

## Appendix A

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

Product Name: Smart Phone

Trade Mark: Kalley

Test Model: BLACK PRO

#### Environmental Conditions

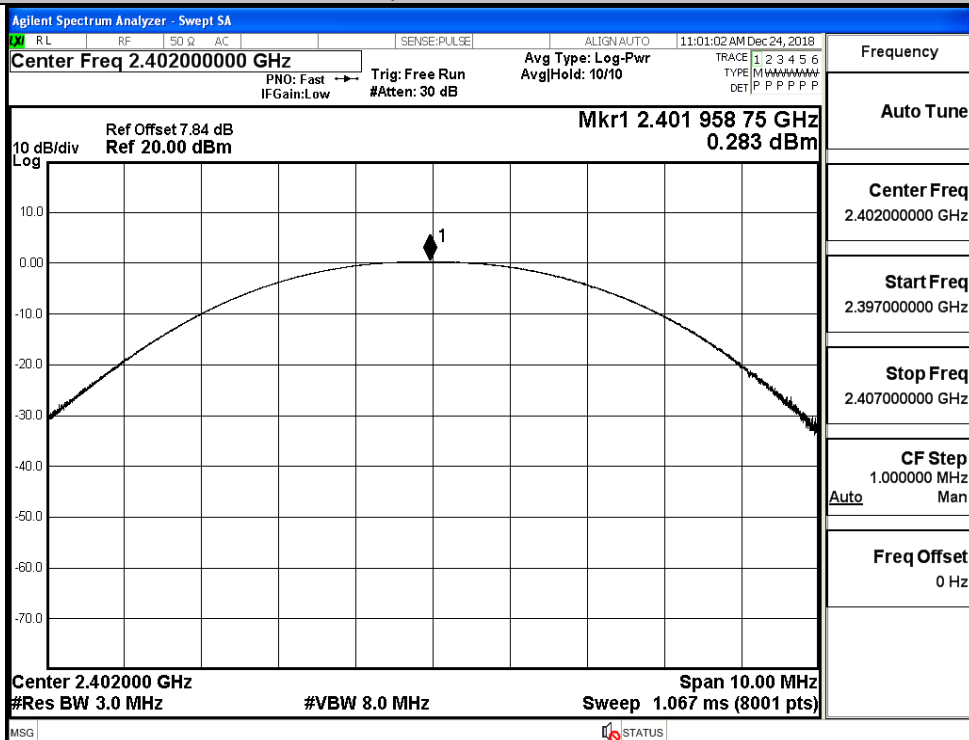
|                    |             |
|--------------------|-------------|
| Temperature:       | 23.6 ° C    |
| Relative Humidity: | 52.1%       |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | WANG CHUANG |
| Supervised by:     | Jayden Zhuo |

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

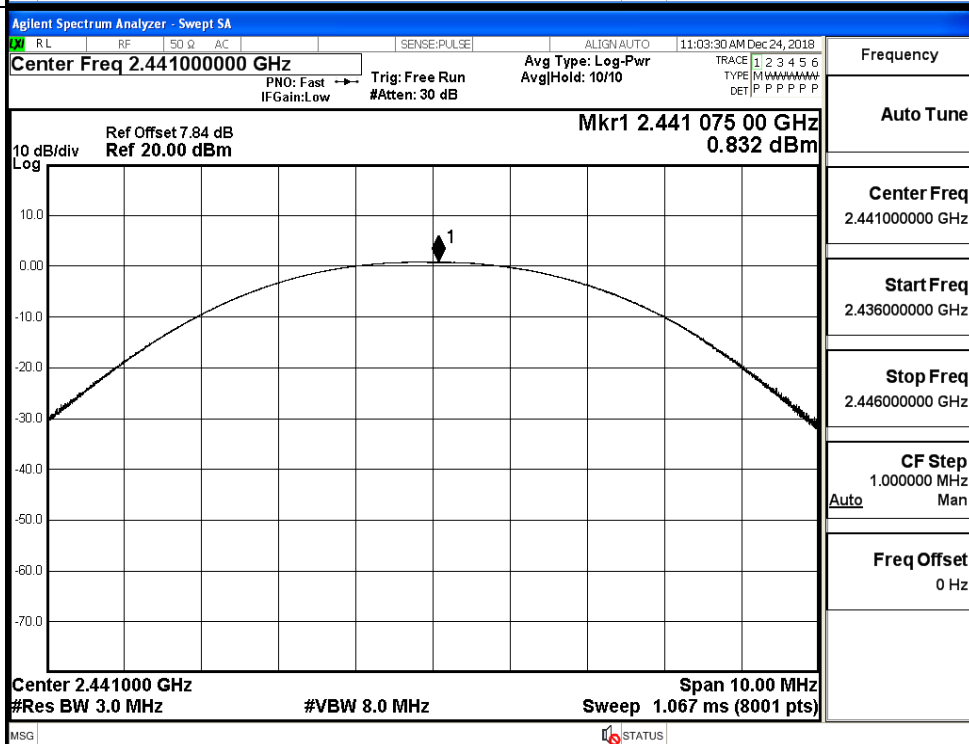
| Mode          | Channel. | Maximum Peak<br>Output Power<br>[dBm] | Maximum<br>Average Output<br>Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------------|--|-------------|---------|
| GFSK          | LCH      | 0.283                                 | 0.119                                    | 30          | PASS    |
|               | MCH      | 0.832                                 | 0.659                                    | 30          | PASS    |
|               | HCH      | 1.884                                 | 1.696                                    | 30          | PASS    |
| $\pi/4$ DQPSK | LCH      | -0.630                                | -0.778                                   | 21          | PASS    |
|               | MCH      | -1.472                                | -1.679                                   | 21          | PASS    |
|               | HCH      | -0.658                                | -0.807                                   | 21          | PASS    |
| 8DPSK         | LCH      | -0.741                                | -0.912                                   | 21          | PASS    |
|               | MCH      | -0.188                                | -0.340                                   | 21          | PASS    |
|               | HCH      | 0.452                                 | 0.304                                    | 21          | PASS    |

## Test Graphs

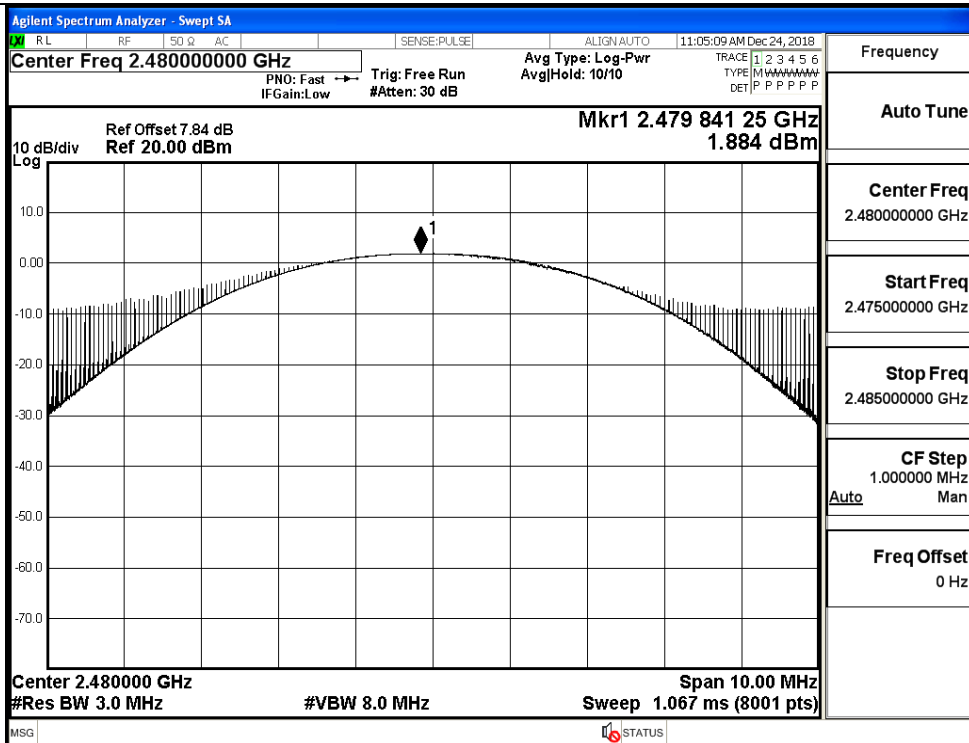
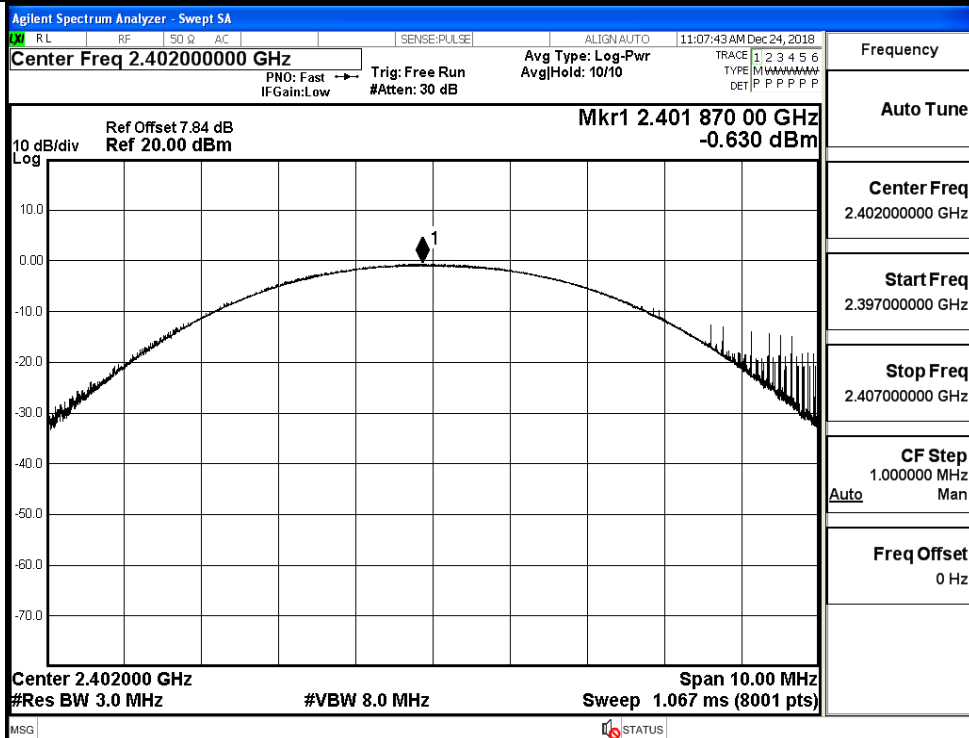
GFSK/LCH

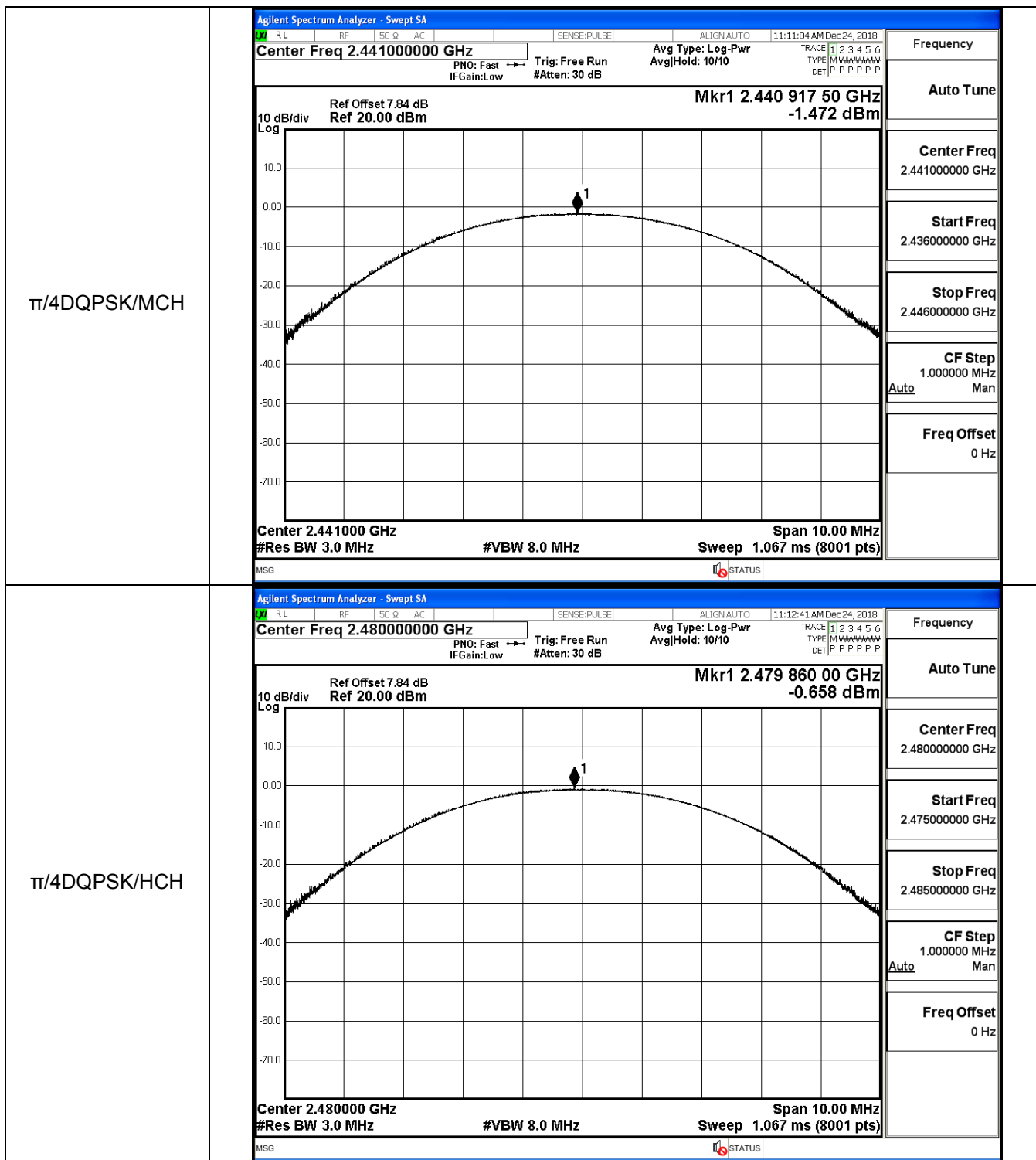


GFSK/MCH

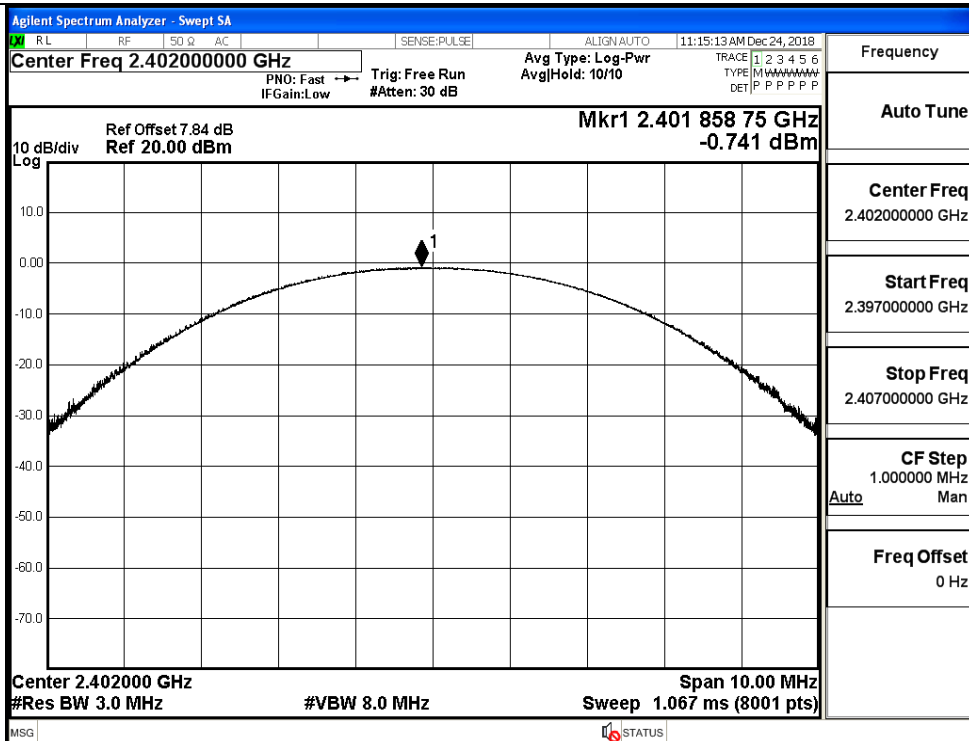


GFSK/HCH

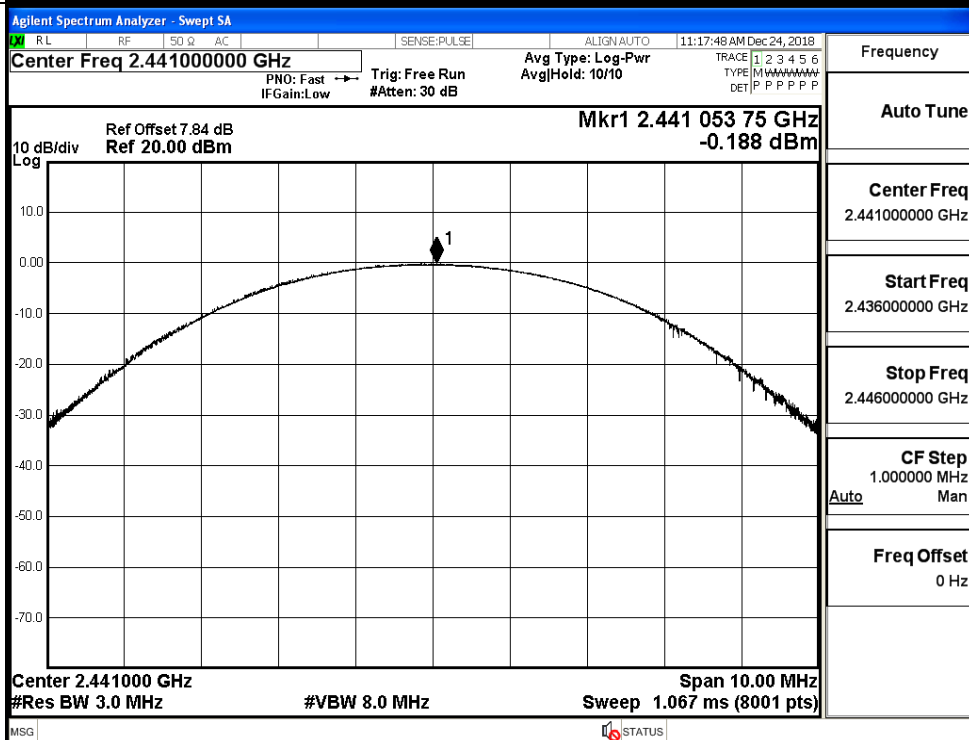
 $\pi$ /4DQPSK/LCH



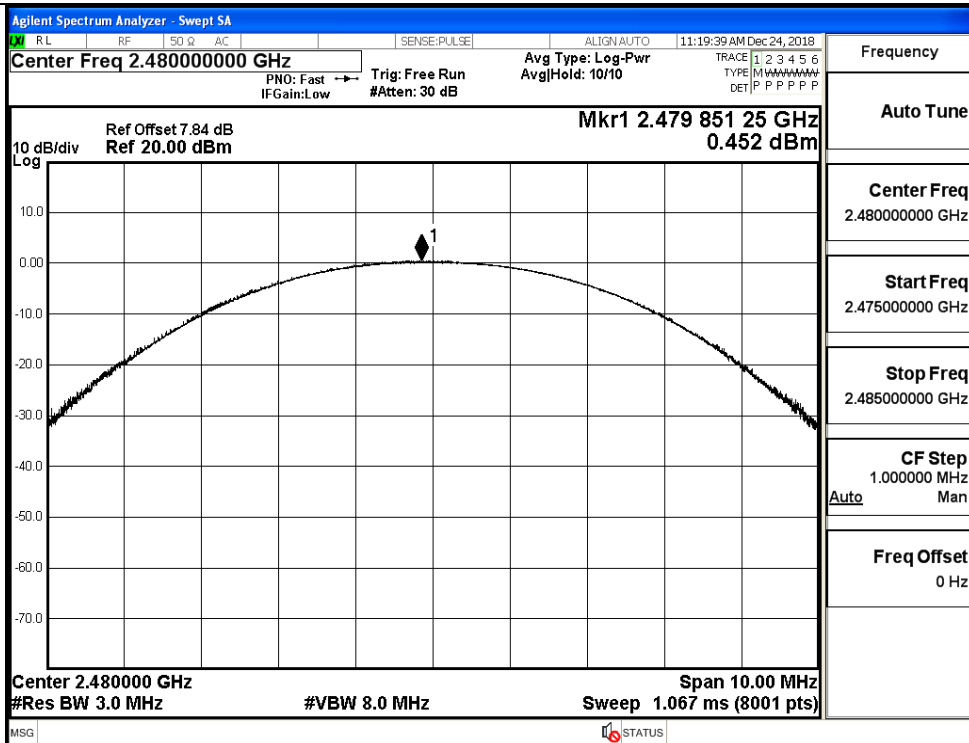
8DPSK/LCH



8DPSK/MCH



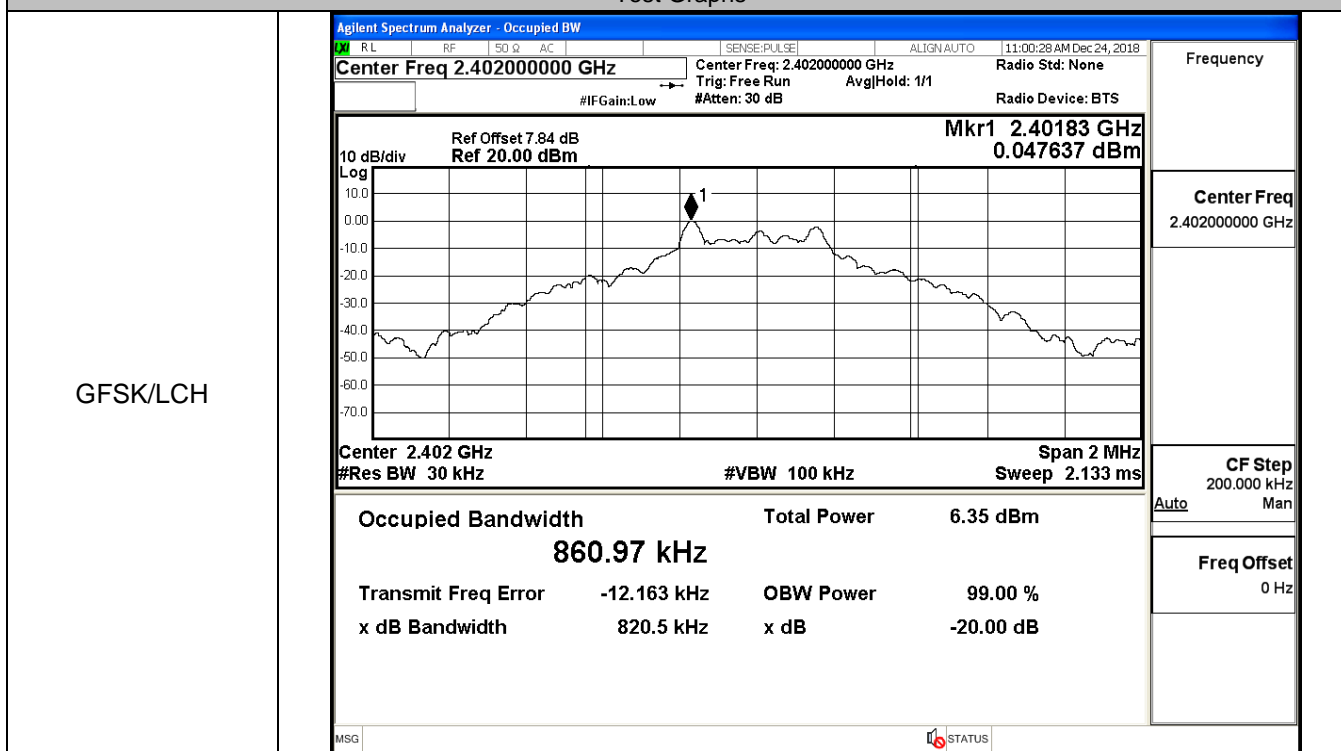
8DPSK/HCH



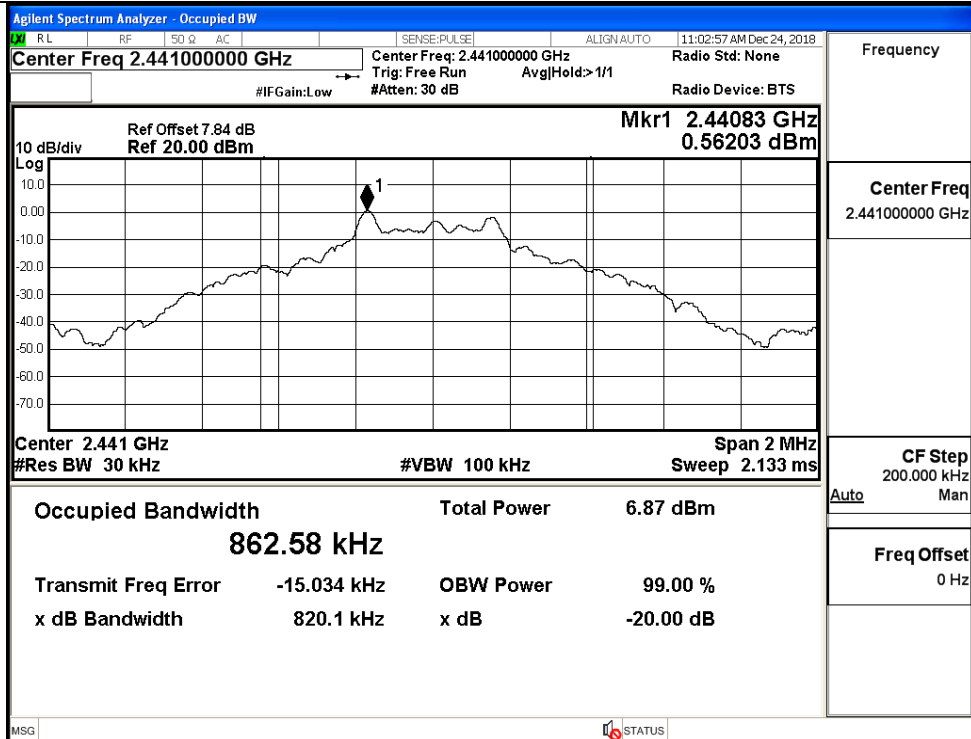
## A.2 20dB Bandwidth

| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.8205               | Not Specified | PASS    |
|               | MCH      | 0.8201               | Not Specified | PASS    |
|               | HCH      | 0.8292               | Not Specified | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.122                | Not Specified | PASS    |
|               | MCH      | 1.130                | Not Specified | PASS    |
|               | HCH      | 1.151                | Not Specified | PASS    |
| 8DPSK         | LCH      | 1.140                | Not Specified | PASS    |
|               | MCH      | 1.153                | Not Specified | PASS    |
|               | HCH      | 1.136                | Not Specified | PASS    |

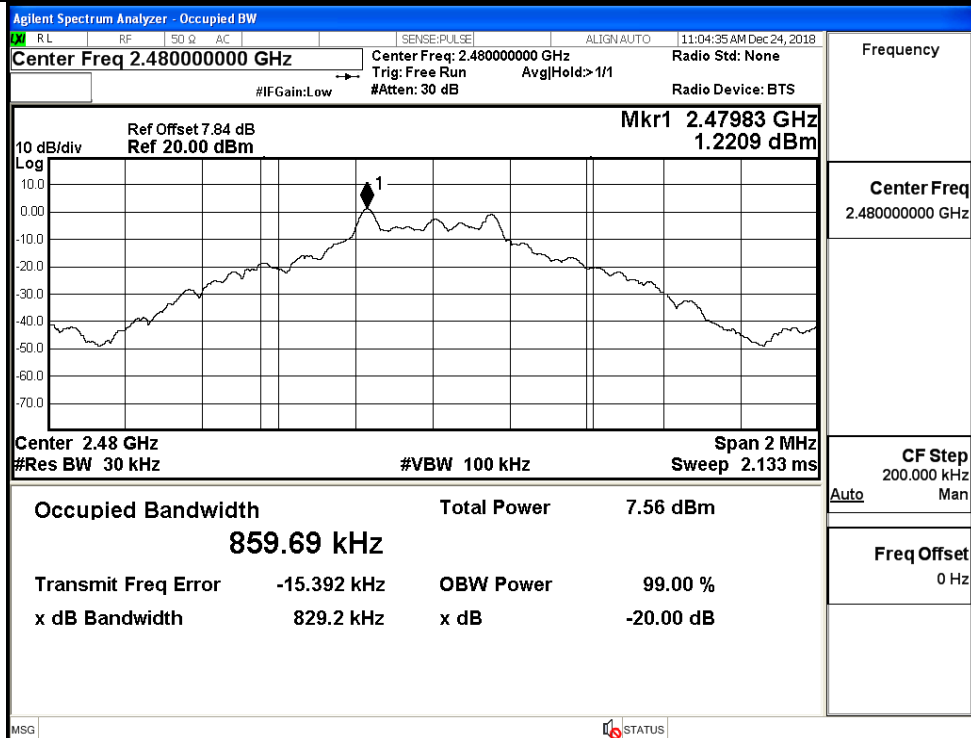
Test Graphs



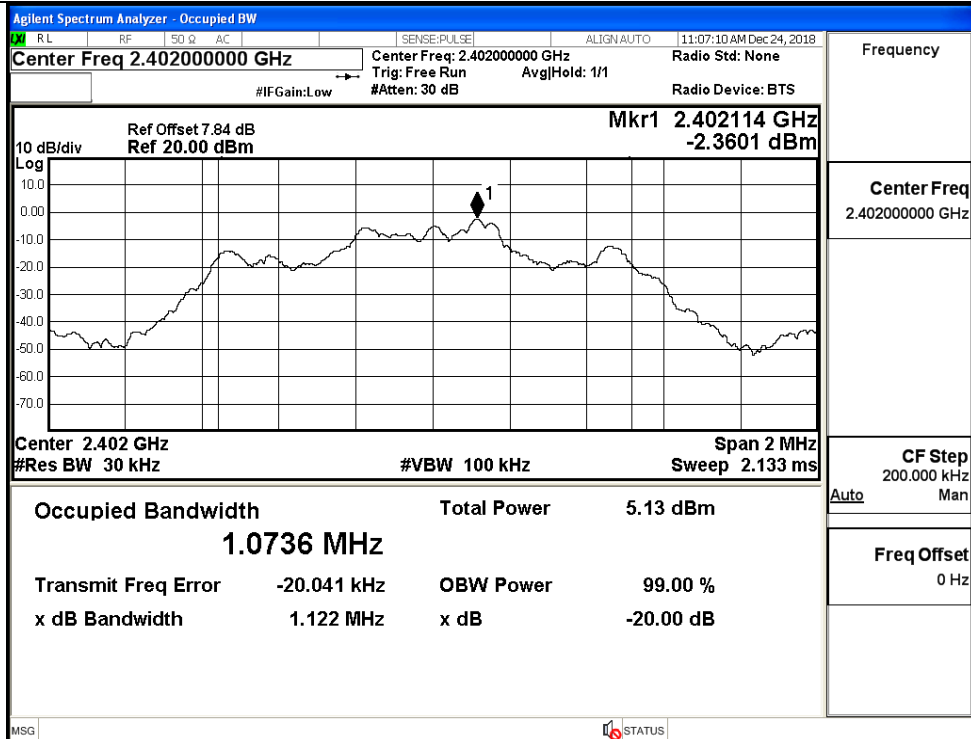
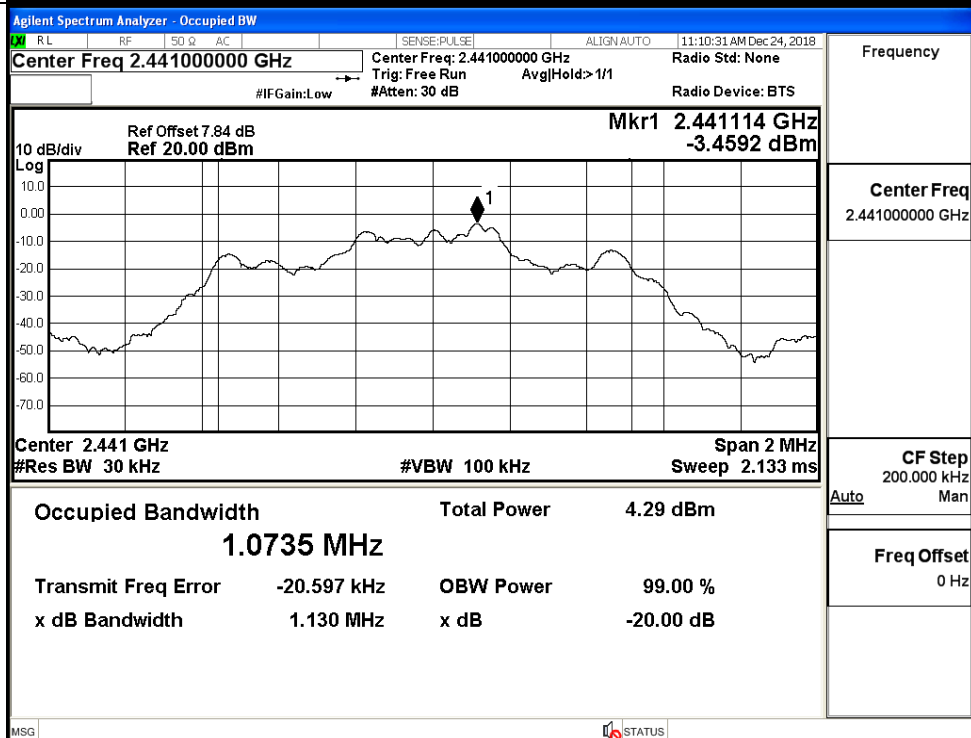
GFSK/MCH

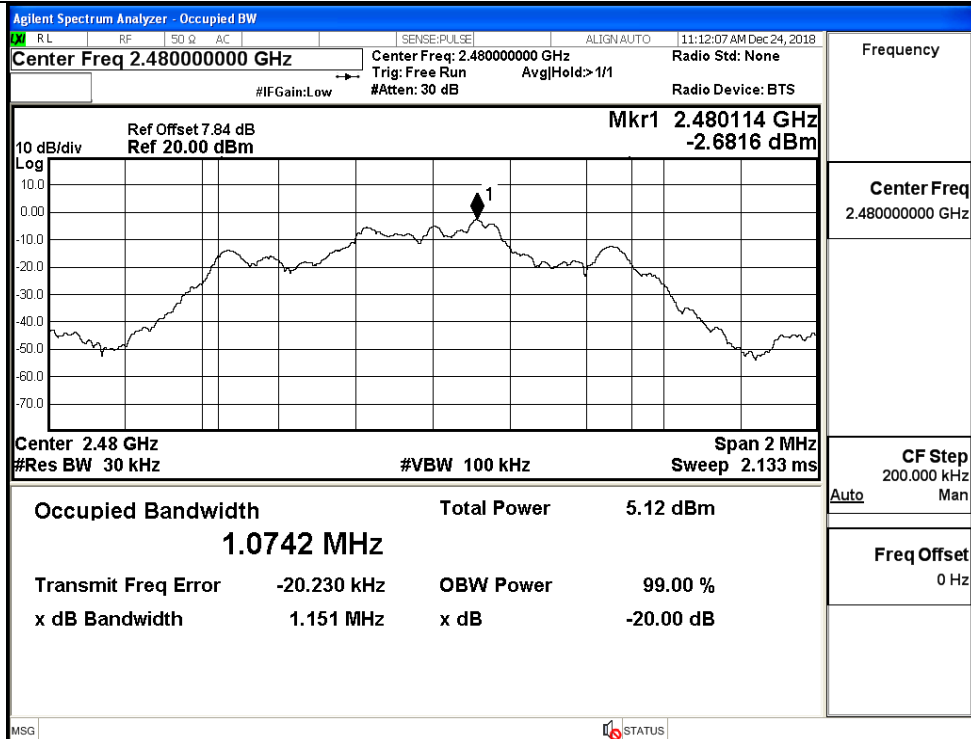


GFSK/HCH

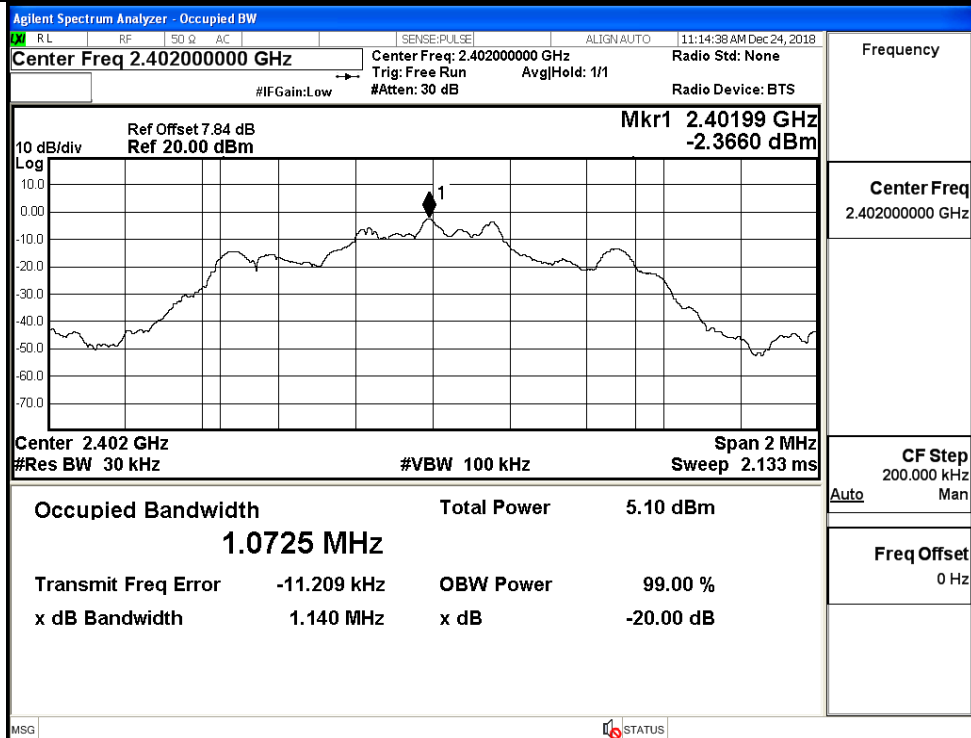




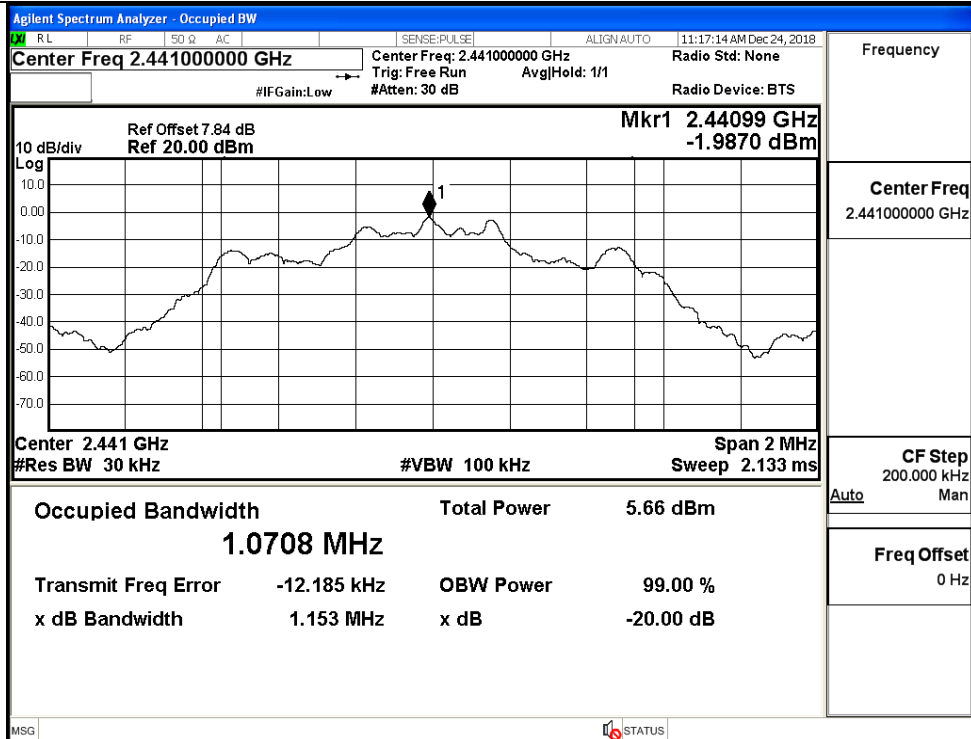
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

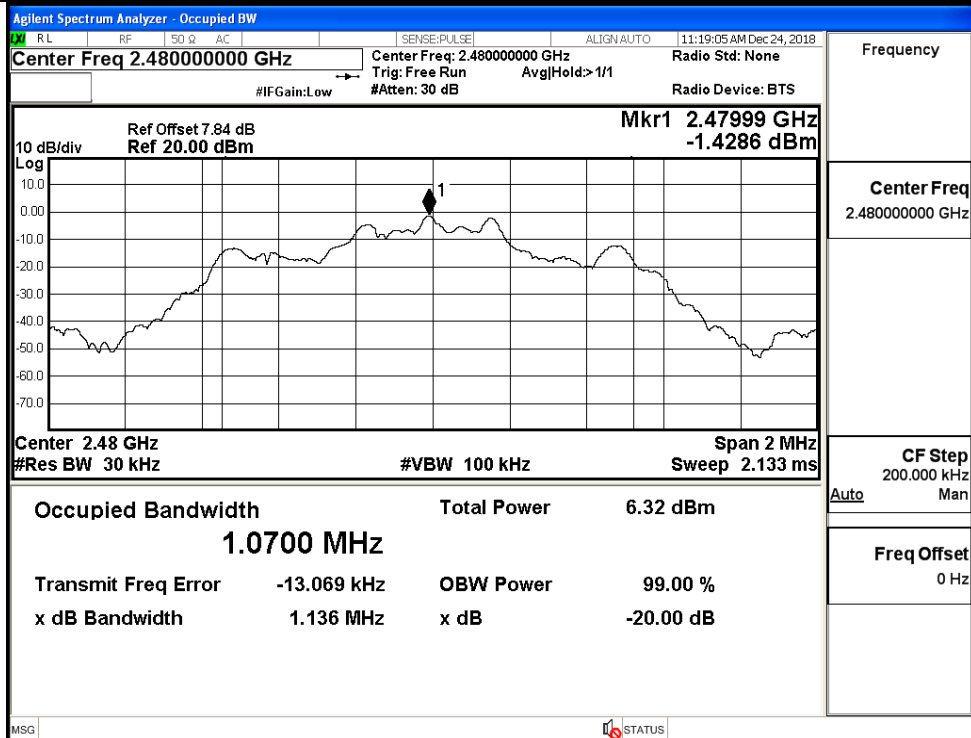
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

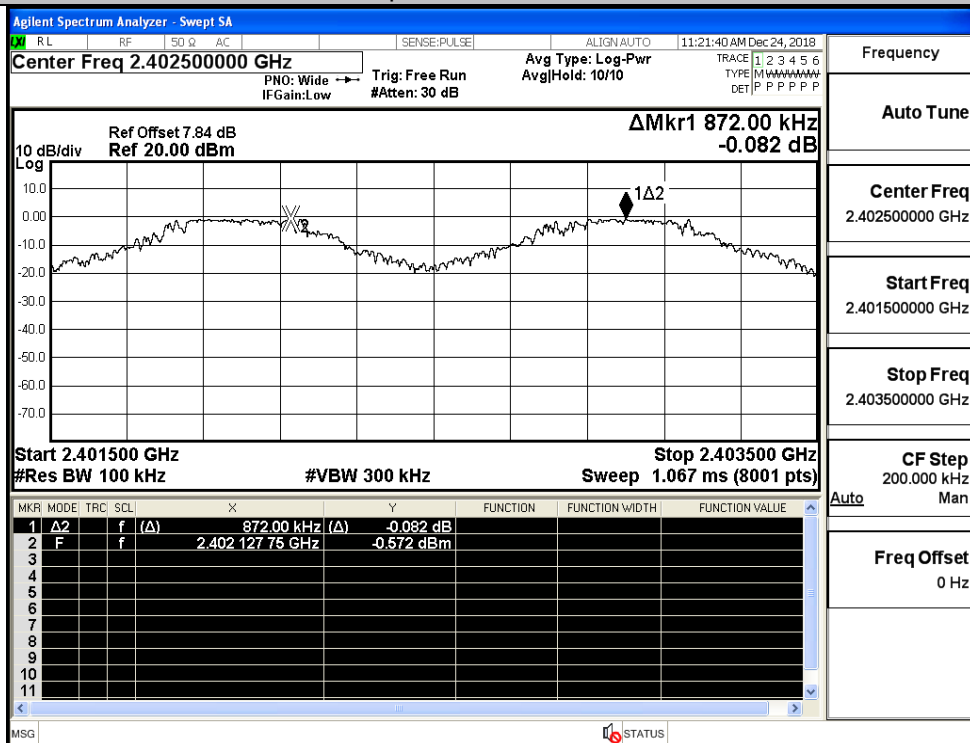


### A.3 Carrier Frequency Separation

| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK          | LCH      | 0.872                              | 0.8205      | PASS    |
|               | MCH      | 0.860                              | 0.8201      | PASS    |
|               | HCH      | 1.044                              | 0.8292      | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.304                              | 0.767       | PASS    |
|               | MCH      | 1.040                              | 0.767       | PASS    |
|               | HCH      | 0.790                              | 0.767       | PASS    |
| 8DPSK         | LCH      | 1.028                              | 0.769       | PASS    |
|               | MCH      | 0.876                              | 0.769       | PASS    |
|               | HCH      | 0.790                              | 0.769       | PASS    |

#### Test Graphs

GFSK/LCH

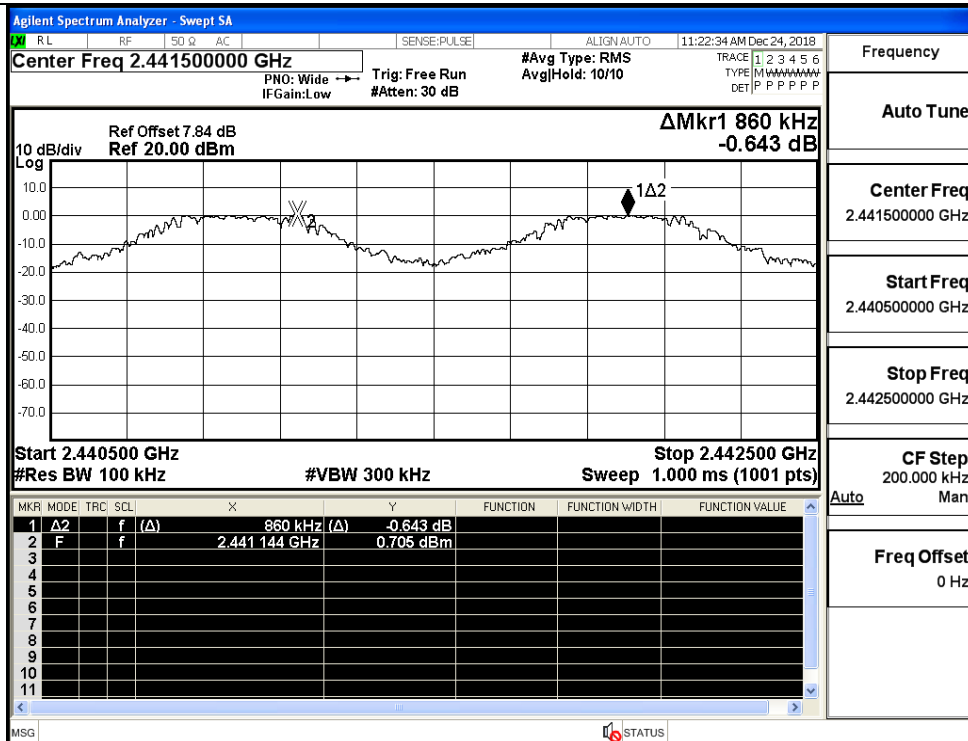


Frequency

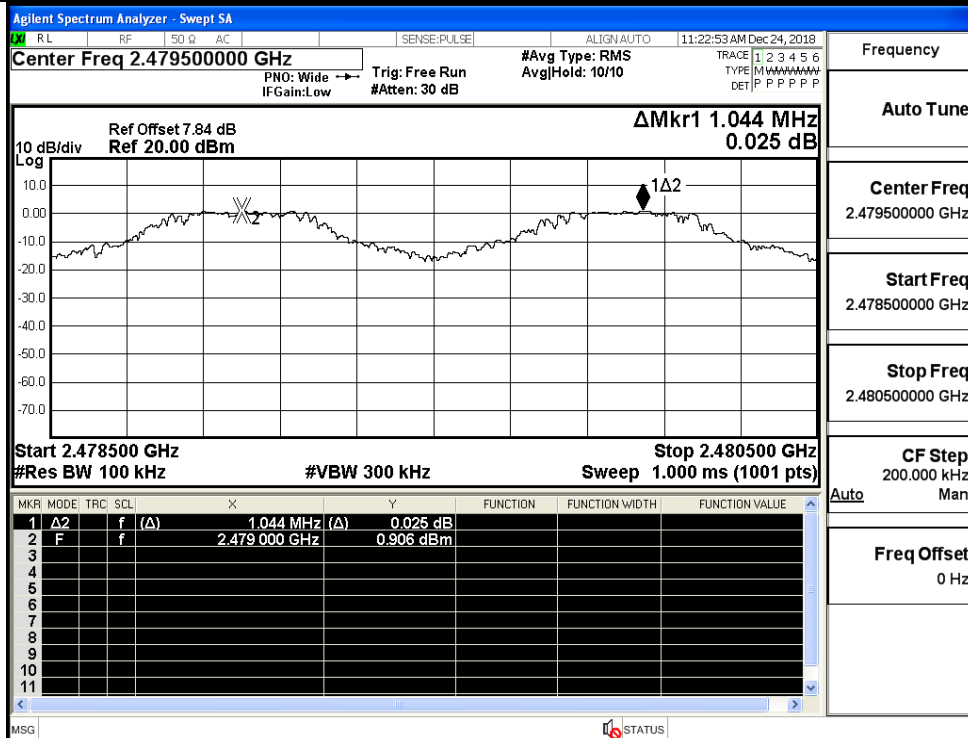
Auto Tune

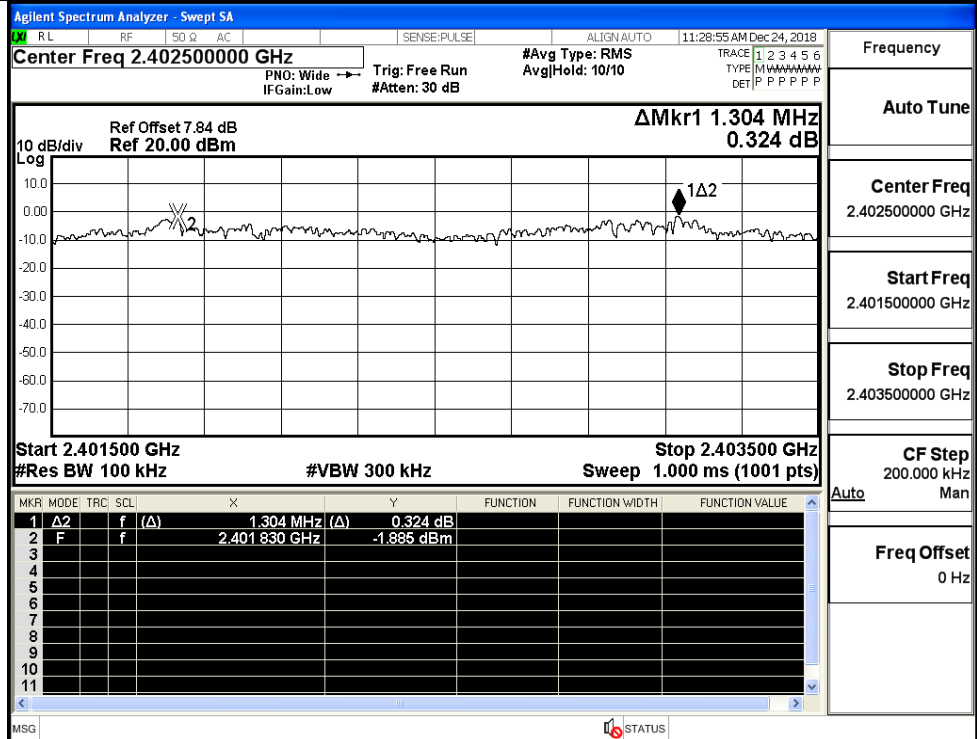
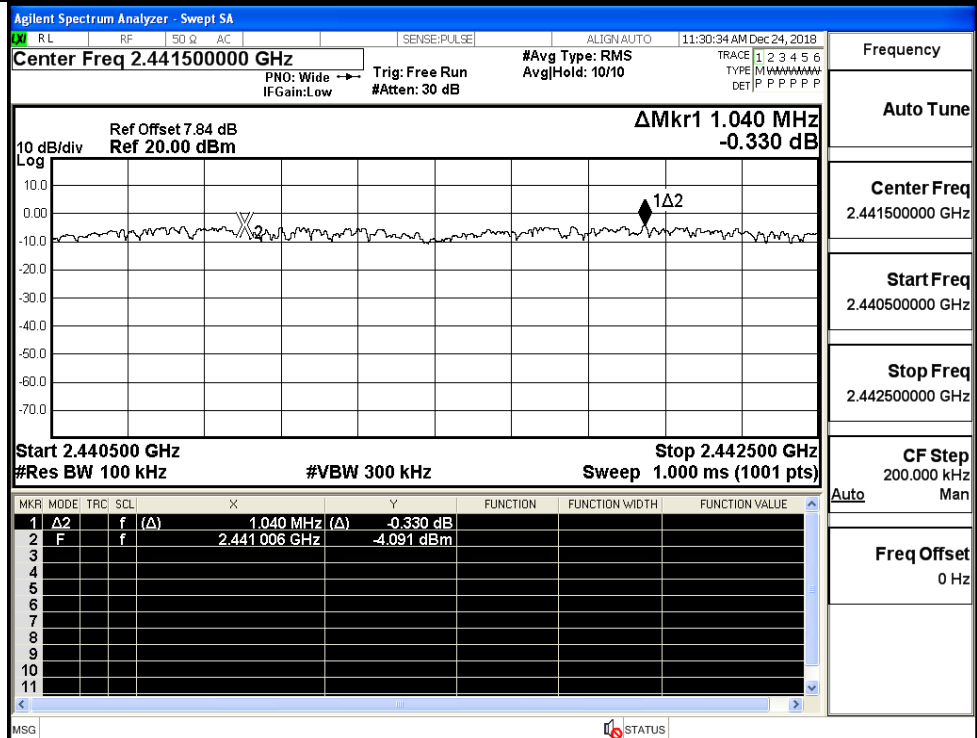
Center Freq  
2.402500000 GHzStart Freq  
2.401500000 GHzStop Freq  
2.403500000 GHzCF Step  
200.000 kHz  
ManFreq Offset  
0 Hz

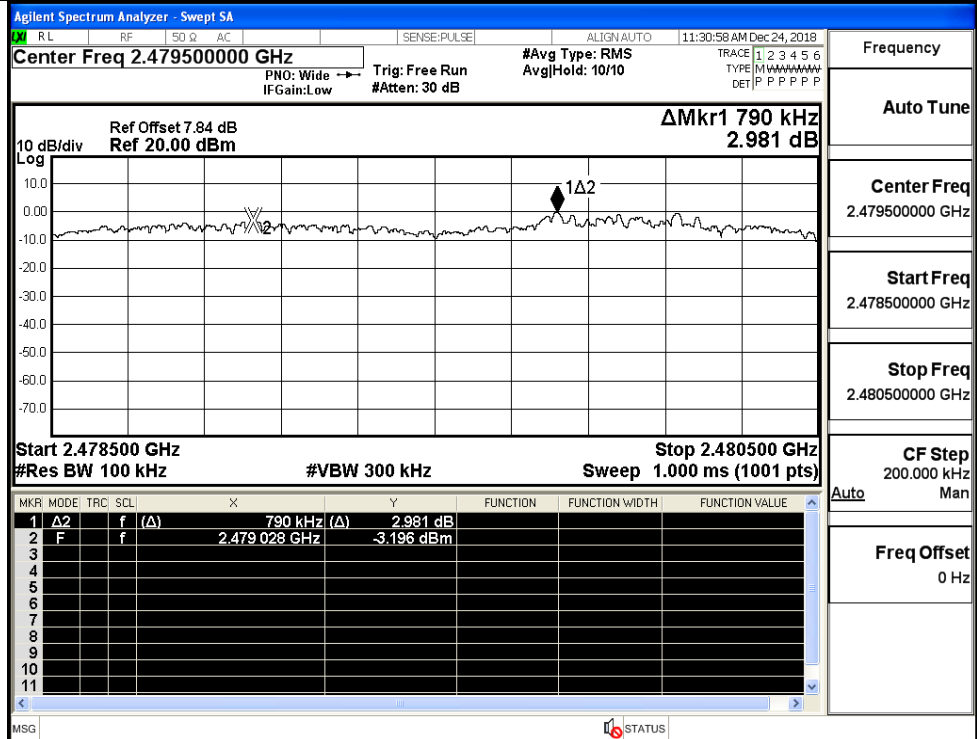
GFSK/MCH



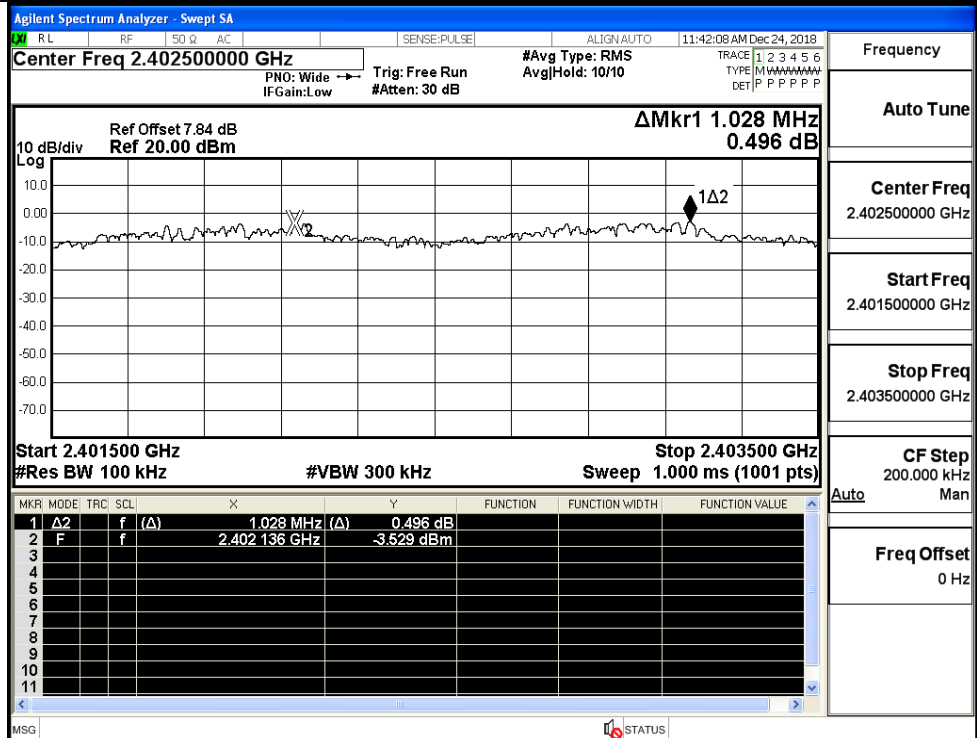
GFSK/HCH



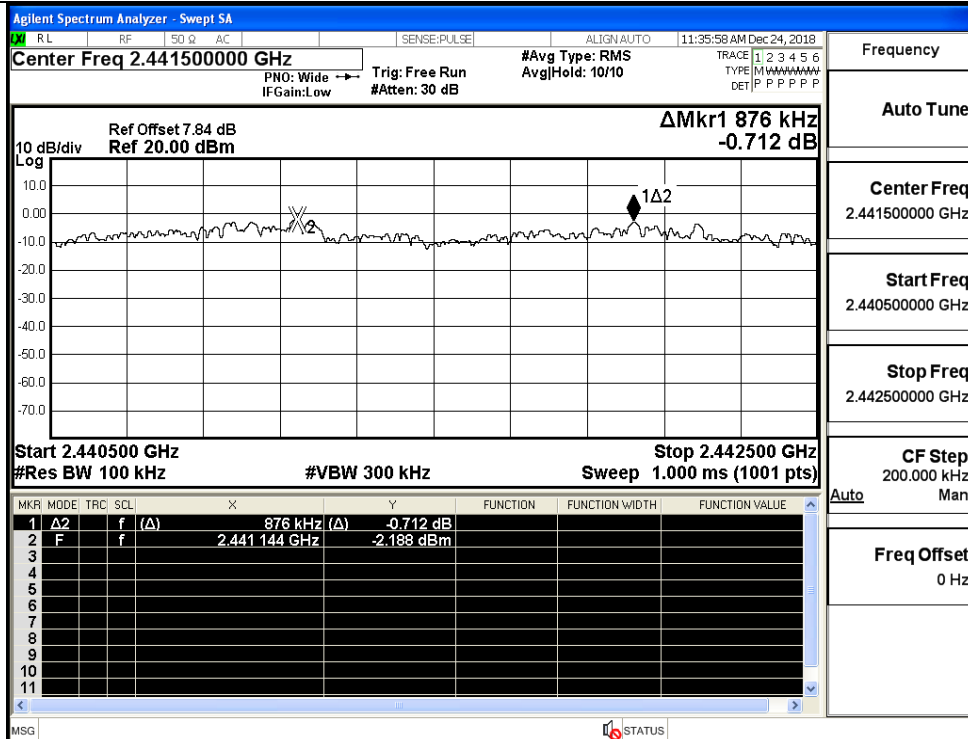
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

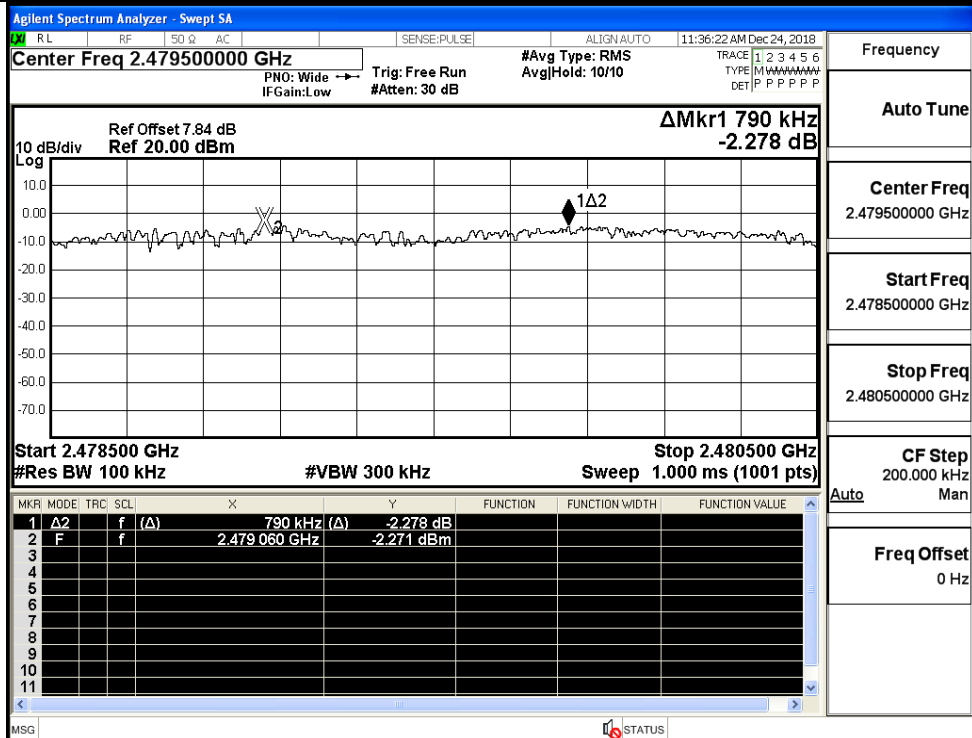
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



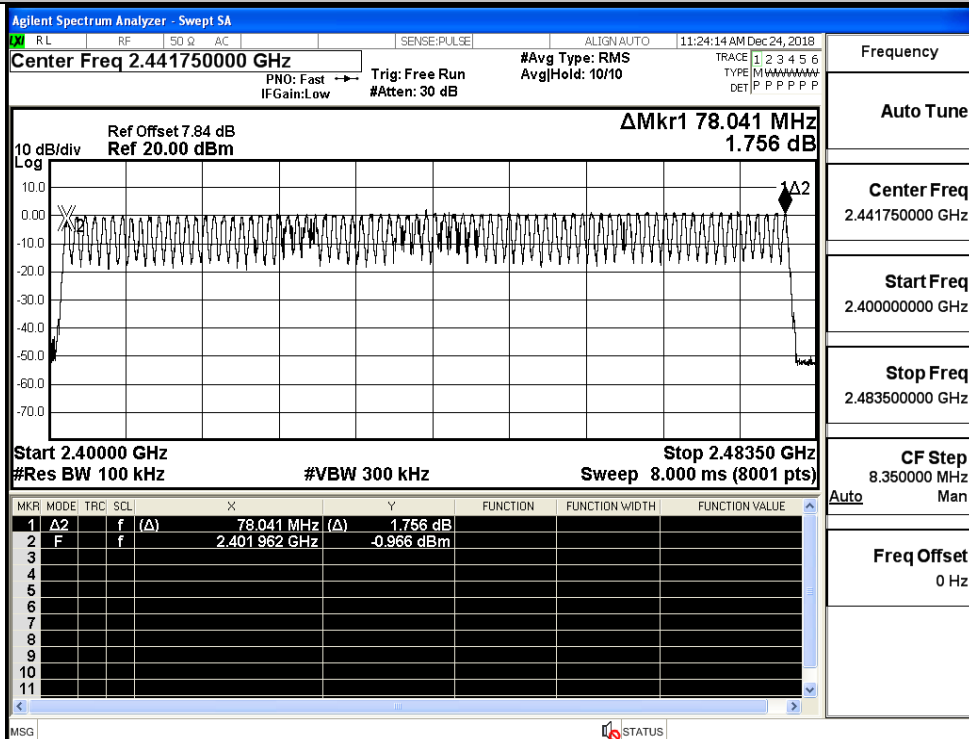
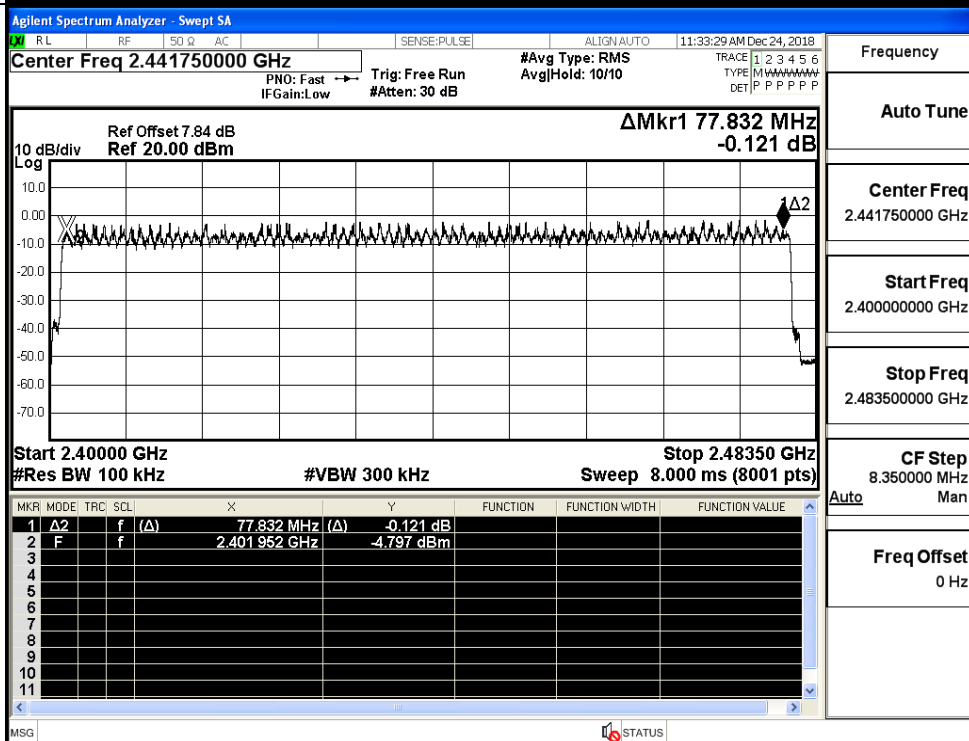


## A.4 Hopping Channel Number

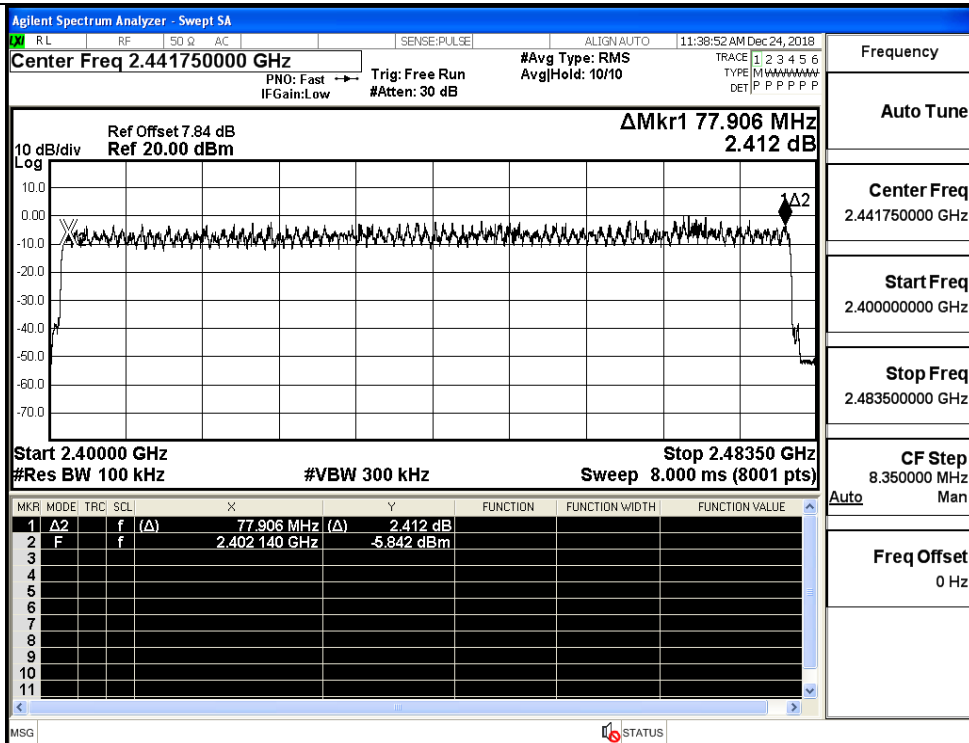
| Mode          | Channel. | Number of Hopping Channel [N] | Limit [N] | Verdict |
|---------------|----------|-------------------------------|-----------|---------|
| GFSK          | Hop      | 79                            | $\geq 15$ | PASS    |
| $\pi/4$ DQPSK | Hop      | 79                    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

### Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

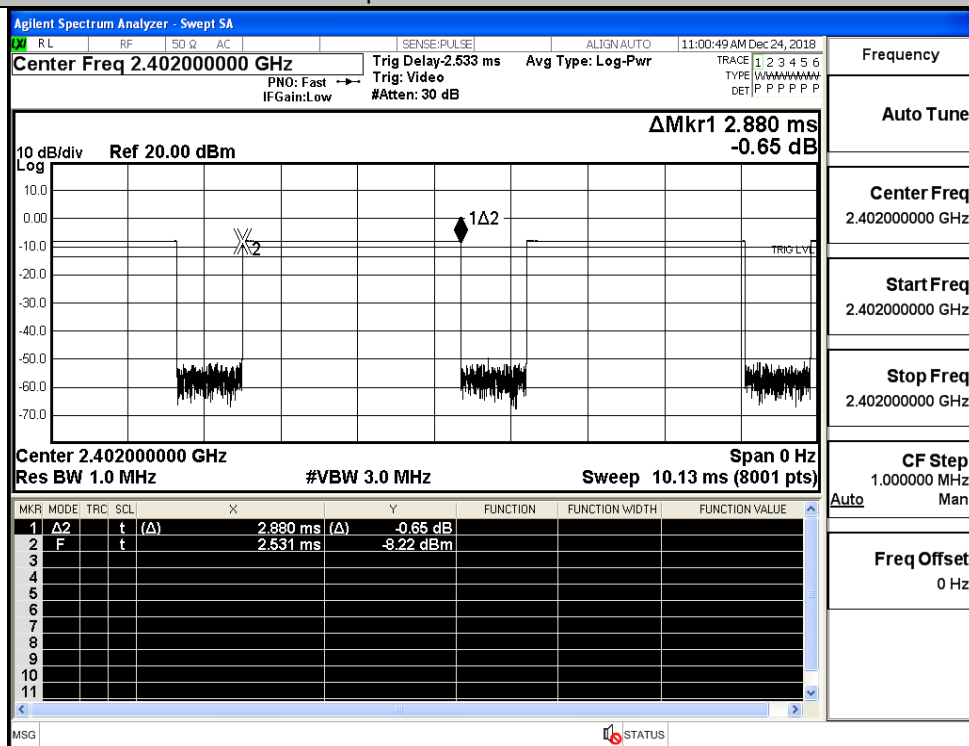


## A.5 Dwell Time

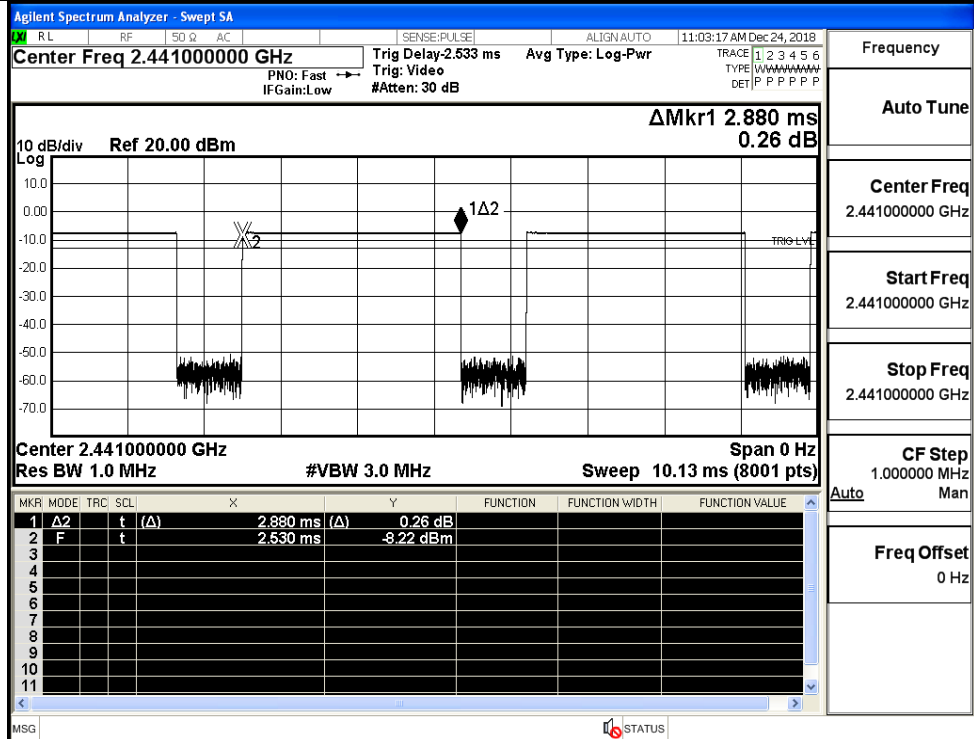
| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|---------------|-----------|---------|
| GFSK          | DH5    | LCH     | 2.88                       | 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     | 2.89                       | 106.7                 | 0.308         | 0.4       | PASS    |
|               | 3DH5   | MCH     | 2.89                       | 106.7                 | 0.308         | 0.4       | PASS    |
|               | 3DH5   | HCH     | 2.89                       | 106.7                 | 0.308         | 0.4       | PASS    |

### Test Graphs

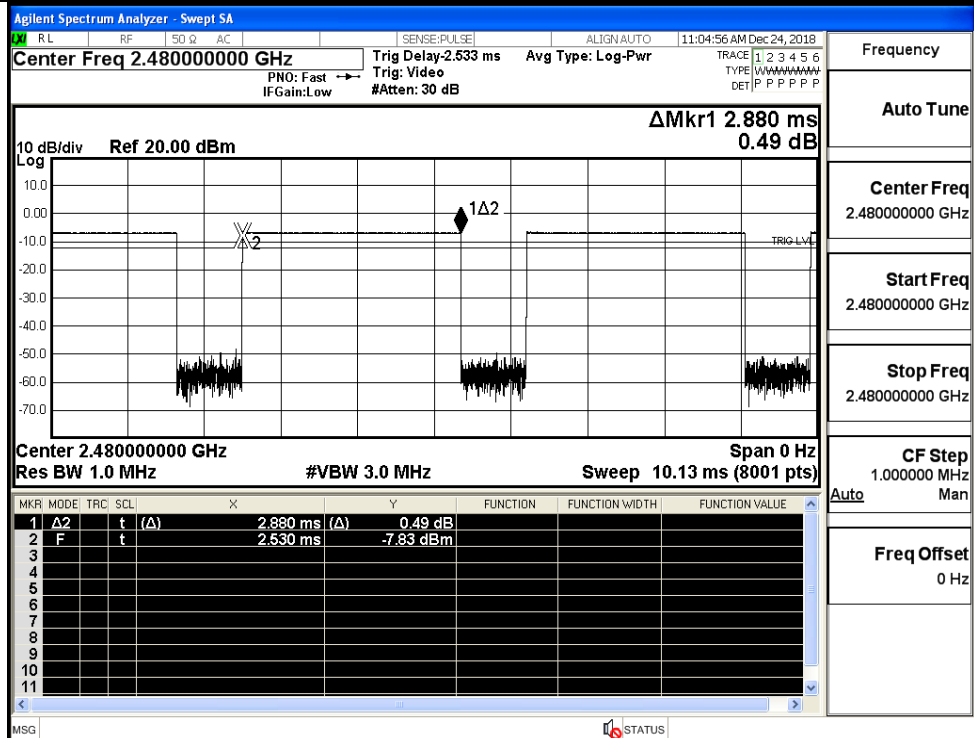
GFSK\_DH5/LCH



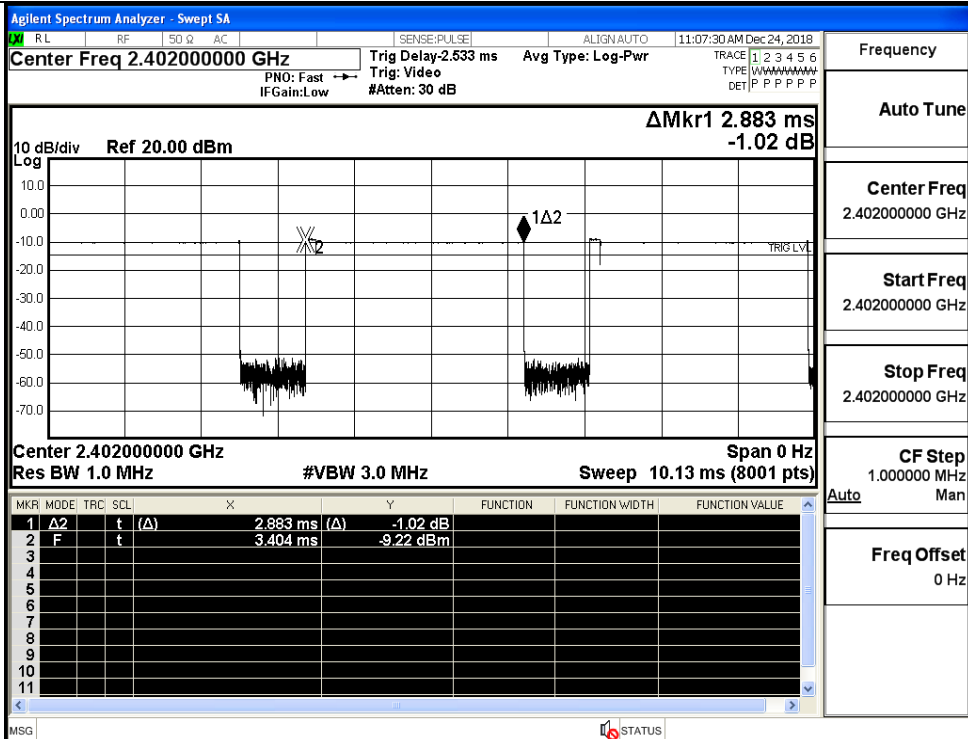
GFSK\_DH5/MCH



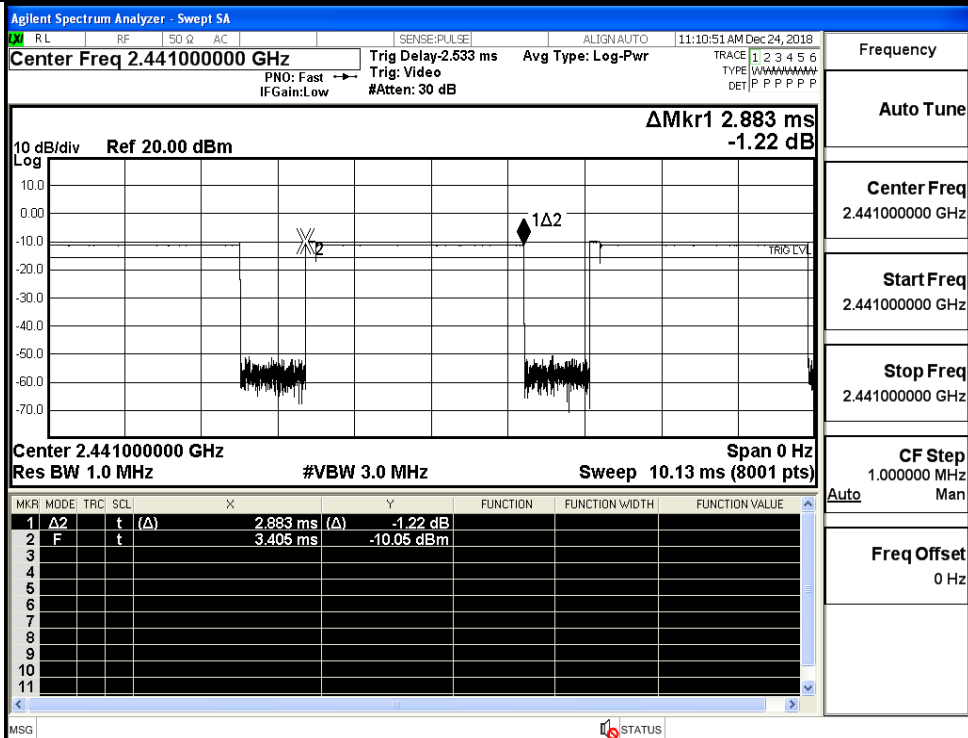
GFSK\_DH5/HCH



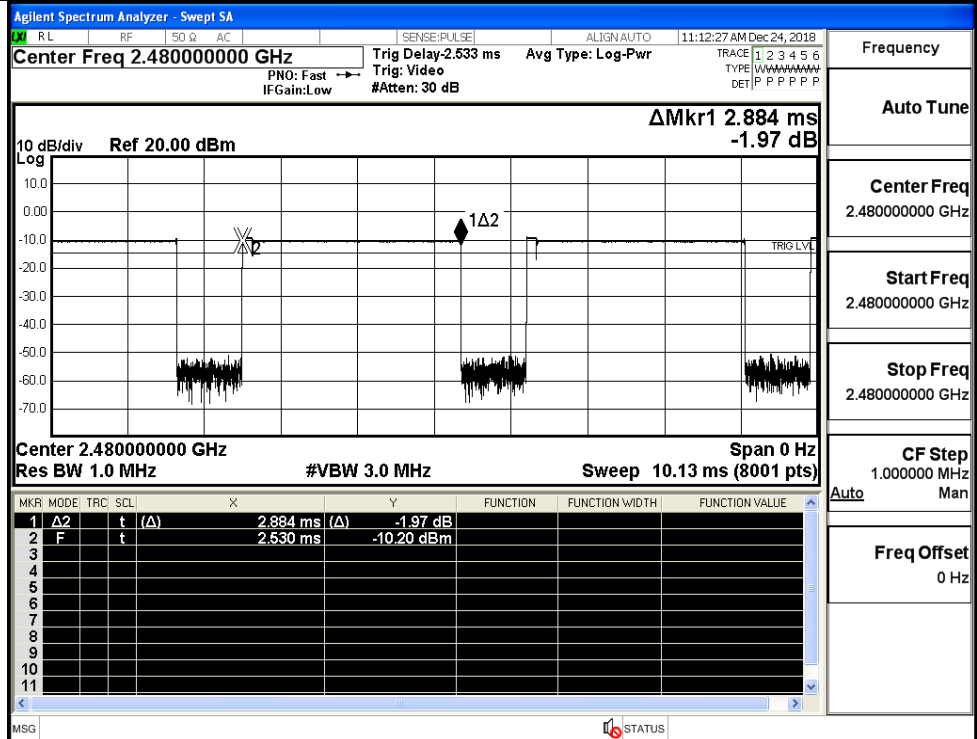
$\pi/4$ DQPSK  
\_2DH5/LCH



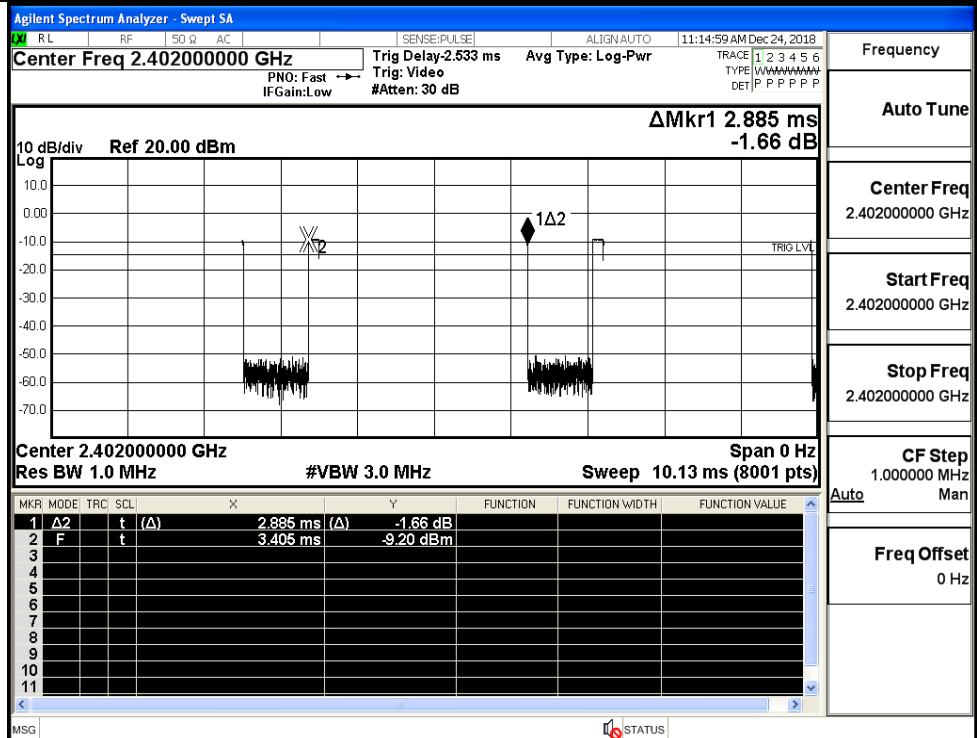
$\pi/4$ DQPSK  
\_2DH5/MCH



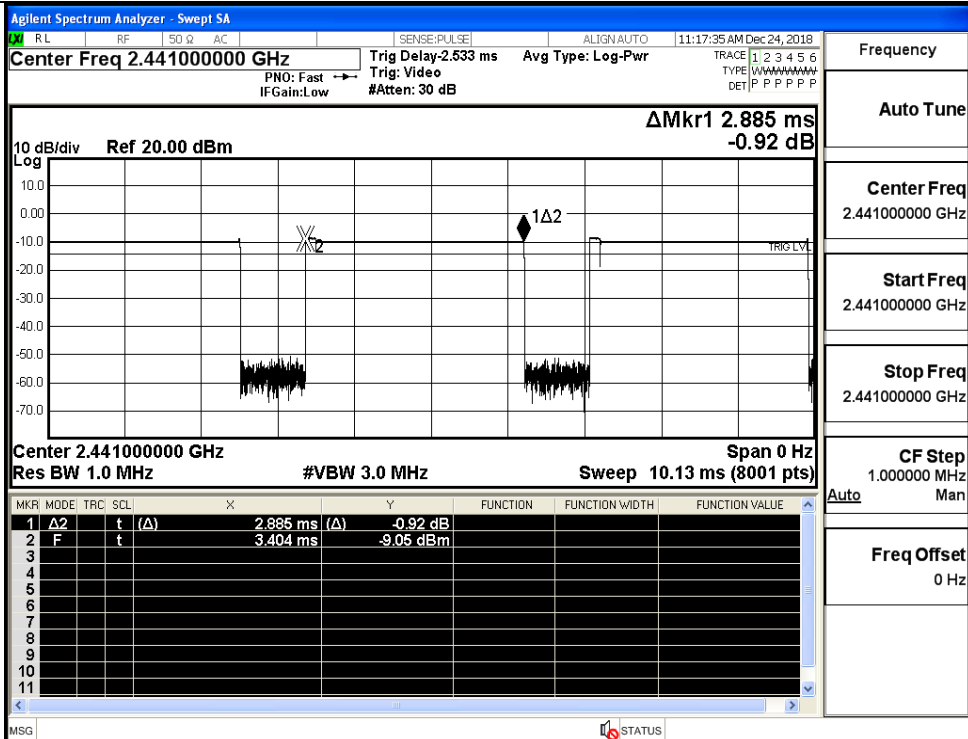
$\pi/4$ DQPSK  
\_2DH5/HCH



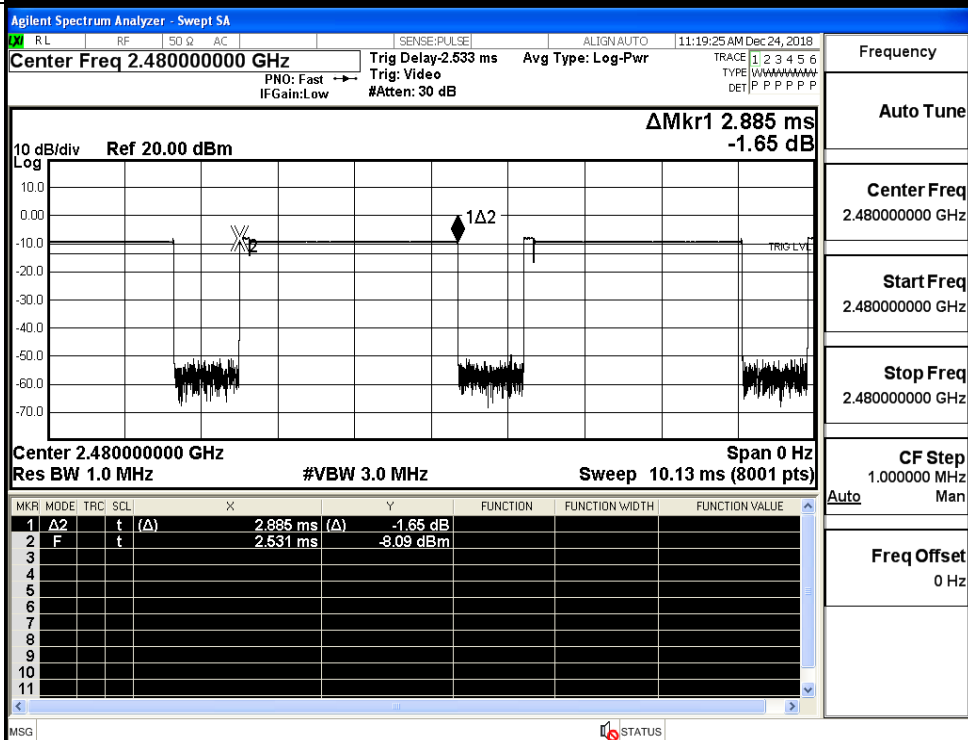
8DPSK \_3DH5/LCH



8DPSK\_3DH5/MCH



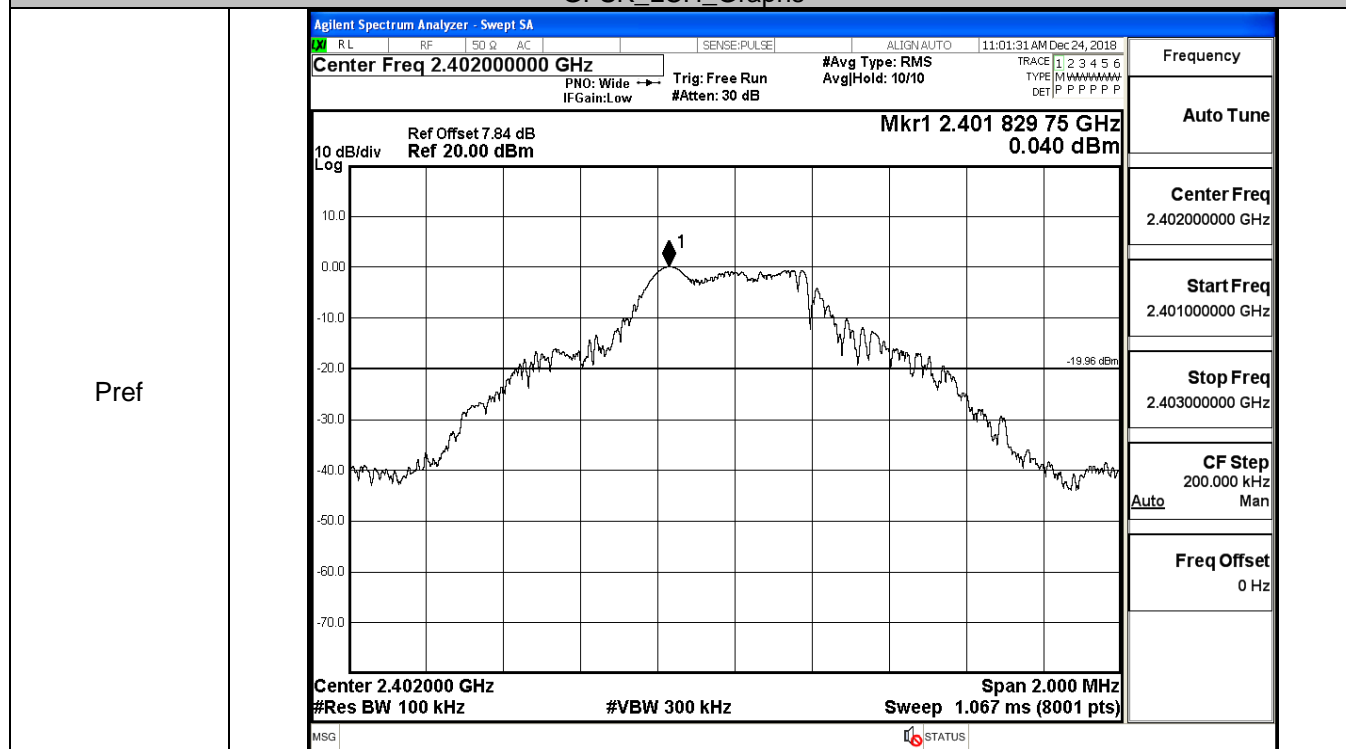
8DPSK\_3DH5/HCH



## A.6 RF Conducted Spurious Emissions

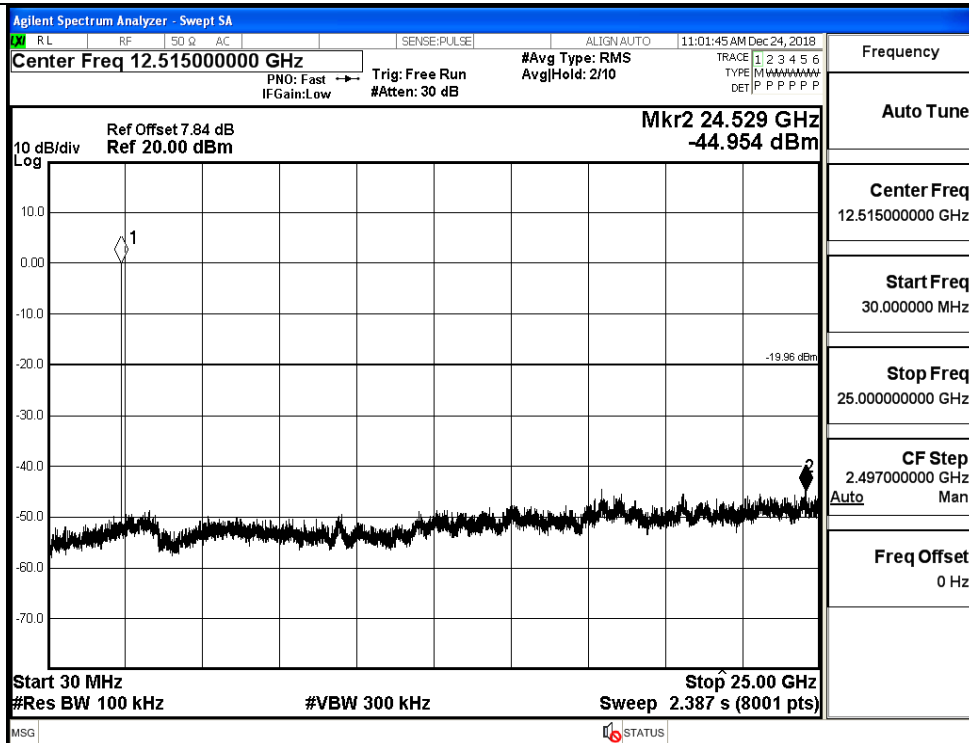
| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | 0.04       | -44.954          | -19.960     | PASS    |
|               | MCH     | 0.534      | -44.720          | -19.466     | PASS    |
|               | HCH     | 1.256      | -44.773          | -18.744     | PASS    |
| $\pi/4$ DQPSK | LCH     | -2.218     | -45.006          | -22.218     | PASS    |
|               | MCH     | -2.094     | -45.104          | -22.094     | PASS    |
|               | HCH     | -1.485     | -45.103          | -21.485     | PASS    |
| 8DPSK         | LCH     | -1.293     | -44.080          | -21.293     | PASS    |
|               | MCH     | -0.825     | -44.423          | -20.825     | PASS    |
|               | HCH     | -0.681     | -44.306          | -20.681     | PASS    |

GFSK\_LCH\_Graphs



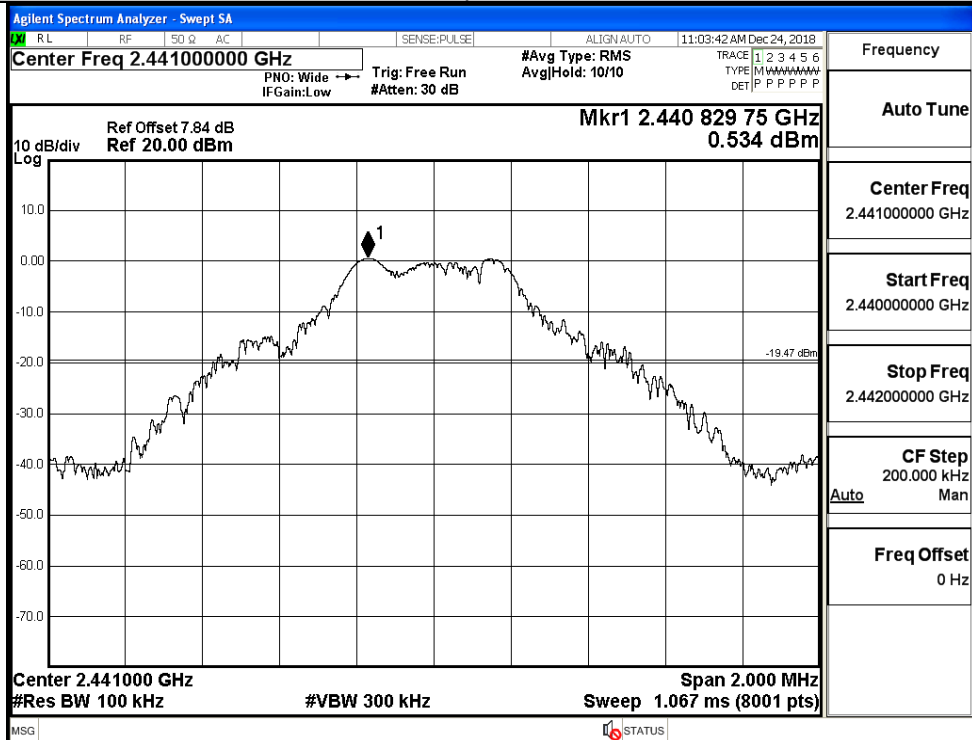


Puw

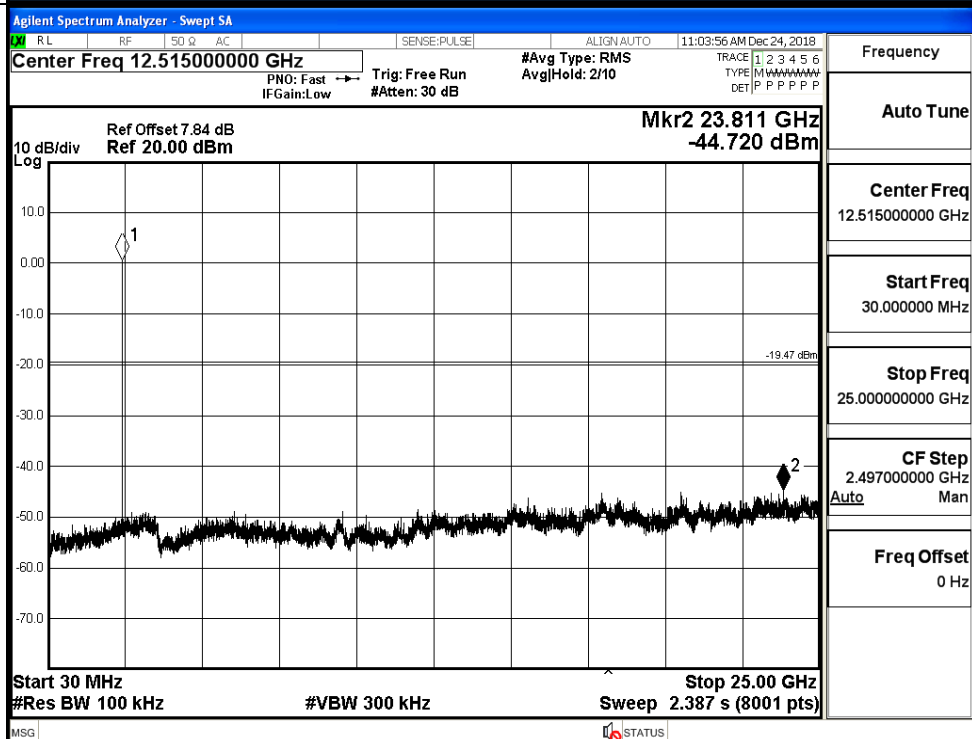


## GFSK\_MCH\_Graphs

Pref

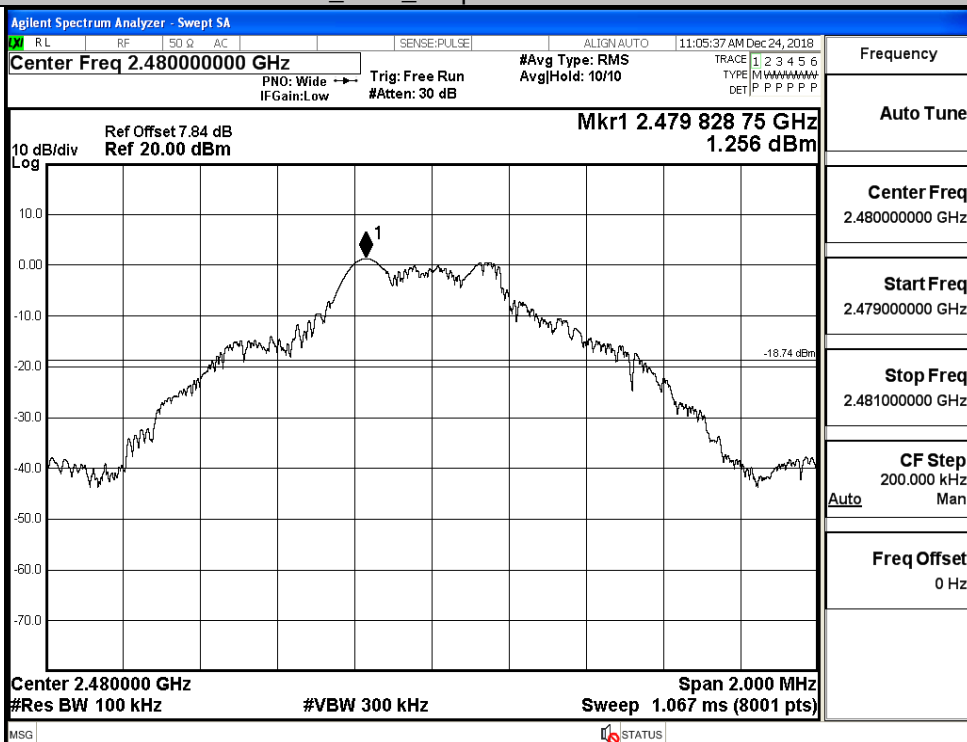


Puw

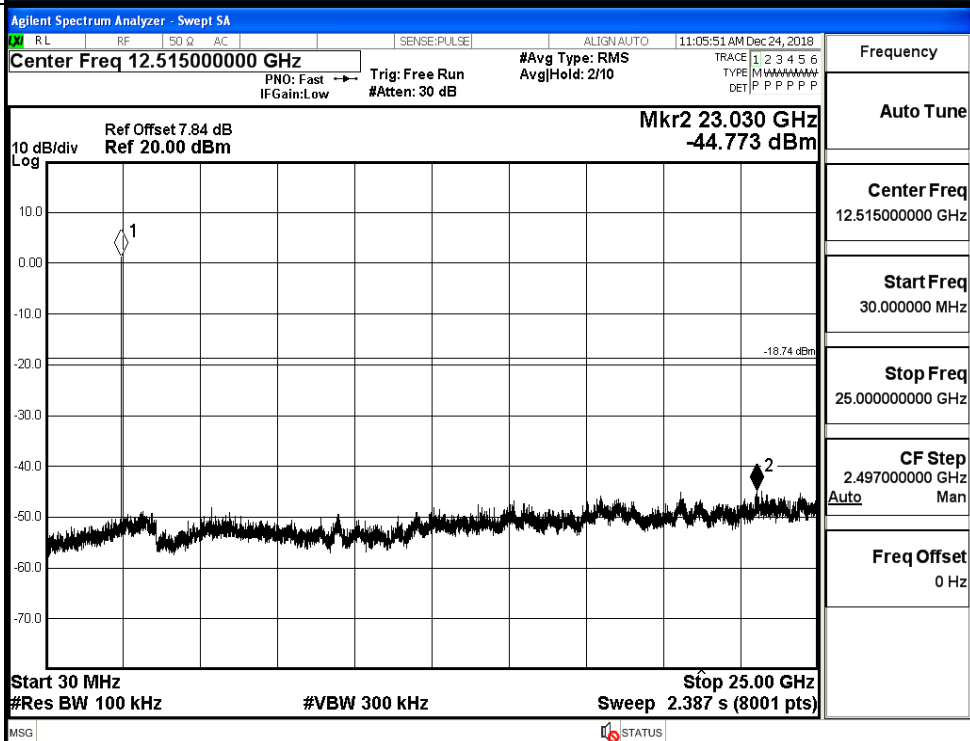


## GFSK\_HCH\_Graphs

Pref

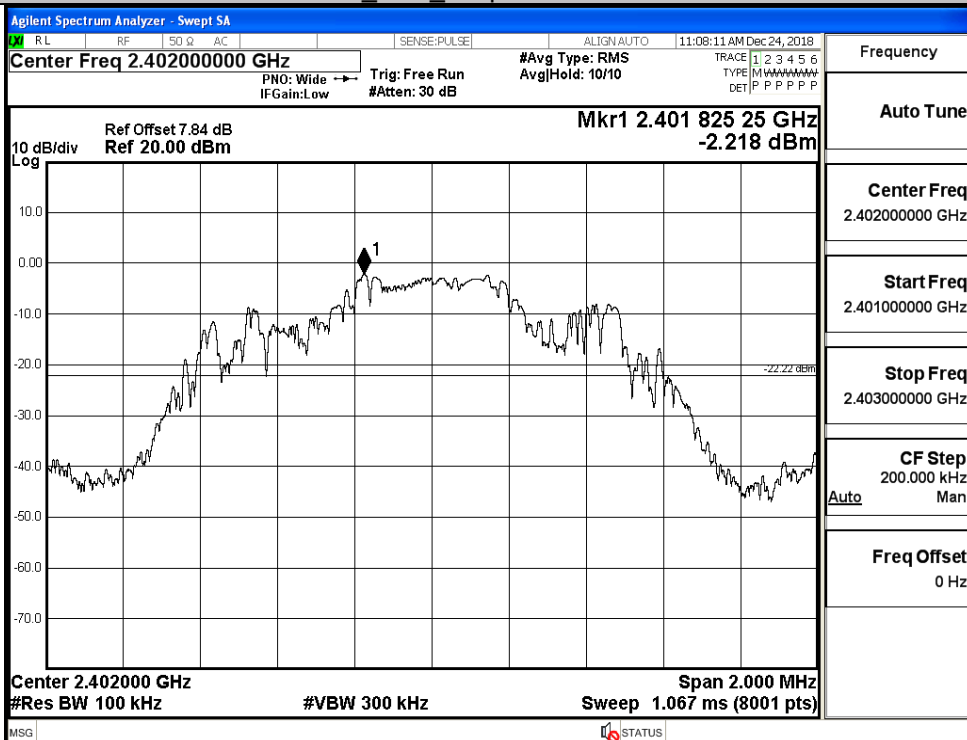


Puw

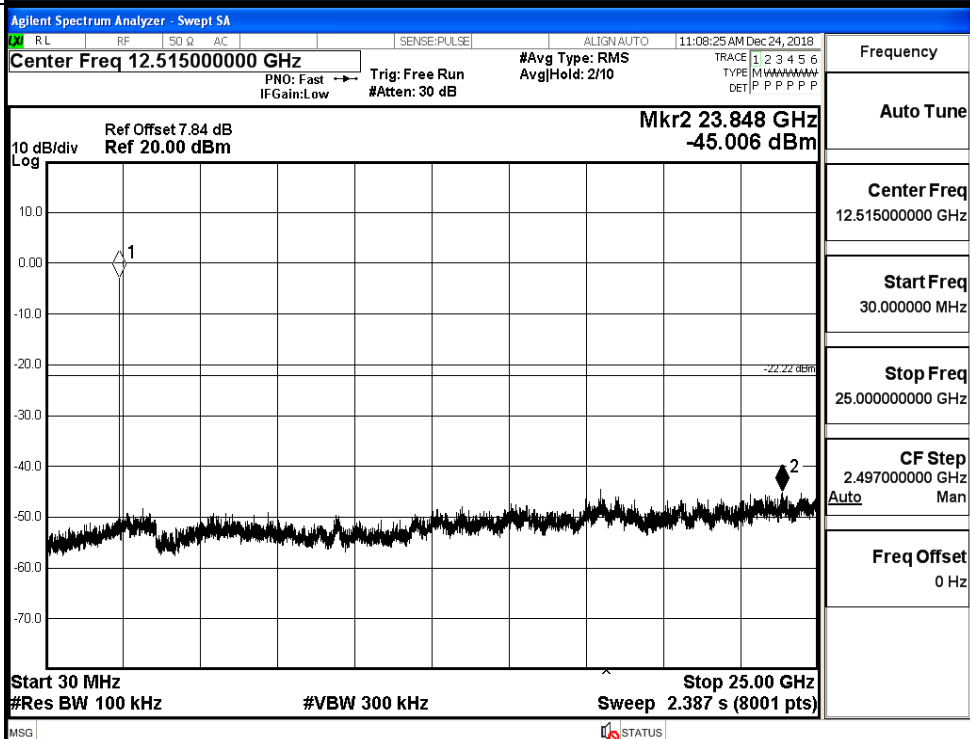


$\pi/4$ DQPSK\_LCH\_Graphs

Pref

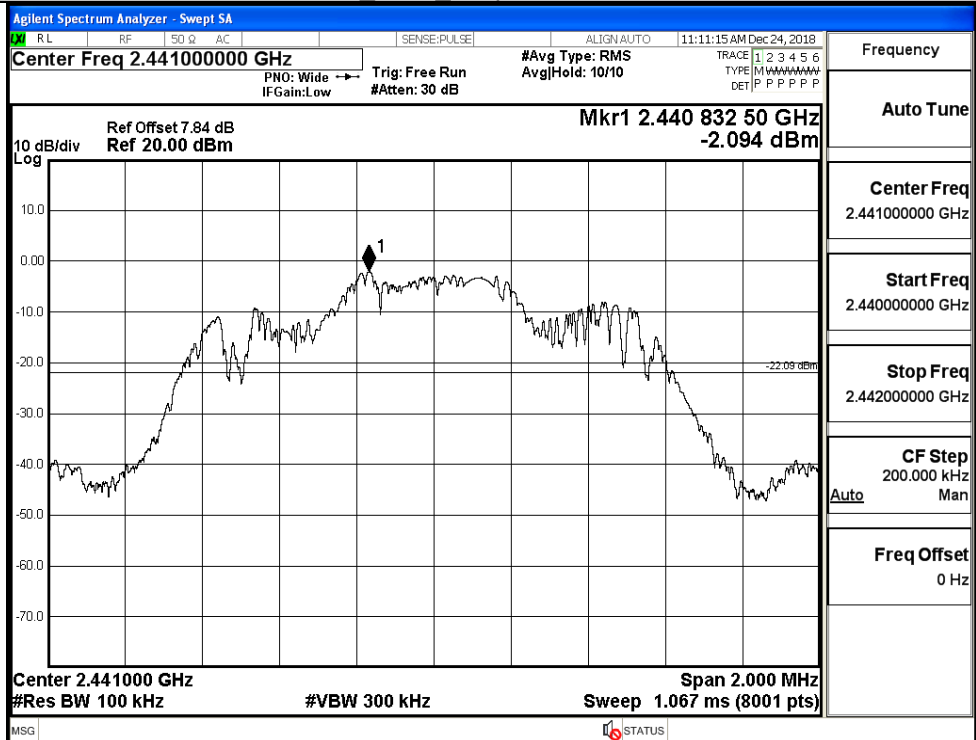


Puw

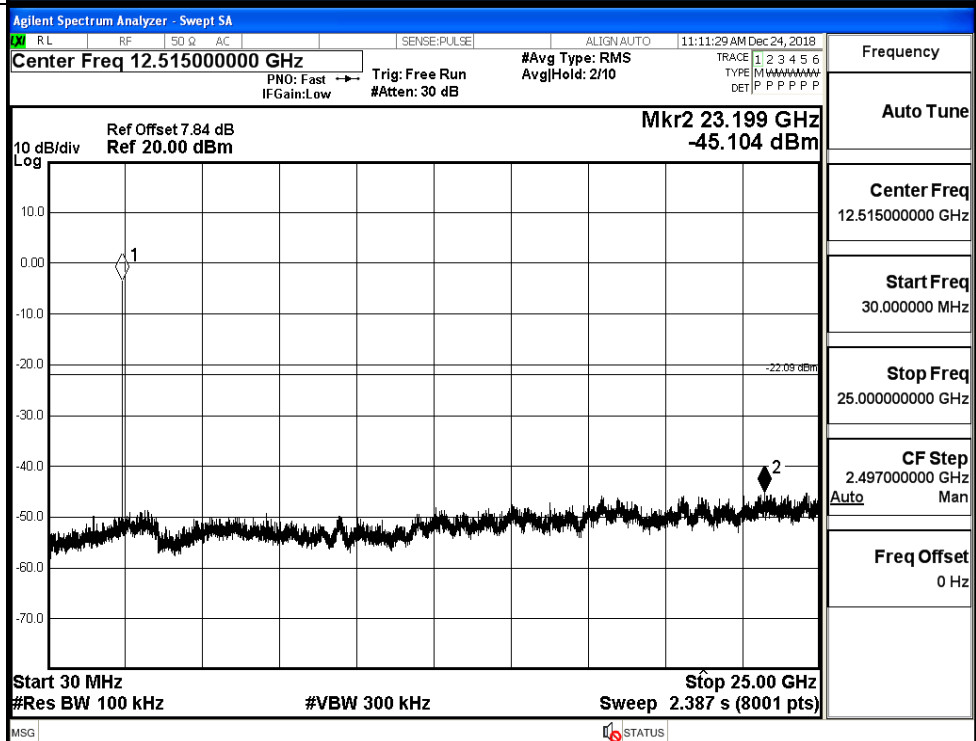


$\pi/4$ DQPSK\_MCH\_Graphs

Pref

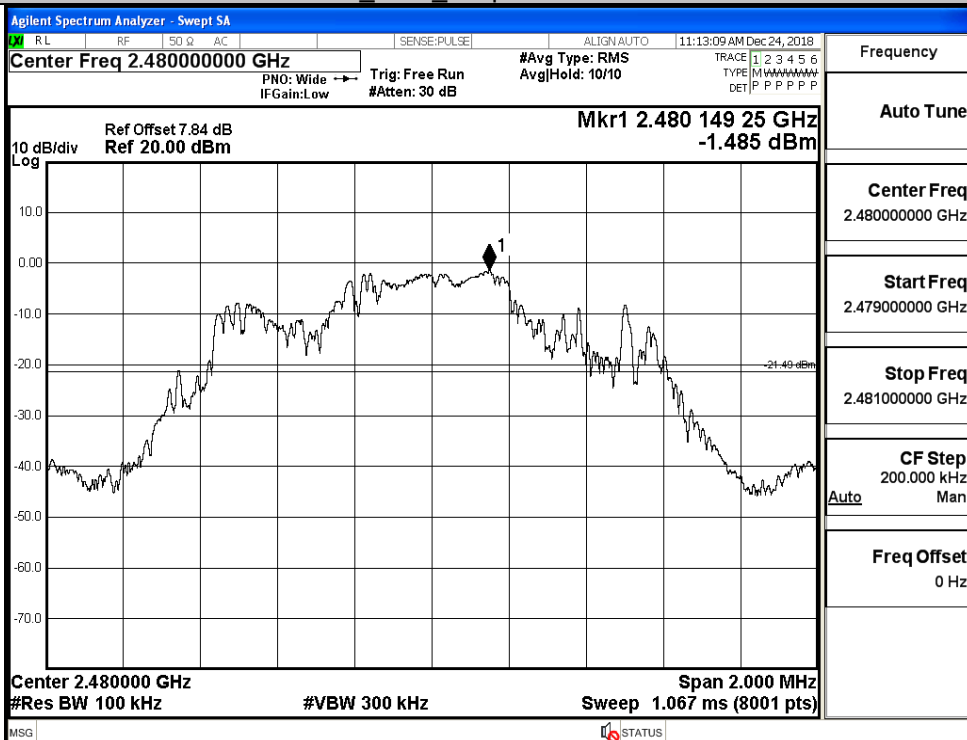


Puw

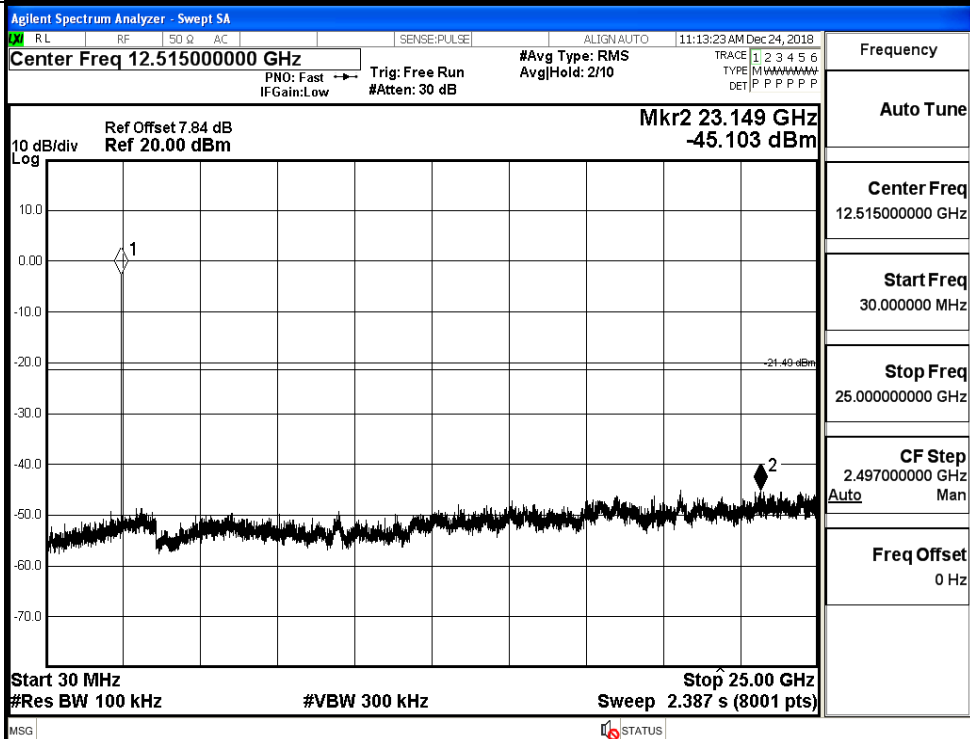


$\pi/4$ DQPSK\_HCH\_Graphs

Pref

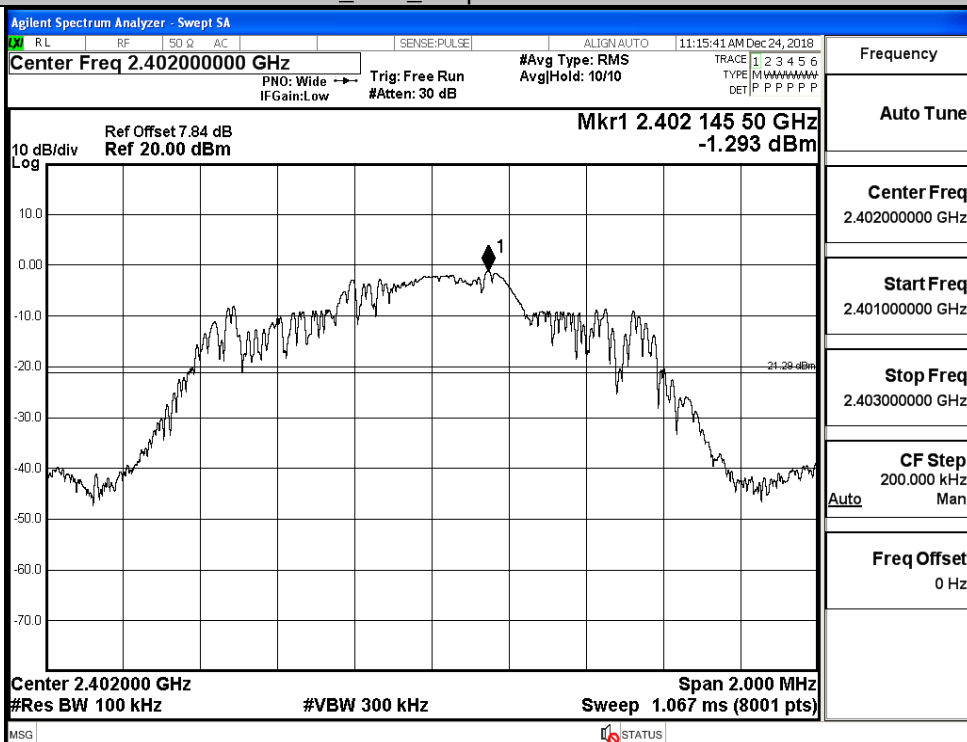


Puw

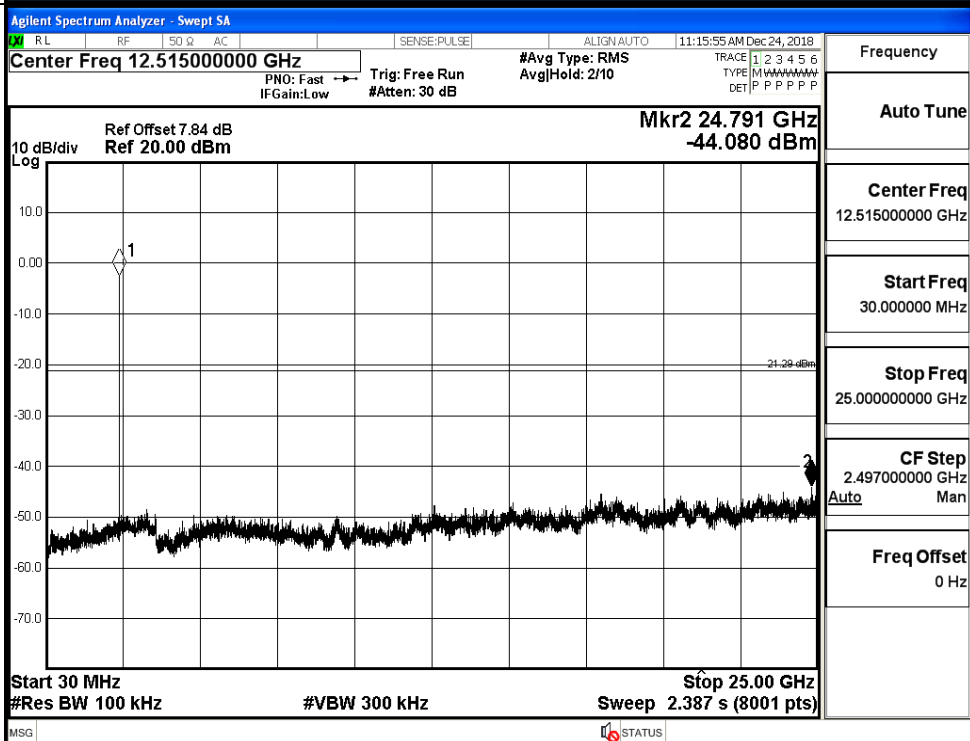


## 8DPSK\_LCH\_Graphs

Pref

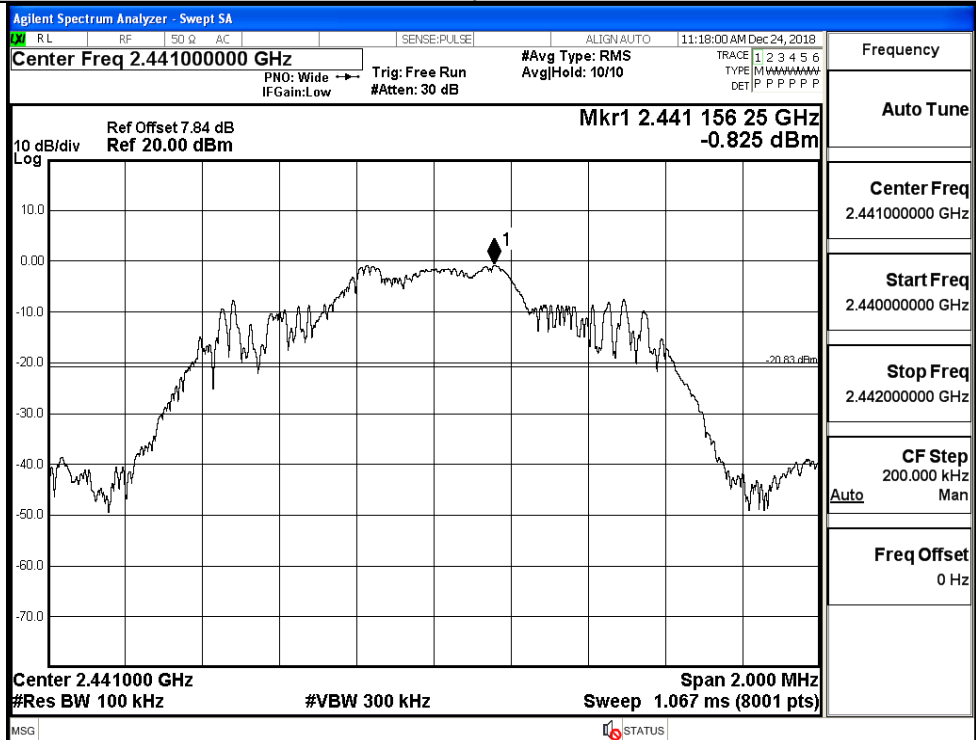


Puw

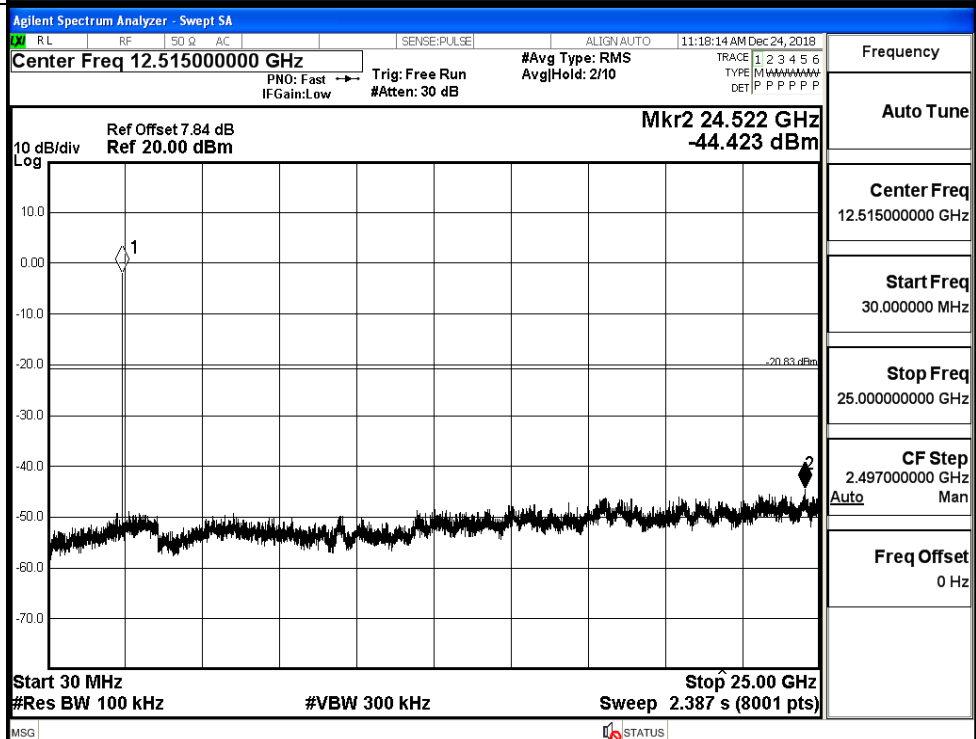


## 8DPSK\_MCH\_Graphs

Pref



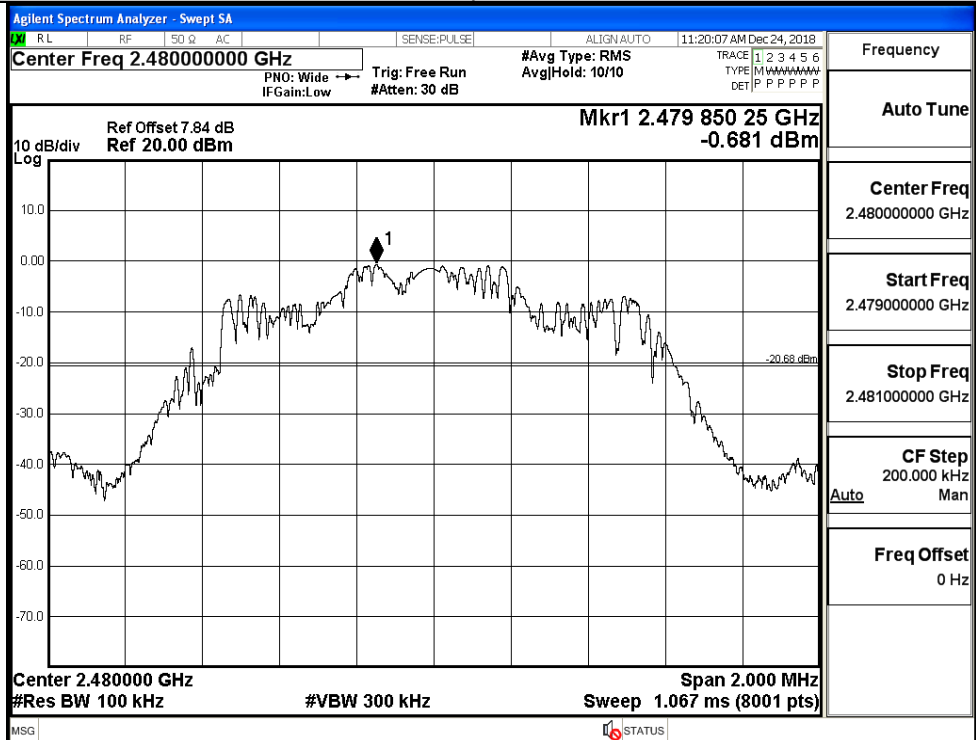
Puw



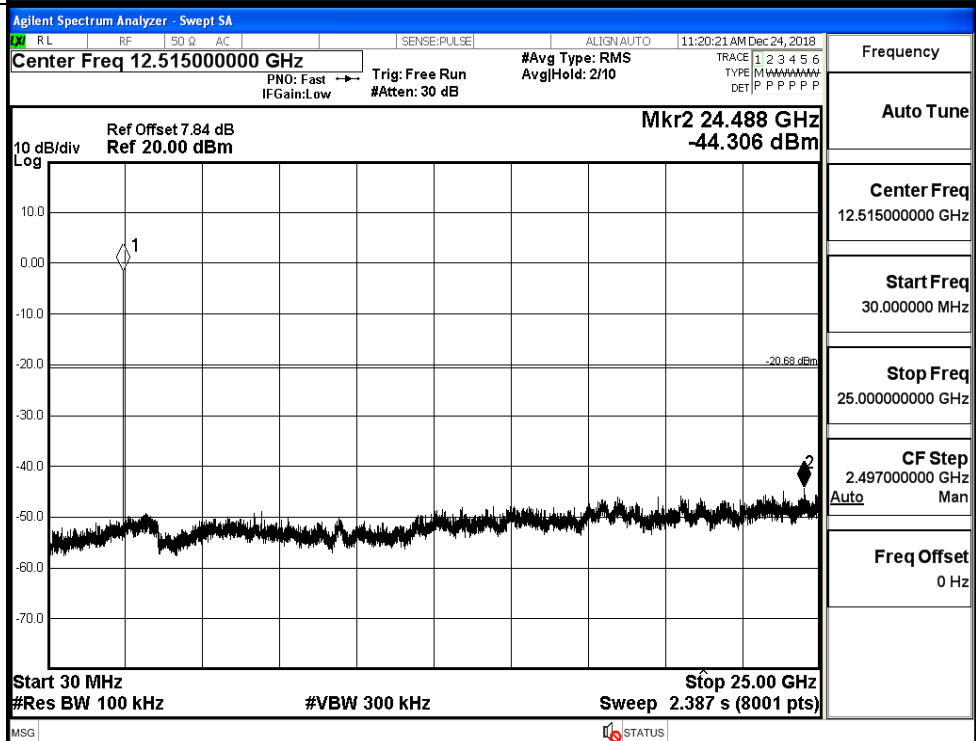


## 8DPSK\_HCH\_Graphs

Pref



Puw

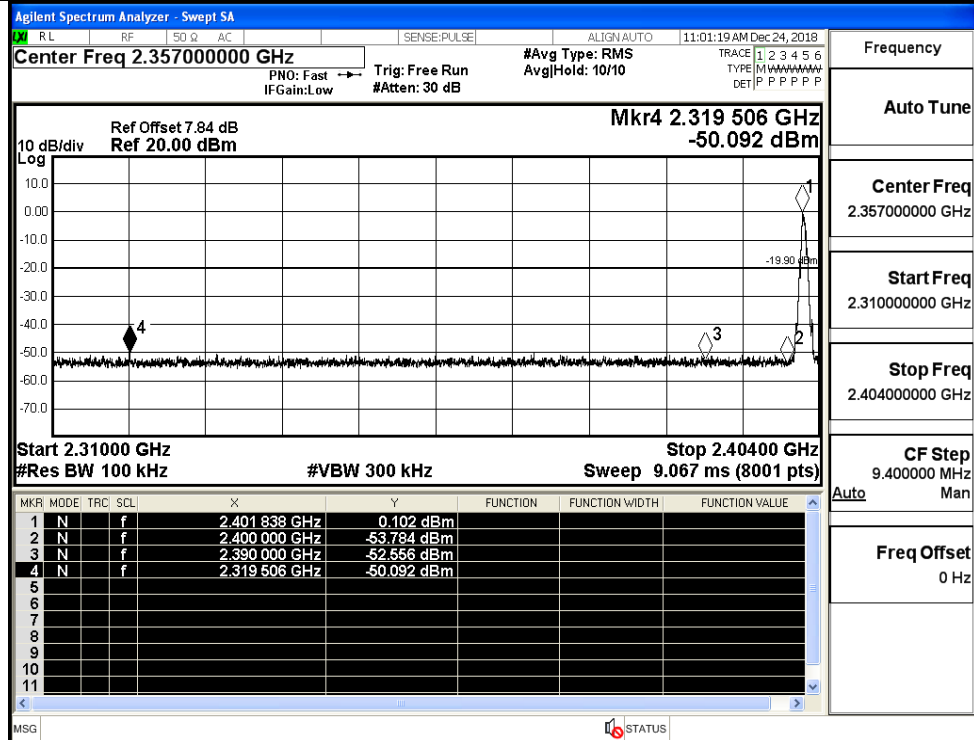


## A.7 Band-edge for RF Conducted Emissions

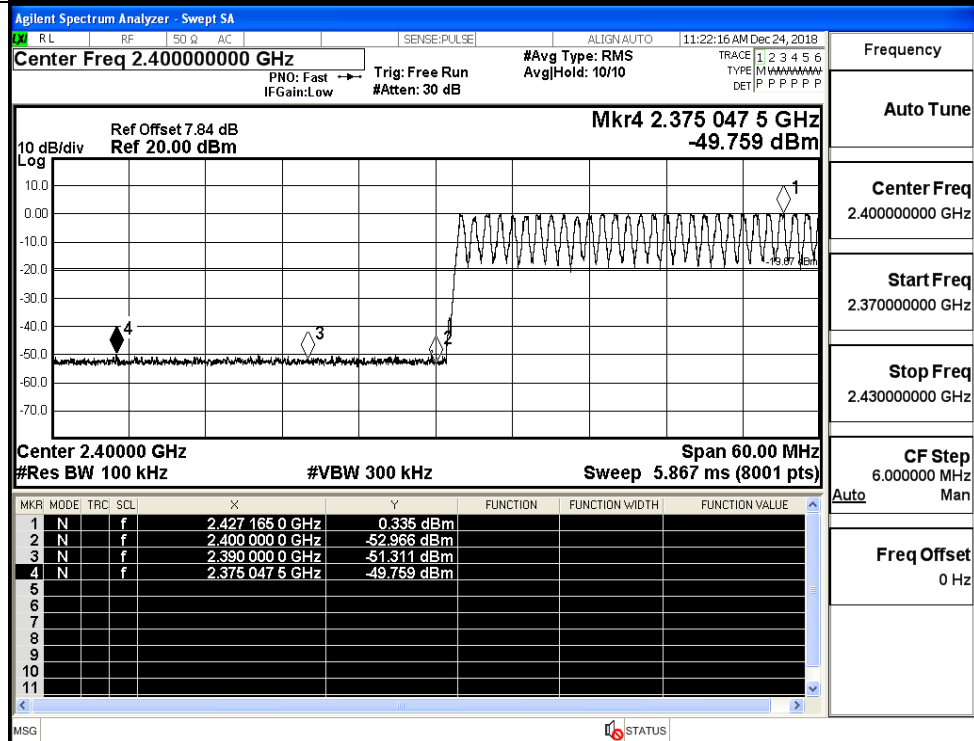
| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | 0.102               | Off               | -50.092                  | -19.9       | PASS    |
|               |         |                         | 0.335               | On                | -49.759                  | -19.67      | PASS    |
|               | HCH     | 2480                    | 1.310               | Off               | -50.218                  | -18.69      | PASS    |
|               |         |                         | 1.243               | On                | -49.694                  | -18.76      | PASS    |
| $\pi/4$ DQPSK | LCH     | 2402                    | -3.010              | Off               | -49.885                  | -23.01      | PASS    |
|               |         |                         | -0.580              | On                | -49.905                  | -20.58      | PASS    |
|               | HCH     | 2480                    | -1.288              | Off               | -49.177                  | -21.29      | PASS    |
|               |         |                         | -0.286              | On                | -37.652                  | -20.29      | PASS    |
| 8DPSK         | LCH     | 2402                    | -1.577              | Off               | -50.071                  | -21.58      | PASS    |
|               |         |                         | -2.409              | On                | -49.789                  | -22.41      | PASS    |
|               | HCH     | 2480                    | -0.123              | Off               | -49.847                  | -20.12      | PASS    |
|               |         |                         | -1.430              | On                | -49.039                  | -21.43      | PASS    |

## Test Graphs

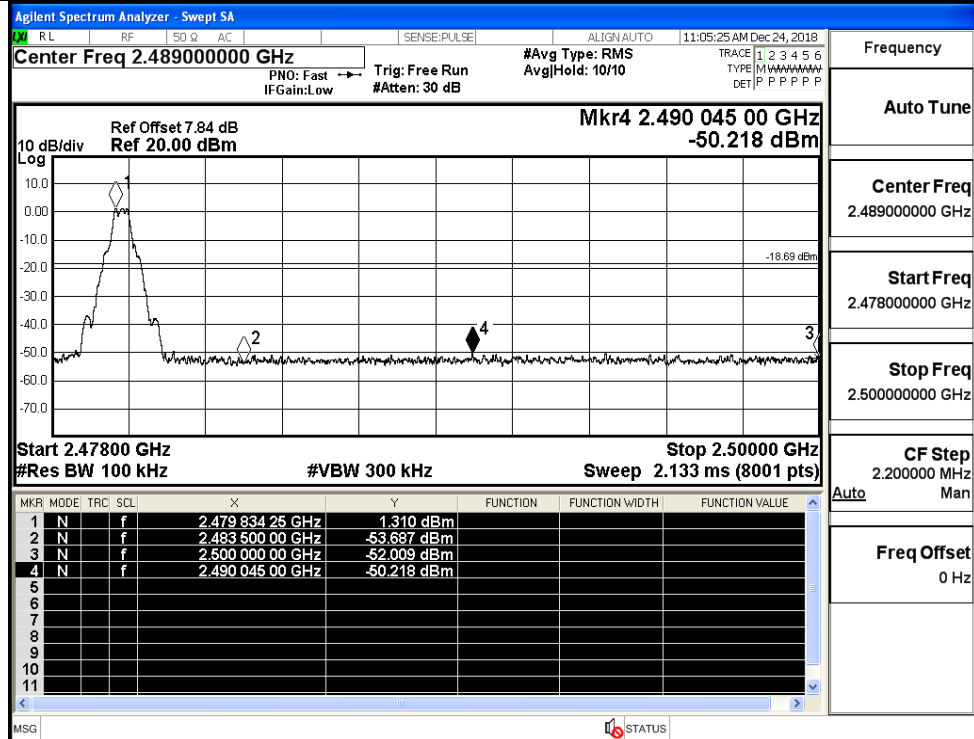
GFSK/LCH/No Hop



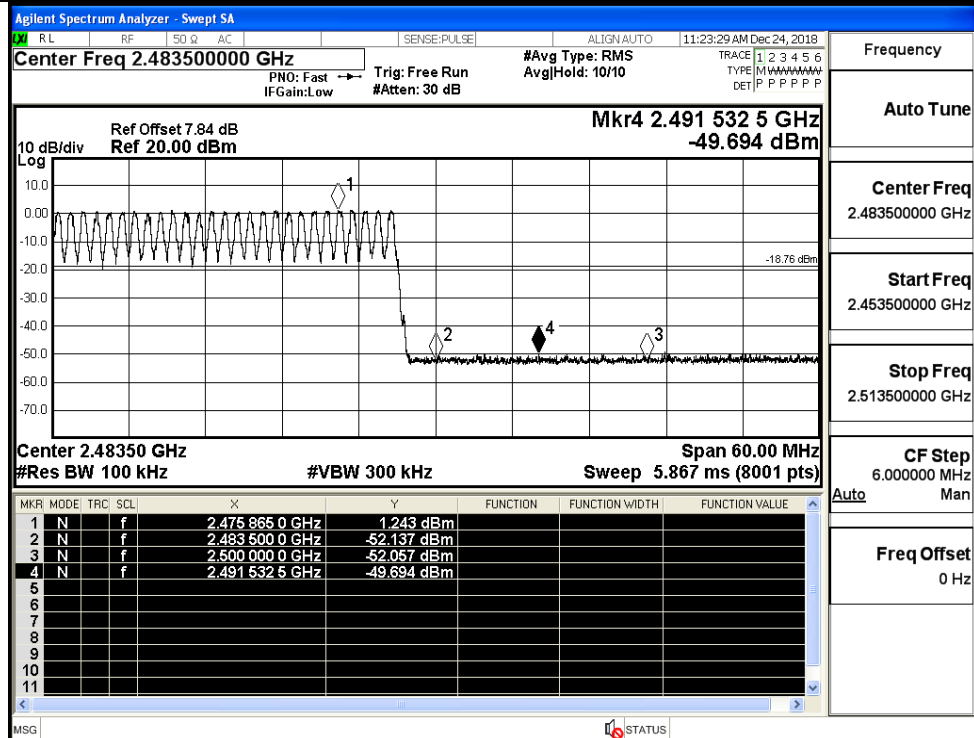
GFSK/LCH/Hop



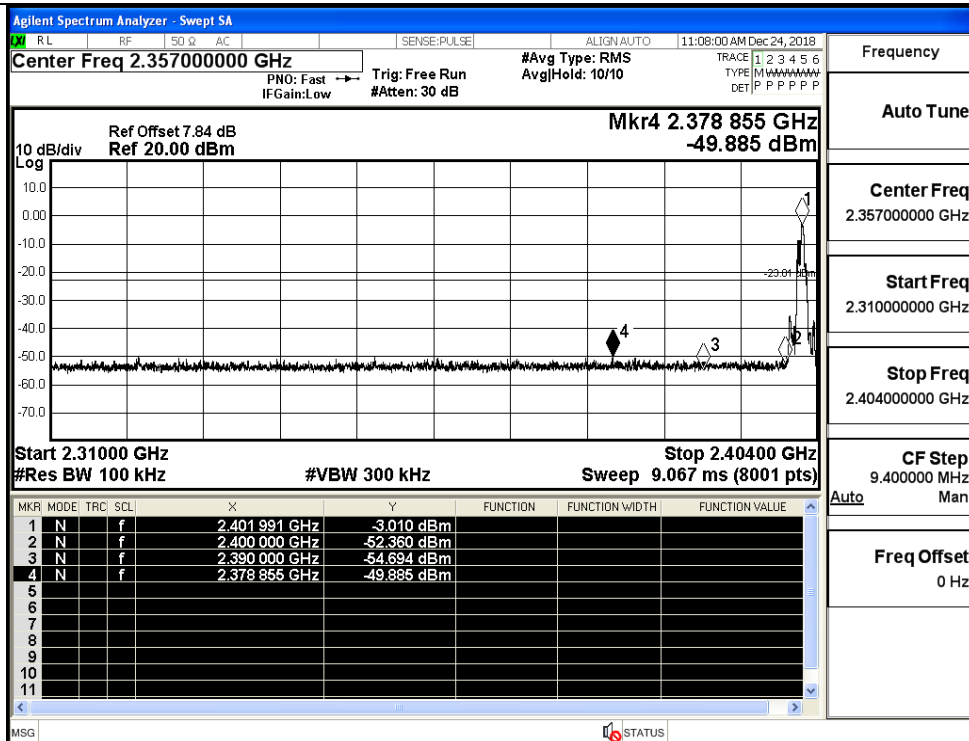
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq  
2.357000000 GHz

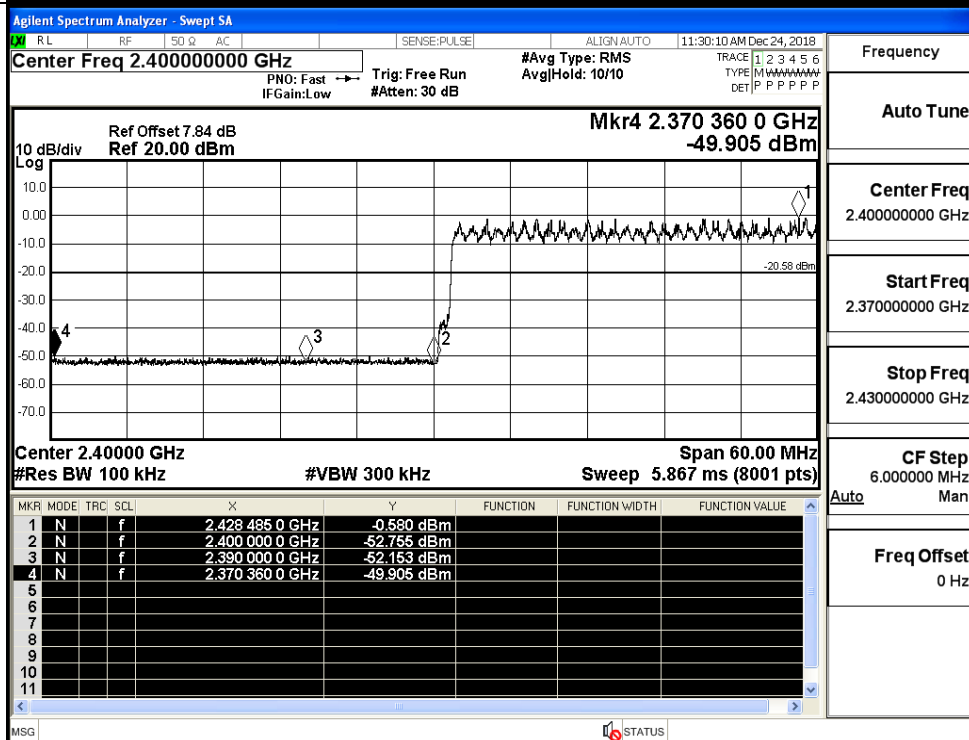
Start Freq  
2.310000000 GHz

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

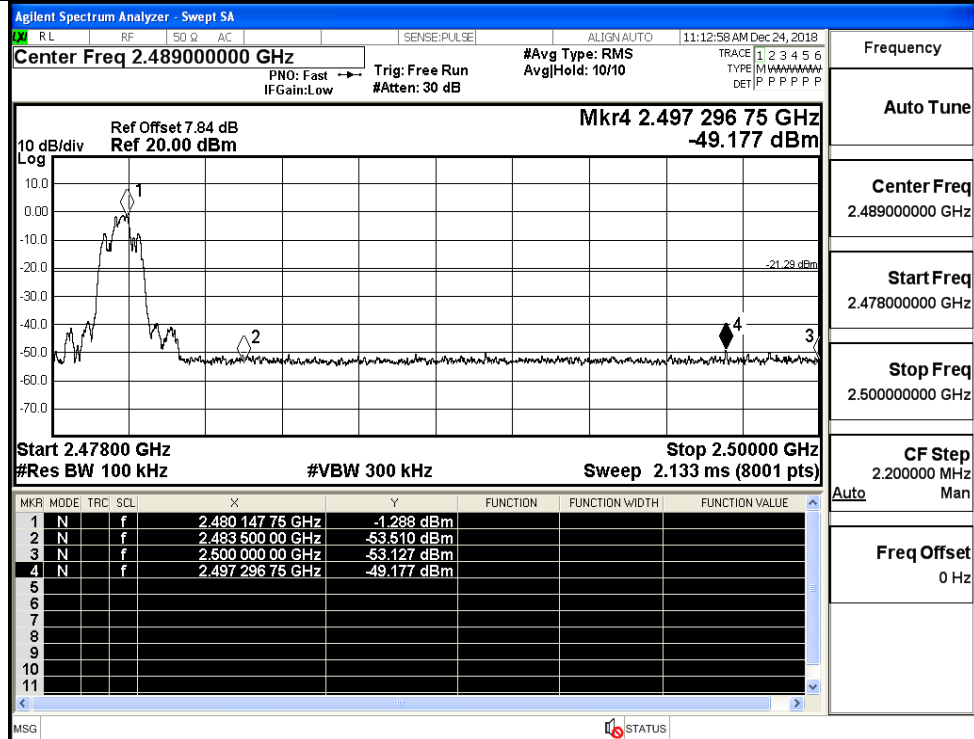
Start Freq  
2.370000000 GHz

Stop Freq  
2.430000000 GHz

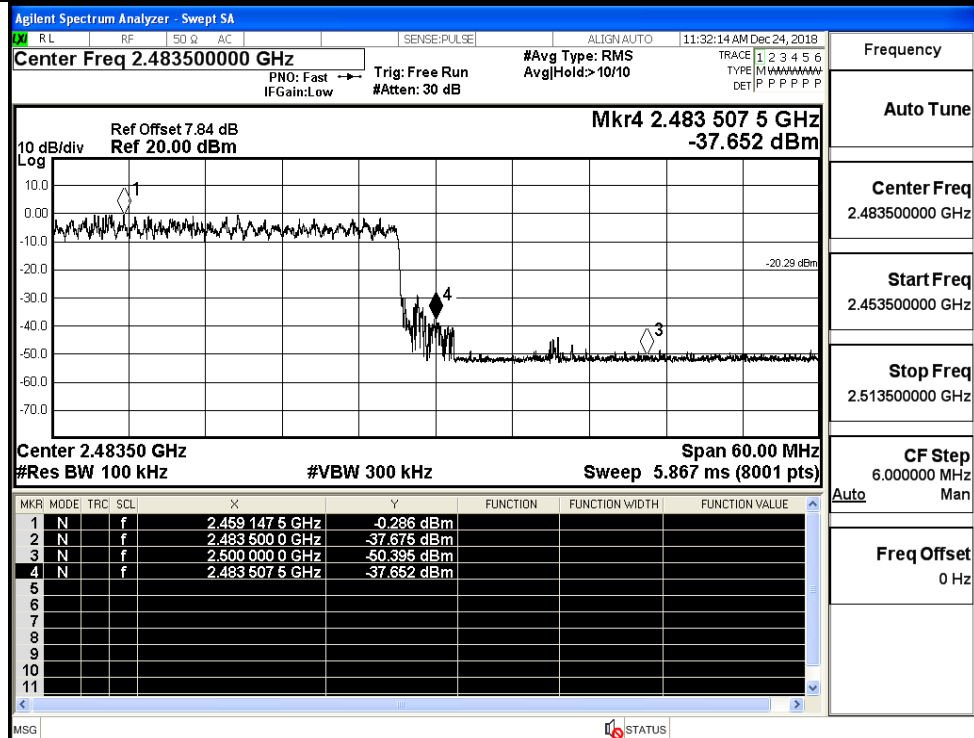
CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

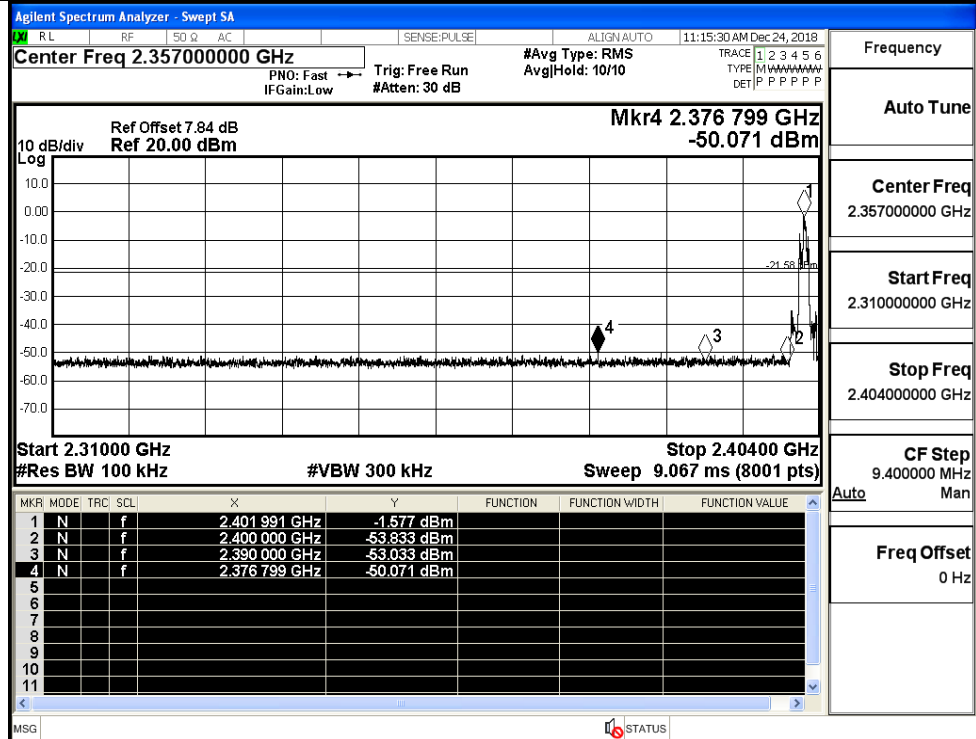
$\pi/4$ DQPSK/HCH/No  
Hop



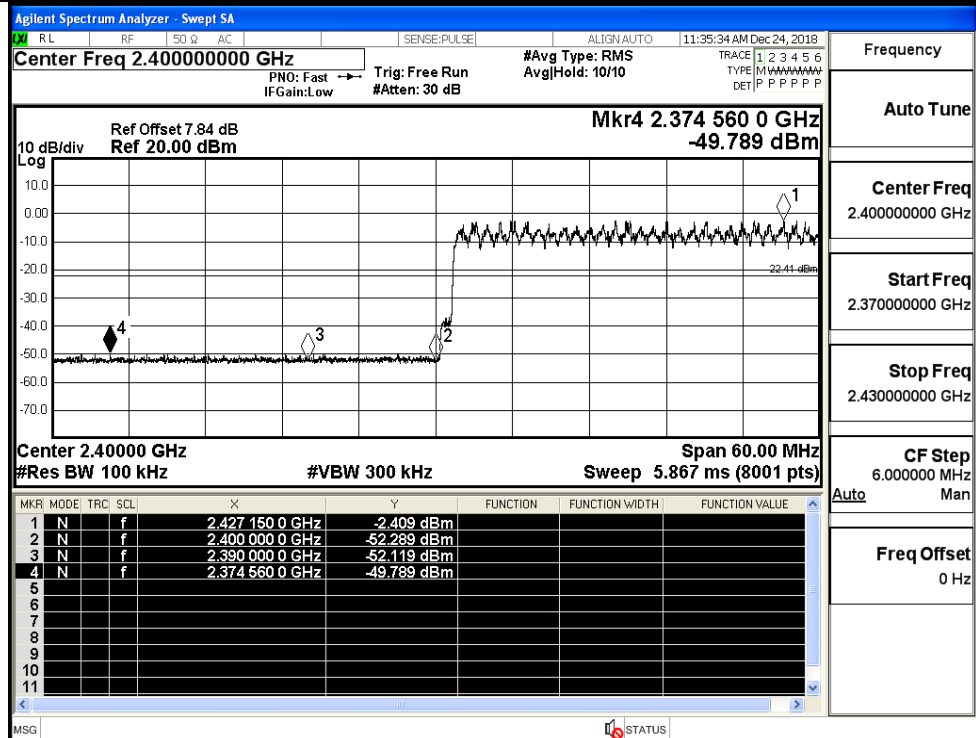
$\pi/4$ DQPSK/HCH/Hop



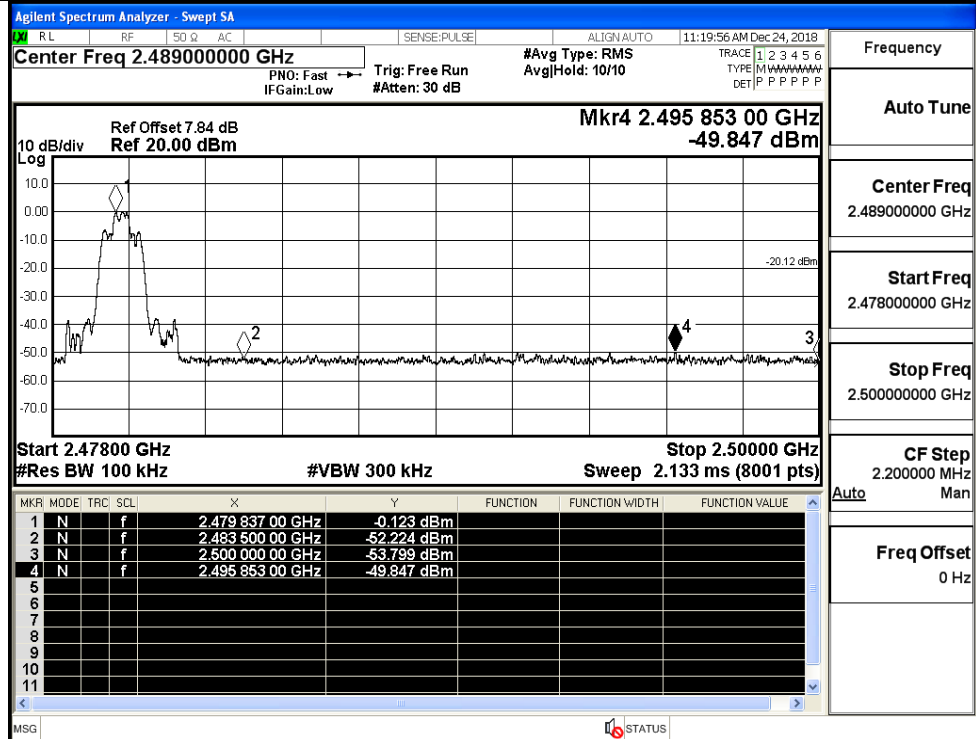
8DPSK/LCH/No Hop



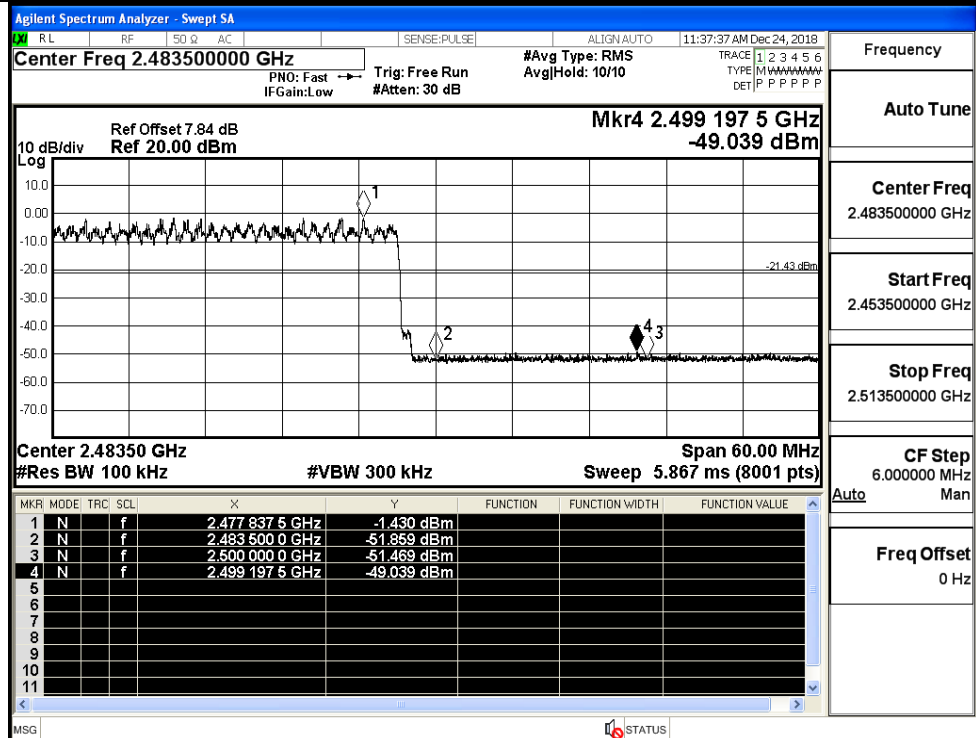
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



8DPSK/HCH/Hop

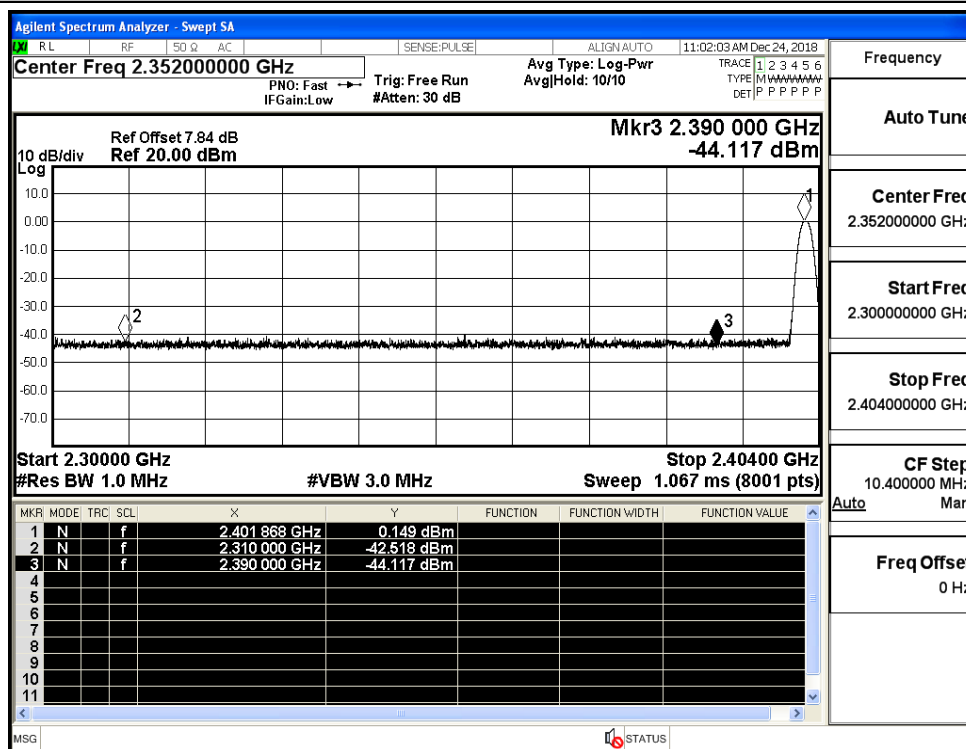




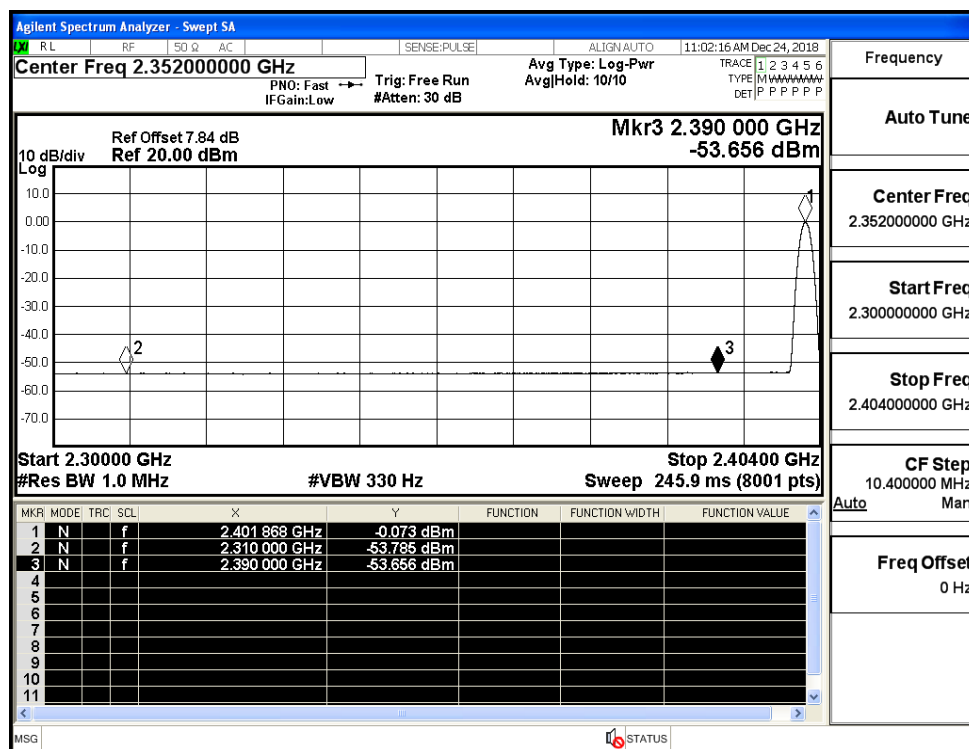
## A.8 Restrict-band band-edge measurements

| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -42.52      | 2.0  | 0             | 54.74      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.79      | 2.0  | 0             | 43.47      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -44.12      | 2.0  | 0             | 53.14      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.66      | 2.0  | 0             | 43.60      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.01      | 2.0  | 0             | 54.25      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -53.36      | 2.0  | 0             | 43.90      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -43.74      | 2.0  | 0             | 53.52      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -53.29      | 2.0  | 0             | 43.97      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -43.23      | 2.0  | 0             | 54.03      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -54.00      | 2.0  | 0             | 43.26      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -42.56      | 2.0  | 0             | 54.70      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.73      | 2.0  | 0             | 43.53      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.37      | 2.0  | 0             | 53.89      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -53.44      | 2.0  | 0             | 43.82      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -43.74      | 2.0  | 0             | 53.52      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -50.66      | 2.0  | 0             | 46.60      | AV       | 54             | PASS    |
| 8DPSK         | Off     | 2310.0 | -43.85      | 2.0  | 0             | 53.40      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.96      | 2.0  | 0             | 43.30      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -44.27      | 2.0  | 0             | 52.99      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.76      | 2.0  | 0             | 43.50      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -42.71      | 2.0  | 0             | 54.55      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -53.54      | 2.0  | 0             | 43.72      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -44.55      | 2.0  | 0             | 52.71      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -53.28      | 2.0  | 0             | 43.98      | AV       | 54             | PASS    |

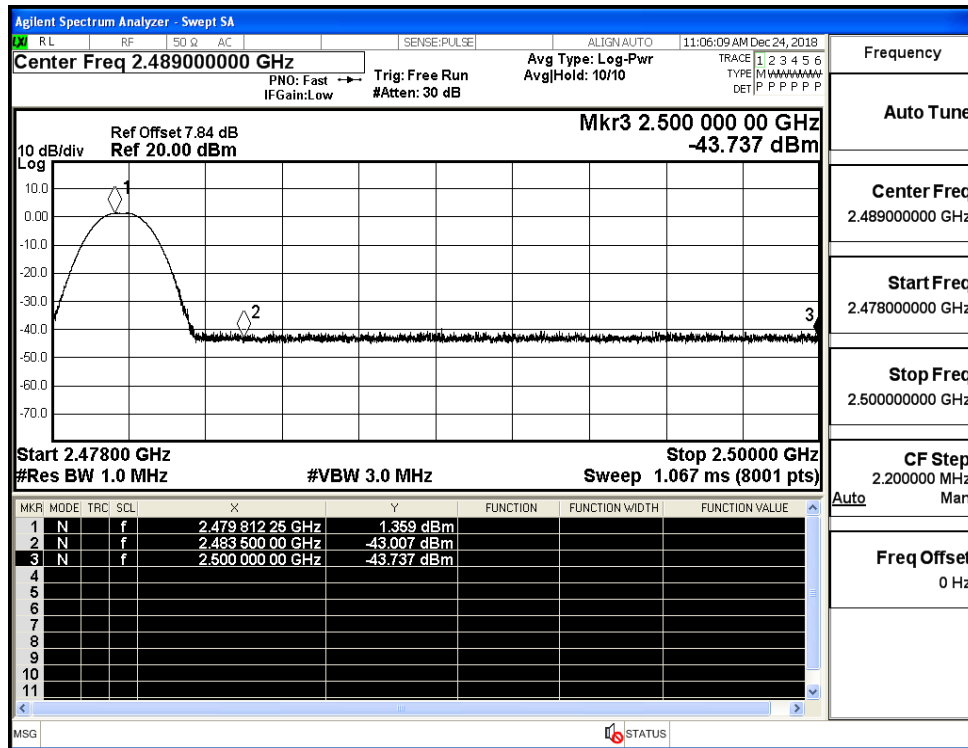
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



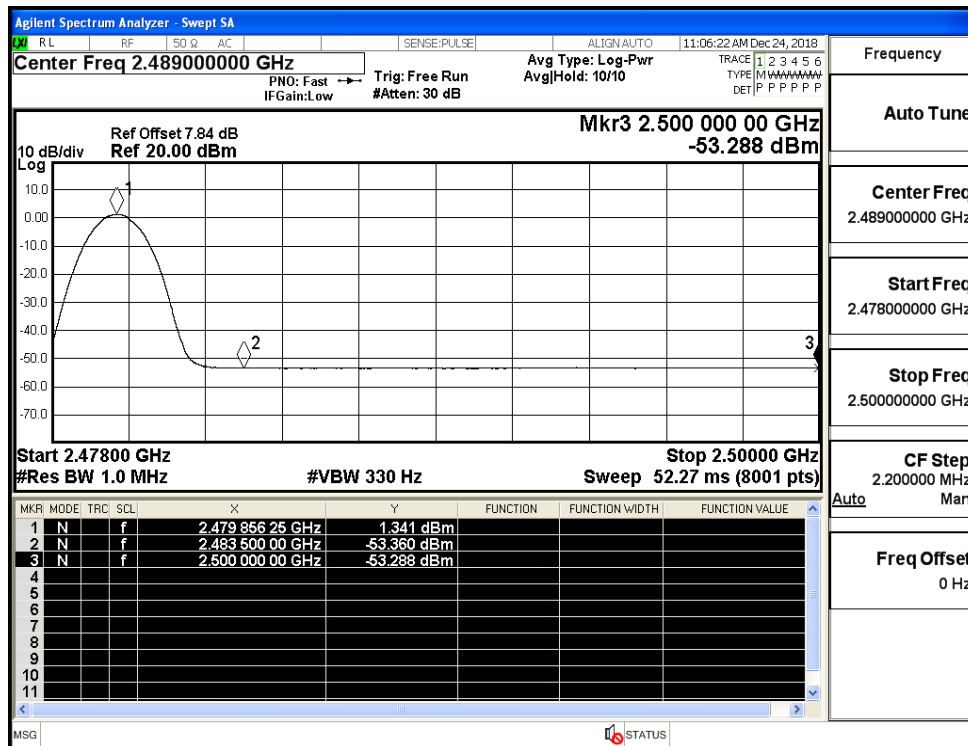
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)

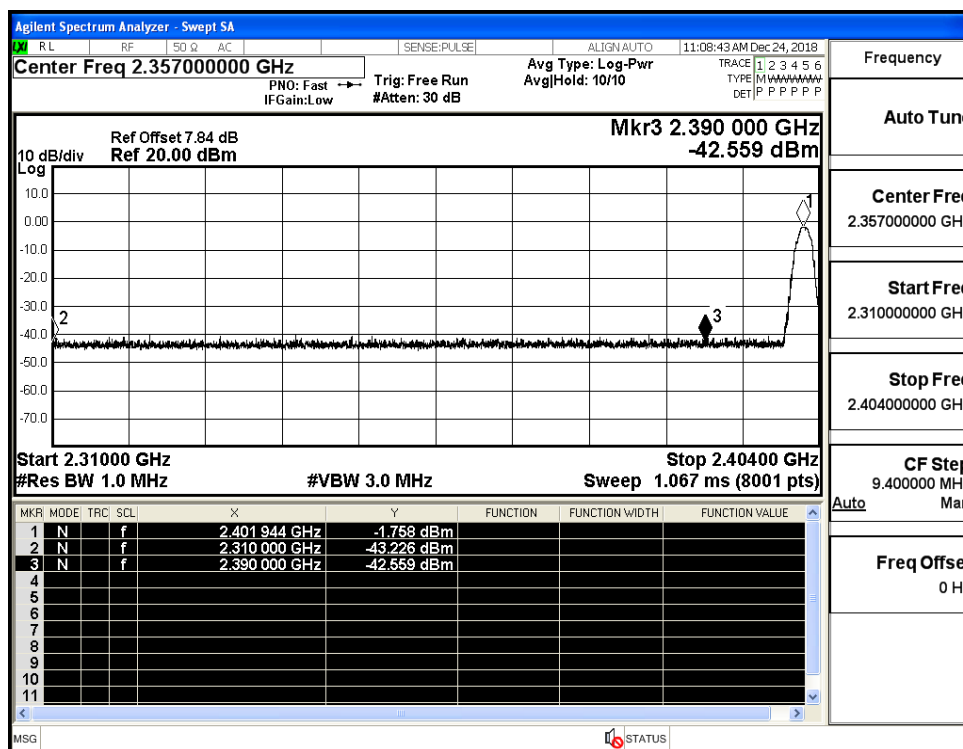
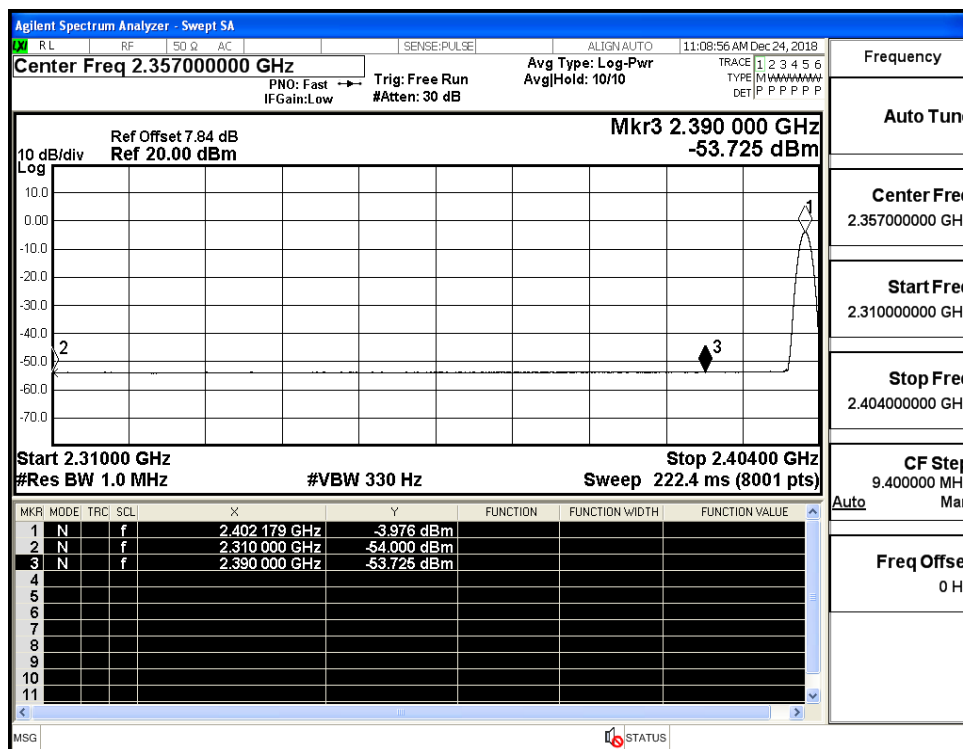


## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (High Channel)

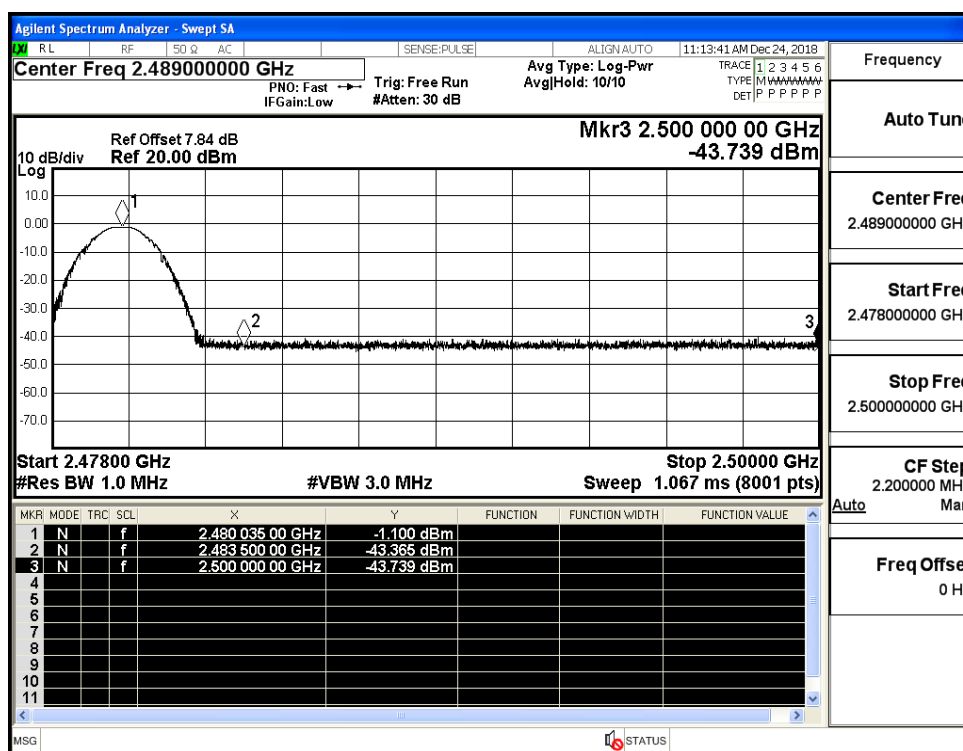


## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (High Channel)

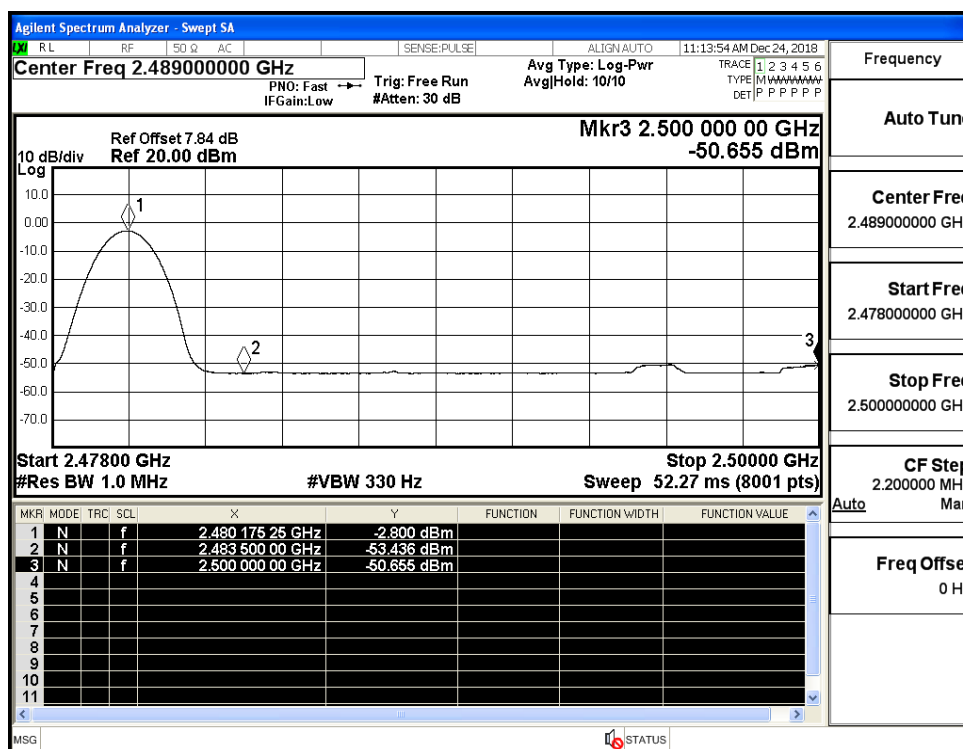


Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)

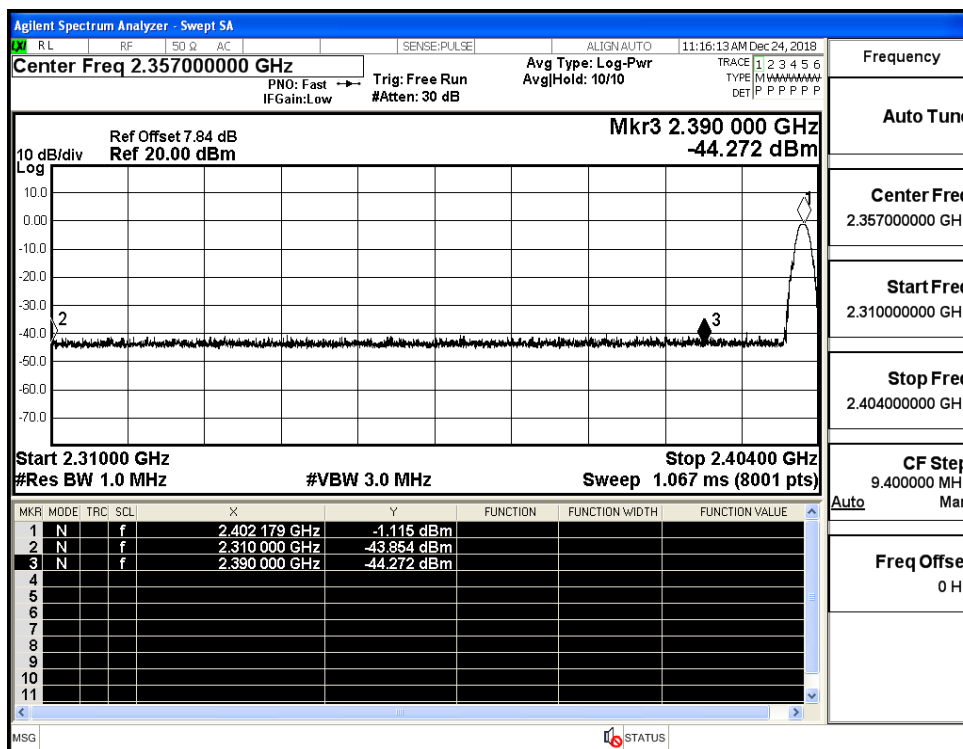
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



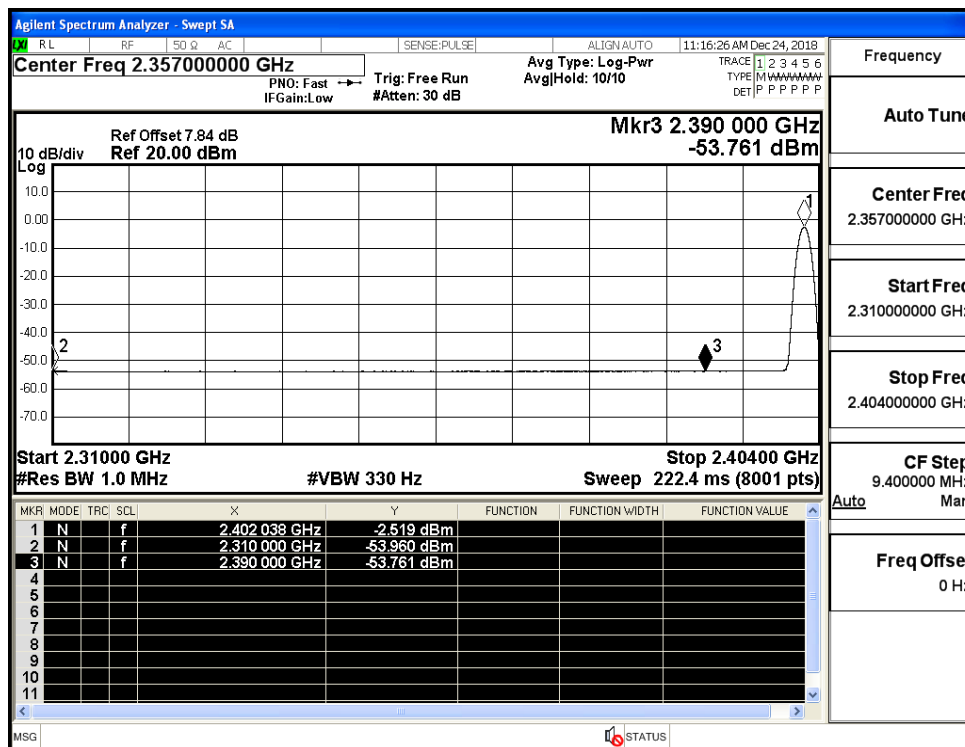
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



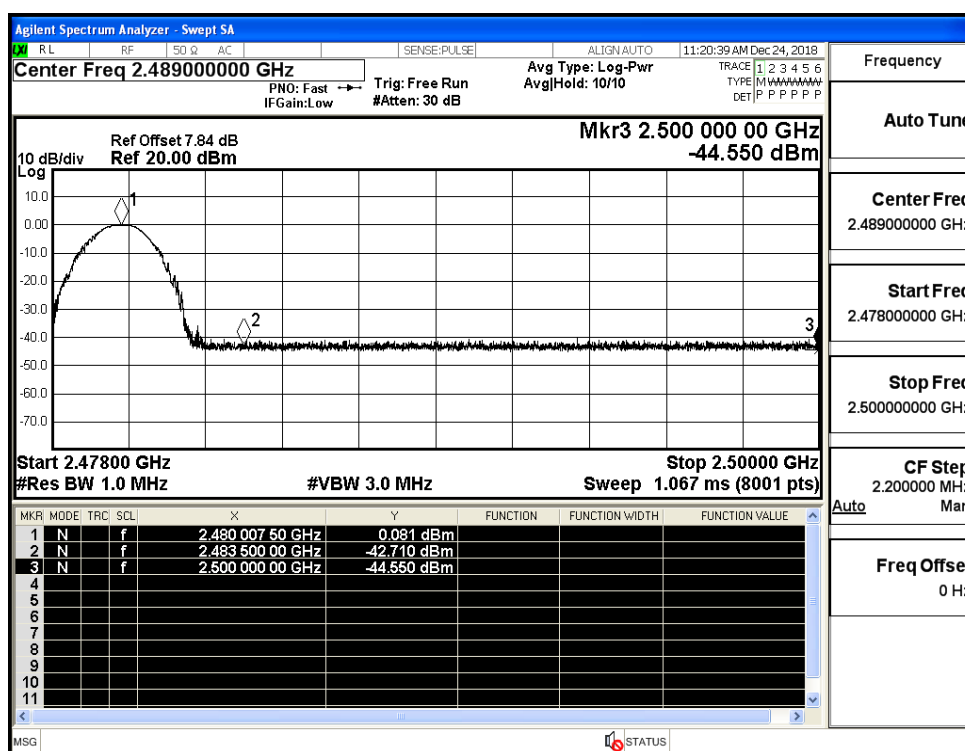
## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



## 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)

