# ANNEX D TEST DATA

# For

| | |
|---|---|
| Project No.: | 8132EU012601W |
| Client: | Dongshun Tech Development Limited |
| Product Name: | Portable Indoor/Outdoor Bluetooth Speaker |
| Model No.: | MI-S305B |
| FCC ID: | 2AMPL-MI-S305B |
| Technology: | Bluetooth BDR&EDR |
| Test Engineer: | Mikey zhu |
| Test Date: | 2023-10-17 |

**Test Summary**

| Item | Result |
|---|---|
| Duty Cycle | Pass |
| Bandwidth | Pass |
| Maximum Conducted Output Power | Pass |
| Carrier Frequency Separation | Pass |
| Number of Hopping Frequencies | Pass |
| Time of Occupancy (Dwell Time) | Pass |
| Unwanted Emissions In Non-restricted Frequency Bands | Pass |

## 1. Duty Cycle

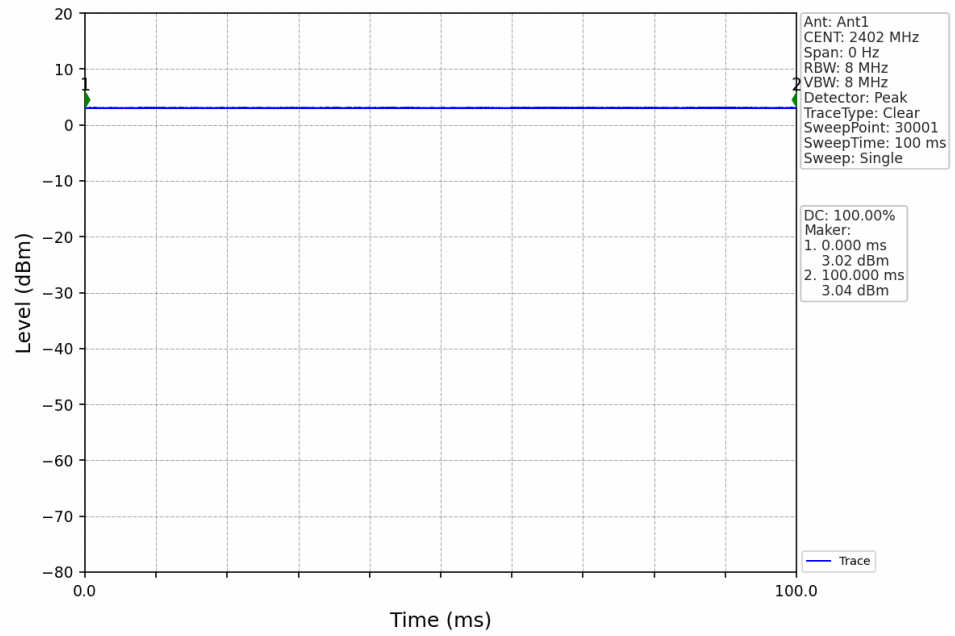
### 1.1 Ant1

#### 1.1.1 Test Result

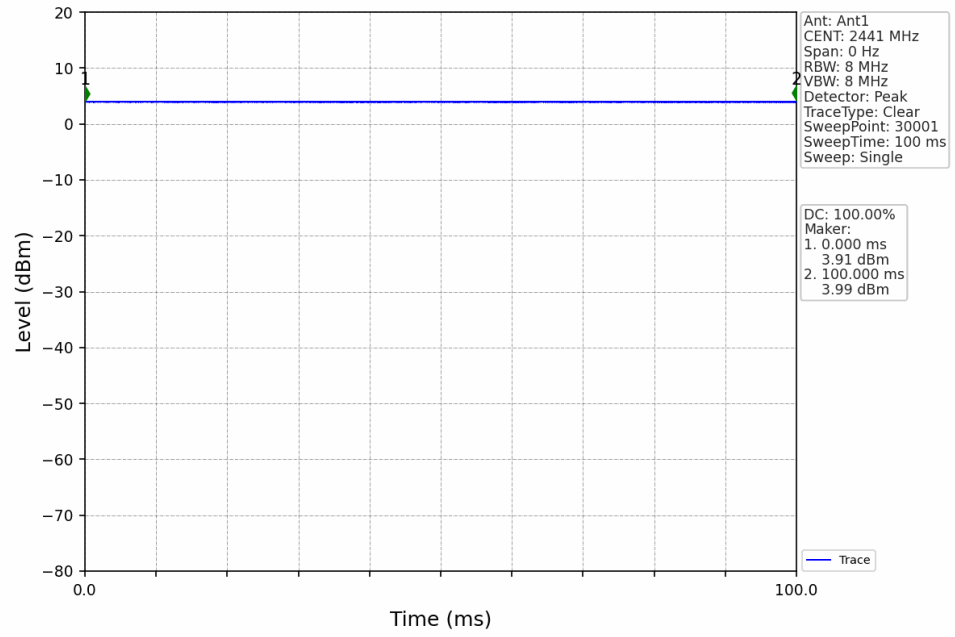
| Ant1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode | TX Type | Frequency (MHz) | Packet Type | T_on (ms) | Period (ms) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | Max. DC Variation (%) |
| GFSK | SISO | 2402 | DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |
| | | 2441 | DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |
| | | 2480 | DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |
| | | 2441 | 2DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |
| | | 2480 | 2DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |
| 8-DPSK | SISO | 2402 | 3DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |
| | | 2441 | 3DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |
| | | 2480 | 3DH5 | 100.000 | 100.000 | 100.00 | 0.00 | 0.00 |

1.1.2 Test Graph

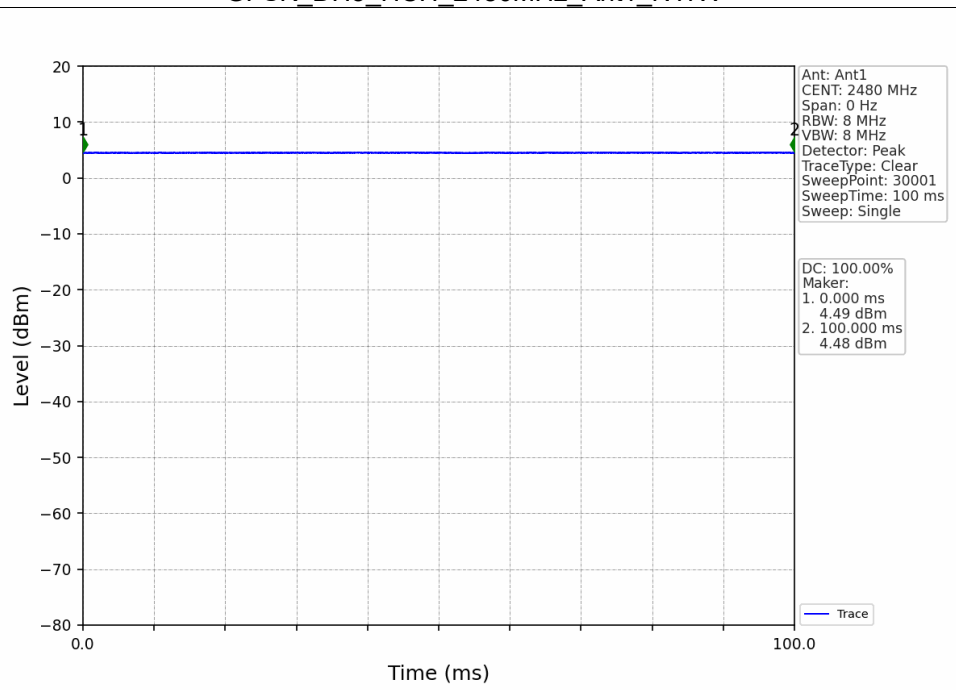
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



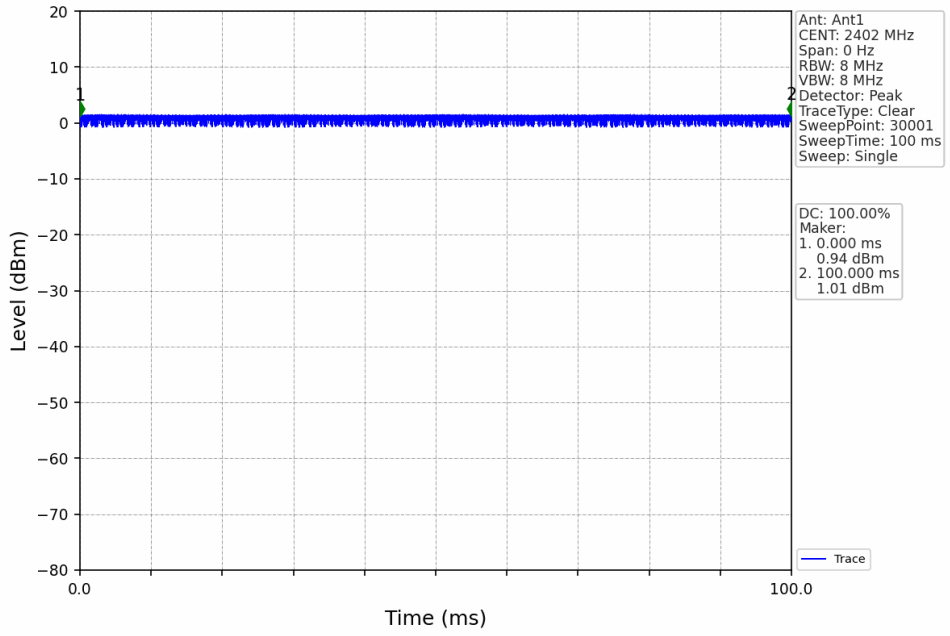

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



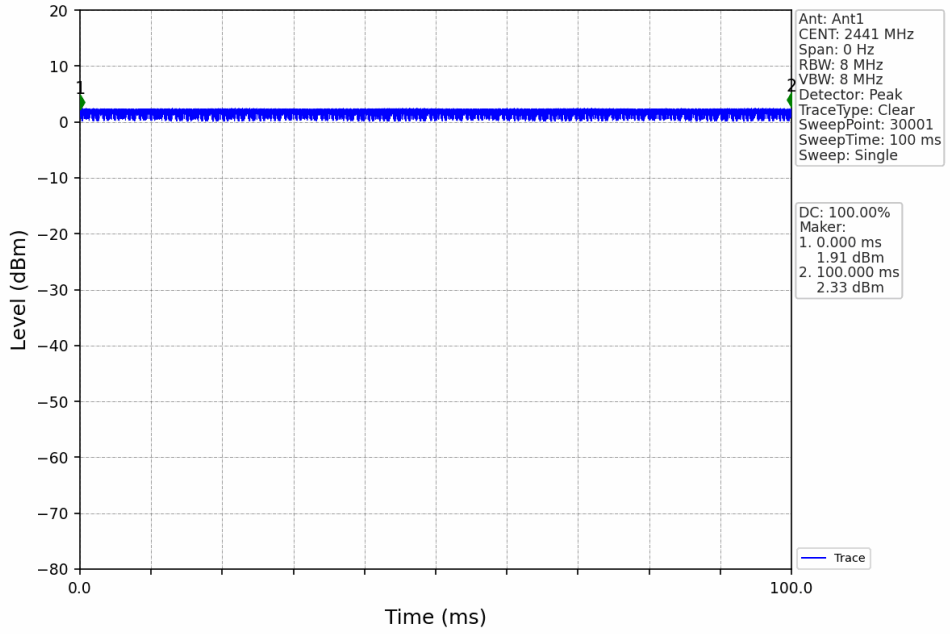
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



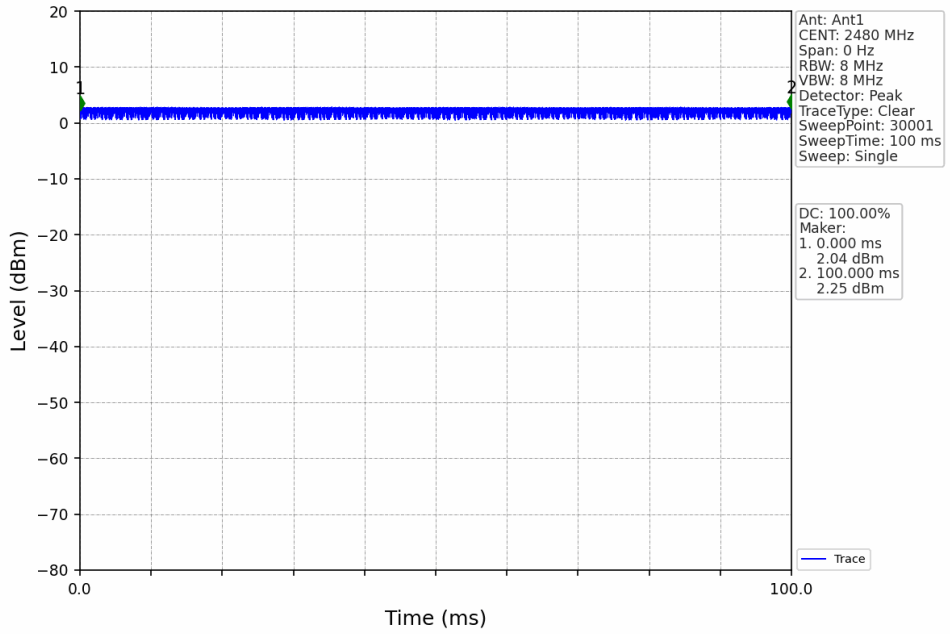

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



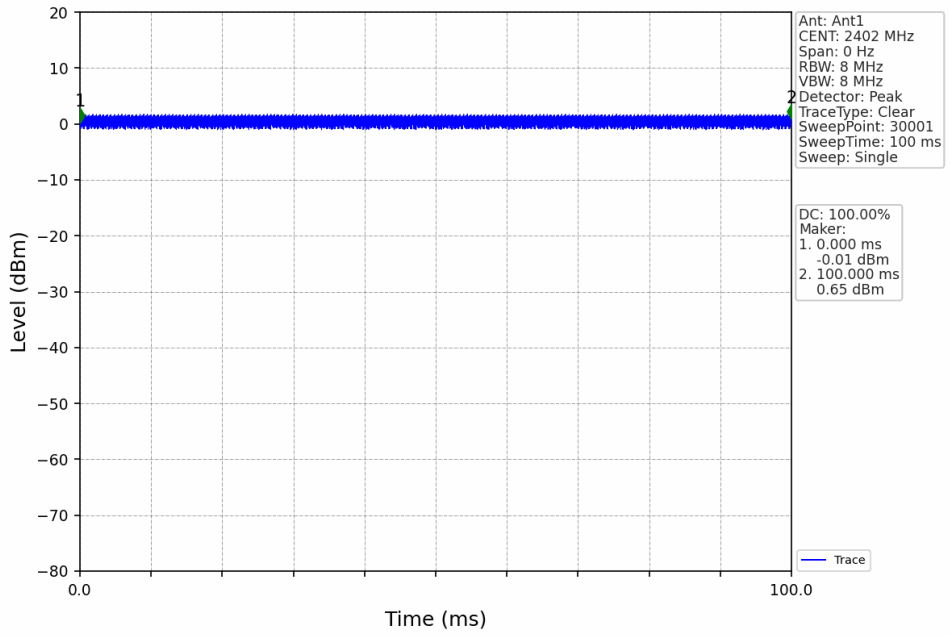
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



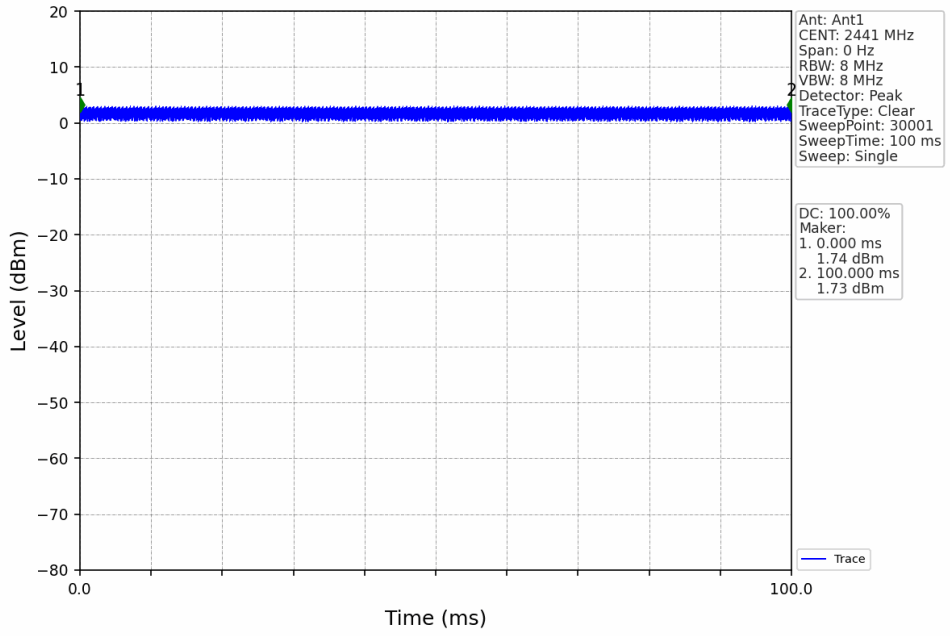

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



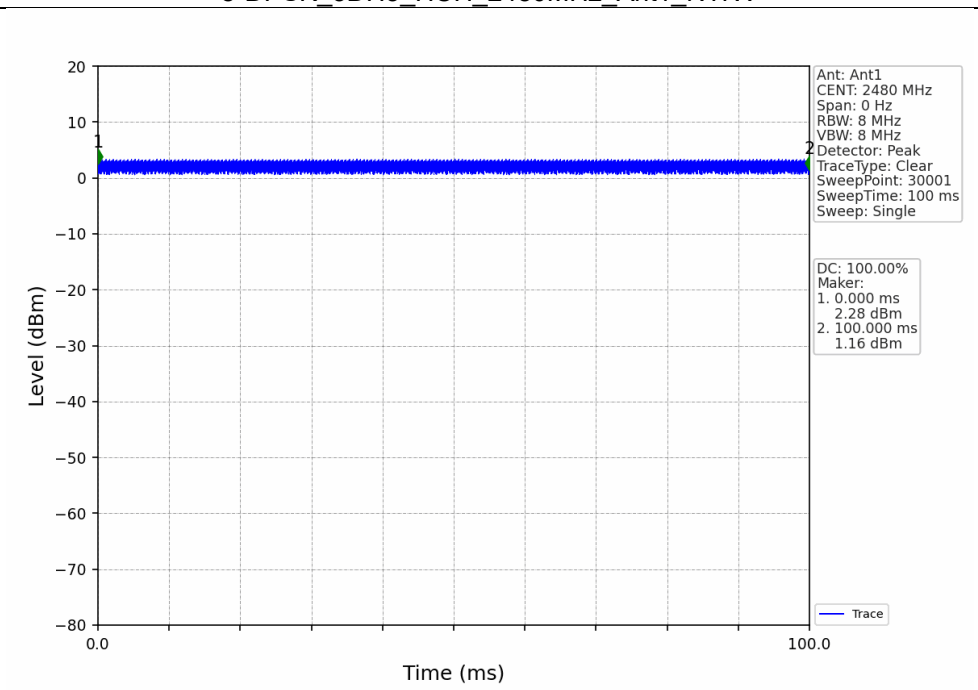
8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8-DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



## 2. Bandwidth

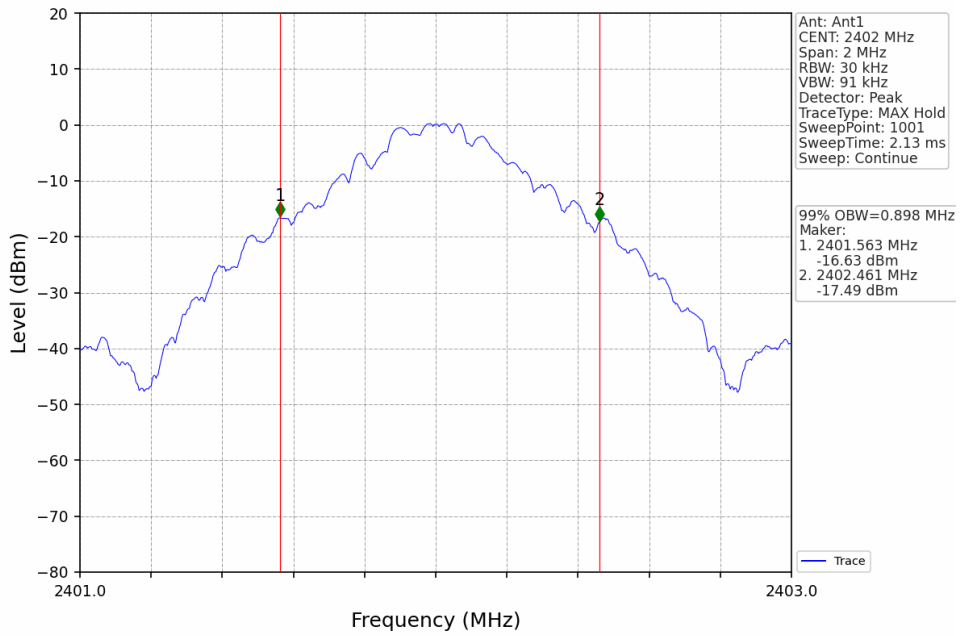
### 2.1 OBW

#### 2.1.1 Test Result

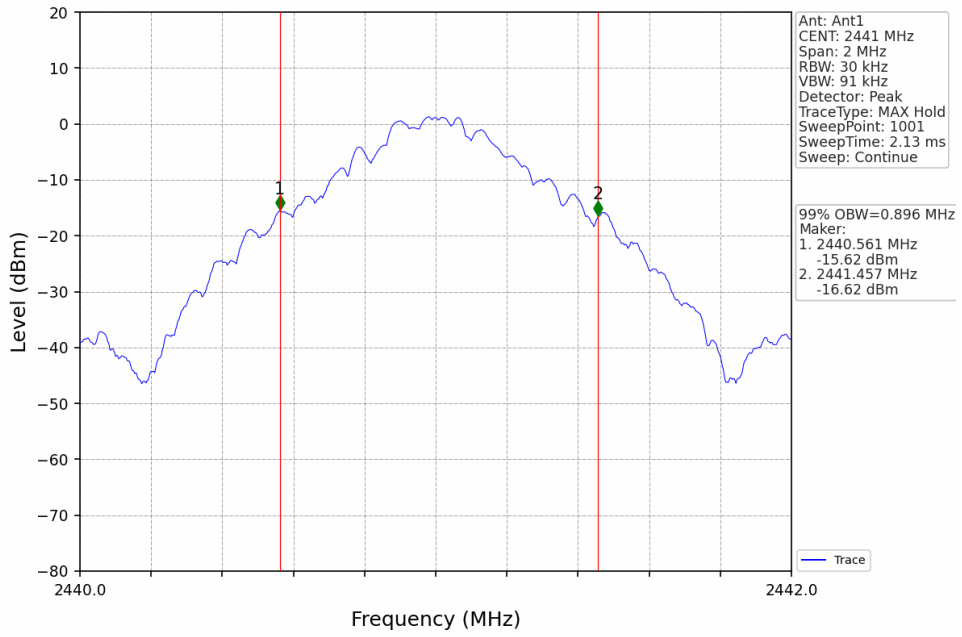
| Mode | TX Type | Frequency (MHz) | Packet Type | ANT | 99% Occupied Bandwidth (MHz) Result | Verdict |
|---|---|---|---|---|---|---|
| GFSK | SISO | 2402 | DH5 | 1 | 0.898 | Pass |
| | | 2441 | DH5 | 1 | 0.896 | Pass |
| | | 2480 | DH5 | 1 | 0.895 | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | 1.199 | Pass |
| | | 2441 | 2DH5 | 1 | 1.199 | Pass |
| | | 2480 | 2DH5 | 1 | 1.199 | Pass |
| 8-DPSK | SISO | 2402 | 3DH5 | 1 | 1.202 | Pass |
| | | 2441 | 3DH5 | 1 | 1.202 | Pass |
| | | 2480 | 3DH5 | 1 | 1.202 | Pass |

2.1.2 Test Graph

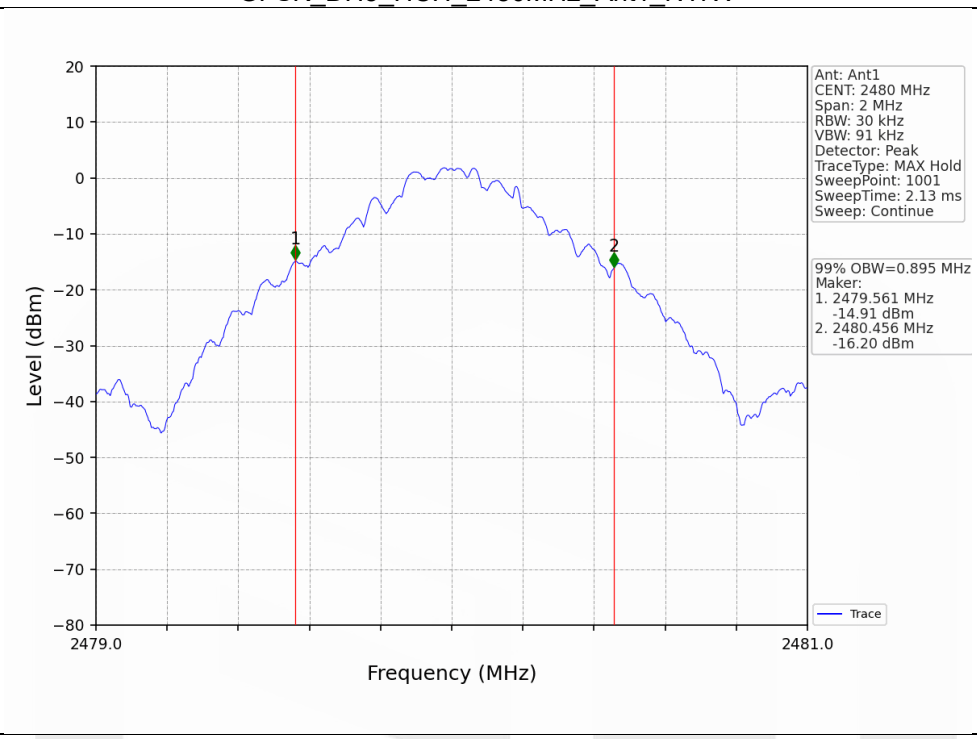
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



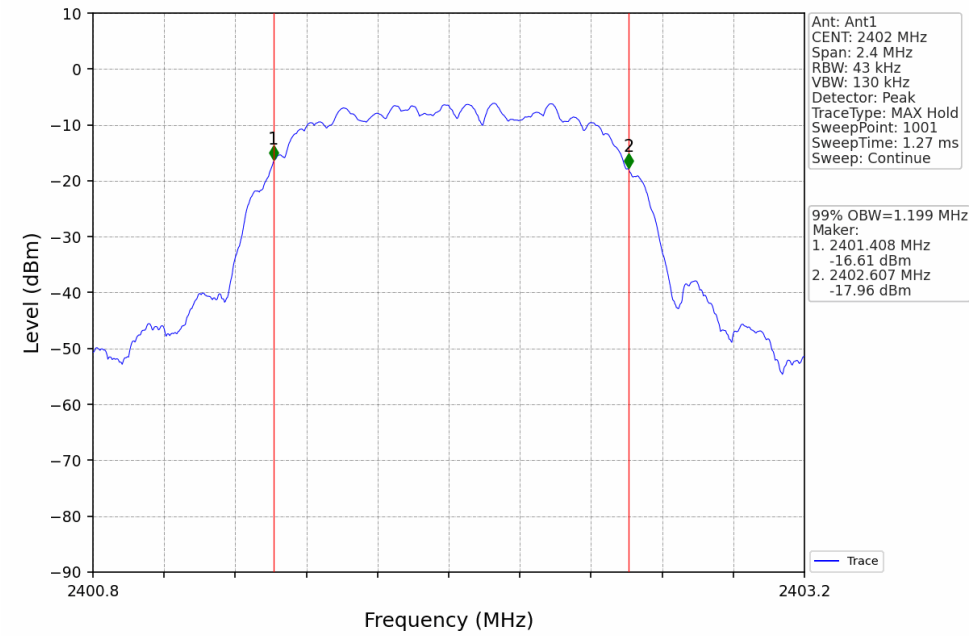

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



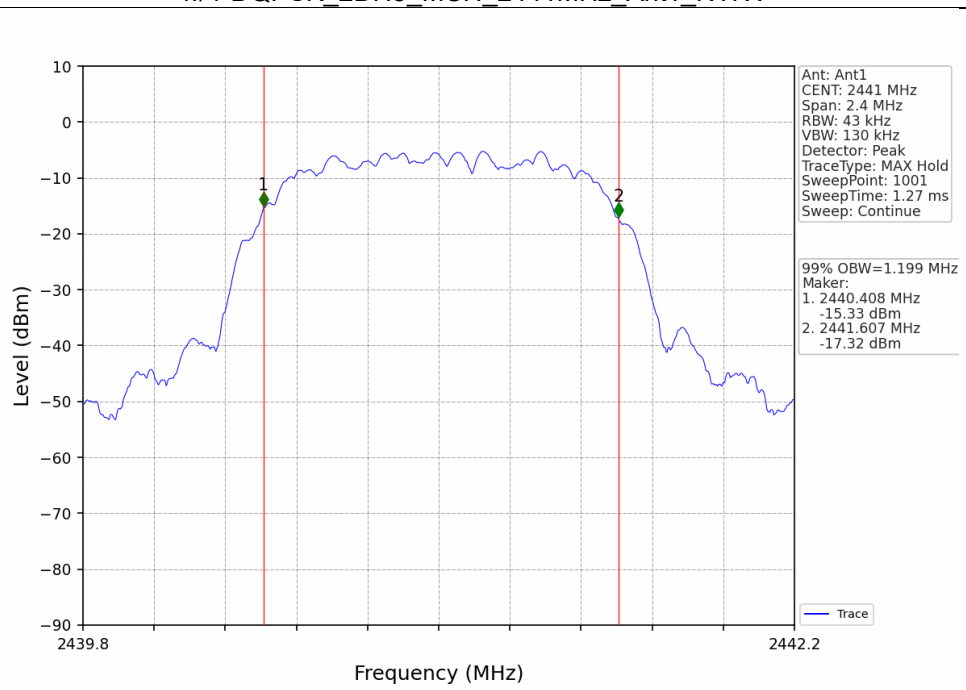
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



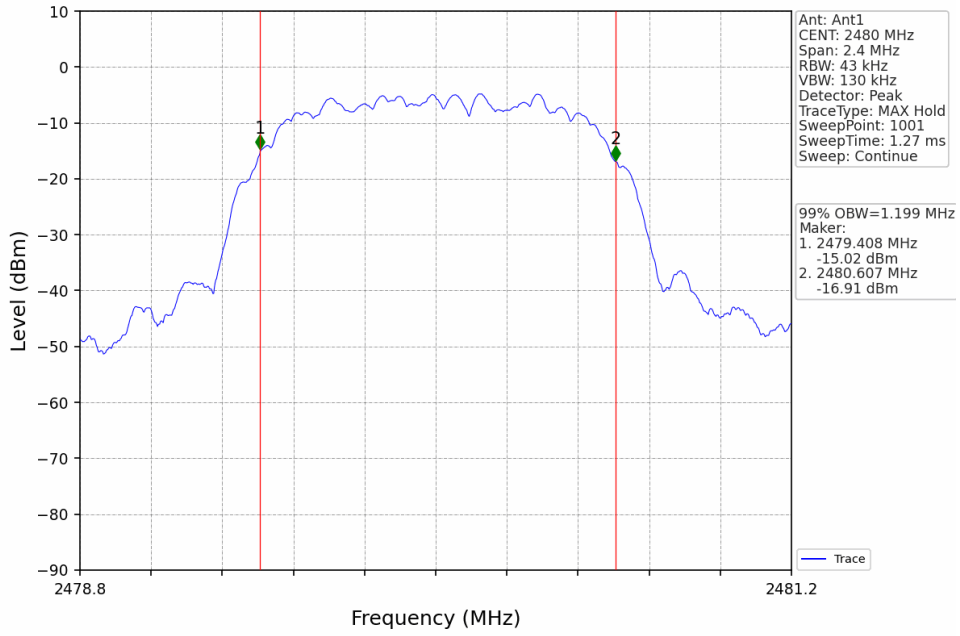

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



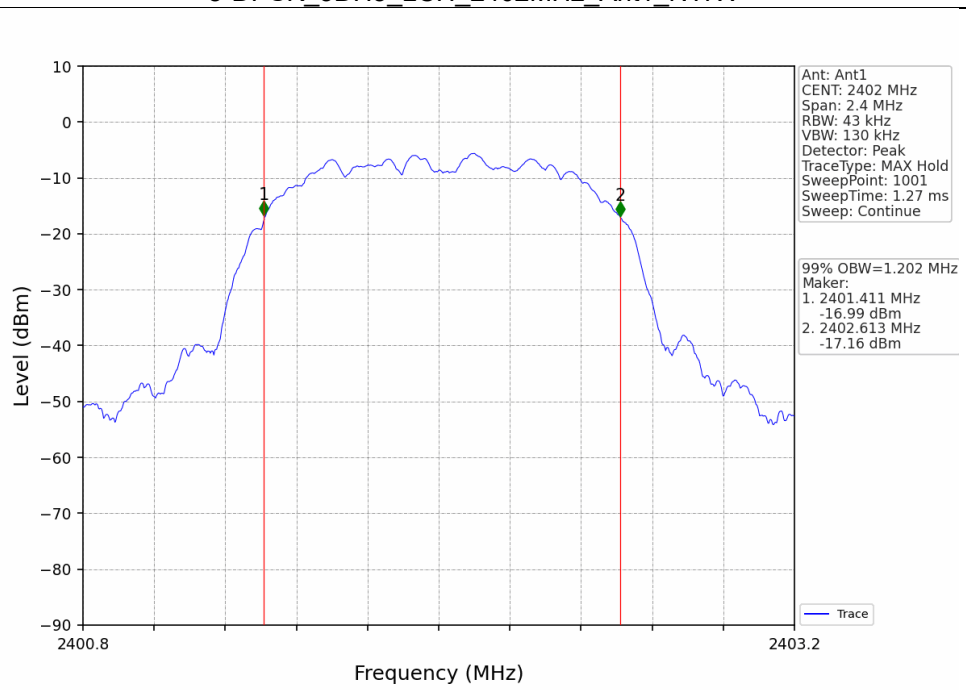
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



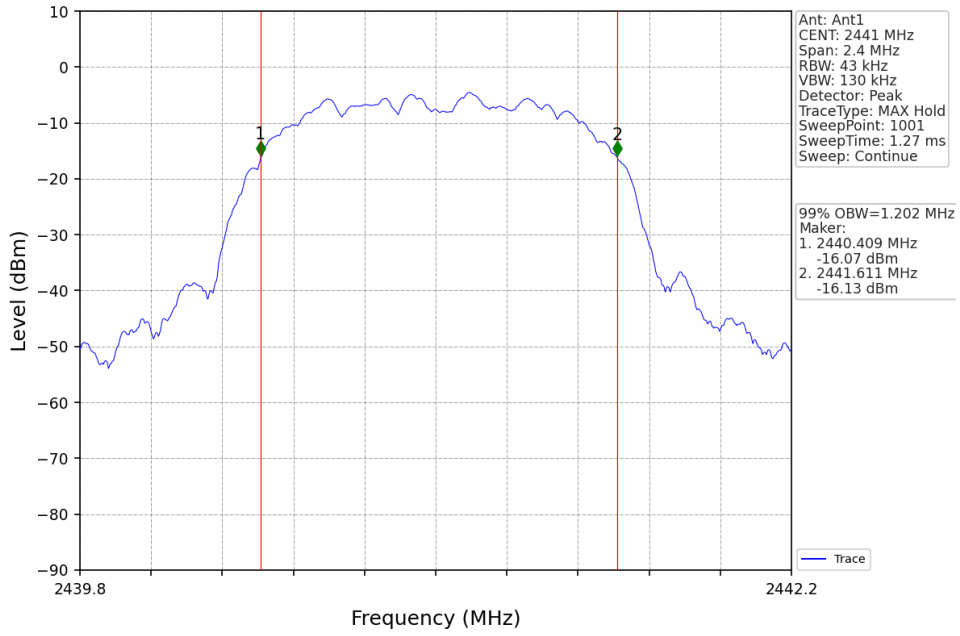

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



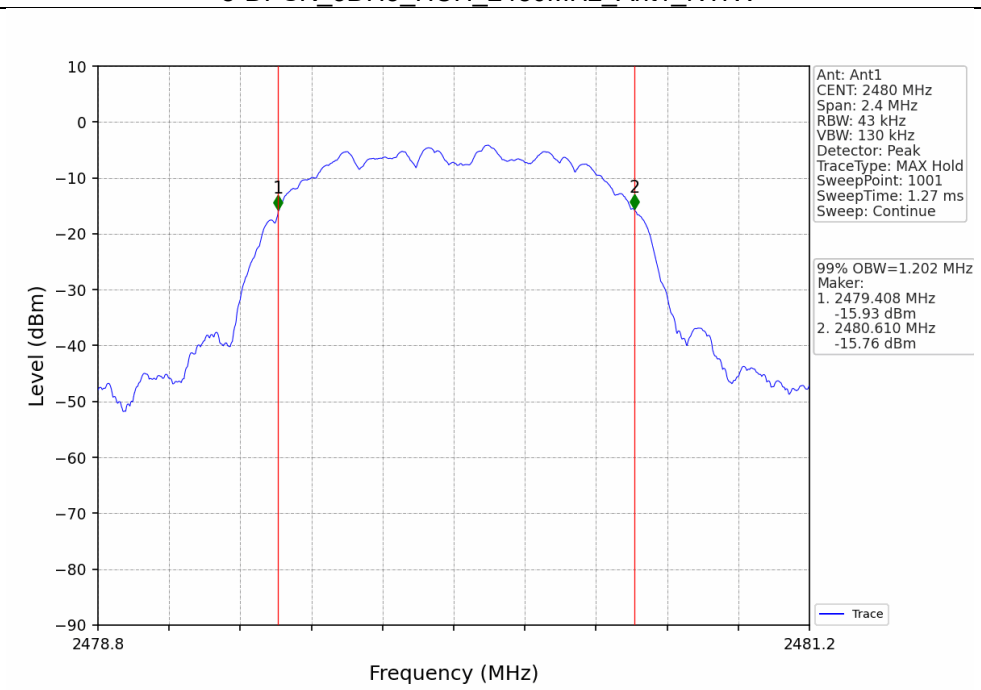
8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8-DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



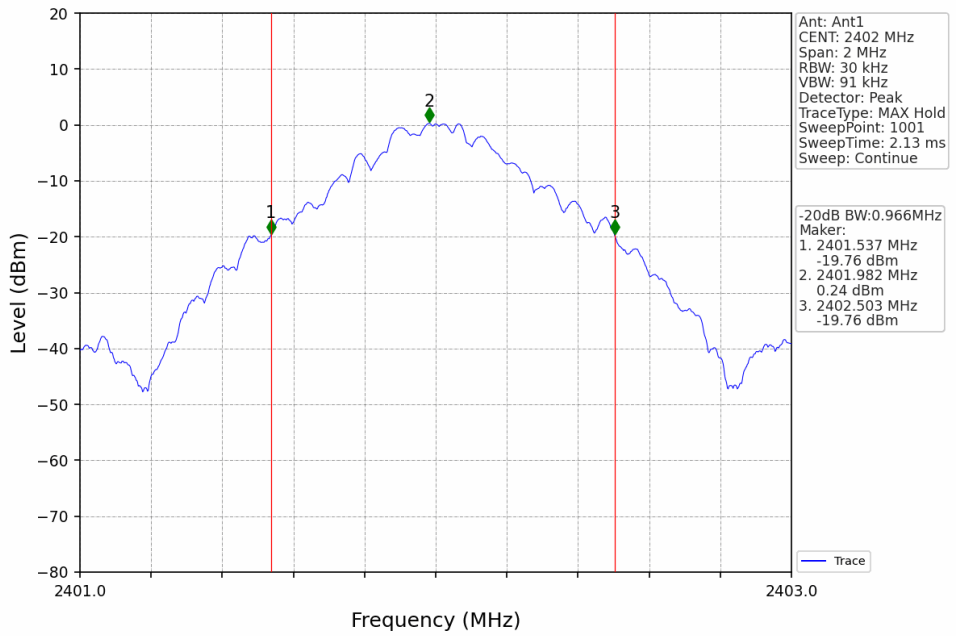
## 2.2 20dB BW

### 2.2.1 Test Result

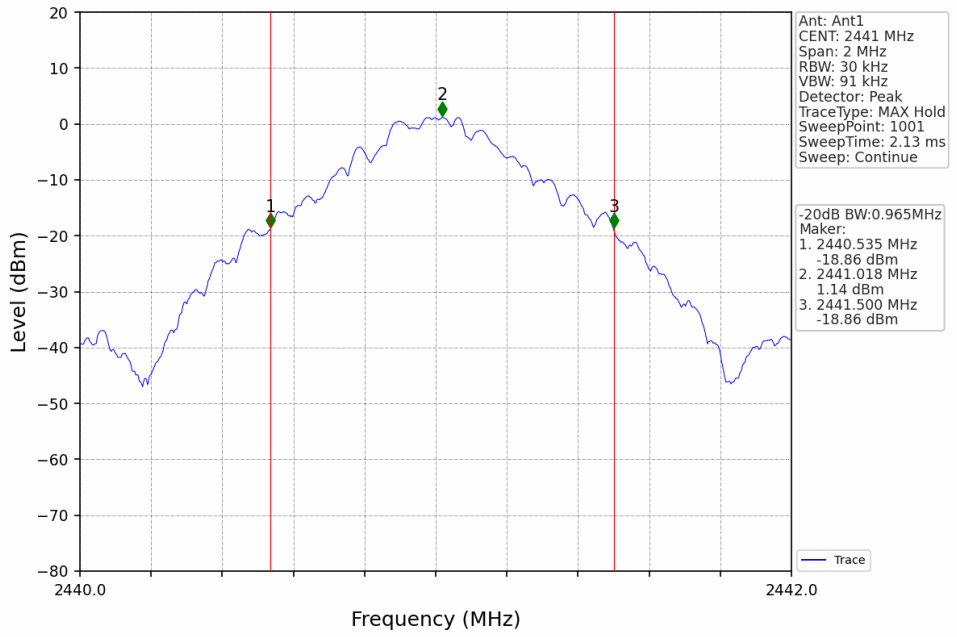
| Mode | TX Type | Frequency (MHz) | Packet Type | ANT | 20dB Bandwidth (MHz) Result | Verdict |
|---|---|---|---|---|---|---|
| GFSK | SISO | 2402 | DH5 | 1 | 0.966 | Pass |
| | | 2441 | DH5 | 1 | 0.965 | Pass |
| | | 2480 | DH5 | 1 | 0.965 | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | 1.376 | Pass |
| | | 2441 | 2DH5 | 1 | 1.373 | Pass |
| | | 2480 | 2DH5 | 1 | 1.374 | Pass |
| 8-DPSK | SISO | 2402 | 3DH5 | 1 | 1.357 | Pass |
| | | 2441 | 3DH5 | 1 | 1.354 | Pass |
| | | 2480 | 3DH5 | 1 | 1.354 | Pass |

2.2.2 Test Graph

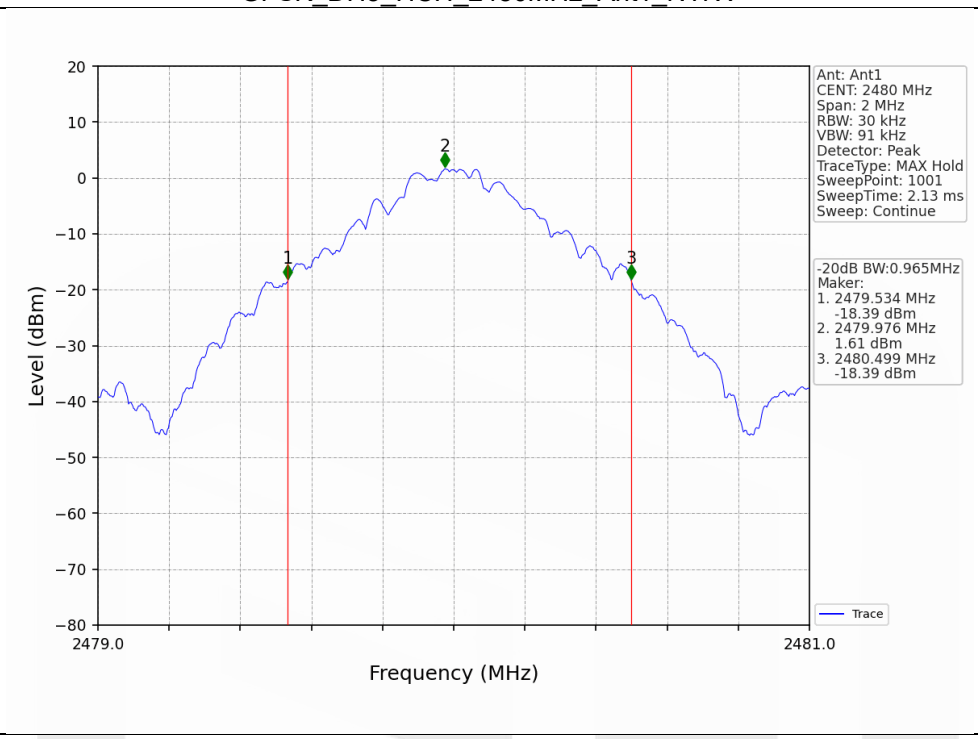
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



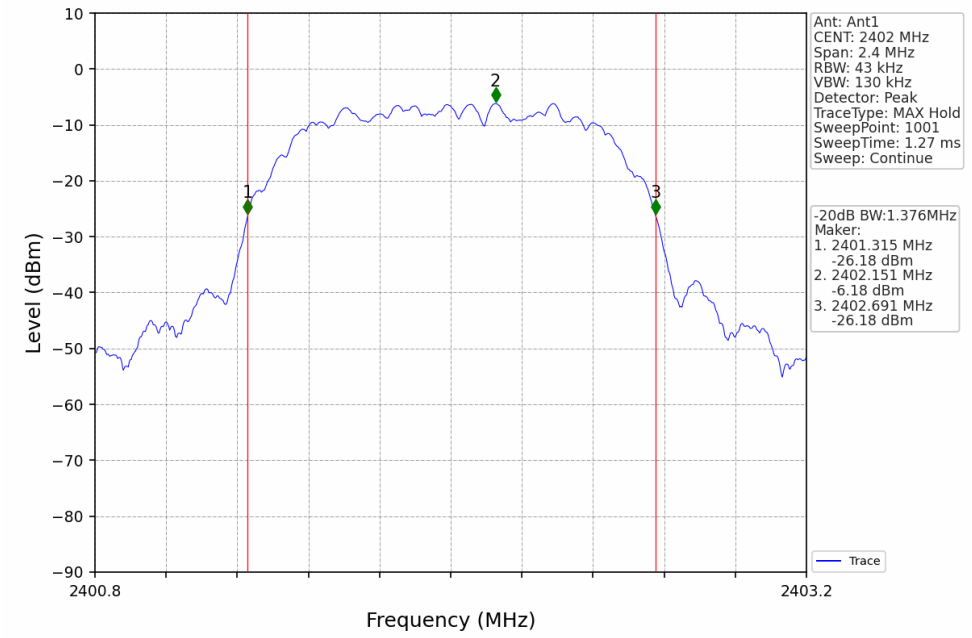

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



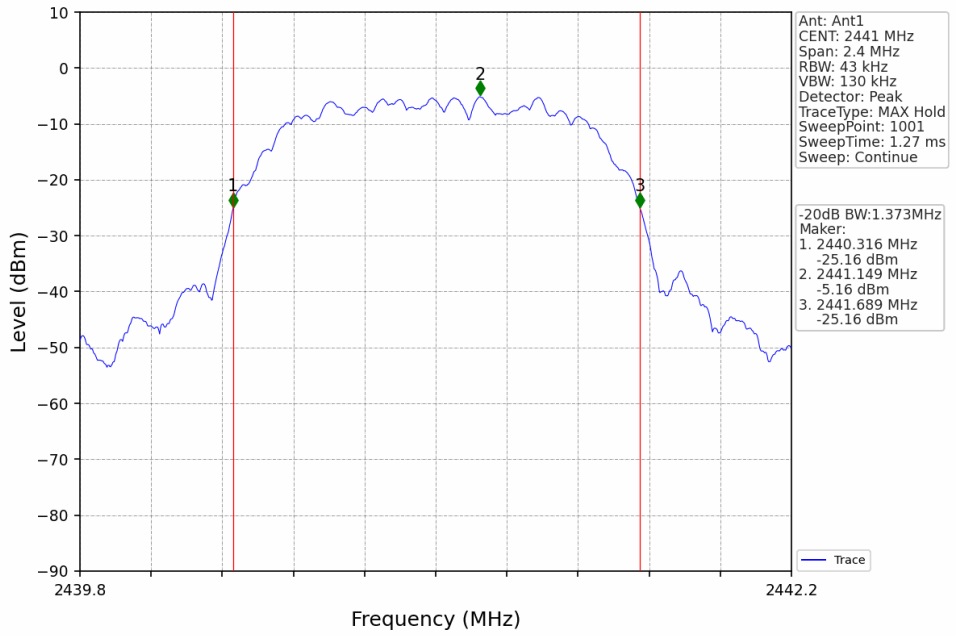
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



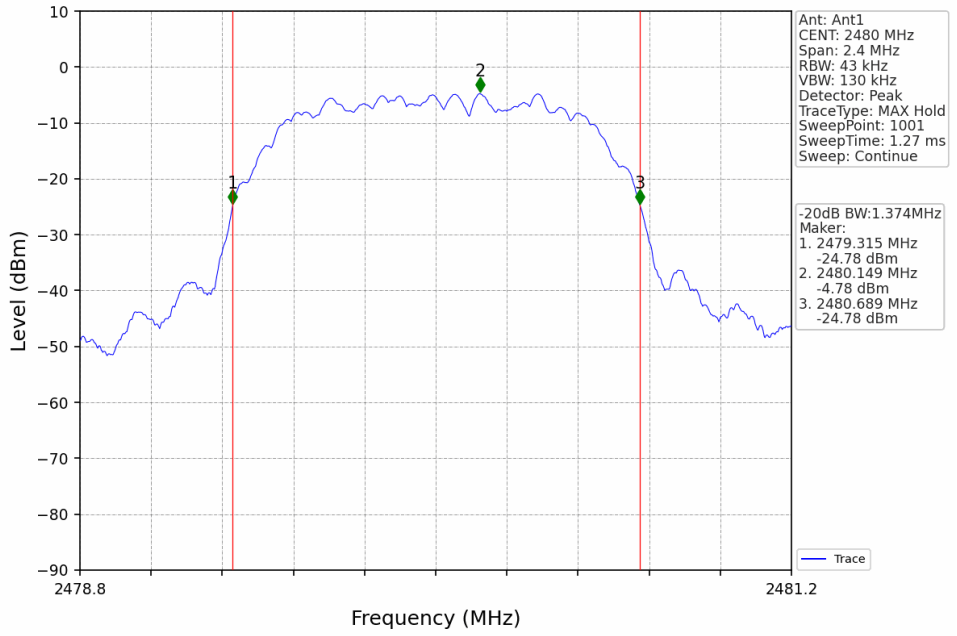

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



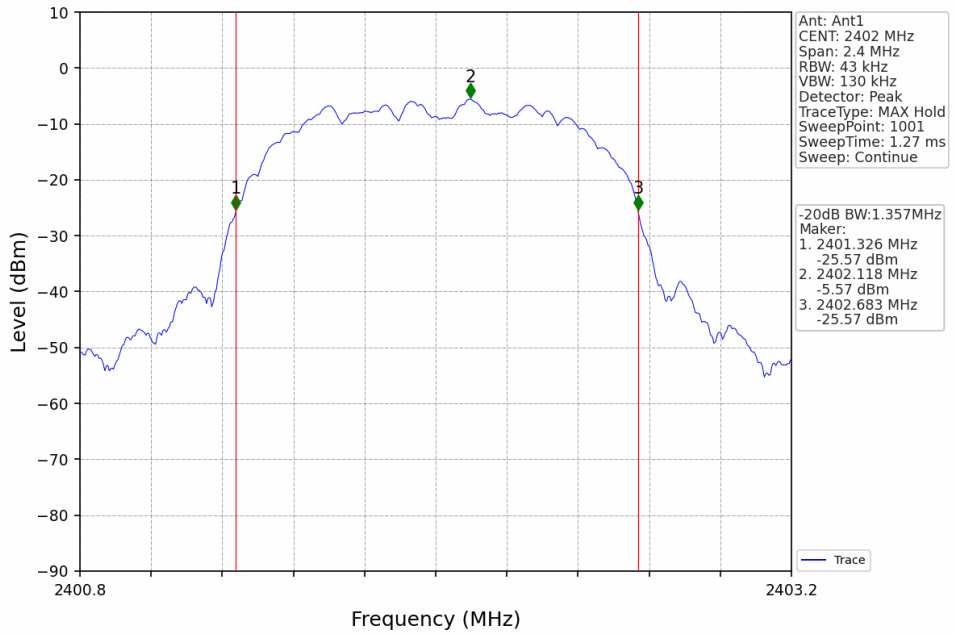
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



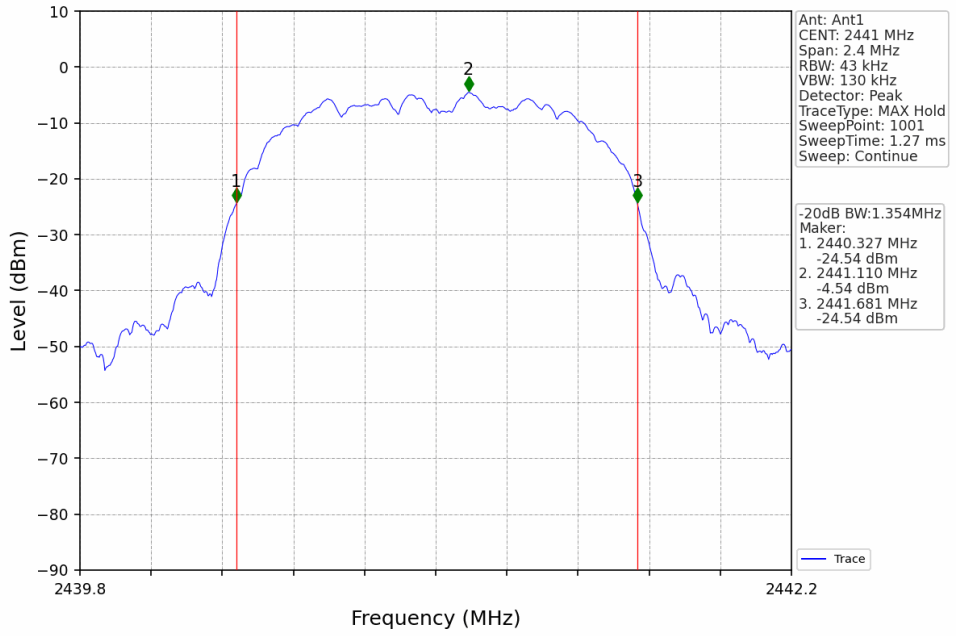

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



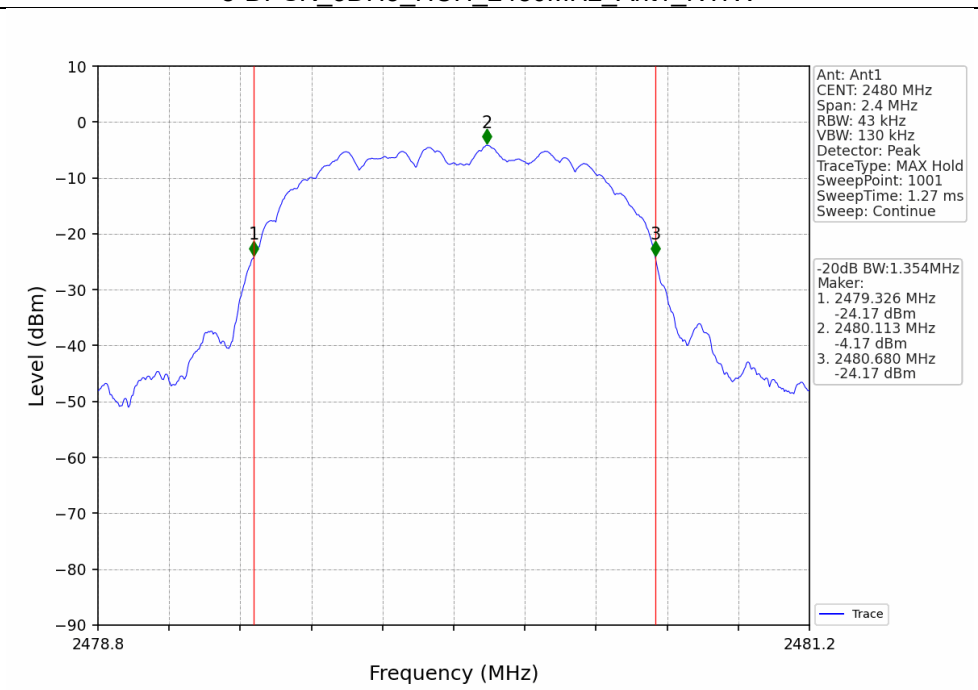
8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8-DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



## 3. Maximum Conducted Output Power

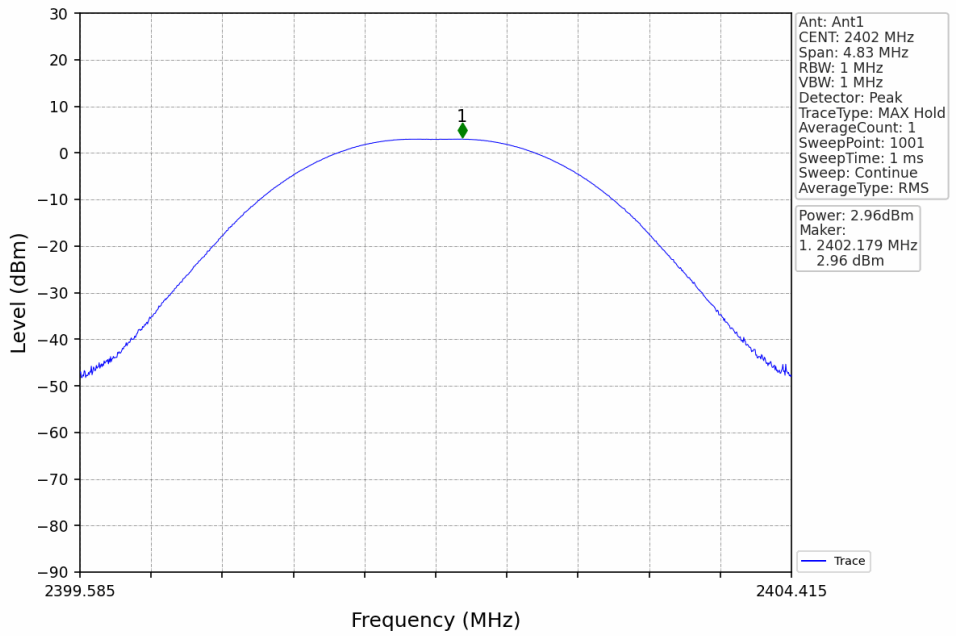
### 3.1 Power

#### 3.1.1 Test Result

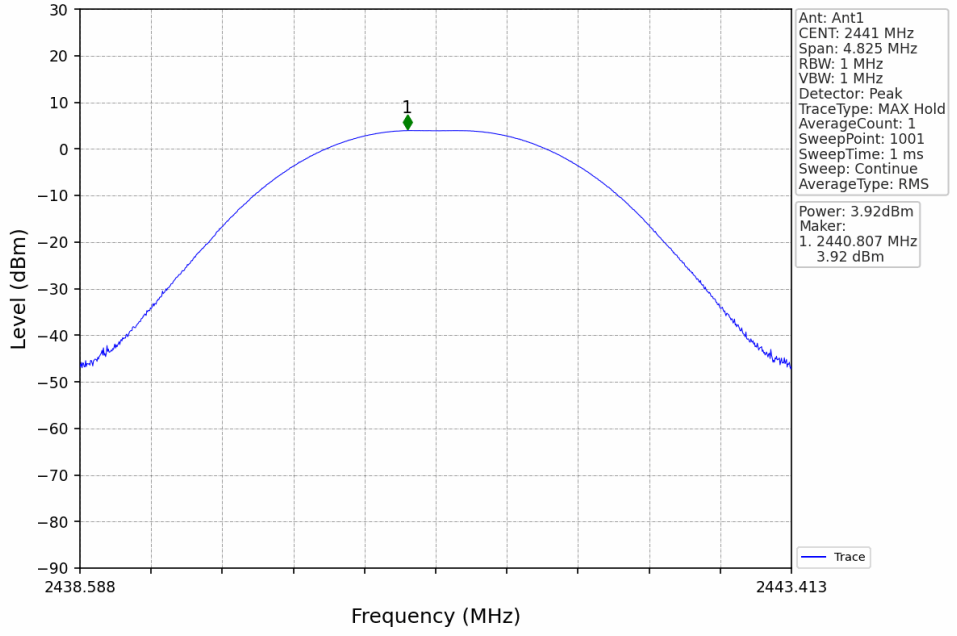
| Mode | TX Type | Frequency (MHz) | Packet Type | Maximum Peak Conducted Output Power (dBm) | | Verdict |
|---|---|---|---|---|---|---|
| | | | | ANT1 | Limit | |
| GFSK | SISO | 2402 | DH5 | 2.96 | <=30 | Pass |
| | | 2441 | DH5 | 3.92 | <=30 | Pass |
| | | 2480 | DH5 | 4.49 | <=30 | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1.40 | <=20.97 | Pass |
| | | 2441 | 2DH5 | 2.31 | <=20.97 | Pass |
| | | 2480 | 2DH5 | 2.75 | <=20.97 | Pass |
| 8-DPSK | SISO | 2402 | 3DH5 | 1.78 | <=20.97 | Pass |
| | | 2441 | 3DH5 | 2.75 | <=20.97 | Pass |
| | | 2480 | 3DH5 | 3.19 | <=20.97 | Pass |

3.1.2 Test Graph

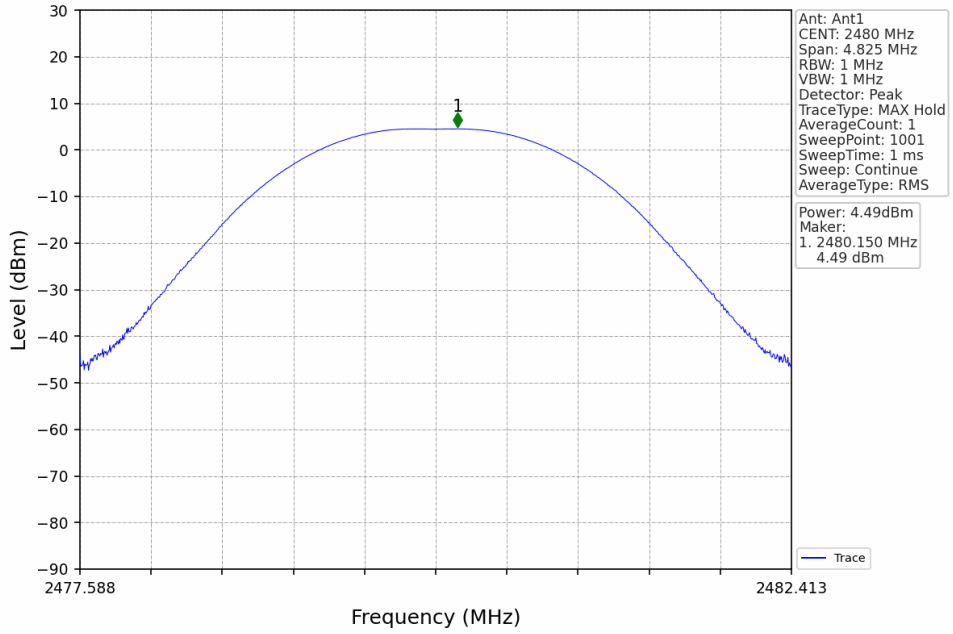
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



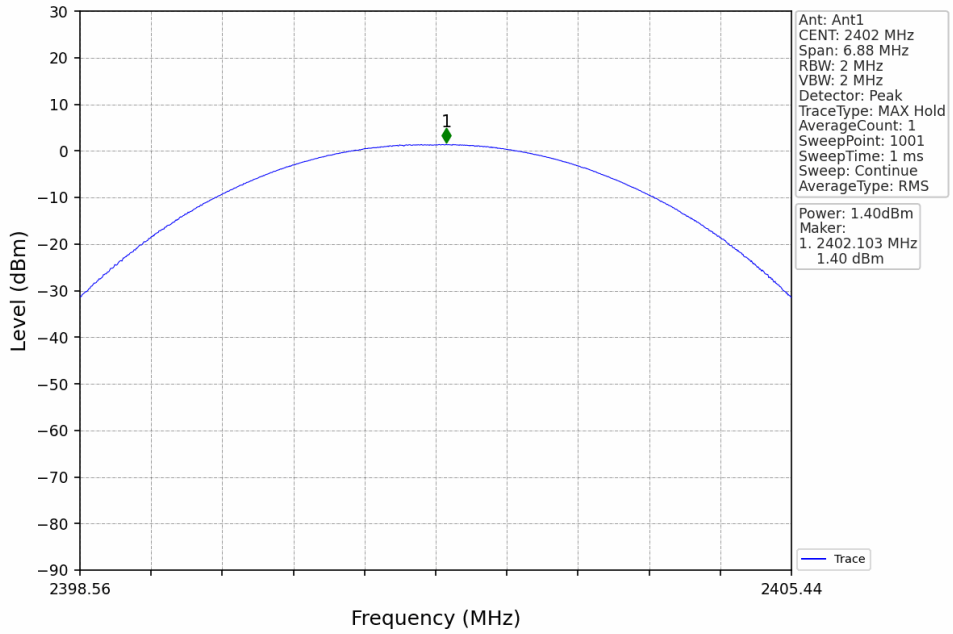

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



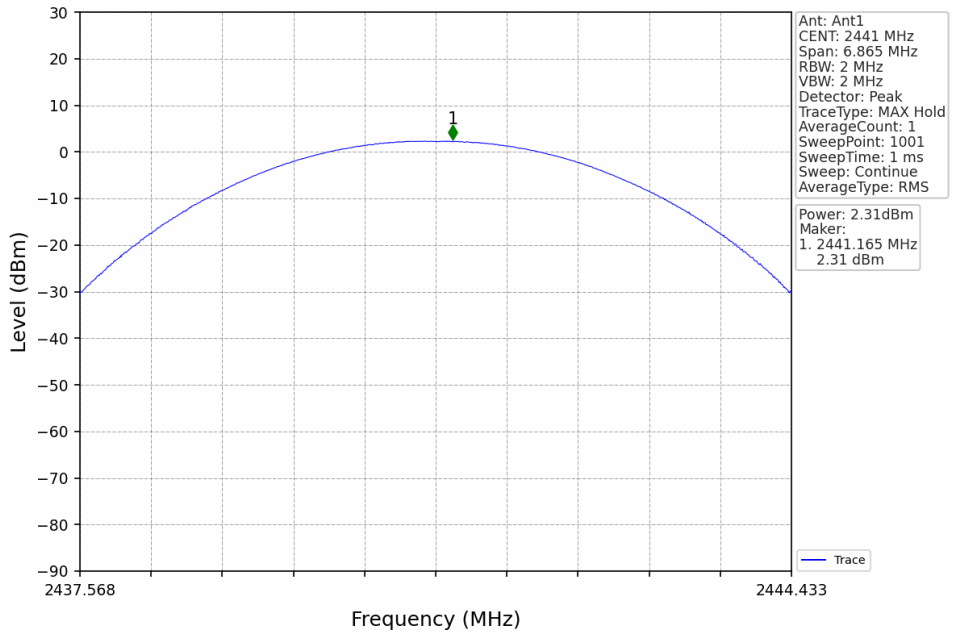
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



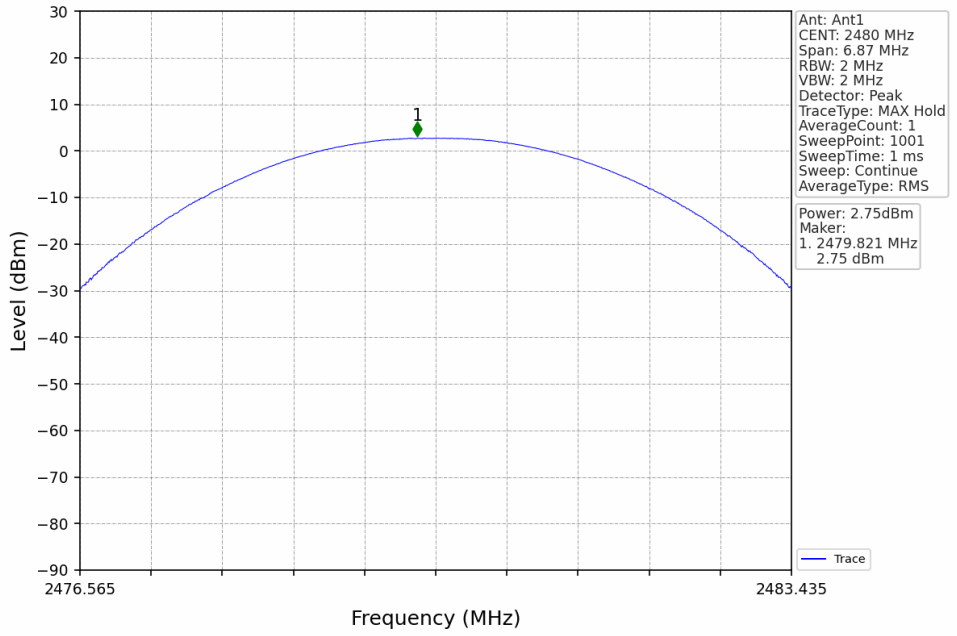

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



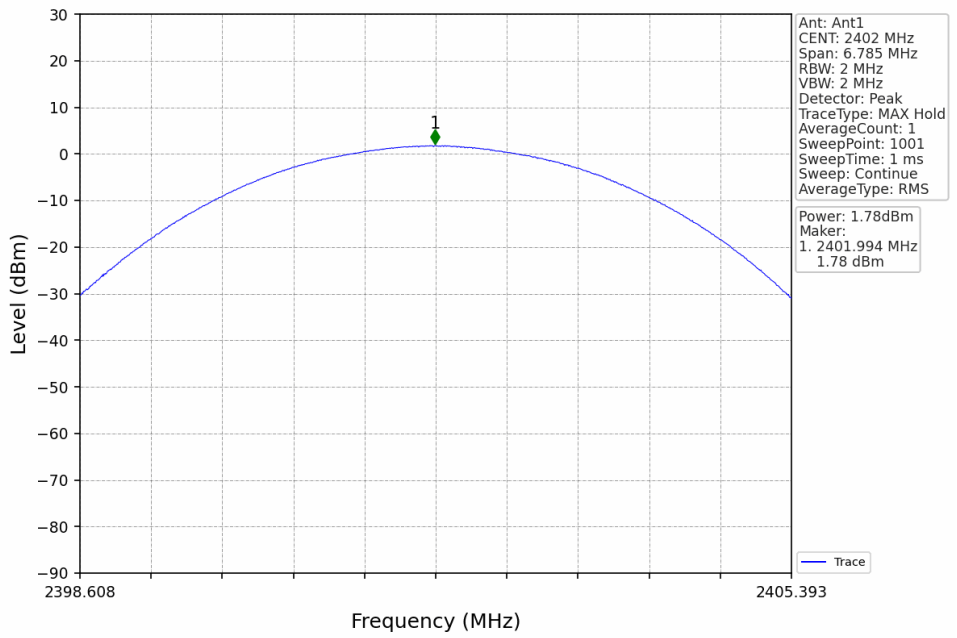
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



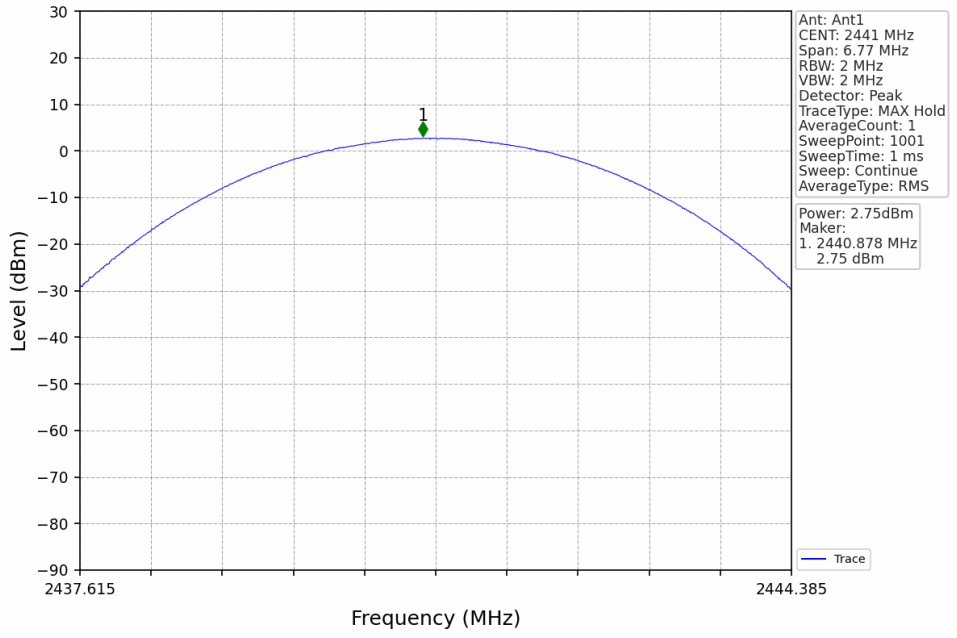

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



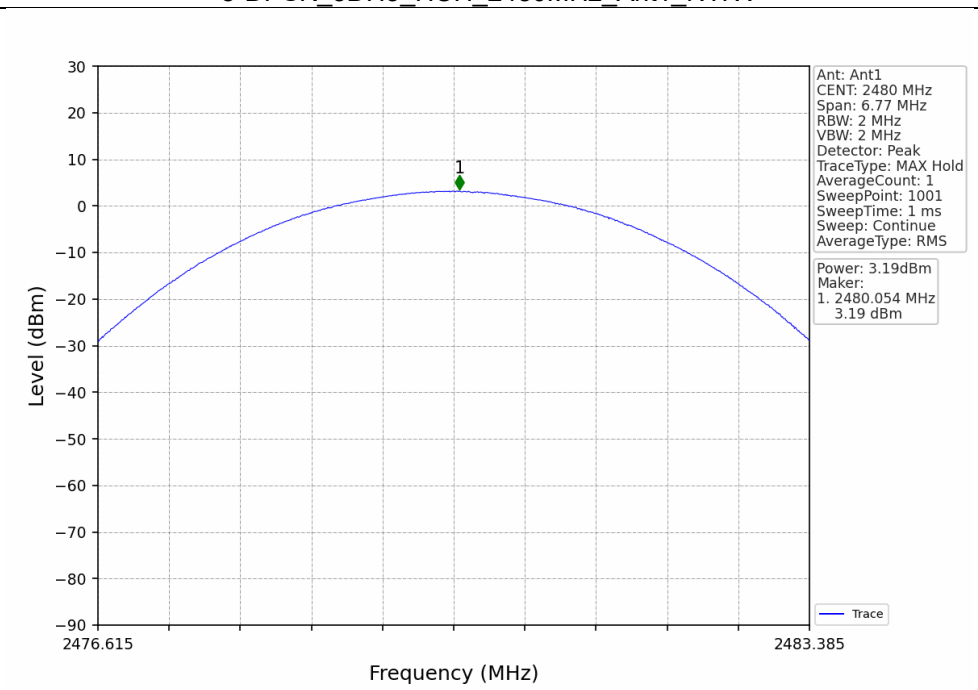
8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8-DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



## 4. Carrier Frequency Separation

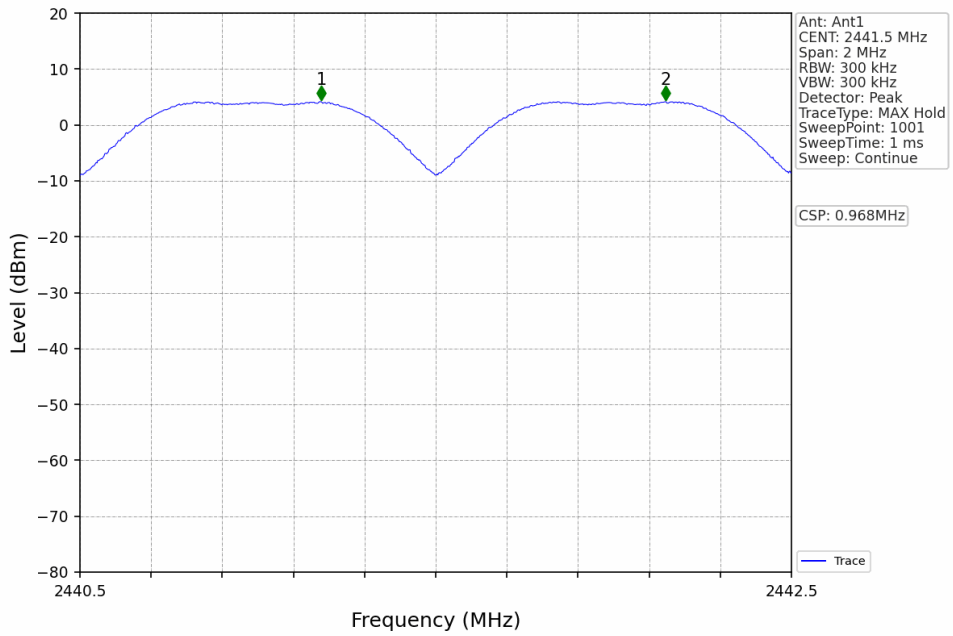
### 4.1 Ant1

#### 4.1.1 Test Result

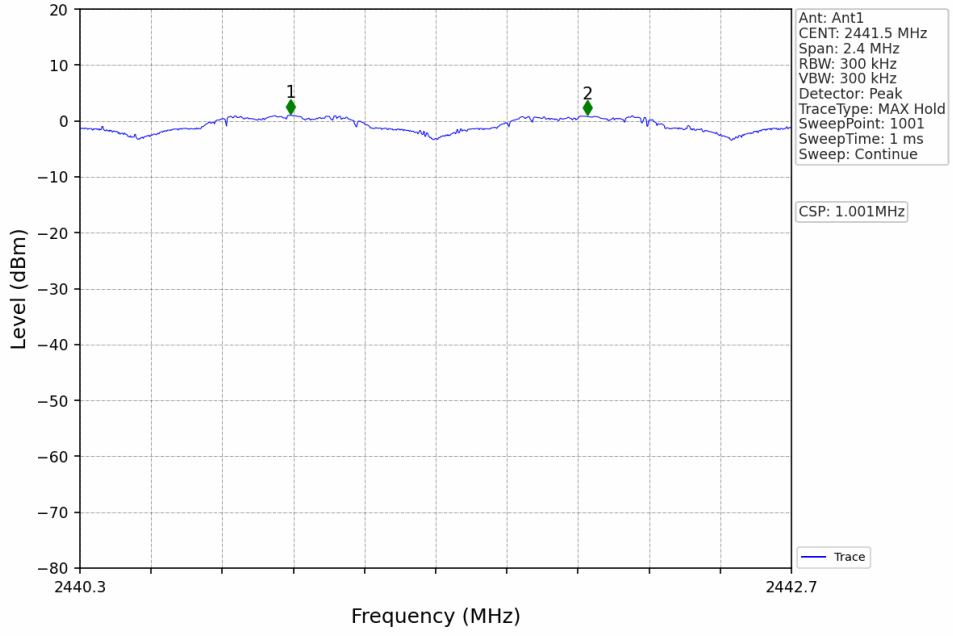
| Ant1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode | TX Type | Frequency (MHz) | Packet Type | Channel Separation (MHz) | 20dB Bandwidth (MHz) | Limit (MHz) | Verdict |
| GFSK | SISO | HOPP | DH5 | 0.968 | 0.966 | >=0.966 | Pass |
| π/4-DQPSK | SISO | HOPP | 2DH5 | 1.001 | 1.376 | >=0.917 | Pass |
| 8-DPSK | SISO | HOPP | 3DH5 | 1.001 | 1.357 | >=0.905 | Pass |

4.1.2 Test Graph

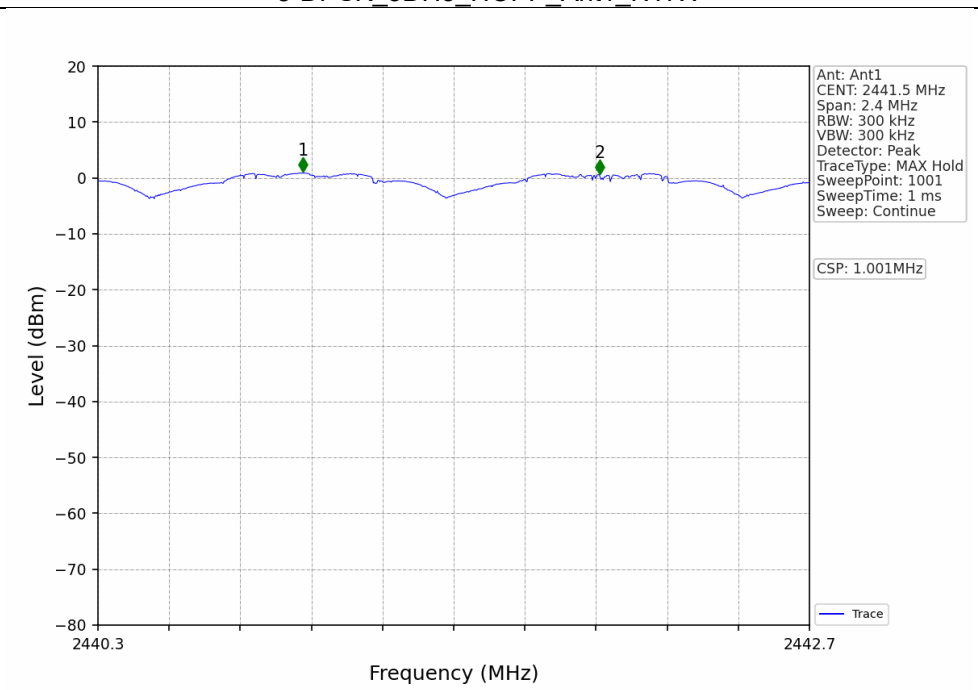
GFSK_DH5_HOPP_Ant1_NTNV




π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



8-DPSK_3DH5_HOPP_Ant1_NTNV



## 5. Number of Hopping Frequencies

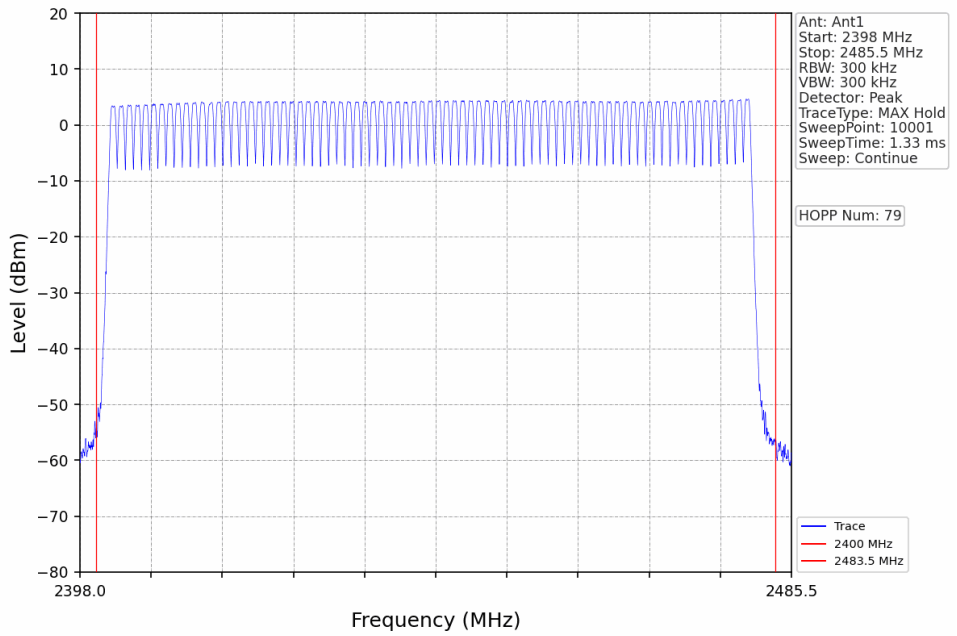
### 5.1 HoppNum

#### 5.1.1 Test Result

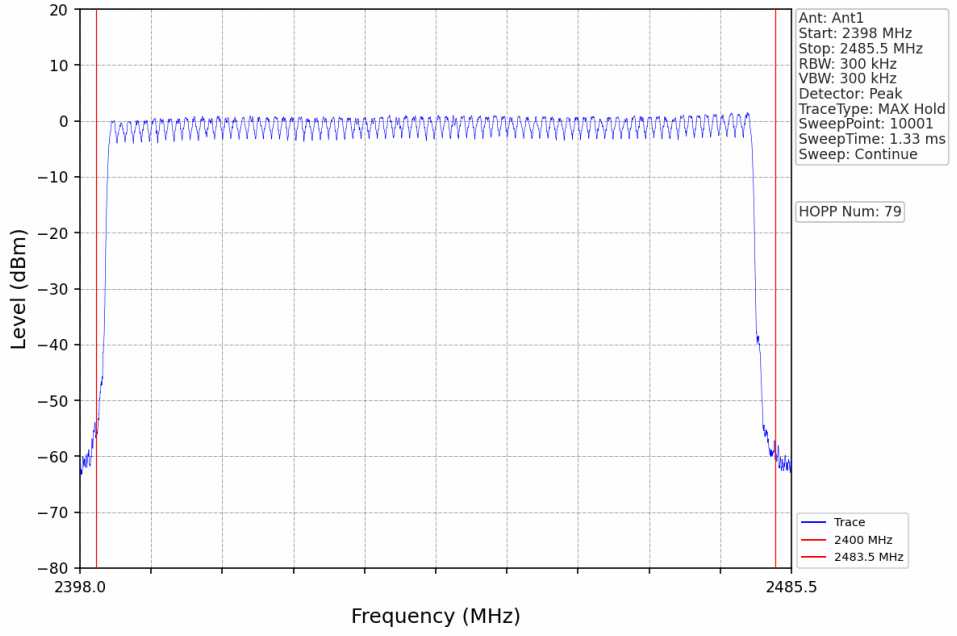
| Mode | TX Type | Frequency (MHz) | Packet Type | Num of Hopping Frequencies | | Verdict |
|---|---|---|---|---|---|---|
| | | | | ANT1 | Limit | |
| GFSK | SISO | HOPP | DH5 | 79 | >=15 | Pass |
| π/4-DQPSK | SISO | HOPP | 2DH5 | 79 | >=15 | Pass |
| 8-DPSK | SISO | HOPP | 3DH5 | 79 | >=15 | Pass |

5.1.2 Test Graph

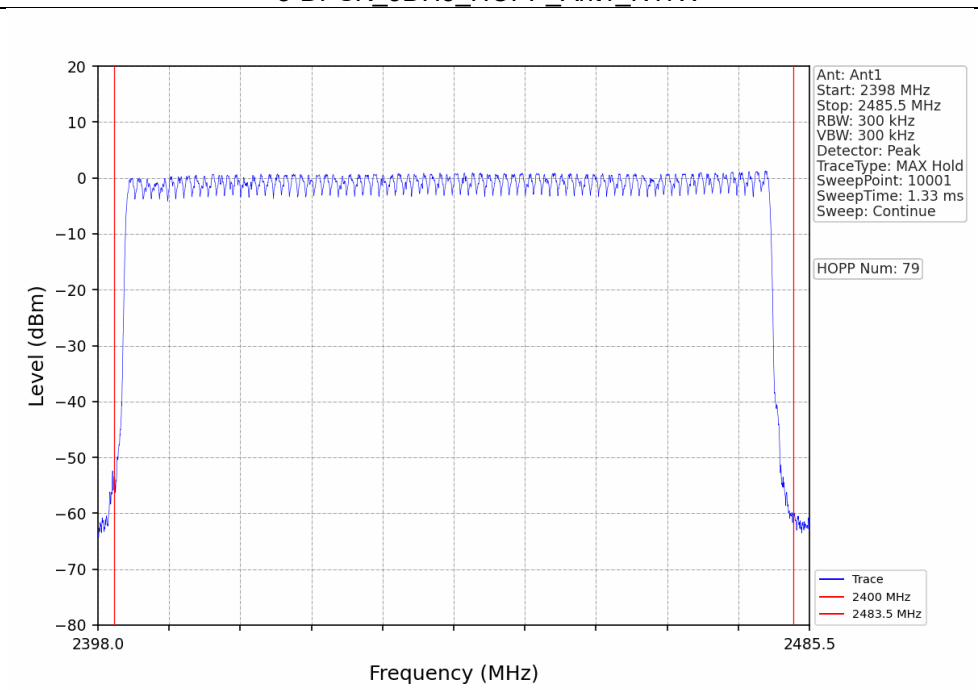
GFSK_DH5_HOPP_Ant1_NTNV




π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



8-DPSK_3DH5_HOPP_Ant1_NTNV



## 6. Time of Occupancy (Dwell Time)

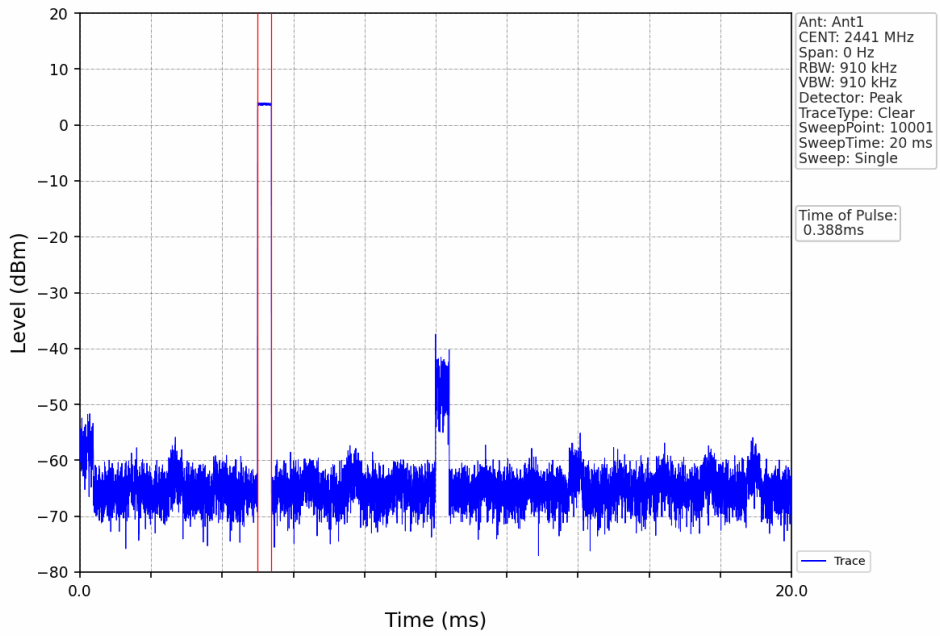
### 6.1 Ant1

#### 6.1.1 Test Result

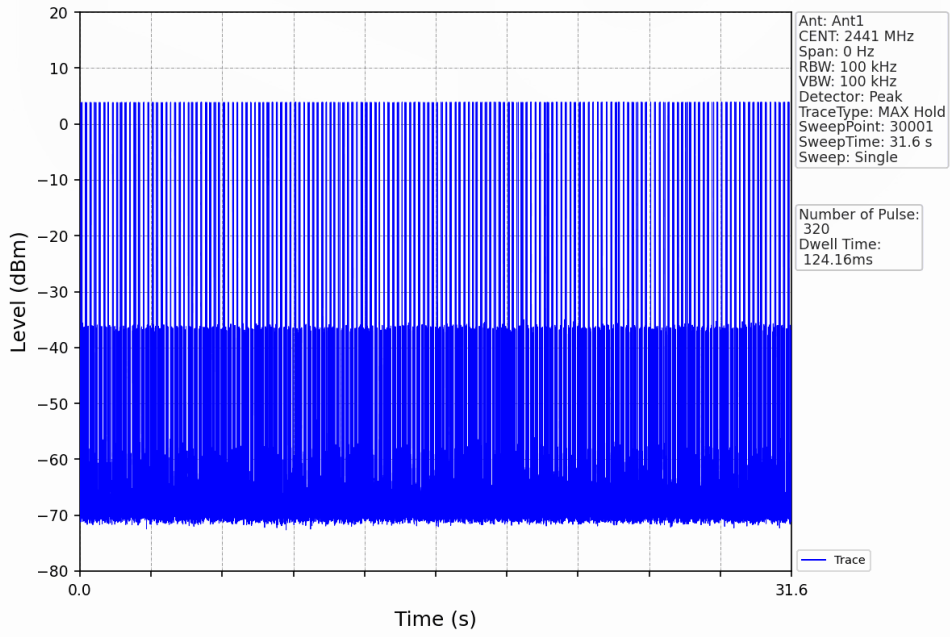
| Ant1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mode | TX Type | Frequency (MHz) | Packet Type | Duration of Single Pulse (ms) | Observation Period (s) | Num of Pulse in Observation Period | Dwell Time (ms) | Limit (ms) | Verdict |
| GFSK | SISO | HOPP | DH1 | 0.388 | 31.600 | 320 | 124.160 | <=400 | Pass |
| | | | DH3 | 1.642 | 31.600 | 162 | 266.004 | <=400 | Pass |
| | | | DH5 | 2.898 | 31.600 | 99 | 286.902 | <=400 | Pass |
| π/4-DQPSK | SISO | HOPP | 2DH1 | 0.394 | 31.600 | 320 | 126.080 | <=400 | Pass |
| | | | 2DH3 | 1.648 | 31.600 | 166 | 273.568 | <=400 | Pass |
| | | | 2DH5 | 2.896 | 31.600 | 107 | 309.872 | <=400 | Pass |
| 8-DPSK | SISO | HOPP | 3DH1 | 0.396 | 31.600 | 320 | 126.720 | <=400 | Pass |
| | | | 3DH3 | 1.656 | 31.600 | 154 | 255.024 | <=400 | Pass |
| | | | 3DH5 | 2.906 | 31.600 | 103 | 299.318 | <=400 | Pass |

6.1.2 Test Graph

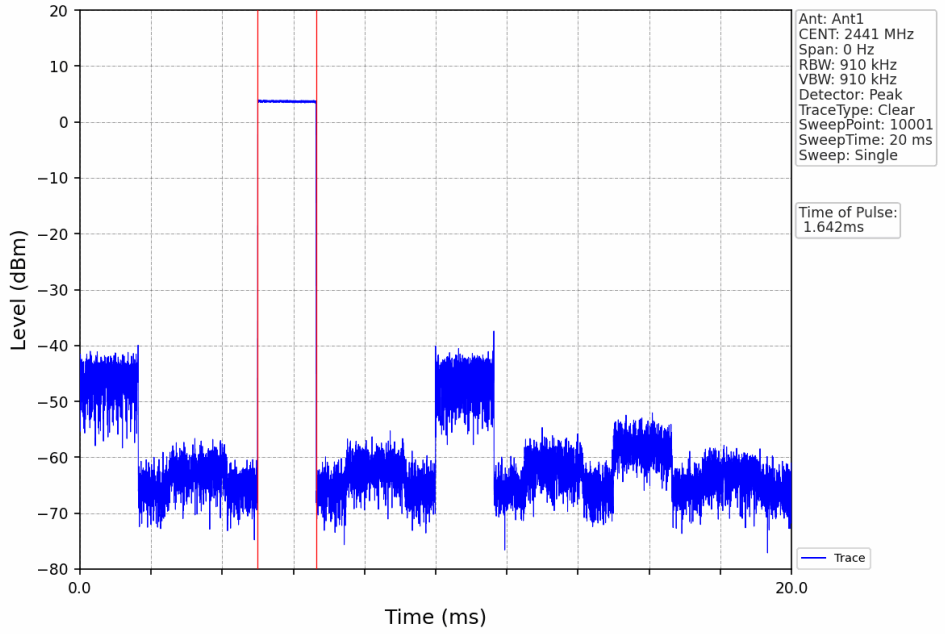
GFSK_DH1_HOPP_Ant1_NTNV



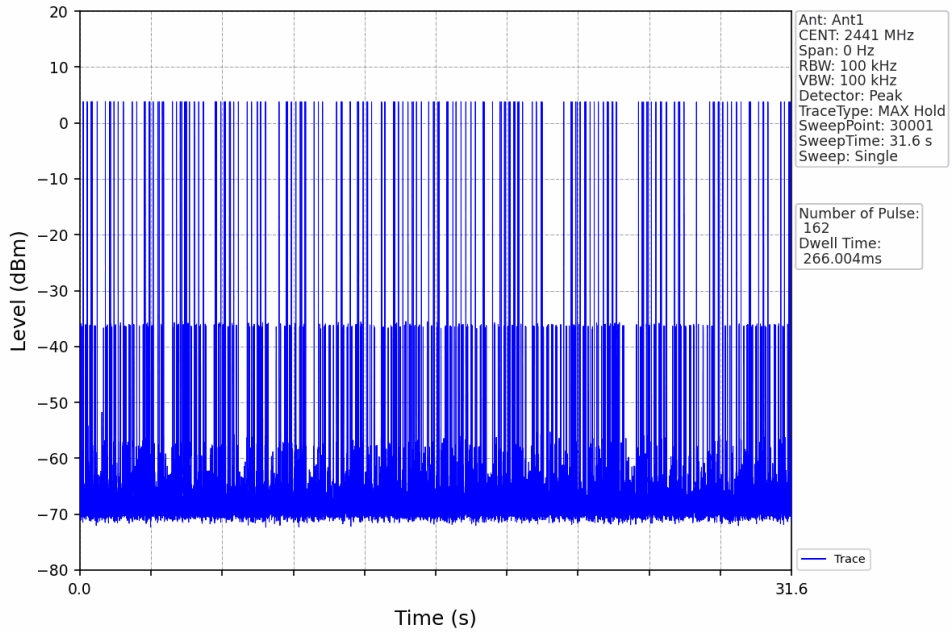

GFSK_DH1_HOPP_Ant1_NTNV



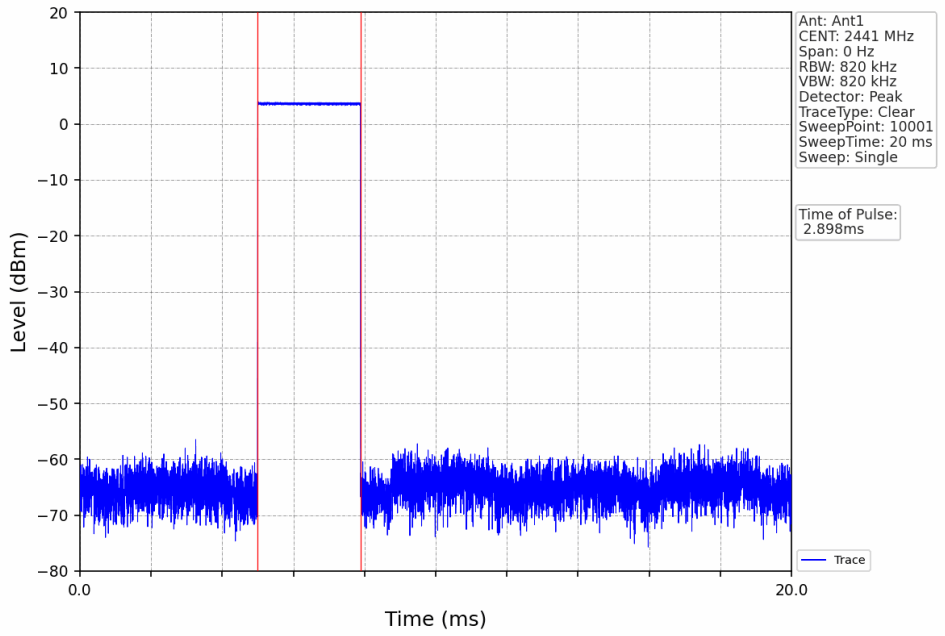
GFSK_DH3_HOPP_Ant1_NTNV



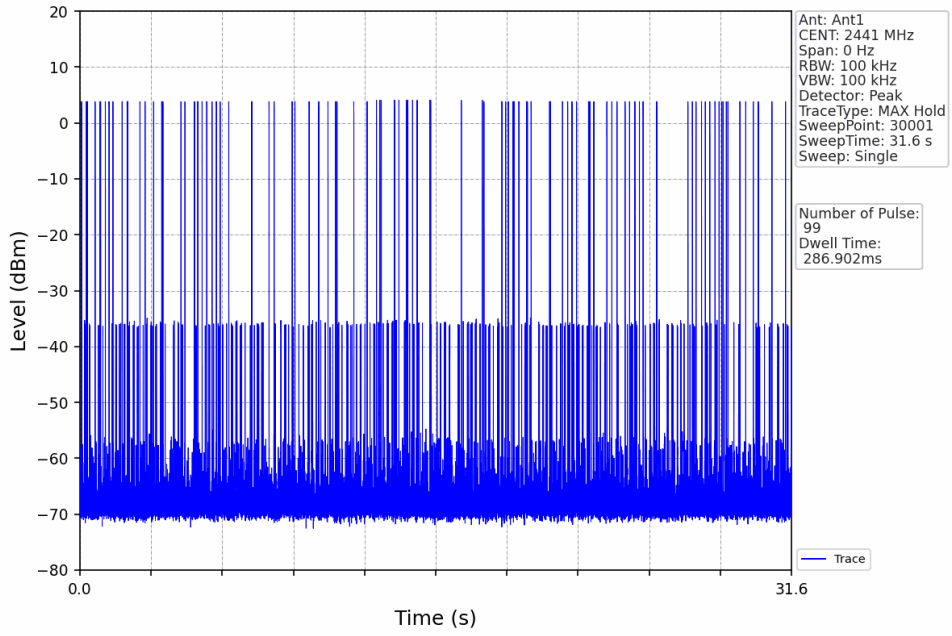

GFSK_DH3_HOPP_Ant1_NTNV



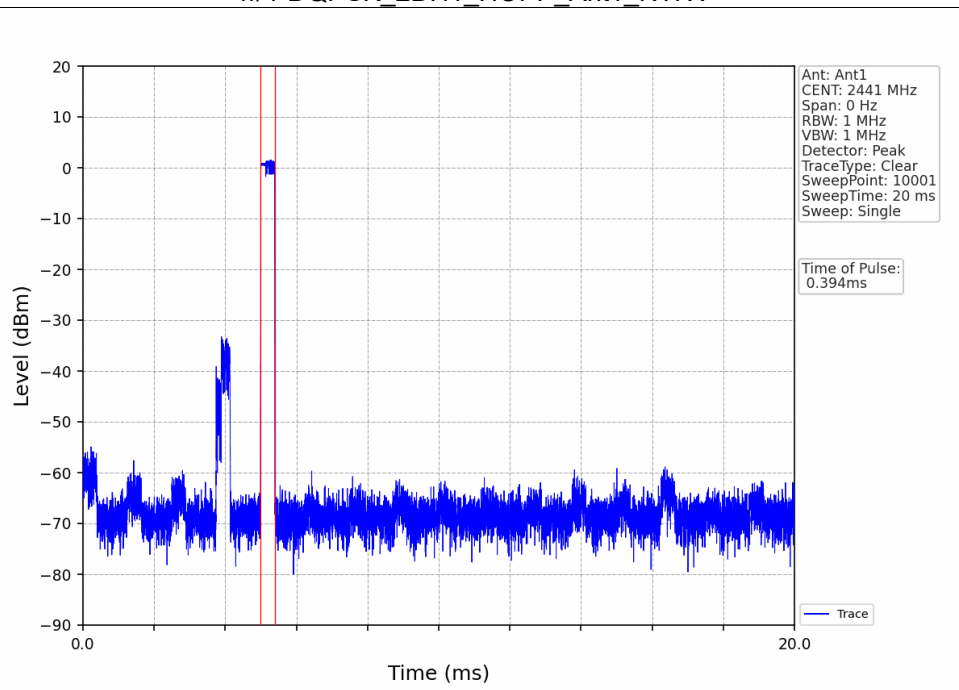
GFSK_DH5_HOPP_Ant1_NTNV



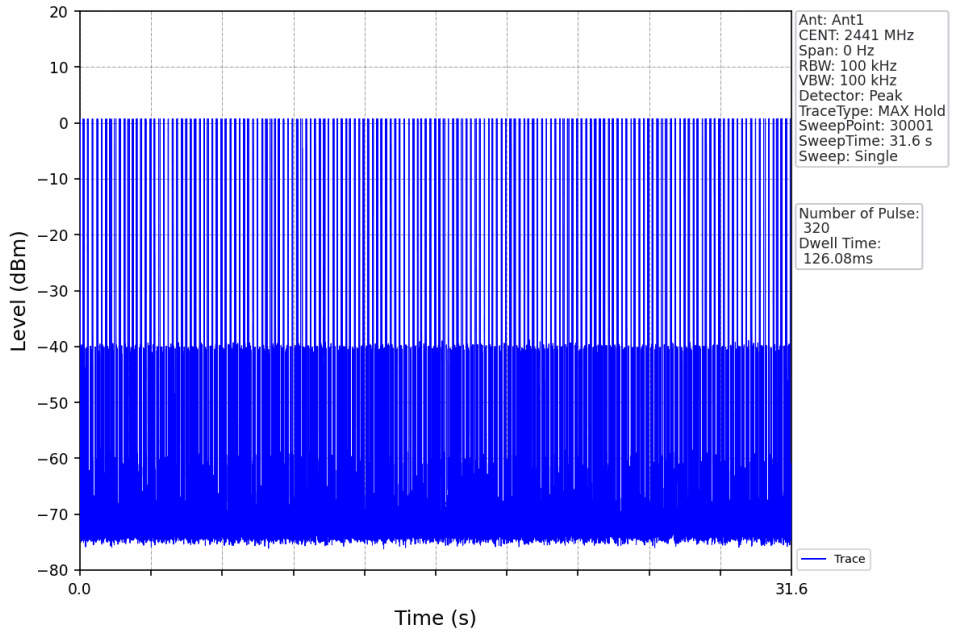

GFSK_DH5_HOPP_Ant1_NTNV



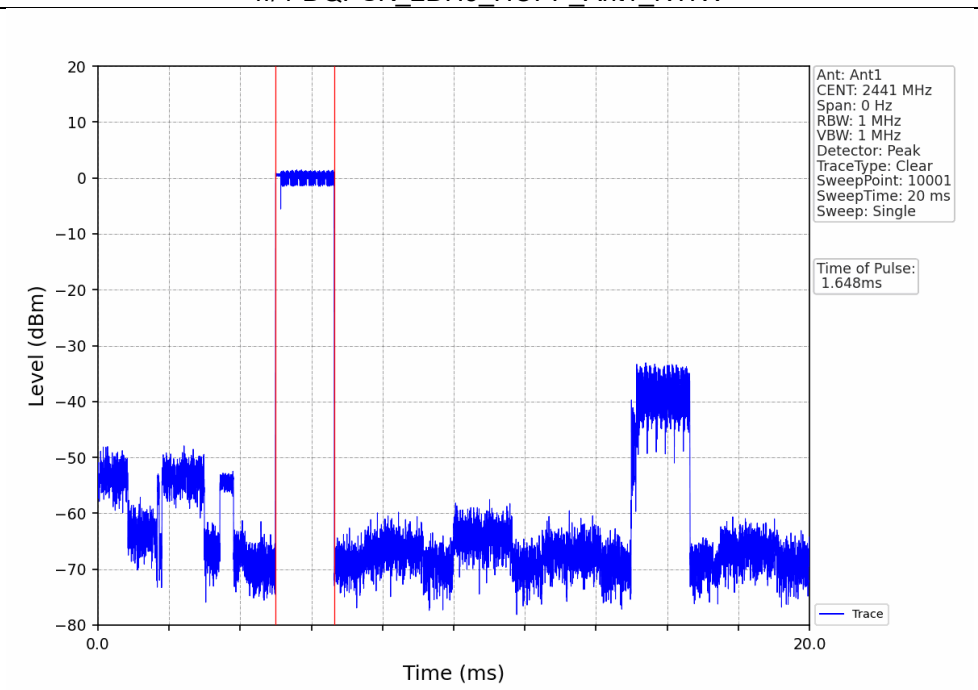
π/4-DQPSK_2DH1_HOPP_Ant1_NTNV



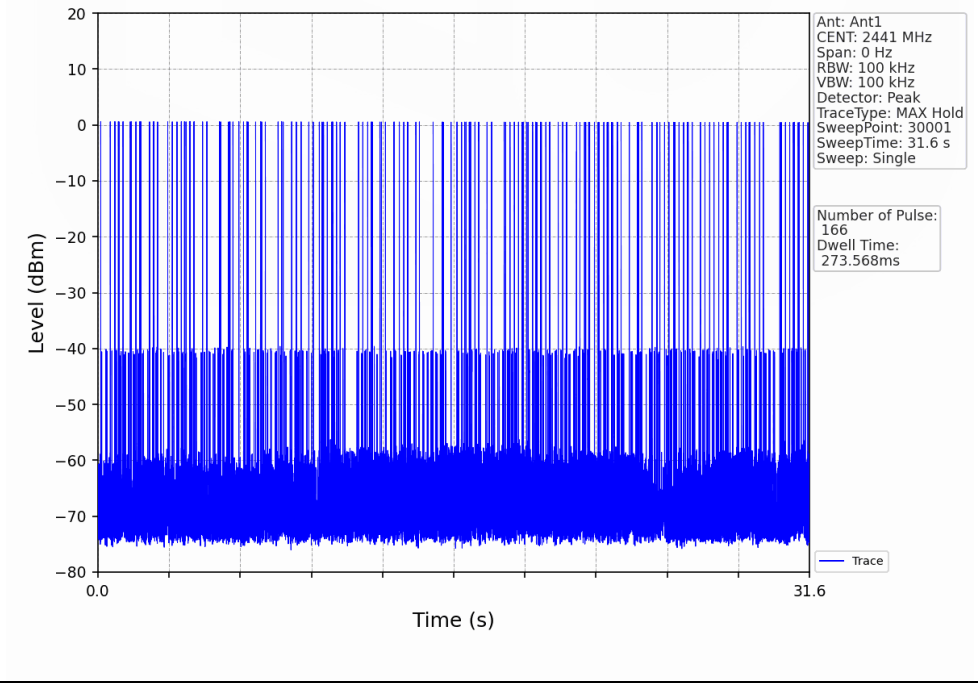

π/4-DQPSK_2DH1_HOPP_Ant1_NTNV



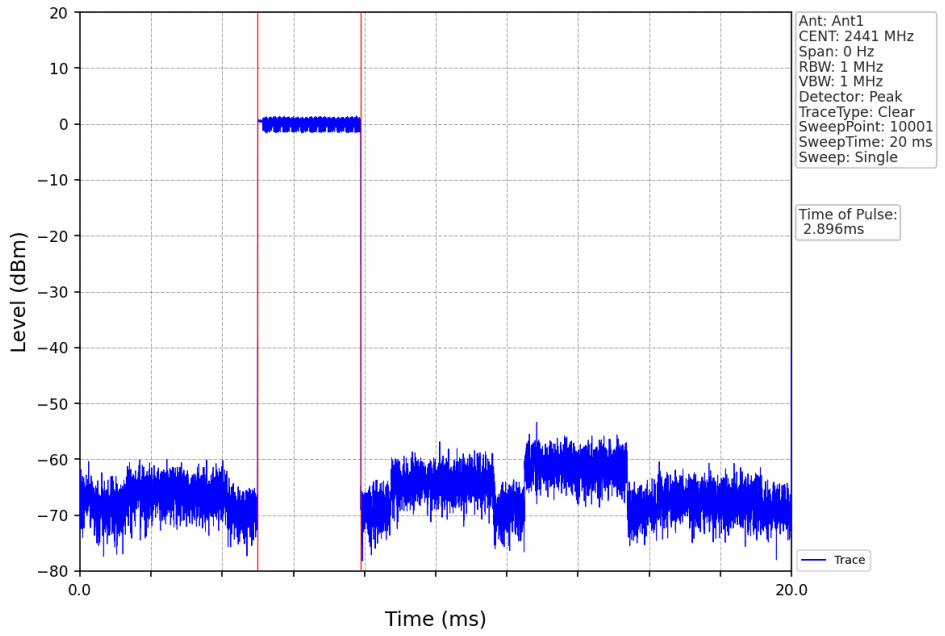
π/4-DQPSK_2DH3_HOPP_Ant1_NTNV



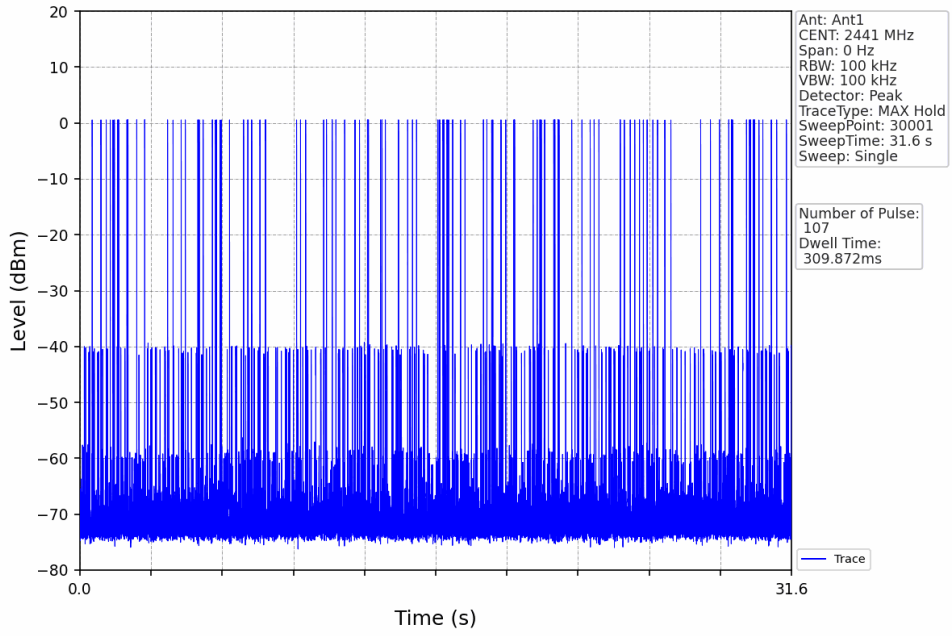

π/4-DQPSK_2DH3_HOPP_Ant1_NTNV



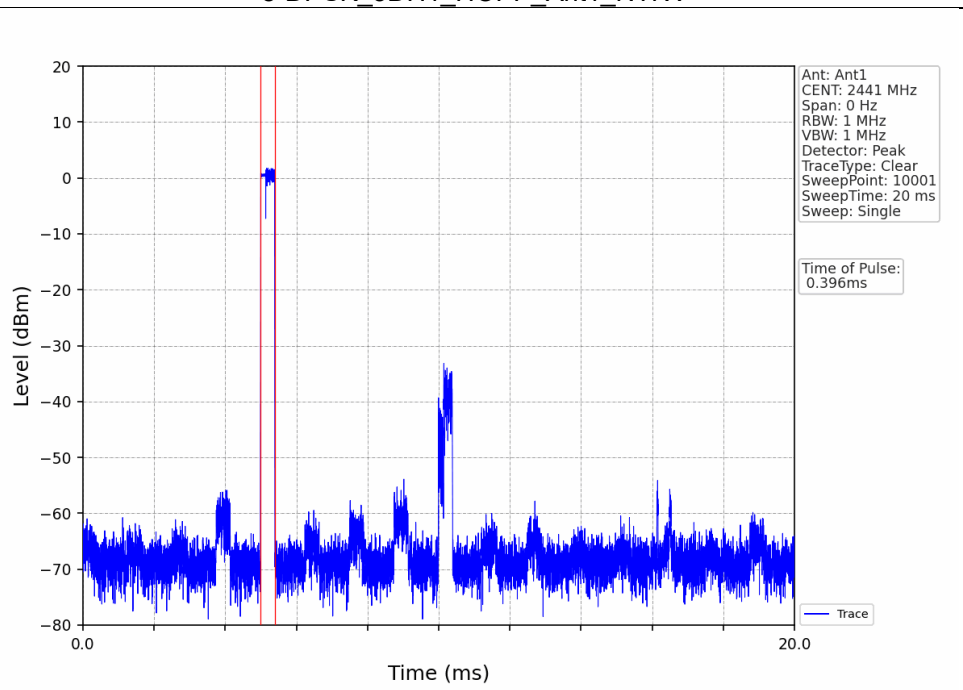
π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



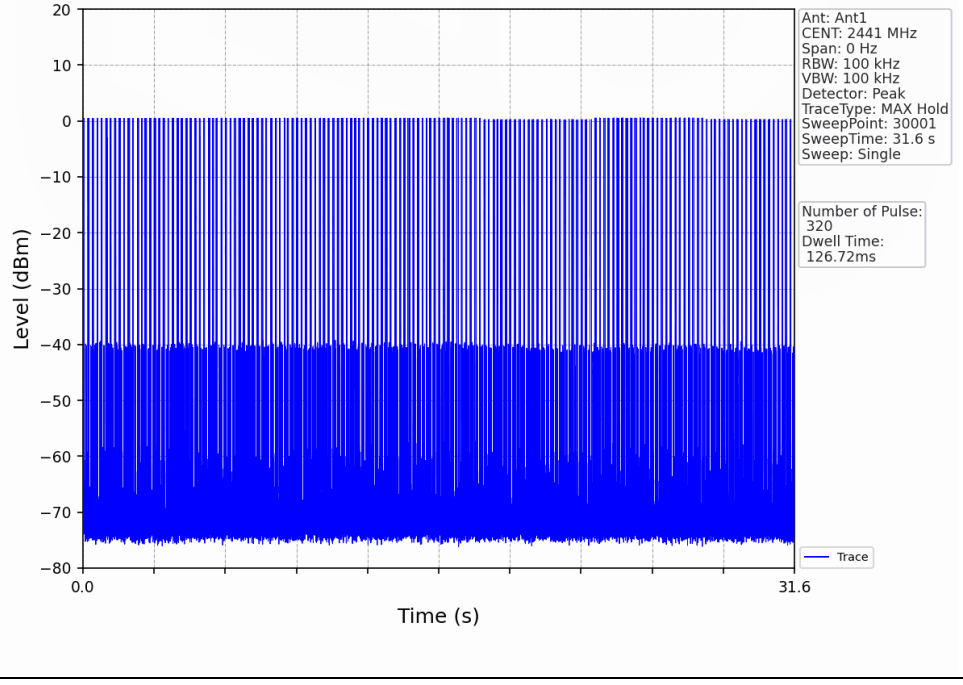

π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



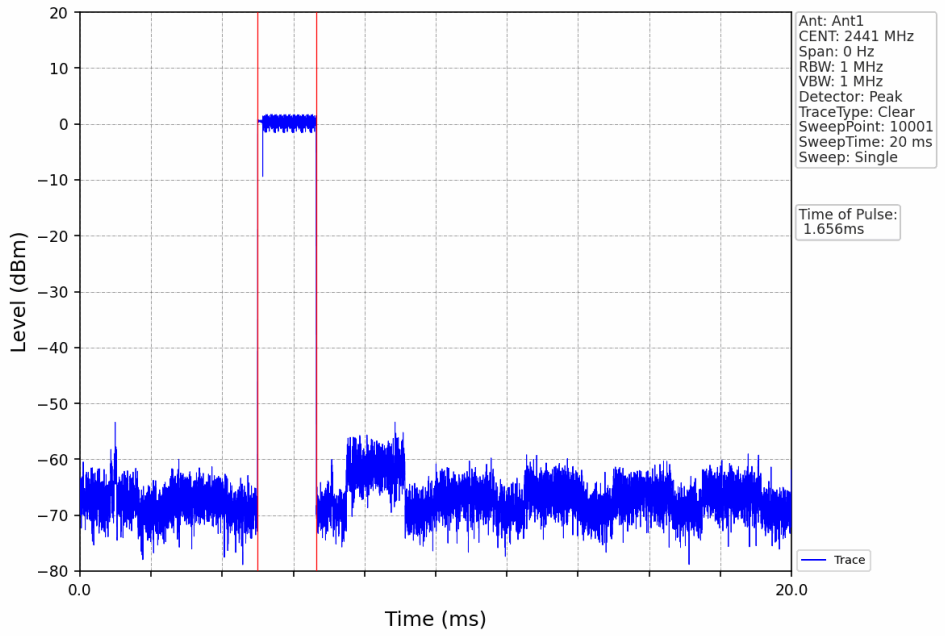
8-DPSK_3DH1_HOPP_Ant1_NTNV



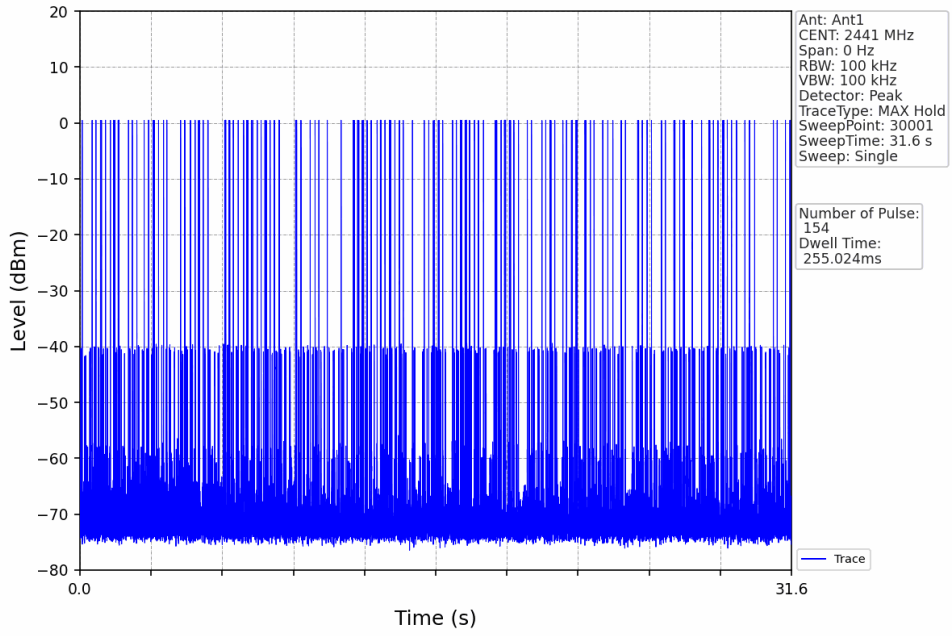

8-DPSK_3DH1_HOPP_Ant1_NTNV



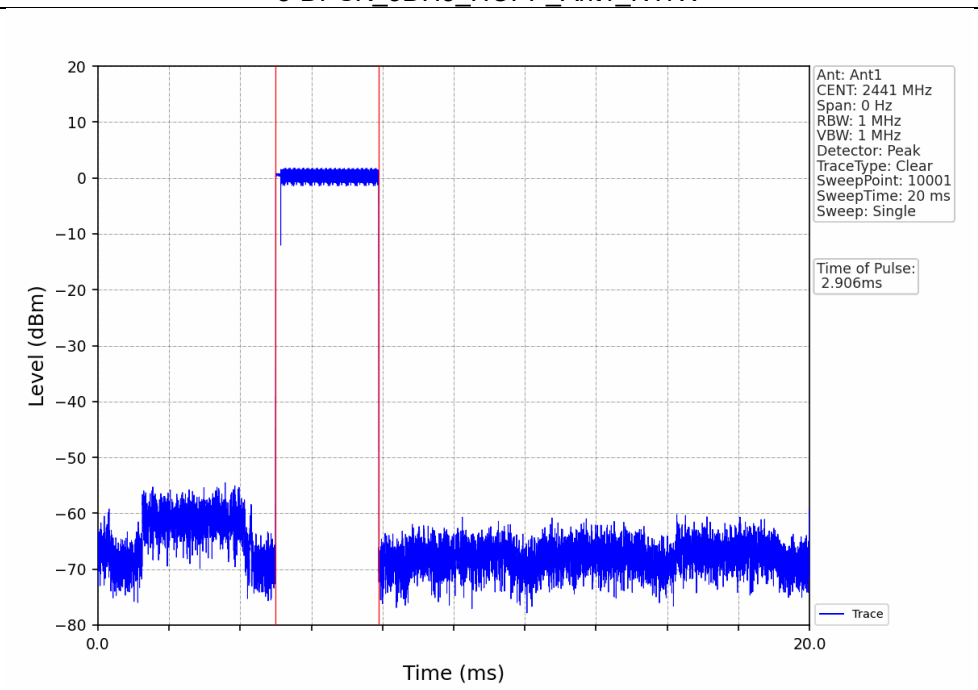
8-DPSK_3DH3_HOPP_Ant1_NTNV



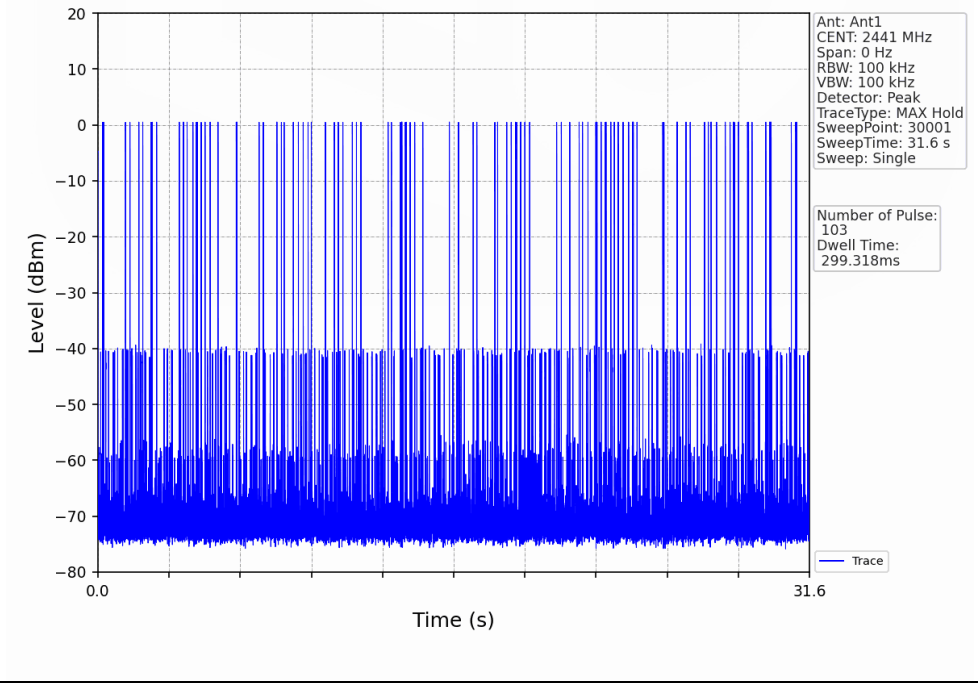

8-DPSK_3DH3_HOPP_Ant1_NTNV



8-DPSK_3DH5_HOPP_Ant1_NTNV




8-DPSK_3DH5_HOPP_Ant1_NTNV



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

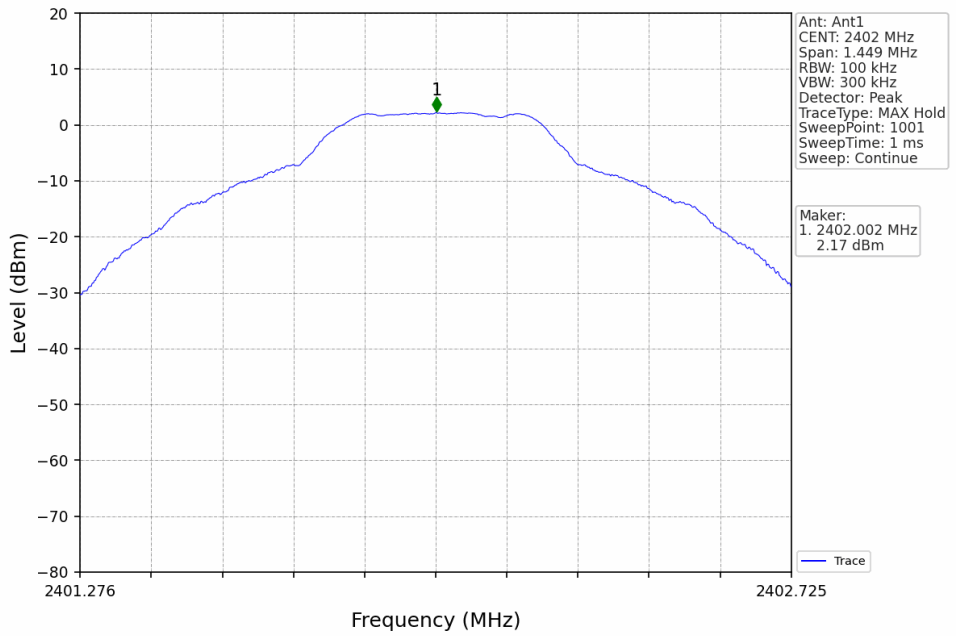
### 7.1 Ref

#### 7.1.1 Test Result

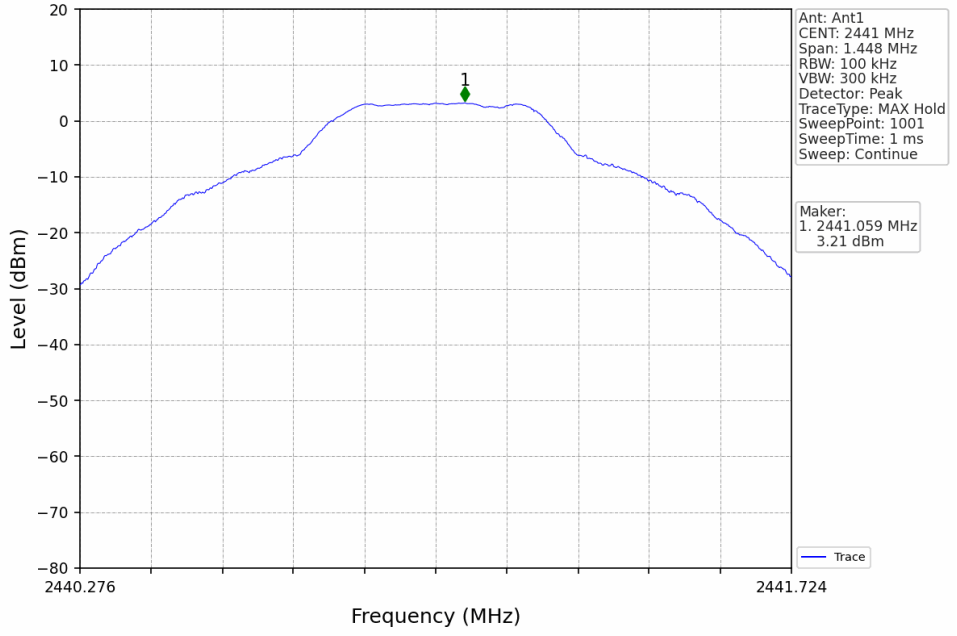
| Mode | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) |
|---|---|---|---|---|---|
| GFSK | SISO | 2402 | DH5 | 1 | 2.17 |
| | | 2441 | DH5 | 1 | 3.21 |
| | | 2480 | DH5 | 1 | 3.79 |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | -2.97 |
| | | 2441 | 2DH5 | 1 | -2.04 |
| | | 2480 | 2DH5 | 1 | -1.61 |
| 8-DPSK | SISO | 2402 | 3DH5 | 1 | -3.26 |
| | | 2441 | 3DH5 | 1 | -2.26 |
| | | 2480 | 3DH5 | 1 | -1.88 |
| 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 Test Graph

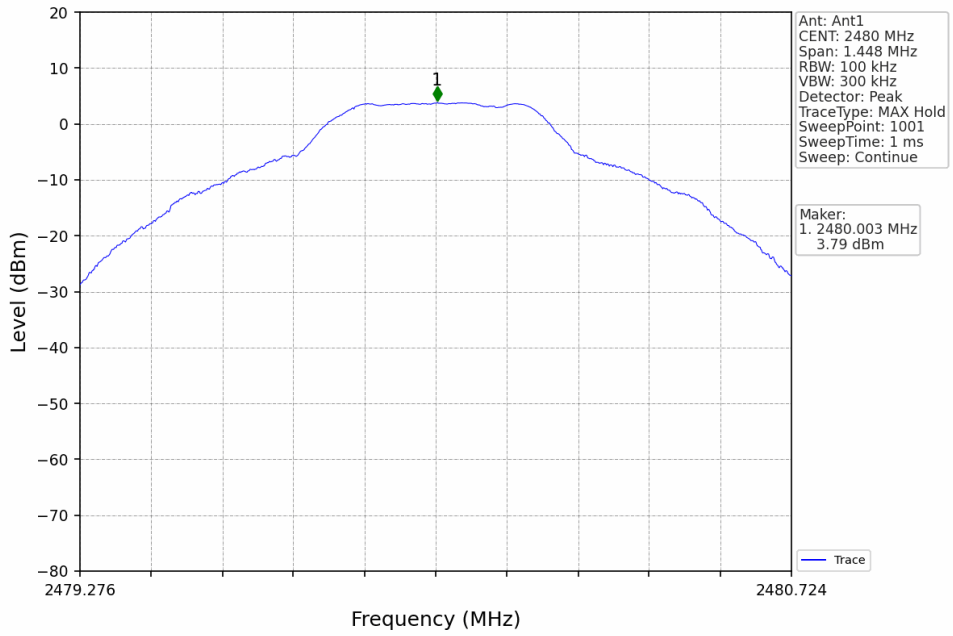
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



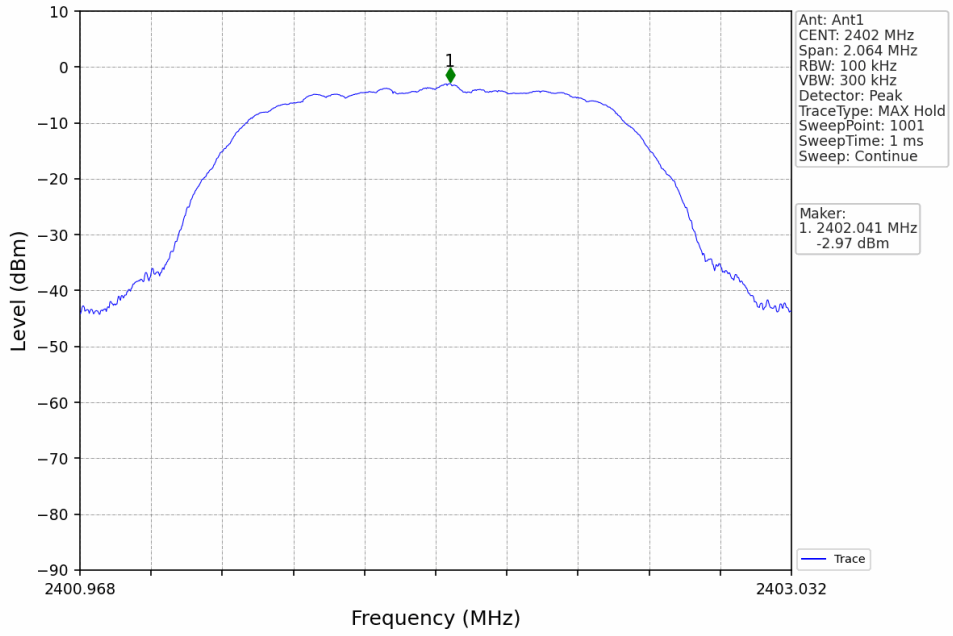

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



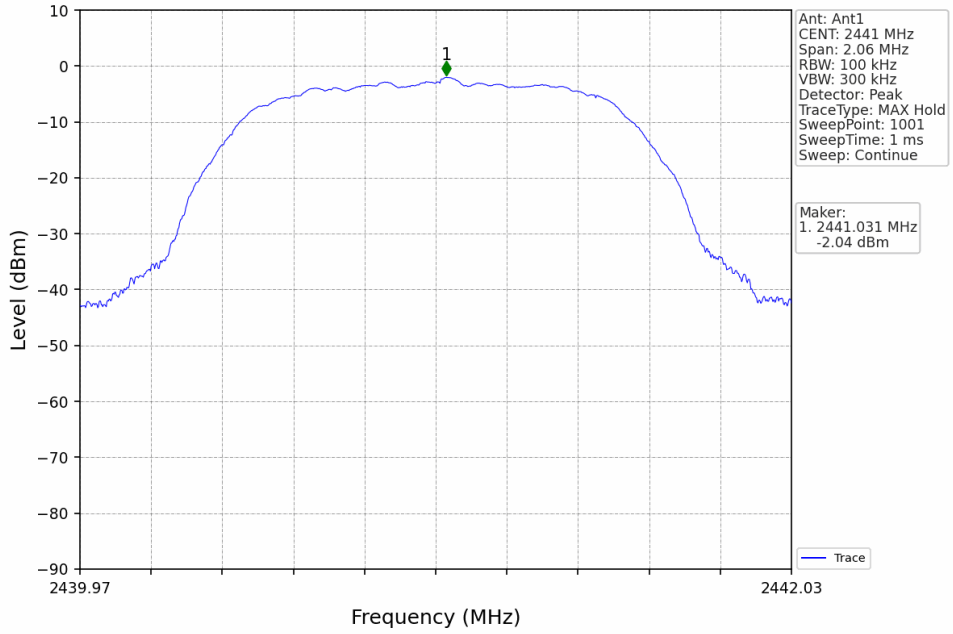
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



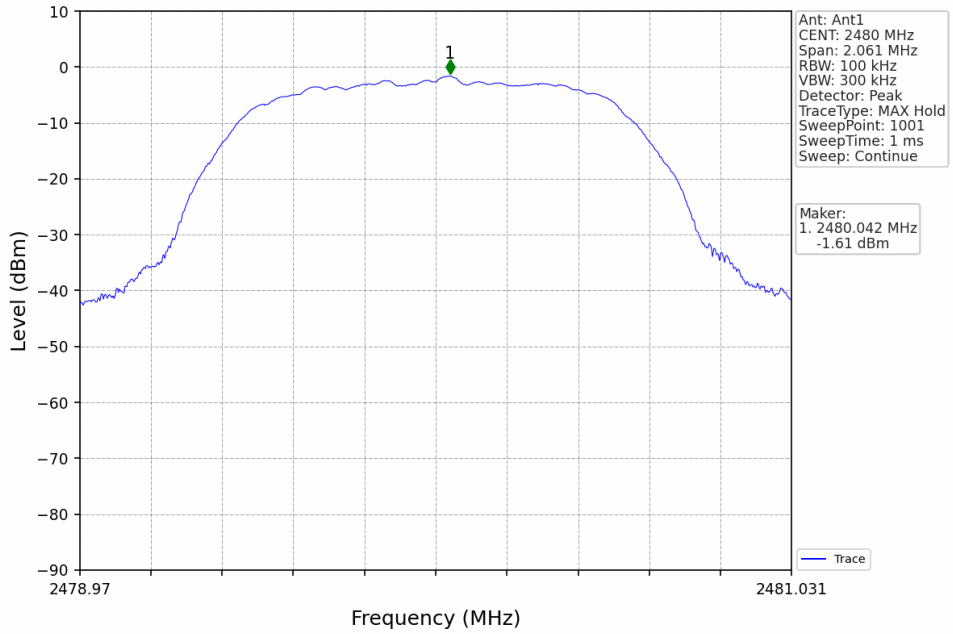

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



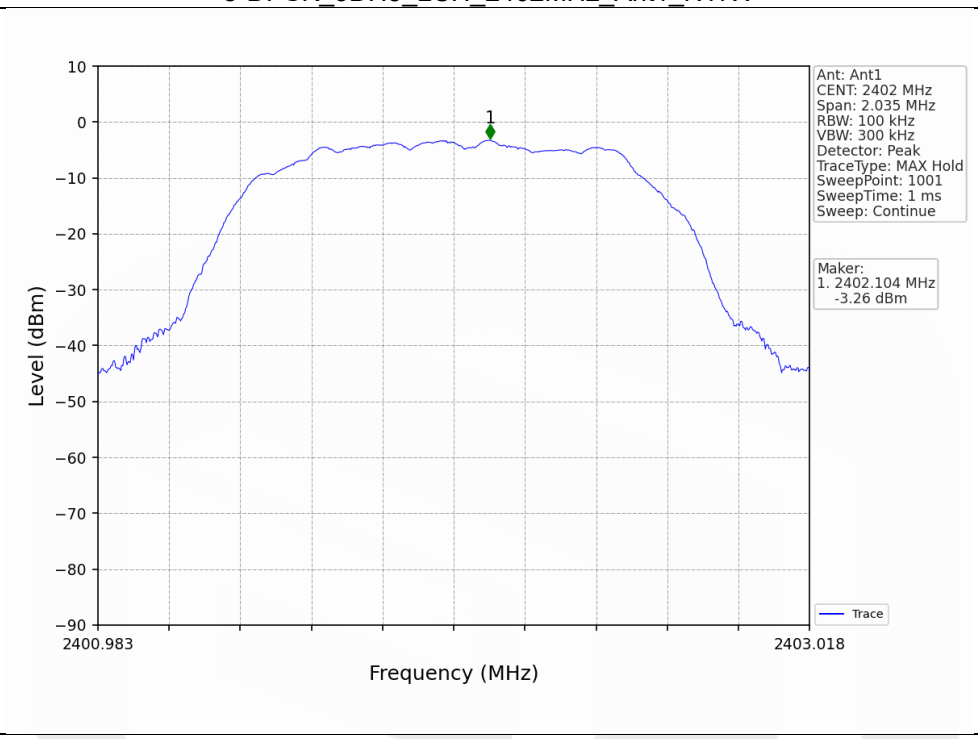
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



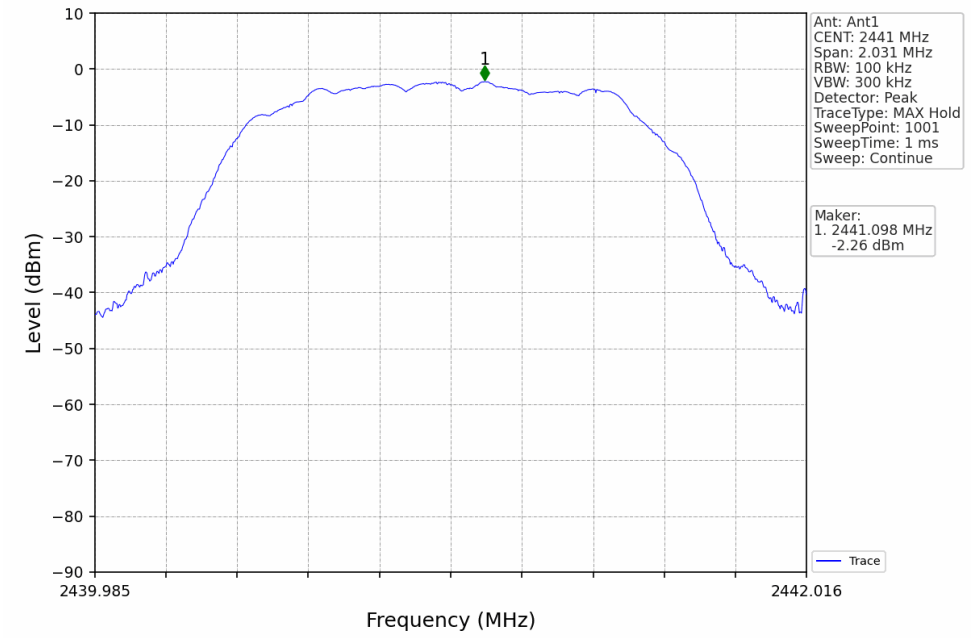

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



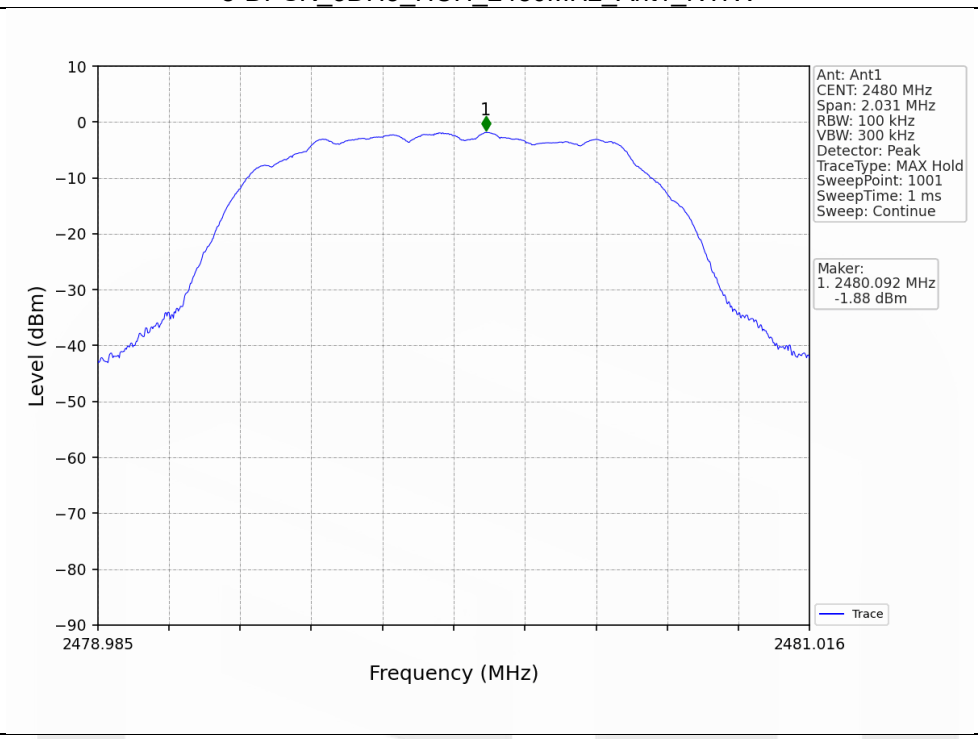
8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8-DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



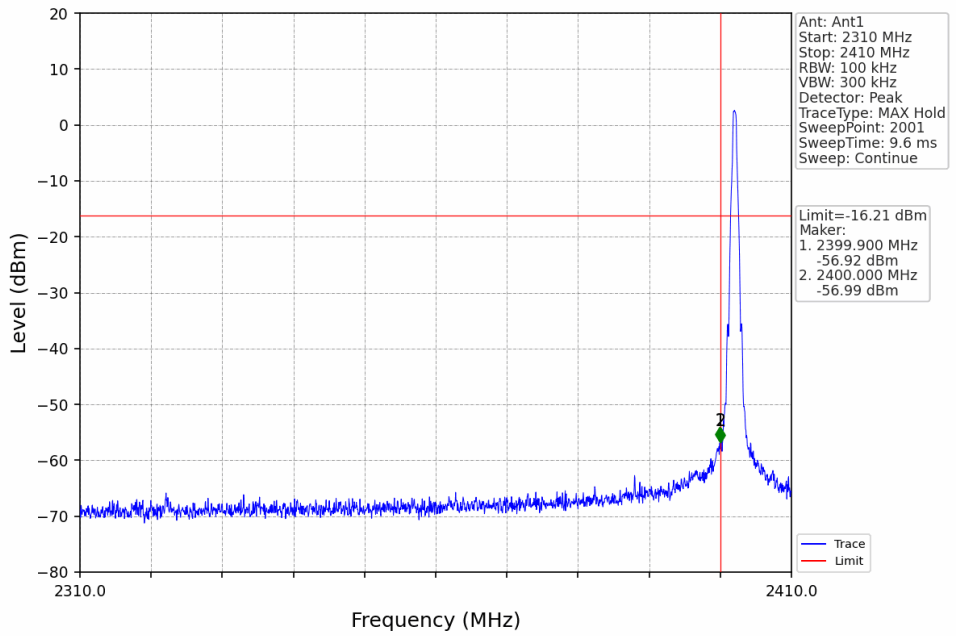
### 7.2 CSE

#### 7.2.1 Test Result

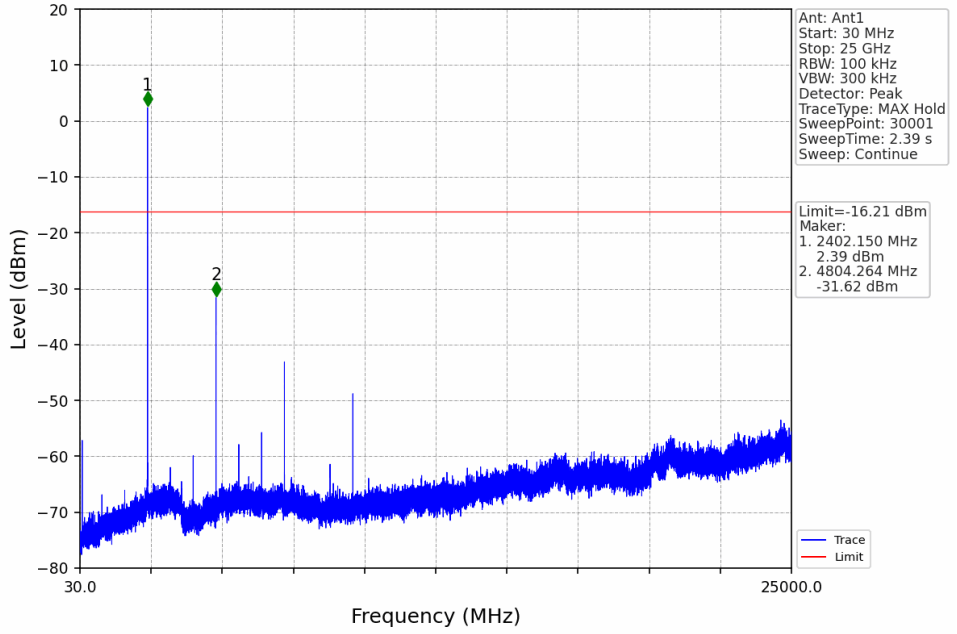
| Mode | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| GFSK | SISO | 2402 | DH5 | 1 | 3.79 | -16.21 | Pass |
| | | 2441 | DH5 | 1 | 3.79 | -16.21 | Pass |
| | | 2480 | DH5 | 1 | 3.79 | -16.21 | Pass |
| | | HOPP | DH5 | 1 | 3.79 | -16.21 | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | -1.61 | -21.61 | Pass |
| | | 2441 | 2DH5 | 1 | -1.61 | -21.61 | Pass |
| | | 2480 | 2DH5 | 1 | -1.61 | -21.61 | Pass |
| | | HOPP | 2DH5 | 1 | -1.61 | -21.61 | Pass |
| 8-DPSK | SISO | 2402 | 3DH5 | 1 | -1.88 | -21.88 | Pass |
| | | 2441 | 3DH5 | 1 | -1.88 | -21.88 | Pass |
| | | 2480 | 3DH5 | 1 | -1.88 | -21.88 | Pass |
| | | HOPP | 3DH5 | 1 | -1.88 | -21.88 | 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. | | | | | | | |

7.2.2 Test Graph

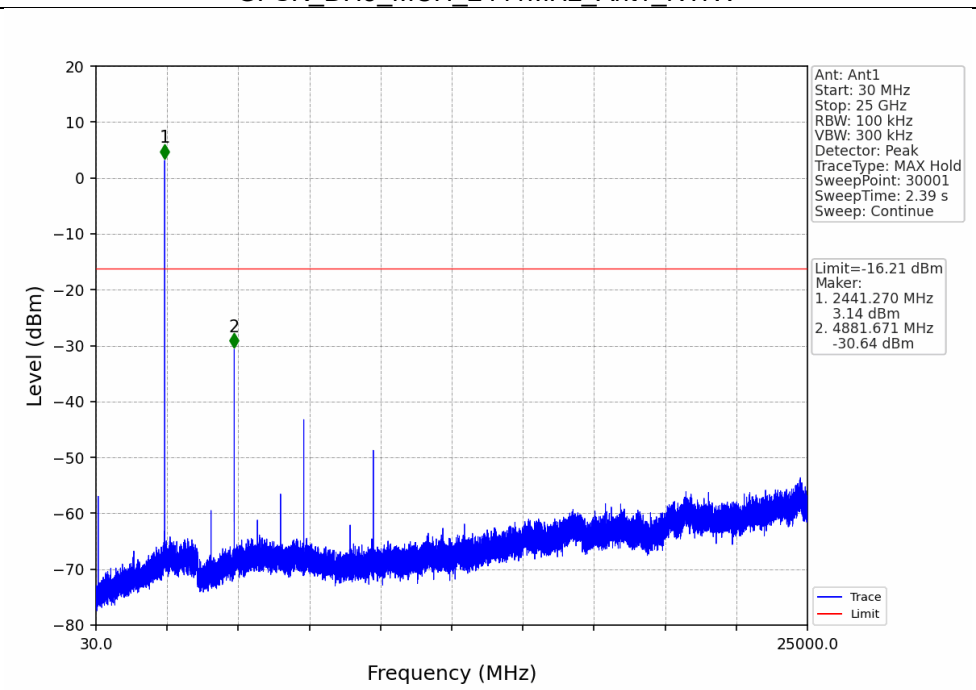
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



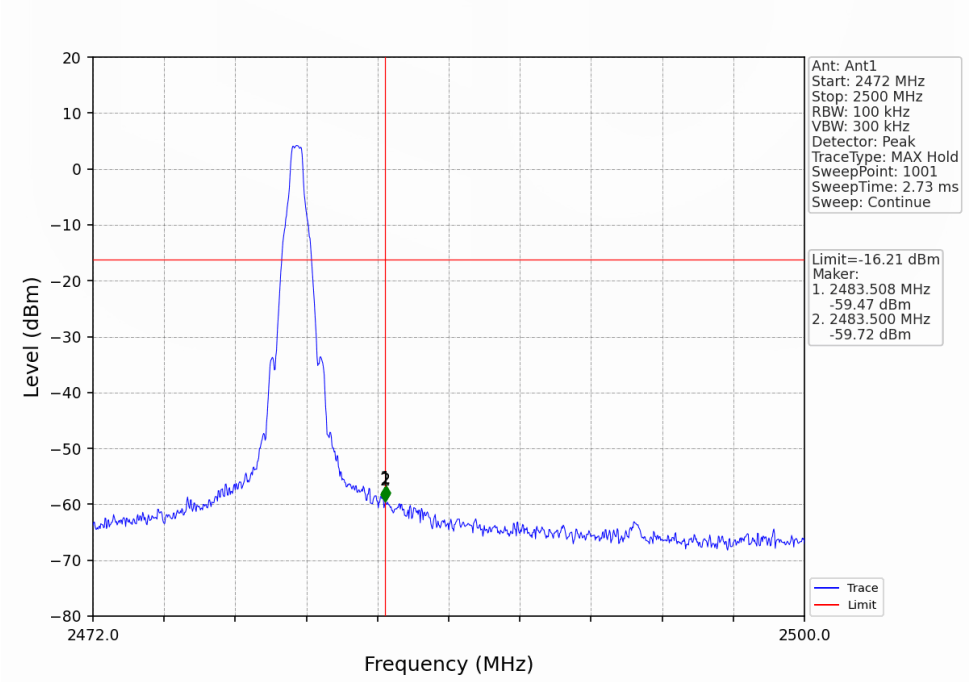

GFSK_DH5_LCH_2402MHz_Ant1_NTNV



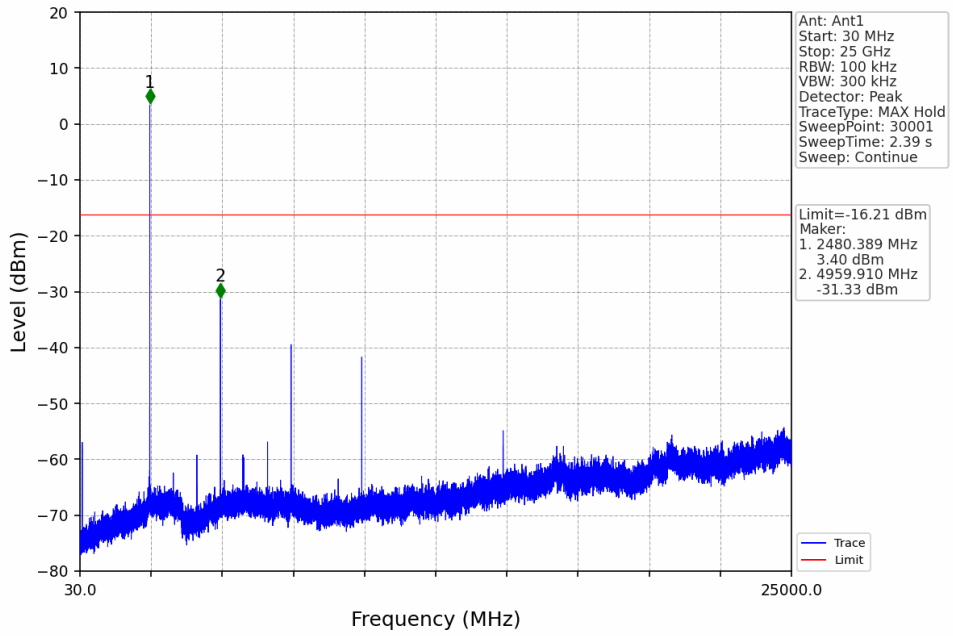
GFSK_DH5_MCH_2441MHz_Ant1_NTNV



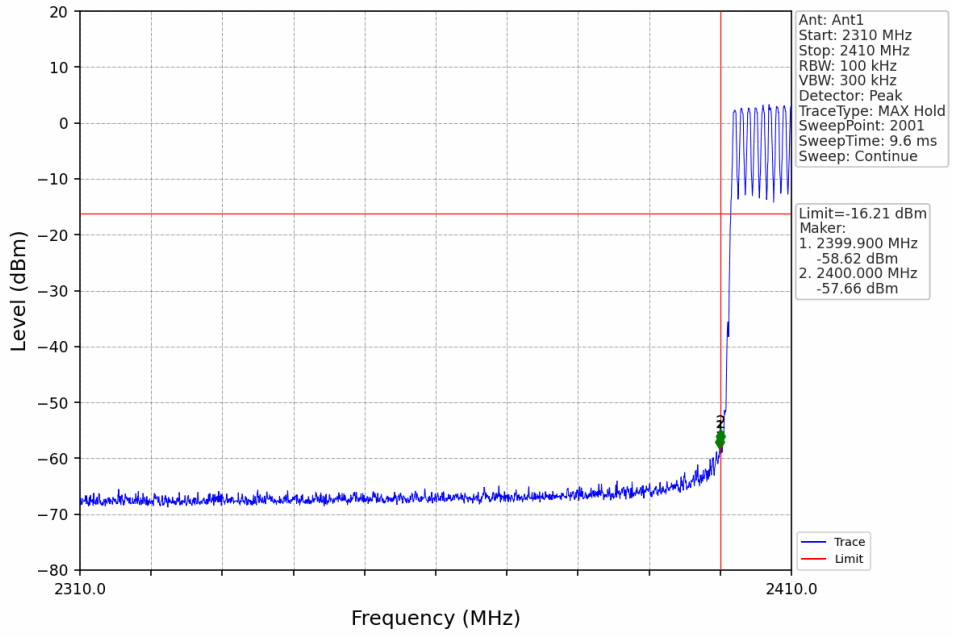

GFSK_DH5_HCH_2480MHz_Ant1_NTNV



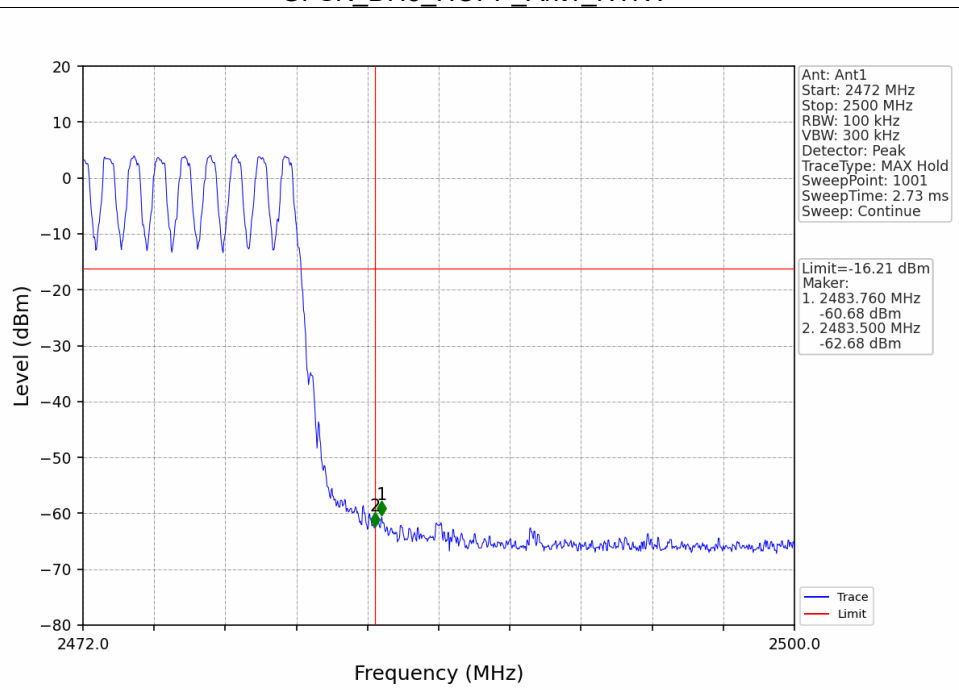
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



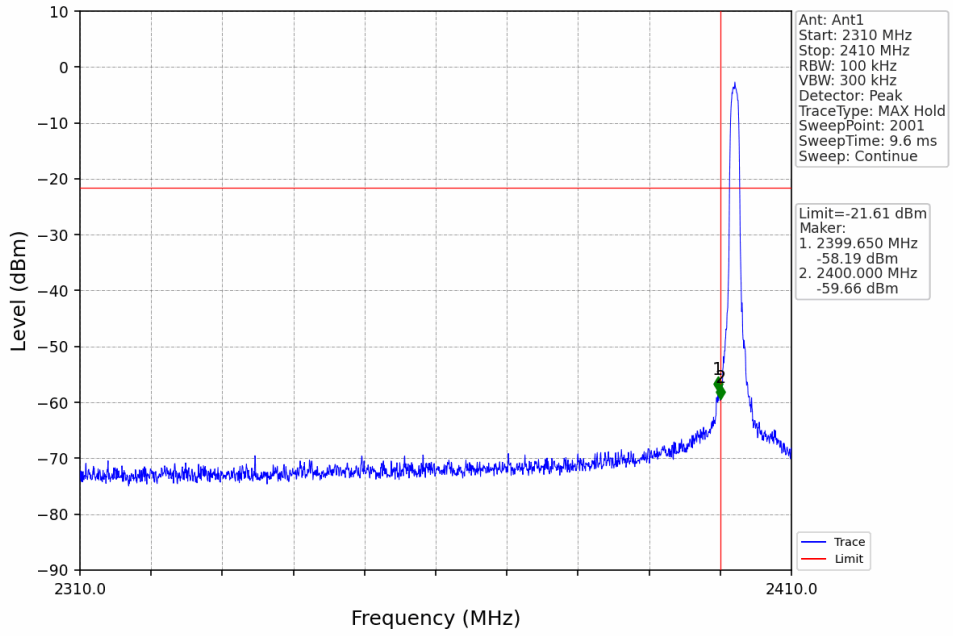

GFSK_DH5_HOPP_Ant1_NTNV



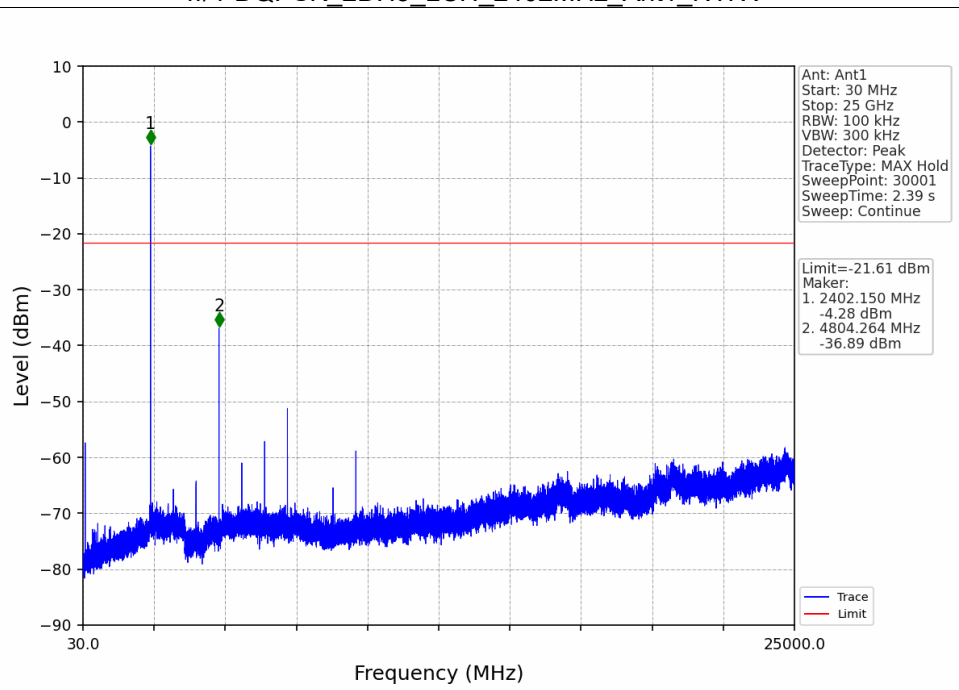
GFSK_DH5_HOPP_Ant1_NTNV



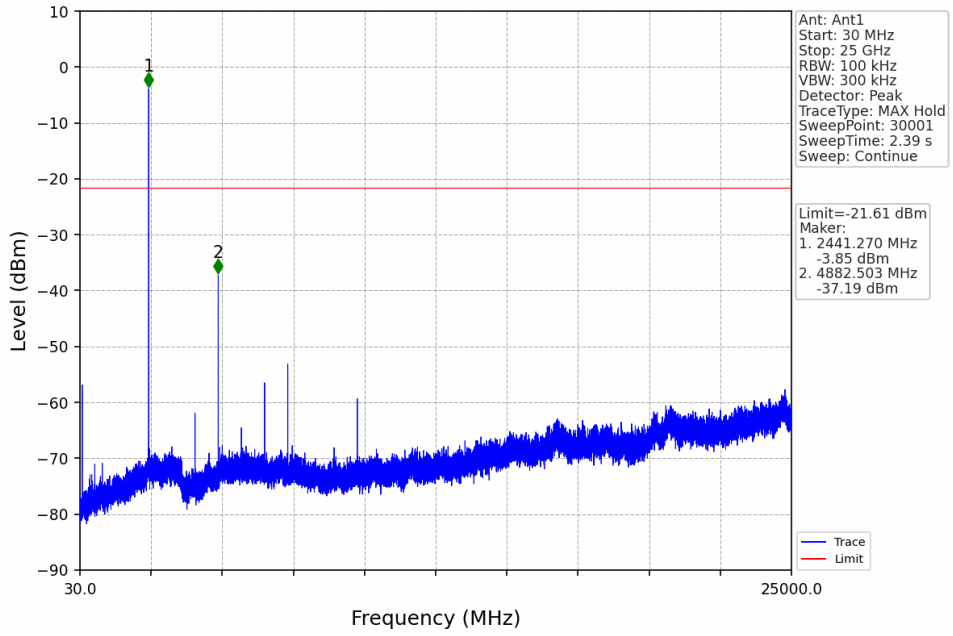

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



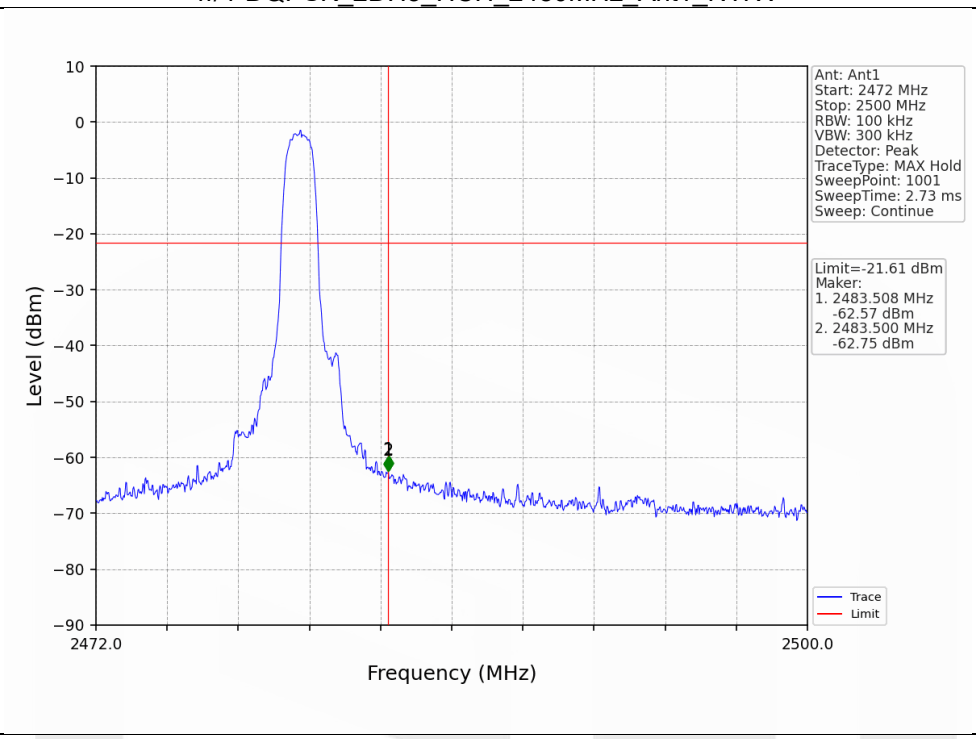
π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



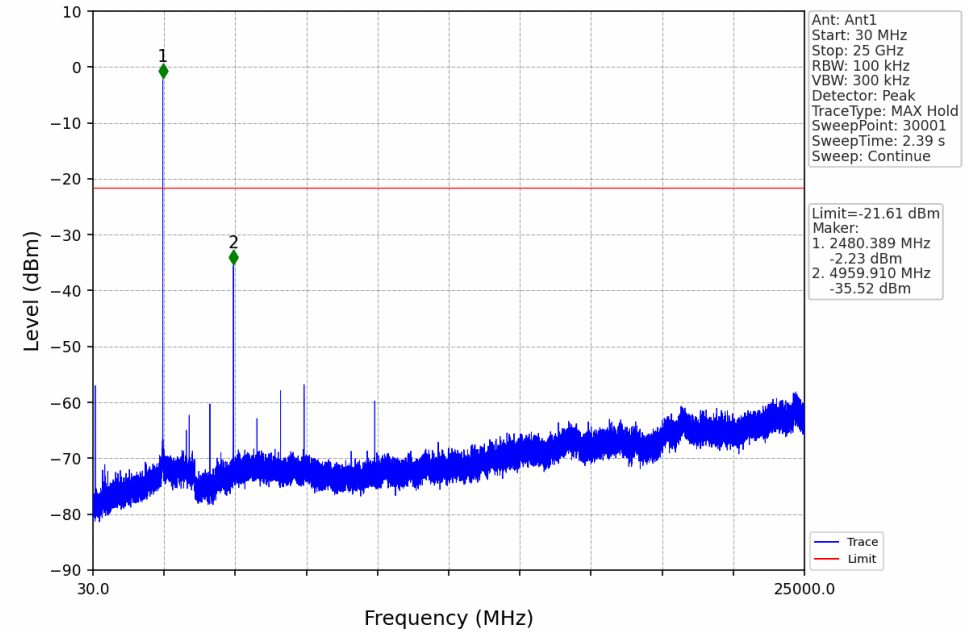

π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



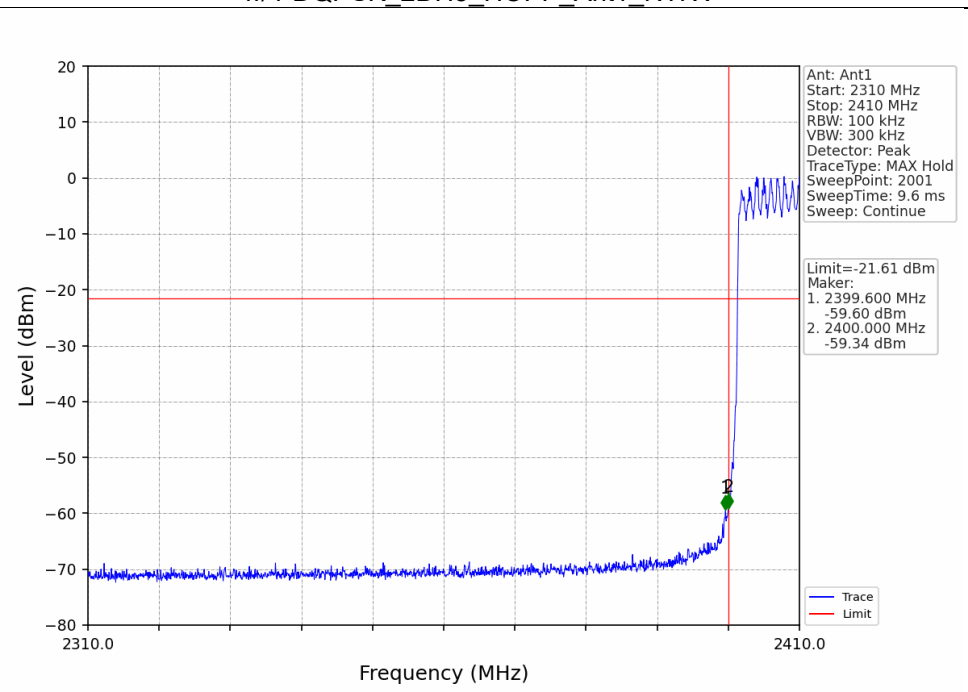
π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



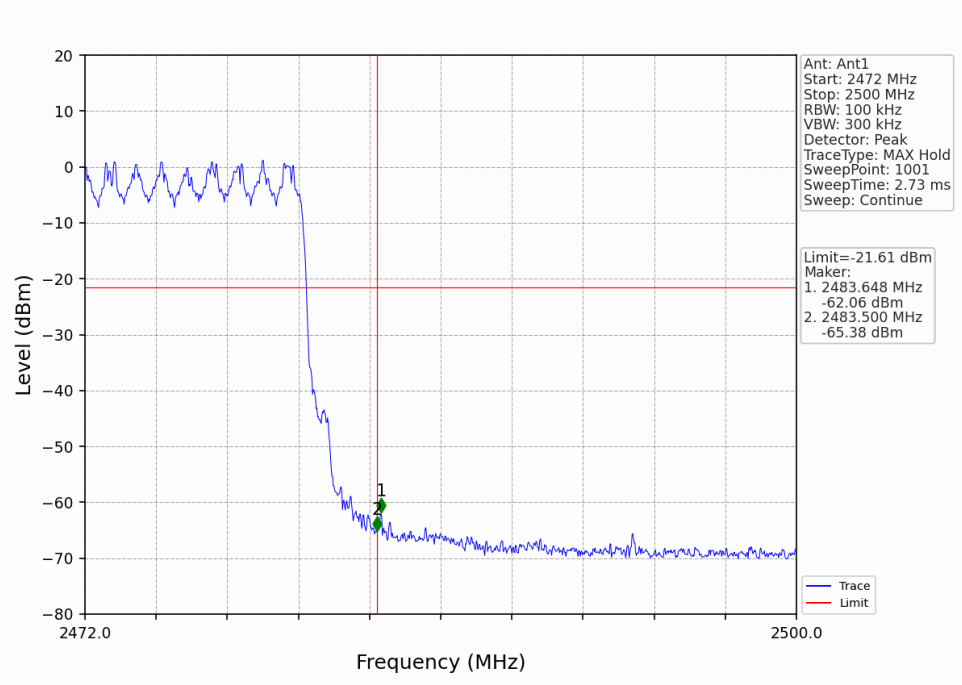

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



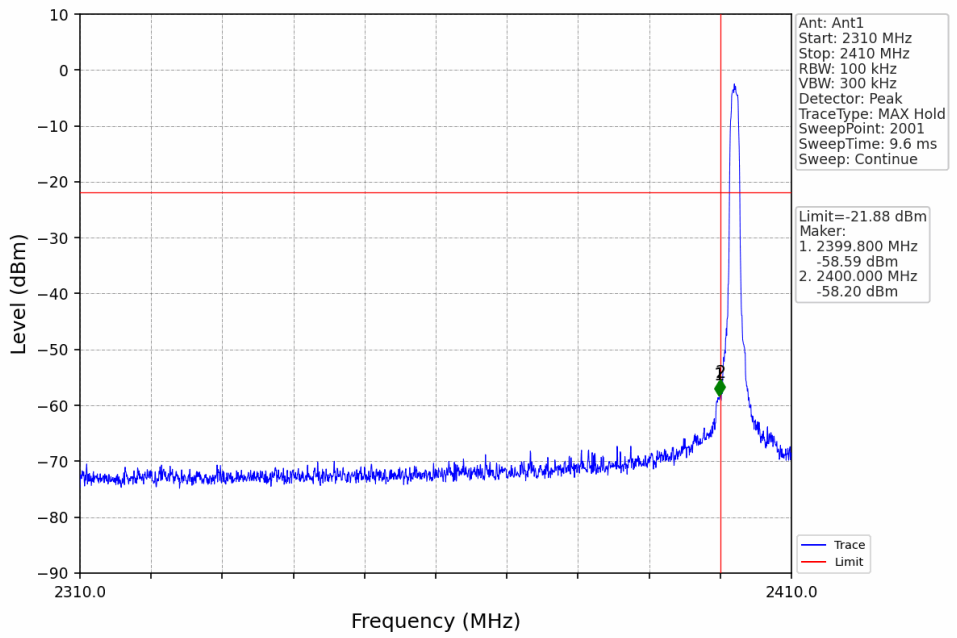
π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



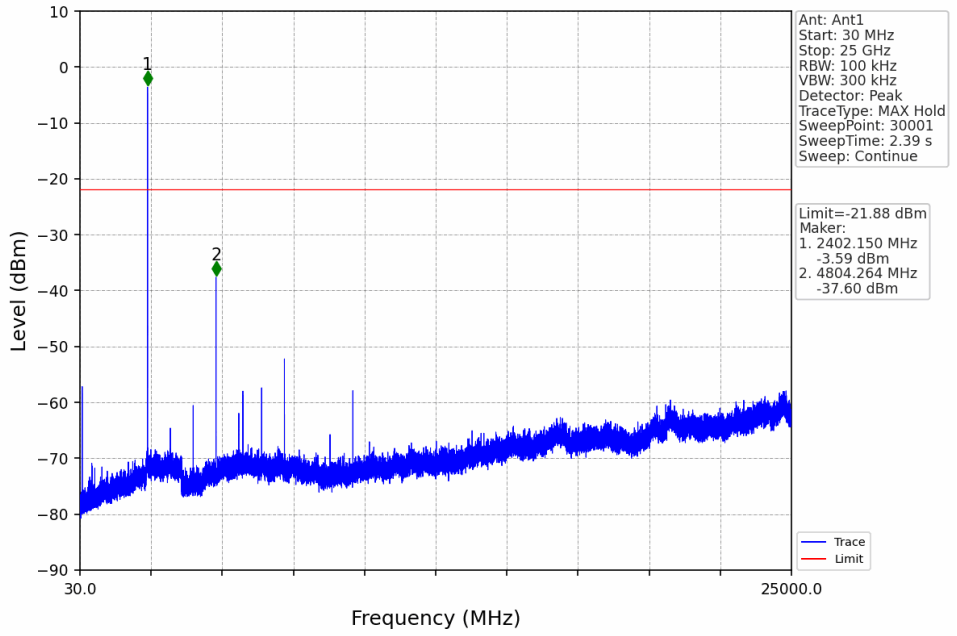

π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



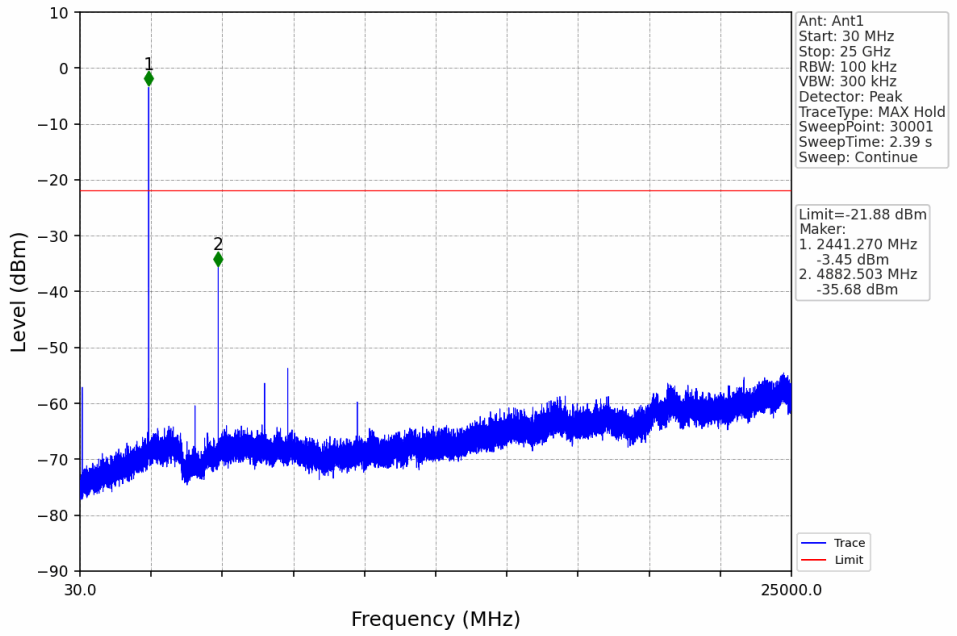
8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



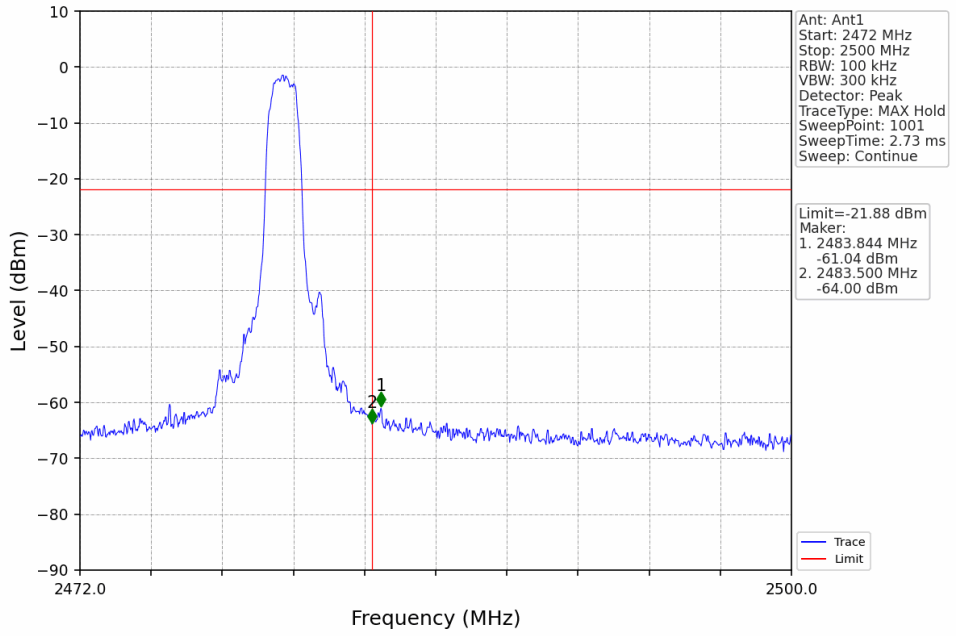

8-DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8-DPSK_3DH5_MCH_2441MHz_Ant1_NTNV




8-DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



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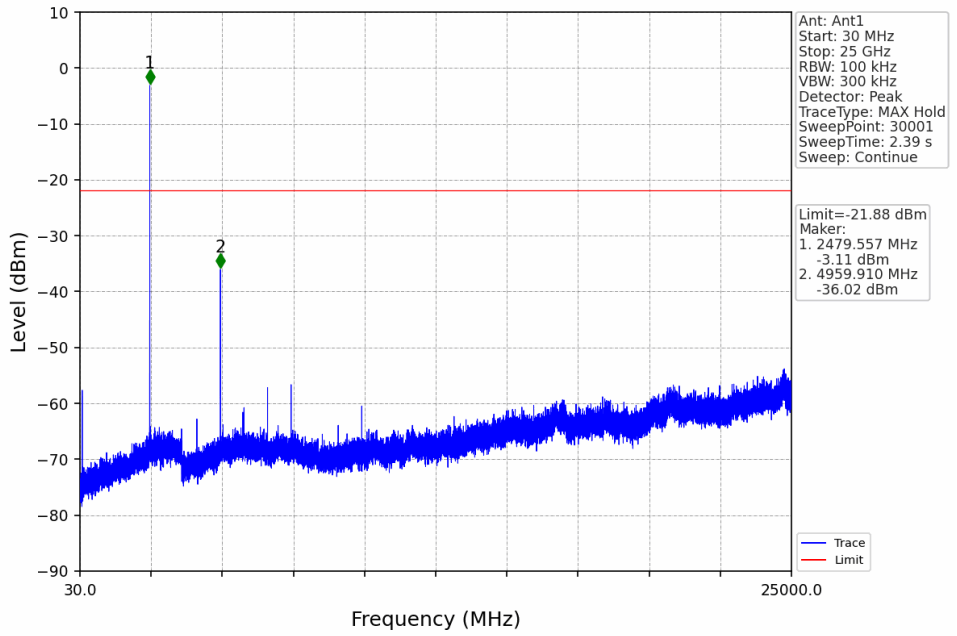


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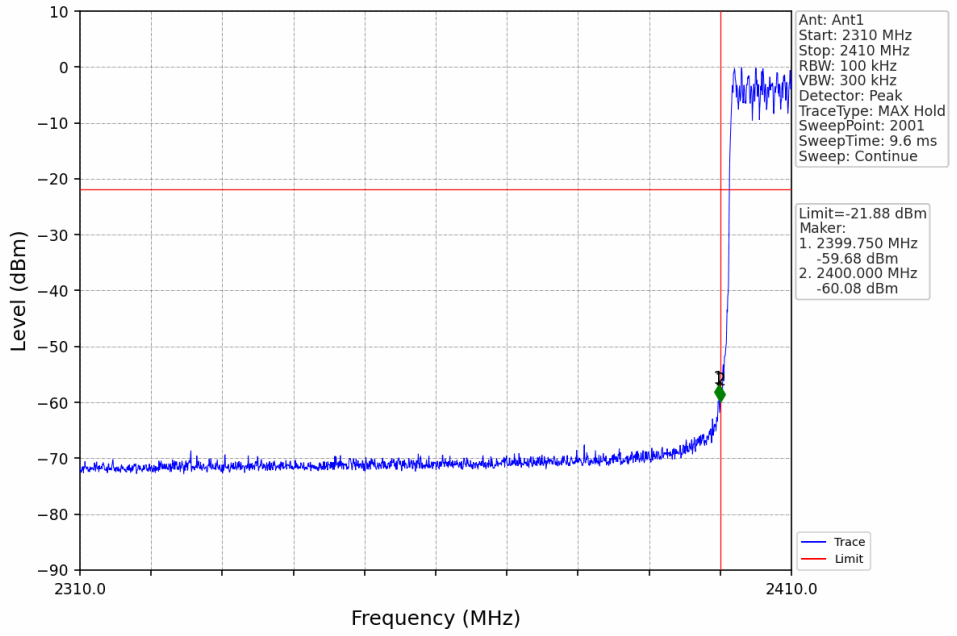
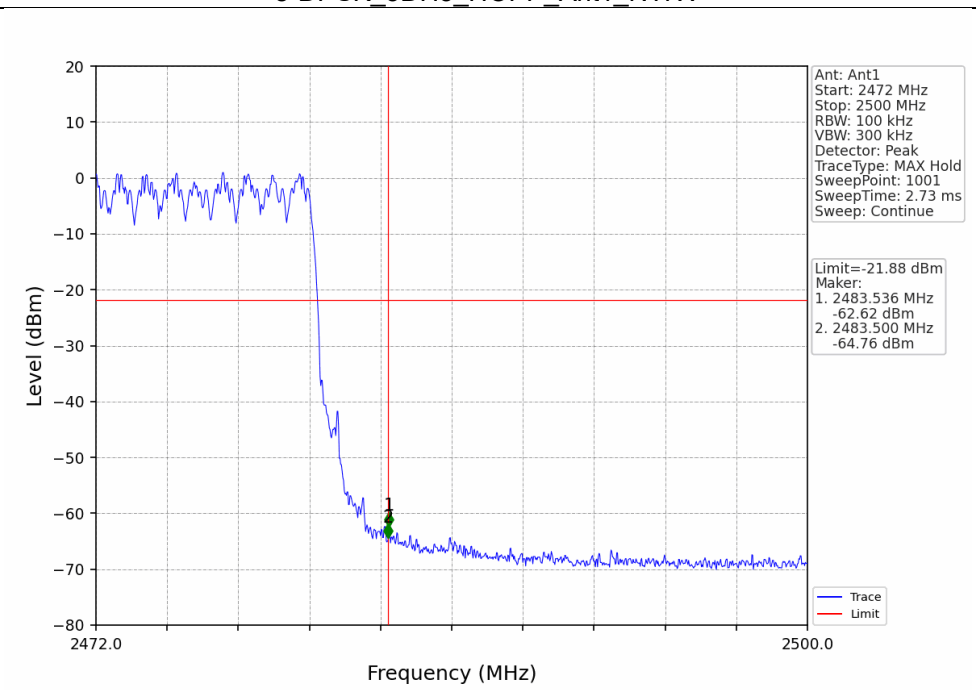


8-DPSK_3DH5_HOPP_Ant1_NTNV

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