

## **Appendix RF test data for BT**

## 1. Duty Cycle

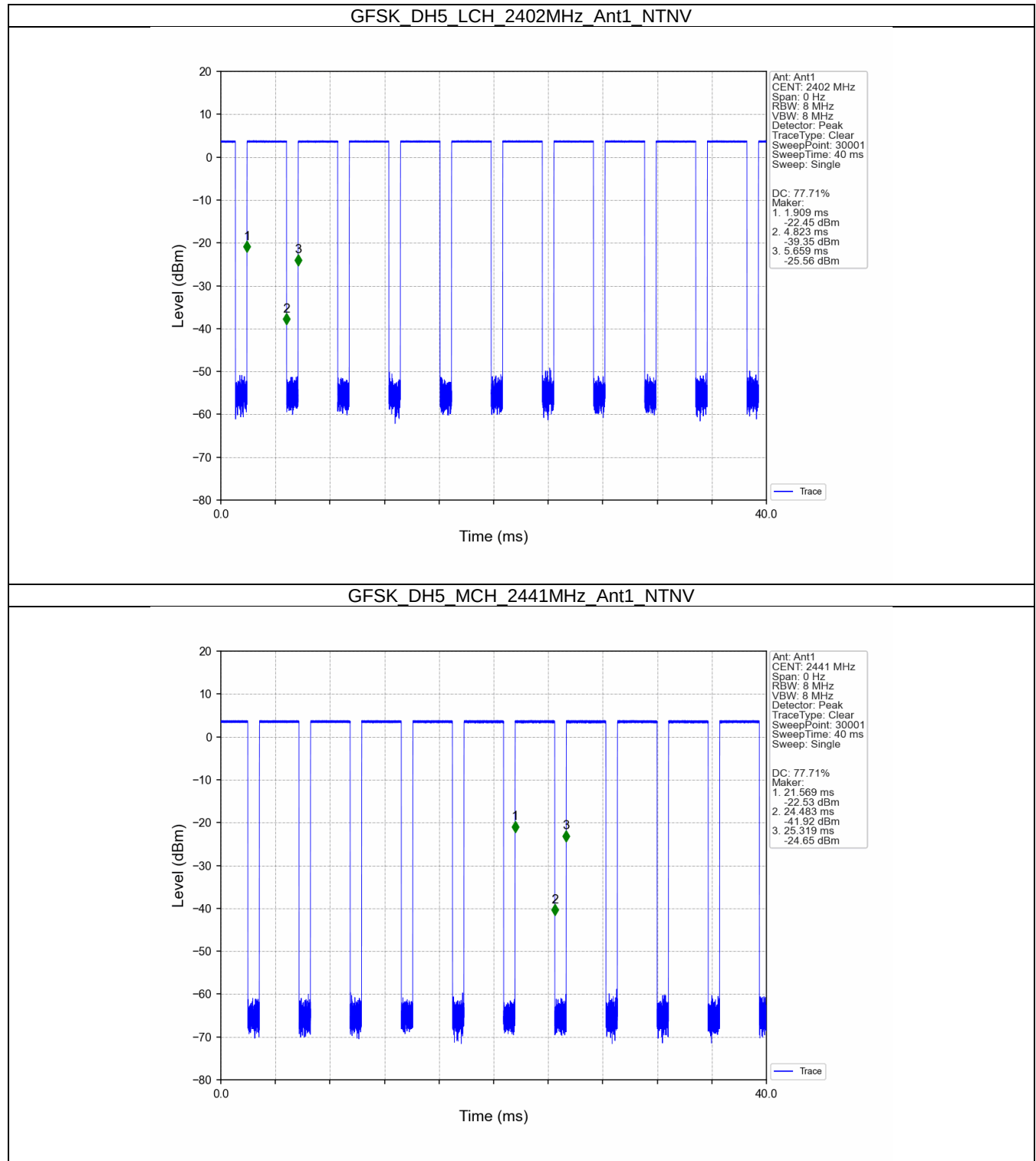
### 1.1 Test Result

#### 1.1.1 Ant1

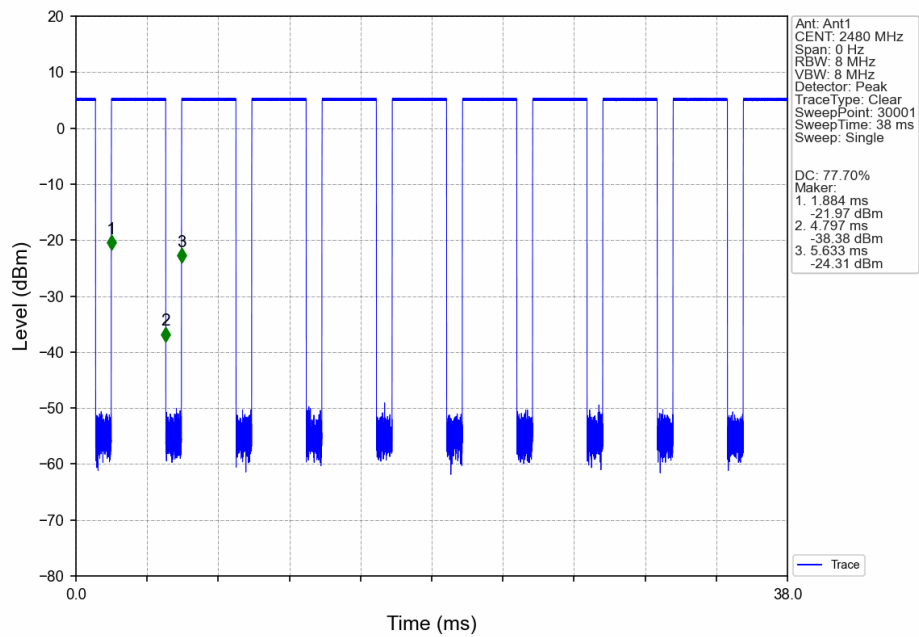
| Ant1      |         |                 |             |           |             |                |                                   |                       |
|-----------|---------|-----------------|-------------|-----------|-------------|----------------|-----------------------------------|-----------------------|
| 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         | 2.914     | 3.750       | 77.71          | 1.10                              | 0.04                  |
|           |         | 2441            | DH5         | 2.914     | 3.750       | 77.71          | 1.10                              | 0.04                  |
|           |         | 2480            | DH5         | 2.913     | 3.749       | 77.70          | 1.10                              | 0.03                  |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 2.920     | 3.751       | 77.85          | 1.09                              | 0.03                  |
|           |         | 2441            | 2DH5        | 2.920     | 3.751       | 77.85          | 1.09                              | 0.03                  |
|           |         | 2480            | 2DH5        | 2.920     | 3.751       | 77.85          | 1.09                              | 0.03                  |
| 8DPSK     | SISO    | 2402            | 3DH5        | 2.922     | 3.749       | 77.94          | 1.08                              | 0.03                  |
|           |         | 2441            | 3DH5        | 2.923     | 3.750       | 77.95          | 1.08                              | 0.01                  |
|           |         | 2480            | 3DH5        | 2.922     | 3.749       | 77.94          | 1.08                              | 0.03                  |

## 1.2 Test Graph

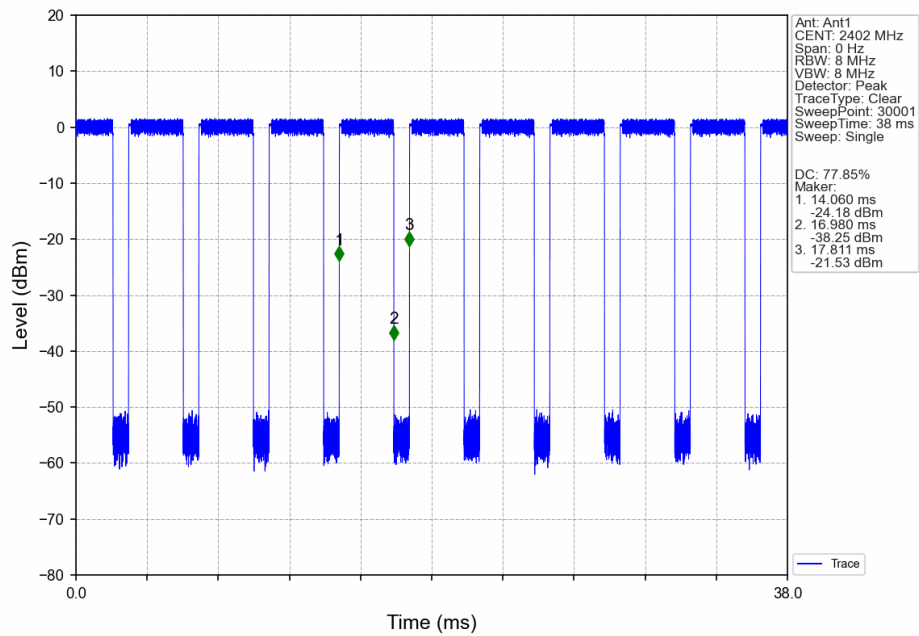
### 1.2.1 Ant1



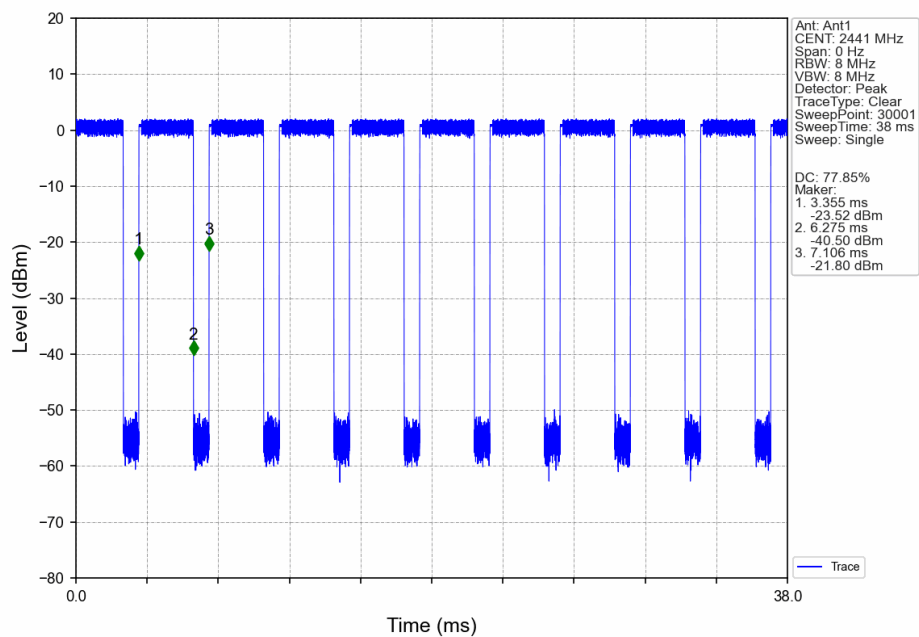
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



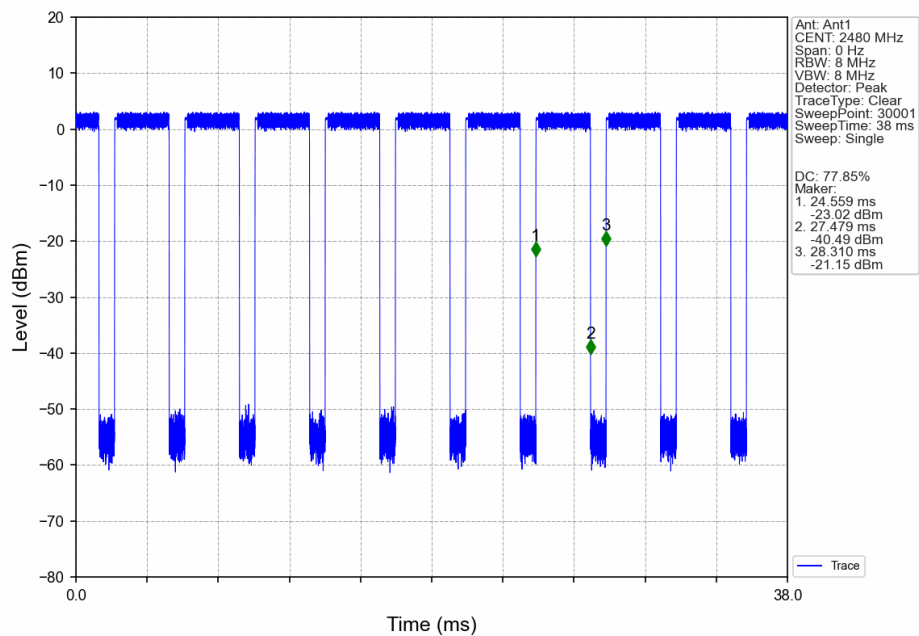
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



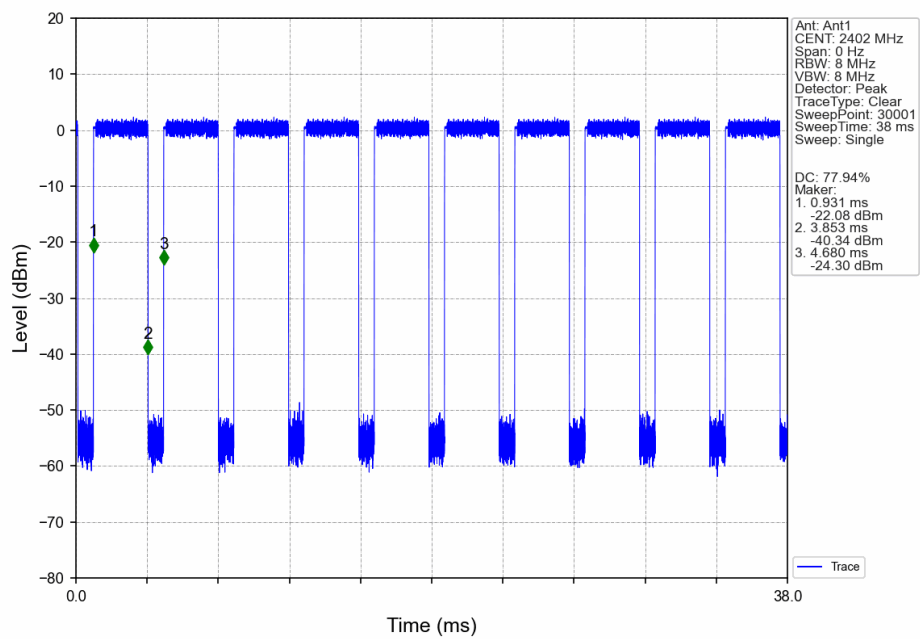
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



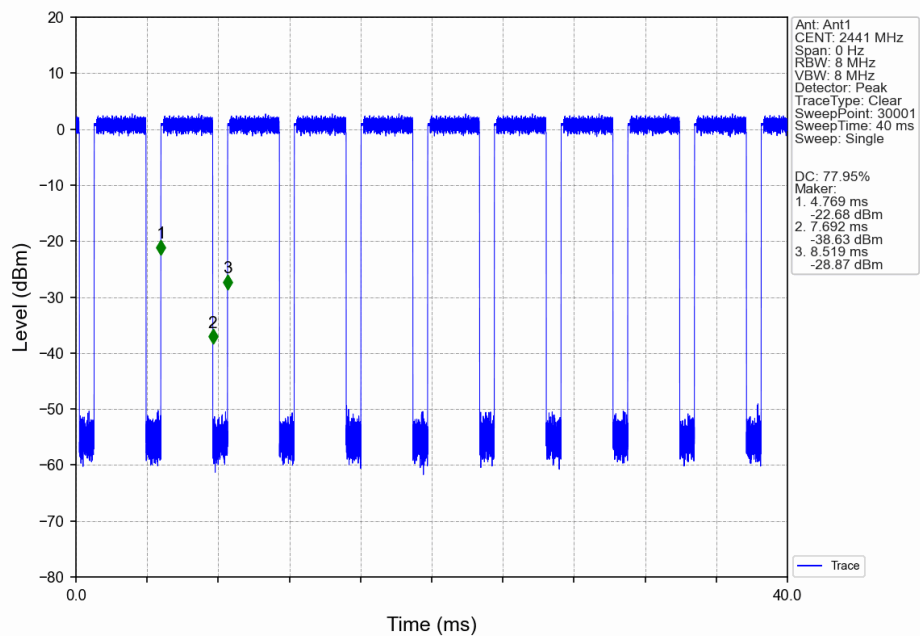
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

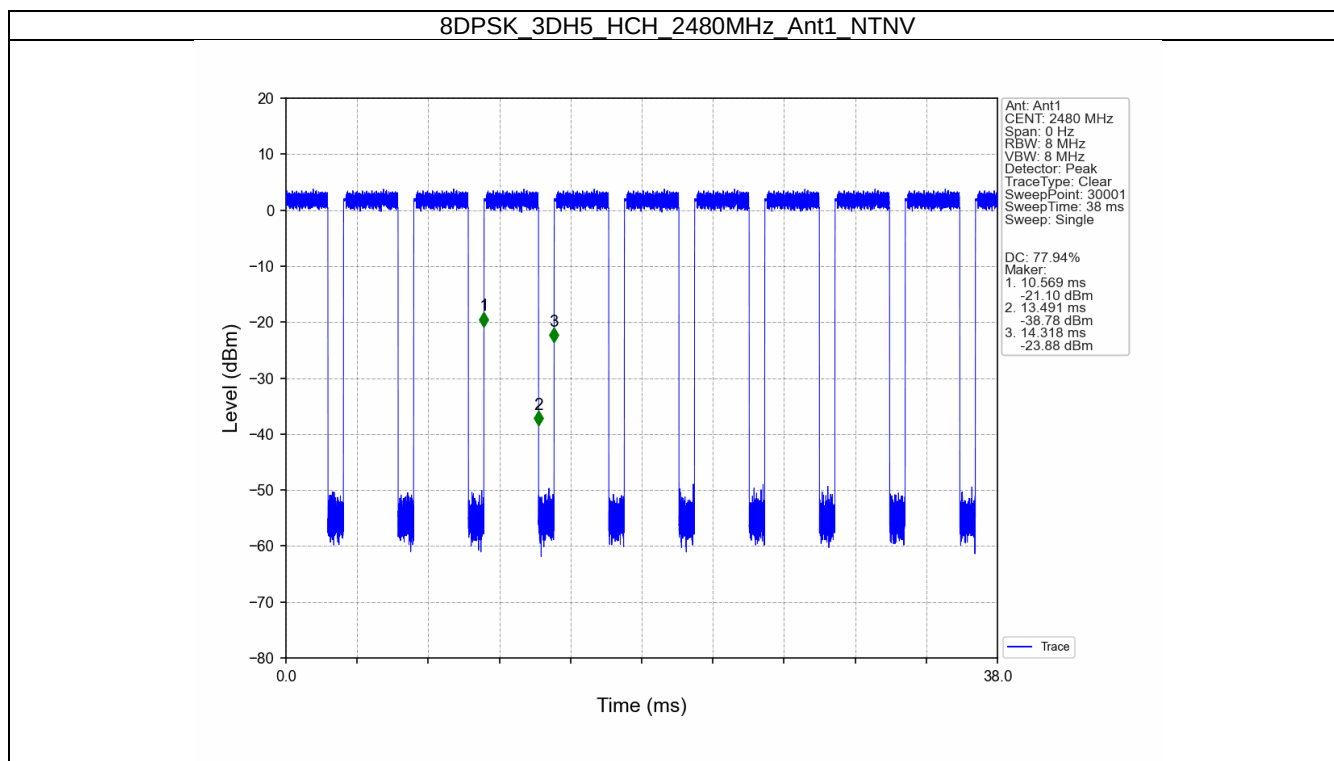


8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



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





## 2. Bandwidth

### 2.1 Test Result

#### 2.1.1 OBW

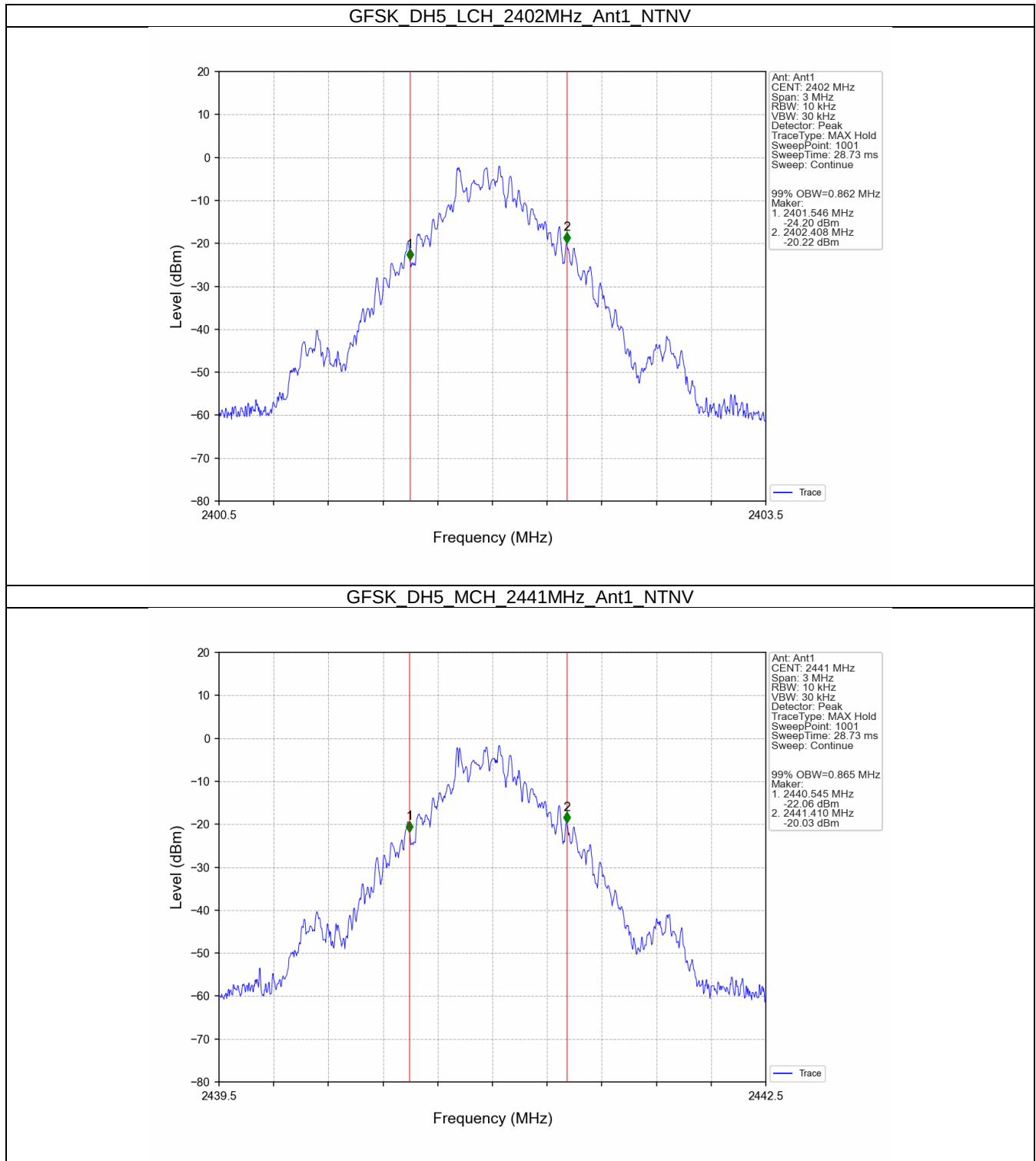
| Mode      | TX Type | Frequency (MHz) | Packet Type | ANT | 99% Occupied Bandwidth (MHz) |       | Verdict |
|-----------|---------|-----------------|-------------|-----|------------------------------|-------|---------|
|           |         |                 |             |     | Result                       | Limit |         |
| GFSK      | SISO    | 2402            | DH5         | 1   | 0.862                        | /     | Pass    |
|           |         | 2441            | DH5         | 1   | 0.865                        | /     | Pass    |
|           |         | 2480            | DH5         | 1   | 0.864                        | /     | Pass    |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 1   | 1.166                        | /     | Pass    |
|           |         | 2441            | 2DH5        | 1   | 1.166                        | /     | Pass    |
|           |         | 2480            | 2DH5        | 1   | 1.158                        | /     | Pass    |
| 8DPSK     | SISO    | 2402            | 3DH5        | 1   | 1.166                        | /     | Pass    |
|           |         | 2441            | 3DH5        | 1   | 1.166                        | /     | Pass    |
|           |         | 2480            | 3DH5        | 1   | 1.166                        | /     | Pass    |

#### 2.1.2 20dB BW

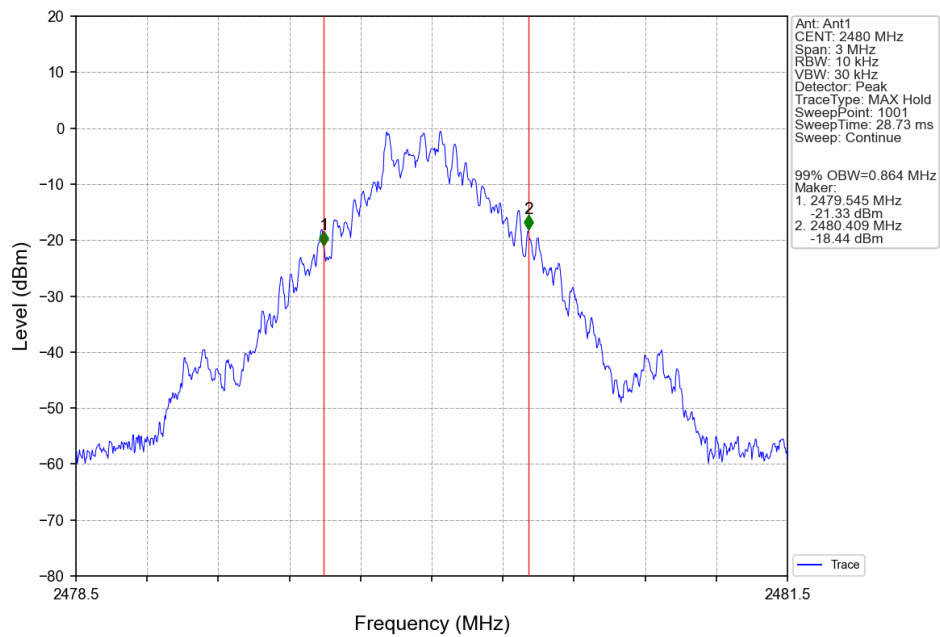
| Mode      | TX Type | Frequency (MHz) | Packet Type | ANT | 20dB Bandwidth (MHz) |       | Verdict |
|-----------|---------|-----------------|-------------|-----|----------------------|-------|---------|
|           |         |                 |             |     | Result               | Limit |         |
| GFSK      | SISO    | 2402            | DH5         | 1   | 0.927                | /     | Pass    |
|           |         | 2441            | DH5         | 1   | 0.929                | /     | Pass    |
|           |         | 2480            | DH5         | 1   | 0.930                | /     | Pass    |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 1   | 1.261                | /     | Pass    |
|           |         | 2441            | 2DH5        | 1   | 1.264                | /     | Pass    |
|           |         | 2480            | 2DH5        | 1   | 1.260                | /     | Pass    |
| 8DPSK     | SISO    | 2402            | 3DH5        | 1   | 1.257                | /     | Pass    |
|           |         | 2441            | 3DH5        | 1   | 1.279                | /     | Pass    |
|           |         | 2480            | 3DH5        | 1   | 1.260                | /     | Pass    |

## 2.2 Test Graph

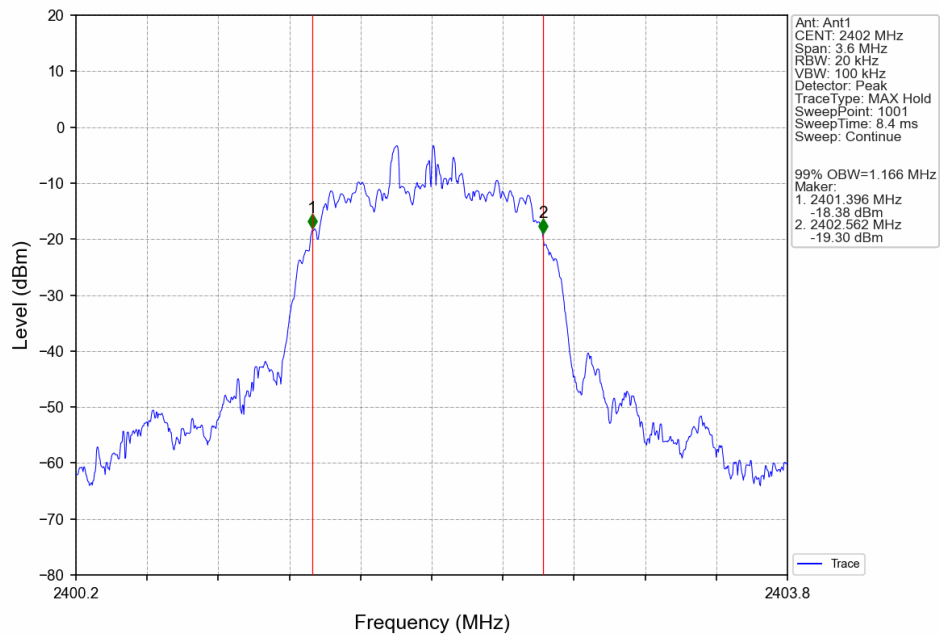
### 2.2.1 OBW



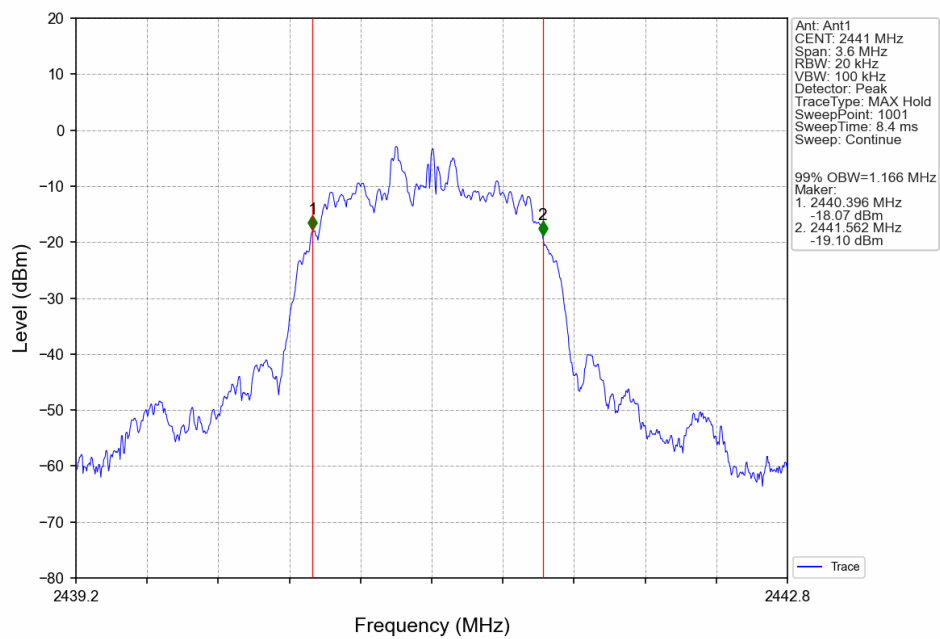
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



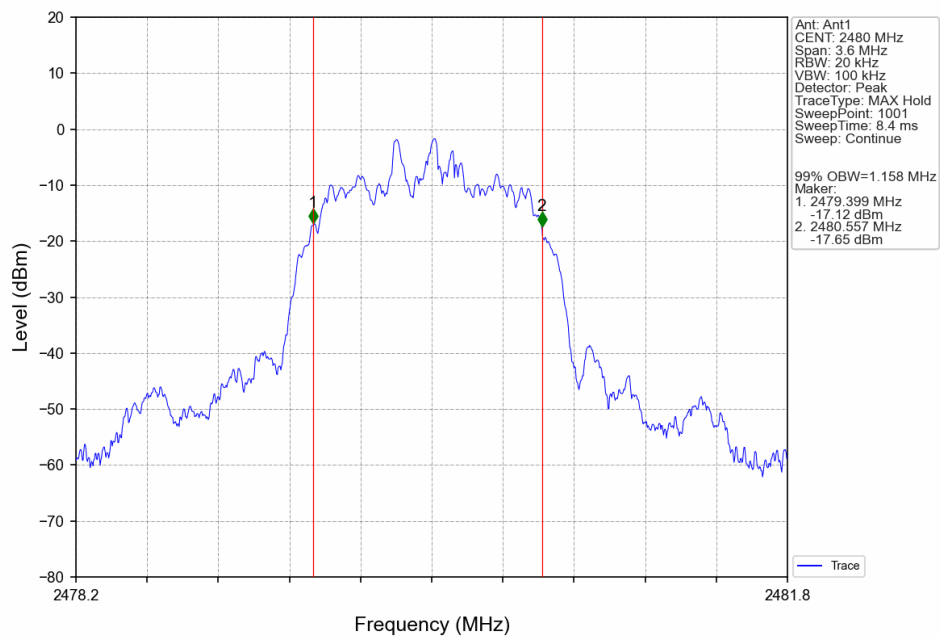
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



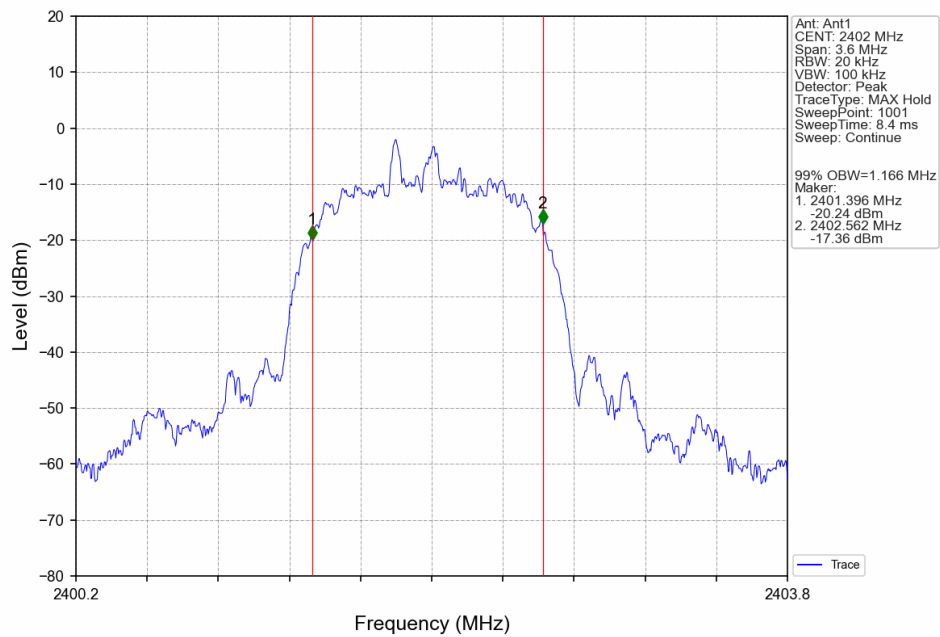
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



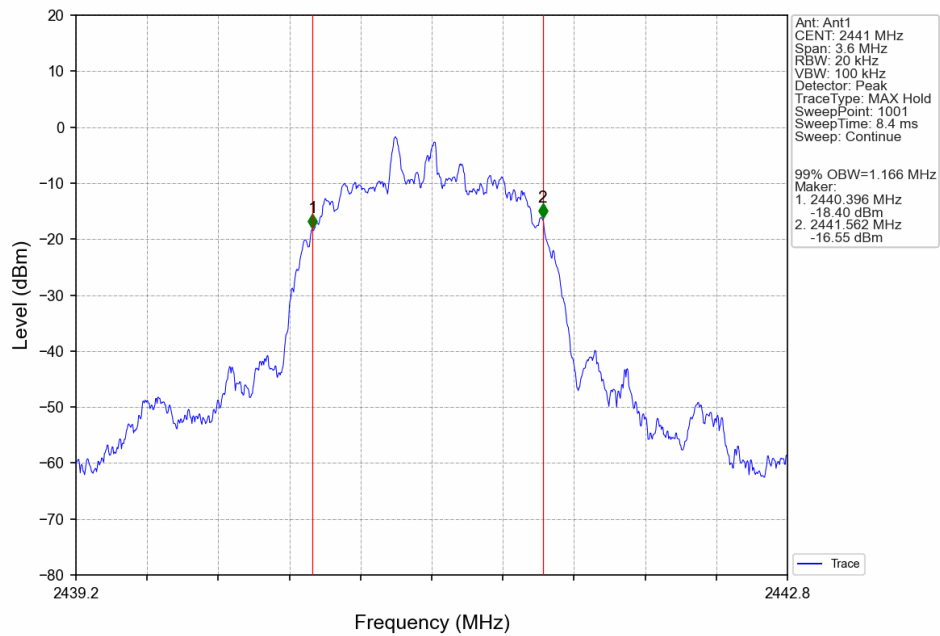
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

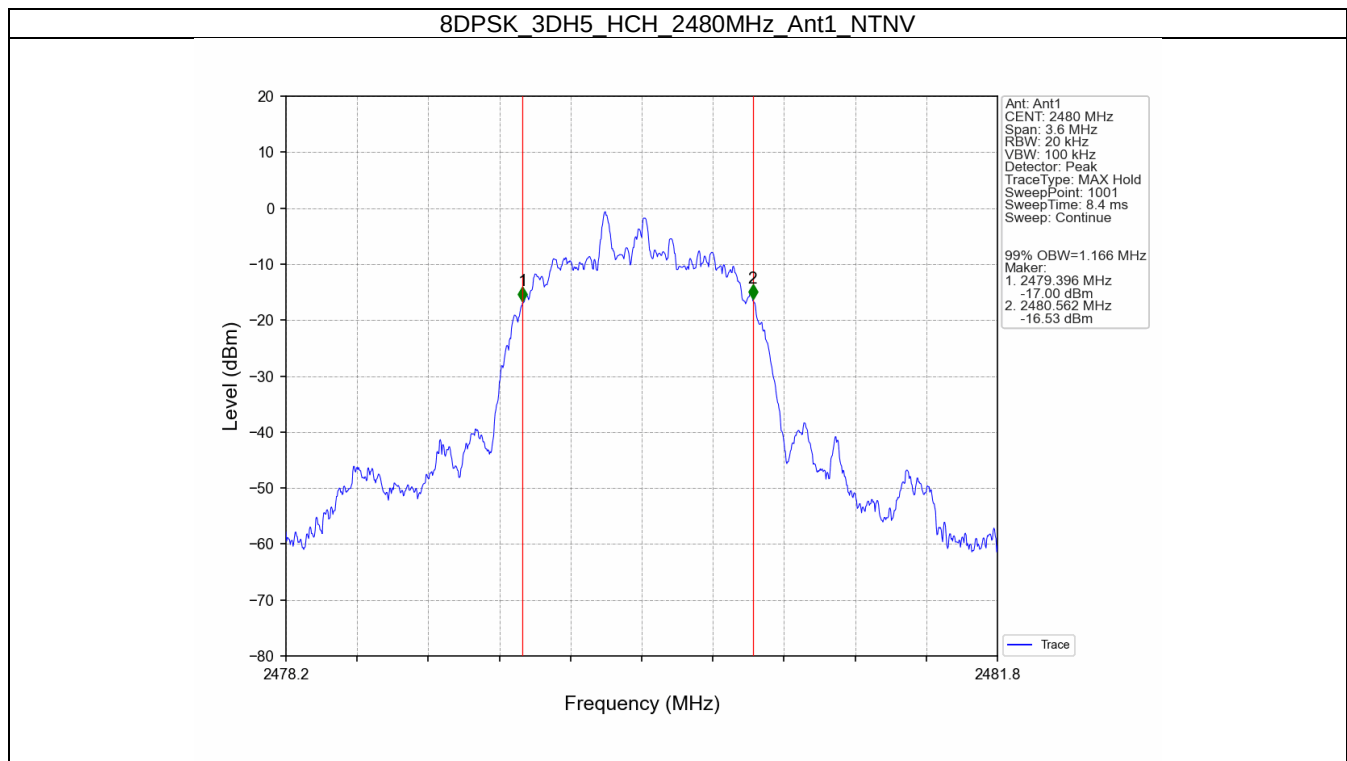


8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV

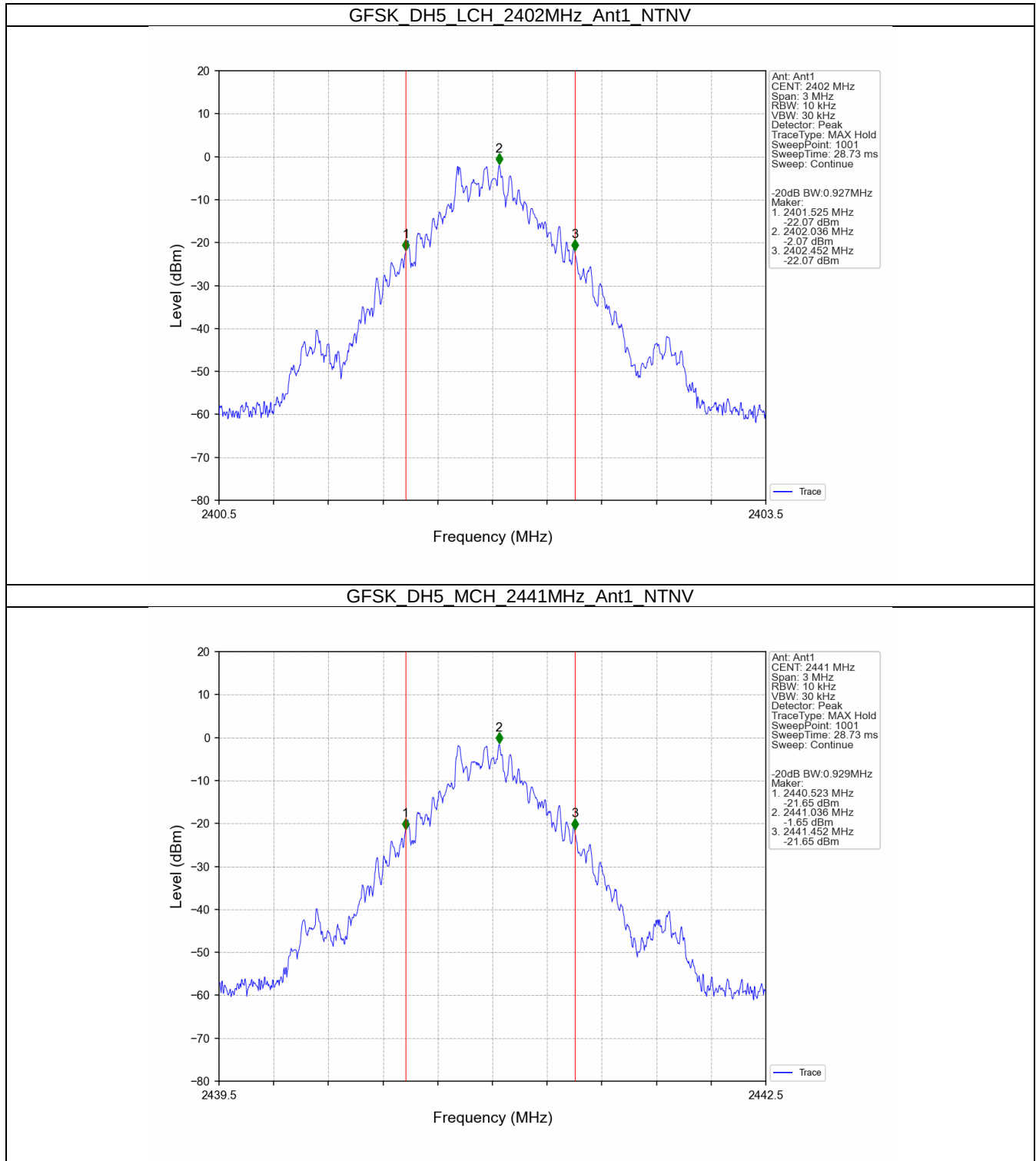


8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV

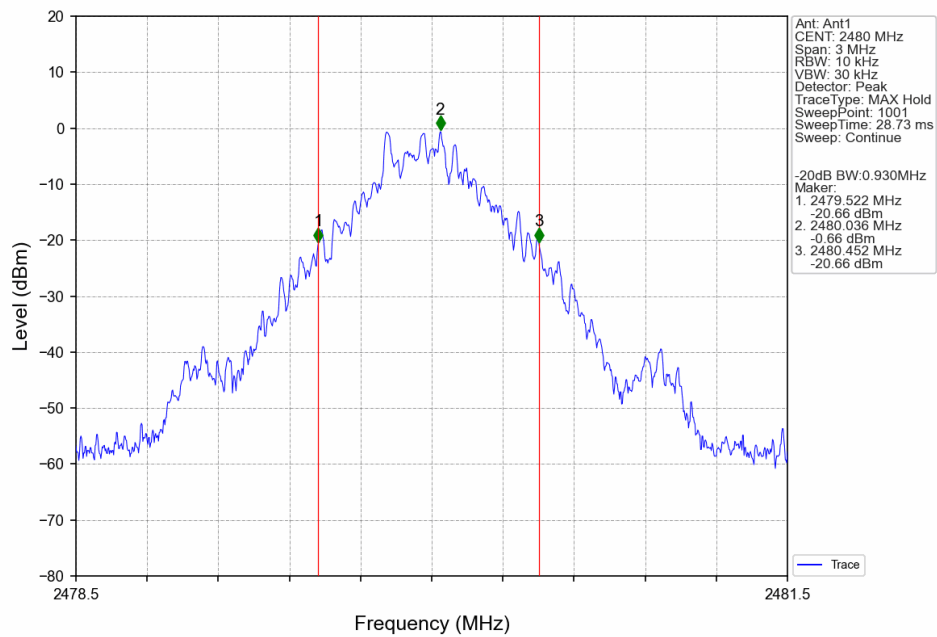




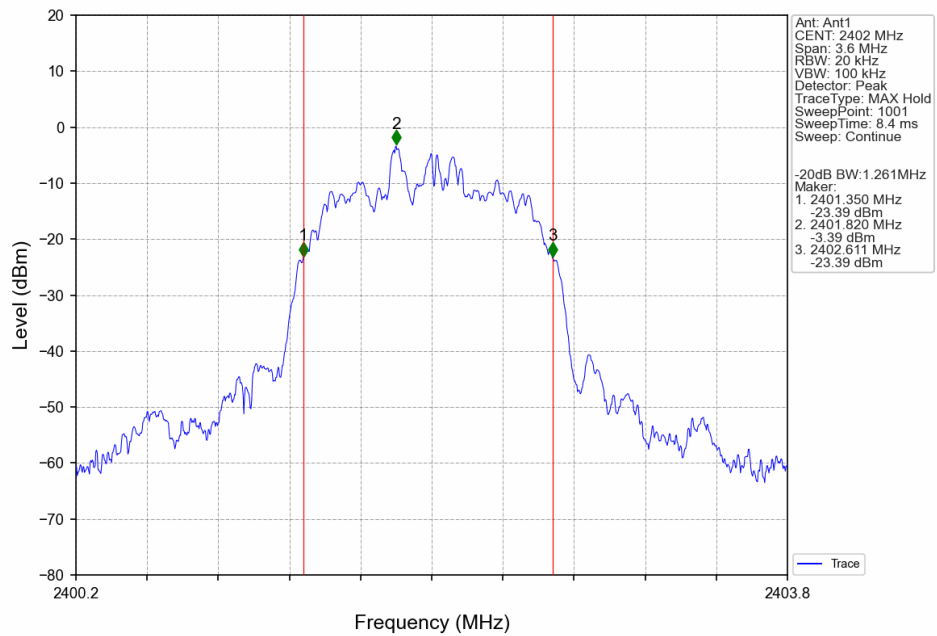
## 2.2.2 20dB BW



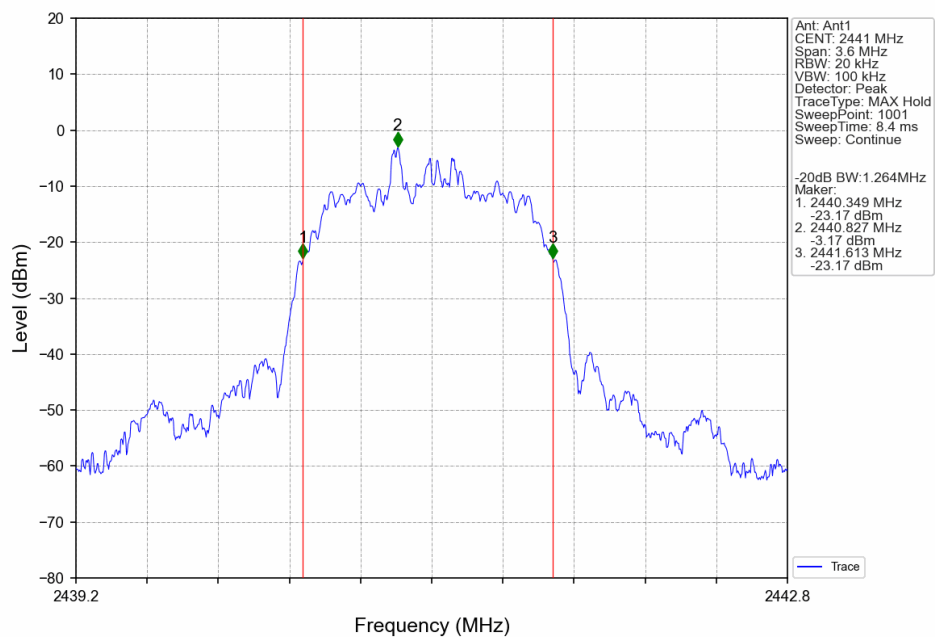
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



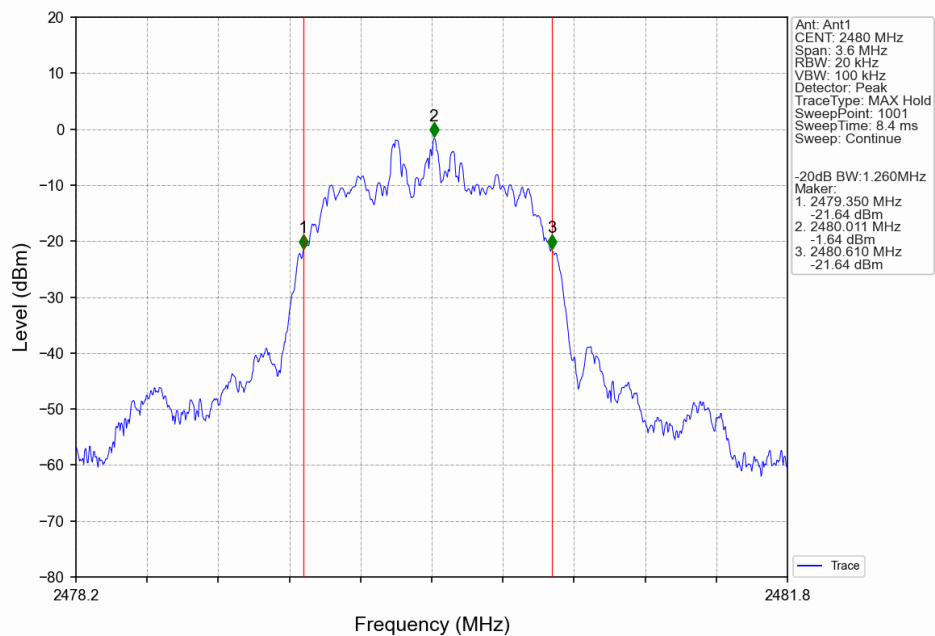
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



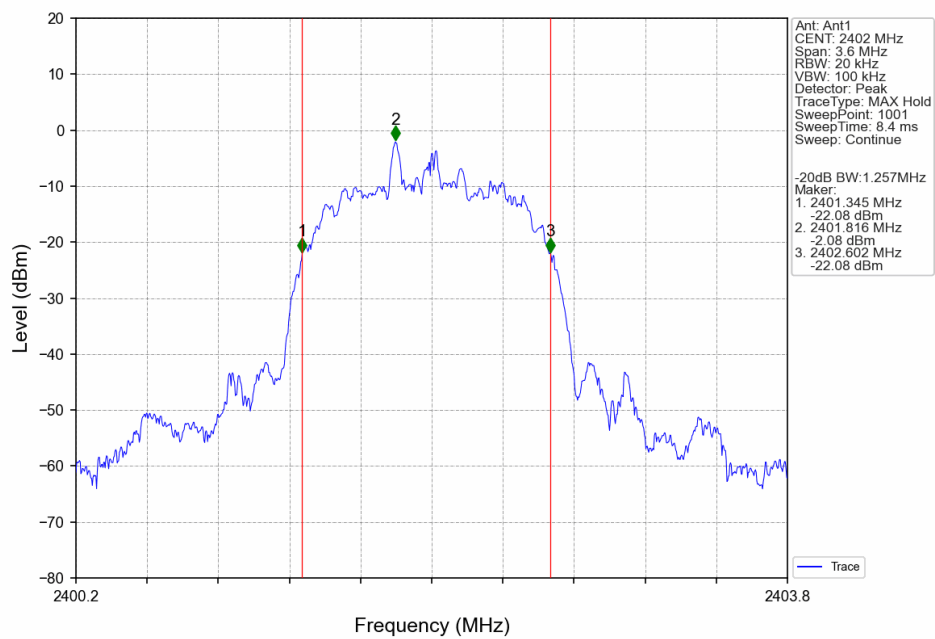
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



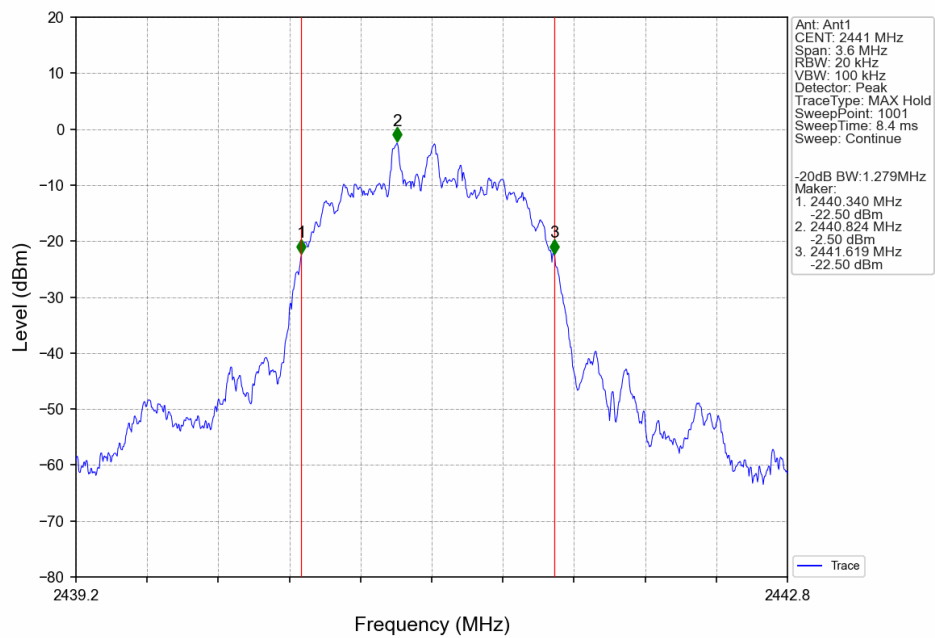
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

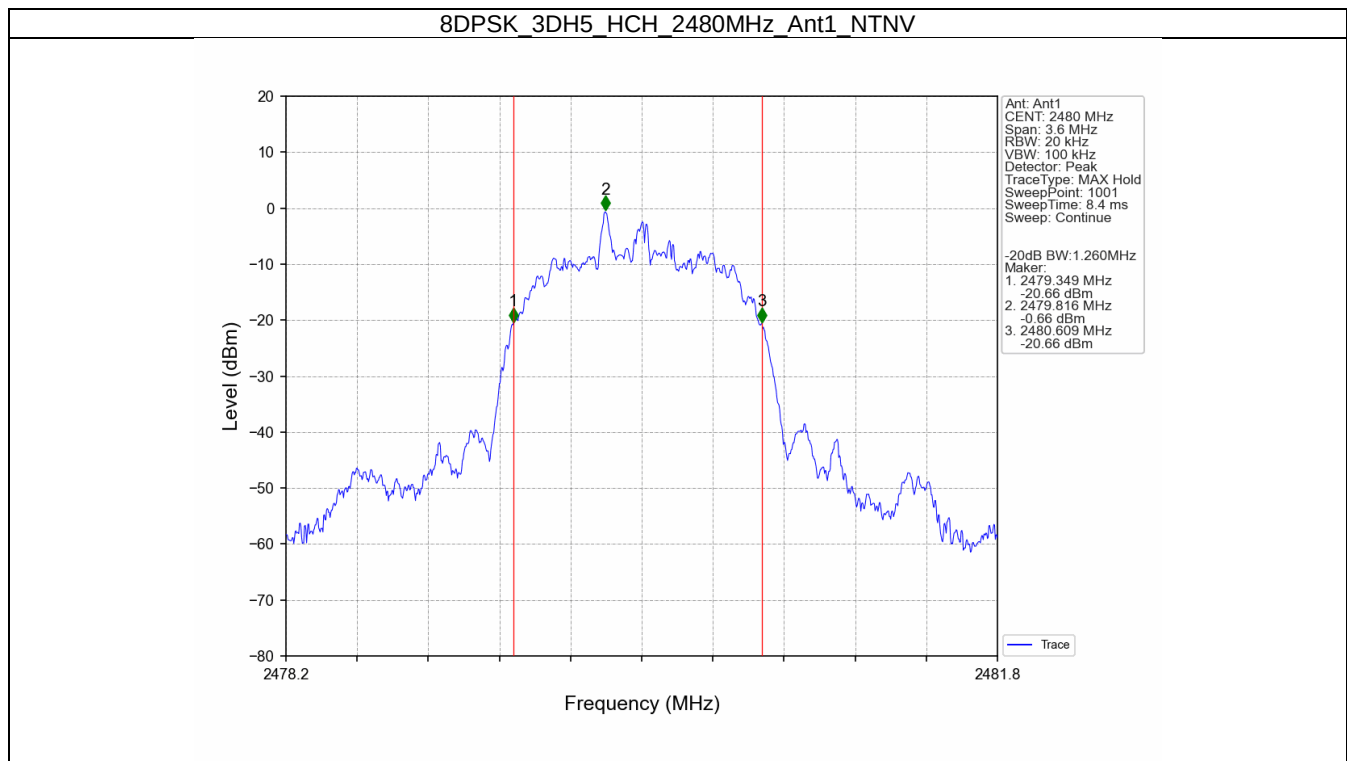


8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



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





### 3. Maximum Conducted Output Power

### 3.1 Test Result

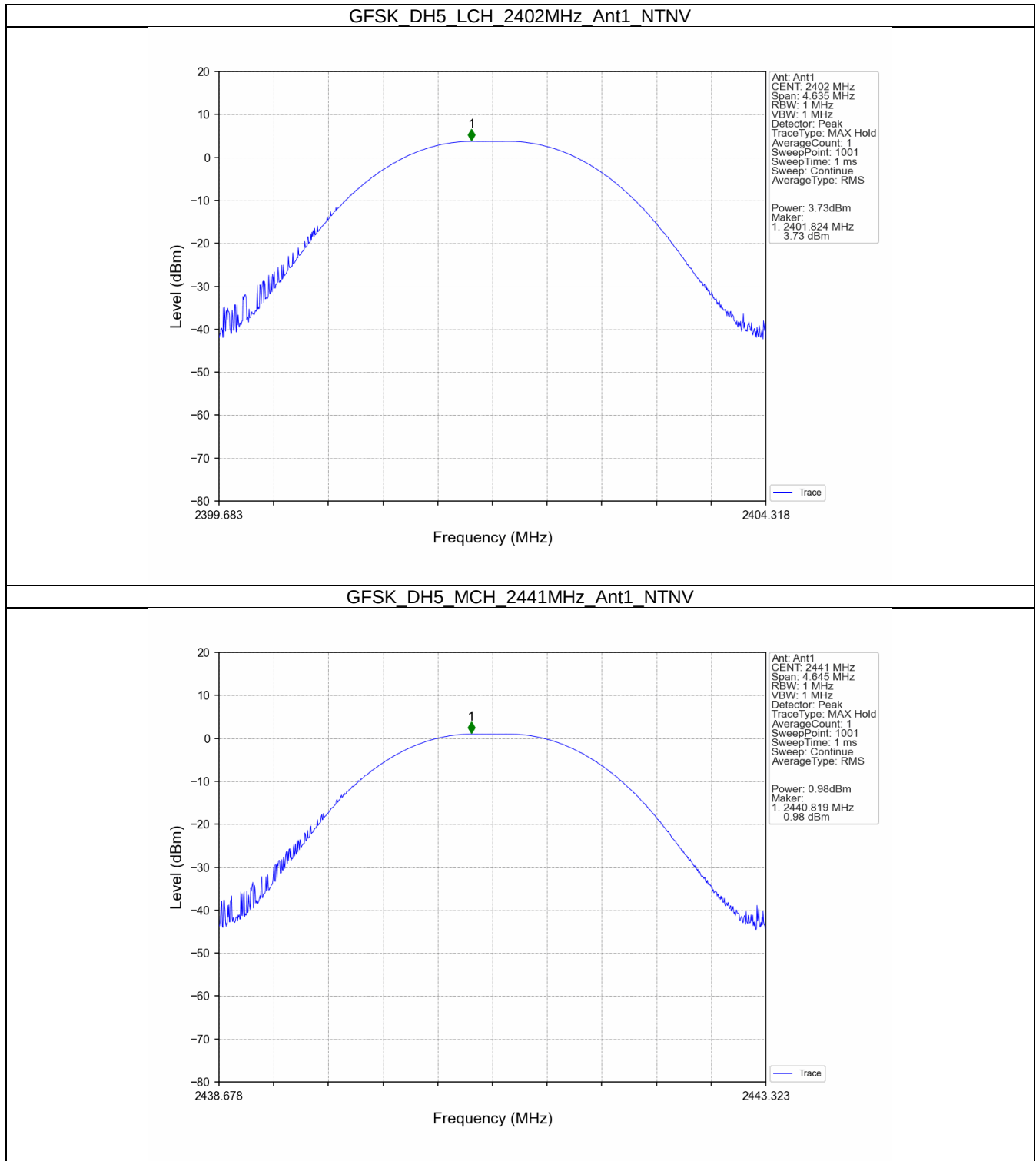
### 3.1.1 Power

| Mode      | TX Type | Frequency (MHz) | Packet Type | Maximum Peak Conducted Output Power (dBm) |         | Verdict |
|-----------|---------|-----------------|-------------|-------------------------------------------|---------|---------|
|           |         |                 |             | ANT1                                      | Limit   |         |
| GFSK      | SISO    | 2402            | DH5         | 3.73                                      | <=30    | Pass    |
|           |         | 2441            | DH5         | 0.98                                      | <=30    | Pass    |
|           |         | 2480            | DH5         | 2.02                                      | <=30    | Pass    |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 1.37                                      | <=20.97 | Pass    |
|           |         | 2441            | 2DH5        | 1.83                                      | <=20.97 | Pass    |
|           |         | 2480            | 2DH5        | 2.89                                      | <=20.97 | Pass    |
| 8DPSK     | SISO    | 2402            | 3DH5        | 2.20                                      | <=20.97 | Pass    |
|           |         | 2441            | 3DH5        | 2.60                                      | <=20.97 | Pass    |
|           |         | 2480            | 3DH5        | 3.66                                      | <=20.97 | Pass    |

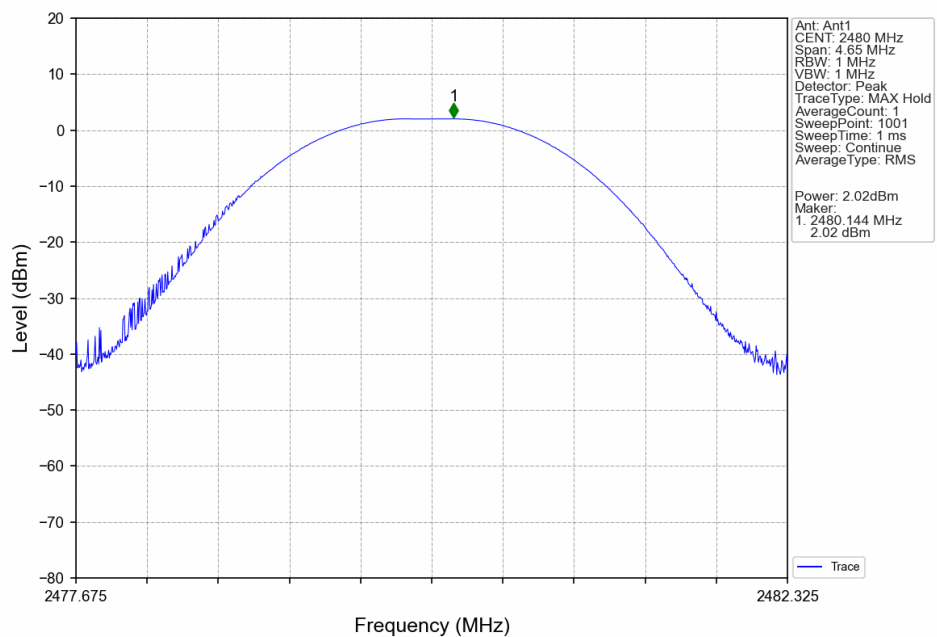
Note1: Antenna Gain: Ant1: 2.70dBi;

## 3.2 Test Graph

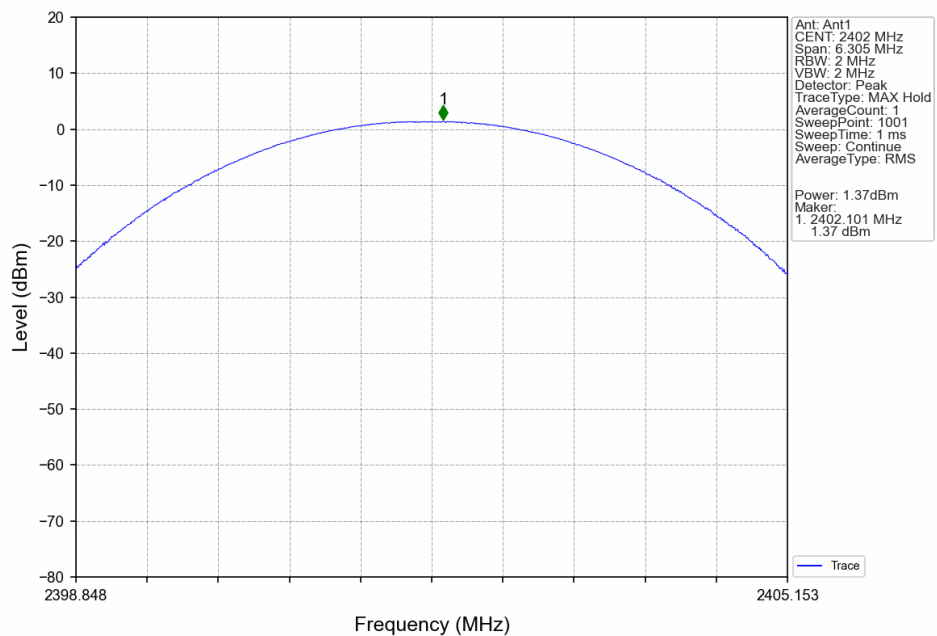
### 3.2.1 Power



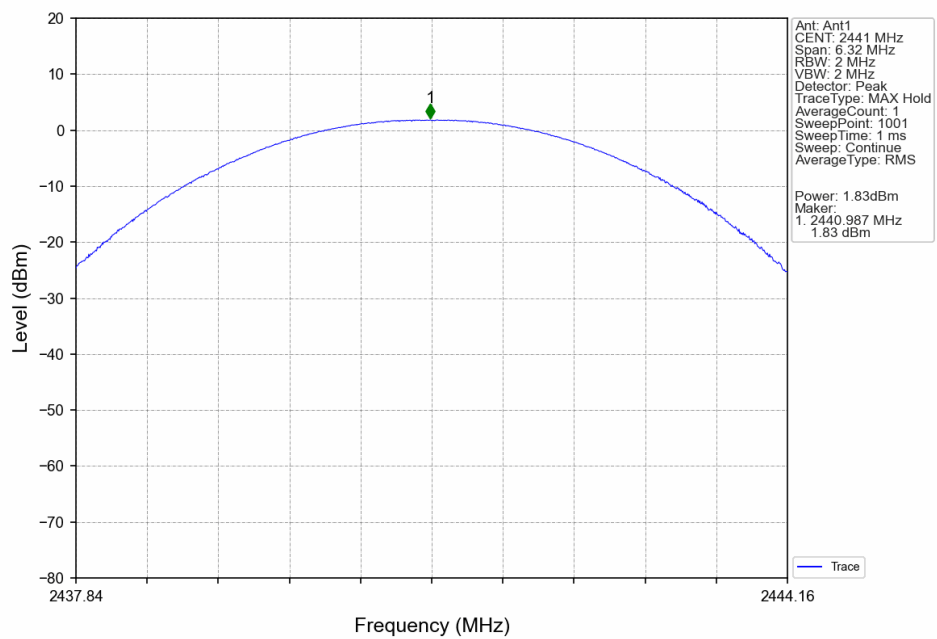
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



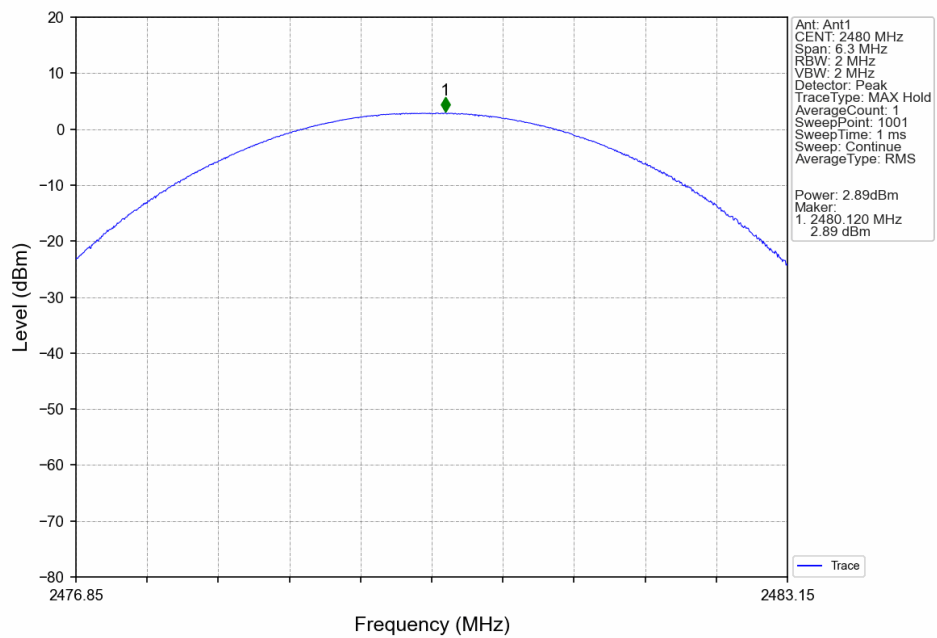
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



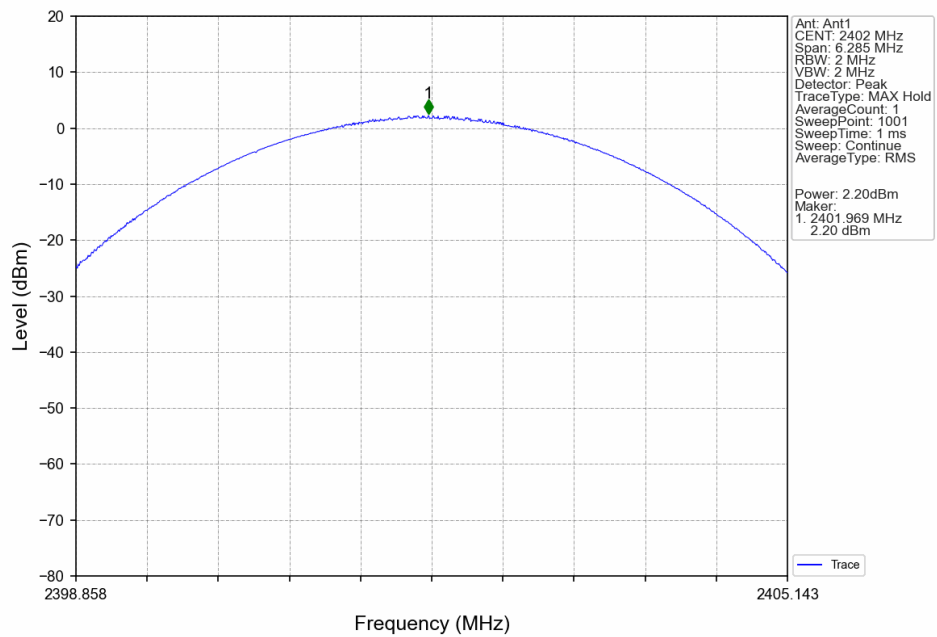
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



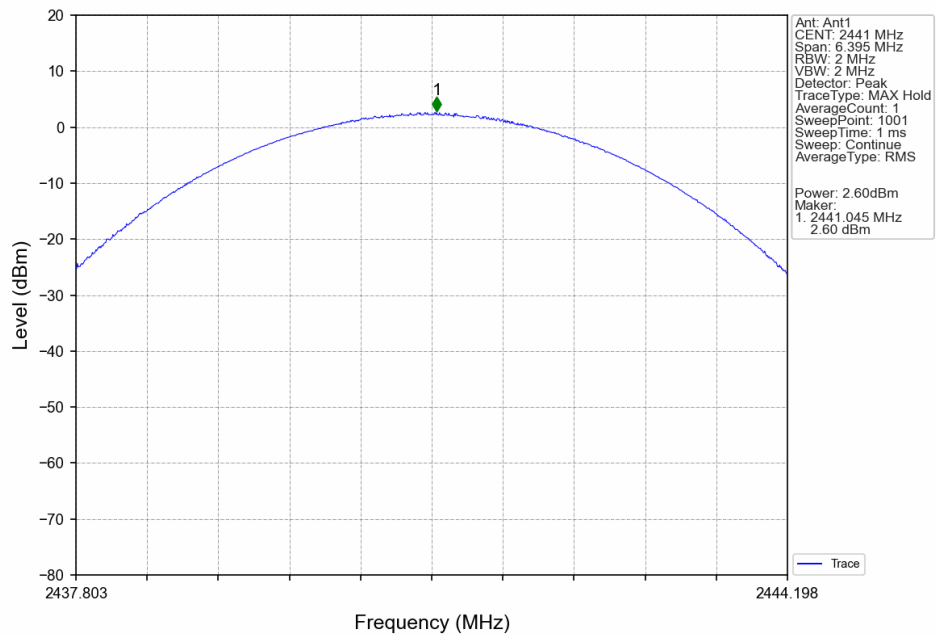
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV

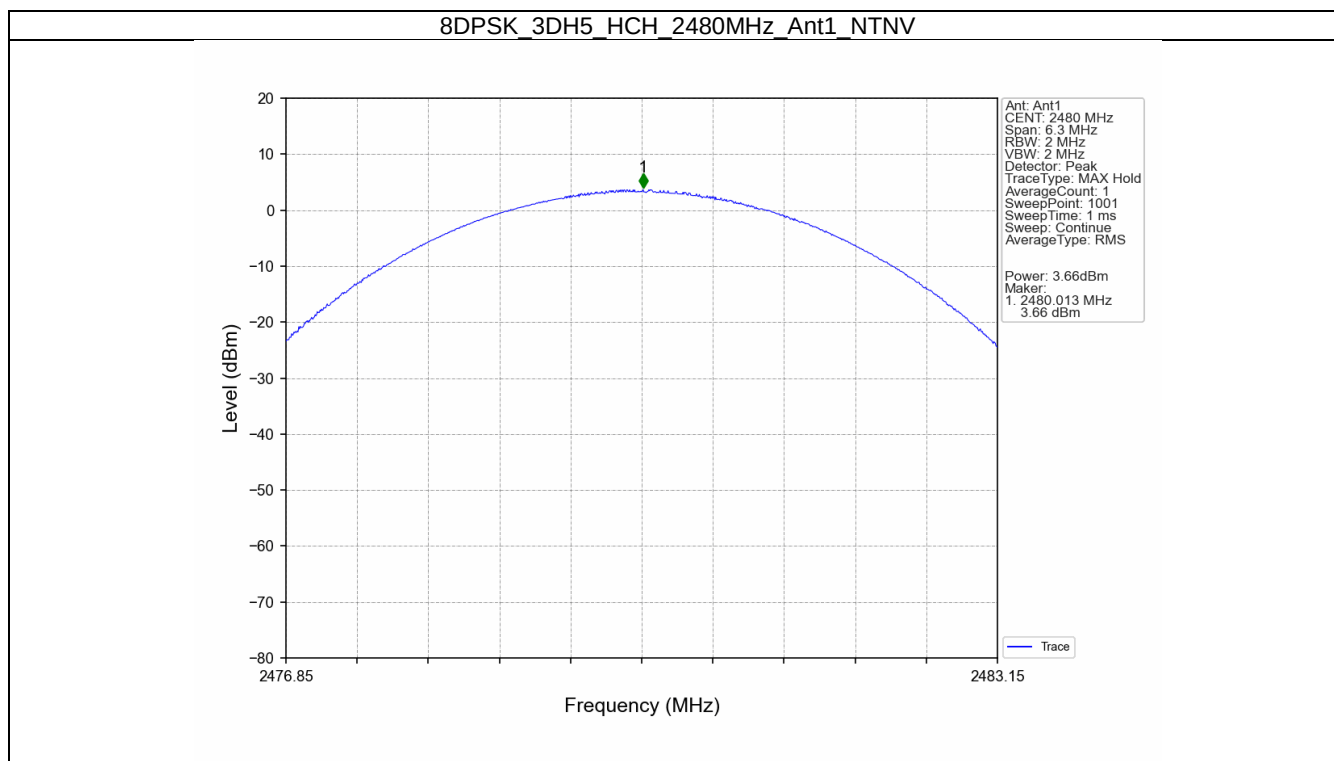


8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



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





## 4. Carrier Frequency Separation

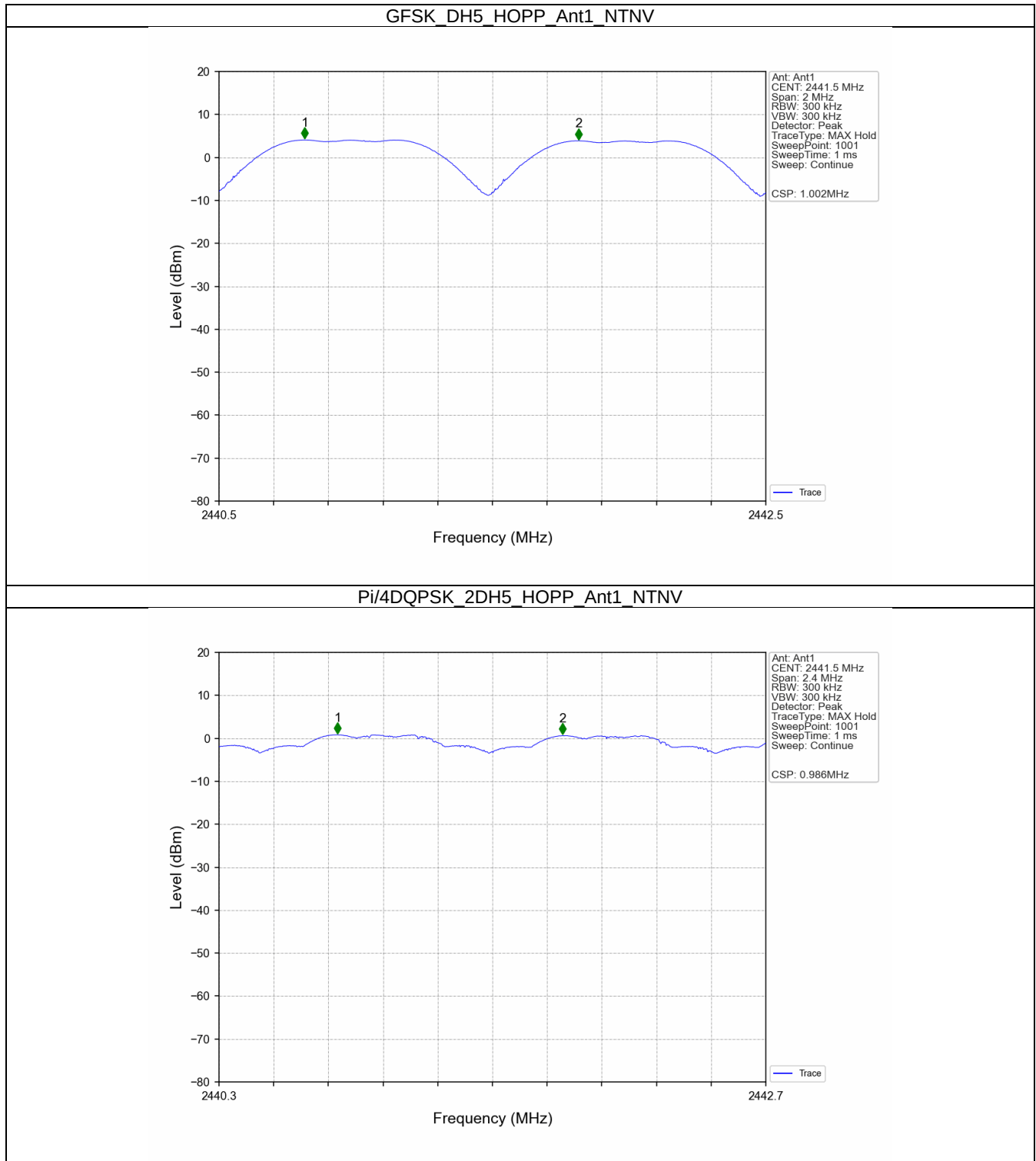
### 4.1 Test Result

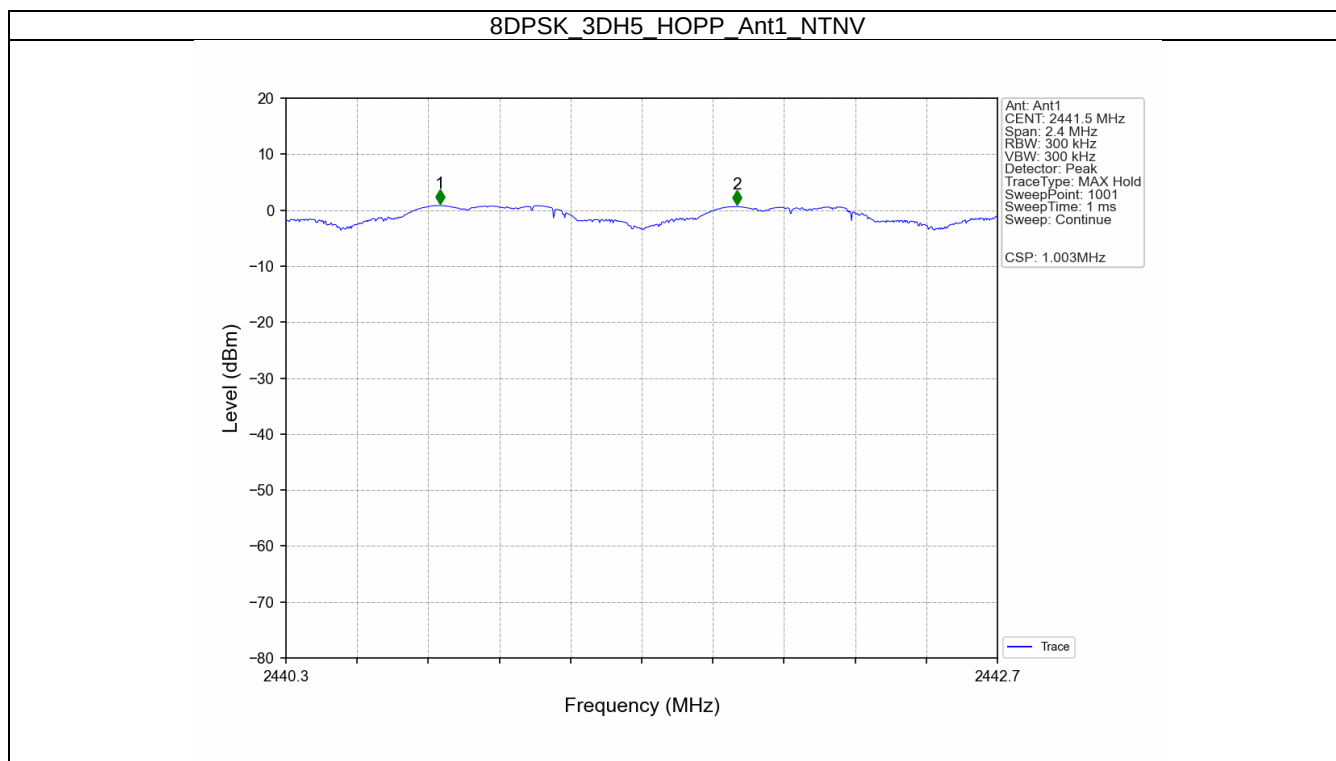
#### 4.1.1 Ant1

| Ant1      |         |                 |             |                          |                      |              |         |
|-----------|---------|-----------------|-------------|--------------------------|----------------------|--------------|---------|
| Mode      | TX Type | Frequency (MHz) | Packet Type | Channel Separation (MHz) | 20dB Bandwidth (MHz) | Limit (MHz)  | Verdict |
| GFSK      | SISO    | HOPP            | DH5         | 1.002                    | 0.930                | $\geq 0.93$  | Pass    |
| Pi/4DQPSK | SISO    | HOPP            | 2DH5        | 0.986                    | 1.264                | $\geq 0.843$ | Pass    |
| 8DPSK     | SISO    | HOPP            | 3DH5        | 1.003                    | 1.279                | $\geq 0.853$ | Pass    |

## 4.2 Test Graph

### 4.2.1 Ant1





## 5. Number of Hopping Frequencies

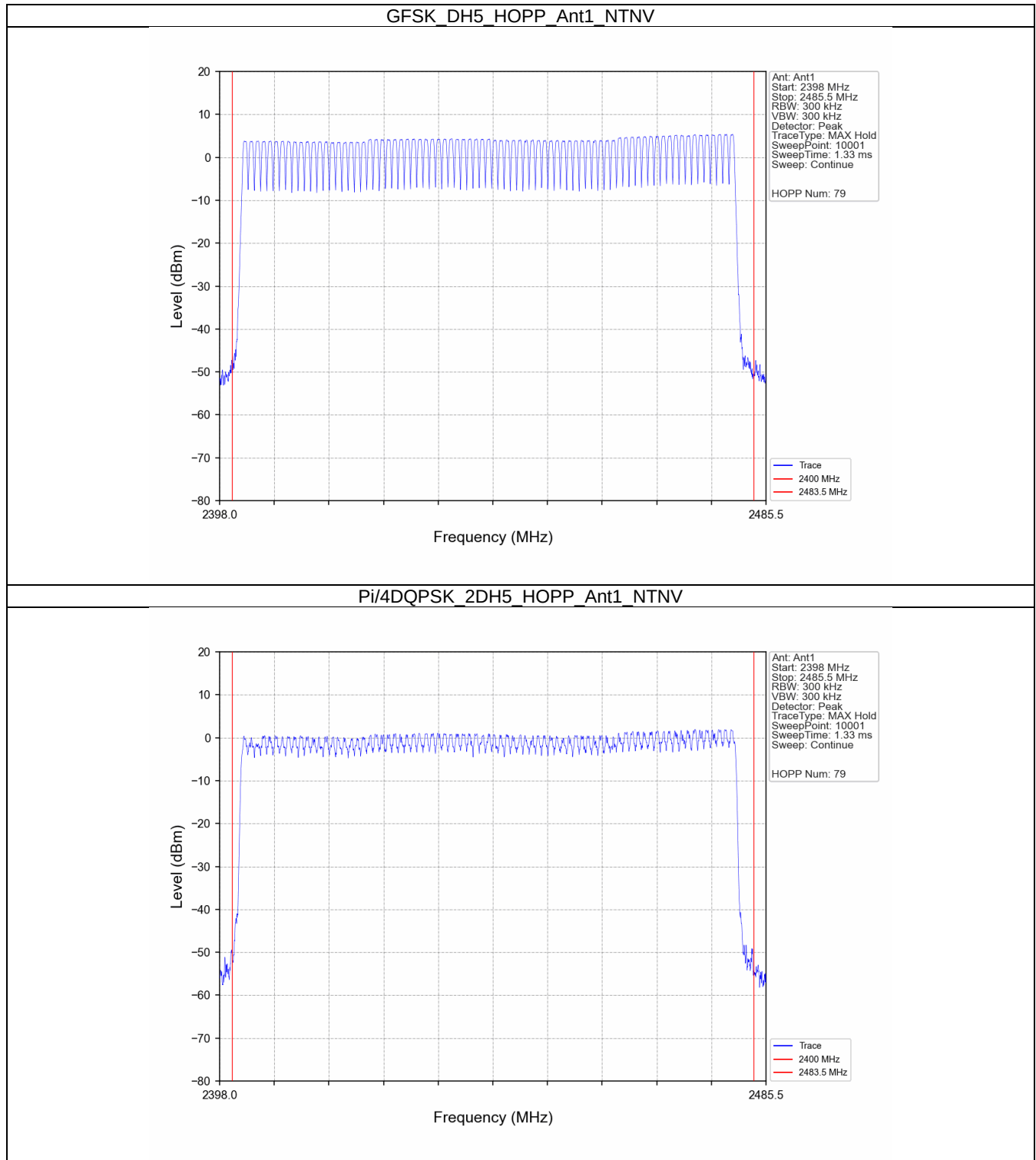
### 5.1 Test Result

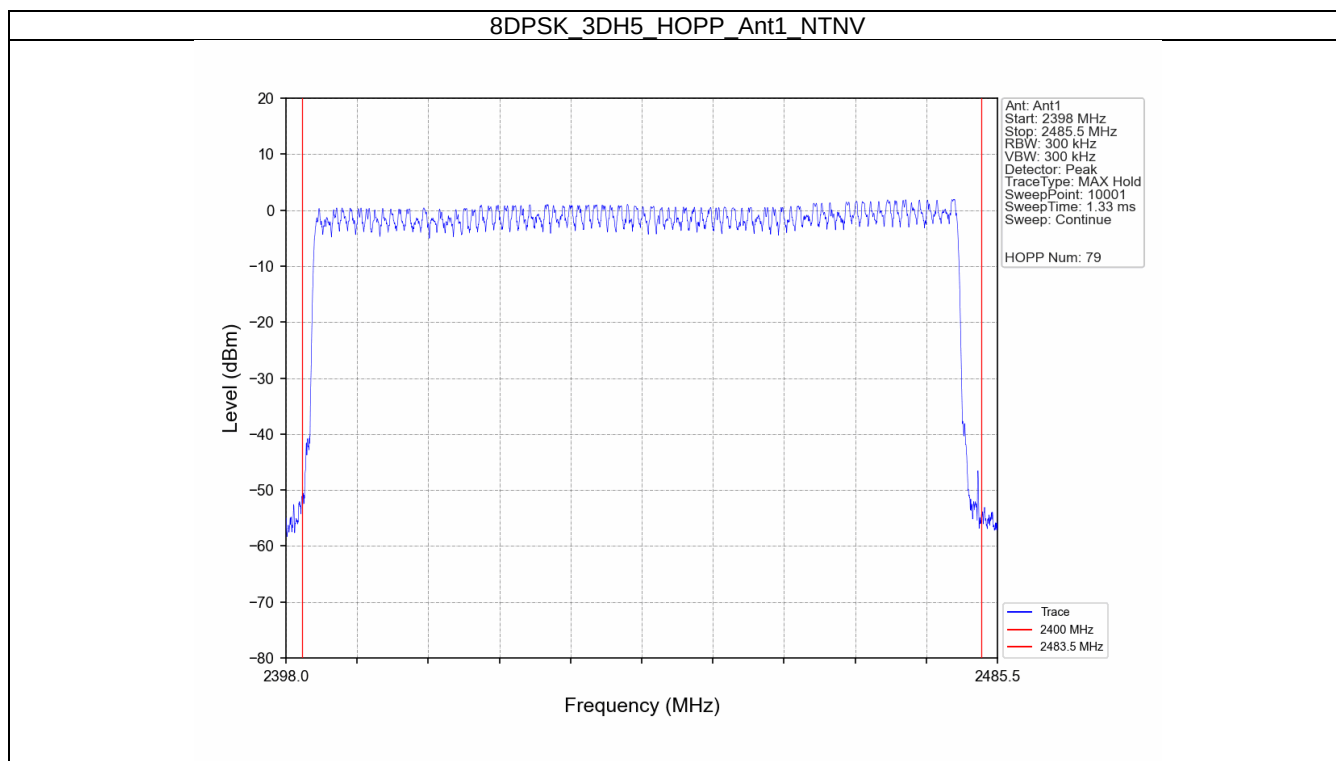
#### 5.1.1 HoppNum

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

## 5.2 Test Graph

### 5.2.1 HoppNum





## 6. Time of Occupancy (Dwell Time)

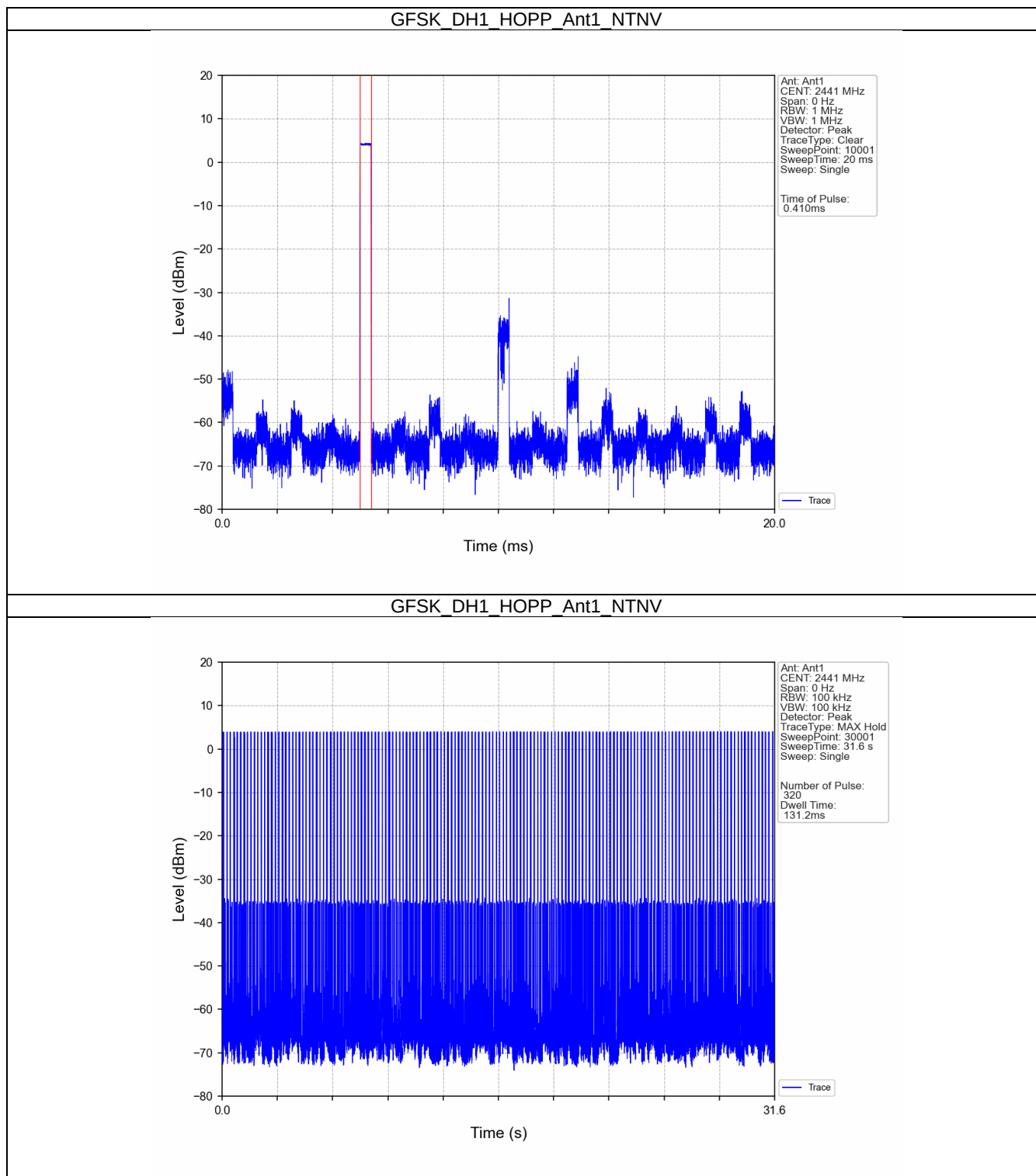
### 6.1 Test Result

#### 6.1.1 Ant1

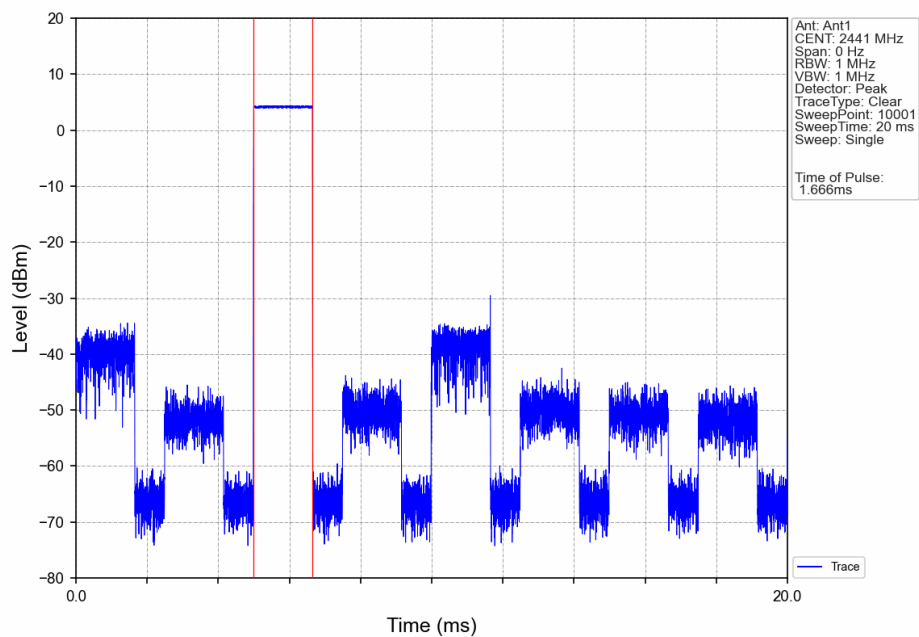
| Ant1      |         |                 |             |                               |                        |                                    |                 |            |         |
|-----------|---------|-----------------|-------------|-------------------------------|------------------------|------------------------------------|-----------------|------------|---------|
| 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         | 0.410                         | 31.600                 | 320                                | 131.200         | <=400      | Pass    |
|           |         |                 | DH3         | 1.666                         | 31.600                 | 160                                | 266.560         | <=400      | Pass    |
|           |         |                 | DH5         | 2.916                         | 31.600                 | 102                                | 297.432         | <=400      | Pass    |
| Pi/4DQPSK | SISO    | HOPP            | 2DH1        | 0.424                         | 31.600                 | 320                                | 135.680         | <=400      | Pass    |
|           |         |                 | 2DH3        | 1.676                         | 31.600                 | 159                                | 266.484         | <=400      | Pass    |
|           |         |                 | 2DH5        | 2.926                         | 31.600                 | 102                                | 298.452         | <=400      | Pass    |
| 8DPSK     | SISO    | HOPP            | 3DH1        | 0.422                         | 31.600                 | 320                                | 135.040         | <=400      | Pass    |
|           |         |                 | 3DH3        | 1.672                         | 31.600                 | 158                                | 264.176         | <=400      | Pass    |
|           |         |                 | 3DH5        | 2.926                         | 31.600                 | 105                                | 307.230         | <=400      | Pass    |

## 6.2 Test Graph

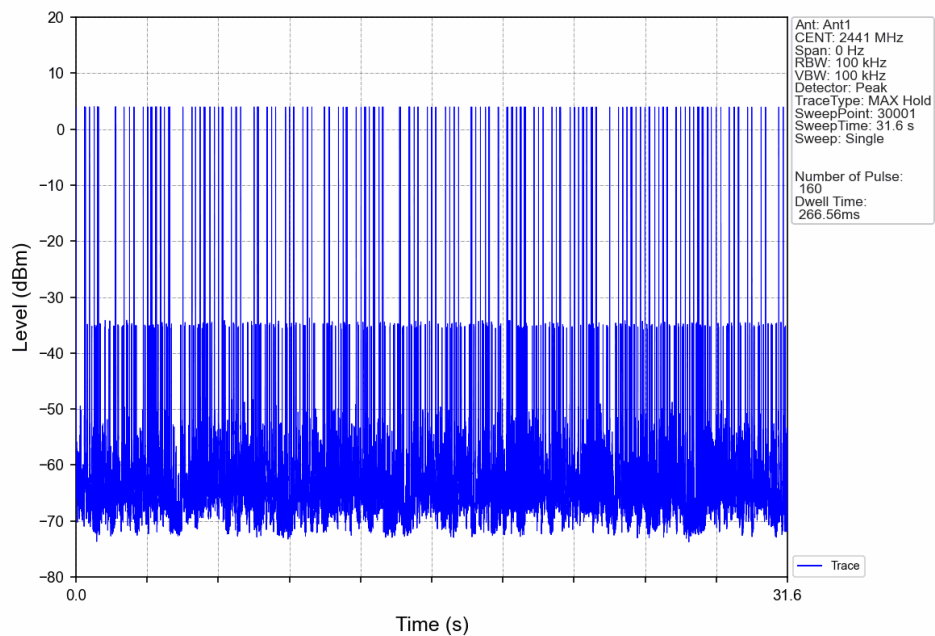
### 6.2.1 Ant1



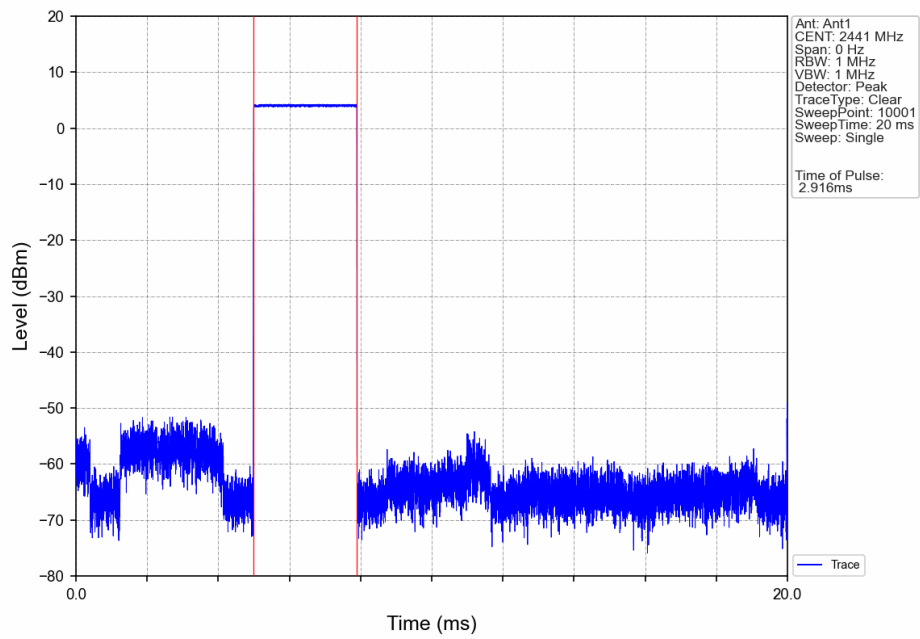
GFSK\_DH3\_HOPP\_Ant1\_NTNV



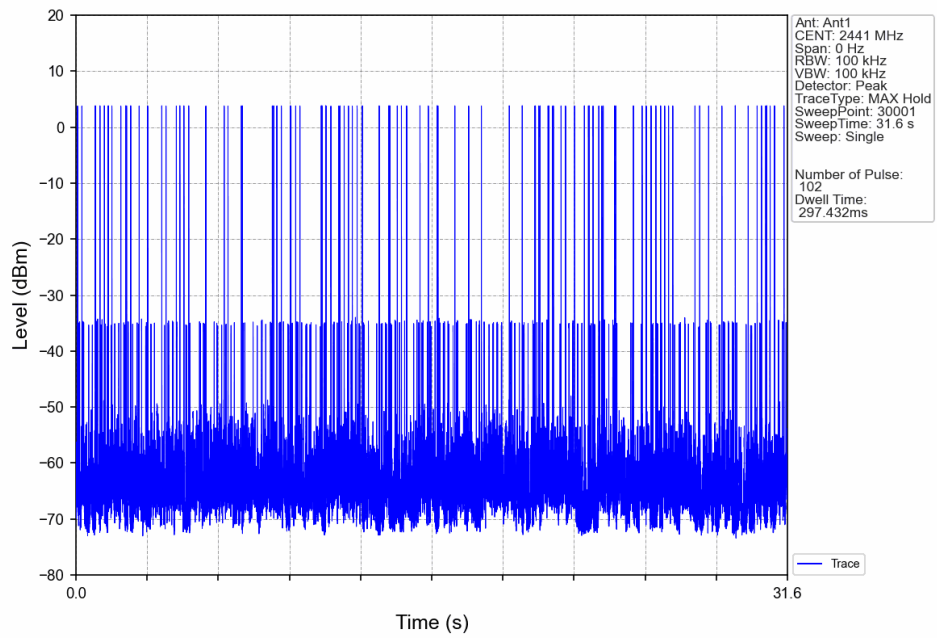
GFSK\_DH3\_HOPP\_Ant1\_NTNV



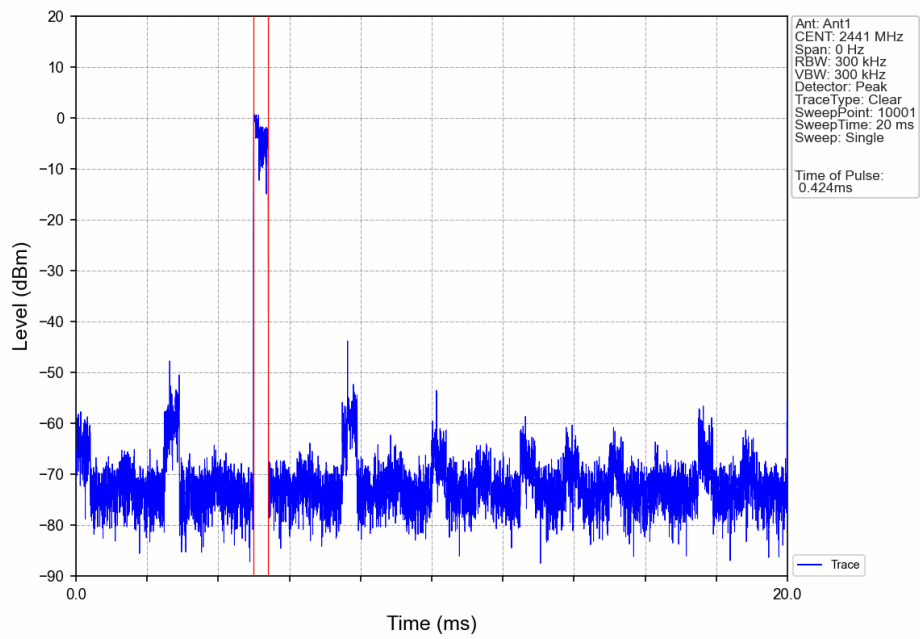
GFSK\_DH5\_HOPP\_Ant1\_NTNV



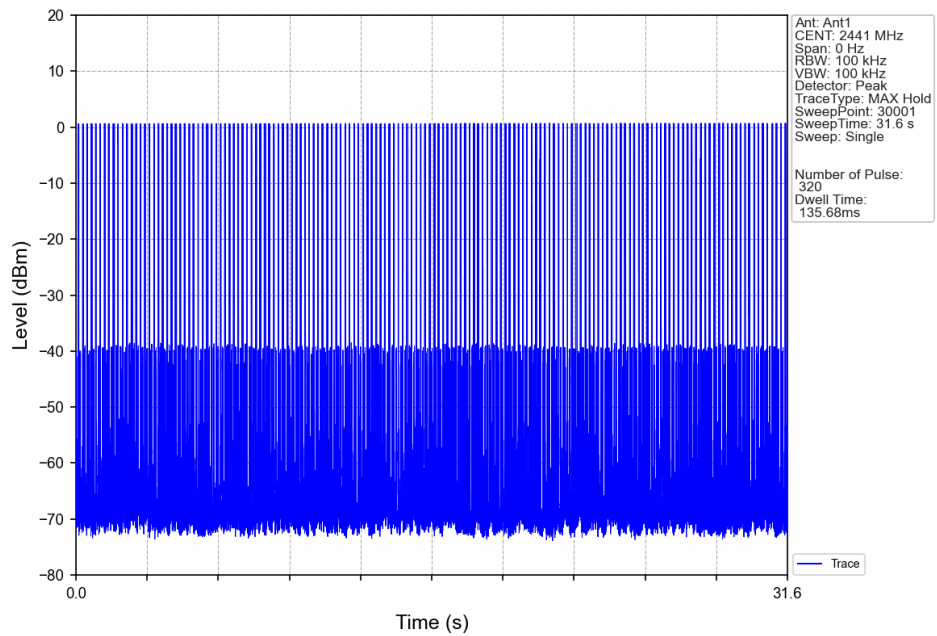
GFSK\_DH5\_HOPP\_Ant1\_NTNV



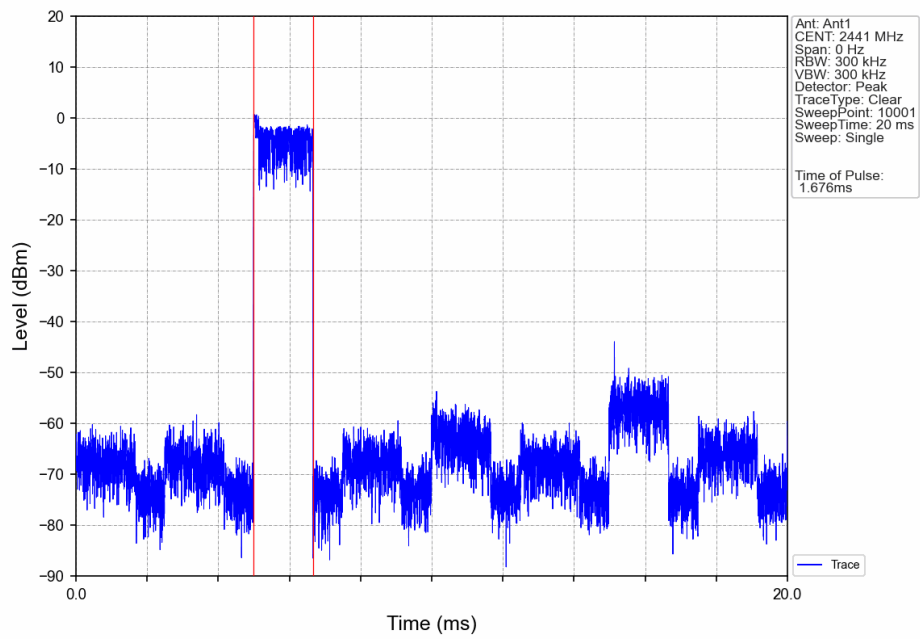
Pi/4DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



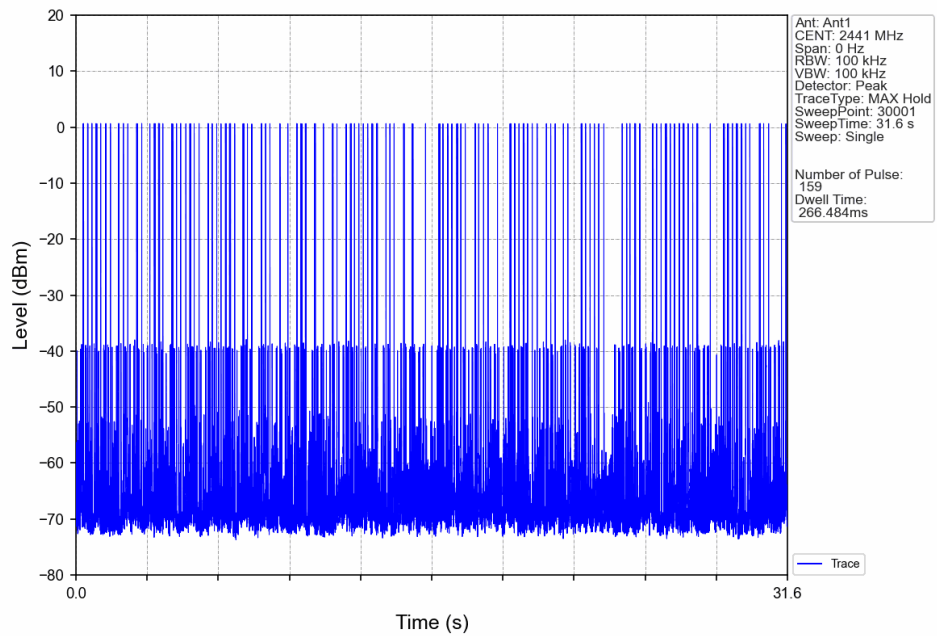
Pi/4DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



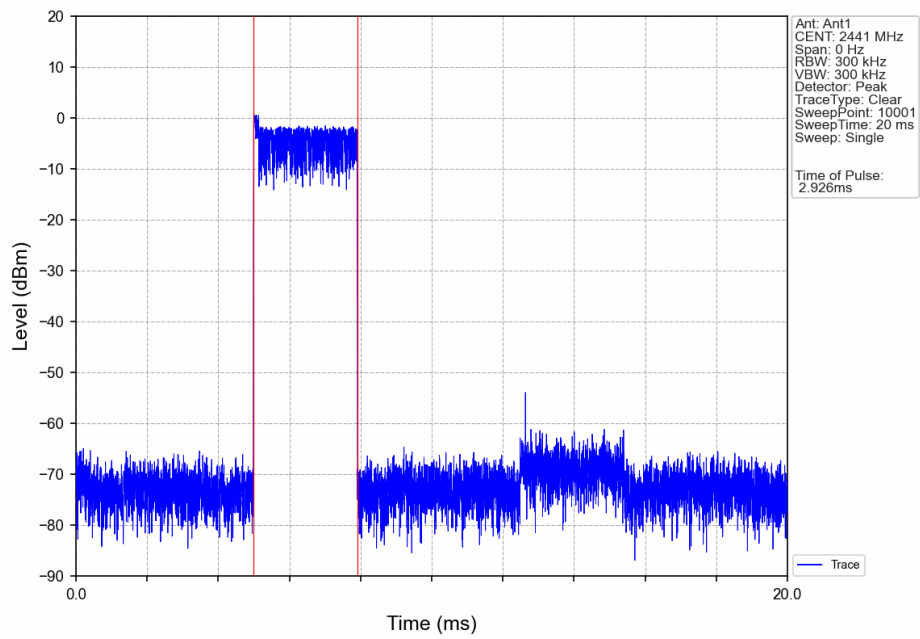
Pi/4DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



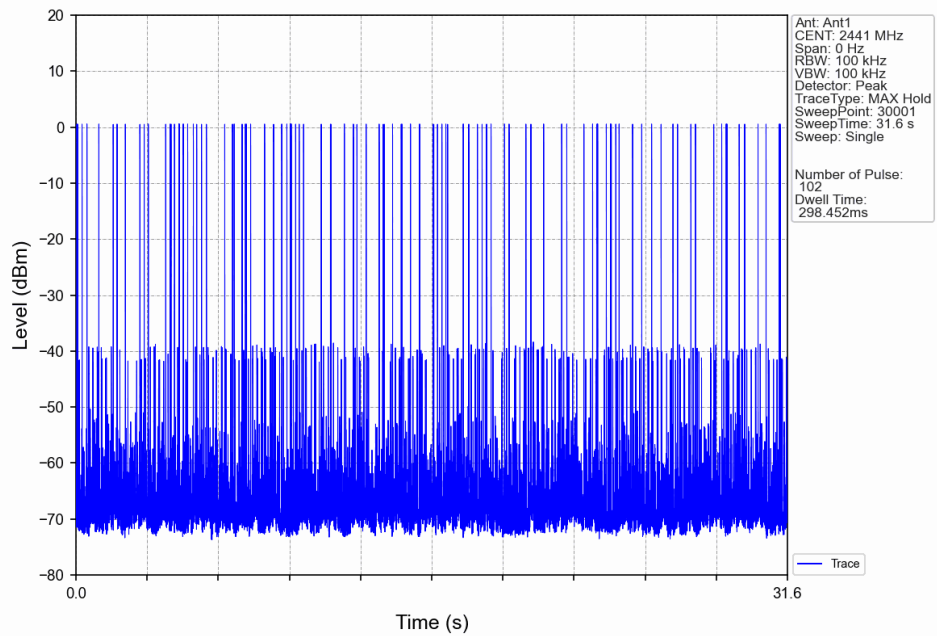
Pi/4DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



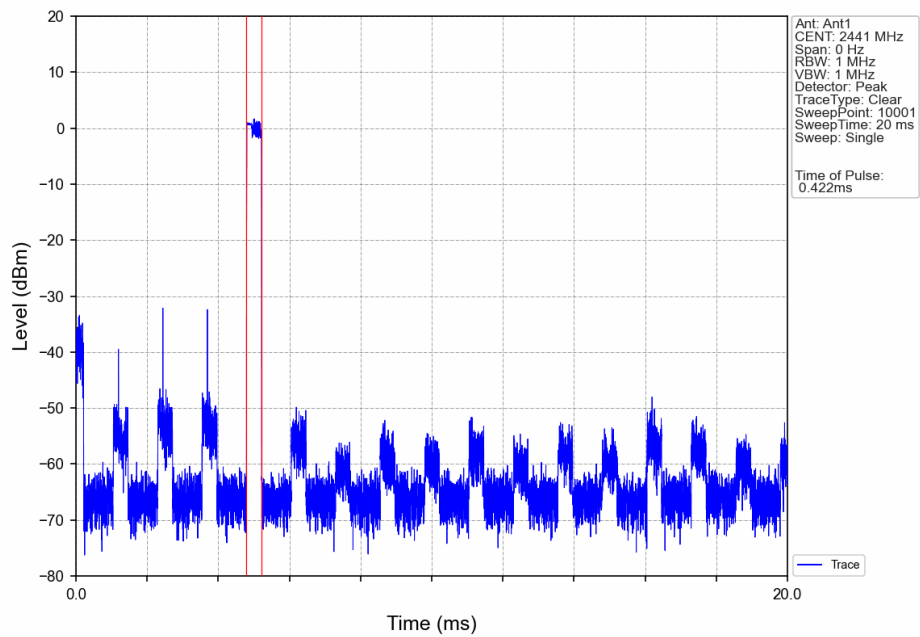
Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



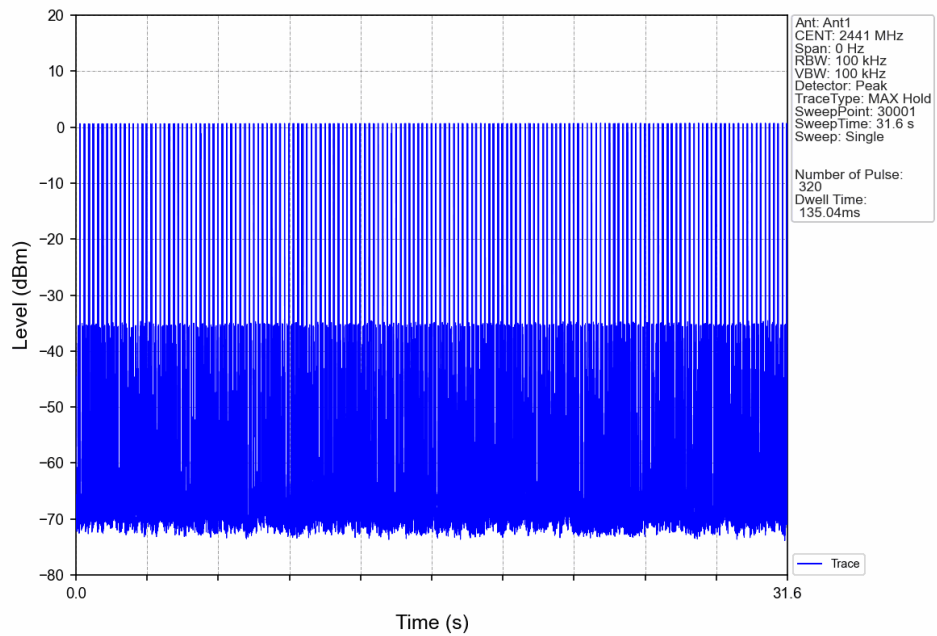
Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



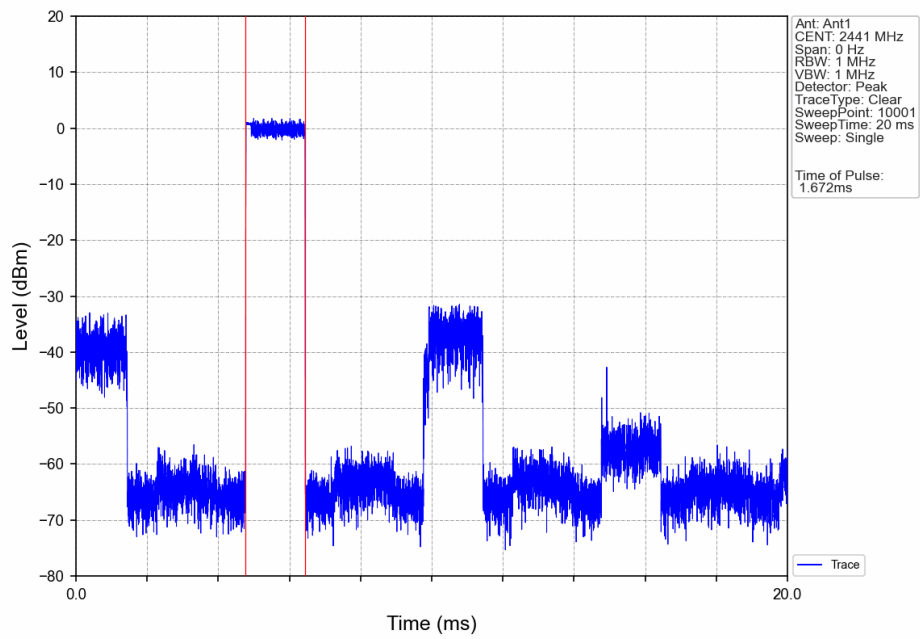
8DPSK\_3DH1\_HOPP\_Ant1\_NTNV



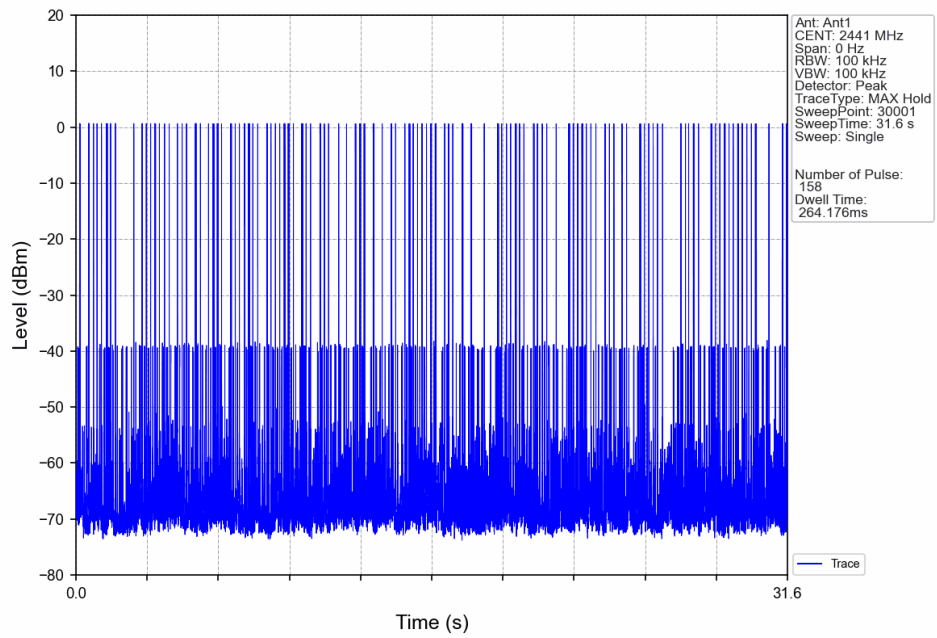
8DPSK\_3DH1\_HOPP\_Ant1\_NTNV



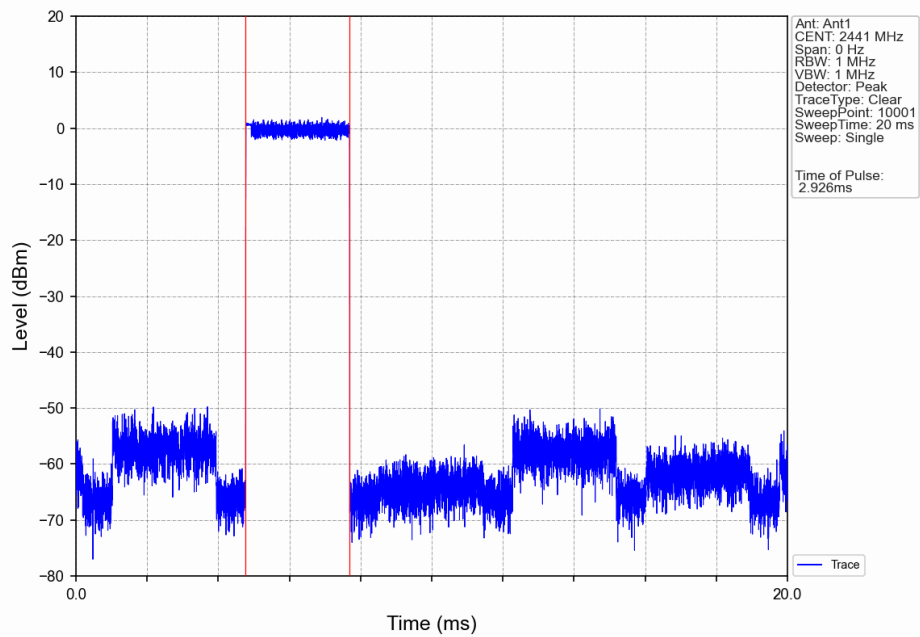
8DPSK\_3DH3\_HOPP\_Ant1\_NTNV



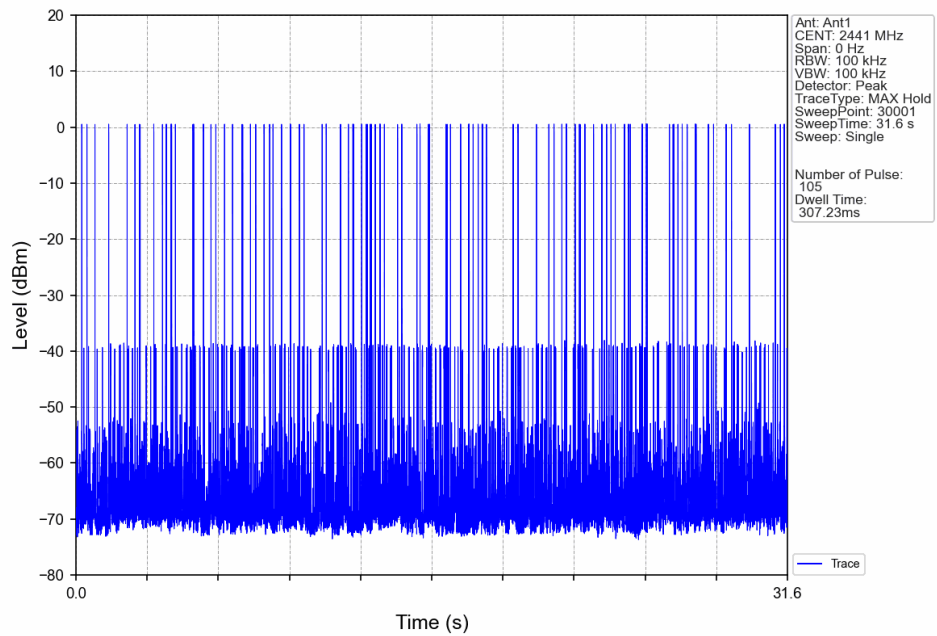
8DPSK\_3DH3\_HOPP\_Ant1\_NTNV



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

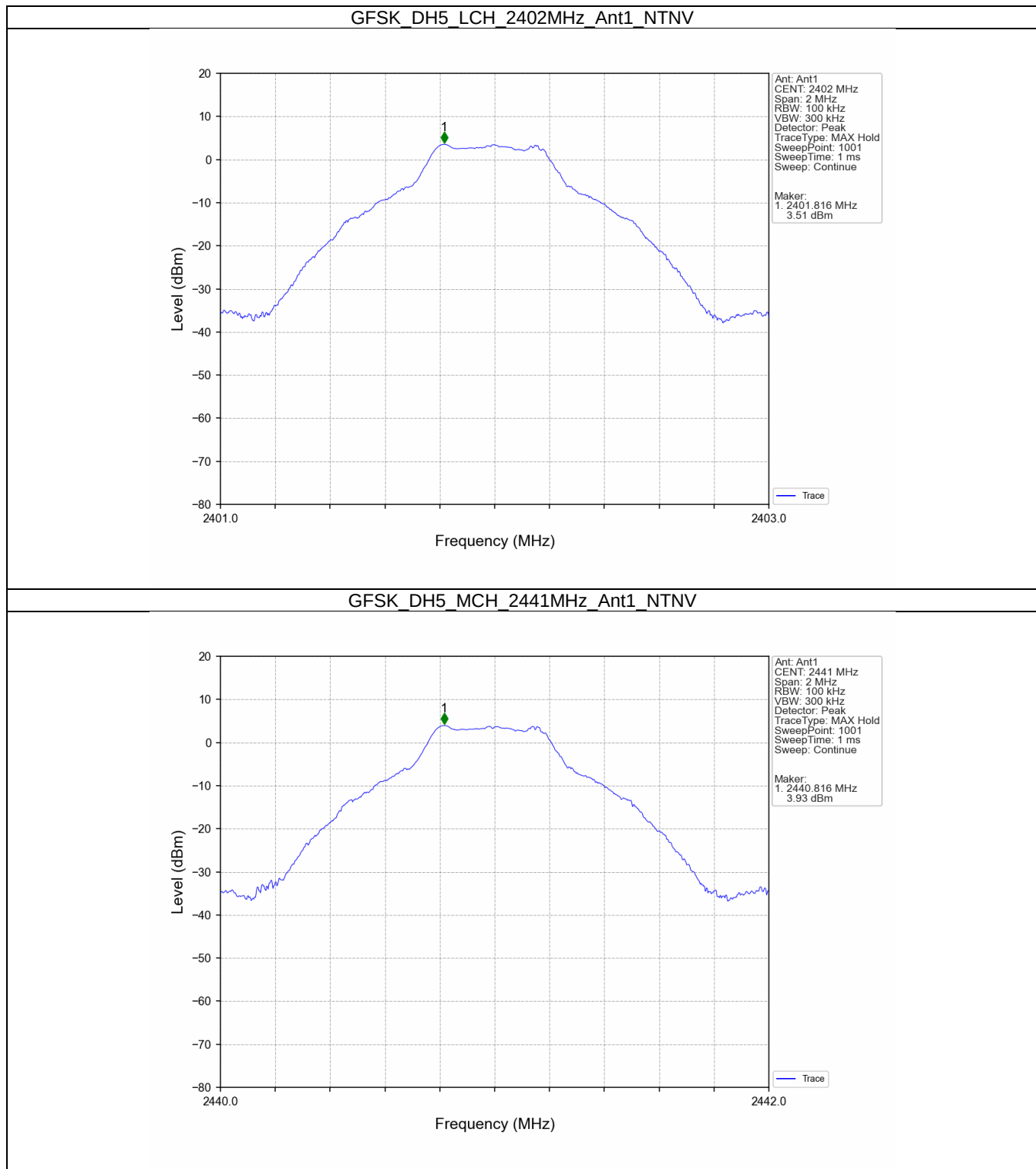
| Mode      | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) |
|-----------|---------|-----------------|-------------|-----|--------------------------|
| GFSK      | SISO    | 2402            | DH5         | 1   | 3.51                     |
|           |         | 2441            | DH5         | 1   | 3.93                     |
|           |         | 2480            | DH5         | 1   | 5.02                     |
|           |         | HOPP            | DH5         | 1   | 5.11                     |
|           |         |                 |             |     | 5.11                     |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 1   | 0.35                     |
|           |         | 2441            | 2DH5        | 1   | 0.77                     |
|           |         | 2480            | 2DH5        | 1   | 1.81                     |
|           |         | HOPP            | 2DH5        | 1   | 1.82                     |
|           |         |                 |             |     | 1.82                     |
| 8DPSK     | SISO    | 2402            | 3DH5        | 1   | 0.40                     |
|           |         | 2441            | 3DH5        | 1   | 0.81                     |
|           |         | 2480            | 3DH5        | 1   | 1.82                     |
|           |         | HOPP            | 3DH5        | 1   | 1.85                     |
|           |         |                 |             |     | 1.85                     |

#### 7.1.2 CSE

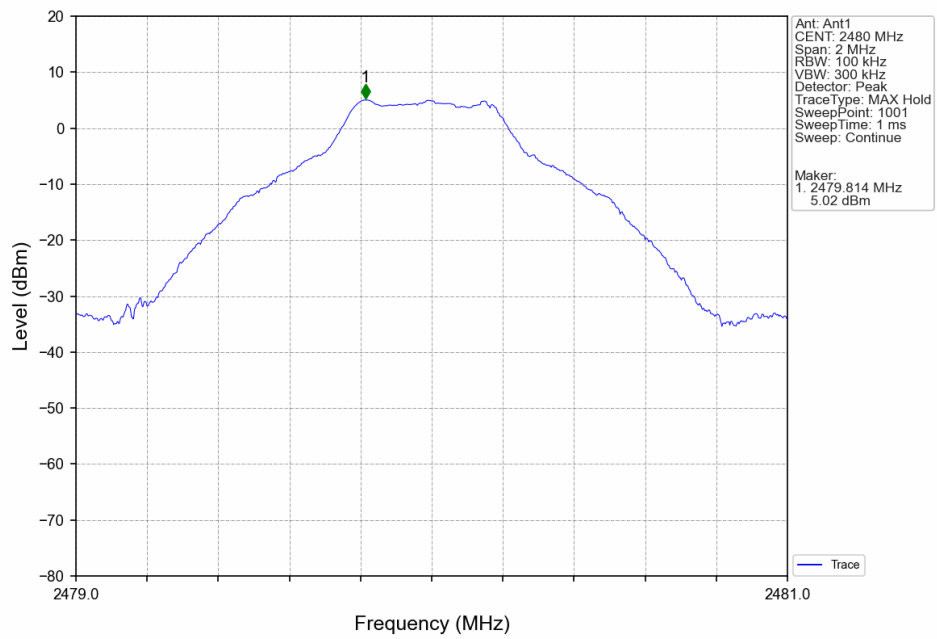
| Mode      | TX Type | Frequency (MHz) | Packet Type | ANT | Level of Reference (dBm) | Limit (dBm) | Verdict |
|-----------|---------|-----------------|-------------|-----|--------------------------|-------------|---------|
| GFSK      | SISO    | 2402            | DH5         | 1   | 3.51                     | -16.49      | Pass    |
|           |         | 2441            | DH5         | 1   | 3.93                     | -16.07      | Pass    |
|           |         | 2480            | DH5         | 1   | 5.02                     | -14.98      | Pass    |
|           |         | HOPP            | DH5         | 1   | 5.11                     | -14.89      | Pass    |
|           |         |                 |             |     | 5.11                     | -14.89      | Pass    |
| Pi/4DQPSK | SISO    | 2402            | 2DH5        | 1   | 0.35                     | -19.65      | Pass    |
|           |         | 2441            | 2DH5        | 1   | 0.77                     | -19.23      | Pass    |
|           |         | 2480            | 2DH5        | 1   | 1.81                     | -18.19      | Pass    |
|           |         | HOPP            | 2DH5        | 1   | 1.82                     | -18.18      | Pass    |
|           |         |                 |             |     | 1.82                     | -18.18      | Pass    |
| 8DPSK     | SISO    | 2402            | 3DH5        | 1   | 0.40                     | -19.60      | Pass    |
|           |         | 2441            | 3DH5        | 1   | 0.81                     | -19.19      | Pass    |
|           |         | 2480            | 3DH5        | 1   | 1.82                     | -18.18      | Pass    |
|           |         | HOPP            | 3DH5        | 1   | 1.85                     | -18.15      | Pass    |
|           |         |                 |             |     | 1.85                     | -18.15      | Pass    |

## 7.2 Test Graph

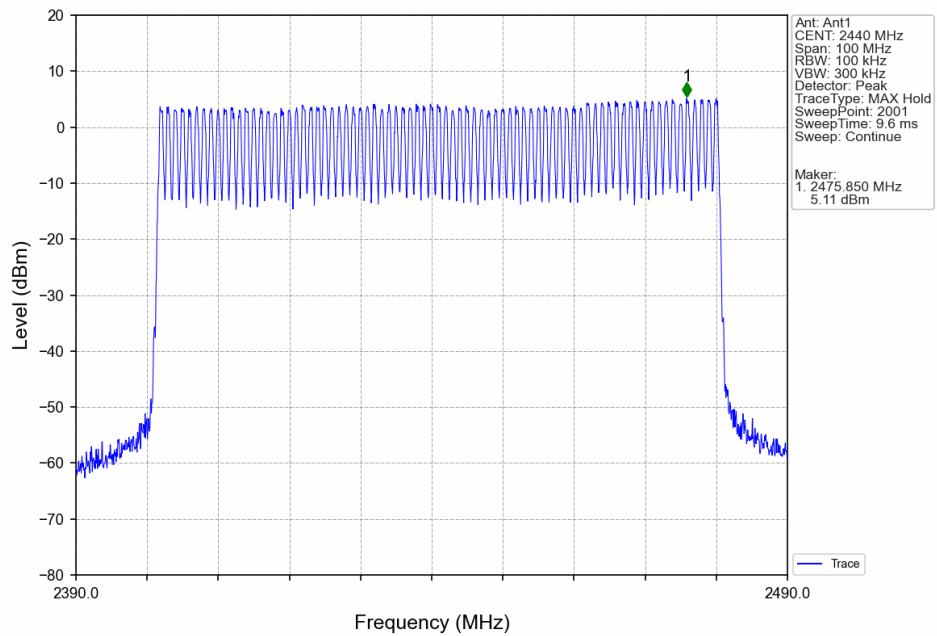
### 7.2.1 Ref



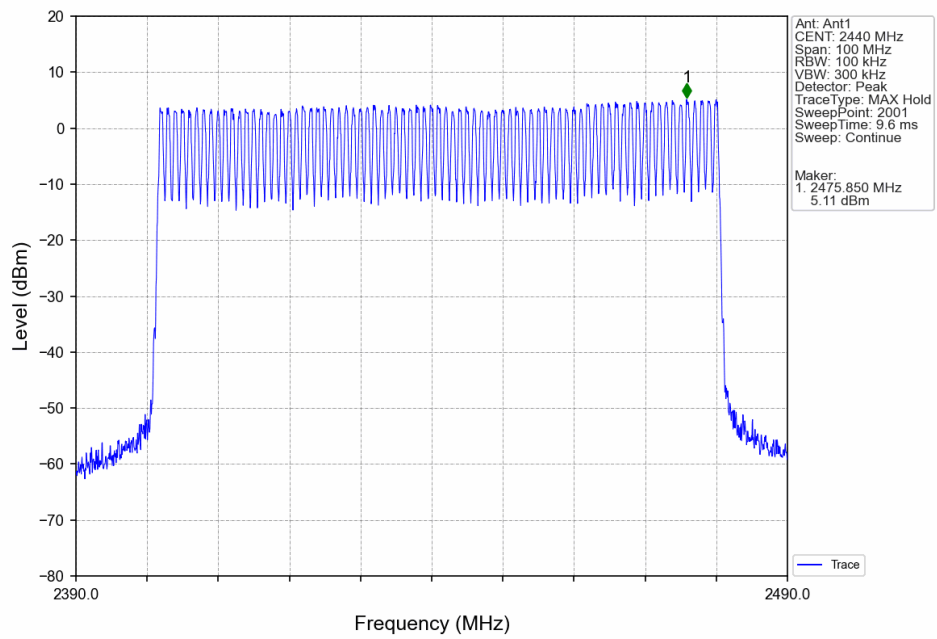
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



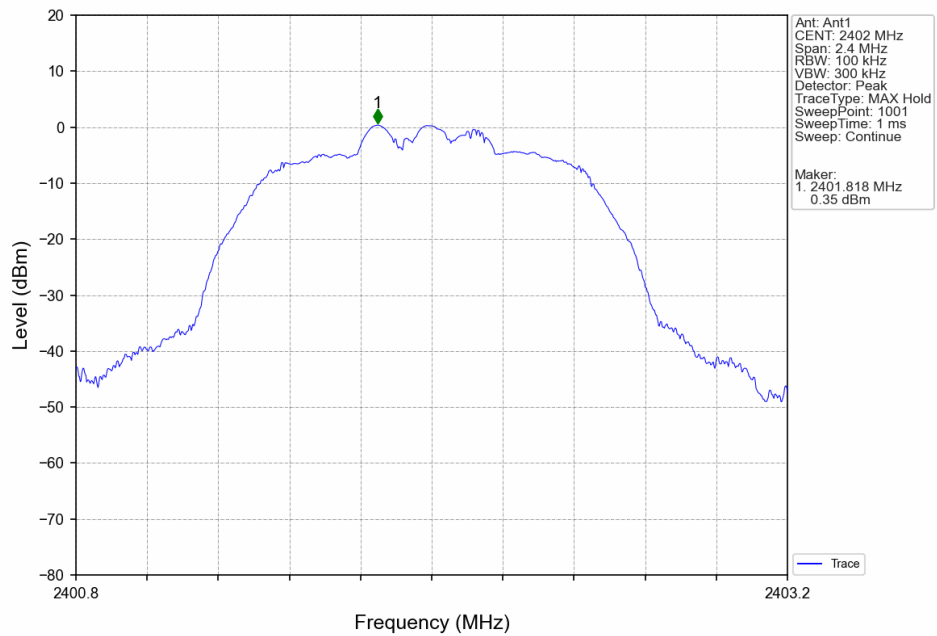
GFSK\_DH5\_HOPP\_Ant1\_NTNV



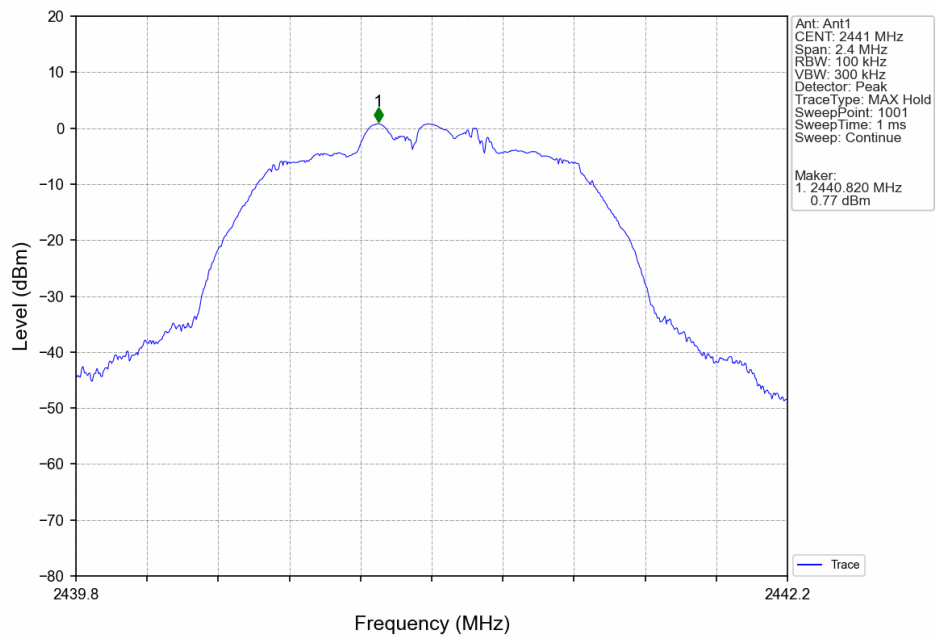
GFSK\_DH5\_HOPP\_Ant1\_NTNV



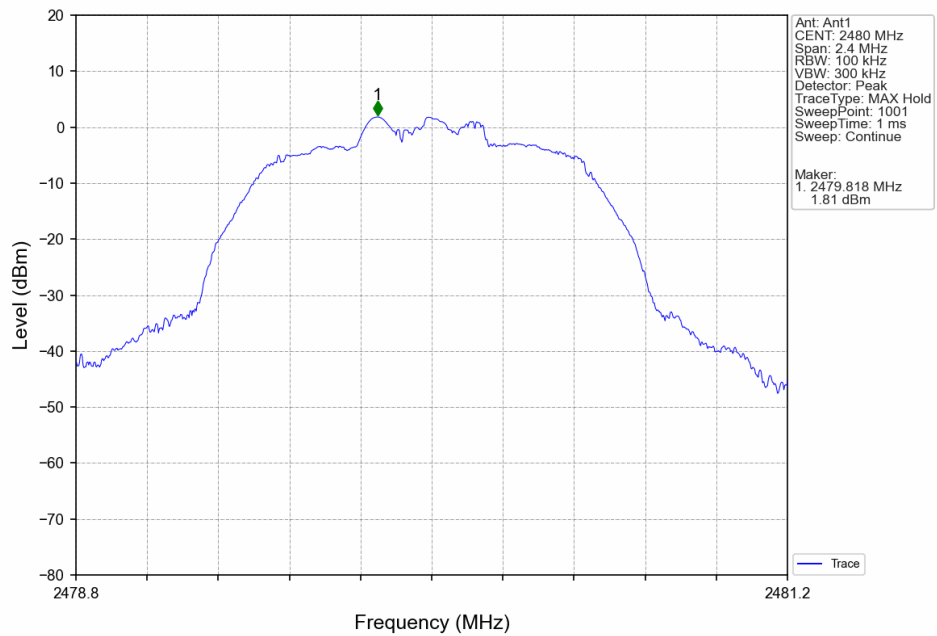
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



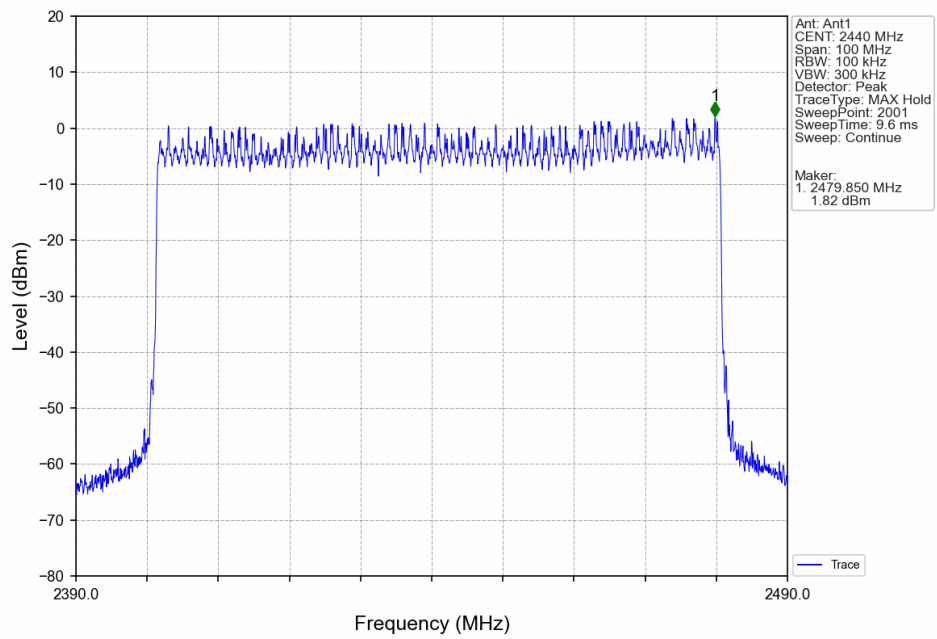
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



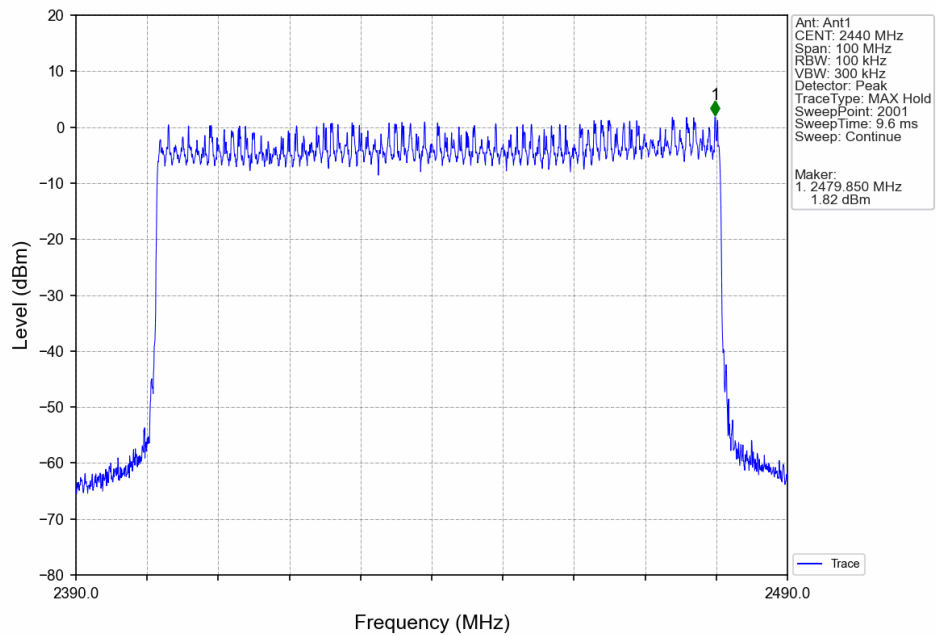
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



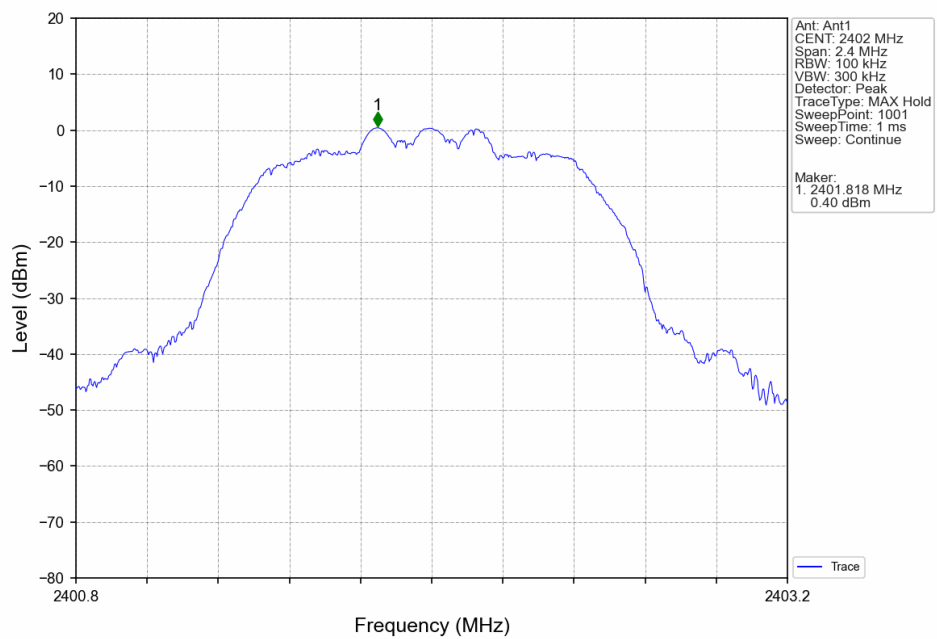
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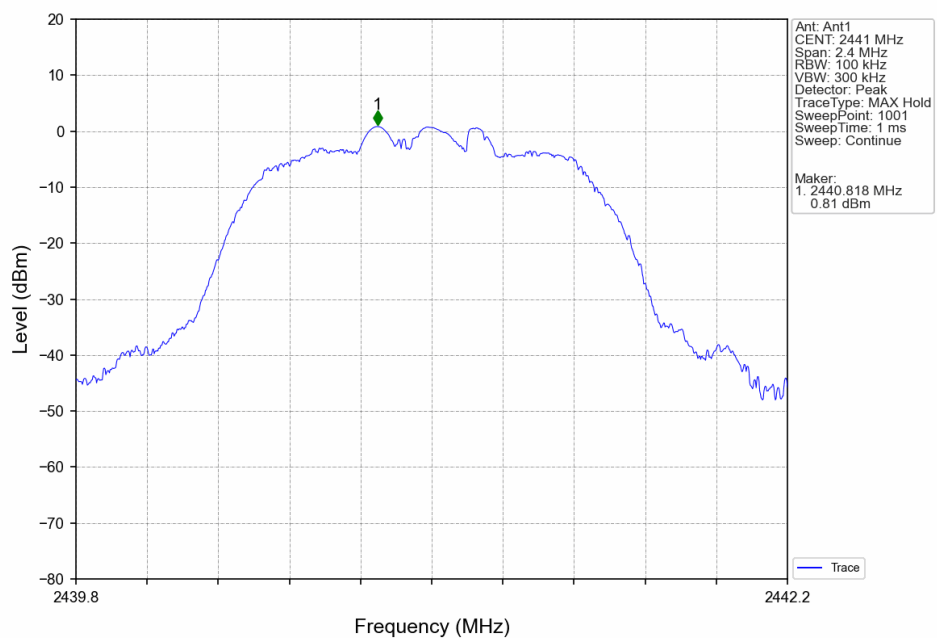
Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



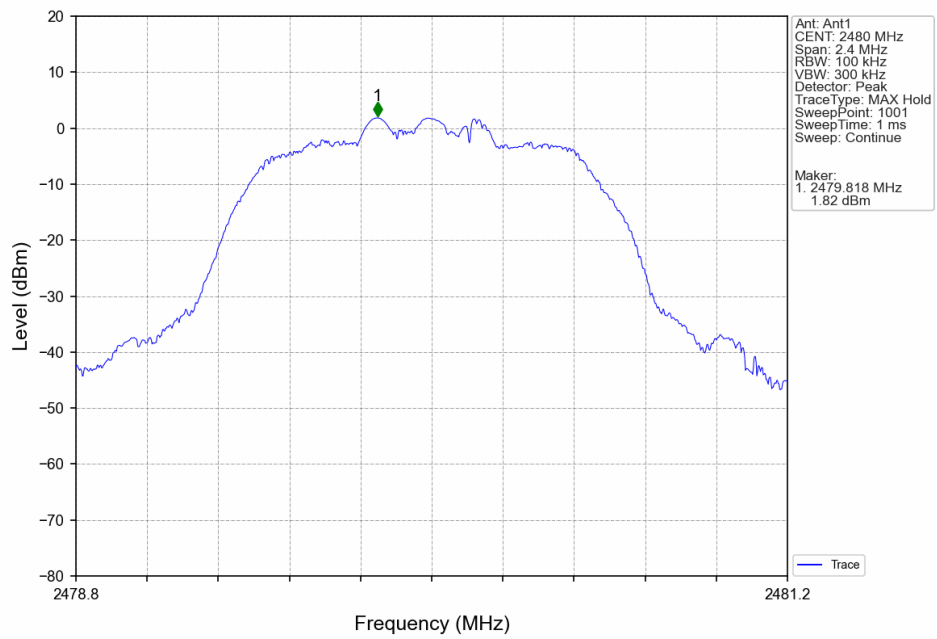
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



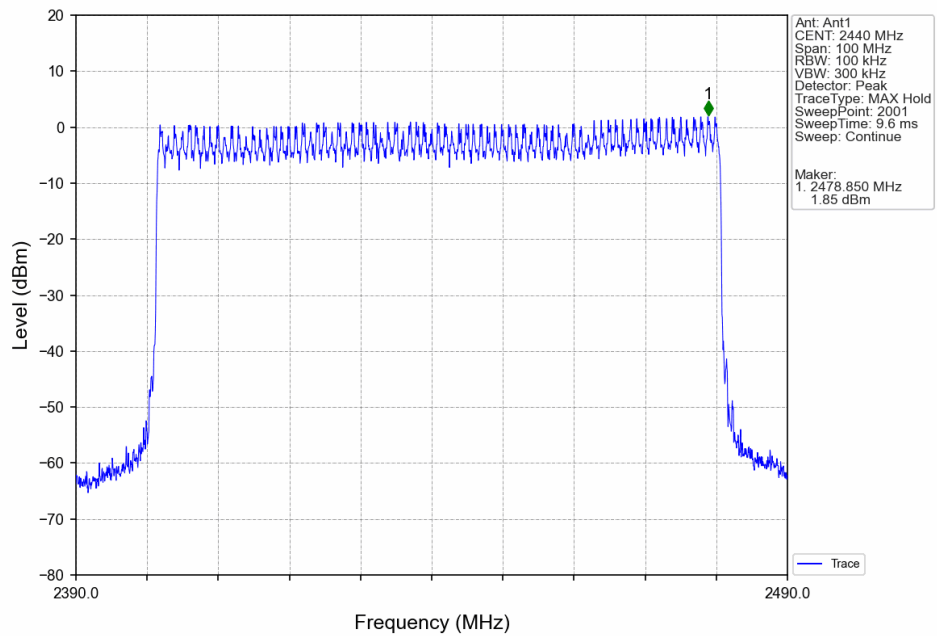
8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV

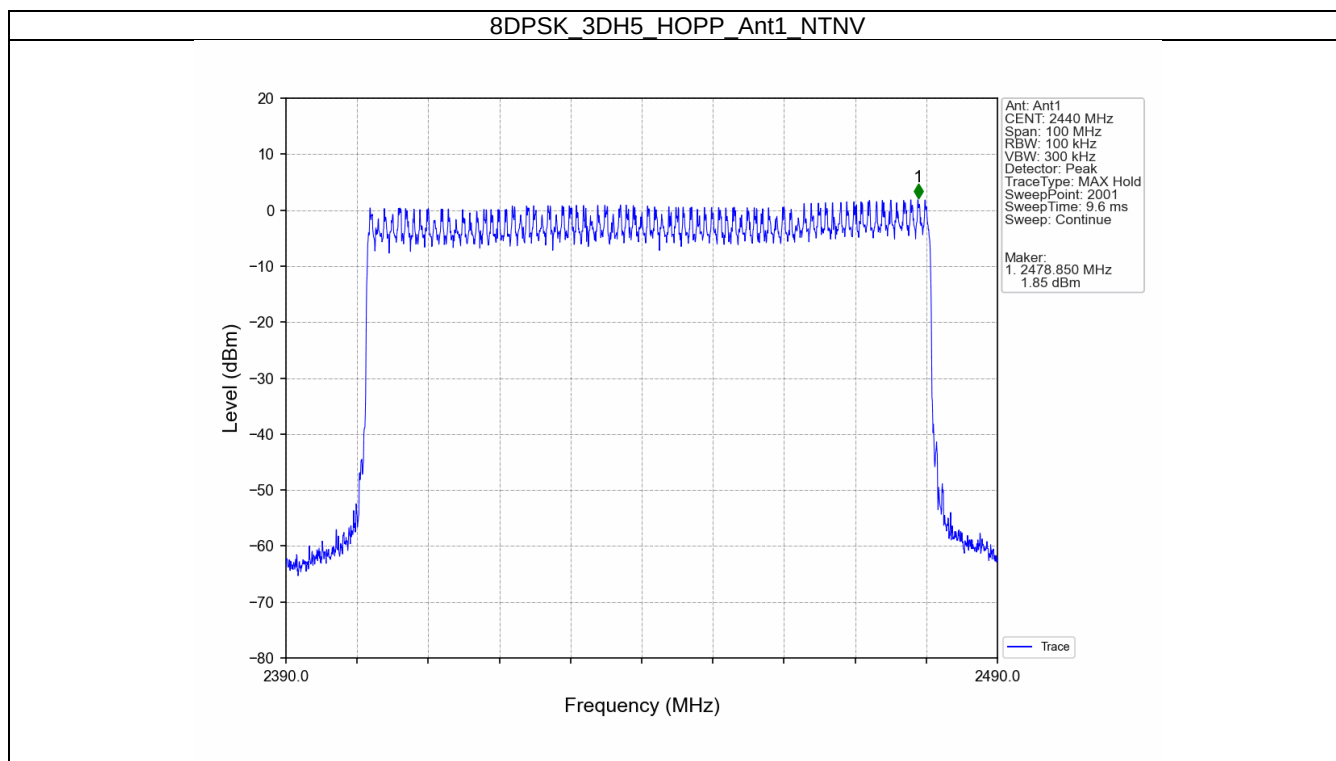


8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV

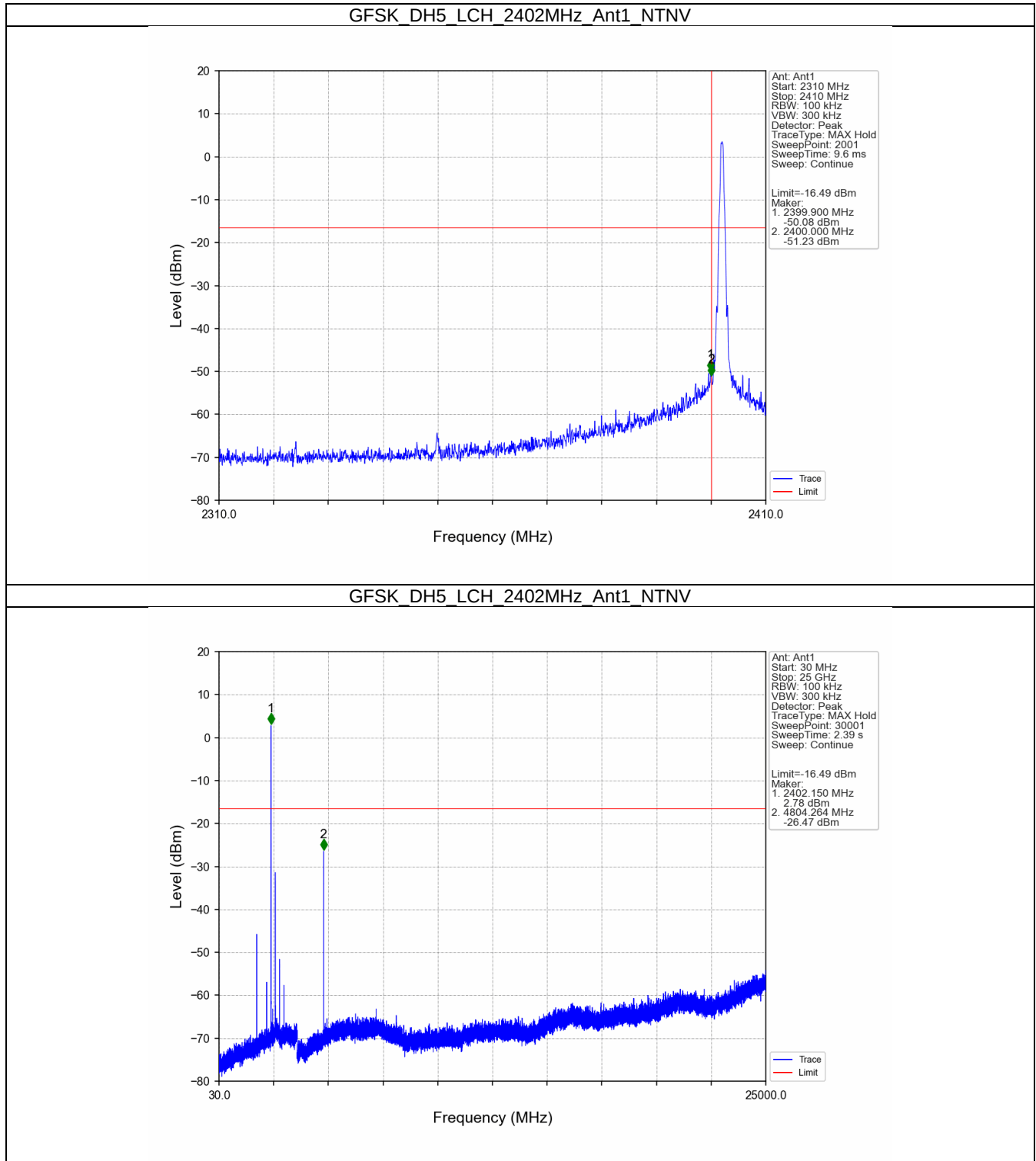


8DPSK\_3DH5\_HOPP\_Ant1\_NTNV

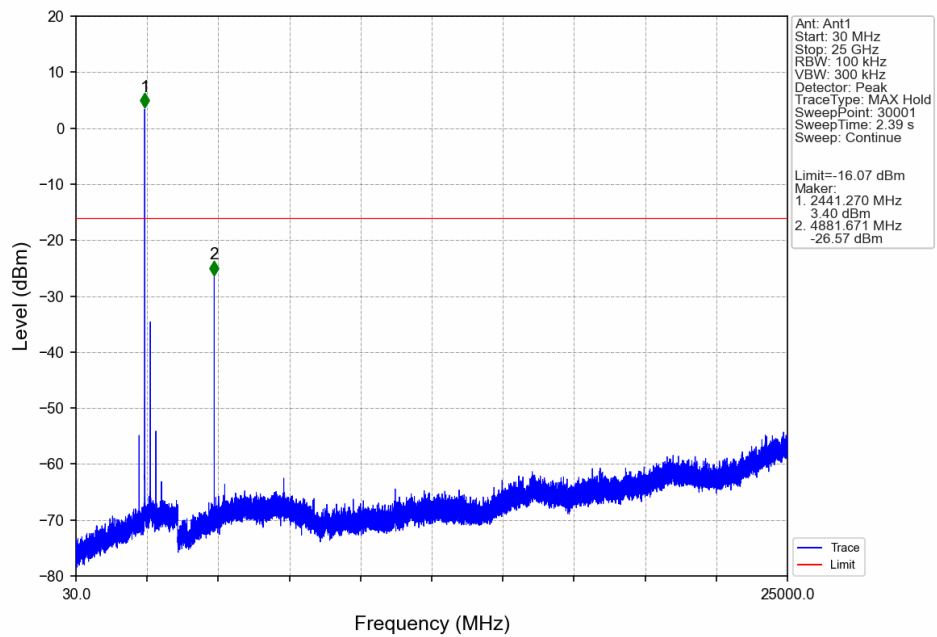




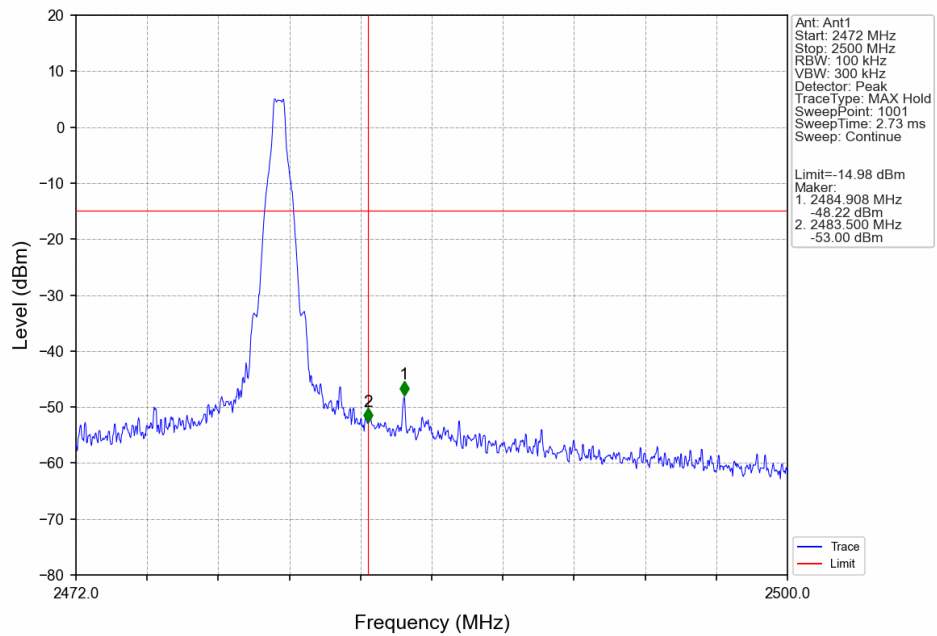
## 7.2.2 CSE



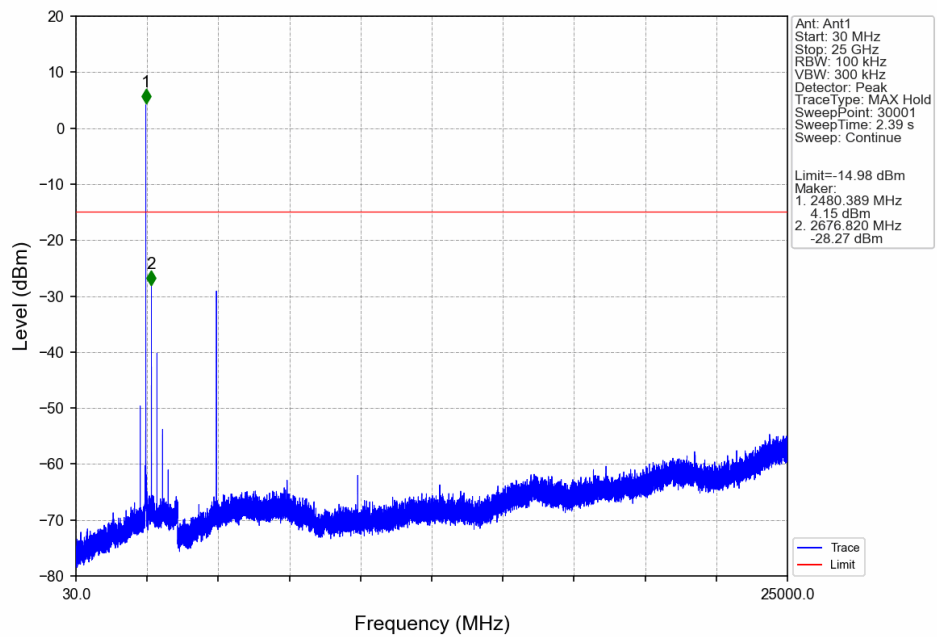
GFSK\_DH5\_MCH\_2441MHz\_Ant1\_NTNV



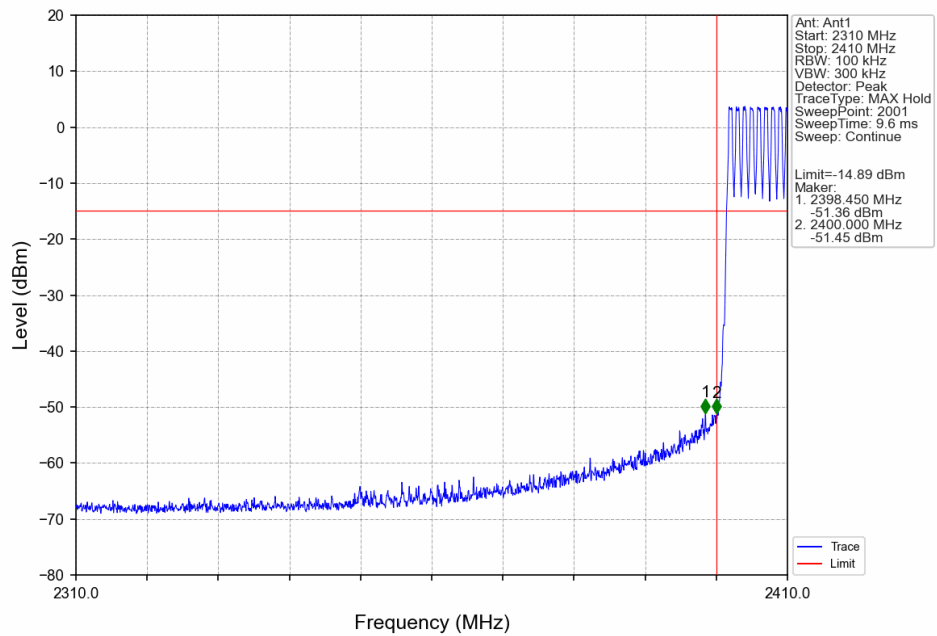
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



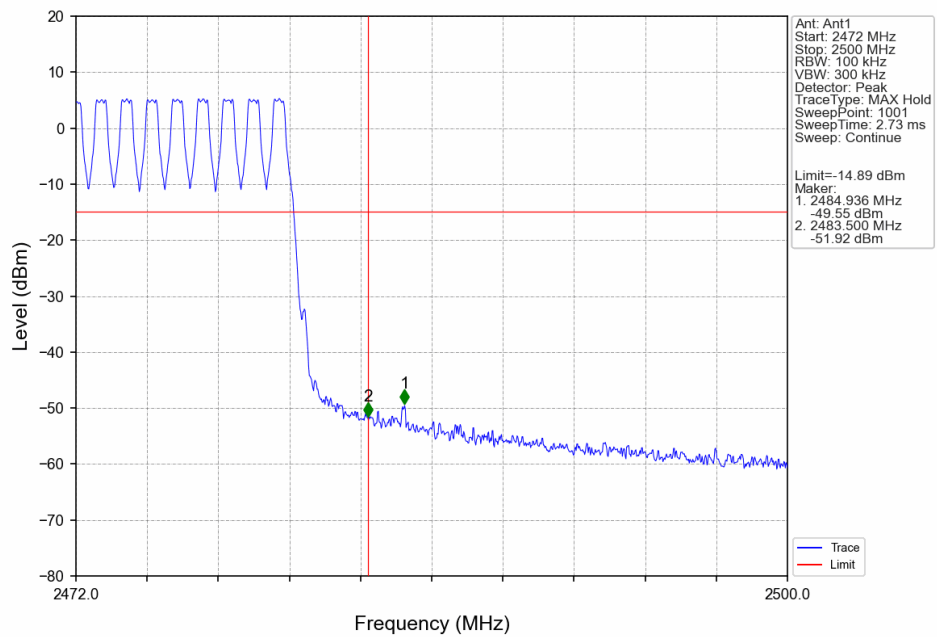
GFSK\_DH5\_HCH\_2480MHz\_Ant1\_NTNV



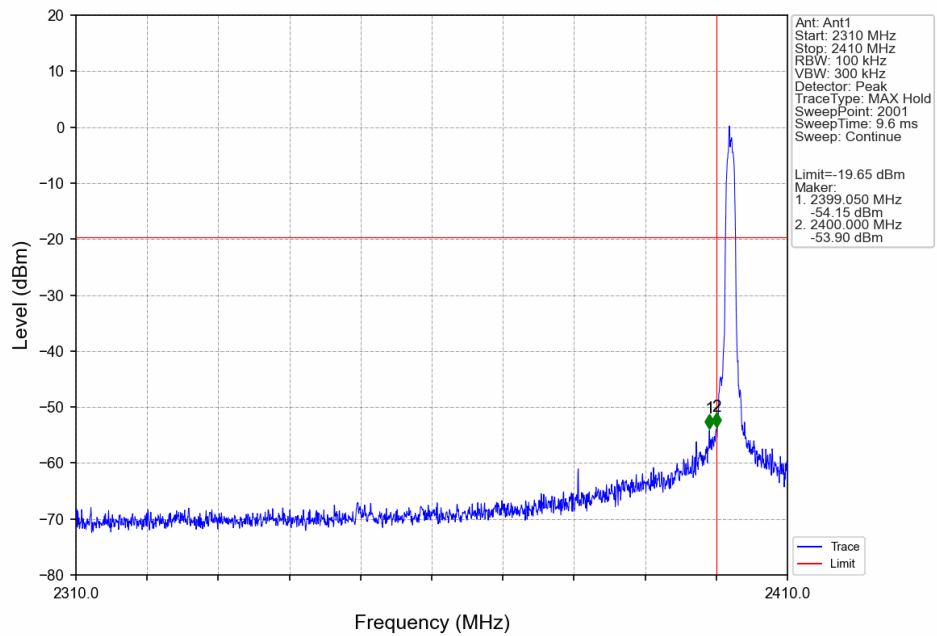
GFSK\_DH5\_HOPP\_Ant1\_NTNV



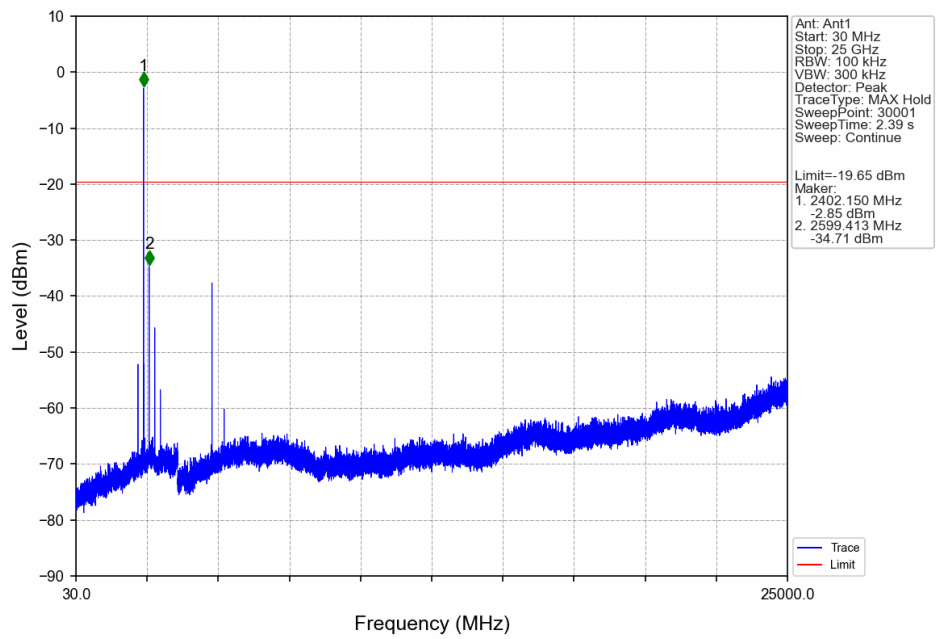
GFSK\_DH5\_HOPP\_Ant1\_NTNV



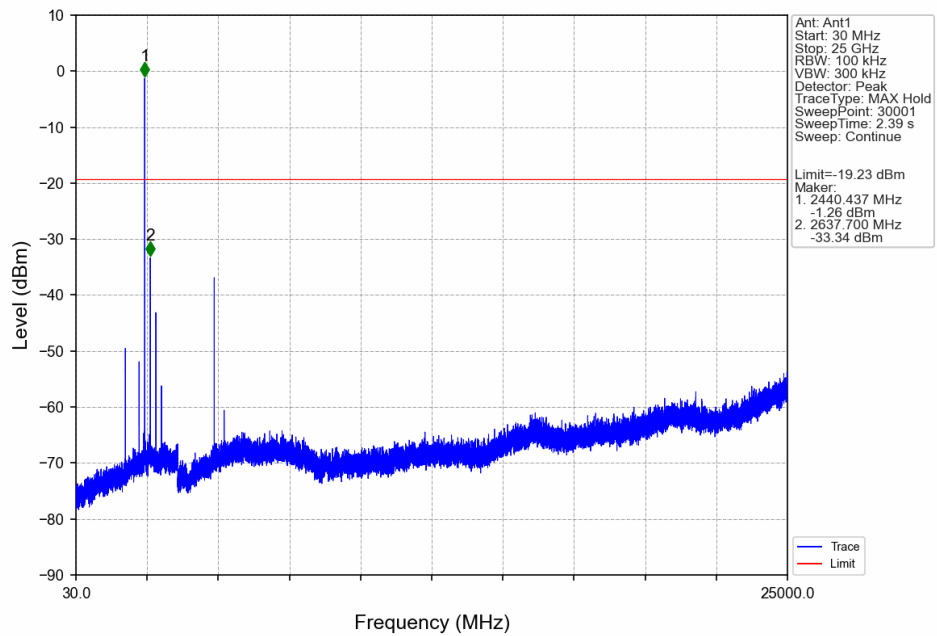
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



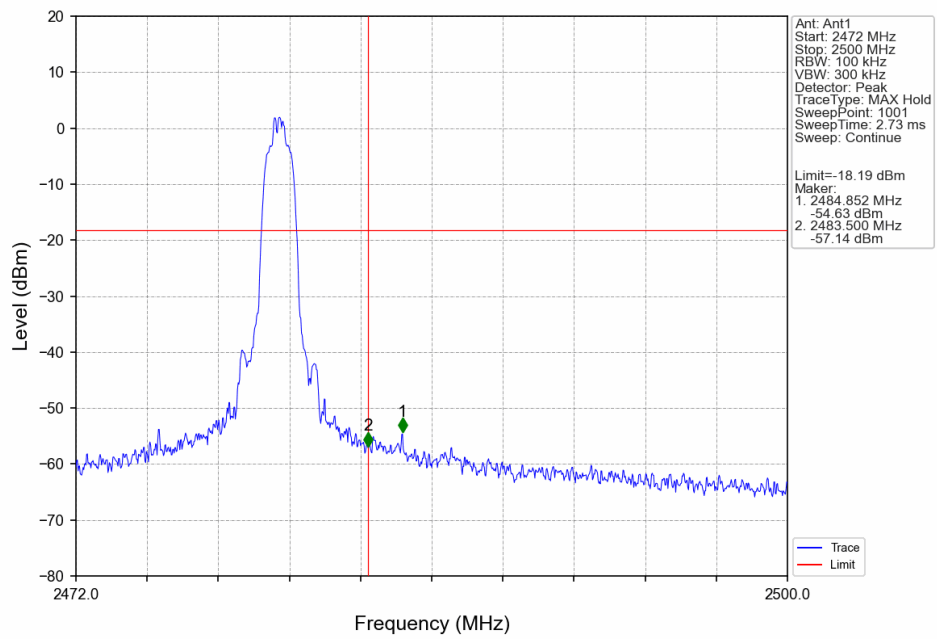
Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



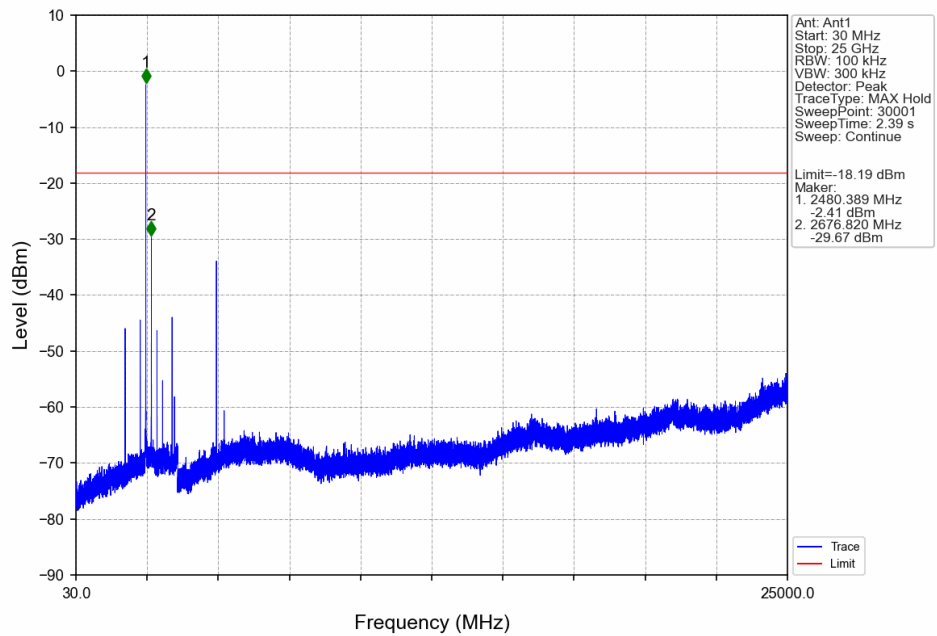
Pi/4DQPSK\_2DH5\_MCH\_2441MHz\_Ant1\_NTNV



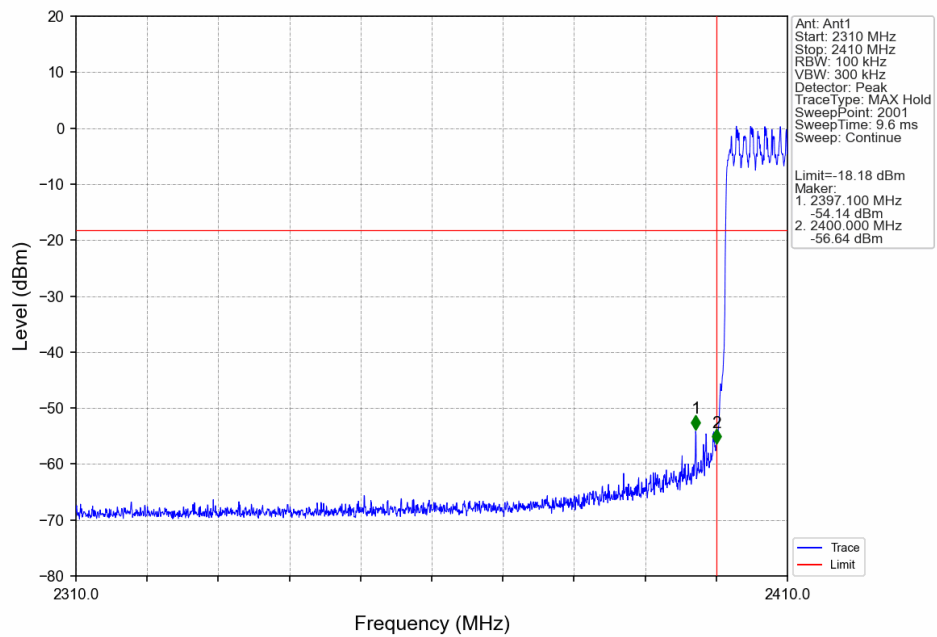
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



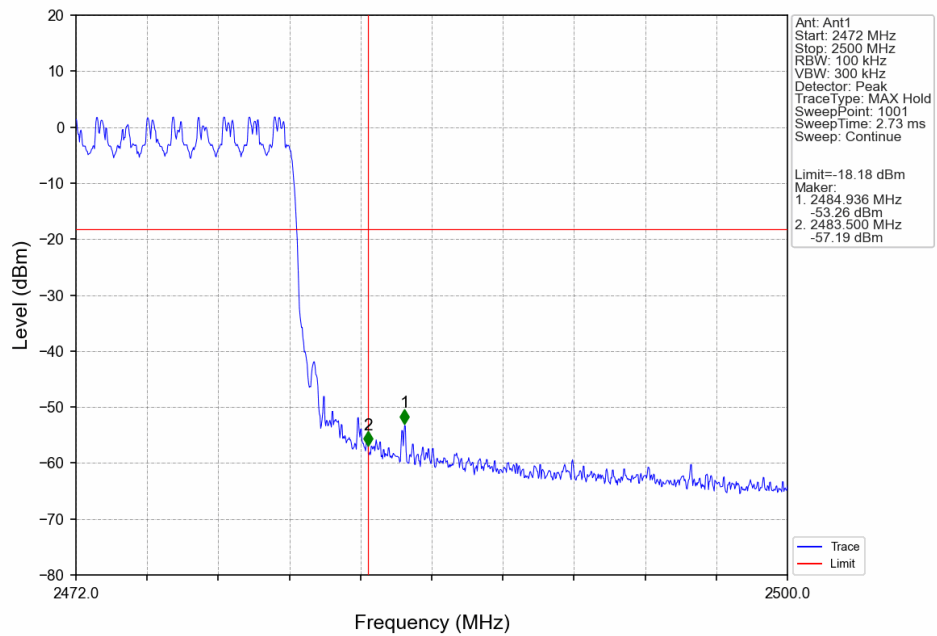
Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



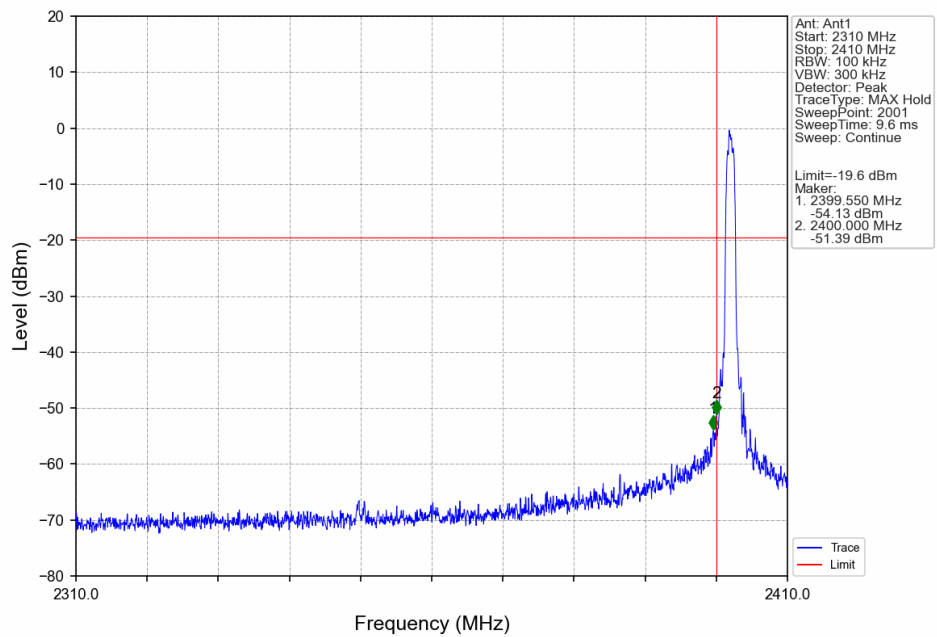
Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



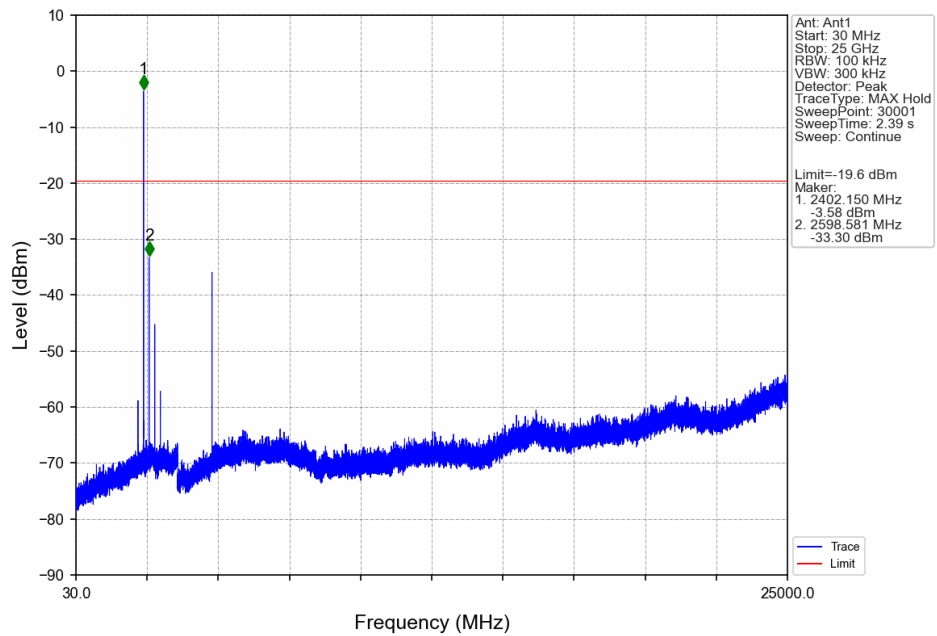
Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



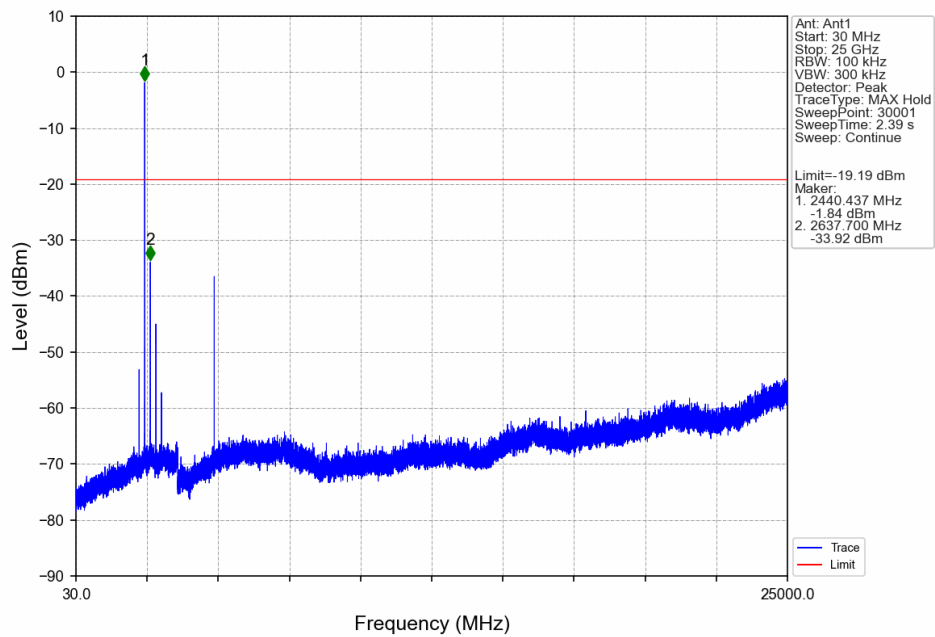
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



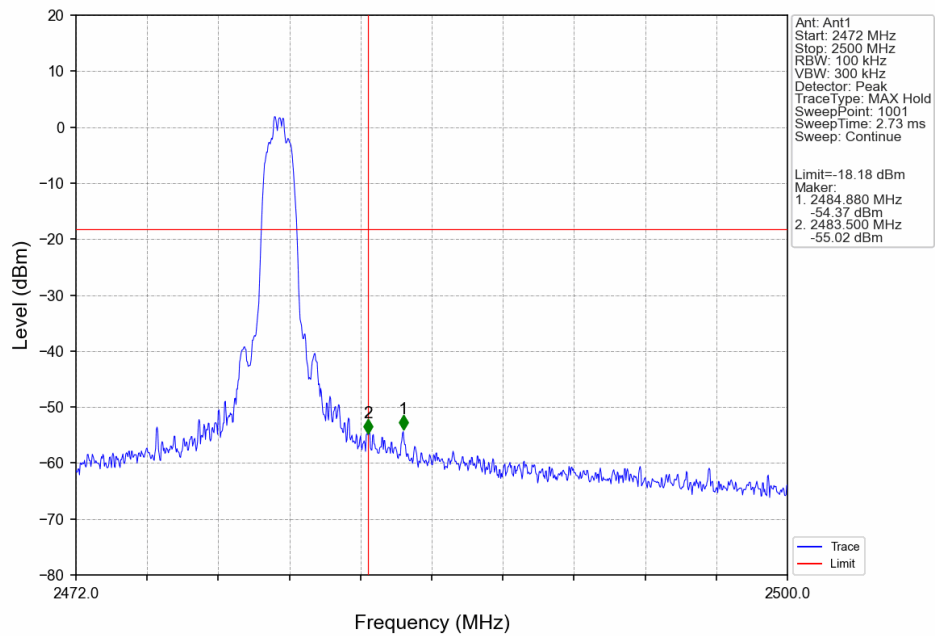
8DPSK\_3DH5\_LCH\_2402MHz\_Ant1\_NTNV



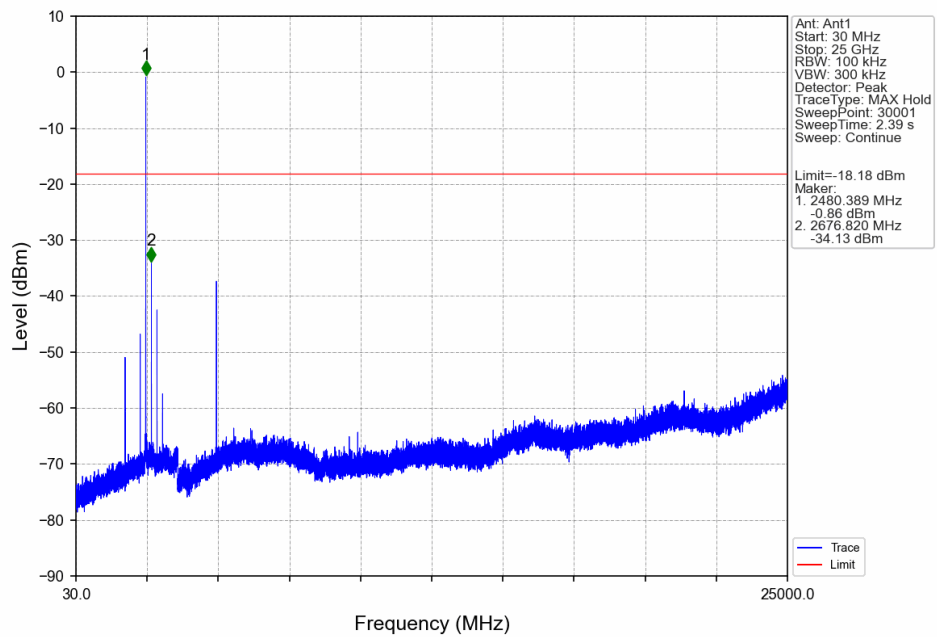
8DPSK\_3DH5\_MCH\_2441MHz\_Ant1\_NTNV



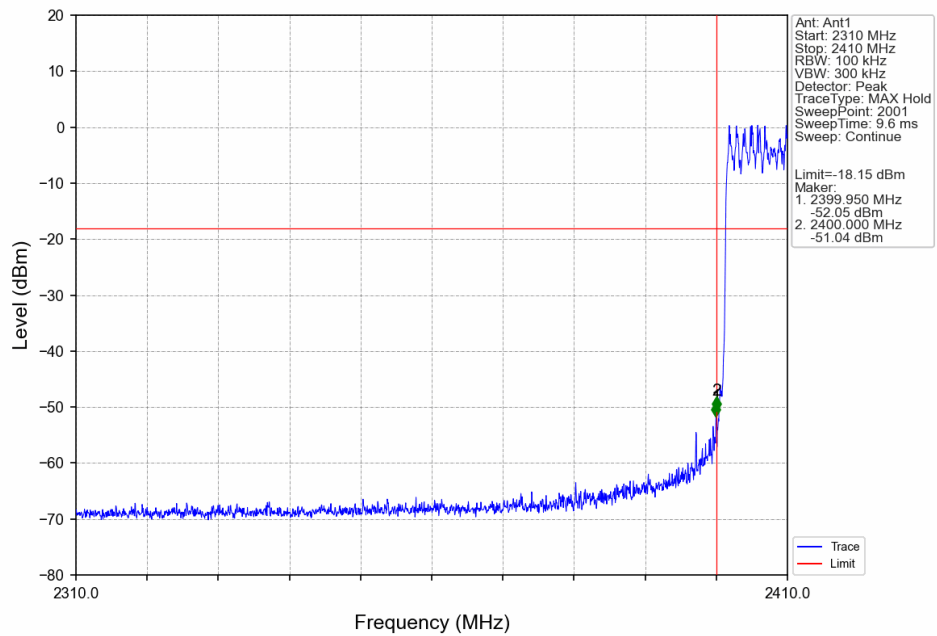
8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV

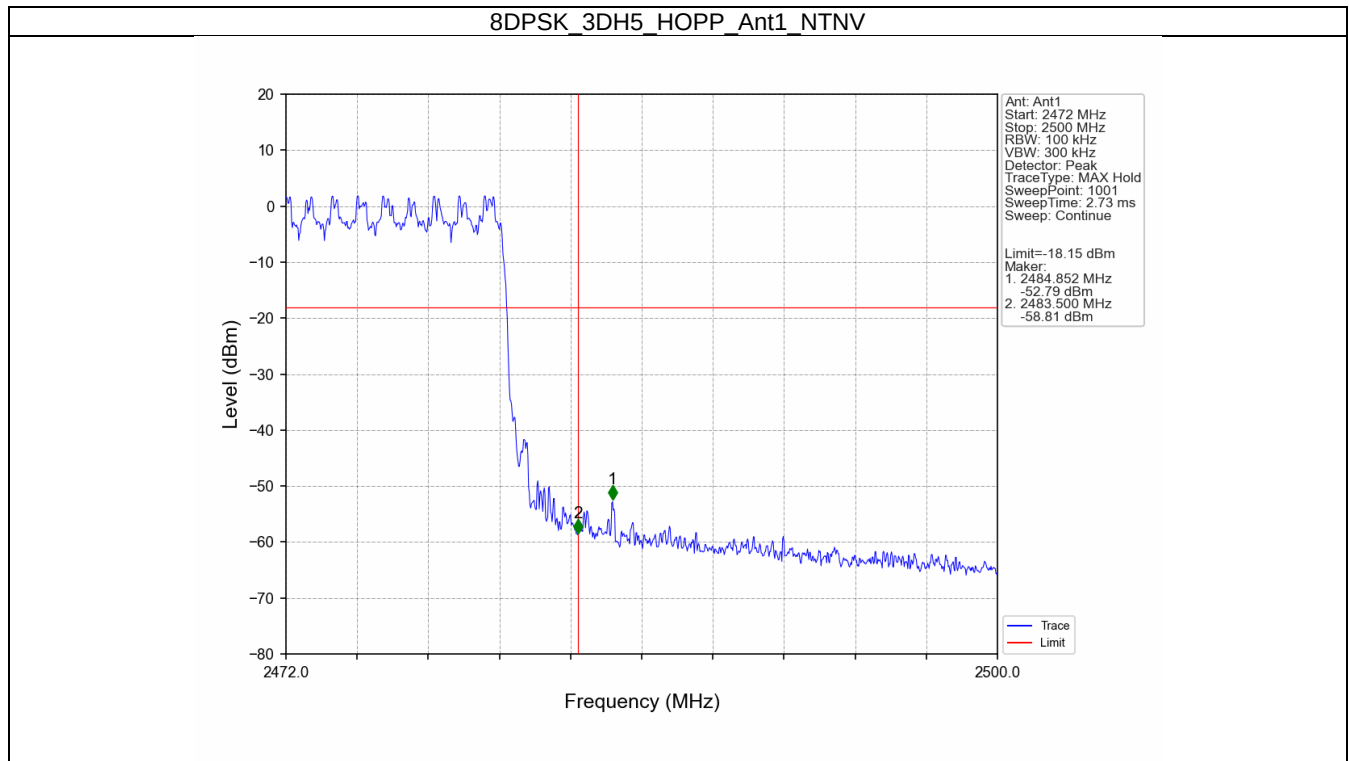


8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



8DPSK\_3DH5\_HOPP\_Ant1\_NTNV





\*\*\*\*\* End of Report \*\*\*\*\*