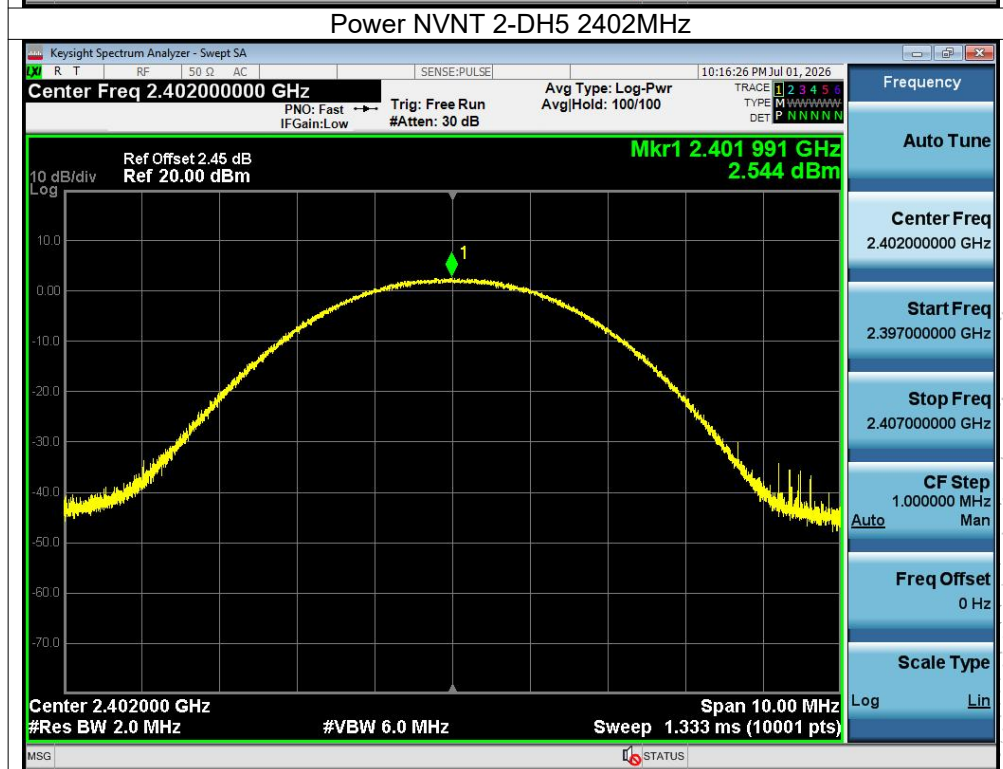
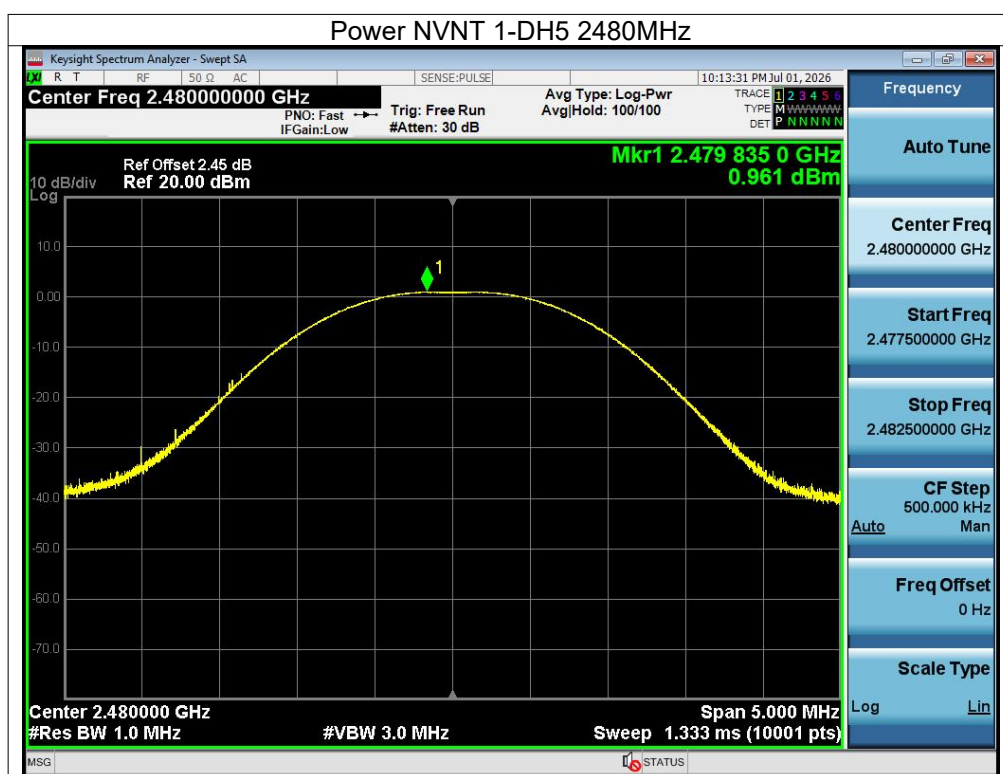
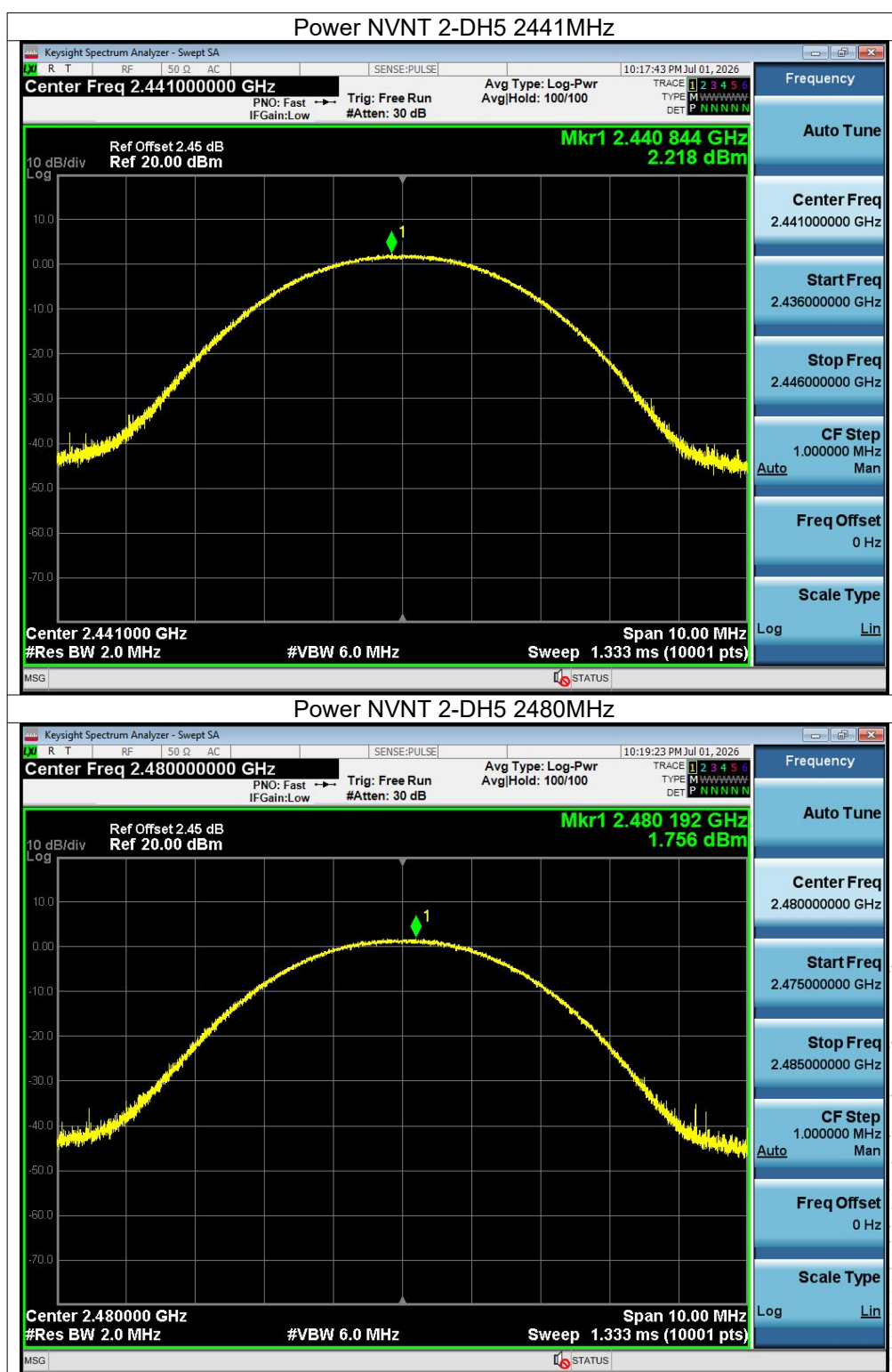
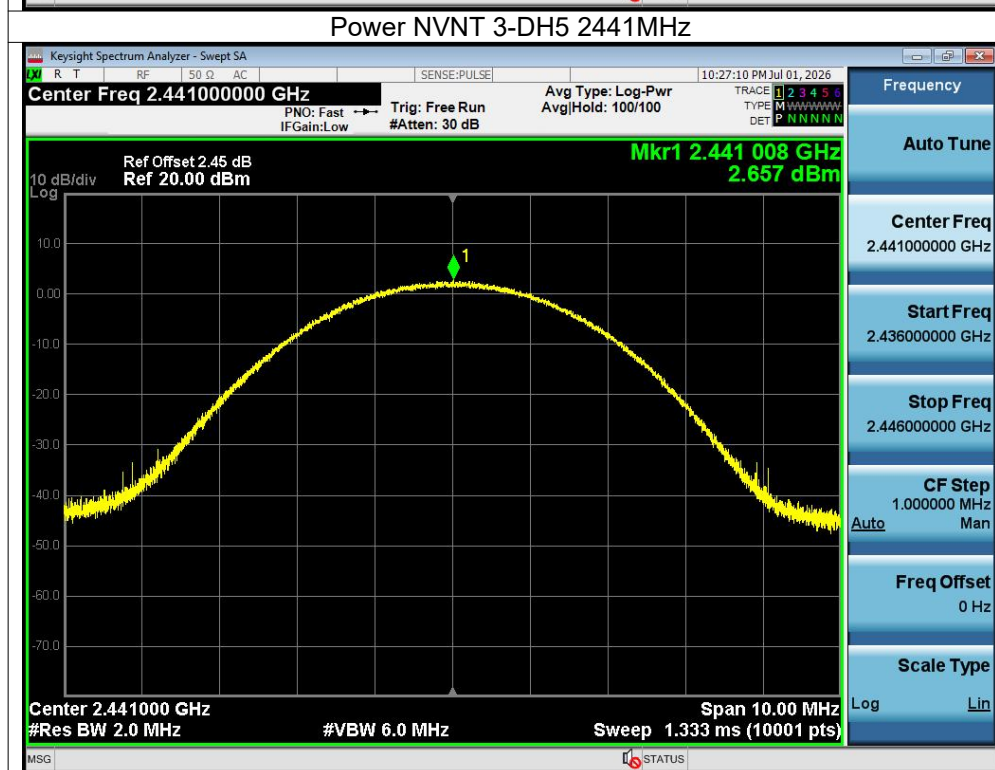
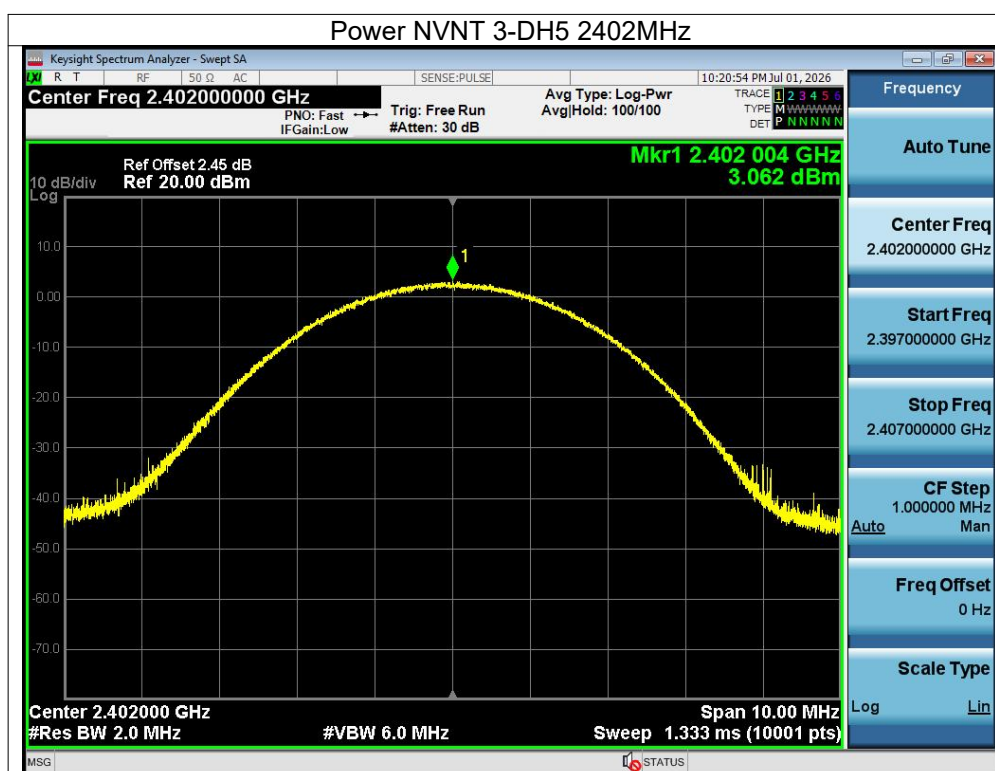
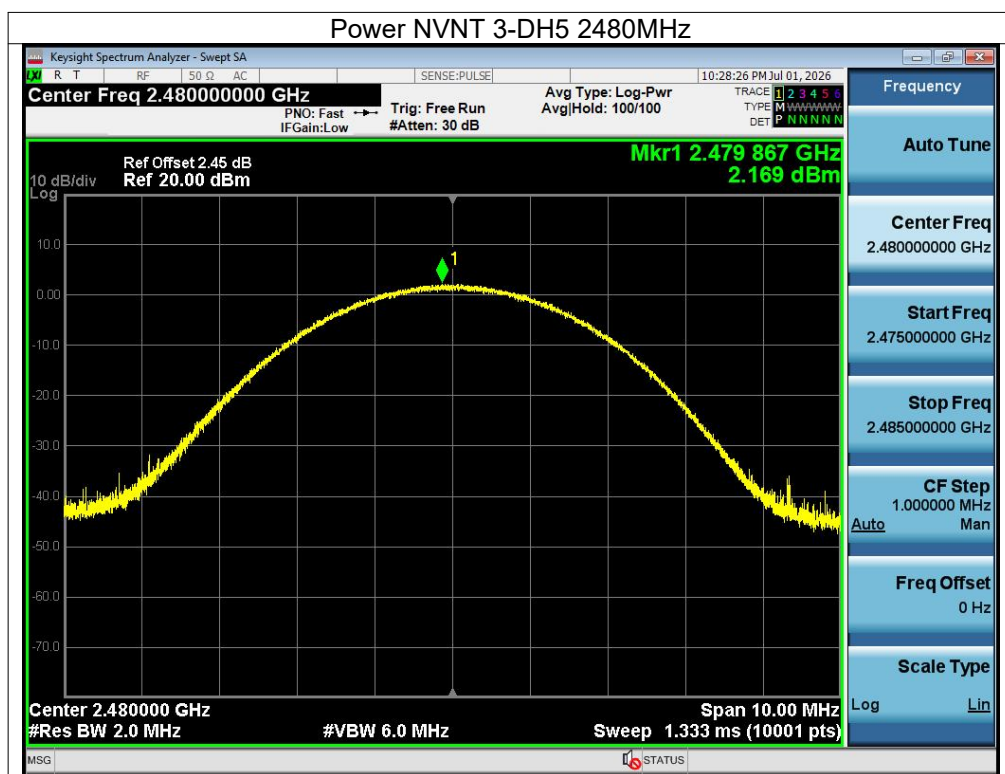










12. Hopping Channel Separation

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

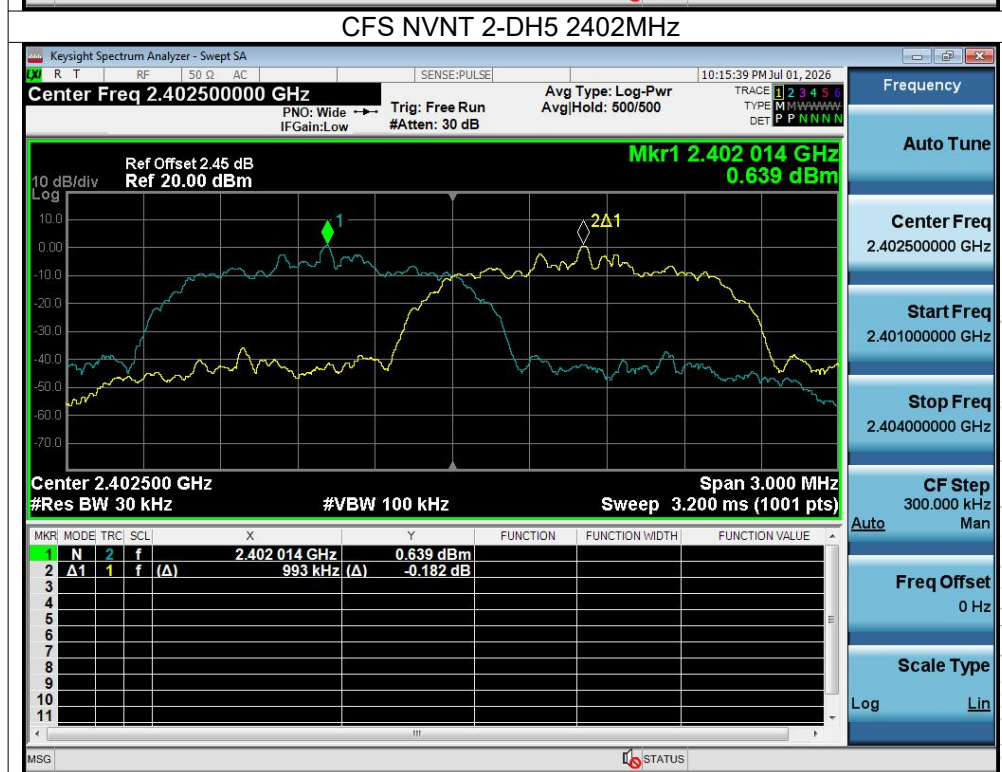
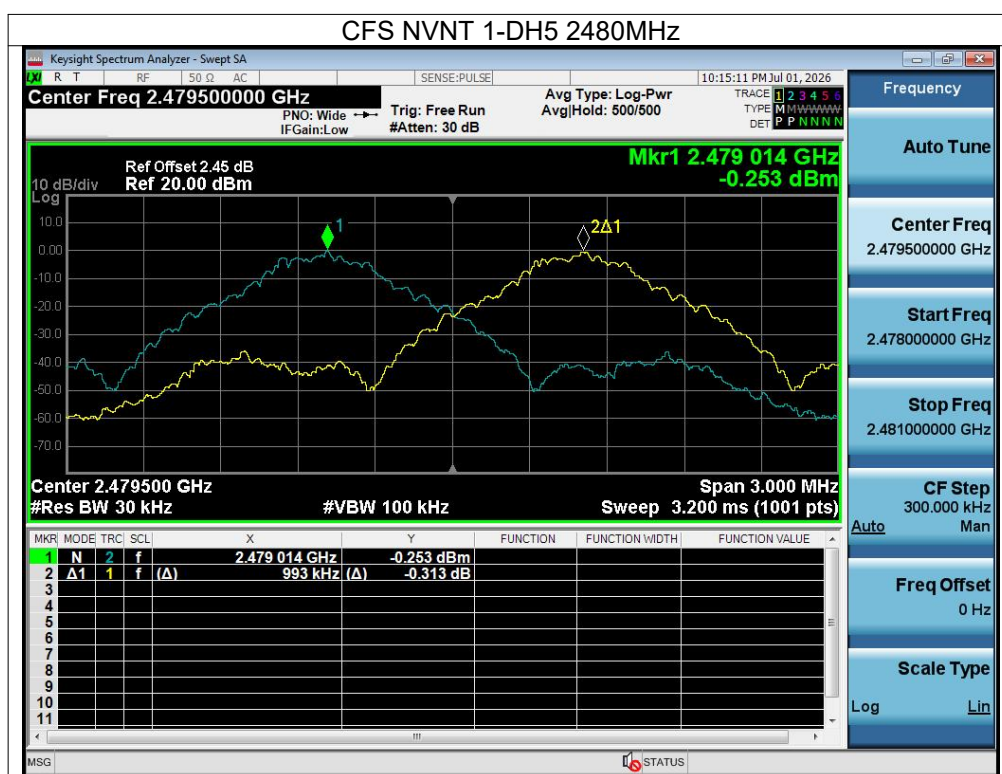
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to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

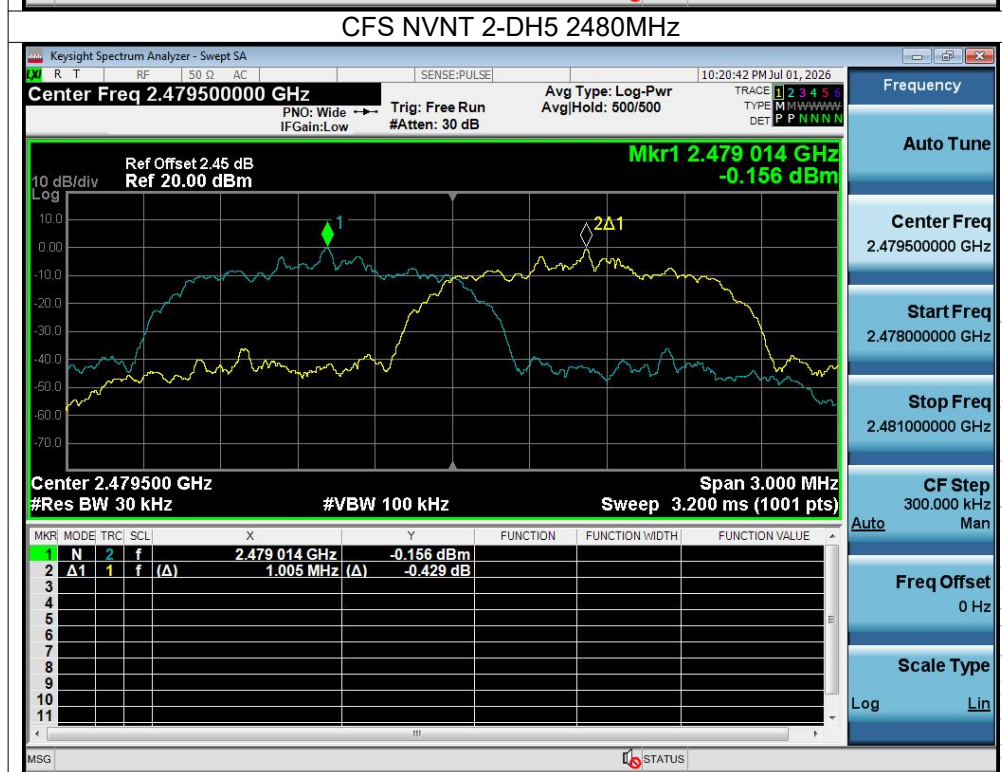
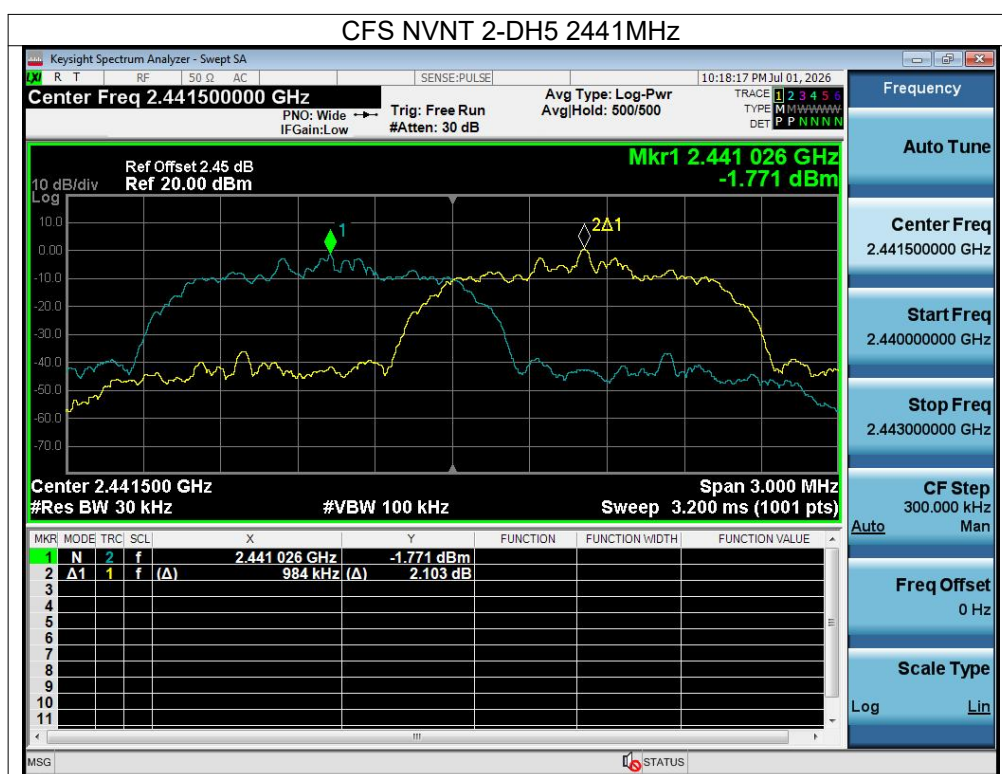
12.4 Test Result

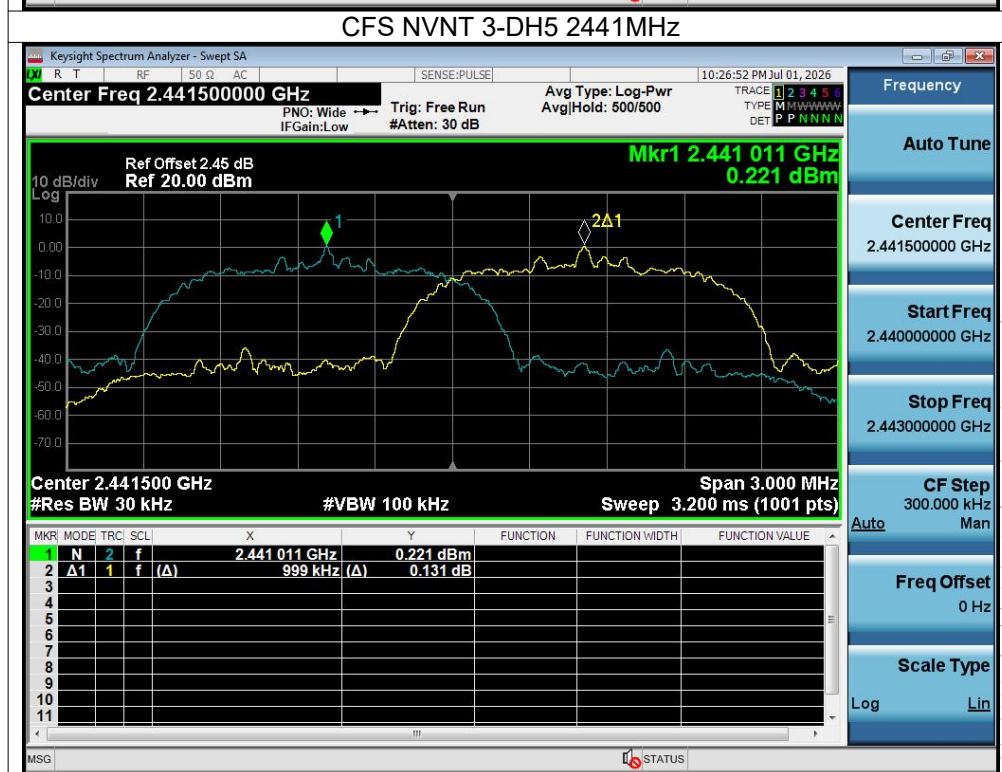
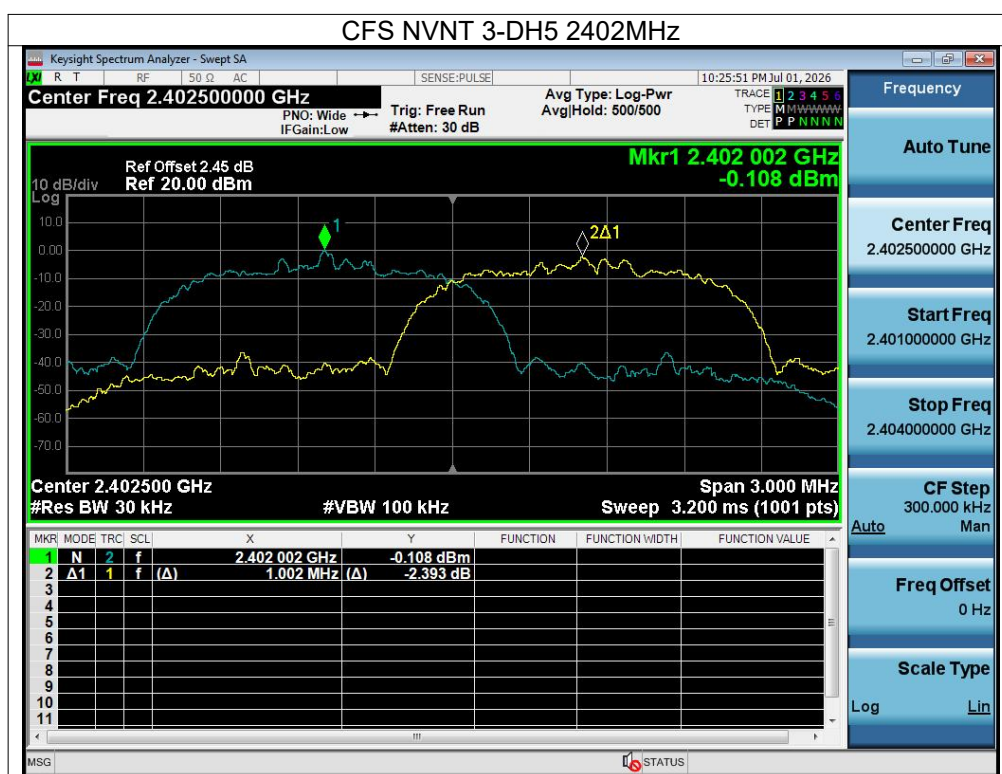
Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	2402.017	2403.022	1.005	0.624	Pass
NVNT	1-DH1	2441.011	2442.010	0.999	0.625	Pass
NVNT	1-DH1	2479.014	2480.007	0.993	0.619	Pass
NVNT	2-DH1	2402.014	2403.007	0.993	0.879	Pass
NVNT	2-DH1	2441.026	2442.010	0.984	0.848	Pass
NVNT	2-DH1	2479.014	2480.019	1.005	0.850	Pass
NVNT	3-DH5	2402.002	2403.004	1.002	0.865	Pass
NVNT	3-DH5	2441.011	2442.010	0.999	0.878	Pass
NVNT	3-DH5	2479.011	2480.013	1.002	0.855	Pass

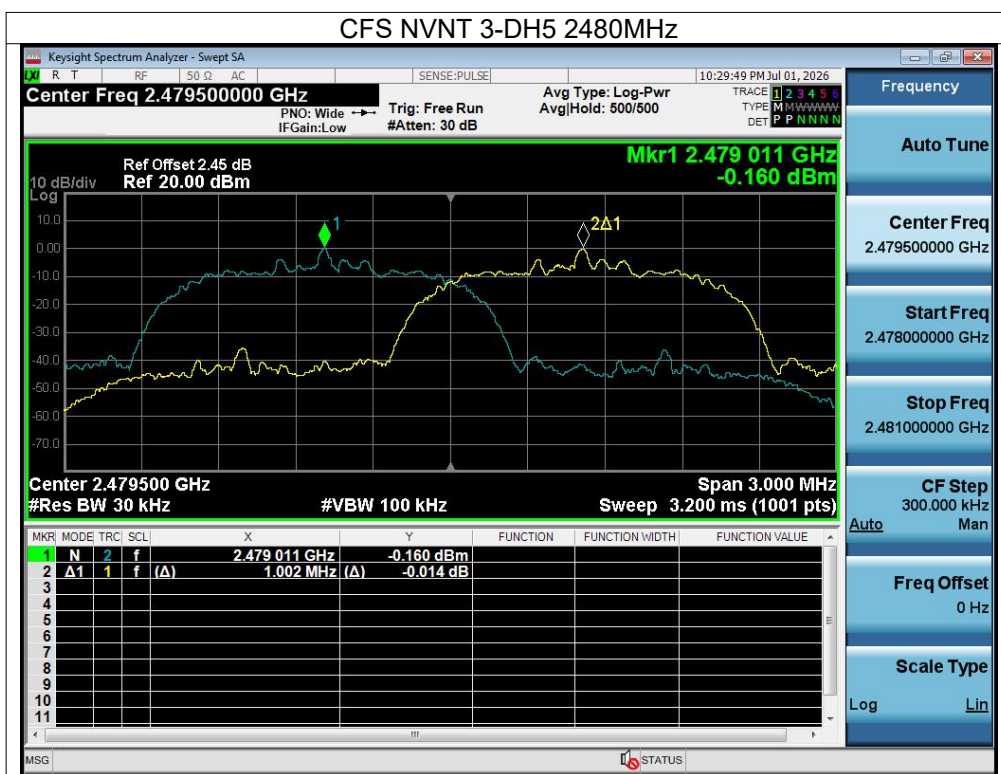


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13. Number of Hopping Frequency

13.1 Block Diagram Of Test Setup



13.2 Limit

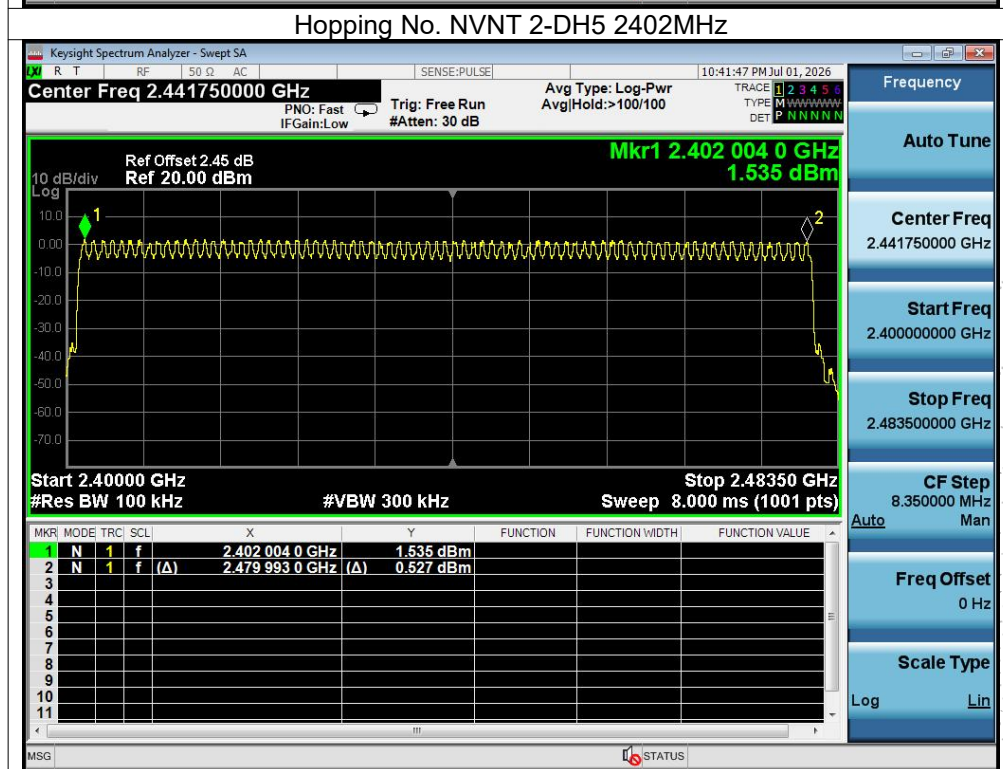
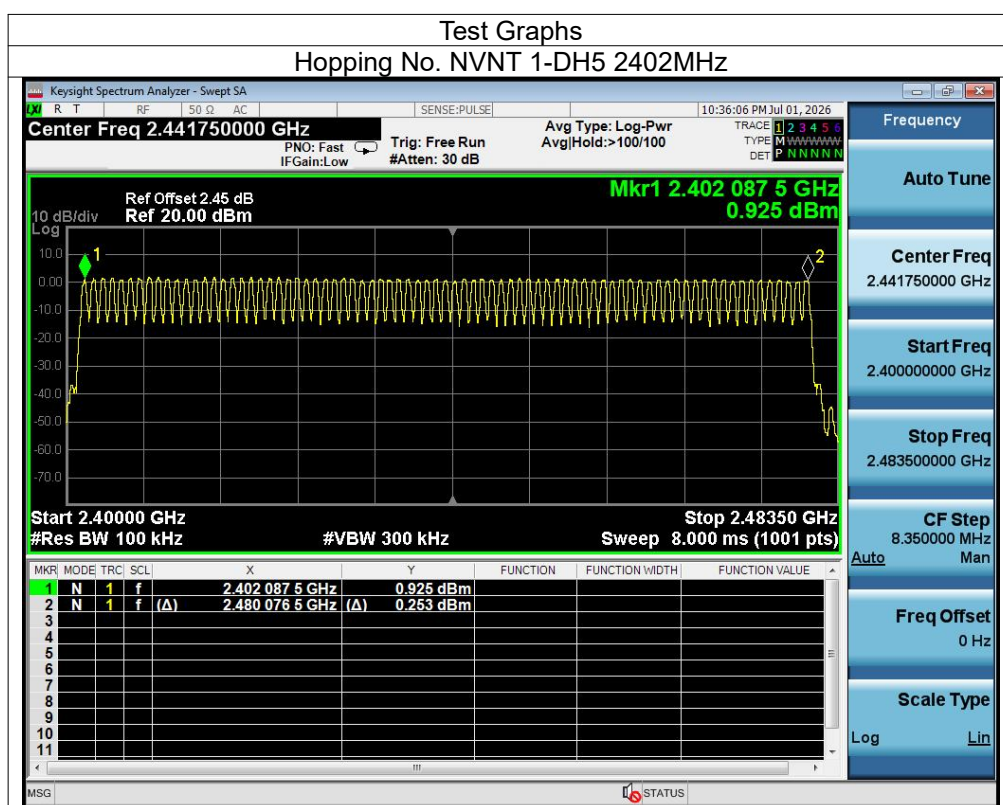
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

13.3 Test procedure

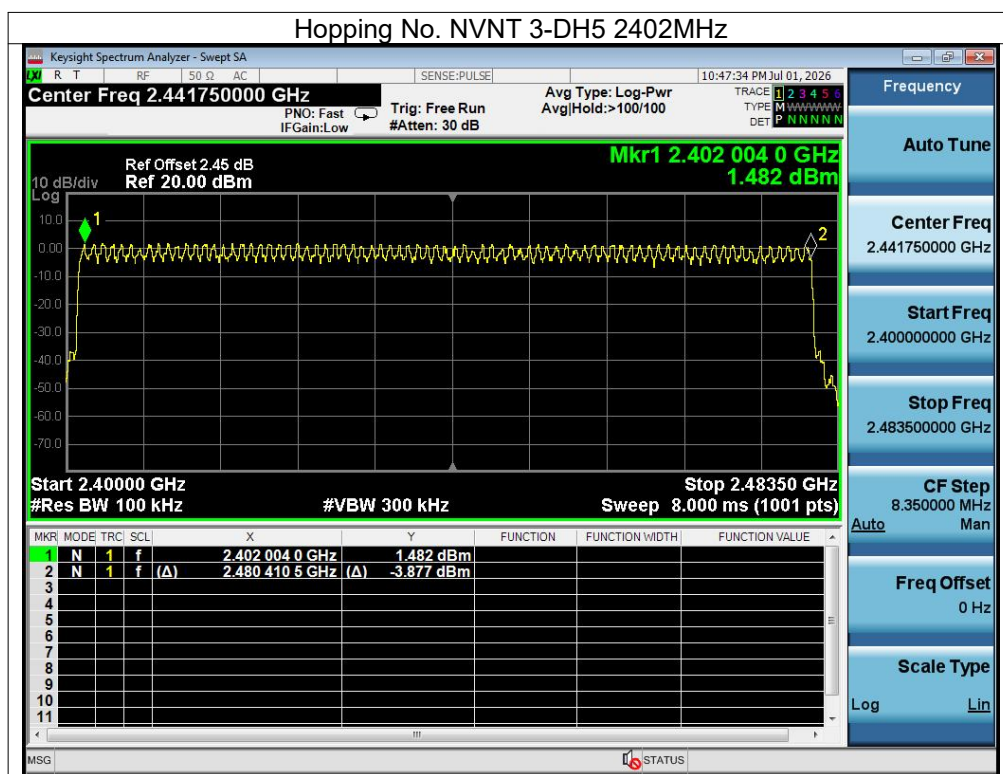
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to 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-DH1	79	15	Pass
NVNT	2-DH1	79	15	Pass
NVNT	3-DH5	79	15	Pass



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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	0.401	127.117	400	Pass
NVNT	1-DH3	2441	1.659	262.122	400	Pass
NVNT	1-DH5	2441	2.905	331.170	400	Pass
NVNT	2-DH1	2441	0.413	131.747	400	Pass
NVNT	2-DH3	2441	1.654	267.948	400	Pass
NVNT	2-DH5	2441	2.889	323.568	400	Pass
NVNT	3-DH1	2441	0.412	130.192	400	Pass
NVNT	3-DH3	2441	1.662	250.962	400	Pass
NVNT	3-DH5	2441	2.913	326.256	400	Pass

