

# FCC TEST REPORT

## FCC ID:2BBFL-TWS-T

Report Number..... : ZHT-241022111W02-1

Date of Test..... : Oct. 22, 2024 to Nov. 06, 2024

Date of issue ..... : Nov. 06, 2024

Test Result ..... : PASS

Testing Laboratory..... : Guangdong Zhonghan Testing Technology Co., Ltd.

Address ..... : Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Applicant's name ..... : Shenzhen SaiFeng Electronic Technology Co., Ltd

Address ..... : Community, Ban Tin Street, LonggangDistrict, Shenzhen City, China

Manufacturer's name ..... : Shenzhen SaiFeng Electronic Technology Co., Ltd

Address ..... : Community, Ban Tin Street, LonggangDistrict, Shenzhen City, China

Test specification:

Standard..... : FCC CFR Title 47 Part 15 Subpart C Section 15.247

Test procedure..... : ANSI C63.10:2013

Non-standard test method ..... : N/A

This device described above has been tested by ZHT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Product name..... : Bluetooth Headset

Trademark ..... : /

Model/Type reference ..... : TWS-T, T30, T50, T60, T70, T80, T90

Model difference ..... : TWS-T is the test model, while other models are derivative models. These models are the same on the circuit, with only different model names. Therefore, the test data of TWS-T can represent the remaining models.

Ratings..... : Input: DC 5V or DC 3.7V powered by battery

Testing procedure and testing location:

Testing Laboratory .....: Guangdong Zhonghan Testing Technology Co., Ltd.

Address .....: Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Tested by (name + signature) .....: Kimi Lu

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Approved (name + signature) .....: Levi Lee

*Levi Lee*

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| Report No.         | Version | Description             | Approved      |
|--------------------|---------|-------------------------|---------------|
| ZHT-241022111W02-1 | Rev.01  | Initial issue of report | Nov. 06, 2024 |
|                    |         |                         |               |



Test procedures according to the technical standards:

| FCC Part15 (15.247) , Subpart C |                                               |        |        |
|---------------------------------|-----------------------------------------------|--------|--------|
| Standard Section                | Test Item                                     | Result | Remark |
| FCC part 15.203/15.247 (b)(4)   | Antenna Requirement                           | PASS   |        |
| 15.207                          | AC Power Line Conducted Emission              | N/A    |        |
| 15.247 (b)(1)                   | Conducted Peak Output Power                   | PASS   |        |
| 15.247 (a)(1)                   | 20dB Occupied Bandwidth<br>99% OCB            | PASS   |        |
| 15.247 (a)(1)                   | Carrier Frequencies Separation                | PASS   |        |
| 15.247 (a)(1)(iii)              | Hopping Channel Number                        | PASS   |        |
| 15.247 (a)(1)(iii)              | Dwell Time                                    | PASS   |        |
| 15.205/15.209                   | Radiated Emission and Restricted Band         | PASS   |        |
| 15.247(d)                       | Conducted Unwanted emissions and<br>Band Edge | PASS   |        |

Note: The RF chips of the left and right earphones are the same, with differences in circuit layout. The RF output power of the left and right earphones is not significantly different, while the RF output power of the right earphone is slightly larger than that of the left earphone. So chose the right earphone for all the tests, while the left earphone was tested for radiation emissions and radiation spurious tests.

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

## 2.1 TEST FACILITY

Guangdong Zhonghan Testing Technology Co., Ltd.

Add. : Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

FCC Registration Number:255941

Designation Number: CN0325

IC Registered No.: 29832

CAB identifier: CN0143

## 2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$  , 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                              | Uncertainty               |
|-----|-----------------------------------|---------------------------|
| 1   | Conducted Emission Test           | $\pm 1.38\text{dB}$       |
| 2   | RF conducted power                | $\pm 0.16\text{dB}$       |
| 3   | Conducted spurious emissions      | $\pm 0.21\text{dB}$       |
| 4   | All radiated emissions (9k-30MHz) | $\pm 4.68\text{dB}$       |
| 5   | All radiated emissions (<1G)      | $\pm 4.68\text{dB}$       |
| 6   | All radiated emissions (>1G)      | $\pm 4.89\text{dB}$       |
| 7   | Temperature                       | $\pm 0.5^{\circ}\text{C}$ |
| 8   | Humidity                          | $\pm 2\%$                 |
| 9   | Occupied Bandwidth                | $\pm 4.96\text{dB}$       |



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                                                                                                                                                                                                 |                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Product Name:                                                                                                                                                                                   | Bluetooth Headset                          |
| Test Model No.:                                                                                                                                                                                 | TWS-T                                      |
| Hardware Version:                                                                                                                                                                               | V1.0                                       |
| Software Version:                                                                                                                                                                               | V1.0                                       |
| Sample(s) Status:                                                                                                                                                                               | Engineer sample                            |
| Channel numbers:                                                                                                                                                                                | 79                                         |
| Channel separation:                                                                                                                                                                             | 2402MHz-2480MHz                            |
| Modulation technology:                                                                                                                                                                          | GFSK, $\pi/4$ DQPSK, 8DPSK                 |
| Antenna Type:                                                                                                                                                                                   | PCB Antenna                                |
| Antenna gain:                                                                                                                                                                                   | 2.78dBi                                    |
| Power supply:                                                                                                                                                                                   | Input: DC 5V or DC 3.7V powered by battery |
| Sample Number:                                                                                                                                                                                  | 241022111YP002                             |
| Remark: The antenna gain is provided by the customer, if the data provided by the customer is not accurate, Guangdong Zhonghan Testing Technology Co., Ltd. does not assume any responsibility. |                                            |

| Operation Frequency each of channel |           |         |           |         |           |         |           |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1                                   | 2402MHz   | 21      | 2422MHz   | 41      | 2442MHz   | 61      | 2462MHz   |
| 2                                   | 2403MHz   | 22      | 2423MHz   | 42      | 2443MHz   | 62      | 2463MHz   |
| 3                                   | 2404MHz   | 23      | 2424MHz   | 43      | 2444MHz   | 63      | 2464MHz   |
| 4                                   | 2405MHz   | 24      | 2425MHz   | 44      | 2445MHz   | 64      | 2465MHz   |
| 5                                   | 2406MHz   | 25      | 2426MHz   | 45      | 2446MHz   | 65      | 2466MHz   |
| 6                                   | 2407MHz   | 26      | 2427MHz   | 46      | 2447MHz   | 66      | 2467MHz   |
| 7                                   | 2408MHz   | 27      | 2428MHz   | 47      | 2448MHz   | 67      | 2468MHz   |
| 8                                   | 2409MHz   | 28      | 2429MHz   | 48      | 2449MHz   | 68      | 2469MHz   |
| 9                                   | 2410MHz   | 29      | 2430MHz   | 49      | 2450MHz   | 69      | 2470MHz   |
| 10                                  | 2411MHz   | 30      | 2431MHz   | 50      | 2451MHz   | 70      | 2471MHz   |
| 11                                  | 2412MHz   | 31      | 2432MHz   | 51      | 2452MHz   | 71      | 2472MHz   |
| 12                                  | 2413MHz   | 32      | 2433MHz   | 52      | 2453MHz   | 72      | 2473MHz   |
| 13                                  | 2414MHz   | 33      | 2434MHz   | 53      | 2454MHz   | 73      | 2474MHz   |
| 14                                  | 2415MHz   | 34      | 2435MHz   | 54      | 2455MHz   | 74      | 2475MHz   |
| 15                                  | 2416MHz   | 35      | 2436MHz   | 55      | 2456MHz   | 75      | 2476MHz   |
| 16                                  | 2417MHz   | 36      | 2437MHz   | 56      | 2457MHz   | 76      | 2477MHz   |
| 17                                  | 2418MHz   | 37      | 2438MHz   | 57      | 2458MHz   | 77      | 2478MHz   |
| 18                                  | 2419MHz   | 38      | 2439MHz   | 58      | 2459MHz   | 78      | 2479MHz   |
| 19                                  | 2420MHz   | 39      | 2440MHz   | 59      | 2460MHz   | 79      | 2480MHz   |
| 20                                  | 2421MHz   | 40      | 2441MHz   | 60      | 2461MHz   |         |           |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Test channel        | Frequency |
|---------------------|-----------|
| The lowest channel  | 2402MHz   |
| The middle channel  | 2441MHz   |
| The Highest channel | 2480MHz   |

### 3.2 Test Setup Configuration

Radiated Emission

EUT



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.

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|------|-----------|-----------|----------------|------------|------|
|      |           |           |                |            |      |
|      |           |           |                |            |      |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
|      |               |              |        |      |
|      |               |              |        |      |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) The test software is the Bluetooth RF Test Tool which can set the EUT into the individual test modes. TX Power: 7

### 3.4 Test Mode

|                                                                                                                                                                                                                                       |                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Transmitting mode                                                                                                                                                                                                                     | Keep the EUT in continuously transmitting mode. |
| Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data. |                                                 |



## 3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

## Radiation Test equipment

| Item | Equipment                          | Manufacturer | Model        | Serial No. | Last Cal.     | Next Cal.     |
|------|------------------------------------|--------------|--------------|------------|---------------|---------------|
| 1    | Receiver                           | R&S          | ESCI         | 100874     | May 10, 2024  | May 09, 2025  |
| 2    | Loop antenna                       | EMCI         | LAP600       | 272        | May 10, 2024  | May 09, 2025  |
| 3    | Amplifier                          | Schwarzbeck  | BBV 9743 B   | 00378      | May 10, 2024  | May 09, 2025  |
| 4    | Amplifier                          | Schwarzbeck  | BBV 9718 B   | 00040      | May 10, 2024  | May 09, 2025  |
| 5    | Bilog Antenna                      | Schwarzbeck  | VULB9162     | 00498      | May 28, 2024  | May 27, 2025  |
| 6    | Horn Antenna                       | Schwarzbeck  | BBHA9120D    | 02623      | May 16, 2024  | May 15, 2025  |
| 7    | Horn Antenna                       | A.H.SYSTEMS  | SAS574       | 588        | May 10, 2024  | May 09, 2025  |
| 8    | Amplifier                          | AEROFLEX     | 100KHz-40GHz | 097        | May 10, 2024  | May 09, 2025  |
| 9    | Spectrum Analyzer                  | R&S          | FSV40        | 101413     | May 10, 2024  | May 09, 2025  |
| 10   | 966 Anechoic Chamber               | EMToni       | 9m6m6m       | /          | Nov. 25, 2021 | Nov. 24, 2024 |
| 11   | Spectrum Analyzer                  | KEYSIGHT     | N9020A       | MY53420208 | May 10, 2024  | May 09, 2025  |
| 12   | WIDBAND RADIO COMMUNICATION TESTER | R&S          | CMW500       | 109863     | May 10, 2024  | May 09, 2025  |
| 13   | Single Generator                   | Agilent      | N5182A       | MY48180575 | May 10, 2024  | May 09, 2025  |
| 14   | Power Sensor                       | MWRFTest     | MW100-RFCB   | /          | May 10, 2024  | May 09, 2025  |
| 15   | Power Amplifier Shielding Room     | EMToni       | 2m3m3m       | /          | Nov. 25, 2021 | Nov. 24, 2024 |



## Conduction Test equipment

| Equipment                 | Manufacturer | Model      | Serial No.  | Last Cal.     | Next Cal.     |
|---------------------------|--------------|------------|-------------|---------------|---------------|
| Receiver                  | R&S          | ESCI       | 100874      | May 10, 2024  | May 09, 2025  |
| LISN                      | R&S          | ENV216     | 102794      | May 10, 2024  | May 09, 2025  |
| ISN CAT 6                 | Schwarzbeck  | NTFM 8158  | 00318       | May 10, 2024  | May 09, 2025  |
| ISN CAT 5                 | Schwarzbeck  | CAT5 8158  | 00343       | May 10, 2024  | May 09, 2025  |
| Capacitive Voltage Probe  | Schwarzbeck  | CVP 9222 C | 00101       | May 10, 2024  | May 09, 2025  |
| Current Transformer Clamp | Schwarzbeck  | SW 9605    | SW9605 #209 | May 10, 2024  | May 09, 2025  |
| CE Shielding Room         | EMToni       | 9m4m3m     | /           | Nov. 25, 2021 | Nov. 24, 2024 |

## Conducted Test equipment

| Item | Equipment         | Manufacturer | Model      | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|------------|------------|--------------|--------------|
| 1    | Spectrum Analyzer | R&S          | FSV40      | 101413     | May 10, 2024 | May 09, 2025 |
| 2    | Spectrum Analyzer | KEYSIGHT     | N9020A     | MY53420208 | May 10, 2024 | May 09, 2025 |
| 3    | Power Sensor      | MWRFTest     | MW100-RFCB | /          | May 10, 2024 | May 09, 2025 |

## Testing software

| Project           | Software name | Edition     |
|-------------------|---------------|-------------|
| RF Conducted      | MTS 8310      | 2.0.0.0     |
| Radiated Emission | EZ-EMC        | FA-03A2 RE+ |



#### 4. EMC EMISSION TEST

##### 4.1 Conducted emissions

|                       |                                          |
|-----------------------|------------------------------------------|
| Test Requirement:     | FCC Part15 C Section 15.207, RSS-Gen 8.8 |
| Test Method:          | ANSI C63.10:2013                         |
| Test Frequency Range: | 150KHz to 30MHz                          |
| Receiver setup:       | RBW=9KHz, VBW=30KHz, Sweep time=auto     |

##### 4.1.1 POWER LINE CONDUCTED EMISSION Limits

| FREQUENCY (MHz) | Limit (dBuV) |           | Standard |
|-----------------|--------------|-----------|----------|
|                 | Quasi-peak   | Average   |          |
| 0.15 -0.5       | 66 - 56 *    | 56 - 46 * | FCC      |
| 0.50 -5.0       | 56.00        | 46.00     | FCC      |
| 5.0 -30.0       | 60.00        | 50.00     | FCC      |

Note:

(1) \*Decreases with the logarithm of the frequency.

##### 4.1.2 TEST PROCEDURE

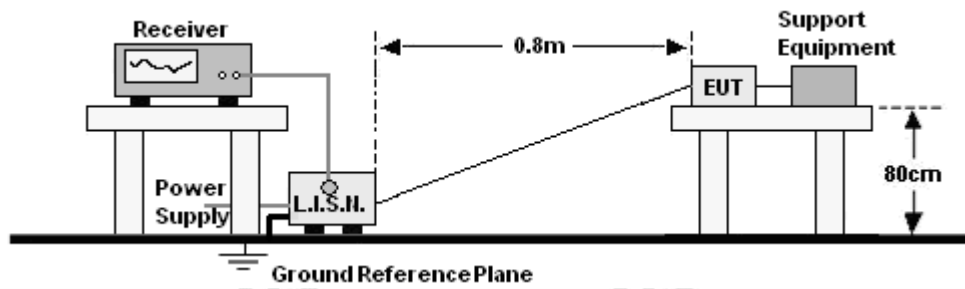
- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

##### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation



#### 4.1.4 TEST SETUP



#### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

#### 4.1.6 Test Result

**N/A**

This product charging and BT cannot be used at the same time



## 4.2 Radiated emissions

|                       |                                                        |            |        |        |            |
|-----------------------|--------------------------------------------------------|------------|--------|--------|------------|
| Test Requirement:     | FCC Part15 C Section 15.209, RSS-Gen 8.9, RSS-Gen 8.10 |            |        |        |            |
| Test Method:          | ANSI C63.10:2013                                       |            |        |        |            |
| Test Frequency Range: | 9kHz to 25GHz                                          |            |        |        |            |
| Test site:            | Measurement Distance: 3m                               |            |        |        |            |
| Receiver setup:       | Frequency                                              | Detector   | RBW    | VBW    | Value      |
|                       | 9KHz-150KHz                                            | Quasi-peak | 200Hz  | 600Hz  | Quasi-peak |
|                       | 150KHz-30MHz                                           | Quasi-peak | 9KHz   | 30KHz  | Quasi-peak |
|                       | 30MHz-1GHz                                             | Quasi-peak | 100KHz | 300KHz | Quasi-peak |
|                       | Above 1GHz                                             | Peak       | 1MHz   | 3MHz   | Peak       |
|                       |                                                        | Average    | 1MHz   | 10Hz   | Average    |

## 4.2.1 Radiated Emission Limits

| Frequencies (MHz) | Field Strength (micorvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009~0.490       | 2400/F(KHz)                       | 300                           |
| 0.490~1.705       | 24000/F(KHz)                      | 30                            |
| 1.705~30.0        | 30                                | 30                            |
| 30~88             | 100                               | 3                             |
| 88~216            | 150                               | 3                             |
| 216~960           | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

## LIMITS OF RADIATED EMISSION MEASUREMENT

| FREQUENCY (MHz) | Limit (dBuV/m) (at 3M) |         |
|-----------------|------------------------|---------|
|                 | PEAK                   | AVERAGE |
| Above 1000      | 74                     | 54      |

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

## 4.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre( Above 18GHz the distance is 1 meter and table is 1.5 metre).
- h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

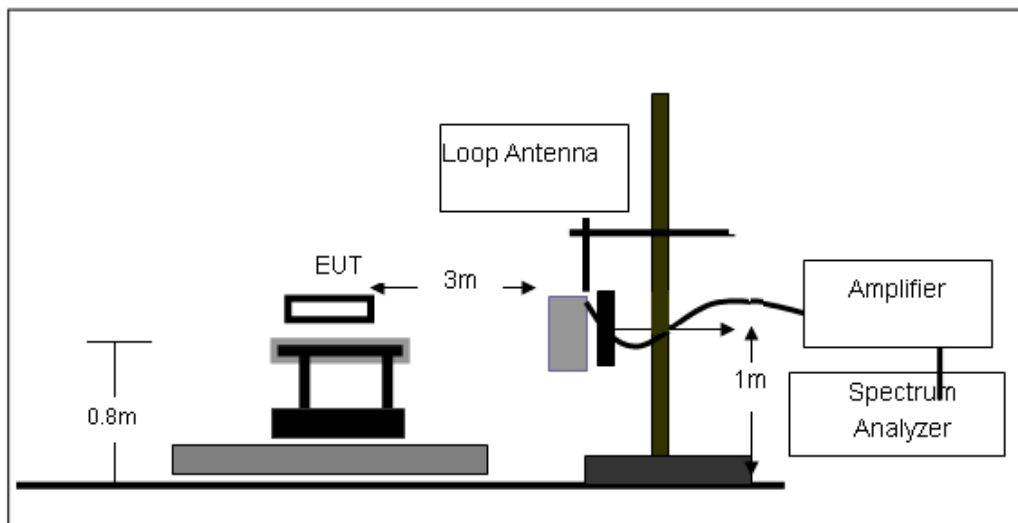
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

#### 4.2.3 DEVIATION FROM TEST STANDARD

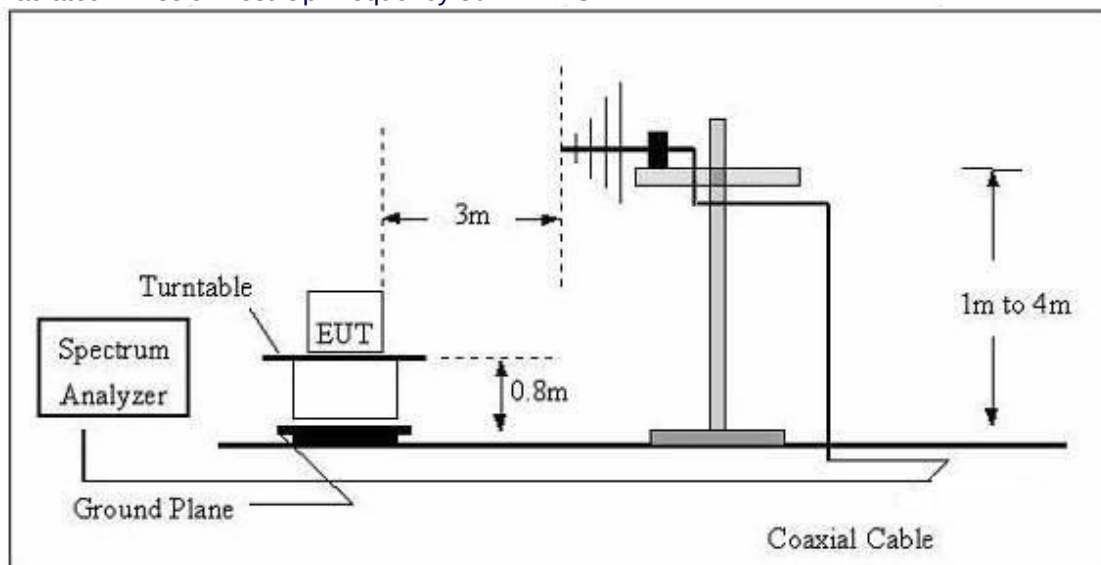
No deviation

#### 4.2.4 TEST SETUP

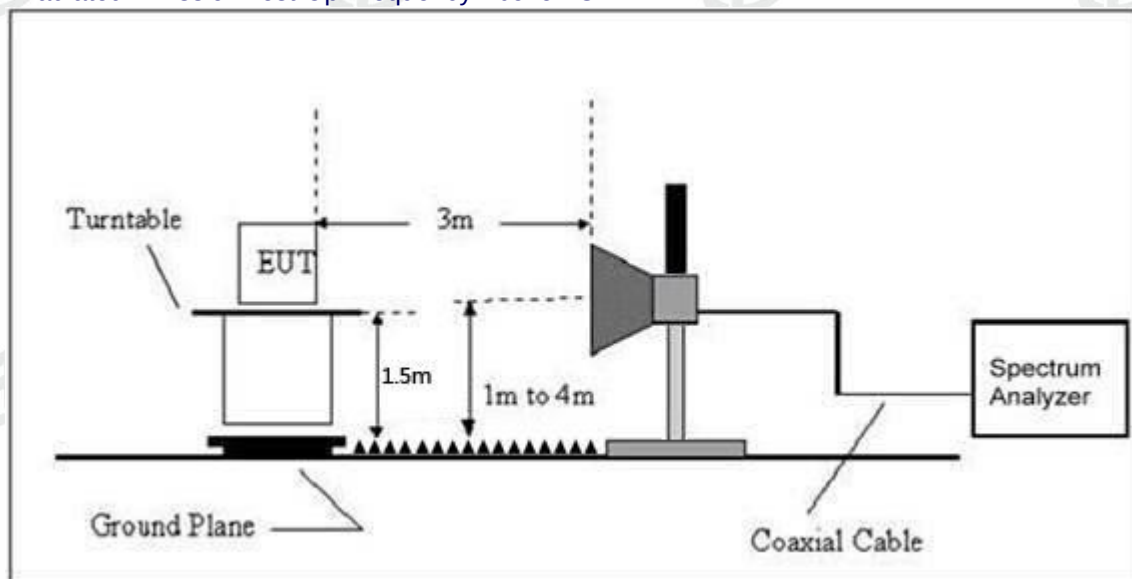
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



#### 4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

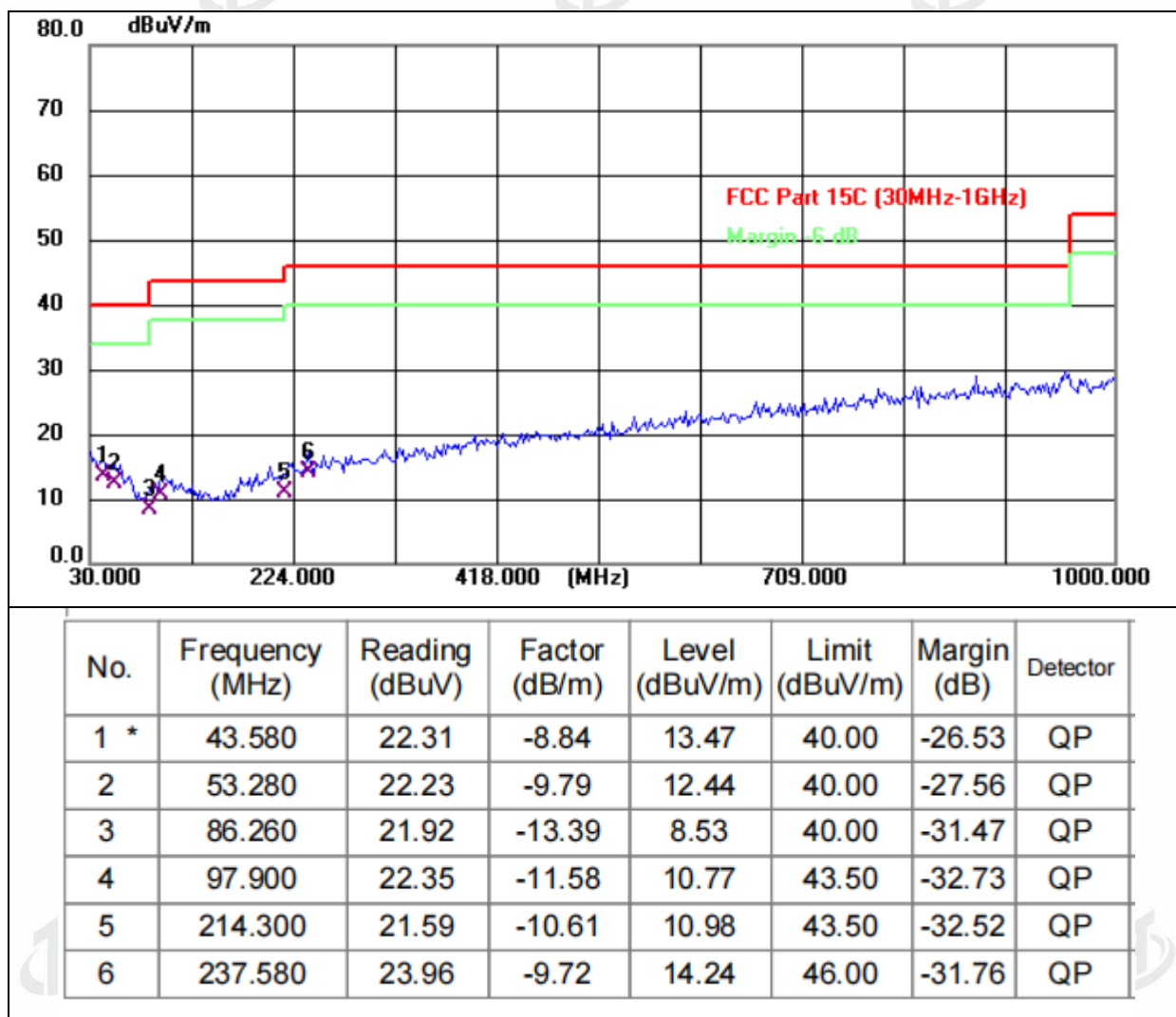
#### 4.2.6 TEST RESULTS

Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

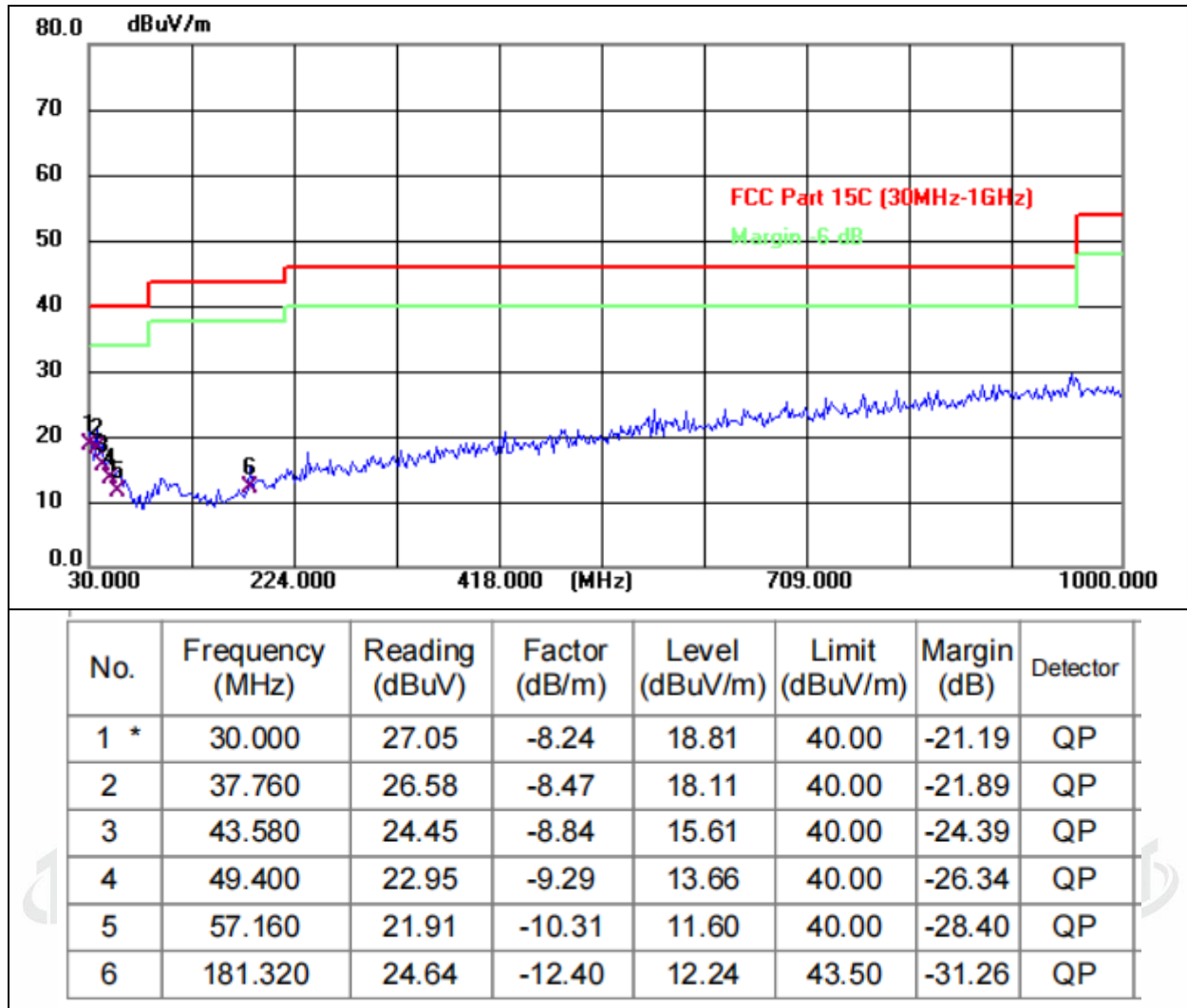
Between 30MHz – 1GHz

|               |          |                    |            |
|---------------|----------|--------------------|------------|
| Temperature:  | 25.2°C   | Relative Humidity: | 50%        |
| Pressure:     | 1010kPa  | Polarization:      | Horizontal |
| Test Voltage: | DC 3.7 V |                    |            |





|               |          |                    |          |
|---------------|----------|--------------------|----------|
| Temperature:  | 25.2°C   | Relative Humidity: | 50%      |
| Pressure:     | 1010kPa  | Polarization:      | Vertical |
| Test Voltage: | DC 3.7 V |                    |          |



## Remarks:

- 1.Final Level =Receiver Read level + Antenna Factor + Cable Loss
- 2.The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3.The test data shows only the worst case 8DPSK mode(High Channel:2480MHz).

1GHz~25GHz ((Left earphone)

GFSK

| Polar<br>(H/V)         | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-ampli<br>fier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Detector<br>Type |
|------------------------|--------------------|----------------------------|---------------------------|-----------------------|---------------------------|-------------------------------|--------------------|----------------|------------------|
| Low Channel:2402MHz    |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4804               | 56.81                      | 30.55                     | 5.77                  | 24.66                     | 56.69                         | 74                 | -17.31         | Pk               |
| V                      | 4804               | 42.61                      | 30.55                     | 5.77                  | 24.66                     | 42.49                         | 54                 | -11.51         | AV               |
| V                      | 7206               | 59.2                       | 30.33                     | 6.32                  | 24.55                     | 59.74                         | 74                 | -14.26         | Pk               |
| V                      | 7206               | 42.36                      | 30.33                     | 6.32                  | 24.55                     | 42.9                          | 54                 | -11.1          | AV               |
| H                      | 4804               | 56.23                      | 30.55                     | 5.77                  | 24.66                     | 56.11                         | 74                 | -17.89         | Pk               |
| H                      | 4804               | 41.92                      | 30.55                     | 5.77                  | 24.66                     | 41.8                          | 54                 | -12.2          | AV               |
| H                      | 7206               | 55.29                      | 30.33                     | 6.32                  | 24.55                     | 55.83                         | 74                 | -18.17         | Pk               |
| H                      | 7206               | 44.71                      | 30.33                     | 6.32                  | 24.55                     | 45.25                         | 54                 | -8.75          | AV               |
| Middle Channel:2441MHz |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4882               | 56.42                      | 30.55                     | 5.77                  | 24.66                     | 56.3                          | 74                 | -17.7          | Pk               |
| V                      | 4882               | 41.28                      | 30.55                     | 5.77                  | 24.66                     | 41.16                         | 54                 | -12.84         | AV               |
| V                      | 7323               | 58.74                      | 30.33                     | 6.32                  | 24.55                     | 59.28                         | 74                 | -14.72         | Pk               |
| V                      | 7323               | 44.8                       | 30.33                     | 6.32                  | 24.55                     | 45.34                         | 54                 | -8.66          | AV               |
| H                      | 4882               | 59.06                      | 30.55                     | 5.77                  | 24.66                     | 58.94                         | 74                 | -15.06         | Pk               |
| H                      | 4882               | 41.33                      | 30.55                     | 5.77                  | 24.66                     | 41.21                         | 54                 | -12.79         | AV               |
| H                      | 7323               | 59.22                      | 30.33                     | 6.32                  | 24.55                     | 59.76                         | 74                 | -14.24         | Pk               |
| H                      | 7323               | 41.72                      | 30.33                     | 6.32                  | 24.55                     | 42.26                         | 54                 | -11.74         | AV               |
| High Channel:2480MHz   |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4960               | 58.11                      | 30.55                     | 5.77                  | 24.66                     | 57.99                         | 74                 | -16.01         | Pk               |
| V                      | 4960               | 41.8                       | 30.55                     | 5.77                  | 24.66                     | 41.68                         | 54                 | -12.32         | AV               |
| V                      | 7440               | 55.39                      | 30.33                     | 6.32                  | 24.55                     | 55.93                         | 74                 | -18.07         | Pk               |
| V                      | 7440               | 44.56                      | 30.33                     | 6.32                  | 24.55                     | 45.1                          | 54                 | -8.9           | AV               |
| H                      | 4960               | 56.46                      | 30.55                     | 5.77                  | 24.66                     | 56.34                         | 74                 | -17.66         | Pk               |
| H                      | 4960               | 43.35                      | 30.55                     | 5.77                  | 24.66                     | 43.23                         | 54                 | -10.77         | AV               |
| H                      | 7440               | 55.18                      | 30.33                     | 6.32                  | 24.55                     | 55.72                         | 74                 | -18.28         | Pk               |
| H                      | 7440               | 44.02                      | 30.33                     | 6.32                  | 24.55                     | 44.56                         | 54                 | -9.44          | AV               |

 $\pi/4$ DQPSK

| Polar<br>(H/V)         | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-ampli<br>fier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Detector<br>Type |
|------------------------|--------------------|----------------------------|---------------------------|-----------------------|---------------------------|-------------------------------|--------------------|----------------|------------------|
| Low Channel:2402MHz    |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4804               | 55.16                      | 30.55                     | 5.77                  | 24.66                     | 55.04                         | 74                 | -18.96         | Pk               |
| V                      | 4804               | 43.02                      | 30.55                     | 5.77                  | 24.66                     | 42.9                          | 54                 | -11.1          | AV               |
| V                      | 7206               | 55.86                      | 30.33                     | 6.32                  | 24.55                     | 56.4                          | 74                 | -17.6          | Pk               |
| V                      | 7206               | 43.71                      | 30.33                     | 6.32                  | 24.55                     | 44.25                         | 54                 | -9.75          | AV               |
| H                      | 4804               | 57.11                      | 30.55                     | 5.77                  | 24.66                     | 56.99                         | 74                 | -17.01         | Pk               |
| H                      | 4804               | 42.67                      | 30.55                     | 5.77                  | 24.66                     | 42.55                         | 54                 | -11.45         | AV               |
| H                      | 7206               | 57.37                      | 30.33                     | 6.32                  | 24.55                     | 57.91                         | 74                 | -16.09         | Pk               |
| H                      | 7206               | 44.75                      | 30.33                     | 6.32                  | 24.55                     | 45.29                         | 54                 | -8.71          | AV               |
| Middle Channel:2441MHz |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4882               | 59.39                      | 30.55                     | 5.77                  | 24.66                     | 59.27                         | 74                 | -14.73         | Pk               |
| V                      | 4882               | 41.05                      | 30.55                     | 5.77                  | 24.66                     | 40.93                         | 54                 | -13.07         | AV               |
| V                      | 7323               | 59.89                      | 30.33                     | 6.32                  | 24.55                     | 60.43                         | 74                 | -13.57         | Pk               |
| V                      | 7323               | 41.7                       | 30.33                     | 6.32                  | 24.55                     | 42.24                         | 54                 | -11.76         | AV               |
| H                      | 4882               | 58.31                      | 30.55                     | 5.77                  | 24.66                     | 58.19                         | 74                 | -15.81         | Pk               |
| H                      | 4882               | 41.8                       | 30.55                     | 5.77                  | 24.66                     | 41.68                         | 54                 | -12.32         | AV               |
| H                      | 7323               | 58.4                       | 30.33                     | 6.32                  | 24.55                     | 58.94                         | 74                 | -15.06         | Pk               |
| H                      | 7323               | 41.28                      | 30.33                     | 6.32                  | 24.55                     | 41.82                         | 54                 | -12.18         | AV               |
| High Channel:2480MHz   |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4960               | 58.2                       | 30.55                     | 5.77                  | 24.66                     | 58.08                         | 74                 | -15.92         | Pk               |
| V                      | 4960               | 41.32                      | 30.55                     | 5.77                  | 24.66                     | 41.2                          | 54                 | -12.8          | AV               |
| V                      | 7440               | 57.48                      | 30.33                     | 6.32                  | 24.55                     | 58.02                         | 74                 | -15.98         | Pk               |
| V                      | 7440               | 42.37                      | 30.33                     | 6.32                  | 24.55                     | 42.91                         | 54                 | -11.09         | AV               |
| H                      | 4960               | 58.39                      | 30.55                     | 5.77                  | 24.66                     | 58.27                         | 74                 | -15.73         | Pk               |
| H                      | 4960               | 42.81                      | 30.55                     | 5.77                  | 24.66                     | 42.69                         | 54                 | -11.31         | AV               |
| H                      | 7440               | 59.17                      | 30.33                     | 6.32                  | 24.55                     | 59.71                         | 74                 | -14.29         | Pk               |
| H                      | 7440               | 43.18                      | 30.33                     | 6.32                  | 24.55                     | 43.72                         | 54                 | -10.28         | AV               |



## 8DPSK

| Polar (H/V)            | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|------------------------|-----------------|----------------------|--------------------|-----------------|---------------------|-------------------------|-----------------|-------------|---------------|
| Low Channel:2402MHz    |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4804            | 59.71                | 30.55              | 5.77            | 24.66               | 59.59                   | 74              | -14.41      | Pk            |
| V                      | 4804            | 41.46                | 30.55              | 5.77            | 24.66               | 41.34                   | 54              | -12.66      | AV            |
| V                      | 7206            | 58.48                | 30.33              | 6.32            | 24.55               | 59.02                   | 74              | -14.98      | Pk            |
| V                      | 7206            | 42.97                | 30.33              | 6.32            | 24.55               | 43.51                   | 54              | -10.49      | AV            |
| H                      | 4804            | 56.33                | 30.55              | 5.77            | 24.66               | 56.21                   | 74              | -17.79      | Pk            |
| H                      | 4804            | 43.24                | 30.55              | 5.77            | 24.66               | 43.12                   | 54              | -10.88      | AV            |
| H                      | 7206            | 56.71                | 30.33              | 6.32            | 24.55               | 57.25                   | 74              | -16.75      | Pk            |
| H                      | 7206            | 43.87                | 30.33              | 6.32            | 24.55               | 44.41                   | 54              | -9.59       | AV            |
| Middle Channel:2441MHz |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4882            | 58.27                | 30.55              | 5.77            | 24.66               | 58.15                   | 74              | -15.85      | Pk            |
| V                      | 4882            | 41.31                | 30.55              | 5.77            | 24.66               | 41.19                   | 54              | -12.81      | AV            |
| V                      | 7323            | 55.05                | 30.33              | 6.32            | 24.55               | 55.59                   | 74              | -18.41      | Pk            |
| V                      | 7323            | 44.96                | 30.33              | 6.32            | 24.55               | 45.5                    | 54              | -8.5        | AV            |
| H                      | 4882            | 58.39                | 30.55              | 5.77            | 24.66               | 58.27                   | 74              | -15.73      | Pk            |
| H                      | 4882            | 41.85                | 30.55              | 5.77            | 24.66               | 41.73                   | 54              | -12.27      | AV            |
| H                      | 7323            | 59.54                | 30.33              | 6.32            | 24.55               | 60.08                   | 74              | -13.92      | Pk            |
| H                      | 7323            | 41.36                | 30.33              | 6.32            | 24.55               | 41.9                    | 54              | -12.1       | AV            |
| High Channel:2480MHz   |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4960            | 55.82                | 30.55              | 5.77            | 24.66               | 55.7                    | 74              | -18.3       | Pk            |
| V                      | 4960            | 41.62                | 30.55              | 5.77            | 24.66               | 41.5                    | 54              | -12.5       | AV            |
| V                      | 7440            | 57.42                | 30.33              | 6.32            | 24.55               | 57.96                   | 74              | -16.04      | Pk            |
| V                      | 7440            | 41.18                | 30.33              | 6.32            | 24.55               | 41.72                   | 54              | -12.28      | AV            |
| H                      | 4960            | 56.83                | 30.55              | 5.77            | 24.66               | 56.71                   | 74              | -17.29      | Pk            |
| H                      | 4960            | 42.55                | 30.55              | 5.77            | 24.66               | 42.43                   | 54              | -11.57      | AV            |
| H                      | 7440            | 58.66                | 30.33              | 6.32            | 24.55               | 59.2                    | 74              | -14.8       | Pk            |
| H                      | 7440            | 42.88                | 30.33              | 6.32            | 24.55               | 43.42                   | 54              | -10.58      | AV            |

## Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,  
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported



**ZHONGHAN**

1GHz~25GHz (Right earphone)

Project No.: ZHT-241022111W02-1

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GFSK

| Polar<br>(H/V)         | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-ampli<br>fier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Detector<br>Type |
|------------------------|--------------------|----------------------------|---------------------------|-----------------------|---------------------------|-------------------------------|--------------------|----------------|------------------|
| Low Channel:2402MHz    |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4804               | 56.76                      | 30.55                     | 5.77                  | 24.66                     | 56.64                         | 74                 | -17.36         | Pk               |
| V                      | 4804               | 43.52                      | 30.55                     | 5.77                  | 24.66                     | 43.4                          | 54                 | -10.6          | AV               |
| V                      | 7206               | 58.66                      | 30.33                     | 6.32                  | 24.55                     | 59.2                          | 74                 | -14.8          | Pk               |
| V                      | 7206               | 41.95                      | 30.33                     | 6.32                  | 24.55                     | 42.49                         | 54                 | -11.51         | AV               |
| H                      | 4804               | 58.75                      | 30.55                     | 5.77                  | 24.66                     | 58.63                         | 74                 | -15.37         | Pk               |
| H                      | 4804               | 41.68                      | 30.55                     | 5.77                  | 24.66                     | 41.56                         | 54                 | -12.44         | AV               |
| H                      | 7206               | 59.95                      | 30.33                     | 6.32                  | 24.55                     | 60.49                         | 74                 | -13.51         | Pk               |
| H                      | 7206               | 41.74                      | 30.33                     | 6.32                  | 24.55                     | 42.28                         | 54                 | -11.72         | AV               |
| Middle Channel:2441MHz |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4882               | 59.56                      | 30.55                     | 5.77                  | 24.66                     | 59.44                         | 74                 | -14.56         | Pk               |
| V                      | 4882               | 41.01                      | 30.55                     | 5.77                  | 24.66                     | 40.89                         | 54                 | -13.11         | AV               |
| V                      | 7323               | 55.79                      | 30.33                     | 6.32                  | 24.55                     | 56.33                         | 74                 | -17.67         | Pk               |
| V                      | 7323               | 41.8                       | 30.33                     | 6.32                  | 24.55                     | 42.34                         | 54                 | -11.66         | AV               |
| H                      | 4882               | 55.73                      | 30.55                     | 5.77                  | 24.66                     | 55.61                         | 74                 | -18.39         | Pk               |
| H                      | 4882               | 41.25                      | 30.55                     | 5.77                  | 24.66                     | 41.13                         | 54                 | -12.87         | AV               |
| H                      | 7323               | 59.15                      | 30.33                     | 6.32                  | 24.55                     | 59.69                         | 74                 | -14.31         | Pk               |
| H                      | 7323               | 41.11                      | 30.33                     | 6.32                  | 24.55                     | 41.65                         | 54                 | -12.35         | AV               |
| High Channel:2480MHz   |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                      | 4960               | 57.62                      | 30.55                     | 5.77                  | 24.66                     | 57.5                          | 74                 | -16.5          | Pk               |
| V                      | 4960               | 42                         | 30.55                     | 5.77                  | 24.66                     | 41.88                         | 54                 | -12.12         | AV               |
| V                      | 7440               | 59.06                      | 30.33                     | 6.32                  | 24.55                     | 59.6                          | 74                 | -14.4          | Pk               |
| V                      | 7440               | 44.94                      | 30.33                     | 6.32                  | 24.55                     | 45.48                         | 54                 | -8.52          | AV               |
| H                      | 4960               | 59.56                      | 30.55                     | 5.77                  | 24.66                     | 59.44                         | 74                 | -14.56         | Pk               |
| H                      | 4960               | 41.45                      | 30.55                     | 5.77                  | 24.66                     | 41.33                         | 54                 | -12.67         | AV               |
| H                      | 7440               | 59.69                      | 30.33                     | 6.32                  | 24.55                     | 60.23                         | 74                 | -13.77         | Pk               |
| H                      | 7440               | 42.66                      | 30.33                     | 6.32                  | 24.55                     | 43.2                          | 54                 | -10.8          | AV               |

 $\pi/4$ DQPSK

| Polar (H/V)            | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|------------------------|-----------------|----------------------|--------------------|-----------------|---------------------|-------------------------|-----------------|-------------|---------------|
| Low Channel:2402MHz    |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4804            | 58.36                | 30.55              | 5.77            | 24.66               | 58.24                   | 74              | -15.76      | Pk            |
| V                      | 4804            | 41.97                | 30.55              | 5.77            | 24.66               | 41.85                   | 54              | -12.15      | AV            |
| V                      | 7206            | 55.4                 | 30.33              | 6.32            | 24.55               | 55.94                   | 74              | -18.06      | Pk            |
| V                      | 7206            | 41.25                | 30.33              | 6.32            | 24.55               | 41.79                   | 54              | -12.21      | AV            |
| H                      | 4804            | 57.38                | 30.55              | 5.77            | 24.66               | 57.26                   | 74              | -16.74      | Pk            |
| H                      | 4804            | 43.57                | 30.55              | 5.77            | 24.66               | 43.45                   | 54              | -10.55      | AV            |
| H                      | 7206            | 55.18                | 30.33              | 6.32            | 24.55               | 55.72                   | 74              | -18.28      | Pk            |
| H                      | 7206            | 41.82                | 30.33              | 6.32            | 24.55               | 42.36                   | 54              | -11.64      | AV            |
| Middle Channel:2441MHz |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4882            | 56.18                | 30.55              | 5.77            | 24.66               | 56.06                   | 74              | -17.94      | Pk            |
| V                      | 4882            | 41.18                | 30.55              | 5.77            | 24.66               | 41.06                   | 54              | -12.94      | AV            |
| V                      | 7323            | 57.93                | 30.33              | 6.32            | 24.55               | 58.47                   | 74              | -15.53      | Pk            |
| V                      | 7323            | 41.5                 | 30.33              | 6.32            | 24.55               | 42.04                   | 54              | -11.96      | AV            |
| H                      | 4882            | 58.27                | 30.55              | 5.77            | 24.66               | 58.15                   | 74              | -15.85      | Pk            |
| H                      | 4882            | 41.63                | 30.55              | 5.77            | 24.66               | 41.51                   | 54              | -12.49      | AV            |
| H                      | 7323            | 56.74                | 30.33              | 6.32            | 24.55               | 57.28                   | 74              | -16.72      | Pk            |
| H                      | 7323            | 41.09                | 30.33              | 6.32            | 24.55               | 41.63                   | 54              | -12.37      | AV            |
| High Channel:2480MHz   |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4960            | 57.37                | 30.55              | 5.77            | 24.66               | 57.25                   | 74              | -16.75      | Pk            |
| V                      | 4960            | 41.25                | 30.55              | 5.77            | 24.66               | 41.13                   | 54              | -12.87      | AV            |
| V                      | 7440            | 56.91                | 30.33              | 6.32            | 24.55               | 57.45                   | 74              | -16.55      | Pk            |
| V                      | 7440            | 41.01                | 30.33              | 6.32            | 24.55               | 41.55                   | 54              | -12.45      | AV            |
| H                      | 4960            | 56.55                | 30.55              | 5.77            | 24.66               | 56.43                   | 74              | -17.57      | Pk            |
| H                      | 4960            | 42.65                | 30.55              | 5.77            | 24.66               | 42.53                   | 54              | -11.47      | AV            |
| H                      | 7440            | 55.47                | 30.33              | 6.32            | 24.55               | 56.01                   | 74              | -17.99      | Pk            |
| H                      | 7440            | 43.13                | 30.33              | 6.32            | 24.55               | 43.67                   | 54              | -10.33      | AV            |



## 8DPSK

| Polar (H/V)            | Frequency (MHz) | Meter Reading (dBUV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB) | Emission Level (dBUV/m) | Limits (dBUV/m) | Margin (dB) | Detector Type |
|------------------------|-----------------|----------------------|--------------------|-----------------|---------------------|-------------------------|-----------------|-------------|---------------|
| Low Channel:2402MHz    |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4804            | 58.38                | 30.55              | 5.77            | 24.66               | 58.26                   | 74              | -15.74      | Pk            |
| V                      | 4804            | 41.13                | 30.55              | 5.77            | 24.66               | 41.01                   | 54              | -12.99      | AV            |
| V                      | 7206            | 58.93                | 30.33              | 6.32            | 24.55               | 59.47                   | 74              | -14.53      | Pk            |
| V                      | 7206            | 42.32                | 30.33              | 6.32            | 24.55               | 42.86                   | 54              | -11.14      | AV            |
| H                      | 4804            | 56.61                | 30.55              | 5.77            | 24.66               | 56.49                   | 74              | -17.51      | Pk            |
| H                      | 4804            | 41.67                | 30.55              | 5.77            | 24.66               | 41.55                   | 54              | -12.45      | AV            |
| H                      | 7206            | 55.76                | 30.33              | 6.32            | 24.55               | 56.3                    | 74              | -17.7       | Pk            |
| H                      | 7206            | 41.17                | 30.33              | 6.32            | 24.55               | 41.71                   | 54              | -12.29      | AV            |
| Middle Channel:2441MHz |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4882            | 55.32                | 30.55              | 5.77            | 24.66               | 55.2                    | 74              | -18.8       | Pk            |
| V                      | 4882            | 41.61                | 30.55              | 5.77            | 24.66               | 41.49                   | 54              | -12.51      | AV            |
| V                      | 7323            | 56.91                | 30.33              | 6.32            | 24.55               | 57.45                   | 74              | -16.55      | Pk            |
| V                      | 7323            | 42.39                | 30.33              | 6.32            | 24.55               | 42.93                   | 54              | -11.07      | AV            |
| H                      | 4882            | 57.71                | 30.55              | 5.77            | 24.66               | 57.59                   | 74              | -16.41      | Pk            |
| H                      | 4882            | 41.47                | 30.55              | 5.77            | 24.66               | 41.35                   | 54              | -12.65      | AV            |
| H                      | 7323            | 55.77                | 30.33              | 6.32            | 24.55               | 56.31                   | 74              | -17.69      | Pk            |
| H                      | 7323            | 41.13                | 30.33              | 6.32            | 24.55               | 41.67                   | 54              | -12.33      | AV            |
| High Channel:2480MHz   |                 |                      |                    |                 |                     |                         |                 |             |               |
| V                      | 4960            | 56.55                | 30.55              | 5.77            | 24.66               | 56.43                   | 74              | -17.57      | Pk            |
| V                      | 4960            | 41.67                | 30.55              | 5.77            | 24.66               | 41.55                   | 54              | -12.45      | AV            |
| V                      | 7440            | 58.89                | 30.33              | 6.32            | 24.55               | 59.43                   | 74              | -14.57      | Pk            |
| V                      | 7440            | 43.09                | 30.33              | 6.32            | 24.55               | 43.63                   | 54              | -10.37      | AV            |
| H                      | 4960            | 56.33                | 30.55              | 5.77            | 24.66               | 56.21                   | 74              | -17.79      | Pk            |
| H                      | 4960            | 41.31                | 30.55              | 5.77            | 24.66               | 41.19                   | 54              | -12.81      | AV            |
| H                      | 7440            | 57.61                | 30.33              | 6.32            | 24.55               | 58.15                   | 74              | -15.85      | Pk            |
| H                      | 7440            | 42.77                | 30.33              | 6.32            | 24.55               | 43.31                   | 54              | -10.69      | AV            |

## Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported

**5. RADIATED BAND EMISSION MEASUREMENT****5.1 Test Requirement:**

|                       |                                                                                                    |          |      |      |         |
|-----------------------|----------------------------------------------------------------------------------------------------|----------|------|------|---------|
| Test Requirement:     | FCC Part15 C Section 15.209 and 15.205, RSS-Gen 8.9, RSS-Gen 8.10                                  |          |      |      |         |
| Test Method:          | ANSI C63.10: 2013                                                                                  |          |      |      |         |
| Test Frequency Range: | All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed. |          |      |      |         |
| Test site:            | Measurement Distance: 3m                                                                           |          |      |      |         |
| Receiver setup:       | Frequency                                                                                          | Detector | RBW  | VBW  | Value   |
|                       | Above 1GHz                                                                                         | Peak     | 1MHz | 3MHz | Peak    |
|                       |                                                                                                    | Average  | 1MHz | 3MHz | Average |

**LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)**

| FREQUENCY (MHz) | Limit (dBuV/m) (at 3M) |         |
|-----------------|------------------------|---------|
|                 | PEAK                   | AVERAGE |
| Above 1000      | 74                     | 54      |

**Notes:**

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

| Spectrum Parameter                    | Setting                                          |
|---------------------------------------|--------------------------------------------------|
| Attenuation                           | Auto                                             |
| Start Frequency                       | 2300MHz                                          |
| Stop Frequency                        | 2520                                             |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

**5.2 TEST PROCEDURE**

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel,the Highest channel

**Note:**

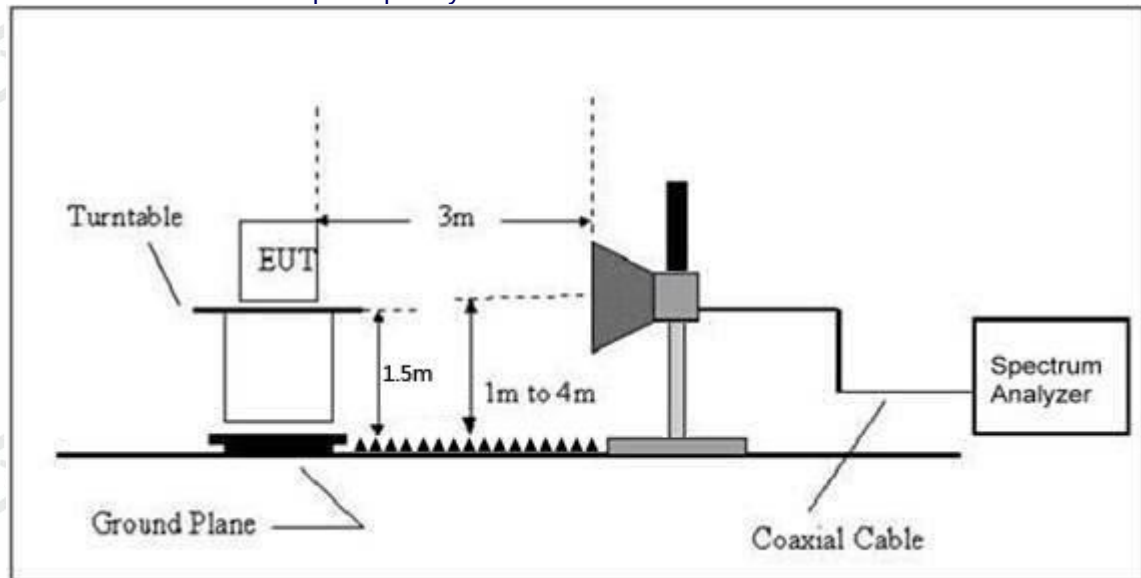
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

### 5.3 DEVIATION FROM TEST STANDARD

No deviation

### 5.4 TEST SETUP

#### Radiated Emission Test-Up Frequency Above 1GHz



### 5.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



## 5.6 TEST RESULT

| Left earphone |                       |                        |                            |                           |                       |                             |                               |                       |                    |                      |        |
|---------------|-----------------------|------------------------|----------------------------|---------------------------|-----------------------|-----------------------------|-------------------------------|-----------------------|--------------------|----------------------|--------|
|               | Polar<br>(H/V)        | Frequenc<br>y<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-<br>amplifier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Emission<br>level<br>(dBuV/m) | Limit<br>(dBuV<br>/m) | Margi<br>n<br>(dB) | Detec<br>tor<br>Type | Result |
| GFSK          | Low Channel: 2402MHz  |                        |                            |                           |                       |                             |                               |                       |                    |                      |        |
|               | H                     | 2390.00                | 61.88                      | 30.22                     | 4.85                  | 23.98                       | 60.49                         | 74.00                 | -13.51             | PK                   | PASS   |
|               | H                     | 2390.00                | 48.51                      | 30.22                     | 4.85                  | 23.98                       | 47.12                         | 54.00                 | -6.88              | AV                   | PASS   |
|               | H                     | 2400.00                | 62.87                      | 30.22                     | 4.85                  | 23.98                       | 61.48                         | 74.00                 | -12.52             | PK                   | PASS   |
|               | H                     | 2400.00                | 46.36                      | 30.22                     | 4.85                  | 23.98                       | 44.97                         | 54.00                 | -9.03              | AV                   | PASS   |
|               | V                     | 2390.00                | 61.08                      | 30.22                     | 4.85                  | 23.98                       | 59.69                         | 74.00                 | -14.31             | PK                   | PASS   |
|               | V                     | 2390.00                | 48.59                      | 30.22                     | 4.85                  | 23.98                       | 47.20                         | 54.00                 | -6.80              | AV                   | PASS   |
|               | V                     | 2400.00                | 60.38                      | 30.22                     | 4.85                  | 23.98                       | 58.99                         | 74.00                 | -15.01             | PK                   | PASS   |
|               | V                     | 2400.00                | 48.75                      | 30.22                     | 4.85                  | 23.98                       | 47.36                         | 54.00                 | -6.64              | AV                   | PASS   |
|               | High Channel: 2480MHz |                        |                            |                           |                       |                             |                               |                       |                    |                      |        |
|               | H                     | 2483.50                | 61.16                      | 30.22                     | 4.85                  | 23.98                       | 59.77                         | 74.00                 | -14.23             | PK                   | PASS   |
|               | H                     | 2483.50                | 48.98                      | 30.22                     | 4.85                  | 23.98                       | 47.59                         | 54.00                 | -6.41              | AV                   | PASS   |
|               | H                     | 2500.00                | 59.97                      | 30.22                     | 4.85                  | 23.98                       | 58.58                         | 74.00                 | -15.42             | PK                   | PASS   |
|               | H                     | 2500.00                | 48.25                      | 30.22                     | 4.85                  | 23.98                       | 46.86                         | 54.00                 | -7.14              | AV                   | PASS   |
|               | V                     | 2483.50                | 62.68                      | 30.22                     | 4.85                  | 23.98                       | 61.29                         | 74.00                 | -12.71             | PK                   | PASS   |
|               | V                     | 2483.50                | 47.82                      | 30.22                     | 4.85                  | 23.98                       | 46.43                         | 54.00                 | -7.57              | AV                   | PASS   |
|               | V                     | 2500.00                | 62.51                      | 30.22                     | 4.85                  | 23.98                       | 61.12                         | 74.00                 | -12.88             | PK                   | PASS   |
|               | V                     | 2500.00                | 48.00                      | 30.22                     | 4.85                  | 23.98                       | 46.61                         | 54.00                 | -7.39              | AV                   | PASS   |
| π/4DQPSK      | Low Channel: 2402MHz  |                        |                            |                           |                       |                             |                               |                       |                    |                      |        |
|               | H                     | 2390.00                | 62.65                      | 30.22                     | 4.85                  | 23.98                       | 61.26                         | 74.00                 | -12.74             | PK                   | PASS   |
|               | H                     | 2390.00                | 48.49                      | 30.22                     | 4.85                  | 23.98                       | 47.10                         | 54.00                 | -6.90              | AV                   | PASS   |
|               | H                     | 2400.00                | 60.49                      | 30.22                     | 4.85                  | 23.98                       | 59.10                         | 74.00                 | -14.90             | PK                   | PASS   |
|               | H                     | 2400.00                | 48.04                      | 30.22                     | 4.85                  | 23.98                       | 46.65                         | 54.00                 | -7.35              | AV                   | PASS   |
|               | V                     | 2390.00                | 60.43                      | 30.22                     | 4.85                  | 23.98                       | 59.04                         | 74.00                 | -14.96             | PK                   | PASS   |
|               | V                     | 2390.00                | 48.27                      | 30.22                     | 4.85                  | 23.98                       | 46.88                         | 54.00                 | -7.12              | AV                   | PASS   |
|               | V                     | 2400.00                | 60.23                      | 30.22                     | 4.85                  | 23.98                       | 58.84                         | 74.00                 | -15.16             | PK                   | PASS   |
|               | V                     | 2400.00                | 48.58                      | 30.22                     | 4.85                  | 23.98                       | 47.19                         | 54.00                 | -6.81              | AV                   | PASS   |
|               | High Channel: 2480MHz |                        |                            |                           |                       |                             |                               |                       |                    |                      |        |
|               | H                     | 2483.50                | 59.81                      | 30.22                     | 4.85                  | 23.98                       | 58.42                         | 74.00                 | -15.58             | PK                   | PASS   |
|               | H                     | 2483.50                | 46.71                      | 30.22                     | 4.85                  | 23.98                       | 45.32                         | 54.00                 | -8.68              | AV                   | PASS   |
|               | H                     | 2500.00                | 60.86                      | 30.22                     | 4.85                  | 23.98                       | 59.47                         | 74.00                 | -14.53             | PK                   | PASS   |
|               | H                     | 2500.00                | 46.69                      | 30.22                     | 4.85                  | 23.98                       | 45.30                         | 54.00                 | -8.70              | AV                   | PASS   |
|               | V                     | 2483.50                | 62.23                      | 30.22                     | 4.85                  | 23.98                       | 60.84                         | 74.00                 | -13.16             | PK                   | PASS   |
|               | V                     | 2483.50                | 46.30                      | 30.22                     | 4.85                  | 23.98                       | 44.91                         | 54.00                 | -9.09              | AV                   | PASS   |
|               | V                     | 2500.00                | 60.09                      | 30.22                     | 4.85                  | 23.98                       | 58.70                         | 74.00                 | -15.30             | PK                   | PASS   |
|               | V                     | 2500.00                | 46.65                      | 30.22                     | 4.85                  | 23.98                       | 45.26                         | 54.00                 | -8.74              | AV                   | PASS   |
| 8DPSK         | Low Channel: 2402MHz  |                        |                            |                           |                       |                             |                               |                       |                    |                      |        |
|               | H                     | 2390.00                | 61.41                      | 30.22                     | 4.85                  | 23.98                       | 60.02                         | 74.00                 | -13.98             | PK                   | PASS   |
|               | H                     | 2390.00                | 46.81                      | 30.22                     | 4.85                  | 23.98                       | 45.42                         | 54.00                 | -8.58              | AV                   | PASS   |
|               | H                     | 2400.00                | 61.06                      | 30.22                     | 4.85                  | 23.98                       | 59.67                         | 74.00                 | -14.33             | PK                   | PASS   |
|               | H                     | 2400.00                | 46.52                      | 30.22                     | 4.85                  | 23.98                       | 45.13                         | 54.00                 | -8.87              | AV                   | PASS   |
|               | V                     | 2390.00                | 62.58                      | 30.22                     | 4.85                  | 23.98                       | 61.19                         | 74.00                 | -12.81             | PK                   | PASS   |
|               | V                     | 2390.00                | 47.61                      | 30.22                     | 4.85                  | 23.98                       | 46.22                         | 54.00                 | -7.78              | AV                   | PASS   |
|               | V                     | 2400.00                | 60.70                      | 30.22                     | 4.85                  | 23.98                       | 59.31                         | 74.00                 | -14.69             | PK                   | PASS   |
|               | V                     | 2400.00                | 47.11                      | 30.22                     | 4.85                  | 23.98                       | 45.72                         | 54.00                 | -8.28              | AV                   | PASS   |
|               | High Channel: 2480MHz |                        |                            |                           |                       |                             |                               |                       |                    |                      |        |
|               | H                     | 2483.50                | 62.89                      | 30.22                     | 4.85                  | 23.98                       | 61.50                         | 74.00                 | -12.50             | PK                   | PASS   |
|               | H                     | 2483.50                | 46.55                      | 30.22                     | 4.85                  | 23.98                       | 45.16                         | 54.00                 | -8.84              | AV                   | PASS   |
|               | H                     | 2500.00                | 62.31                      | 30.22                     | 4.85                  | 23.98                       | 60.92                         | 74.00                 | -13.08             | PK                   | PASS   |
|               | H                     | 2500.00                | 48.96                      | 30.22                     | 4.85                  | 23.98                       | 47.57                         | 54.00                 | -6.43              | AV                   | PASS   |



|  |   |         |       |       |      |       |       |       |        |    |      |
|--|---|---------|-------|-------|------|-------|-------|-------|--------|----|------|
|  | V | 2483.50 | 62.69 | 30.22 | 4.85 | 23.98 | 61.30 | 74.00 | -12.70 | PK | PASS |
|  | V | 2483.50 | 46.45 | 30.22 | 4.85 | 23.98 | 45.06 | 54.00 | -8.94  | AV | PASS |
|  | V | 2500.00 | 59.66 | 30.22 | 4.85 | 23.98 | 58.27 | 74.00 | -15.73 | PK | PASS |
|  | V | 2500.00 | 48.42 | 30.22 | 4.85 | 23.98 | 47.03 | 54.00 | -6.97  | AV | PASS |

**Remark:**

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit



| Right earphone |                       |                    |                            |                           |                       |                             |                               |                       |                    |                      |        |
|----------------|-----------------------|--------------------|----------------------------|---------------------------|-----------------------|-----------------------------|-------------------------------|-----------------------|--------------------|----------------------|--------|
|                | Polar<br>(H/V)        | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-<br>amplifier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Emission<br>level<br>(dBuV/m) | Limit<br>(dBuV<br>/m) | Margi<br>n<br>(dB) | Detec<br>tor<br>Type | Result |
| GFSK           | Low Channel: 2402MHz  |                    |                            |                           |                       |                             |                               |                       |                    |                      |        |
|                | H                     | 2390.00            | 60.86                      | 30.22                     | 4.85                  | 23.98                       | 59.47                         | 74.00                 | -14.53             | Pk                   | PASS   |
|                | H                     | 2390.00            | 47.37                      | 30.22                     | 4.85                  | 23.98                       | 45.98                         | 54.00                 | -8.02              | AV                   | PASS   |
|                | H                     | 2400.00            | 62.85                      | 30.22                     | 4.85                  | 23.98                       | 61.46                         | 74.00                 | -12.54             | Pk                   | PASS   |
|                | H                     | 2400.00            | 46.84                      | 30.22                     | 4.85                  | 23.98                       | 45.45                         | 54.00                 | -8.55              | AV                   | PASS   |
|                | V                     | 2390.00            | 60.41                      | 30.22                     | 4.85                  | 23.98                       | 59.02                         | 74.00                 | -14.98             | Pk                   | PASS   |
|                | V                     | 2390.00            | 46.05                      | 30.22                     | 4.85                  | 23.98                       | 44.66                         | 54.00                 | -9.34              | AV                   | PASS   |
|                | V                     | 2400.00            | 62.24                      | 30.22                     | 4.85                  | 23.98                       | 60.85                         | 74.00                 | -13.15             | Pk                   | PASS   |
|                | V                     | 2400.00            | 48.83                      | 30.22                     | 4.85                  | 23.98                       | 47.44                         | 54.00                 | -6.56              | AV                   | PASS   |
|                | High Channel: 2480MHz |                    |                            |                           |                       |                             |                               |                       |                    |                      |        |
|                | H                     | 2483.50            | 61.95                      | 30.22                     | 4.85                  | 23.98                       | 60.56                         | 74.00                 | -13.44             | PK                   | PASS   |
|                | H                     | 2483.50            | 47.70                      | 30.22                     | 4.85                  | 23.98                       | 46.31                         | 54.00                 | -7.69              | AV                   | PASS   |
|                | H                     | 2500.00            | 60.29                      | 30.22                     | 4.85                  | 23.98                       | 58.90                         | 74.00                 | -15.10             | PK                   | PASS   |
|                | H                     | 2500.00            | 46.35                      | 30.22                     | 4.85                  | 23.98                       | 44.96                         | 54.00                 | -9.04              | AV                   | PASS   |
|                | V                     | 2483.50            | 60.91                      | 30.22                     | 4.85                  | 23.98                       | 59.52                         | 74.00                 | -14.48             | PK                   | PASS   |
|                | V                     | 2483.50            | 47.08                      | 30.22                     | 4.85                  | 23.98                       | 45.69                         | 54.00                 | -8.31              | AV                   | PASS   |
|                | V                     | 2500.00            | 62.83                      | 30.22                     | 4.85                  | 23.98                       | 61.44                         | 74.00                 | -12.56             | PK                   | PASS   |
|                | V                     | 2500.00            | 46.41                      | 30.22                     | 4.85                  | 23.98                       | 45.02                         | 54.00                 | -8.98              | AV                   | PASS   |
| $\pi/4$ DQPSK  | Low Channel: 2402MHz  |                    |                            |                           |                       |                             |                               |                       |                    |                      |        |
|                | H                     | 2390.00            | 61.23                      | 30.22                     | 4.85                  | 23.98                       | 59.84                         | 74.00                 | -14.16             | PK                   | PASS   |
|                | H                     | 2390.00            | 47.39                      | 30.22                     | 4.85                  | 23.98                       | 46.00                         | 54.00                 | -8.00              | AV                   | PASS   |
|                | H                     | 2400.00            | 62.19                      | 30.22                     | 4.85                  | 23.98                       | 60.80                         | 74.00                 | -13.20             | PK                   | PASS   |
|                | H                     | 2400.00            | 47.37                      | 30.22                     | 4.85                  | 23.98                       | 45.98                         | 54.00                 | -8.02              | AV                   | PASS   |
|                | V                     | 2390.00            | 62.56                      | 30.22                     | 4.85                  | 23.98                       | 61.17                         | 74.00                 | -12.83             | PK                   | PASS   |
|                | V                     | 2390.00            | 48.68                      | 30.22                     | 4.85                  | 23.98                       | 47.29                         | 54.00                 | -6.71              | AV                   | PASS   |
|                | V                     | 2400.00            | 62.00                      | 30.22                     | 4.85                  | 23.98                       | 60.61                         | 74.00                 | -13.39             | PK                   | PASS   |
|                | V                     | 2400.00            | 46.64                      | 30.22                     | 4.85                  | 23.98                       | 45.25                         | 54.00                 | -8.75              | AV                   | PASS   |
|                | High Channel: 2480MHz |                    |                            |                           |                       |                             |                               |                       |                    |                      |        |
|                | H                     | 2483.50            | 62.34                      | 30.22                     | 4.85                  | 23.98                       | 60.95                         | 74.00                 | -13.05             | PK                   | PASS   |
|                | H                     | 2483.50            | 46.02                      | 30.22                     | 4.85                  | 23.98                       | 44.63                         | 54.00                 | -9.37              | AV                   | PASS   |
|                | H                     | 2500.00            | 61.93                      | 30.22                     | 4.85                  | 23.98                       | 60.54                         | 74.00                 | -13.46             | PK                   | PASS   |
|                | H                     | 2500.00            | 47.27                      | 30.22                     | 4.85                  | 23.98                       | 45.88                         | 54.00                 | -8.12              | AV                   | PASS   |
|                | V                     | 2483.50            | 63.00                      | 30.22                     | 4.85                  | 23.98                       | 61.61                         | 74.00                 | -12.39             | PK                   | PASS   |
|                | V                     | 2483.50            | 47.84                      | 30.22                     | 4.85                  | 23.98                       | 46.45                         | 54.00                 | -7.55              | AV                   | PASS   |
|                | V                     | 2500.00            | 62.79                      | 30.22                     | 4.85                  | 23.98                       | 61.40                         | 74.00                 | -12.60             | PK                   | PASS   |
|                | V                     | 2500.00            | 47.92                      | 30.22                     | 4.85                  | 23.98                       | 46.53                         | 54.00                 | -7.47              | AV                   | PASS   |
| 8DPSK          | Low Channel: 2402MHz  |                    |                            |                           |                       |                             |                               |                       |                    |                      |        |
|                | H                     | 2390.00            | 60.45                      | 30.22                     | 4.85                  | 23.98                       | 59.06                         | 74.00                 | -14.94             | PK                   | PASS   |
|                | H                     | 2390.00            | 47.84                      | 30.22                     | 4.85                  | 23.98                       | 46.45                         | 54.00                 | -7.55              | AV                   | PASS   |
|                | H                     | 2400.00            | 61.19                      | 30.22                     | 4.85                  | 23.98                       | 59.80                         | 74.00                 | -14.20             | PK                   | PASS   |
|                | H                     | 2400.00            | 47.94                      | 30.22                     | 4.85                  | 23.98                       | 46.55                         | 54.00                 | -7.45              | AV                   | PASS   |
|                | V                     | 2390.00            | 61.93                      | 30.22                     | 4.85                  | 23.98                       | 60.54                         | 74.00                 | -13.46             | PK                   | PASS   |
|                | V                     | 2390.00            | 48.53                      | 30.22                     | 4.85                  | 23.98                       | 47.14                         | 54.00                 | -6.86              | AV                   | PASS   |
|                | V                     | 2400.00            | 59.30                      | 30.22                     | 4.85                  | 23.98                       | 57.91                         | 74.00                 | -16.09             | PK                   | PASS   |
|                | V                     | 2400.00            | 46.74                      | 30.22                     | 4.85                  | 23.98                       | 45.35                         | 54.00                 | -8.65              | AV                   | PASS   |
|                | High Channel: 2480MHz |                    |                            |                           |                       |                             |                               |                       |                    |                      |        |
|                | H                     | 2483.50            | 60.65                      | 30.22                     | 4.85                  | 23.98                       | 59.26                         | 74.00                 | -14.74             | PK                   | PASS   |
|                | H                     | 2483.50            | 47.36                      | 30.22                     | 4.85                  | 23.98                       | 45.97                         | 54.00                 | -8.03              | AV                   | PASS   |
|                | H                     | 2500.00            | 59.34                      | 30.22                     | 4.85                  | 23.98                       | 57.95                         | 74.00                 | -16.05             | PK                   | PASS   |
|                | H                     | 2500.00            | 46.68                      | 30.22                     | 4.85                  | 23.98                       | 45.29                         | 54.00                 | -8.71              | AV                   | PASS   |
|                | V                     | 2483.50            | 62.93                      | 30.22                     | 4.85                  | 23.98                       | 61.54                         | 74.00                 | -12.46             | PK                   | PASS   |
|                | V                     | 2483.50            | 47.59                      | 30.22                     | 4.85                  | 23.98                       | 46.20                         | 54.00                 | -7.80              | AV                   | PASS   |



|  |   |         |       |       |      |       |       |       |        |    |      |
|--|---|---------|-------|-------|------|-------|-------|-------|--------|----|------|
|  | V | 2500.00 | 60.01 | 30.22 | 4.85 | 23.98 | 58.62 | 74.00 | -15.38 | PK | PASS |
|  | V | 2500.00 | 46.95 | 30.22 | 4.85 | 23.98 | 45.56 | 54.00 | -8.44  | AV | PASS |

**Remark:**

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

## 6. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

|                   |                                              |
|-------------------|----------------------------------------------|
| Test Requirement: | FCC Part15 C Section 15.247 (d), RSS-247 5.5 |
| Test Method:      | ANSI C63.10                                  |

### 6.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

According to RSS-247§5.5 and RSS-Gen§8.9, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) or RSS-Gen is not required.

### 6.2 Test Setup



### 6.3 Test procedure

Using the following spectrum analyzer setting:

- A) Set the RBW = 100KHz.
- B) Set the VBW = 300KHz.
- C) Sweep time = auto couple.
- D) Detector function = peak.
- E) Trace mode = max hold.
- F) Allow trace to fully stabilize.

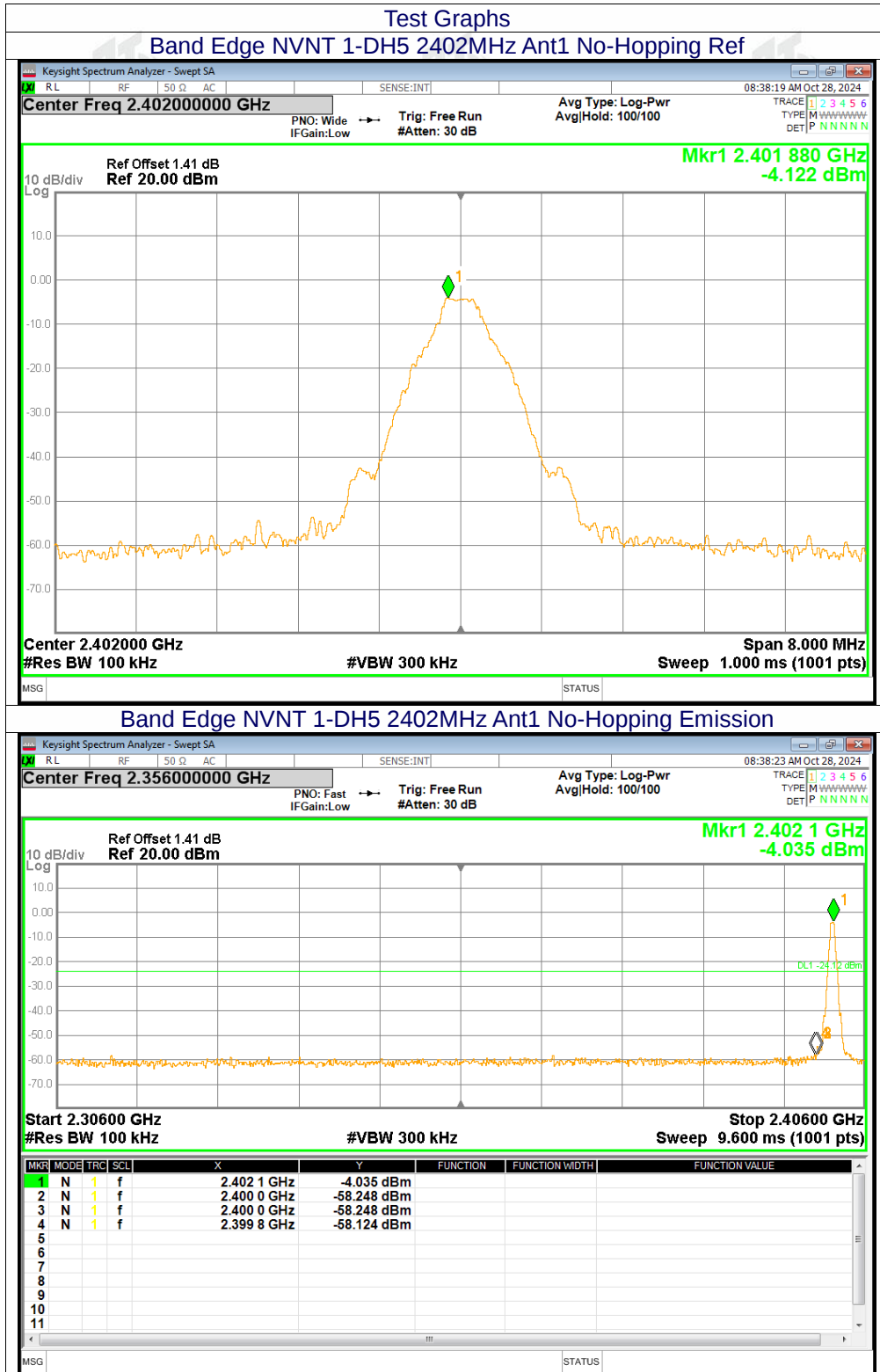
### 6.4 DEVIATION FROM STANDARD

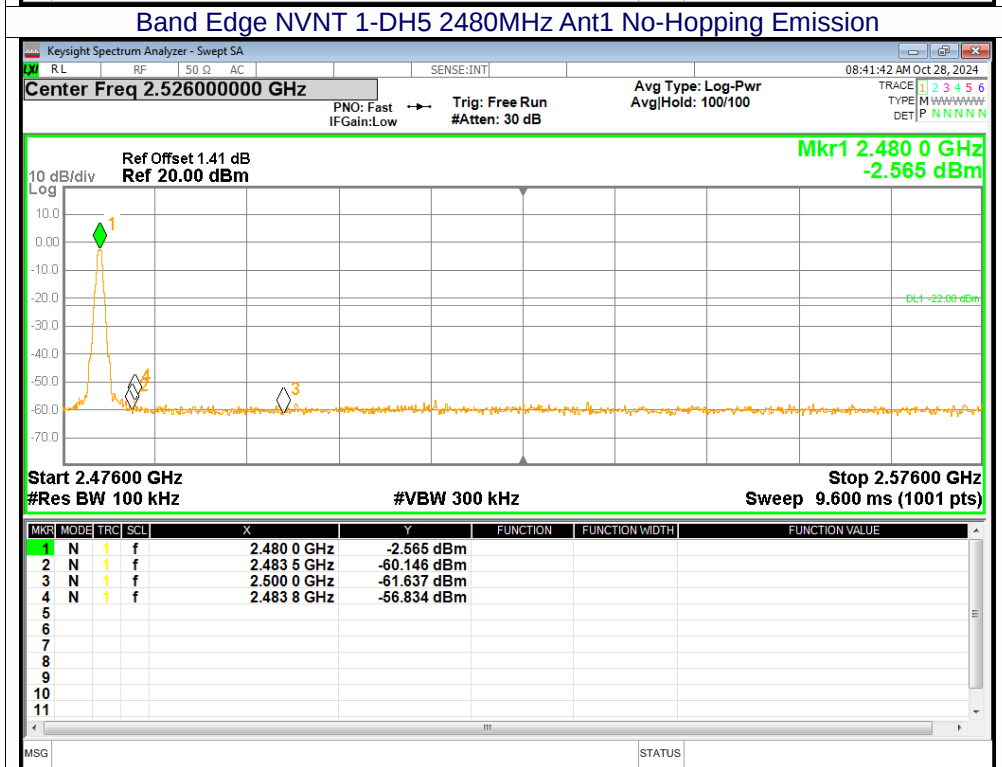
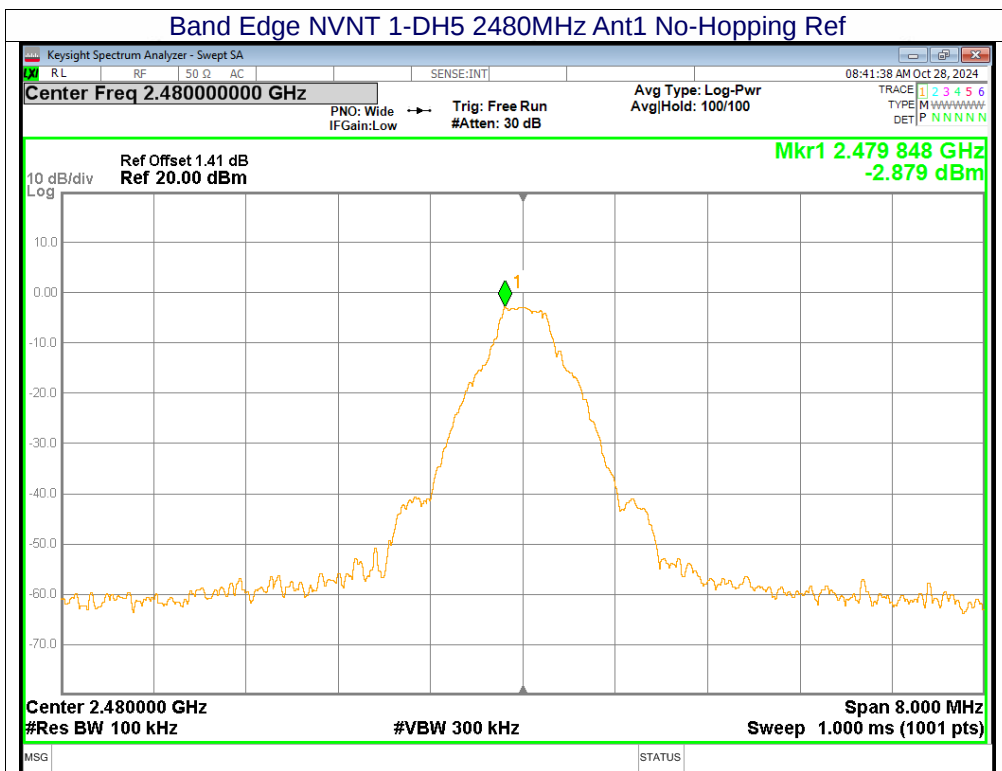
No deviation.

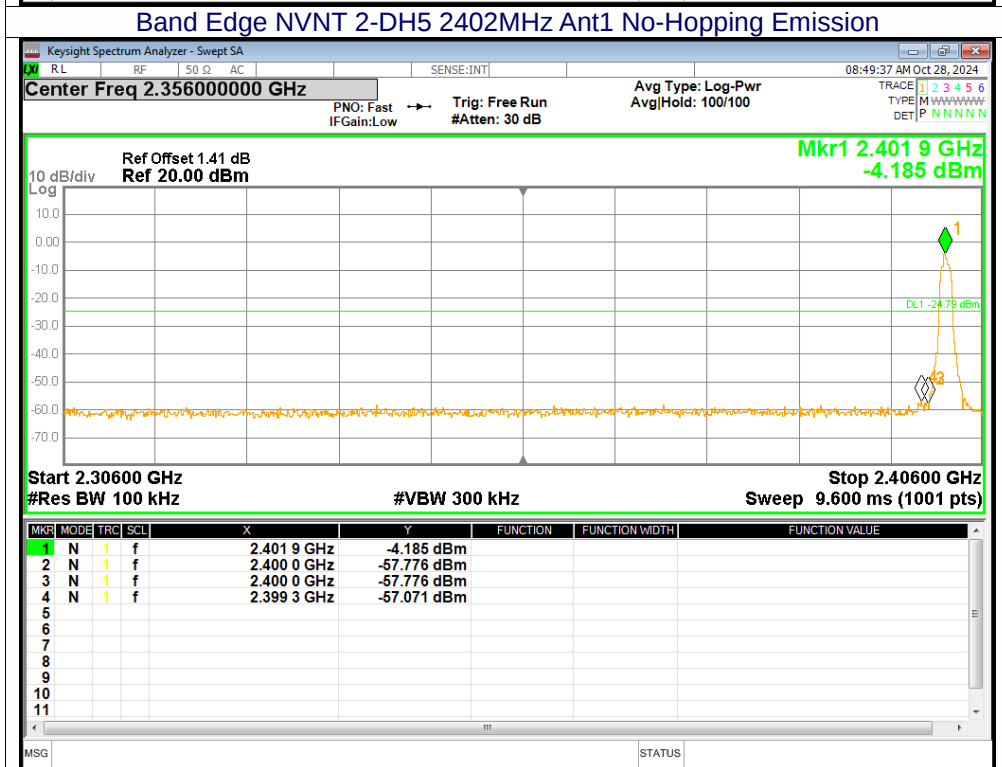
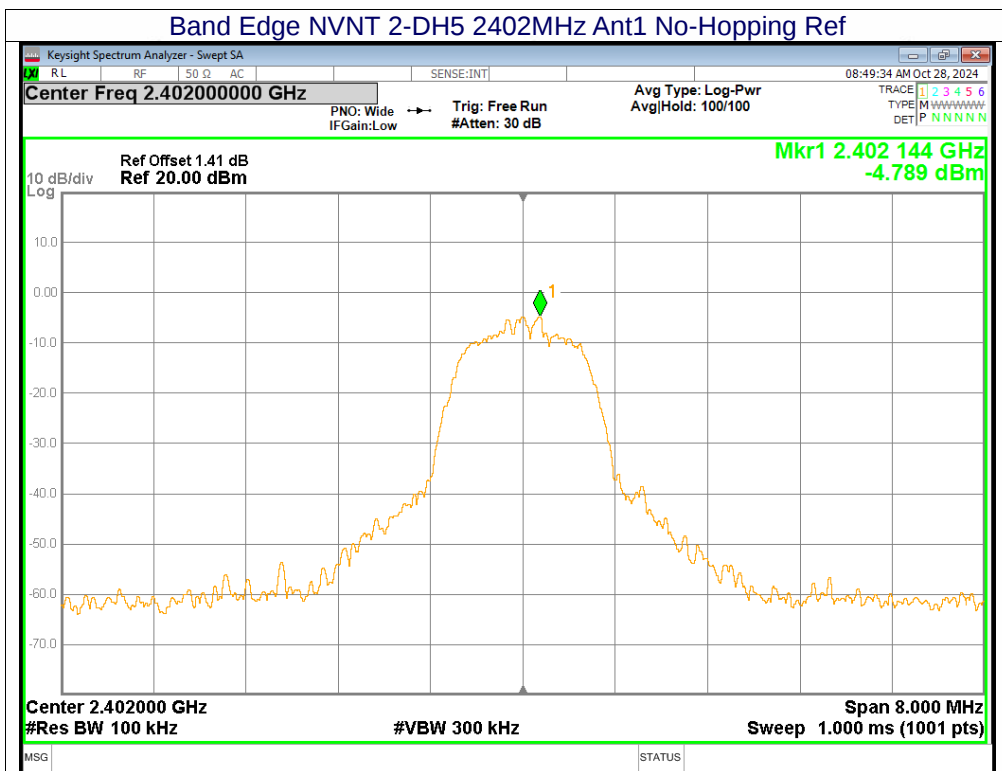
## 6.5 Test Result

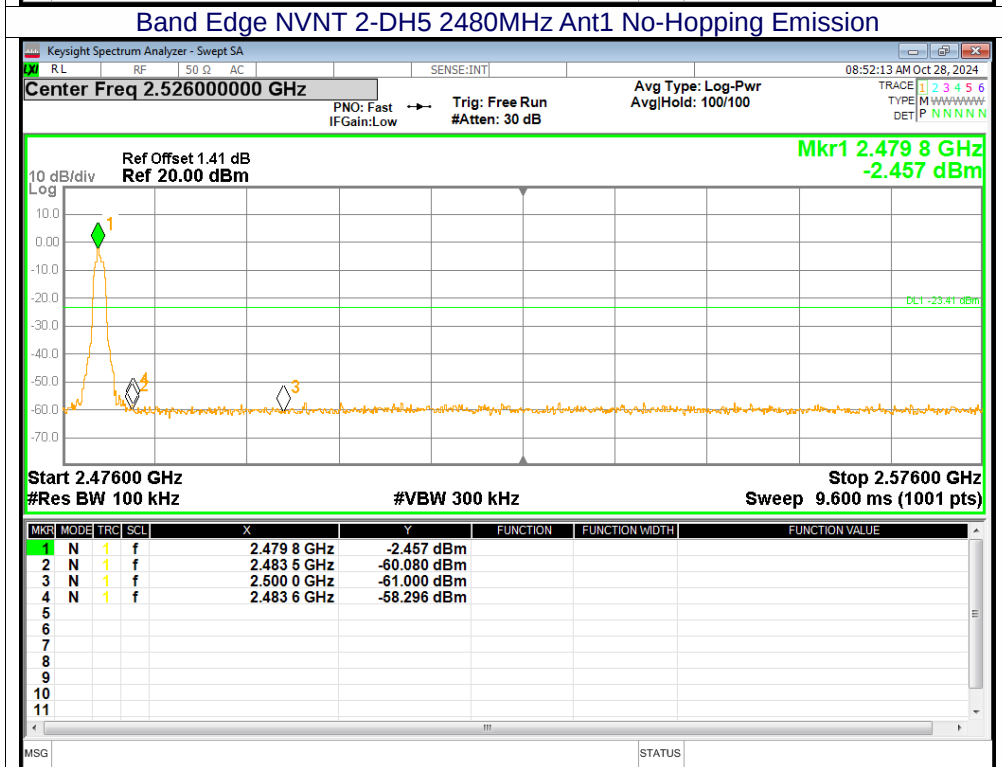
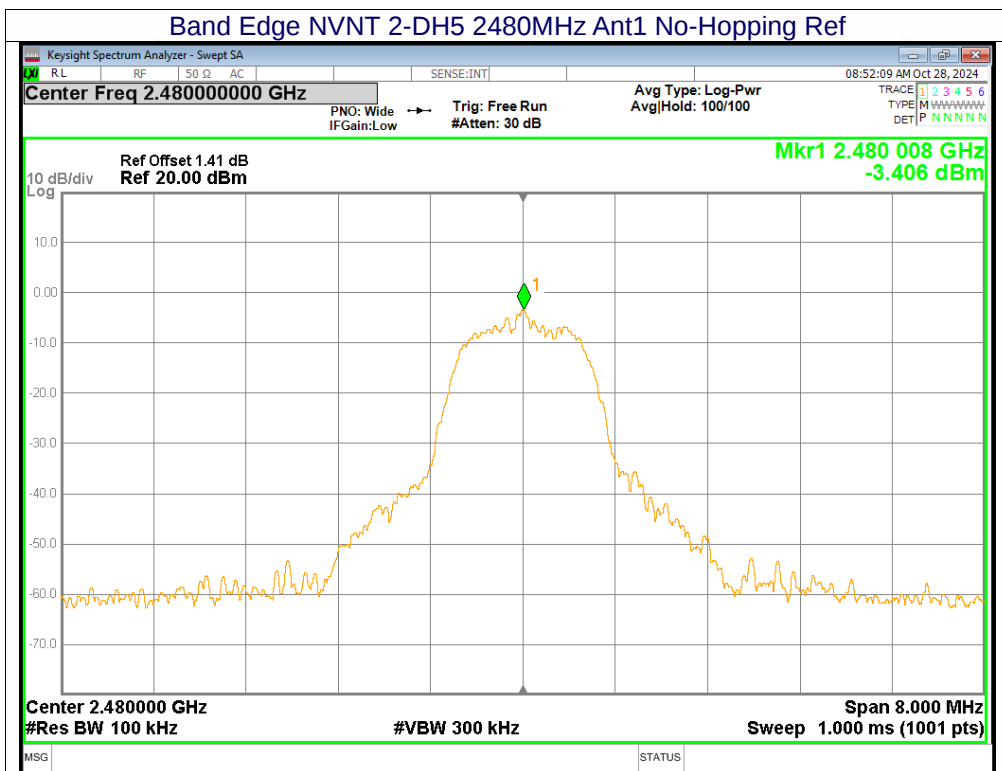
## Band Edge

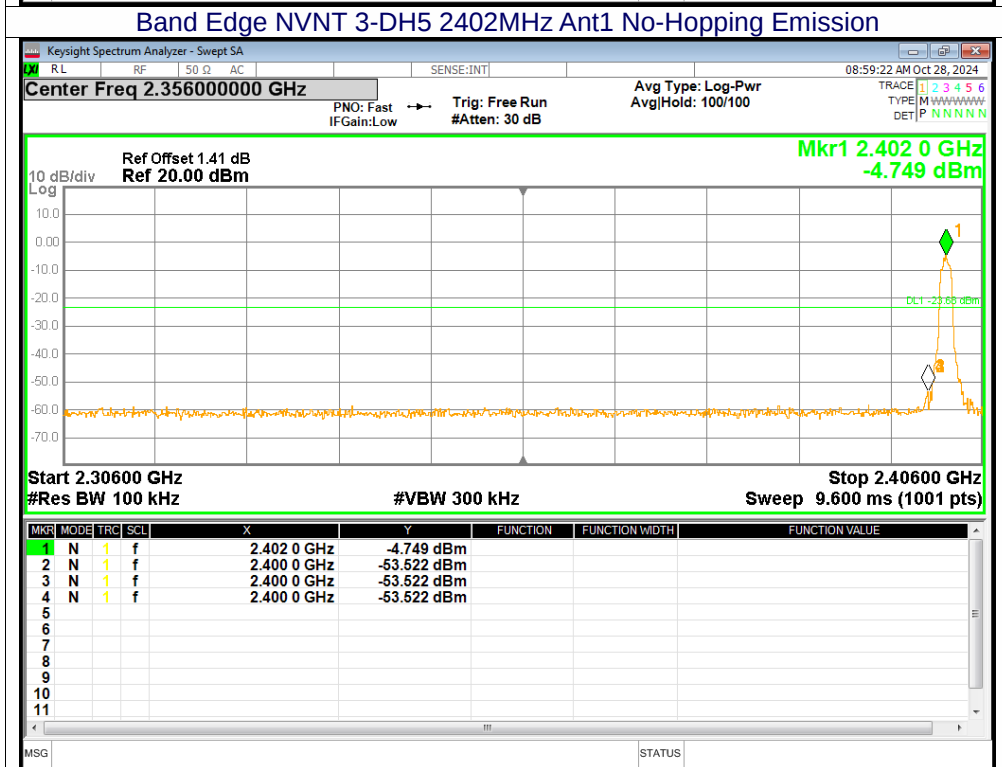
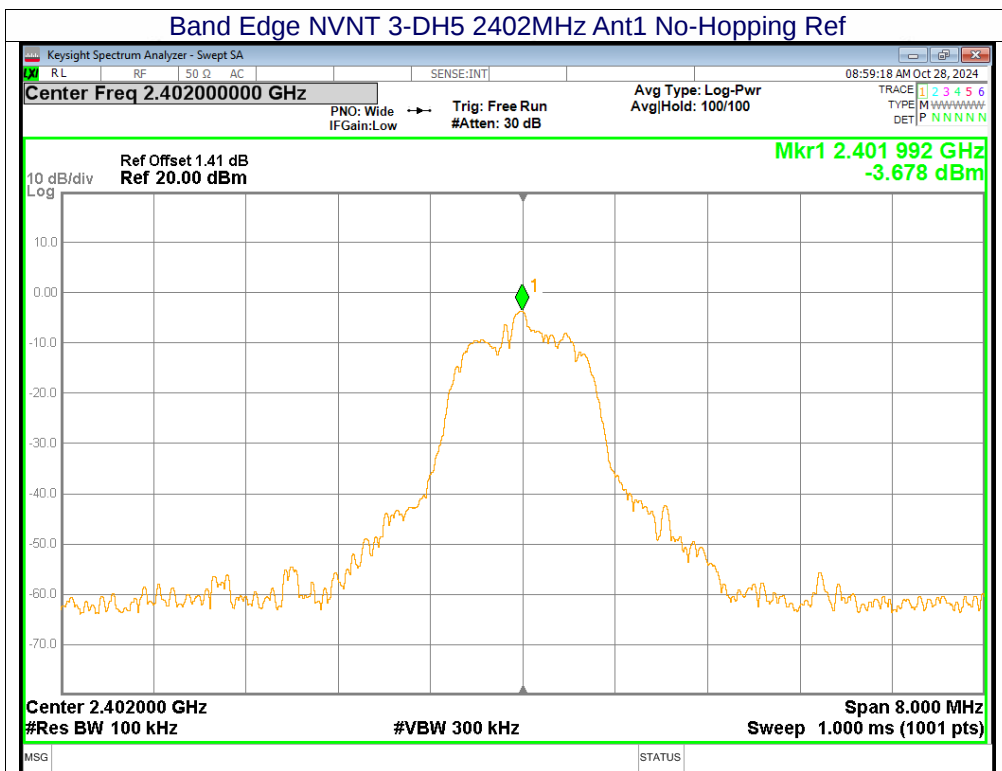
| Mode  | Frequency (MHz) | Hopping Mode | Max Value (dBc) | Limit (dBc) | Verdict |
|-------|-----------------|--------------|-----------------|-------------|---------|
| 1-DH5 | 2402            | No-Hopping   | -54             | -20         | Pass    |
| 1-DH5 | 2480            | No-Hopping   | -53.95          | -20         | Pass    |
| 2-DH5 | 2402            | No-Hopping   | -52.28          | -20         | Pass    |
| 2-DH5 | 2480            | No-Hopping   | -54.88          | -20         | Pass    |
| 3-DH5 | 2402            | No-Hopping   | -49.84          | -20         | Pass    |
| 3-DH5 | 2480            | No-Hopping   | -53.96          | -20         | Pass    |

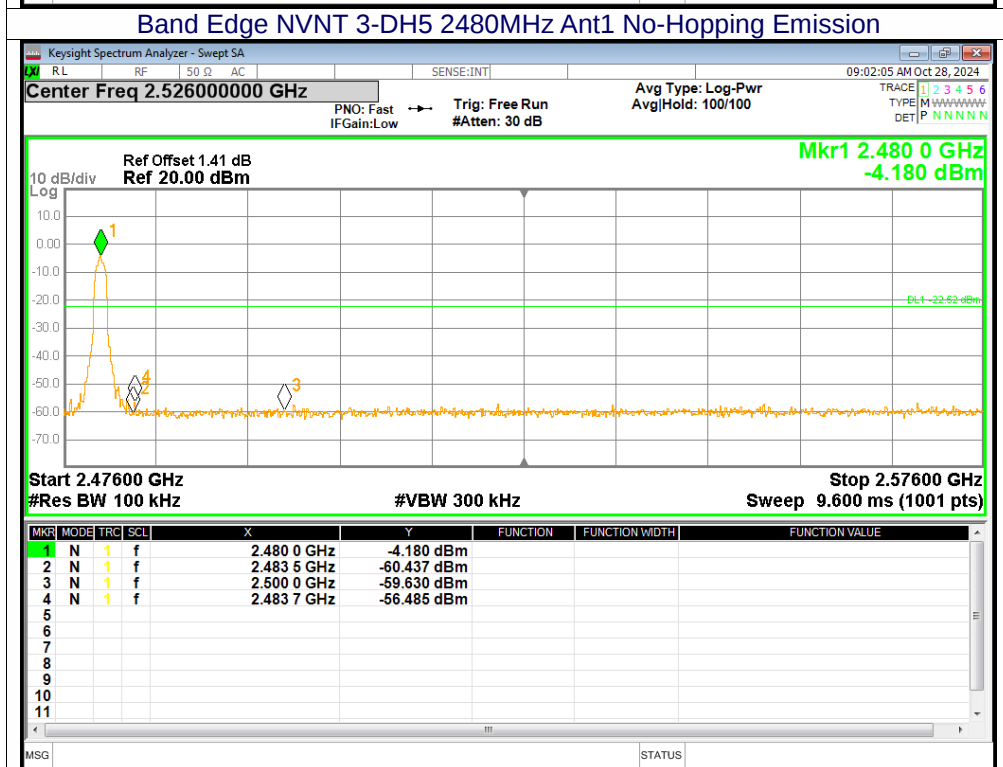
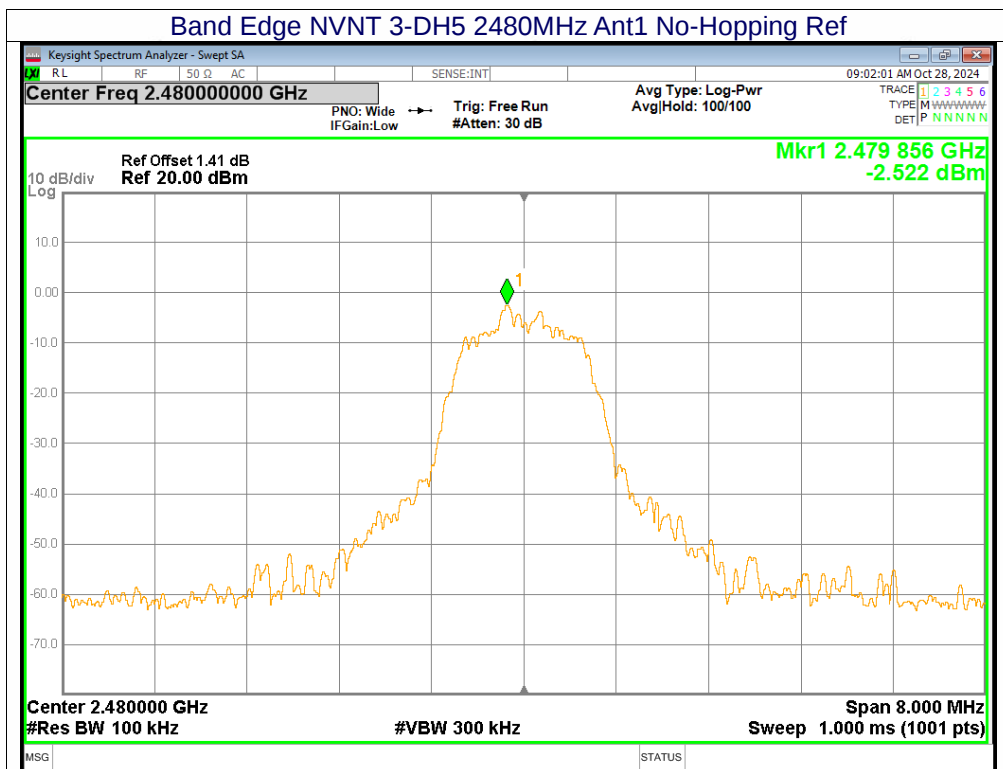










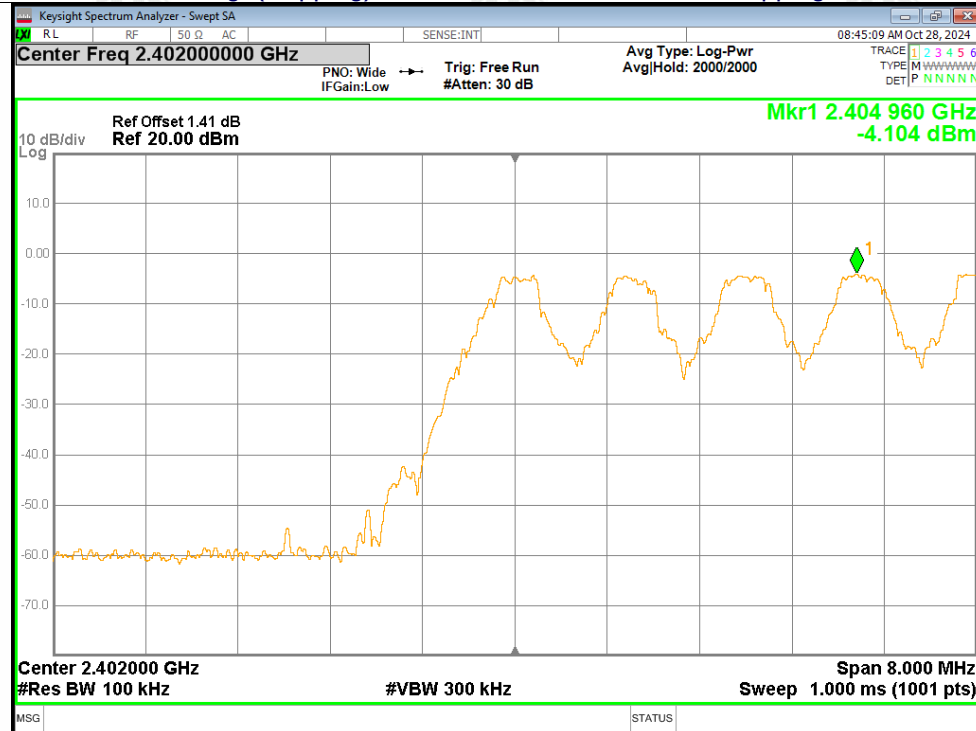


**Band Edge(Hopping)**

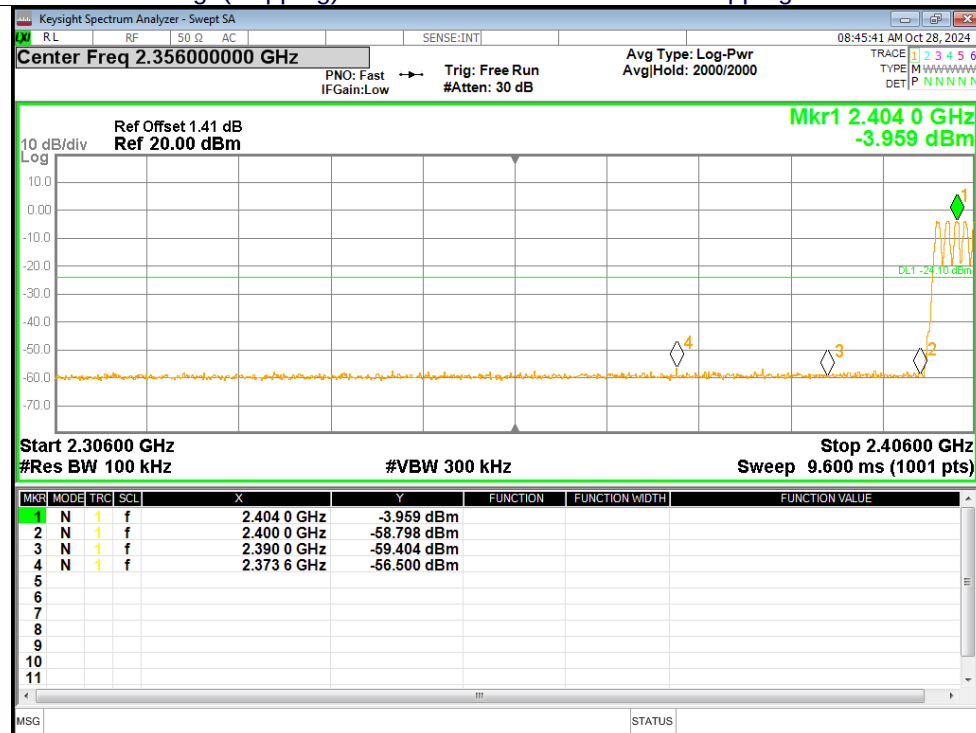
| Mode  | Frequency (MHz) | Hopping Mode | Max Value (dBc) | Limit (dBc) | Verdict |
|-------|-----------------|--------------|-----------------|-------------|---------|
| 1-DH5 | 2402            | Hopping      | -52.4           | -20         | Pass    |
| 1-DH5 | 2480            | Hopping      | -53.63          | -20         | Pass    |
| 2-DH5 | 2402            | Hopping      | -51.53          | -20         | Pass    |
| 2-DH5 | 2480            | Hopping      | -53.07          | -20         | Pass    |
| 3-DH5 | 2402            | Hopping      | -53.51          | -20         | Pass    |
| 3-DH5 | 2480            | Hopping      | -55.09          | -20         | Pass    |

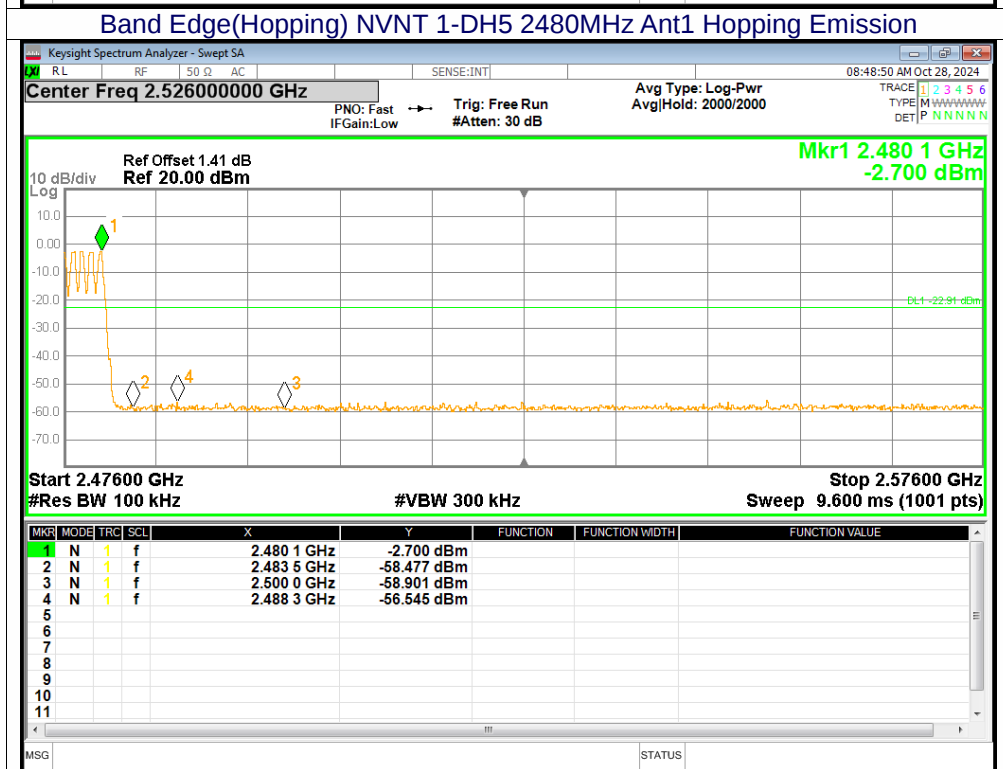
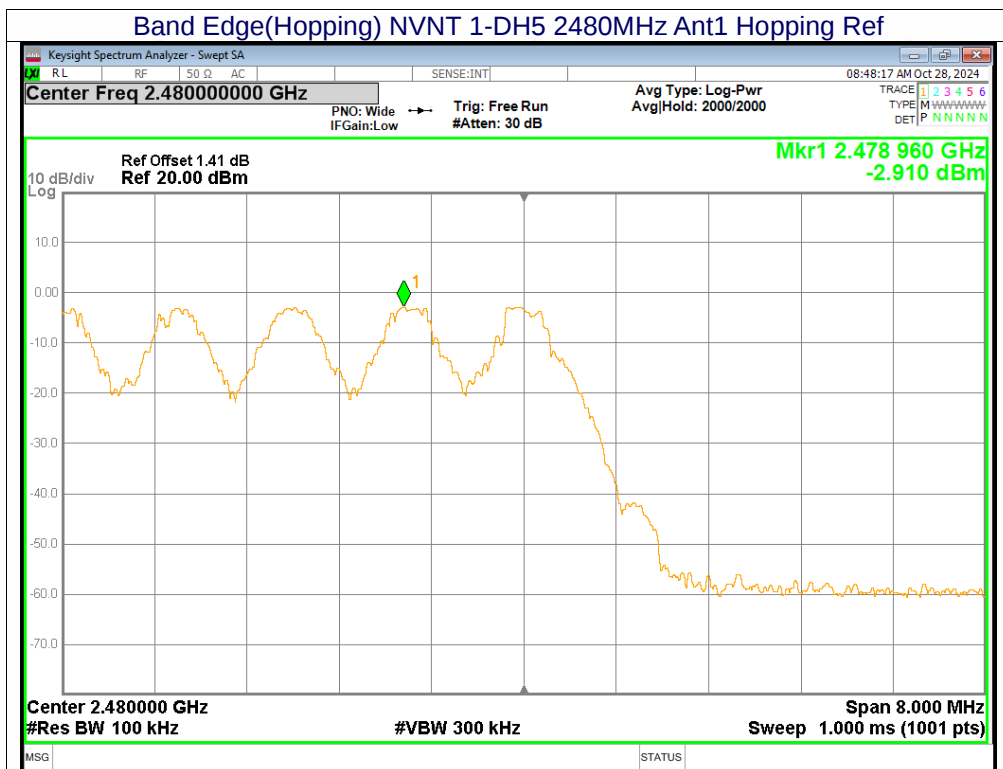
### Test Graphs

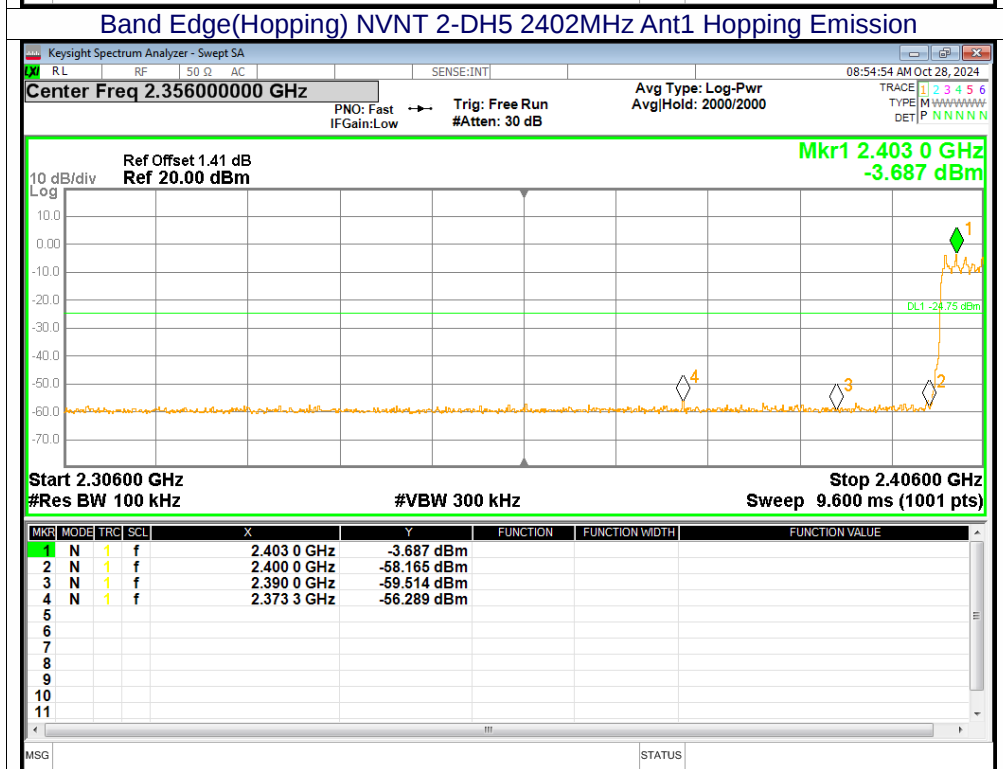
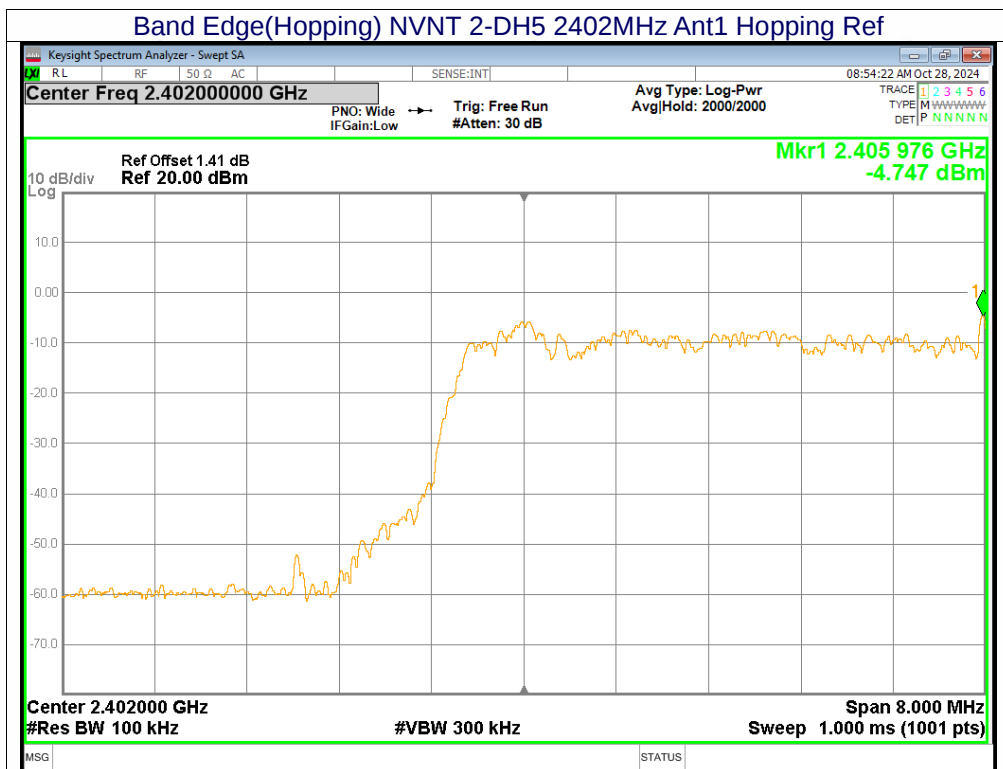
#### Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref

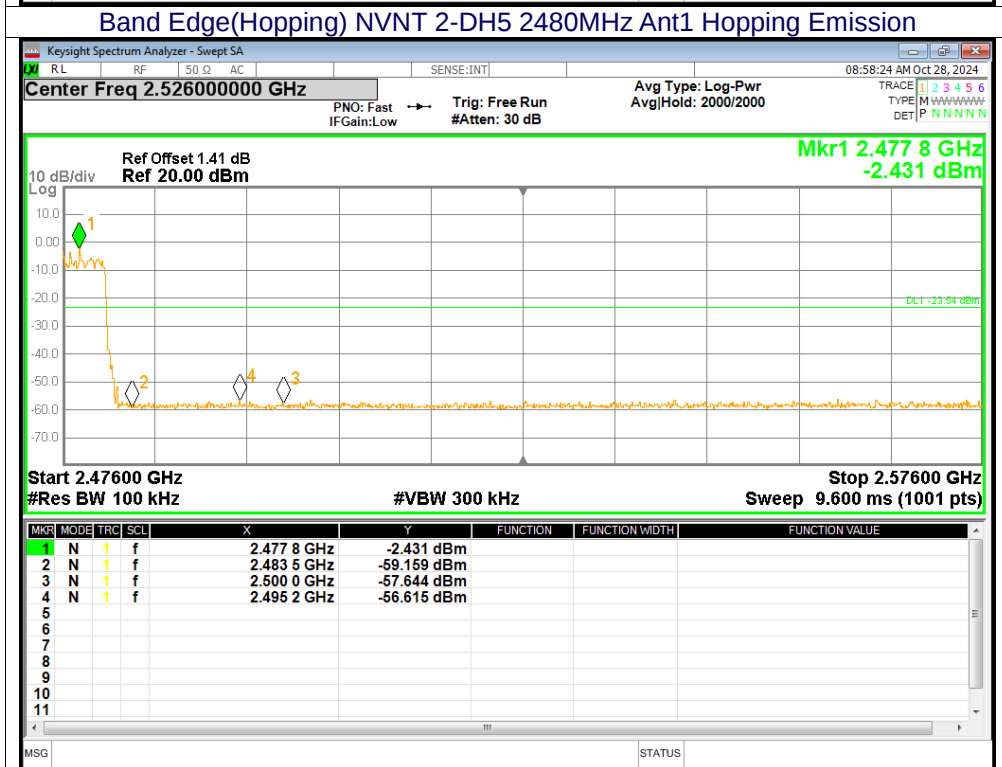
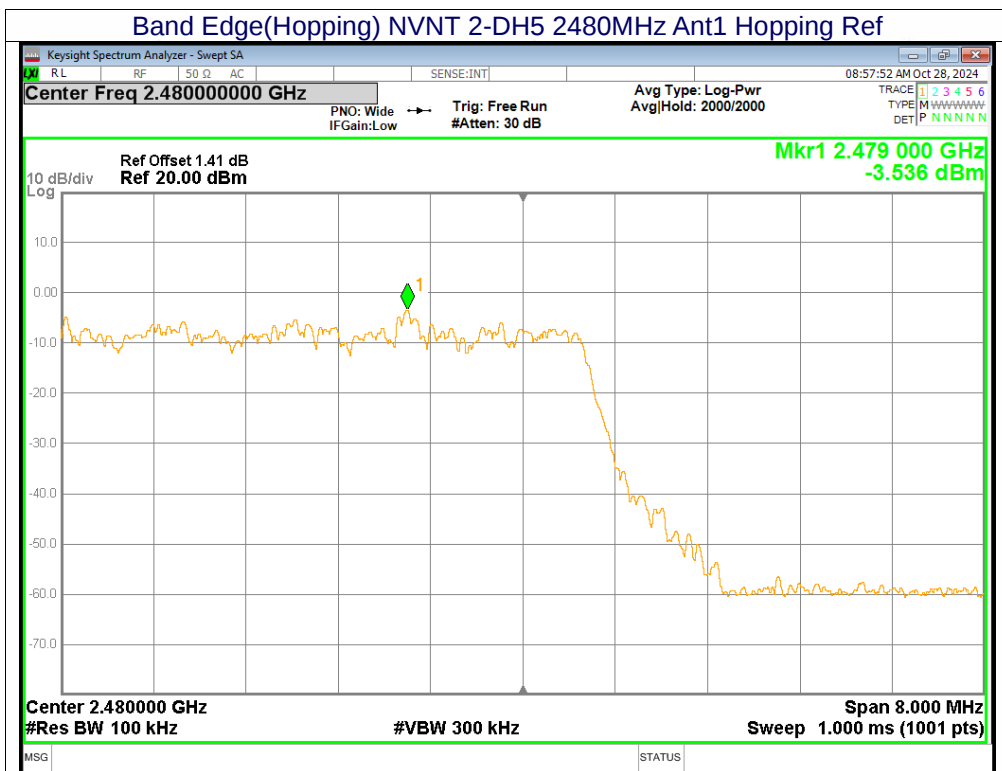


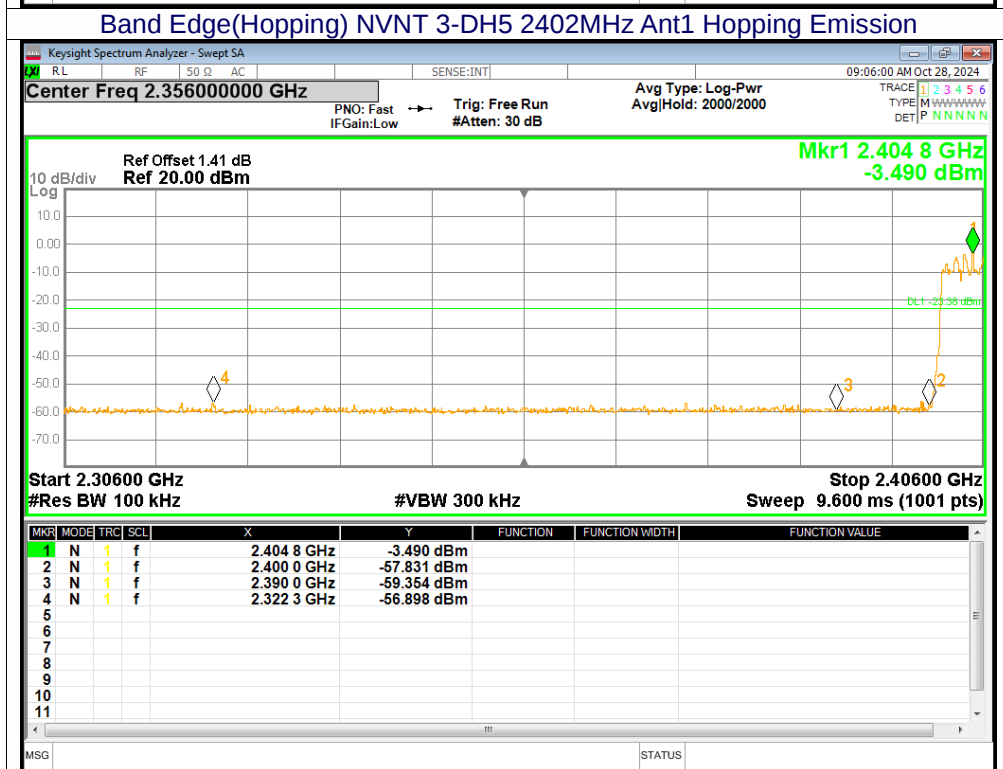
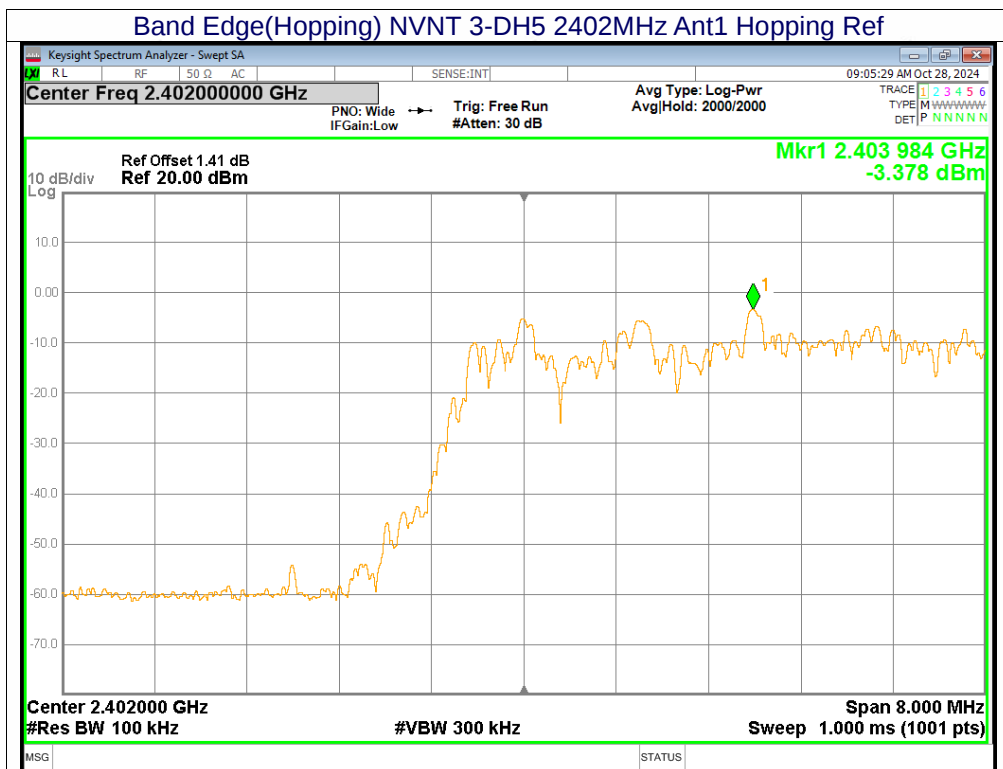
#### Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission

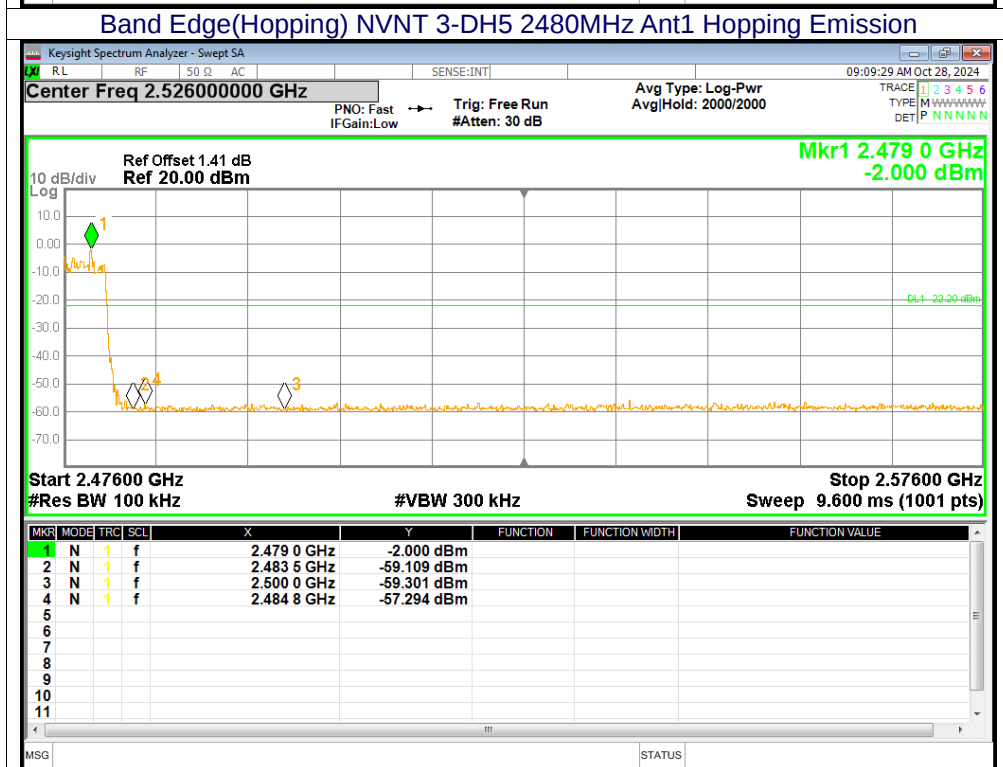
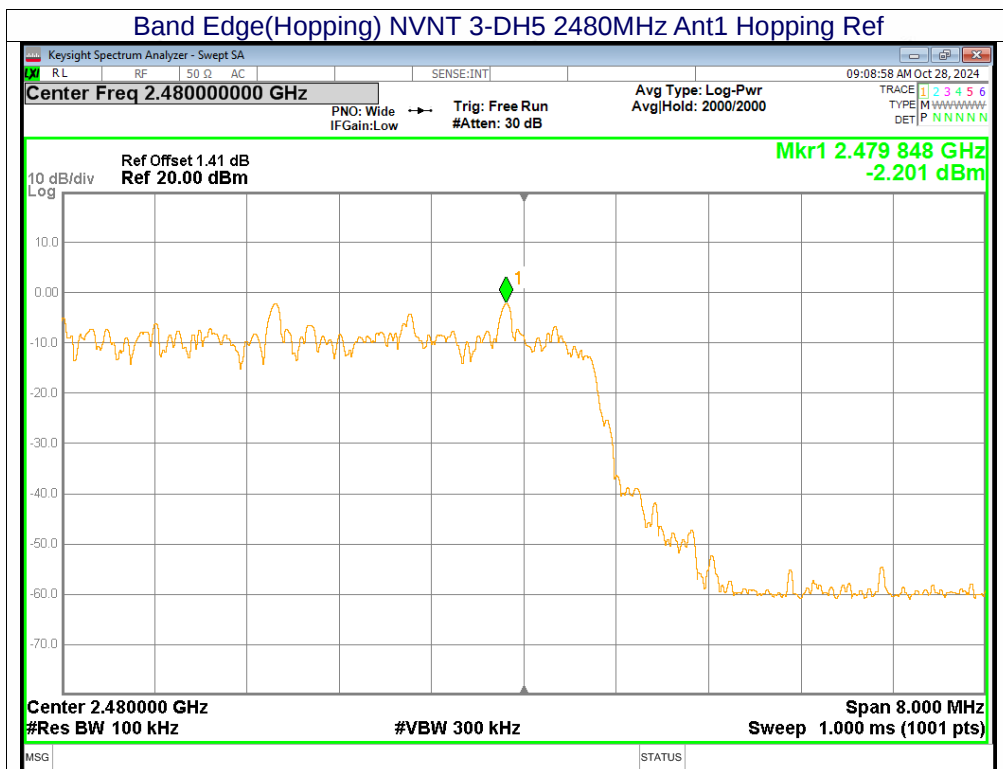












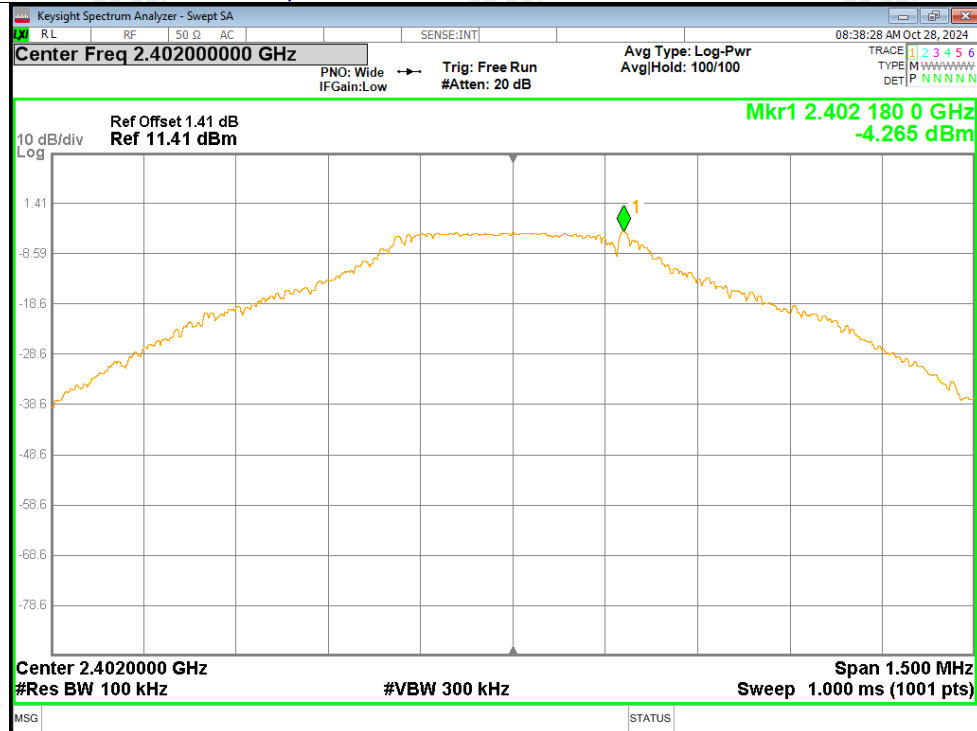


## Conducted RF Spurious Emission

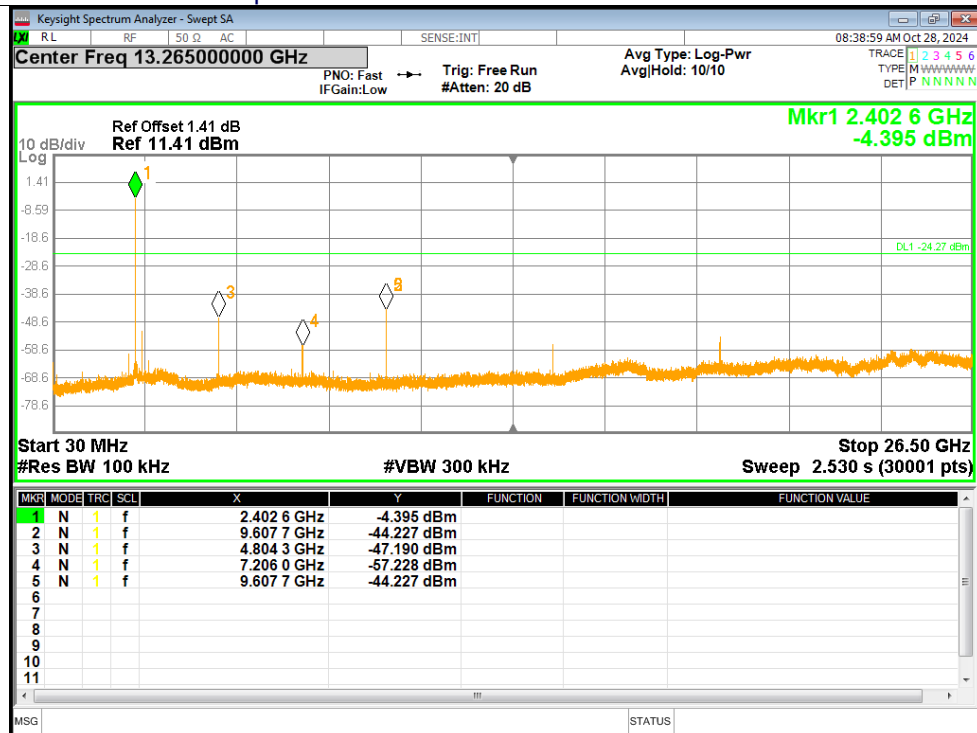
| Mode  | Frequency (MHz) | Max Value (dBc) | Limit (dBc) | Verdict |
|-------|-----------------|-----------------|-------------|---------|
| 1-DH5 | 2402            | -39.96          | -20         | Pass    |
| 1-DH5 | 2441            | -38.35          | -20         | Pass    |
| 1-DH5 | 2480            | -34.66          | -20         | Pass    |
| 2-DH5 | 2402            | -39.39          | -20         | Pass    |
| 2-DH5 | 2441            | -37.93          | -20         | Pass    |
| 2-DH5 | 2480            | -35.05          | -20         | Pass    |
| 3-DH5 | 2402            | -39.93          | -20         | Pass    |
| 3-DH5 | 2441            | -38.59          | -20         | Pass    |
| 3-DH5 | 2480            | -35.17          | -20         | Pass    |

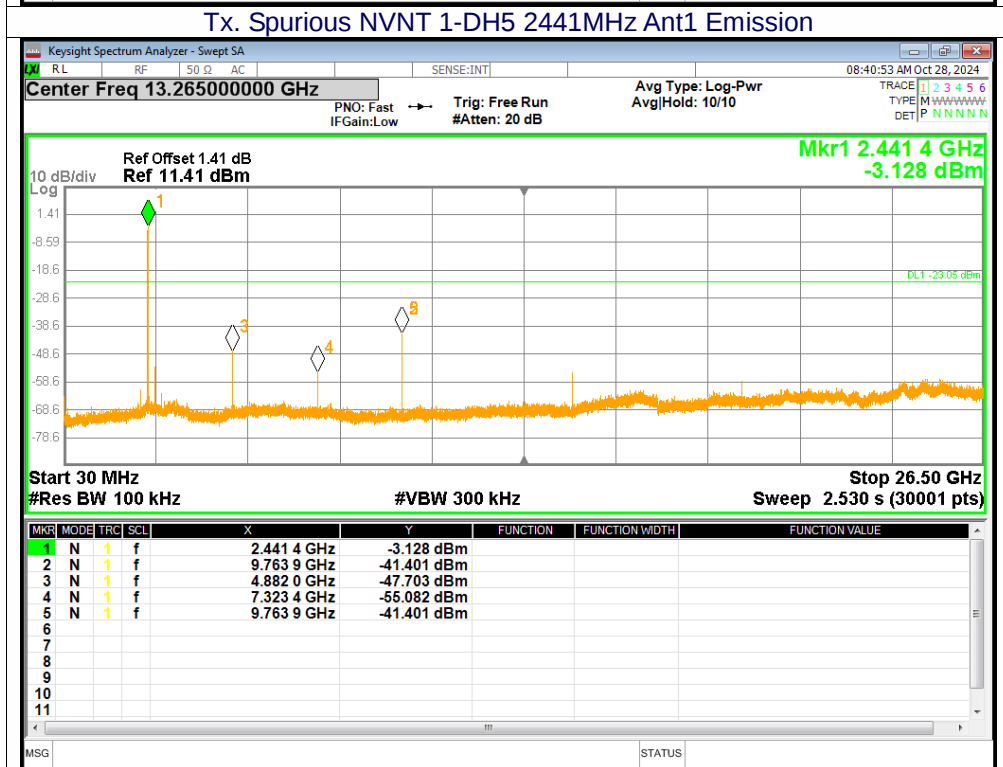
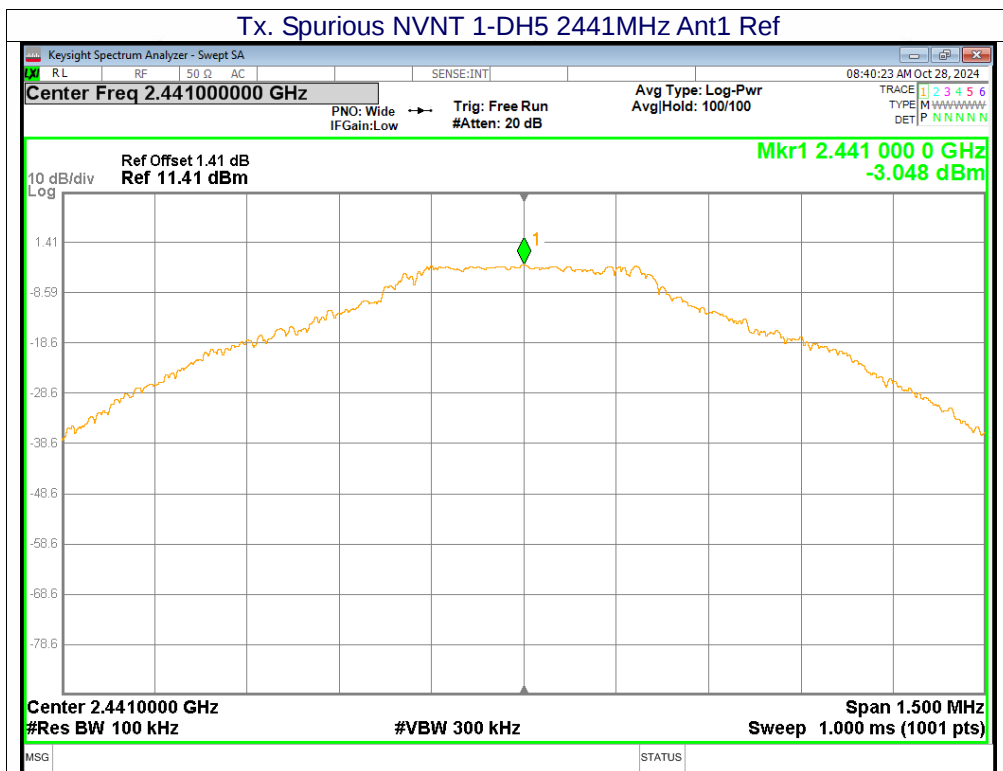
### Test Graphs

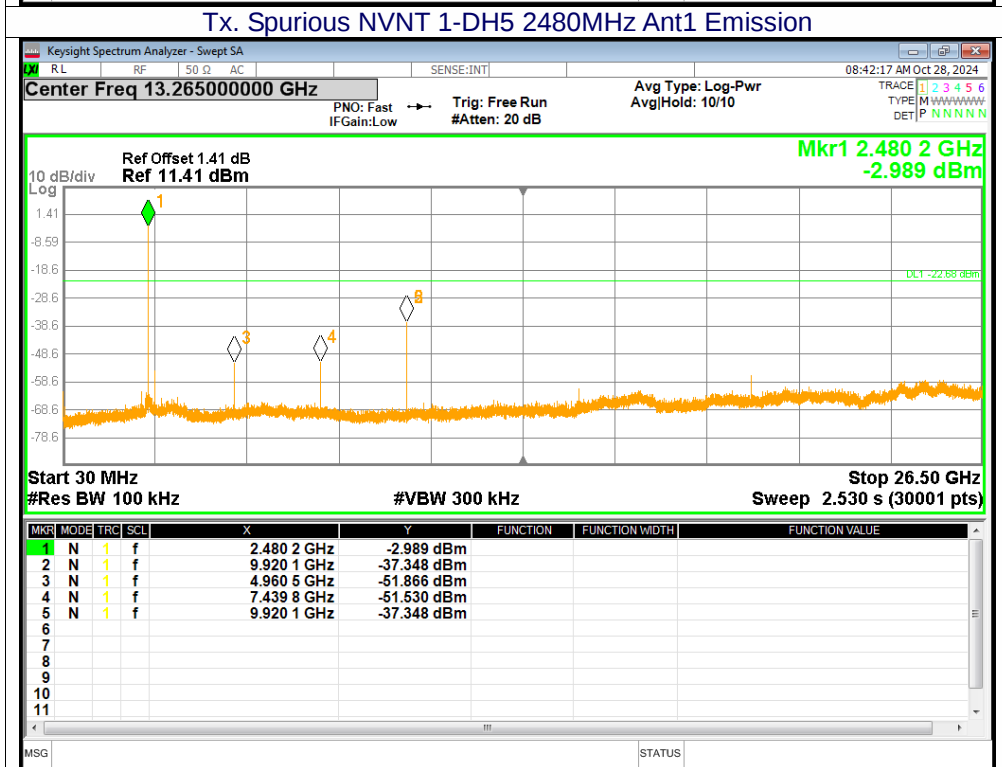
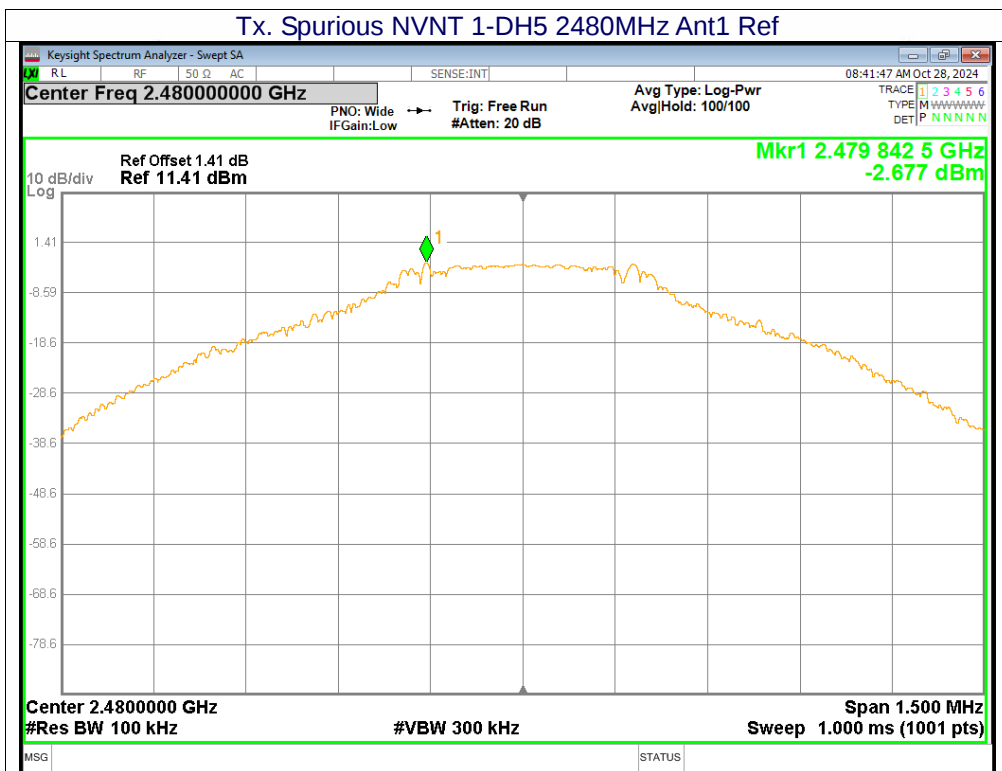
#### Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Ref

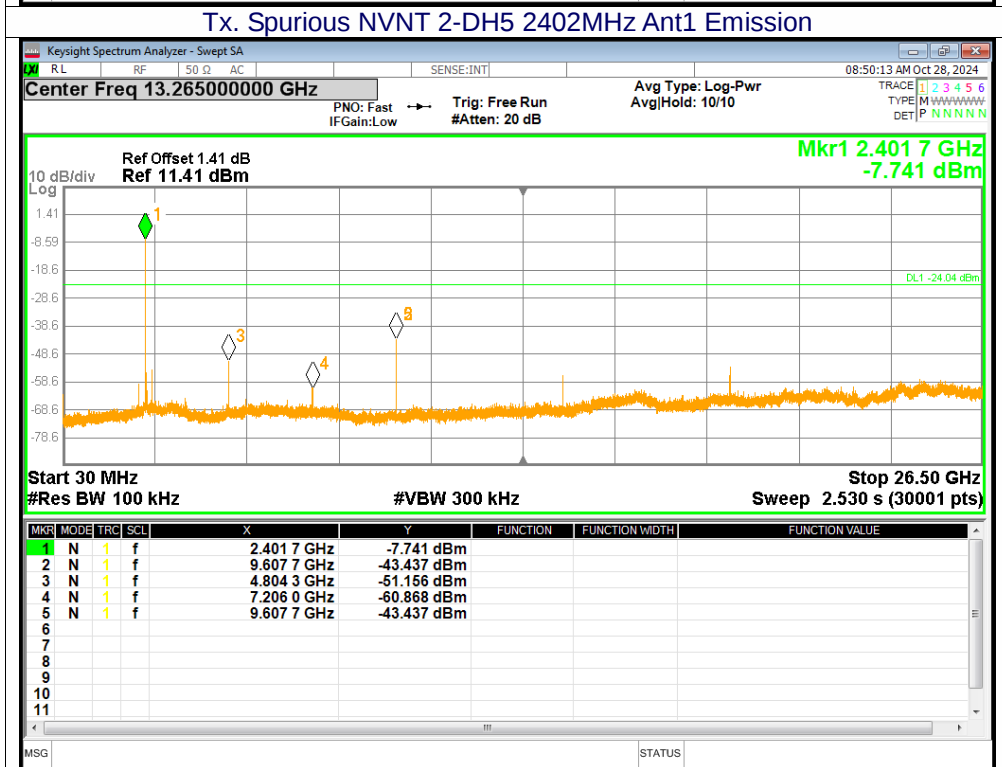
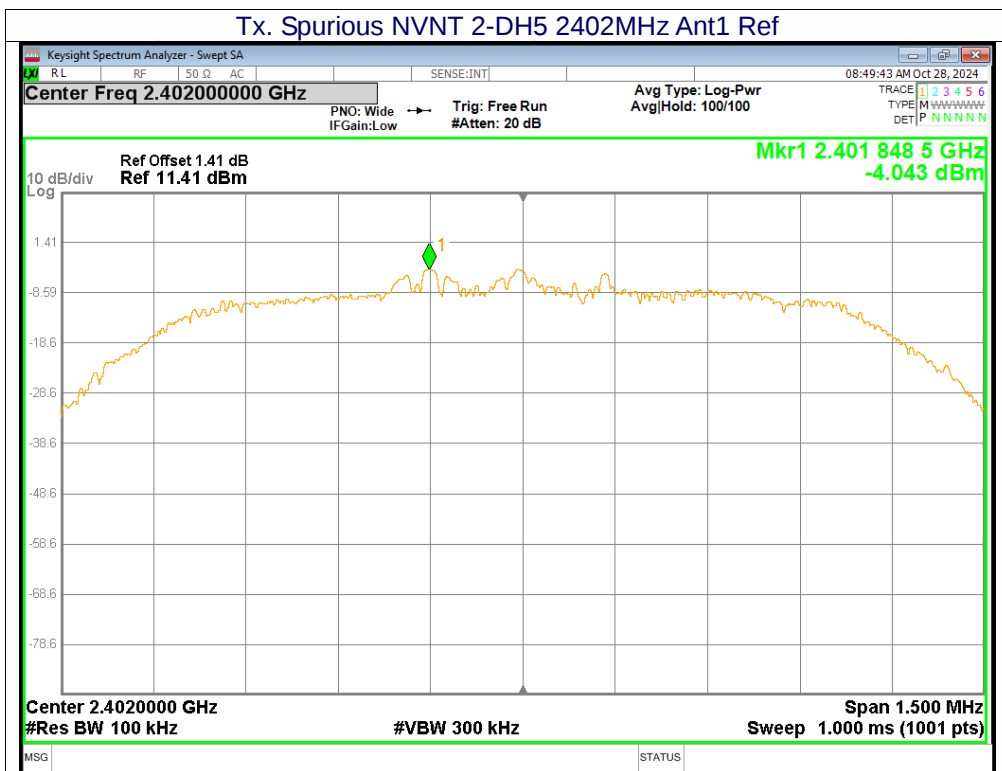


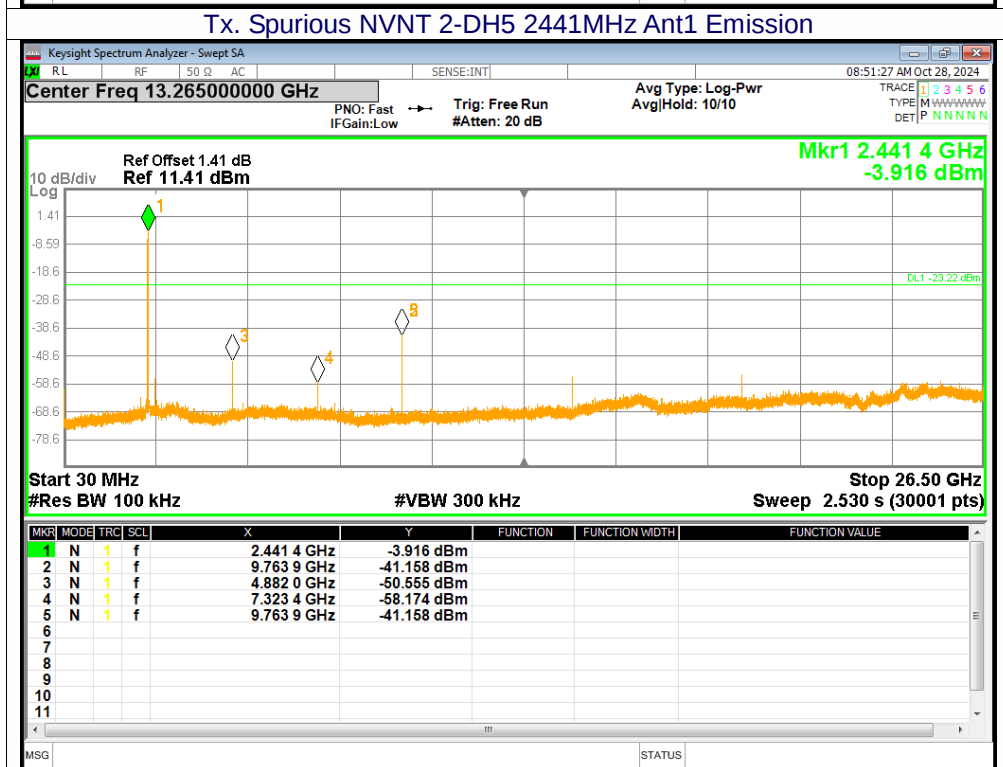
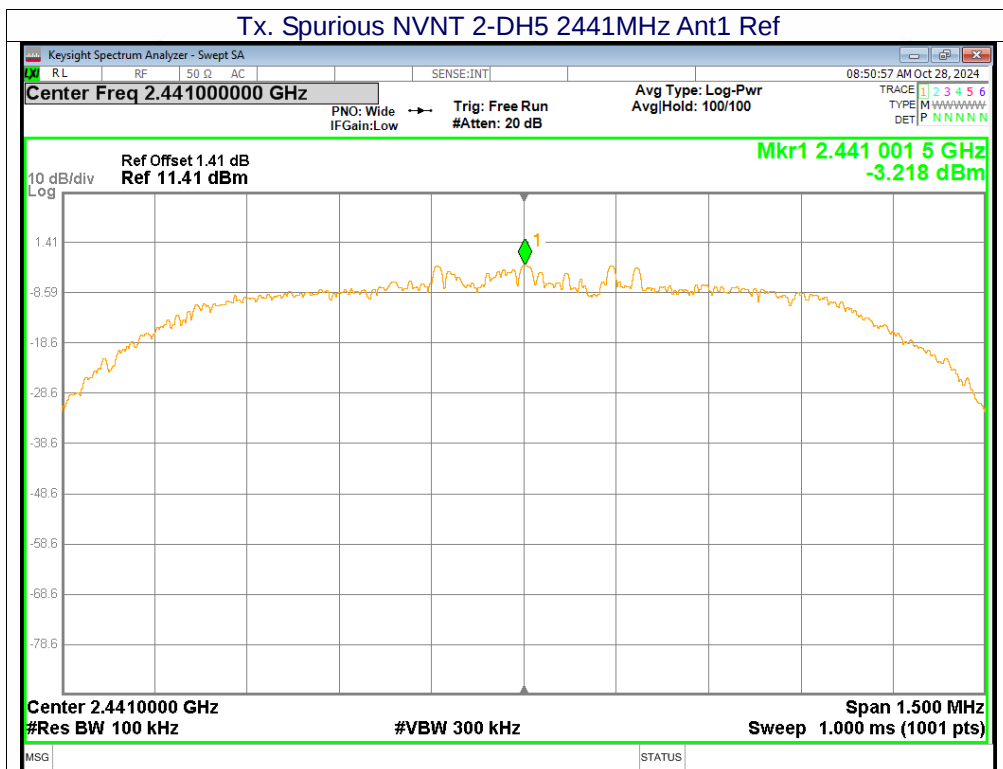
#### Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Emission

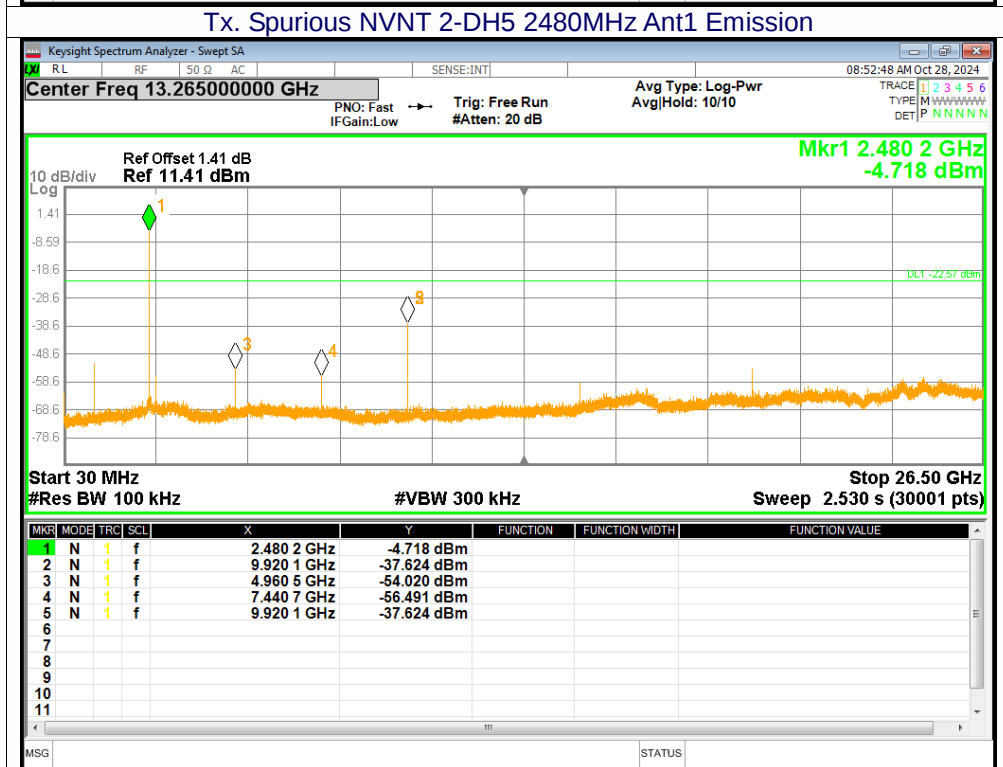
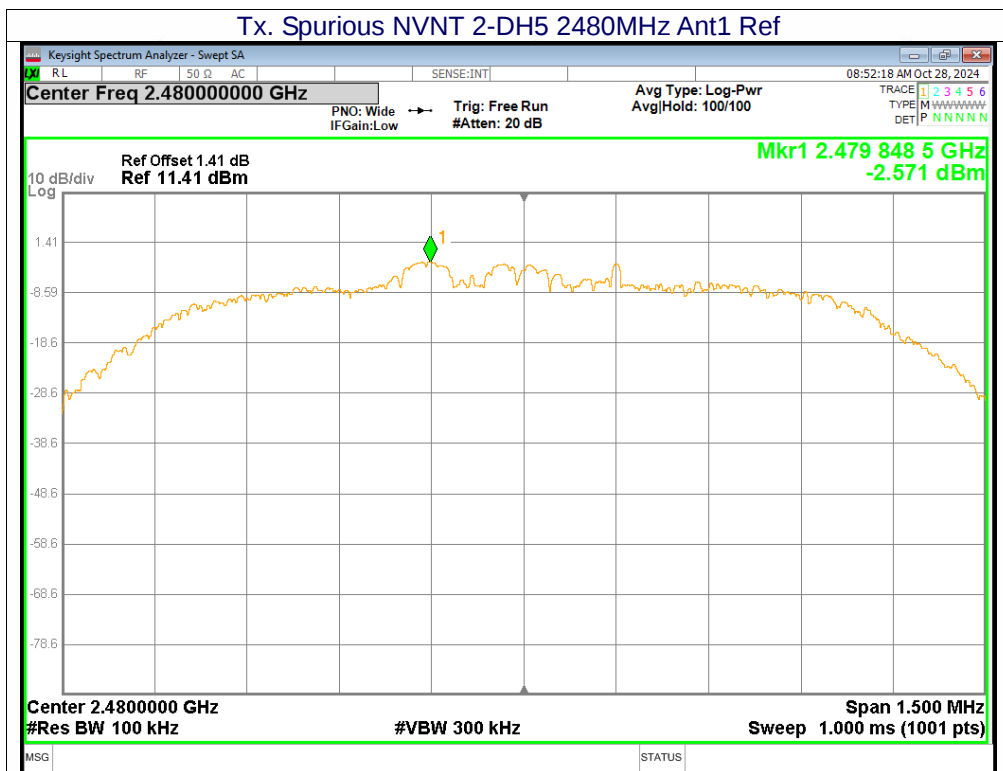


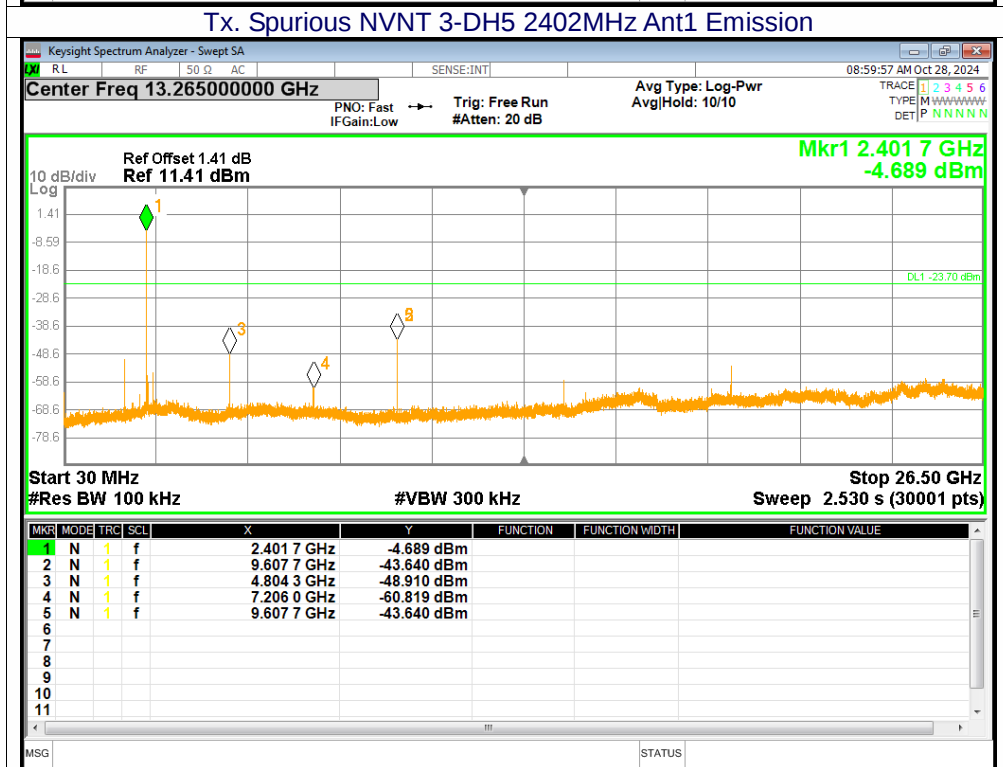
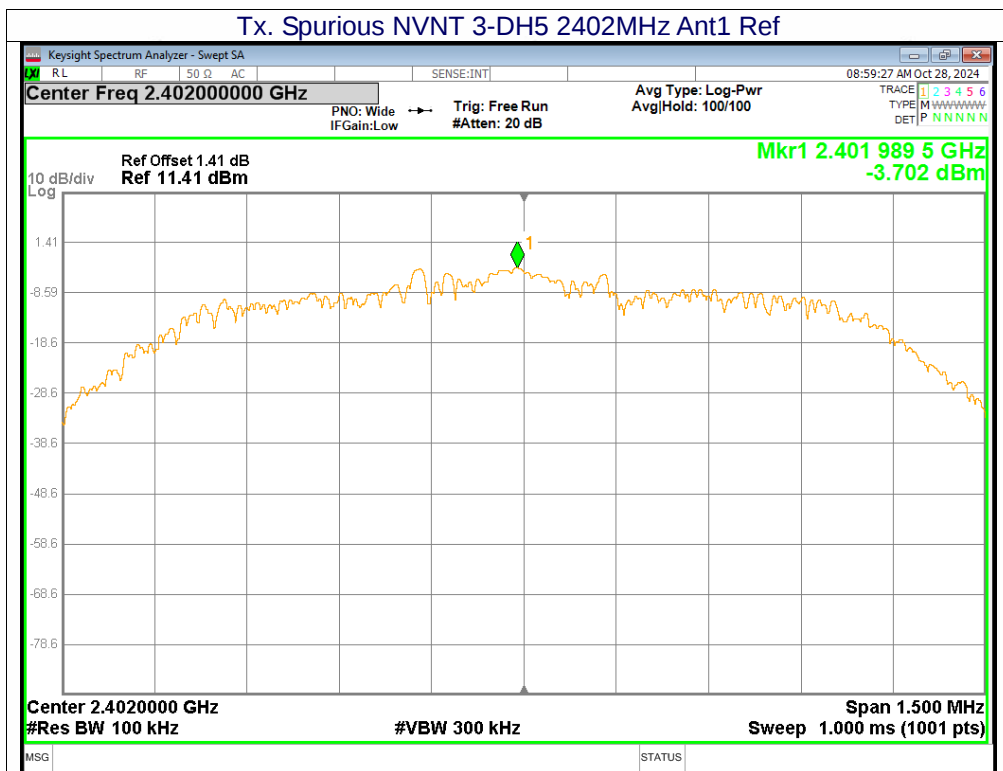


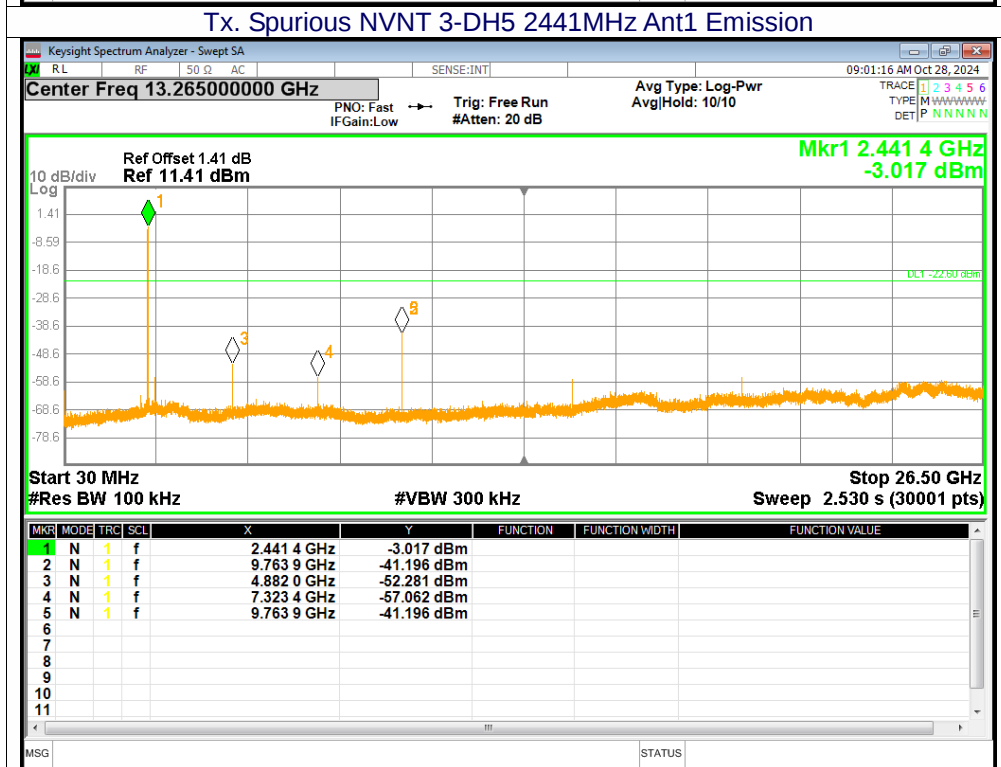
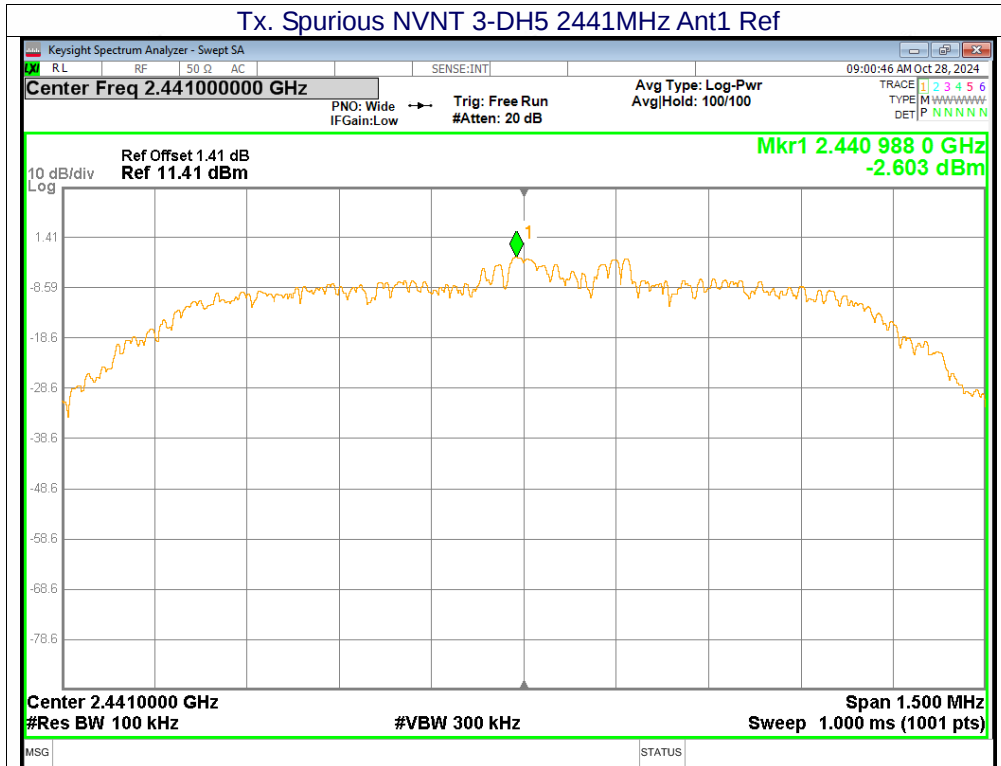


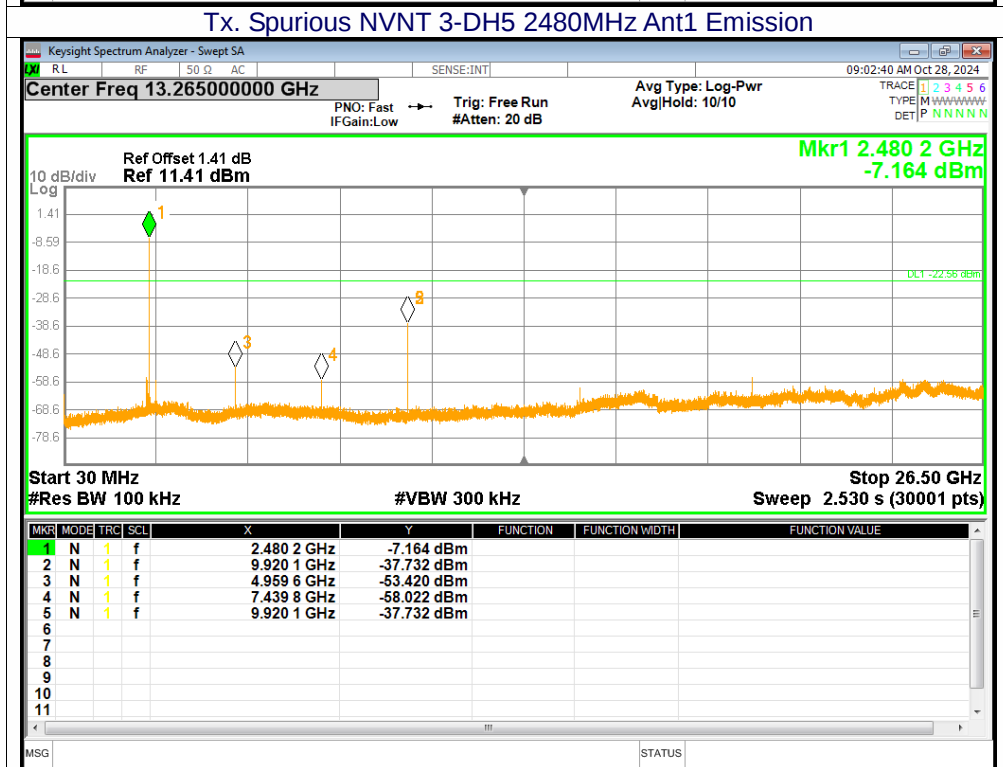
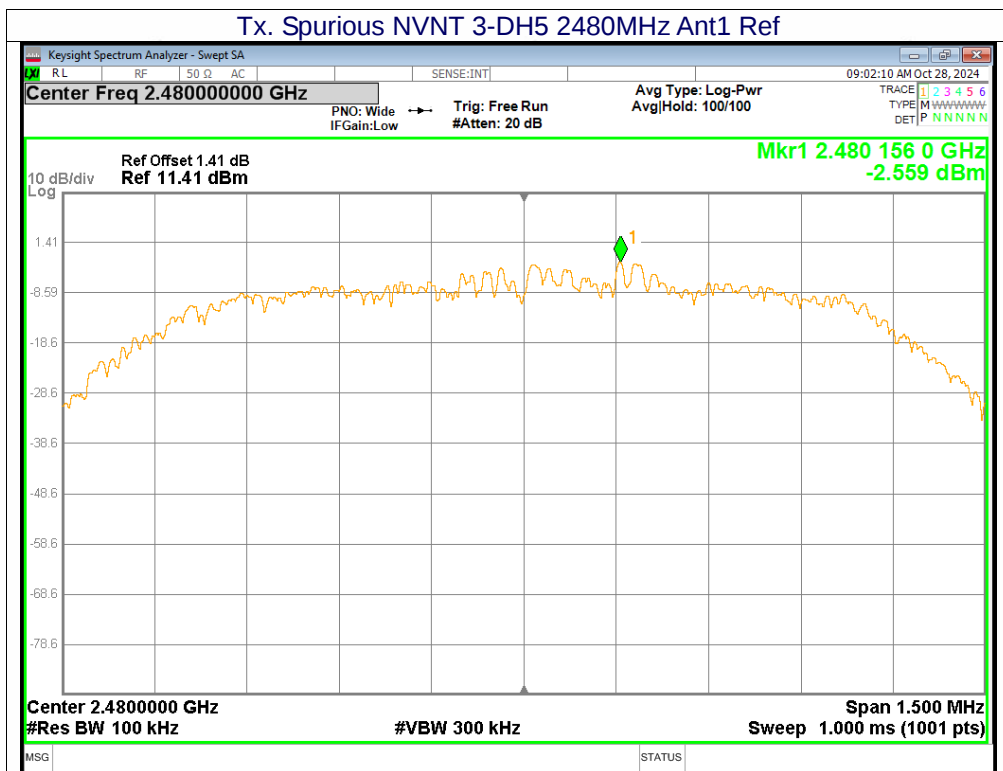












**7. 20DB&99% BANDWIDTH**

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

**7.1 Test Setup****7.2 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.

**7.3 Test procedure**

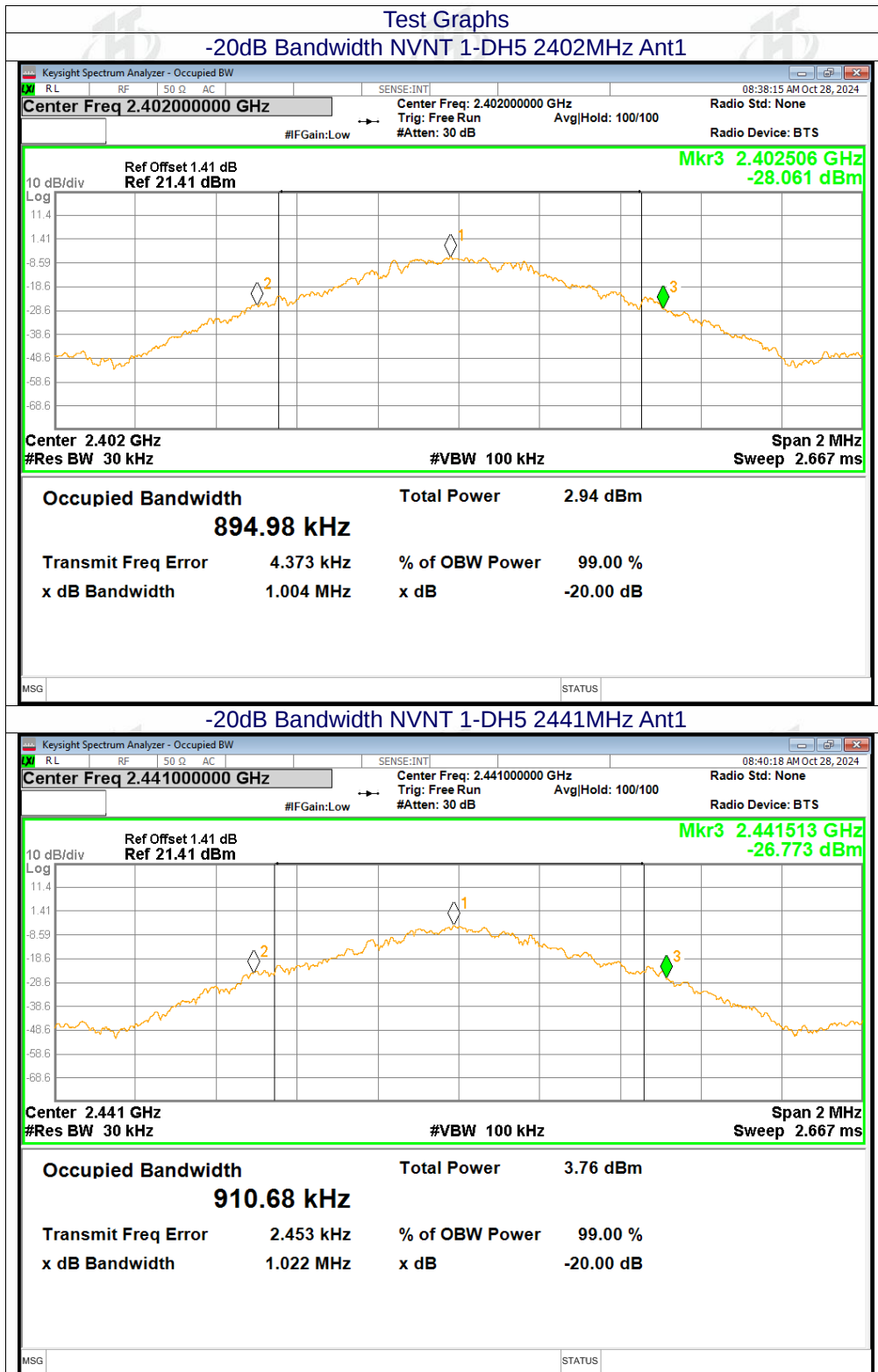
1. Set RBW = 30 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude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

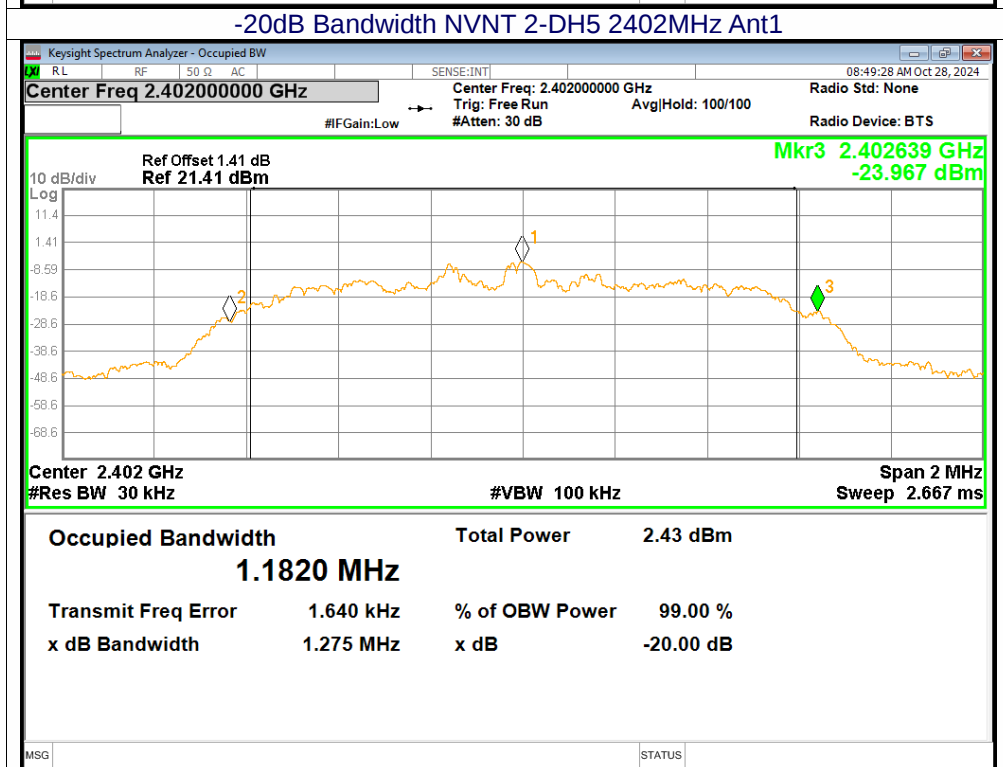
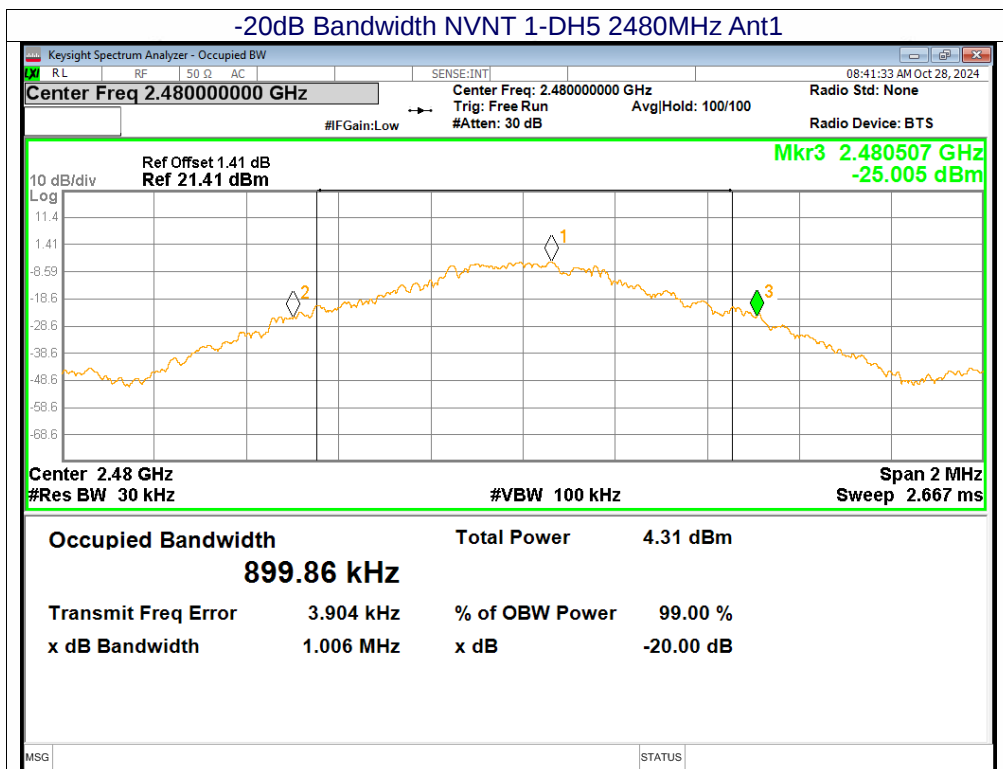
**7.4 DEVIATION FROM STANDARD**

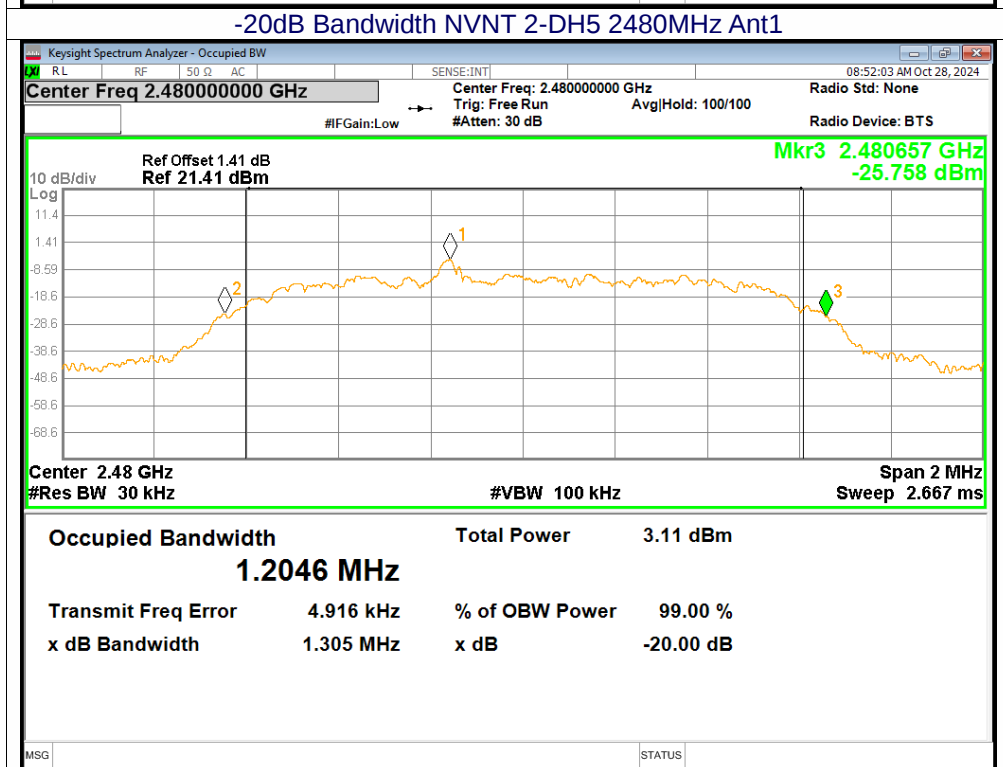
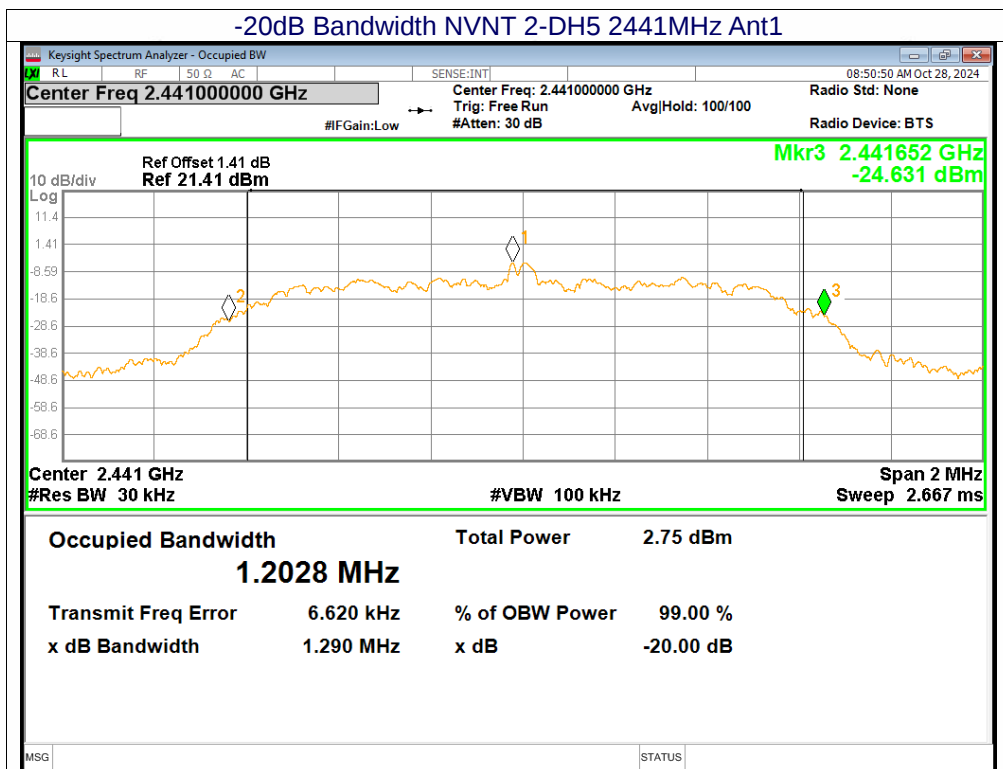
No deviation.

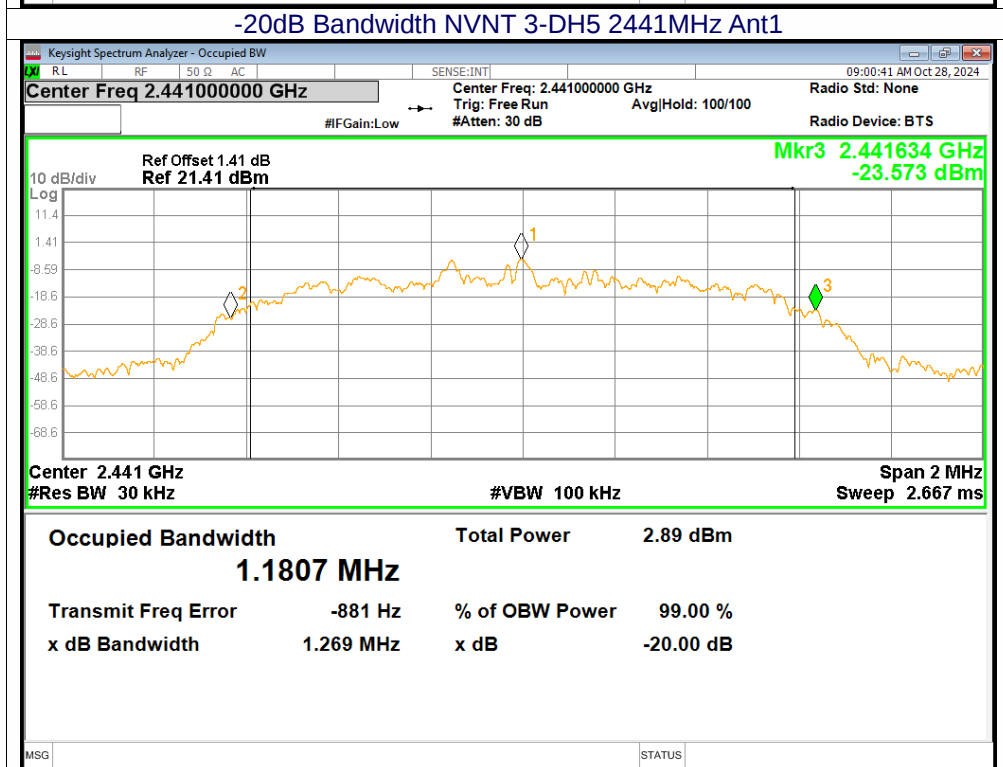
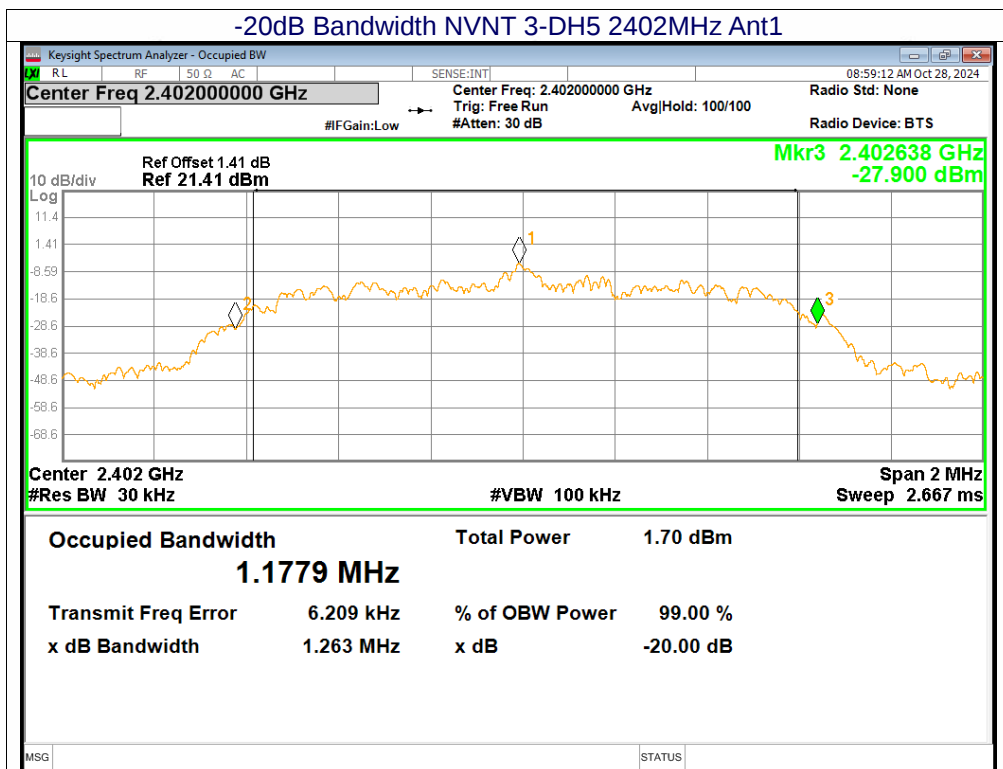
**7.5 Test Result**

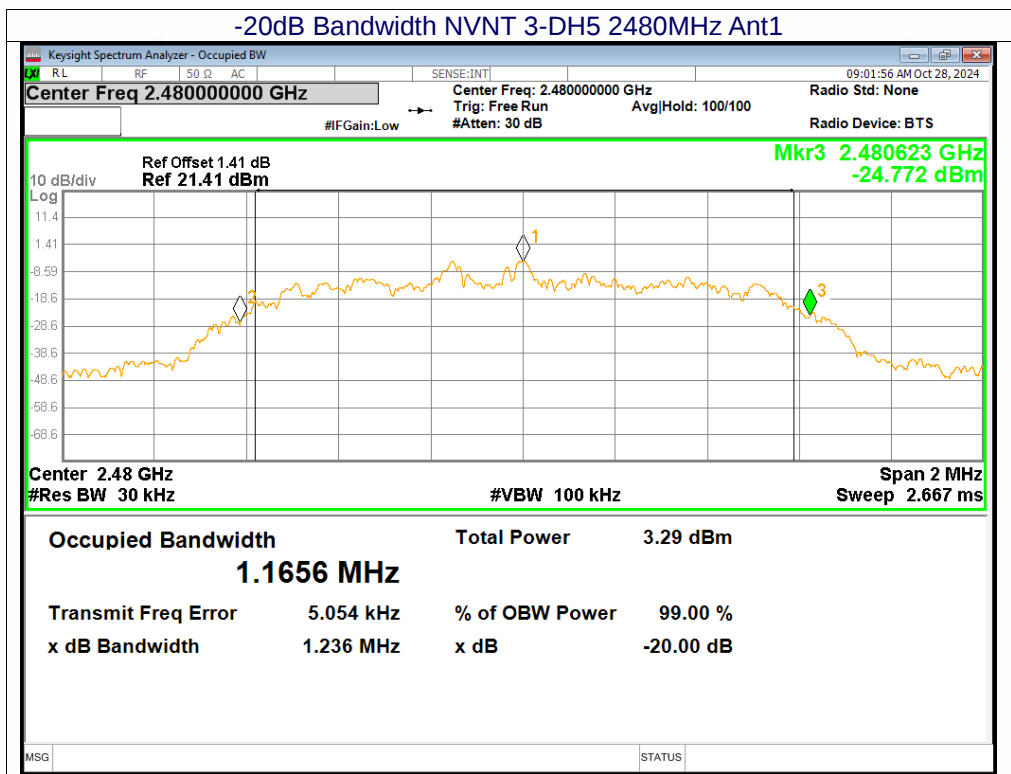
| Mode          | Test channel | 20dB Emission Bandwidth (MHz) | 99%Bandwidth (MHz) | Result |
|---------------|--------------|-------------------------------|--------------------|--------|
| GFSK          | Lowest       | 1.004                         | 0.907              | Pass   |
|               | Middle       | 1.022                         | 0.895              |        |
|               | Highest      | 1.006                         | 0.904              |        |
| $\pi/4$ DQPSK | Lowest       | 1.275                         | 1.184              | Pass   |
|               | Middle       | 1.29                          | 1.182              |        |
|               | Highest      | 1.305                         | 1.202              |        |
| 8DPSK         | Lowest       | 1.263                         | 1.172              | Pass   |
|               | Middle       | 1.269                         | 1.166              |        |
|               | Highest      | 1.236                         | 1.186              |        |





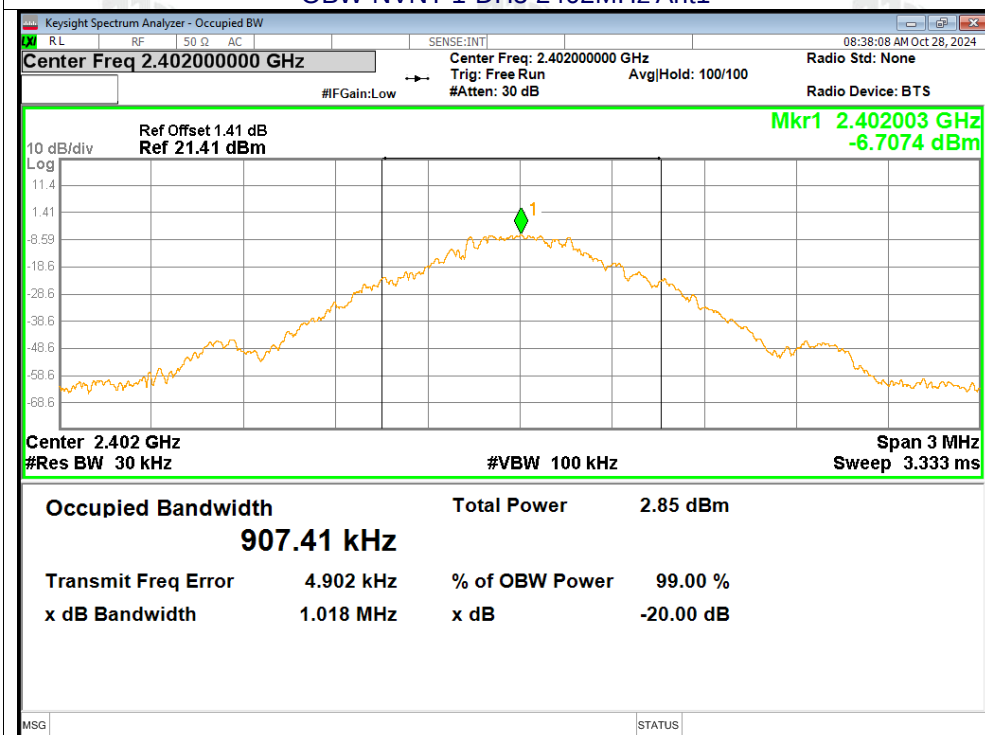




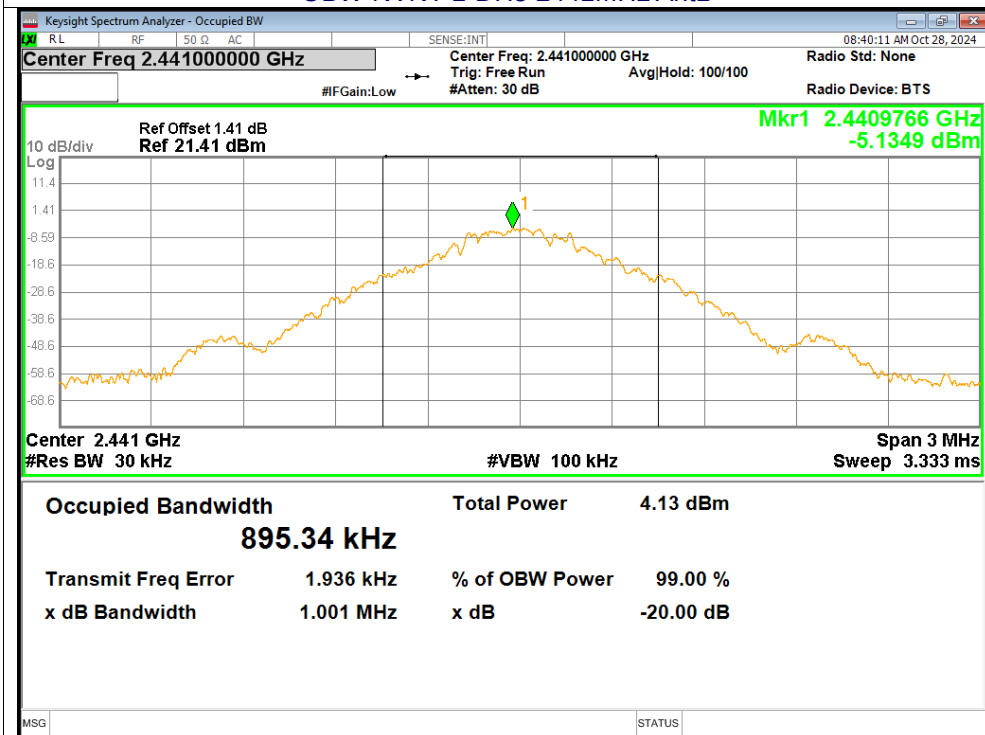


### Test Graphs

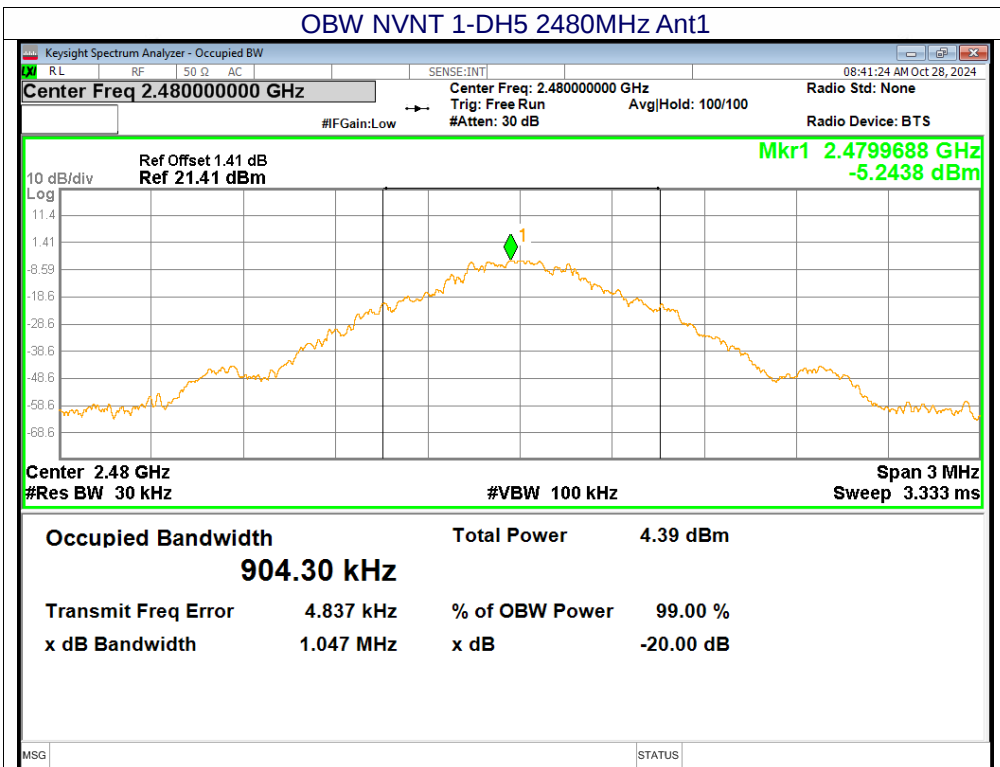
#### OBW NVNT 1-DH5 2402MHz Ant1



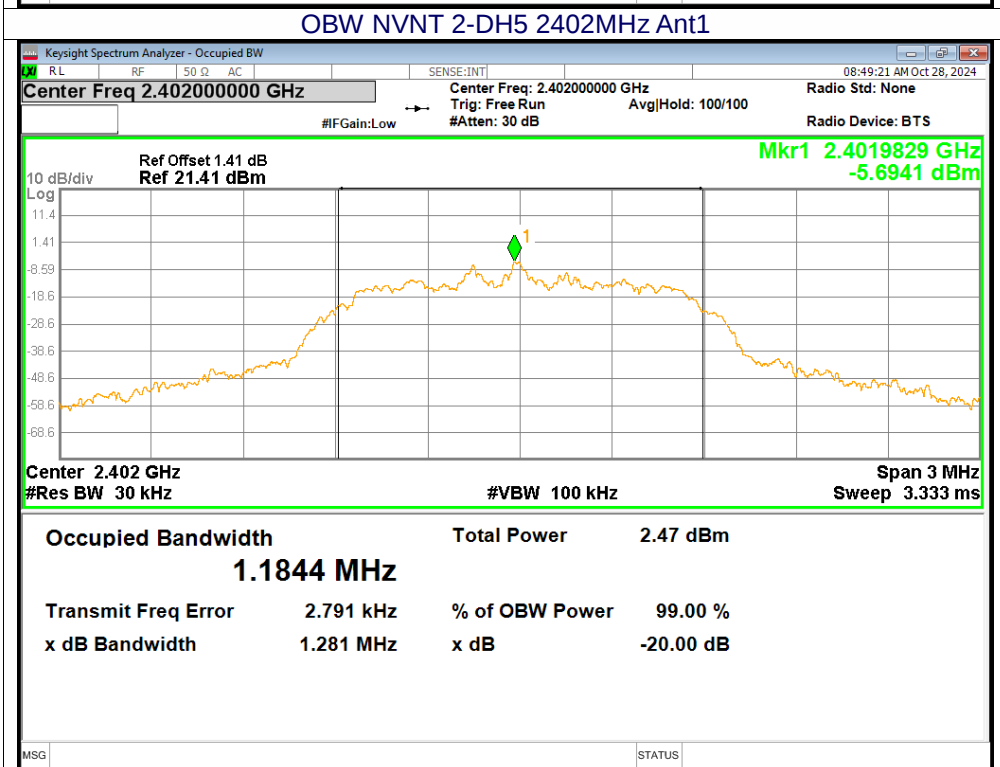
#### OBW NVNT 1-DH5 2441MHz Ant1



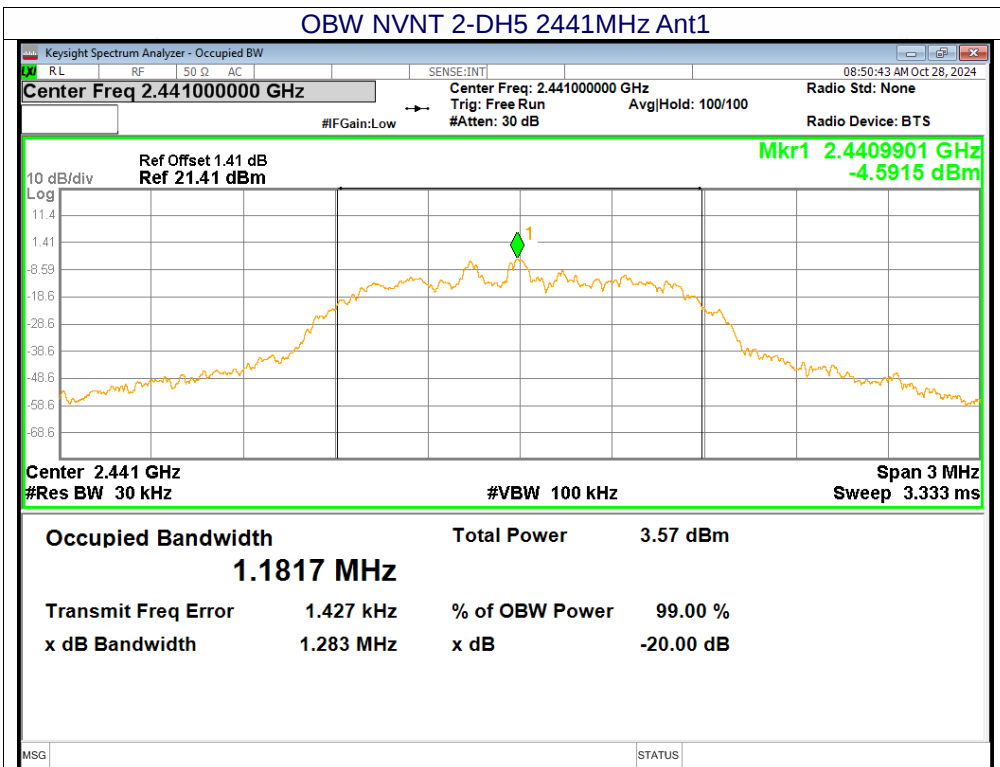
### OBW NVNT 1-DH5 2480MHz Ant1



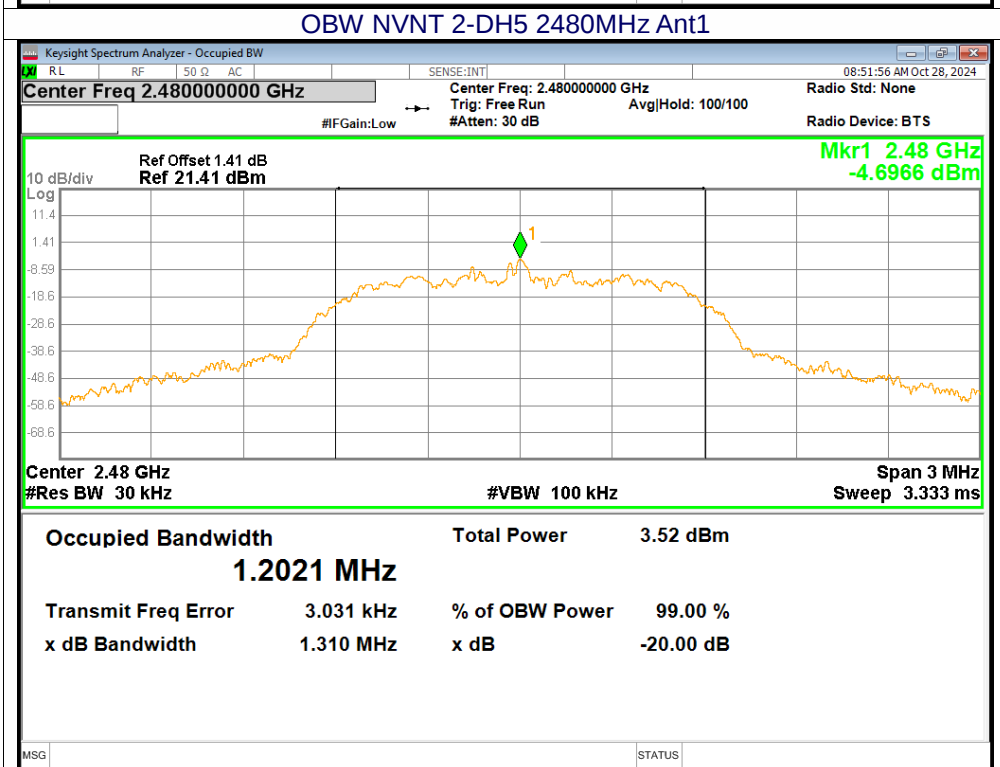
### OBW NVNT 2-DH5 2402MHz Ant1

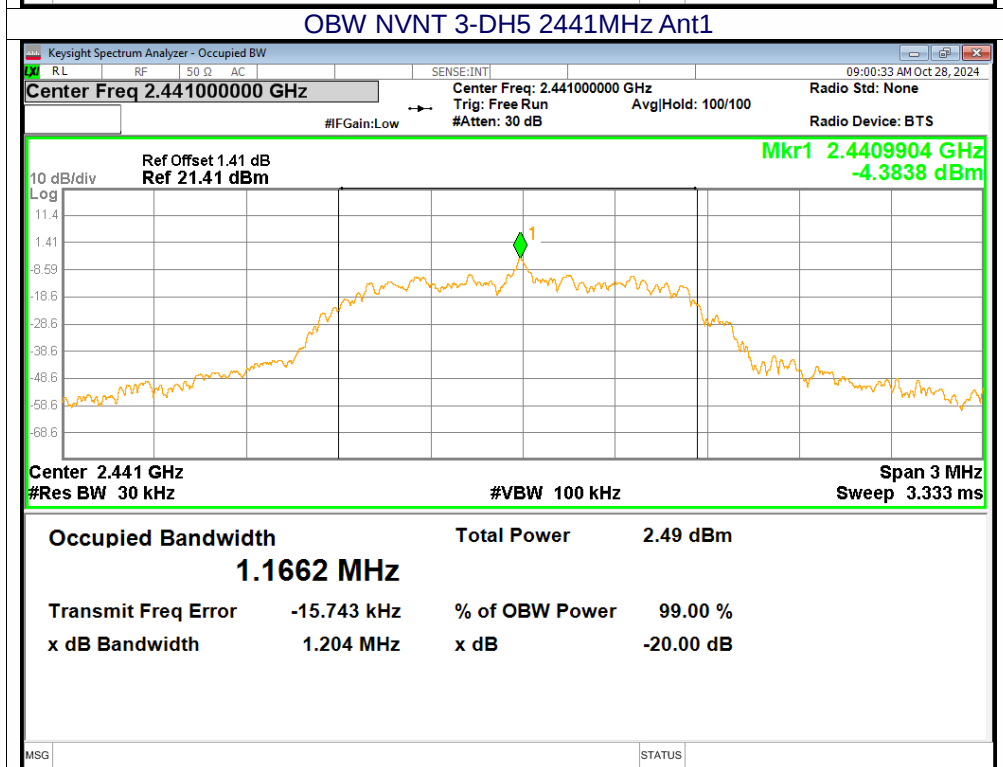
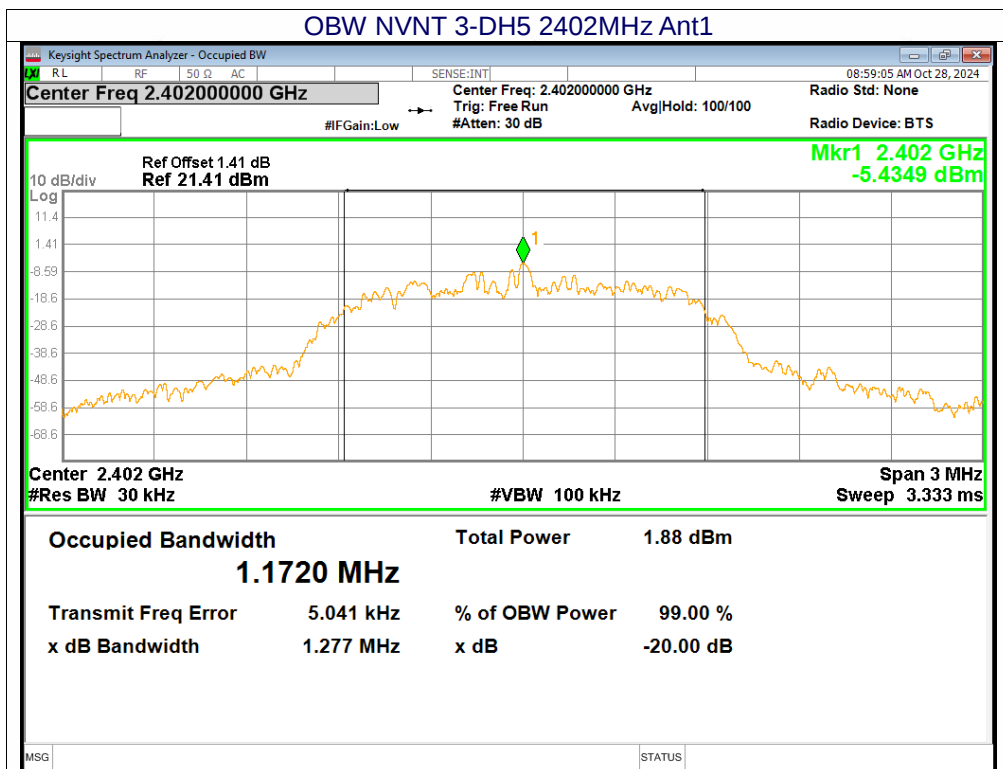


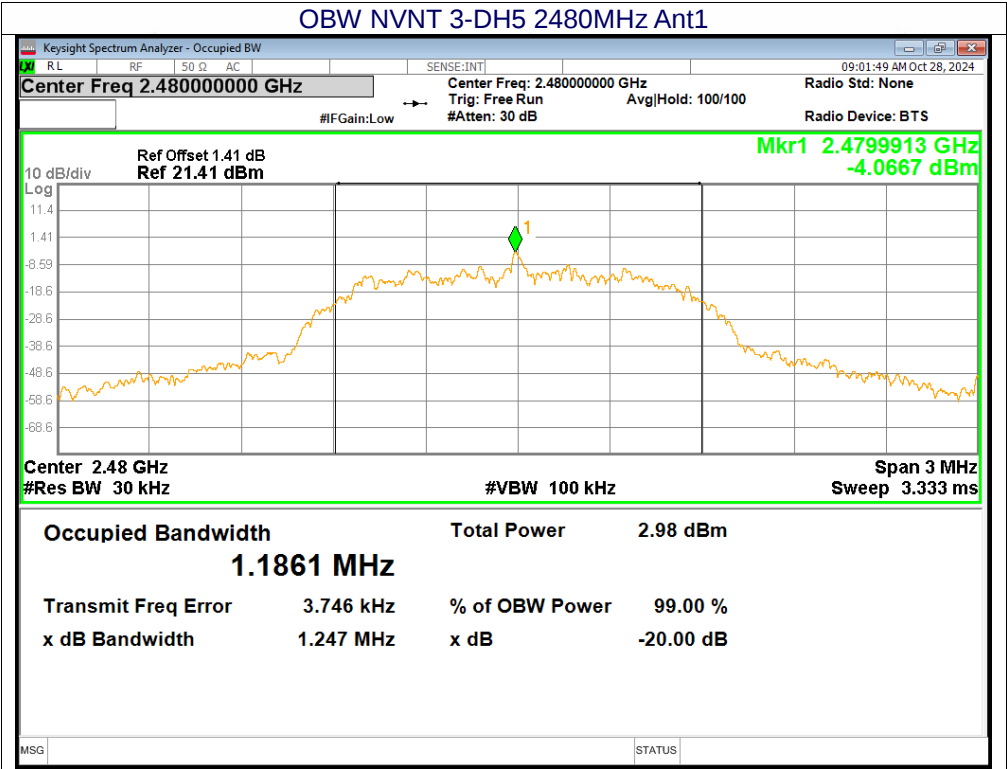
### OBW NVNT 2-DH5 2441MHz Ant1



### OBW NVNT 2-DH5 2480MHz Ant1



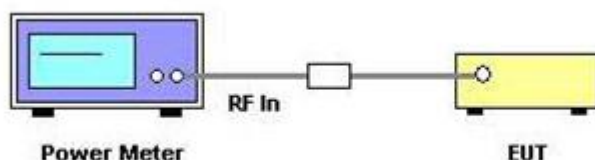




## 8. Maximum Peak Output Power

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

### 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. A power meter is connected on the RF output port of the EUT.
2. EUT have transmitted continuous maximum power
3. Antenna Power Error is definition that actual measure antenna power tolerance
4. Antenna Power (dBm): It is measured directly by power meter, calculated and read out by software

### 8.4 DEVIATION FROM STANDARD

No deviation.



## 8.5 Test Result

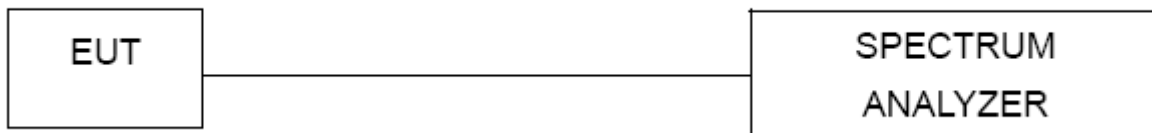
|                | Mode          | Test channel | Peak Output Power (dBm) | Peak Output Power Limit (dBm) | Result |
|----------------|---------------|--------------|-------------------------|-------------------------------|--------|
| Left earphone  | GFSK          | Lowest       | -3.59                   | 21.00                         | Pass   |
|                |               | Middle       | -2.58                   |                               |        |
|                |               | Highest      | -2.19                   |                               |        |
|                | $\pi/4$ DQPSK | Lowest       | -2.68                   | 21.00                         | Pass   |
|                |               | Middle       | -1.68                   |                               |        |
|                |               | Highest      | -1.27                   |                               |        |
|                | 8DPSK         | Lowest       | -2.54                   | 21.00                         | Pass   |
|                |               | Middle       | -1.48                   |                               |        |
|                |               | Highest      | -1.17                   |                               |        |
| Right earphone | GFSK          | Lowest       | -3.51                   | 21.00                         | Pass   |
|                |               | Middle       | -2.55                   |                               |        |
|                |               | Highest      | -2.17                   |                               |        |
|                | $\pi/4$ DQPSK | Lowest       | -2.67                   | 21.00                         | Pass   |
|                |               | Middle       | -1.64                   |                               |        |
|                |               | Highest      | -1.26                   |                               |        |
|                | 8DPSK         | Lowest       | -2.52                   | 21.00                         | Pass   |
|                |               | Middle       | -1.47                   |                               |        |
|                |               | Highest      | -1.11                   |                               |        |



## 9. 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) |

### 9.1 Test Setup



### 9.2 Test procedure

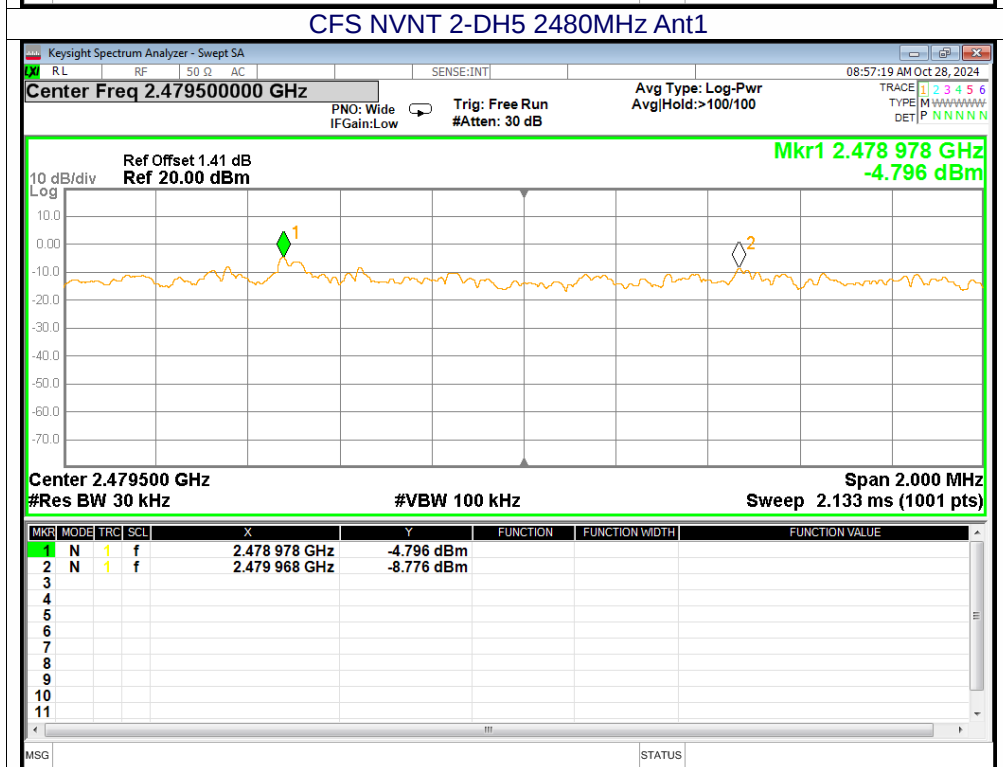
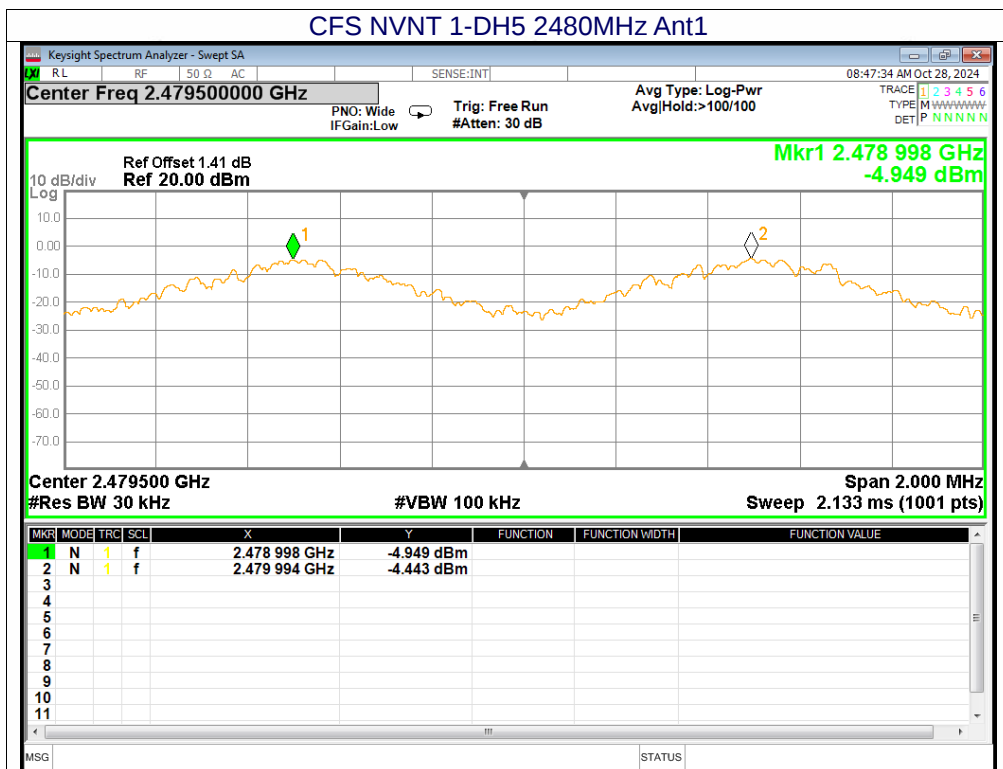
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to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

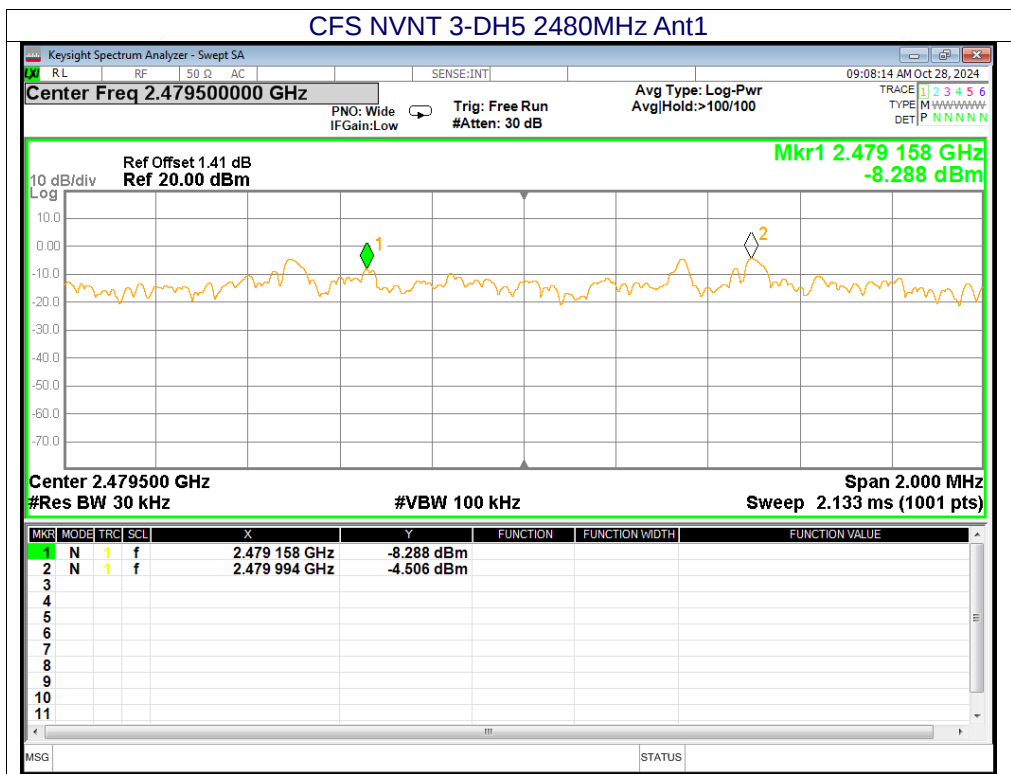
### 9.3 DEVIATION FROM STANDARD

No deviation.

### 9.4 Test Result

| Modulation    | Separation (MHz) | Limit(MHz) | Result |
|---------------|------------------|------------|--------|
| GFSK          | 0.996            | 0.904      | PASS   |
| $\pi/4$ DQPSK | 0.99             | 0.87       | PASS   |
| 8DPSK         | 0.836            | 0.824      | PASS   |





#### 10.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                                                              |

##### 10.1 Test Setup



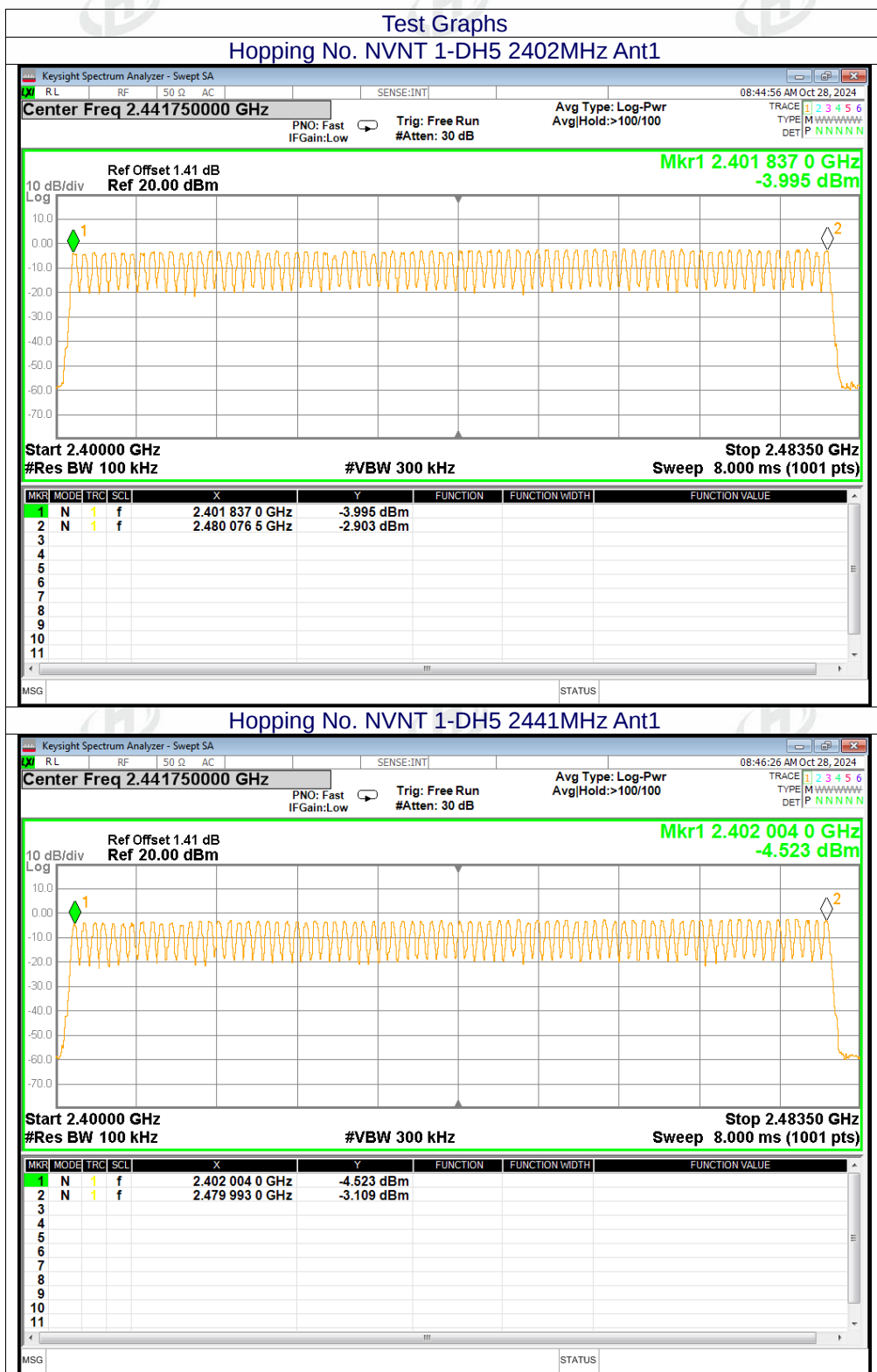
##### 10.2 Test procedure

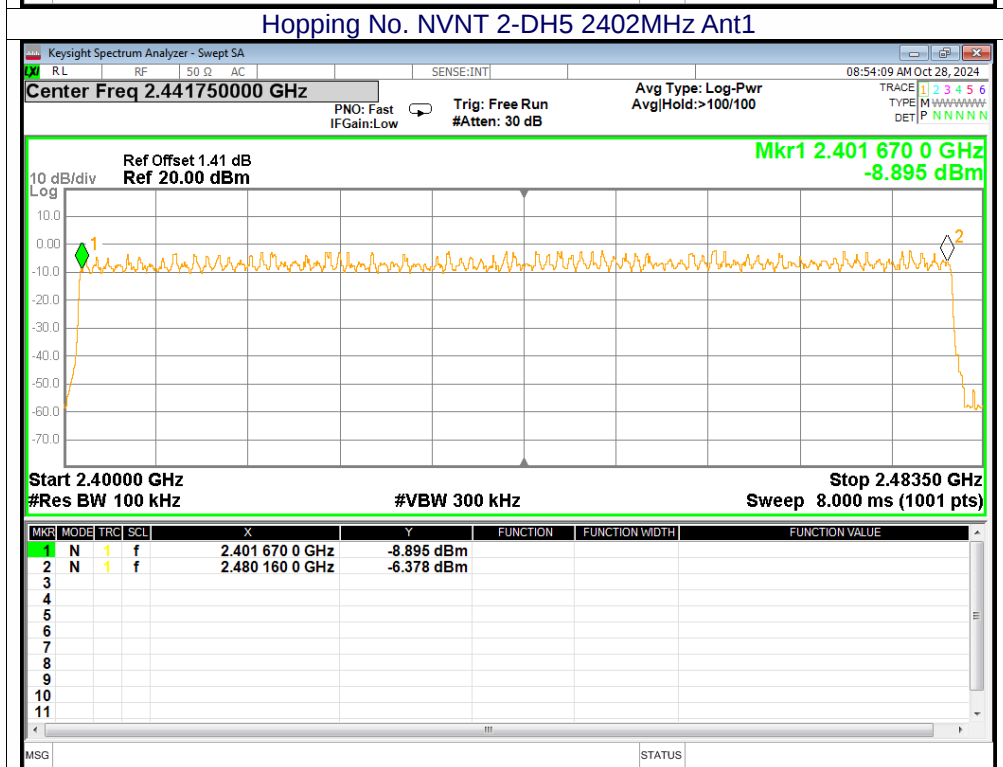
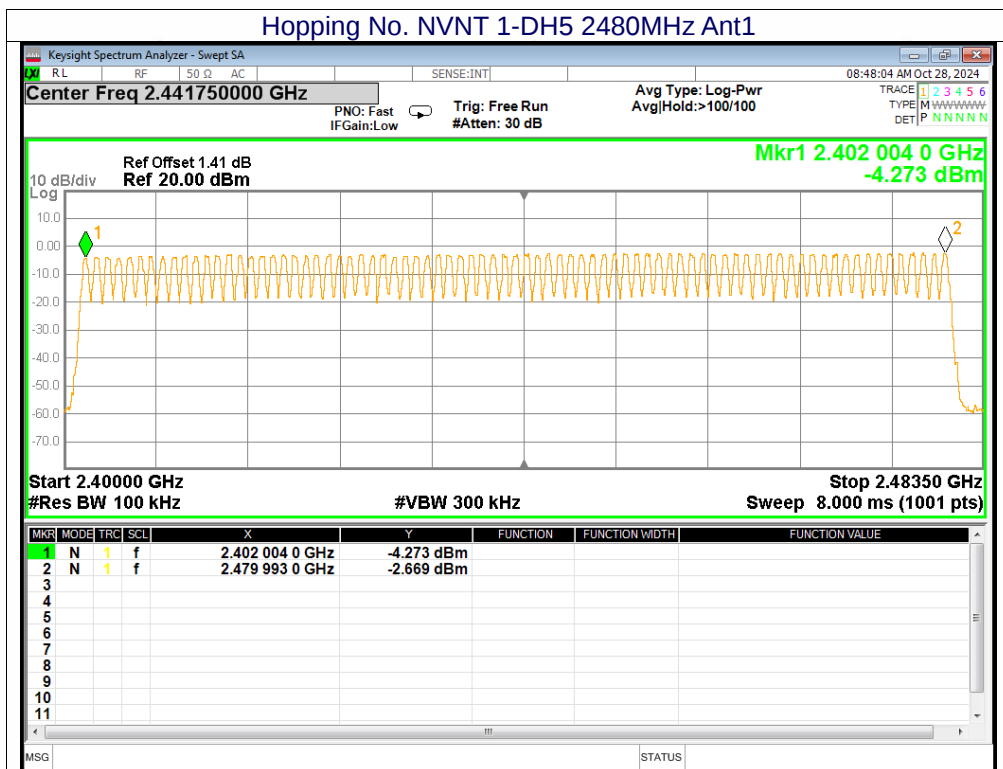
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to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

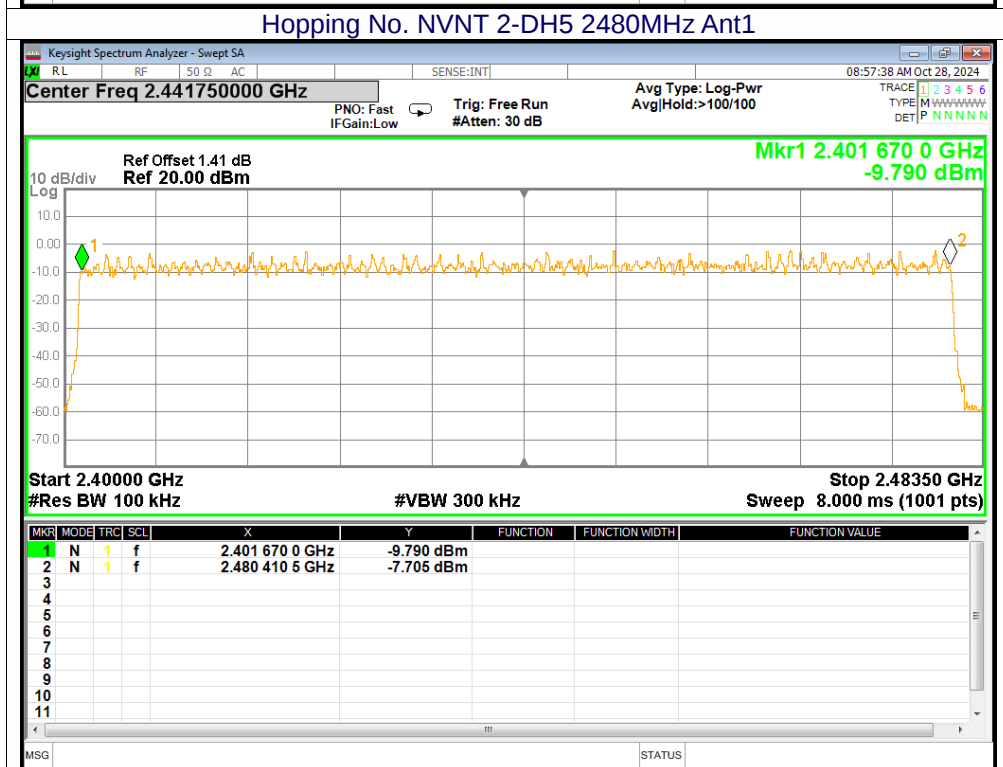
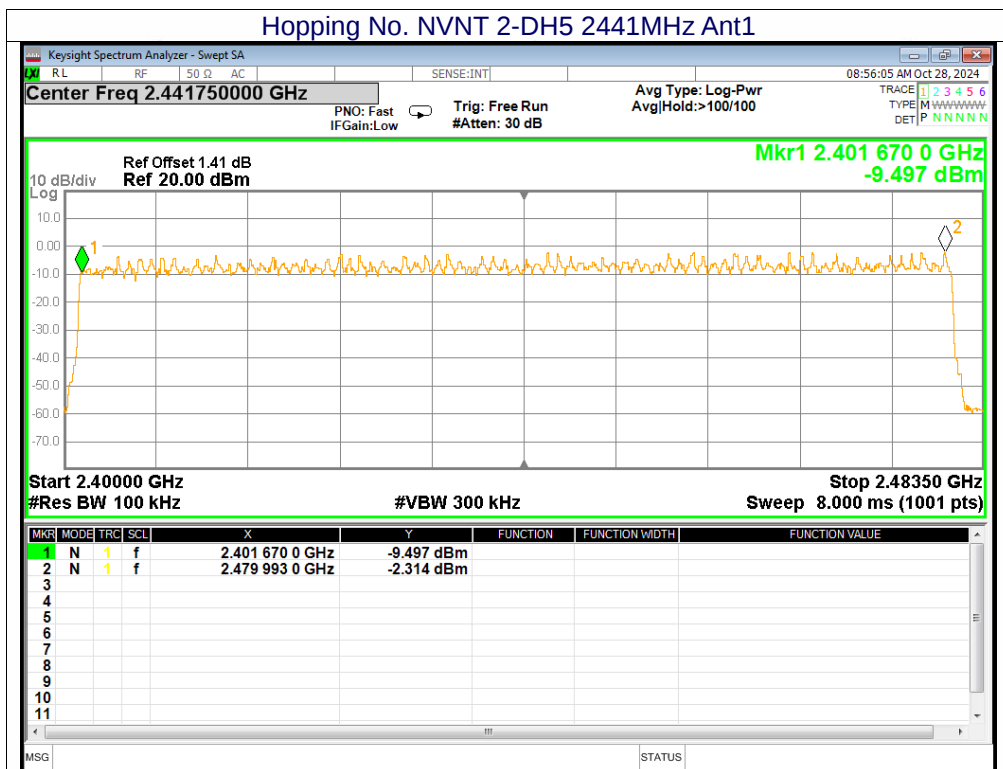
##### 10.3 DEVIATION FROM STANDARD

No deviation.

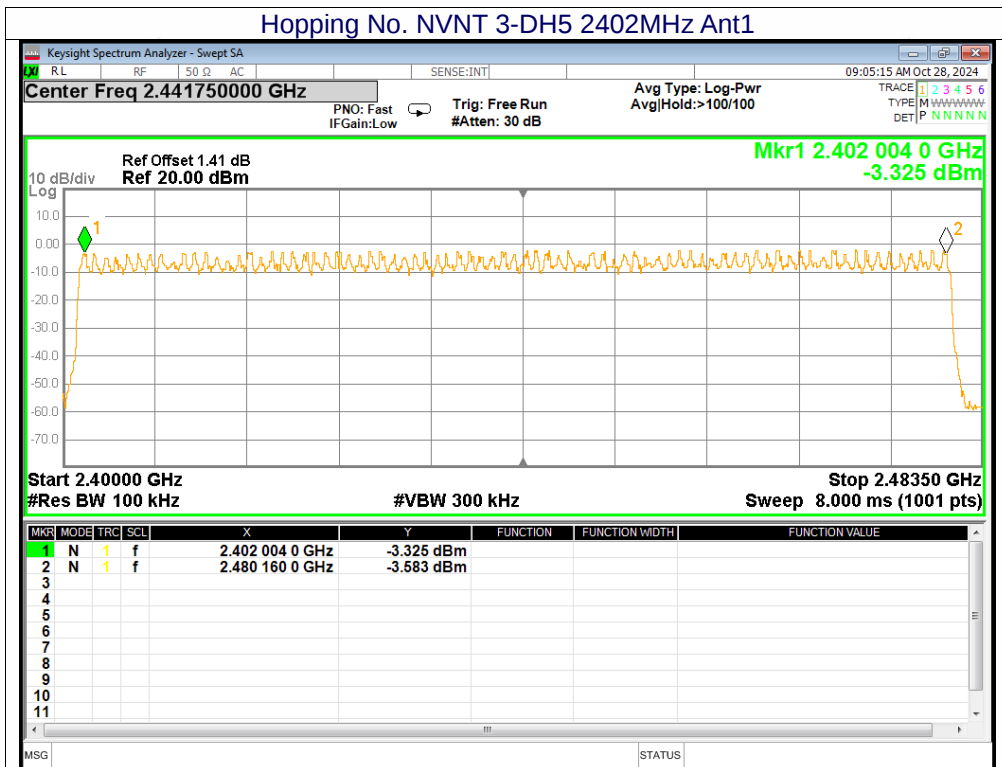
## 10.4 Test Result



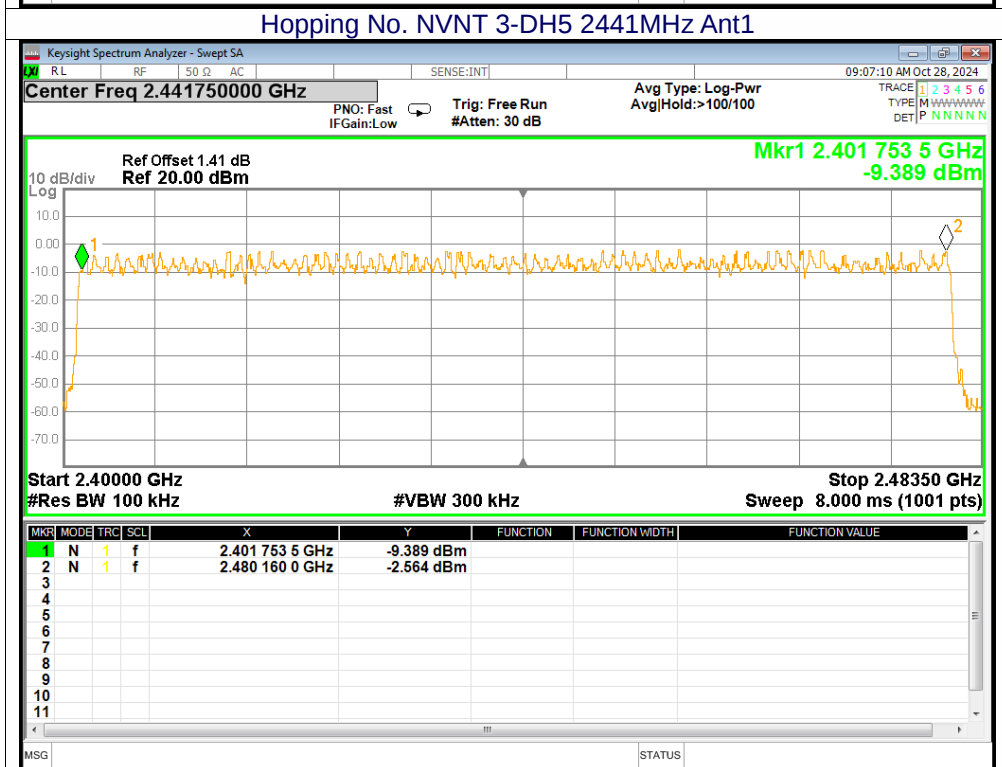


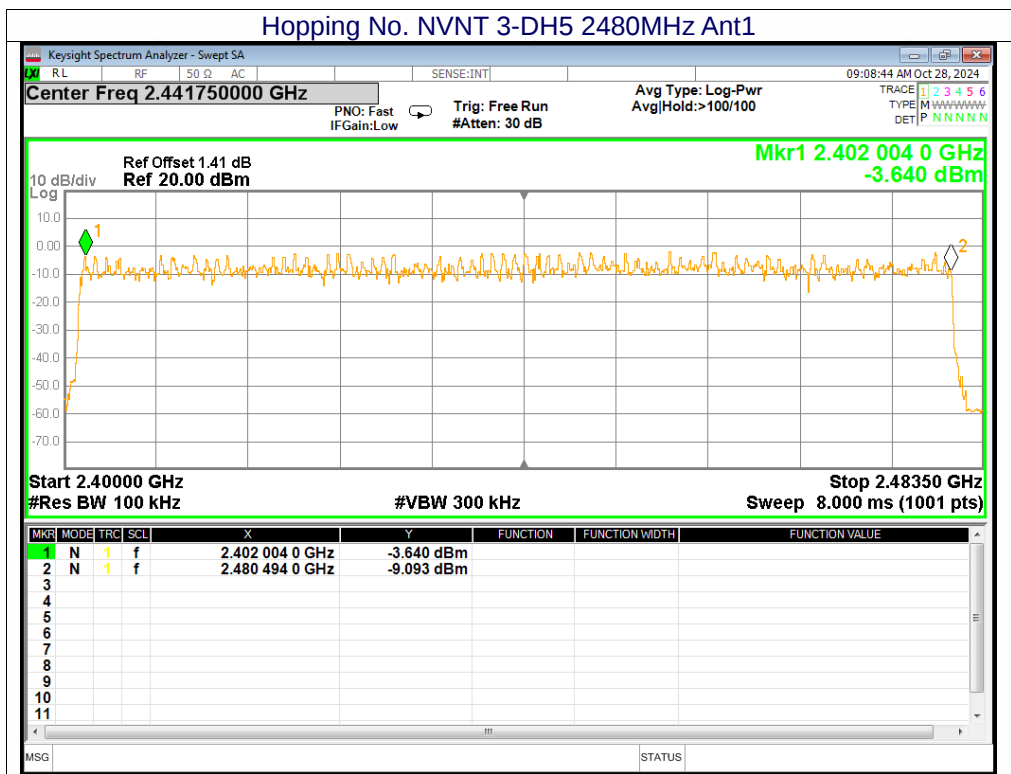


### Hopping No. NVNT 3-DH5 2402MHz Ant1



### Hopping No. NVNT 3-DH5 2441MHz Ant1





## 11. 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                                           |

### 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            | 0.384           | 121.344               | 316         | 31600            | 400        | Pass    |
| 1-DH3 | 2441            | 1.64            | 262.4                 | 160         | 31600            | 400        | Pass    |
| 1-DH5 | 2441            | 2.887           | 334.892               | 116         | 31600            | 400        | Pass    |
| 2-DH1 | 2441            | 0.391           | 123.947               | 317         | 31600            | 400        | Pass    |
| 2-DH3 | 2441            | 1.644           | 261.396               | 159         | 31600            | 400        | Pass    |
| 2-DH5 | 2441            | 2.891           | 332.465               | 115         | 31600            | 400        | Pass    |
| 3-DH1 | 2441            | 0.391           | 123.947               | 317         | 31600            | 400        | Pass    |
| 3-DH3 | 2441            | 1.643           | 261.237               | 159         | 31600            | 400        | Pass    |
| 3-DH5 | 2441            | 2.891           | 280.427               | 97          | 31600            | 400        | Pass    |

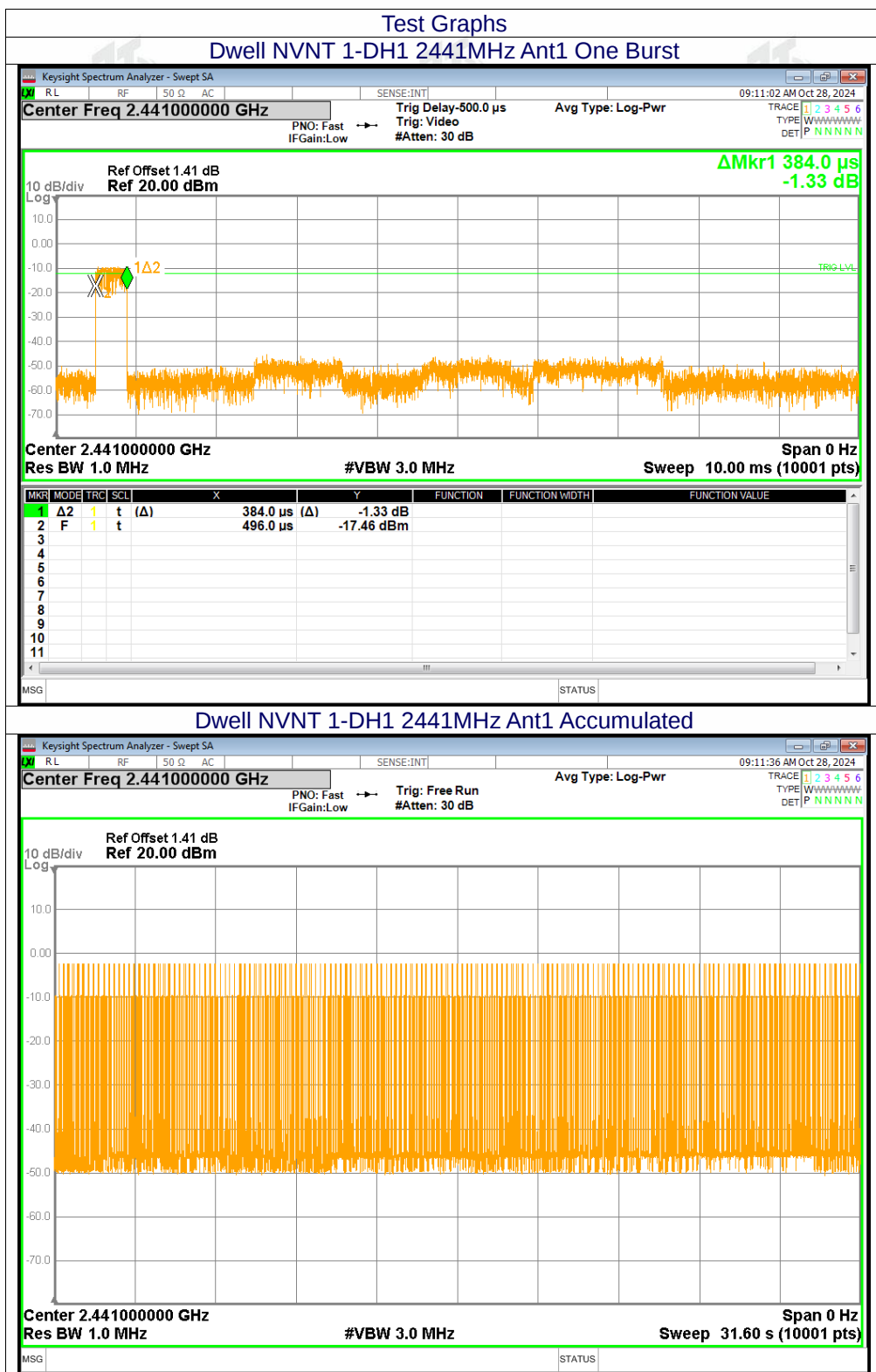
#### Remarks:

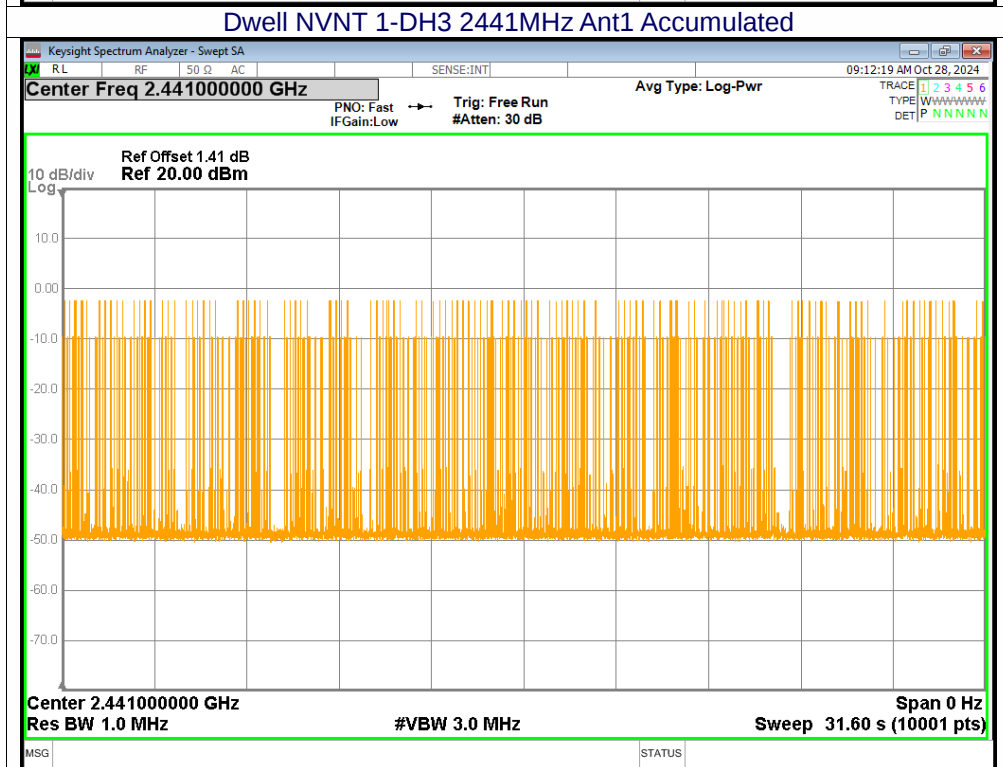
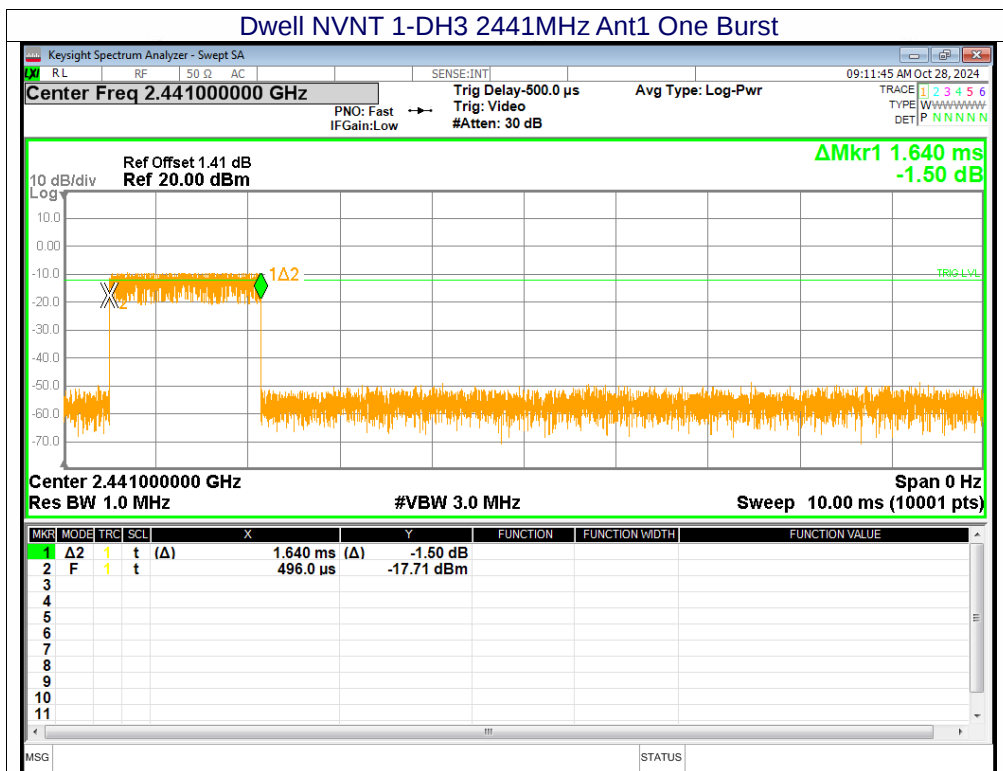
The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

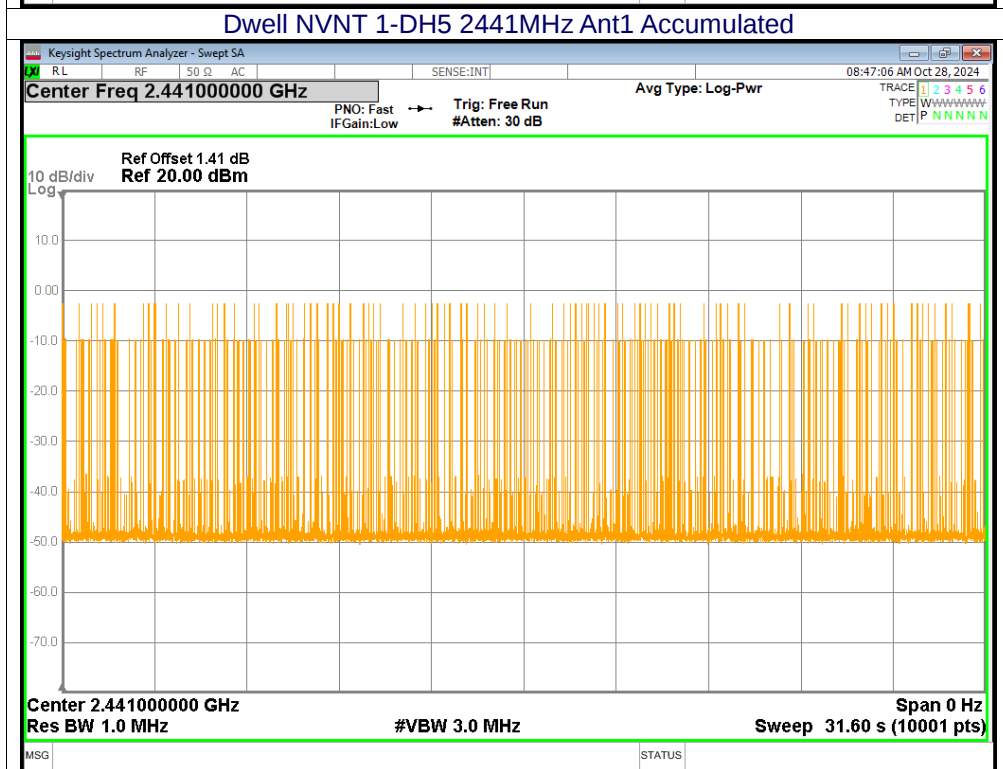
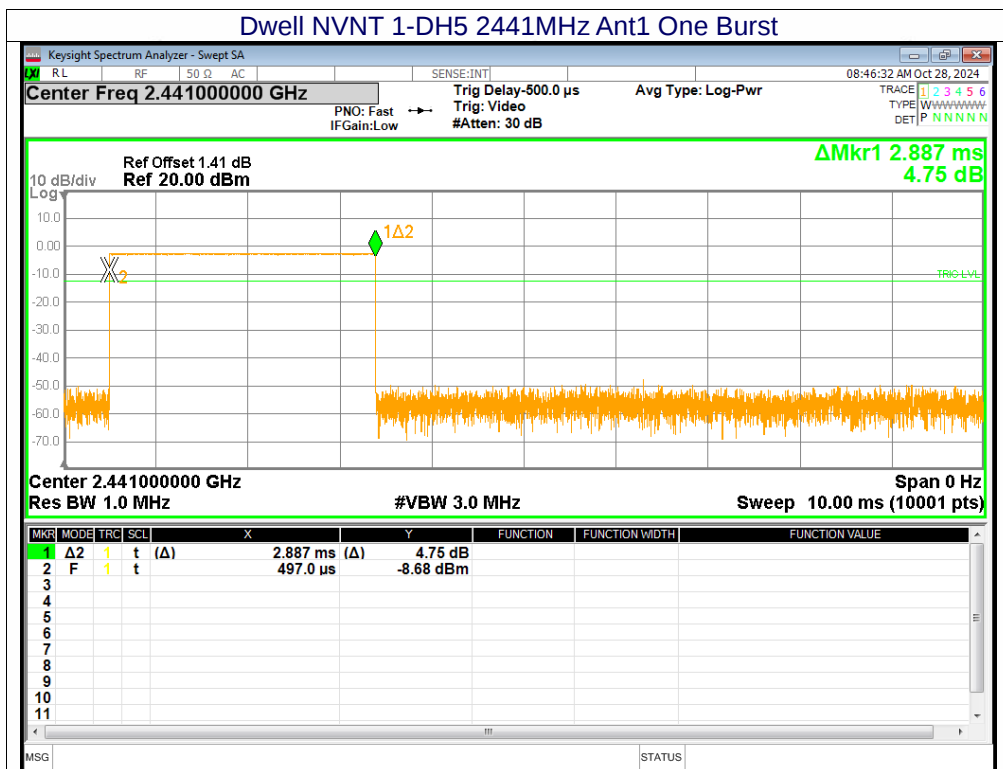
(1 / 2 / 3)-DH1: Dwell time (ms) = Pulse Time (ms) \*  $[1600 / (2 * 79)] * 31.6\text{s}$

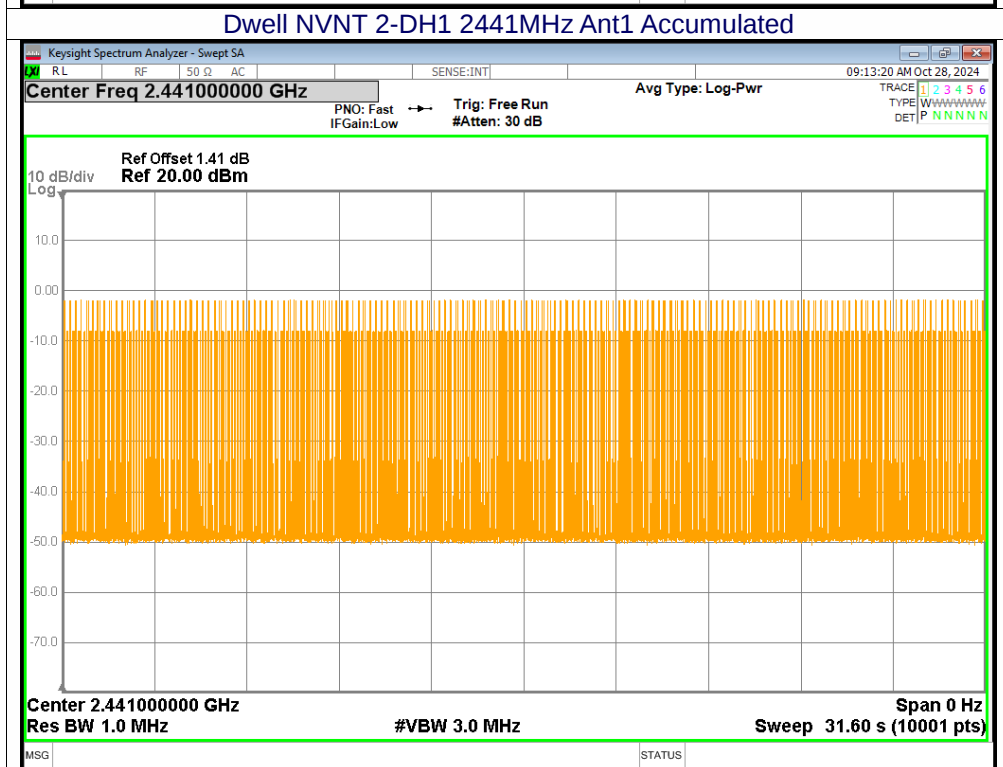
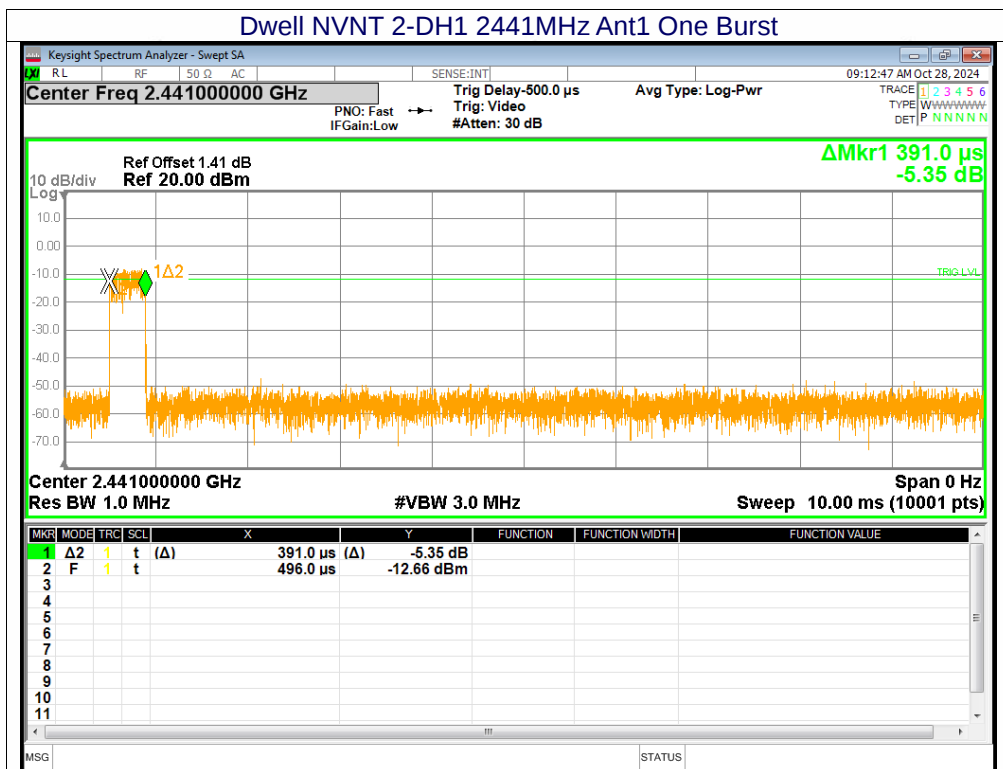
(1 / 2 / 3)-DH3: Dwell time (ms) = Pulse Time (ms) \*  $[1600 / (4 * 79)] * 31.6\text{s}$

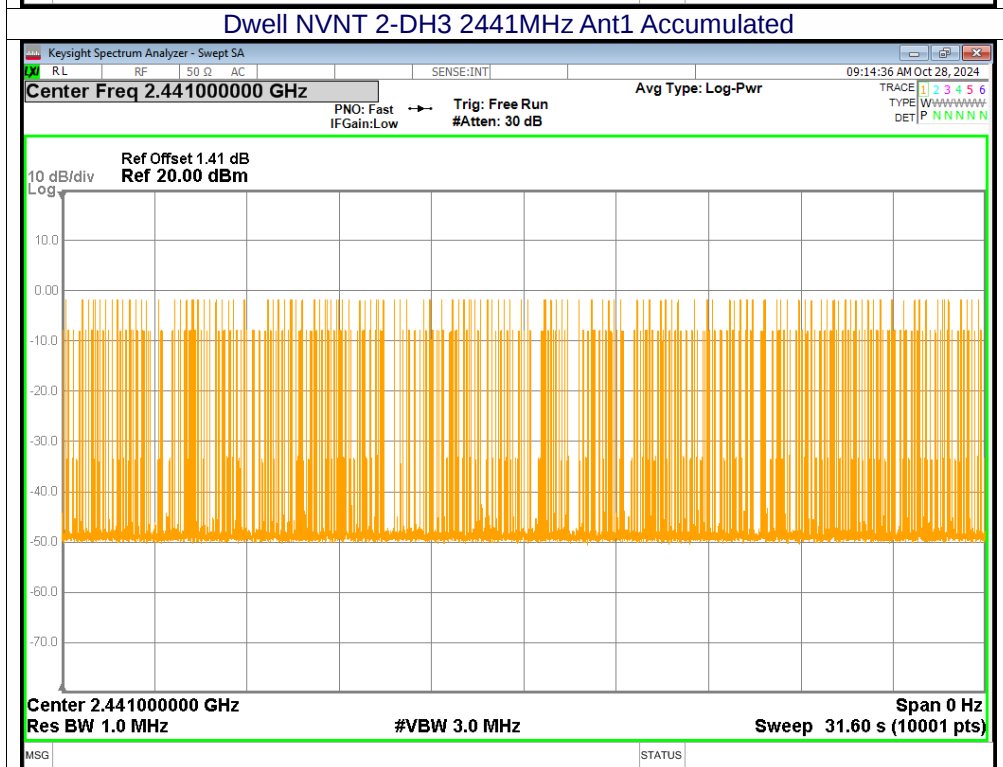
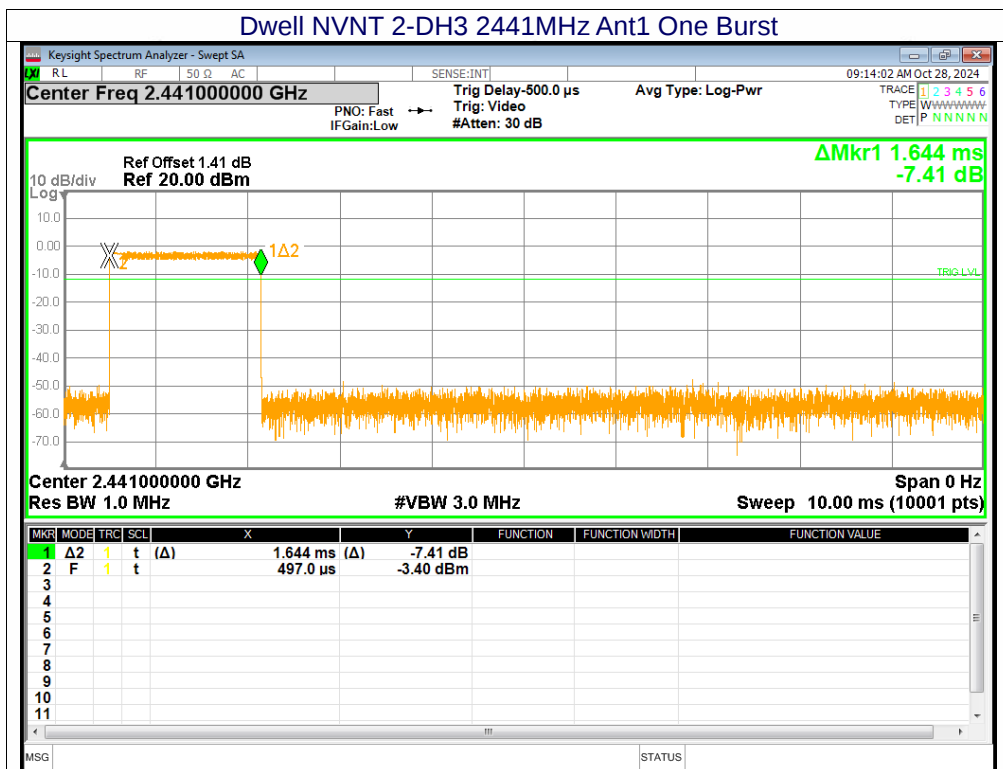
(1 / 2 / 3)-DH5: Dwell time (ms) = Pulse Time (ms) \*  $[1600 / (6 * 79)] * 31.6\text{s}$

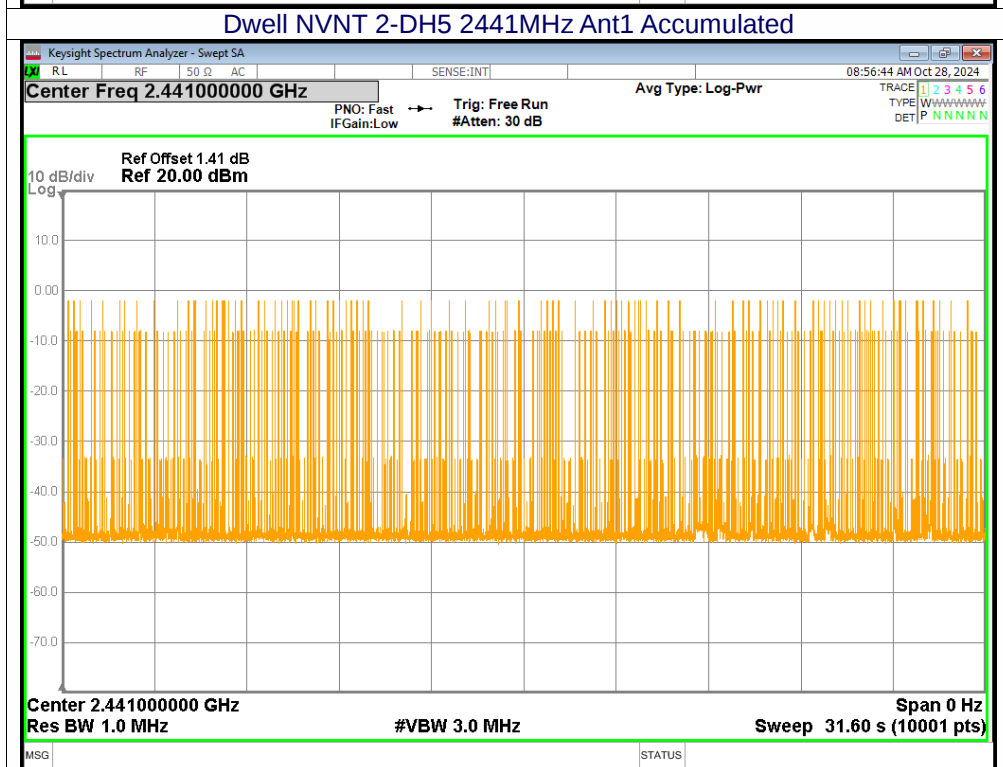
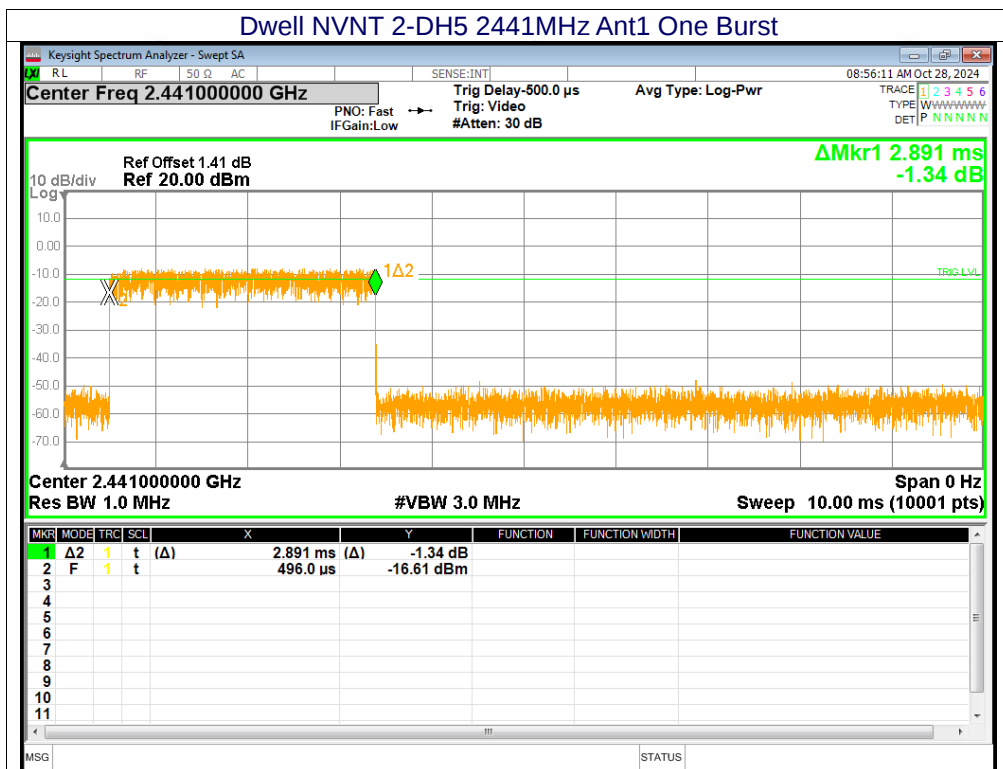


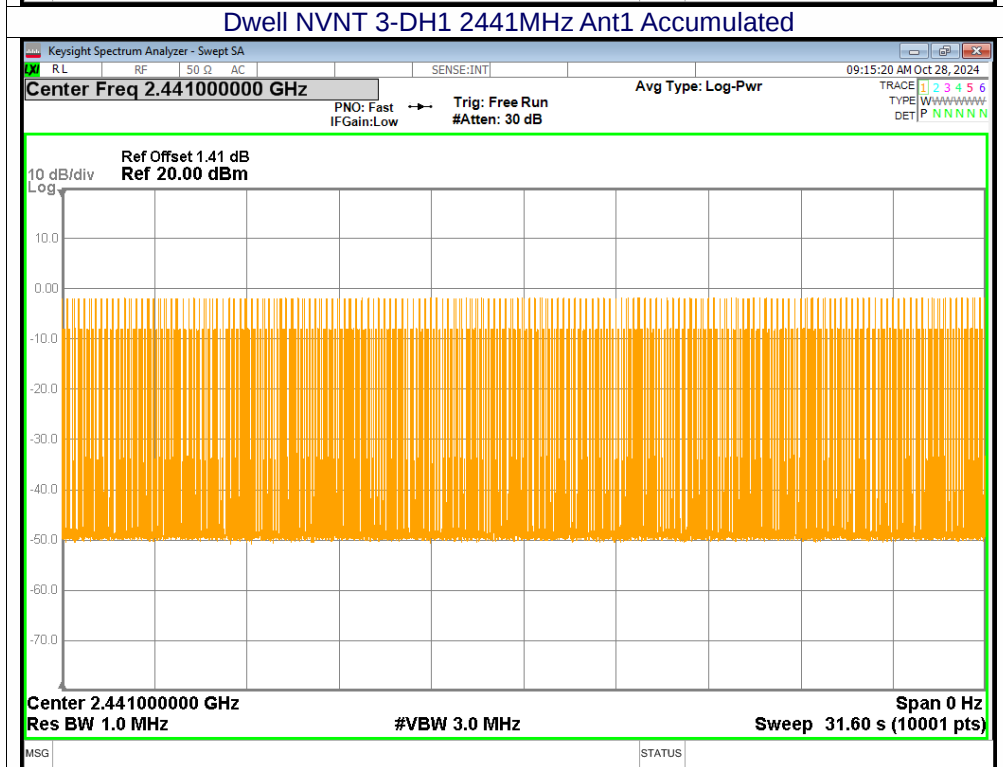
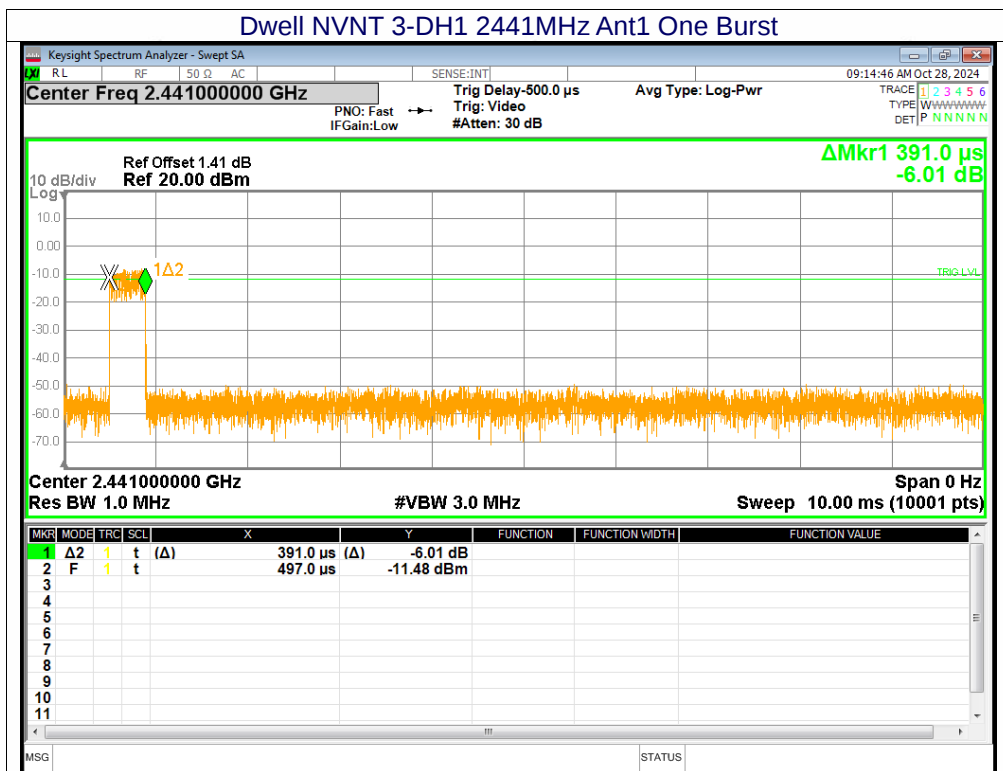


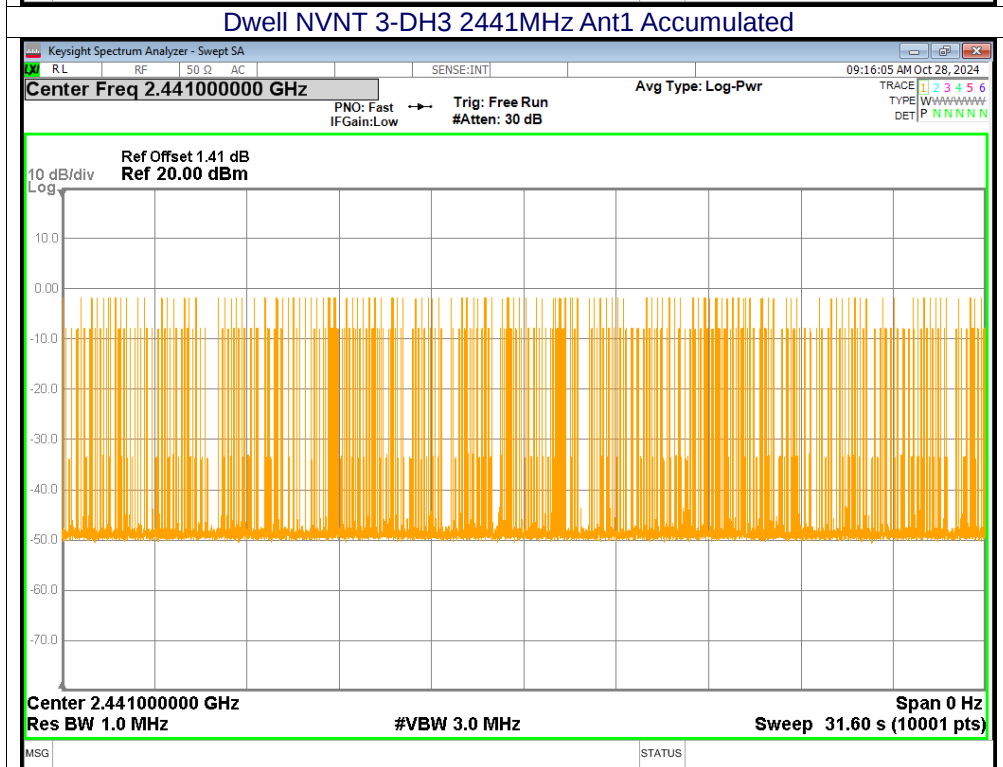
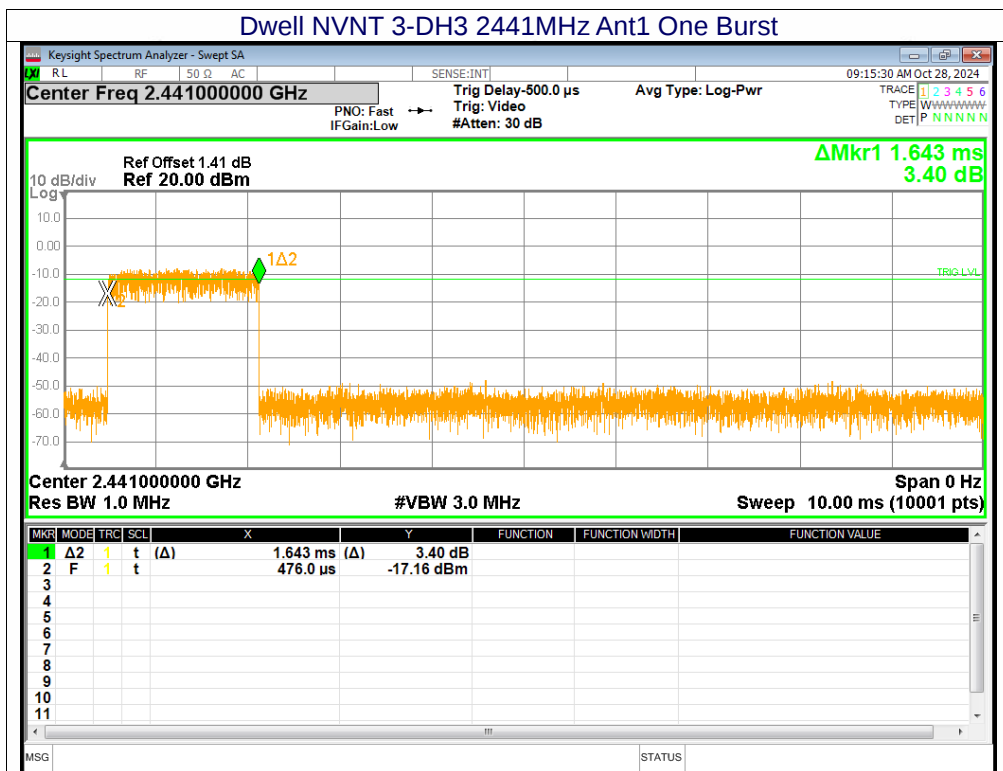


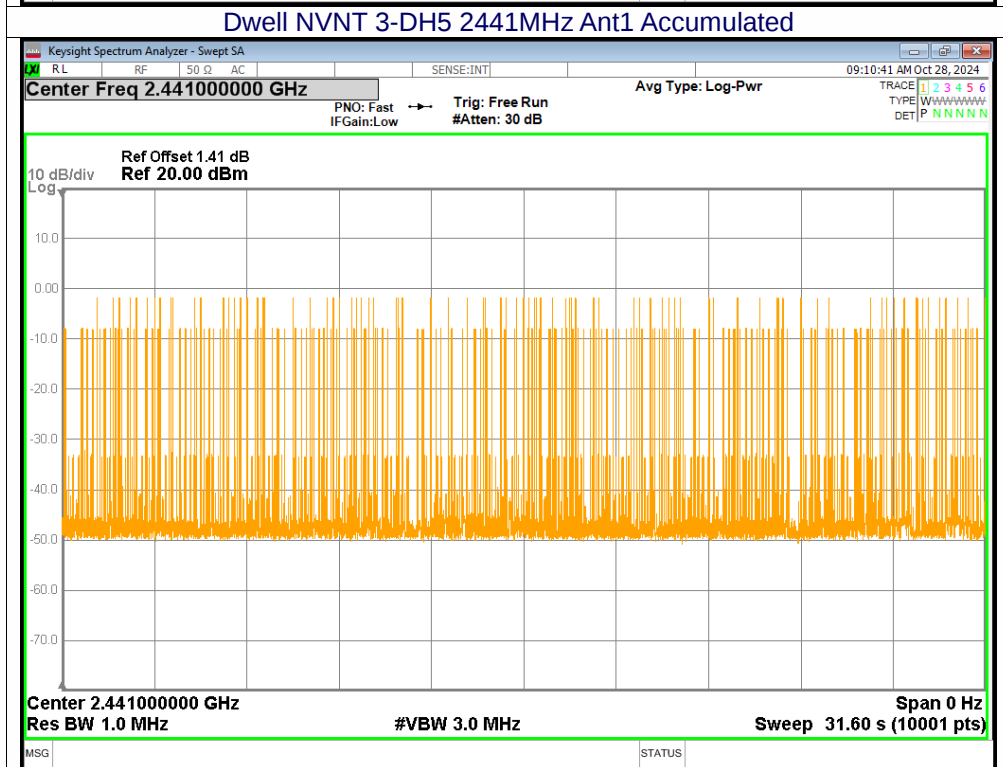
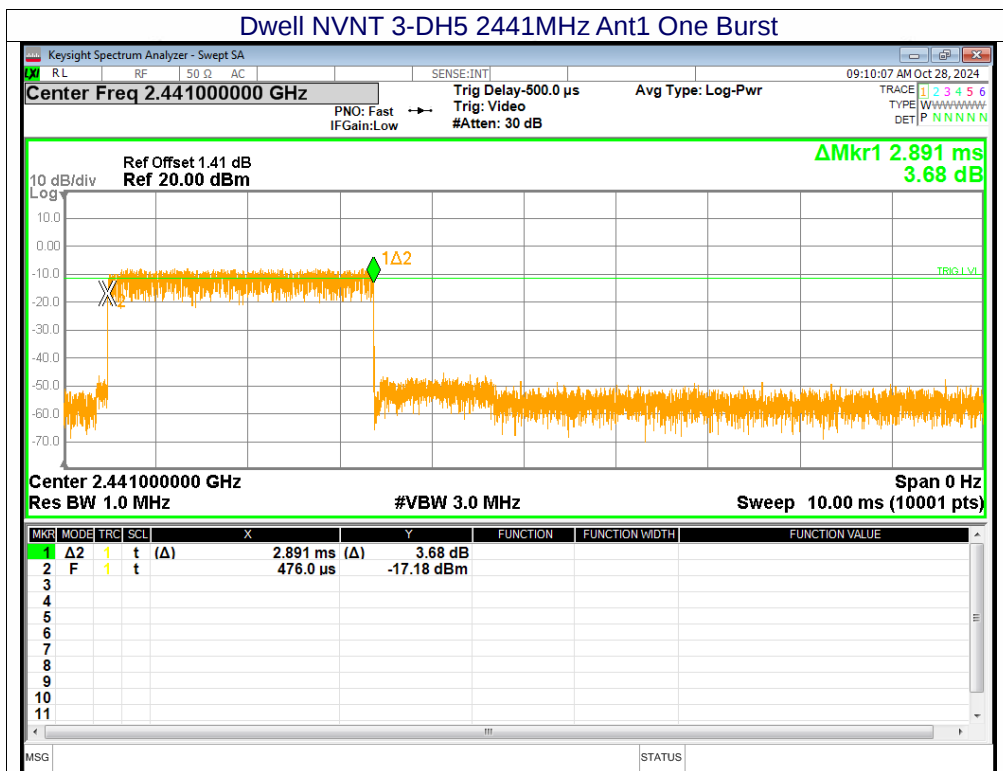












## 12. Antenna Requirement

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Standard requirement:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FCC Part15 C Section 15.203 /247(b)(4), RSS-Gen 6.8 |
| <p>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.</p> <p>15.247(b) (4) requirement:<br/>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.</p> <p>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.</p> |                                                     |
| EUT Antenna:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                     |
| The antenna is PCB Antenna, the best case gain of the antennas is 2.78dBi, 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 \*\*\*\*\***