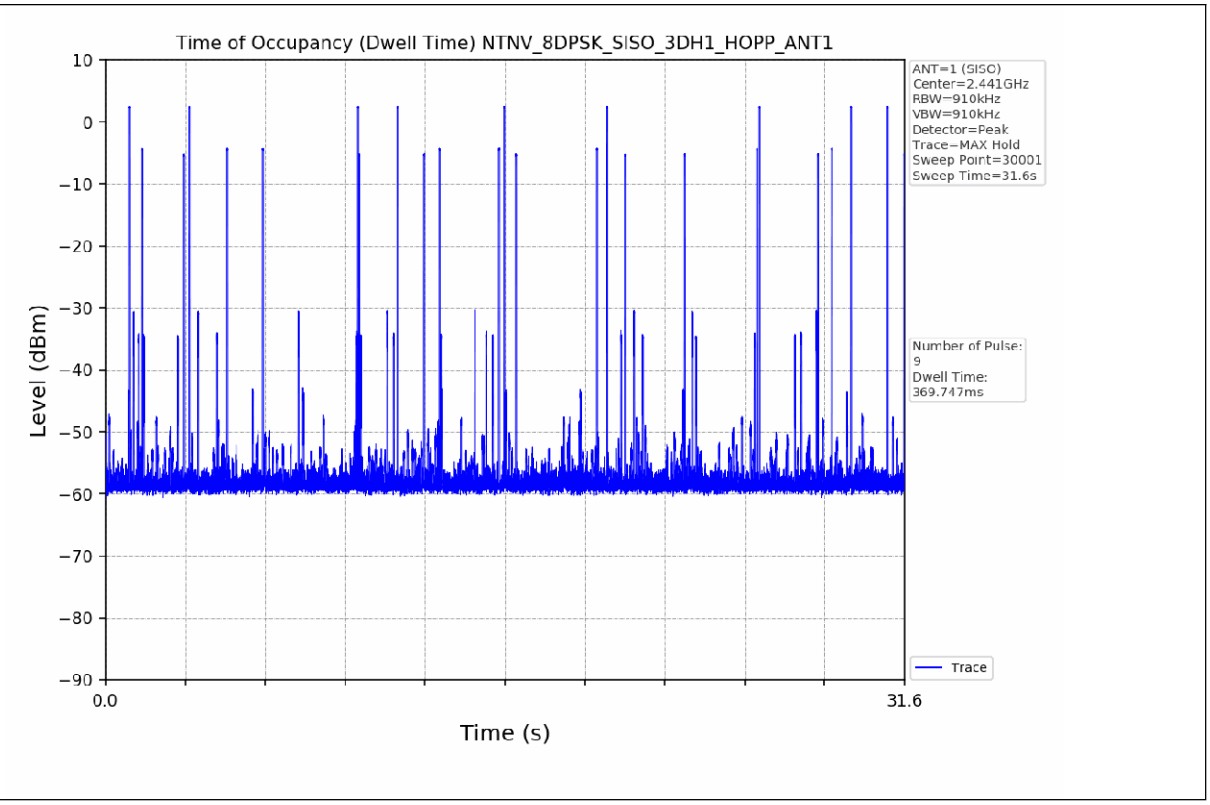

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=206ms
Time of Pulse:
41.042ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
206.0

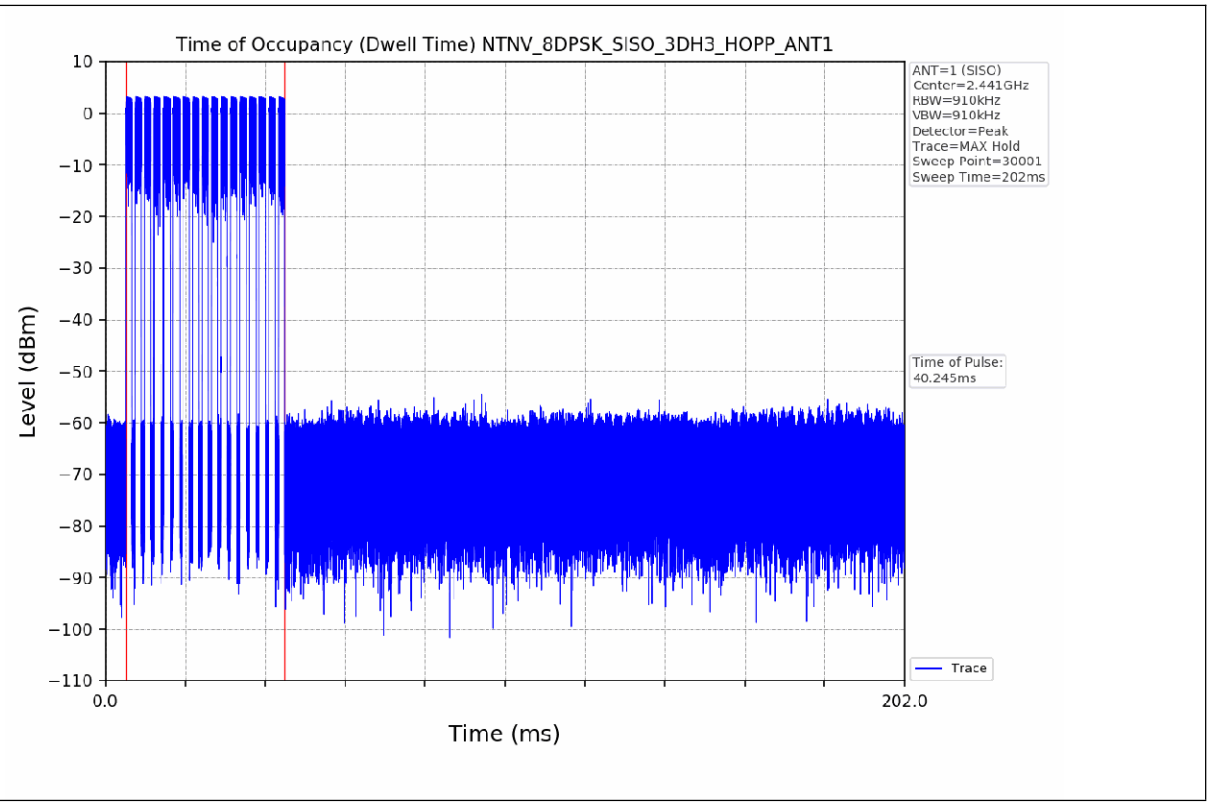

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH3_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
8
Dwell Time:
328.336ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

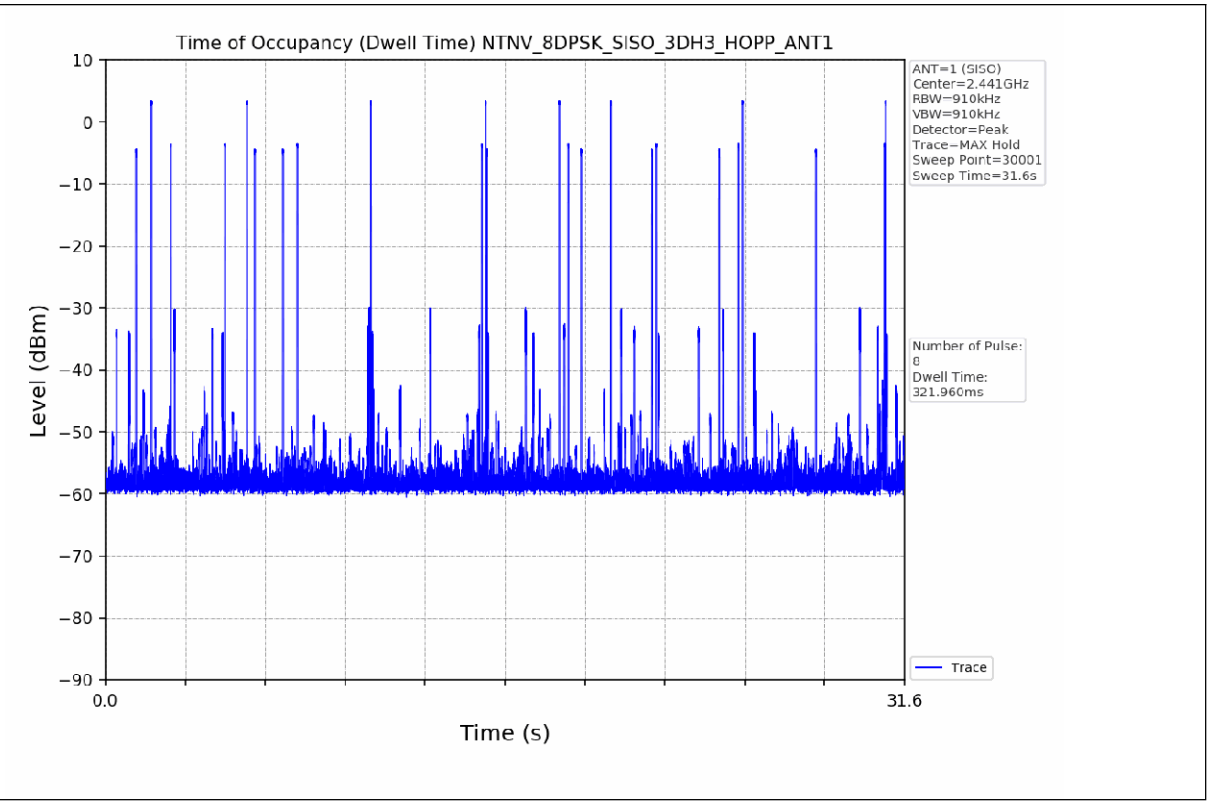

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=204ms
Time of Pulse:
40.725ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
204.0

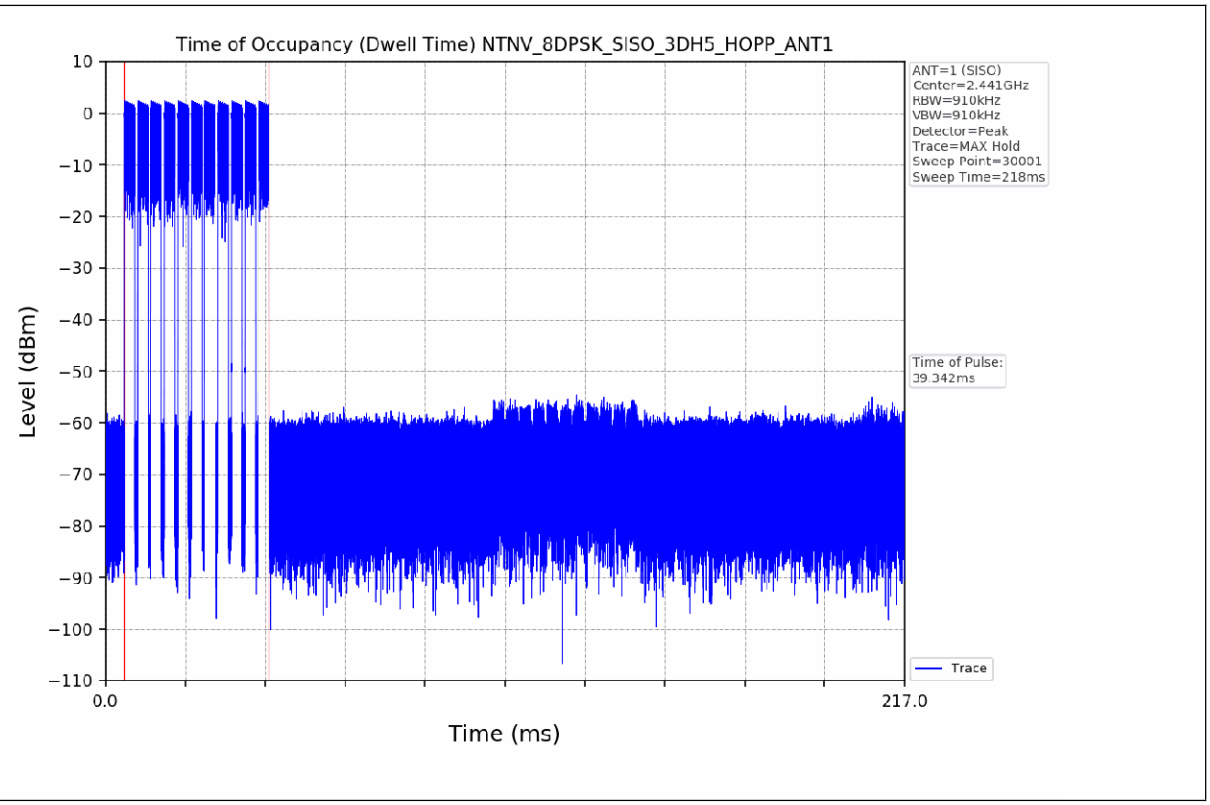

Time of Occupancy (Dwell Time) NTNV_Pi/4DQPSK_SISO_2DH5_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=31.6s
Number of Pulse:
7
Dwell Time:
285.075ms
Trace
Level (dBm)
Time (s)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
0.0
31.6

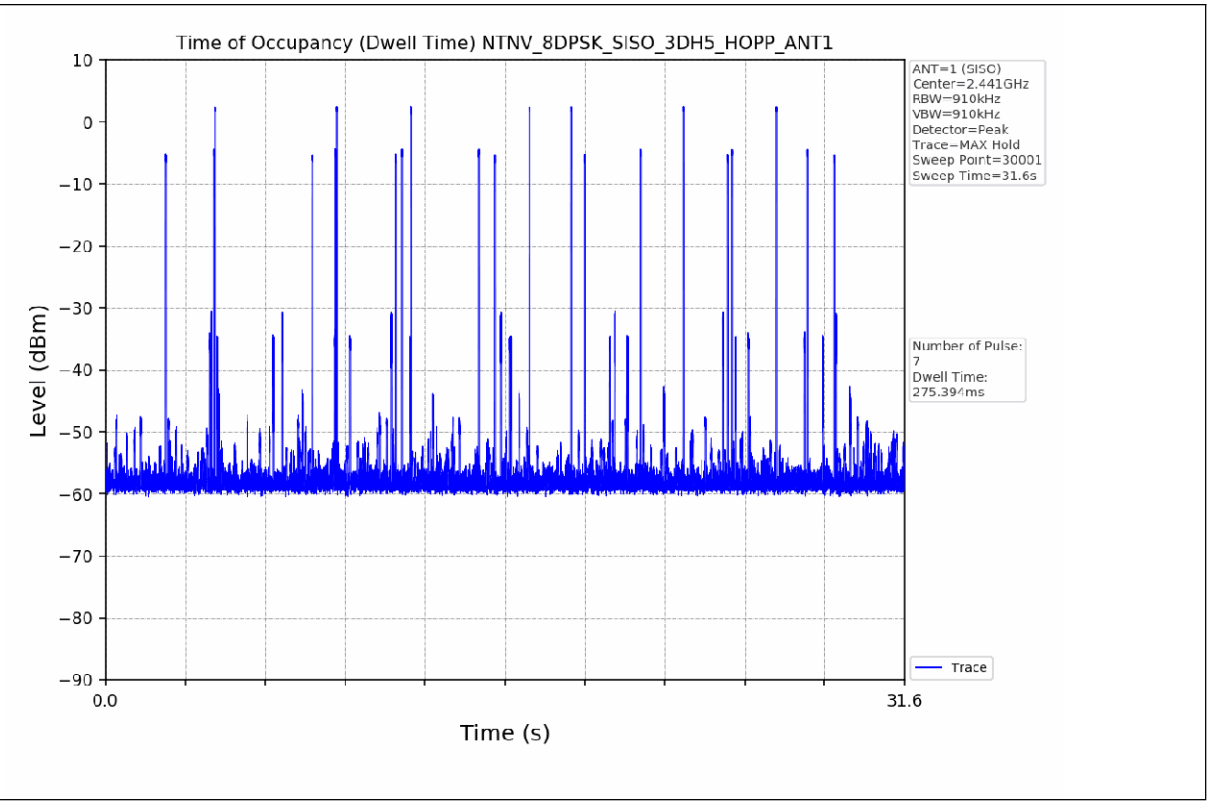

Time of Occupancy (Dwell Time) NTNV_8DPSK_SISO_3DH1_HOPP_ANT1
ANT=1 (SISO)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=206ms
Time of Pulse:
41.083ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
206.0


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:
9
Dwell Time:
369.747ms
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)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=202ms
Time of Pulse:
40.245ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
202.0


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:
8
Dwell Time:
321.960ms
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)
Center=2.441GHz
RBW=910kHz
VBW=910kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=30001
Sweep Time=218ms
Time of Pulse:
39.342ms
Trace
Level (dBm)
Time (ms)
10
0
−10
−20
−30
−40
−50
−60
−70
−80
−90
−100
−110
0.0
217.0



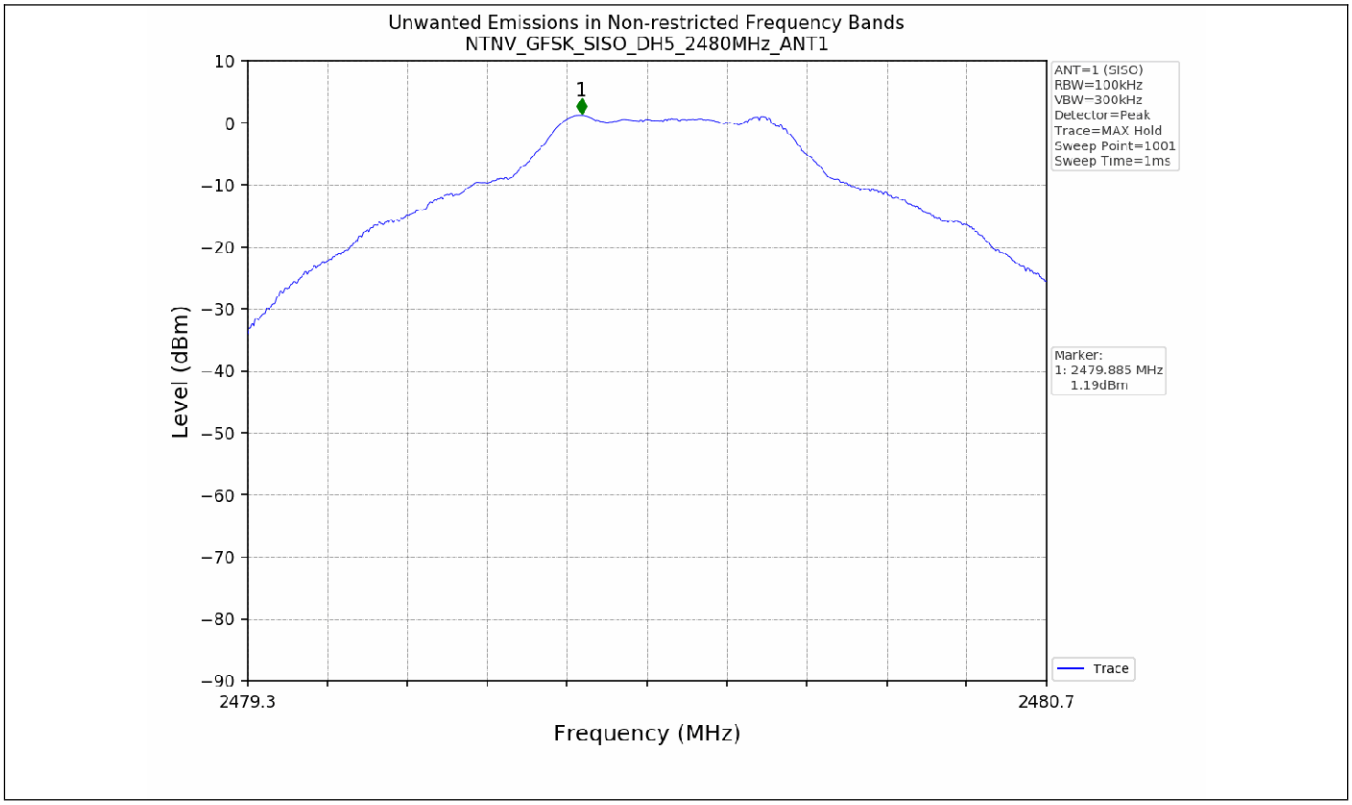
6. Unwanted Emissions in Non-restricted Frequency Bands

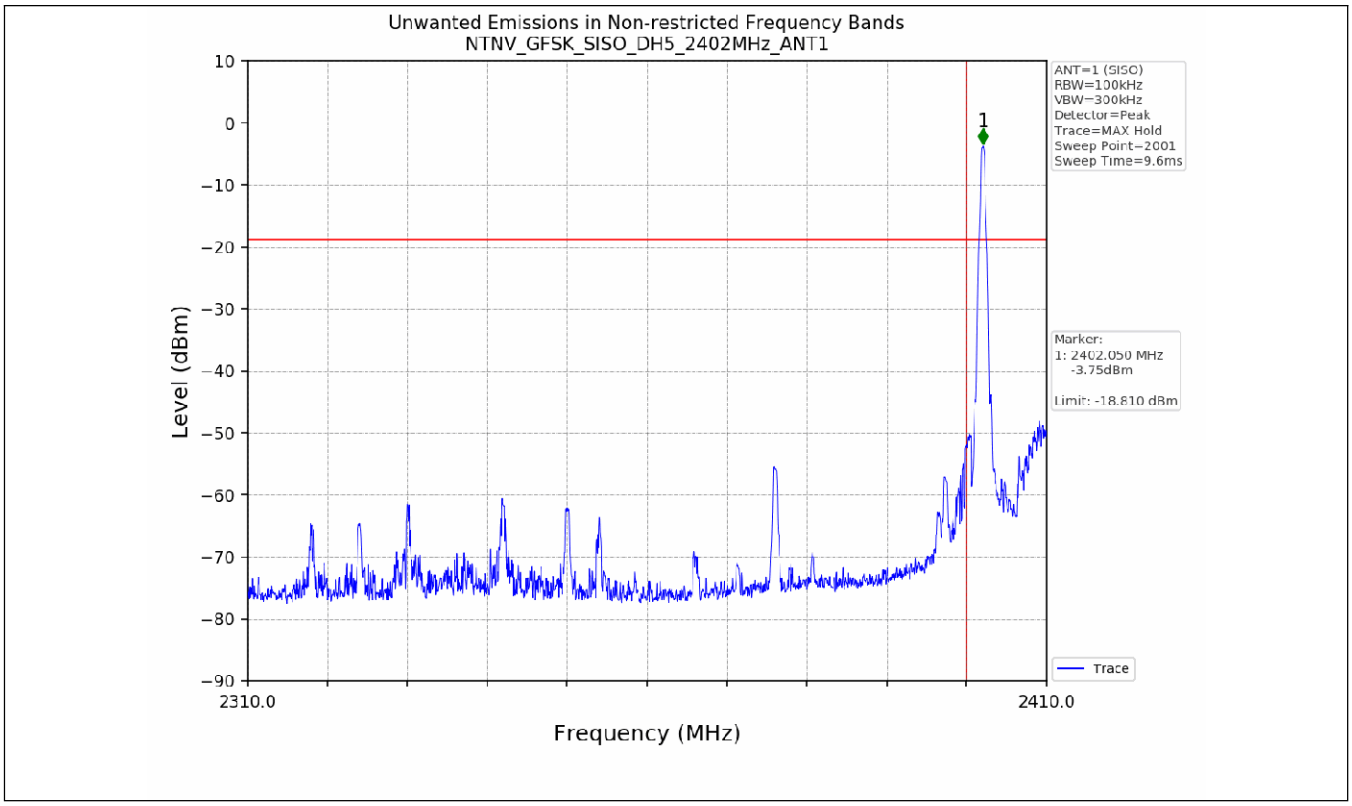
6.1 Test Result

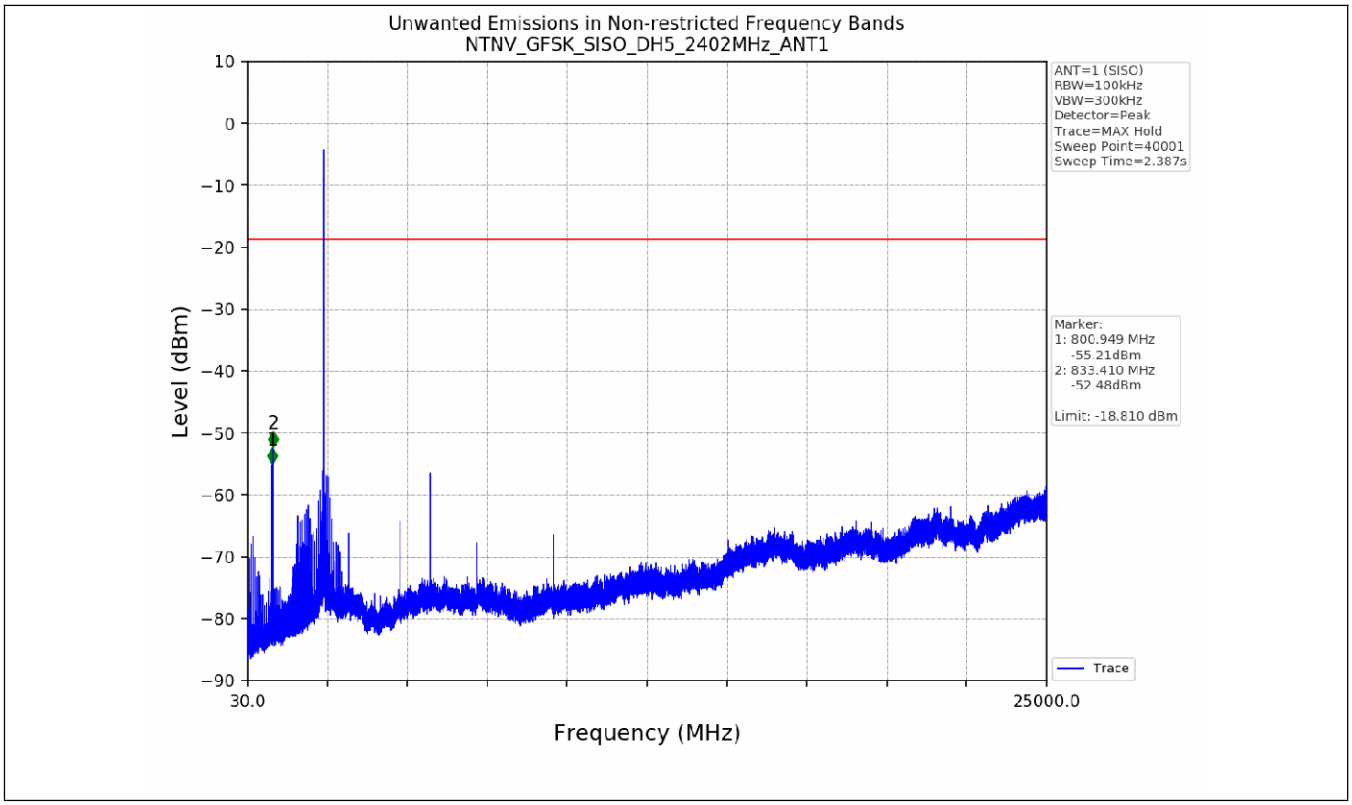
Test Mode	Frequency (MHz)	TX Type	ANT No.	Spurious Conducted Emission (dBm)	Limits (dBm)	Verdict
GFSK	2402	SISO	1	Refer to test graph	-18.81	PASS
	2441	SISO	1	Refer to test graph	-18.81	PASS
	2480	SISO	1	Refer to test graph	-18.81	PASS
	Hopping	SISO	1	Refer to test graph	-18.81	PASS
Pi/4DQPSK	2402	SISO	1	Refer to test graph	-18.82	PASS
	2441	SISO	1	Refer to test graph	-18.82	PASS
	2480	SISO	1	Refer to test graph	-18.82	PASS
	Hopping	SISO	1	Refer to test graph	-18.82	PASS
8DPSK	2402	SISO	1	Refer to test graph	-18.60	PASS
	2441	SISO	1	Refer to test graph	-18.60	PASS
	2480	SISO	1	Refer to test graph	-18.60	PASS

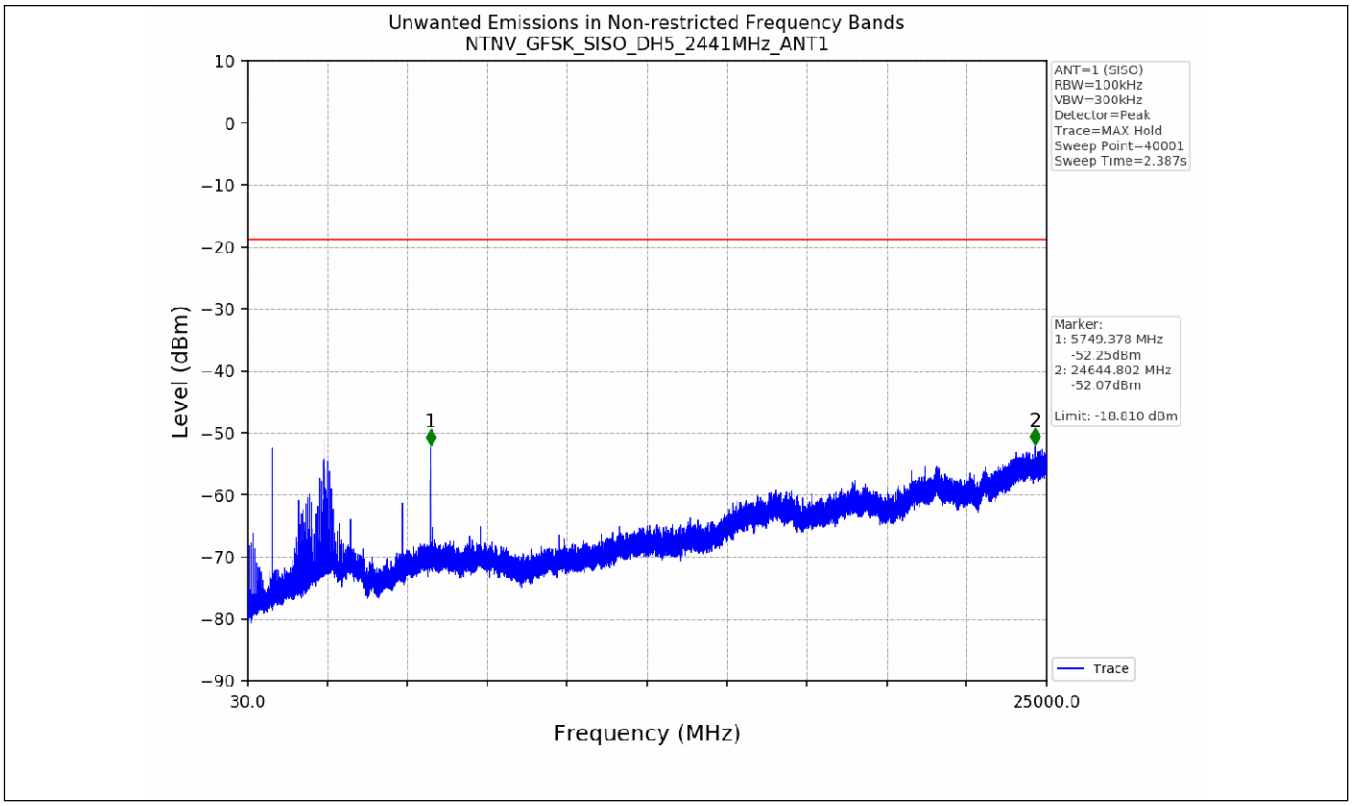
	Hopping	SISO	1	Refer to test graph	-18.60	PASS

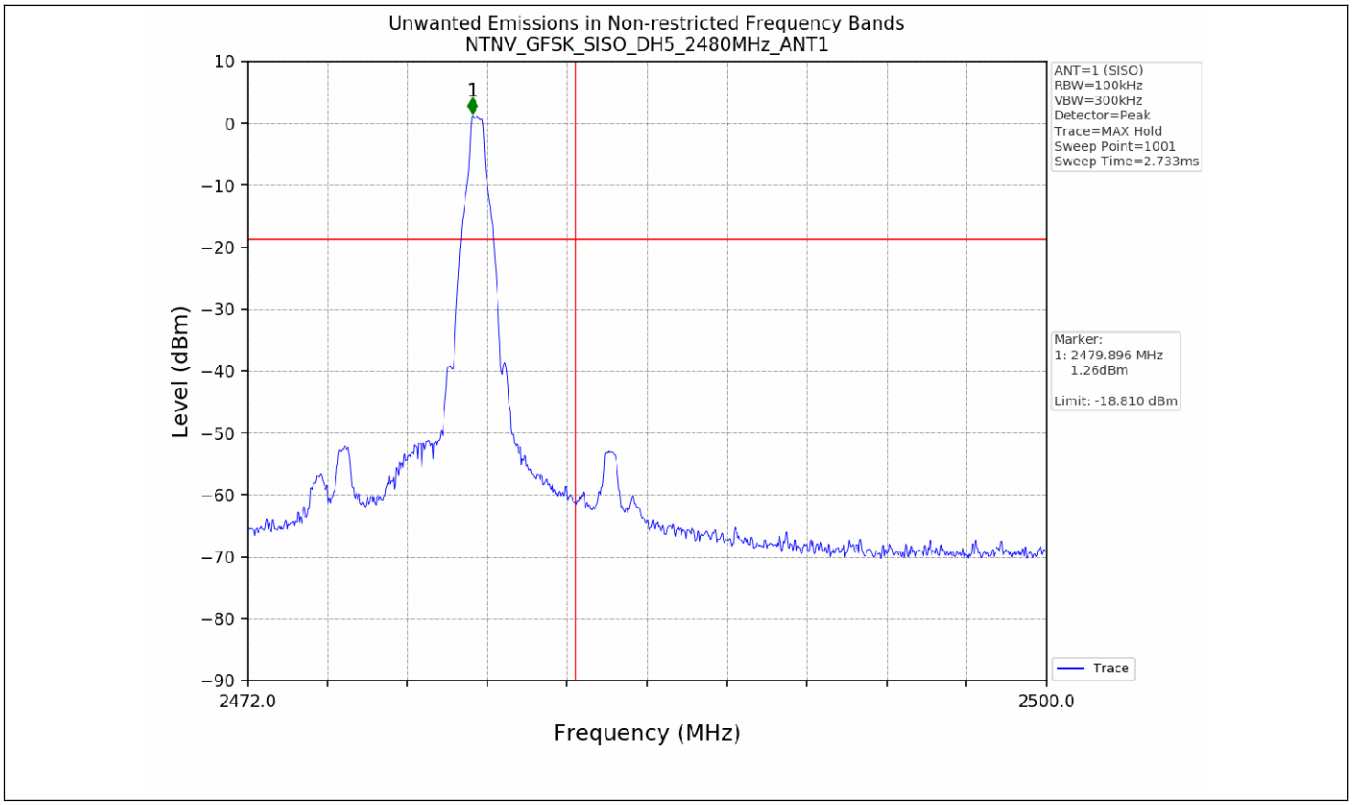
6.2 Test Graph

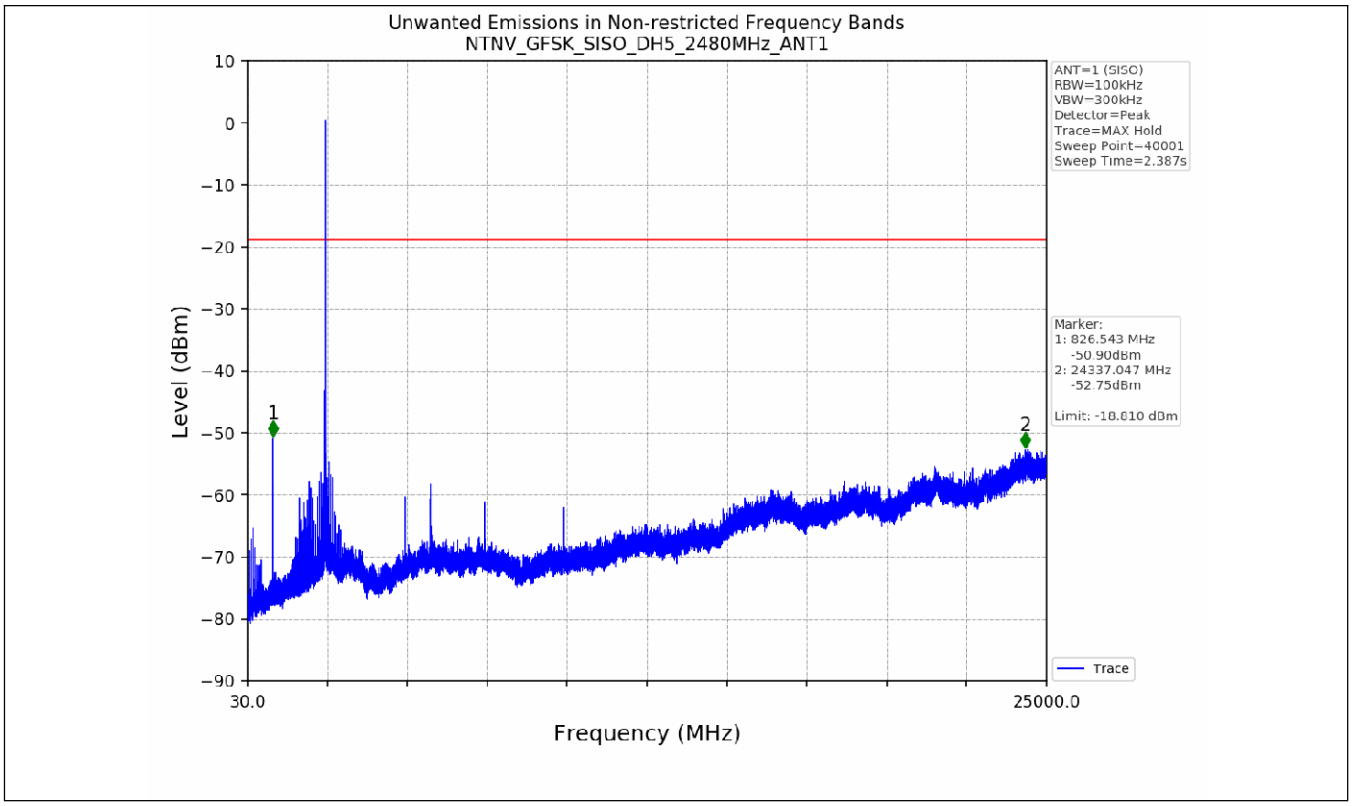


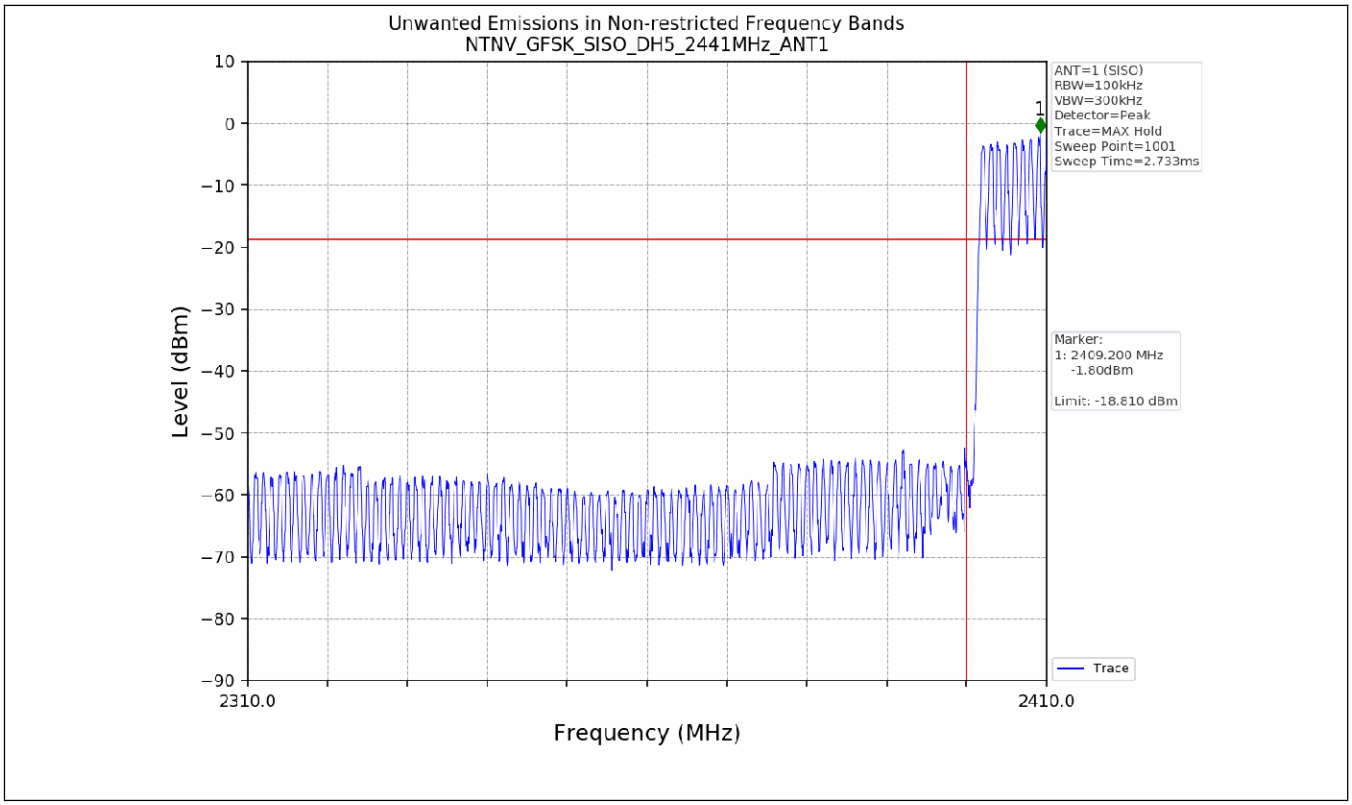

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.050 MHz
-3.75dBm
Limit: -18.810 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

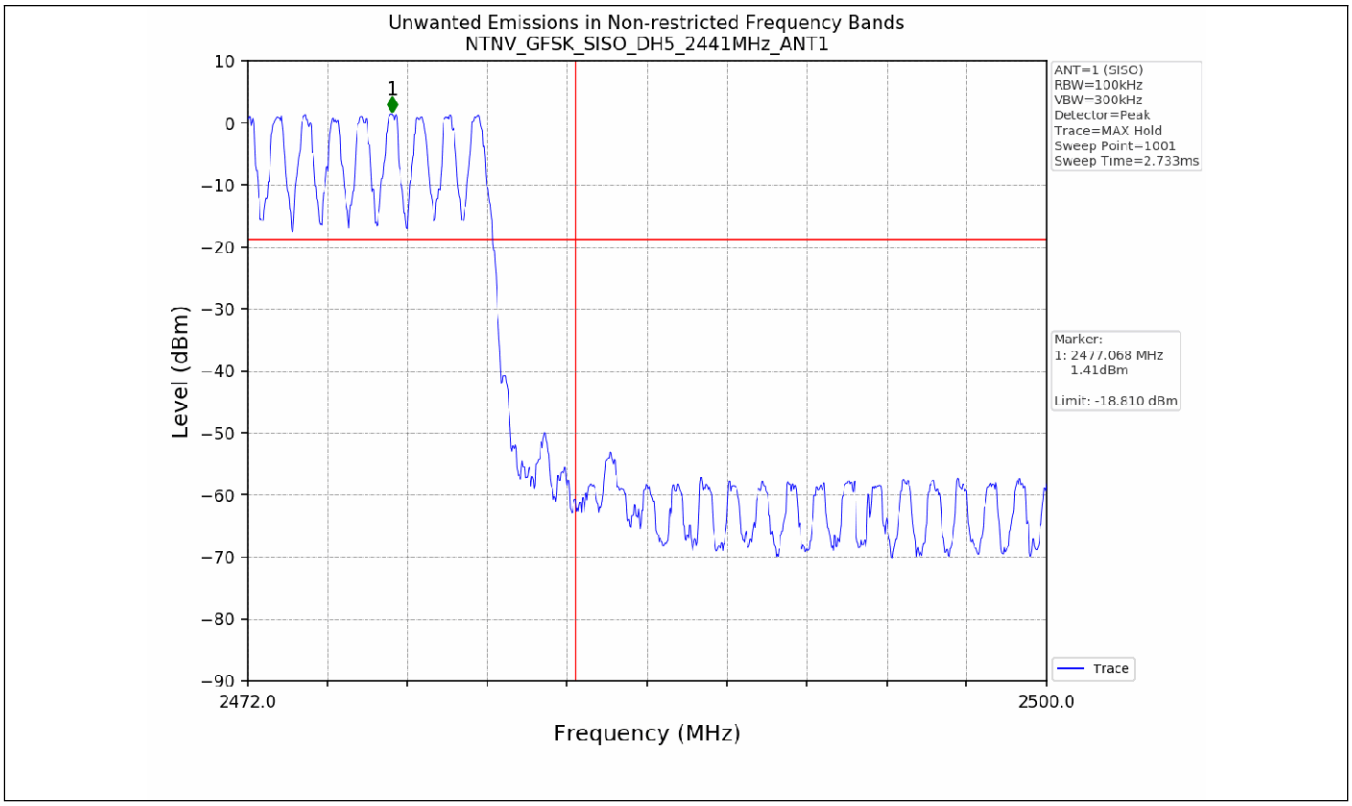

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 800.949 MHz
-55.21dBm
2: 833.410 MHz
-52.48dBm
Limit: -18.810 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

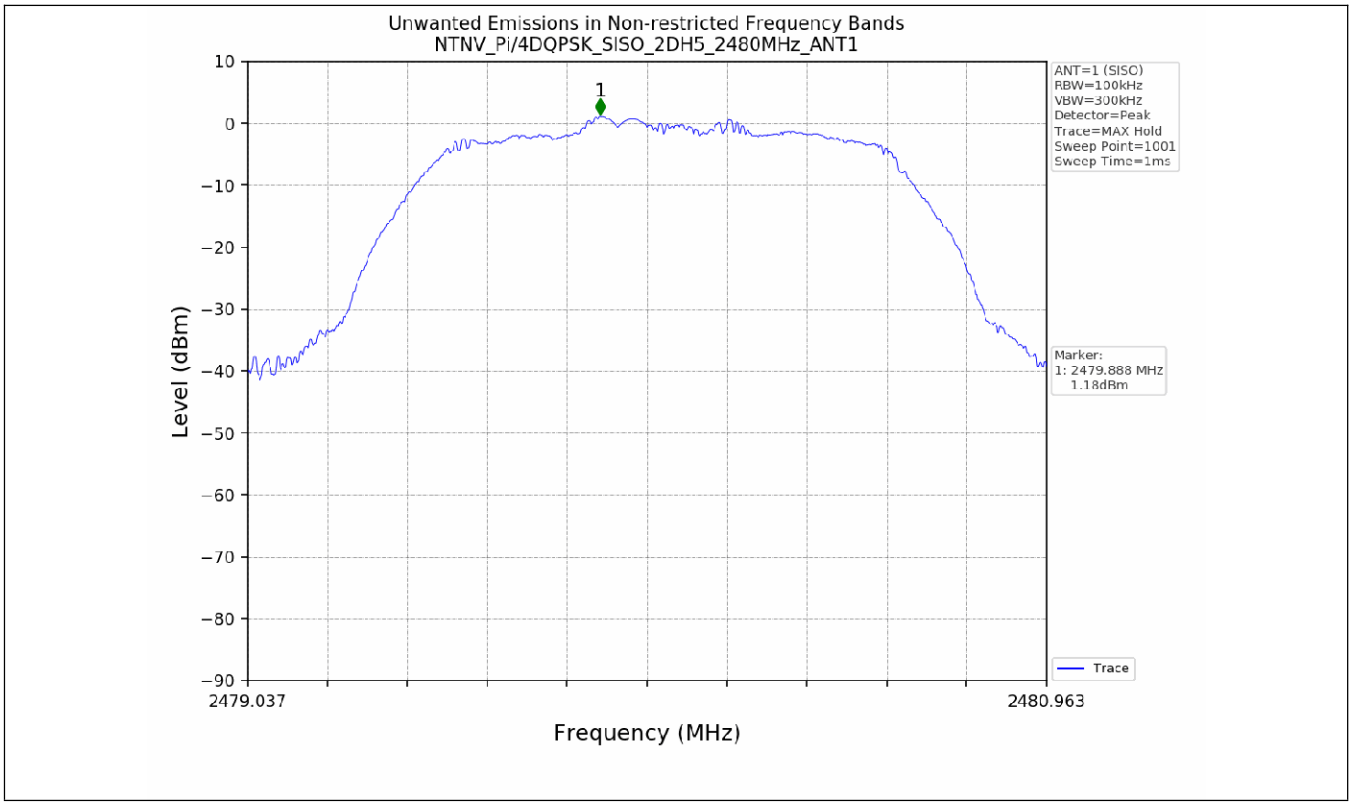

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 5749.378 MHz
-52.25dBm
2: 24644.802 MHz
-52.07dBm
Limit: -18.810 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

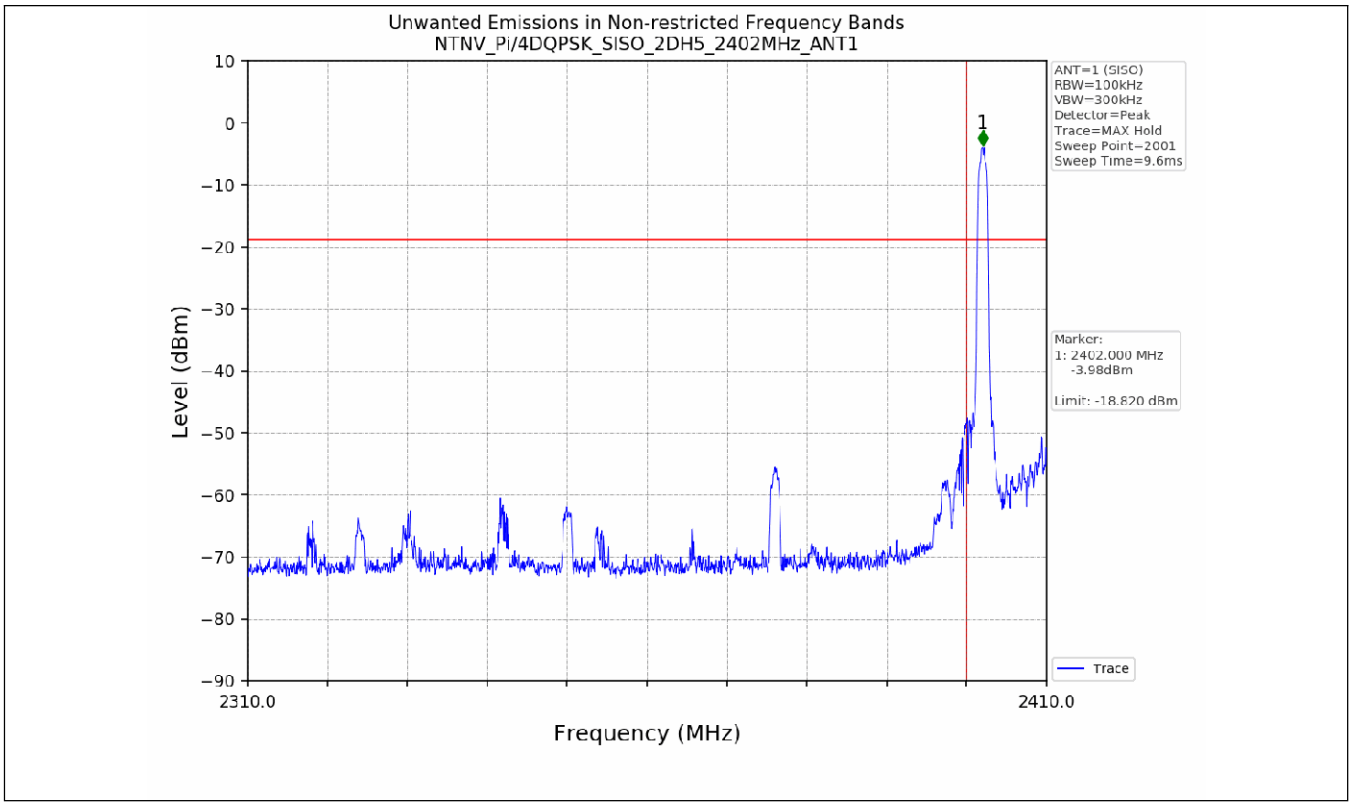

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2479.896 MHz
1.26dBm
Limit: -18.810 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

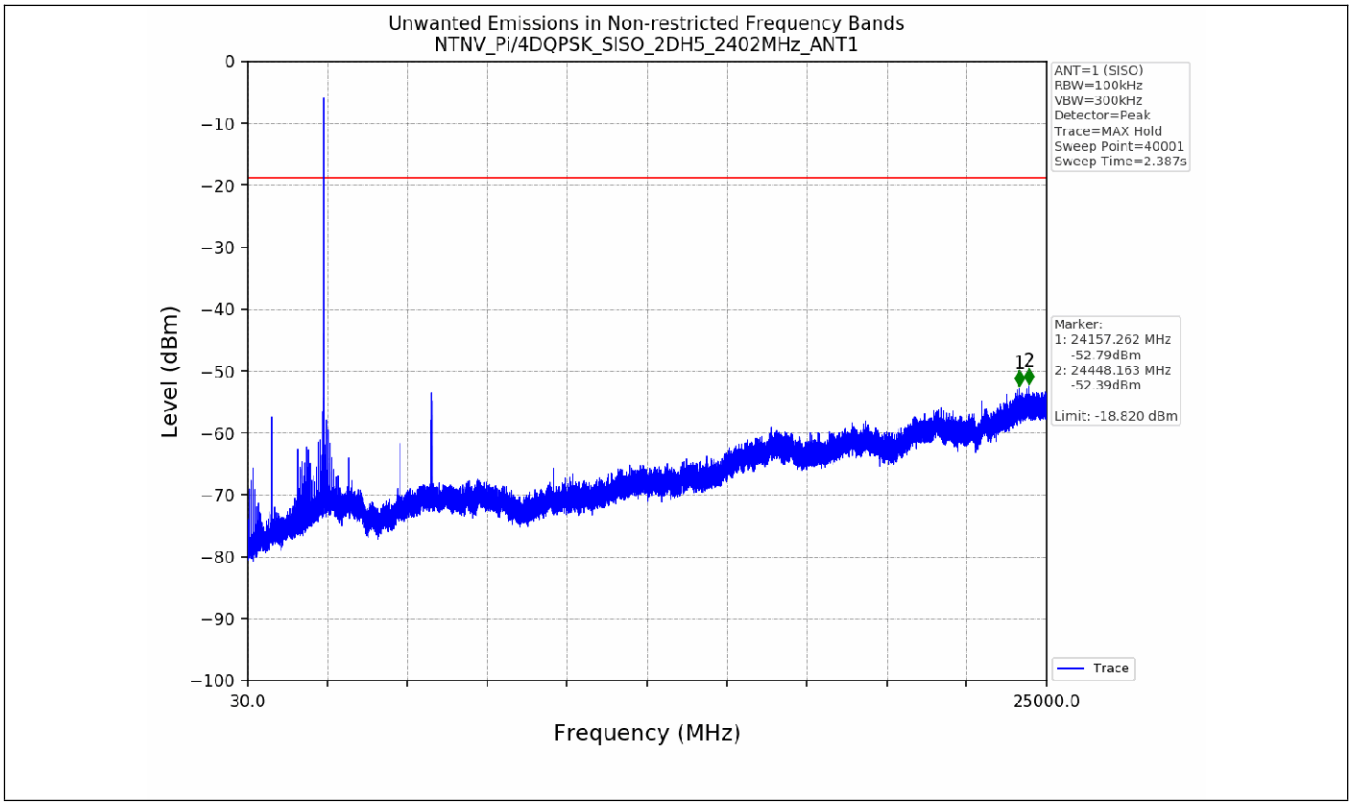

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 826.543 MHz
-50.90dBm
2: 24337.047 MHz
-52.75dBm
Limit: -18.810 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

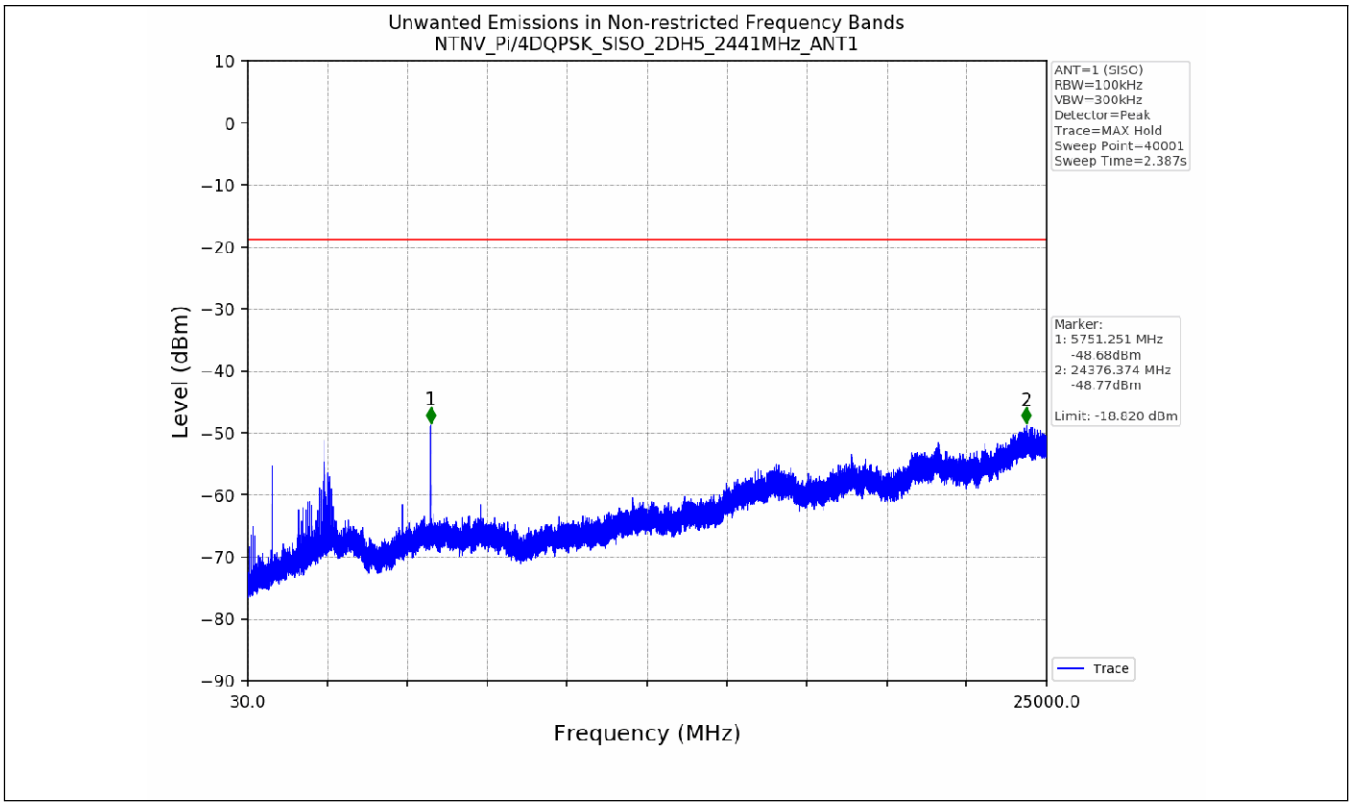

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2409.200 MHz
-1.80dBm
Limit: -18.810 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

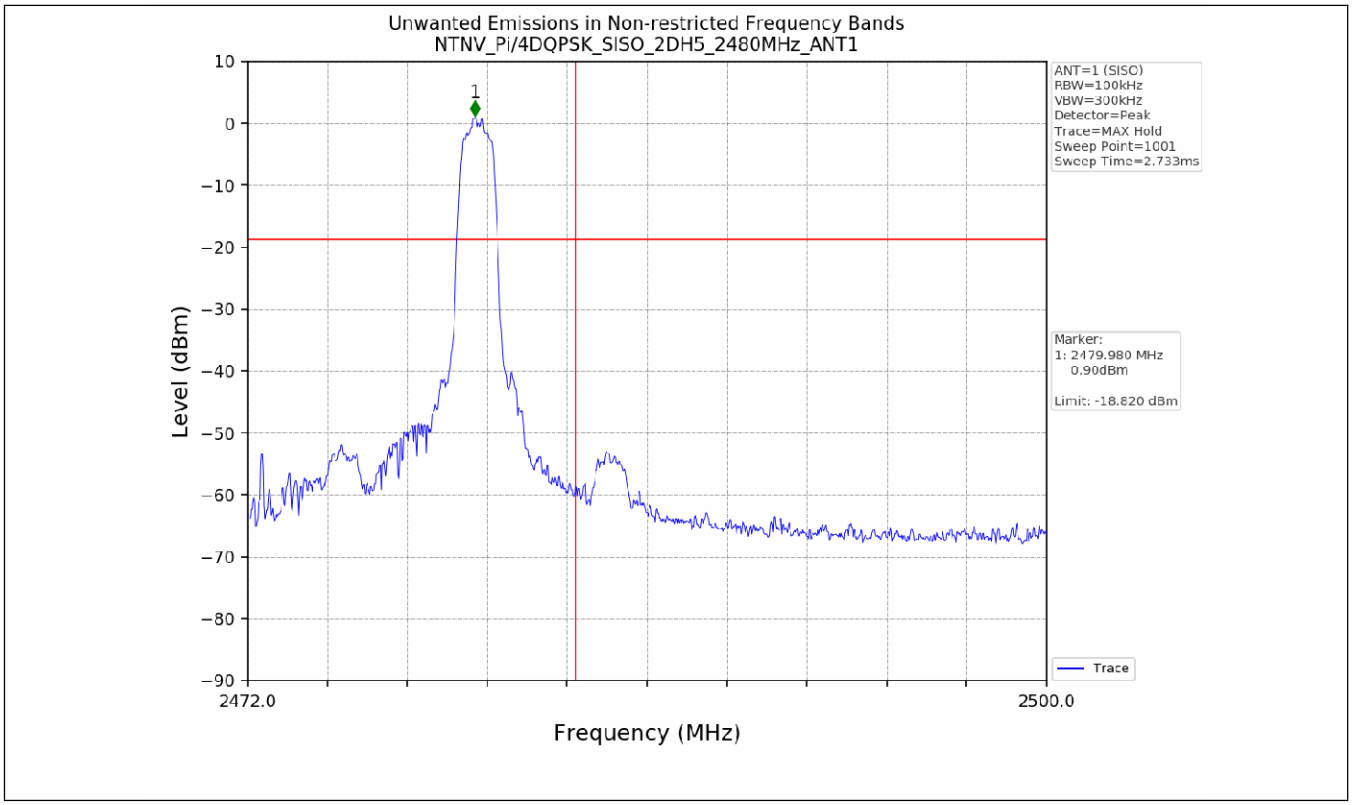

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_GFSK_SISO_DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2477.068 MHz
1.41dBm
Limit: -18.810 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

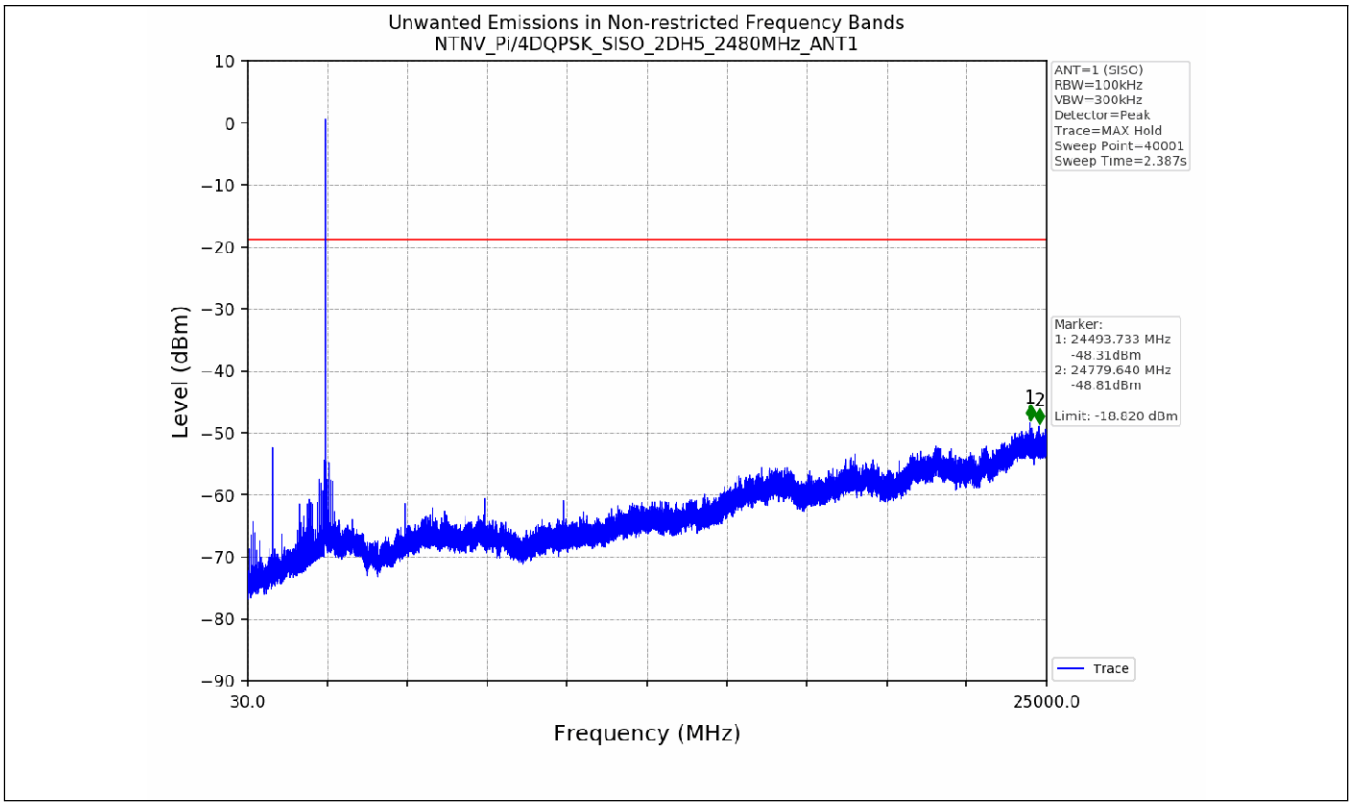

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2479.888 MHz
1.18dBm
Trace
Level (dBm)
Frequency (MHz)
2479.037
2480.963

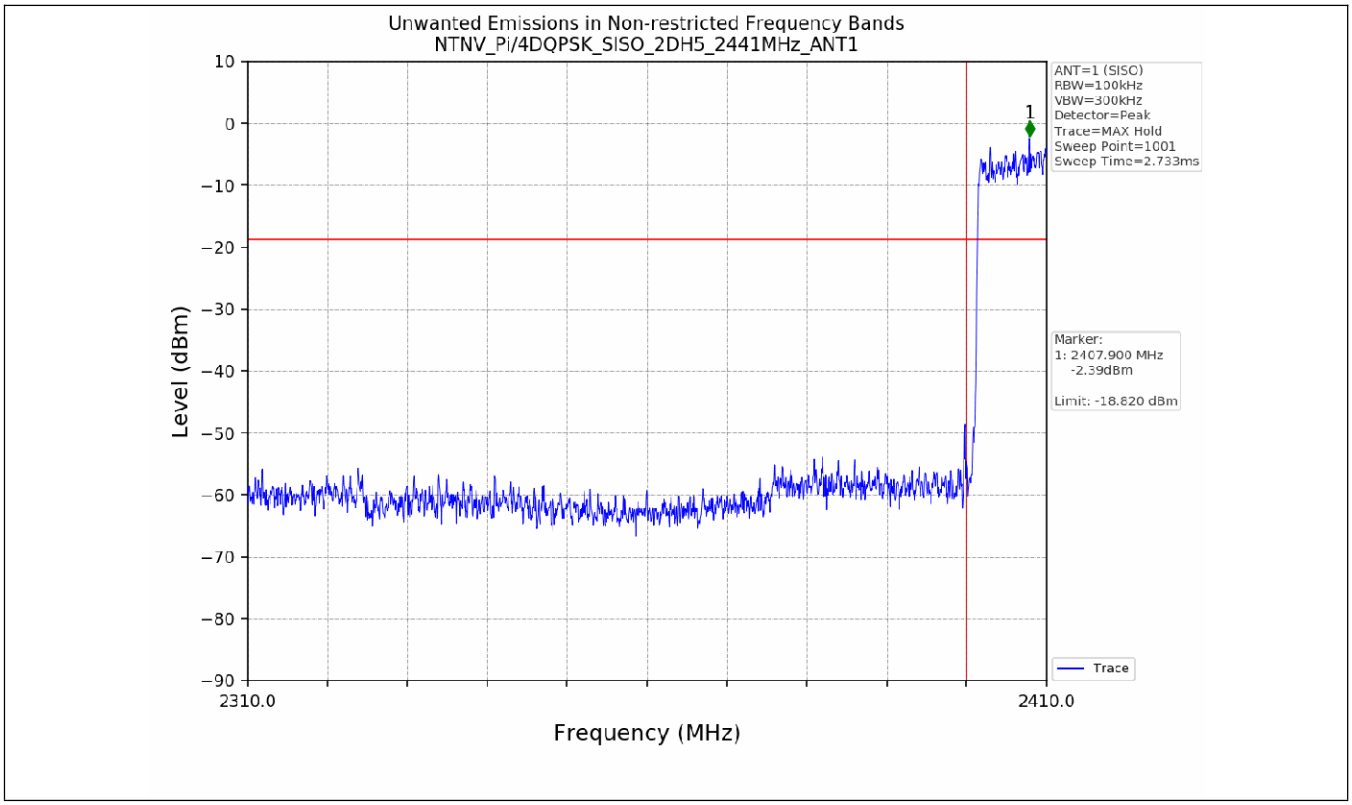

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.000 MHz
-3.98dBm
Limit: -18.820 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

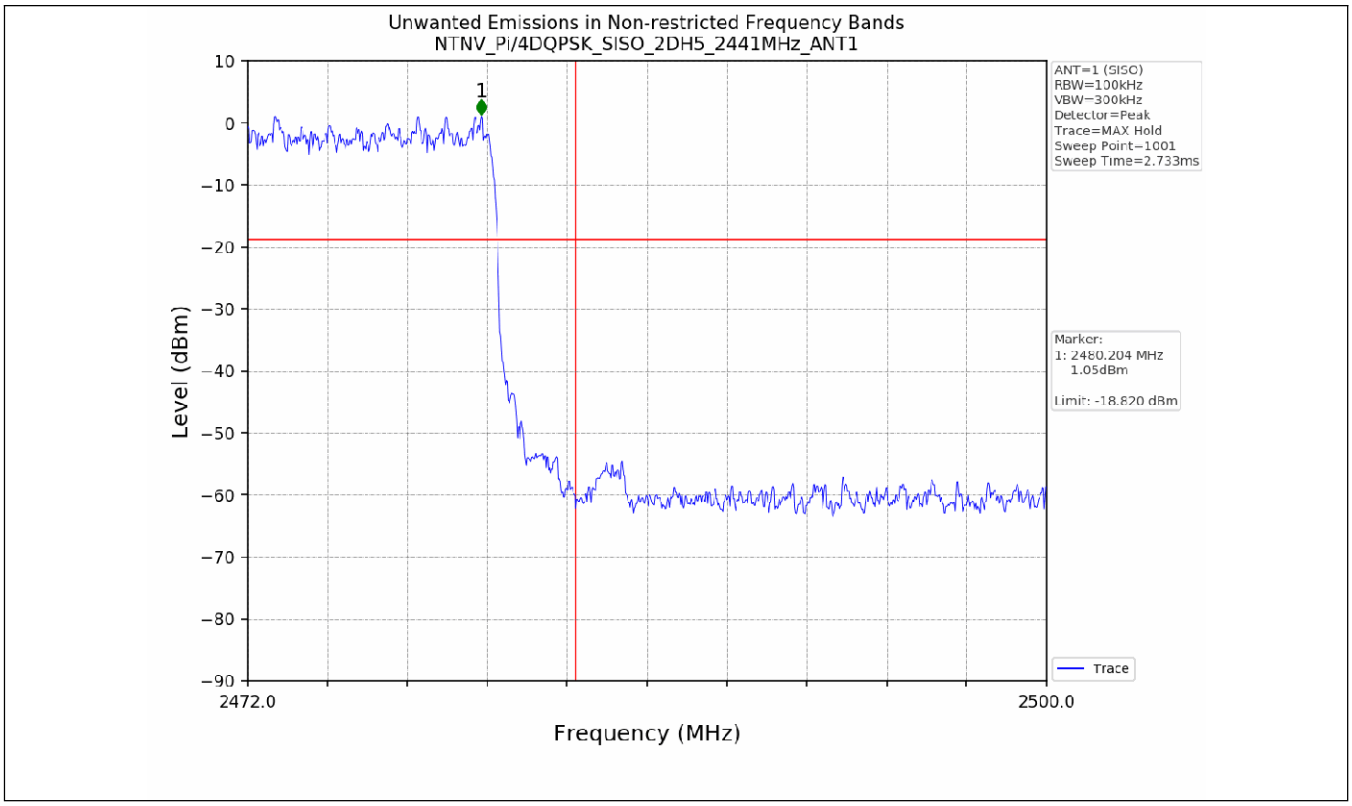

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 24157.262 MHz
-52.79dBm
2: 24448.163 MHz
-52.39dBm
Limit: -18.820 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

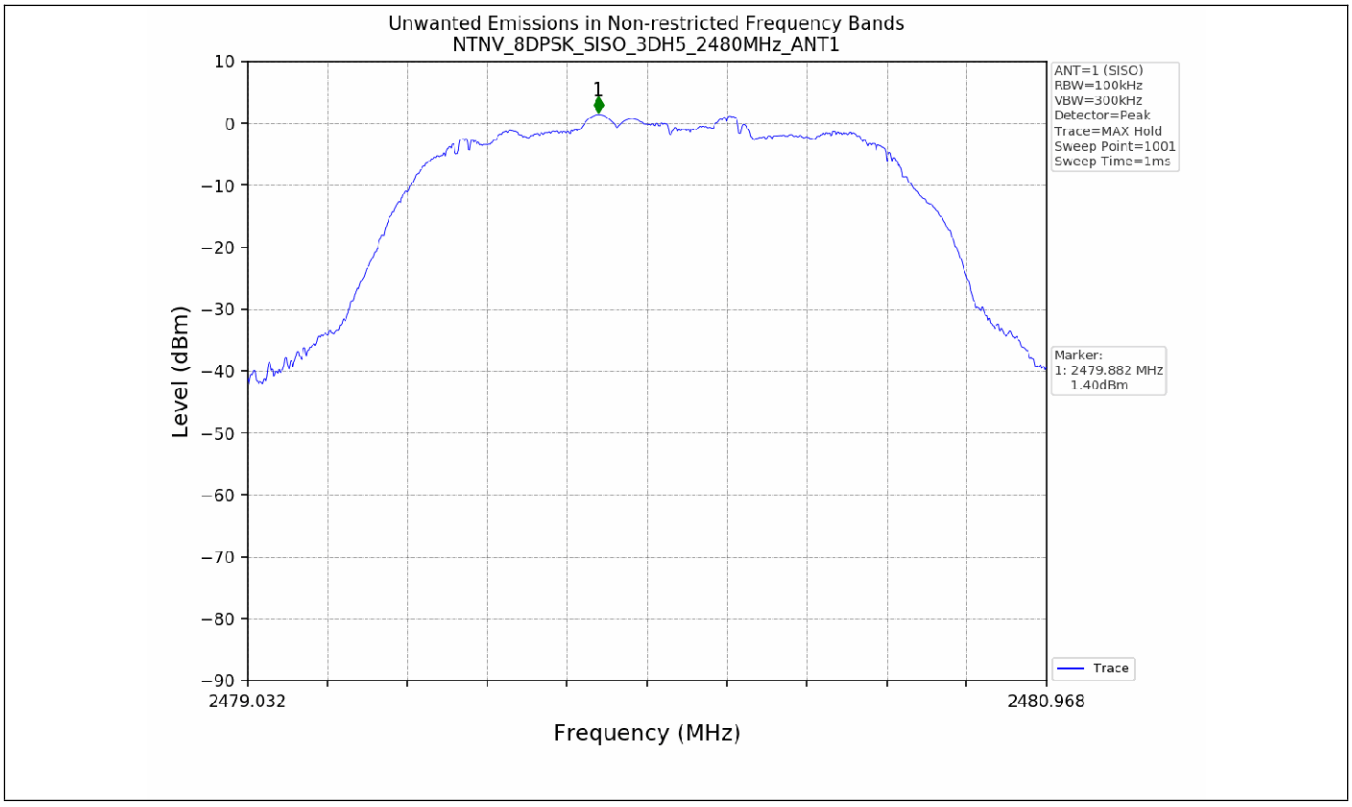

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 5751.251 MHz
-48.68dBm
2: 24376.374 MHz
-48.77dBm
Limit: -18.620 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

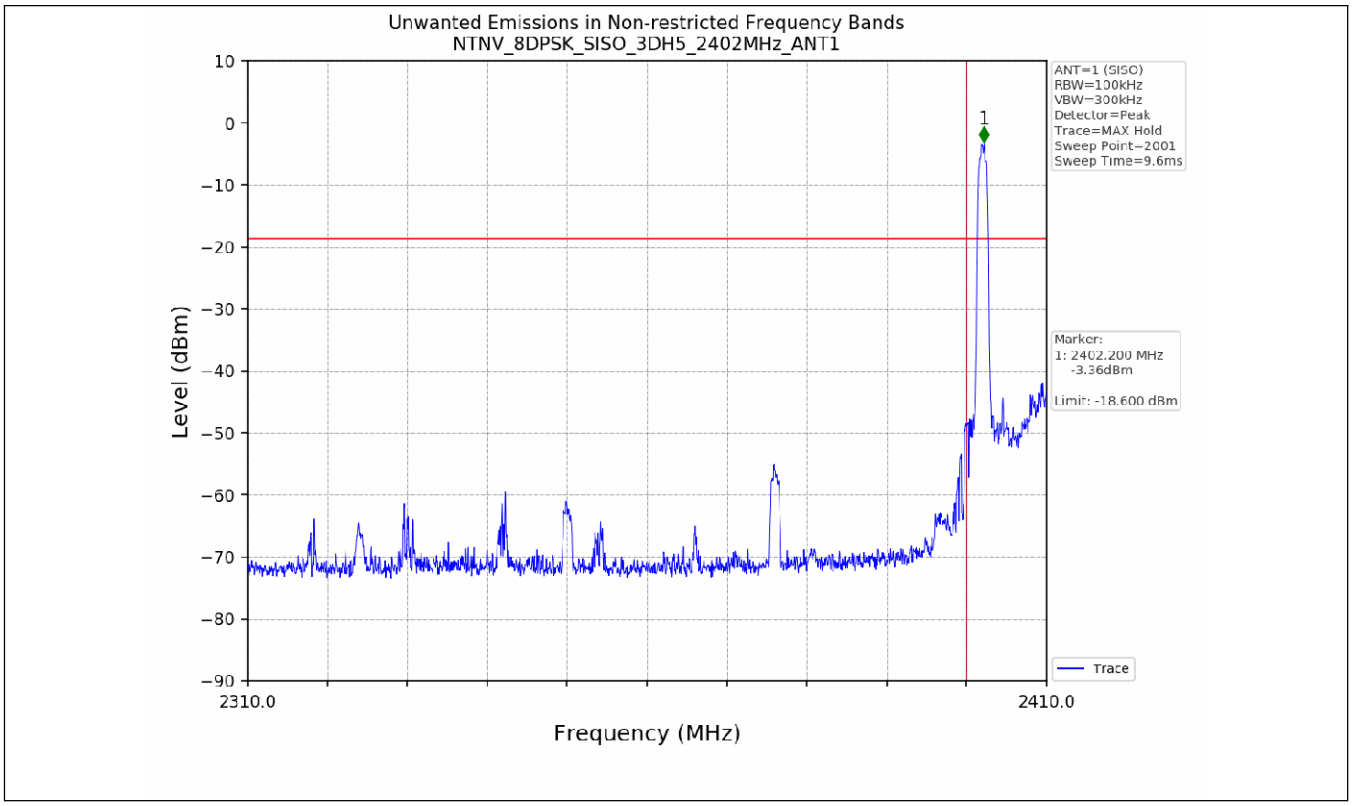

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2479.980 MHz
0.90dBm
Limit: -18.620 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

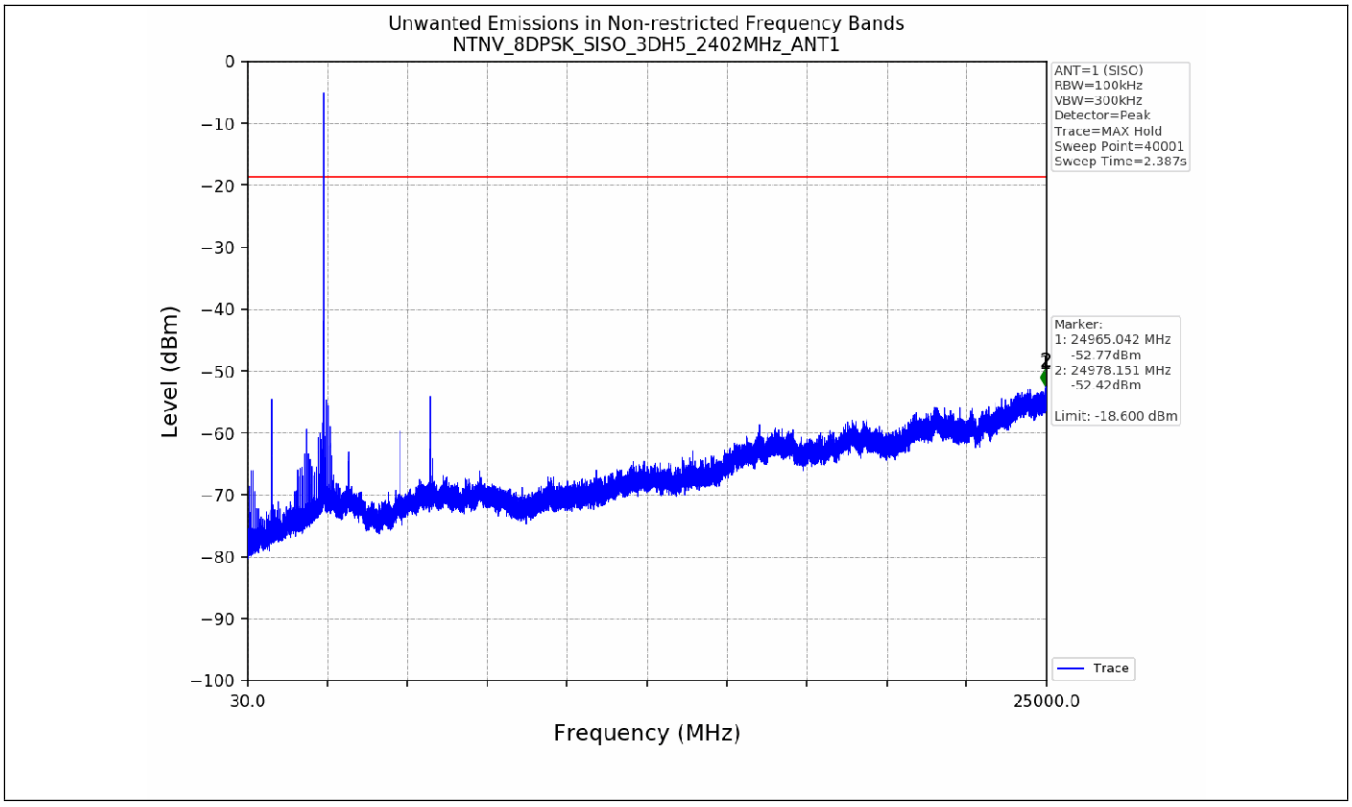

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 24493.733 MHz
-48.31dBm
2: 24779.640 MHz
-48.81dBm
Limit: -18.620 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0

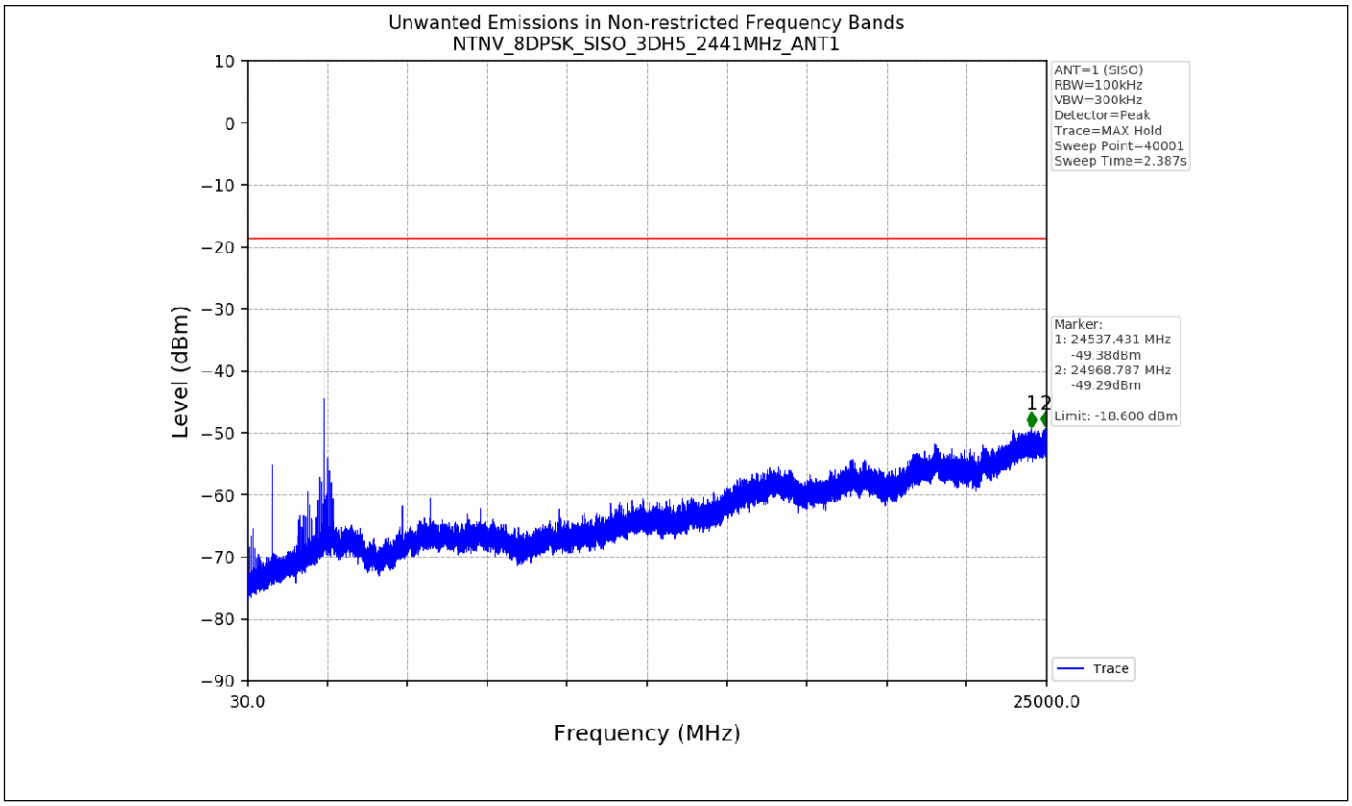

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2407.900 MHz
-2.39dBm
Limit: -18.620 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

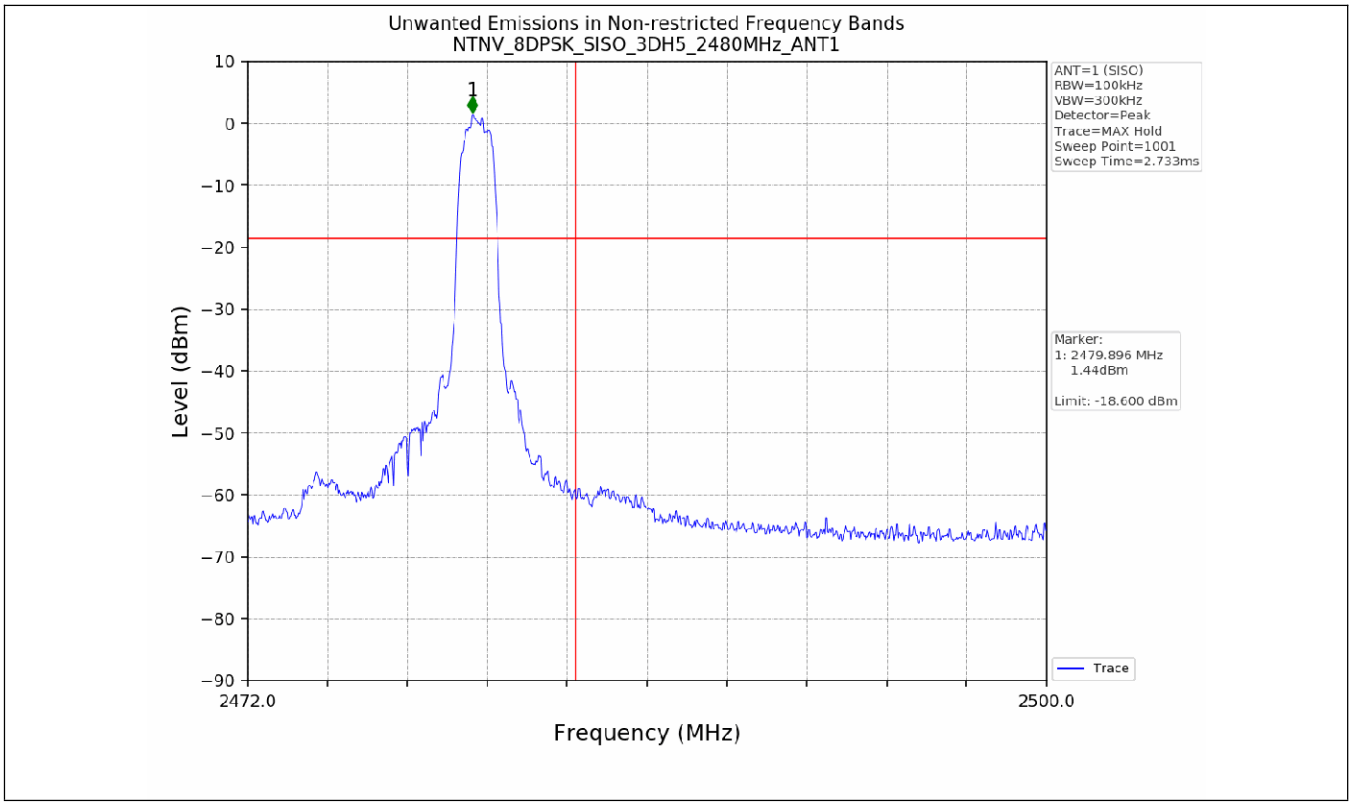

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_Pi/4DQPSK_SISO_2DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2480.204 MHz
1.05dBm
Limit: -18.820 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0

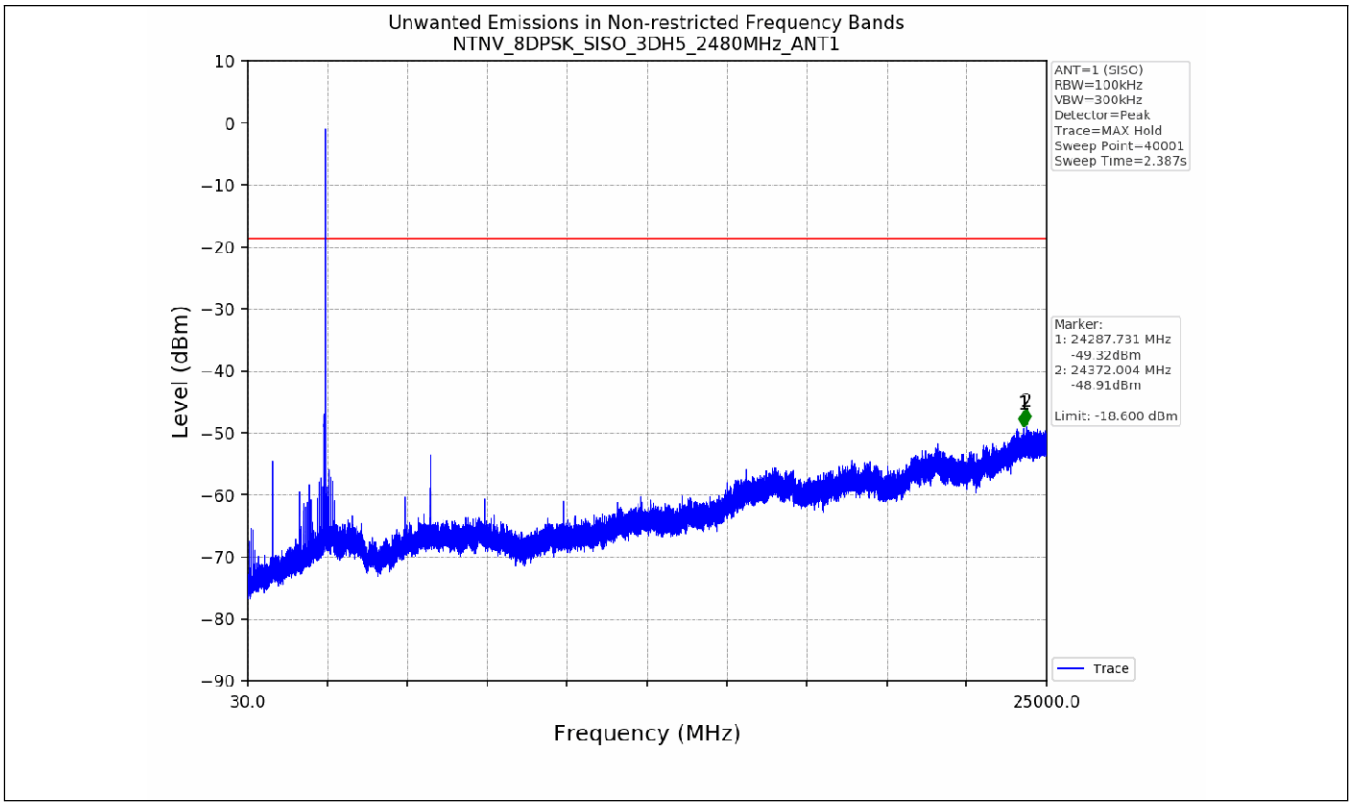

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2480MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=1ms
Marker:
1: 2479.882 MHz
1.40dBm
Trace
Level (dBm)
Frequency (MHz)
2479.032
2480.968

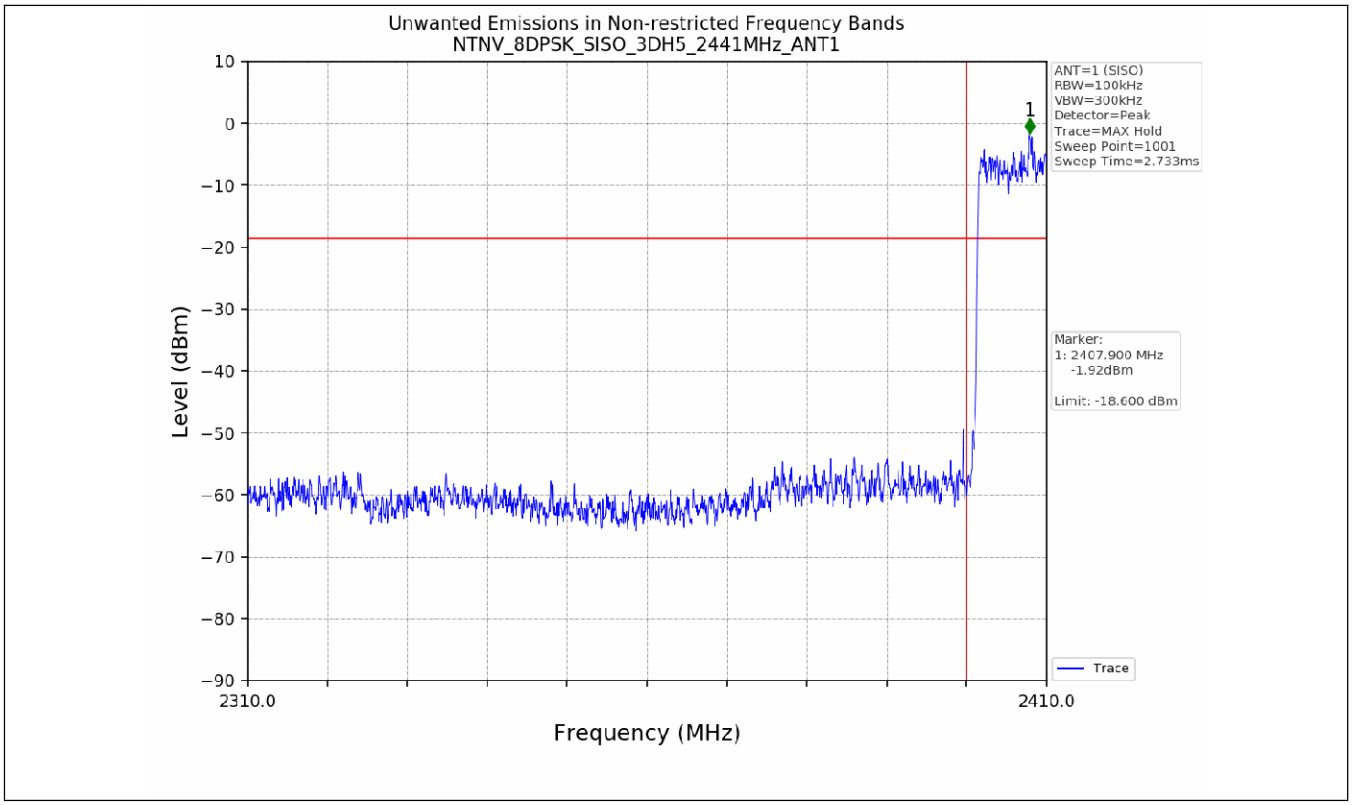

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=2001
Sweep Time=9.6ms
Marker:
1: 2402.200 MHz
-3.36dBm
Limit: -18.600 dBm
Trace
Level (dBm)
Frequency (MHz)
2310.0
2410.0

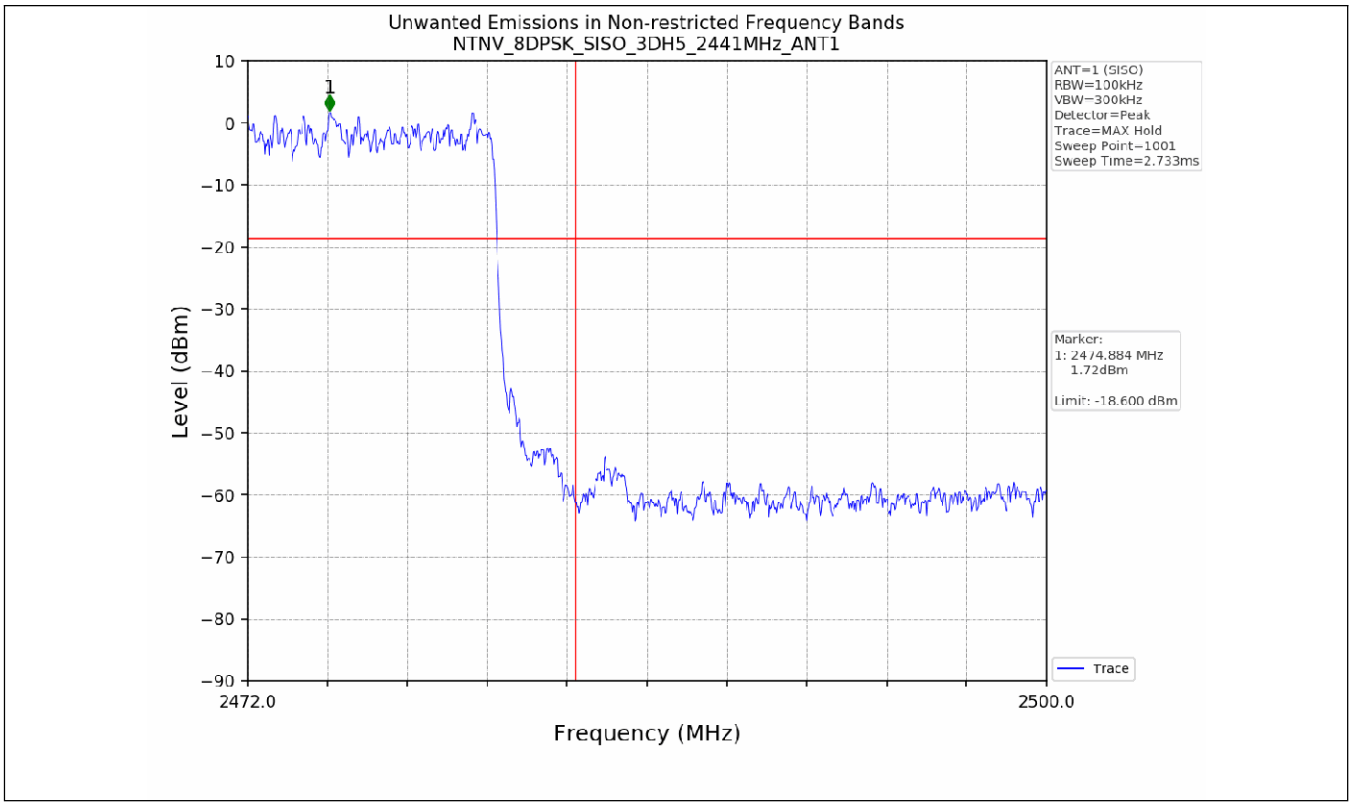

Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2402MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 24965.042 MHz
-52.77dBm
2: 24978.151 MHz
-52.42dBm
Limit: -18.600 dBm
Trace
Level (dBm)
Frequency (MHz)
30.0
25000.0


Unwanted Emissions in Non-restricted Frequency Bands
NTNV_8DPSK_SISO_3DH5_2441MHz_ANT1
ANT=1 (SISO)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 24537.431 MHz
-49.38dBm
2: 24968.787 MHz
-49.29dBm
Limit: -18.600 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)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2479.896 MHz
1.44dBm
Limit: -18.600 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)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=40001
Sweep Time=2.387s
Marker:
1: 24287.731 MHz
-49.32dBm
2: 24372.004 MHz
-48.91dBm
Limit: -18.600 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)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2407.900 MHz
-1.92dBm
Limit: -18.600 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)
RBW=100kHz
VBW=300kHz
Detector=Peak
Trace=MAX Hold
Sweep Point=1001
Sweep Time=2.733ms
Marker:
1: 2474.884 MHz
1.72dBm
Limit: -18.600 dBm
Trace
Level (dBm)
Frequency (MHz)
2472.0
2500.0