# TEST REPORT

**FCC ID: 2AXYP-OSW-832N**

**Product: Smart Watch**

**Model No.: OSW-832N**

**Trade Mark: oraimo**

**Report No.: WSCT-ANAB-R&E241100064A-BT**

**Issued Date: 28 November 2024**

Issued for:

**ORAIMO TECHNOLOGY LIMITED**
**FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG**

Issued By:

**World Standardization Certification & Testing Group(Shenzhen) Co., Ltd.**
**Building A-B,Baoli'an Industrial Park,No.58 and 60,Tangtou Avenue, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province, China.**
**TEL: +86-755-26996192**
**FAX: +86-755-86376605**

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# 1. Test Certification

| | |
|---|---|
| **Product:** | Smart Watch |
| **Model No.:** | OSW-832N |
| **Additional Model:** | oraimo |
| **Applicant:** | **ORAIMO TECHNOLOGY LIMITED**<br>FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG |
| **Manufacturer:** | **ORAIMO TECHNOLOGY LIMITED**<br>FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG |
| **Date of receipt:** | 14 November 2024 |
| **Date of Test:** | 15 November 2024 ~ 27 November 2024 |
| **Applicable Standards:** | FCC CFR Title 47 Part 15 Subpart C Section 15.247 |

*The above equipment has been tested by World Standardization Certification & Testing Group(Shenzhen)Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.*

**Tested By:** Wang Xiang **(Wang Xiang)**

**Checked By:** Qin Shuiquan **( Qin Shuiquan)**

**Approved By:** Li Huaibi **( Li Huaibi)**

**Date:** 28 November 2024

## 2. Test Result Summary

| Requirement | CFR 47 Section | Result |
|---|---|---|
| Antenna Requirement | §15.203/§15.247 (c) | PASS |
| AC Power Line Conducted Emission | §15.207 | N/A |
| Maximum conducted output power | §15.247 (b)(1)<br>§2.1046 | PASS |
| 20dB Occupied Bandwidth | §15.247 (a)(1)<br>§2.1049 | PASS |
| Carrier Frequencies Separation | §15.247 (a)(1) | PASS |
| Hopping Channel Number | §15.247 (a)(1) | PASS |
| Dwell Time | §15.247 (a)(1) | PASS |
| Radiated Emission | §15.205/§15.209<br>§2.1053, §2.1057 | PASS |
| Band Edge | §15.247(d)<br>§2.1051, §2.1057 | PASS |

***Note:***

*1. PASS: Test item meets the requirement.*

*2. Fail: Test item does not meet the requirement.*

*3. N/A: Test case does not apply to the test object.*

*4. The test result judgment is decided by the limit of test standard.*

# 3. EUT Description

| | |
|---|---|
| **Product Name:** | Smart Watch |
| **Model :** | OSW-832N |
| **Trade Mark:** | oraimo |
| **Software version:** | V1.0 |
| **Hardware version:** | Z1650 V2.0 |
| **Frequency Range:** | 2402-2480MHz(TX/RX) |
| **Channel Separation:** | 1MHz |
| **Number of Channel:** | 79 |
| **Modulation Type:** | GFSK, π/4-DQPSK, 8-DPSK |
| **Antenna Type** | FPC Antenna |
| **Antenna Gain:** | -5.2dBi |
| **Operating Voltage** | Li-ion Polymer Battery: 552123V<br>Capacity:300mAh/3.8V/1.140Wh<br>Limited Charge Votage:4.35 |
| **Remark:** | N/A. |

Note: 1. N/A stands for no applicable.

2. Antenna gain provided by the applicant

**Operation Frequency each of channel for GFSK, π/4-DQPSK, 8DPSK**

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 0 | 2402MHz | 20 | 2422MHz | 40 | 2442MHz | 60 | 2462MHz |
| 1 | 2403MHz | 21 | 2423MHz | 41 | 2443MHz | 61 | 2463MHz |
| … | … | … | … | … | … | … | … |
| 10 | 2412MHz | 30 | 2432MHz | 50 | 2452MHz | 70 | 2472MHz |
| 11 | 2413MHz | 31 | 2433MHz | 51 | 2453MHz | 71 | 2473MHz |
| … | … | … | … | … | … | … | … |
| 18 | 2420MHz | 38 | 2440MHz | 58 | 2460MHz | 78 | 2480MHz |
| 19 | 2421MHz | 39 | 2441MHz | 59 | 2461MHz | | - |
| Remark: Channel 0, 39 &78 have been tested for GFSK, π/4-DQPSK, 8DPSK modulation mode. | | | | | | | |

# 4. Genera Information

## 4.1. Test environment and mode

| Operating Environment: | |
|---|---|
| Temperature: | 25.0 °C |
| Humidity: | 56 % RH |
| Atmospheric Pressure: | 1010 mbar |
| **Test Mode:** | |
| Engineering mode: | Keep the EUT in continuous transmitting by select channel and modulations with Fully-charged battery |
| The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. | |

## 4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Equipment | Model No. | Serial No. | FCC ID | Trade Name |
|---|---|---|---|---|
| / | / | / | / | / |
| Adapter | / | / | / | / |

***Note:***

*1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*

*2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

*3. For conducted measurements (Output Power, 20dB Occupied Bandwidth, Carrier Frequencies Separation, Hopping Channel Number, Dwell Time, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.*

# 5. Facilities and Accreditations

## 5.1. Facilities

All measurement facilities used to collect the measurement data are located at

**World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.**

**Building A-B,Baoli'an Industrial Park,No.58 and 60,Tangtou Avenue, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province, China.**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

## 5.2. ACCREDITATIONS

**CNAS - Registration Number: L3732**

China National Accreditation Service for Conformity Assessment, The test firm Registration Number: L3732

**FCC - Designation Number: CN1303**

World Standardization Certification & Testing Group(Shenzhen) CO., LTD. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Designation Number: CN1303.

**ANAB - Certificate Number: AT-3951**

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (ANAB).Certification Number: AT-3951

## 5.3. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

| No. | Item | MU |
|---|---|---|
| 1 | Conducted Emission Test | ±3.2dB |
| 2 | RF power, conducted | ±0.16dB |
| 3 | Spurious emissions, conducted | ±0.21dB |
| 4 | All emissions, radiated(<1GHz) | ±4.7dB |
| 5 | All emissions, radiated(>1GHz) | ±4.7dB |
| 6 | Temperature | ±0.5°C |
| 7 | Humidity | ±2.0% |

## 5.4. MEASUREMENT INSTRUMENTS

| NAME OF EQUIPMENT | MANUFACTURER | MODEL | SERIAL NUMBER | Calibration Date | Calibration Due. |
|---|---|---|---|---|---|
| Test software | - | EZ-EMC | CON-03A | - | - |
| Test software | - | MTS8310 | - | - | - |
| EMI Test Receiver | R&S | ESCI | 100005 | 11/05/2024 | 11/04/2025 |
| LISN | AFJ | LS16 | 16010222119 | 11/05/2024 | 11/04/2025 |
| LISN(EUT) | Mestec | AN3016 | 04/10040 | 11/05/2024 | 11/04/2025 |
| Universal Radio Communication Tester | R&S | CMU 200 | 1100.0008.02 | 11/05/2024 | 11/04/2025 |
| Coaxial cable | Megalon | LMR400 | N/A | 11/05/2024 | 11/04/2025 |
| GPIB cable | Megalon | GPIB | N/A | 11/05/2024 | 11/04/2025 |
| Spectrum Analyzer | R&S | FSU | 100114 | 11/05/2024 | 11/04/2025 |
| Pre Amplifier | H.P. | HP8447E | 2945A02715 | 11/05/2024 | 11/04/2025 |
| Pre-Amplifier | CDSI | PAP-1G18-38 | - | 11/05/2024 | 11/04/2025 |
| Bi-log Antenna | SCHWARZBECK | VULB9168 | 01488 | 7/29/2024 | 7/28/2025 |
| 9*6*6 Anechoic | - | - | - | 11/05/2024 | 11/04/2025 |
| Horn Antenna | COMPLIANCE ENGINEERING | CE18000 | - | 11/05/2024 | 11/04/2025 |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 9120D-631 | 11/05/2024 | 11/04/2025 |
| Cable | TIME MICROWAVE | LMR-400 | N-TYPE04 | 11/05/2024 | 11/04/2025 |
| System-Controller | CCS | N/A | N/A | N.C.R | N.C.R |
| Turn Table | CCS | N/A | N/A | N.C.R | N.C.R |
| Antenna Tower | CCS | N/A | N/A | N.C.R | N.C.R |
| RF cable | Murata | MXHQ87WA3000 | - | 11/05/2024 | 11/04/2025 |
| Loop Antenna | EMCO | 6502 | 00042960 | 11/05/2024 | 11/04/2025 |
| Horn Antenna | SCHWARZBECK | BBHA 9170 | 1123 | 11/05/2024 | 11/04/2025 |
| Power meter | Anritsu | ML2487A | 6K00003613 | 11/05/2024 | 11/04/2025 |
| Power sensor | Anritsu | MX248XD | - | 11/05/2024 | 11/04/2025 |
| Spectrum Analyzer | Keysight | N9010B | MY60241089 | 11/05/2024 | 11/04/2025 |

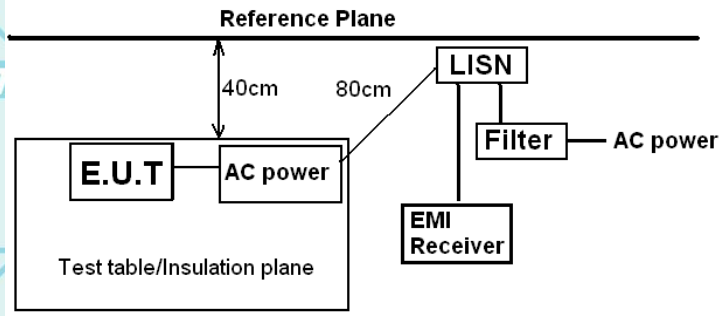
# 6. Test Results and Measurement Data

## 6.1. Antenna requirement

| **Standard requirement:** | FCC Part15 C Section 15.203 /247(c) |
|---|---|
| 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(c) (1)(i) requirement:<br>(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. | |
| **E.U.T Antenna:** | |
| The Bluetooth antenna is a Wire Antenna. it meets the standards, and the best case gain of the antenna is -5.2dBi. | |

## 6.2. Conducted Emission

### 6.2.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.207 |
| **Test Method:** | ANSI C63.10:2014 |
| **Frequency Range:** | 150 kHz to 30 MHz |
| **Receiver setup:** | RBW=9 kHz, VBW=30 kHz, Sweep time=auto |
| **Limits:** | Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average<br>0.15-0.5: 66 to 56* / 56 to 46*<br>0.5-5: 56 / 46<br>5-30: 60 / 50 |
| **Test Setup:** |  <br>*Remark:*<br>*E.U.T: Equipment Under Test*<br>*LISN: Line Impedence Stabilization Network*<br>*Test table height=0.8m* |
| **Test Mode:** | Refer to item 4.1 |
| **Test Procedure:** | 1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.<br>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).<br>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2014 on conducted measurement. |
| **Test Result:** | N/A |

### 6.2.2. Test data

The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.

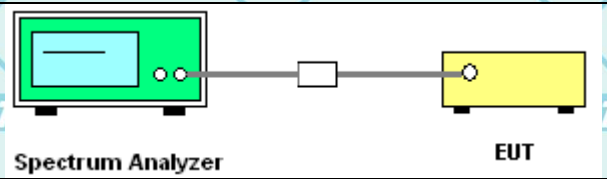
Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

### Test data

Note: EUT powered by battery not applicable

## 6.3. Conducted Output Power

### 6.3.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.247 (b)(3) |
| **Test Method:** | ANSI C63.10:2014 |
| **Limit:** | Section 15.247 (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) 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. |
| **Test Setup:** |  |
| **Test Mode:** | Transmitting mode with modulation |
| Test Procedure: | Use the following spectrum analyzer settings:<br>Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel<br>RBW > the 20 dB bandwidth of the emission being measured VBW ≥ RBW<br>Sweep = auto<br>Detector function = peak<br>Trace = max hold<br>Allow the trace to stabilize.<br>Use the marker-to-peak function to set the marker to the peak of the emission. |
| **Test Result:** | PASS |

### 6.3.2. Test Data

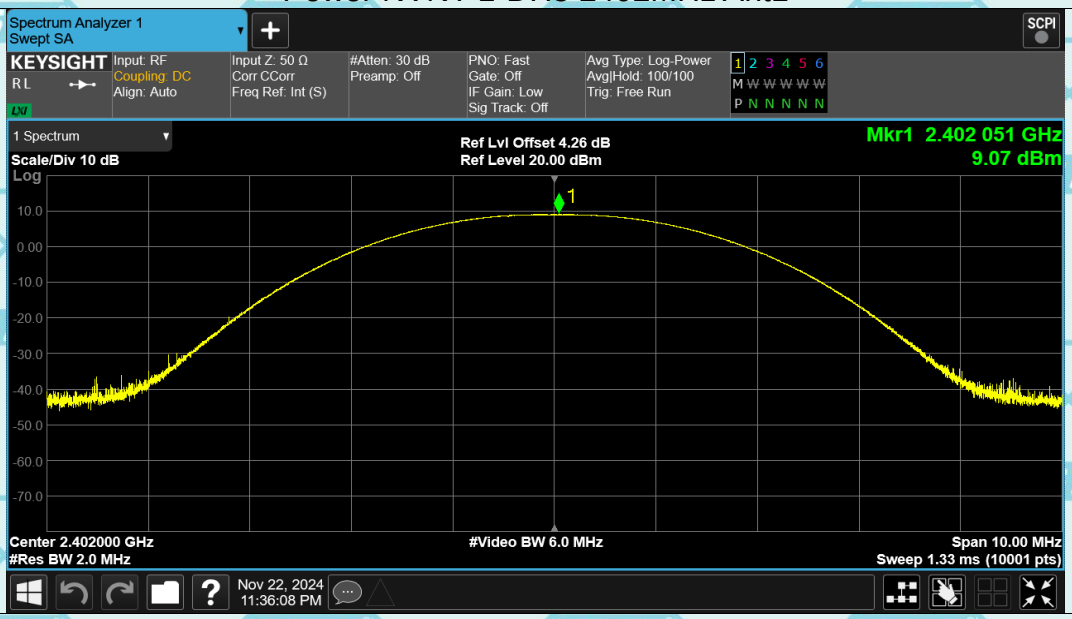
| GFSK mode | | | |
|---|---|---|---|
| Test channel | Maximum conducted output power (dBm) | Limit (dBm) | Result |
| Lowest | 9.07 | 21 | PASS |
| Middle | **9.51** | 21 | PASS |
| Highest | 9.04 | 21 | PASS |

| Pi/4DQPSK mode | | | |
|---|---|---|---|
| Test channel | Maximum conducted output power (dBm) | Limit (dBm) | Result |
| Lowest | 9.06 | 21 | PASS |
| Middle | **9.51** | 21 | PASS |
| Highest | 9.08 | 21 | PASS |

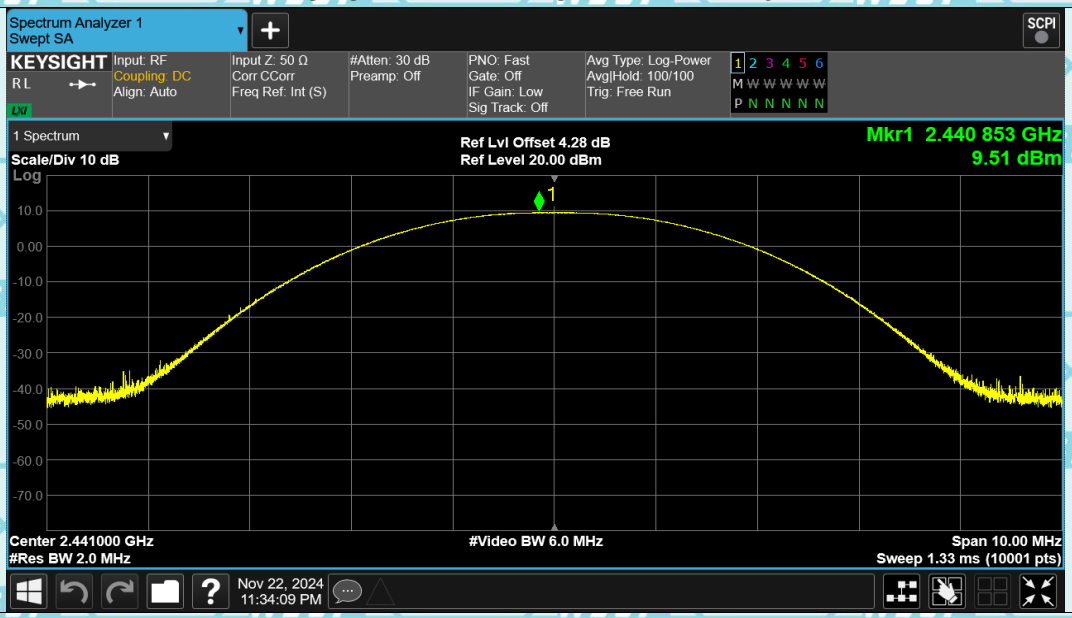
| 8DPSK mode | | | |
|---|---|---|---|
| Test channel | Maximum conducted output power (dBm) | Limit (dBm) | Result |
| Lowest | 9.05 | 21 | PASS |
| Middle | **9.52** | 21 | PASS |
| Highest | 9.07 | 21 | PASS |

# Test Graphs

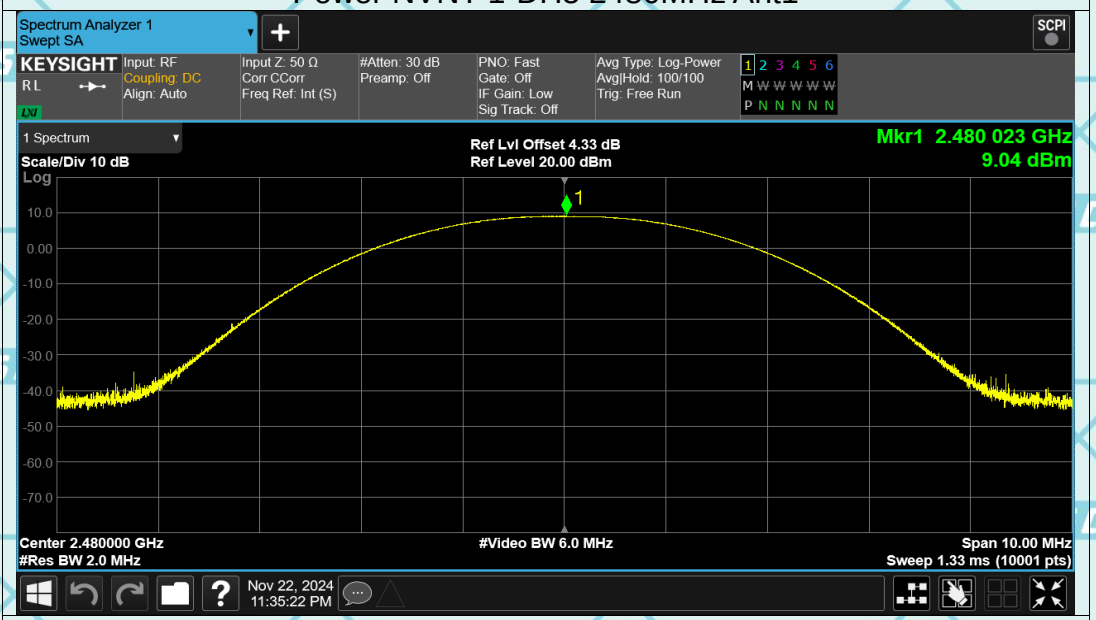
## Power NVNT 1-DH5 2402MHz Ant1



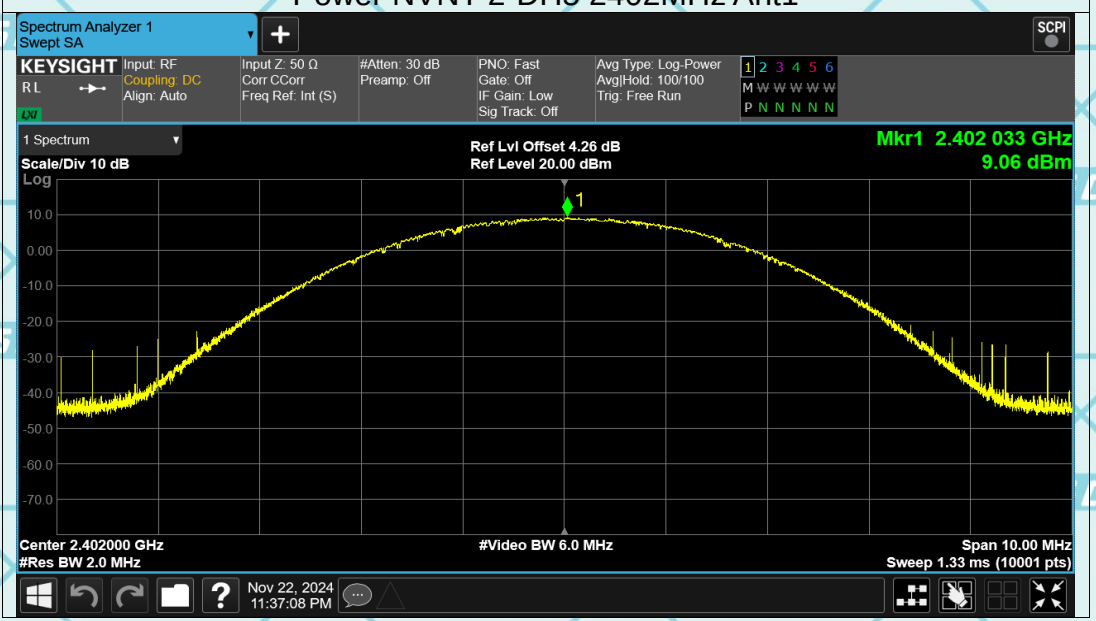

## Power NVNT 1-DH5 2441MHz Ant1



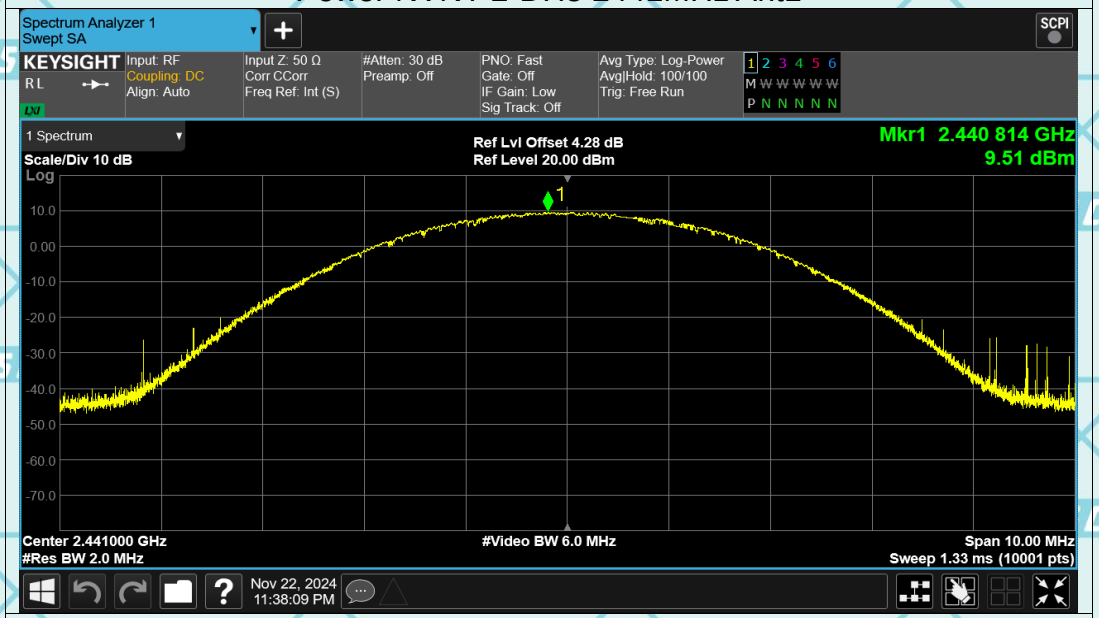
Power NVNT 1-DH5 2480MHz Ant1



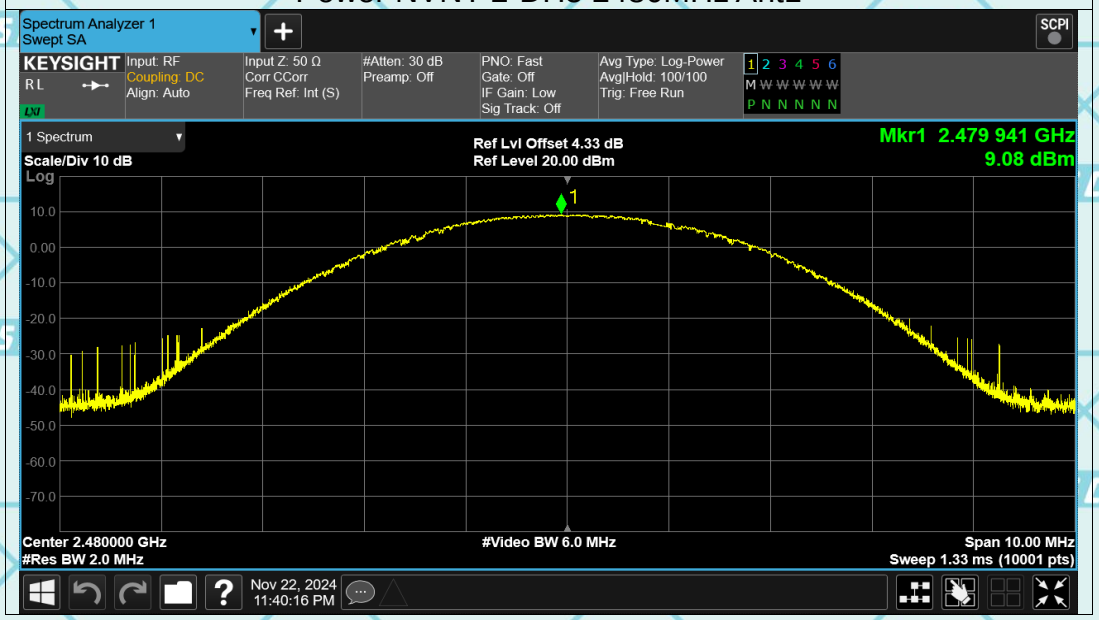

Power NVNT 2-DH5 2402MHz Ant1



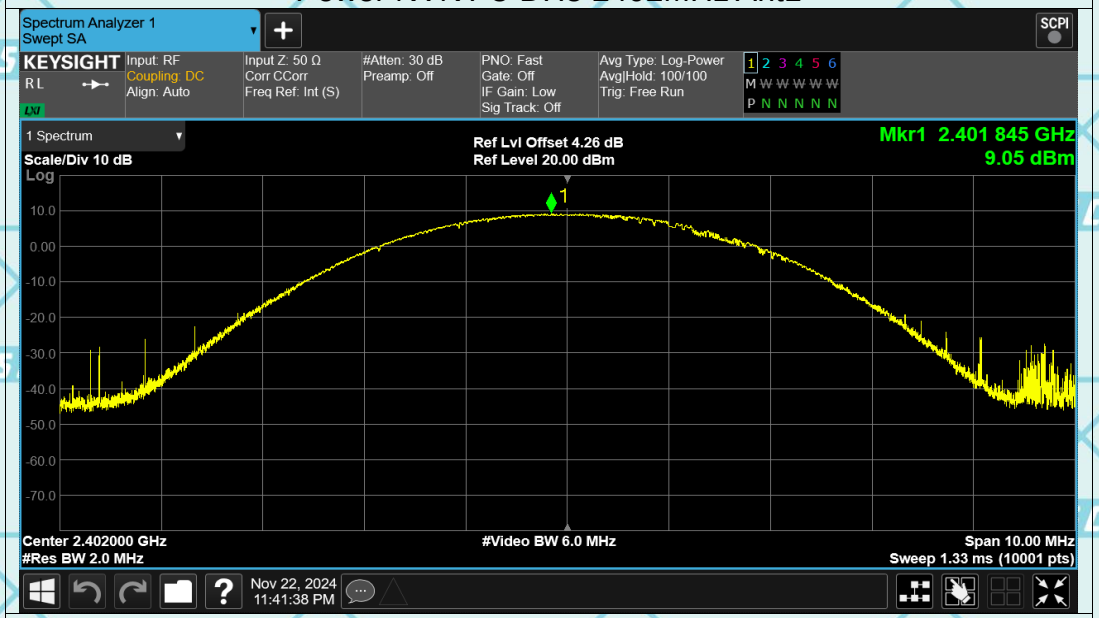
Power NVNT 2-DH5 2441MHz Ant1



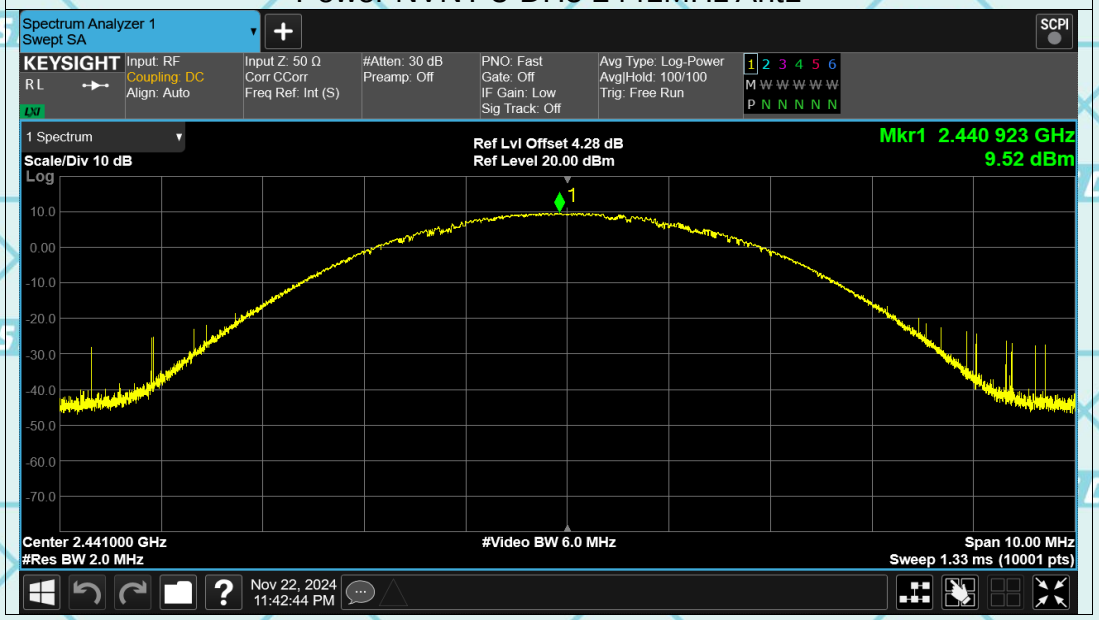

Power NVNT 2-DH5 2480MHz Ant1



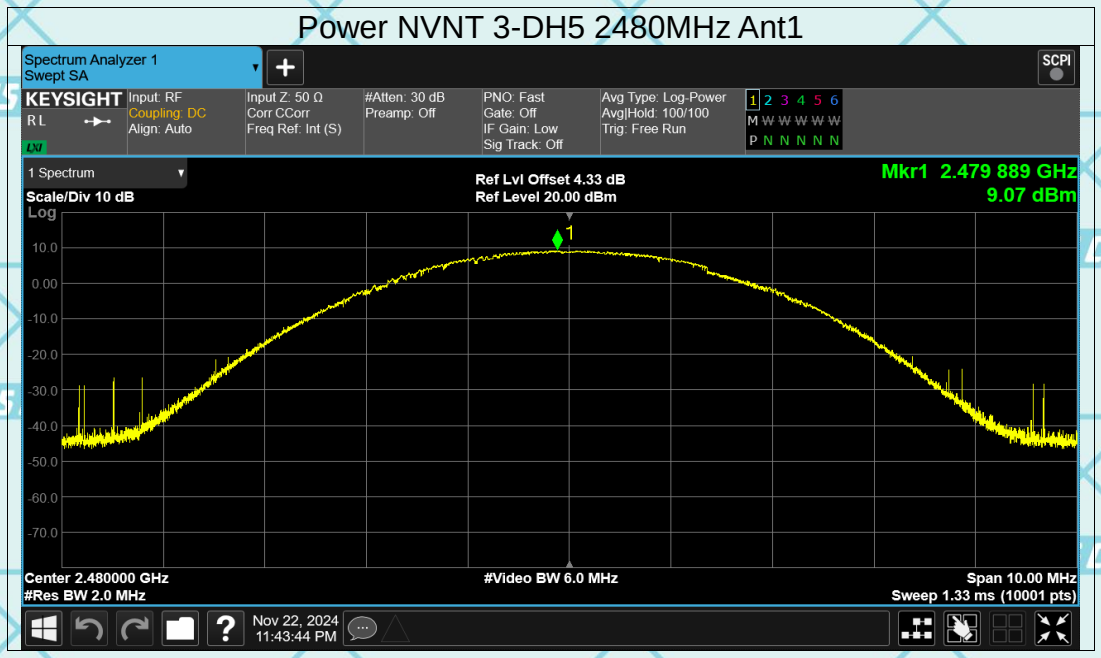
Power NVNT 3-DH5 2402MHz Ant1




Power NVNT 3-DH5 2441MHz Ant1

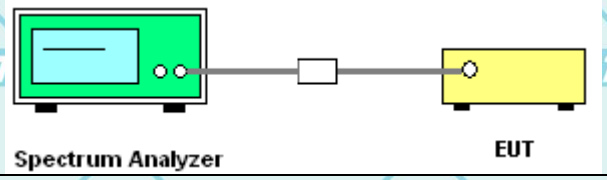


Power NVNT 3-DH5 2480MHz Ant1



## 6.4. 20dB Occupy Bandwidth

### 6.4.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.247 (a)(1) |
| **Test Method:** | ANSI C63.10:2014 |
| **Limit:** | N/A |
| **Test Setup:** |  |
| **Test Mode:** | Transmitting mode with modulation |
| **Test Procedure:** | 1. The testing follows ANSI C63.10:2014 Measurement Guidelines.<br>2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.<br>3. Set to the maximum power setting and enable the EUT transmit continuously.<br>4. Use the following spectrum analyzer settings for 20dB Bandwidth measurement.<br>Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel; 1%≤ RBW≤5% of the 20 dB bandwidth; VBW≥3RBW; Sweep = auto; Detector function = peak; Trace = max hold.<br>5. Measure and record the results in the test report. |
| **Test Result:** | PASS |

### 6.4.2. Test data

| Test channel | 20dB Occupy Bandwidth (MHz) | | | |
|---|---|---|---|---|
| | GFSK | π/4-DQPSK | 8DPSK | Conclusion |
| Lowest | 0.9661 | 1.200 | 1.241 | PASS |
| Middle | 0.9564 | 1.184 | 1.181 | PASS |
| Highest | 0.9542 | 1.258 | 1.241 | PASS |

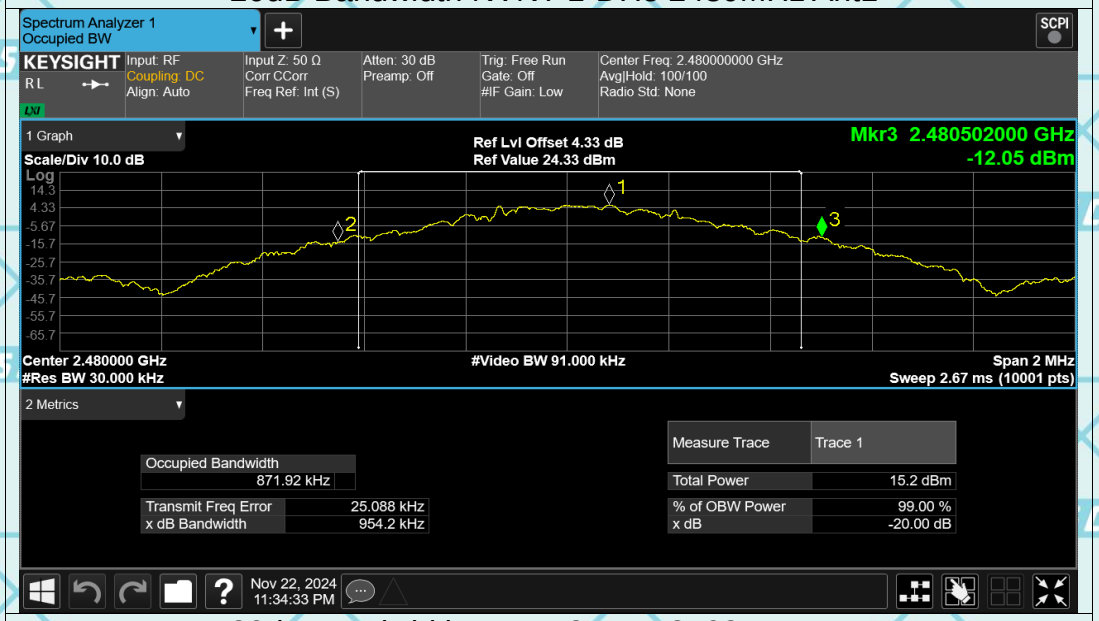
**Test plots as follows:**

## Test Graphs

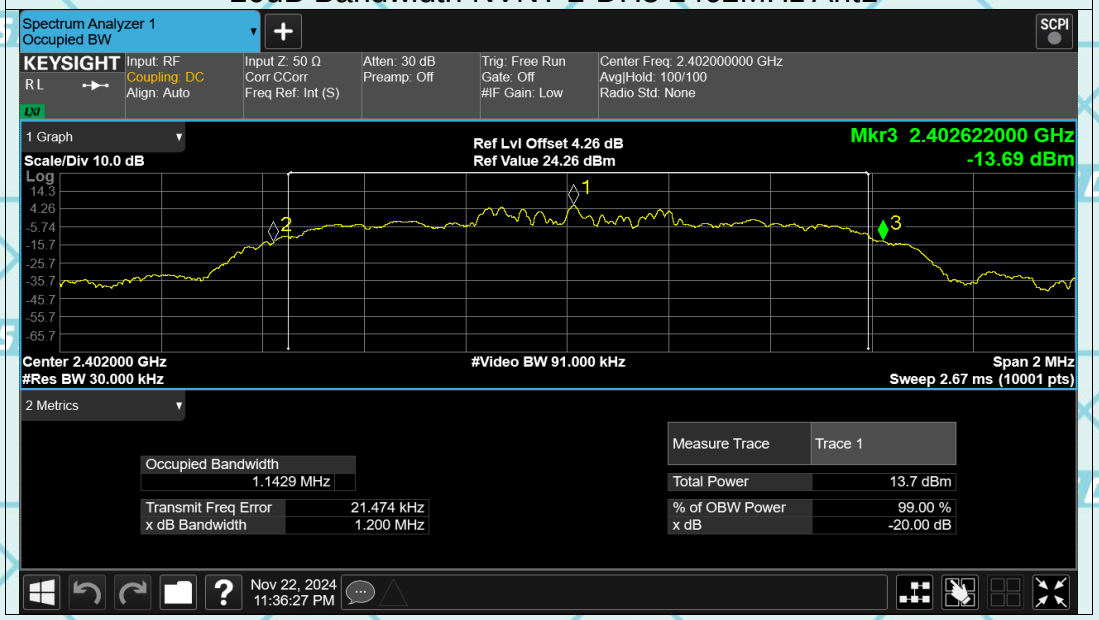
### -20dB Bandwidth NVNT 1-DH5 2402MHz Ant1


### -20dB Bandwidth NVNT 1-DH5 2441MHz Ant1

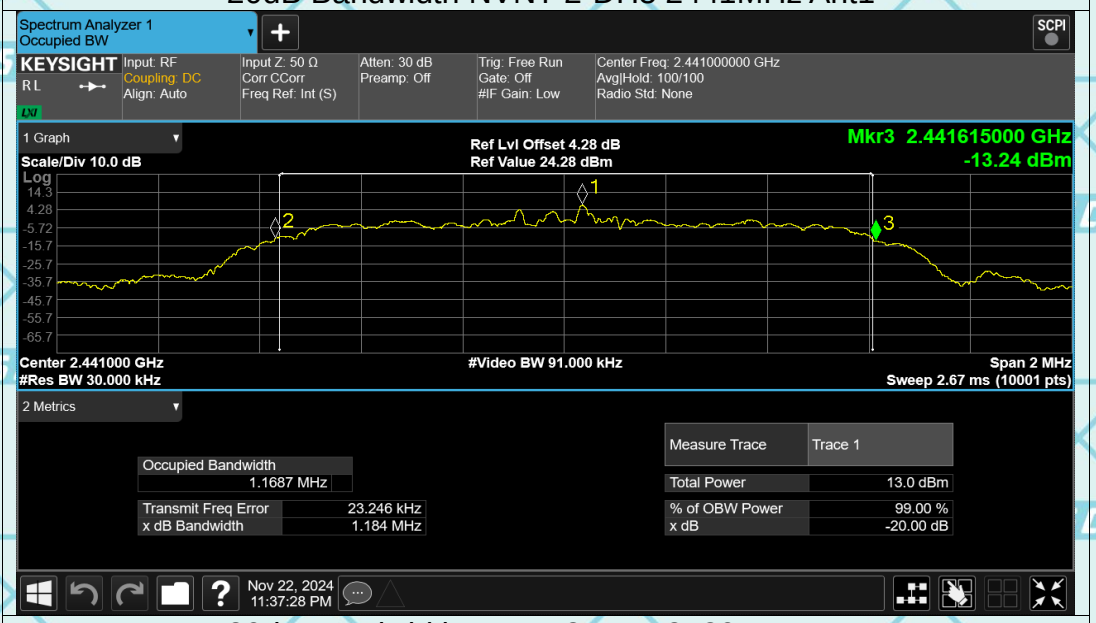
## -20dB Bandwidth NVNT 1-DH5 2480MHz Ant1



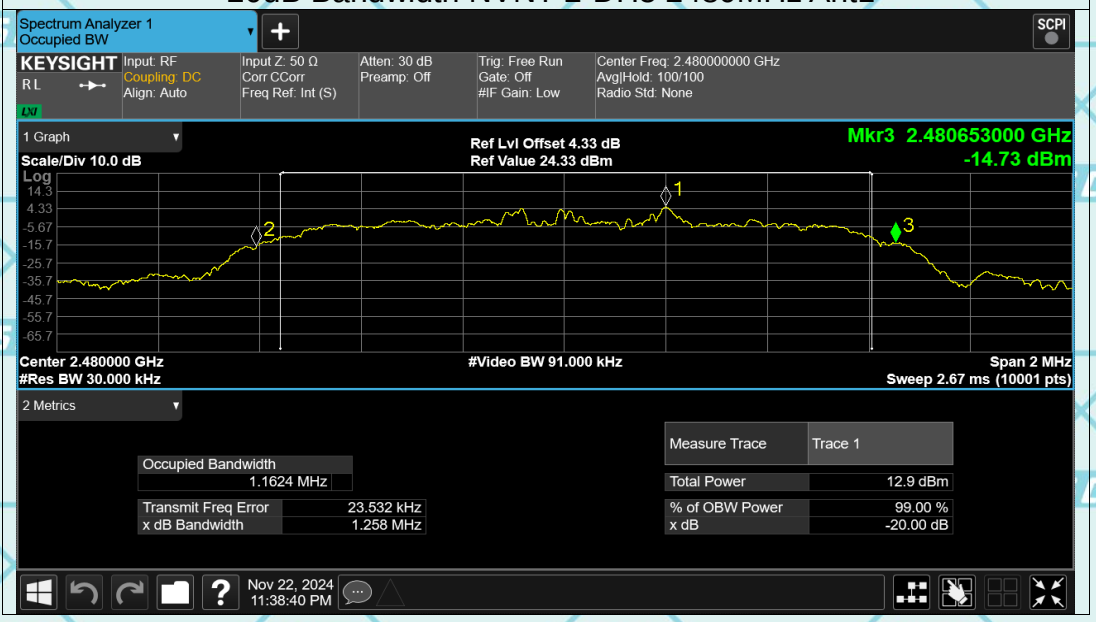

## -20dB Bandwidth NVNT 2-DH5 2402MHz Ant1



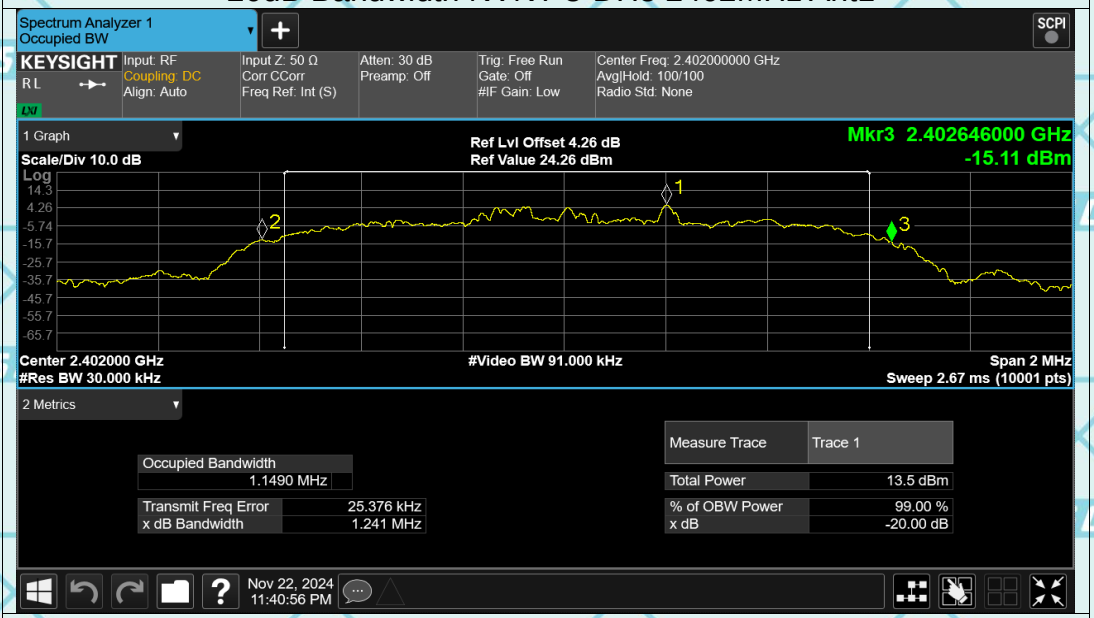
-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1



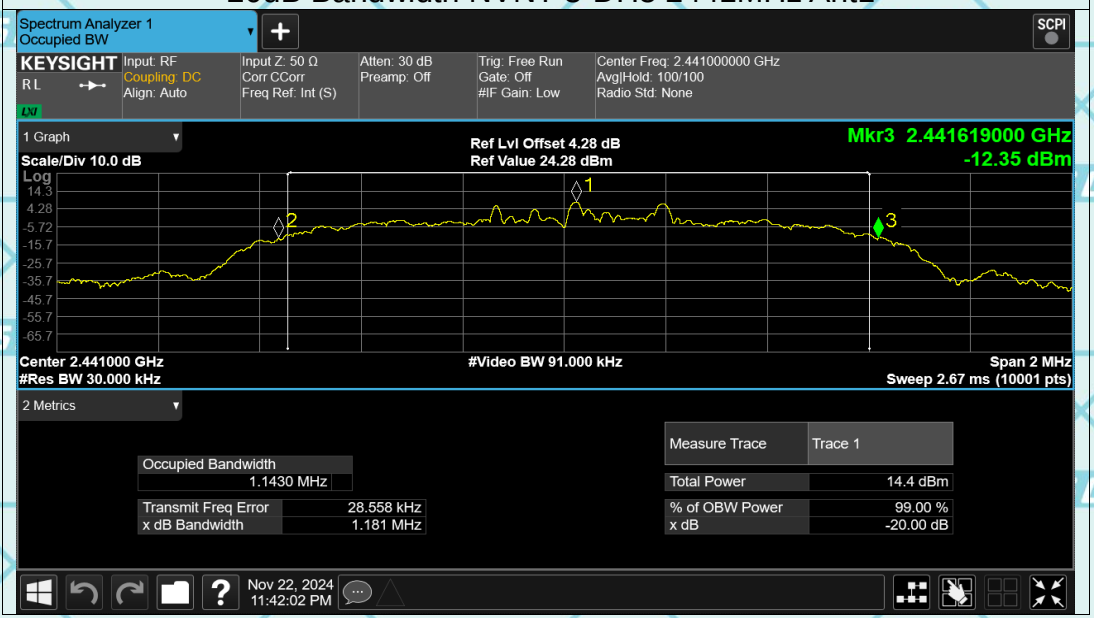

-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1



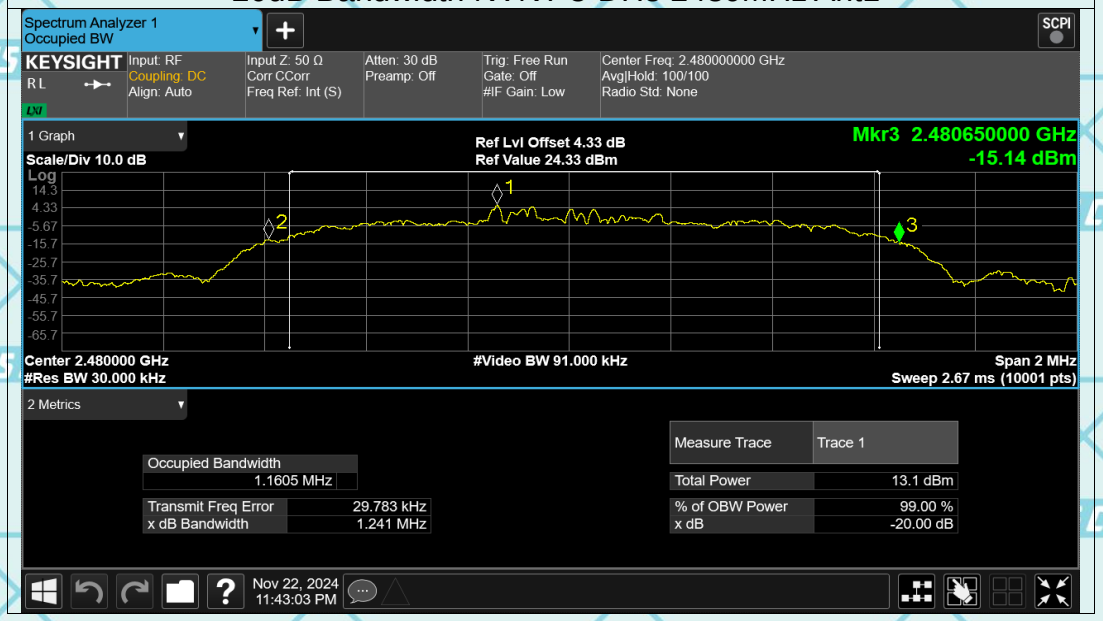
## -20dB Bandwidth NVNT 3-DH5 2402MHz Ant1




## -20dB Bandwidth NVNT 3-DH5 2441MHz Ant1

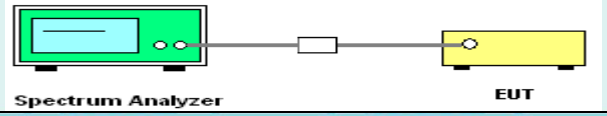


-20dB Bandwidth NVNT 3-DH5 2480MHz Ant1



## 6.5. Carrier Frequencies Separation

### 6.5.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.247 (a)(1) |
| **Test Method:** | ANSI C63.10:2014 |
| **Limit:** | 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. |
| **Test Setup:** |  |
| **Test Mode:** | Hopping mode |
| **Test Procedure:** | 1. The testing follows ANSI C63.10:2014 Measurement Guidelines.<br>2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.<br>3. Set to the maximum power setting and enable the EUT transmit continuously.<br>4. Enable the EUT hopping function.<br>5. Use the following spectrum analyzer settings:<br>Span = wide enough to capture the peaks of two adjacent channels; RBW is set to approximately 30% of the channel spacing, adjust as necessary to best identify the center of each individual channel; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.<br>6. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Record the value in report. |
| **Test Result:** | PASS |

### 6.5.2. Test data

| GFSK mode | | | |
|---|---|---|---|
| Test channel | Carrier Frequencies Separation (MHz) | Limit ((2/3*20dB BW MHz)) | Result |
| Lowest | 0.994 | 0.644 | PASS |
| Middle | 1.010 | 0.638 | PASS |
| Highest | 1.008 | 0.636 | PASS |

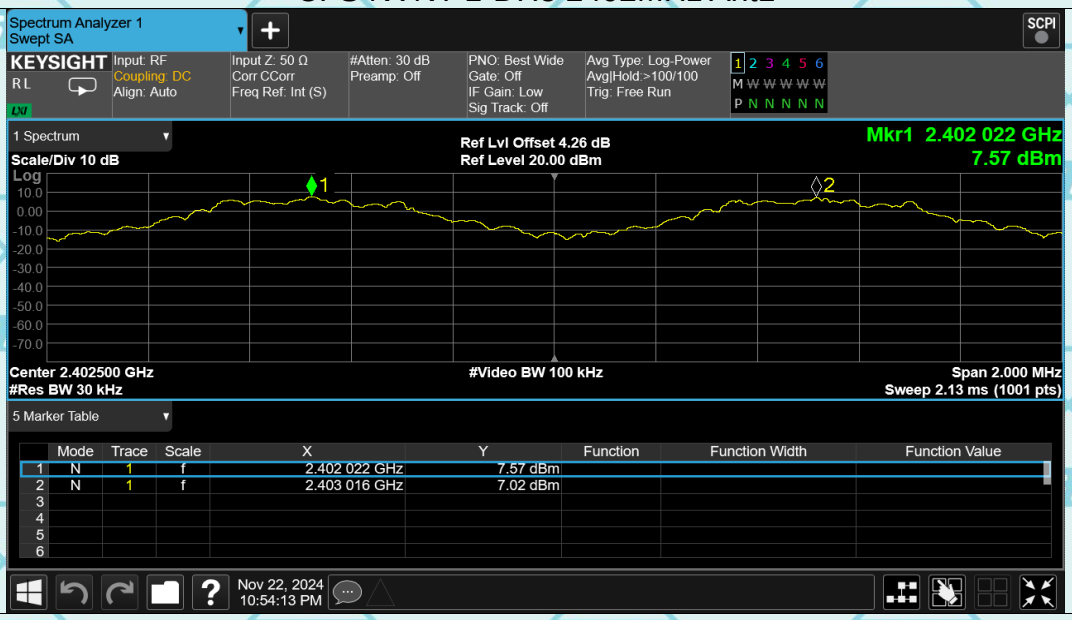
| Pi/4 DQPSK mode | | | |
|---|---|---|---|
| Test channel | Carrier Frequencies Separation (MHz) | Limit ((2/3*20dB BW MHz)) | Result |
| Lowest | 0.998 | 0.800 | PASS |
| Middle | 0.996 | 0.789 | PASS |
| Highest | 1.002 | 0.839 | PASS |

| 8DPSK mode | | | |
|---|---|---|---|
| Test channel | Carrier Frequencies Separation (MHz) | Limit ((2/3*20dB BW MHz)) | Result |
| Lowest | 1.004 | 0.827 | PASS |
| Middle | 1.004 | 0.787 | PASS |
| Highest | 0.992 | 0.827 | PASS |

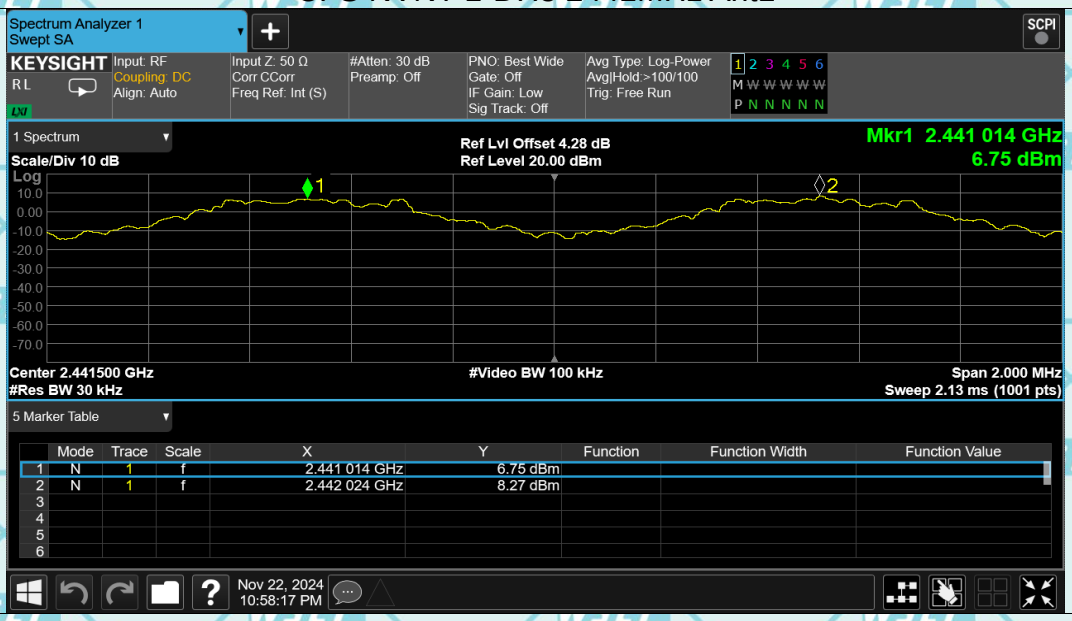
**Test plots as follows:**

## Test Graphs

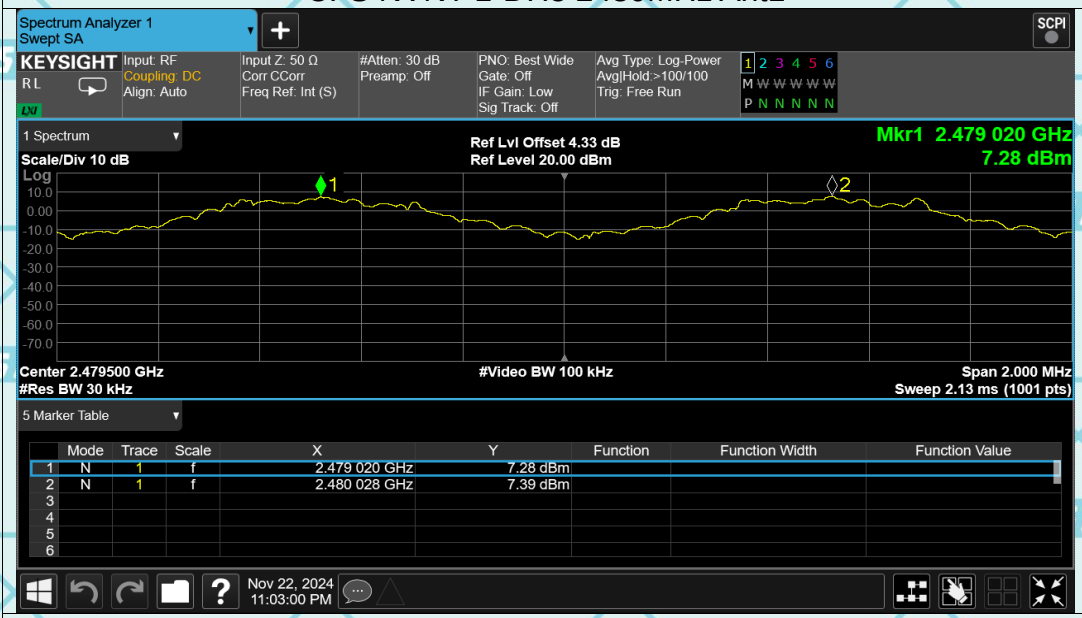
### CFS NVNT 1-DH5 2402MHz Ant1



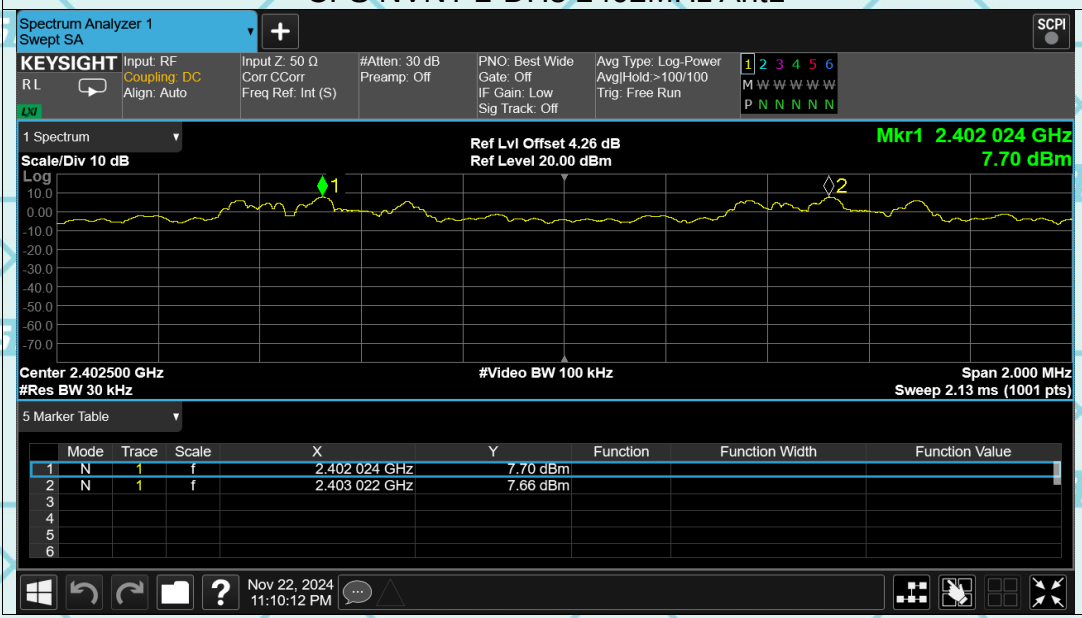

### CFS NVNT 1-DH5 2441MHz Ant1



## CFS NVNT 1-DH5 2480MHz Ant1



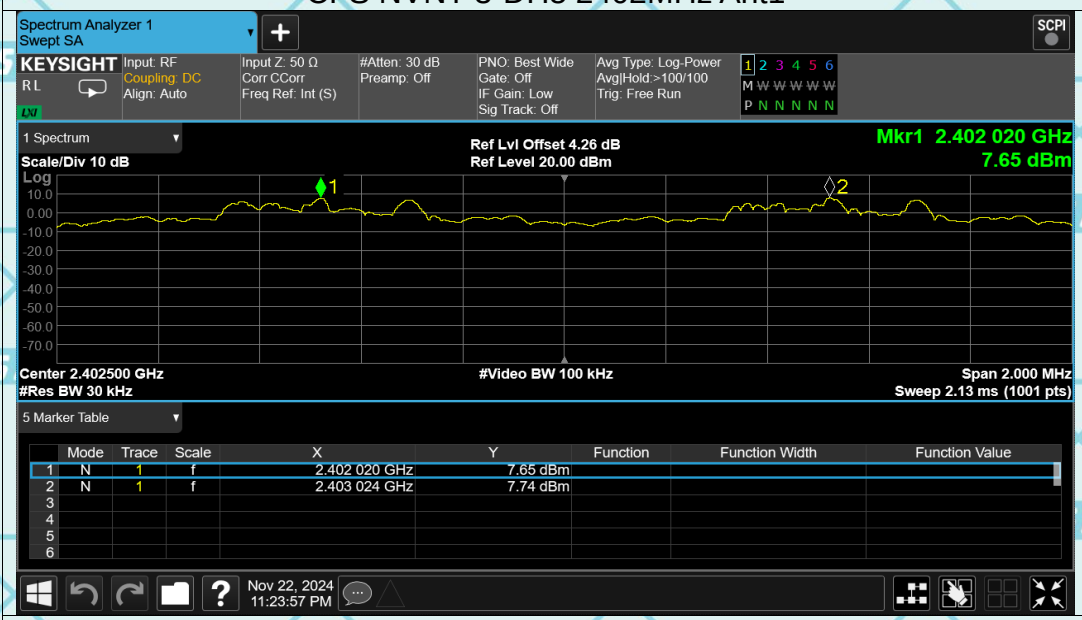

## CFS NVNT 2-DH5 2402MHz Ant1



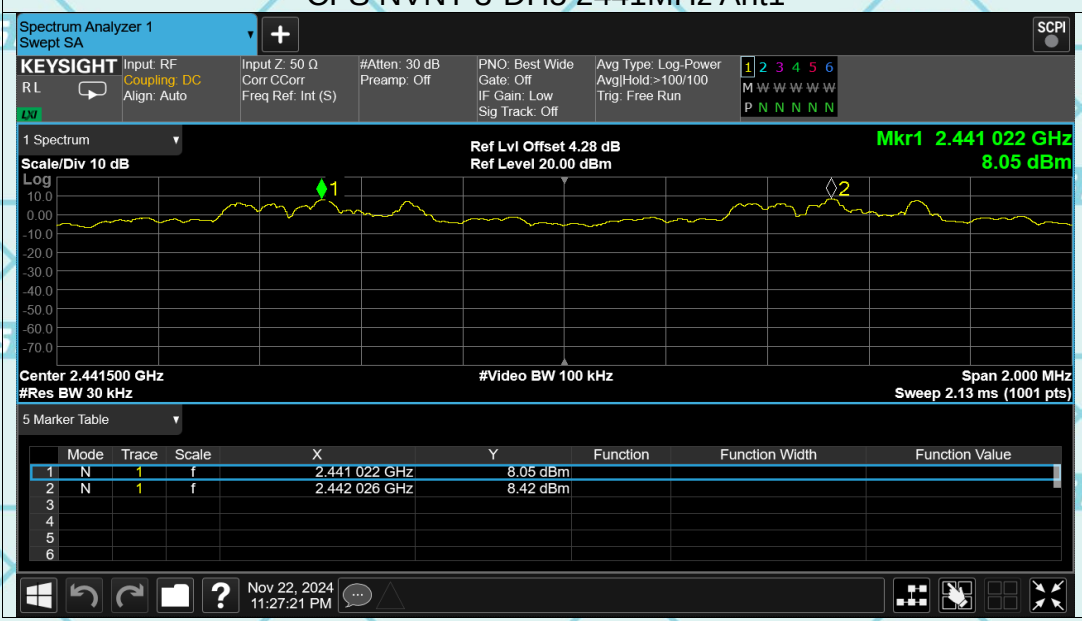
CFS NVNT 2-DH5 2441MHz Ant1


CFS NVNT 2-DH5 2480MHz Ant1

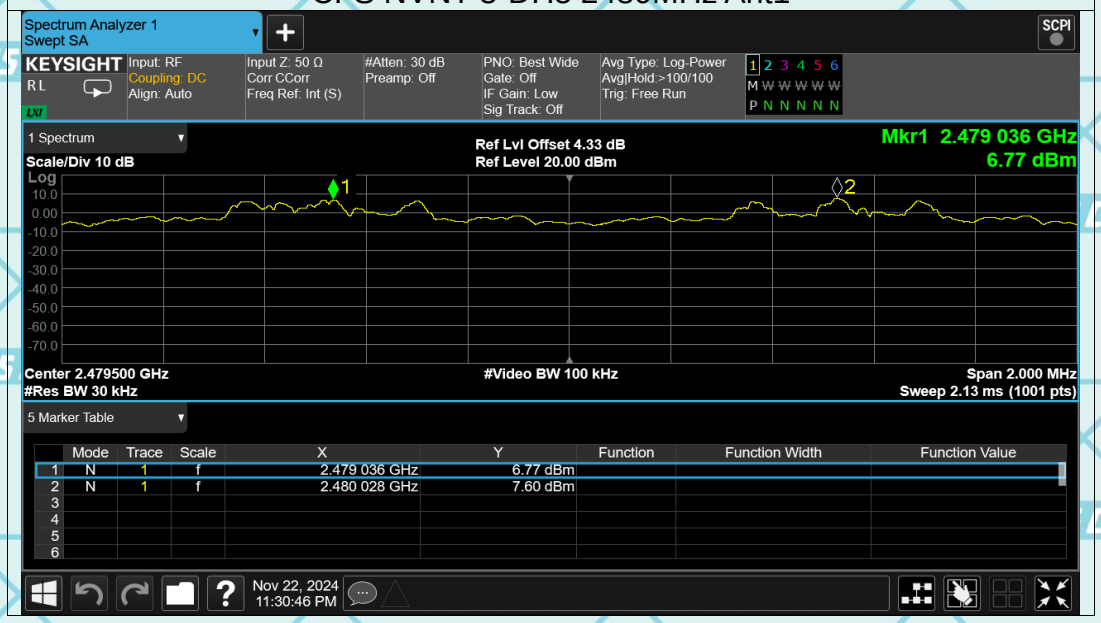
CFS NVNT 3-DH5 2402MHz Ant1




CFS NVNT 3-DH5 2441MHz Ant1

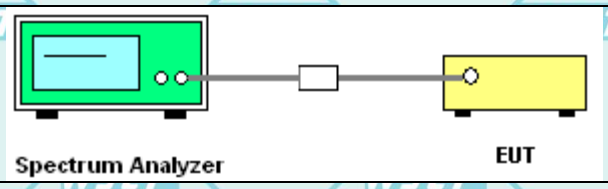


CFS NVNT 3-DH5 2480MHz Ant1



## 6.6. Hopping Channel Number

### 6.6.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.247 (a)(1) |
| **Test Method:** | ANSI C63.10:2014 |
| **Limit:** | Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. |
| **Test Setup:** |  |
| **Test Mode:** | Hopping mode |
| **Test Procedure:** | 1. The testing follows ANSI C63.10:2014 Measurement Guidelines.<br>2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.<br>3. Set to the maximum power setting and enable the EUT transmit continuously.<br>4. Enable the EUT hopping function.<br>5. Use the following spectrum analyzer settings: Span = the frequency band of operation; set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.<br>6. The number of hopping frequency used is defined as the number of total channel.<br>7. Record the measurement data in report. |
| **Test Result:** | PASS |

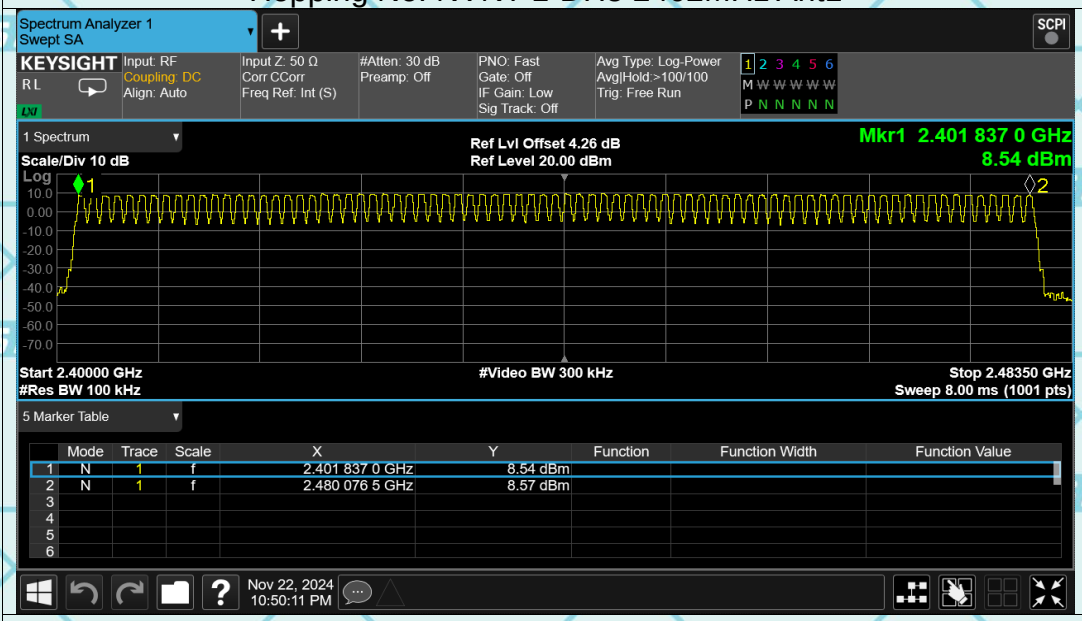
## Test data

| Mode | Hopping channel numbers | Limit | Result |
|---|---|---|---|
| GFSK, P/4-DQPSK, 8DPSK | 79 | 15 | PASS |

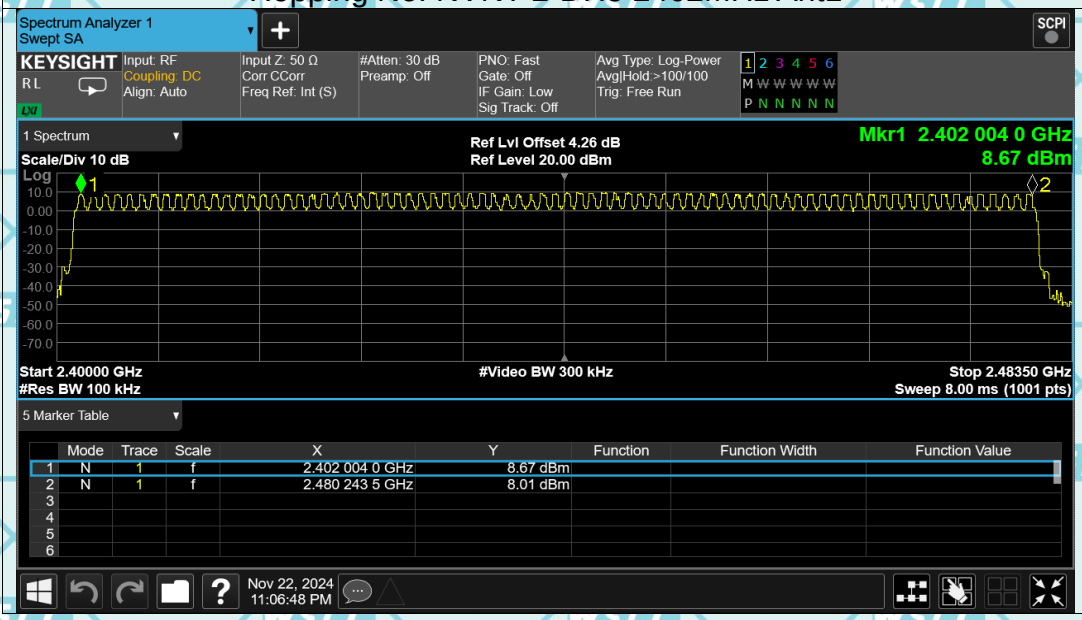
**Test plots as follows:**

Test Graphs

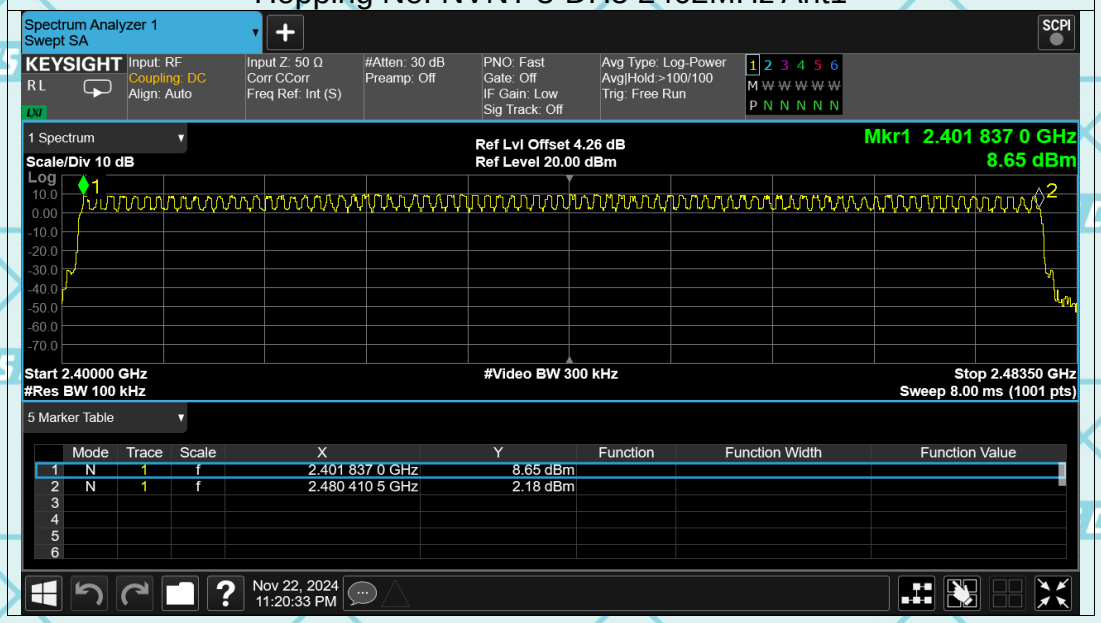
Hopping No. NVNT 1-DH5 2402MHz Ant1




Hopping No. NVNT 2-DH5 2402MHz Ant1

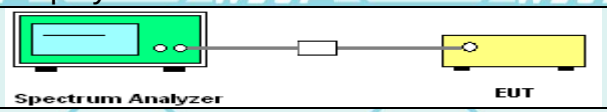


Hopping No. NVNT 3-DH5 2402MHz Ant1



## 6.7. Dwell Time

### 6.7.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.247 (a)(1) |
| **Test Method:** | ANSI C63.10:2014 |
| **Limit:** | 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. |
| **Test Setup:** |  |
| **Test Mode:** | Hopping mode |
| **Test Procedure:** | 1. The testing follows ANSI C63.10:2014 Measurement Guidelines.<br>2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.<br>3. Set to the maximum power setting and enable the EUT transmit continuously.<br>4. Enable the EUT hopping function.<br>5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW shall be $\leqslant$ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel; VBW≥RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.<br>6. Measure and record the results in the test report. |
| **Test Result:** | PASS |

### 6.7.2. Test Data

| Mode | Frequency (MHz) | Pulse Time (ms) | Total Dwell Time (ms) | Burst Count | Period Time (ms) | Limit (ms) | Verdict |
|---|---|---|---|---|---|---|---|
| 1-DH1 | 2402 | 0.405 | 129.195 | 319 | 31600 | 400 | Pass |
| 1-DH1 | 2441 | 0.405 | 128.79 | 318 | 31600 | 400 | Pass |
| 1-DH1 | 2480 | 0.404 | 128.472 | 318 | 31600 | 400 | Pass |
| 1-DH3 | 2402 | 1.661 | 242.506 | 146 | 31600 | 400 | Pass |
| 1-DH3 | 2441 | 1.661 | 252.472 | 152 | 31600 | 400 | Pass |
| 1-DH3 | 2480 | 1.66 | 267.26 | 161 | 31600 | 400 | Pass |
| 1-DH5 | 2402 | 2.91 | 299.73 | 103 | 31600 | 400 | Pass |
| 1-DH5 | 2441 | 2.909 | 308.354 | 106 | 31600 | 400 | Pass |
| 1-DH5 | 2480 | 2.908 | 296.616 | 102 | 31600 | 400 | Pass |

***Note:*** *1. In normal mode, hopping rate is 1600 hops/s with 6 slots in 79 hopping channels.*

*For DH1, With channel hopping rate (1600 / 2 / 79) in Occupancy Time Limit (0.4 x 79) (s), Hops Over Occupancy Time comes to (1600 / 2 / 79) x (0.4 x 79) = 320 hops*

*For DH3, With channel hopping rate (1600 / 4 / 79) in Occupancy Time Limit (0.4 x 79) (s), Hops Over Occupancy Time comes to (1600 / 4 / 79) x (0.4 x 79) = 160 hops*

*For DH5, With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s), Hops Over Occupancy Time comes to (1600 / 6 / 79) x (0.4 x 79) = 106.67 hops*

*2. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time*

**Test plots as follows:**