

## Appendix A

### RF Test Data for BT V5.0(BDR/EDR) (Conducted Measurement)

Product Name: Speaker cup

Trade Mark: N/A

Test Model: L20

#### Environmental Conditions

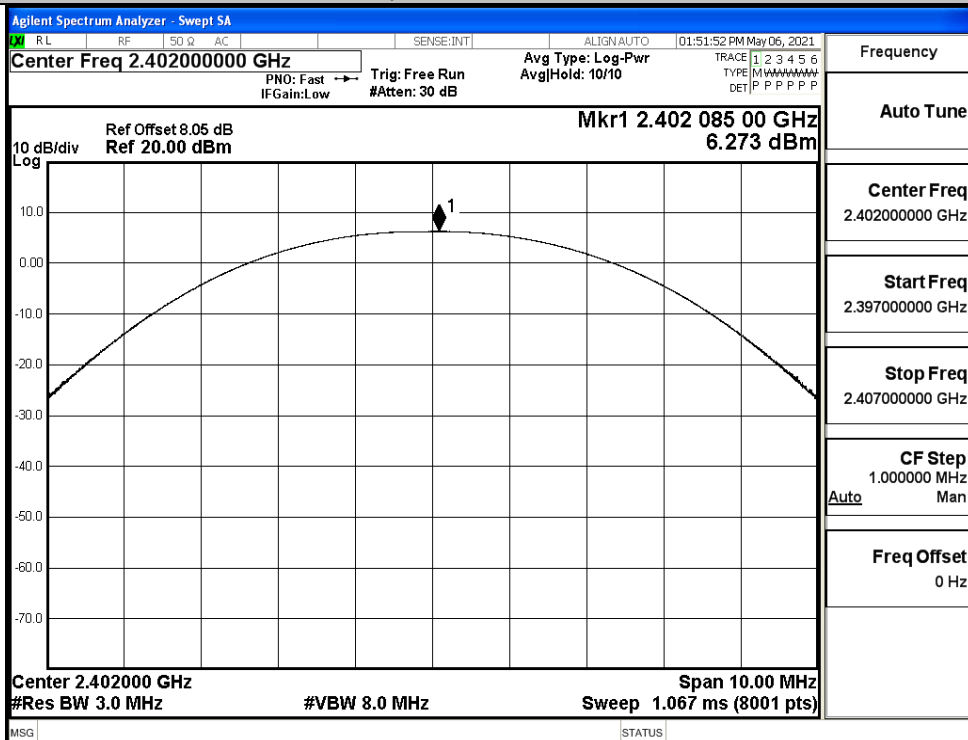
|                    |           |
|--------------------|-----------|
| Temperature:       | 25 ° C    |
| Relative Humidity: | 50%       |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Li Huan   |
| Supervised by:     | Li Huan   |

#### A.1 Maximum Conducted Peak Output Power

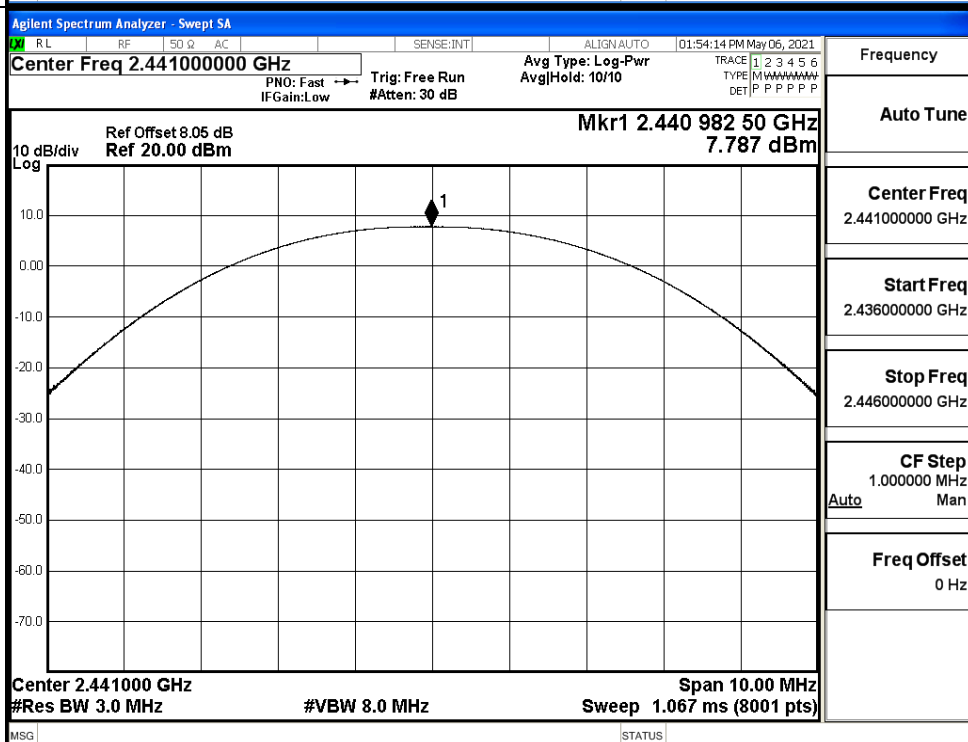
| Mode          | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK          | LCH      | 6.273                           | 21          | PASS    |
|               | MCH      | 7.787                           | 21          | PASS    |
|               | HCH      | 6.225                           | 21          | PASS    |
| $\pi/4$ DQPSK | LCH      | 5.470                           | 21          | PASS    |
|               | MCH      | 6.966                           | 21          | PASS    |
|               | HCH      | 5.487                           | 21          | PASS    |
| 8DPSK         | LCH      | 5.568                           | 21          | PASS    |
|               | MCH      | 7.133                           | 21          | PASS    |
|               | HCH      | 5.638                           | 21          | PASS    |

## Test Graphs

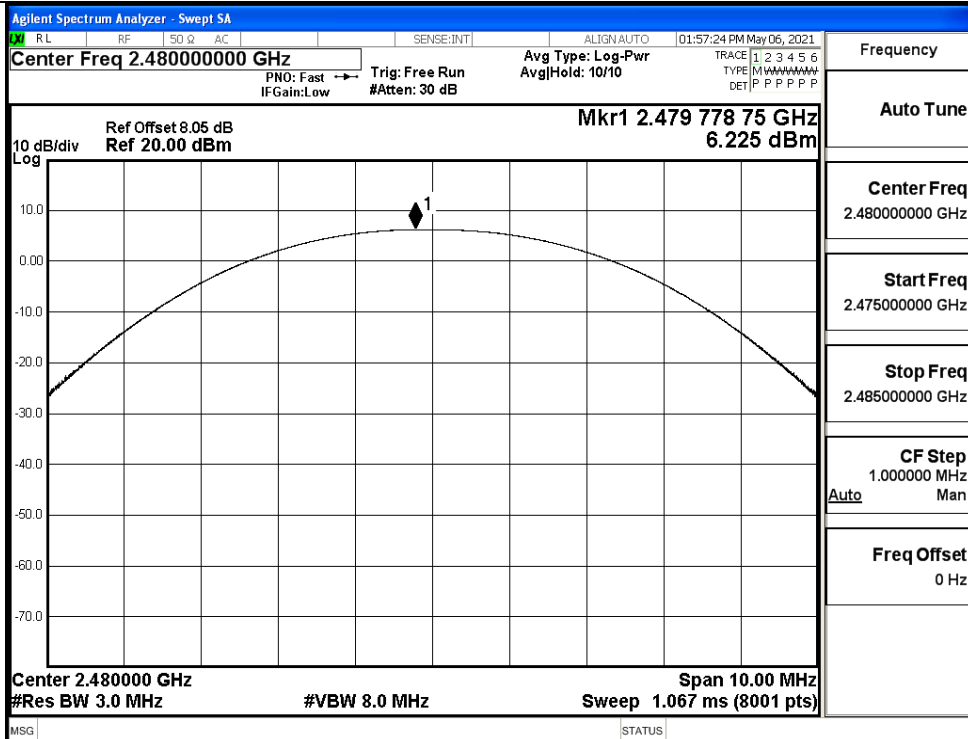
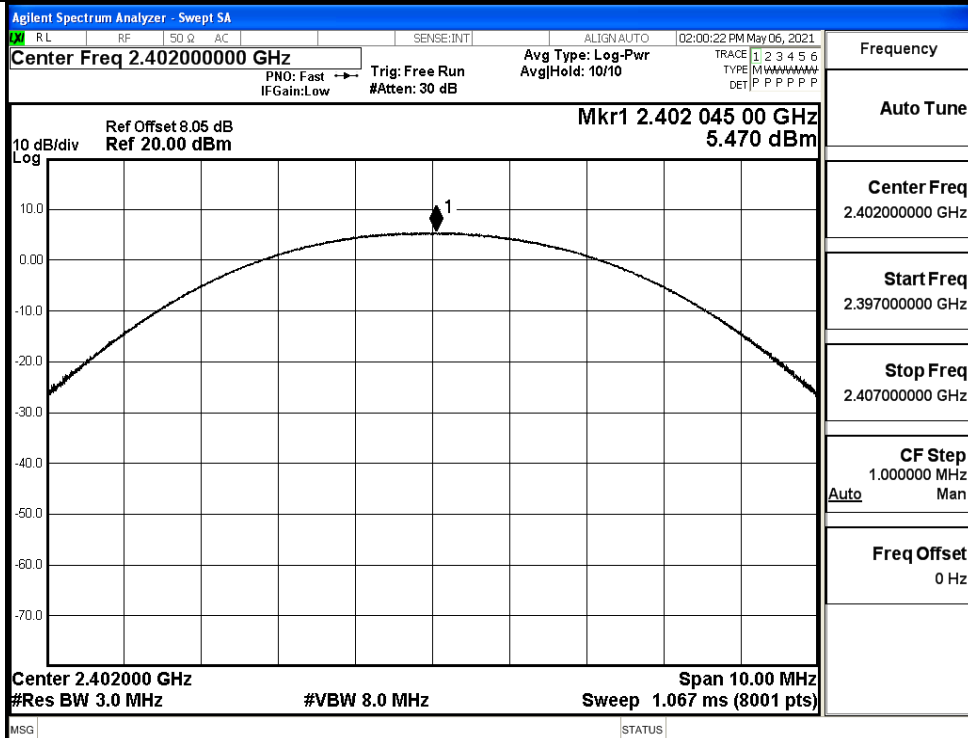
GFSK/LCH

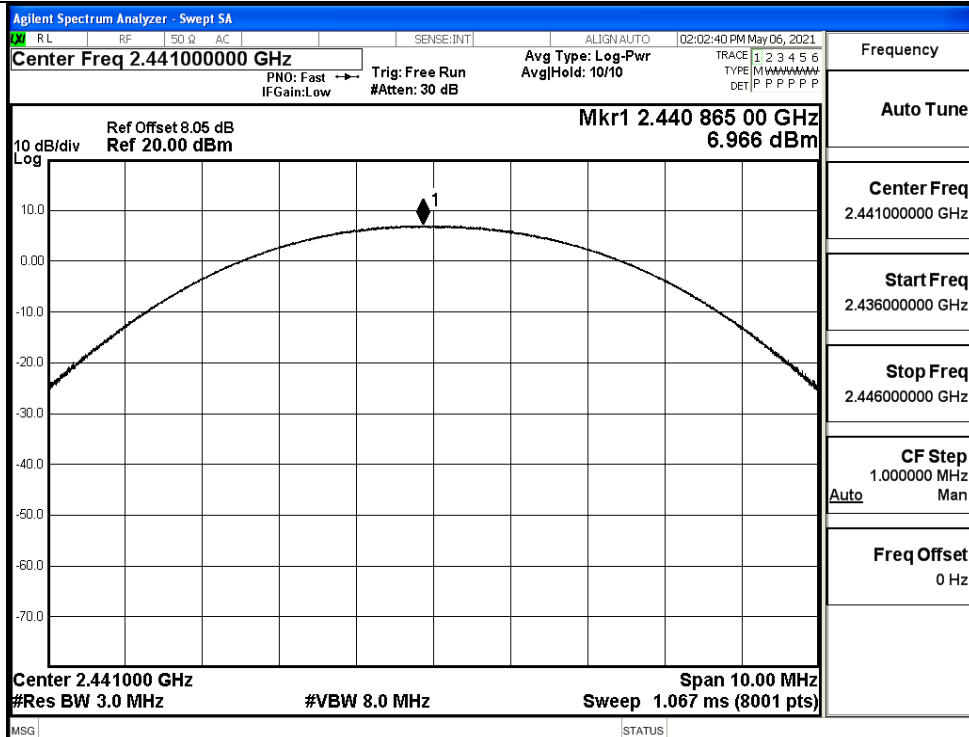
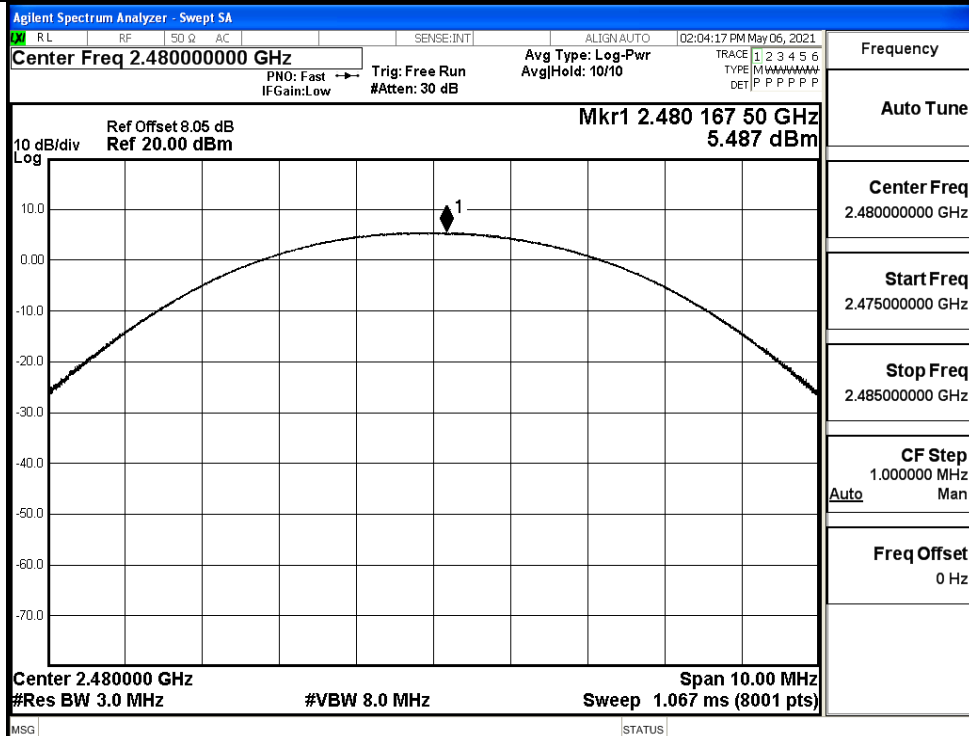


GFSK/MCH

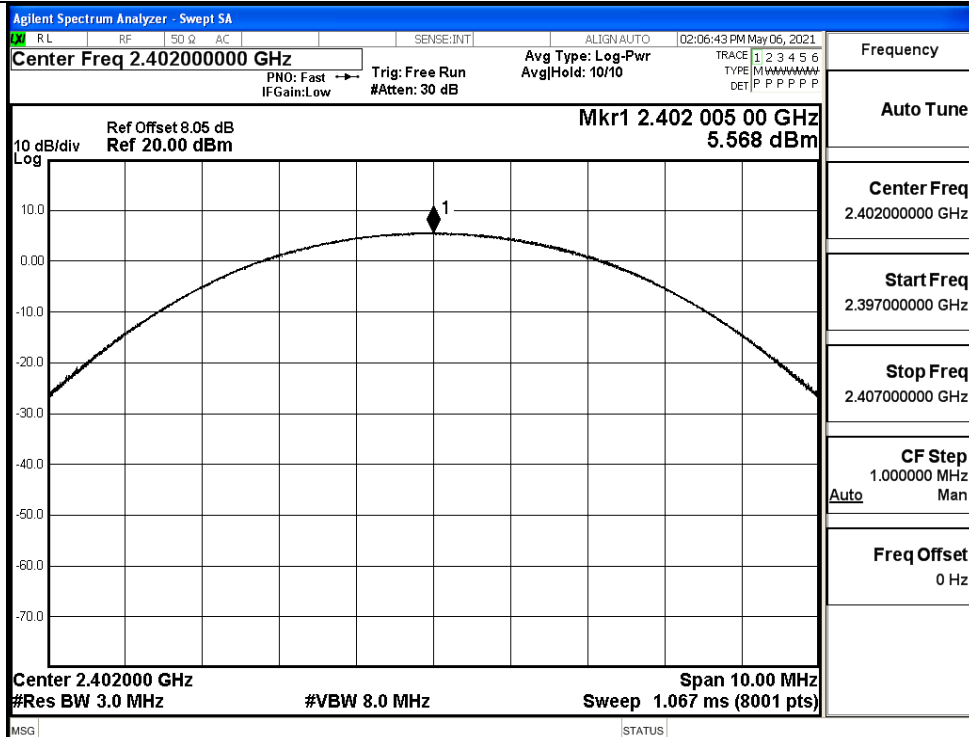


GFSK/HCH

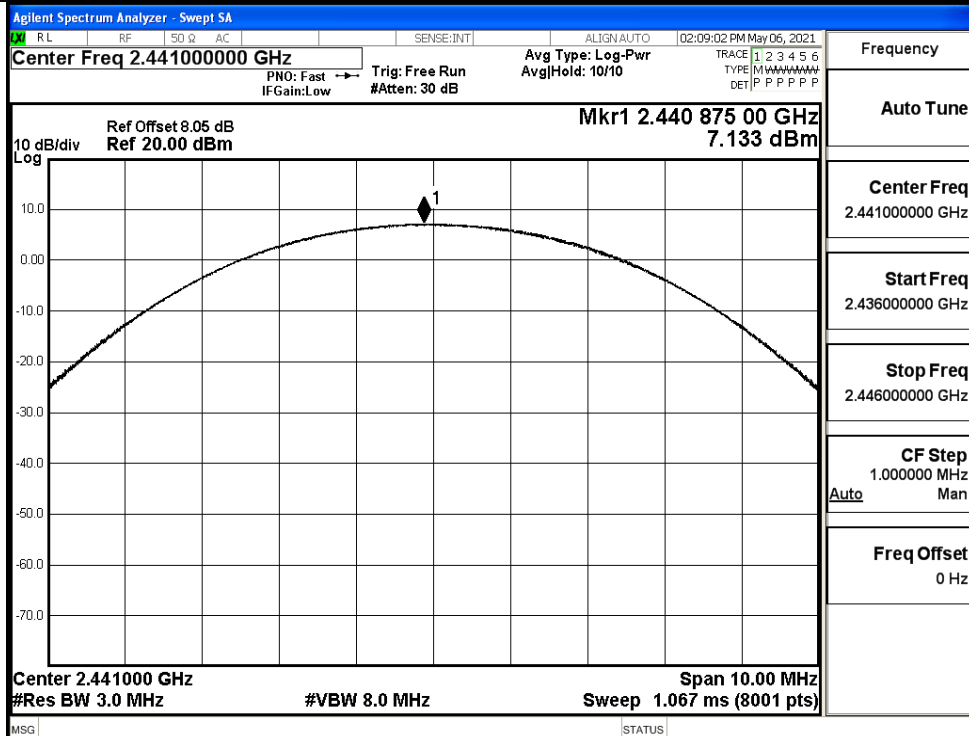
 $\pi/4$ DQPSK/LCH

$\pi/4$ DQPSK/MCH $\pi/4$ DQPSK/HCH

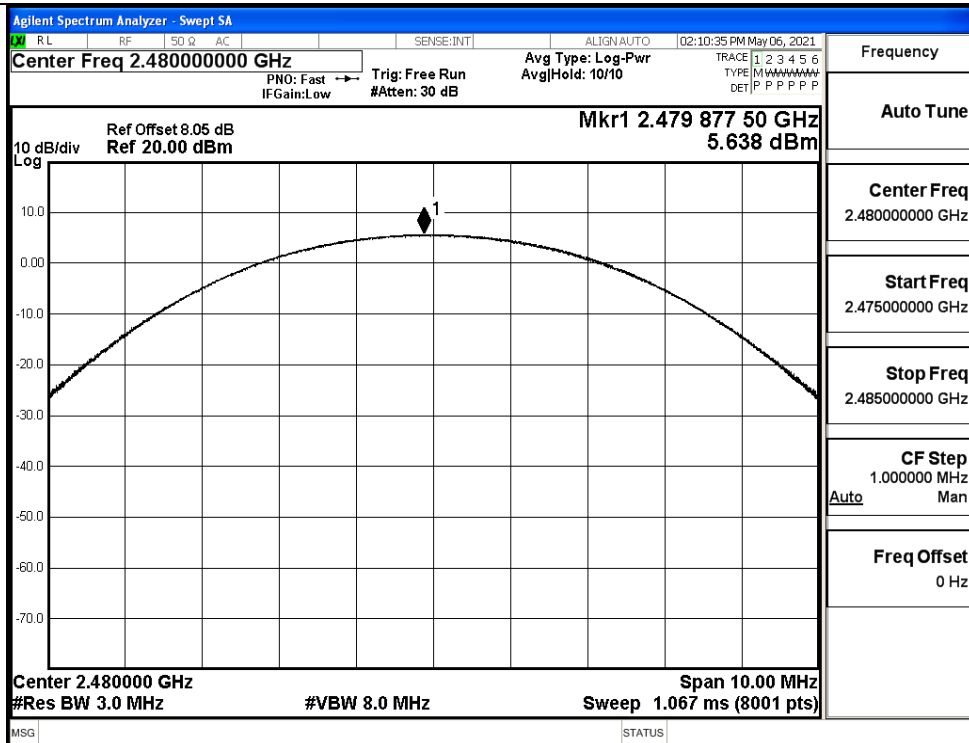
8DPSK/LCH



8DPSK/MCH



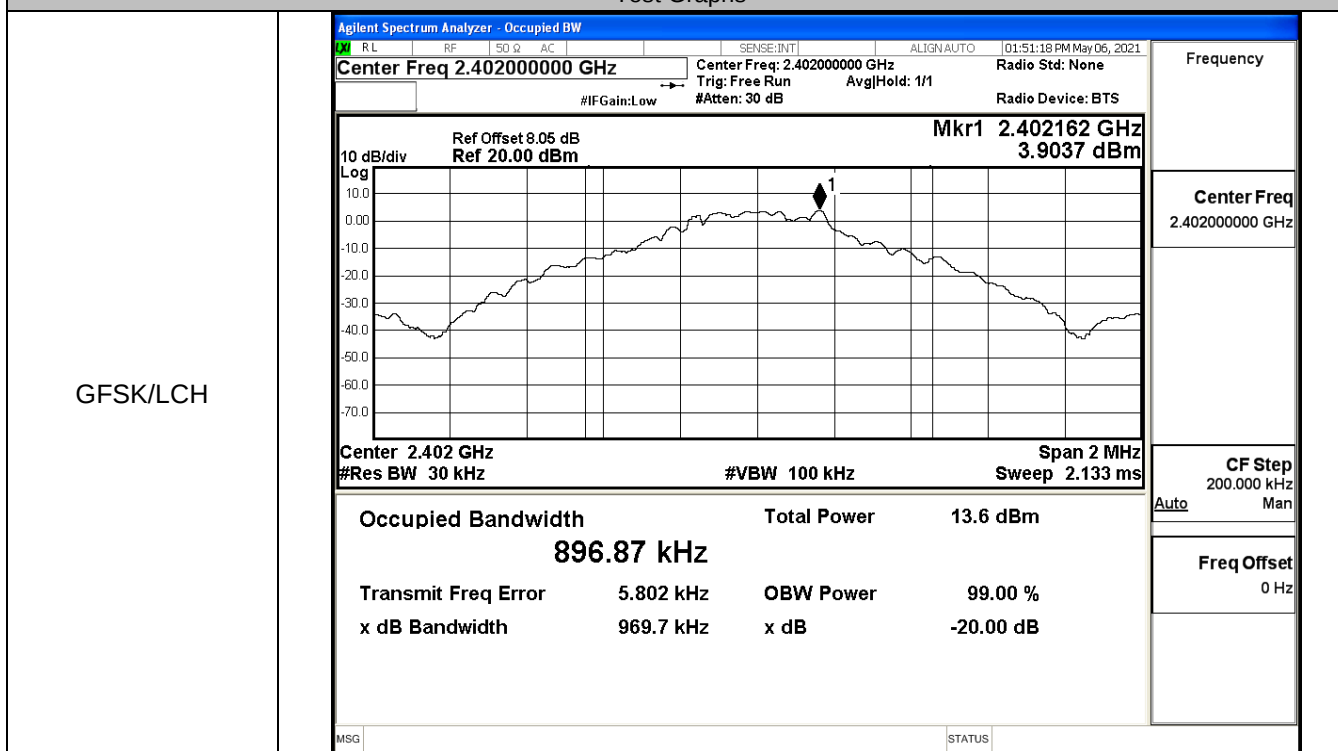
8DPSK/HCH



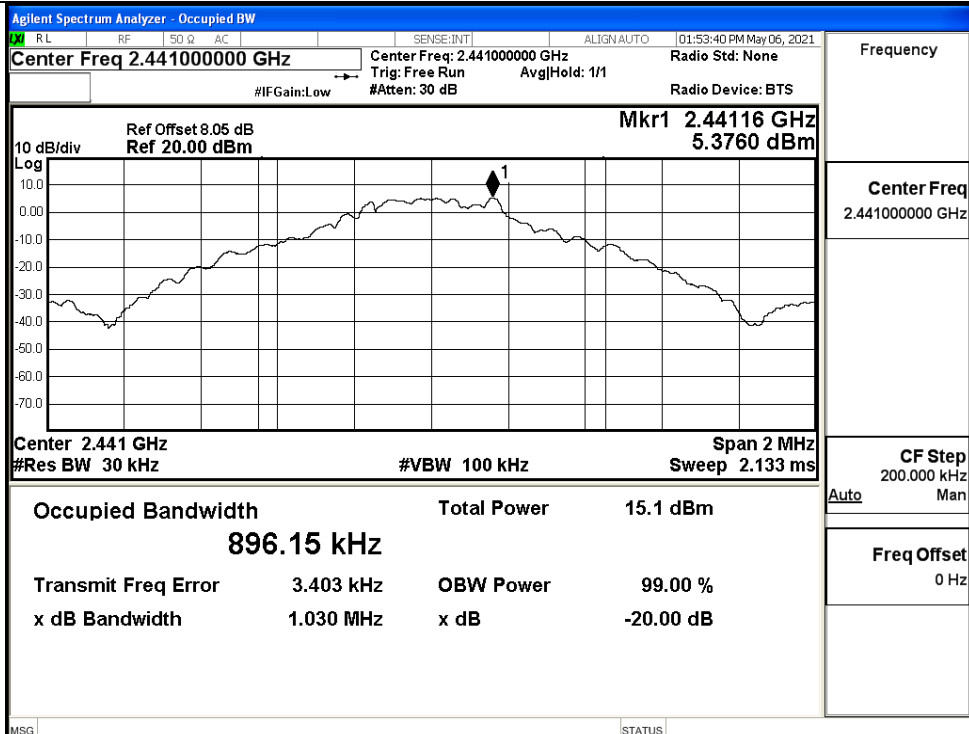
## A.2 20dB Bandwidth

| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.9697               | Not Specified | PASS    |
|               | MCH      | 1.030                | Not Specified | PASS    |
|               | HCH      | 1.019                | Not Specified | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.289                | Not Specified | PASS    |
|               | MCH      | 1.288                | Not Specified | PASS    |
|               | HCH      | 1.289                | Not Specified | PASS    |
| 8DPSK         | LCH      | 1.290                | Not Specified | PASS    |
|               | MCH      | 1.293                | Not Specified | PASS    |
|               | HCH      | 1.295                | Not Specified | PASS    |

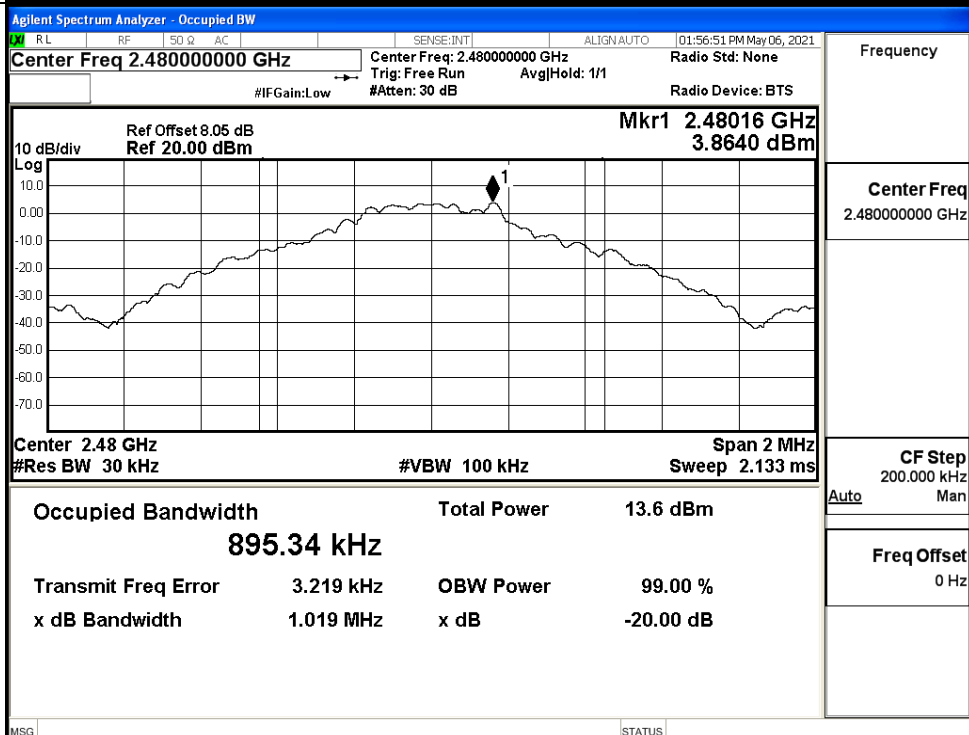
Test Graphs

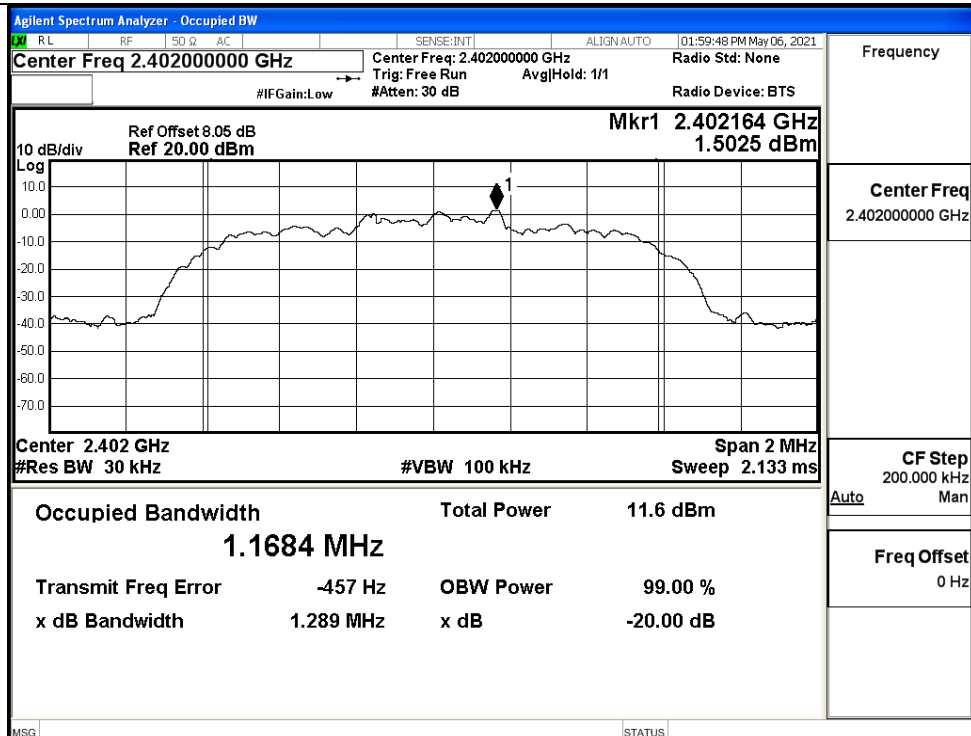
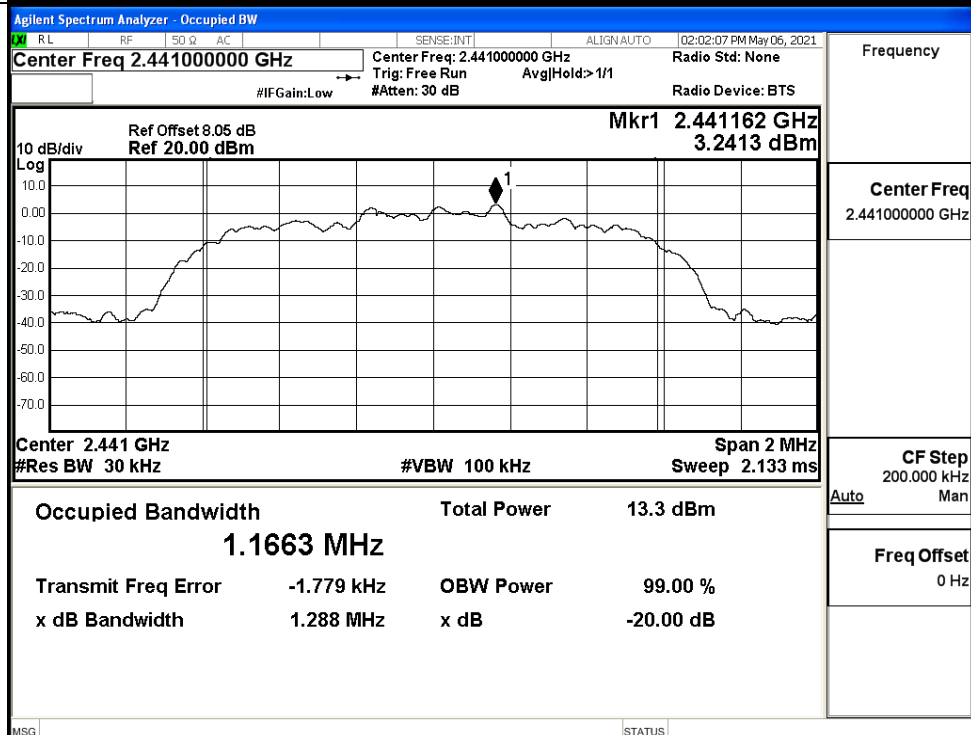


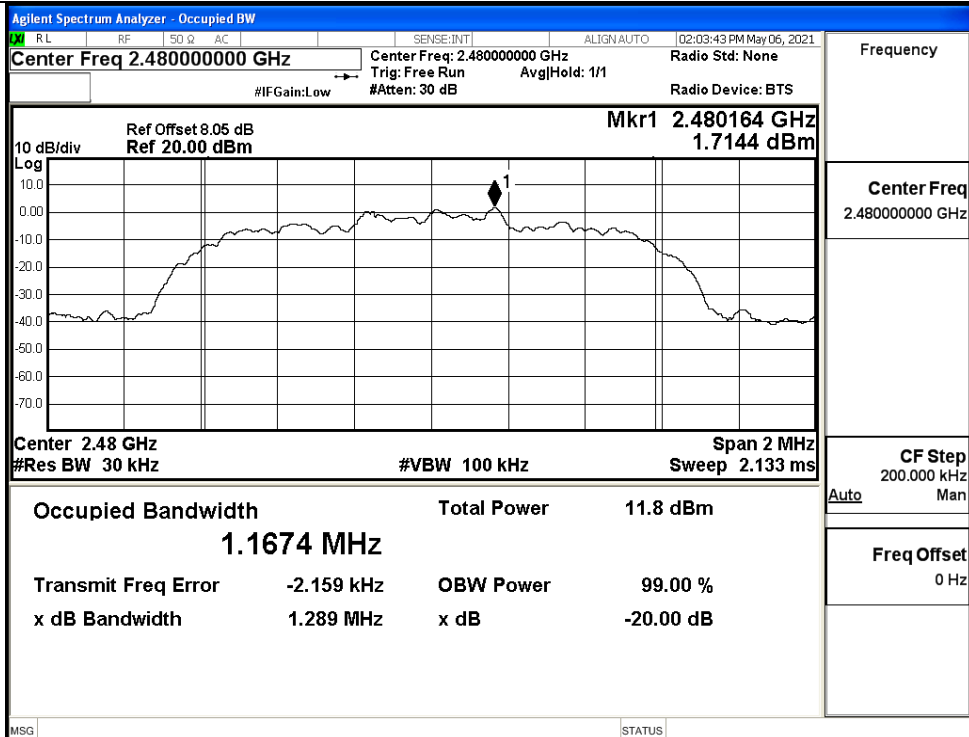
GFSK/MCH



GFSK/HCH



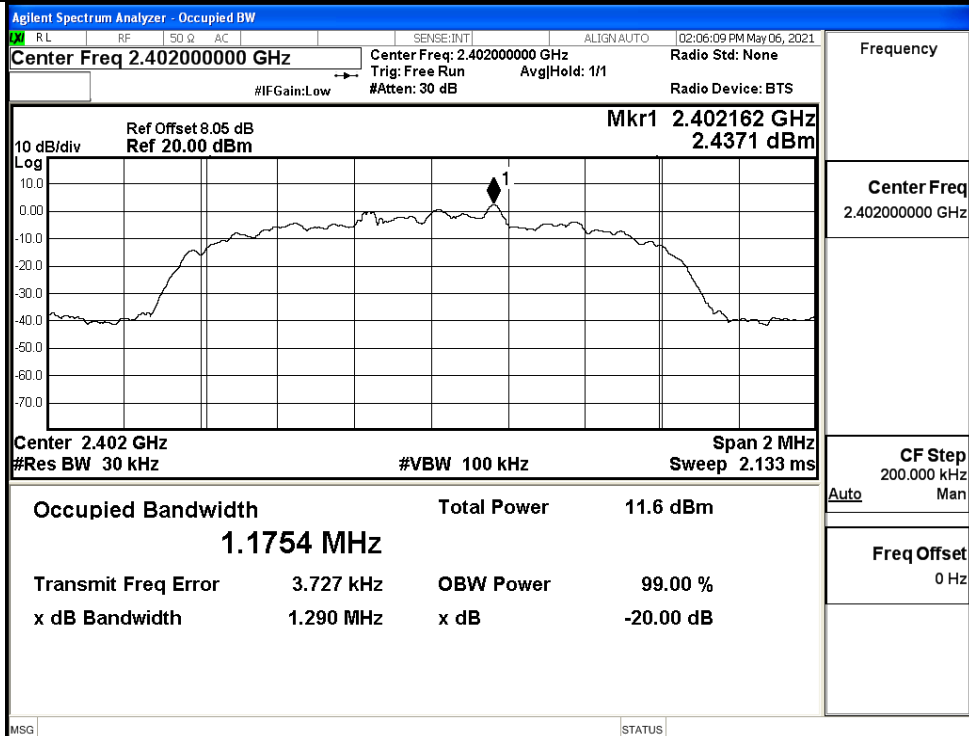
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

Frequency

Center Freq  
2.48000000 GHzCF Step  
200.000 kHz  
Auto ManFreq Offset  
0 Hz

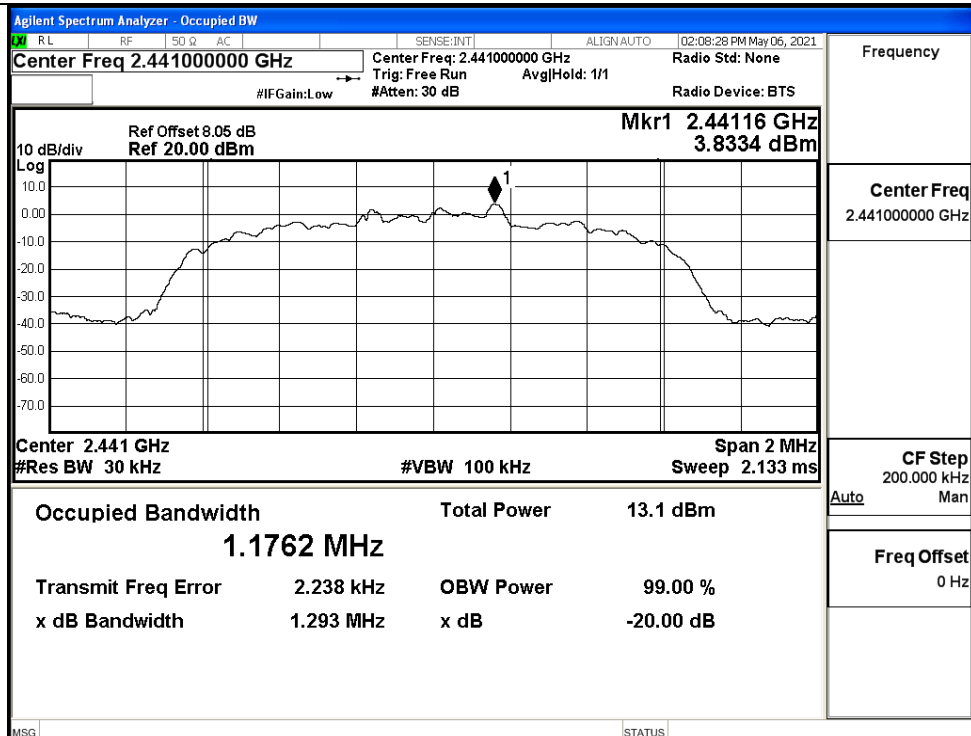
8DPSK/LCH



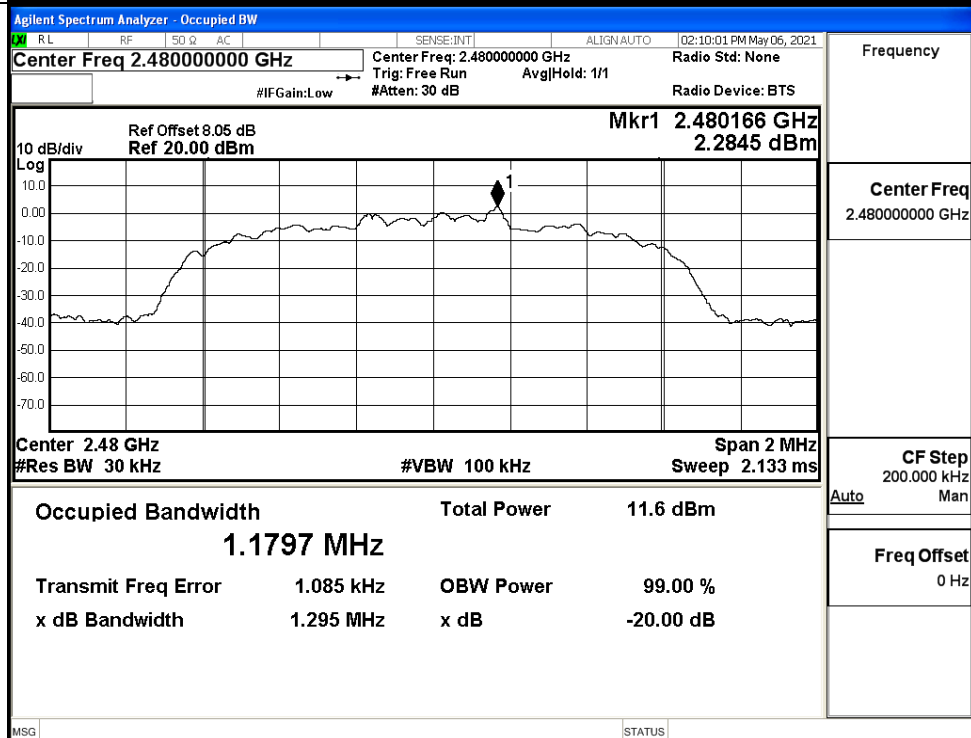
Frequency

Center Freq  
2.40200000 GHzCF Step  
200.000 kHz  
Auto ManFreq Offset  
0 Hz

8DPSK/MCH



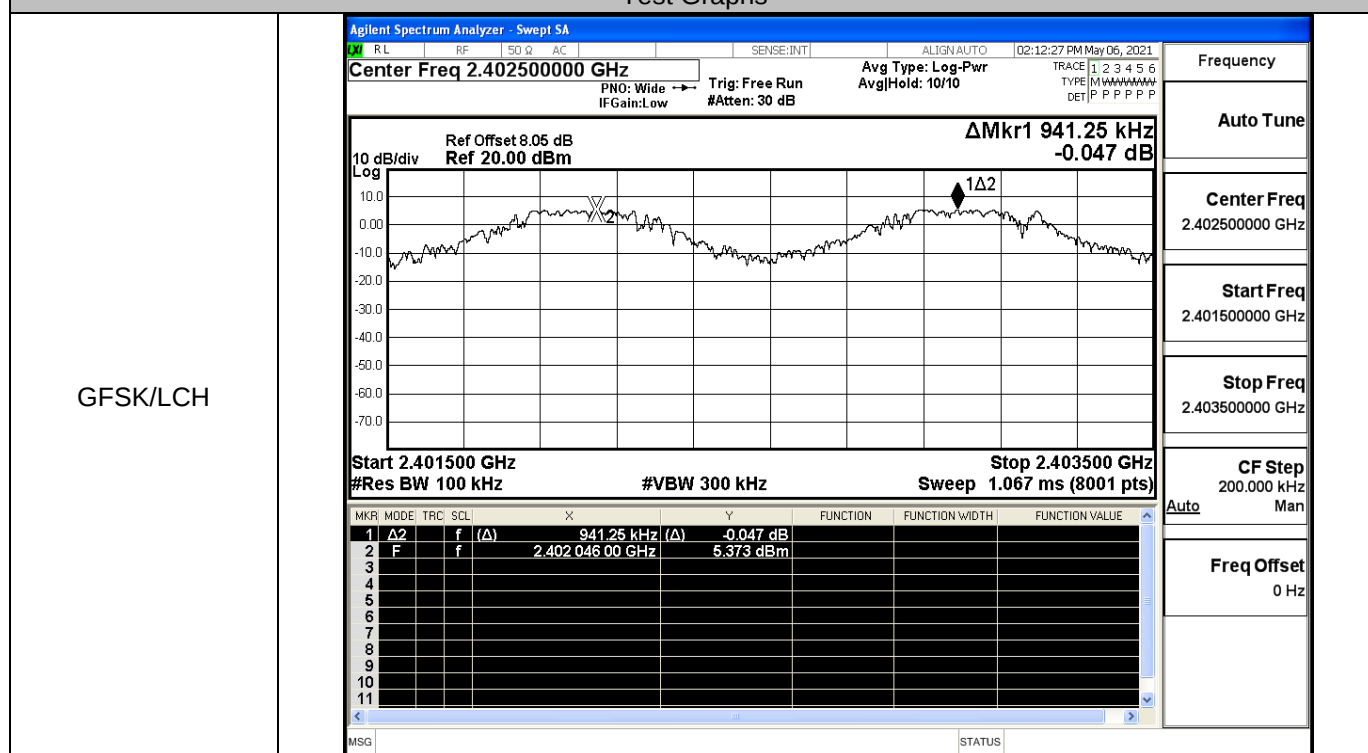
8DPSK/HCH



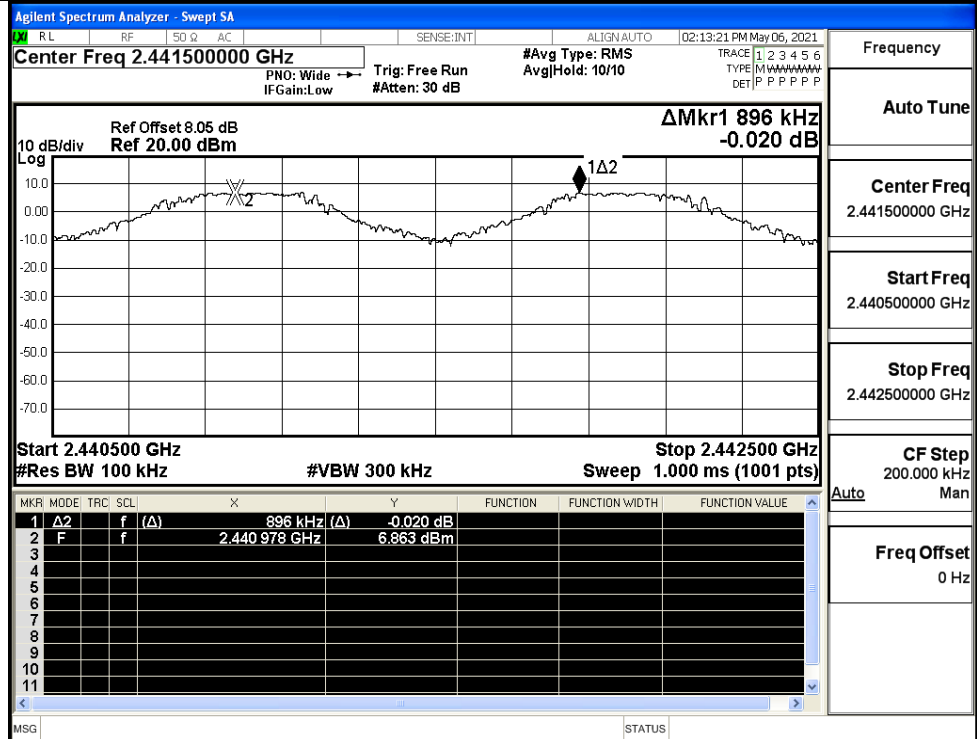
### A.3 Carrier Frequency Separation

| Mode          | Channel | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|---------|------------------------------------|-------------|---------|
| GFSK          | LCH     | 0.941                              | 0.687       | PASS    |
|               | MCH     | 0.896                              | 0.687       | PASS    |
|               | HCH     | 0.962                              | 0.687       | PASS    |
| $\pi/4$ DQPSK | LCH     | 1.216                              | 0.859       | PASS    |
|               | MCH     | 1.186                              | 0.859       | PASS    |
|               | HCH     | 1.012                              | 0.859       | PASS    |
| 8DPSK         | LCH     | 1.266                              | 0.863       | PASS    |
|               | MCH     | 0.922                              | 0.863       | PASS    |
|               | HCH     | 1.284                              | 0.863       | PASS    |

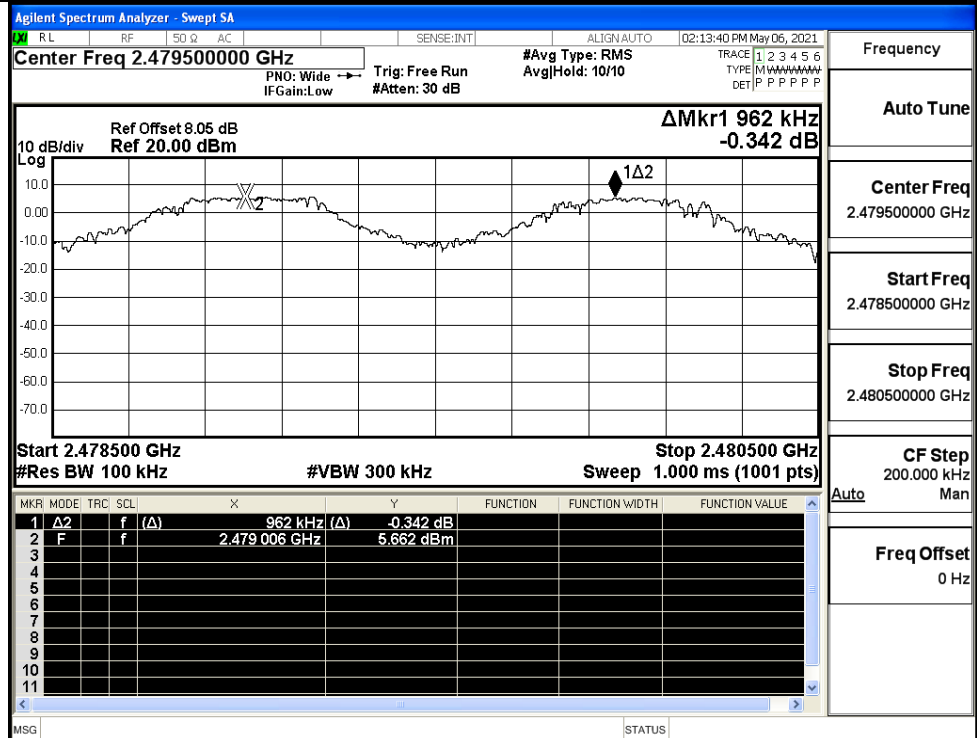
#### Test Graphs

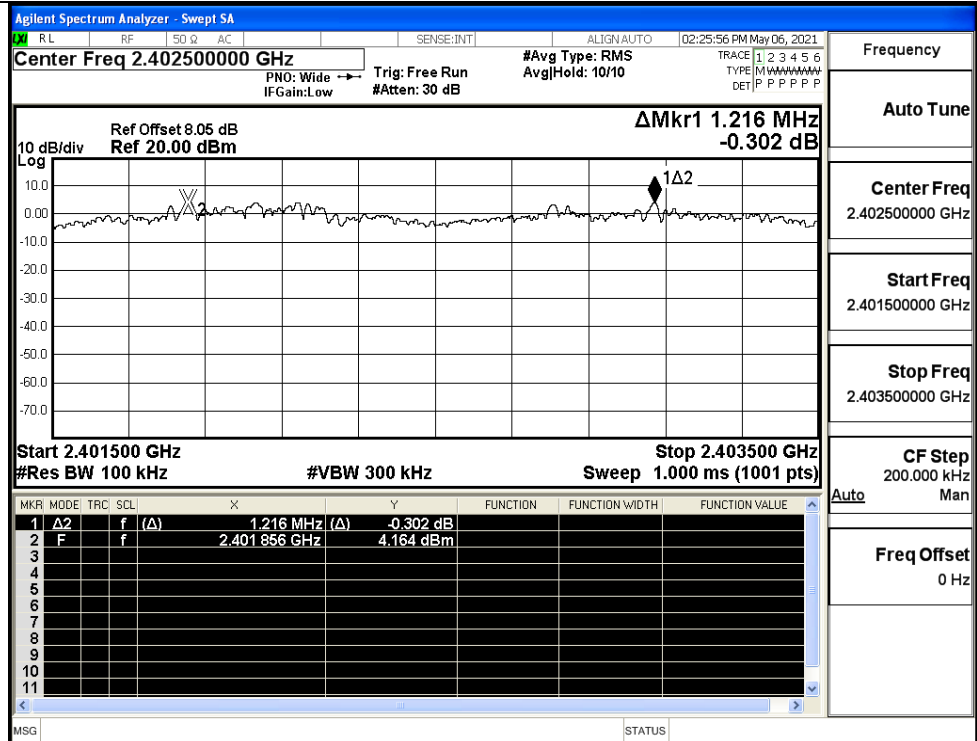
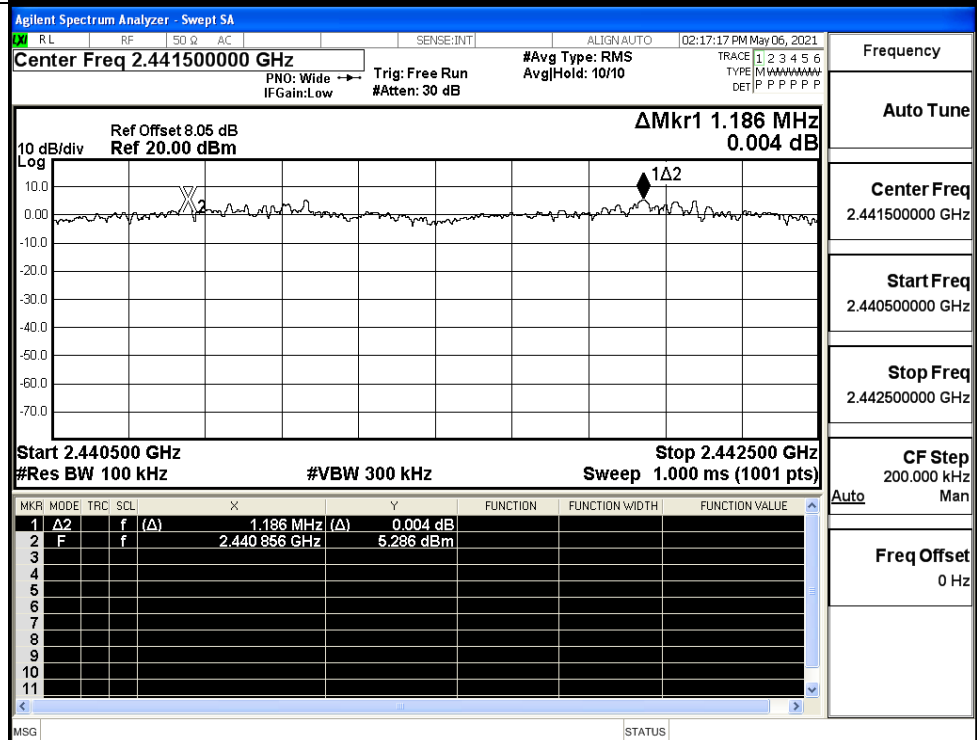


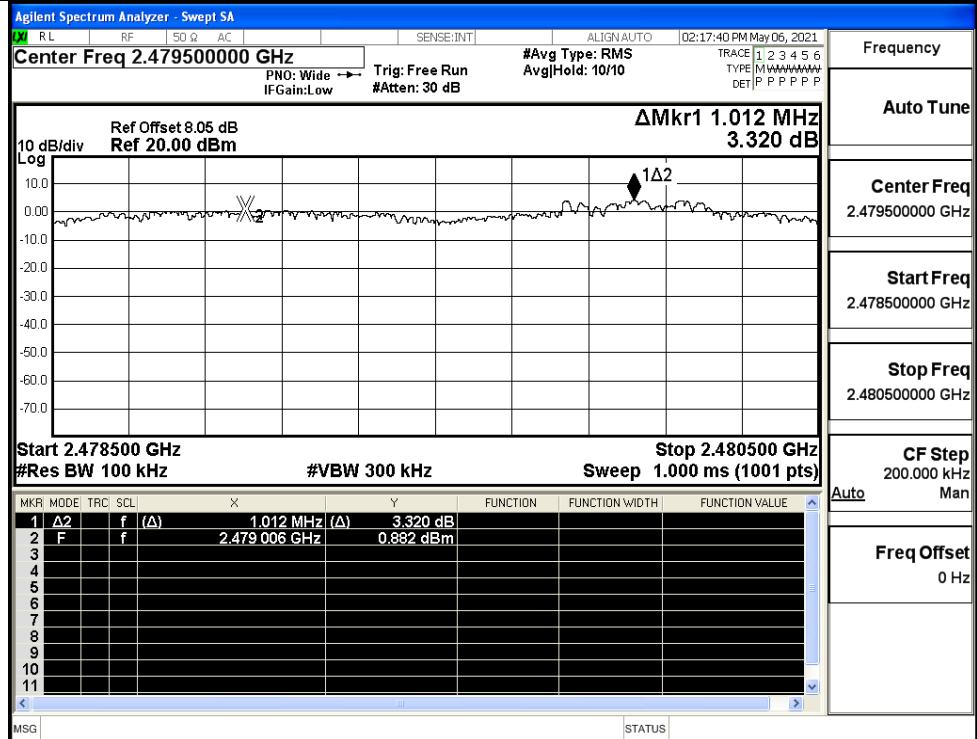
GFSK/MCH



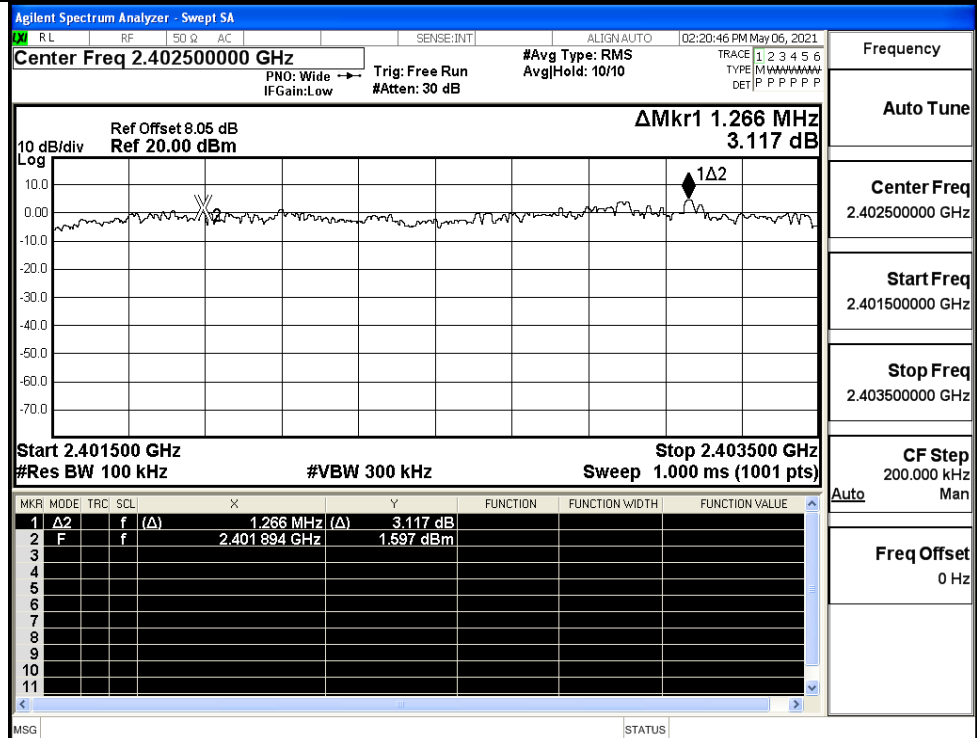
GFSK/HCH



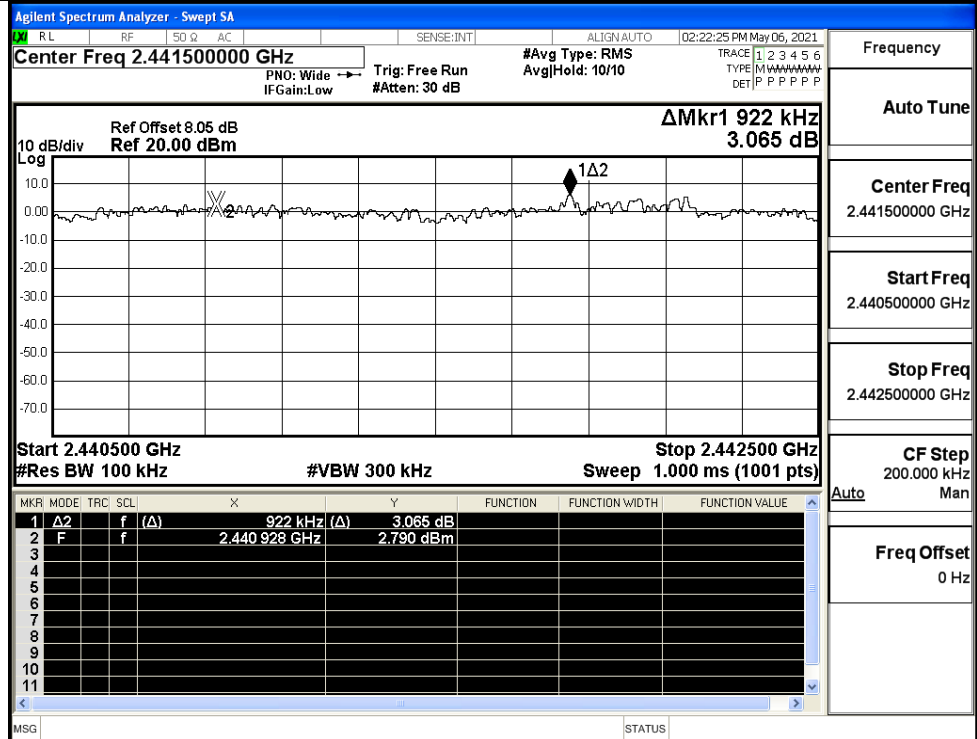
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

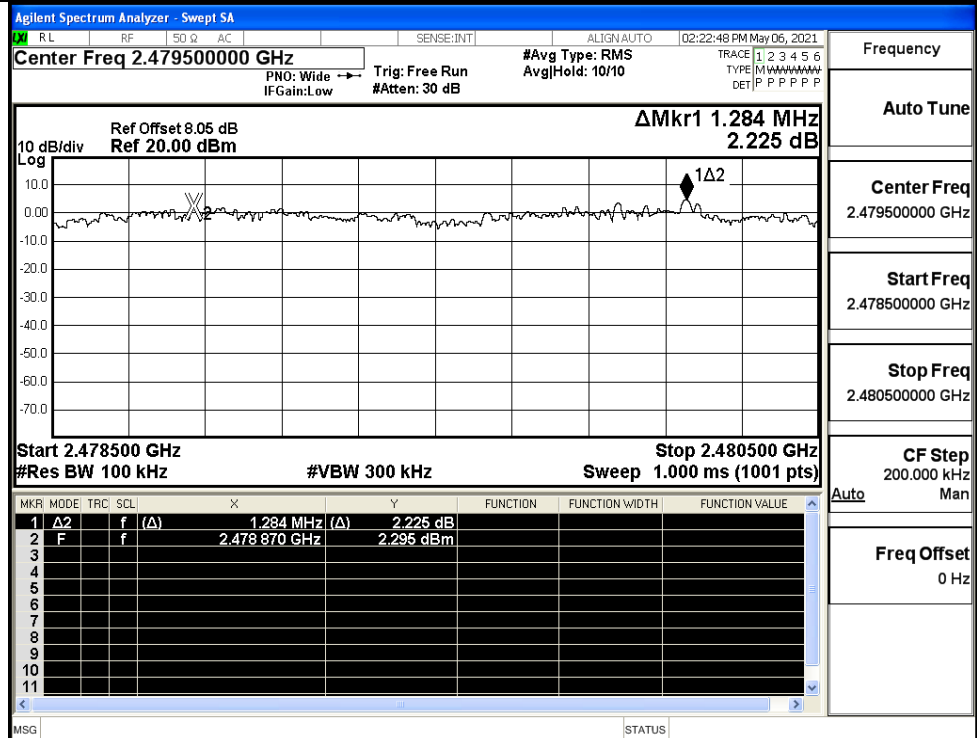
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

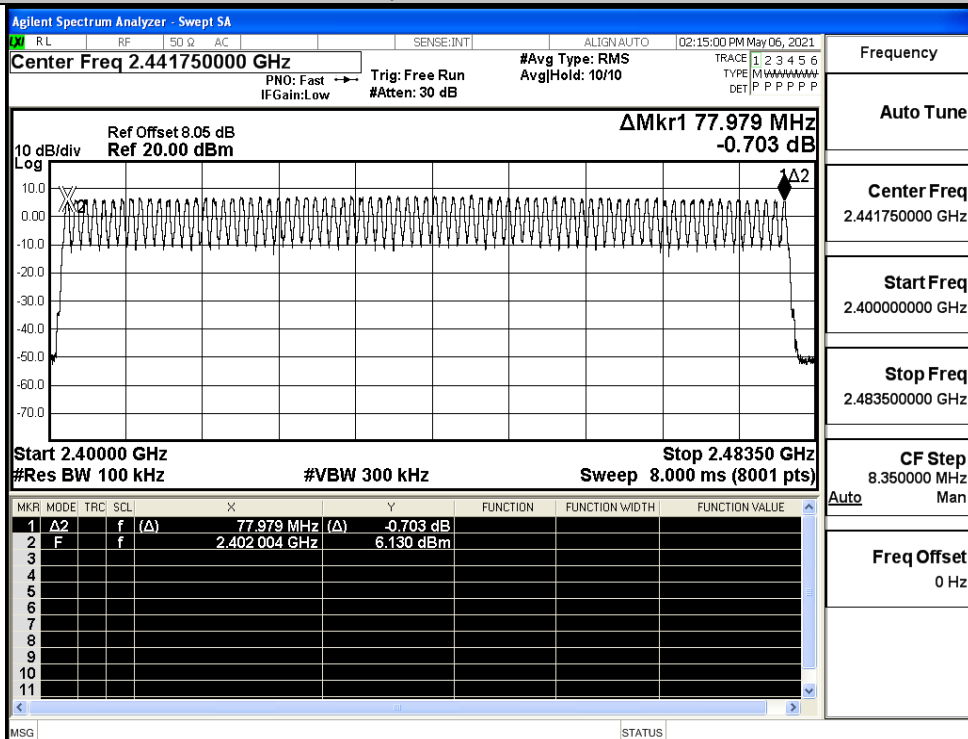


## A.4 Hopping Channel Number

| Mode          | Channel. | Number of Hopping Channel [N] | Limit [N] | Verdict |
|---------------|----------|-------------------------------|-----------|---------|
| GFSK          | Hop      | 79                            | >=15      | PASS    |
| $\pi/4$ DQPSK | Hop      | 79                            | >=15      | PASS    |
| 8DPSK         | Hop      | 79                            | >=15      | PASS    |

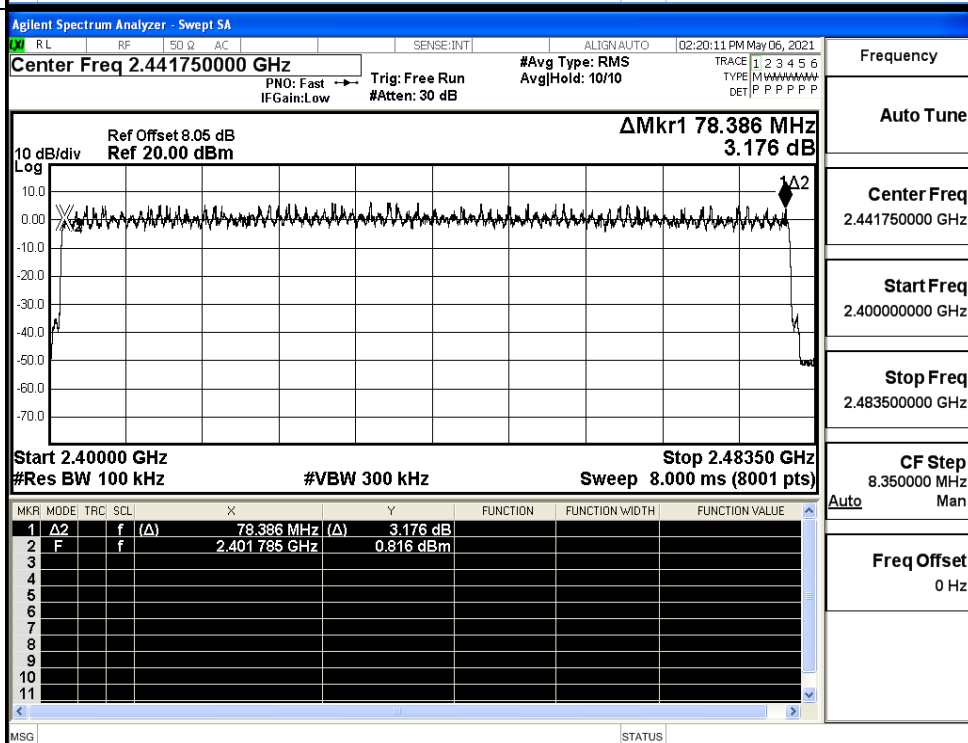
### Test Graphs

GFSK/Hop



Frequency

Auto Tune

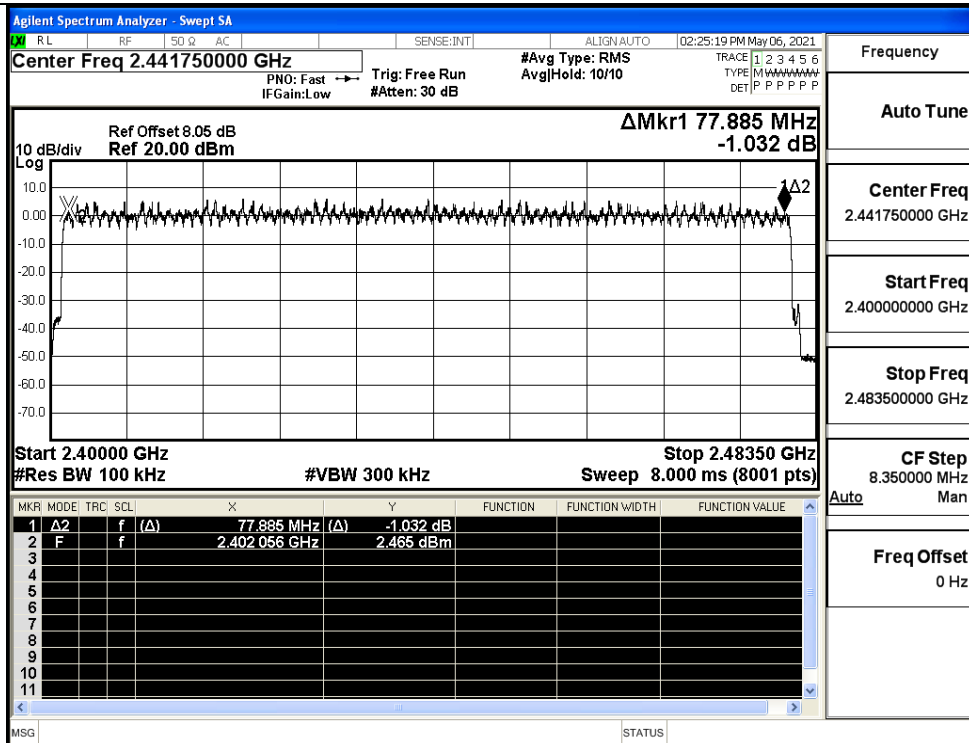
Center Freq  
2.441750000 GHzStart Freq  
2.400000000 GHzStop Freq  
2.483500000 GHzCF Step  
8.350000 MHz  
ManFreq Offset  
0 Hz $\pi/4$ DQPSK/Hop

Frequency

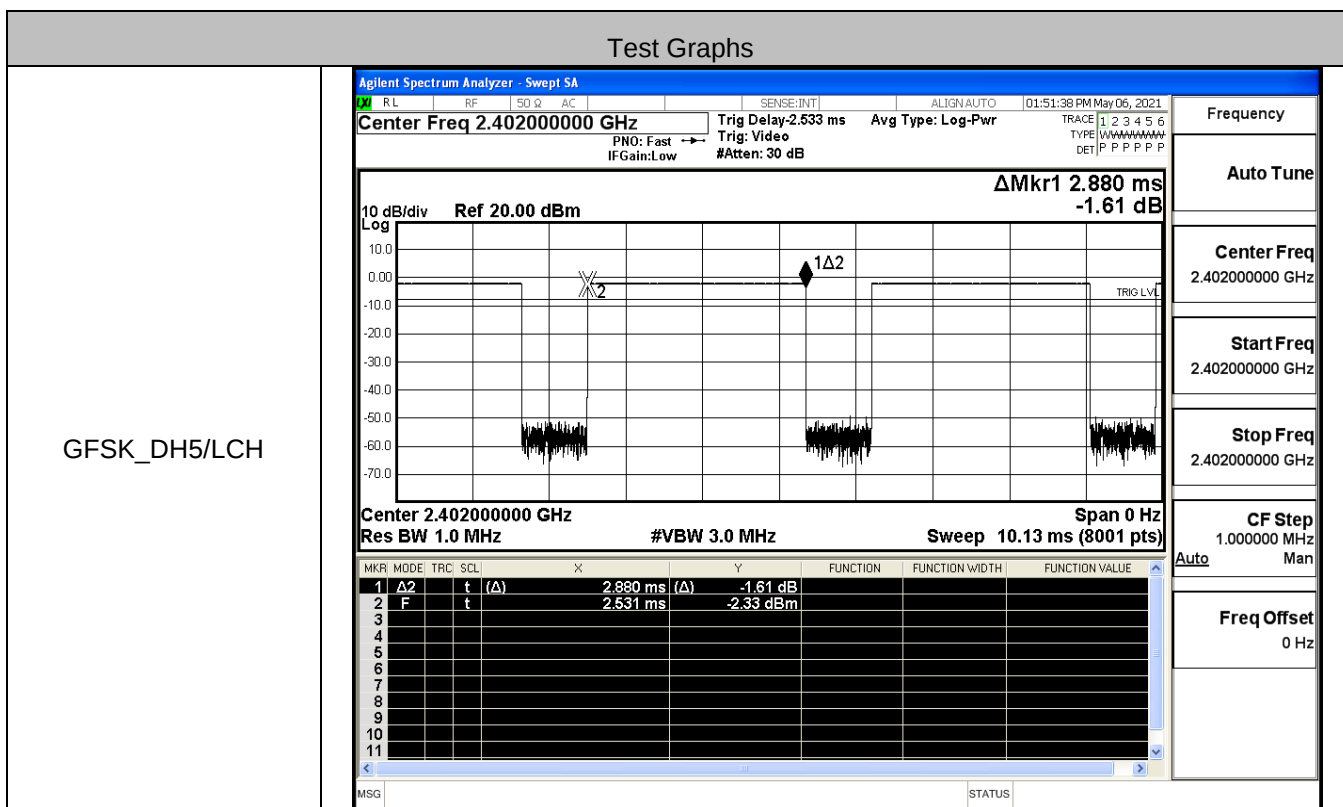
Auto Tune

Center Freq  
2.441750000 GHzStart Freq  
2.400000000 GHzStop Freq  
2.483500000 GHzCF Step  
8.350000 MHz  
ManFreq Offset  
0 Hz

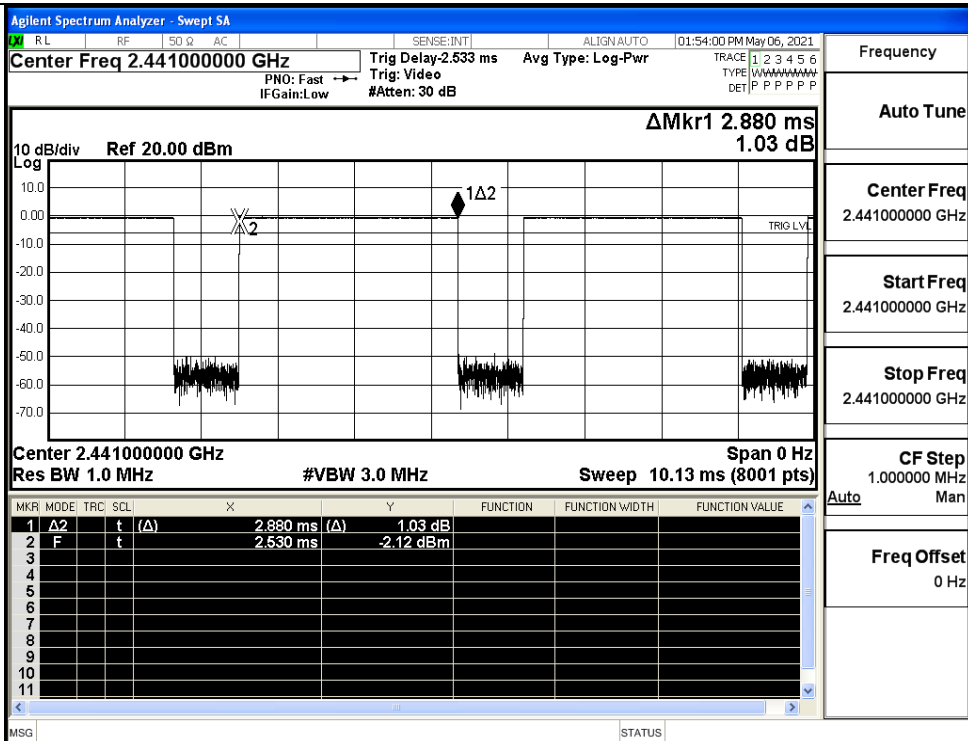
8DPSK/Hop



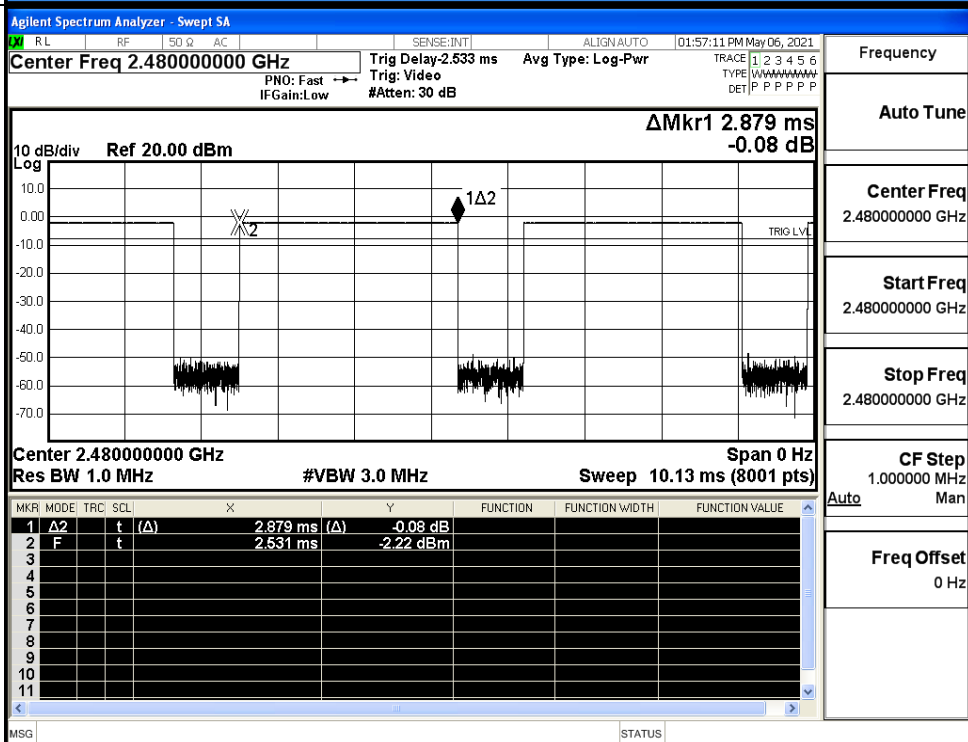
| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|---------------|-----------|---------|
| GFSK          | DH5    | LCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
|               | DH5    | MCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
|               | DH5    | HCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
| $\pi/4$ DQPSK | 2DH5   | LCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
|               | 2DH5   | MCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
|               | 2DH5   | HCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
| 8DPSK         | 3DH5   | LCH     | 2.88                       | 106.7                 | 0.308         | 0.4       | PASS    |
|               | 3DH5   | MCH     | 2.88                       | 106.7                 | 0.308         | 0.4       | PASS    |
|               | 3DH5   | HCH     | 2.88                       | 106.7                 | 0.308         | 0.4       | PASS    |



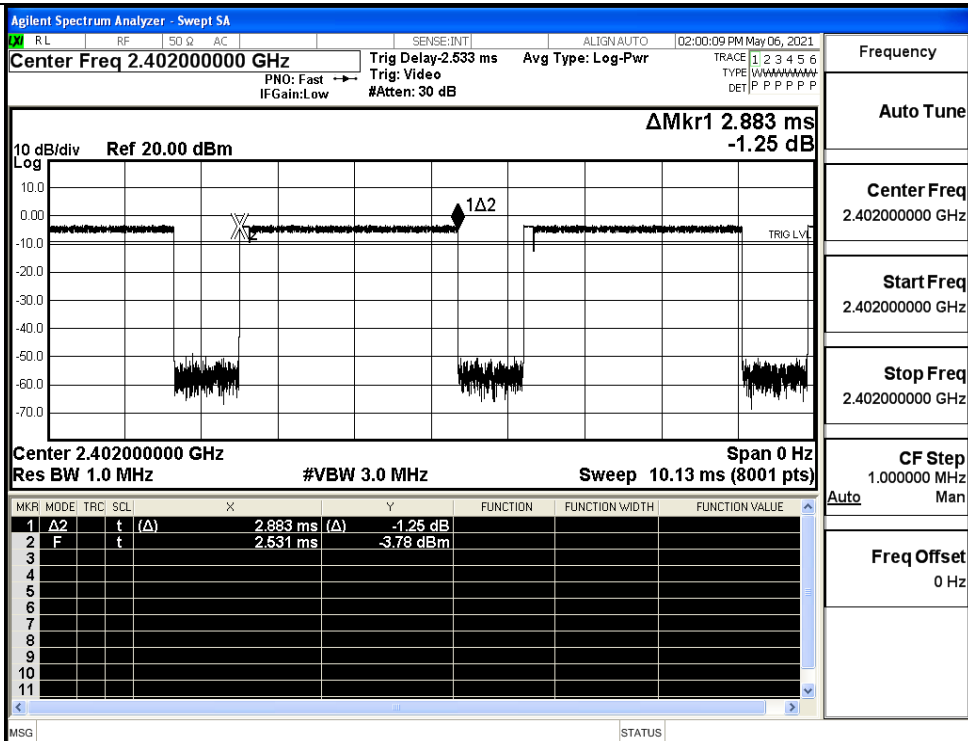
GFSK\_DH5/MCH



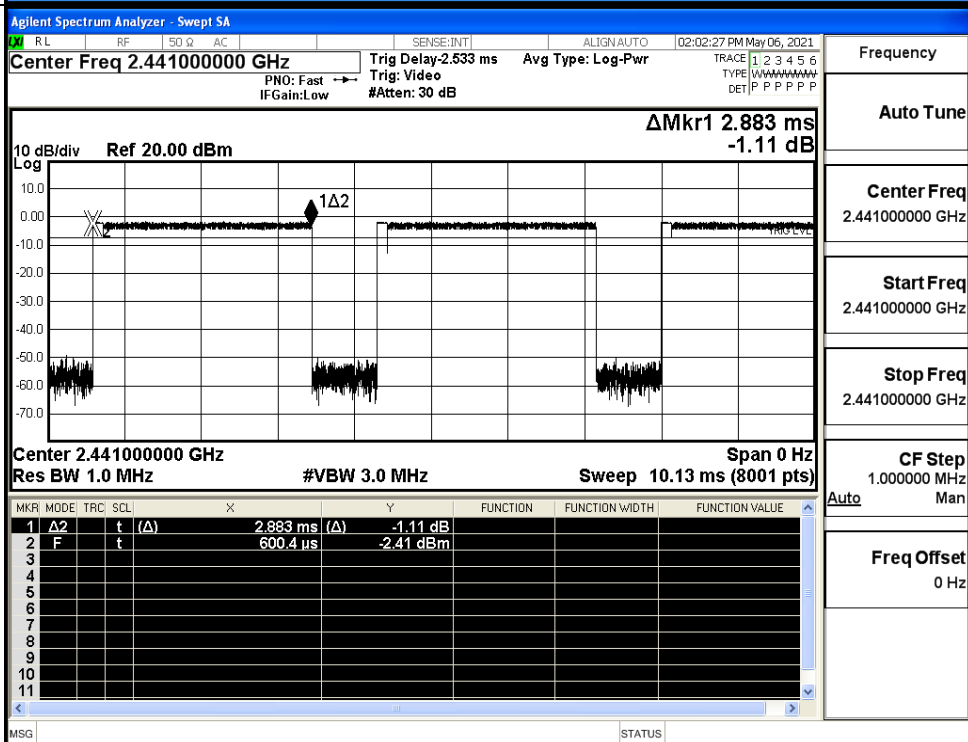
GFSK\_DH5/HCH



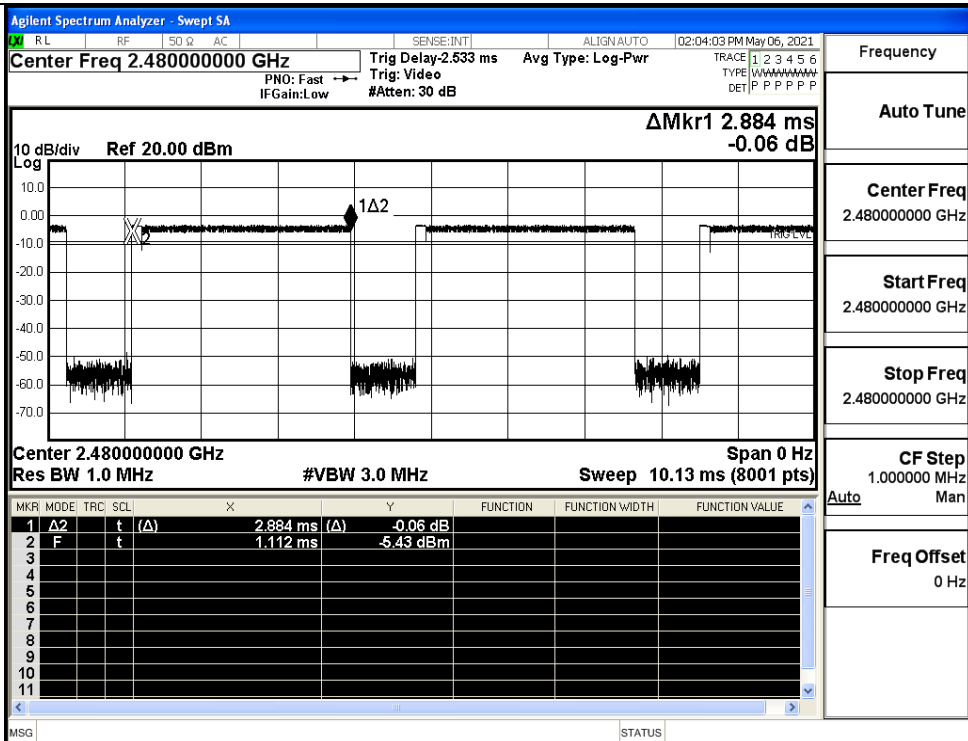
$\pi/4$ DQPSK  
\_2DH5/LCH



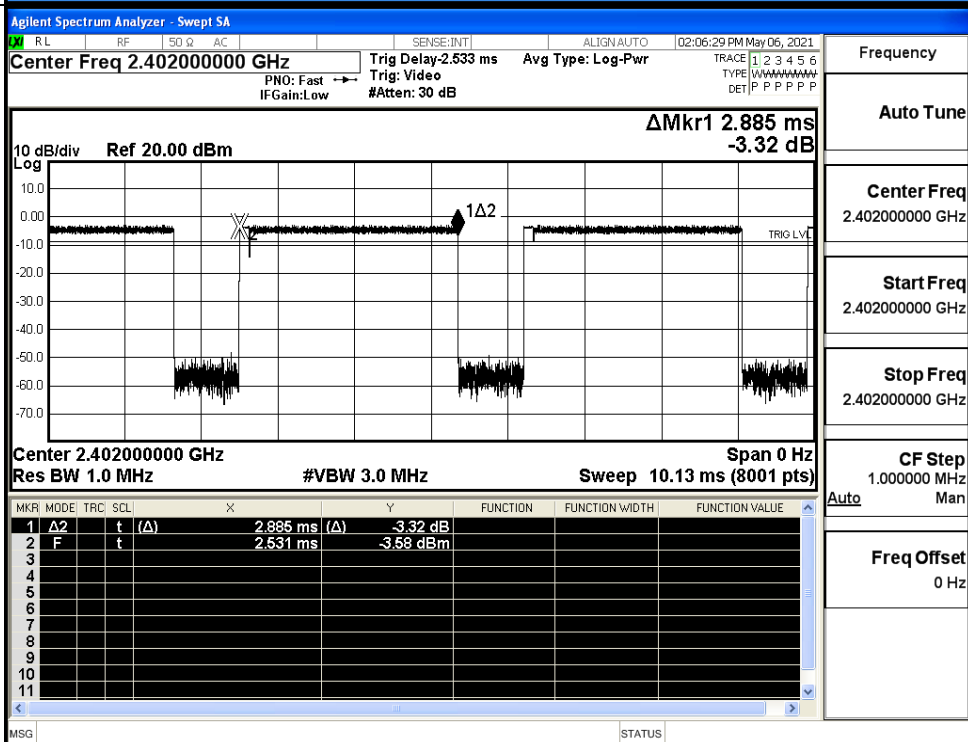
$\pi/4$ DQPSK  
\_2DH5/MCH



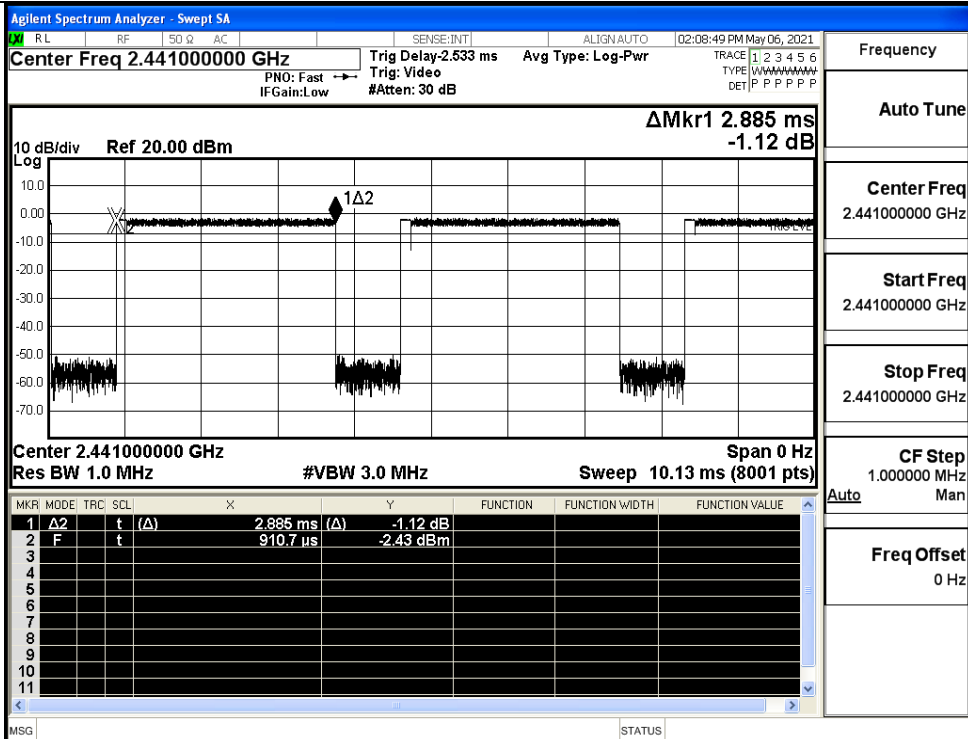
$\pi/4$ DQPSK  
\_2DH5/HCH



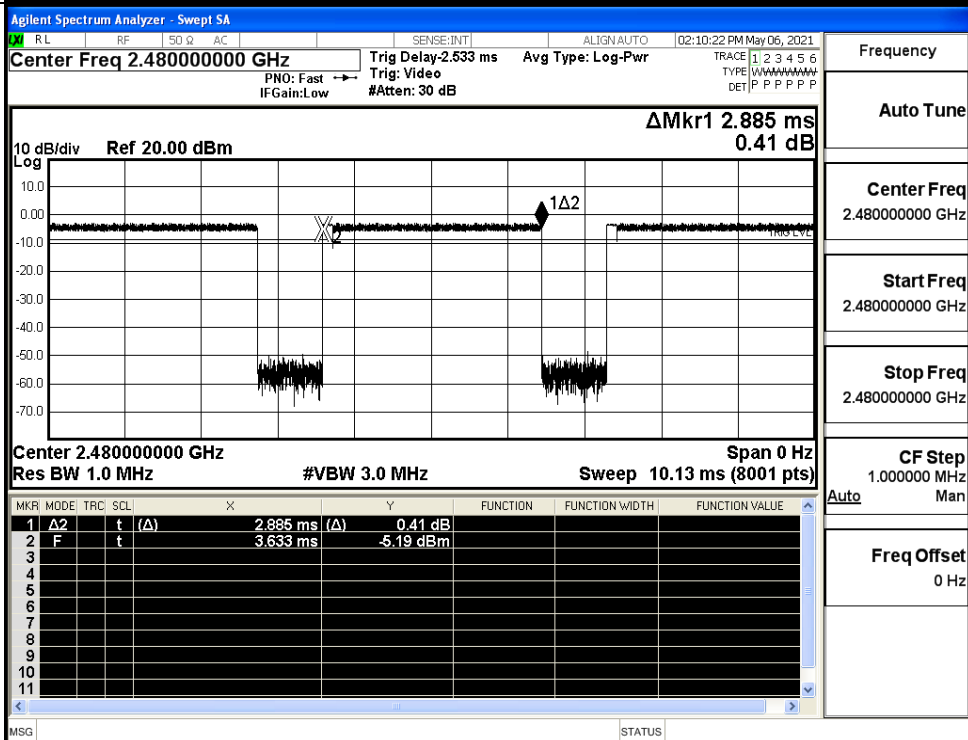
8DPSK \_3DH5/LCH



8DPSK\_3DH5/MCH



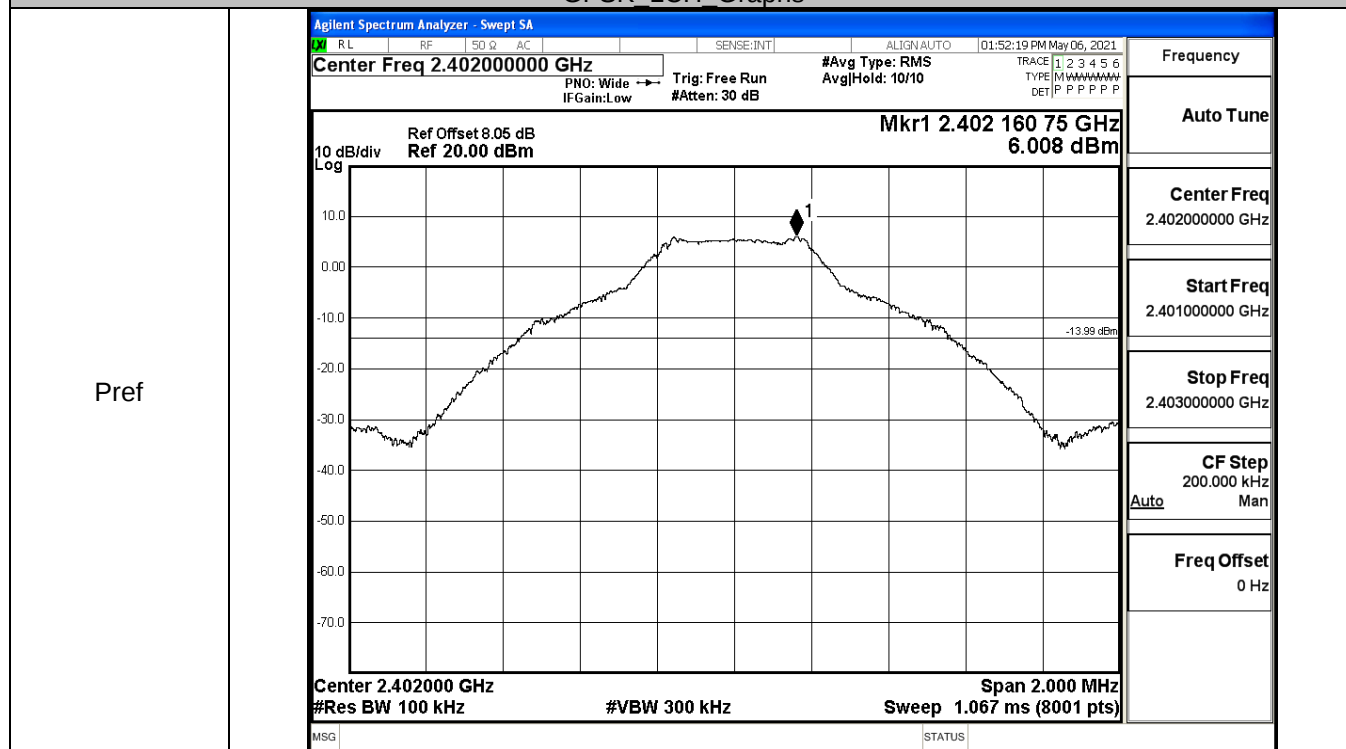
8DPSK\_3DH5/HCH



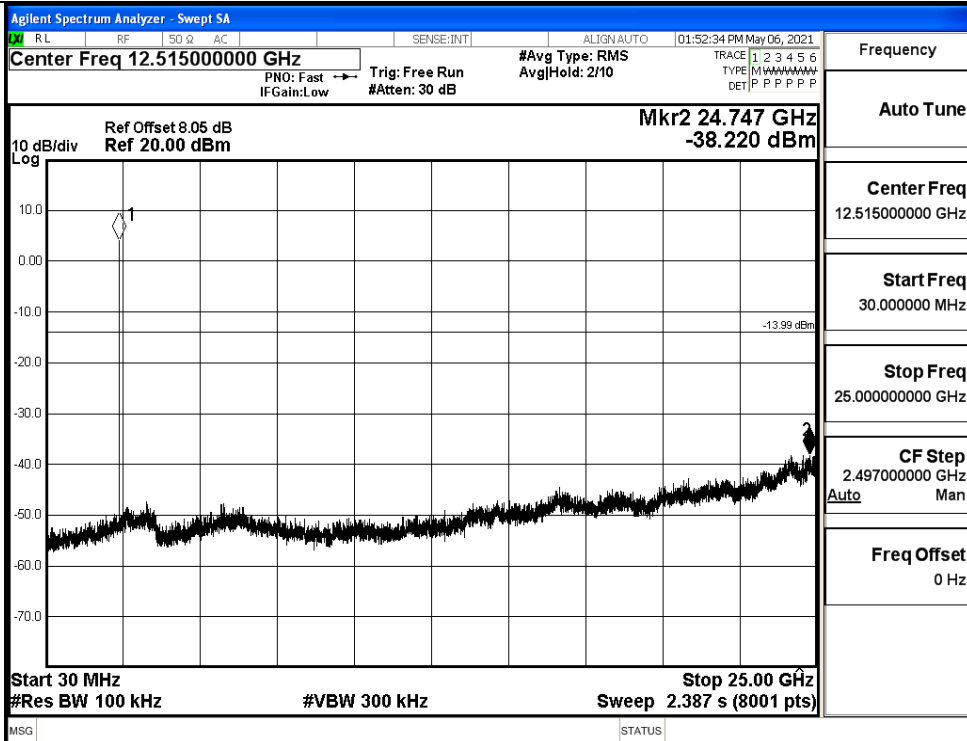
## A.6 RF Conducted Spurious Emissions

| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | 6.008      | -38.220          | -13.992     | PASS    |
|               | MCH     | 7.305      | -38.145          | -12.695     | PASS    |
|               | HCH     | 5.897      | -37.795          | -14.103     | PASS    |
| $\pi/4$ DQPSK | LCH     | 4.39       | -37.632          | -15.610     | PASS    |
|               | MCH     | 5.878      | -37.182          | -14.122     | PASS    |
|               | HCH     | 4.203      | -37.199          | -15.797     | PASS    |
| 8DPSK         | LCH     | 4.505      | -38.362          | -15.495     | PASS    |
|               | MCH     | 5.9        | -37.519          | -14.100     | PASS    |
|               | HCH     | 4.531      | -38.200          | -15.469     | PASS    |

GFSK LCH Graphs

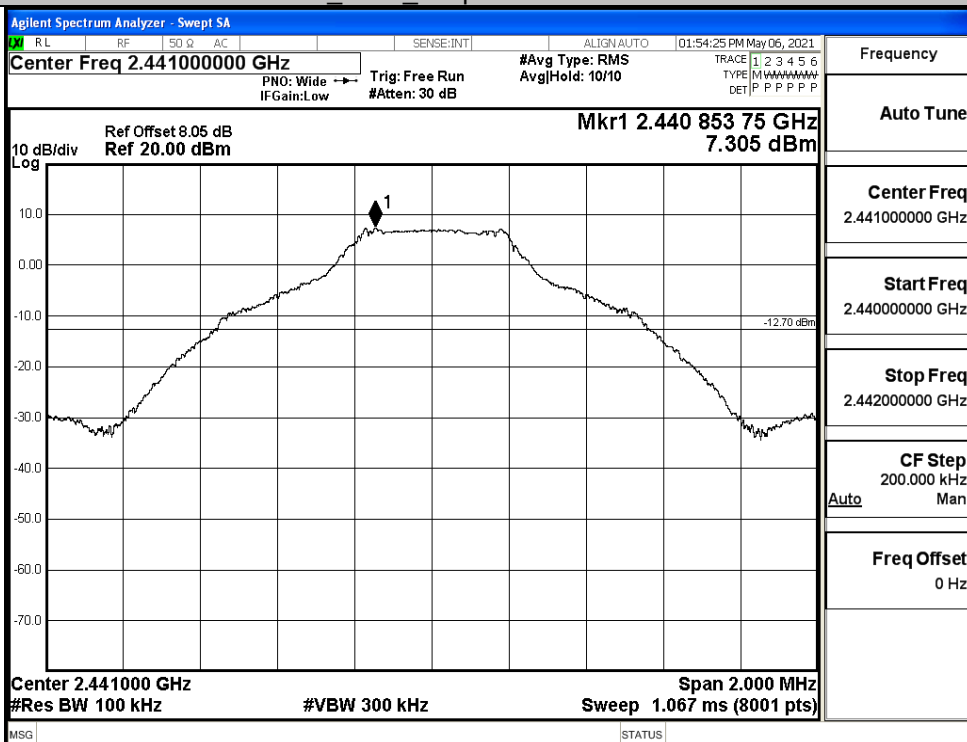


Puw

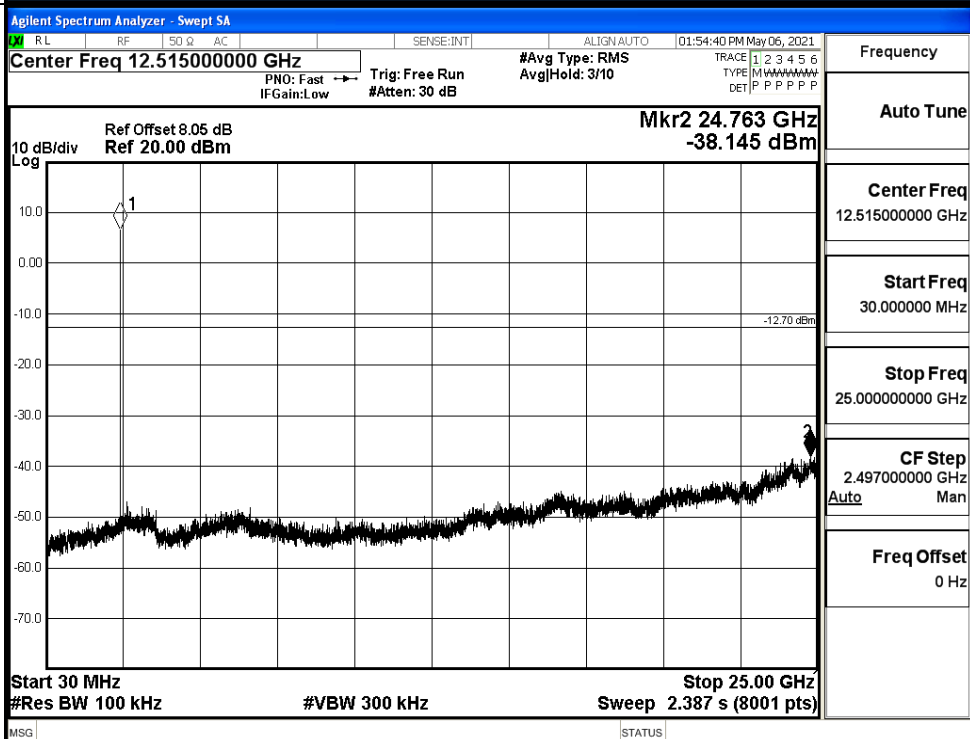


## GFSK\_MCH\_Graphs

Pref

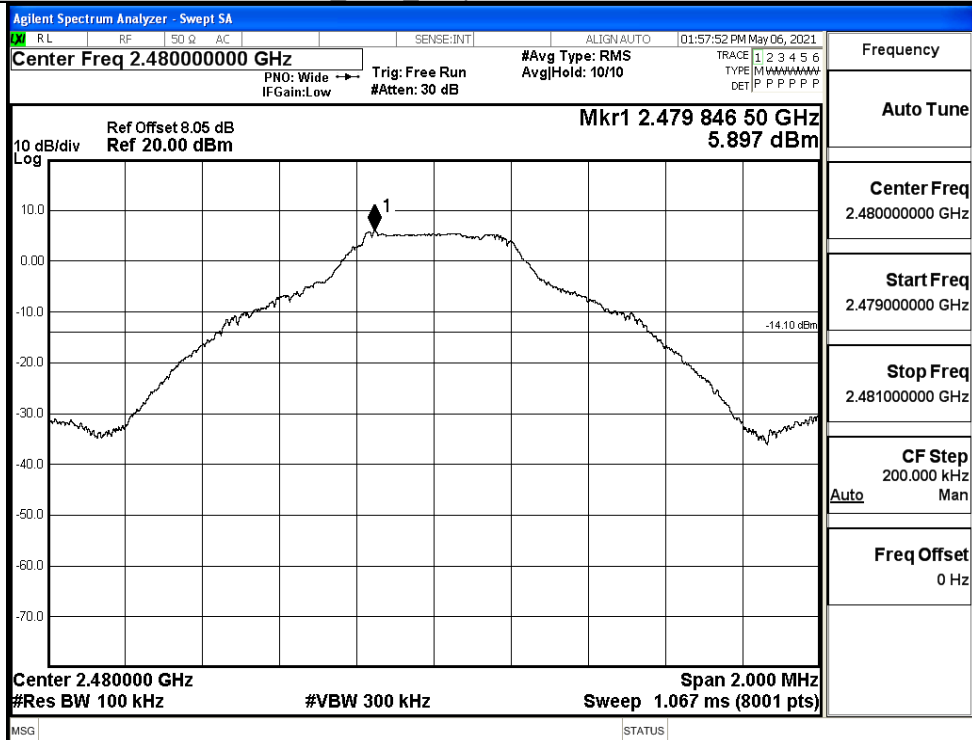


Puw

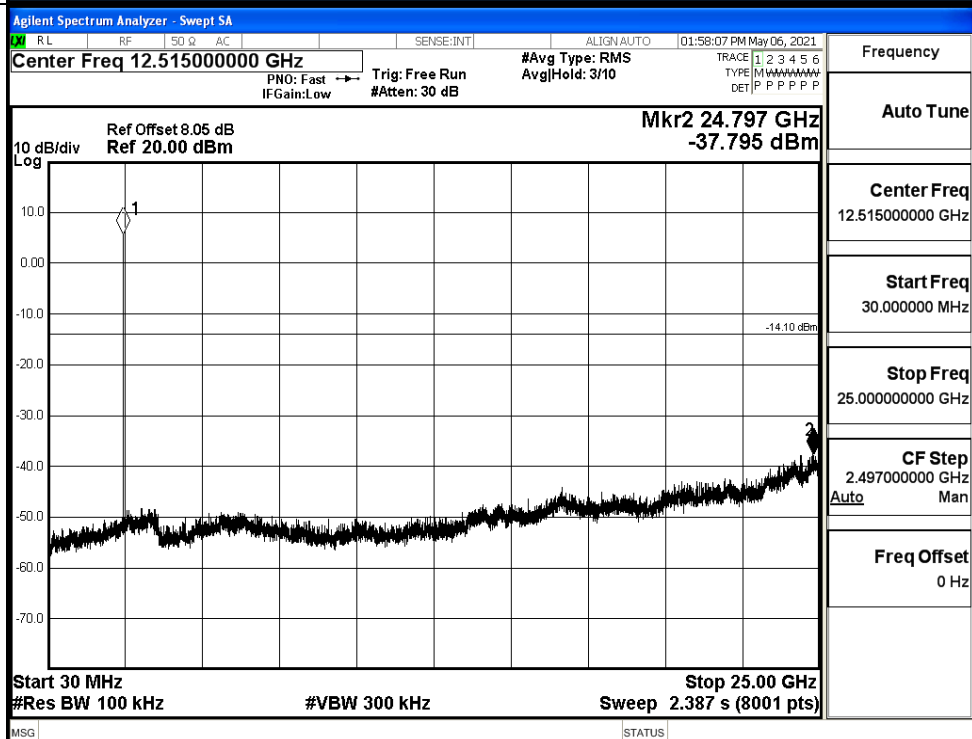


## GFSK HCH Graphs

Pref

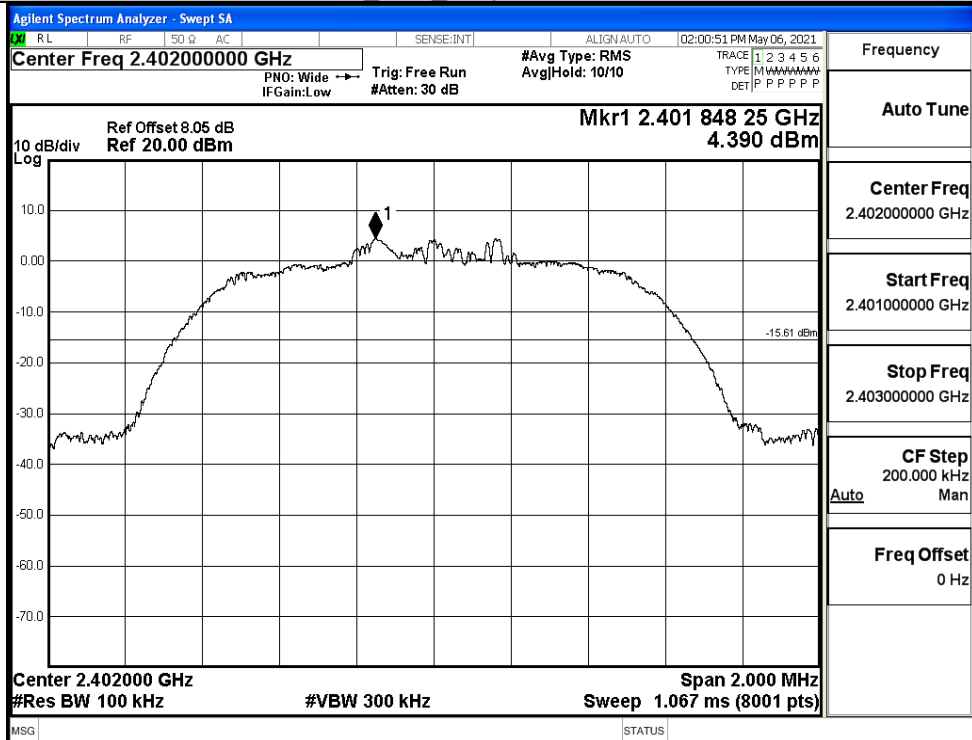


Puw

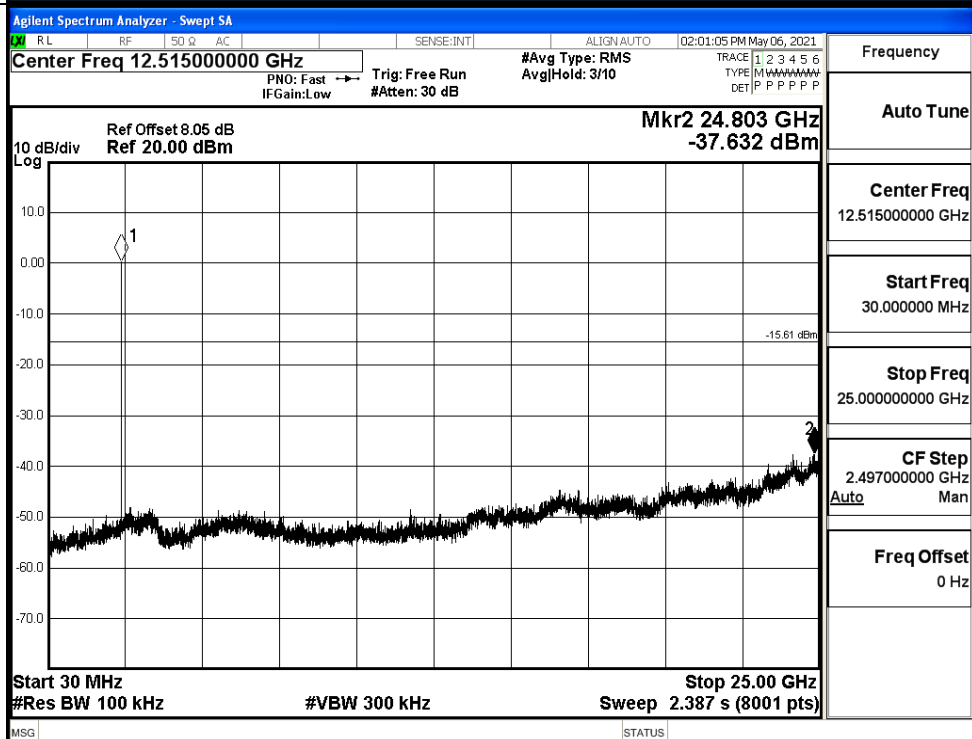


$\pi/4$ DQPSK\_LCH\_Graphs

Pref

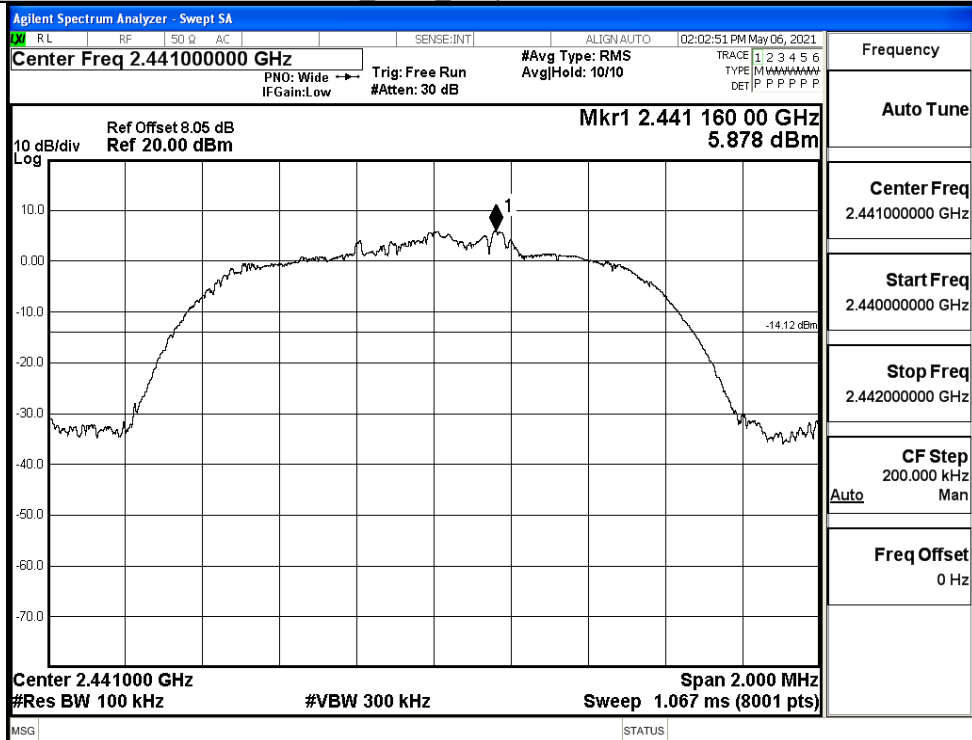


Puw



$\pi$ /4DQPSK\_MCH\_Graphs

Pref

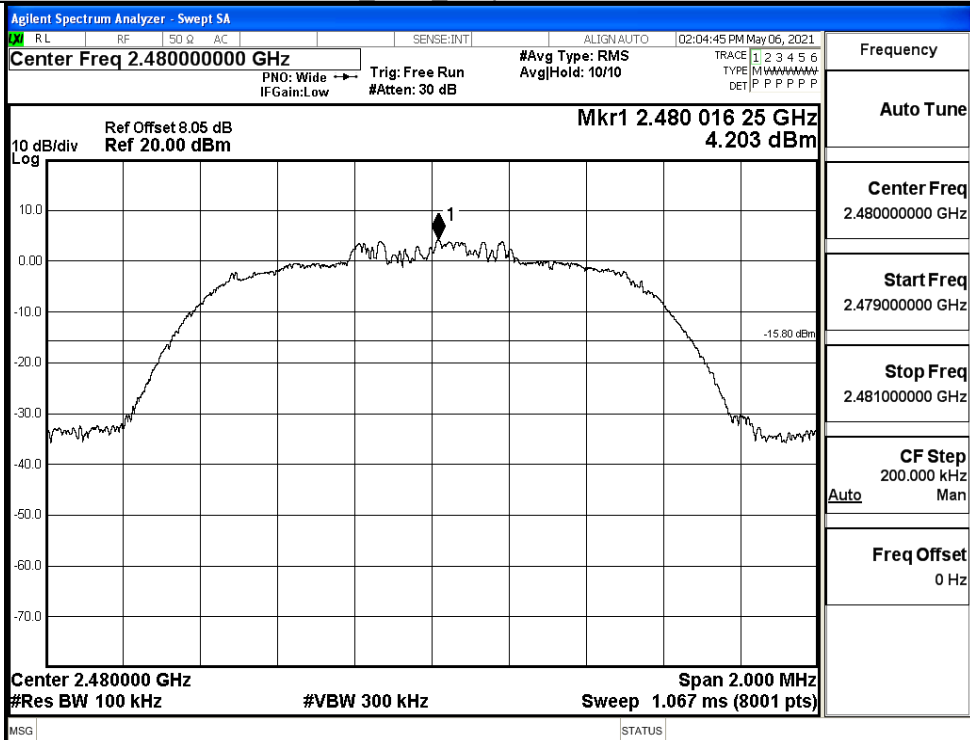


Puw

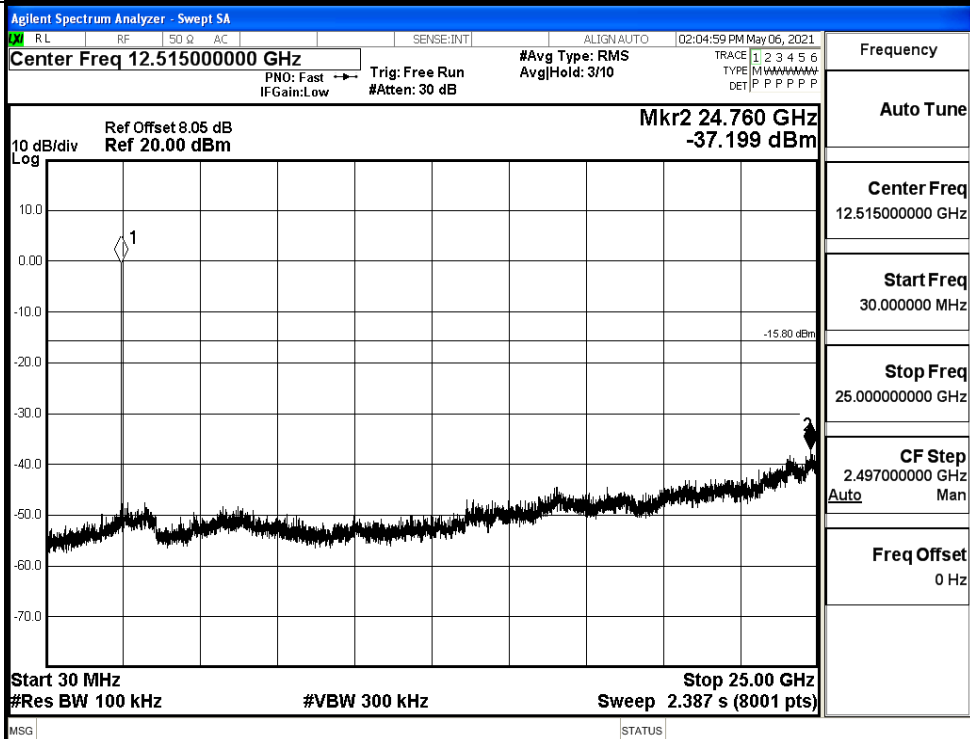


$\pi$ /4DQPSK\_HCH\_Graphs

Pref

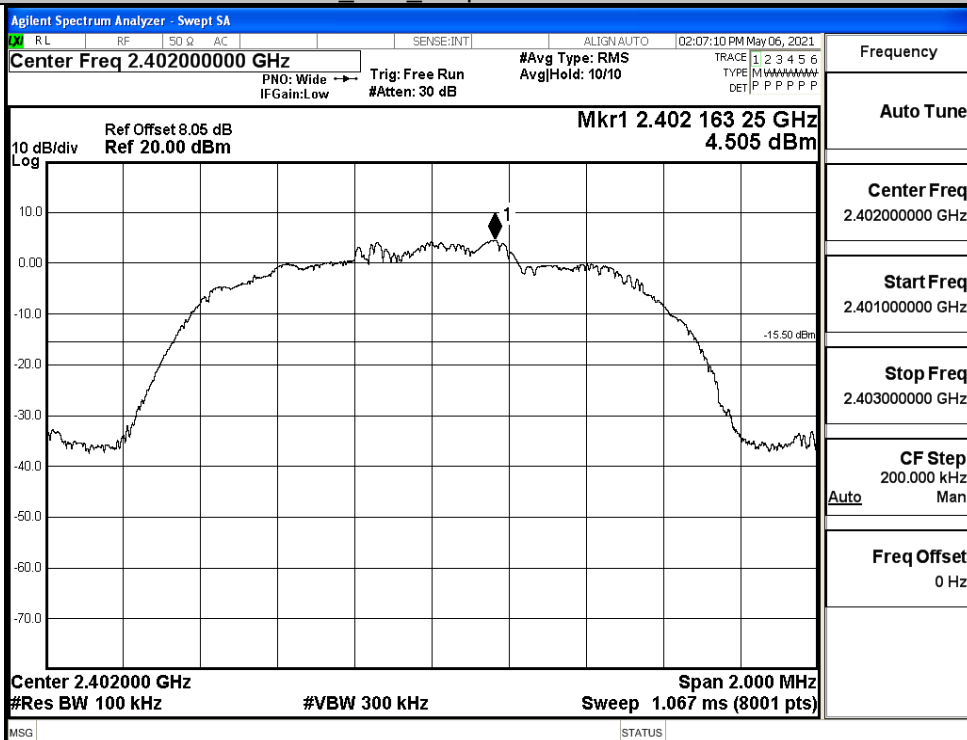


Puw

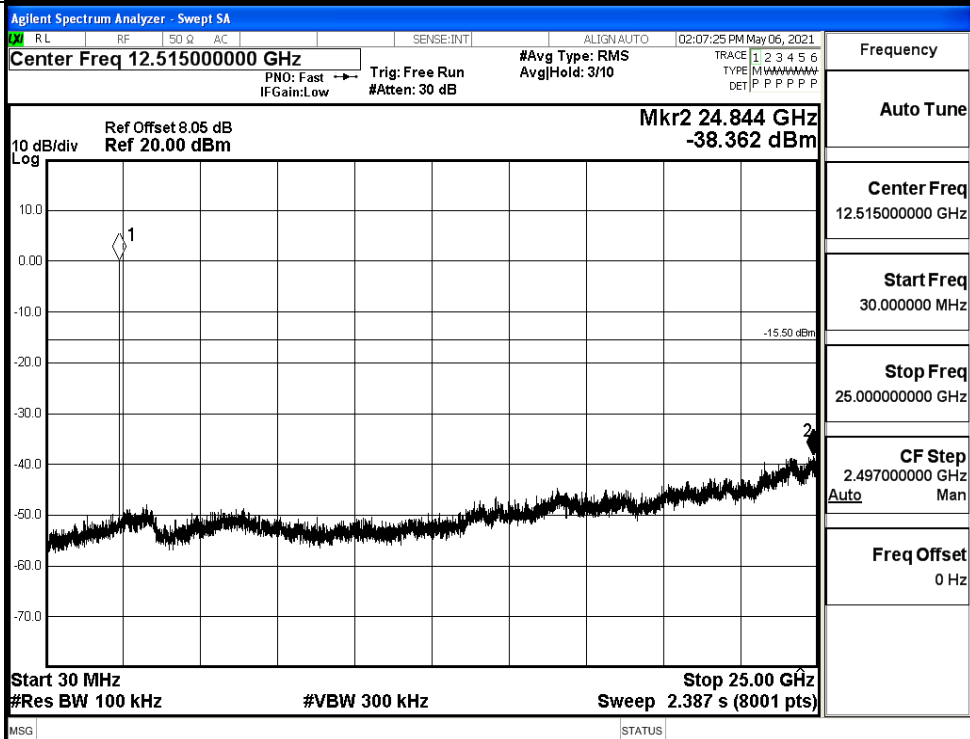


## 8DPSK\_LCH\_Graphs

Pref

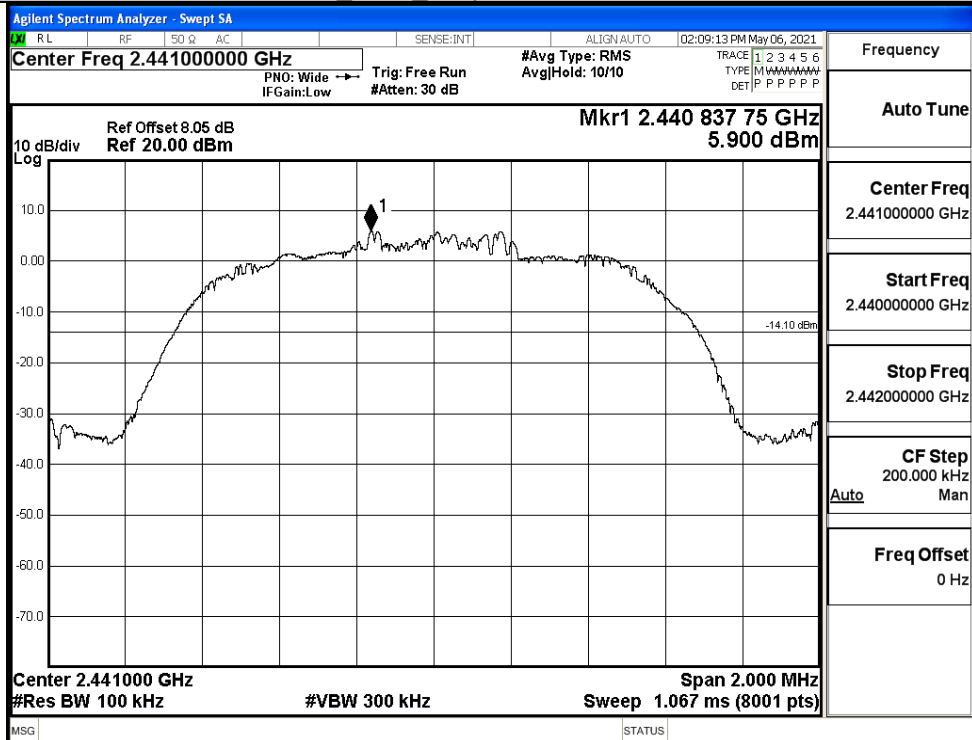


Puw



## 8DPSK\_MCH\_Graphs

Pref

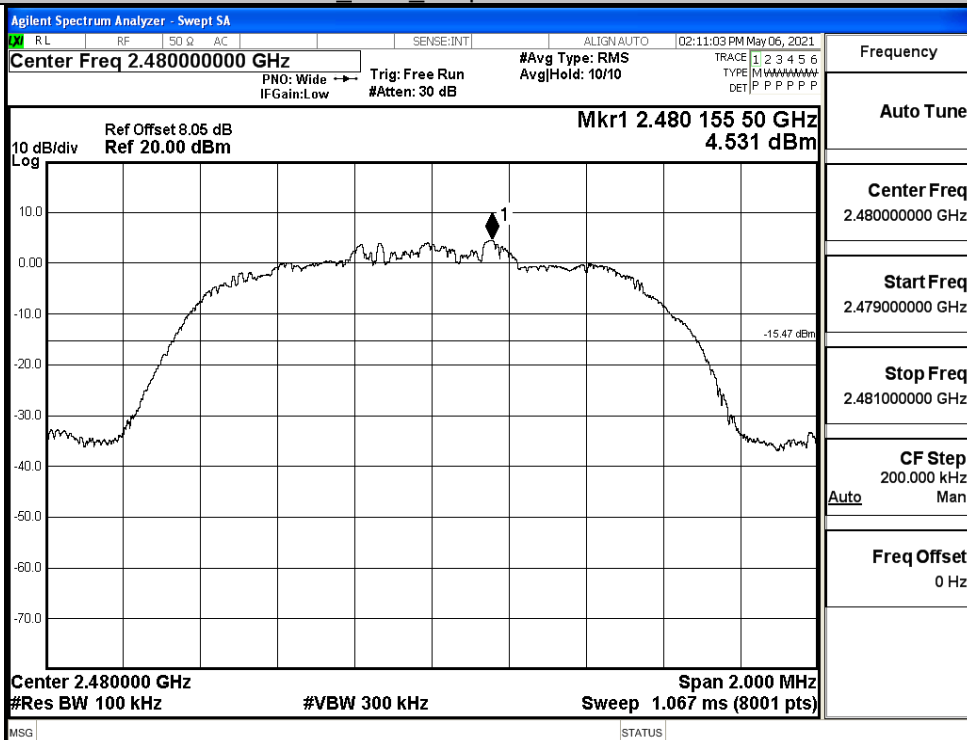


Puw

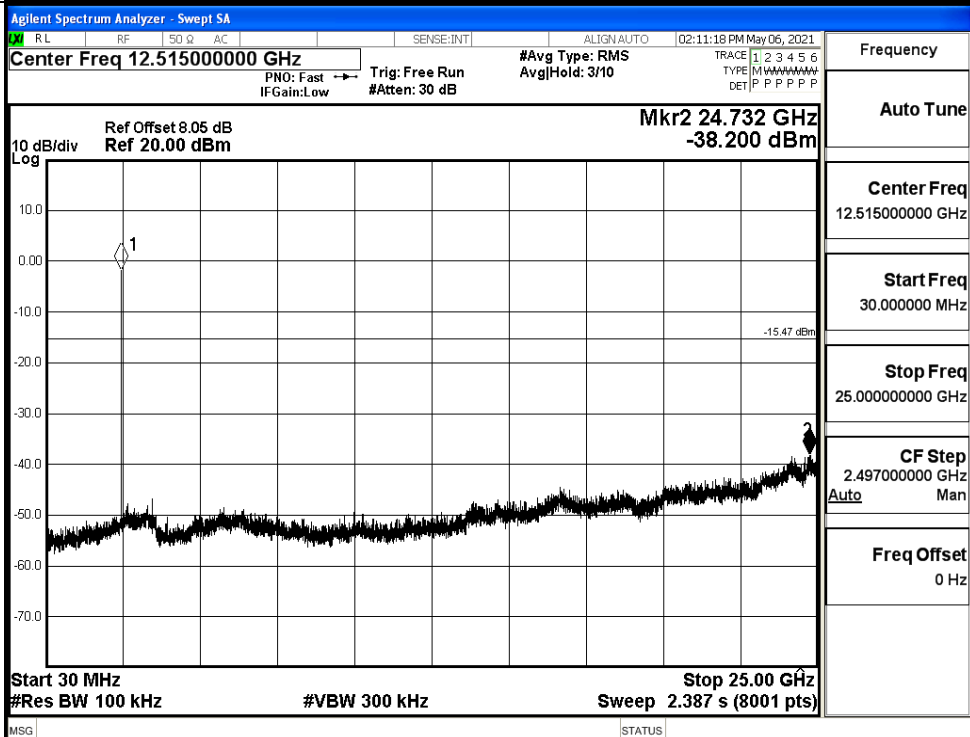


## 8DPSK\_HCH\_Graphs

Pref



Puw

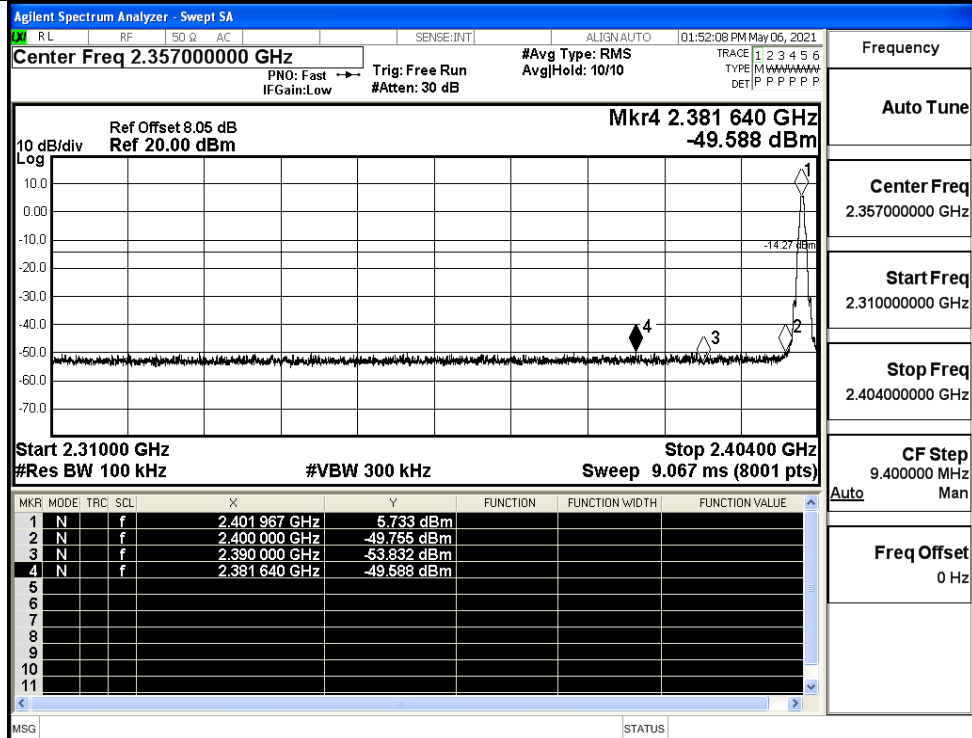


## A.7 Band-edge for RF Conducted Emissions

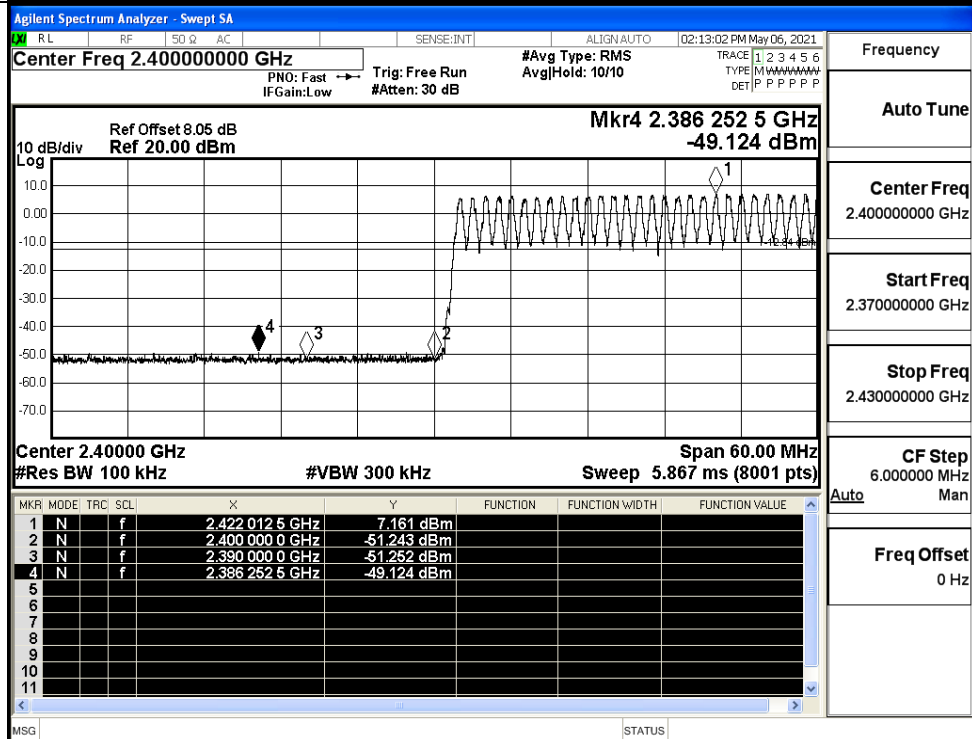
| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | 5.733               | Off               | -49.588                  | -14.27      | PASS    |
|               |         |                         | 7.161               | On                | -49.124                  | -12.84      | PASS    |
|               | HCH     | 2480                    | 5.869               | Off               | -48.087                  | -14.13      | PASS    |
|               |         |                         | 6.997               | On                | -49.031                  | -13         | PASS    |
| $\pi/4$ DQPSK | LCH     | 2402                    | 4.063               | Off               | -49.057                  | -15.94      | PASS    |
|               |         |                         | 5.938               | On                | -48.967                  | -14.06      | PASS    |
|               | HCH     | 2480                    | 4.551               | Off               | -48.785                  | -15.45      | PASS    |
|               |         |                         | 5.408               | On                | -47.715                  | -14.59      | PASS    |
| 8DPSK         | LCH     | 2402                    | 4.472               | Off               | -49.681                  | -15.53      | PASS    |
|               |         |                         | 5.692               | On                | -48.862                  | -14.31      | PASS    |
|               | HCH     | 2480                    | 4.588               | Off               | -48.794                  | -15.41      | PASS    |
|               |         |                         | 5.189               | On                | -48.162                  | -14.81      | PASS    |

## Test Graphs

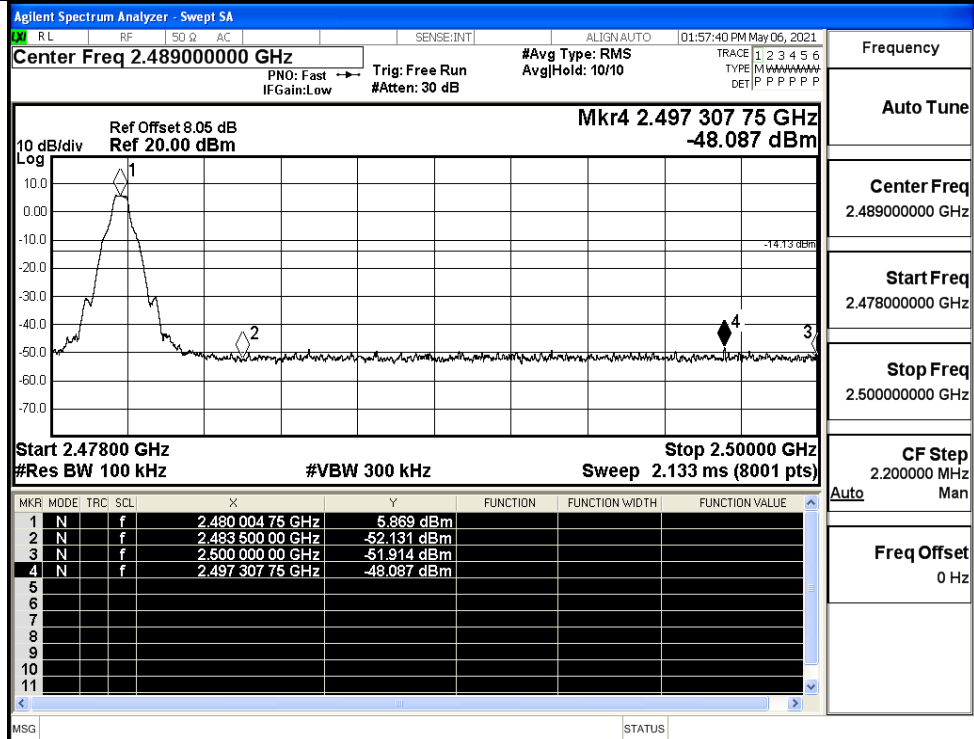
GFSK/LCH/No Hop



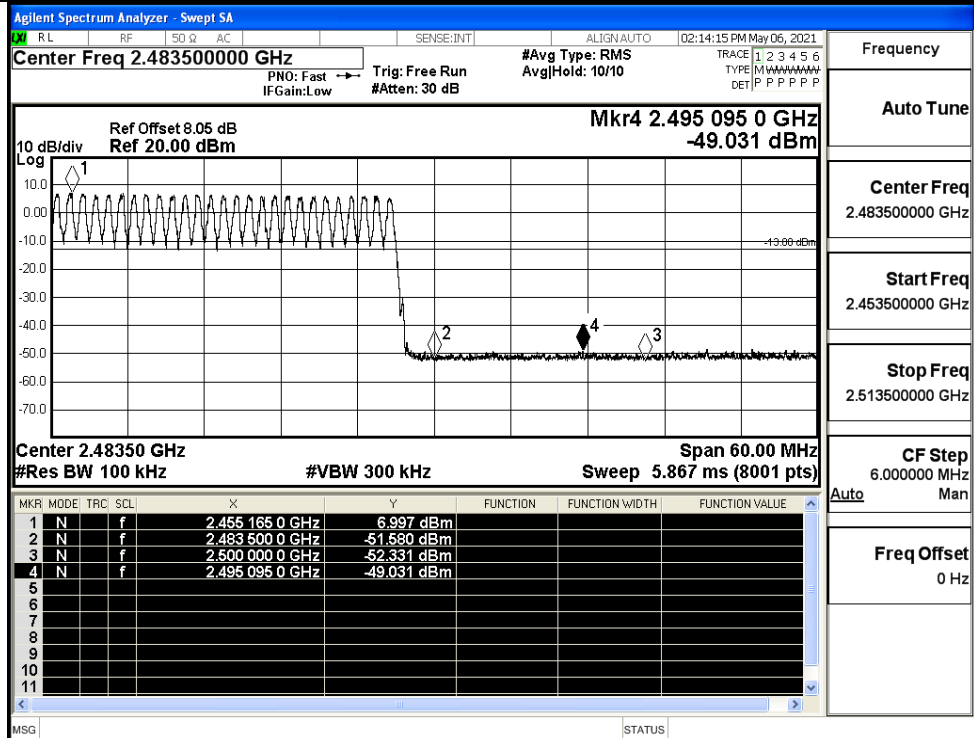
GFSK/LCH/Hop



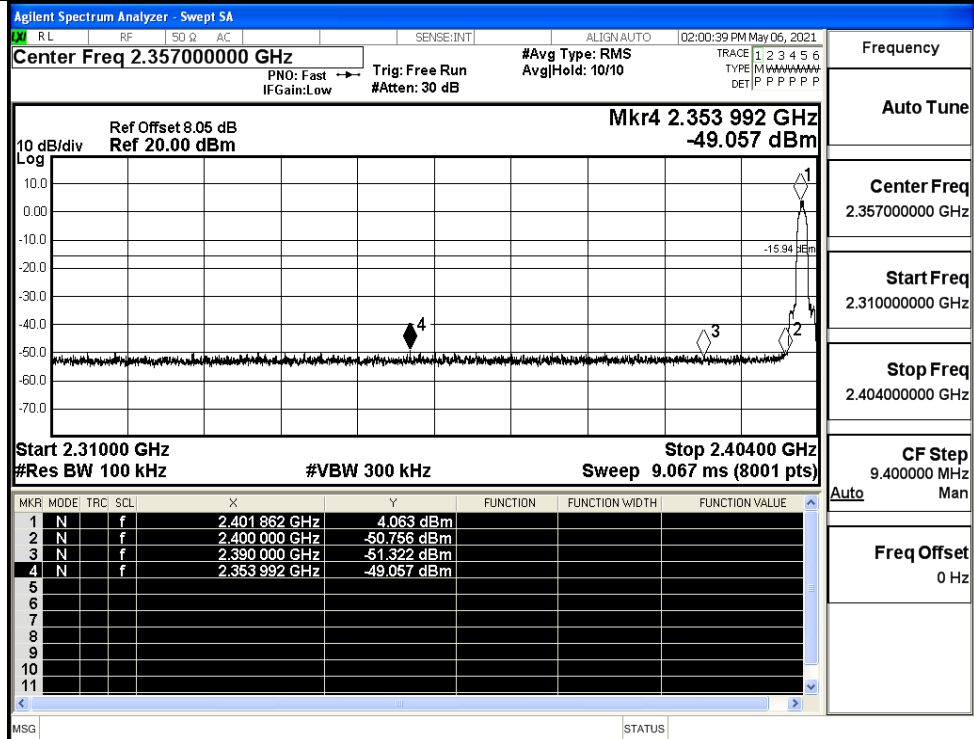
GFSK/HCH/No Hop



GFSK/HCH/Hop



$\pi/4$ DQPSK/LCH/No  
Hop



Frequency

Auto Tune

Center Freq  
2.357000000 GHz

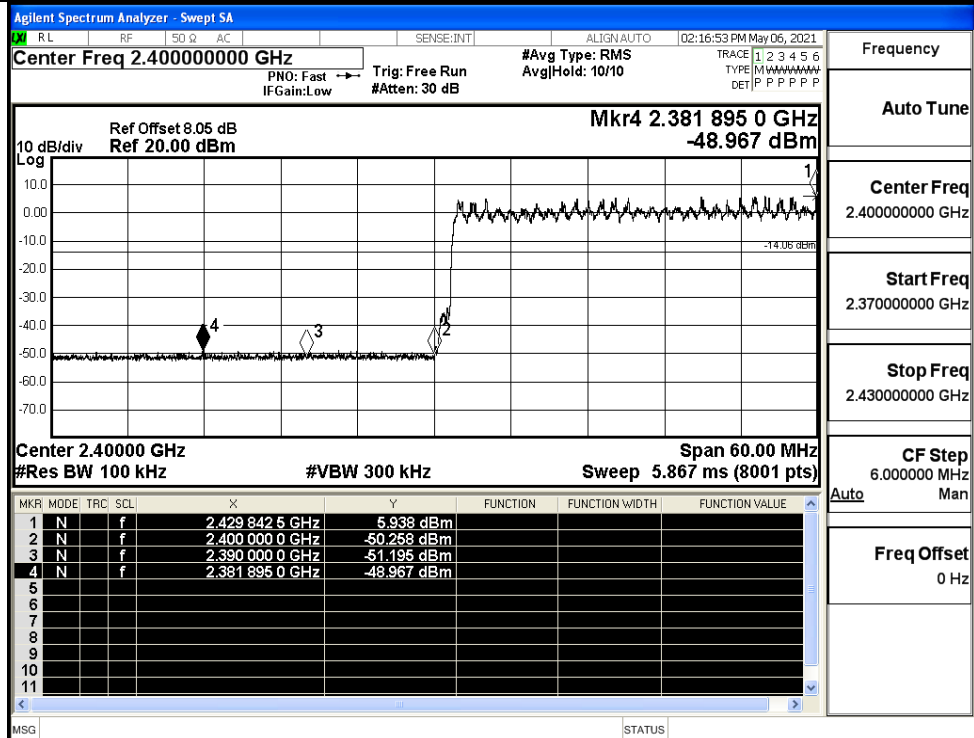
Start Freq  
2.310000000 GHz

Stop Freq  
2.404000000 GHz

CF Step  
9.400000 MHz  
Auto Man

Freq Offset  
0 Hz

$\pi/4$ DQPSK/LCH/Hop



Frequency

Auto Tune

Center Freq  
2.400000000 GHz

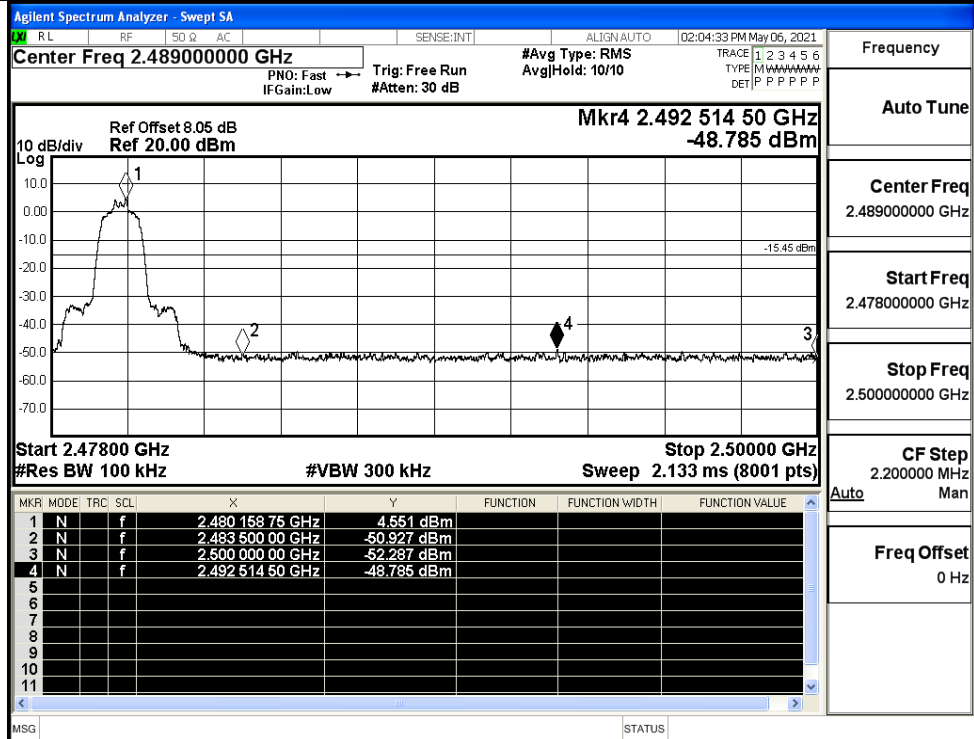
Start Freq  
2.370000000 GHz

Stop Freq  
2.430000000 GHz

CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

$\pi/4$ DQPSK/HCH/No  
Hop



Frequency

Auto Tune

Center Freq  
2.489000000 GHz

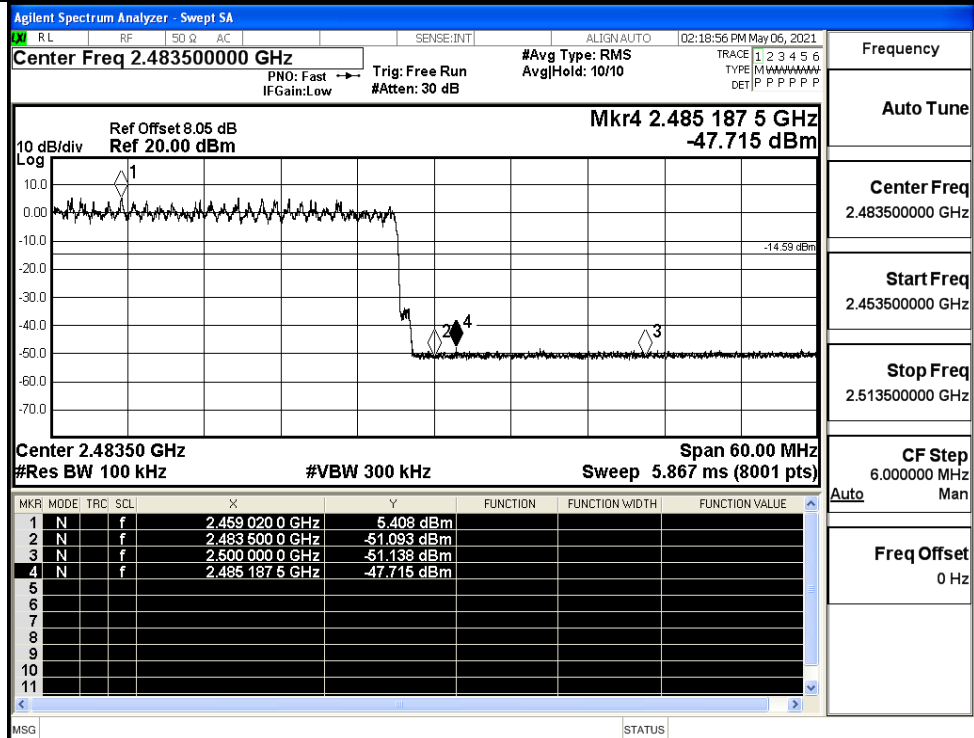
Start Freq  
2.478000000 GHz

Stop Freq  
2.500000000 GHz

CF Step  
2.200000 MHz  
Auto Man

Freq Offset  
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq  
2.483500000 GHz

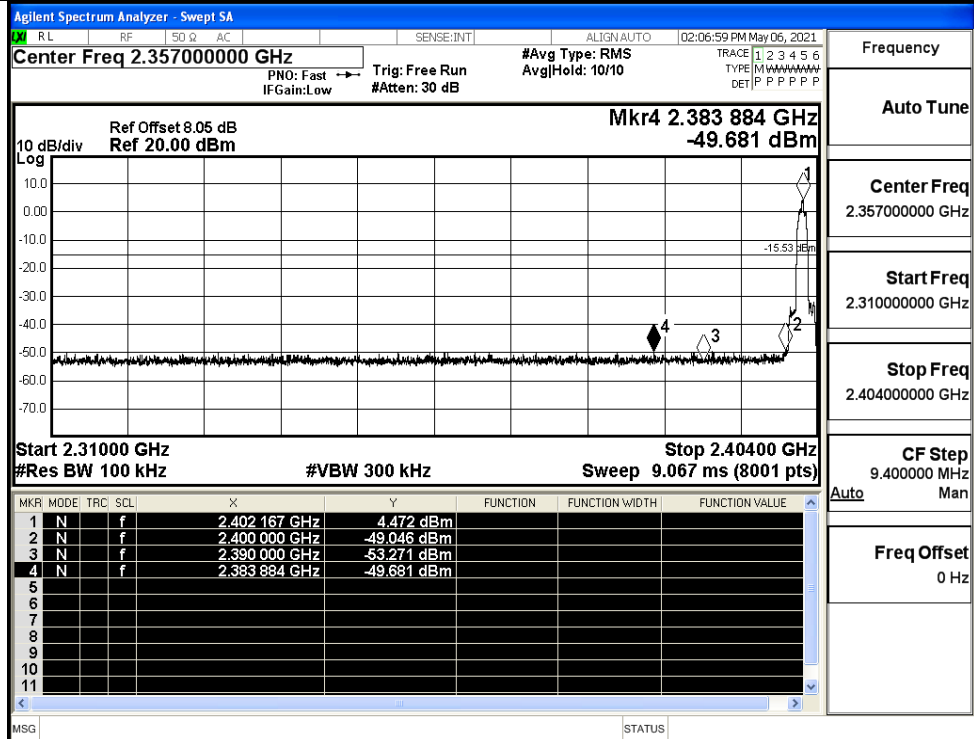
Start Freq  
2.453500000 GHz

Stop Freq  
2.513500000 GHz

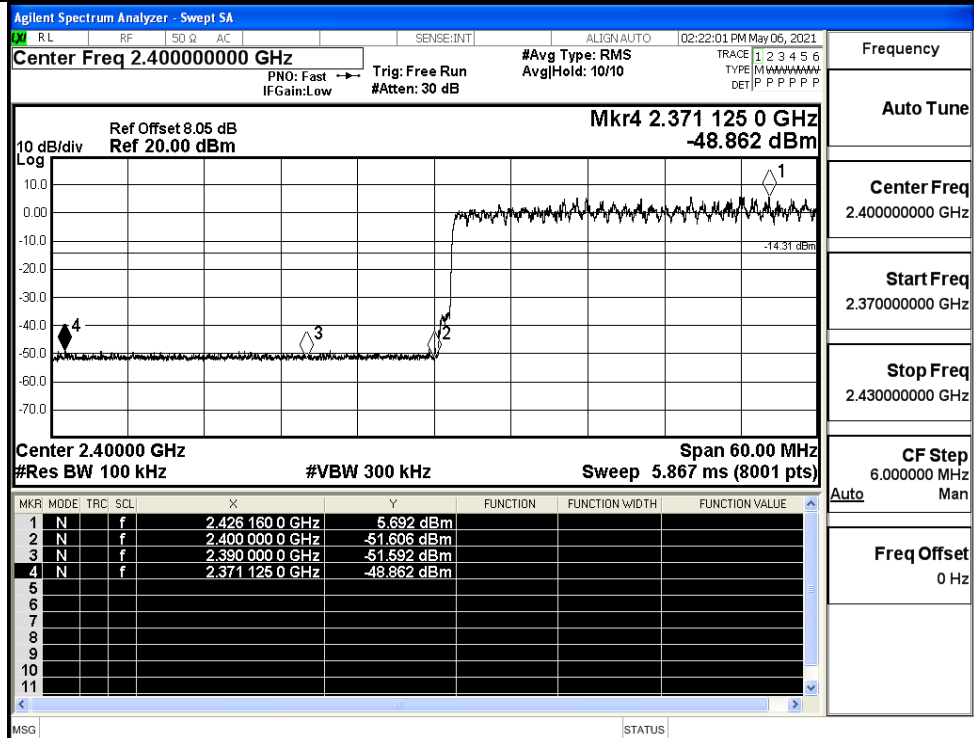
CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

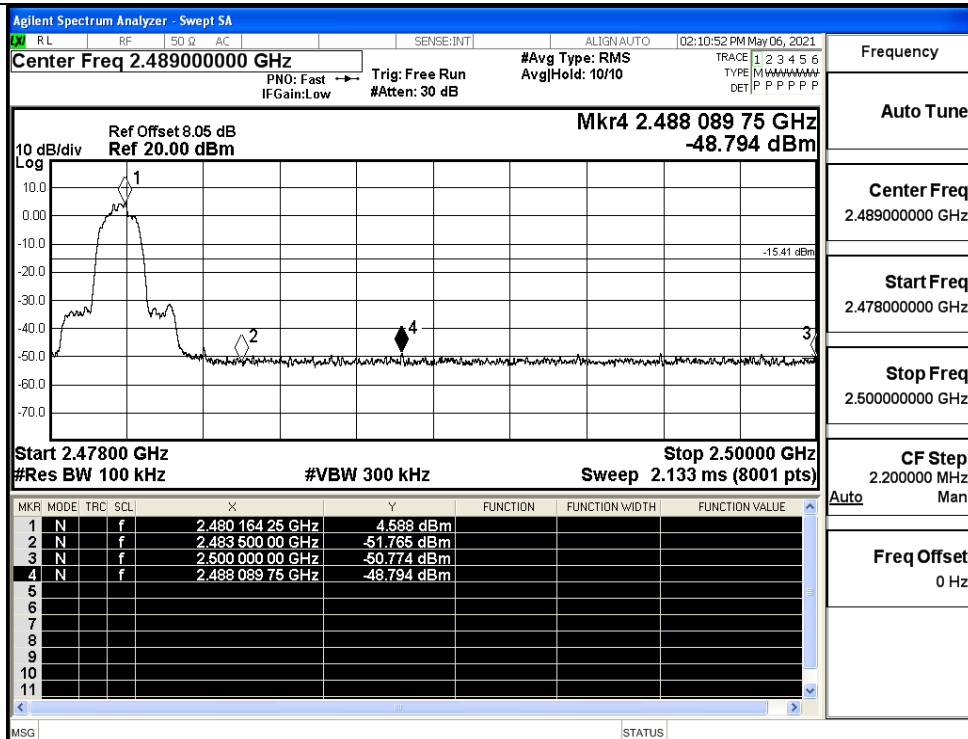
8DPSK/LCH/No Hop



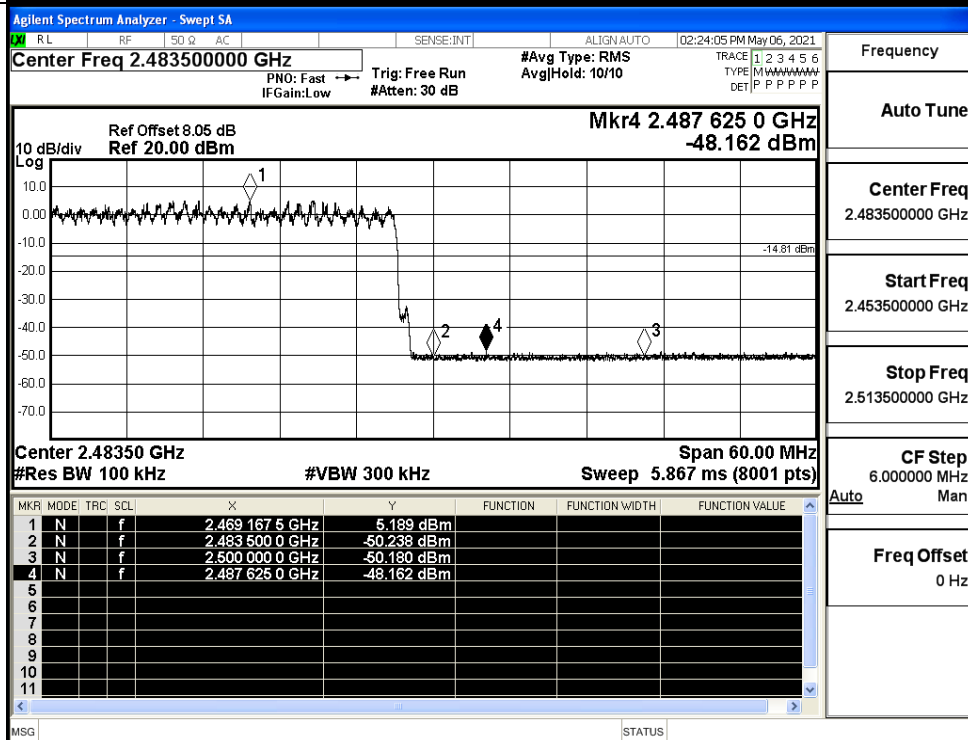
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



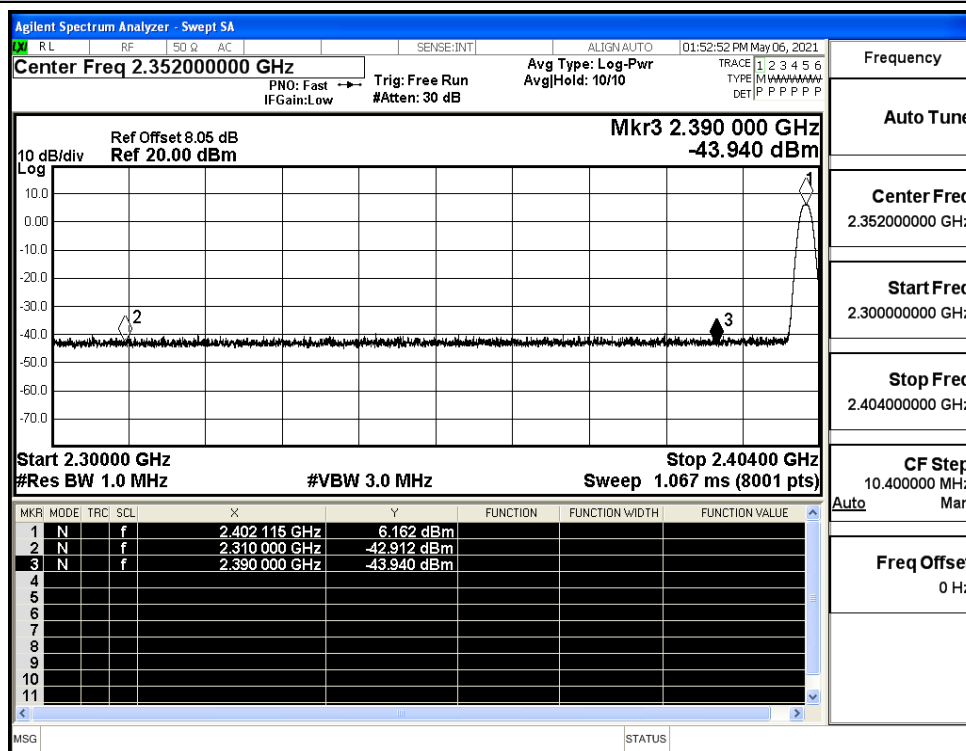
8DPSK/HCH/Hop



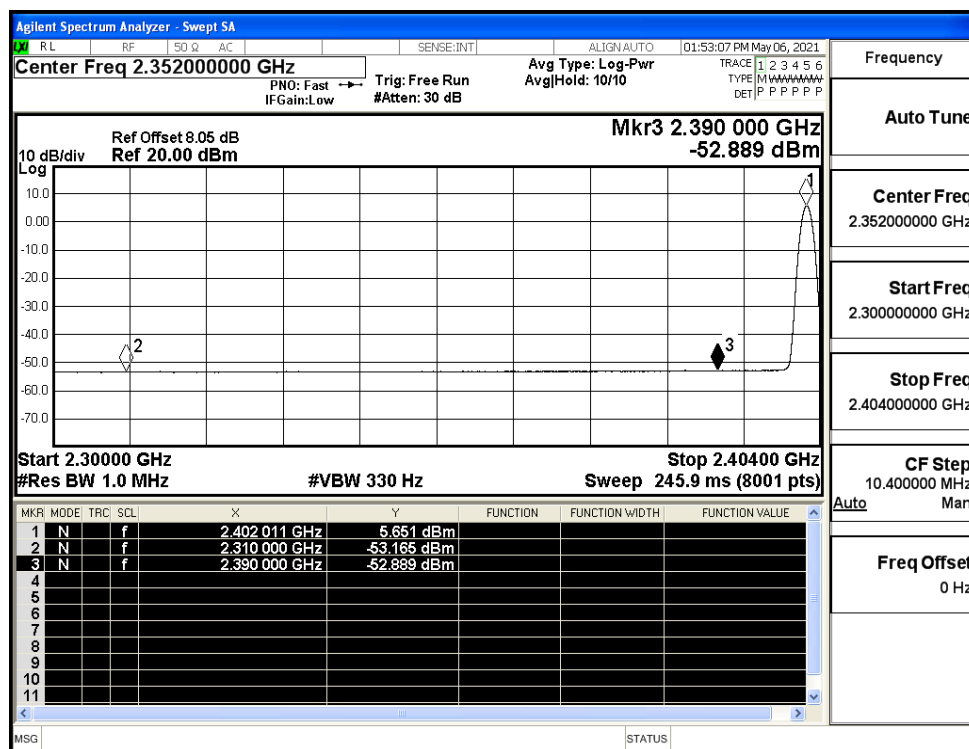
## A.8 Restrict-band band-edge measurements

| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -42.91      | 4.0  | 0             | 56.32      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.17      | 4.0  | 0             | 46.06      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.94      | 4.0  | 0             | 55.29      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -52.89      | 4.0  | 0             | 46.34      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.34      | 4.0  | 0             | 55.89      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.19      | 4.0  | 0             | 47.04      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -41.64      | 4.0  | 0             | 57.59      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.31      | 4.0  | 0             | 46.92      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -43.19      | 4.0  | 0             | 56.04      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.30      | 4.0  | 0             | 45.93      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -41.96      | 4.0  | 0             | 57.27      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -52.99      | 4.0  | 0             | 46.24      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.19      | 4.0  | 0             | 56.04      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.18      | 4.0  | 0             | 47.05      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -40.61      | 4.0  | 0             | 58.62      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.28      | 4.0  | 0             | 46.95      | AV       | 54             | PASS    |
| 8DPSK         | Off     | 2310.0 | -43.37      | 4.0  | 0             | 55.86      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.28      | 4.0  | 0             | 45.95      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -41.70      | 4.0  | 0             | 57.53      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -52.95      | 4.0  | 0             | 46.28      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -40.74      | 4.0  | 0             | 58.49      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.17      | 4.0  | 0             | 47.06      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -42.06      | 4.0  | 0             | 57.17      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.35      | 4.0  | 0             | 46.88      | AV       | 54             | PASS    |

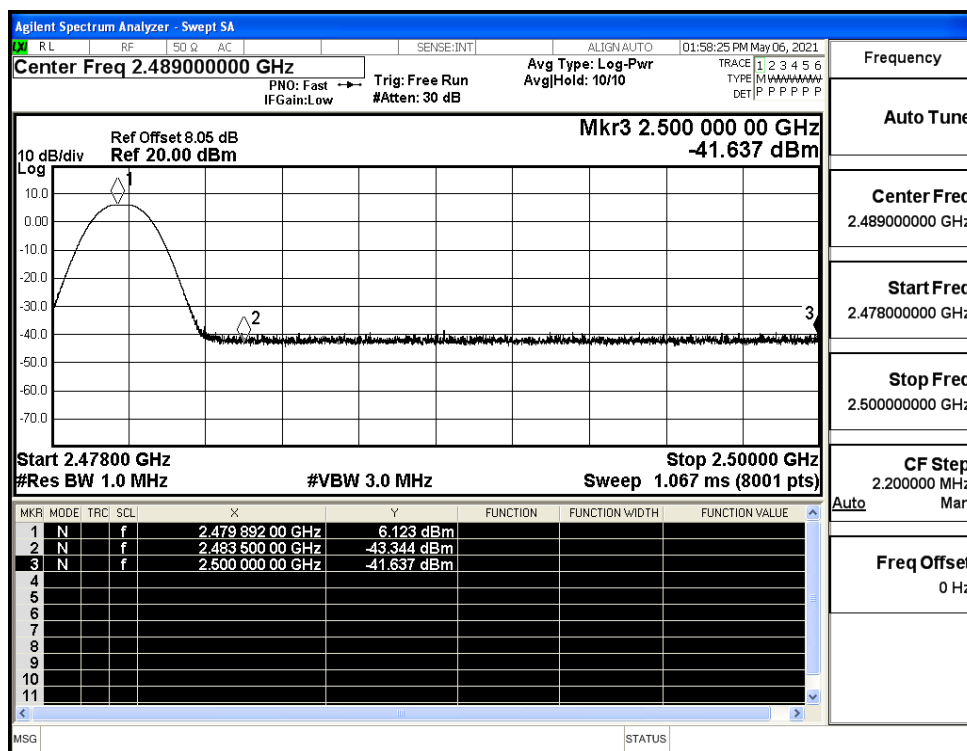
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



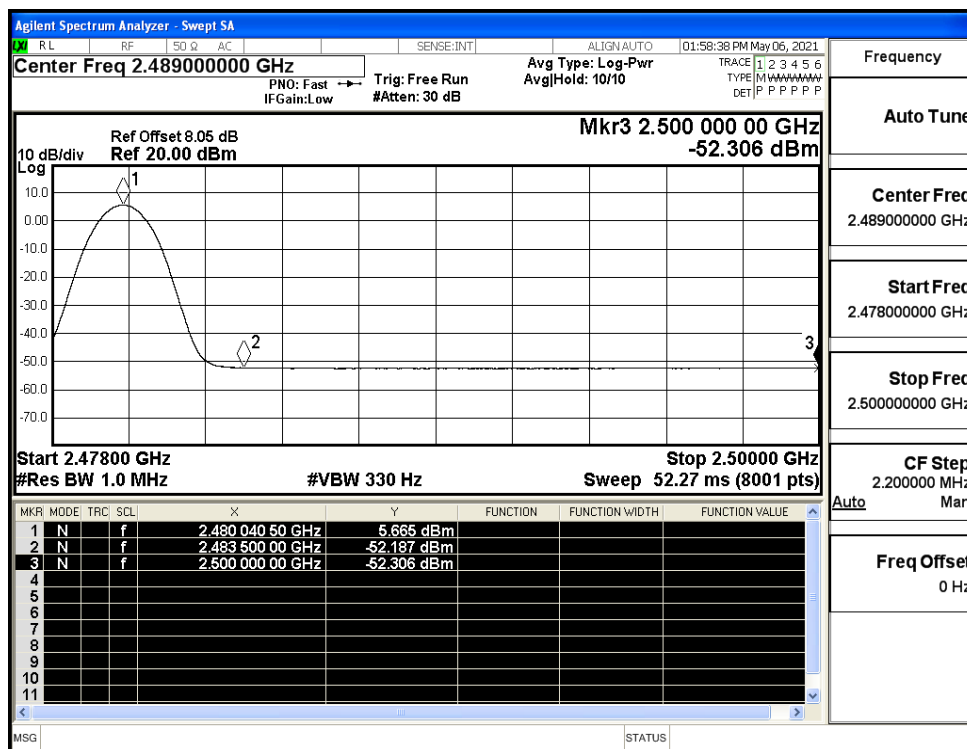
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)

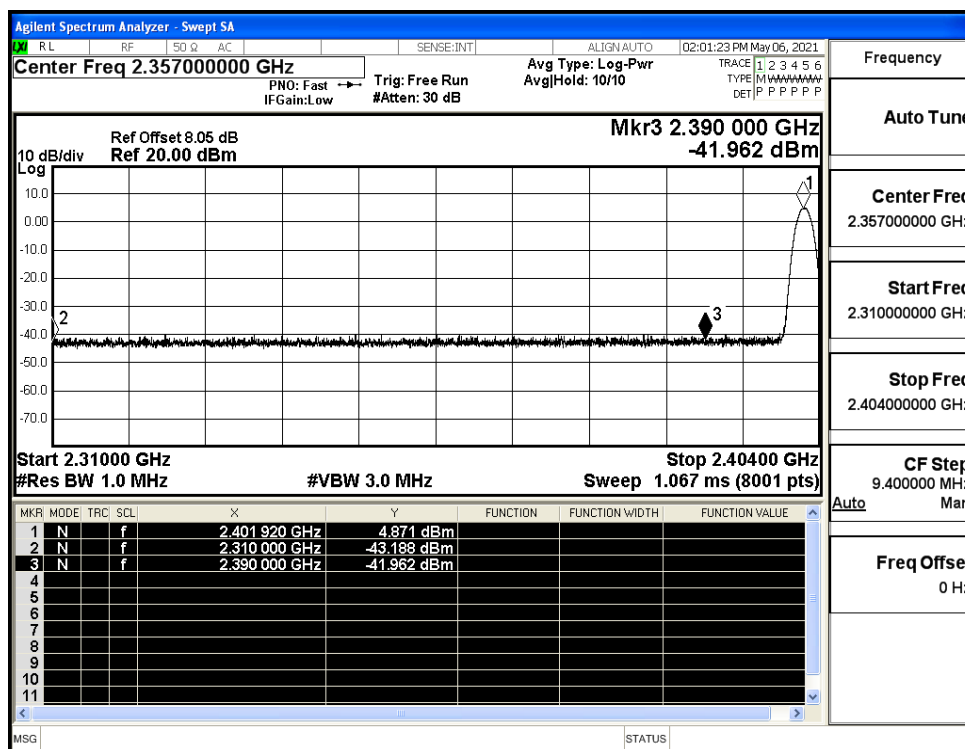
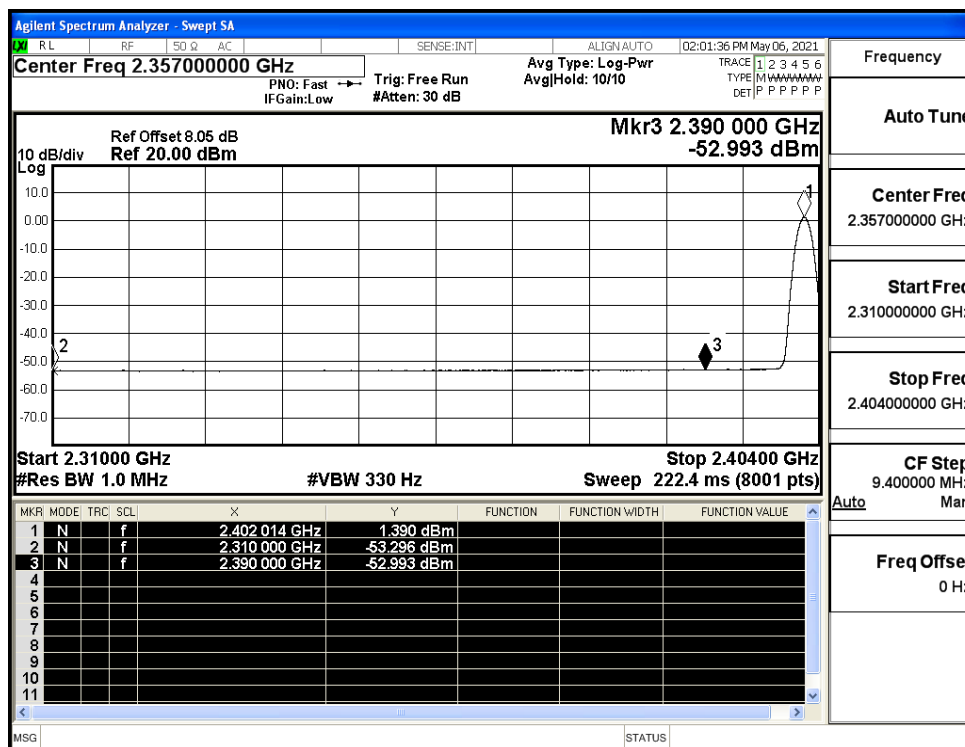


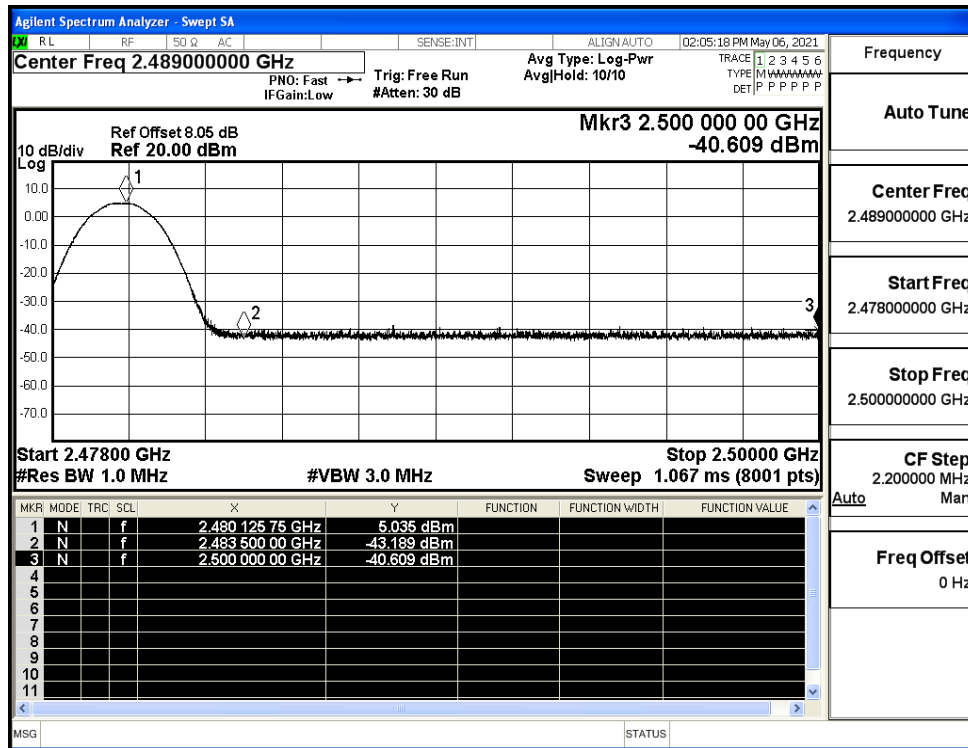
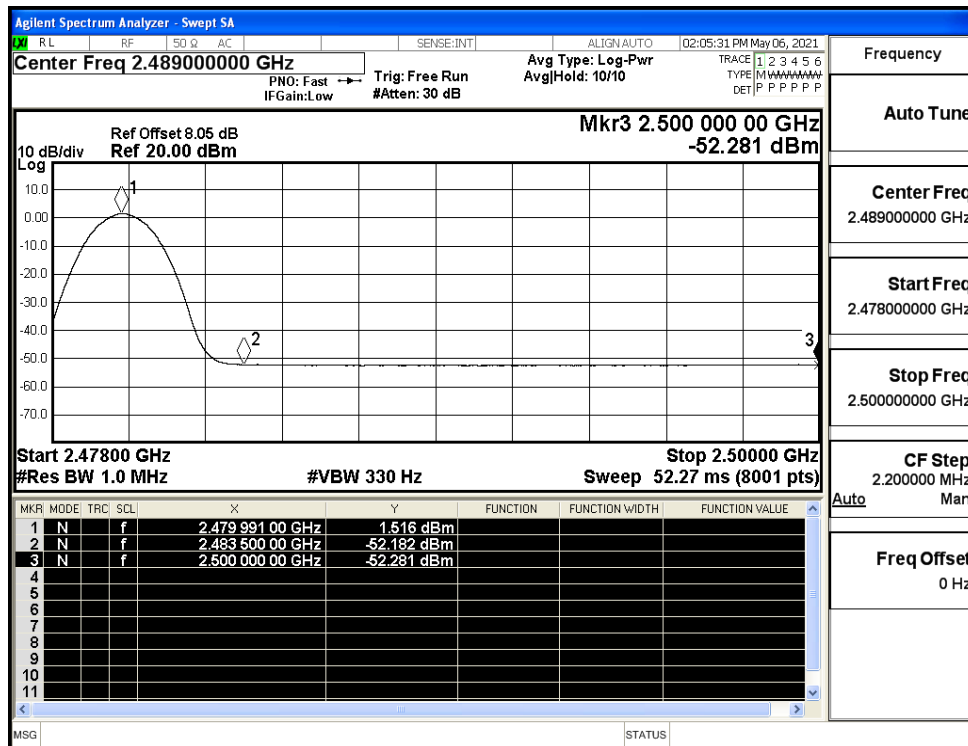
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



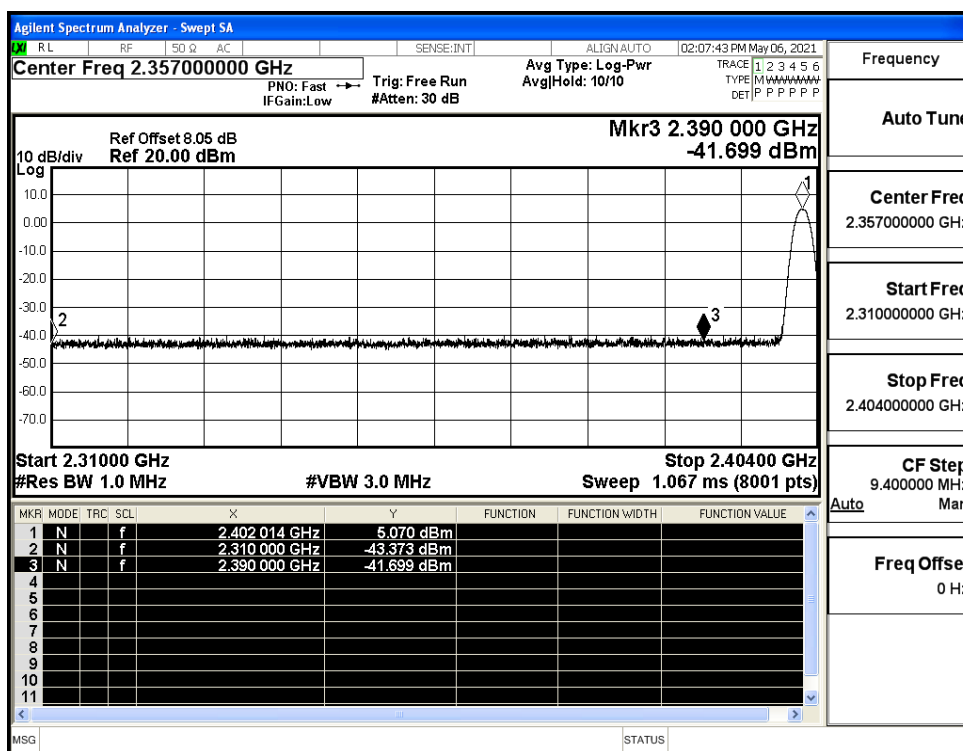
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



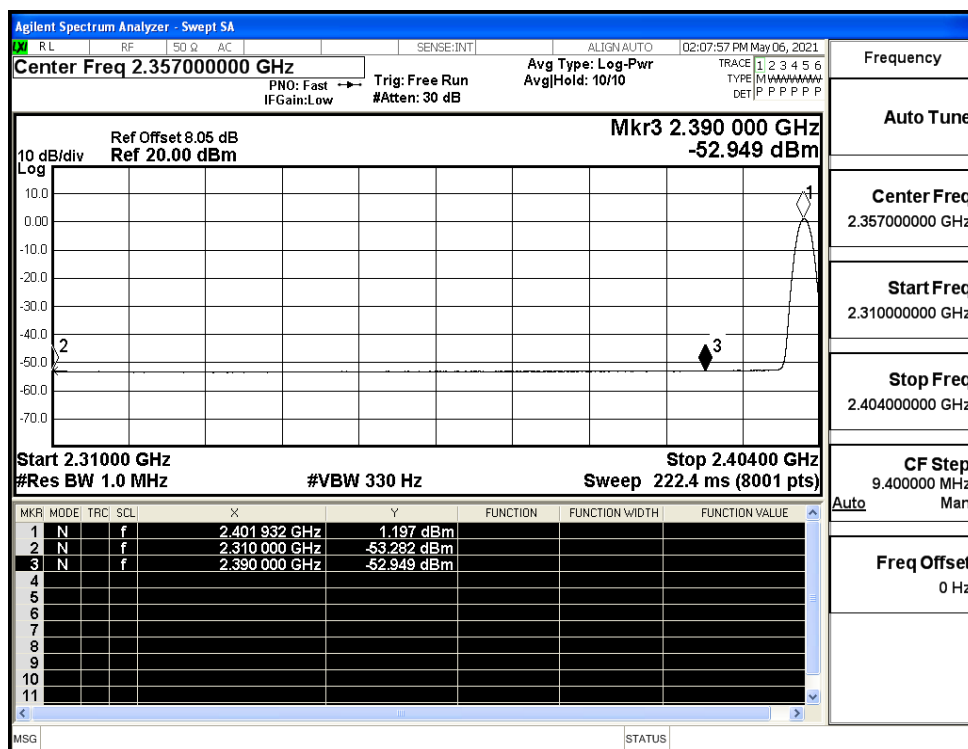
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)

Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (High Channel)Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (High Channel)

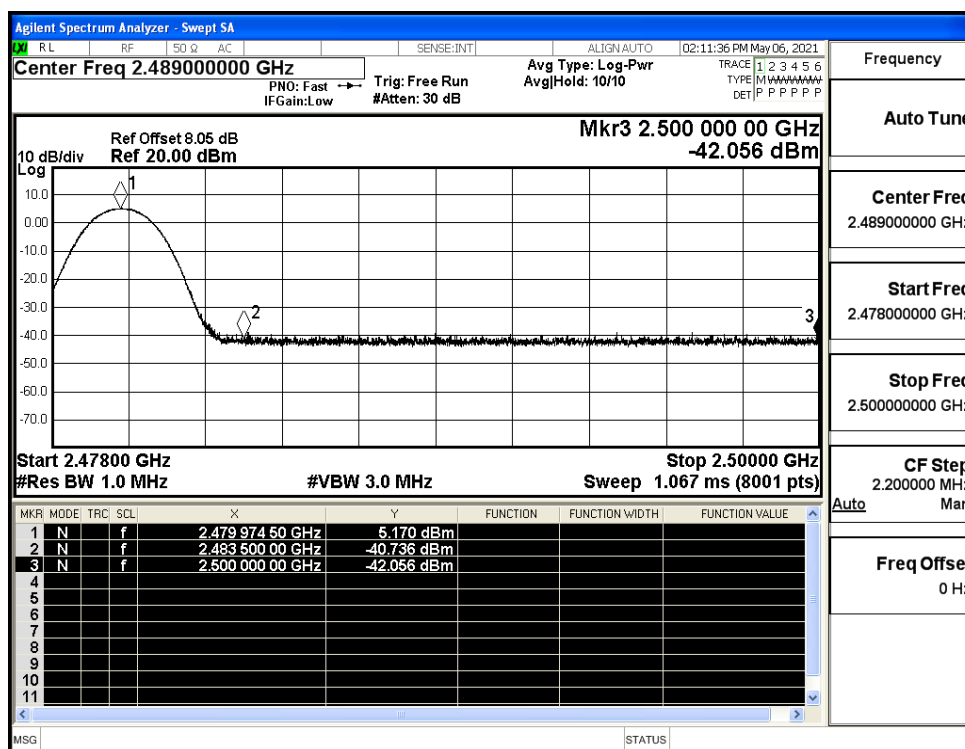
## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (Low Channel)



## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (High Channel)



## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (High Channel)

