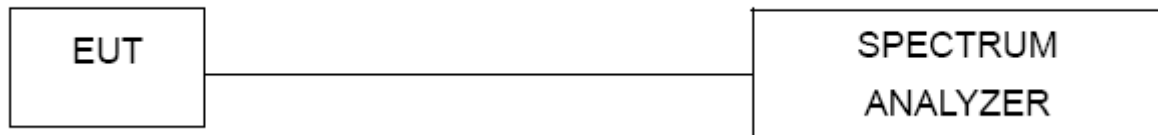


10. 20 dB Bandwidth

10.1 Block Diagram Of Test Setup



10.2 Limit

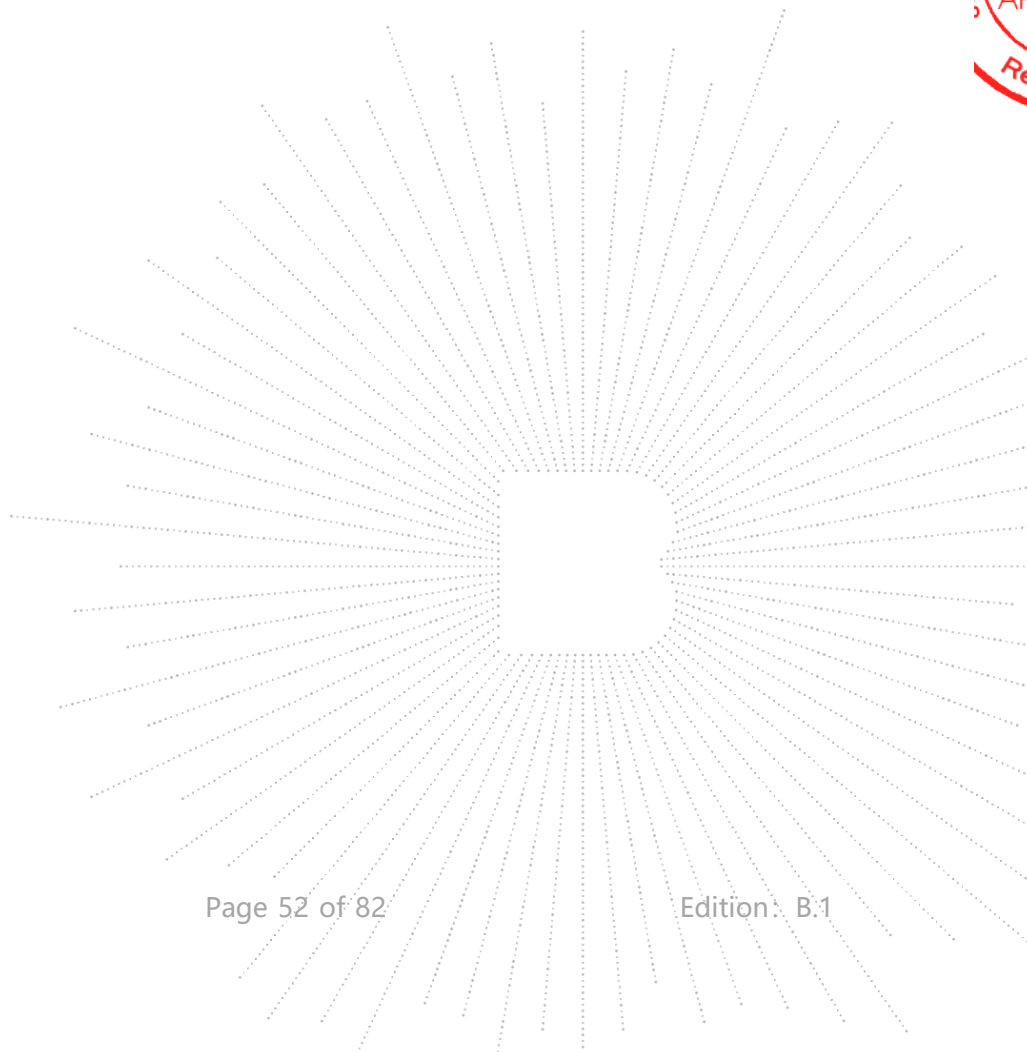
N/A

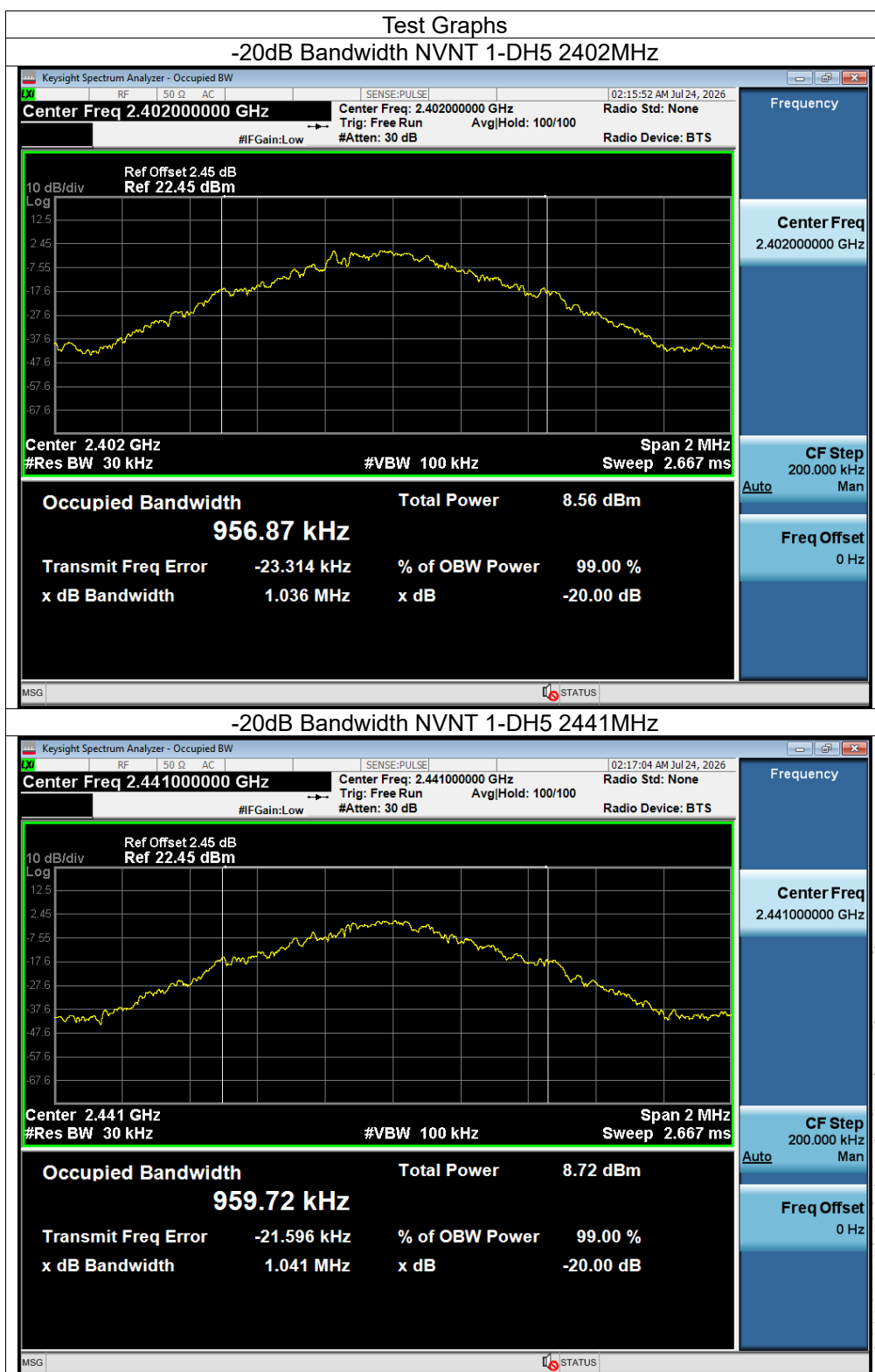
10.3 Test procedure

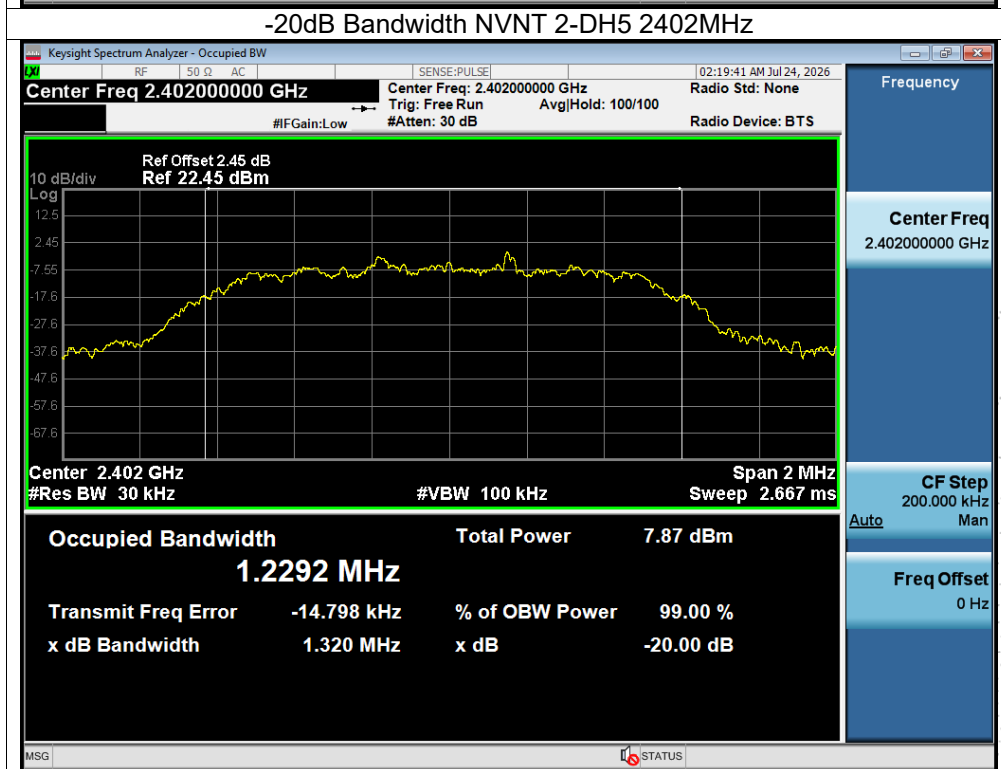
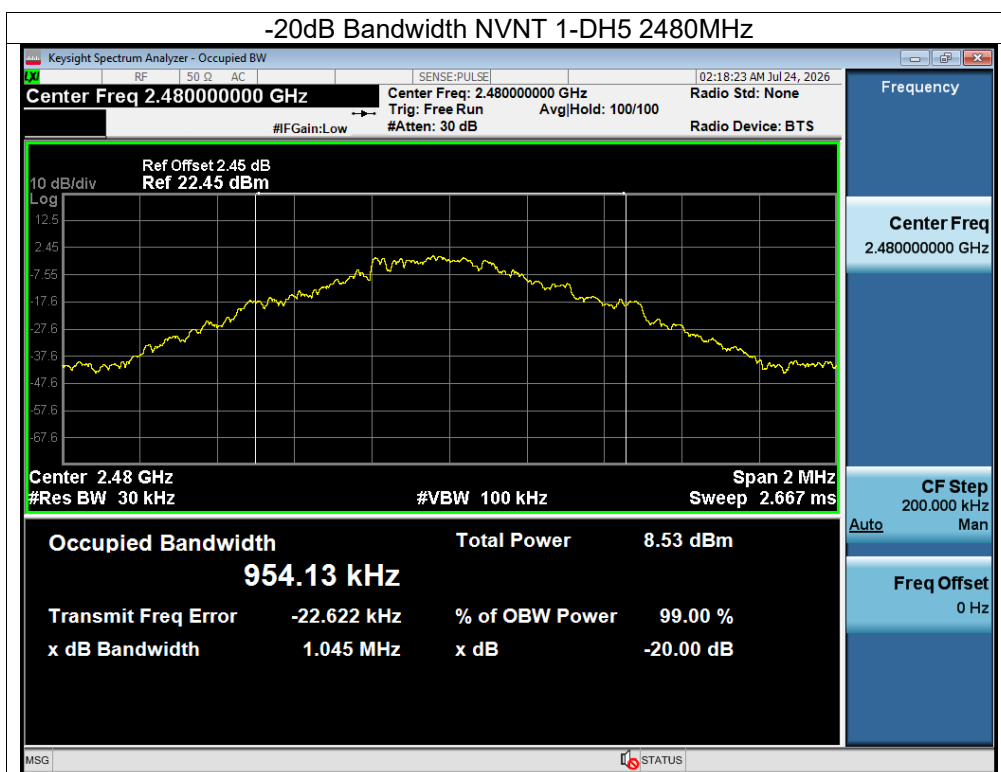
1. Set RBW = 30kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude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

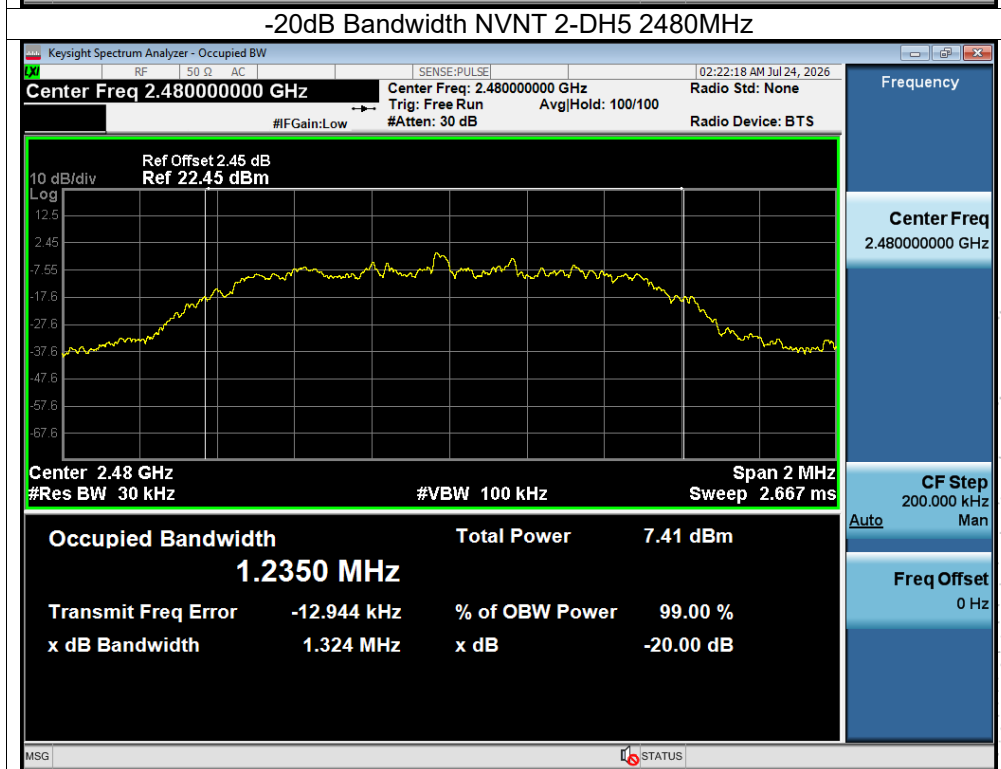
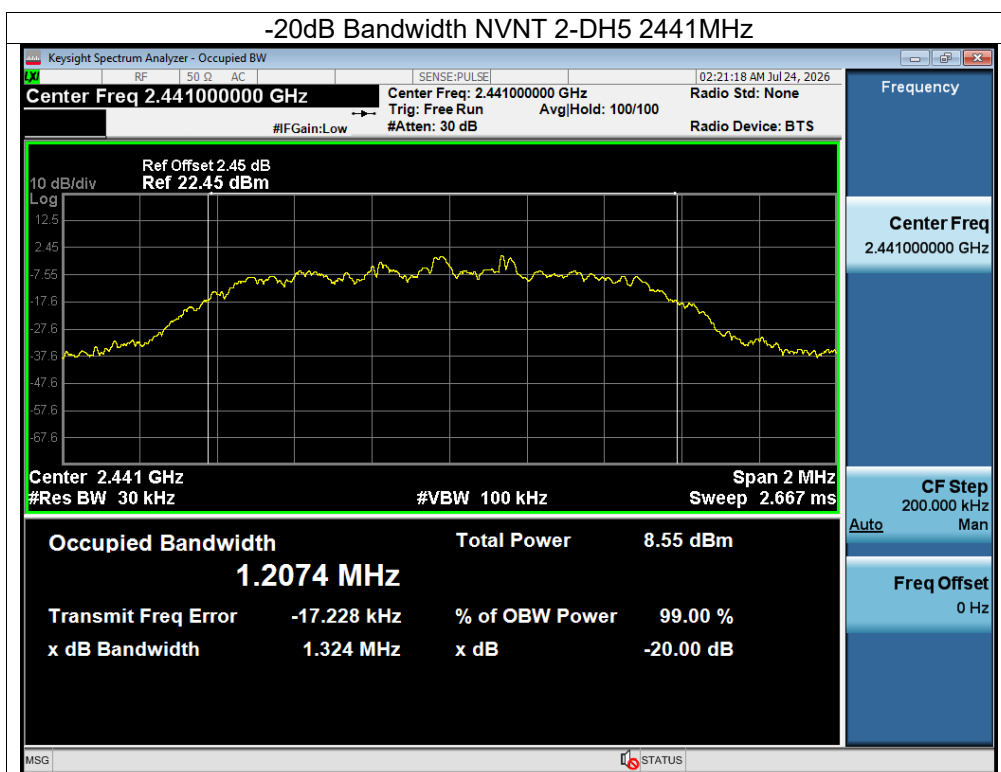
10.4 Test Result

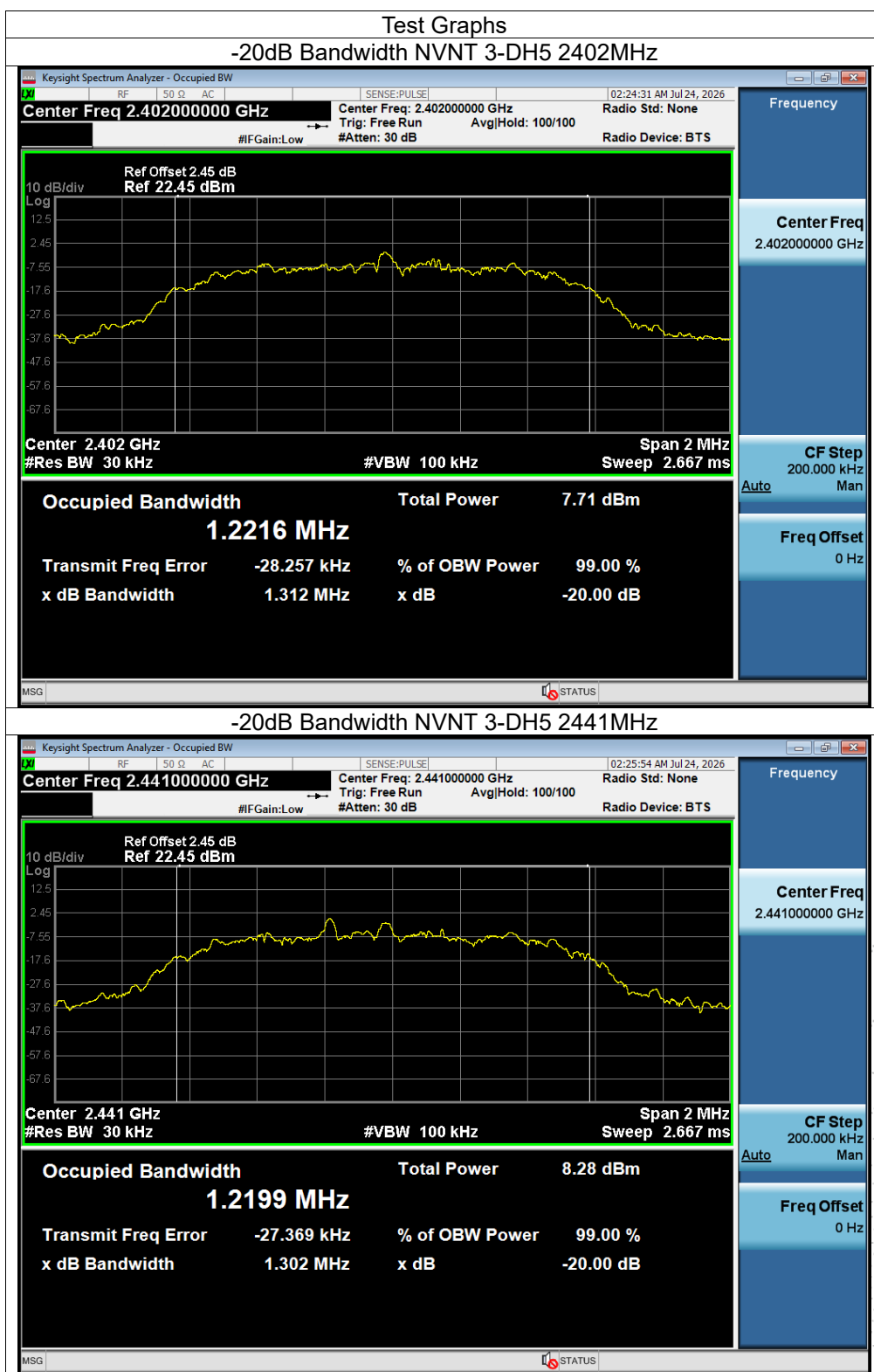
Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	1.036	Pass
NVNT	1-DH5	2441	1.041	Pass
NVNT	1-DH5	2480	1.045	Pass
NVNT	2-DH5	2402	1.32	Pass
NVNT	2-DH5	2441	1.324	Pass
NVNT	2-DH5	2480	1.324	Pass
NVNT	3-DH5	2402	1.312	Pass
NVNT	3-DH5	2441	1.302	Pass
NVNT	3-DH5	2480	1.352	Pass



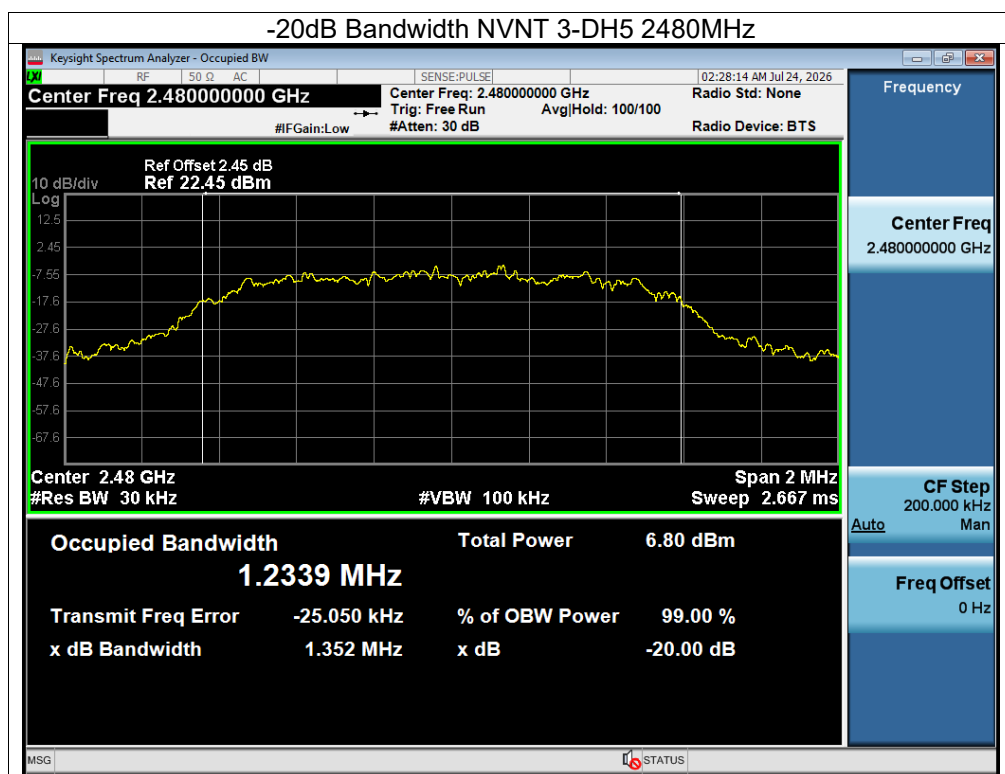






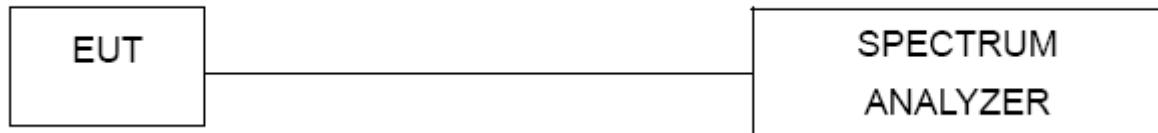


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11. Maximum Peak Output Power

11.1 Block Diagram Of Test Setup



11.2 Limit

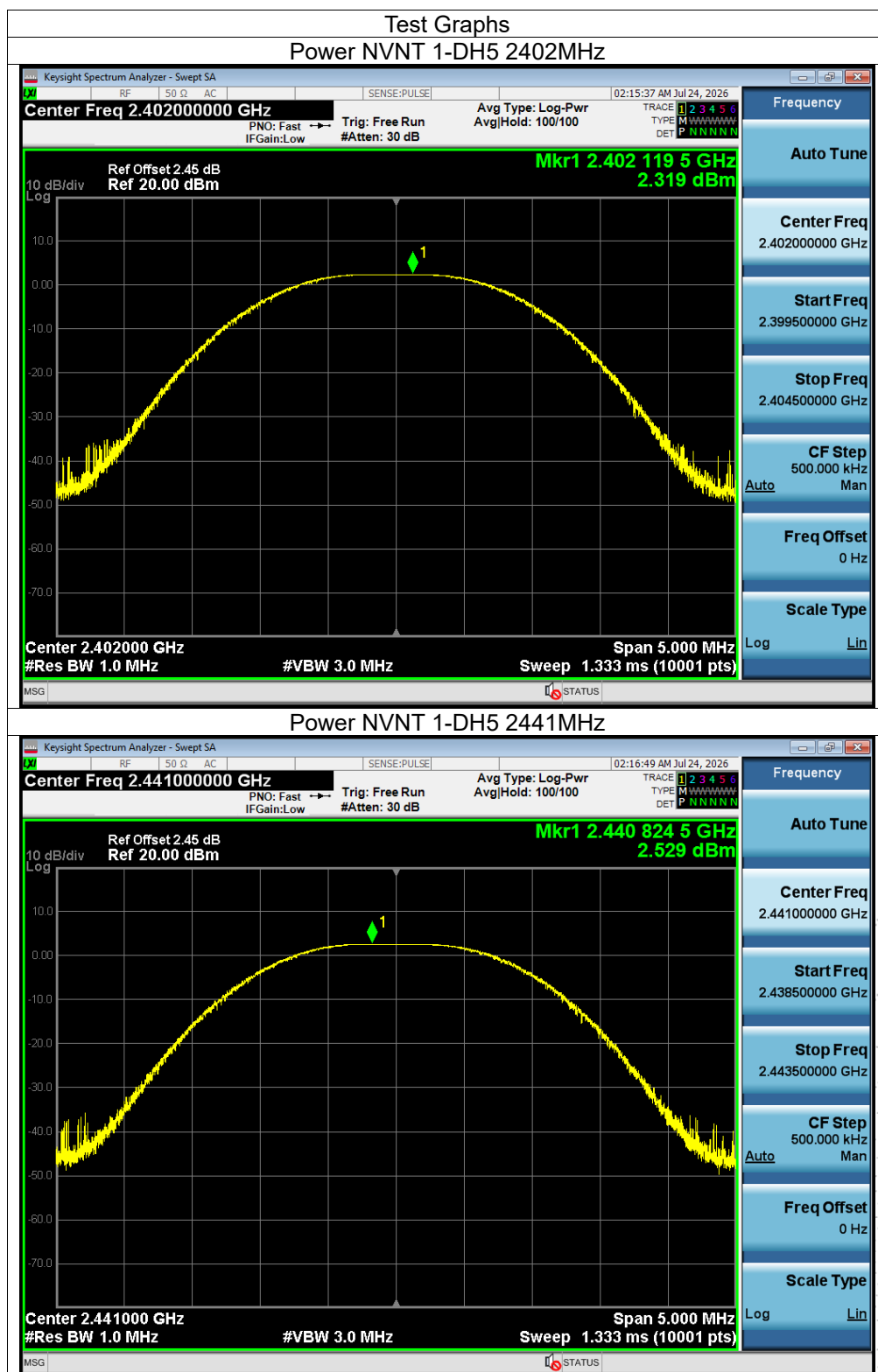
FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1)	Peak Output Power	0.125 watt or 21dBm	2400-2483.5	PASS

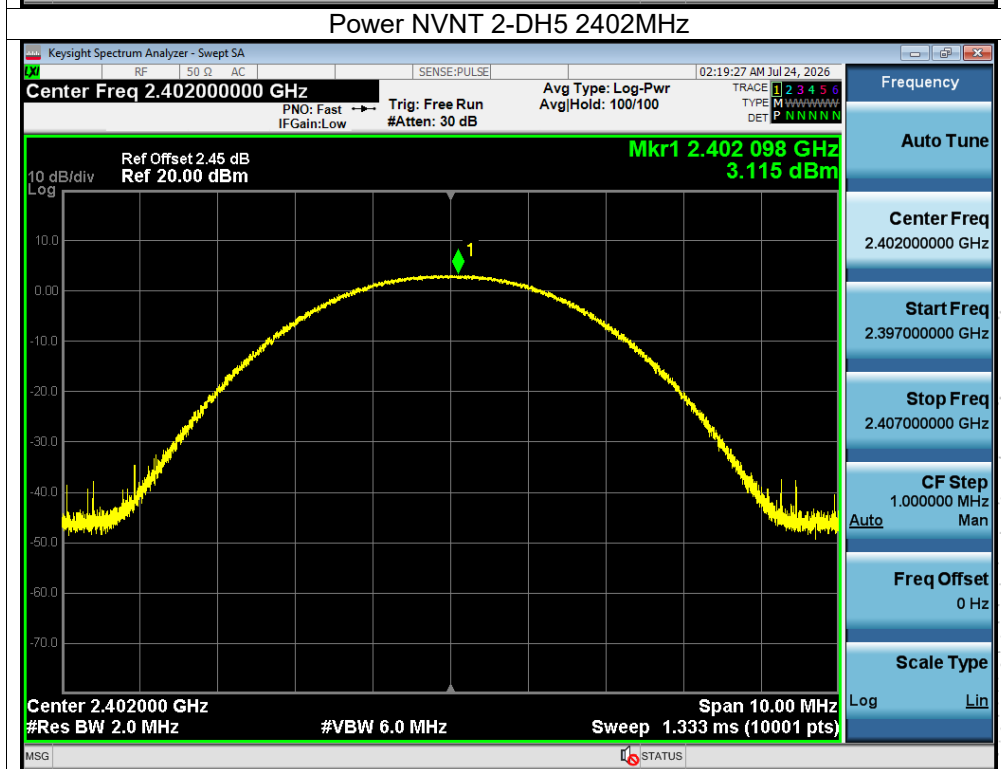
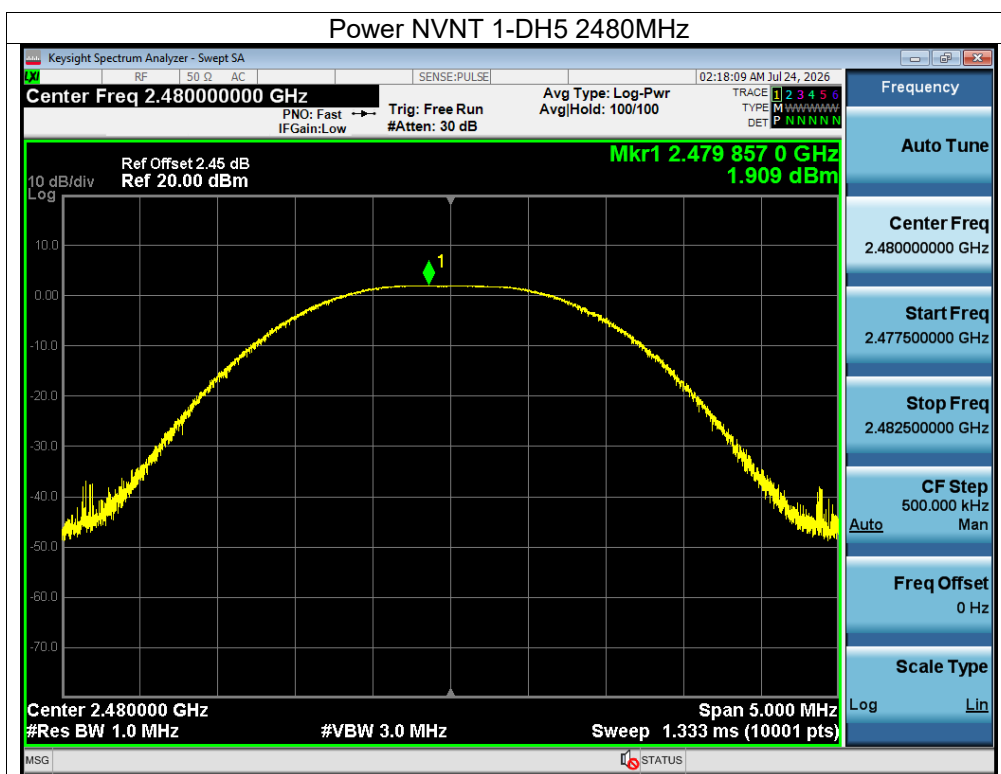
11.3 Test procedure

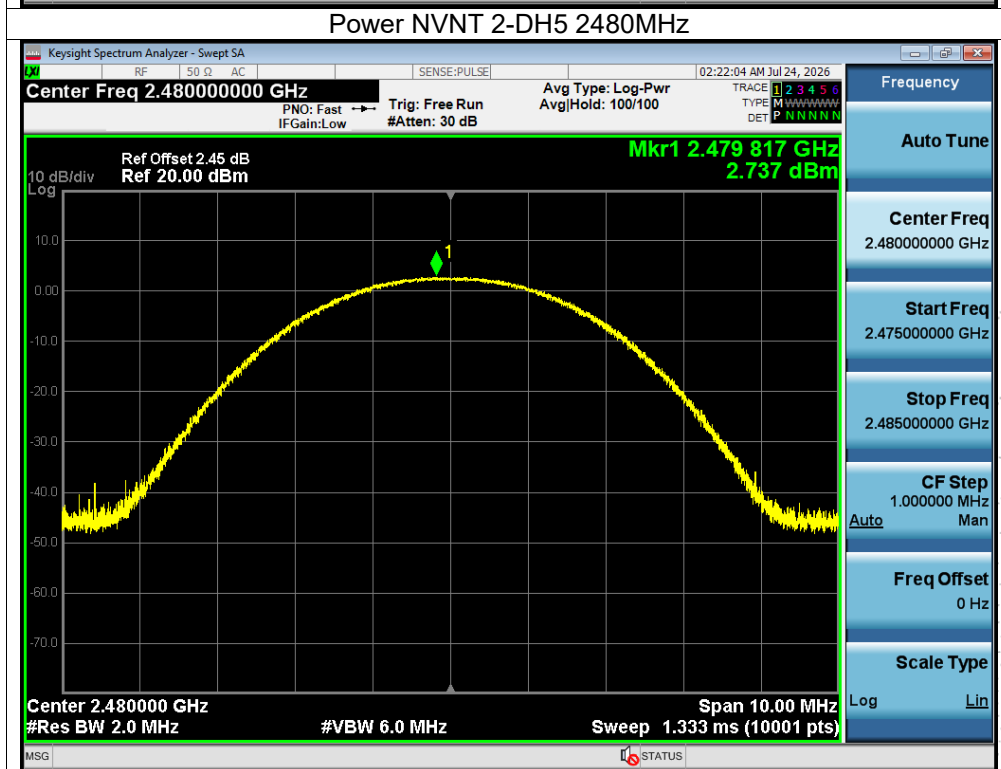
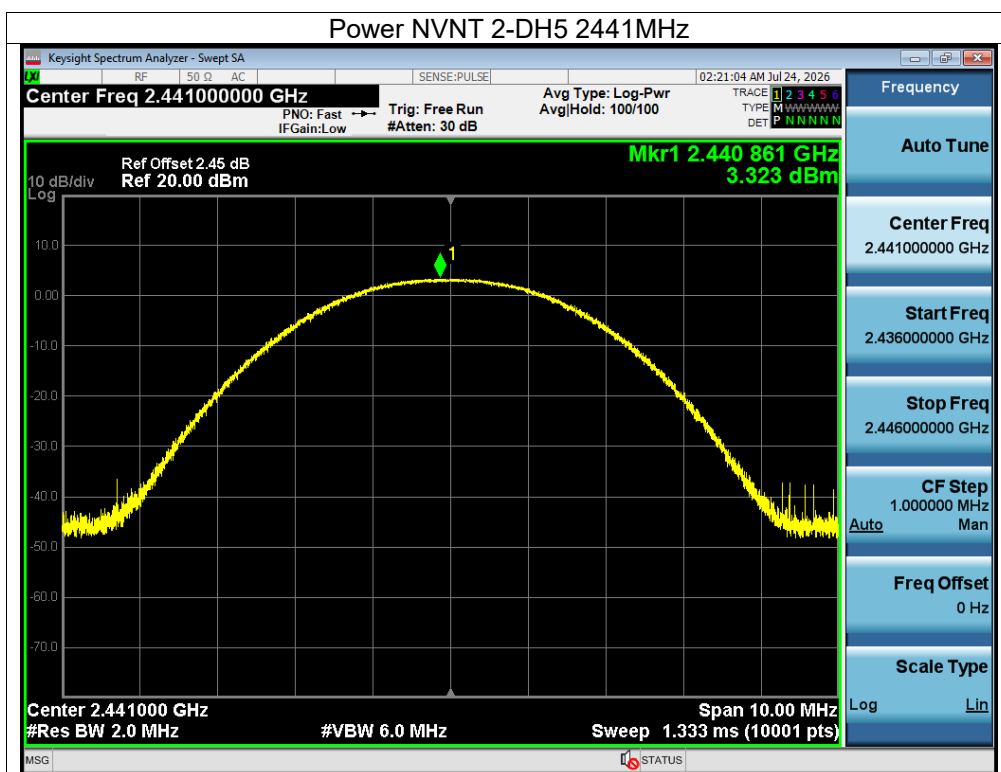
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

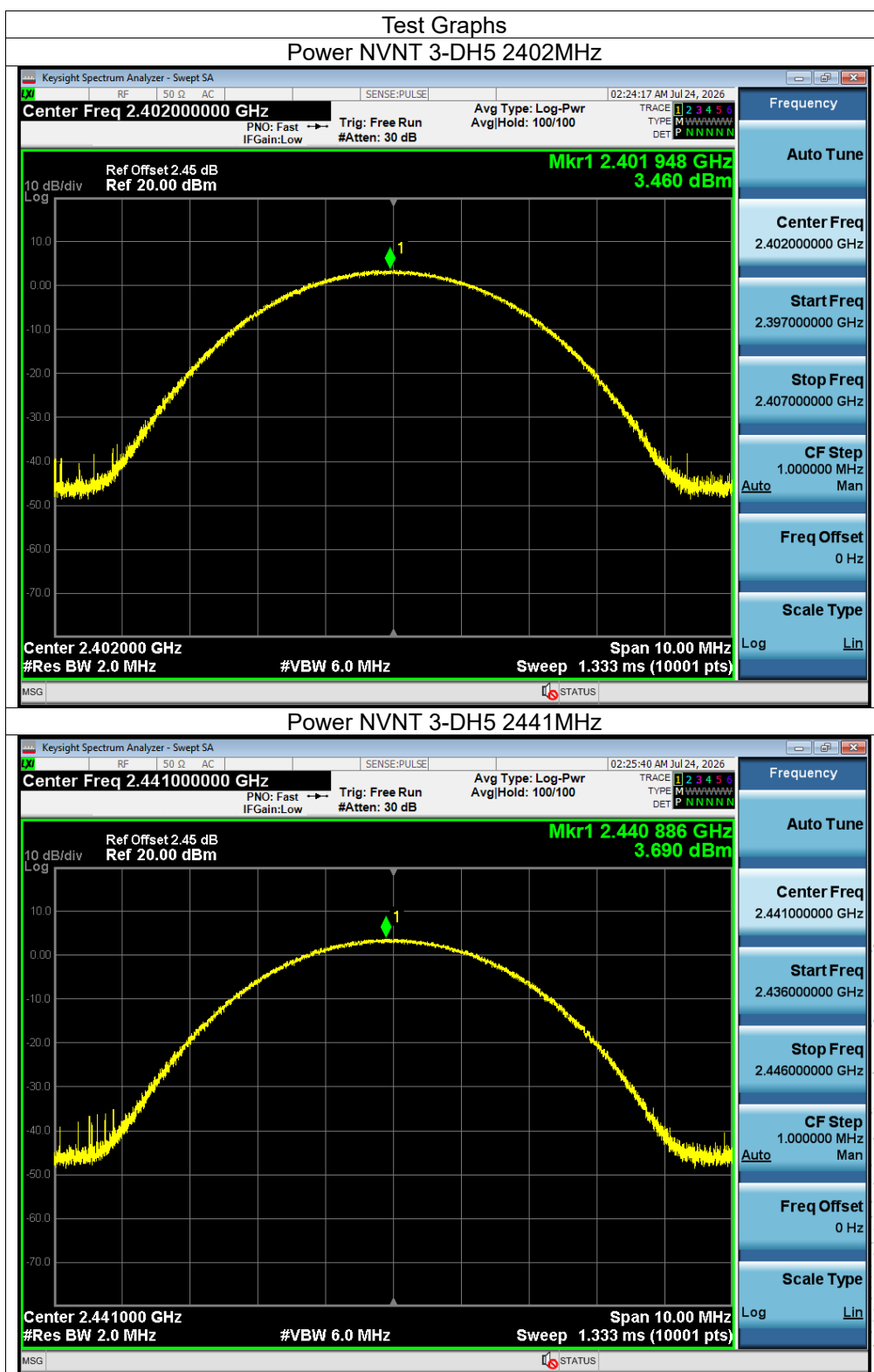
11.4 Test Result

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	2.32	21	Pass
NVNT	1-DH5	2441	2.53	21	Pass
NVNT	1-DH5	2480	1.91	21	Pass
NVNT	2-DH5	2402	3.12	21	Pass
NVNT	2-DH5	2441	3.32	21	Pass
NVNT	2-DH5	2480	2.74	21	Pass
NVNT	3-DH5	2402	3.46	21	Pass
NVNT	3-DH5	2441	3.69	21	Pass
NVNT	3-DH5	2480	3.06	21	Pass

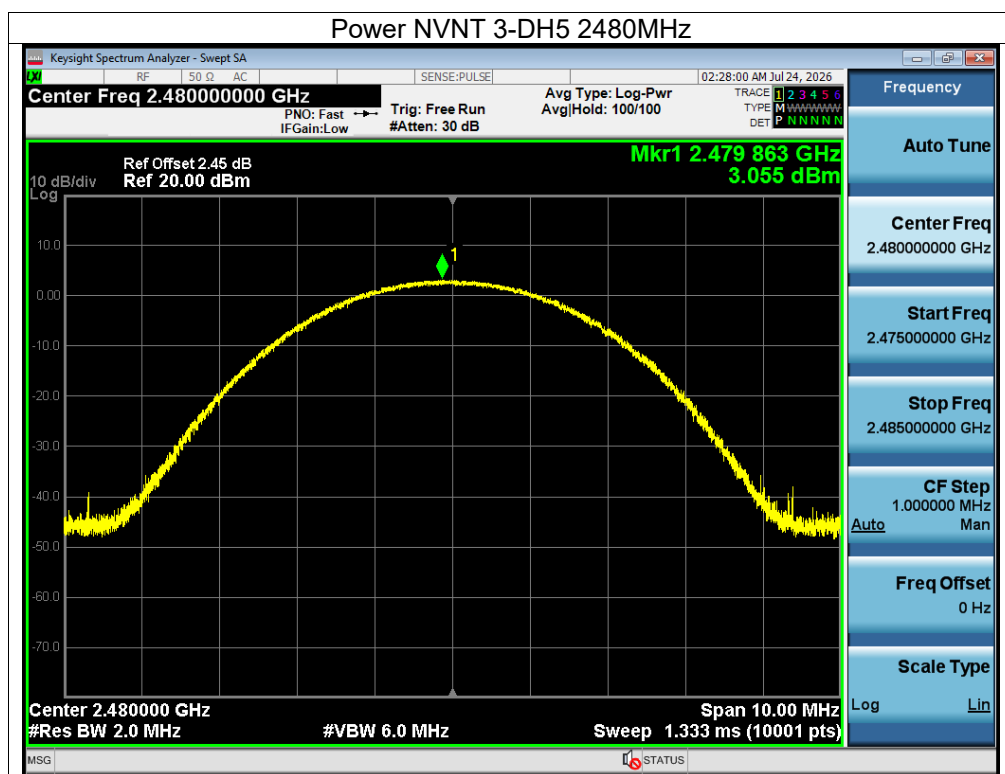






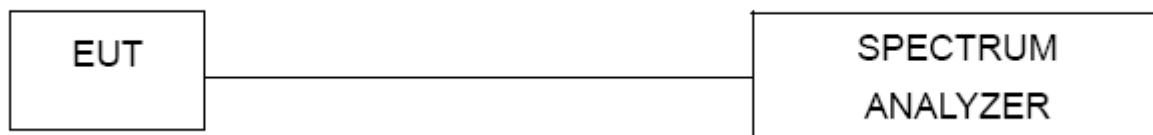


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12. Hopping Channel Separation

12.1 Block Diagram Of Test Setup



12.2 Limit

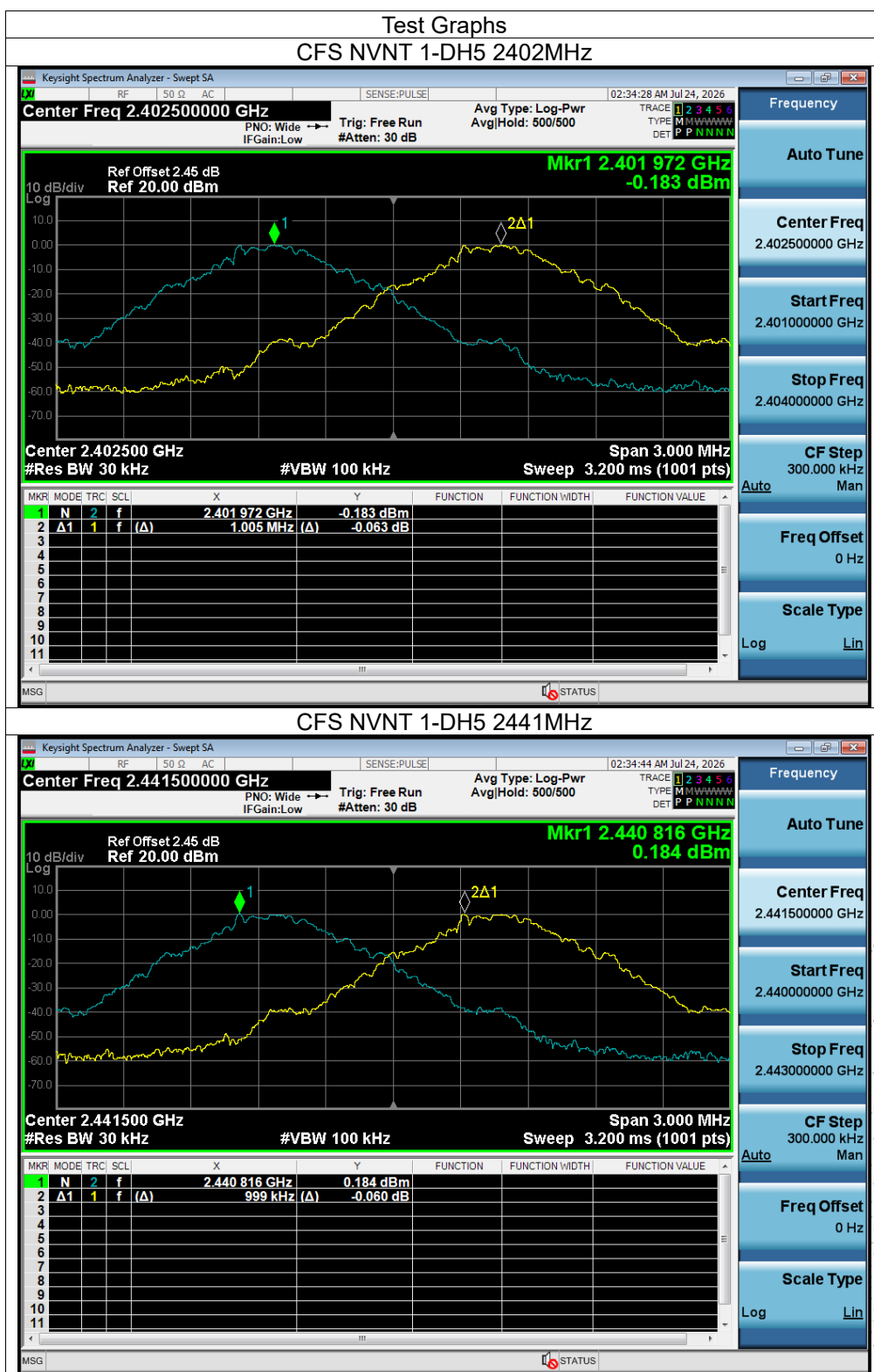
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that 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 0.125W.

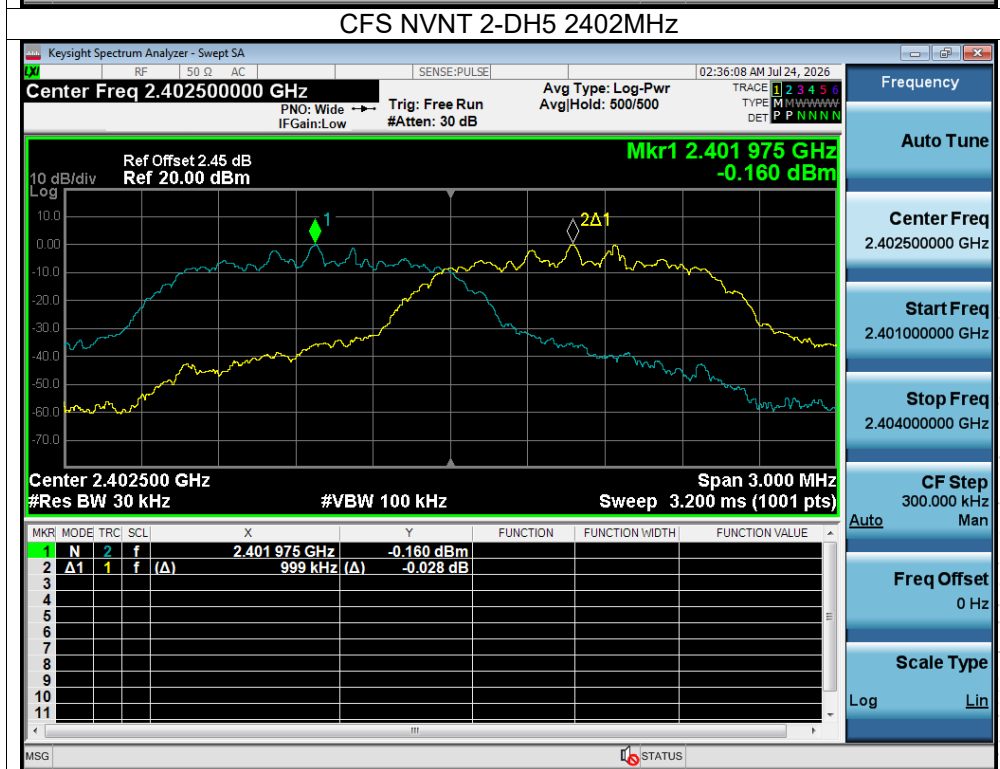
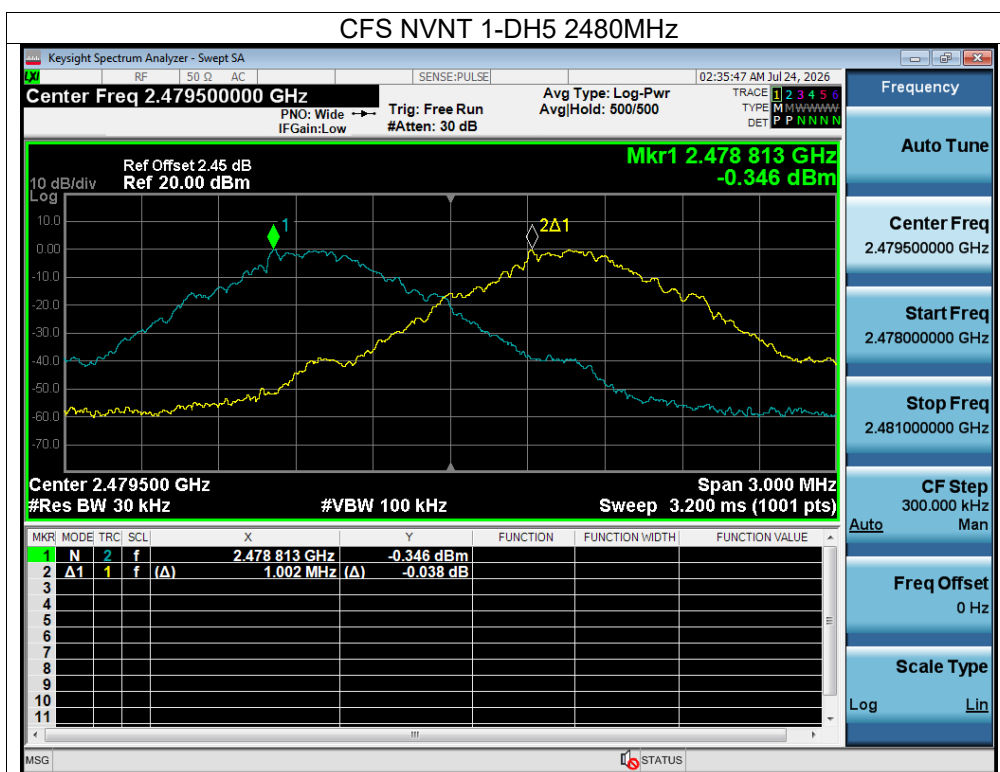
12.3 Test procedure

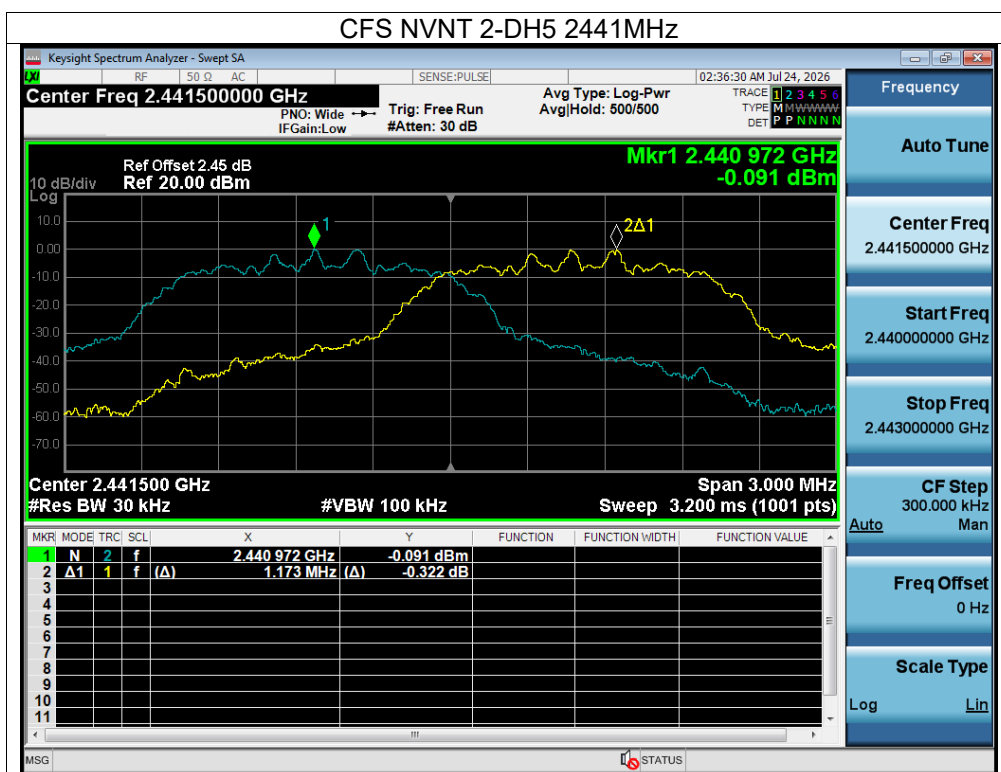
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to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

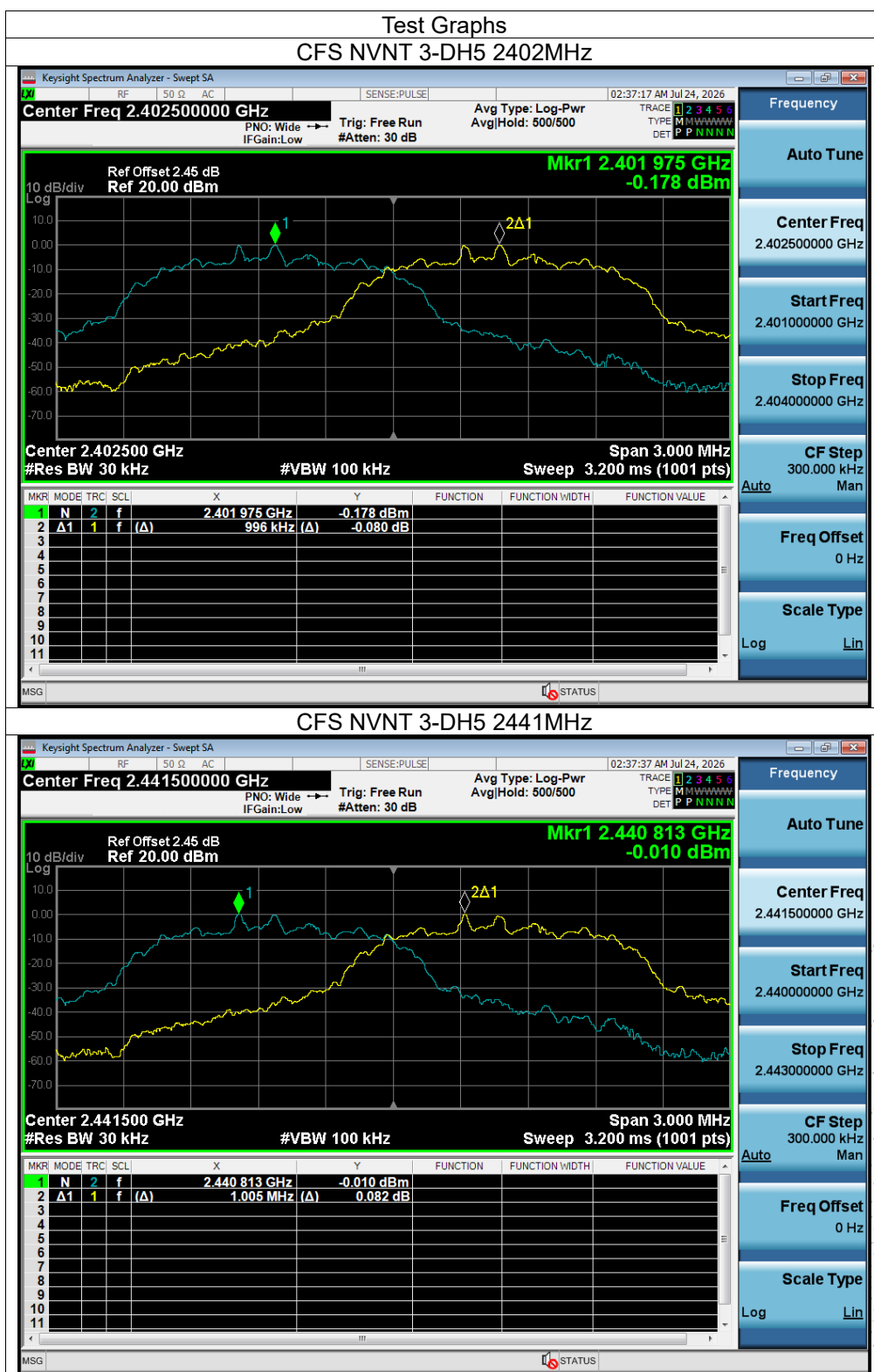
12.4 Test Result

Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	2401.972	2402.977	1.005	0.691	Pass
NVNT	1-DH5	2440.816	2441.815	0.999	0.694	Pass
NVNT	1-DH5	2478.813	2479.815	1.002	0.697	Pass
NVNT	2-DH5	2401.975	2402.974	0.999	0.88	Pass
NVNT	2-DH5	2440.972	2442.145	1.173	0.883	Pass
NVNT	2-DH5	2479.137	2480.142	1.005	0.883	Pass
NVNT	3-DH5	2401.975	2402.971	0.996	0.875	Pass
NVNT	3-DH5	2440.813	2441.818	1.005	0.868	Pass
NVNT	3-DH5	2478.813	2479.812	0.999	0.901	Pass

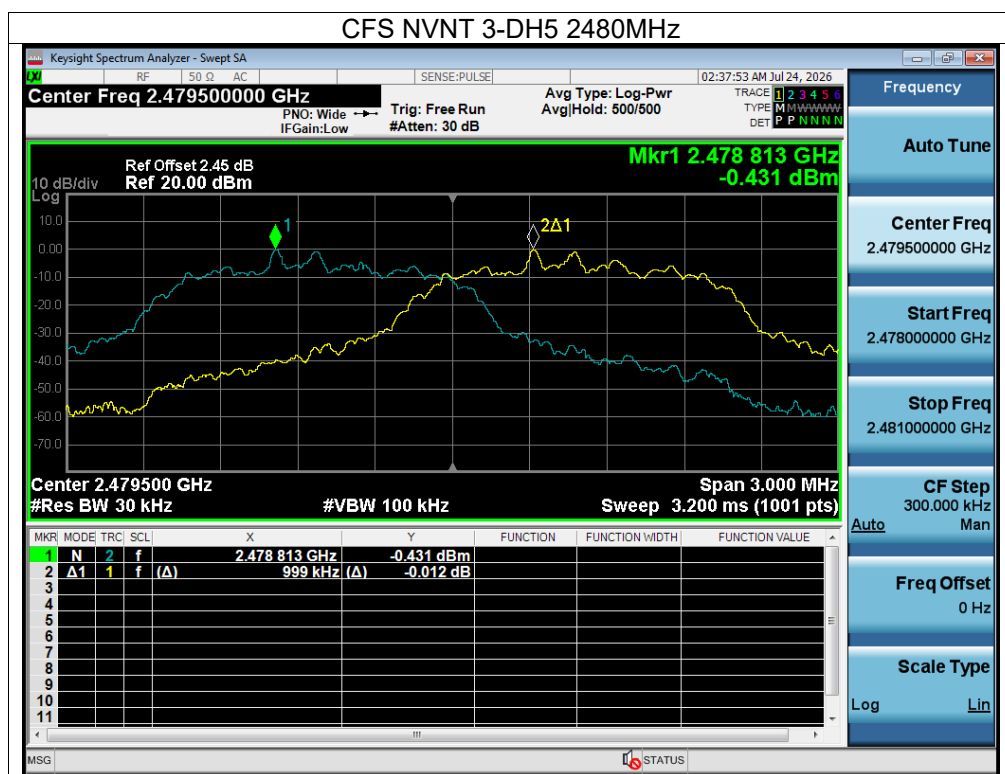






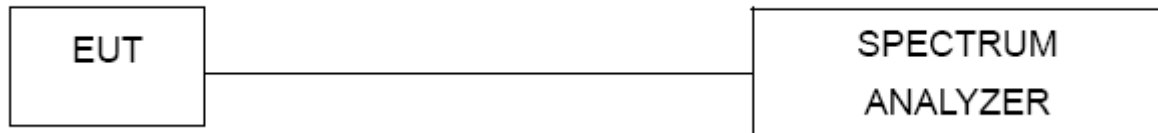


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13. Number of Hopping Frequency

13.1 Block Diagram Of Test Setup



13.2 Limit

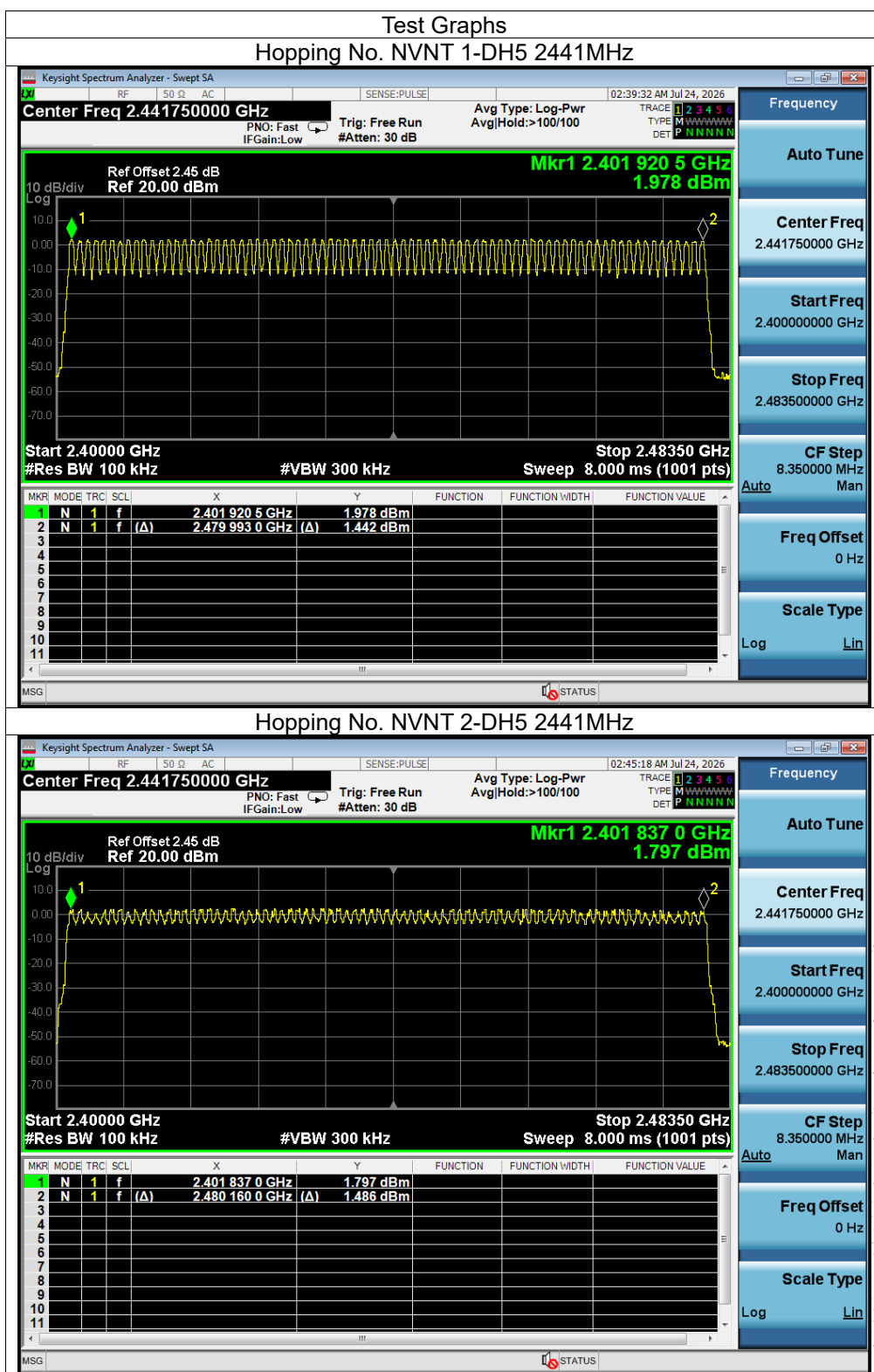
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

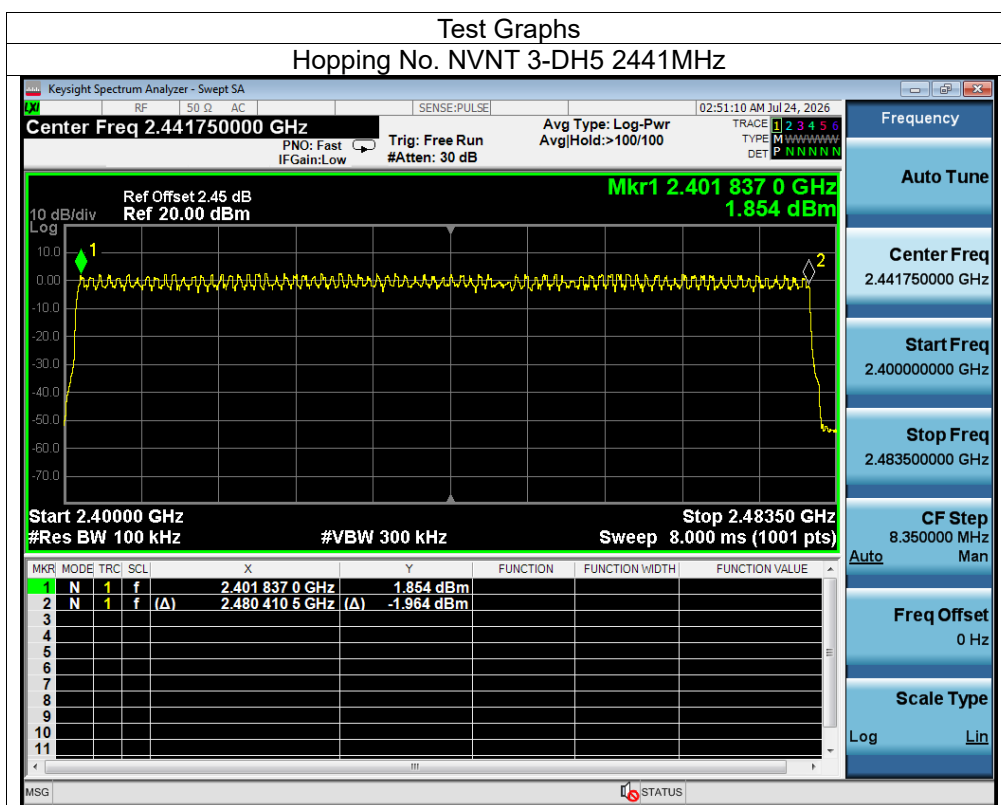
13.3 Test procedure

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 = 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;

13.4 Test Result

Condition	Mode	Hopping Number	Limit	Verdict
NVNT	1-DH5	79	15	Pass
NVNT	2-DH5	79	15	Pass
NVNT	3-DH5	79	15	Pass





14. Dwell Time

14.1 Block Diagram Of Test Setup



14.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

14.3 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 spectrum analyzer span = 0. Centred on a hopping channel;
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).

14.4 Test Result

DH5 Packet permit maximum 1600 / 79 / 6 hops per second in each channel
(5 time slots RX, 1 time slot TX).

DH3 Packet permit maximum 1600 / 79 / 4 hops per second in each channel
(3 time slots RX, 1 time slot TX).

DH1 Packet permit maximum 1600 / 79 / 2 hops per second in each channel
(1 time slot RX, 1 time slot TX). So, the Dwell Time can be calculated as follows:

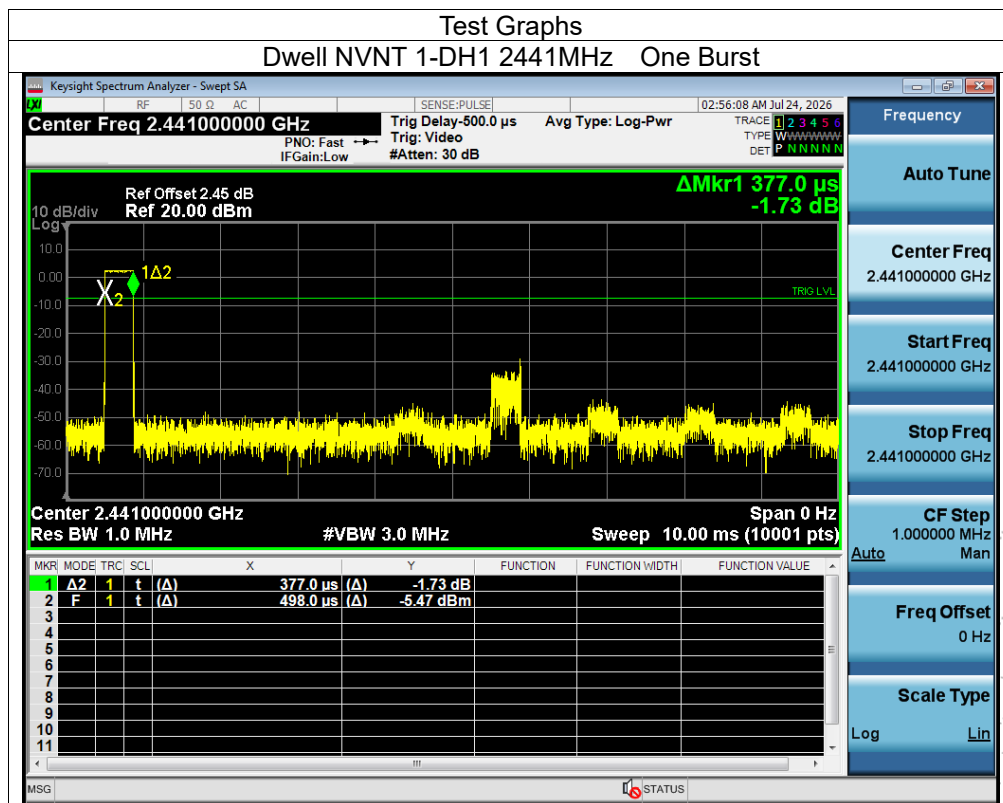
DH5: $1600/79/6 \times 0.4 \times 79 \times (\text{MkrDelta})/1000$

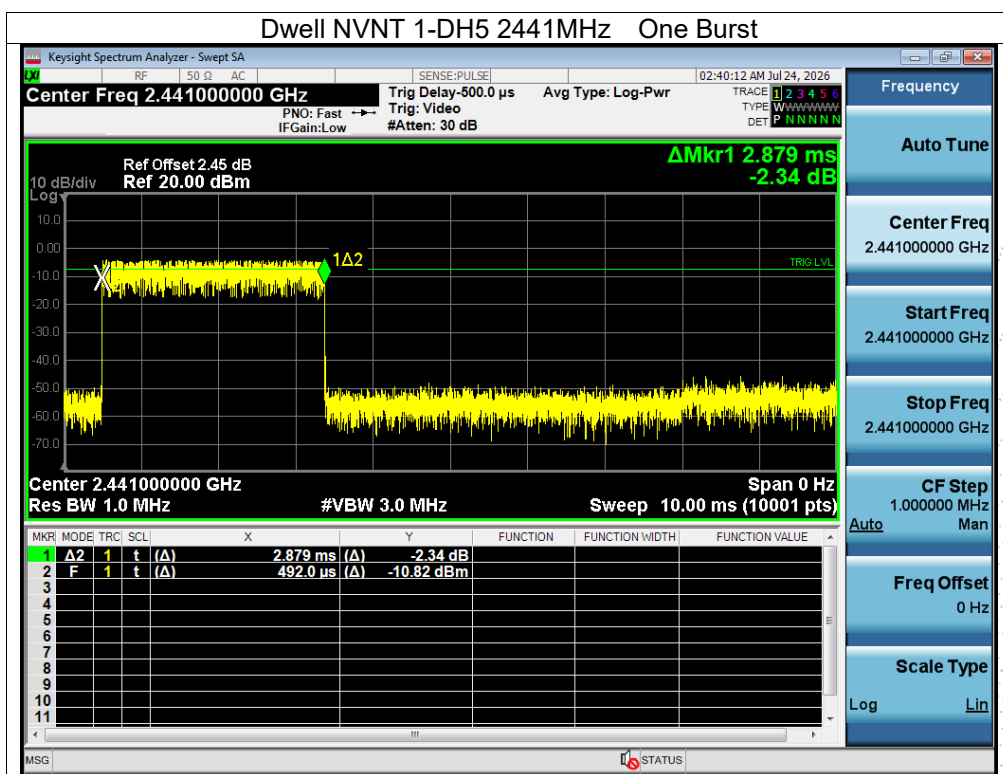
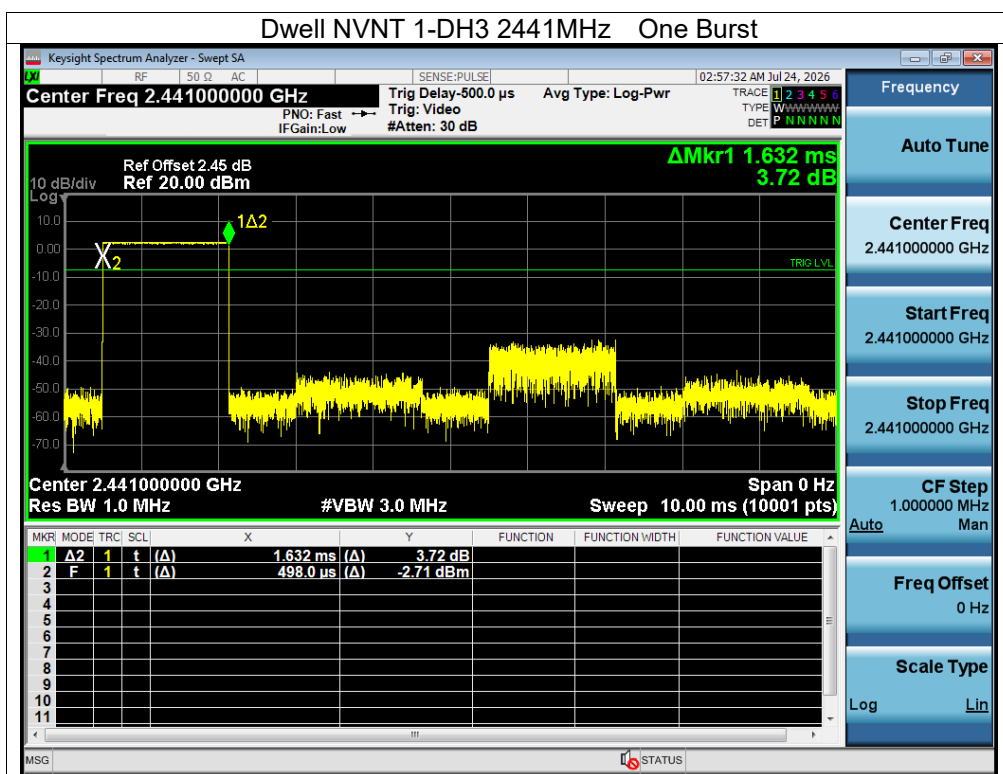
DH3: $1600/79/4 \times 0.4 \times 79 \times (\text{MkrDelta})/1000$

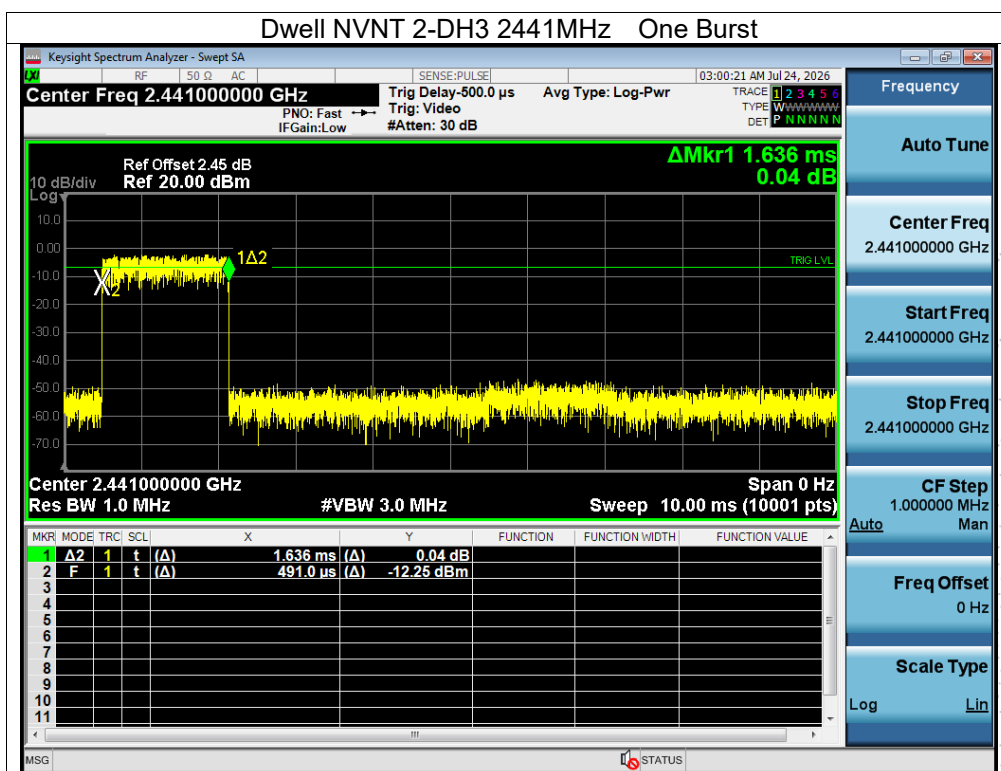
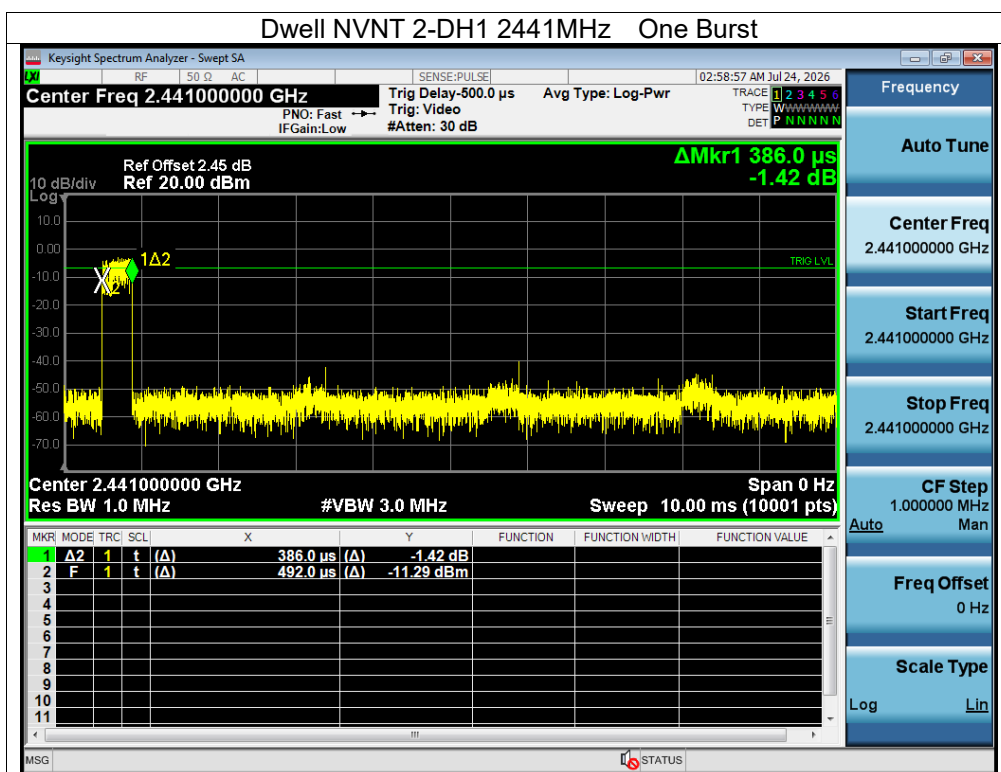
DH1: $1600/79/2 \times 0.4 \times 79 \times (\text{MkrDelta})/1000$

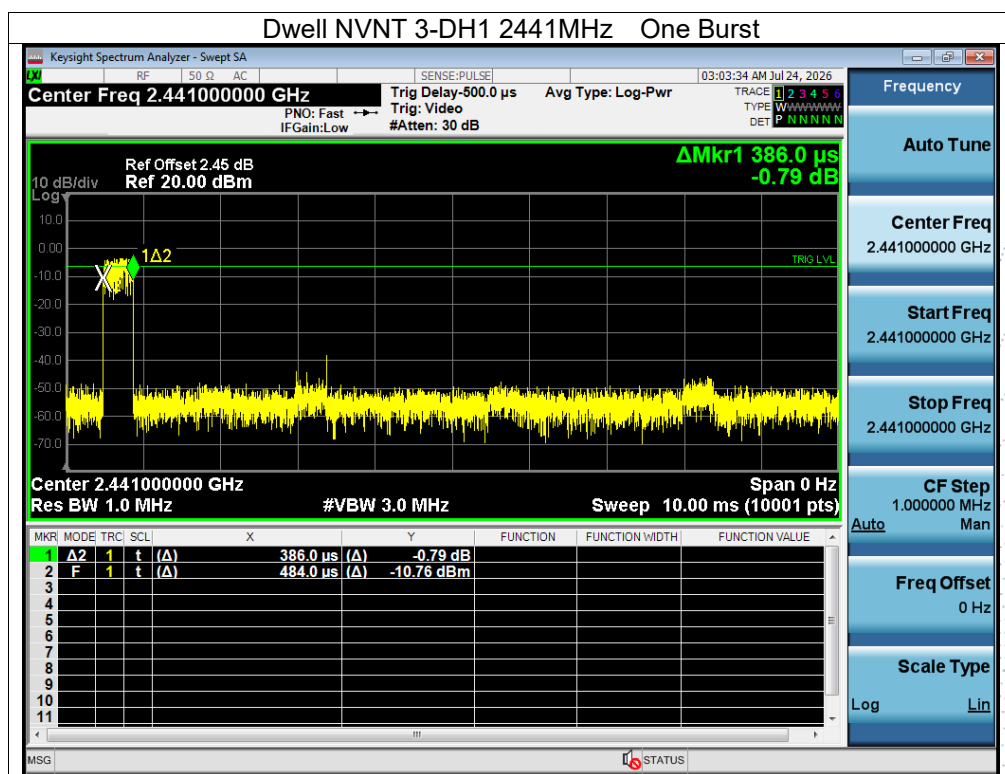
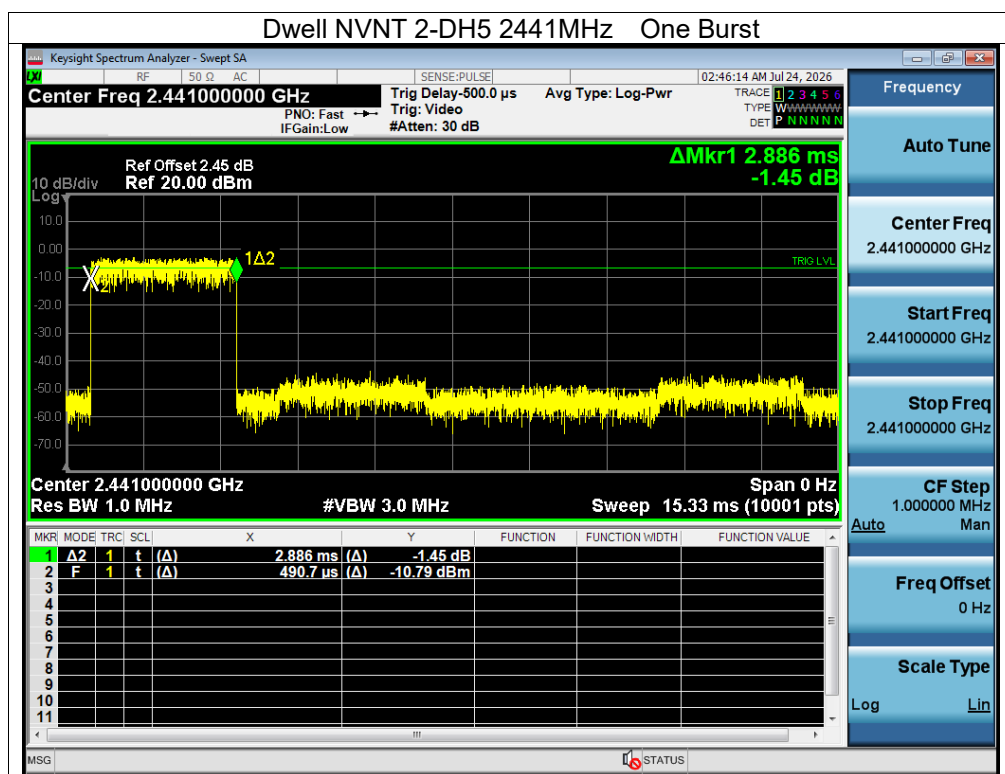
Remark: Mkr Delta is once pulse time.

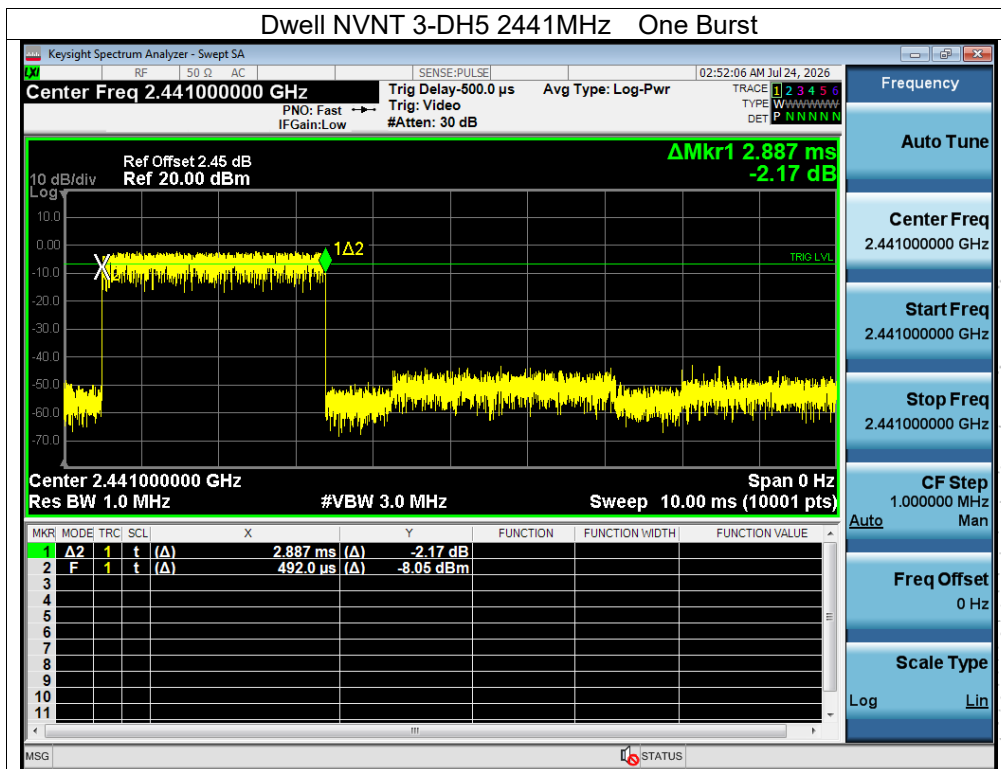
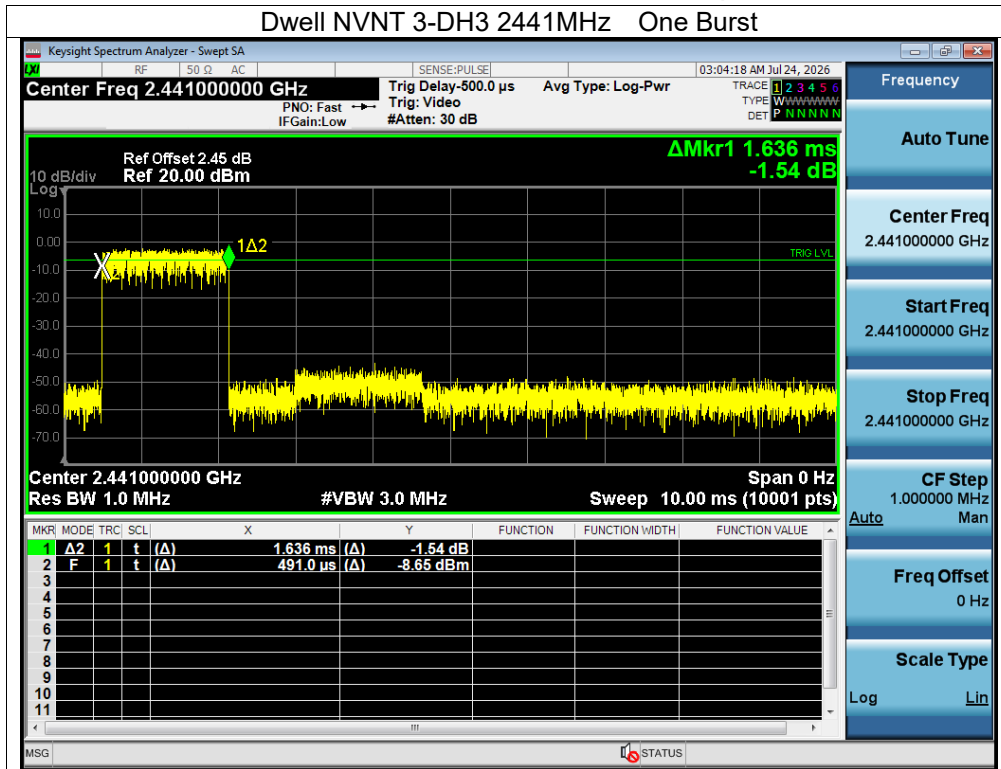
Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	0.377	118.378	400	Pass
NVNT	1-DH3	2441	1.632	252.96	400	Pass
NVNT	1-DH5	2441	2.879	328.206	400	Pass
NVNT	2-DH1	2441	0.386	122.748	400	Pass
NVNT	2-DH3	2441	1.636	261.76	400	Pass
NVNT	2-DH5	2441	2.886	274.17	400	Pass
NVNT	3-DH1	2441	0.386	122.748	400	Pass
NVNT	3-DH3	2441	1.636	273.212	400	Pass
NVNT	3-DH5	2441	2.887	308.909	400	Pass











15. Antenna Requirement

15.1 Limit

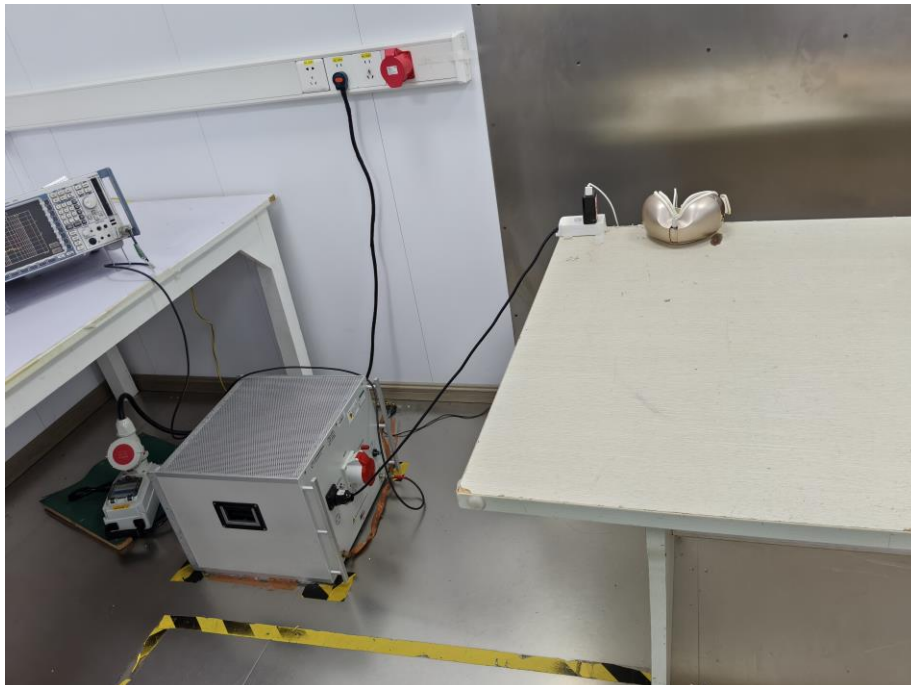
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

15.2 Test Result

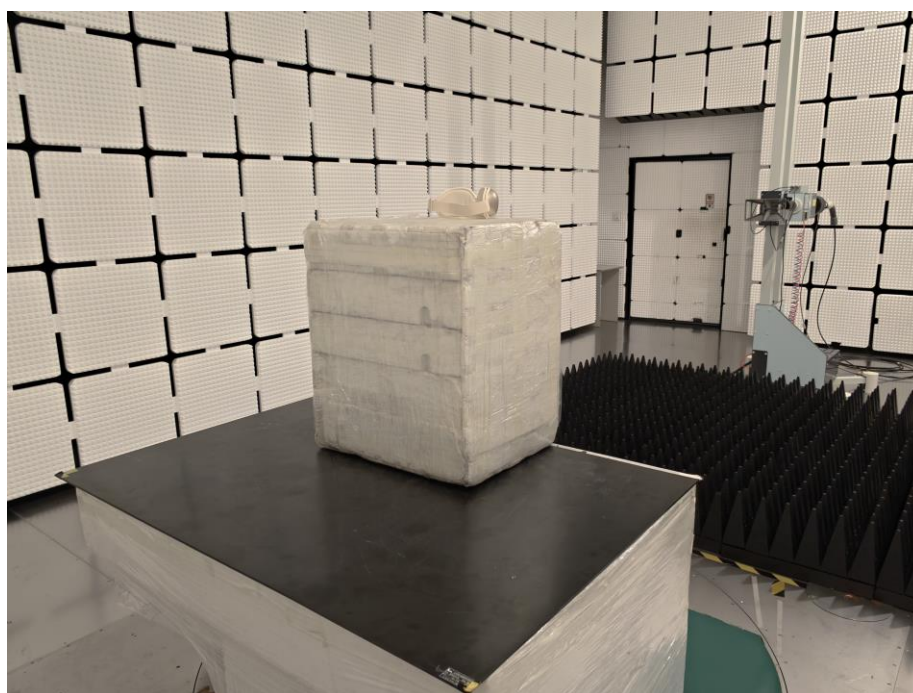
The EUT antenna is PCB antenna, fulfill the requirement of this section.

16. EUT Test Setup Photographs

Conducted emissions



Radiated Measurement Photos



STATEMENT

1. The equipment lists are traceable to the International System of Units (SI)
2. The test report can not be partially copied unless prior written approval is issued from our lab.
3. The test report is invalid without the "special seal for inspection and testing".
4. The test report is invalid without the signature of the approver.
5. The test process and test result is only related to the Unit Under Test.
6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.
7. The quality system of our laboratory is in accordance with ISO/IEC 17025:2017.
8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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***** END *****