# ANNEX D TEST DATA

# For

| | |
|---|---|
| Project No.: | 8232EU012012W |
| Client: | Shenzhen Century Digital Technology Co., Ltd. |
| Product Name: | Wireless Headphones |
| Model No.: | BT056NC |
| FCC ID: | 2BF6H-BT056NC |
| Technology: | Bluetooth BDR&EDR |
| Test Engineer: | Mikey zhu |
| Test Date: | 2024-08-23 |

# 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

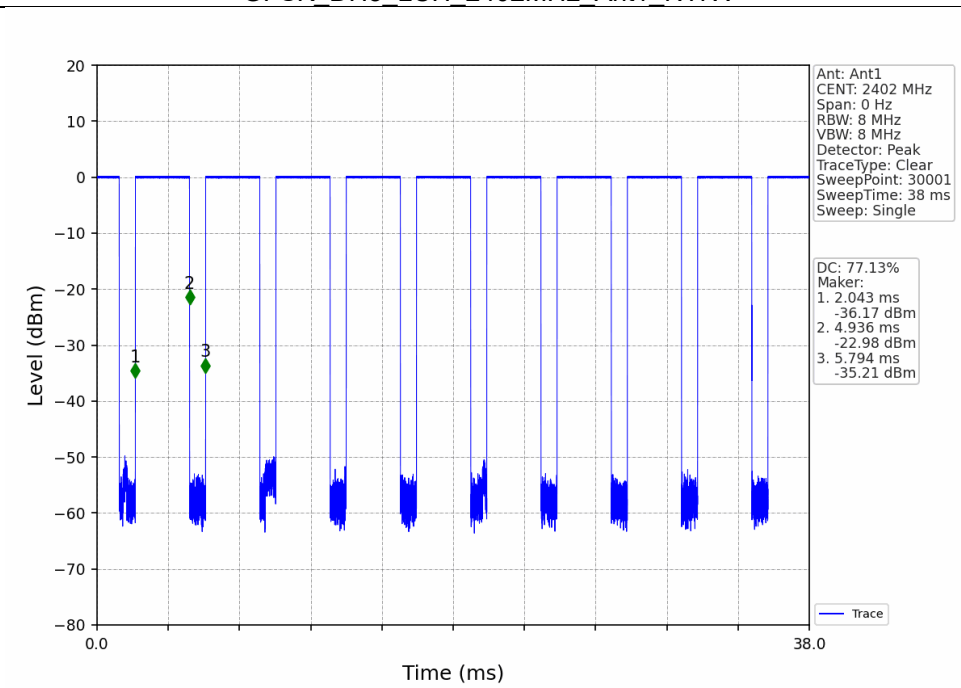
#### 1.1.1 Ant1

| 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 | 2.893 | 3.751 | 77.13 | 1.13 | 0.03 |
| | | 2441 | DH5 | 2.893 | 3.751 | 77.13 | 1.13 | 0.03 |
| | | 2480 | DH5 | 2.893 | 3.750 | 77.15 | 1.13 | 0.03 |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 2.899 | 3.750 | 77.31 | 1.12 | 0.03 |
| | | 2441 | 2DH5 | 2.898 | 3.750 | 77.28 | 1.12 | 0.03 |
| | | 2480 | 2DH5 | 2.898 | 3.749 | 77.30 | 1.12 | 0.01 |
| 8DPSK | SISO | 2402 | 3DH5 | 2.899 | 3.749 | 77.33 | 1.12 | 0.03 |
| | | 2441 | 3DH5 | 2.899 | 3.749 | 77.33 | 1.12 | 0.03 |
| | | 2480 | 3DH5 | 2.899 | 3.749 | 77.33 | 1.12 | 0.01 |

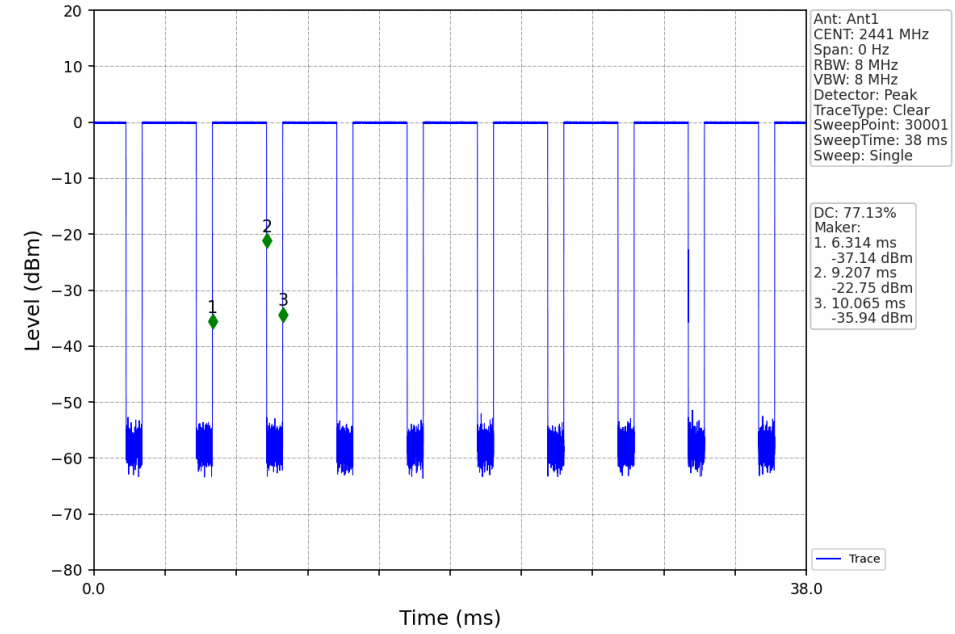
## 1.2 Test Graph

### 1.2.1 Ant1

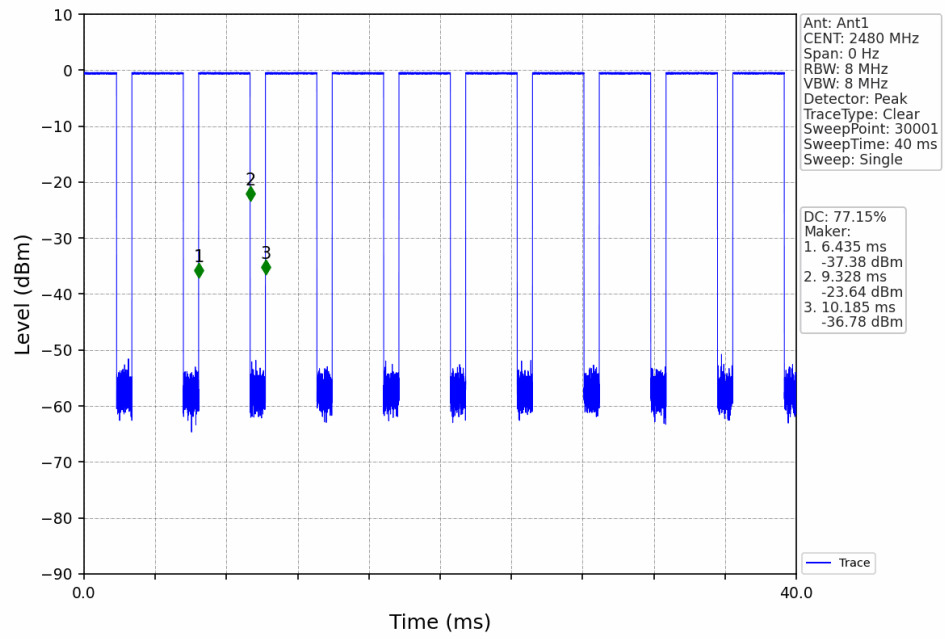
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



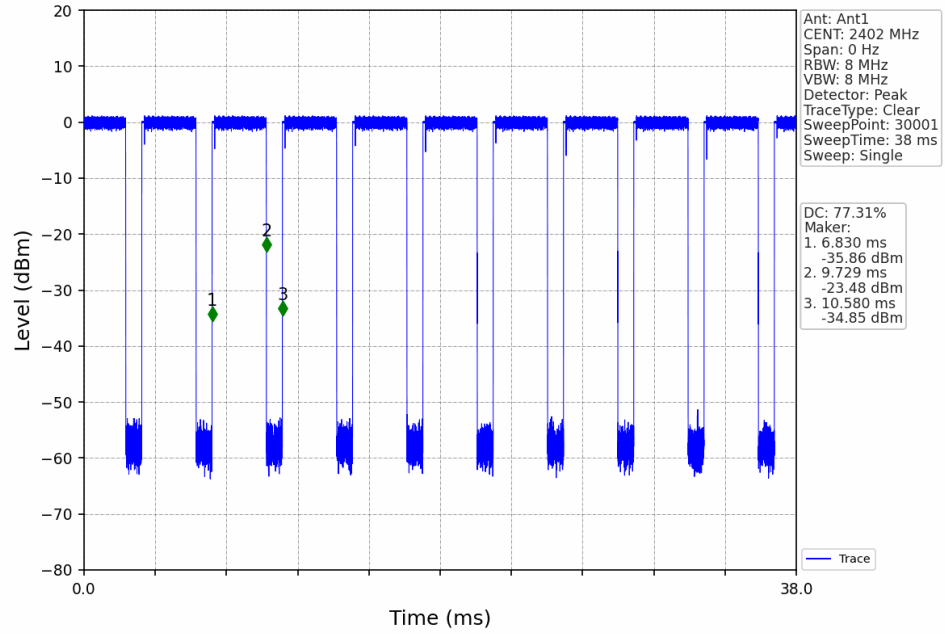

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



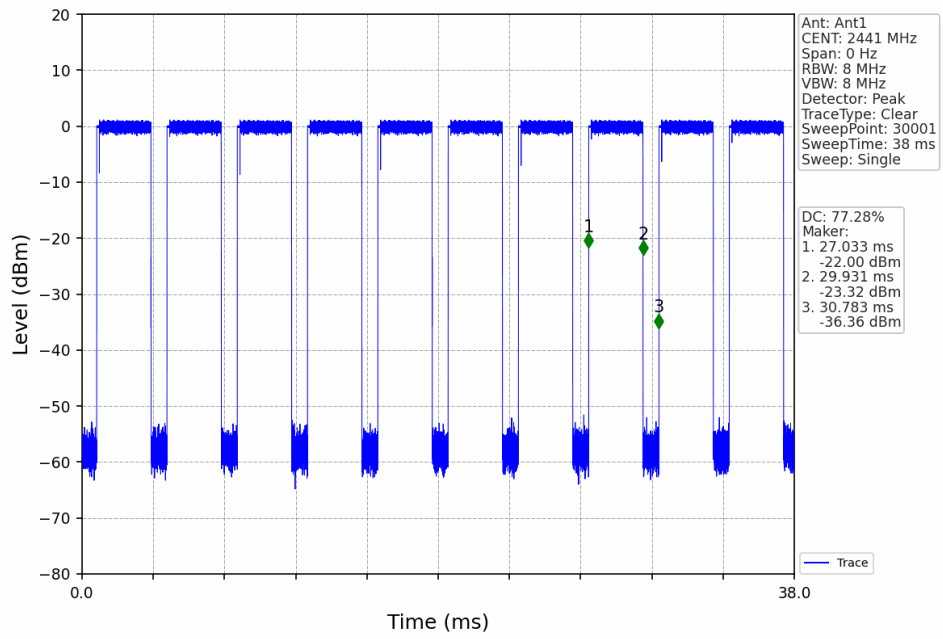
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



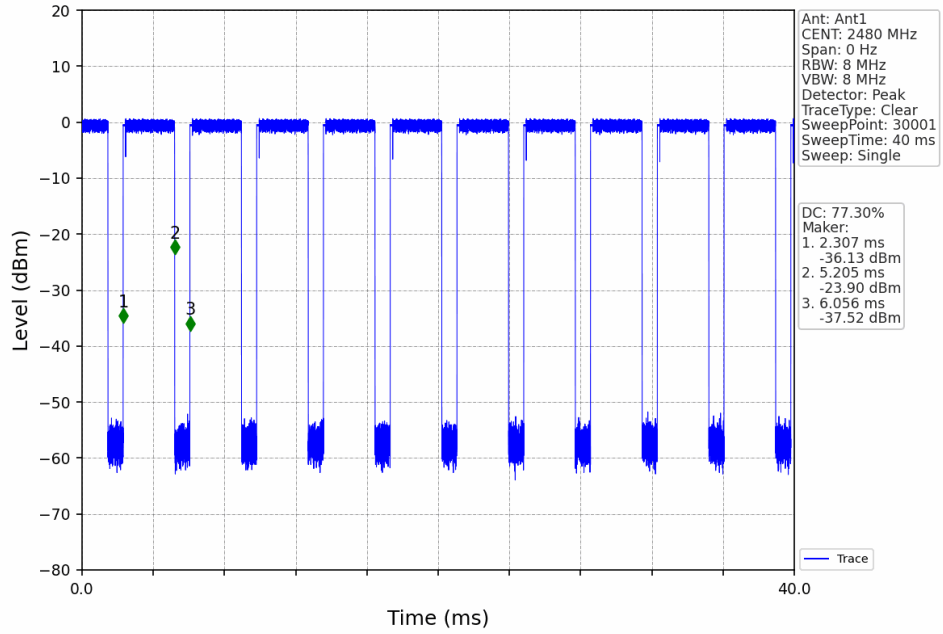

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



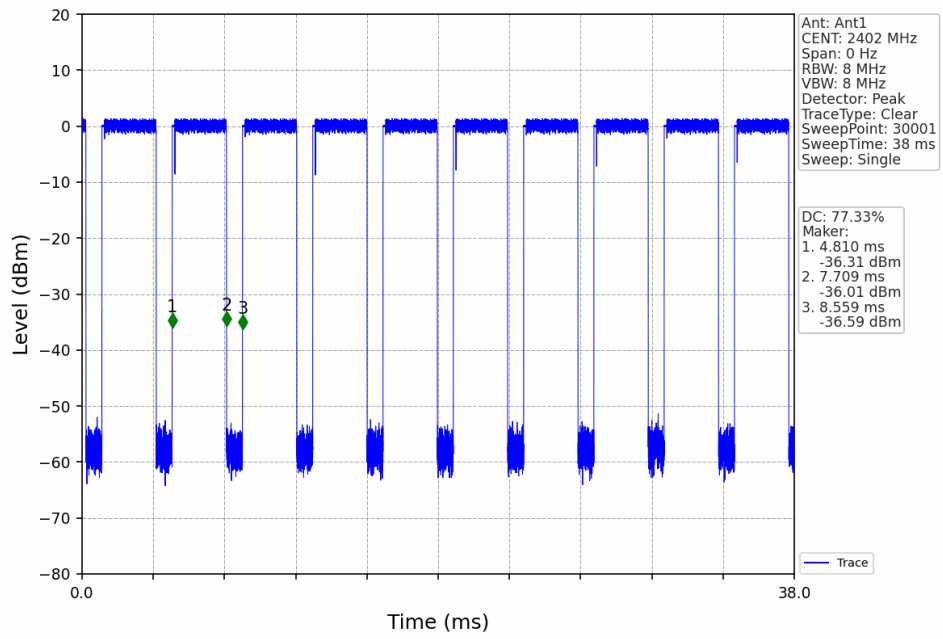
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



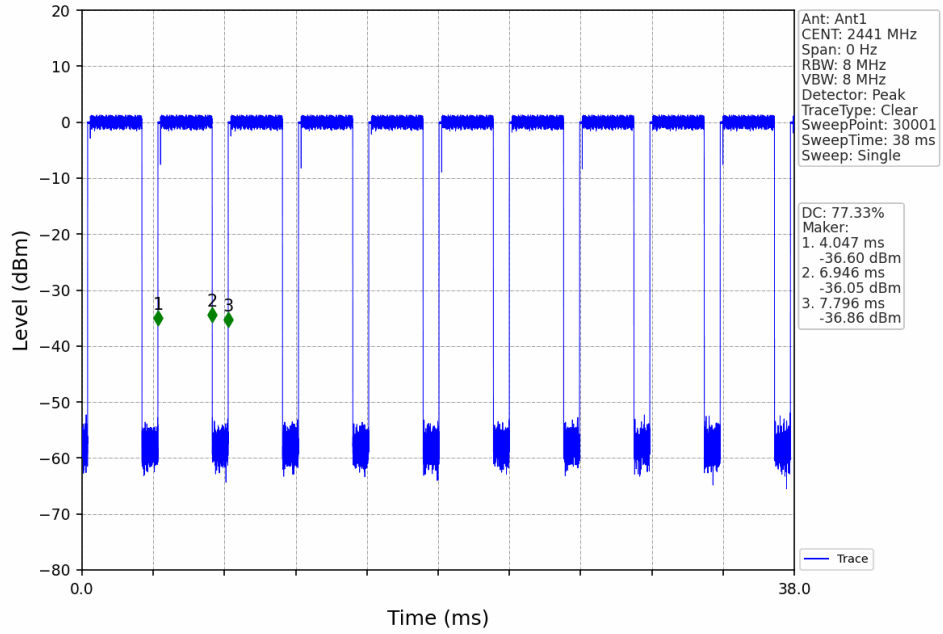

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



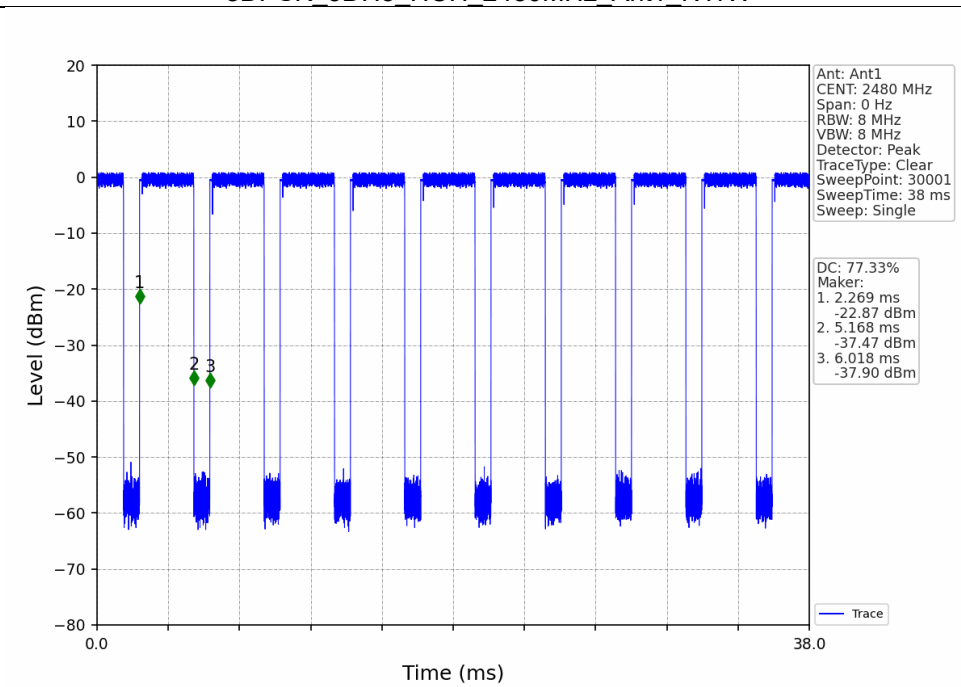
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




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 | 0.871 | / | Pass |
| | | 2441 | DH5 | 1 | 0.876 | / | Pass |
| | | 2480 | DH5 | 1 | 0.873 | / | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | 1.175 | / | Pass |
| | | 2441 | 2DH5 | 1 | 1.176 | / | Pass |
| | | 2480 | 2DH5 | 1 | 1.175 | / | Pass |
| 8DPSK | SISO | 2402 | 3DH5 | 1 | 1.184 | / | Pass |
| | | 2441 | 3DH5 | 1 | 1.181 | / | Pass |
| | | 2480 | 3DH5 | 1 | 1.180 | / | Pass |

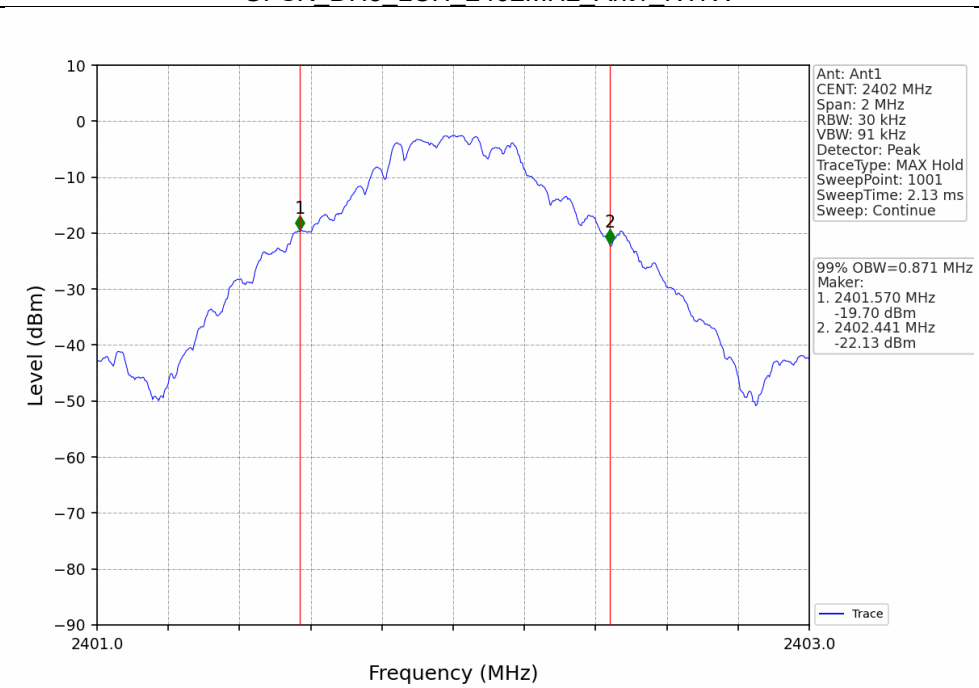
#### 2.1.2 20dB BW

| Mode | TX Type | Frequency (MHz) | Packet Type | ANT | 20dB Bandwidth (MHz) | | Verdict |
|---|---|---|---|---|---|---|---|
| | | | | | Result | Limit | |
| GFSK | SISO | 2402 | DH5 | 1 | 0.970 | / | Pass |
| | | 2441 | DH5 | 1 | 0.964 | / | Pass |
| | | 2480 | DH5 | 1 | 0.958 | / | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | 1.319 | / | Pass |
| | | 2441 | 2DH5 | 1 | 1.320 | / | Pass |
| | | 2480 | 2DH5 | 1 | 1.323 | / | Pass |
| 8DPSK | SISO | 2402 | 3DH5 | 1 | 1.318 | / | Pass |
| | | 2441 | 3DH5 | 1 | 1.315 | / | Pass |
| | | 2480 | 3DH5 | 1 | 1.313 | / | Pass |

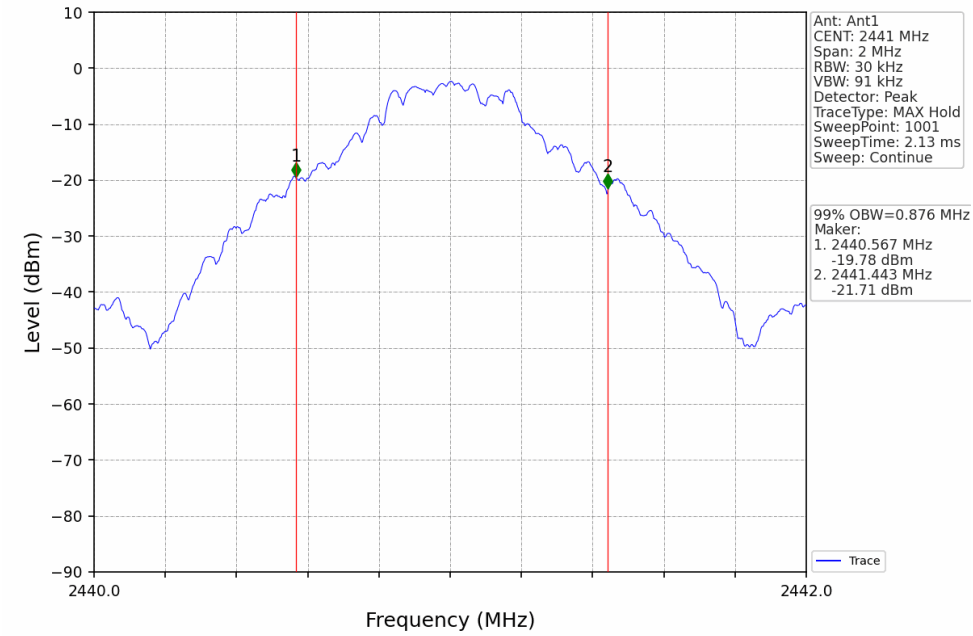
## 2.2 Test Graph

### 2.2.1 OBW

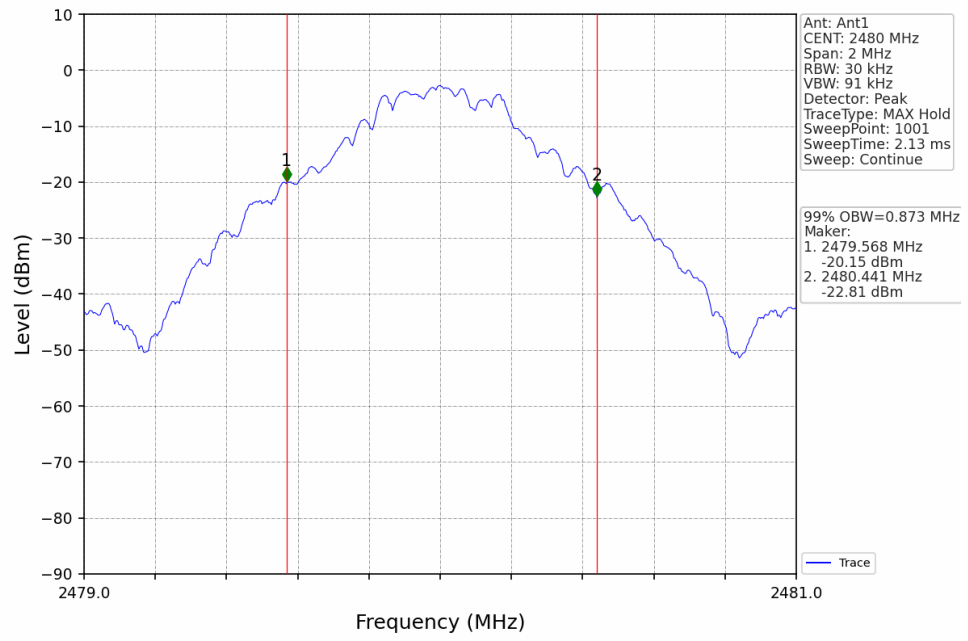
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



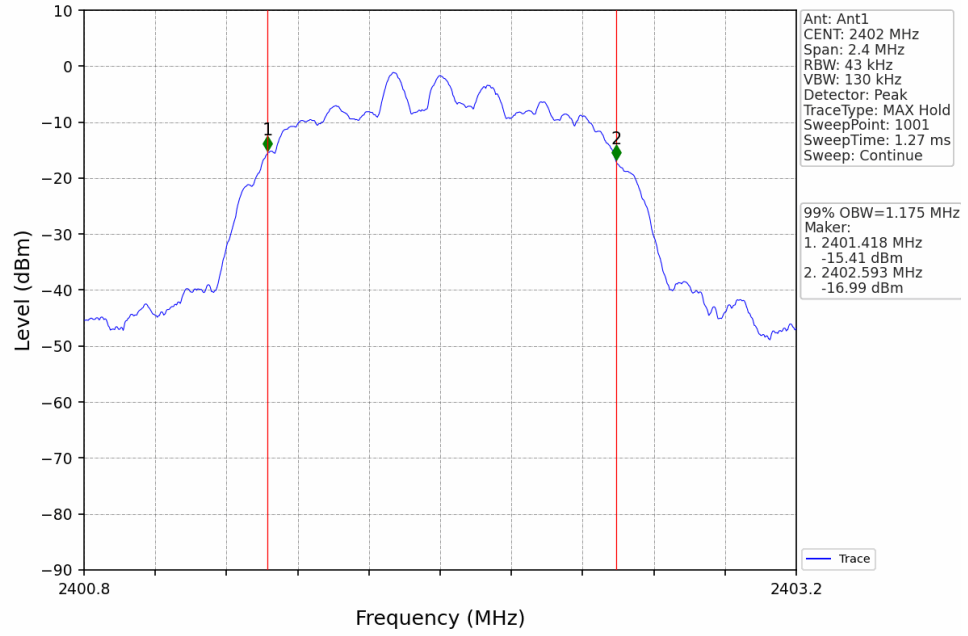

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



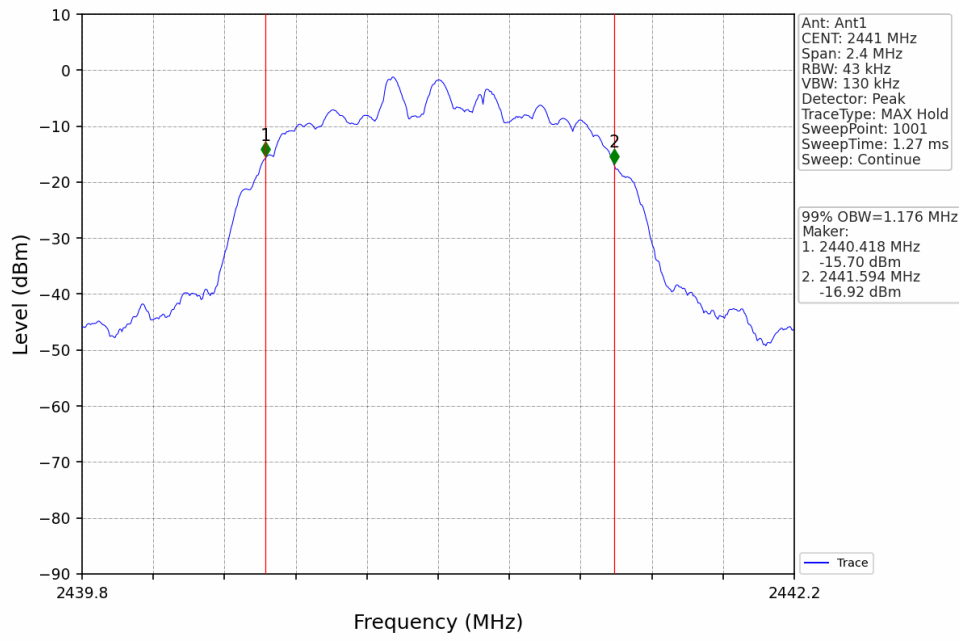
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



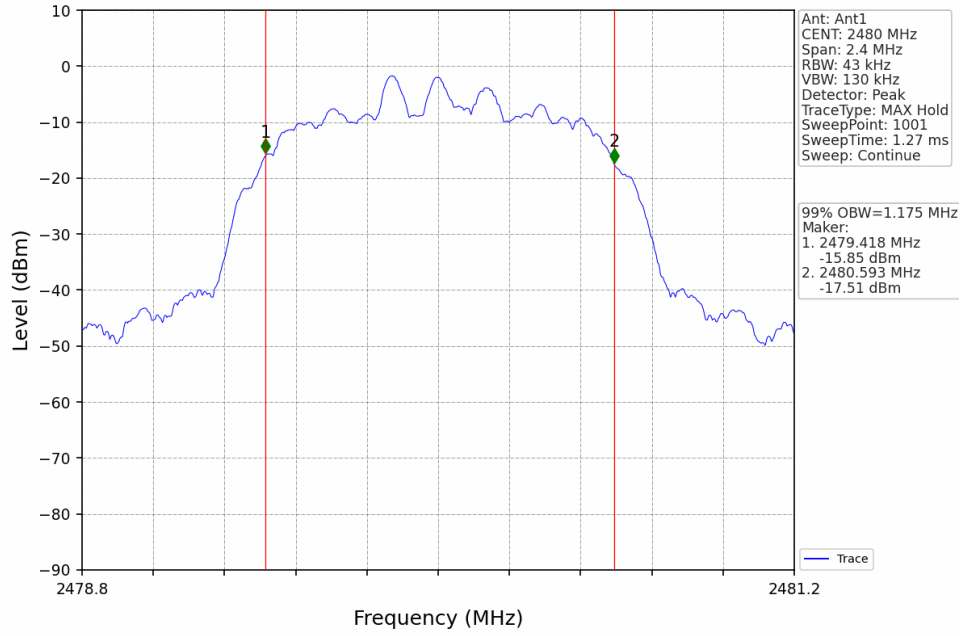

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



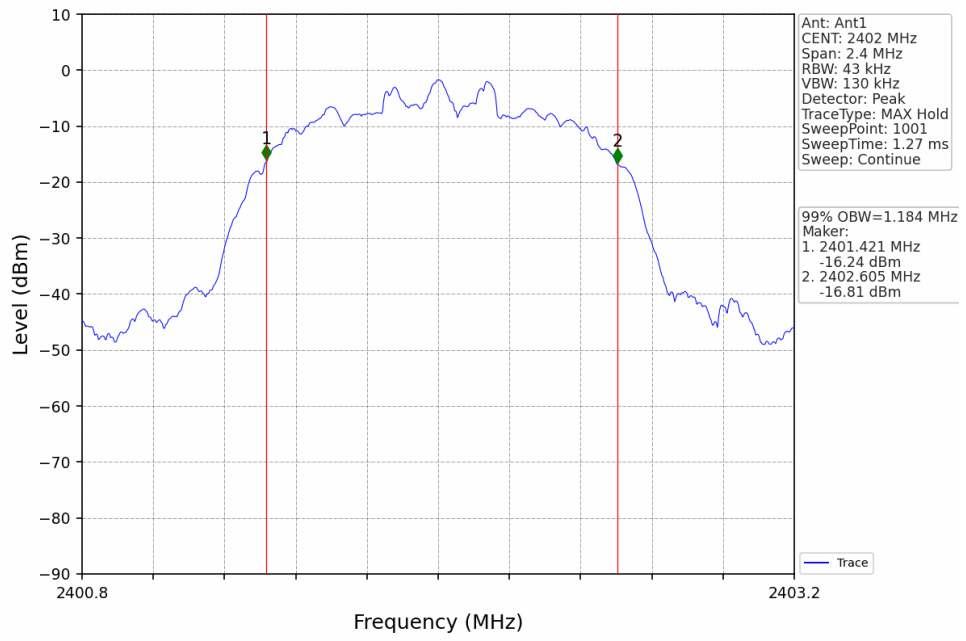
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



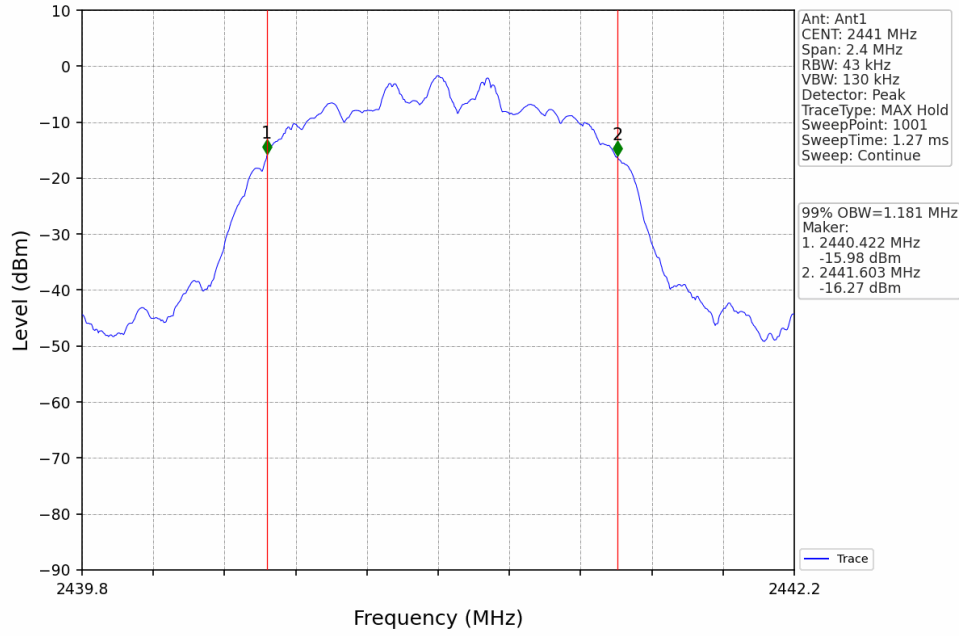

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



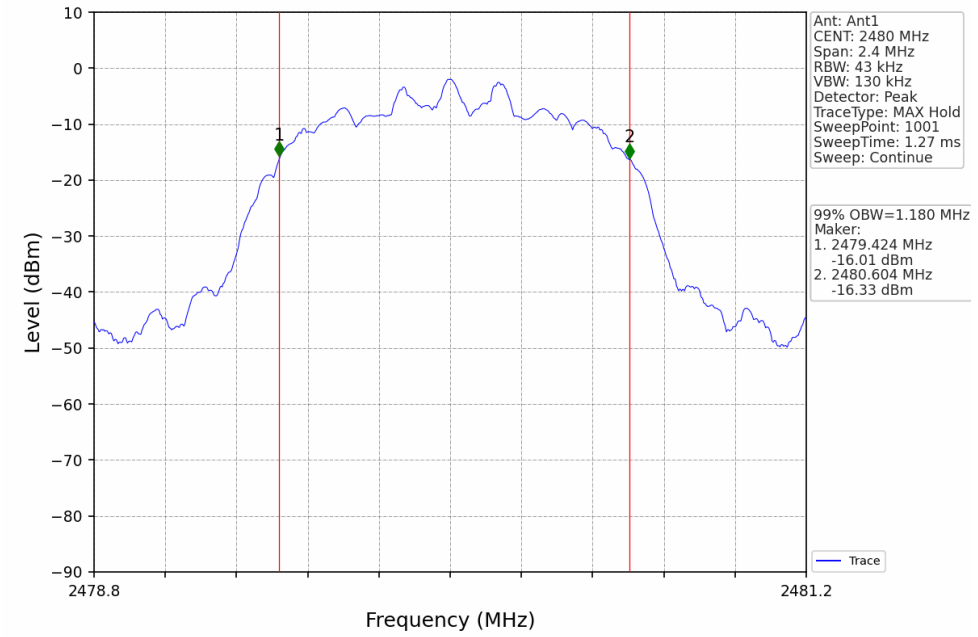
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV

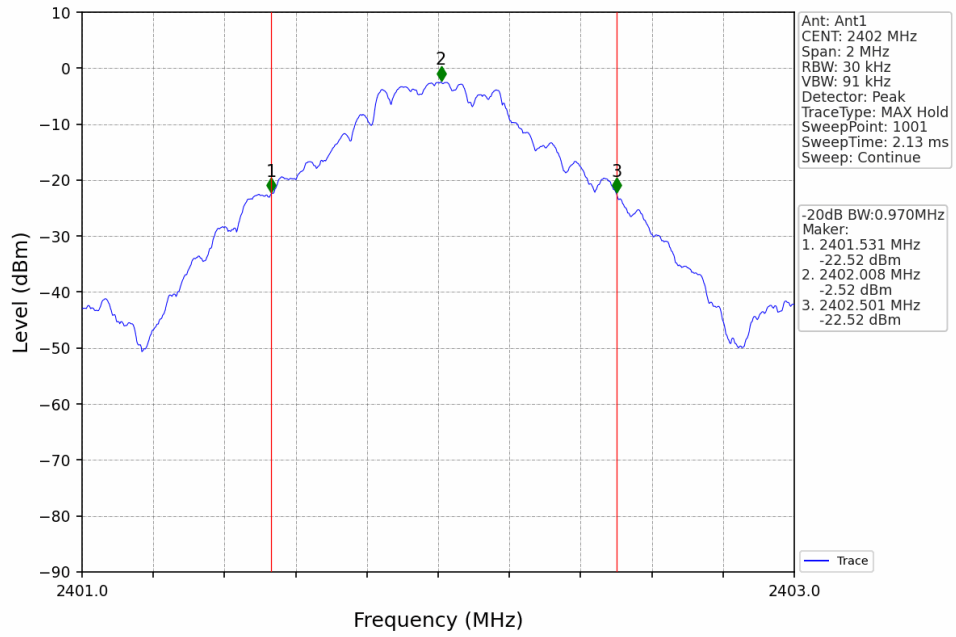


8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV

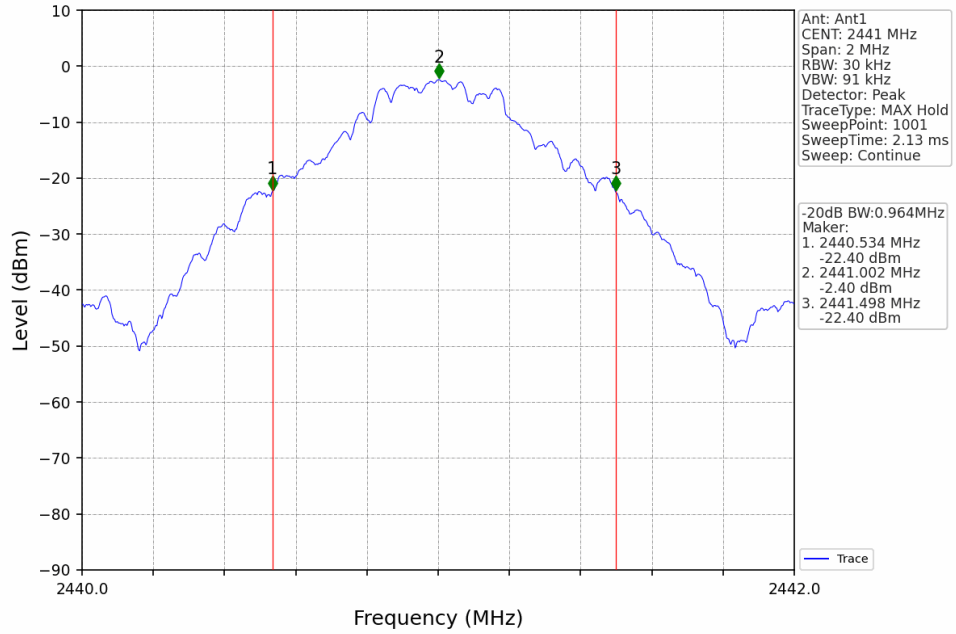


### 2.2.2 20dB BW

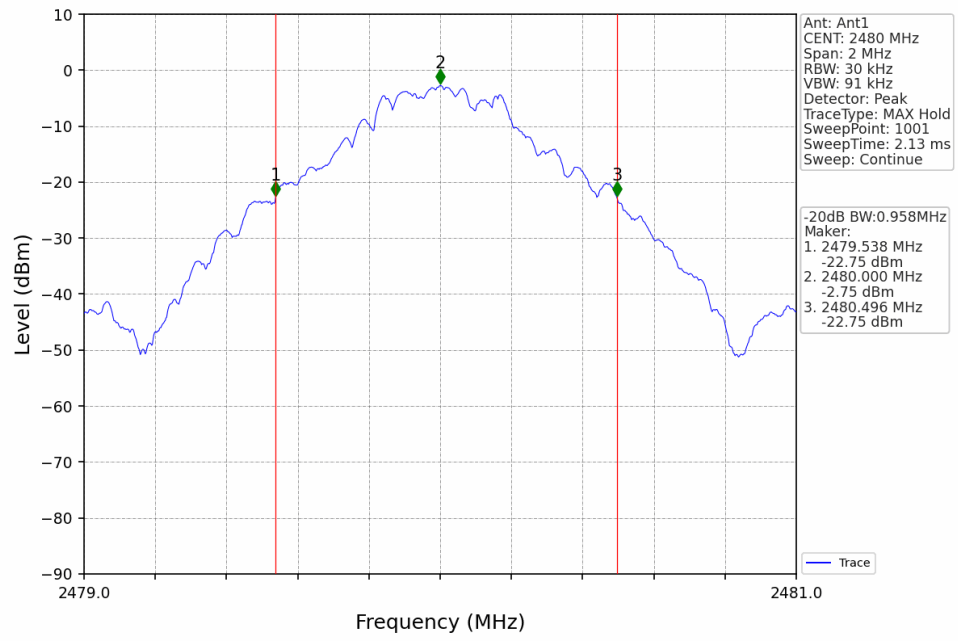
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



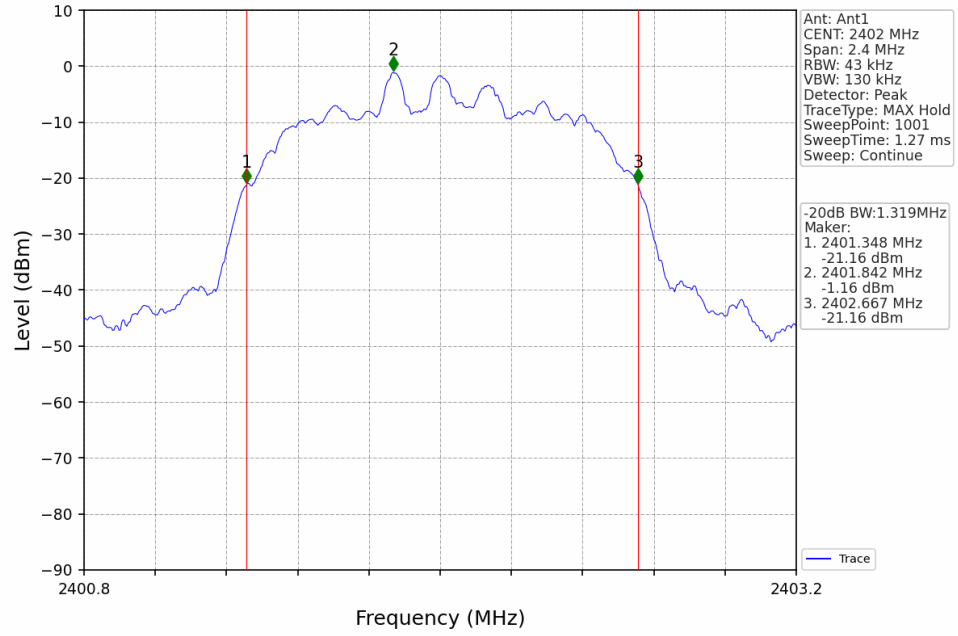

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



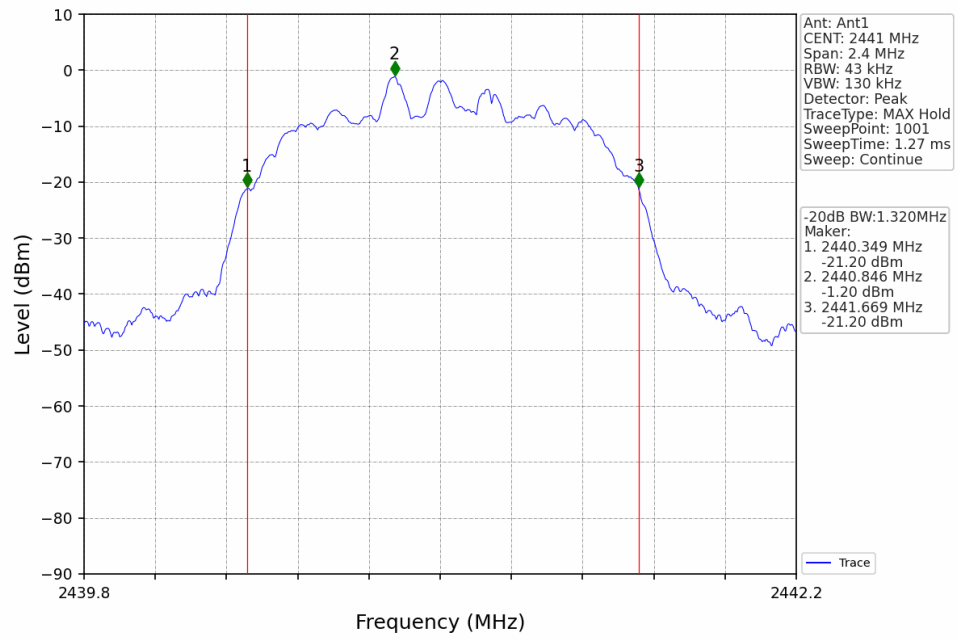
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



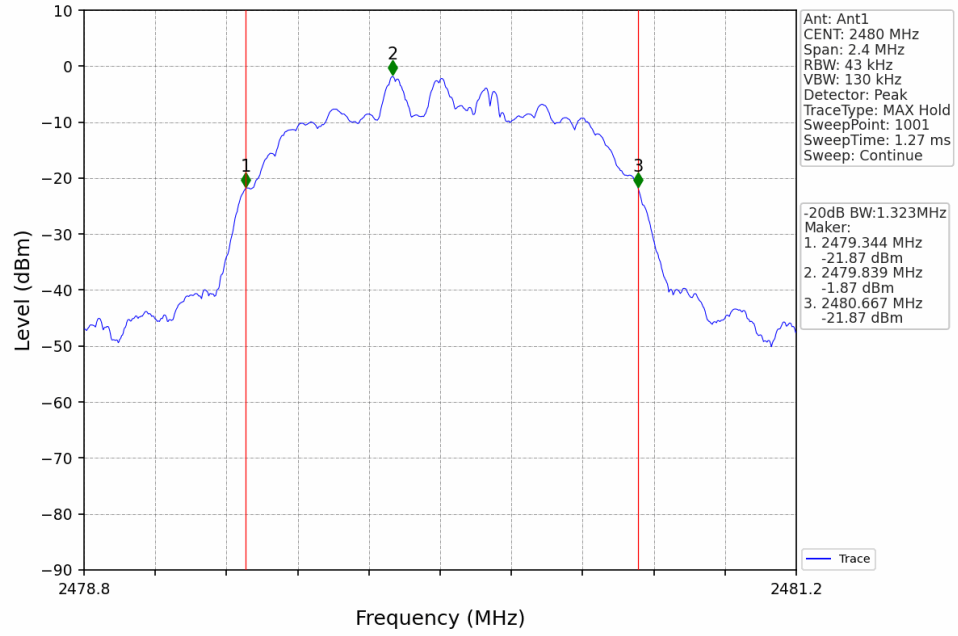

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



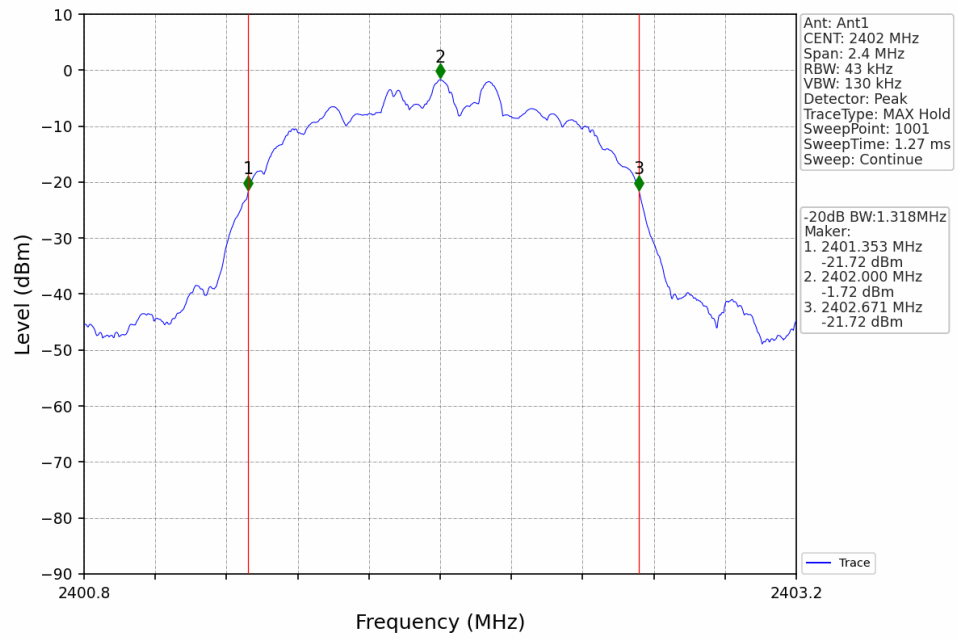
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



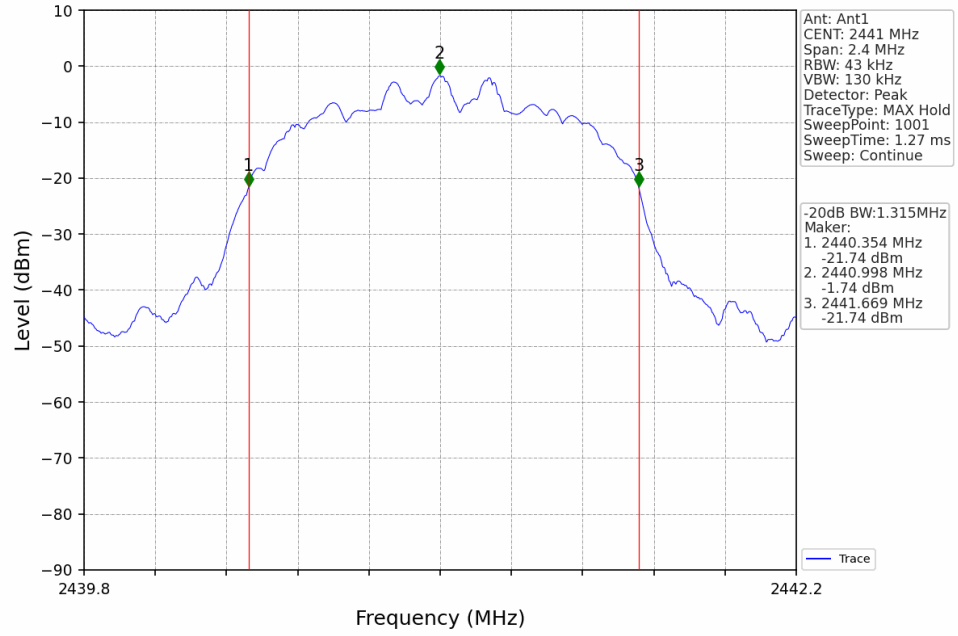

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



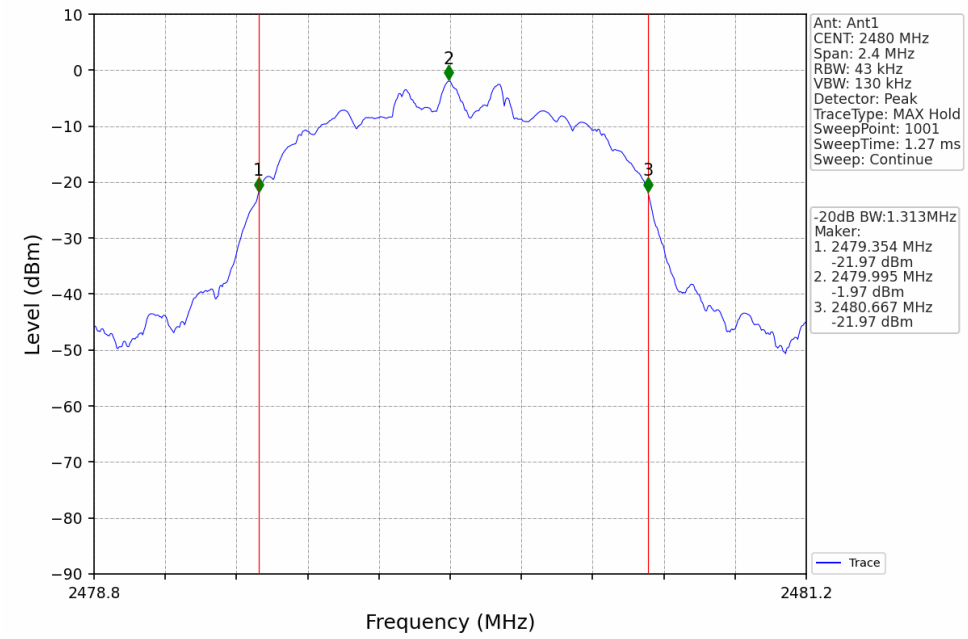
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



## 3. Maximum Conducted Output Power

### 3.1 Test Result

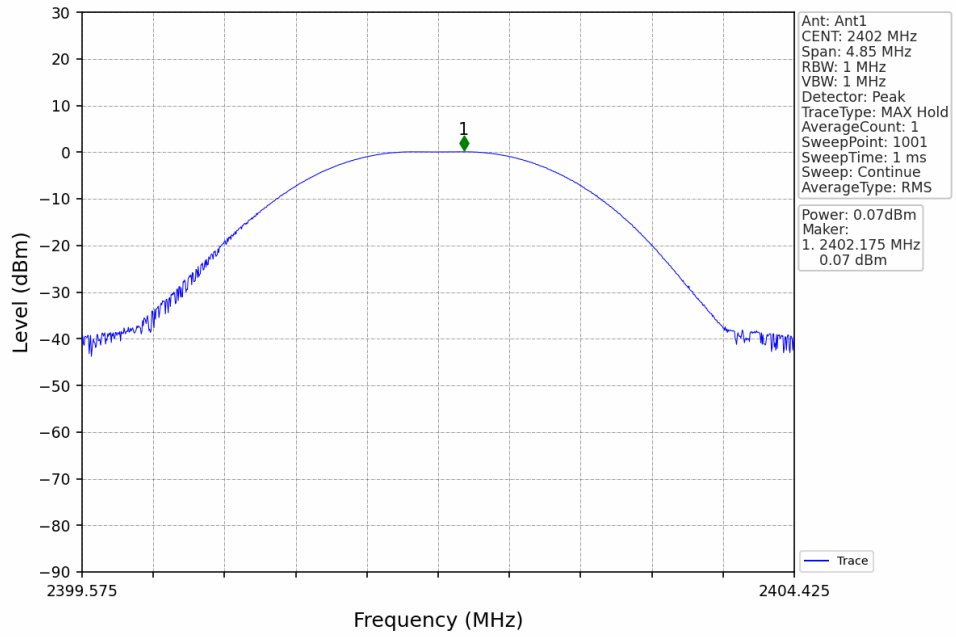
#### 3.1.1 Power

| Mode | TX Type | Frequency (MHz) | Packet Type | Maximum Peak Conducted Output Power (dBm) | | Verdict |
|---|---|---|---|---|---|---|
| | | | | ANT1 | Limit | |
| GFSK | SISO | 2402 | DH5 | 0.07 | <=30 | Pass |
| | | 2441 | DH5 | 0.02 | <=30 | Pass |
| | | 2480 | DH5 | -0.43 | <=30 | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 0.96 | <=20.97 | Pass |
| | | 2441 | 2DH5 | 0.90 | <=20.97 | Pass |
| | | 2480 | 2DH5 | 0.41 | <=20.97 | Pass |
| 8DPSK | SISO | 2402 | 3DH5 | 1.21 | <=20.97 | Pass |
| | | 2441 | 3DH5 | 1.18 | <=20.97 | Pass |
| | | 2480 | 3DH5 | 0.69 | <=20.97 | Pass |

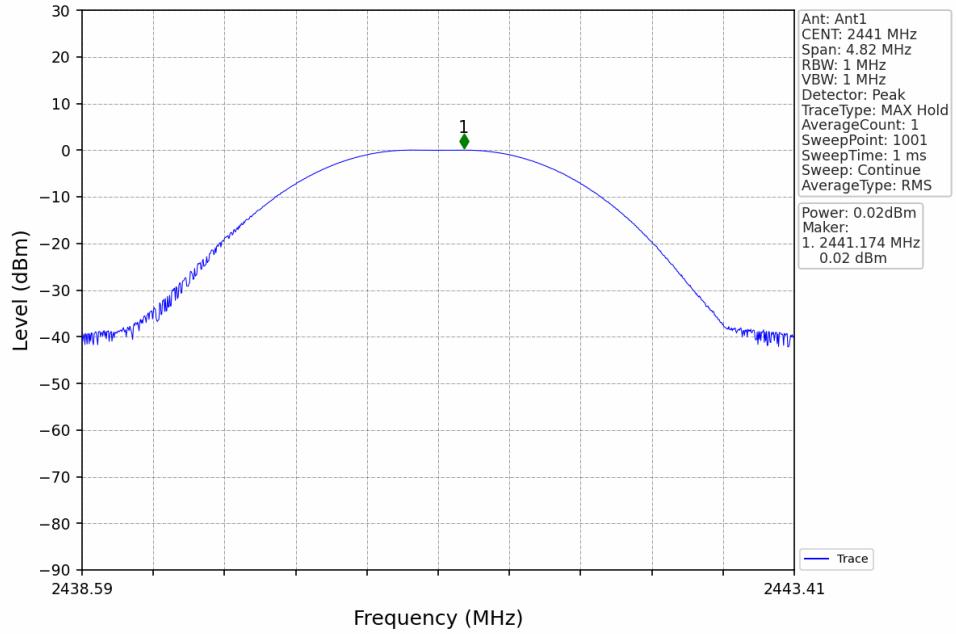
### 3.2 Test Graph

#### 3.2.1 Power

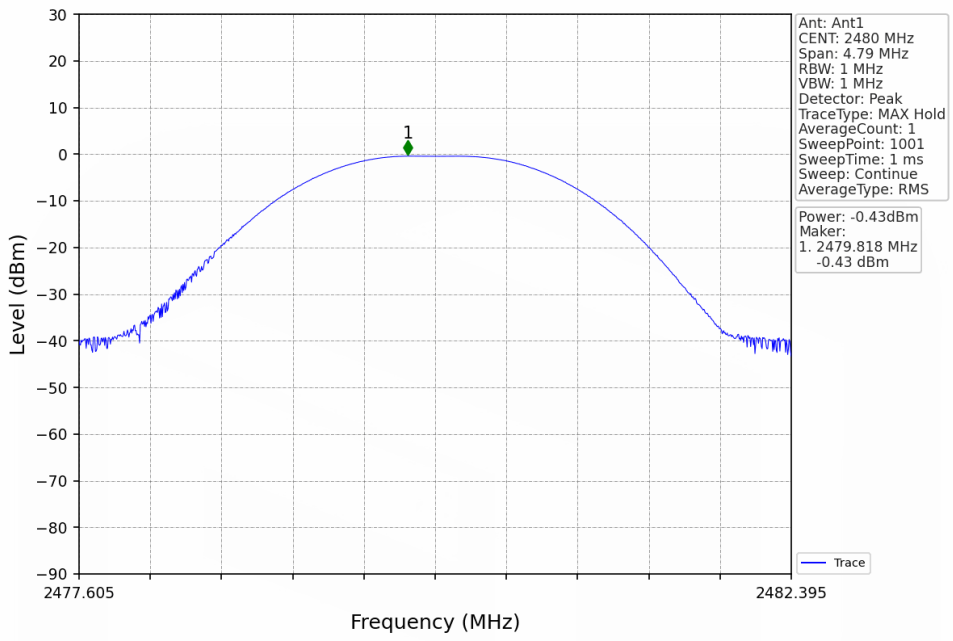
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



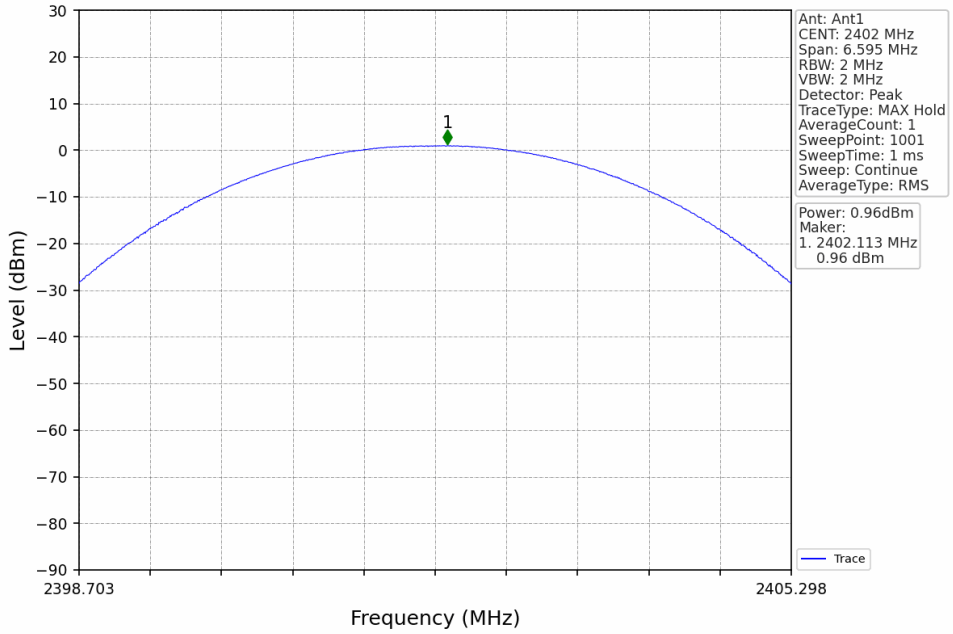

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



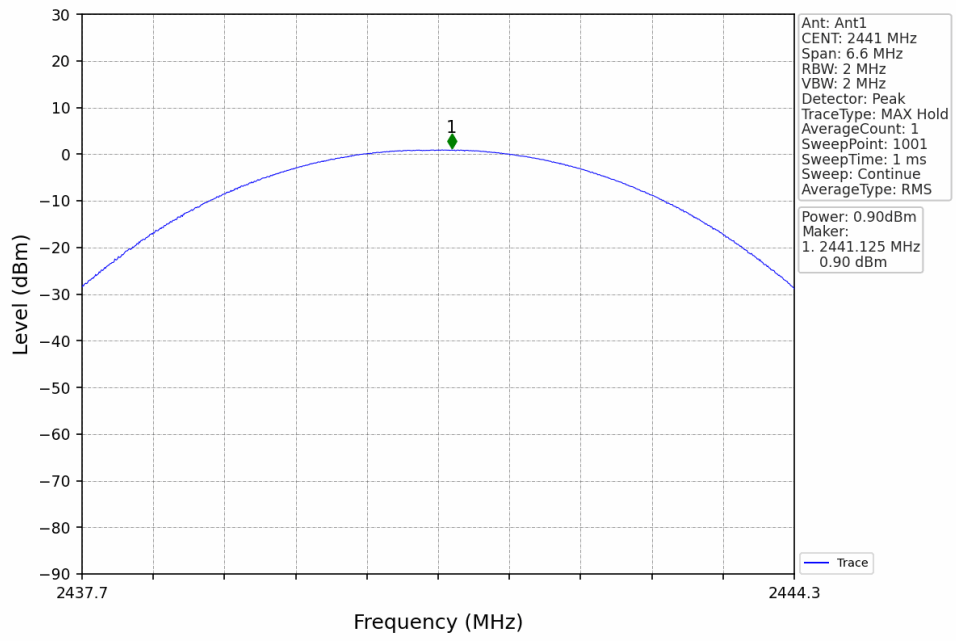
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



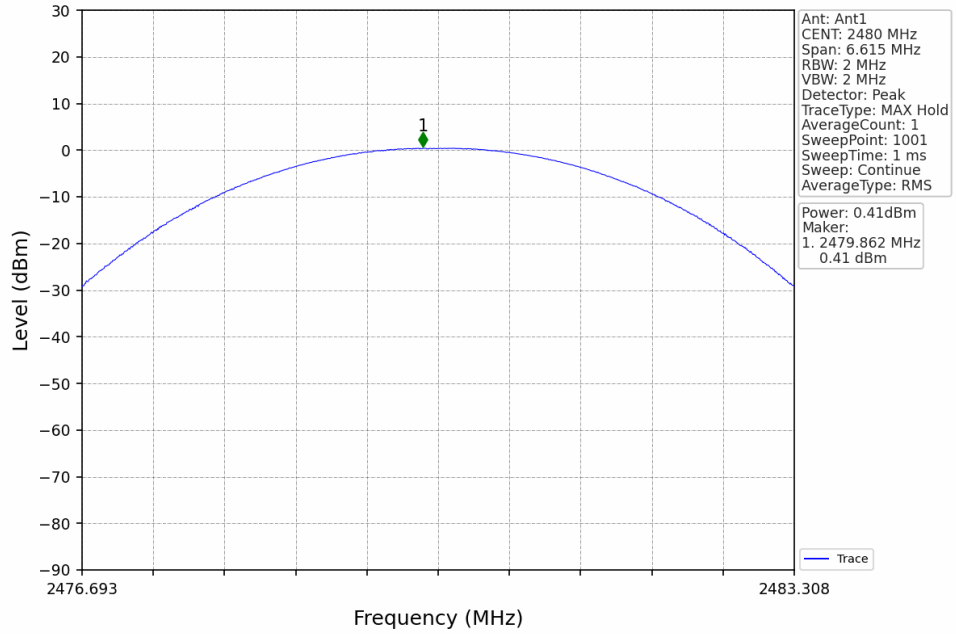

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



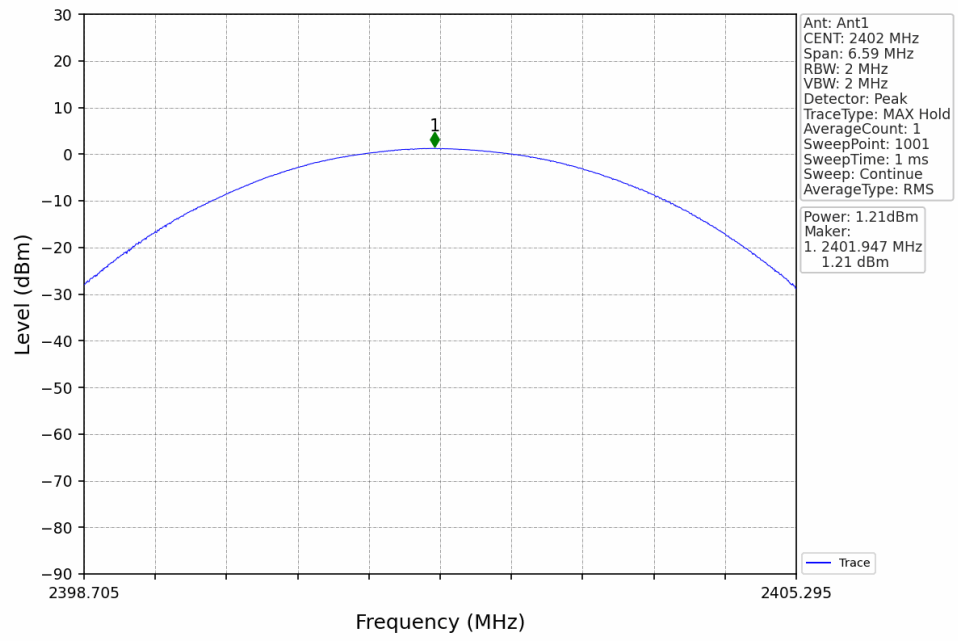
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



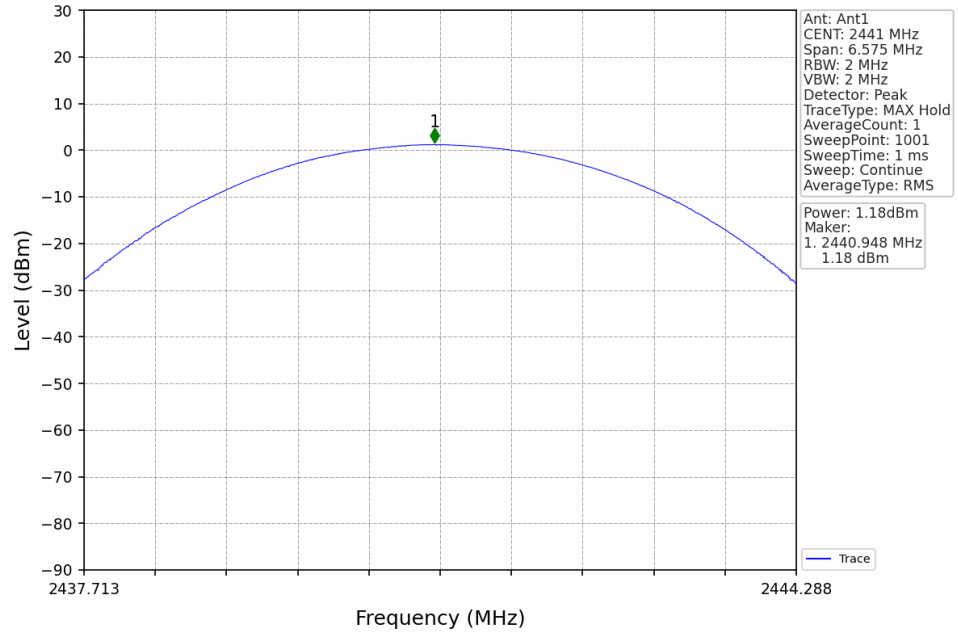

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



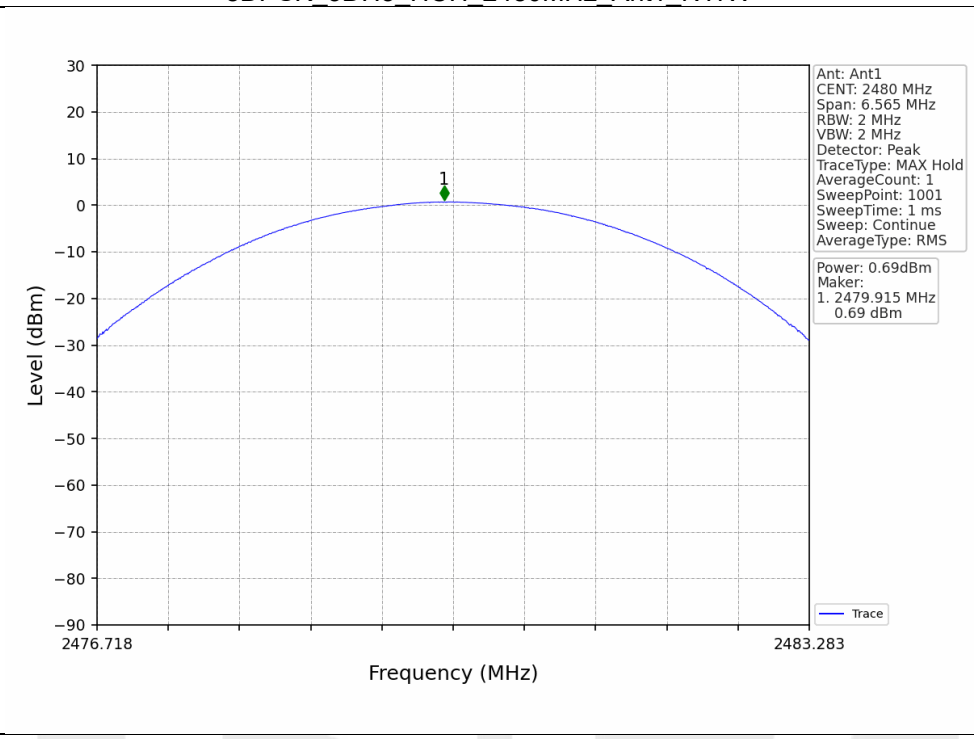
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV




8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



## 4. Carrier Frequency Separation

### 4.1 Test Result

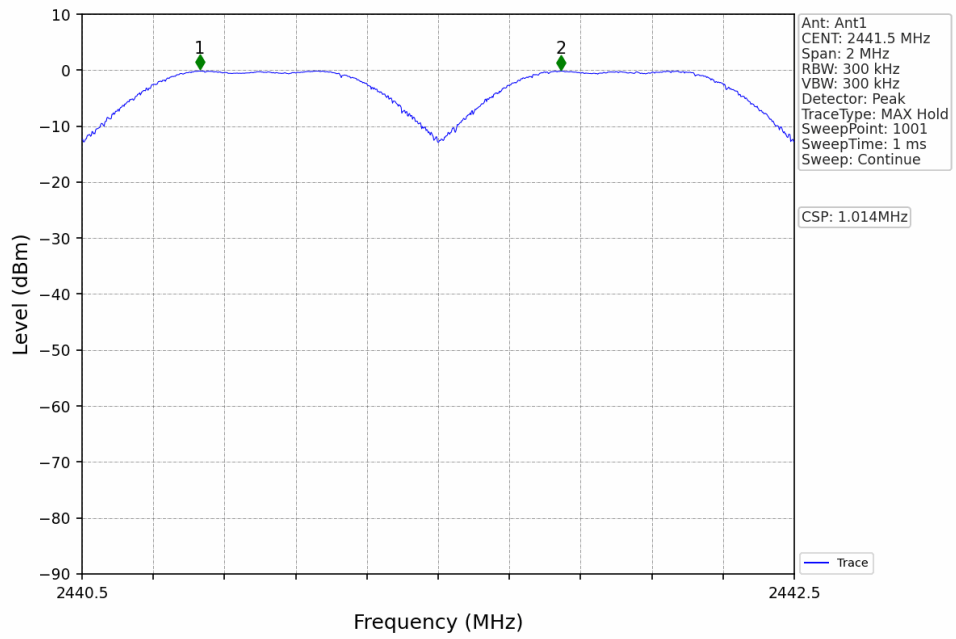
#### 4.1.1 Ant1

| Ant1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode | TX Type | Frequency (MHz) | Packet Type | Channel Separation (MHz) | 20dB Bandwidth (MHz) | Limit (MHz) | Verdict |
| GFSK | SISO | HOPP | DH5 | 1.014 | 0.970 | >=0.97 | Pass |
| π/4-DQPSK | SISO | HOPP | 2DH5 | 1.022 | 1.323 | >=0.882 | Pass |
| 8DPSK | SISO | HOPP | 3DH5 | 0.974 | 1.318 | >=0.879 | Pass |

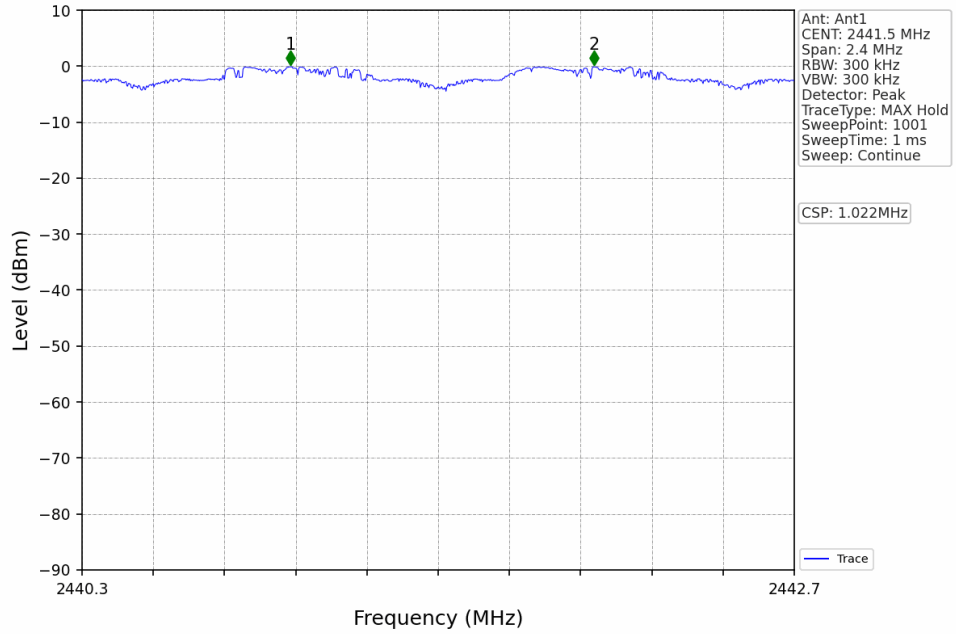
### 4.2 Test Graph

#### 4.2.1 Ant1

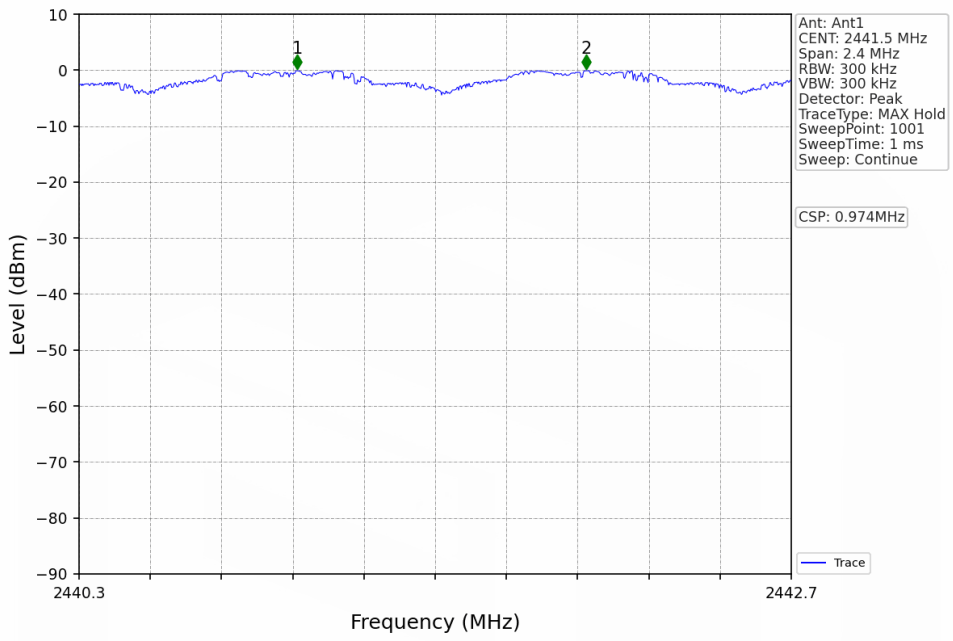
GFSK_DH5_HOPP_Ant1_NTNV




π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



## 5. Number of Hopping Frequencies

### 5.1 Test Result

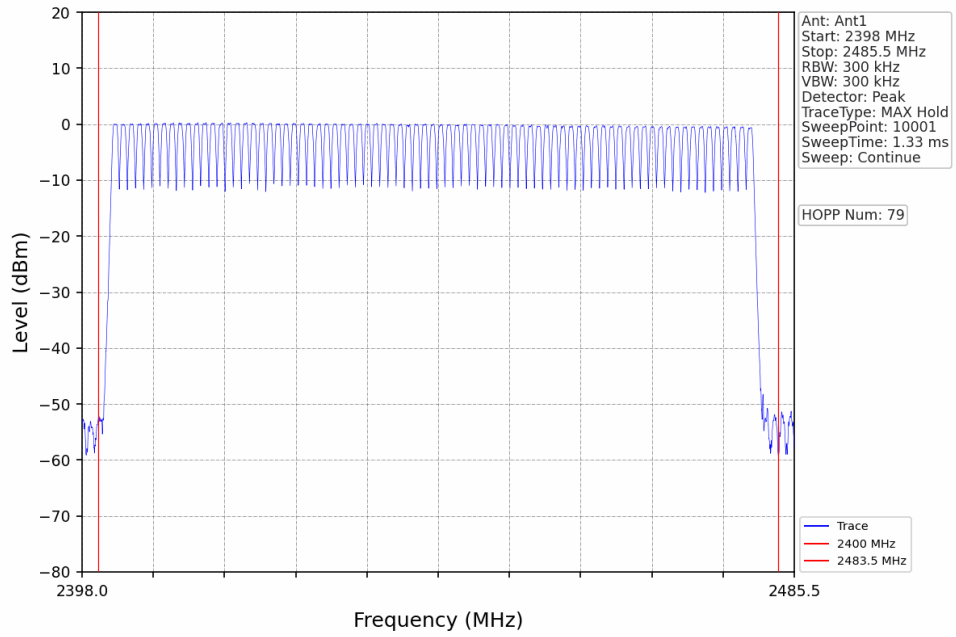
#### 5.1.1 HoppNum

| 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 |

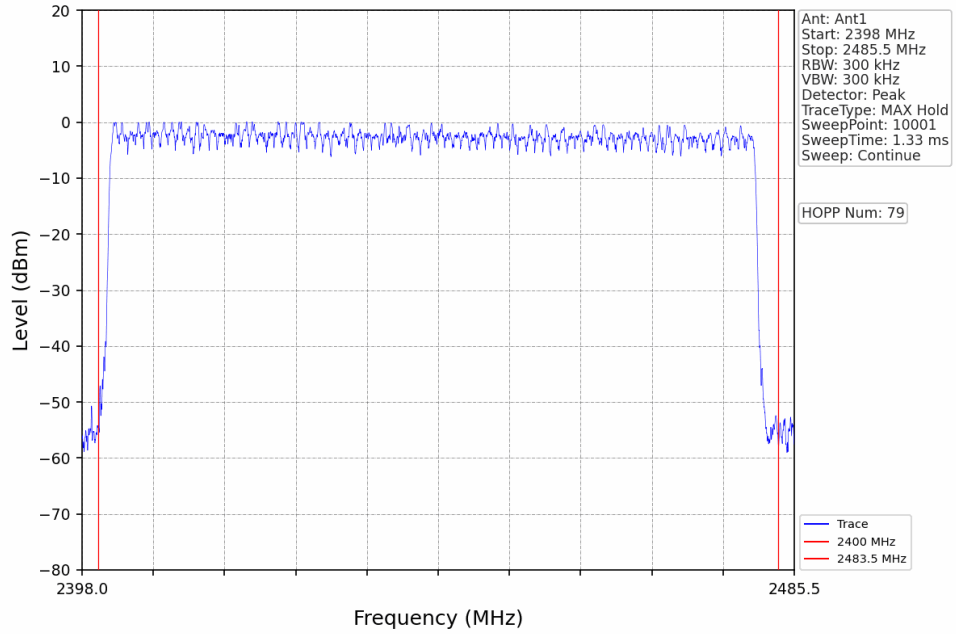
## 5.2 Test Graph

### 5.2.1 HoppNum

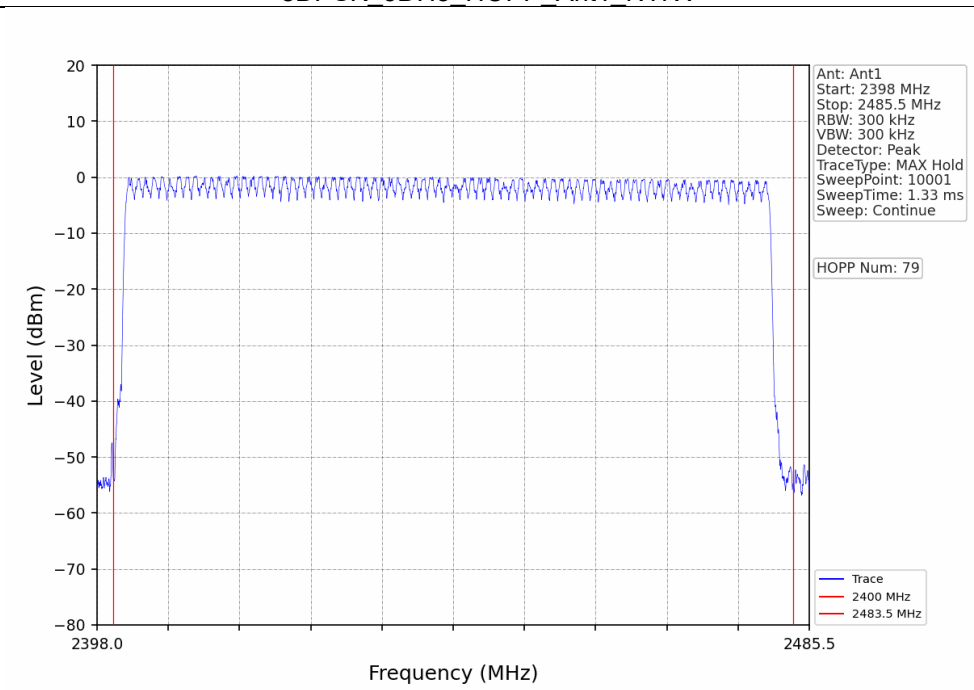
GFSK_DH5_HOPP_Ant1_NTNV




π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



8DPSK_3DH5_HOPP_Ant1_NTNV



## 6. Time of Occupancy (Dwell Time)

### 6.1 Test Result

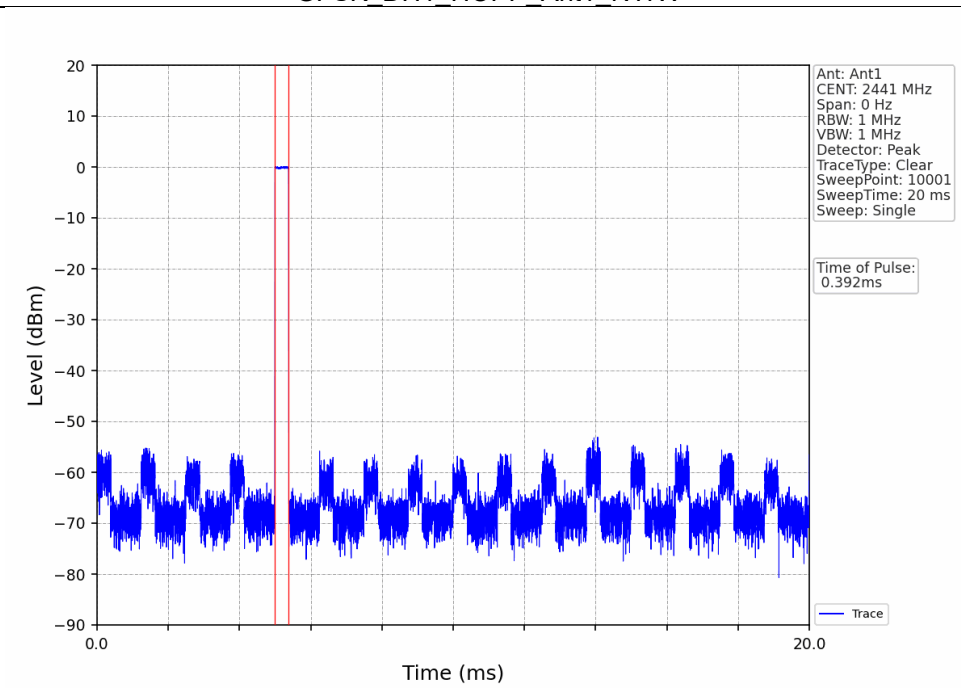
#### 6.1.1 Ant1

| 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 | 319 | 125.048 | <=400 | Pass |
| | | | DH3 | 1.646 | 31.600 | 159 | 261.714 | <=400 | Pass |
| | | | DH5 | 2.896 | 31.600 | 101 | 292.496 | <=400 | Pass |
| π/4-DQPSK | SISO | HOPP | 2DH1 | 0.396 | 31.600 | 318 | 125.928 | <=400 | Pass |
| | | | 2DH3 | 1.648 | 31.600 | 157 | 258.736 | <=400 | Pass |
| | | | 2DH5 | 2.902 | 31.600 | 112 | 325.024 | <=400 | Pass |
| 8DPSK | SISO | HOPP | 3DH1 | 0.402 | 31.600 | 320 | 128.640 | <=400 | Pass |
| | | | 3DH3 | 1.652 | 31.600 | 165 | 272.580 | <=400 | Pass |
| | | | 3DH5 | 2.902 | 31.600 | 117 | 339.534 | <=400 | Pass |

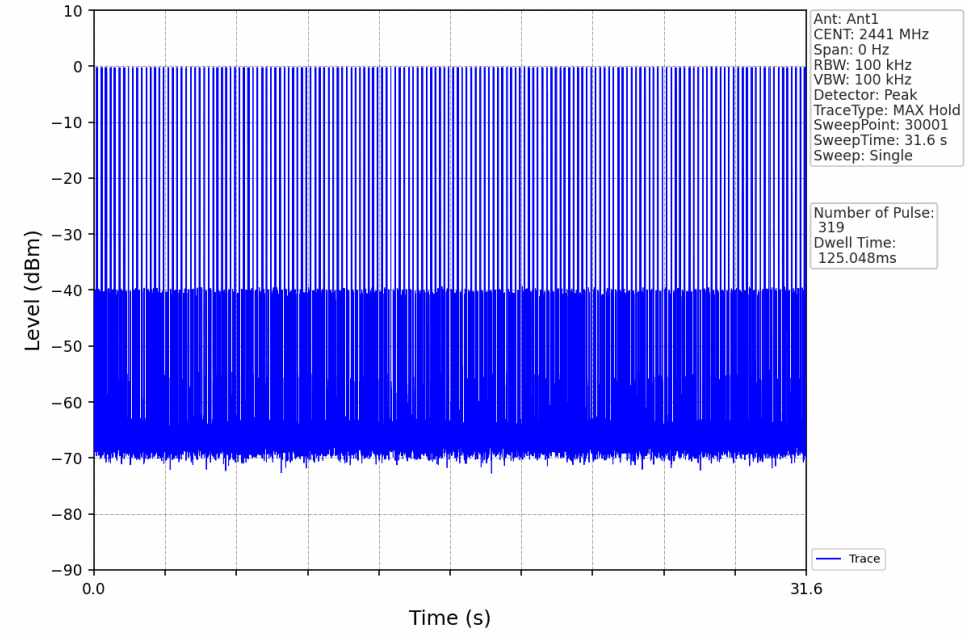
## 6.2 Test Graph

### 6.2.1 Ant1

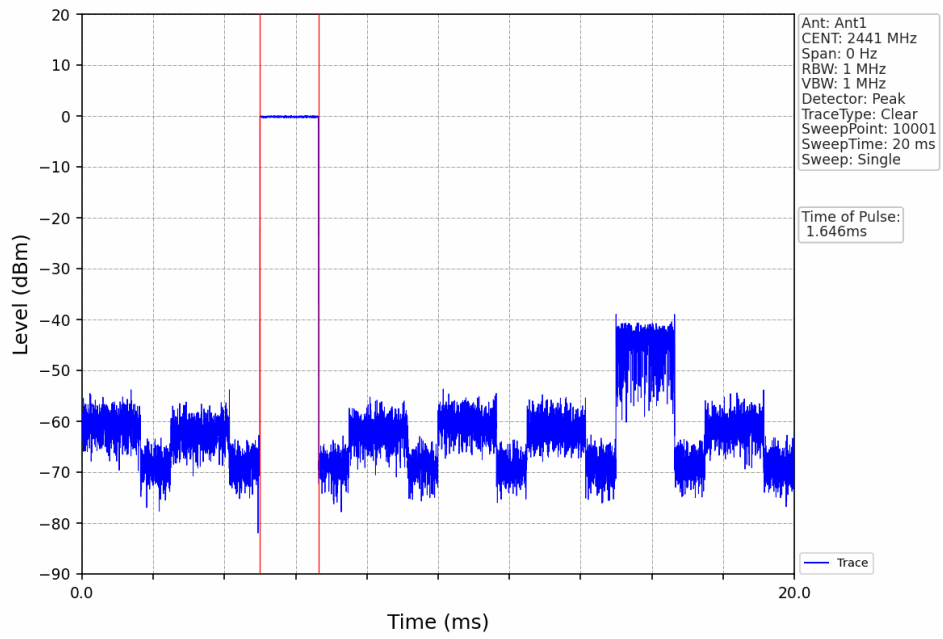
GFSK_DH1_HOPP_Ant1_NTNV



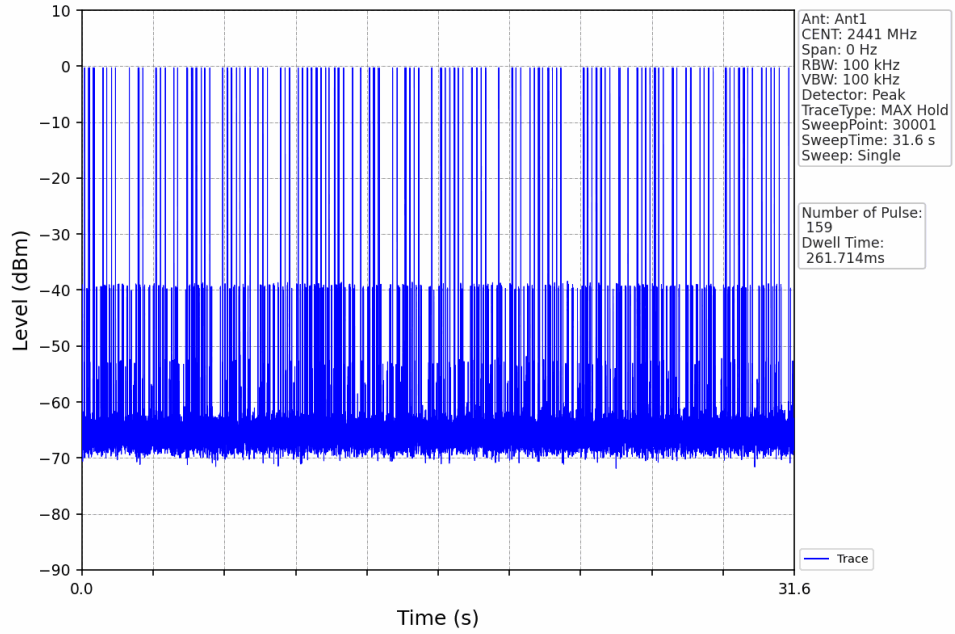

GFSK_DH1_HOPP_Ant1_NTNV



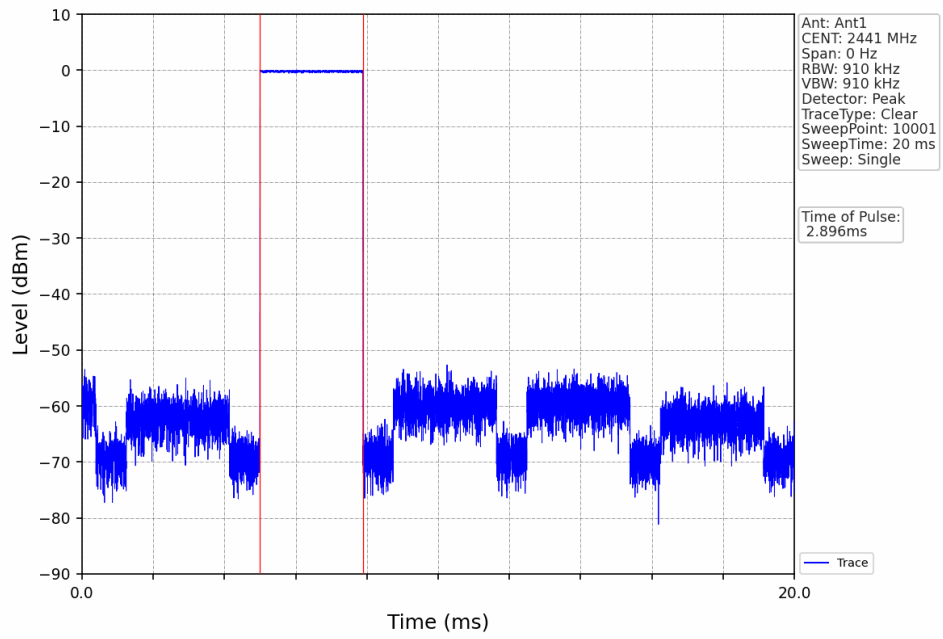
GFSK_DH3_HOPP_Ant1_NTNV



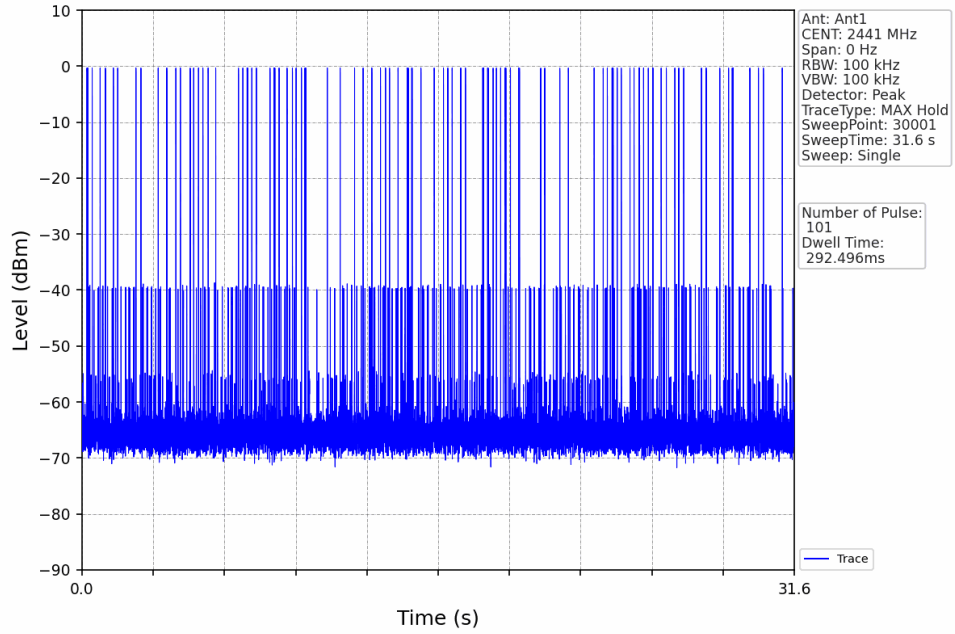

GFSK_DH3_HOPP_Ant1_NTNV



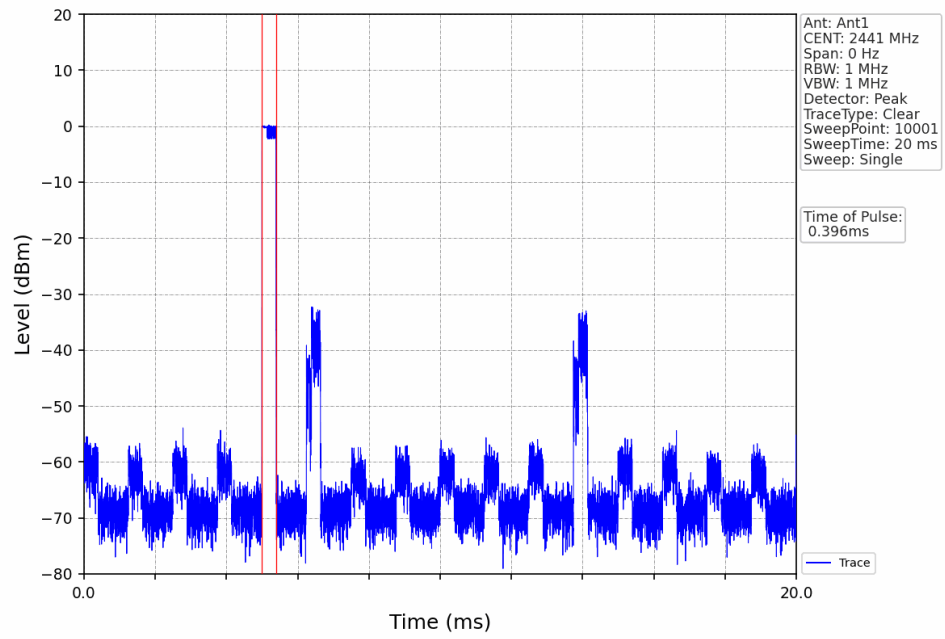
GFSK_DH5_HOPP_Ant1_NTNV



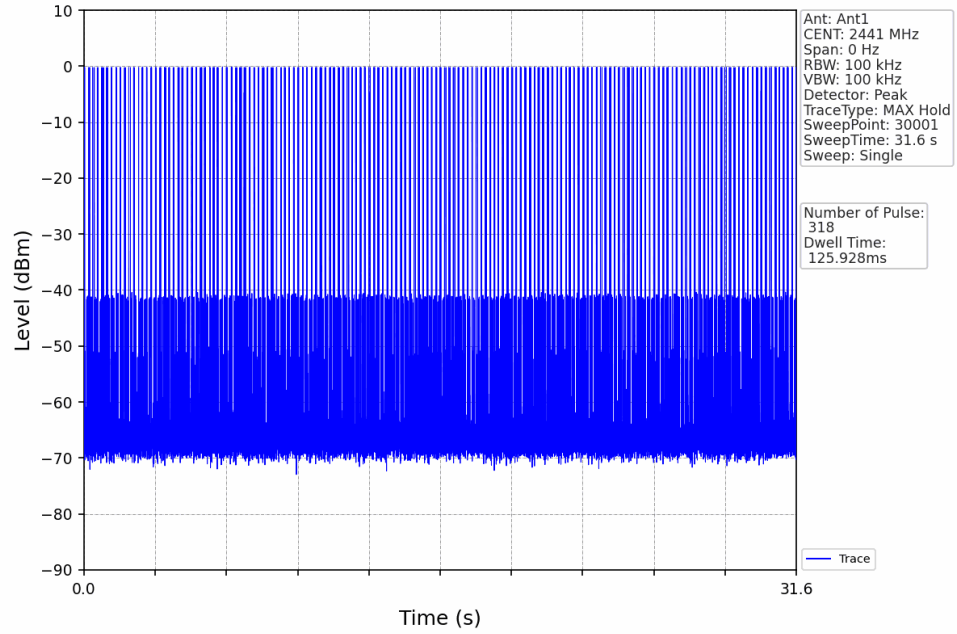

GFSK_DH5_HOPP_Ant1_NTNV



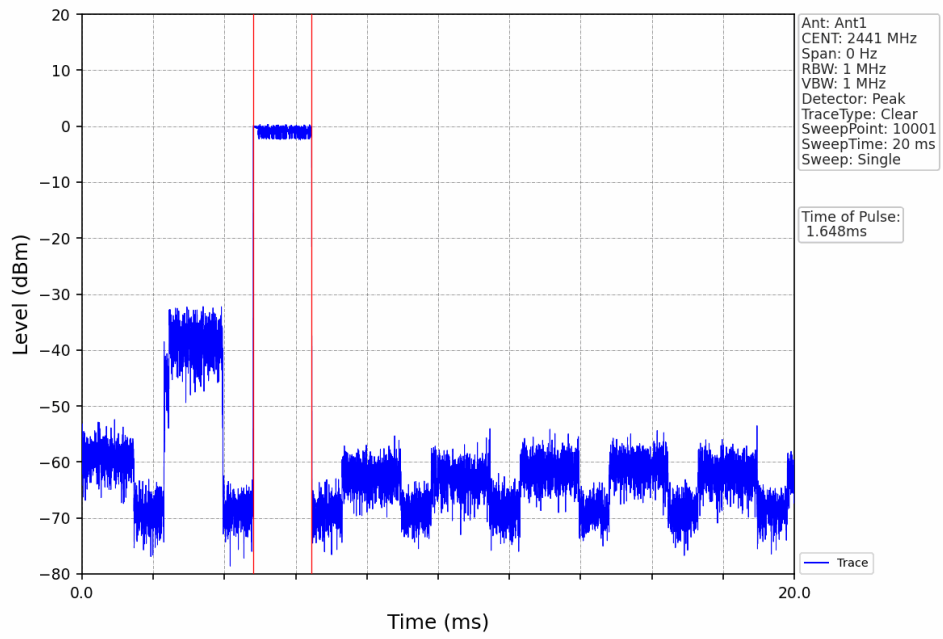
π/4-DQPSK_2DH1_HOPP_Ant1_NTNV



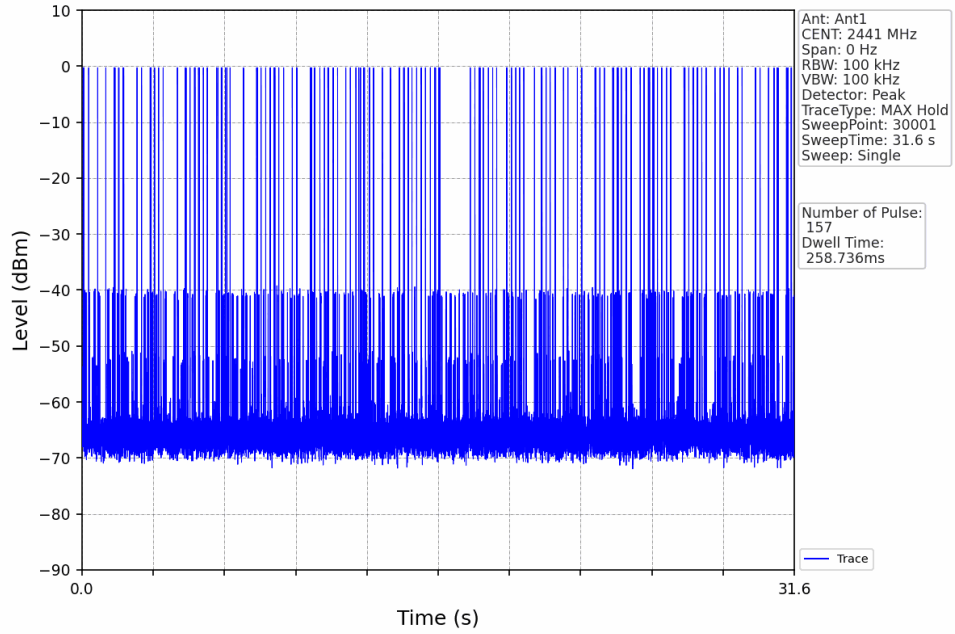

π/4-DQPSK_2DH1_HOPP_Ant1_NTNV



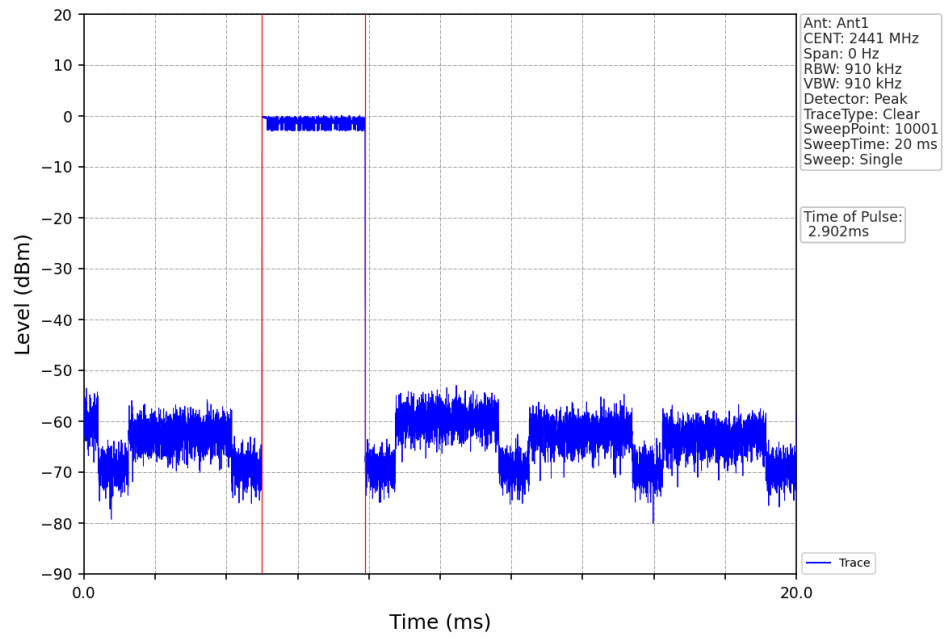
π/4-DQPSK_2DH3_HOPP_Ant1_NTNV



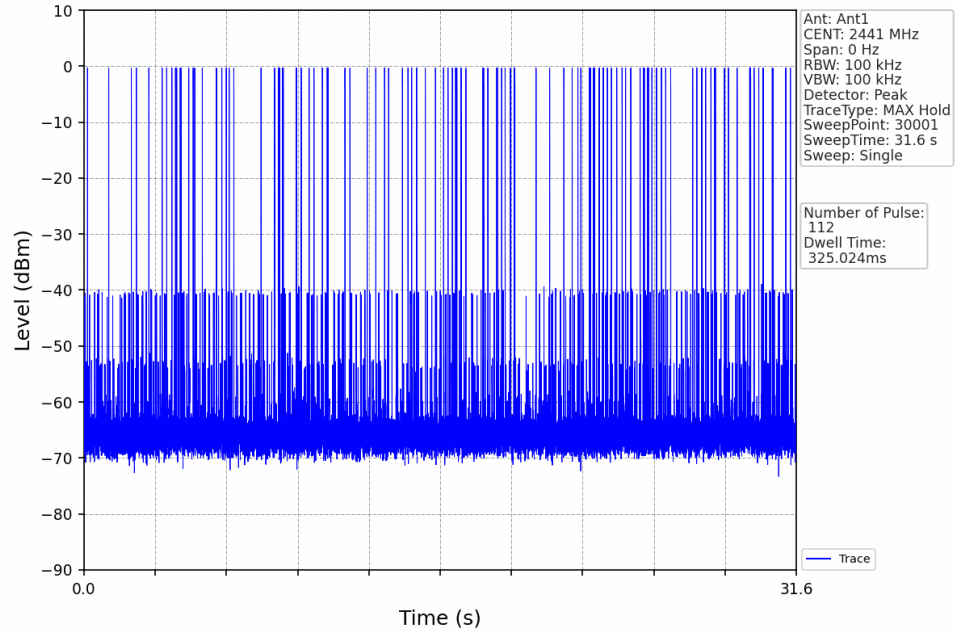

π/4-DQPSK_2DH3_HOPP_Ant1_NTNV



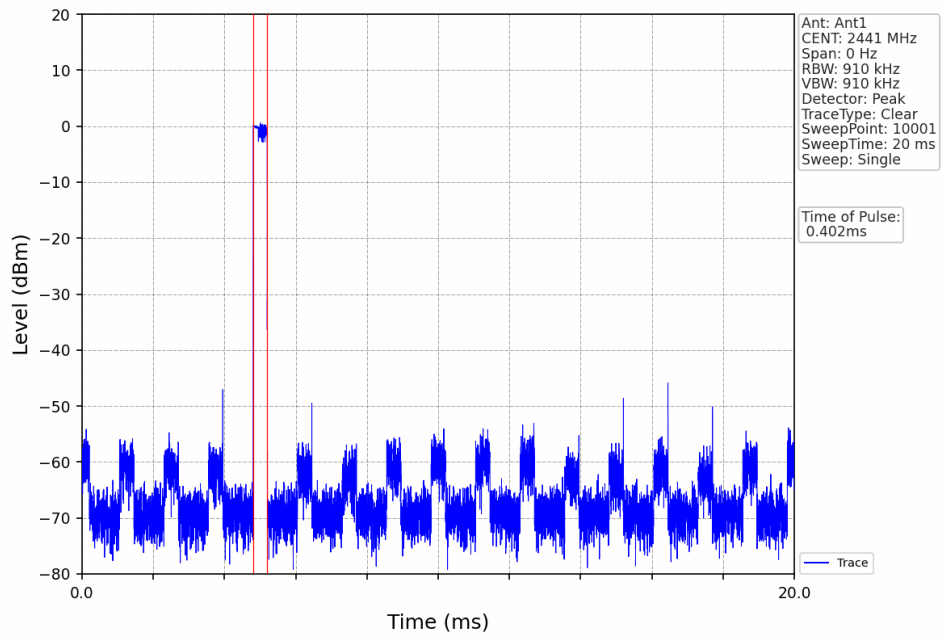
π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



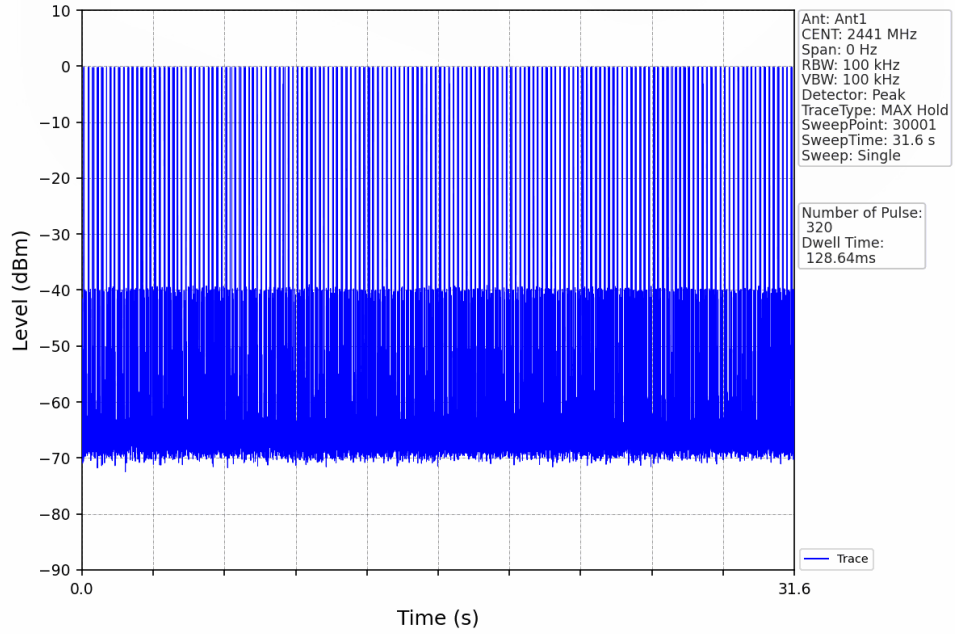

π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



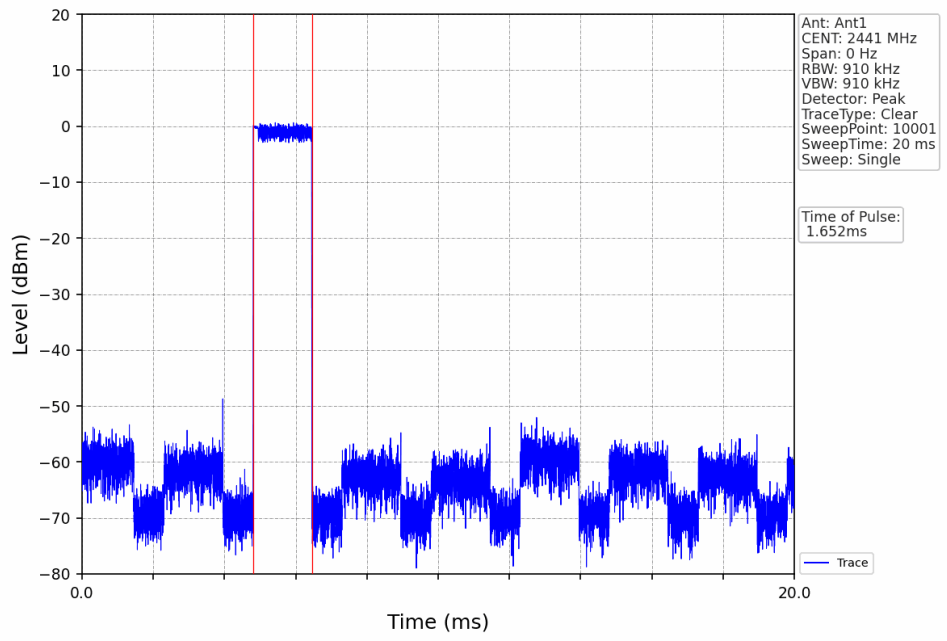
8DPSK_3DH1_HOPP_Ant1_NTNV



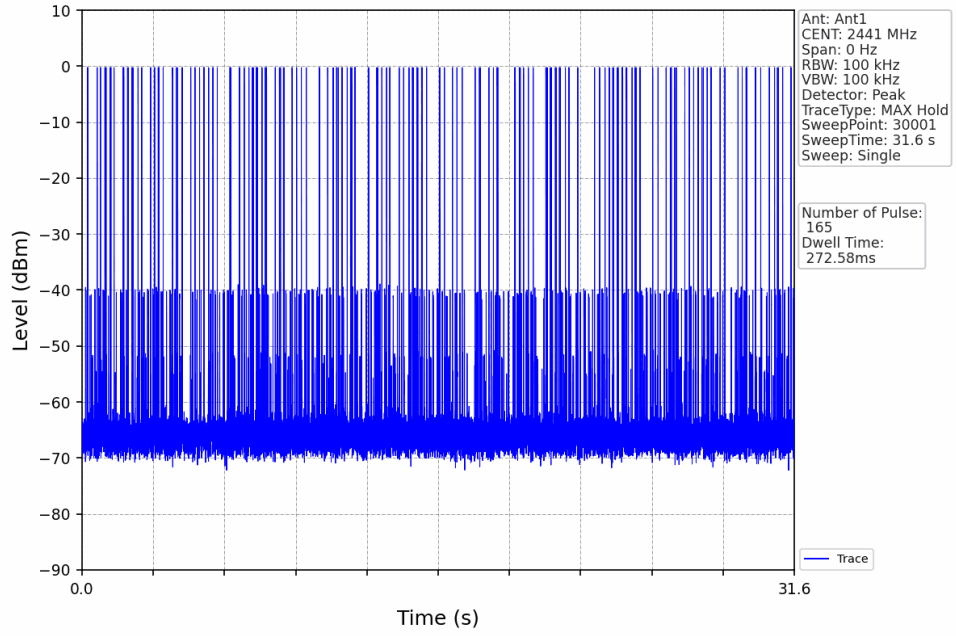

8DPSK_3DH1_HOPP_Ant1_NTNV



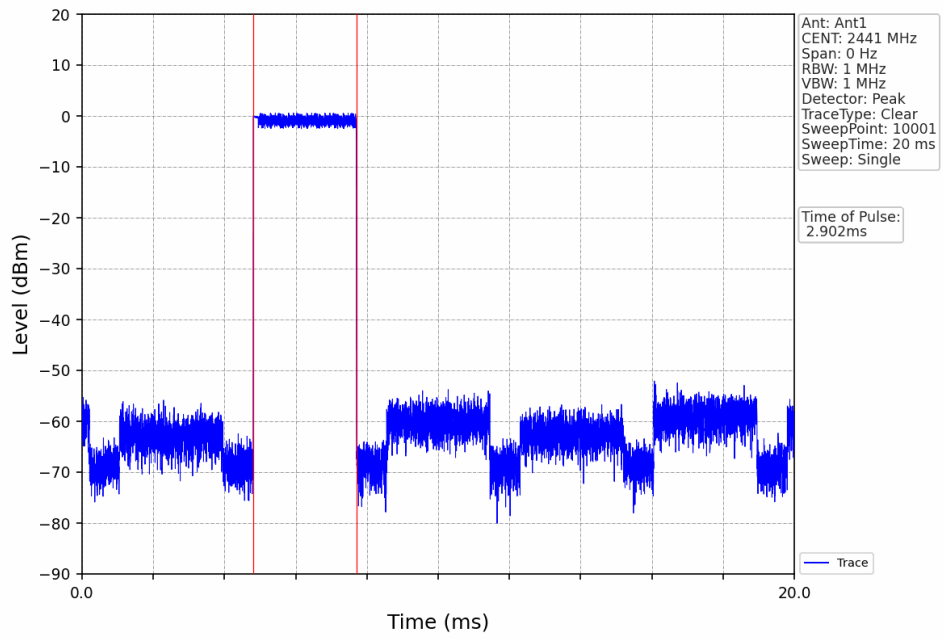
8DPSK_3DH3_HOPP_Ant1_NTNV



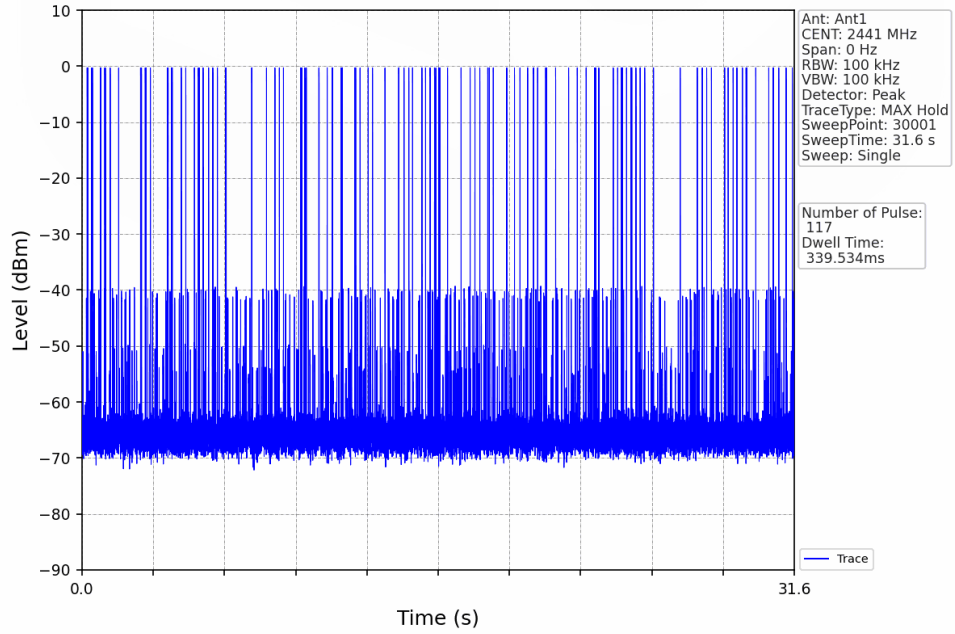

8DPSK_3DH3_HOPP_Ant1_NTNV



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 | -0.22 |
| | | 2441 | DH5 | 1 | -0.30 |
| | | 2480 | DH5 | 1 | -0.71 |
| | | HOPP | DH5 | 1 | -0.06 |
| | | | | | -0.06 |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | -0.23 |
| | | 2441 | 2DH5 | 1 | -0.23 |
| | | 2480 | 2DH5 | 1 | -0.71 |
| | | HOPP | 2DH5 | 1 | -0.10 |
| | | | | | -0.10 |
| 8DPSK | SISO | 2402 | 3DH5 | 1 | -0.23 |
| | | 2441 | 3DH5 | 1 | -0.26 |
| | | 2480 | 3DH5 | 1 | -0.71 |
| | | HOPP | 3DH5 | 1 | -0.01 |
| | | | | | -0.01 |
| 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. | | | | | |

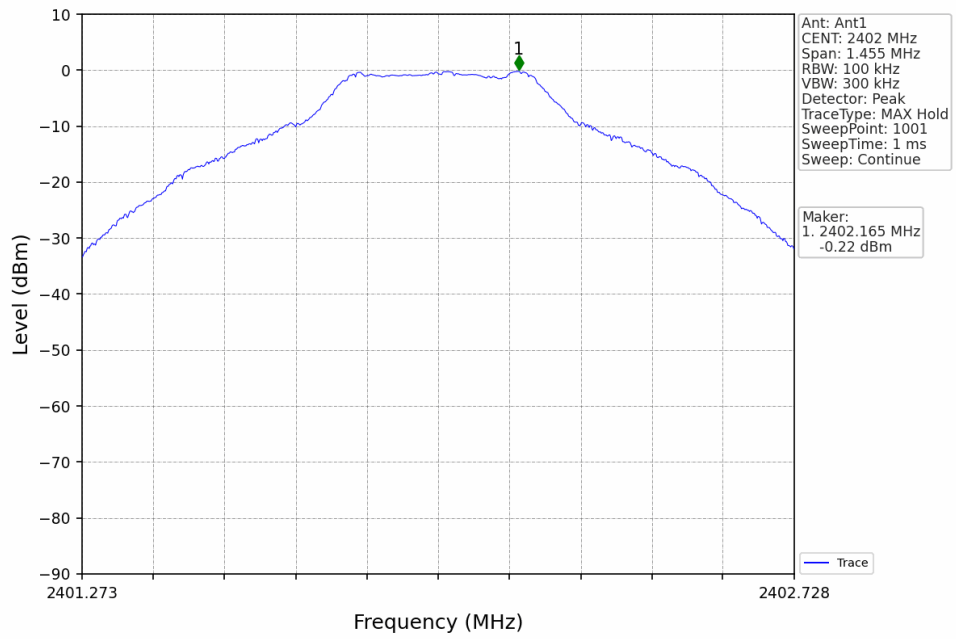
#### 7.1.2 CSE

| Mode | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| GFSK | SISO | 2402 | DH5 | 1 | -0.22 | -20.22 | Pass |
| | | 2441 | DH5 | 1 | -0.30 | -20.30 | Pass |
| | | 2480 | DH5 | 1 | -0.71 | -20.71 | Pass |
| | | HOPP | DH5 | 1 | -0.06 | -20.06 | Pass |
| | | | | | -0.06 | -20.06 | Pass |
| π/4-DQPSK | SISO | 2402 | 2DH5 | 1 | -0.23 | -20.23 | Pass |
| | | 2441 | 2DH5 | 1 | -0.23 | -20.23 | Pass |
| | | 2480 | 2DH5 | 1 | -0.71 | -20.71 | Pass |
| | | HOPP | 2DH5 | 1 | -0.10 | -20.10 | Pass |
| | | | | | -0.10 | -20.10 | Pass |
| 8DPSK | SISO | 2402 | 3DH5 | 1 | -0.23 | -20.23 | Pass |
| | | 2441 | 3DH5 | 1 | -0.26 | -20.26 | Pass |
| | | 2480 | 3DH5 | 1 | -0.71 | -20.71 | Pass |
| | | HOPP | 3DH5 | 1 | -0.01 | -20.01 | Pass |
| | | | | | -0.01 | -20.01 | 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. | | | | | | | |

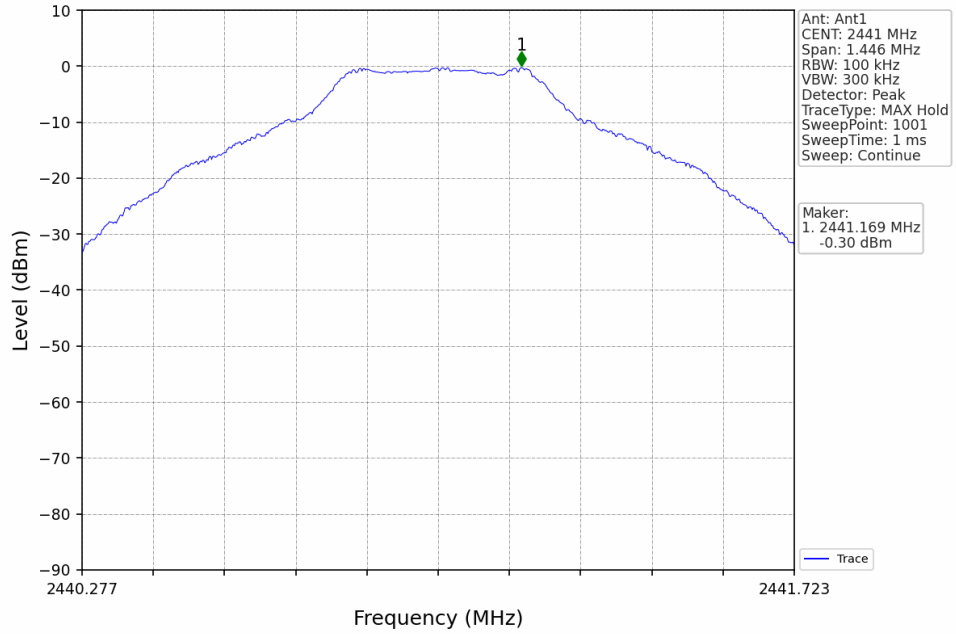
7.2 Test Graph

**7.2.1 Ref**

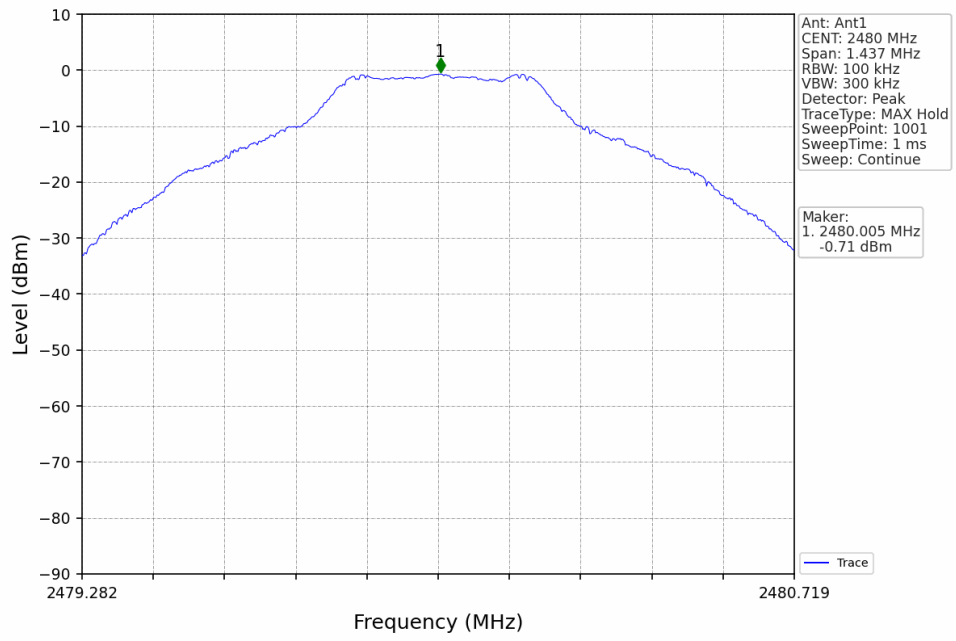
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



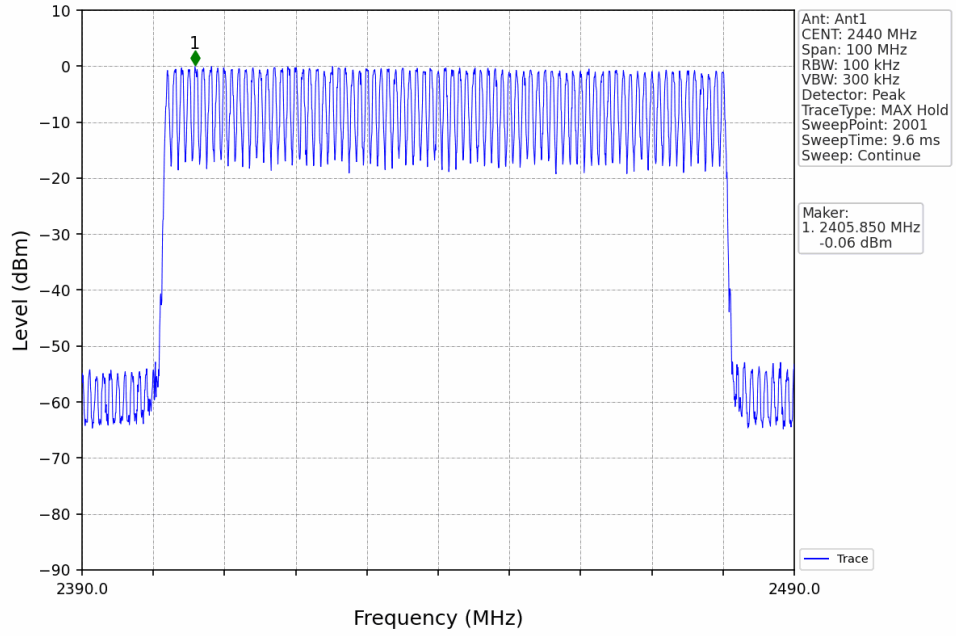

GFSK_DH5_MCH_2441MHz_Ant1_NTNV



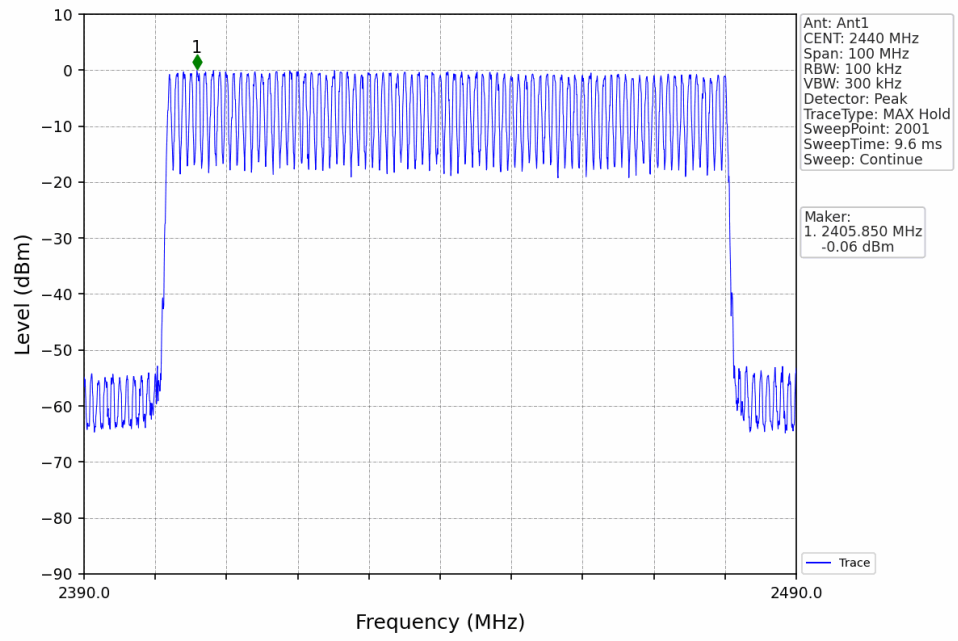
GFSK_DH5_HCH_2480MHz_Ant1_NTNV



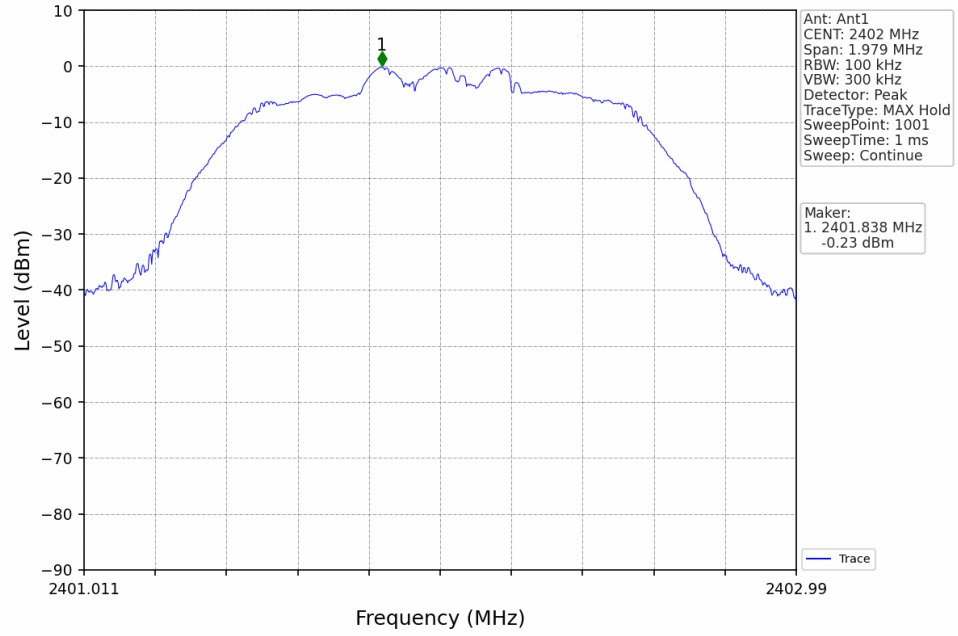

GFSK_DH5_HOPP_Ant1_NTNV



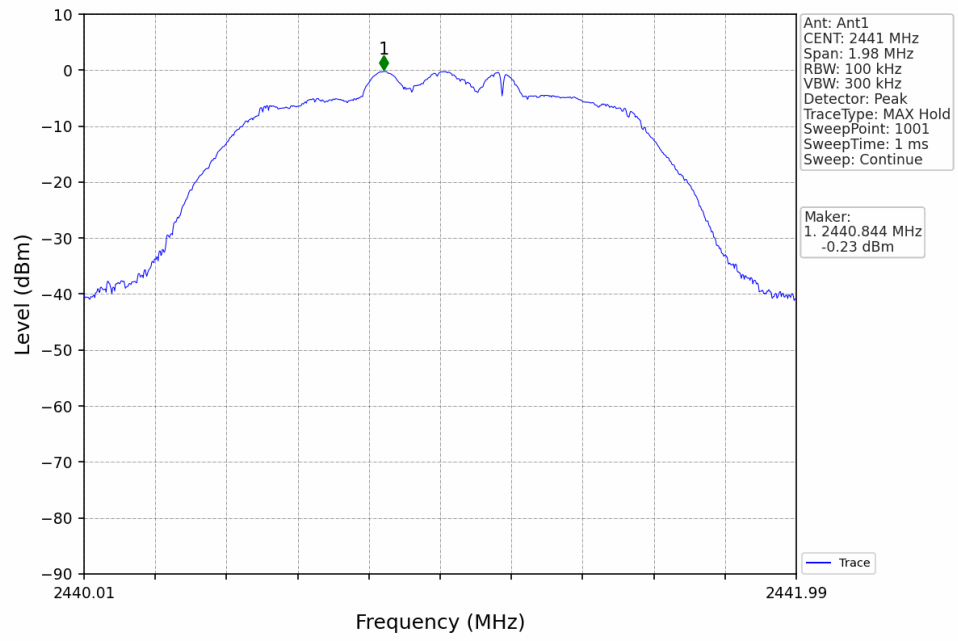
GFSK_DH5_HOPP_Ant1_NTNV



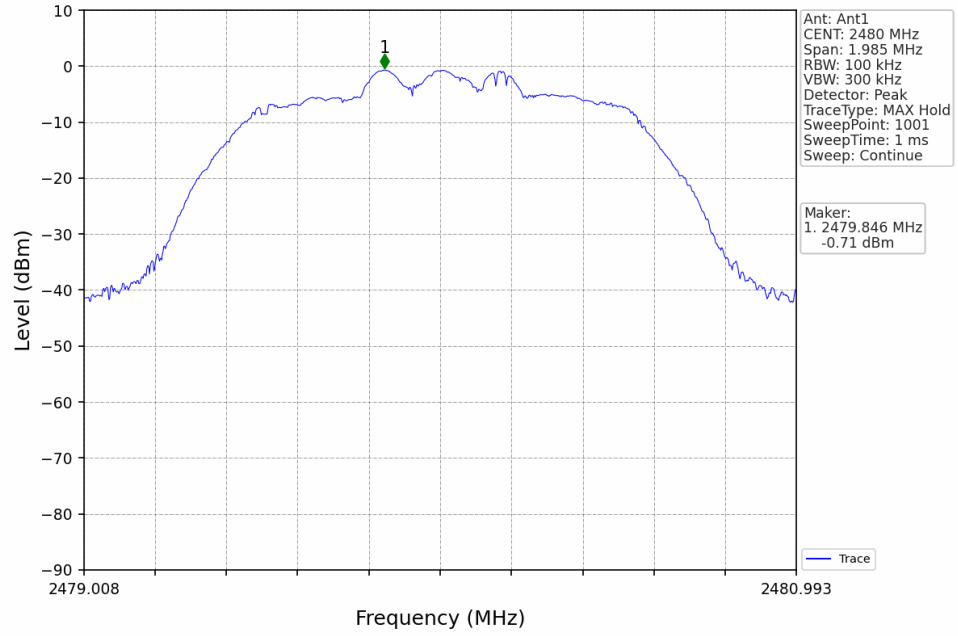

π/4-DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



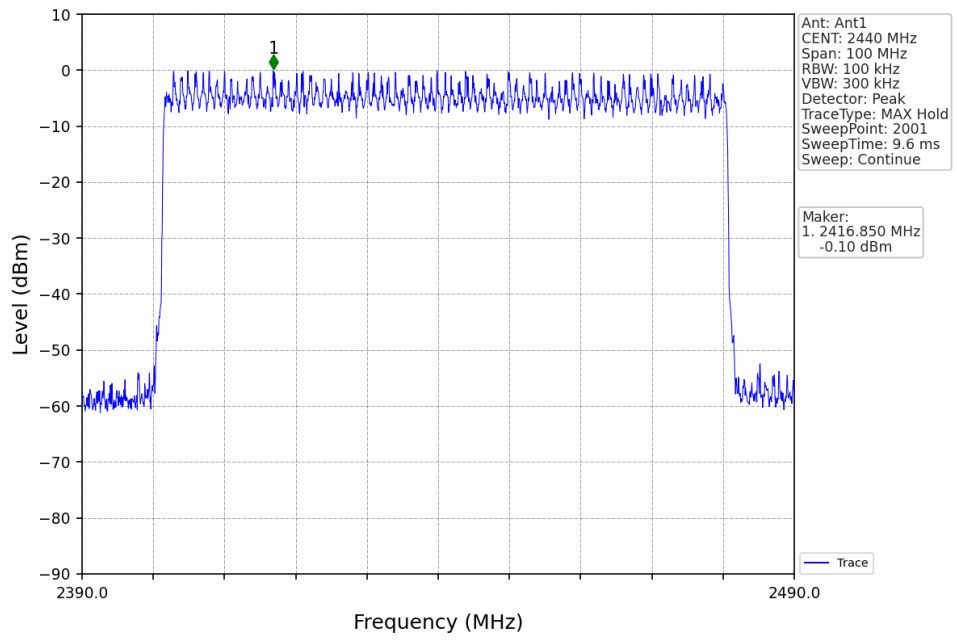
π/4-DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



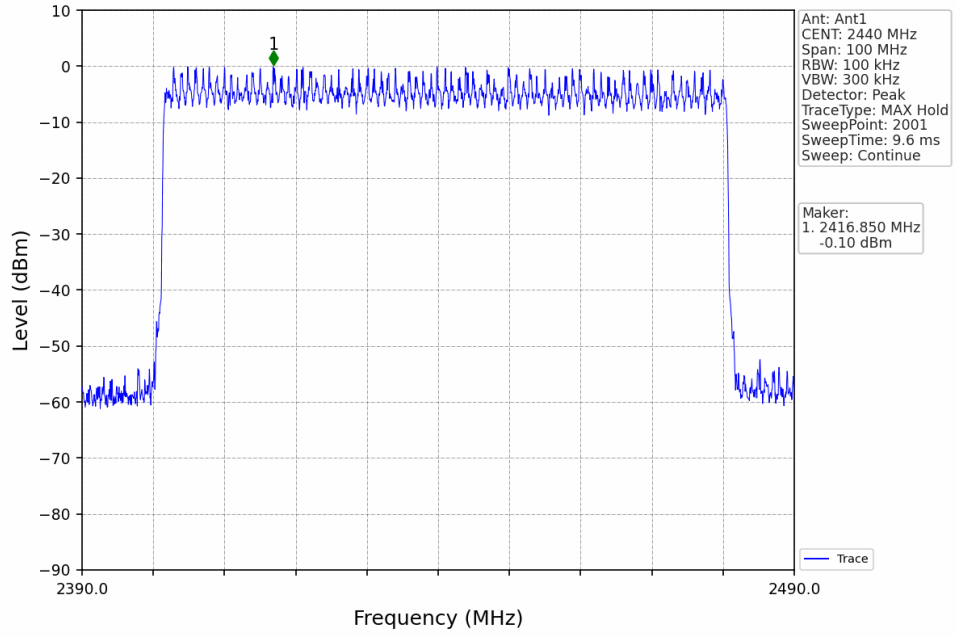

π/4-DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



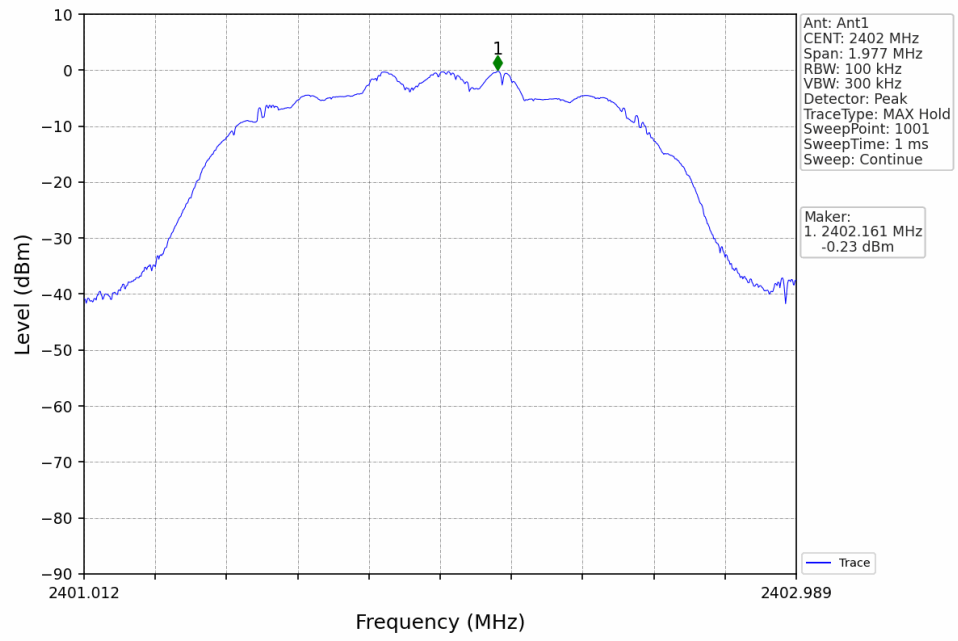
π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



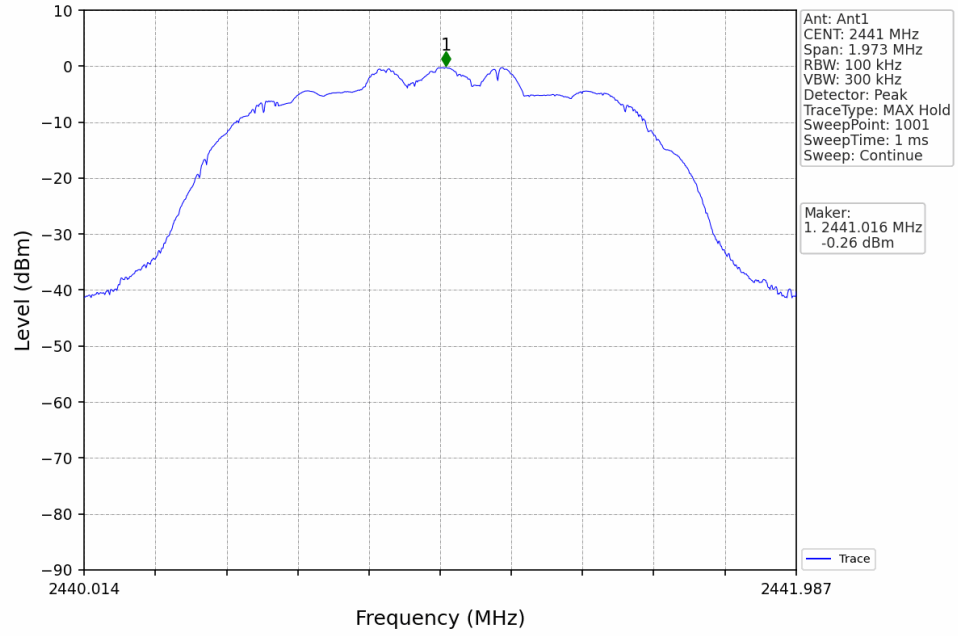

π/4-DQPSK_2DH5_HOPP_Ant1_NTNV



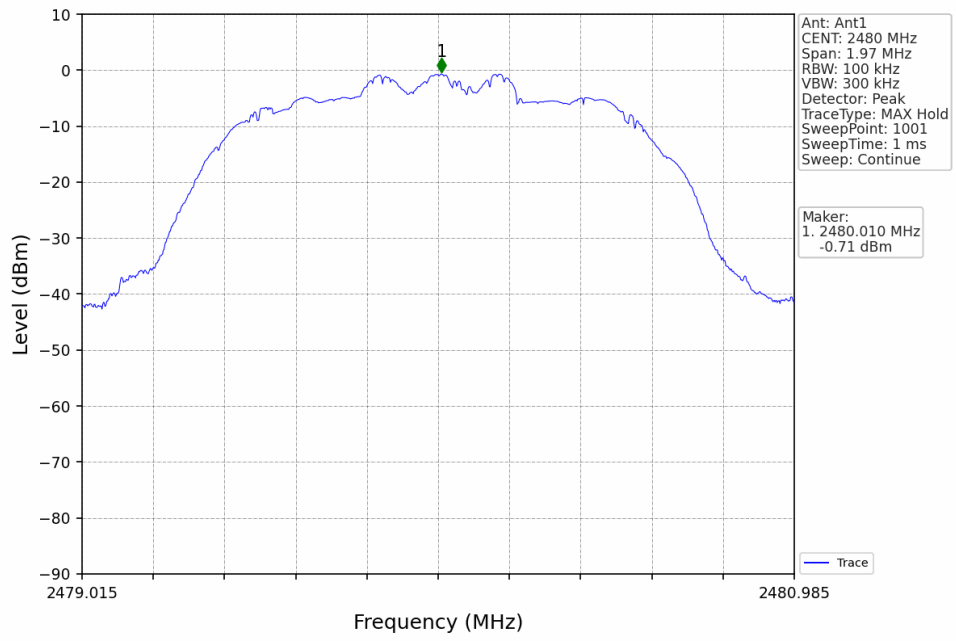
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



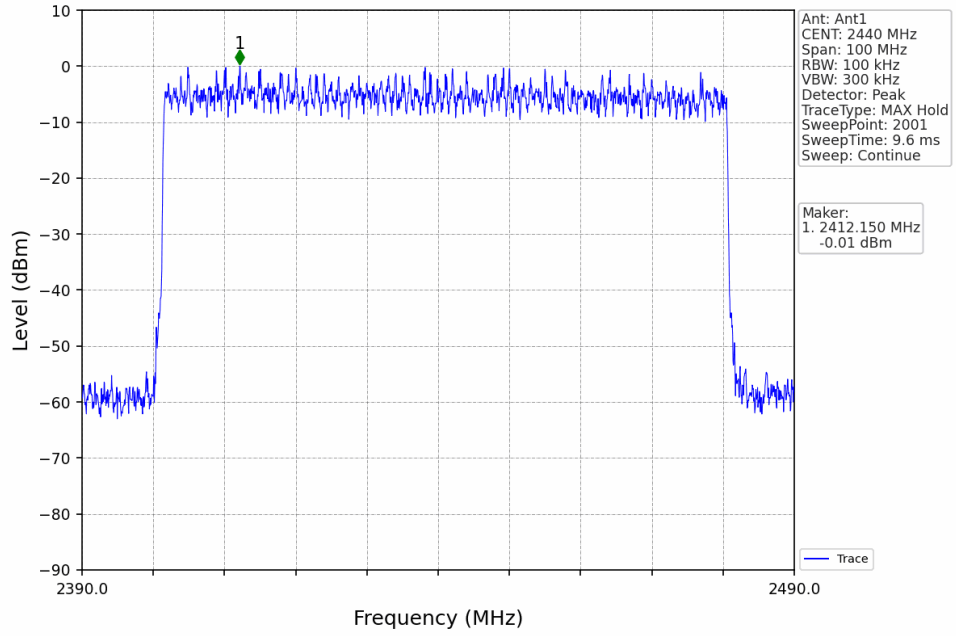

8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



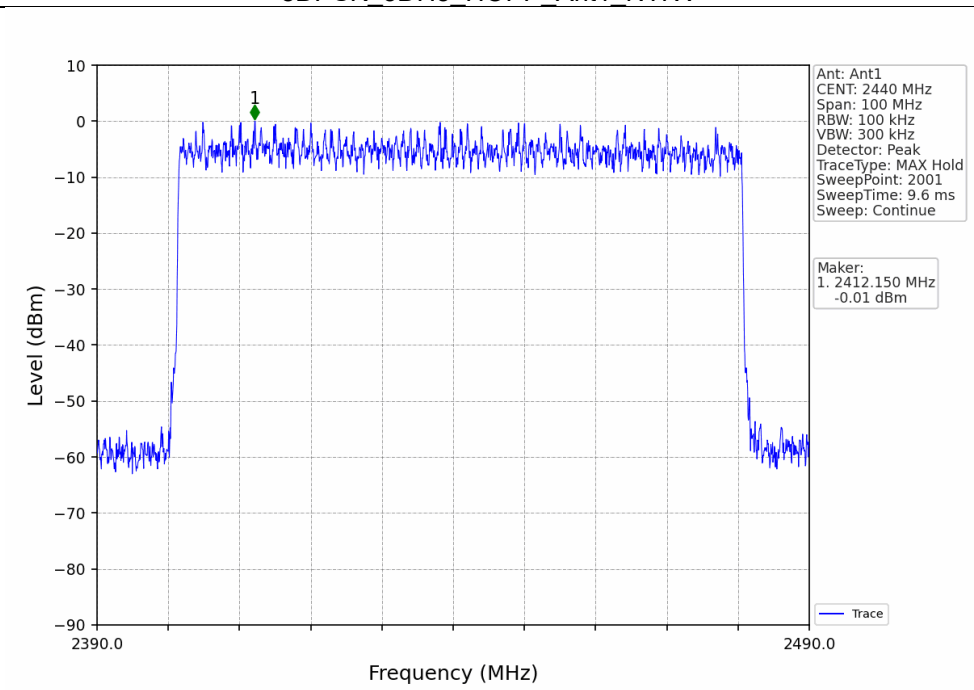
8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV




8DPSK_3DH5_HOPP_Ant1_NTNV

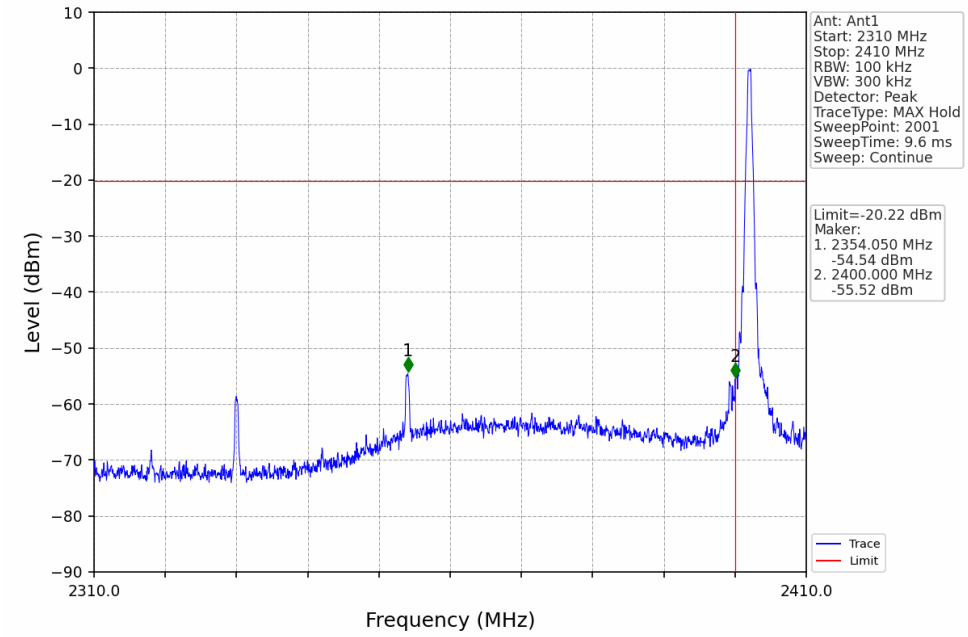


8DPSK_3DH5_HOPP_Ant1_NTNV

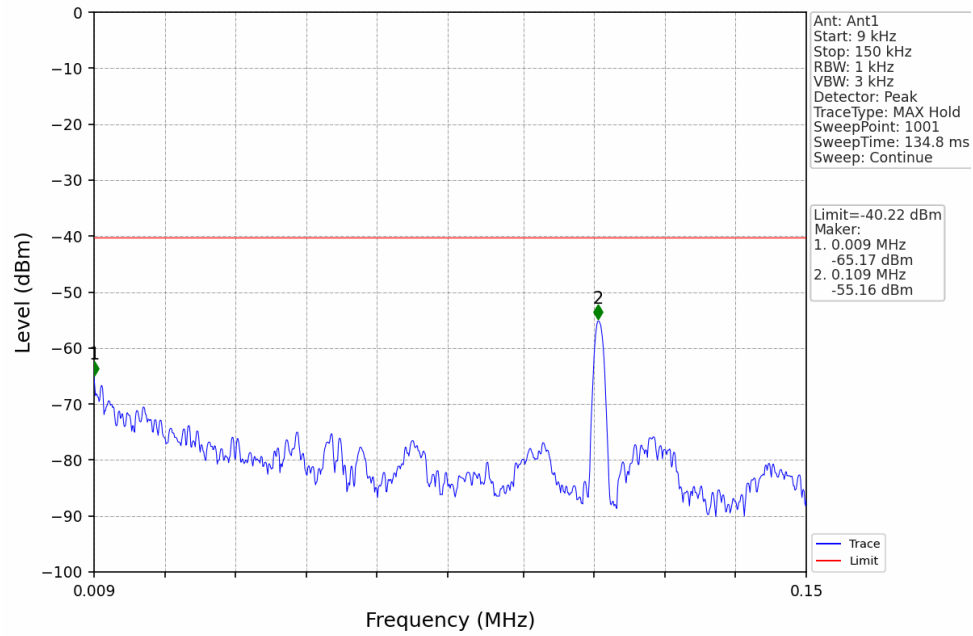


### 7.2.2 CSE

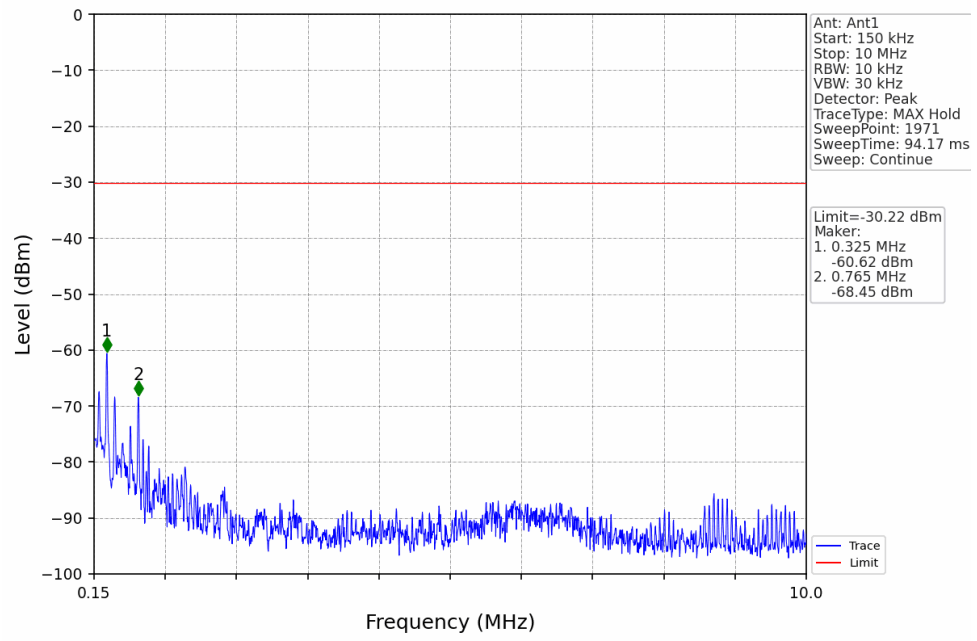
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



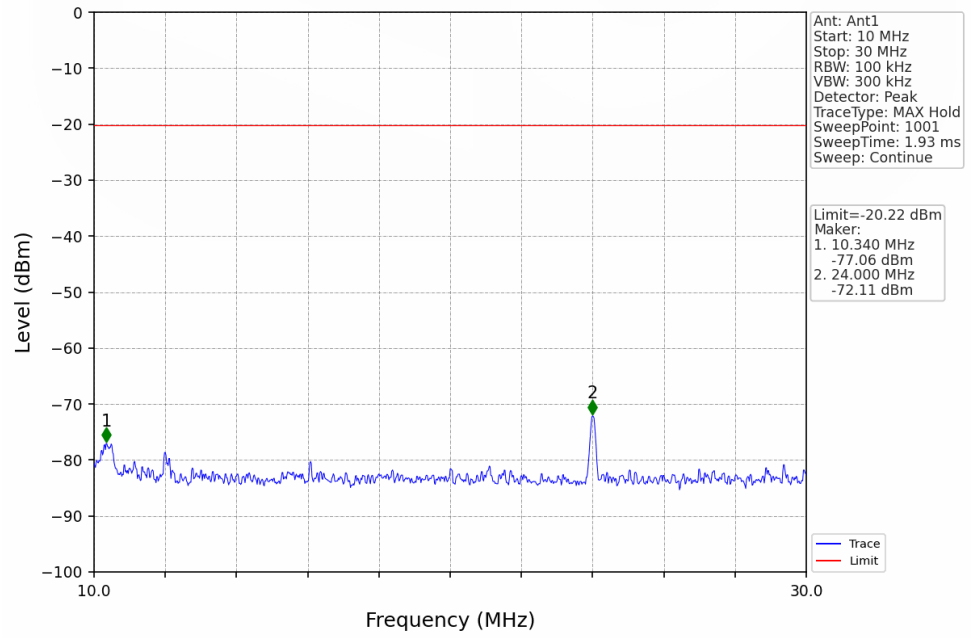

GFSK_DH5_LCH_2402MHz_Ant1_NTNV



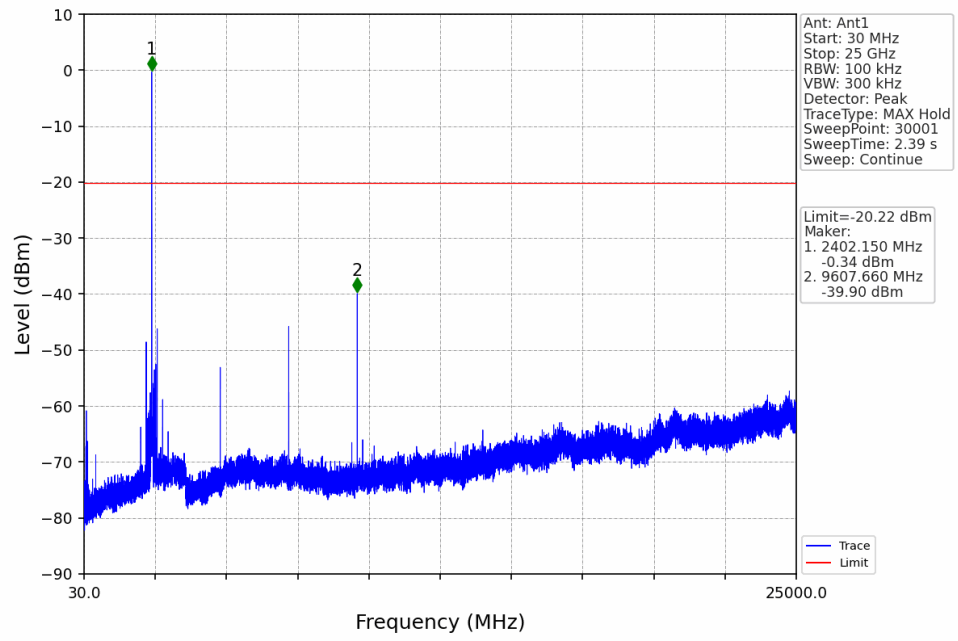
GFSK_DH5_LCH_2402MHz_Ant1_NTNV




GFSK_DH5_LCH_2402MHz_Ant1_NTNV



GFSK_DH5_LCH_2402MHz_Ant1_NTNV

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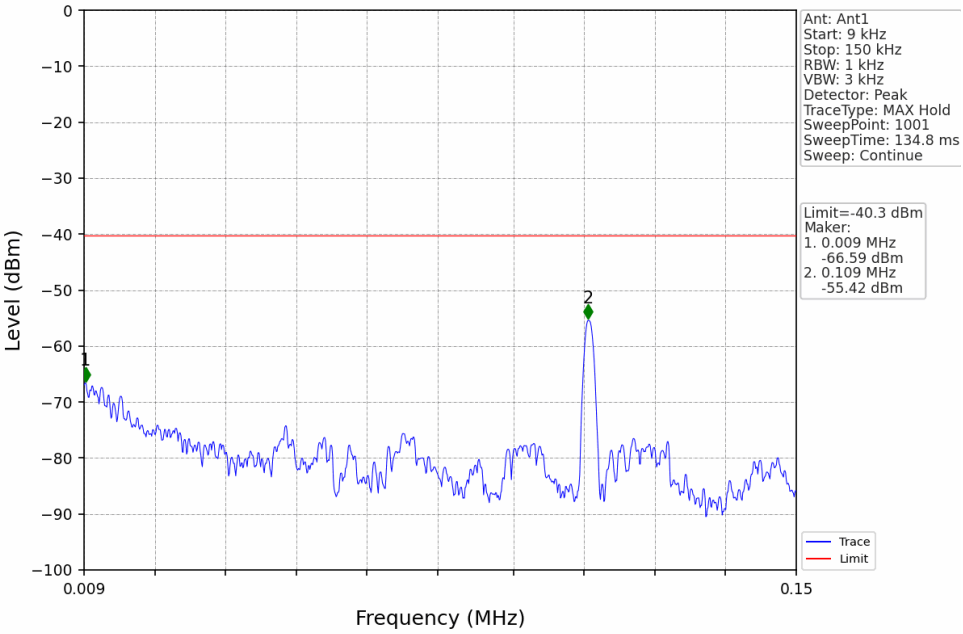

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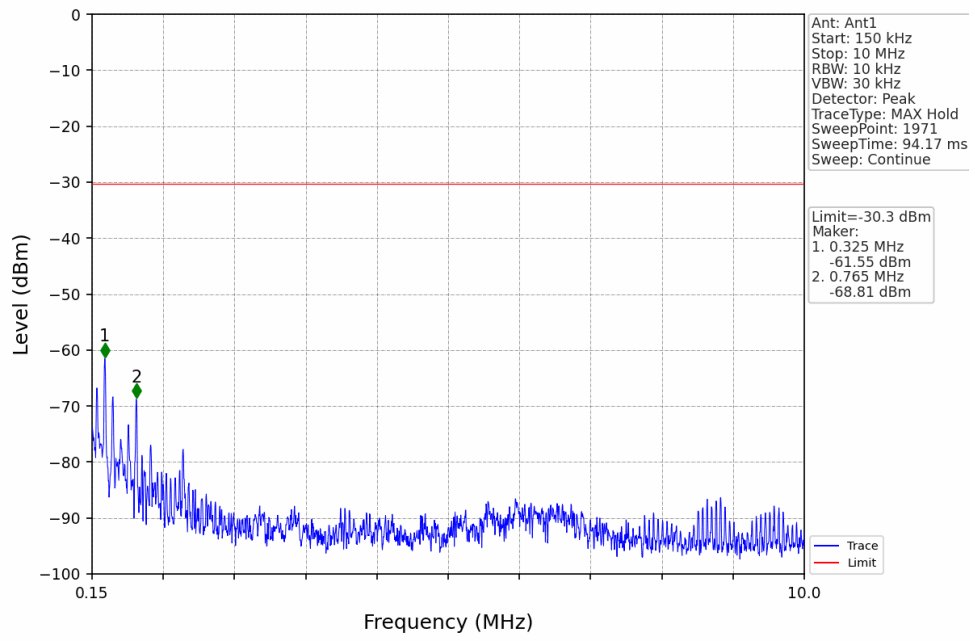


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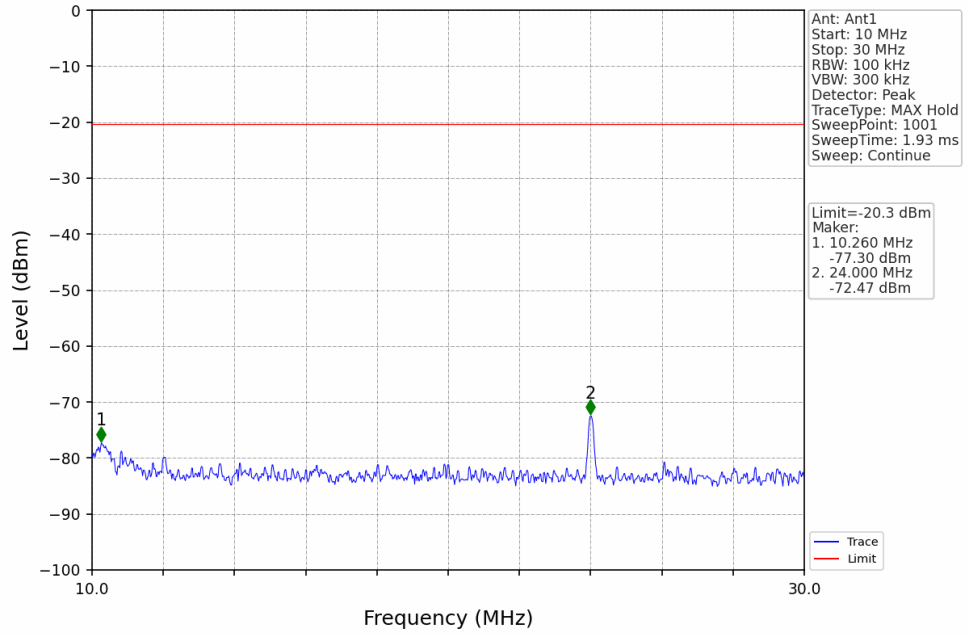

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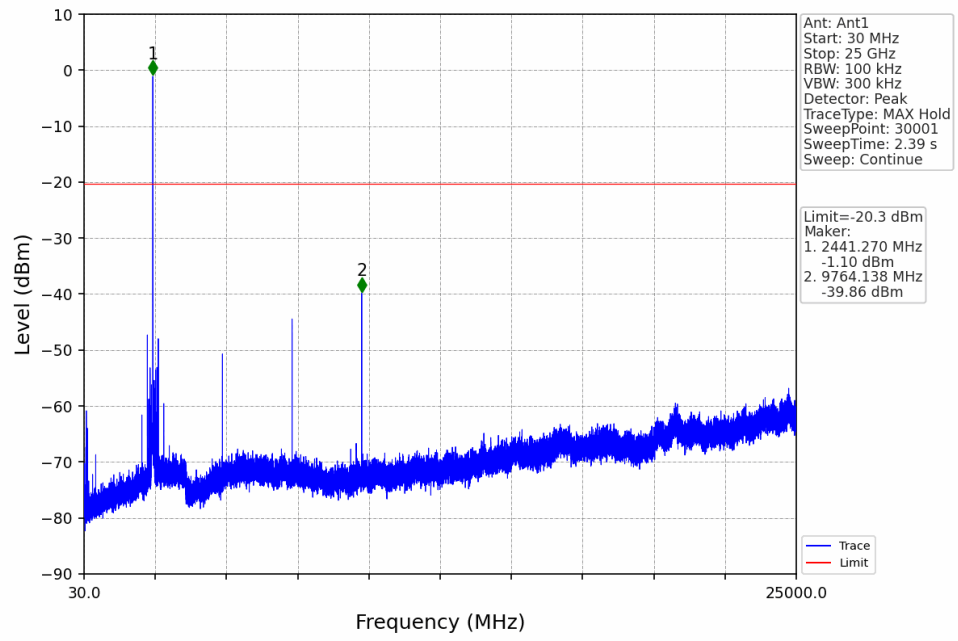


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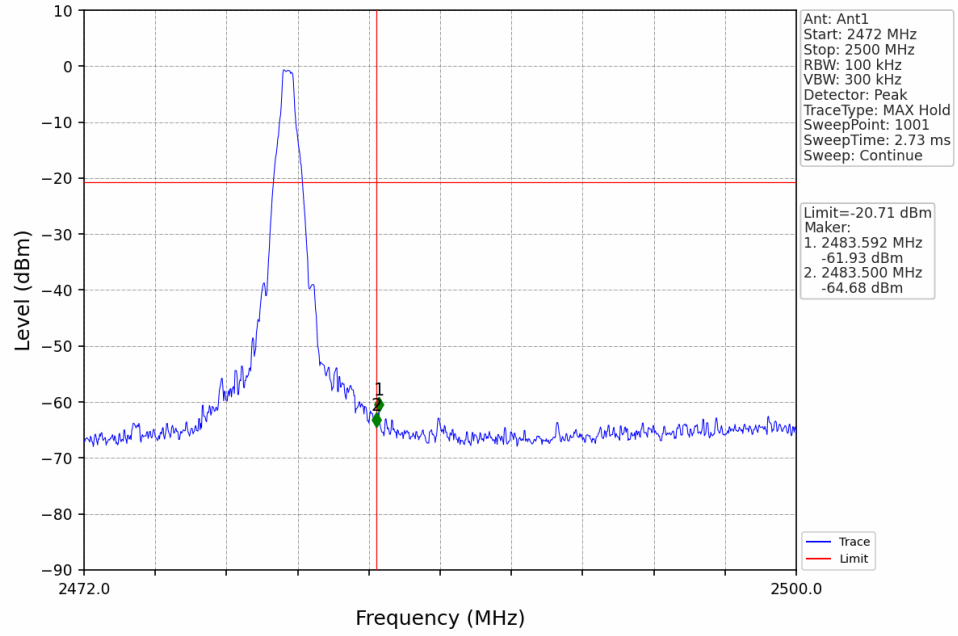

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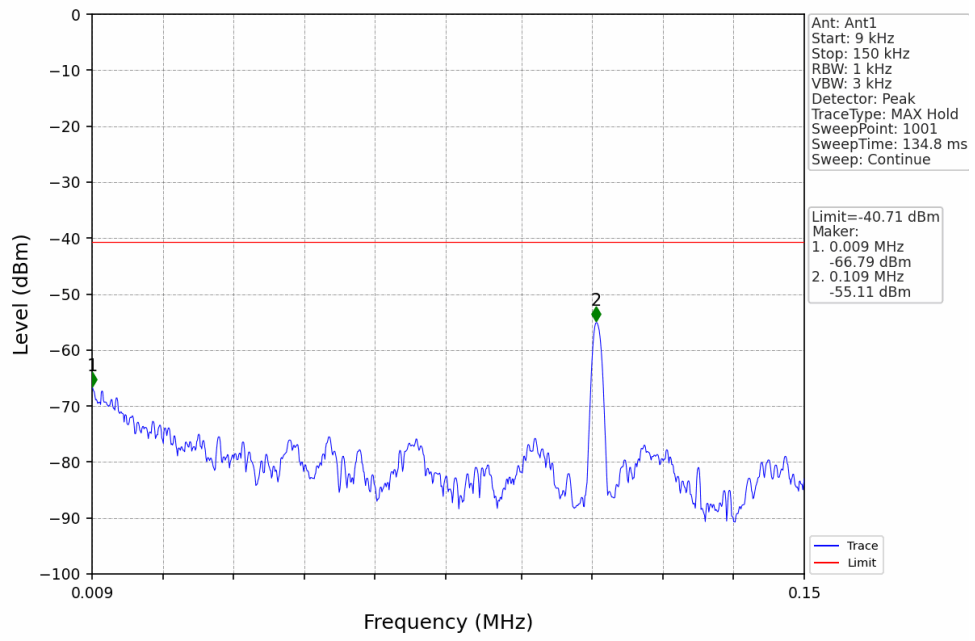


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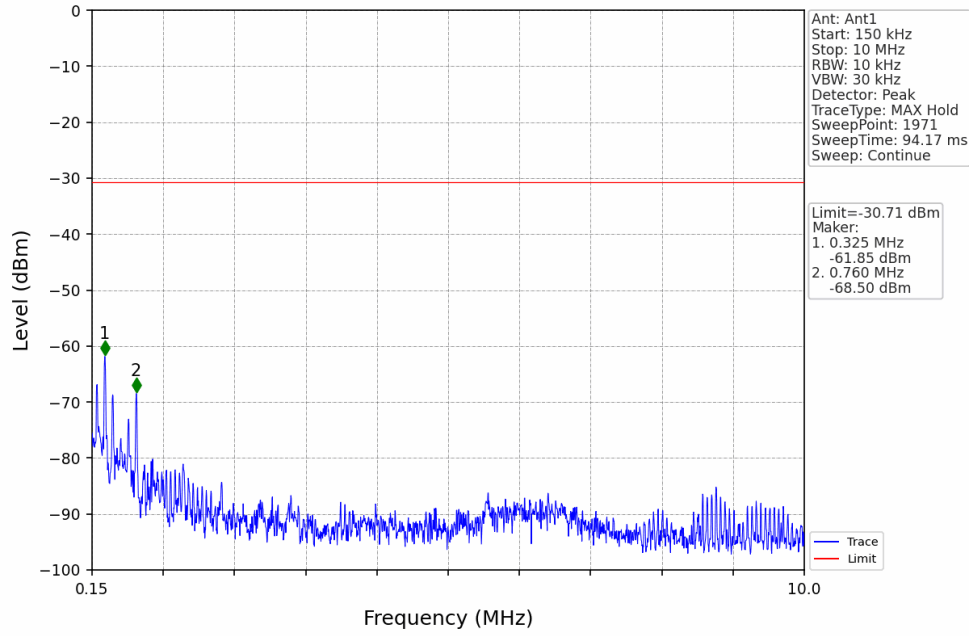

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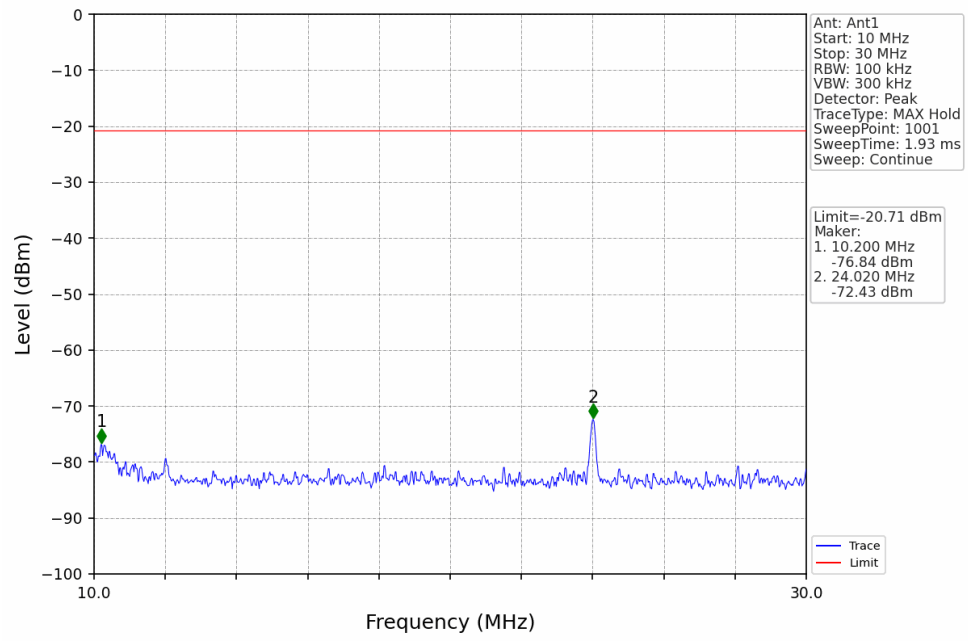


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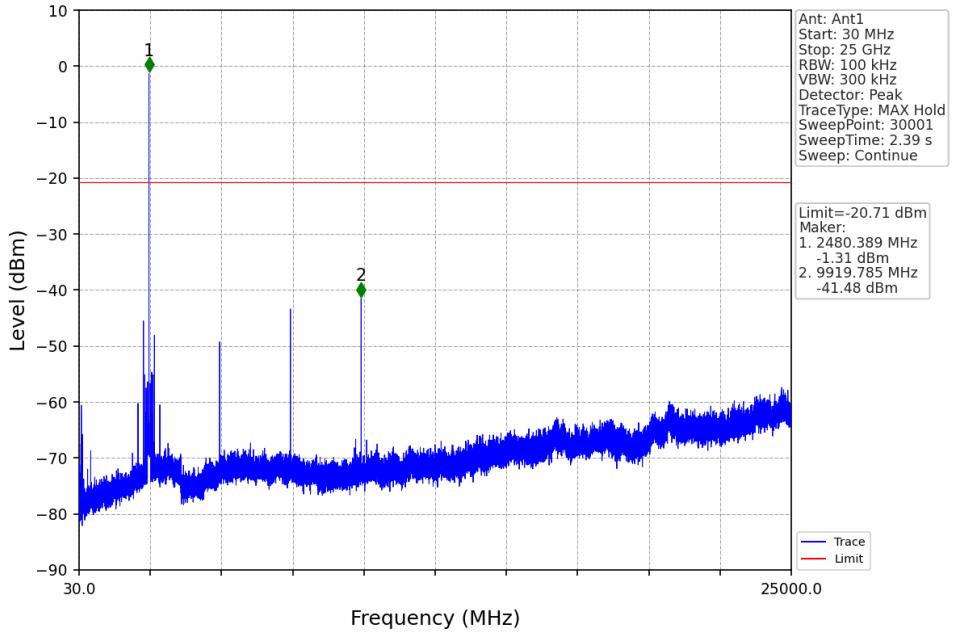

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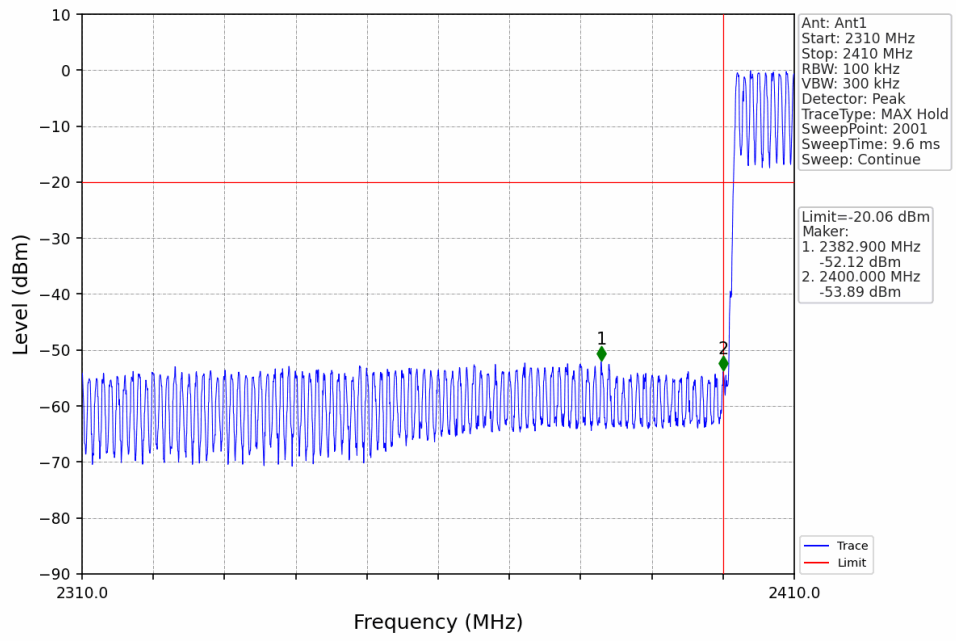


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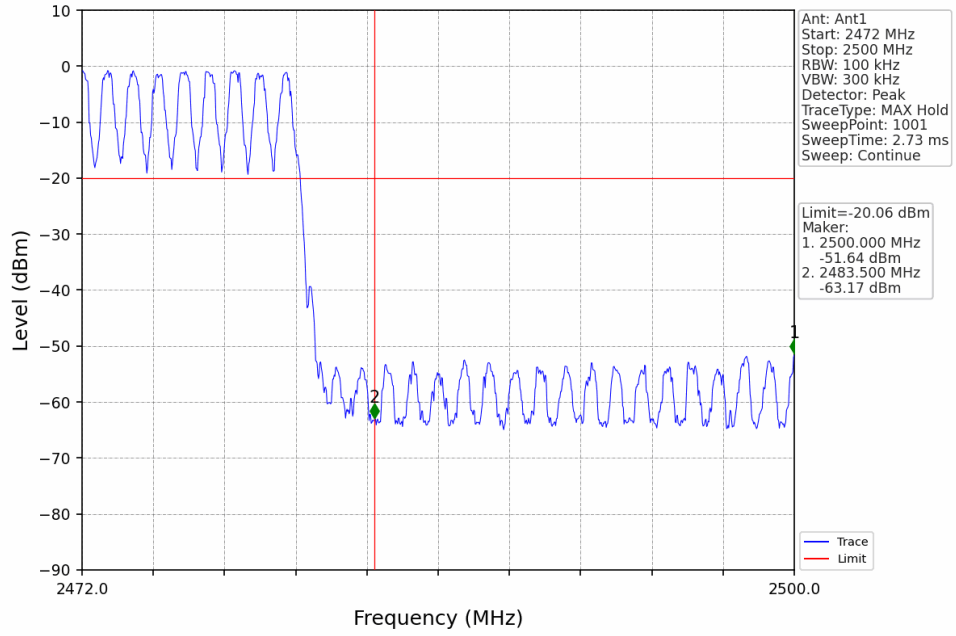

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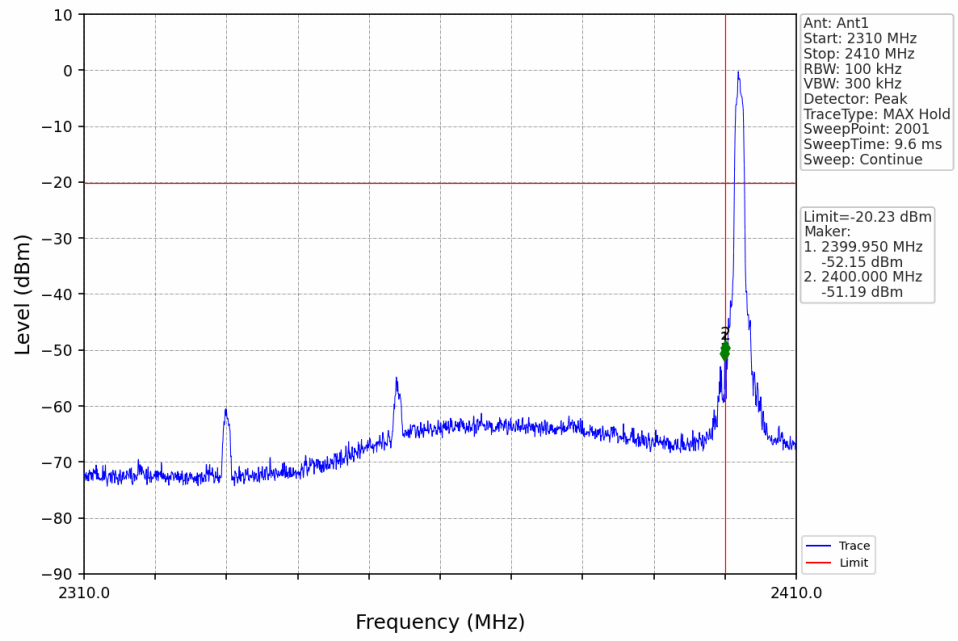


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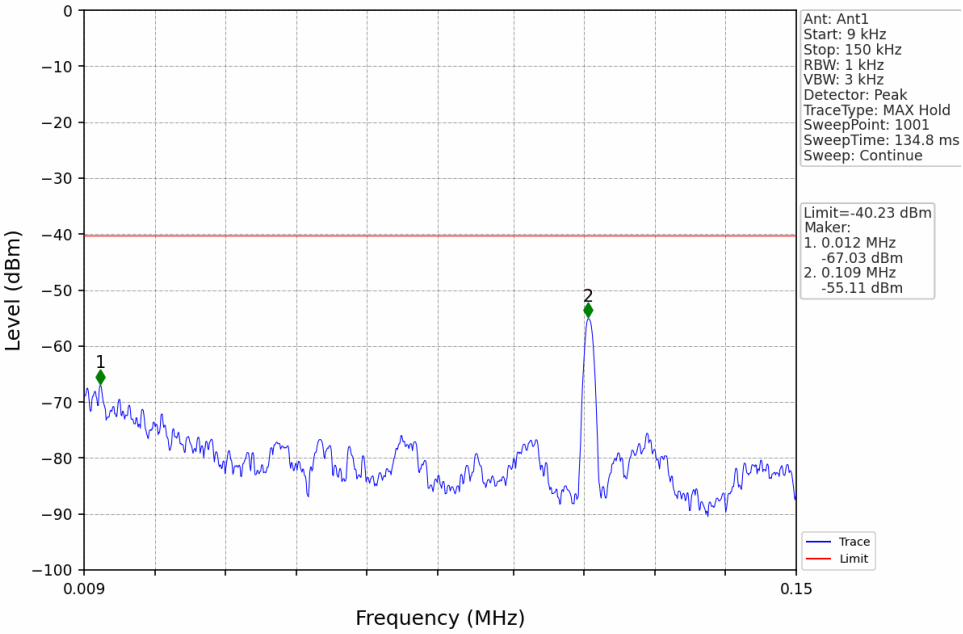

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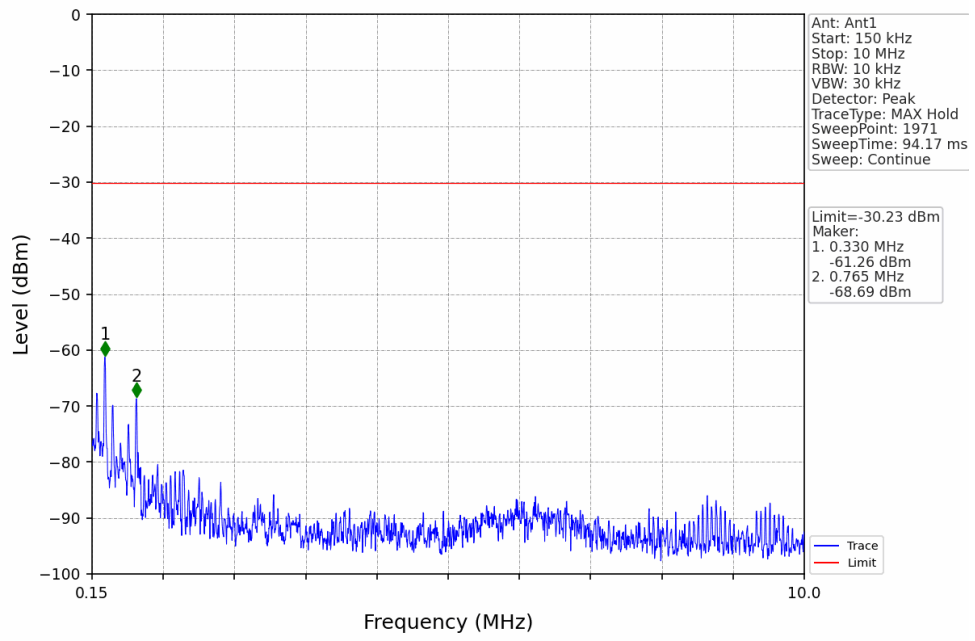


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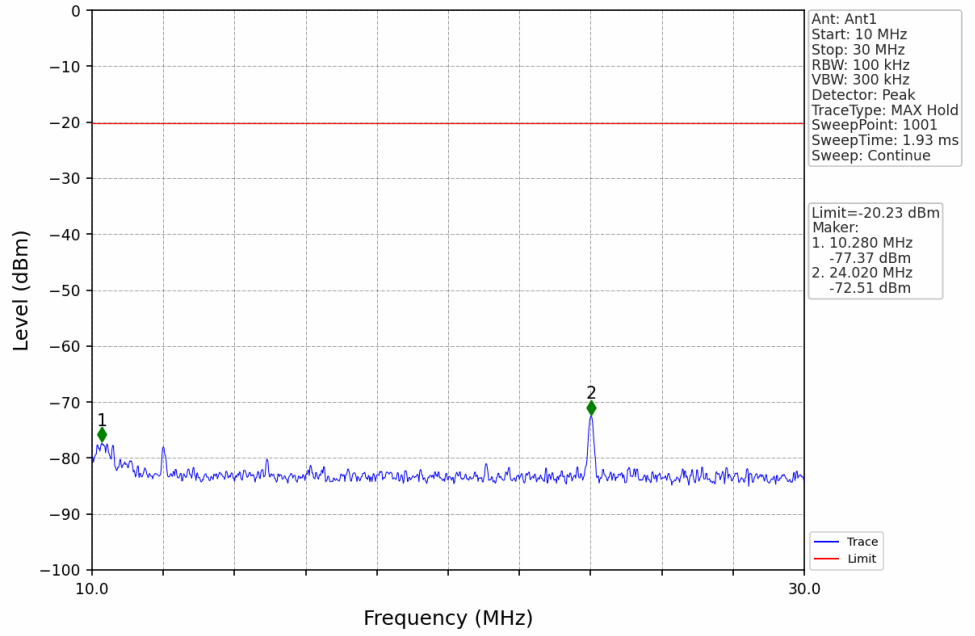

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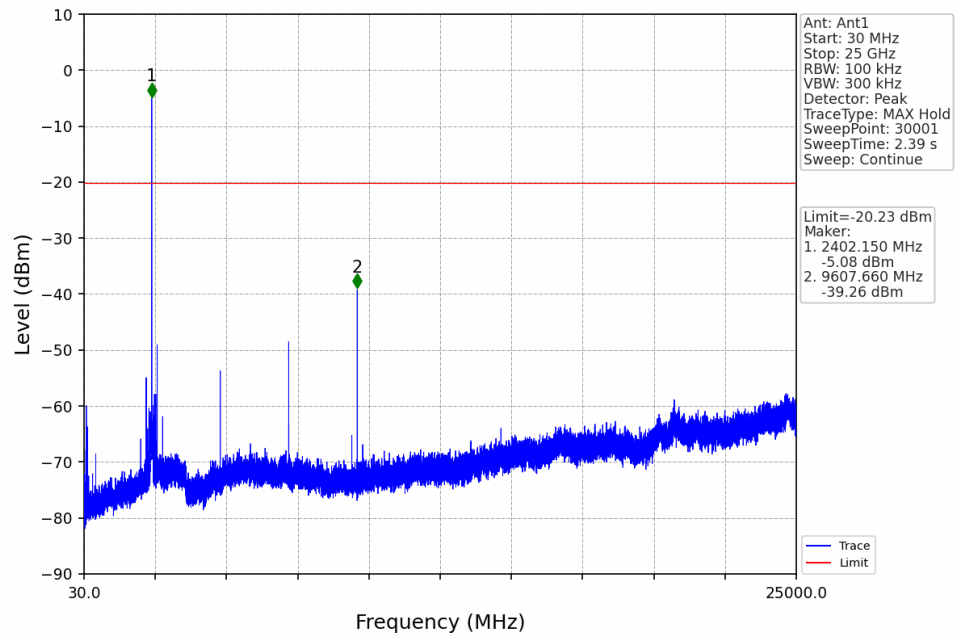


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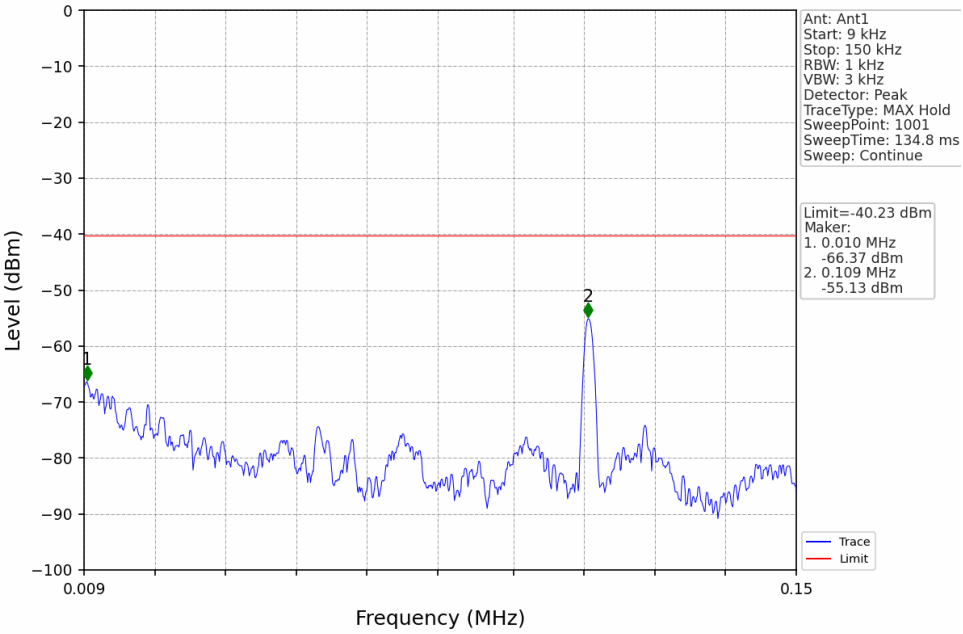

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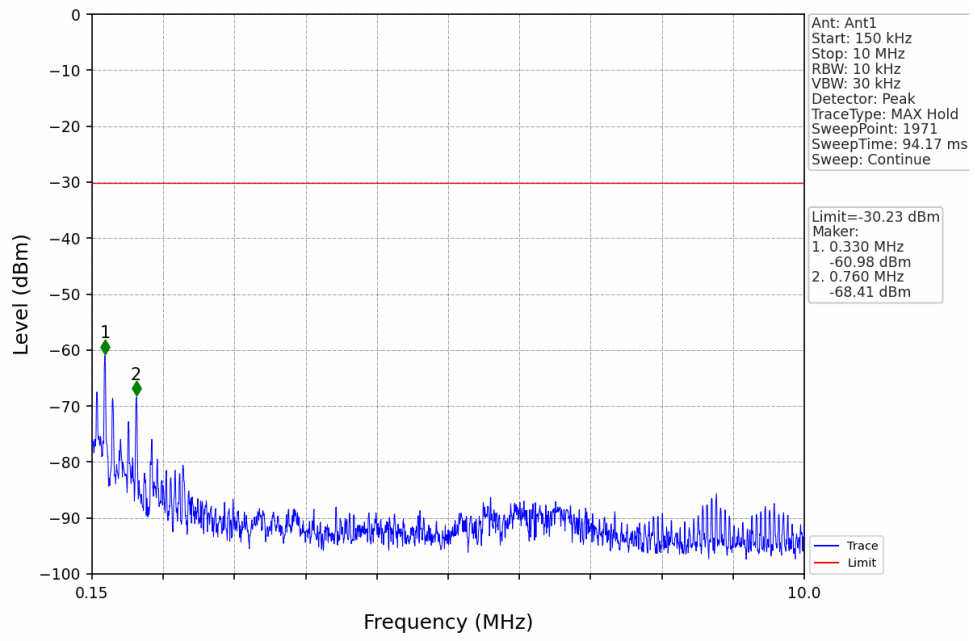


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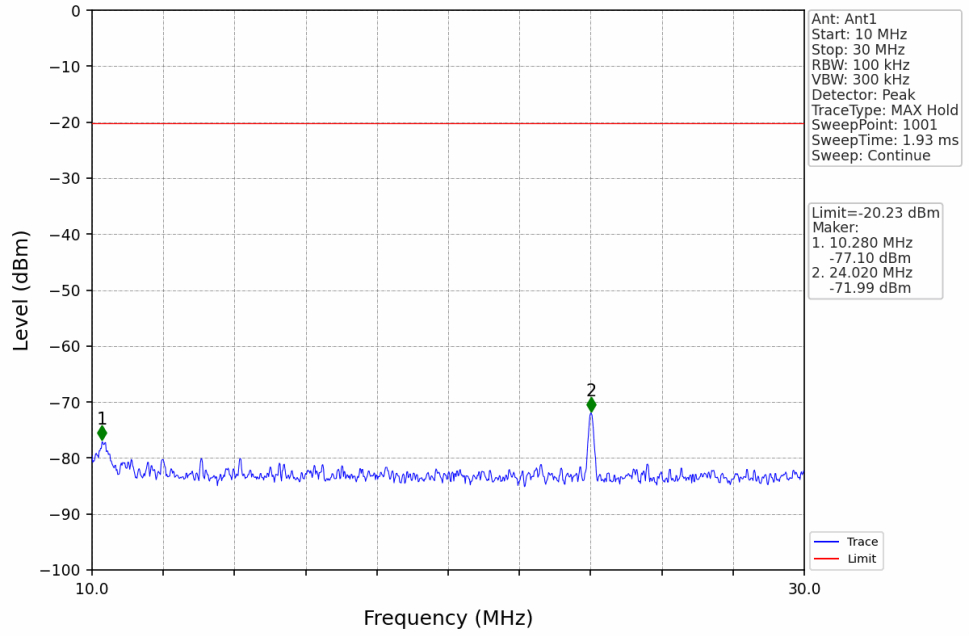

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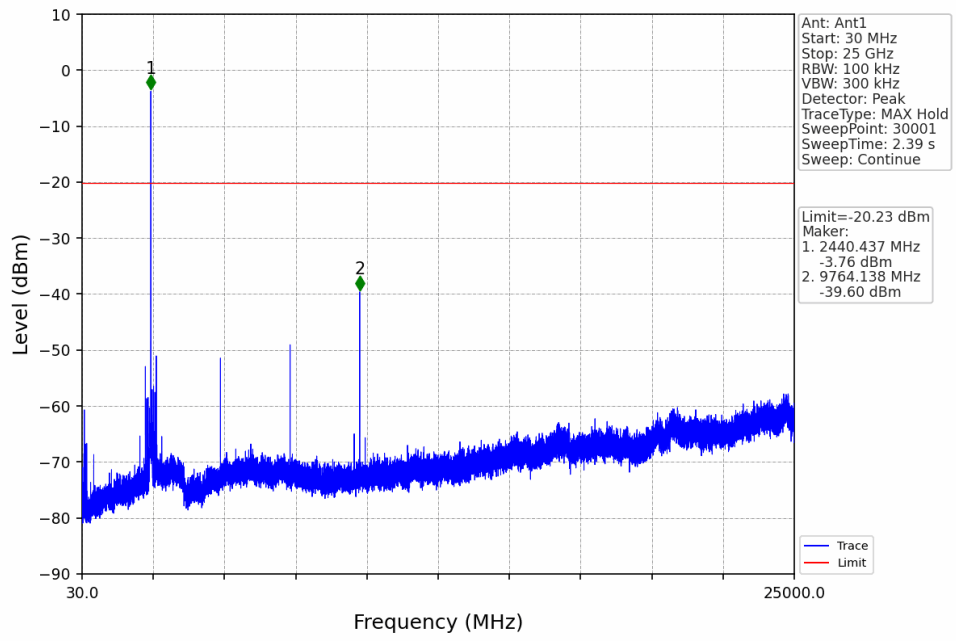


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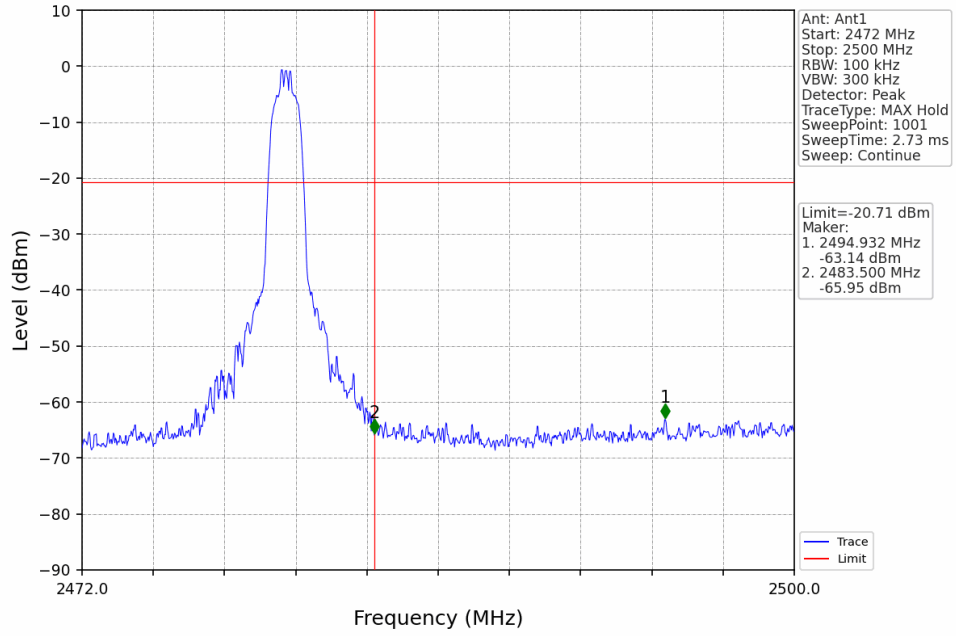

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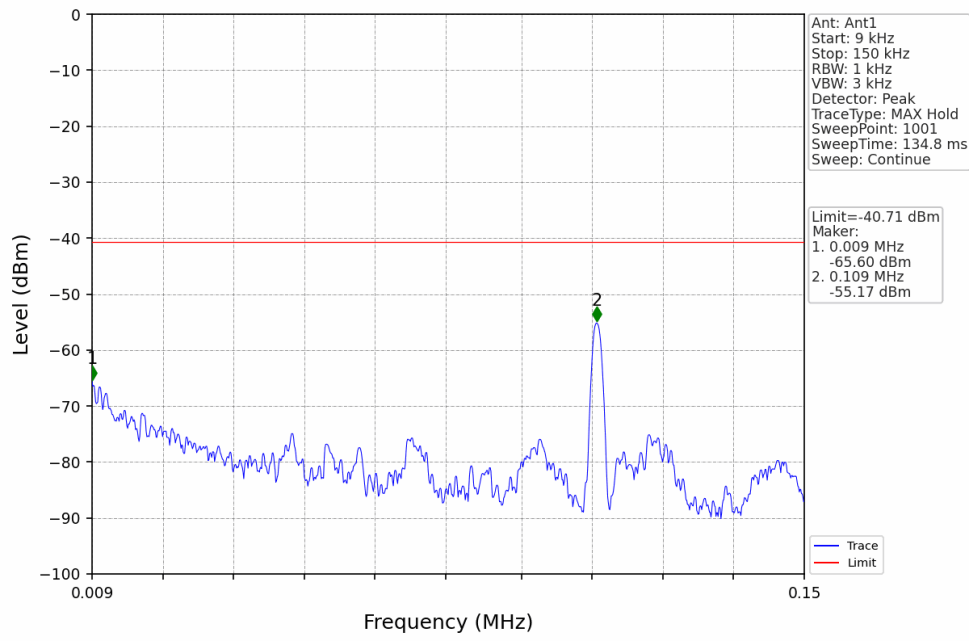


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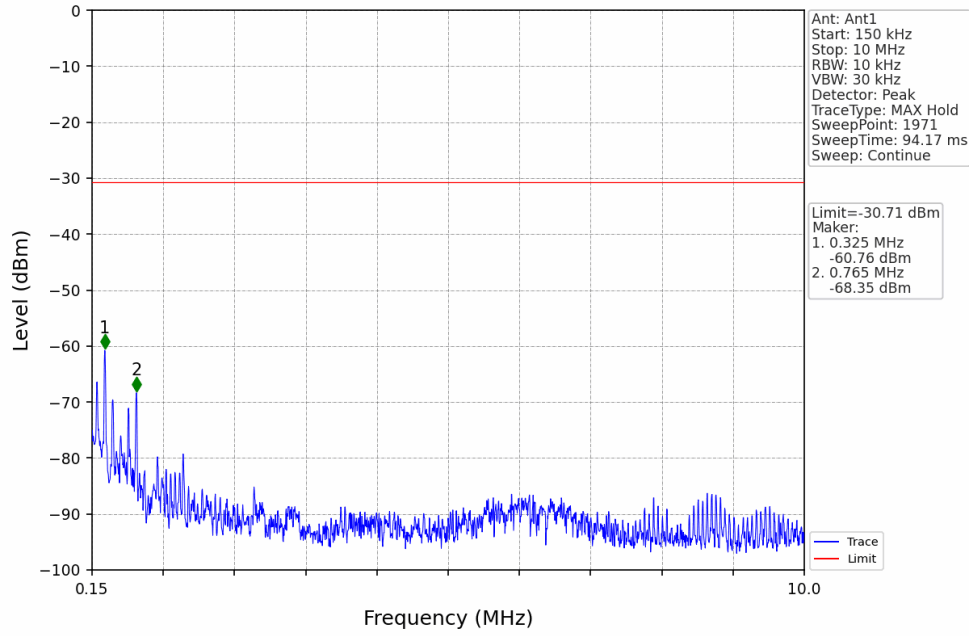

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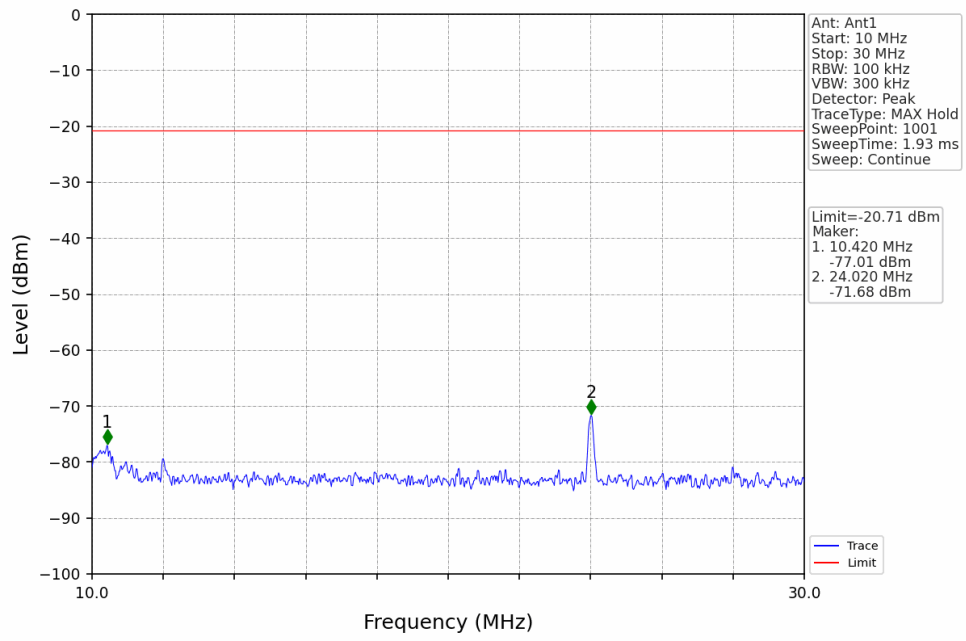


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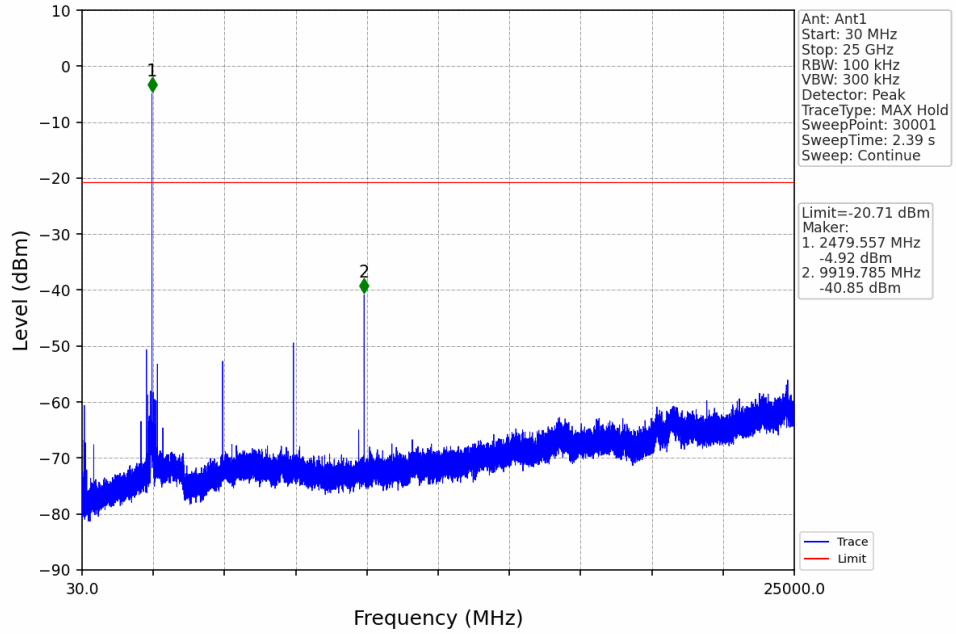

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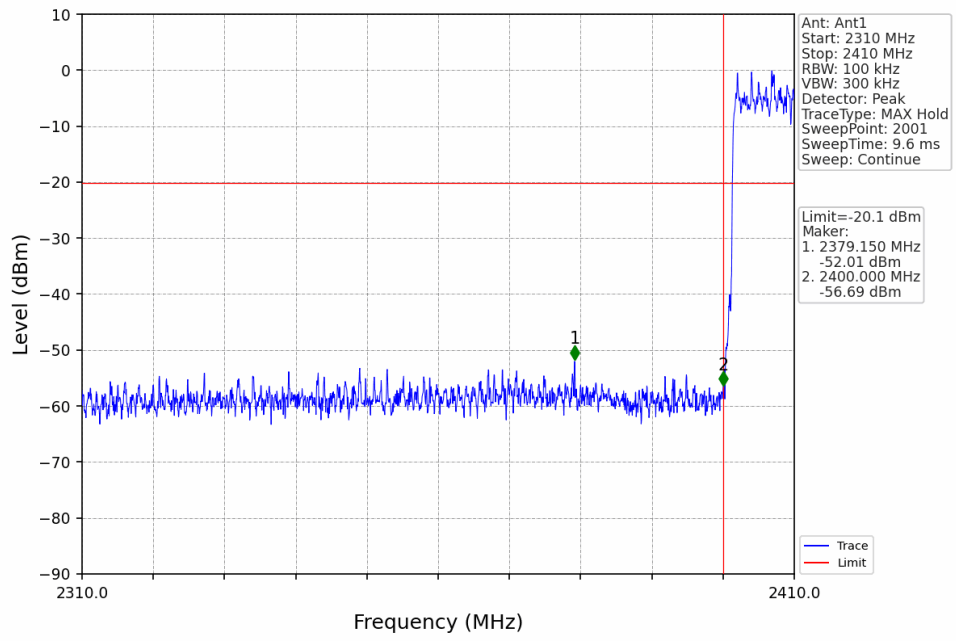


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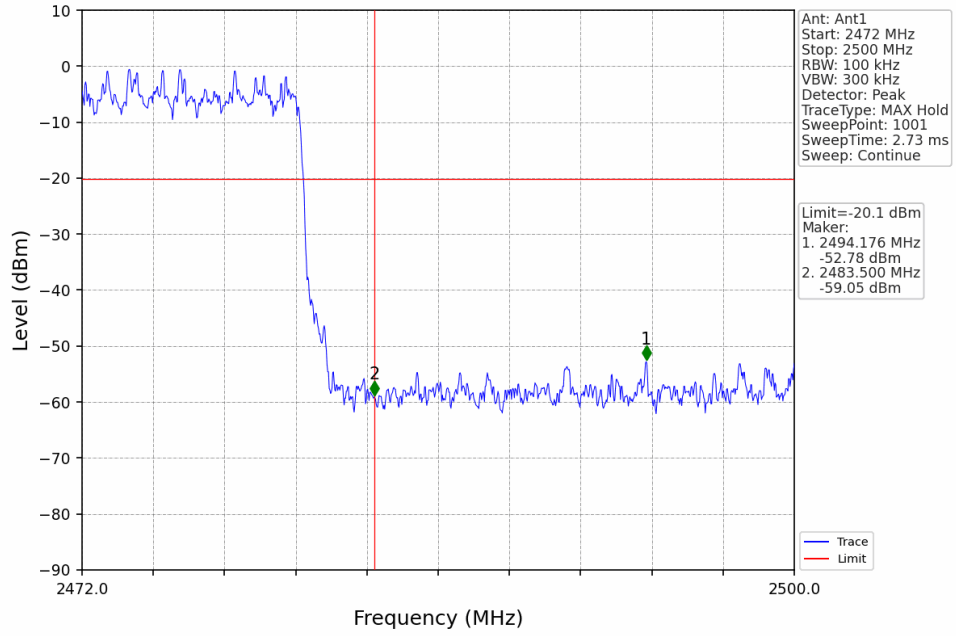

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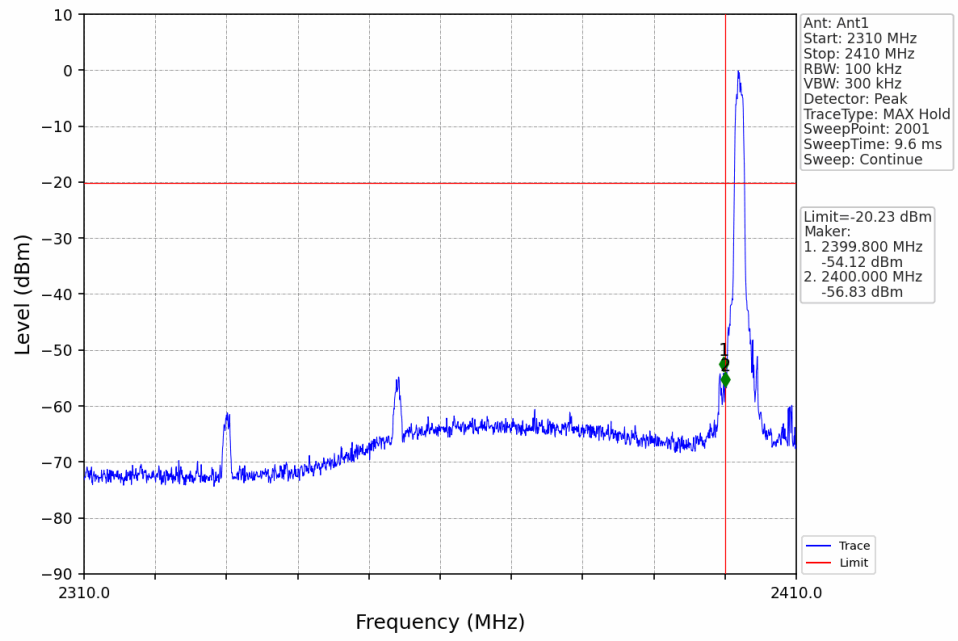


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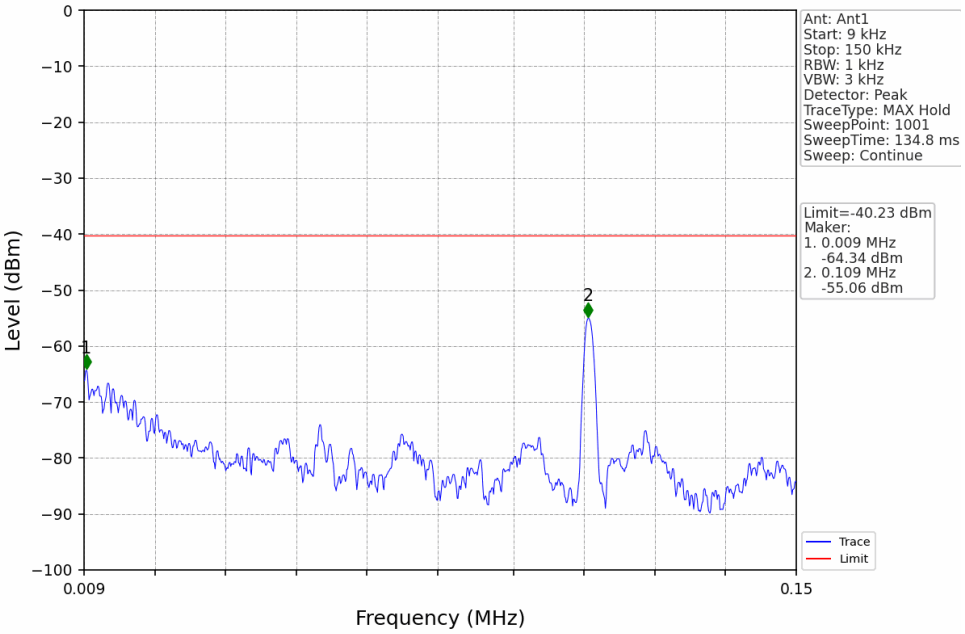

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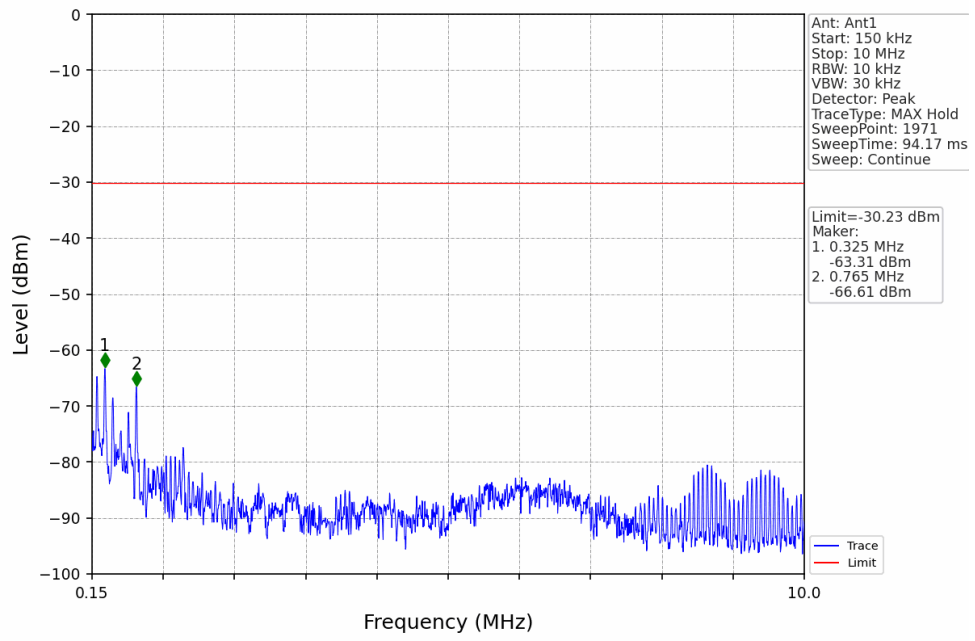


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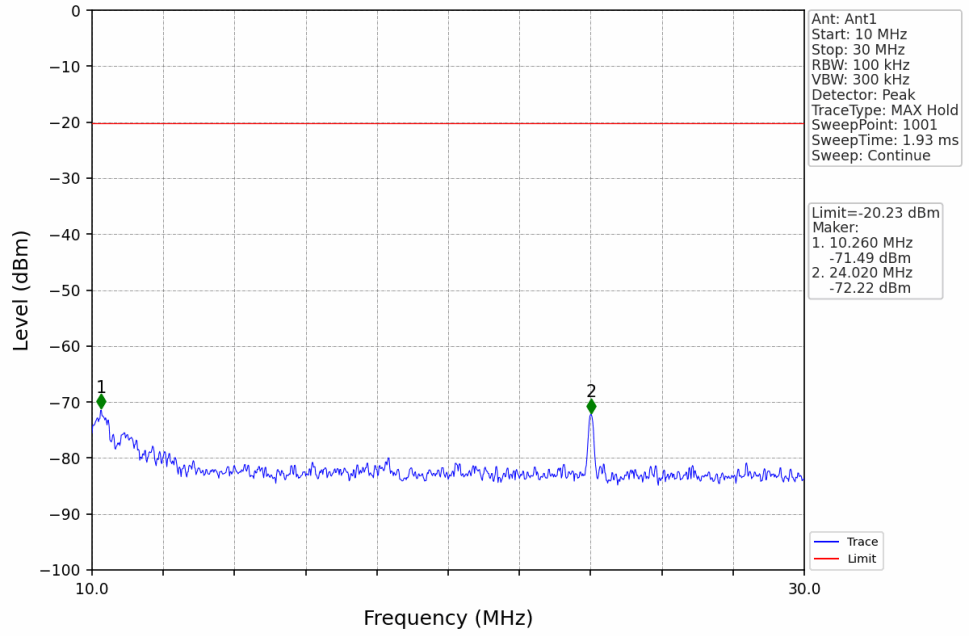

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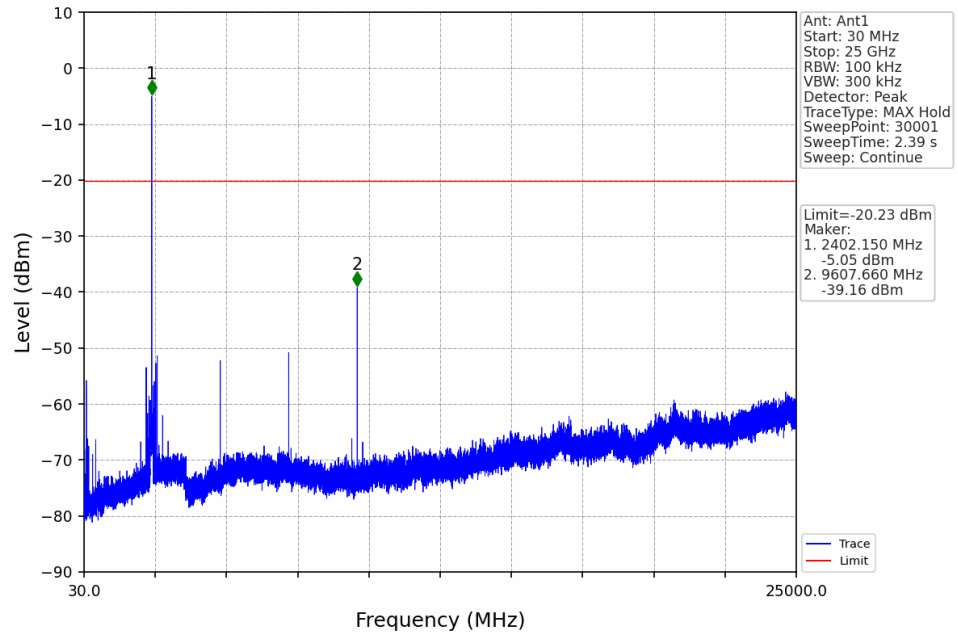


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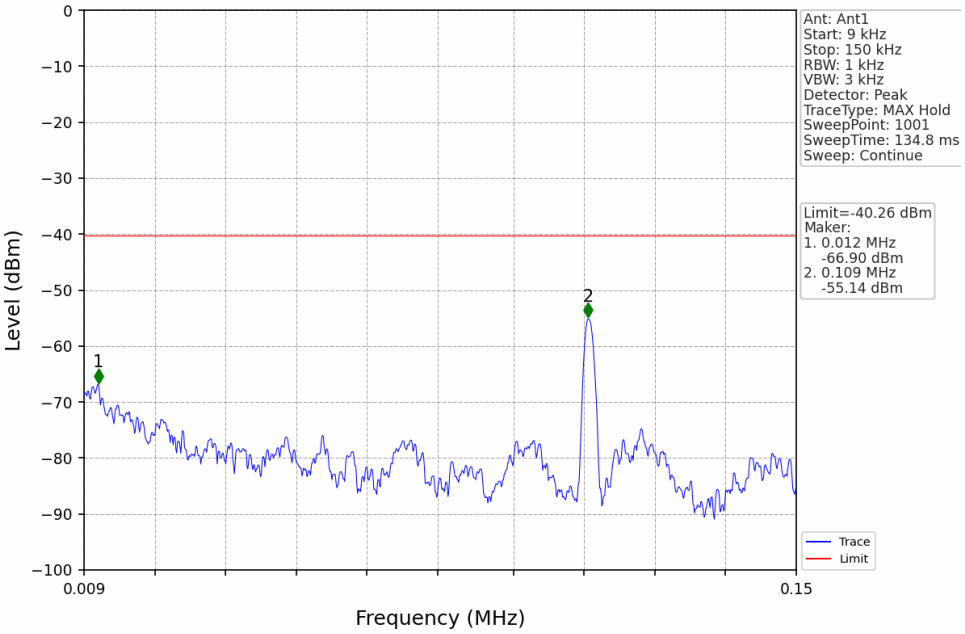

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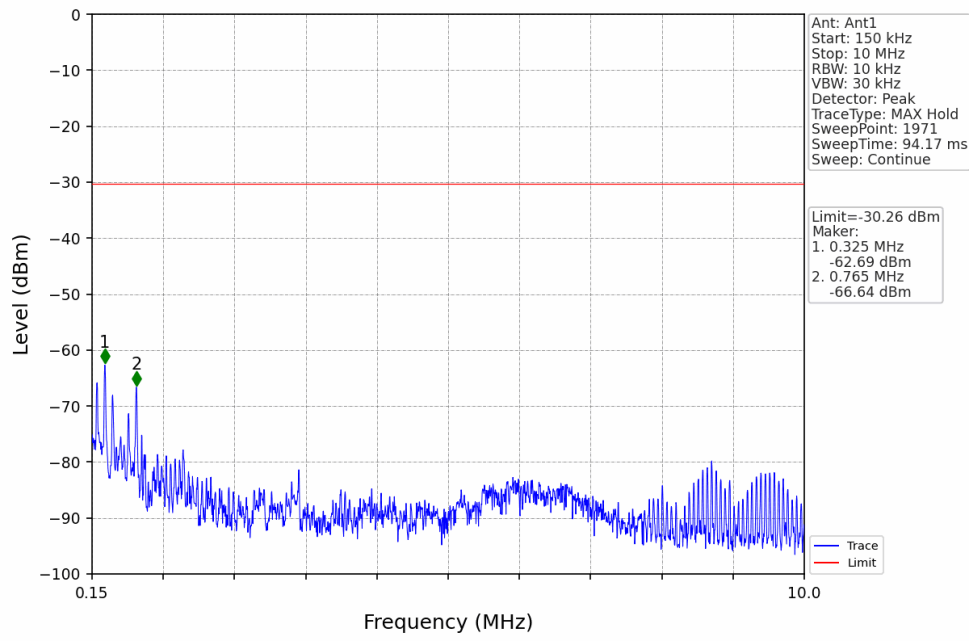


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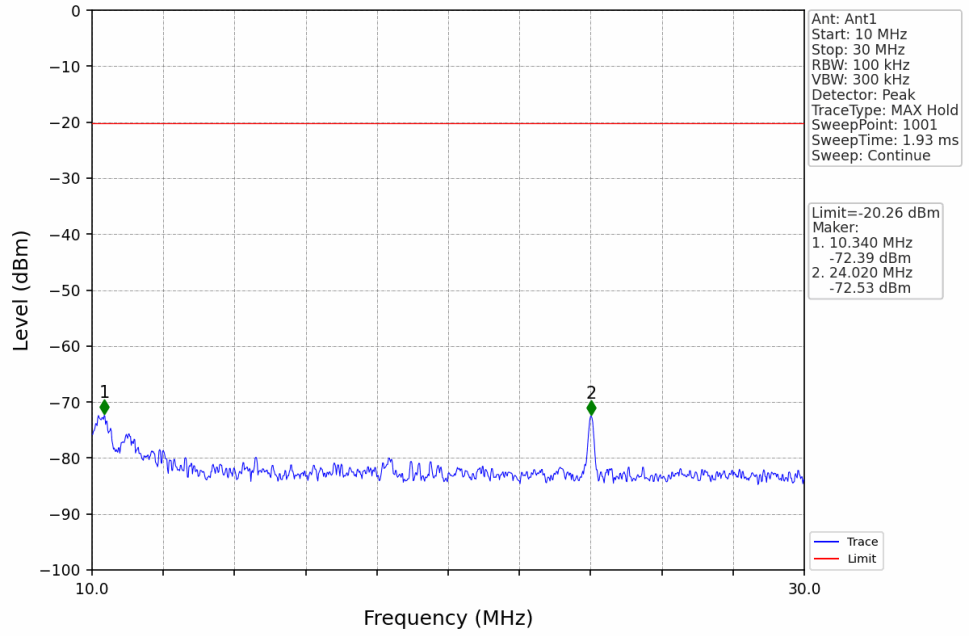

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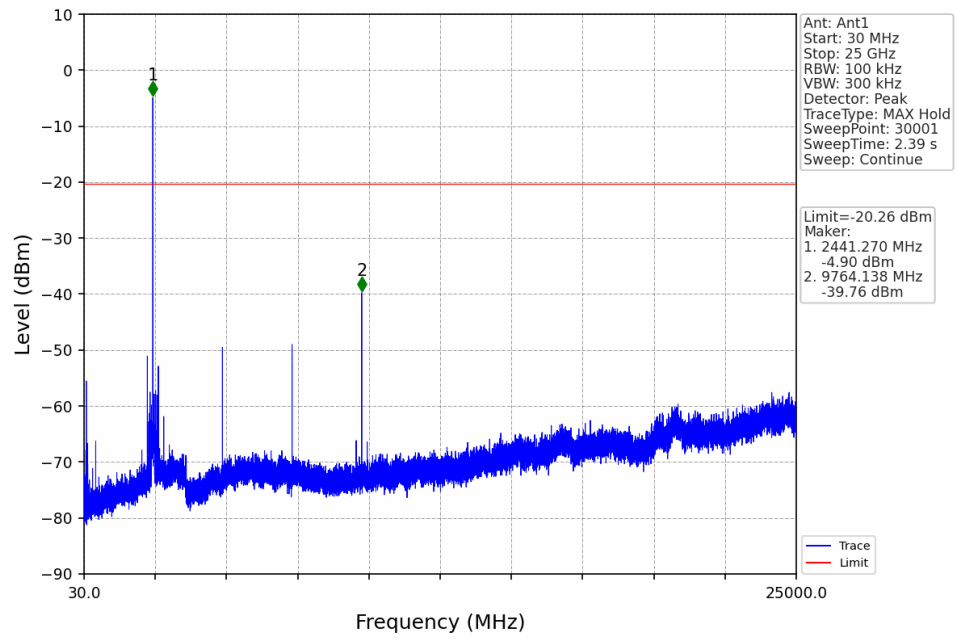


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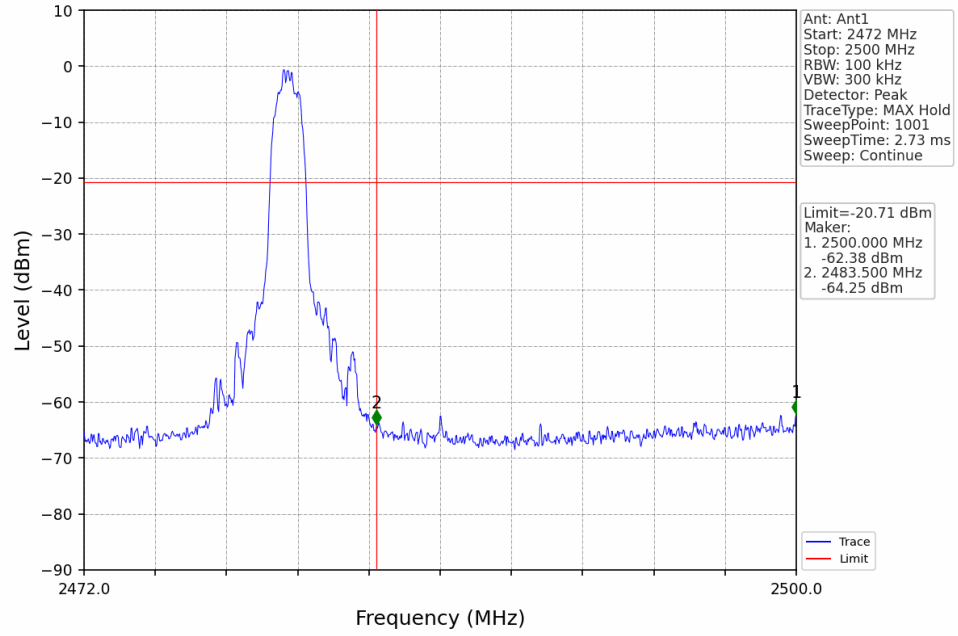

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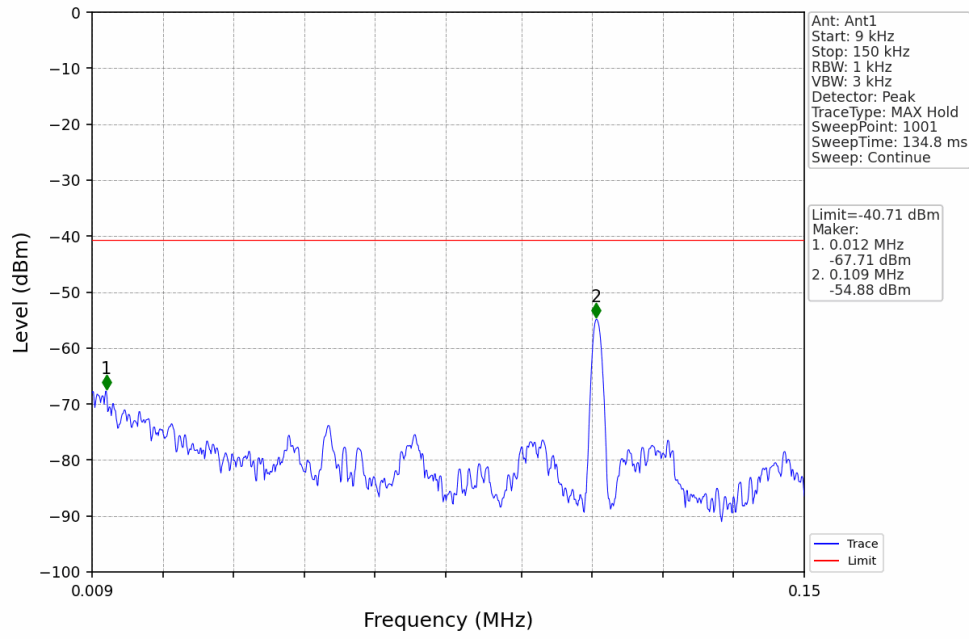


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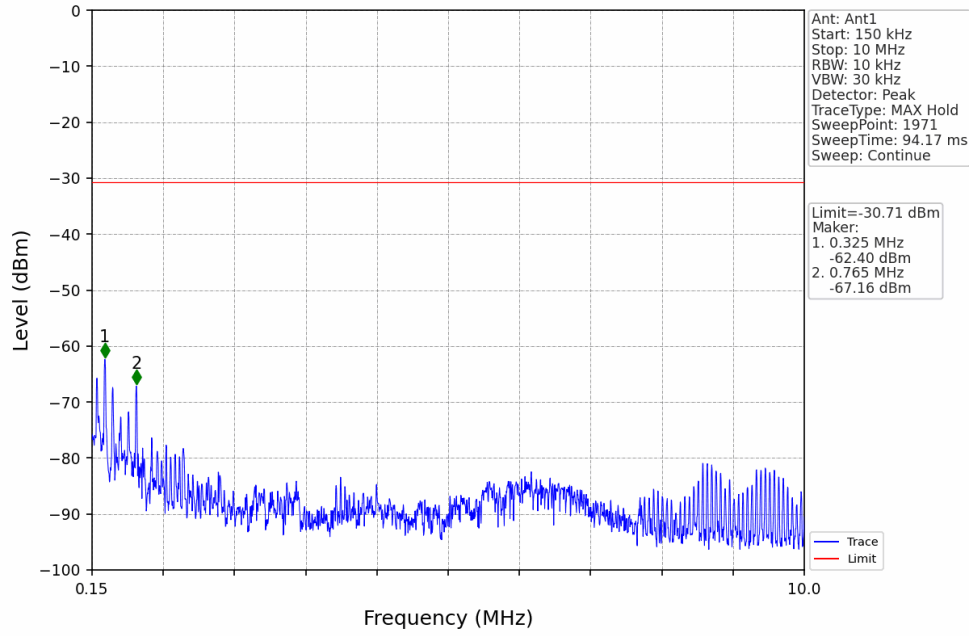

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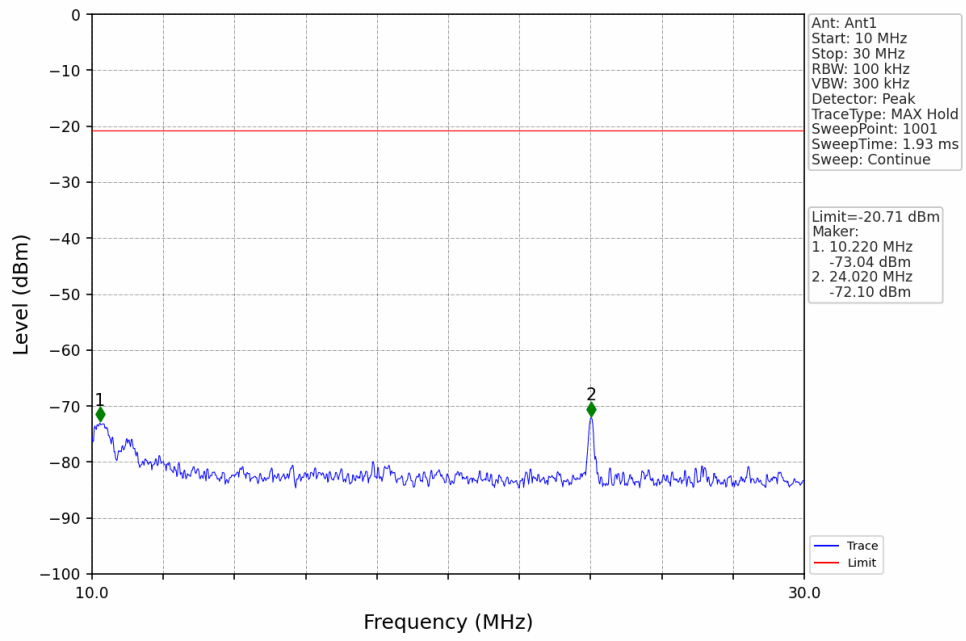


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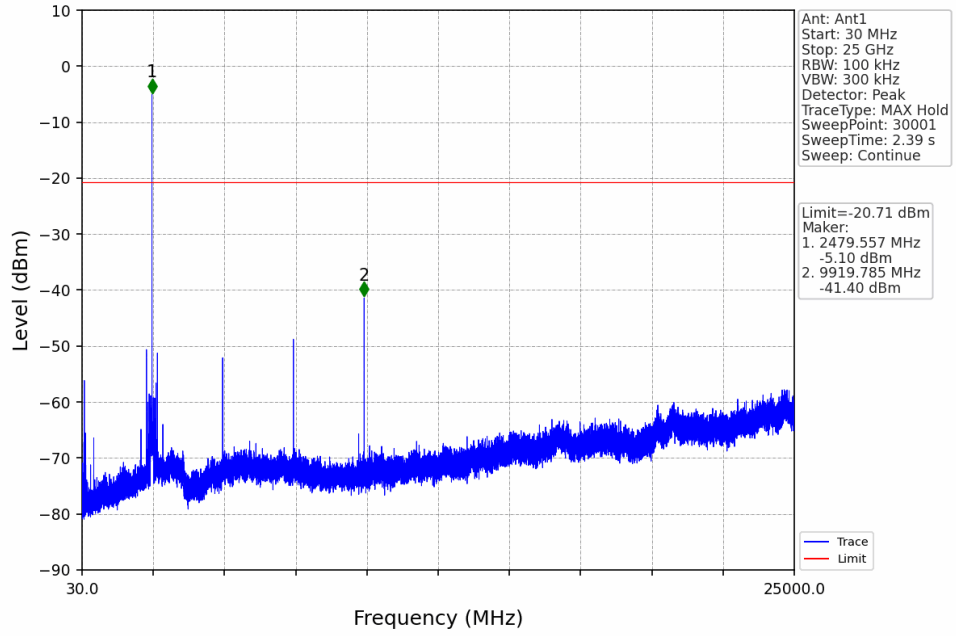

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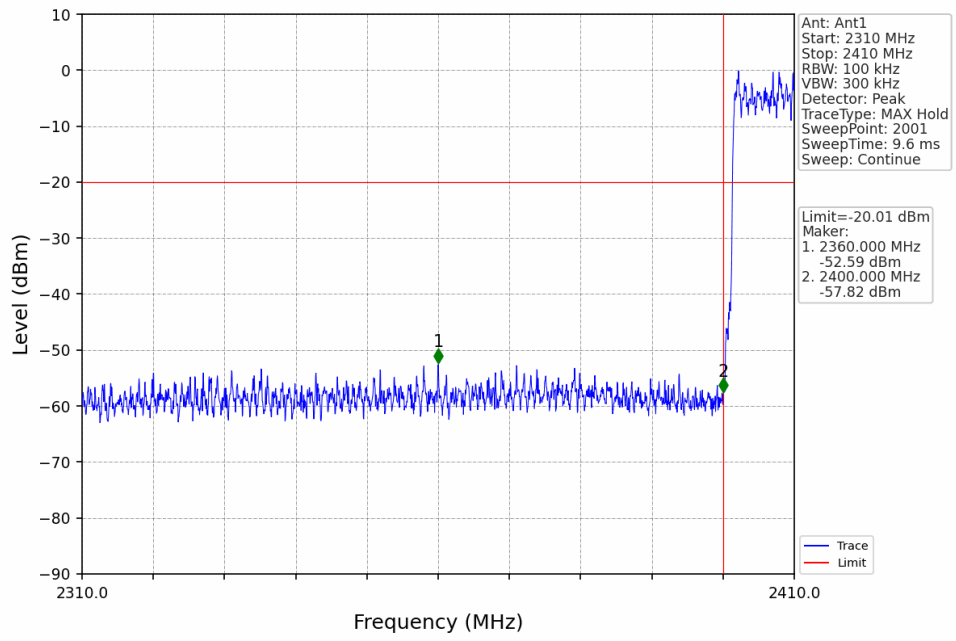


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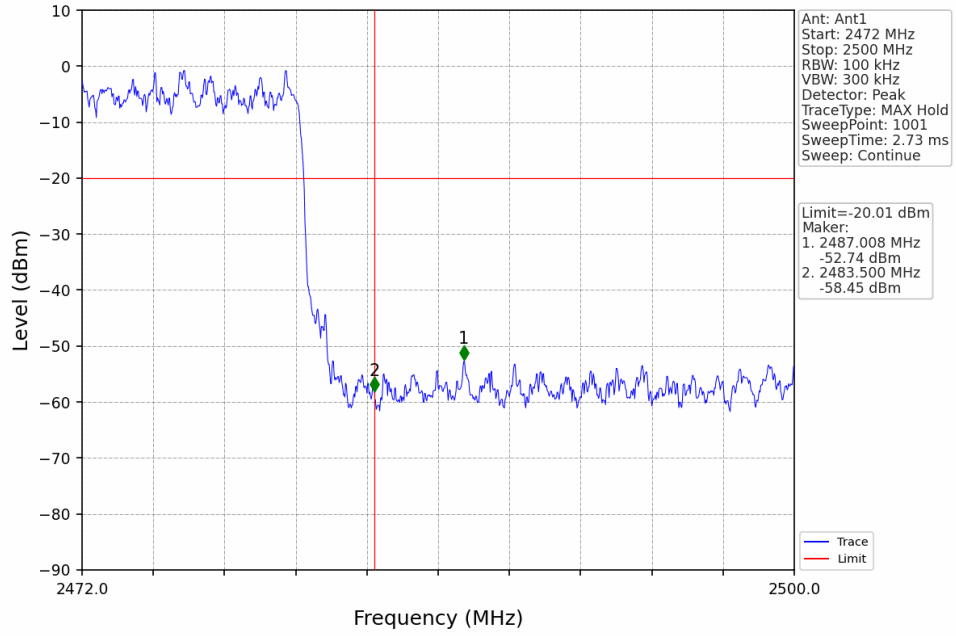


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