

## **Appendix RF Test Data for BT**

**Company:** : Tivo Technologies Pte Ltd

**EUT** : Ghost 75 Mechanical Keyboard

**FCC ID:** : 2BMK5-KG985W

**Model Number** : KG985W

**Report No.** : HTT202511146F03

**Reviewed By** : Heber He

## 1. Duty Cycle

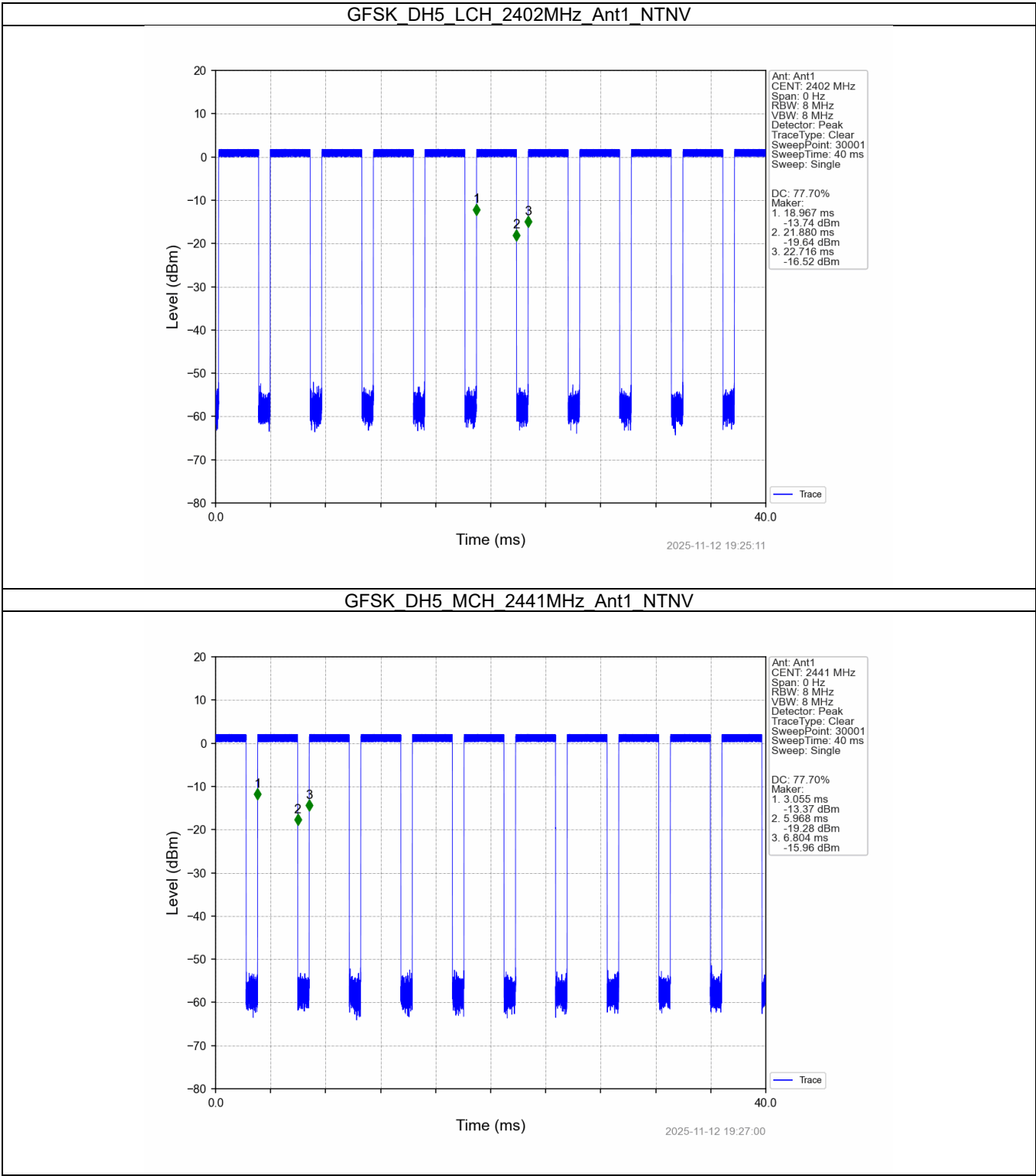
### 1.1 Test Result

#### 1.1.1 Ant1

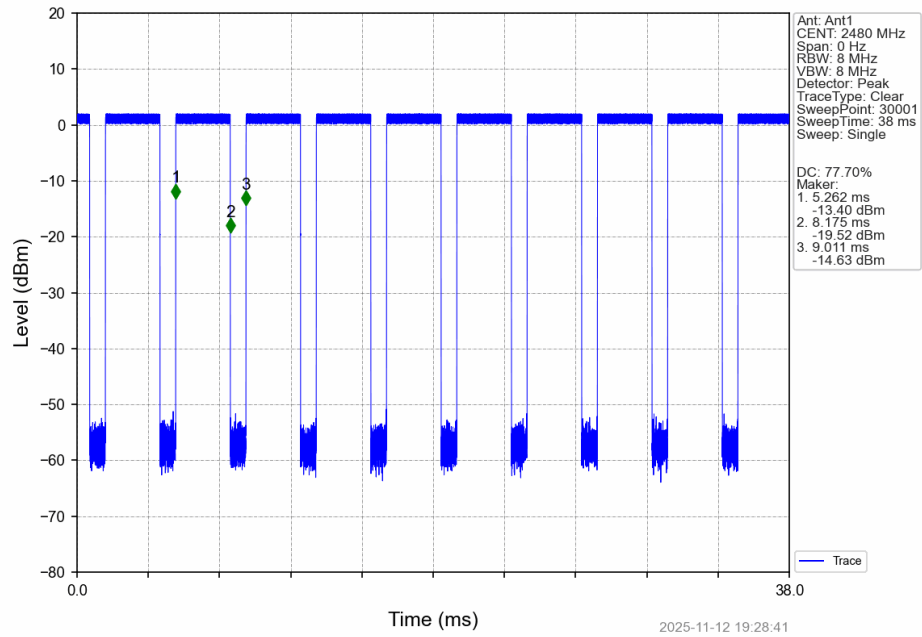
| Ant1      |         |                 |             |           |             |                |                                   |                       |
|-----------|---------|-----------------|-------------|-----------|-------------|----------------|-----------------------------------|-----------------------|
| 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         | 2.913     | 3.749       | 77.70          | 1.10                              | 0.04                  |
|           |         | 2441            | DH5         | 2.913     | 3.749       | 77.70          | 1.10                              | 0.04                  |
|           |         | 2480            | DH5         | 2.913     | 3.749       | 77.70          | 1.10                              | 0.03                  |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 2.920     | 3.750       | 77.87          | 1.09                              | 0.01                  |
|           |         | 2441            | 2DH5        | 2.919     | 3.749       | 77.86          | 1.09                              | 0.01                  |
|           |         | 2480            | 2DH5        | 2.920     | 3.750       | 77.87          | 1.09                              | 0.01                  |
| 8DPSK     | SISO    | 2402            | 3DH5        | 2.923     | 3.750       | 77.95          | 1.08                              | 0.03                  |
|           |         | 2441            | 3DH5        | 2.924     | 3.751       | 77.95          | 1.08                              | 0.03                  |
|           |         | 2480            | 3DH5        | 2.924     | 3.751       | 77.95          | 1.08                              | 0.03                  |

# 1.2 Test Graph

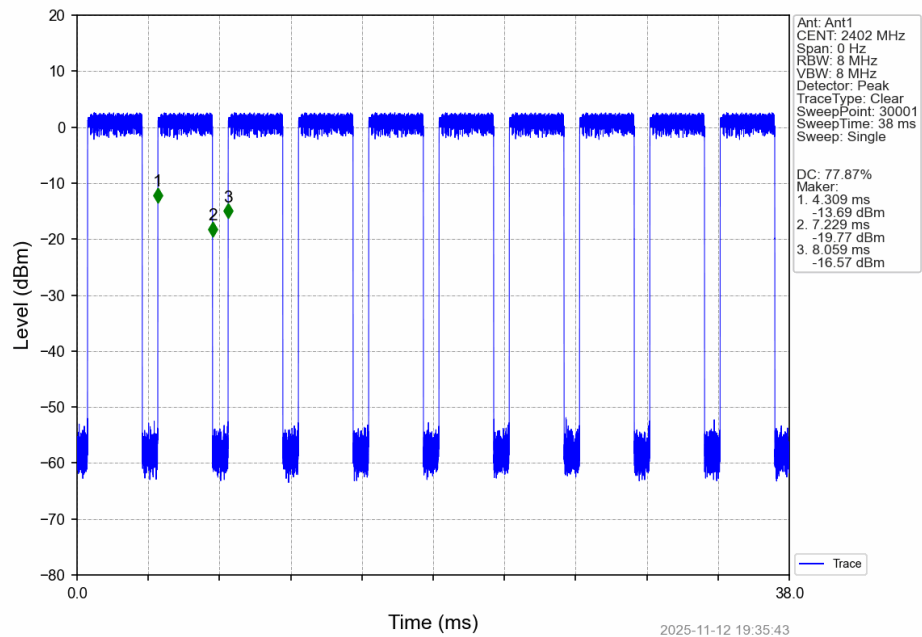
## 1.2.1 Ant1



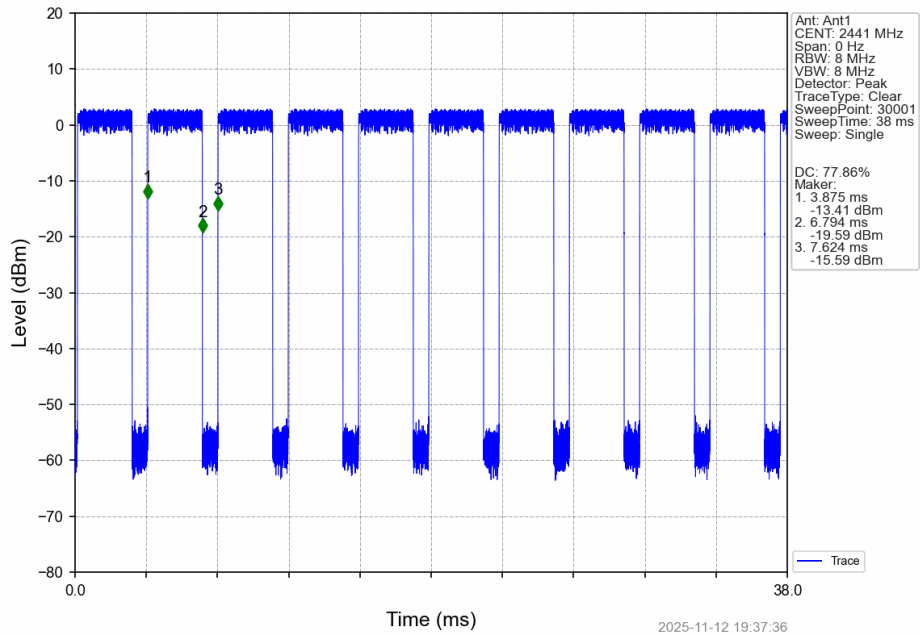
# GFSK DH5\_HCH\_2480MHz\_Ant1\_NTNV



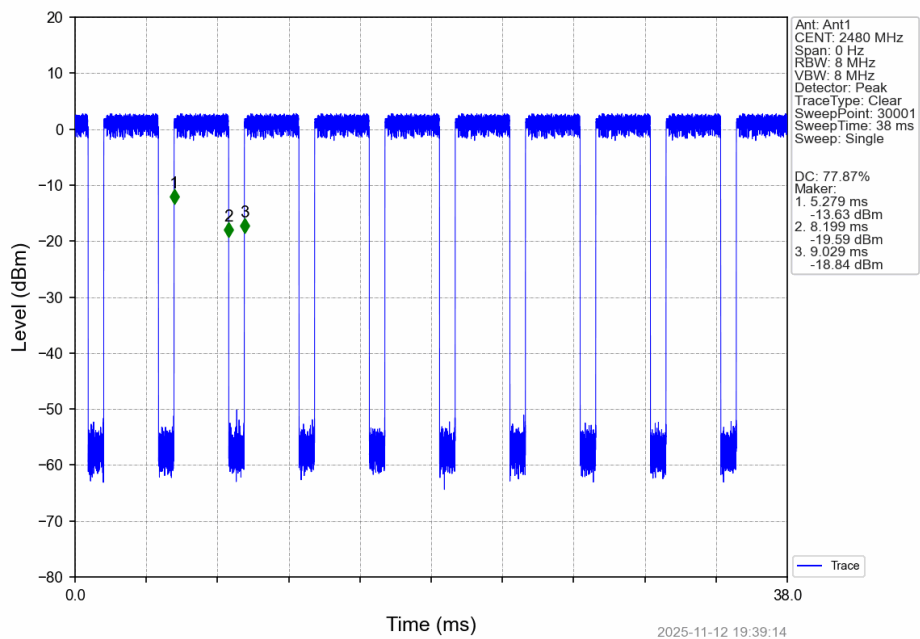
# Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



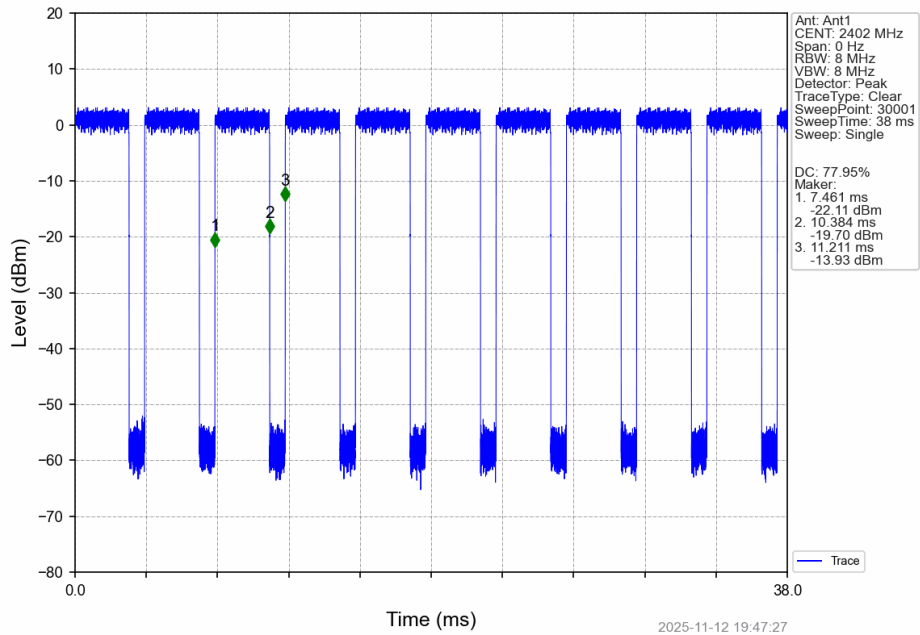
# Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



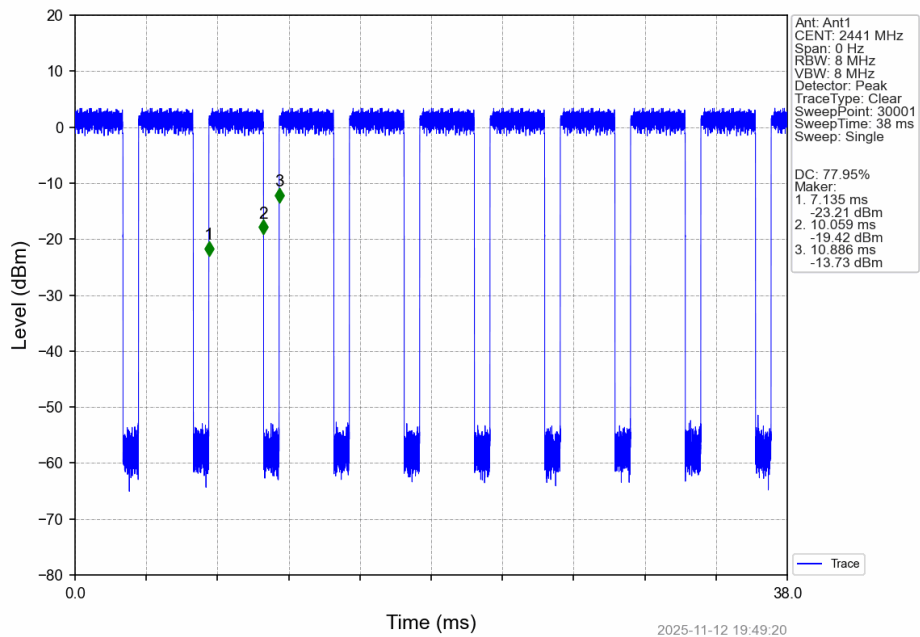
# Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



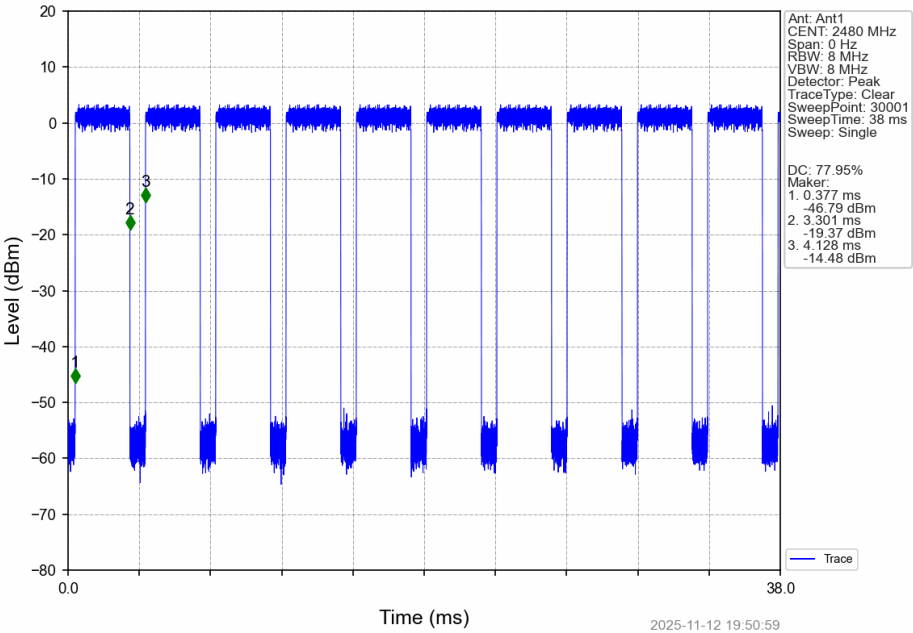
# 8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



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



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



## 2. Bandwidth

### 2.1 Test Result

#### 2.1.1 OBW

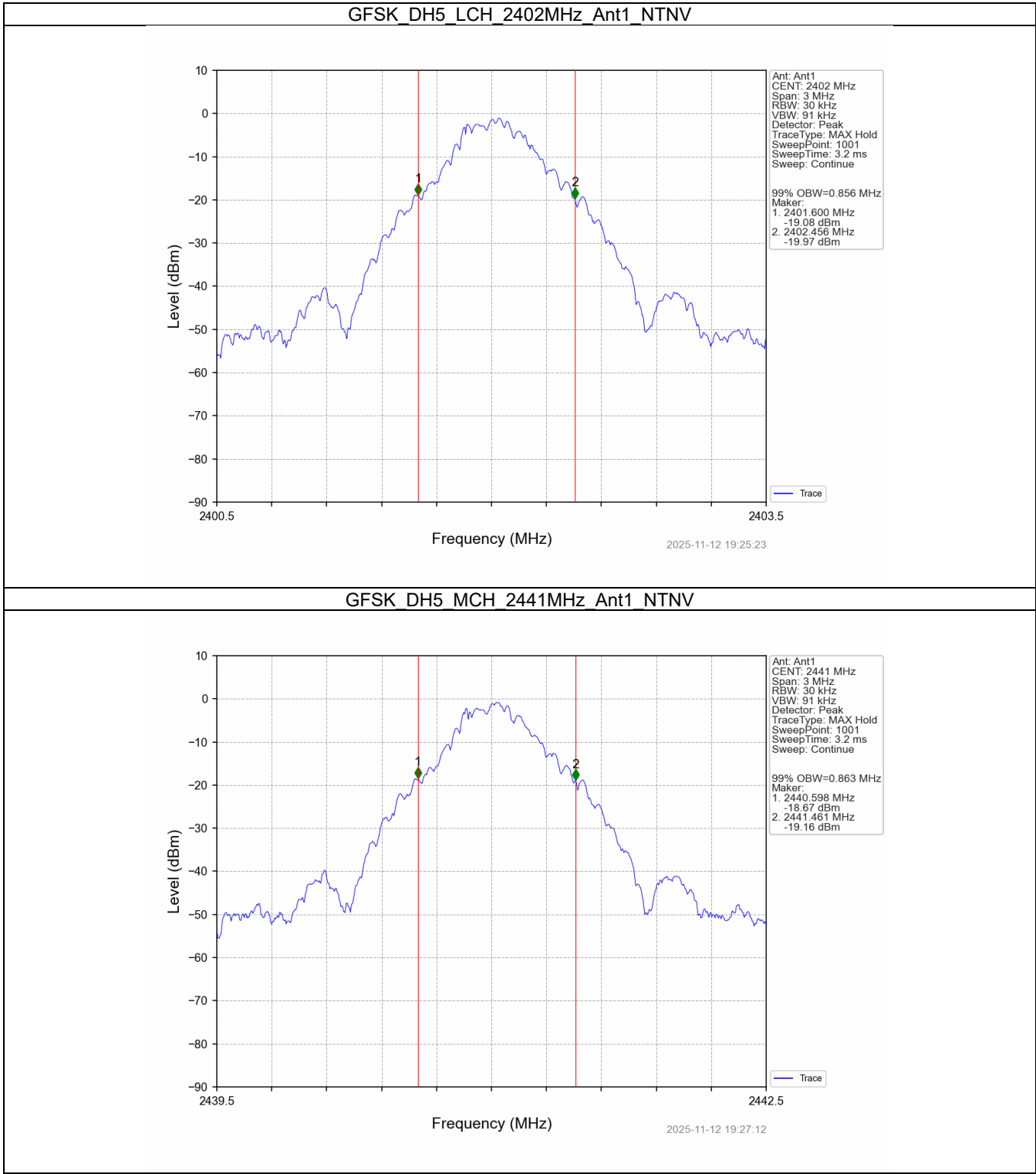
| Mode      | TX Type | Frequency (MHz) | Packet Type | ANT | 99% Occupied Bandwidth (MHz) |       | Verdict |
|-----------|---------|-----------------|-------------|-----|------------------------------|-------|---------|
|           |         |                 |             |     | Result                       | Limit |         |
| GFSK      | SISO    | 2402            | DH5         | 1   | 0.856                        | /     | Pass    |
|           |         | 2441            | DH5         | 1   | 0.863                        | /     | Pass    |
|           |         | 2480            | DH5         | 1   | 0.855                        | /     | Pass    |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 1   | 1.161                        | /     | Pass    |
|           |         | 2441            | 2DH5        | 1   | 1.160                        | /     | Pass    |
|           |         | 2480            | 2DH5        | 1   | 1.164                        | /     | Pass    |
| 8DPSK     | SISO    | 2402            | 3DH5        | 1   | 1.179                        | /     | Pass    |
|           |         | 2441            | 3DH5        | 1   | 1.182                        | /     | Pass    |
|           |         | 2480            | 3DH5        | 1   | 1.179                        | /     | Pass    |

#### 2.1.2 20dB BW

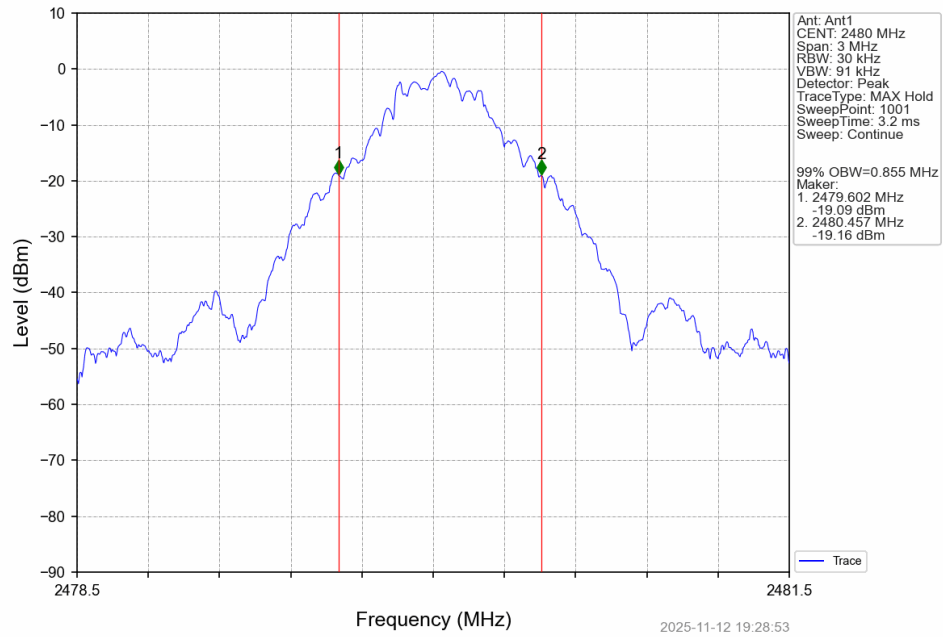
| Mode      | TX Type | Frequency (MHz) | Packet Type | ANT | 20dB Bandwidth (MHz) |       | Verdict |
|-----------|---------|-----------------|-------------|-----|----------------------|-------|---------|
|           |         |                 |             |     | Result               | Limit |         |
| GFSK      | SISO    | 2402            | DH5         | 1   | 0.945                | /     | Pass    |
|           |         | 2441            | DH5         | 1   | 0.953                | /     | Pass    |
|           |         | 2480            | DH5         | 1   | 0.949                | /     | Pass    |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 1   | 1.275                | /     | Pass    |
|           |         | 2441            | 2DH5        | 1   | 1.263                | /     | Pass    |
|           |         | 2480            | 2DH5        | 1   | 1.264                | /     | Pass    |
| 8DPSK     | SISO    | 2402            | 3DH5        | 1   | 1.279                | /     | Pass    |
|           |         | 2441            | 3DH5        | 1   | 1.280                | /     | Pass    |
|           |         | 2480            | 3DH5        | 1   | 1.281                | /     | Pass    |

2.2 Test Graph

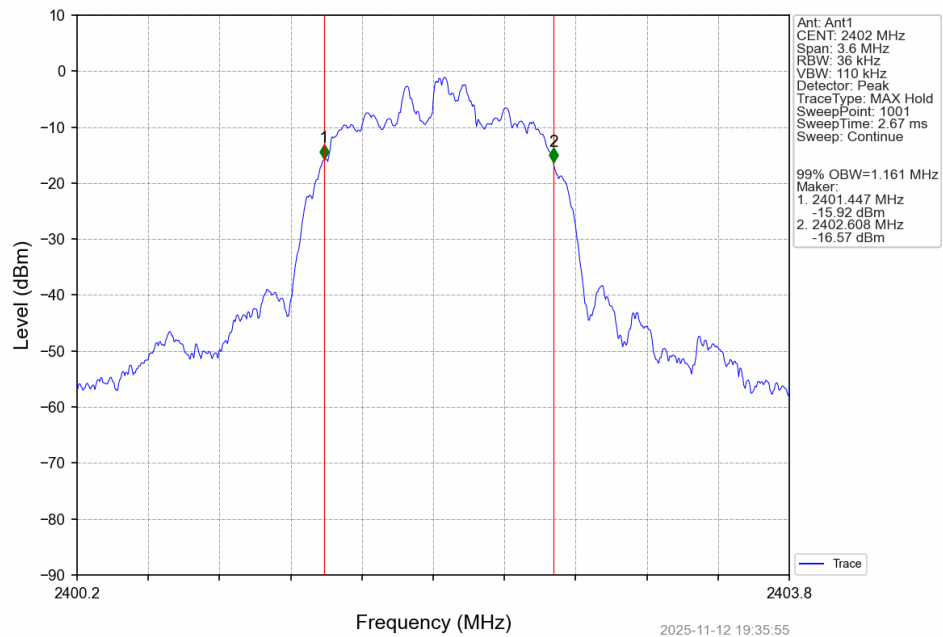
2.2.1 OBW



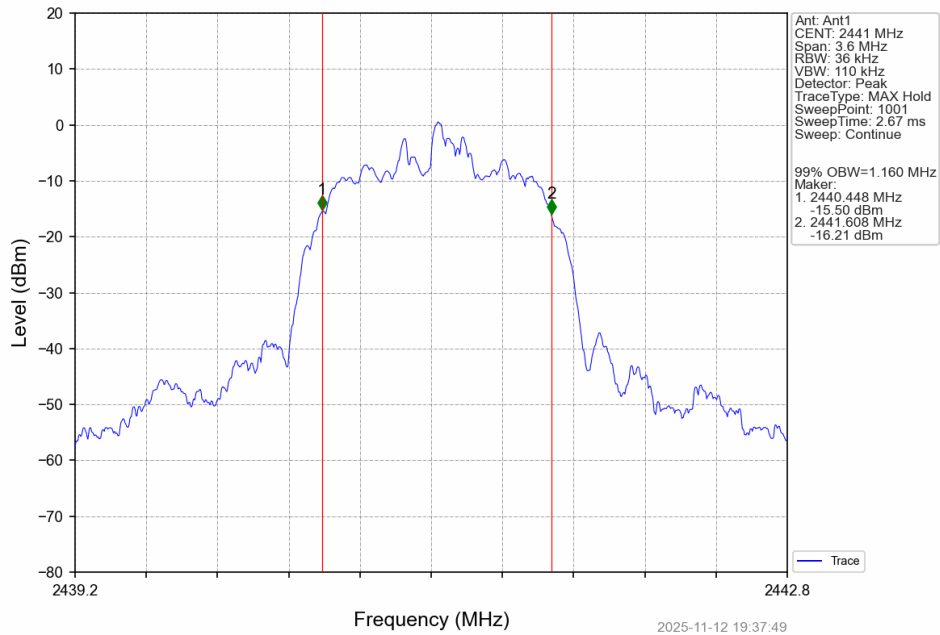
# GFSK DH5\_HCH\_2480MHz\_Ant1\_NTNV



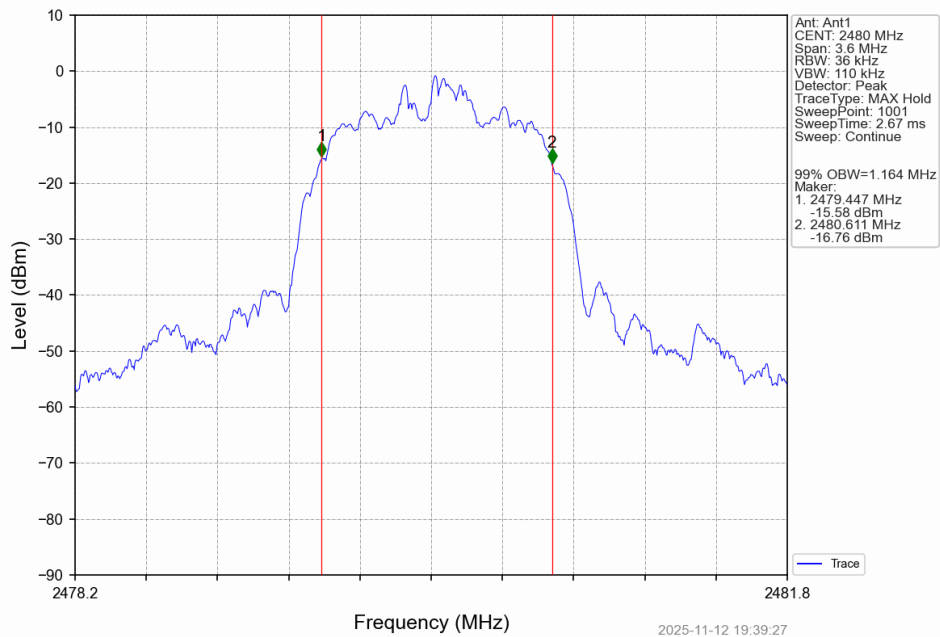
# Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



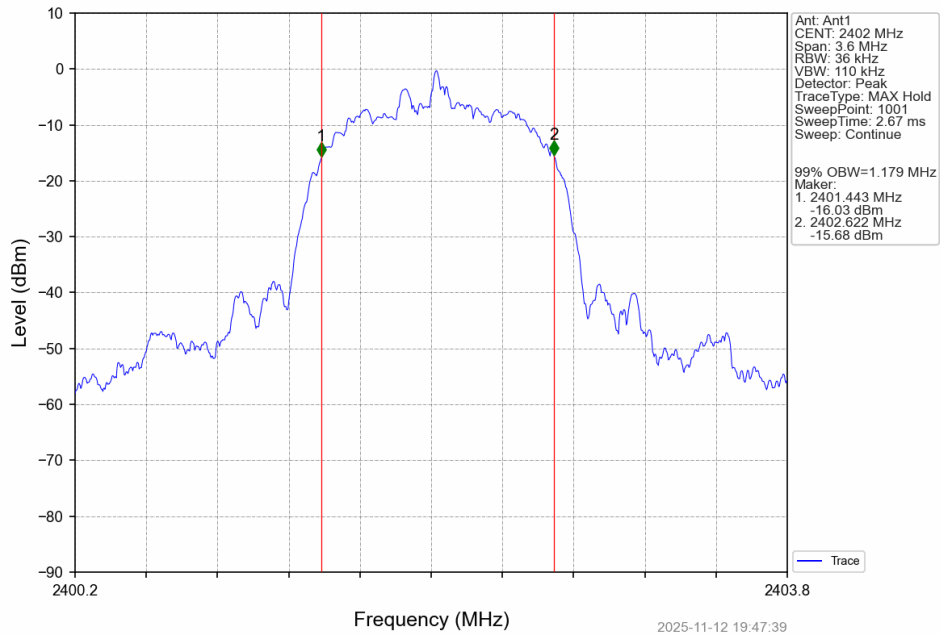
# Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



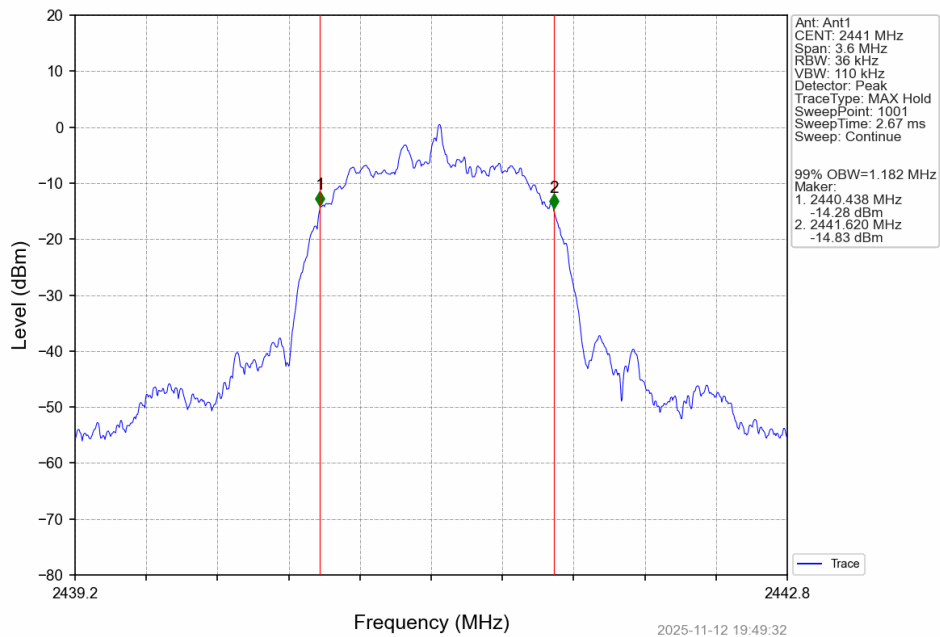
# Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



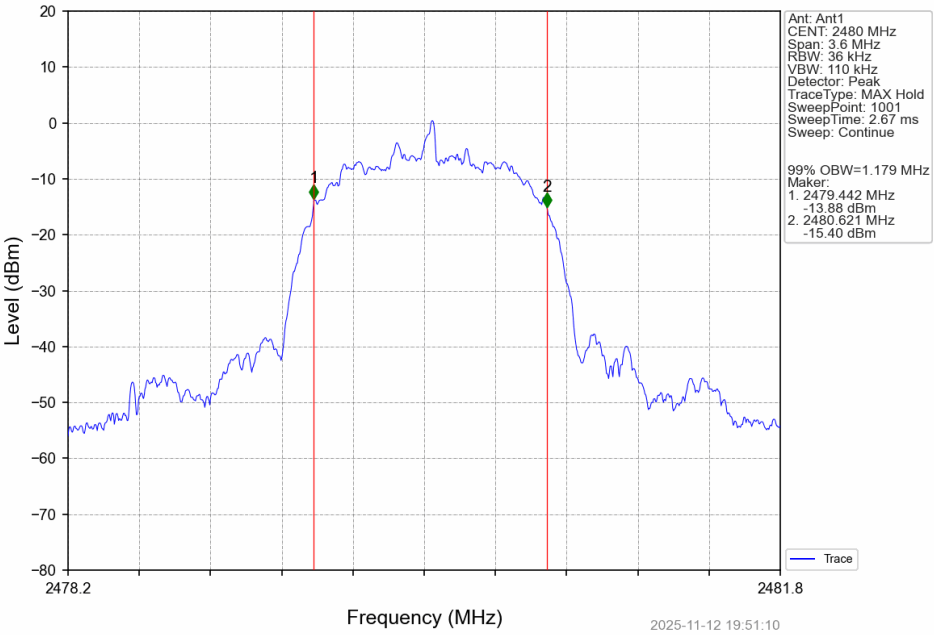
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



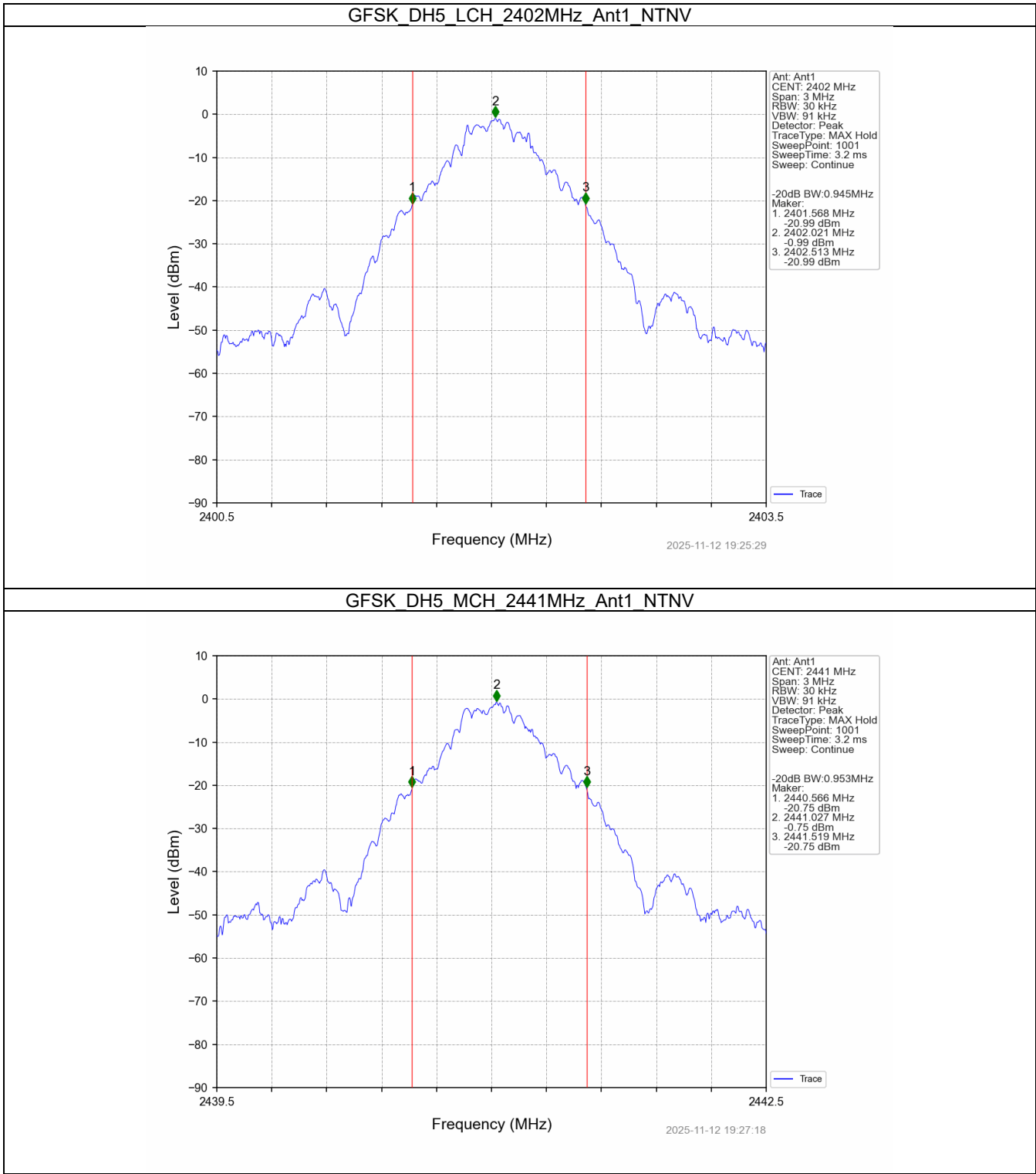
8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



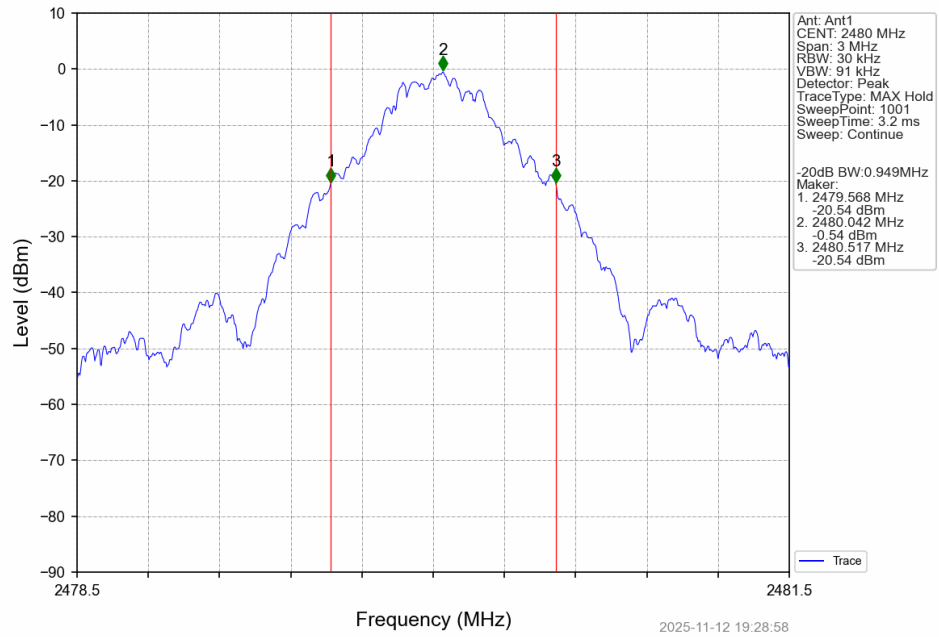
8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



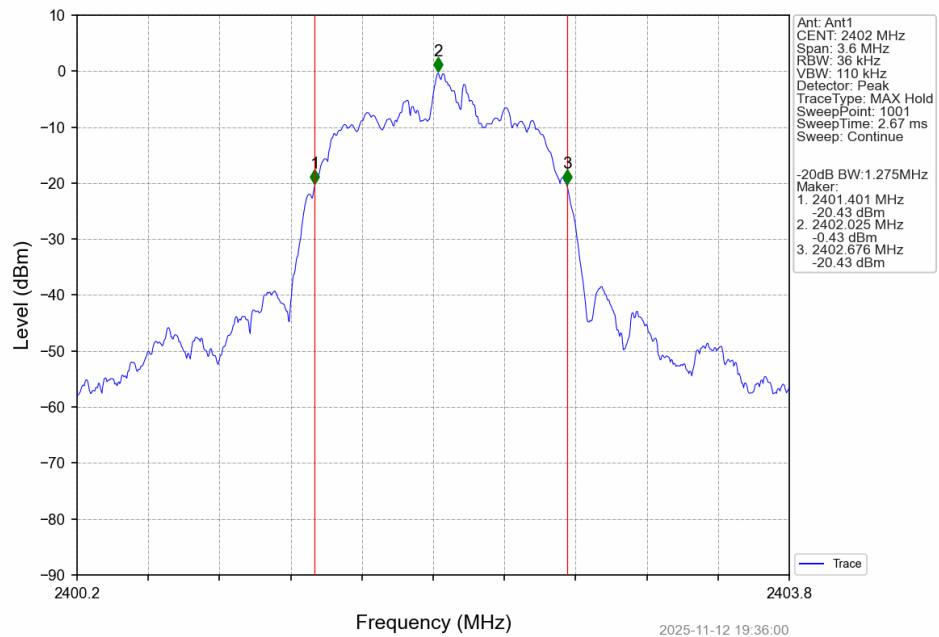
2.2.2 20dB BW



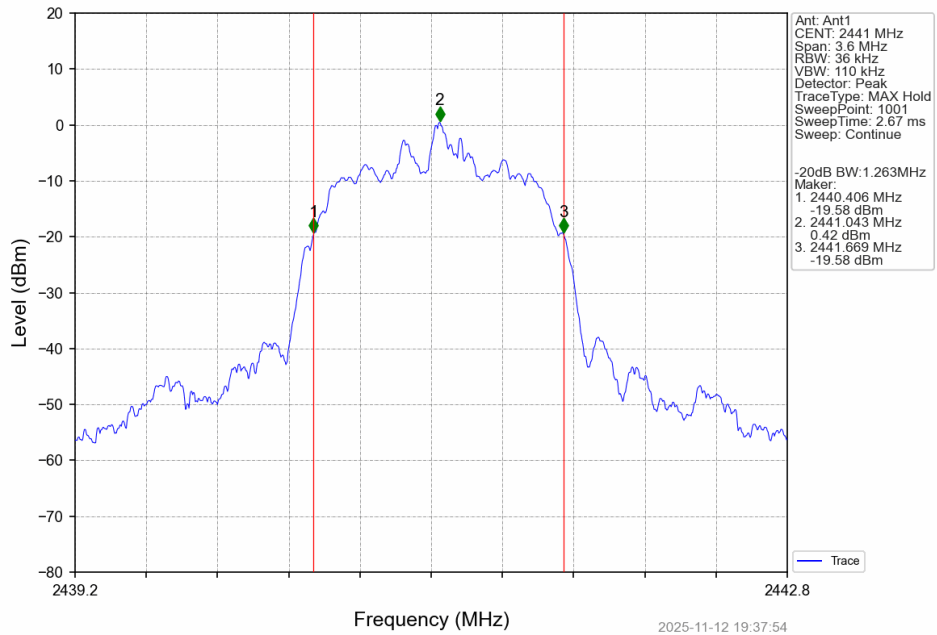
# GFSK DH5\_HCH\_2480MHz\_Ant1\_NTNV



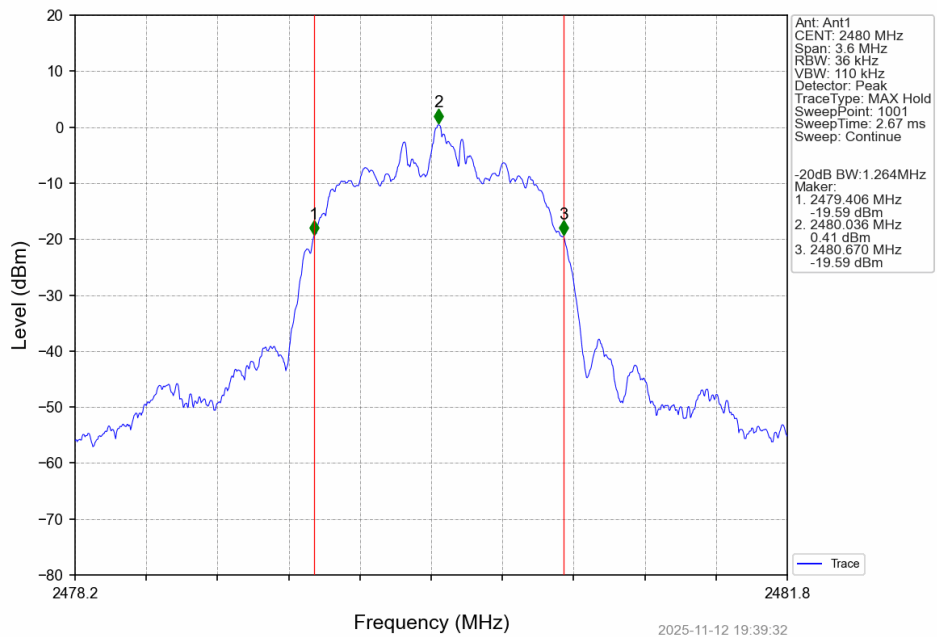
# PI/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



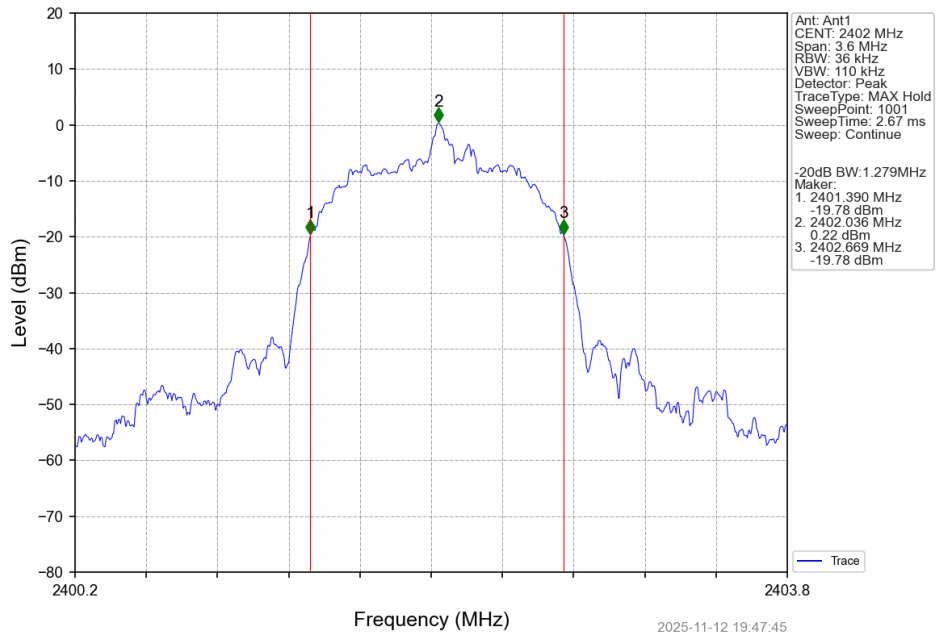
# Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



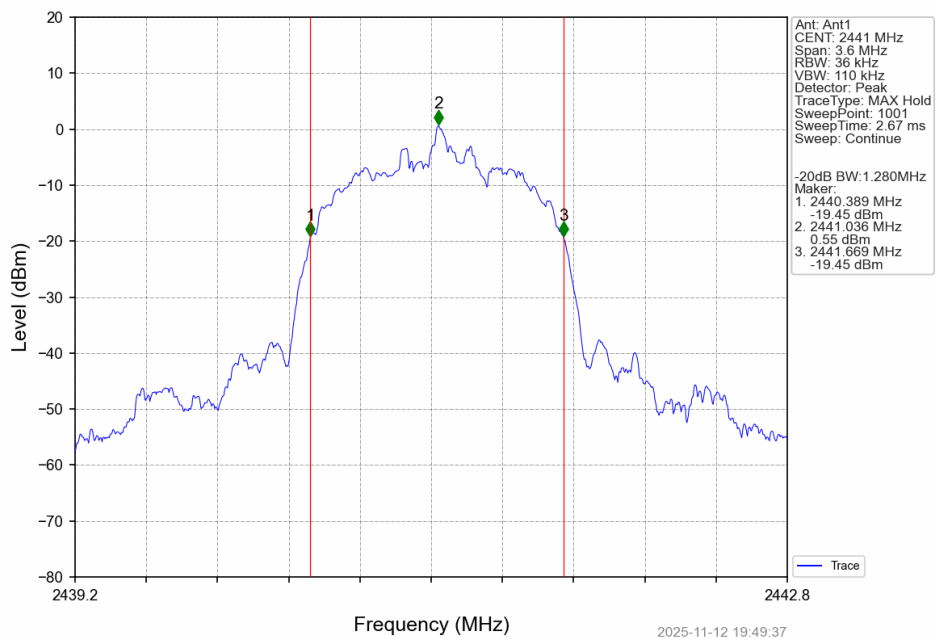
# Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



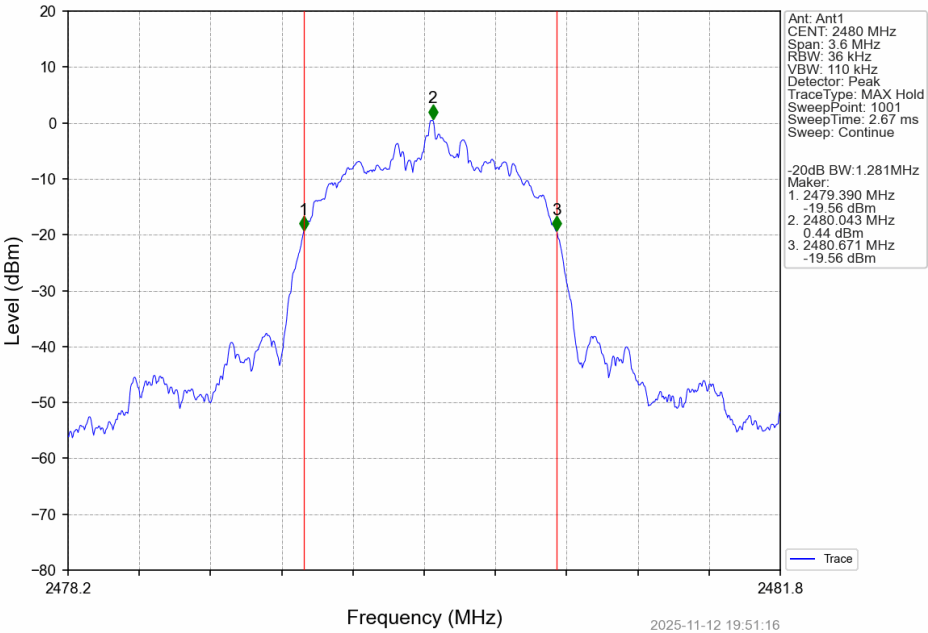
### 8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



### 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         | 1.70                                      | <=30    | Pass    |
|           |         | 2441            | DH5         | 1.98                                      | <=30    | Pass    |
|           |         | 2480            | DH5         | 1.90                                      | <=30    | Pass    |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 2.40                                      | <=20.97 | Pass    |
|           |         | 2441            | 2DH5        | 2.70                                      | <=20.97 | Pass    |
|           |         | 2480            | 2DH5        | 2.61                                      | <=20.97 | Pass    |
| 8DPSK     | SISO    | 2402            | 3DH5        | 2.88                                      | <=20.97 | Pass    |
|           |         | 2441            | 3DH5        | 3.19                                      | <=20.97 | Pass    |
|           |         | 2480            | 3DH5        | 3.14                                      | <=20.97 | Pass    |

## 4. Carrier Frequency Separation

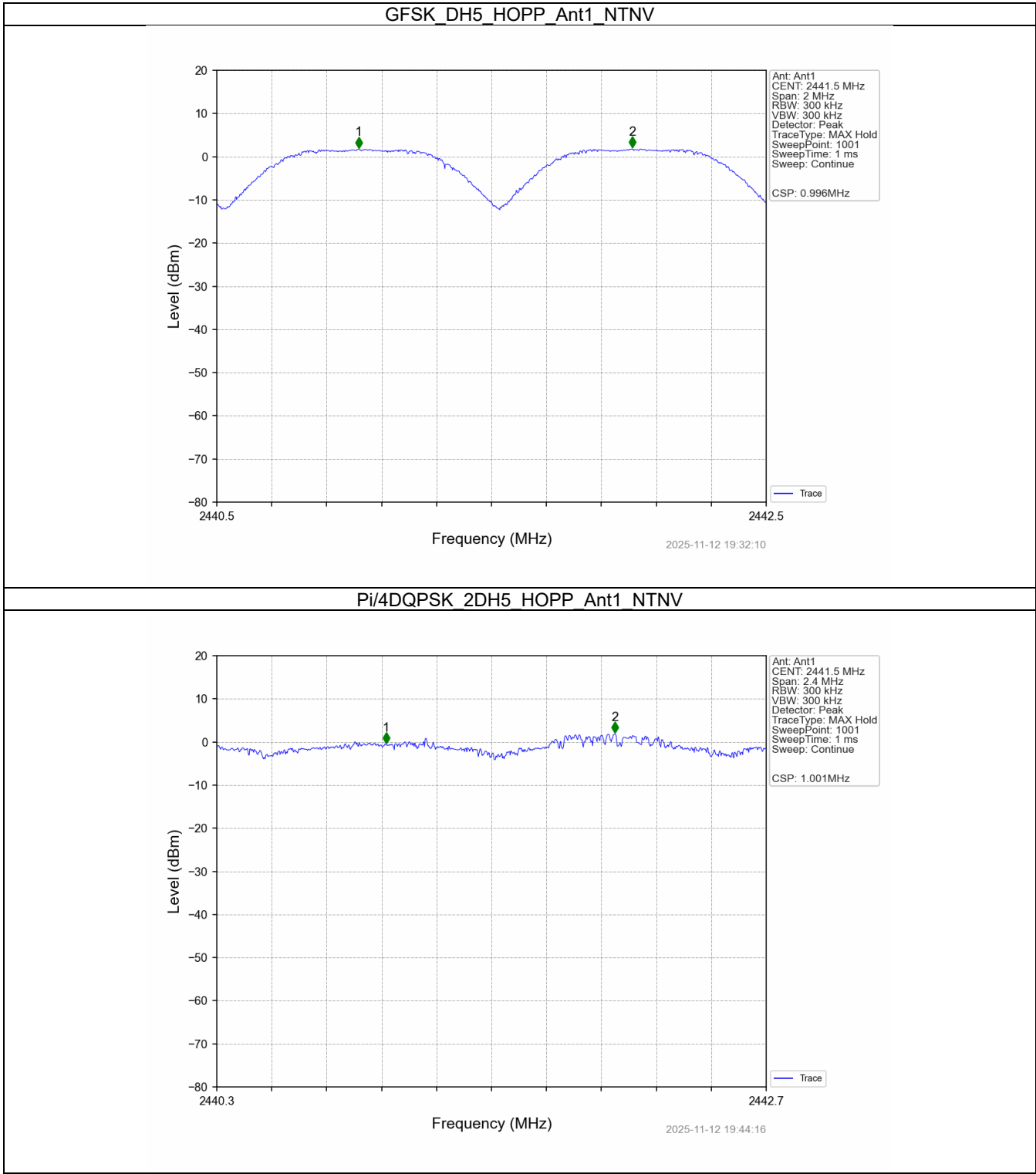
### 4.1 Test Result

#### 4.1.1 Ant1

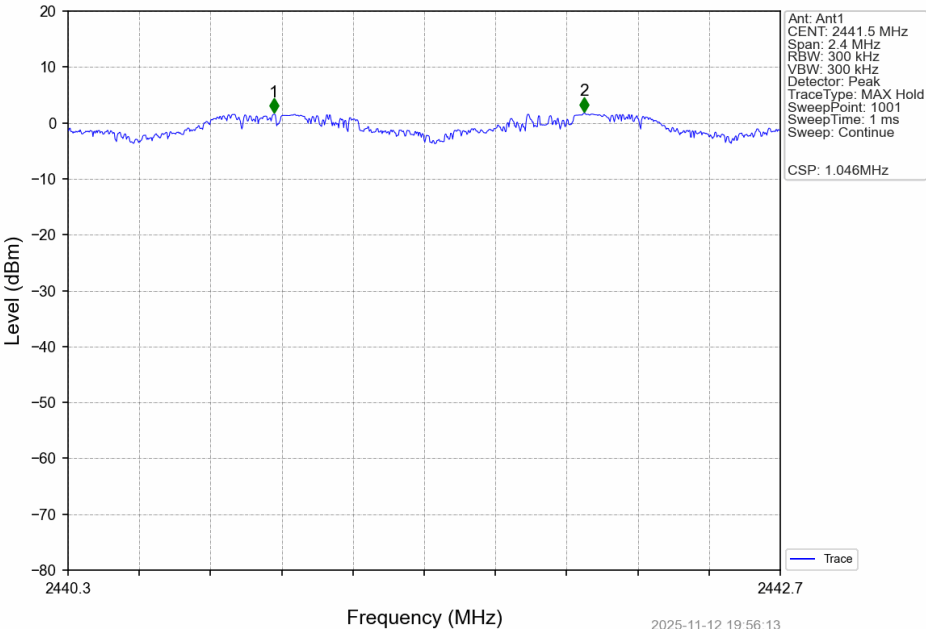
| Ant1      |         |                 |             |                          |                      |              |         |
|-----------|---------|-----------------|-------------|--------------------------|----------------------|--------------|---------|
| Mode      | TX Type | Frequency (MHz) | Packet Type | Channel Separation (MHz) | 20dB Bandwidth (MHz) | Limit (MHz)  | Verdict |
| GFSK      | SISO    | HOPP            | DH5         | 0.996                    | 0.953                | $\geq 0.953$ | Pass    |
| Pi/4DQPSK | SISO    | HOPP            | 2DH5        | 1.001                    | 1.275                | $\geq 0.85$  | Pass    |
| 8DPSK     | SISO    | HOPP            | 3DH5        | 1.046                    | 1.281                | $\geq 0.854$ | Pass    |

4.2 Test Graph

4.2.1 Ant1



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



## 5. Number of Hopping Frequencies

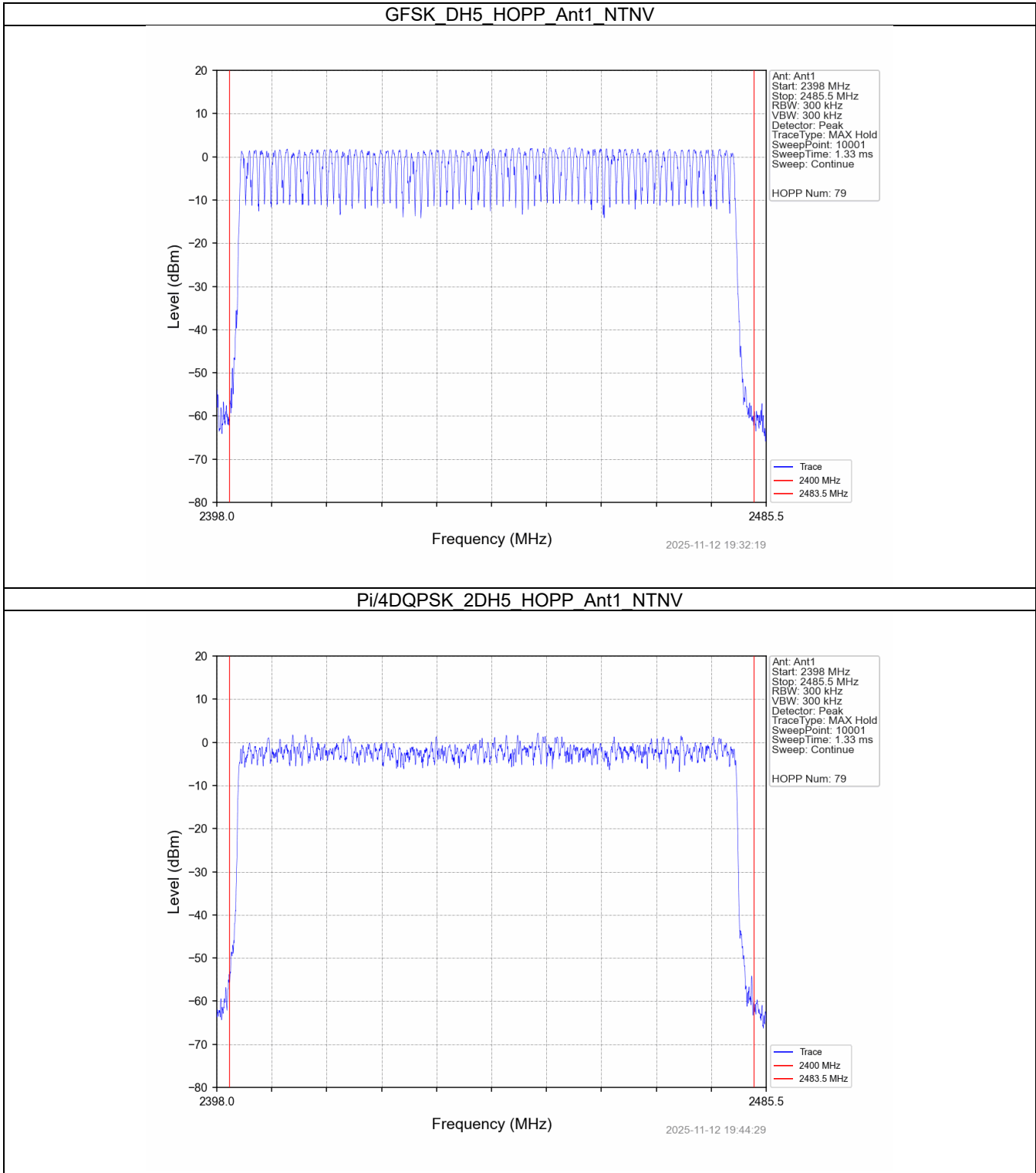
### 5.1 Test Result

#### 5.1.1 HoppNum

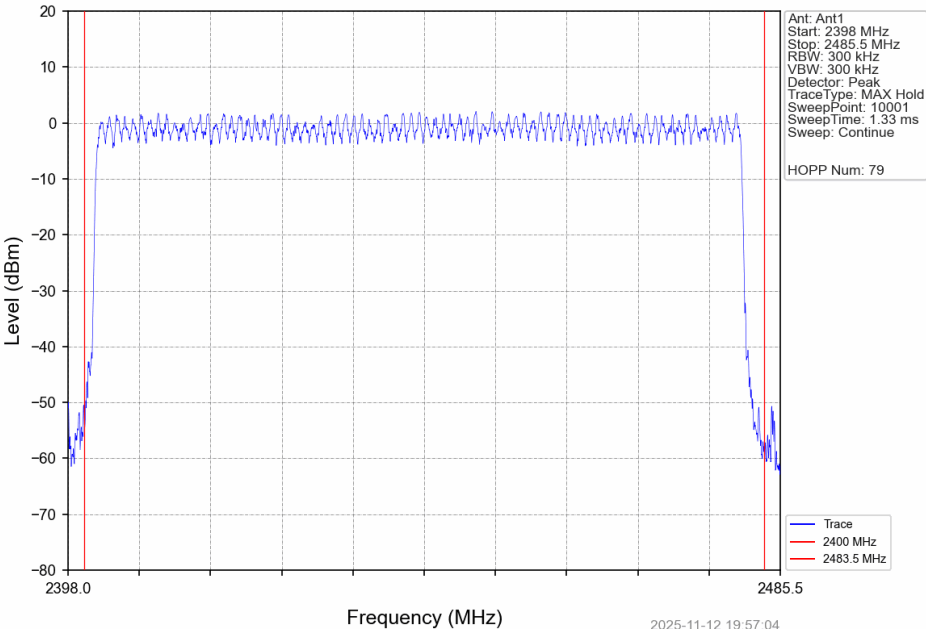
| Mode      | TX Type | Frequency (MHz) | Packet Type | Num of Hopping Frequencies |           | Verdict |
|-----------|---------|-----------------|-------------|----------------------------|-----------|---------|
|           |         |                 |             | ANT1                       | Limit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

5.2 Test Graph

5.2.1 HoppNum



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



## 6. Time of Occupancy (Dwell Time)

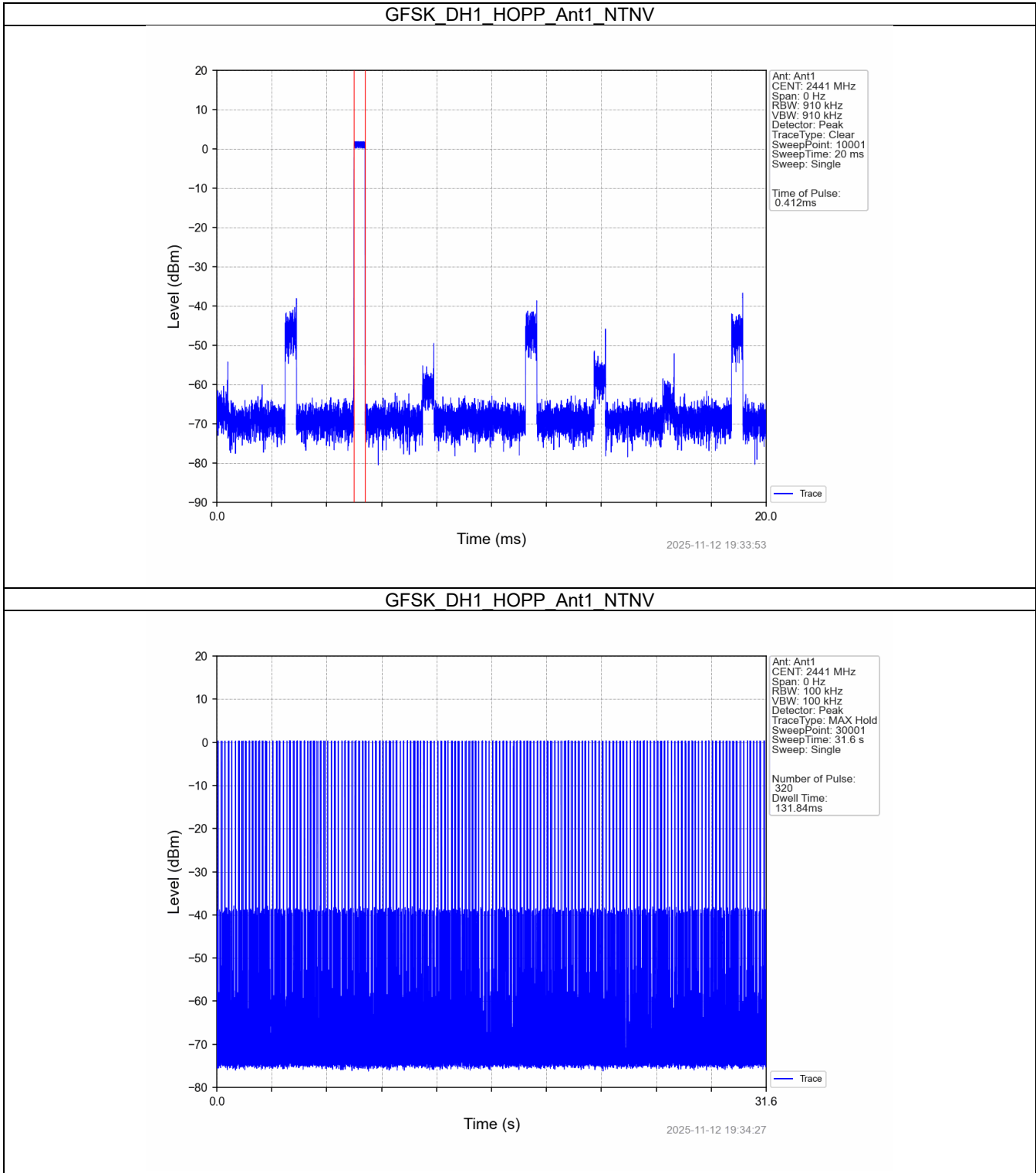
### 6.1 Test Result

#### 6.1.1 Ant1

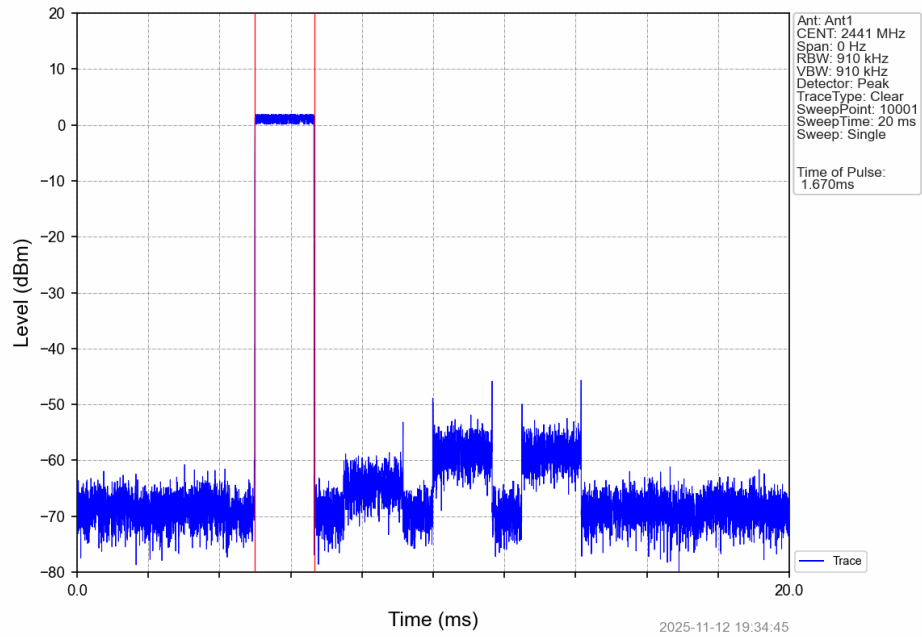
| Ant1      |         |                 |             |                               |                        |                                    |                 |            |         |
|-----------|---------|-----------------|-------------|-------------------------------|------------------------|------------------------------------|-----------------|------------|---------|
| Mode      | Tx Type | Frequency (MHz) | Packet Type | Duration of Single Pulse (ms) | Observation Period (s) | Num of Pulse in Observation Period | Dwell Time (ms) | Limit (ms) | Verdict |
| GFSK      | SISO    | HOPP            | DH1         | 0.412                         | 31.600                 | 320                                | 131.840         | <=400      | Pass    |
|           |         |                 | DH3         | 1.670                         | 31.600                 | 156                                | 260.520         | <=400      | Pass    |
|           |         |                 | DH5         | 2.918                         | 31.600                 | 114                                | 332.652         | <=400      | Pass    |
| Pi/4DQPSK | SISO    | HOPP            | 2DH1        | 0.422                         | 31.600                 | 318                                | 134.196         | <=400      | Pass    |
|           |         |                 | 2DH3        | 1.672                         | 31.600                 | 158                                | 264.176         | <=400      | Pass    |
|           |         |                 | 2DH5        | 2.924                         | 31.600                 | 104                                | 304.096         | <=400      | Pass    |
| 8DPSK     | SISO    | HOPP            | 3DH1        | 0.424                         | 31.600                 | 320                                | 135.680         | <=400      | Pass    |
|           |         |                 | 3DH3        | 1.676                         | 31.600                 | 159                                | 266.484         | <=400      | Pass    |
|           |         |                 | 3DH5        | 2.926                         | 31.600                 | 111                                | 324.786         | <=400      | Pass    |

6.2 Test Graph

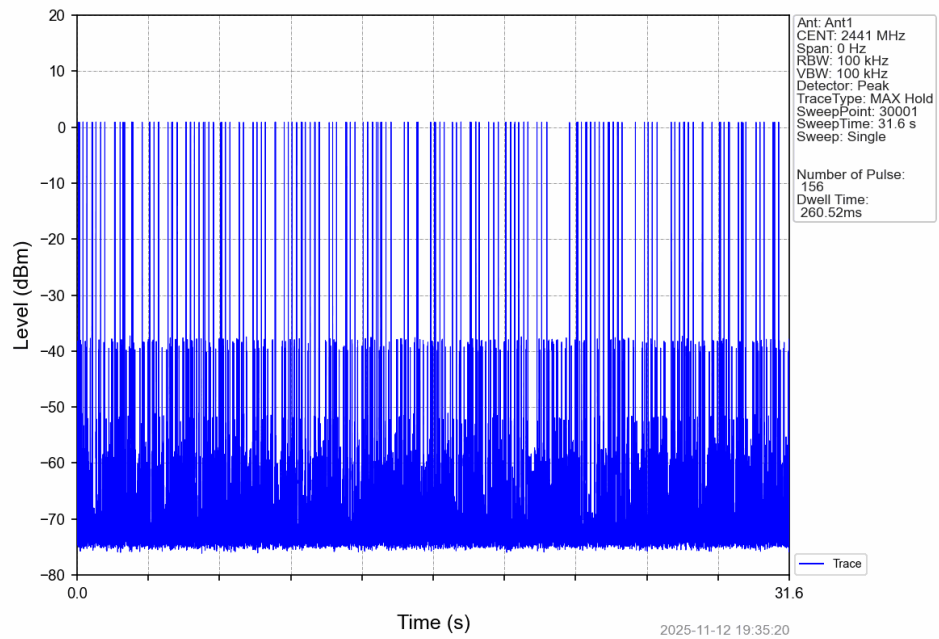
6.2.1 Ant1



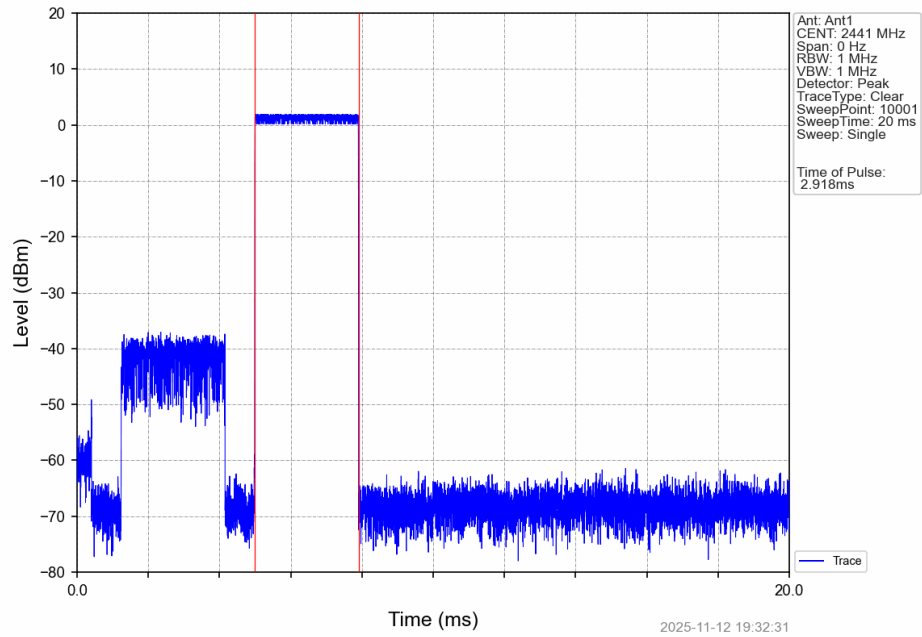
# GFSK\_DH3\_HOPP\_Ant1\_NTNV



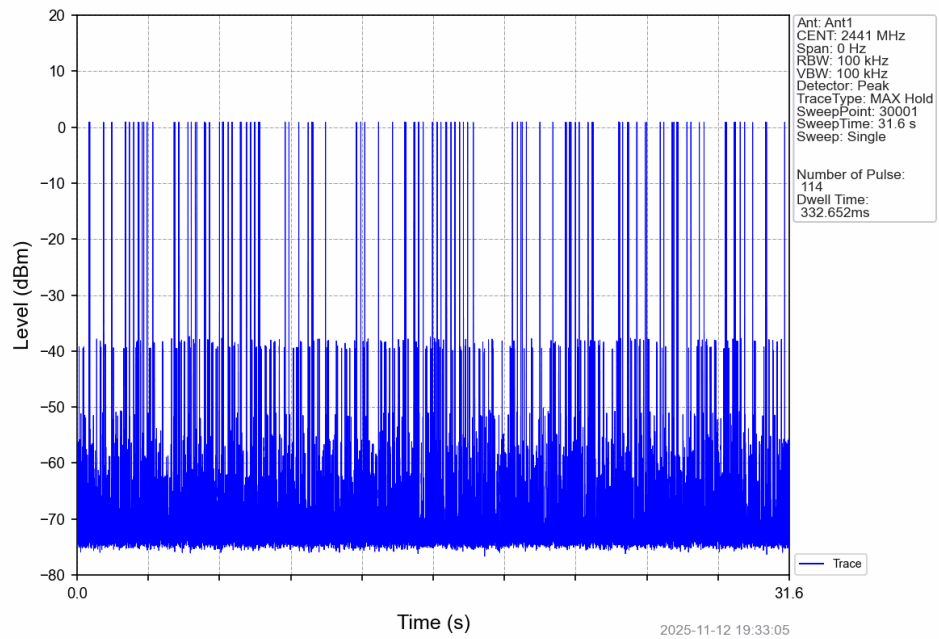
# GFSK\_DH3\_HOPP\_Ant1\_NTNV



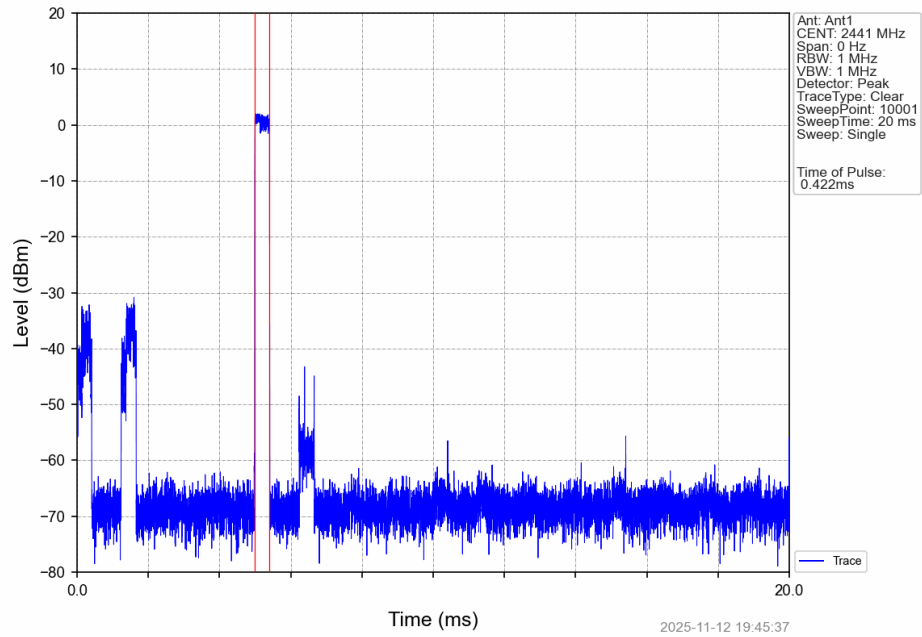
# GFSK\_DH5\_HOPP\_Ant1\_NTNV



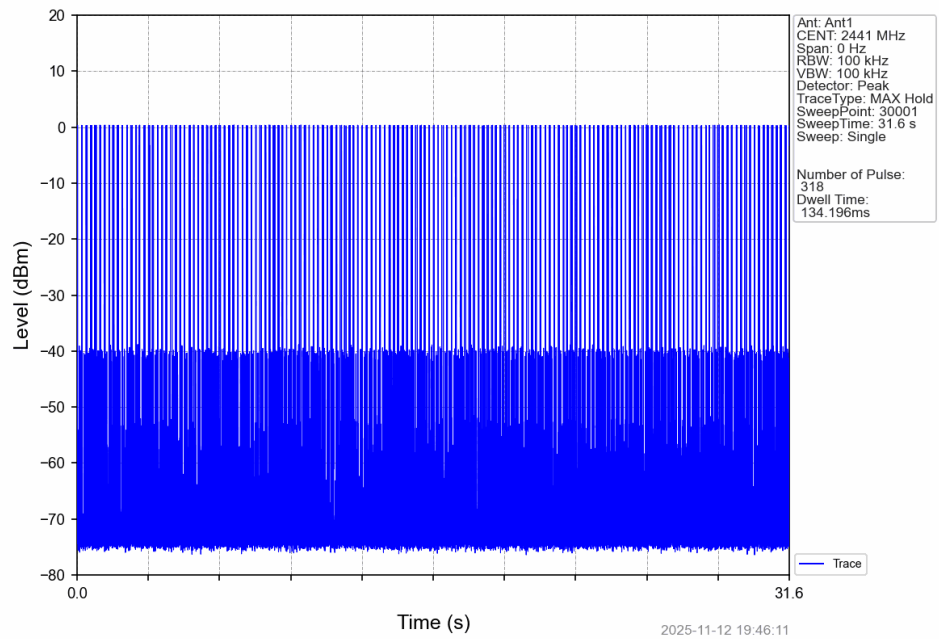
# GFSK\_DH5\_HOPP\_Ant1\_NTNV



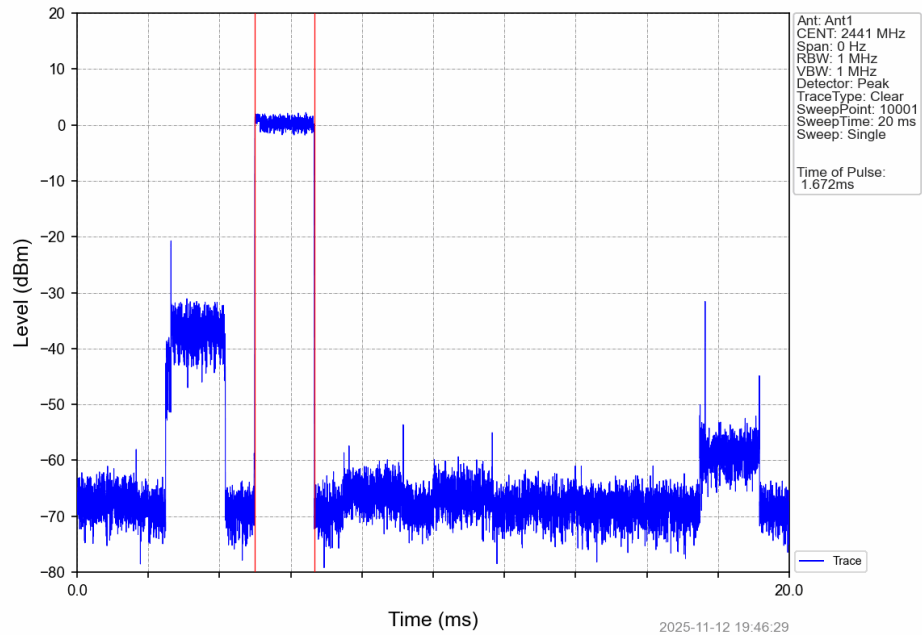
# Pi/4DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



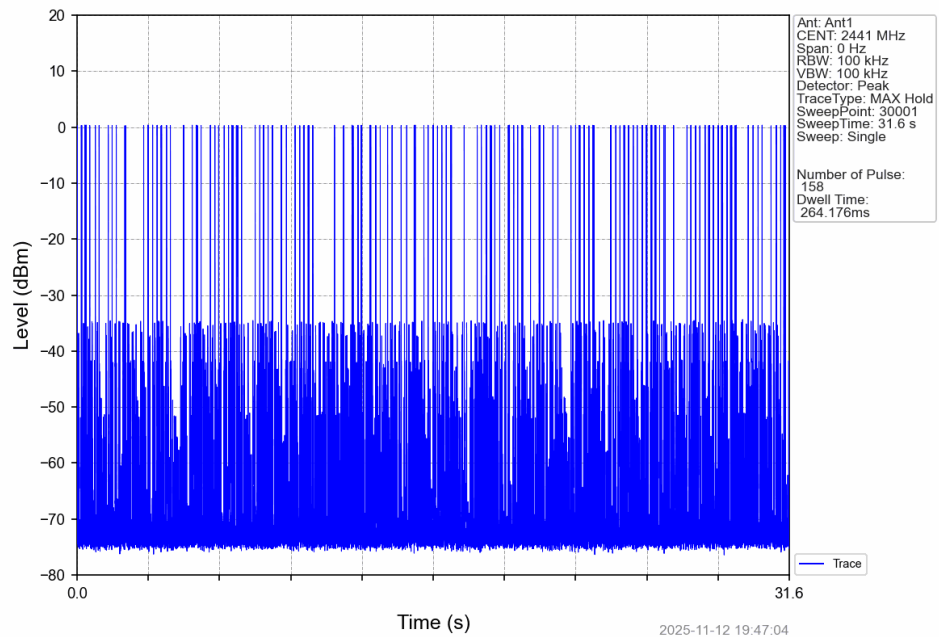
# Pi/4DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



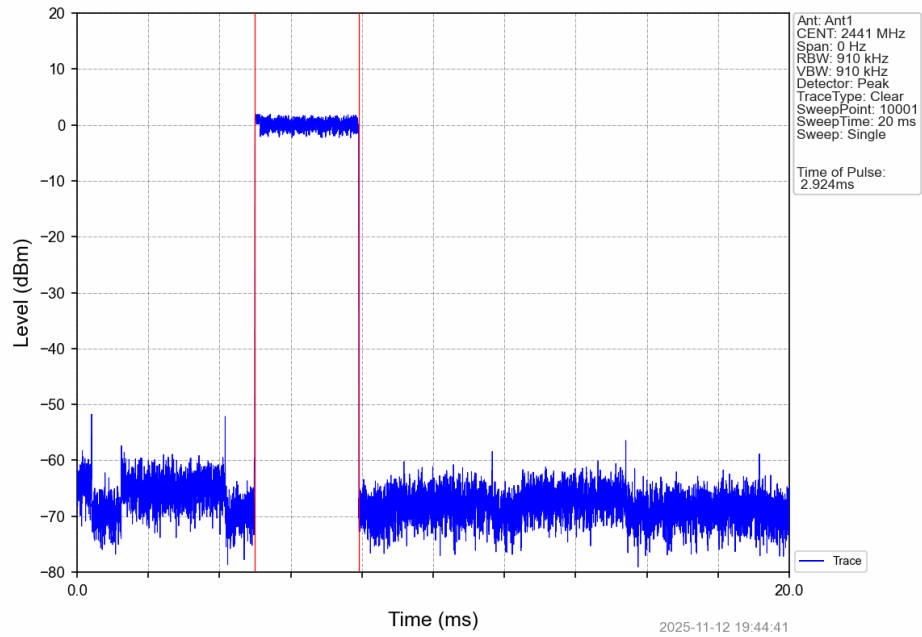
# Pi/4DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



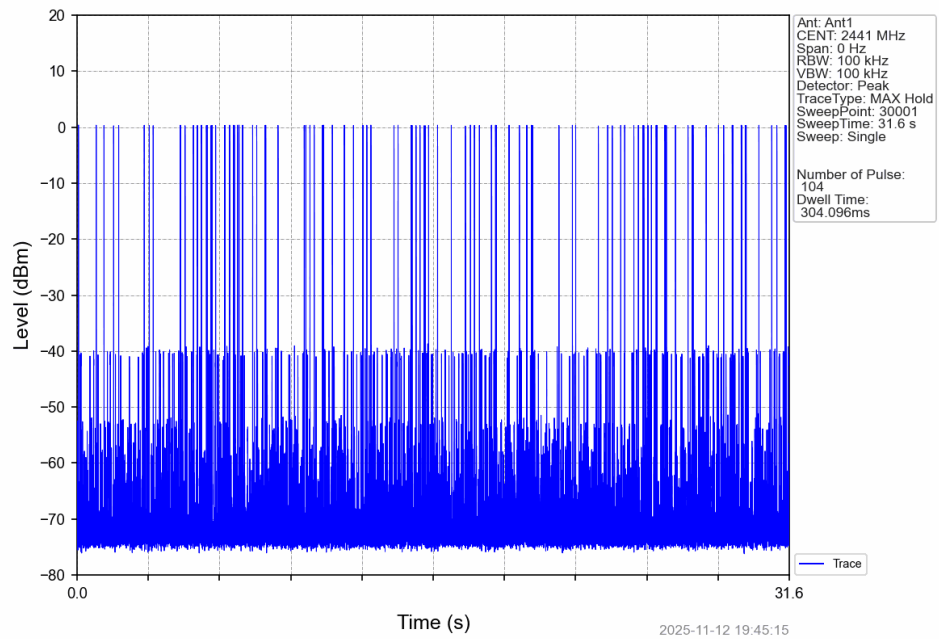
# Pi/4DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



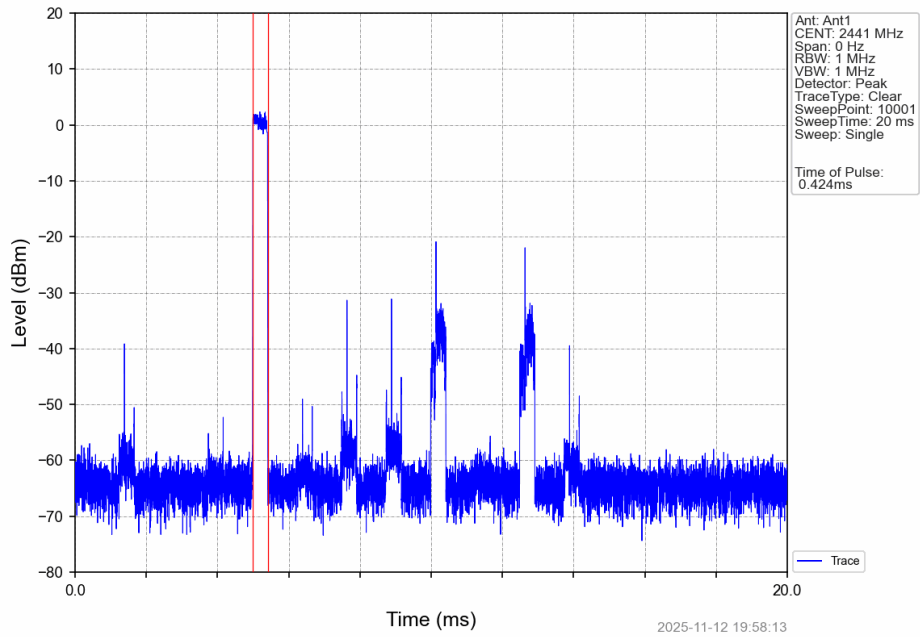
# Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



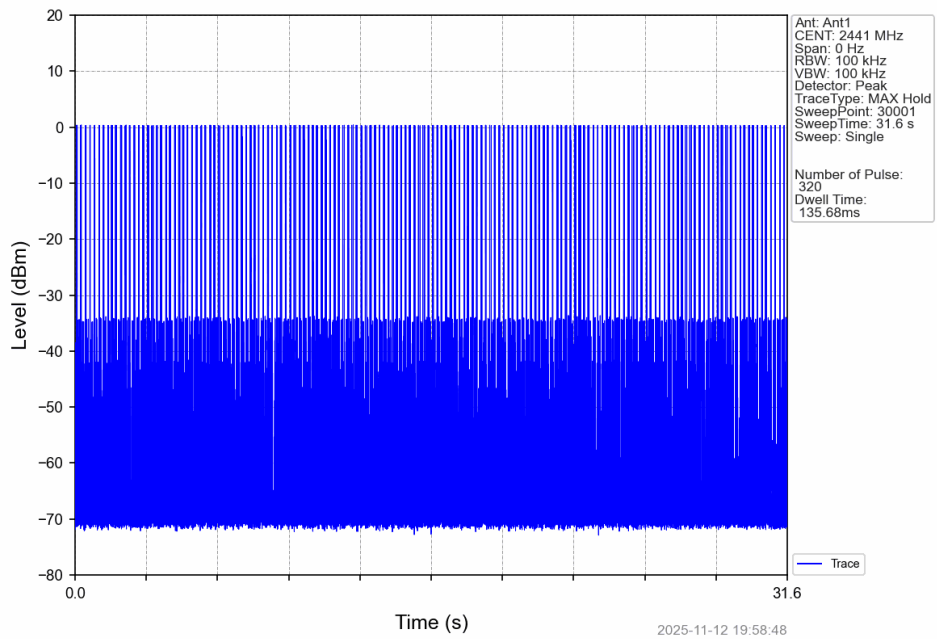
# Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



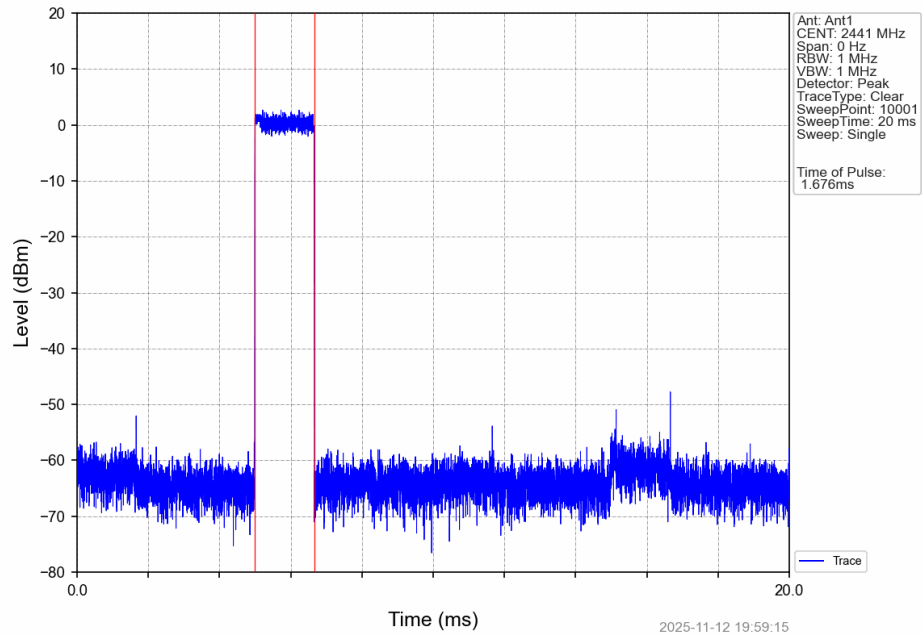
# 8DPSK\_3DH1\_HOPP\_Ant1\_NTNV



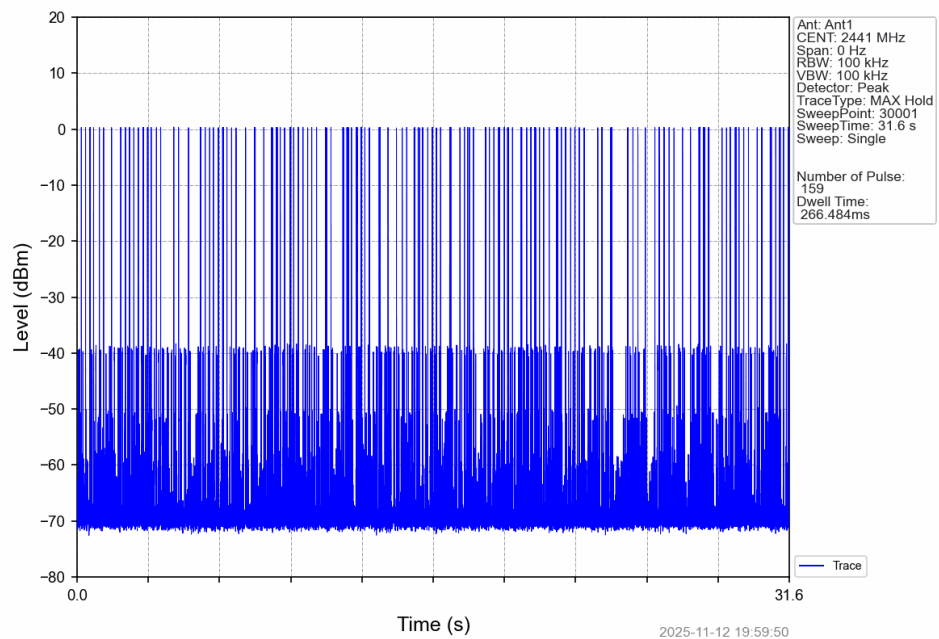
# 8DPSK\_3DH1\_HOPP\_Ant1\_NTNV



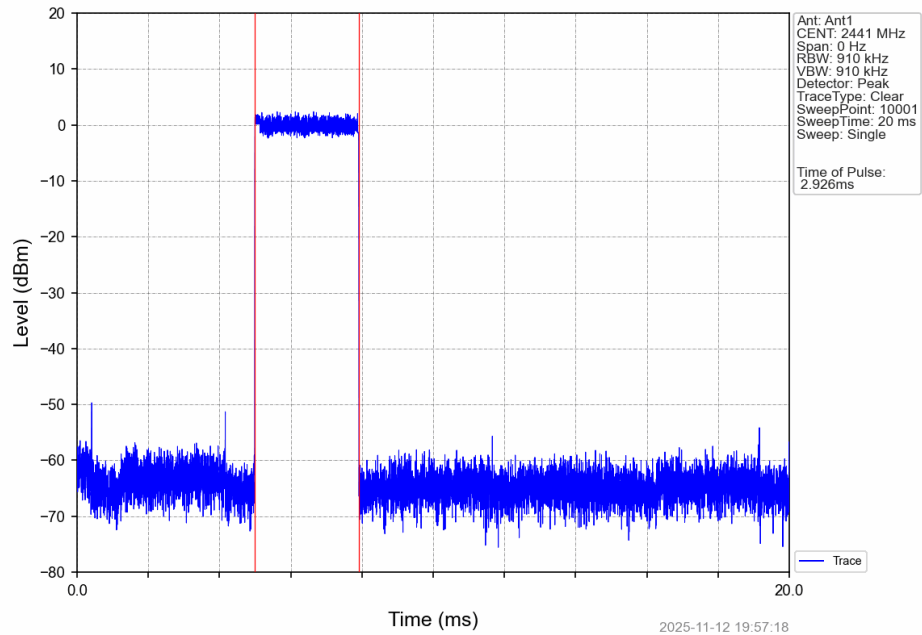
# 8DPSK\_3DH3\_HOPP\_Ant1\_NTNV



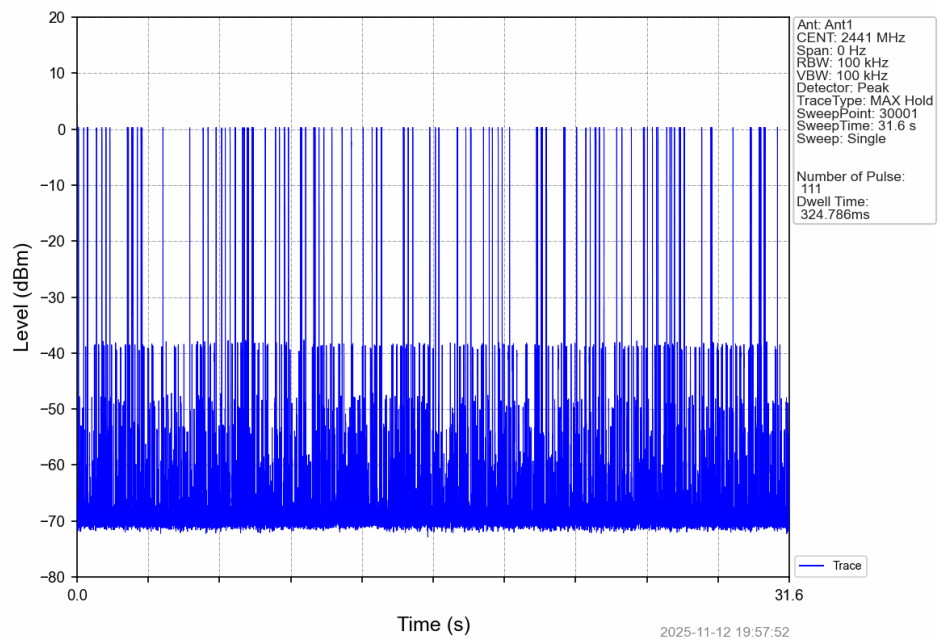
# 8DPSK\_3DH3\_HOPP\_Ant1\_NTNV



# 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

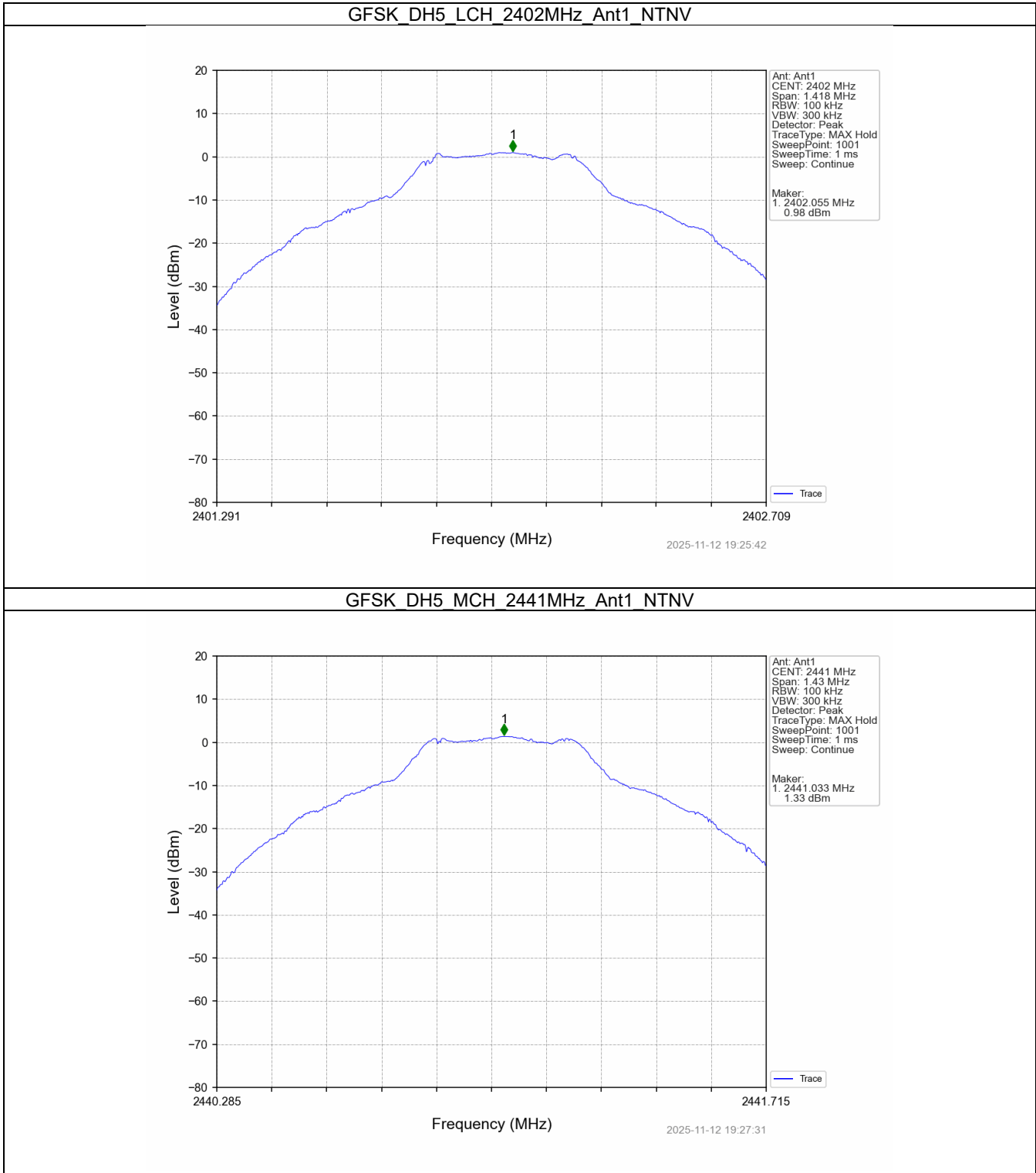
| Mode                                                                                                                                            | Tx Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------|-------------|-----|--------------------------|
| GFSK                                                                                                                                            | SISO    | 2402            | DH5         | 1   | 0.98                     |
|                                                                                                                                                 |         | 2441            | DH5         | 1   | 1.33                     |
|                                                                                                                                                 |         | 2480            | DH5         | 1   | 1.22                     |
|                                                                                                                                                 |         | HOPP            | DH5         | 1   | 1.67                     |
|                                                                                                                                                 |         |                 |             |     | 1.67                     |
| Pi/4DQPSK                                                                                                                                       | SISO    | 2402            | 2DH5        | 1   | 1.01                     |
|                                                                                                                                                 |         | 2441            | 2DH5        | 1   | 0.94                     |
|                                                                                                                                                 |         | 2480            | 2DH5        | 1   | 1.17                     |
|                                                                                                                                                 |         | HOPP            | 2DH5        | 1   | 1.51                     |
|                                                                                                                                                 |         |                 |             |     | 1.51                     |
| 8DPSK                                                                                                                                           | SISO    | 2402            | 3DH5        | 1   | 0.60                     |
|                                                                                                                                                 |         | 2441            | 3DH5        | 1   | 1.30                     |
|                                                                                                                                                 |         | 2480            | 3DH5        | 1   | 1.23                     |
|                                                                                                                                                 |         | HOPP            | 3DH5        | 1   | 1.62                     |
|                                                                                                                                                 |         |                 |             |     | 1.62                     |
| 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

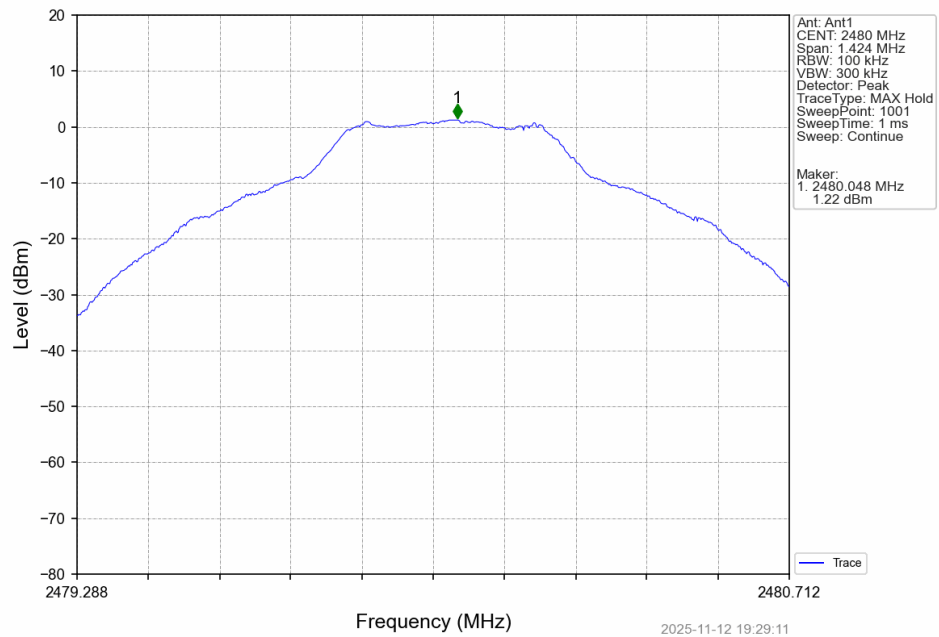
| Mode                                                                                                                                            | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) | Limit (dBm) | Verdict |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------|-------------|-----|--------------------------|-------------|---------|
| GFSK                                                                                                                                            | SISO    | 2402            | DH5         | 1   | 0.98                     | -19.02      | Pass    |
|                                                                                                                                                 |         | 2441            | DH5         | 1   | 1.33                     | -18.67      | Pass    |
|                                                                                                                                                 |         | 2480            | DH5         | 1   | 1.22                     | -18.78      | Pass    |
|                                                                                                                                                 |         | HOPP            | DH5         | 1   | 1.67                     | -18.33      | Pass    |
|                                                                                                                                                 |         |                 |             |     | 1.67                     | -18.33      | Pass    |
| Pi/4DQPSK                                                                                                                                       | SISO    | 2402            | 2DH5        | 1   | 1.01                     | -18.99      | Pass    |
|                                                                                                                                                 |         | 2441            | 2DH5        | 1   | 0.94                     | -19.06      | Pass    |
|                                                                                                                                                 |         | 2480            | 2DH5        | 1   | 1.17                     | -18.83      | Pass    |
|                                                                                                                                                 |         | HOPP            | 2DH5        | 1   | 1.51                     | -18.49      | Pass    |
|                                                                                                                                                 |         |                 |             |     | 1.51                     | -18.49      | Pass    |
| 8DPSK                                                                                                                                           | SISO    | 2402            | 3DH5        | 1   | 0.60                     | -19.40      | Pass    |
|                                                                                                                                                 |         | 2441            | 3DH5        | 1   | 1.30                     | -18.70      | Pass    |
|                                                                                                                                                 |         | 2480            | 3DH5        | 1   | 1.23                     | -18.77      | Pass    |
|                                                                                                                                                 |         | HOPP            | 3DH5        | 1   | 1.62                     | -18.38      | Pass    |
|                                                                                                                                                 |         |                 |             |     | 1.62                     | -18.38      | Pass    |
| Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level. |         |                 |             |     |                          |             |         |

7.2 Test Graph

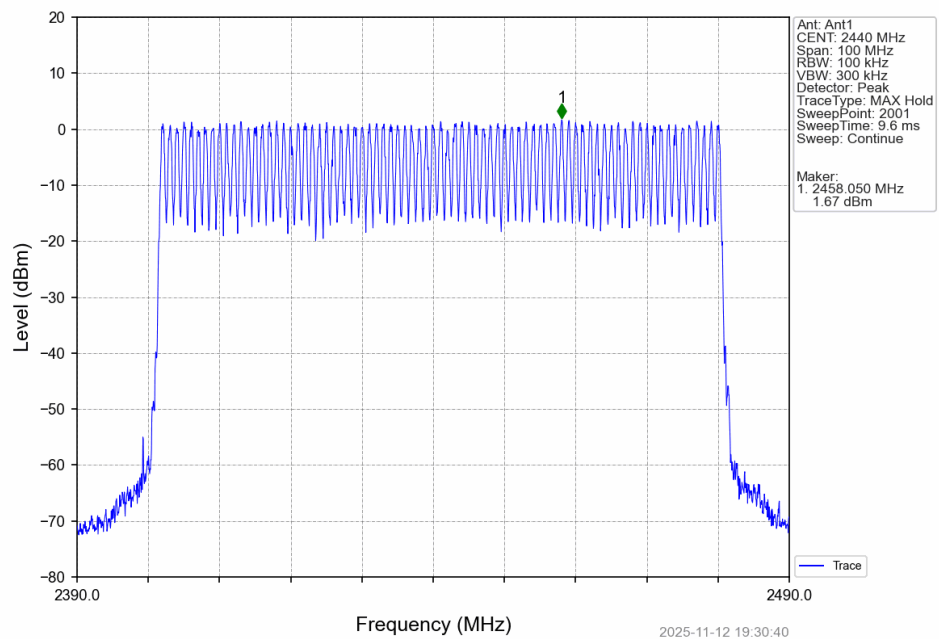
7.2.1 Ref



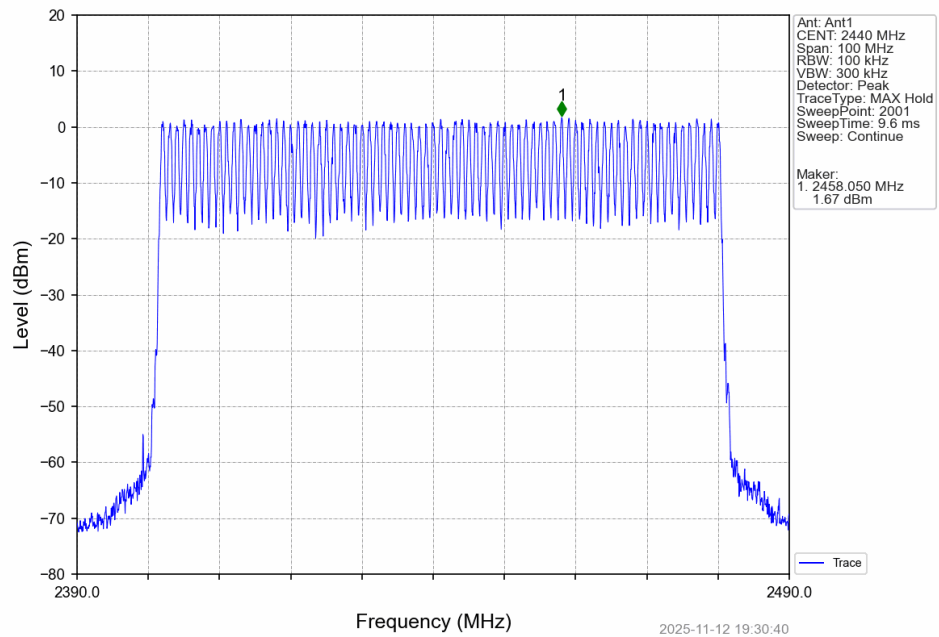
# GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



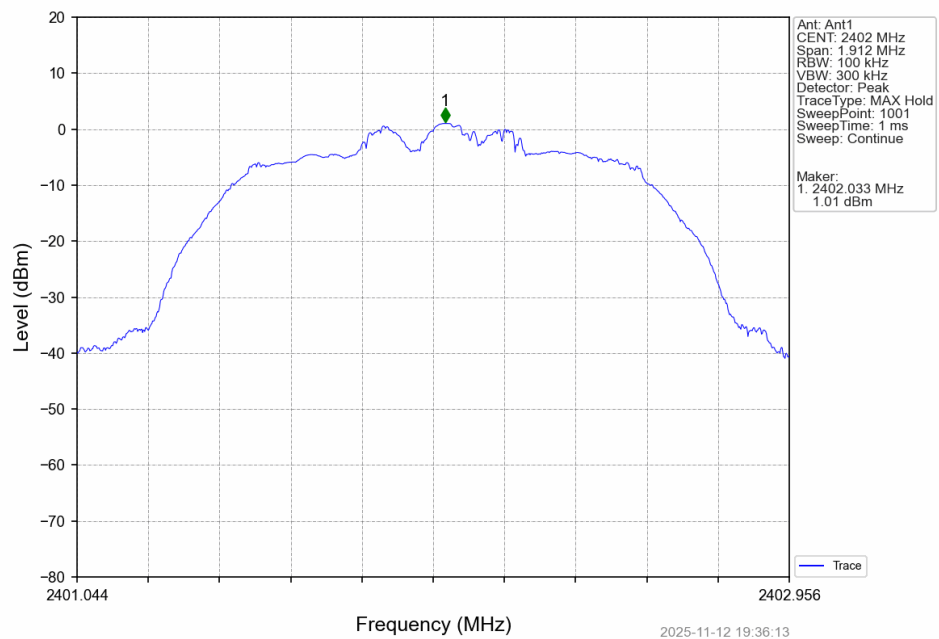
# GFSK\_DH5\_HOPP\_2440MHz\_Ant1\_NTNV



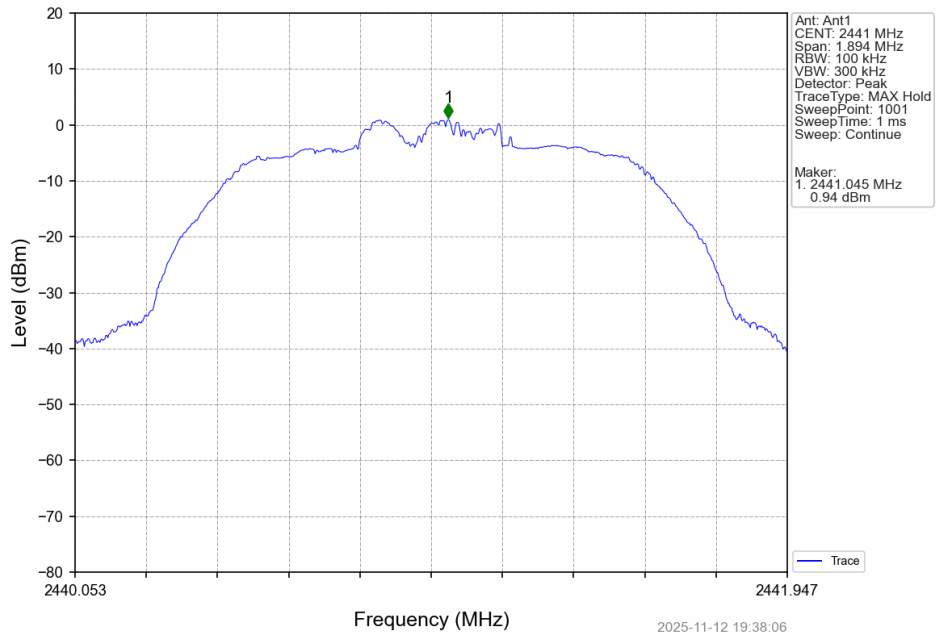
# GFSK\_DH5\_HOPP\_Ant1\_NTNV



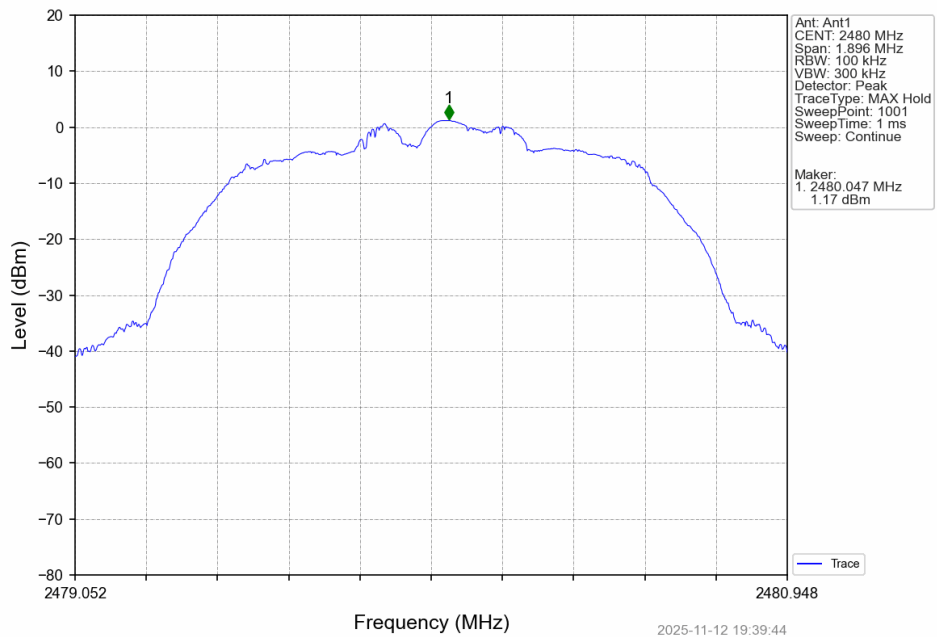
# Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



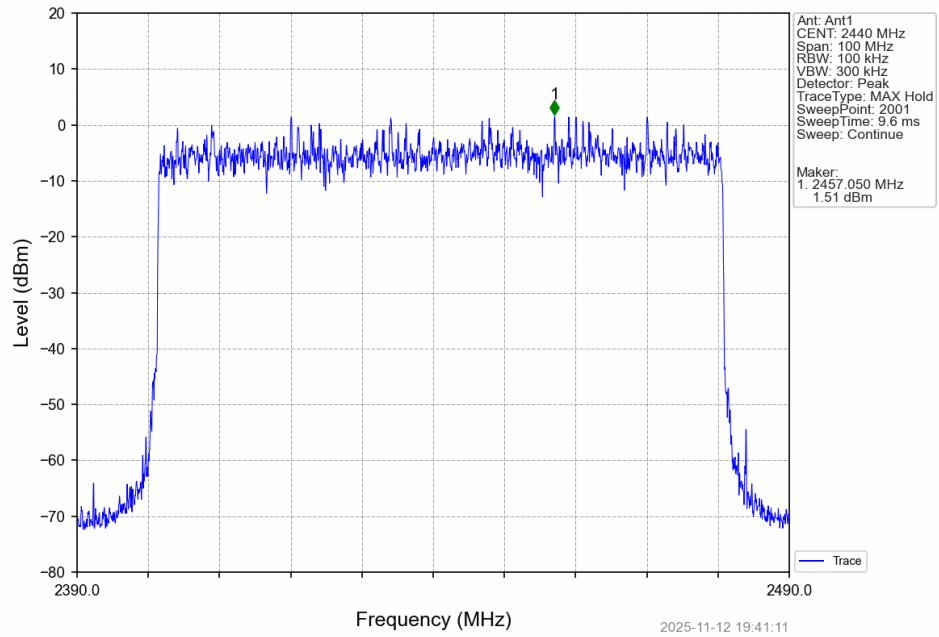
# Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



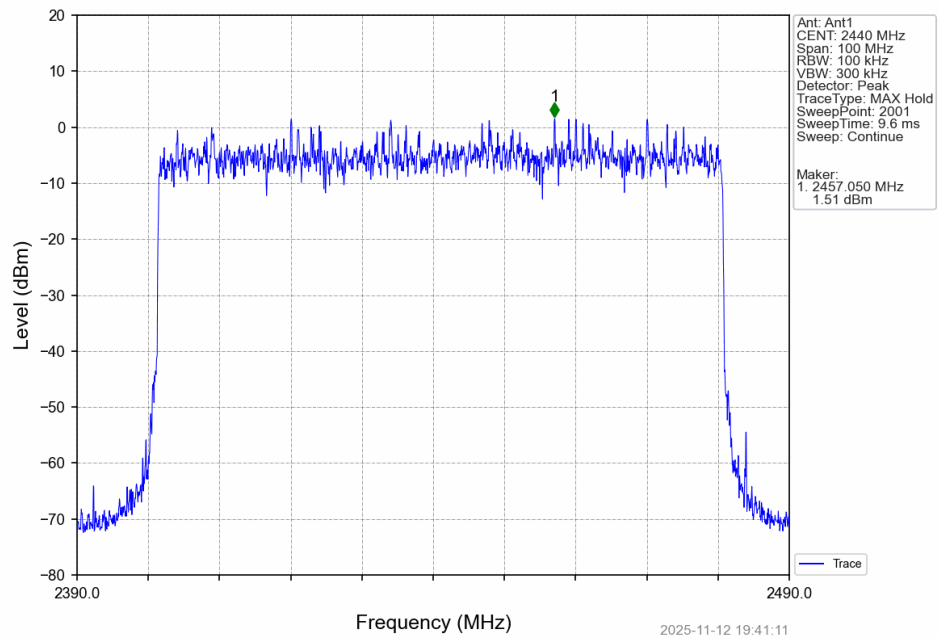
# Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



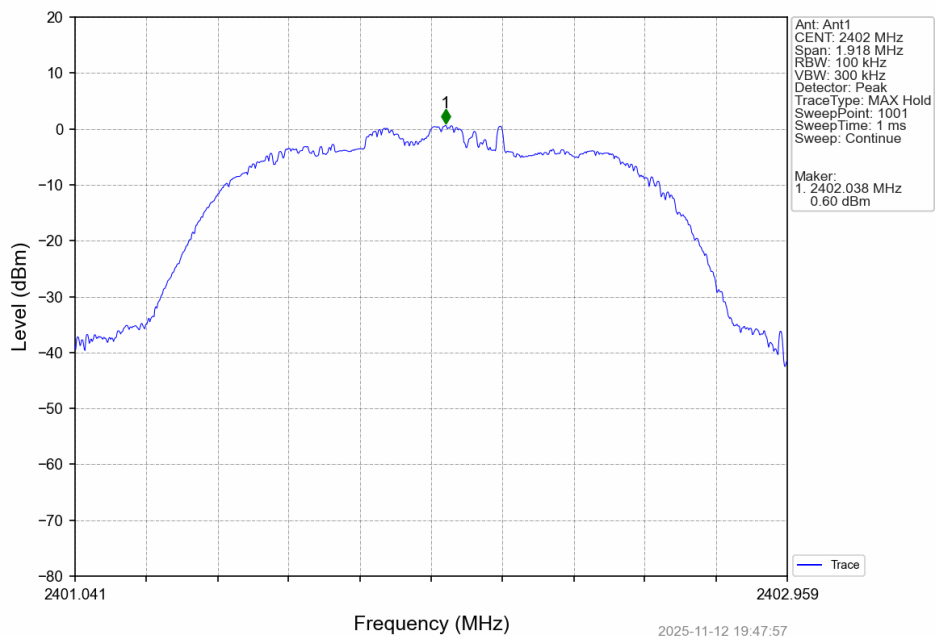
# Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



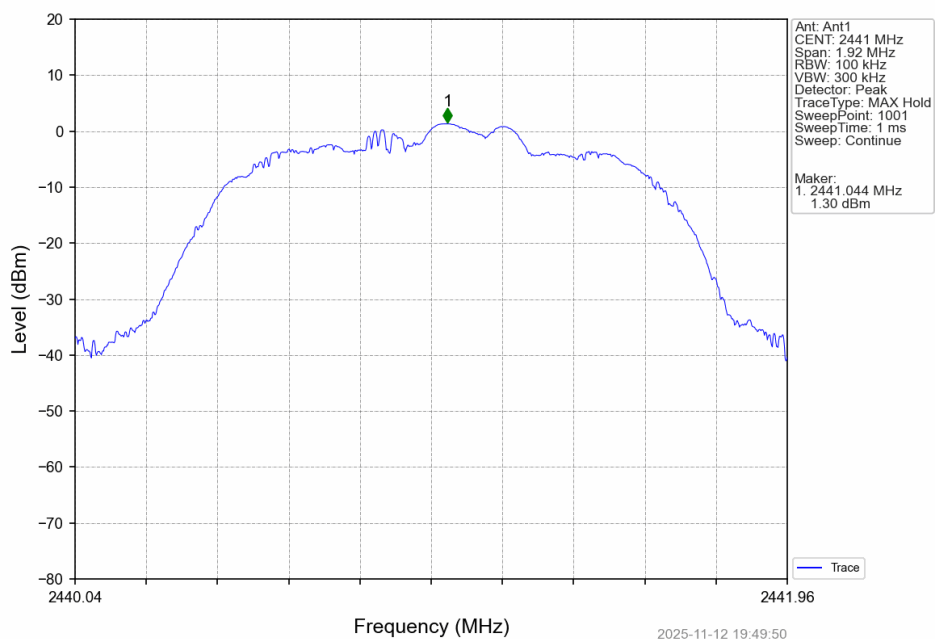
# Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



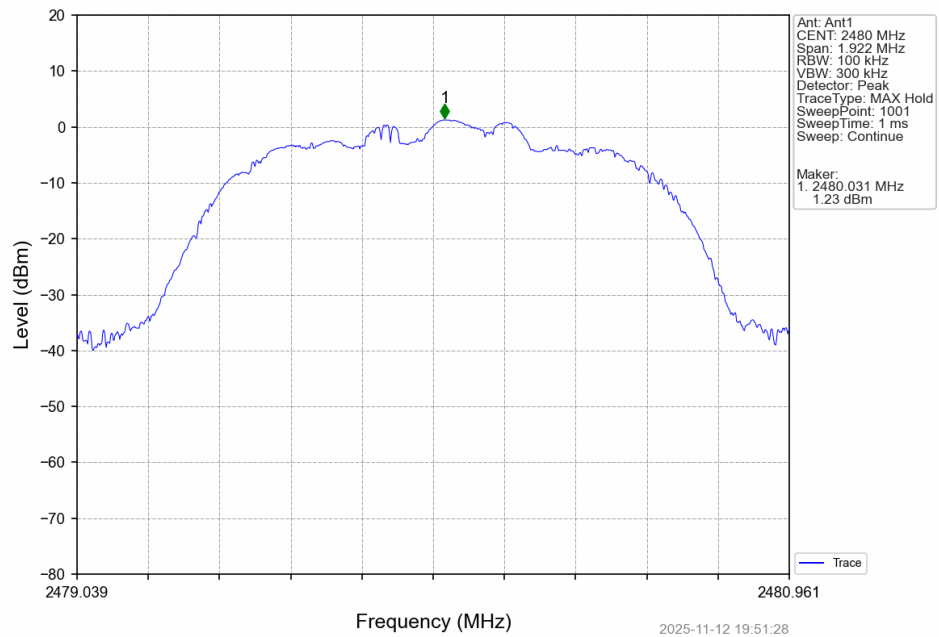
# 8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



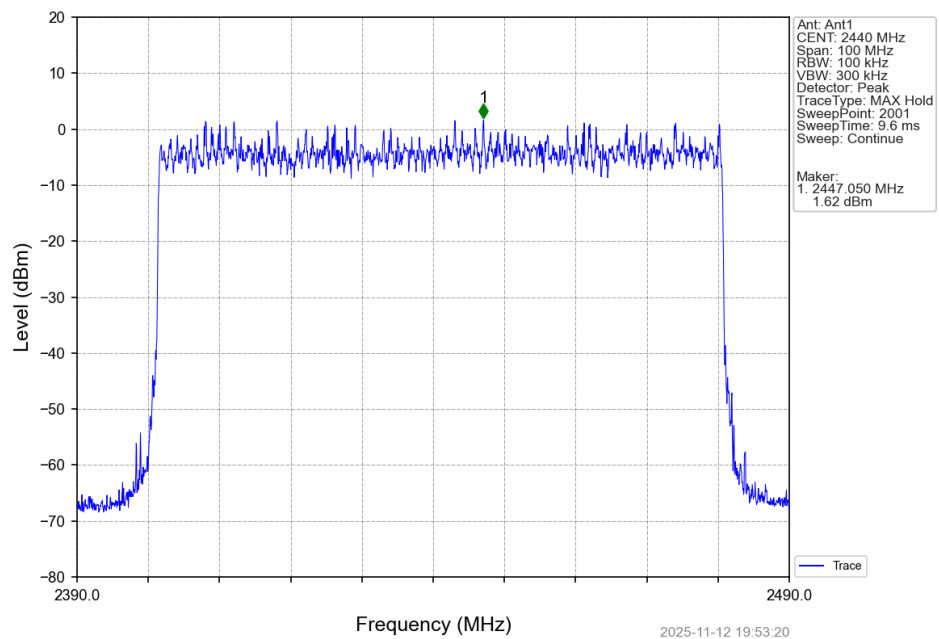
# 8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



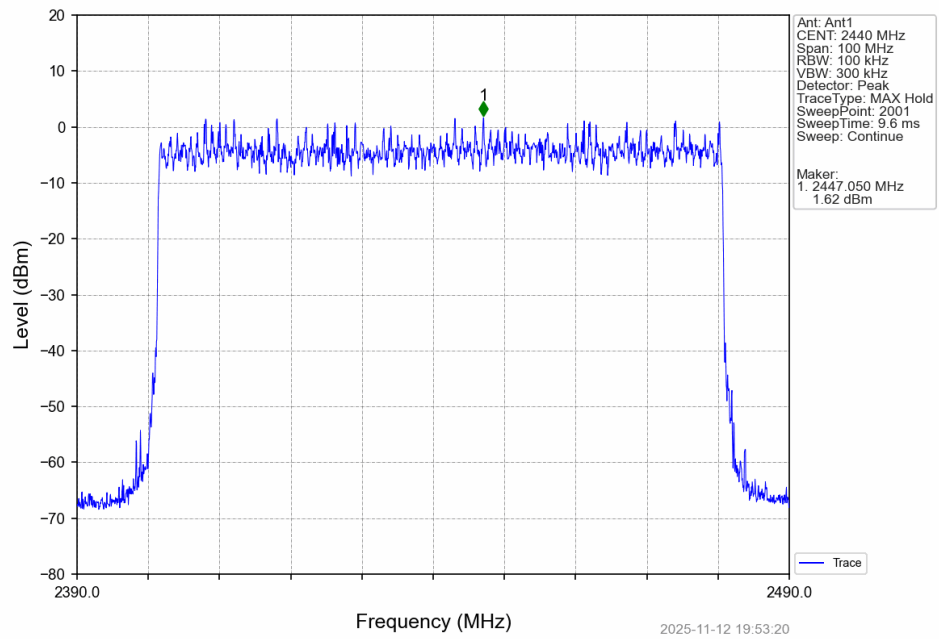
### 8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



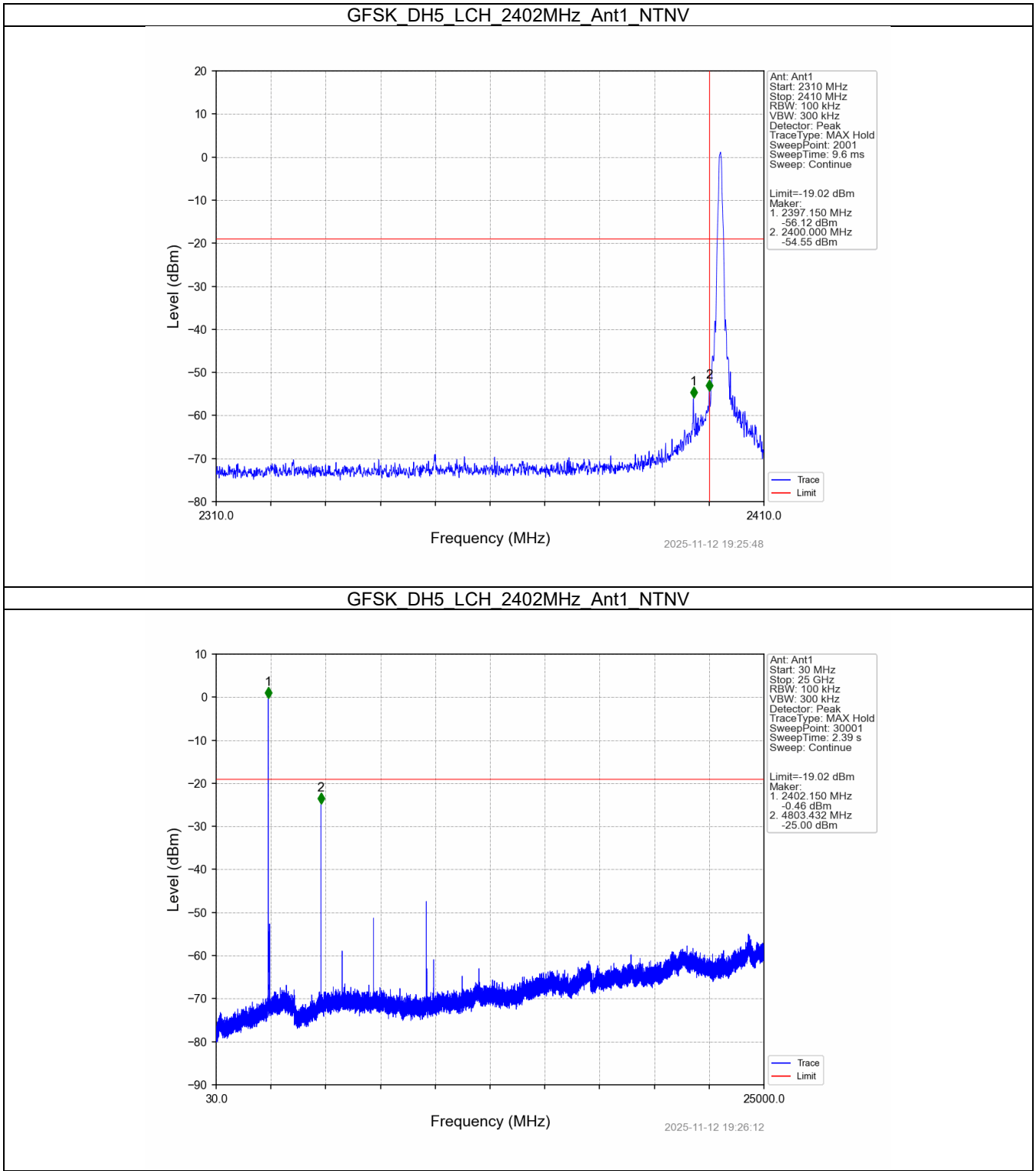
### 8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



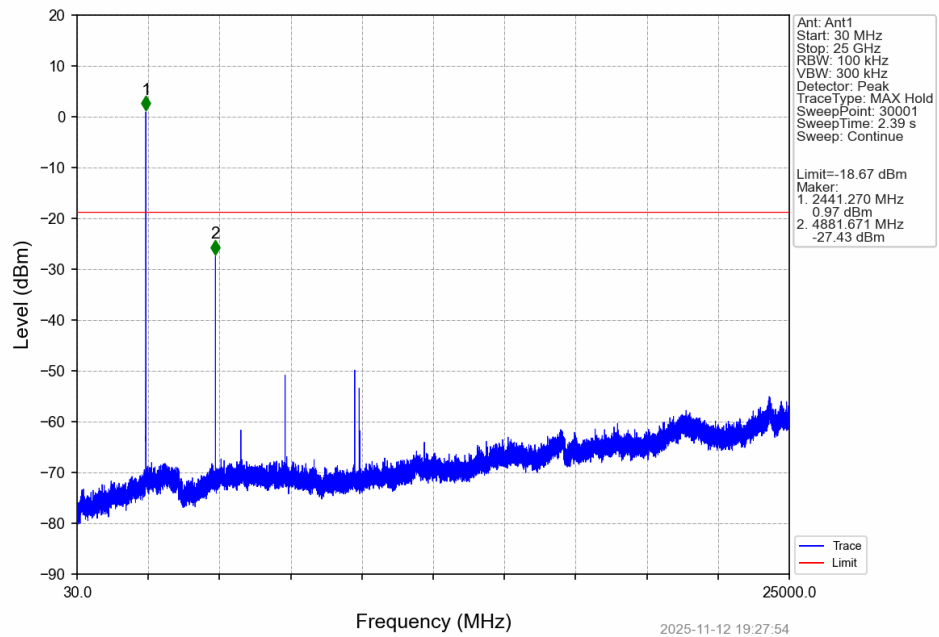
# 8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



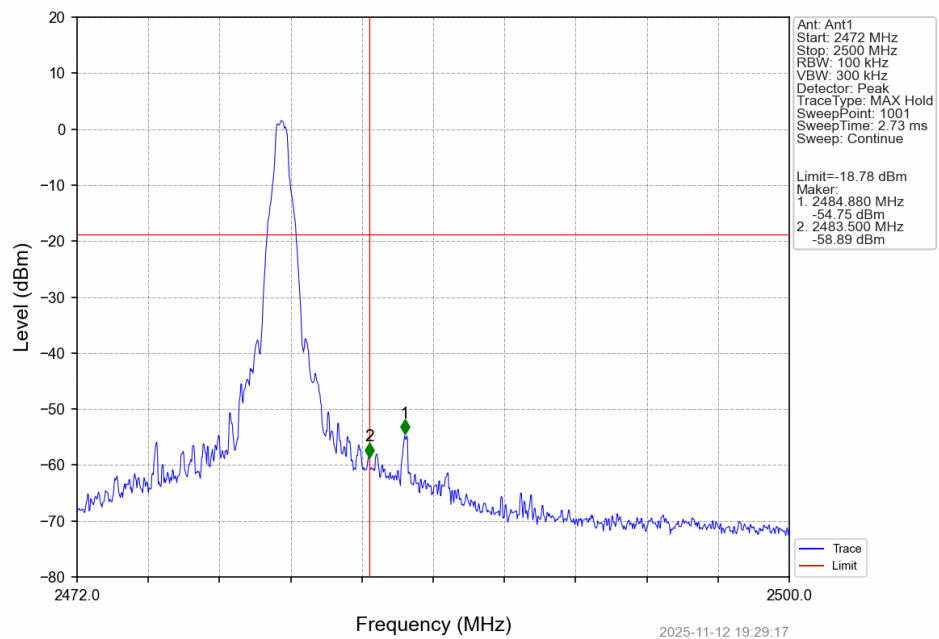
7.2.2 CSE



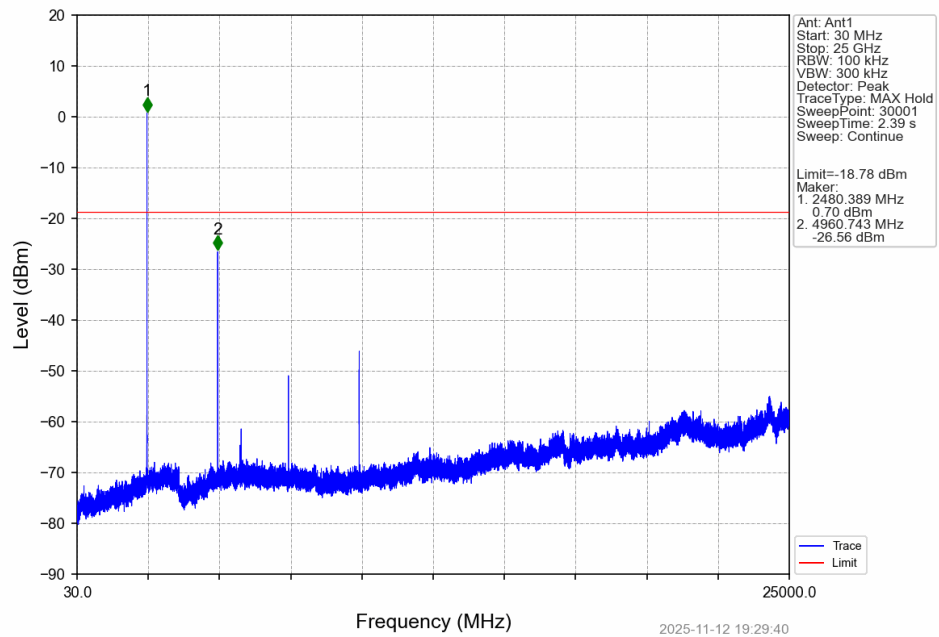
# GFSK\_DH5\_MCH\_2441MHz\_Ant1\_NTNV



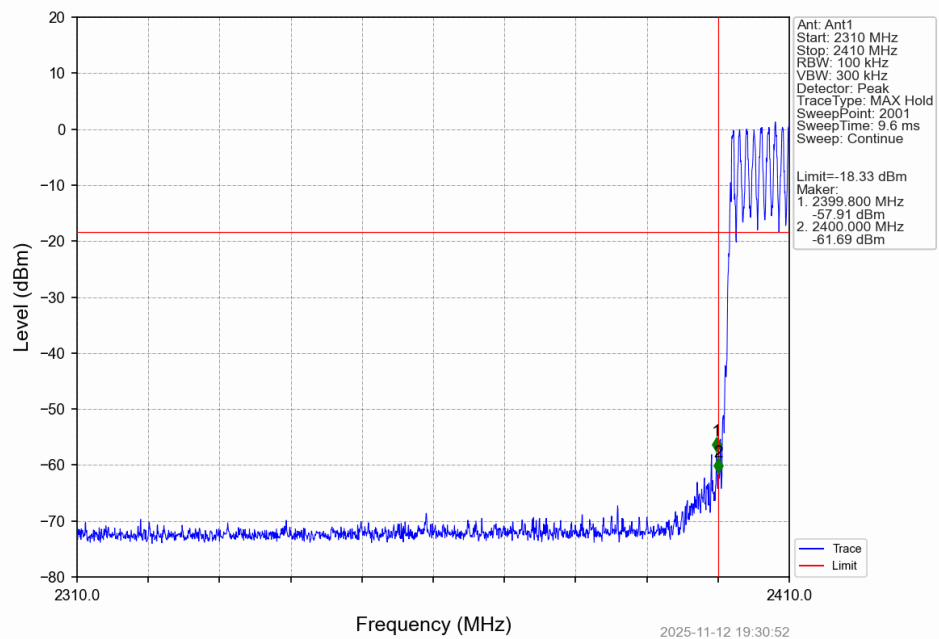
# GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



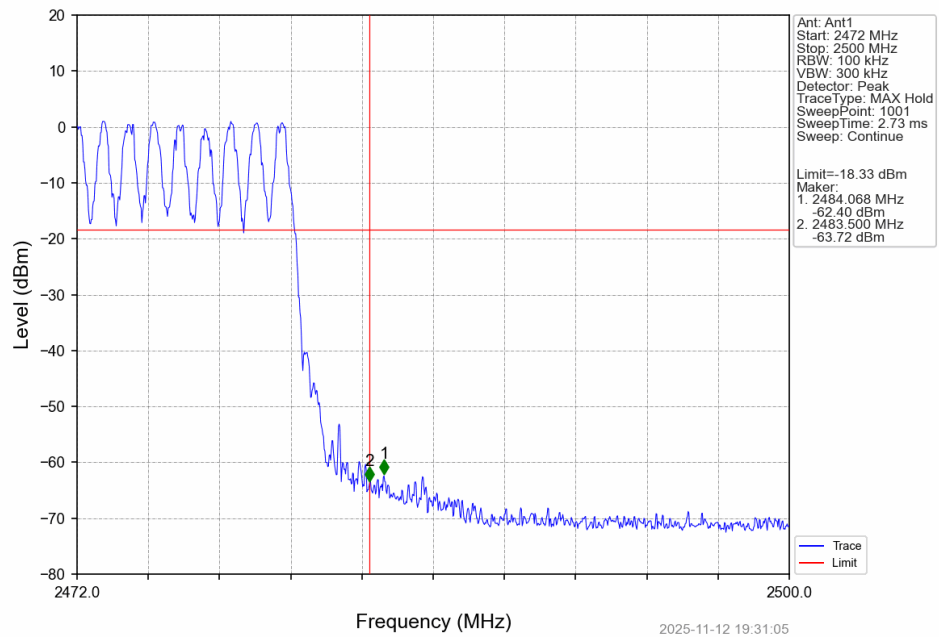
# GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



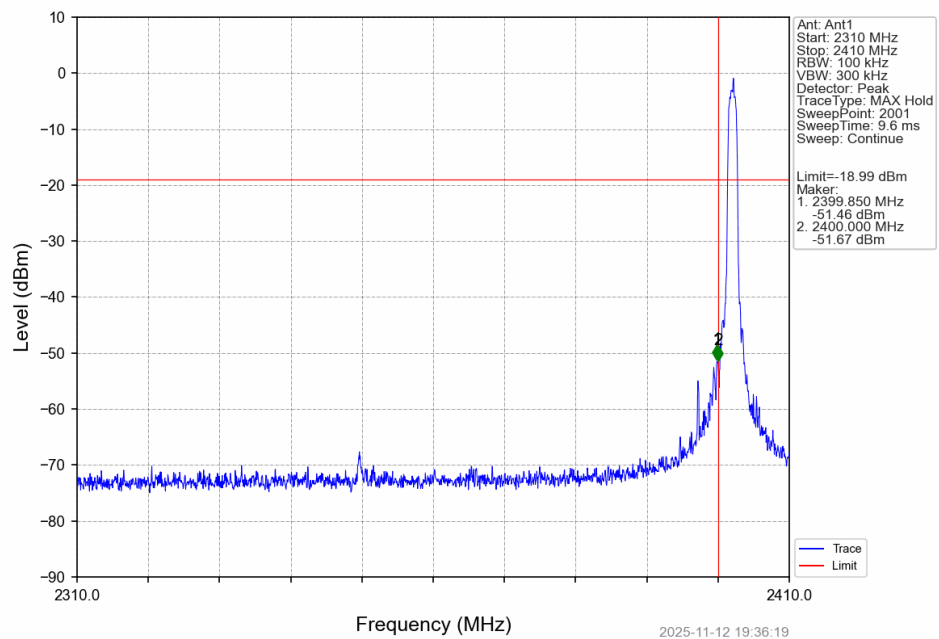
# GFSK\_DH5\_HOPP\_Ant1\_NTNV



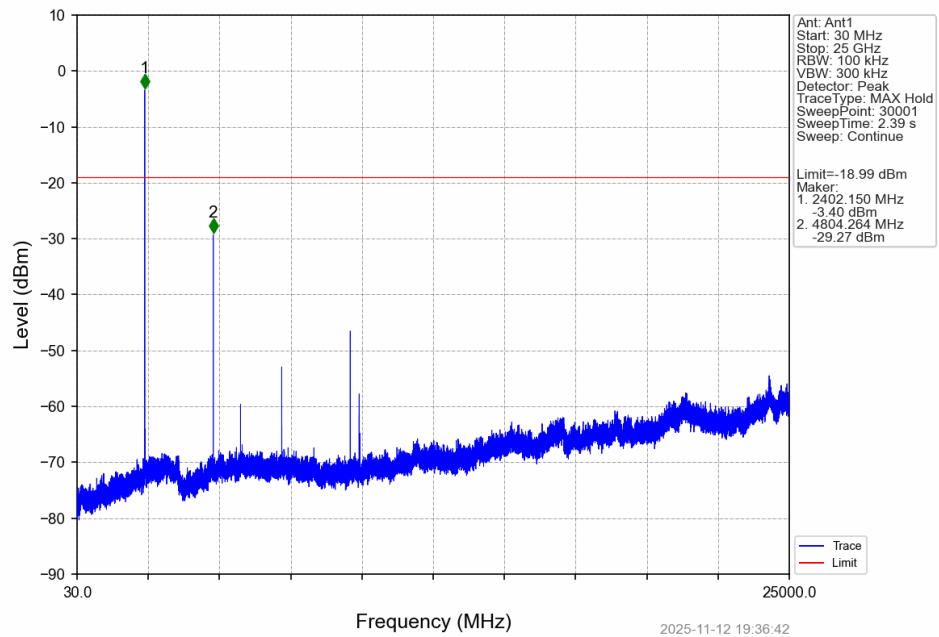
# GFSK\_DH5\_HOPP\_Ant1\_NTNV



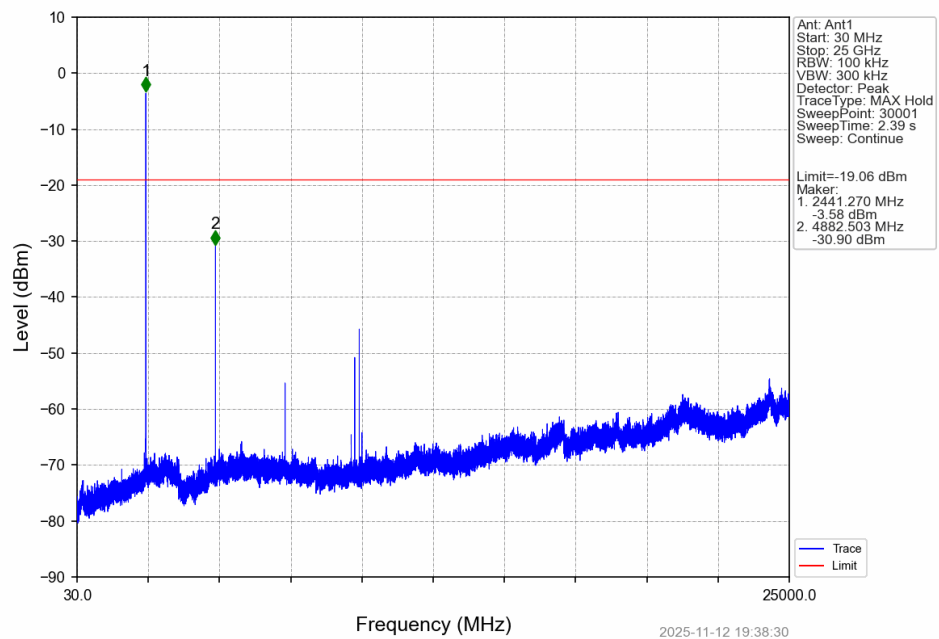
# Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



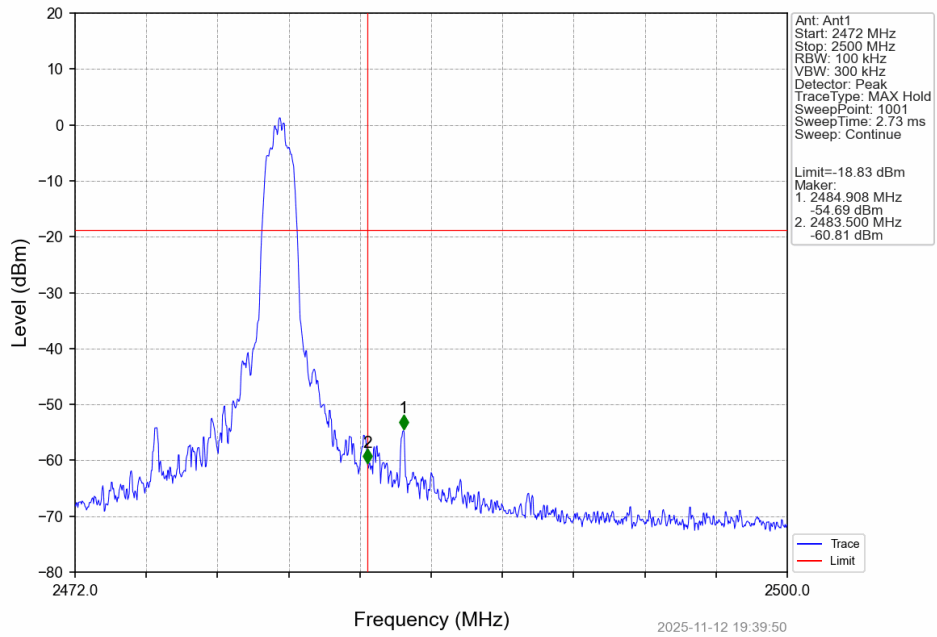
# Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



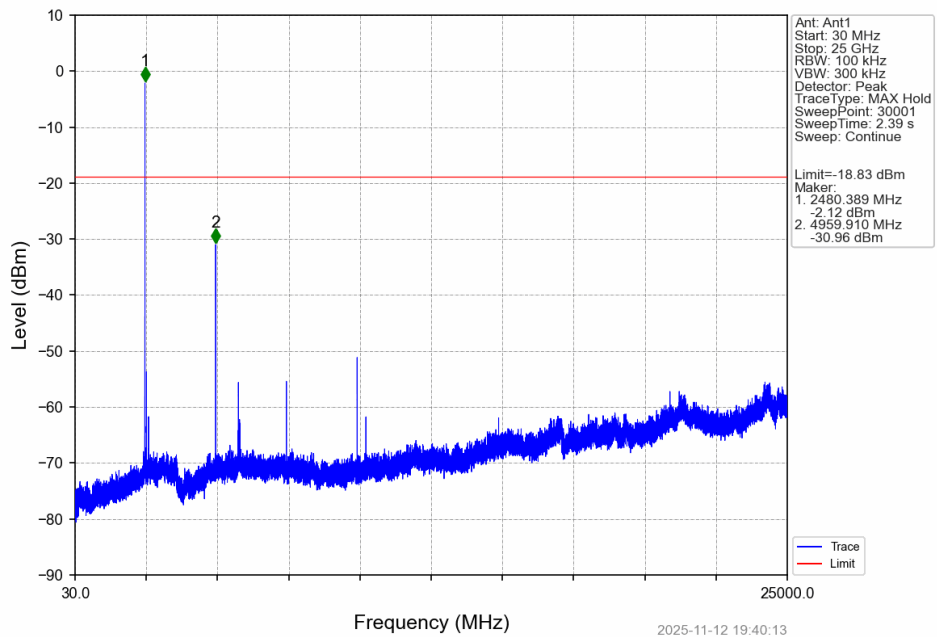
# Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



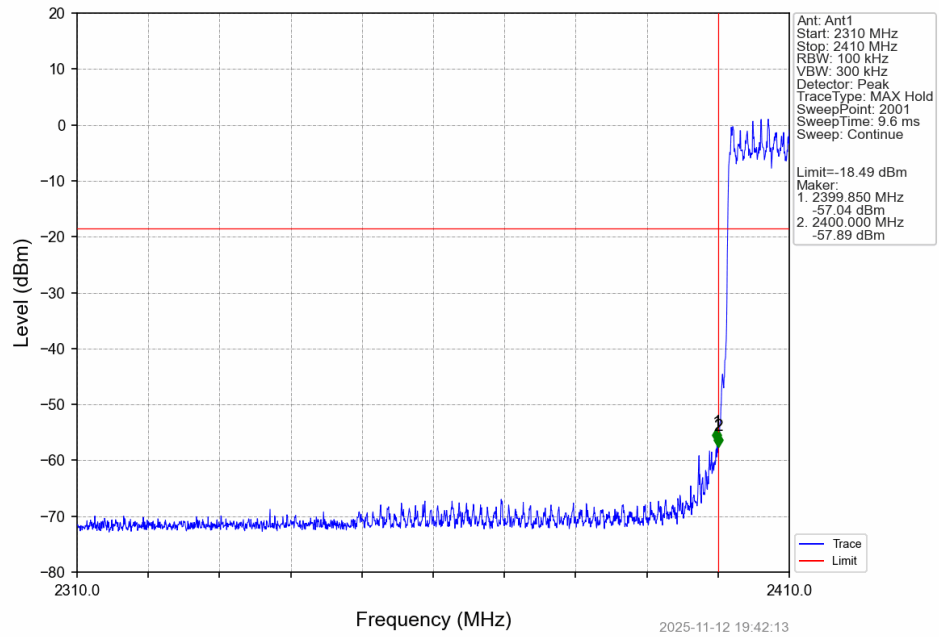
# Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



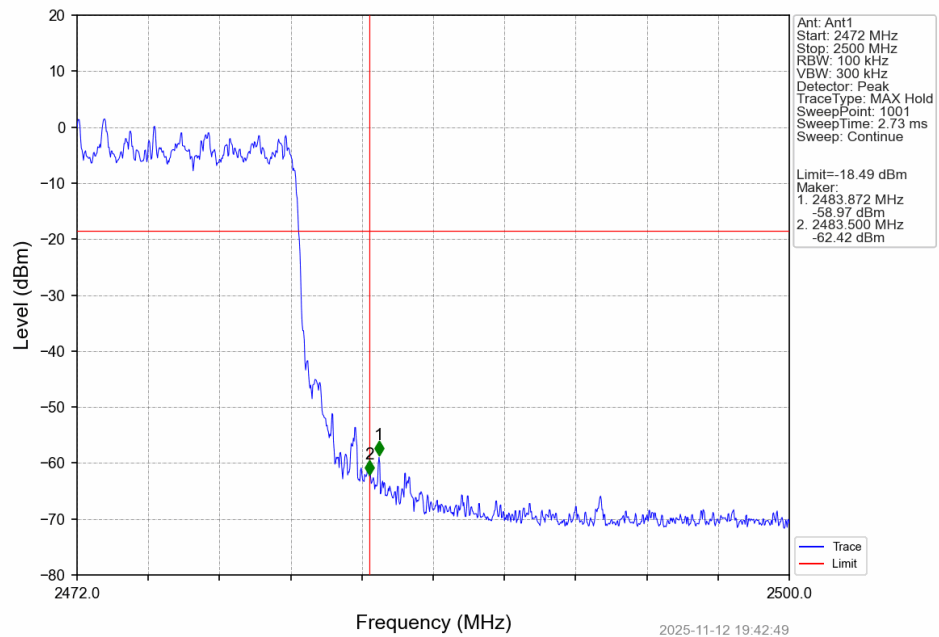
# Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



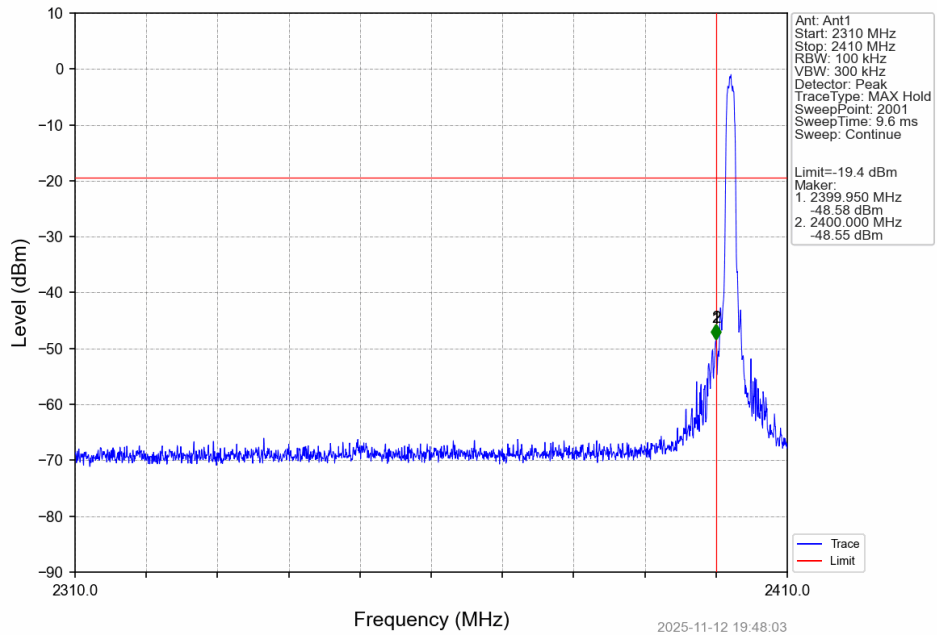
# Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



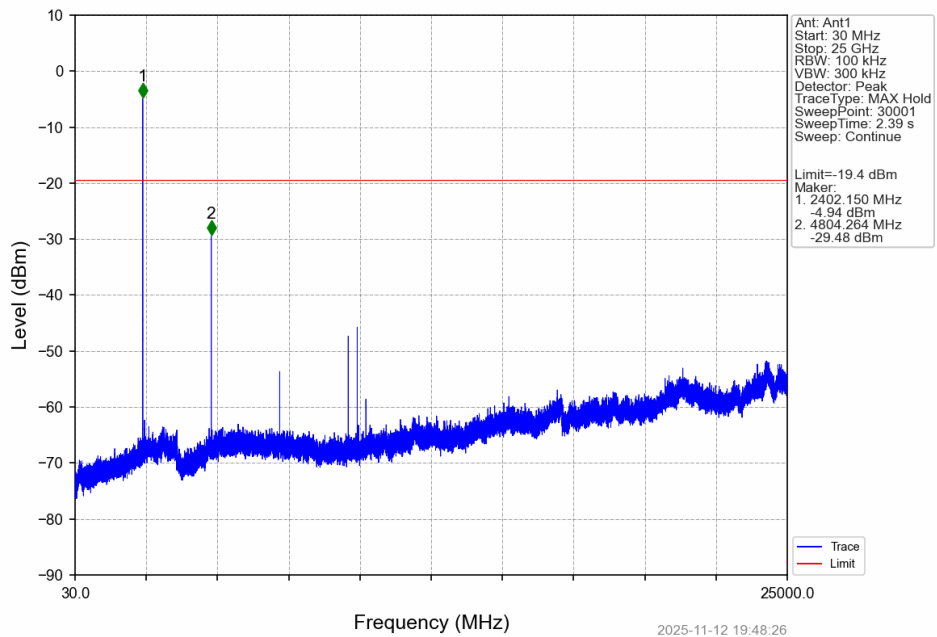
# Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



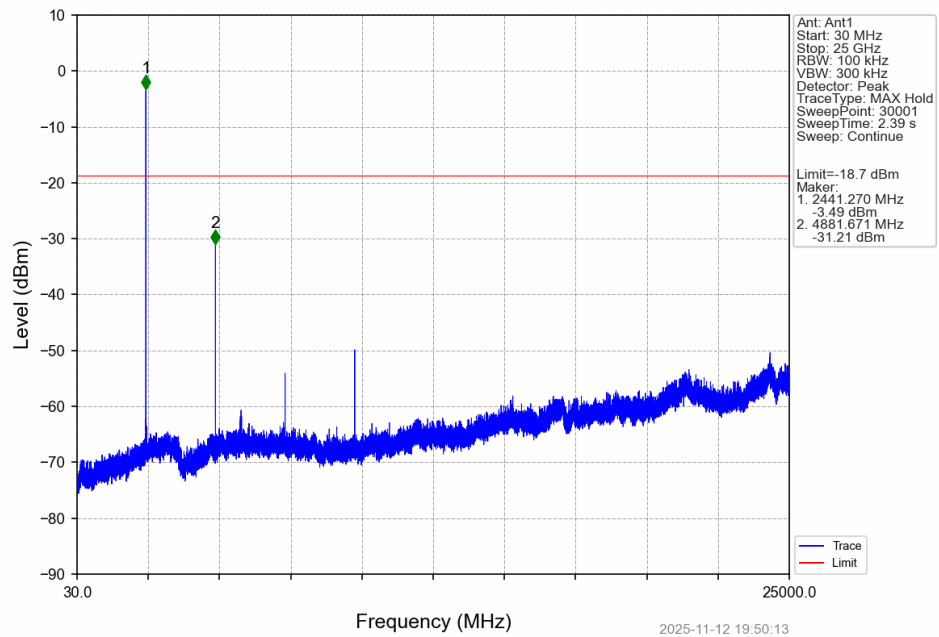
# 8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



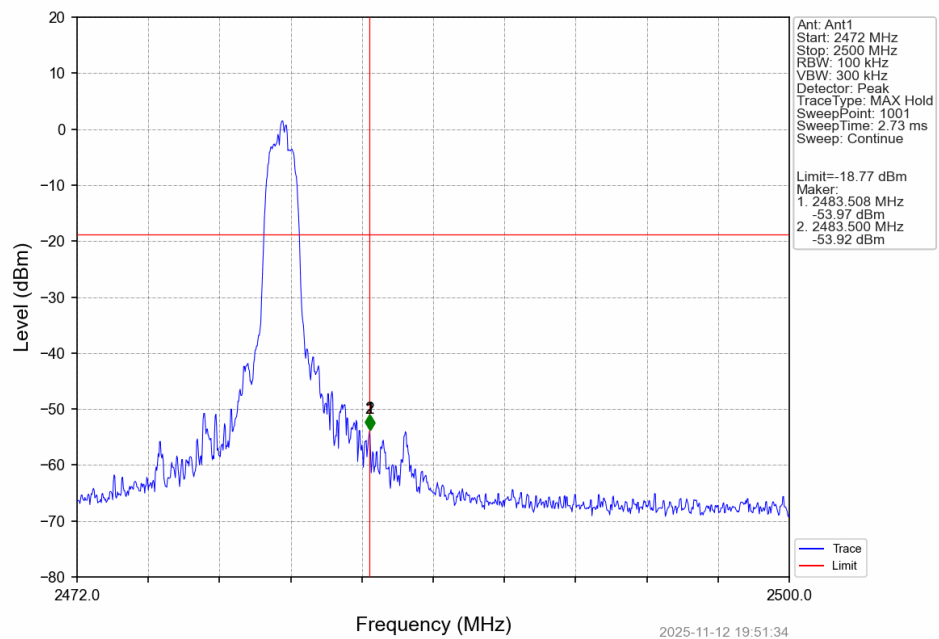
# 8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



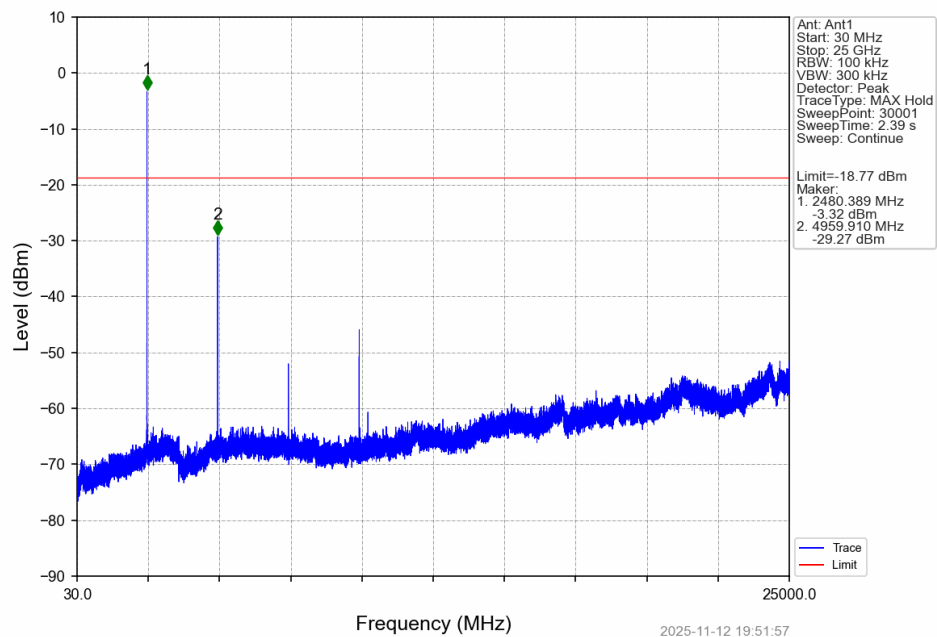
# 8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



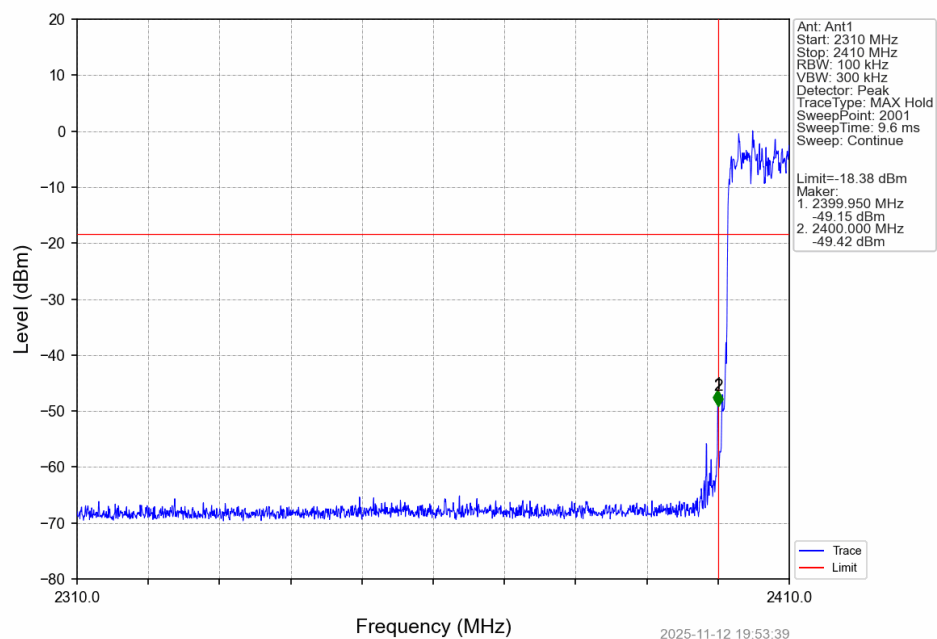
# 8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



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



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV

