

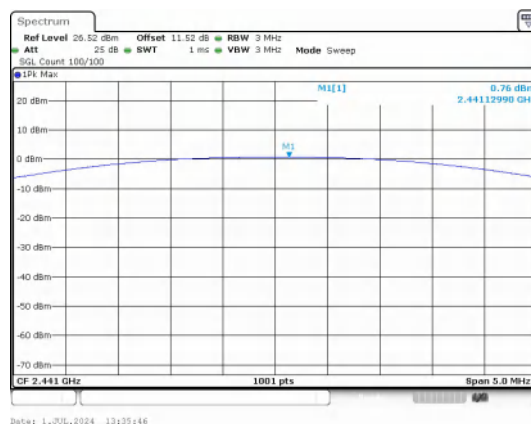
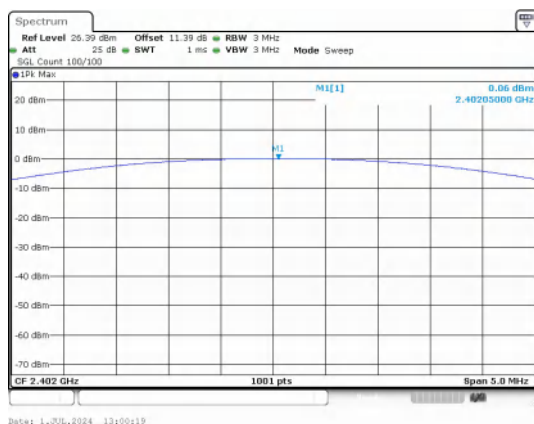
## Appendix A

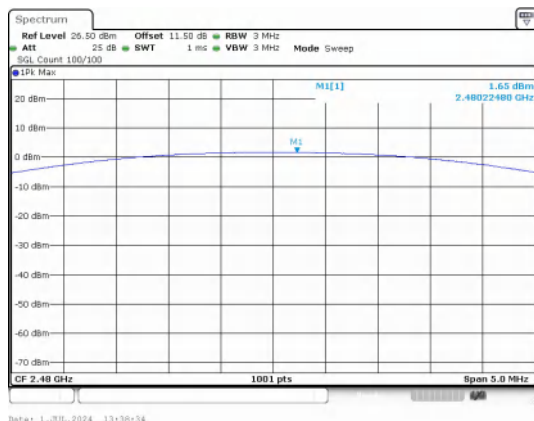
|                |                  |
|----------------|------------------|
| Report No.:    | CISRR24062418301 |
| FCC ID:        | 2A5TA-AM-2301    |
| Product Name:  | Wireless speaker |
| Model No.:     | AM-2301          |
| Test Engineer: | Lucas Huang      |
| Supervised by: | Rory Huang       |

## 1) Conducted Peak Output Power

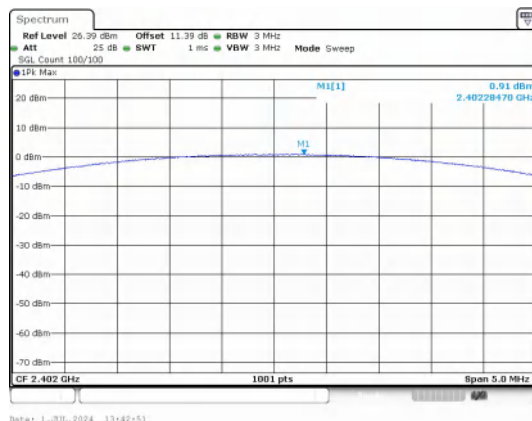
### Test Result

| Modulation    | Packet Type | Channel | Peak Output Power (dBm) | Peak Output Power (mW) | Limit (dBm) | Result |
|---------------|-------------|---------|-------------------------|------------------------|-------------|--------|
| GFSK          | DH5         | 0       | 0.06                    | 1.01                   | 30          | PASS   |
|               |             | 39      | 0.76                    | 1.19                   |             | PASS   |
|               |             | 78      | 1.65                    | 1.46                   |             | PASS   |
| $\pi/4$ DQPSK | 2-DH5       | 0       | 0.91                    | 1.23                   | 20.97       | PASS   |
|               |             | 39      | 1.55                    | 1.43                   |             | PASS   |
|               |             | 78      | 2.49                    | 1.77                   |             | PASS   |
| 8DPSK         | 3-DH5       | 0       | 1.35                    | 1.37                   |             | PASS   |
|               |             | 39      | 1.90                    | 1.55                   |             | PASS   |
|               |             | 78      | 2.77                    | 1.89                   |             | PASS   |

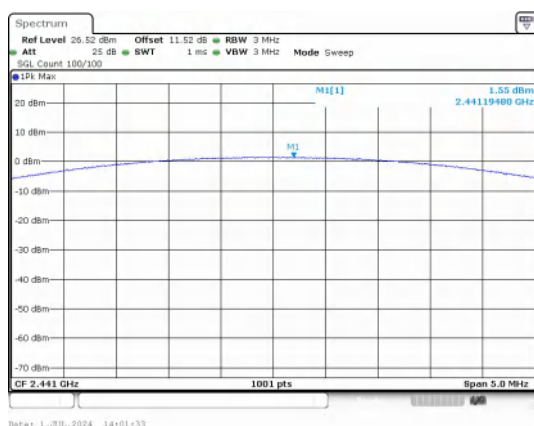




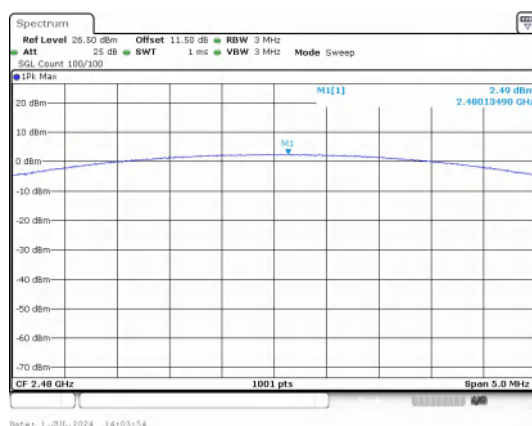
Peak Output Power  
GFSK\_Channel 78



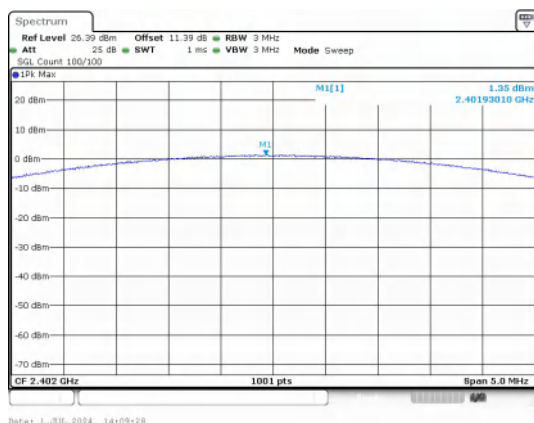
Peak Output Power  
 $\pi/4$ DQPSK\_Channel 0



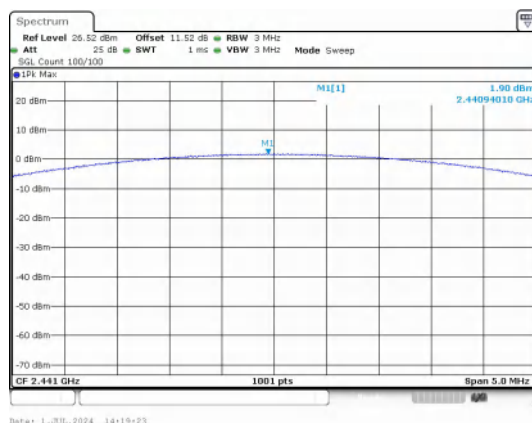
Peak Output Power  
 $\pi/4$ DQPSK\_Channel 39



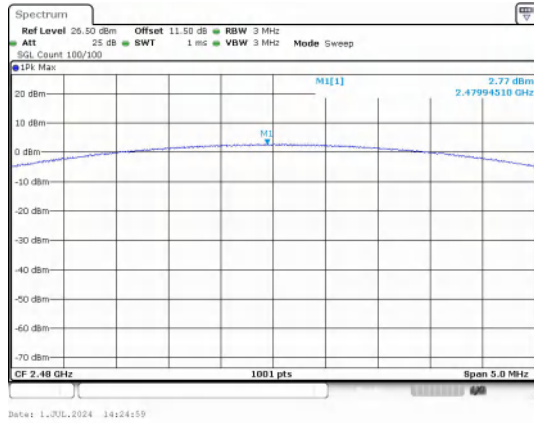
Peak Output Power  
 $\pi/4$ DQPSK\_Channel 78



Peak Output Power  
8DPSK\_Channel 0



Peak Output Power  
8DPSK\_Channel 39



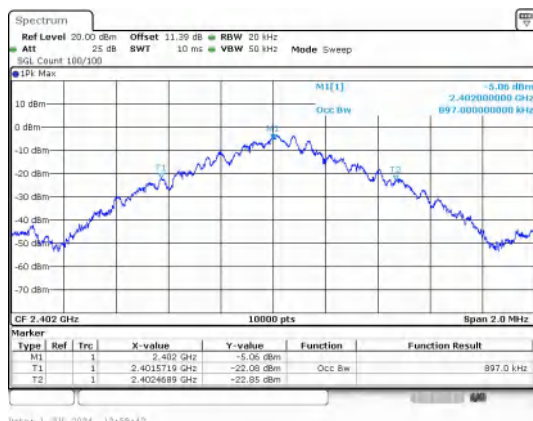
**Peak Output Power**  
**8DPSK\_Channel 78**

## 2) 99% Bandwidth

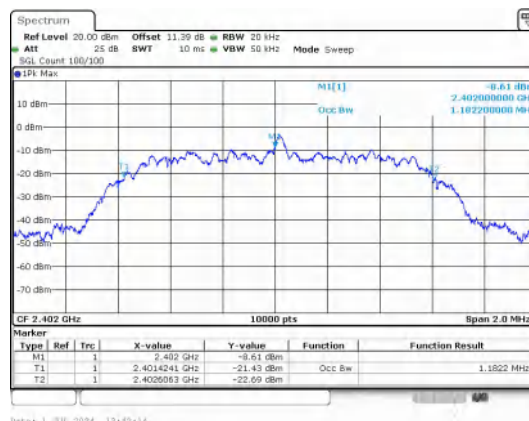
### Test Result

| Modulation    | Channel | Center Frequency (MHz) | 99% BW (MHz) |
|---------------|---------|------------------------|--------------|
| GFSK          | 0       | 2402                   | 0.8970       |
|               | 39      | 2441                   | 0.9062       |
|               | 78      | 2480                   | 0.9086       |
| $\pi/4$ DQPSK | 0       | 2402                   | 1.1822       |
|               | 39      | 2441                   | 1.1976       |
|               | 78      | 2480                   | 1.2064       |
| 8DPSK         | 0       | 2402                   | 1.2040       |
|               | 39      | 2441                   | 1.2022       |
|               | 78      | 2480                   | 1.2080       |

### Test Graphs

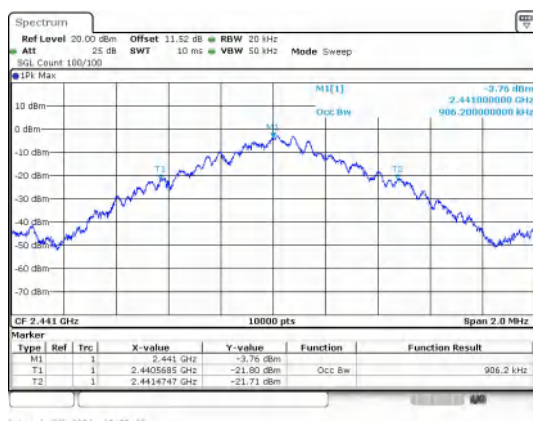


Date: 1.03.2024 12:59:42

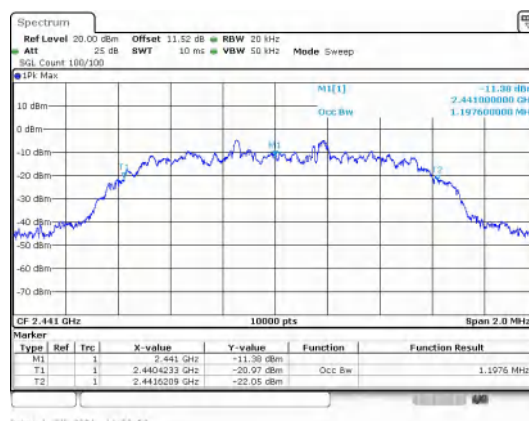


Date: 1.03.2024 13:14:14

GFSK\_DH5\_Channel 0

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


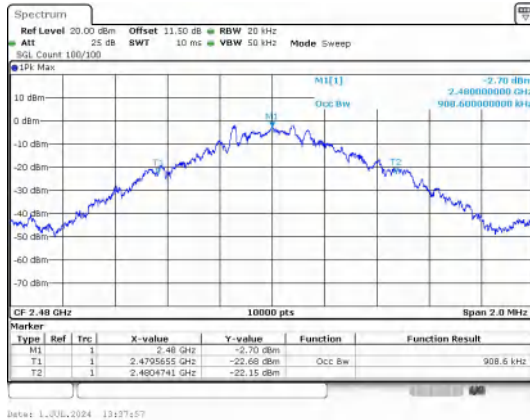
Date: 1.03.2024 13:35:09



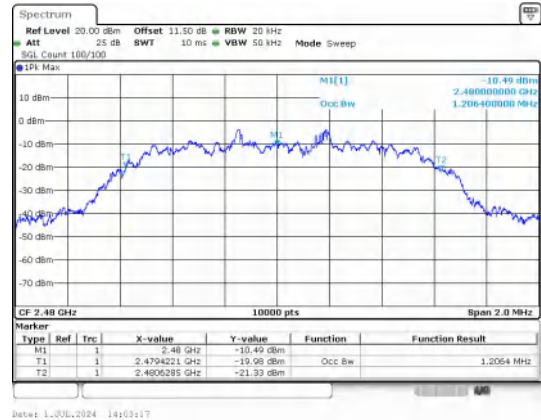
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GFSK\_DH5\_Channel 39

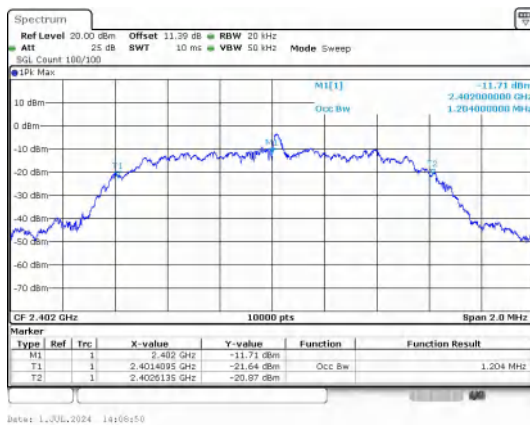
 $\pi/4$ DQPSK\_2-DH5\_Channel 39



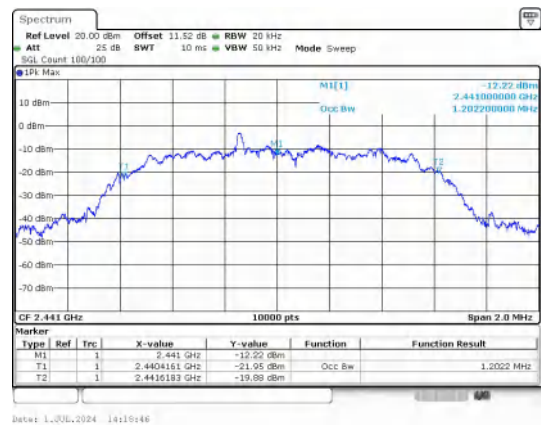
GFSK\_DH5\_Channel 78



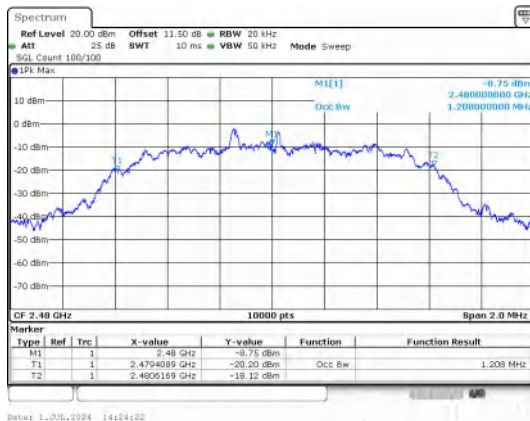
$\pi/4$ DQPSK\_2-DH5\_Channel 78



8DPSK\_3-DH5\_Channel 0



8DPSK\_3-DH5\_Channel 39



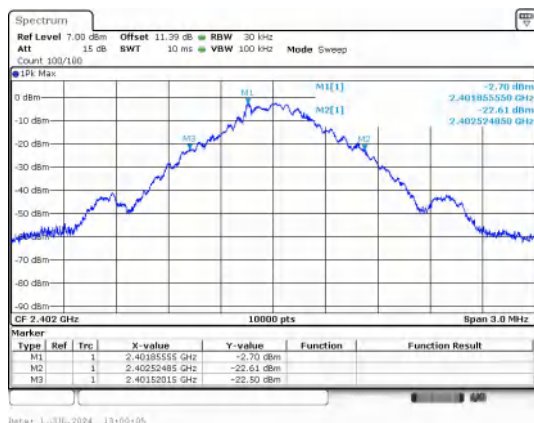
8DPSK\_3-DH5\_Channel 78

### 3) 20dB Bandwidth

#### Test Result

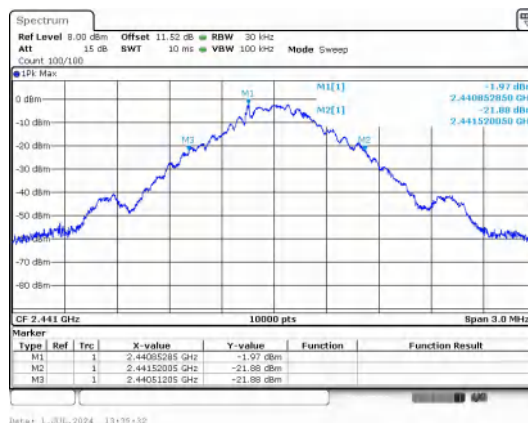
| Modulation    | Channel | Center Frequency (MHz) | 20 dB Bandwidth (MHz) |
|---------------|---------|------------------------|-----------------------|
| GFSK          | 0       | 2402 MHz               | 1.000                 |
|               | 39      | 2441 MHz               | 1.010                 |
|               | 78      | 2480 MHz               | 1.020                 |
| $\pi/4$ DQPSK | 0       | 2402 MHz               | 1.290                 |
|               | 39      | 2441 MHz               | 1.320                 |
|               | 78      | 2480 MHz               | 1.310                 |
| 8DPSK         | 0       | 2402 MHz               | 1.290                 |
|               | 39      | 2441 MHz               | 1.300                 |
|               | 78      | 2480 MHz               | 1.290                 |

#### Test Graphs



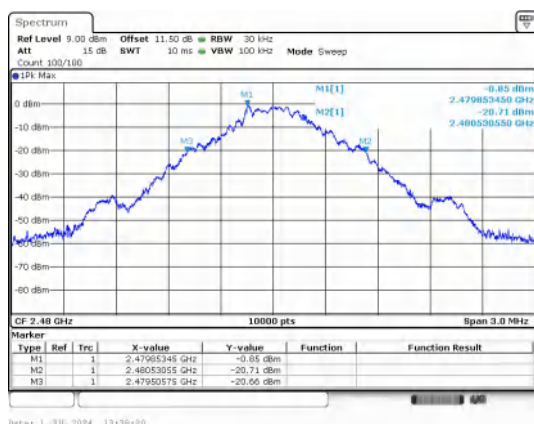
Date: 1.03.2024 13:00:05

GFSK\_DH5\_Channel 0



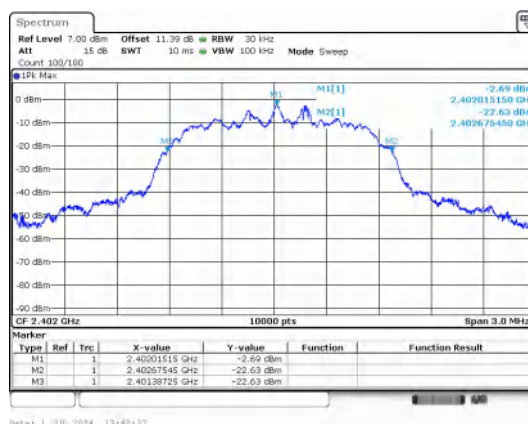
Date: 1.03.2024 13:19:12

GFSK\_DH5\_Channel 39



Date: 1.03.2024 13:13:29

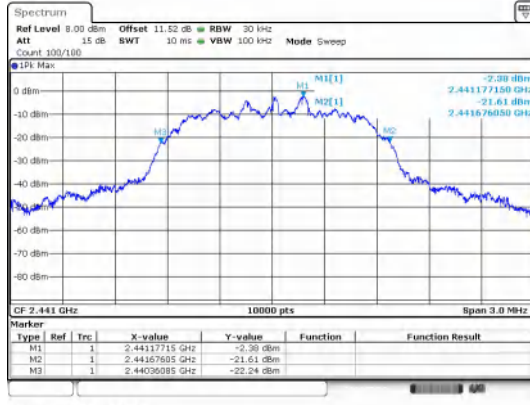
GFSK\_DH5\_Channel 78



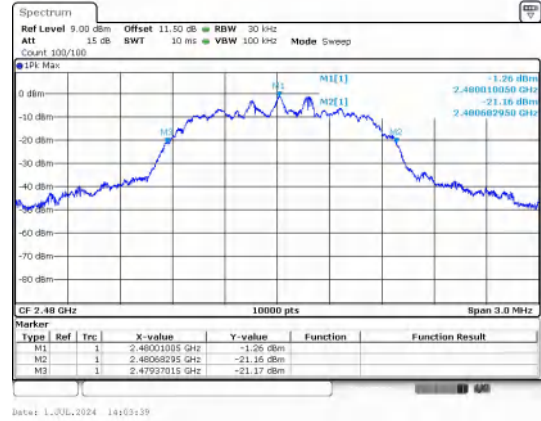
Date: 1.03.2024 13:42:37

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

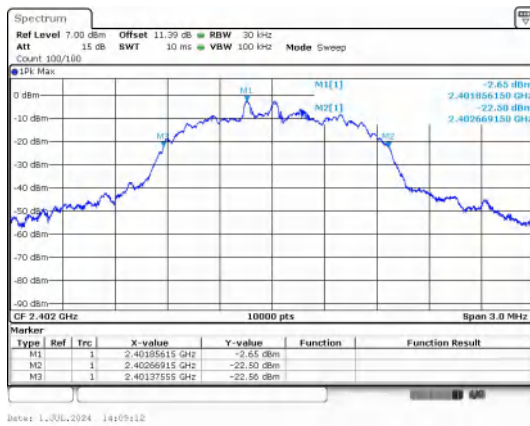




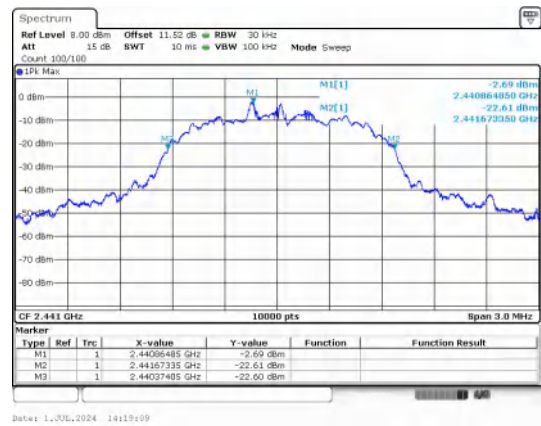
$\pi/4$ DQPSK\_2-DH5\_Channel 39



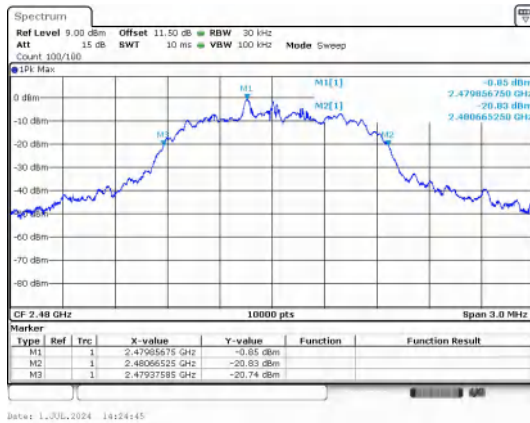
$\pi/4$ DQPSK\_2-DH5\_Channel 78



8DPSK\_3-DH5\_Channel 0



8DPSK\_3-DH5\_Channel 39



8DPSK\_3-DH5\_Channel 78

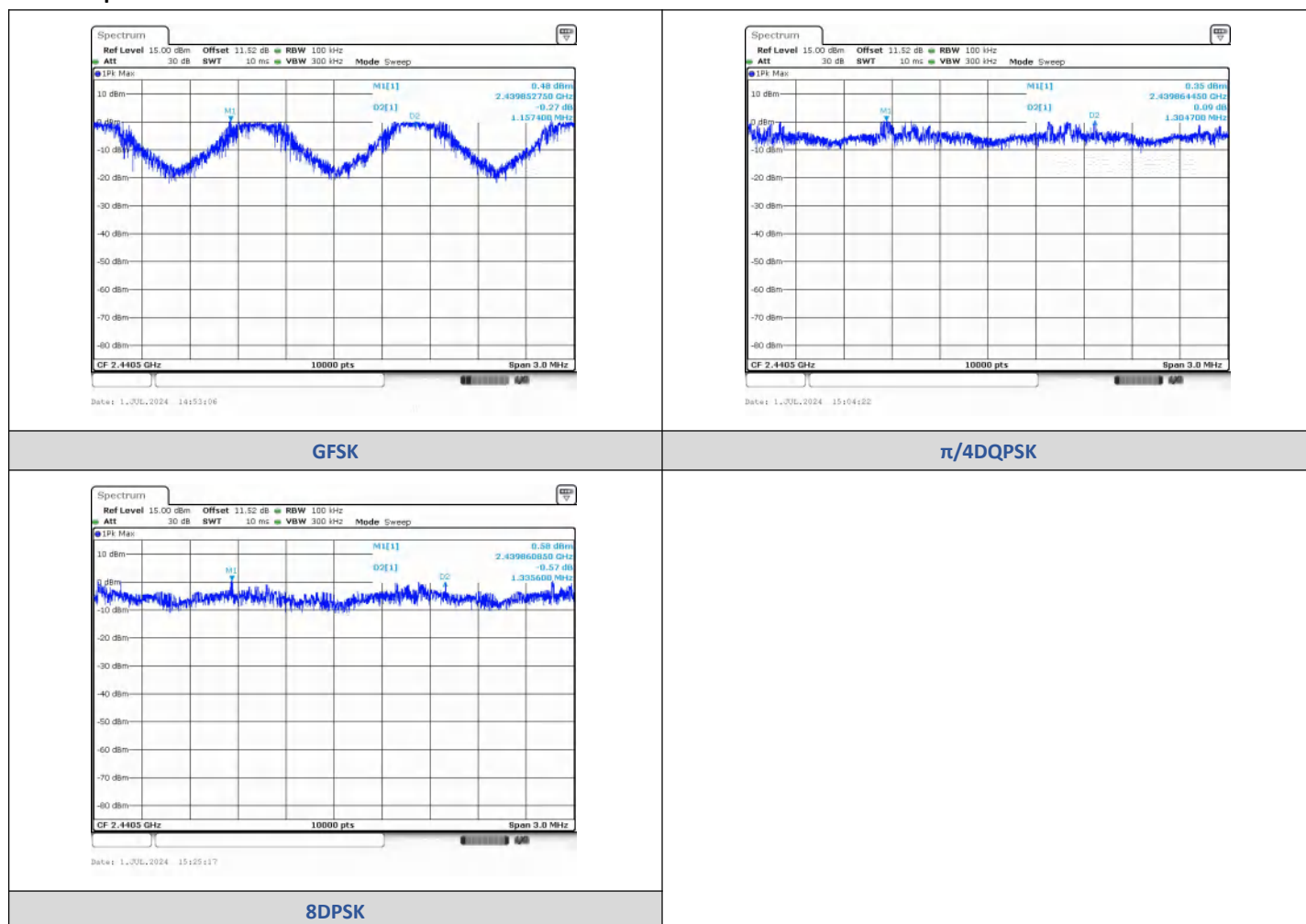


## 4) Carrier Frequencies Separation

### Test Result

| Modulation    | Packet | Left Center frequency (MHz) | Right Center frequency (MHz) | Hopping Frequency Separation (MHz) | Limit (MHz) | Result |
|---------------|--------|-----------------------------|------------------------------|------------------------------------|-------------|--------|
| GFSK          | DH5    | 2439.8528                   | 2441.0102                    | 1.1574                             | 1.020       | PASS   |
| $\pi/4$ DQPSK | 2-DH5  | 2439.8645                   | 2441.1692                    | 1.3047                             | 0.86        | PASS   |
| 8DPSK         | 3-DH5  | 2439.8609                   | 2441.1964                    | 1.3356                             | 0.86        | PASS   |

### Test Graphs



## 5) Conducted Out Of Band Emission

### Test Result

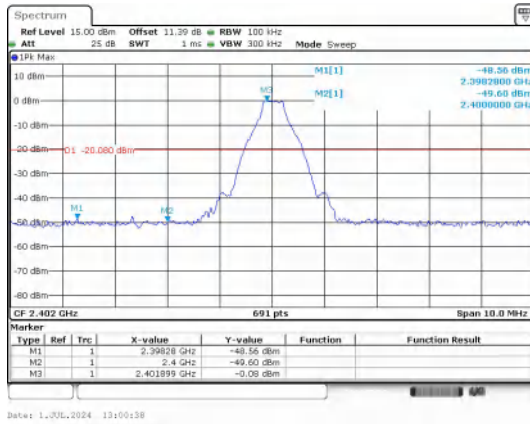
#### Non-Hopping

| Modulation    | Packet | Channel | OOB Emission Frequency (MHz) | OOB Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result |
|---------------|--------|---------|------------------------------|--------------------------|-------------|-----------------|--------|
| GFSK          | DH5    | 0       | 2398.28                      | -48.563                  | -20.08      | -28.483         | PASS   |
|               |        |         | 2400.00                      | -49.600                  | -20.08      | -29.520         | PASS   |
|               |        |         | 9608.10                      | -47.915                  | -20.08      | -27.835         | PASS   |
|               |        | 39      | 9763.72                      | -45.356                  | -19.35      | -26.006         | PASS   |
|               |        | 78      | 2483.50                      | -49.581                  | -18.41      | -31.171         | PASS   |
|               |        |         | 4960.33                      | -43.374                  | -18.41      | -24.964         | PASS   |
| $\pi/4$ DQPSK | 2-DH5  | 0       | 2398.37                      | -49.087                  | -19.99      | -29.097         | PASS   |
|               |        |         | 2400.00                      | -49.714                  | -19.99      | -29.724         | PASS   |
|               |        | 39      | 9608.10                      | -48.084                  | -19.99      | -28.094         | PASS   |
|               |        | 78      | 9763.72                      | -45.828                  | -19.34      | -26.488         | PASS   |
|               |        |         | 2483.50                      | -50.515                  | -18.55      | -31.965         | PASS   |
| 8DPSK         | 3-DH5  | 0       | 4959.49                      | -48.712                  | -18.55      | -30.162         | PASS   |
|               |        |         | 2398.11                      | -48.573                  | -20.06      | -28.513         | PASS   |
|               |        | 39      | 2400.00                      | -50.194                  | -20.06      | -30.134         | PASS   |
|               |        | 78      | 9608.10                      | -46.411                  | -20.06      | -26.351         | PASS   |
|               |        |         | 4882.09                      | -46.528                  | -19.5       | -27.028         | PASS   |

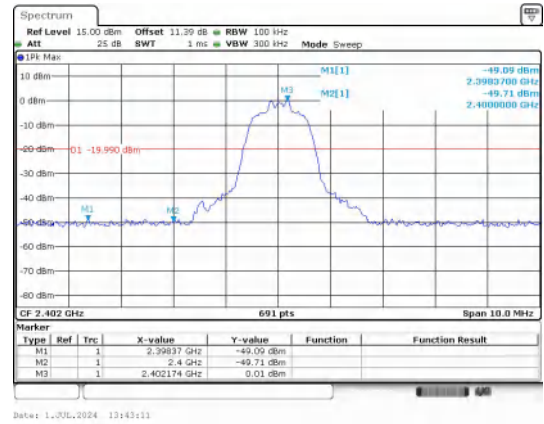
#### Hopping

| 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 | 2395.05                            | -47.125                        | -19.96         | -27.165            | PASS   |
|               |        |         | 2400.00                            | -47.899                        | -19.96         | -27.939            | PASS   |
|               |        |         | 2483.50                            | -49.198                        | -18.48         | -30.718            | PASS   |
|               |        |         | 2398.51                            | -47.563                        | -20.0          | -27.563            | PASS   |
|               |        |         | 2400.00                            | -49.287                        | -20.0          | -29.287            | PASS   |
|               |        |         | 2483.50                            | -49.159                        | -18.62         | -30.539            | PASS   |
| $\pi/4$ DQPSK | 2-DH5  |         | 2397.12                            | -47.585                        | -20.02         | -27.565            | PASS   |
|               |        |         | 2400.00                            | -49.497                        | -20.02         | -29.477            | PASS   |
|               |        |         | 2483.50                            | -49.370                        | -19.21         | -30.160            | PASS   |
|               |        |         | 2395.51                            | -47.744                        | -20.0          | -27.744            | PASS   |
| 8DPSK         | 3-DH5  |         | 2400.00                            | -49.000                        | -20.0          | -29.000            | PASS   |
|               |        |         | 2483.50                            | -49.494                        | -19.95         | -29.544            | PASS   |
|               |        |         | 2397.28                            | -47.684                        | -20.43         | -27.254            | PASS   |
|               |        |         | 2400.00                            | -48.630                        | -20.43         | -28.200            | PASS   |
|               |        |         | 2483.50                            | -49.116                        | -18.83         | -30.286            | PASS   |
|               |        |         | 2397.76                            | -47.432                        | -20.0          | -27.432            | PASS   |

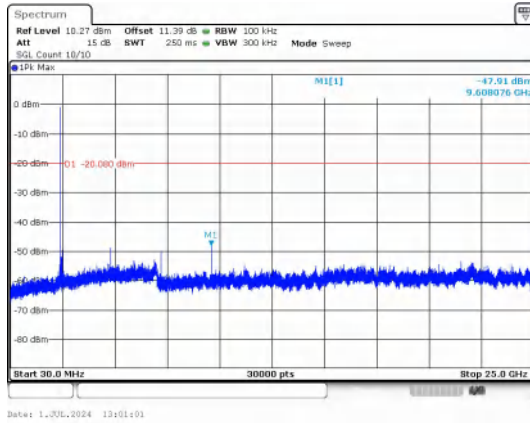
## Test Graphs



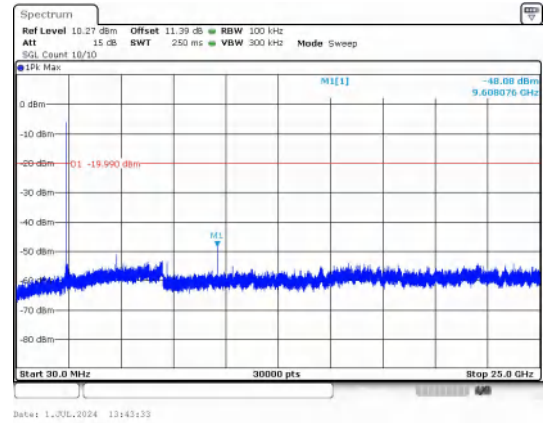
Out Of Band Emission  
GFSK\_DH5\_Channel 0



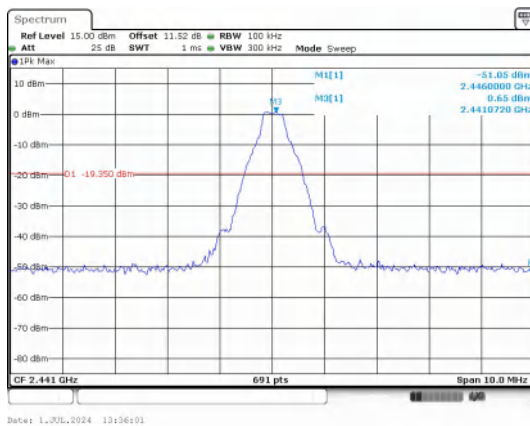
Out Of Band Emission  
 $\pi/4$ DQPSK\_2-DH5\_Channel 0



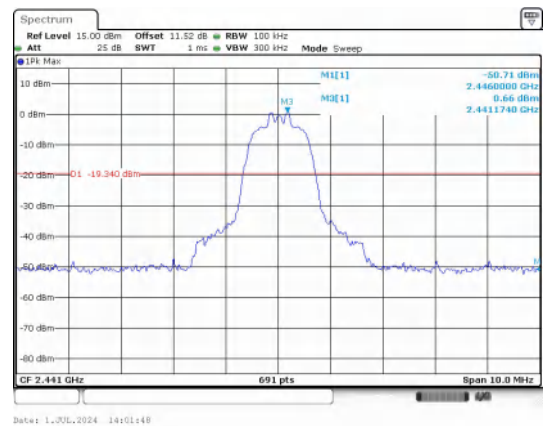
30.0 MHz - 25000.0 MHz  
GFSK\_DH5\_Channel 0



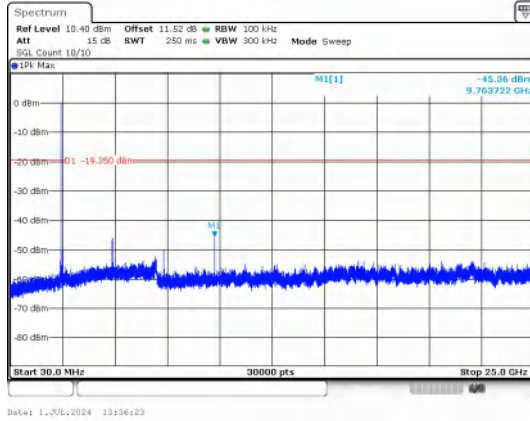
30.0 MHz - 25000.0 MHz  
 $\pi/4$ DQPSK\_2-DH5\_Channel 0



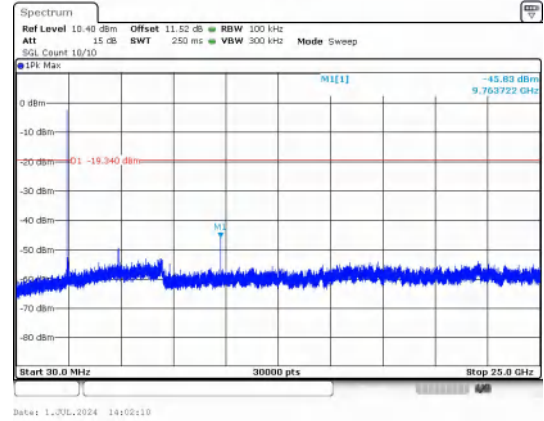
Out Of Band Emission  
GFSK\_DH5\_Channel 39



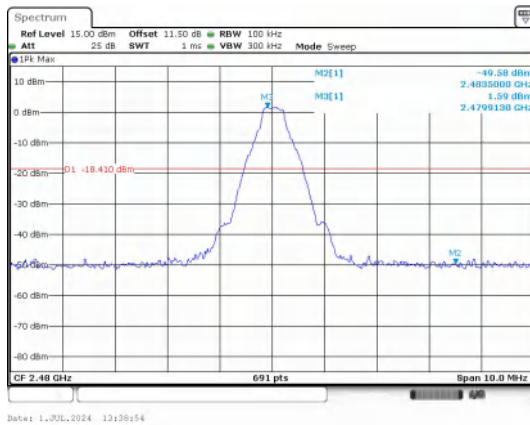
Out Of Band Emission  
 $\pi/4$ DQPSK\_2-DH5\_Channel 39



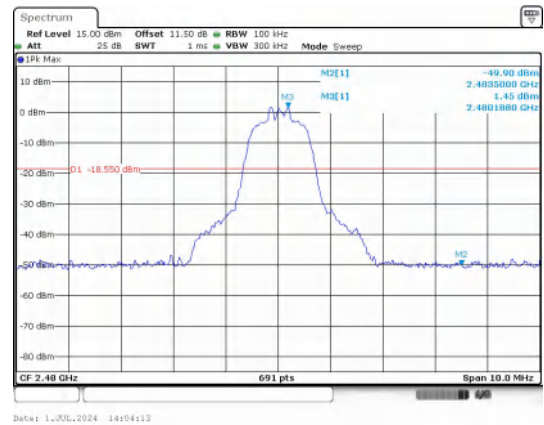
30.0 MHz - 25000.0 MHz  
GFSK\_DH5\_Channel 39



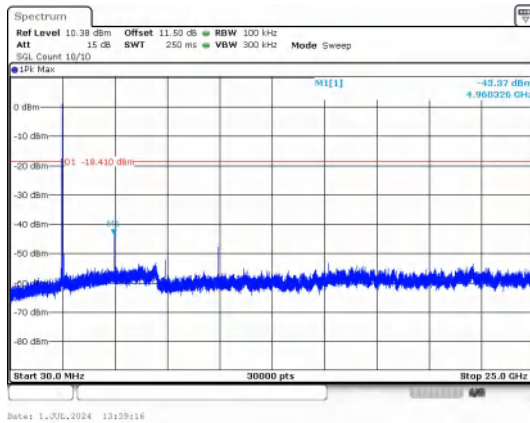
30.0 MHz - 25000.0 MHz  
 $\pi/4$ DQPSK\_2-DH5\_Channel 39



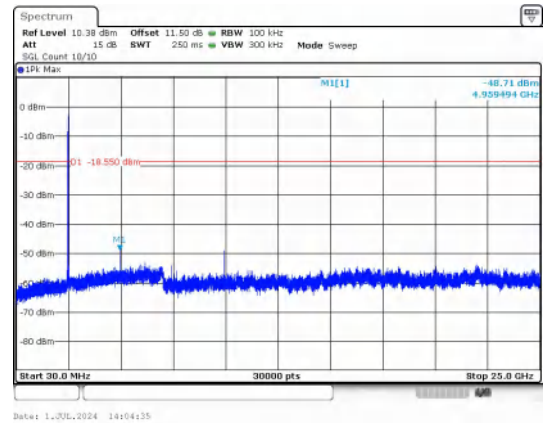
Out Of Band Emission  
GFSK\_DH5\_Channel 78



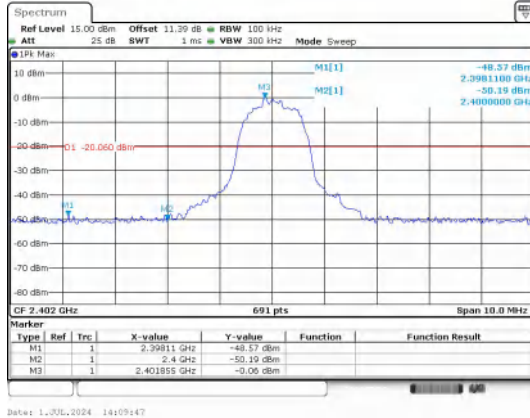
Out Of Band Emission  
 $\pi/4$ DQPSK\_2-DH5\_Channel 78



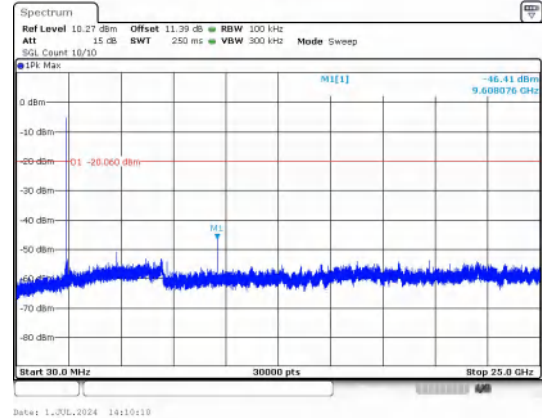
30.0 MHz - 25000.0 MHz  
GFSK\_DH5\_Channel 78



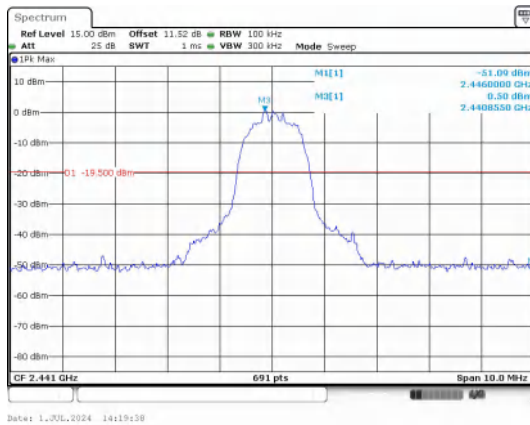
30.0 MHz - 25000.0 MHz  
 $\pi/4$ DQPSK\_2-DH5\_Channel 78



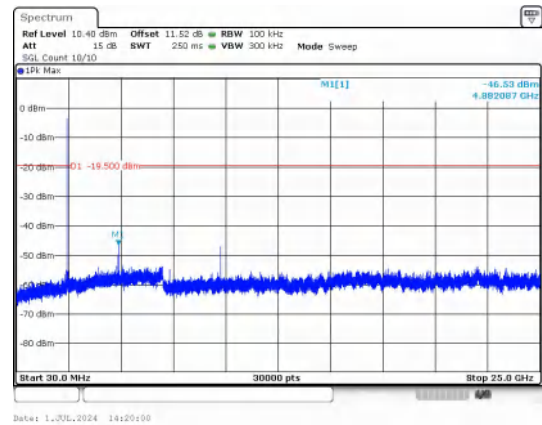
Out Of Band Emission  
8DPSK\_3-DH5\_Channel 0



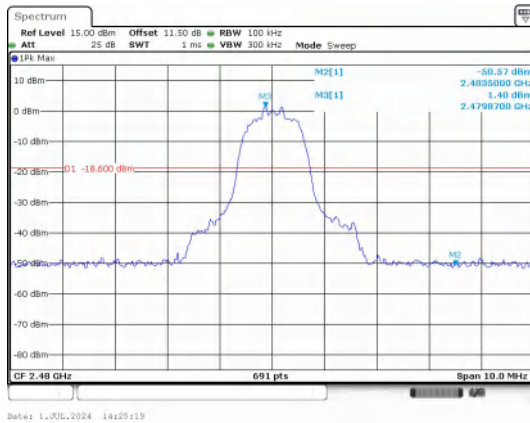
30.0 MHz - 25000.0 MHz  
8DPSK\_3-DH5\_Channel 0



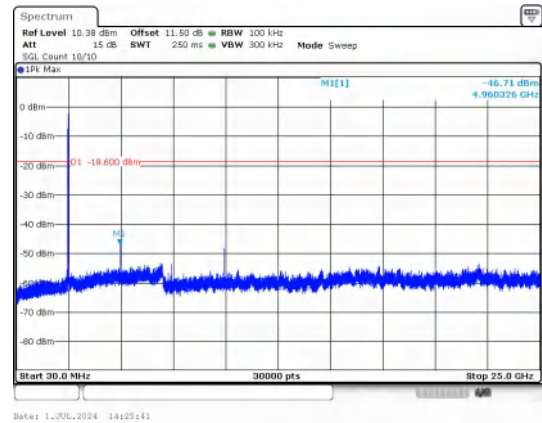
Out Of Band Emission  
8DPSK\_3-DH5\_Channel 39



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

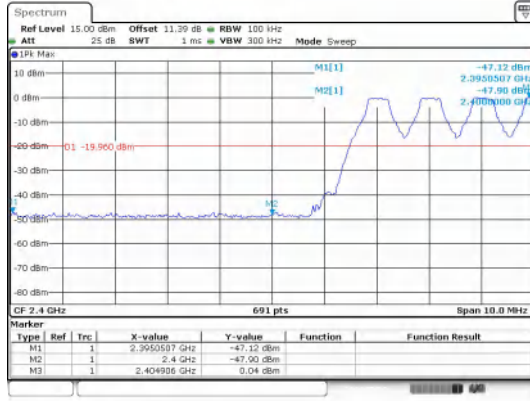


Out Of Band Emission  
8DPSK\_3-DH5\_Channel 78

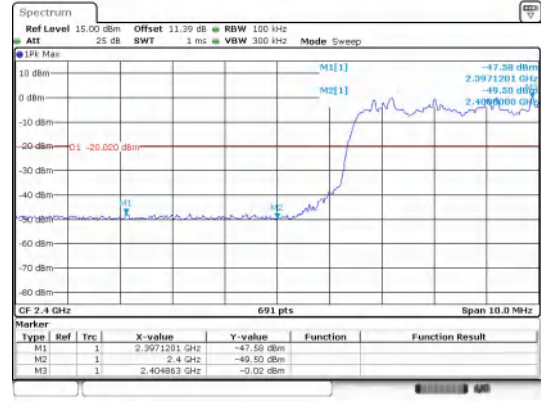


30.0 MHz - 25000.0 MHz  
8DPSK\_3-DH5\_Channel 78

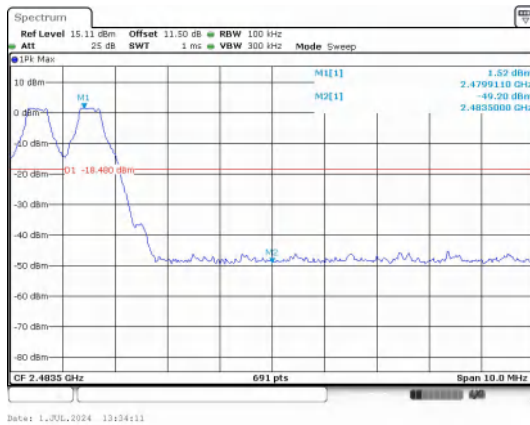




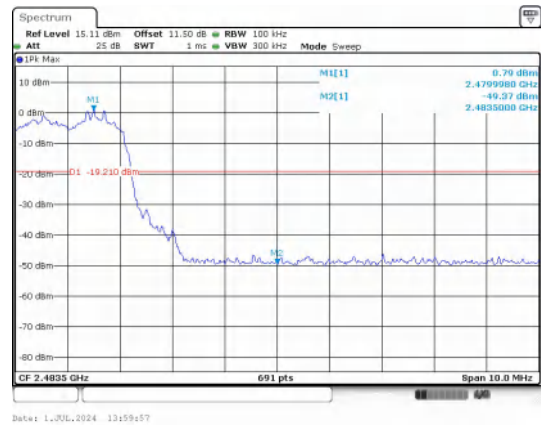
Out Of Band Emission(Left)  
GFSK\_DH5\_Channel Hopping



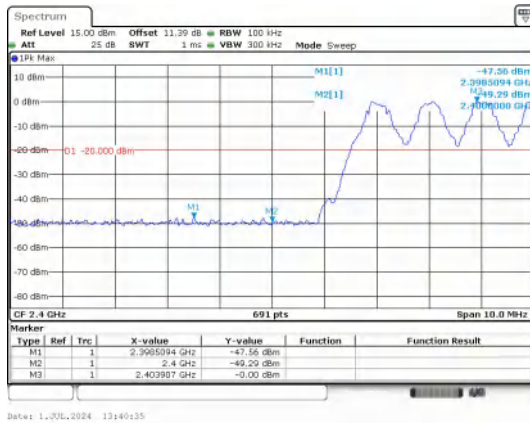
Out Of Band Emission(Left)  
 $\pi/4$ DQPSK\_2-DH5\_Channel Hopping



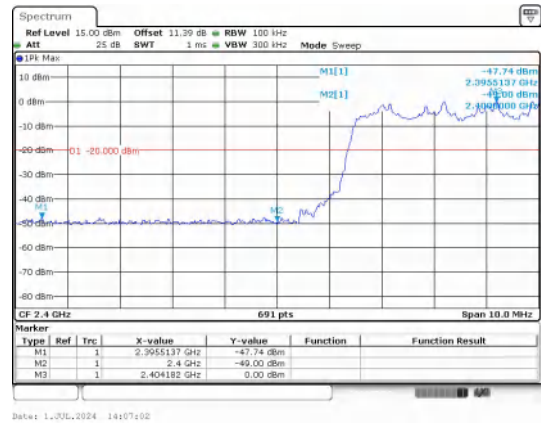
Out Of Band Emission(Right)  
GFSK\_DH5\_Channel Hopping



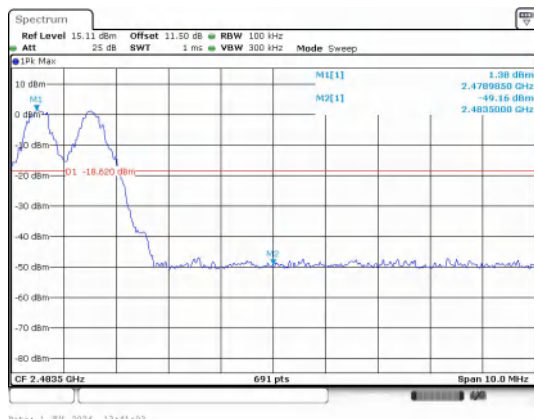
Out Of Band Emission(Right)  
 $\pi/4$ DQPSK\_2-DH5\_Channel Hopping



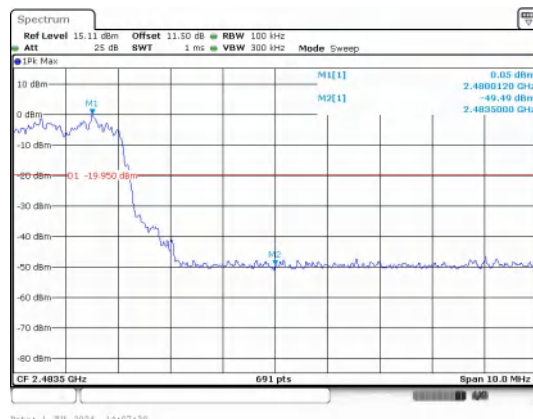
Out Of Band Emission(Left)  
GFSK\_DH5\_Channel Hopping



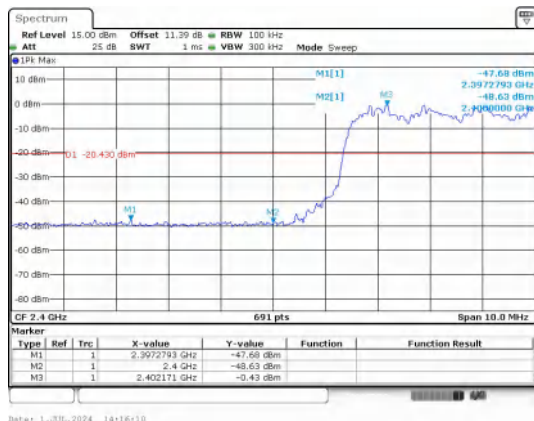
Out Of Band Emission(Left)  
 $\pi/4$ DQPSK\_2-DH5\_Channel Hopping



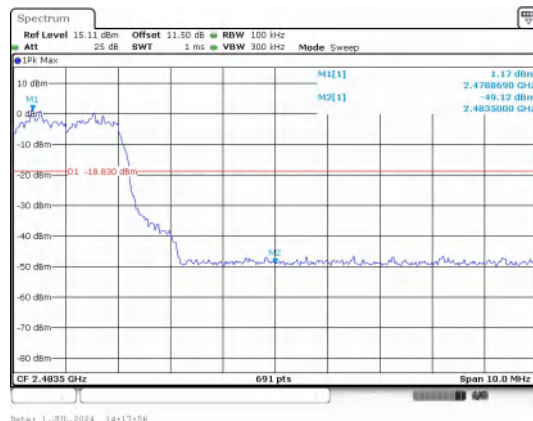
Out Of Band Emission(Right)  
GFSK\_DH5\_Channel Hopping



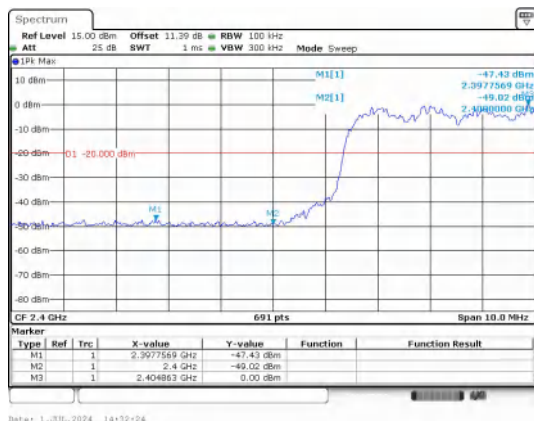
Out Of Band Emission(Right)  
 $\pi/4$ DQPSK\_2-DH5\_Channel Hopping



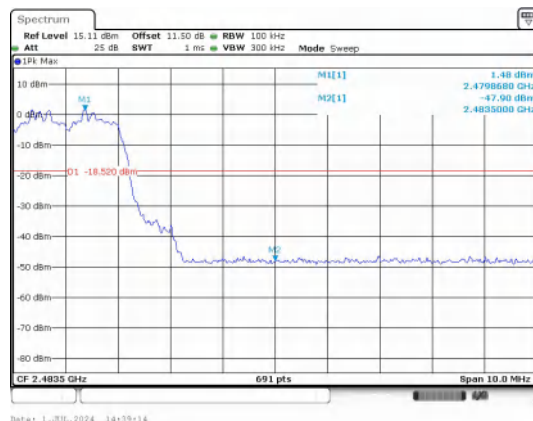
Out Of Band Emission(Left)  
8DPSK\_3-DH5\_Channel Hopping



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



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



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

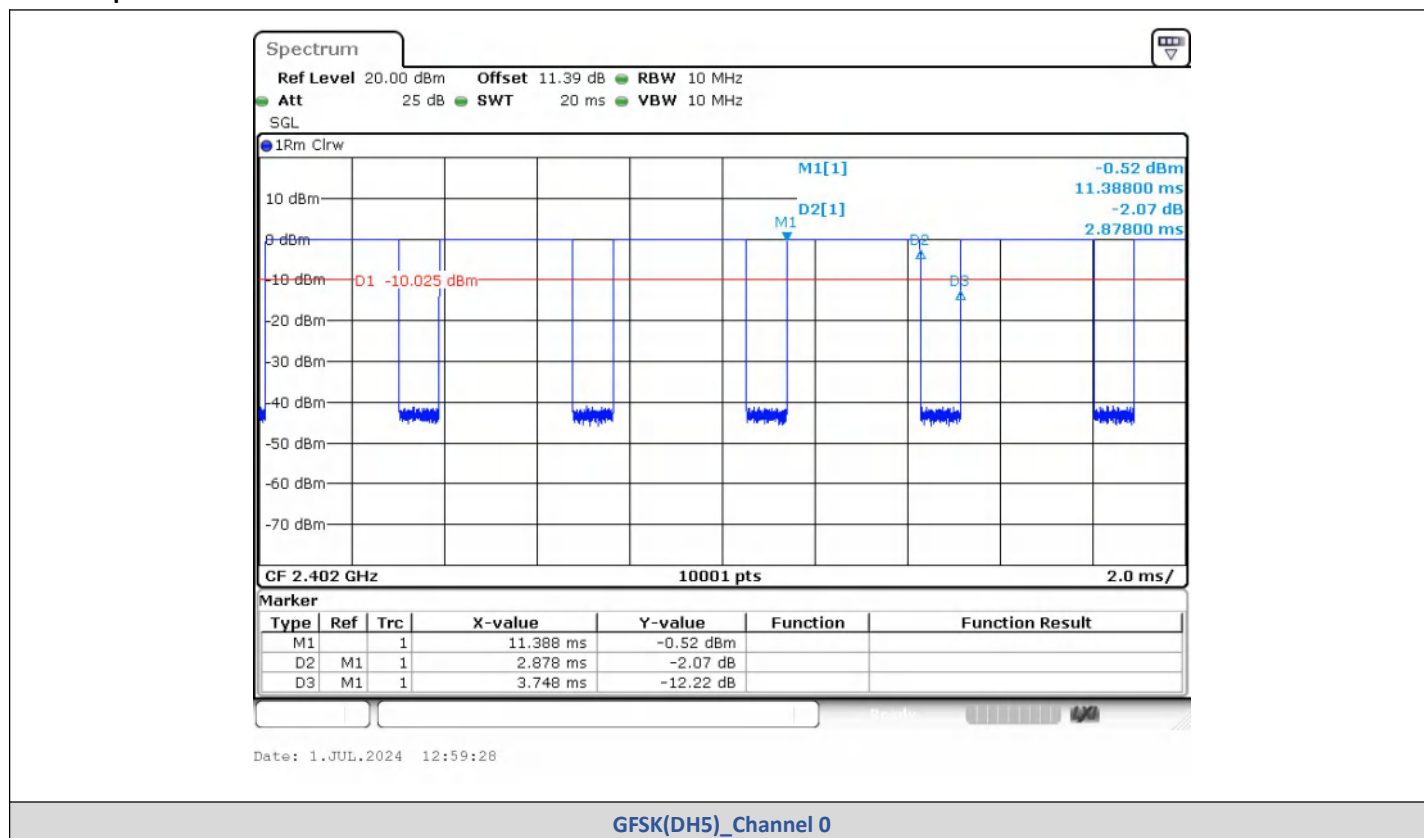


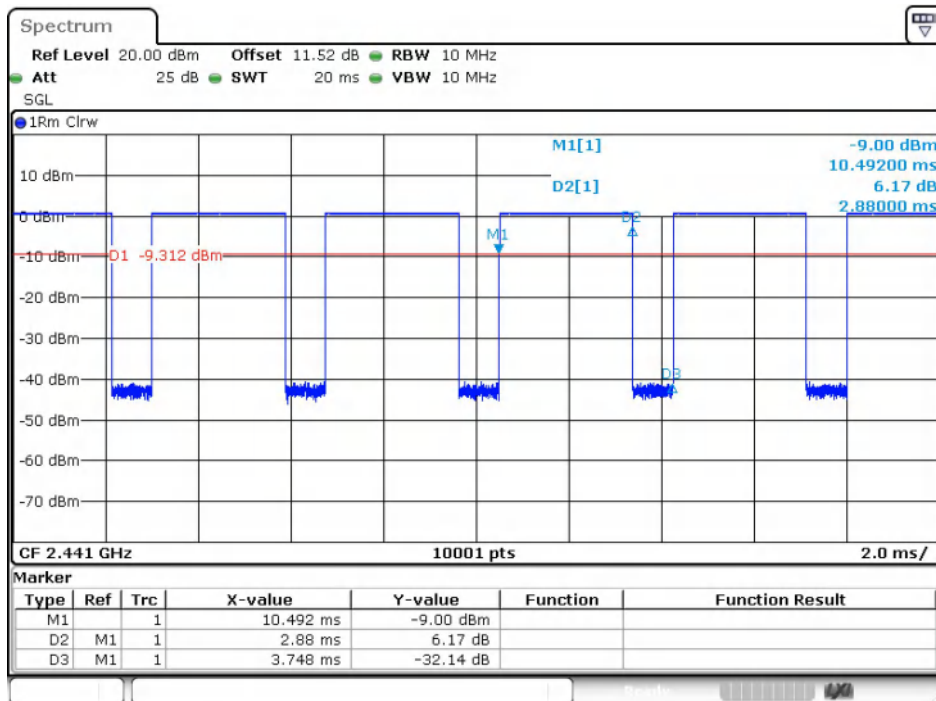
## 6) Duty Cycle

### Test Result

| Modulation    | Packets | Channel | On Time (ms) | Period (ms) | Duty Cycle (%) | Duty Cycle (linear) | Duty Cycle Factor (dB) | 1/T  |
|---------------|---------|---------|--------------|-------------|----------------|---------------------|------------------------|------|
| GFSK          | DH5     | 0       | 2.878        | 3.748       | 76.79          | 0.7679              | 1.147                  | 0.35 |
|               |         | 39      | 2.880        | 3.748       | 76.84          | 0.7684              | 1.1441                 | 0.35 |
|               |         | 78      | 2.878        | 3.748       | 76.79          | 0.7679              | 1.147                  | 0.35 |
| $\pi/4$ DQPSK | 2-DH5   | 0       | 2.884        | 3.748       | 76.95          | 0.7695              | 1.1379                 | 0.35 |
|               |         | 39      | 2.884        | 3.748       | 76.95          | 0.7695              | 1.1379                 | 0.35 |
|               |         | 78      | 2.884        | 3.748       | 76.95          | 0.7695              | 1.1379                 | 0.35 |
| 8DPSK         | 3-DH5   | 0       | 2.888        | 3.748       | 77.05          | 0.7705              | 1.1323                 | 0.35 |
|               |         | 39      | 2.886        | 3.748       | 77.00          | 0.7700              | 1.1351                 | 0.35 |
|               |         | 78      | 2.888        | 3.748       | 77.05          | 0.7705              | 1.1323                 | 0.35 |

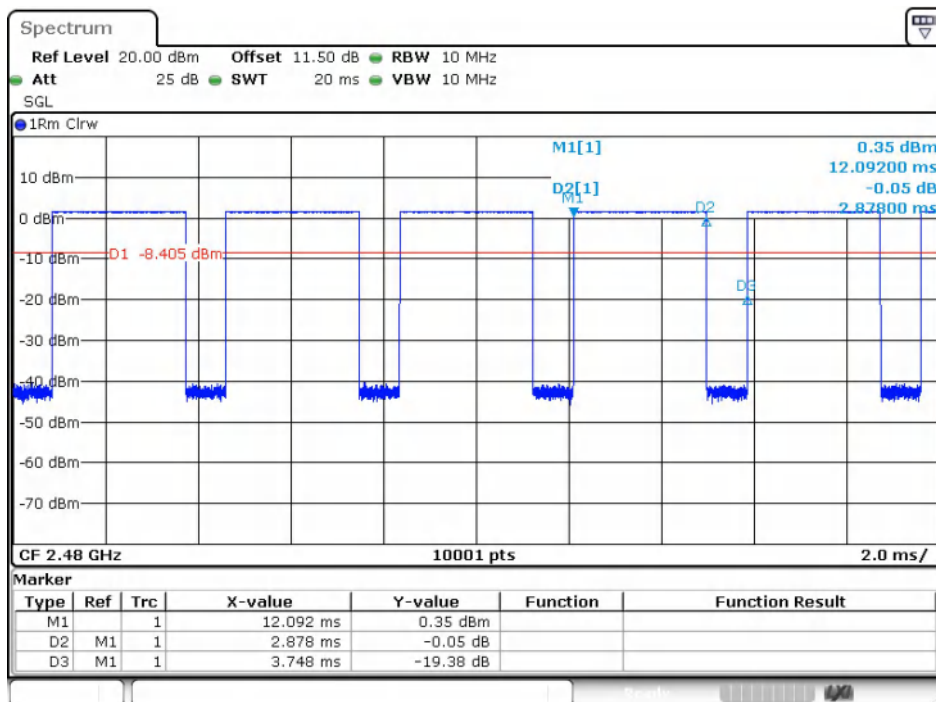
### Test Graphs





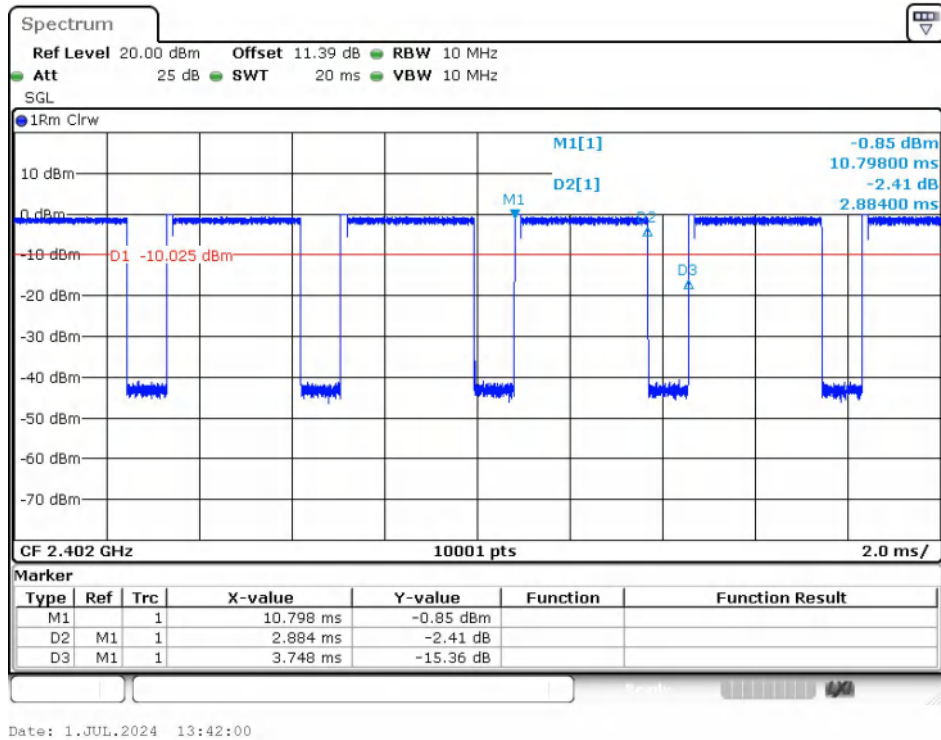
Date: 1.JUL.2024 13:34:55

#### GFSK(DH5)\_Channel 39

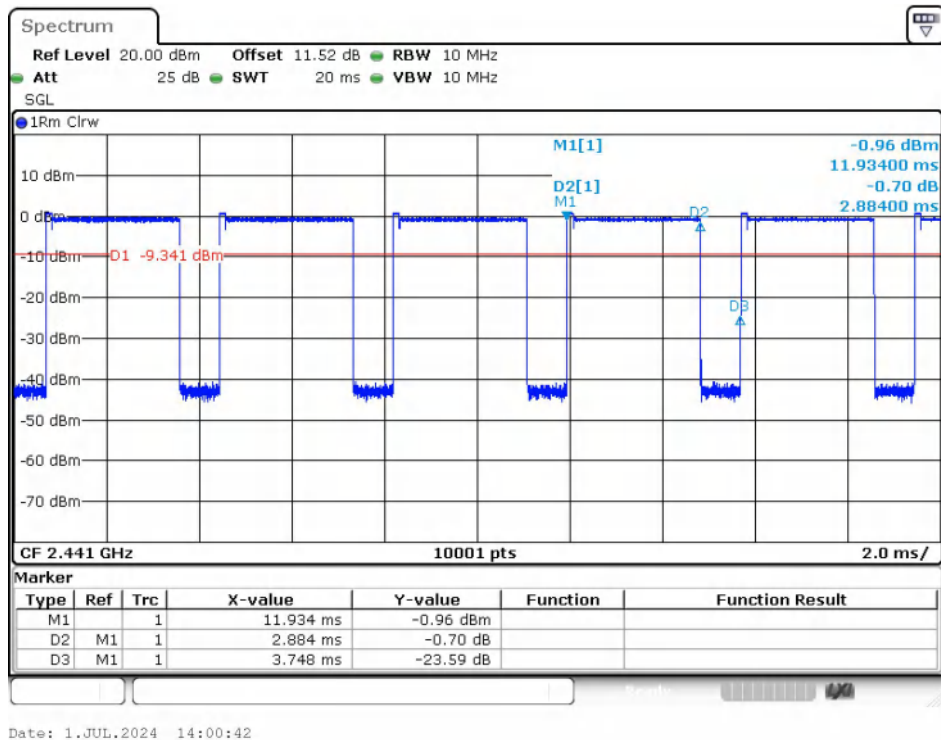


Date: 1.JUL.2024 13:37:43

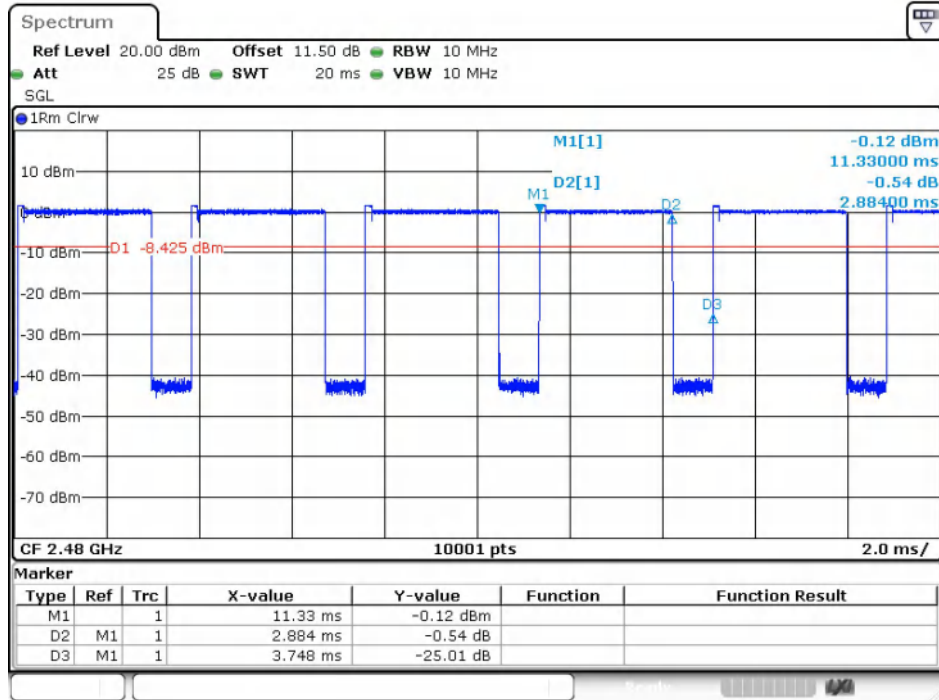
#### GFSK(DH5)\_Channel 78



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

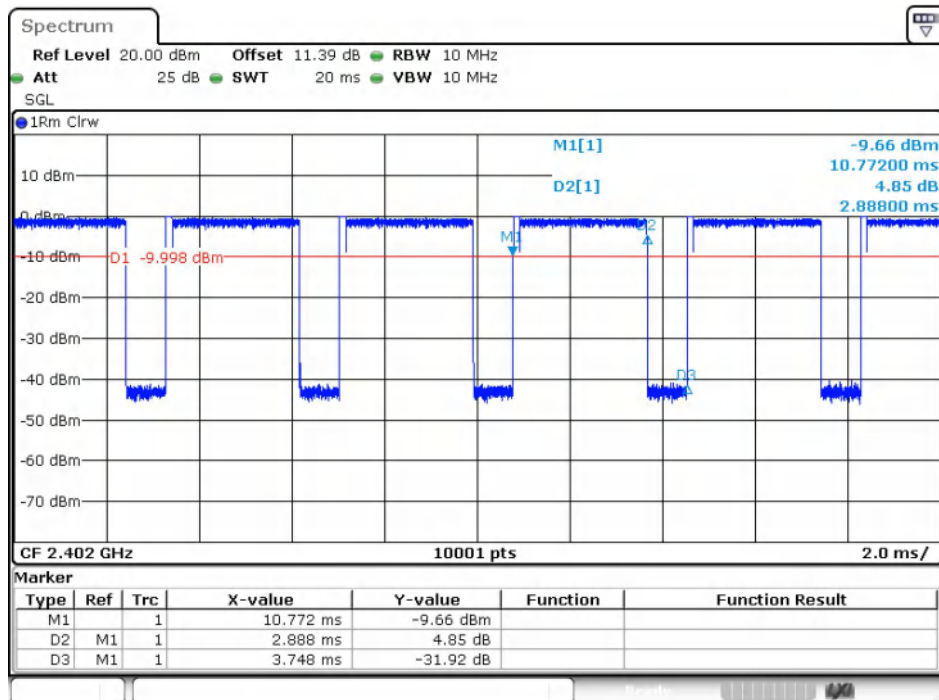


$\pi/4$ QPSK(2-DH5)\_Channel 39



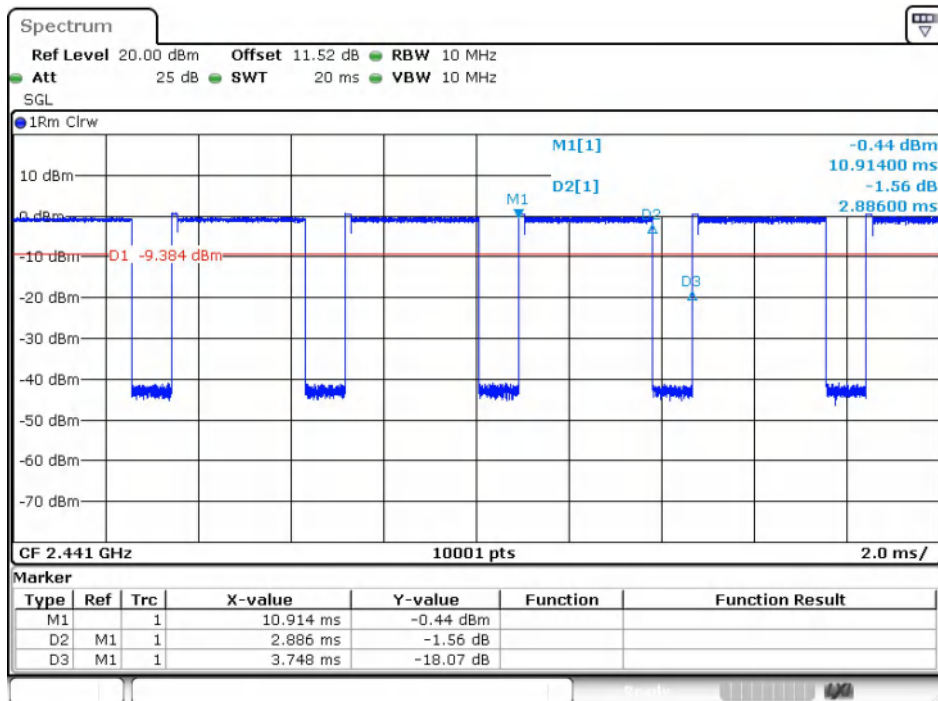
Date: 1.JUL.2024 14:03:02

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



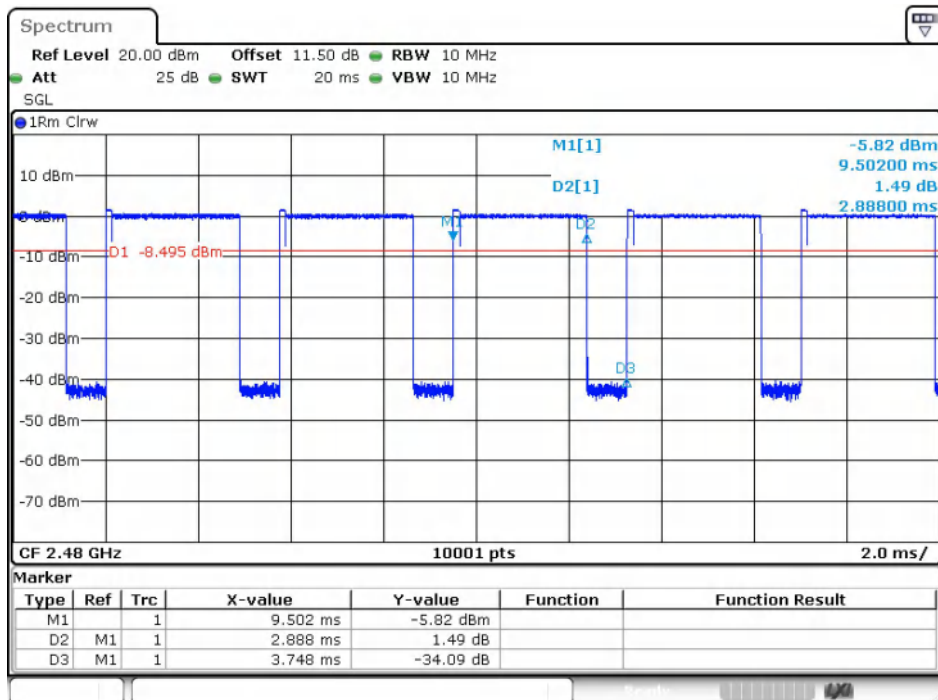
Date: 1.JUL.2024 14:08:35

8DPSK(3-DH5)\_Channel 0



Date: 1.JUL.2024 14:18:32

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



Date: 1.JUL.2024 14:24:08

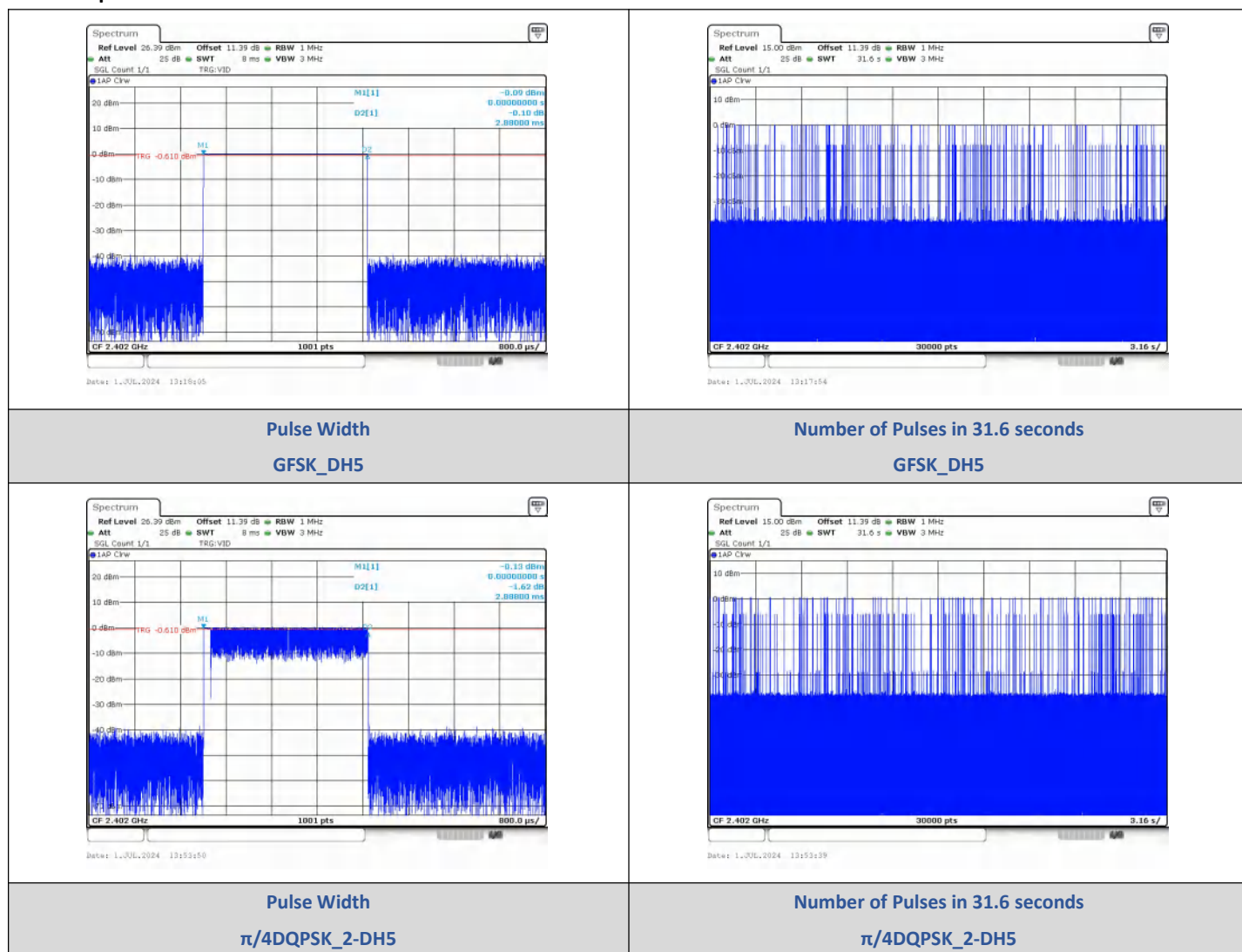
### 8DPSK(3-DH5)\_Channel 78

## 7) Dwell Time

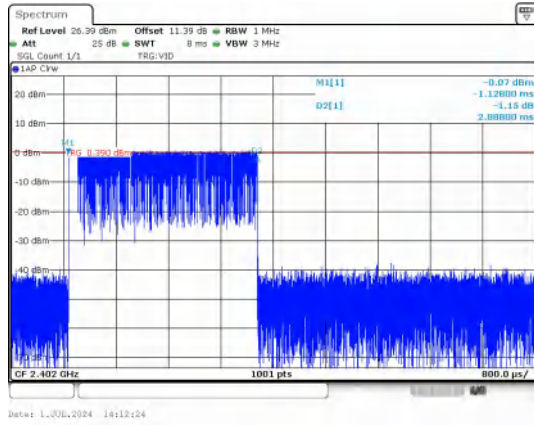
### Test Result

| Modulation    | Packet | Channel          | Pulse Width (ms) | Number of Pulses in 31.6 seconds | Dwell Time (ms) | Limit (ms) | Result |
|---------------|--------|------------------|------------------|----------------------------------|-----------------|------------|--------|
| GFSK          | DH5    | CH0<br>(2402MHz) | 2.880            | 109                              | 313.92          | < 400      | PASS   |
| $\pi/4$ DQPSK | 2-DH5  |                  | 2.888            | 105                              | 303.24          |            | PASS   |
| 8DPSK         | 3-DH5  |                  | 2.888            | 101                              | 291.69          |            | PASS   |

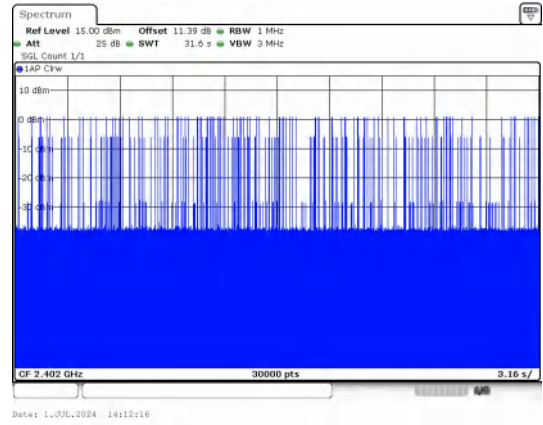
### Test Graphs







Pulse Width  
8DPSK\_3-DH5



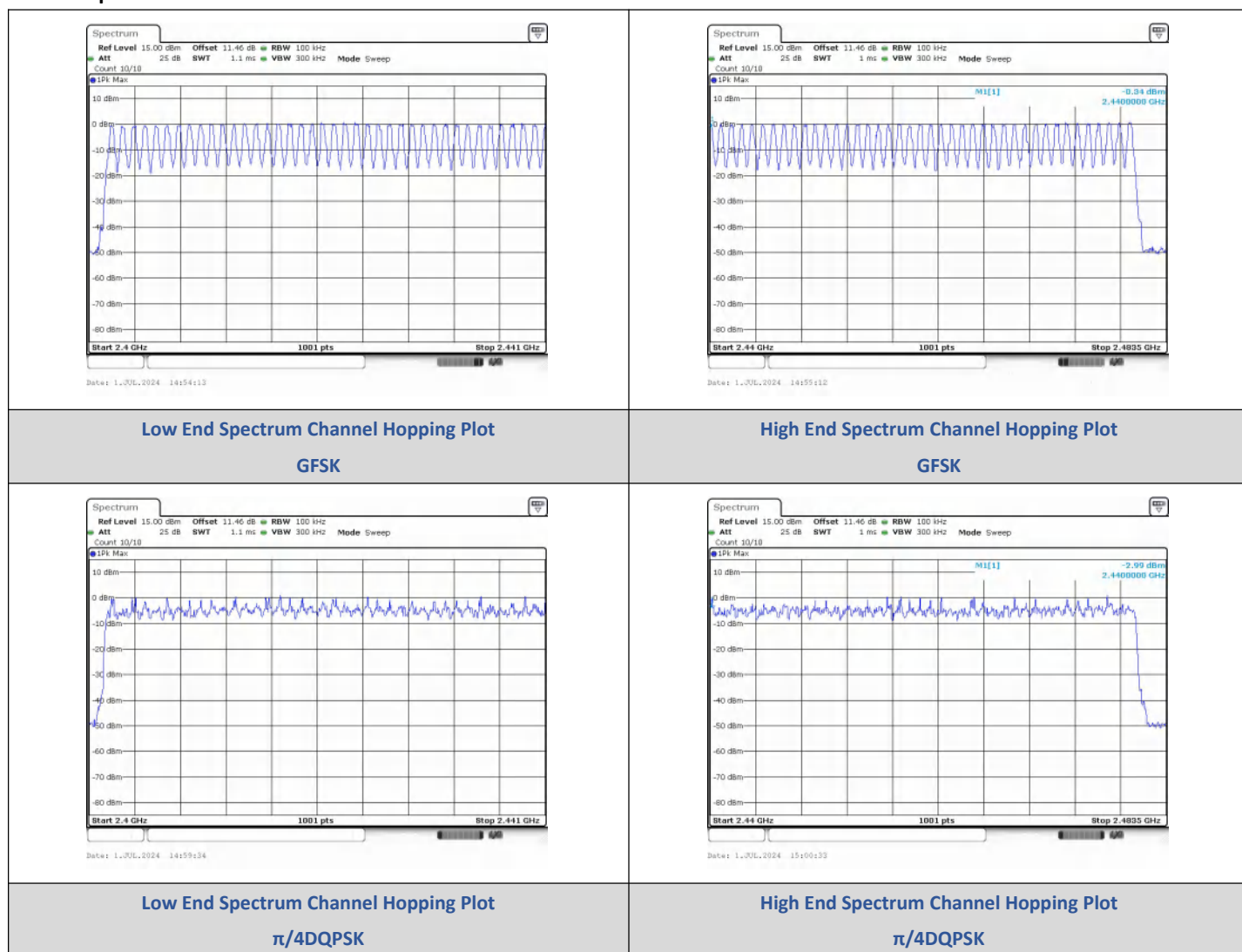
Number of Pulses in 31.6 seconds  
8DPSK\_3-DH5

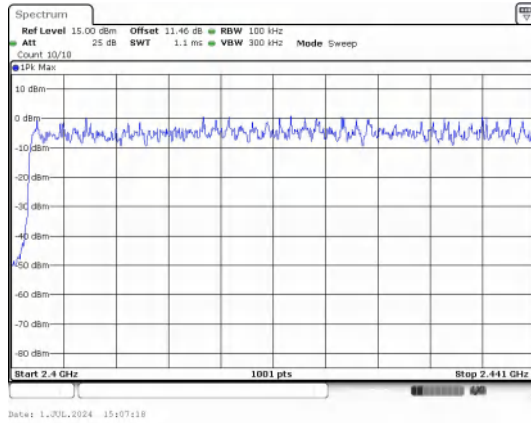
## 8) Number Of Hopping Channel

### Test Result

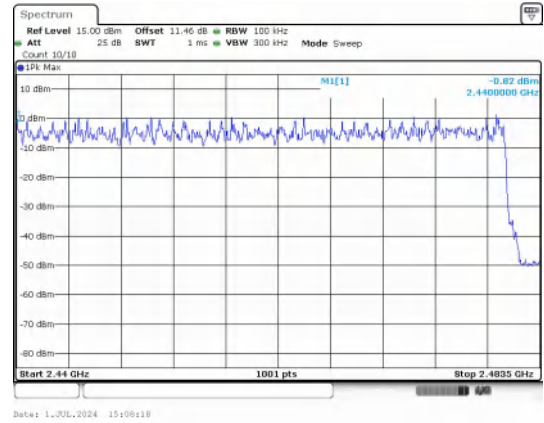
| Modulation    | Packet | Number of Hopping Channel | Limit | Result |
|---------------|--------|---------------------------|-------|--------|
| GFSK          | DH5    | 79                        | 15    | PASS   |
| $\pi/4$ DQPSK | 2-DH5  | 79                        | 15    | PASS   |
| 8DPSK     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

### Test Graphs





Low End Spectrum Channel Hopping Plot  
8DPSK



High End Spectrum Channel Hopping Plot  
8DPSK