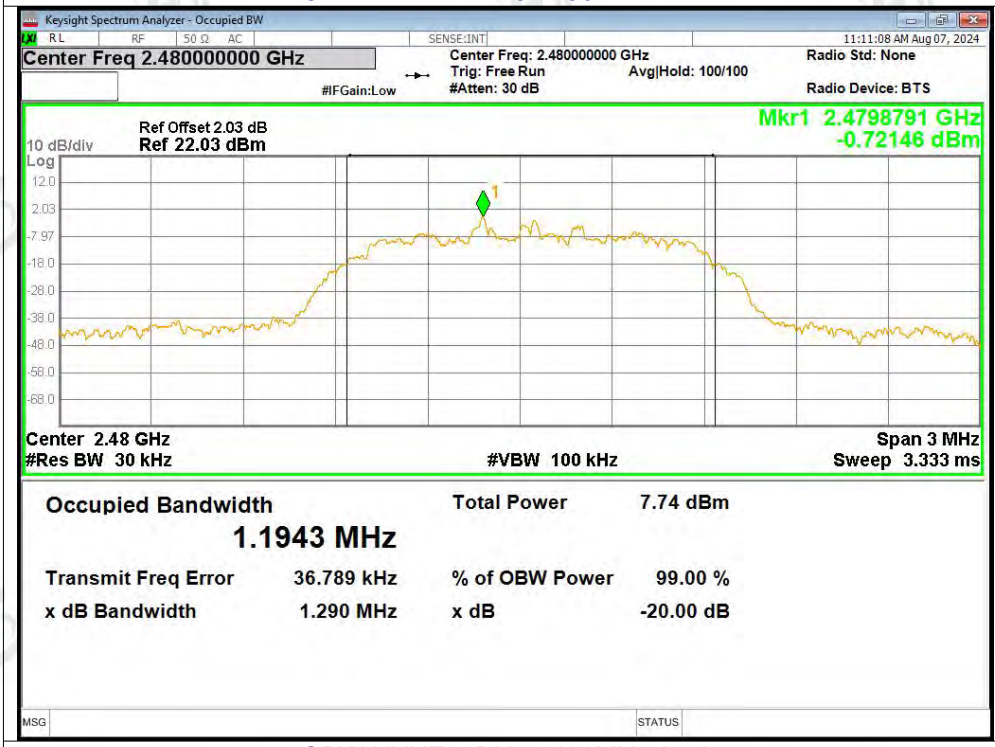
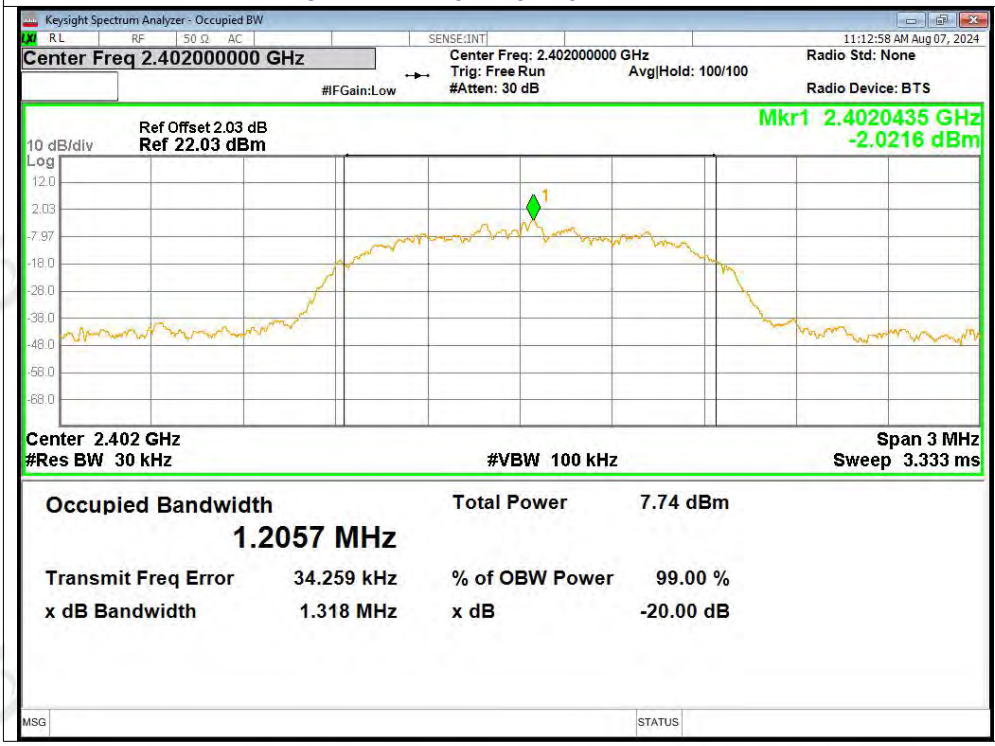
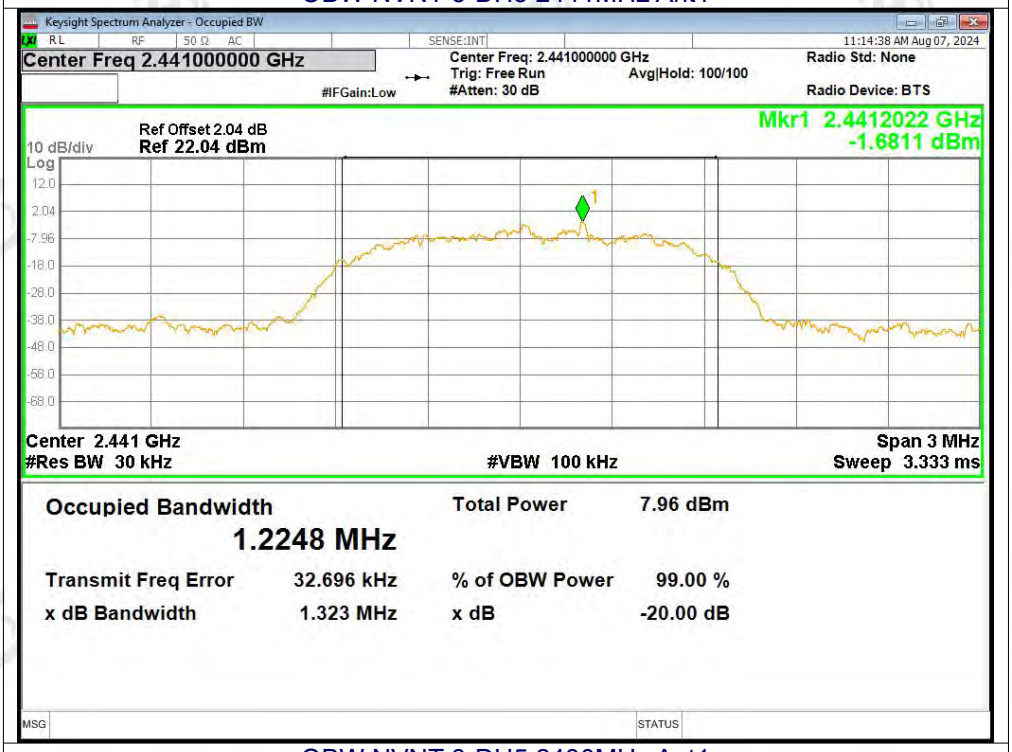
OBW NVNT 2-DH5 2480MHz Ant1



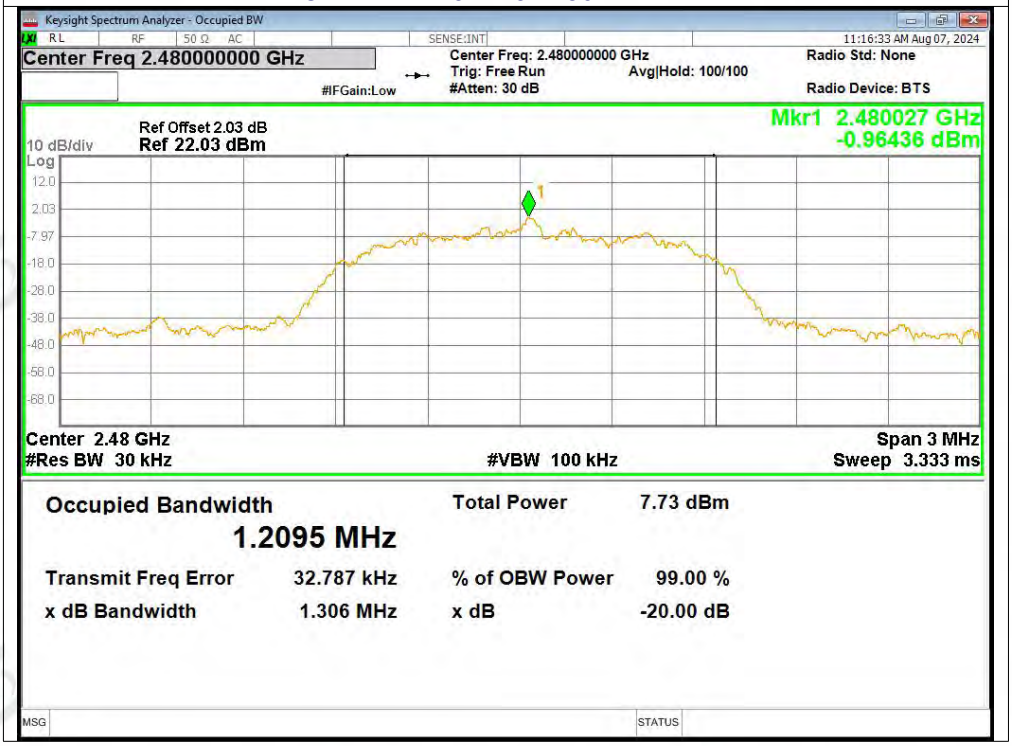

OBW NVNT 3-DH5 2402MHz Ant1



OBW NVNT 3-DH5 2441MHz Ant1




OBW 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 |

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

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.

8.4 DEVIATION FROM STANDARD

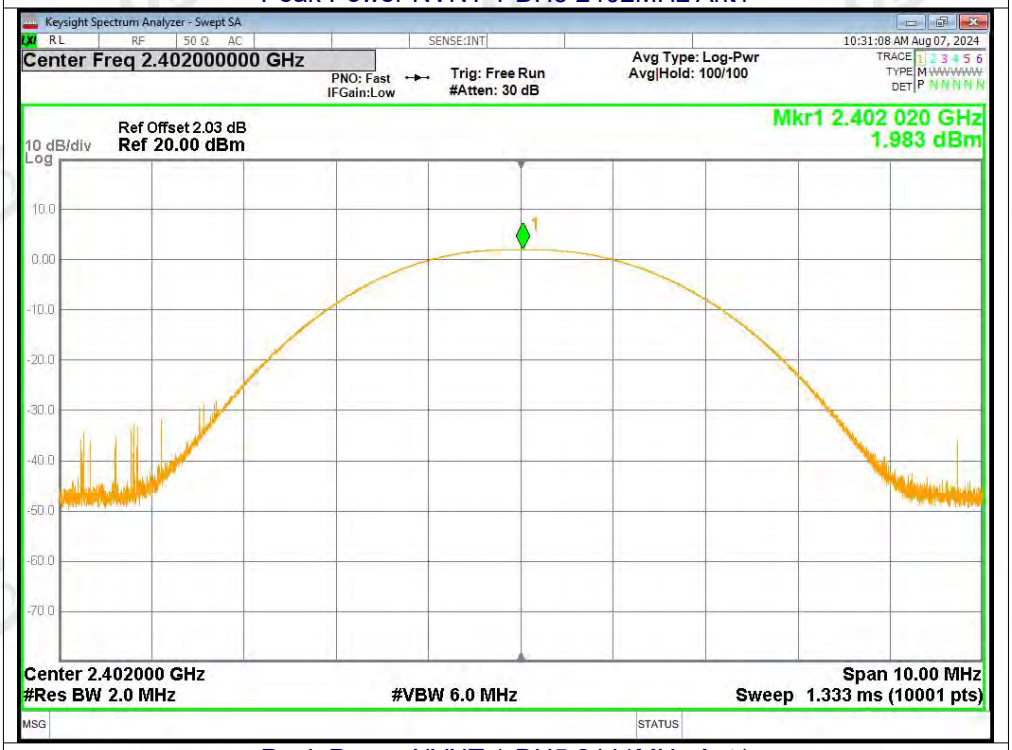
No deviation.

8.5 Test Result

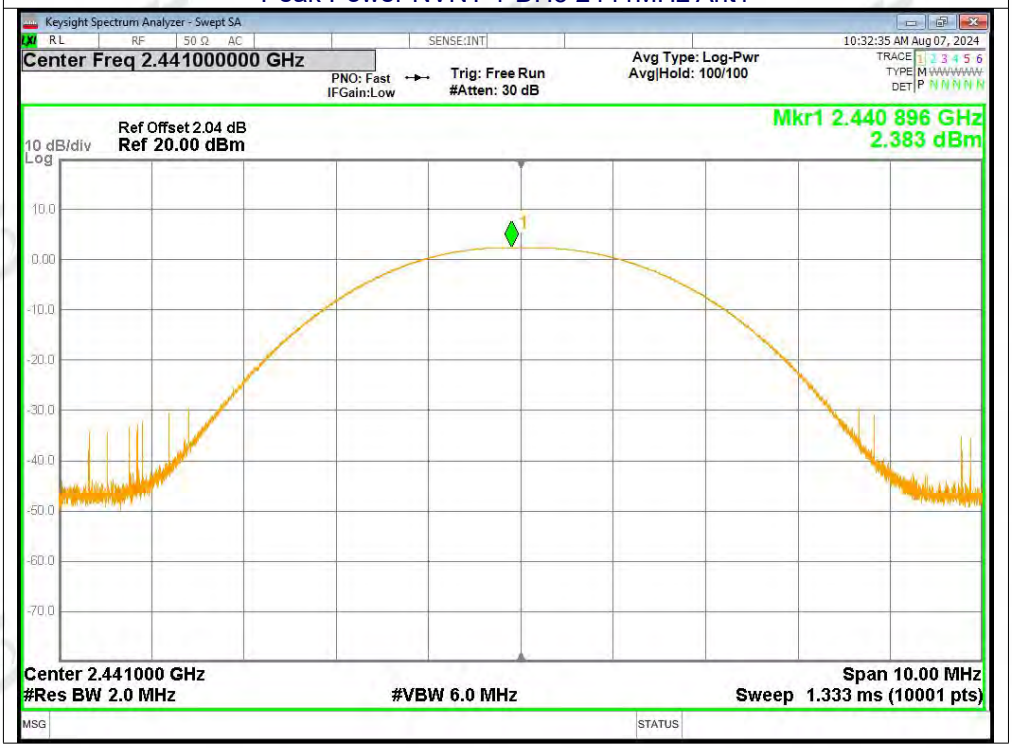
| Mode | Test channel | Peak Output Power (dBm) | FCC Limit (dBm) | Result |
|---|---|---|---|---|
| GFSK | Lowest | 1.98 | 21.00 | Pass |
| | Middle | 2.38 | | |
| | Highest | 1.75 | | |
| π/4DQPSK | Lowest | 2.54 | 21.00 | Pass |
| | Middle | 3.02 | | |
| | Highest | 2.42 | | |
| 8DPSK | Lowest | 2.91 | 21.00 | Pass |
| | Middle | 3.31 | | |
| | Highest | 2.7 | | |

## Test Graphs

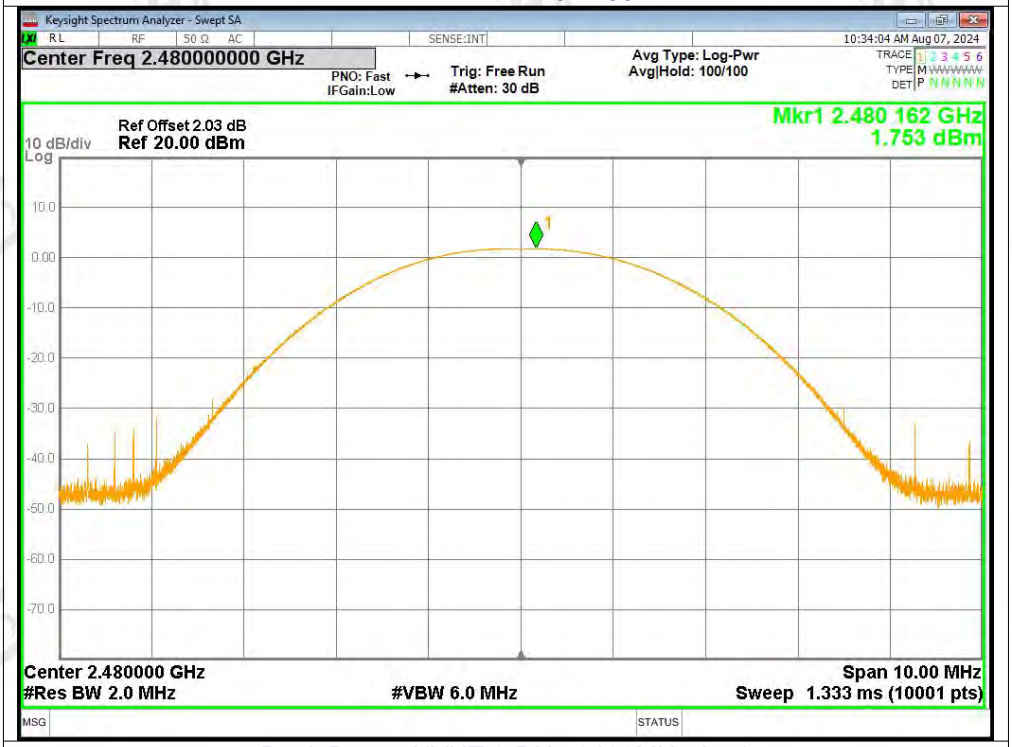
### Peak Power NVNT 1-DH5 2402MHz Ant1



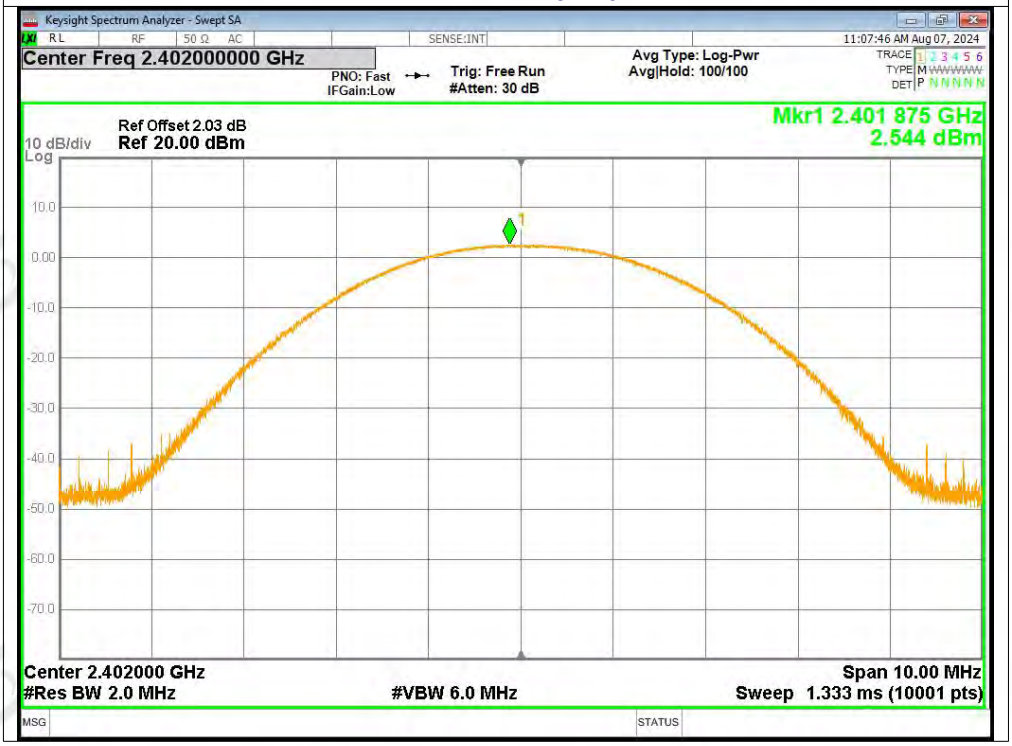

### Peak Power NVNT 1-DH5 2441MHz Ant1



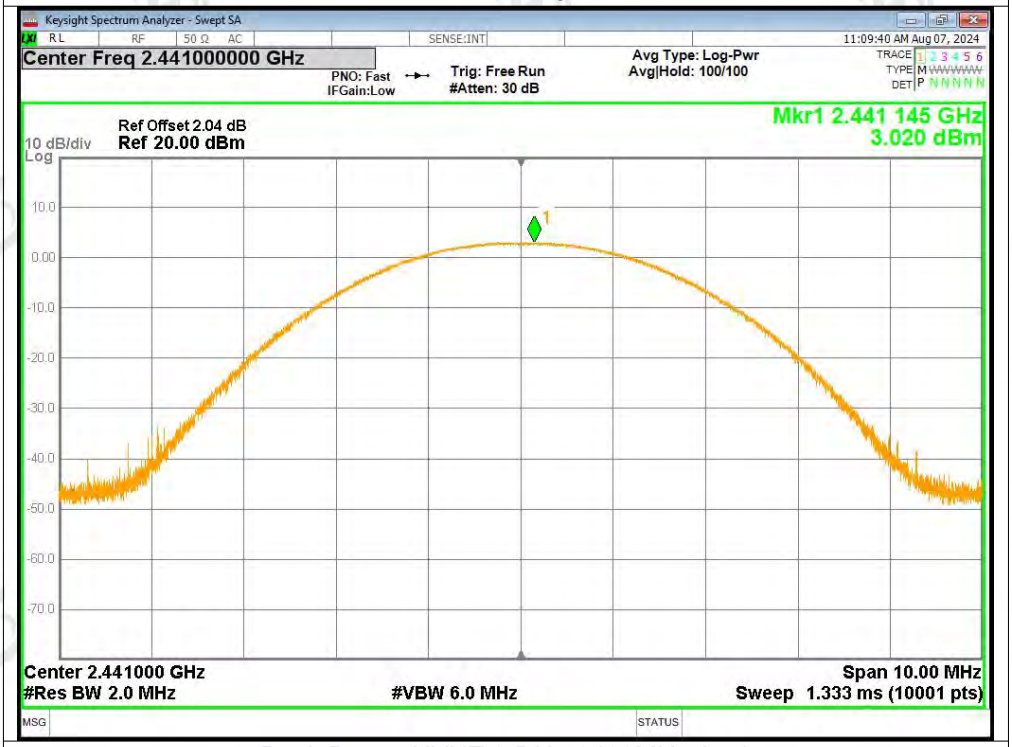
Peak Power NVNT 1-DH5 2480MHz Ant1



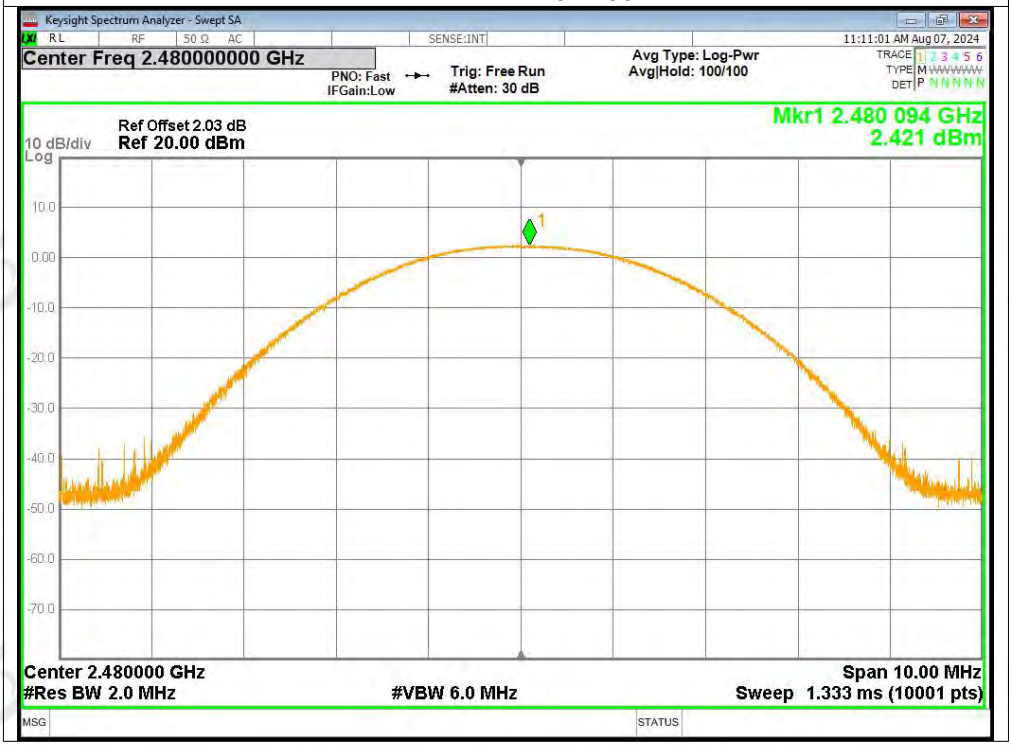

Peak Power NVNT 2-DH5 2402MHz Ant1



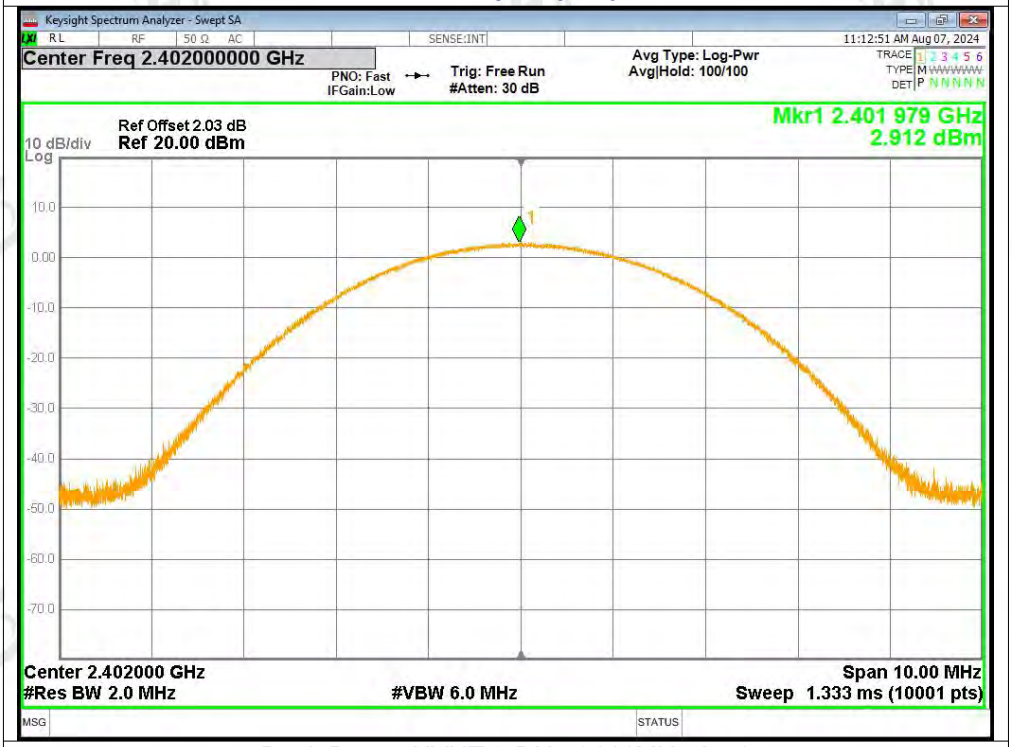
Peak Power NVNT 2-DH5 2441MHz Ant1



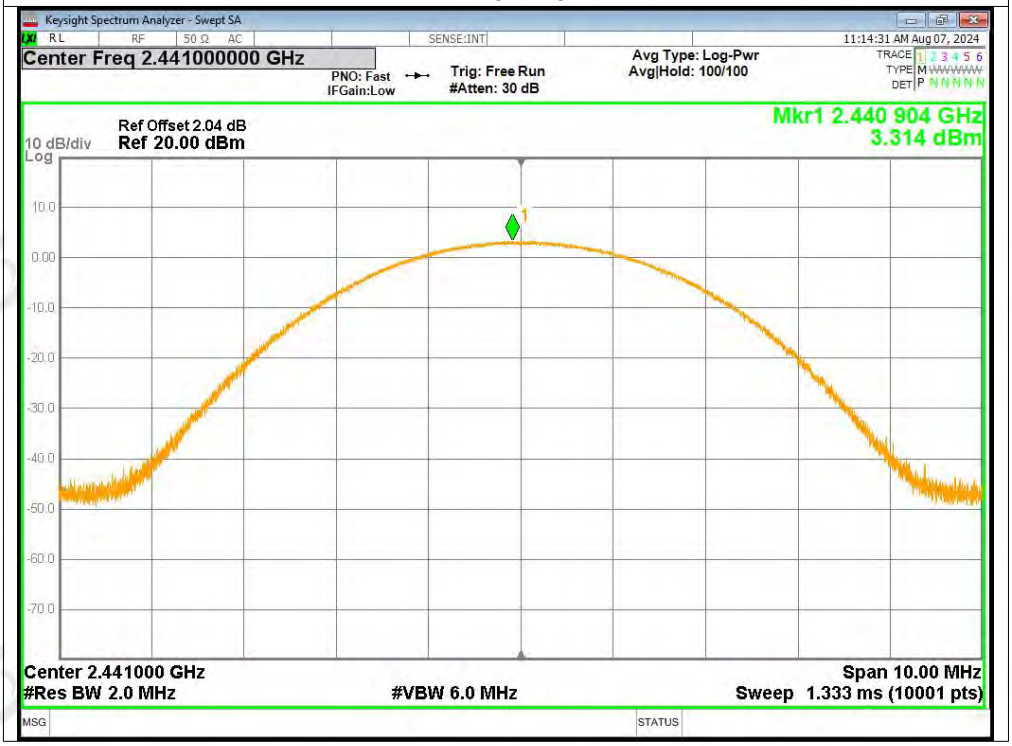

Peak Power NVNT 2-DH5 2480MHz Ant1



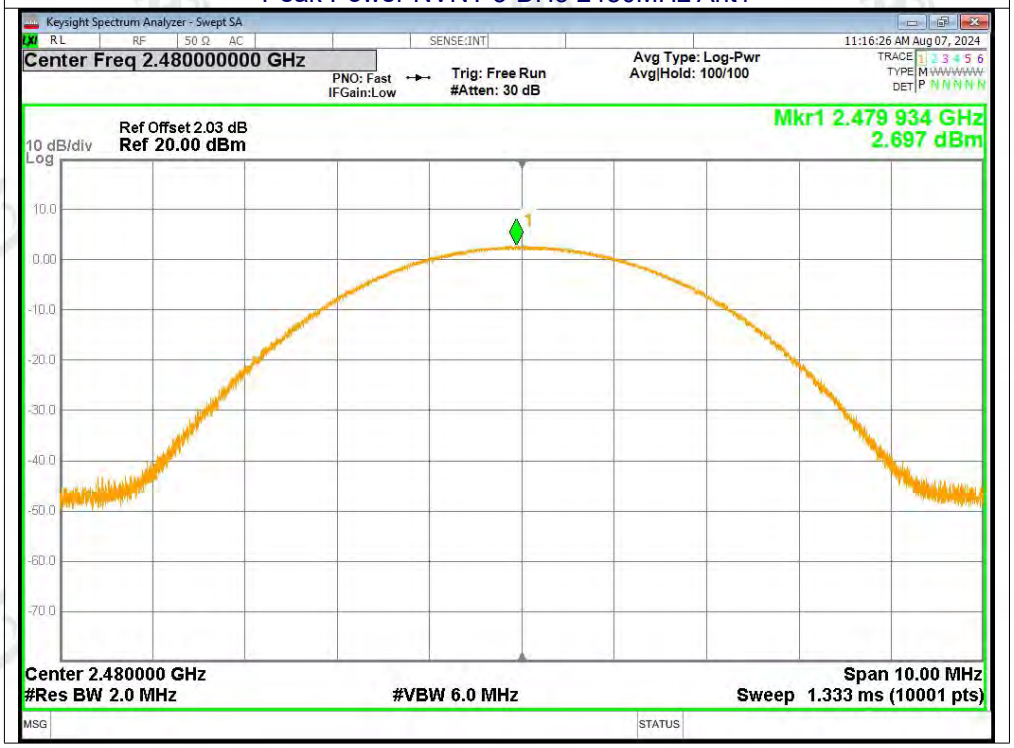
Peak Power NVNT 3-DH5 2402MHz Ant1




Peak Power NVNT 3-DH5 2441MHz Ant1



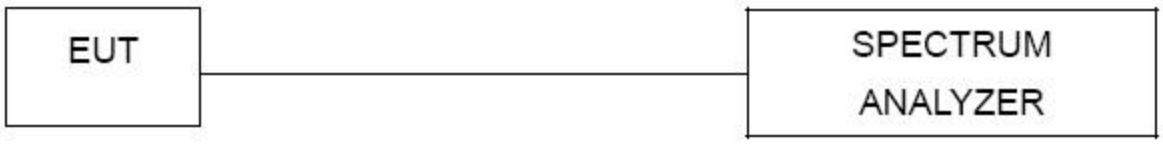
Peak Power NVNT 3-DH5 2480MHz Ant1



**9. Hopping Channel Separation**

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1) |
| Test Method: | ANSI C63.10:2013 |
| Receiver setup: | RBW=30KHz, VBW=100KHz, detector=Peak |
| Limit: | 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

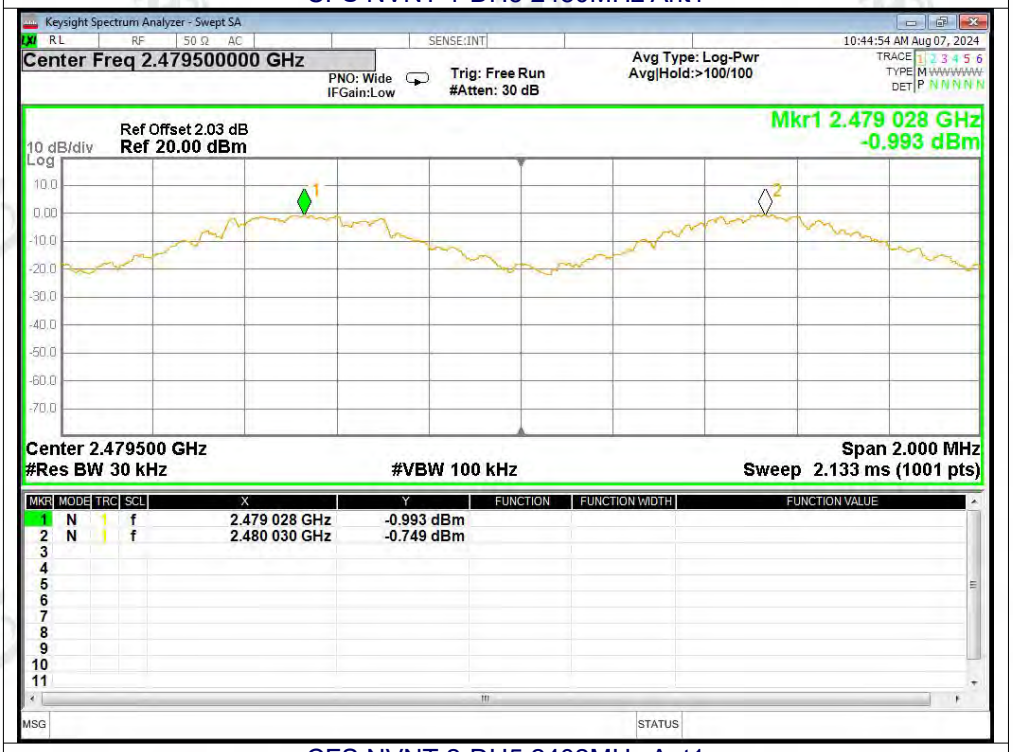
| Modulation | Test Channel | Separation (MHz) | Limit(MHz) | Result |
|---|---|---|---|---|
| GFSK | Low | 1.014 | 0.635 | PASS |
| GFSK | Middle | 1.024 | 0.629 | PASS |
| GFSK | High | 1.002 | 0.673 | PASS |
| π/4DQPSK | Low | 1.166 | 0.870 | PASS |
| π/4DQPSK | Middle | 1.010 | 0.875 | PASS |
| π/4DQPSK | High | 1.150 | 0.873 | PASS |
| 8DPSK | Low | 0.986 | 0.870 | PASS |
| 8DPSK | Middle | 1.016 | 0.902 | PASS |
| 8DPSK | High | 1.160 | 0.882 | PASS |

## Test Graphs

CFS NVNT 1-DH5 2402MHz Ant1


CFS NVNT 1-DH5 2441MHz Ant1

CFS NVNT 1-DH5 2480MHz Ant1




CFS NVNT 2-DH5 2402MHz Ant1

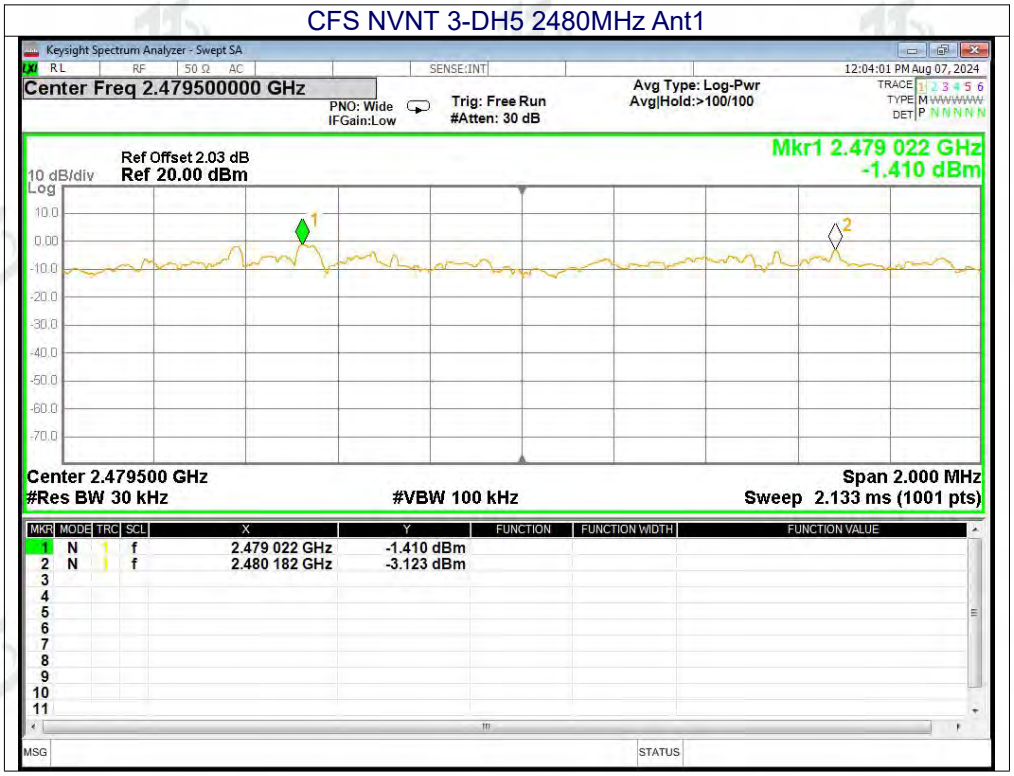
CFS NVNT 2-DH5 2441MHz Ant1


CFS NVNT 2-DH5 2480MHz Ant1

CFS NVNT 3-DH5 2402MHz Ant1


CFS NVNT 3-DH5 2441MHz Ant1

CFS NVNT 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.

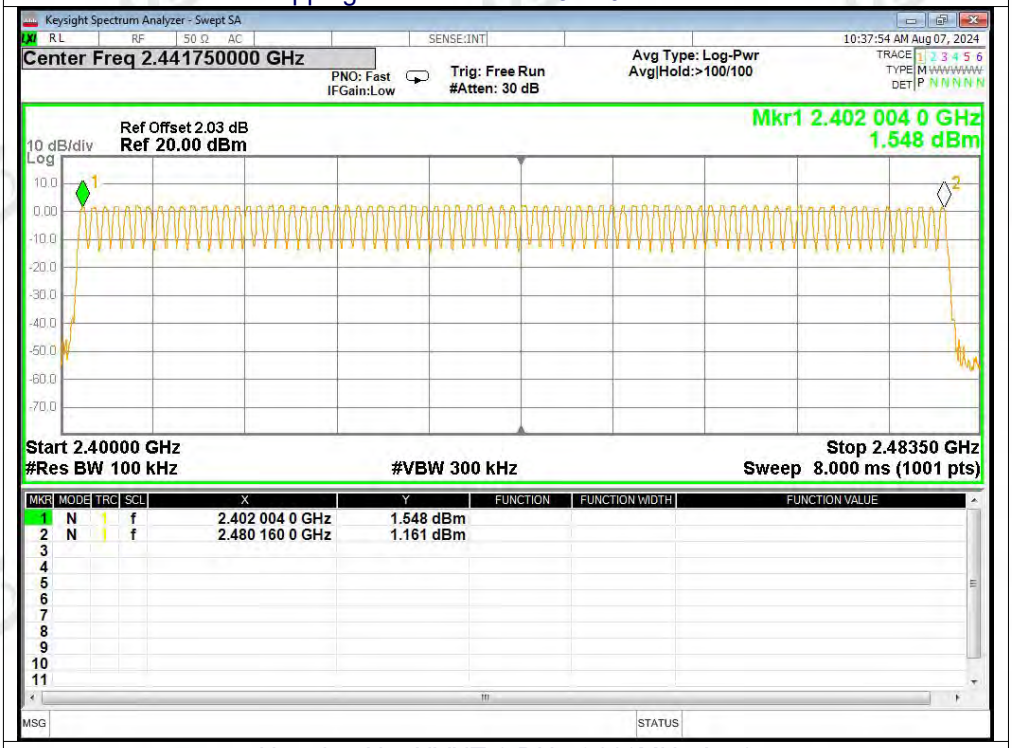
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

10.3 DEVIATION FROM STANDARD

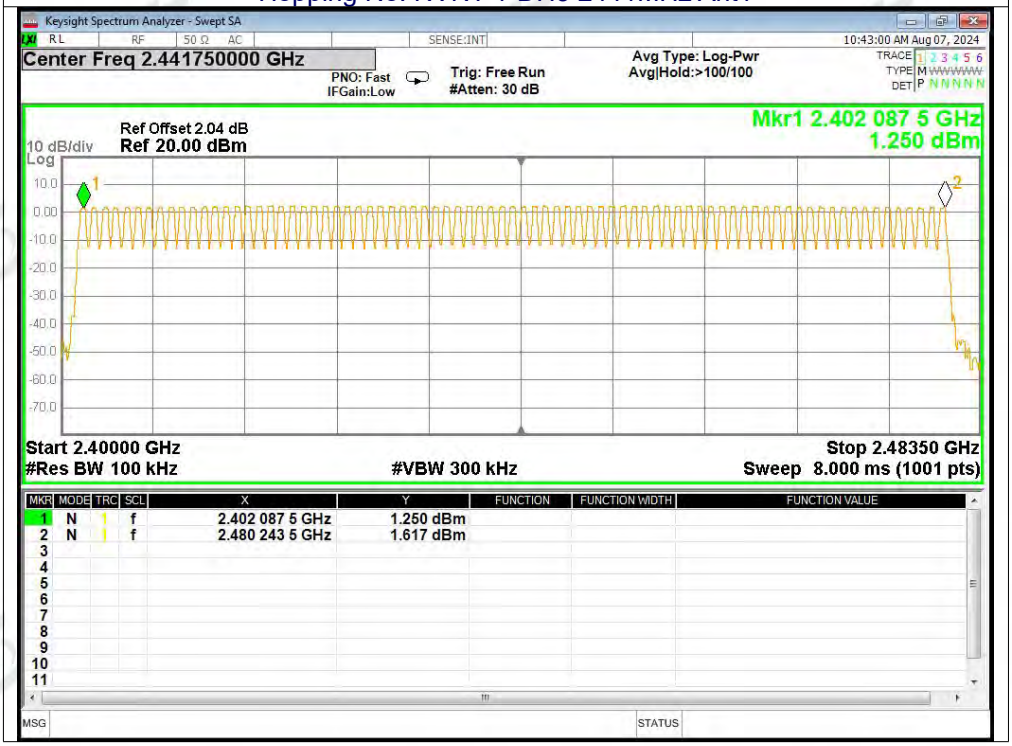
No deviation.

## 10.4 Test Result

| Test Graphs |
| --- |
| Hopping No. NVNT 1-DH5 2402MHz Ant1 |

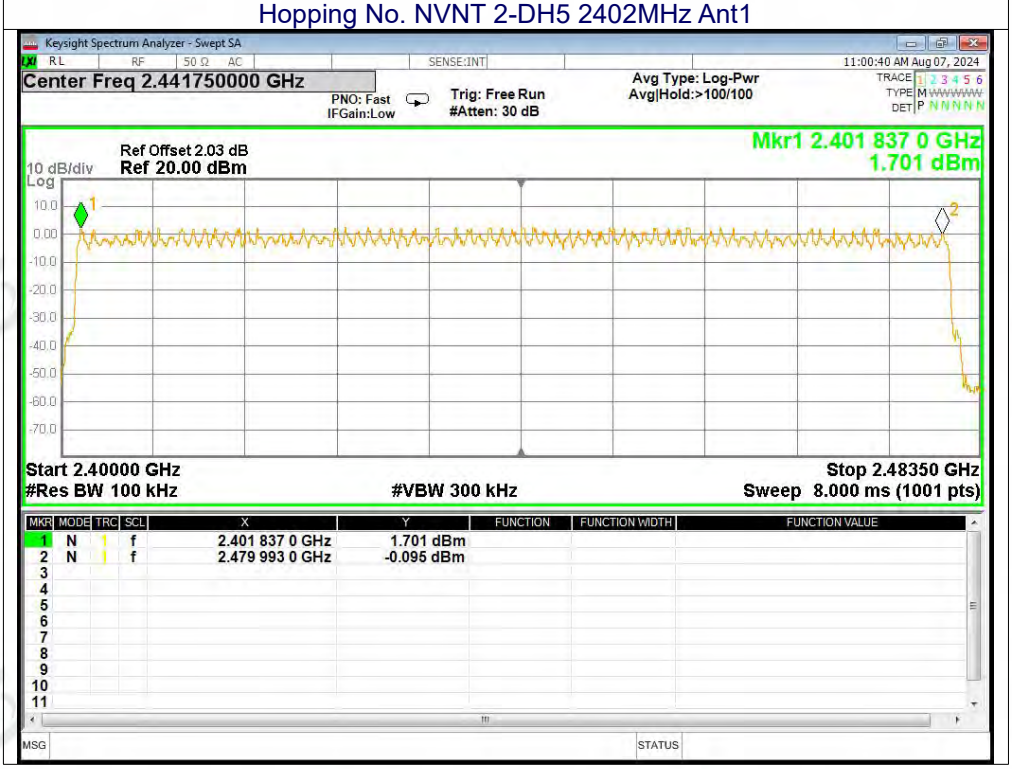



| Hopping No. NVNT 1-DH5 2441MHz Ant1 |
| --- |

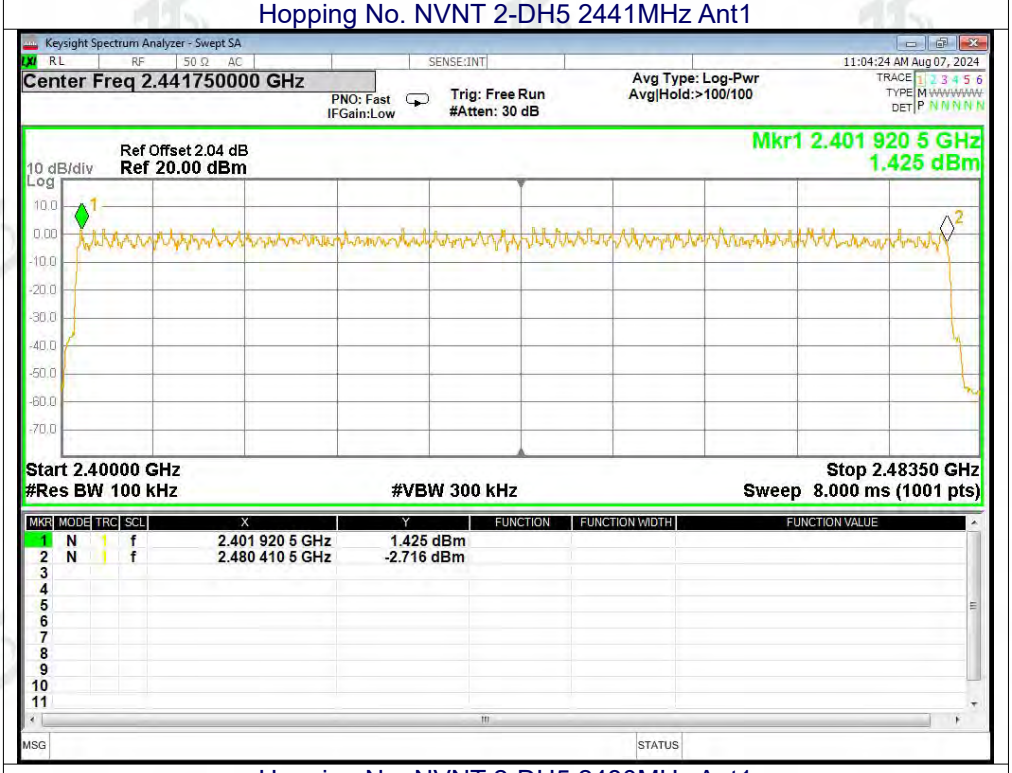


Hopping No. NVNT 1-DH5 2480MHz Ant1


Hopping No. NVNT 2-DH5 2402MHz Ant1

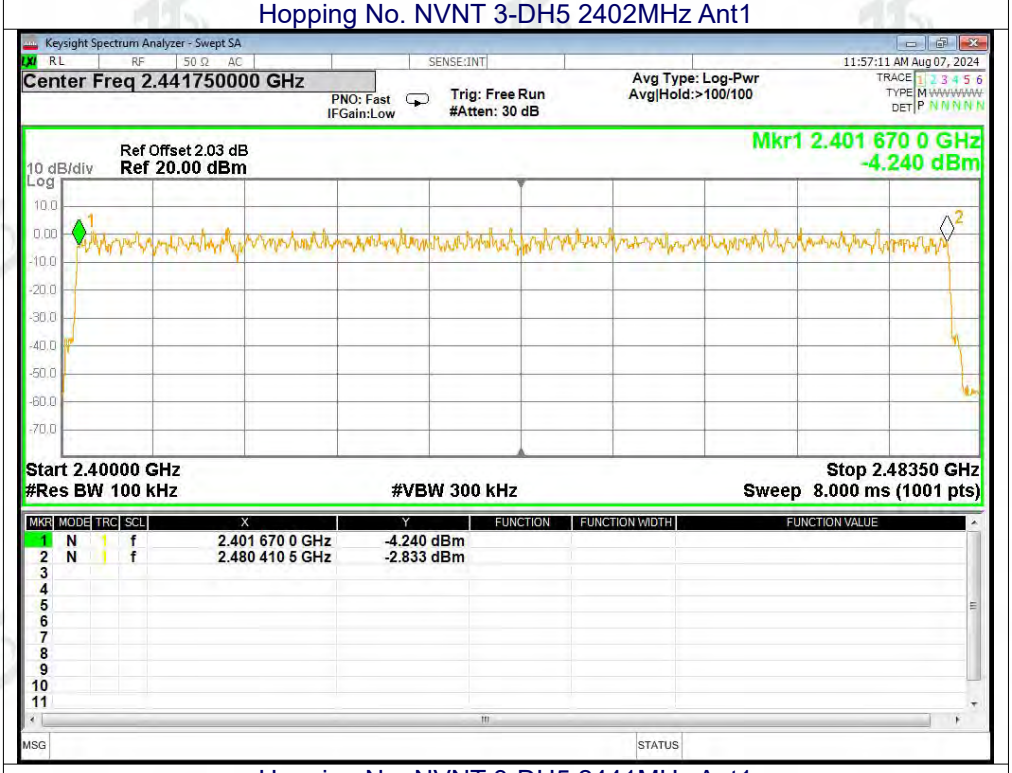


Hopping No. NVNT 2-DH5 2441MHz Ant1




Hopping No. NVNT 2-DH5 2480MHz Ant1

Hopping No. NVNT 3-DH5 2402MHz Ant1



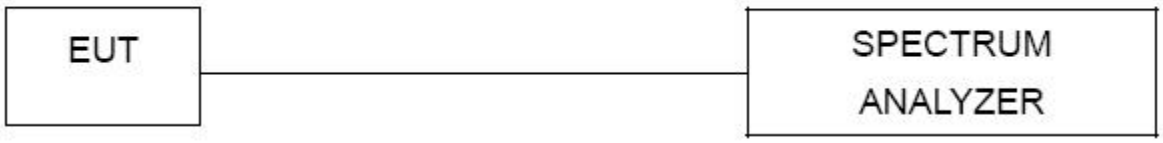

Hopping No. NVNT 3-DH5 2441MHz Ant1

Hopping No. NVNT 3-DH5 2480MHz 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 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).

11.3 DEVIATION FROM STANDARD

No deviation.

11.4 Test Result

| Mode | Frequency (MHz) | Pulse Time (ms) | Total Dwell Time (ms) | Burst Count | Period Time (ms) | Limit (ms) | Verdict |
|---|---|---|---|---|---|---|---|
| 1-DH1 | 2441 | 0.383 | 122.177 | 319 | 31600 | 400 | Pass |
| 1-DH3 | 2441 | 1.639 | 250.767 | 153 | 31600 | 400 | Pass |
| 1-DH5 | 2441 | 2.887 | 285.813 | 99 | 31600 | 400 | Pass |
| 2-DH1 | 2441 | 0.392 | 124.656 | 318 | 31600 | 400 | Pass |
| 2-DH3 | 2441 | 1.643 | 251.379 | 153 | 31600 | 400 | Pass |
| 2-DH5 | 2441 | 2.885 | 291.385 | 101 | 31600 | 400 | Pass |
| 3-DH1 | 2441 | 0.391 | 124.338 | 318 | 31600 | 400 | Pass |
| 3-DH3 | 2441 | 1.643 | 274.381 | 167 | 31600 | 400 | Pass |
| 3-DH5 | 2441 | 2.894 | 309.658 | 107 | 31600 | 400 | Pass |

Remarks:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

(1 / 2 / 3)-DH1: Dwell time (ms) = Pulse Time (ms) * [1600 / (2 * 79)] * 31.6s

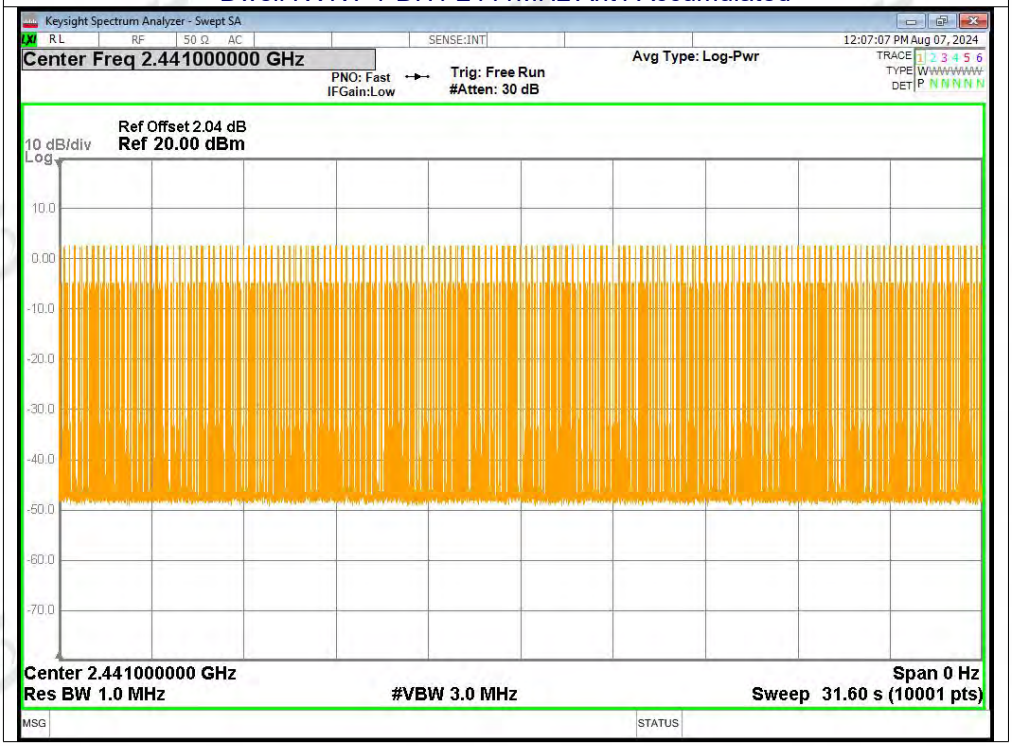
(1 / 2 / 3)-DH3: Dwell time (ms) = Pulse Time (ms) * [1600 / (4 * 79)] * 31.6s

(1 / 2 / 3)-DH5: Dwell time (ms) = Pulse Time (ms) * [1600 / (6 * 79)] * 31.6s

## Test Graphs

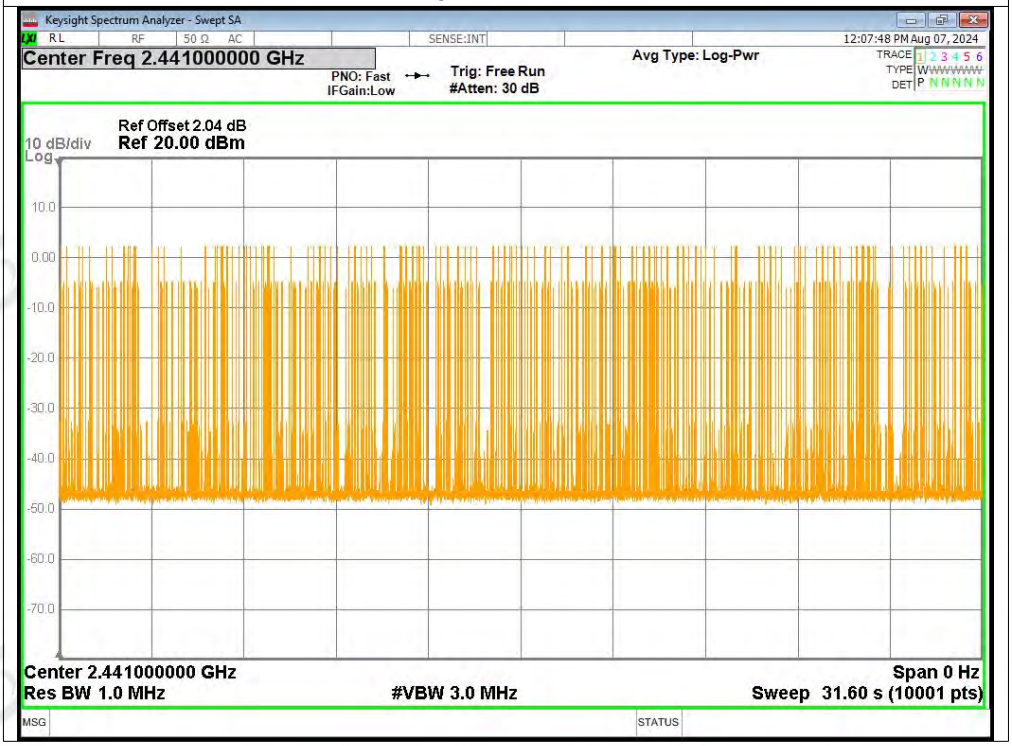
### Dwell NVNT 1-DH1 2441MHz Ant1 One Burst


### Dwell NVNT 1-DH1 2441MHz Ant1 Accumulated



Dwell NVNT 1-DH3 2441MHz Ant1 One Burst


Dwell NVNT 1-DH3 2441MHz Ant1 Accumulated

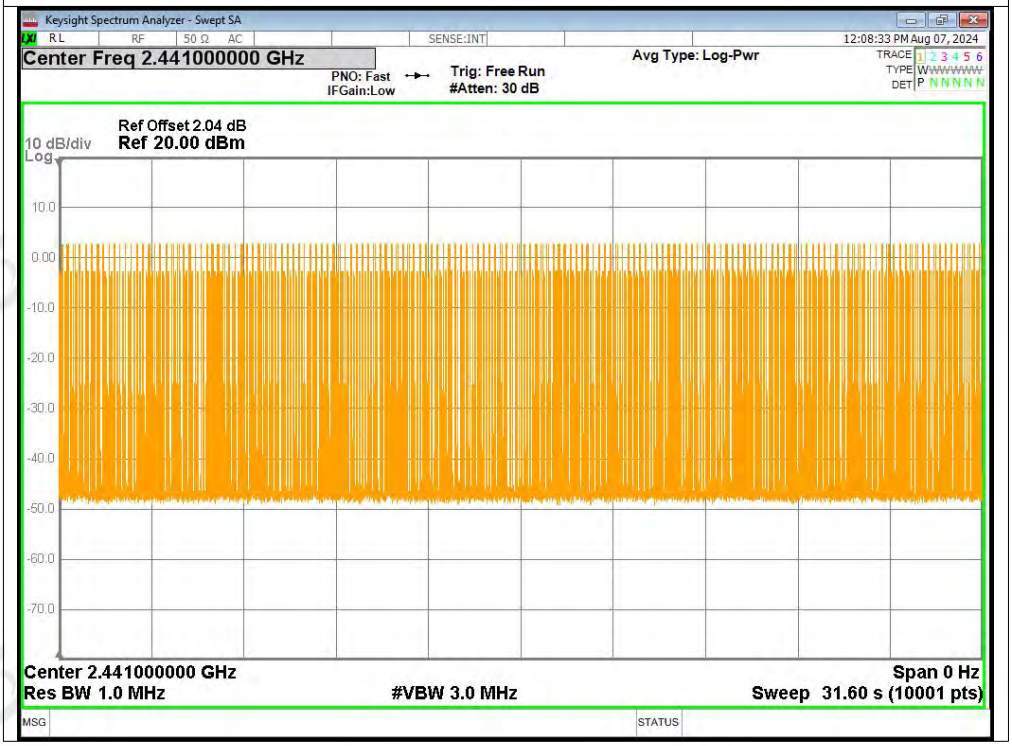


Dwell NVNT 1-DH5 2441MHz Ant1 One Burst


Dwell NVNT 1-DH5 2441MHz Ant1 Accumulated

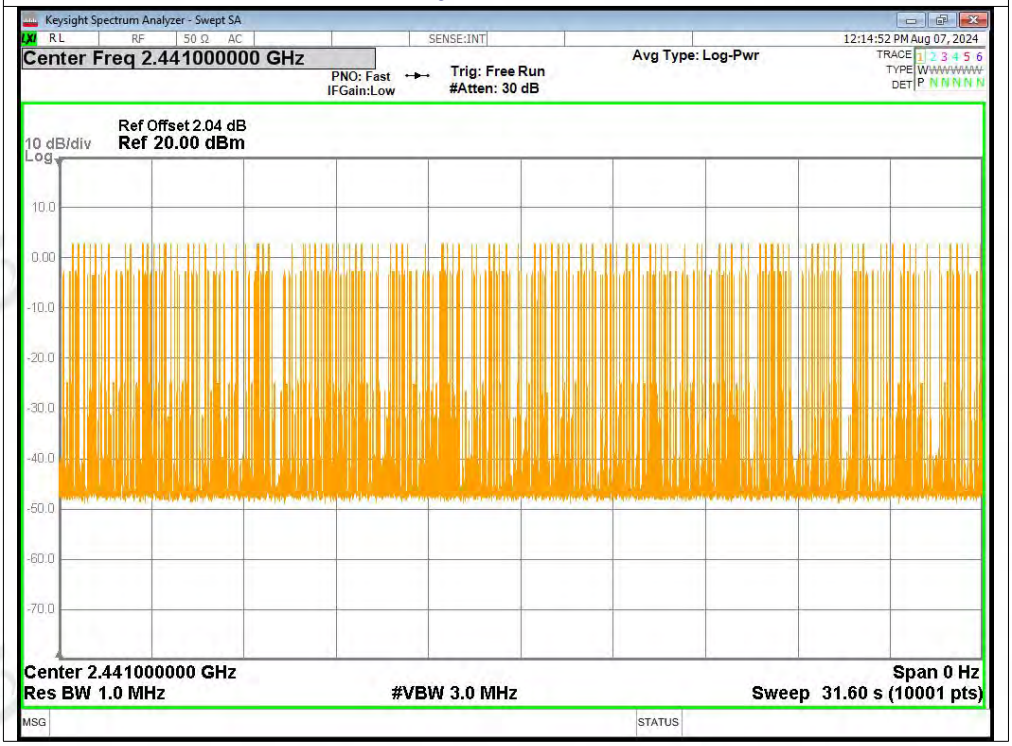
Dwell NVNT 2-DH1 2441MHz Ant1 One Burst


Dwell NVNT 2-DH1 2441MHz Ant1 Accumulated



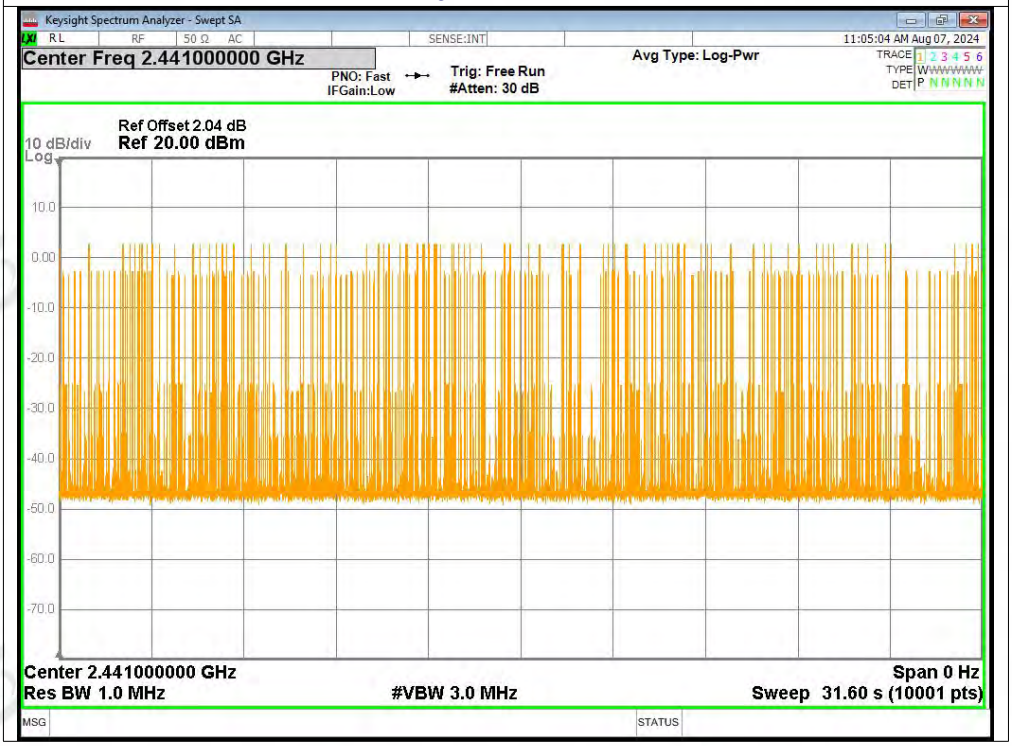
Dwell NVNT 2-DH3 2441MHz Ant1 One Burst


Dwell NVNT 2-DH3 2441MHz Ant1 Accumulated



Dwell NVNT 2-DH5 2441MHz Ant1 One Burst


Dwell NVNT 2-DH5 2441MHz Ant1 Accumulated



Dwell NVNT 3-DH1 2441MHz Ant1 One Burst


Dwell NVNT 3-DH1 2441MHz Ant1 Accumulated

Dwell NVNT 3-DH3 2441MHz Ant1 One Burst


Dwell NVNT 3-DH3 2441MHz Ant1 Accumulated

Dwell NVNT 3-DH5 2441MHz Ant1 One Burst


Dwell NVNT 3-DH5 2441MHz Ant1 Accumulated

## 12. Antenna Requirement

| Standard requirement: | FCC Part15 C Section 15.203 /247(b)(4) |
|---|---|
| 15.203 requirement:<br>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.<br>15.247(b) (4) requirement:<br>(4) 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. | |
| EUT Antenna: | |
| The antenna is PCB Antenna, the best case gain of the antennas is -0.58dBi, 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 ※※※※※**