

# TEST REPORT

**Report No.:** 8336EU010406W

**Applicant:** Hong Kong Etech Groups Ltd.

**Address:** 16/F, Block C, 2nd Phase of Central Avenue, Haihong Industrial Area, Xixiang, Baoan, Shenzhen, China

**Product Name:** Bluetooth Speaker

**Model No.:** EBA2-250018A (refer to clause 2.4)

**Trademark:** N/A

**FCC ID:** 2A3ZO-250018A

**Test Standard(s):** 47 CFR Part 15.247

**Test Result:** Pass

**Date of Receipt:** Nov. 04, 2025

**Test Date:** Nov. 04, 2025 - Nov. 26, 2025

**Date of Issue:** Dec. 10, 2025

**ISSUED BY:**

SHENZHEN EU TESTING LABORATORY LIMITED



**Prepared by:**



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**Reviewed and Approved by:**



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### Revision Record

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|                |               |             |        |
|                |               |             |        |



## Table of Contents

|          |                                                      |           |
|----------|------------------------------------------------------|-----------|
| <b>1</b> | <b>COVER PAGE.....</b>                               | <b>1</b>  |
| <b>2</b> | <b>GENERAL INFORMATION .....</b>                     | <b>5</b>  |
| 2.1      | APPLICANT INFORMATION .....                          | 5         |
| 2.2      | MANUFACTURER INFORMATION .....                       | 5         |
| 2.3      | FACTORY INFORMATION .....                            | 5         |
| 2.4      | GENERAL DESCRIPTION OF E.U.T. ....                   | 5         |
| 2.5      | TECHNICAL INFORMATION OF E.U.T. ....                 | 6         |
| <b>3</b> | <b>TEST SUMMARY .....</b>                            | <b>7</b>  |
| 3.1      | TEST STANDARD .....                                  | 7         |
| 3.2      | TEST VERDICT .....                                   | 7         |
| 3.3      | TEST LABORATORY .....                                | 8         |
| <b>4</b> | <b>TEST CONFIGURATION .....</b>                      | <b>9</b>  |
| 4.1      | TEST ENVIRONMENT .....                               | 9         |
| 4.2      | TEST EQUIPMENT .....                                 | 9         |
| 4.3      | DESCRIPTION OF SUPPORT UNIT .....                    | 11        |
| 4.4      | TEST MODE .....                                      | 11        |
| 4.5      | DESCRIPTION OF CALCULATION .....                     | 11        |
| 4.5.1    | Field Strength Calculation .....                     | 11        |
| 4.5.2    | Disturbance Calculation .....                        | 11        |
| 4.6      | MEASUREMENT UNCERTAINTY .....                        | 11        |
| 4.7      | DEVIATION FROM STANDARDS .....                       | 12        |
| 4.8      | ABNORMALITIES FROM STANDARD CONDITION .....          | 12        |
| <b>5</b> | <b>EVALUATION RESULTS (EVALUATION) .....</b>         | <b>13</b> |
| 5.1      | ANTENNA REQUIREMENT .....                            | 13        |
| 5.1.1    | Test Specification .....                             | 13        |
| 5.1.2    | Test Data .....                                      | 13        |
| <b>6</b> | <b>RADIO SPECTRUM MATTER TEST RESULTS (RF) .....</b> | <b>14</b> |
| 6.1      | CONDUCTED EMISSION AT AC POWER LINE .....            | 14        |
| 6.1.1    | Test Specification .....                             | 14        |
| 6.1.2    | E.U.T. Operation .....                               | 14        |
| 6.1.3    | Test Setup Diagram .....                             | 14        |
| 6.1.4    | Test Data .....                                      | 14        |
| 6.2      | 20dB BANDWIDTH .....                                 | 17        |
| 6.2.1    | Test Specification .....                             | 17        |
| 6.2.2    | E.U.T. Operation .....                               | 17        |
| 6.2.3    | Test Setup Diagram .....                             | 18        |
| 6.2.4    | Test Data .....                                      | 18        |
| 6.3      | MAXIMUM CONDUCTED OUTPUT POWER .....                 | 19        |
| 6.3.1    | Test Specification .....                             | 19        |
| 6.3.2    | E.U.T. Operation .....                               | 19        |
| 6.3.3    | Test Setup Diagram .....                             | 20        |
| 6.3.4    | Test Data .....                                      | 20        |
| 6.4      | CHANNEL SEPARATION .....                             | 21        |
| 6.4.1    | Test Specification .....                             | 21        |
| 6.4.2    | E.U.T. Operation .....                               | 21        |
| 6.4.3    | Test Setup Diagram .....                             | 21        |

|                |                                                          |           |
|----------------|----------------------------------------------------------|-----------|
| 6.4.4          | Test Data .....                                          | 22        |
| <b>6.5</b>     | <b>NUMBER OF HOPPING FREQUENCIES .....</b>               | <b>23</b> |
| 6.5.1          | Test Specification .....                                 | 23        |
| 6.5.2          | E.U.T. Operation .....                                   | 23        |
| 6.5.3          | Test Setup Diagram .....                                 | 24        |
| 6.5.4          | Test Data .....                                          | 24        |
| <b>6.6</b>     | <b>DWELL TIME .....</b>                                  | <b>25</b> |
| 6.6.1          | Test Specification .....                                 | 25        |
| 6.6.2          | E.U.T. Operation .....                                   | 26        |
| 6.6.3          | Test Setup Diagram .....                                 | 26        |
| 6.6.4          | Test Data .....                                          | 26        |
| <b>6.7</b>     | <b>EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS .....</b> | <b>27</b> |
| 6.7.1          | Test Specification .....                                 | 27        |
| 6.7.2          | E.U.T. Operation .....                                   | 28        |
| 6.7.3          | Test Setup Diagram .....                                 | 28        |
| 6.7.4          | Test Data .....                                          | 28        |
| <b>6.8</b>     | <b>BAND EDGE EMISSIONS (RADIATED) .....</b>              | <b>29</b> |
| 6.8.1          | Test Specification .....                                 | 29        |
| 6.8.2          | E.U.T. Operation .....                                   | 29        |
| 6.8.3          | Test Setup Diagram .....                                 | 29        |
| 6.8.4          | Test Data .....                                          | 30        |
| <b>6.9</b>     | <b>EMISSIONS IN FREQUENCY BANDS (BELOW 1GHz) .....</b>   | <b>34</b> |
| 6.9.1          | Test Specification .....                                 | 34        |
| 6.9.2          | E.U.T. Operation .....                                   | 34        |
| 6.9.3          | Test Setup Diagram .....                                 | 34        |
| 6.9.4          | Test Data .....                                          | 35        |
| <b>6.10</b>    | <b>EMISSIONS IN FREQUENCY BANDS (ABOVE 1GHz) .....</b>   | <b>38</b> |
| 6.10.1         | Test Specification .....                                 | 38        |
| 6.10.2         | E.U.T. Operation .....                                   | 38        |
| 6.10.3         | Test Setup Diagram .....                                 | 38        |
| 6.10.4         | Test Data .....                                          | 39        |
| <b>ANNEX A</b> | <b>TEST SETUP PHOTOS .....</b>                           | <b>43</b> |
| <b>ANNEX B</b> | <b>EXTERNAL PHOTOS .....</b>                             | <b>43</b> |
| <b>ANNEX C</b> | <b>INTERNAL PHOTOS .....</b>                             | <b>43</b> |
| <b>ANNEX D</b> | <b>TEST DATA .....</b>                                   | <b>44</b> |

## 2 General Information

### 2.1 Applicant Information

|           |                                                                                                      |
|-----------|------------------------------------------------------------------------------------------------------|
| Applicant | Hong Kong Etech Groups Ltd.                                                                          |
| Address   | 16/F, Block C, 2nd Phase of Central Avenue, Haihong Industrial Area, Xixiang, Baoan, Shenzhen, China |

### 2.2 Manufacturer Information

|              |                                                                                                      |
|--------------|------------------------------------------------------------------------------------------------------|
| Manufacturer | Hong Kong Etech Groups Ltd.                                                                          |
| Address      | 16/F, Block C, 2nd Phase of Central Avenue, Haihong Industrial Area, Xixiang, Baoan, Shenzhen, China |

### 2.3 Factory Information

|         |                                                                                                      |
|---------|------------------------------------------------------------------------------------------------------|
| Factory | Hong Kong Etech Groups Ltd.                                                                          |
| Address | 16/F, Block C, 2nd Phase of Central Avenue, Haihong Industrial Area, Xixiang, Baoan, Shenzhen, China |

### 2.4 General Description of E.U.T.

|                                      |                                                                                                                                                                                   |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name                         | Bluetooth Speaker                                                                                                                                                                 |
| Model No. Under Test                 | EBA2-250018A                                                                                                                                                                      |
| List Model No.                       | 25663                                                                                                                                                                             |
| Description of Model differentiation | All models are same with electrical parameters and internal circuit structure, but only differ in appearance color and model name.<br>(this information provided by the customer) |
| Rating(s)                            | Input: 5VDC, 1A<br>Battery Capacity: 3.7VDC, 1500mAh, 5.55Wh                                                                                                                      |
| Product Type                         | <input type="checkbox"/> Mobile<br><input checked="" type="checkbox"/> Portable<br><input type="checkbox"/> Fix Location                                                          |
| Test Sample No.                      | 8336EU010406W-1/2(Normal), 8336EU010406W-2/2(Engineering)                                                                                                                         |
| Hardware Version                     | V1.0                                                                                                                                                                              |
| Software Version                     | V1.0                                                                                                                                                                              |
| Remark                               | For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.                                                                 |

## 2.5 Technical Information of E.U.T.

|                                   |                     |
|-----------------------------------|---------------------|
| Network and Wireless Connectivity | Bluetooth (BDR+EDR) |
|-----------------------------------|---------------------|

The requirement for the following technical information of the EUT was tested in this report:

|                     |                                                                                                                                        |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Operating Frequency | 2402MHz to 2480MHz                                                                                                                     |
| Modulation Type     | GFSK, $\pi/4$ DQPSK, 8DPSK                                                                                                             |
| Number of Channels  | 79                                                                                                                                     |
| Antenna Type        | PCB Antenna                                                                                                                            |
| Antenna Gain(Peak)  | -0.58 dBi                                                                                                                              |
| Remark              | The above information are declared by the applicant, EU-LAB is not responsible for the information accuracy provided by the applicant. |

All channels were listed on the following table:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 0       | 2402            | 20      | 2422            | 40      | 2442            | 60      | 2462            |
| 1       | 2403            | 21      | 2423            | 41      | 2443            | 61      | 2463            |
| 2       | 2404            | 22      | 2424            | 42      | 2444            | 62      | 2464            |
| 3       | 2405            | 23      | 2425            | 43      | 2445            | 63      | 2465            |
| 4       | 2406            | 24      | 2426            | 44      | 2446            | 64      | 2466            |
| 5       | 2407            | 25      | 2427            | 45      | 2447            | 65      | 2467            |
| 6       | 2408            | 26      | 2428            | 46      | 2448            | 66      | 2468            |
| 7       | 2409            | 27      | 2429            | 47      | 2449            | 67      | 2469            |
| 8       | 2410            | 28      | 2430            | 48      | 2450            | 68      | 2470            |
| 9       | 2411            | 29      | 2431            | 49      | 2451            | 69      | 2471            |
| 10      | 2412            | 30      | 2432            | 50      | 2452            | 70      | 2472            |
| 11      | 2413            | 31      | 2433            | 51      | 2453            | 71      | 2473            |
| 12      | 2414            | 32      | 2434            | 52      | 2454            | 72      | 2474            |
| 13      | 2415            | 33      | 2435            | 53      | 2455            | 73      | 2475            |
| 14      | 2416            | 34      | 2436            | 54      | 2456            | 74      | 2476            |
| 15      | 2417            | 35      | 2437            | 55      | 2457            | 75      | 2477            |
| 16      | 2418            | 36      | 2438            | 56      | 2458            | 76      | 2478            |
| 17      | 2419            | 37      | 2439            | 57      | 2459            | 77      | 2479            |
| 18      | 2420            | 38      | 2440            | 58      | 2460            | 78      | 2480            |
| 19      | 2421            | 39      | 2441            | 59      | 2461            | -       | -               |

### 3 Test Summary

#### 3.1 Test Standard

The tests were performed according to following standards:

**47 CFR Part 15.247:** Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

Remark:

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

#### 3.2 Test Verdict

| Test Items                                  | Standard           | Method                                                                        | Requirement              | Results |
|---------------------------------------------|--------------------|-------------------------------------------------------------------------------|--------------------------|---------|
| Antenna requirement                         | 47 CFR Part 15.247 | /                                                                             | 47 CFR 15.203            | Pass    |
| Conducted Emission at AC power line         | 47 CFR Part 15.247 | ANSI C63.10-2020 section 6.2                                                  | 47 CFR 15.207(a)         | Pass    |
| 20dB Bandwidth                              | 47 CFR Part 15.247 | ANSI C63.10-2020, section 7.8.6<br>KDB 558074 D01 15.247 Meas Guidance v05r02 | 47 CFR 15.247(a)(1)      | Pass    |
| Maximum Conducted Output Power              | 47 CFR Part 15.247 | ANSI C63.10-2020, section 7.8.5<br>KDB 558074 D01 15.247 Meas Guidance v05r02 | 47 CFR 15.247(b)(1)      | Pass    |
| Channel Separation                          | 47 CFR Part 15.247 | ANSI C63.10-2020, section 7.8.2<br>KDB 558074 D01 15.247 Meas Guidance v05r02 | 47 CFR 15.247(a)(1)      | Pass    |
| Number of Hopping Frequencies               | 47 CFR Part 15.247 | ANSI C63.10-2020, section 7.8.3<br>KDB 558074 D01 15.247 Meas Guidance v05r02 | 47 CFR 15.247(a)(1)(iii) | Pass    |
| Dwell Time                                  | 47 CFR Part 15.247 | ANSI C63.10-2020, section 7.8.4<br>KDB 558074 D01 15.247 Meas Guidance v05r02 | 47 CFR 15.247(a)(1)(iii) | Pass    |
| Emissions in non-restricted frequency bands | 47 CFR Part 15.247 | ANSI C63.10-2020 section 7.8.7<br>KDB 558074 D01 15.247 Meas Guidance v05r02  | 47 CFR 15.247(d)         | Pass    |
| Band edge emissions                         | 47 CFR Part 15.247 | ANSI C63.10-                                                                  | 47 CFR 15.247(d),        | Pass    |

|                                                                               |                    |                                                                                           |                                     |      |
|-------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------|-------------------------------------|------|
| (Radiated)                                                                    |                    | 2020 section 6.10<br>KDB 558074 D01<br>15.247 Meas<br>Guidance v05r02                     | 15.209, 15.205                      |      |
| Emissions in frequency<br>bands (below 1GHz)                                  | 47 CFR Part 15.247 | ANSI C63.10-<br>2020 section<br>6.6.4<br>KDB 558074 D01<br>15.247 Meas<br>Guidance v05r02 | 47 CFR 15.247(d),<br>15.209, 15.205 | Pass |
| Emissions in frequency<br>bands (above 1GHz)                                  | 47 CFR Part 15.247 | ANSI C63.10-<br>2020 section<br>6.6.4<br>KDB 558074 D01<br>15.247 Meas<br>Guidance v05r02 | 47 CFR 15.247(d),<br>15.209, 15.205 | Pass |
| <b>Note:</b><br>(1) "N/A" denotes test is not applicable in this Test Report. |                    |                                                                                           |                                     |      |

### 3.3 Test Laboratory

|                               |                                                                                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Test Laboratory               | Shenzhen EU Testing Laboratory Limited                                                                                 |
| Address                       | 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China |
| Designation Number            | CN1368                                                                                                                 |
| Test Firm Registration Number | 952583                                                                                                                 |

## 4 Test Configuration

### 4.1 Test Environment

During the measurement, the normal environmental conditions were within the listed ranges:

|                            |                         |                                                   |
|----------------------------|-------------------------|---------------------------------------------------|
| Relative Humidity          | 30% to 60%              |                                                   |
| Atmospheric Pressure       | 86 kPa to 106 kPa       |                                                   |
| Temperature                | NT (Normal Temperature) | +15°C to +35°C                                    |
| Working Voltage of the EUT | NV (Normal Voltage)     | 120VAC, 60Hz for adapter<br>3.7VDC battery inside |

### 4.2 Test Equipment

| Conducted Emission at AC power line |                 |          |           |            |              |
|-------------------------------------|-----------------|----------|-----------|------------|--------------|
| Equipment                           | Manufacturer    | Model No | Serial No | Cal Date   | Cal Due Date |
| L.I.S.N. Artificial Mains Network   | Rohde & Schwarz | ENV216   | EE-004    | 2025-01-08 | 2026-01-07   |
| EMI Test Receiver                   | Rohde & Schwarz | ESCI     | EE-005    | 2025-01-08 | 2026-01-07   |
| Test Software                       | Farad           | EZ-EMC   | EE-014    | /          | /            |

| Emissions in non-restricted frequency bands |                 |              |           |            |              |
|---------------------------------------------|-----------------|--------------|-----------|------------|--------------|
| 20dB Bandwidth                              |                 |              |           |            |              |
| Maximum Conducted Output Power              |                 |              |           |            |              |
| Channel Separation                          |                 |              |           |            |              |
| Number of Hopping Frequencies               |                 |              |           |            |              |
| Dwell Time                                  |                 |              |           |            |              |
| Equipment                                   | Manufacturer    | Model No     | Serial No | Cal Date   | Cal Due Date |
| MXA Signal Analyzer                         | Agilent         | N9020A       | EE-011    | 2025-01-08 | 2026-01-07   |
| MXG RF Vector Signal Generator              | Agilent         | N5182A       | EE-012    | 2025-01-08 | 2026-01-07   |
| MIMO Power Measurement Module               | TSTPASS         | TSPS 2023R   | EE-016    | 2025-01-08 | 2026-01-07   |
| Wideband Radio Communication Tester         | ROHDE & SCHWARZ | CMW500       | EE-402    | 2025-02-14 | 2026-02-13   |
| MXG RF Analog Signal Generator              | Agilent         | N5181A       | EE-406    | 2025-02-14 | 2026-02-13   |
| Power Meter                                 | Anritsu         | ML2495A      | EE-416    | 2025-02-14 | 2026-02-13   |
| Constant Temperature Humidity Chamber       | Guangxin        | GXP-401      | ES-002    | 2025-07-29 | 2026-07-28   |
| RF Test Software                            | TSTPASS         | TS32893 V2.0 | EE-017    | /          | /            |

| <b>Band edge emissions (Radiated)</b>            |                     |                 |                  |                 |                     |
|--------------------------------------------------|---------------------|-----------------|------------------|-----------------|---------------------|
| <b>Emissions in frequency bands (above 1GHz)</b> |                     |                 |                  |                 |                     |
| <b>Equipment</b>                                 | <b>Manufacturer</b> | <b>Model No</b> | <b>Serial No</b> | <b>Cal Date</b> | <b>Cal Due Date</b> |
| EMI Test Receiver                                | ROHDE & SCHWARZ     | ESPI            | EE-006           | 2025-01-08      | 2026-01-07          |
| Double Ridged Horn Antenna                       | A-INFOMW            | LB-10180-NF     | EE-008           | 2023-01-12      | 2026-01-11          |
| Pre-amplifier                                    | Agilent             | 8449B           | EE-010           | 2025-01-08      | 2026-01-07          |
| MXG RF Vector Signal Generator                   | Agilent             | N5182A          | EE-012           | 2025-01-08      | 2026-01-07          |
| DRG Horn Antenna                                 | SCHWARZBECK         | BBHA 9170       | EE-410           | 2025-02-14      | 2026-02-13          |
| Pre-amplifier                                    | SKET                | LNPA-1840-50    | EE-411           | 2025-02-14      | 2026-02-13          |
| Test Software                                    | Farad               | EZ-EMC          | EE-015           | /               | /                   |

| <b>Emissions in frequency bands (below 1GHz)</b> |                     |                 |                  |                 |                     |
|--------------------------------------------------|---------------------|-----------------|------------------|-----------------|---------------------|
| <b>Equipment</b>                                 | <b>Manufacturer</b> | <b>Model No</b> | <b>Serial No</b> | <b>Cal Date</b> | <b>Cal Due Date</b> |
| EMI Test Receiver                                | ROHDE & SCHWARZ     | ESPI            | EE-006           | 2025-01-08      | 2026-01-07          |
| Bilog Broadband Antenna                          | SCHWARZBECK         | VULB 9163       | EE-007           | 2023-01-14      | 2026-01-13          |
| Pre-amplifier                                    | Agilent             | 8447D           | EE-009           | 2025-01-08      | 2026-01-07          |
| MXA Signal Analyzer                              | Agilent             | N9020A          | EE-011           | 2025-01-08      | 2026-01-07          |
| Test Software                                    | Farad               | EZ-EMC          | EE-015           | /               | /                   |

### 4.3 Description of Support Unit

| No. | Title   | Manufacturer | Model No. | Serial No. |
|-----|---------|--------------|-----------|------------|
| 1   | Adapter | Apple        | A1443     | EMC-PJ-001 |

### 4.4 Test Mode

| No. | Test Modes                      | Description                                                                                                                       |
|-----|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| TM1 | TX-GFSK (Non-Hopping)           | Keep the EUT in continuously transmitting mode (non-hopping) with GFSK modulation at lowest, middle and highest channel.          |
| TM2 | TX- $\pi$ /4DQPSK (Non-Hopping) | Keep the EUT in continuously transmitting mode (non-hopping) with $\pi$ /4DQPSK modulation at lowest, middle and highest channel. |
| TM3 | TX-8DPSK (Non-Hopping)          | Keep the EUT in continuously transmitting mode (non-hopping) with 8DPSK modulation at lowest, middle and highest channel.         |
| TM4 | TX-GFSK (Hopping)               | Keep the EUT in continuously transmitting mode (hopping) with GFSK modulation.                                                    |
| TM5 | TX- $\pi$ /4DQPSK (Hopping)     | Keep the EUT in continuously transmitting mode (hopping) with $\pi$ /4DQPSK modulation.                                           |
| TM6 | TX-8DPSK (Hopping)              | Keep the EUT in continuously transmitting mode (hopping) with 8DPSK modulation.                                                   |

### 4.5 Description of Calculation

#### 4.5.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS \text{ (dBuV/m)} = RA \text{ (dBuV)} + AF \text{ (dB/m)} + CL \text{ (dB)} - AG \text{ (dB)}$$

|                           |                                            |
|---------------------------|--------------------------------------------|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude    | AG = Amplifier Gain                        |
| AF = Antenna Factor       |                                            |

#### 4.5.2 Disturbance Calculation

The AC mains conducted disturbance is calculated by adding the 10dB Pulse Limiter and Cable Factor and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$CD \text{ (dBuV)} = RA \text{ (dBuV)} + PL \text{ (dB)} + CL \text{ (dB)}$$

|                                  |                                            |
|----------------------------------|--------------------------------------------|
| Where CD = Conducted Disturbance | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude           | PL = 10 dB Pulse Limiter Factor            |

### 4.6 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

| Test Item                        | Measurement Uncertainty                              |
|----------------------------------|------------------------------------------------------|
| Conducted Emission               | 2.64 dB                                              |
| Occupied Channel Bandwidth       | 70 kHz                                               |
| RF output power, conducted       | 1.04 dB                                              |
| Time of Occupancy (Dwell Time)   | 1.8 %                                                |
| Unwanted Emissions, conducted    | 2.72 dB                                              |
| Radiated Emission (1GHz- 18GHz)  | Ur = 3.50 dB (Horizontal)<br>Ur = 3.50 dB (Vertical) |
| Radiated Emission (9kHz- 30MHz)  | Ur = 2.50 dB                                         |
| Radiated Emission (30MHz- 1GHz)  | Ur = 2.70 dB (Horizontal)<br>Ur = 2.70 dB (Vertical) |
| Radiated Emission (18GHz- 40GHz) | Ur = 5.15 dB (Horizontal)<br>Ur = 5.24 dB (Vertical) |

#### 4.7 Deviation from Standards

None

#### 4.8 Abnormalities from Standard Condition

None

## 5 Evaluation Results (Evaluation)

### 5.1 Antenna requirement

#### 5.1.1 Test Specification

|                   |                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 5.1.2 Test Data

**PASS.**

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

## 6 Radio Spectrum Matter Test Results (RF)

## 6.1 Conducted Emission at AC power line

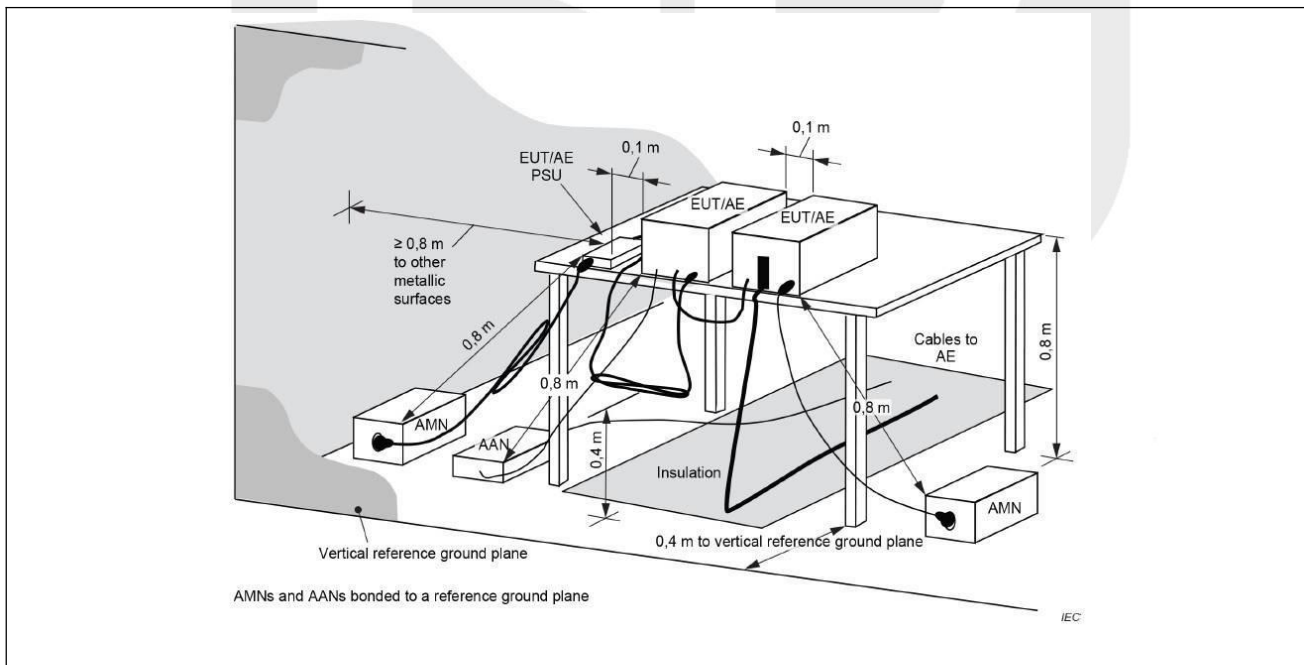
### 6.1.1 Test Specification

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------|
| Test Requirement: | Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 ohms line impedance stabilization network (LISN). |                              |           |
| Test Limit:       | Frequency of emission (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Conducted limit (dB $\mu$ V) |           |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Quasi-peak                   | Average   |
|                   | 0.15-0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 66 to 56*                    | 56 to 46* |
|                   | 0.5-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 56                           | 46        |
|                   | 5-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 60                           | 50        |
|                   | *Decreases with the logarithm of the frequency.                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |           |
| Test Method:      | ANSI C63.10-2020 section 6.2                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |           |
| Procedure:        | Refer to ANSI C63.10-2020 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices                                                                                                                                                                                                                                                                                                                                              |                              |           |

### 6.1.2 E.U.T. Operation

|                  |     |
|------------------|-----|
| Pre test mode:   | TM1 |
| Final test mode: | TM1 |

### 6.1.3 Test Setup Diagram



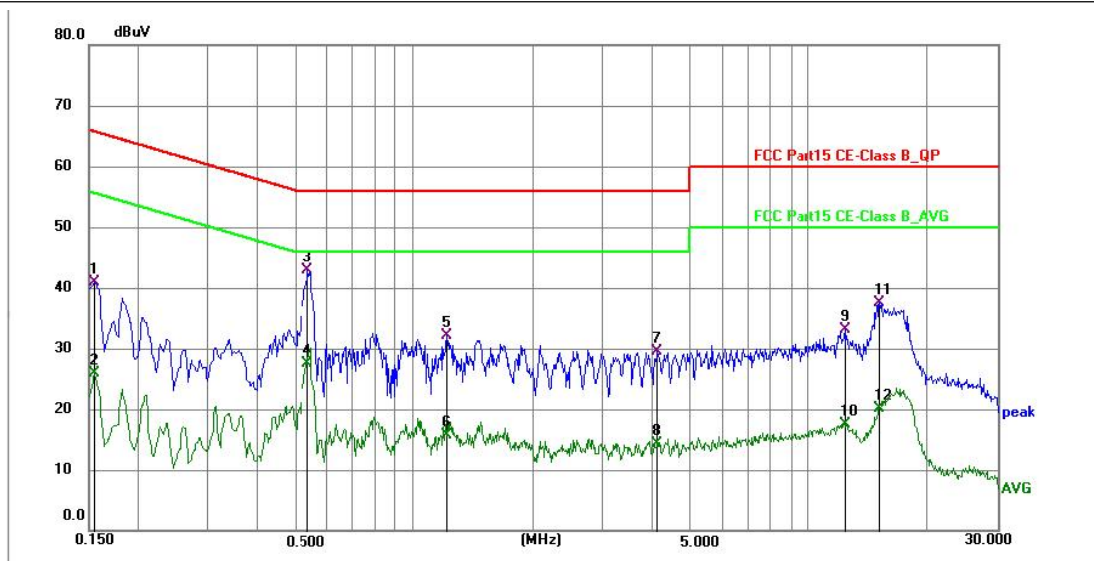
### 6.1.4 Test Data

**PASS.**

Please refer to the following pages.

## Conducted Emission at AC power line Test Data

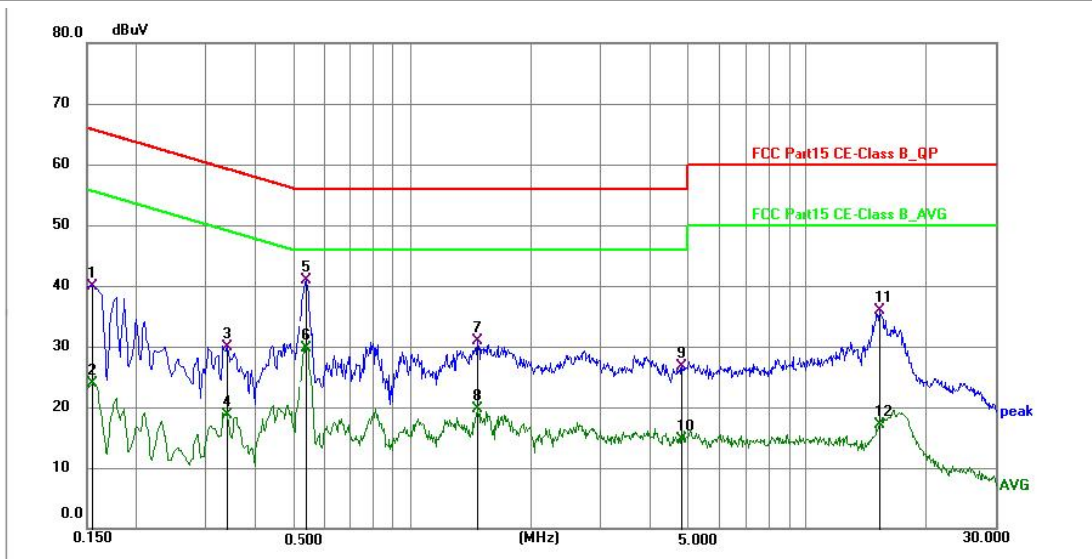
TM1 / Line: Line / Band: 2400-2483.5 MHz / BW: 1 / CH: L



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.1545          | 30.94          | 9.96        | 40.90        | 65.75        | -24.85      | QP       | P   |        |
| 2   | 0.1545          | 15.86          | 9.96        | 25.82        | 55.75        | -29.93      | AVG      | P   |        |
| 3 * | 0.5370          | 32.88          | 10.04       | 42.92        | 56.00        | -13.08      | QP       | P   |        |
| 4   | 0.5370          | 17.49          | 10.04       | 27.53        | 46.00        | -18.47      | AVG      | P   |        |
| 5   | 1.2120          | 22.09          | 10.04       | 32.13        | 56.00        | -23.87      | QP       | P   |        |
| 6   | 1.2120          | 5.76           | 10.04       | 15.80        | 46.00        | -30.20      | AVG      | P   |        |
| 7   | 4.1280          | 19.46          | 10.04       | 29.50        | 56.00        | -26.50      | QP       | P   |        |
| 8   | 4.1280          | 4.23           | 10.04       | 14.27        | 46.00        | -31.73      | AVG      | P   |        |
| 9   | 12.3405         | 23.12          | 9.96        | 33.08        | 60.00        | -26.92      | QP       | P   |        |
| 10  | 12.3405         | 7.52           | 9.96        | 17.48        | 50.00        | -32.52      | AVG      | P   |        |
| 11  | 15.1440         | 27.62          | 9.97        | 37.59        | 60.00        | -22.41      | QP       | P   |        |
| 12  | 15.1440         | 10.13          | 9.97        | 20.10        | 50.00        | -29.90      | AVG      | P   |        |

### Conducted Emission at AC power line Test Data

TM1 / Line: Neutral / Band: 2400-2483.5 MHz / BW: 1 / CH: L



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.1545          | 30.01          | 9.98        | 39.99        | 65.75        | -25.76      | QP       | P   |        |
| 2   | 0.1545          | 13.92          | 9.98        | 23.90        | 55.75        | -31.85      | AVG      | P   |        |
| 3   | 0.3390          | 19.97          | 10.02       | 29.99        | 59.23        | -29.24      | QP       | P   |        |
| 4   | 0.3390          | 8.72           | 10.02       | 18.74        | 49.23        | -30.49      | AVG      | P   |        |
| 5 * | 0.5415          | 30.77          | 10.07       | 40.84        | 56.00        | -15.16      | QP       | P   |        |
| 6   | 0.5415          | 19.54          | 10.07       | 29.61        | 46.00        | -16.39      | AVG      | P   |        |
| 7   | 1.4640          | 20.80          | 10.06       | 30.86        | 56.00        | -25.14      | QP       | P   |        |
| 8   | 1.4640          | 9.56           | 10.06       | 19.62        | 46.00        | -26.38      | AVG      | P   |        |
| 9   | 4.8210          | 16.58          | 10.05       | 26.63        | 56.00        | -29.37      | QP       | P   |        |
| 10  | 4.8210          | 4.74           | 10.05       | 14.79        | 46.00        | -31.21      | AVG      | P   |        |
| 11  | 15.2565         | 25.99          | 9.99        | 35.98        | 60.00        | -24.02      | QP       | P   |        |
| 12  | 15.2565         | 7.10           | 9.99        | 17.09        | 50.00        | -32.91      | AVG      | P   |        |

## 6.2 20dB Bandwidth

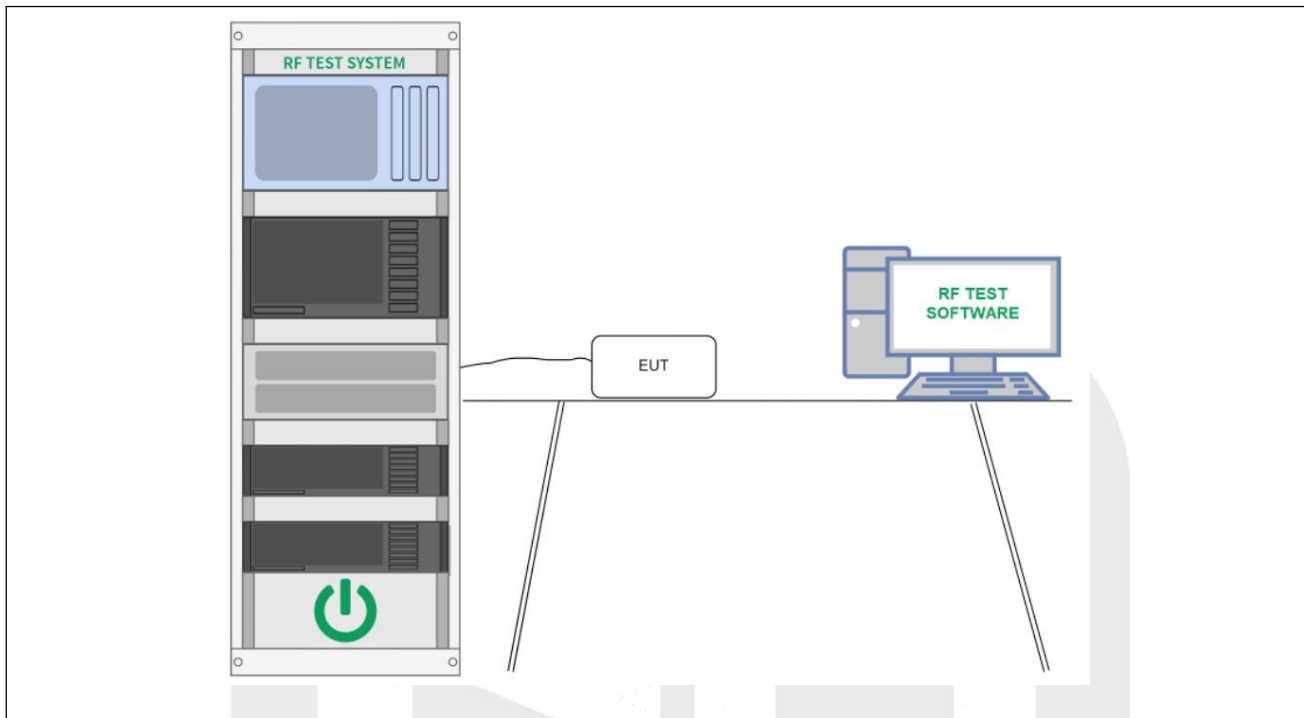
### 6.2.1 Test Specification

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR 15.247(a)(1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Test Limit:       | Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Test Method:      | ANSI C63.10-2020, section 7.8.6, For occupied bandwidth measurements, use the procedure in 6.9.3. Frequency hopping shall be disabled for this test.<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Procedure:        | <p>The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:</p> <p>a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.</p> <p>b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be at least three times the RBW, unless otherwise specified by the applicable requirement.</p> <p>c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than <math>[10 \log (OBW/RBW)]</math> below the reference level. Specific guidance is given in 4.1.6.2.</p> <p>d) Step a) through step c) might require iteration to adjust within the specified range.</p> <p>e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max-hold mode (until the trace stabilizes) shall be used.</p> <p>f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.</p> <p>g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.</p> <p>h) The occupied bandwidth shall be reported by providing spectral plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).</p> |

### 6.2.2 E.U.T. Operation

|                  |               |
|------------------|---------------|
| Pre test mode:   | TM1, TM2, TM3 |
| Final test mode: | TM1, TM2, TM3 |

### 6.2.3 Test Setup Diagram



### 6.2.4 Test Data

**PASS.**

Please refer to Annex D for details.

### 6.3 Maximum Conducted Output Power

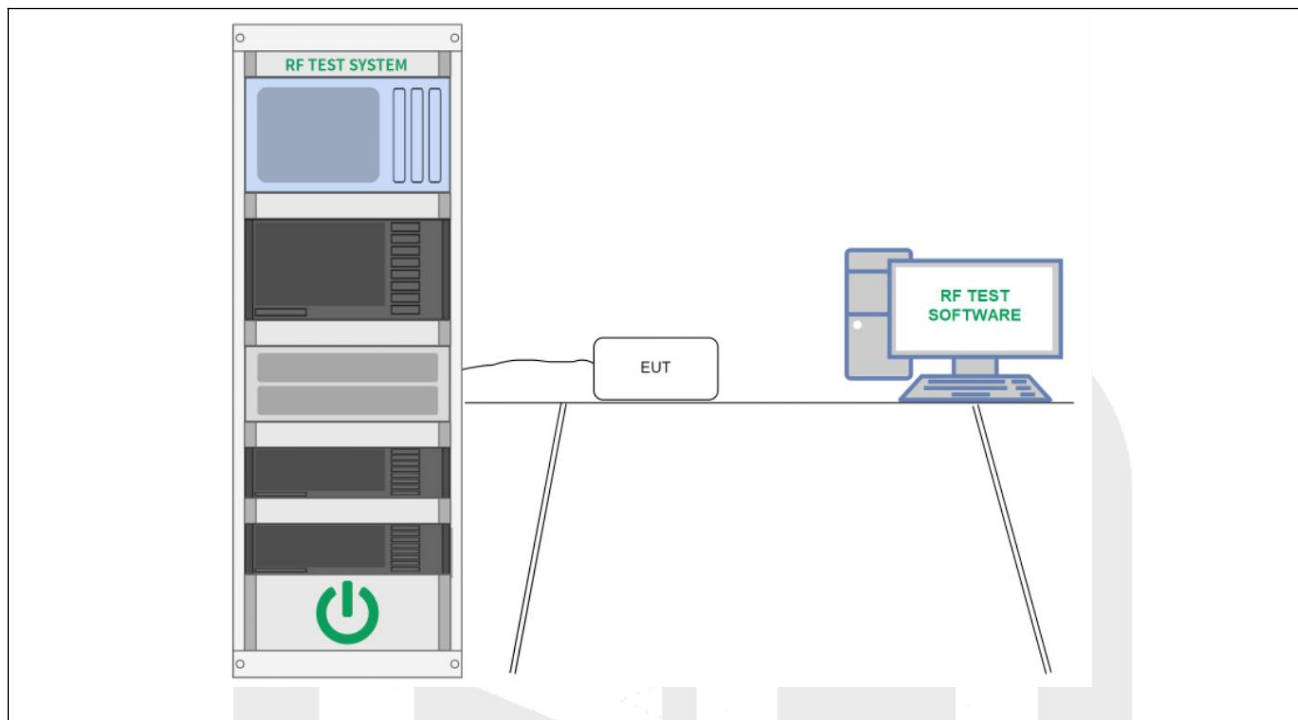
#### 6.3.1 Test Specification

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR 15.247(b)(1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Test Limit:       | Refer to 47 CFR 15.247(b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Test Method:      | ANSI C63.10-2020, section 7.8.5<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Procedure:        | <p>This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. Frequency hopping shall be disabled for this test. Use the following spectrum analyzer settings:</p> <ul style="list-style-type: none"> <li>a) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.</li> <li>b) RBW &gt; 20 dB bandwidth of the emission being measured.</li> <li>c) VBW ≥ RBW.</li> <li>d) Sweep: No faster than coupled (auto) time.</li> <li>e) Detector function: Peak.</li> <li>f) Trace: Max-hold.</li> <li>g) Allow trace to stabilize.</li> <li>h) Use the marker-to-peak function to set the marker to the peak of the emission.</li> <li>i) The indicated level is the peak output power, after any corrections for external attenuators and cables.</li> <li>j) A spectral plot of the test results and setup description shall be included in the test report.</li> </ul> <p>NOTE—A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.</p> |

#### 6.3.2 E.U.T. Operation

|                  |               |
|------------------|---------------|
| Pre test mode:   | TM1, TM2, TM3 |
| Final test mode: | TM1, TM2, TM3 |

### 6.3.3 Test Setup Diagram



### 6.3.4 Test Data

**PASS.**

Please refer to Annex D for details.

## 6.4 Channel Separation

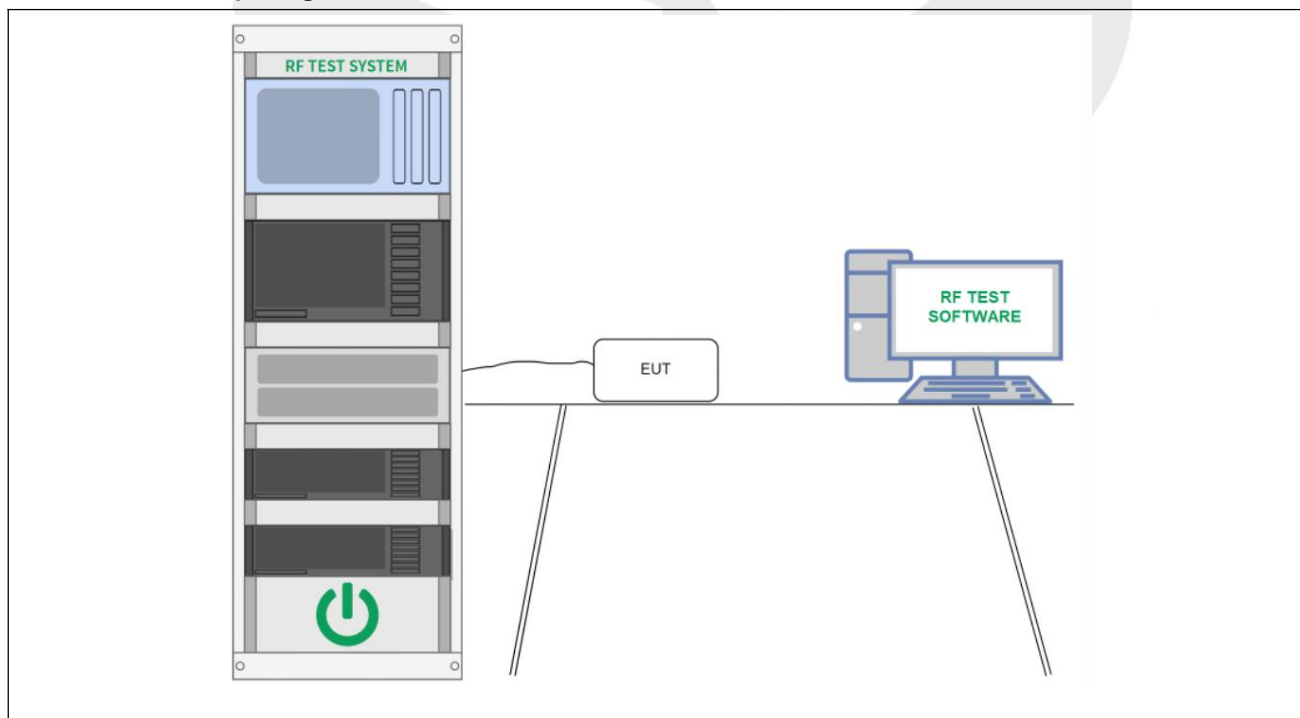
### 6.4.1 Test Specification

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR 15.247(a)(1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Test Limit:       | Refer to 47 CFR 15.247(a)(1), 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.                                                                                                                                                                                                                                                                                                                                                                   |
| Test Method:      | ANSI C63.10-2020, section 7.8.2<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Procedure:        | <p>The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:</p> <ul style="list-style-type: none"> <li>a) Span: Wide enough to capture the peaks of two adjacent channels.</li> <li>b) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.</li> <li>c) Video (or average) bandwidth (VBW) <math>\geq</math> RBW.</li> <li>d) Sweep: No faster than coupled (auto) time.</li> <li>e) Detector function: Peak.</li> <li>f) Trace: Max-hold.</li> <li>g) Allow the trace to stabilize.</li> </ul> <p>Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined. A spectral plot of the data shall be included in the test report.</p> |

### 6.4.2 E.U.T. Operation

|                  |               |
|------------------|---------------|
| Pre test mode:   | TM4, TM5, TM6 |
| Final test mode: | TM4, TM5, TM6 |

### 6.4.3 Test Setup Diagram



#### 6.4.4 Test Data

**PASS.**

Please refer to Annex D for details.



## 6.5 Number of Hopping Frequencies

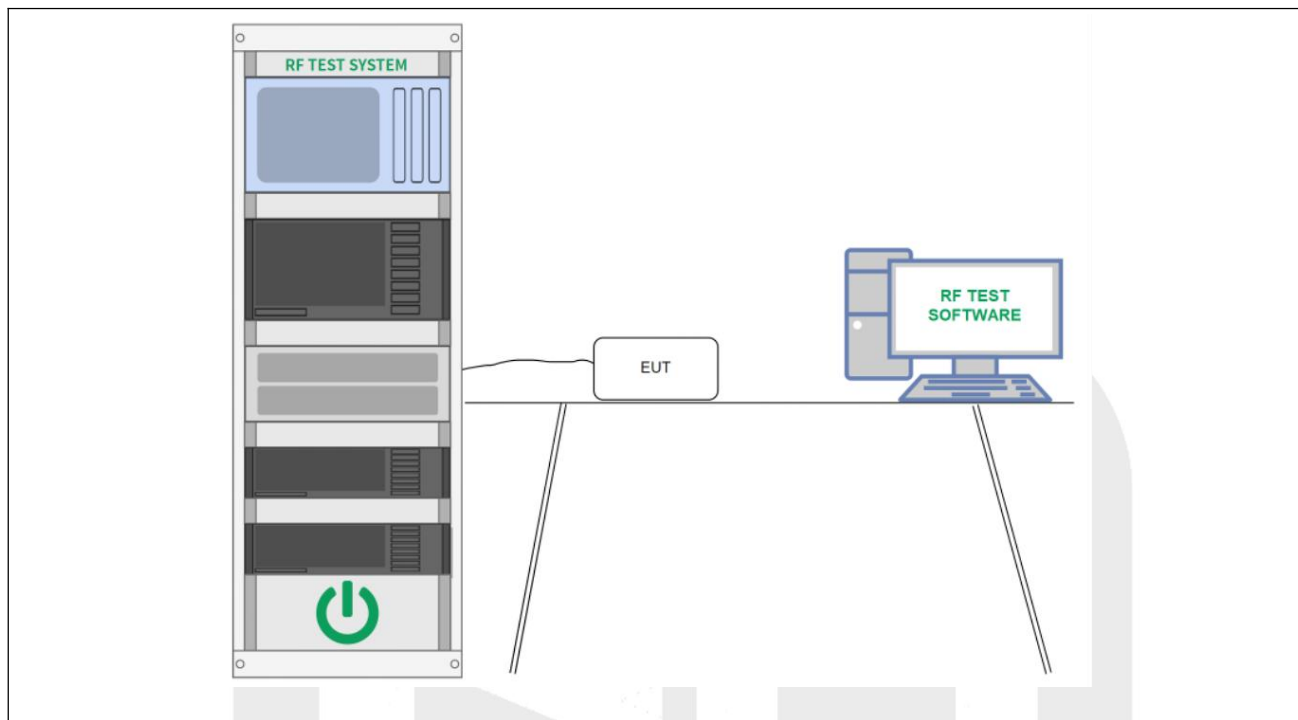
### 6.5.1 Test Specification

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR 15.247(a)(1)(iii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Test Limit:       | Refer to 47 CFR 15.247(a)(1)(iii), Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Test Method:      | ANSI C63.10-2020, section 7.8.3<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Procedure:        | <p>The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:</p> <ul style="list-style-type: none"> <li>a) Span: The frequency band of operation. Depending on the number of channels the device supports, it could be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.</li> <li>b) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.</li> <li>c) VBW <math>\geq</math> RBW.</li> <li>d) Sweep: No faster than coupled (auto) time.</li> <li>e) Detector function: Peak.</li> <li>f) Trace: Max-hold.</li> <li>g) Allow the trace to stabilize.</li> </ul> <p>It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A spectral plot of the data shall be included in the test report.</p> |

### 6.5.2 E.U.T. Operation

|                  |               |
|------------------|---------------|
| Pre test mode:   | TM4, TM5, TM6 |
| Final test mode: | TM4, TM5, TM6 |

### 6.5.3 Test Setup Diagram



### 6.5.4 Test Data

**PASS.**

Please refer to Annex D for details.

## 6.6 Dwell Time

### 6.6.1 Test Specification

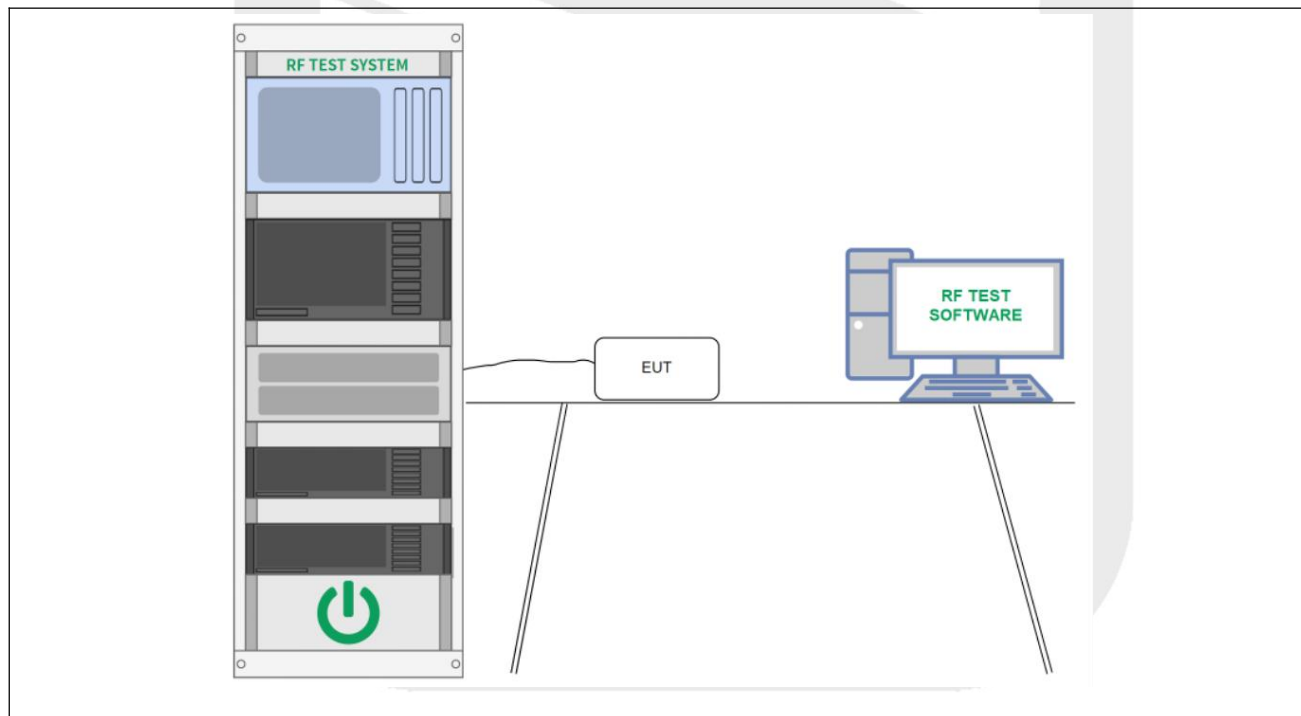
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR 15.247(a)(1)(iii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Test Limit:       | Refer to 47 CFR 15.247(a)(1)(iii), Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Test Method:      | ANSI C63.10-2020, section 7.8.4<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Procedure:        | <p>The dwell time per hop on a channel is the time from the start of the first transmission to the end of the last transmission for that hop. If the device has a single transmission per hop then the dwell time is the duration of that transmission. If the device has a multiple transmissions per hop then the dwell time is measured from the start of the first transmission to the end of the last transmission.</p> <p>The time of occupancy is the total time that the device dwells on a channel over an observation period specified in the regulatory requirement. To determine the time of occupancy the spectrum analyzer will be configured to measure both the dwell time per hop and the number of times the device transmits on a specific channel in a given period.</p> <p>The EUT shall have its hopping function enabled. Compliance with the requirements shall be made with the minimum and with the maximum number of channels enabled. If the dwell time per channel does not vary with the number of channels then compliance with the requirements may be based on the minimum number of channels. If the device supports different dwell times per channel (example Bluetooth devices can dwell on a channel for 1, 3 or 5 time slots) then measurements can be limited to the longest dwell time with the minimum number of channels.</p> <p>Use the following spectrum analyzer settings to determine the dwell time per hop:</p> <ul style="list-style-type: none"> <li>a) Span: Zero span, centered on a hopping channel.</li> <li>b) RBW shall be <math>\leq</math> channel spacing and where possible RBW should be set <math>\gg 1/T</math>, where T is the expected transmission time per hop.</li> <li>c) Sweep time: Set so that the start of the first transmission and end of the last transmission for the hop are clearly captured. Setting the sweep time to be slightly longer than the hopping period per channel (hopping period = <math>1/\text{hopping rate}</math>) should achieve this.</li> <li>d) Use a video trigger, where possible with a trigger delay, so that the start of the transmission is clearly observed. The trigger level might need adjustment to reduce the chance of triggering when the system hops on an adjacent channel.</li> <li>e) Detector function: Peak.</li> <li>f) Trace: Clear-write, single sweep.</li> <li>g) Place markers at the start of the first transmission on the channel and at the end of the last transmission. The dwell time per hop is the time between these two markers.</li> </ul> <p>To determine the number of hops on a channel in the regulatory observation period repeat the measurement using a longer sweep time. When the device uses a single hopping sequence the period of measurement should be sufficient to capture at least 2 hops. When the device uses a dynamic hopping sequence, or the sequence varies, the period of measurement may need to capture multiple</p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>hops to better determine the average time of occupancy. Count the number of hops on the channel across the sweep time.</p> <p>The average number of hops on the same channel within the regulatory observation period is calculated from the number of hops on the channel divided by the spectrum analyzer sweep time multiplied by the regulatory observation period. For example, if three hops are counted with an analyzer sweep time of 500 ms and the regulatory observation period is 10 s, then the number of hops in that ten seconds is <math>3 / 0.5 \times 10</math>, or 60 hops.</p> <p>The average time of occupancy is calculated by multiplying the dwell time per hop by the number of hops in the observation period.</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 6.6.2 E.U.T. Operation

|                  |               |
|------------------|---------------|
| Pre test mode:   | TM4, TM5, TM6 |
| Final test mode: | TM4, TM5, TM6 |

#### 6.6.3 Test Setup Diagram



#### 6.6.4 Test Data

**PASS.**

Please refer to Annex D for details.

## 6.7 Emissions in non-restricted frequency bands

### 6.7.1 Test Specification

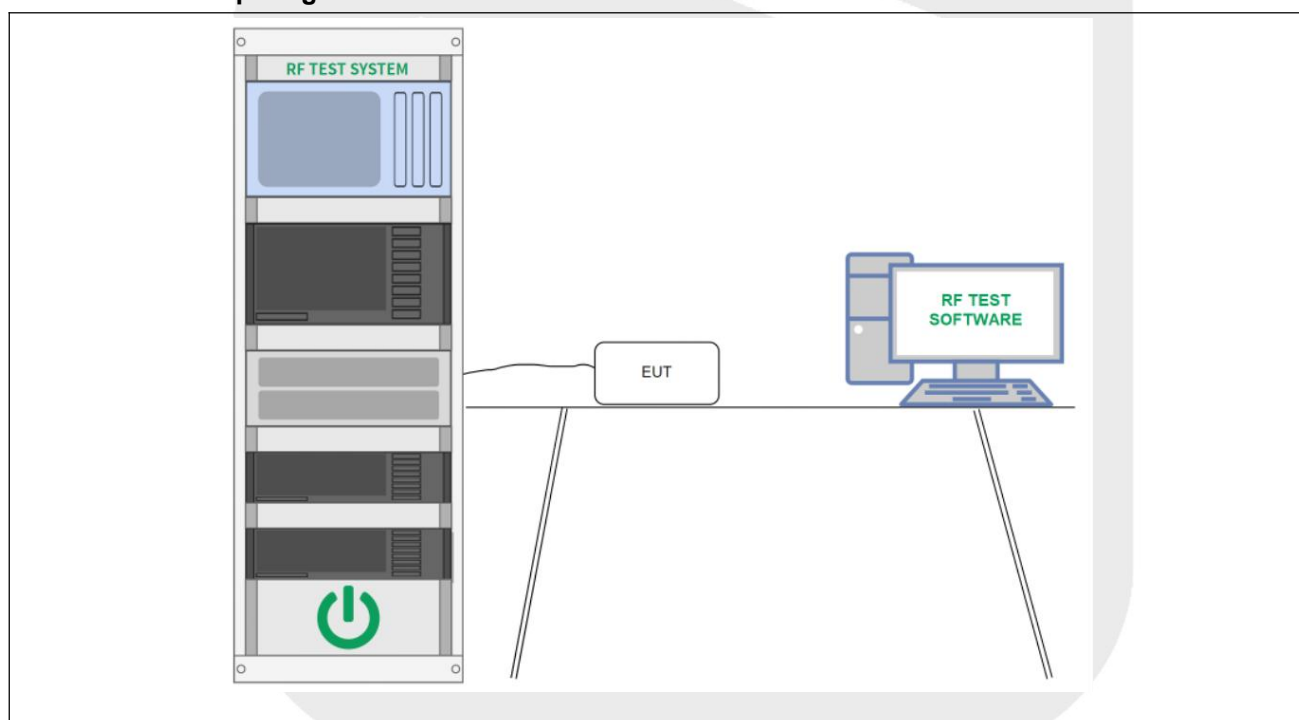
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | 47 CFR 15.247(d)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Test Limit:       | Refer to 47 CFR 15.247(d), 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Test Method:      | ANSI C63.10-2020 section 7.8.7<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Procedure:        | <p><b>7.8.7.1 General considerations</b><br/>To demonstrate compliance with the relative out-of-band emissions requirements conducted spurious emissions shall be measured for the transmit frequencies, per 5.5 and 5.6, and at the maximum transmit powers. Frequency hopping shall be disabled for this test with the exception of measurements at the allocated band-edges which shall be repeated with hopping enabled.</p> <p>Connect the primary antenna port through an attenuator to the spectrum analyzer input; in the results, account for all losses between the unlicensed wireless device output and the spectrum analyzer. The frequency range of testing shall span 30 MHz to 10 times the operating frequency and this may be done in a single sweep or, to aid resolution, across a number of sweeps. The resolution bandwidth shall be 100 kHz, video bandwidth 300 kHz, and a coupled sweep time with a peak detector.</p> <p>The limit is based on the highest in-band level across all channels measured using the same instrument settings (resolution bandwidth of 100 kHz, video bandwidth of 300 kHz, and a coupled sweep time with a peak detector). To help clearly demonstrate compliance a display line may be set at the required offset (typically 20 dB) below the highest in-band level. Where the highest in-band level is not clearly identified in the out-of-band measurements a separate spectral plot showing the in-band level shall be provided.</p> <p>When conducted measurements cannot be made (for example a device with integrated, non-removable antenna) radiated measurements shall be used. The reference level for determining the limit shall be established by maximizing the field strength from the highest power channel and measuring using the resolution and video bandwidth settings and peak detector as described above. The field strength limit for spurious emissions outside of restricted-bands shall then be set at the required offset (typically 20 dB) below the highest in-band level. Radiated measurements will follow the standards measurement procedures described in Clause 6 with the exception that the resolution bandwidth shall be 100 kHz, video bandwidth 300 kHz, and a coupled sweep time with a peak detector. Note that use of wider measurement bandwidths are acceptable for measuring the spurious emissions provided that the peak detector is used and that the measured value of spurious emissions are compared to the highest in-band level measured with the 100 kHz / 300 kHz bandwidth settings to determine compliance.</p> <p><b>7.8.7.2 Band-edges</b><br/>Compliance with a relative limit at the band-edges (e.g., -20 dBc) shall be made</p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>on the lowest and on the highest channels with frequency hopping disabled and repeated with frequency hopping enabled. For the latter test the hopping sequence shall include the lowest and highest channels.</p> <p>For measurements with the hopping disabled the analyzer screen shall clearly show compliance with the requirement within 10 MHz of the allocated band-edge.</p> <p>For measurements with the hopping enabled the analyzer screen shall clearly show compliance with the requirement within 10 MHz of both of the allocated band-edges. This could require separate spectral plots for each band-edge.</p> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 6.7.2 E.U.T. Operation

|                  |                              |
|------------------|------------------------------|
| Pre test mode:   | TM1, TM2, TM3, TM4, TM5, TM6 |
| Final test mode: | TM1, TM2, TM3, TM4, TM5, TM6 |

### 6.7.3 Test Setup Diagram



### 6.7.4 Test Data

**PASS.**

Please refer to Annex D for details.

## 6.8 Band edge emissions (Radiated)

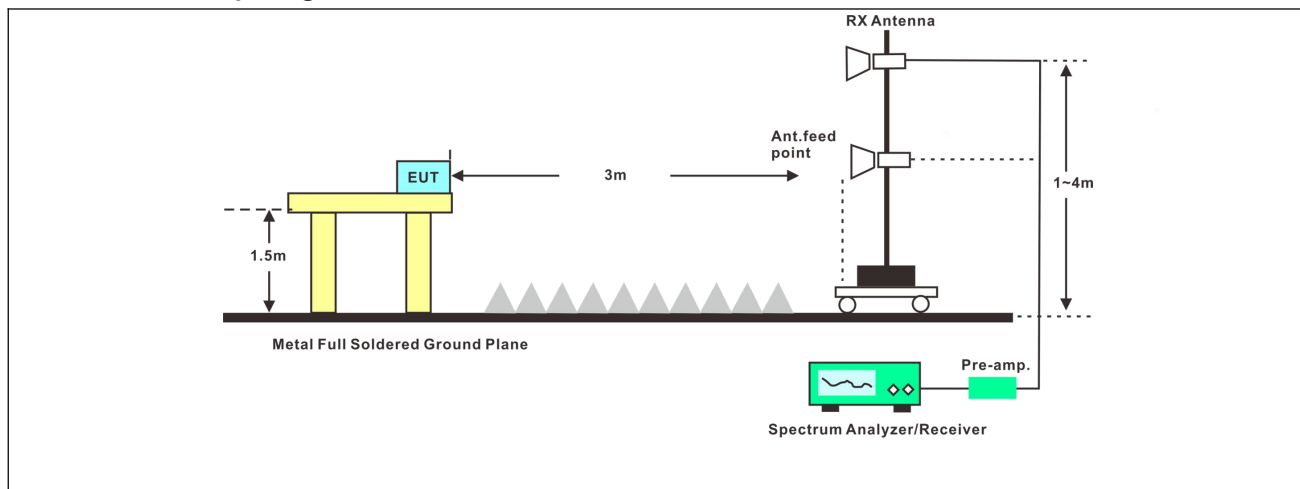
### 6.8.1 Test Specification

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                         |                                   |                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------|
| Test Requirement:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)). |                                   |                               |
| Test Limit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Frequency (MHz)                                                                                                                                                                                                         | Field strength (microvolts/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                             |
| <p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p> |                                                                                                                                                                                                                         |                                   |                               |
| Test Method:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ANSI C63.10-2020 section 6.10<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                             |                                   |                               |
| Procedure:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ANSI C63.10-2020 section 6.10.5.2                                                                                                                                                                                       |                                   |                               |

### 6.8.2 E.U.T. Operation

|                  |               |
|------------------|---------------|
| Pre test mode:   | TM1, TM2, TM3 |
| Final test mode: | TM1, TM2, TM3 |

### 6.8.3 Test Setup Diagram



#### 6.8.4 Test Data

**PASS.**

Please refer to the following pages.



**Band Edge Emissions (Restricted frequency bands):**

| Test Mode: GFSK |                 |                |               |                         | CH Low: 2402 MHz |             |               |        |
|-----------------|-----------------|----------------|---------------|-------------------------|------------------|-------------|---------------|--------|
| Pol.            | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)   | Margin (dB) | Detector Type | Result |
| H               | 2310.00         | 43.79          | -2.81         | 40.98                   | 74.00            | -33.02      | PK            | PASS   |
| H               | 2390.00         | 46.60          | -2.69         | 43.91                   | 74.00            | -30.09      | PK            | PASS   |
| H               | **2400.00       | 62.90          | -2.68         | 60.22                   | 74.00            | -13.78      | PK            | PASS   |
| V               | 2310.00         | 44.68          | -2.81         | 41.87                   | 74.00            | -32.13      | PK            | PASS   |
| V               | 2390.00         | 48.41          | -2.69         | 45.72                   | 74.00            | -28.28      | PK            | PASS   |
| V               | **2400.00       | 62.19          | -2.68         | 59.51                   | 74.00            | -14.49      | PK            | PASS   |
| H               | 2310.00         | 32.47          | -2.81         | 29.66                   | 54.00            | -24.34      | AV            | PASS   |
| H               | 2390.00         | 37.01          | -2.69         | 34.32                   | 54.00            | -19.68      | AV            | PASS   |
| H               | **2400.00       | 48.16          | -2.68         | 45.48                   | 54.00            | -8.52       | AV            | PASS   |
| V               | 2310.00         | 32.30          | -2.81         | 29.49                   | 54.00            | -24.51      | AV            | PASS   |
| V               | 2390.00         | 37.62          | -2.69         | 34.93                   | 54.00            | -19.07      | AV            | PASS   |
| V               | **2400.00       | 48.29          | -2.68         | 45.61                   | 54.00            | -8.39       | AV            | PASS   |

| Test Mode: GFSK |                 |                |               |                         | CH High: 2480 MHz |             |               |        |
|-----------------|-----------------|----------------|---------------|-------------------------|-------------------|-------------|---------------|--------|
| Pol.            | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)    | Margin (dB) | Detector Type | Result |
| H               | **2483.50       | 47.25          | -2.56         | 44.69                   | 74.00             | -29.31      | PK            | PASS   |
| H               | 2500.00         | 48.49          | -2.54         | 45.95                   | 74.00             | -28.05      | PK            | PASS   |
| V               | **2483.50       | 45.93          | -2.56         | 43.37                   | 74.00             | -30.63      | PK            | PASS   |
| V               | 2500.00         | 50.44          | -2.54         | 47.90                   | 74.00             | -26.10      | PK            | PASS   |
| H               | **2483.50       | 37.02          | -2.56         | 34.46                   | 54.00             | -19.54      | AV            | PASS   |
| H               | 2500.00         | 41.04          | -2.54         | 38.50                   | 54.00             | -15.50      | AV            | PASS   |
| V               | **2483.50       | 38.77          | -2.56         | 36.21                   | 54.00             | -17.79      | AV            | PASS   |
| V               | 2500.00         | 41.82          | -2.54         | 39.28                   | 54.00             | -14.72      | AV            | PASS   |

Remark:

1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.

**Band Edge Emissions (Restricted frequency bands):**

| Test Mode: $\pi/4$ DQPSK |                 |                |               |                         | CH Low: 2402 MHz |             |               |        |
|--------------------------|-----------------|----------------|---------------|-------------------------|------------------|-------------|---------------|--------|
| Pol.                     | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)   | Margin (dB) | Detector Type | Result |
| H                        | 2310.00         | 42.84          | -2.81         | 40.03                   | 74.00            | -33.97      | PK            | PASS   |
| H                        | 2390.00         | 46.98          | -2.69         | 44.29                   | 74.00            | -29.71      | PK            | PASS   |
| H                        | **2400.00       | 63.98          | -2.68         | 61.30                   | 74.00            | -12.70      | PK            | PASS   |
| V                        | 2310.00         | 42.91          | -2.81         | 40.10                   | 74.00            | -33.90      | PK            | PASS   |
| V                        | 2390.00         | 47.37          | -2.69         | 44.68                   | 74.00            | -29.32      | PK            | PASS   |
| V                        | **2400.00       | 61.30          | -2.68         | 58.62                   | 74.00            | -15.38      | PK            | PASS   |
| H                        | 2310.00         | 32.41          | -2.81         | 29.60                   | 54.00            | -24.40      | AV            | PASS   |
| H                        | 2390.00         | 36.79          | -2.69         | 34.10                   | 54.00            | -19.90      | AV            | PASS   |
| H                        | **2400.00       | 48.44          | -2.68         | 45.76                   | 54.00            | -8.24       | AV            | PASS   |
| V                        | 2310.00         | 32.81          | -2.81         | 30.00                   | 54.00            | -24.00      | AV            | PASS   |
| V                        | 2390.00         | 34.96          | -2.69         | 32.27                   | 54.00            | -21.73      | AV            | PASS   |
| V                        | **2400.00       | 45.84          | -2.68         | 43.16                   | 54.00            | -10.84      | AV            | PASS   |

| Test Mode: $\pi/4$ DQPSK |                 |                |               |                         | CH High: 2480 MHz |             |               |        |
|--------------------------|-----------------|----------------|---------------|-------------------------|-------------------|-------------|---------------|--------|
| Pol.                     | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)    | Margin (dB) | Detector Type | Result |
| H                        | **2483.50       | 45.72          | -2.56         | 43.16                   | 74.00             | -30.84      | PK            | PASS   |
| H                        | 2500.00         | 51.68          | -2.54         | 49.14                   | 74.00             | -24.86      | PK            | PASS   |
| V                        | **2483.50       | 46.04          | -2.56         | 43.48                   | 74.00             | -30.52      | PK            | PASS   |
| V                        | 2500.00         | 49.89          | -2.54         | 47.35                   | 74.00             | -26.65      | PK            | PASS   |
| H                        | **2483.50       | 37.29          | -2.56         | 34.73                   | 54.00             | -19.27      | AV            | PASS   |
| H                        | 2500.00         | 40.53          | -2.54         | 37.99                   | 54.00             | -16.01      | AV            | PASS   |
| V                        | **2483.50       | 38.61          | -2.56         | 36.05                   | 54.00             | -17.95      | AV            | PASS   |
| V                        | 2500.00         | 40.01          | -2.54         | 37.47                   | 54.00             | -16.53      | AV            | PASS   |

Remark:

1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.

**Band Edge Emissions (Restricted frequency bands):**

| Test Mode: 8DPSK |                 |                |               |                         | CH Low: 2402 MHz |             |               |        |
|------------------|-----------------|----------------|---------------|-------------------------|------------------|-------------|---------------|--------|
| Pol.             | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)   | Margin (dB) | Detector Type | Result |
| H                | 2310.00         | 42.77          | -2.81         | 39.96                   | 74.00            | -34.04      | PK            | PASS   |
| H                | 2390.00         | 45.51          | -2.69         | 42.82                   | 74.00            | -31.18      | PK            | PASS   |
| H                | **2400.00       | 61.13          | -2.68         | 58.45                   | 74.00            | -15.55      | PK            | PASS   |
| V                | 2310.00         | 42.87          | -2.81         | 40.06                   | 74.00            | -33.94      | PK            | PASS   |
| V                | 2390.00         | 48.37          | -2.69         | 45.68                   | 74.00            | -28.32      | PK            | PASS   |
| V                | **2400.00       | 61.11          | -2.68         | 58.43                   | 74.00            | -15.57      | PK            | PASS   |
| H                | 2310.00         | 33.82          | -2.81         | 31.01                   | 54.00            | -22.99      | AV            | PASS   |
| H                | 2390.00         | 36.96          | -2.69         | 34.27                   | 54.00            | -19.73      | AV            | PASS   |
| H                | **2400.00       | 46.19          | -2.68         | 43.51                   | 54.00            | -10.49      | AV            | PASS   |
| V                | 2310.00         | 33.95          | -2.81         | 31.14                   | 54.00            | -22.86      | AV            | PASS   |
| V                | 2390.00         | 35.03          | -2.69         | 32.34                   | 54.00            | -21.66      | AV            | PASS   |
| V                | **2400.00       | 45.99          | -2.68         | 43.31                   | 54.00            | -10.69      | AV            | PASS   |

| Test Mode: 8DPSK |                 |                |               |                         | CH High: 2480 MHz |             |               |        |
|------------------|-----------------|----------------|---------------|-------------------------|-------------------|-------------|---------------|--------|
| Pol.             | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)    | Margin (dB) | Detector Type | Result |
| H                | **2483.50       | 46.82          | -2.56         | 44.26                   | 74.00             | -29.74      | PK            | PASS   |
| H                | 2500.00         | 50.56          | -2.54         | 48.02                   | 74.00             | -25.98      | PK            | PASS   |
| V                | **2483.50       | 48.81          | -2.56         | 46.25                   | 74.00             | -27.75      | PK            | PASS   |
| V                | 2500.00         | 48.95          | -2.54         | 46.41                   | 74.00             | -27.59      | PK            | PASS   |
| H                | **2483.50       | 36.95          | -2.56         | 34.39                   | 54.00             | -19.61      | AV            | PASS   |
| H                | 2500.00         | 41.61          | -2.54         | 39.07                   | 54.00             | -14.93      | AV            | PASS   |
| V                | **2483.50       | 38.67          | -2.56         | 36.11                   | 54.00             | -17.89      | AV            | PASS   |
| V                | 2500.00         | 41.69          | -2.54         | 39.15                   | 54.00             | -14.85      | AV            | PASS   |

Remark:

1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.

## 6.9 Emissions in frequency bands (below 1GHz)

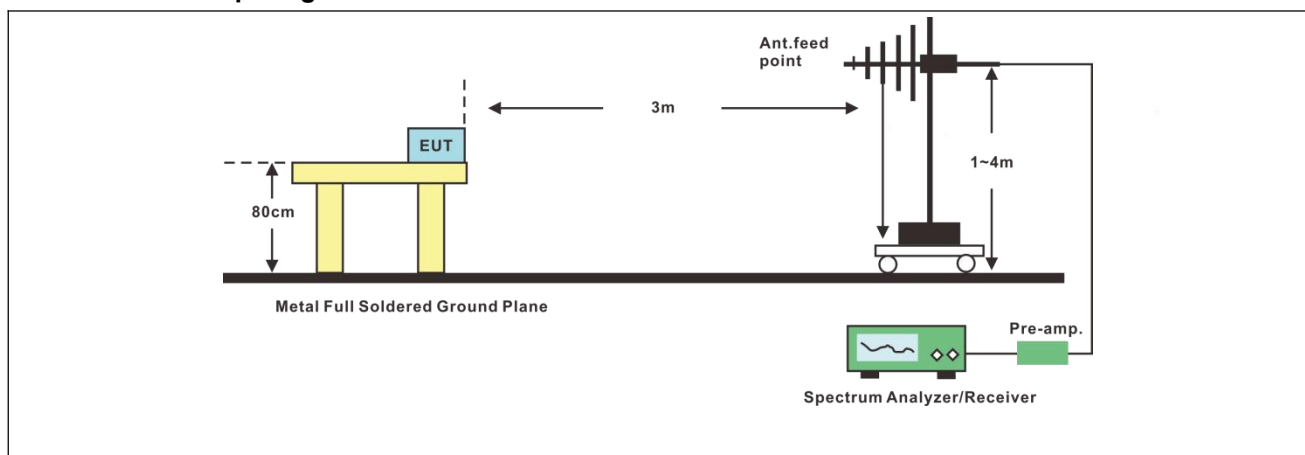
### 6.9.1 Test Specification

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                         |                                   |                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------|
| Test Requirement:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)). |                                   |                               |
| Test Limit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Frequency (MHz)                                                                                                                                                                                                         | Field strength (microvolts/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                             |
| <p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p> |                                                                                                                                                                                                                         |                                   |                               |
| Test Method:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ANSI C63.10-2020 section 6.6.4<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                            |                                   |                               |
| Procedure:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ANSI C63.10-2020 section 6.6.4                                                                                                                                                                                          |                                   |                               |

### 6.9.2 E.U.T. Operation

|                  |     |
|------------------|-----|
| Pre test mode:   | TM1 |
| Final test mode: | TM1 |

### 6.9.3 Test Setup Diagram



**6.9.4 Test Data****PASS.**

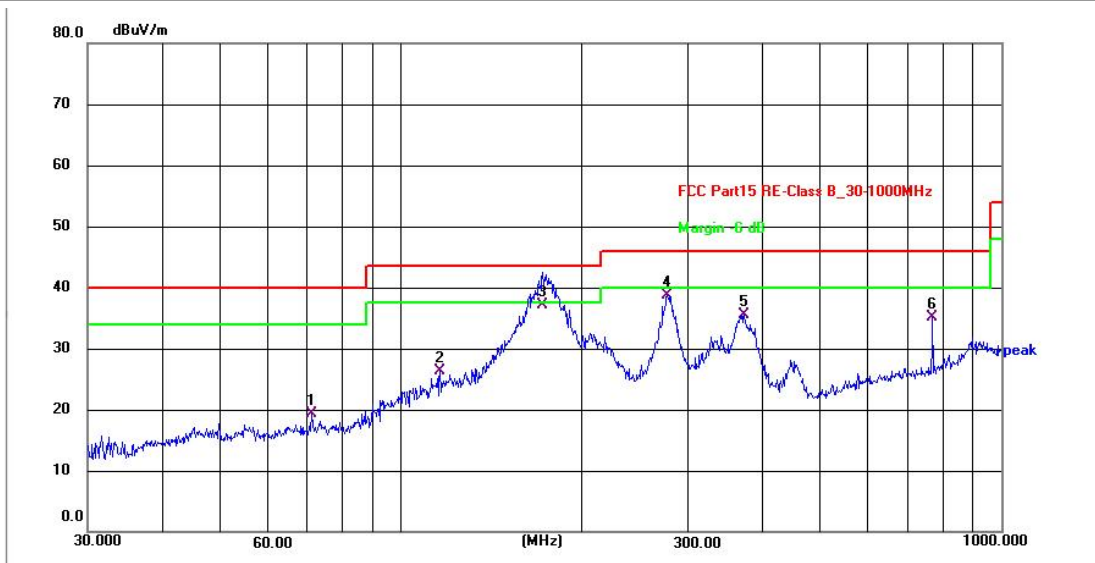
The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, for 30MHz-1000MHz, pre-scan all modulations, and found the GFSK modulation Low channel which is the worst case, only the worst case is recorded in the report.



### Emissions in frequency bands (below 1GHz) Test Data

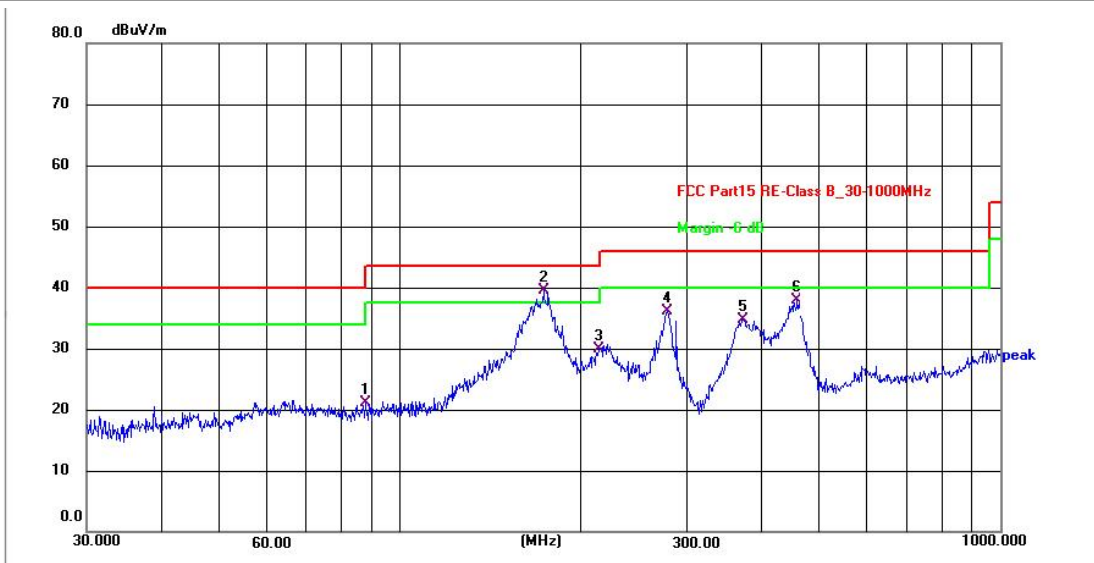
TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: L



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-----|--------|
| 1   | 71.0803         | 37.54          | -18.26        | 19.28          | 40.00          | -20.72      | QP       | P   |        |
| 2   | 116.1321        | 42.99          | -16.69        | 26.30          | 43.50          | -17.20      | QP       | P   |        |
| 3 * | 171.9946        | 54.20          | -17.10        | 37.10          | 43.50          | -6.40       | QP       | P   |        |
| 4   | 277.0935        | 51.40          | -12.60        | 38.80          | 46.00          | -7.20       | QP       | P   |        |
| 5   | 372.0045        | 45.92          | -10.48        | 35.44          | 46.00          | -10.56      | QP       | P   |        |
| 6   | 768.7481        | 39.45          | -4.40         | 35.05          | 46.00          | -10.95      | QP       | P   |        |

### Emissions in frequency bands (below 1GHz) Test Data

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-----|--------|
| 1   | 87.7248         | 39.07          | -18.02        | 21.05          | 40.00          | -18.95      | QP       | P   |        |
| 2 * | 173.2051        | 56.47          | -17.00        | 39.47          | 43.50          | -4.03       | QP       | P   |        |
| 3   | 213.7634        | 44.61          | -14.63        | 29.98          | 43.50          | -13.52      | QP       | P   |        |
| 4   | 278.0668        | 48.64          | -12.62        | 36.02          | 46.00          | -9.98       | QP       | P   |        |
| 5   | 372.0045        | 45.28          | -10.49        | 34.79          | 46.00          | -11.21      | QP       | P   |        |
| 6   | 457.5073        | 46.84          | -9.01         | 37.83          | 46.00          | -8.17       | QP       | P   |        |

## 6.10 Emissions in frequency bands (above 1GHz)

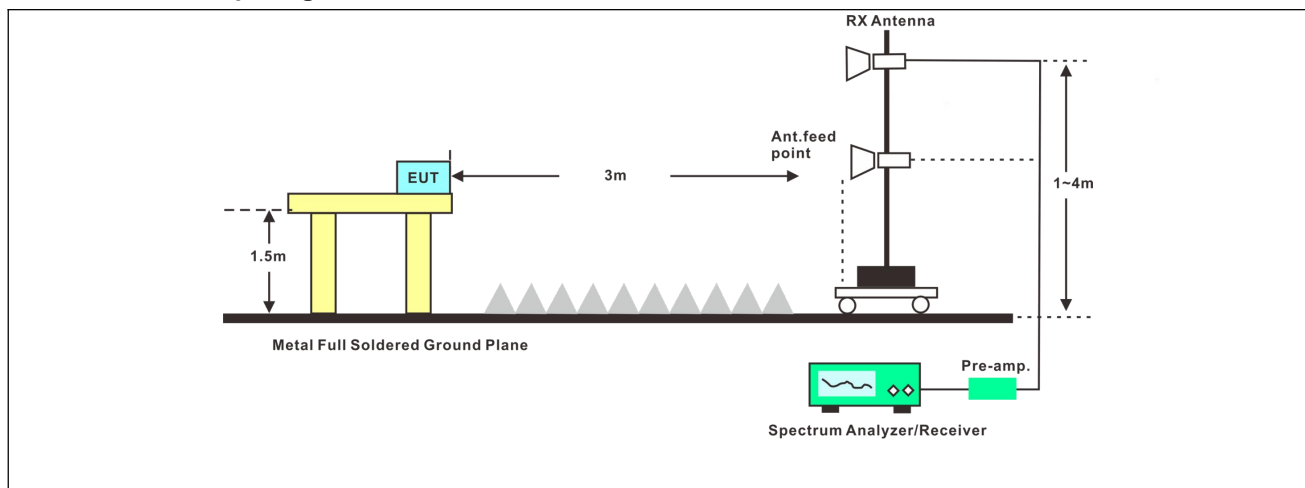
### 6.10.1 Test Specification

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                         |                                   |                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------|
| Test Requirement:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Refer to 47 CFR 15.247(d), in addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)). |                                   |                               |
| Test Limit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Frequency (MHz)                                                                                                                                                                                                         | Field strength (microvolts/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                             |
| <p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p> |                                                                                                                                                                                                                         |                                   |                               |
| Test Method:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ANSI C63.10-2020 section 6.6.4<br>KDB 558074 D01 15.247 Meas Guidance v05r02                                                                                                                                            |                                   |                               |
| Procedure:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ANSI C63.10-2020 section 6.6.4                                                                                                                                                                                          |                                   |                               |

### 6.10.2 E.U.T. Operation

|                  |               |
|------------------|---------------|
| Pre test mode:   | TM1, TM2, TM3 |
| Final test mode: | TM1, TM2, TM3 |

### 6.10.3 Test Setup Diagram



**6.10.4 Test Data****PASS.**

During the test, for 1GHz- 25GHz, pre-scan all modulations, and found the GFSK modulation which is the worst case, only the worst case is recorded in the report.



**Radiated Spurious Emission (1GHz-25GHz)**

| Test Mode: GFSK |                 |                |               |                         | CH Low: 2402 MHz |             |               |        |
|-----------------|-----------------|----------------|---------------|-------------------------|------------------|-------------|---------------|--------|
| Pol.            | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)   | Margin (dB) | Detector Type | Result |
| V               | 4804.88         | 42.31          | 4.68          | 46.99                   | 74.00            | -27.01      | PK            | PASS   |
| V               | 7206.92         | 35.64          | 9.84          | 45.48                   | 74.00            | -28.53      | PK            | PASS   |
| V               | 9608.71         | 28.90          | 13.17         | 42.07                   | 74.00            | -31.93      | PK            | PASS   |
| V               | 12010.40        | *              | *             | *                       | 74.00            | *           | PK            | PASS   |
| V               | 14412.43        | *              | *             | *                       | 74.00            | *           | PK            | PASS   |
| V               | 16814.94        | *              | *             | *                       | 74.00            | *           | PK            | PASS   |
| H               | 4804.64         | 40.81          | 4.68          | 45.49                   | 74.00            | -28.52      | PK            | PASS   |
| H               | 7206.88         | 33.12          | 9.84          | 42.96                   | 74.00            | -31.04      | PK            | PASS   |
| H               | 9608.40         | 28.60          | 13.17         | 41.77                   | 74.00            | -32.24      | PK            | PASS   |
| H               | 12010.31        | *              | *             | *                       | 74.00            | *           | PK            | PASS   |
| H               | 14412.39        | *              | *             | *                       | 74.00            | *           | PK            | PASS   |
| H               | 16814.20        | *              | *             | *                       | 74.00            | *           | PK            | PASS   |
| V               | 4804.48         | 31.12          | 4.68          | 35.80                   | 54.00            | -18.20      | AV            | PASS   |
| V               | 7206.15         | 23.40          | 9.84          | 33.24                   | 54.00            | -20.76      | AV            | PASS   |
| V               | 9608.81         | 18.02          | 13.17         | 31.19                   | 54.00            | -22.81      | AV            | PASS   |
| V               | 12010.03        | *              | *             | *                       | 54.00            | *           | AV            | PASS   |
| V               | 14412.58        | *              | *             | *                       | 54.00            | *           | AV            | PASS   |
| V               | 16814.34        | *              | *             | *                       | 54.00            | *           | AV            | PASS   |
| H               | 4804.68         | 30.31          | 4.68          | 34.99                   | 54.00            | -19.02      | AV            | PASS   |
| H               | 7206.88         | 24.15          | 9.84          | 33.99                   | 54.00            | -20.01      | AV            | PASS   |
| H               | 9608.40         | 19.27          | 13.17         | 32.44                   | 54.00            | -21.57      | AV            | PASS   |
| H               | 12010.31        | *              | *             | *                       | 54.00            | *           | AV            | PASS   |
| H               | 14412.39        | *              | *             | *                       | 54.00            | *           | AV            | PASS   |
| H               | 16814.20        | *              | *             | *                       | 54.00            | *           | AV            | PASS   |

**Remark:**

1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.
2. “\*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

**Radiated Spurious Emission (1GHz-25GHz)**

| Test Mode: GFSK |                 |                |               |                         | CH Middle: 2441 MHz |             |               |        |
|-----------------|-----------------|----------------|---------------|-------------------------|---------------------|-------------|---------------|--------|
| Pol.            | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)      | Margin (dB) | Detector Type | Result |
| V               | 4882.36         | 40.45          | 4.92          | 45.37                   | 74.00               | -28.63      | PK            | PASS   |
| V               | 7323.17         | 35.10          | 9.83          | 44.93                   | 74.00               | -29.08      | PK            | PASS   |
| V               | 9764.58         | 30.61          | 13.22         | 43.83                   | 74.00               | -30.17      | PK            | PASS   |
| V               | 12205.51        | *              | *             | *                       | 74.00               | *           | PK            | PASS   |
| V               | 14646.46        | *              | *             | *                       | 74.00               | *           | PK            | PASS   |
| V               | 17087.98        | *              | *             | *                       | 74.00               | *           | PK            | PASS   |
| H               | 4882.70         | 41.71          | 4.92          | 46.63                   | 74.00               | -27.37      | PK            | PASS   |
| H               | 7323.66         | 33.88          | 9.83          | 43.71                   | 74.00               | -30.30      | PK            | PASS   |
| H               | 9764.93         | 30.59          | 13.22         | 43.81                   | 74.00               | -30.20      | PK            | PASS   |
| H               | 12205.02        | *              | *             | *                       | 74.00               | *           | PK            | PASS   |
| H               | 14646.96        | *              | *             | *                       | 74.00               | *           | PK            | PASS   |
| H               | 17087.97        | *              | *             | *                       | 74.00               | *           | PK            | PASS   |
| V               | 4882.52         | 32.46          | 4.92          | 37.38                   | 54.00               | -16.63      | AV            | PASS   |
| V               | 7323.93         | 24.55          | 9.83          | 34.38                   | 54.00               | -19.62      | AV            | PASS   |
| V               | 9764.49         | 18.26          | 13.22         | 31.48                   | 54.00               | -22.53      | AV            | PASS   |
| V               | 12205.26        | *              | *             | *                       | 54.00               | *           | AV            | PASS   |
| V               | 14646.37        | *              | *             | *                       | 54.00               | *           | AV            | PASS   |
| V               | 17087.08        | *              | *             | *                       | 54.00               | *           | AV            | PASS   |
| H               | 4882.70         | 32.42          | 4.92          | 37.34                   | 54.00               | -16.67      | AV            | PASS   |
| H               | 7323.66         | 24.32          | 9.83          | 34.15                   | 54.00               | -19.86      | AV            | PASS   |
| H               | 9764.93         | 17.95          | 13.22         | 31.17                   | 54.00               | -22.84      | AV            | PASS   |
| H               | 12205.02        | *              | *             | *                       | 54.00               | *           | AV            | PASS   |
| H               | 14646.96        | *              | *             | *                       | 54.00               | *           | AV            | PASS   |
| H               | 17087.97        | *              | *             | *                       | 54.00               | *           | AV            | PASS   |

**Remark:**

1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.
2. “\*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

**Radiated Spurious Emission (1GHz-25GHz)**

| Test Mode: GFSK |                 |                |               |                         | CH High: 2480 MHz |             |               |        |
|-----------------|-----------------|----------------|---------------|-------------------------|-------------------|-------------|---------------|--------|
| Pol.            | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m)    | Margin (dB) | Detector Type | Result |
| V               | 4960.14         | 41.22          | 5.17          | 46.39                   | 74.00             | -27.62      | PK            | PASS   |
| V               | 7440.54         | 34.23          | 9.83          | 44.06                   | 74.00             | -29.94      | PK            | PASS   |
| V               | 9920.09         | 28.25          | 13.27         | 41.52                   | 74.00             | -32.48      | PK            | PASS   |
| V               | 12400.90        | *              | *             | *                       | 74.00             | *           | PK            | PASS   |
| V               | 14880.91        | *              | *             | *                       | 74.00             | *           | PK            | PASS   |
| V               | 17360.78        | *              | *             | *                       | 74.00             | *           | PK            | PASS   |
| H               | 4960.48         | 41.51          | 5.17          | 46.68                   | 74.00             | -27.33      | PK            | PASS   |
| H               | 7440.55         | 35.00          | 9.83          | 44.83                   | 74.00             | -29.17      | PK            | PASS   |
| H               | 9920.66         | 28.29          | 13.27         | 41.56                   | 74.00             | -32.44      | PK            | PASS   |
| H               | 12400.54        | *              | *             | *                       | 74.00             | *           | PK            | PASS   |
| H               | 14880.71        | *              | *             | *                       | 74.00             | *           | PK            | PASS   |
| H               | 17360.35        | *              | *             | *                       | 74.00             | *           | PK            | PASS   |
| V               | 4960.71         | 32.92          | 5.17          | 38.09                   | 54.00             | -15.92      | AV            | PASS   |
| V               | 7440.32         | 23.53          | 9.83          | 33.36                   | 54.00             | -20.64      | AV            | PASS   |
| V               | 9920.14         | 19.72          | 13.27         | 32.99                   | 54.00             | -21.01      | AV            | PASS   |
| V               | 12400.66        | *              | *             | *                       | 54.00             | *           | AV            | PASS   |
| V               | 14880.07        | *              | *             | *                       | 54.00             | *           | AV            | PASS   |
| V               | 17360.61        | *              | *             | *                       | 54.00             | *           | AV            | PASS   |
| H               | 4960.48         | 32.92          | 5.17          | 38.09                   | 54.00             | -15.91      | AV            | PASS   |
| H               | 7440.55         | 23.51          | 9.83          | 33.34                   | 54.00             | -20.66      | AV            | PASS   |
| H               | 9920.66         | 19.54          | 13.27         | 32.81                   | 54.00             | -21.19      | AV            | PASS   |
| H               | 12400.54        | *              | *             | *                       | 54.00             | *           | AV            | PASS   |
| H               | 14880.71        | *              | *             | *                       | 54.00             | *           | AV            | PASS   |
| H               | 17360.35        | *              | *             | *                       | 54.00             | *           | AV            | PASS   |

**Remark:**

1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.
2. “\*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

## **ANNEX A TEST SETUP PHOTOS**

Please refer to the document "8336EU010406W-ANNEX A.PDF"

## **ANNEX B EXTERNAL PHOTOS**

Please refer to the document "8336EU010406W-ANNEX B.PDF"

## **ANNEX C INTERNAL PHOTOS**

Please refer to the document "8336EU010406W-ANNEX C.PDF"



## ANNEX D TEST DATA

### 1. Duty Cycle

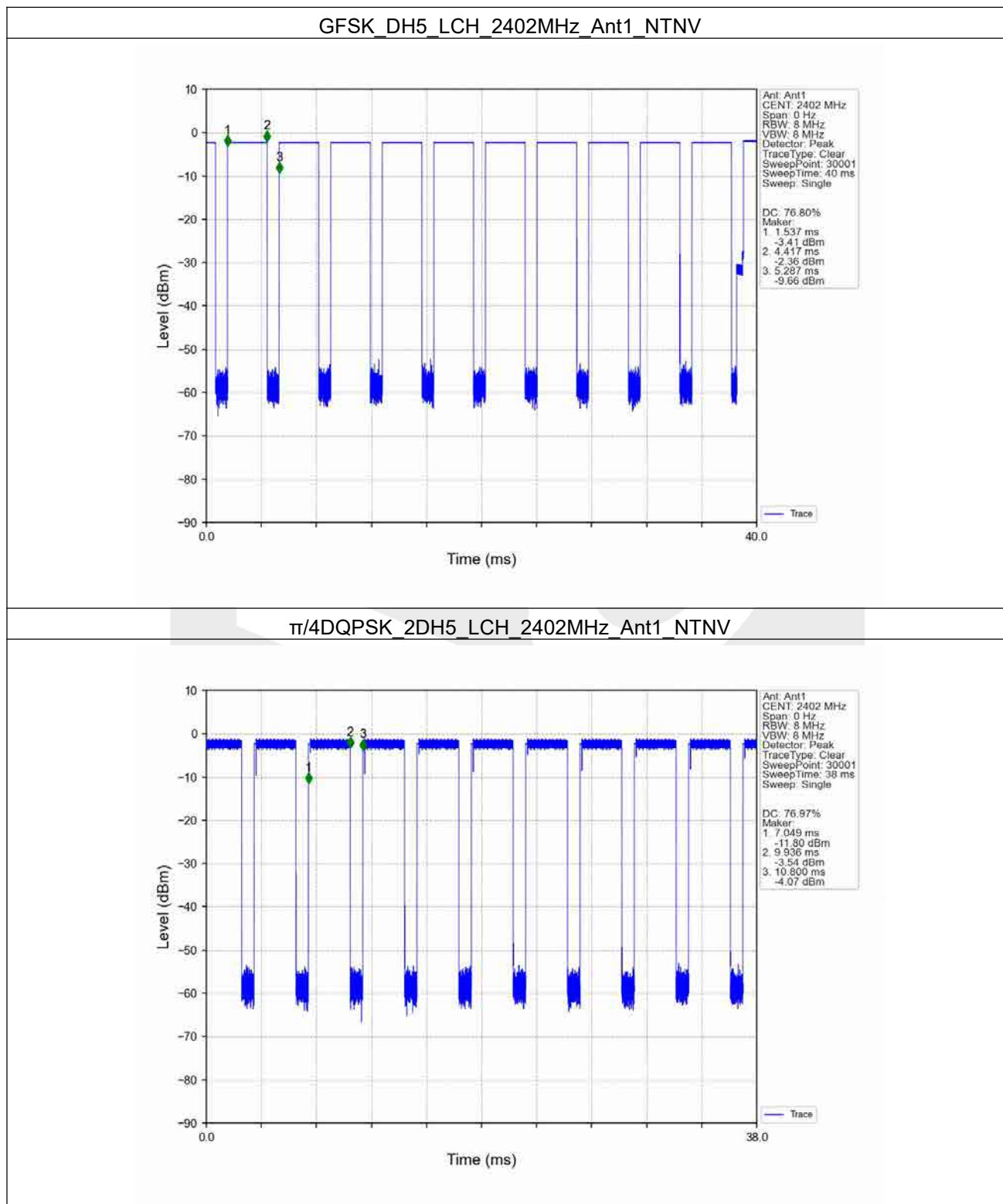
#### 1.1 Test Result

##### 1.1.1 Ant1

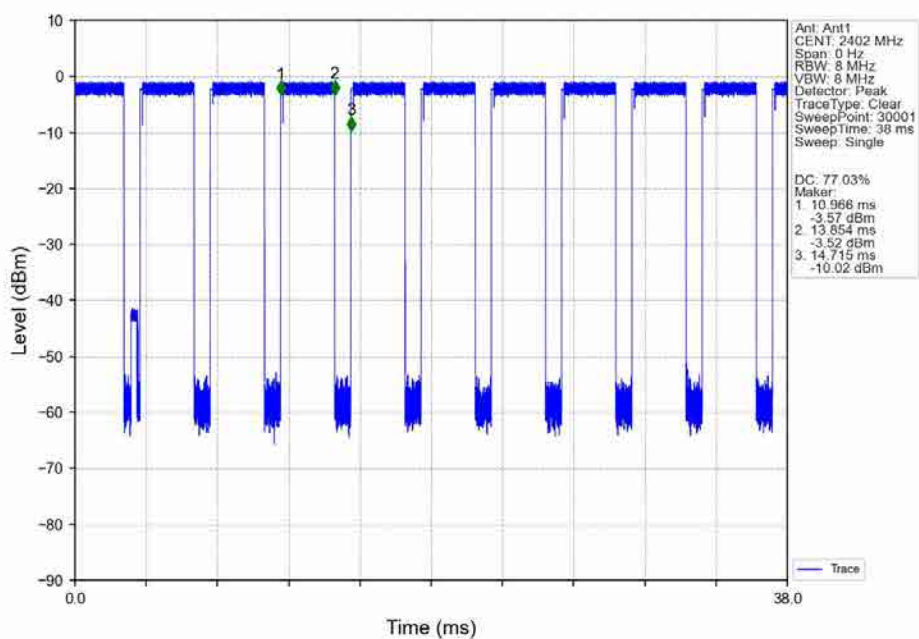
| Ant1          |         |                 |             |           |             |                |                                   |                       |
|---------------|---------|-----------------|-------------|-----------|-------------|----------------|-----------------------------------|-----------------------|
| Mode          | TX Type | Frequency (MHz) | Packet Type | T_on (ms) | Period (ms) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | Max. DC Variation (%) |
| GFSK          | SISO    | 2402            | DH5         | 2.880     | 3.750       | 76.80          | 1.15                              | 0.04                  |
| $\pi/4$ DQPSK | SISO    | 2402            | 2DH5        | 2.887     | 3.751       | 76.97          | 1.14                              | 0.03                  |
| 8DPSK         | SISO    | 2402            | 3DH5        | 2.888     | 3.749       | 77.03          | 1.13                              | 0.03                  |

## 1.2 Test Graph

### 1.2.1 Ant1



8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



## 2. Bandwidth

### 2.1 Test Result

#### 2.1.1 OBW

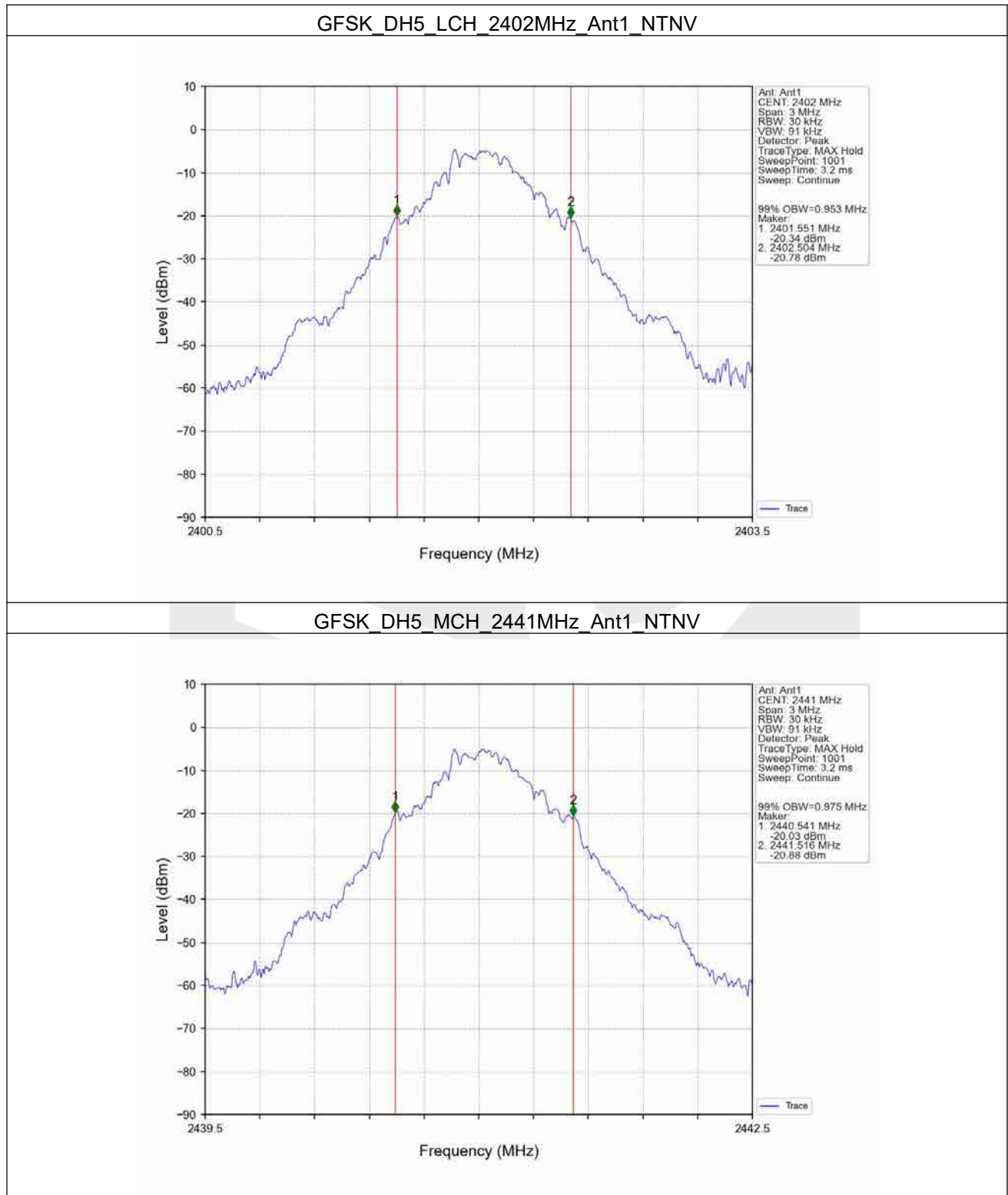
| Mode          | TX Type | Frequency (MHz) | Packet Type | ANT | 99% Occupied Bandwidth (MHz) |       | Verdict |
|---------------|---------|-----------------|-------------|-----|------------------------------|-------|---------|
|               |         |                 |             |     | Result                       | Limit |         |
| GFSK          | SISO    | 2402            | DH5         | 1   | 0.953                        | /     | Pass    |
|               |         | 2441            | DH5         | 1   | 0.975                        | /     | Pass    |
|               |         | 2480            | DH5         | 1   | 0.981                        | /     | Pass    |
| $\pi$ /4DQPSK | SISO    | 2402            | 2DH5        | 1   | 1.231                        | /     | Pass    |
|               |         | 2441            | 2DH5        | 1   | 1.241                        | /     | Pass    |
|               |         | 2480            | 2DH5        | 1   | 1.258                        | /     | Pass    |
| 8DPSK         | SISO    | 2402            | 3DH5        | 1   | 1.220                        | /     | Pass    |
|               |         | 2441            | 3DH5        | 1   | 1.227                        | /     | Pass    |
|               |         | 2480            | 3DH5        | 1   | 1.228                        | /     | Pass    |

#### 2.1.2 20dB BW

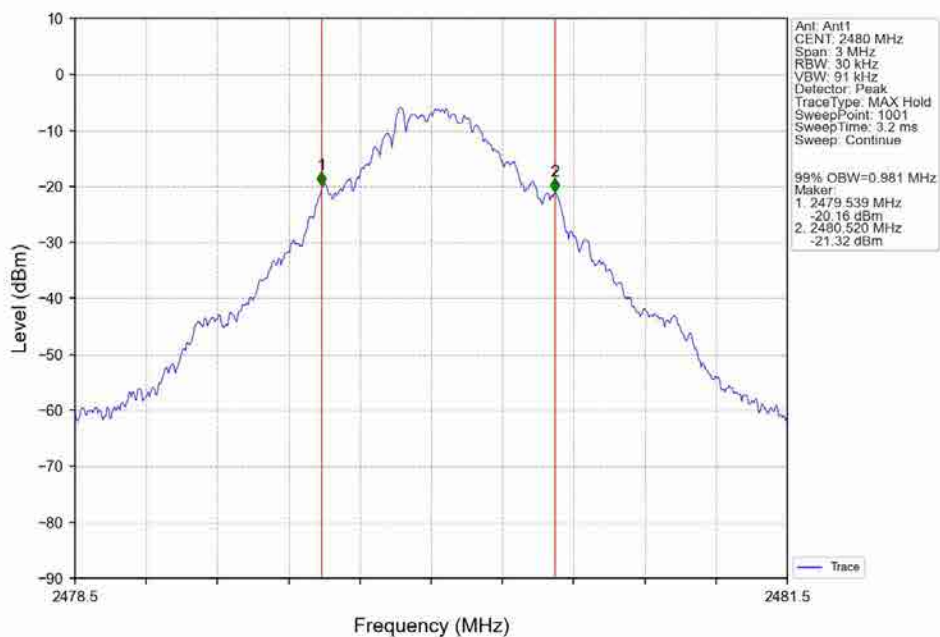
| Mode          | TX Type | Frequency (MHz) | Packet Type | ANT | 20dB Bandwidth (MHz) |       | Verdict |
|---------------|---------|-----------------|-------------|-----|----------------------|-------|---------|
|               |         |                 |             |     | Result               | Limit |         |
| GFSK          | SISO    | 2402            | DH5         | 1   | 1.051                | /     | Pass    |
|               |         | 2441            | DH5         | 1   | 1.064                | /     | Pass    |
|               |         | 2480            | DH5         | 1   | 1.074                | /     | Pass    |
| $\pi$ /4DQPSK | SISO    | 2402            | 2DH5        | 1   | 1.340                | /     | Pass    |
|               |         | 2441            | 2DH5        | 1   | 1.358                | /     | Pass    |
|               |         | 2480            | 2DH5        | 1   | 1.356                | /     | Pass    |
| 8DPSK         | SISO    | 2402            | 3DH5        | 1   | 1.322                | /     | Pass    |
|               |         | 2441            | 3DH5        | 1   | 1.307                | /     | Pass    |
|               |         | 2480            | 3DH5        | 1   | 1.301                | /     | Pass    |

## 2.2 Test Graph

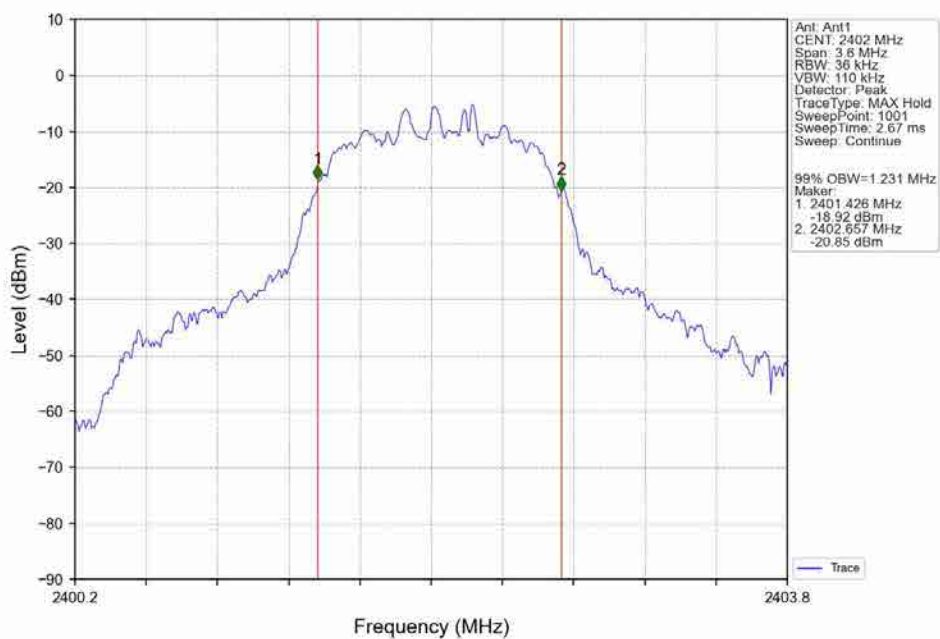
### 2.2.1 OBW



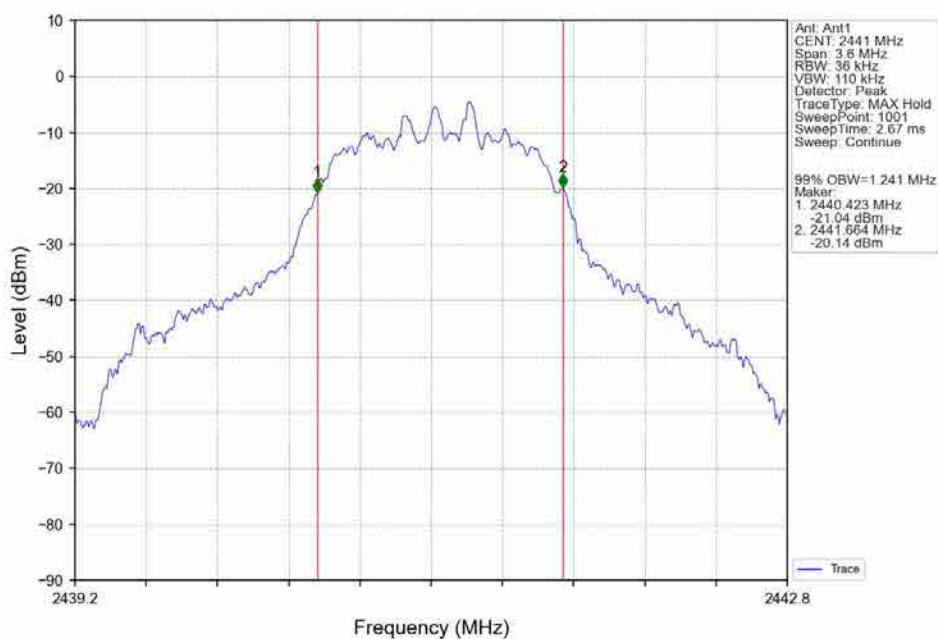
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



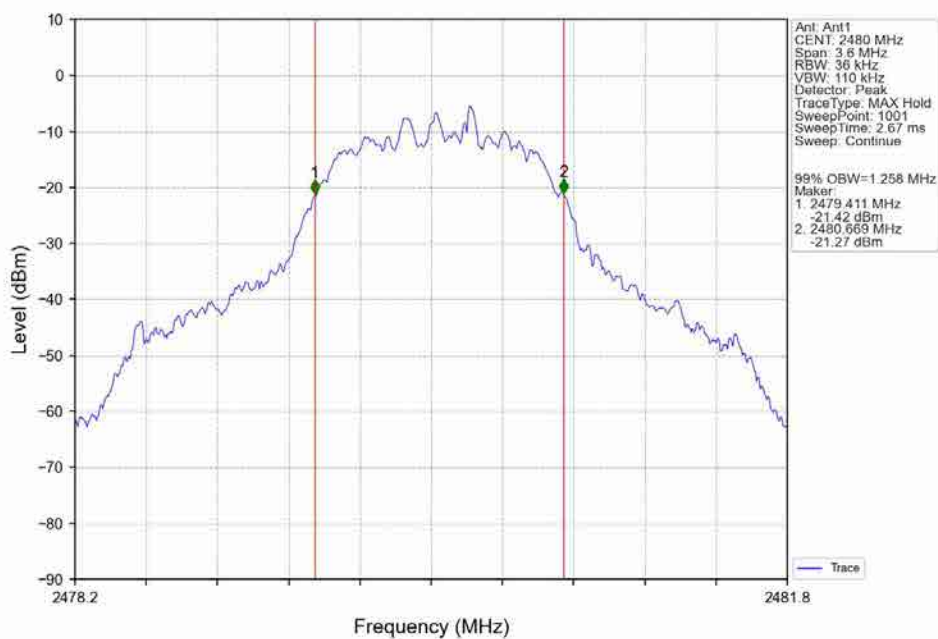
$\pi/4$ DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



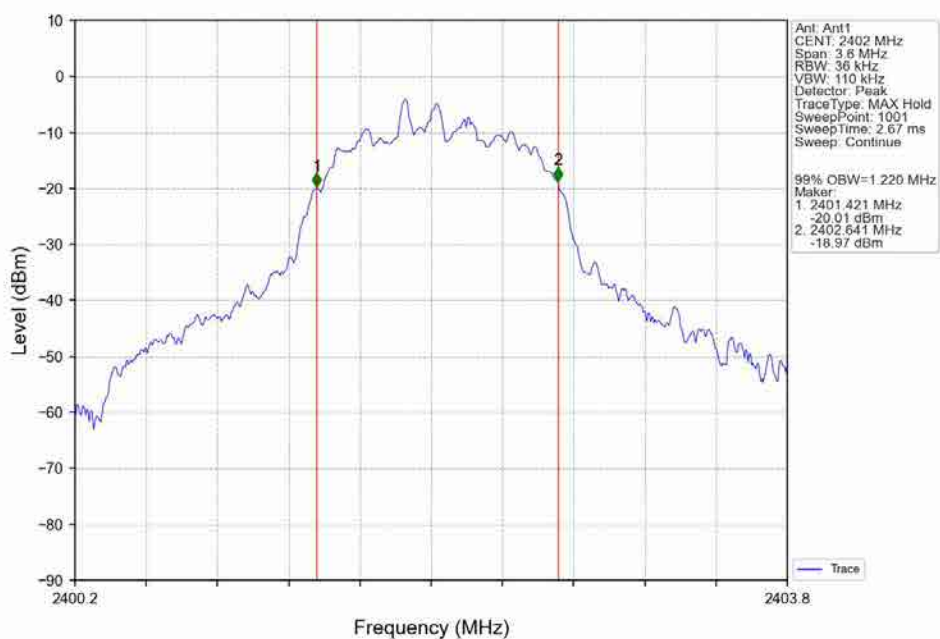
$\pi/4$ DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



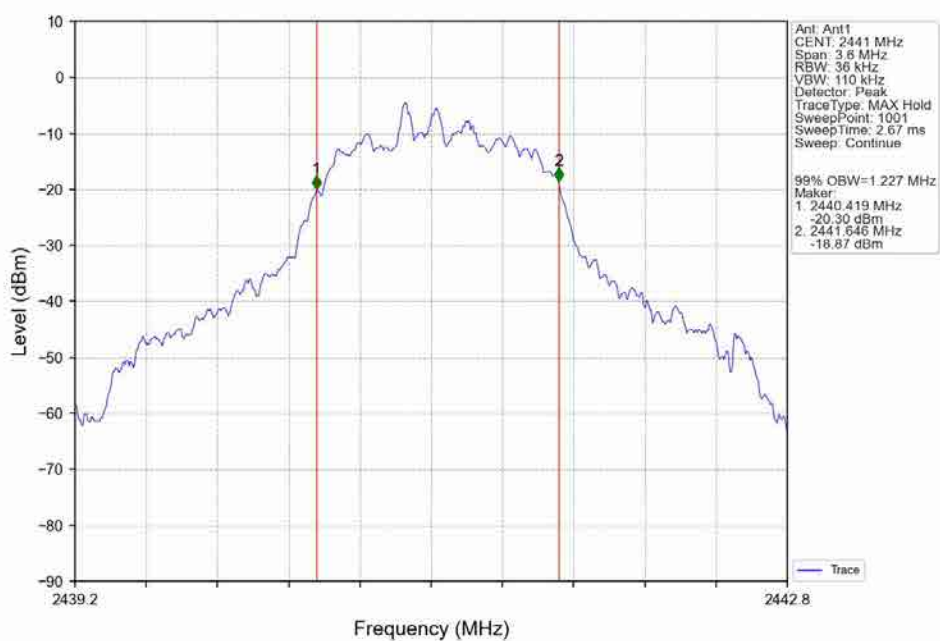
$\pi/4$ DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



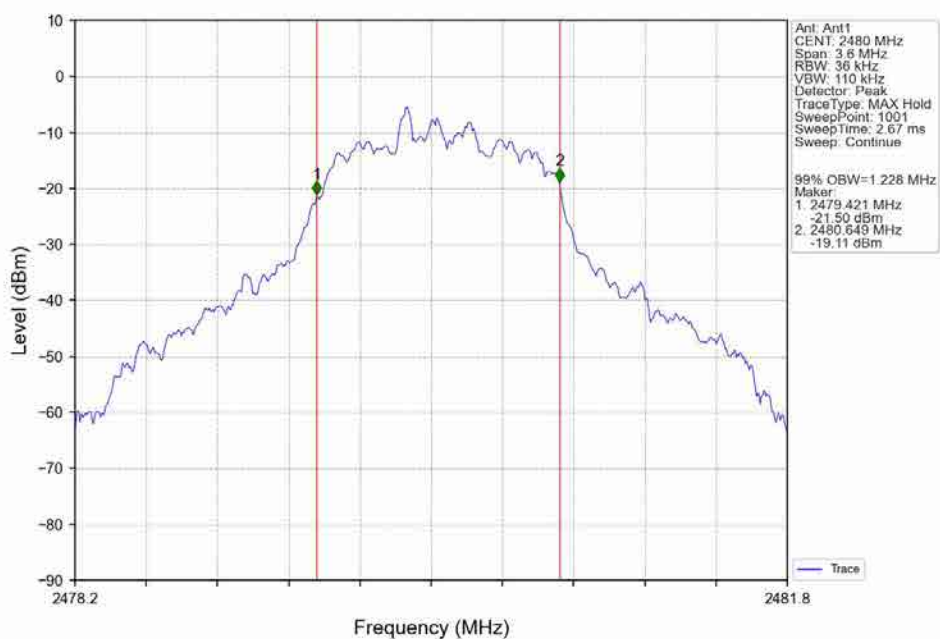
### 8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



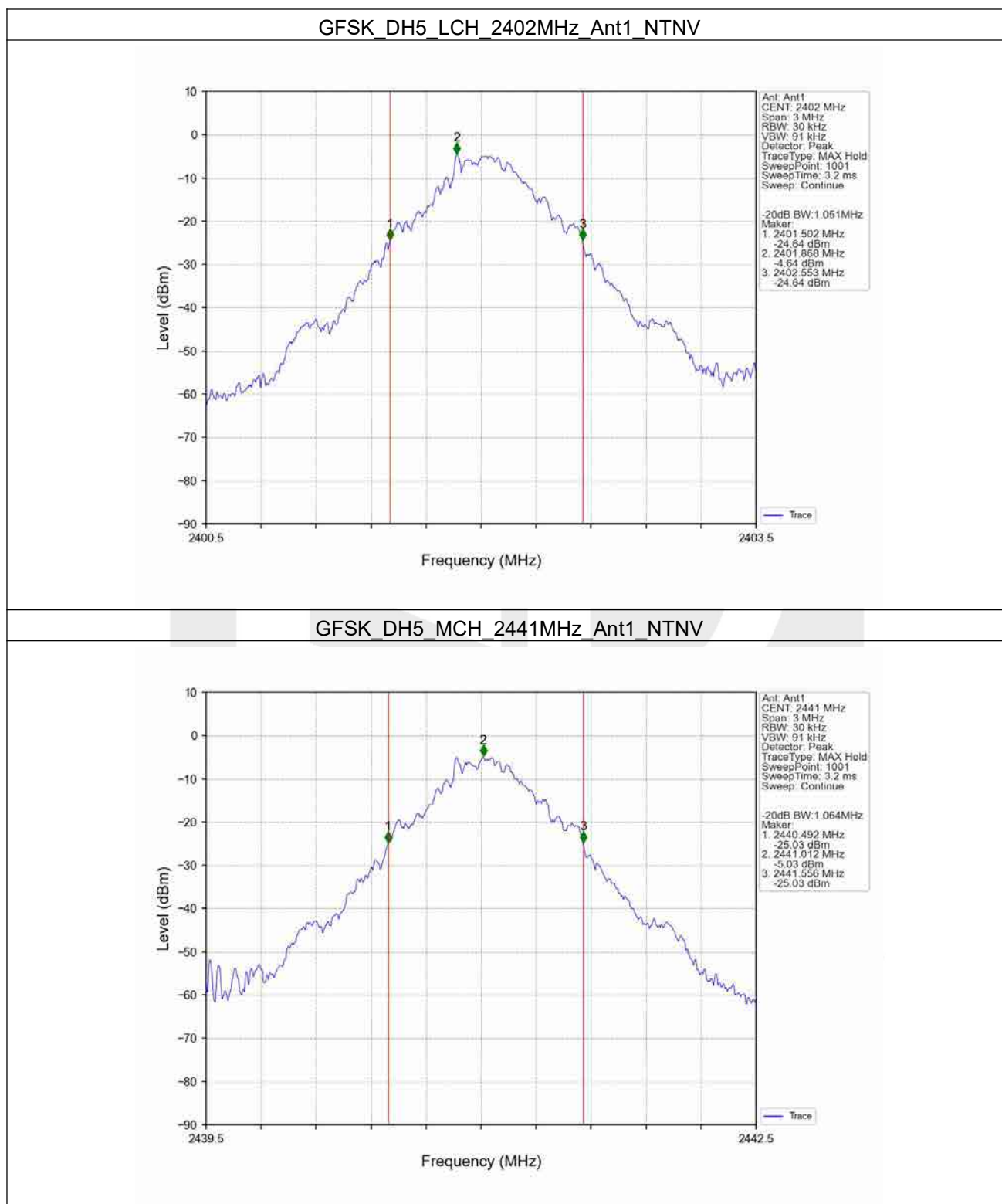
### 8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



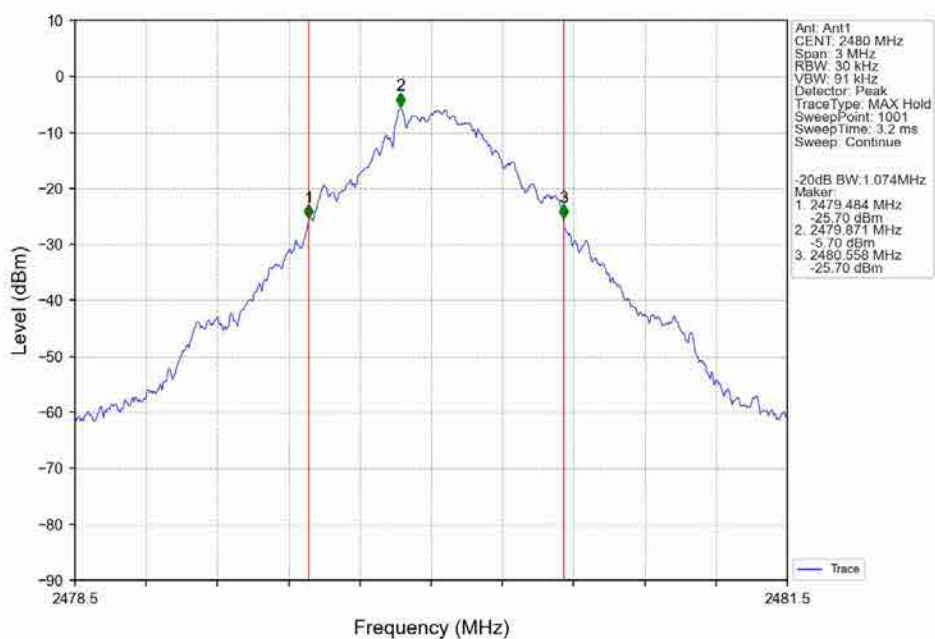
8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



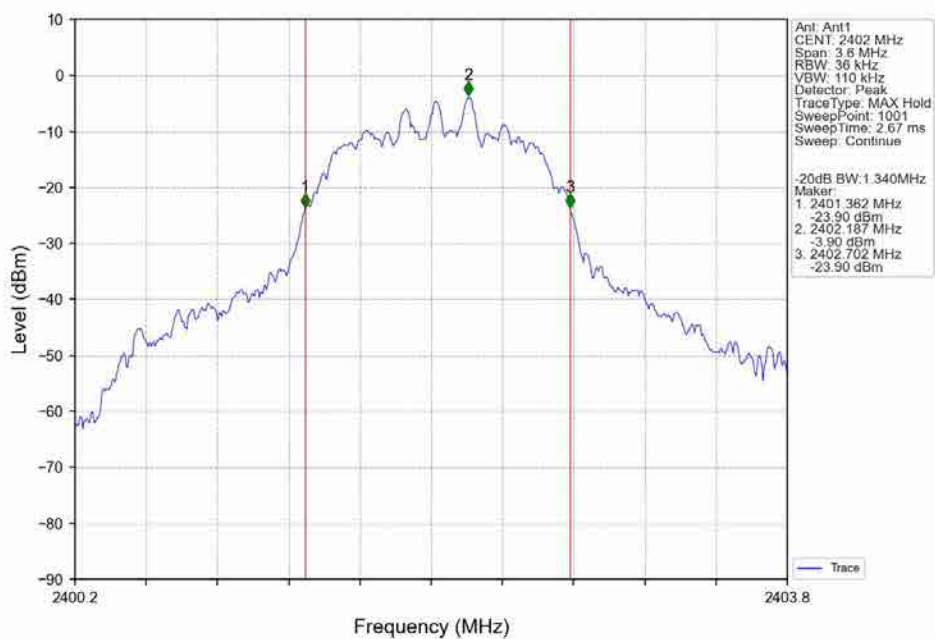
## 2.2.2 20dB BW



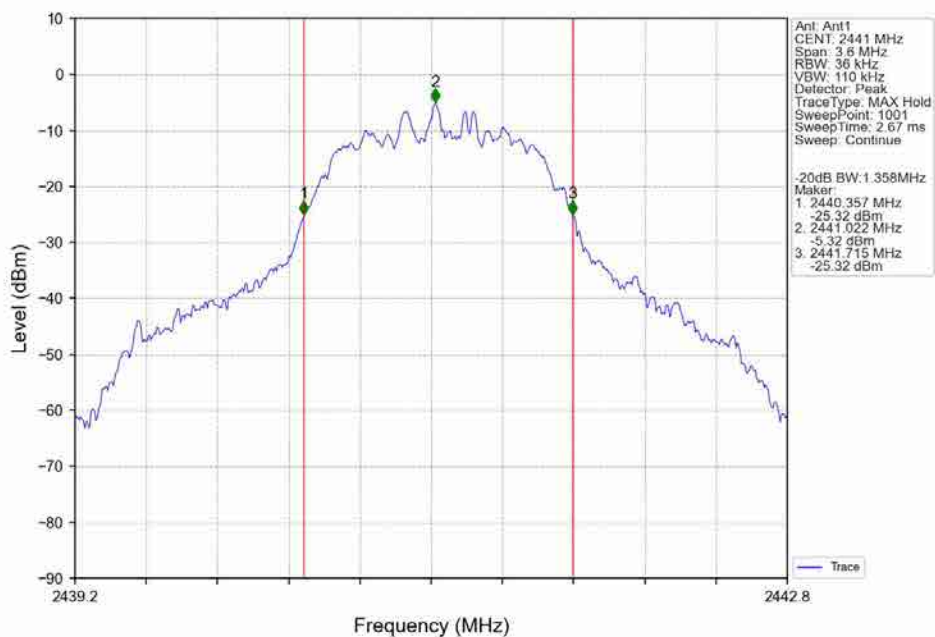
### GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



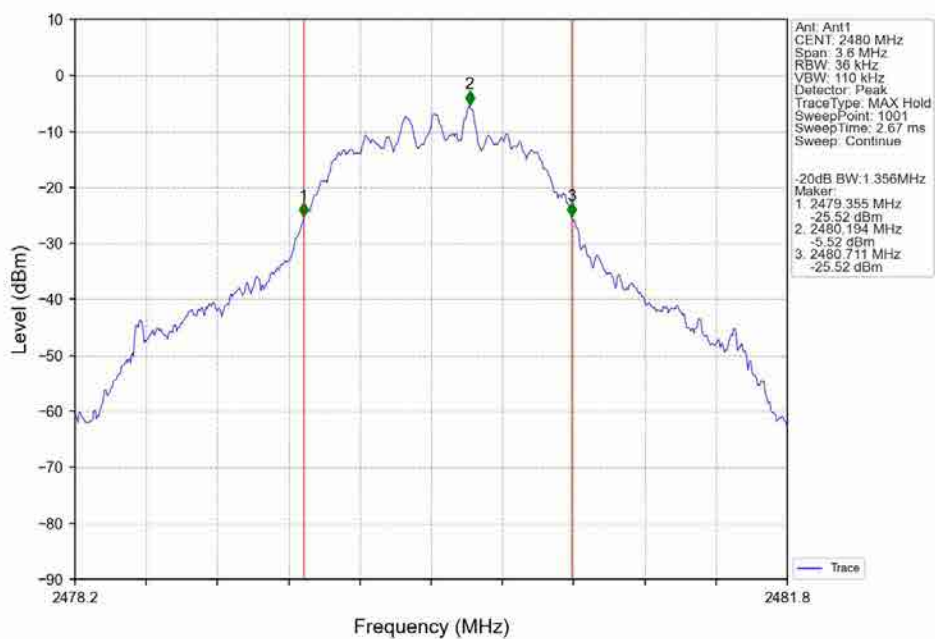
### $\pi/4$ DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



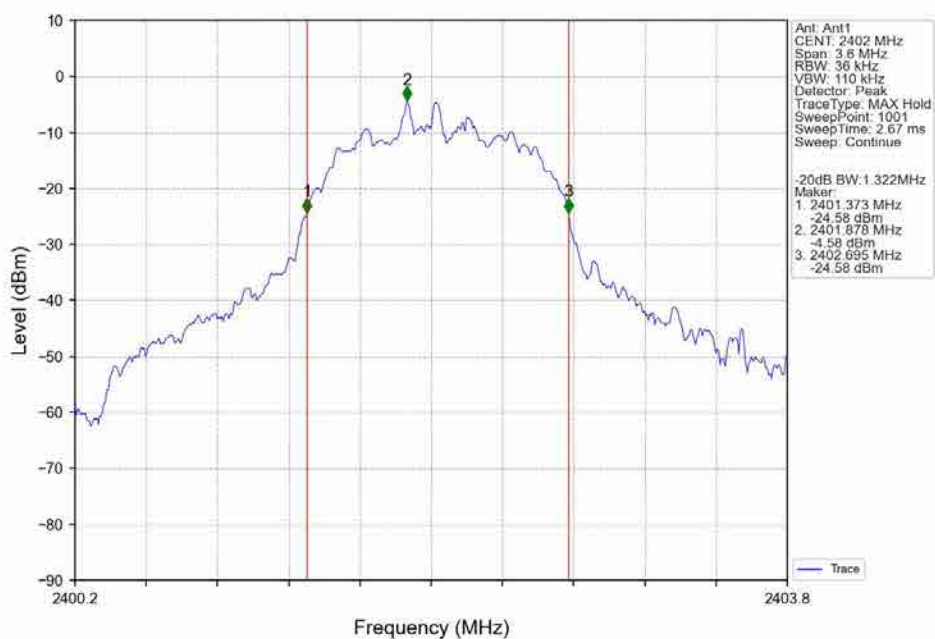
$\pi/4$ DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



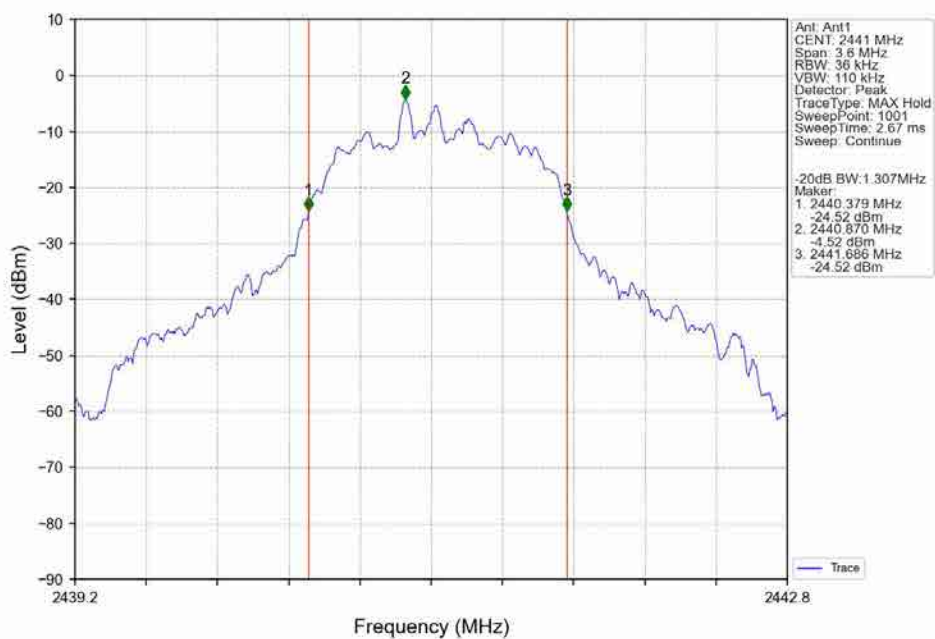
$\pi/4$ DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



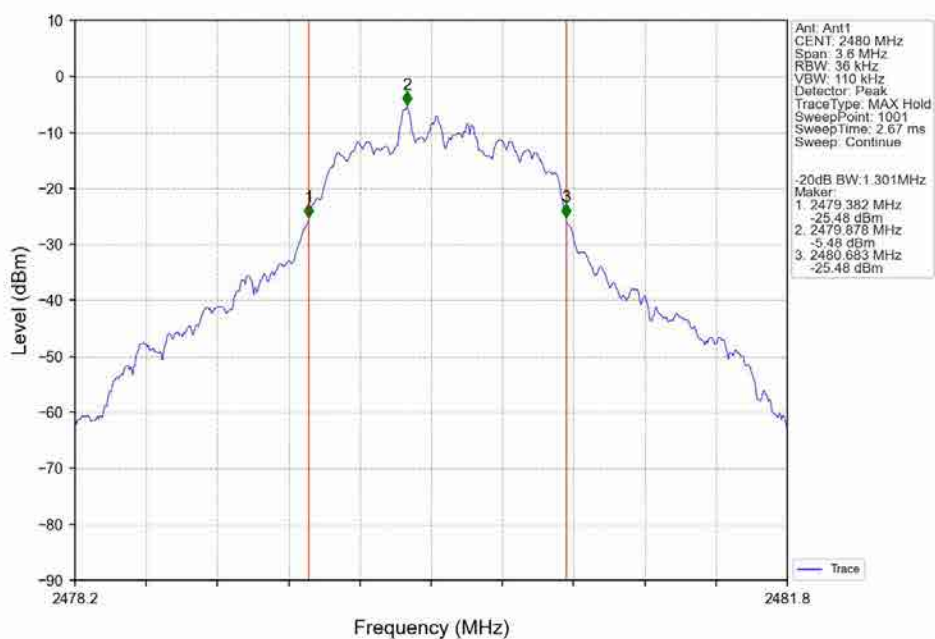
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



### 3. Maximum Conducted Output Power

#### 3.1 Test Result

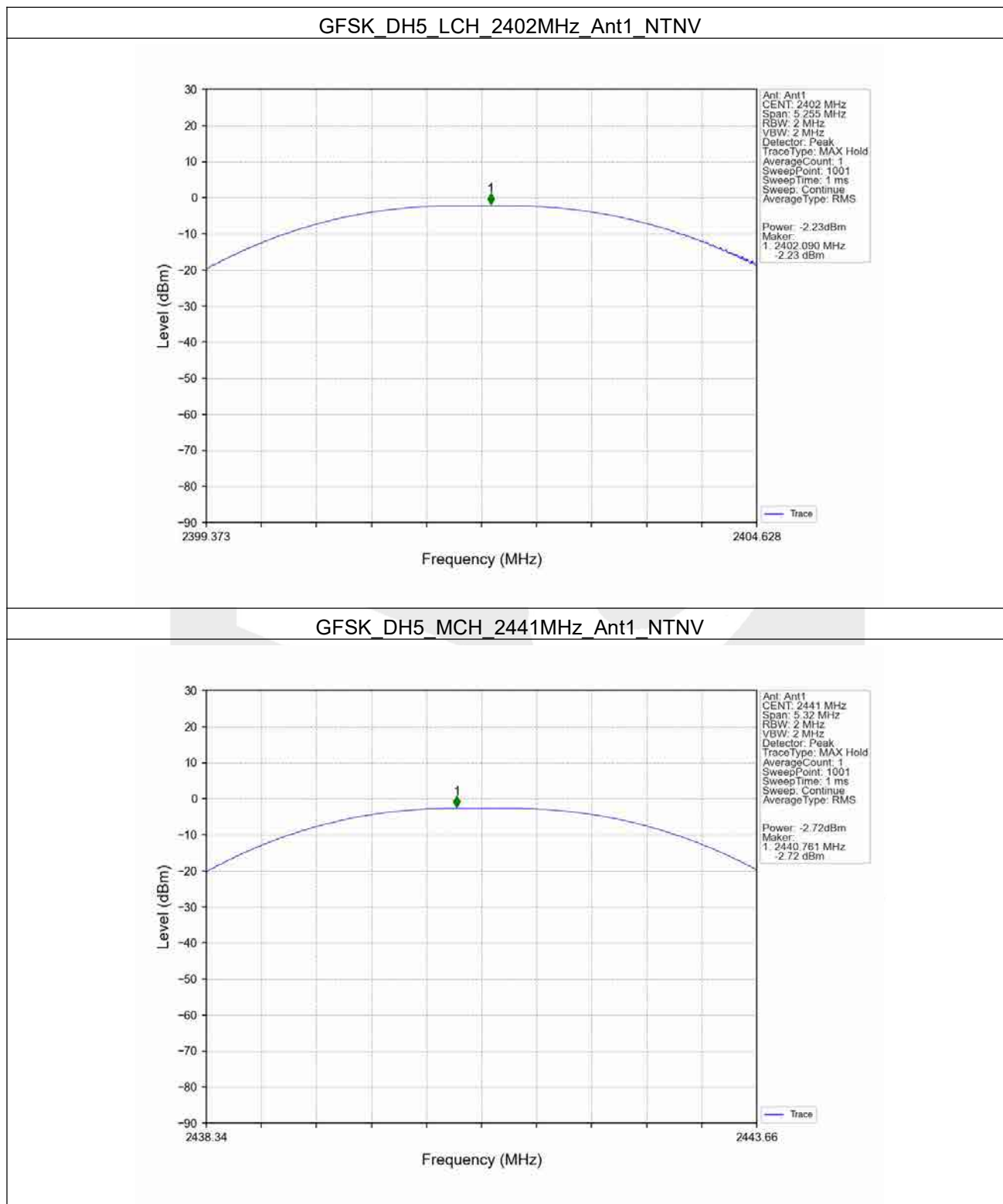
##### 3.1.1 Power

| Mode          | TX Type | Frequency (MHz) | Packet Type | Maximum Peak Conducted Output Power (dBm) |         | Verdict |
|---------------|---------|-----------------|-------------|-------------------------------------------|---------|---------|
|               |         |                 |             | ANT1                                      | Limit   |         |
| GFSK          | SISO    | 2402            | DH5         | -2.23                                     | <=20.97 | Pass    |
|               |         | 2441            | DH5         | -2.72                                     | <=20.97 | Pass    |
|               |         | 2480            | DH5         | -3.44                                     | <=20.97 | Pass    |
| $\pi/4$ DQPSK | SISO    | 2402            | 2DH5        | -1.42                                     | <=20.97 | Pass    |
|               |         | 2441            | 2DH5        | -1.92                                     | <=20.97 | Pass    |
|               |         | 2480            | 2DH5        | -2.64                                     | <=20.97 | Pass    |
| 8DPSK         | SISO    | 2402            | 3DH5        | -1.02                                     | <=20.97 | Pass    |
|               |         | 2441            | 3DH5        | -1.56                                     | <=20.97 | Pass    |
|               |         | 2480            | 3DH5        | -2.35                                     | <=20.97 | Pass    |

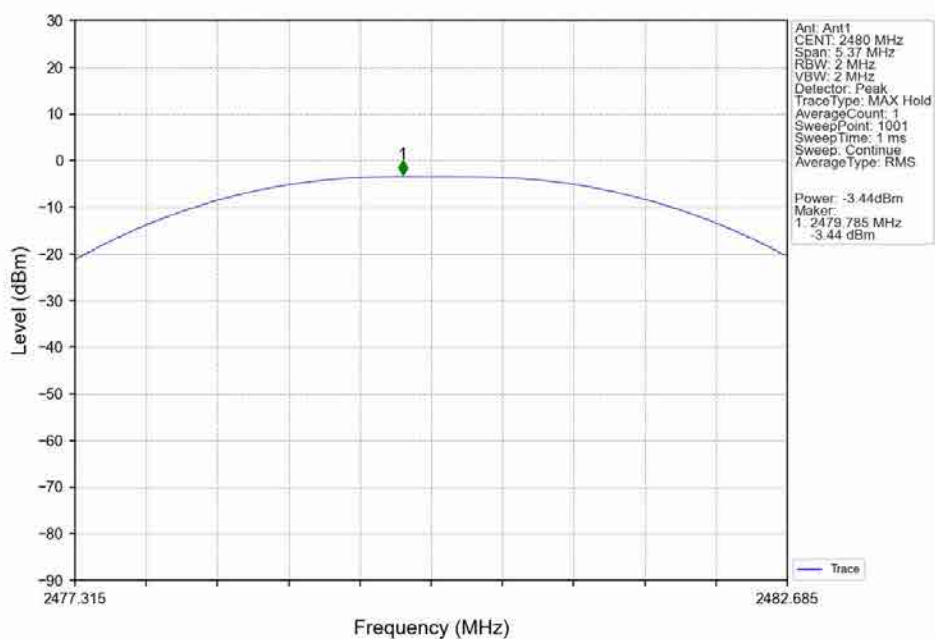
Note1: Antenna Gain: Ant1: -0.58dBi;

### 3.2 Test Graph

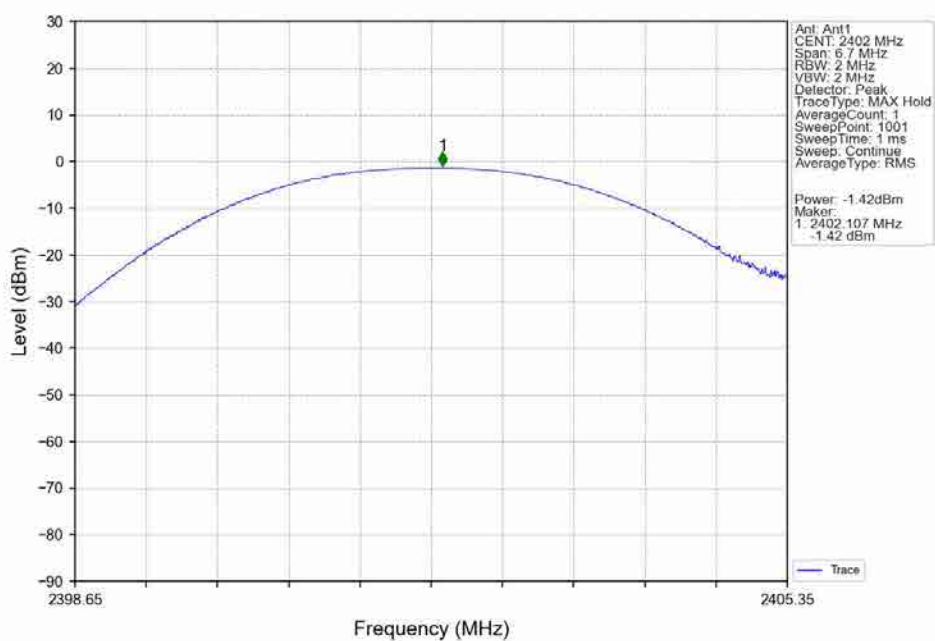
#### 3.2.1 Power



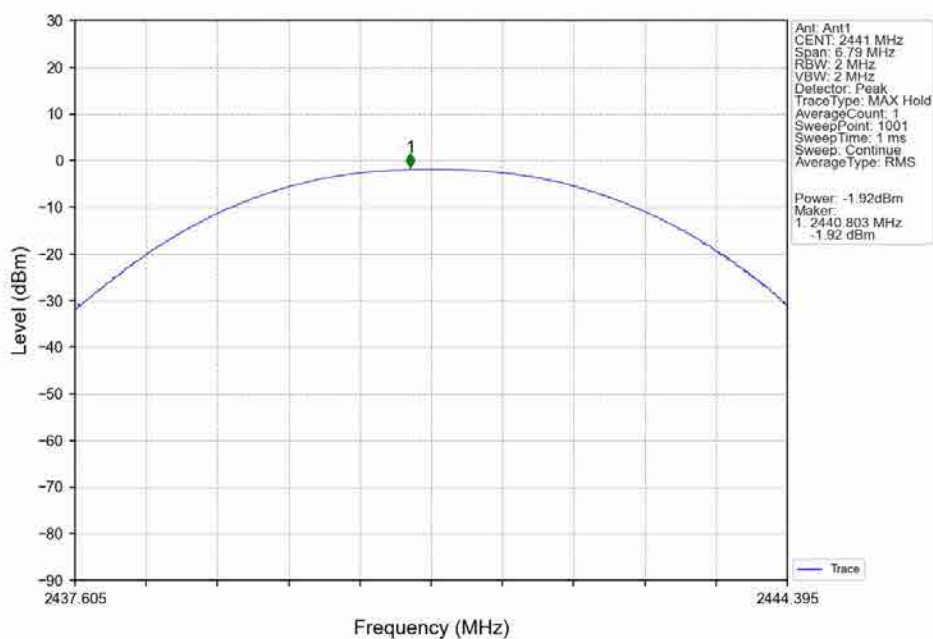
### GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



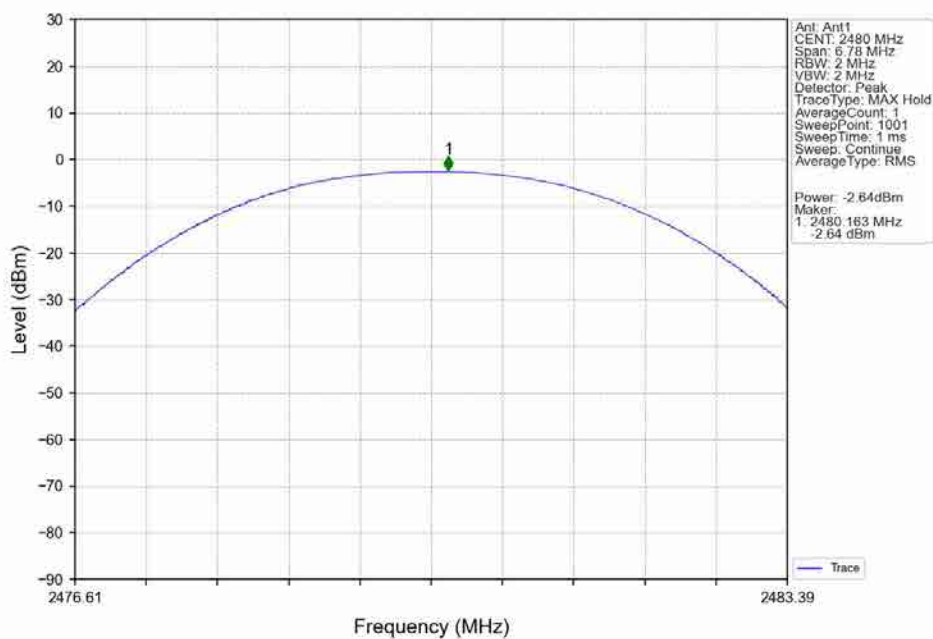
### $\pi/4$ DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



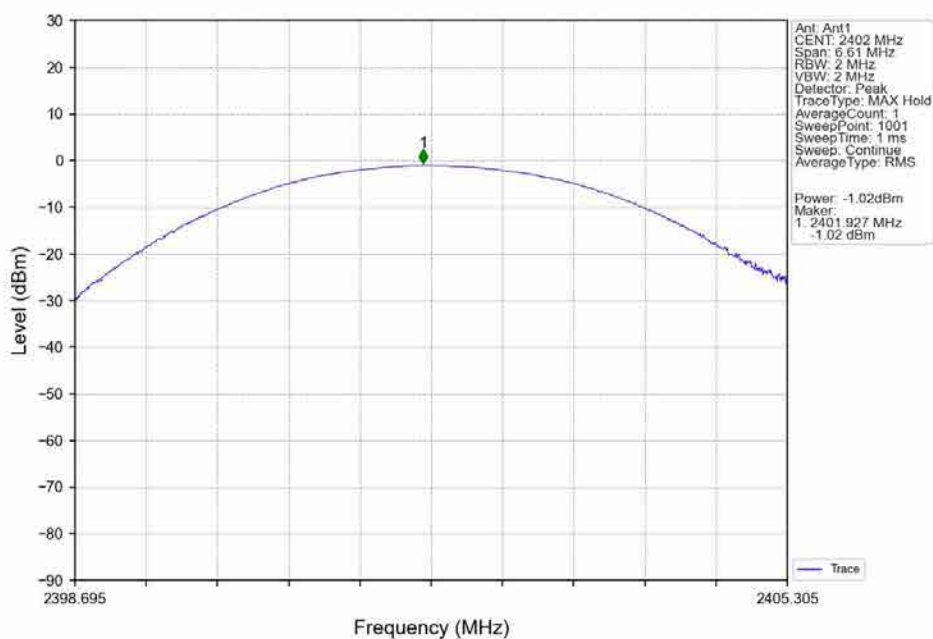
$\pi/4$ DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



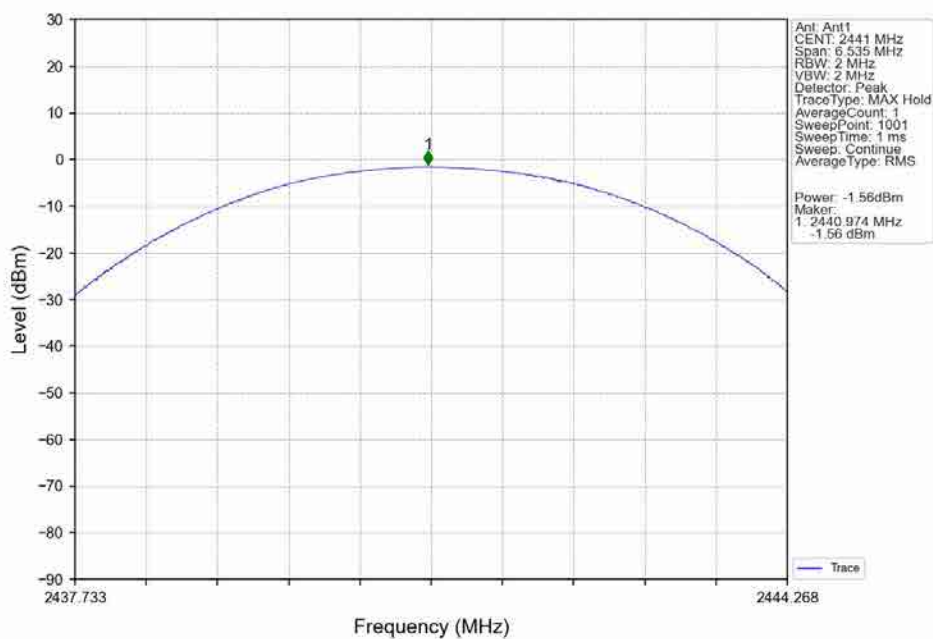
$\pi/4$ DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

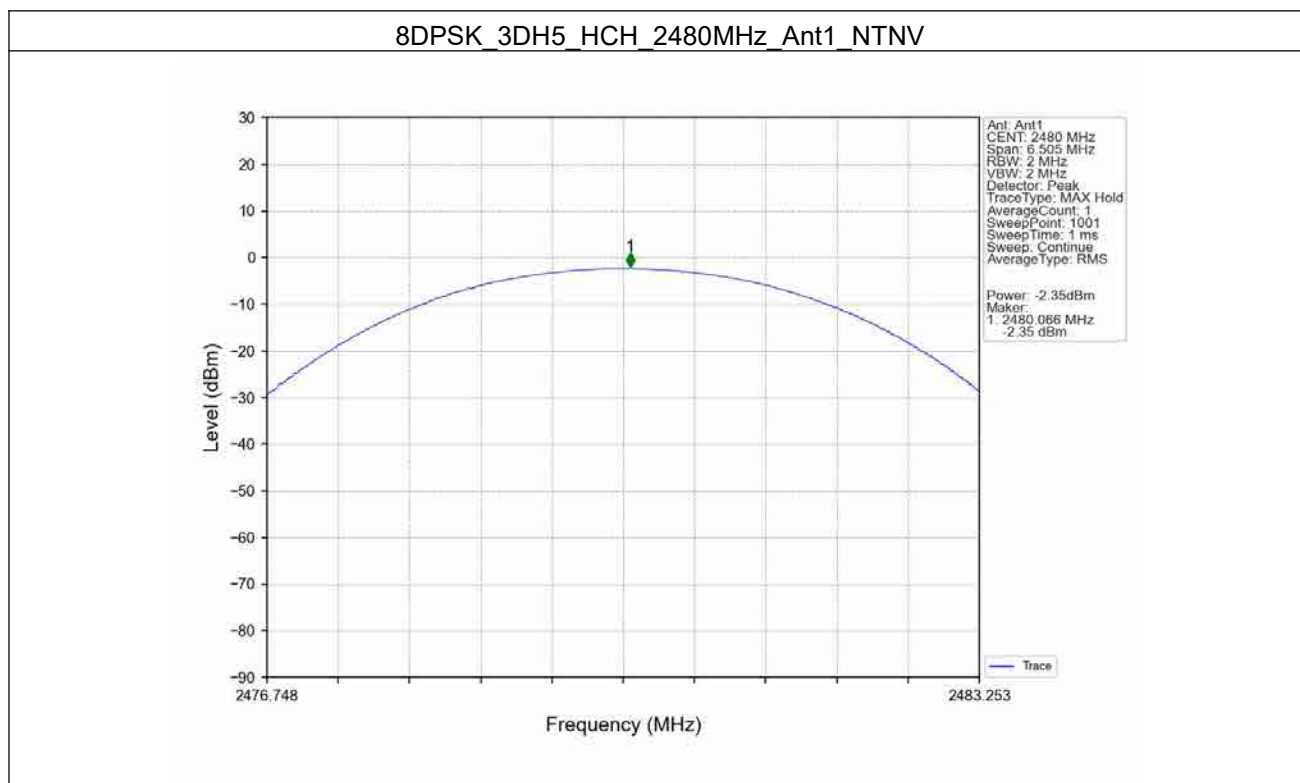


8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV





#### 4. Carrier Frequency Separation

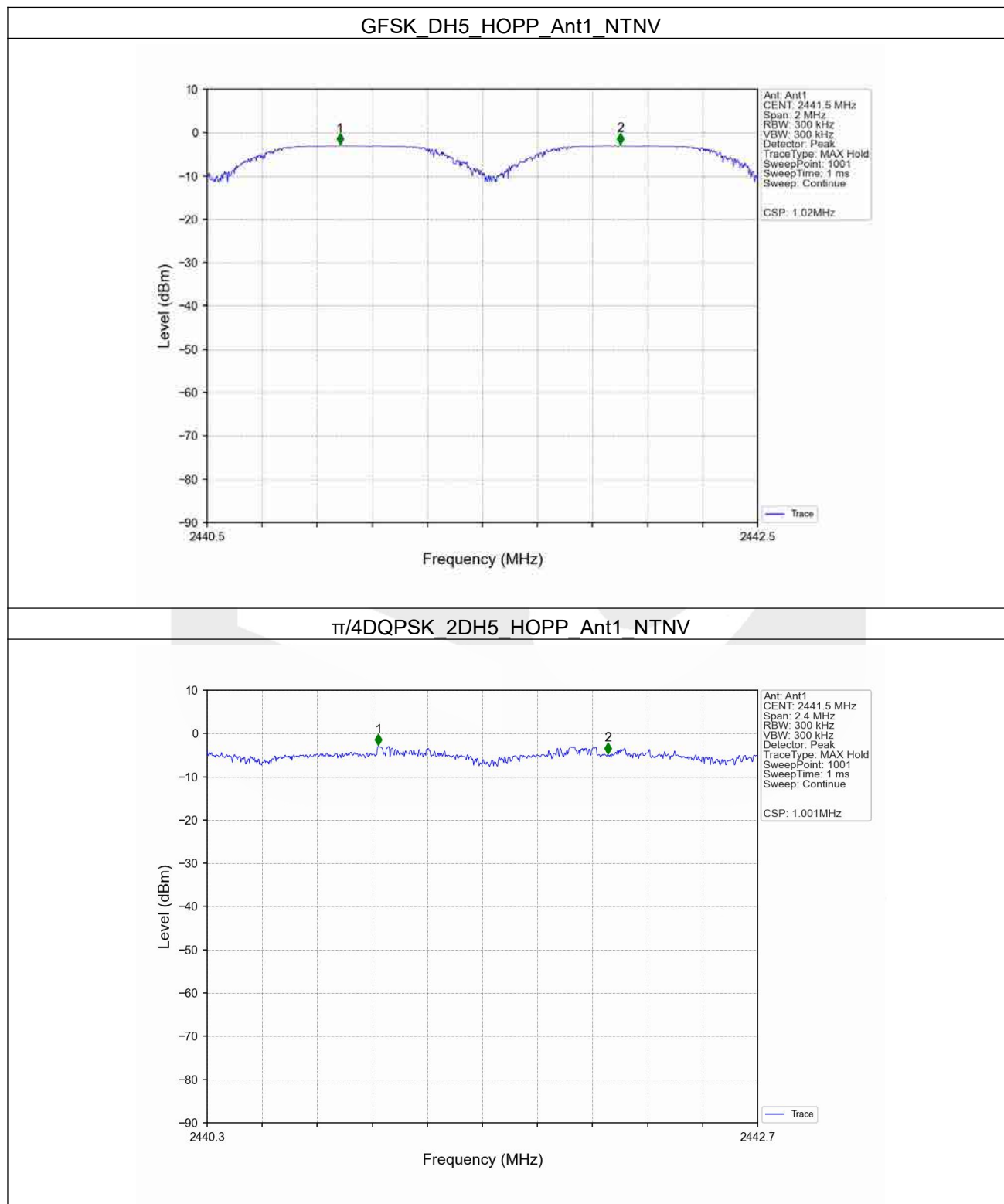
##### 4.1 Test Result

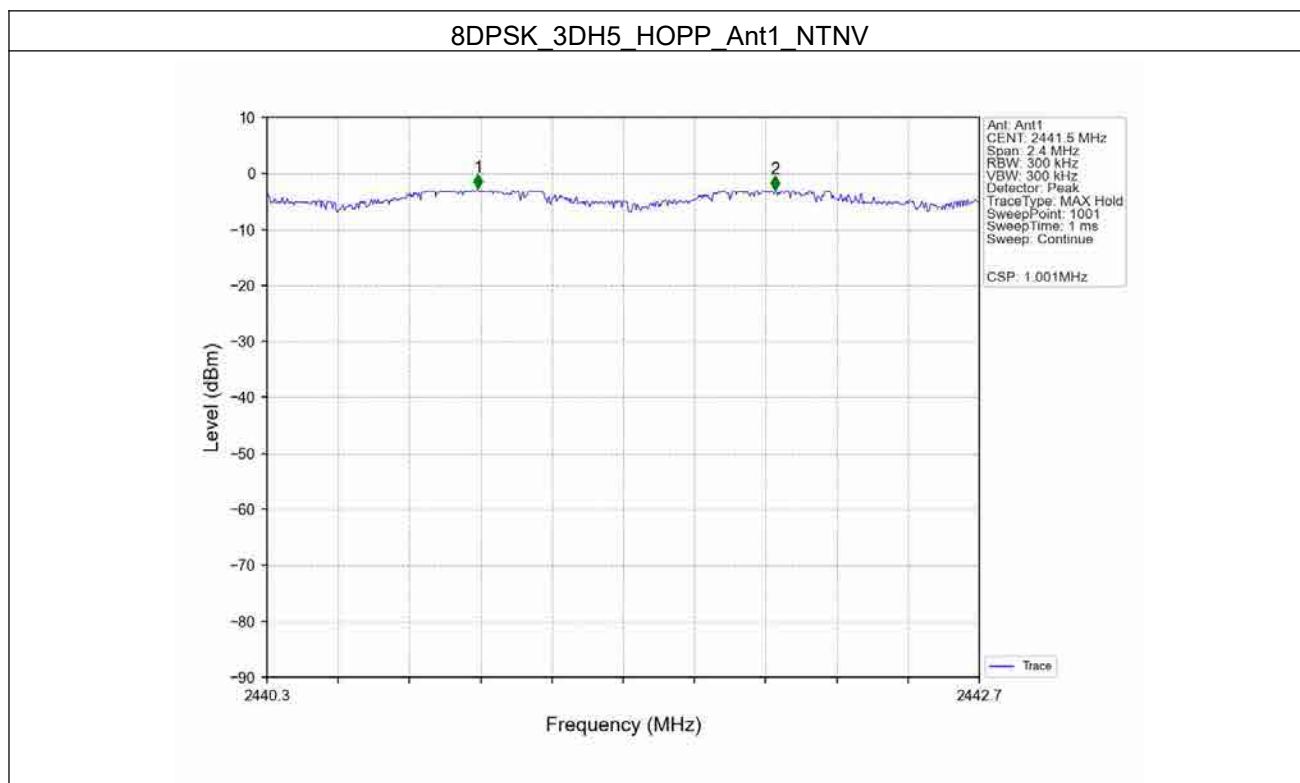
###### 4.1.1 Ant1

| Ant1          |         |                 |             |                          |                      |              |         |
|---------------|---------|-----------------|-------------|--------------------------|----------------------|--------------|---------|
| Mode          | TX Type | Frequency (MHz) | Packet Type | Channel Separation (MHz) | 20dB Bandwidth (MHz) | Limit (MHz)  | Verdict |
| GFSK          | SISO    | HOPP            | DH5         | 1.020                    | 1.074                | $\geq 0.716$ | Pass    |
| $\pi/4$ DQPSK | SISO    | HOPP            | 2DH5        | 1.001                    | 1.358                | $\geq 0.905$ | Pass    |
| 8DPSK         | SISO    | HOPP            | 3DH5        | 1.001                    | 1.322                | $\geq 0.881$ | Pass    |

## 4.2 Test Graph

### 4.2.1 Ant1





## 5. Number of Hopping Frequencies

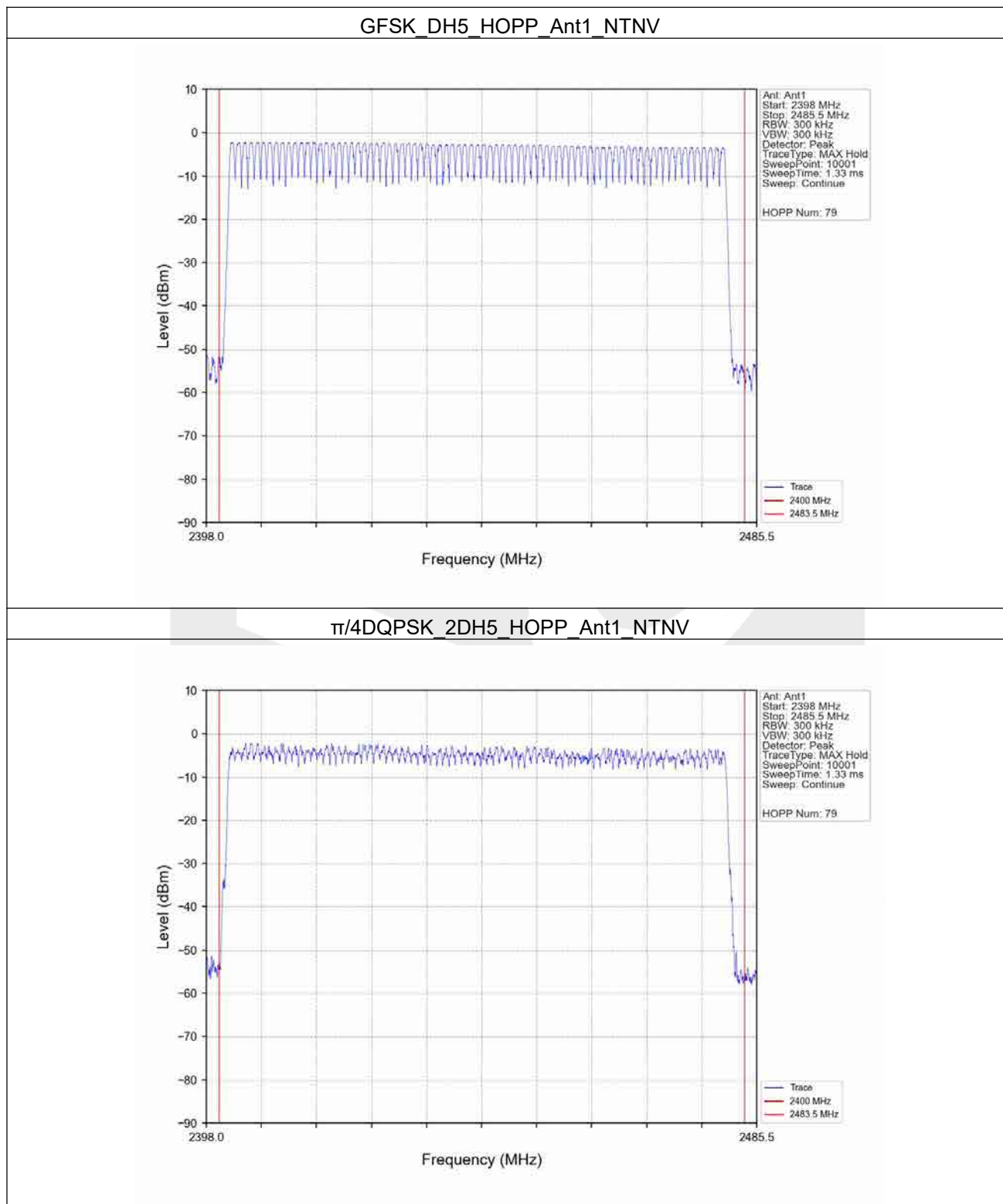
### 5.1 Test Result

#### 5.1.1 HoppNum

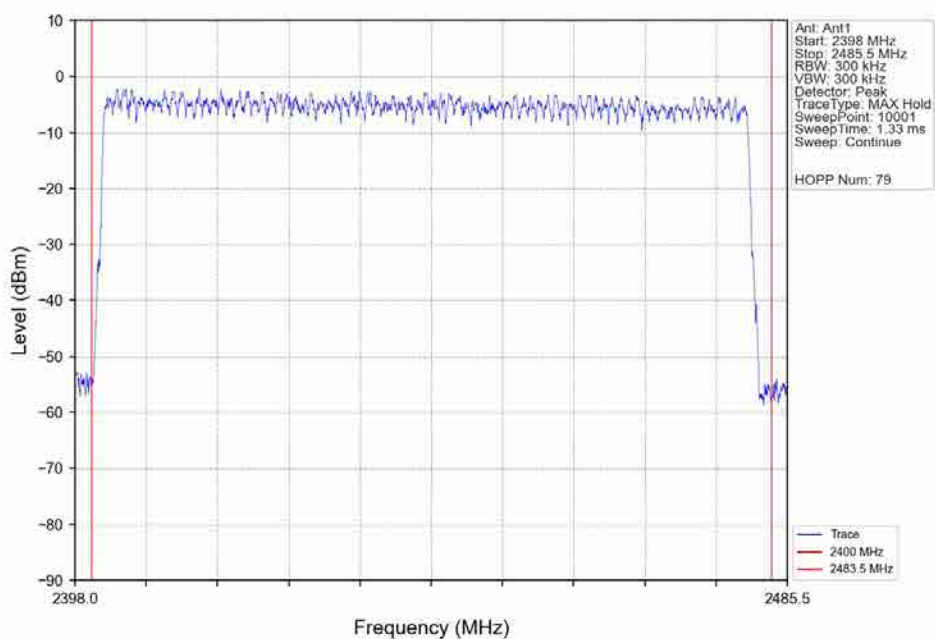
| Mode          | TX Type | Frequency (MHz) | Packet Type | Num of Hopping Frequencies |           | Verdict |
|---------------|---------|-----------------|-------------|----------------------------|-----------|---------|
|               |         |                 |             | ANT1                       | Limit     |         |
| GFSK          | SISO    | HOPP            | DH5         | 79                         | $\geq 15$ | Pass    |
| $\pi/4$ DQPSK | SISO    | HOPP            | 2DH5        | 79                         | $\geq 15$ | Pass    |
| 8DPSK         | SISO    | HOPP            | 3DH5        | 79                         | $\geq 15$ | Pass    |

## 5.2 Test Graph

### 5.2.1 HoppNum



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



## 6. Time of Occupancy (Dwell Time)

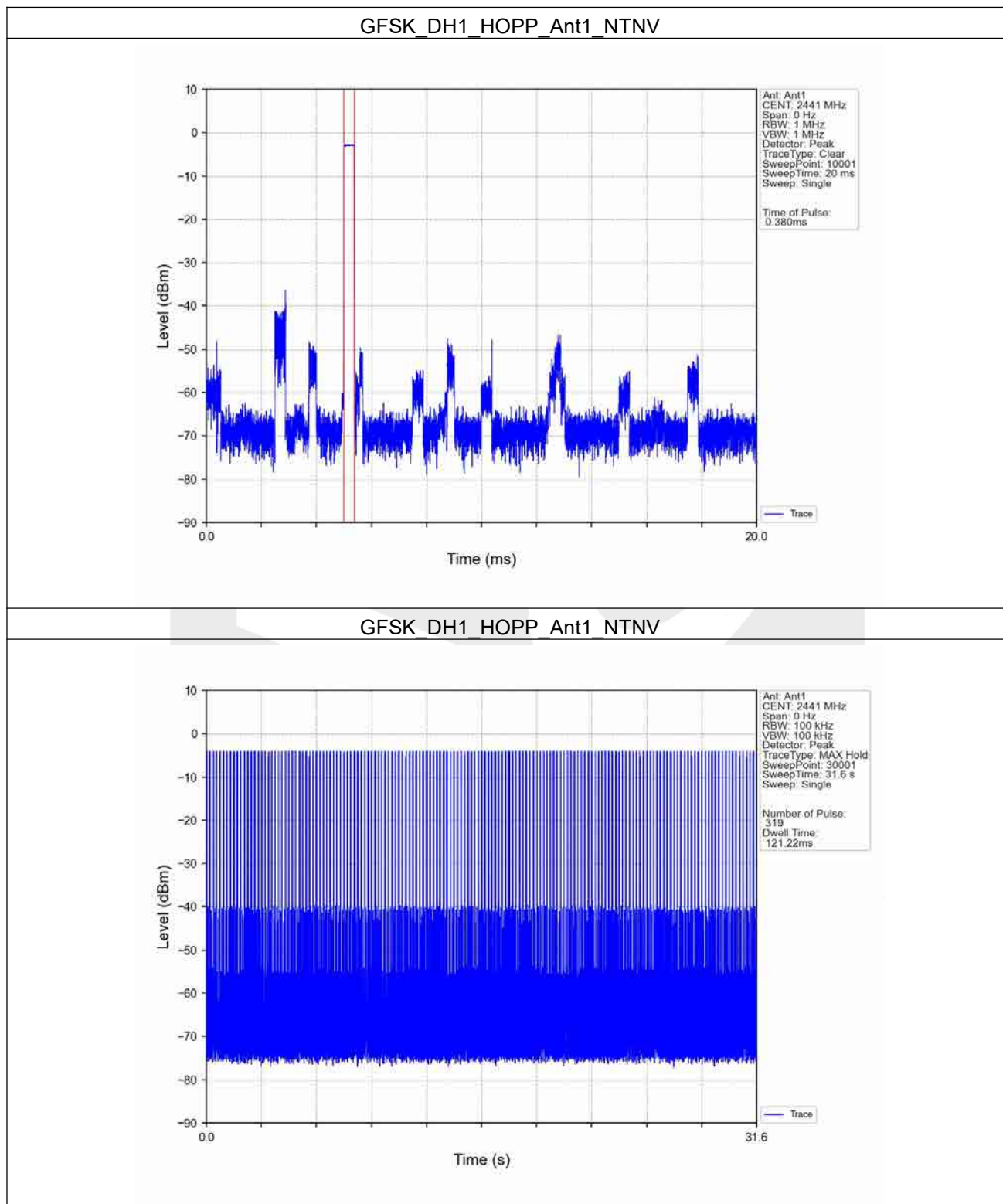
### 6.1 Test Result

#### 6.1.1 Ant1

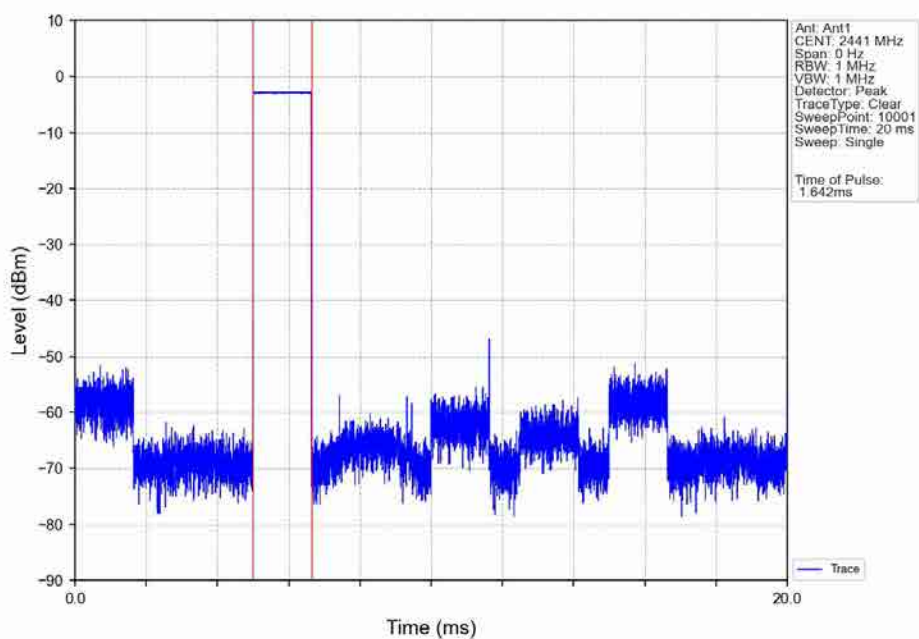
| Ant1          |         |                 |             |                               |                        |                                    |                 |            |         |
|---------------|---------|-----------------|-------------|-------------------------------|------------------------|------------------------------------|-----------------|------------|---------|
| Mode          | TX Type | Frequency (MHz) | Packet Type | Duration of Single Pulse (ms) | Observation Period (s) | Num of Pulse in Observation Period | Dwell Time (ms) | Limit (ms) | Verdict |
| GFSK          | SISO    | HOPP            | DH1         | 0.380                         | 31.600                 | 319                                | 121.220         | <=400      | Pass    |
|               |         |                 | DH3         | 1.642                         | 31.600                 | 167                                | 274.214         | <=400      | Pass    |
|               |         |                 | DH5         | 2.884                         | 31.600                 | 105                                | 302.820         | <=400      | Pass    |
| $\pi$ /4DQPSK | SISO    | HOPP            | 2DH1        | 0.390                         | 31.600                 | 320                                | 124.800         | <=400      | Pass    |
|               |         |                 | 2DH3        | 1.642                         | 31.600                 | 164                                | 269.288         | <=400      | Pass    |
|               |         |                 | 2DH5        | 2.898                         | 31.600                 | 107                                | 310.086         | <=400      | Pass    |
| 8DPSK         | SISO    | HOPP            | 3DH1        | 0.392                         | 31.600                 | 317                                | 124.264         | <=400      | Pass    |
|               |         |                 | 3DH3        | 1.646                         | 31.600                 | 155                                | 255.130         | <=400      | Pass    |
|               |         |                 | 3DH5        | 2.892                         | 31.600                 | 94                                 | 271.848         | <=400      | Pass    |

## 6.2 Test Graph

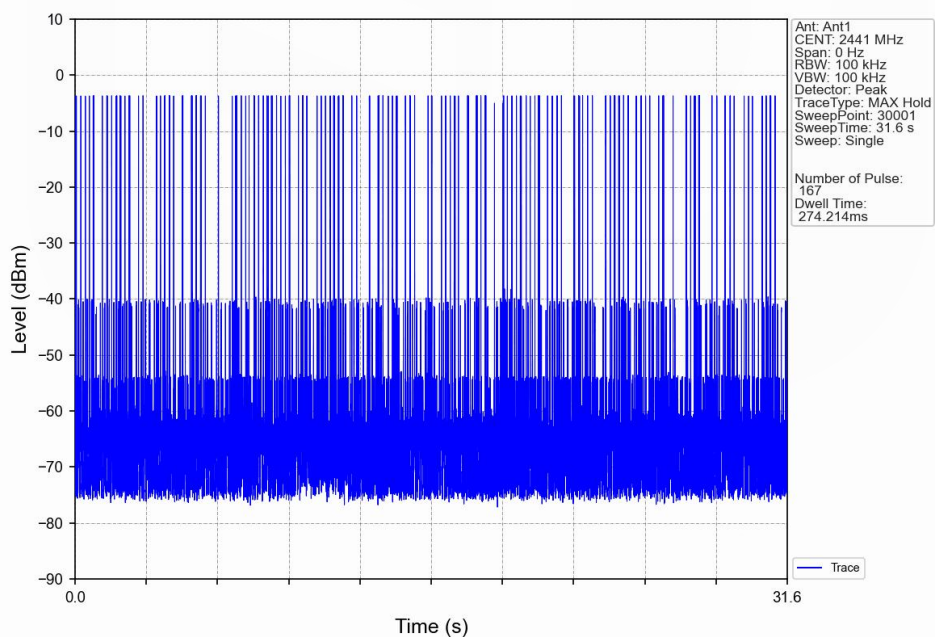
### 6.2.1 Ant1



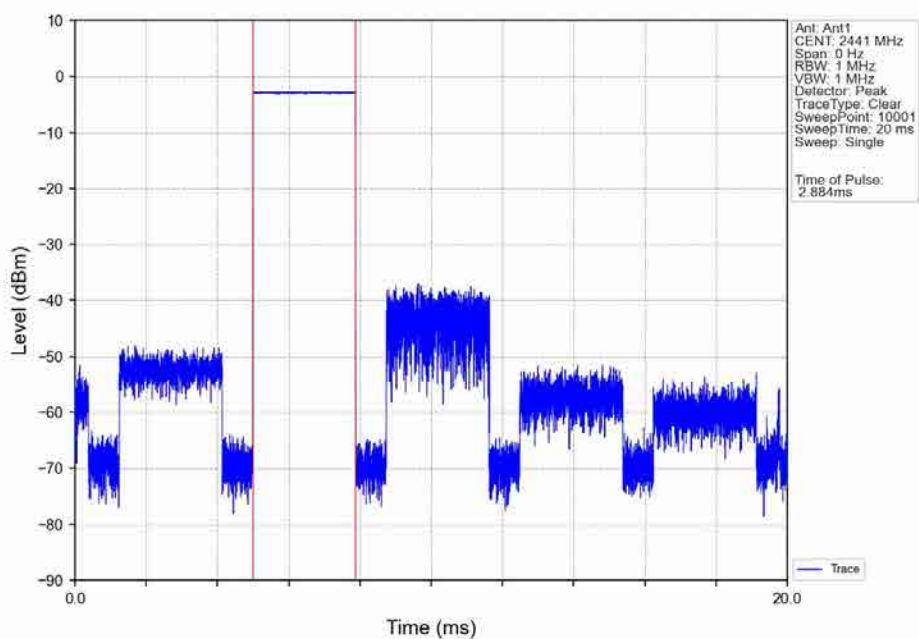
### GFSK\_DH3\_HOPP\_Ant1\_NTNV



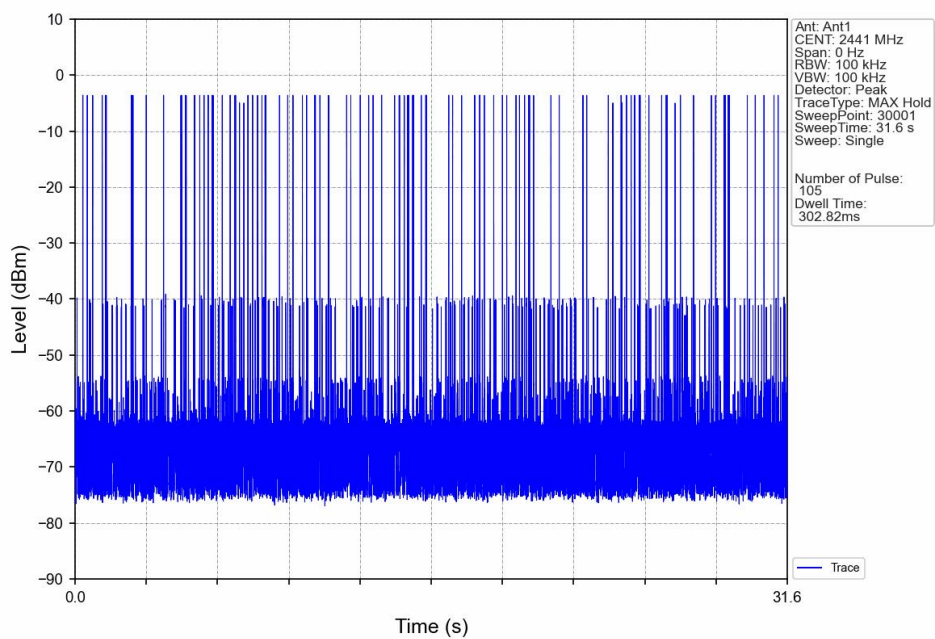
### GFSK\_DH3\_HOPP\_Ant1\_NTNV



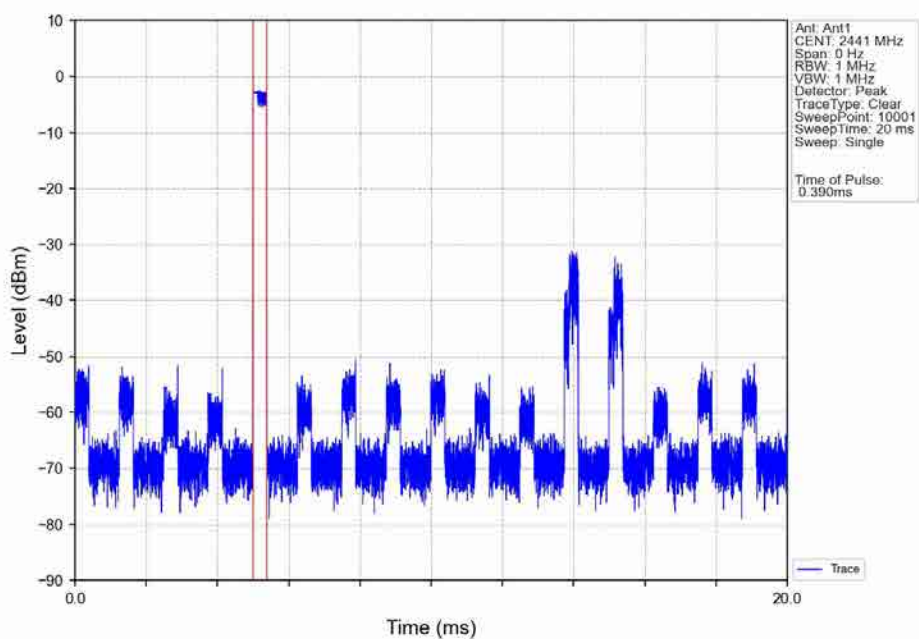
GFSK\_DH5\_HOPP\_Ant1\_NTNV



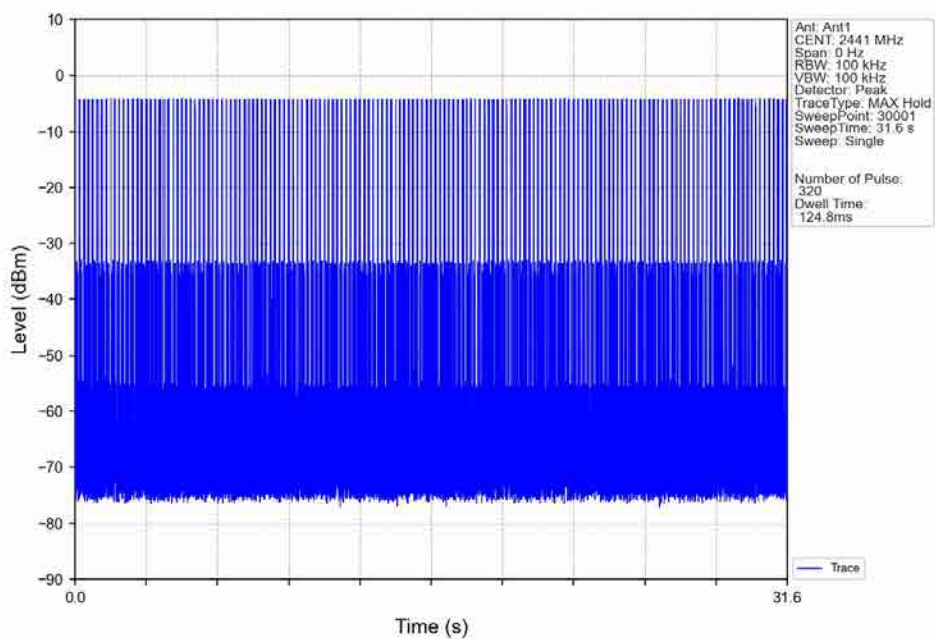
GFSK\_DH5\_HOPP\_Ant1\_NTNV



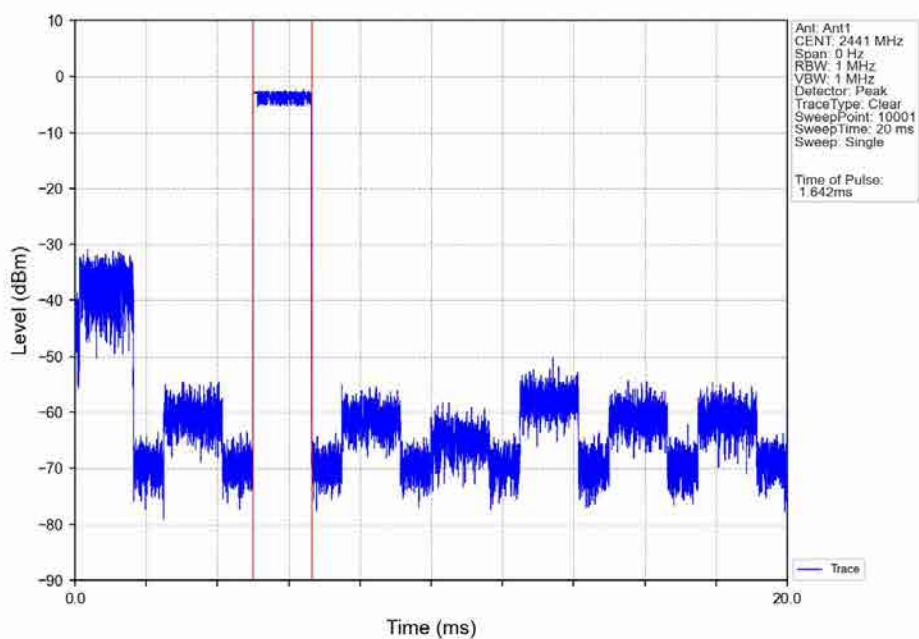
$\pi/4$ DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



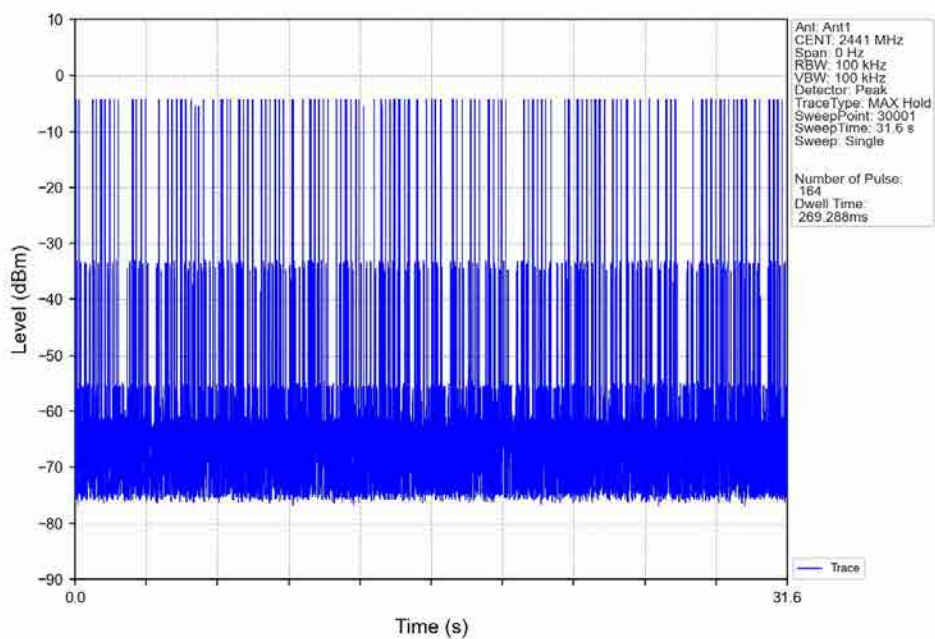
$\pi/4$ DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



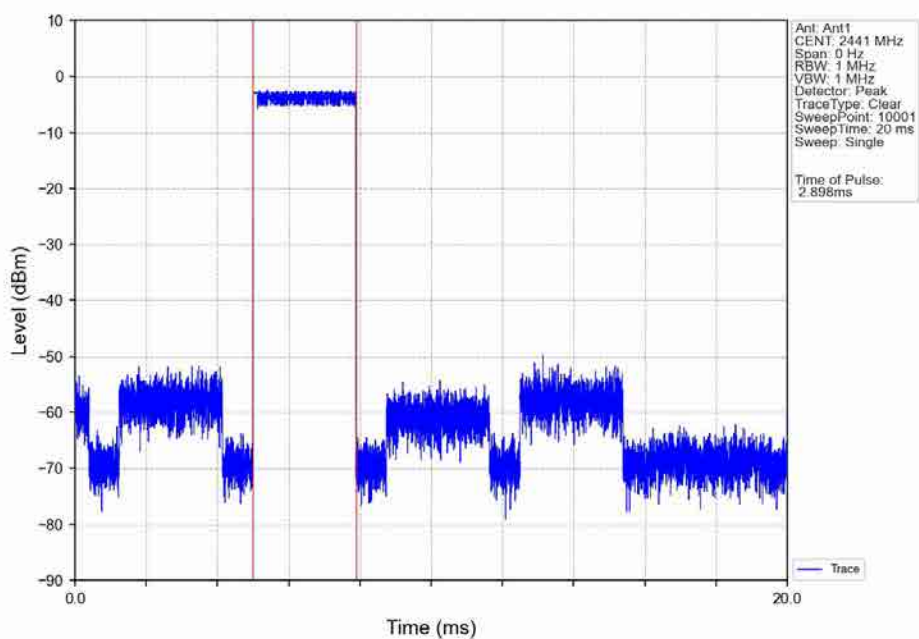
$\pi/4$ DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



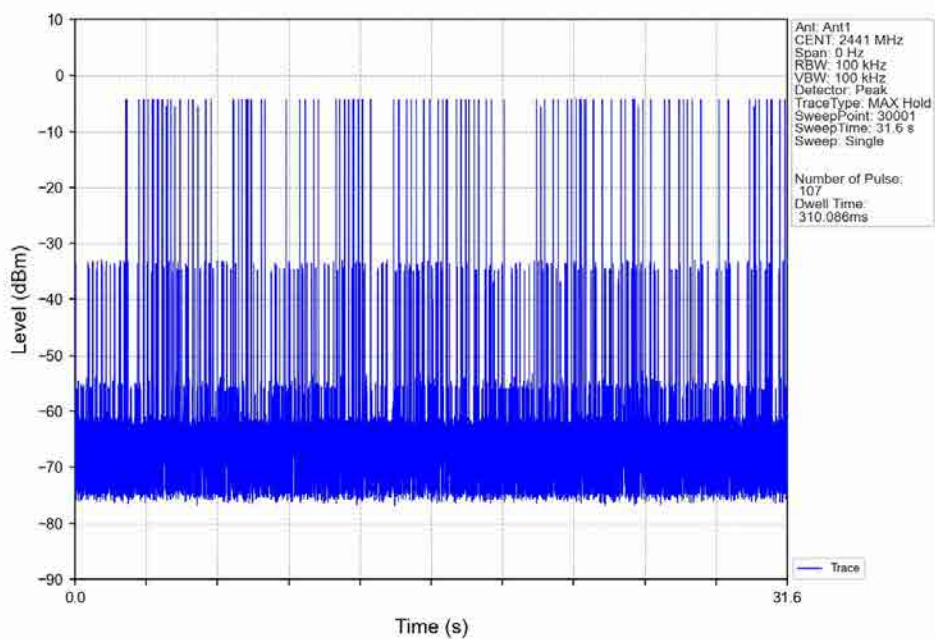
$\pi/4$ DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



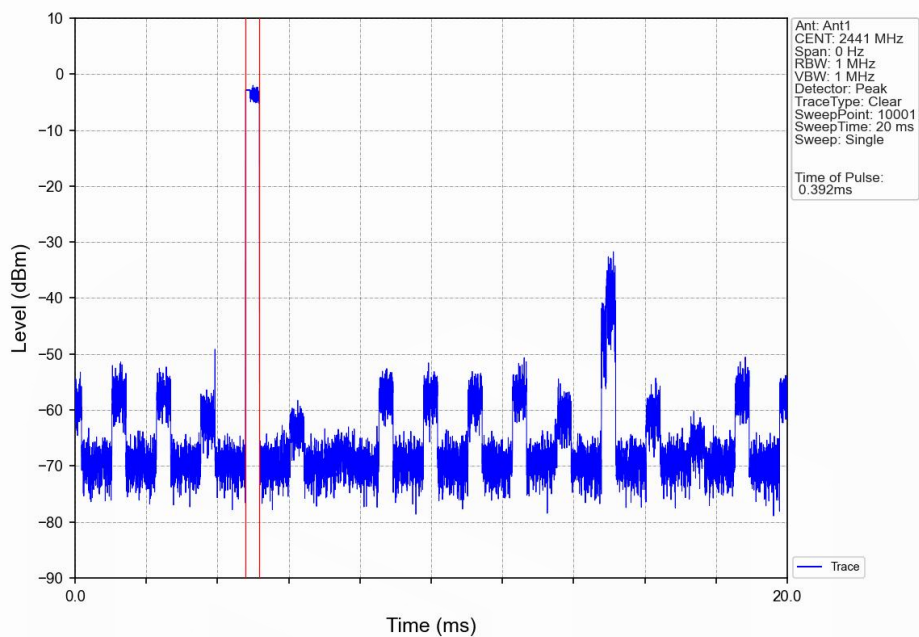
$\pi/4$ DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



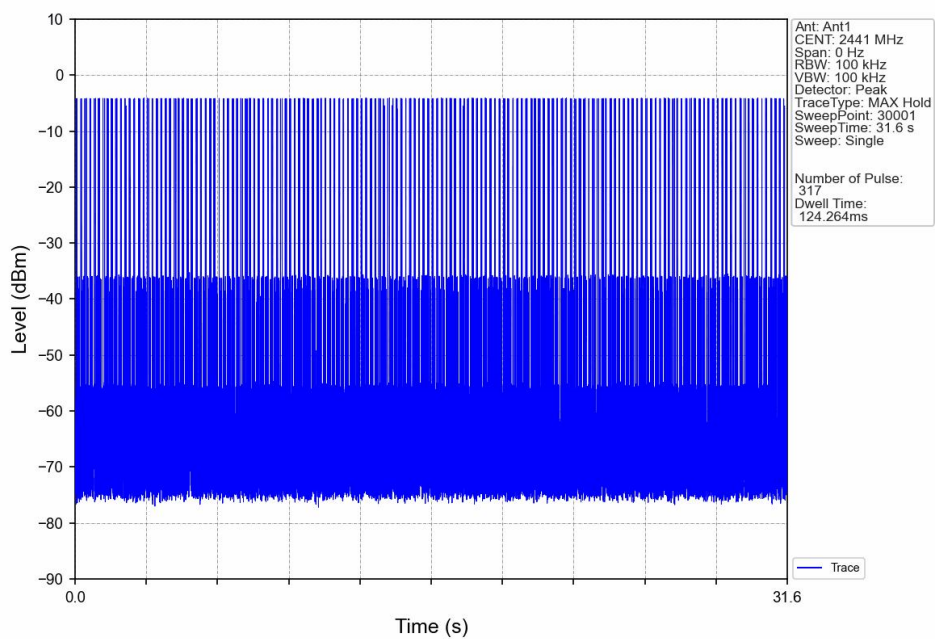
$\pi/4$ DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



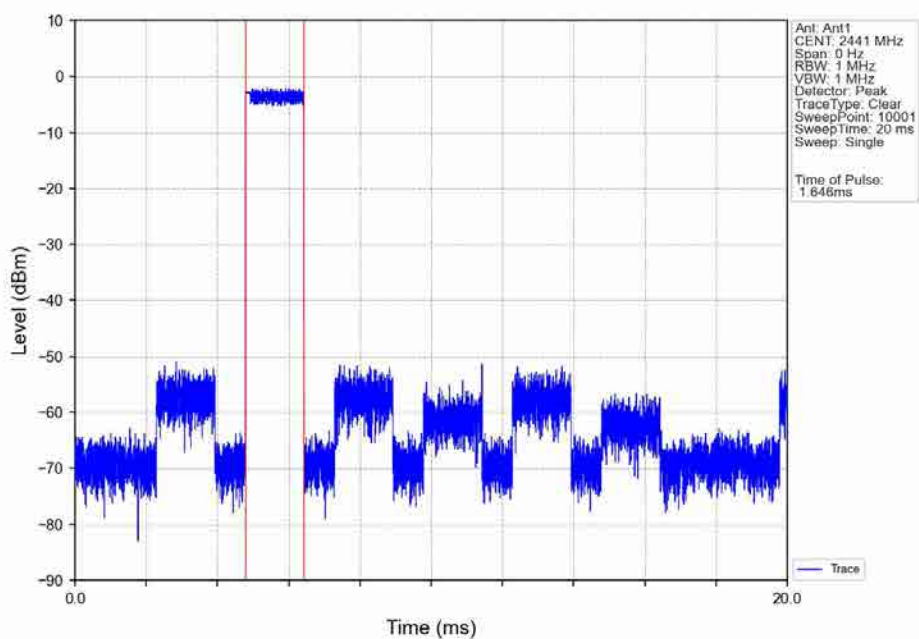
### 8DPSK\_3DH1\_HOPP\_Ant1\_NTNV



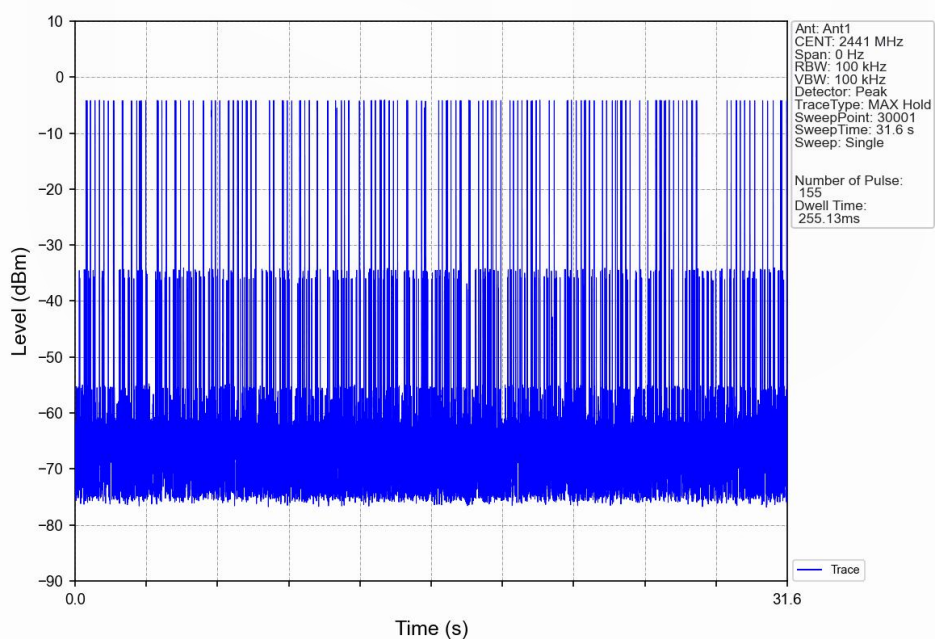
### 8DPSK\_3DH1\_HOPP\_Ant1\_NTNV



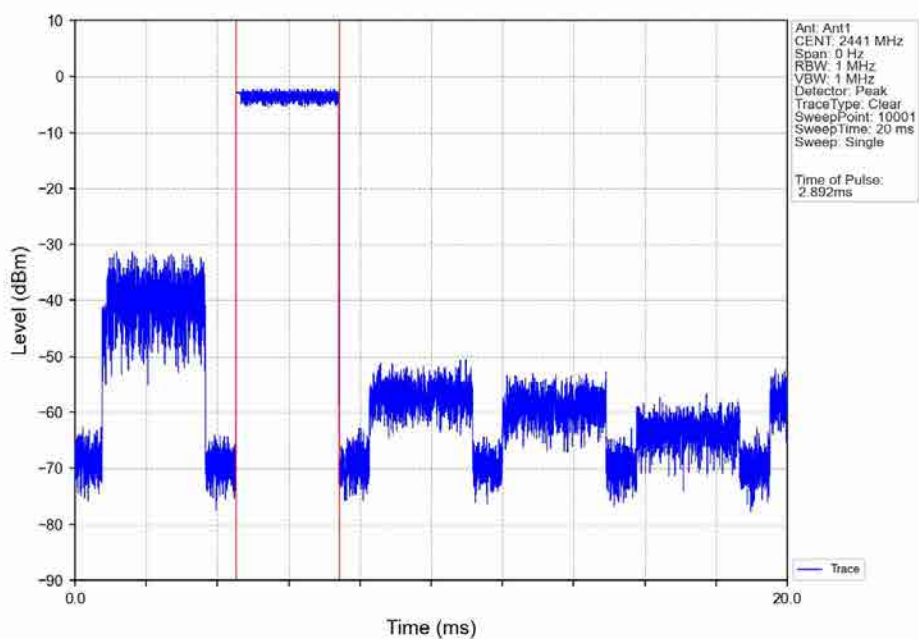
### 8DPSK\_3DH3\_HOPP\_Ant1\_NTNV



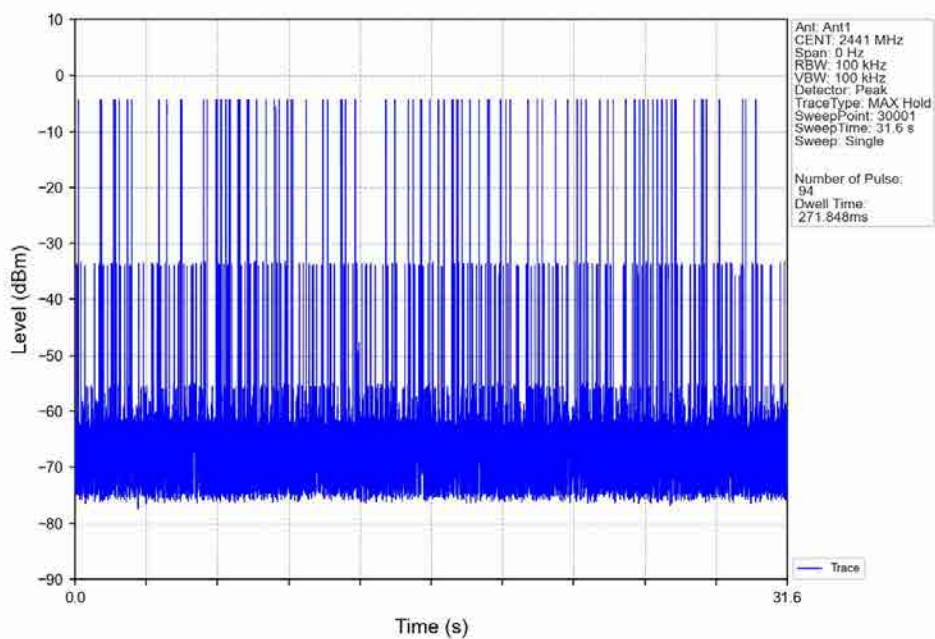
### 8DPSK\_3DH3\_HOPP\_Ant1\_NTNV



### 8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



### 8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



## 7. Unwanted Emissions In Non-restricted Frequency Bands

### 7.1 Test Result

#### 7.1.1 Ref

| Mode          | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) |
|---------------|---------|-----------------|-------------|-----|--------------------------|
| GFSK          | SISO    | 2402            | DH5         | 1   | -2.57                    |
|               |         | 2441            | DH5         | 1   | -3.12                    |
|               |         | 2480            | DH5         | 1   | -3.94                    |
|               |         | HOPP            | DH5         | 1   | -2.55                    |
|               |         |                 |             |     | -2.55                    |
| $\pi/4$ DQPSK | SISO    | 2402            | 2DH5        | 1   | -2.54                    |
|               |         | 2441            | 2DH5        | 1   | -3.13                    |
|               |         | 2480            | 2DH5        | 1   | -3.97                    |
|               |         | HOPP            | 2DH5        | 1   | -2.63                    |
|               |         |                 |             |     | -2.63                    |
| 8DPSK         | SISO    | 2402            | 3DH5        | 1   | -2.54                    |
|               |         | 2441            | 3DH5        | 1   | -3.22                    |
|               |         | 2480            | 3DH5        | 1   | -3.97                    |
|               |         | HOPP            | 3DH5        | 1   | -2.69                    |
|               |         |                 |             |     | -2.69                    |

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

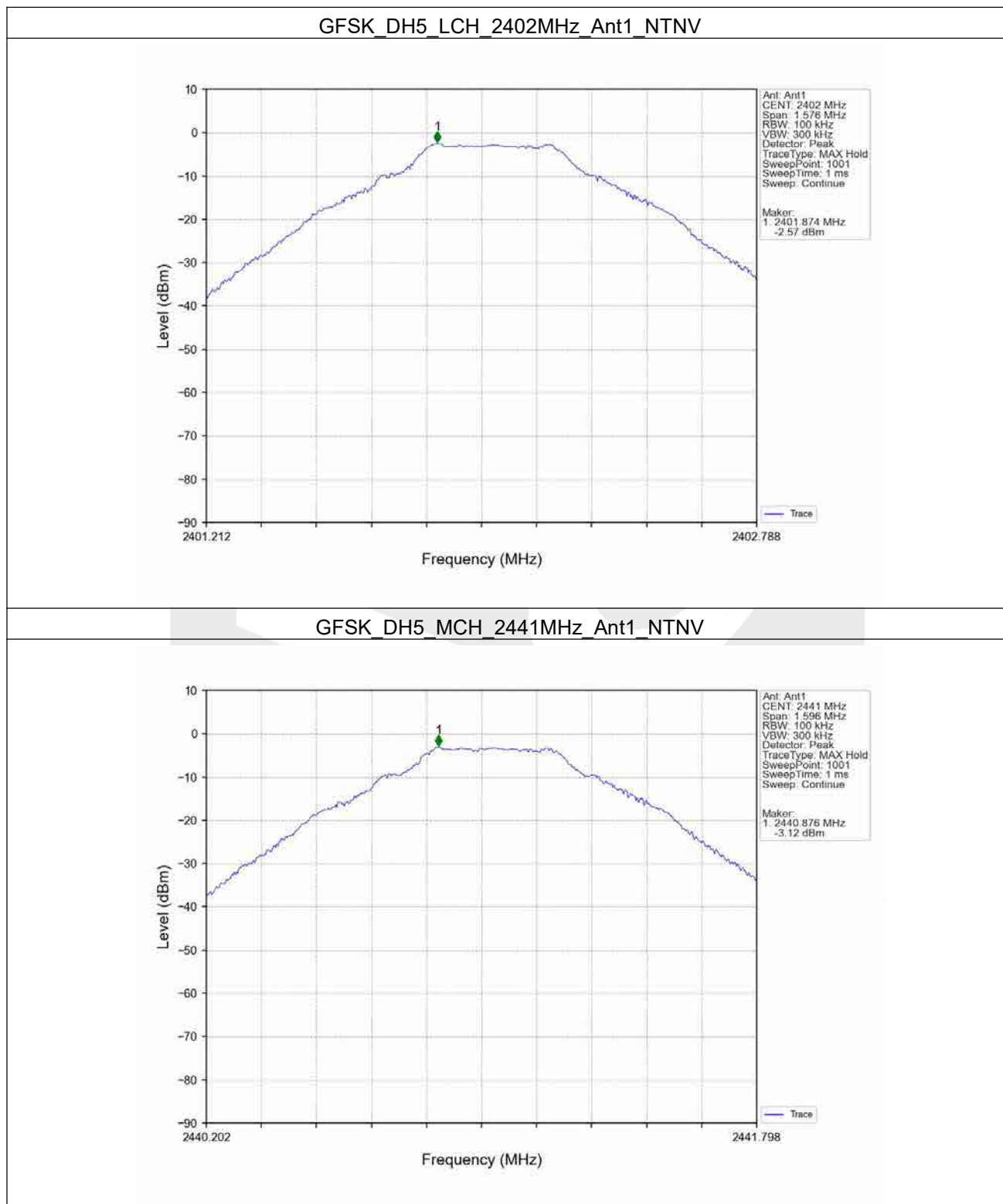
#### 7.1.2 CSE

| Mode          | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) | Limit (dBm) | Verdict |
|---------------|---------|-----------------|-------------|-----|--------------------------|-------------|---------|
| GFSK          | SISO    | 2402            | DH5         | 1   | -2.57                    | -22.57      | Pass    |
|               |         | 2441            | DH5         | 1   | -3.12                    | -23.12      | Pass    |
|               |         | 2480            | DH5         | 1   | -3.94                    | -23.94      | Pass    |
|               |         | HOPP            | DH5         | 1   | -2.55                    | -22.55      | Pass    |
|               |         |                 |             |     | -2.55                    | -22.55      | Pass    |
| $\pi/4$ DQPSK | SISO    | 2402            | 2DH5        | 1   | -2.54                    | -22.54      | Pass    |
|               |         | 2441            | 2DH5        | 1   | -3.13                    | -23.13      | Pass    |
|               |         | 2480            | 2DH5        | 1   | -3.97                    | -23.97      | Pass    |
|               |         | HOPP            | 2DH5        | 1   | -2.63                    | -22.63      | Pass    |
|               |         |                 |             |     | -2.63                    | -22.63      | Pass    |
| 8DPSK         | SISO    | 2402            | 3DH5        | 1   | -2.54                    | -22.54      | Pass    |
|               |         | 2441            | 3DH5        | 1   | -3.22                    | -23.22      | Pass    |
|               |         | 2480            | 3DH5        | 1   | -3.97                    | -23.97      | Pass    |
|               |         | HOPP            | 3DH5        | 1   | -2.69                    | -22.69      | Pass    |
|               |         |                 |             |     | -2.69                    | -22.69      | Pass    |

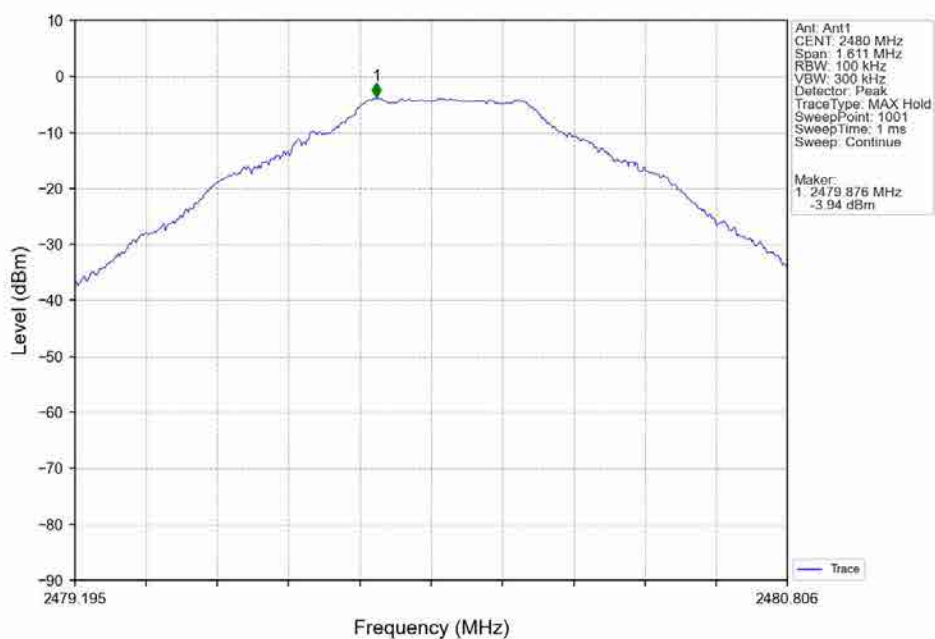
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

## 7.2 Test Graph

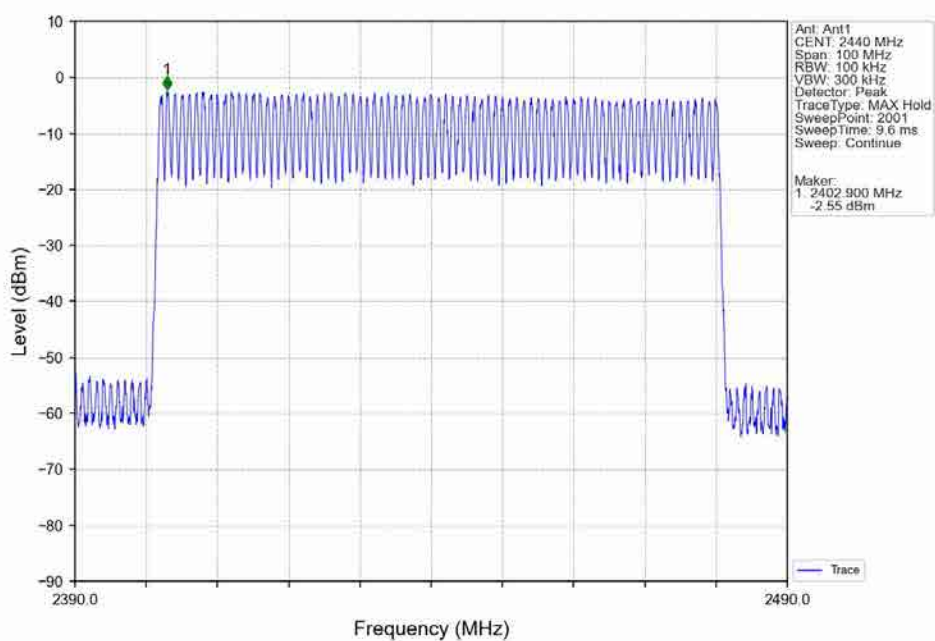
### 7.2.1 Ref



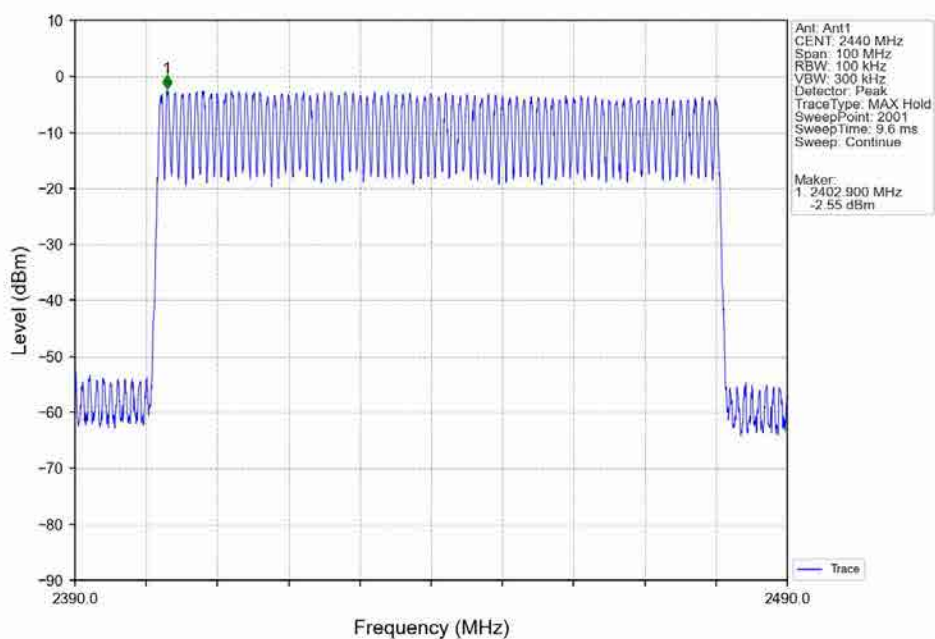
### GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



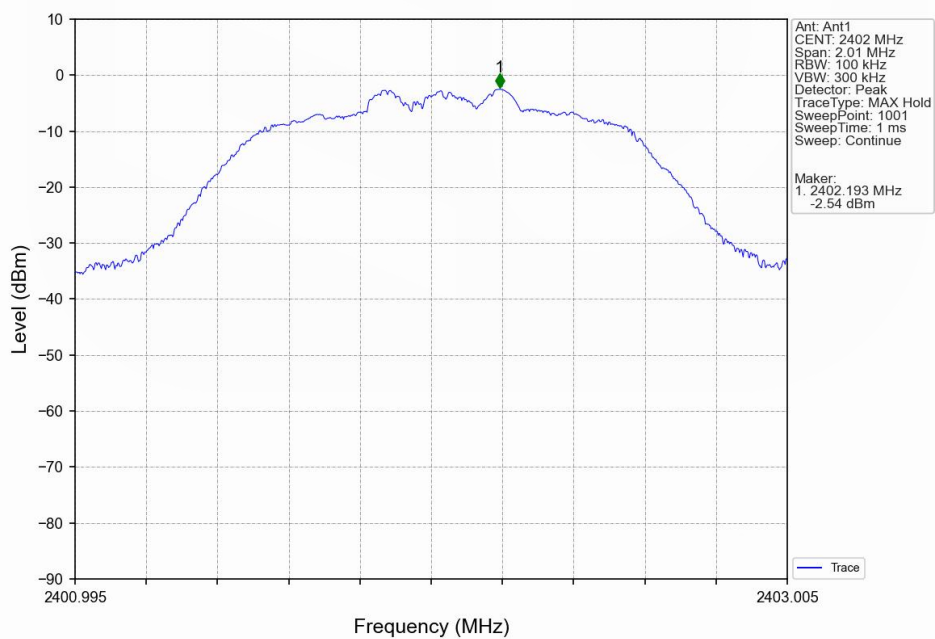
### GFSK\_DH5\_HOPP\_Ant1\_NTNV



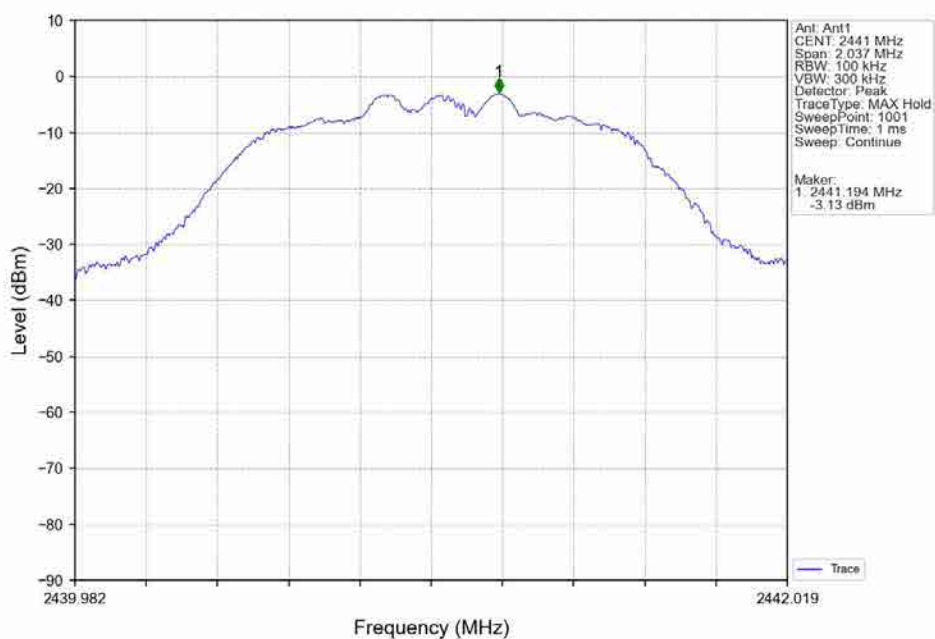
### GFSK\_DH5\_HOPP\_Ant1\_NTNV



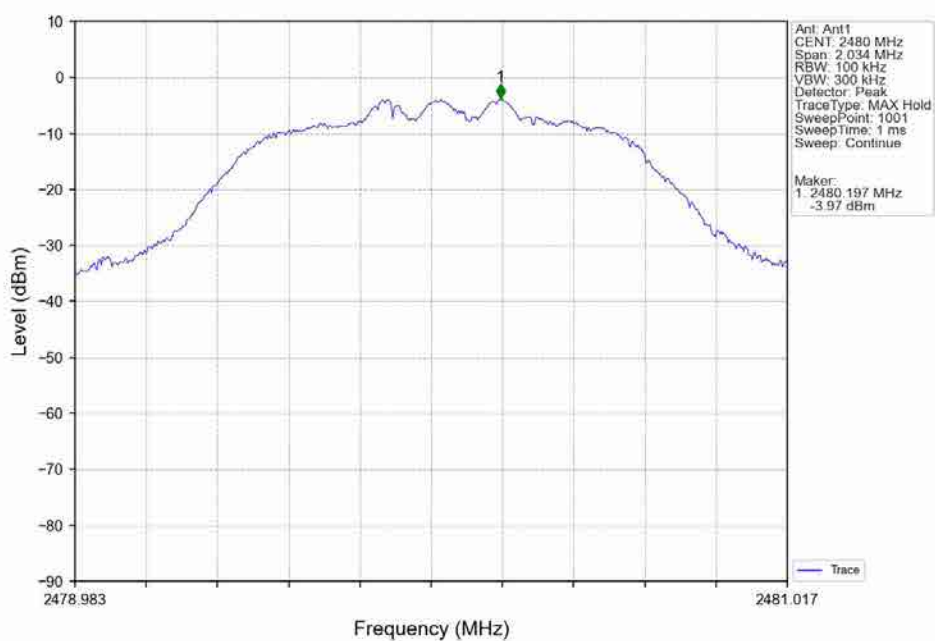
### $\pi/4$ DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



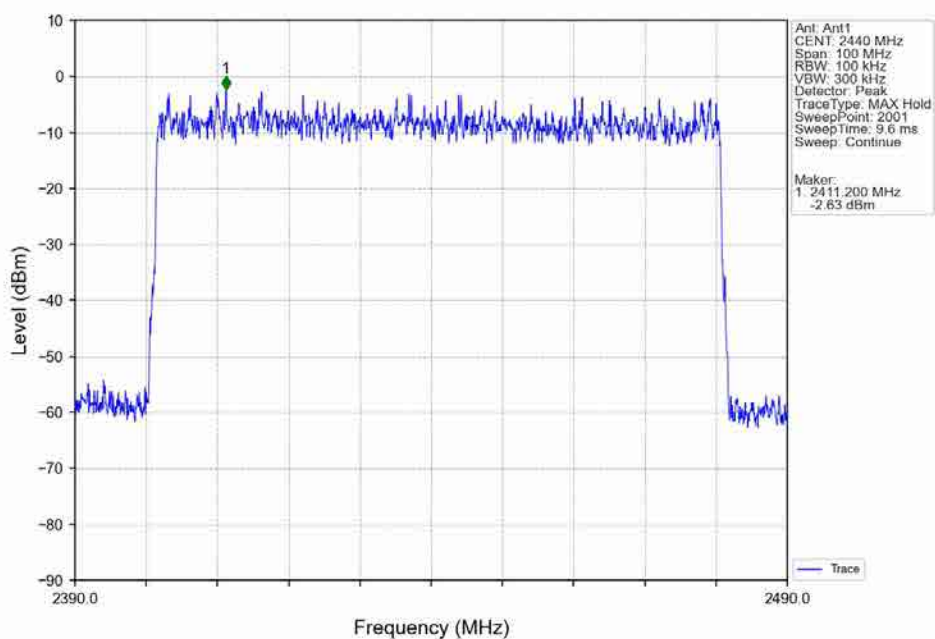
$\pi/4$ DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



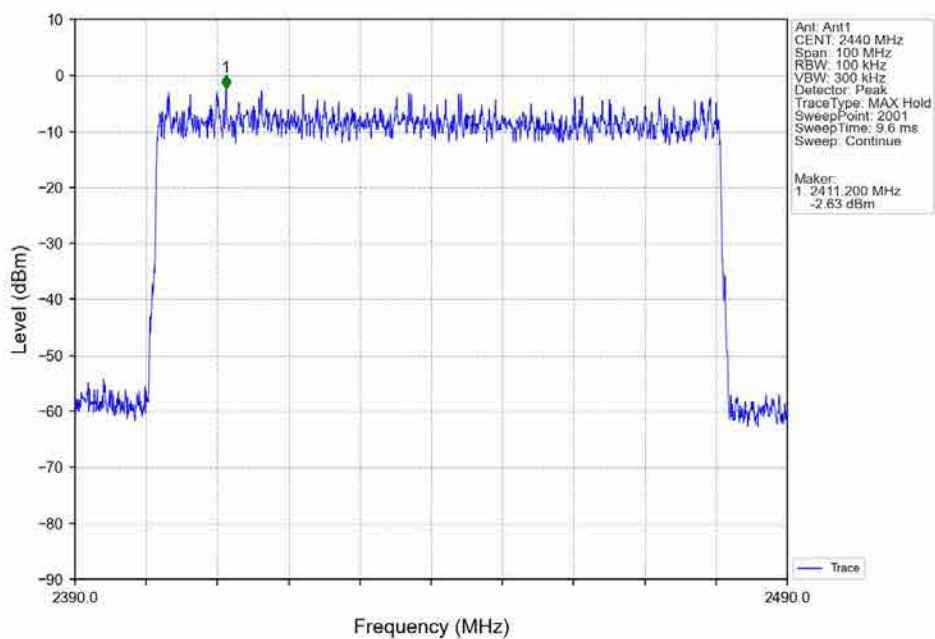
$\pi/4$ DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



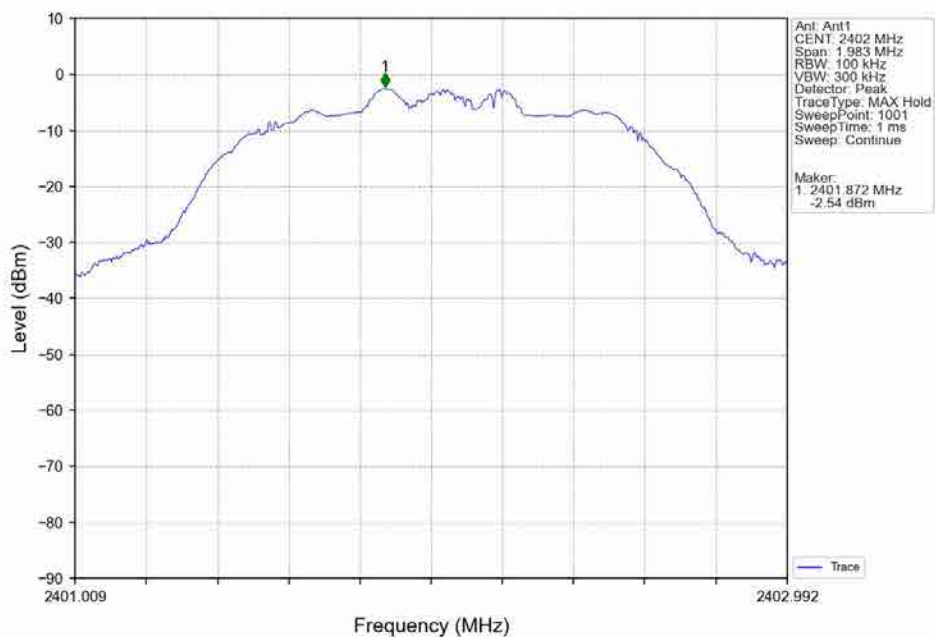
$\pi/4$ DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



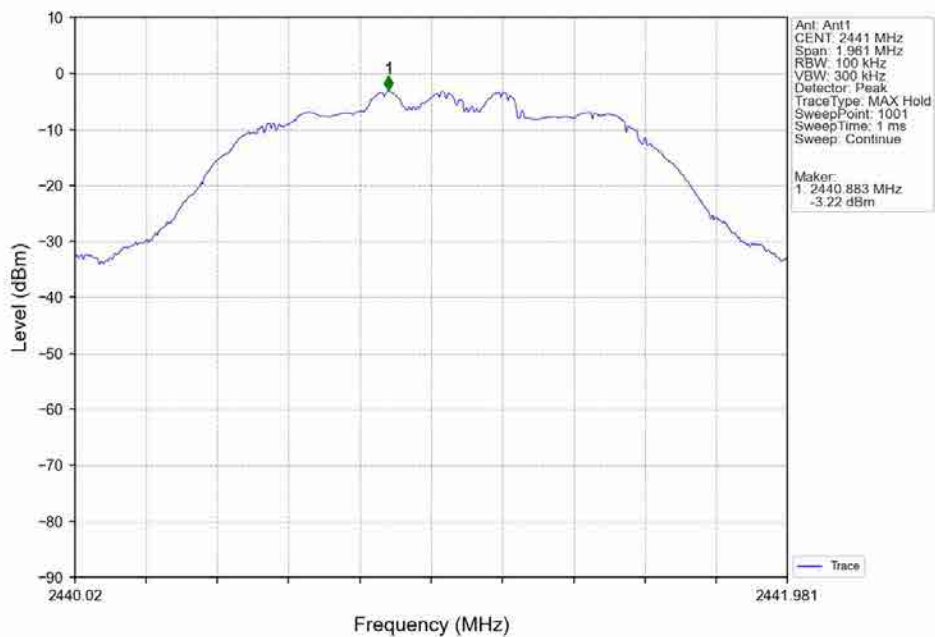
$\pi/4$ DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



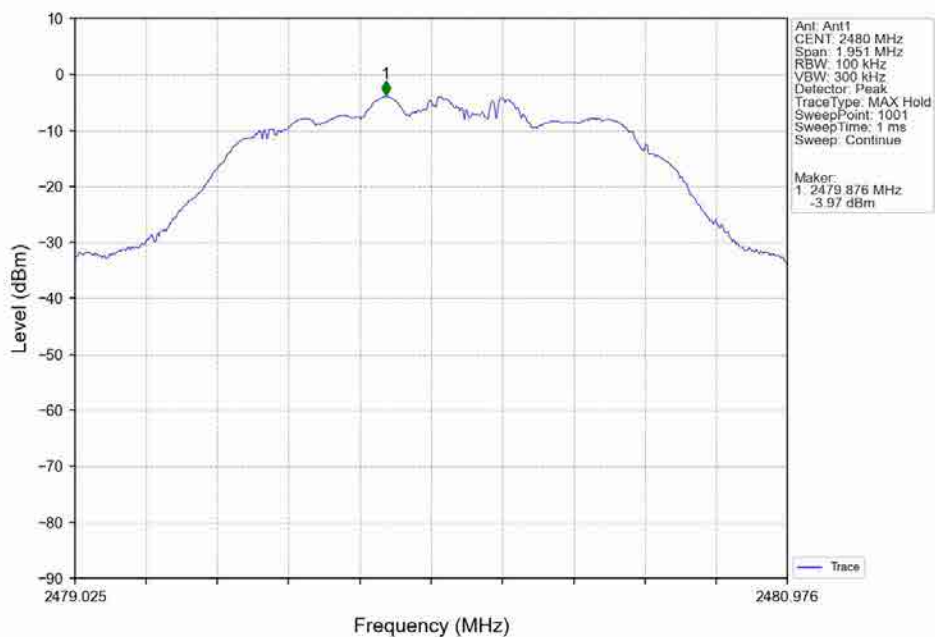
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



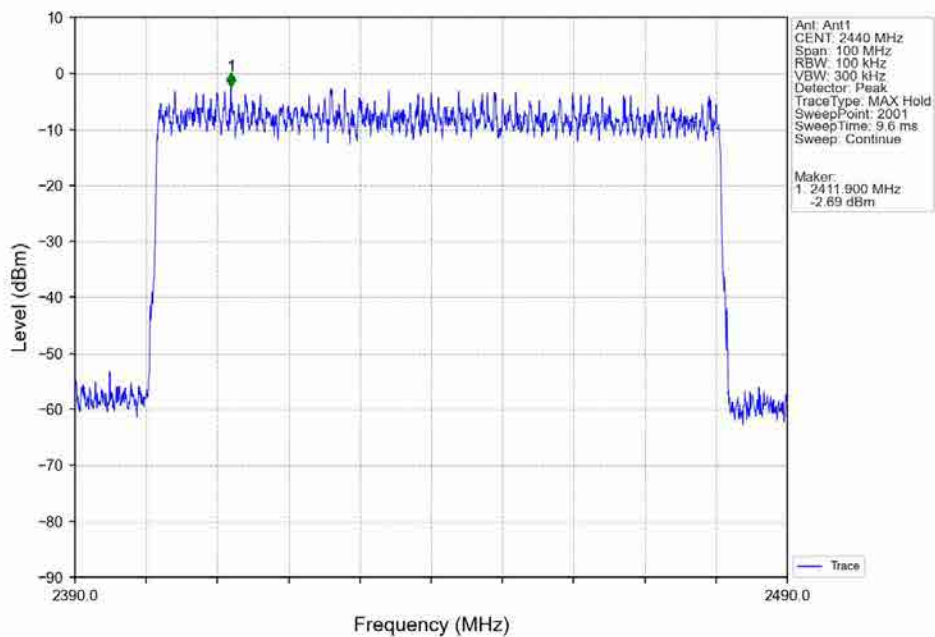
8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV

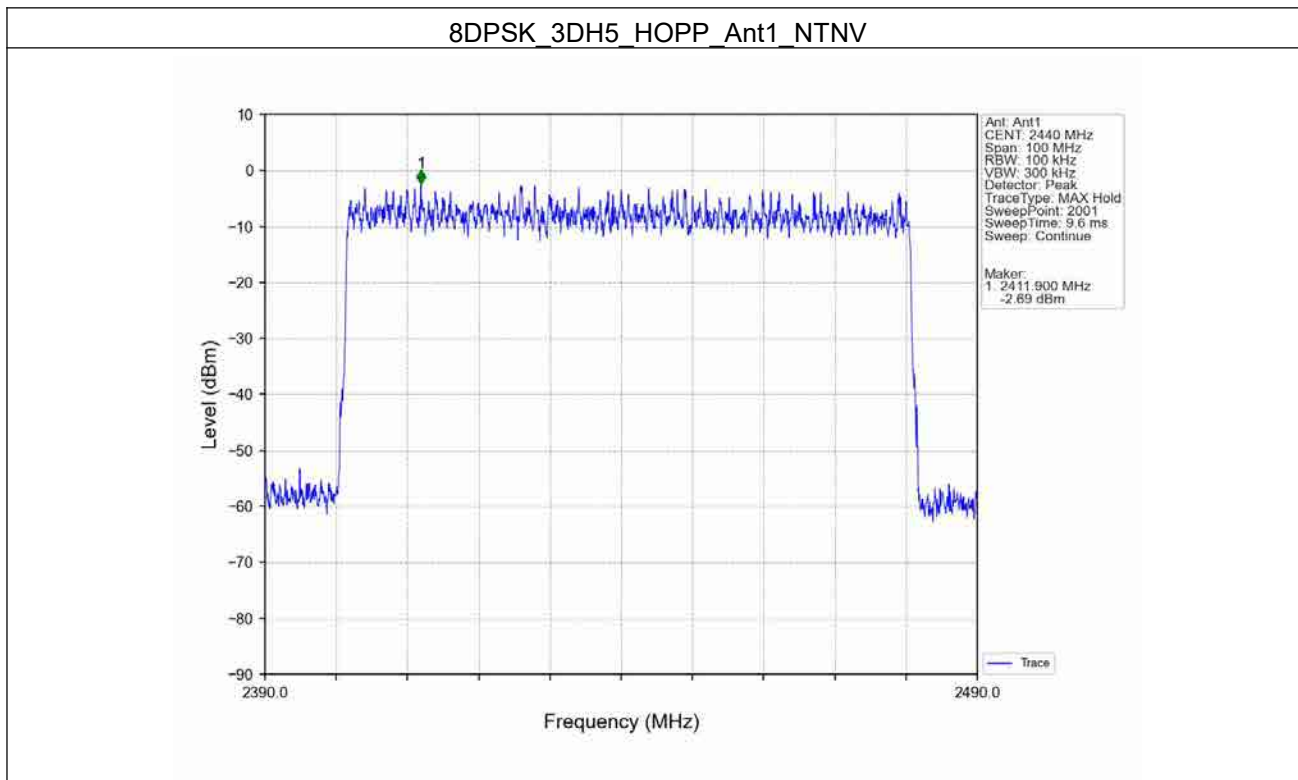


### 8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



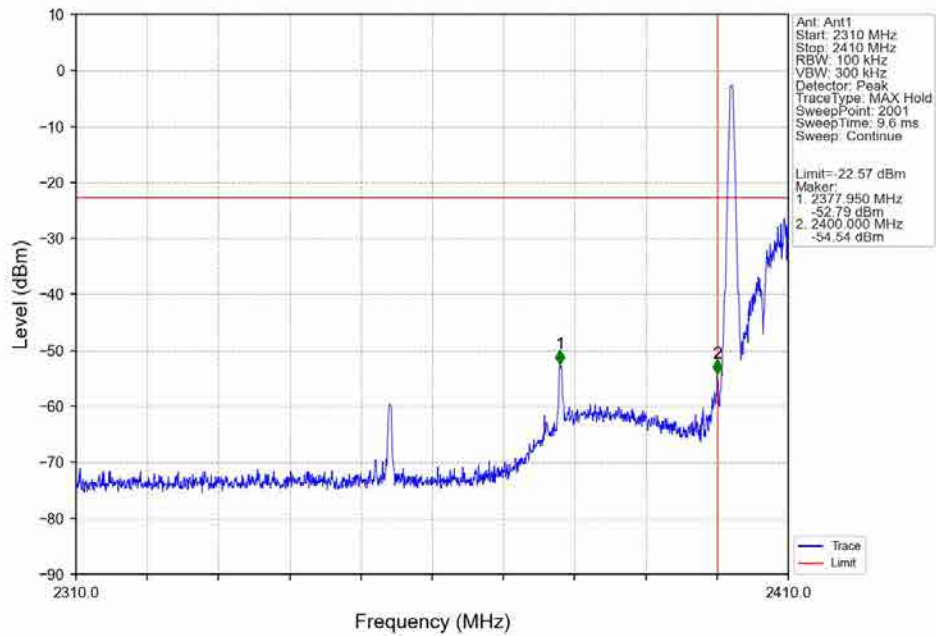
### 8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



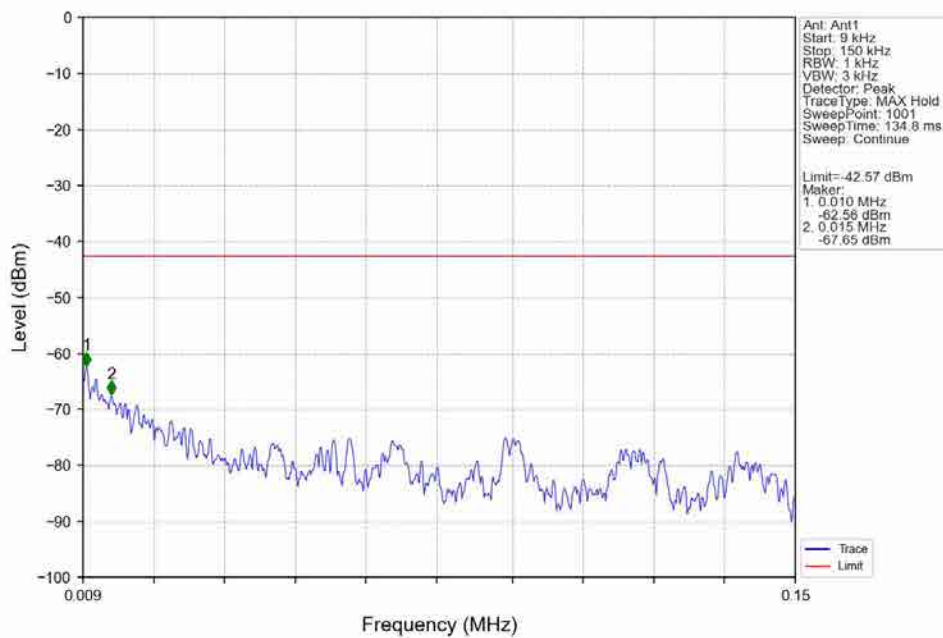


## 7.2.2 CSE

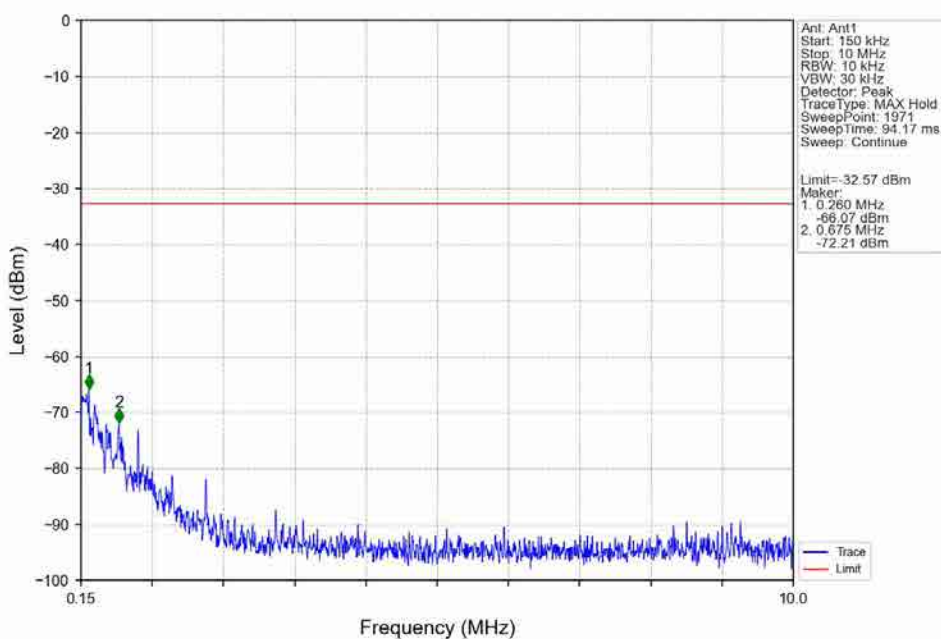
GFSK\_DH5\_LCH\_2402MHz\_Ant1\_NTNV



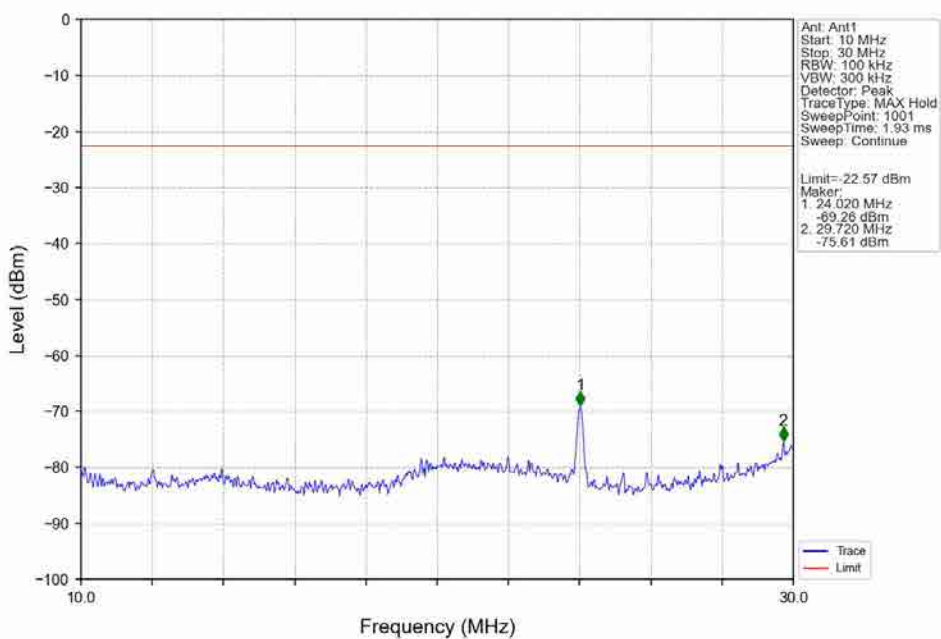
GFSK\_DH5\_LCH\_2402MHz\_Ant1\_NTNV



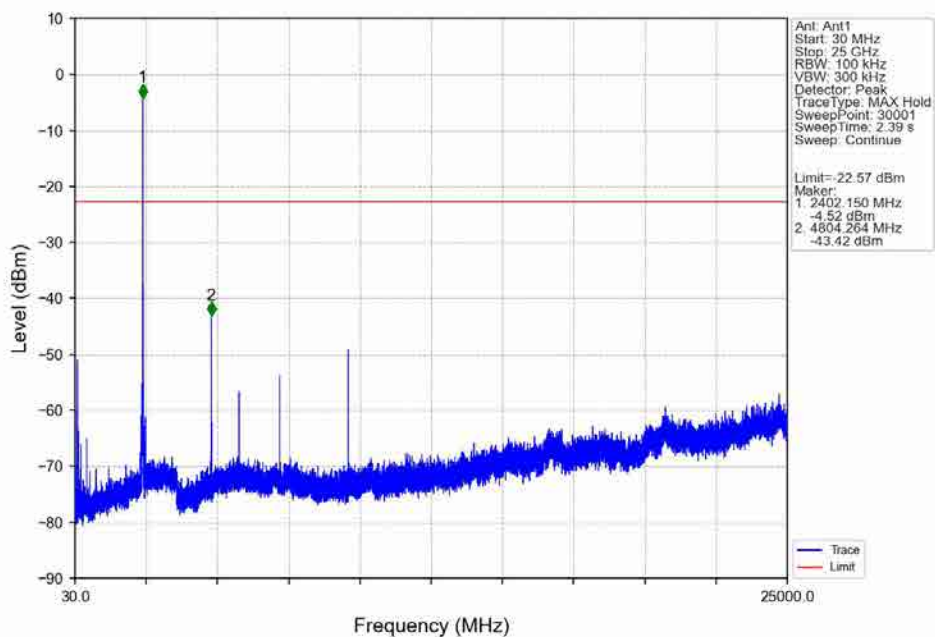
GFSK\_DH5\_LCH\_2402MHz\_Ant1\_NTNV



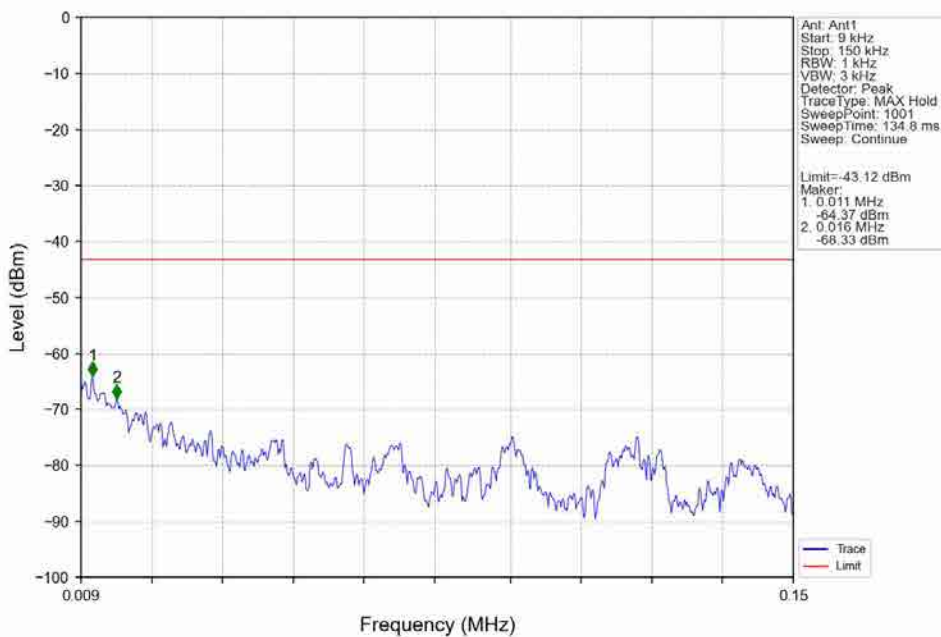
GFSK\_DH5\_LCH\_2402MHz\_Ant1\_NTNV



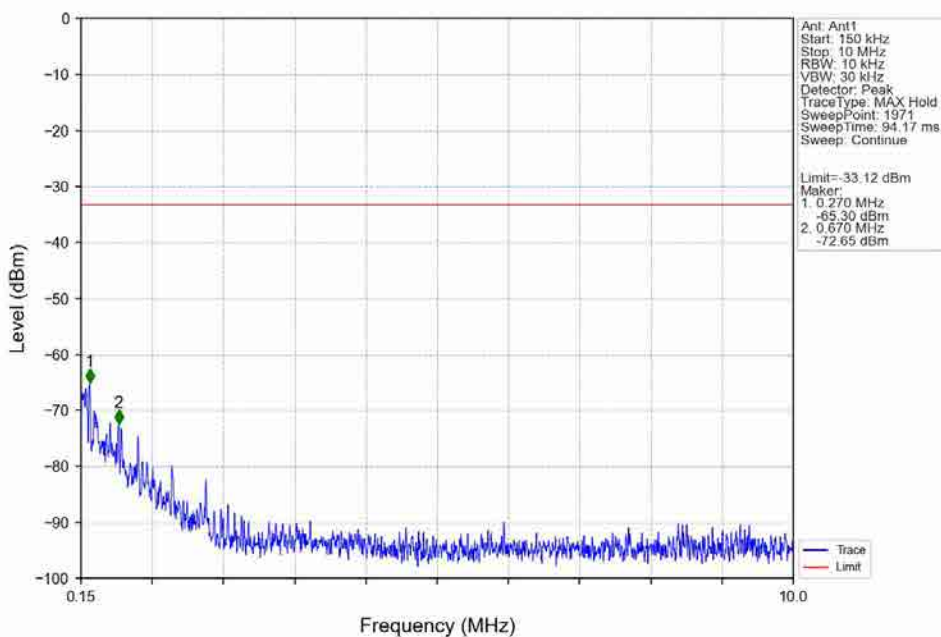
### GFSK\_DH5\_LCH\_2402MHz\_Ant1\_NTNV



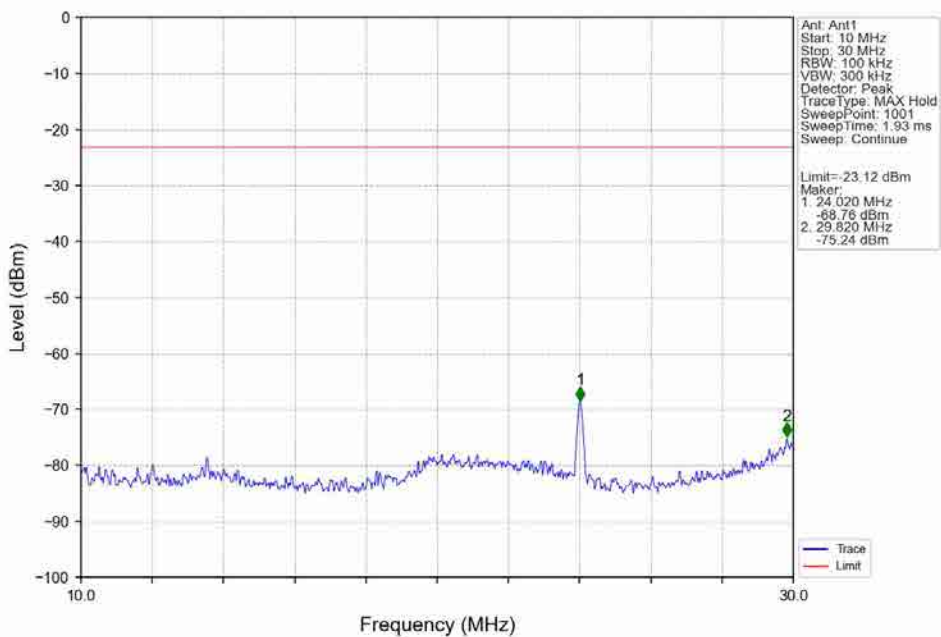
### GFSK\_DH5\_MCH\_2441MHz\_Ant1\_NTNV



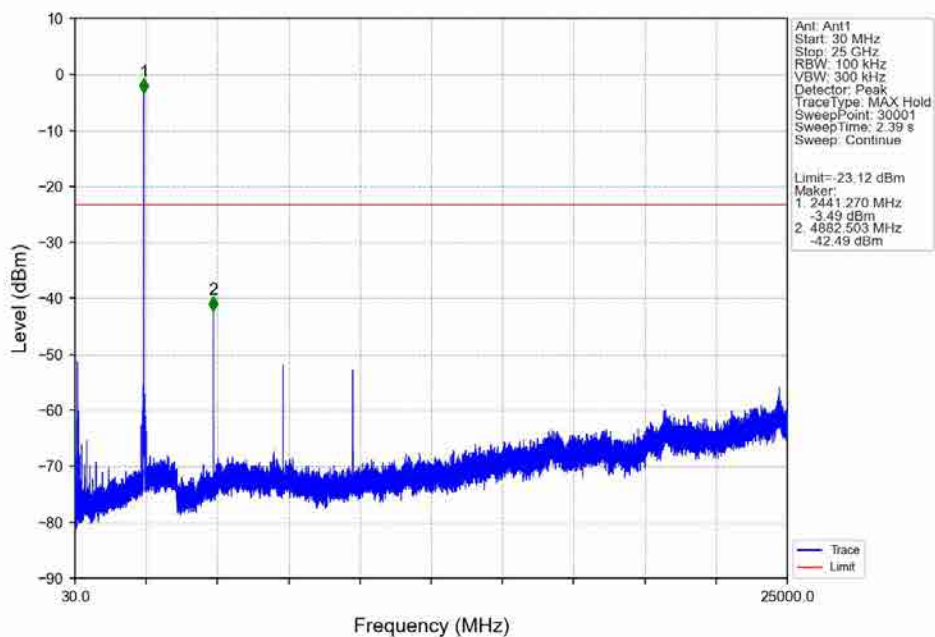
GFSK\_DH5\_MCH\_2441MHz\_Ant1\_NTNV



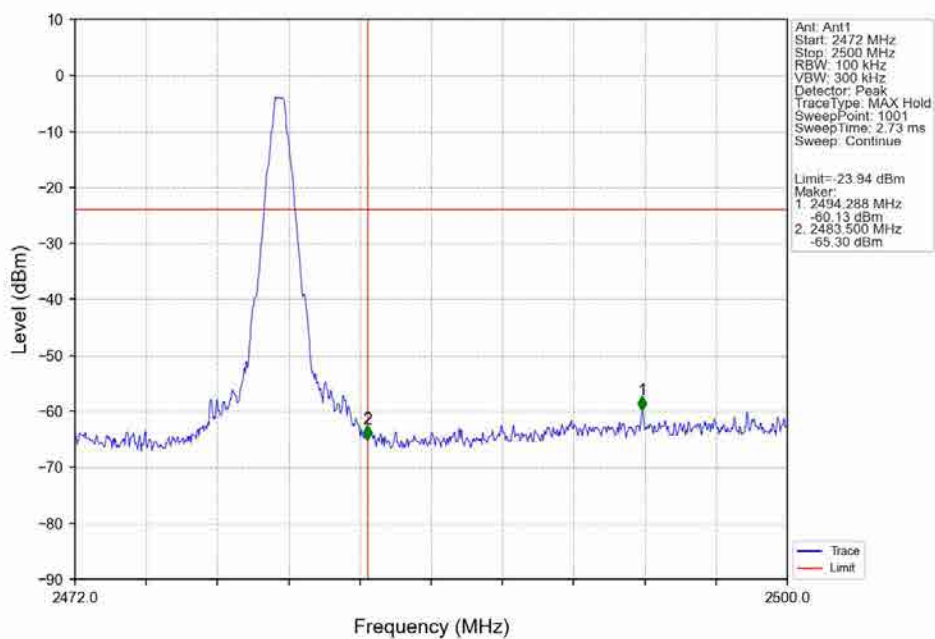
GFSK\_DH5\_MCH\_2441MHz\_Ant1\_NTNV



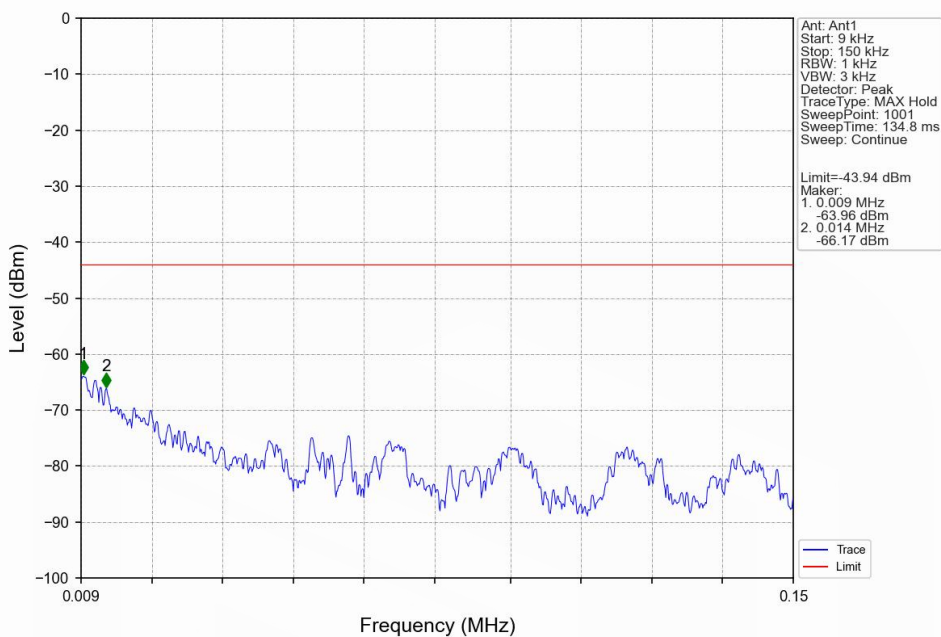
GFSK\_DH5\_MCH\_2441MHz\_Ant1\_NTNV



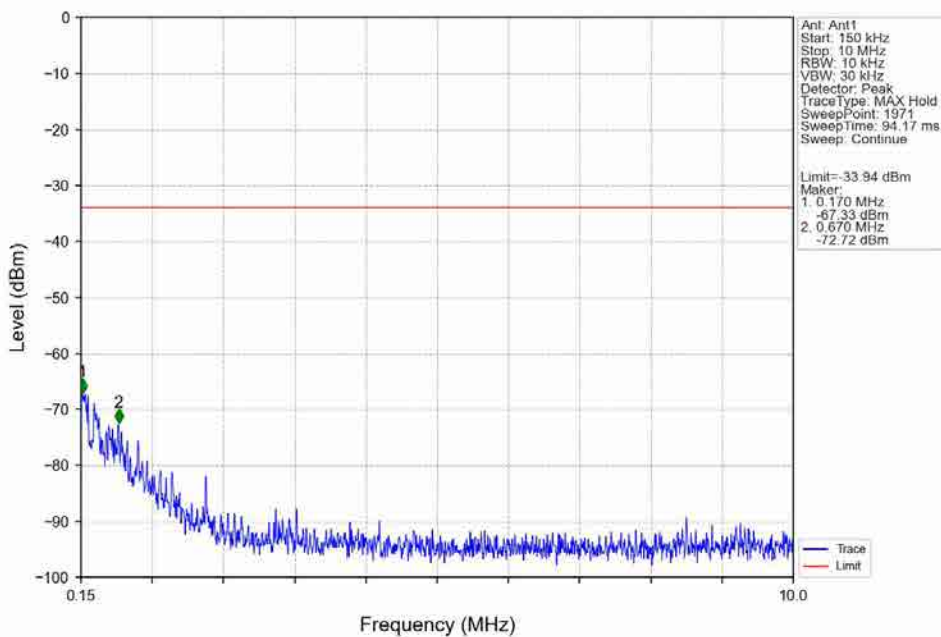
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



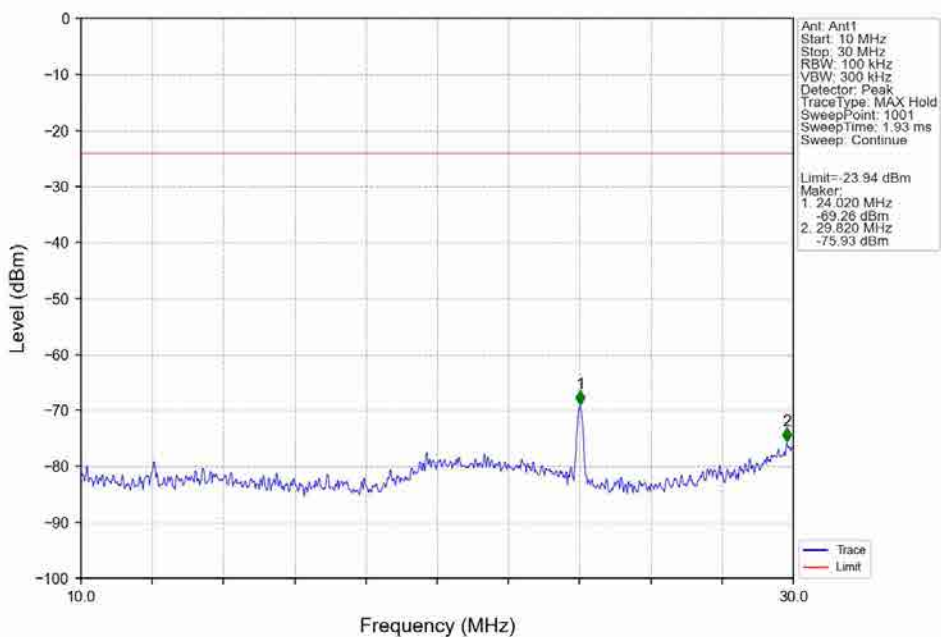
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



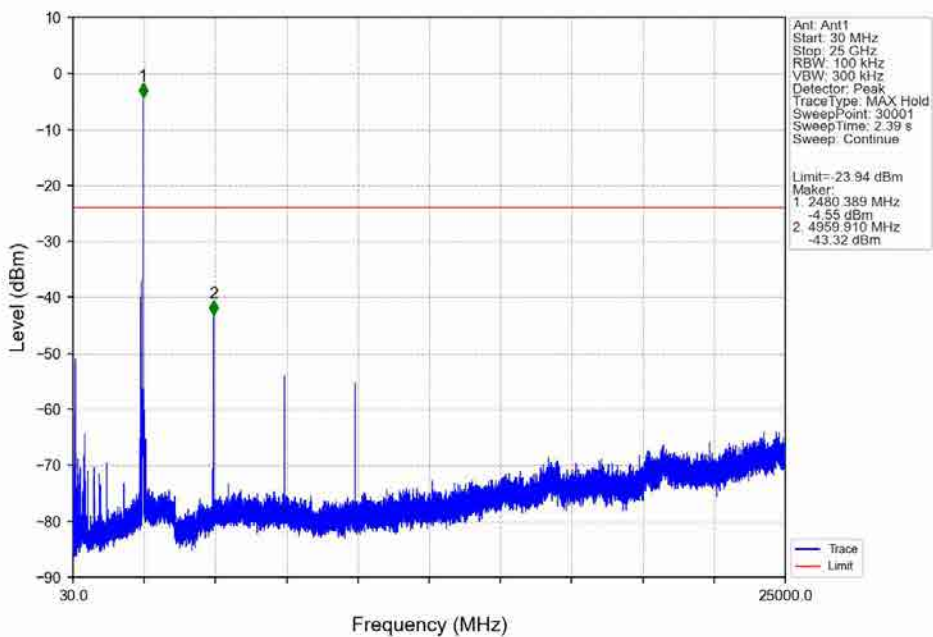
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



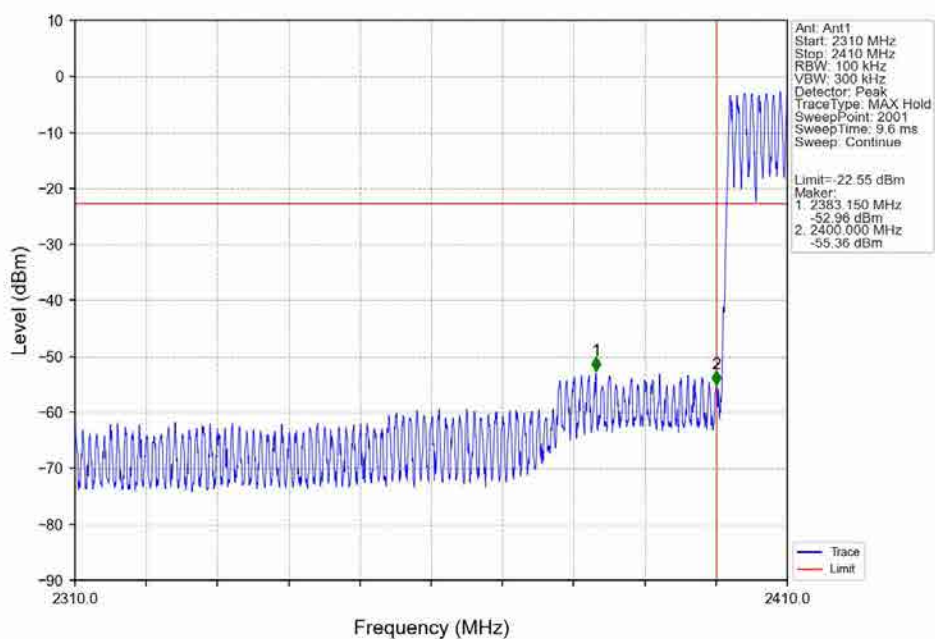
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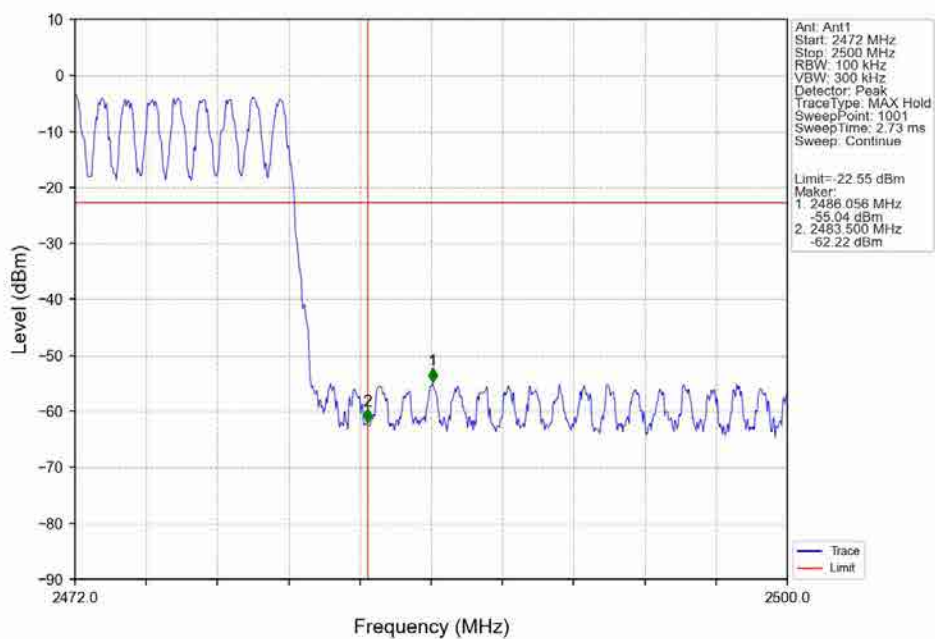
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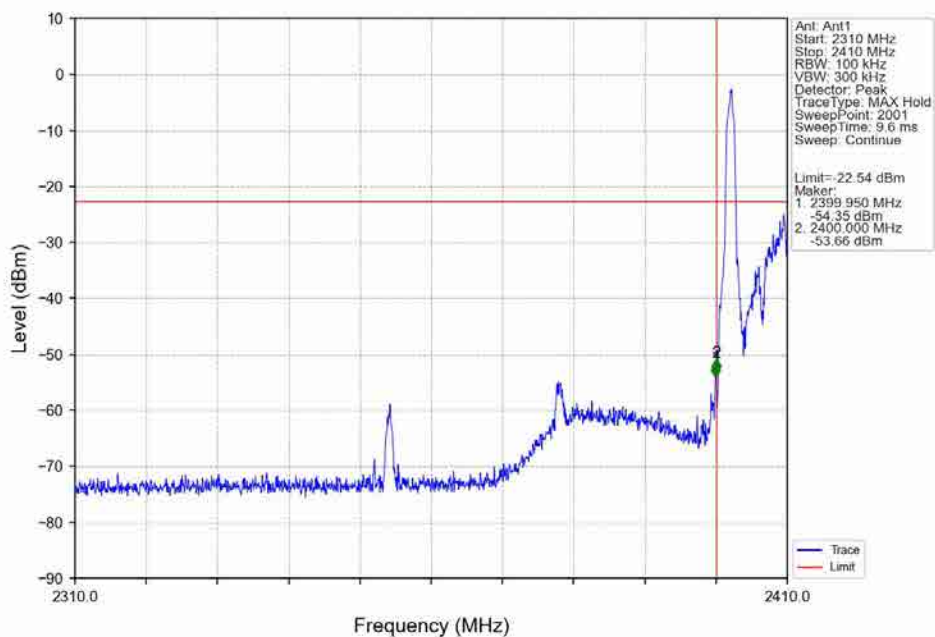
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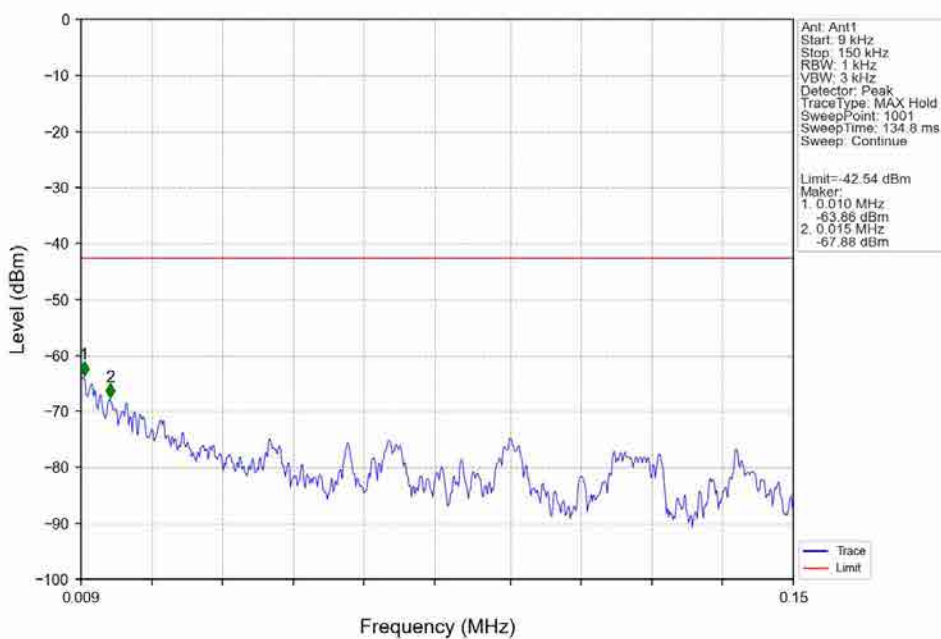
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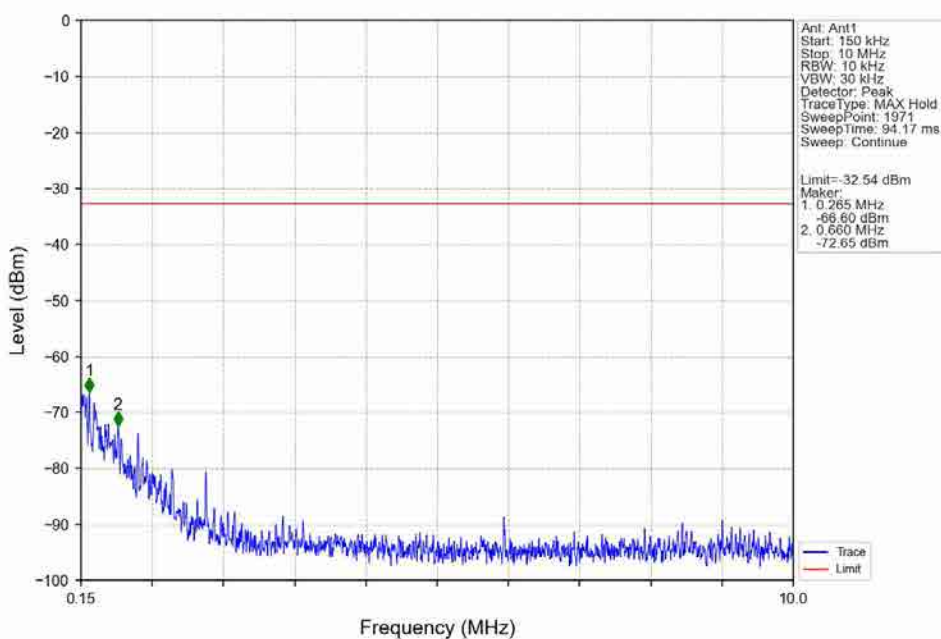
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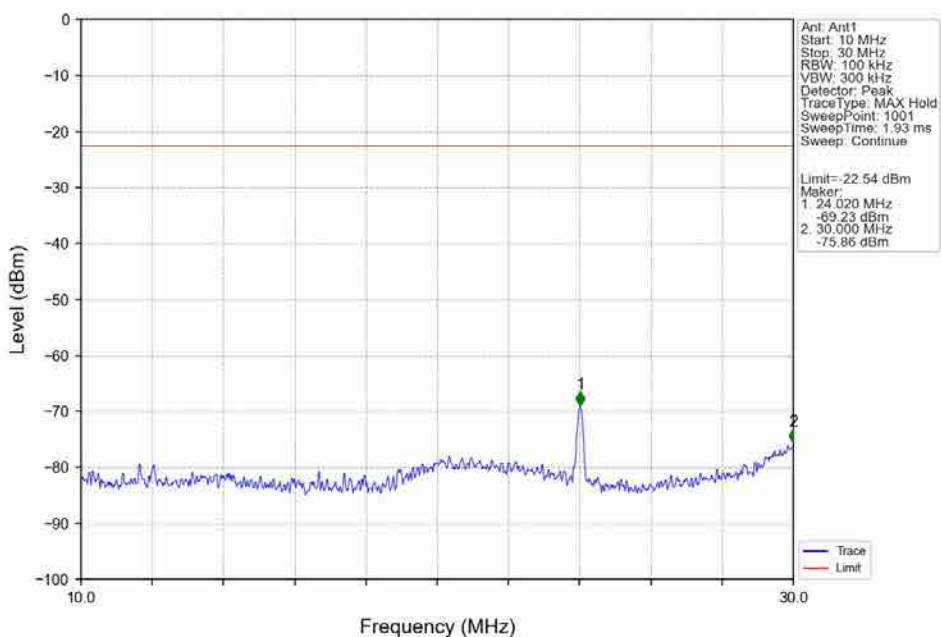
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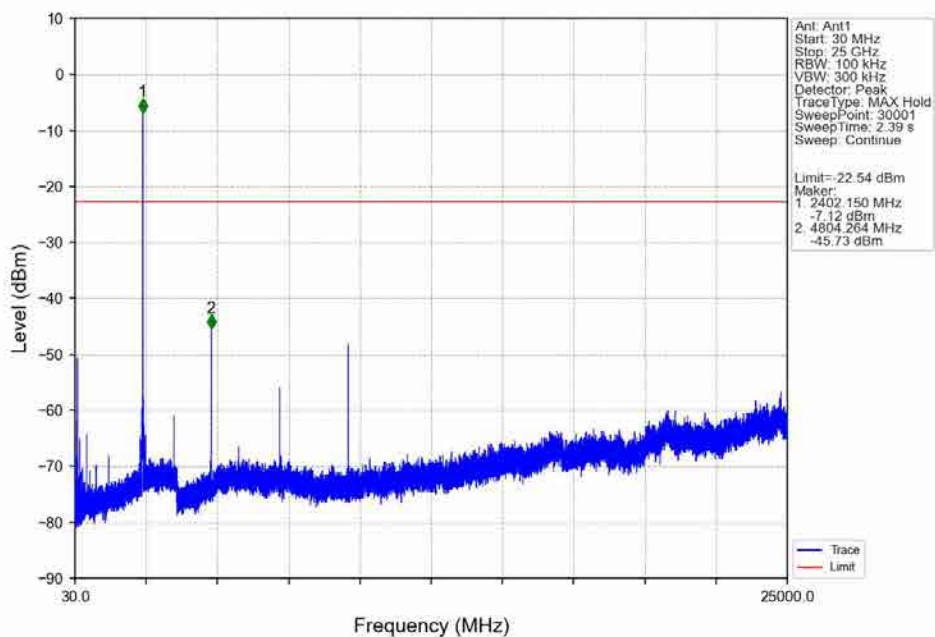
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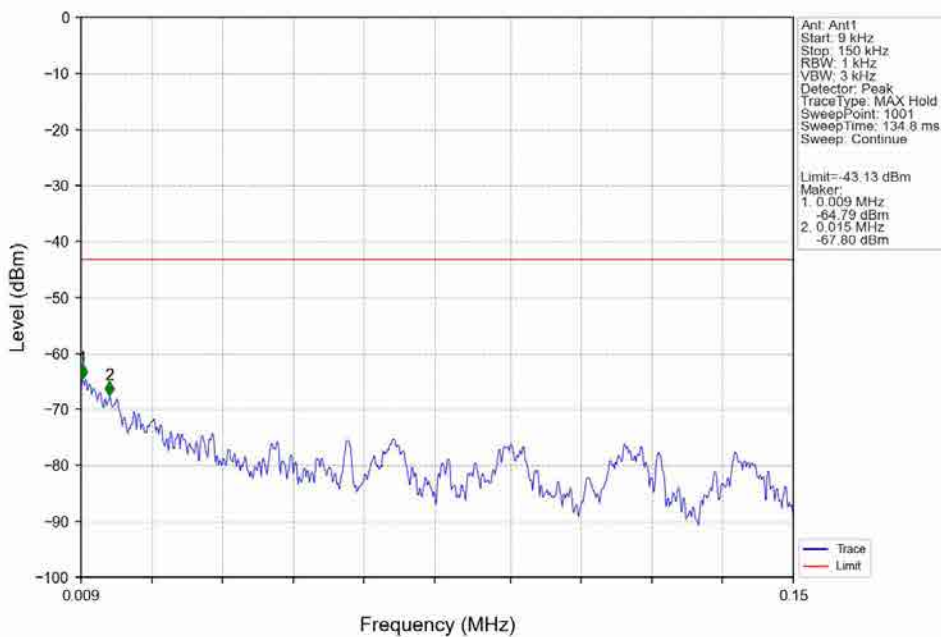
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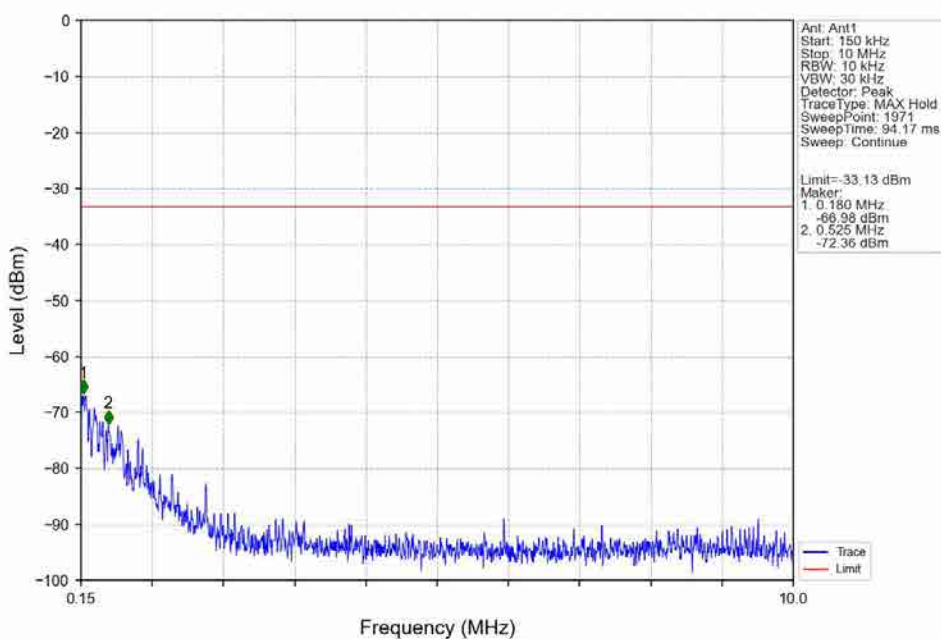
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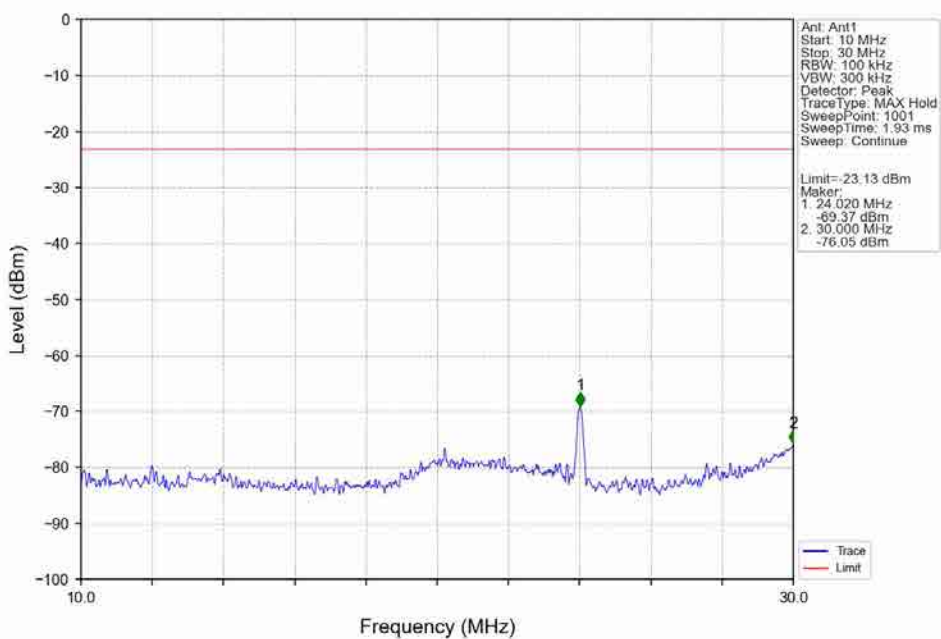
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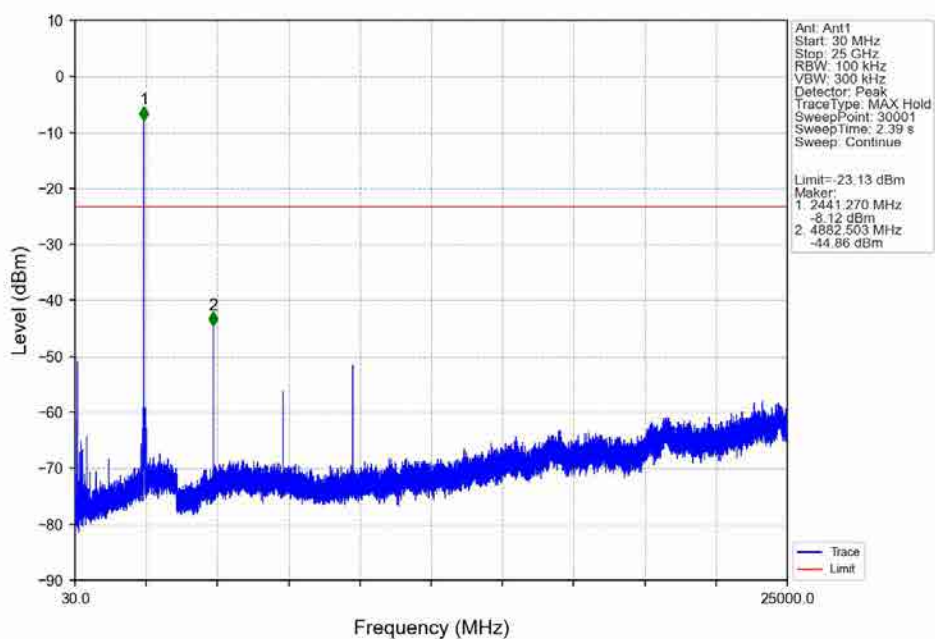
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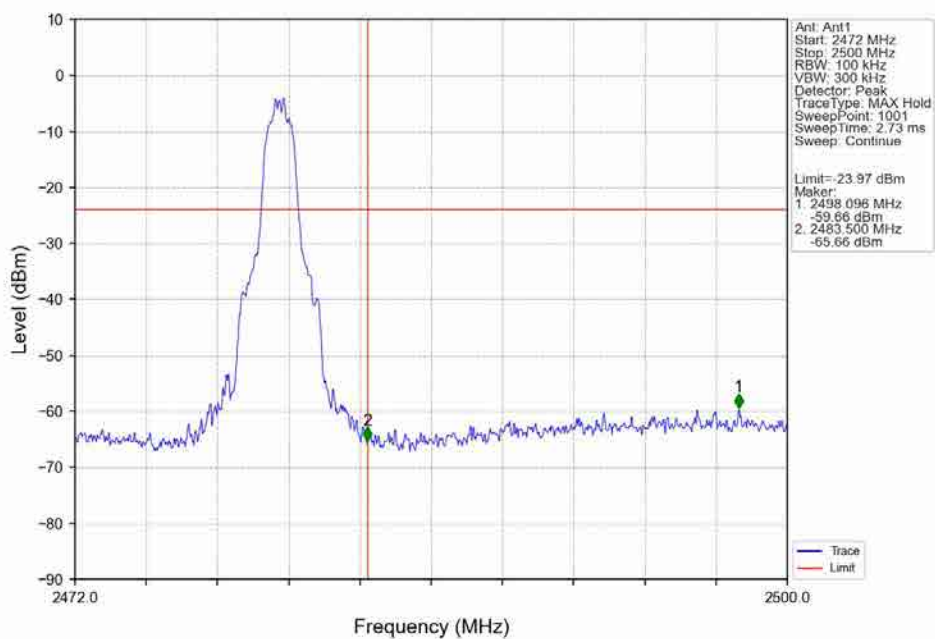
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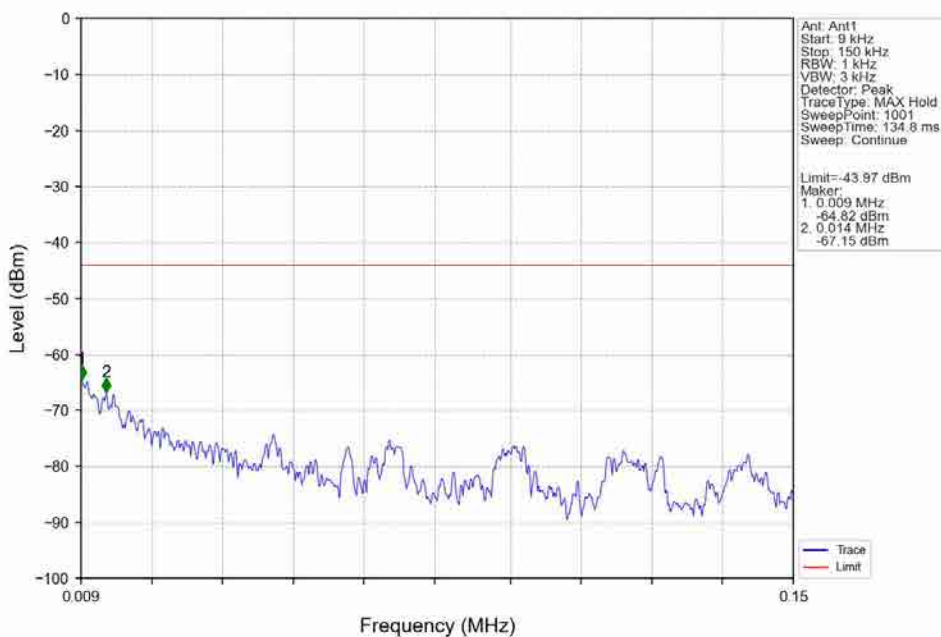
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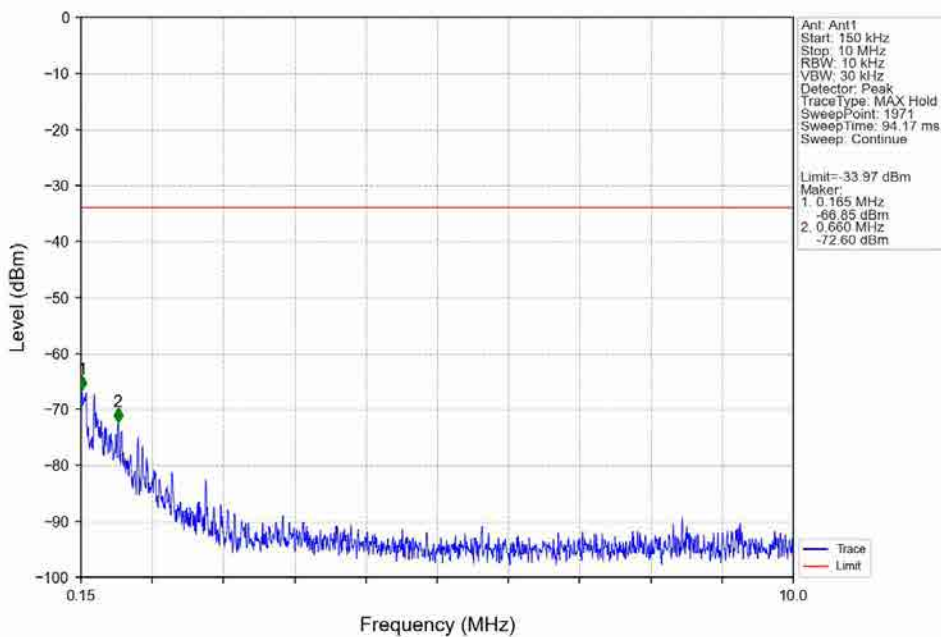
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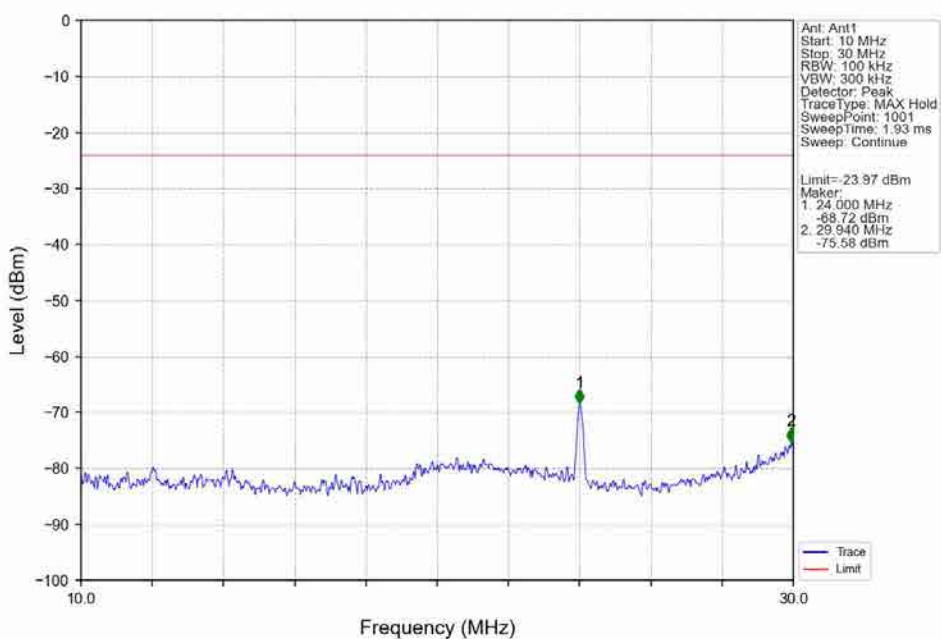
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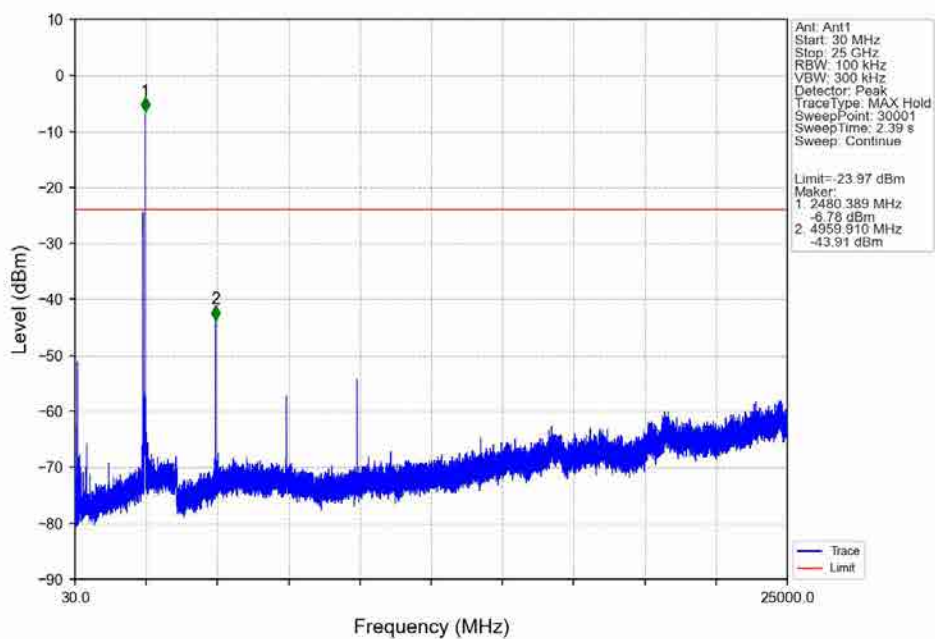
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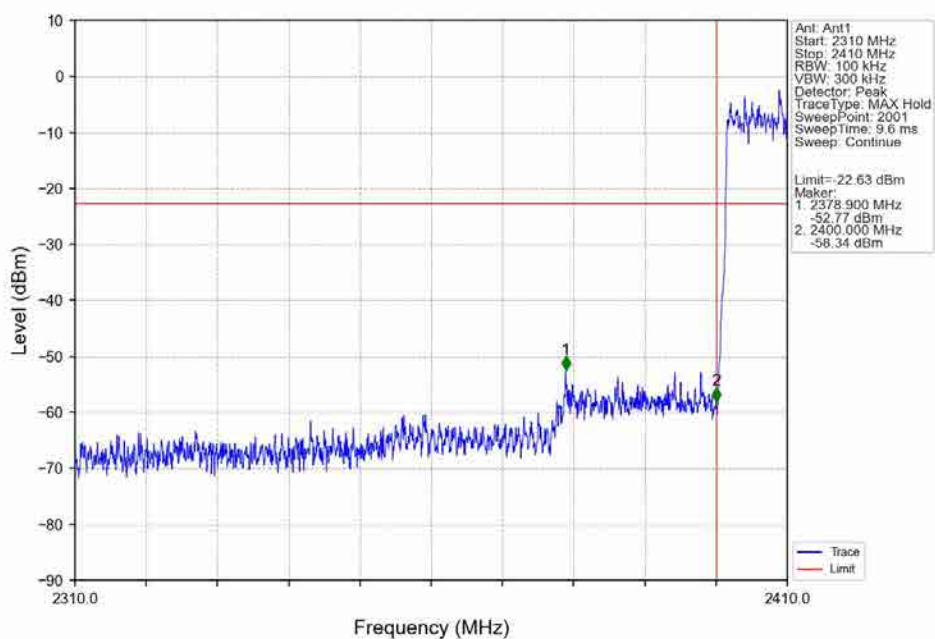
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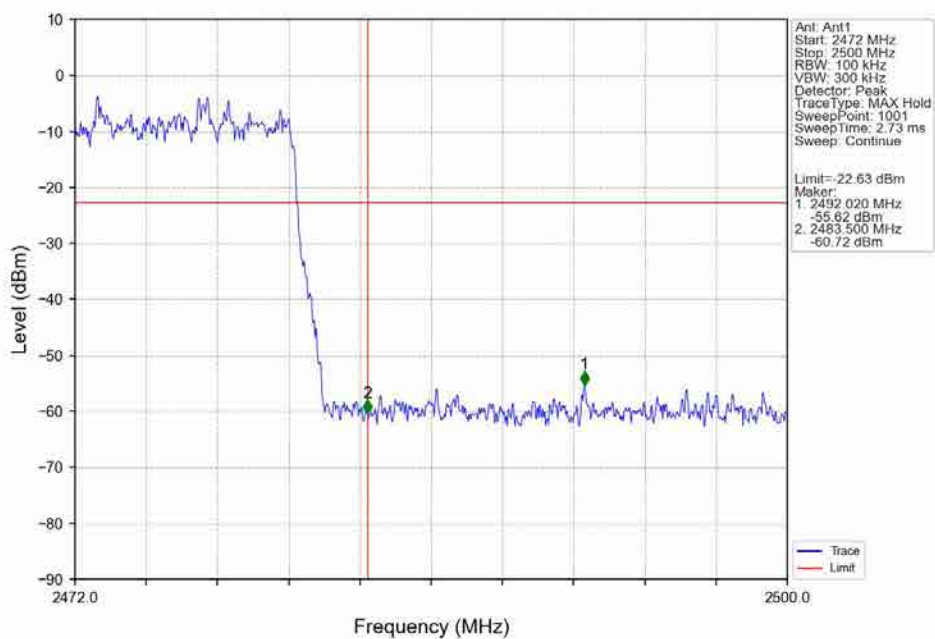
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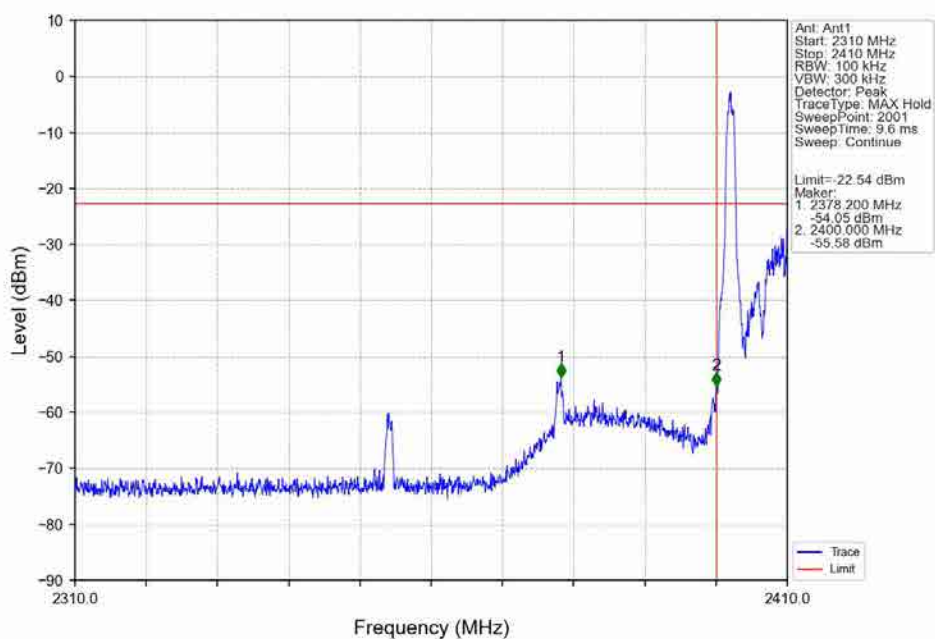
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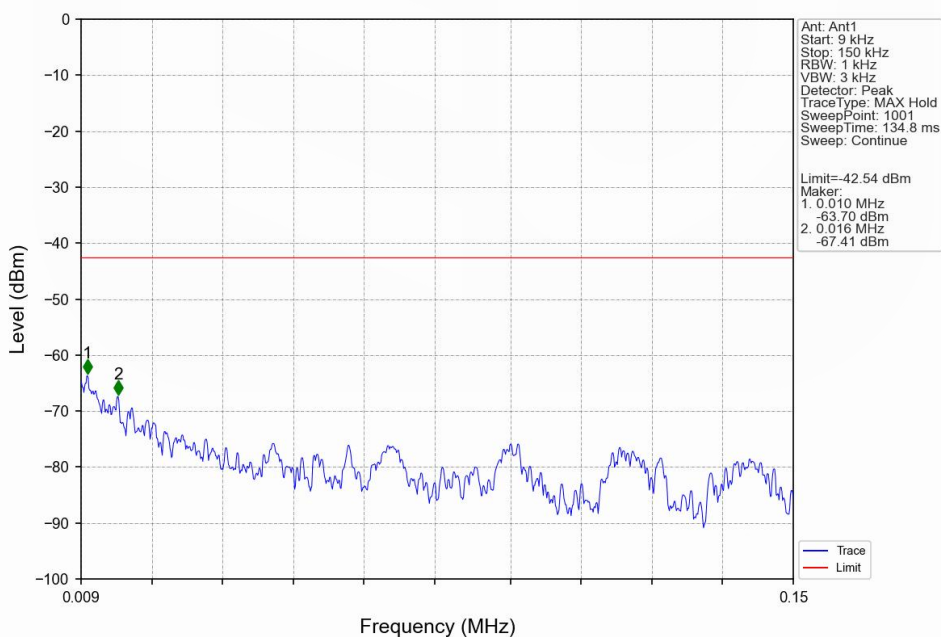
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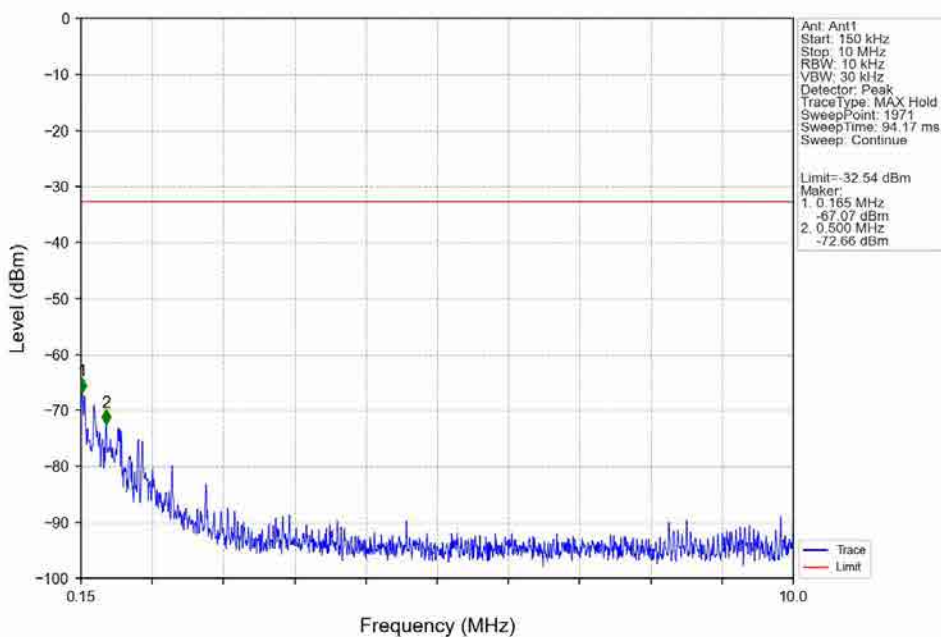
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



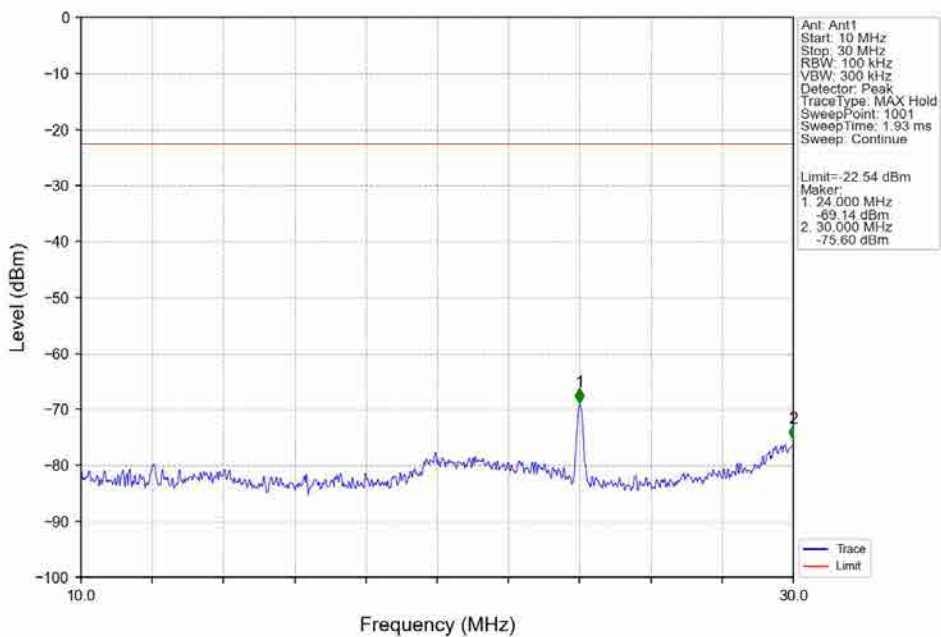
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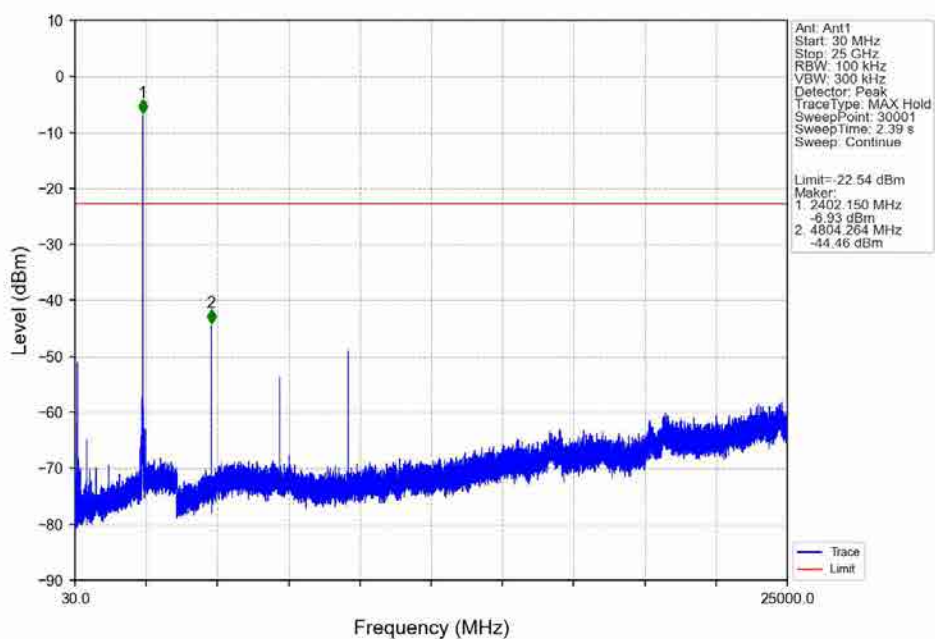
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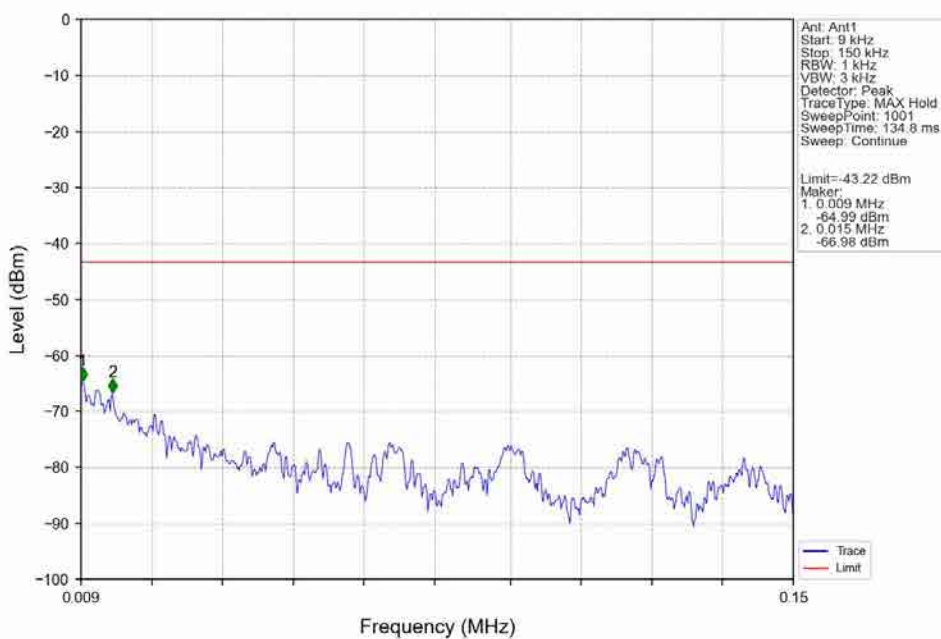
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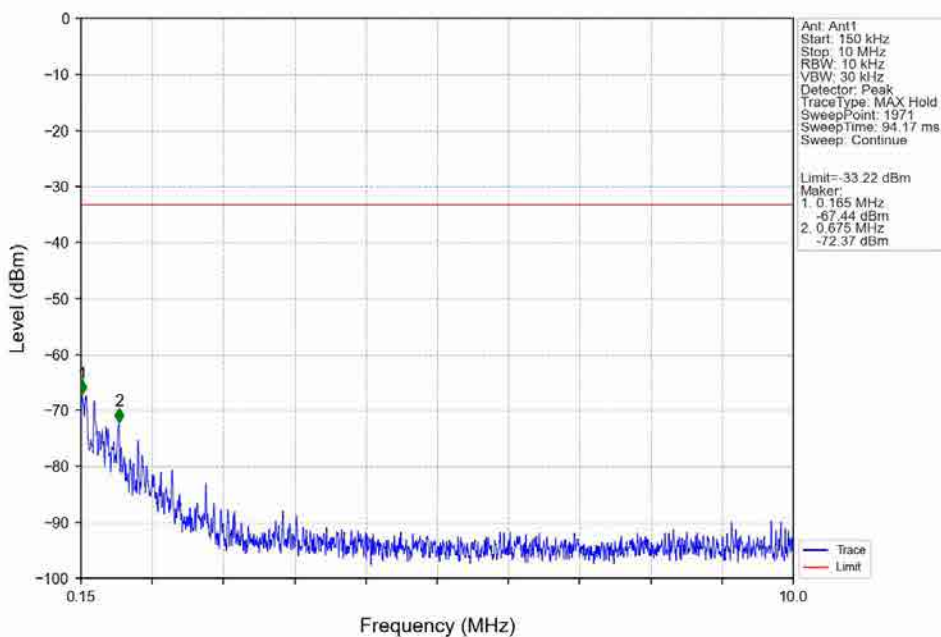
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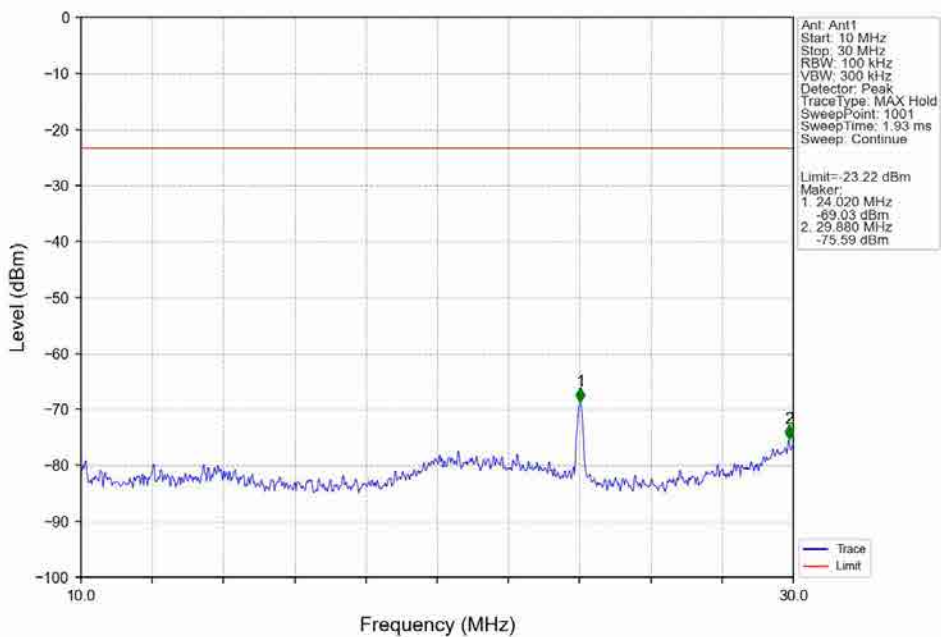
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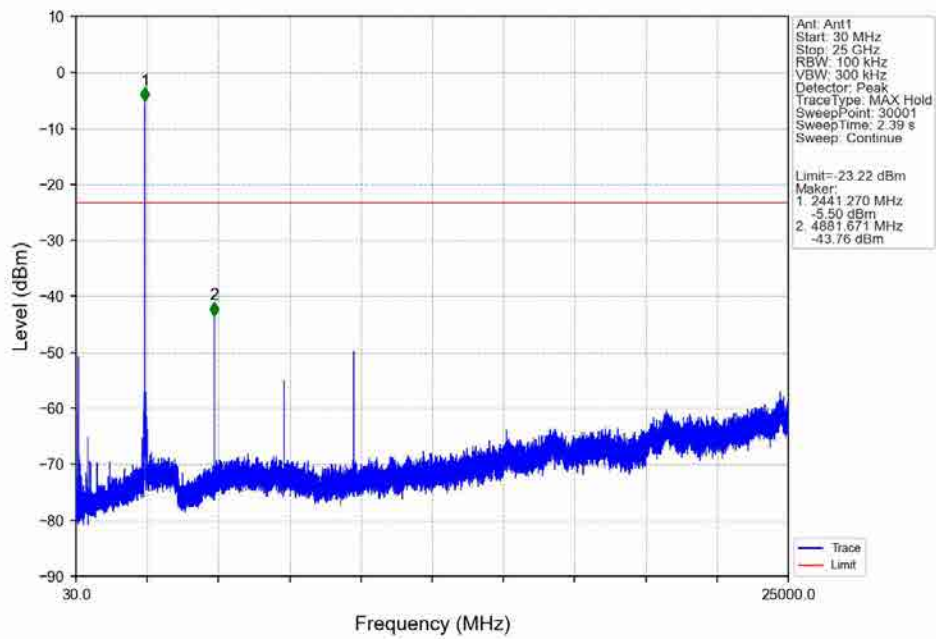
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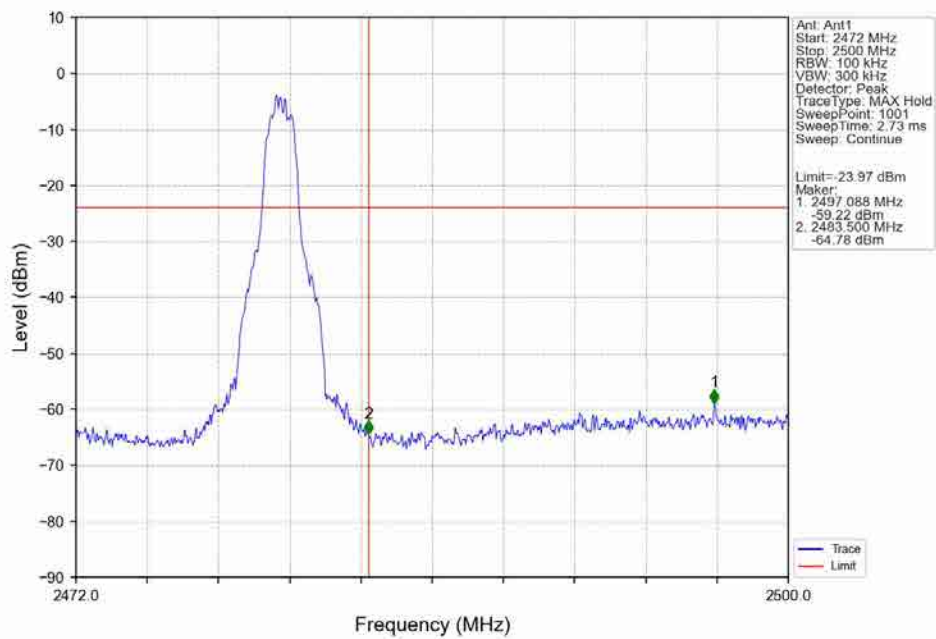
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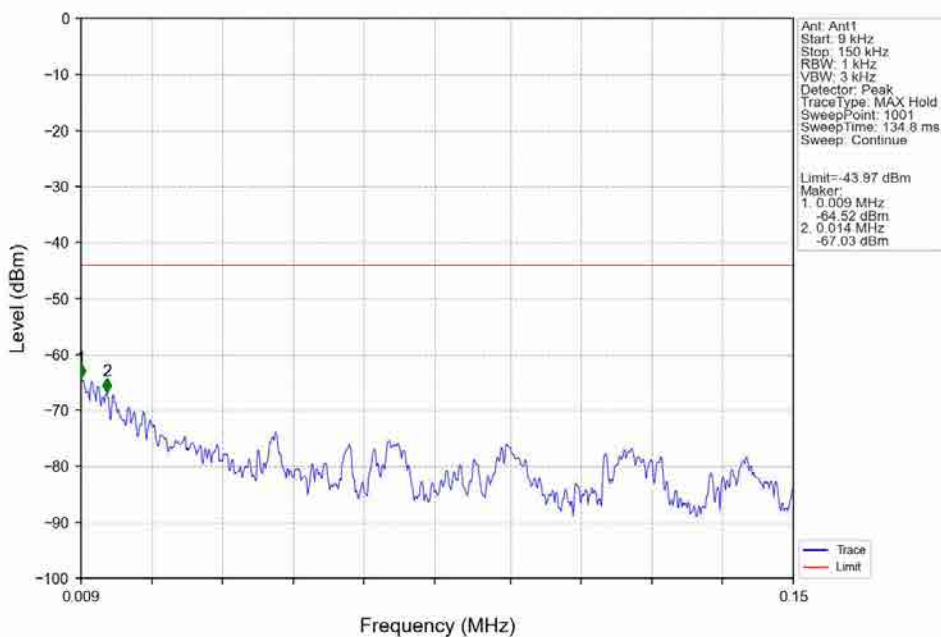
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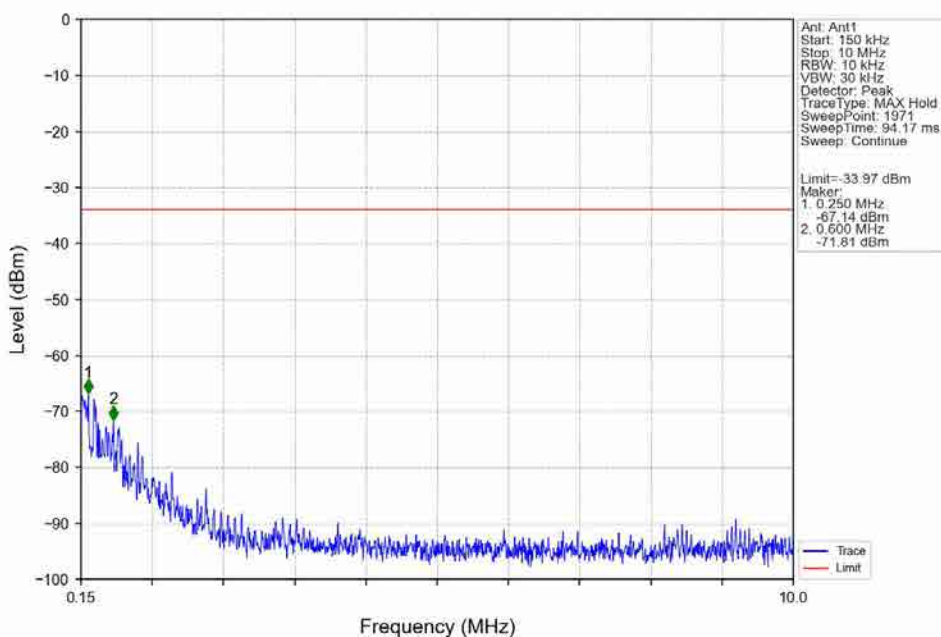
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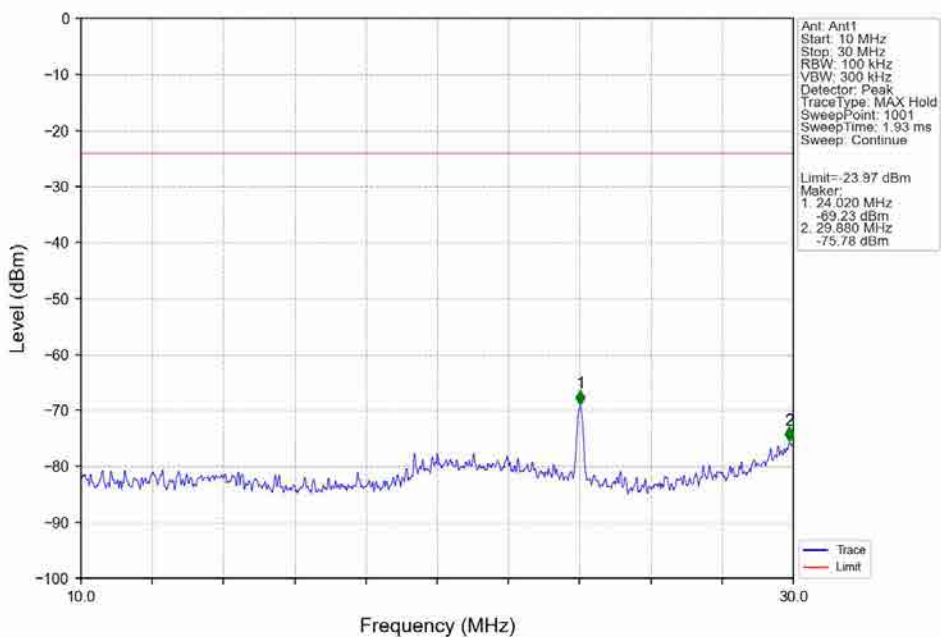
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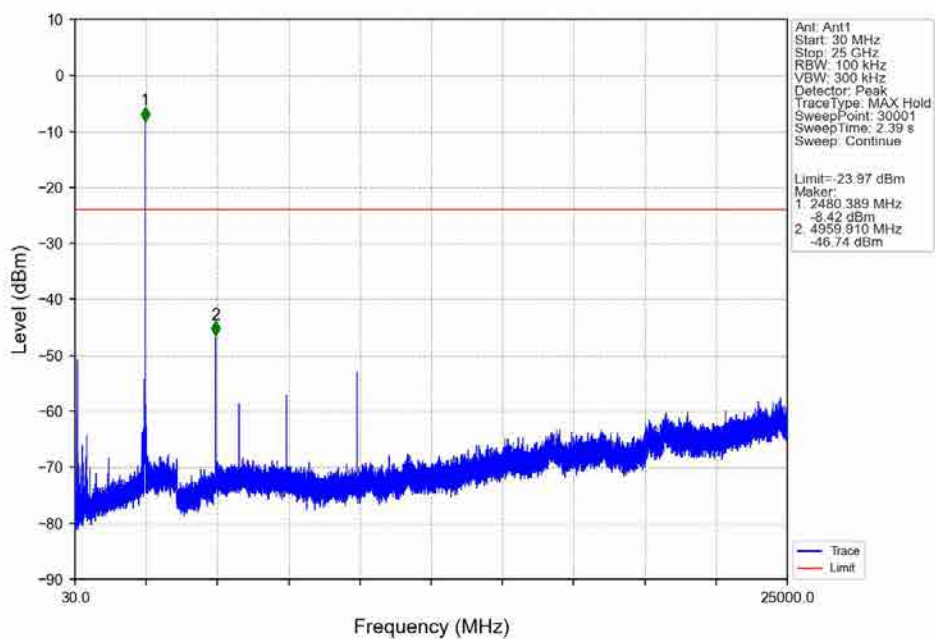
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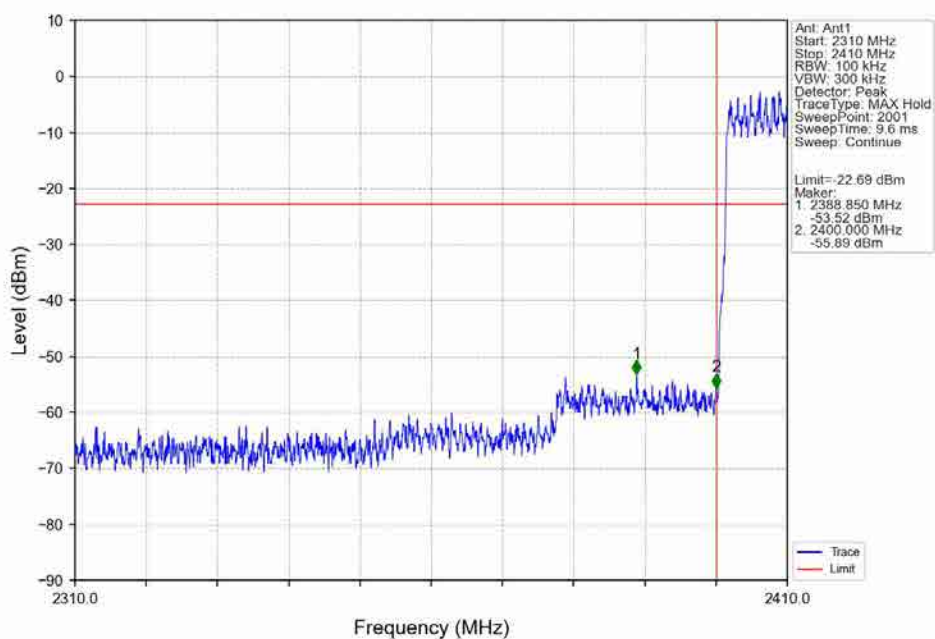
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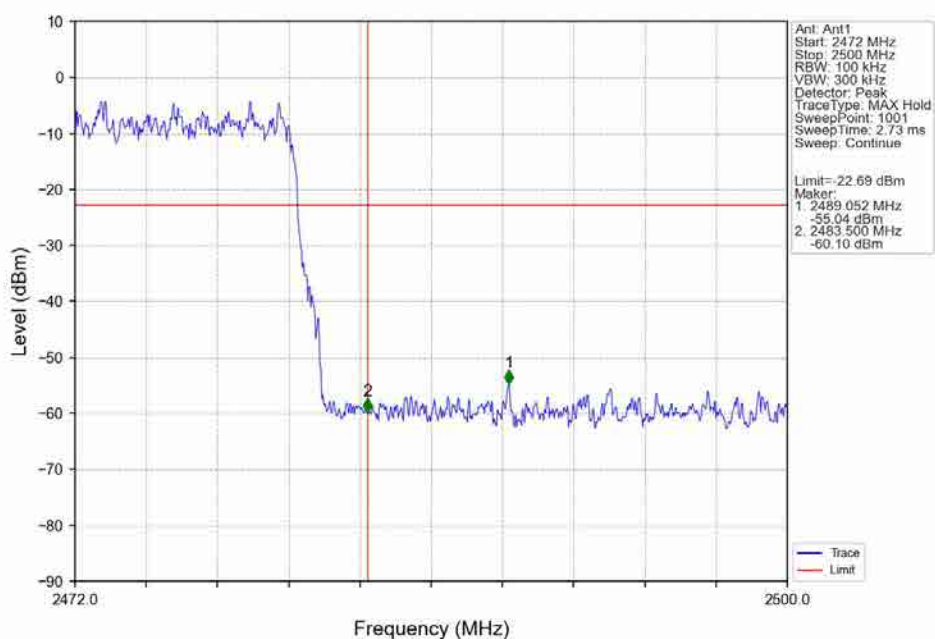
8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



### 8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



### 8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



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