# ANNEX D TEST DATA

# For

| | |
|---|---|
| Project No.: | 8231EU013101W |
| Client: | Shenzhen Hruitu Intelligence Co., Ltd |
| Product Name: | Skiing wireless Bluetooth headphone |
| Model No.: | T3 |
| FCC ID: | 2BH4I-T3 |
| Technology: | Bluetooth BDR&EDR |
| Test Engineer: | Mikey zhu |
| Test Date: | 2024-08-13 |

# 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 Test Result

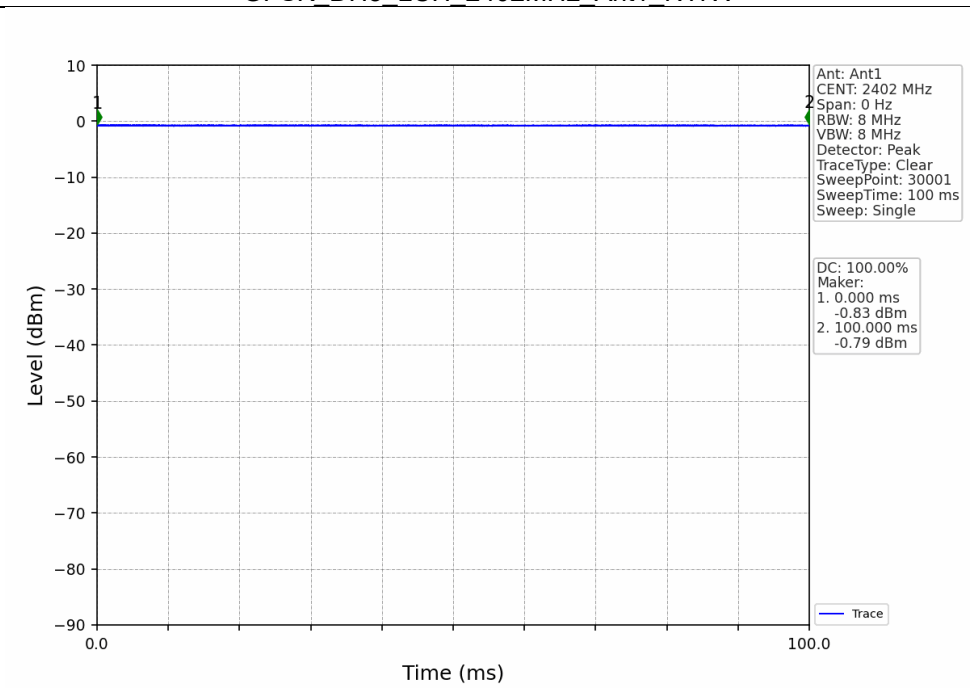
#### 1.1.1 Ant1

| 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 | 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 | 2.893 | 3.749 | 77.17 | 1.13 | 0.04 |
| | | 2441 | 2DH5 | 2.893 | 3.749 | 77.17 | 1.13 | 0.04 |
| | | 2480 | 2DH5 | 2.893 | 3.749 | 77.17 | 1.13 | 0.04 |
| 8DPSK | SISO | 2402 | 3DH5 | 2.895 | 3.749 | 77.22 | 1.12 | 0.03 |
| | | 2441 | 3DH5 | 2.896 | 3.751 | 77.21 | 1.12 | 0.04 |
| | | 2480 | 3DH5 | 2.896 | 3.750 | 77.23 | 1.12 | 0.03 |

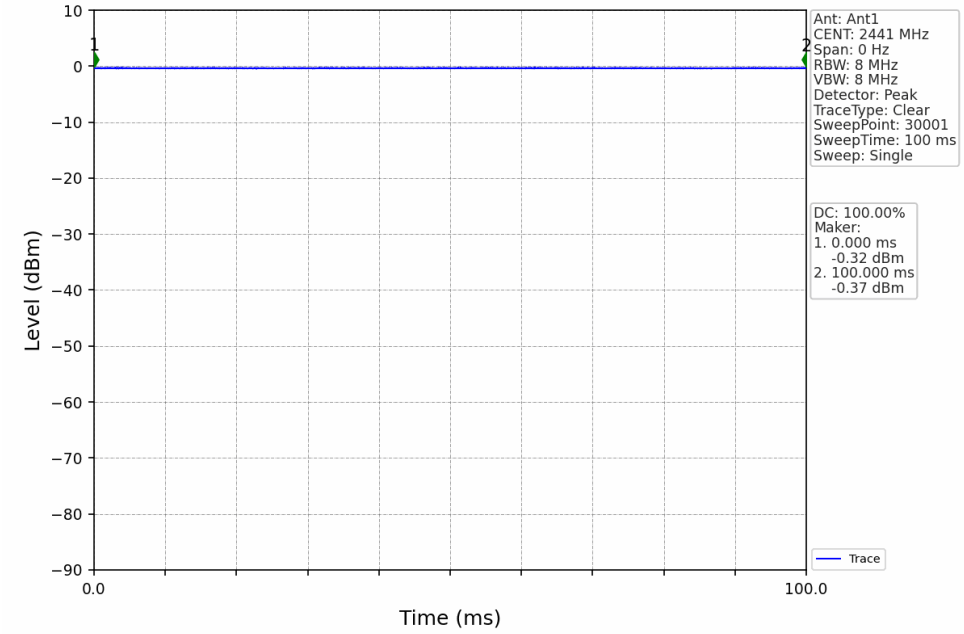
## 1.2 Test Graph

### 1.2.1 Ant1

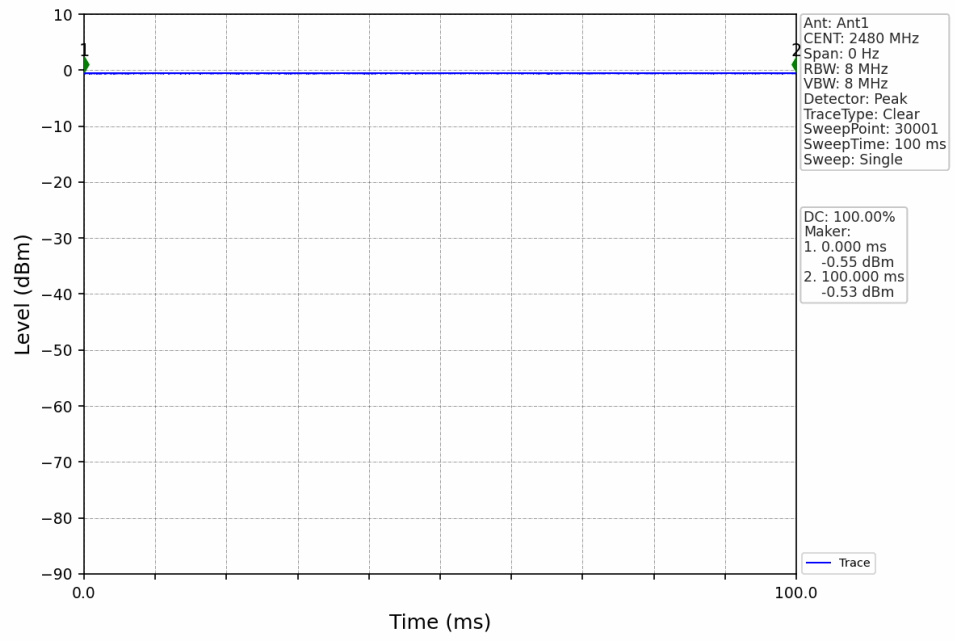
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



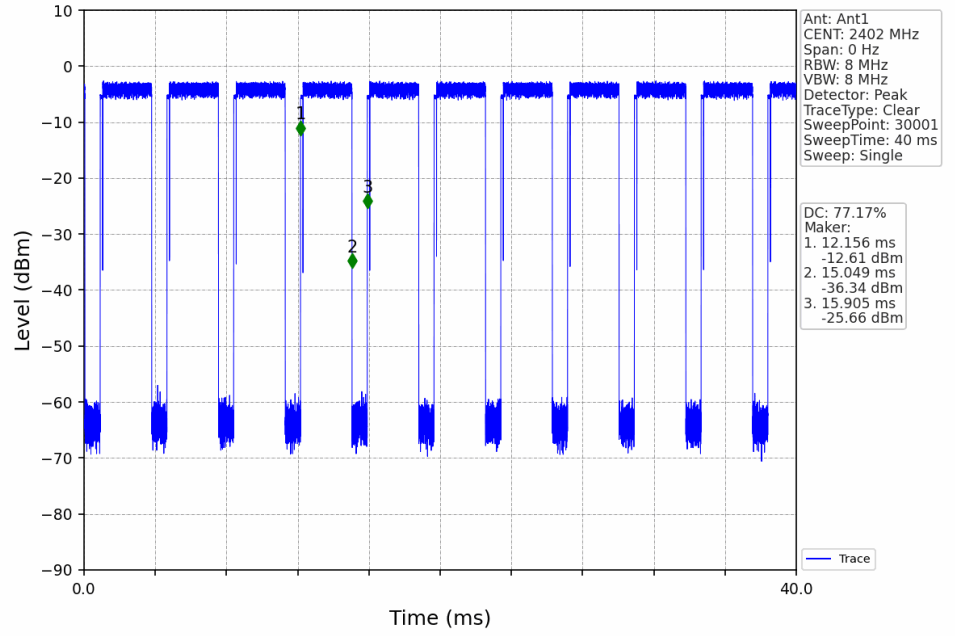

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



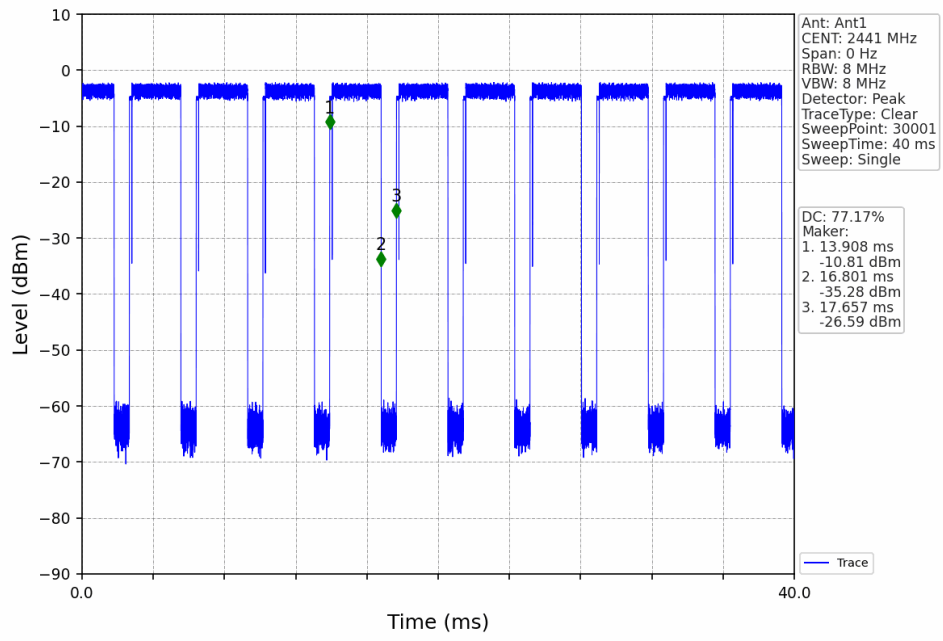
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



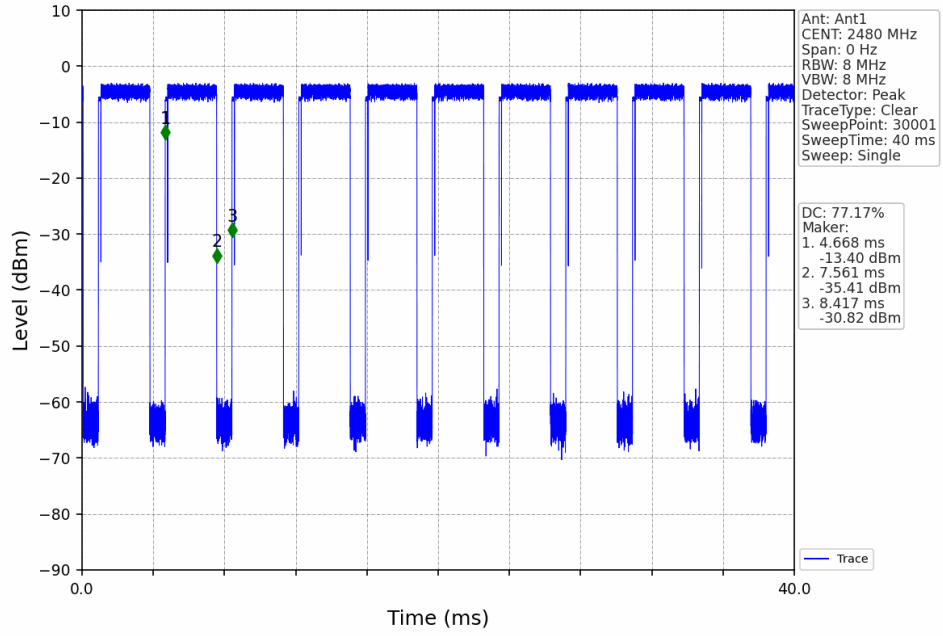

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



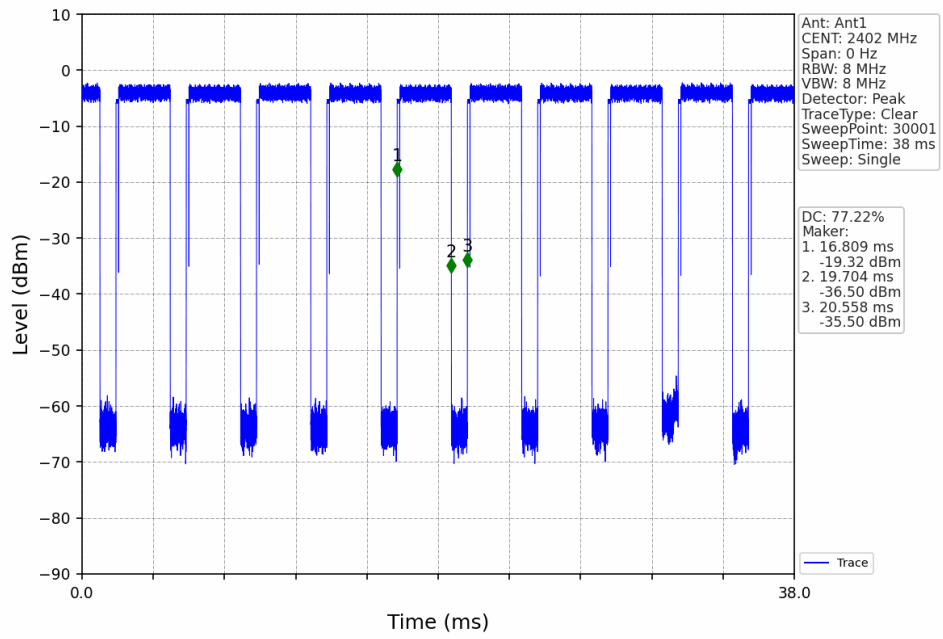
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



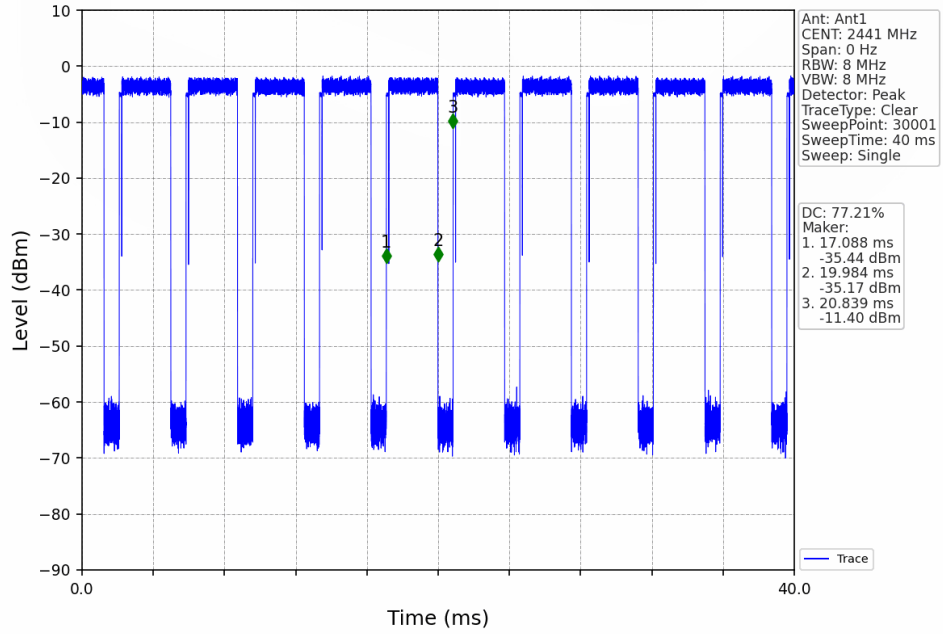

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



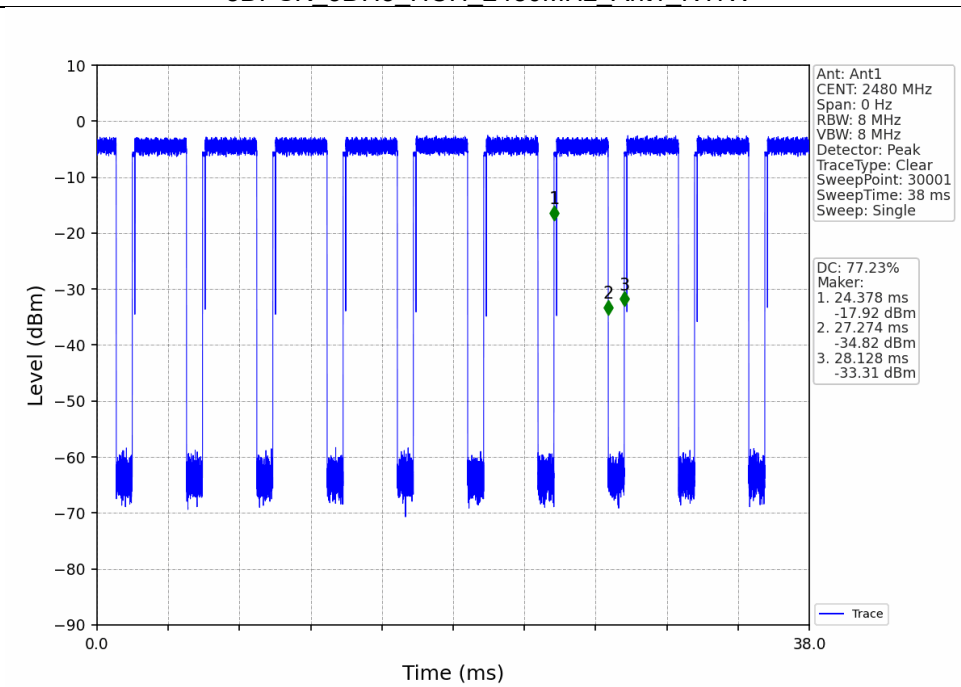
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_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 | 0.896 | / | Pass |
| | | 2441 | DH5 | 1 | 0.895 | / | Pass |
| | | 2480 | DH5 | 1 | 0.895 | / | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | 1.177 | / | Pass |
| | | 2441 | 2DH5 | 1 | 1.173 | / | Pass |
| | | 2480 | 2DH5 | 1 | 1.174 | / | Pass |
| 8DPSK | SISO | 2402 | 3DH5 | 1 | 1.179 | / | Pass |
| | | 2441 | 3DH5 | 1 | 1.178 | / | Pass |
| | | 2480 | 3DH5 | 1 | 1.177 | / | Pass |

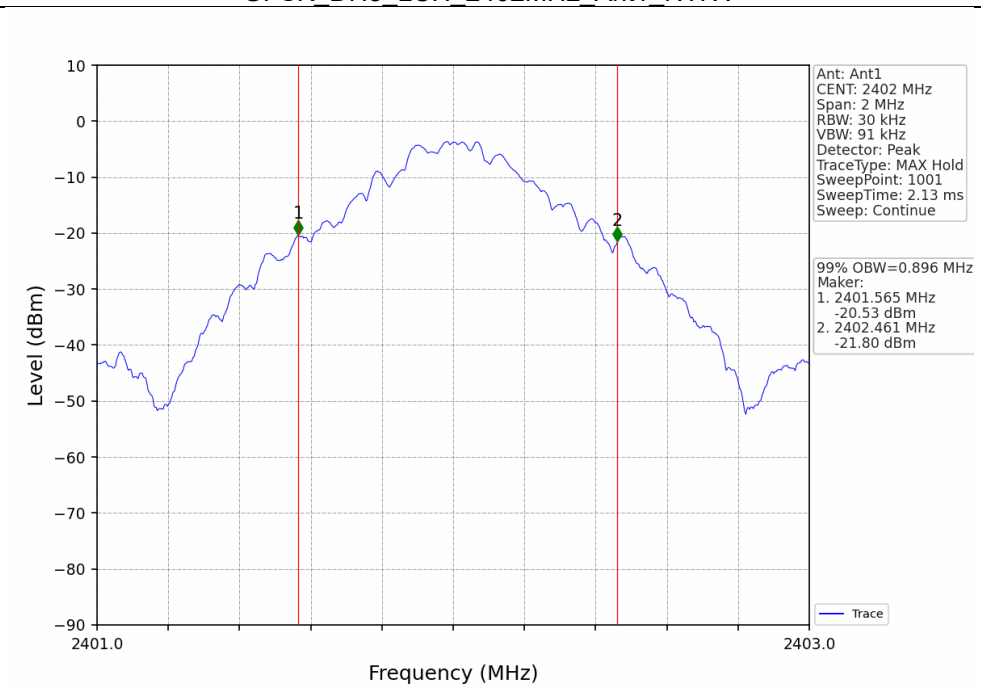
#### 2.1.2 20dB BW

| Mode | TX Type | Frequency (MHz) | Packet Type | ANT | 20dB Bandwidth (MHz) | | Verdict |
|---|---|---|---|---|---|---|---|
| | | | | | Result | Limit | |
| GFSK | SISO | 2402 | DH5 | 1 | 0.964 | / | Pass |
| | | 2441 | DH5 | 1 | 1.030 | / | Pass |
| | | 2480 | DH5 | 1 | 1.026 | / | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | 1.291 | / | Pass |
| | | 2441 | 2DH5 | 1 | 1.293 | / | Pass |
| | | 2480 | 2DH5 | 1 | 1.294 | / | Pass |
| 8DPSK | SISO | 2402 | 3DH5 | 1 | 1.307 | / | Pass |
| | | 2441 | 3DH5 | 1 | 1.312 | / | Pass |
| | | 2480 | 3DH5 | 1 | 1.311 | / | Pass |

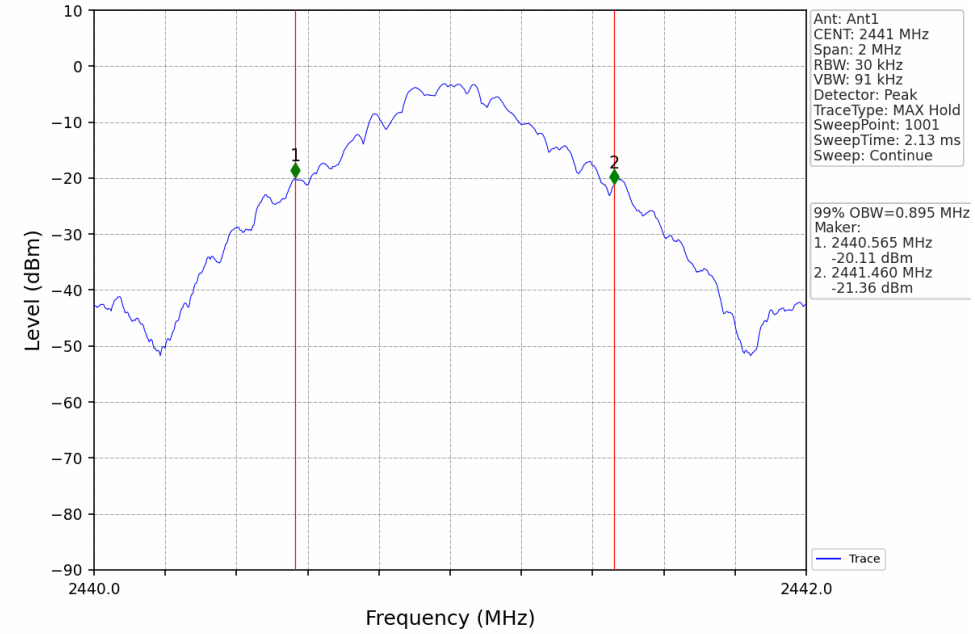
## 2.2 Test Graph

### 2.2.1 OBW

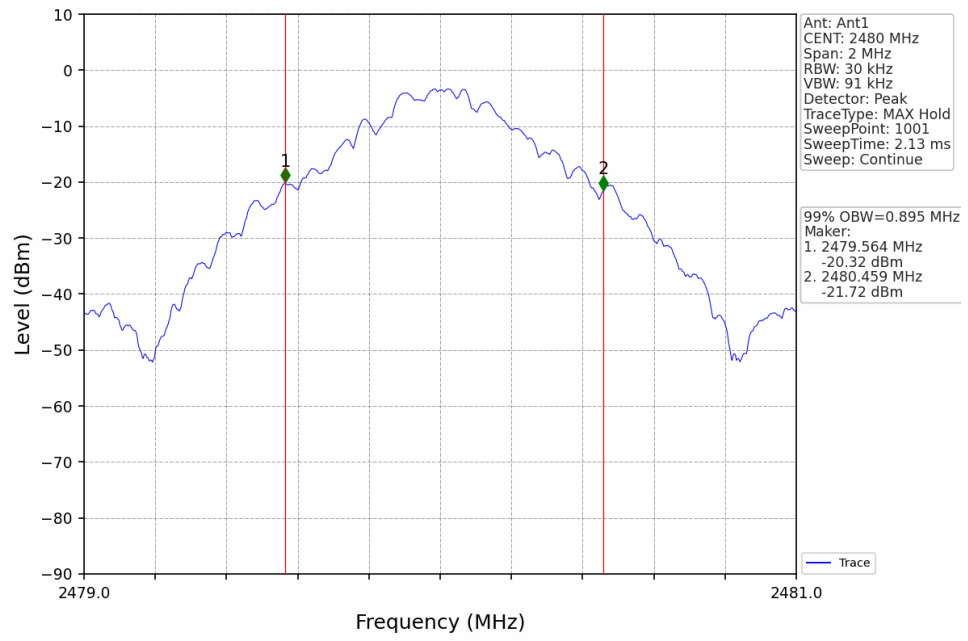
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



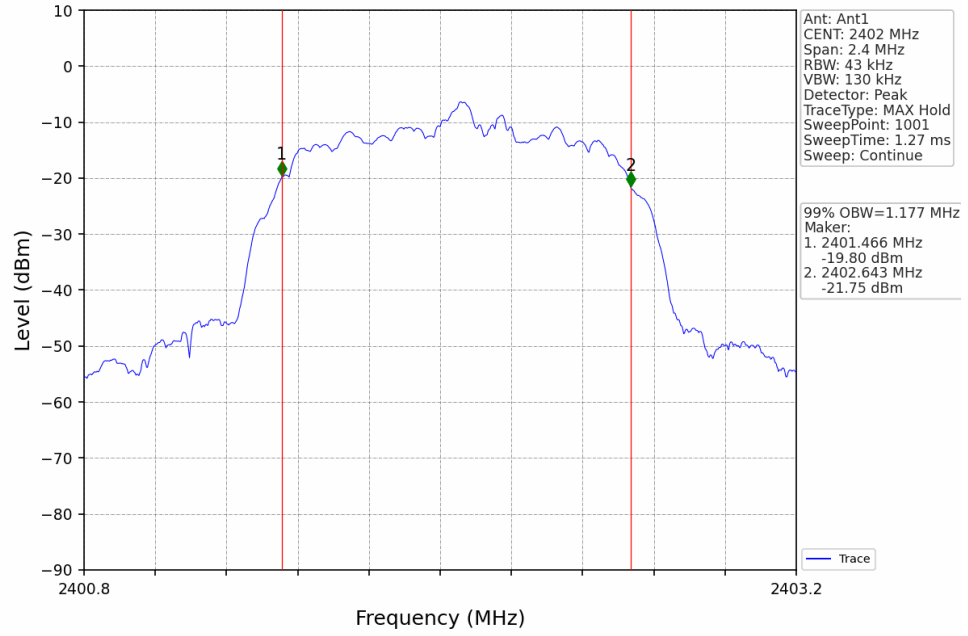

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



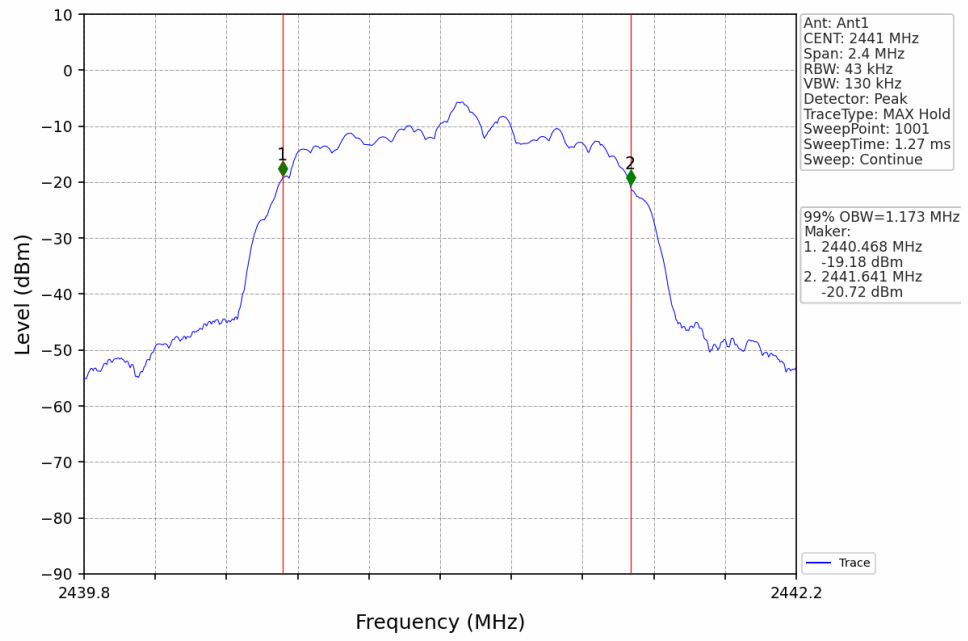
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



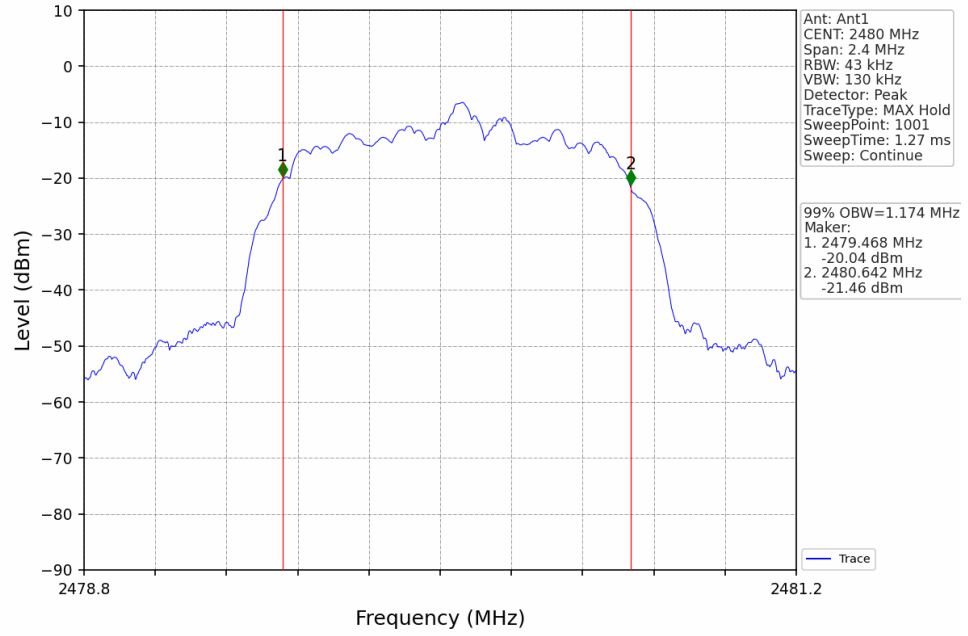

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



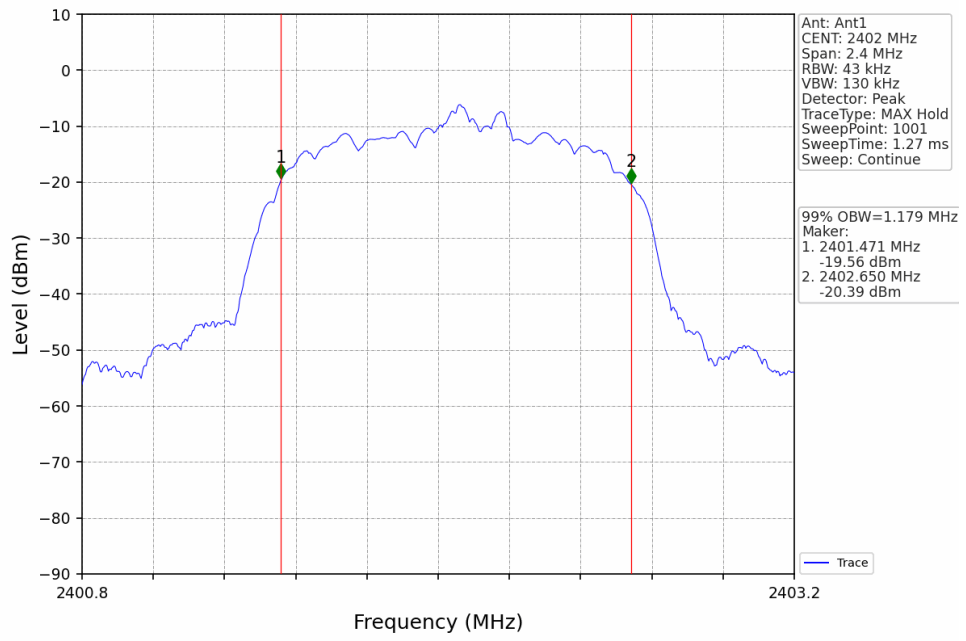
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



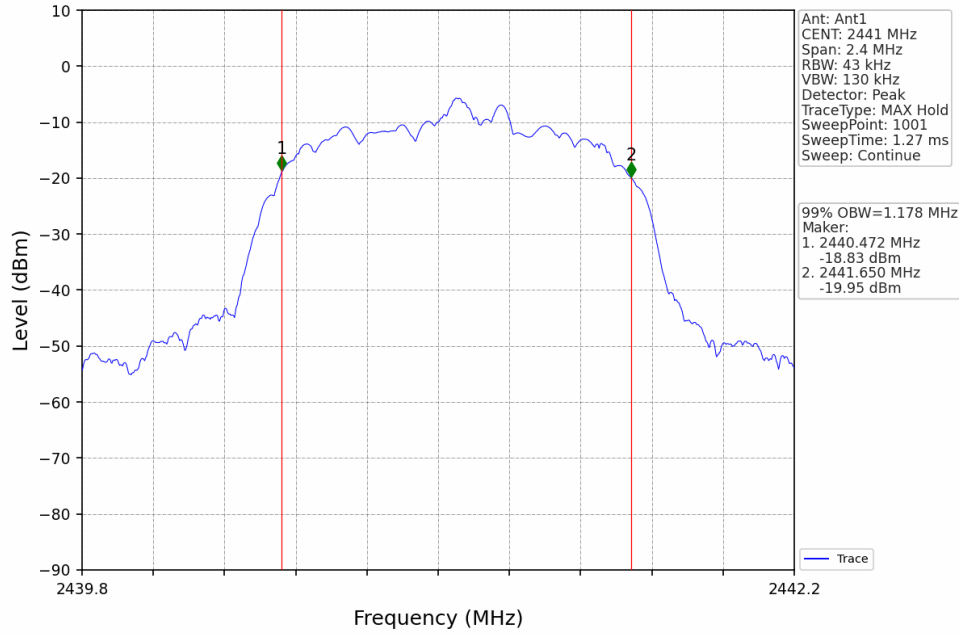

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



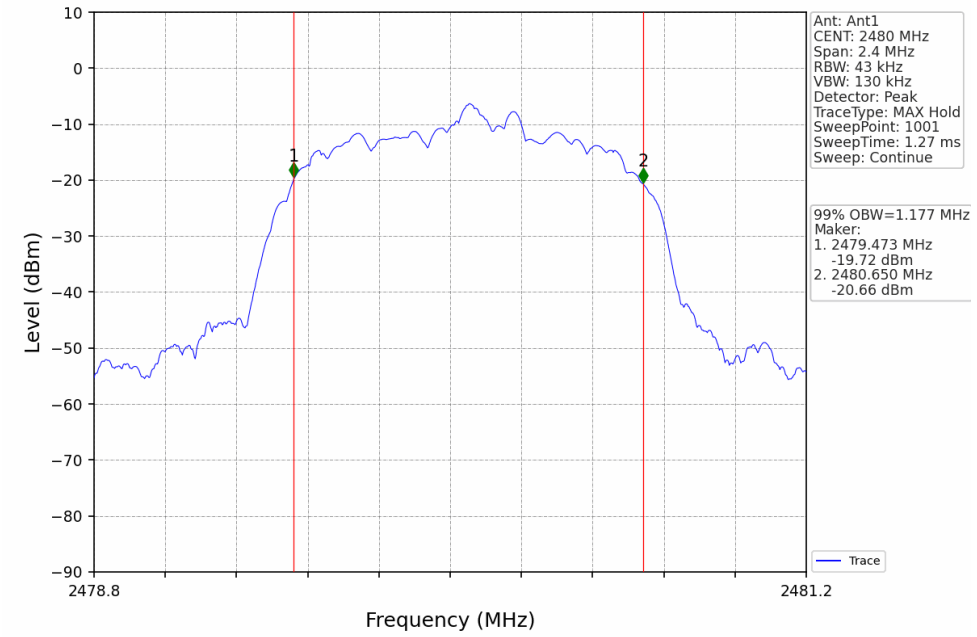
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV

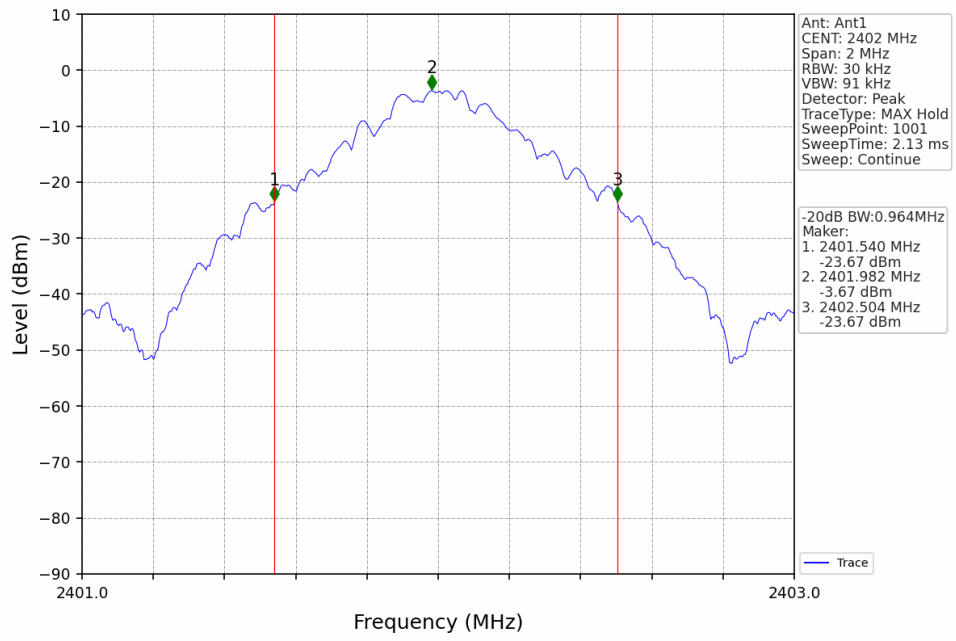


8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV

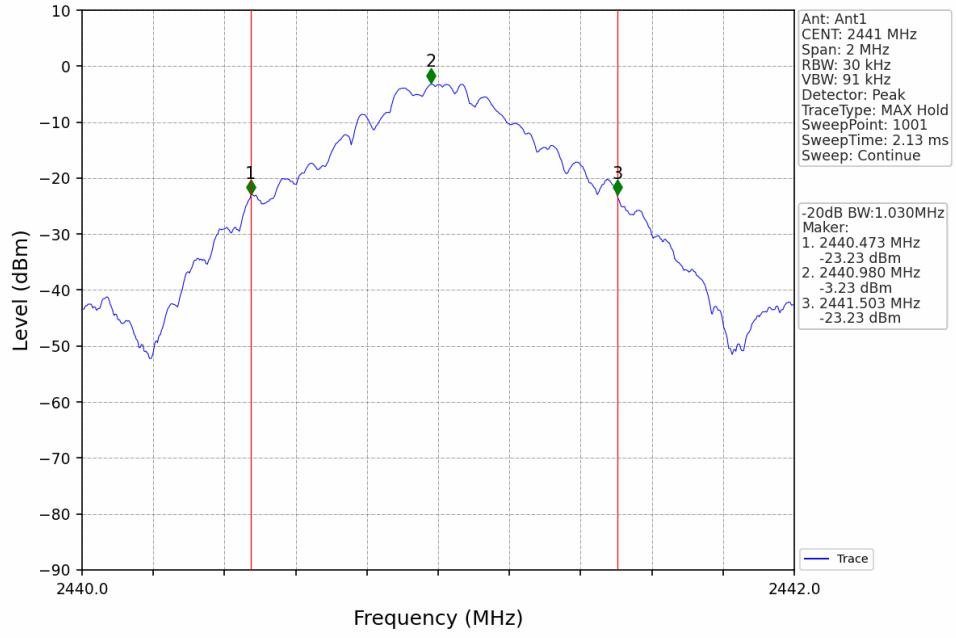


### 2.2.2 20dB BW

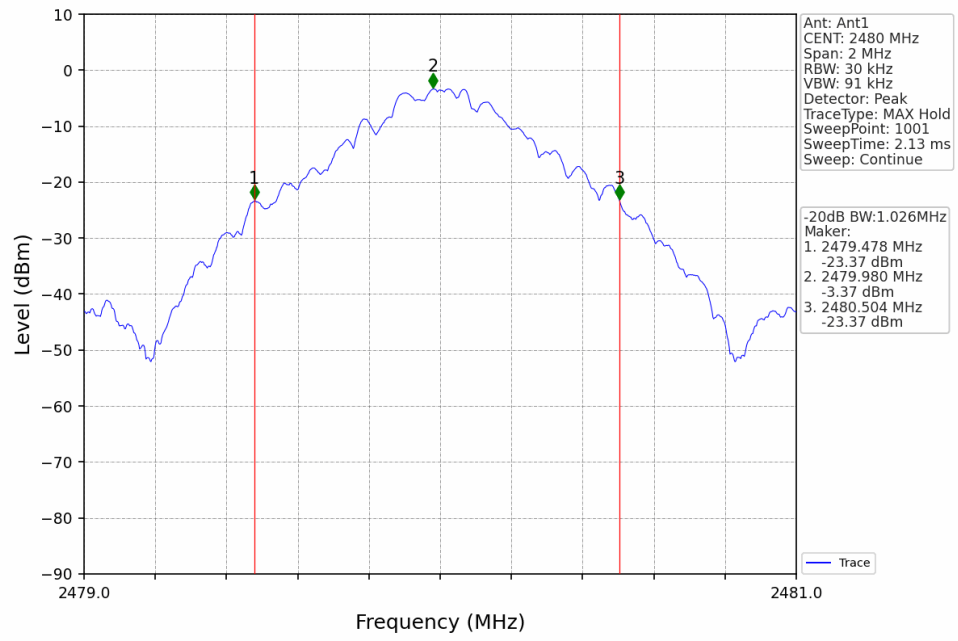
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



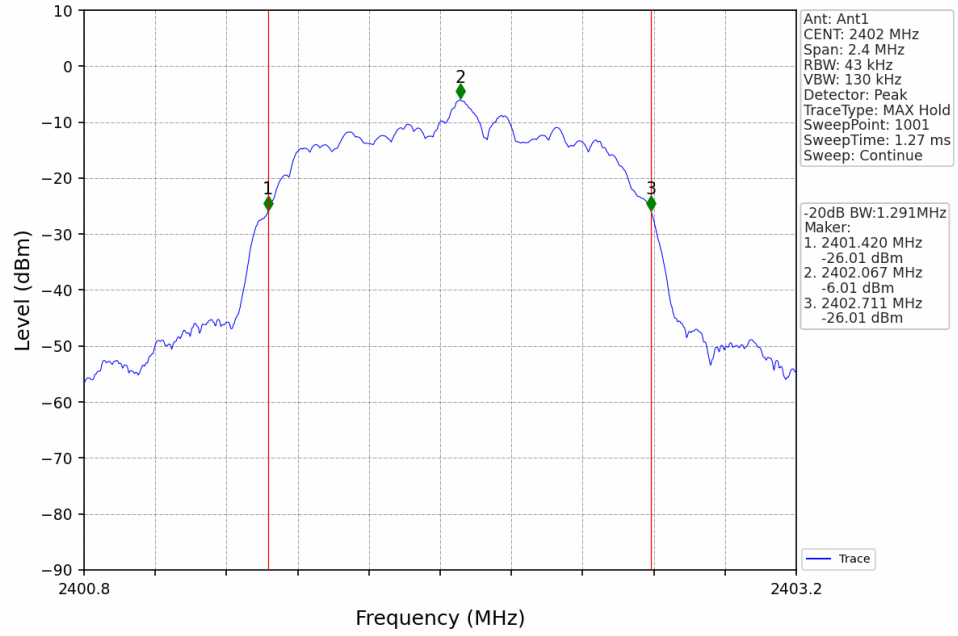

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



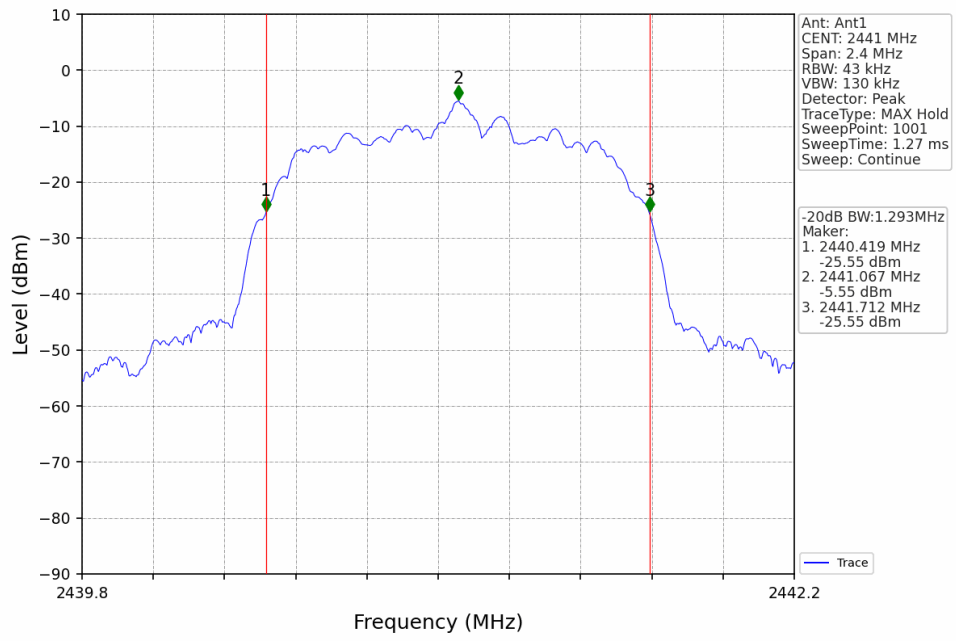
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



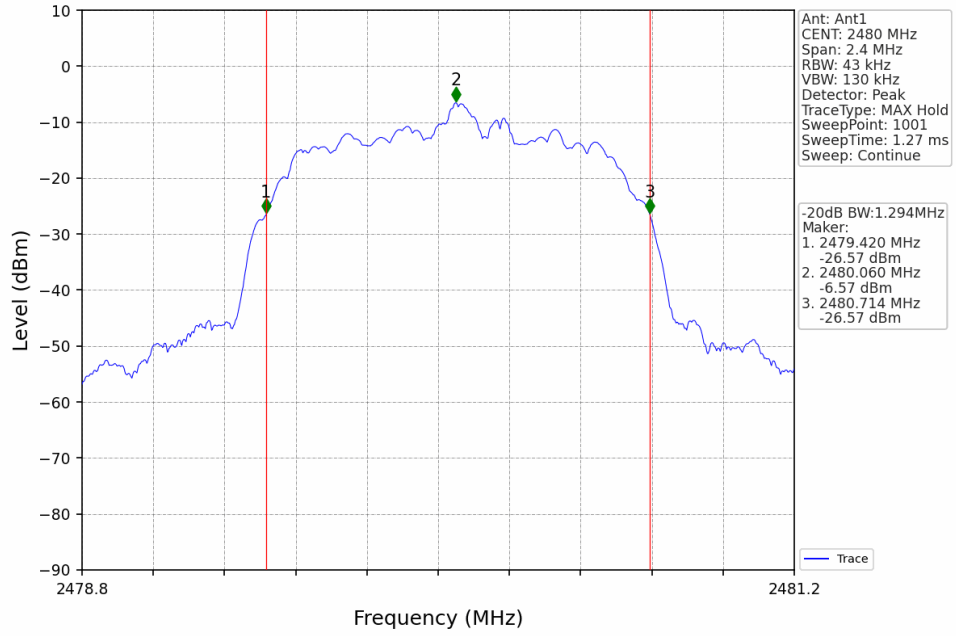

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



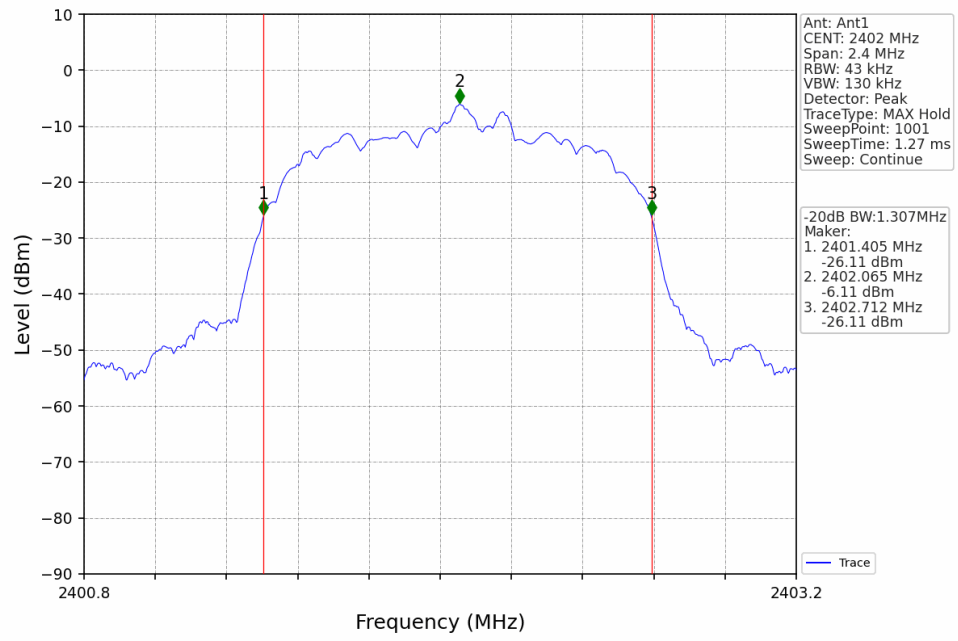
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



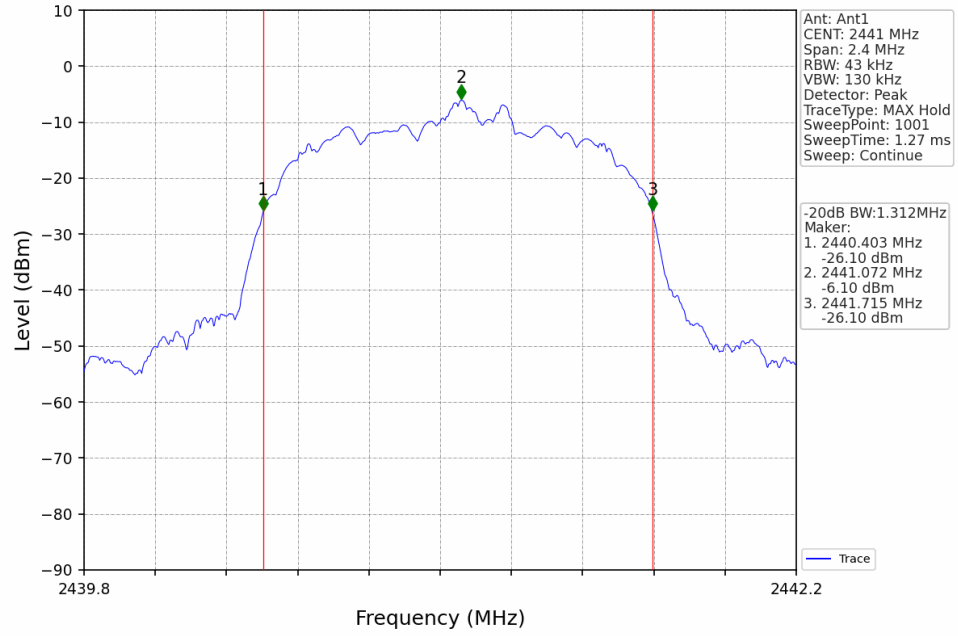

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



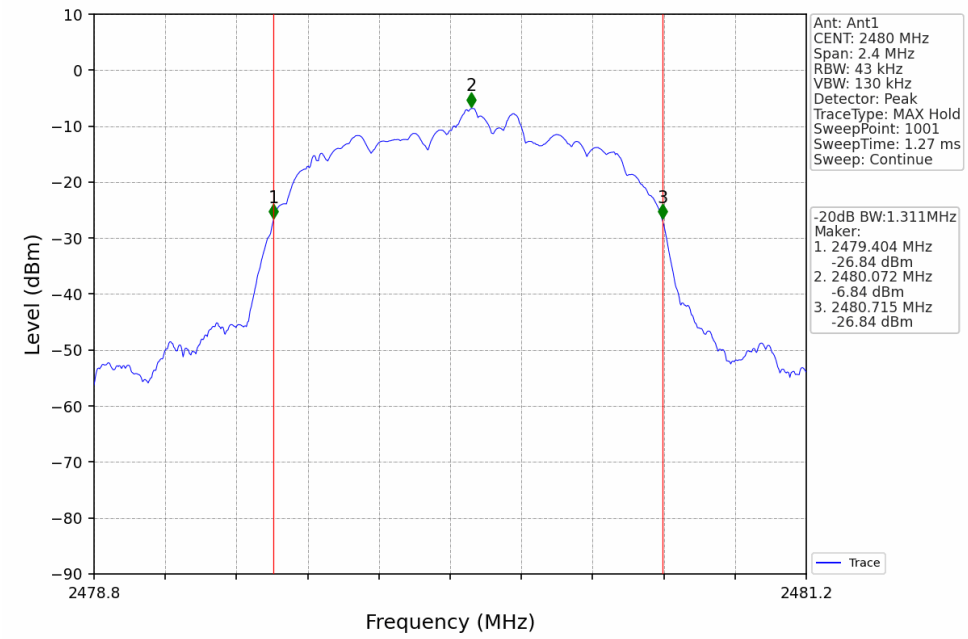
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



## 3. Maximum Conducted Output Power

### 3.1 Test Result

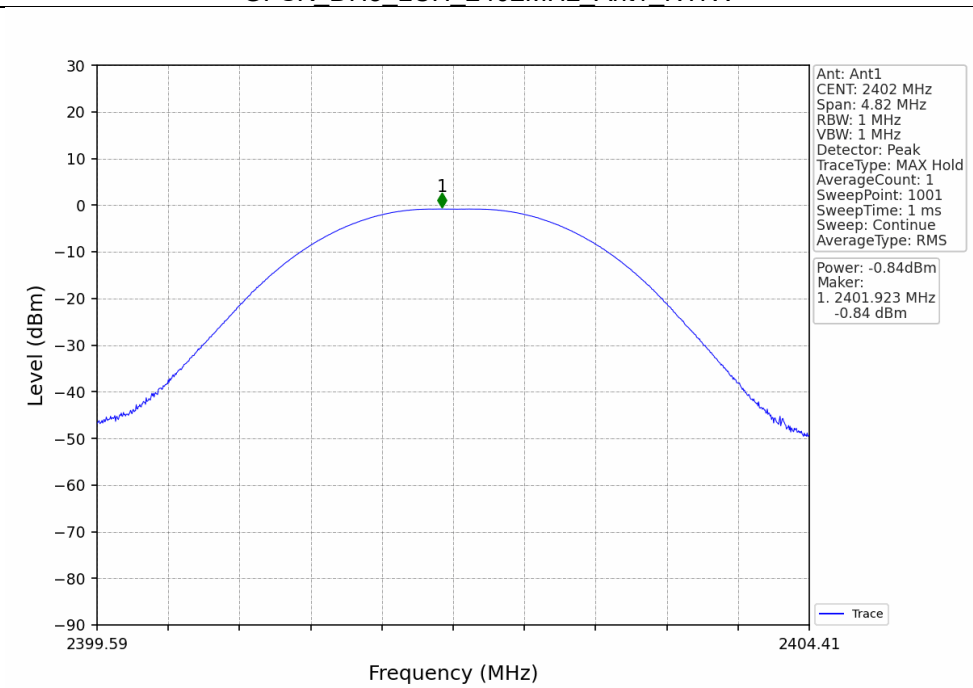
#### 3.1.1 Power

| Mode | TX Type | Frequency (MHz) | Packet Type | Maximum Peak Conducted Output Power (dBm) | | Verdict |
|---|---|---|---|---|---|---|
| | | | | ANT1 | Limit | |
| GFSK | SISO | 2402 | DH5 | -0.84 | <=20.97 | Pass |
| | | 2441 | DH5 | -0.32 | <=20.97 | Pass |
| | | 2480 | DH5 | -0.49 | <=20.97 | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | -2.90 | <=20.97 | Pass |
| | | 2441 | 2DH5 | -2.38 | <=20.97 | Pass |
| | | 2480 | 2DH5 | -3.20 | <=20.97 | Pass |
| 8DPSK | SISO | 2402 | 3DH5 | -2.49 | <=20.97 | Pass |
| | | 2441 | 3DH5 | -2.00 | <=20.97 | Pass |
| | | 2480 | 3DH5 | -2.77 | <=20.97 | Pass |

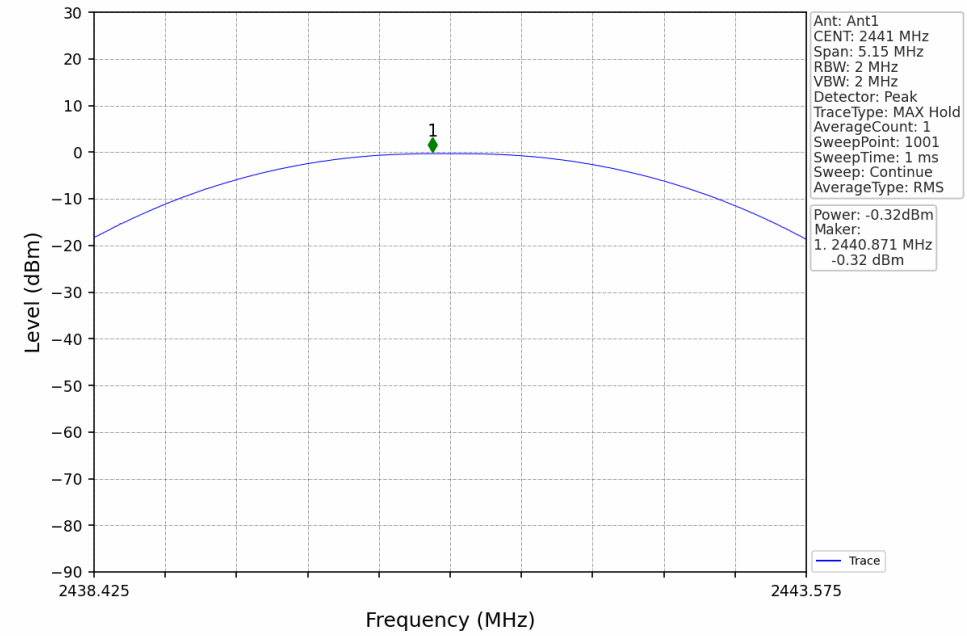
### 3.2 Test Graph

#### 3.2.1 Power

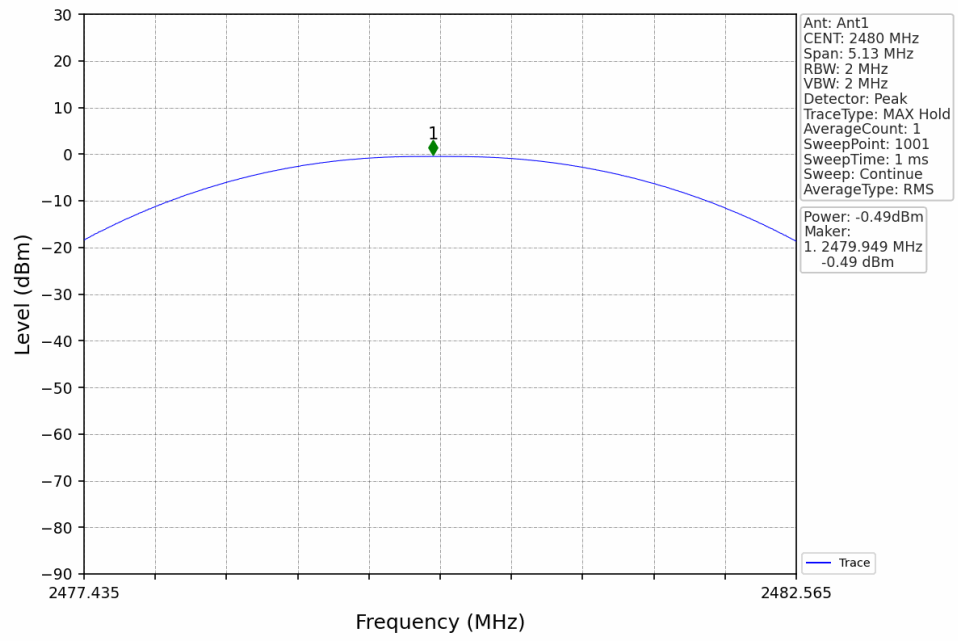
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



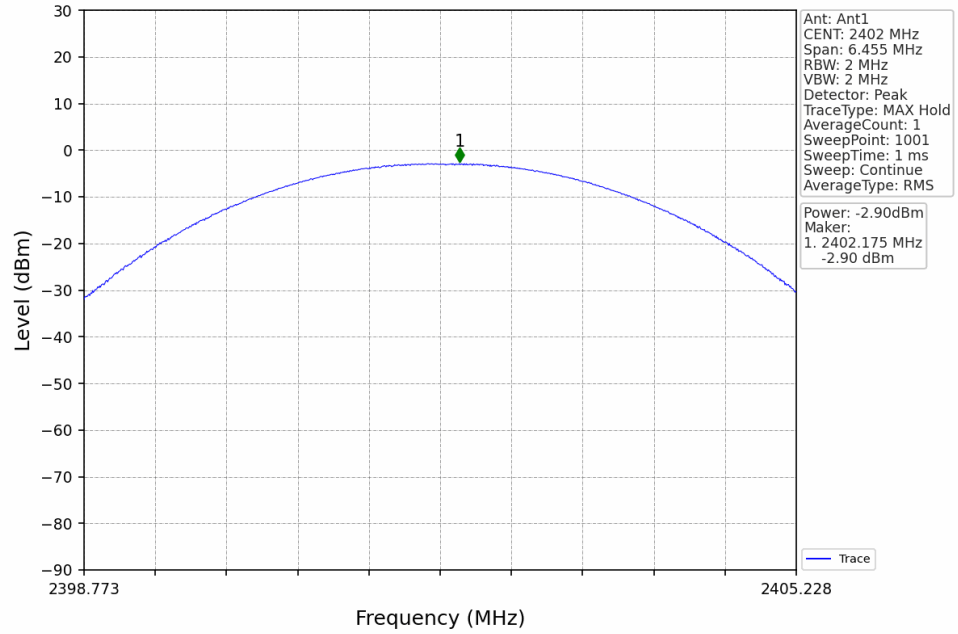

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



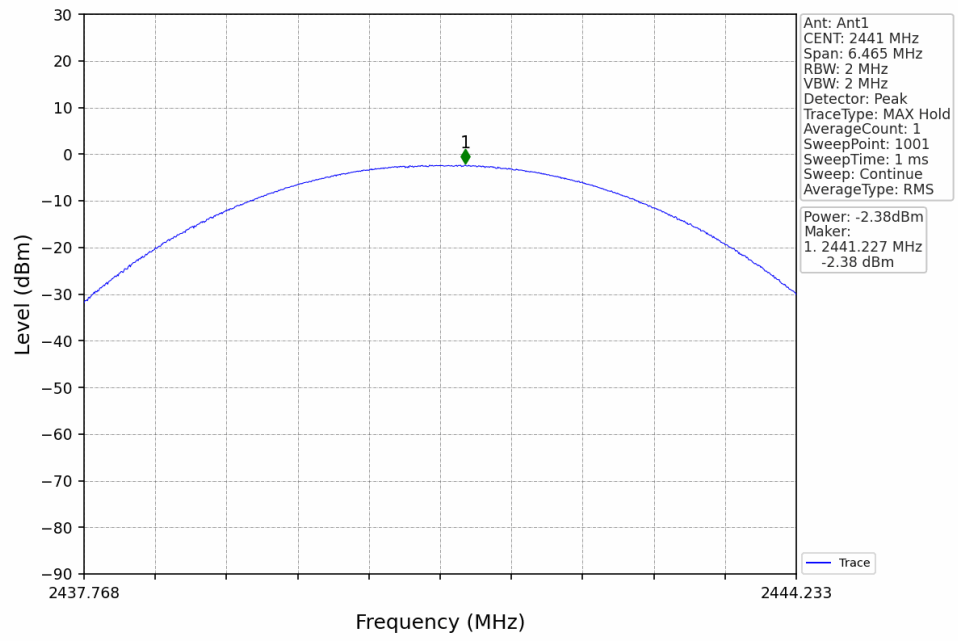
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



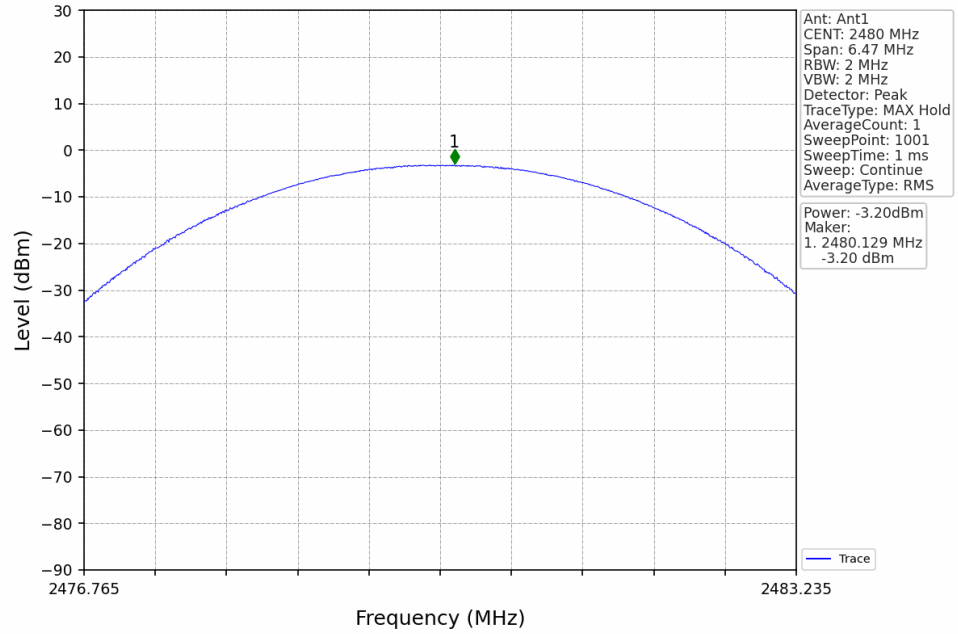

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



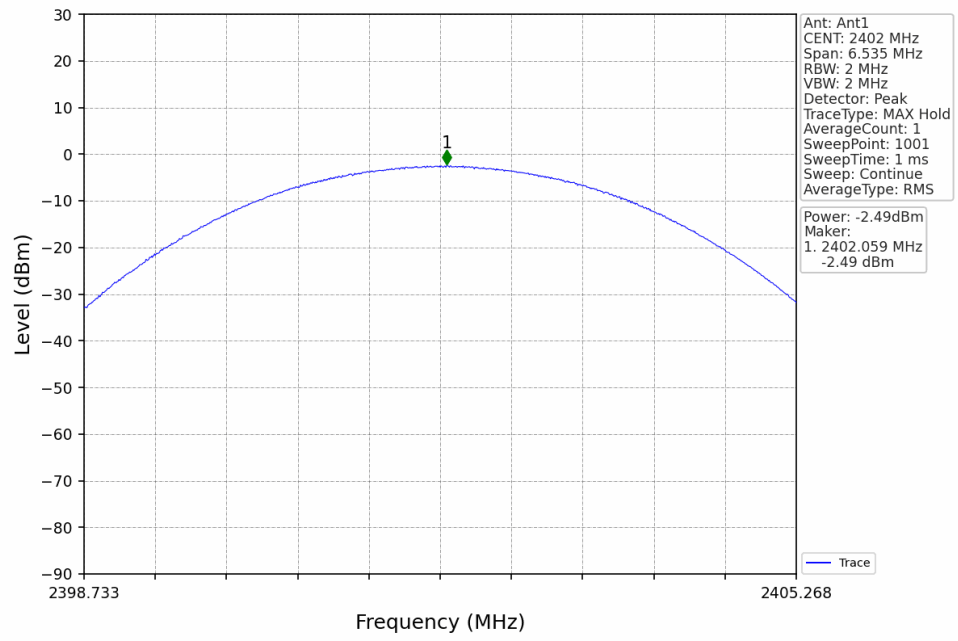
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



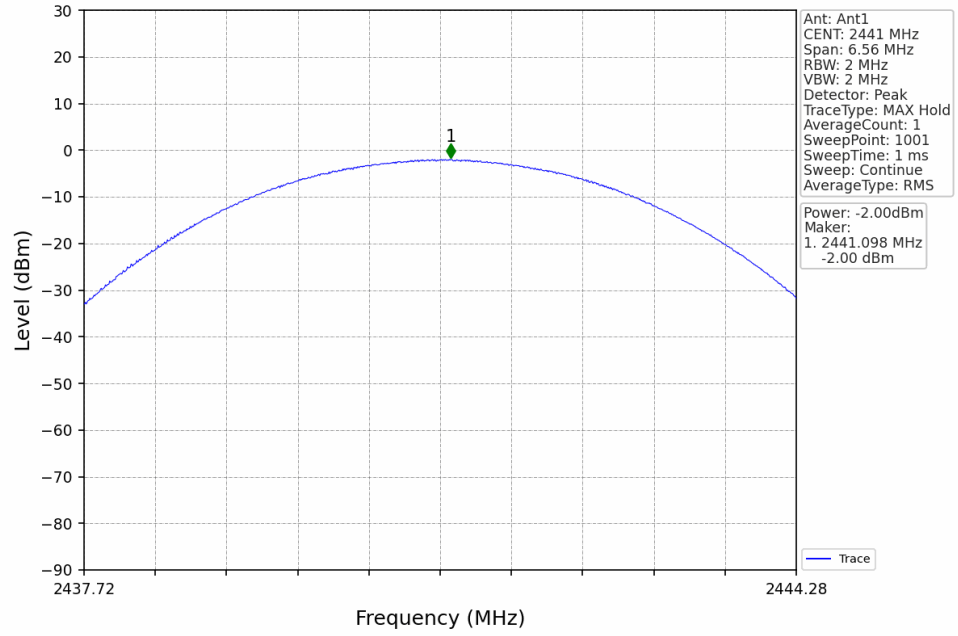

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



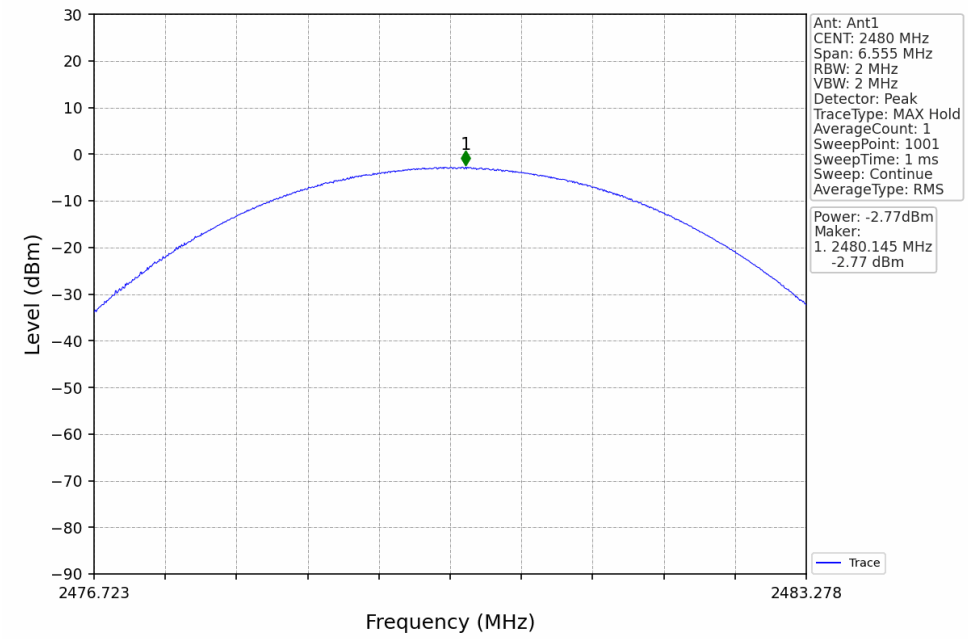
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



## 4. Carrier Frequency Separation

### 4.1 Test Result

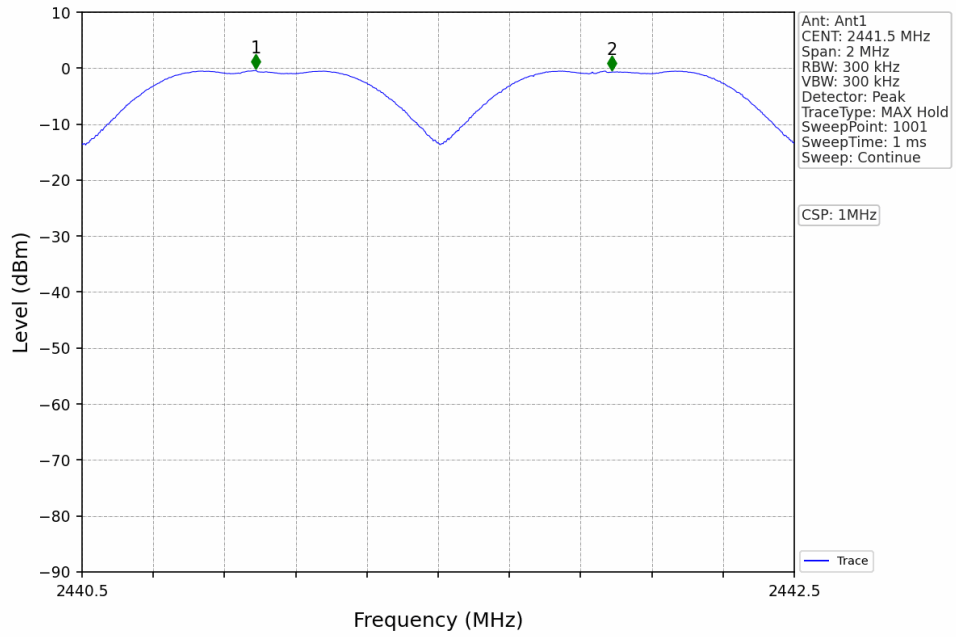
#### 4.1.1 Ant1

| Ant1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode | TX Type | Frequency (MHz) | Packet Type | Channel Separation (MHz) | 20dB Bandwidth (MHz) | Limit (MHz) | Verdict |
| GFSK | SISO | HOPP | DH5 | 1.000 | 1.030 | >=0.687 | Pass |
| π/4-DQPSK | SISO | HOPP | 2DH5 | 1.001 | 1.294 | >=0.863 | Pass |
| 8DPSK | SISO | HOPP | 3DH5 | 1.027 | 1.312 | >=0.875 | Pass |

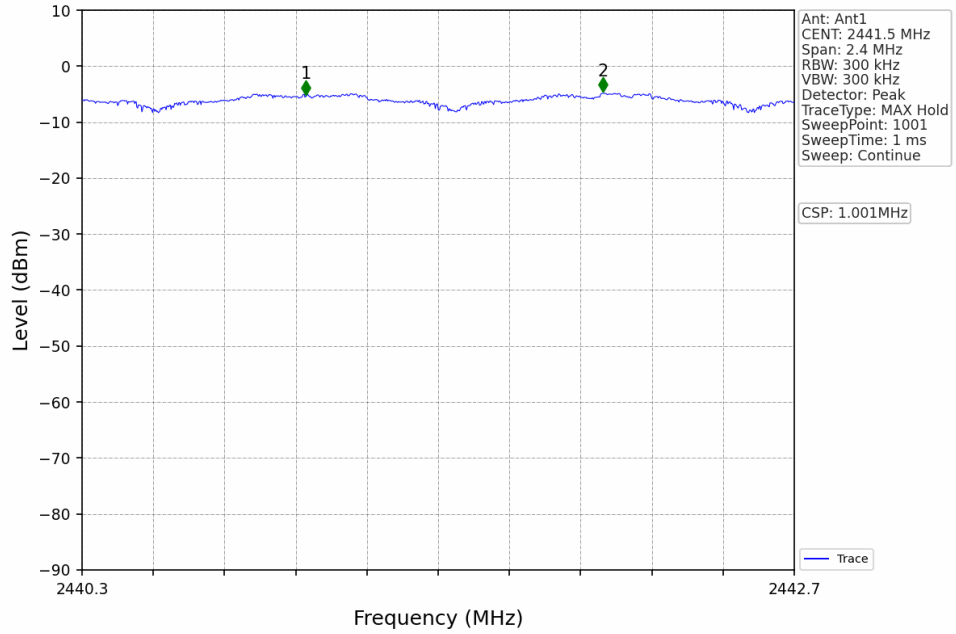
### 4.2 Test Graph

#### 4.2.1 Ant1

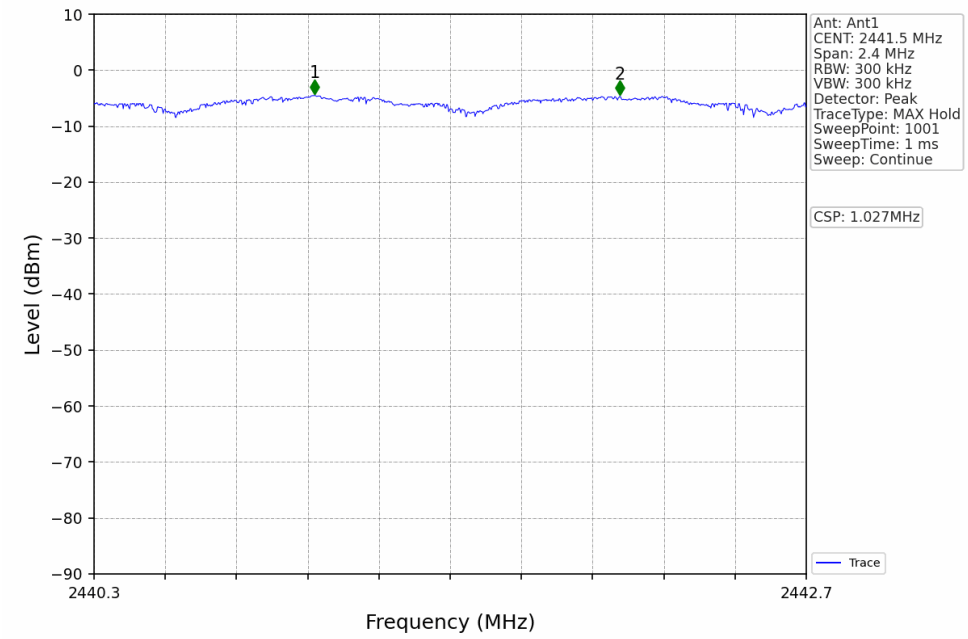
GFSK_DH5_HOPP_Ant1_NTNV




π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



## 5. Number of Hopping Frequencies

### 5.1 Test Result

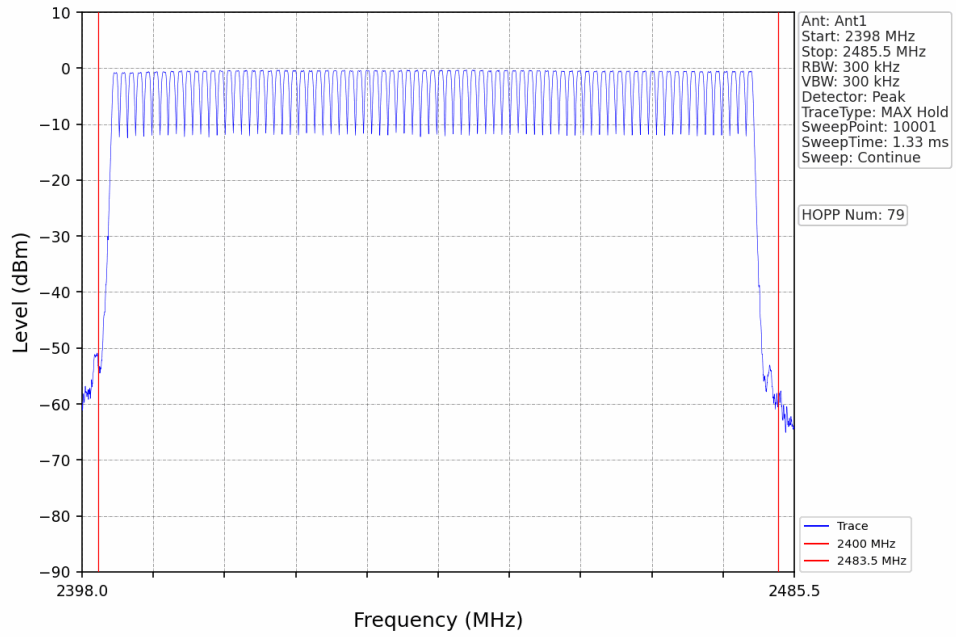
#### 5.1.1 HoppNum

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

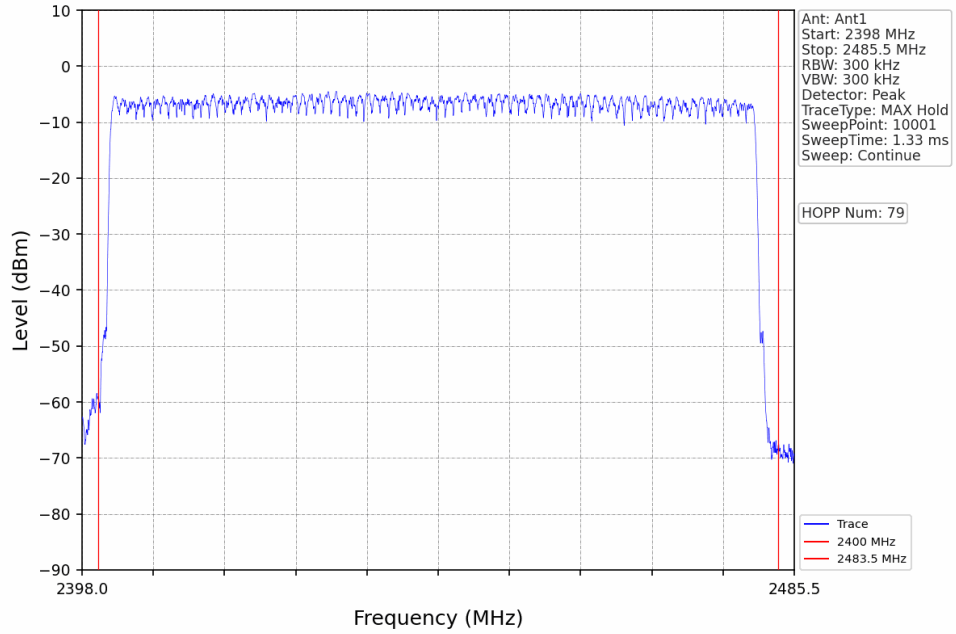
## 5.2 Test Graph

### 5.2.1 HoppNum

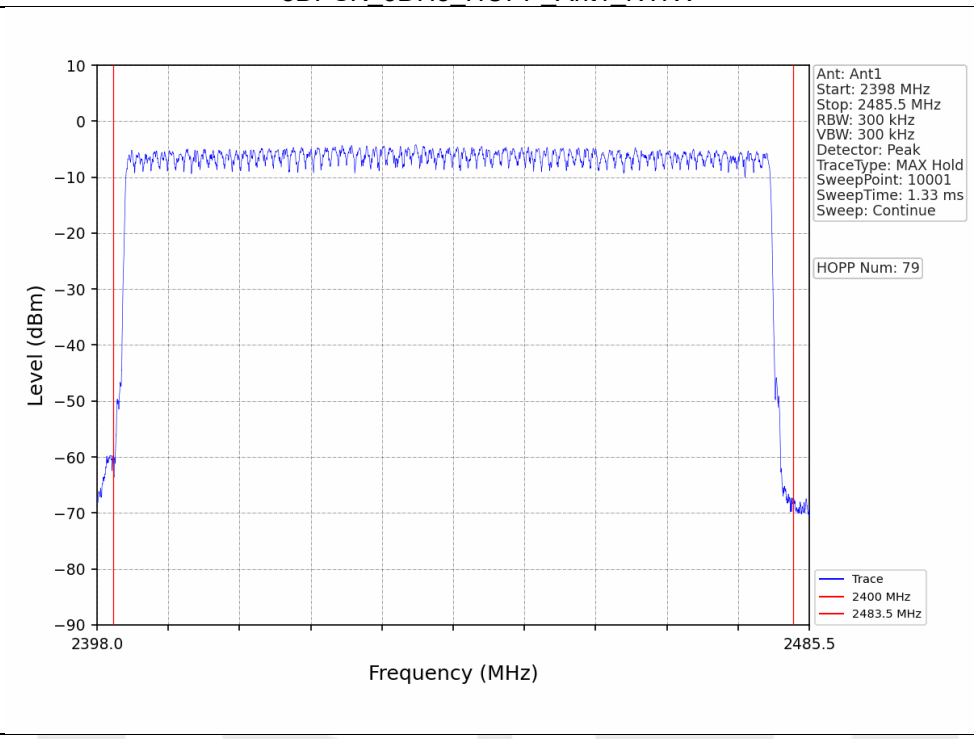
GFSK_DH5_HOPP_Ant1_NTNV




π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



## 6. Time of Occupancy (Dwell Time)

### 6.1 Test Result

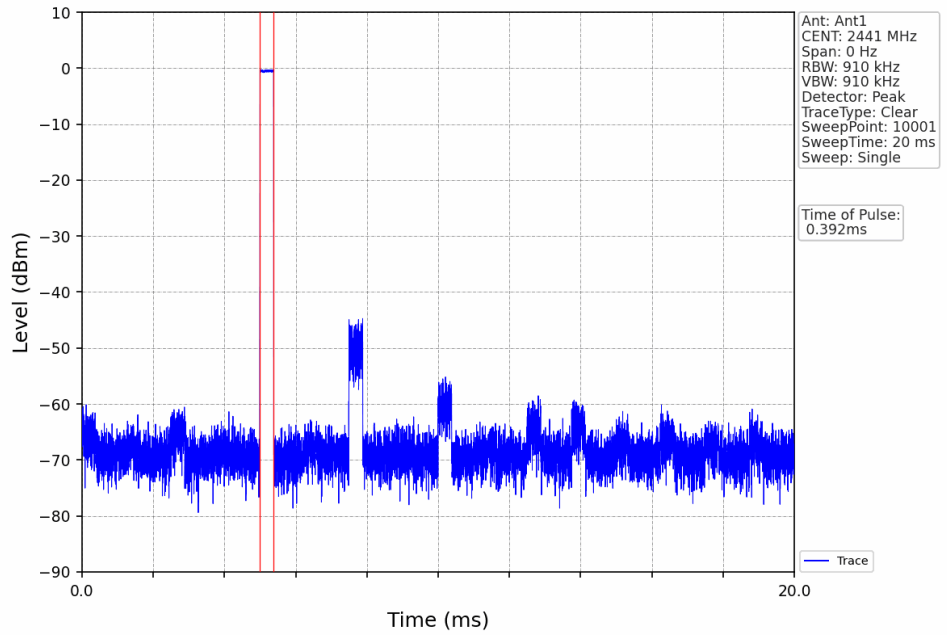
#### 6.1.1 Ant1

| 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 | 0.392 | 31.600 | 320 | 125.440 | <=400 | Pass |
| | | | DH3 | 1.650 | 31.600 | 162 | 267.300 | <=400 | Pass |
| | | | DH5 | 2.898 | 31.600 | 101 | 292.698 | <=400 | Pass |
| π/4-DQPSK | SISO | HOPP | 2DH1 | 0.396 | 31.600 | 320 | 126.720 | <=400 | Pass |
| | | | 2DH3 | 1.650 | 31.600 | 151 | 249.150 | <=400 | Pass |
| | | | 2DH5 | 2.896 | 31.600 | 119 | 344.624 | <=400 | Pass |
| 8DPSK | SISO | HOPP | 3DH1 | 0.398 | 31.600 | 320 | 127.360 | <=400 | Pass |
| | | | 3DH3 | 1.648 | 31.600 | 164 | 270.272 | <=400 | Pass |
| | | | 3DH5 | 2.900 | 31.600 | 102 | 295.800 | <=400 | Pass |

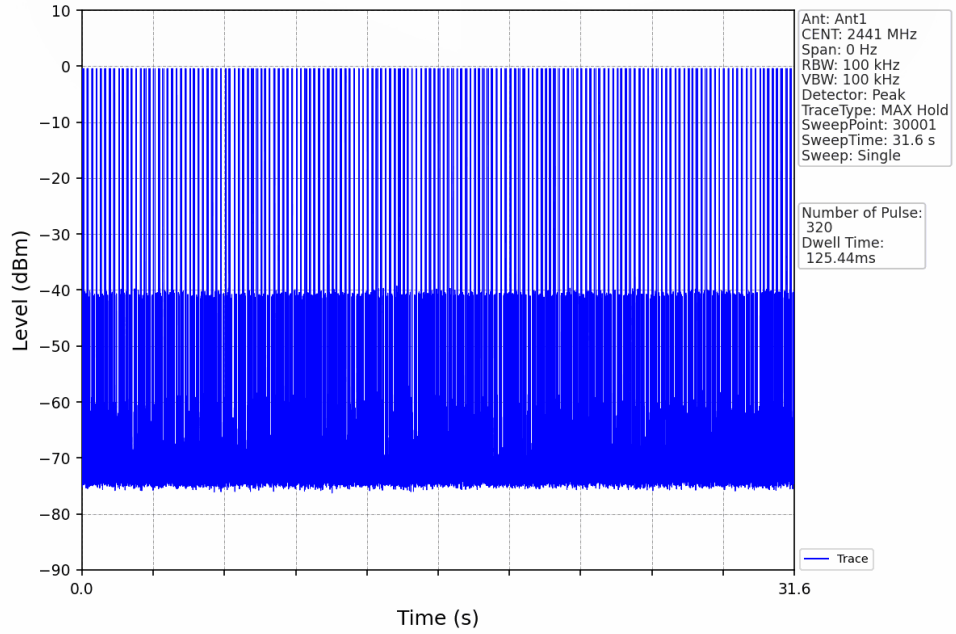
## 6.2 Test Graph

### 6.2.1 Ant1

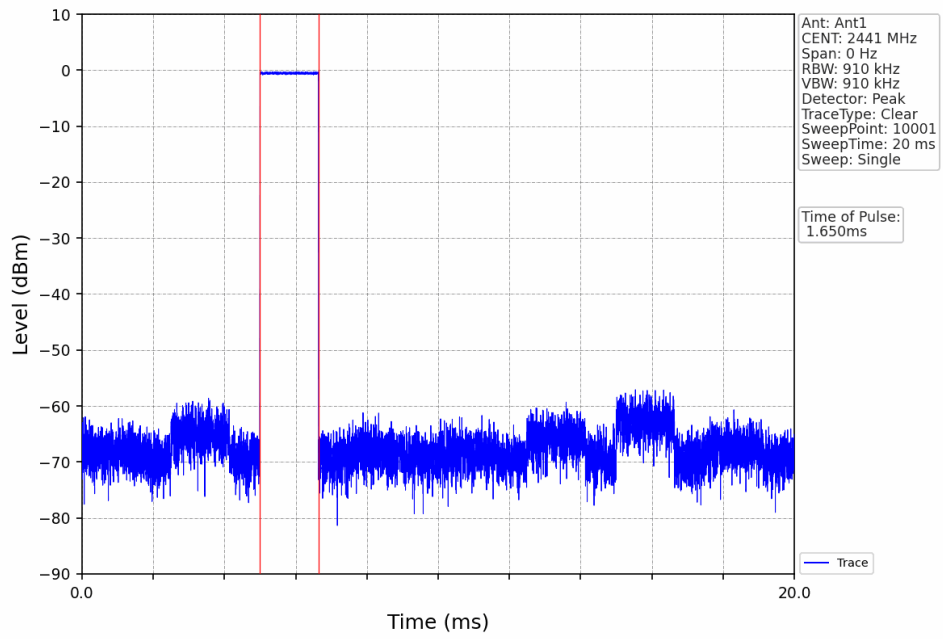
GFSK_DH1_HOPP_Ant1_NTNV



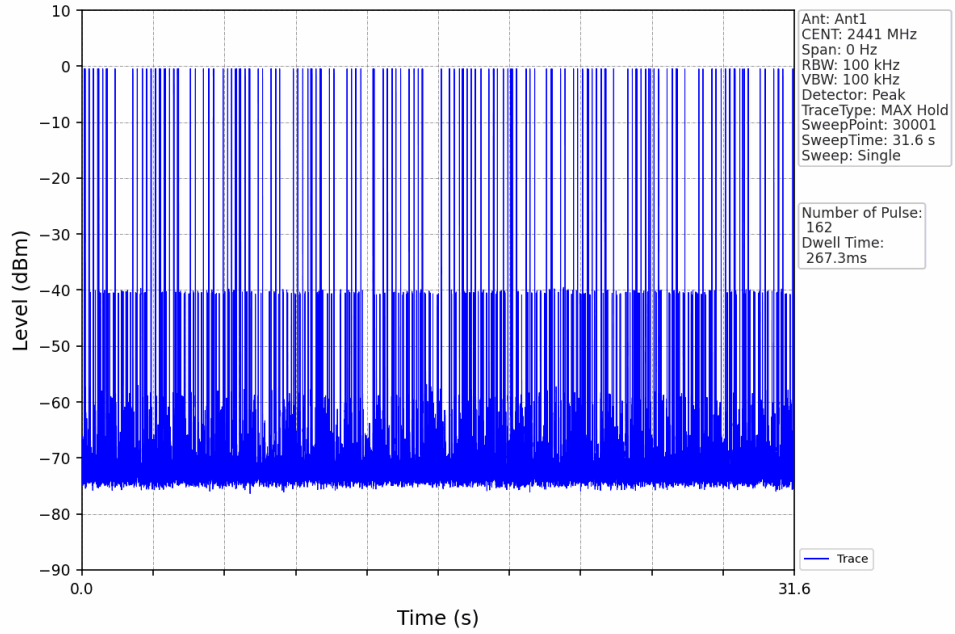

GFSK_DH1_HOPP_Ant1_NTNV



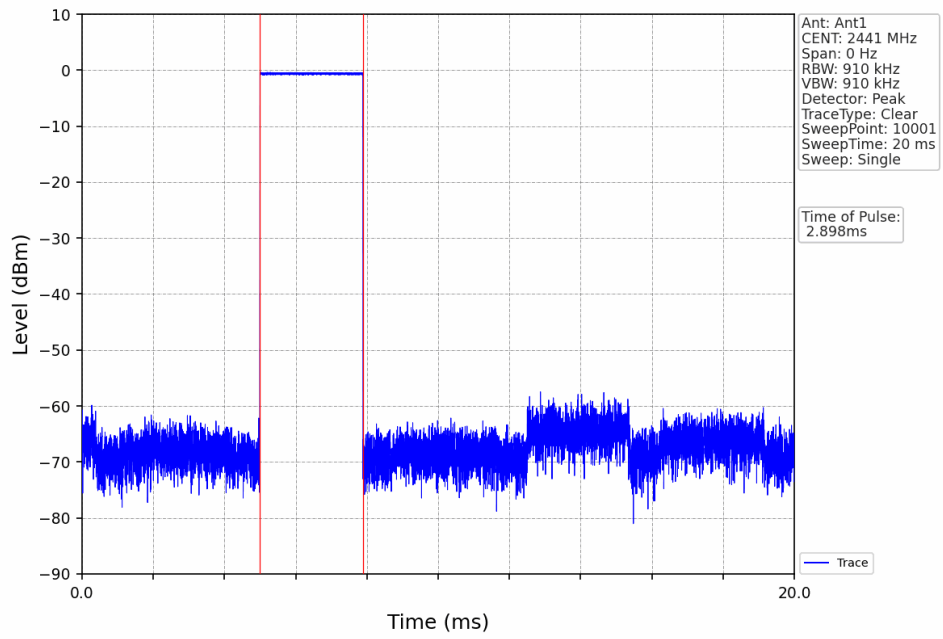
GFSK_DH3_HOPP_Ant1_NTNV



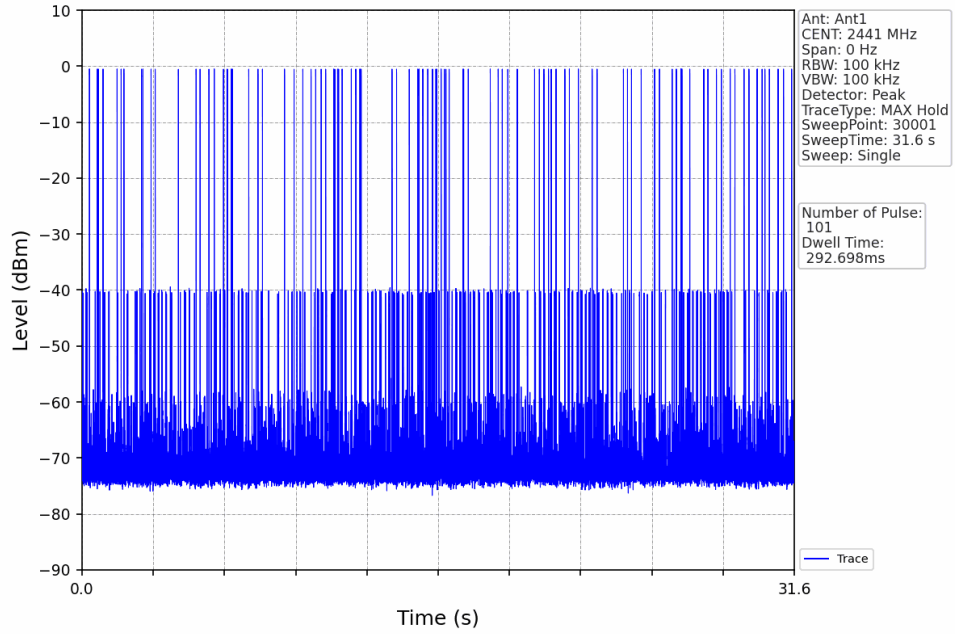

GFSK_DH3_HOPP_Ant1_NTNV



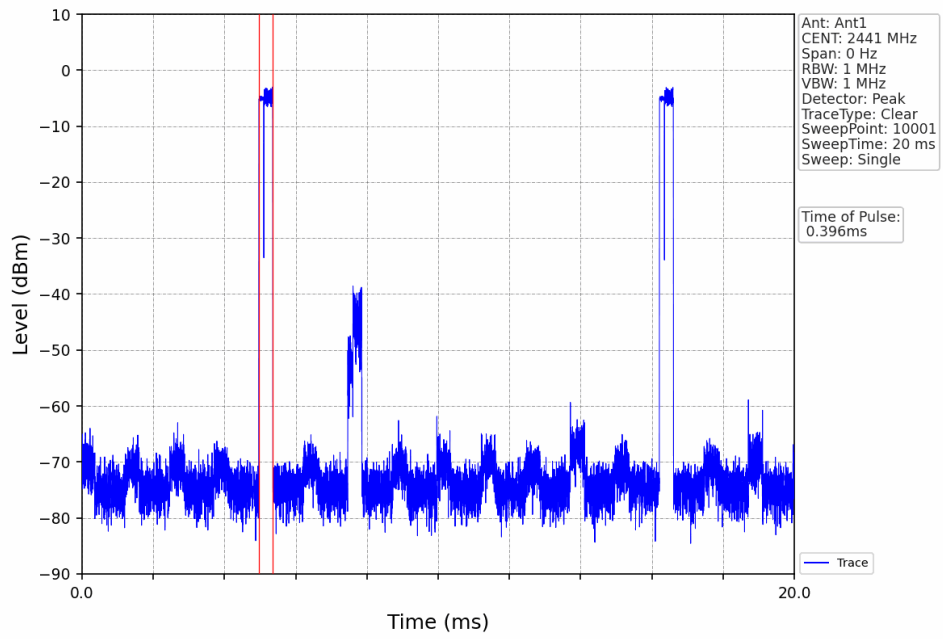
GFSK_DH5_HOPP_Ant1_NTNV



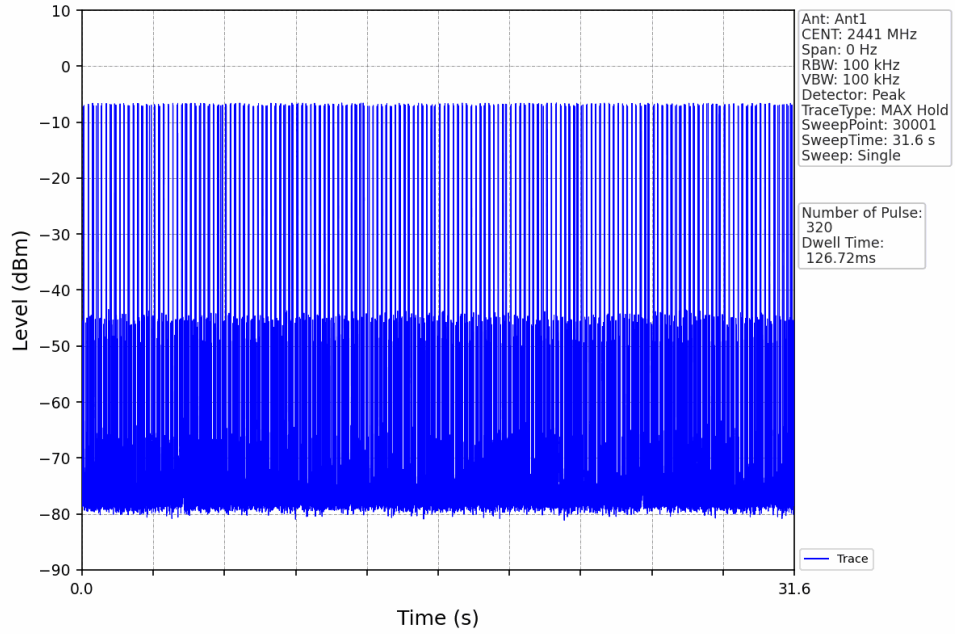

GFSK_DH5_HOPP_Ant1_NTNV



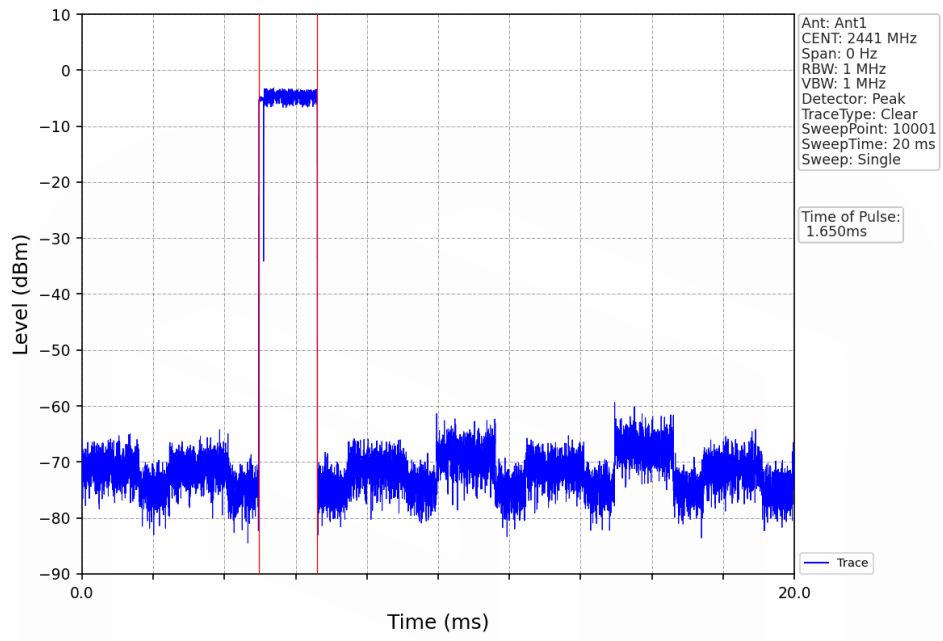
π/4-DQPSK_2DH1_HOPP_Ant1_NTNV



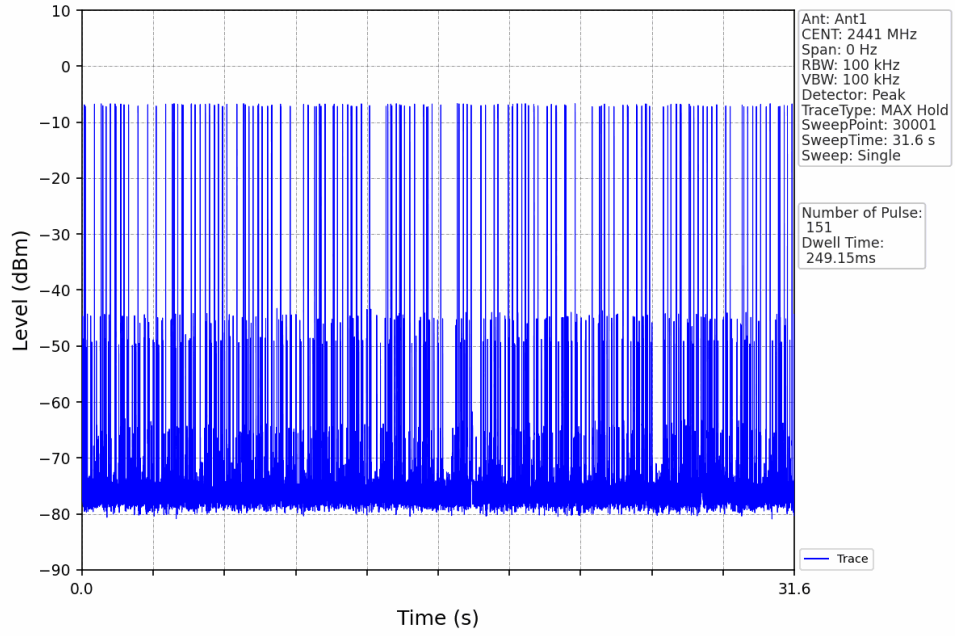

π/4-DQPSK_2DH1_HOPP_Ant1_NTNV



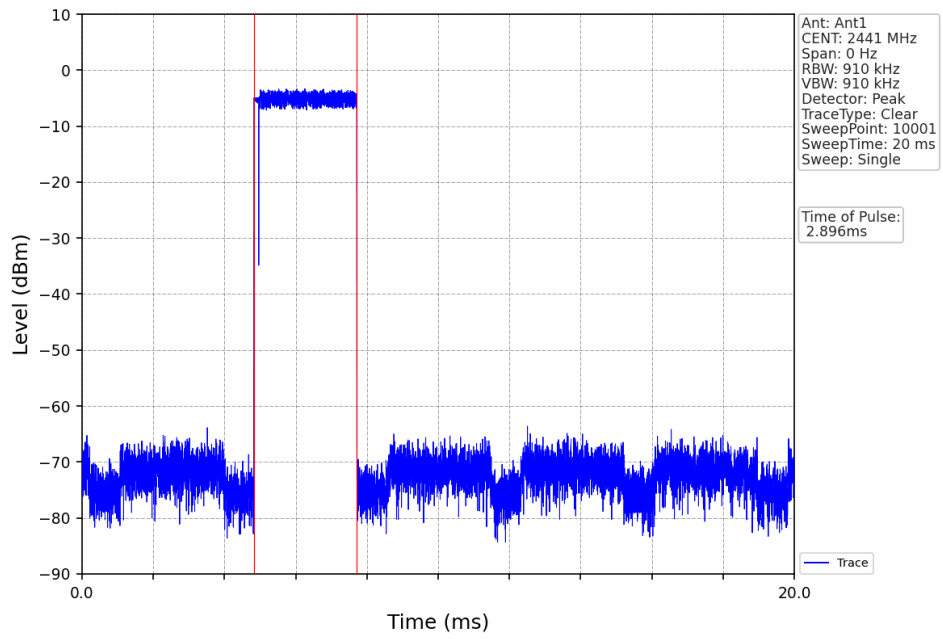
π/4-DQPSK_2DH3_HOPP_Ant1_NTNV



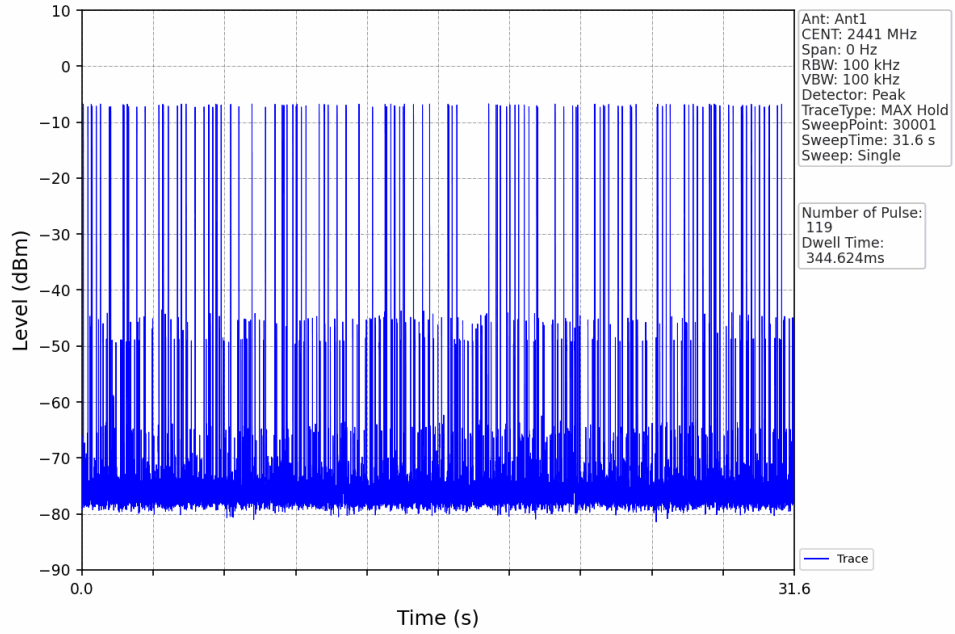

π/4-DQPSK_2DH3_HOPP_Ant1_NTNV



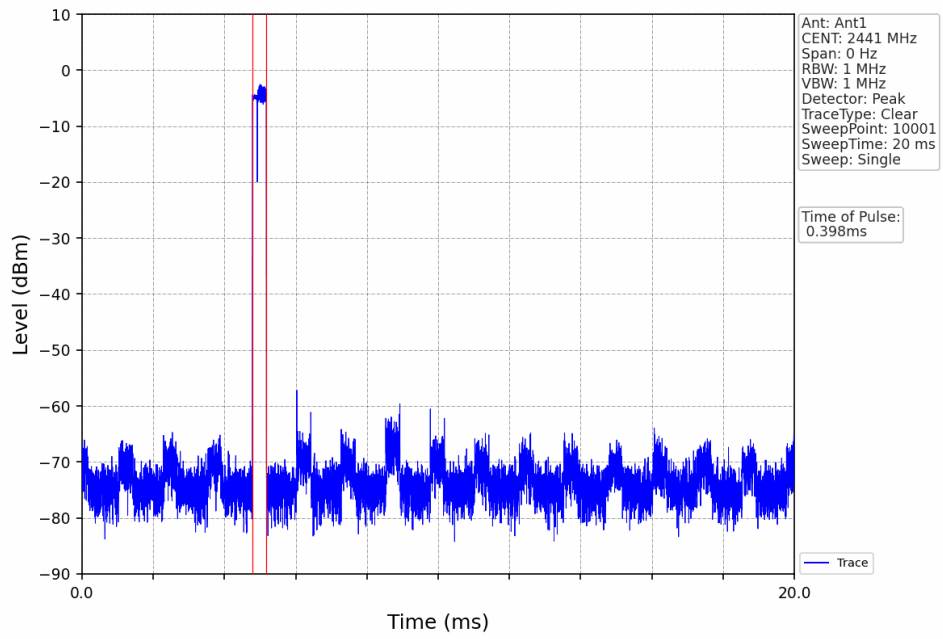
π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



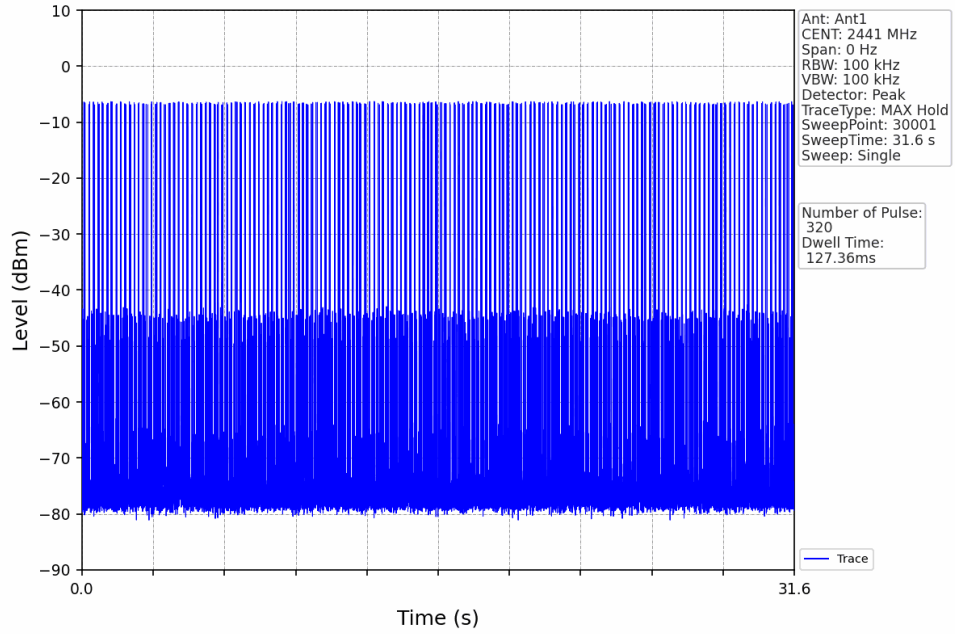

π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



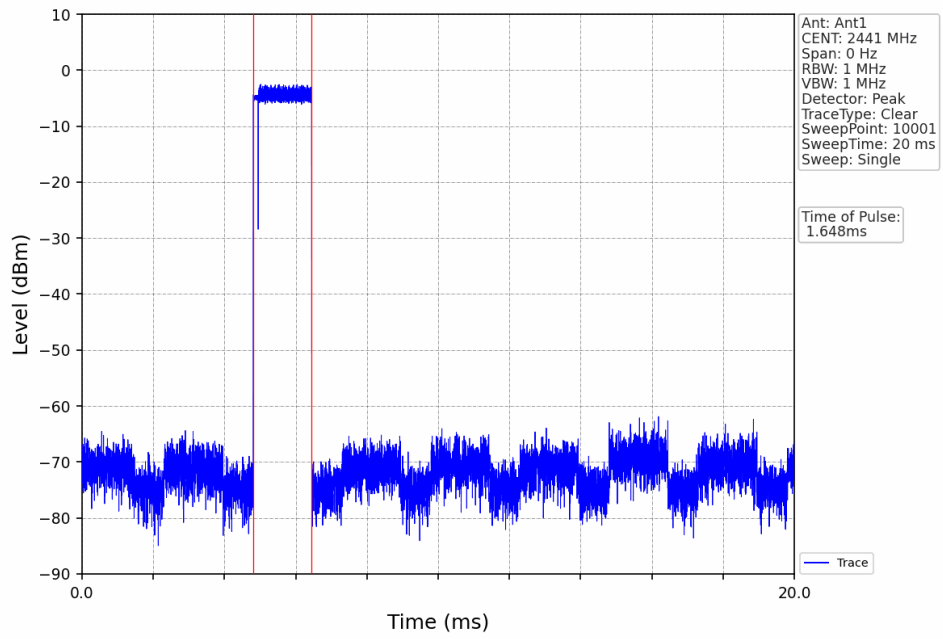
8DPSK_3DH1_HOPP_Ant1_NTNV



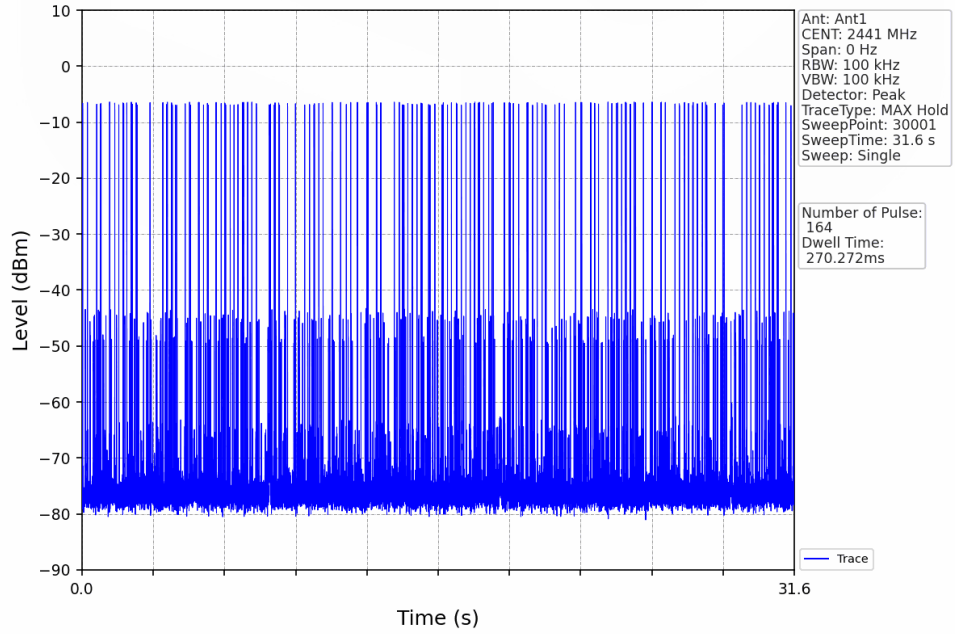

8DPSK_3DH1_HOPP_Ant1_NTNV



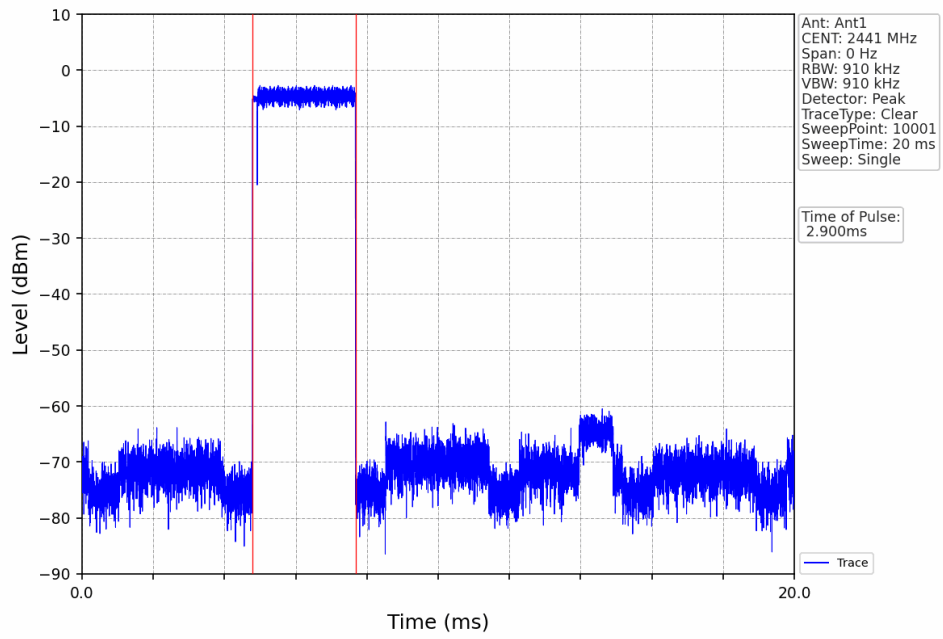
8DPSK_3DH3_HOPP_Ant1_NTNV



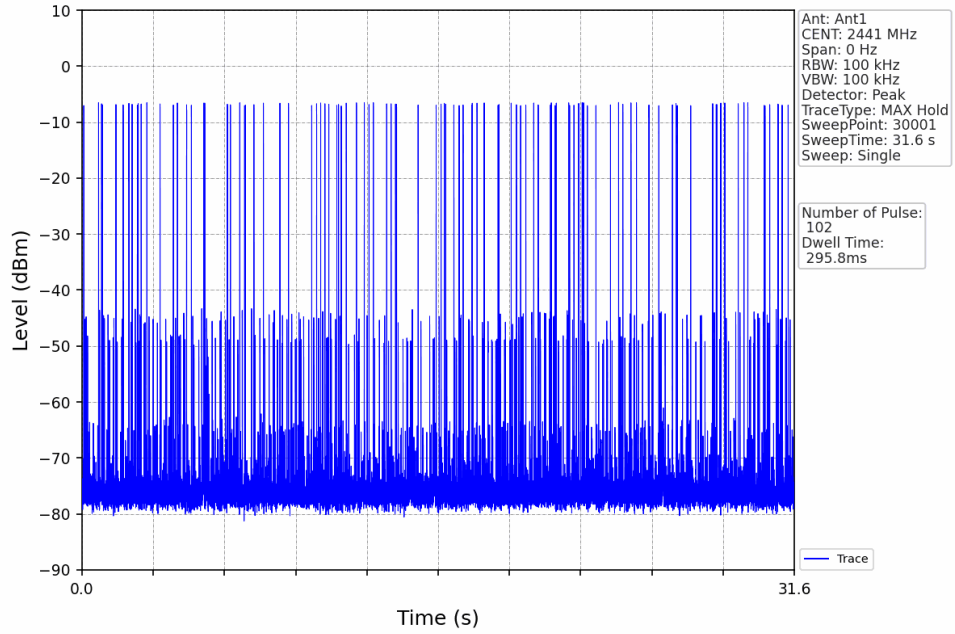

8DPSK_3DH3_HOPP_Ant1_NTNV



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 | -1.64 |
| | | 2441 | DH5 | 1 | -1.19 |
| | | 2480 | DH5 | 1 | -1.34 |
| | | HOPP | DH5 | 1 | -0.42 |
| | | | | | -0.42 |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | -5.47 |
| | | 2441 | 2DH5 | 1 | -4.88 |
| | | 2480 | 2DH5 | 1 | -5.64 |
| | | HOPP | 2DH5 | 1 | -4.80 |
| | | | | | -4.80 |
| 8DPSK | SISO | 2402 | 3DH5 | 1 | -5.85 |
| | | 2441 | 3DH5 | 1 | -5.13 |
| | | 2480 | 3DH5 | 1 | -5.78 |
| | | HOPP | 3DH5 | 1 | -4.90 |
| | | | | | -4.90 |
| Note1: Refer to RSS-247 Issue 2 section 5.5 and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level. | | | | | |

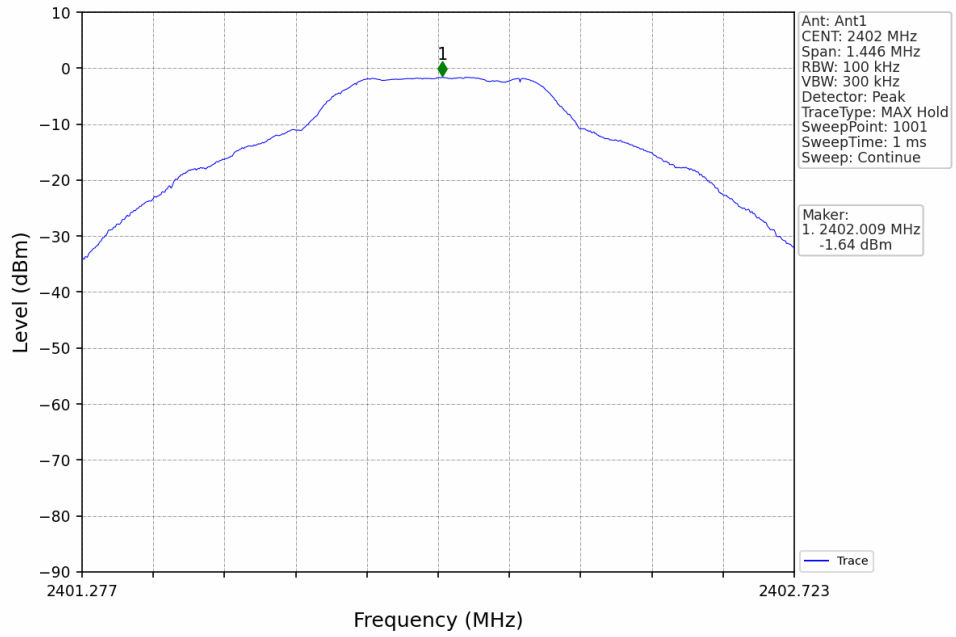
#### 7.1.2 CSE

| Mode | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| GFSK | SISO | 2402 | DH5 | 1 | -1.64 | -21.64 | Pass |
| | | 2441 | DH5 | 1 | -1.19 | -21.19 | Pass |
| | | 2480 | DH5 | 1 | -1.34 | -21.34 | Pass |
| | | HOPP | DH5 | 1 | -0.42 | -20.42 | Pass |
| | | | | | -0.42 | -20.42 | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | -5.47 | -25.47 | Pass |
| | | 2441 | 2DH5 | 1 | -4.88 | -24.88 | Pass |
| | | 2480 | 2DH5 | 1 | -5.64 | -25.64 | Pass |
| | | HOPP | 2DH5 | 1 | -4.80 | -24.80 | Pass |
| | | | | | -4.80 | -24.80 | Pass |
| 8DPSK | SISO | 2402 | 3DH5 | 1 | -5.85 | -25.85 | Pass |
| | | 2441 | 3DH5 | 1 | -5.13 | -25.13 | Pass |
| | | 2480 | 3DH5 | 1 | -5.78 | -25.78 | Pass |
| | | HOPP | 3DH5 | 1 | -4.90 | -24.90 | Pass |
| | | | | | -4.90 | -24.90 | Pass |
| Note1: Refer to RSS-247 Issue 2 section 5.5 and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level. | | | | | | | |

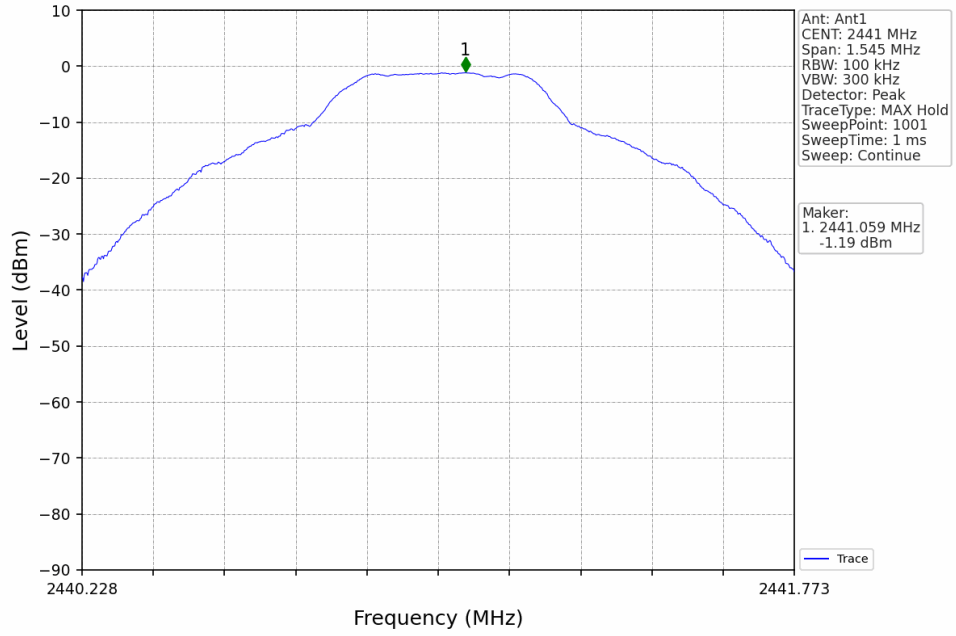
## 7.2 Test Graph

### 7.2.1 Ref

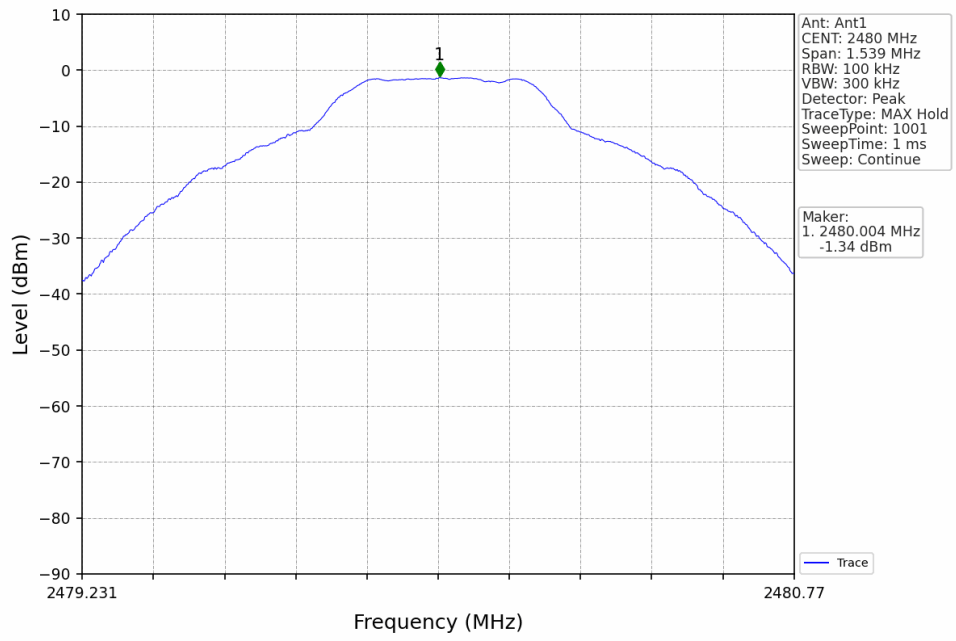
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



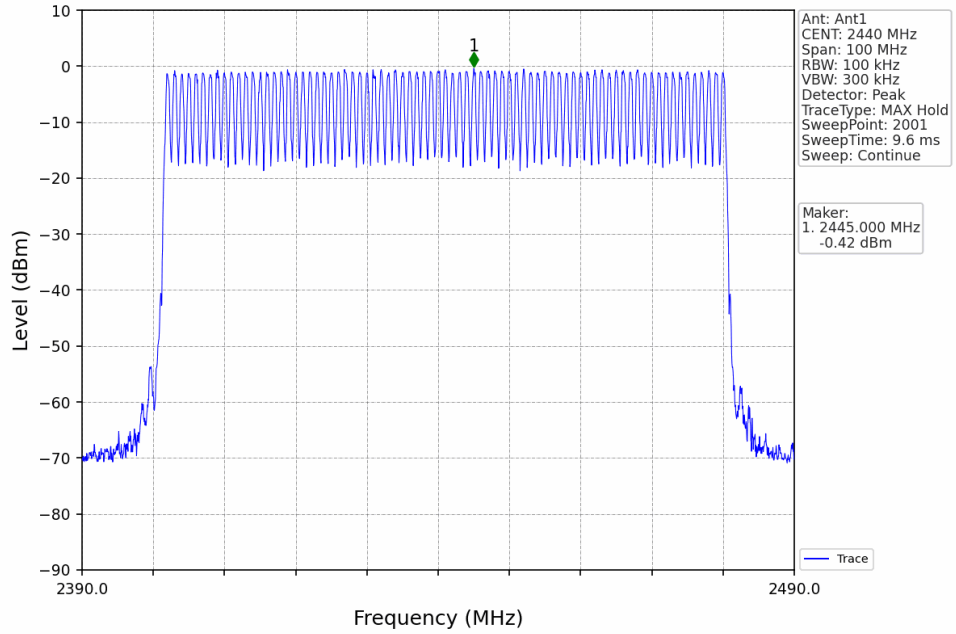

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



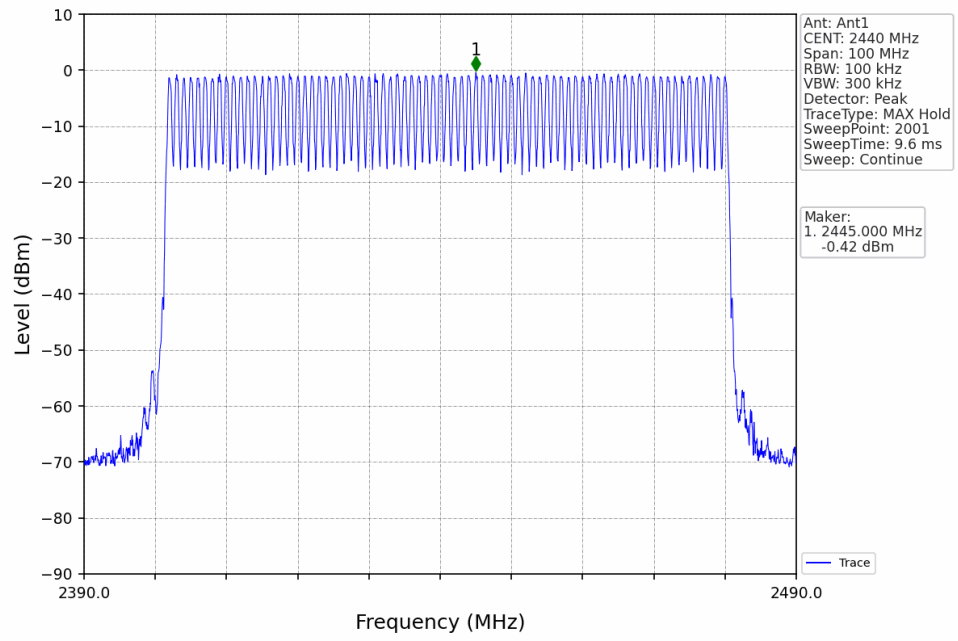
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



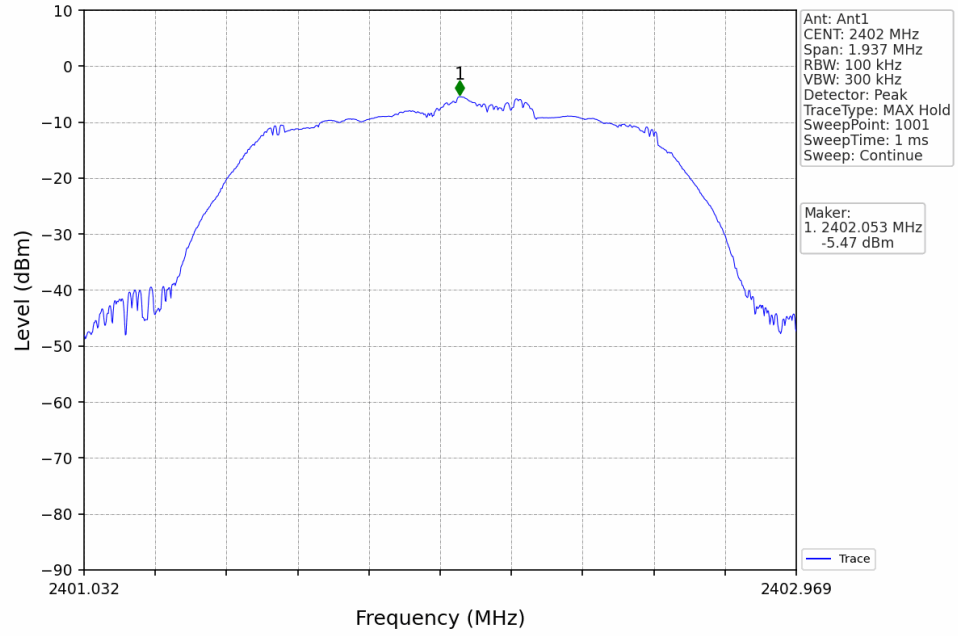

GFSK_DH5_HOPP_Ant1_NTNV



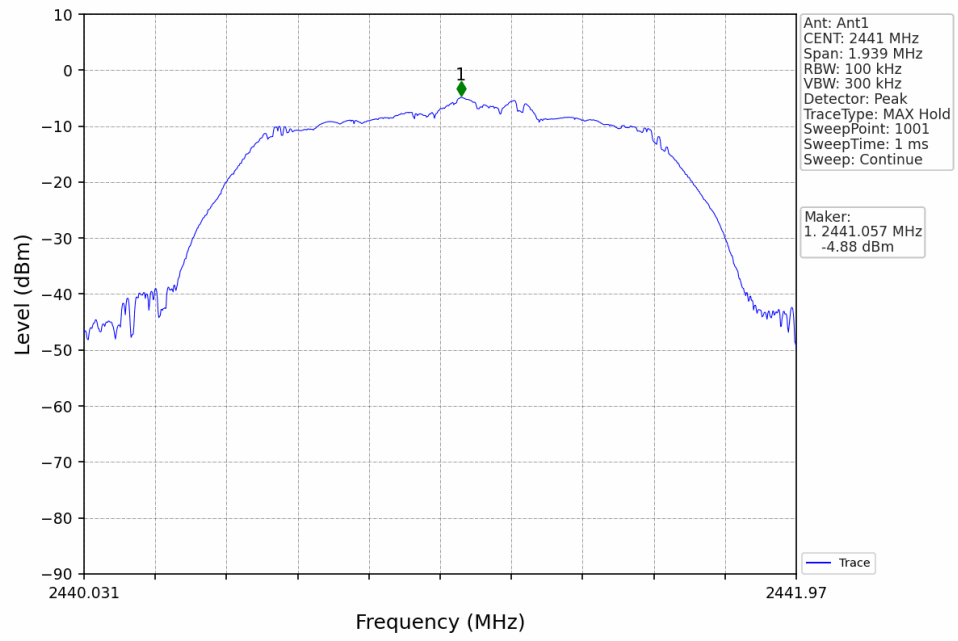
GFSK_DH5_HOPP_Ant1_NTNV



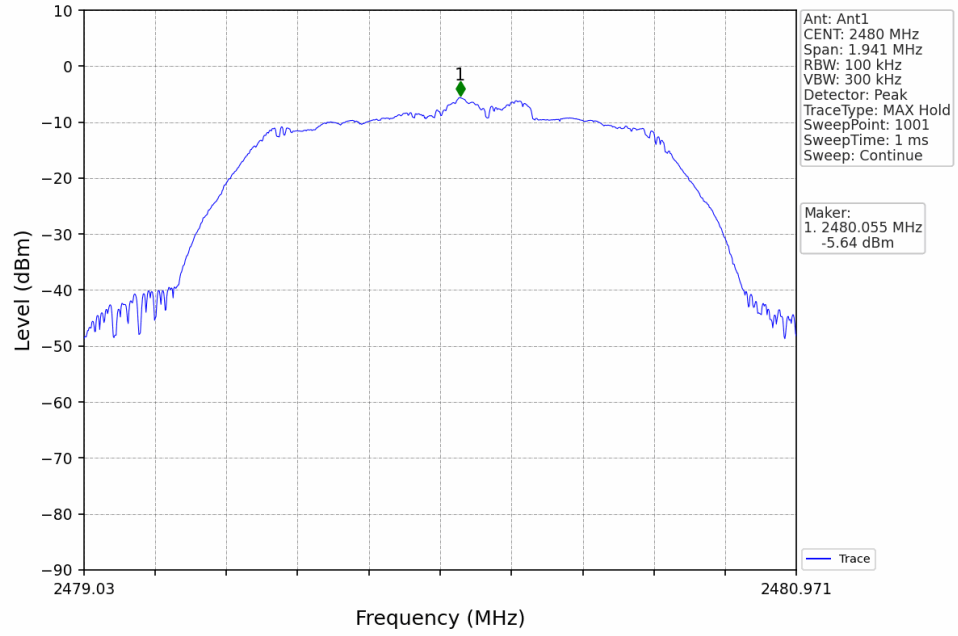

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



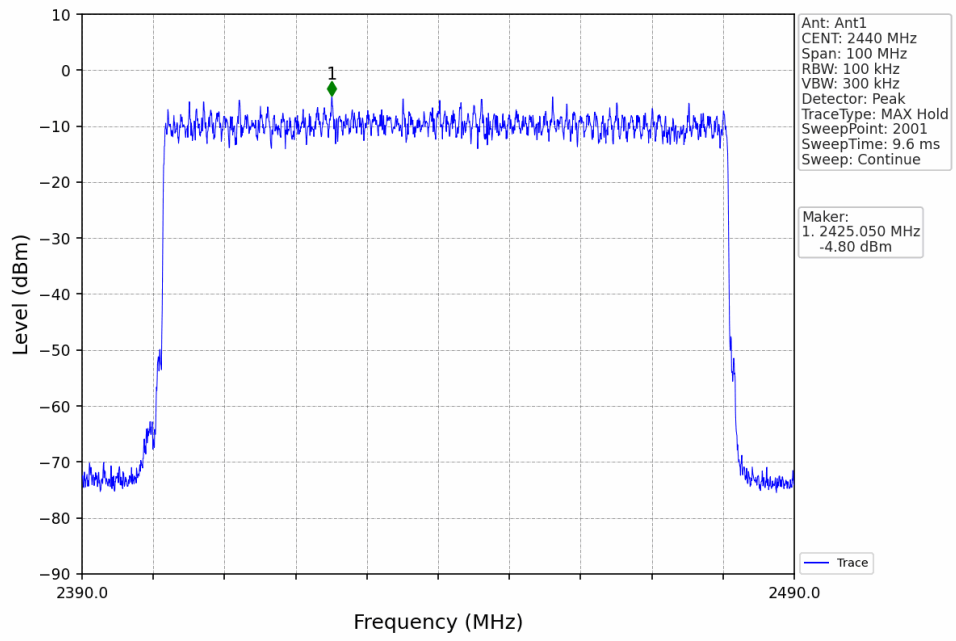
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



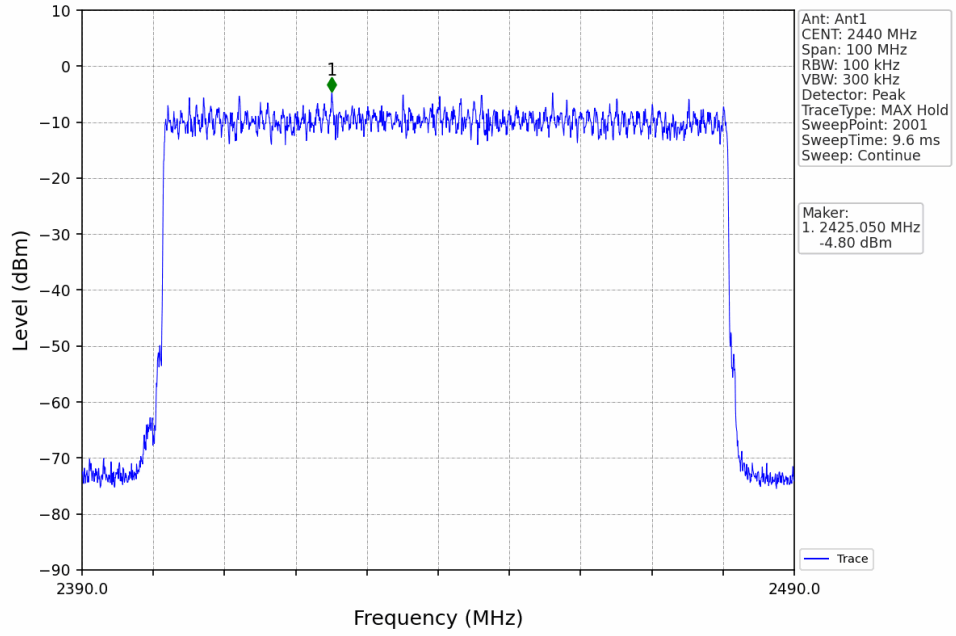

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



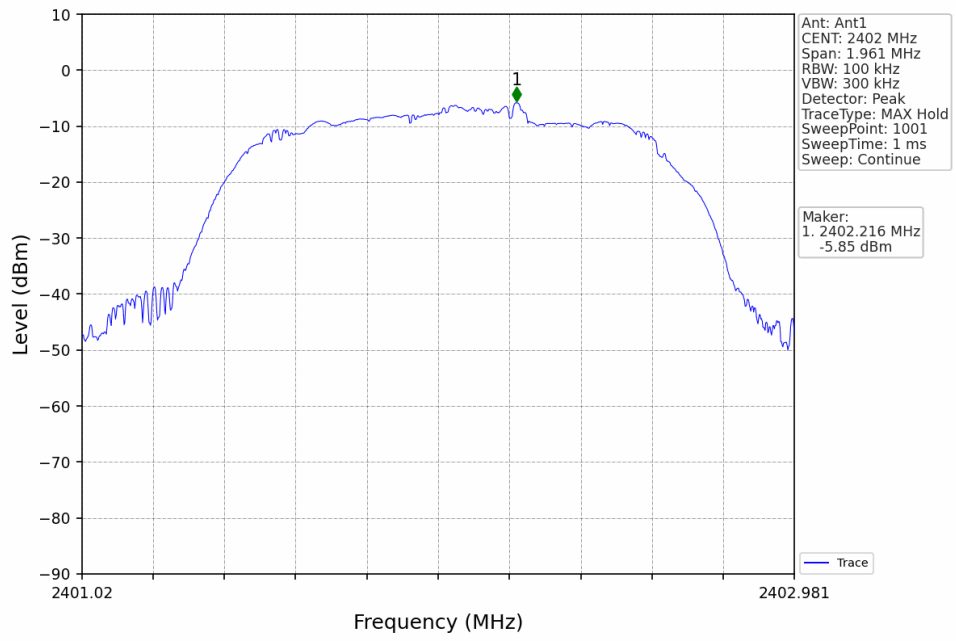
π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



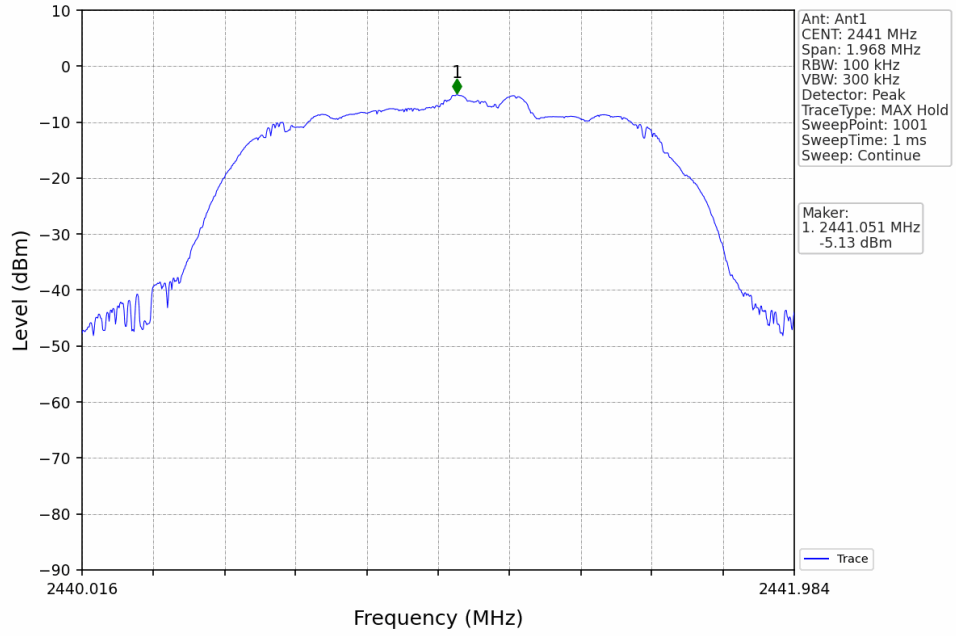

π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



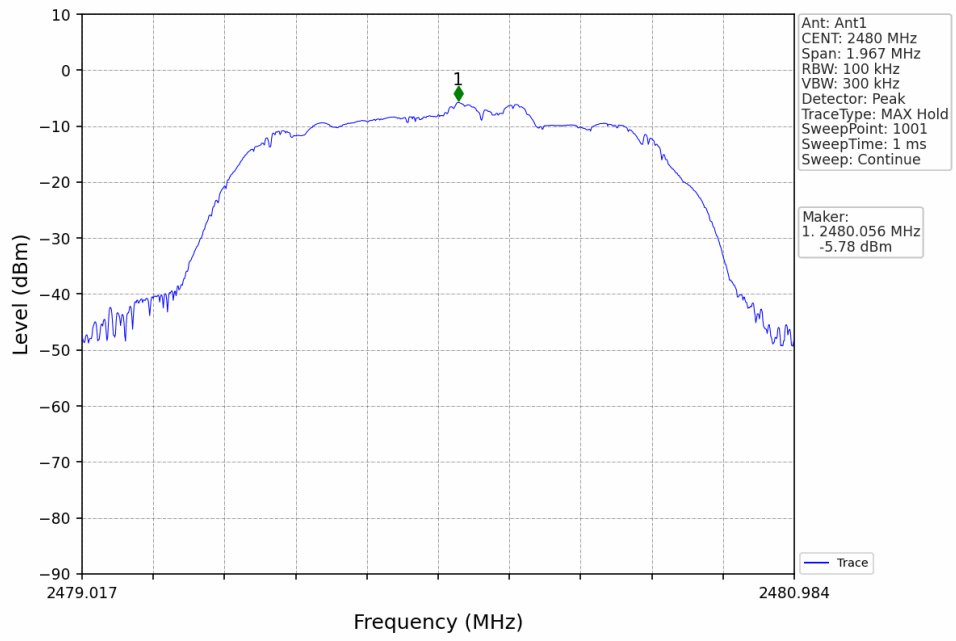
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



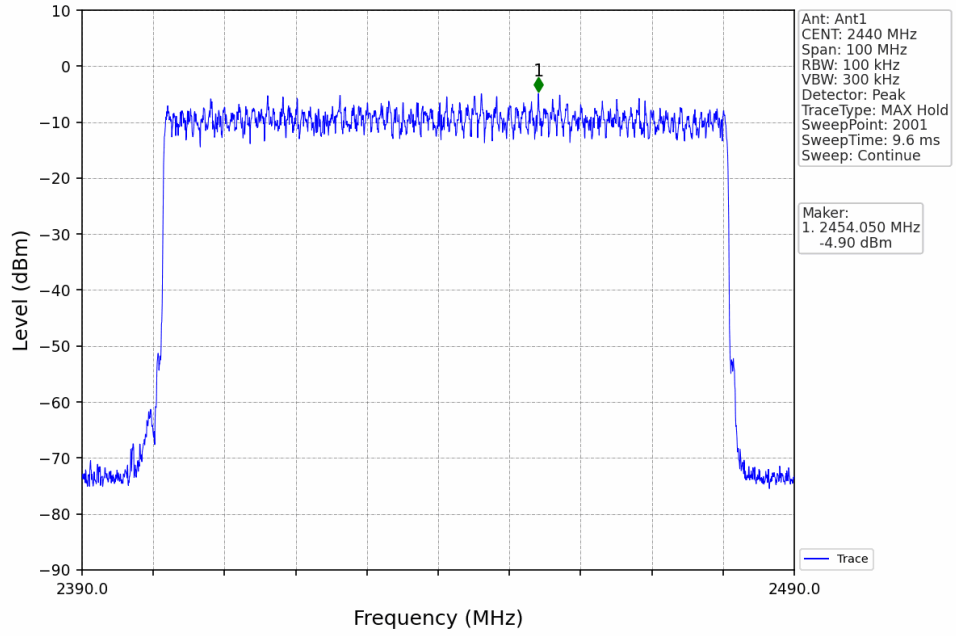

8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



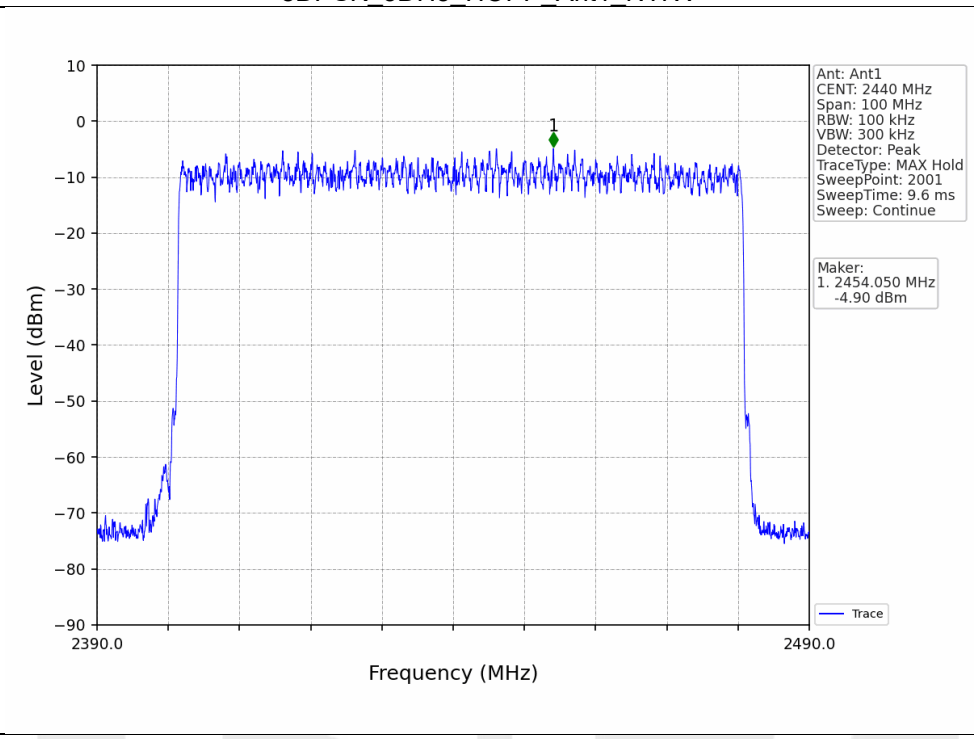
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV




8DPSK_3DH5_HOPP_Ant1_NTNV

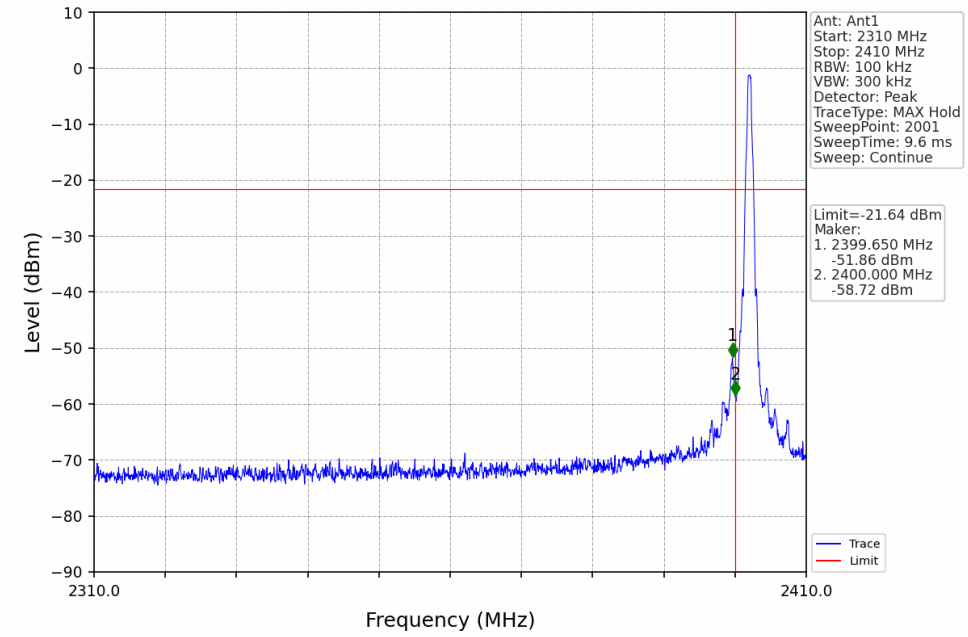


8DPSK_3DH5_HOPP_Ant1_NTNV

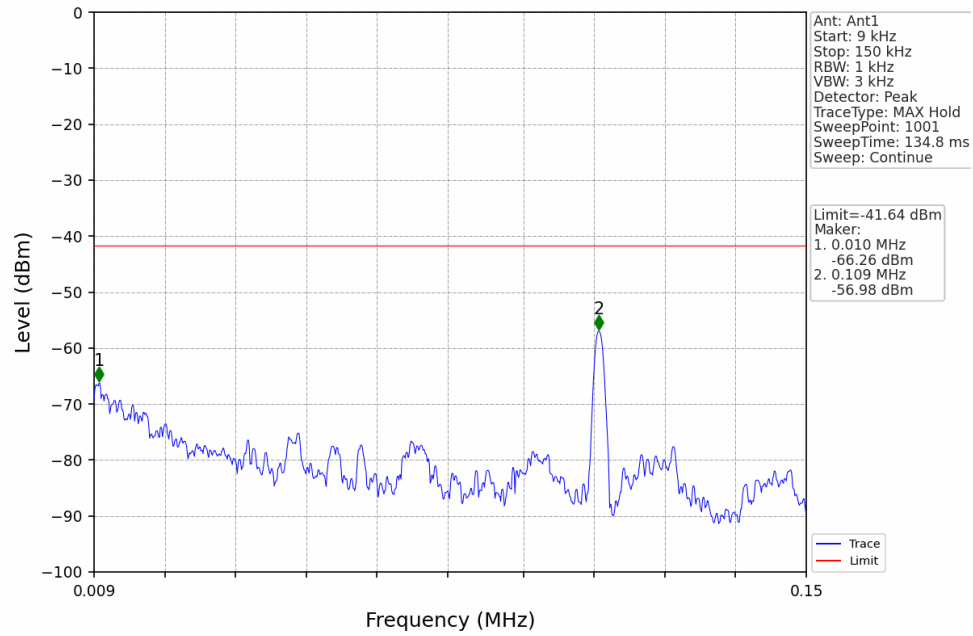


### 7.2.2 CSE

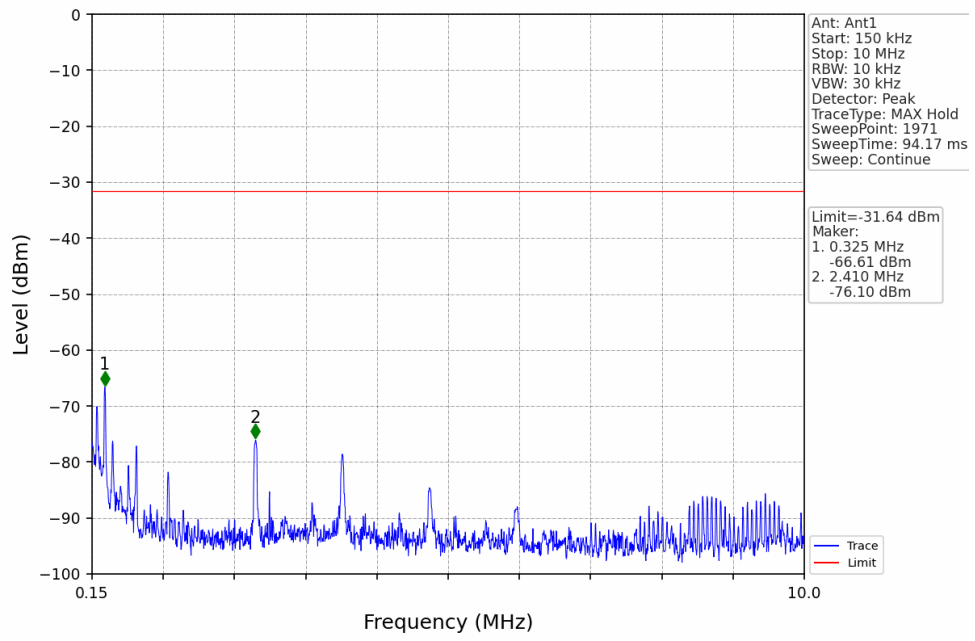
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



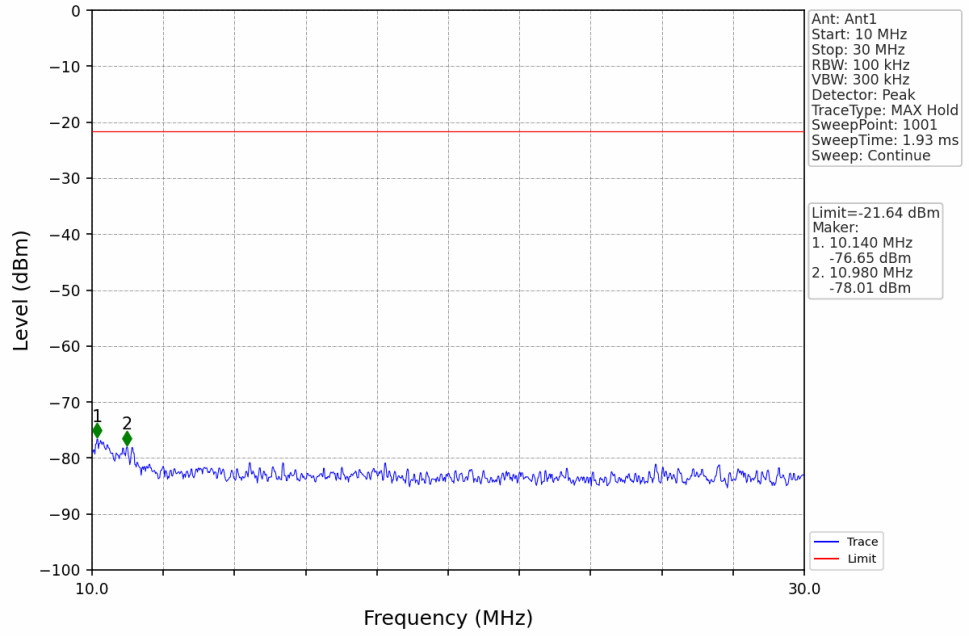

GFSK_DH5_LCH_2402MHz_Ant1_NTNV



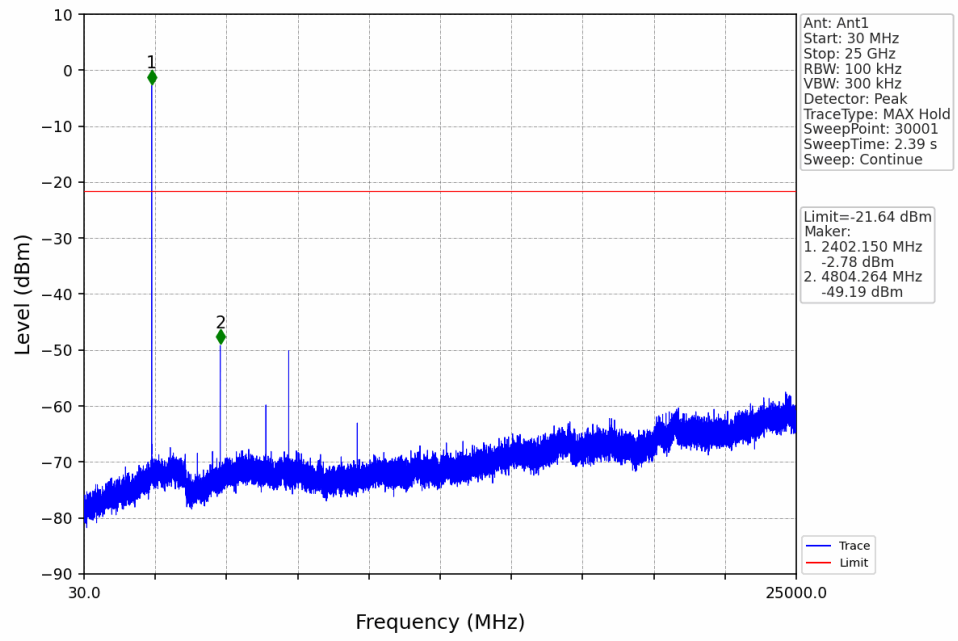
GFSK_DH5_LCH_2402MHz_Ant1_NTNV




GFSK_DH5_LCH_2402MHz_Ant1_NTNV



GFSK_DH5_LCH_2402MHz_Ant1_NTNV

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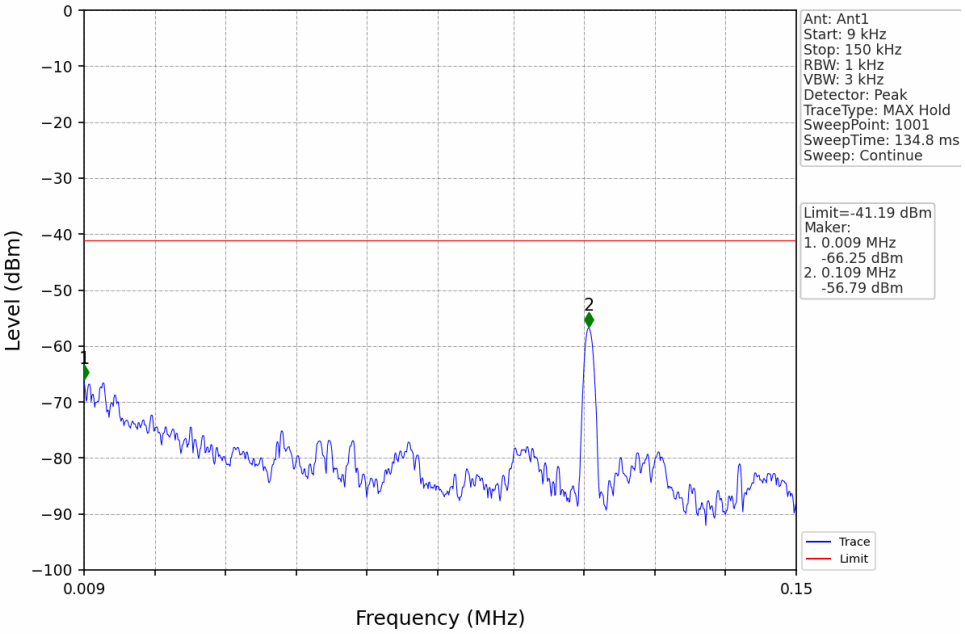

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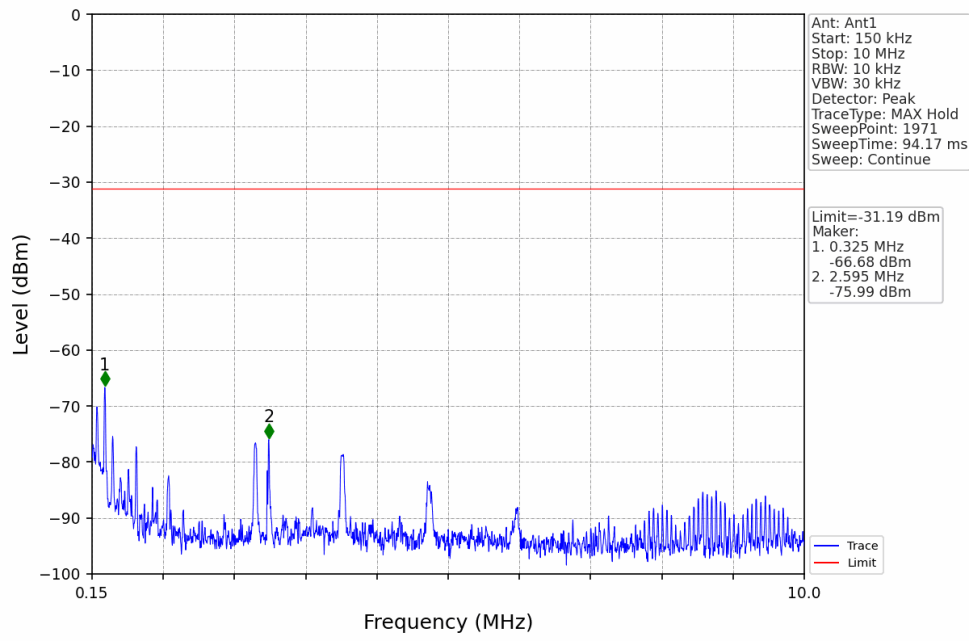


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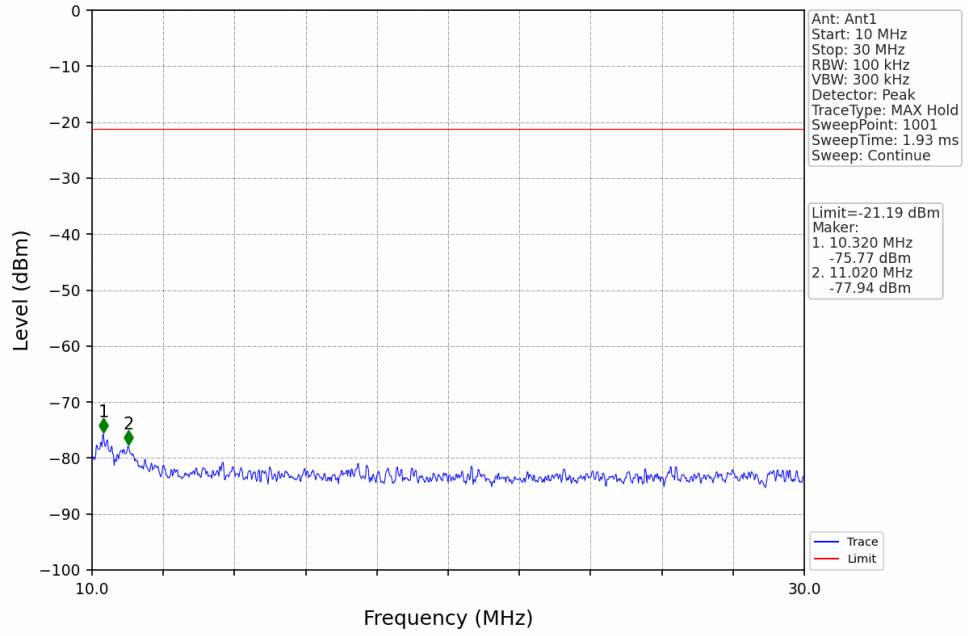

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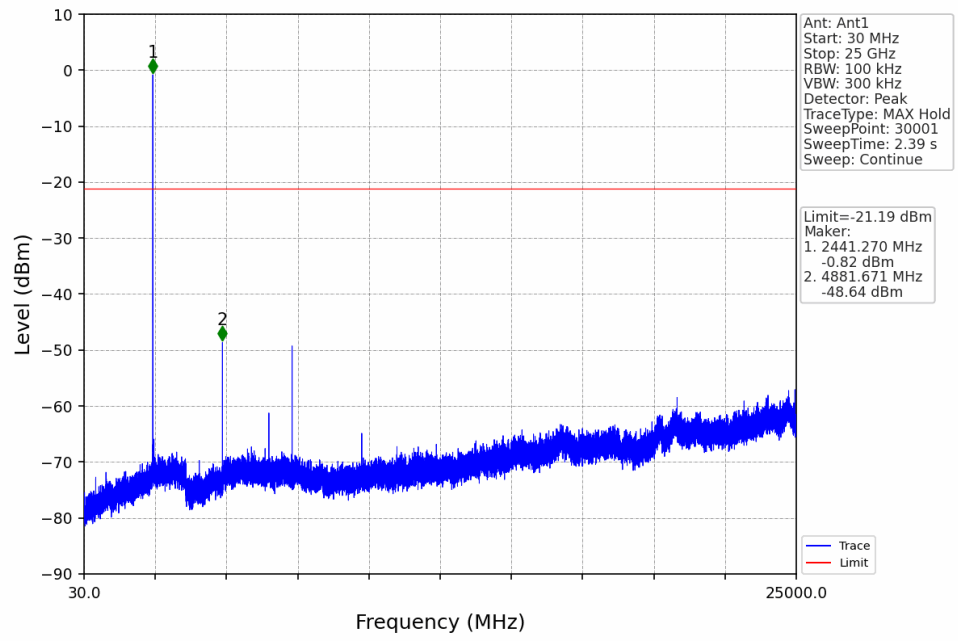


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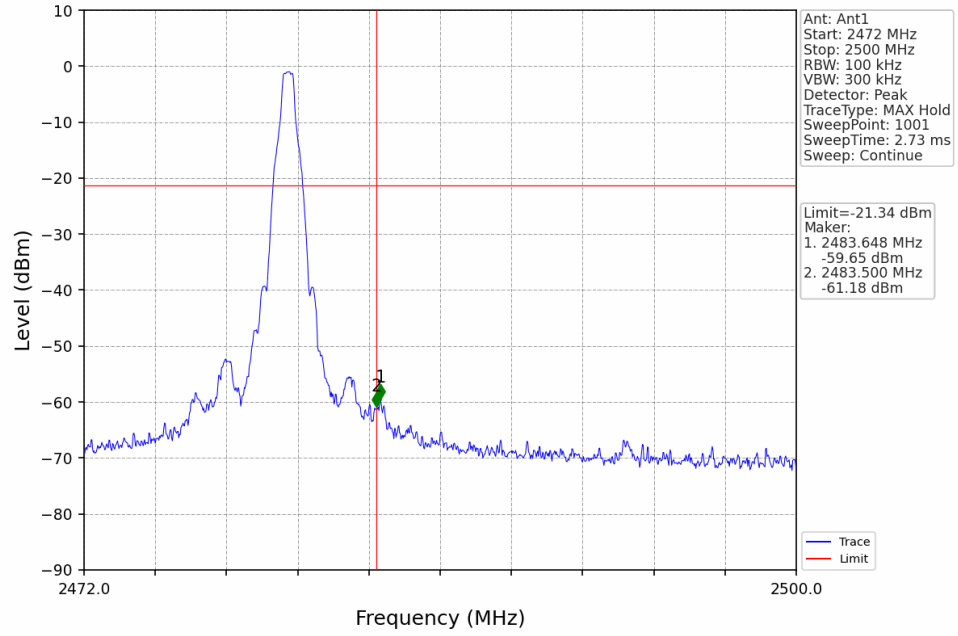

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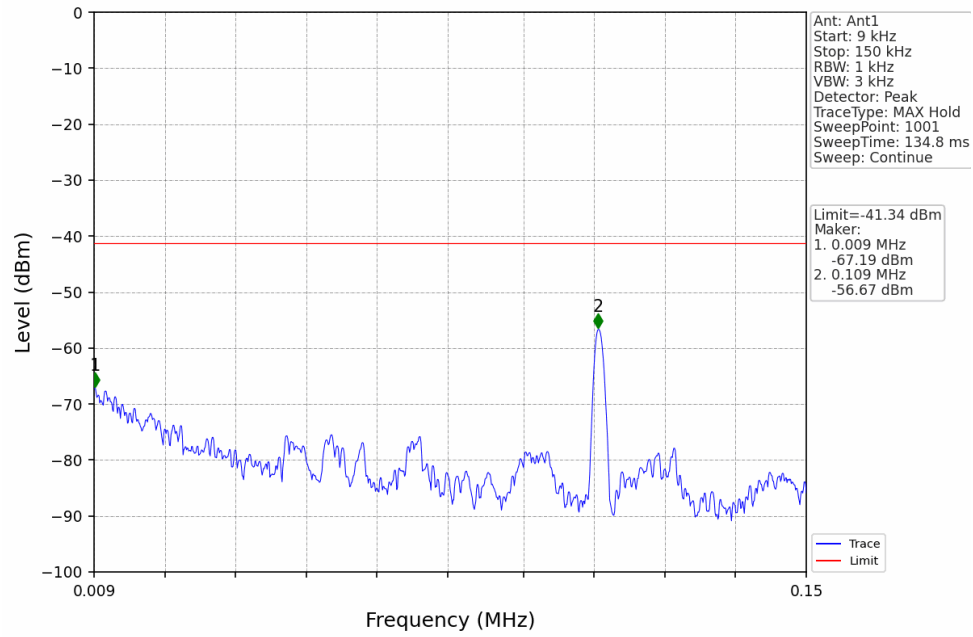


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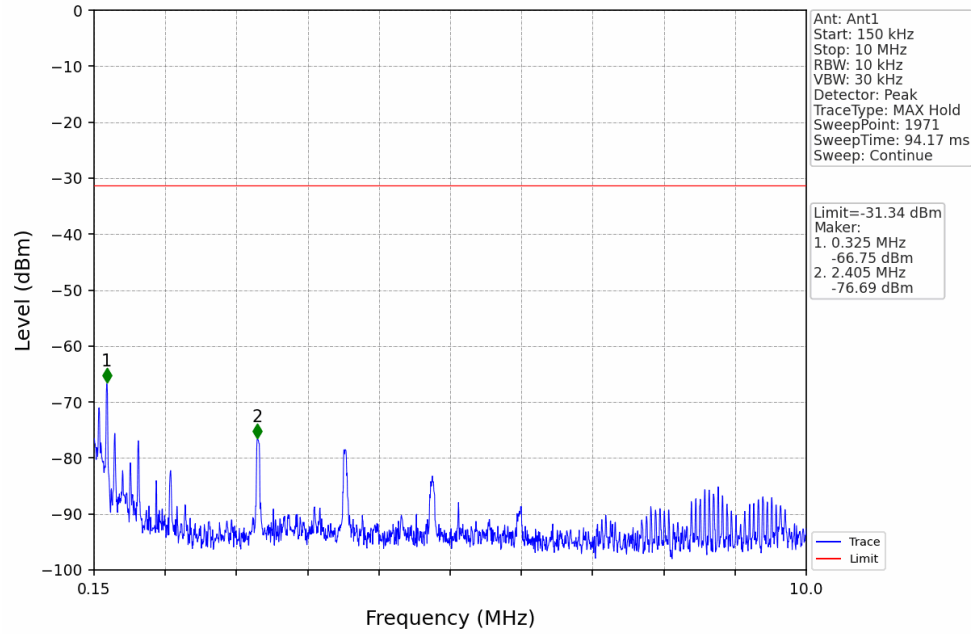

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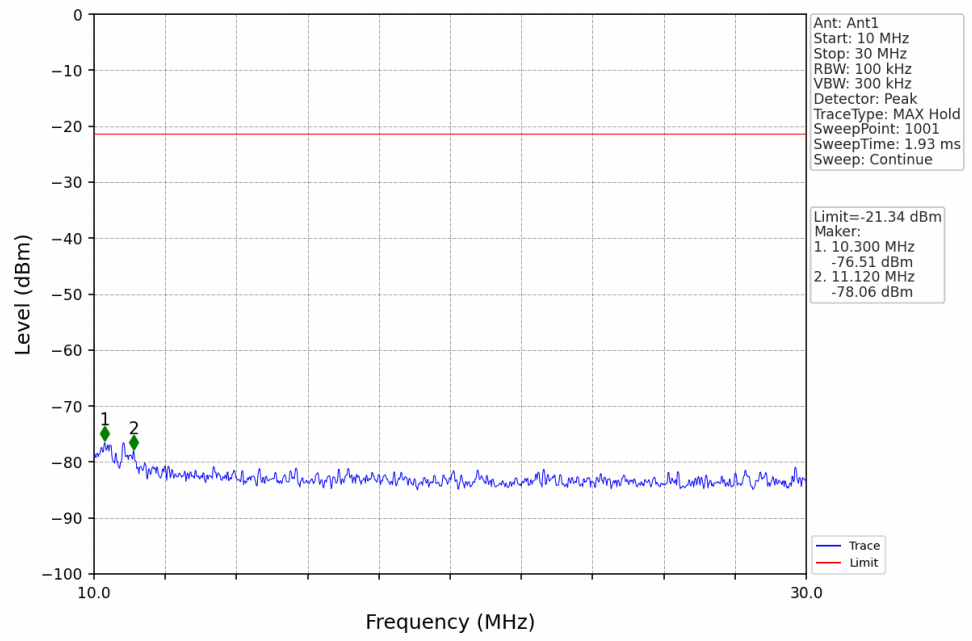


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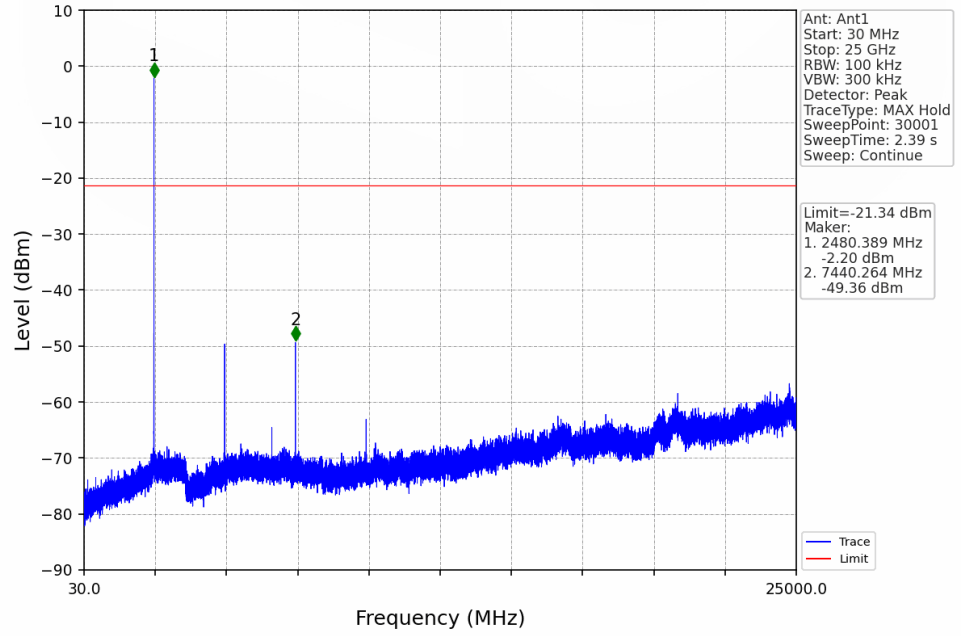

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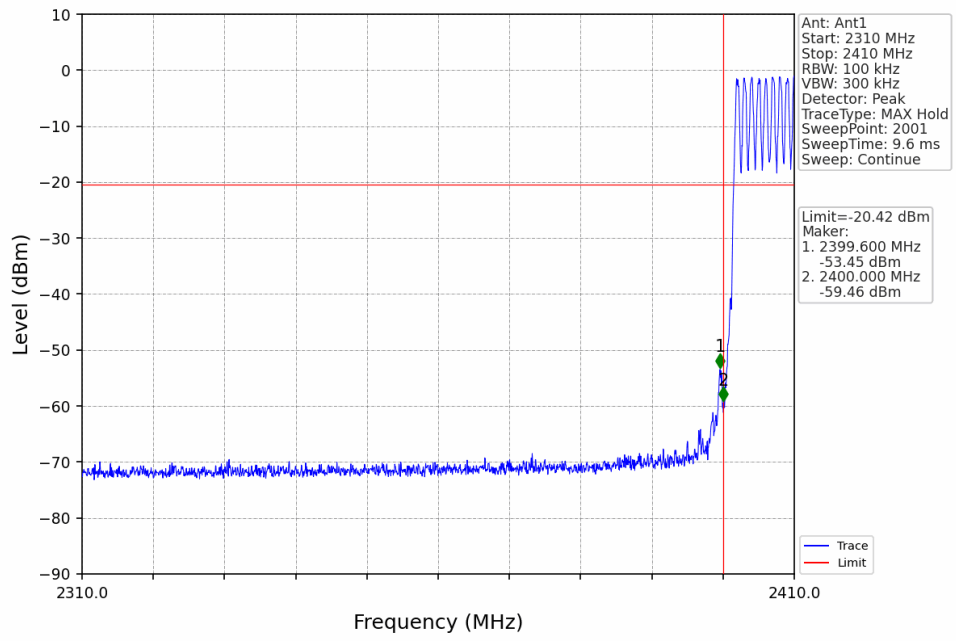


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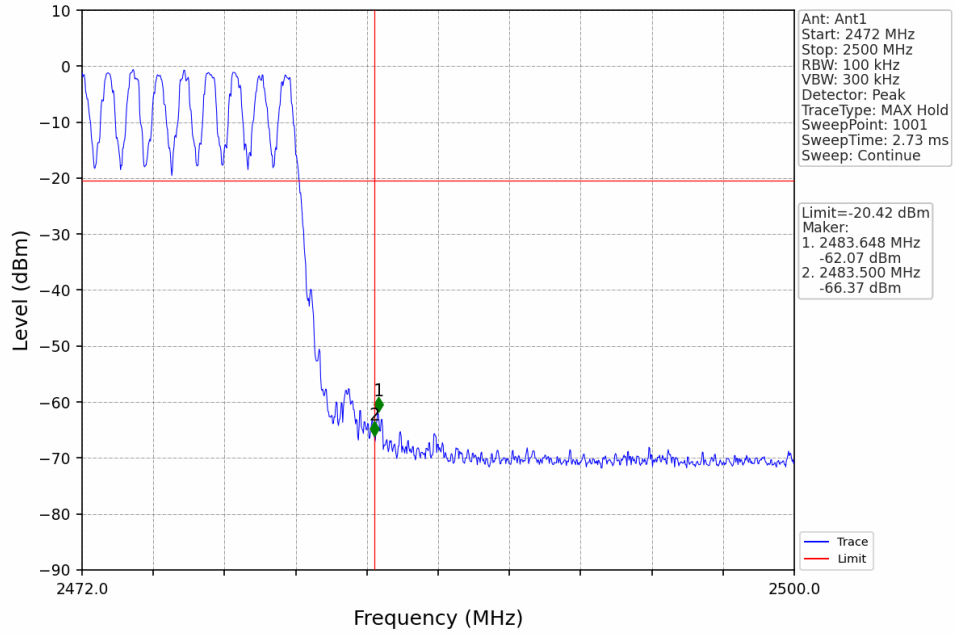

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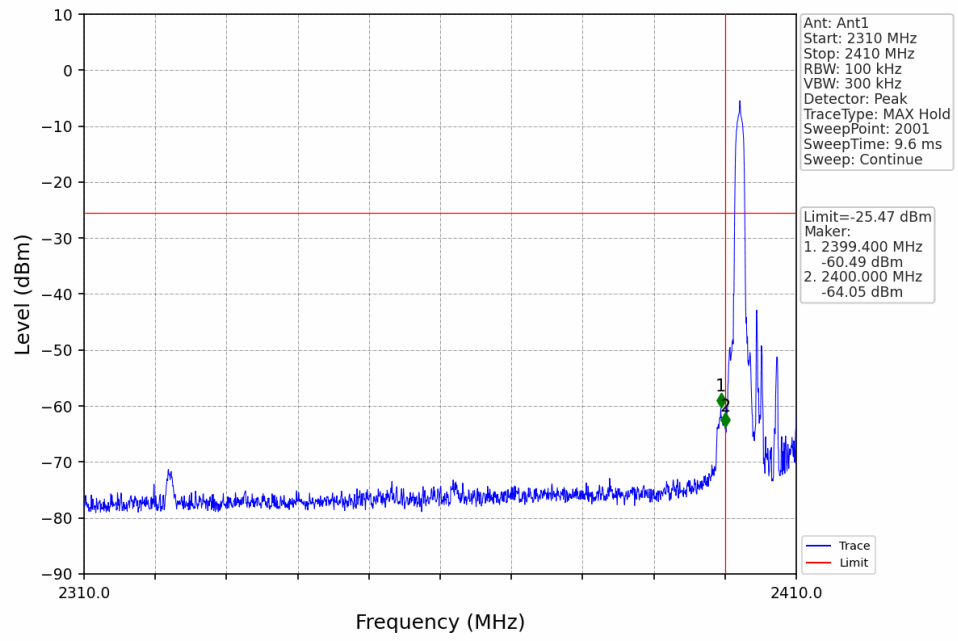


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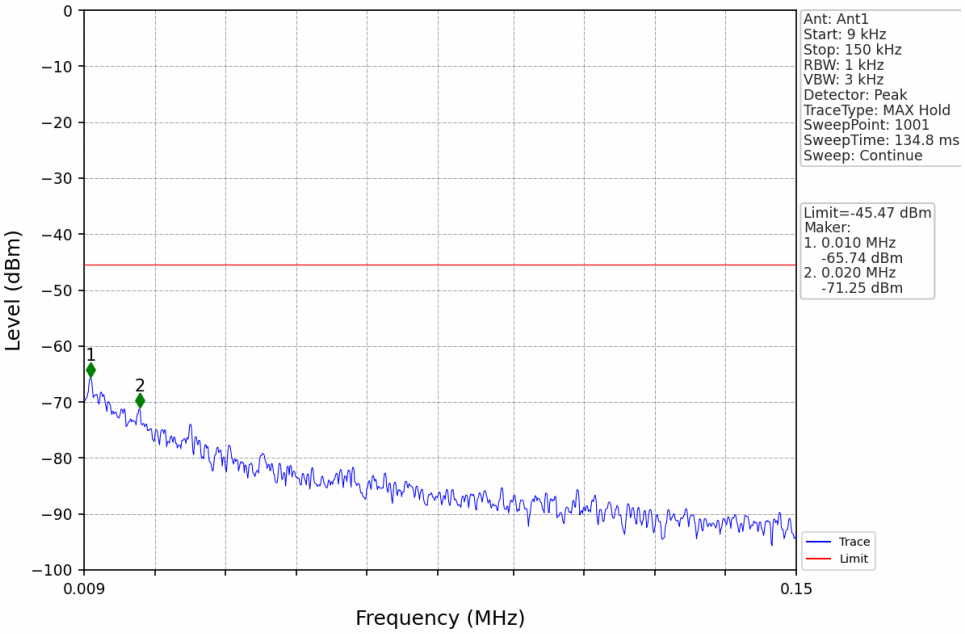

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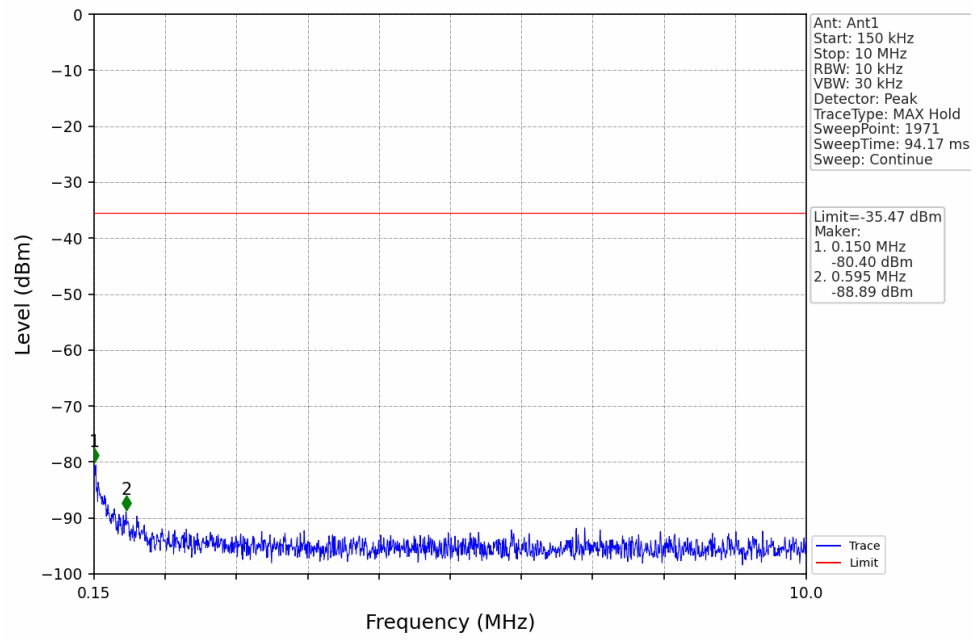


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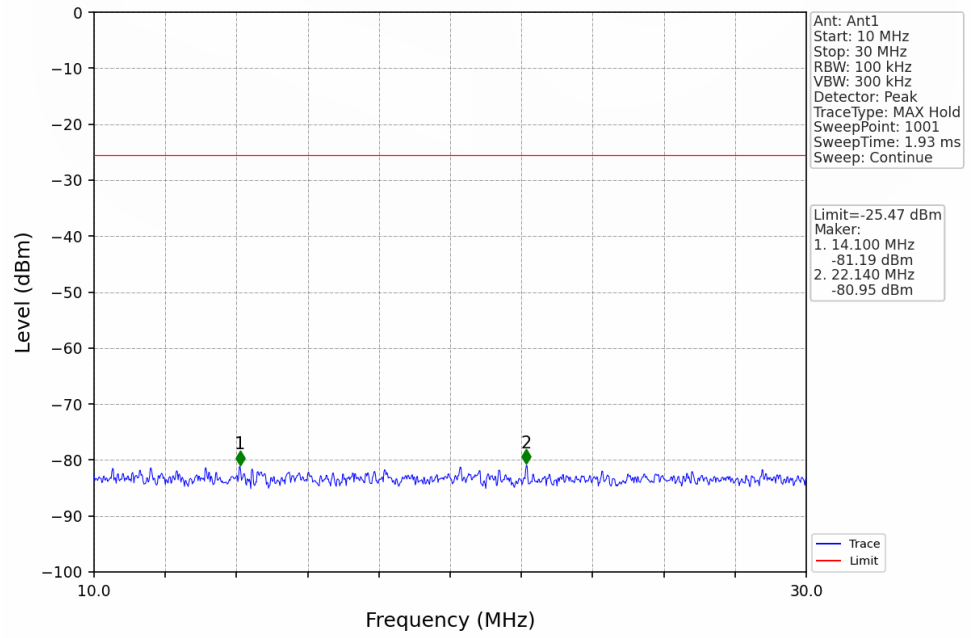

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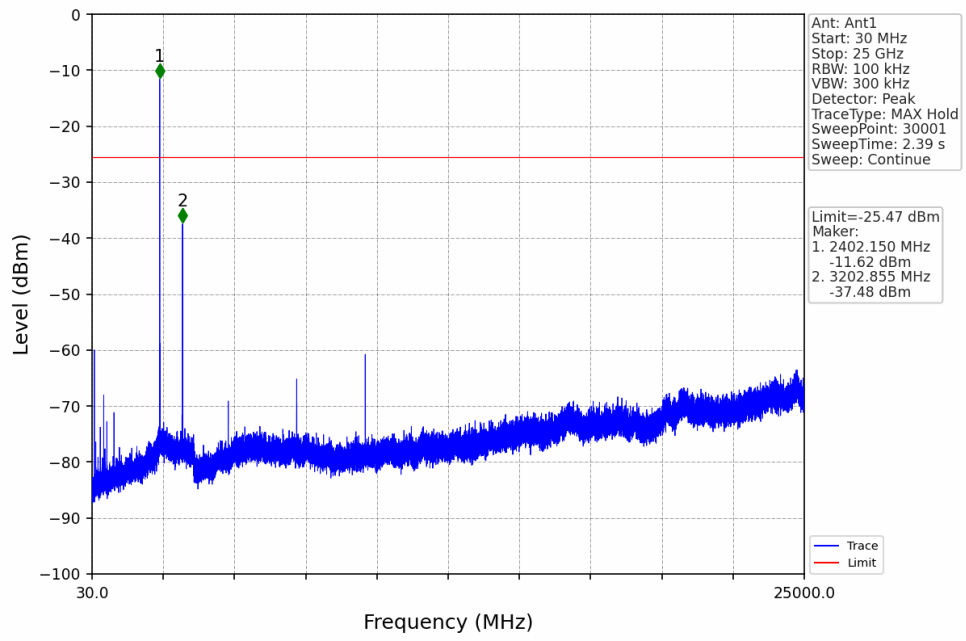


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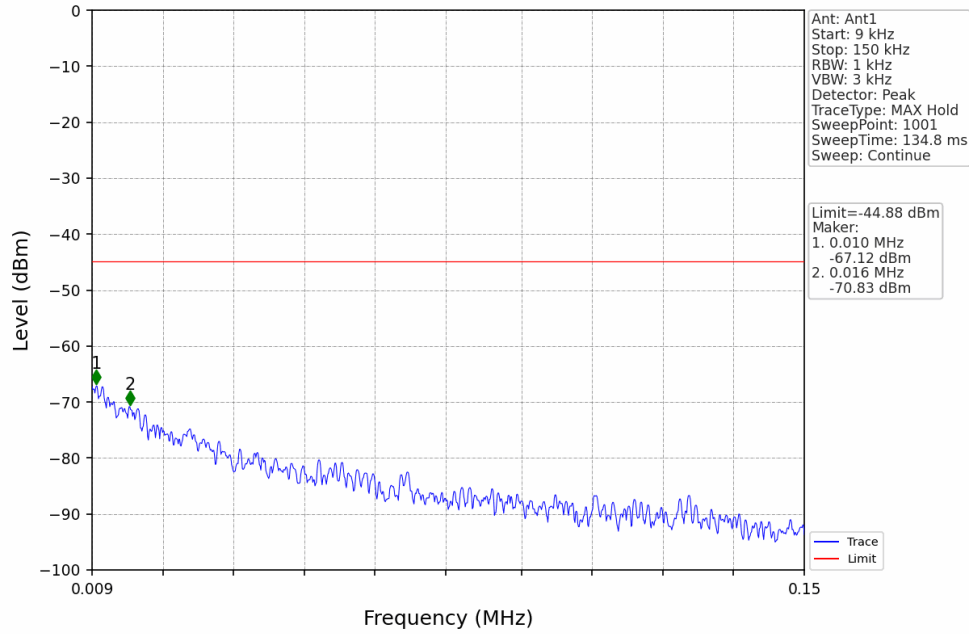

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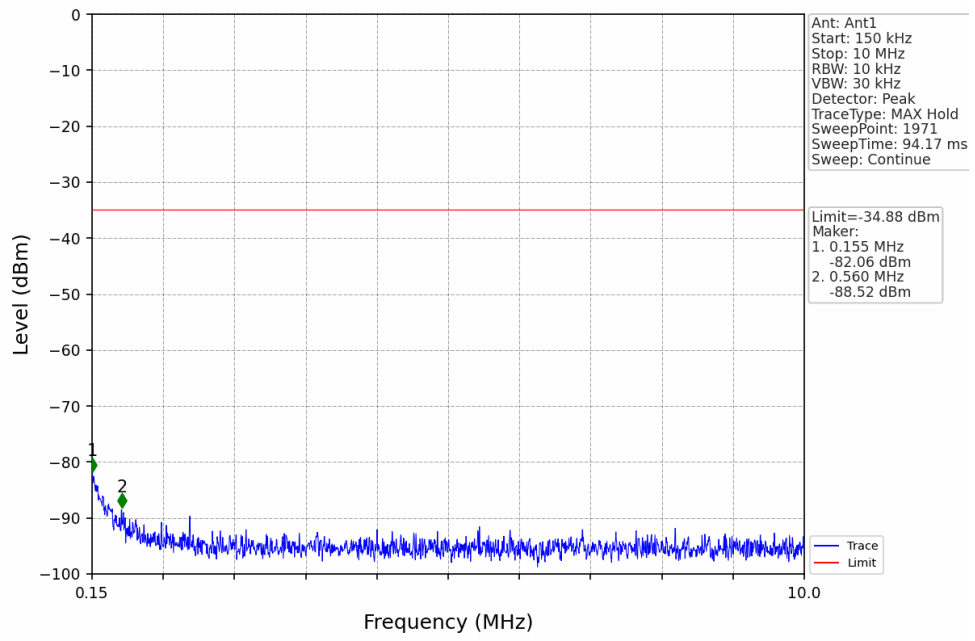


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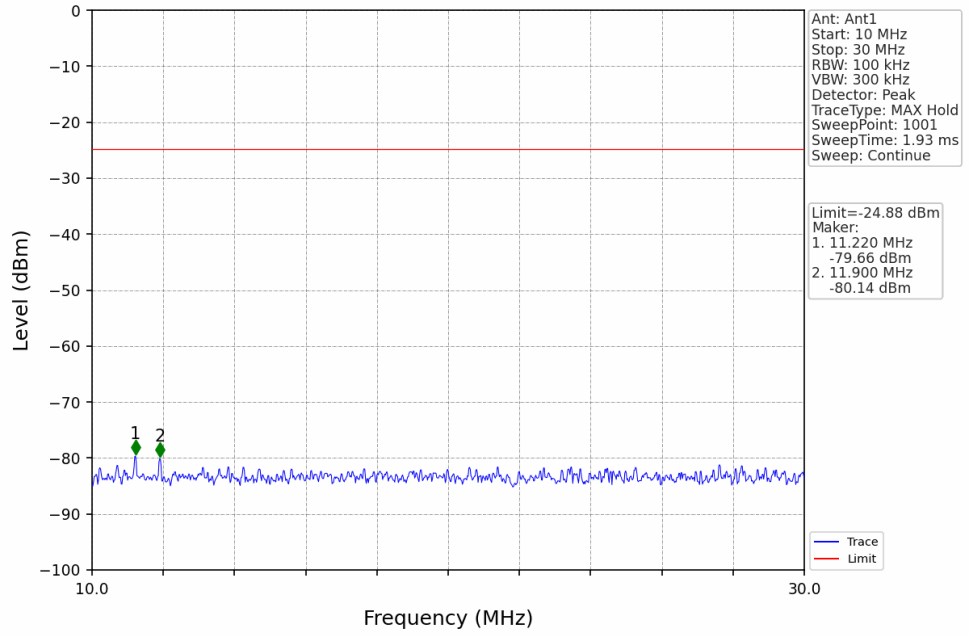

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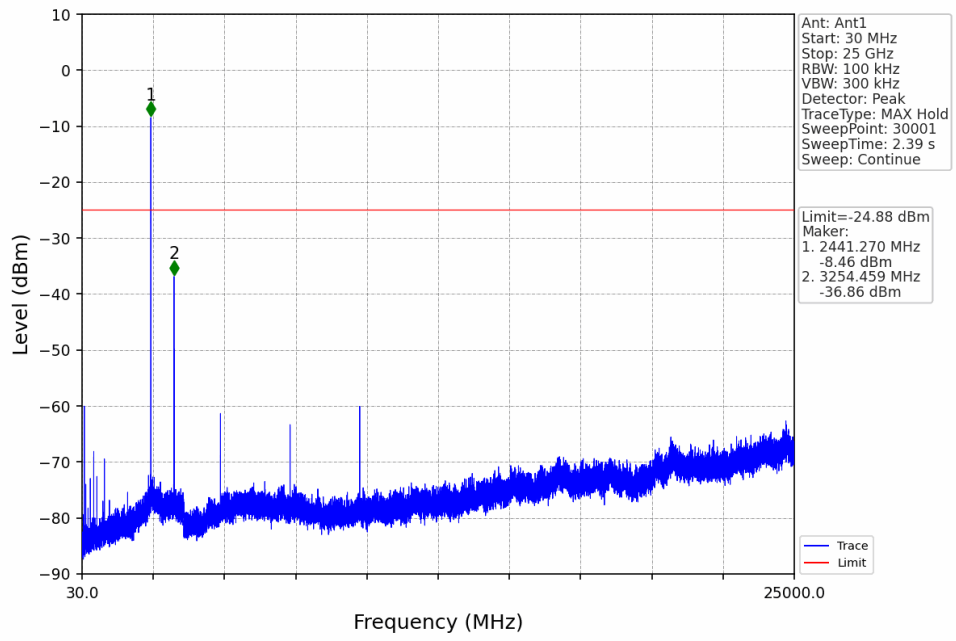


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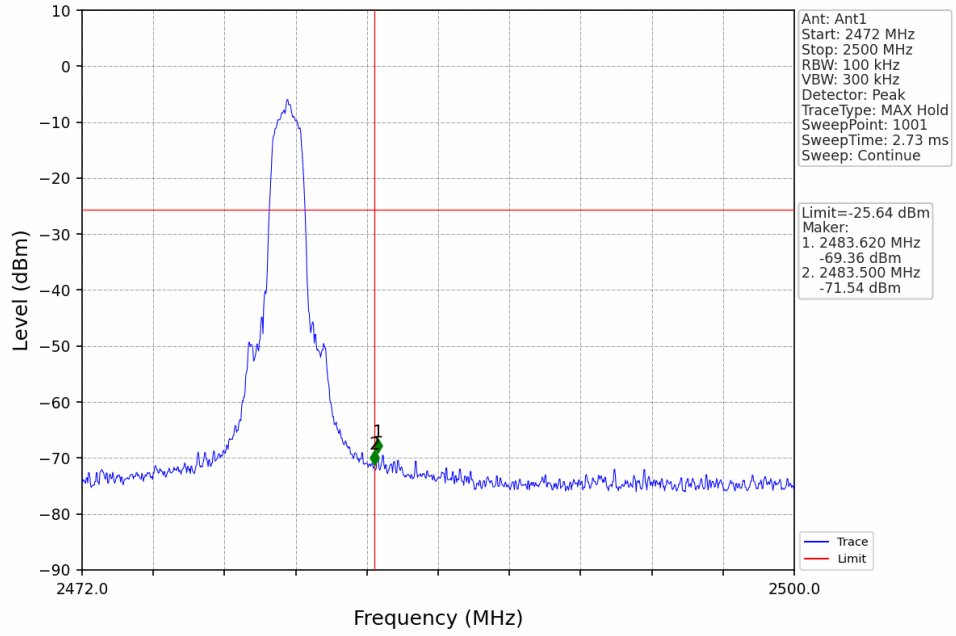

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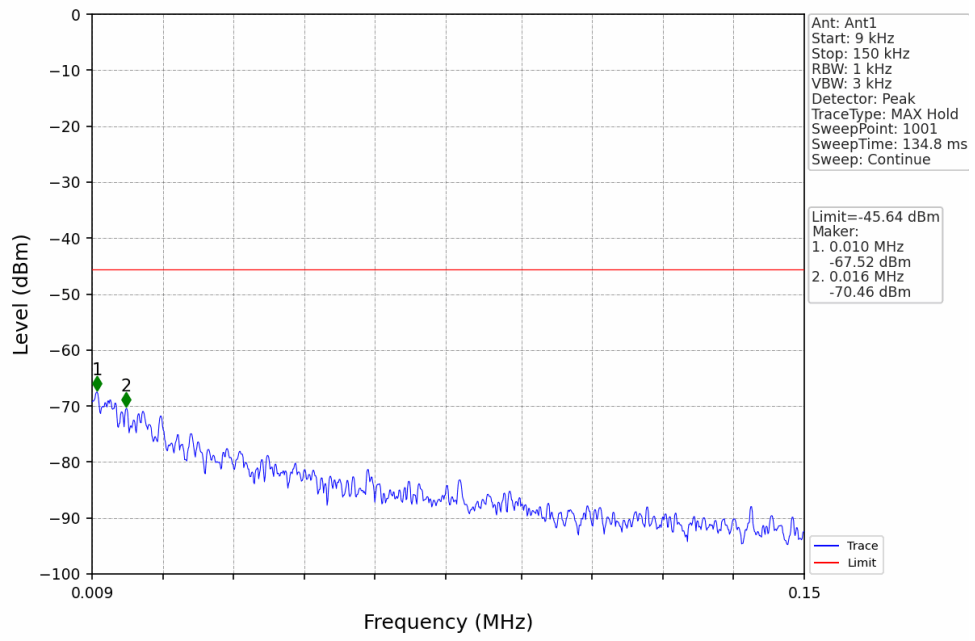


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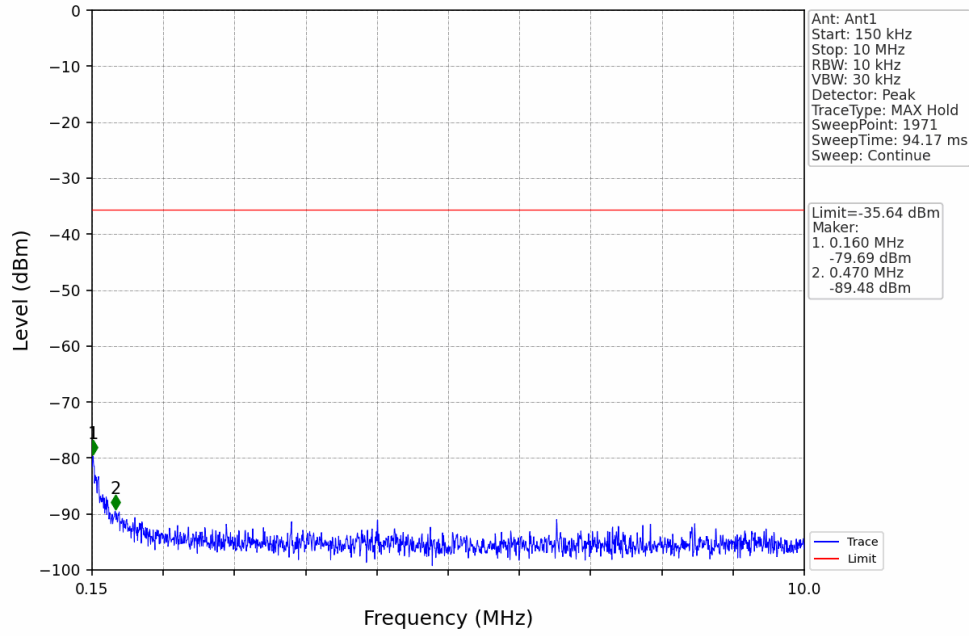

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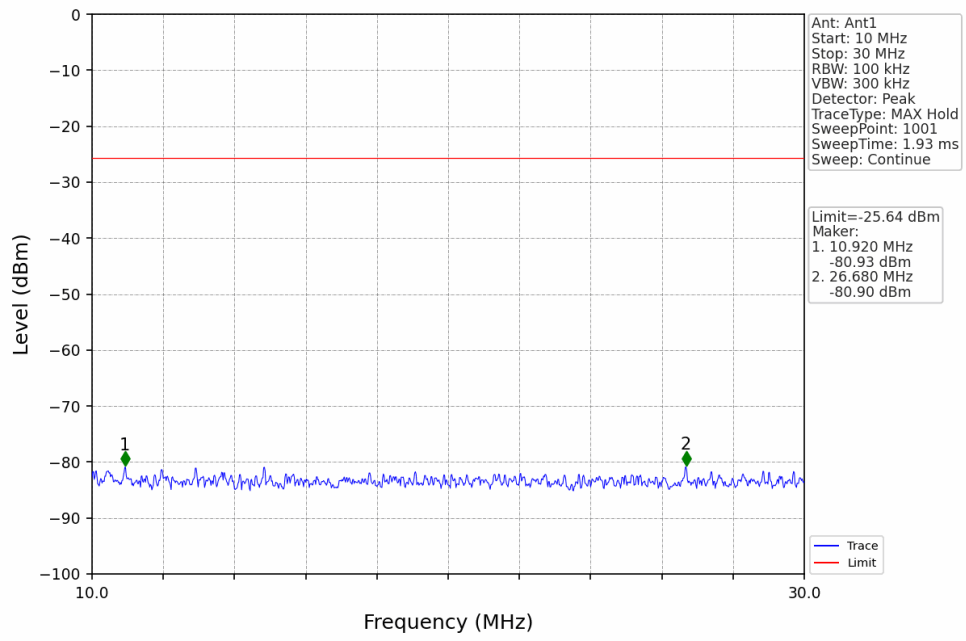


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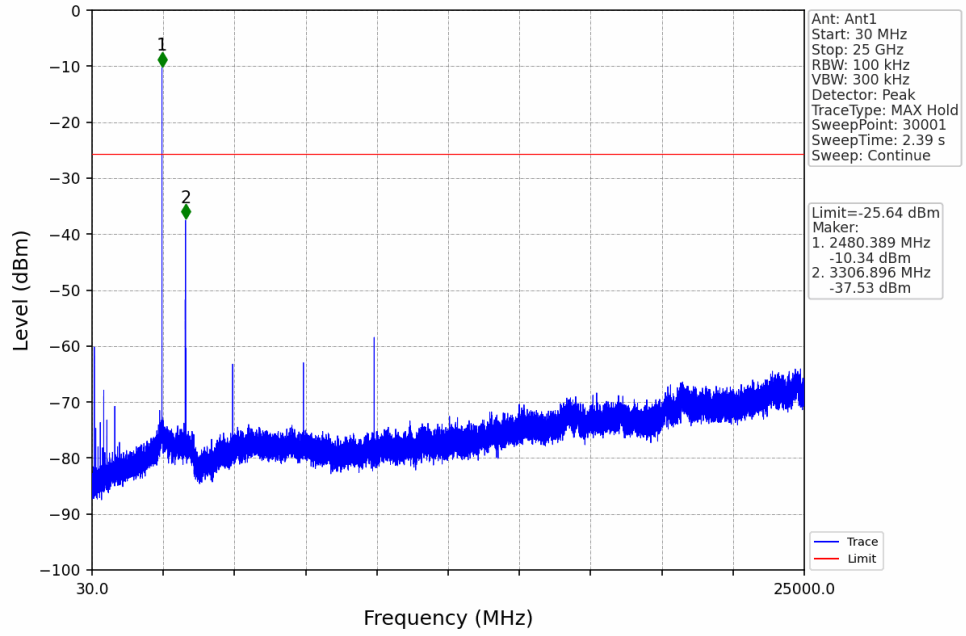

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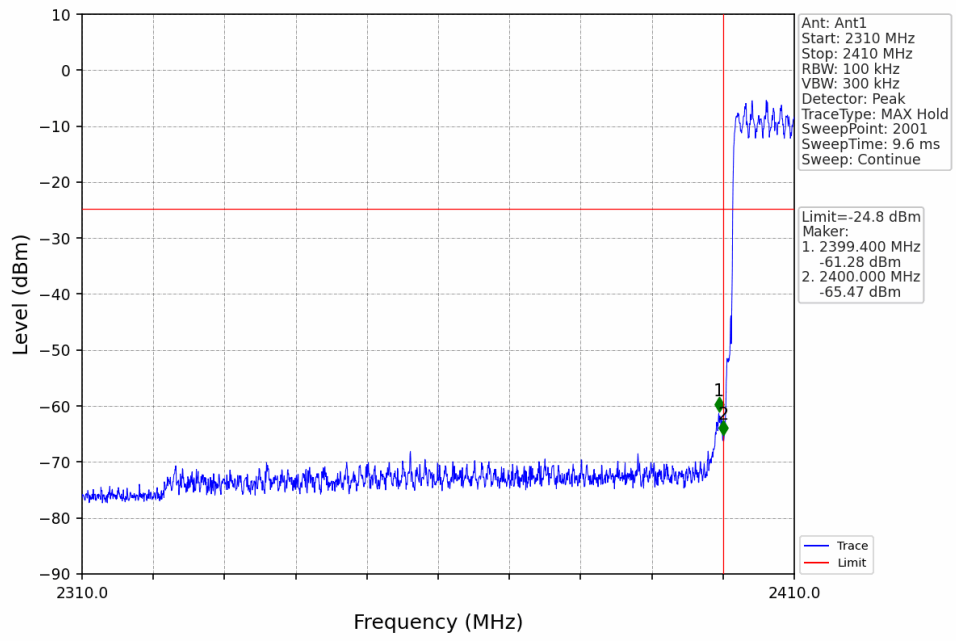


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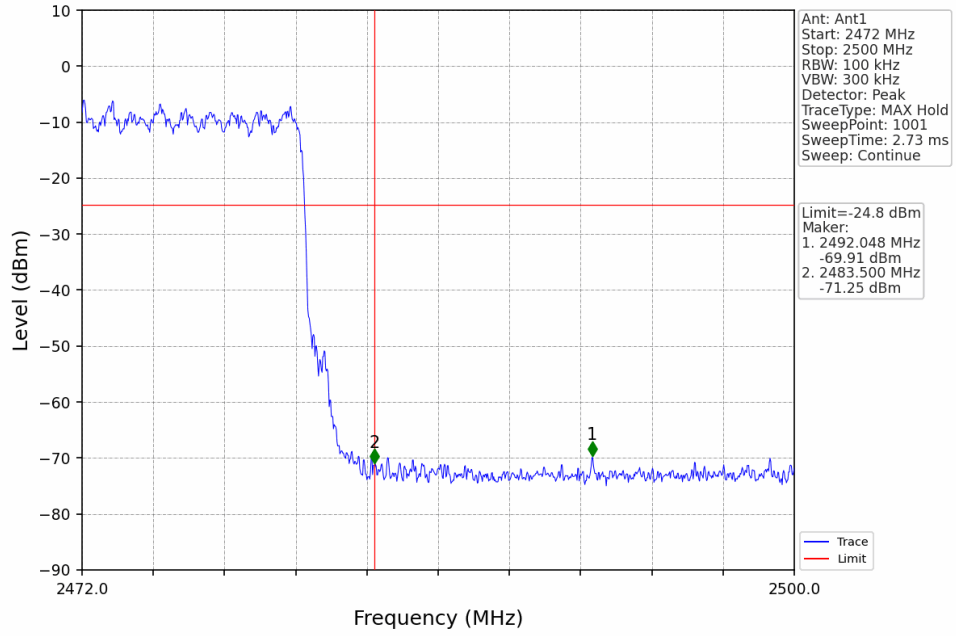

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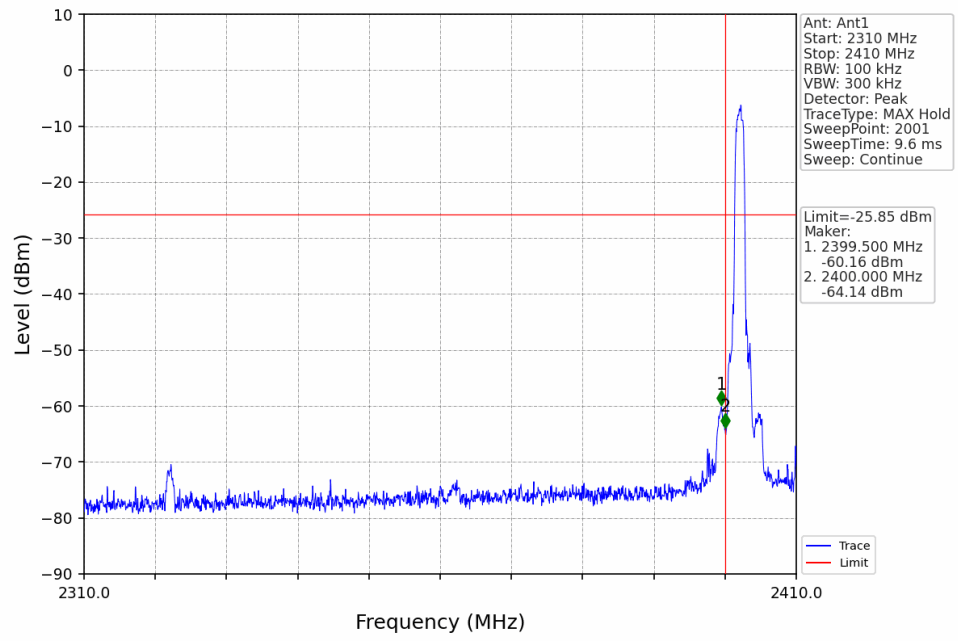


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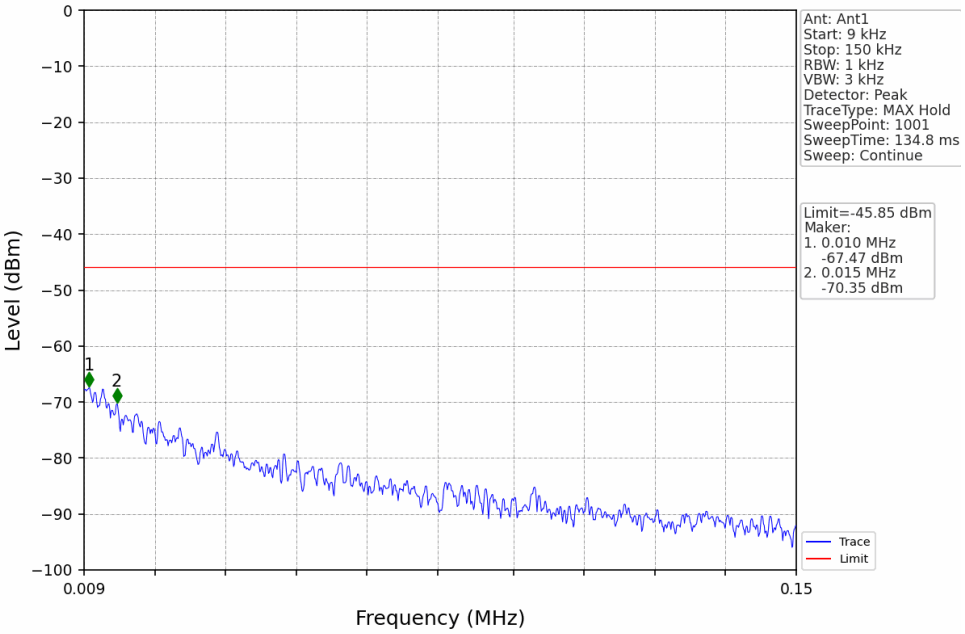

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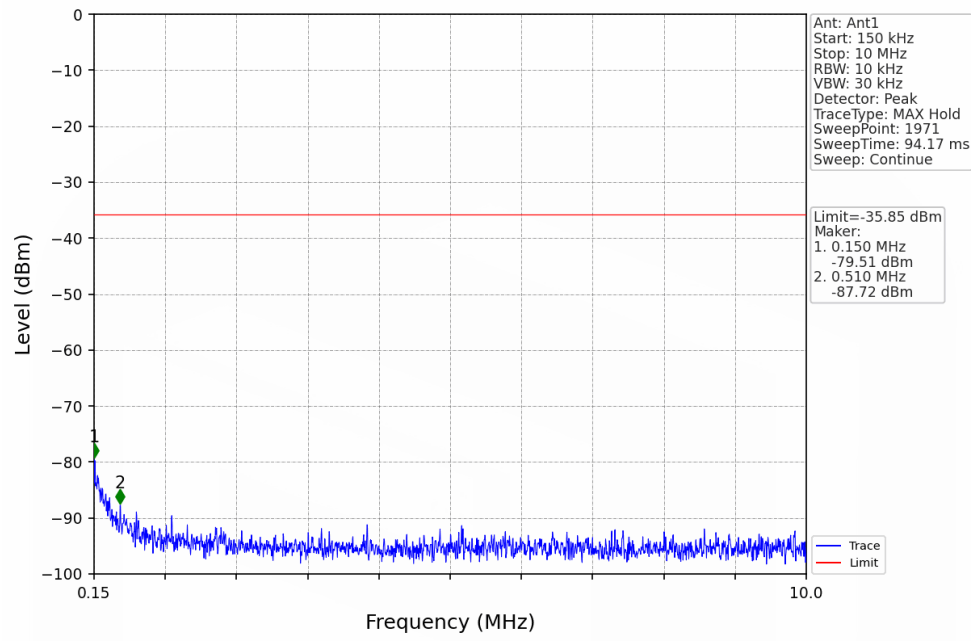


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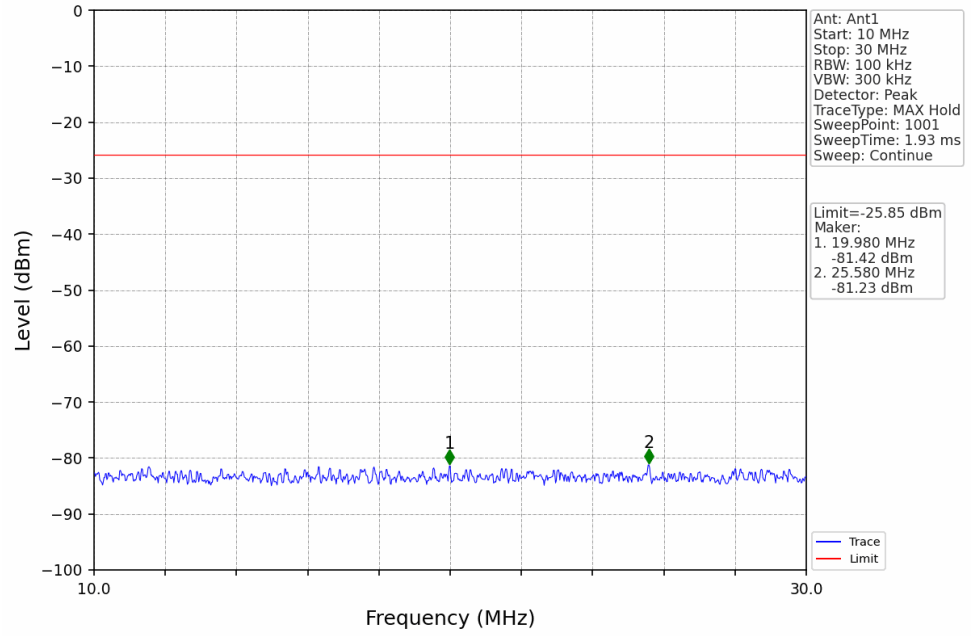

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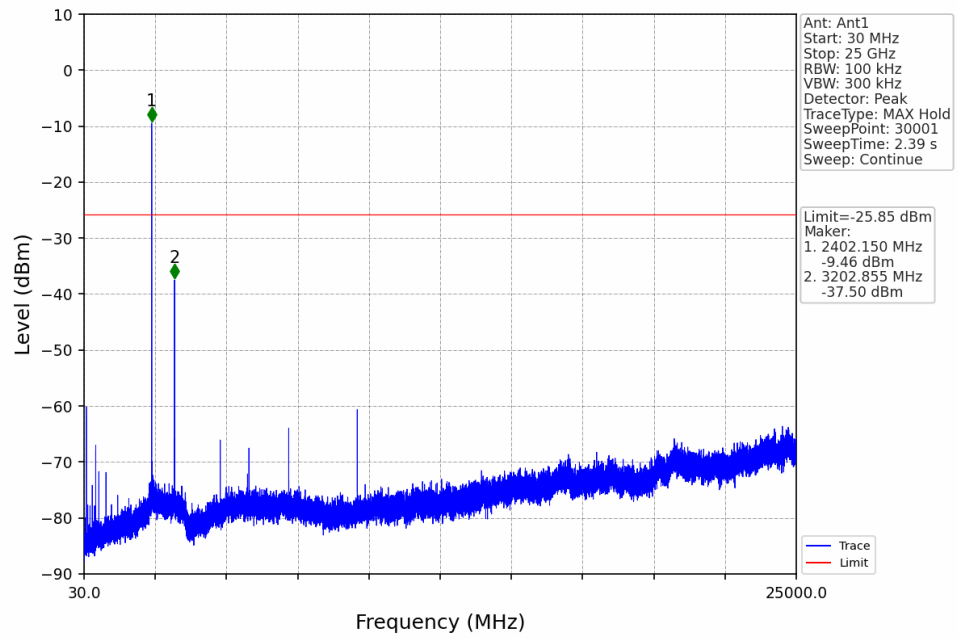


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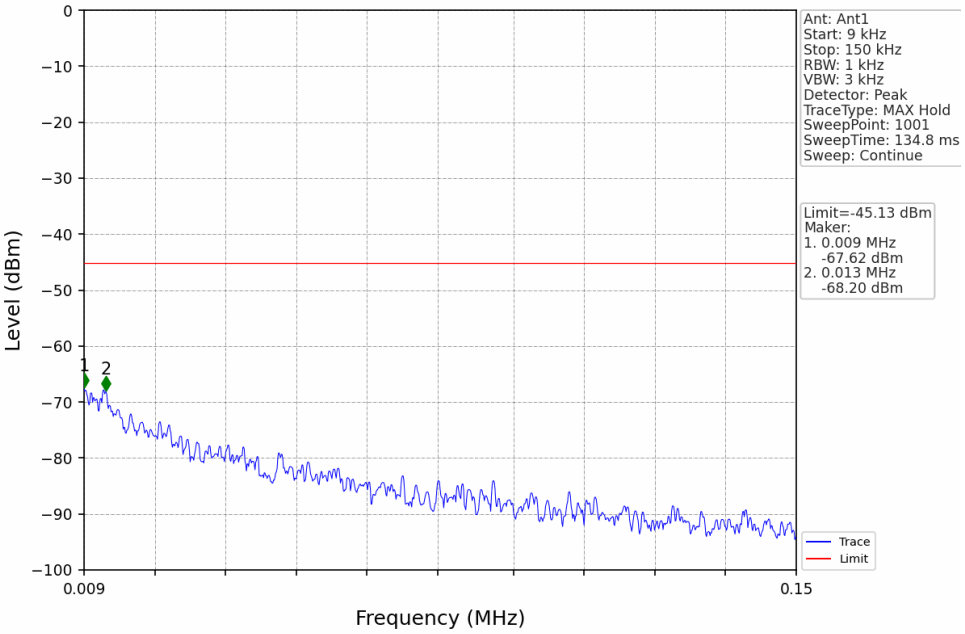

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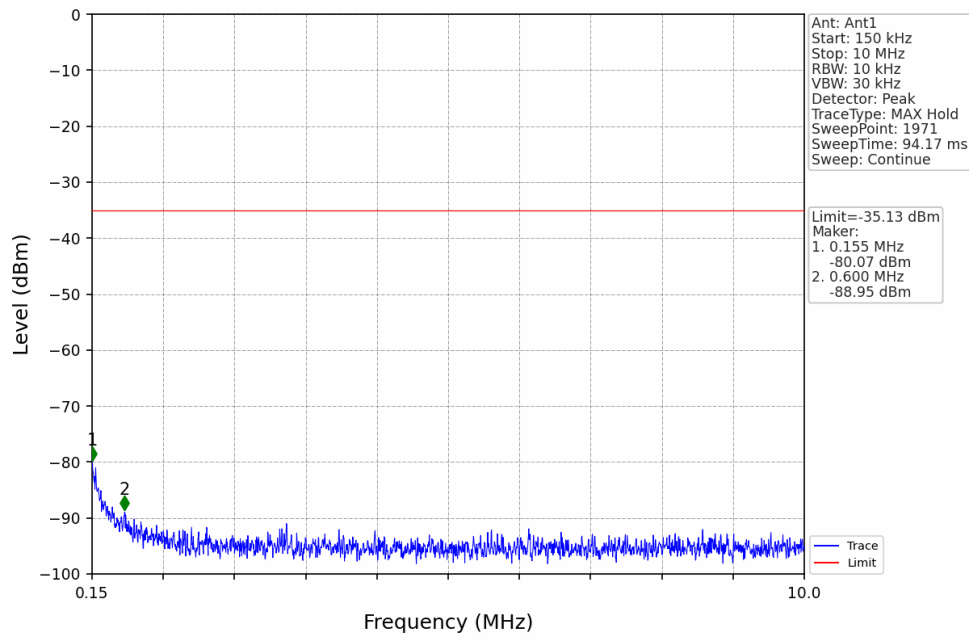


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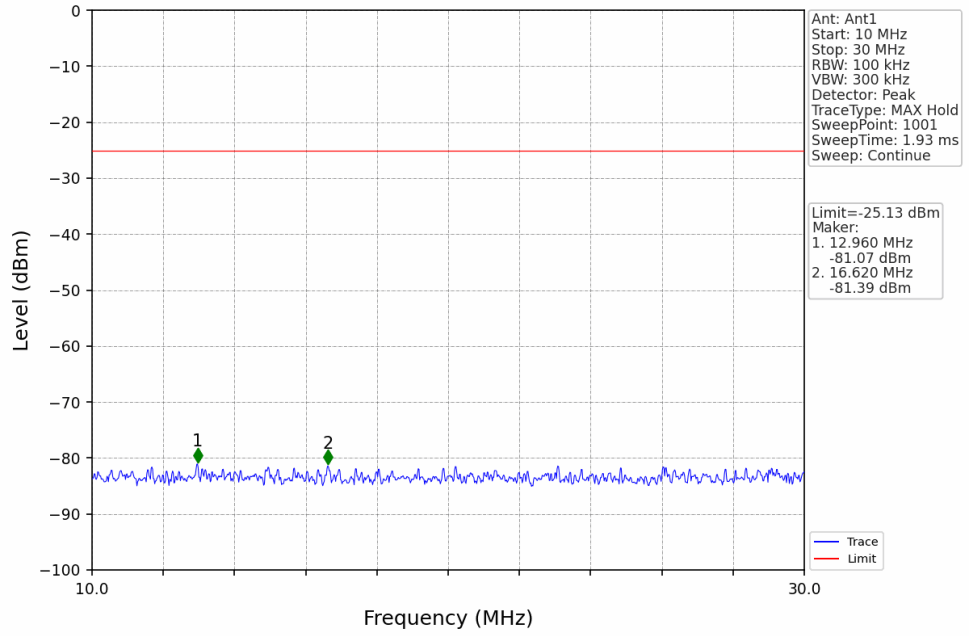

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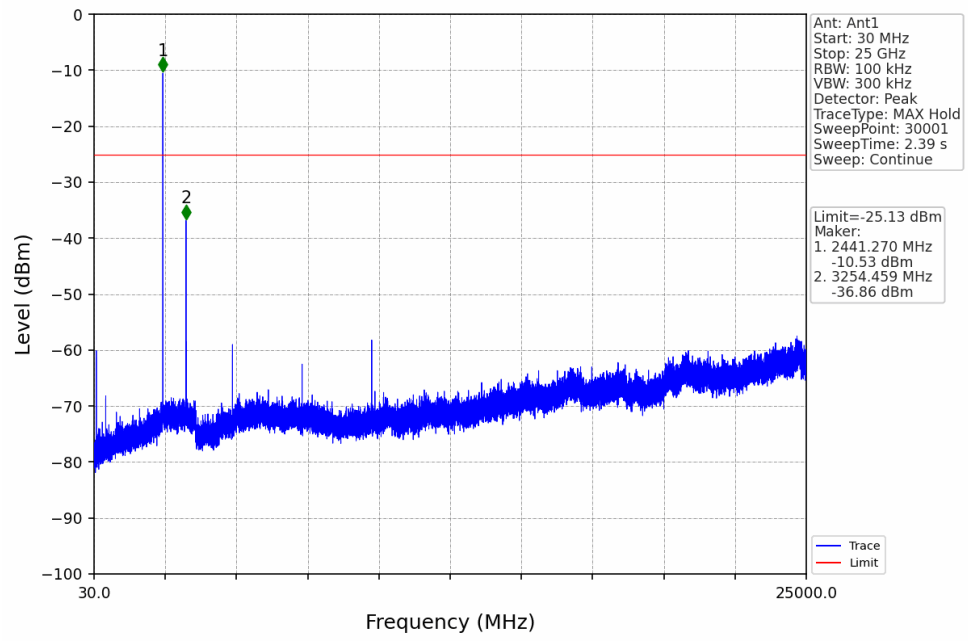


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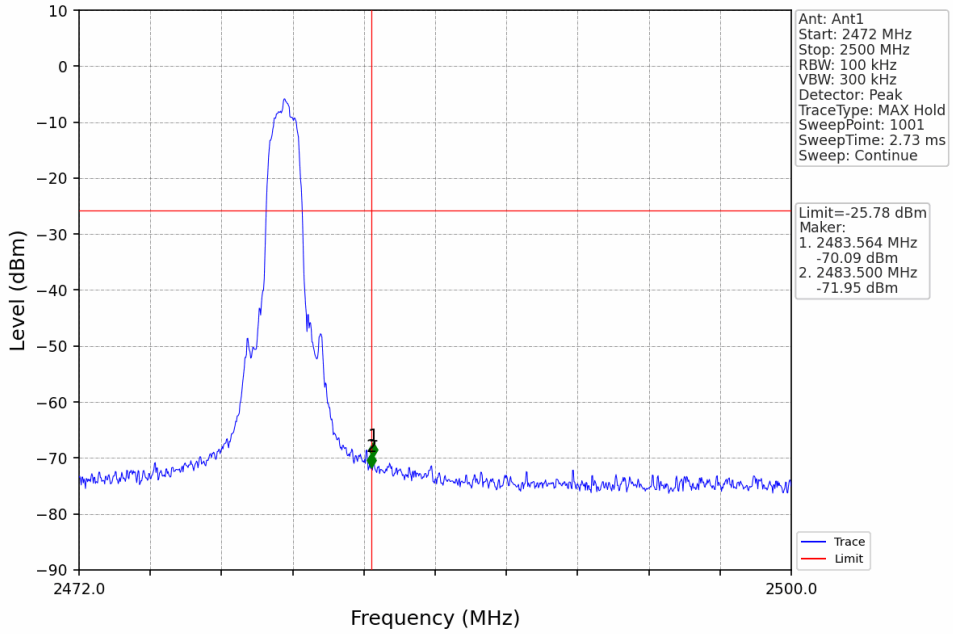

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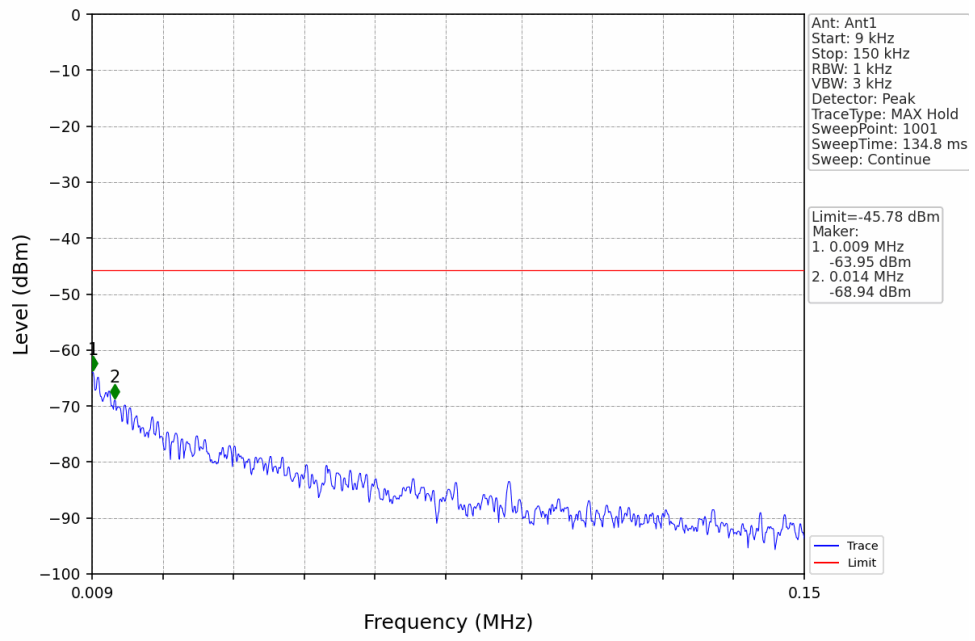


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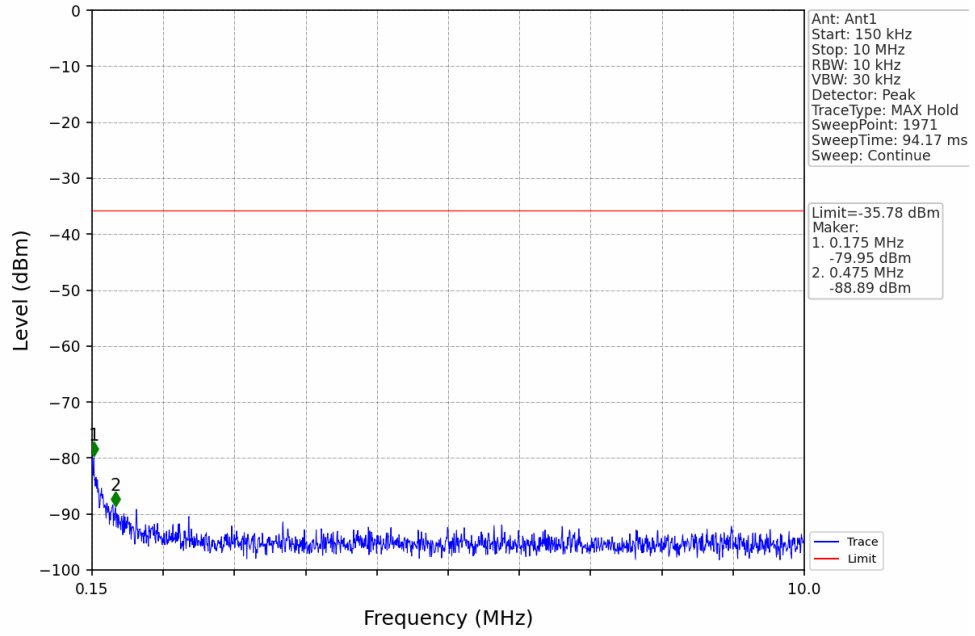

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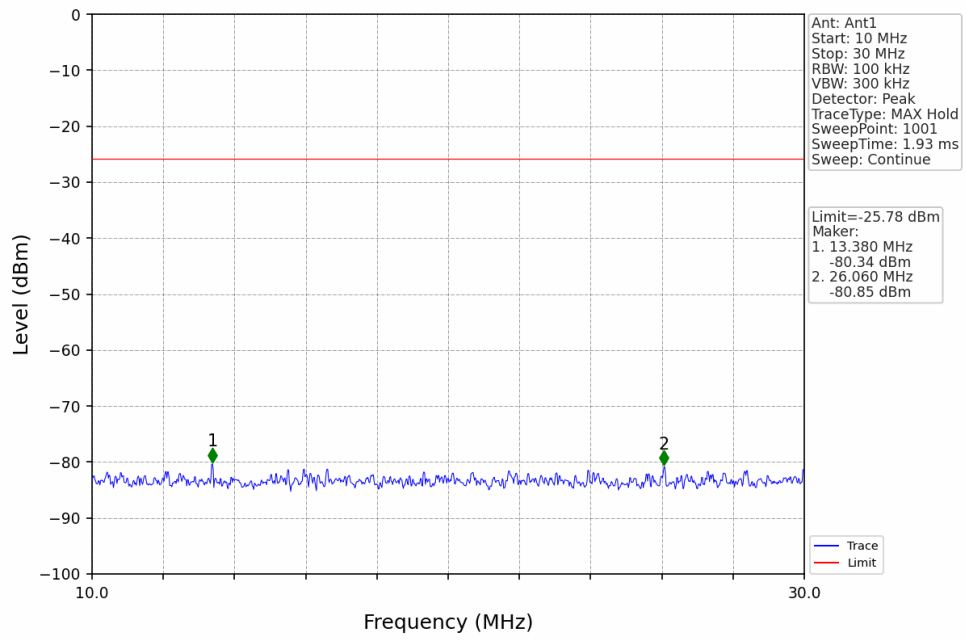


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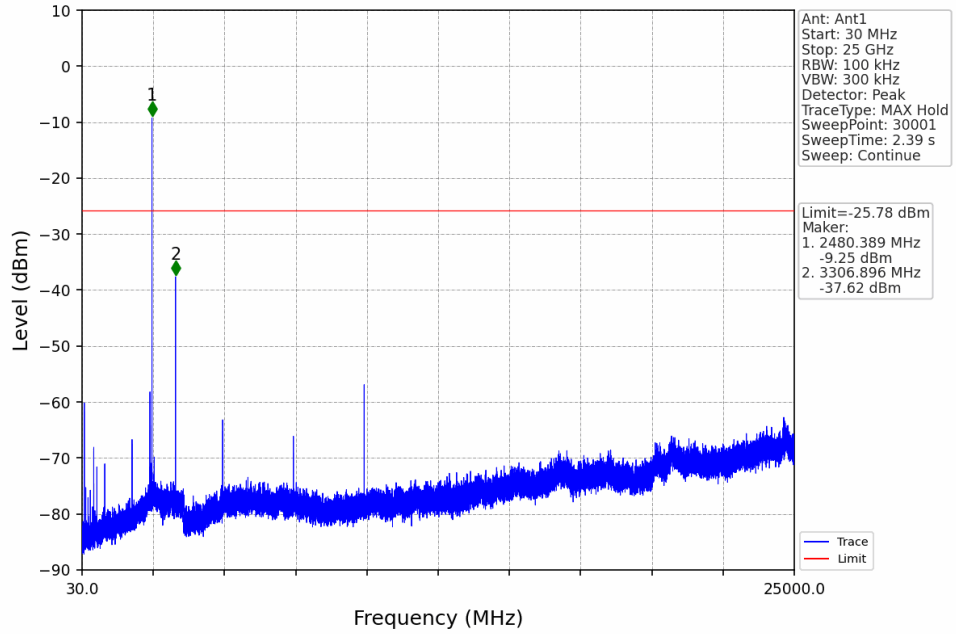

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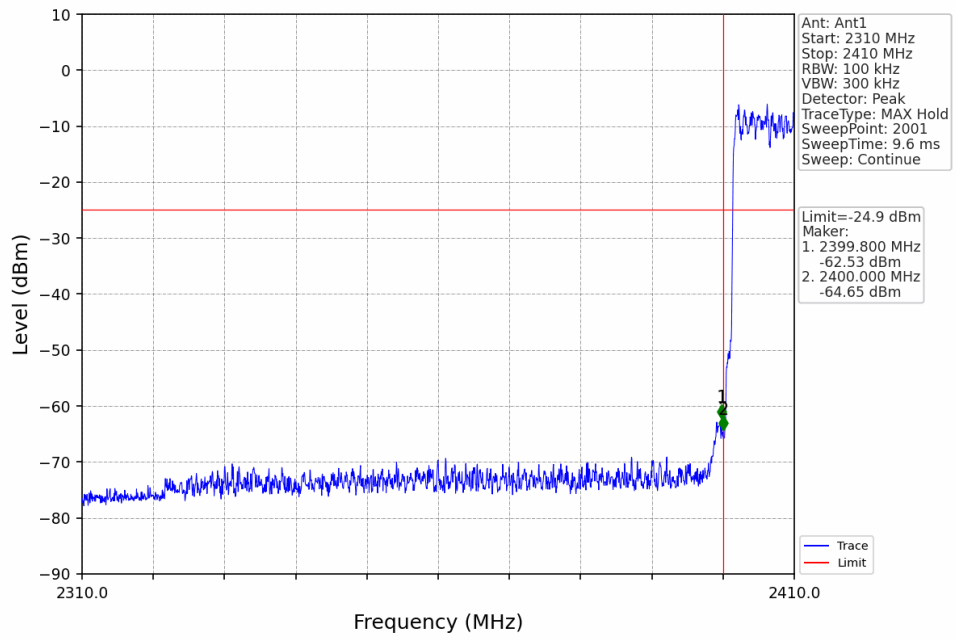


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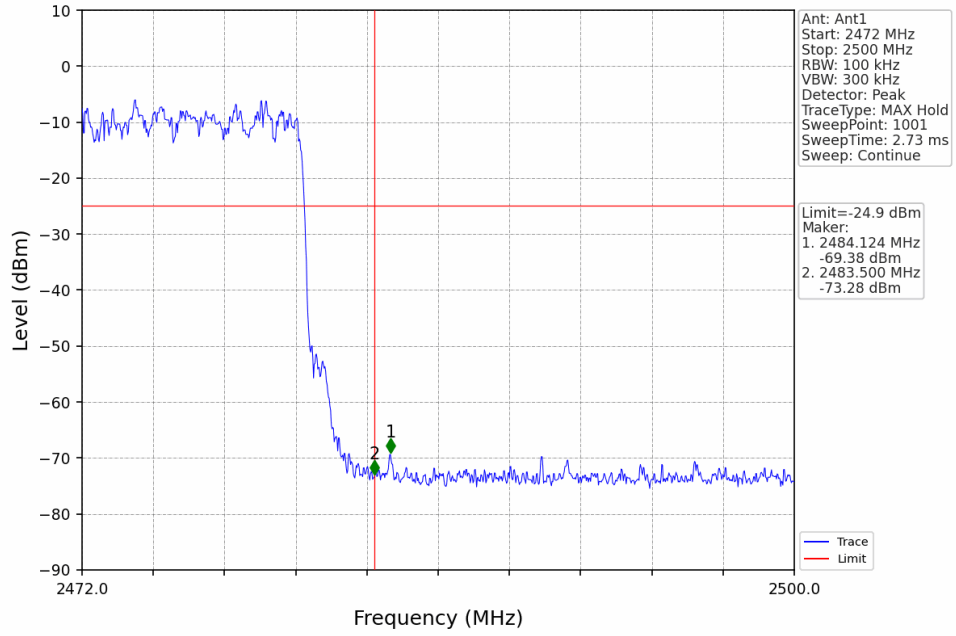


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