

## Appendix A

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

Product Name: Shower mirror /Fog free mirror LED clock with speaker / Shower clock with speaker

Trade Mark: N/A

Test Model: 1703

#### Environmental Conditions

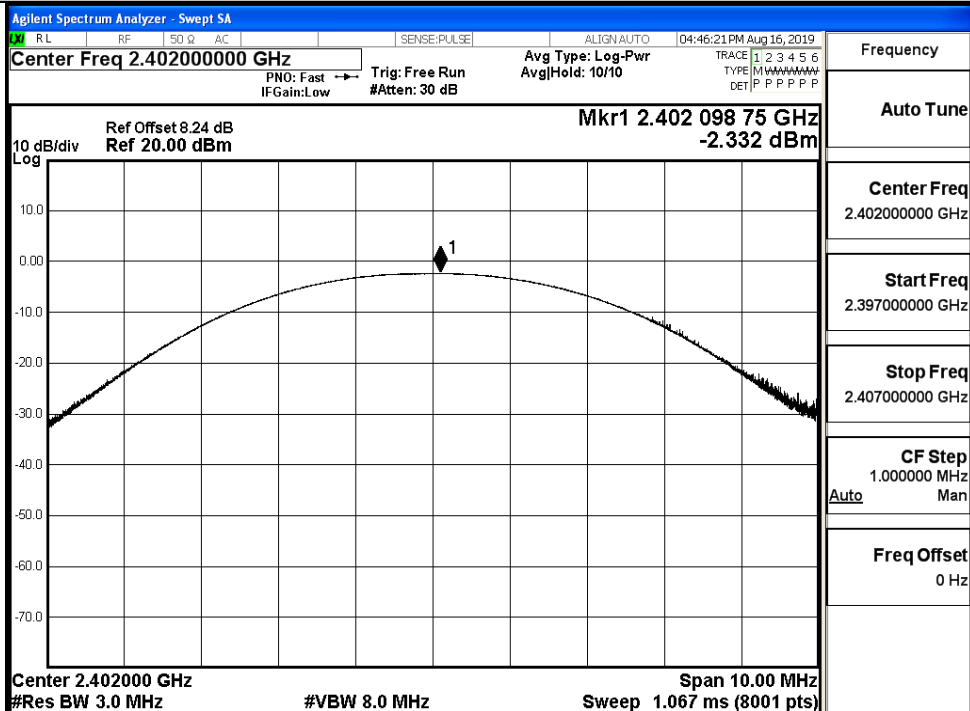
|                    |             |
|--------------------|-------------|
| Temperature:       | 24.2 ° C    |
| Relative Humidity: | 53.8%       |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | JK.ZHOU     |
| Supervised by:     | Wang.Chuang |

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

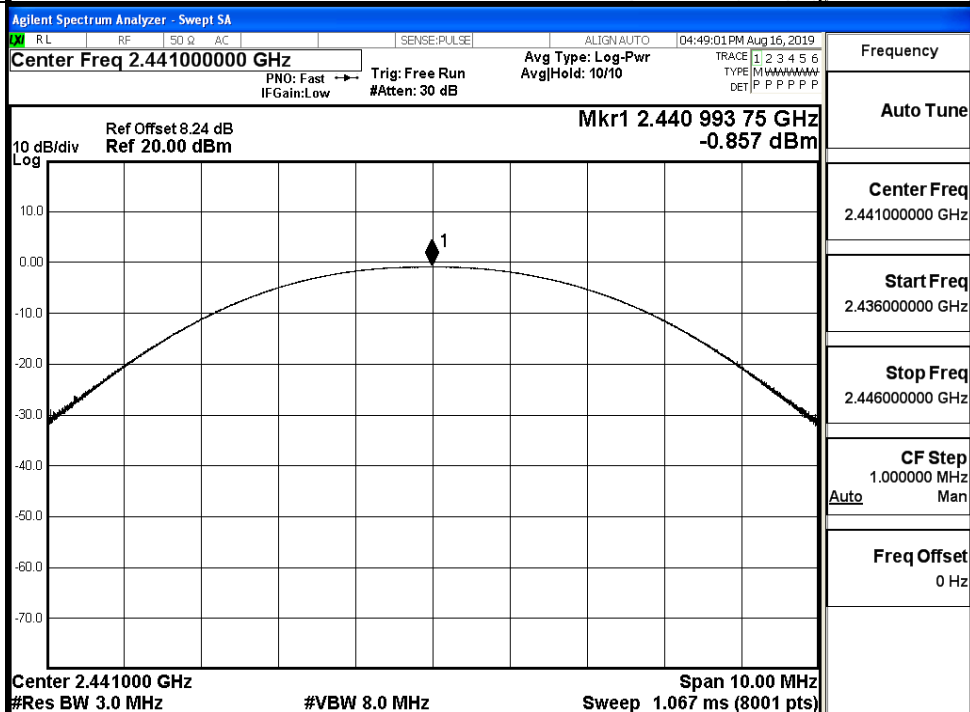
| Mode          | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK          | LCH      | -2.332                          | 30          | PASS    |
|               | MCH      | -0.857                          | 30          | PASS    |
|               | HCH      | -2.243                          | 30          | PASS    |
| $\pi/4$ DQPSK | LCH      | -2.917                          | 21          | PASS    |
|               | MCH      | -1.601                          | 21          | PASS    |
|               | HCH      | -3.426                          | 21          | PASS    |
| 8DPSK         | LCH      | -3.124                          | 21          | PASS    |
|               | MCH      | -1.949                          | 21          | PASS    |
|               | HCH      | -2.991                          | 21          | PASS    |

## Test Graphs

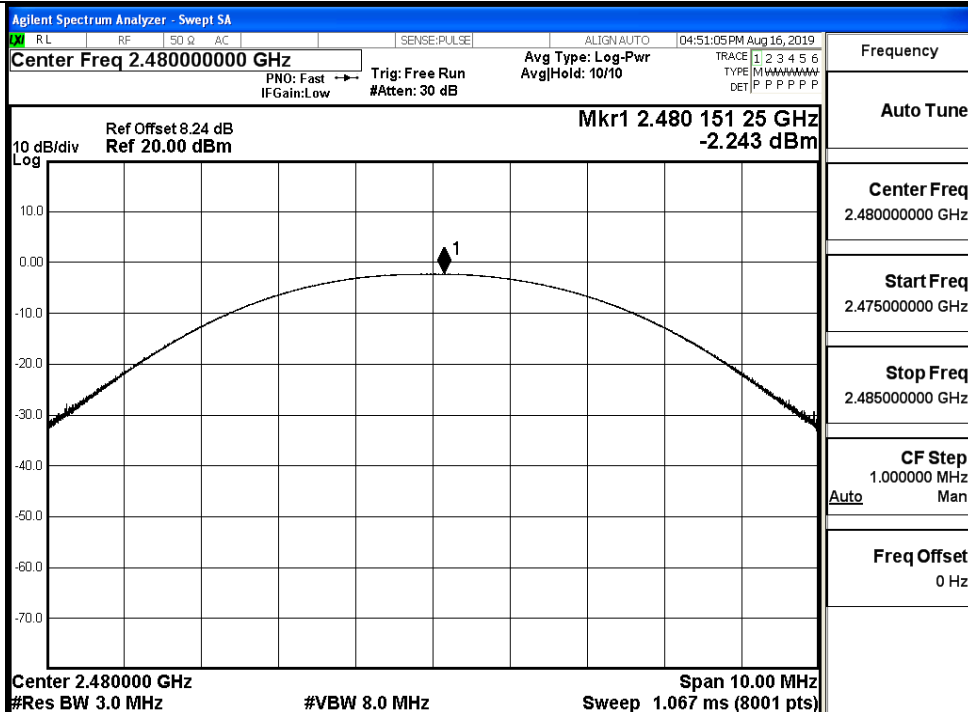
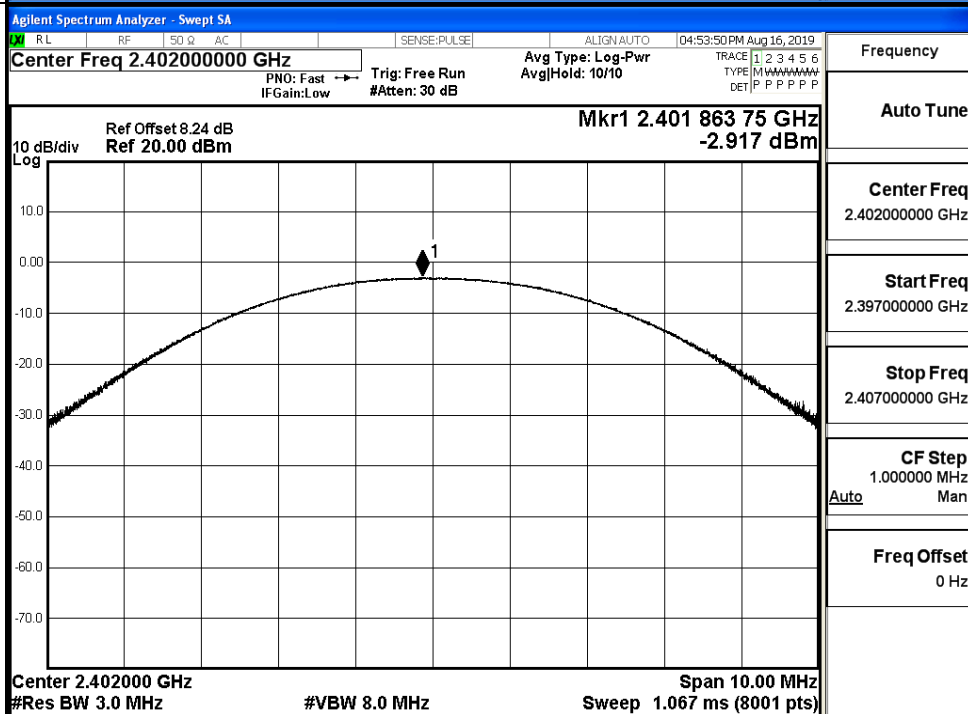
GFSK/LCH

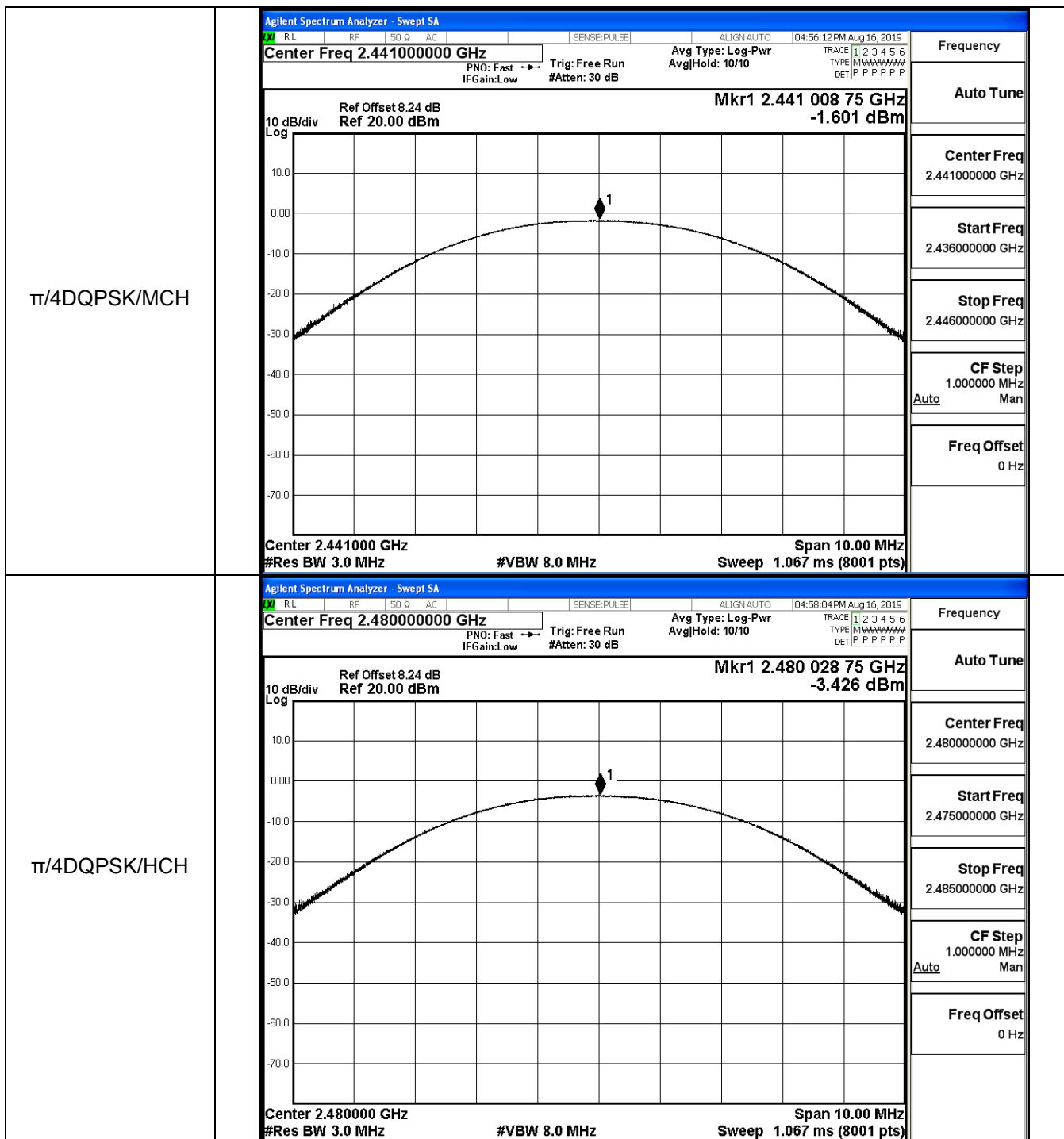


GFSK/MCH

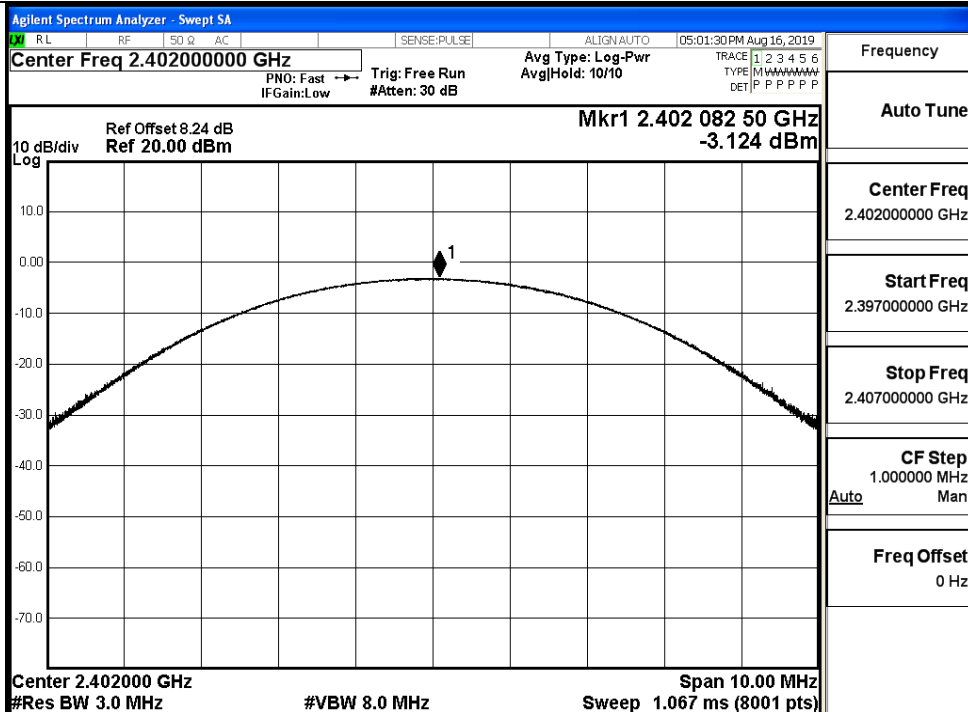


GFSK/HCH

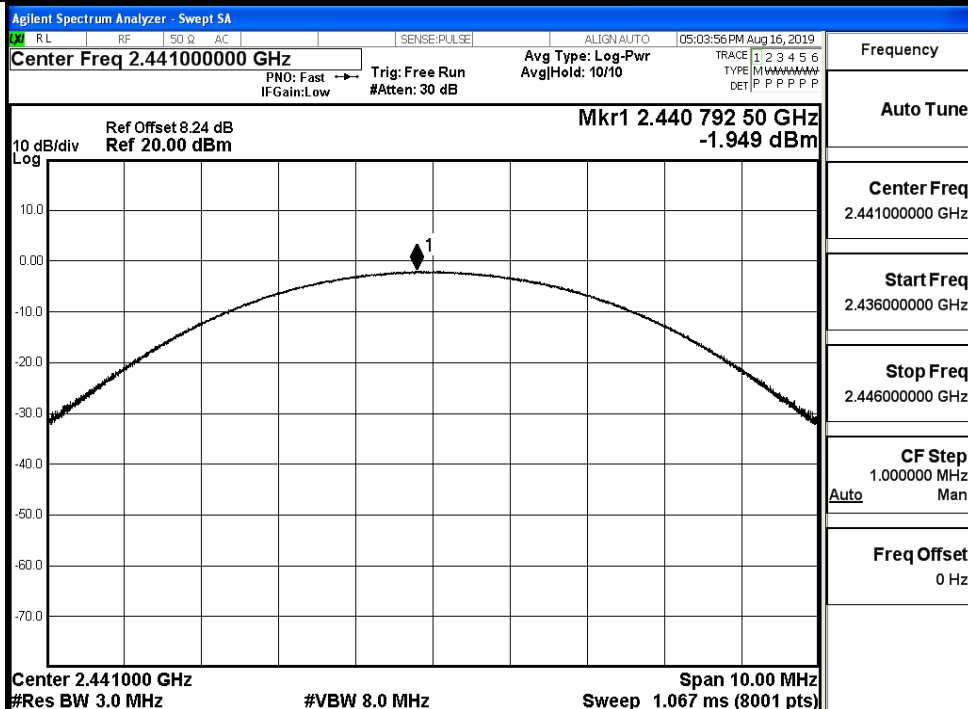
 $\pi$ /4DQPSK/LCH



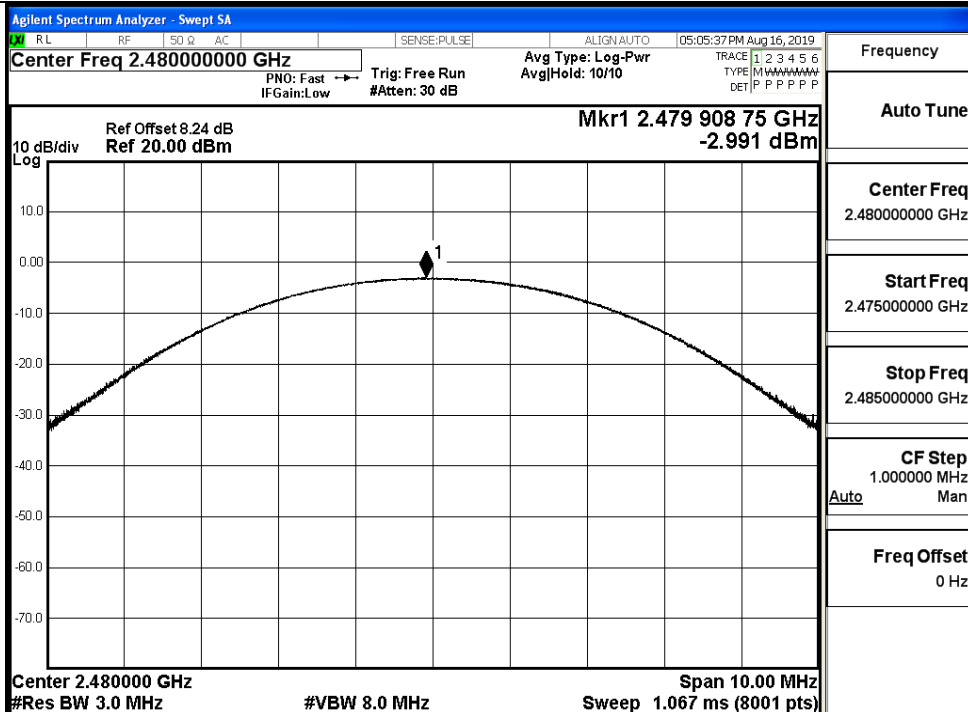
8DPSK/LCH



8DPSK/MCH



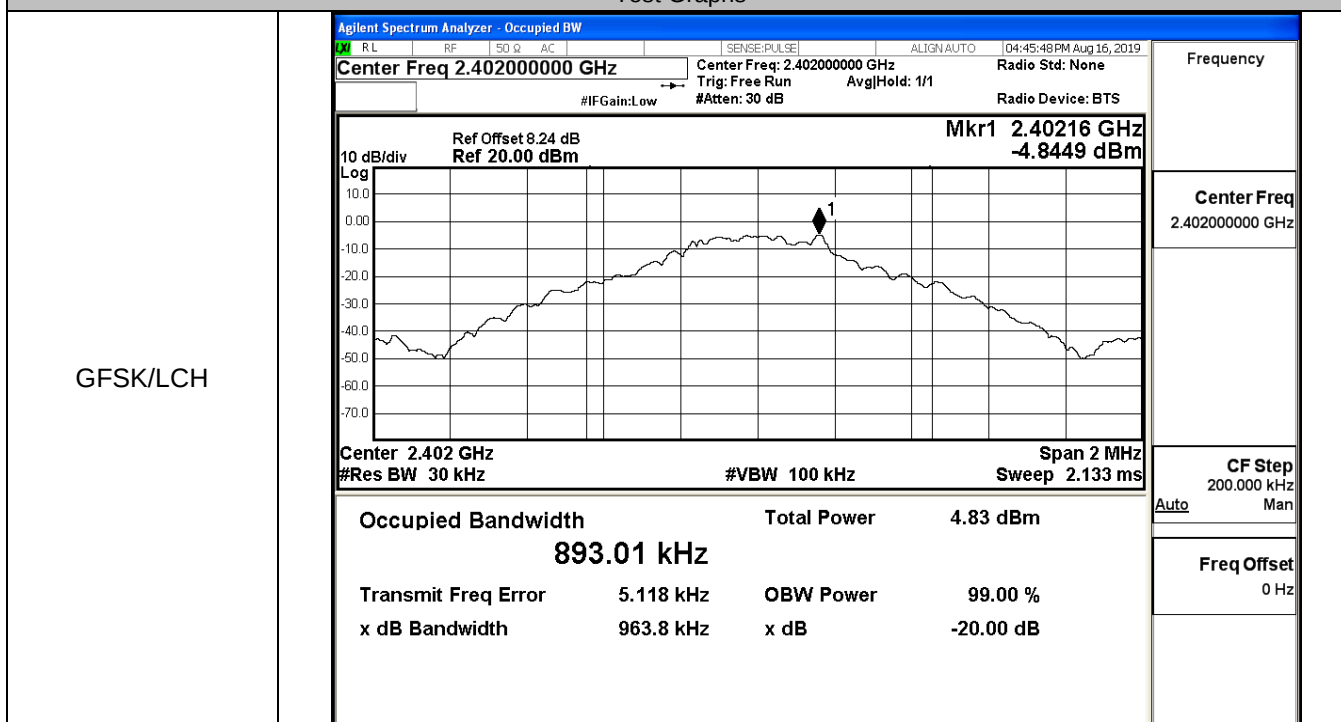
8DPSK/HCH



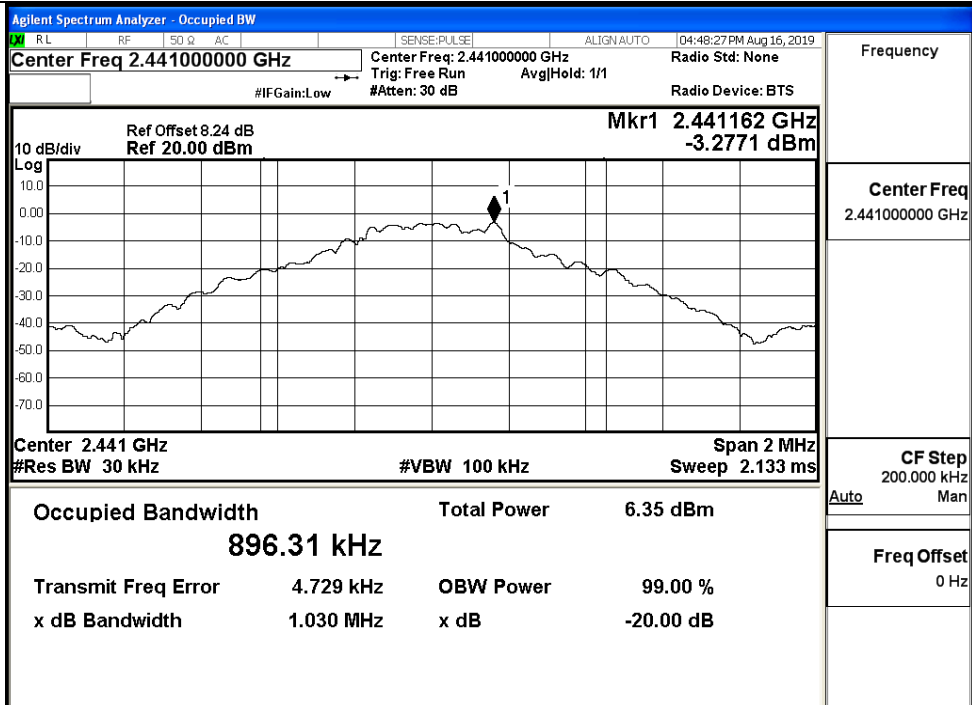
## A.2 20dB Bandwidth

| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.9638               | Not Specified | PASS    |
|               | MCH      | 1.030                | Not Specified | PASS    |
|               | HCH      | 1.031                | Not Specified | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.293                | Not Specified | PASS    |
|               | MCH      | 1.312                | Not Specified | PASS    |
|               | HCH      | 1.313                | Not Specified | PASS    |
| 8DPSK         | LCH      | 1.299                | Not Specified | PASS    |
|               | MCH      | 1.306                | Not Specified | PASS    |
|               | HCH      | 1.296                | Not Specified | PASS    |

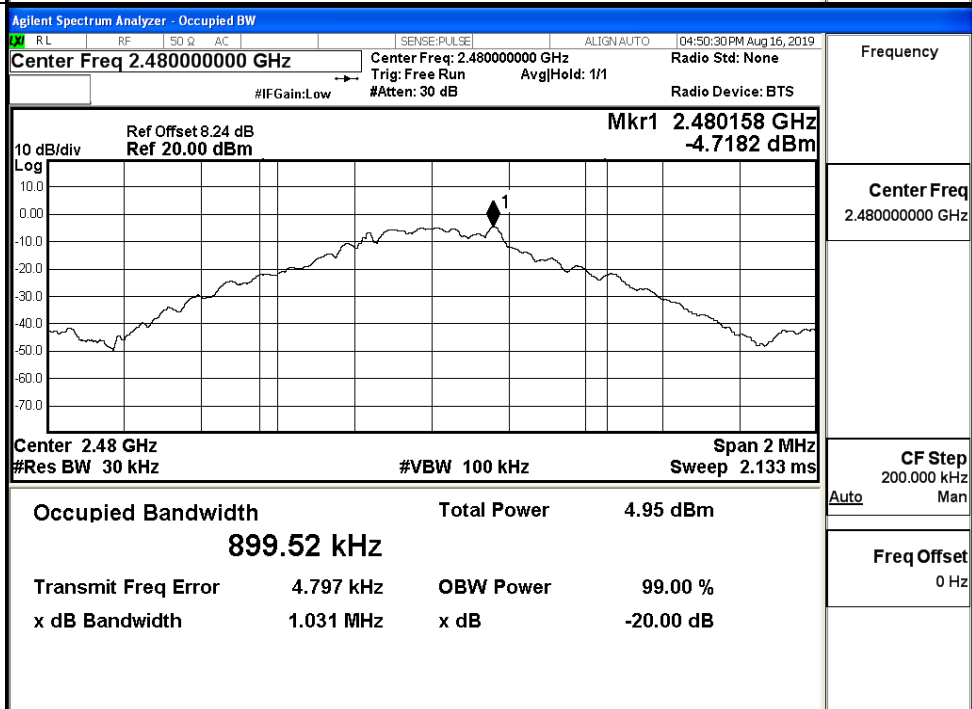
## Test Graphs

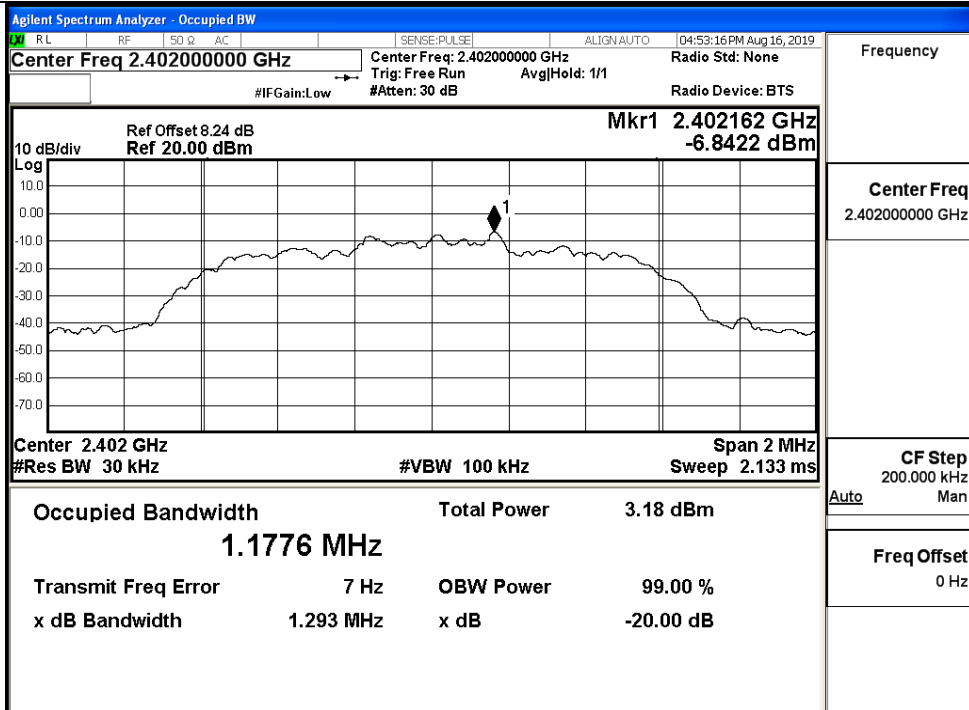
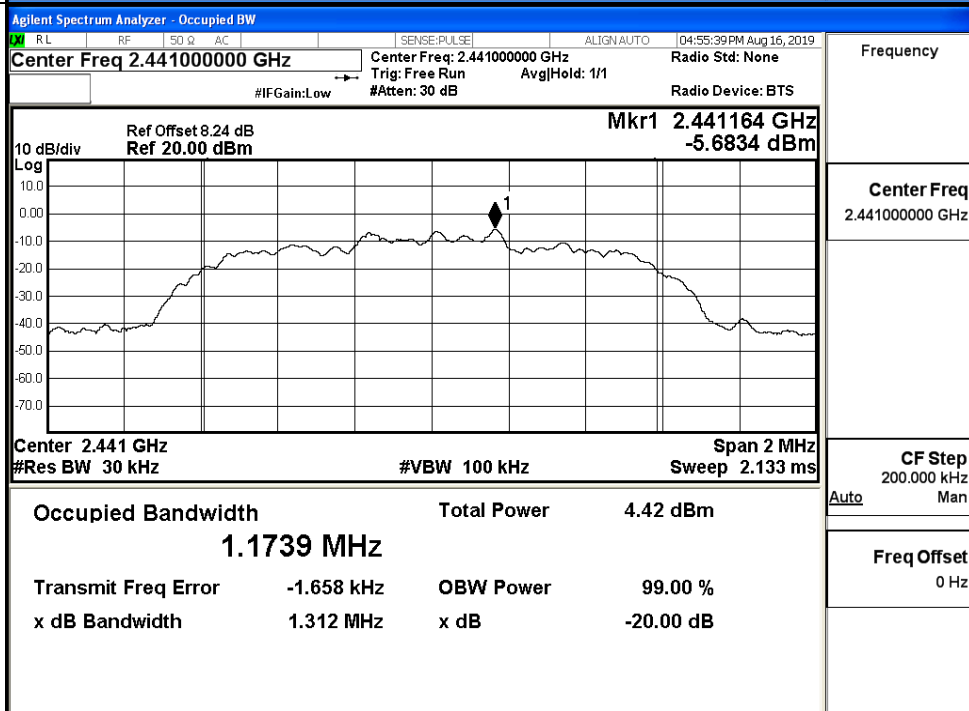


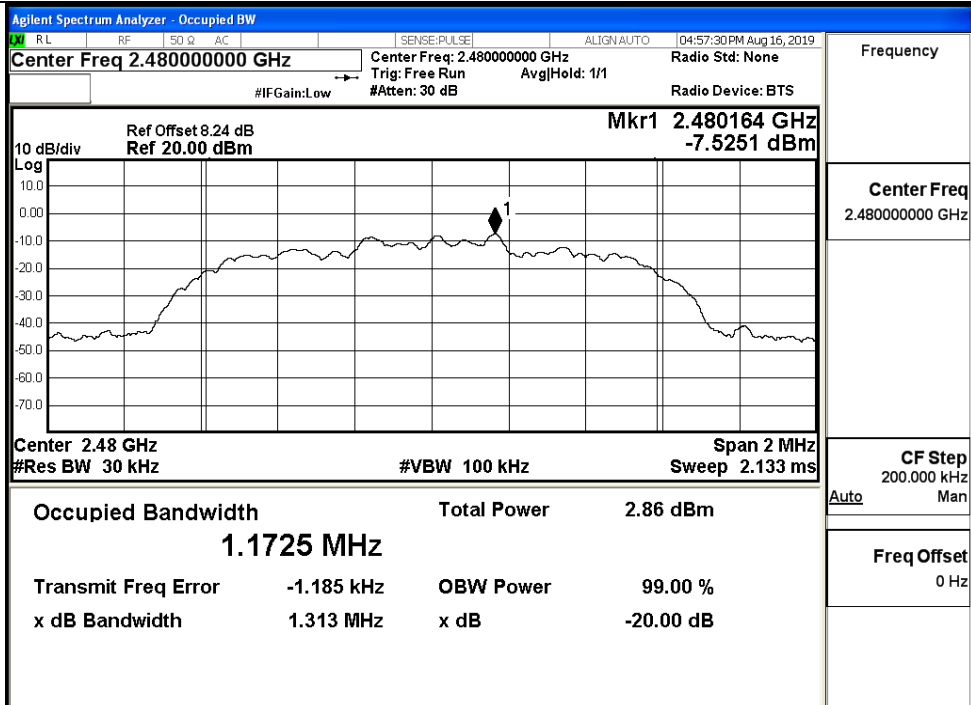
GFSK/MCH



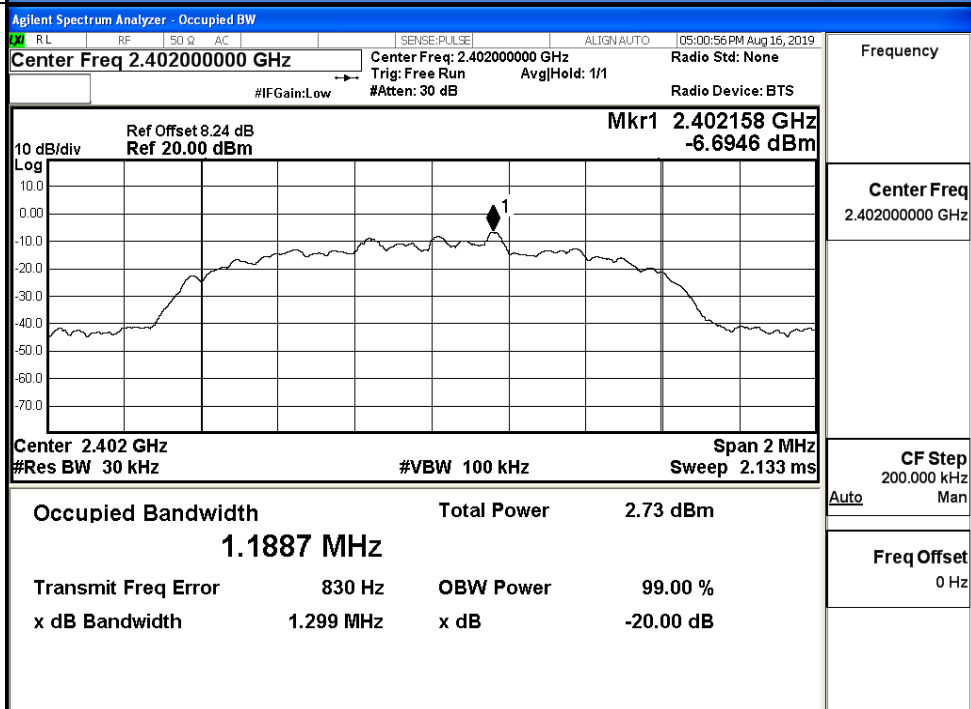
GFSK/HCH



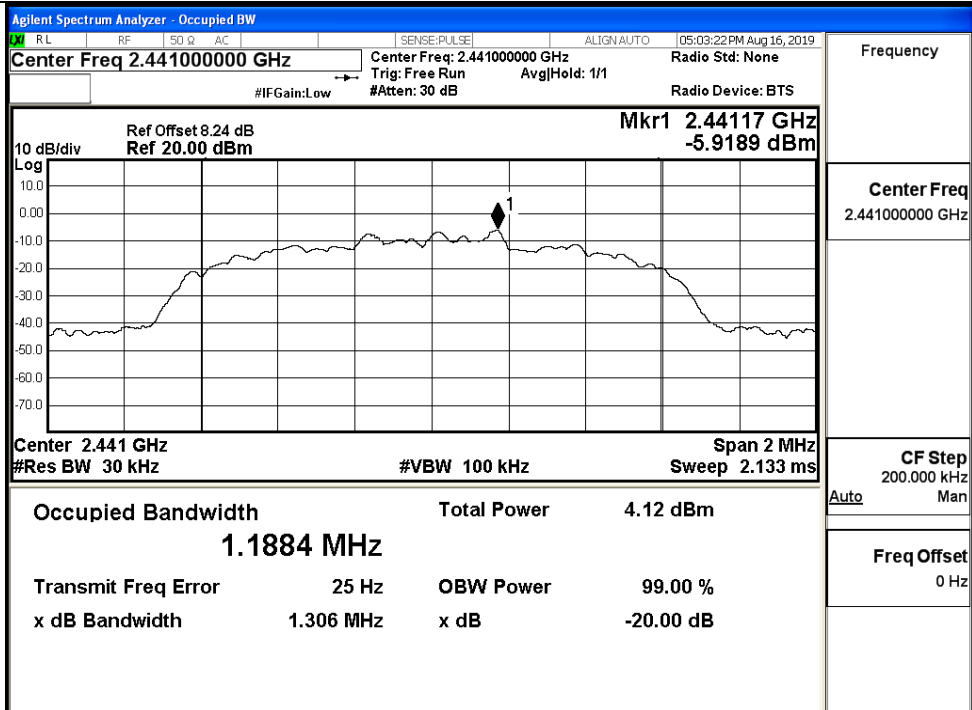
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

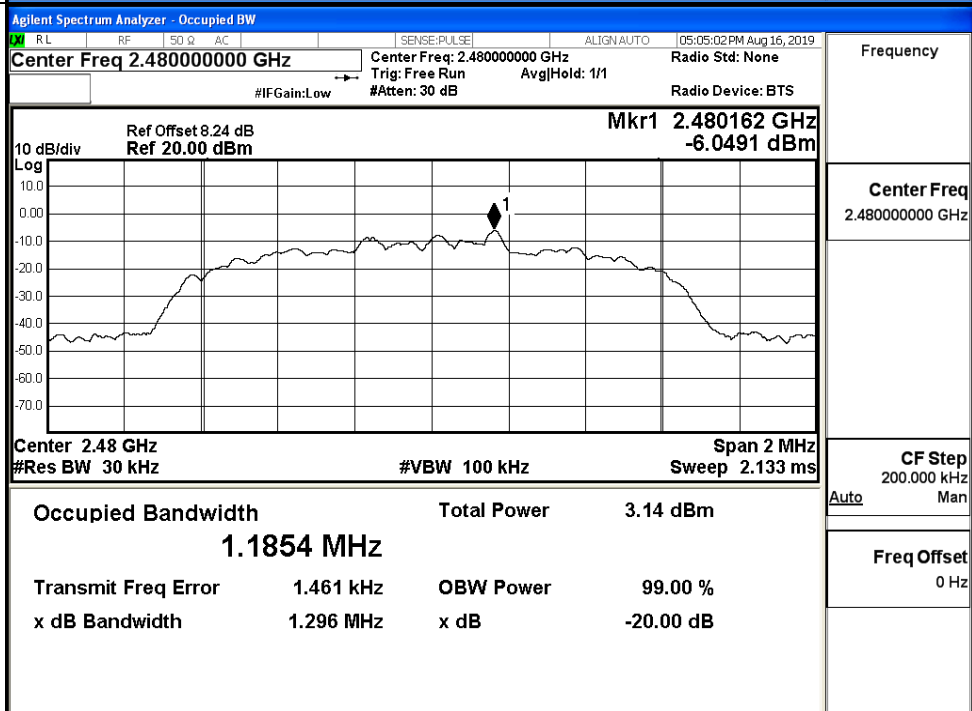
8DPSK/LCH



8DPSK/MCH



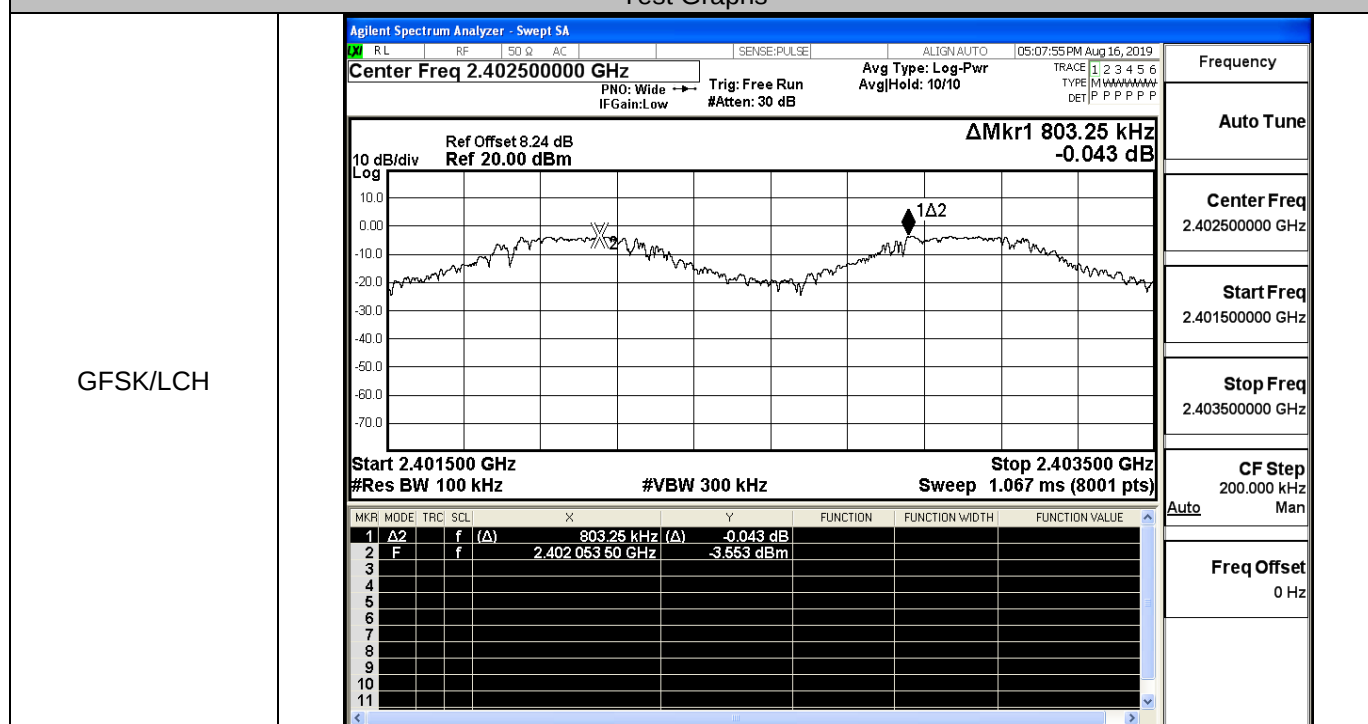
8DPSK/HCH



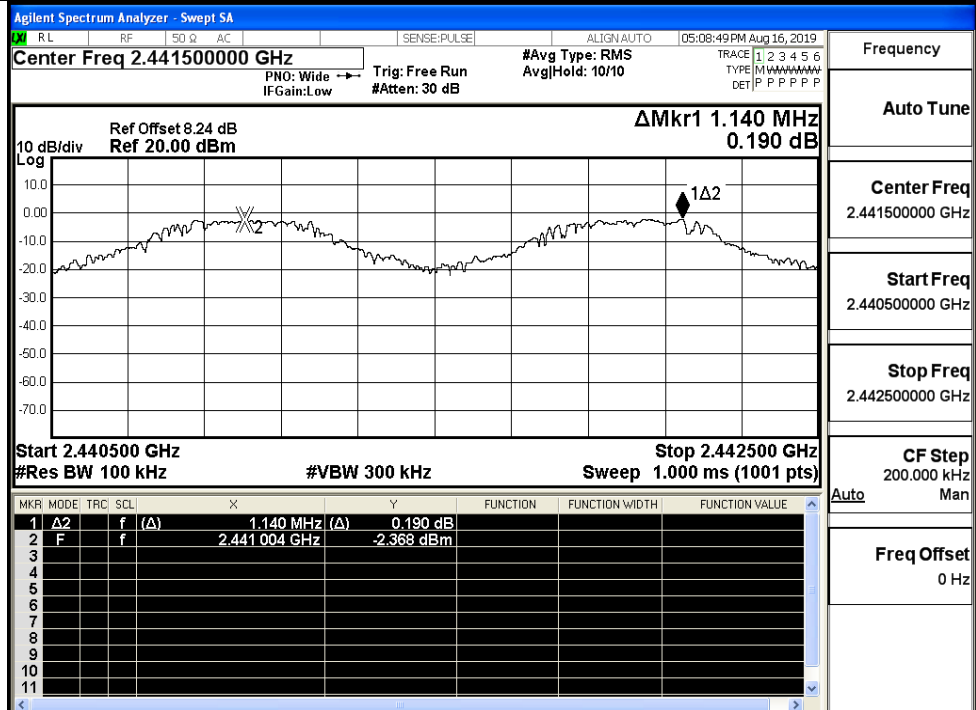
### A.3 Carrier Frequency Separation

| Mode          | Channel | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|---------|------------------------------------|-------------|---------|
| GFSK          | LCH     | 0.803                              | 0.687       | PASS    |
|               | MCH     | 1.140                              | 0.687       | PASS    |
|               | HCH     | 0.916                              | 0.687       | PASS    |
| $\pi/4$ DQPSK | LCH     | 1.186                              | 0.875       | PASS    |
|               | MCH     | 0.964                              | 0.875       | PASS    |
|               | HCH     | 0.884                              | 0.875       | PASS    |
| 8DPSK         | LCH     | 1.000                              | 0.871       | PASS    |
|               | MCH     | 1.056                              | 0.871       | PASS    |
|               | HCH     | 1.000                              | 0.871       | PASS    |

#### Test Graphs



GFSK/MCH

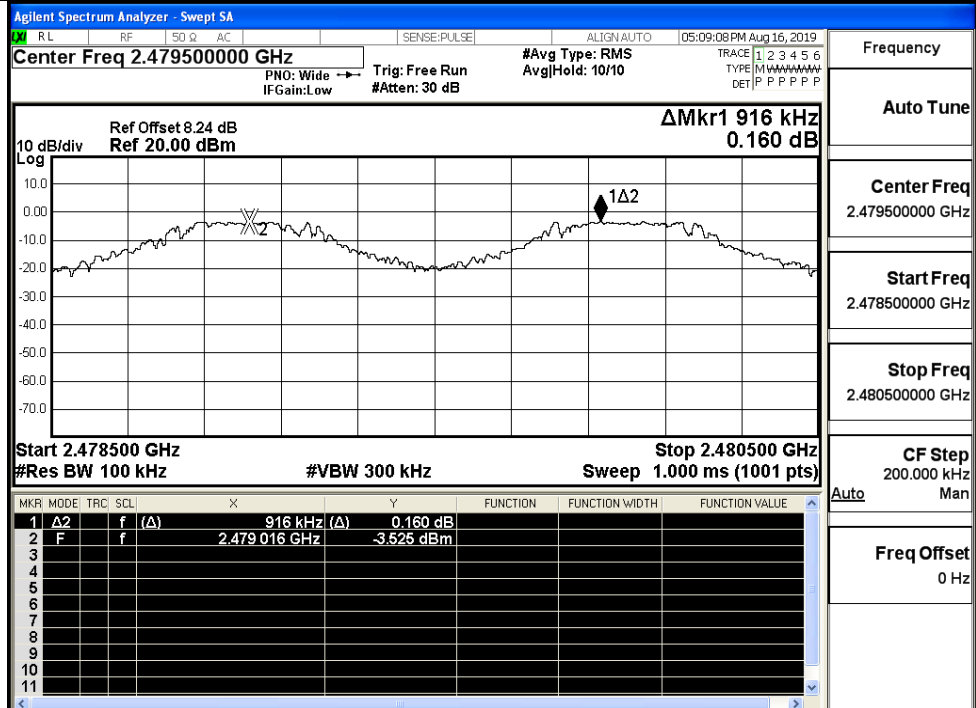


Frequency

Auto Tune

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

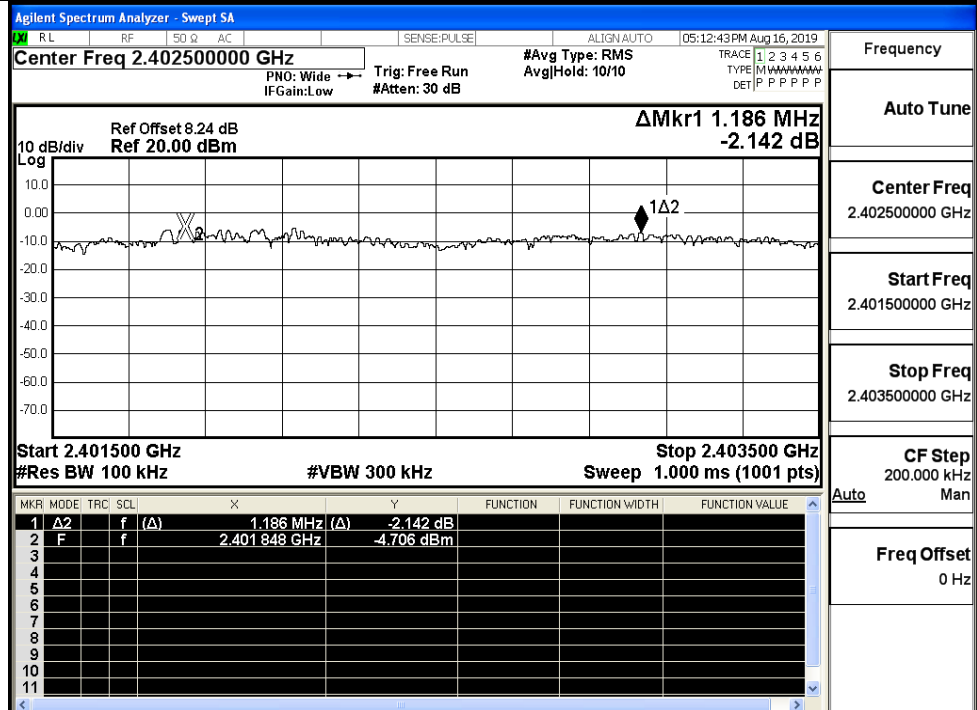
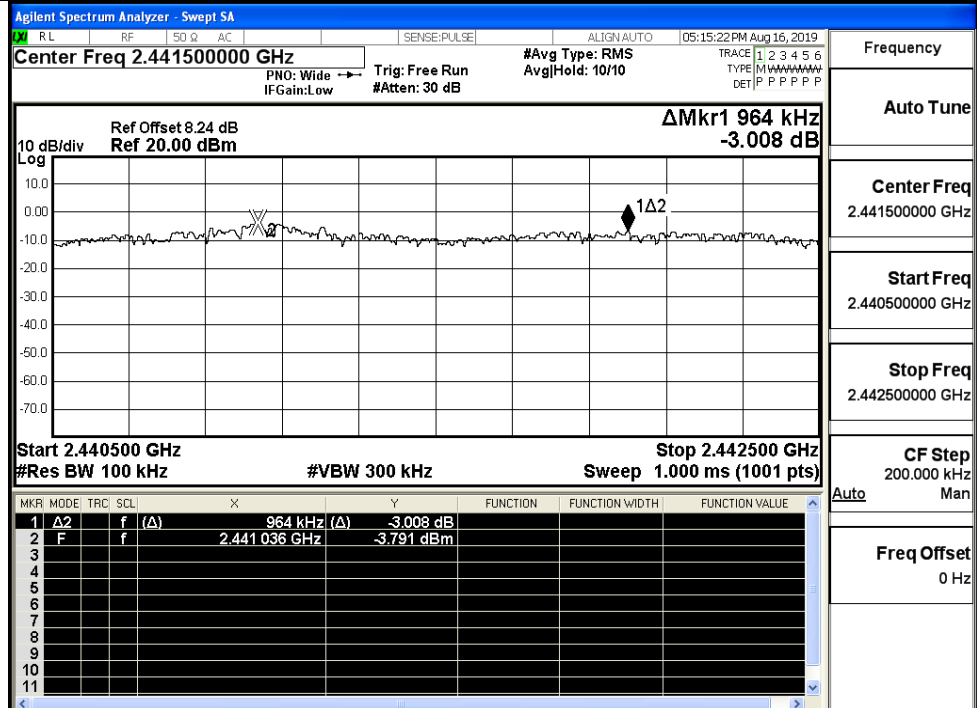
GFSK/HCH

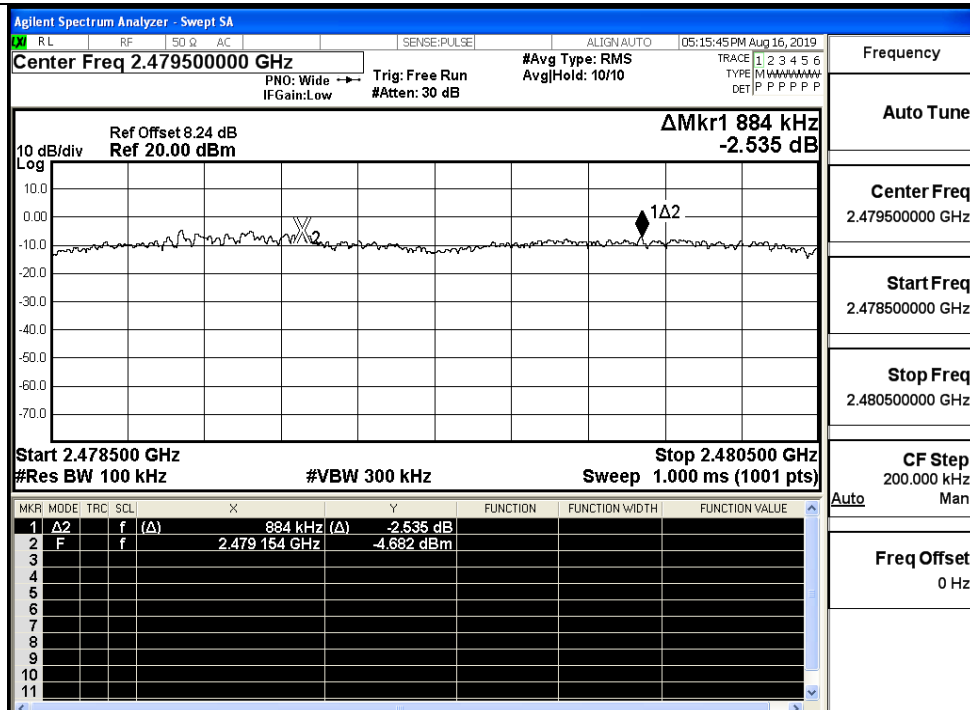


Frequency

Auto Tune

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

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

$\pi$ /4DQPSK/HCH

Frequency

Auto Tune

Center Freq  
2.479500000 GHz

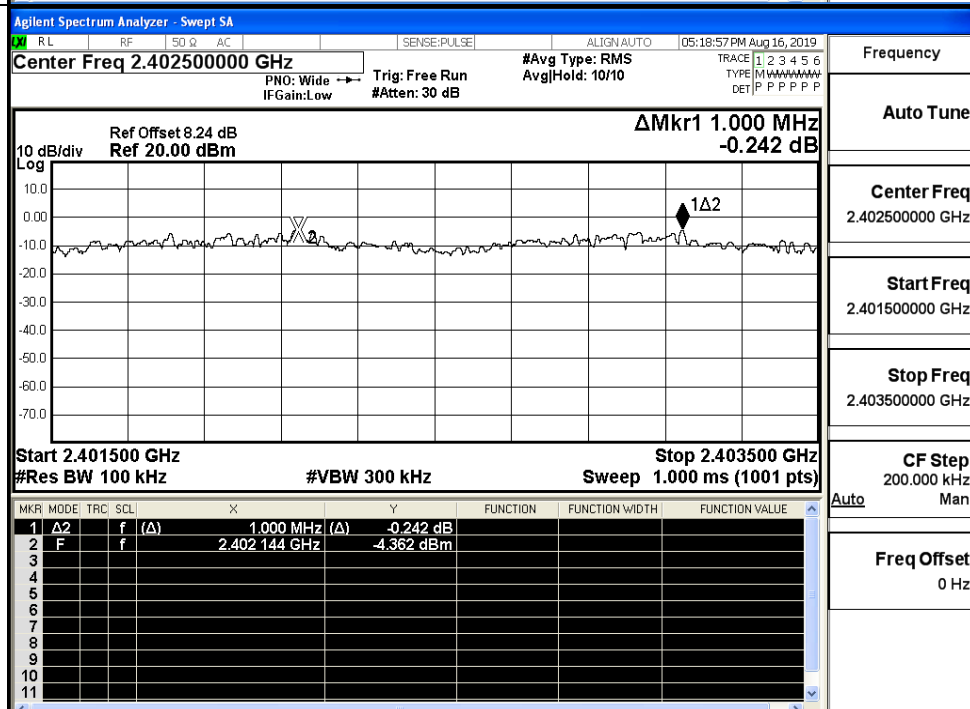
Start Freq  
2.478500000 GHz

Stop Freq  
2.480500000 GHz

CF Step  
200.000 kHz  
Man

Freq Offset  
0 Hz

8DPSK/LCH



Frequency

Auto Tune

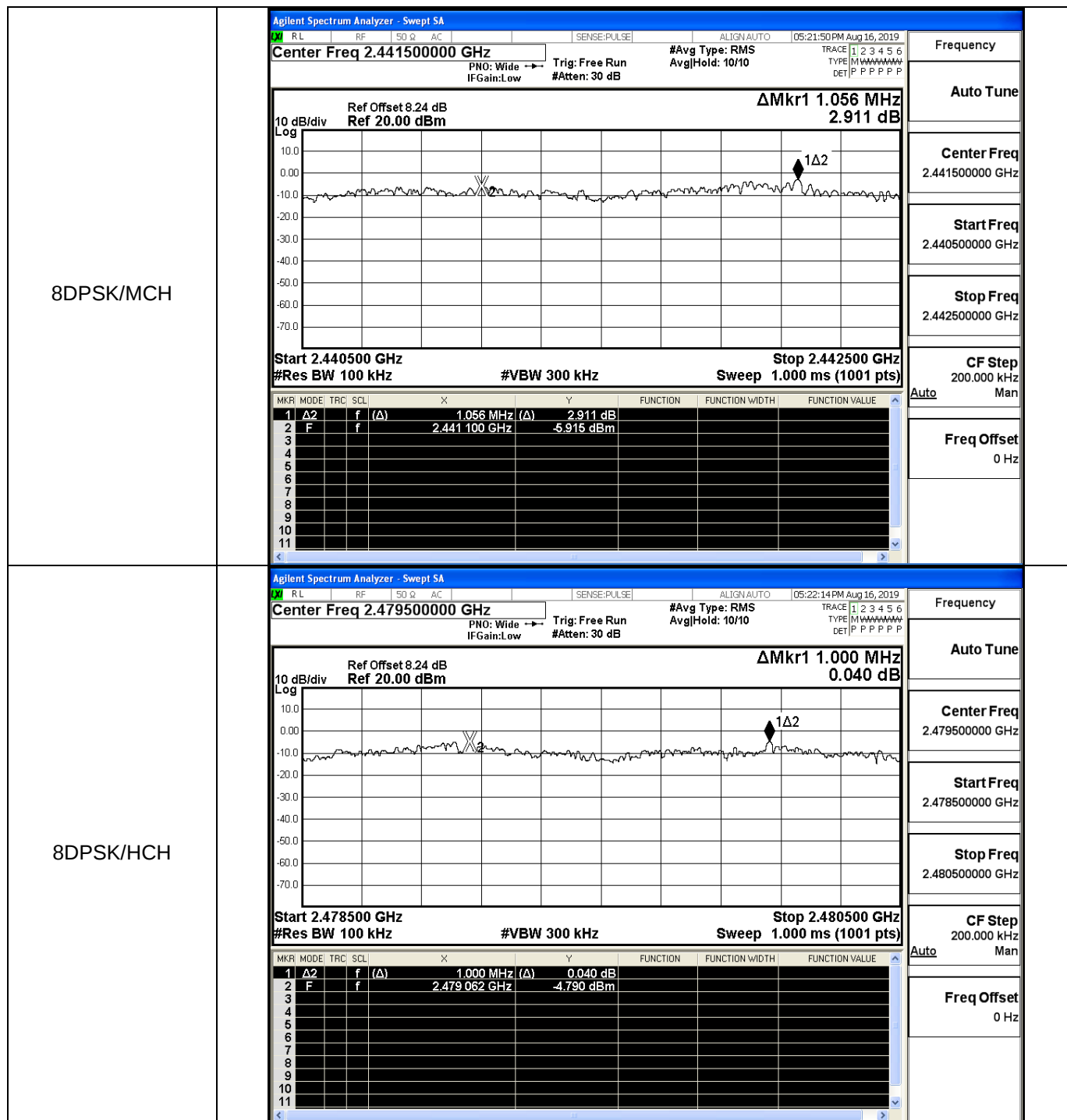
Center Freq  
2.402500000 GHz

Start Freq  
2.401500000 GHz

Stop Freq  
2.403500000 GHz

CF Step  
200.000 kHz  
Man

Freq Offset  
0 Hz

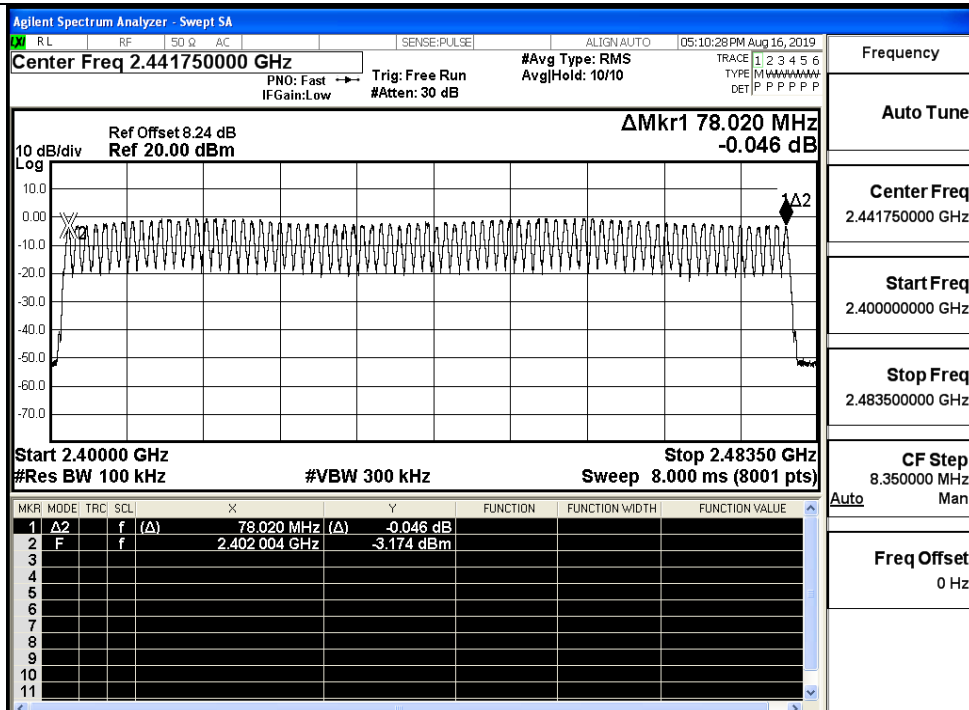


#### A.4 Hopping Channel Number

| 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 GHz

Start Freq

2.400000000 GHz

Stop Freq

2.483500000 GHz

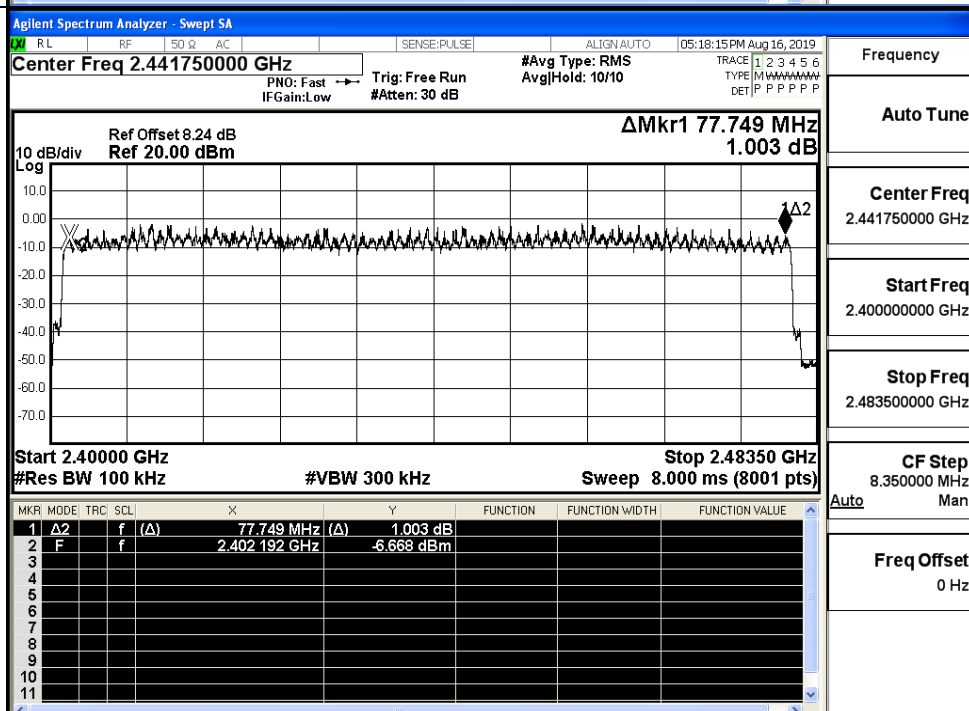
CF Step

8.350000 MHz

Auto

Freq Offset

0 Hz

 $\pi/4$ DQPSK/Hop

Frequency

Auto Tune

Center Freq

2.441750000 GHz

Start Freq

2.400000000 GHz

Stop Freq

2.483500000 GHz

CF Step

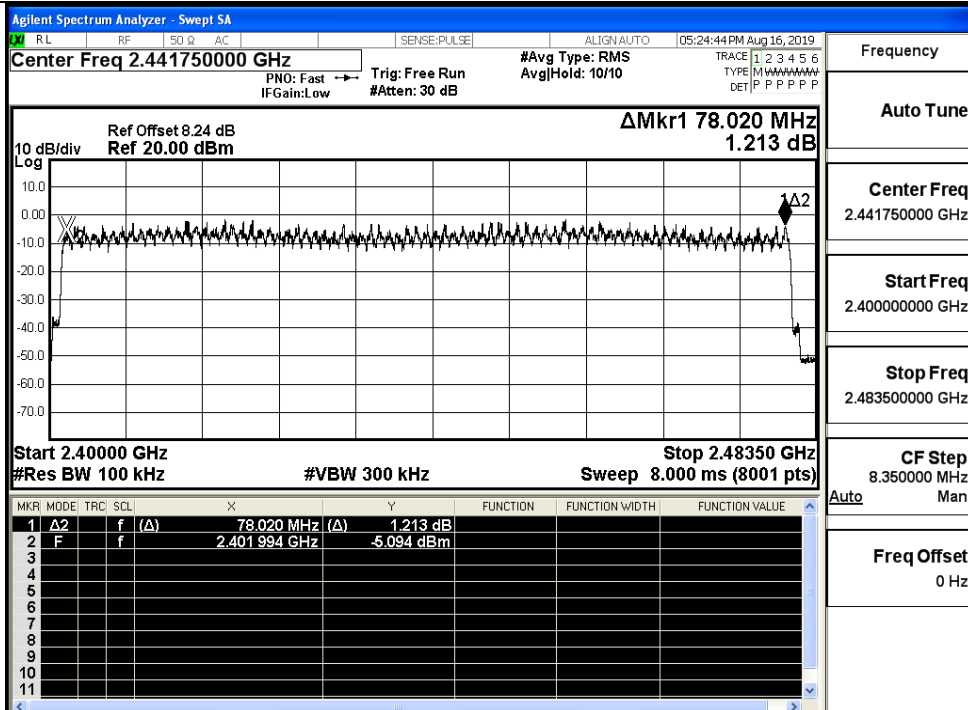
8.350000 MHz

Auto

Freq Offset

0 Hz

8DPSK/Hop

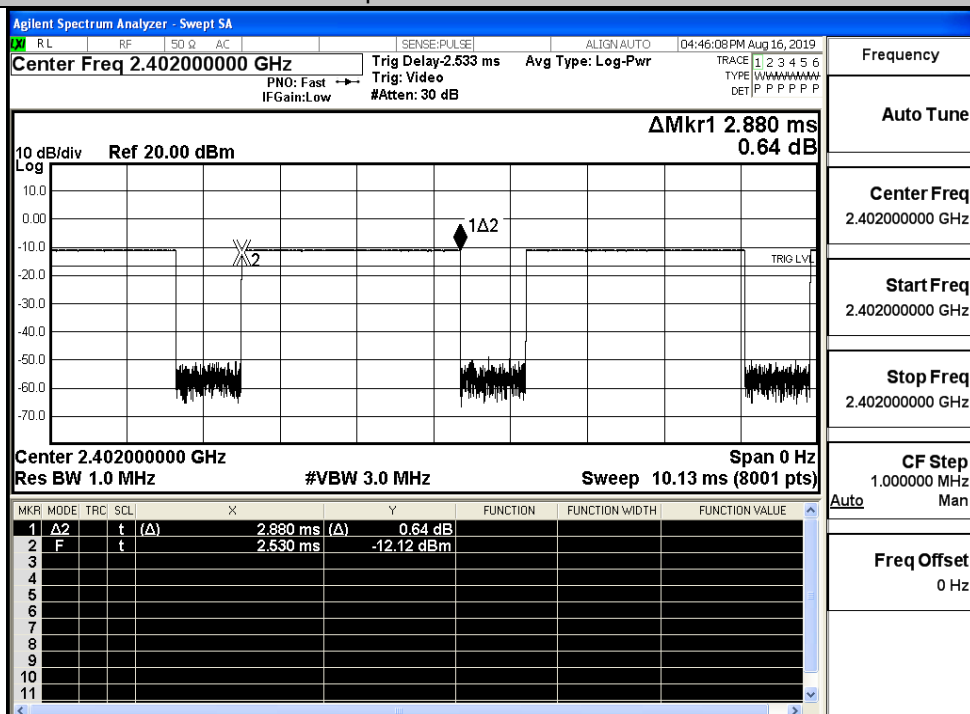


## A.5 Dwell Time

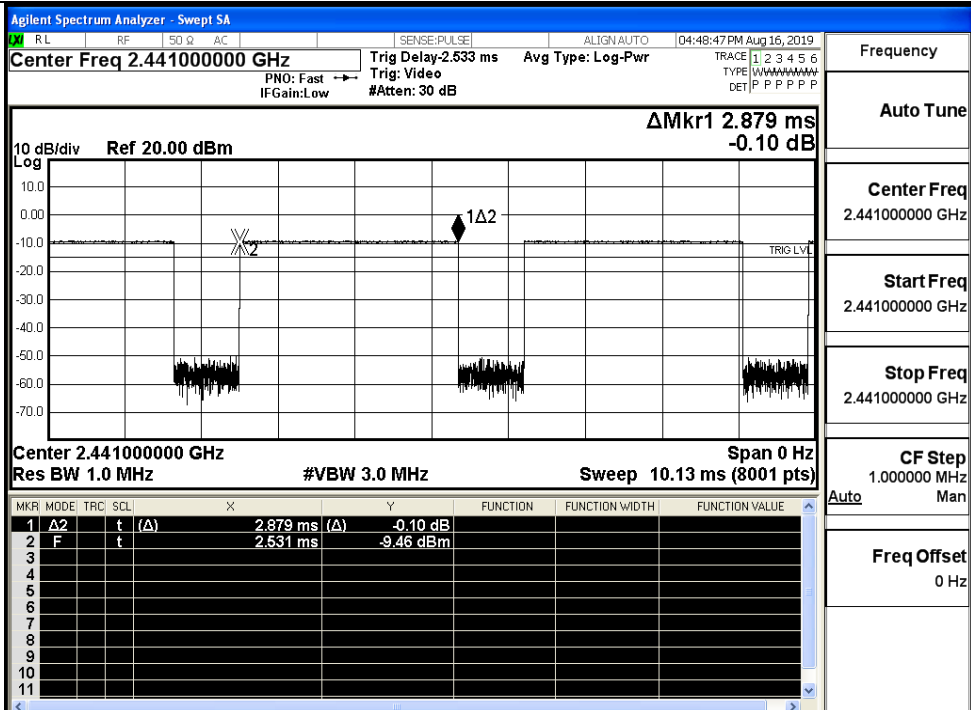
| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|---------------|-----------|---------|
| GFSK          | DH5    | LCH     | 2.88   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

## Test Graphs

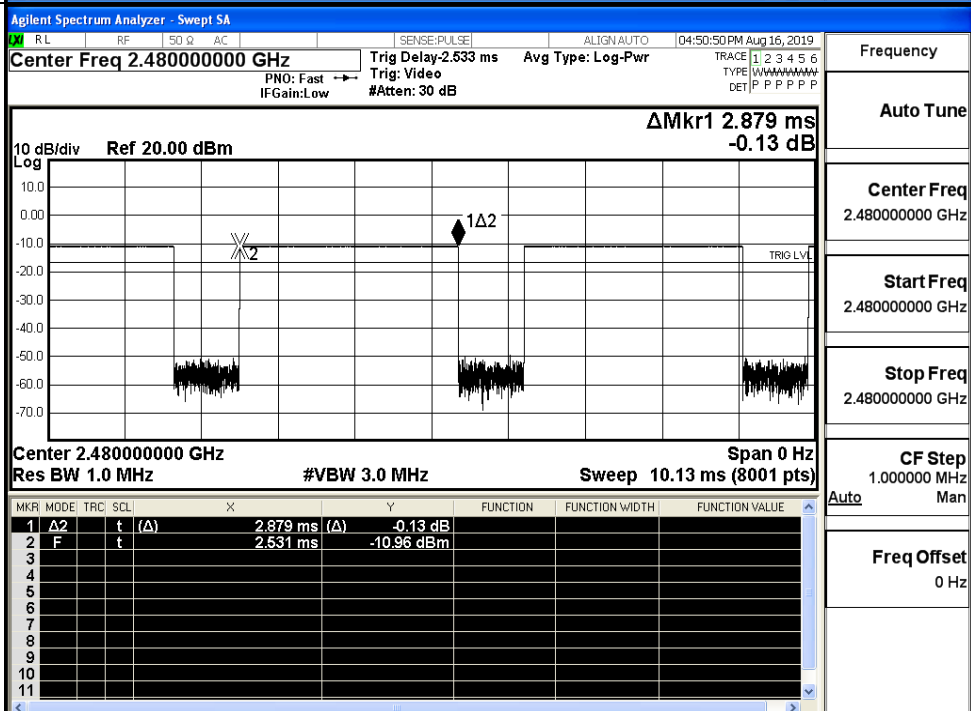
GFSK\_DH5/LCH

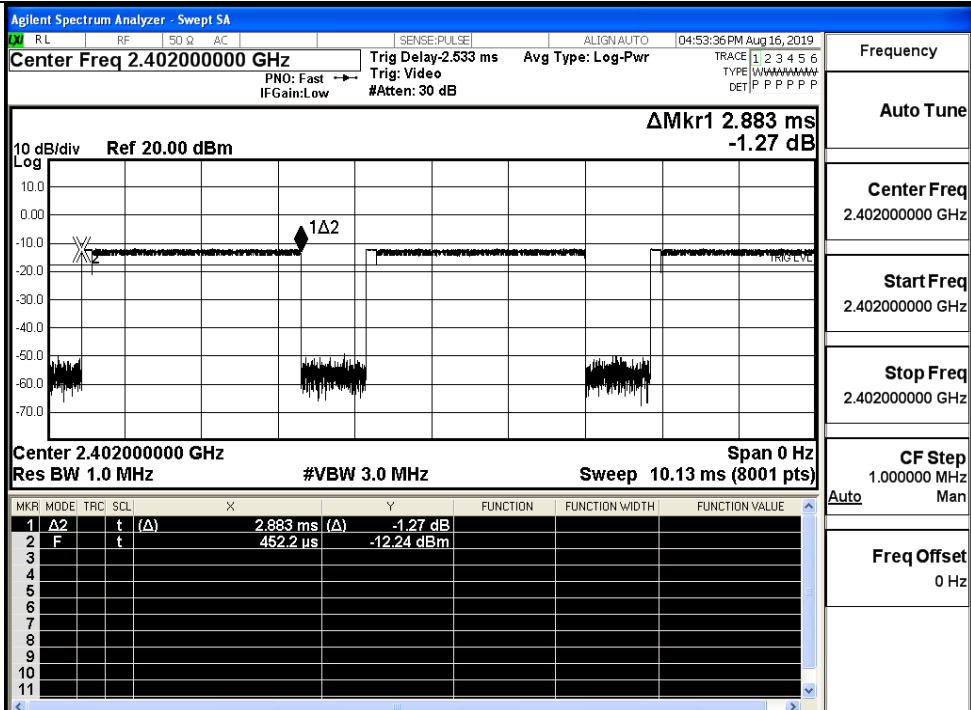
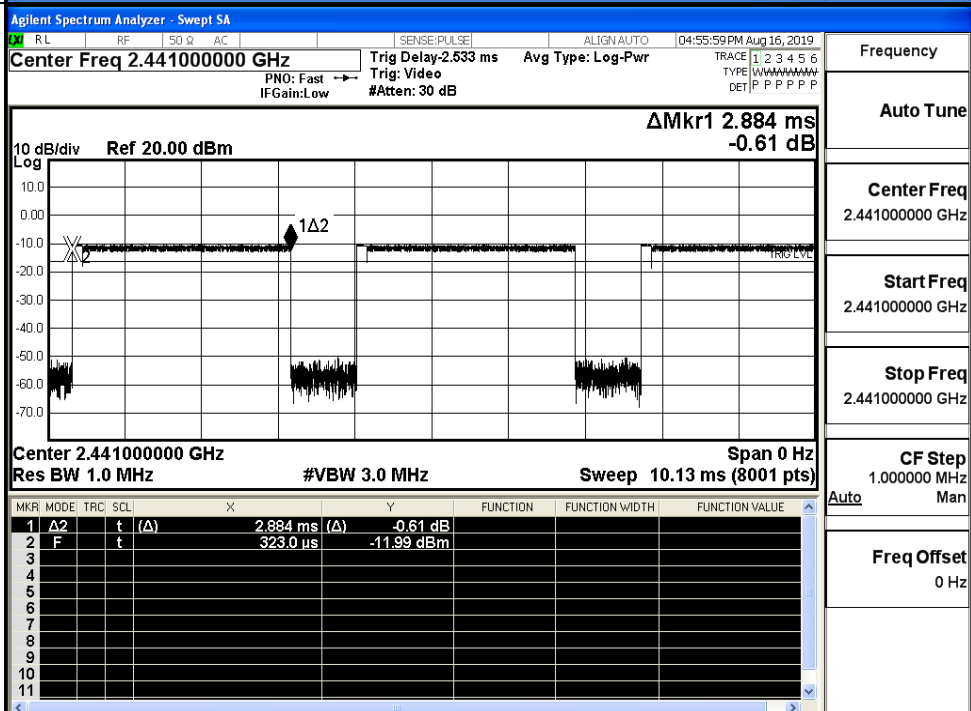


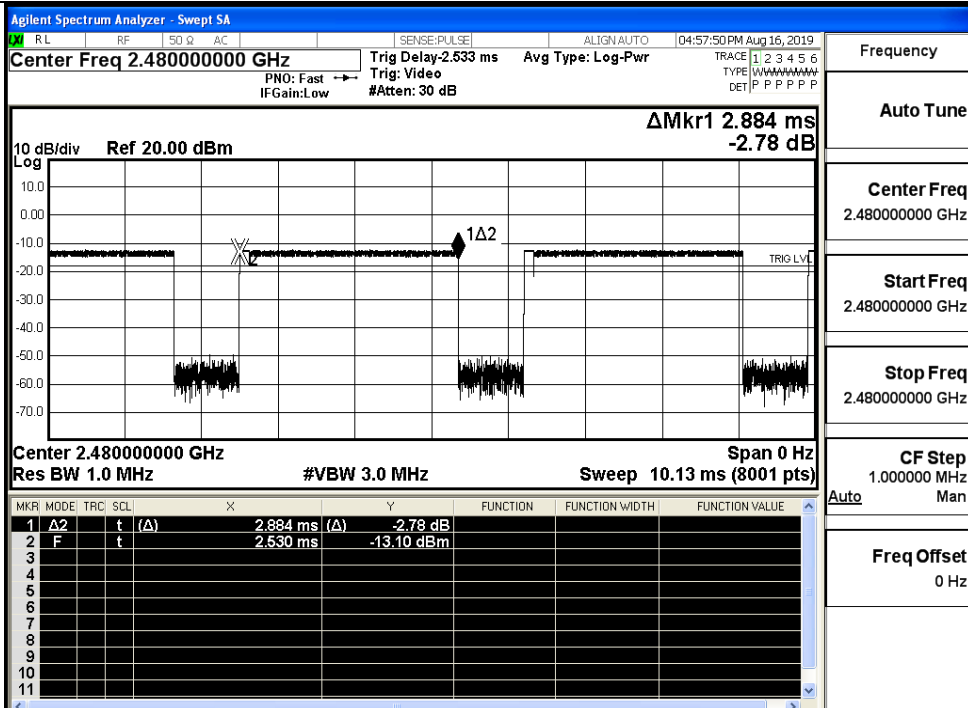
GFSK\_DH5/MCH



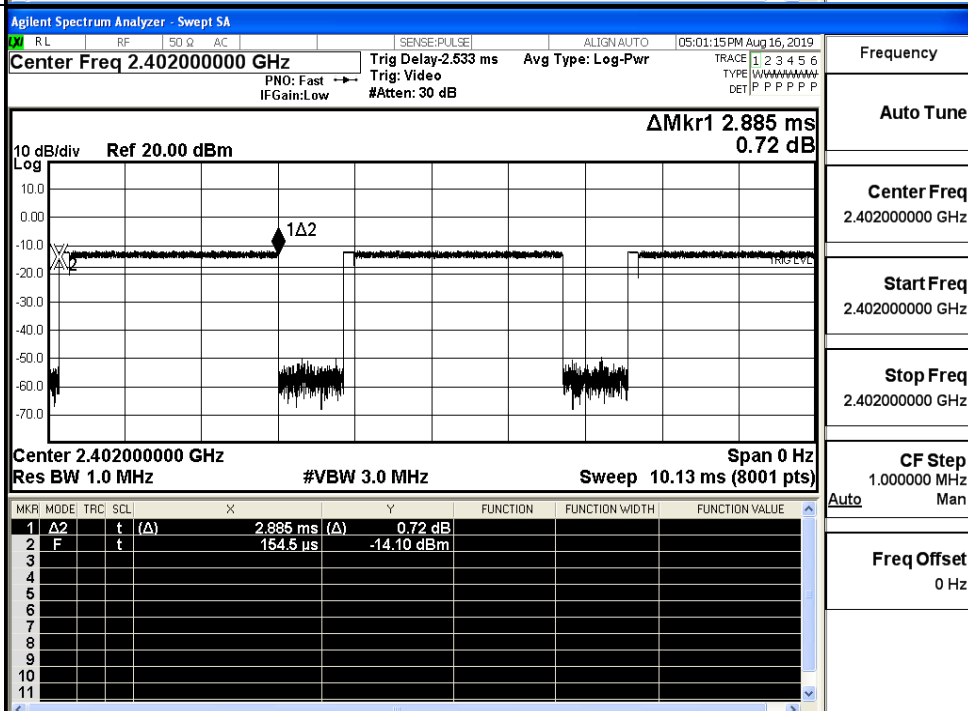
GFSK\_DH5/HCH



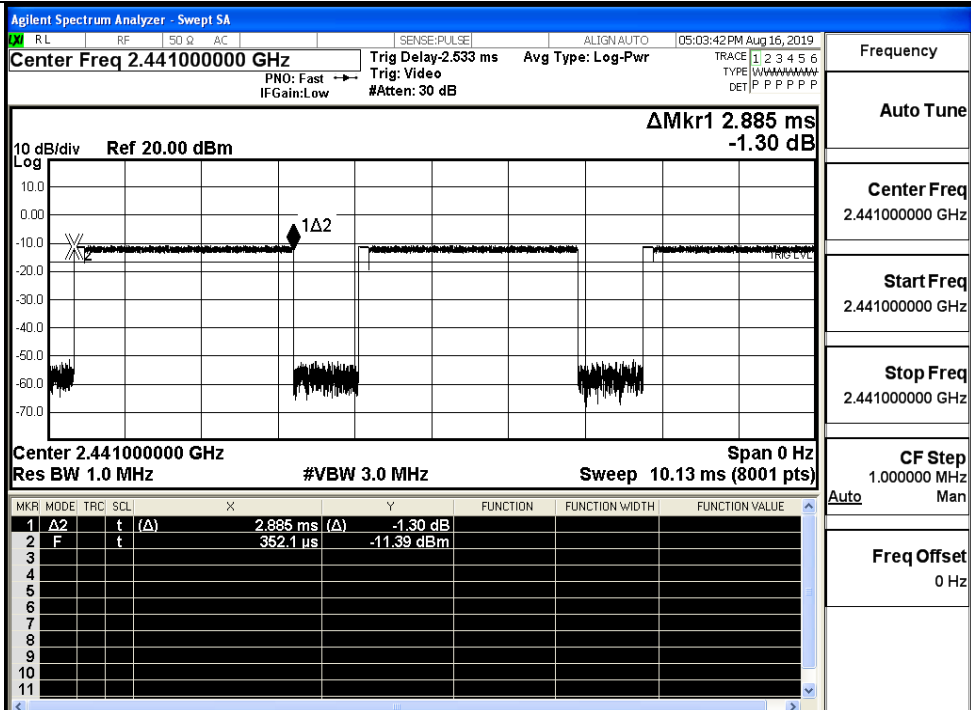
$\pi/4$ DQPSK  
\_2DH5/LCH $\pi/4$ DQPSK  
\_2DH5/MCH

$\pi/4$ DQPSK  
\_2DH5/HCH

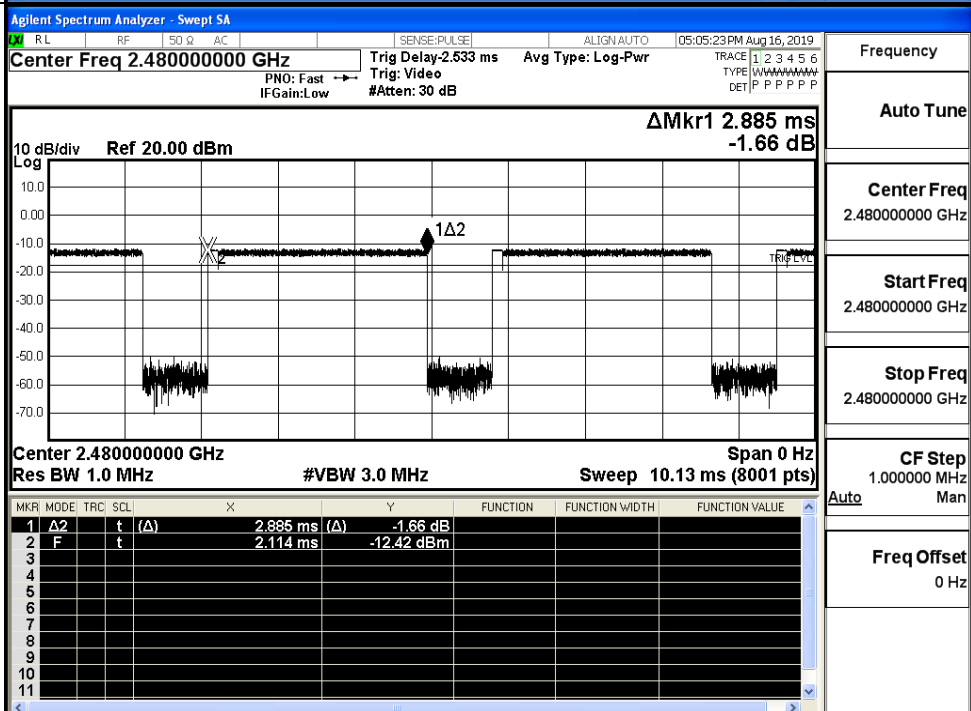
8DPSK \_3DH5/LCH



8DPSK\_3DH5/MCH



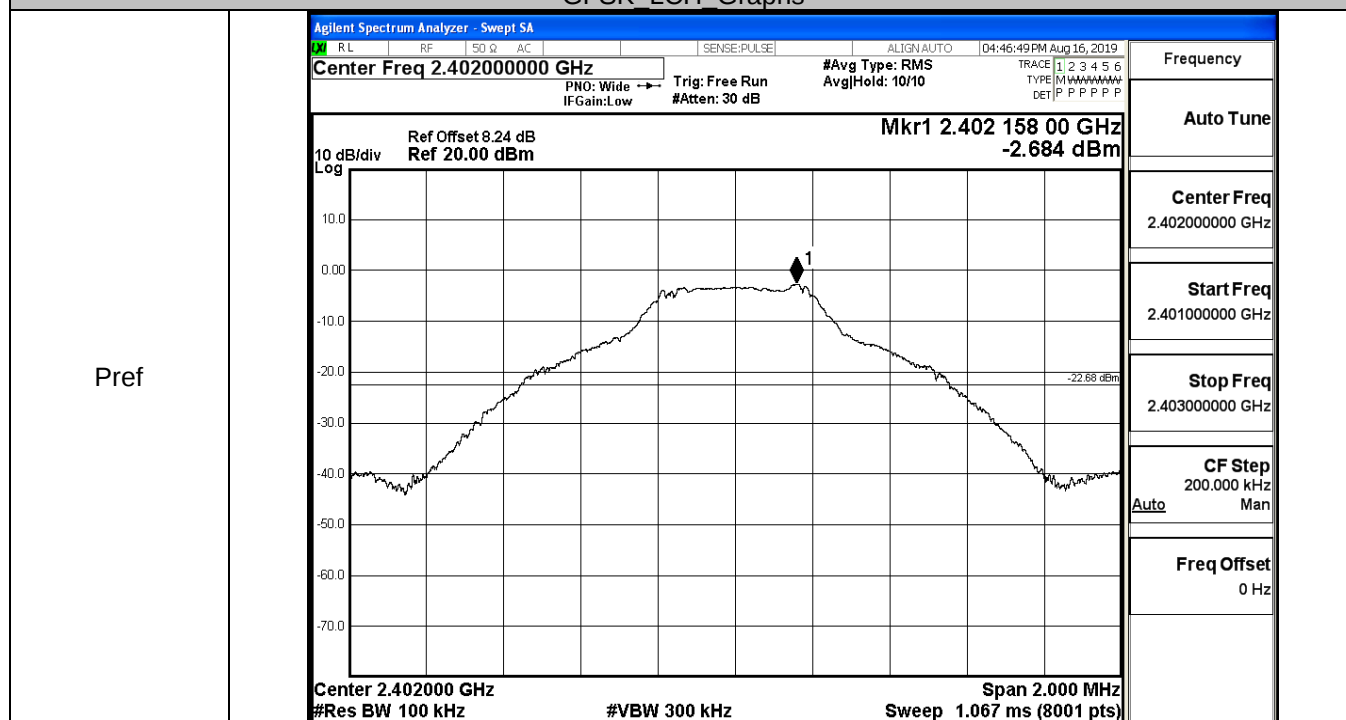
8DPSK\_3DH5/HCH



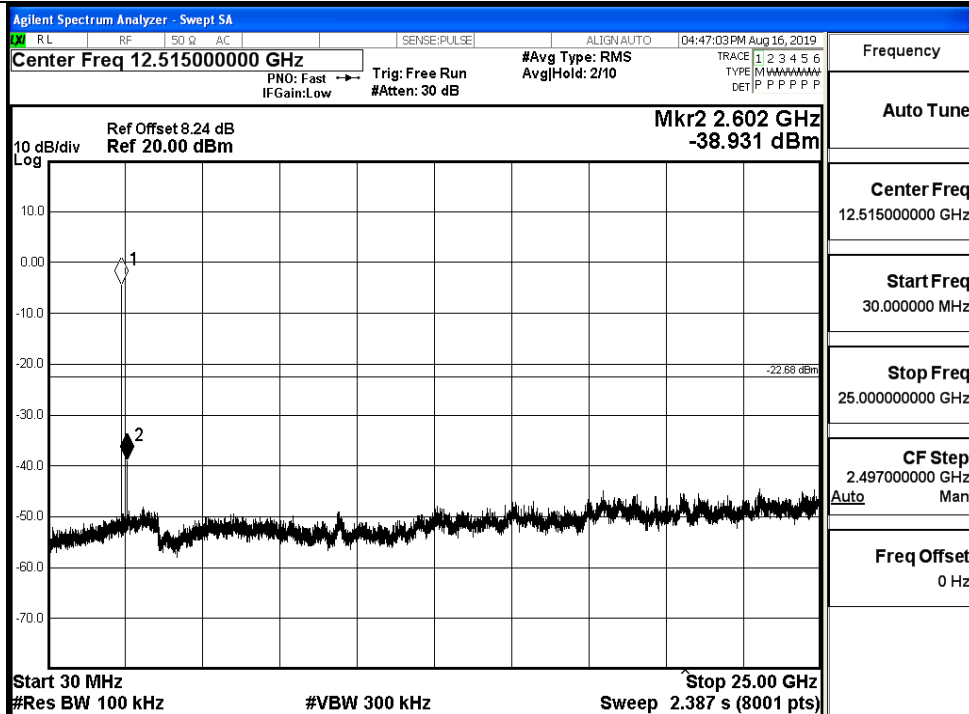
## A.6 RF Conducted Spurious Emissions

| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | -2.684     | -38.931          | -22.684     | PASS    |
|               | MCH     | -1.087     | -40.813          | -21.087     | PASS    |
|               | HCH     | -2.929     | -44.447          | -22.929     | PASS    |
| $\pi/4$ DQPSK | LCH     | -4.603     | -44.698          | -24.603     | PASS    |
|               | MCH     | -2.335     | -44.584          | -22.335     | PASS    |
|               | HCH     | -4.457     | -34.764          | -24.457     | PASS    |
| 8DPSK         | LCH     | -4.447     | -45.865          | -24.447     | PASS    |
|               | MCH     | -2.99      | -45.245          | -22.990     | PASS    |
|               | HCH     | -3.979     | -45.465          | -23.979     | PASS    |

GFSK LCH Graphs

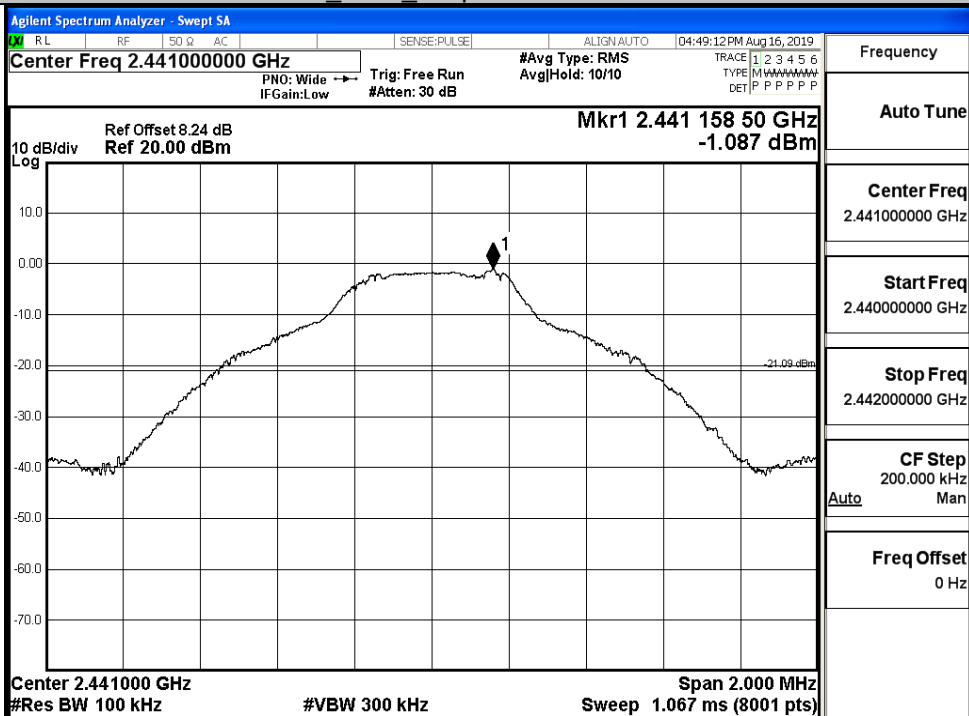


Puw

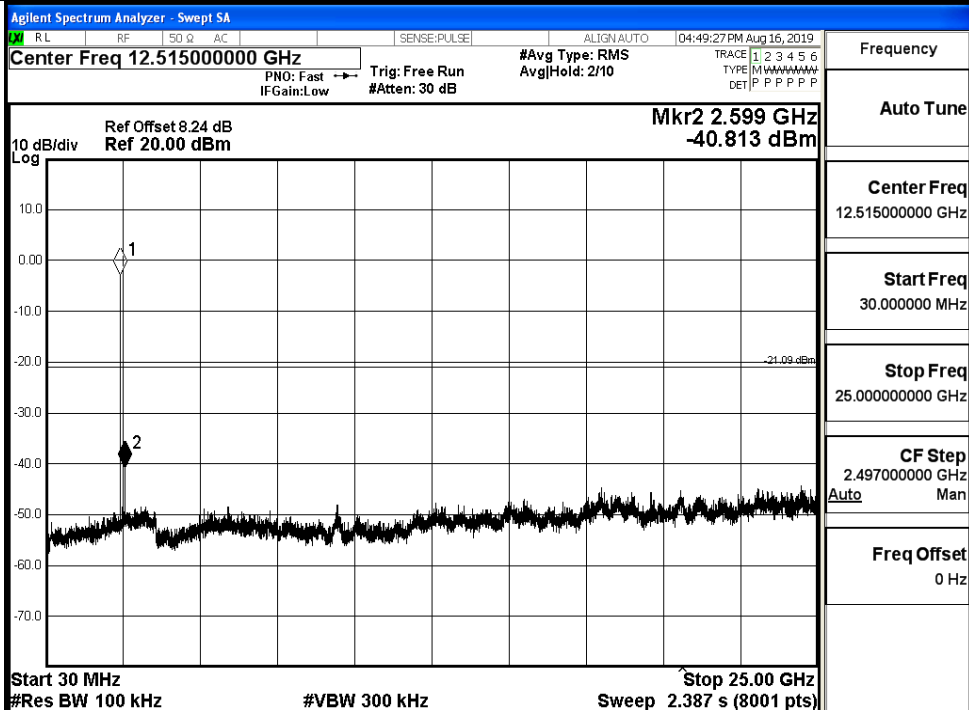


## GFSK\_MCH\_Graphs

Pref

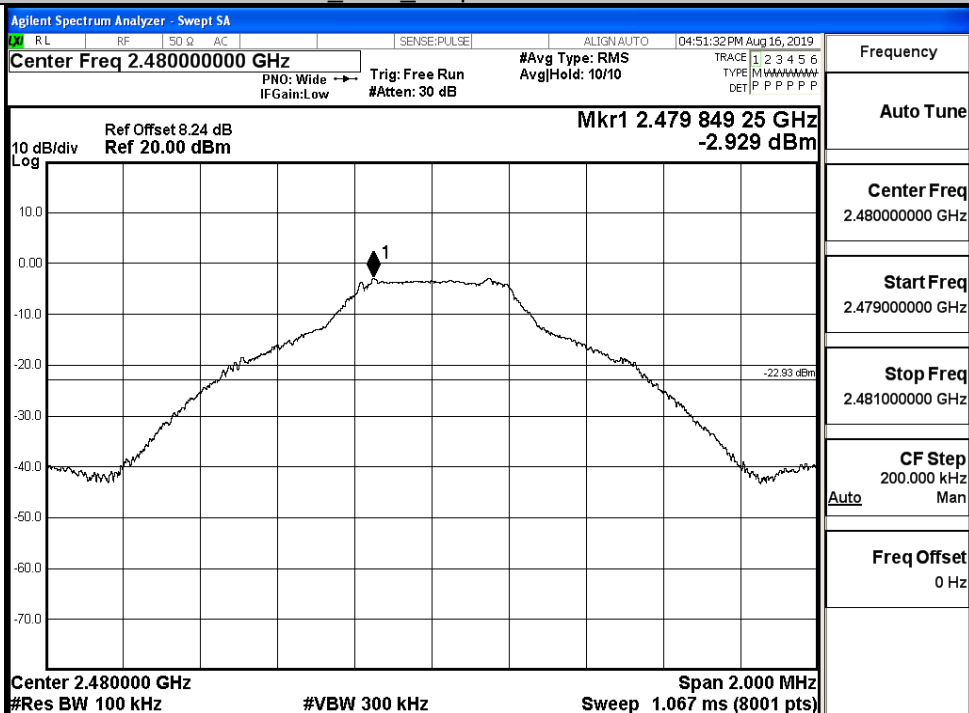


Puw

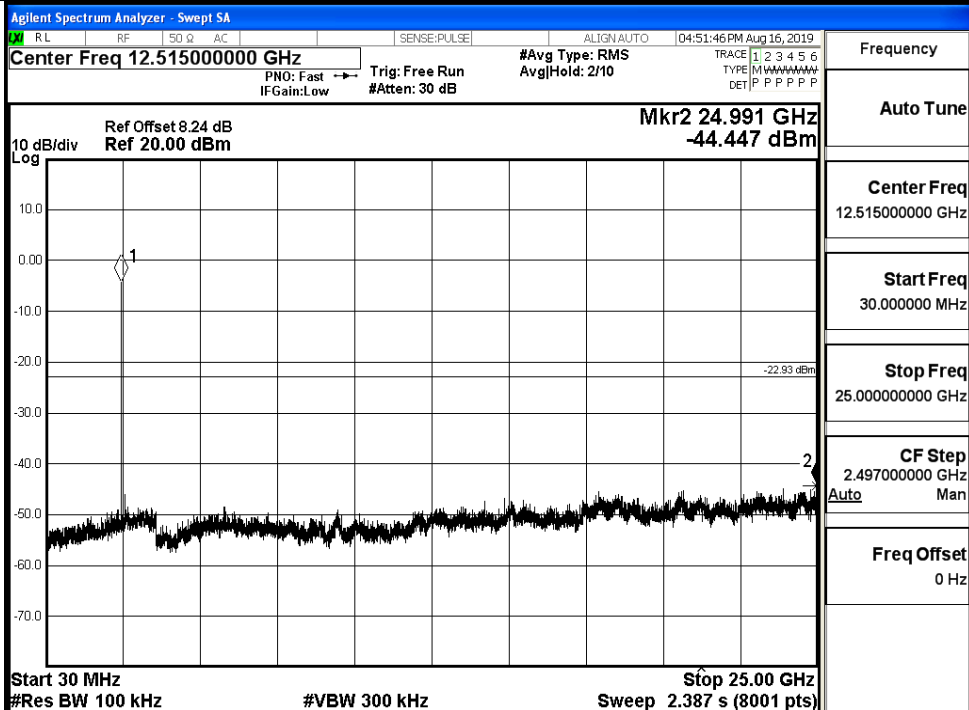


## GFSK HCH\_Graphs

Pref

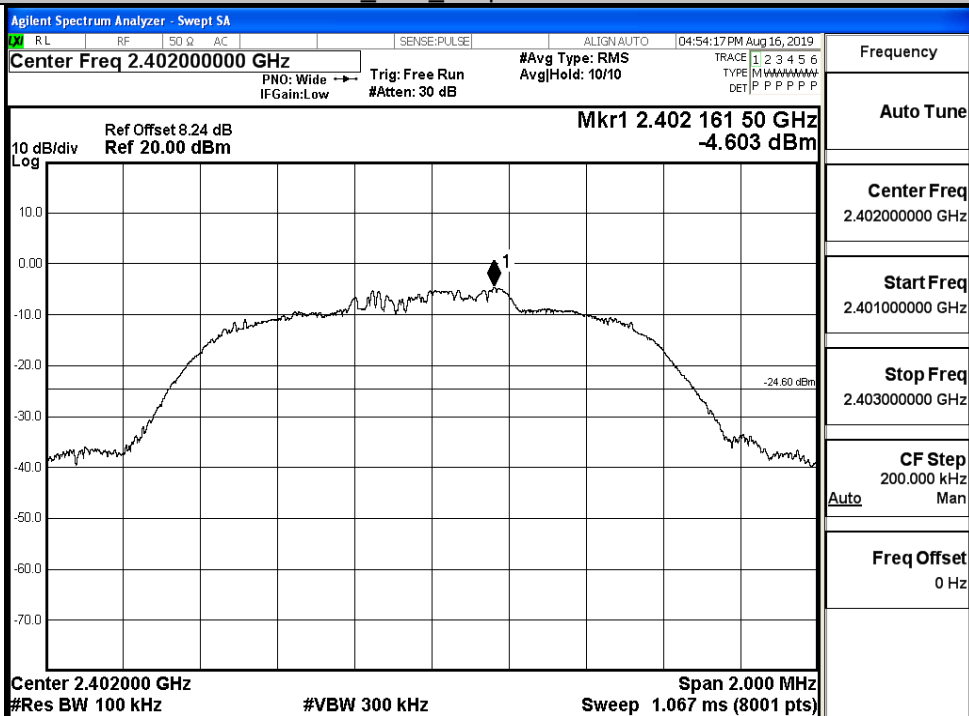


Puw

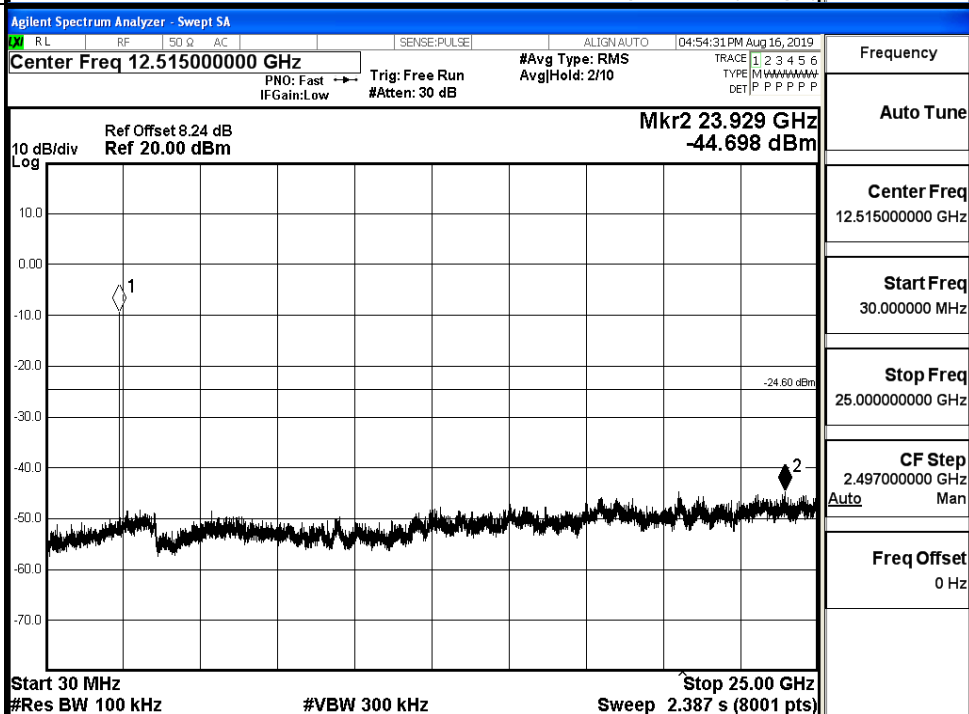


$\pi/4$ DQPSK\_LCH\_Graphs

Pref

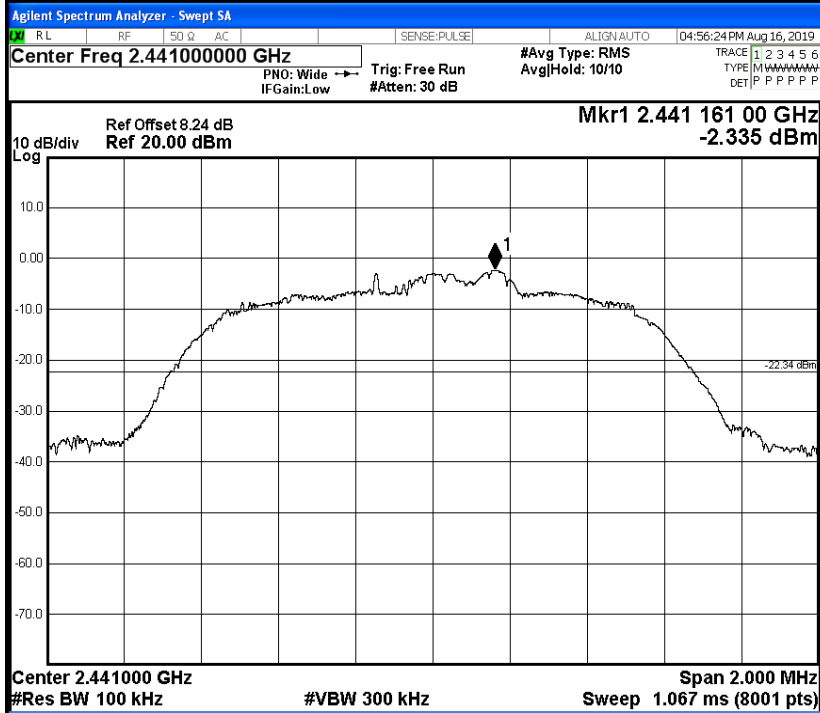


Puw

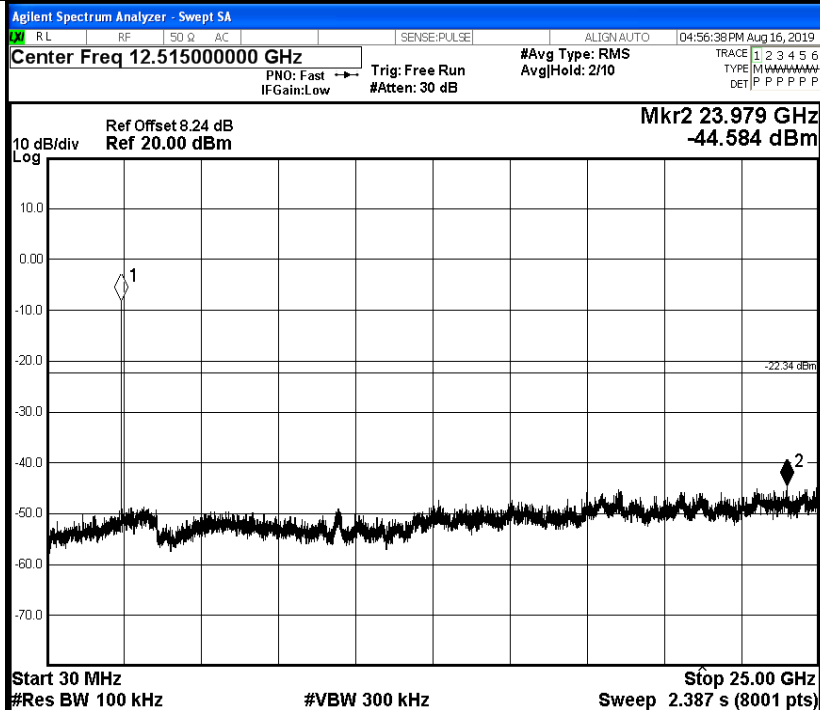


$\pi$ /4DQPSK\_MCH\_Graphs

Pref

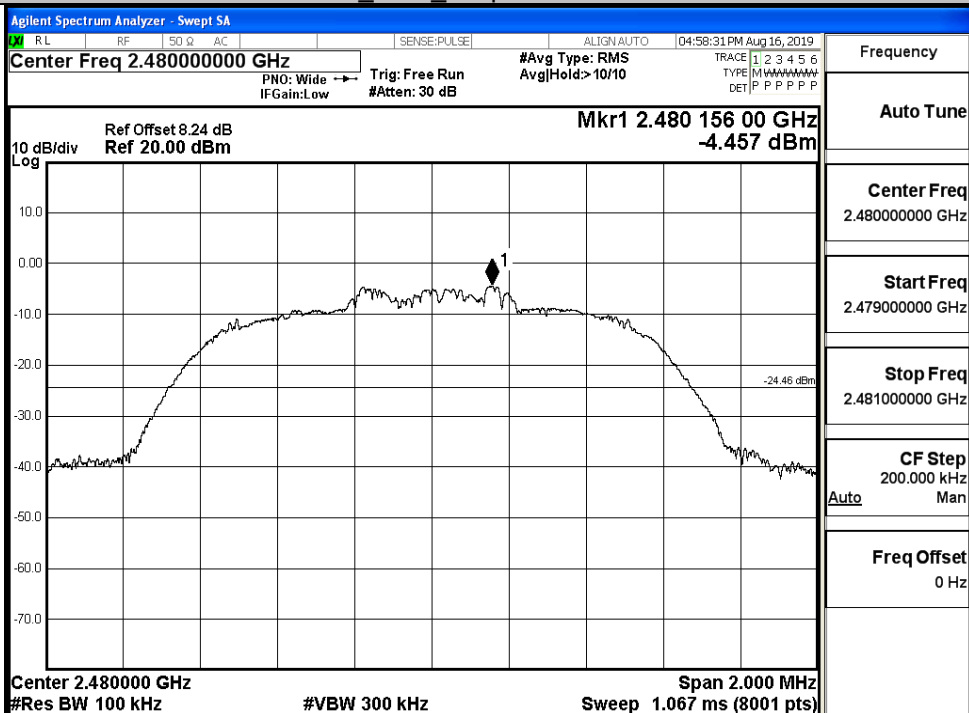


Puw

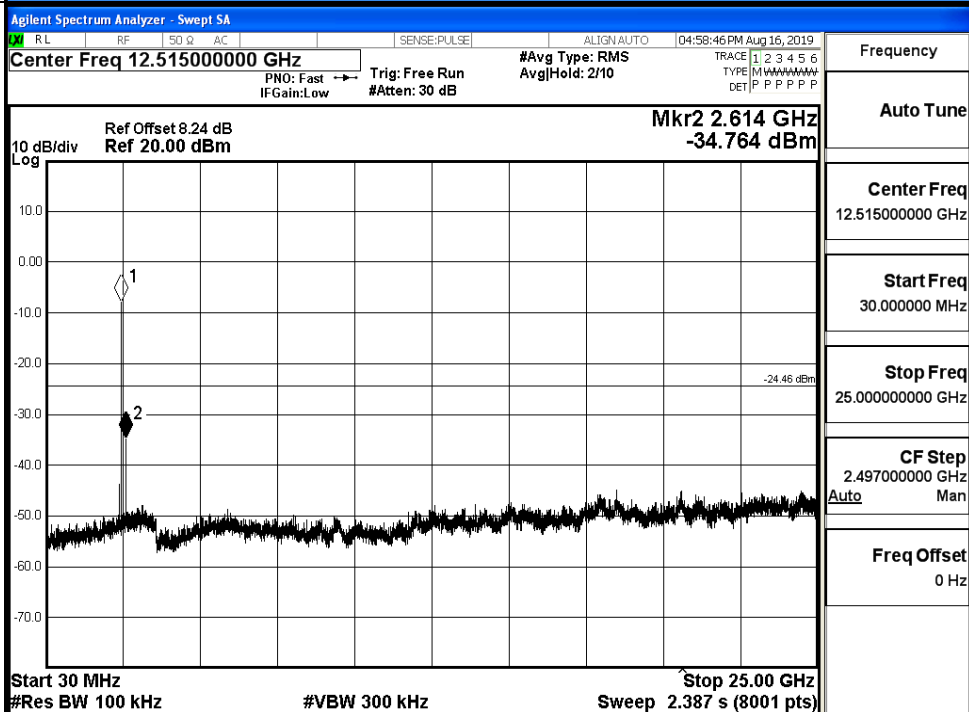


$\pi/4$ DQPSK\_HCH\_Graphs

Pref

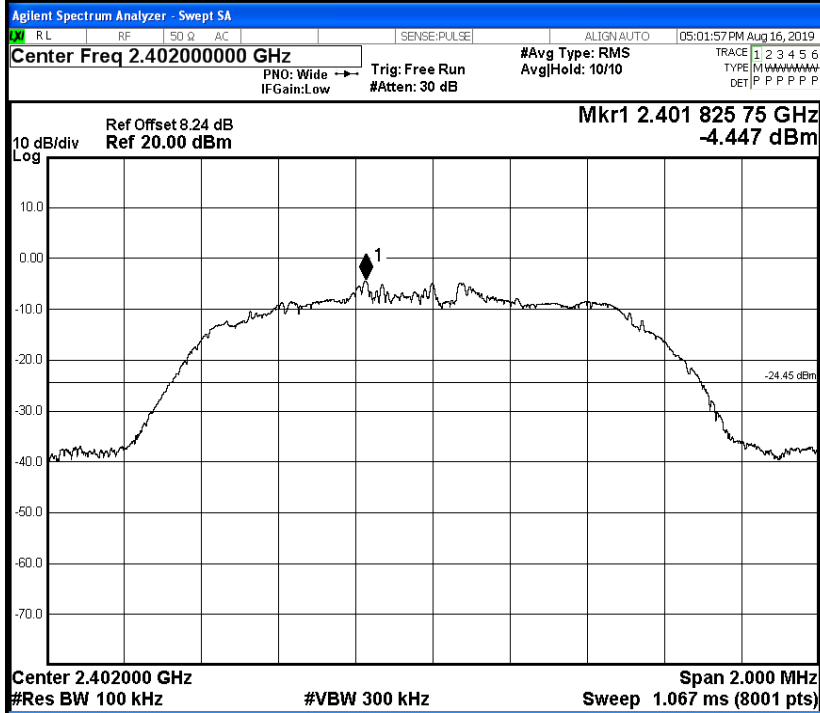


Puw

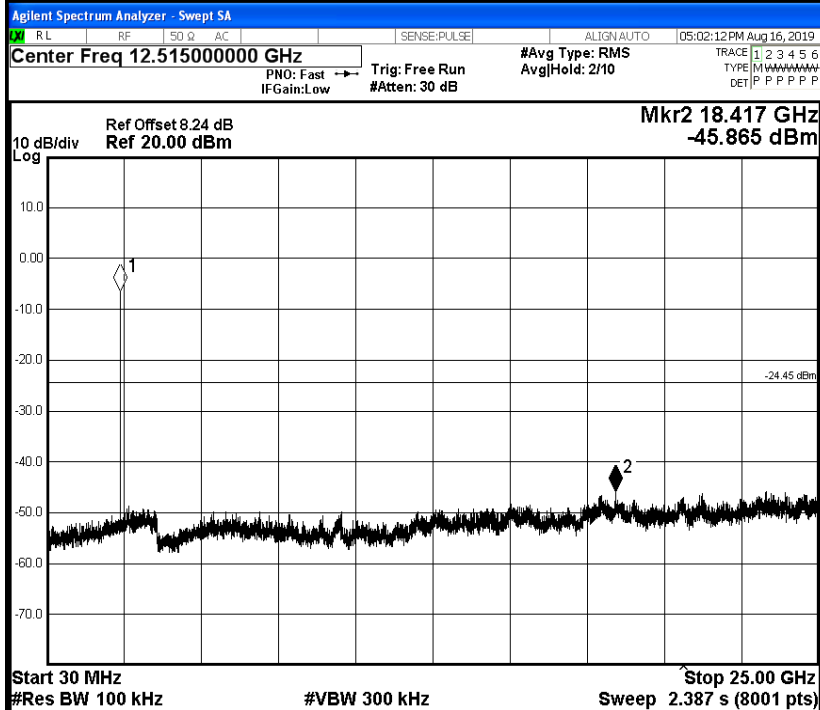


## 8DPSK\_LCH\_Graphs

Pref

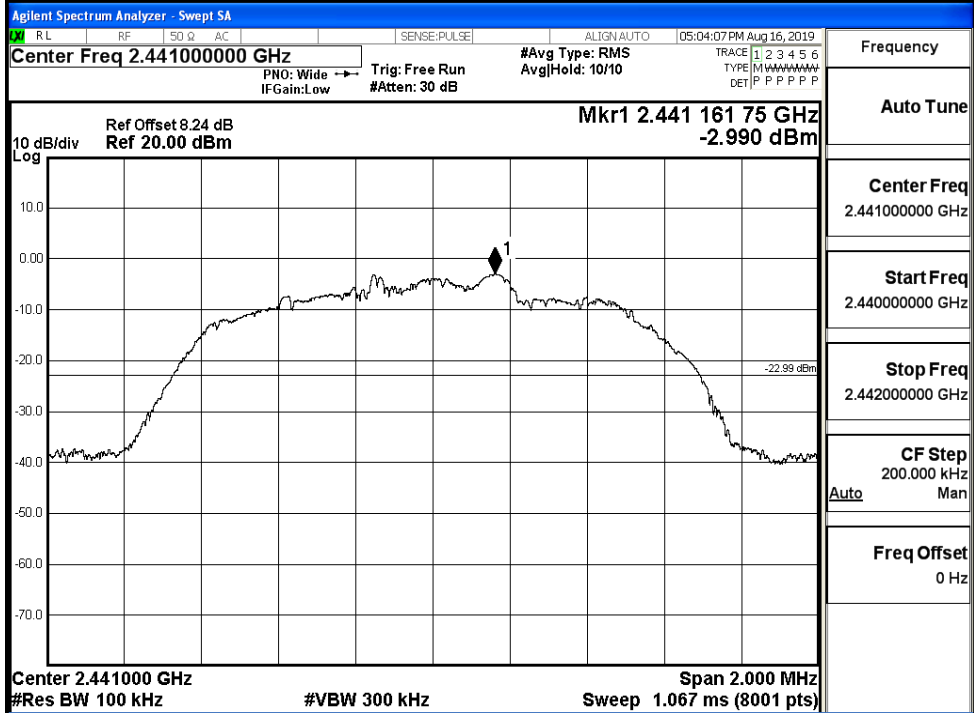


Puw

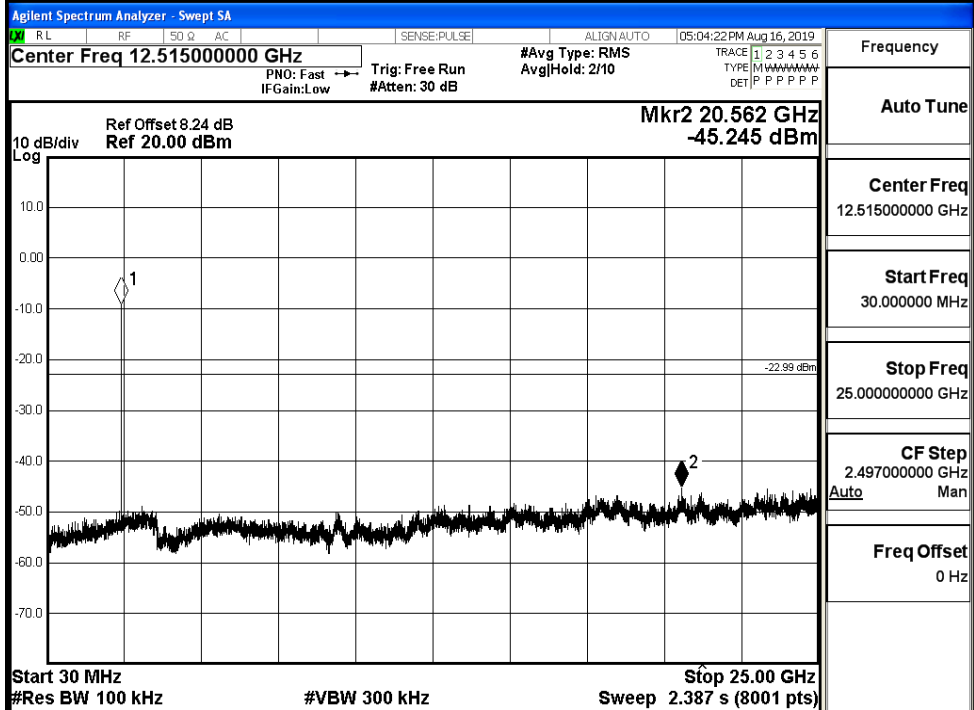


## 8DPSK\_MCH\_Graphs

Pref

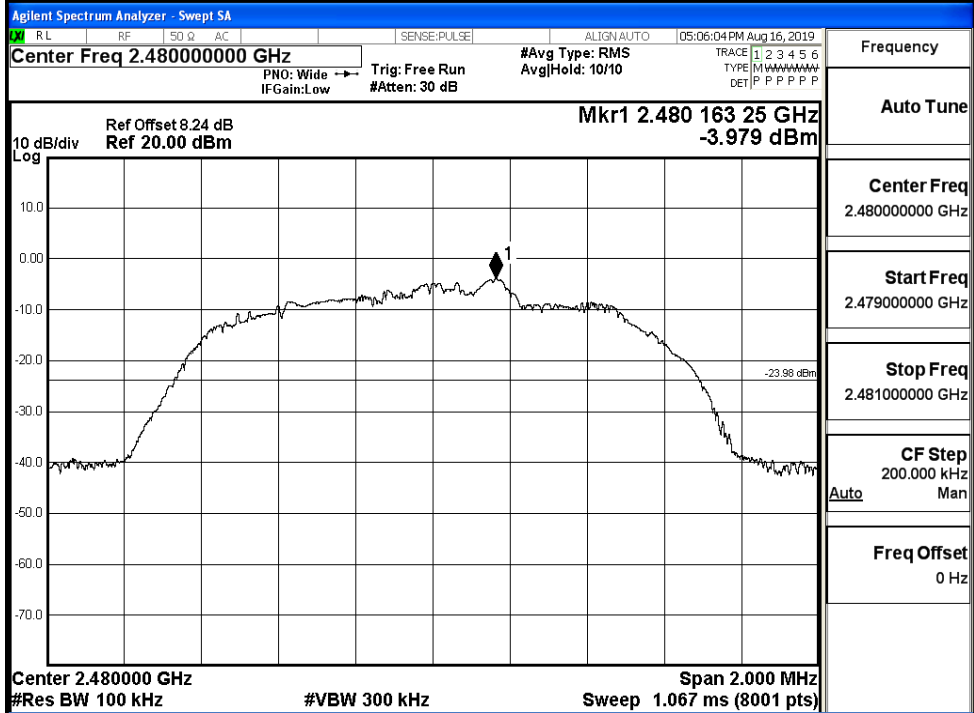


Puw

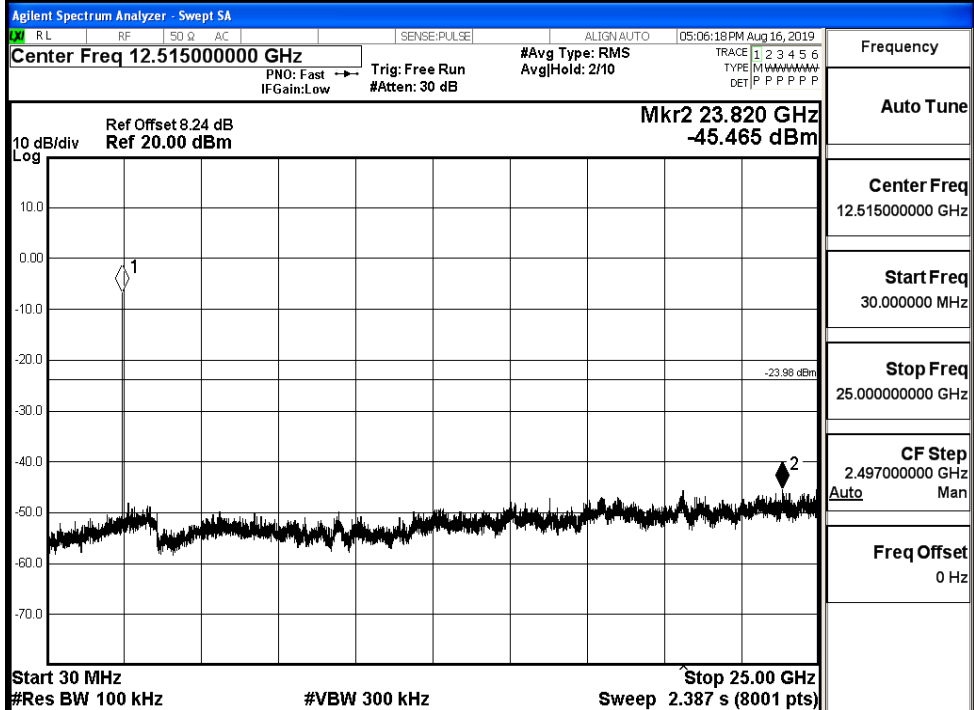


## 8DPSK\_HCH\_Graphs

Pref



Puw

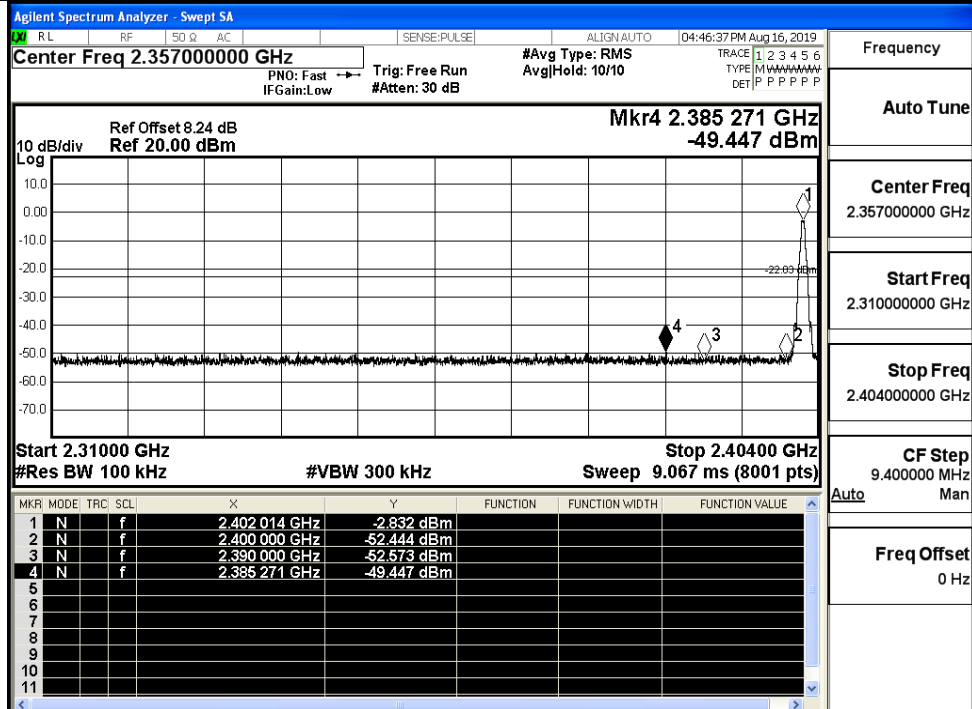


## A.7 Band-edge for RF Conducted Emissions

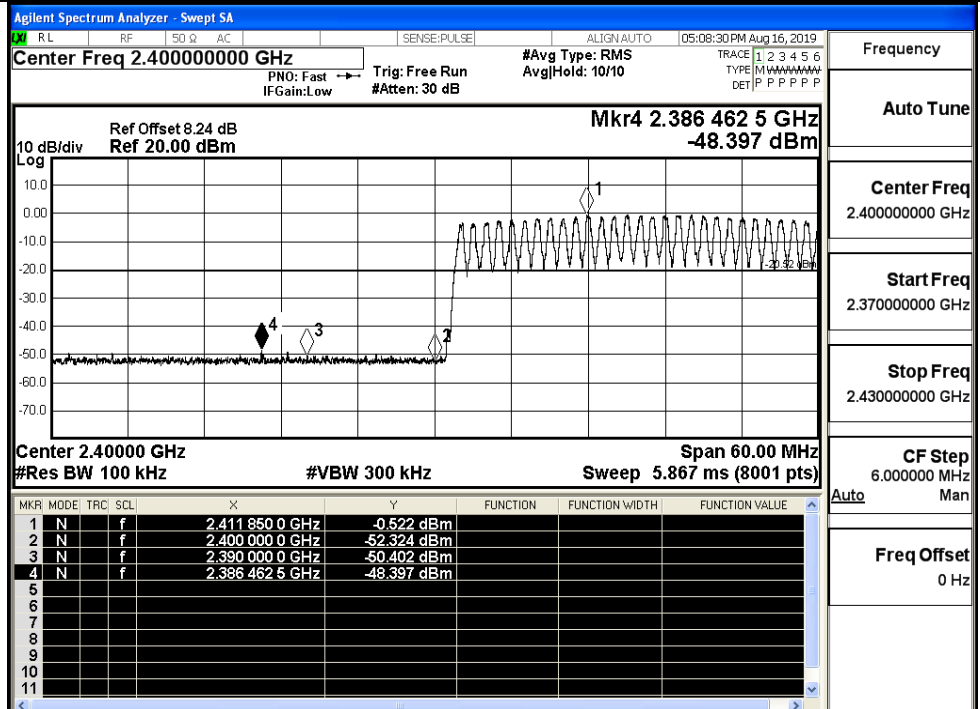
| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | -2.832              | Off               | -49.447                  | -22.83      | PASS    |
|               |         |                         | -0.522              | On                | -48.397                  | -20.52      | PASS    |
|               | HCH     | 2480                    | -2.928              | Off               | -48.763                  | -22.93      | PASS    |
|               |         |                         | -0.551              | On                | -49.925                  | -20.55      | PASS    |
| $\pi/4$ DQPSK | LCH     | 2402                    | -5.280              | Off               | -48.324                  | -25.28      | PASS    |
|               |         |                         | -1.727              | On                | -49.020                  | -21.73      | PASS    |
|               | HCH     | 2480                    | -4.234              | Off               | -48.184                  | -24.23      | PASS    |
|               |         |                         | -1.710              | On                | -49.008                  | -21.71      | PASS    |
| 8DPSK         | LCH     | 2402                    | -3.972              | Off               | -49.764                  | -23.97      | PASS    |
|               |         |                         | -1.721              | On                | -49.410                  | -21.72      | PASS    |
|               | HCH     | 2480                    | -4.376              | Off               | -49.214                  | -24.38      | PASS    |
|               |         |                         | -1.554              | On                | -49.251                  | -21.55      | PASS    |

## Test Graphs

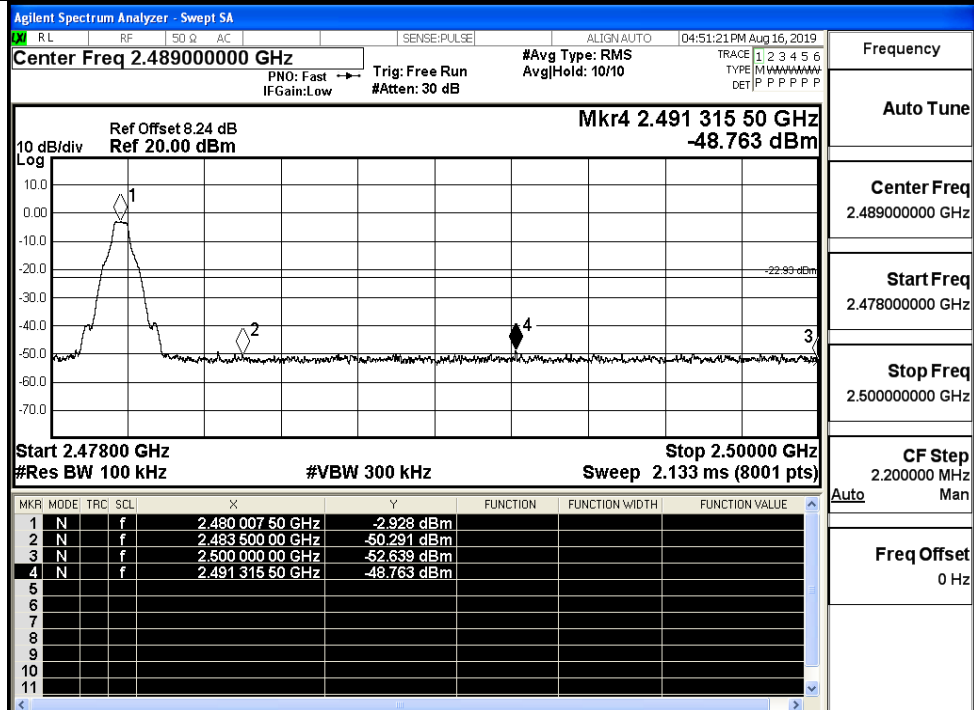
GFSK/LCH/No Hop



GFSK/LCH/Hop



GFSK/HCH/No Hop

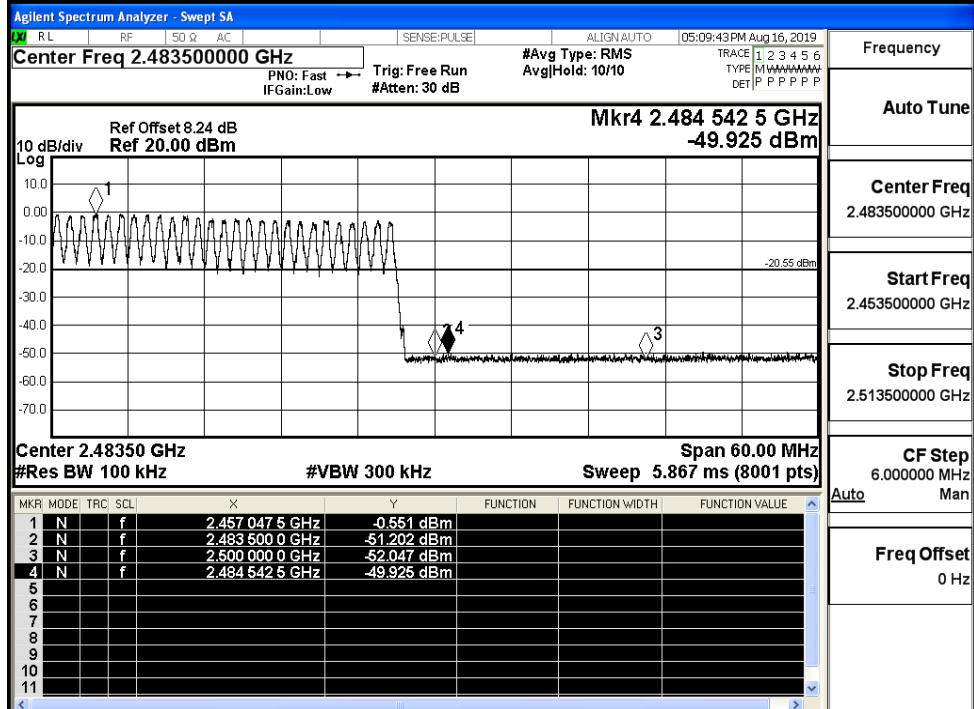


Frequency

Auto Tune

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

GFSK/HCH/Hop

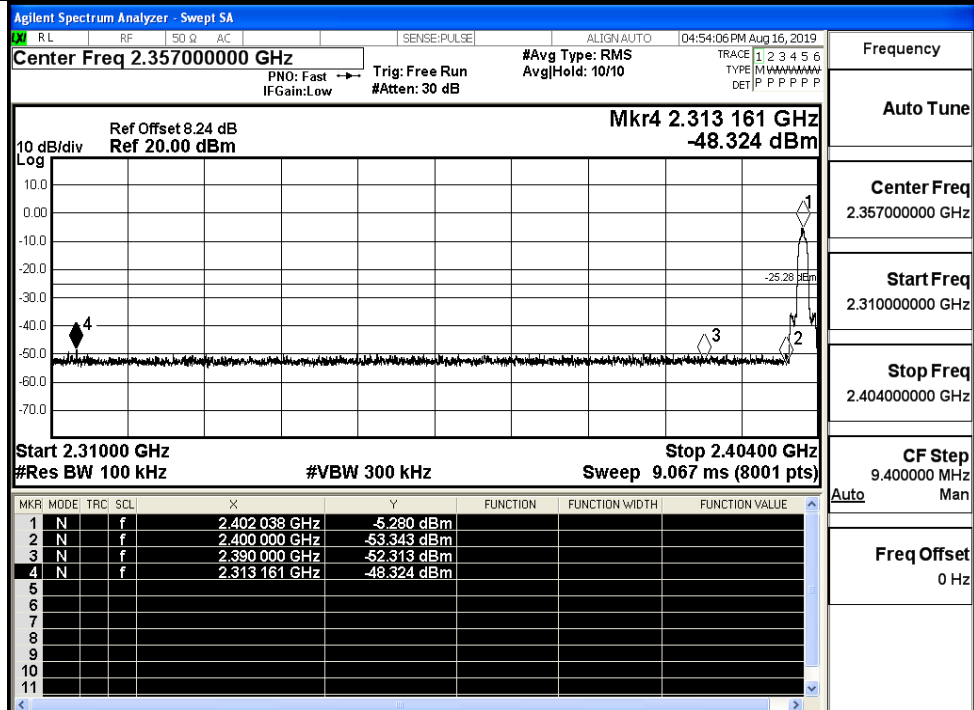


Frequency

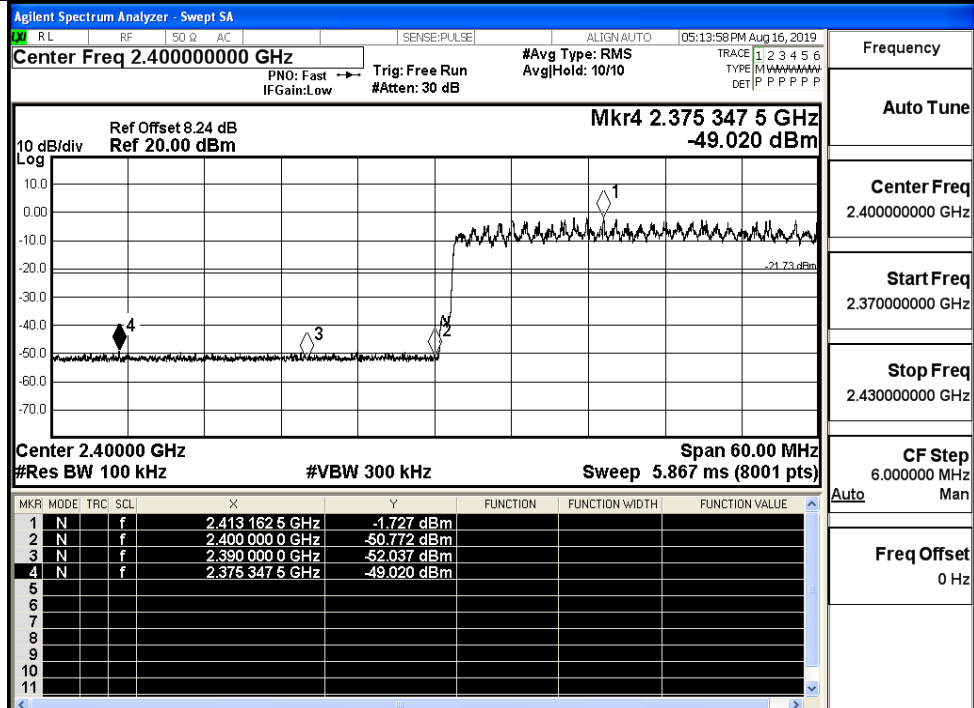
Auto Tune

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

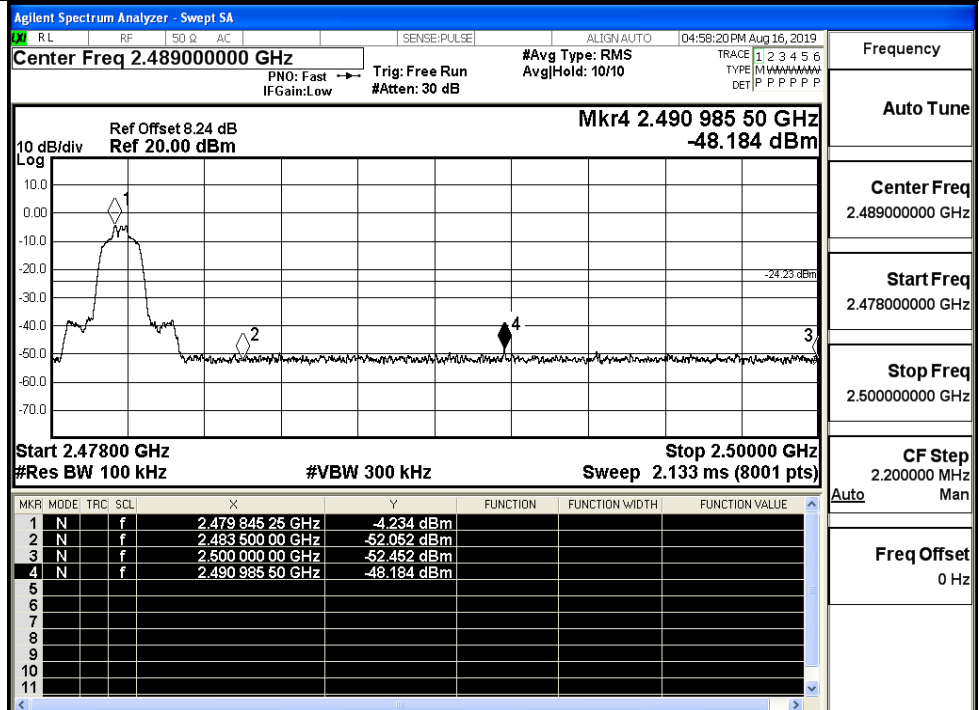
$\pi/4$ DQPSK/LCH/No  
Hop



$\pi/4$ DQPSK/LCH/Hop



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



Frequency

Auto Tune

Center Freq  
2.489000000 GHz

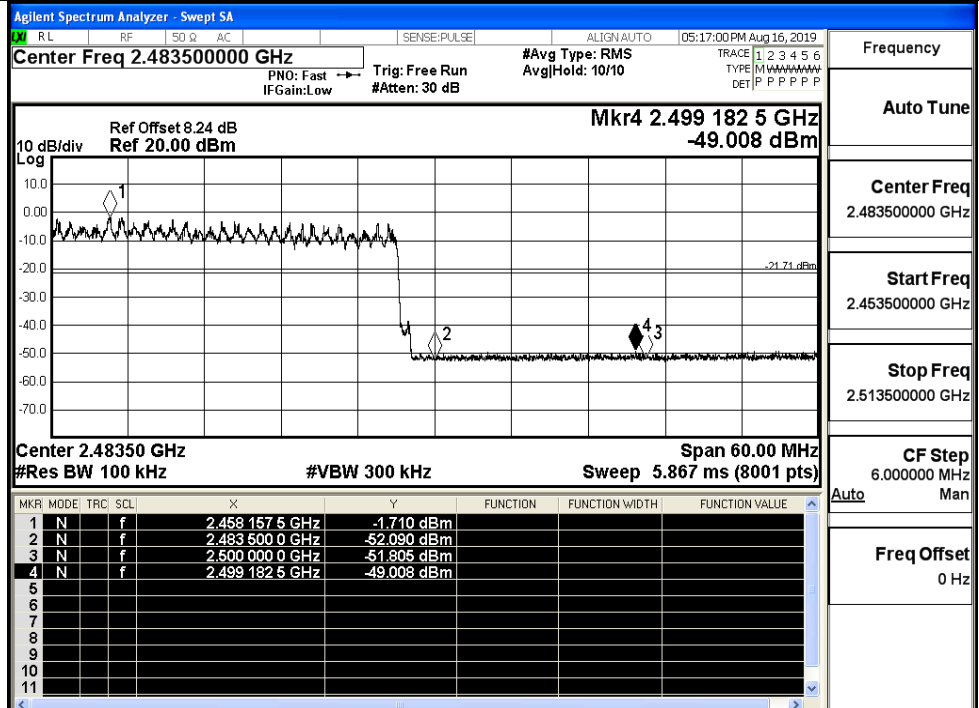
Start Freq  
2.478000000 GHz

Stop Freq  
2.500000000 GHz

CF Step  
2.200000 MHz  
Auto

Freq Offset  
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq  
2.483500000 GHz

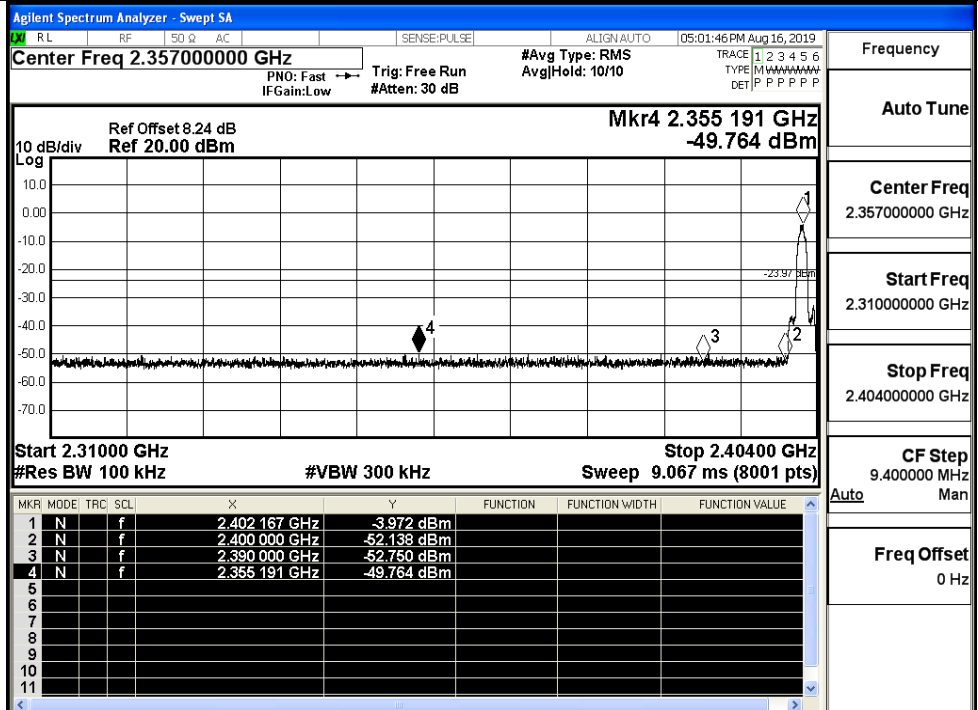
Start Freq  
2.453500000 GHz

Stop Freq  
2.513500000 GHz

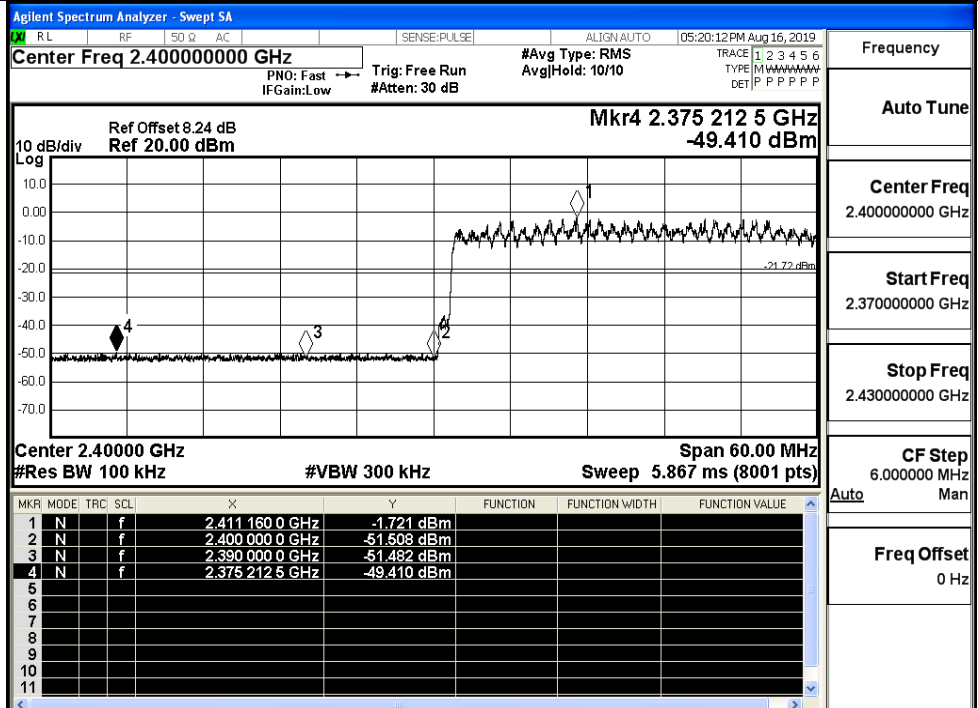
CF Step  
6.000000 MHz  
Auto

Freq Offset  
0 Hz

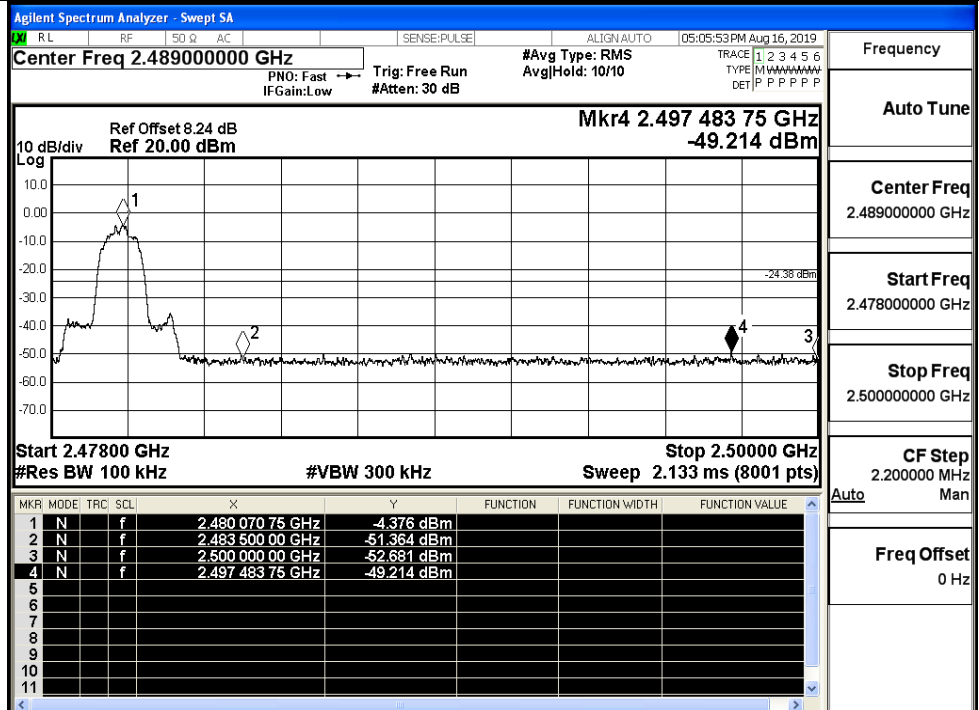
8DPSK/LCH/No Hop



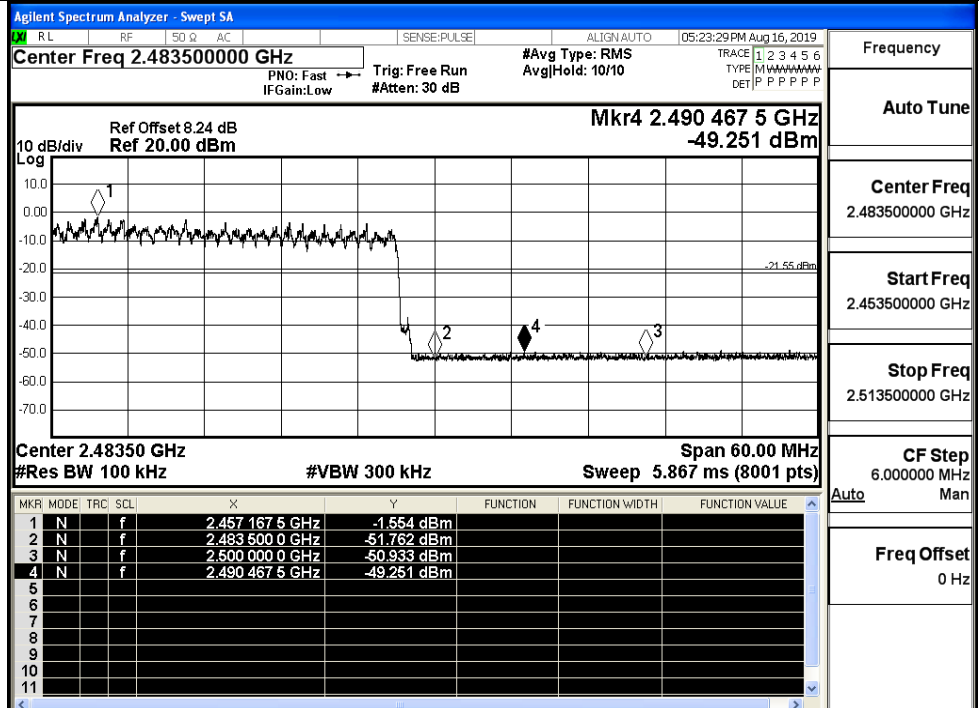
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



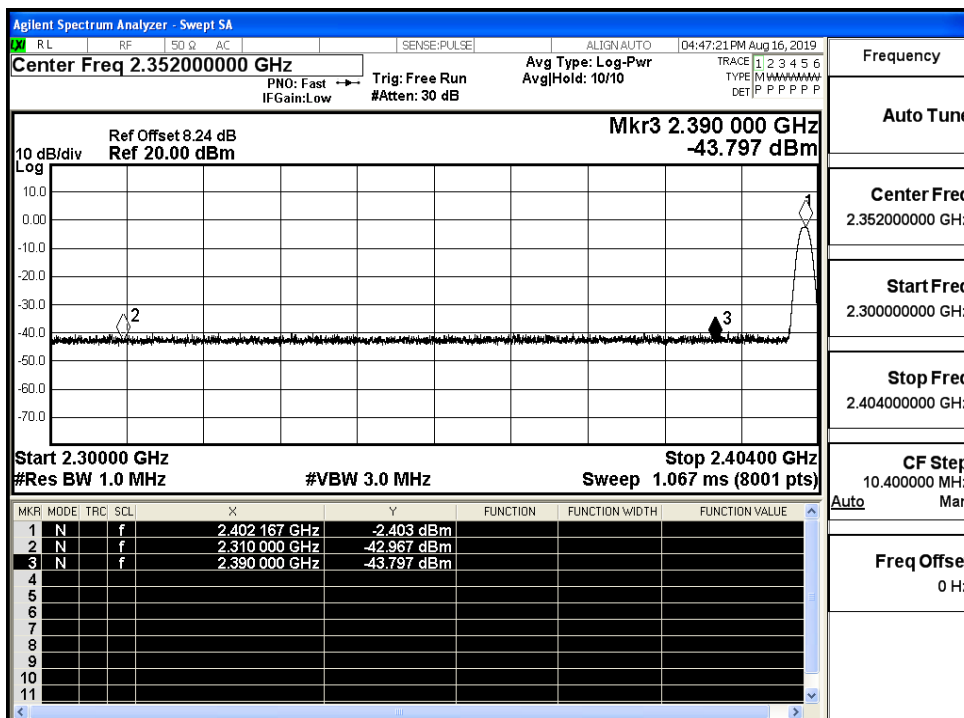
8DPSK/HCH/Hop



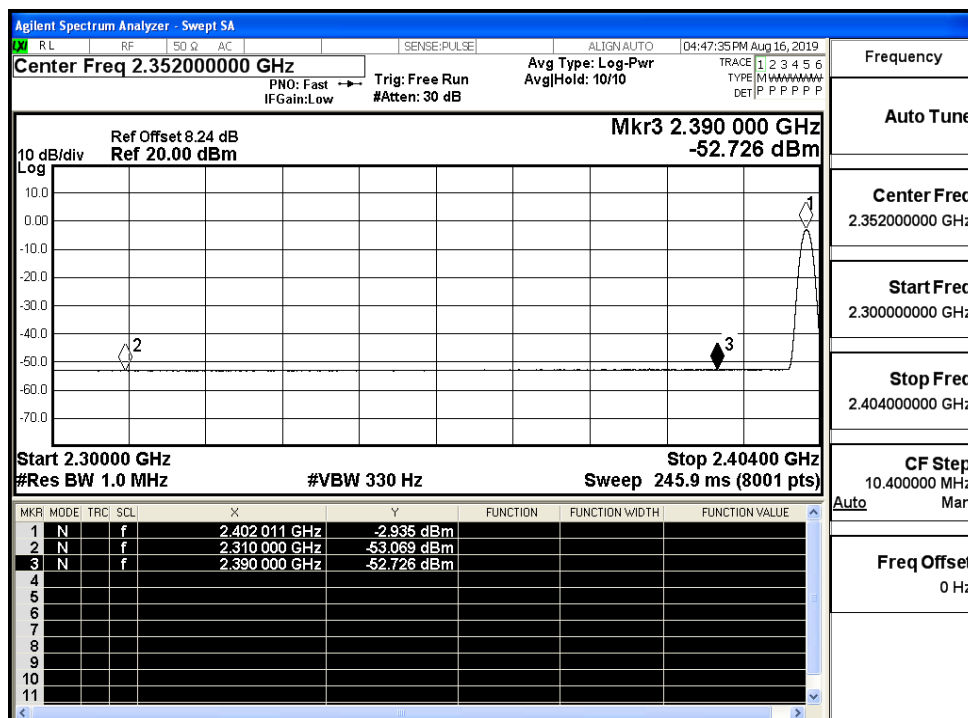
**A.8 Restrict-band measurements on band-edge**

| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -42.97      | 2.0  | 0             | 52.29      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.07      | 2.0  | 0             | 42.19      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.80      | 2.0  | 0             | 51.46      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -52.73      | 2.0  | 0             | 42.53      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.21      | 2.0  | 0             | 52.05      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.49      | 2.0  | 0             | 42.77      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -42.79      | 2.0  | 0             | 52.47      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.36      | 2.0  | 0             | 42.90      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -41.85      | 2.0  | 0             | 53.41      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -52.85      | 2.0  | 0             | 42.41      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.06      | 2.0  | 0             | 52.19      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -52.79      | 2.0  | 0             | 42.47      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -41.53      | 2.0  | 0             | 53.73      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.47      | 2.0  | 0             | 42.78      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -42.94      | 2.0  | 0             | 52.32      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.34      | 2.0  | 0             | 42.92      | AV       | 54             | PASS    |
| 8DPSK         | Off     | 2310.0 | -43.47      | 2.0  | 0             | 51.79      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.60      | 2.0  | 0             | 41.66      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.53      | 2.0  | 0             | 51.73      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.40      | 2.0  | 0             | 41.86      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -42.96      | 2.0  | 0             | 52.30      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -53.13      | 2.0  | 0             | 42.13      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -43.26      | 2.0  | 0             | 52.00      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -53.02      | 2.0  | 0             | 42.24      | AV       | 54             | PASS    |

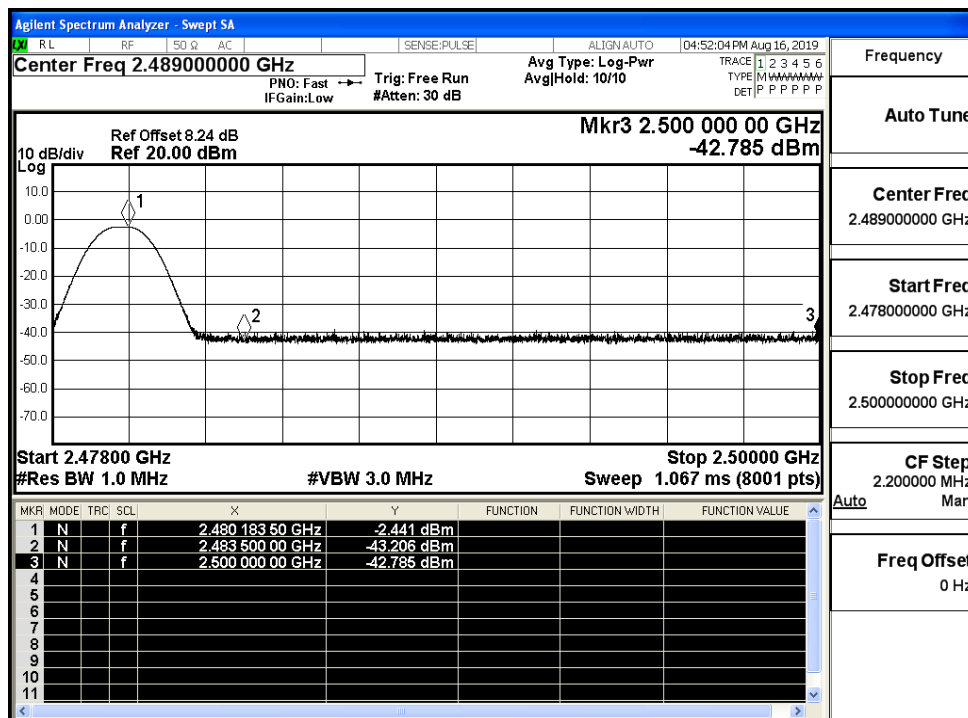
## Restrict-band measurements on band-edge\_Hopping Off\_GFSK\_PEAK (Low Channel)



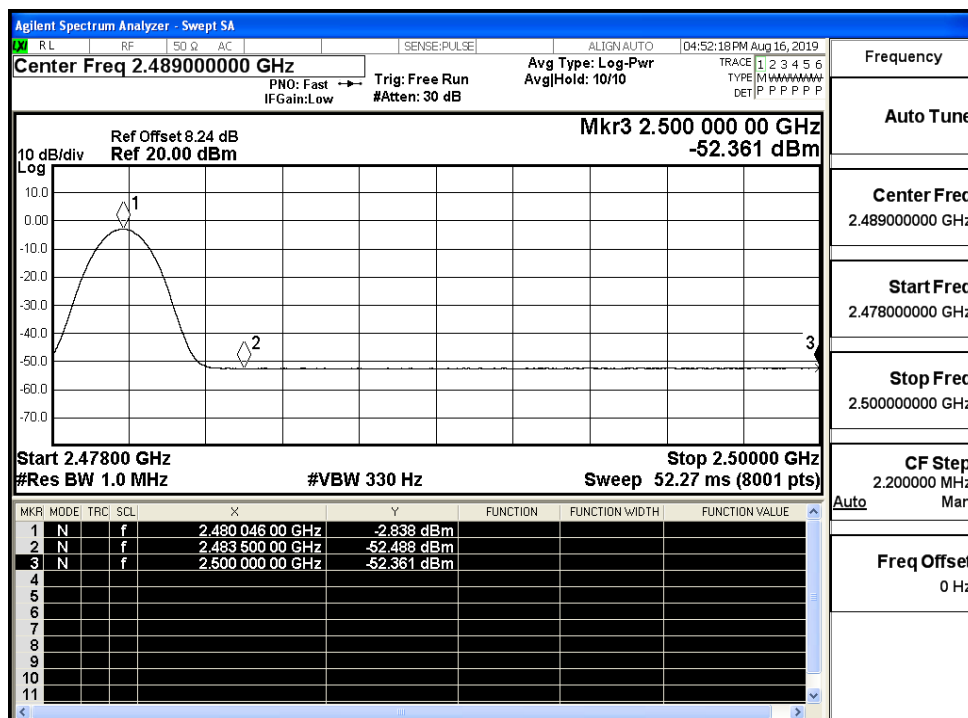
## Restrict-band measurements on band-edge\_Hopping Off\_GFSK\_Average (Low Channel)



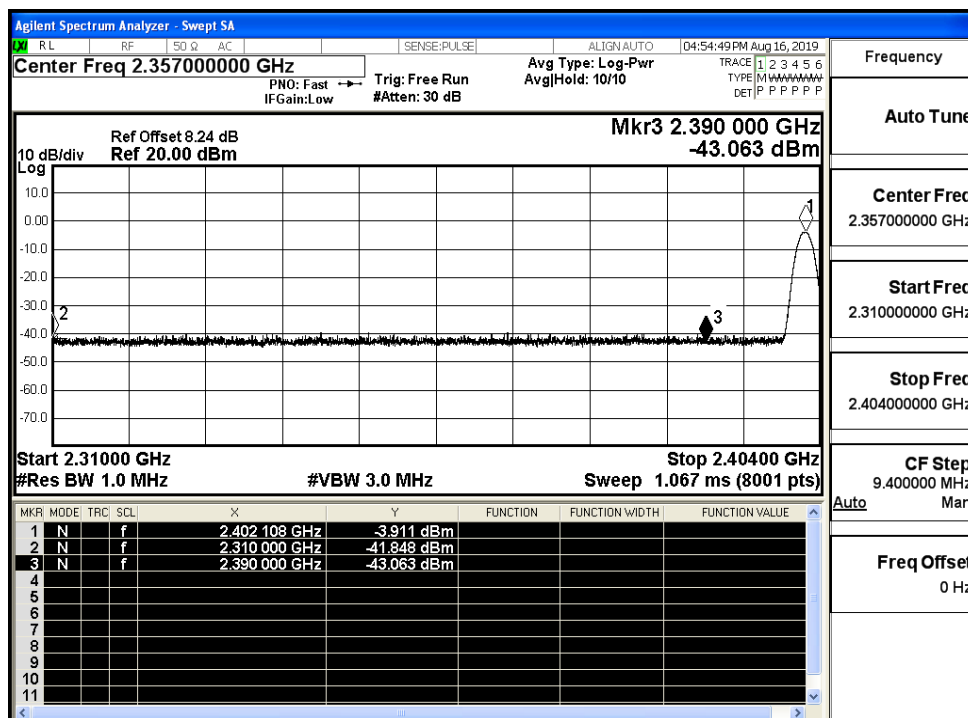
## Restrict-band measurements on band-edge\_Hopping Off\_GFSK\_PEAK (High Channel)



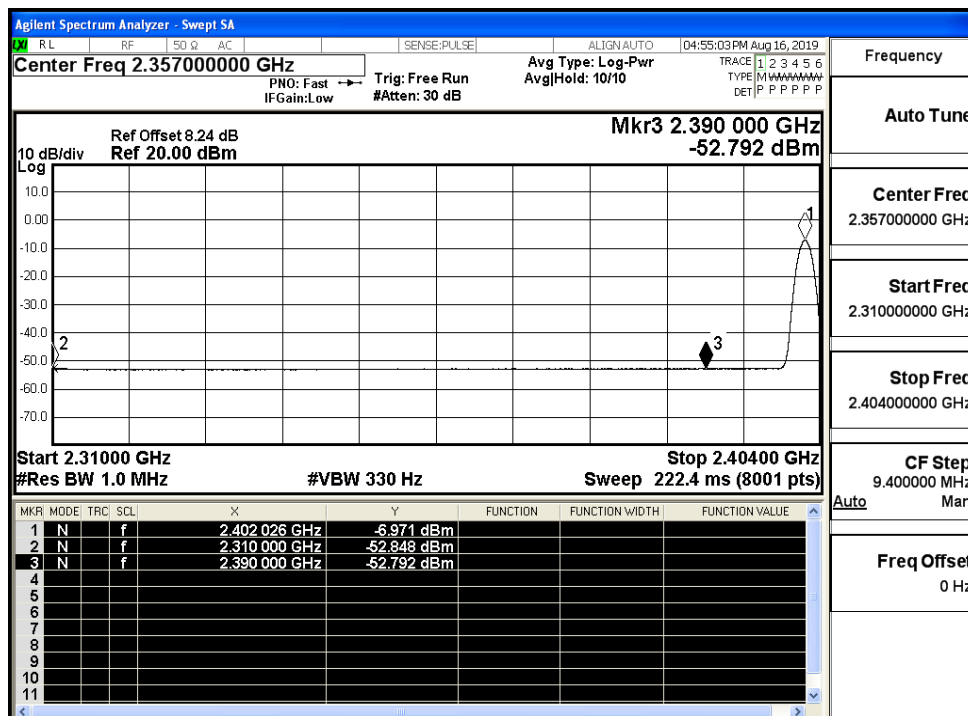
## Restrict-band measurements on band-edge\_Hopping Off\_GFSK\_Average (High Channel)

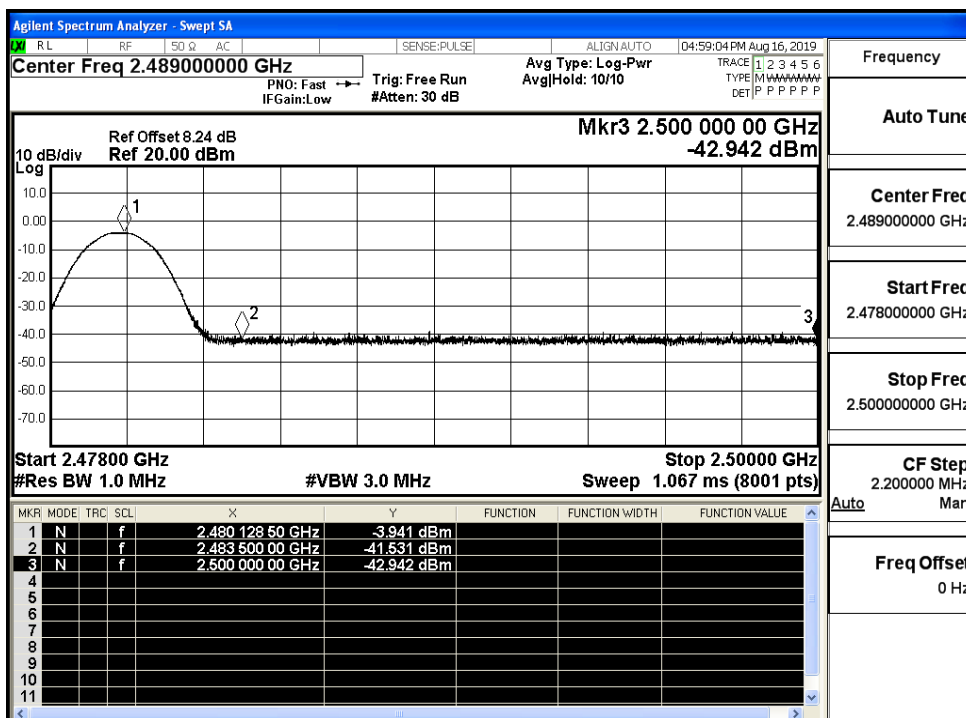
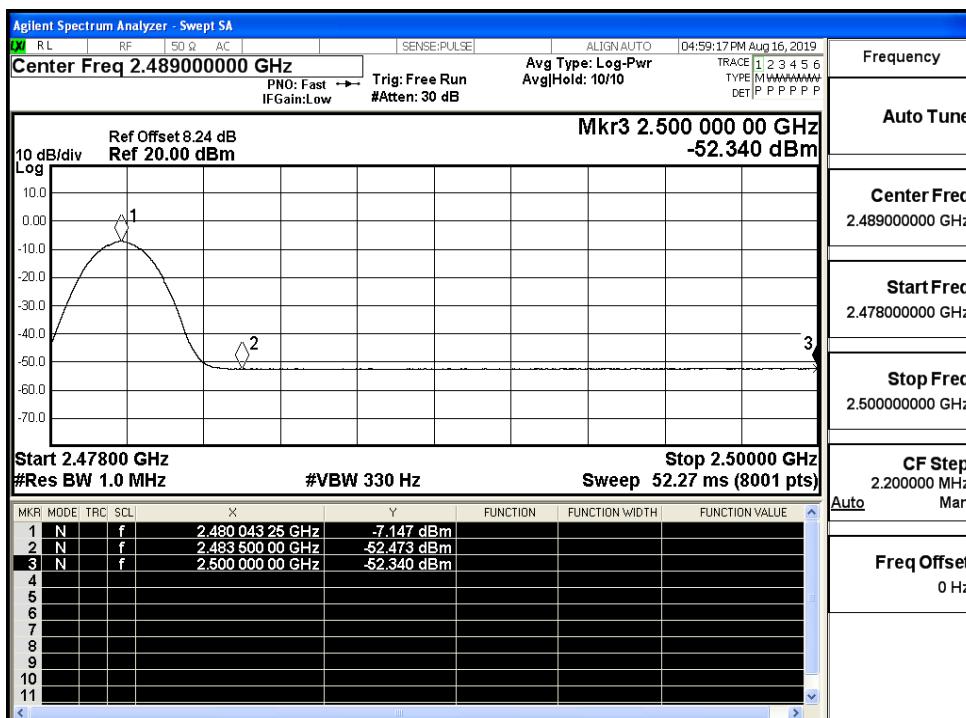


## Restrict-band measurements on band-edge\_Hopping Off\_π/4-DQPSK\_PEAK (Low Channel)

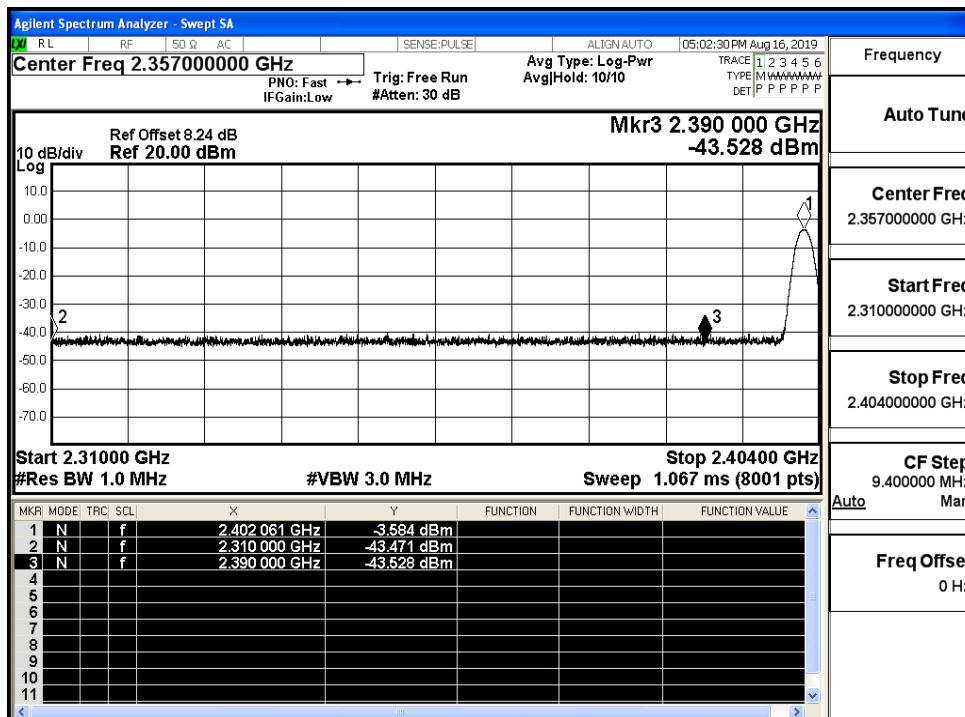


## Restrict-band measurements on band-edge\_Hopping Off\_π/4-DQPSK\_Average (Low Channel)

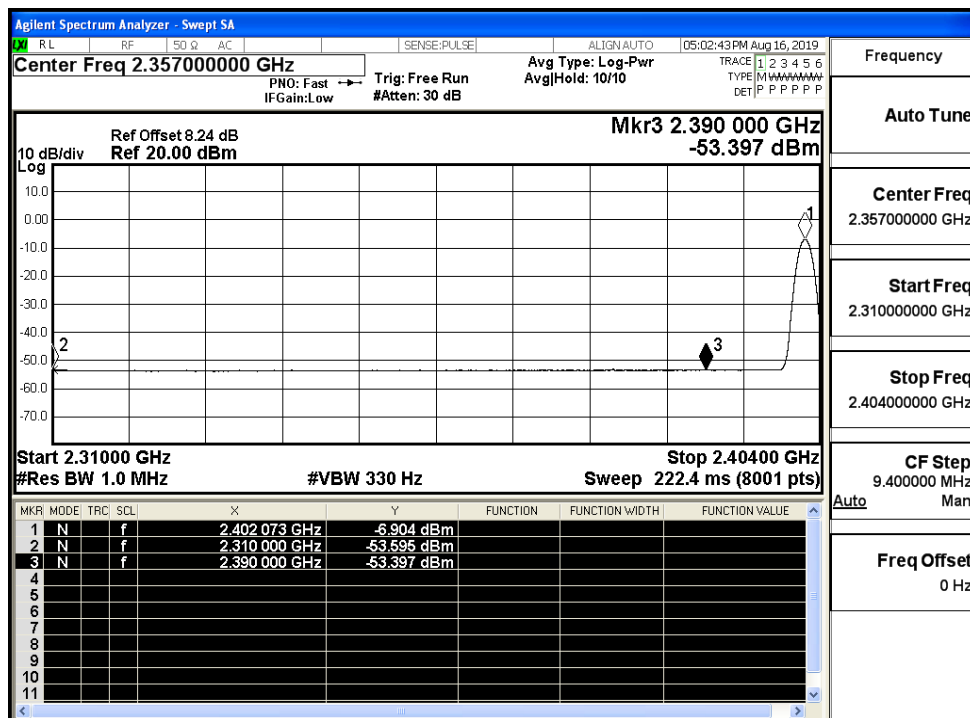


Restrict-band measurements on band-edge\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (High Channel)Restrict-band measurements on band-edge\_Hopping Off  $\pi/4$ -DQPSK\_Average (High Channel)

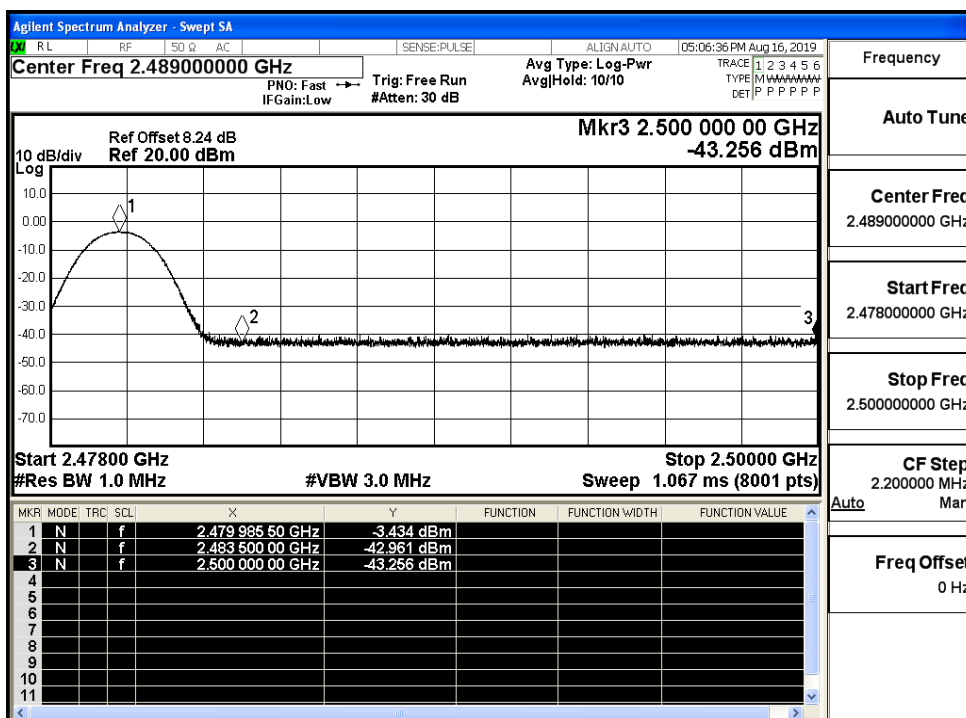
## Restrict-band measurements on band-edge\_Hopping Off\_8DPSK\_PEAK (Low Channel)



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



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



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

