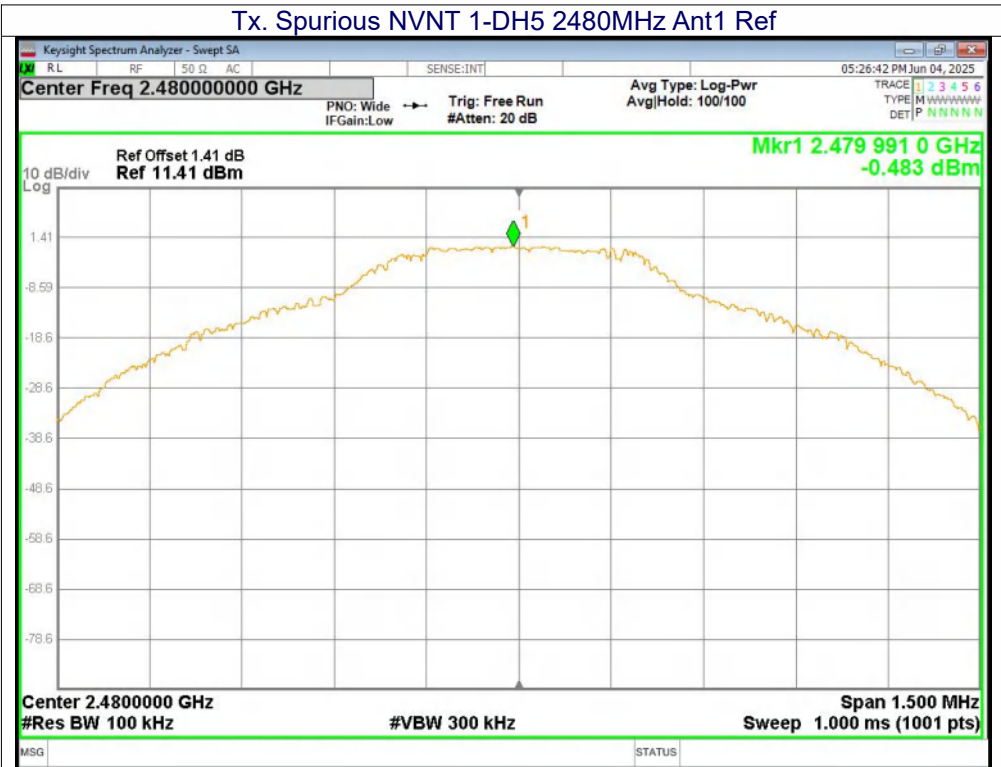
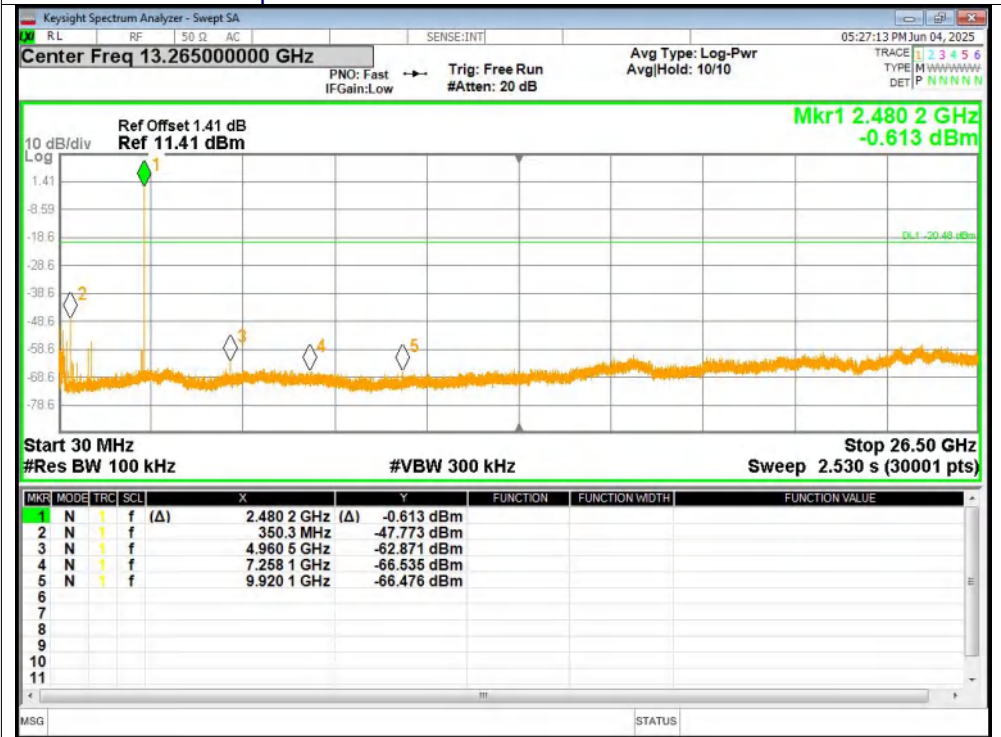


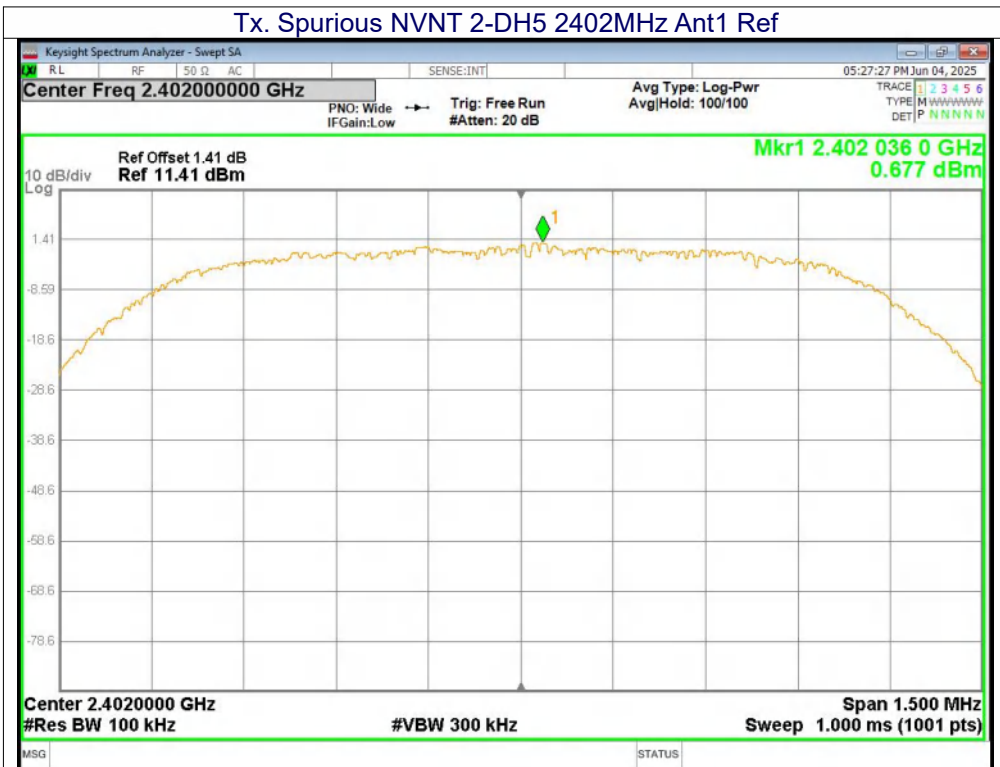
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Ref



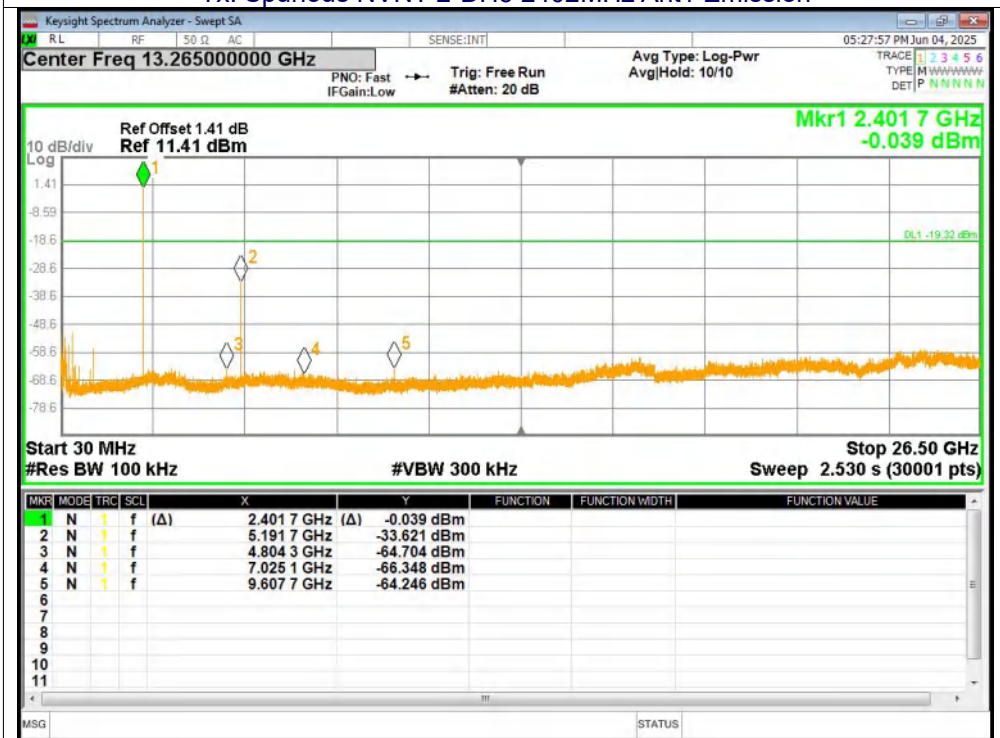
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Emission



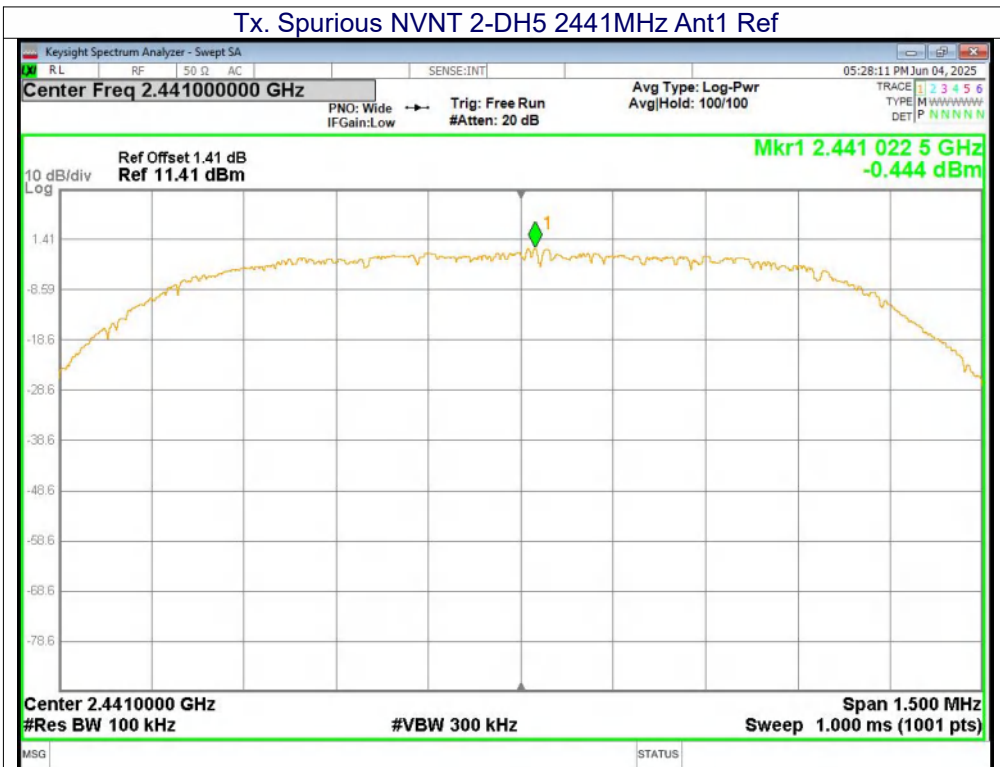
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Ref



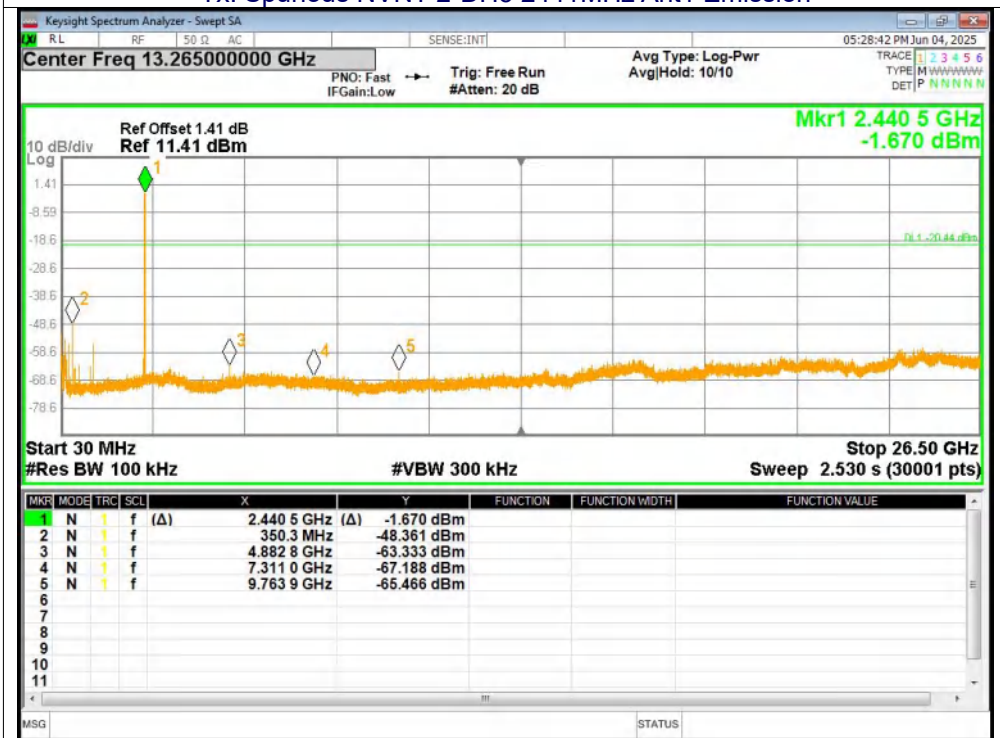
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Emission



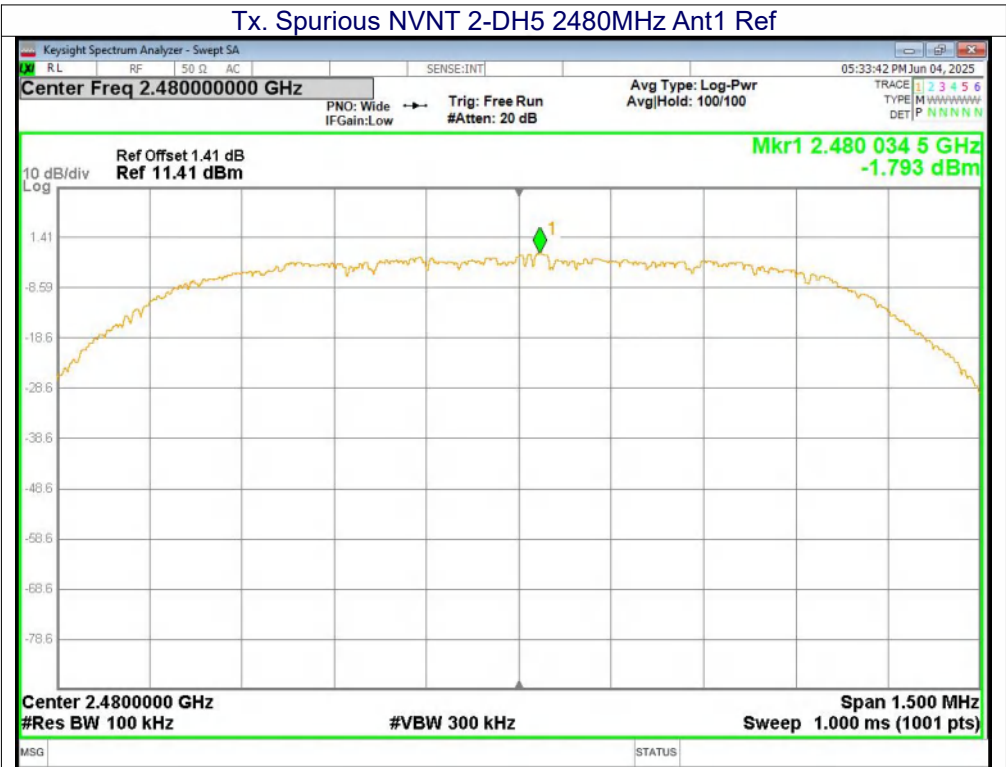
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Ref



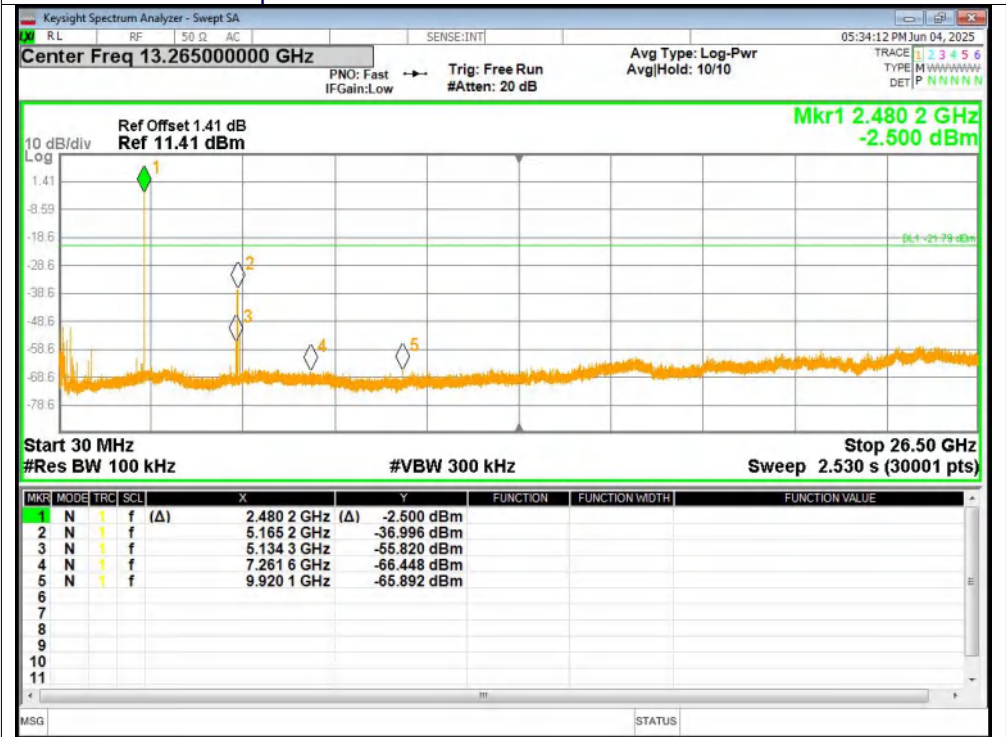
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Emission



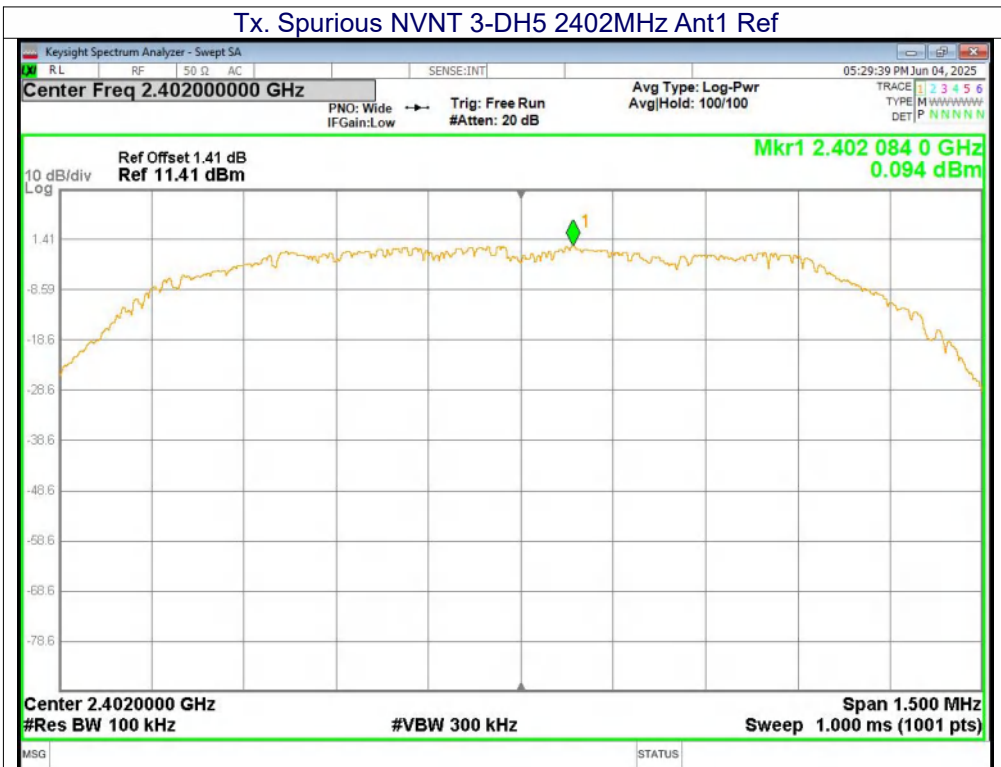
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Ref



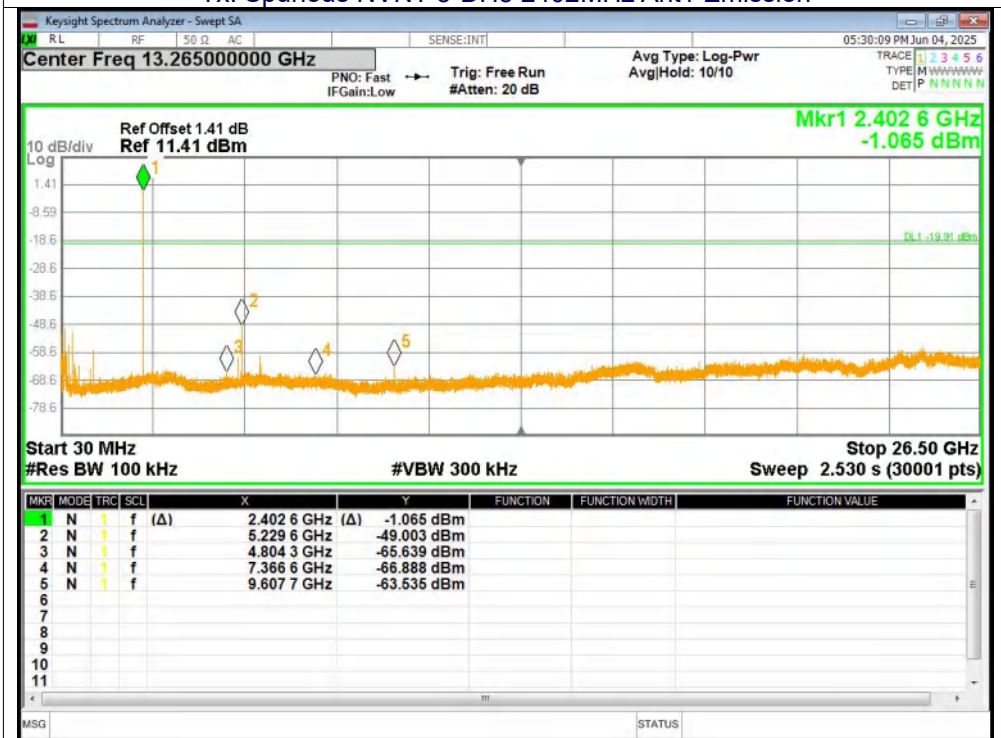
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Emission



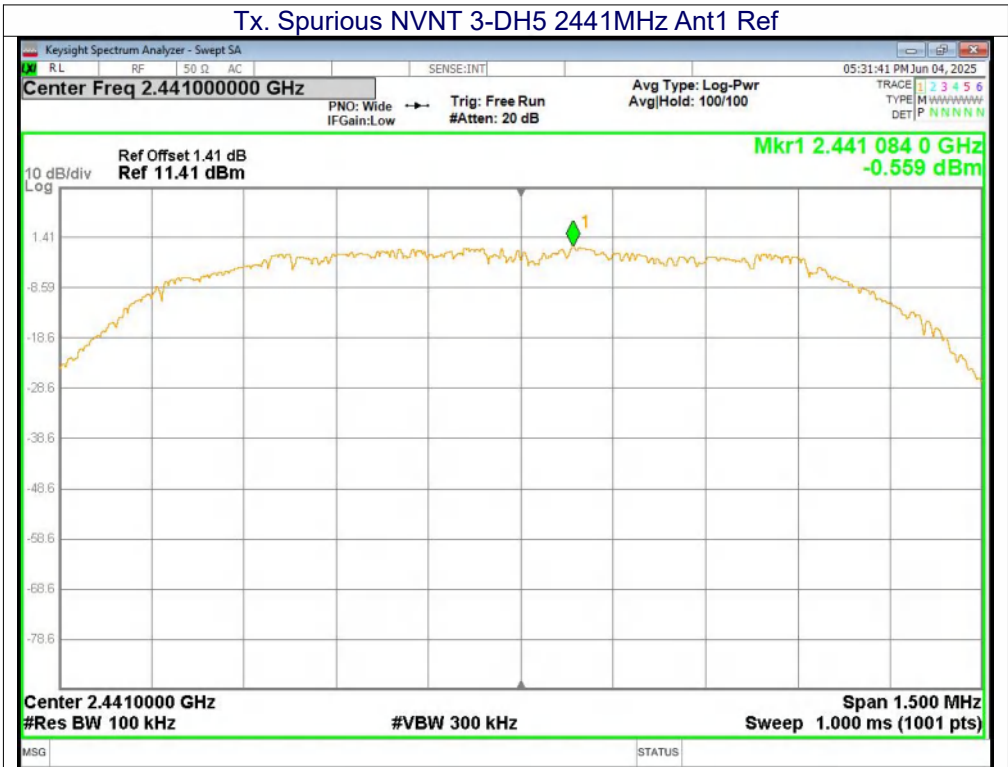
Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Ref



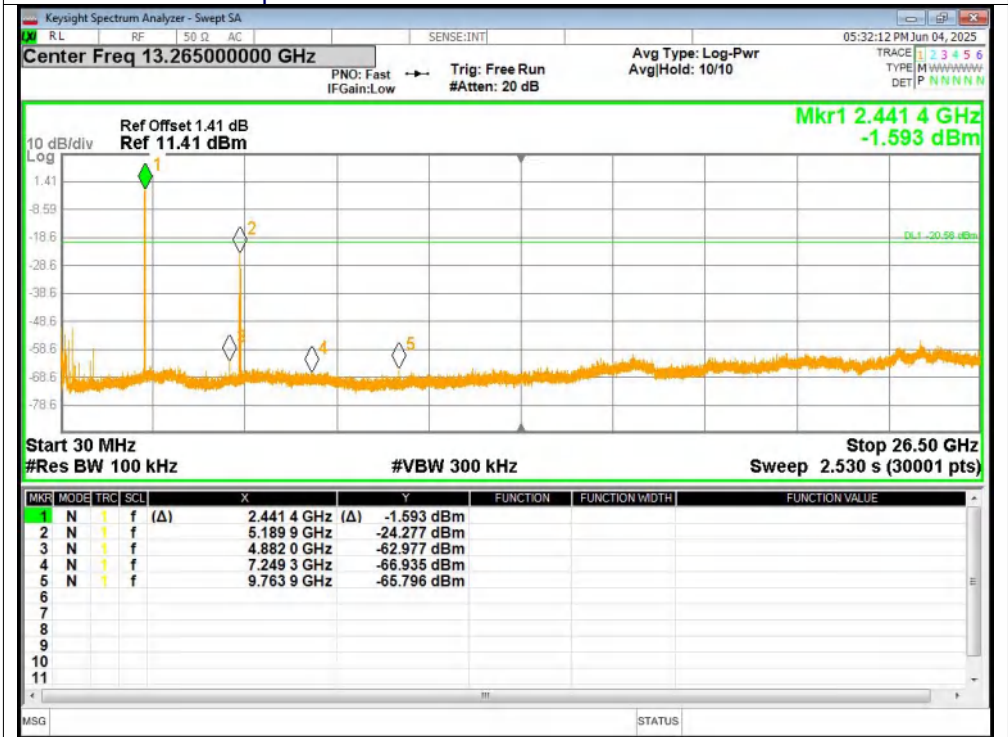
Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Emission



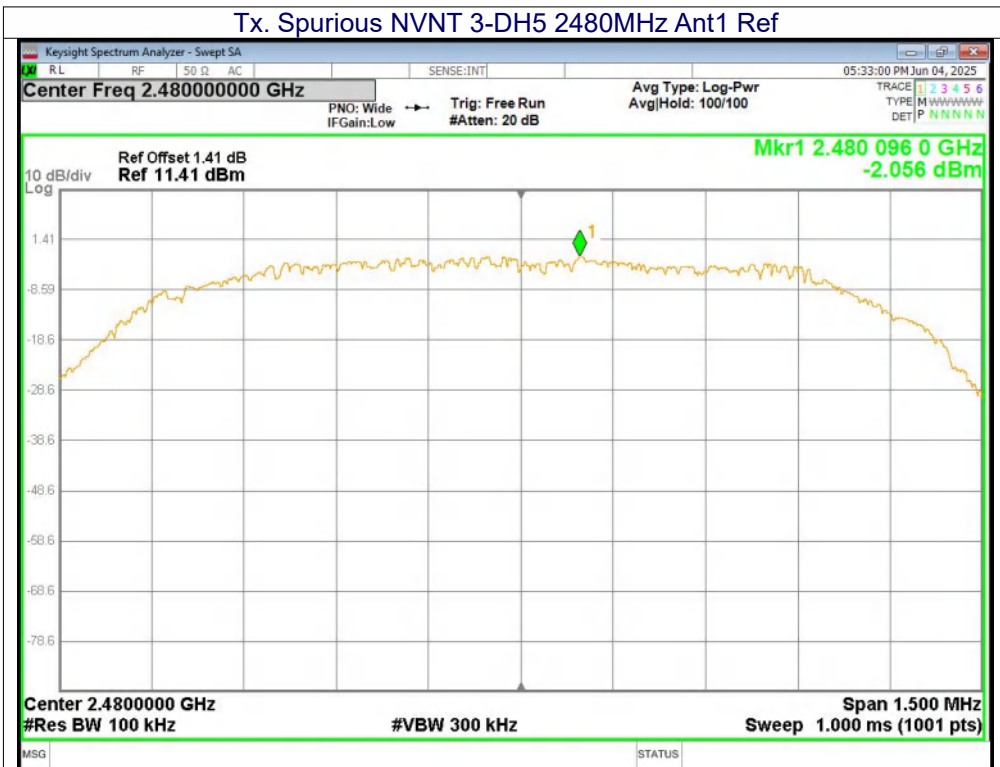
Tx. Spurious NVNT 3-DH5 2441MHz Ant1 Ref



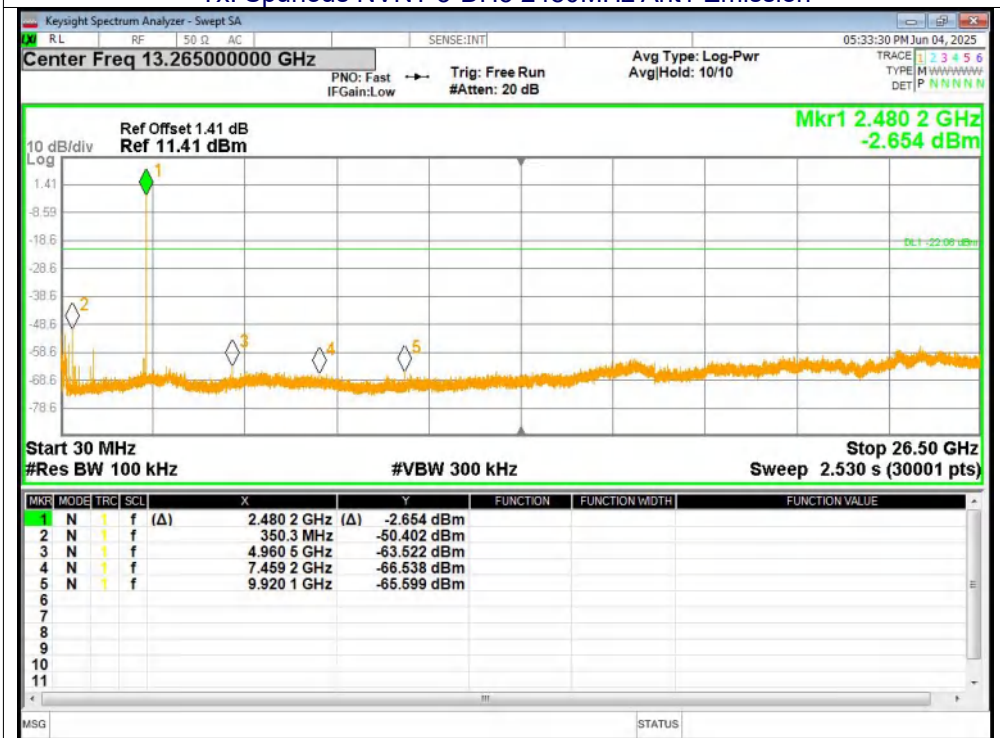
Tx. Spurious NVNT 3-DH5 2441MHz Ant1 Emission



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Emission



8. 20DB&99% BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(1), RSS 247 5.1, RSS-Gen 6.7
Test Method:	ANSI C63.10:2013

8.1 Test Setup



8.2 Limit

According to RSS-247§5.1(a)& §5.1(b), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

8.3 Test procedure

1. Set RBW = 30 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ 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.
8. The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30KHz RBW and 100 KHz VBW record the 99% bandwidth.

8.4 DEVIATION FROM STANDARD

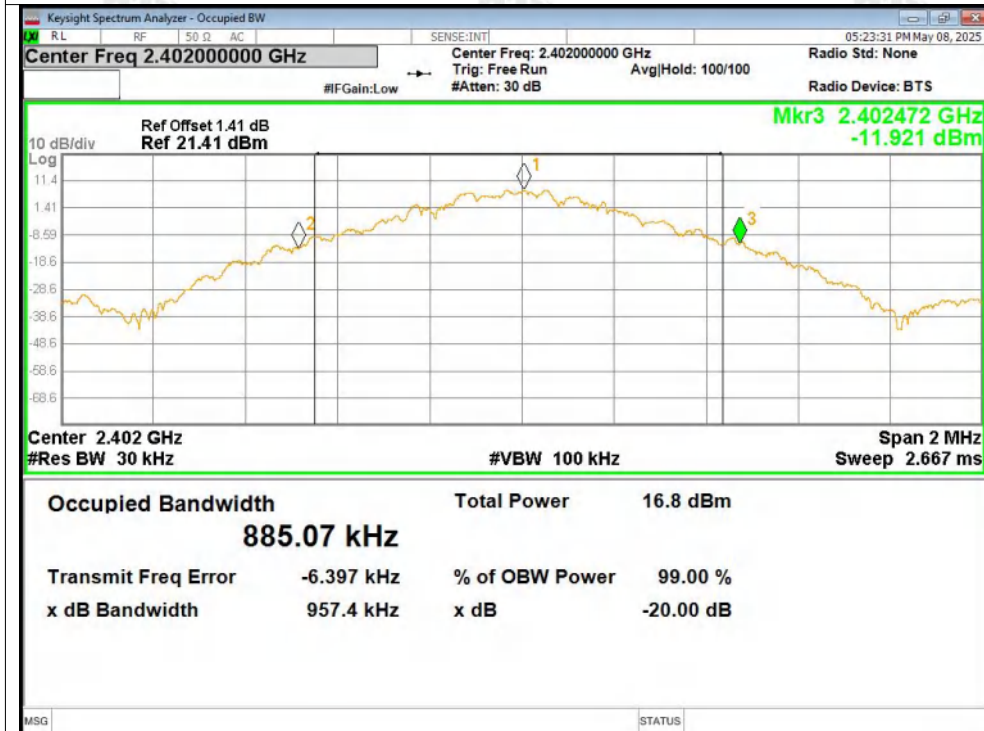
No deviation.

8.5 Test Result

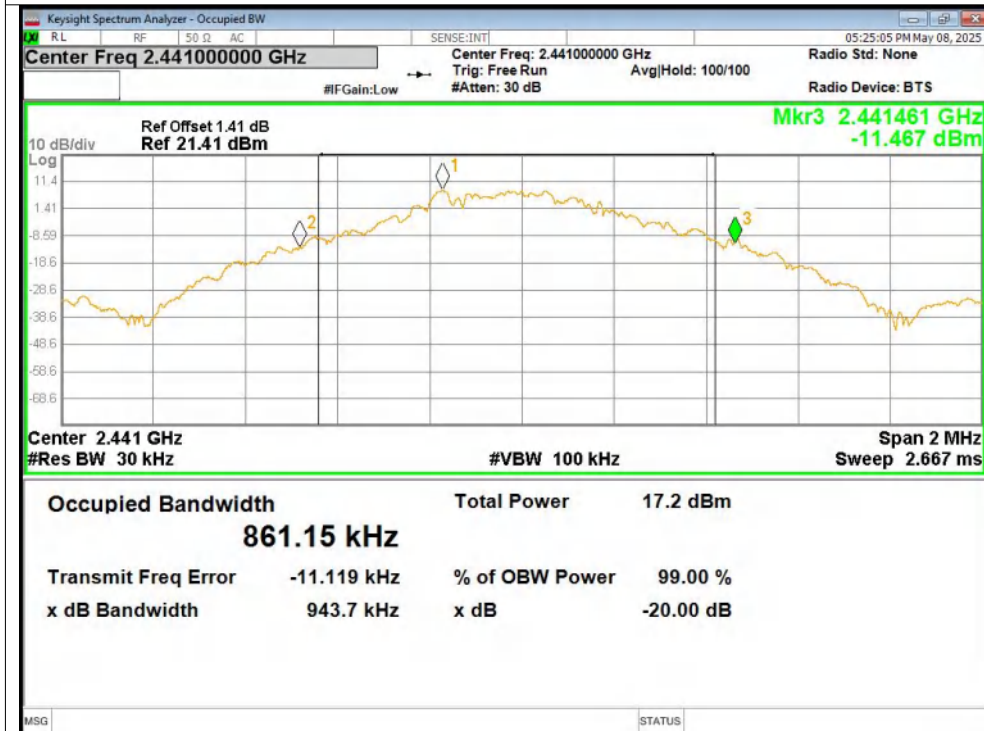
Mode	Test channel	20dB Emission Bandwidth (MHz)	99%Bandwidth (MHz)	Result
GFSK	Lowest	0.957	0.875	Pass
	Middle	0.944	0.865	
	Highest	0.946	0.869	
$\pi/4$ DQPSK	Lowest	1.28	1.188	Pass
	Middle	1.277	1.199	
	Highest	1.304	1.205	
8DPSK	Lowest	1.307	1.209	Pass
	Middle	1.299	1.224	
	Highest	1.307	1.228	

Test Graphs

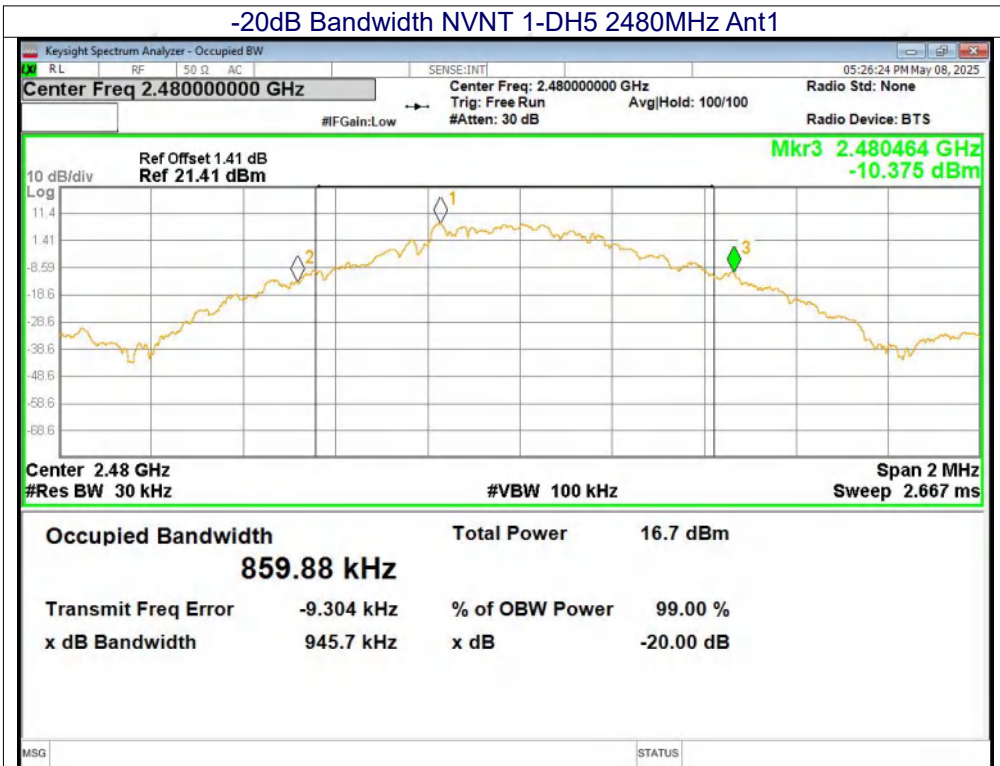
-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



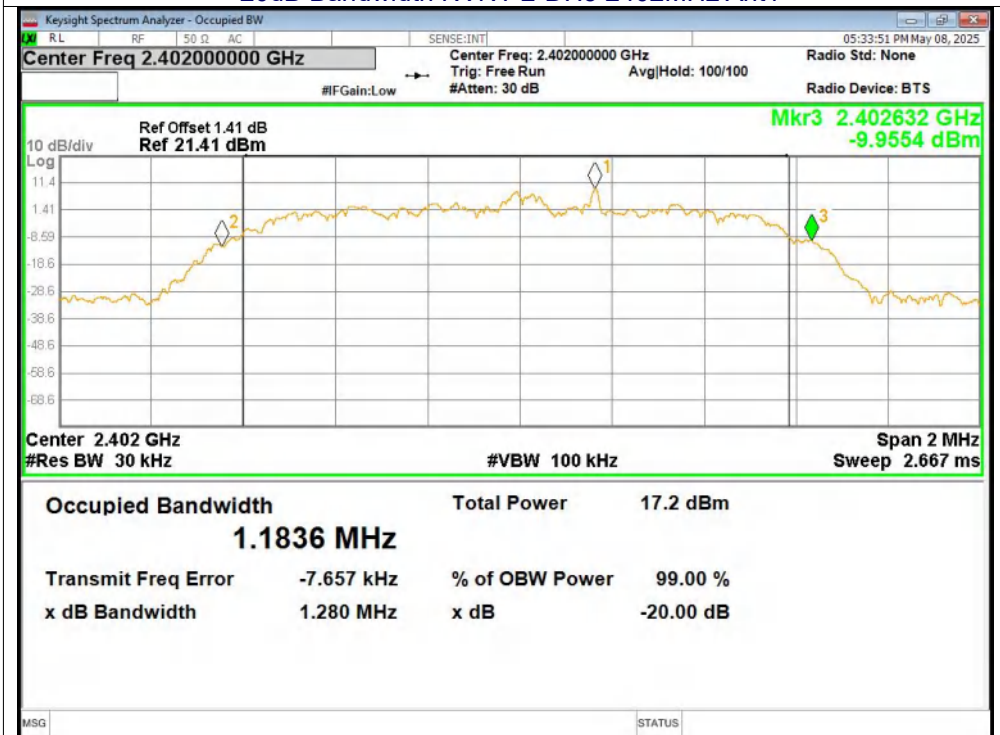
-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1



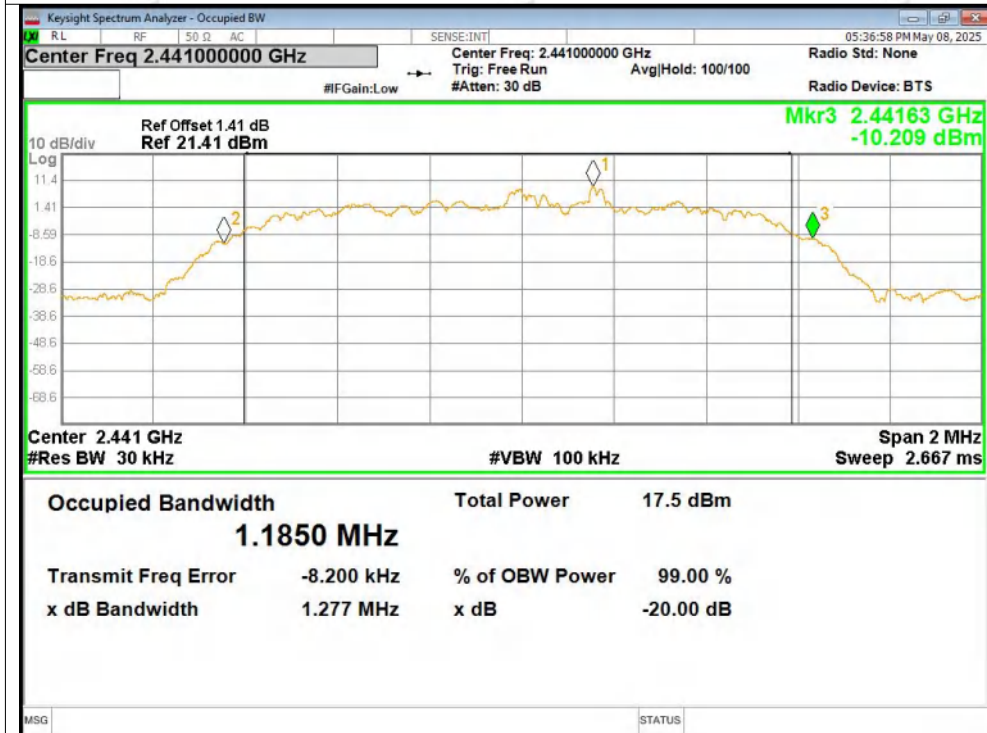
-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1



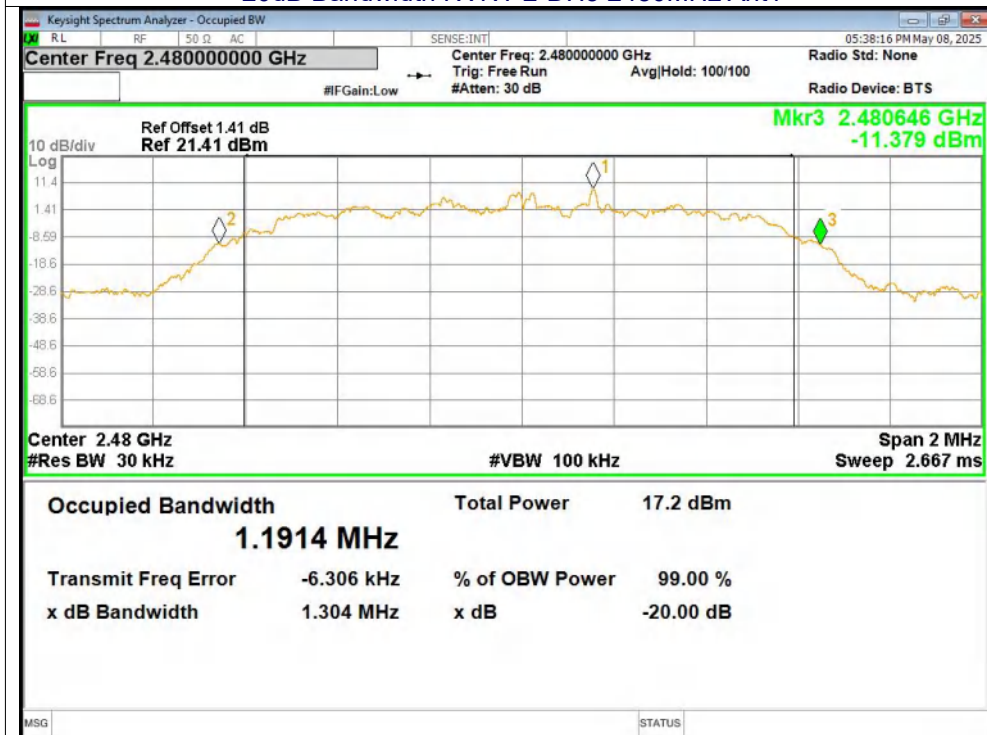
-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1

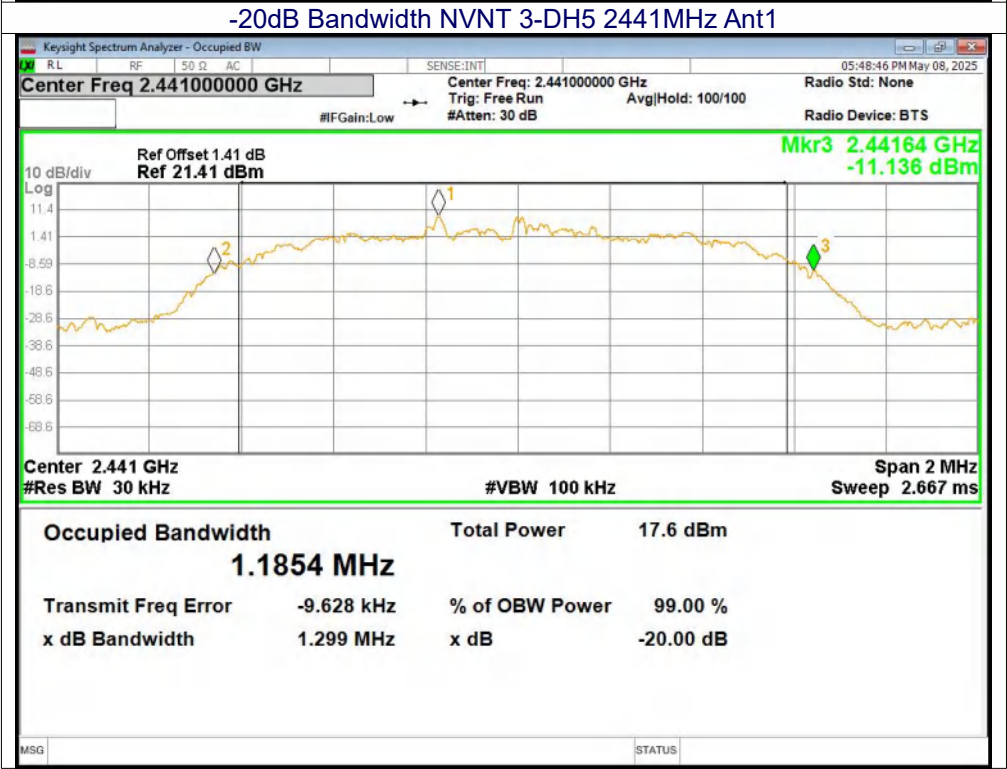
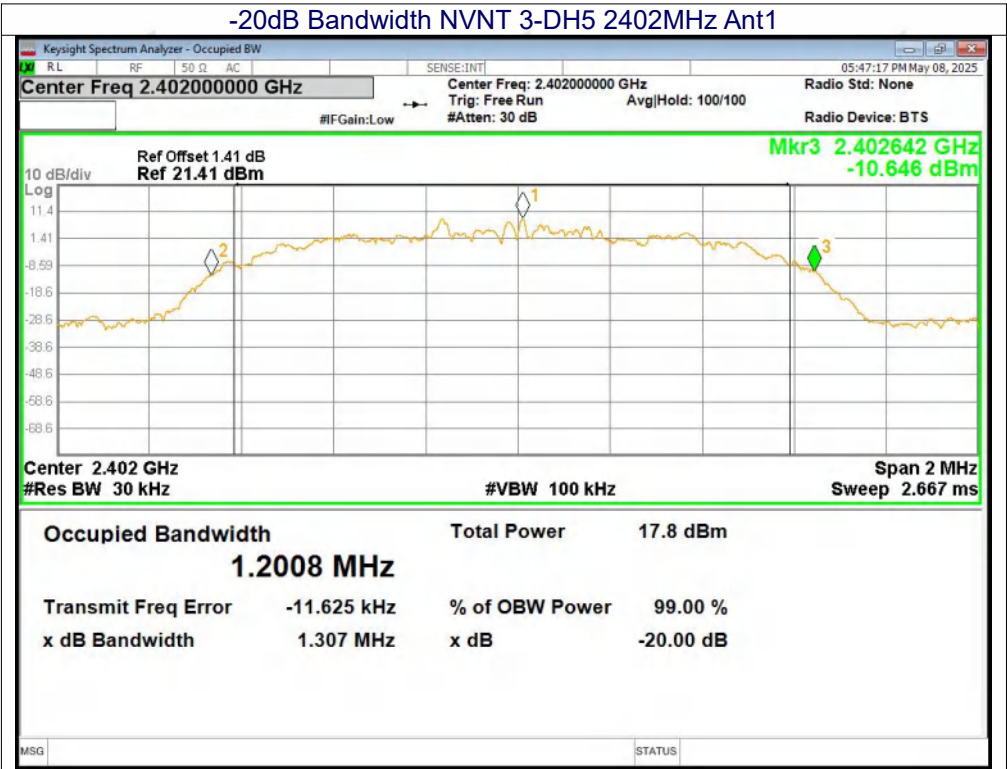


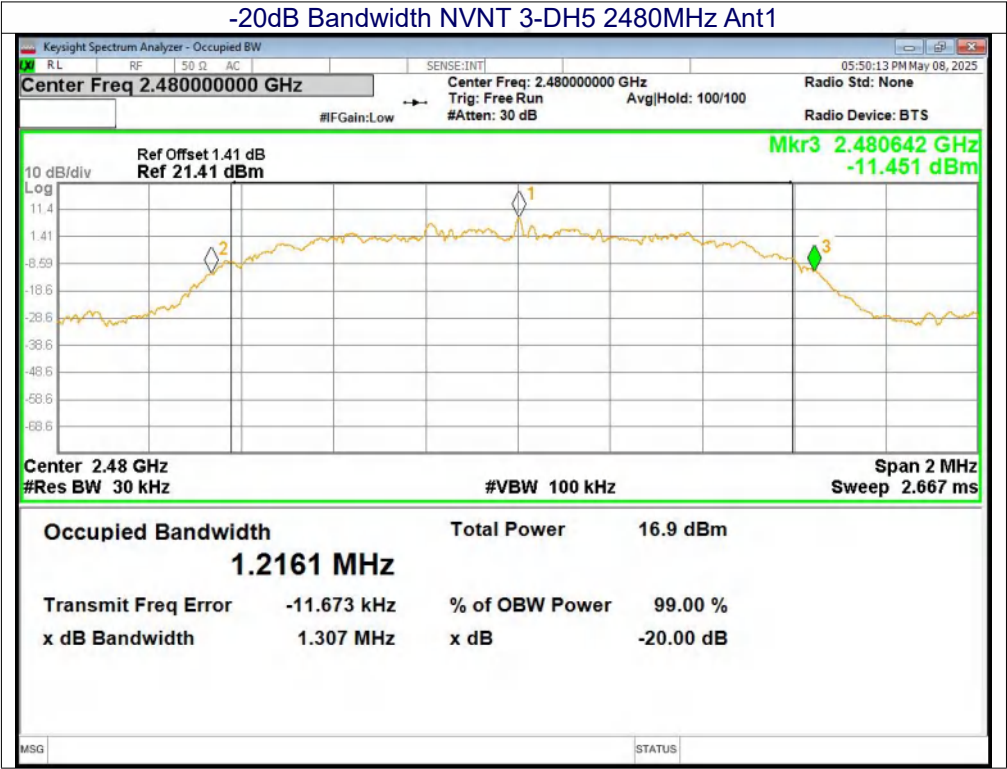
-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1

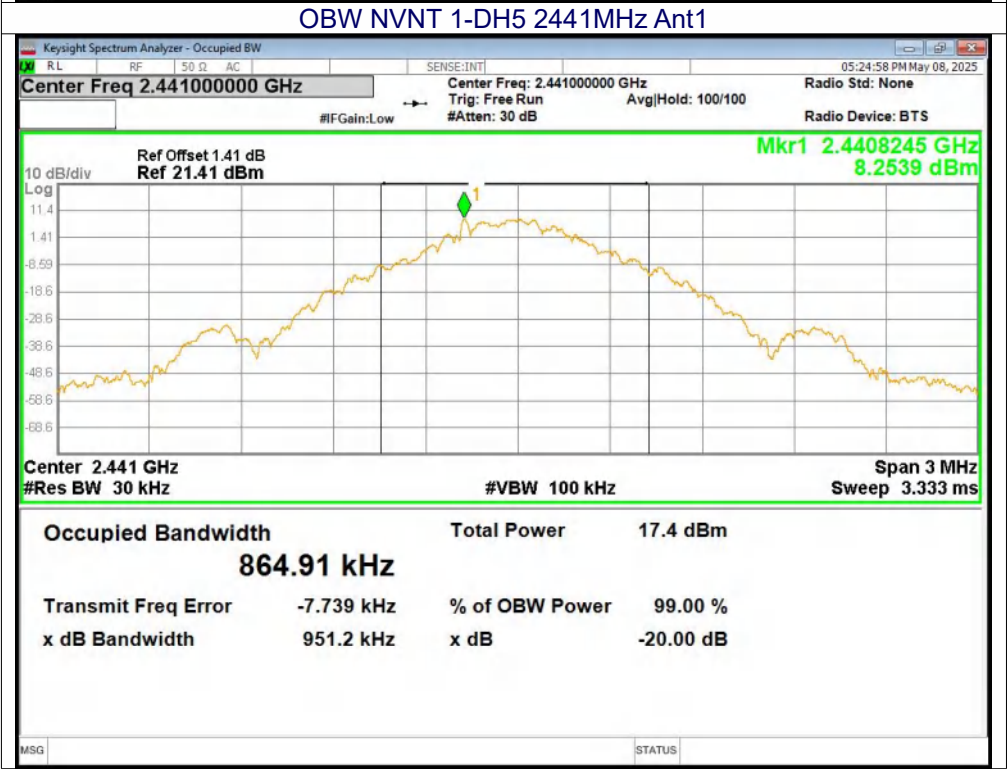
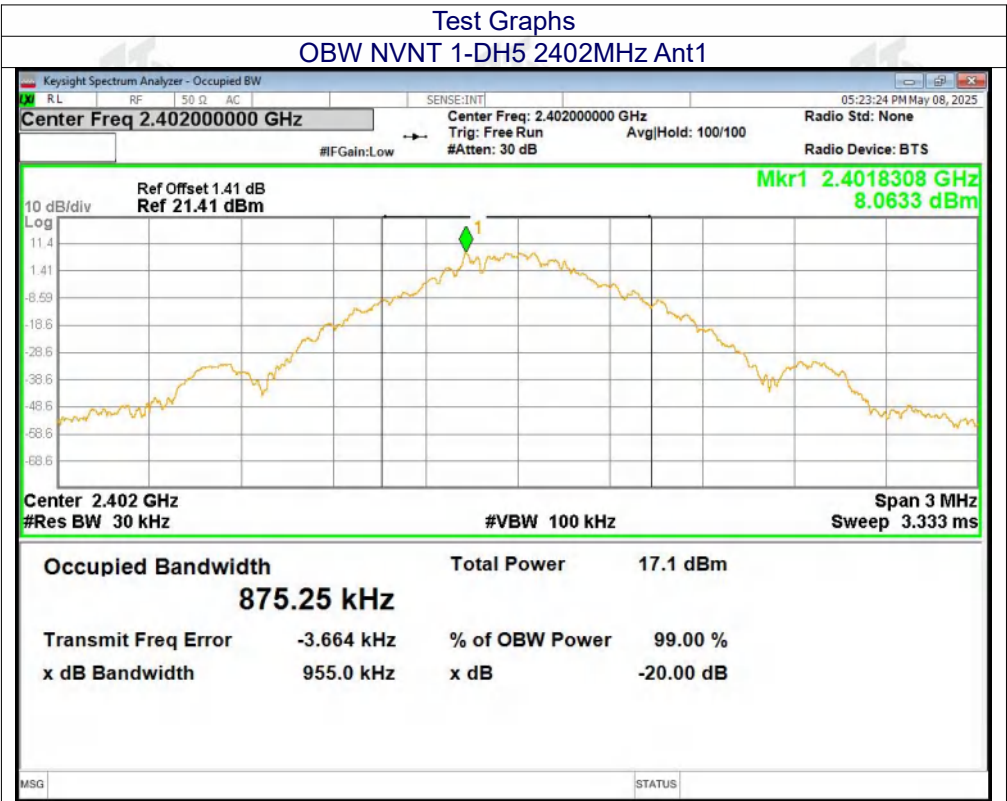


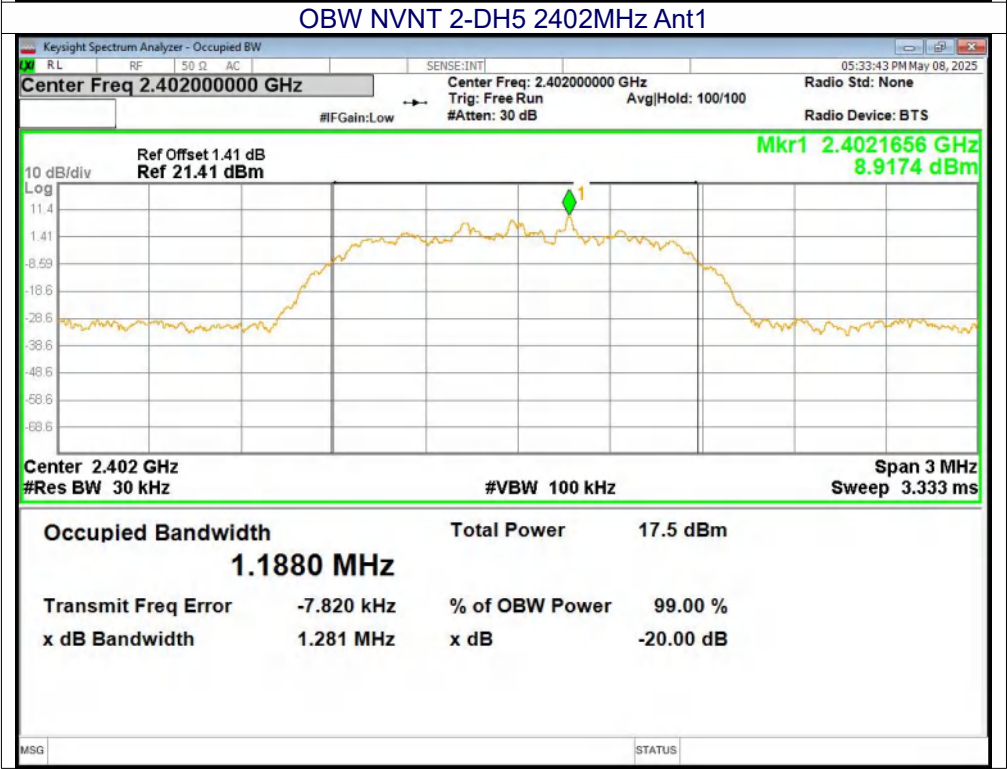
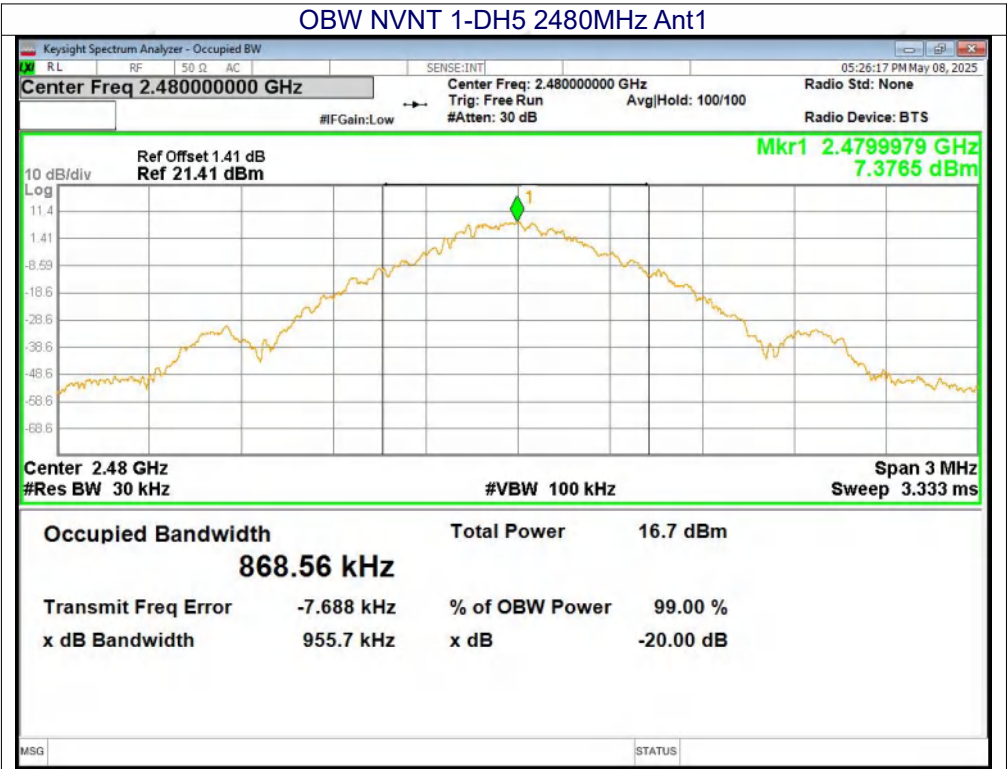
-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1

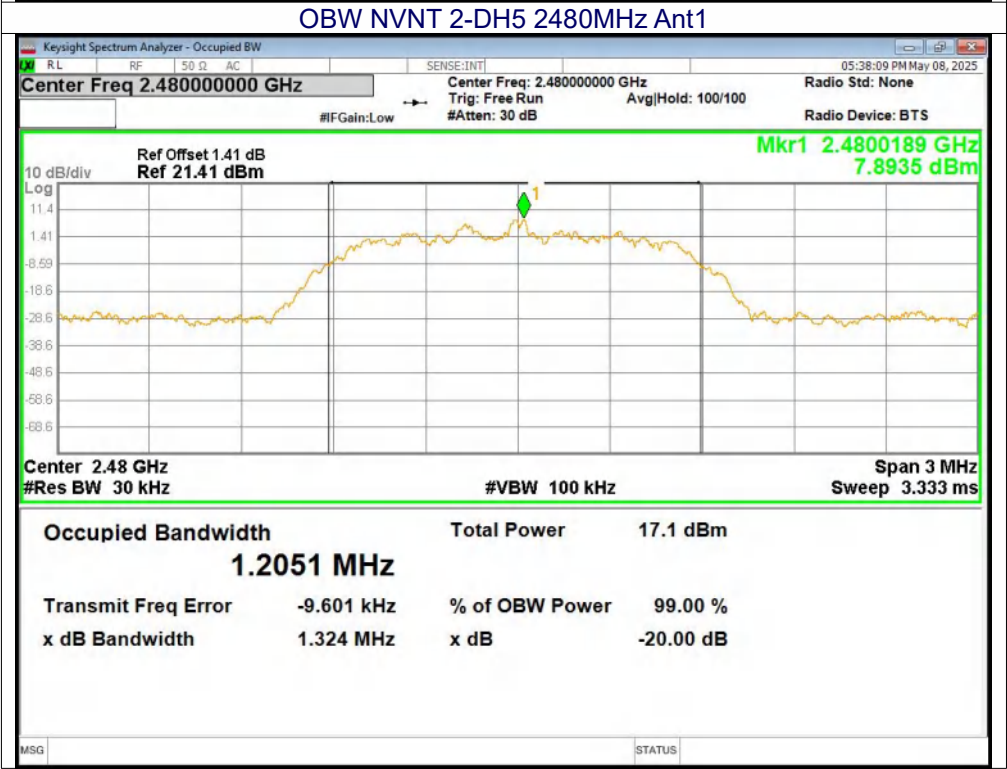
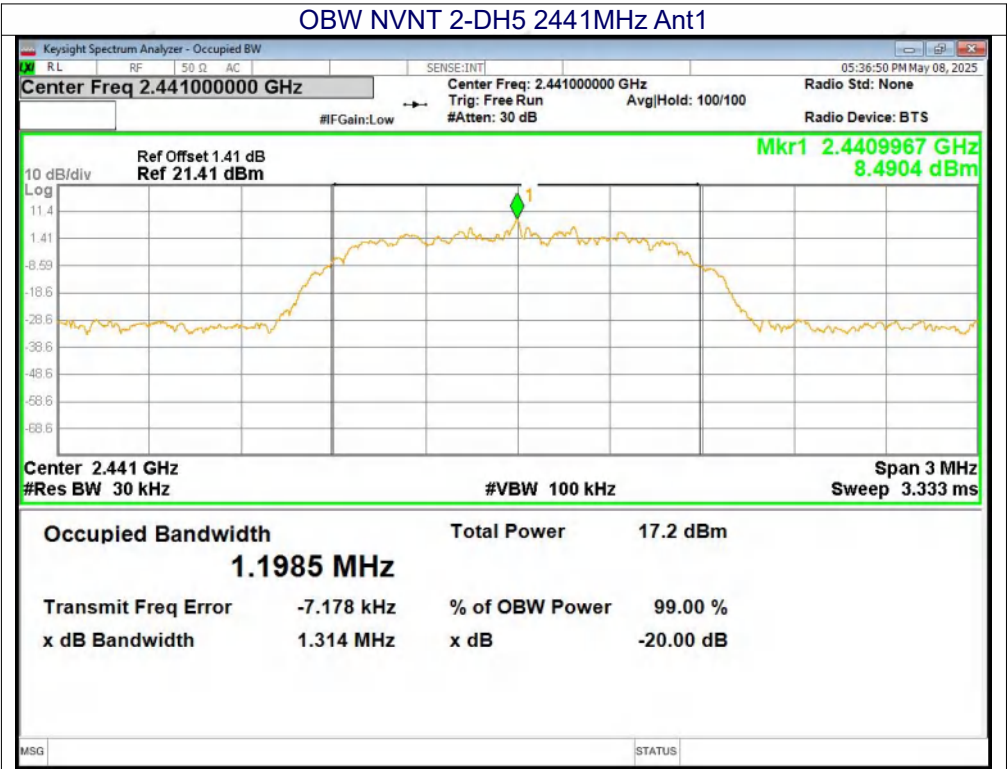


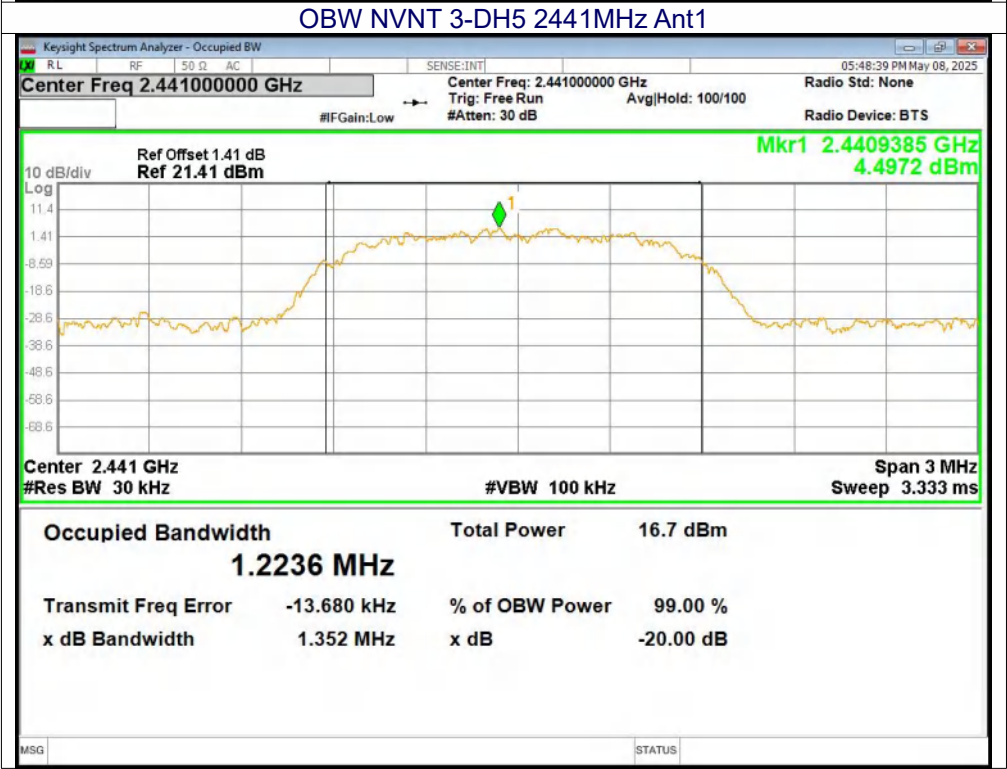
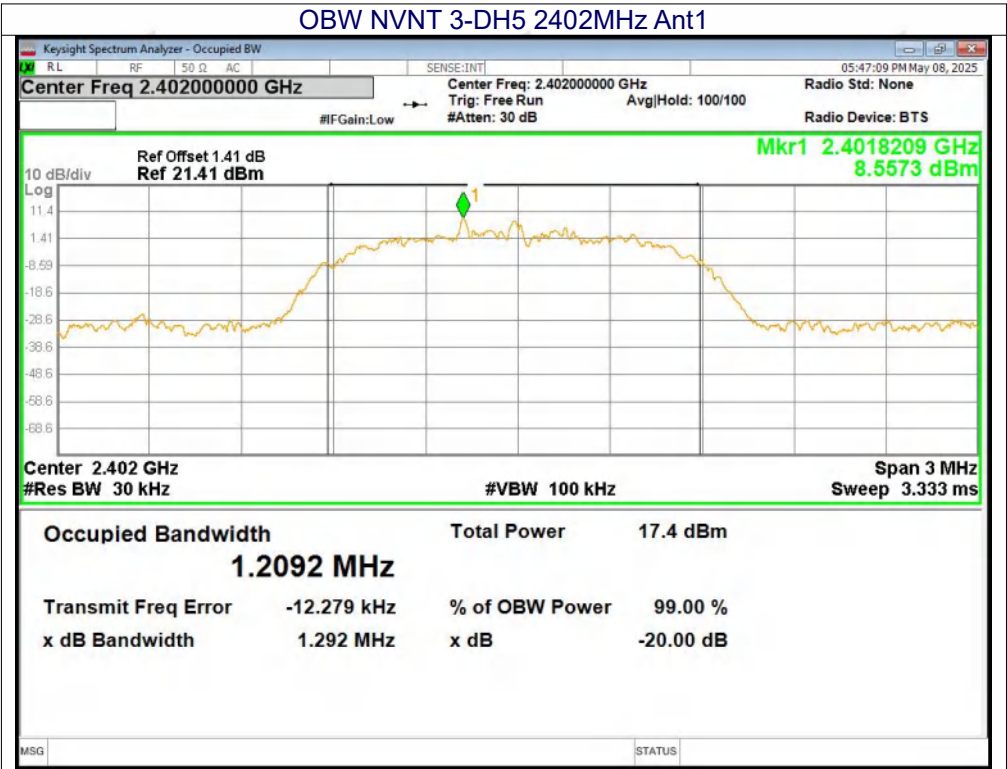


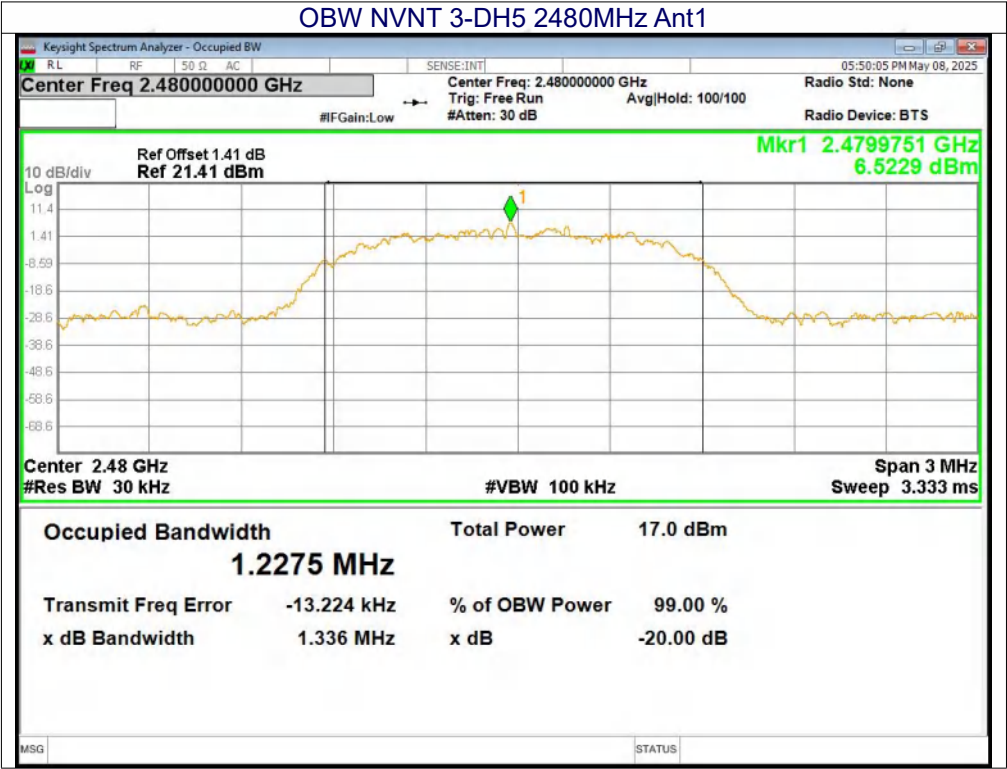












9. Maximum Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(1), RSS 247 5.4 (b)
Test Method:	ANSI C63.10:2013

9.1 Block Diagram Of Test Setup



9.2 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.

9.3 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 = 2MHz. VBW =6MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

9.4 DEVIATION FROM STANDARD

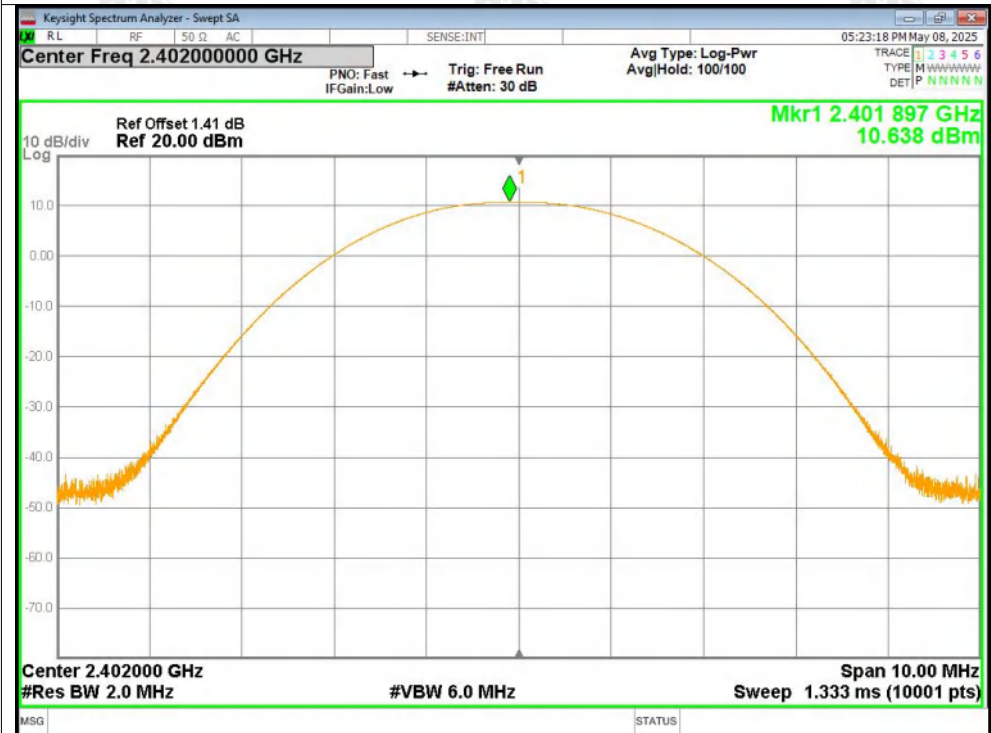
No deviation.

9.5 Test Result

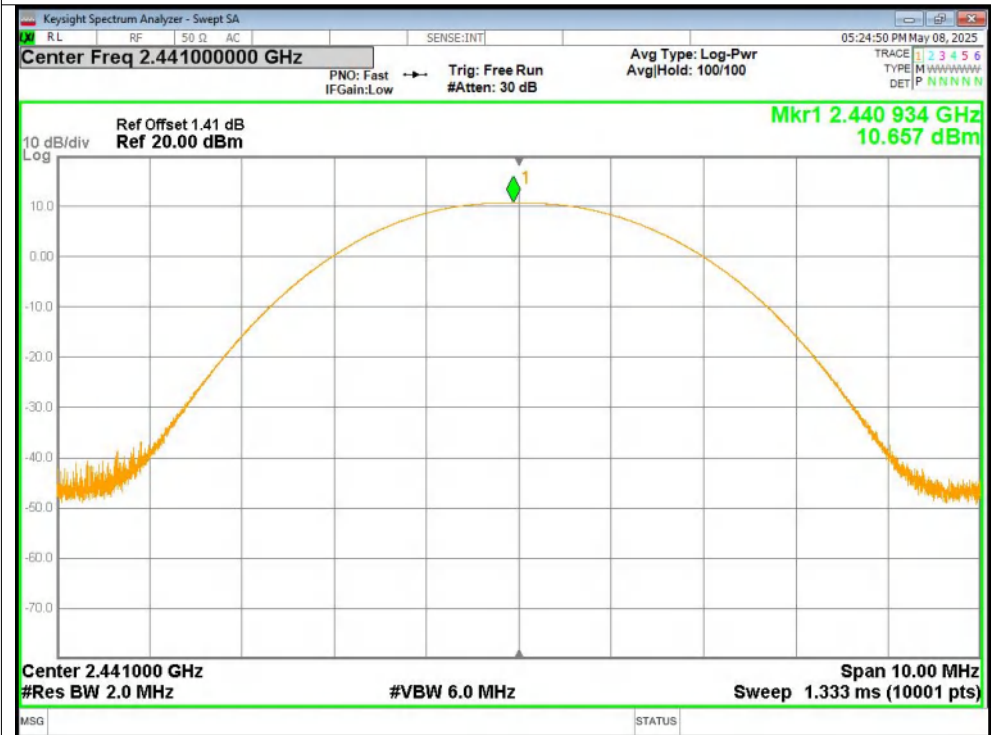
Mode	Test channel	Peak Output Power (dBm)	Peak Output Power Limit (dBm)	Result
GFSK	Lowest	10.64	21.00	Pass
	Middle	10.66		
	Highest	10.12		
$\pi/4$ DQPSK	Lowest	12.11	21.00	Pass
	Middle	12.14		
	Highest	11.8		
8DPSK	Lowest	12.36	21.00	Pass
	Middle	12.41		
	Highest	12.05		

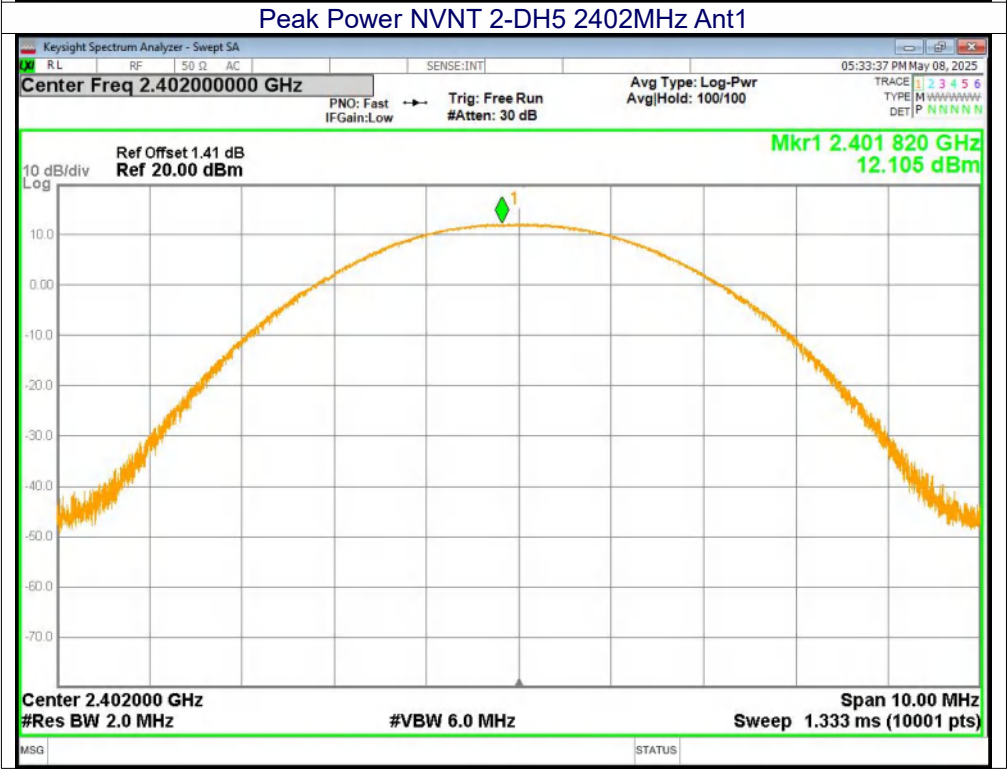
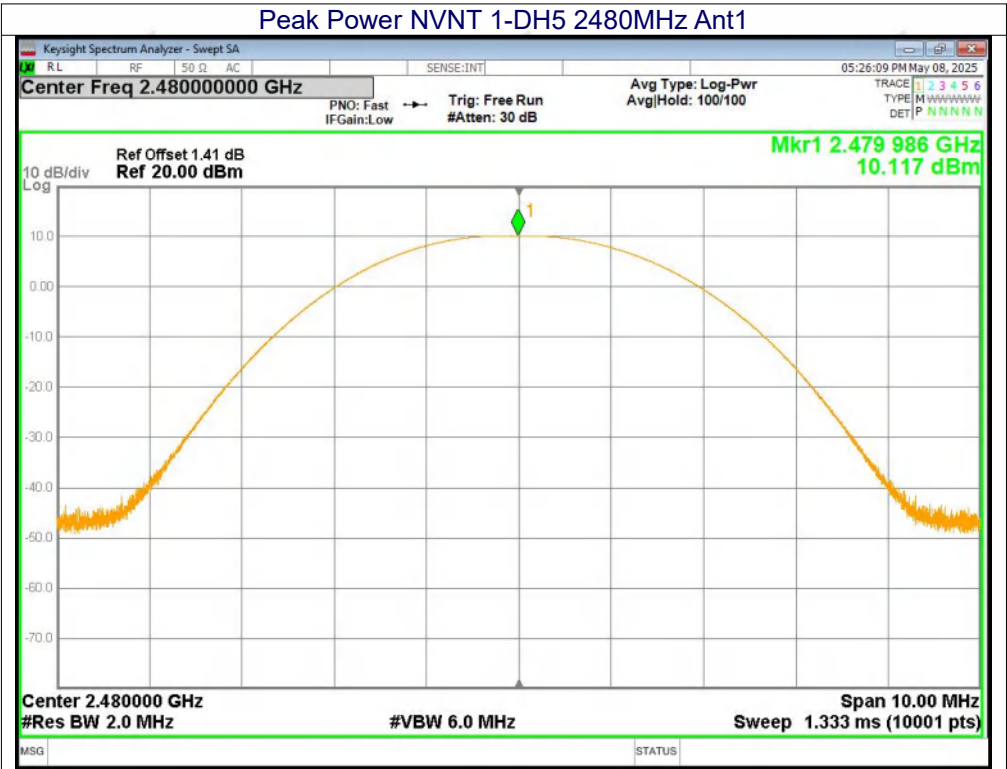
Test Graphs

Peak Power NVNT 1-DH5 2402MHz Ant1

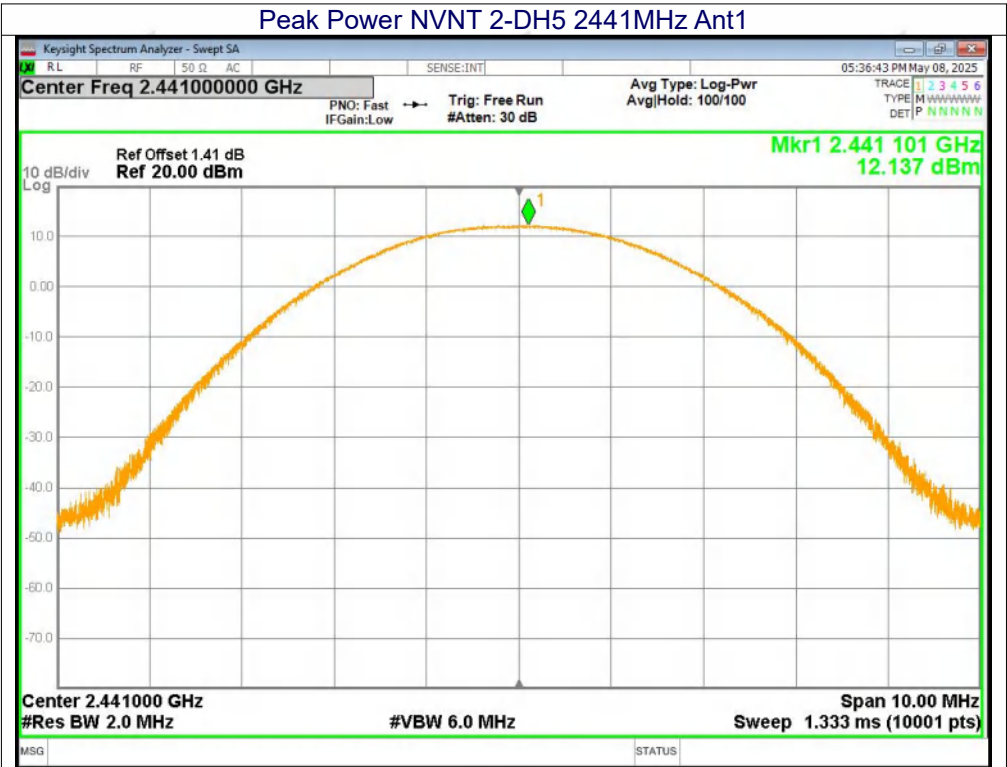


Peak Power NVNT 1-DH5 2441MHz Ant1

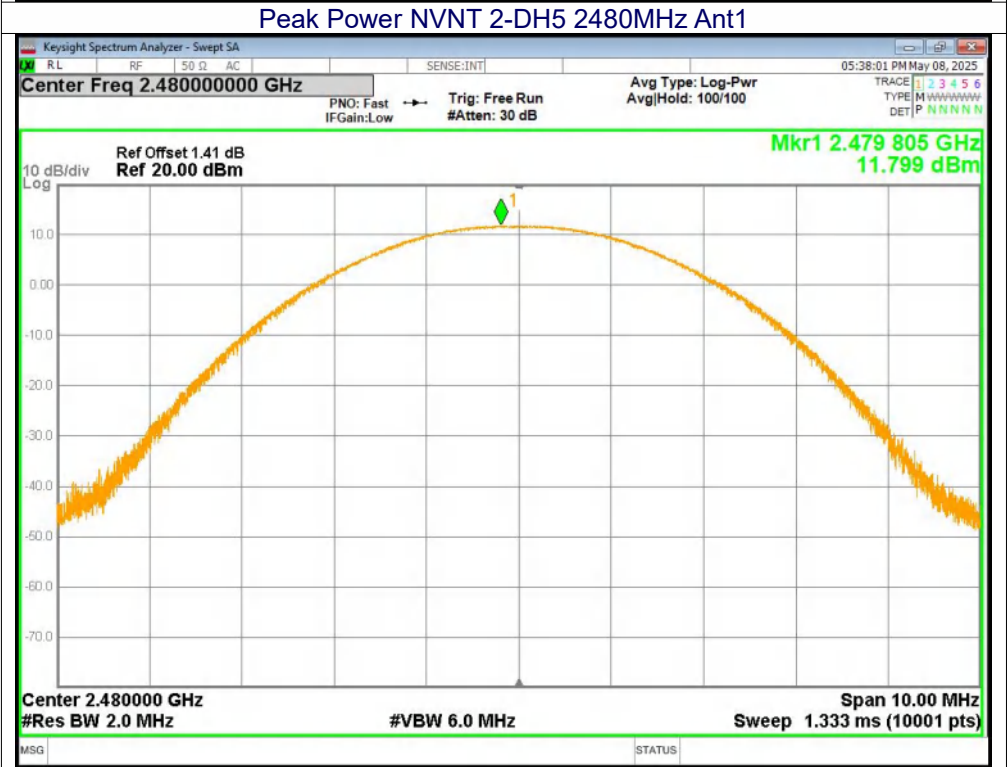


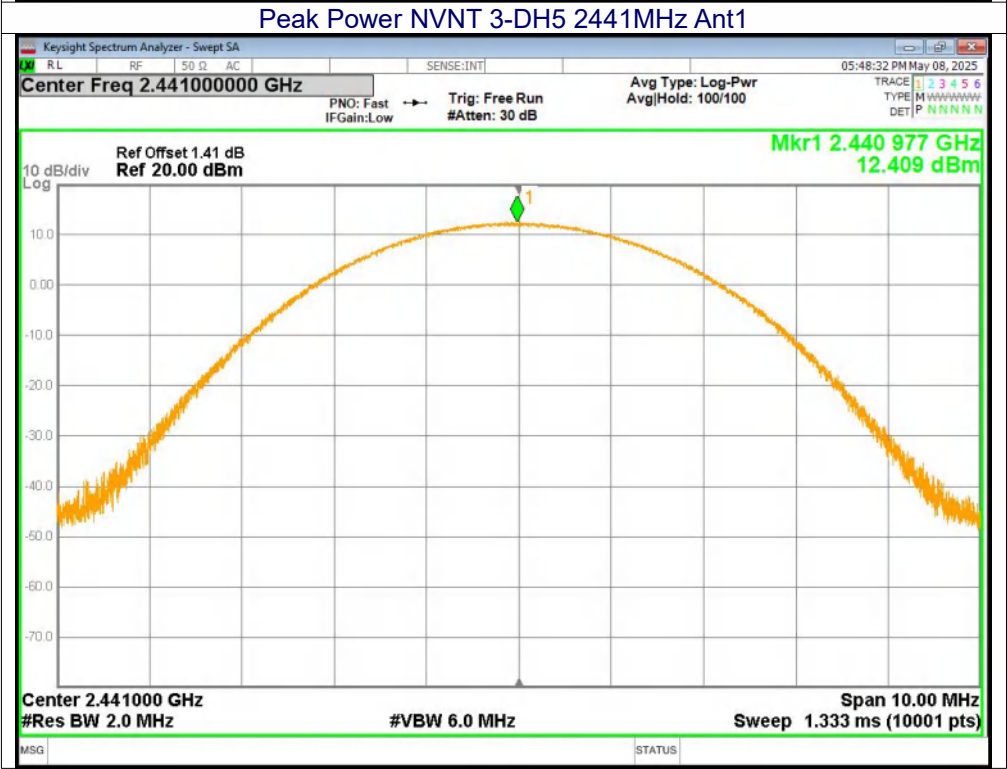
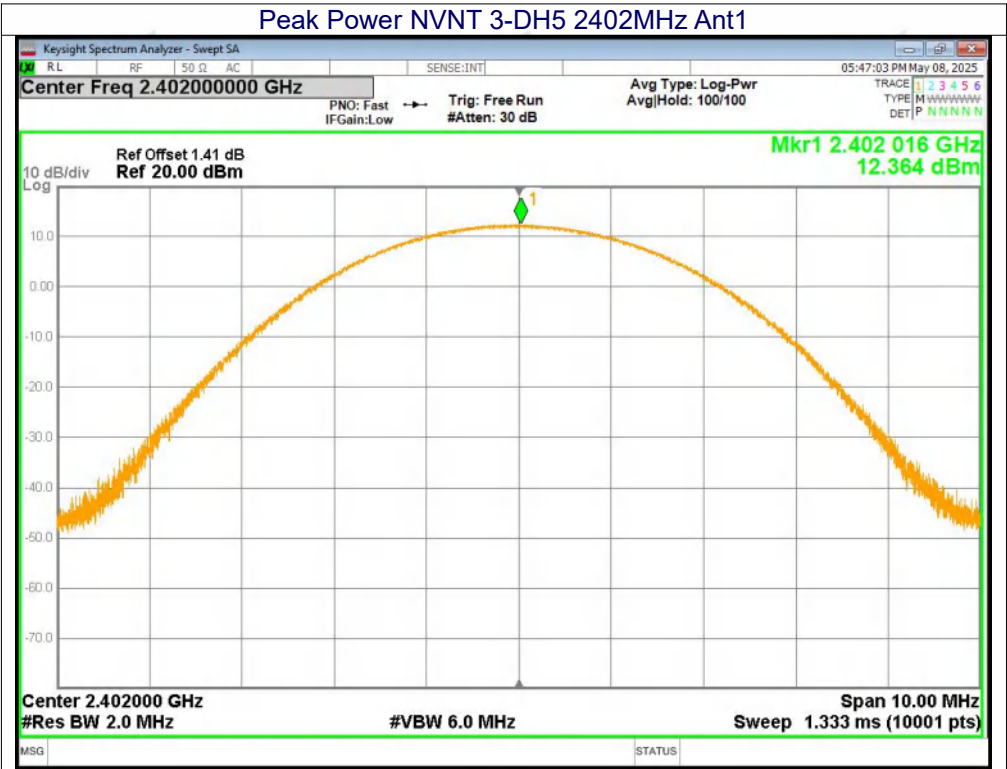


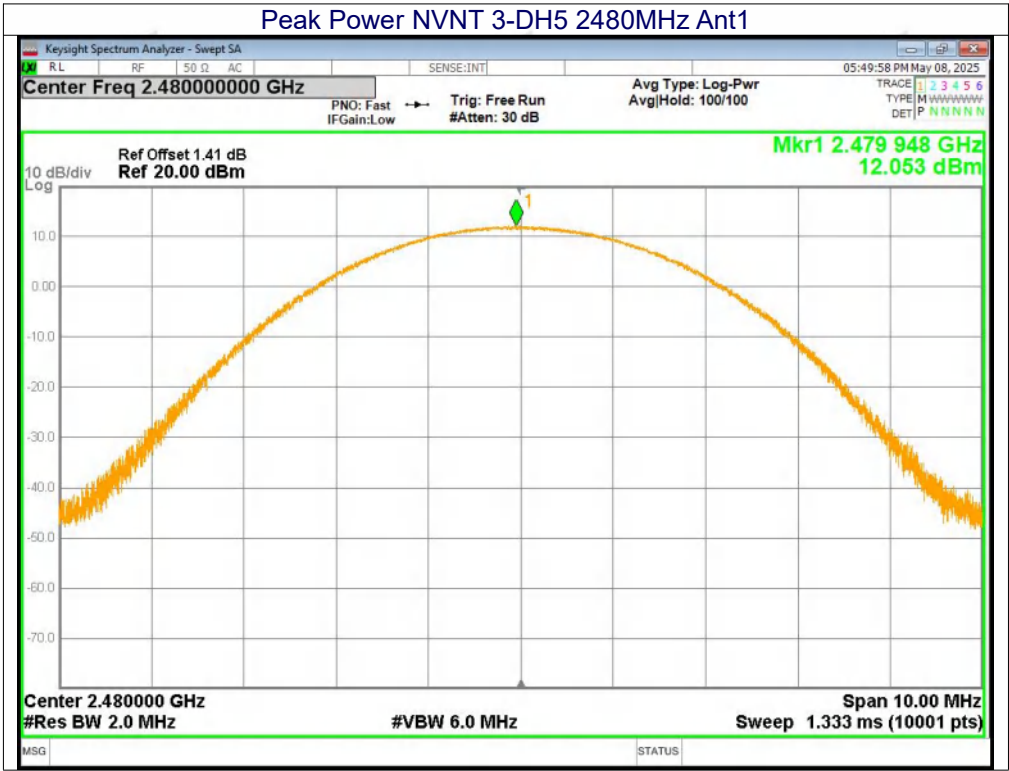
Peak Power NVNT 2-DH5 2441MHz Ant1



Peak Power NVNT 2-DH5 2480MHz Ant1



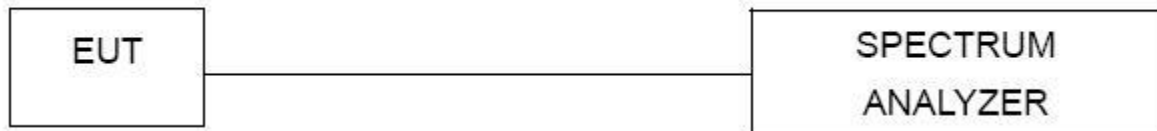




10. HOPPING CHANNEL SEPARATION

Test Requirement:	FCC Part15 C Section 15.247 (a)(1), RSS 247 5.1
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=30KHz, VBW=100KHz, detector=Peak
Limit:	GFSK, $\pi/4$ -DQPSK & 8DSK: 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)

10.1 Test Setup



10.2 Test procedure

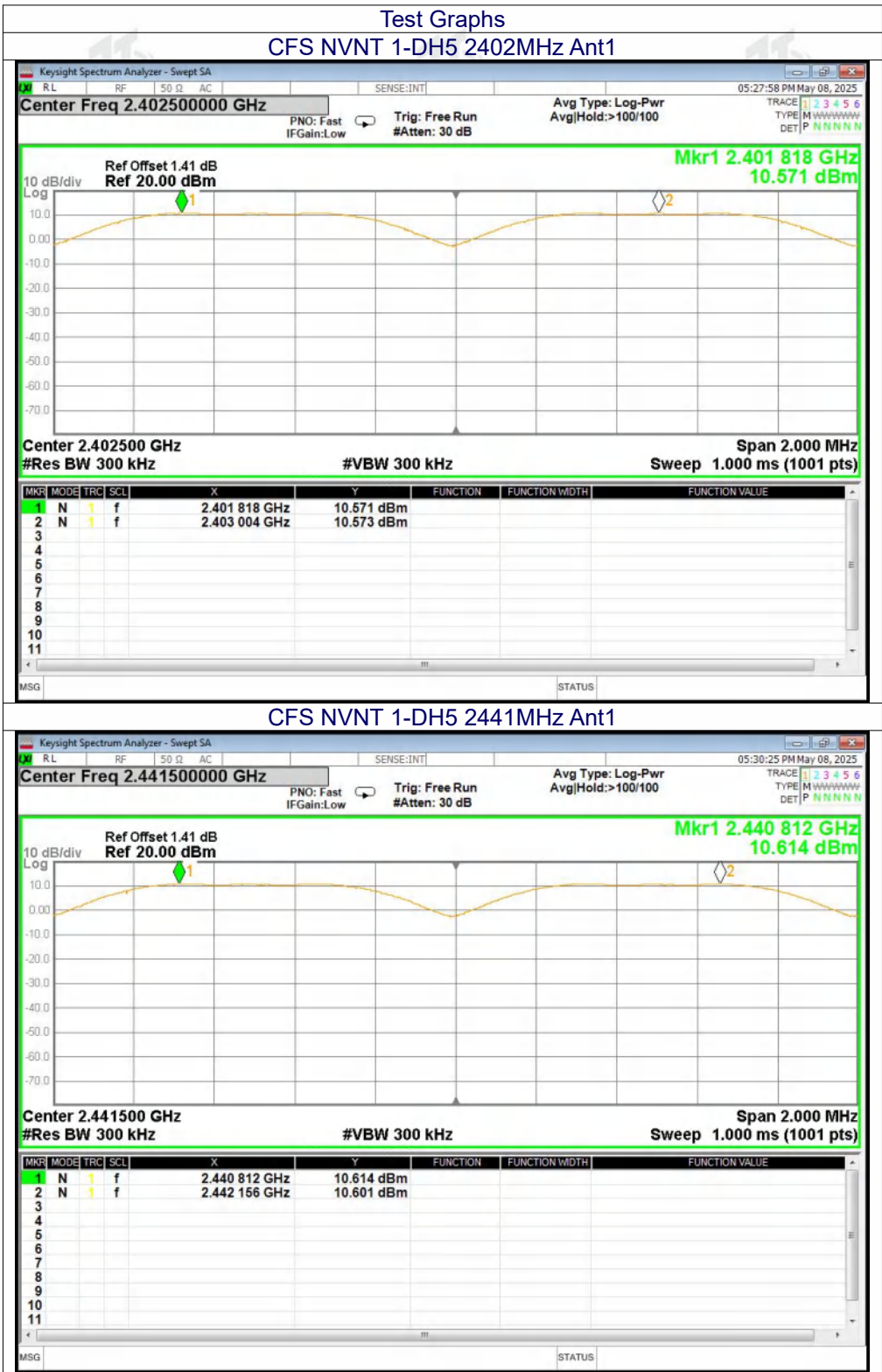
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to 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.

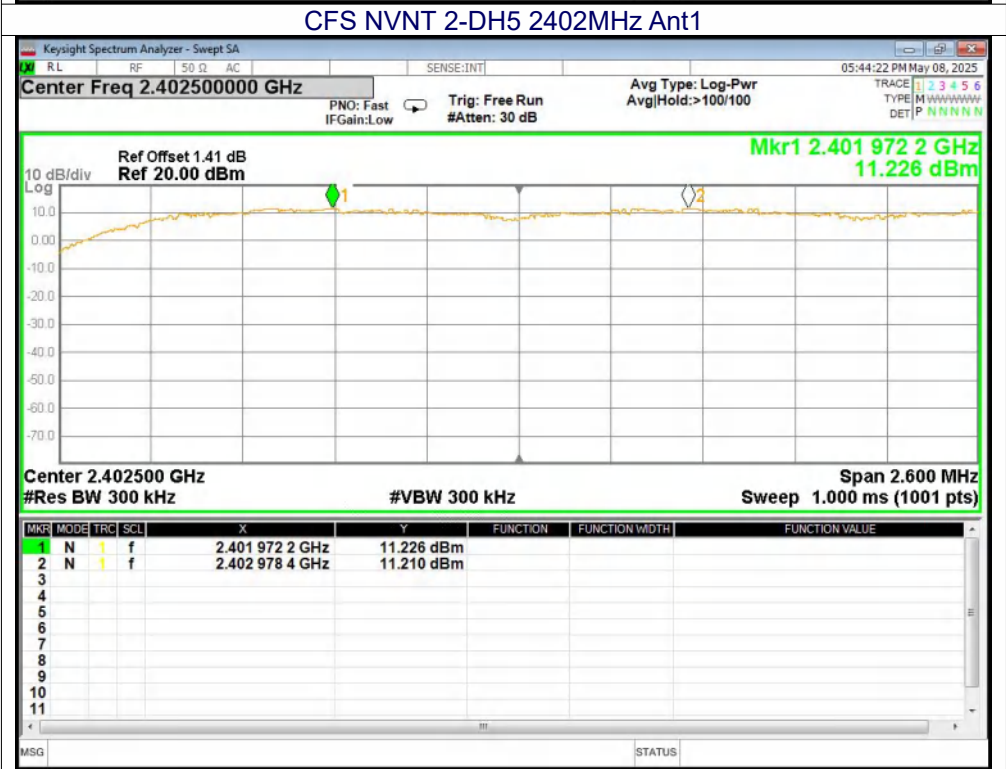
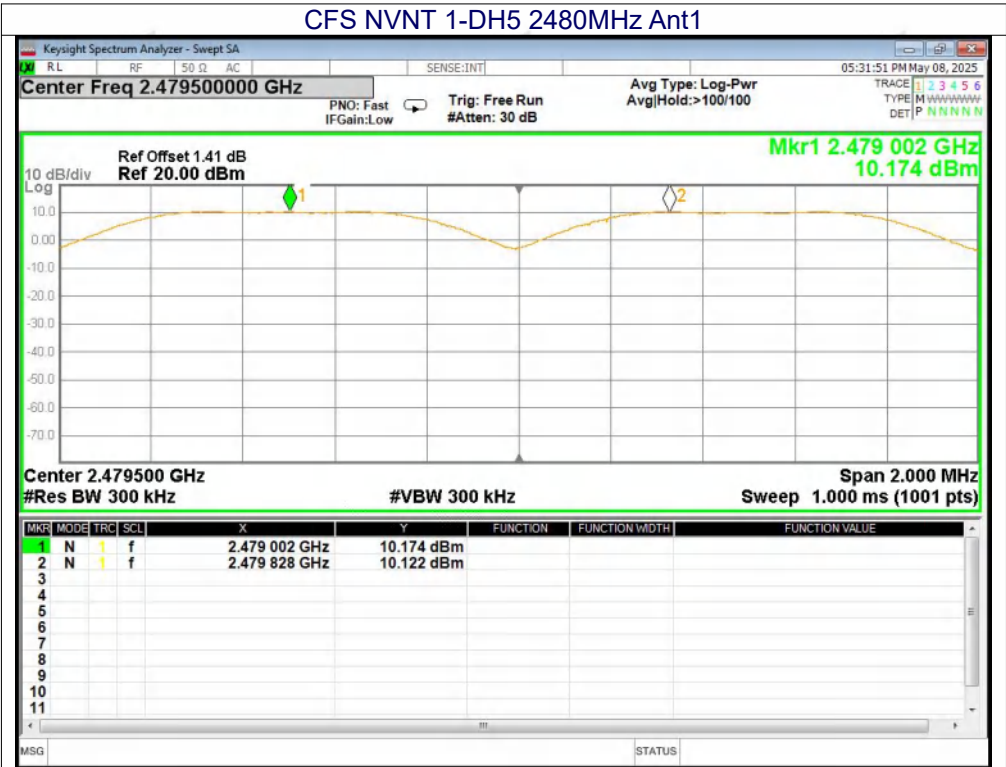
10.3 DEVIATION FROM STANDARD

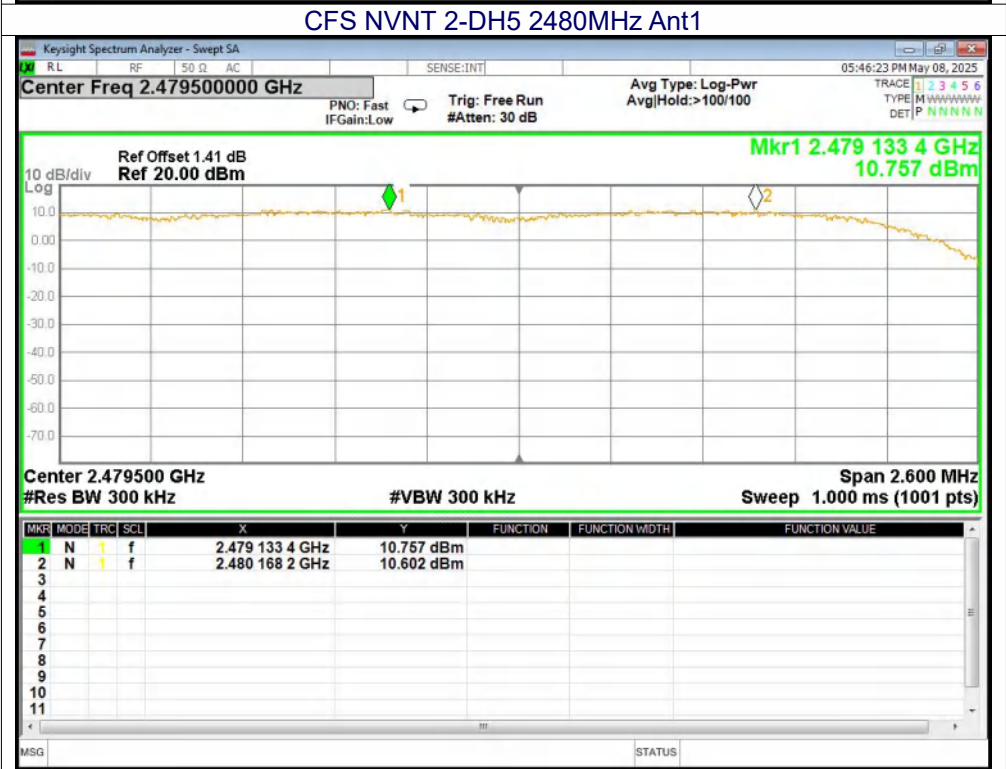
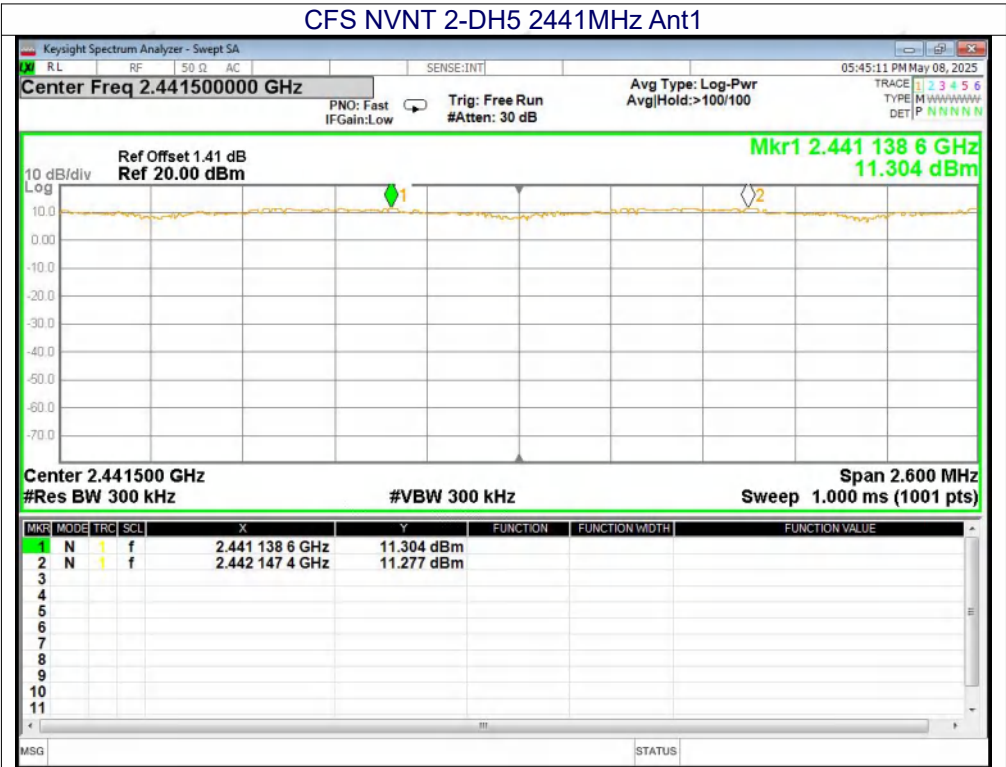
No deviation.

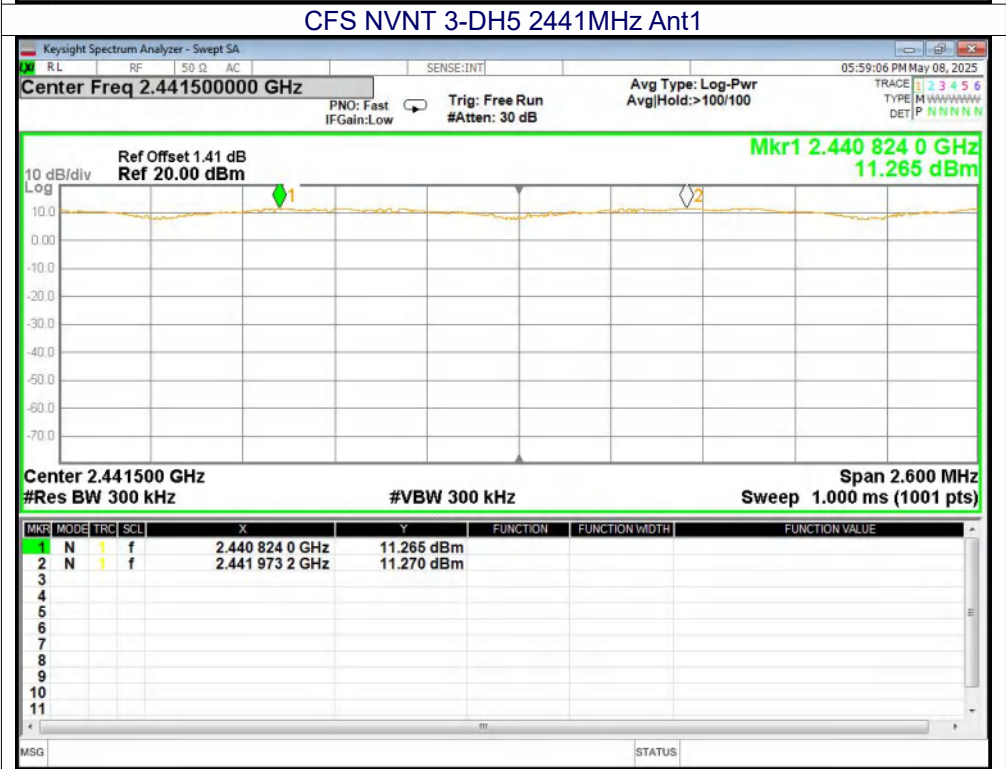
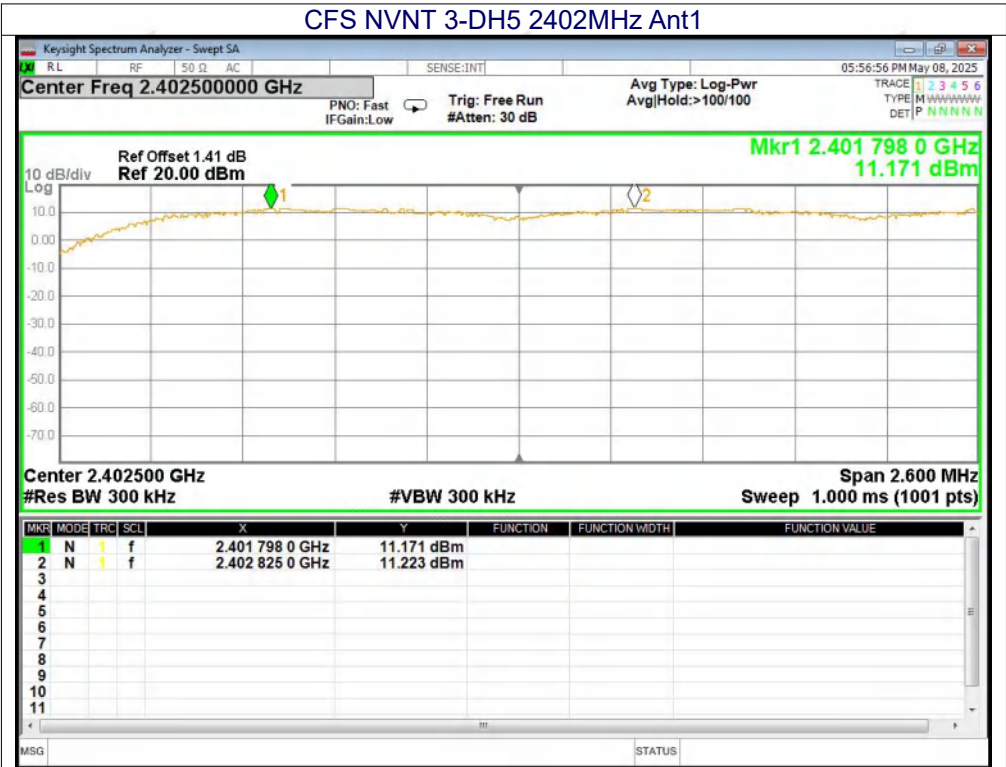
10.4 Test Result

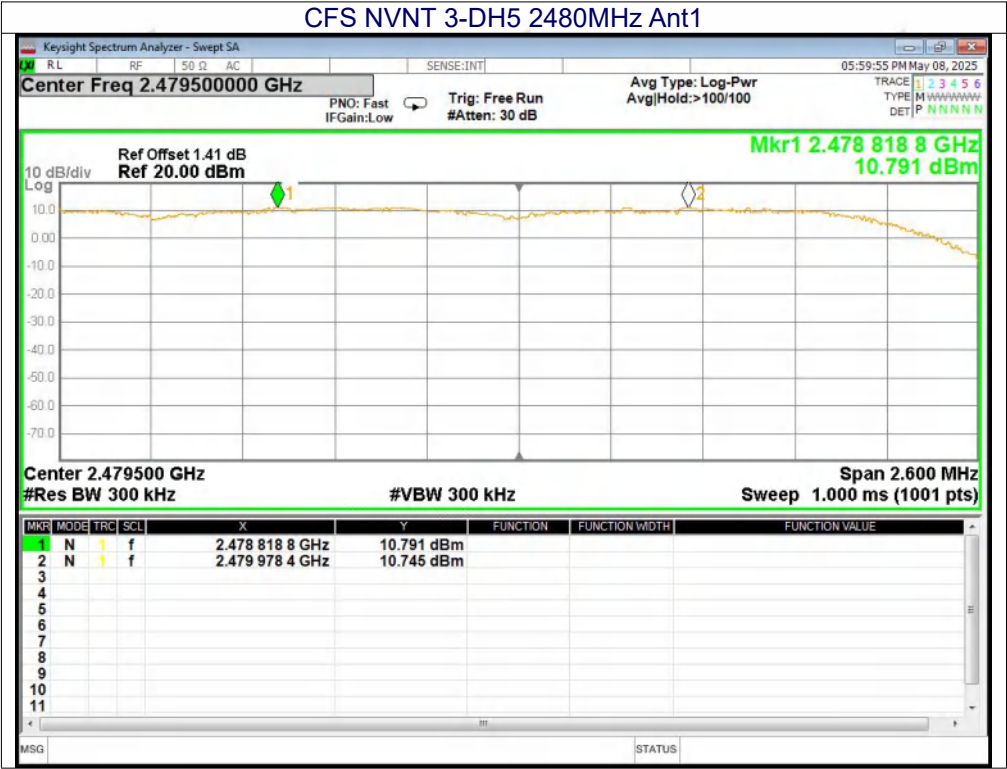
Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2401.818	2403.004	1.186	0.638	Pass
NVNT	1-DH5	Ant1	2440.812	2442.156	1.344	0.629	Pass
NVNT	1-DH5	Ant1	2479.002	2479.828	0.826	0.631	Pass
NVNT	2-DH5	Ant1	2401.9722	2402.9784	1.0062	0.853	Pass
NVNT	2-DH5	Ant1	2441.1386	2442.1474	1.0088	0.851	Pass
NVNT	2-DH5	Ant1	2479.1334	2480.1682	1.0348	0.869	Pass
NVNT	3-DH5	Ant1	2401.798	2402.825	1.027	0.871	Pass
NVNT	3-DH5	Ant1	2440.824	2441.9732	1.1492	0.866	Pass
NVNT	3-DH5	Ant1	2478.8188	2479.9784	1.1596	0.871	Pass







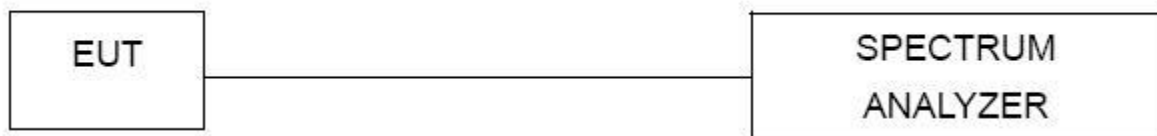




11.NUMBER OF HOPPING FREQUENCY

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii), RSS-247 5.1
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels

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 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;

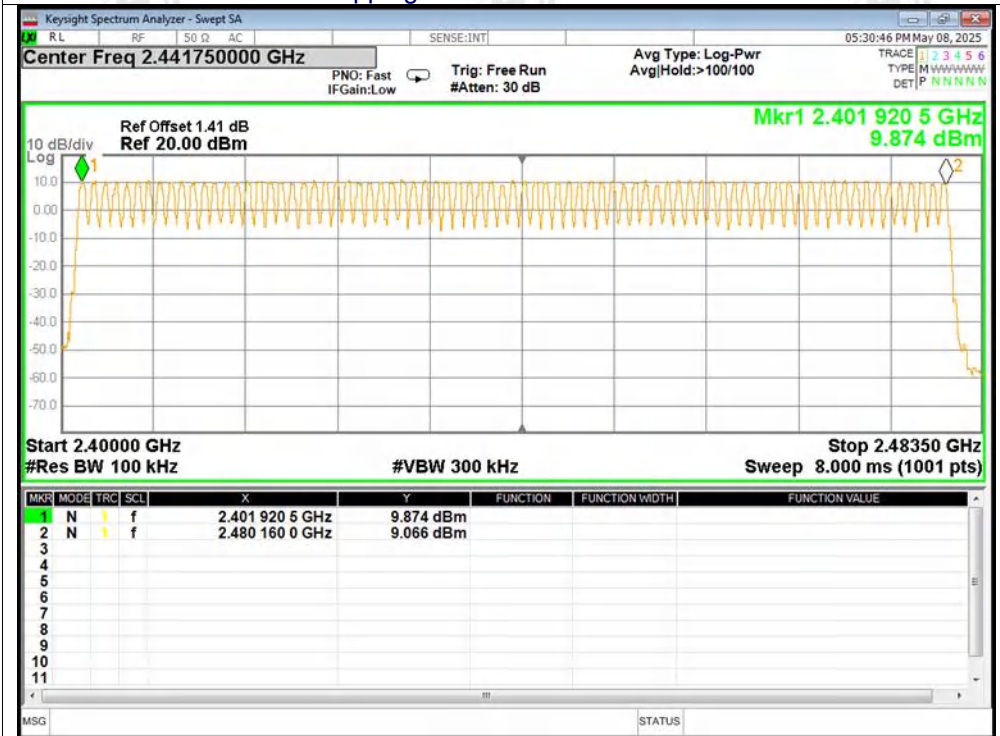
11.3 DEVIATION FROM STANDARD

No deviation.

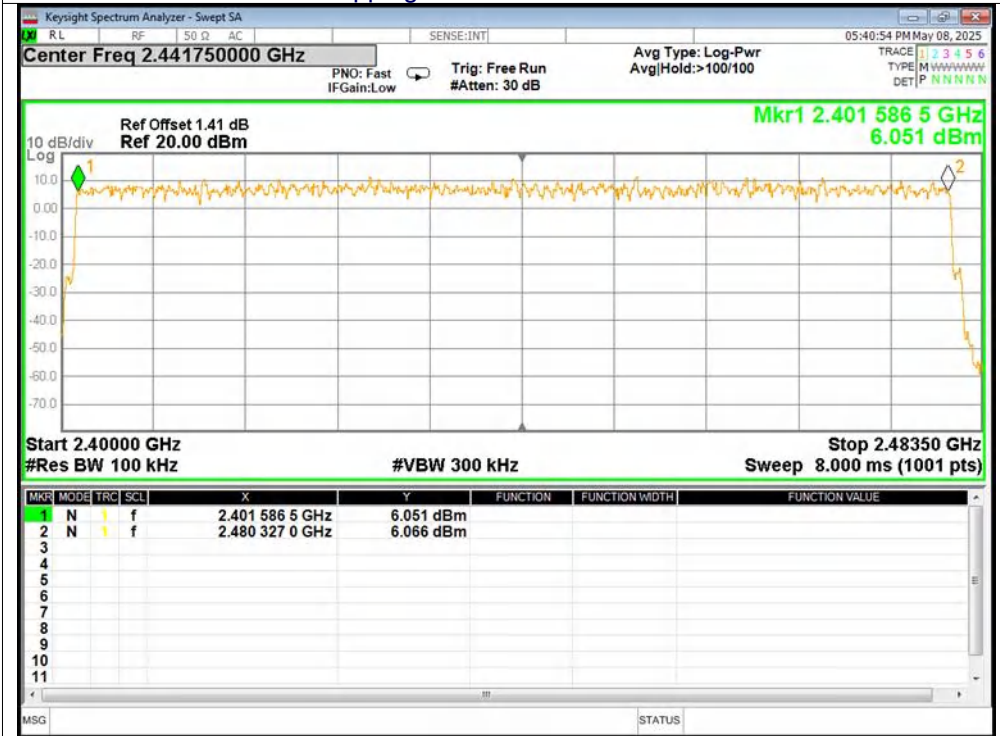
11.4 Test Result

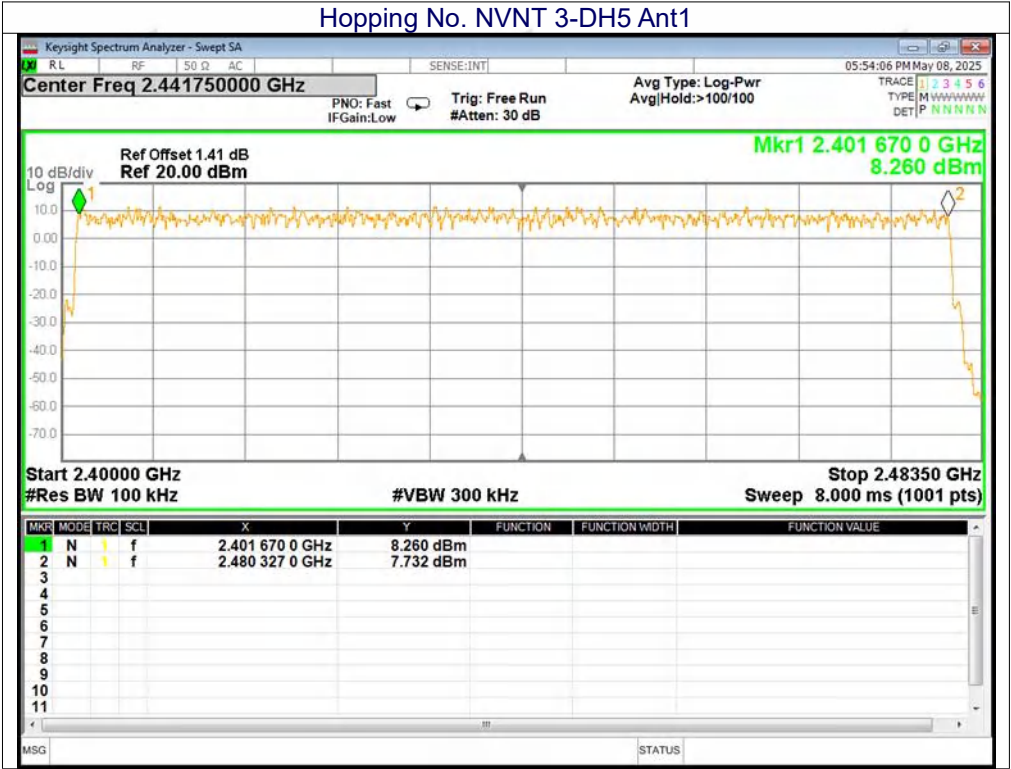
Mode	Antenna	Hopping Number	Limit	Verdict
1-DH5	Ant1	79	15	Pass
2-DH5	Ant1	79	15	Pass
3-DH5	Ant1	79	15	Pass

Test Graphs Hopping No. NVNT 1-DH5 Ant1



Hopping No. NVNT 2-DH5 Ant1

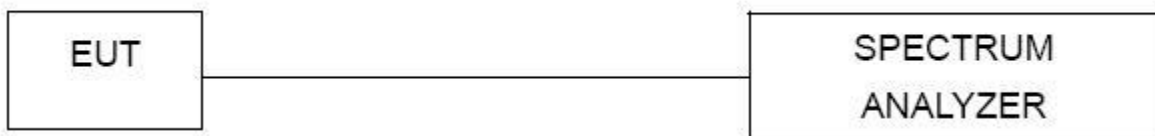




12. DWELL TIME

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii), RSS-247 5.1
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=1MHz, VBW=3MHz, Span=0Hz, Detector=Peak
Limit:	0.4 Second

12.1 Test Setup



12.2 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 DH5, DH3 and DH1 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).

12.3 DEVIATION FROM STANDARD

No deviation.

12.4 Test Result

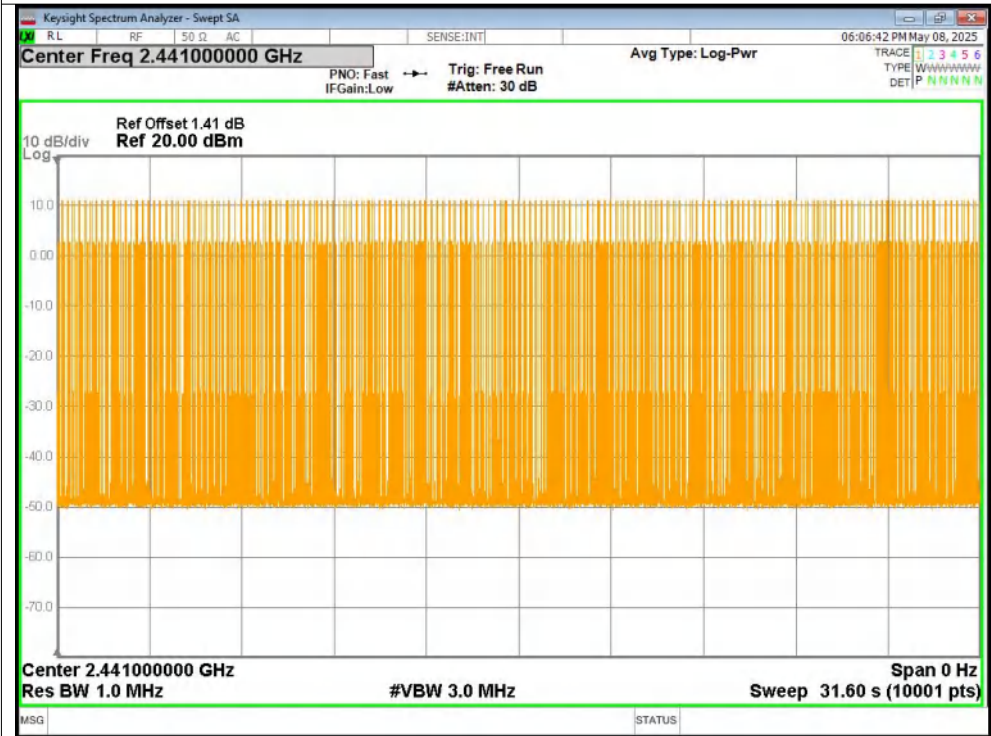
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	Ant1	0.383	121.794	318	31600	400	Pass
NVNT	1-DH3	2441	Ant1	1.639	268.796	164	31600	400	Pass
NVNT	1-DH5	2441	Ant1	2.887	274.265	95	31600	400	Pass
NVNT	2-DH1	2441	Ant1	0.391	124.338	318	31600	400	Pass
NVNT	2-DH3	2441	Ant1	1.643	279.31	170	31600	400	Pass
NVNT	2-DH5	2441	Ant1	2.892	271.848	94	31600	400	Pass
NVNT	3-DH1	2441	Ant1	0.391	123.947	317	31600	400	Pass
NVNT	3-DH3	2441	Ant1	1.643	243.164	148	31600	400	Pass
NVNT	3-DH5	2441	Ant1	2.894	347.28	120	31600	400	Pass

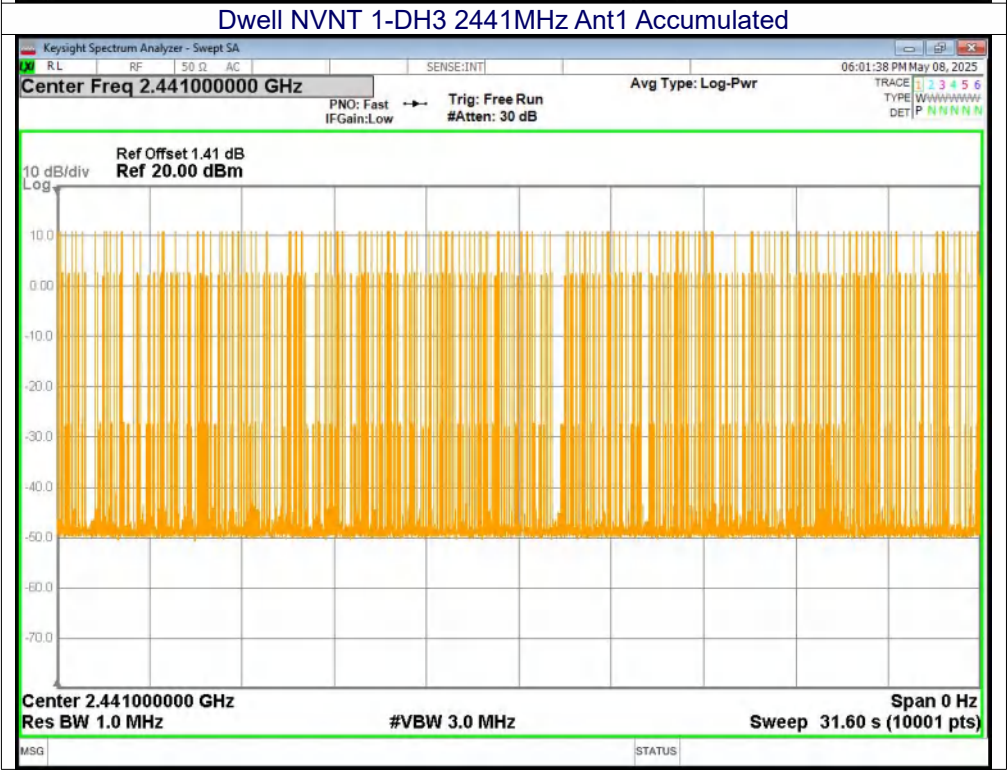
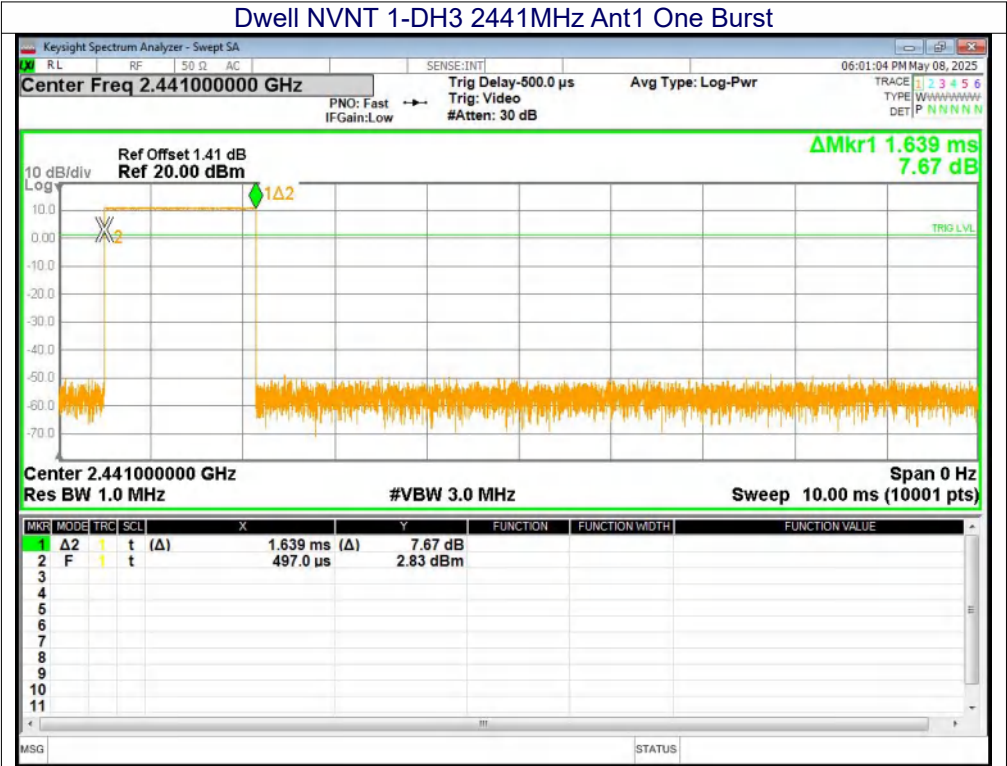
Test Graphs

Dwell NVNT 1-DH1 2441MHz Ant1 One Burst

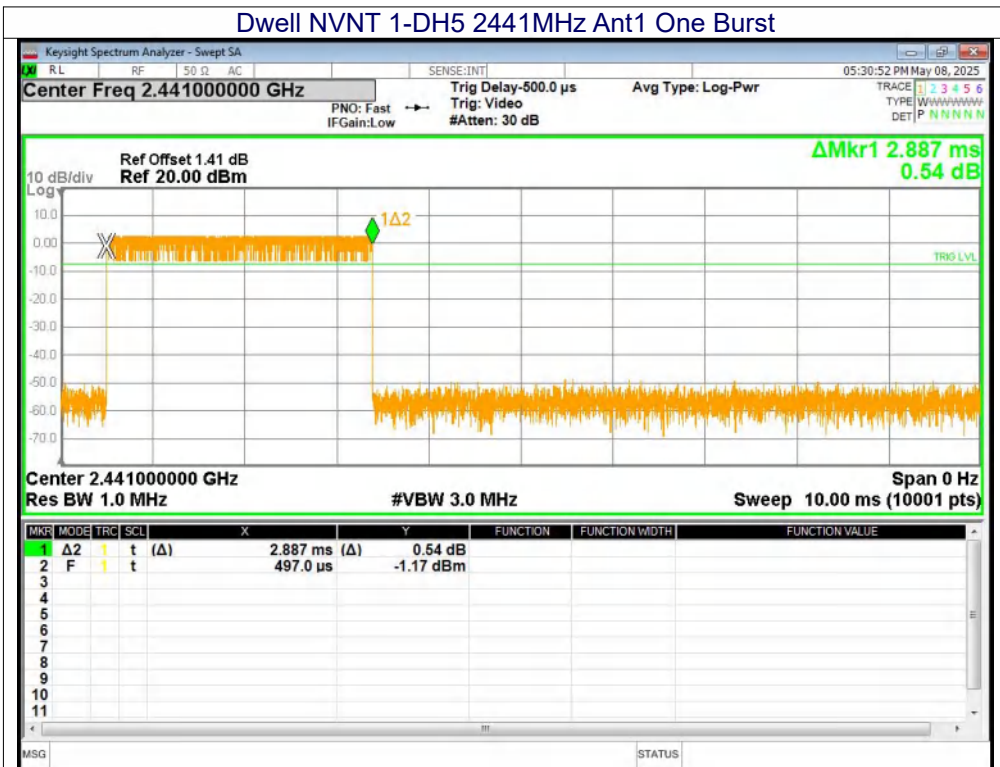


Dwell NVNT 1-DH1 2441MHz Ant1 Accumulated

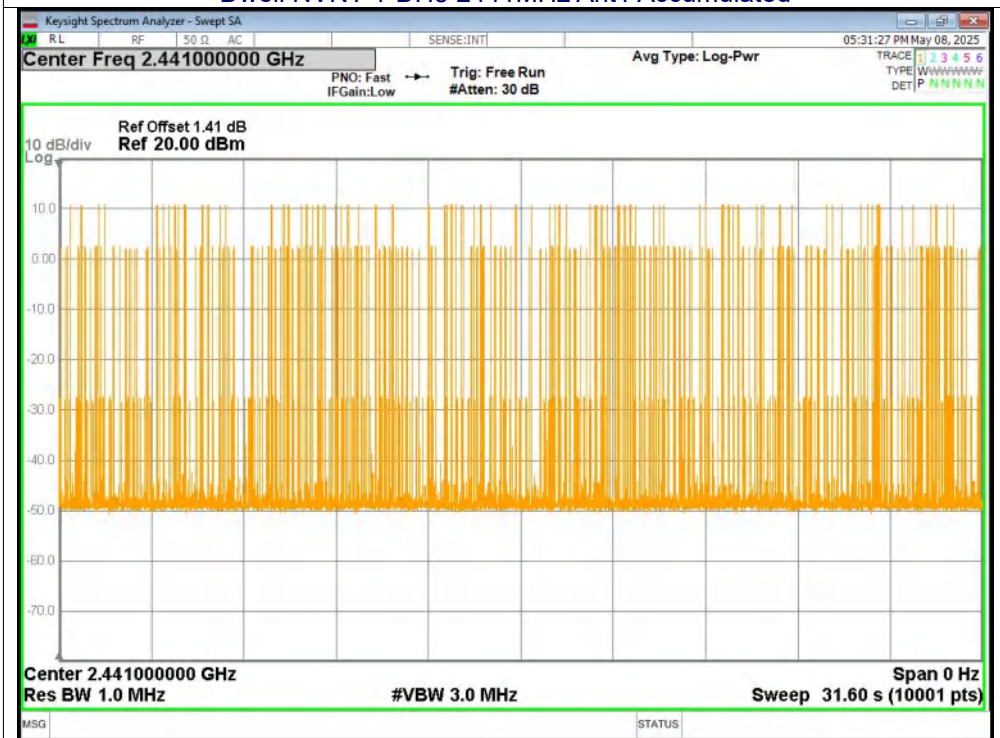


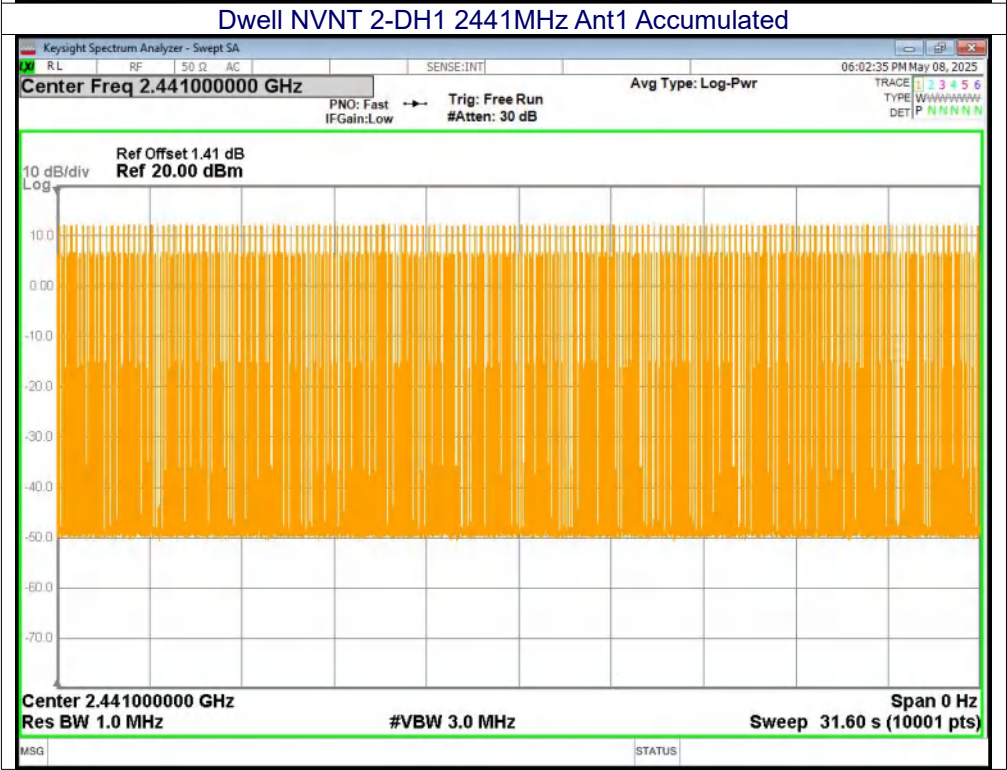
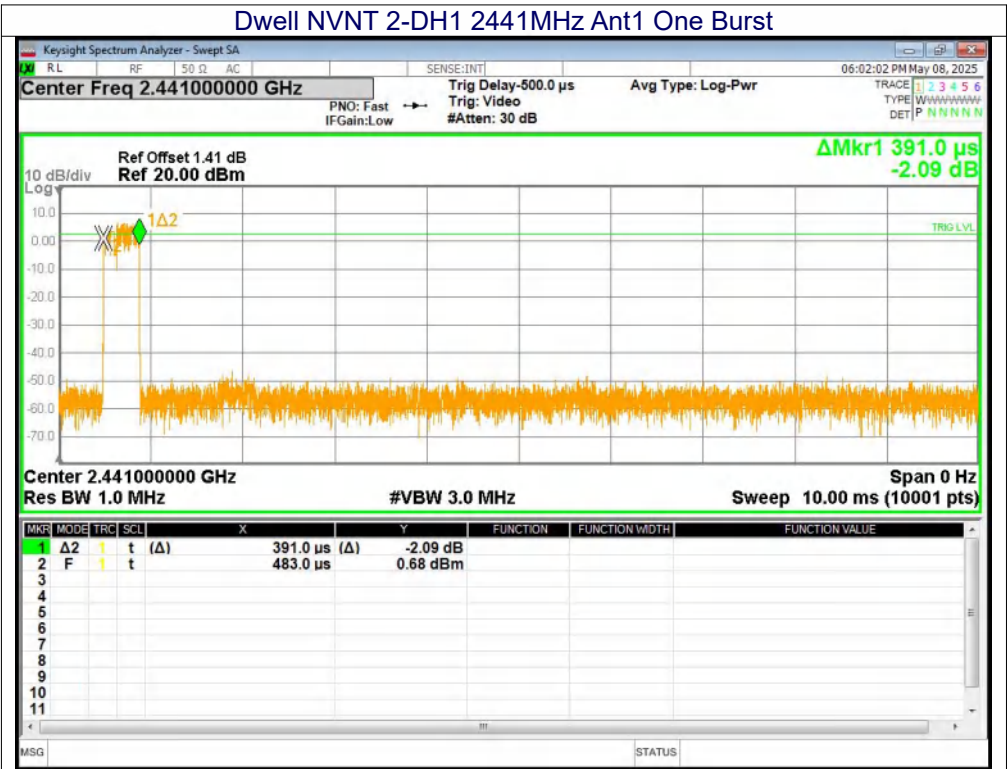


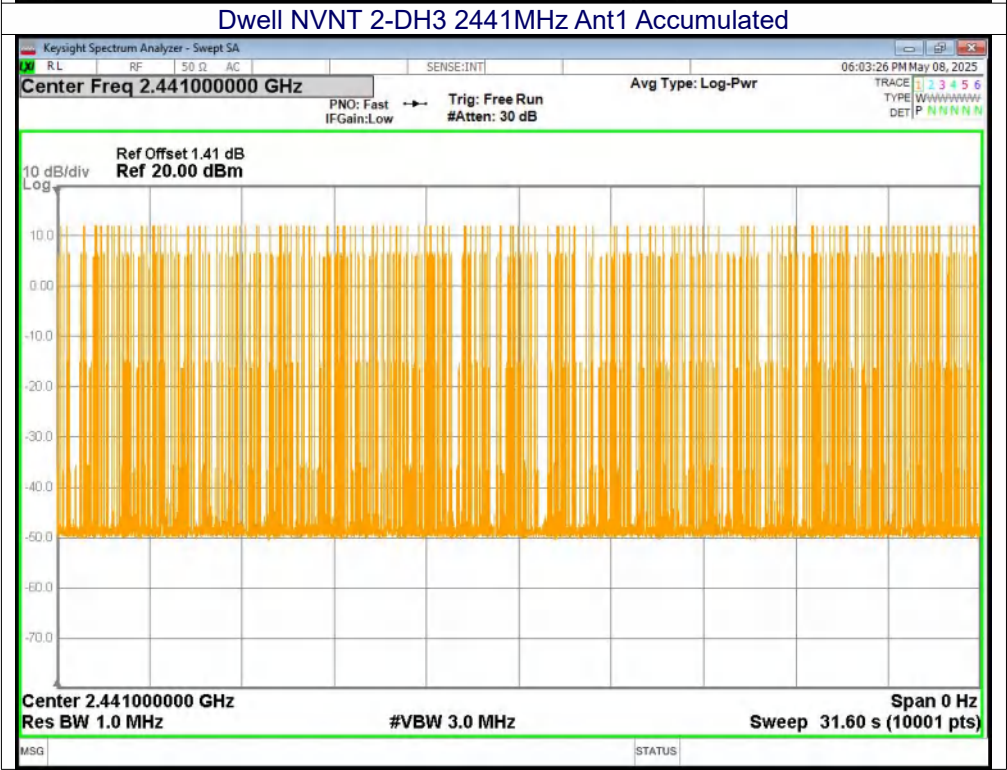
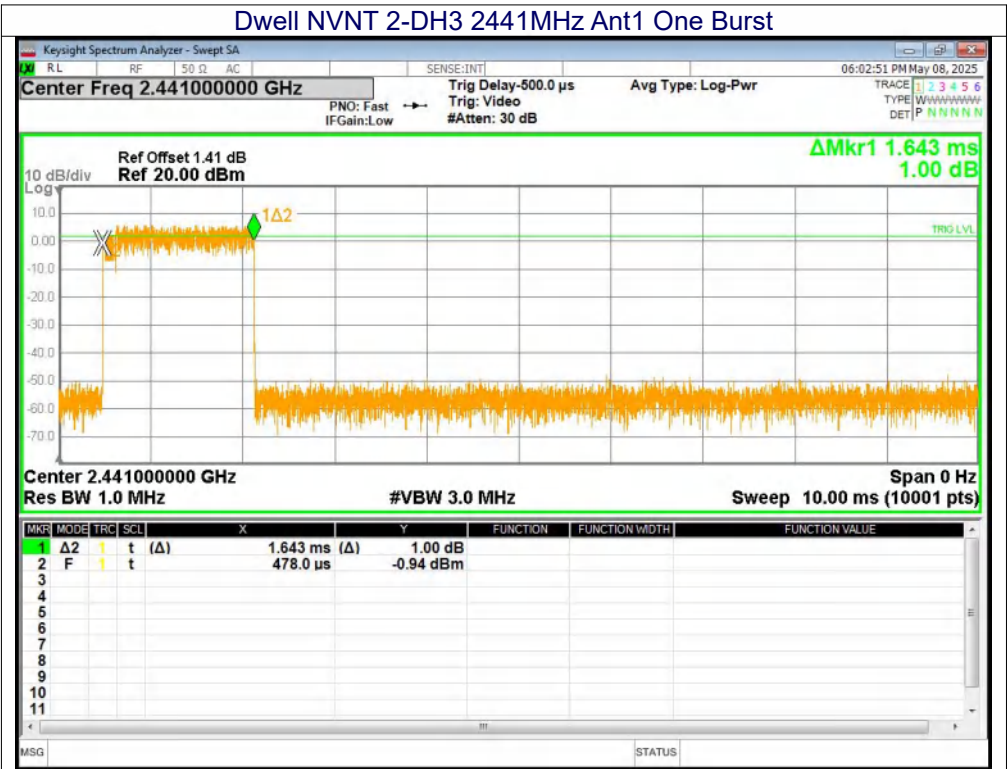
Dwell NVNT 1-DH5 2441MHz Ant1 One Burst

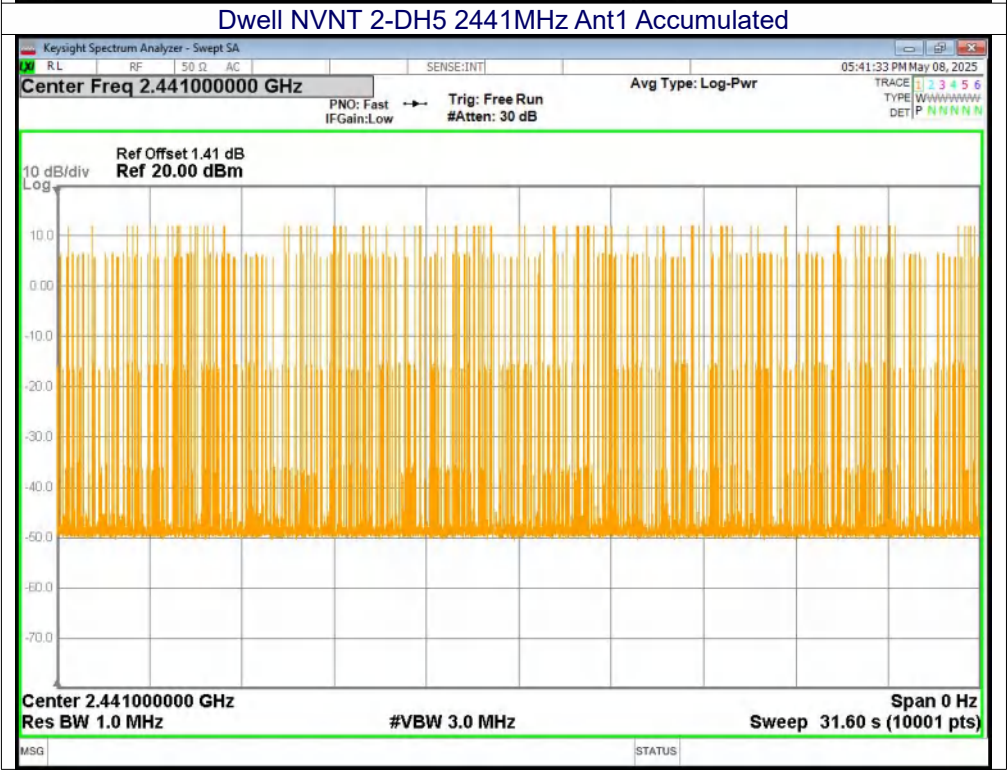
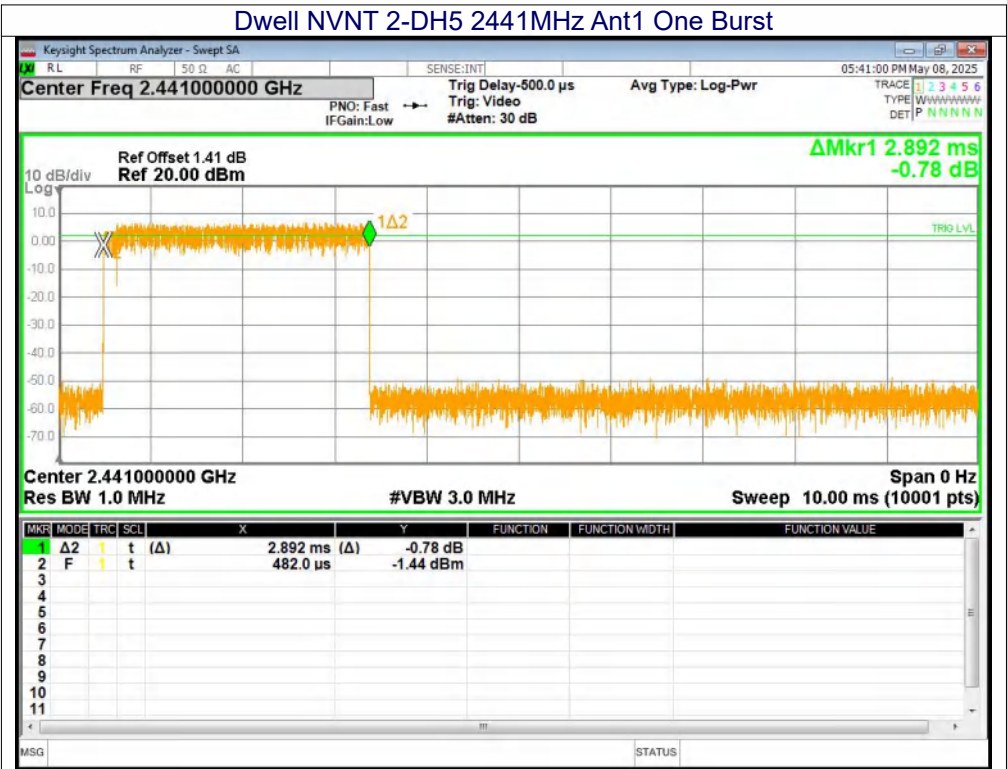


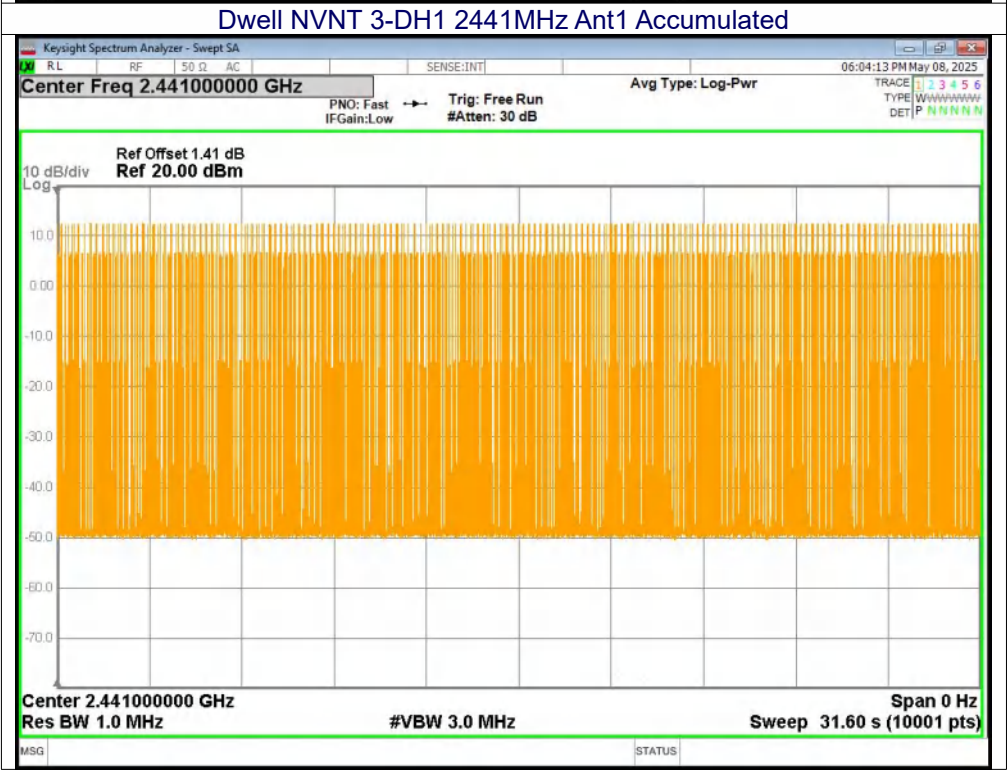
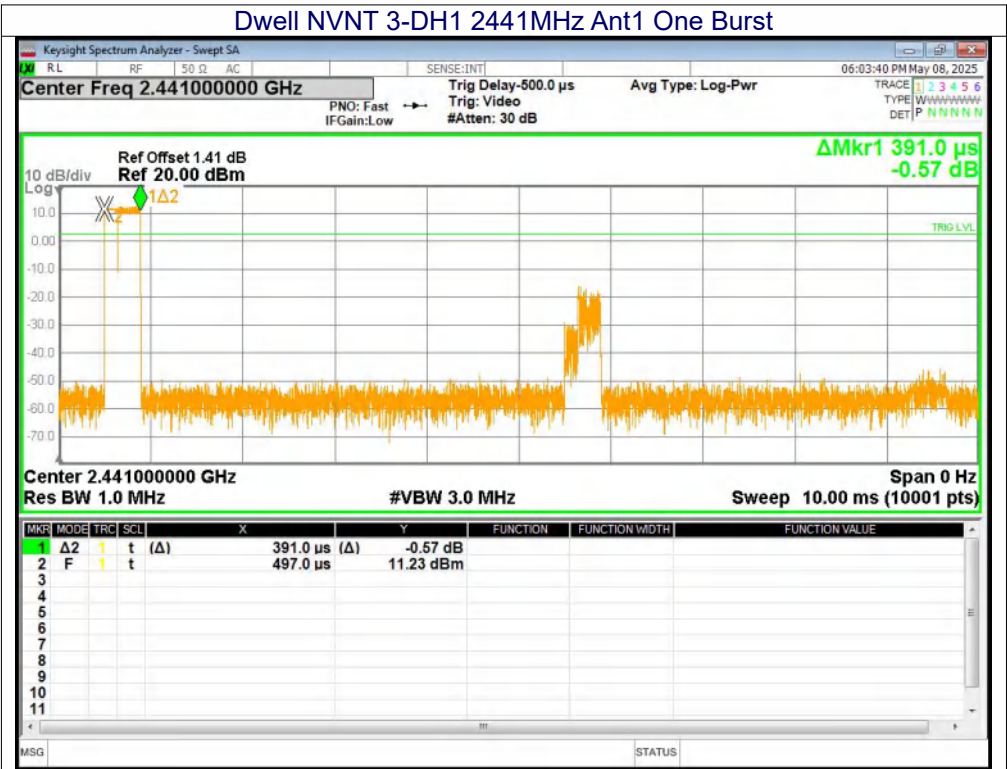
Dwell NVNT 1-DH5 2441MHz Ant1 Accumulated



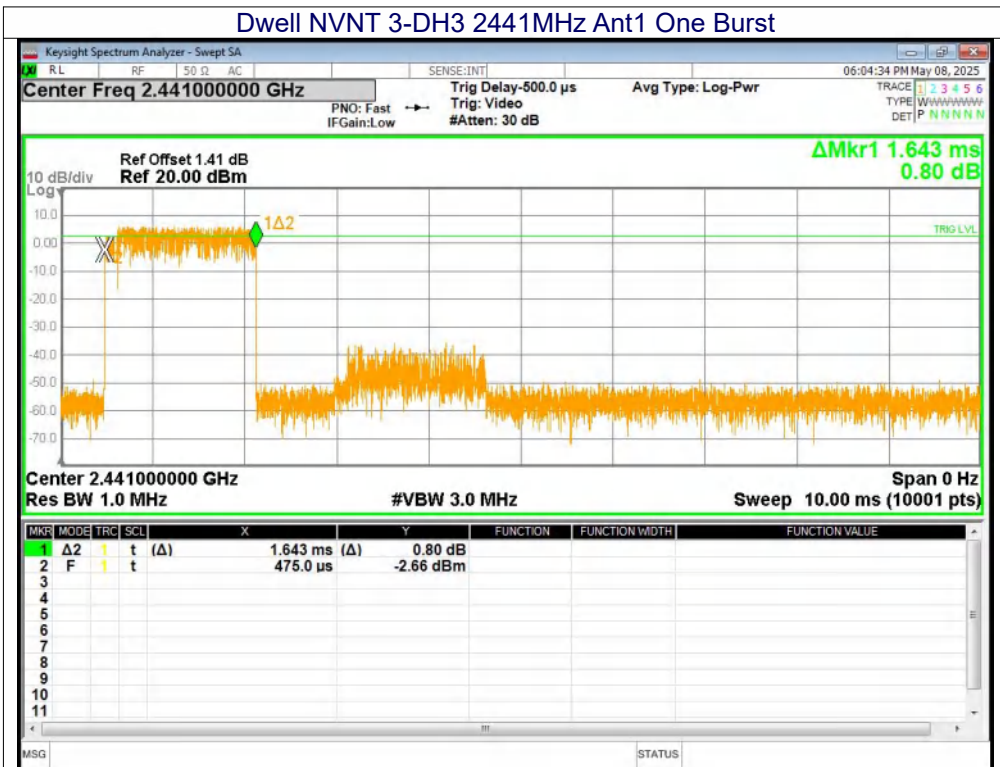




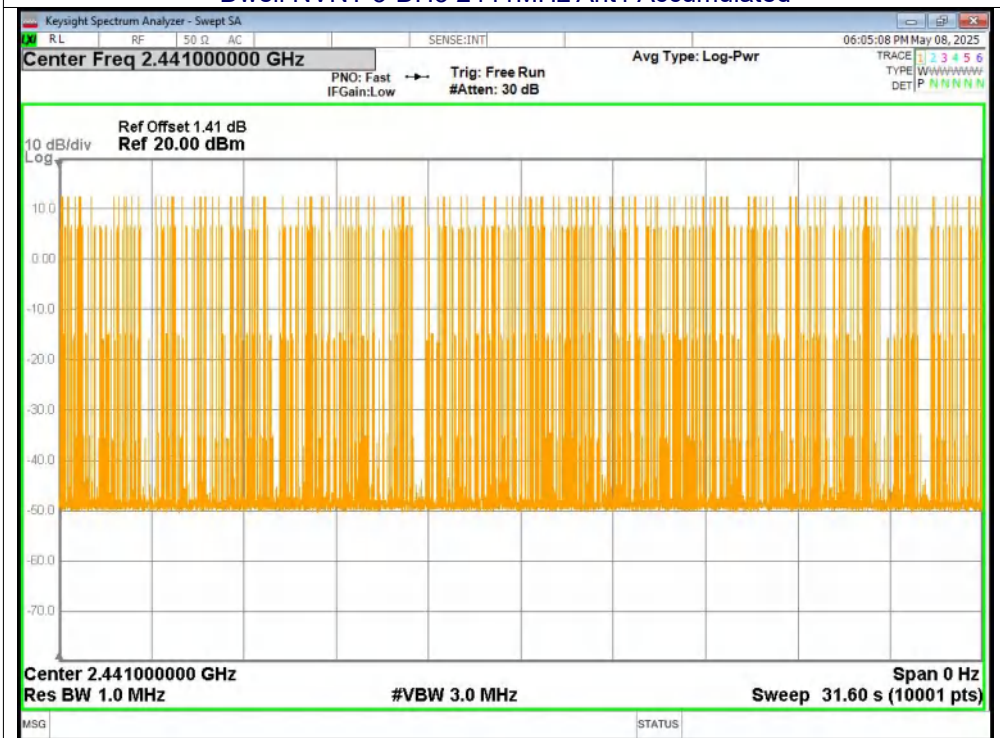


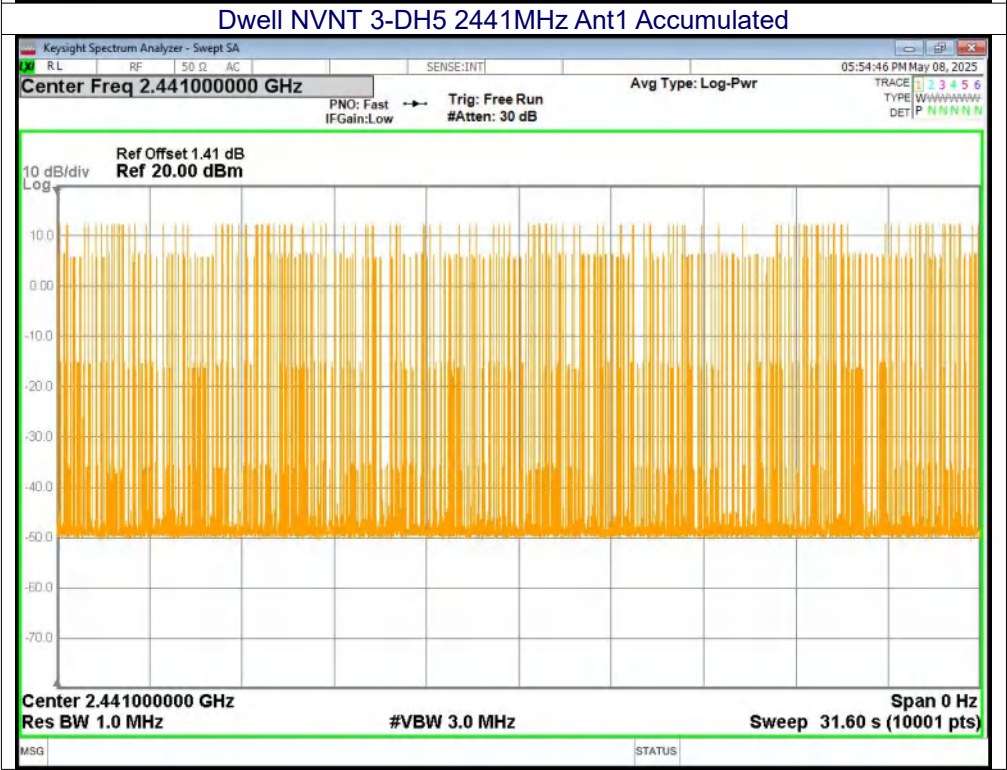
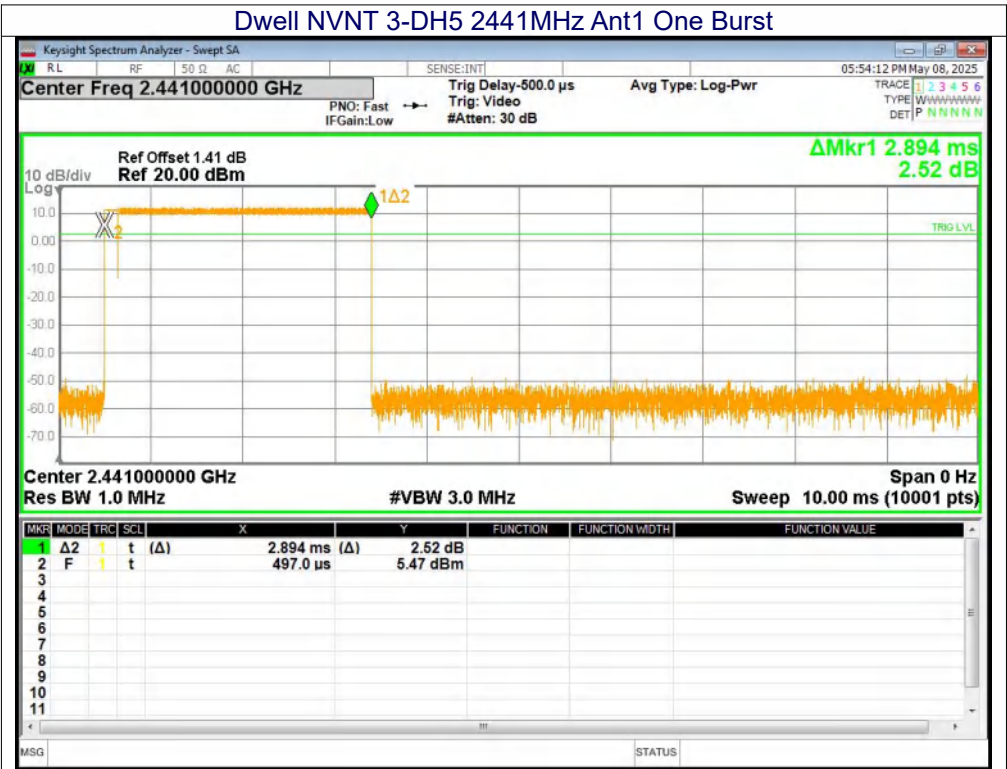


Dwell NVNT 3-DH3 2441MHz Ant1 One Burst



Dwell NVNT 3-DH3 2441MHz Ant1 Accumulated





13. Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(b)(4), RSS-Gen 6.8
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(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (EIRP) limits specified in the applicable standard (RSS) for the licence-exempt apparatus. Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level.9 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.	
EUT Antenna:	
The antenna is FPC antenna, the best case gain of the antennas is 1.75dBi, reference to the appendix II for details	

14. Test Setup Photo

Reference to the appendix I for details.

15. EUT Constructional Details

Reference to the appendix II for details.

***** END OF REPORT *****