

## Appendix A

### RF Test Data for BT V4.0(BDR/EDR) (Conducted Measurement)

Product Name: 14.1 inch laptop

Trade Mark: Hyundai

Test Model: HT14CCIC44SGH

#### Environmental Conditions

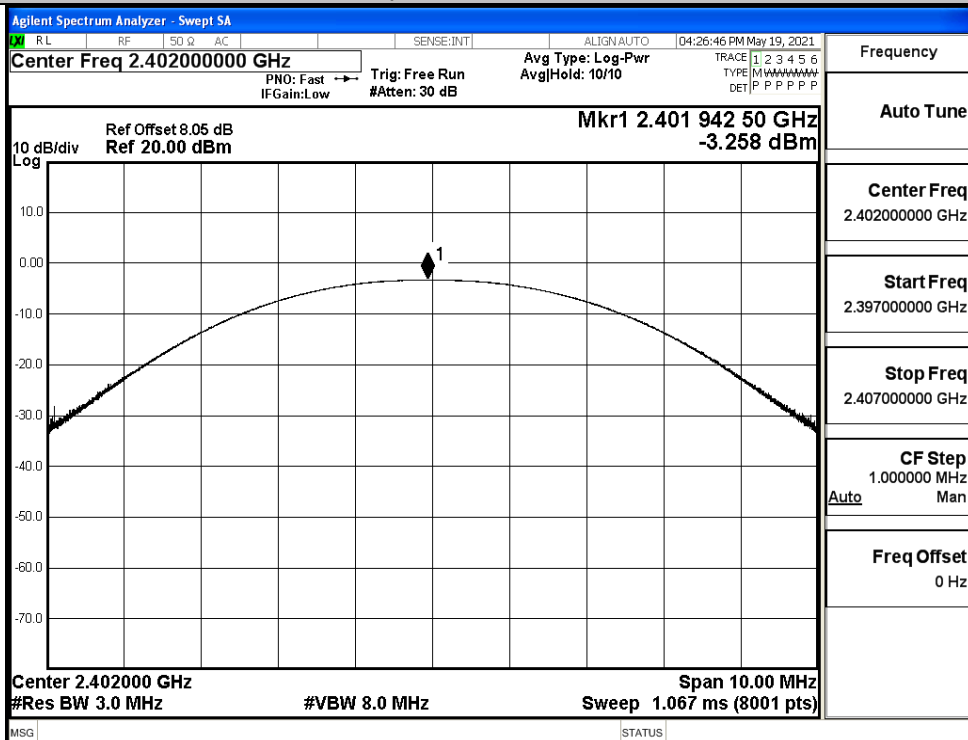
|                    |           |
|--------------------|-----------|
| Temperature:       | 25 ° C    |
| Relative Humidity: | 50%       |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Kay Hu    |
| Supervised by:     | Li Huan   |

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

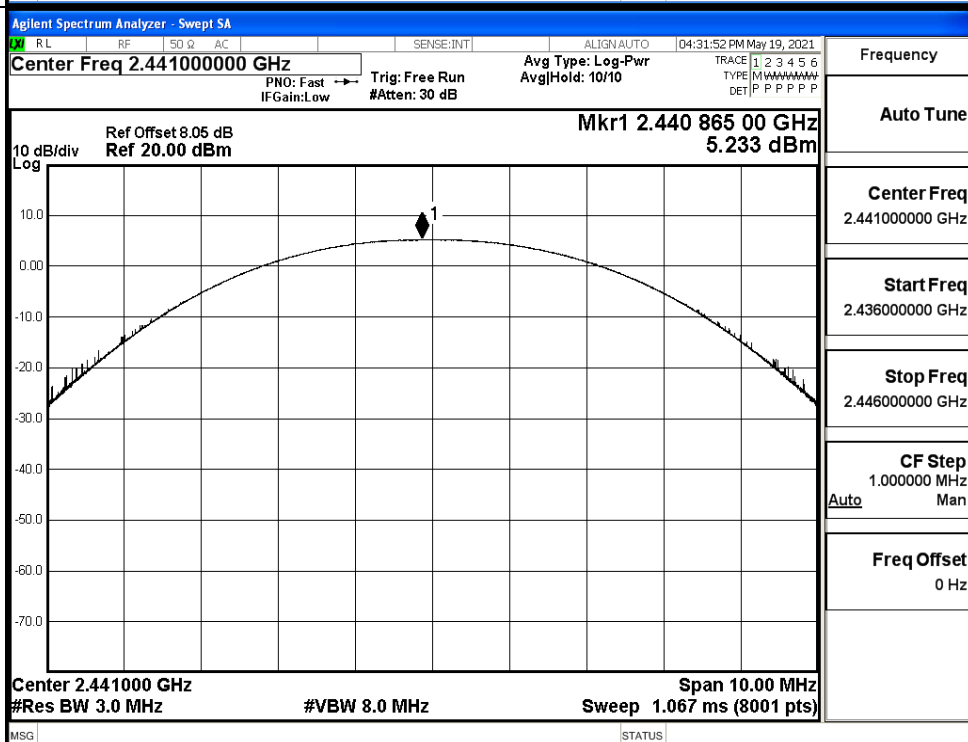
| Mode          | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK          | LCH      | -3.258                          | 21          | PASS    |
|               | MCH      | 5.233                           | 21          | PASS    |
|               | HCH      | 6.306                           | 21          | PASS    |
| $\pi/4$ DQPSK | LCH      | 3.872                           | 21          | PASS    |
|               | MCH      | 5.148                           | 21          | PASS    |
|               | HCH      | 6.156                           | 21          | PASS    |
| 8DPSK         | LCH      | 3.902                           | 21          | PASS    |
|               | MCH      | 5.174                           | 21          | PASS    |
|               | HCH      | 6.271                           | 21          | PASS    |

## Test Graphs

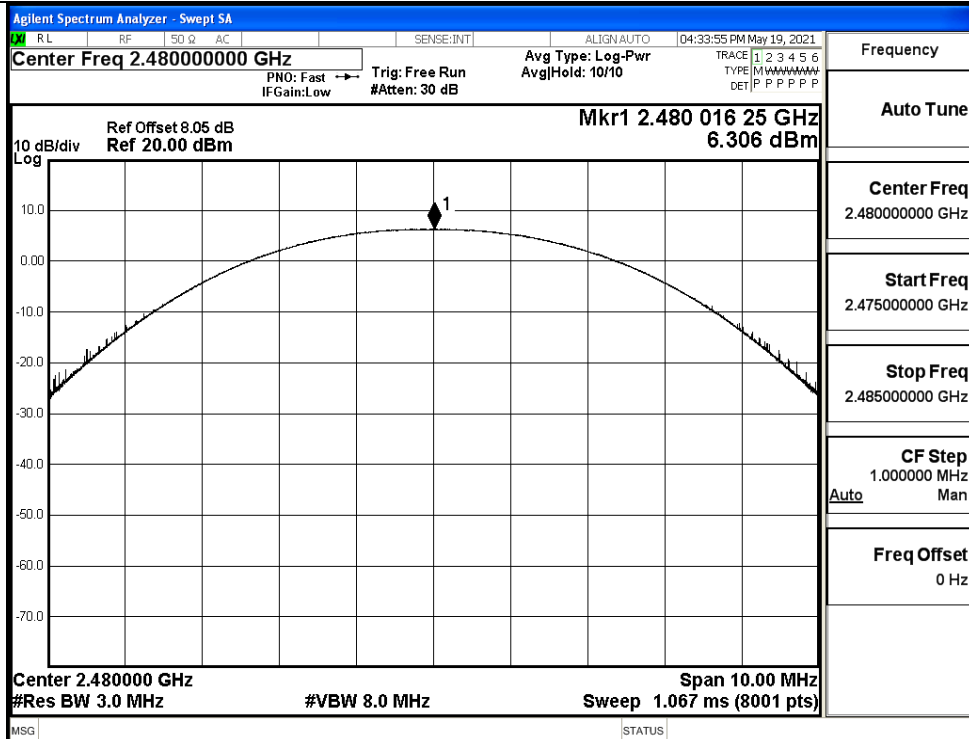
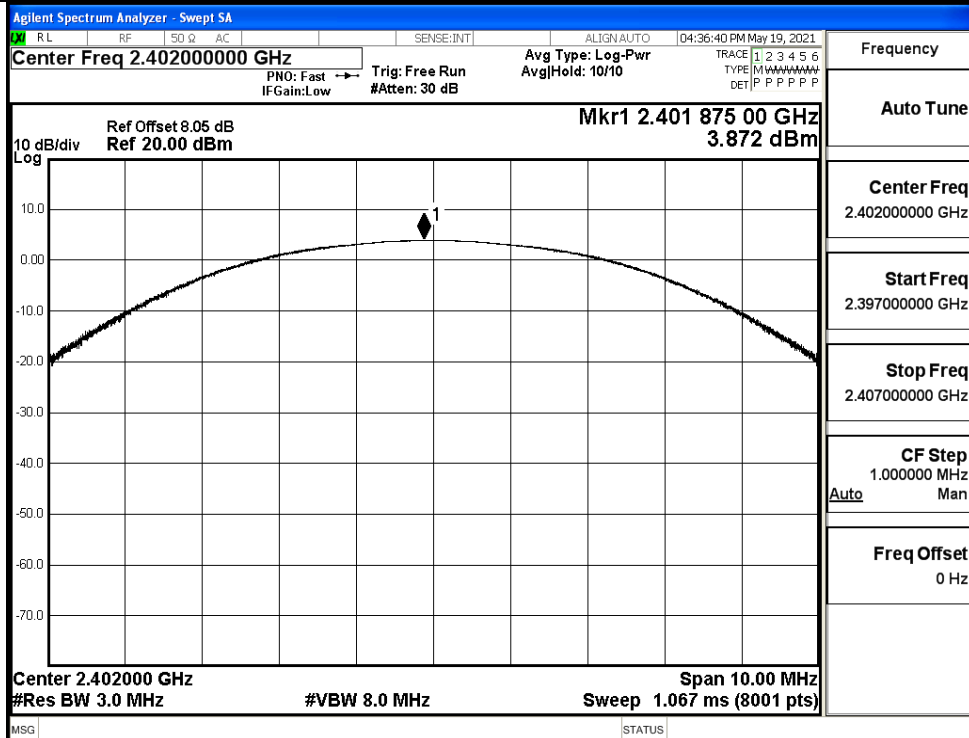
GFSK/LCH

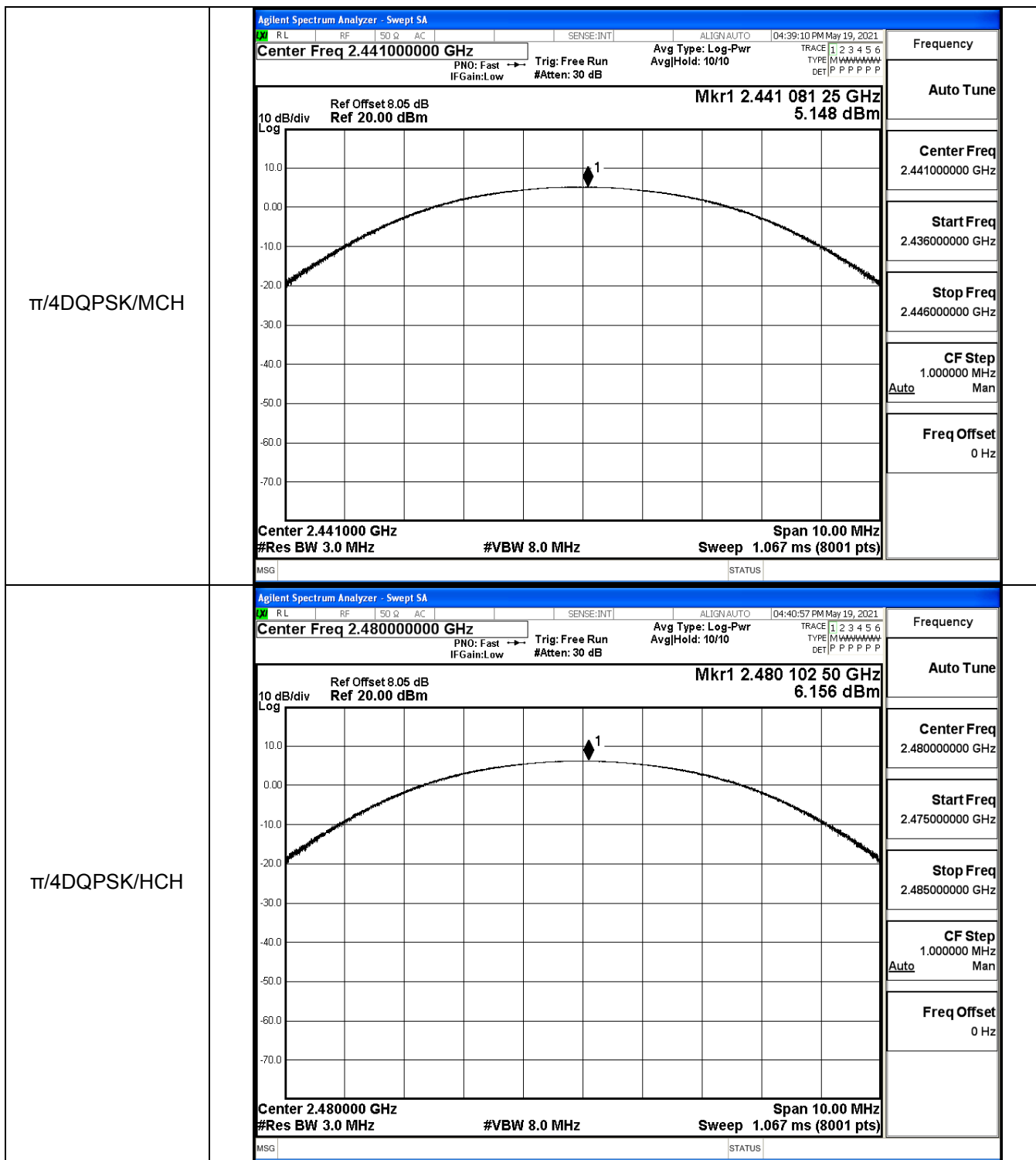


GFSK/MCH

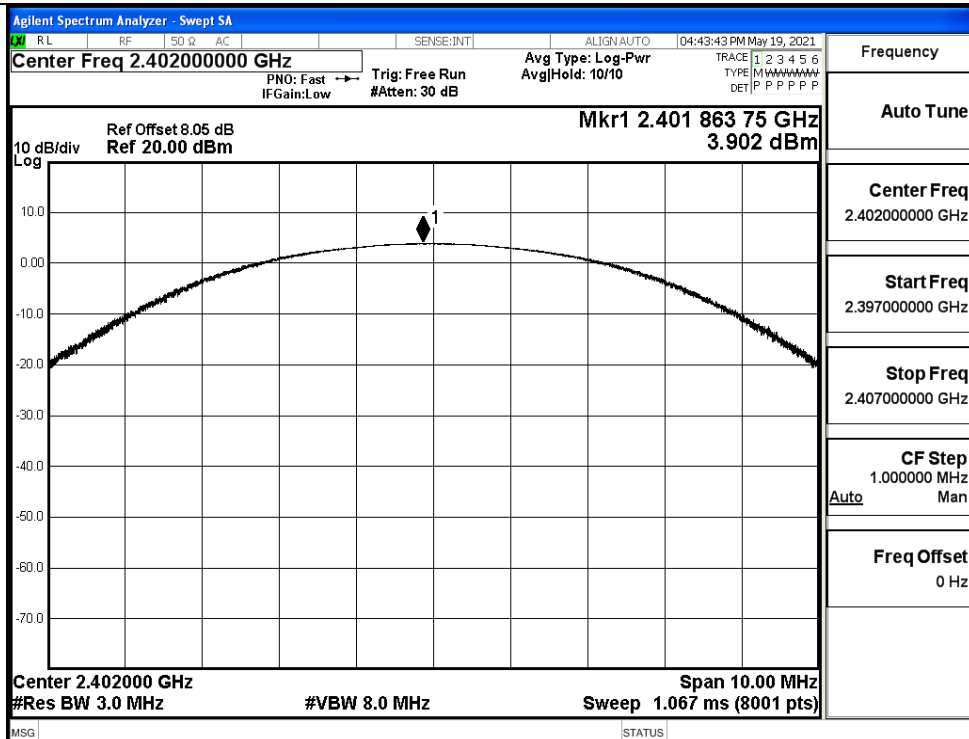


GFSK/HCH

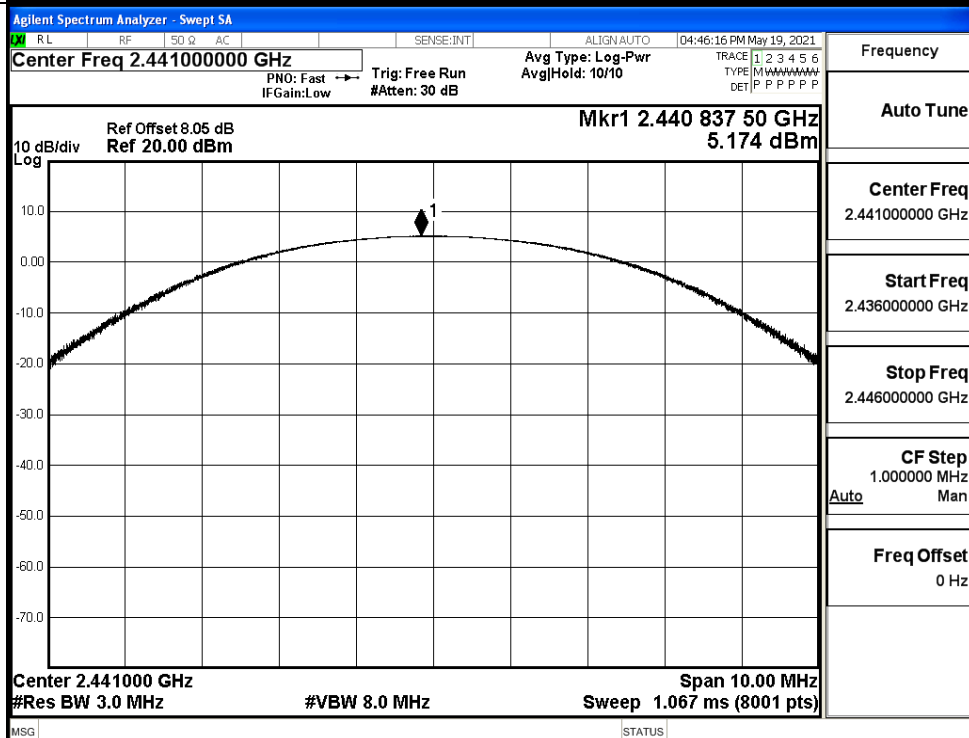
 $\pi/4$ DQPSK/LCH



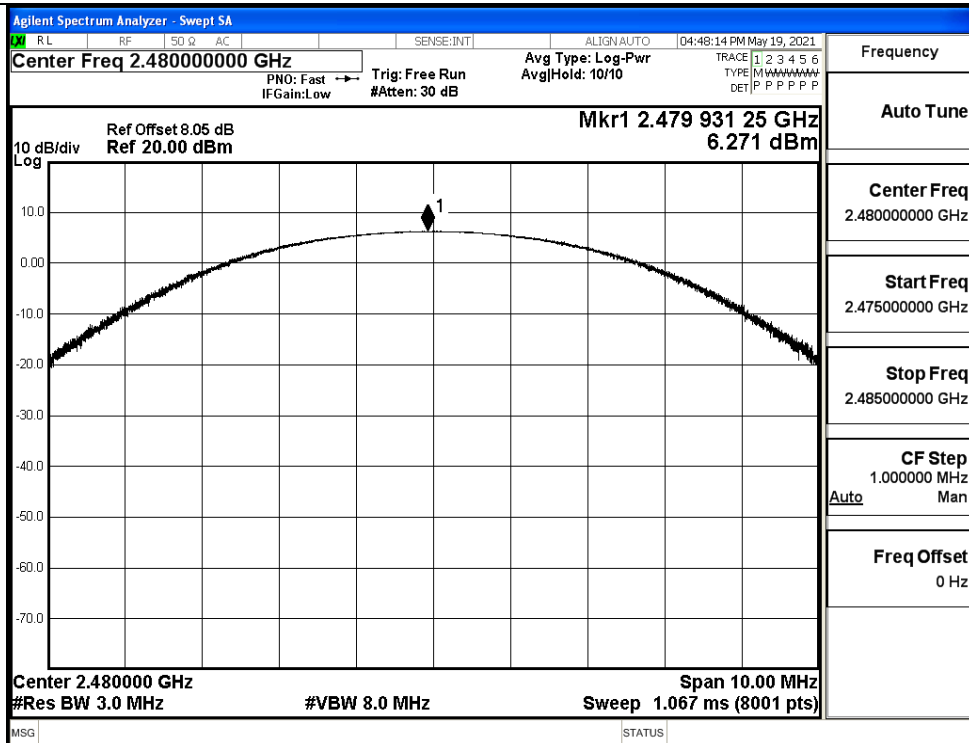
8DPSK/LCH



8DPSK/MCH



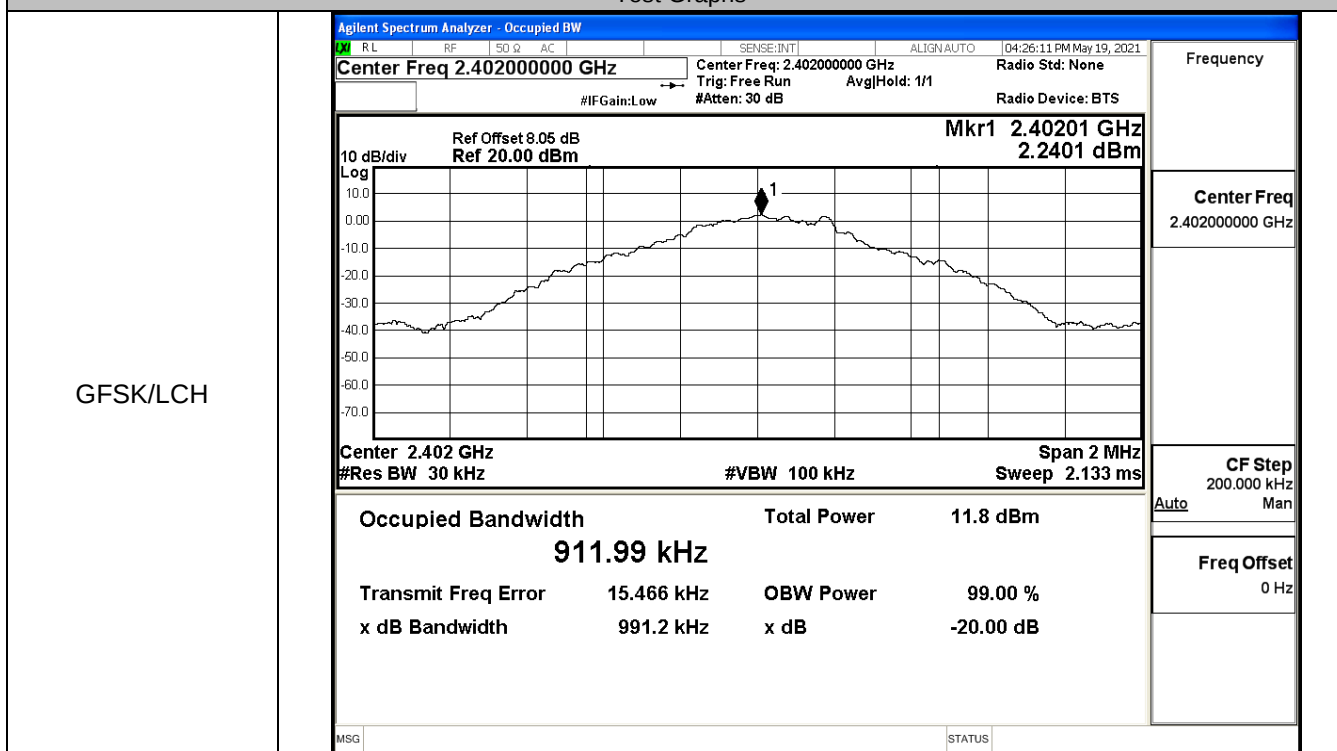
8DPSK/HCH



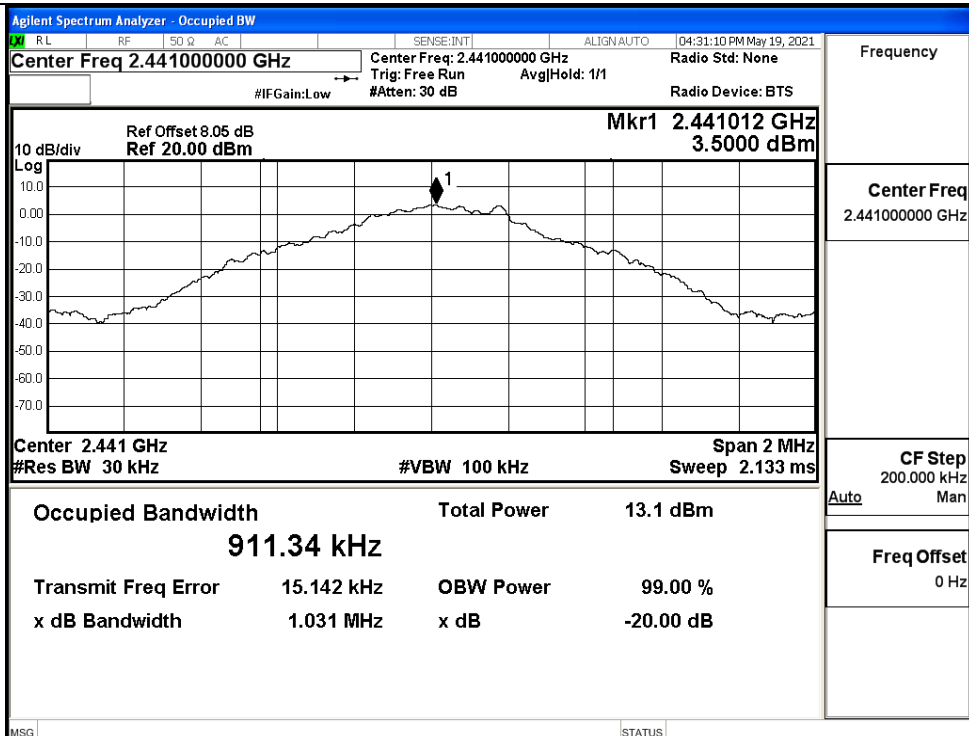
## A.2 20dB Bandwidth

| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.9912               | Not Specified | PASS    |
|               | MCH      | 1.031                | Not Specified | PASS    |
|               | HCH      | 0.9897               | Not Specified | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.425                | Not Specified | PASS    |
|               | MCH      | 1.383                | Not Specified | PASS    |
|               | HCH      | 1.425                | Not Specified | PASS    |
| 8DPSK         | LCH      | 1.419                | Not Specified | PASS    |
|               | MCH      | 1.417                | Not Specified | PASS    |
|               | HCH      | 1.418                | Not Specified | PASS    |

Test Graphs



GFSK/MCH



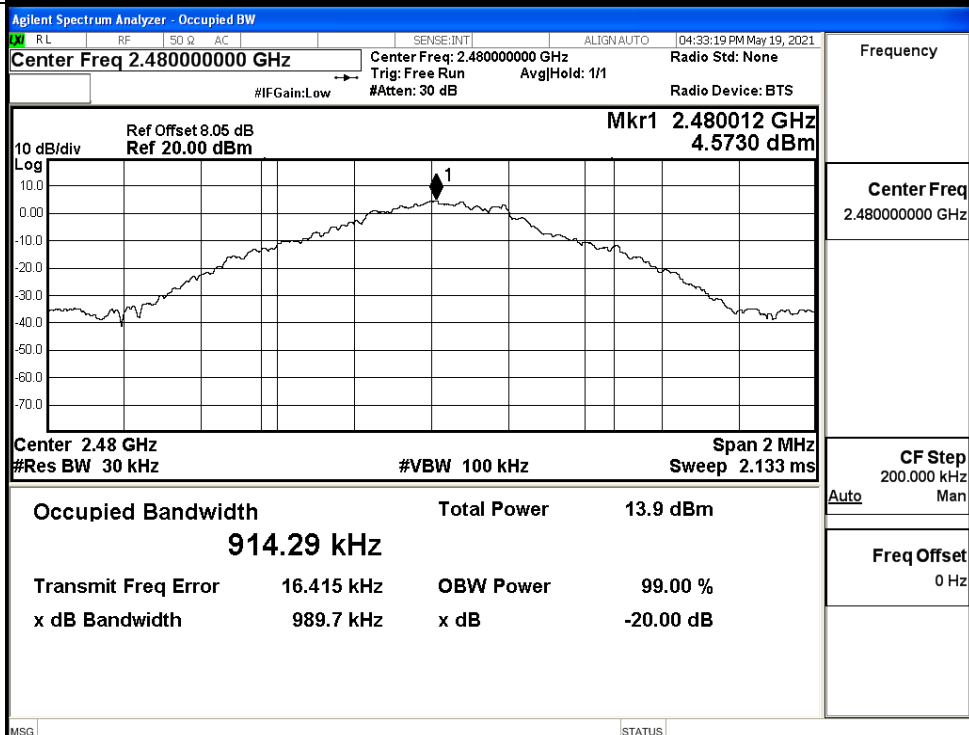
Frequency

Center Freq  
2.441000000 GHzCF Step  
200.000 kHz  
Man

Auto

Freq Offset  
0 Hz

GFSK/HCH

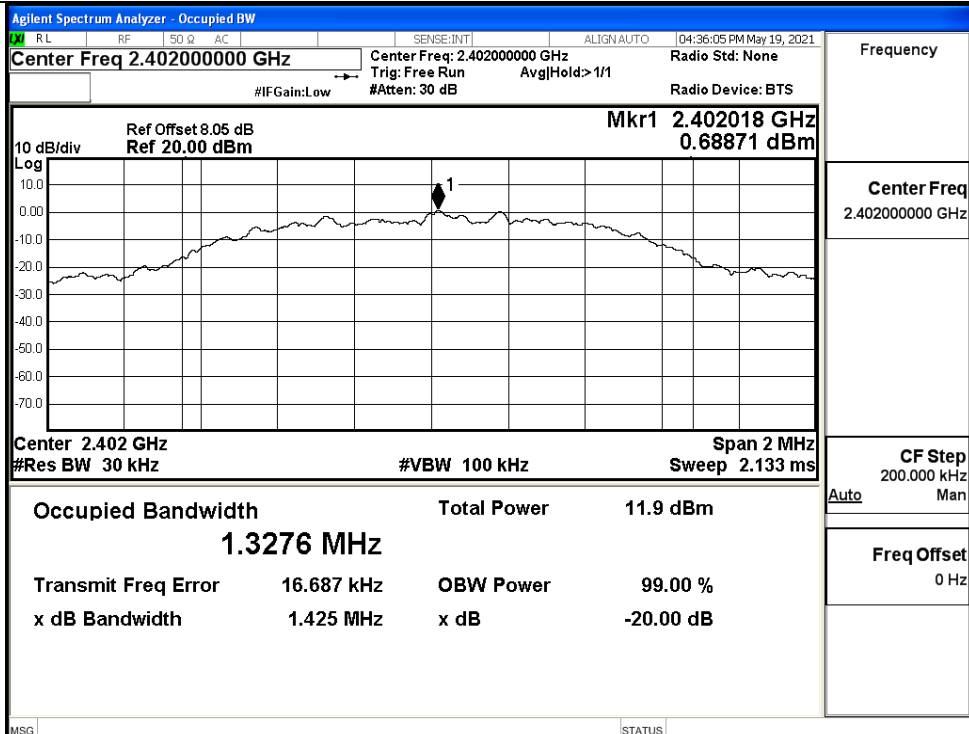
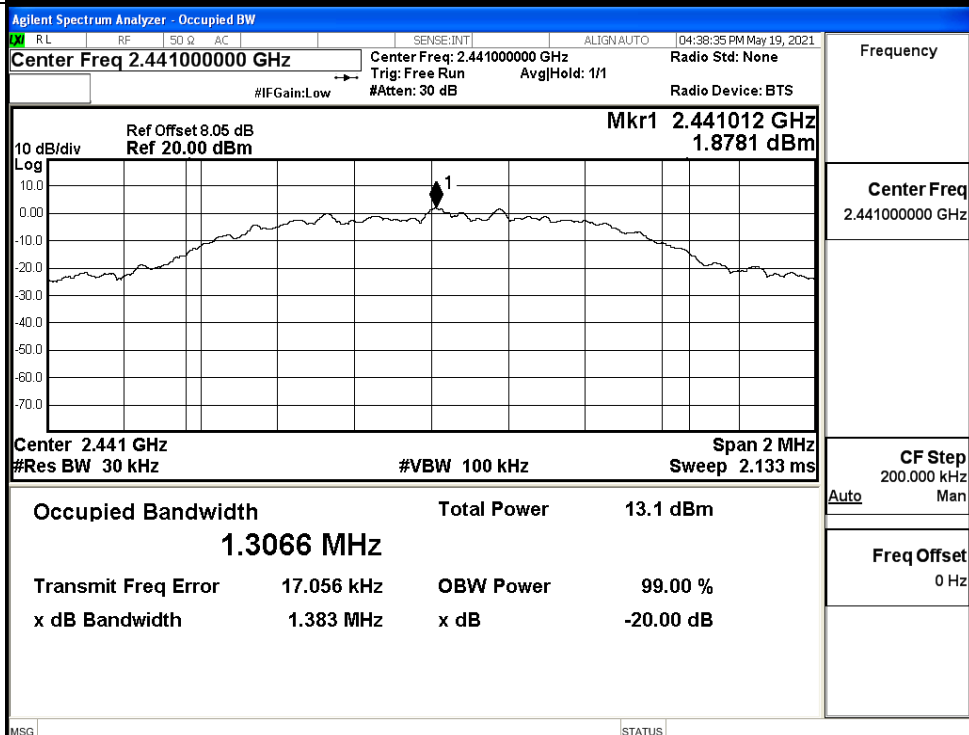


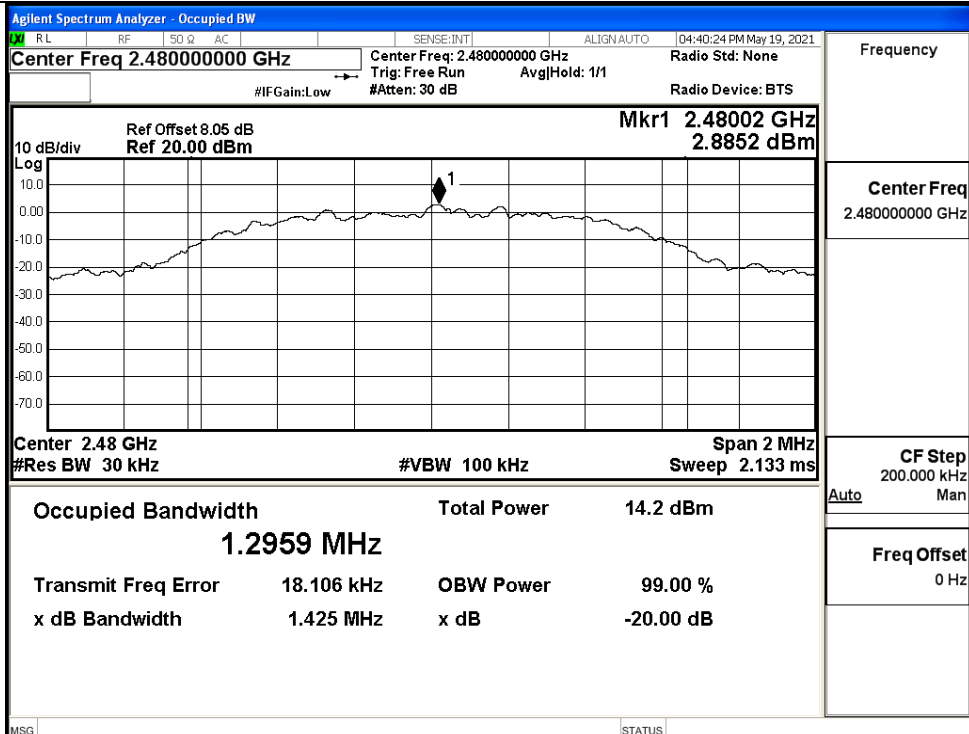
Frequency

Center Freq  
2.480000000 GHzCF Step  
200.000 kHz  
Man

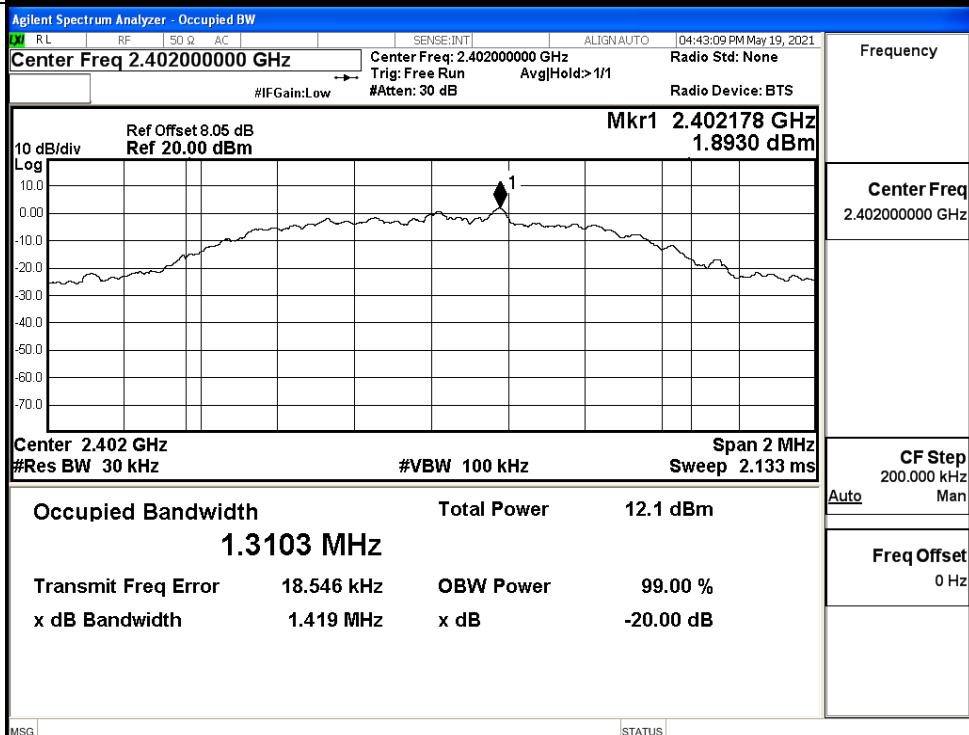
Auto

Freq Offset  
0 Hz

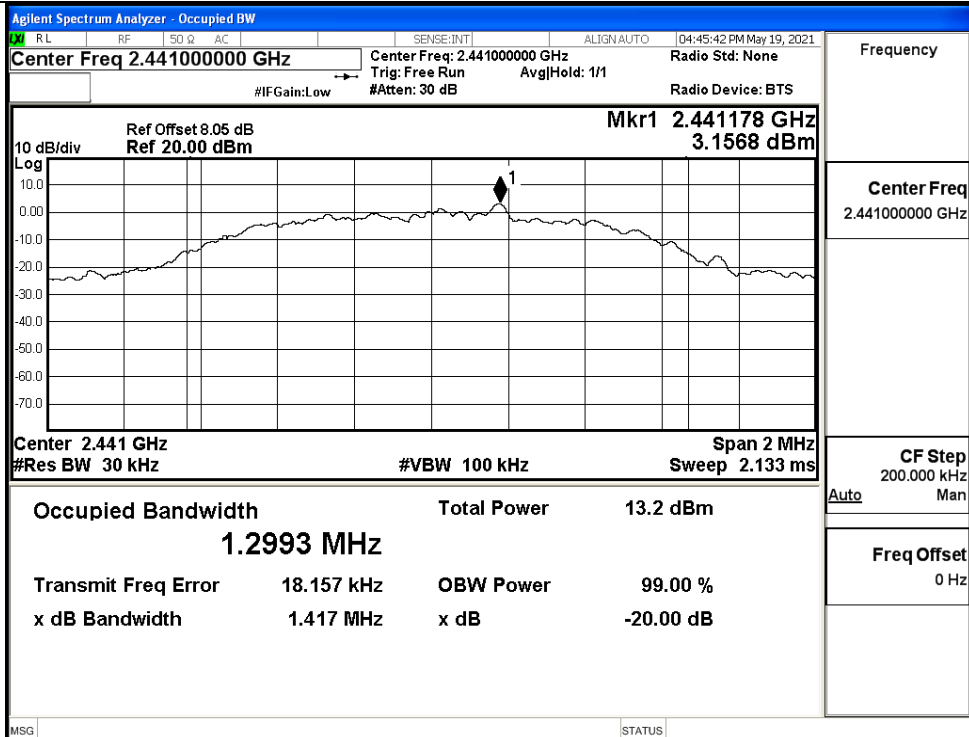
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

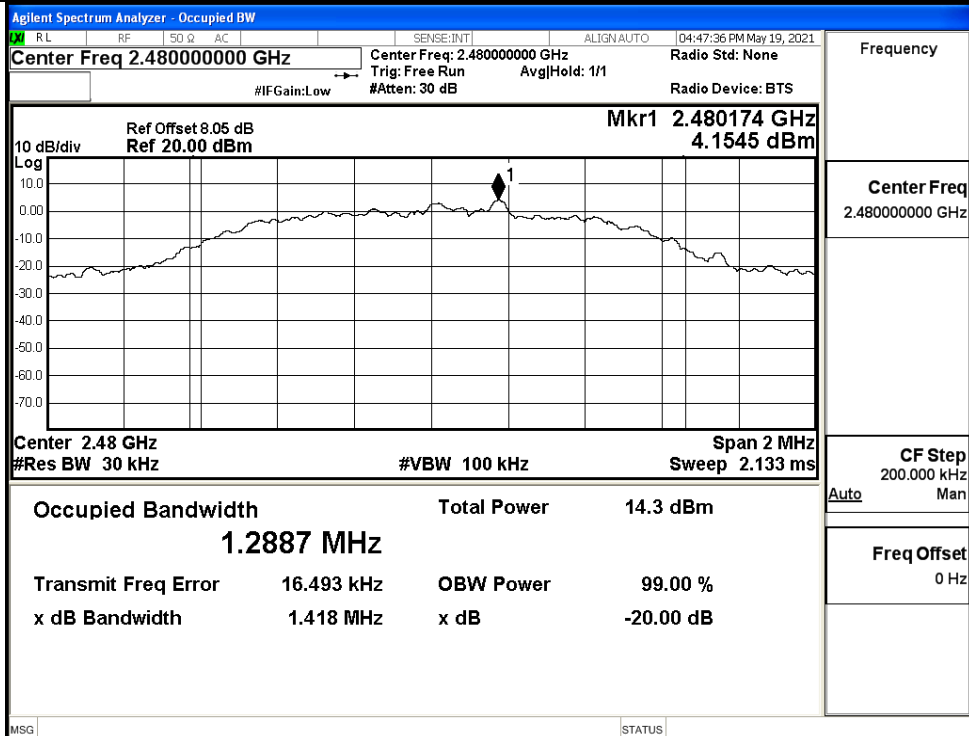
8DPSK/LCH



8DPSK/MCH



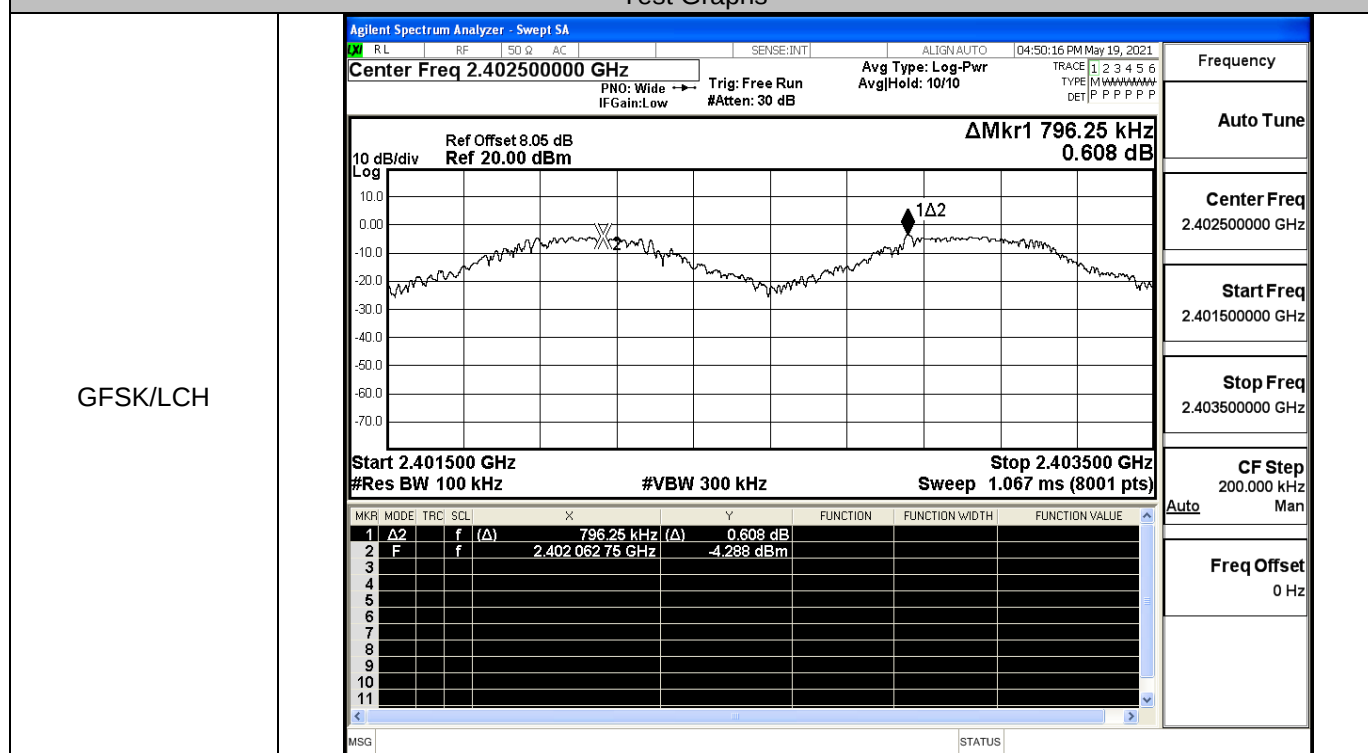
8DPSK/HCH



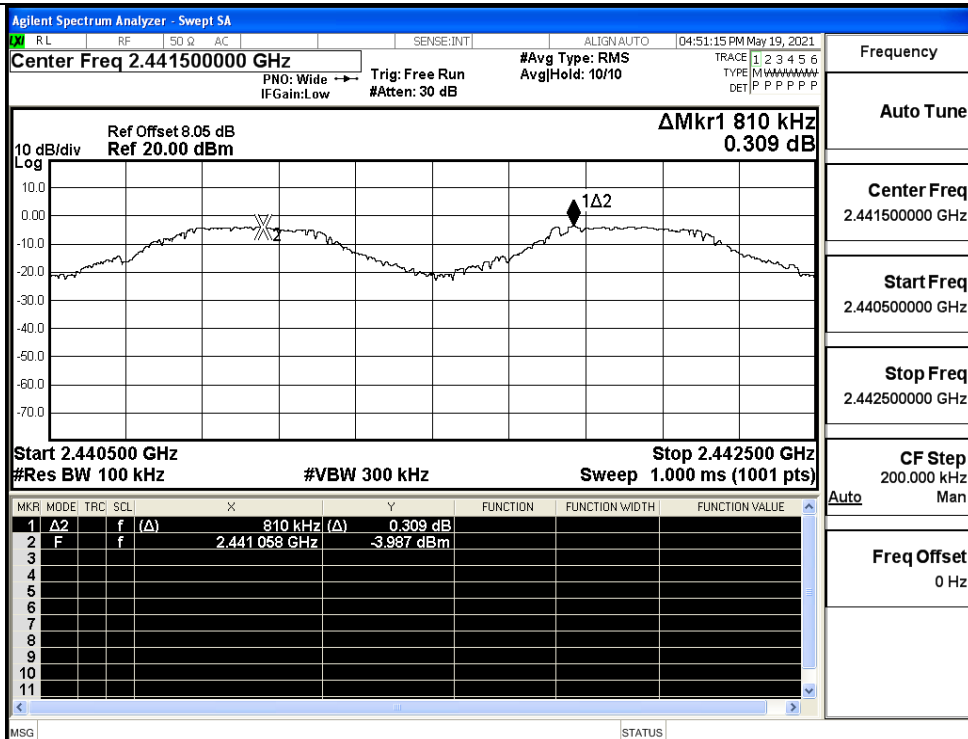
### A.3 Carrier Frequency Separation

| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK          | LCH      | 0.796                              | 0.687       | PASS    |
|               | MCH      | 0.810                              | 0.687       | PASS    |
|               | HCH      | 1.202                              | 0.687       | PASS    |
| $\pi$ /4DQPSK | LCH      | 0.976                              | 0.950       | PASS    |
|               | MCH      | 0.982                              | 0.950       | PASS    |
|               | HCH      | 0.968                              | 0.950       | PASS    |
| 8DPSK         | LCH      | 1.244                              | 0.946       | PASS    |
|               | MCH      | 0.986                              | 0.946       | PASS    |
|               | HCH      | 0.986                              | 0.946       | PASS    |

#### Test Graphs



GFSK/MCH

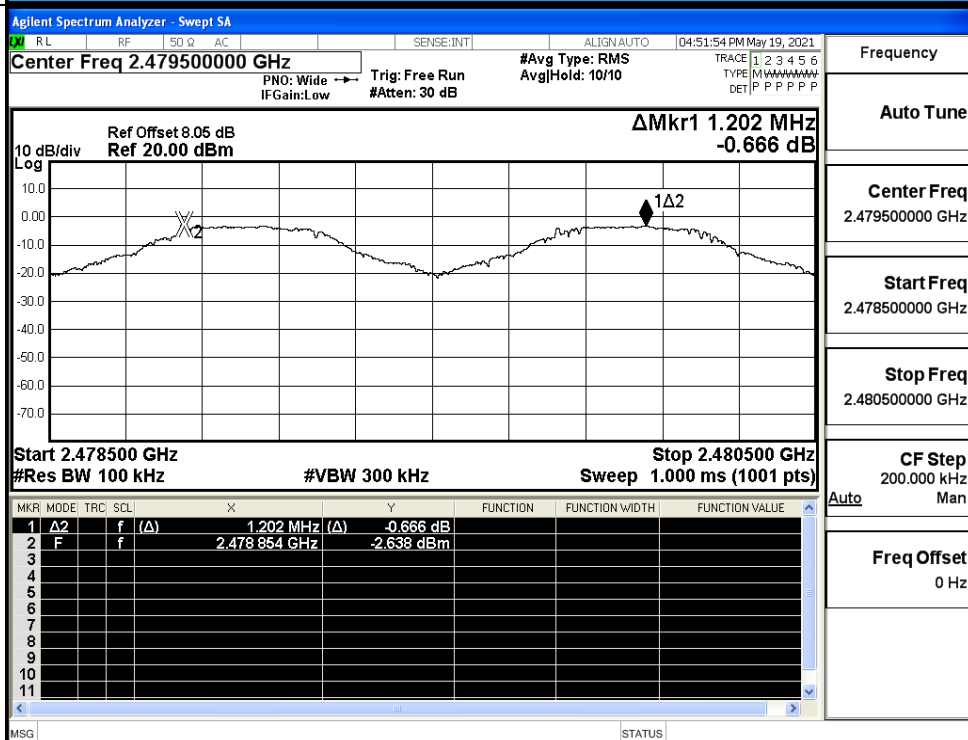


Frequency

Auto Tune

Center Freq  
2.441500000 GHzStart Freq  
2.440500000 GHzStop Freq  
2.442500000 GHzCF Step  
200.000 kHz  
ManFreq Offset  
0 Hz

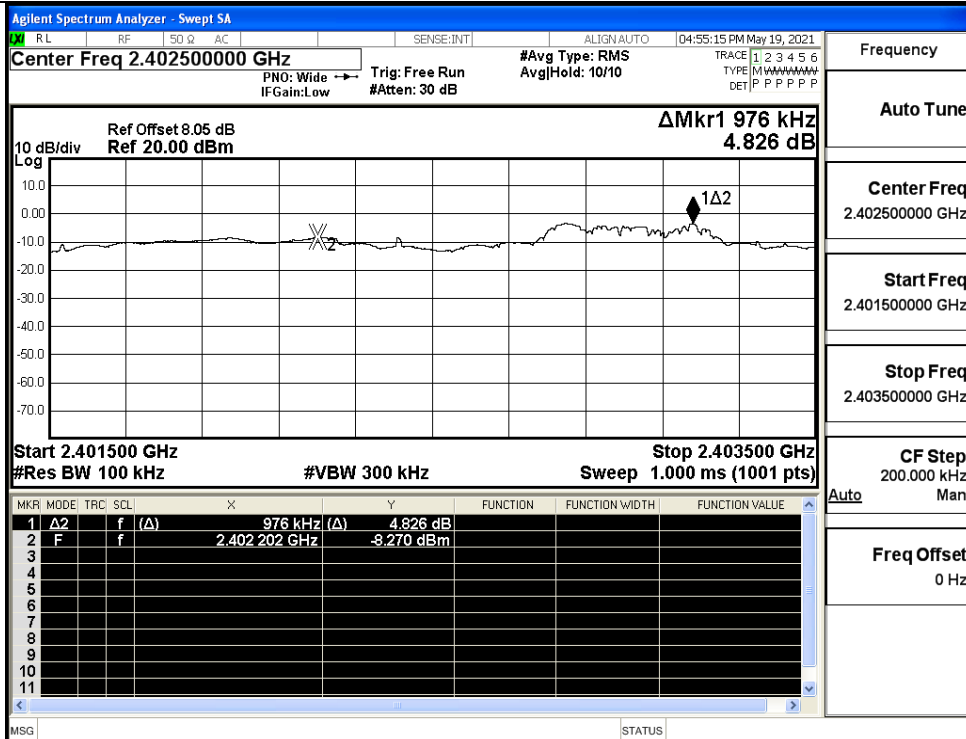
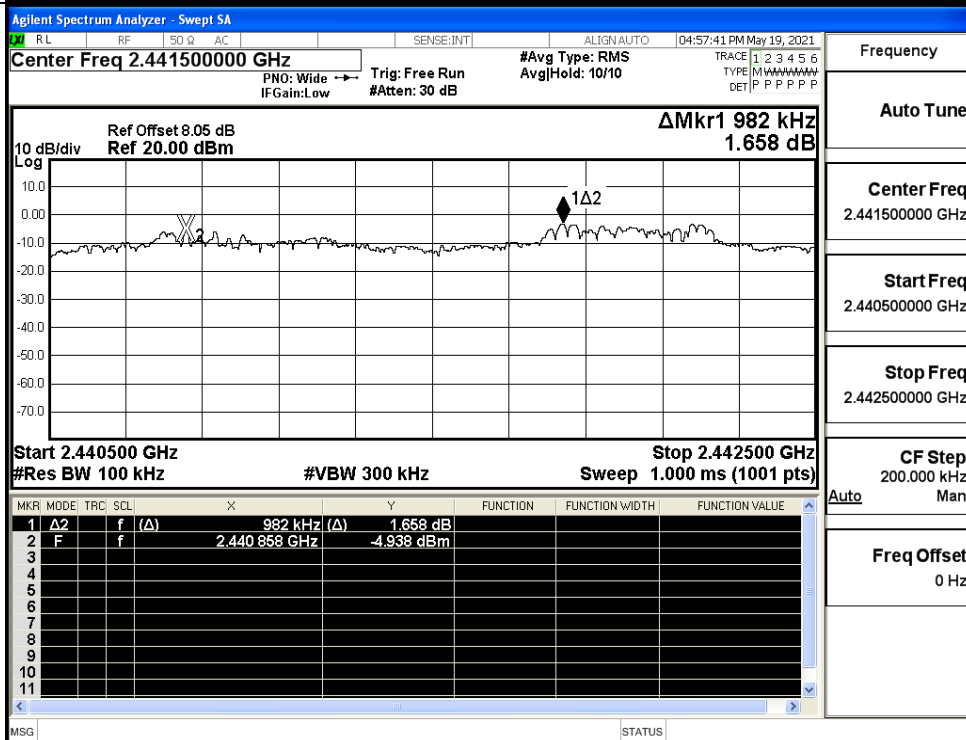
GFSK/HCH

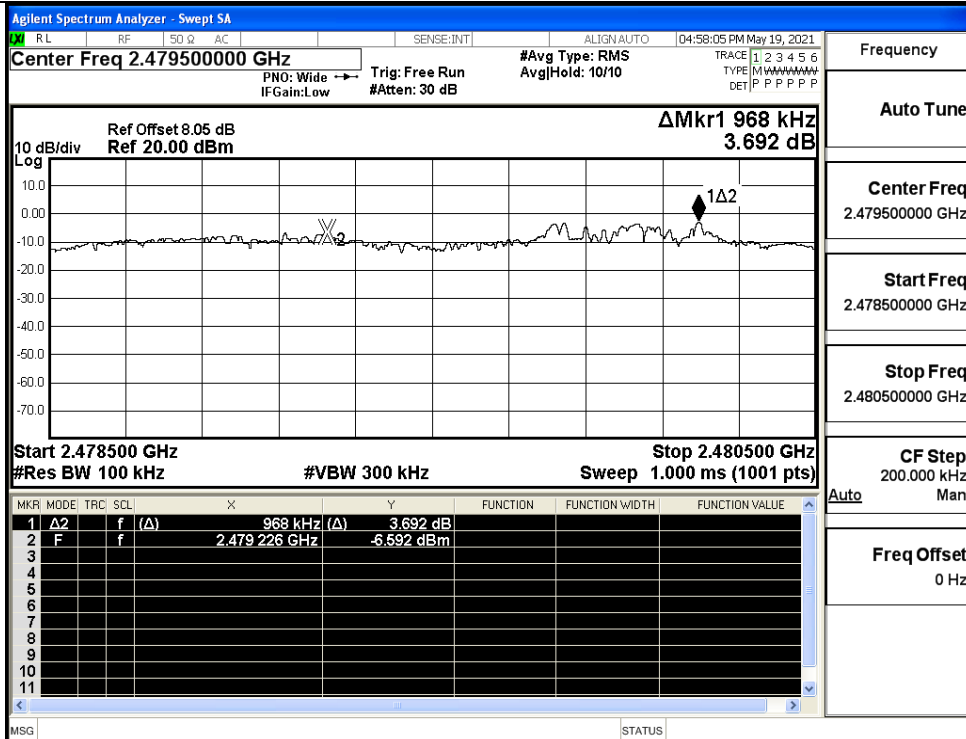


Frequency

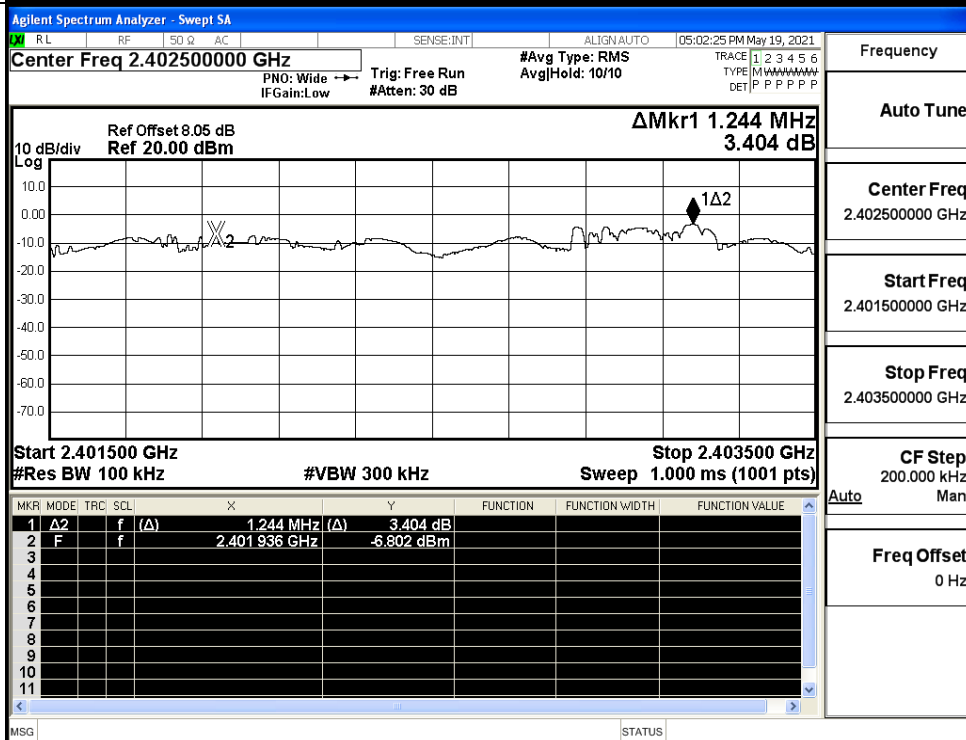
Auto Tune

Center Freq  
2.479500000 GHzStart Freq  
2.478500000 GHzStop Freq  
2.480500000 GHzCF Step  
200.000 kHz  
ManFreq Offset  
0 Hz

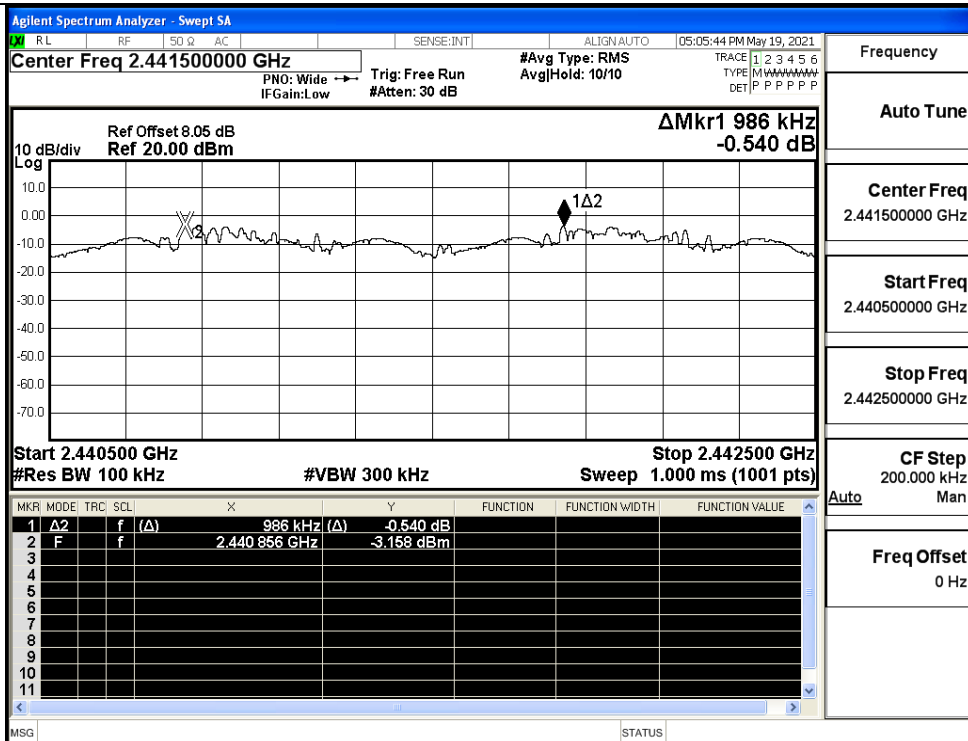
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

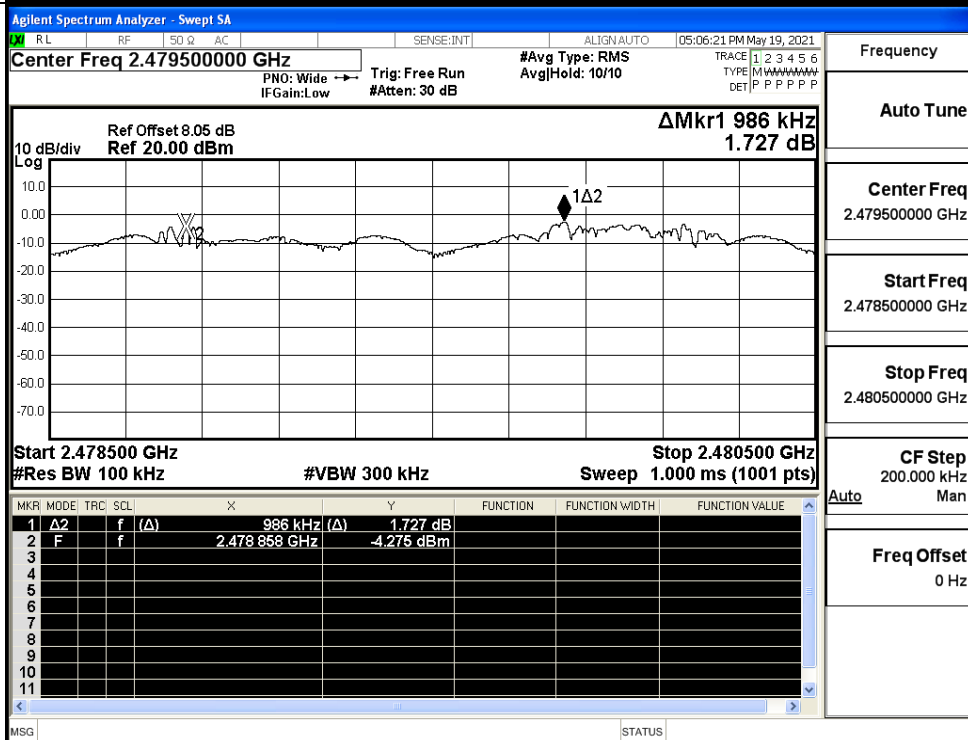
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

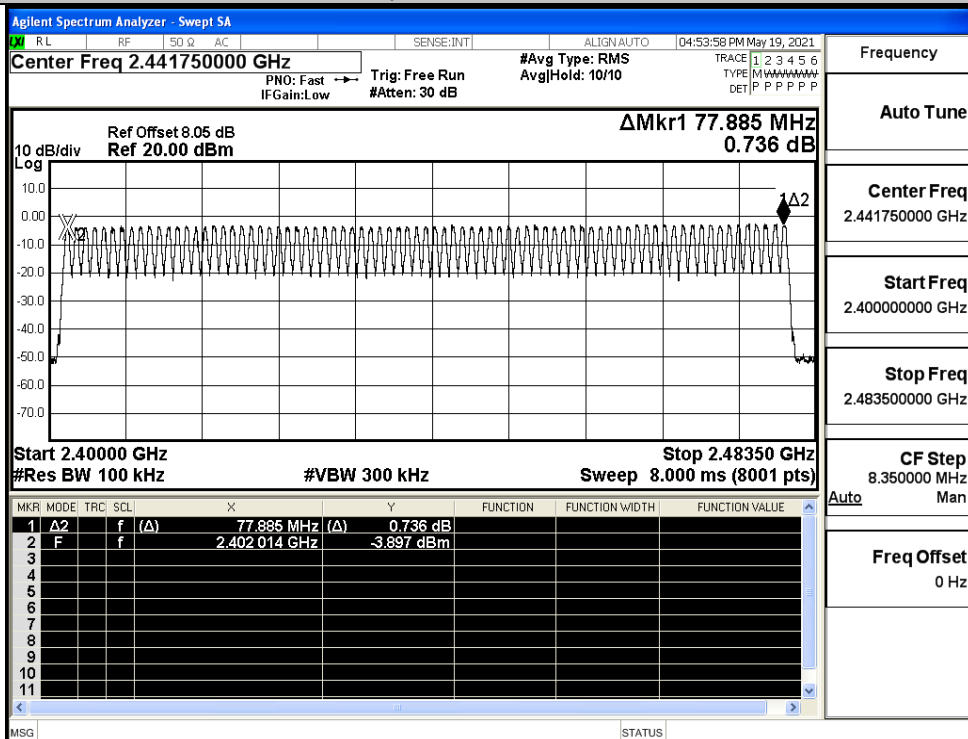


## A.4 Hopping Channel Number

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

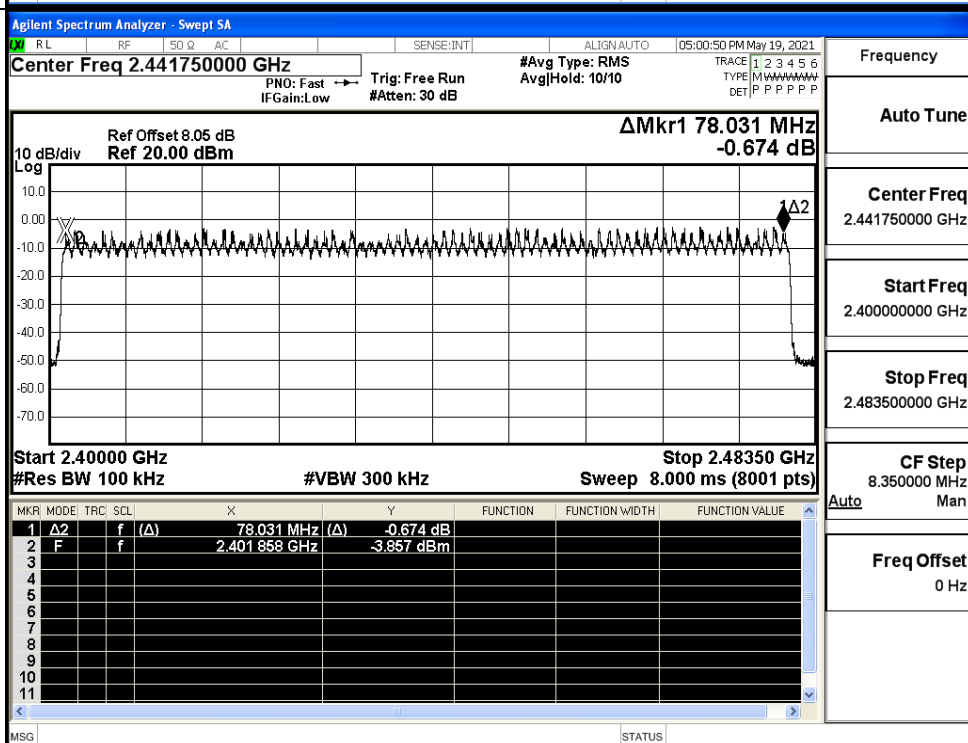
### Test Graphs

GFSK/Hop



Frequency

Auto Tune

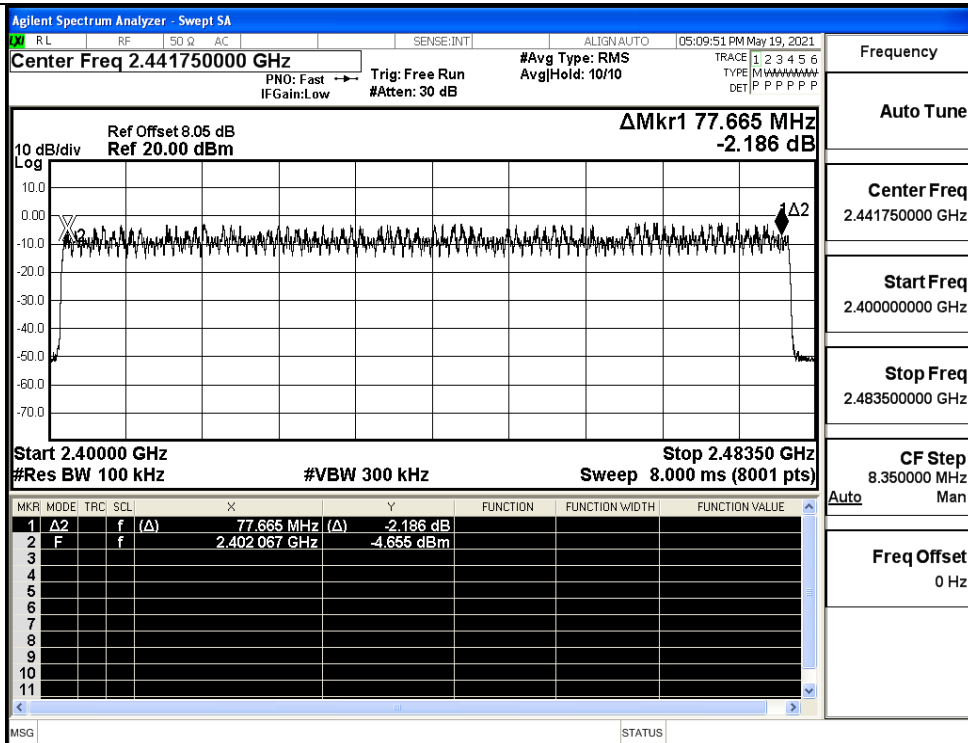
Center Freq  
2.441750000 GHzStart Freq  
2.400000000 GHzStop Freq  
2.483500000 GHzCF Step  
8.350000 MHz  
ManFreq Offset  
0 Hz $\pi/4$ DQPSK/Hop

Frequency

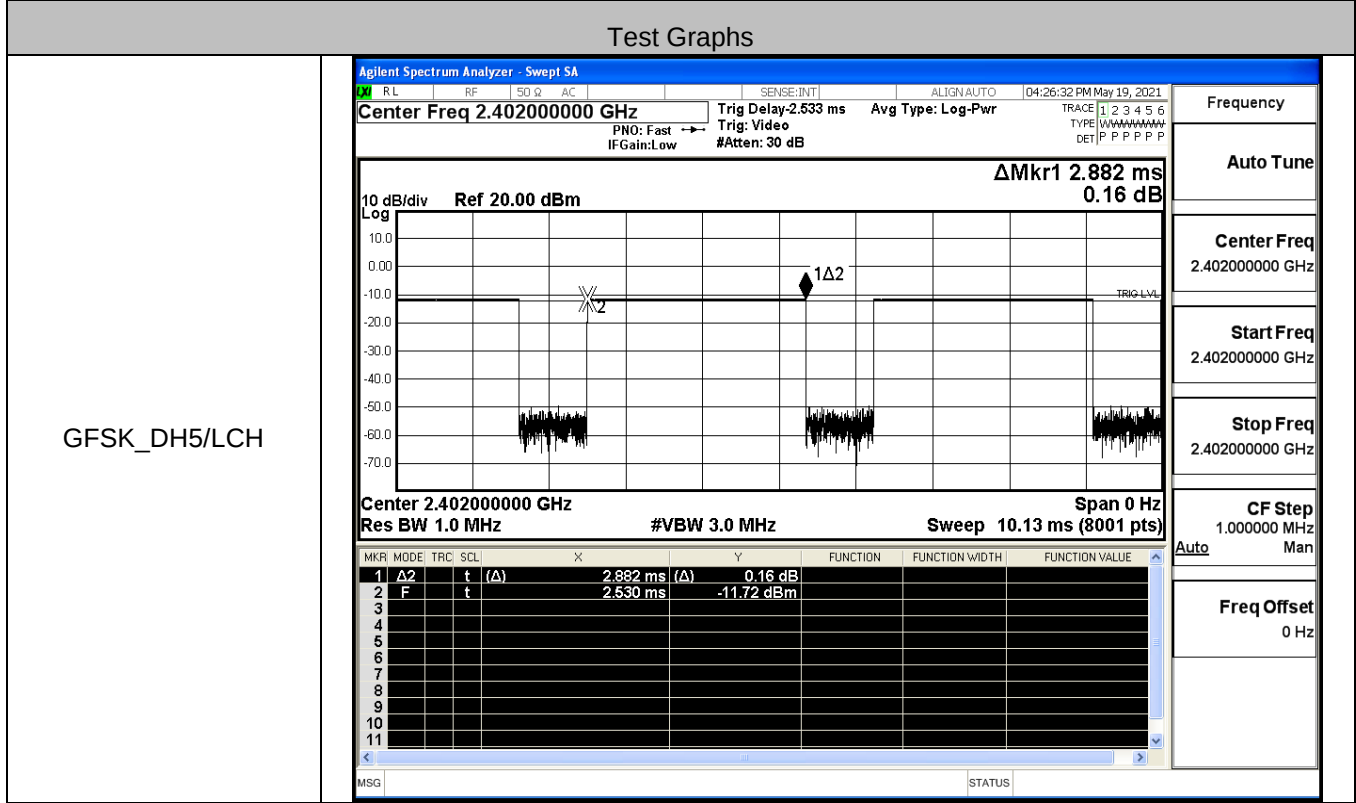
Auto Tune

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

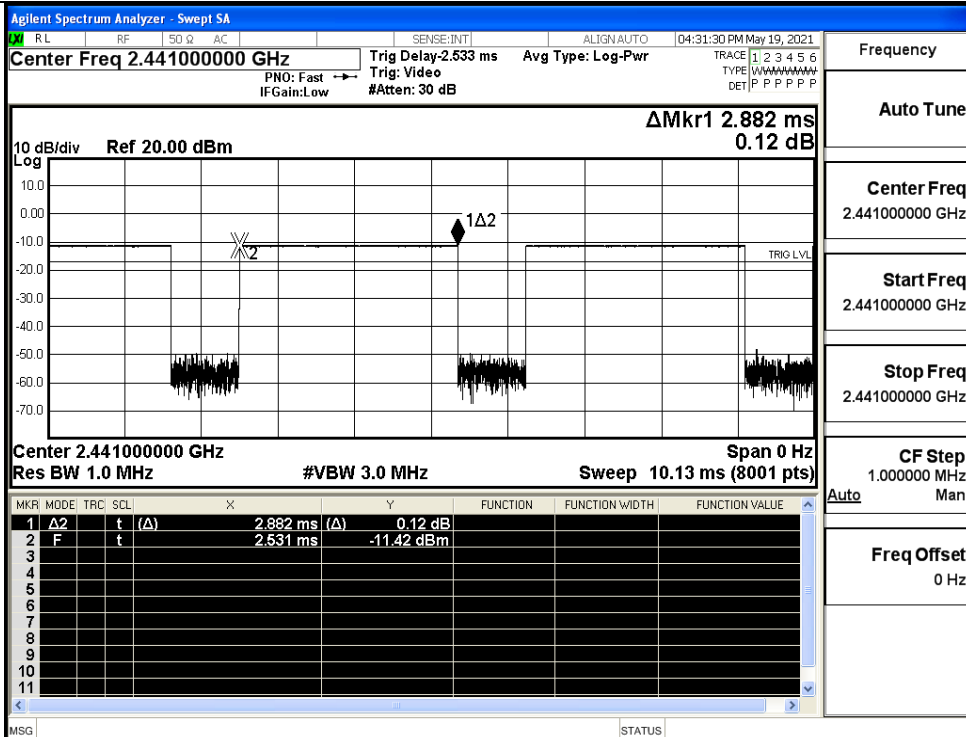
8DPSK/Hop



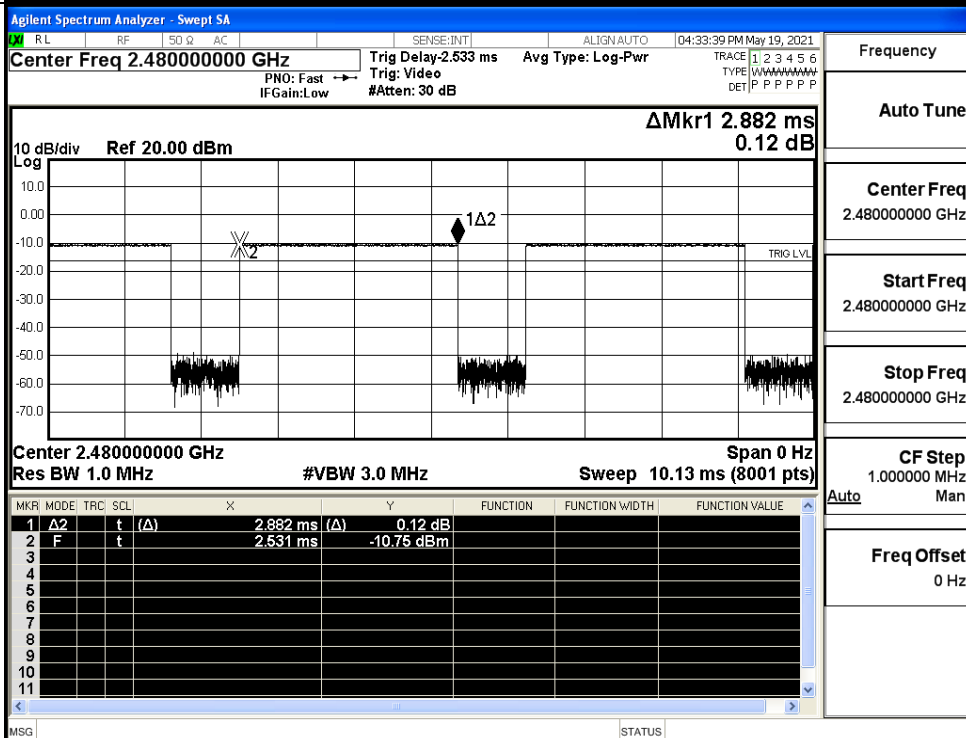
| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|---------------|-----------|---------|
| GFSK          | DH5    | LCH     | 2.88                       | 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                 | 0.308         | 0.4       | PASS    |
|               | 2DH5   | MCH     | 2.88                       | 106.7                 | 0.308         | 0.4       | PASS    |
|               | 2DH5   | HCH     | 2.88                       | 106.7                 | 0.308         | 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    |



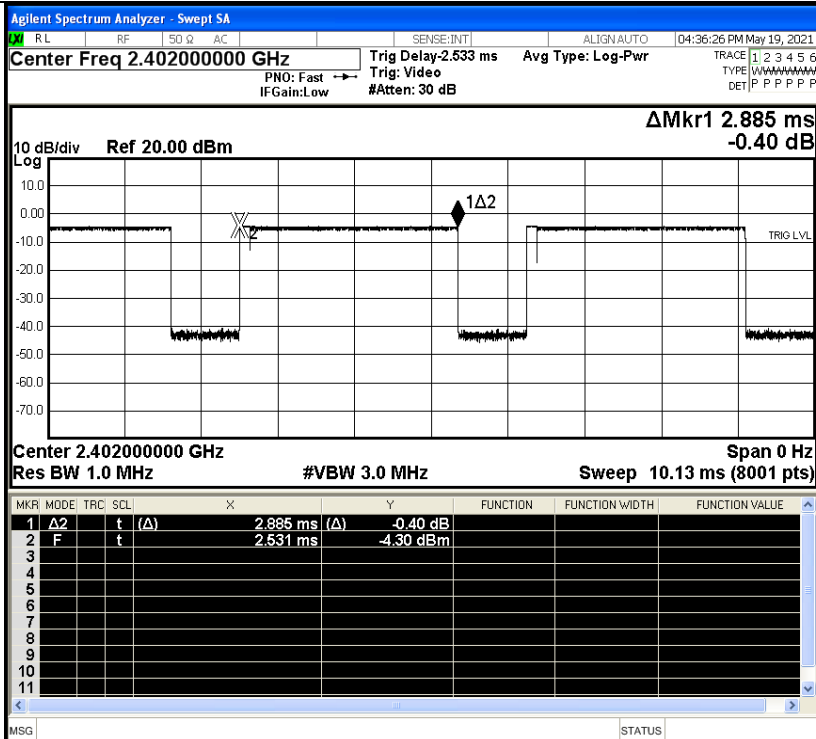
GFSK\_DH5/MCH



GFSK\_DH5/HCH



$\pi/4$ DQPSK  
\_2DH5/LCH

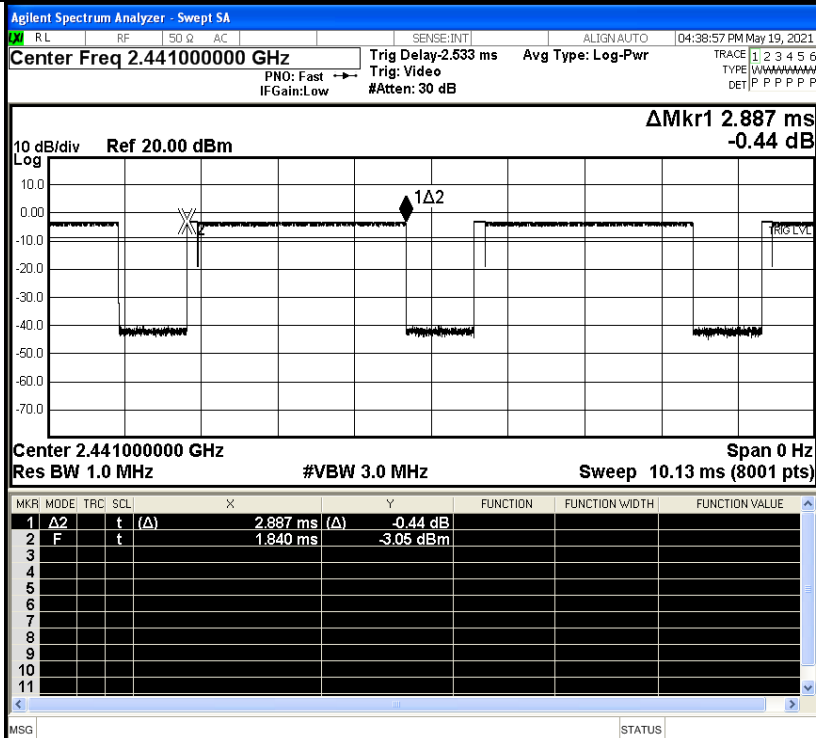


Frequency

Auto Tune

Center Freq  
2.402000000 GHzStart Freq  
2.402000000 GHzStop Freq  
2.402000000 GHzCF Step  
1.000000 MHz  
Auto ManFreq Offset  
0 Hz

$\pi/4$ DQPSK  
\_2DH5/MCH

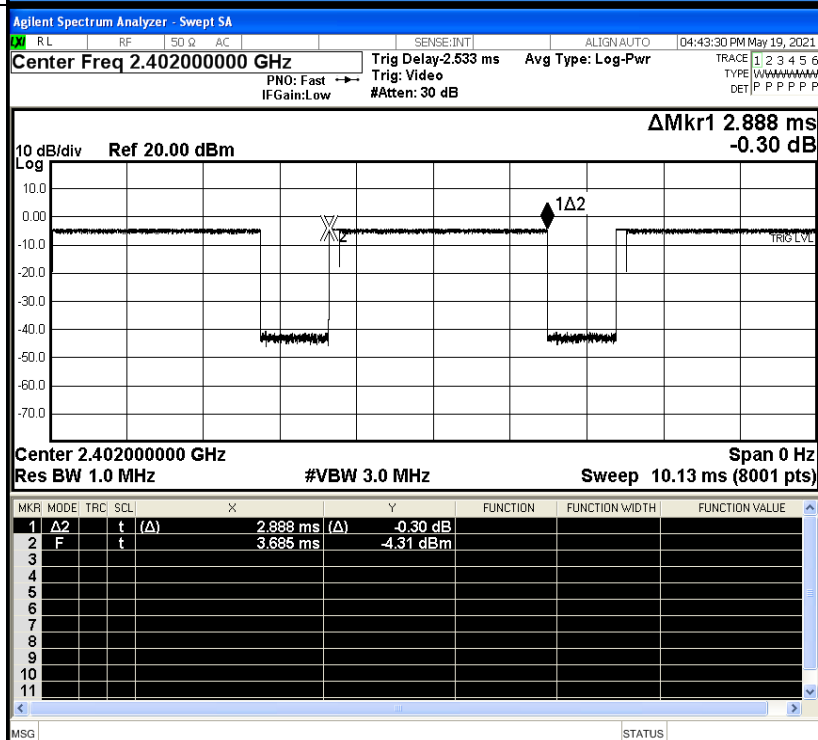


Frequency

Auto Tune

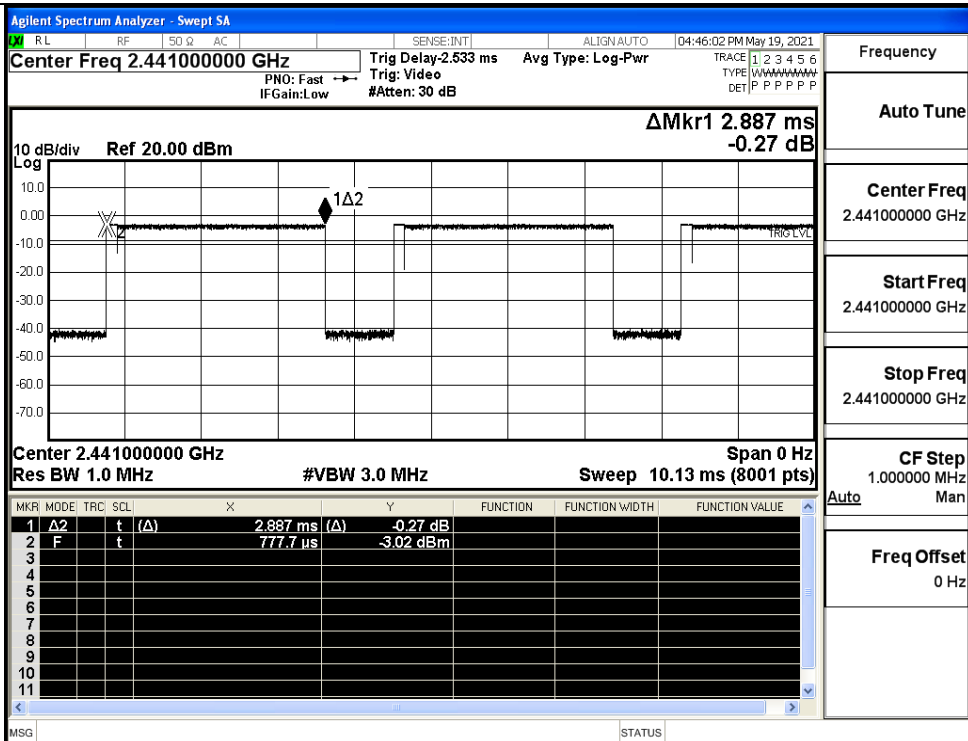
Center Freq  
2.441000000 GHzStart Freq  
2.441000000 GHzStop Freq  
2.441000000 GHzCF Step  
1.000000 MHz  
Auto ManFreq Offset  
0 Hz

8DPSK\_3DH5/LCH

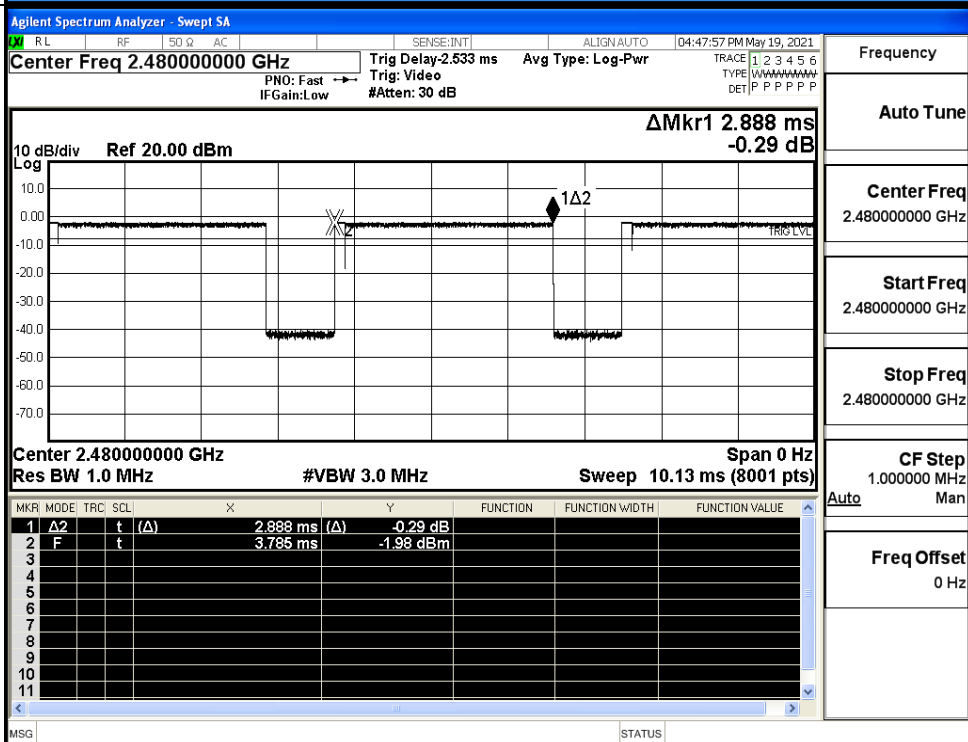


|             |                 |
|-------------|-----------------|
| Frequency   |                 |
| Auto Tune   |                 |
| Center Freq | 2.402000000 GHz |
| Start Freq  | 2.402000000 GHz |
| Stop Freq   | 2.402000000 GHz |
| CF Step     | 1.000000 MHz    |
| Auto        | Man             |
| Freq Offset | 0 Hz            |

8DPSK\_3DH5/MCH



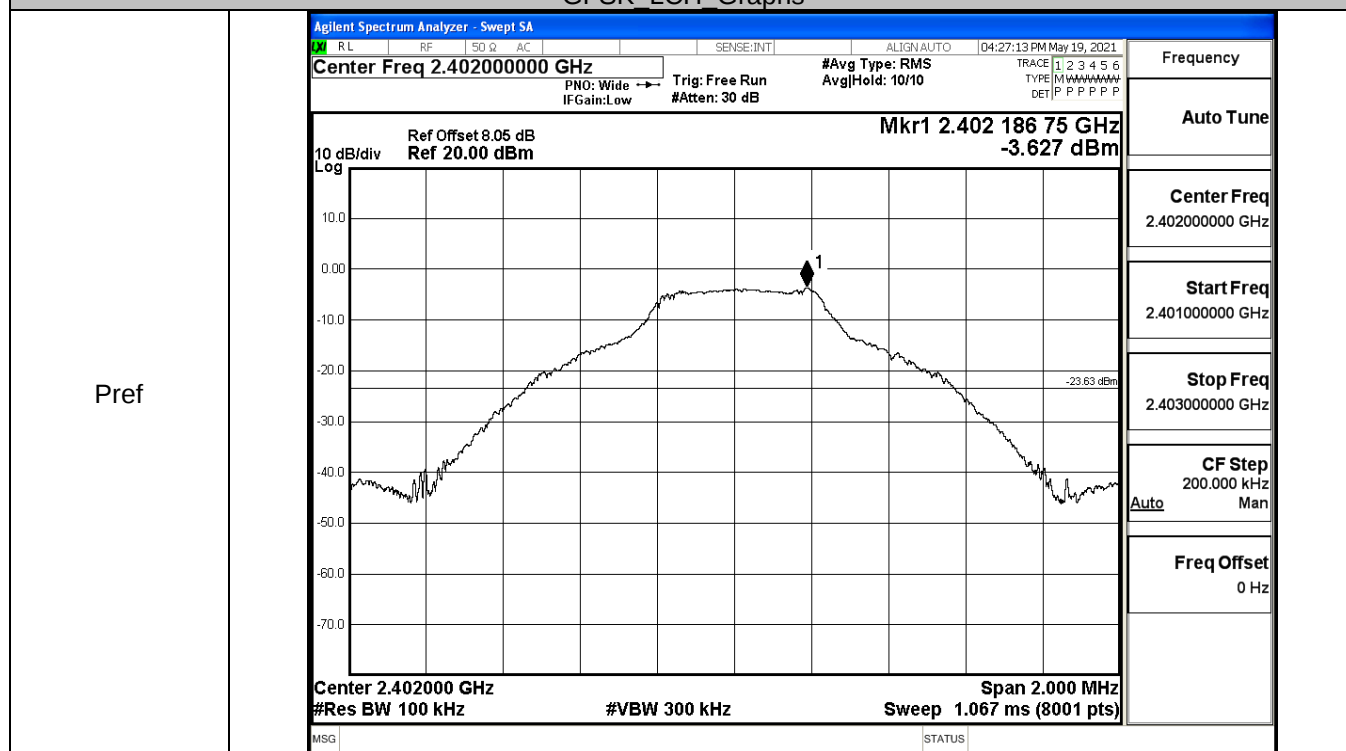
8DPSK\_3DH5/HCH



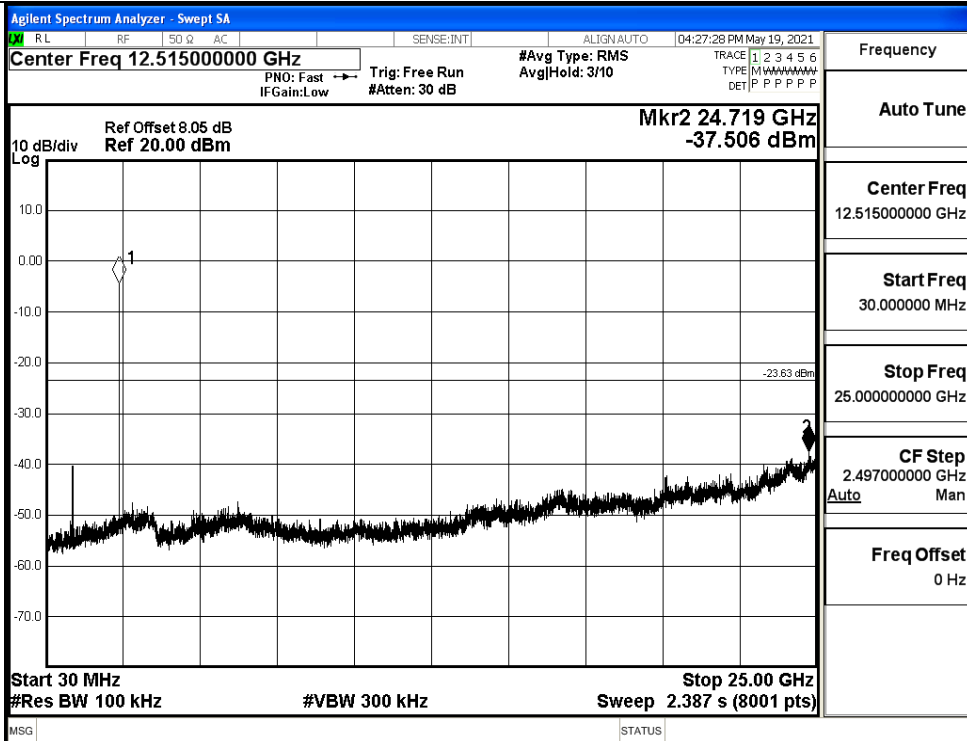
## A.6 RF Conducted Spurious Emissions

| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | -3.627     | -37.506          | -23.627     | PASS    |
|               | MCH     | 4.8        | -37.743          | -15.200     | PASS    |
|               | HCH     | -2.65      | -37.441          | -22.650     | PASS    |
| $\pi/4$ DQPSK | LCH     | 3.597      | -38.168          | -16.403     | PASS    |
|               | MCH     | 4.747      | -37.548          | -15.253     | PASS    |
|               | HCH     | -2.931     | -37.880          | -22.931     | PASS    |
| 8DPSK         | LCH     | 3.717      | -37.364          | -16.283     | PASS    |
|               | MCH     | 4.914      | -37.978          | -15.086     | PASS    |
|               | HCH     | 5.938      | -37.555          | -14.062     | PASS    |

GFSK LCH Graphs

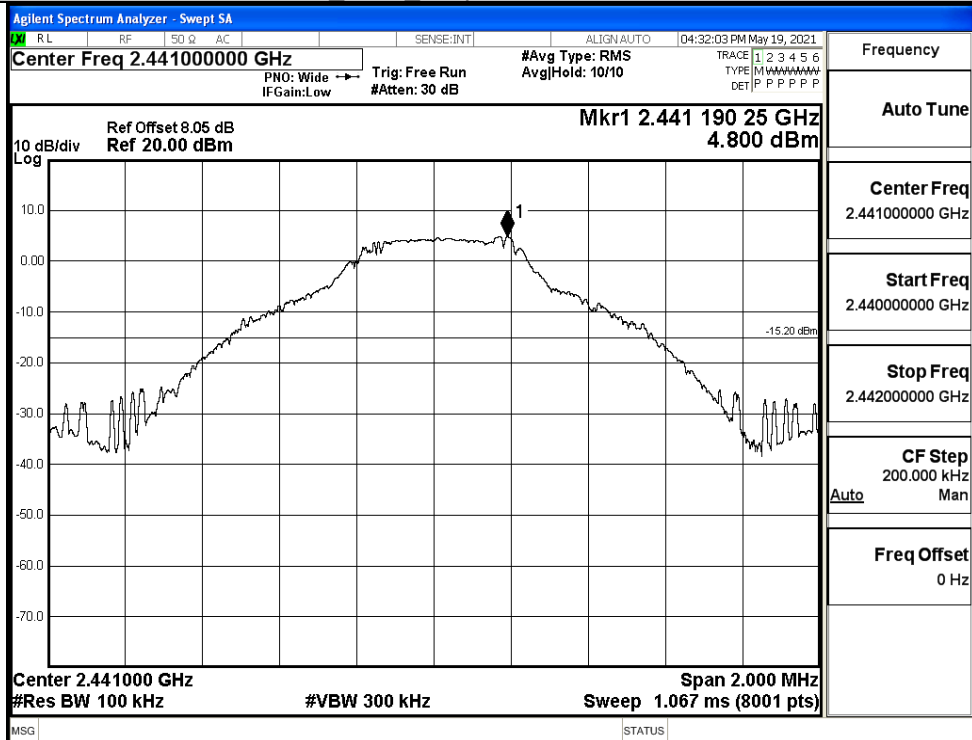


Puw

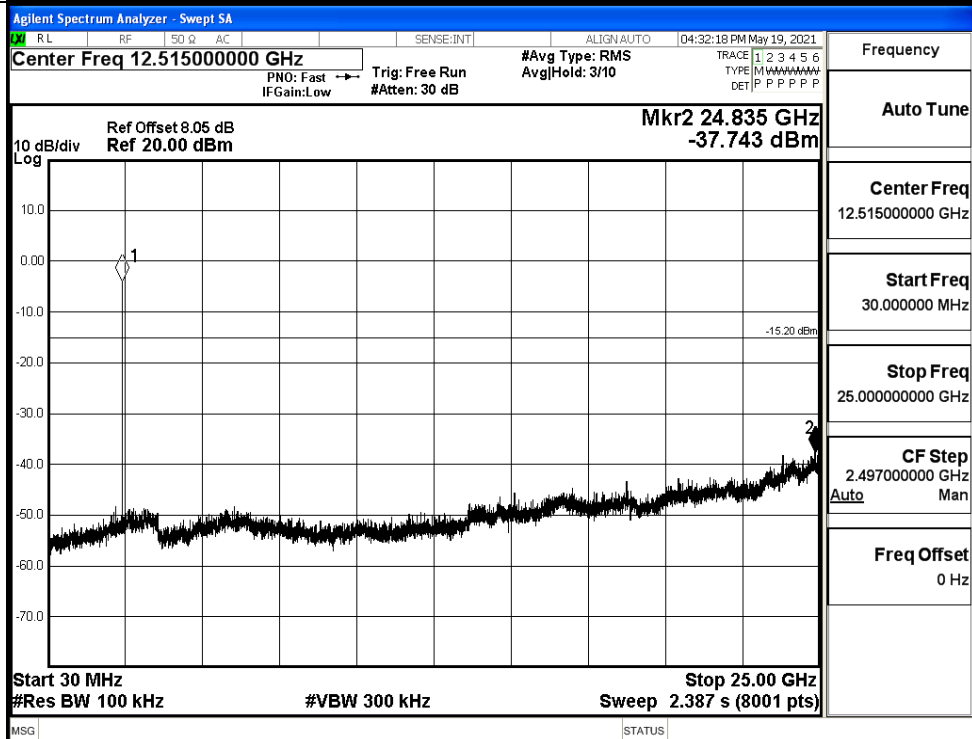


## GFSK\_MCH\_Graphs

Pref

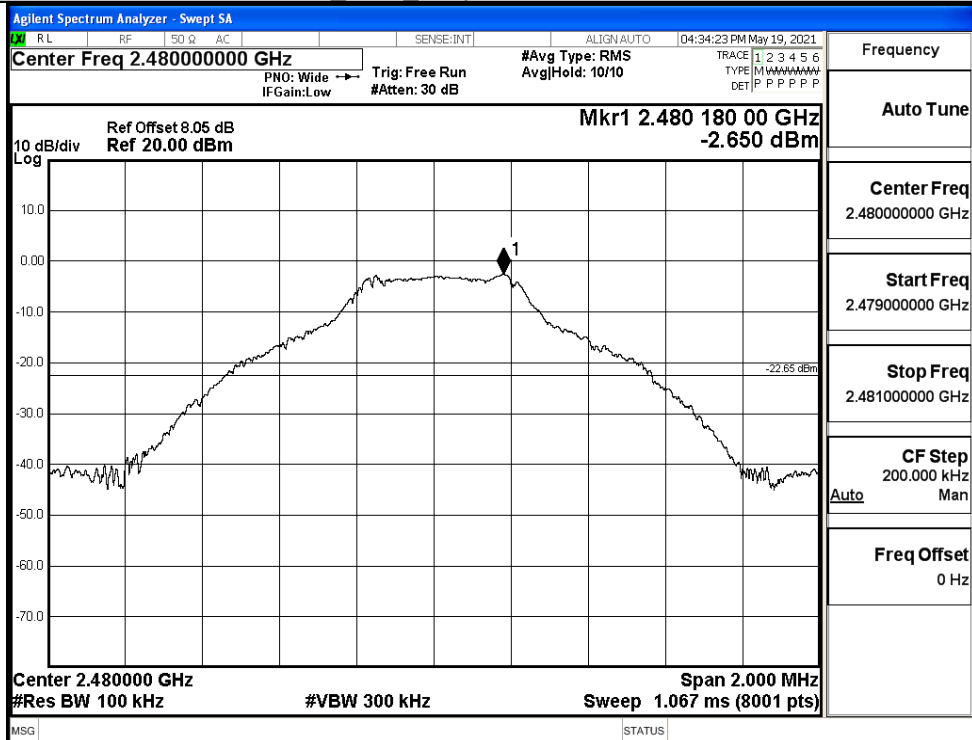


Puw

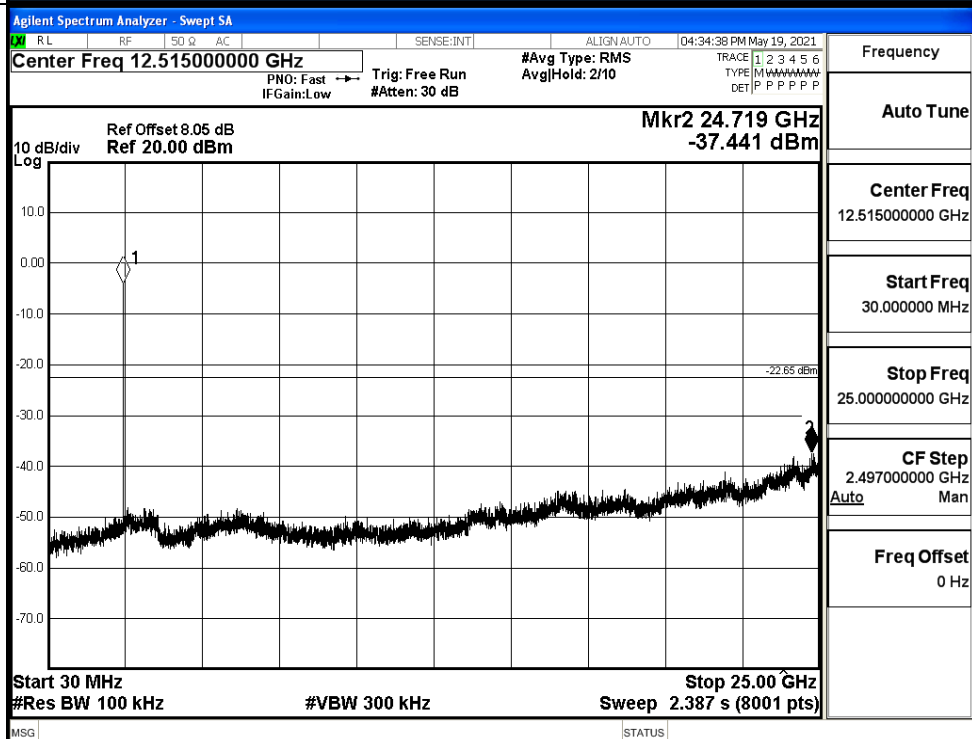


## GFSK HCH\_Graphs

Pref

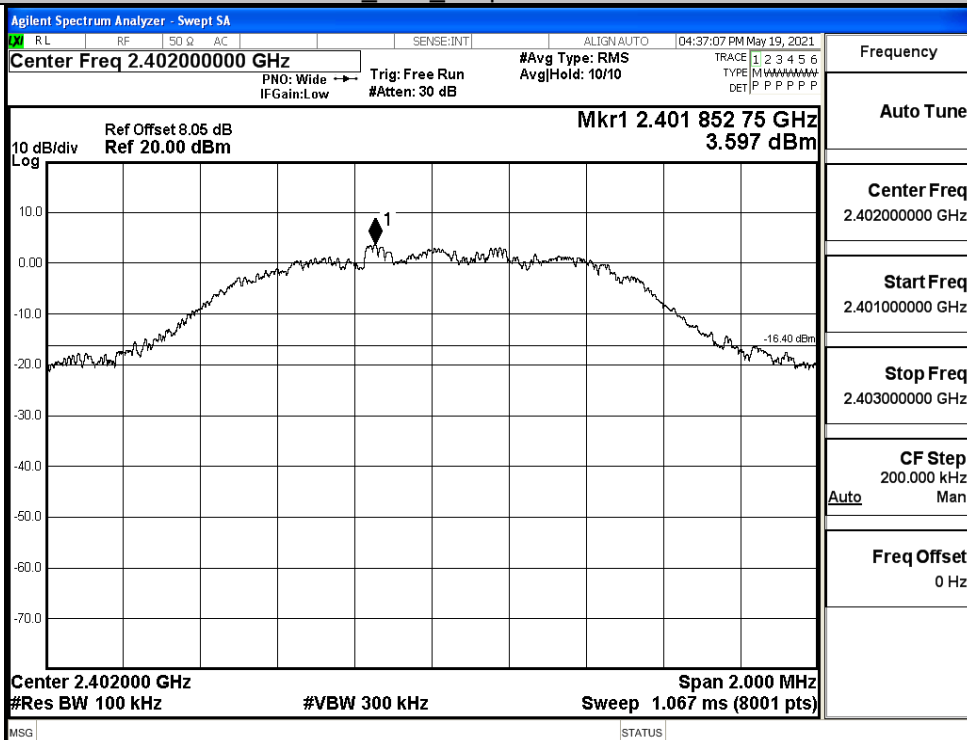


Puw

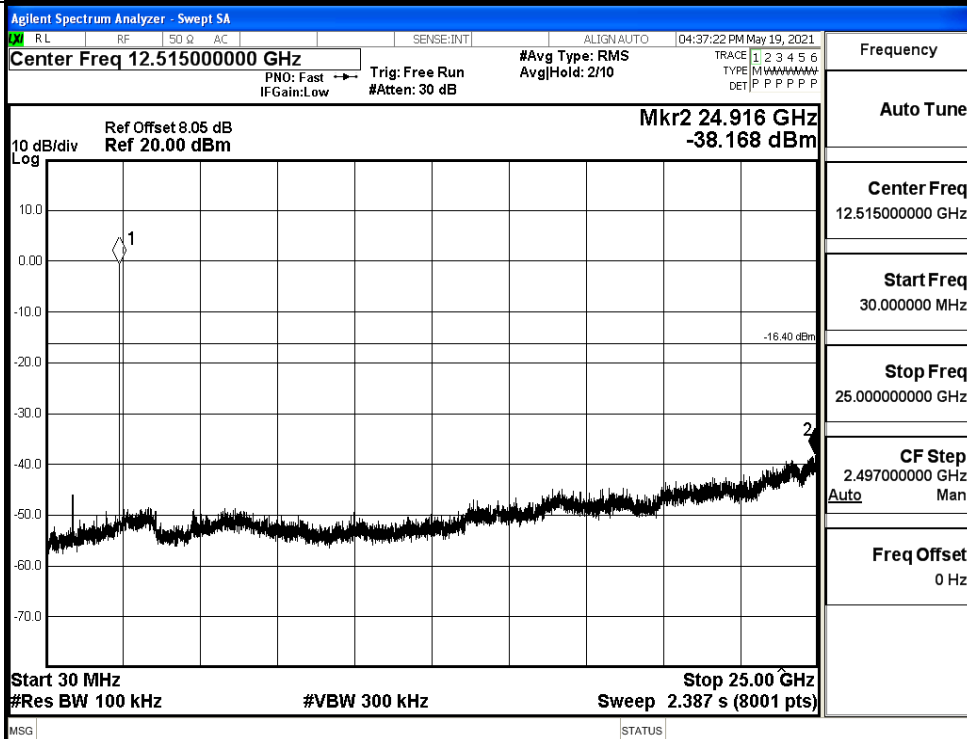


$\pi$ /4DQPSK\_LCH\_Graphs

Pref

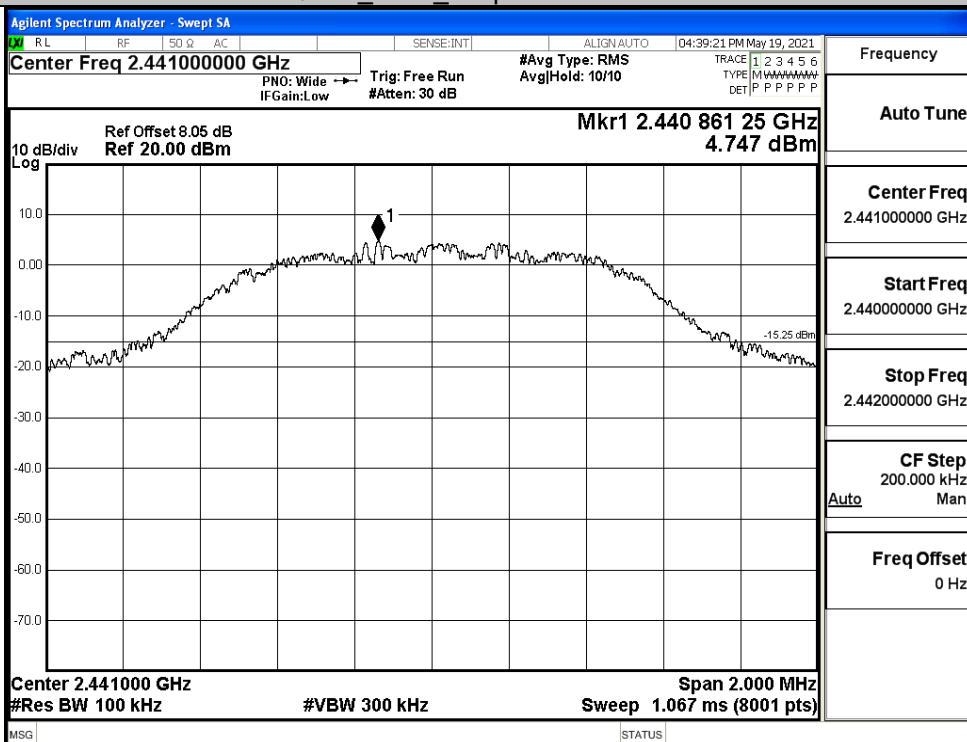


Puw

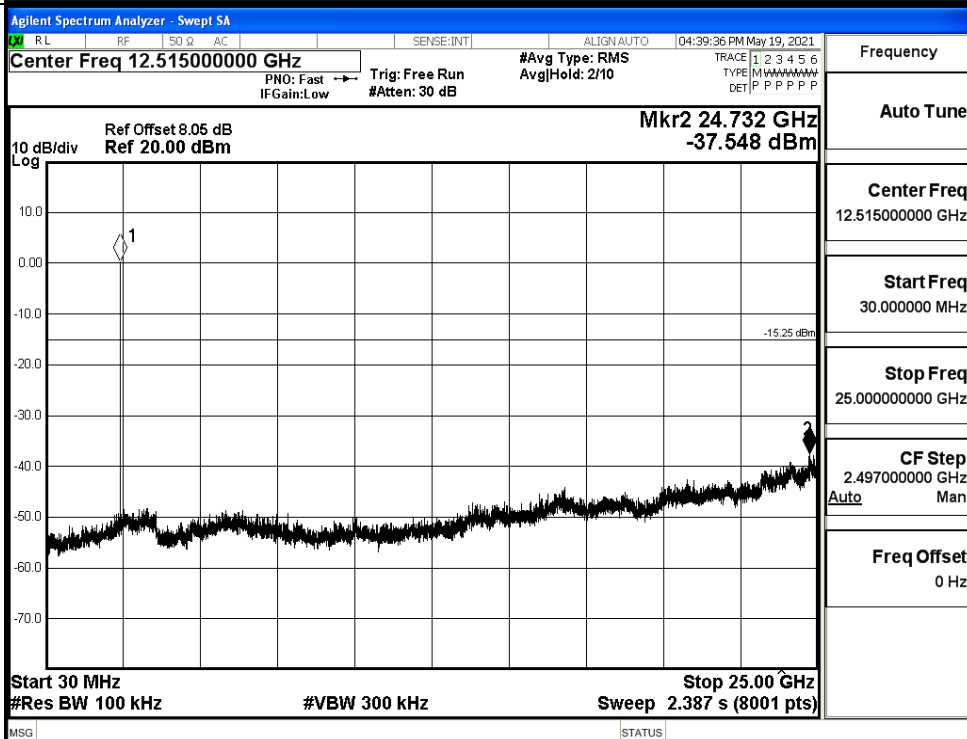


$\pi$ /4DQPSK\_MCH\_Graphs

Pref

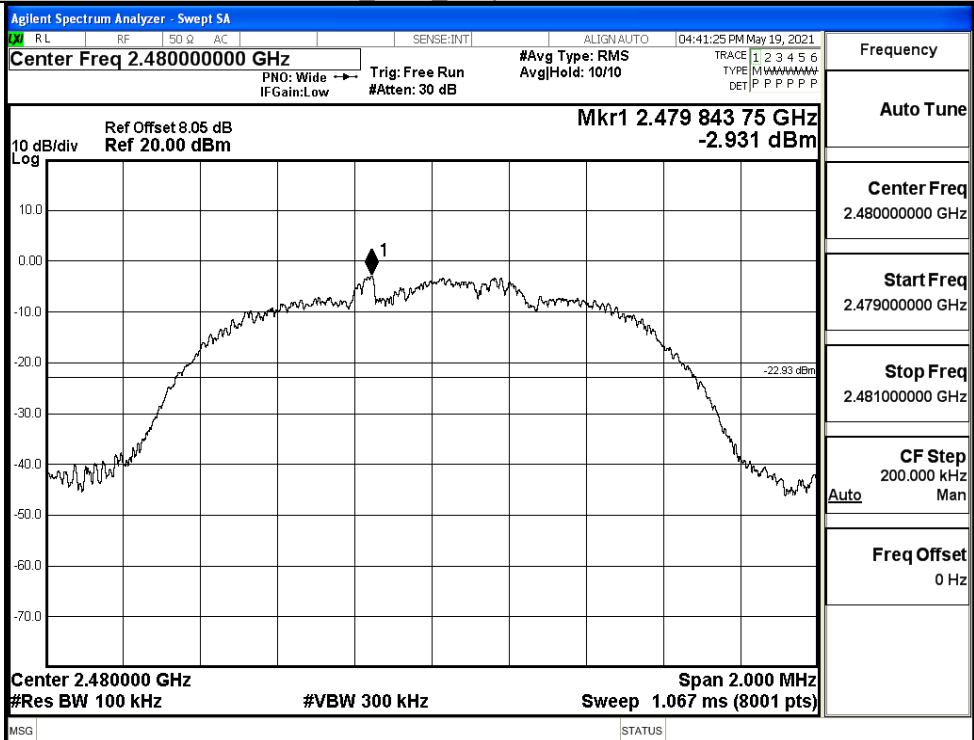


Puw

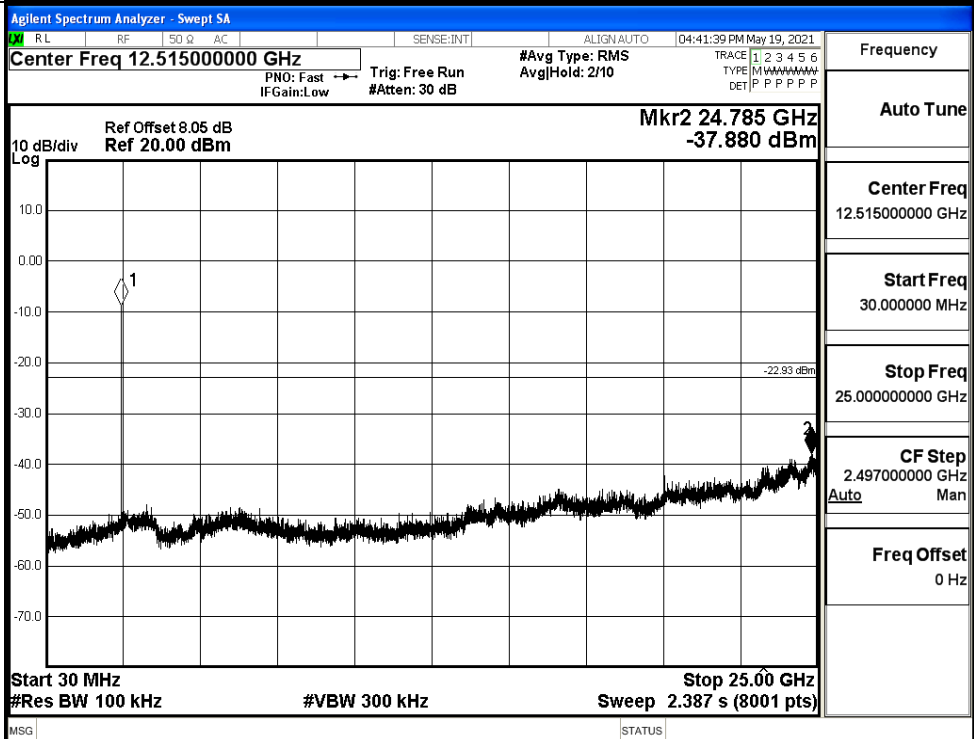


$\pi/4$ DQPSK\_HCH\_Graphs

Pref

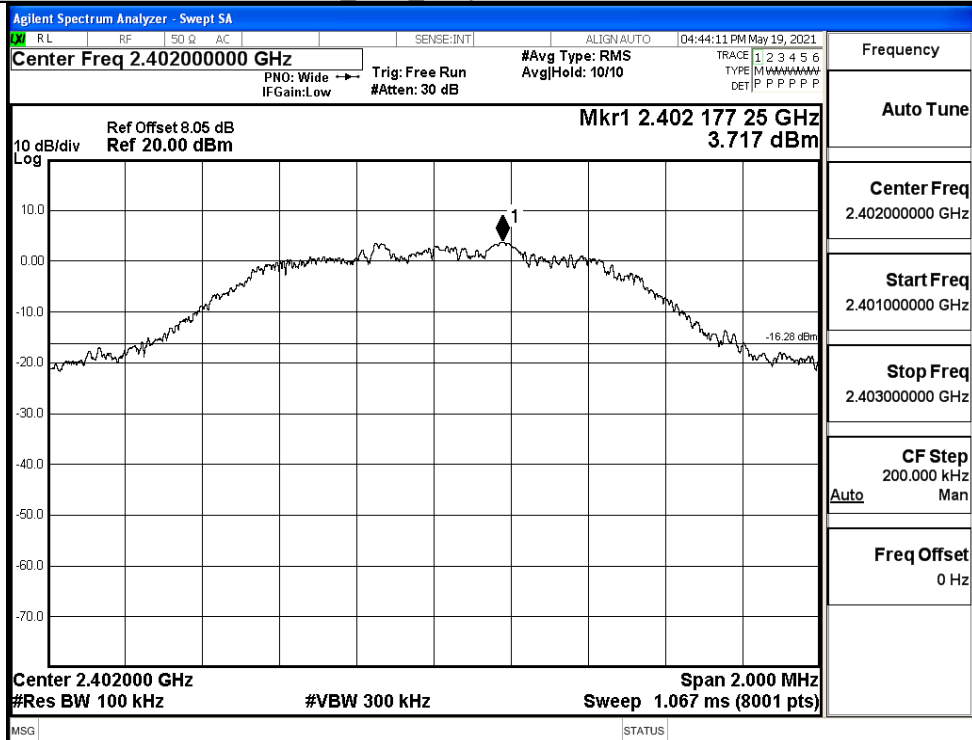


Puw

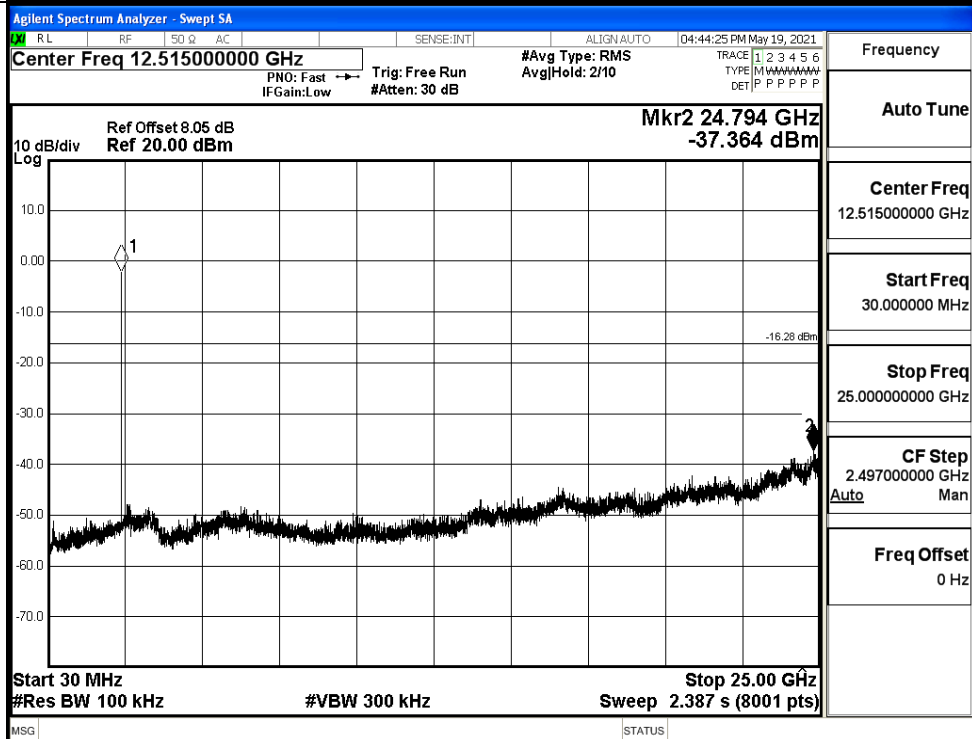


## 8DPSK\_LCH\_Graphs

Pref

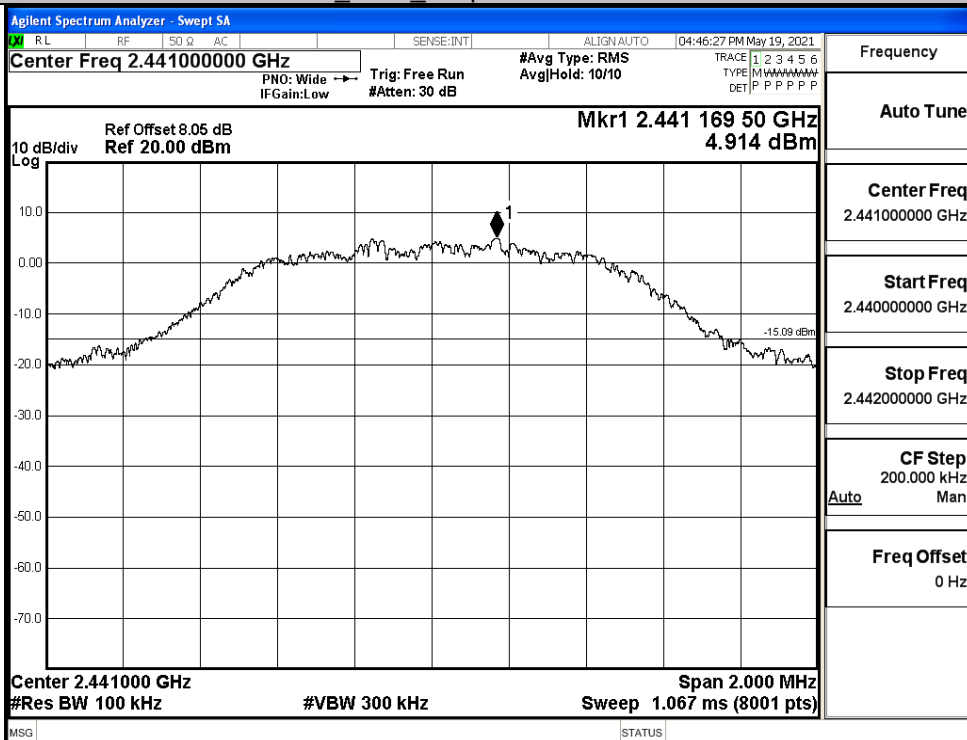


Puw

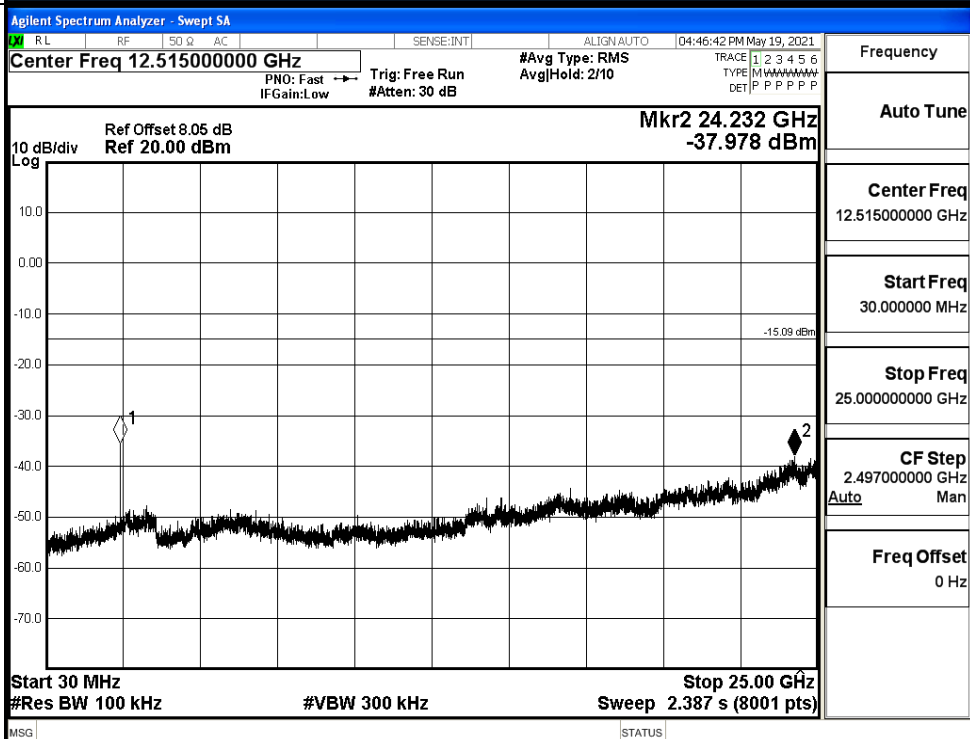


## 8DPSK\_MCH\_Graphs

Pref

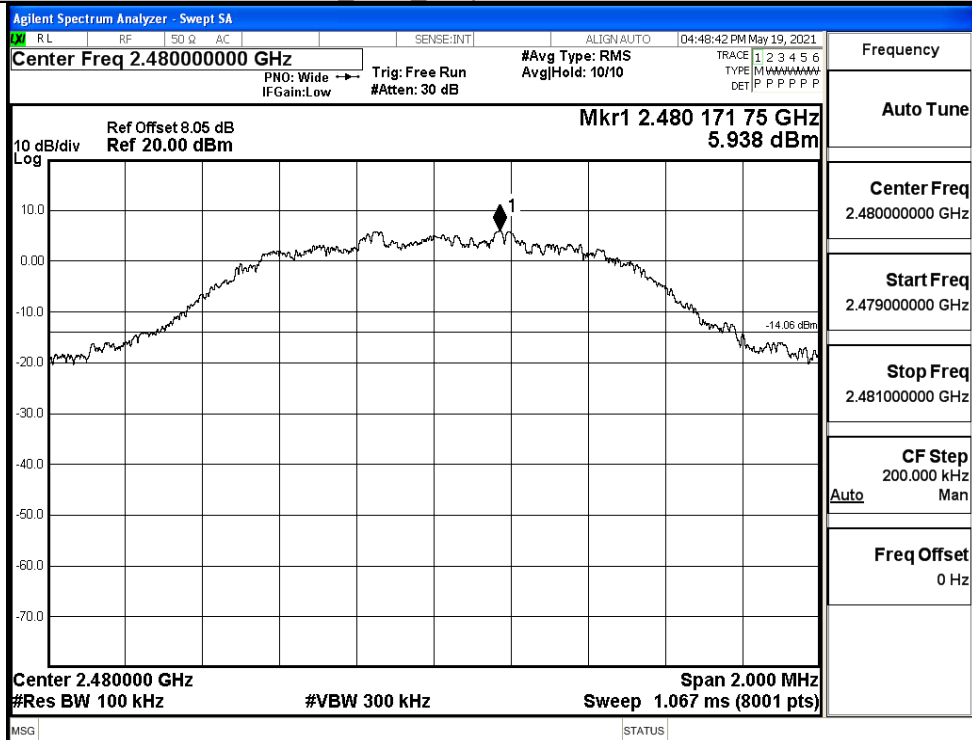


Puw

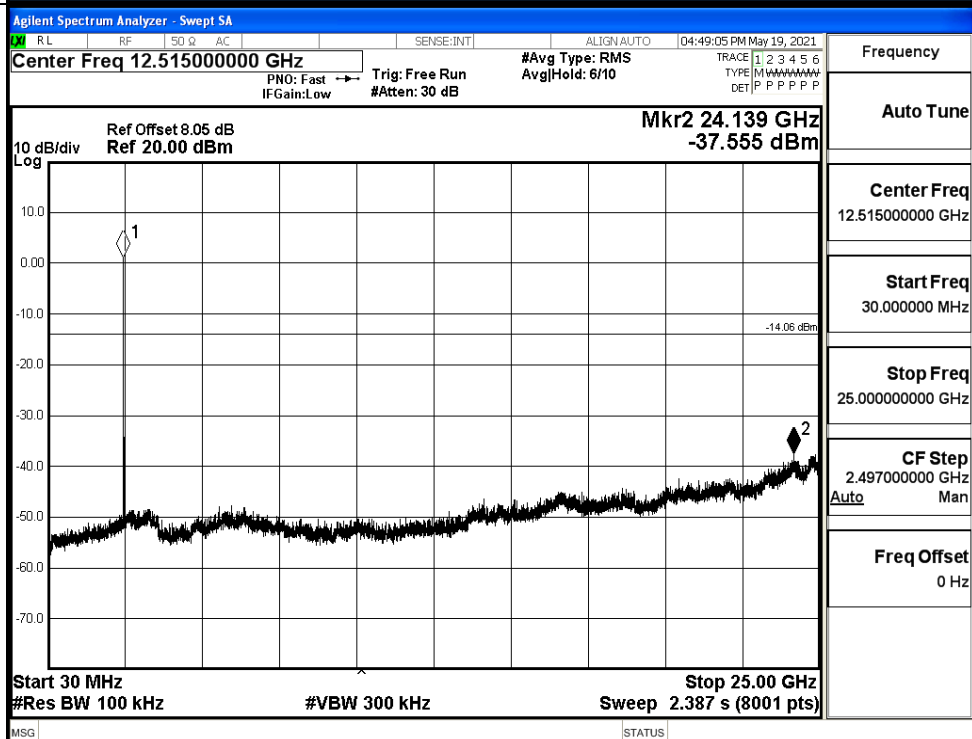


## 8DPSK\_HCH\_Graphs

Pref



Puw

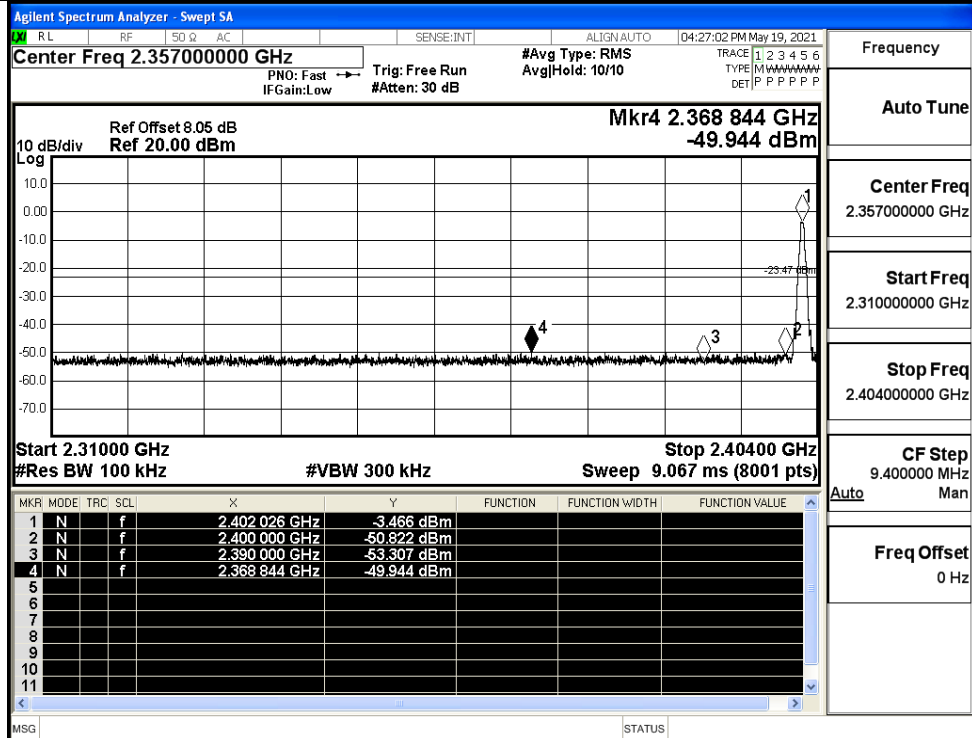


## A.7 Band-edge for RF Conducted Emissions

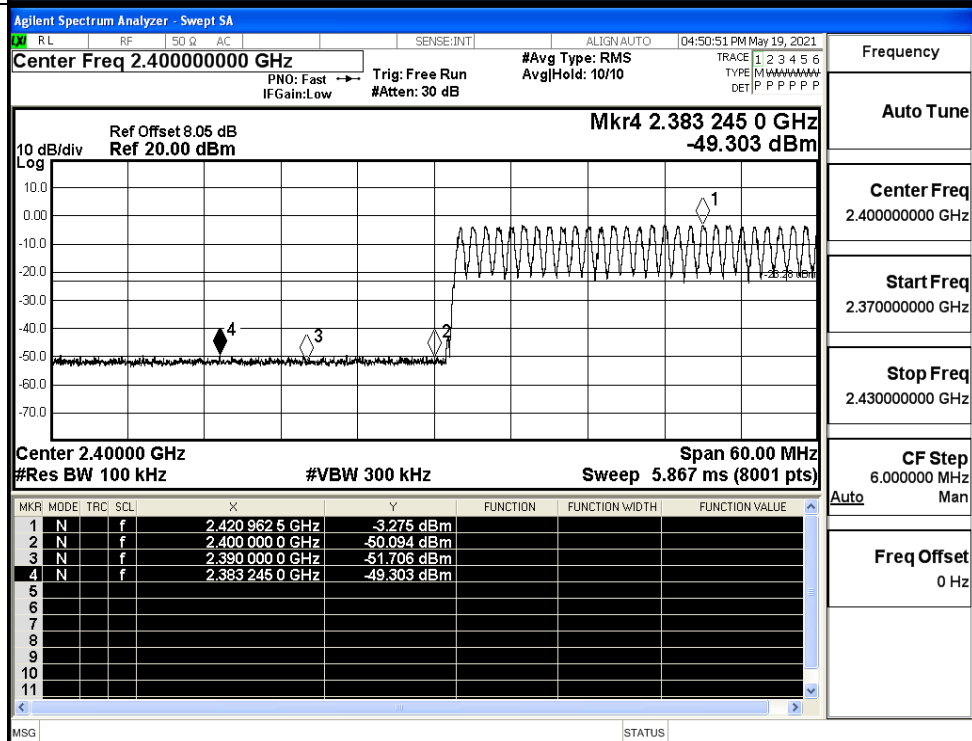
| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | -3.466              | Off               | -49.944                  | -23.47      | PASS    |
|               |         |                         | -3.275              | On                | -49.303                  | -23.28      | PASS    |
|               | HCH     | 2480                    | -2.071              | Off               | -48.709                  | -22.07      | PASS    |
|               |         |                         | -2.603              | On                | -48.503                  | -22.6       | PASS    |
| $\pi/4$ DQPSK | LCH     | 2402                    | 2.679               | Off               | -49.145                  | -17.32      | PASS    |
|               |         |                         | -2.915              | On                | -49.193                  | -22.92      | PASS    |
|               | HCH     | 2480                    | 5.771               | Off               | -40.844                  | -14.23      | PASS    |
|               |         |                         | -2.471              | On                | -48.777                  | -22.47      | PASS    |
| 8DPSK         | LCH     | 2402                    | 3.787               | Off               | -49.285                  | -16.21      | PASS    |
|               |         |                         | -2.851              | On                | -49.050                  | -22.85      | PASS    |
|               | HCH     | 2480                    | 6.067               | Off               | -39.040                  | -13.93      | PASS    |
|               |         |                         | -2.551              | On                | -48.273                  | -22.55      | PASS    |

## Test Graphs

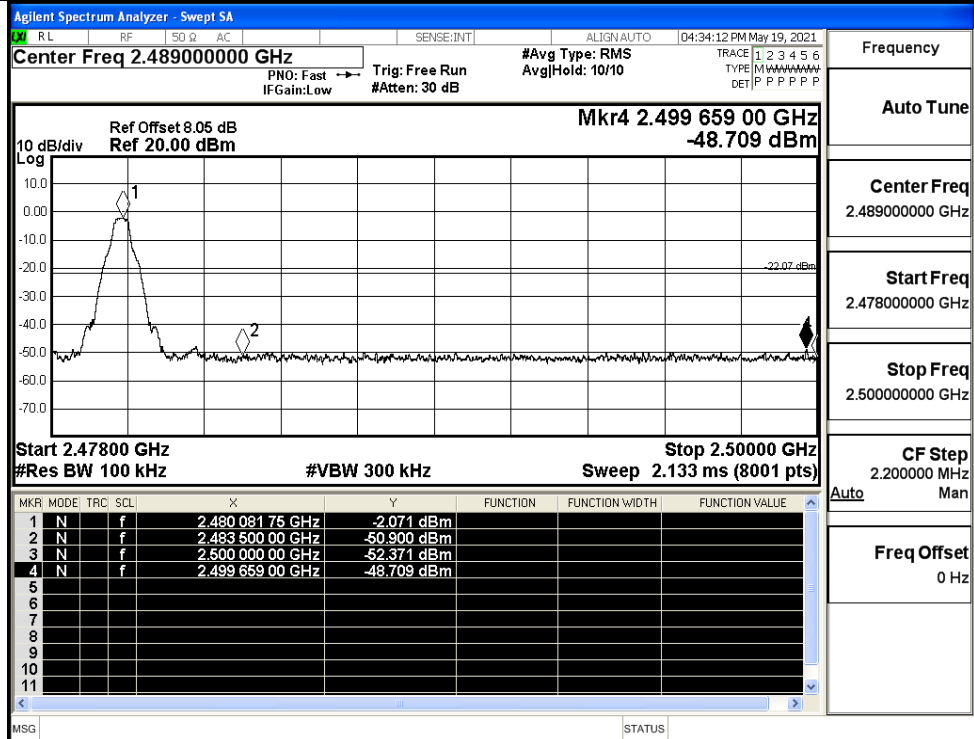
GFSK/LCH/No Hop



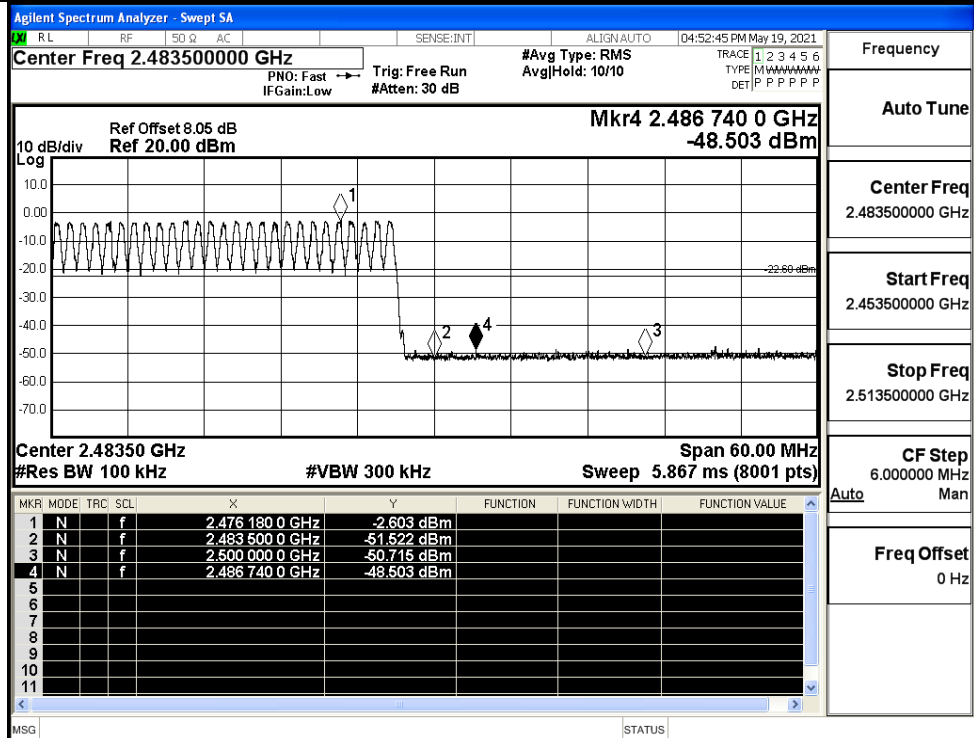
GFSK/LCH/Hop



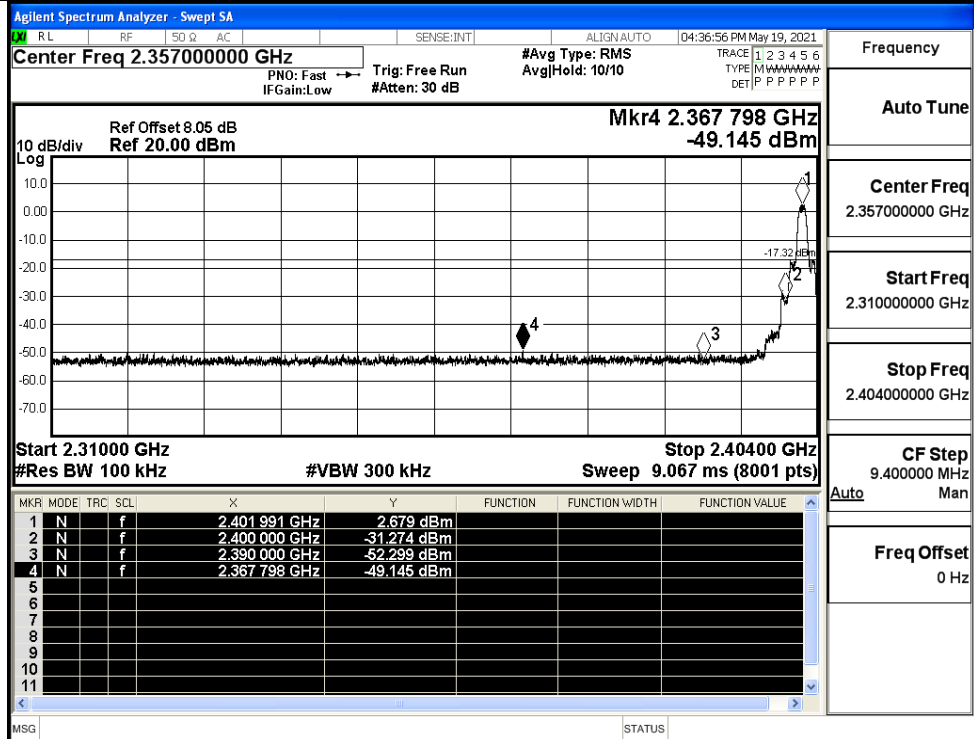
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq  
2.357000000 GHz

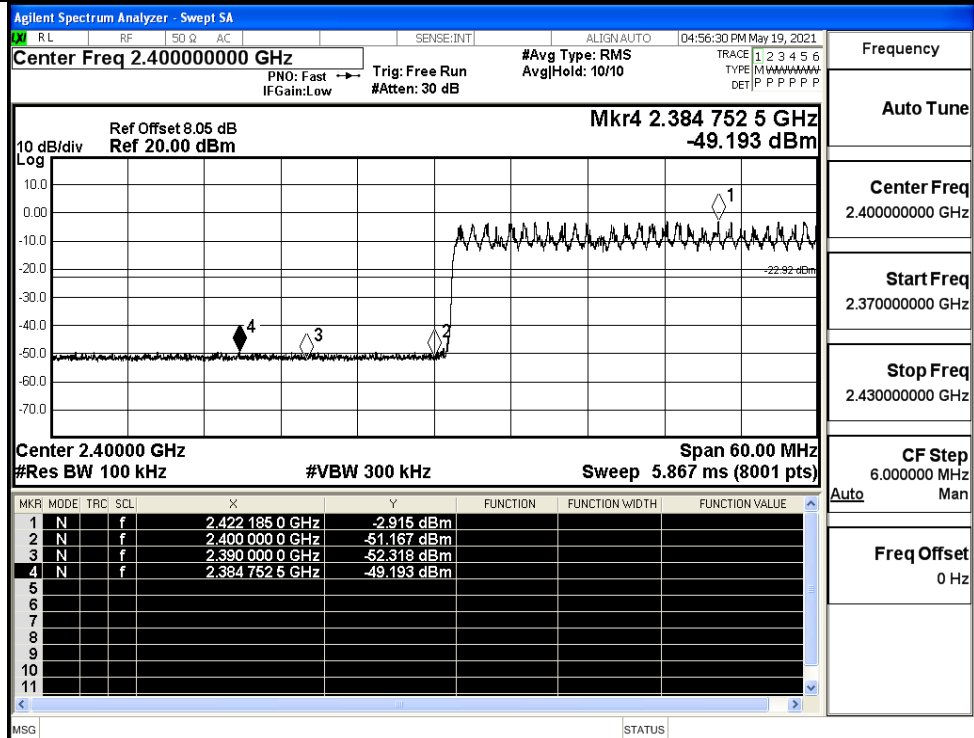
Start Freq  
2.310000000 GHz

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

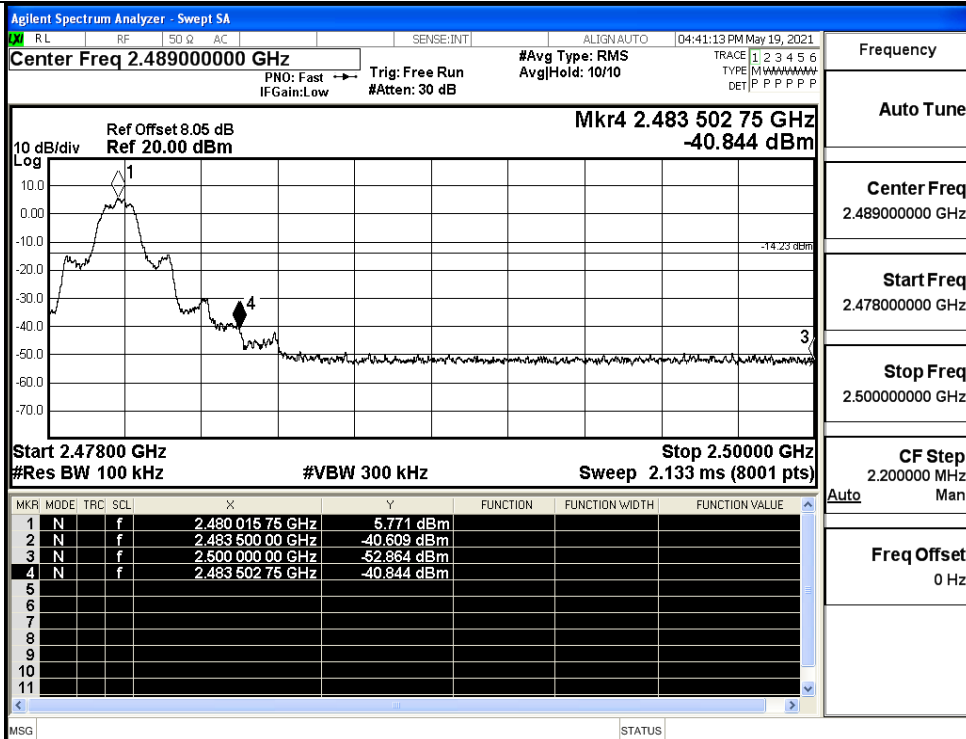
Start Freq  
2.370000000 GHz

Stop Freq  
2.430000000 GHz

CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

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

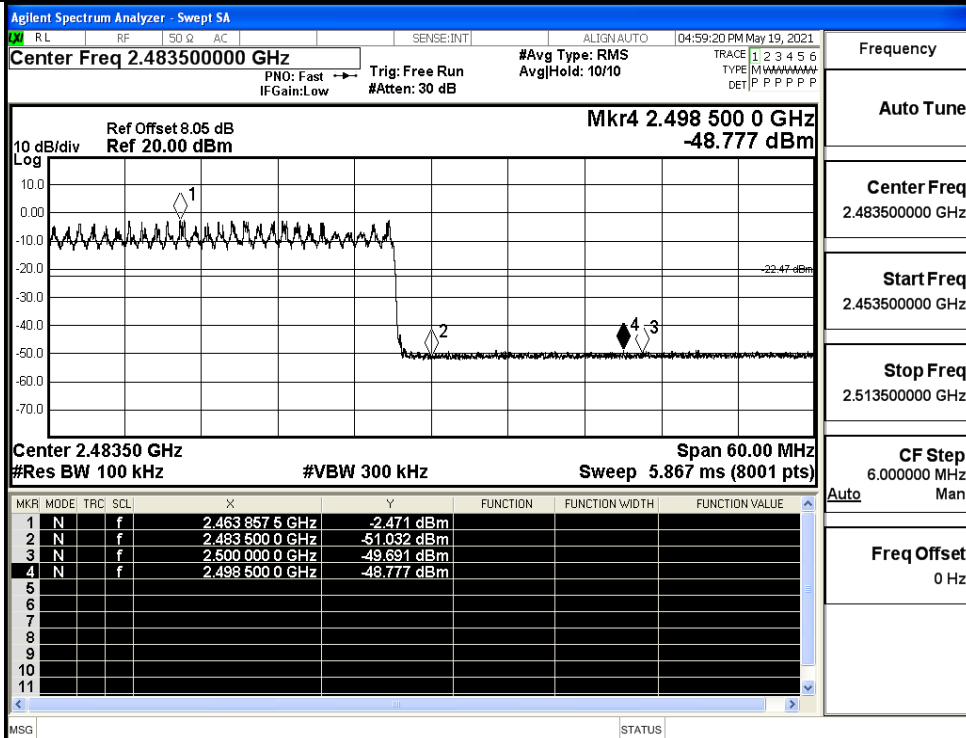


Frequency

Auto Tune

Center Freq  
2.489000000 GHzStart Freq  
2.478000000 GHzStop Freq  
2.500000000 GHzCF Step  
2.200000 MHz  
Auto ManFreq Offset  
0 Hz

$\pi/4$ DQPSK/HCH/Hop

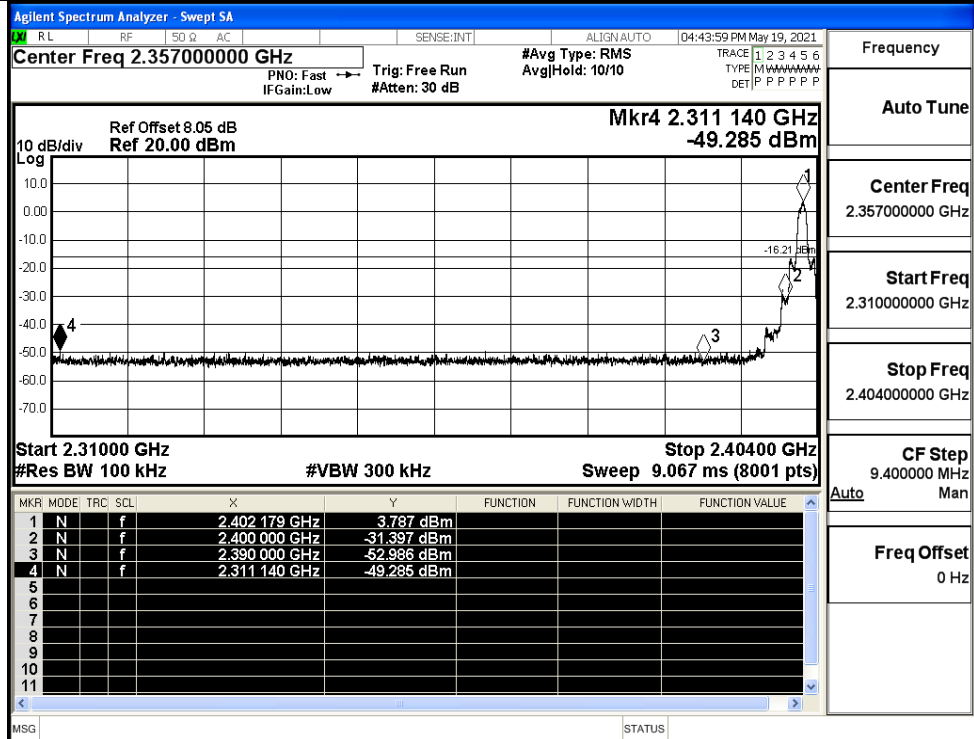


Frequency

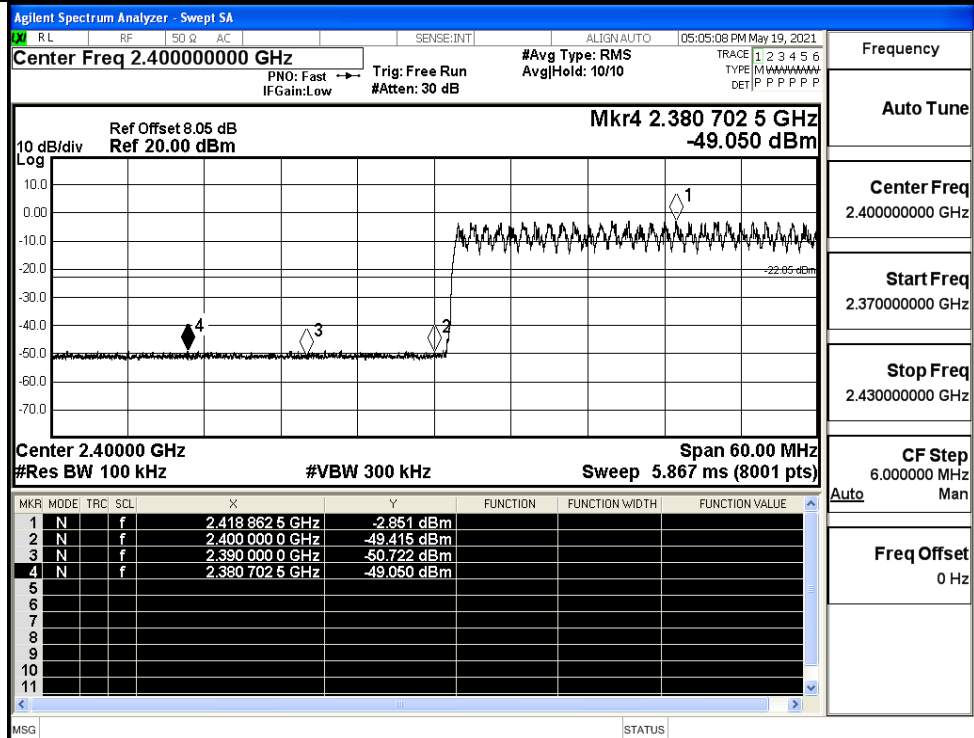
Auto Tune

Center Freq  
2.483500000 GHzStart Freq  
2.453500000 GHzStop Freq  
2.513500000 GHzCF Step  
6.000000 MHz  
Auto ManFreq Offset  
0 Hz

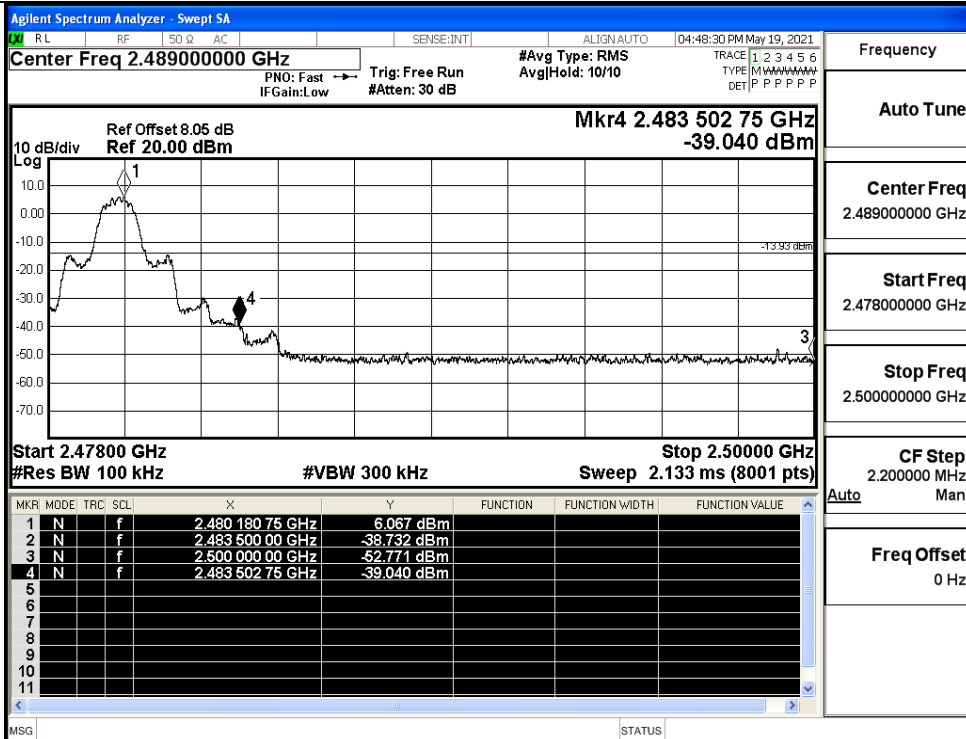
8DPSK/LCH/No Hop



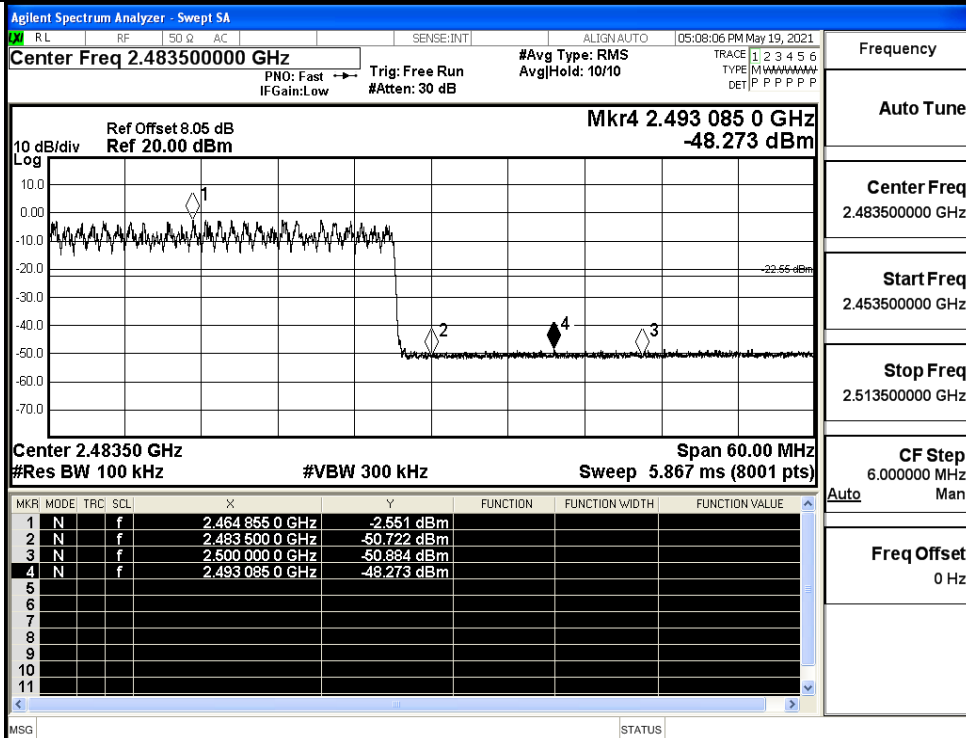
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



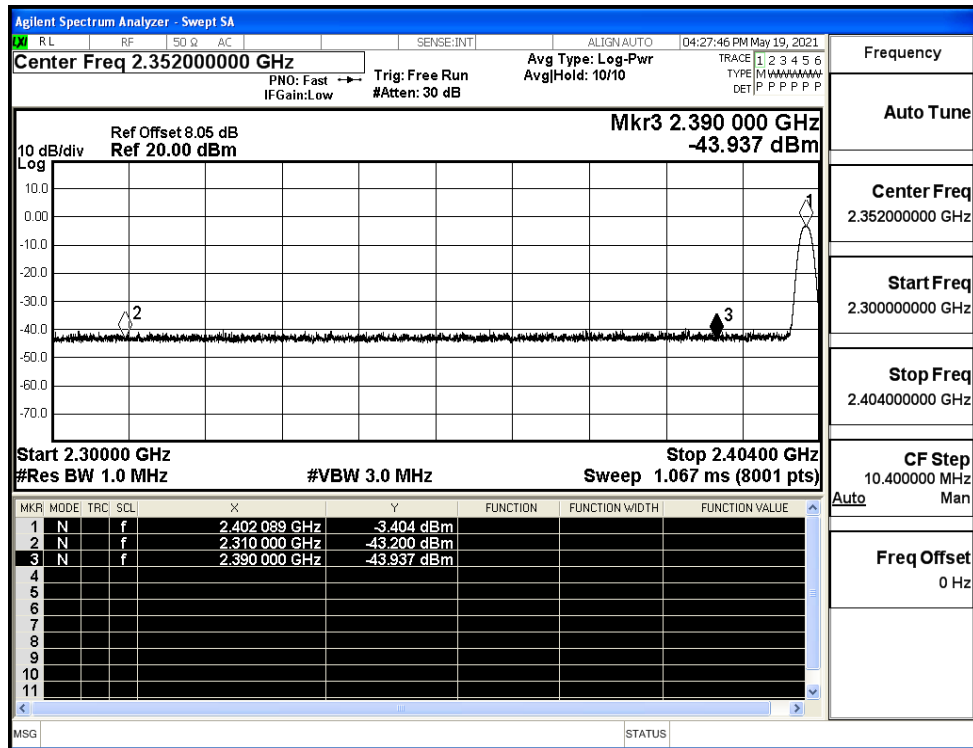
8DPSK/HCH/Hop



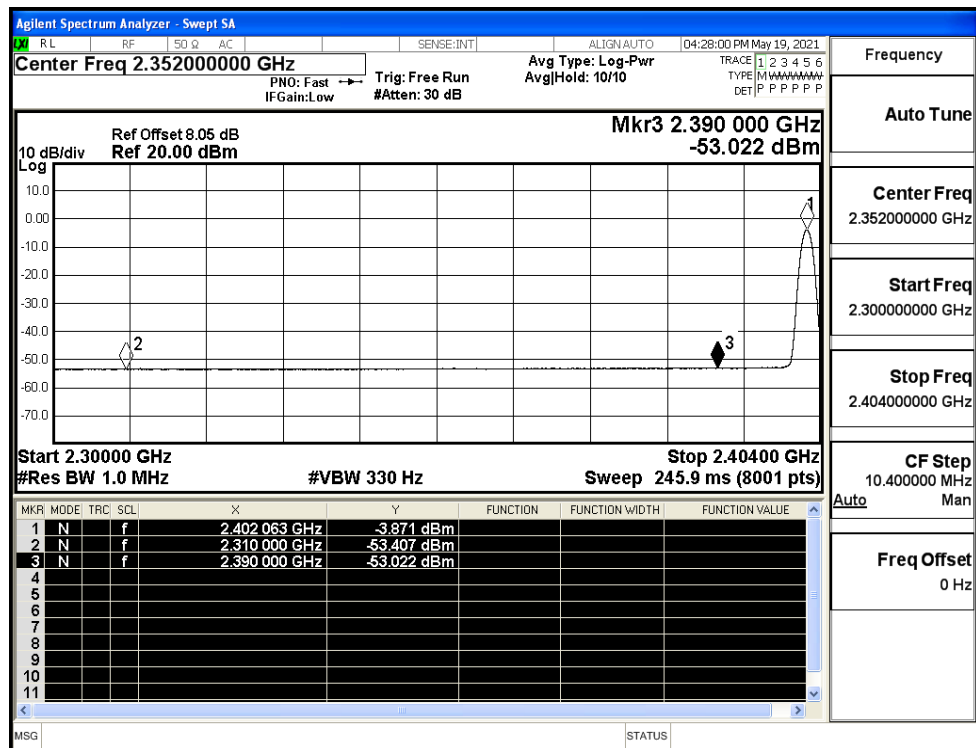
## A.8 Restrict-band band-edge measurements

| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -43.20      | 3.3  | 0             | 55.33      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.41      | 3.3  | 0             | 45.12      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.94      | 3.3  | 0             | 54.59      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.02      | 3.3  | 0             | 45.51      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -39.79      | 3.3  | 0             | 58.74      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.48      | 3.3  | 0             | 46.05      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -41.79      | 3.3  | 0             | 56.74      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.40      | 3.3  | 0             | 46.13      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -43.71      | 3.3  | 0             | 54.82      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.39      | 3.3  | 0             | 45.14      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.66      | 3.3  | 0             | 54.87      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -52.93      | 3.3  | 0             | 45.60      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -42.47      | 3.3  | 0             | 56.06      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.49      | 3.3  | 0             | 46.04      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -42.21      | 3.3  | 0             | 56.32      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.40      | 3.3  | 0             | 46.13      | AV       | 54             | PASS    |
| 8DPSK         | Off     | 2310.0 | -43.11      | 3.3  | 0             | 55.42      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.40      | 3.3  | 0             | 45.13      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -42.30      | 3.3  | 0             | 56.23      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.11      | 3.3  | 0             | 45.42      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.06      | 3.3  | 0             | 55.47      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.44      | 3.3  | 0             | 46.09      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -40.80      | 3.3  | 0             | 57.73      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.28      | 3.3  | 0             | 46.25      | AV       | 54             | PASS    |

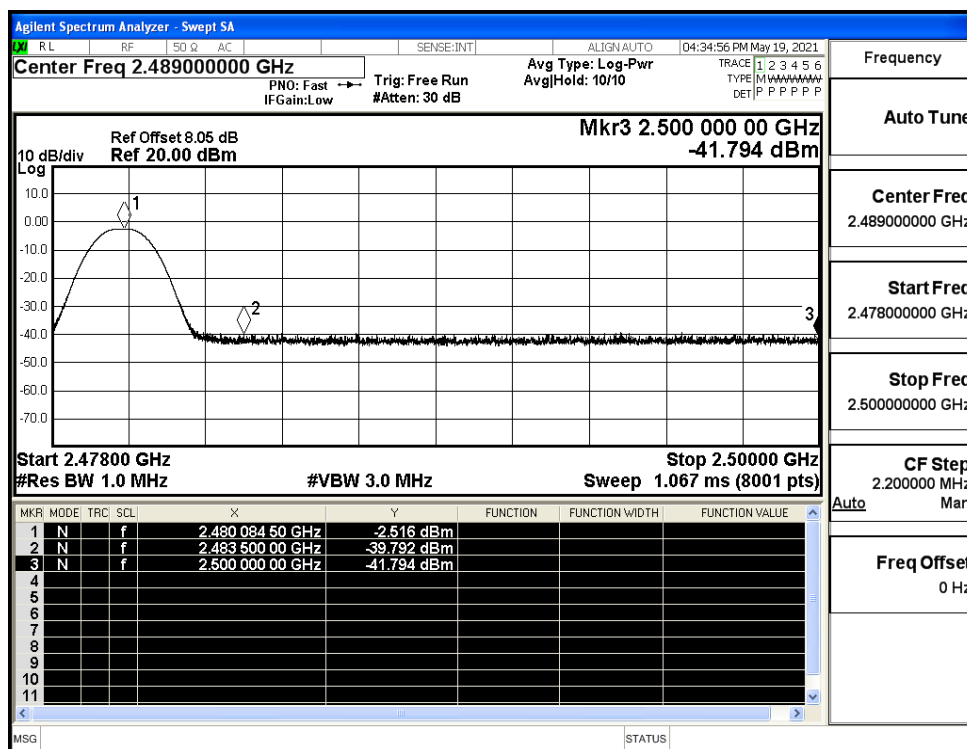
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



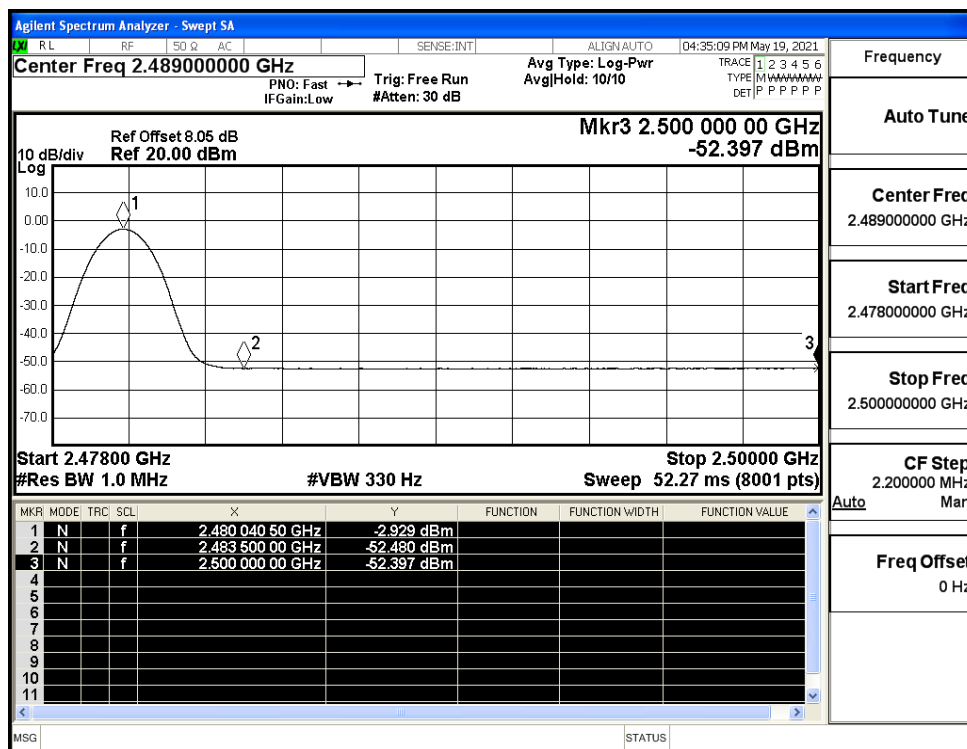
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)

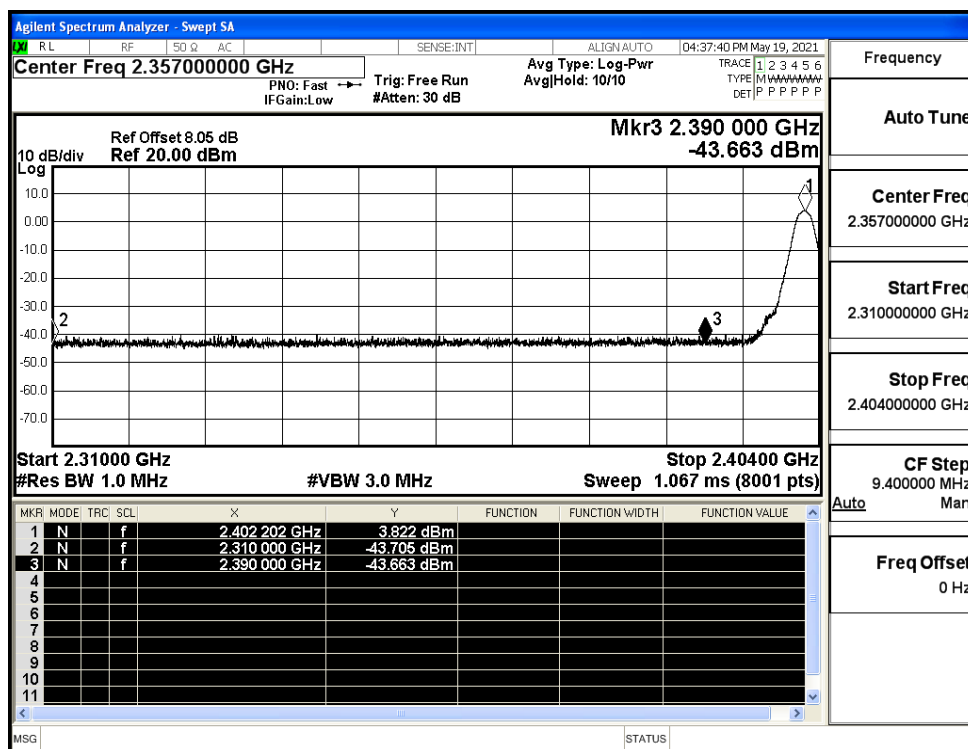
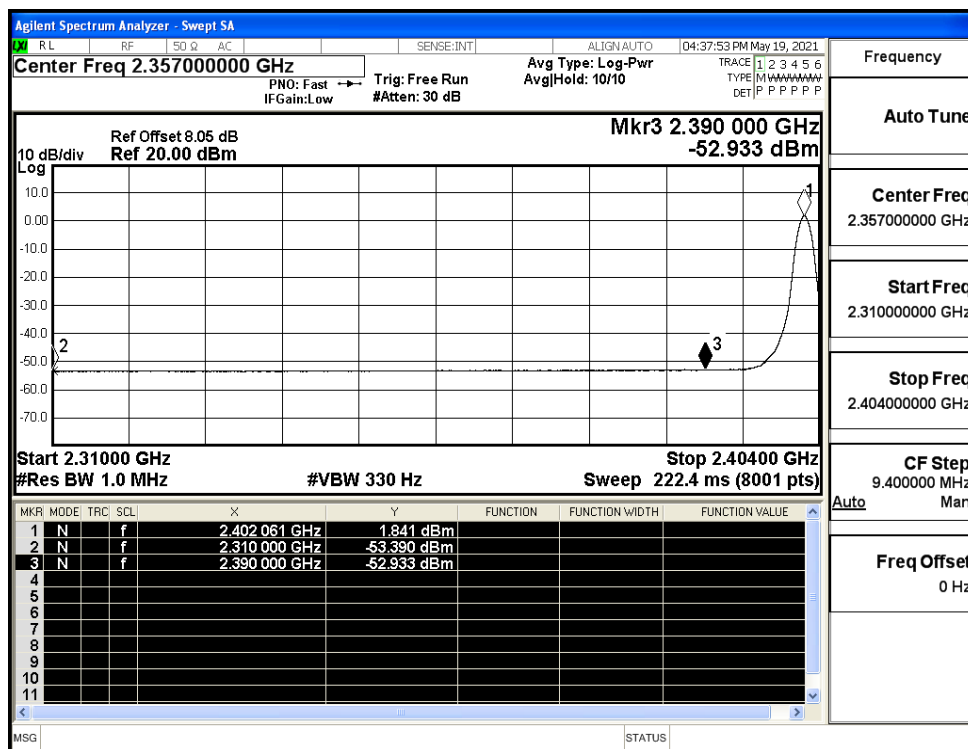


## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)

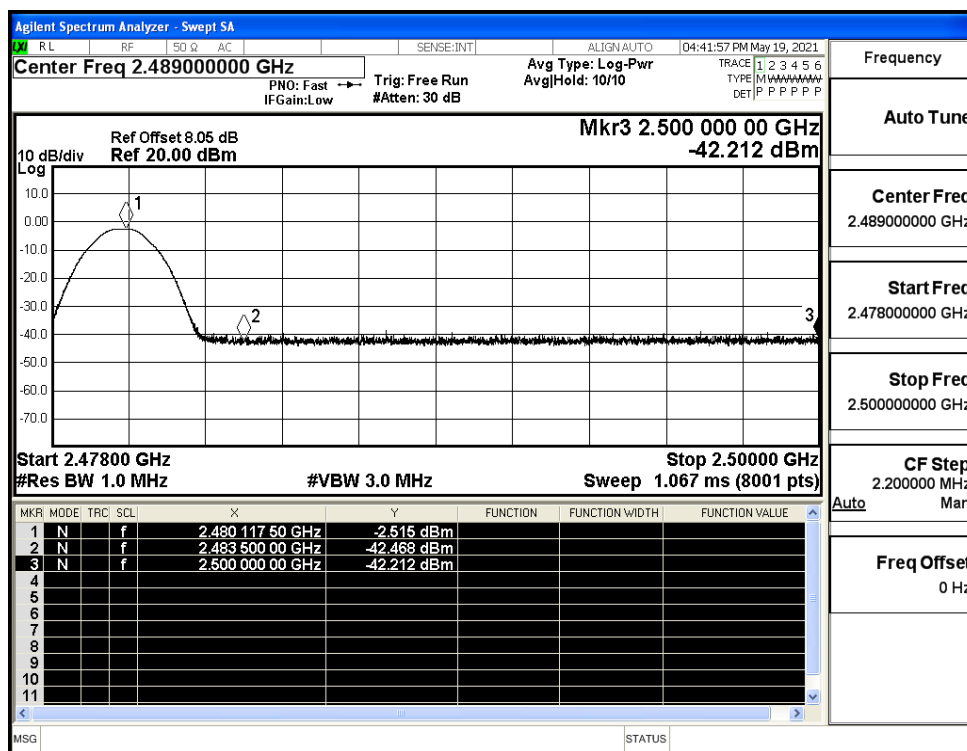


## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)

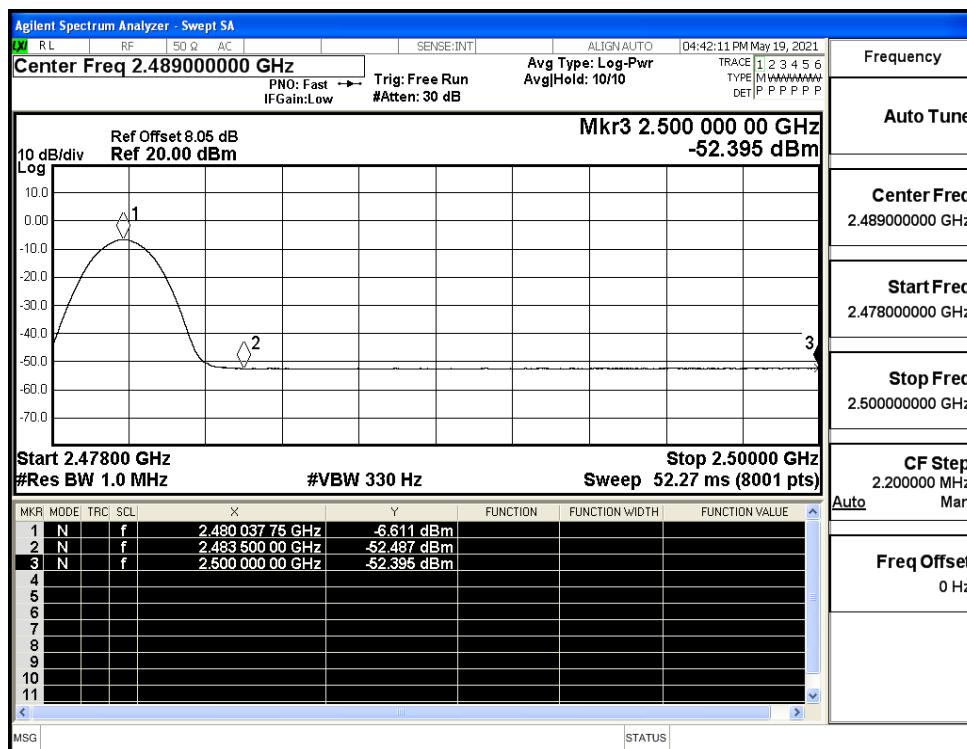


Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)

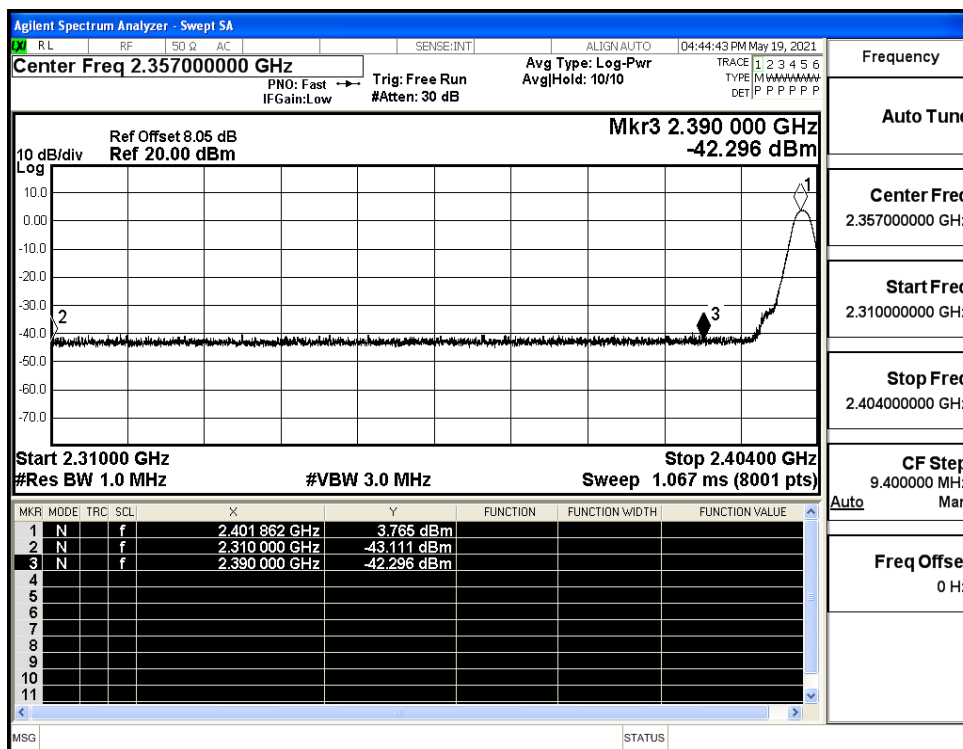
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



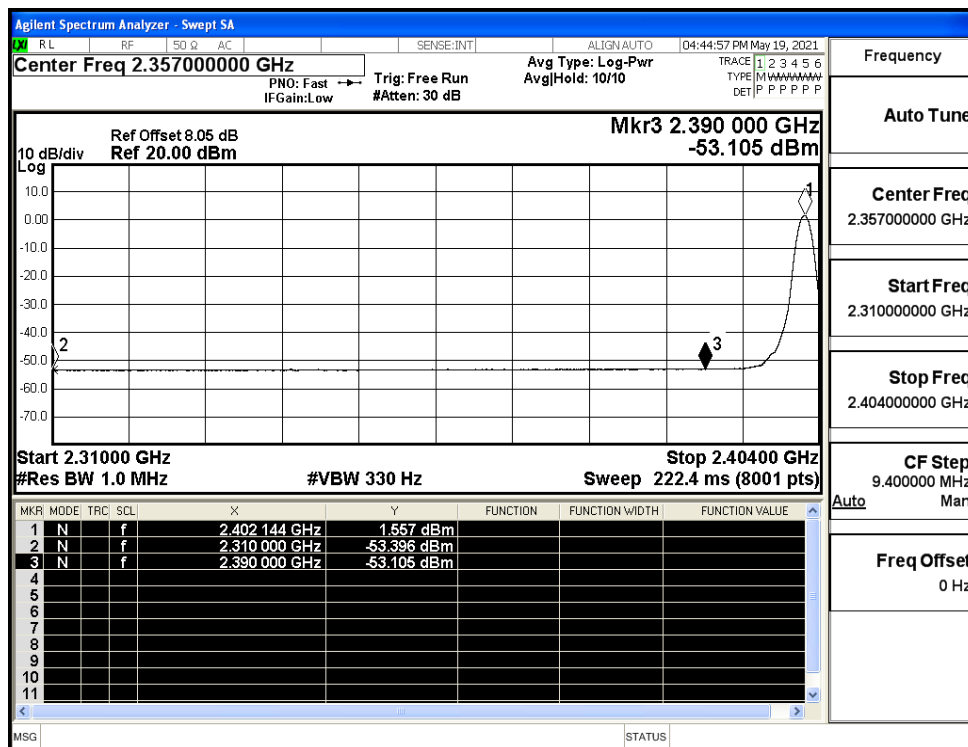
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



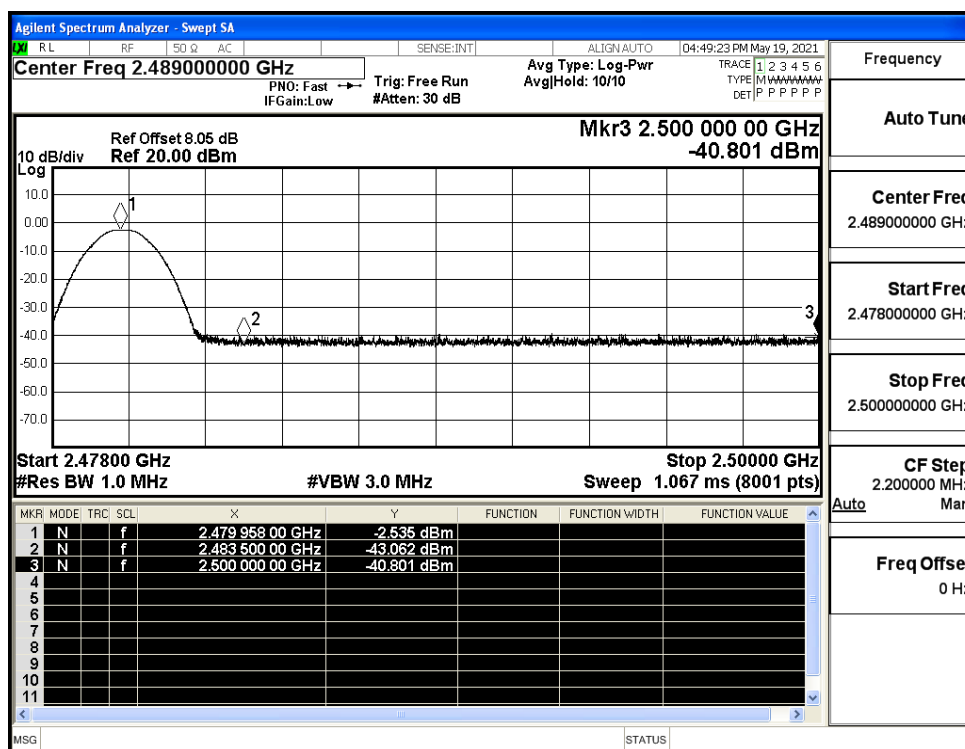
## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



## 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)

