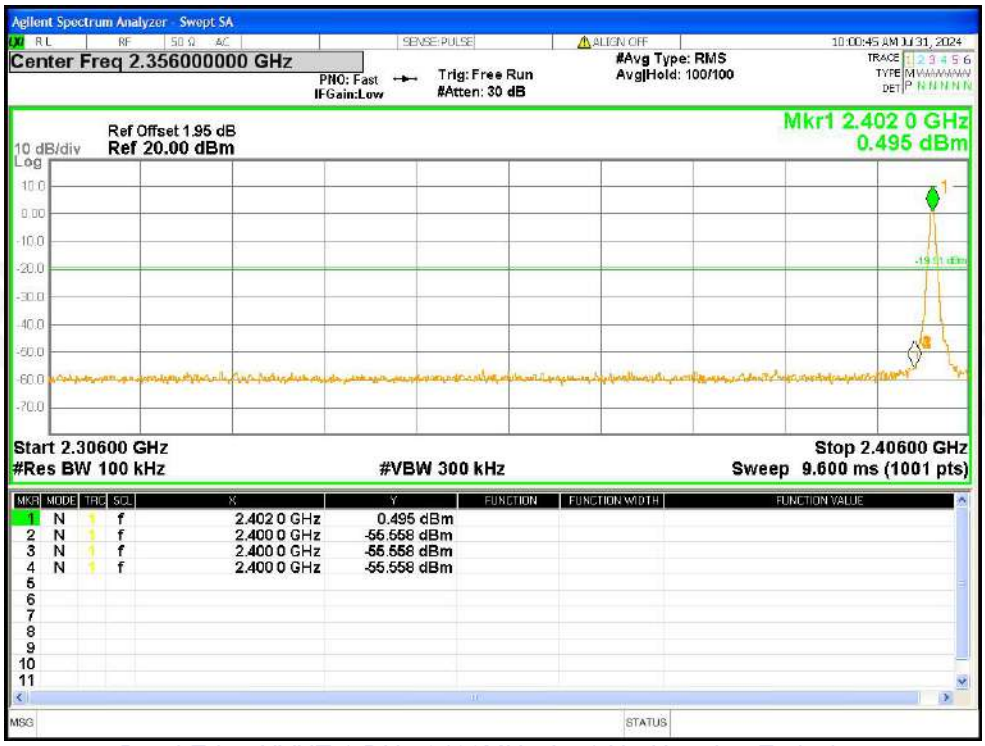
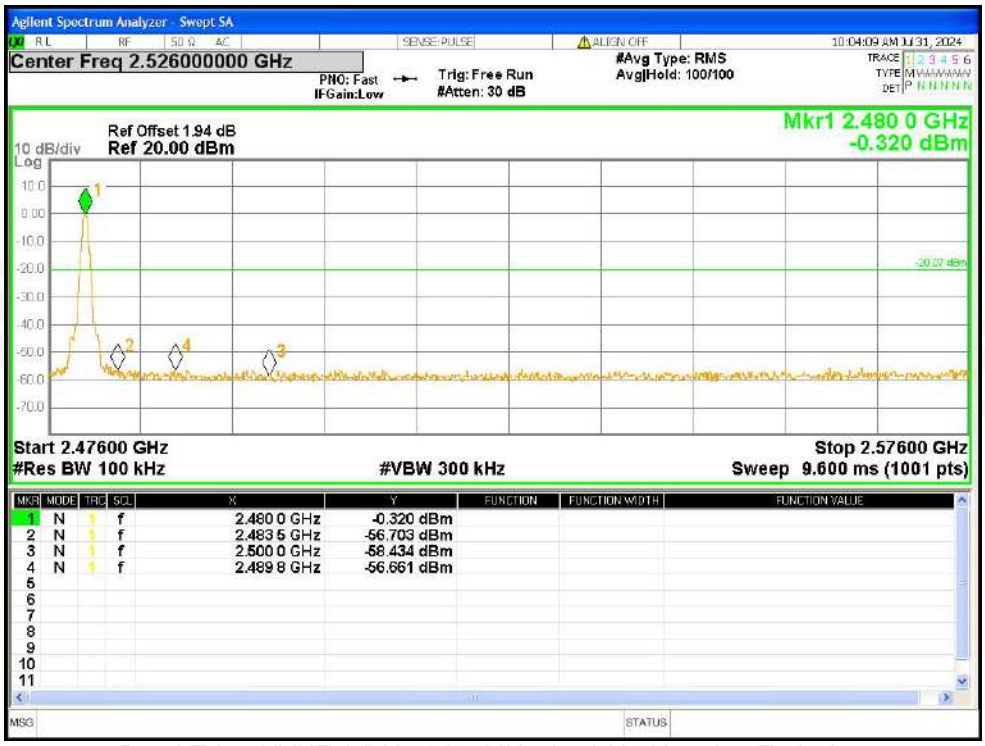
Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Ref



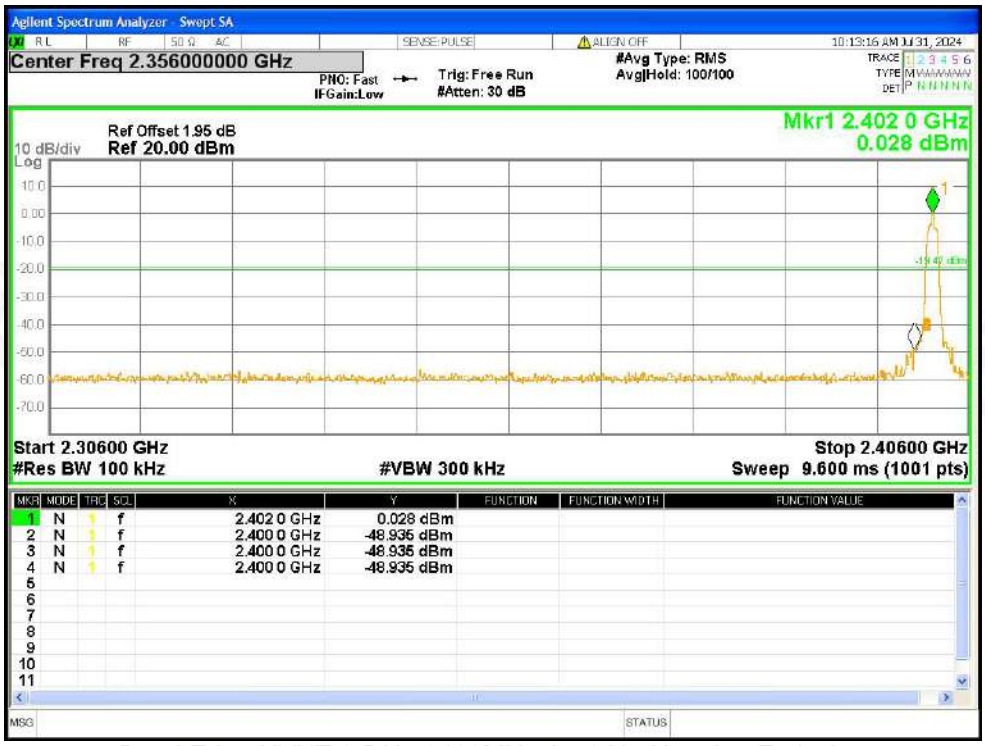
Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Emission

Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Ref



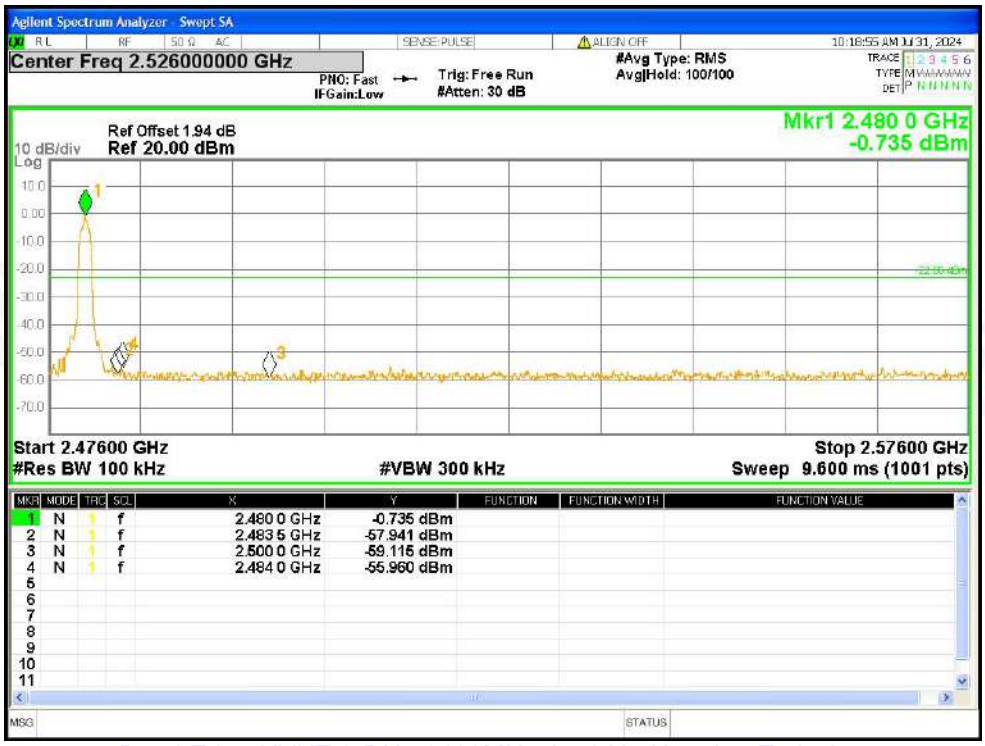
Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Emission

Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Ref

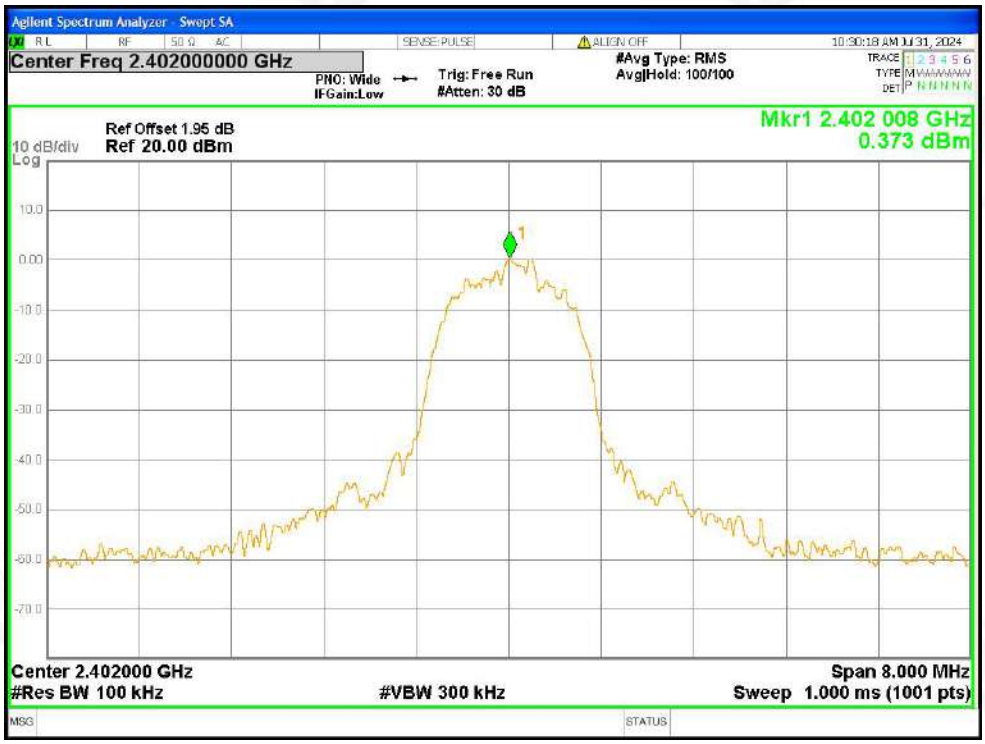


Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Emission

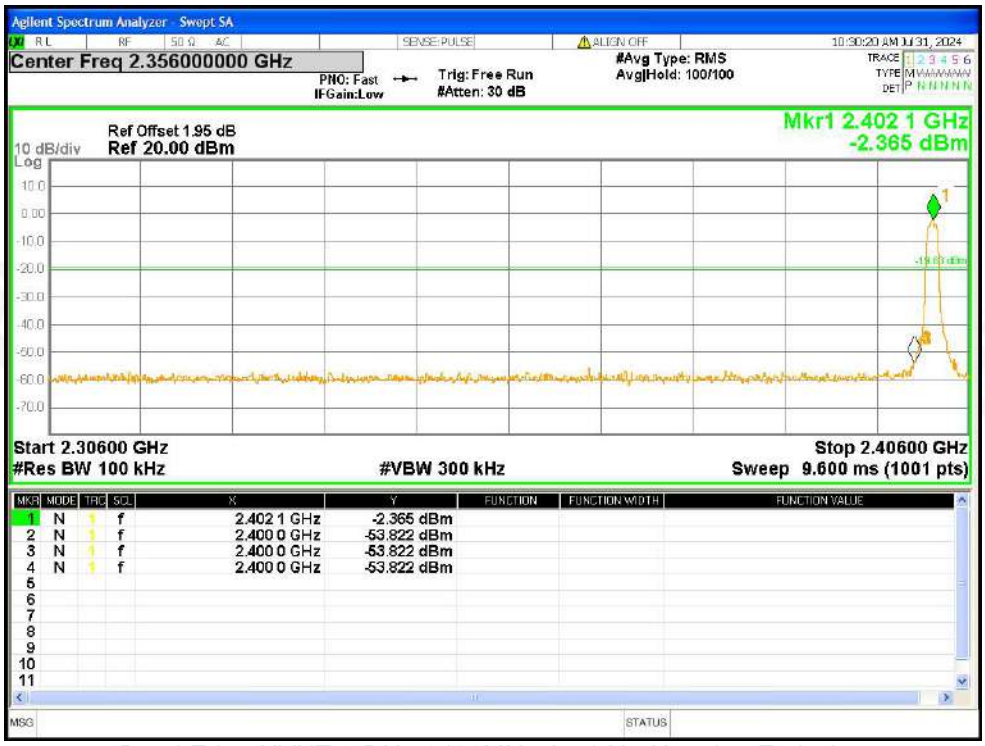
Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Ref



Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Emission

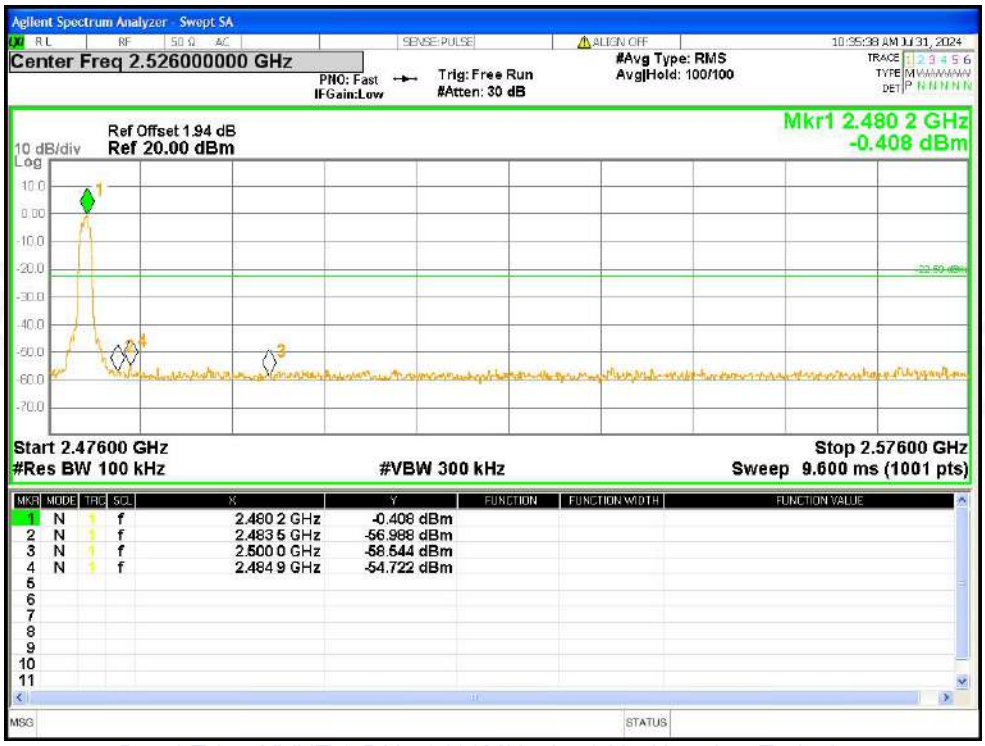


Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Ref



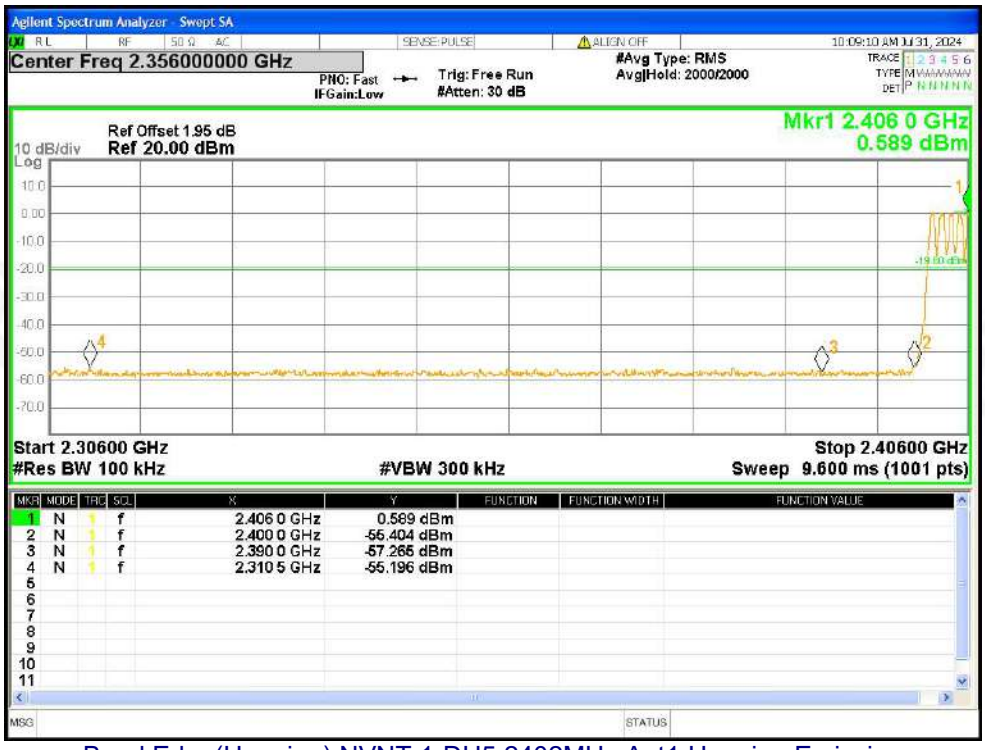
Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Emission

Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Ref



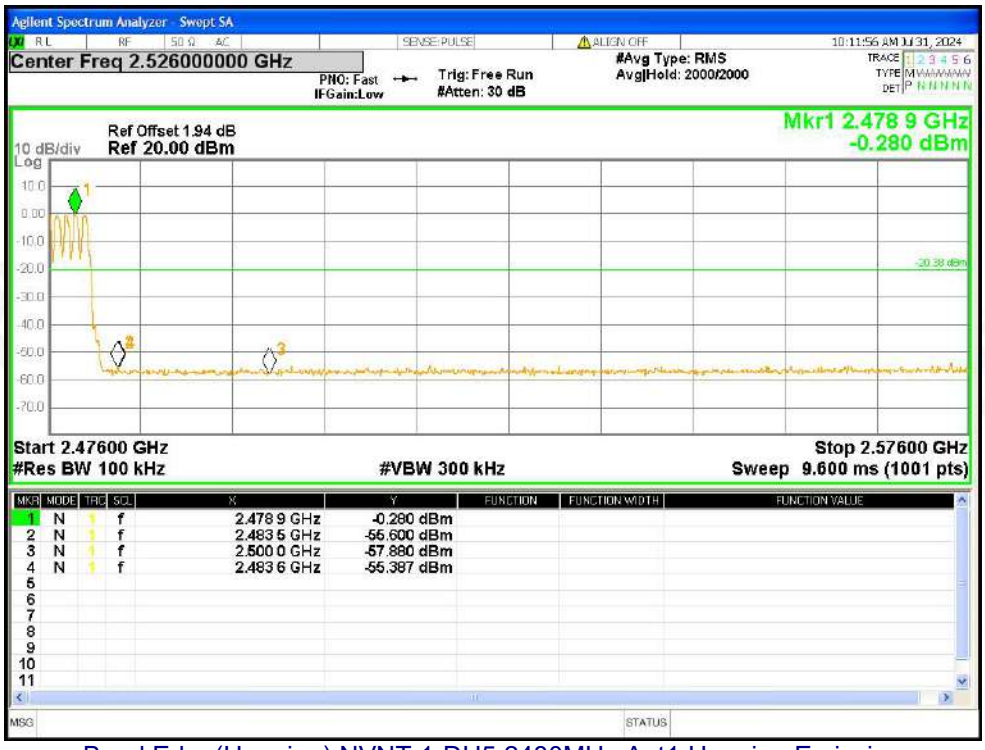
Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Emission

Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref



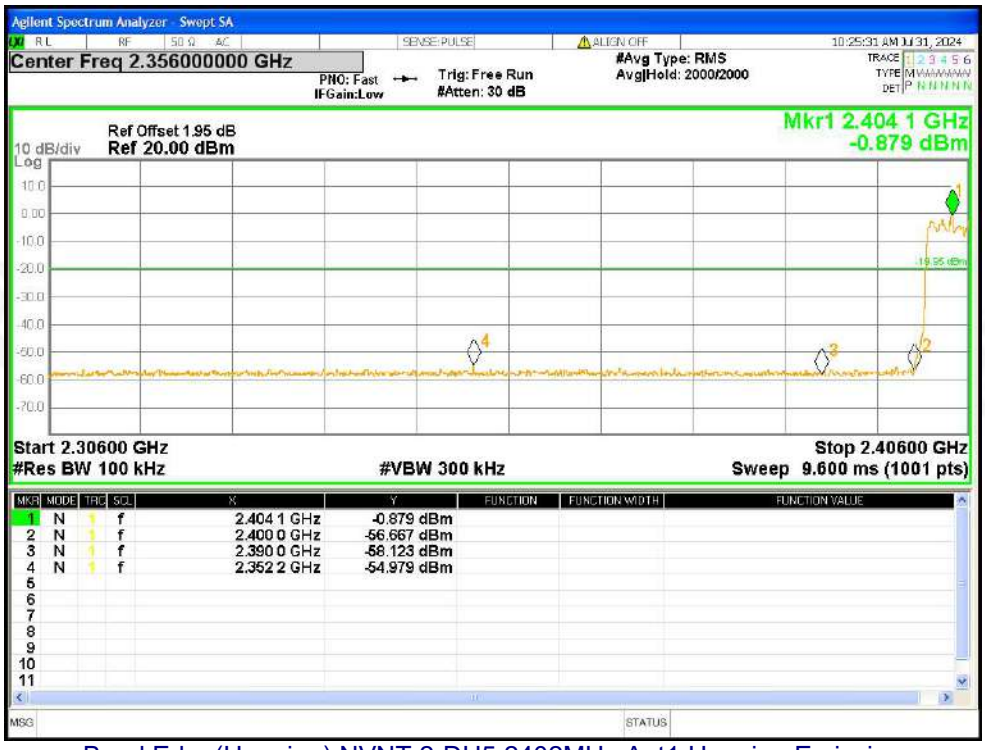
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission

Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Ref



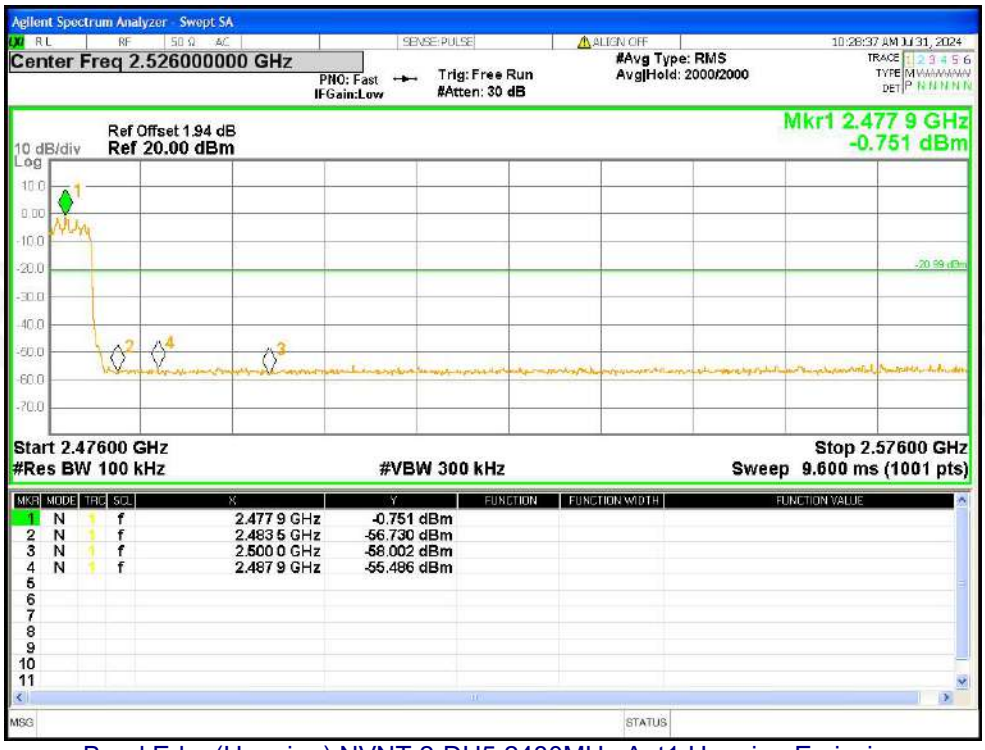
Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Emission

Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Ref



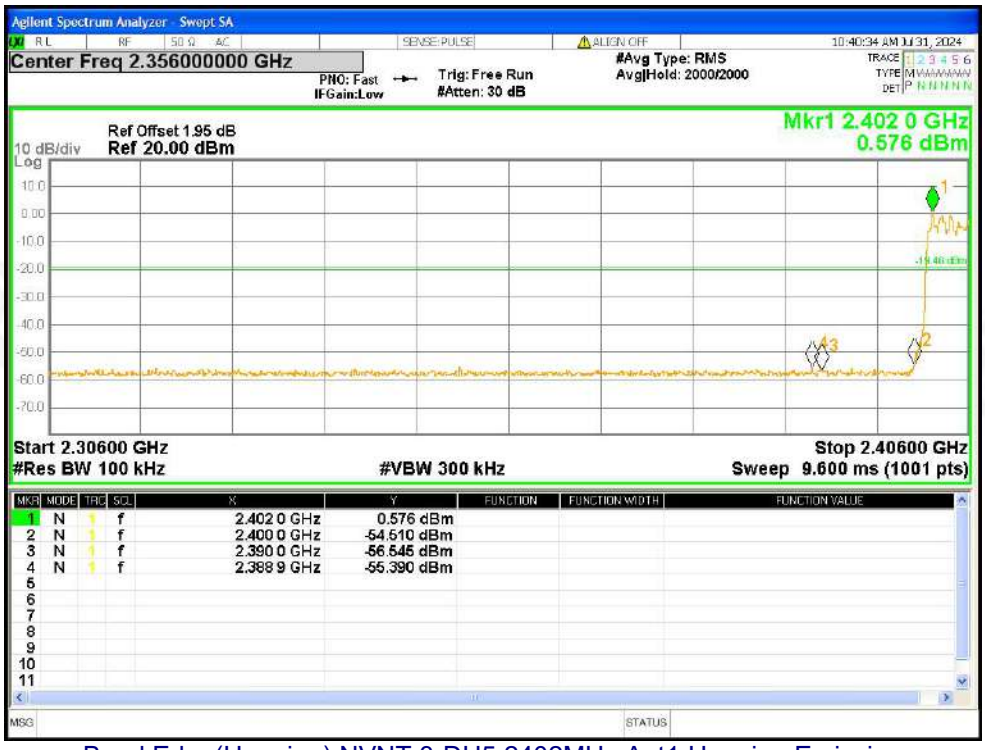
Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Emission

Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Ref



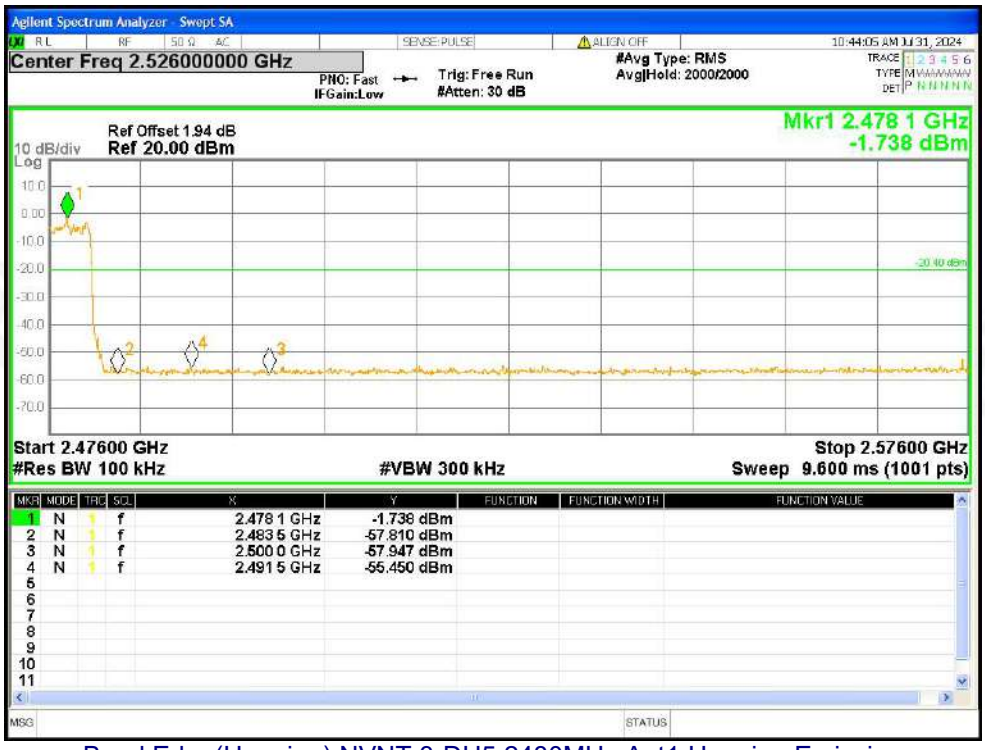
Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Emission

Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Emission

Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Emission

7. 20DB&99% BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013

7.1 Test Setup

7.2 Limit

N/A

7.3 Test procedure

1. Set RBW = 30 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.4 DEVIATION FROM STANDARD

No deviation.

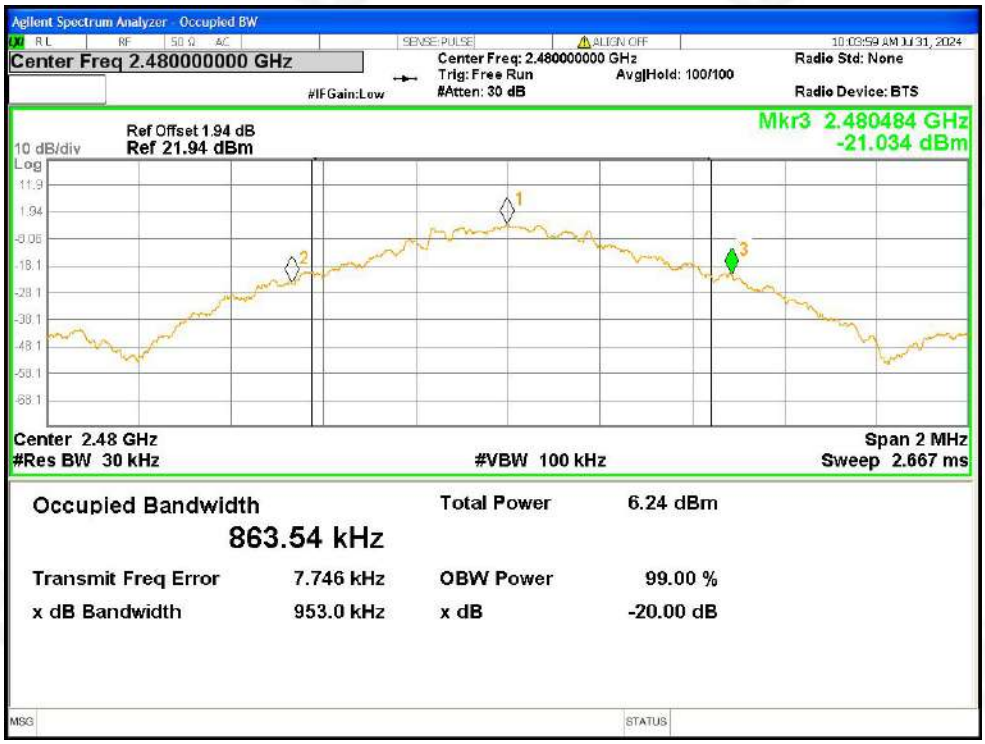
7.5 Test Result

left				
Mode	Test channel	20dB Emission Bandwidth (MHz)	99%Bandwidth (MHz)	Result
GFSK	Lowest	0.954	0.864	Pass
	Middle	0.951	0.860	
	Highest	0.953	0.864	
π/4-DQPSK	Lowest	1.274	1.212	Pass
	Middle	1.324	1.214	
	Highest	1.282	1.212	
8-DPSK	Lowest	1.31	1.189	Pass
	Middle	1.29	1.175	
	Highest	1.297	1.185	

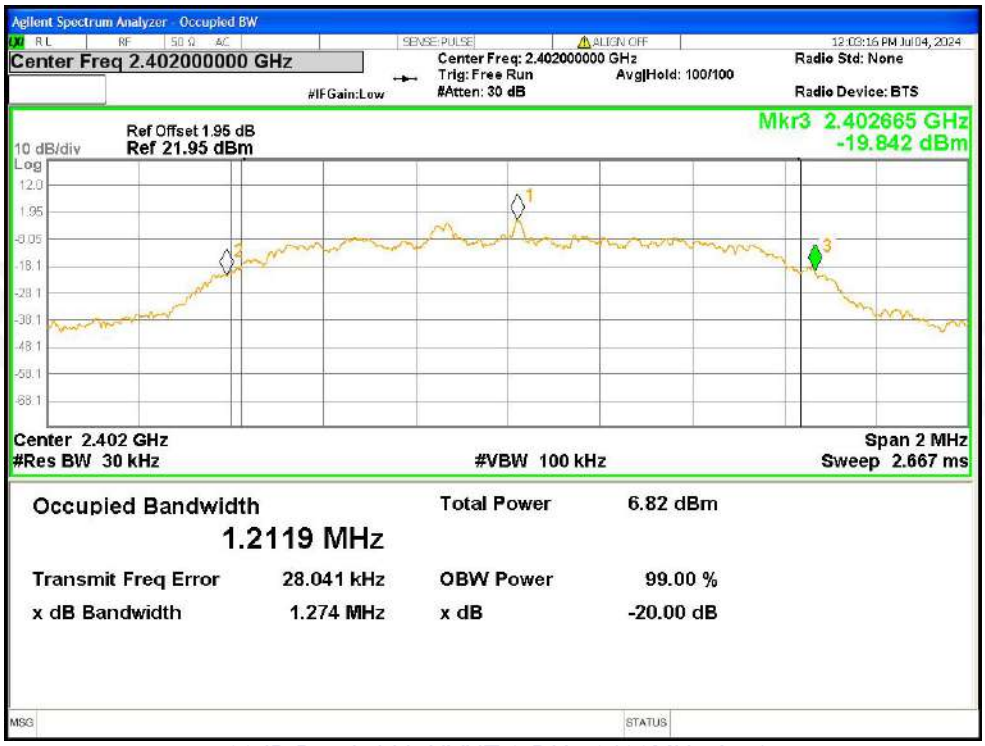
Test plots

-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1

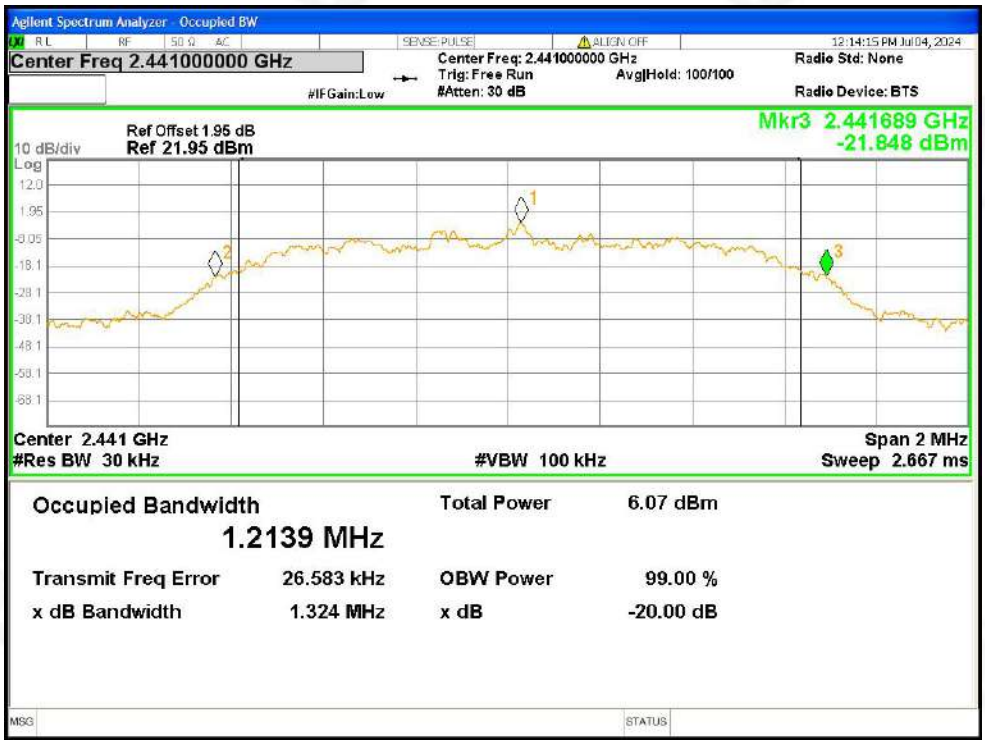
-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1



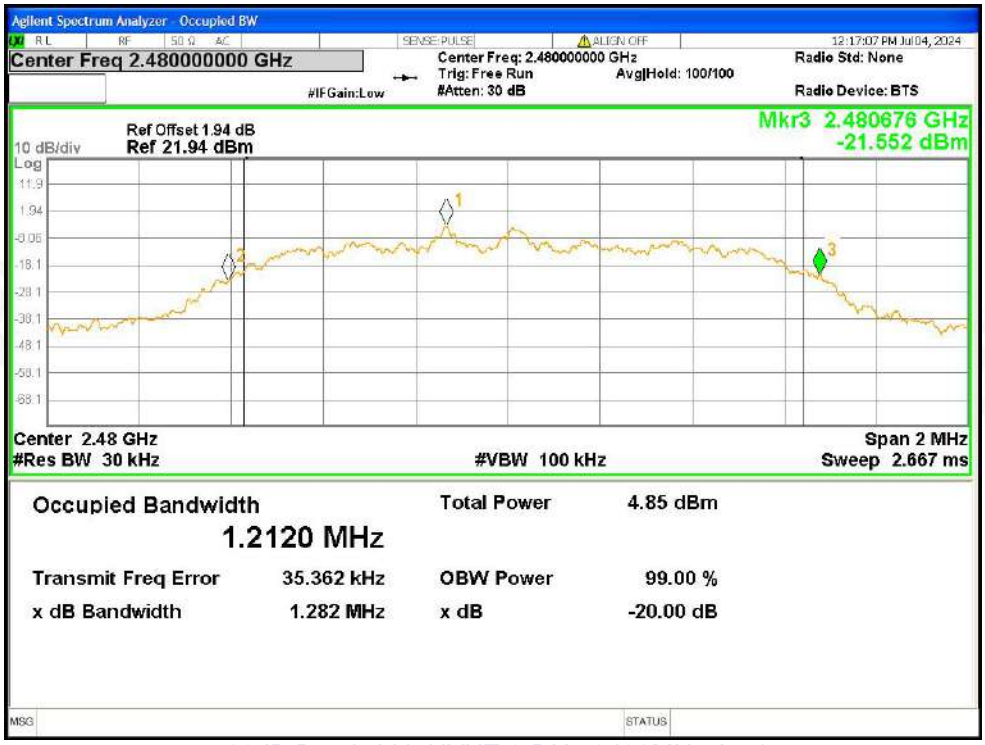
-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1



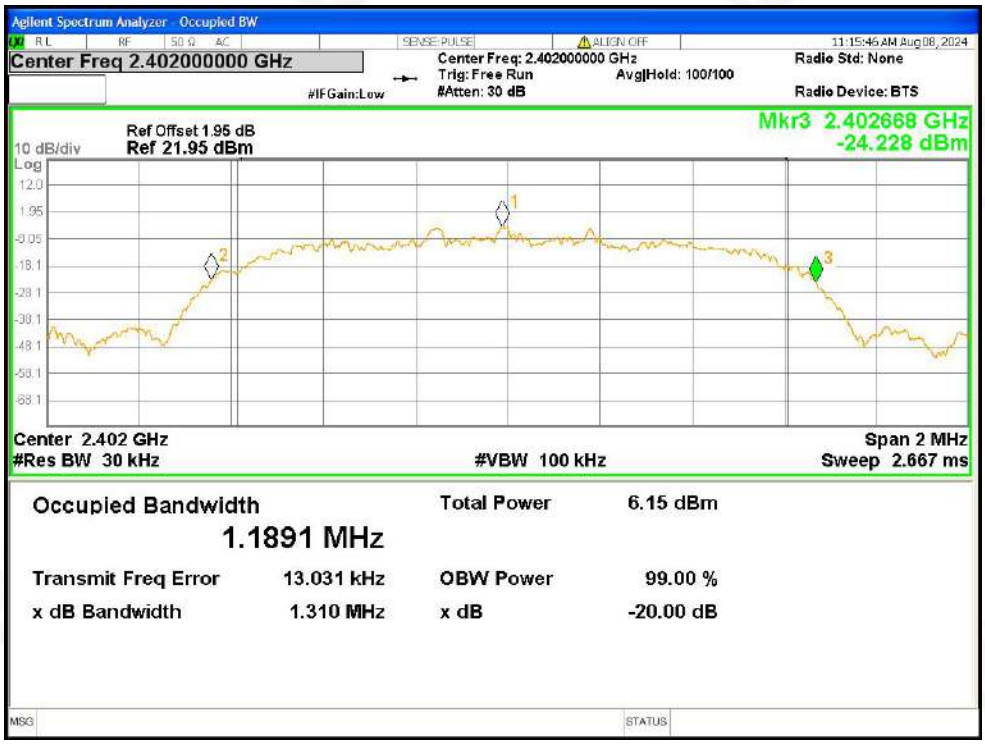
-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1



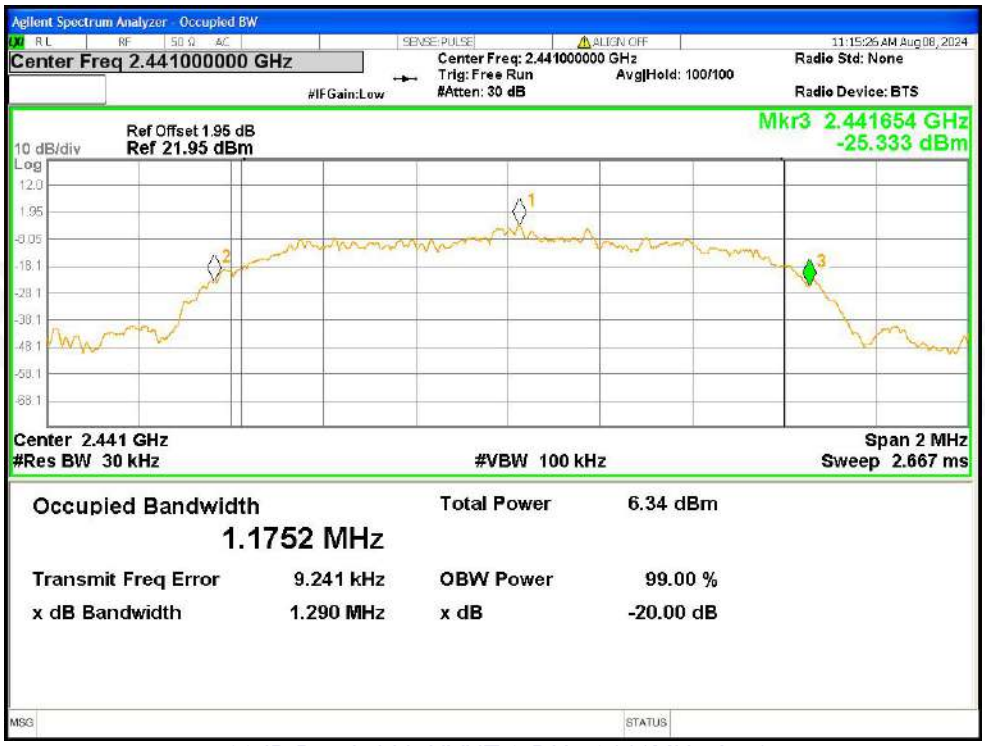
-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1



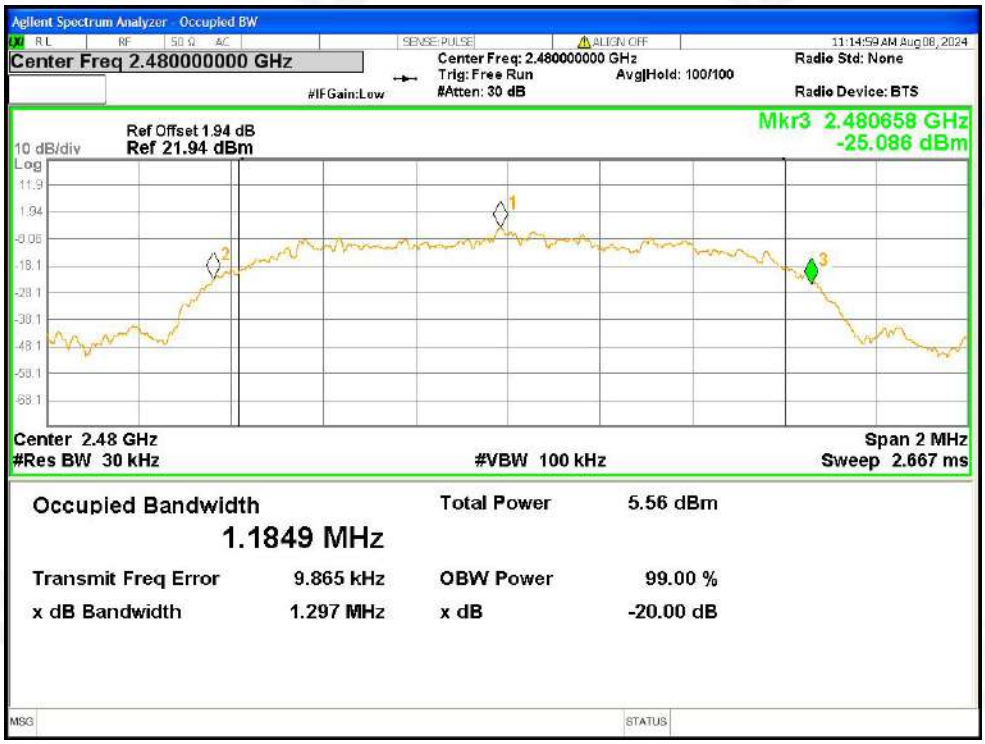
-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1

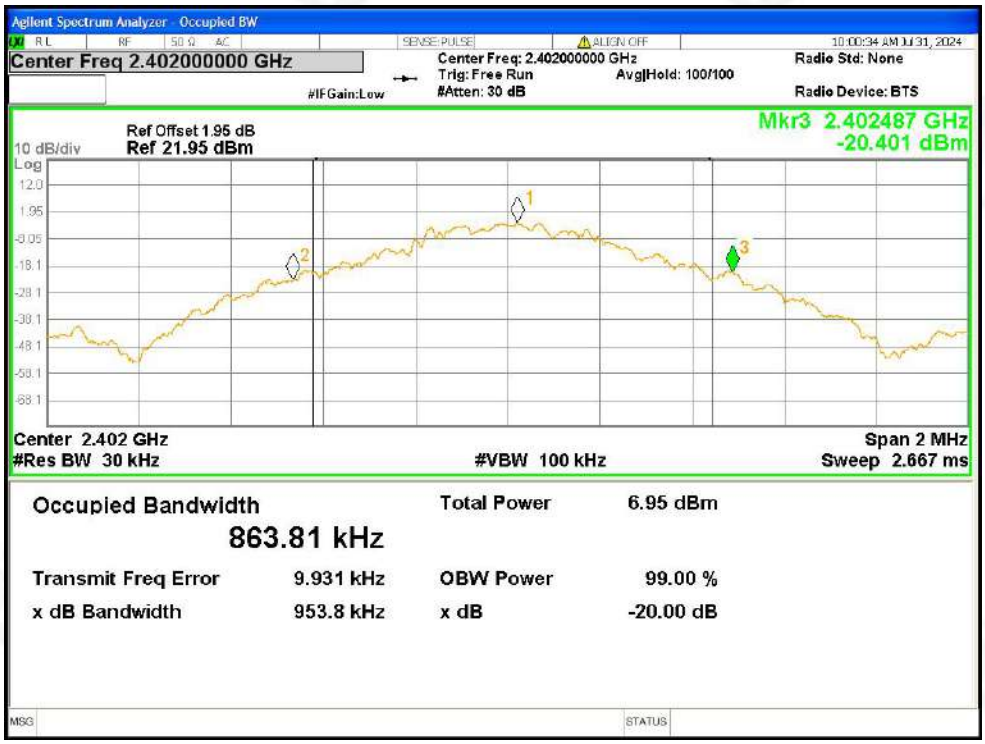


-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1



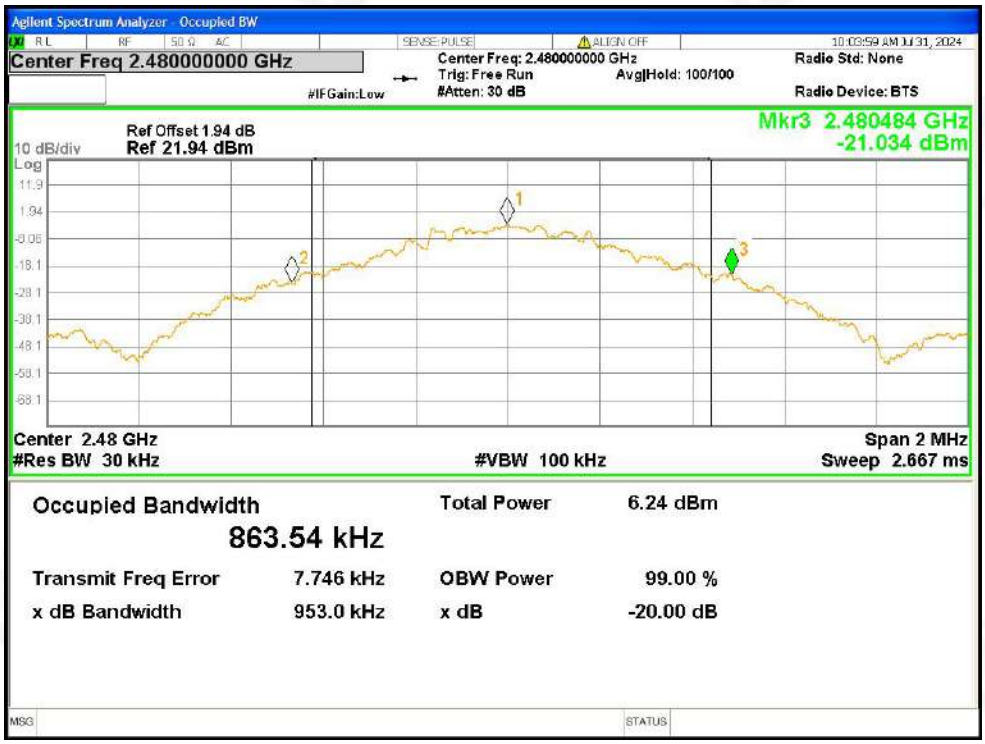
-20dB Bandwidth NVNT 3-DH5 2480MHz Ant1

right				
Mode	Test channel	20dB Emission Bandwidth (MHz)	99%Bandwidth (MHz)	Result
GFSK	Lowest	0.954	0.864	Pass
	Middle	0.951	0.860	
	Highest	0.953	0.864	
π/4-DQPSK	Lowest	1.275	1.168	Pass
	Middle	1.278	1.183	
	Highest	1.269	1.169	
8-DPSK	Lowest	1.281	1.189	Pass
	Middle	1.323	1.190	
	Highest	1.298	1.175	

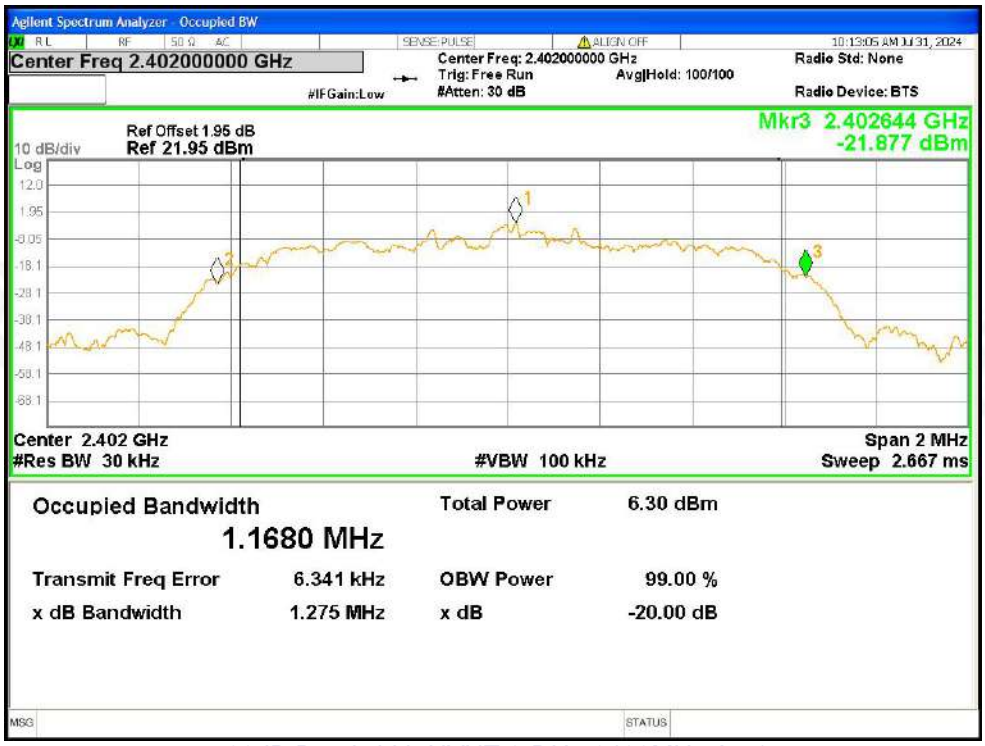


-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1

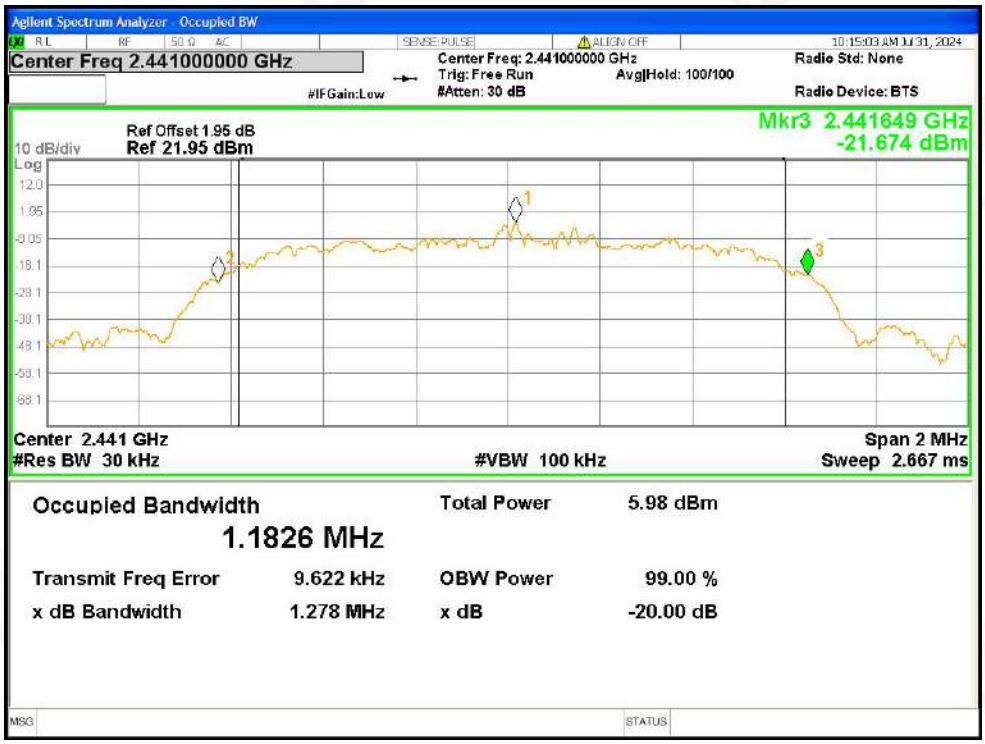
-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1



-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1

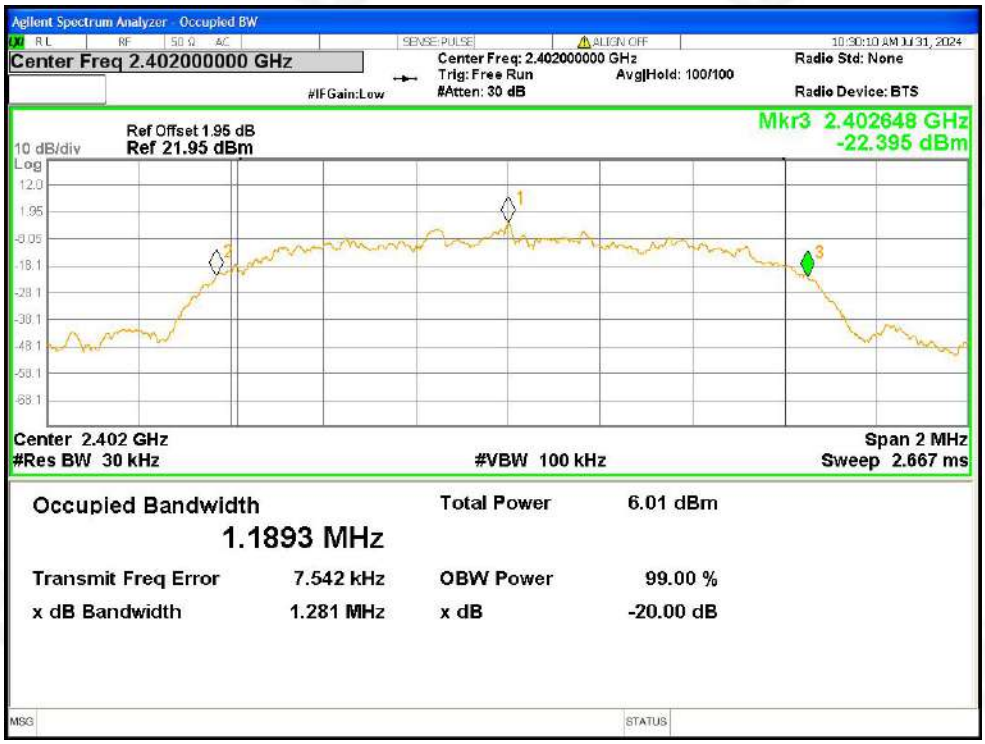


-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1

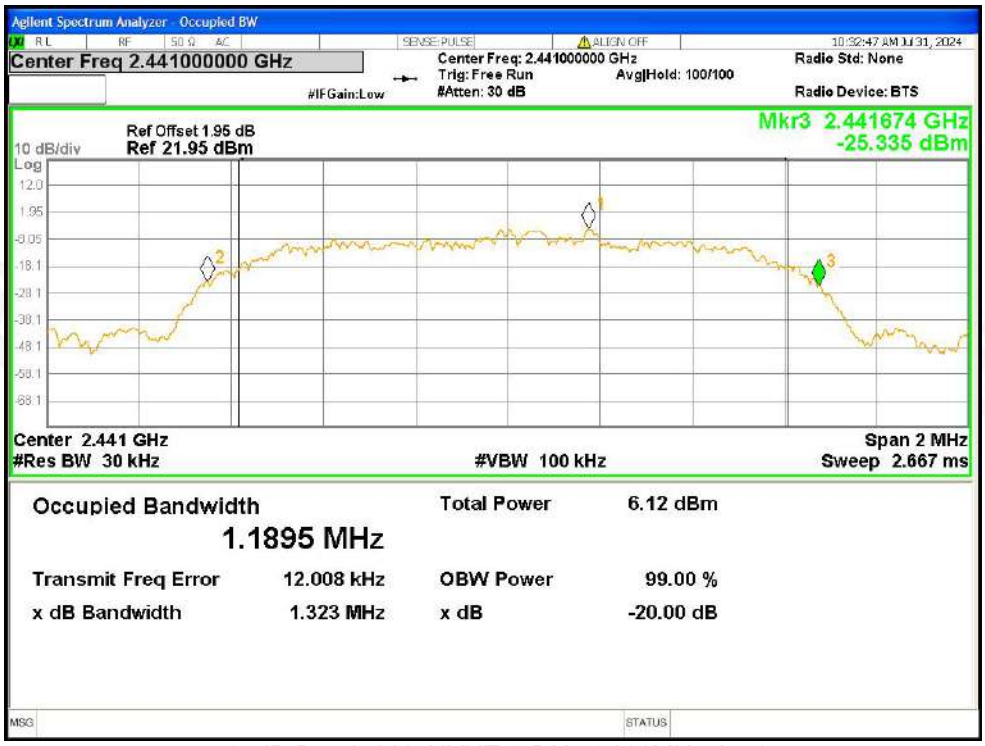


-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1

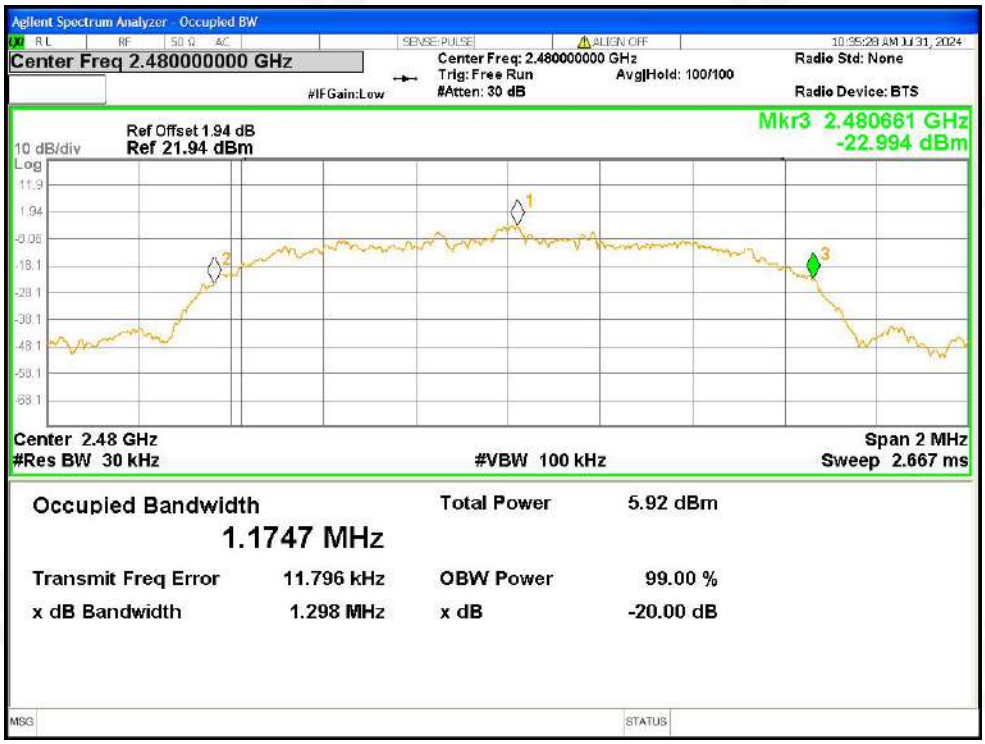
-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1

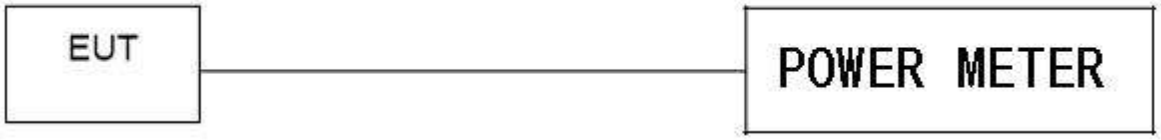


-20dB Bandwidth NVNT 3-DH5 2480MHz Ant1

8. Maximum Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(1)
Test Method:	ANSI C63.10:2013
Limit:	GFSK:30 dBm π/4-DQPSK & 8-DPSK:20.97 dBm

8.1 Block Diagram Of Test Setup



8.2 Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W.

8.3 Test procedure

The EUT was directly connected to the Power meter

8.4 DEVIATION FROM STANDARD

No deviation.

8.5 Test Result

left				
Mode	Test channel	Peak Output Power (dBm)	FCC Limit (dBm)	Result
GFSK	Lowest	1.05	30.00	Pass
	Middle	0.11		
	Highest	-0.77		
π/4-DQPSK	Lowest	1.66	21.00	Pass
	Middle	1.01		
	Highest	-0.02		
8-DPSK	Lowest	0.95	21.00	Pass
	Middle	0.01		
	Highest	-0.96		

right				
Mode	Test channel	Peak Output Power (dBm)	FCC Limit (dBm)	Result
GFSK	Lowest	1.13	30.00	Pass
	Middle	1.19		
	Highest	0.48		
π/4-DQPSK	Lowest	1.89	21.00	Pass
	Middle	2		
	Highest	1.24		
8-DPSK	Lowest	2.23	21.00	Pass
	Middle	2.21		
	Highest	1.48		

9. HOPPING CHANNEL SEPARATION

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, detector=Peak
Limit:	GFSK: 20dB bandwidth π/4-DQPSK & 8DSK: 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)

9.1 Test Setup

9.2 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 Test Result

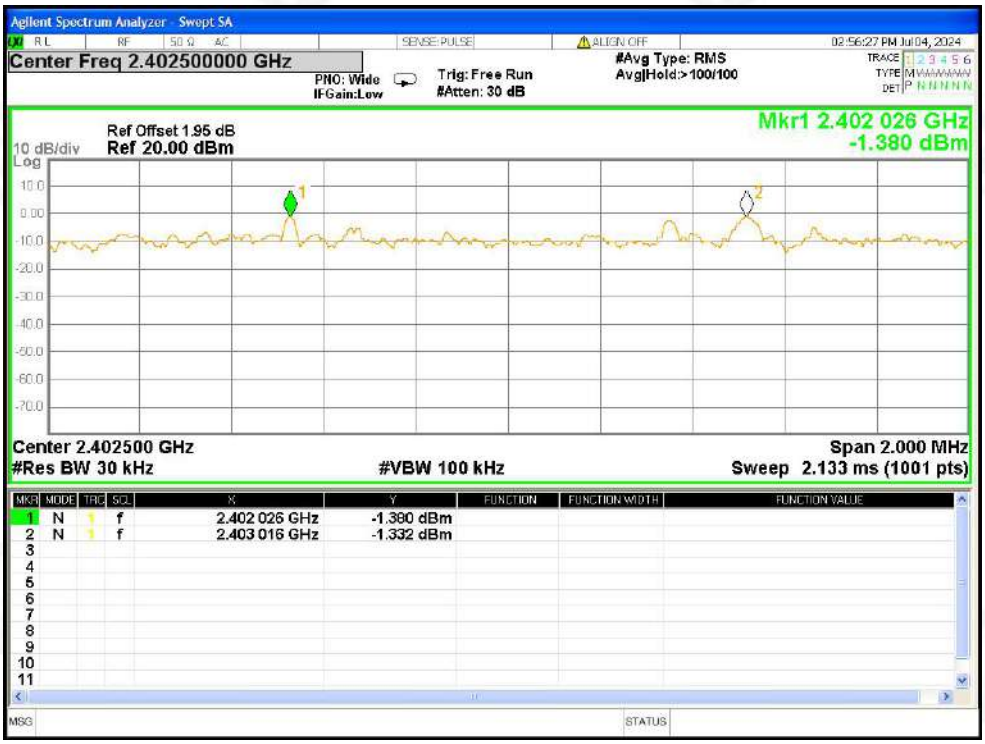
left				
Modulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low	1.006	0.954	PASS
GFSK	Middle	1.016	0.951	PASS
GFSK	High	1.01	0.953	PASS
π/4-DQPSK	Low	0.99	0.849	PASS
π/4-DQPSK	Middle	1.244	0.883	PASS
π/4-DQPSK	High	0.856	0.855	PASS
8-DPSK	Low	0.996	0.863	PASS
8-DPSK	Middle	1.006	0.855	PASS
8-DPSK	High	1.284	0.851	PASS

Test plots

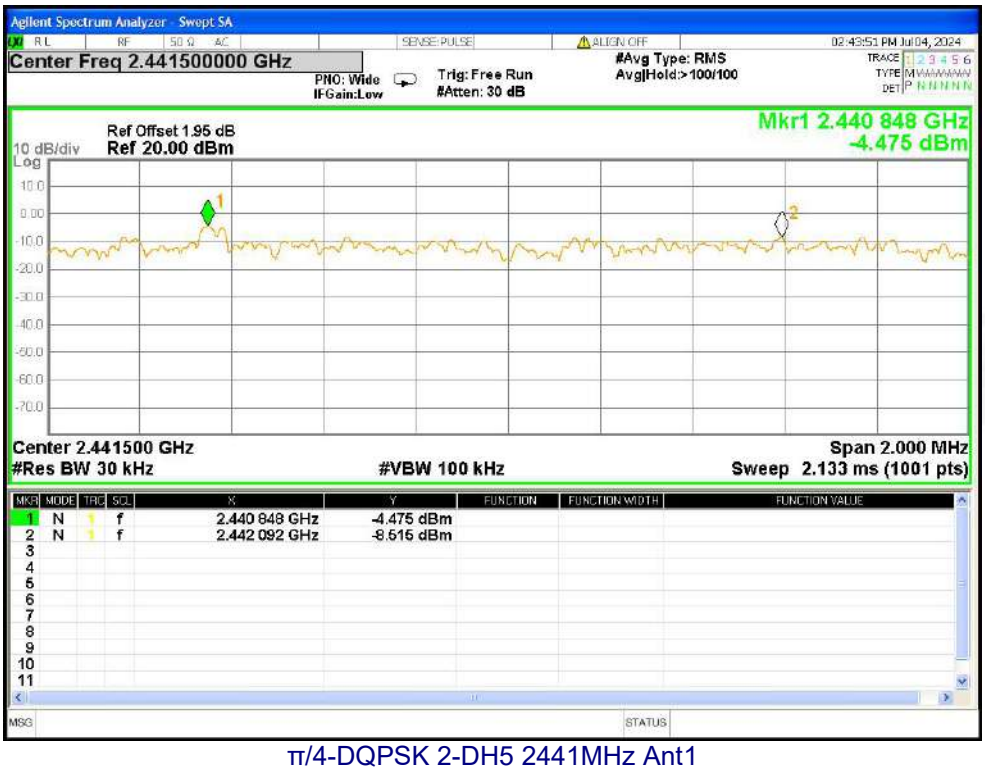
GFSK 1-DH5 2402MHz Ant1

GFSK 1-DH5 2441MHz Ant1

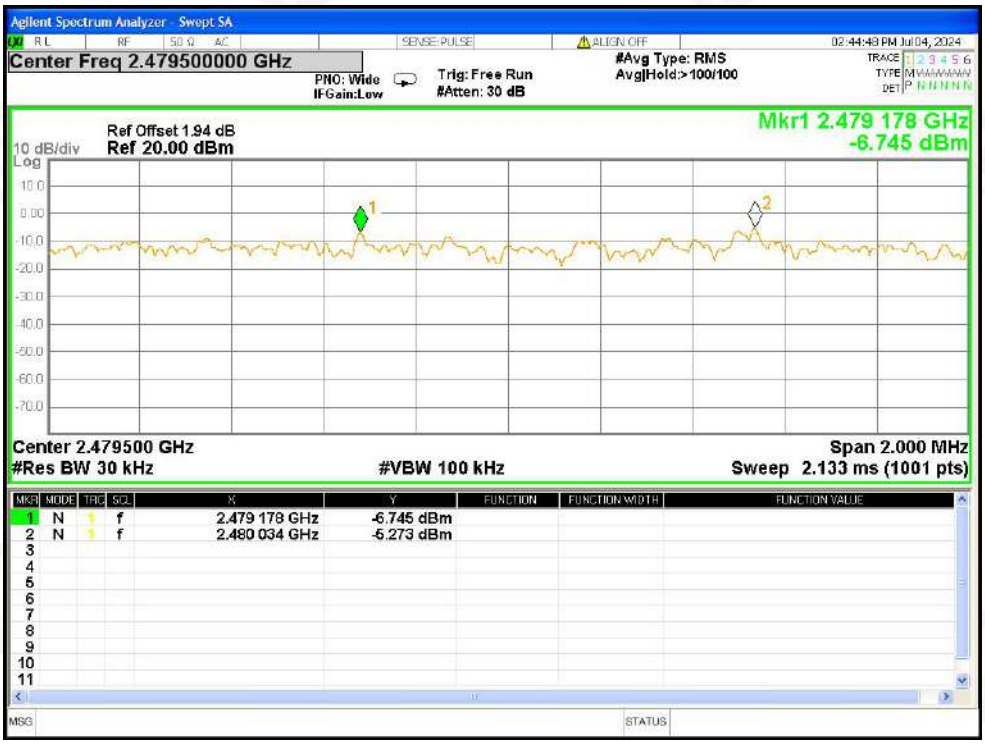
GFSK 1-DH5 2480MHz Ant1



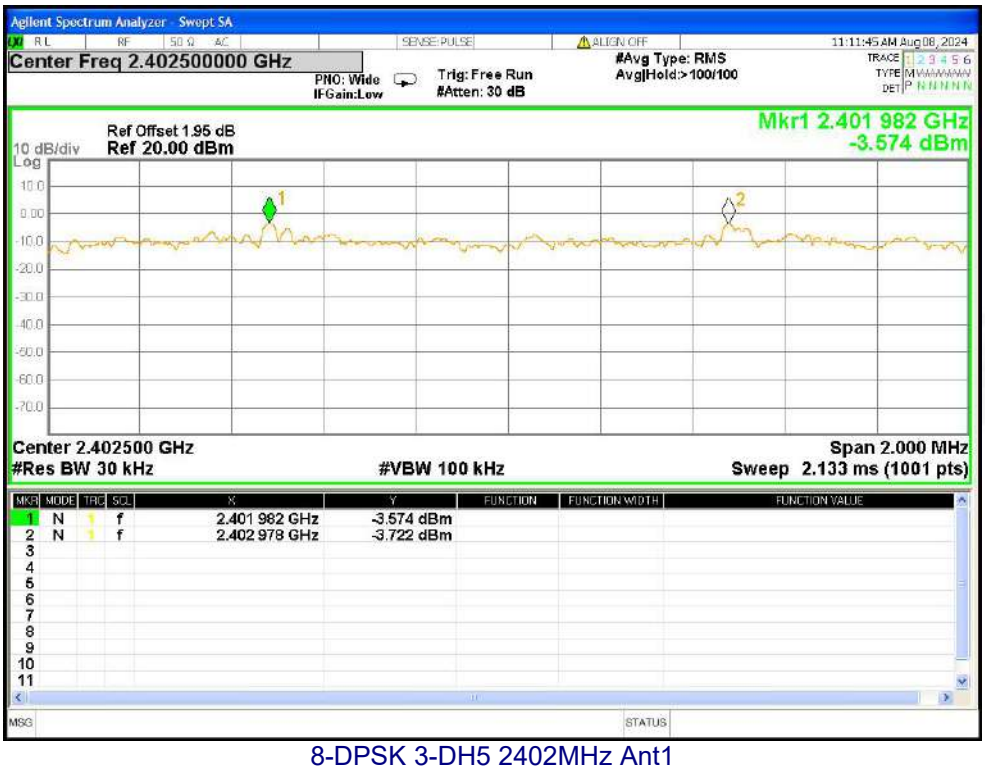
π/4-DQPSK 2-DH5 2402MHz Ant1



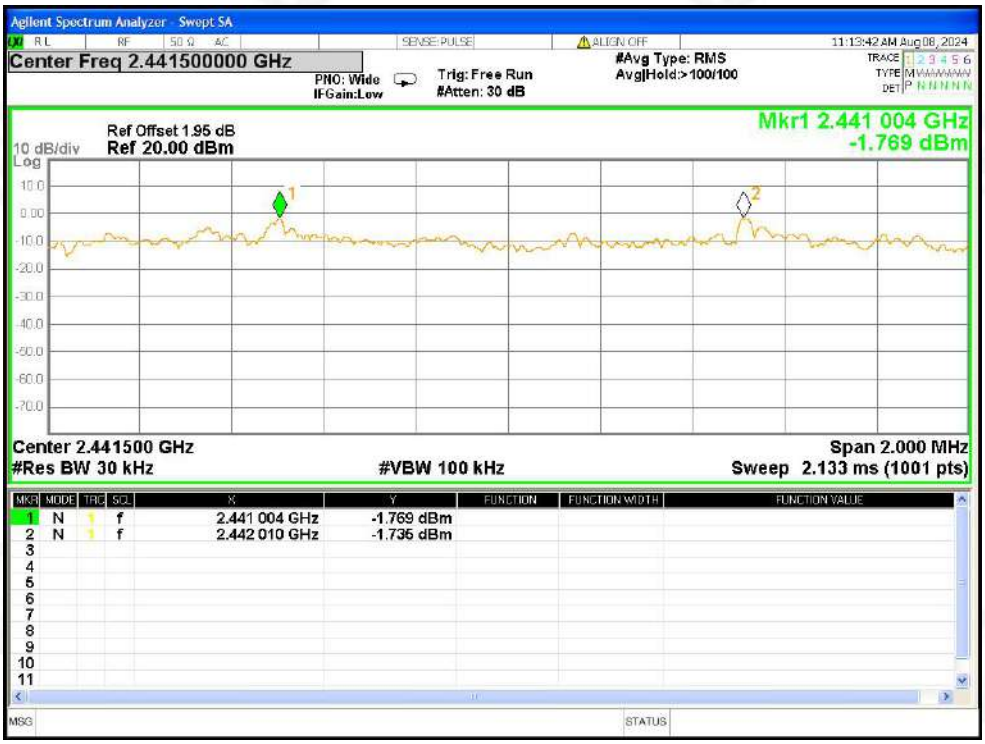
π/4-DQPSK 2-DH5 2441MHz Ant1



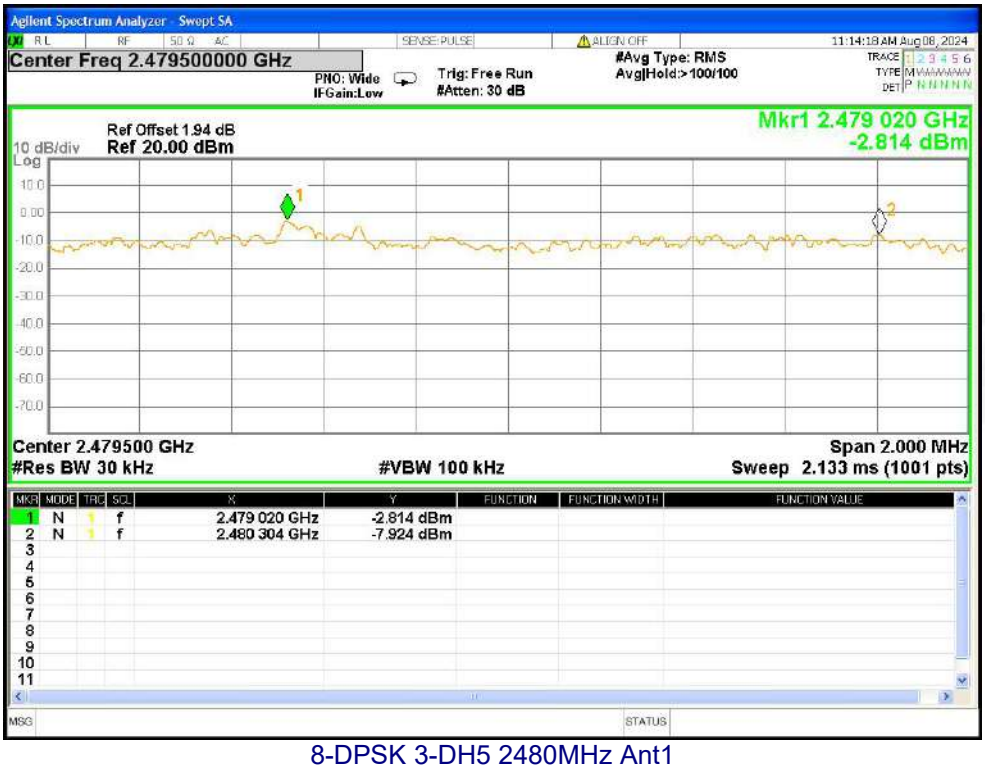
π/4-DQPSK 2-DH5 2480MHz Ant1



8-DPSK 3-DH5 2402MHz Ant1



8-DPSK 3-DH5 2441MHz Ant1

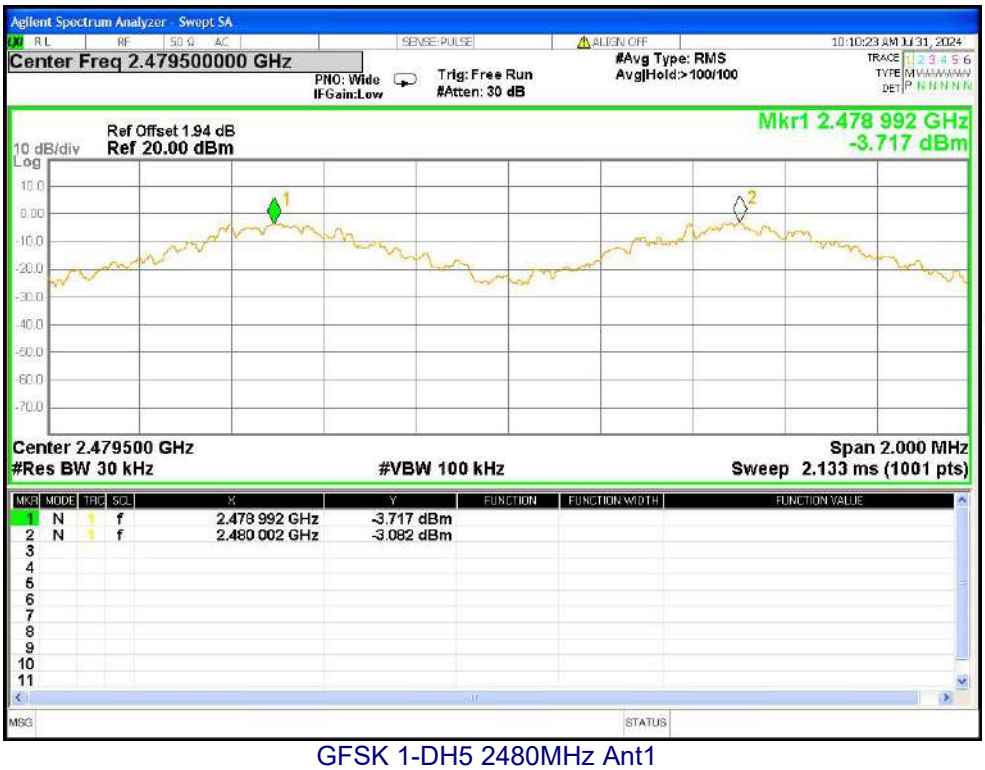


8-DPSK 3-DH5 2480MHz Ant1

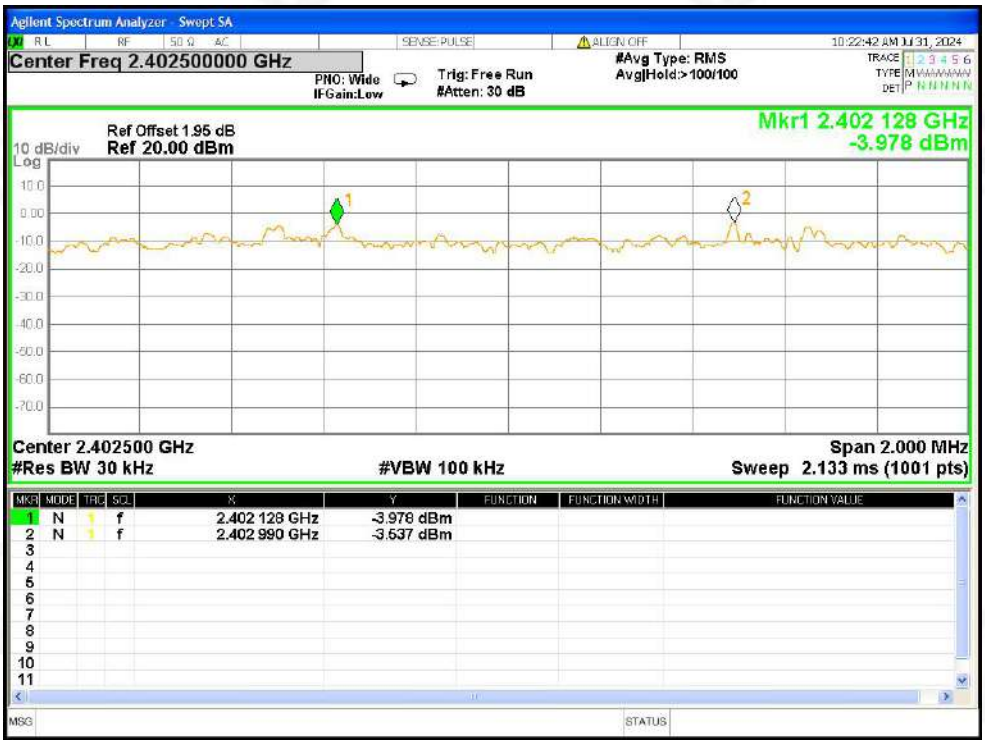
right				
Modulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low	1.006	0.954	PASS
GFSK	Middle	1.016	0.951	PASS
GFSK	High	1.01	0.953	PASS
π/4-DQPSK	Low	0.862	0.85	PASS
π/4-DQPSK	Middle	1.128	0.852	PASS
π/4-DQPSK	High	1.136	0.846	PASS
8-DPSK	Low	1.156	0.854	PASS
8-DPSK	Middle	0.988	0.882	PASS
8-DPSK	High	0.99	0.865	PASS

GFSK 1-DH5 2402MHz Ant1

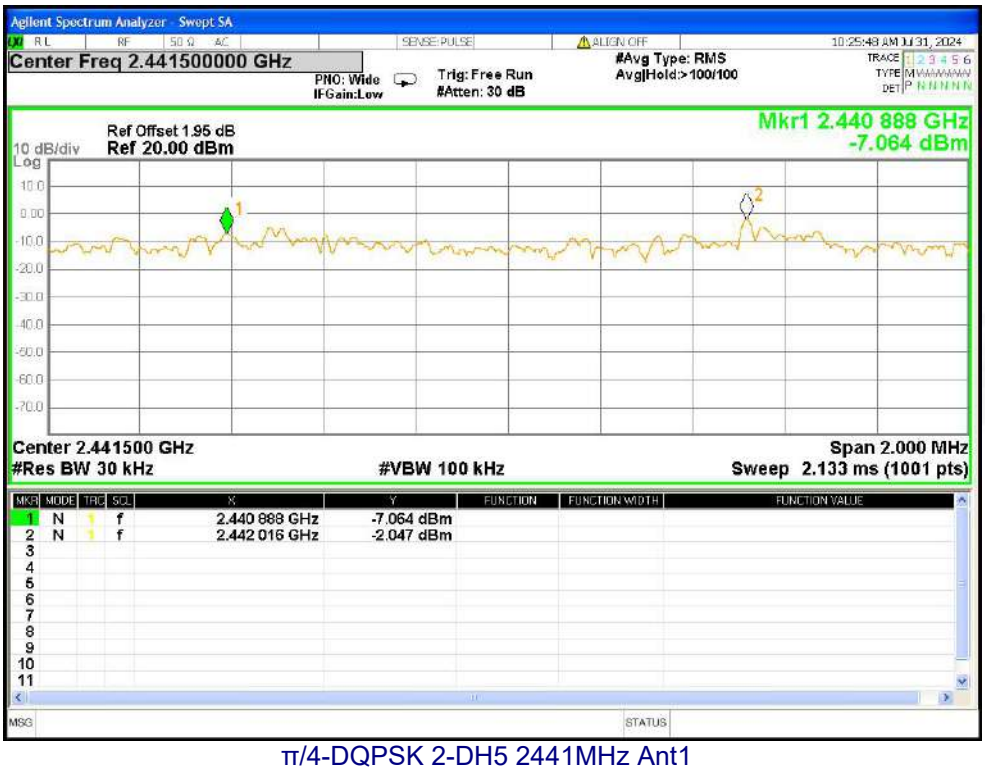
GFSK 1-DH5 2441MHz Ant1



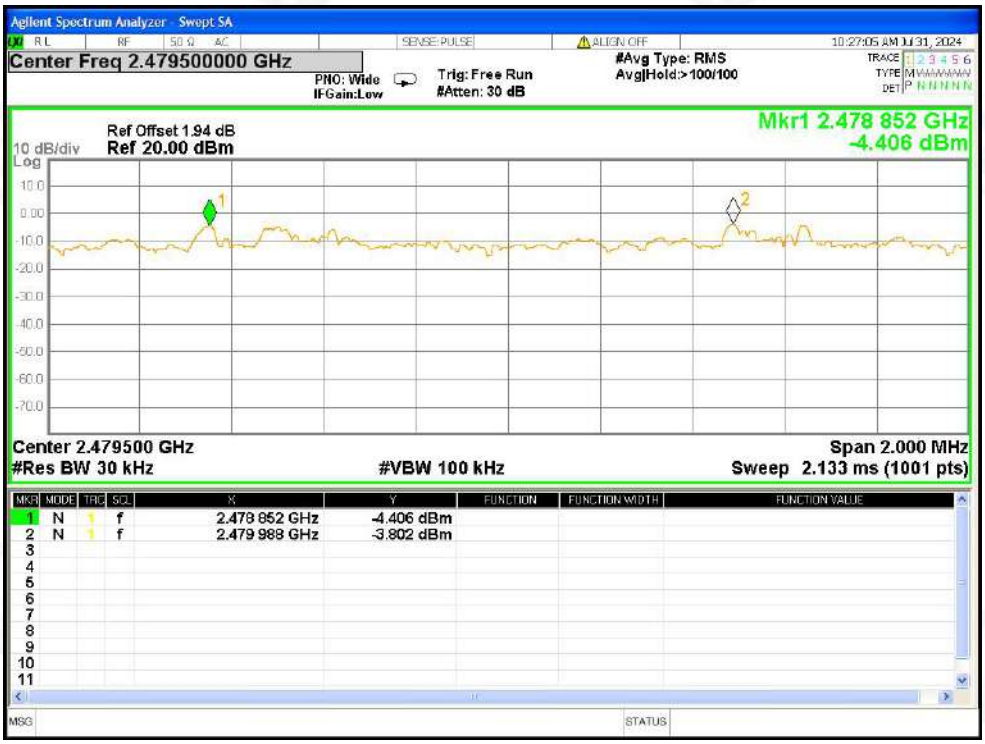
GFSK 1-DH5 2480MHz Ant1



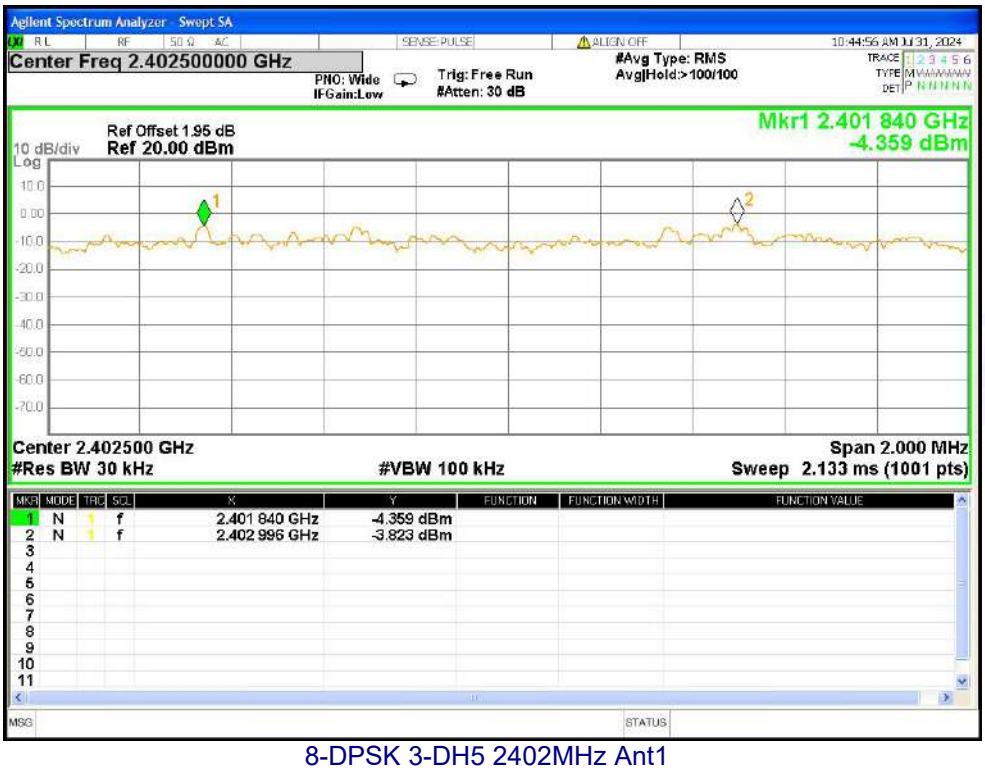
π/4-DQPSK 2-DH5 2402MHz Ant1



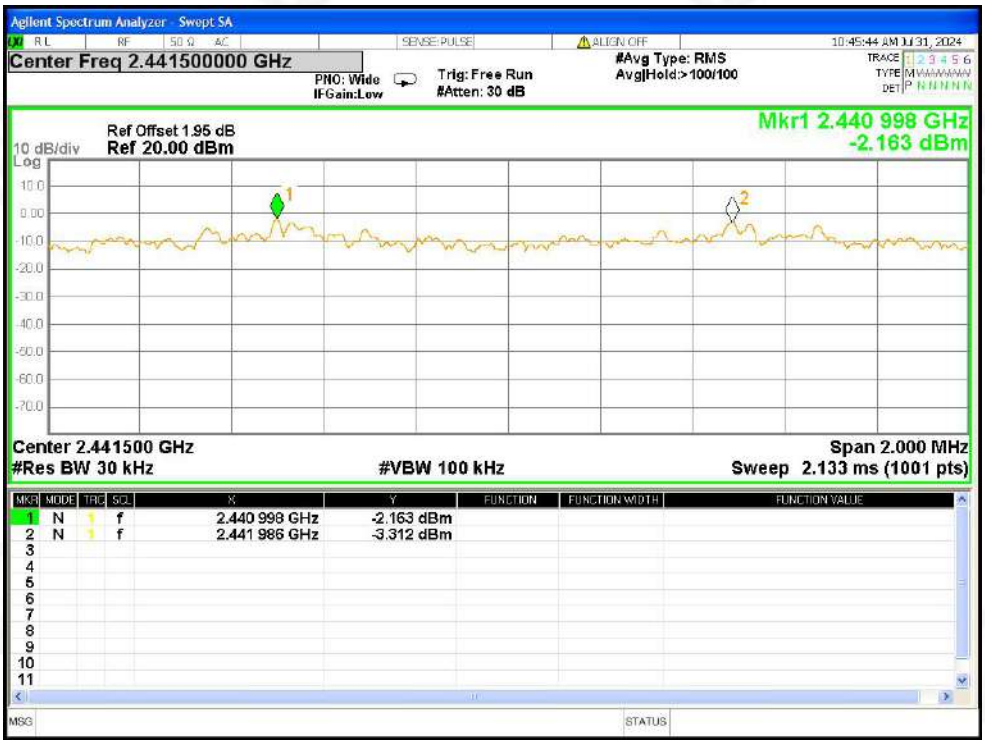
π/4-DQPSK 2-DH5 2441MHz Ant1



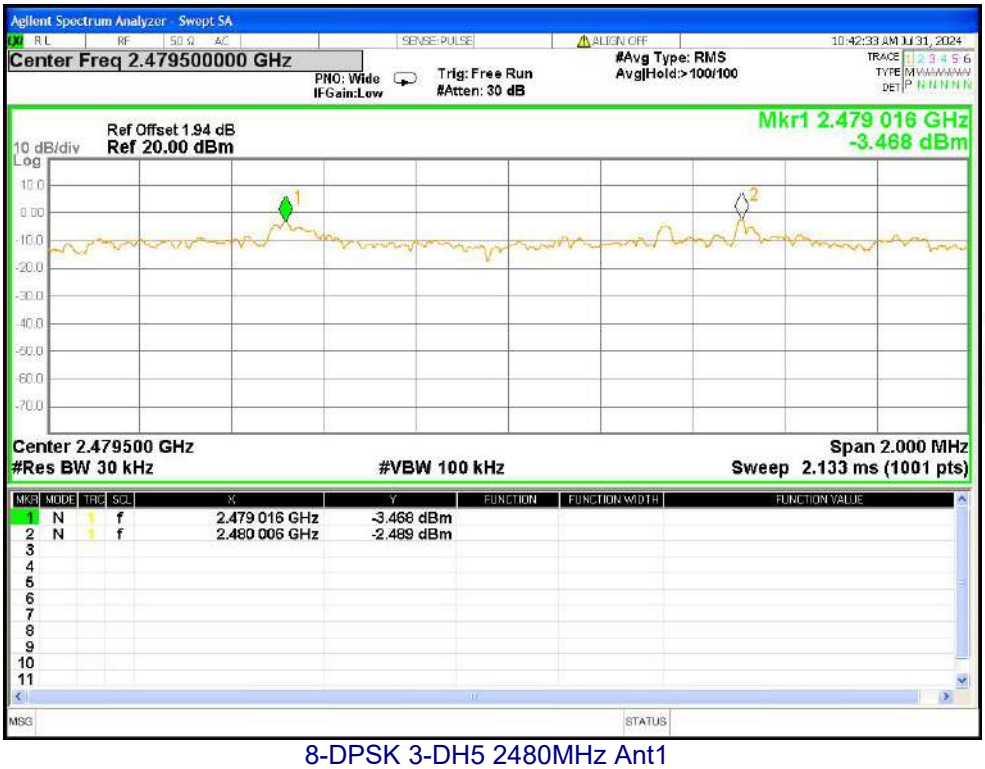
π/4-DQPSK 2-DH5 2480MHz Ant1



8-DPSK 3-DH5 2402MHz Ant1



8-DPSK 3-DH5 2441MHz Ant1



8-DPSK 3-DH5 2480MHz Ant1

10.NUMBER OF HOPPING FREQUENCY

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels

10.1 Test Setup

10.2 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.

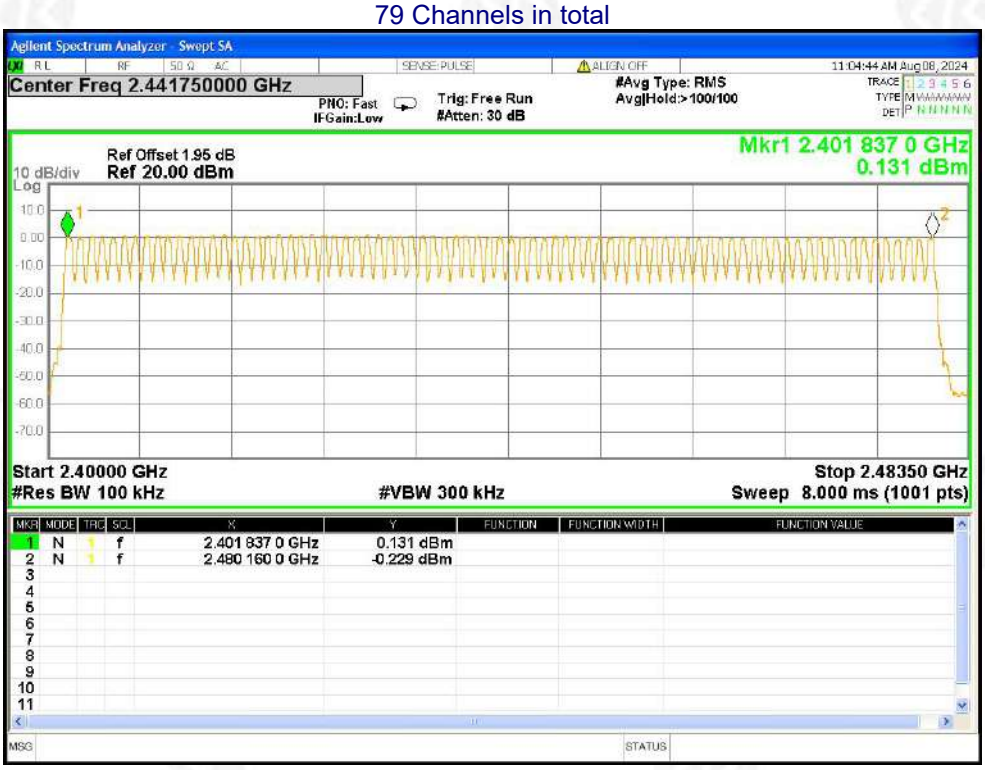
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

10.3 DEVIATION FROM STANDARD

No deviation.

10.4 Test Result

left
Test Plots:
79 Channels in total



Hopping No. NVNT 1-DH5 2402MHz Ant1

Hopping No. NVNT 2-DH5 2402MHz Ant1

Hopping No. NVNT 3-DH5 2402MHz Ant1

right
Test Plots:

Hopping No. NVNT 1-DH5 2402MHz Ant1

Hopping No. NVNT 2-DH5 2402MHz Ant1

Hopping No. NVNT 3-DH5 2402MHz Ant1

11. DWELL TIME

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=1MHz, VBW=3MHz, Span=0Hz, Detector=Peak
Limit:	≤0.4 Second

11.1 Test Setup

11.2 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set spectrum analyzer span = 0Hz;

3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH1/DH2/2DH1/2DH3/3DH1/3DH3 DH5/2DH5/3DH5 packet transmitting.

4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

11.3 DEVIATION FROM STANDARD

No deviation.

11.4 Test Result

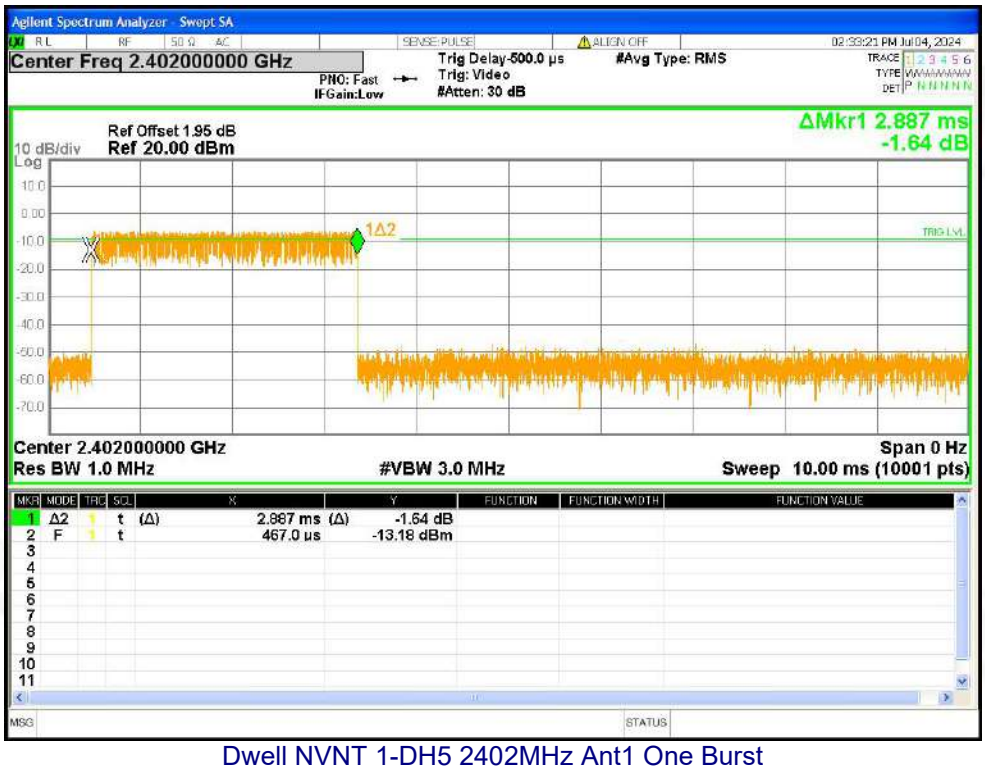
left

Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
1-DH5	2402	Ant1	2.887	311.796	108	31600	400	Pass
1-DH5	2441	Ant1	2.887	311.796	108	31600	400	Pass
1-DH5	2480	Ant1	2.886	320.346	111	31600	400	Pass
2-DH5	2402	Ant1	2.885	349.085	121	31600	400	Pass
2-DH5	2441	Ant1	2.891	309.337	107	31600	400	Pass
2-DH5	2480	Ant1	2.891	286.209	99	31600	400	Pass
3-DH5	2402	Ant1	2.915	303.16	104	31600	400	Pass
3-DH5	2441	Ant1	2.911	308.566	106	31600	400	Pass
3-DH5	2480	Ant1	2.912	308.672	106	31600	400	Pass

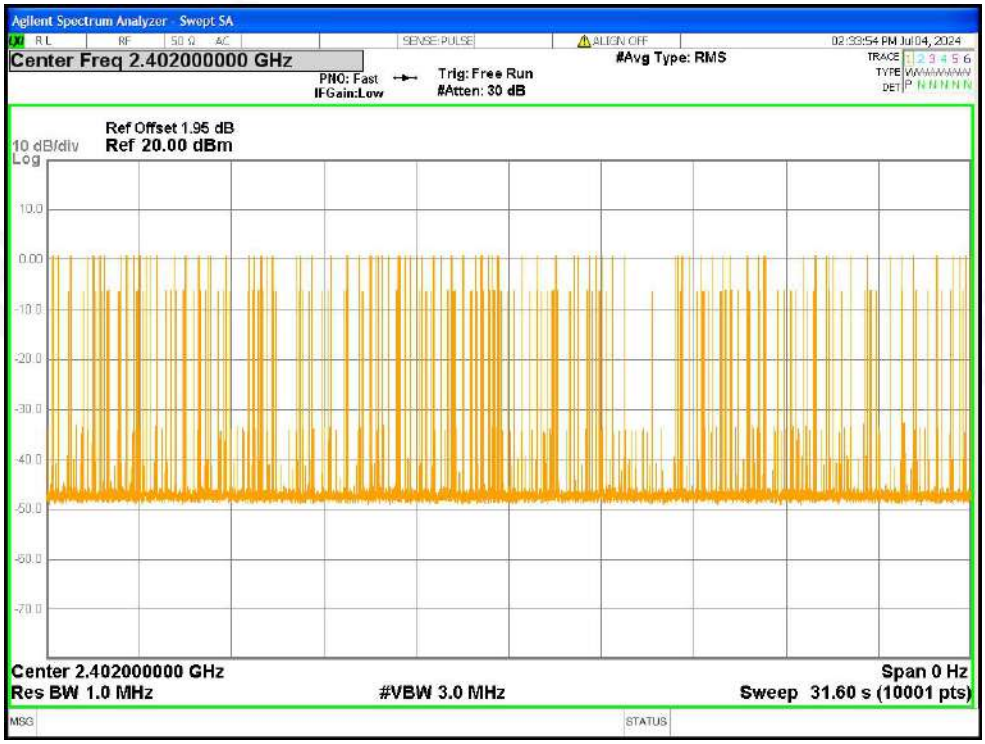
Note1：Total Dwell Time (ms)=Pulse Time (ms)*Burst Count

Note2：Only the worst test data DH5/2DH5/3DH5 put in the report

Test Plots

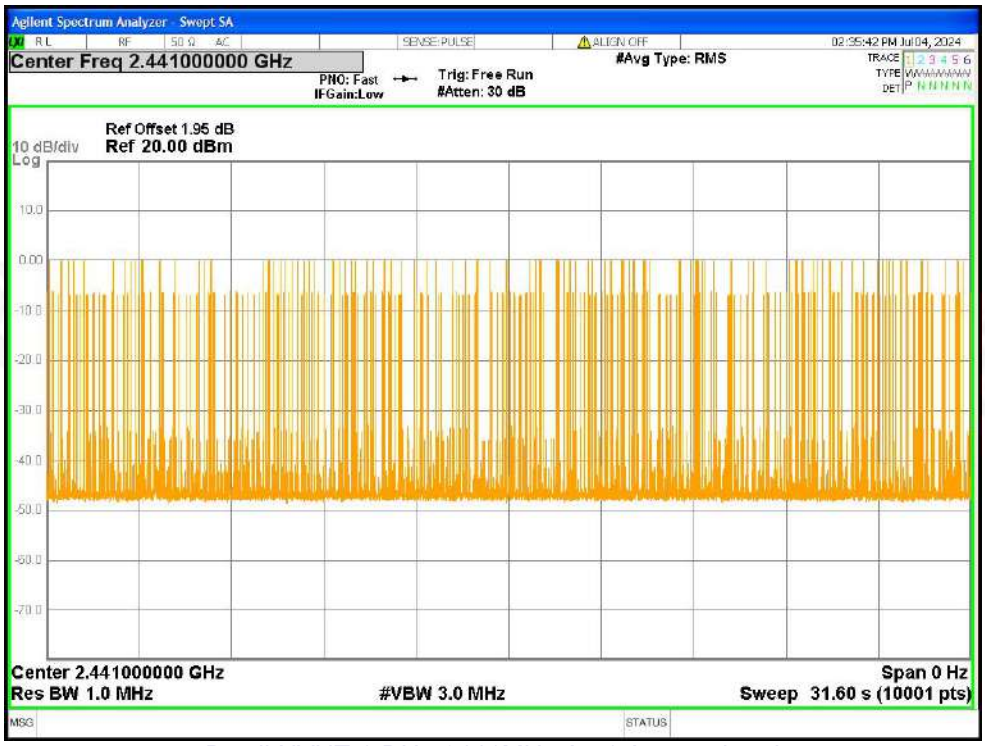


Dwell NVNT 1-DH5 2402MHz Ant1 One Burst

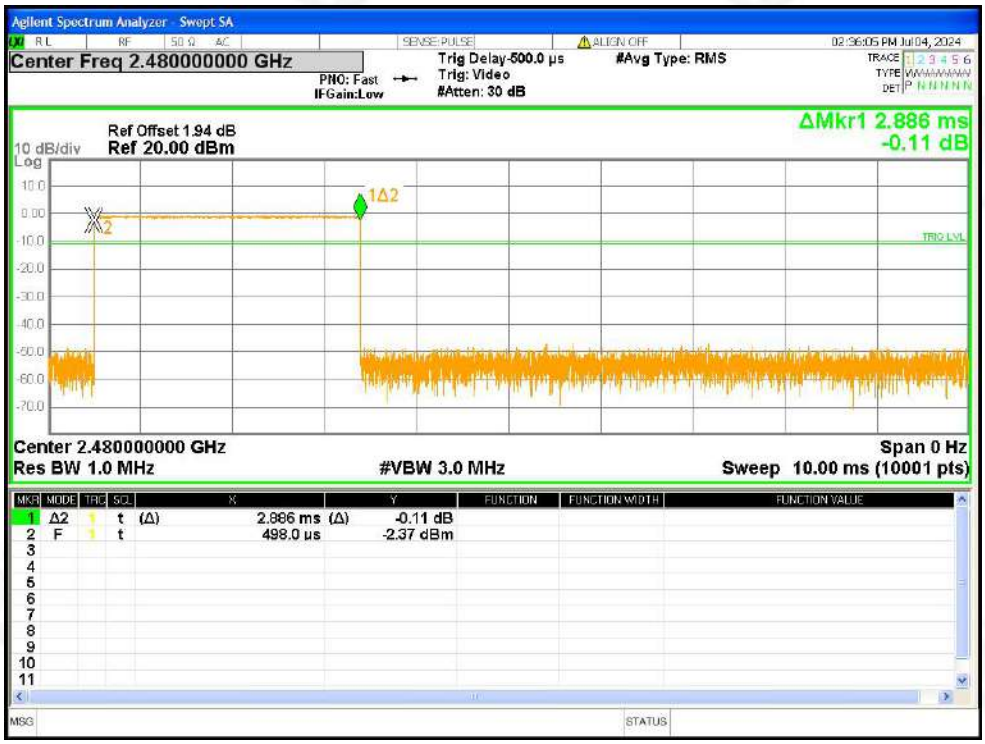


Dwell NVNT 1-DH5 2402MHz Ant1 Accumulated

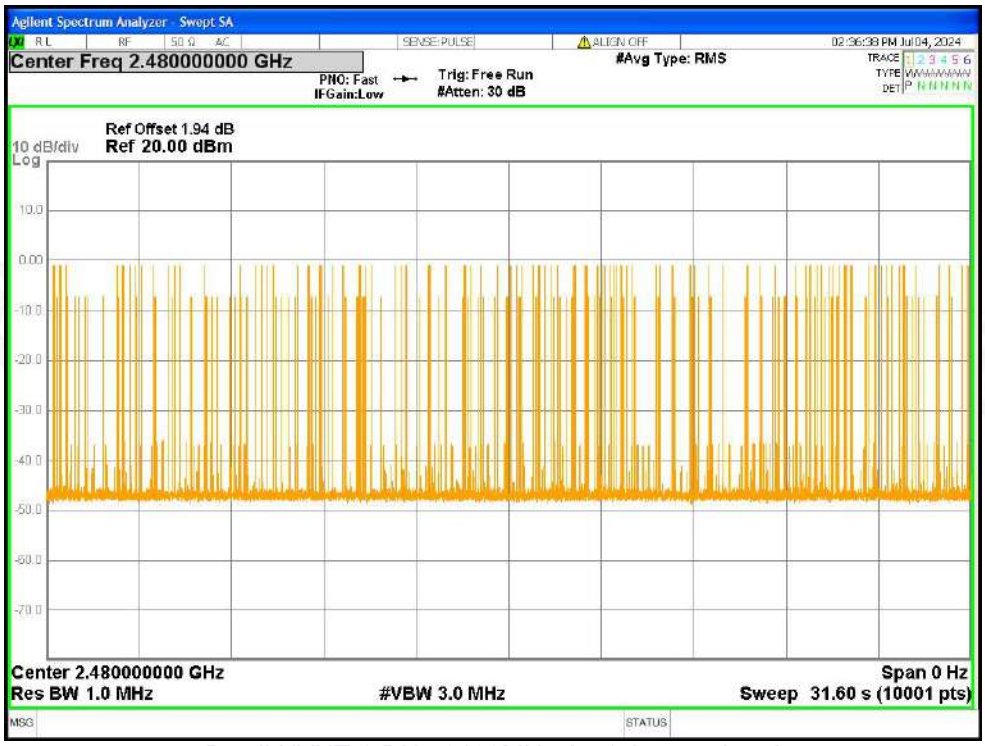
Dwell NVNT 1-DH5 2441MHz Ant1 One Burst



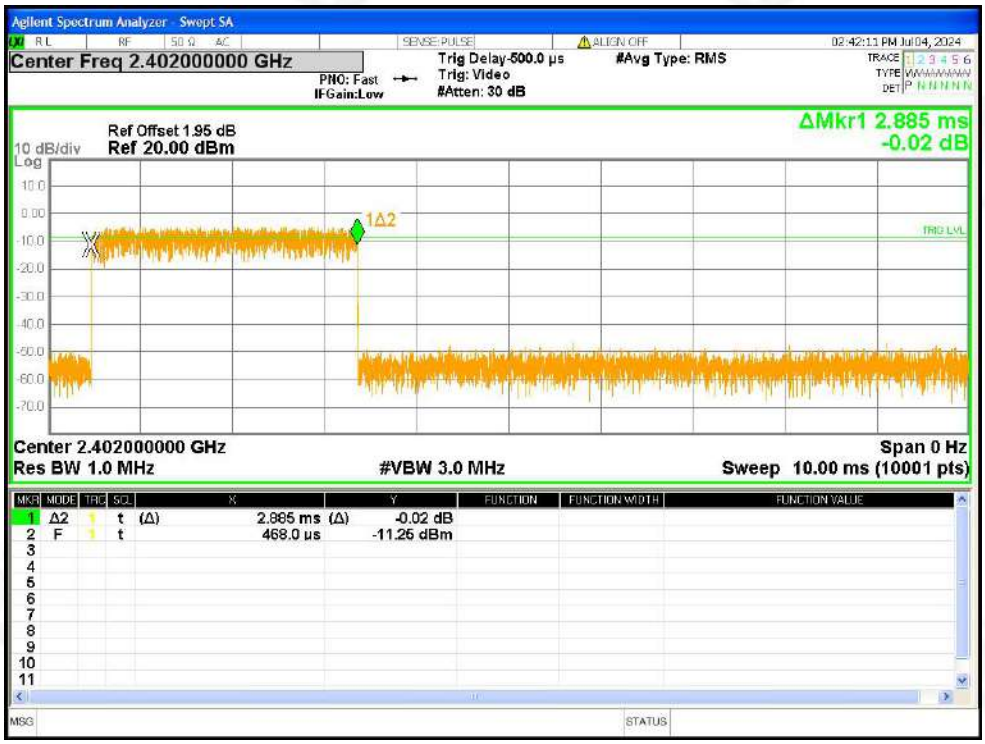
Dwell NVNT 1-DH5 2441MHz Ant1 Accumulated



Dwell NVNT 1-DH5 2480MHz Ant1 One Burst



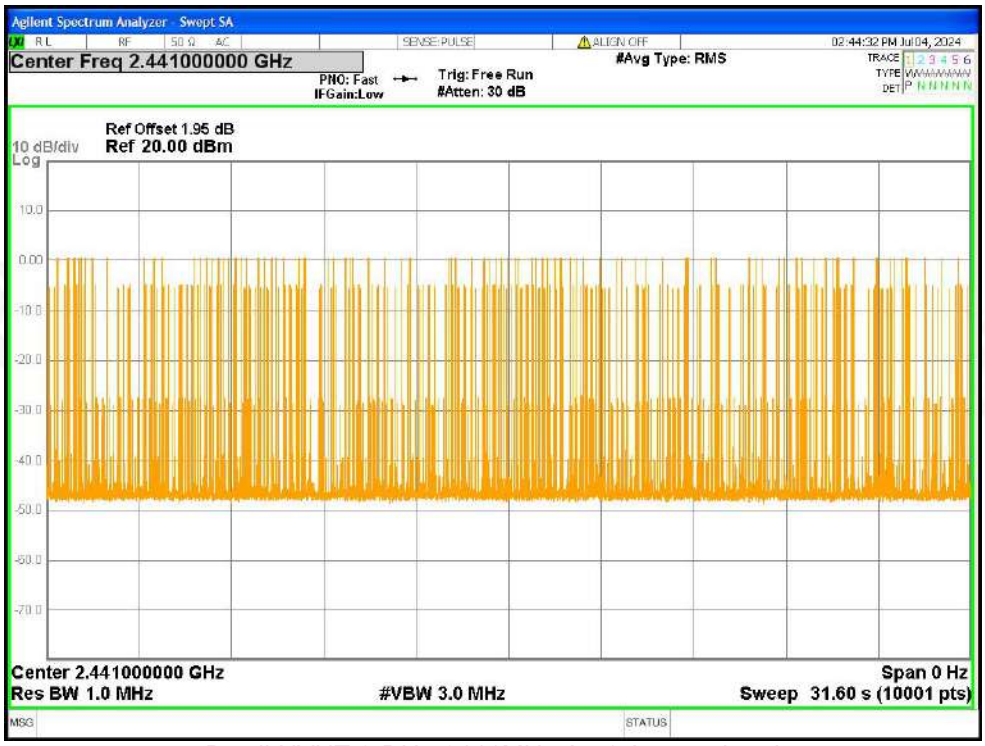
Dwell NVNT 1-DH5 2480MHz Ant1 Accumulated



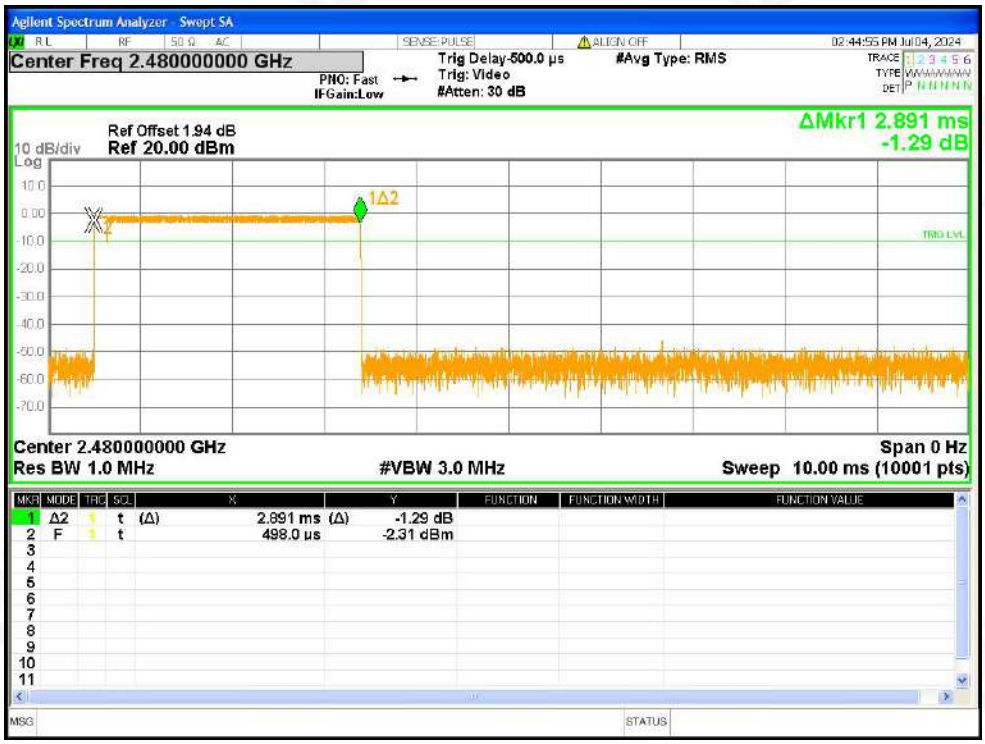
Dwell NVNT 2-DH5 2402MHz Ant1 One Burst

Dwell NVNT 2-DH5 2402MHz Ant1 Accumulated

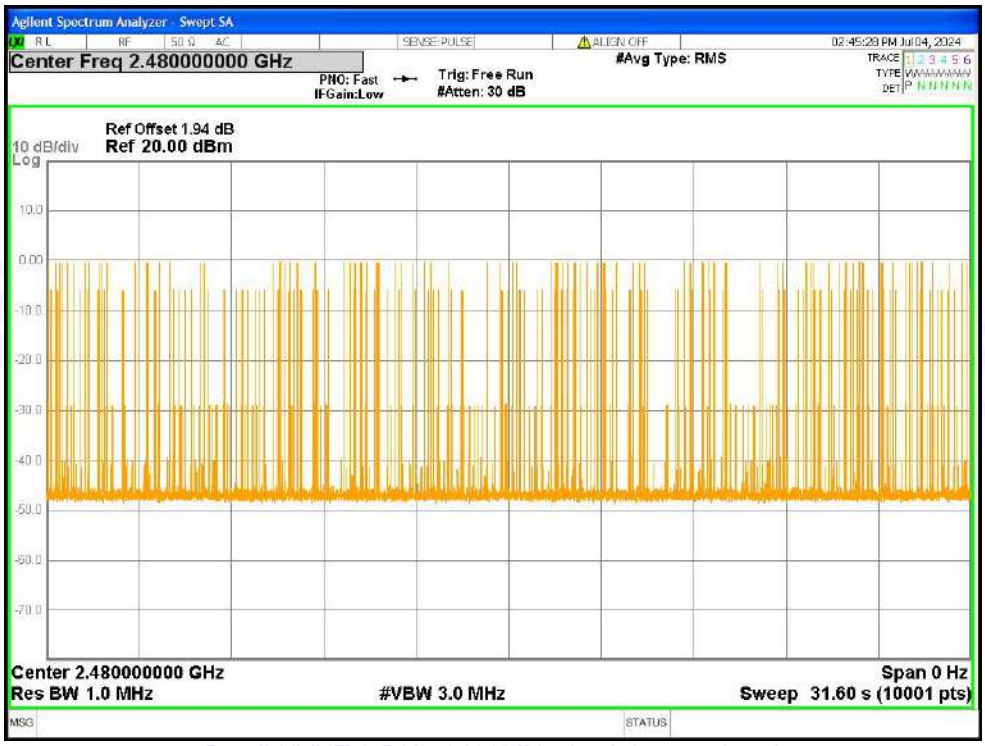
Dwell NVNT 2-DH5 2441MHz Ant1 One Burst



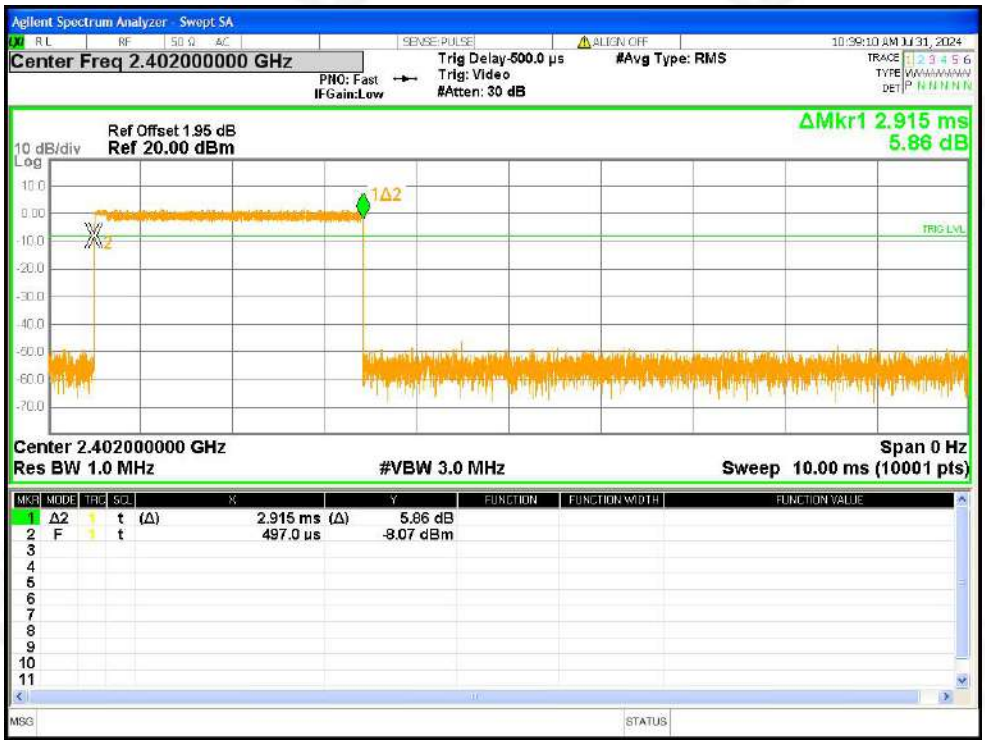
Dwell NVNT 2-DH5 2441MHz Ant1 Accumulated



Dwell NVNT 2-DH5 2480MHz Ant1 One Burst

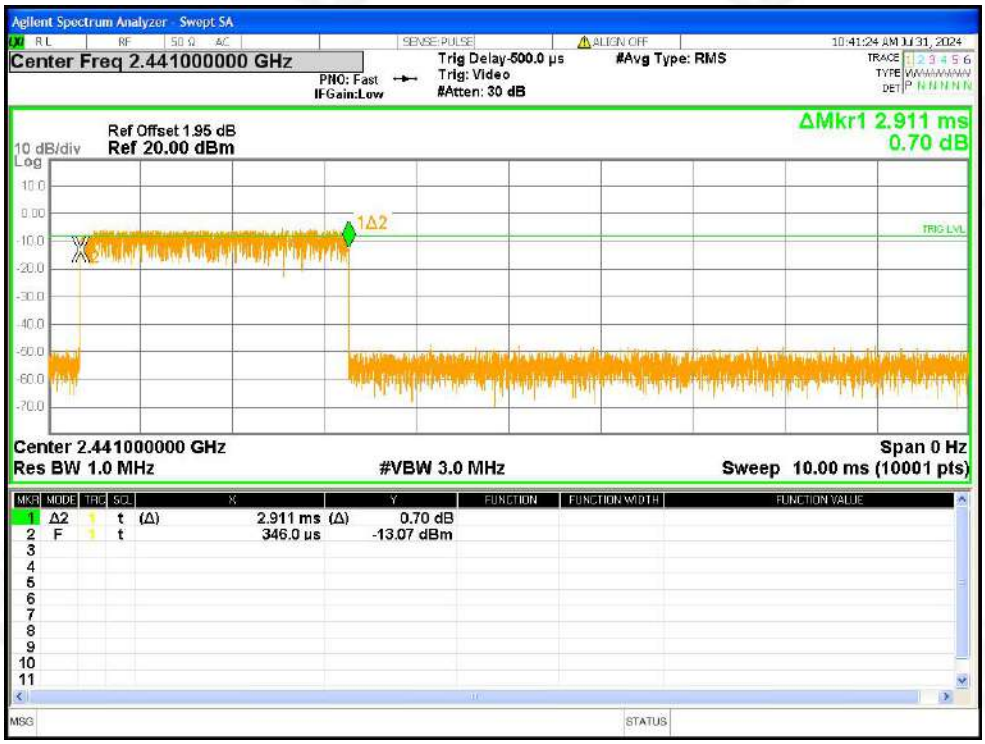


Dwell NVNT 2-DH5 2480MHz Ant1 Accumulated

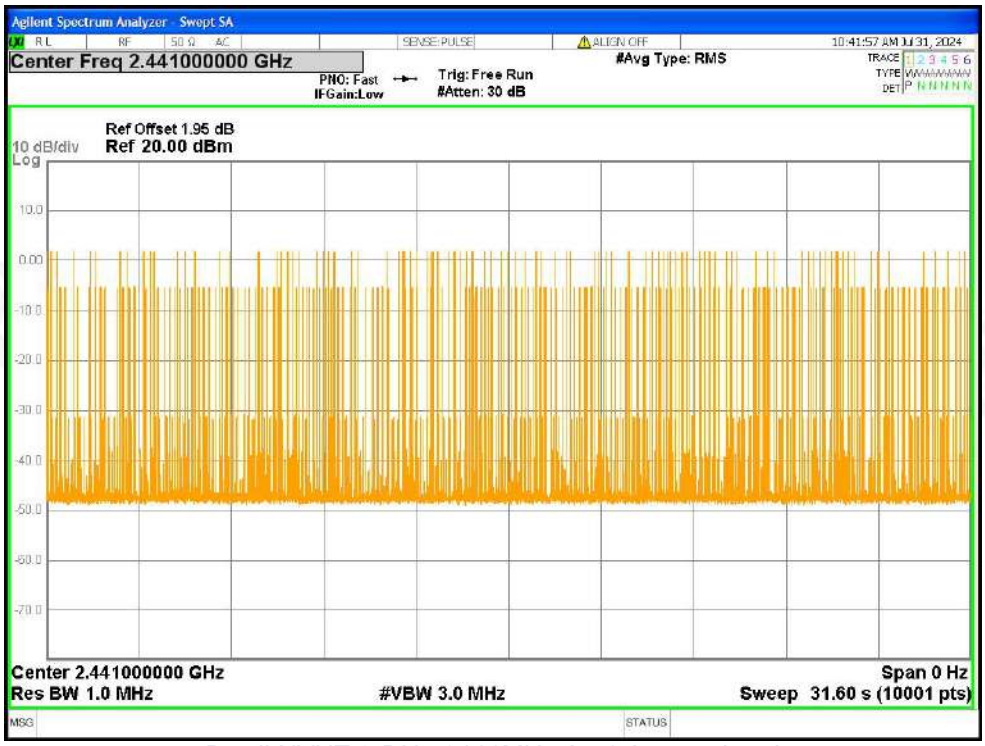


Dwell NVNT 3-DH5 2402MHz Ant1 One Burst

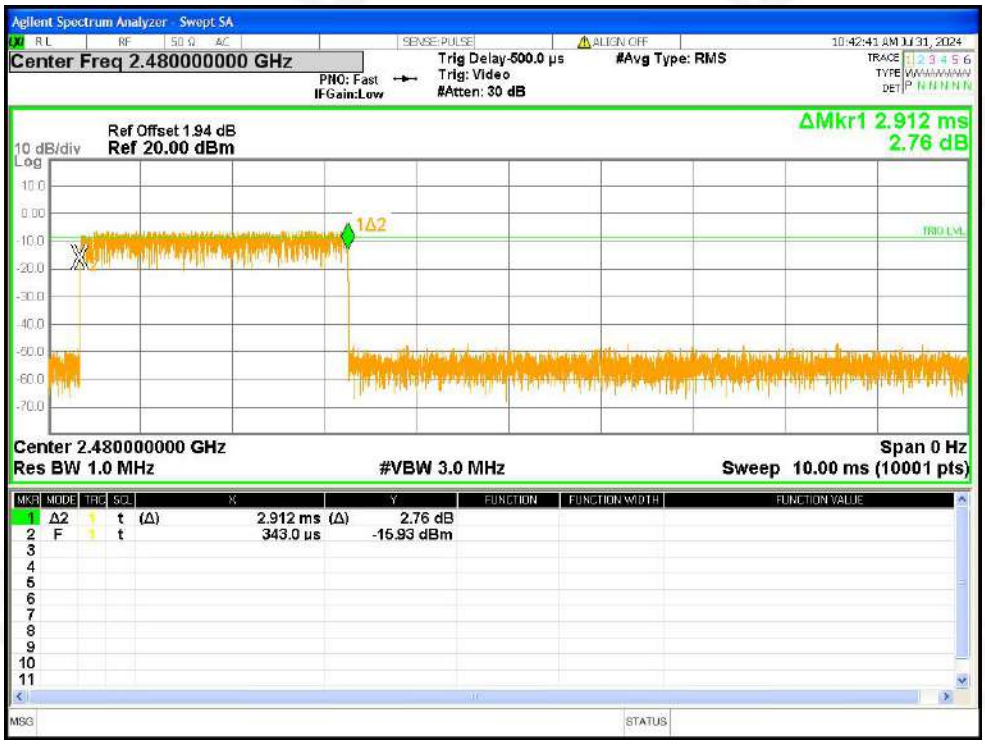
Dwell NVNT 3-DH5 2402MHz Ant1 Accumulated



Dwell NVNT 3-DH5 2441MHz Ant1 One Burst



Dwell NVNT 3-DH5 2441MHz Ant1 Accumulated

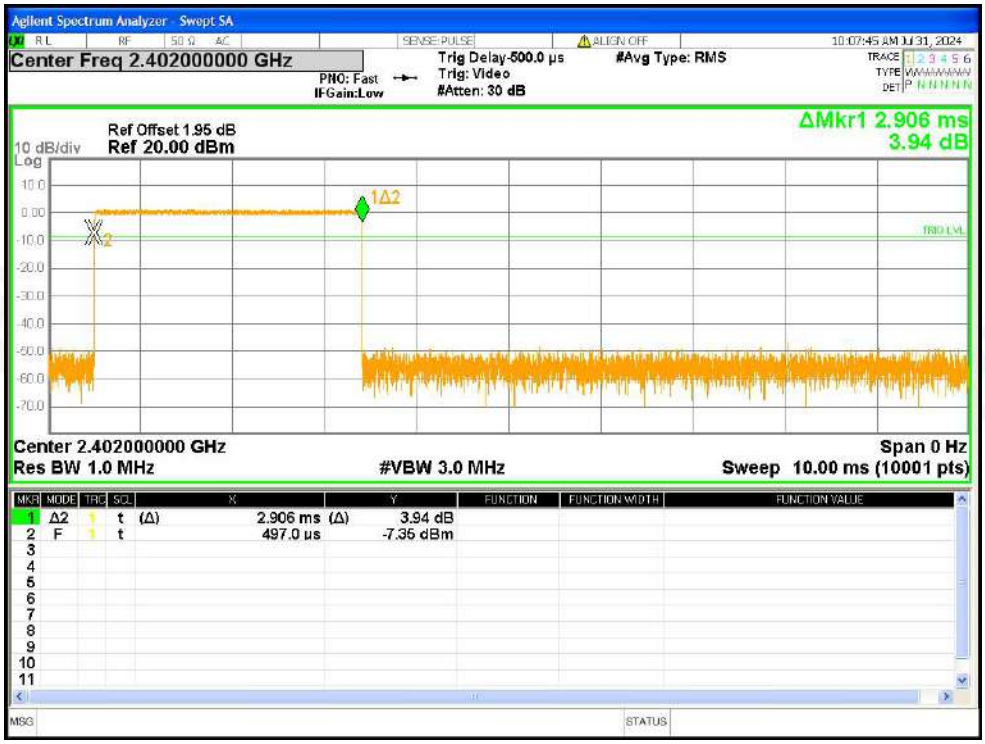


Dwell NVNT 3-DH5 2480MHz Ant1 One Burst

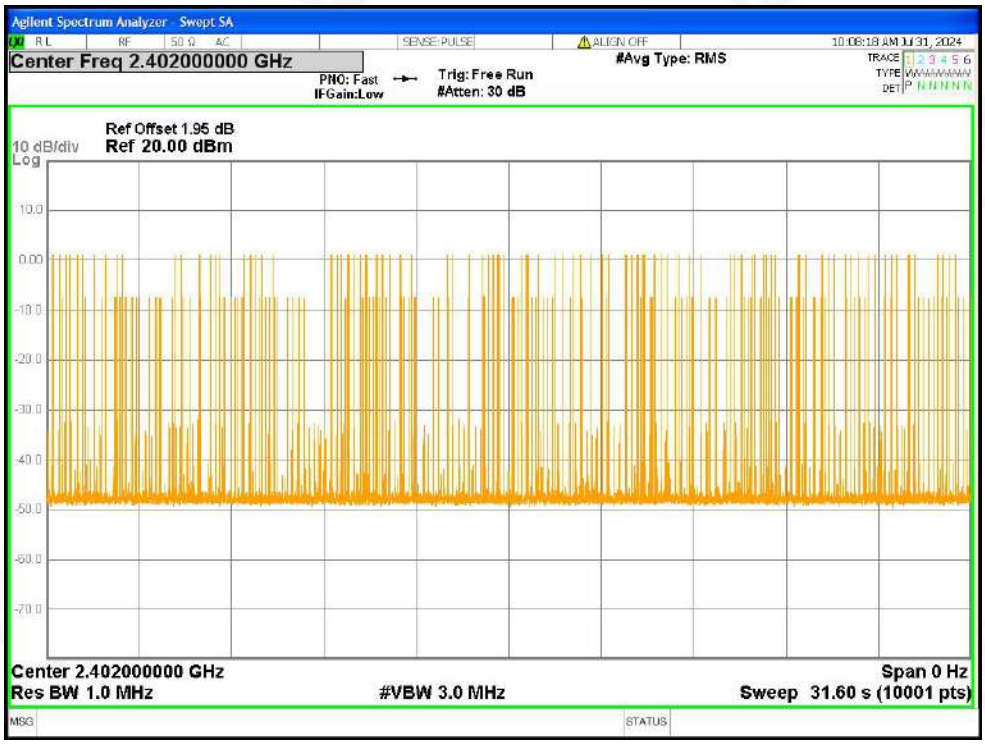
Dwell NVNT 3-DH5 2480MHz Ant1 Accumulated

right

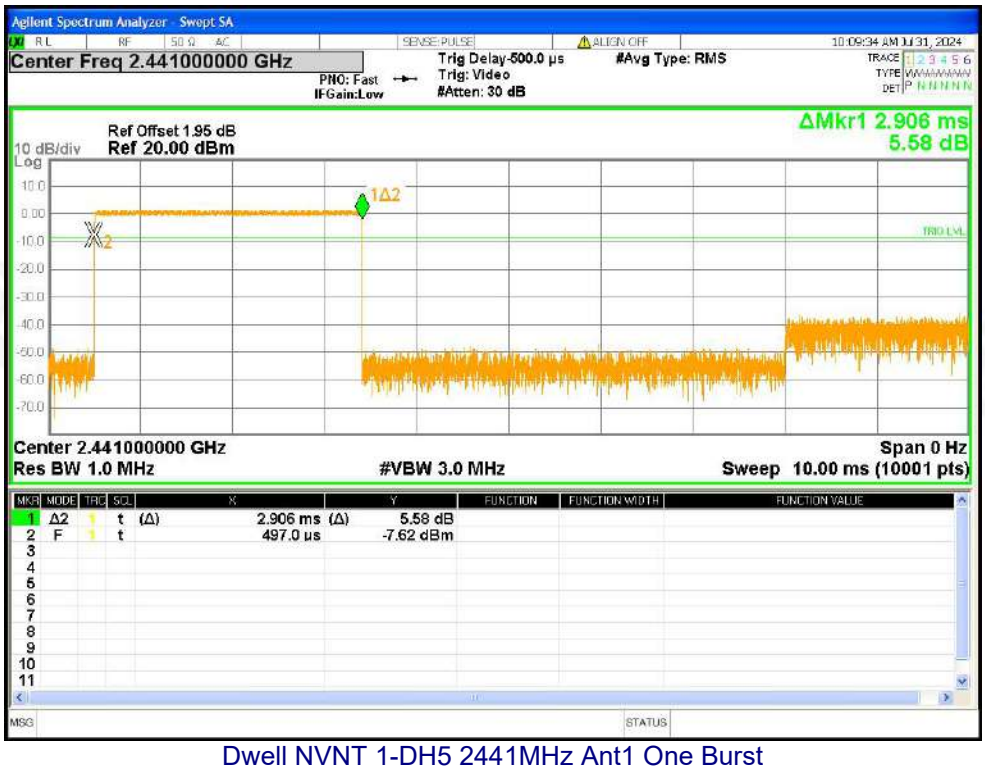
Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
1-DH5	2402	Ant1	2.906	305.13	105	31600	400	Pass
1-DH5	2441	Ant1	2.906	310.942	107	31600	400	Pass
1-DH5	2480	Ant1	2.907	299.421	103	31600	400	Pass
2-DH5	2402	Ant1	2.911	328.943	113	31600	400	Pass
2-DH5	2441	Ant1	2.897	318.67	110	31600	400	Pass
2-DH5	2480	Ant1	2.91	285.18	98	31600	400	Pass
3-DH5	2402	Ant1	2.915	303.16	104	31600	400	Pass
3-DH5	2441	Ant1	2.911	308.566	106	31600	400	Pass
3-DH5	2480	Ant1	2.912	308.672	106	31600	400	Pass



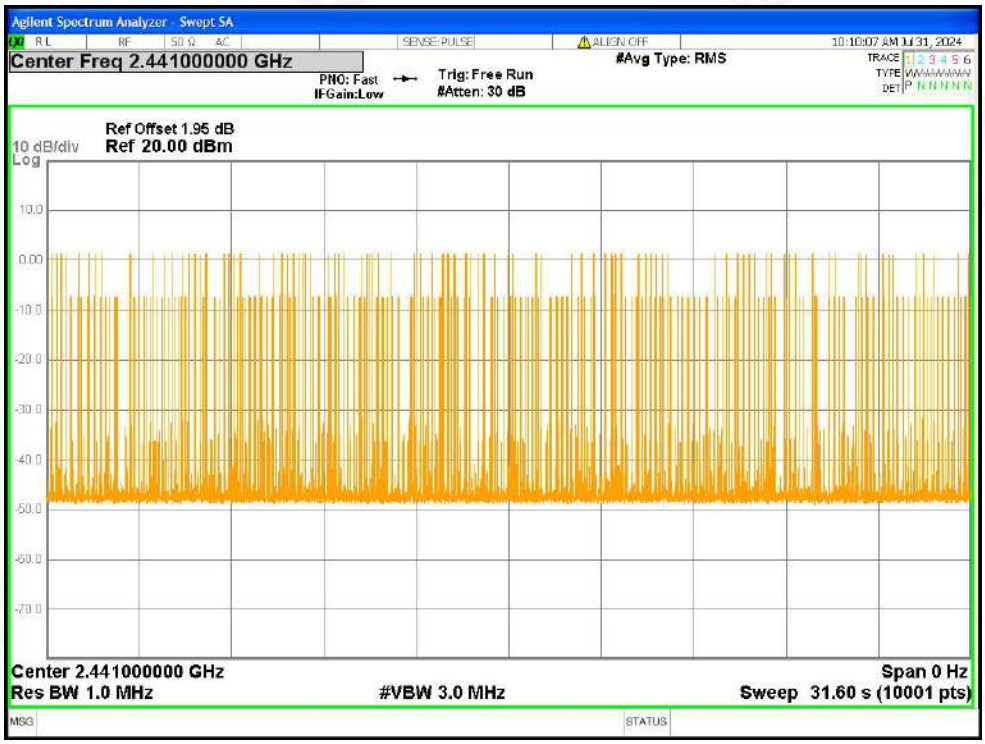
Dwell NVNT 1-DH5 2402MHz Ant1 One Burst



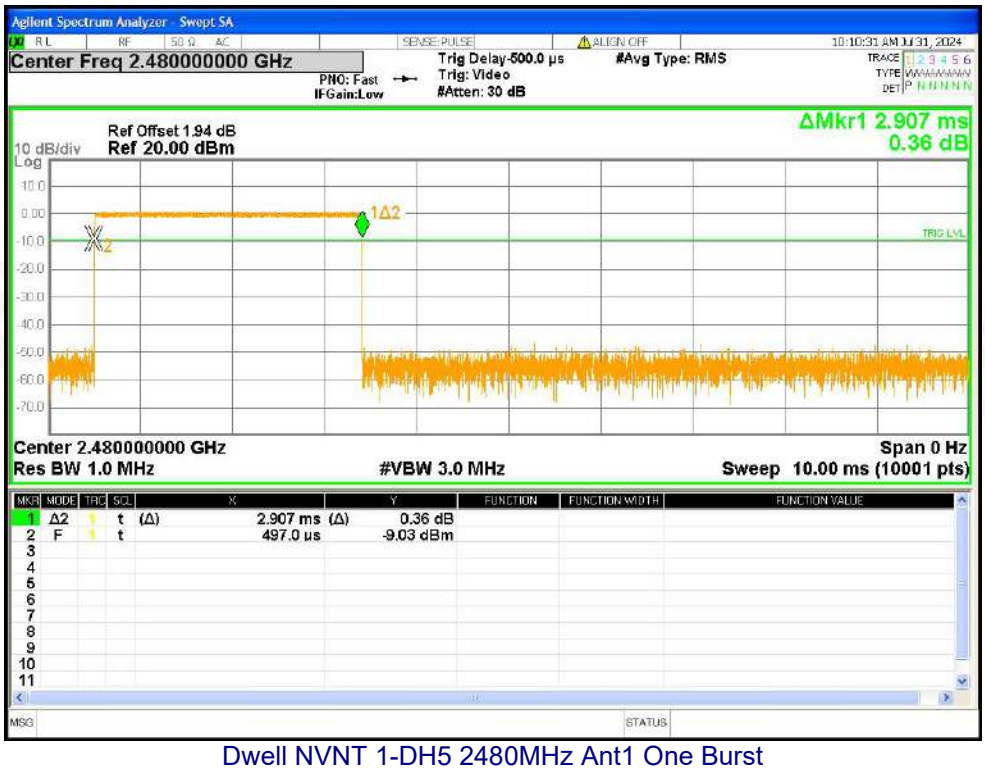
Dwell NVNT 1-DH5 2402MHz Ant1 Accumulated



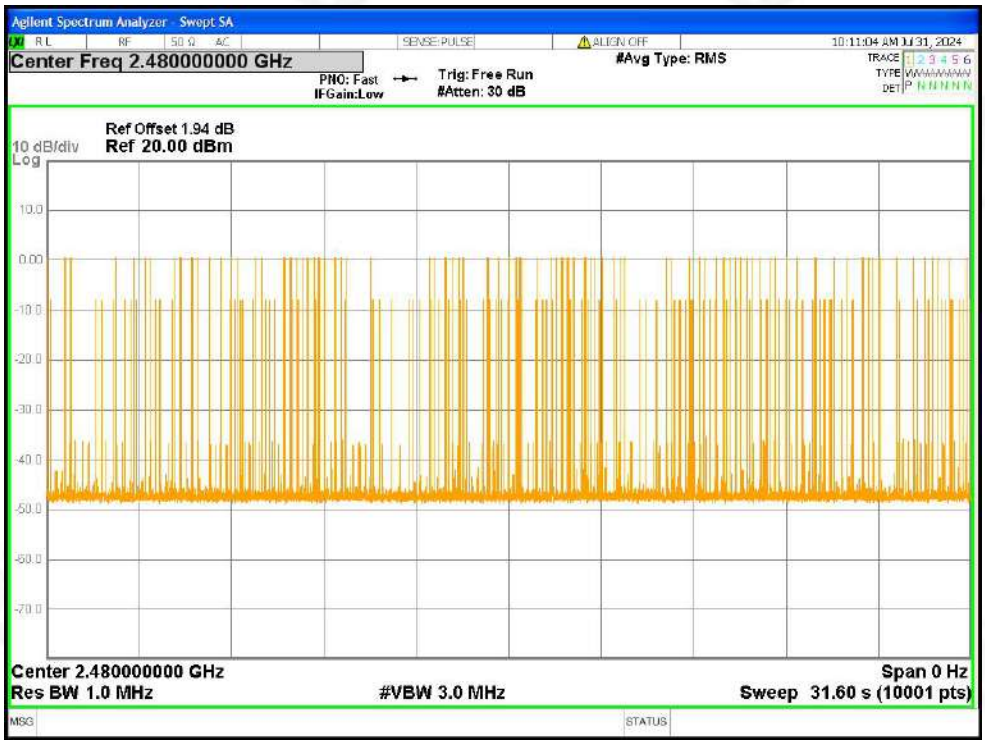
Dwell NVNT 1-DH5 2441MHz Ant1 One Burst



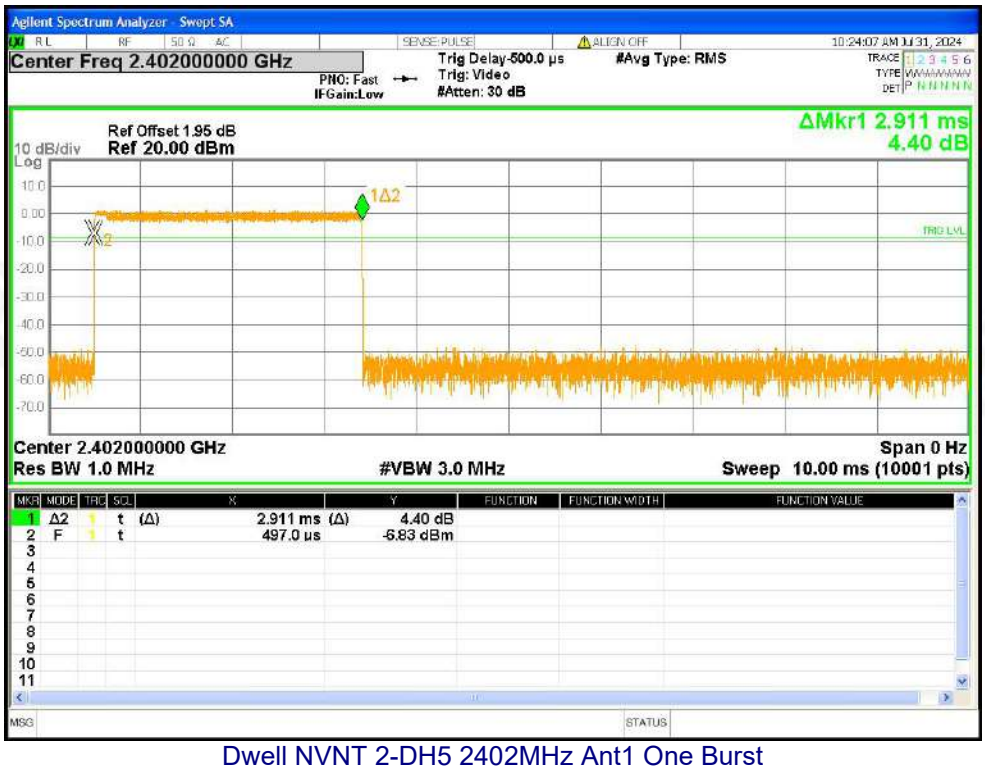
Dwell NVNT 1-DH5 2441MHz Ant1 Accumulated



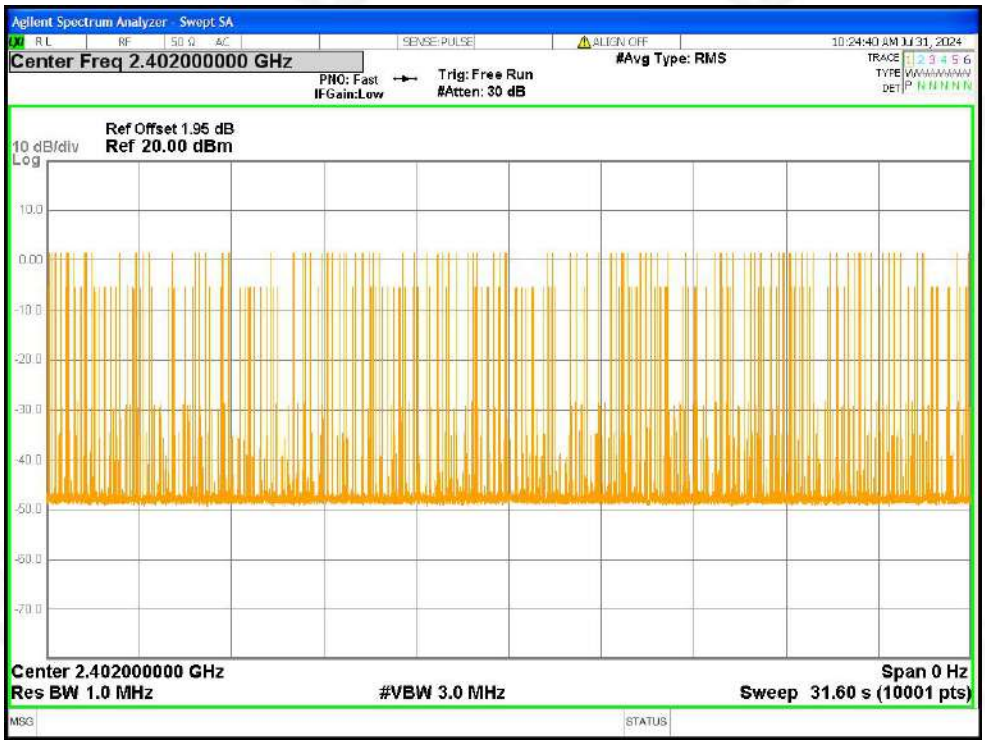
Dwell NVNT 1-DH5 2480MHz Ant1 One Burst



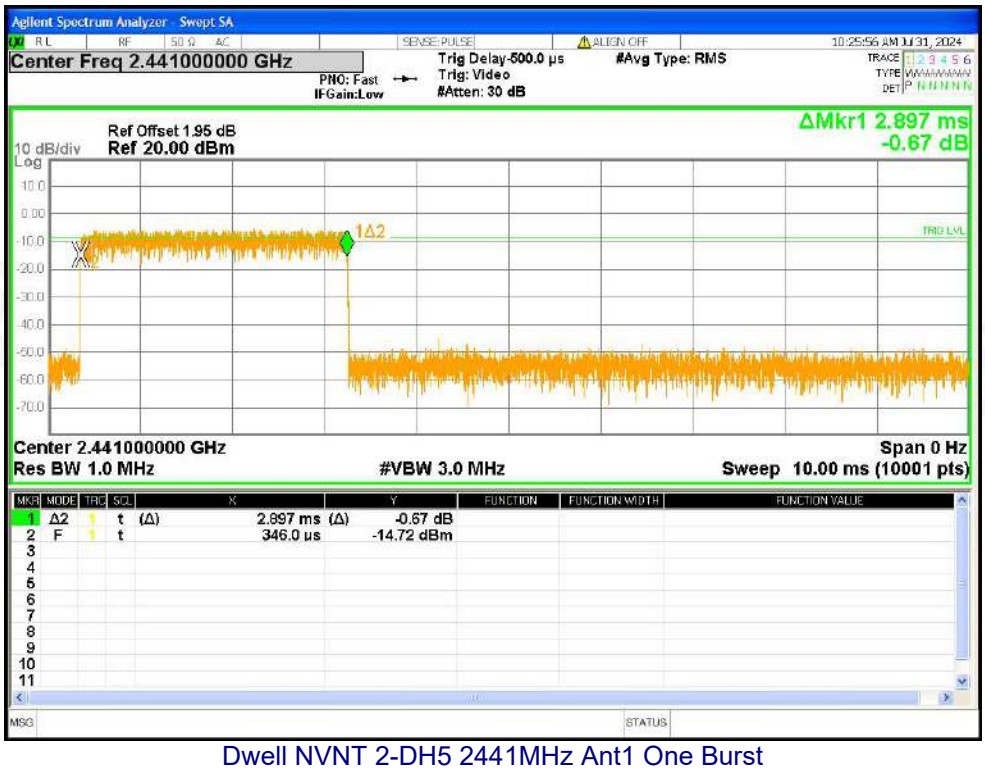
Dwell NVNT 1-DH5 2480MHz Ant1 Accumulated



Dwell NVNT 2-DH5 2402MHz Ant1 One Burst

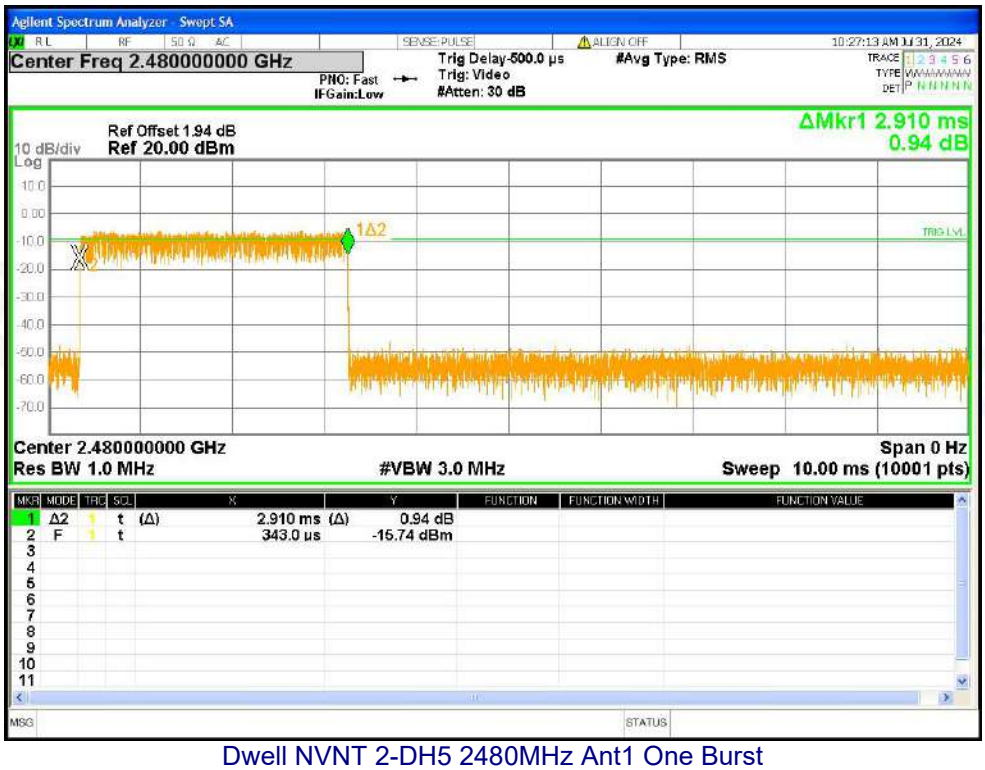


Dwell NVNT 2-DH5 2402MHz Ant1 Accumulated

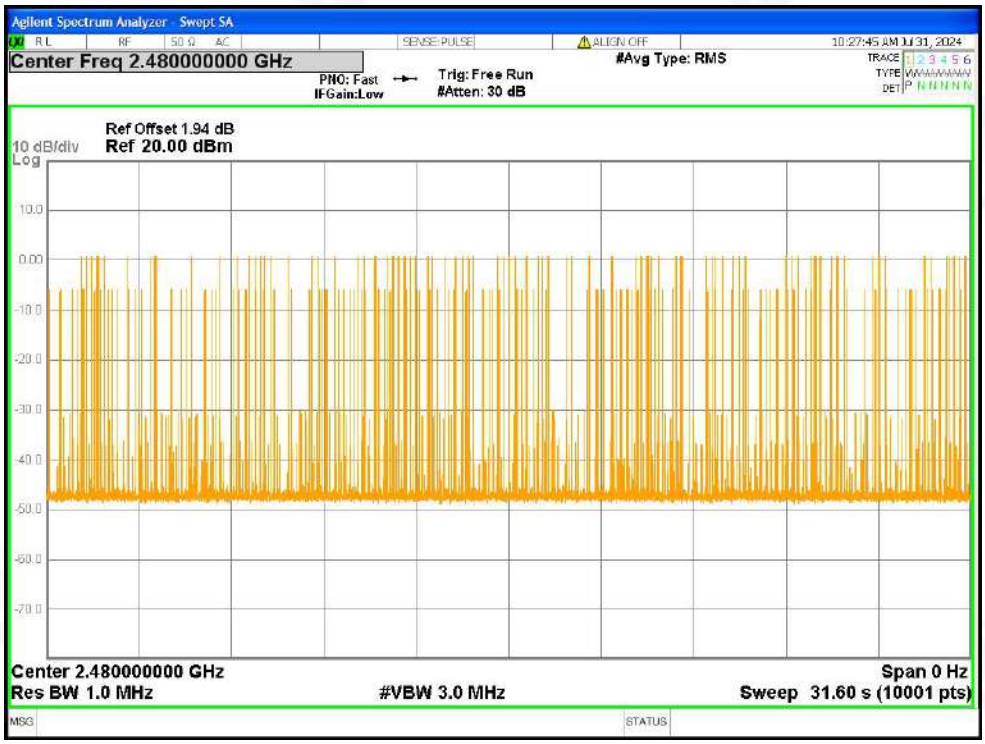


Dwell NVNT 2-DH5 2441MHz Ant1 One Burst

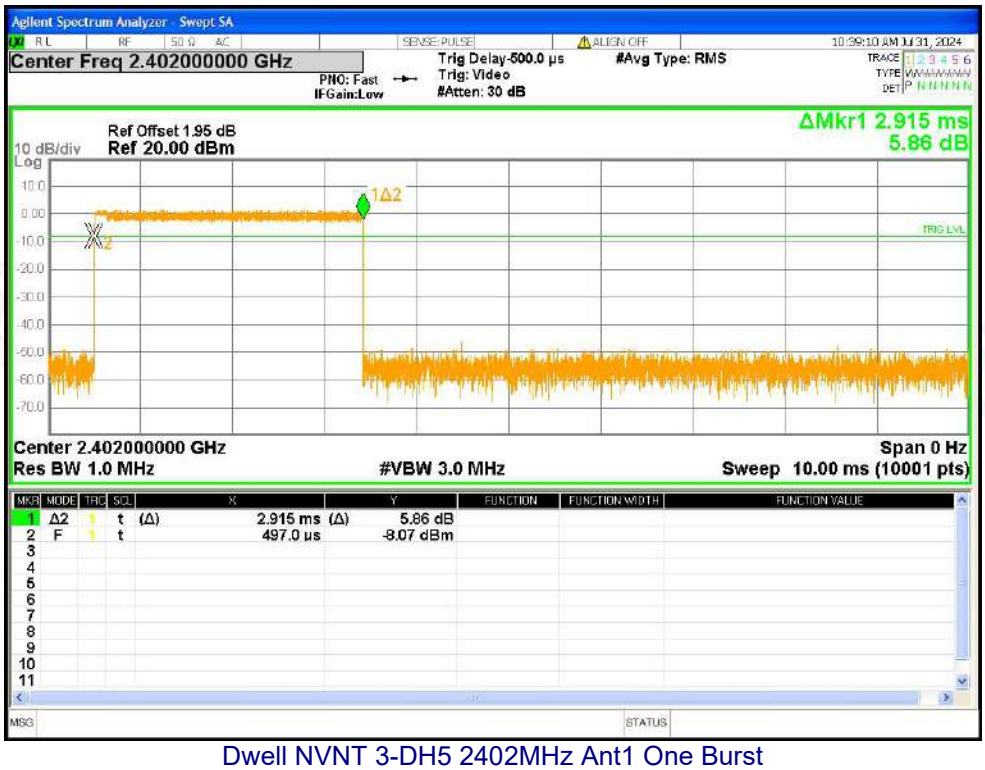
Dwell NVNT 2-DH5 2441MHz Ant1 Accumulated



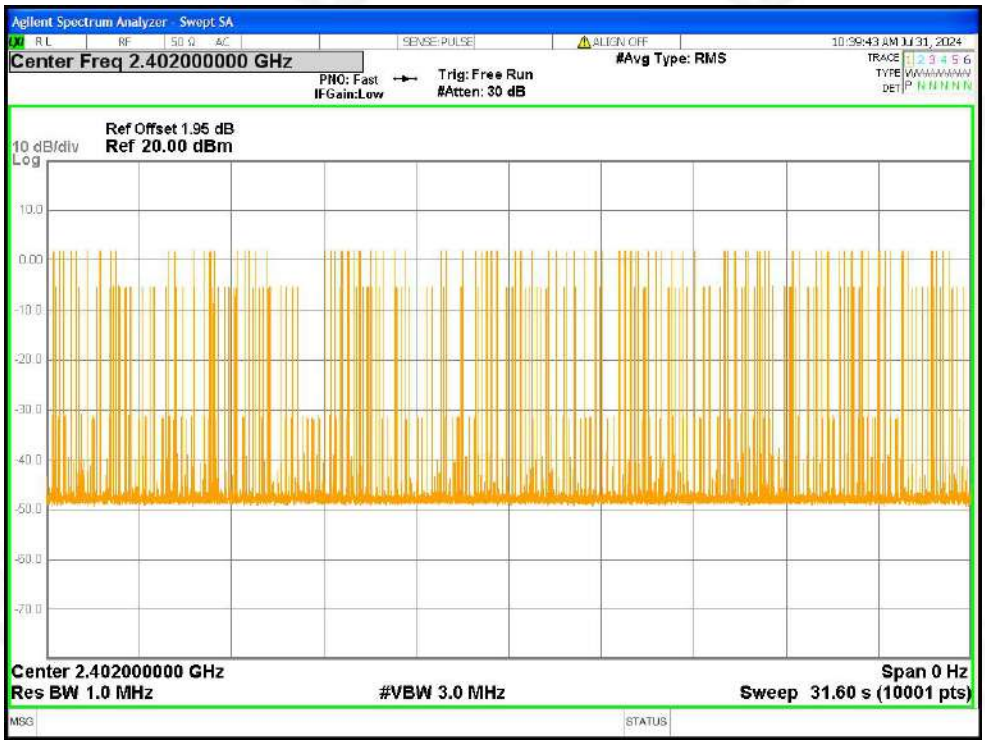
Dwell NVNT 2-DH5 2480MHz Ant1 One Burst



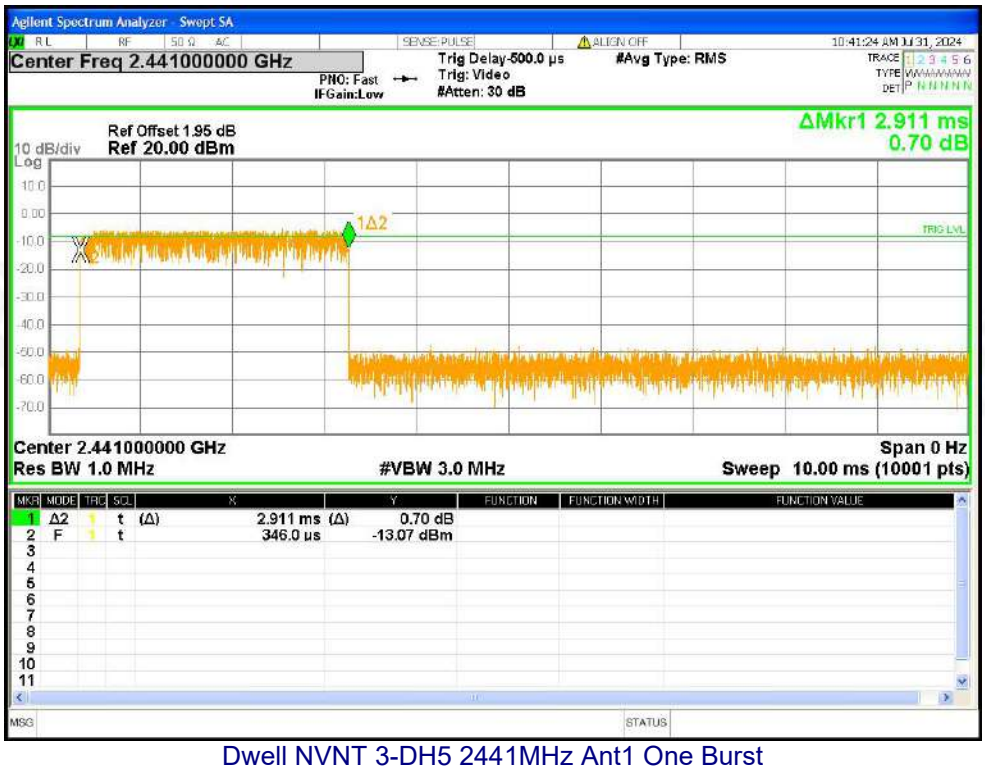
Dwell NVNT 2-DH5 2480MHz Ant1 Accumulated



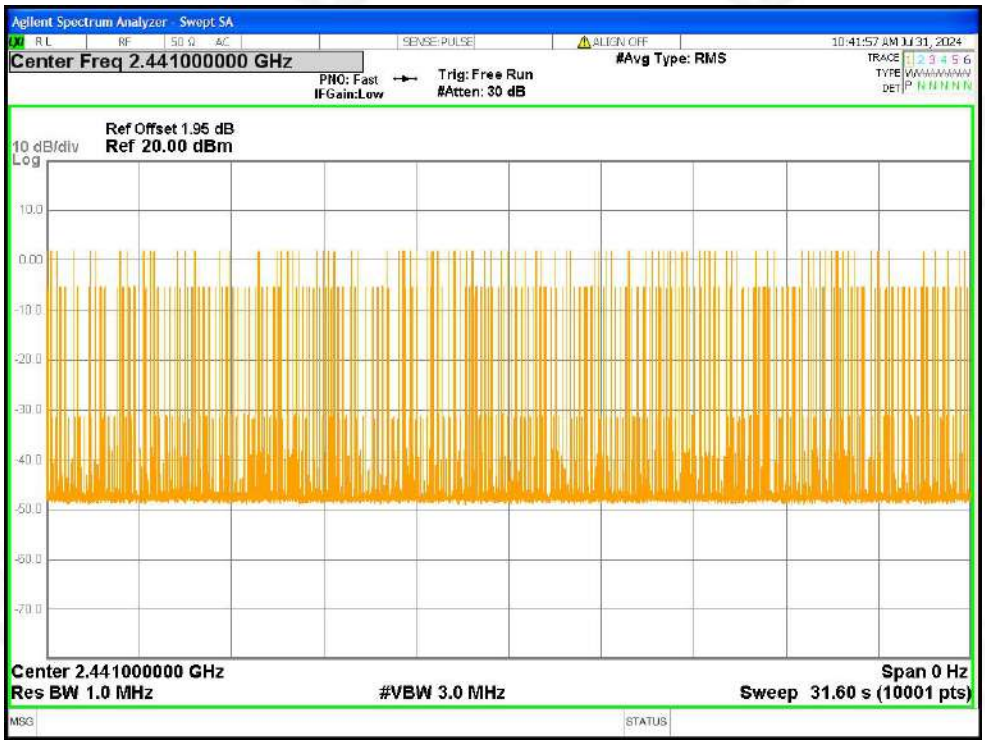
Dwell NVNT 3-DH5 2402MHz Ant1 One Burst



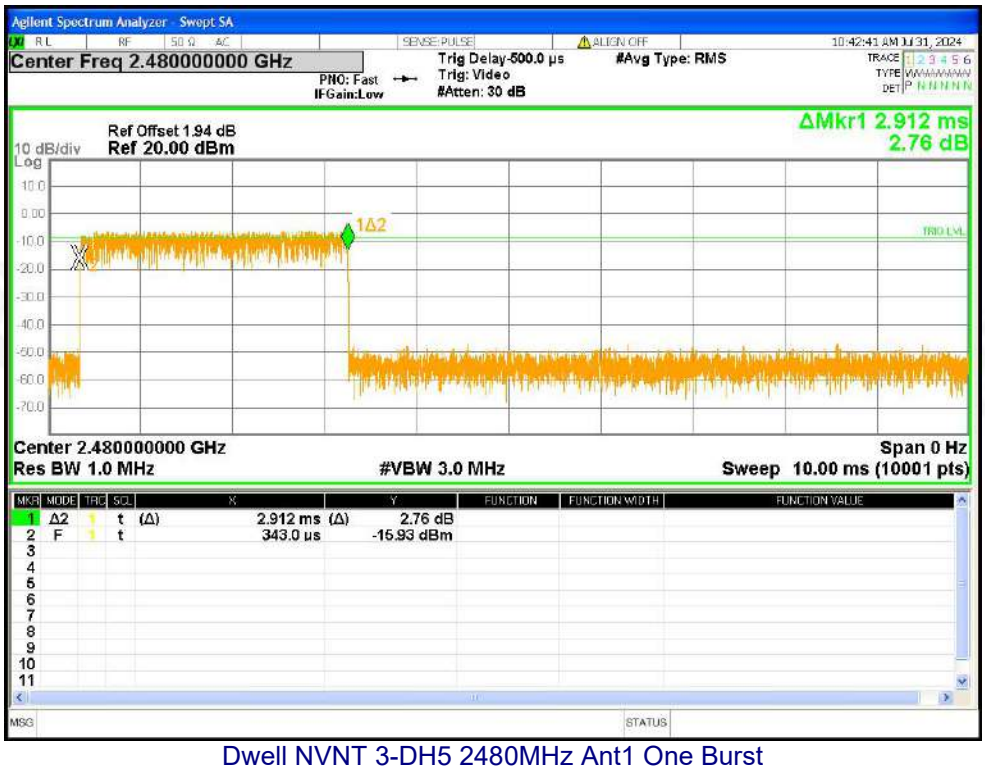
Dwell NVNT 3-DH5 2402MHz Ant1 Accumulated



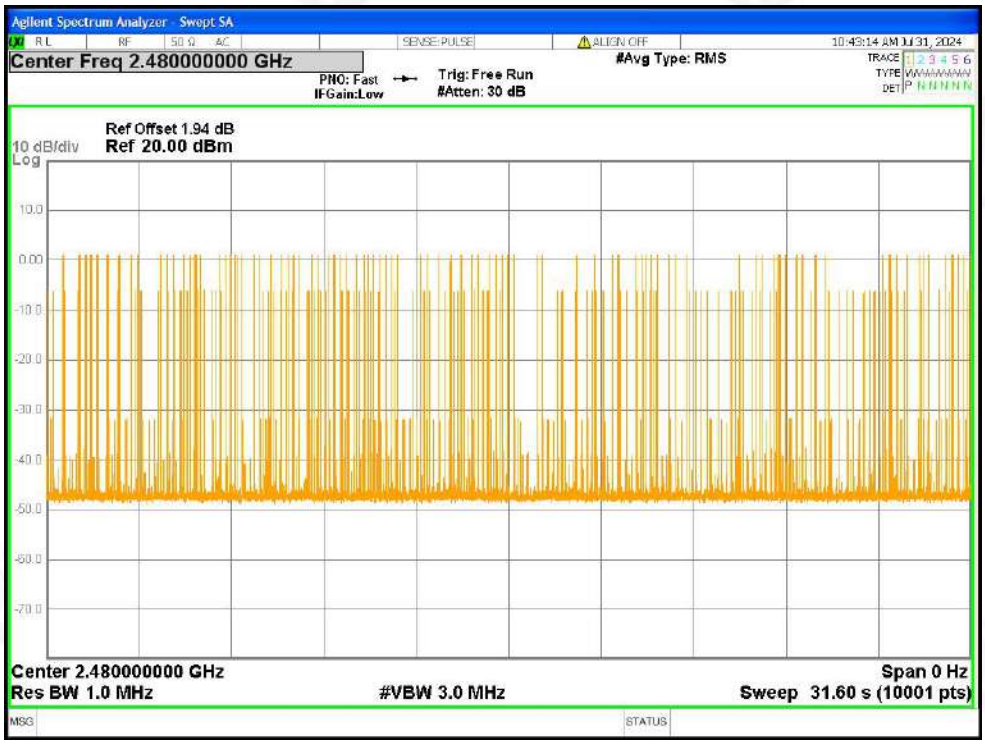
Dwell NVNT 3-DH5 2441MHz Ant1 One Burst



Dwell NVNT 3-DH5 2441MHz Ant1 Accumulated



Dwell NVNT 3-DH5 2480MHz Ant1 One Burst



Dwell NVNT 3-DH5 2480MHz Ant1 Accumulated

12. ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
EUT Antenna:	
The antenna is Chip Antenna,The best-case gain for both the left and right ear antennas is 2.78 dBi, reference to the appendix II for details	

13. TEST SETUP PHOTO

Reference to the appendix I for details.

14. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

※※※※※ END OF REPORT ※※※※※