

## Appendix A

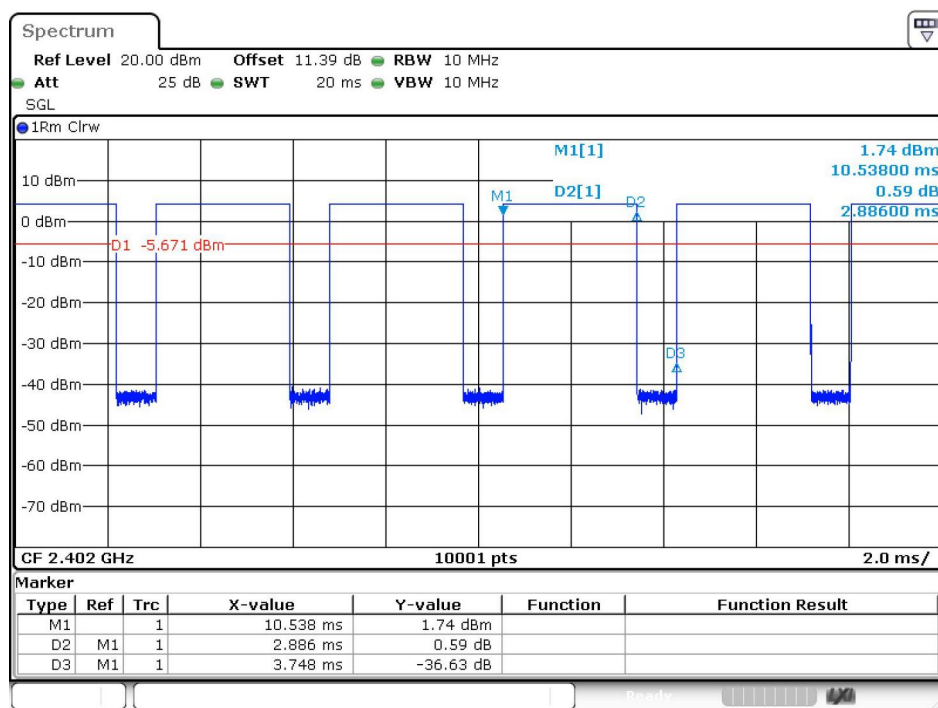
|                |                               |
|----------------|-------------------------------|
| Report No.:    | CISRR241009020                |
| FCC ID:        | 2BLOE-TYD-BZY-001             |
| Product Name:  | Octopus Ocean Projection Lamp |
| Model No.:     | TYD-BZY-001                   |
| Test Engineer: | Lucas Huang                   |
| Supervised by: | Rory Huang                    |

## 1) Duty Cycle

### Test Result

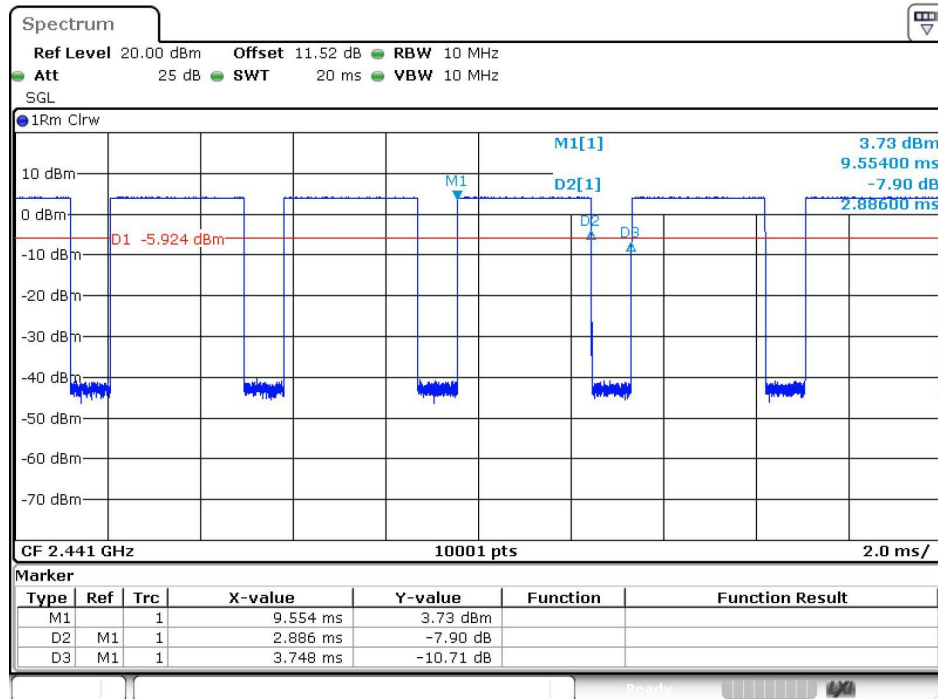
| Modulation    | Packets | Channel | On Time (ms) | Period (ms) | Duty Cycle (%) | Duty Cycle (linear) | Duty Cycle Factor (dB) | 1/T  |
|---------------|---------|---------|--------------|-------------|----------------|---------------------|------------------------|------|
| GFSK          | DH5     | 0       | 2.886        | 3.748       | 77.00          | 0.7700              | 1.1351                 | 0.35 |
|               |         | 39      | 2.886        | 3.748       | 77.00          | 0.7700              | 1.1351                 | 0.35 |
|               |         | 78      | 2.886        | 3.748       | 77.00          | 0.7700              | 1.1351                 | 0.35 |
| $\pi/4$ DQPSK | 2-DH5   | 0       | 2.892        | 3.748       | 77.16          | 0.7716              | 1.1261                 | 0.35 |
|               |         | 39      | 2.890        | 3.748       | 77.11          | 0.7711              | 1.1289                 | 0.35 |
|               |         | 78      | 2.890        | 3.748       | 77.11          | 0.7711              | 1.1289                 | 0.35 |
| 8DPSK         | 3-DH5   | 0       | 2.892        | 3.748       | 77.16          | 0.7716              | 1.1261                 | 0.35 |
|               |         | 39      | 2.894        | 3.748       | 77.21          | 0.7721              | 1.1233                 | 0.35 |
|               |         | 78      | 2.892        | 3.748       | 77.16          | 0.7716              | 1.1261                 | 0.35 |

### Test Graphs



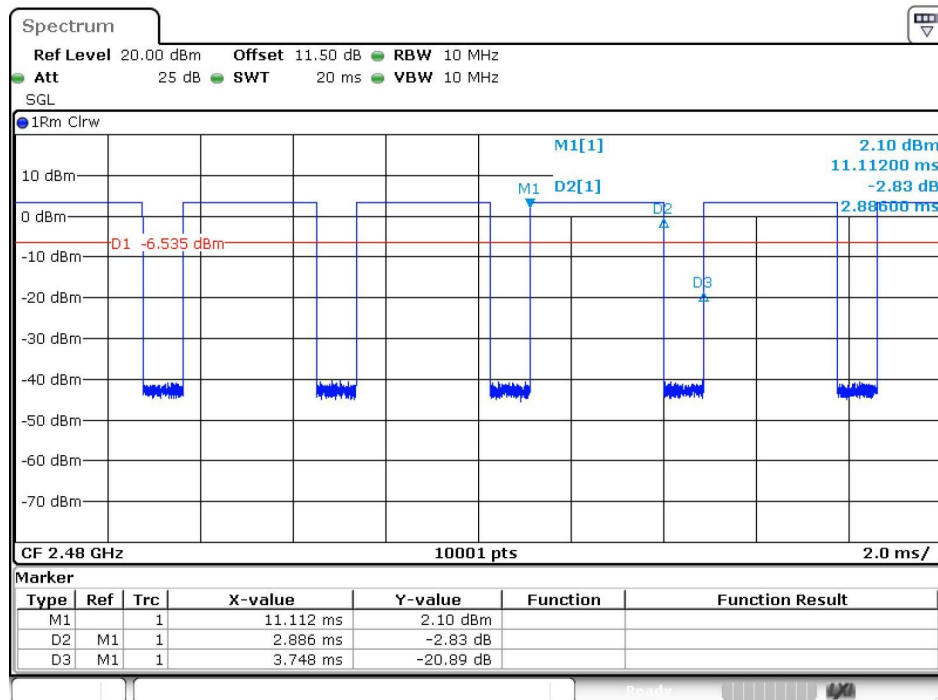
Date: 14.OCT.2024 15:27:07

GFSK(DH5)\_Channel 0



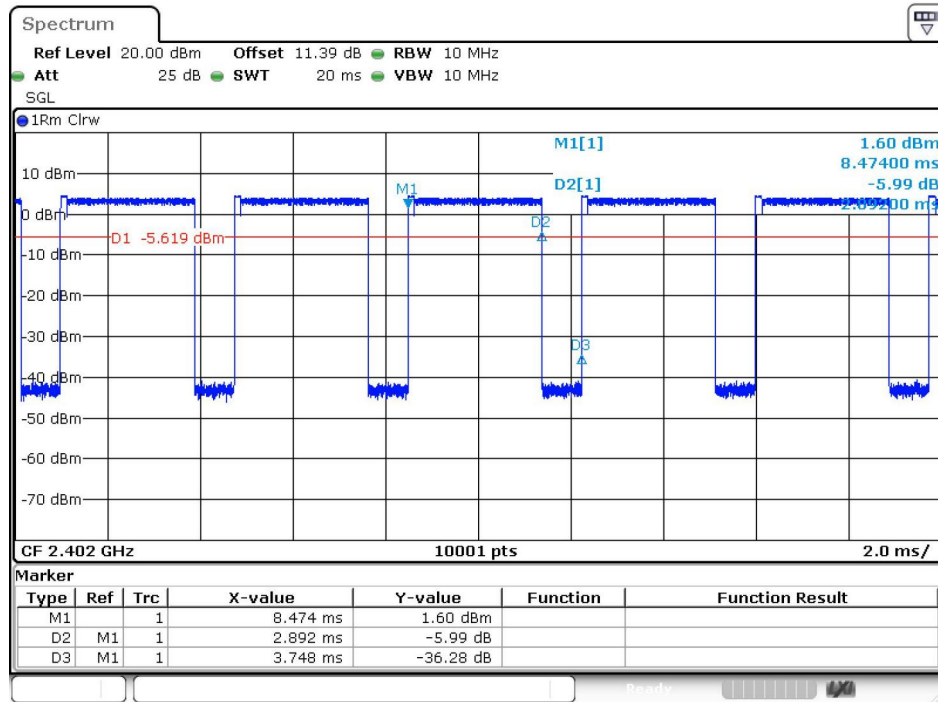
Date: 14.OCT.2024 15:37:15

### GFSK(DH5)\_Channel 39



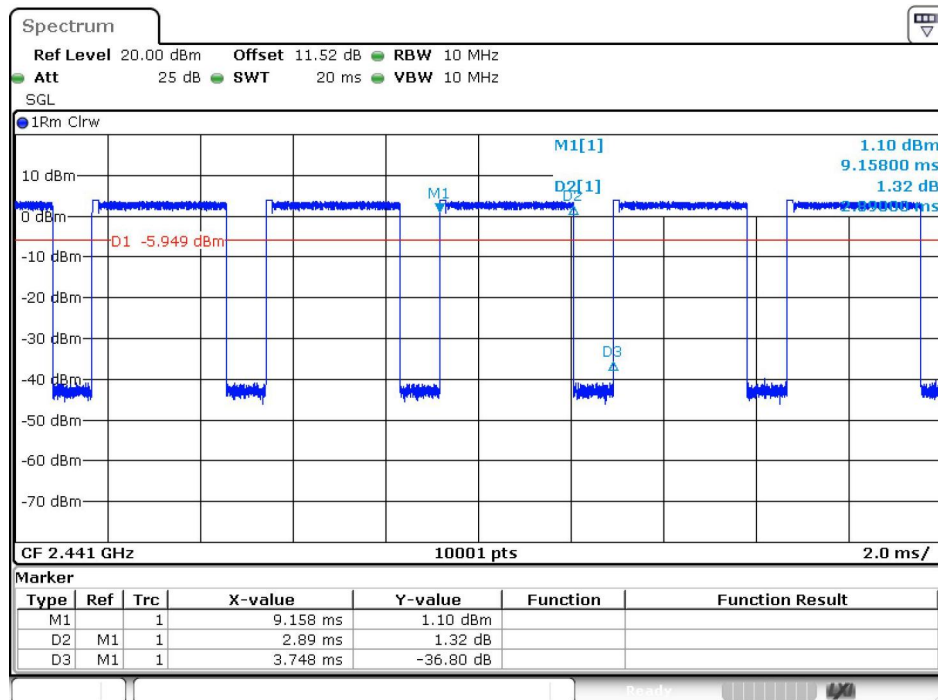
Date: 14.OCT.2024 15:39:52

### GFSK(DH5)\_Channel 78



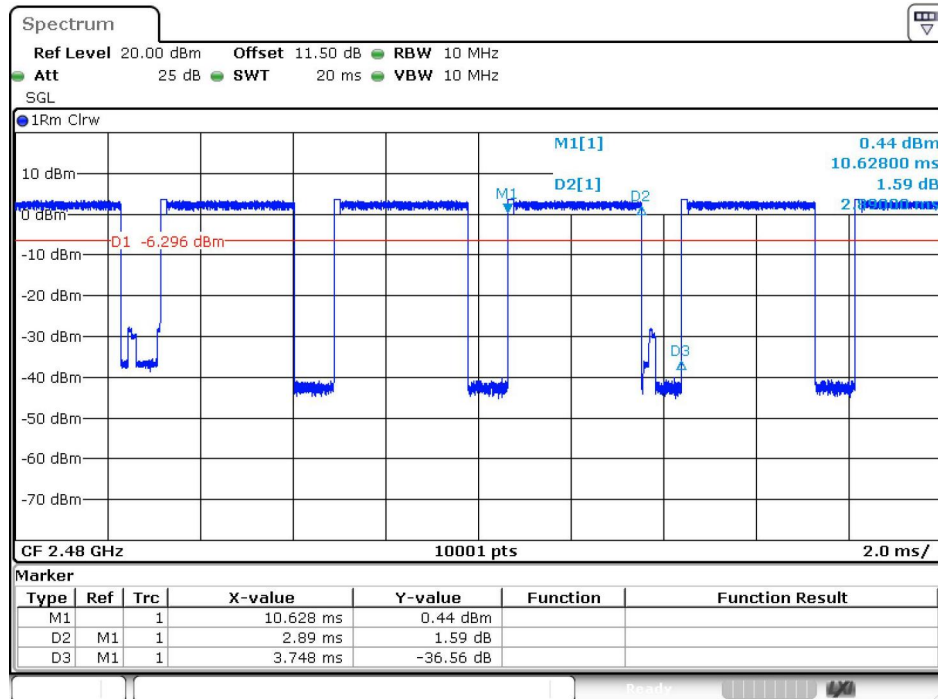
Date: 14.OCT.2024 15:42:31

$\pi/4$ DQPSK(2-DH5)\_Channel 0



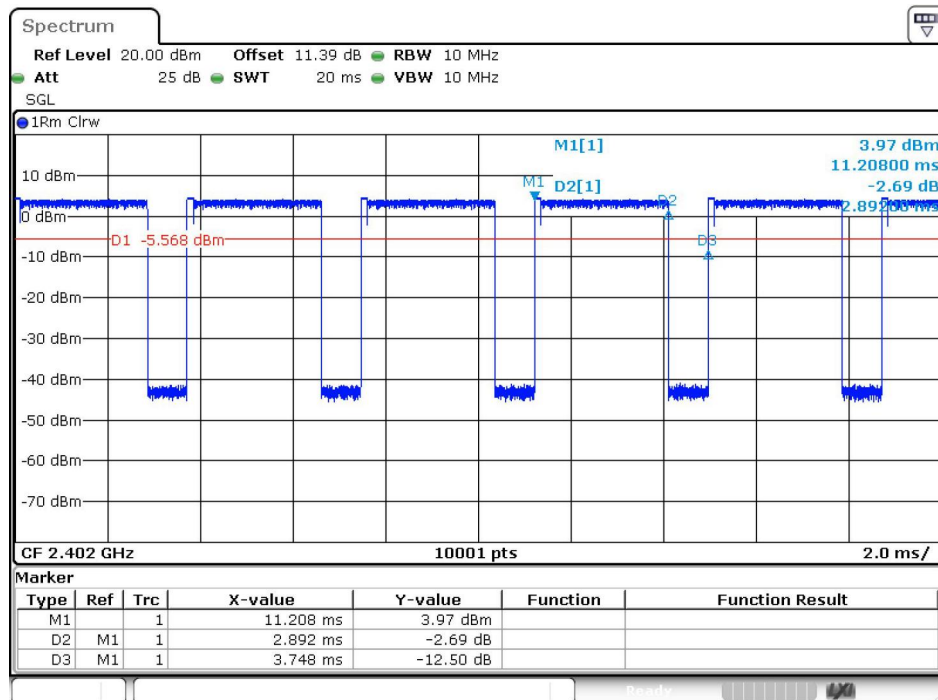
Date: 14.OCT.2024 15:53:45

$\pi/4$ DQPSK(2-DH5)\_Channel 39



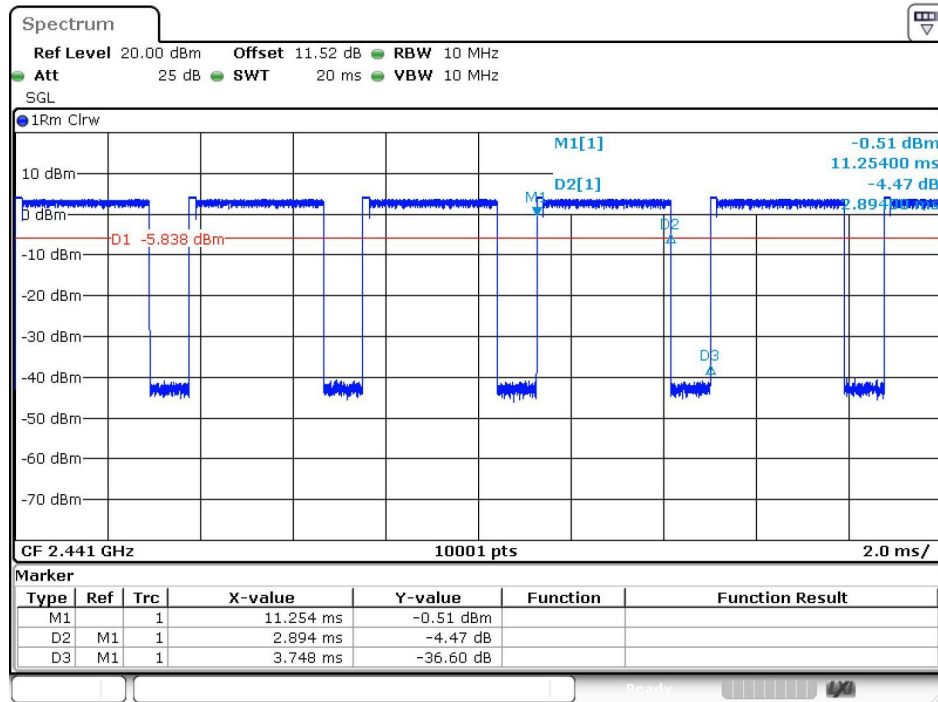
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$\pi/4$ DQPSK(2-DH5)\_Channel 78



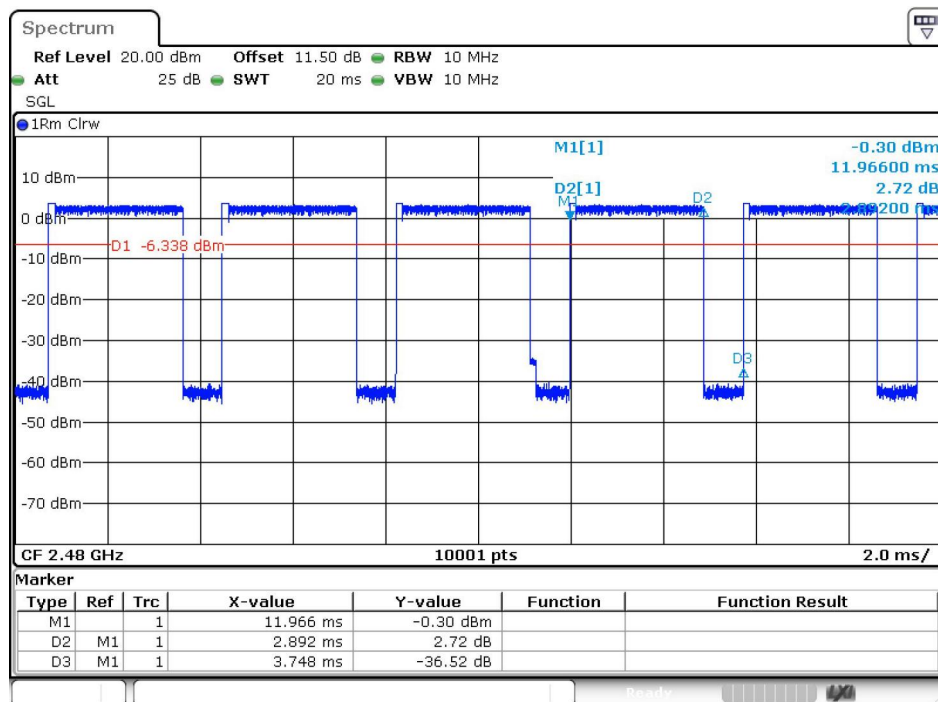
Date: 14.OCT.2024 15:59:17

8DPSK(3-DH5)\_Channel 0



Date: 14.OCT.2024 16:06:35

### 8DPSK(3-DH5)\_Channel 39



Date: 14.OCT.2024 16:08:53

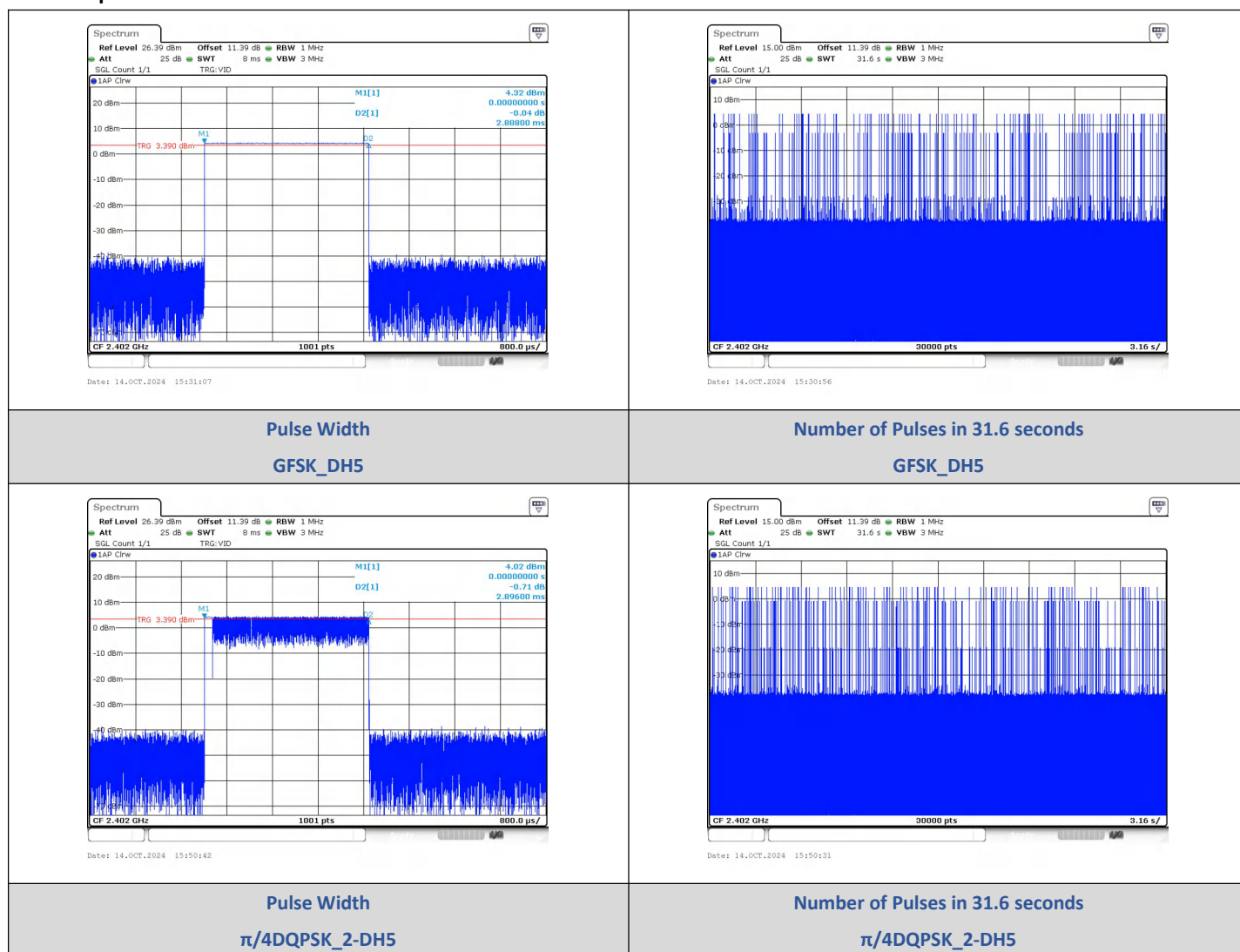
### 8DPSK(3-DH5)\_Channel 78

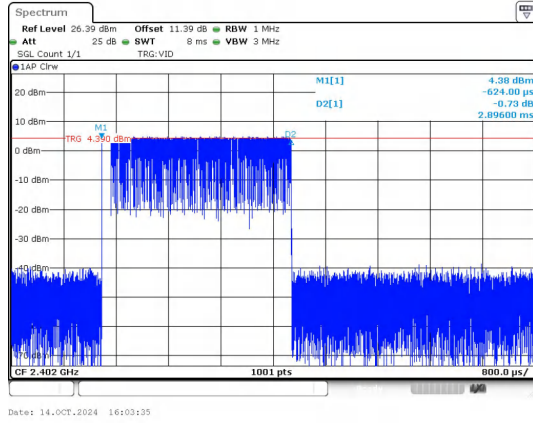
## 2) Dwell Time

### Test Result

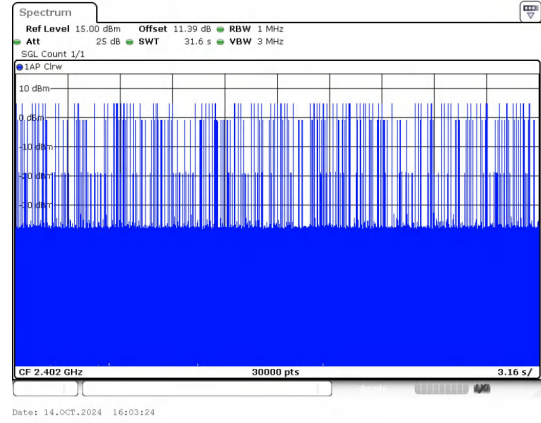
| Modulation    | Packet | Channel          | Pulse Width (ms) | Number of Pulses in 31.6 seconds | Dwell Time (ms) | Limit (ms) | Result |
|---------------|--------|------------------|------------------|----------------------------------|-----------------|------------|--------|
| GFSK          | DH5    | CH0<br>(2402MHz) | 2.888            | 103                              | 297.46          | < 400      | PASS   |
| $\pi/4$ DQPSK | 2-DH5  |                  | 2.896            | 106                              | 306.98          |            | PASS   |
| 8DPSK         | 3-DH5  |                  | 2.896            | 101                              | 292.5           |            | PASS   |

### Test Graphs





**Pulse Width**  
**8DPSK\_3-DH5**



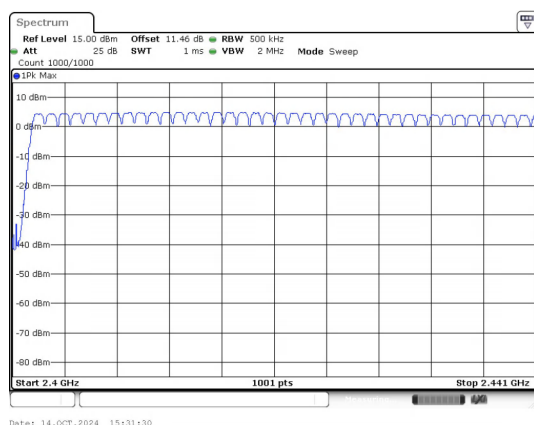
**Number of Pulses in 31.6 seconds**  
**8DPSK\_3-DH5**

### 3) Number Of Hopping Channel

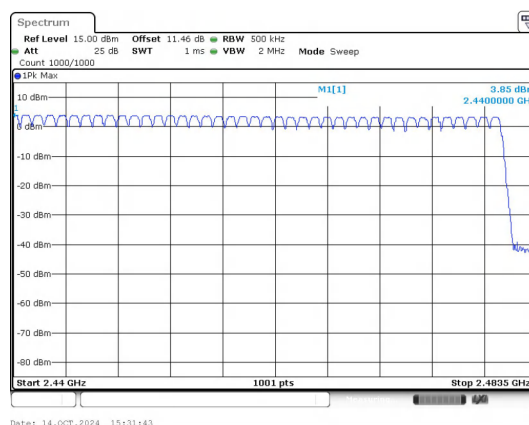
#### Test Result

| Modulation    | Packet | Number of Hopping Channel | Limit | Result |
|---------------|--------|---------------------------|-------|--------|
| GFSK          | DH5    | 79                        | 15    | PASS   |
| $\pi/4$ DQPSK | 2-DH5  | 79                        | 15    | PASS   |
| 8DPSK         | 3-DH5  | 79                        | 15    | PASS   |

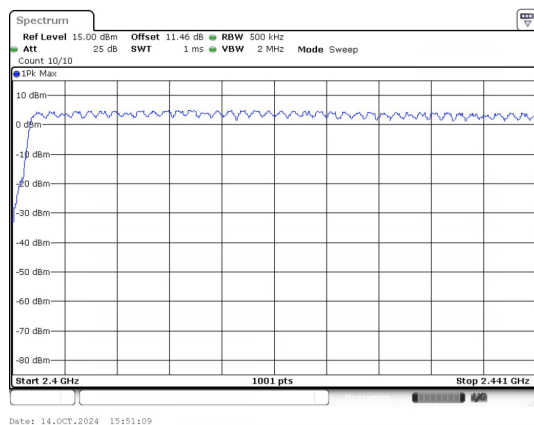
#### Test Graphs



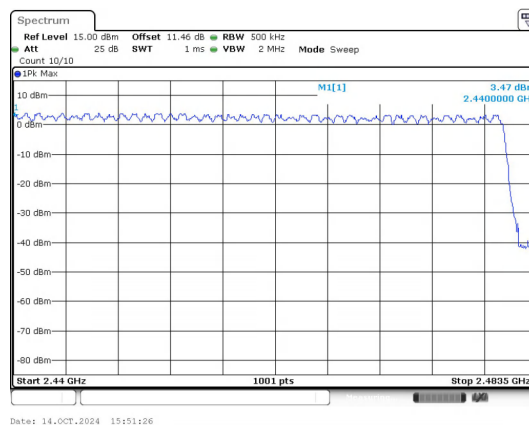
Low End Spectrum Channel Hopping Plot  
GFSK



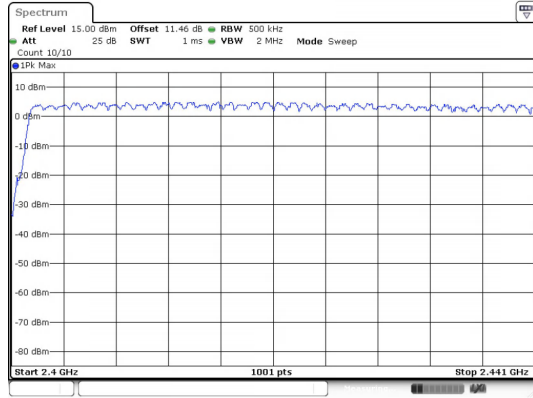
High End Spectrum Channel Hopping Plot  
GFSK



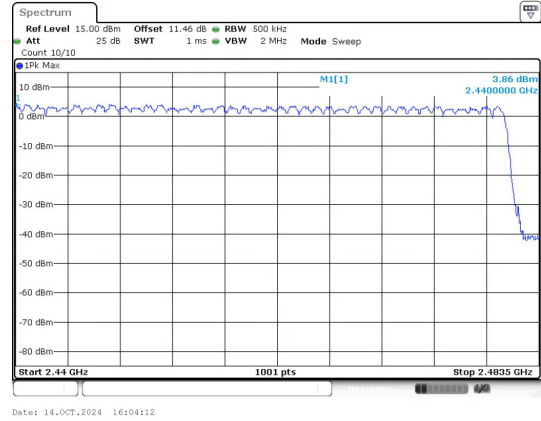
Low End Spectrum Channel Hopping Plot  
 $\pi/4$ DQPSK



High End Spectrum Channel Hopping Plot  
 $\pi/4$ DQPSK



Low End Spectrum Channel Hopping Plot  
8DPSK



High End Spectrum Channel Hopping Plot  
8DPSK

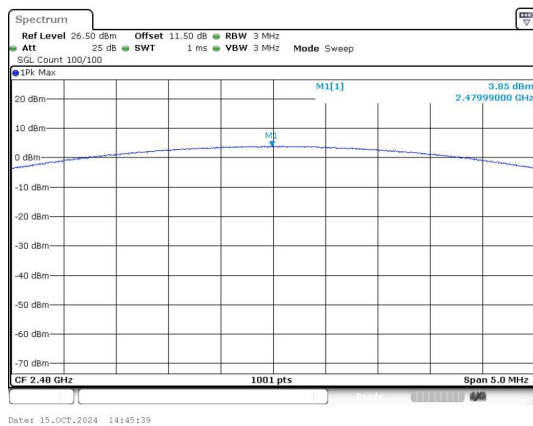
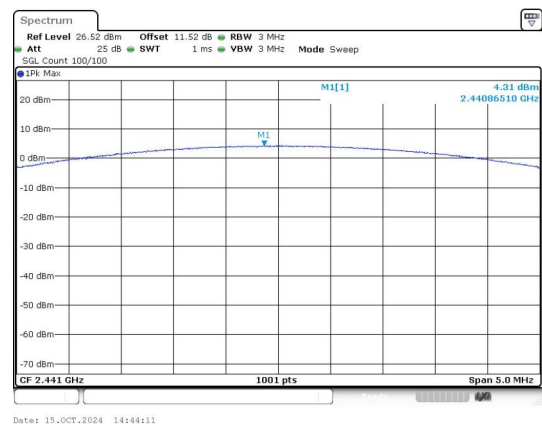
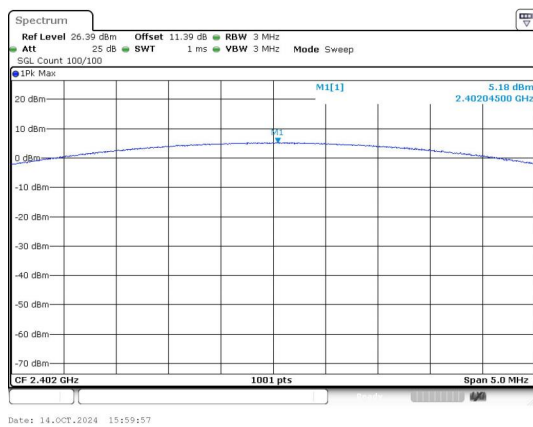
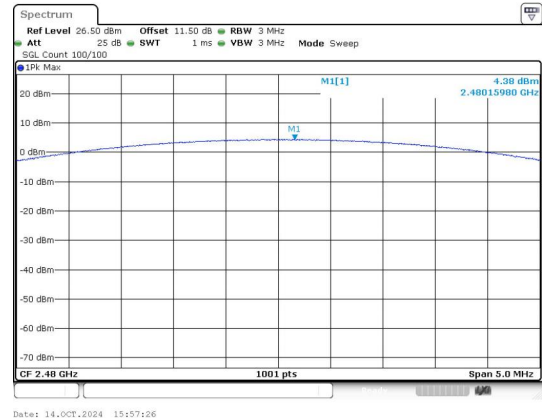
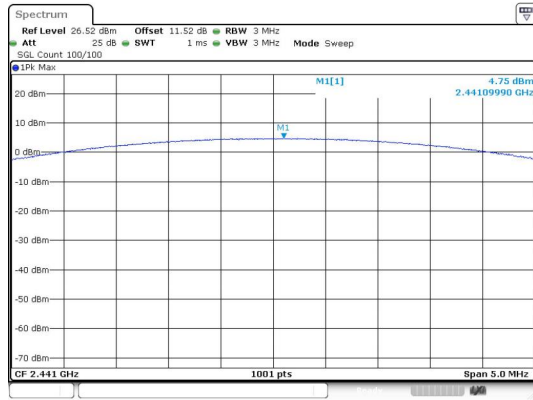
## 4) Conducted Peak Output Power

### Test Result

| Modulation    | Packet Type | Channel | Peak Output Power (dBm) | Peak Output Power (mW) | Limit (dBm) | Result |
|---------------|-------------|---------|-------------------------|------------------------|-------------|--------|
| GFSK          | DH5         | 0       | 4.13                    | 2.59                   | ≤30         | PASS   |
|               |             | 39      | 4.14                    | 2.59                   |             | PASS   |
|               |             | 78      | 3.51                    | 2.24                   |             | PASS   |
| $\pi/4$ DQPSK | 2-DH5       | 0       | 4.93                    | 3.11                   | ≤20.97      | PASS   |
|               |             | 39      | 4.75                    | 2.98                   |             | PASS   |
|               |             | 78      | 4.38                    | 2.74                   |             | PASS   |
| 8DPSK         | 3-DH5       | 0       | 5.19                    | 3.30                   |             | PASS   |
|               |             | 39      | 4.31                    | 2.70                   |             | PASS   |
|               |             | 78      | 3.85                    | 2.43                   |             | PASS   |

### Test Graphs



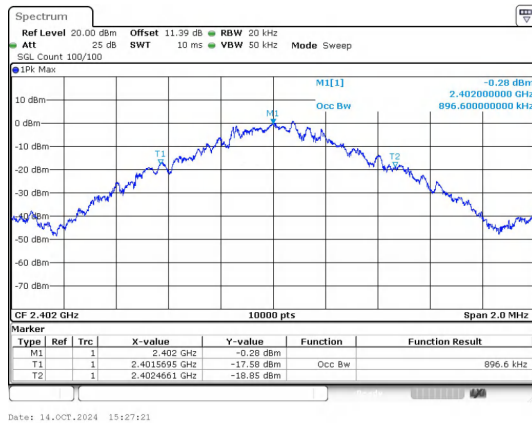


## 5) 99% Bandwidth

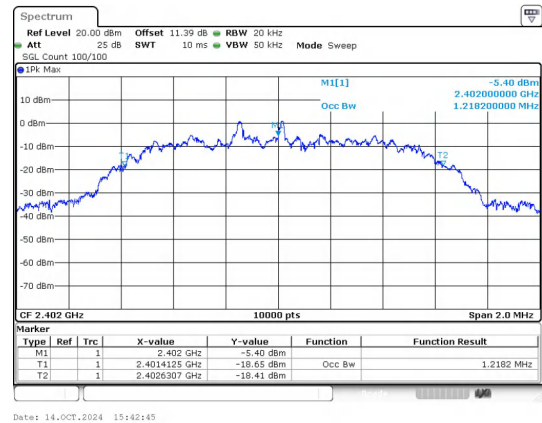
### Test Result

| Modulation    | Channel | Center Frequency (MHz) | 99% BW (MHz) |
|---------------|---------|------------------------|--------------|
| GFSK          | 0       | 2402                   | 0.89660      |
|               | 39      | 2441                   | 0.91320      |
|               | 78      | 2480                   | 0.89160      |
| $\pi/4$ DQPSK | 0       | 2402                   | 1.2180       |
|               | 39      | 2441                   | 1.1950       |
|               | 78      | 2480                   | 1.2070       |
| 8DPSK         | 0       | 2402                   | 1.2290       |
|               | 39      | 2441                   | 1.2210       |
|               | 78      | 2480                   | 1.2080       |

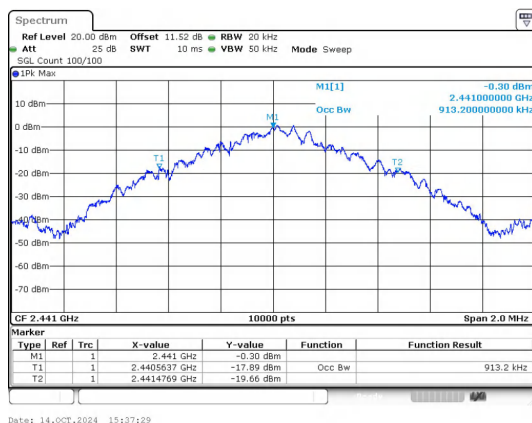
### Test Graphs



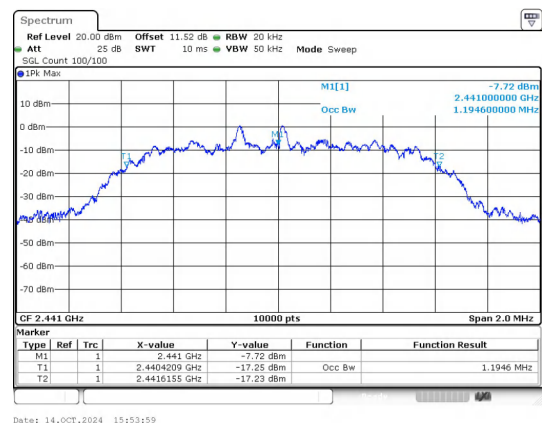
GFSK\_DH5\_Channel 0



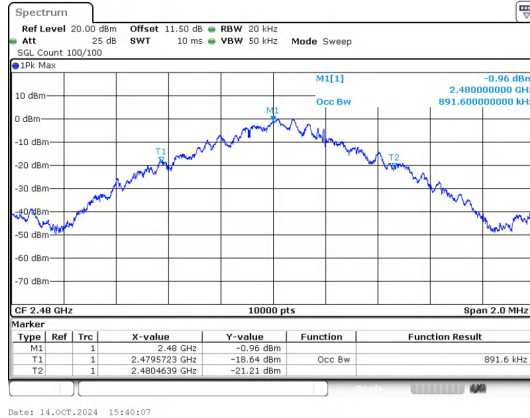
$\pi/4$ DQPSK\_2-DH5\_Channel 0



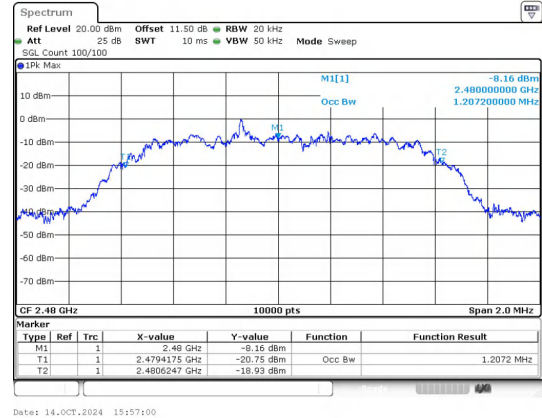
GFSK\_DH5\_Channel 39



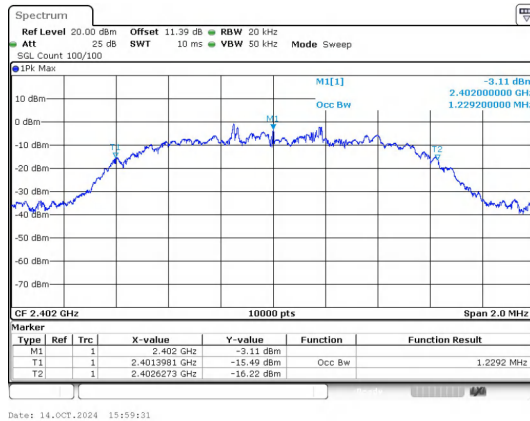
$\pi/4$ DQPSK\_2-DH5\_Channel 39



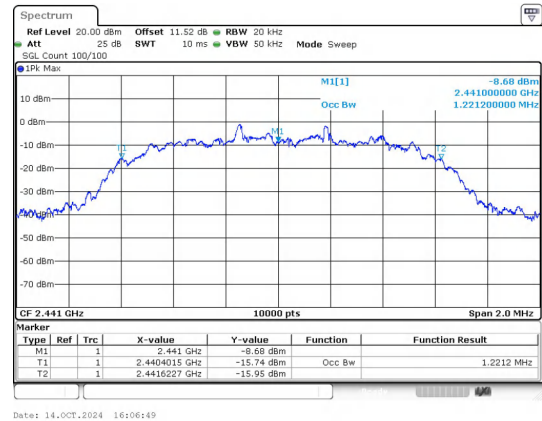
GFSK\_DH5\_Channel 78



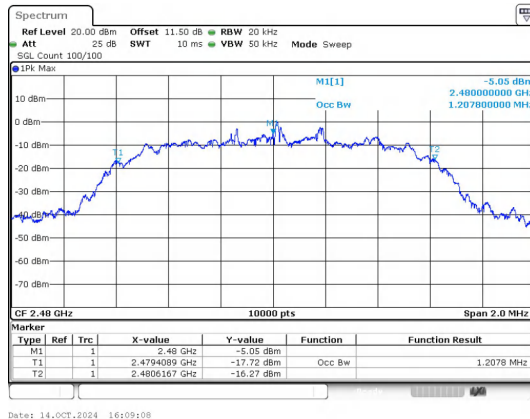
$\pi/4$ DQPSK\_2-DH5\_Channel 78



8DPSK\_3-DH5\_Channel 0



8DPSK\_3-DH5\_Channel 39



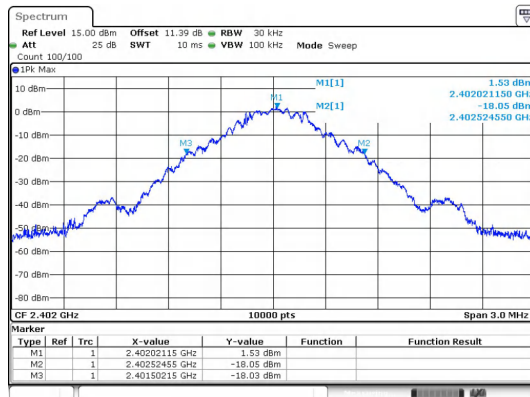
8DPSK\_3-DH5\_Channel 78

## 6) 20dB Bandwidth

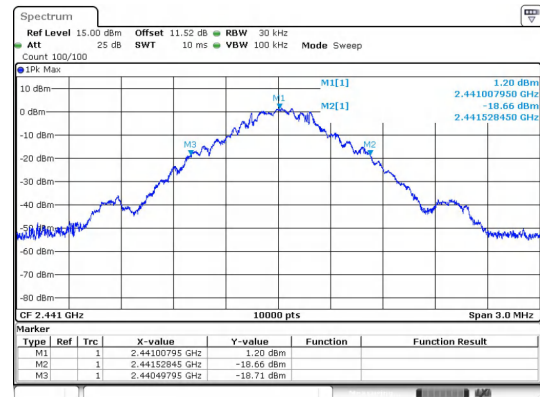
### Test Result

| Modulation    | Channel | Center Frequency (MHz) | 20 dB Bandwidth (MHz) |
|---------------|---------|------------------------|-----------------------|
| GFSK          | 0       | 2402 MHz               | 1.020                 |
|               | 39      | 2441 MHz               | 1.030                 |
|               | 78      | 2480 MHz               | 1.000                 |
| $\pi/4$ DQPSK | 0       | 2402 MHz               | 1.310                 |
|               | 39      | 2441 MHz               | 1.310                 |
|               | 78      | 2480 MHz               | 1.320                 |
| 8DPSK         | 0       | 2402 MHz               | 1.300                 |
|               | 39      | 2441 MHz               | 1.300                 |
|               | 78      | 2480 MHz               | 1.290                 |

### Test Graphs



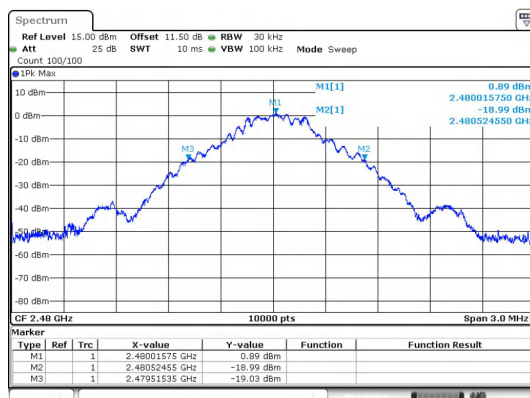
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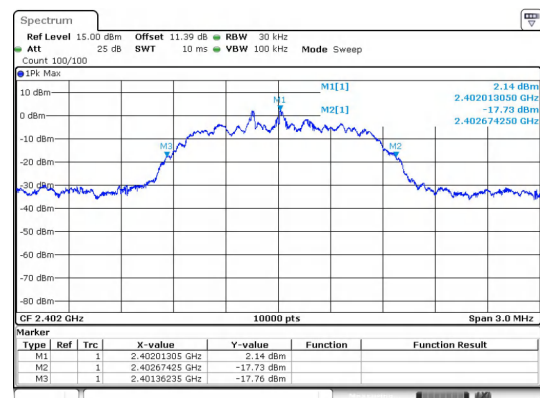
Date: 14.OCT.2024 15:37:45

GFSK\_DH5\_Channel 0

GFSK\_DH5\_Channel 39



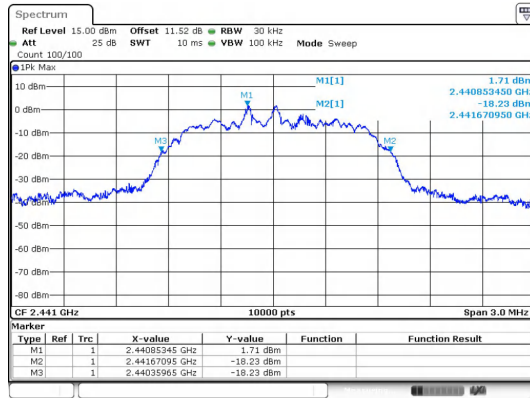
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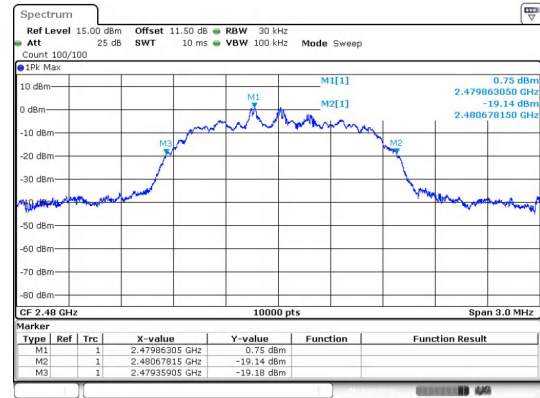
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GFSK\_DH5\_Channel 78

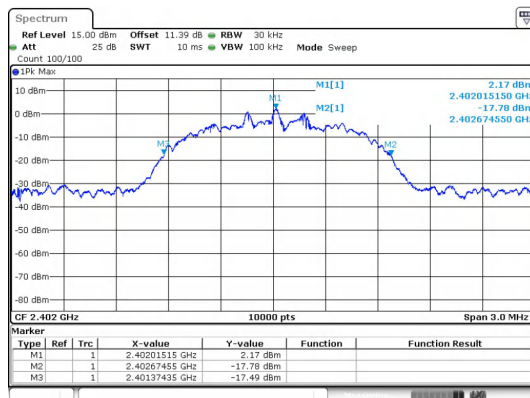
 $\pi/4$ DQPSK\_2-DH5\_Channel 0



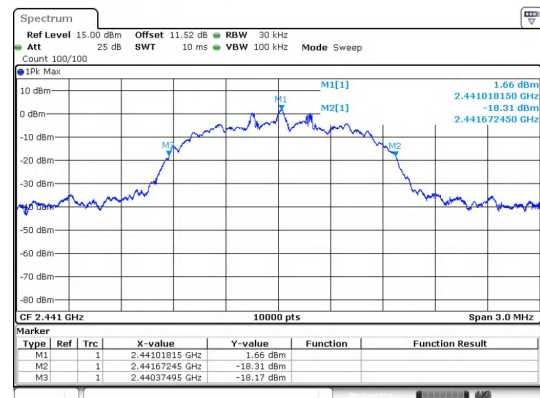
$\pi/4$ DQPSK\_2-DH5\_Channel 39



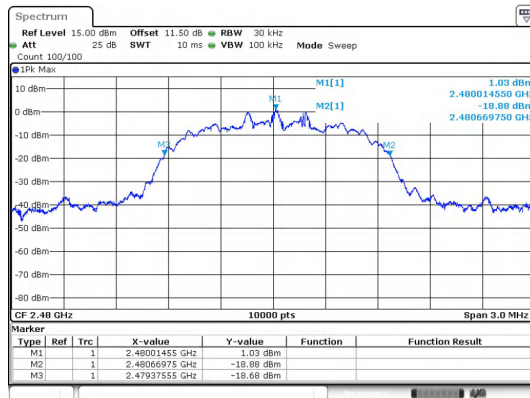
$\pi/4$ DQPSK\_2-DH5\_Channel 78



8DPSK\_3-DH5\_Channel 0



8DPSK\_3-DH5\_Channel 39



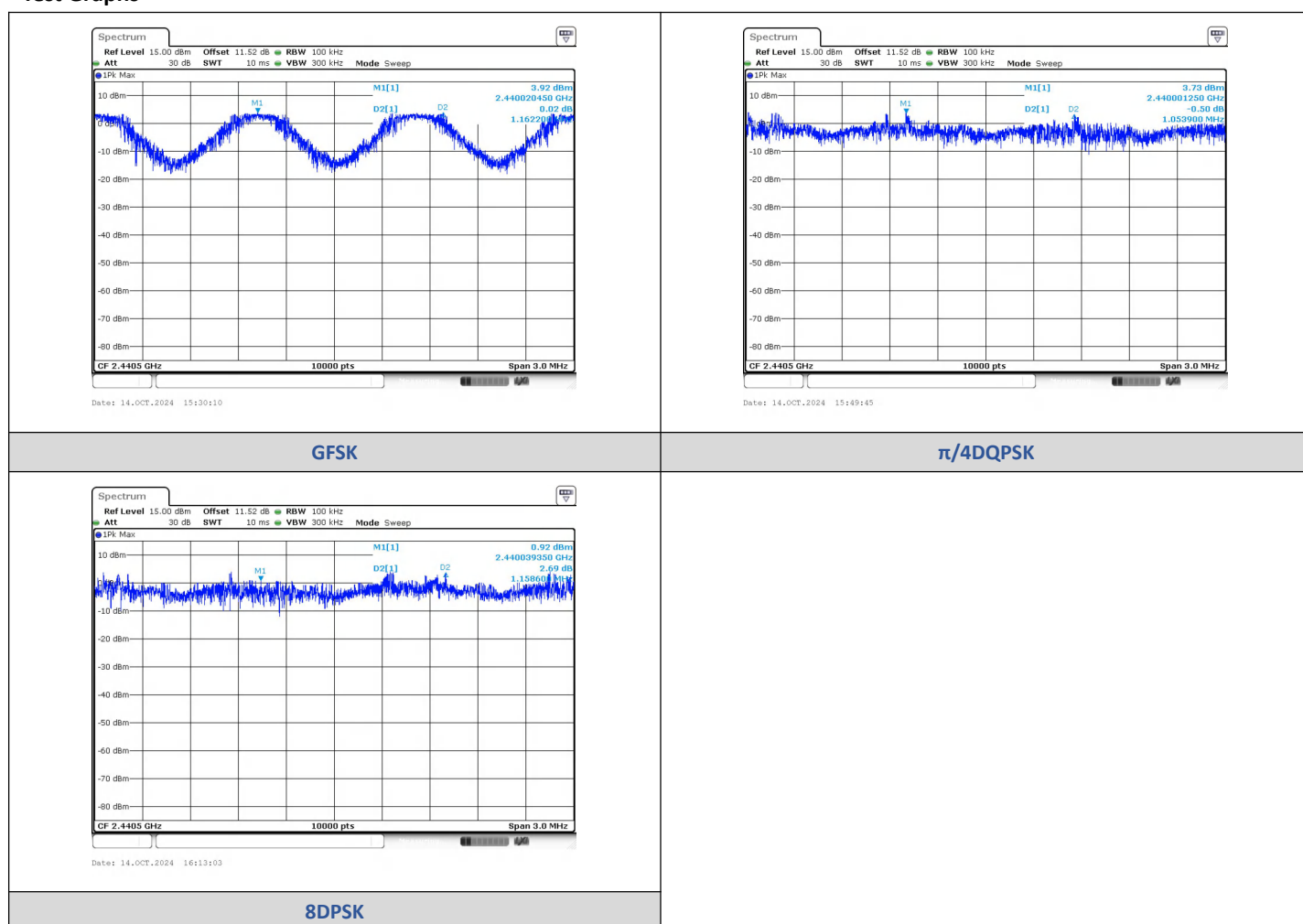
8DPSK\_3-DH5\_Channel 78

## 7) Carrier Frequencies Separation

### Test Result

| Modulation    | Packet | Left Center frequency (MHz) | Right Center frequency (MHz) | Hopping Frequency Separation (MHz) | Limit (MHz) | Result |
|---------------|--------|-----------------------------|------------------------------|------------------------------------|-------------|--------|
| GFSK          | DH5    | 2440.0204                   | 2441.1827                    | 1.1622                             | 1.03        | PASS   |
| $\pi/4$ DQPSK | 2-DH5  | 2440.0012                   | 2441.0552                    | 1.0539                             | 0.88        | PASS   |
| 8DPSK         | 3-DH5  | 2440.0394                   | 2441.198                     | 1.1586                             | 0.87        | PASS   |

### Test Graphs



## 8) Conducted Out Of Band Emission

### Test Result

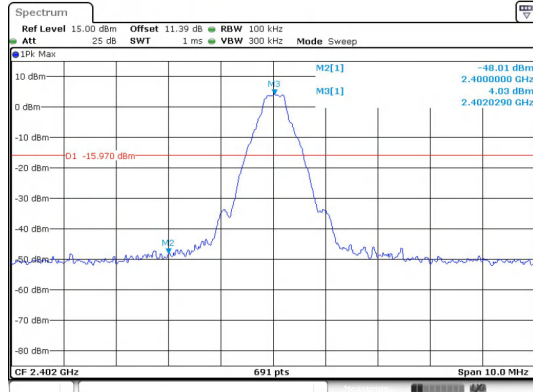
#### Non-Hopping

| Modulation    | Packet | Channel | OOB Emission Frequency (MHz) | OOB Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result |
|---------------|--------|---------|------------------------------|--------------------------|-------------|-----------------|--------|
| GFSK          | DH5    | 0       | 2400.00                      | -48.011                  | -15.97      | -32.041         | PASS   |
|               |        |         | 7205.96                      | -36.849                  | -15.97      | -20.879         | PASS   |
|               |        | 39      | 9763.72                      | -40.505                  | -15.96      | -24.545         | PASS   |
|               |        | 78      | 2483.50                      | -49.962                  | -16.6       | -33.362         | PASS   |
|               |        |         | 9920.20                      | -38.120                  | -16.6       | -21.520         | PASS   |
| $\pi/4$ DQPSK | 2-DH5  | 0       | 2400.00                      | -43.332                  | -15.74      | -27.592         | PASS   |
|               |        |         | 7205.96                      | -41.374                  | -15.74      | -25.634         | PASS   |
|               |        | 39      | 9763.72                      | -39.980                  | -16.13      | -23.850         | PASS   |
|               |        | 78      | 2483.50                      | -50.855                  | -16.45      | -34.405         | PASS   |
|               |        |         | 9920.20                      | -38.279                  | -16.45      | -21.829         | PASS   |
| 8DPSK         | 3-DH5  | 0       | 2400.00                      | -45.977                  | -15.63      | -30.347         | PASS   |
|               |        |         | 9608.08                      | -43.081                  | -15.63      | -27.451         | PASS   |
|               |        | 39      | 9763.72                      | -41.012                  | -16.63      | -24.382         | PASS   |
|               |        | 78      | 2483.50                      | -49.710                  | -17.13      | -32.580         | PASS   |
|               |        |         | 9920.20                      | -39.078                  | -17.13      | -21.948         | PASS   |

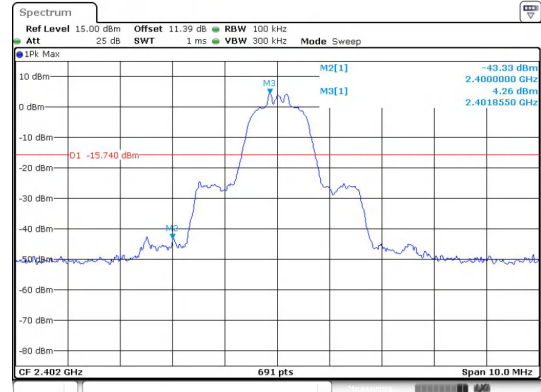
#### Hopping

| Modulation    | Packet | Channel | OOB Emission<br>Frequency<br>(MHz) | OOB Emission<br>Level<br>(dBm) | Limit<br>(dBm) | Over Limit<br>(dB) | Result |
|---------------|--------|---------|------------------------------------|--------------------------------|----------------|--------------------|--------|
| GFSK          | DH5    | Hopping | 2395.83                            | -47.343                        | -15.69         | -31.653            | PASS   |
|               |        |         | 2400.00                            | -49.255                        | -15.69         | -33.565            | PASS   |
|               |        |         | 2483.50                            | -49.563                        | -16.7          | -32.863            | PASS   |
| $\pi/4$ DQPSK | 2-DH5  |         | 2398.78                            | -48.326                        | -15.59         | -32.736            | PASS   |
|               |        |         | 2400.00                            | -48.818                        | -15.59         | -33.228            | PASS   |
|               |        |         | 2483.50                            | -49.548                        | -17.13         | -32.418            | PASS   |
| 8DPSK         | 3-DH5  |         | 2397.37                            | -48.355                        | -15.52         | -32.835            | PASS   |
|               |        |         | 2400.00                            | -49.302                        | -15.52         | -33.782            | PASS   |
|               |        |         | 2483.50                            | -47.246                        | -17.83         | -29.416            | PASS   |

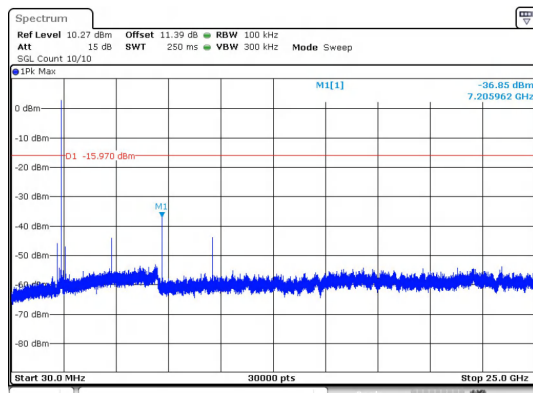
### Test Graphs



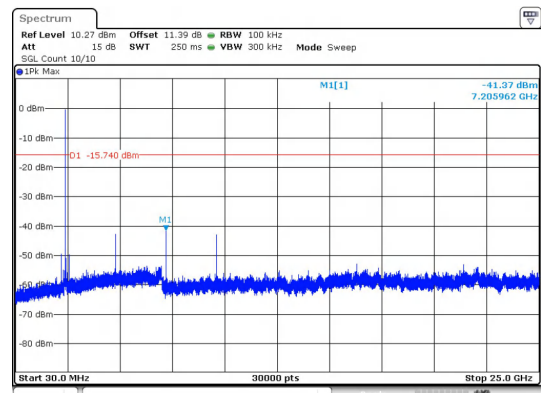
Out Of Band Emission  
GFSK\_DH5\_Channel 0



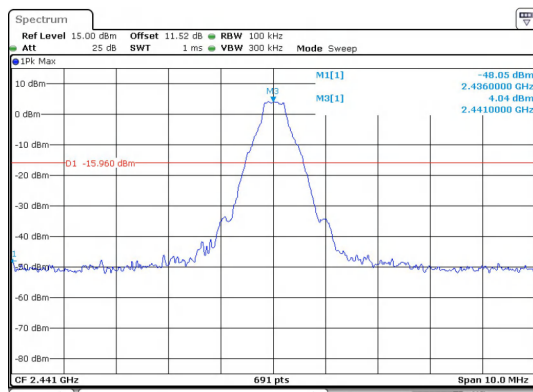
Out Of Band Emission  
 $\pi/4$ QPSK\_2-DH5\_Channel 0



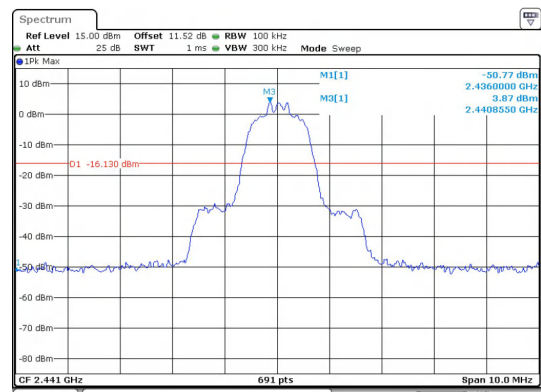
30.0 MHz - 25000.0 MHz  
GFSK\_DH5\_Channel 0



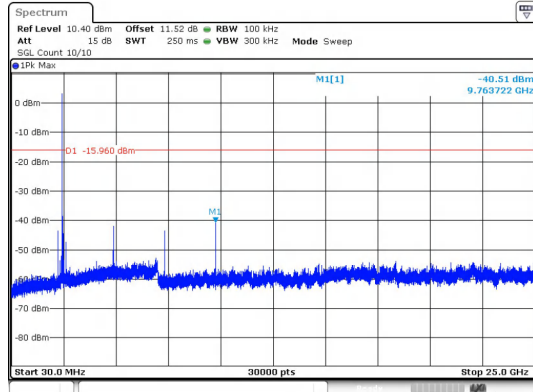
30.0 MHz - 25000.0 MHz  
 $\pi/4$ QPSK\_2-DH5\_Channel 0



Out Of Band Emission  
GFSK\_DH5\_Channel 39

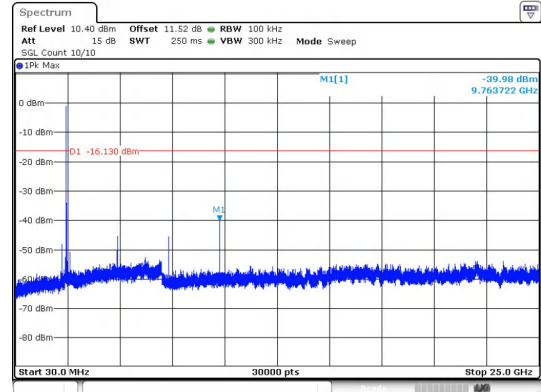


Out Of Band Emission  
 $\pi/4$ QPSK\_2-DH5\_Channel 39



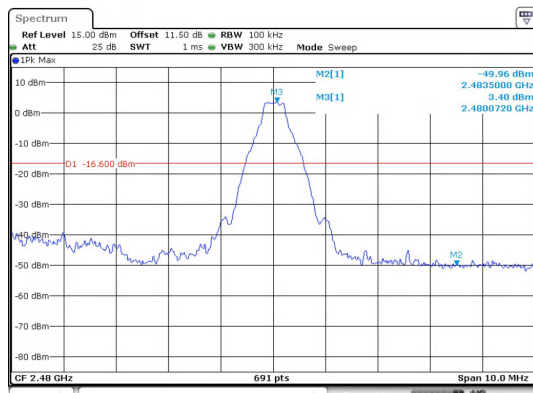
Date: 14.OCT.2024 15:38:54

30.0 MHz - 25000.0 MHz  
GFSK\_DH5\_Channel 39



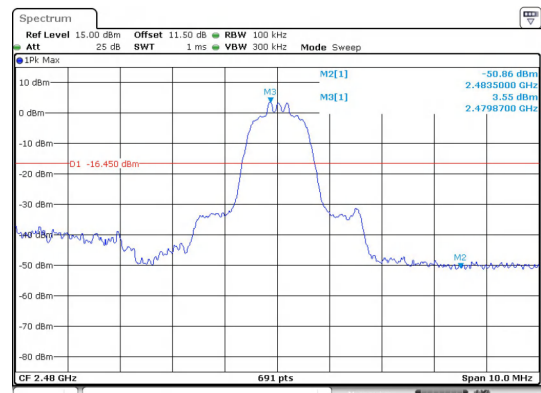
Date: 14.OCT.2024 15:55:24

30.0 MHz - 25000.0 MHz  
 $\pi/4$ DQPSK\_2-DH5\_Channel 39



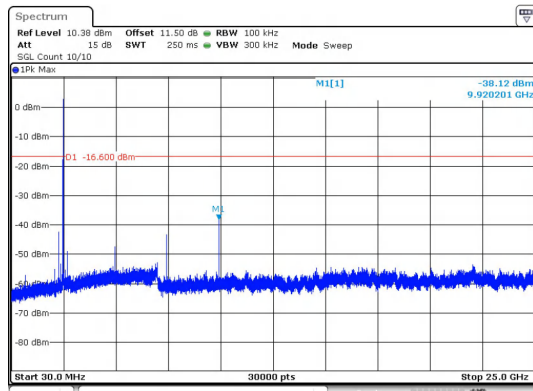
Date: 14.OCT.2024 15:41:15

Out Of Band Emission  
GFSK\_DH5\_Channel 78



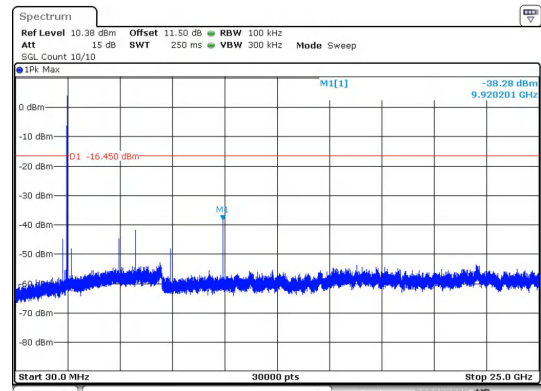
Date: 14.OCT.2024 15:58:07

Out Of Band Emission  
 $\pi/4$ DQPSK\_2-DH5\_Channel 78



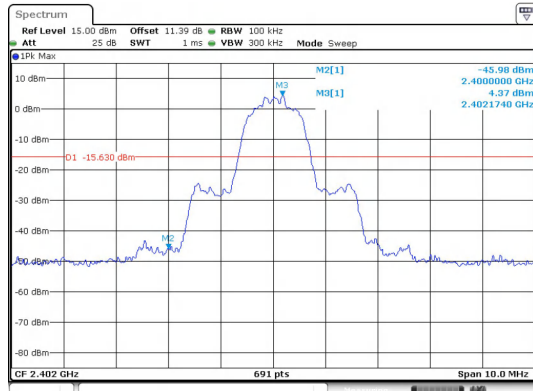
Date: 14.OCT.2024 15:41:37

30.0 MHz - 25000.0 MHz  
GFSK\_DH5\_Channel 78

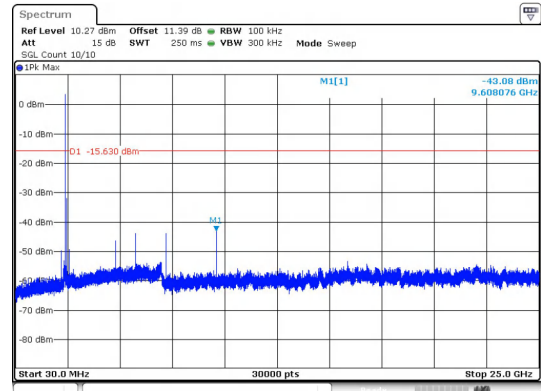


Date: 14.OCT.2024 15:58:30

30.0 MHz - 25000.0 MHz  
 $\pi/4$ DQPSK\_2-DH5\_Channel 78



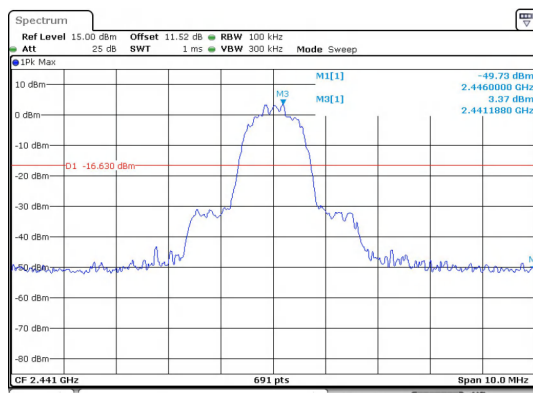
Date: 14.OCT.2024 16:00:38



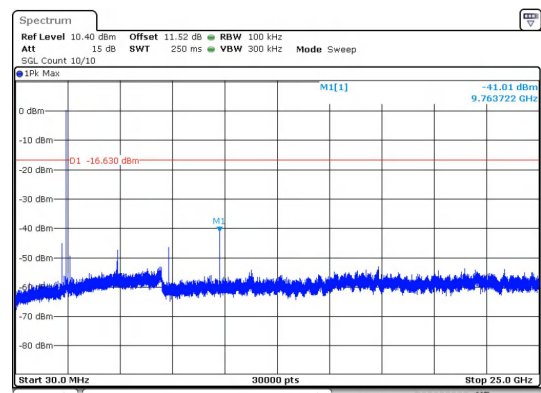
Date: 14.OCT.2024 16:01:00

Out Of Band Emission  
8DPSK\_3-DH5\_Channel 0

30.0 MHz - 25000.0 MHz  
8DPSK\_3-DH5\_Channel 0



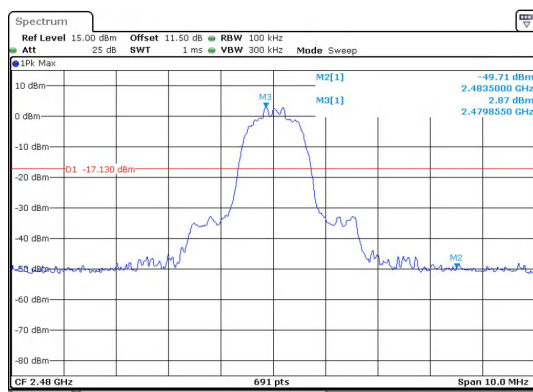
Date: 15.OCT.2024 14:54:07



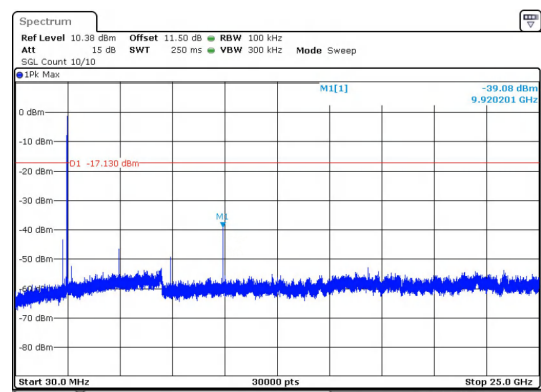
Date: 15.OCT.2024 14:54:30

Out Of Band Emission  
8DPSK\_3-DH5\_Channel 39

30.0 MHz - 25000.0 MHz  
8DPSK\_3-DH5\_Channel 39



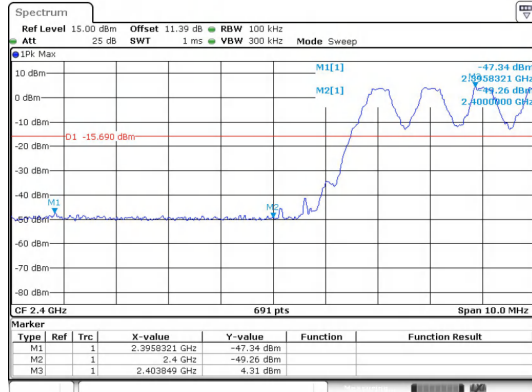
Date: 15.OCT.2024 14:55:33



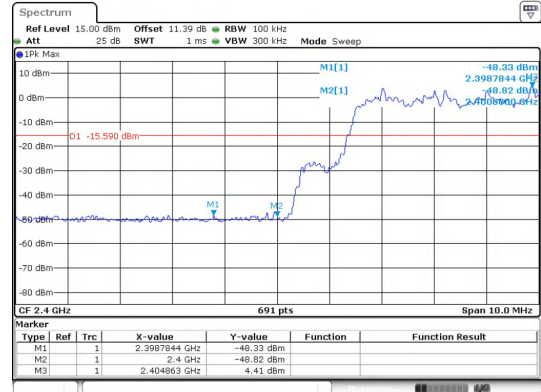
Date: 15.OCT.2024 14:55:55

Out Of Band Emission  
8DPSK\_3-DH5\_Channel 78

30.0 MHz - 25000.0 MHz  
8DPSK\_3-DH5\_Channel 78



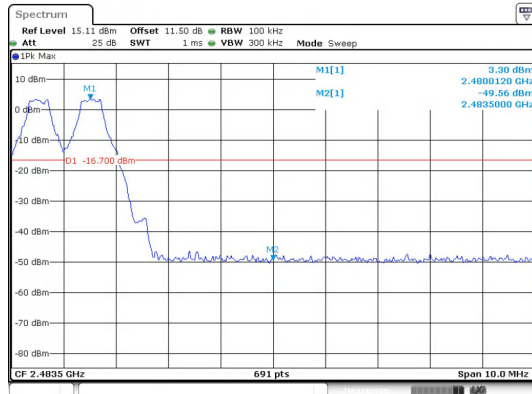
Date: 14.OCT.2024 15:33:26



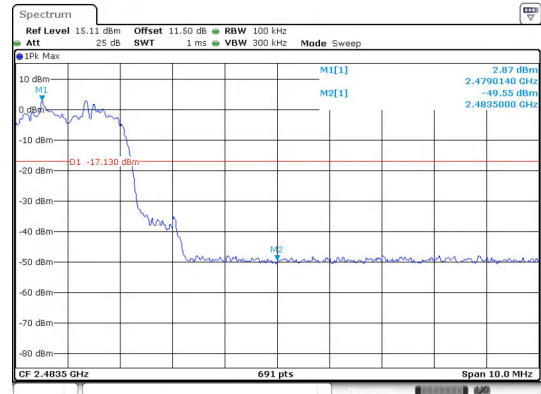
Date: 14.OCT.2024 15:52:25

Out Of Band Emission(Left)  
GFSK\_DH5\_Channel Hopping

Out Of Band Emission(Left)  
 $\pi/4$ DQPSK\_2-DH5\_Channel Hopping



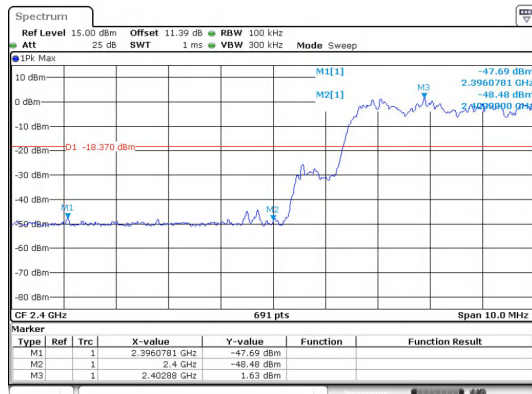
Date: 14.OCT.2024 15:34:26



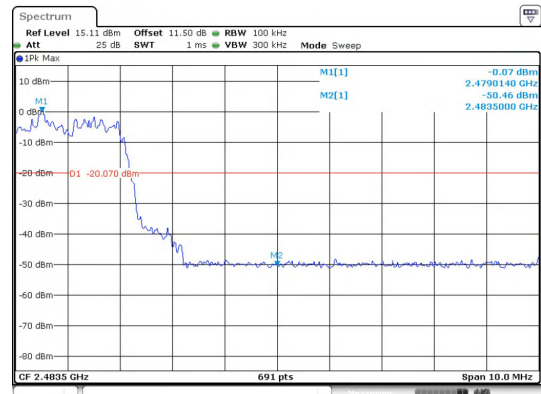
Date: 14.OCT.2024 15:53:07

Out Of Band Emission(Right)  
GFSK\_DH5\_Channel Hopping

Out Of Band Emission(Right)  
 $\pi/4$ DQPSK\_2-DH5\_Channel Hopping



Date: 14.OCT.2024 15:03:09



Date: 14.OCT.2024 15:03:32

Out Of Band Emission(Left)  
8DPSK\_3-DH5\_Channel Hopping

Out Of Band Emission(Right)  
8DPSK\_3-DH5\_Channel Hopping