

## Appendix A

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

Product Name: Bluetooth glasses

Trade Mark: N/A

Test Model: BTSUNGLS

#### Environmental Conditions

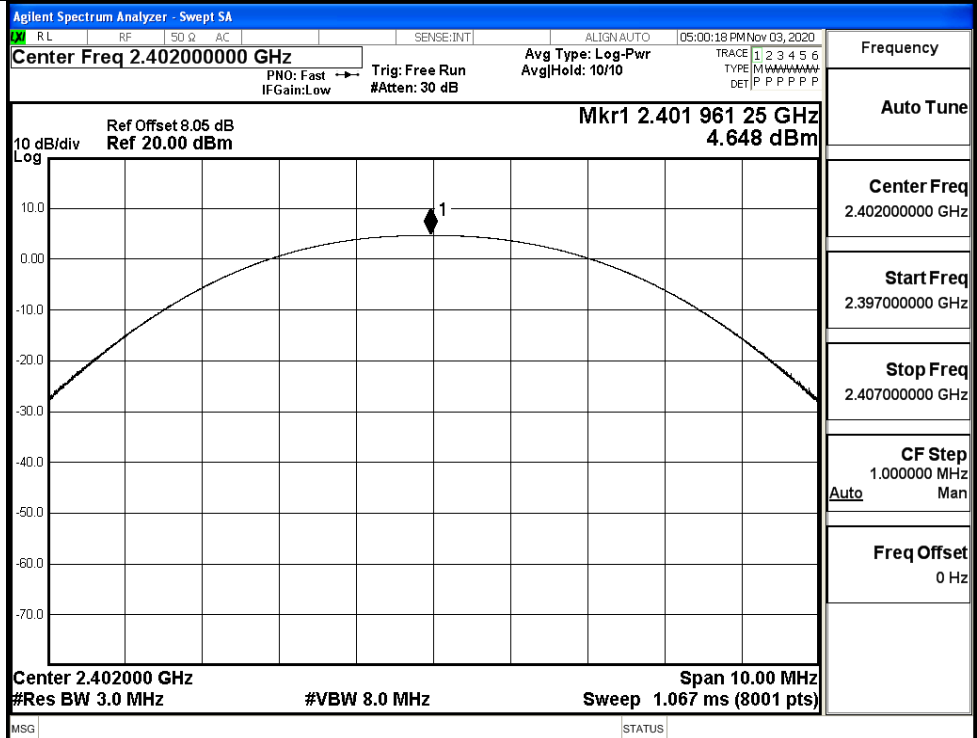
|                    |            |
|--------------------|------------|
| Temperature:       | 25 .3° C   |
| Relative Humidity: | 52.3%      |
| ATM Pressure:      | 100.0 kPa  |
| Test Engineer:     | Diamond Lu |
| Supervised by:     | Li Huan    |

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

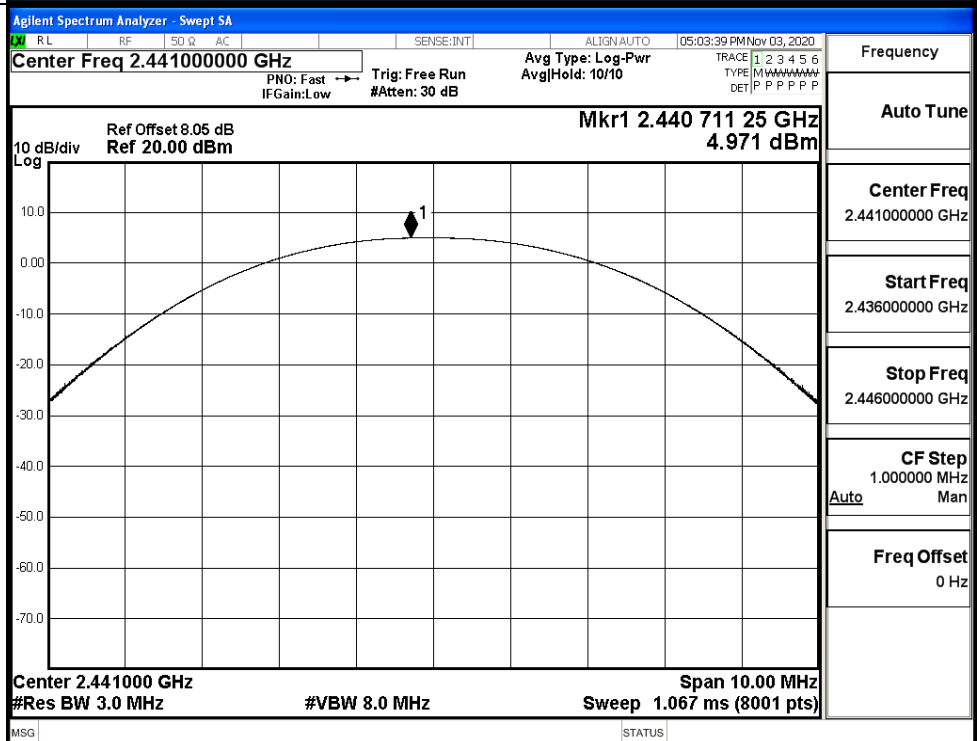
| Mode          | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK          | LCH      | 4.648                           | 21          | PASS    |
|               | MCH      | 4.971                           | 21          | PASS    |
|               | HCH      | 3.722                           | 21          | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.077                           | 21          | PASS    |
|               | MCH      | 1.493                           | 21          | PASS    |
|               | HCH      | 0.271                           | 21          | PASS    |
| 8DPSK         | LCH      | 1.396                           | 21          | PASS    |
|               | MCH      | 1.759                           | 21          | PASS    |
|               | HCH      | 0.506                           | 21          | PASS    |

## Test Graphs

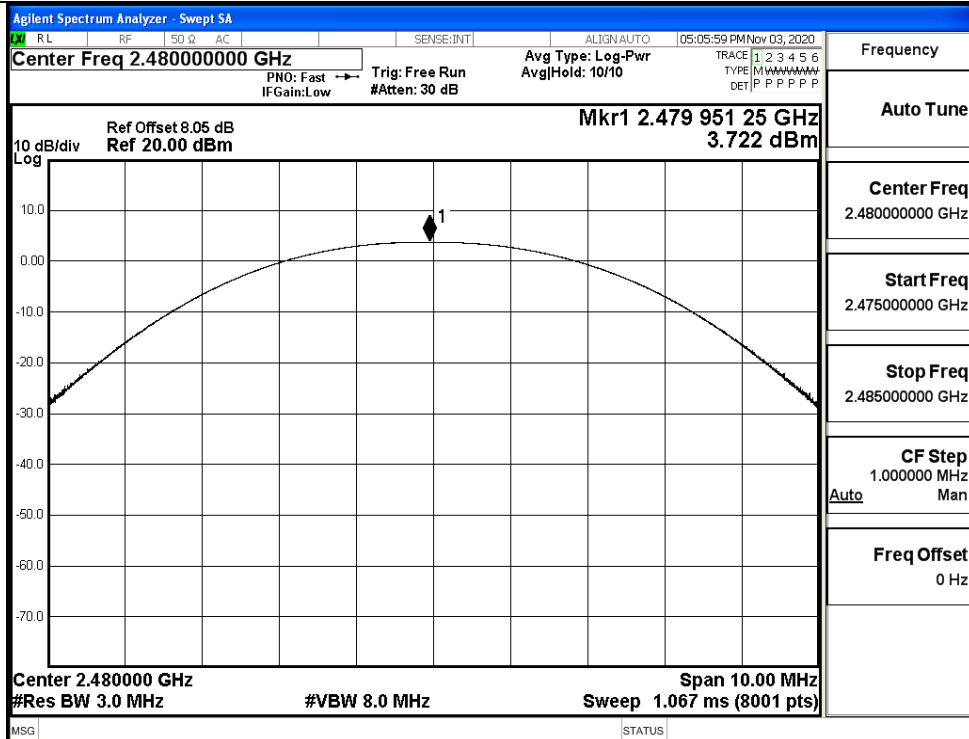
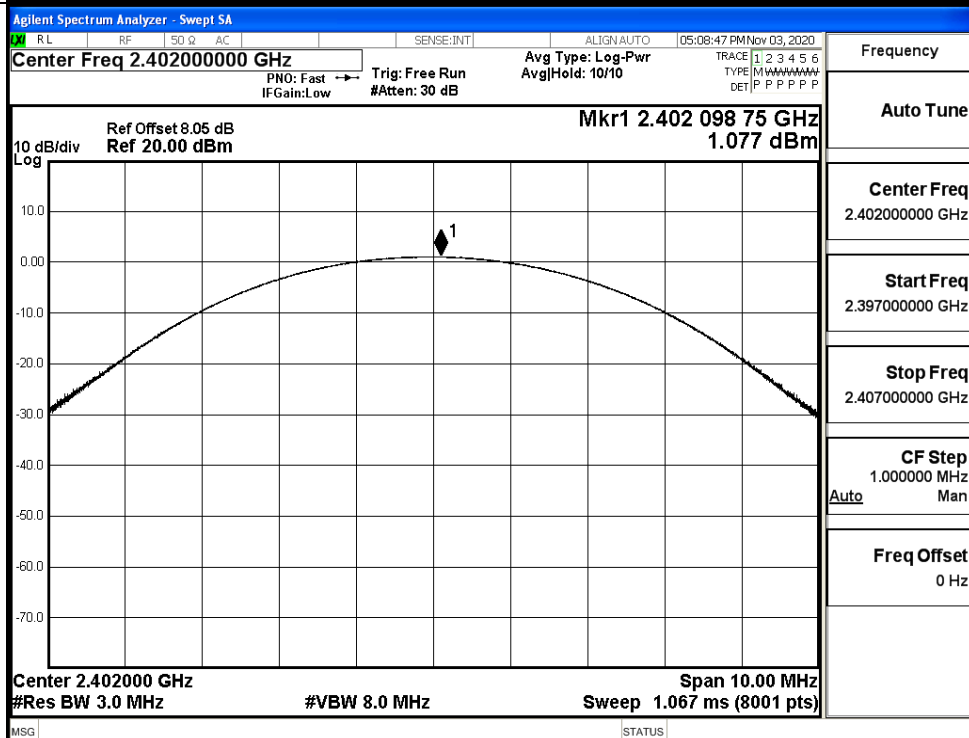
GFSK/LCH

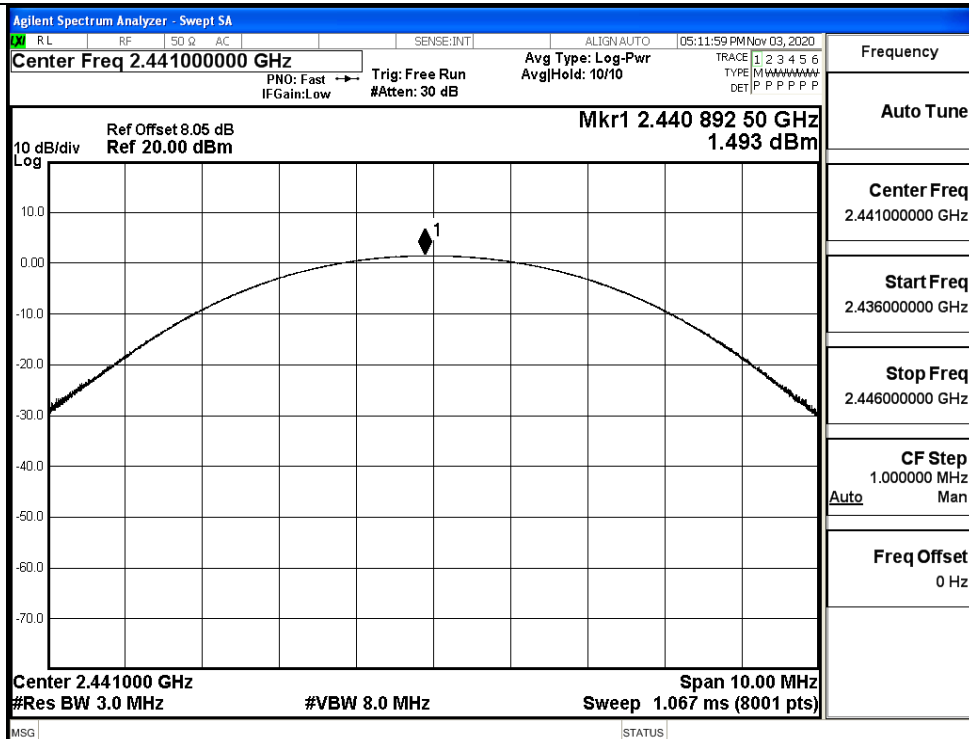
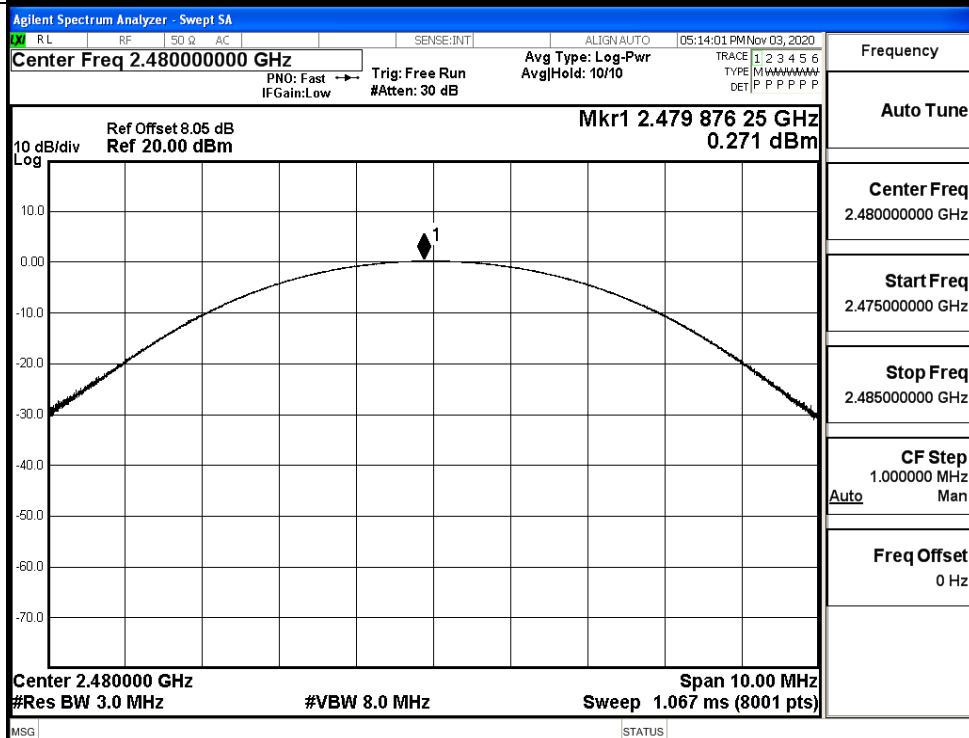


GFSK/MCH

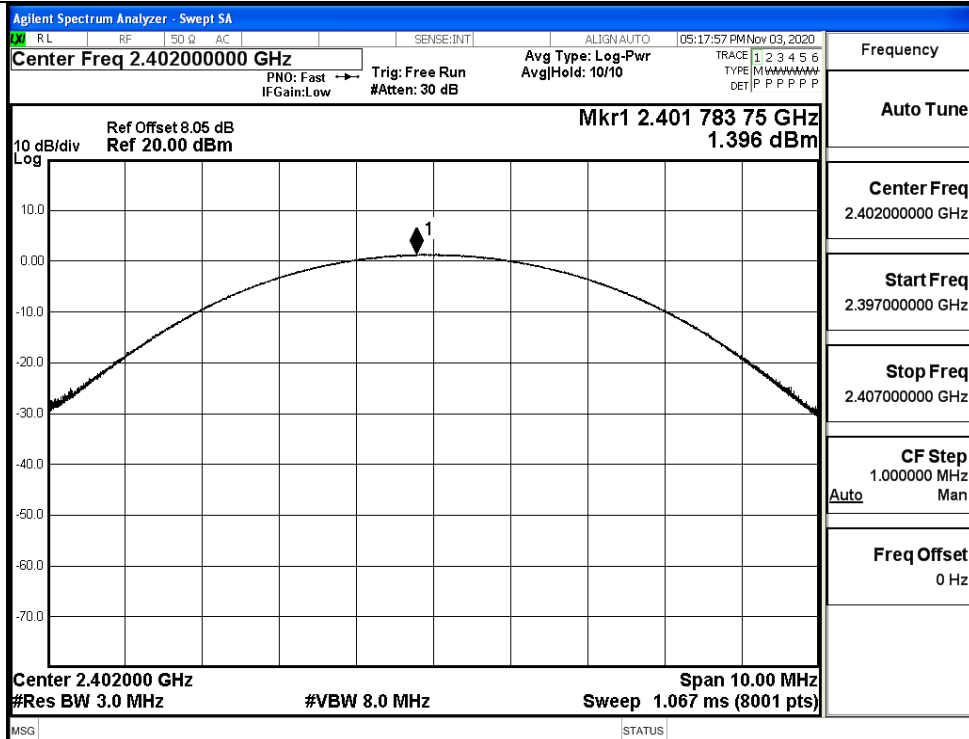


GFSK/HCH

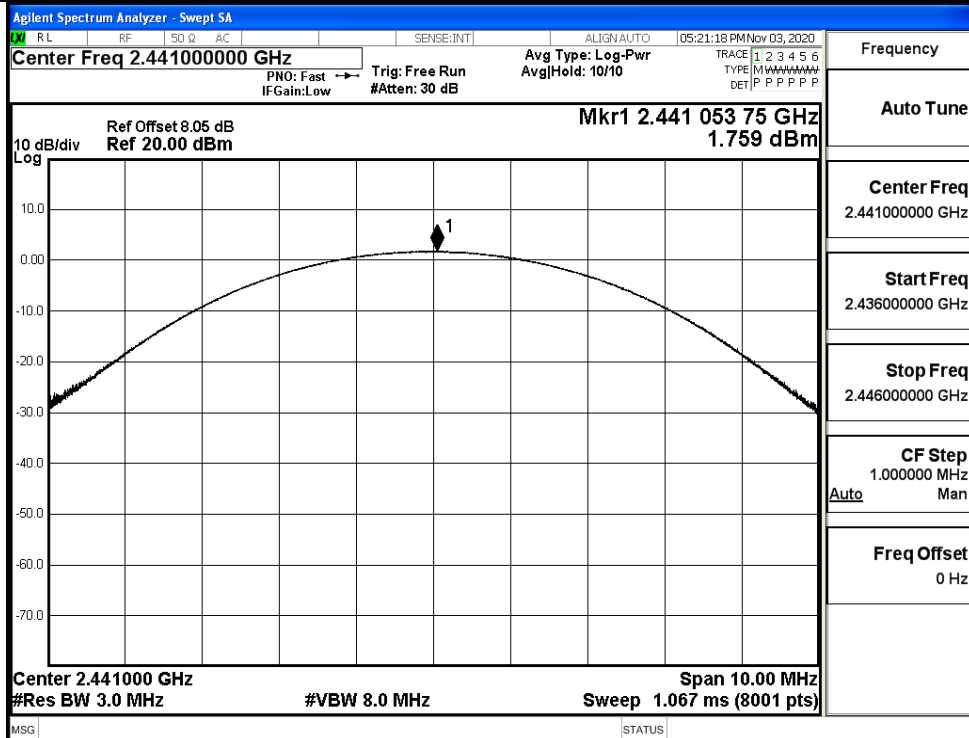
 $\pi/4$ DQPSK/LCH

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

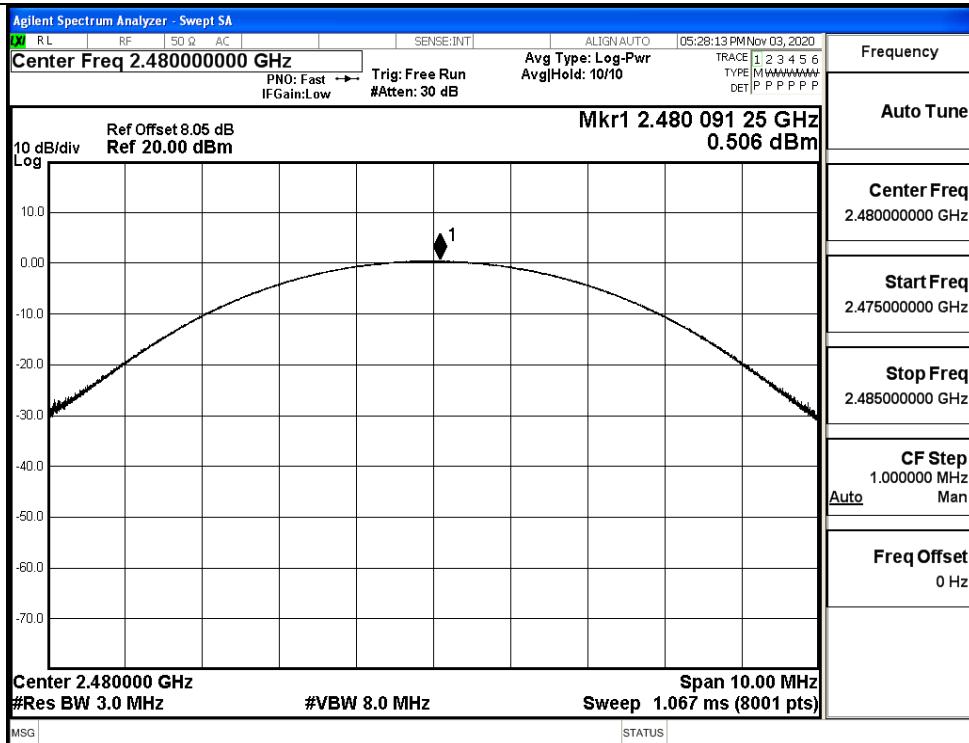
8DPSK/LCH



8DPSK/MCH



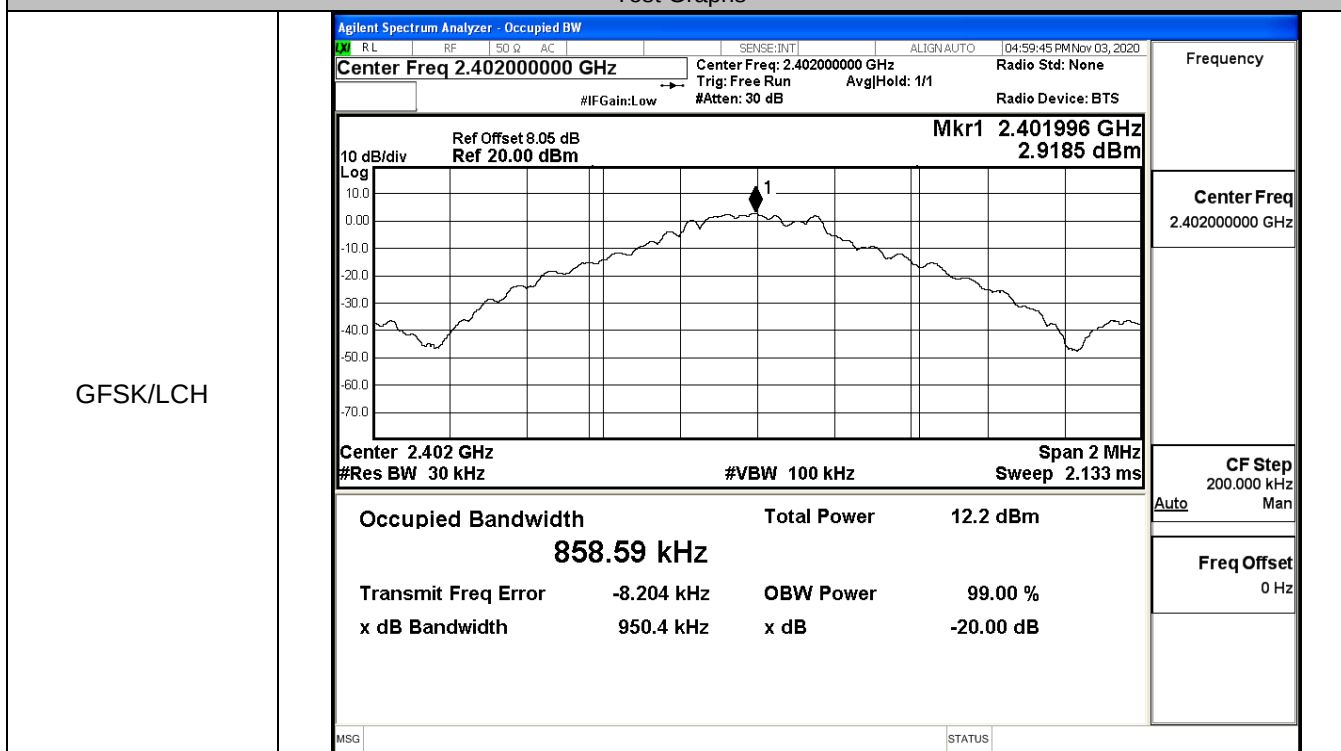
8DPSK/HCH



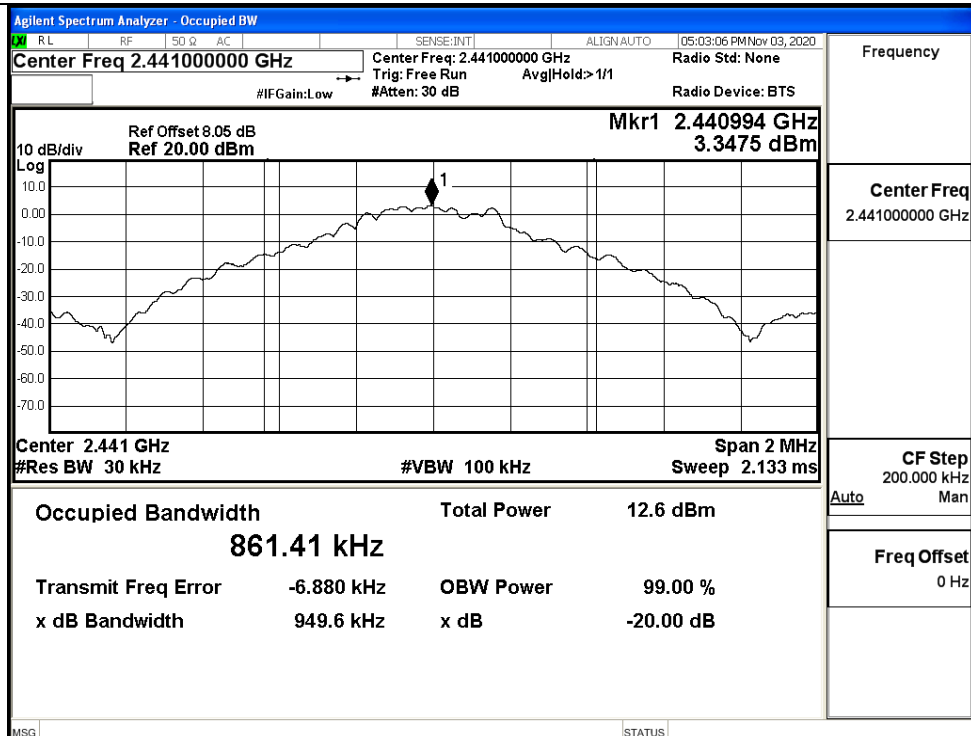
## A.2 20dB Bandwidth

| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.9504               | Not Specified | PASS    |
|               | MCH      | 0.9496               | Not Specified | PASS    |
|               | HCH      | 0.9567               | Not Specified | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.436                | Not Specified | PASS    |
|               | MCH      | 1.436                | Not Specified | PASS    |
|               | HCH      | 1.436                | Not Specified | PASS    |
| 8DPSK         | LCH      | 1.483                | Not Specified | PASS    |
|               | MCH      | 1.480                | Not Specified | PASS    |
|               | HCH      | 1.481                | Not Specified | PASS    |

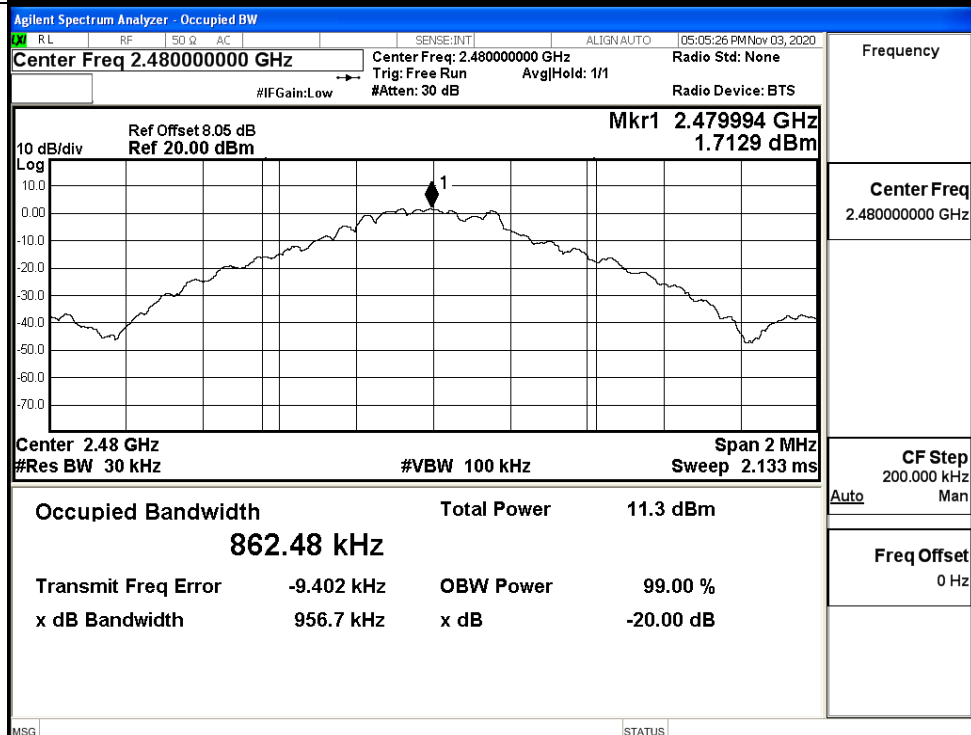
Test Graphs

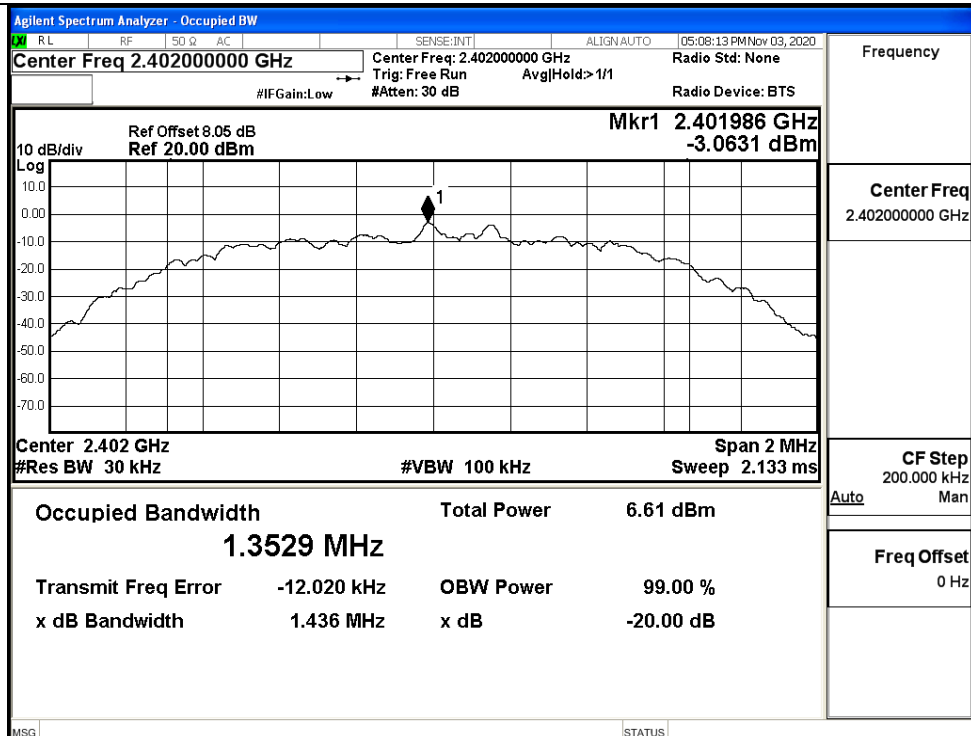


GFSK/MCH



GFSK/HCH

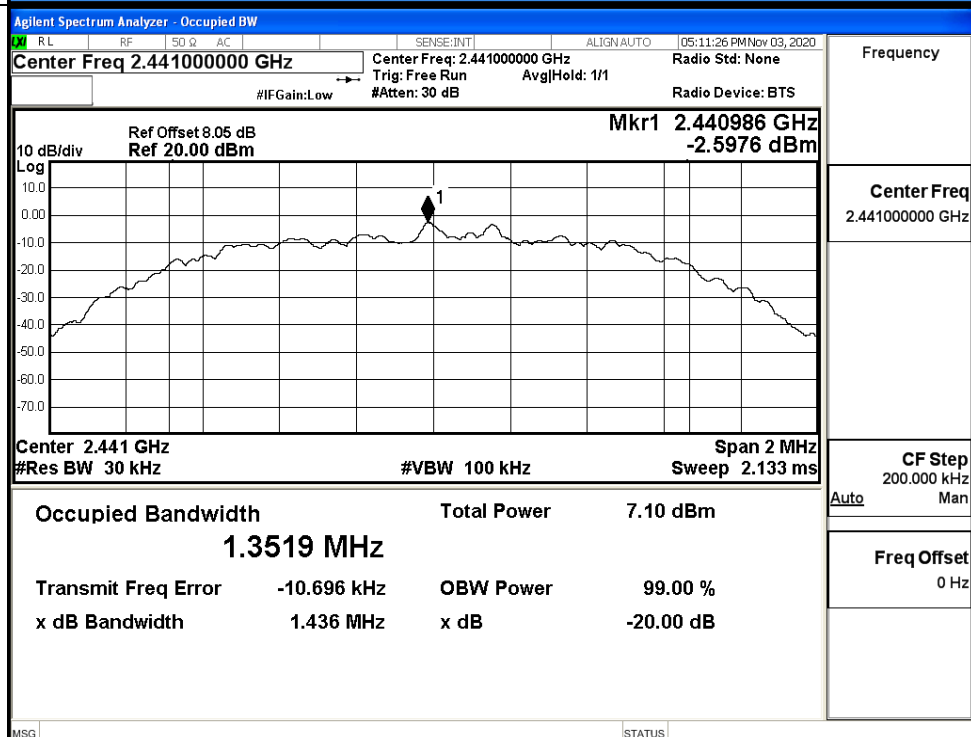


$\pi/4$ DQPSK/LCH

Frequency

Center Freq  
2.40200000 GHzCF Step  
200.000 kHz  
Man

Auto

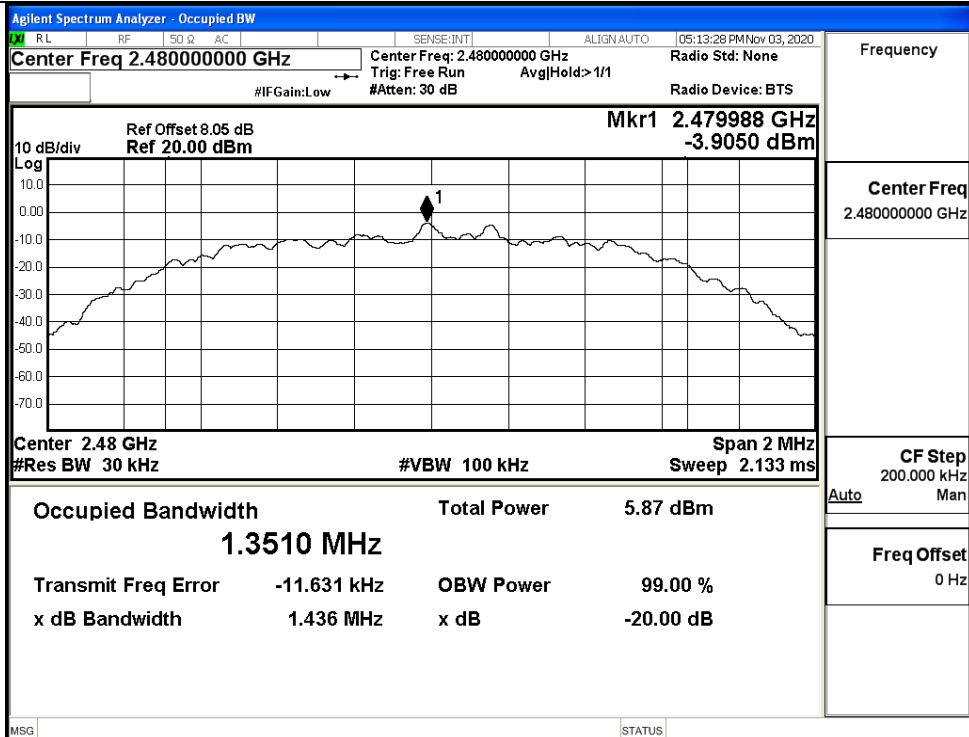
Freq Offset  
0 Hz $\pi/4$ DQPSK/MCH

Frequency

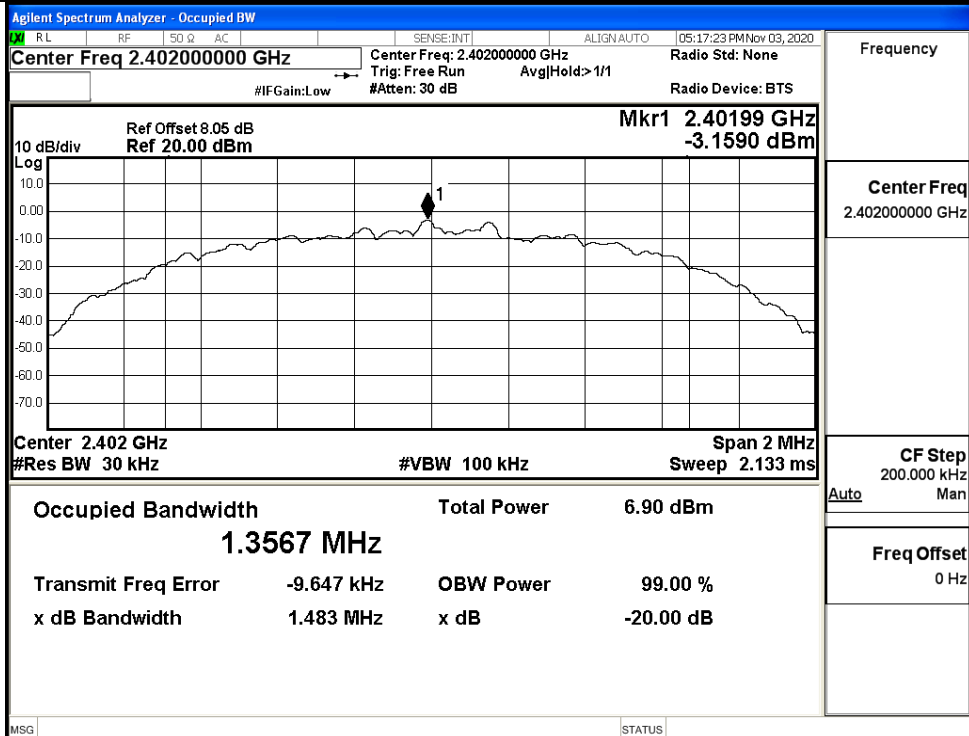
Center Freq  
2.44100000 GHzCF Step  
200.000 kHz  
Man

Auto

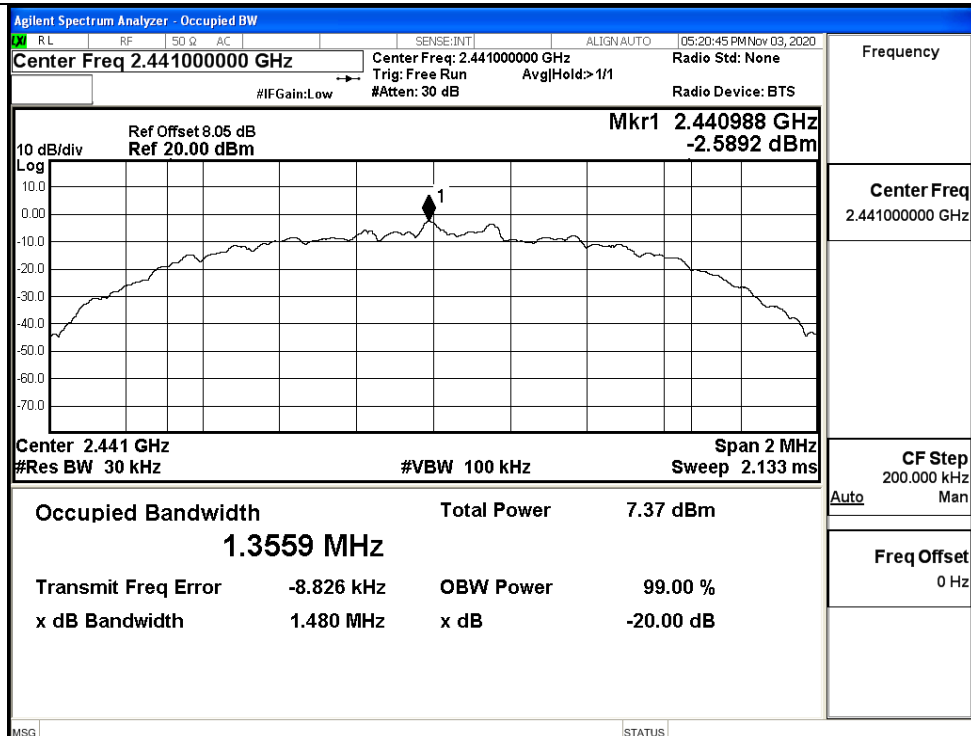
Freq Offset  
0 Hz

$\pi/4$ DQPSK/HCH

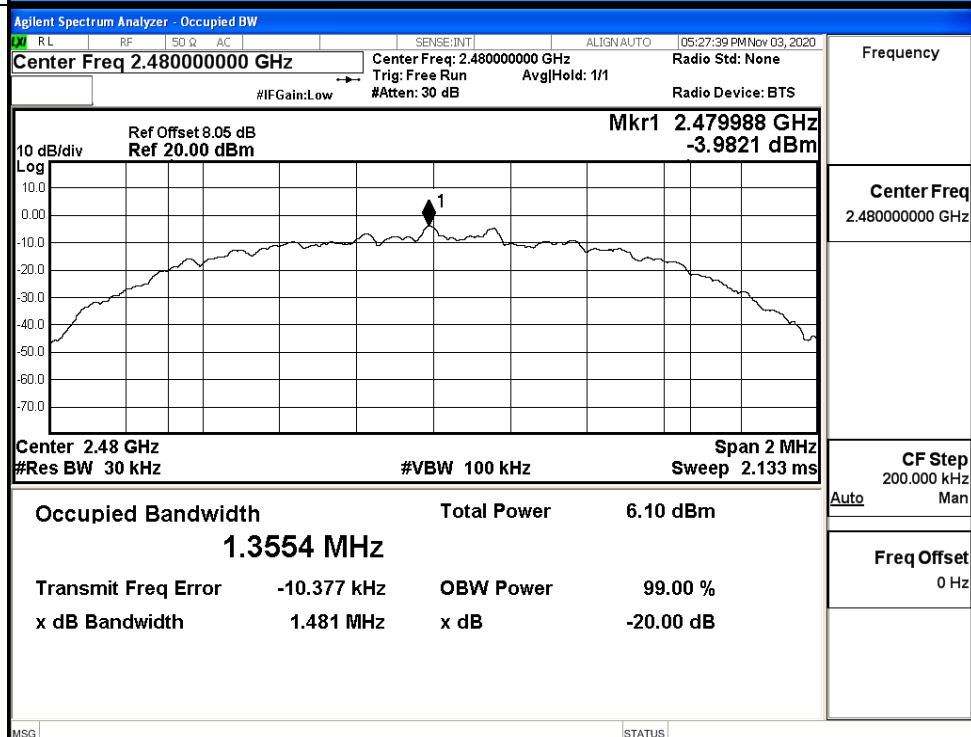
8DPSK/LCH



8DPSK/MCH



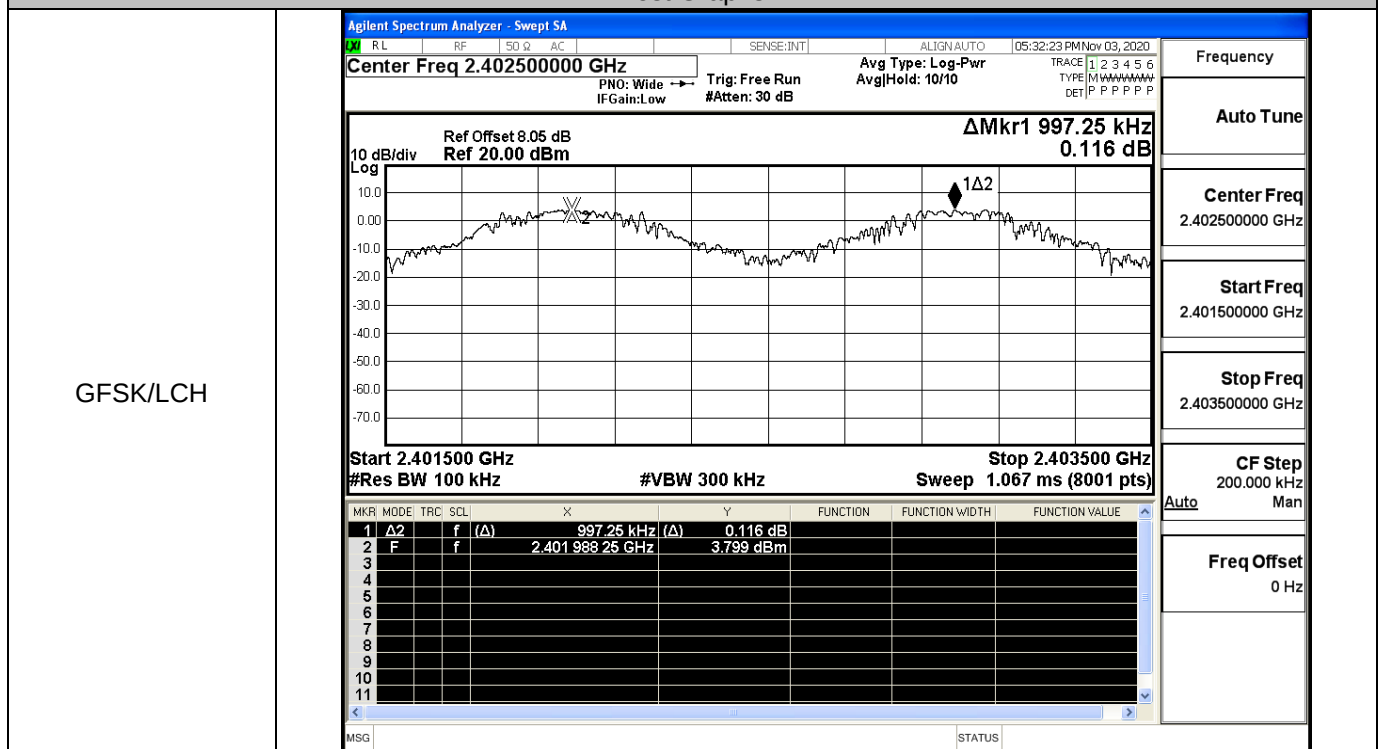
8DPSK/HCH



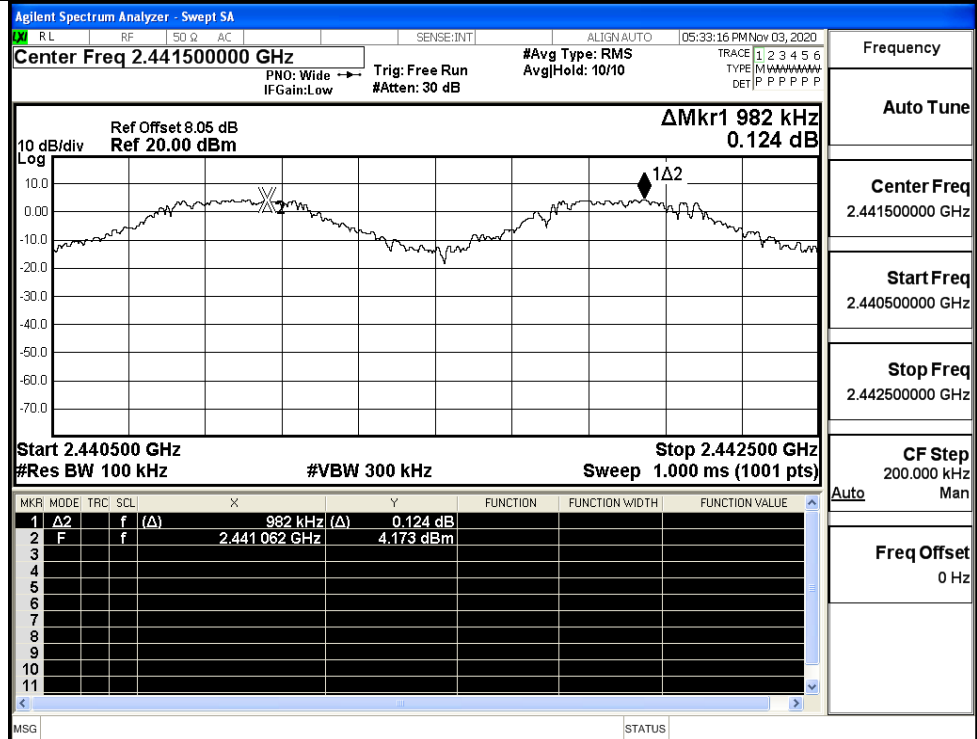
### A.3 Carrier Frequency Separation

| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK          | LCH      | 0.997                              | 0.634       | PASS    |
|               | MCH      | 0.982                              | 0.633       | PASS    |
|               | HCH      | 1.102                              | 0.638       | PASS    |
| $\pi/4$ DQPSK | LCH      | 0.984                              | 0.957       | PASS    |
|               | MCH      | 1.224                              | 0.957       | PASS    |
|               | HCH      | 1.098                              | 0.957       | PASS    |
| 8DPSK         | LCH      | 1.170                              | 0.989       | PASS    |
|               | MCH      | 1.124                              | 0.987       | PASS    |
|               | HCH      | 1.024                              | 0.987       | PASS    |

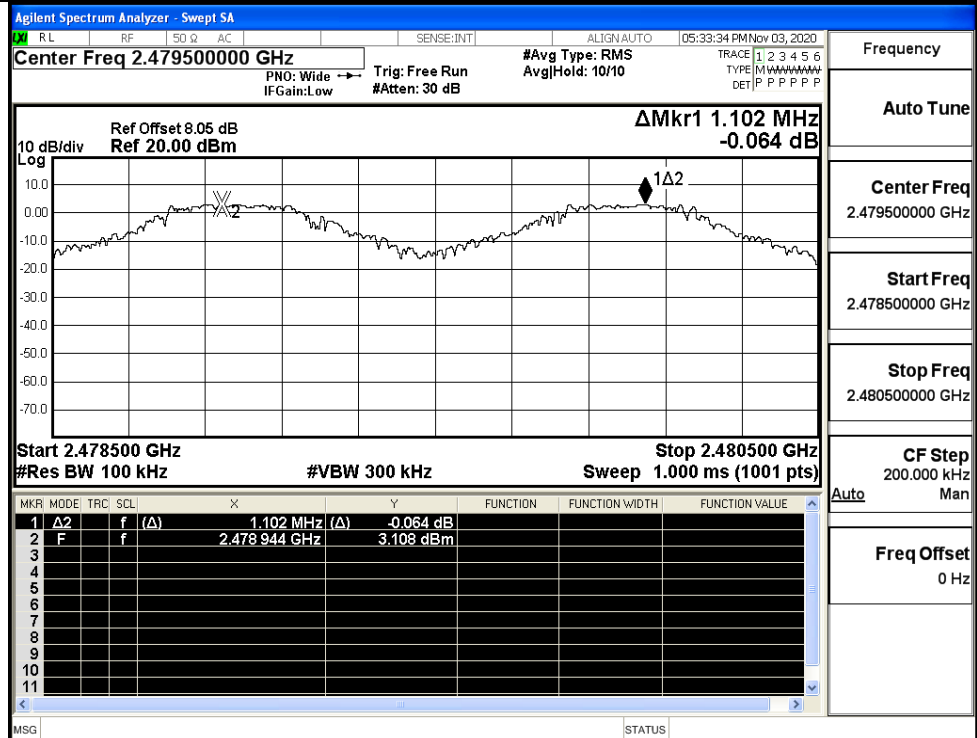
#### Test Graphs

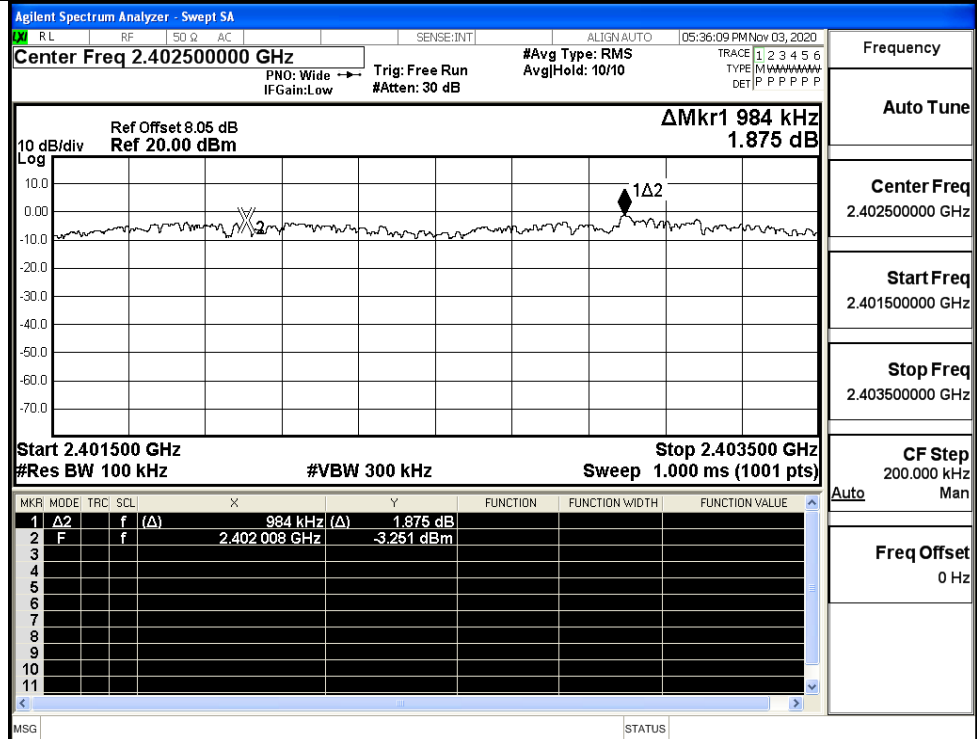
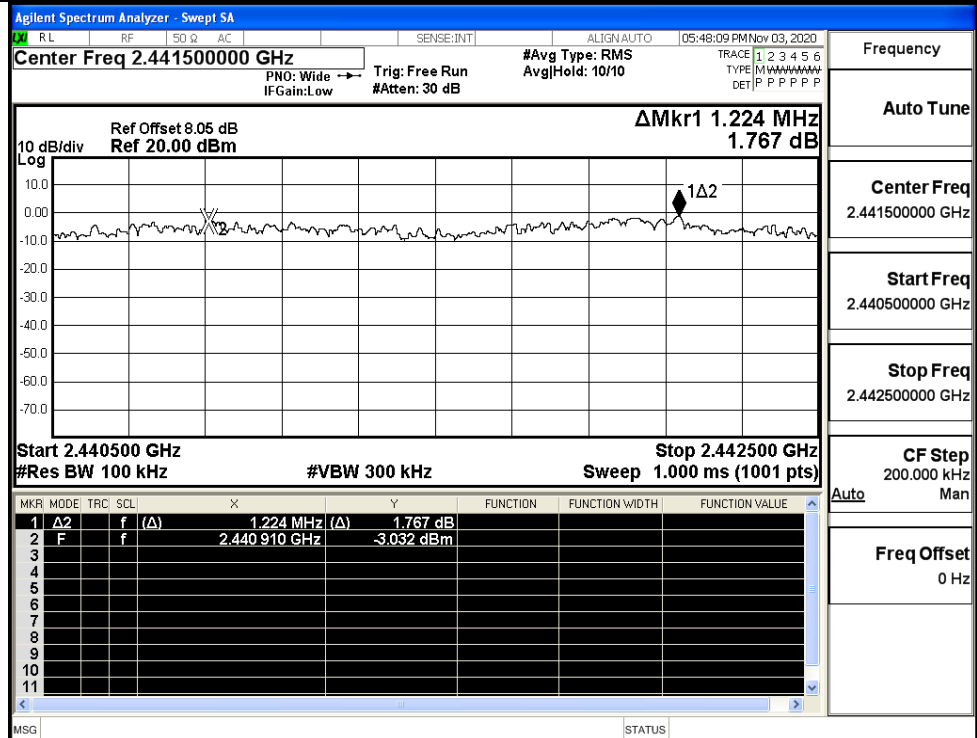


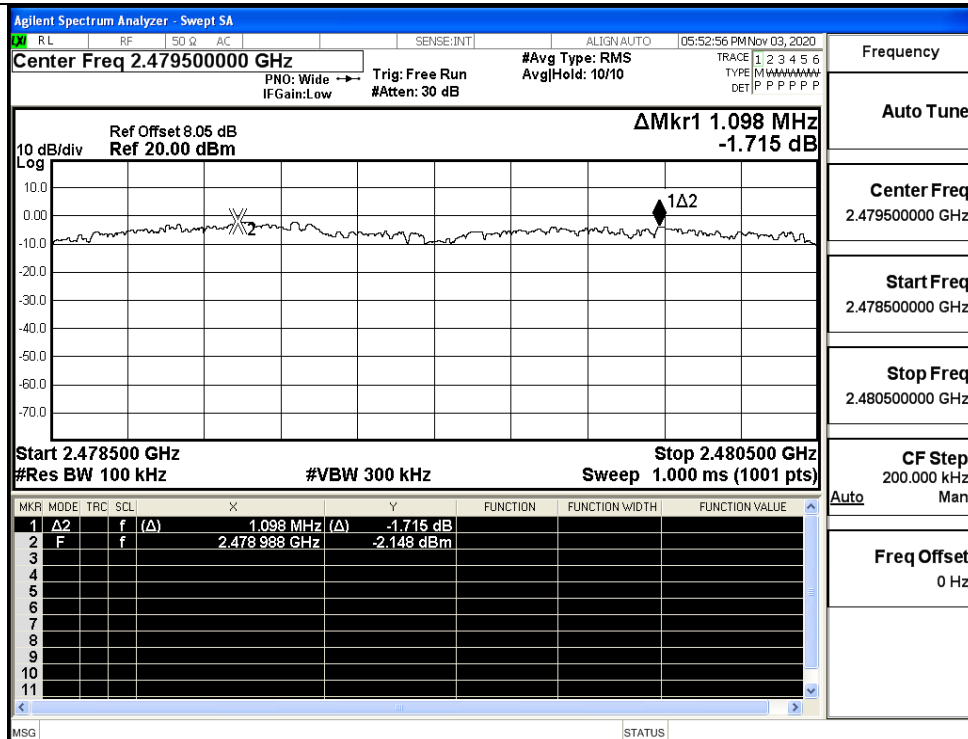
GFSK/MCH



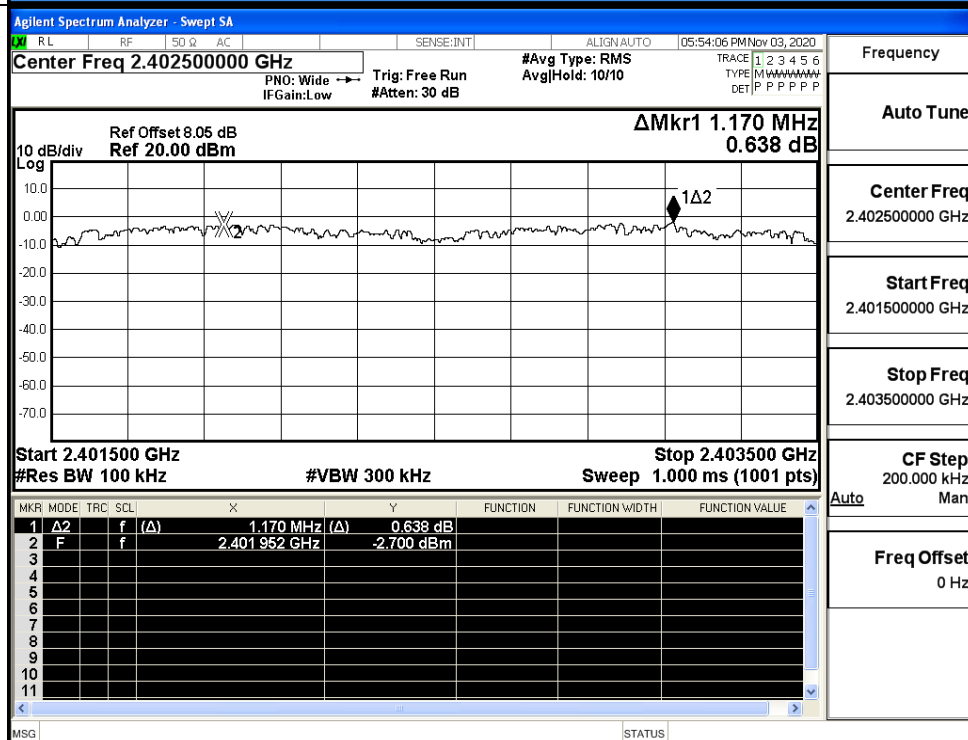
GFSK/HCH



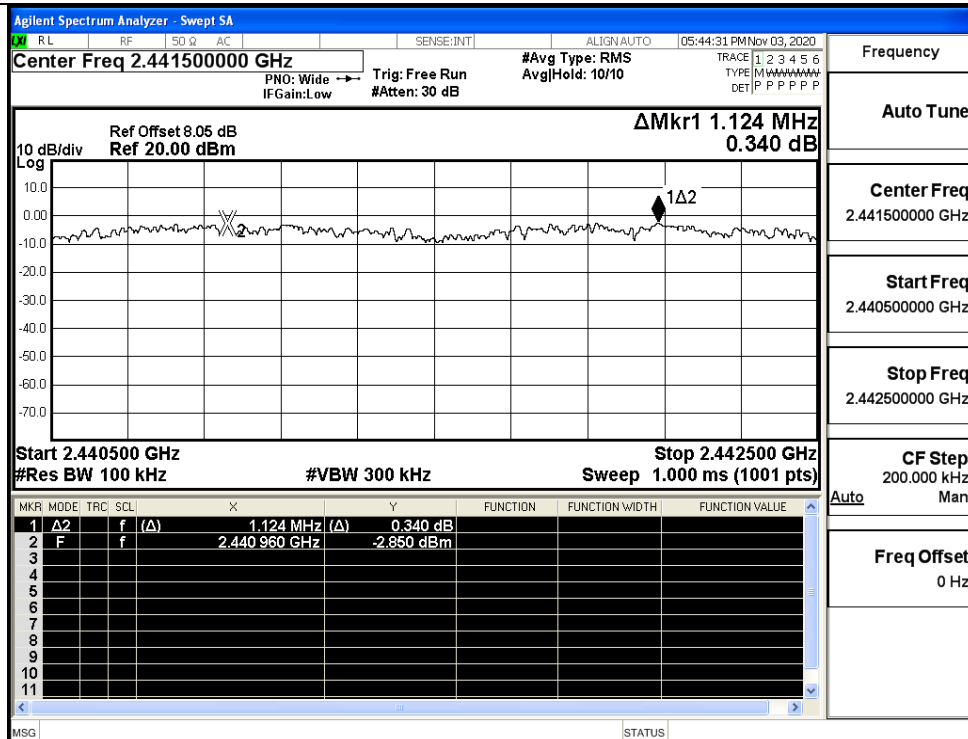
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

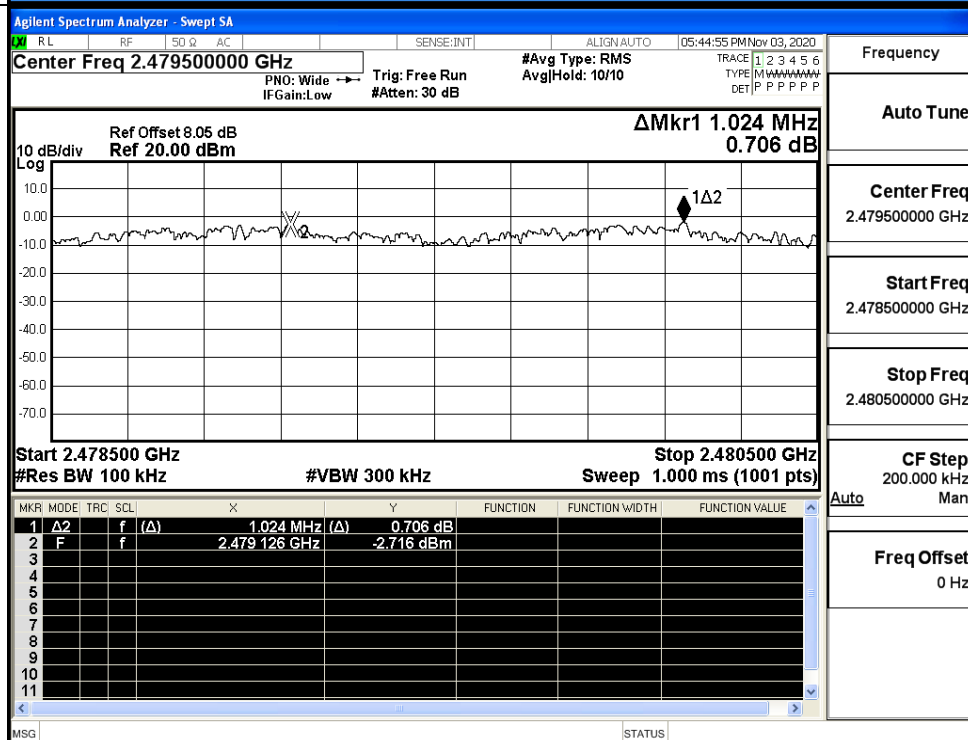
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

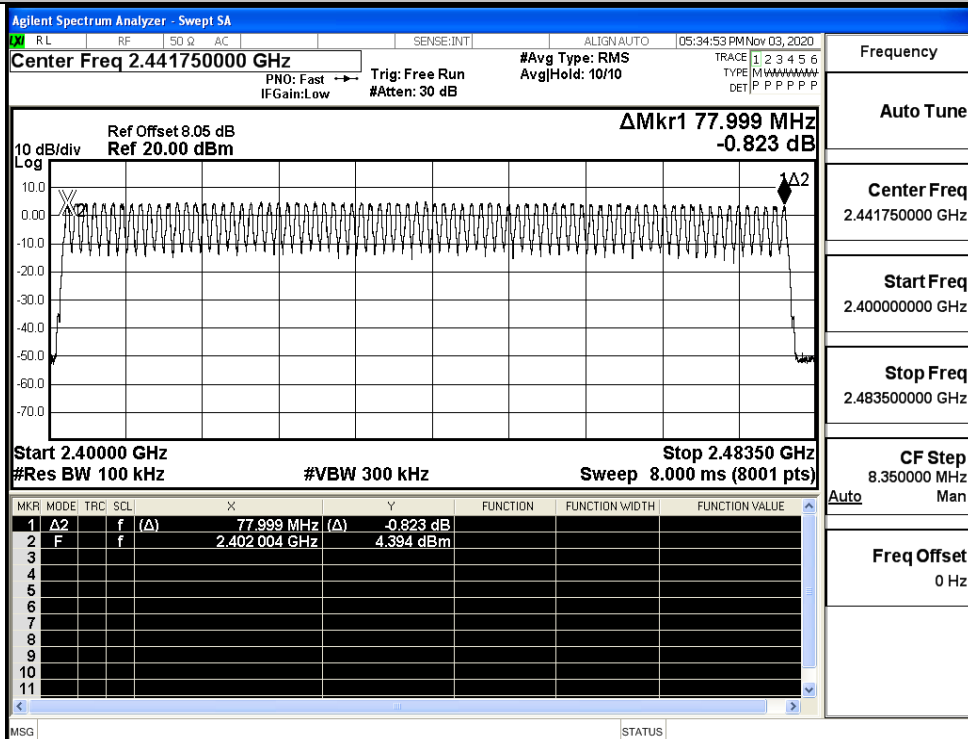


## A.4 Hopping Channel Number

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

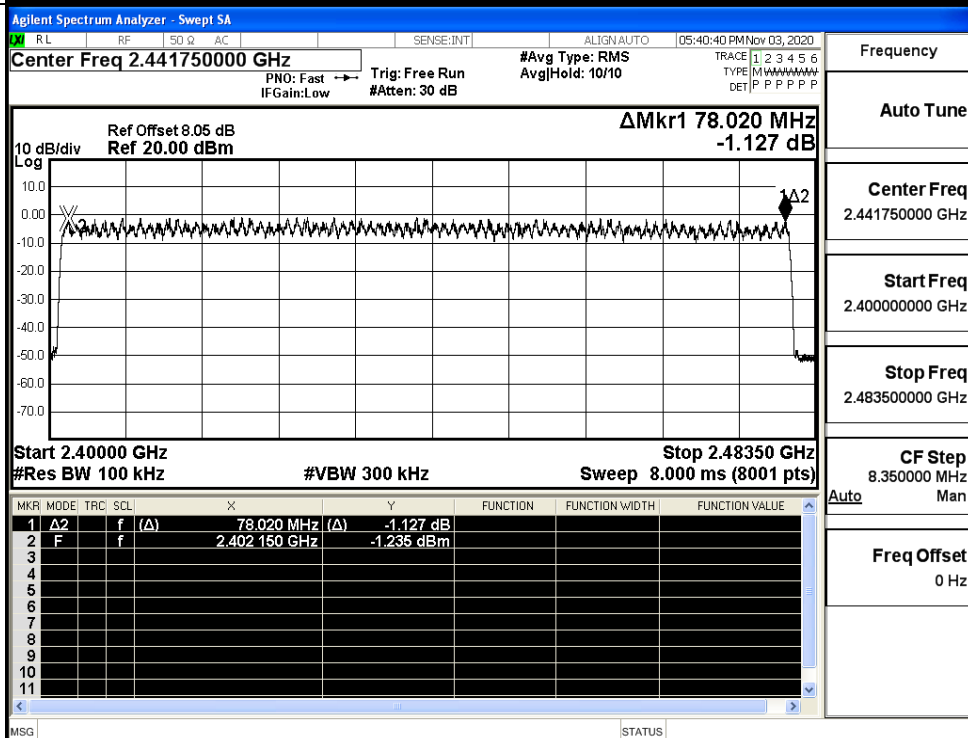
## Test Graphs

GFSK/Hop



Frequency

Auto Tune

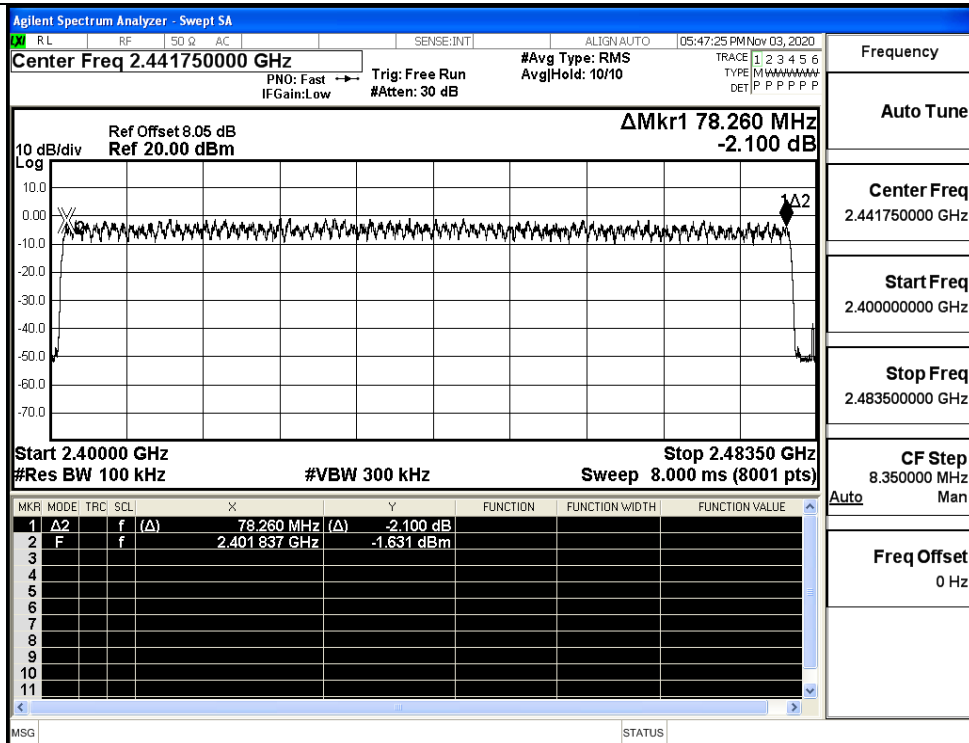
Center Freq  
2.441750000 GHzStart Freq  
2.400000000 GHzStop Freq  
2.483500000 GHzCF Step  
8.350000 MHz  
ManFreq Offset  
0 Hz $\pi/4$ DQPSK/Hop

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

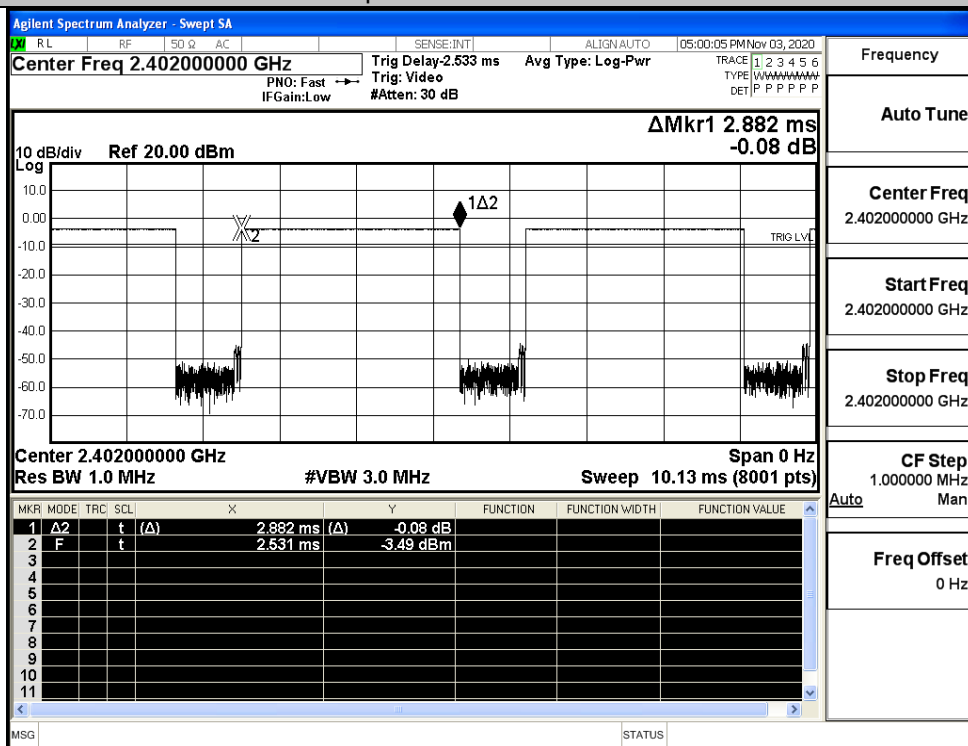


## A.5 Dwell Time

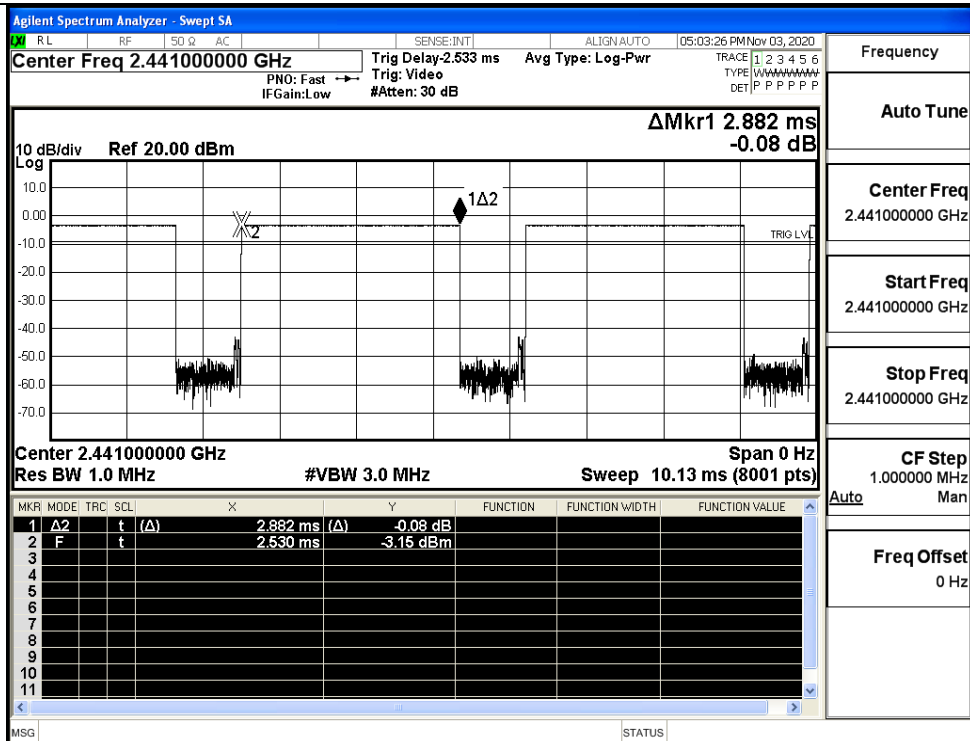
| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|---------------|-----------|---------|
| GFSK          | DH5    | LCH     | 2.88                       | 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                 | 0.015         | 0.4       | PASS    |
|               | 2DH5   | MCH     | 2.88                       | 106.7                 | 0.015         | 0.4       | PASS    |
|               | 2DH5   | HCH     | 2.88                       | 106.7                 | 0.015         | 0.4       | PASS    |
| 8DPSK         | 3DH5   | LCH     | 2.88                       | 106.7                 | 0.015         | 0.4       | PASS    |
|               | 3DH5   | MCH     | 2.88                       | 106.7                 | 0.015         | 0.4       | PASS    |
|               | 3DH5   | HCH     | 2.88                       | 106.7                 | 0.015         | 0.4       | PASS    |

Test Graphs

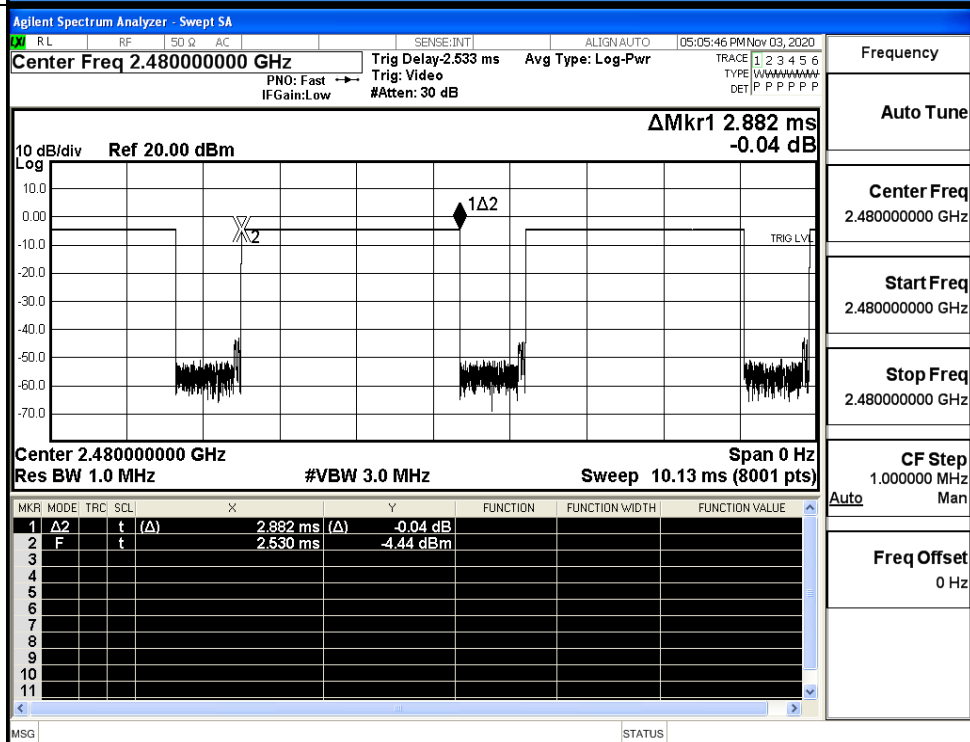
GFSK\_DH5/LCH



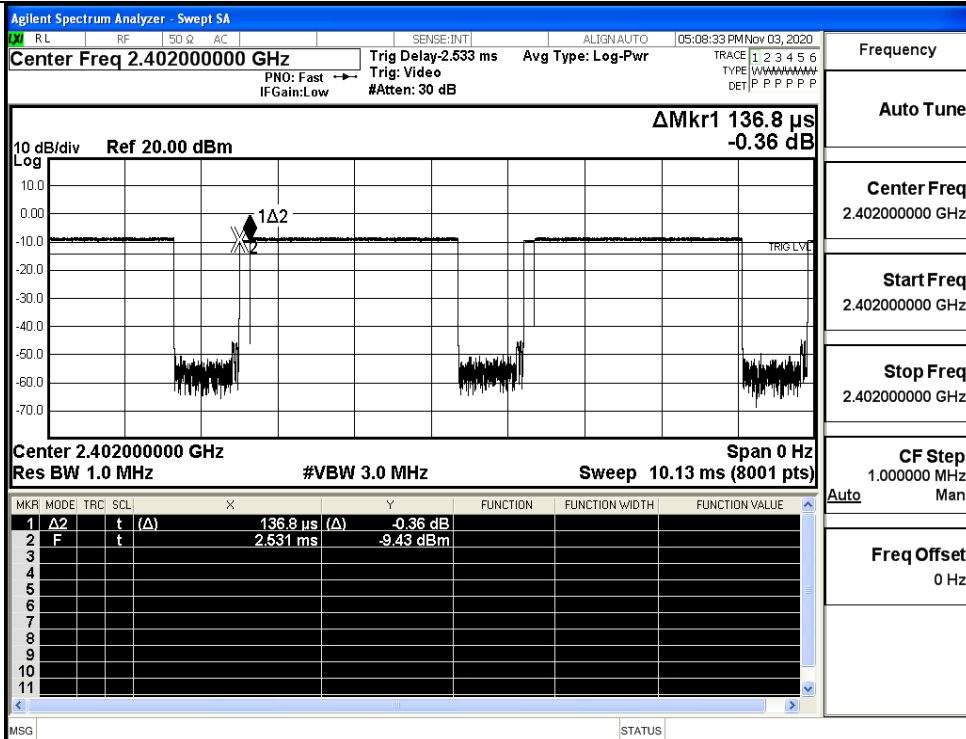
GFSK\_DH5/MCH



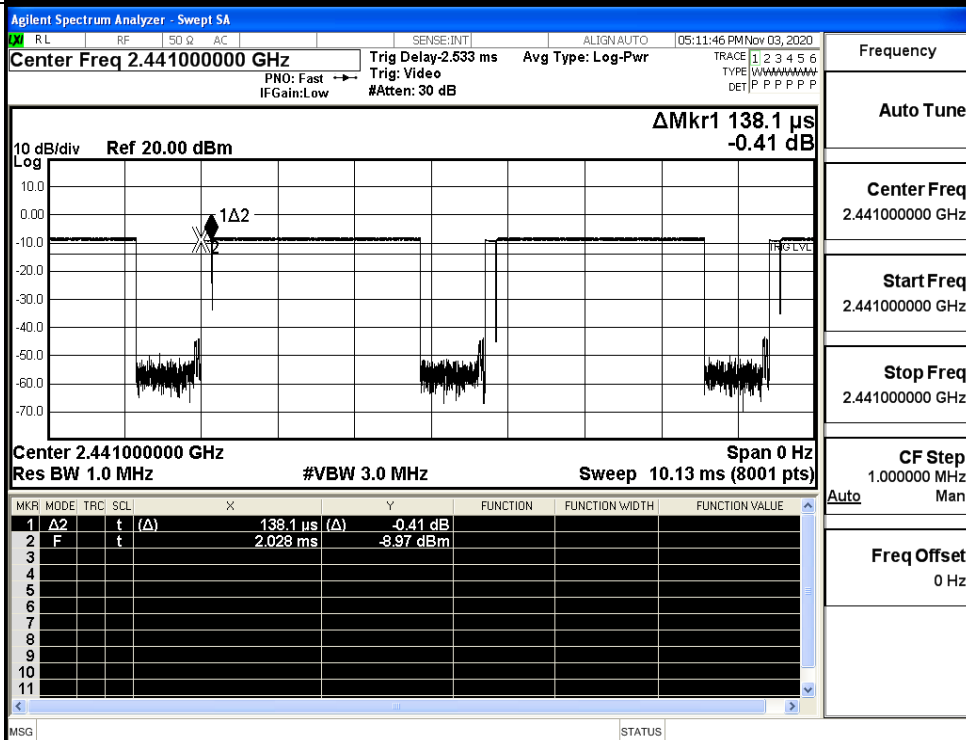
GFSK\_DH5/HCH



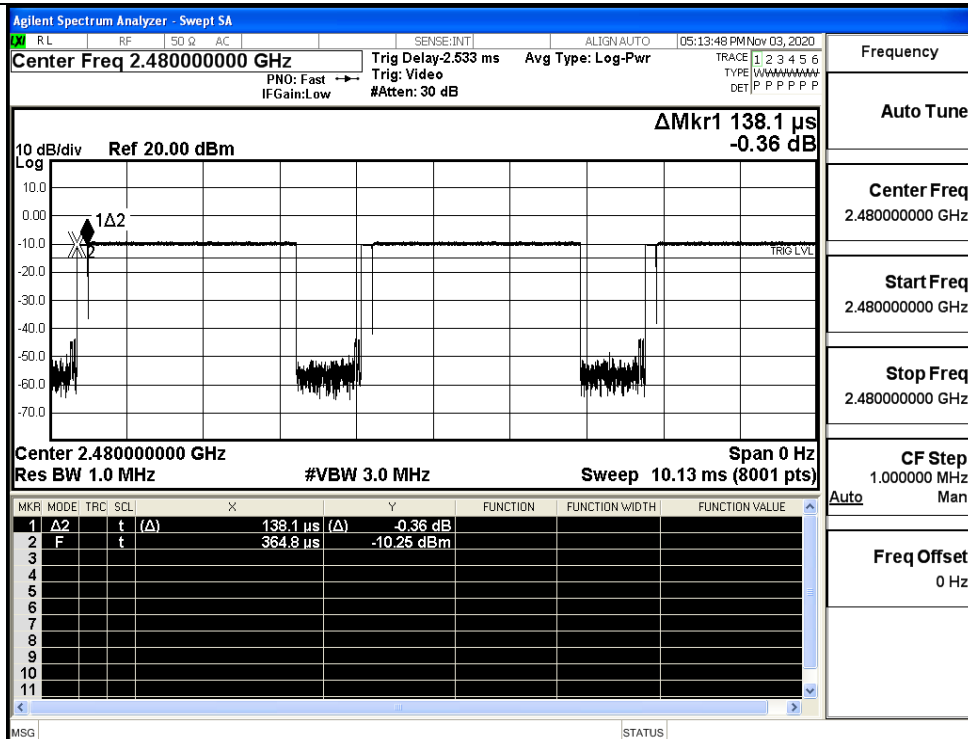
$\pi/4$ DQPSK  
\_2DH5/LCH



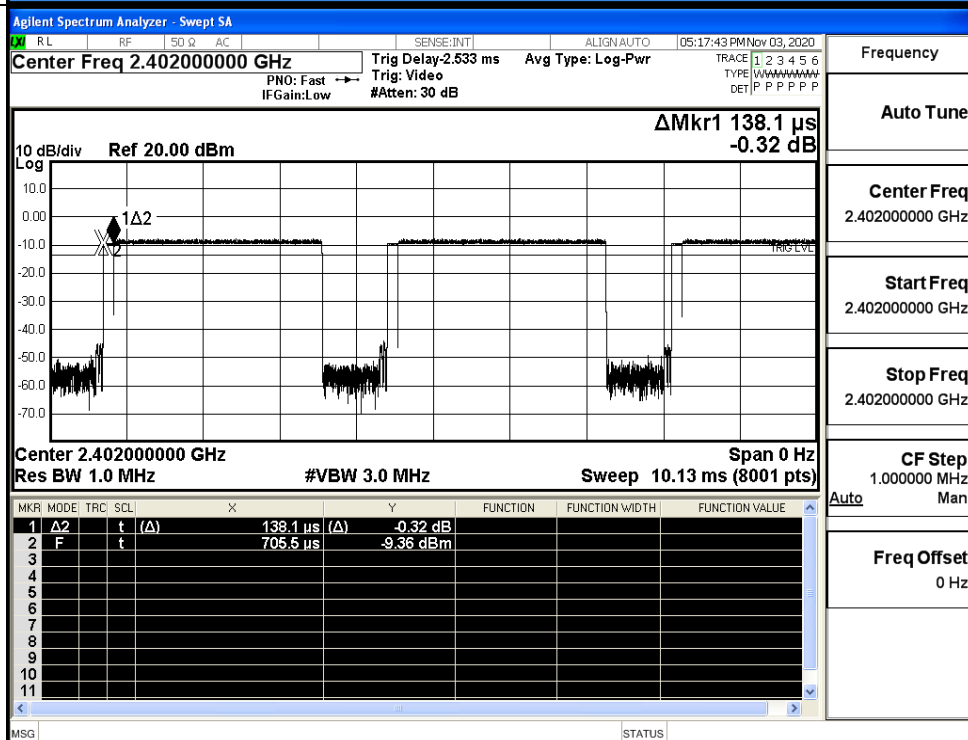
$\pi/4$ DQPSK  
\_2DH5/MCH



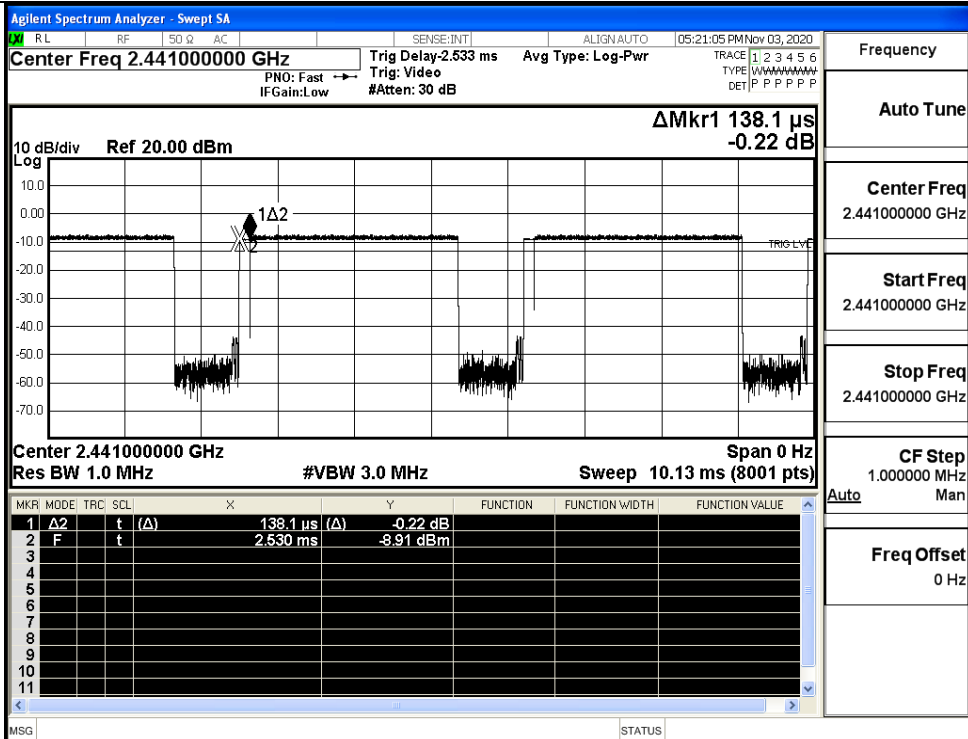
$\pi/4$ DQPSK  
\_2DH5/HCH



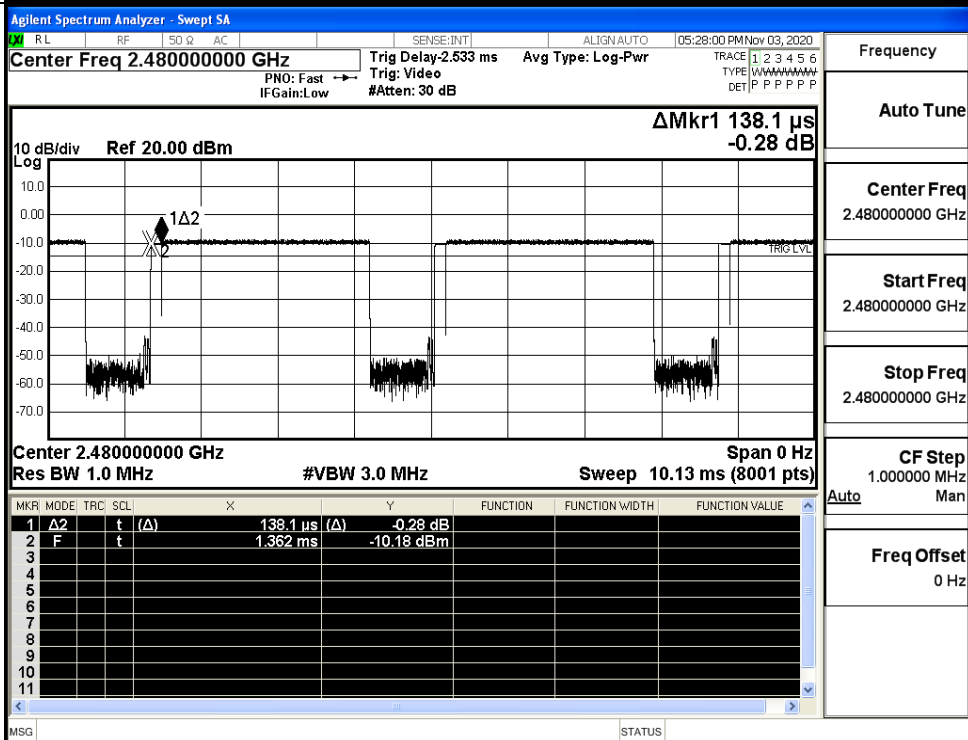
8DPSK \_3DH5/LCH



8DPSK\_3DH5/MCH



8DPSK\_3DH5/HCH

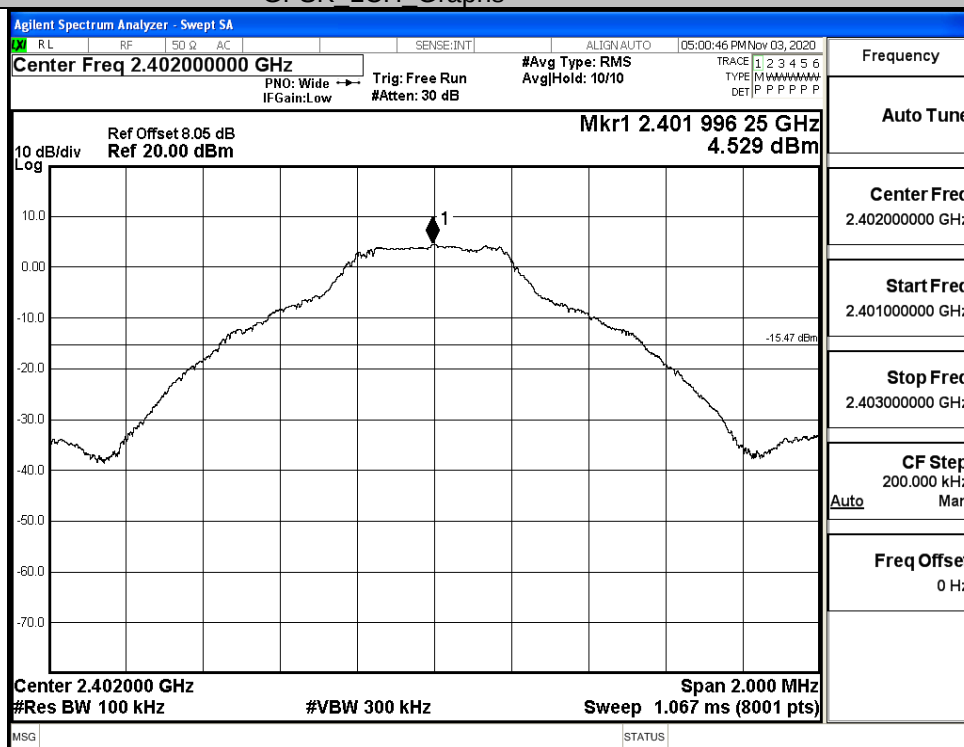


## A.6 RF Conducted Spurious Emissions

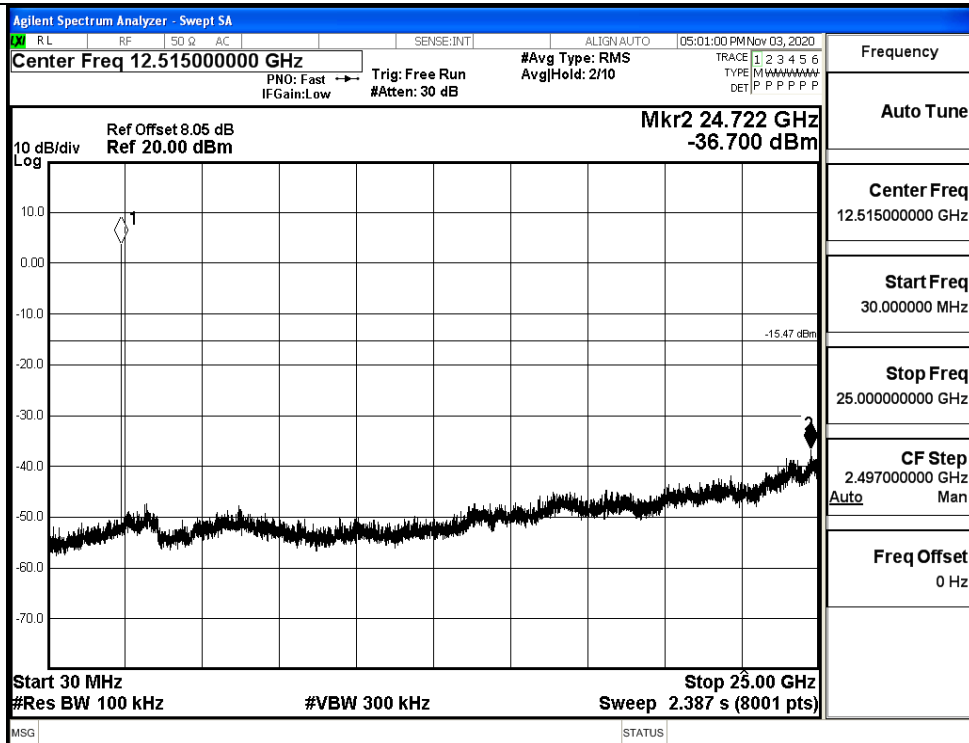
| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | 4.529      | -36.700          | -15.471     | PASS    |
|               | MCH     | -0.509     | -38.289          | -20.509     | PASS    |
|               | HCH     | 3.566      | -38.100          | -16.434     | PASS    |
| $\pi/4$ DQPSK | LCH     | -1.441     | -37.997          | -21.441     | PASS    |
|               | MCH     | -1.094     | -37.308          | -21.094     | PASS    |
|               | HCH     | -2.195     | -37.978          | -22.195     | PASS    |
| 8DPSK         | LCH     | -1.375     | -36.318          | -21.375     | PASS    |
|               | MCH     | -0.915     | -37.883          | -20.915     | PASS    |
|               | HCH     | -2.424     | -37.909          | -22.424     | PASS    |

GFSK LCH Graphs

Pref

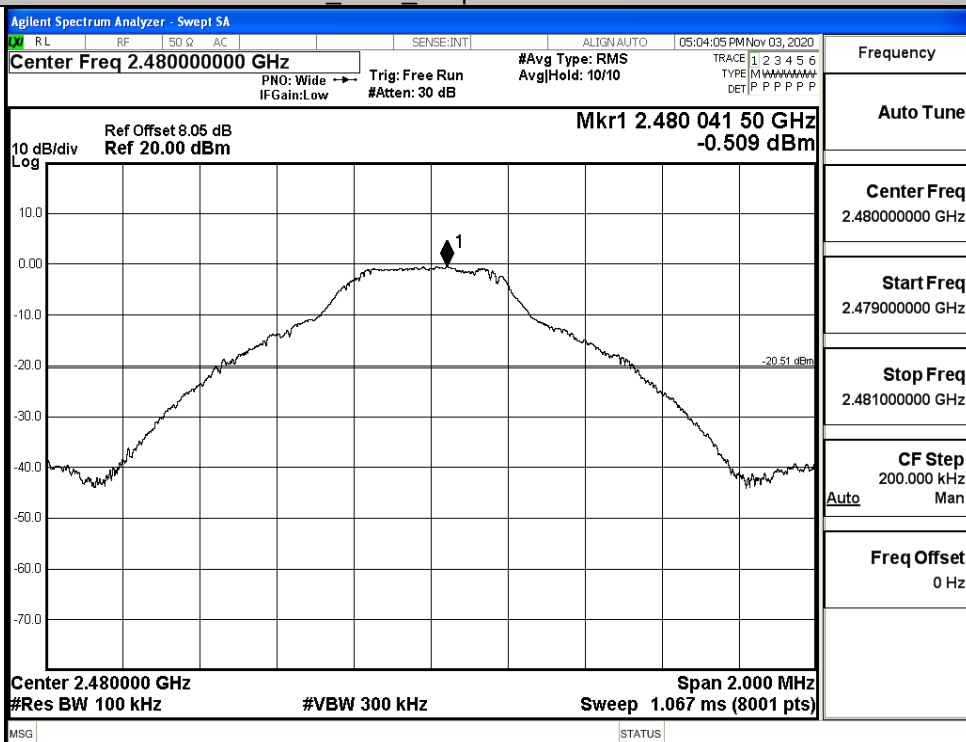


Puw

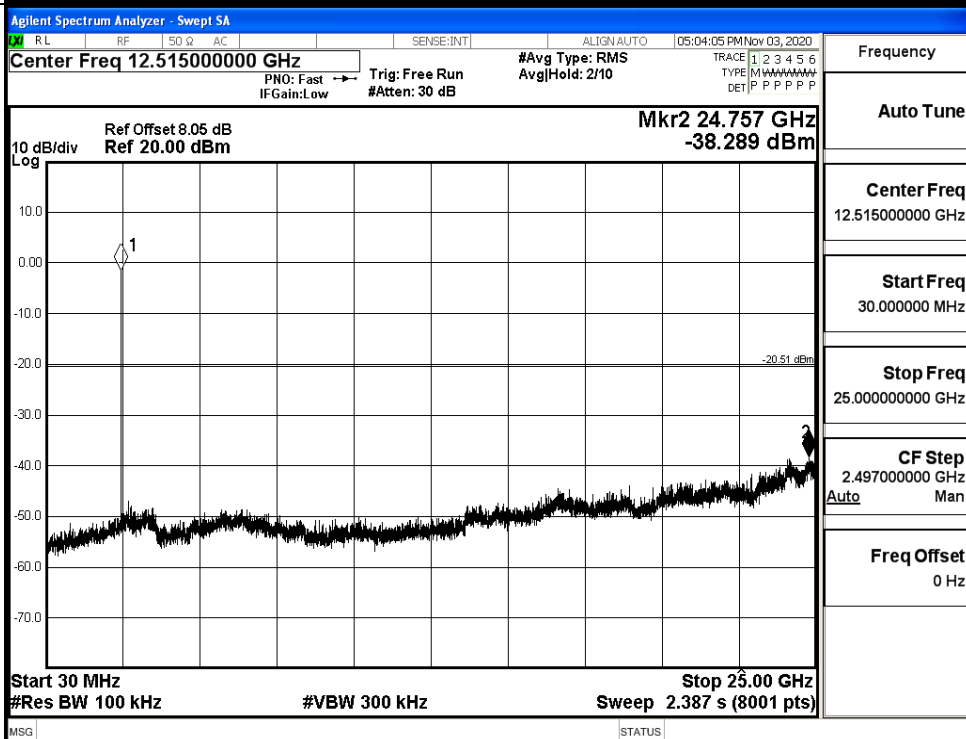


## GFSK\_MCH\_Graphs

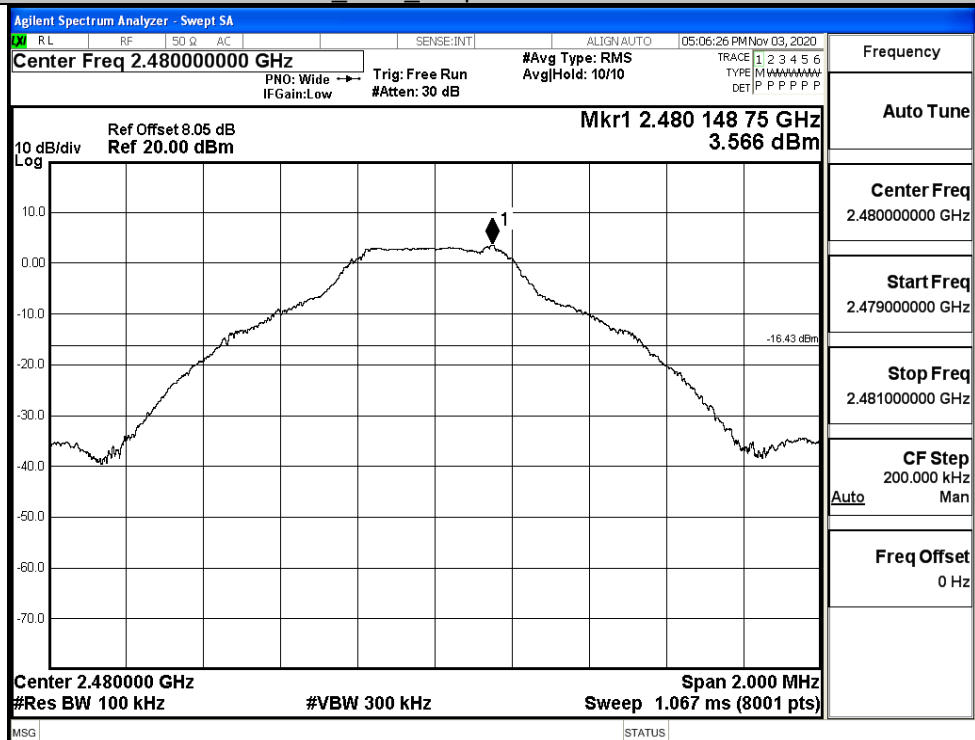
Pref



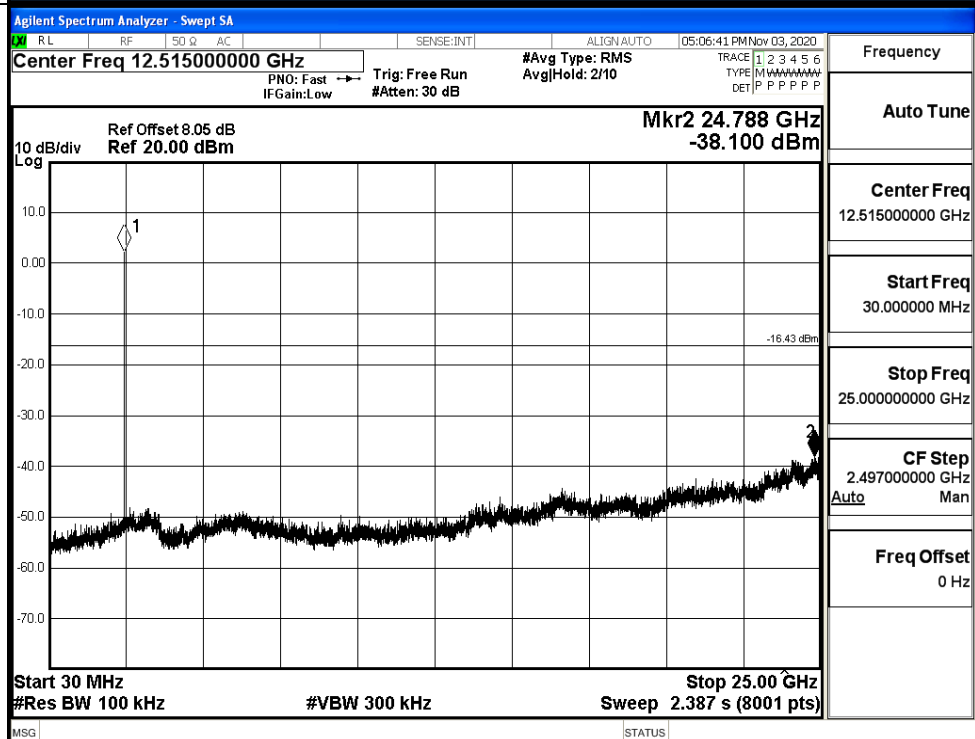
Puw



Pref

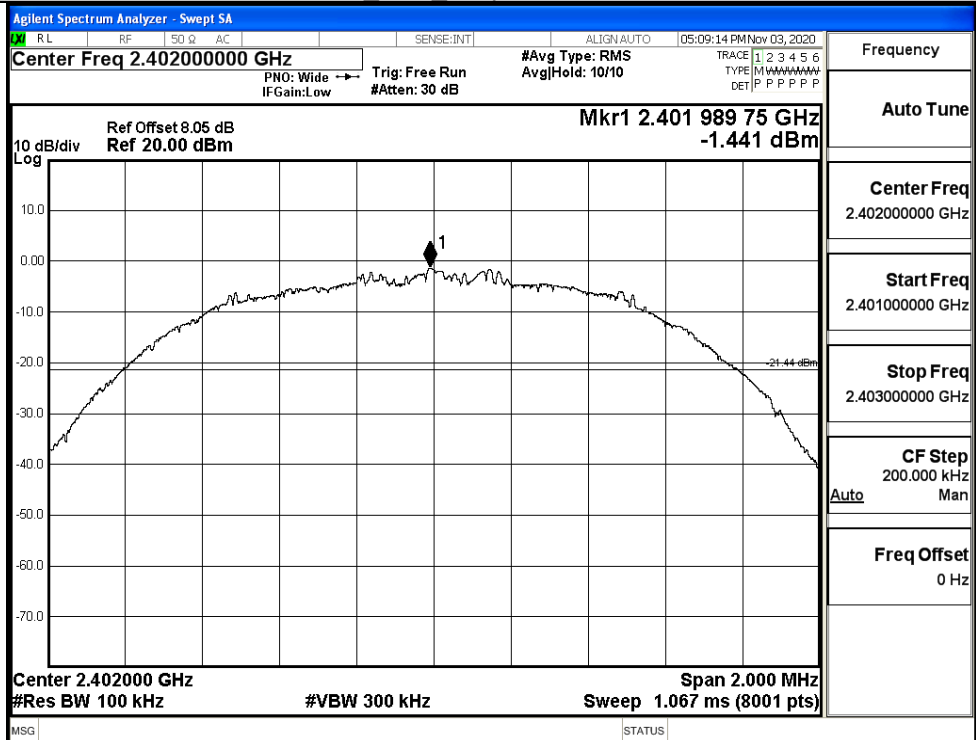


Puw

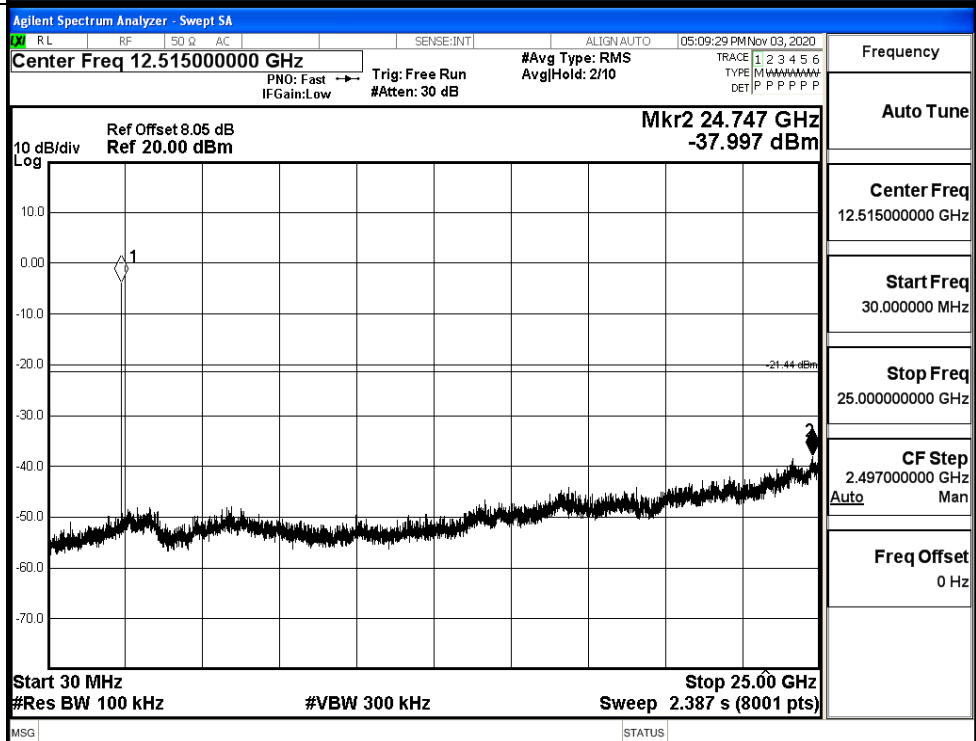


$\pi$ /4DQPSK\_LCH\_Graphs

Pref

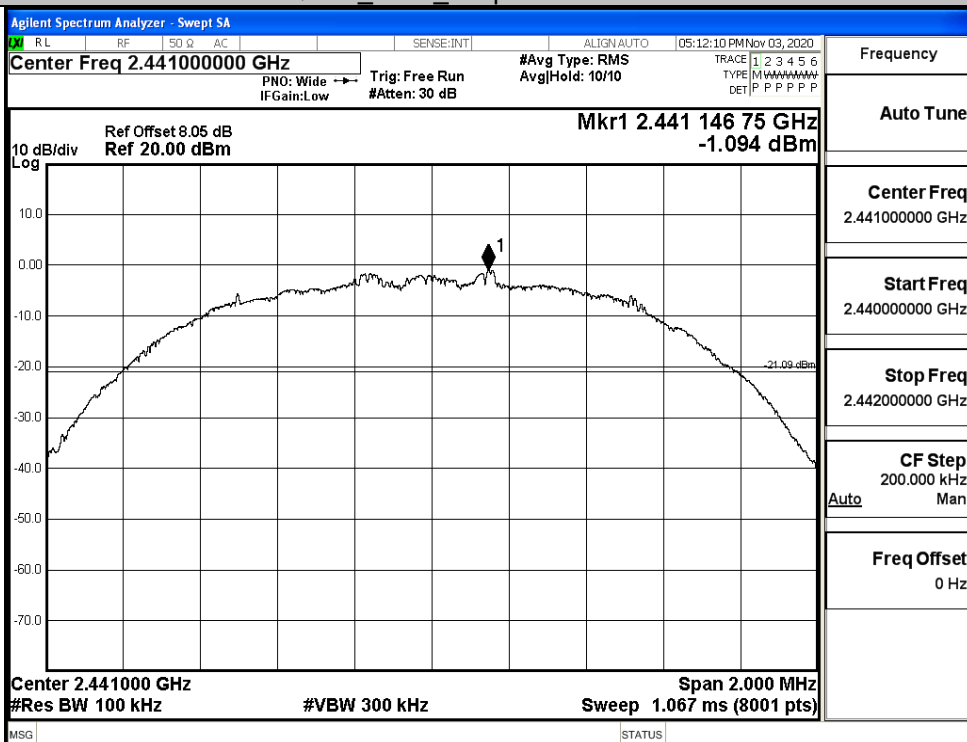


Puw

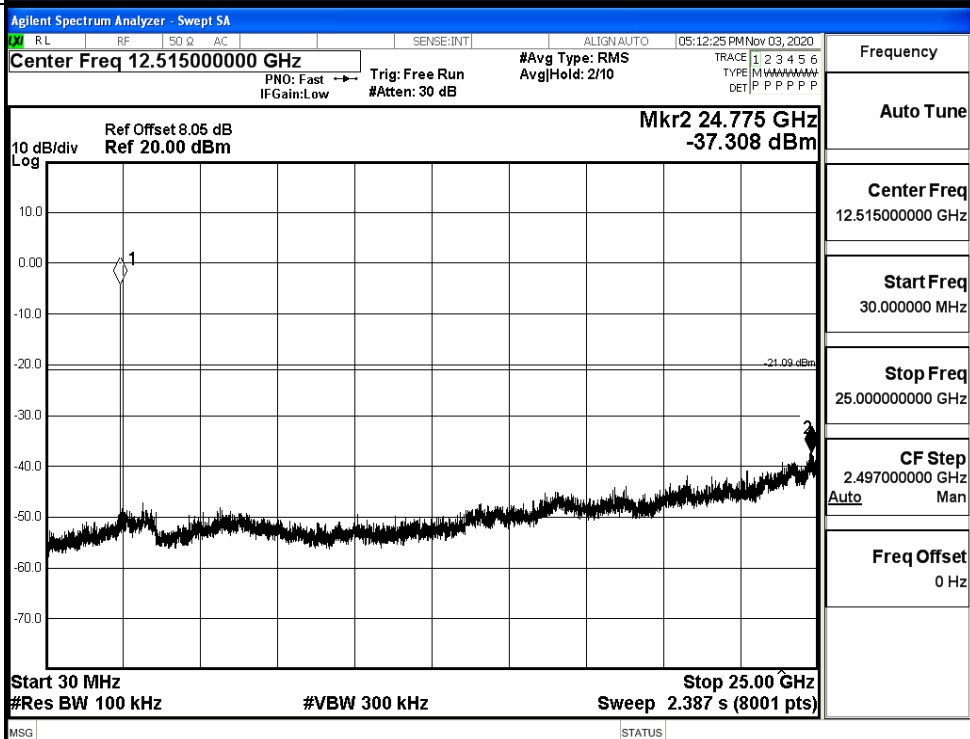


$\pi/4$ DQPSK\_MCH\_Graphs

Pref

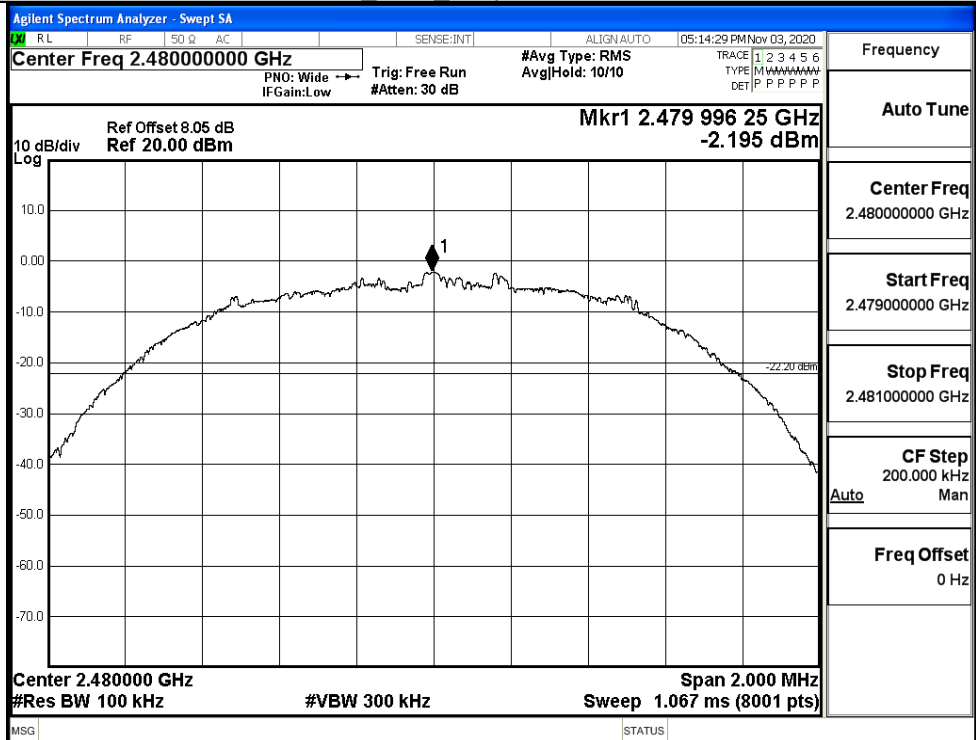


Puw

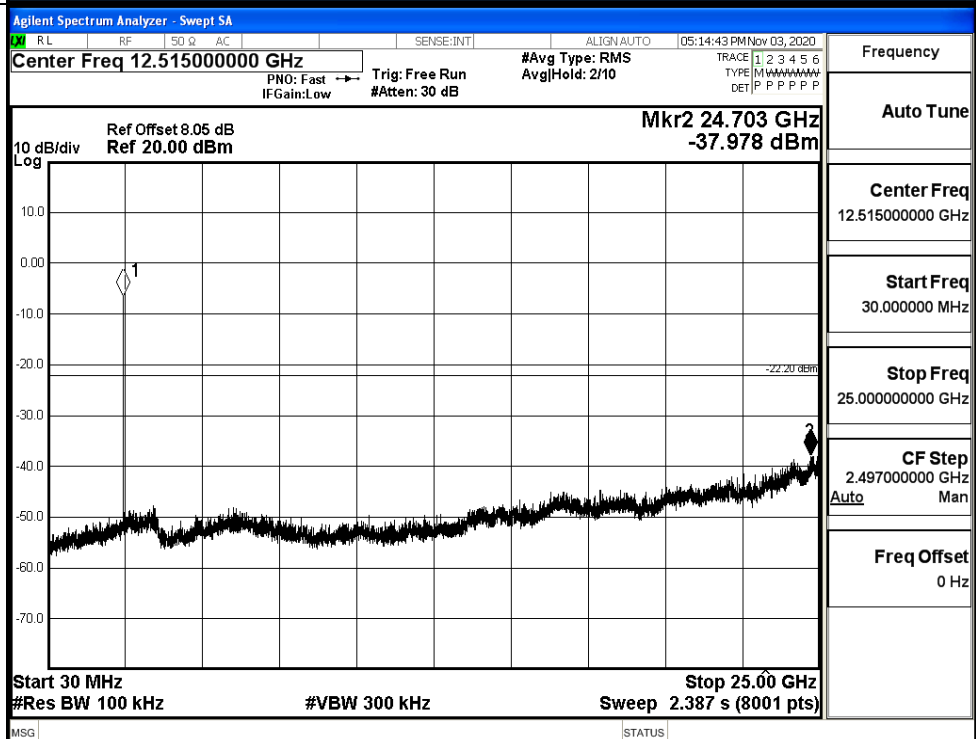


$\pi$ /4DQPSK\_HCH\_Graphs

Pref

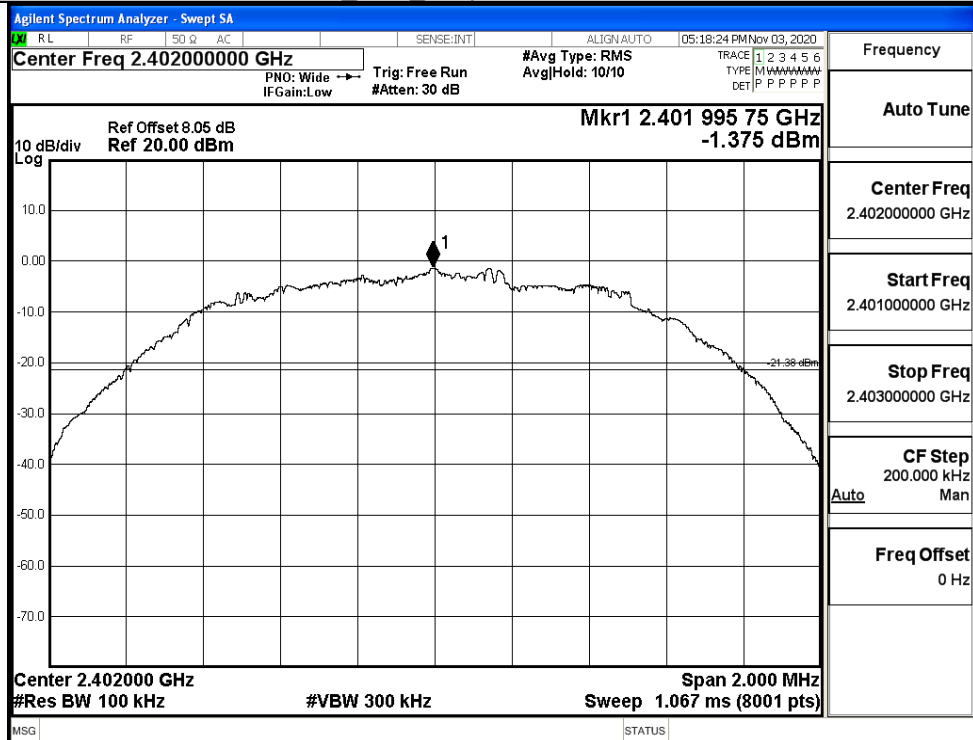


Puw

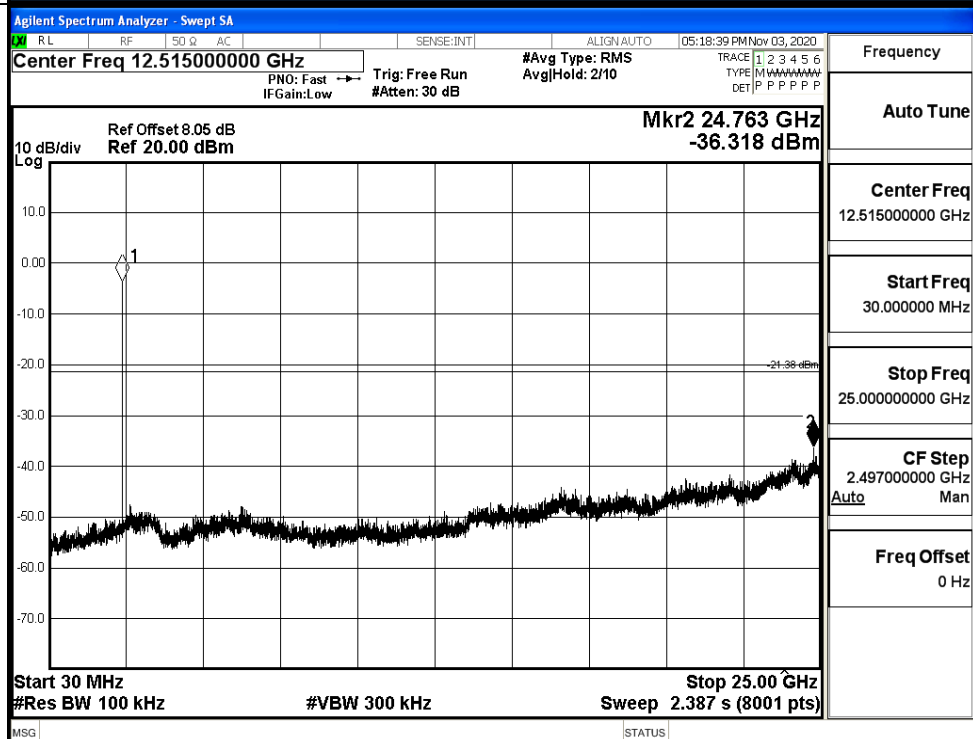


## 8DPSK\_LCH\_Graphs

Pref

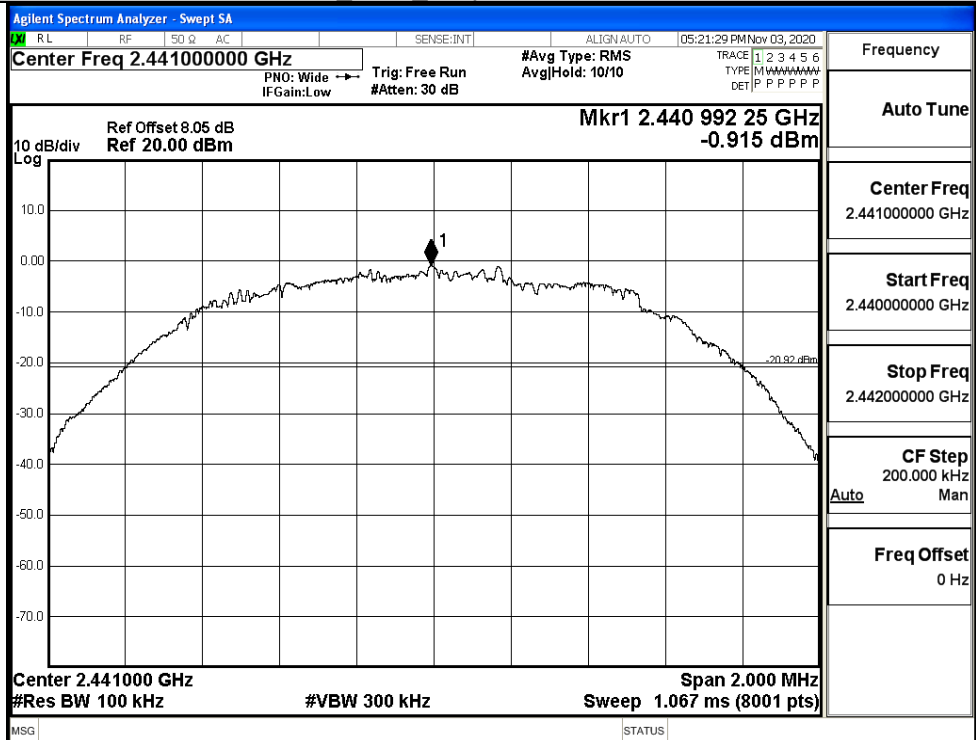


Puw

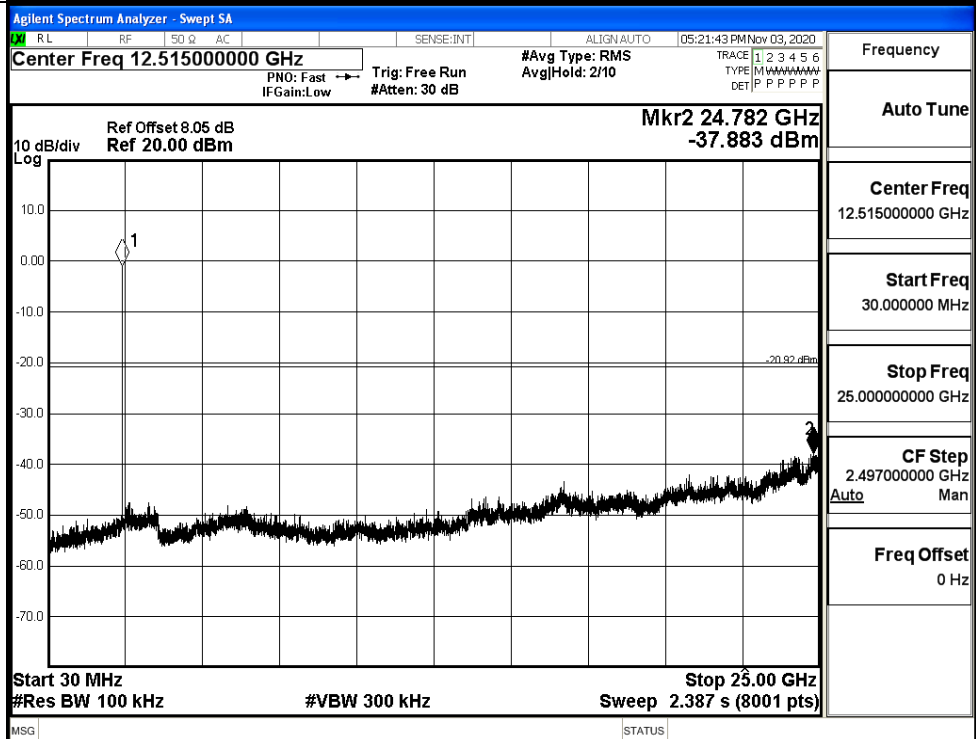


## 8DPSK\_MCH\_Graphs

Pref

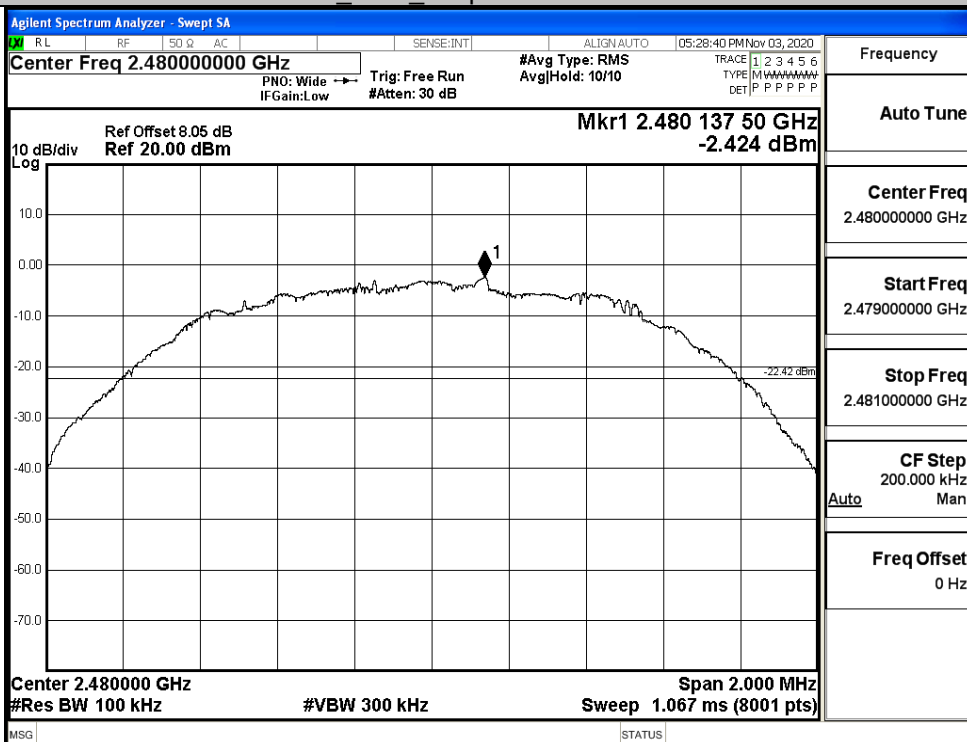


Puw

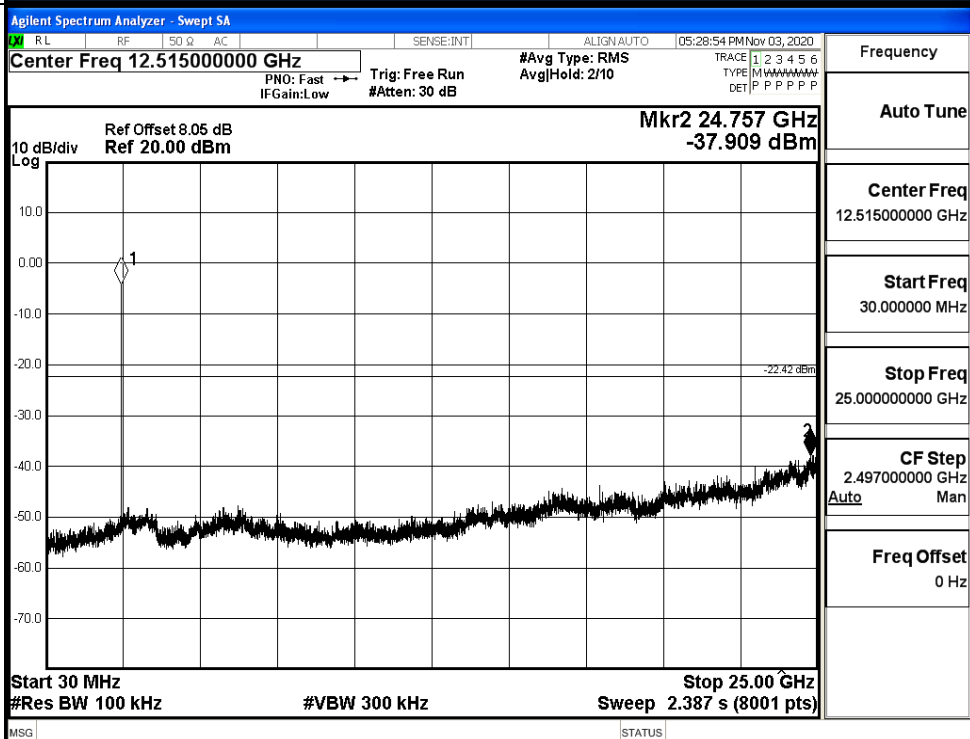


## 8DPSK\_HCH\_Graphs

Pref



Puw

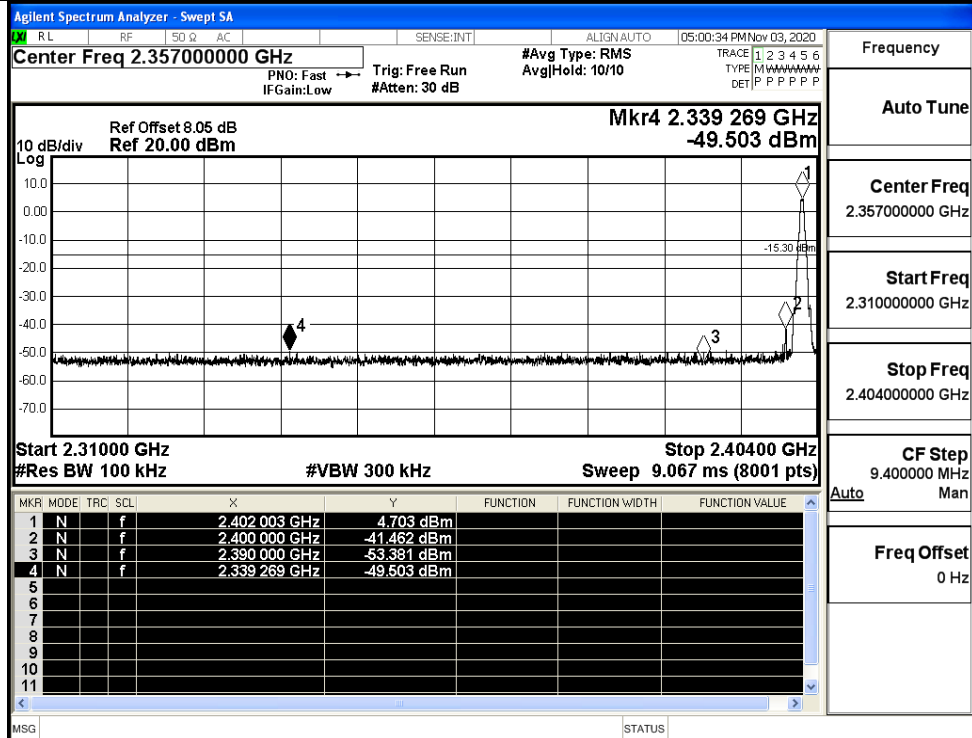


## A.7 Band-edge for RF Conducted Emissions

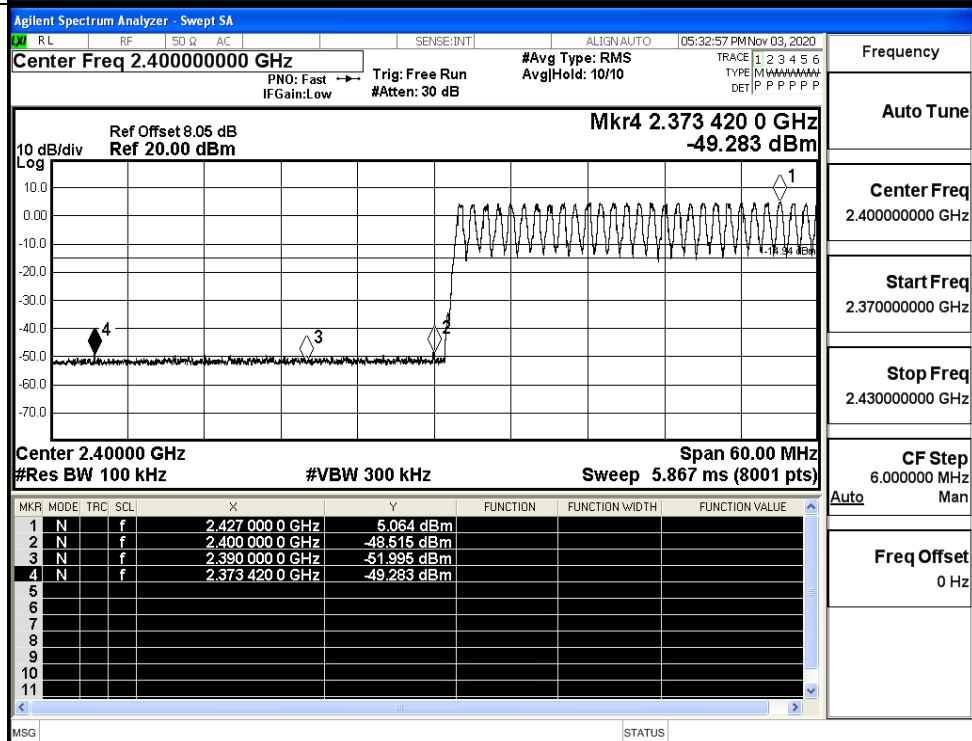
| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | 4.703               | Off               | -49.503                  | -15.3       | PASS    |
|               |         |                         | 5.064               | On                | -49.283                  | -14.94      | PASS    |
|               | HCH     | 2480                    | 3.665               | Off               | -47.655                  | -16.34      | PASS    |
|               |         |                         | 4.512               | On                | -47.038                  | -15.49      | PASS    |
| $\pi/4$ DQPSK | LCH     | 2402                    | -1.614              | Off               | -49.512                  | -21.61      | PASS    |
|               |         |                         | -0.756              | On                | -48.689                  | -20.76      | PASS    |
|               | HCH     | 2480                    | -2.709              | Off               | -37.787                  | -22.71      | PASS    |
|               |         |                         | -1.285              | On                | -48.359                  | -21.29      | PASS    |
| 8DPSK         | LCH     | 2402                    | -1.155              | Off               | -49.656                  | -21.16      | PASS    |
|               |         |                         | -0.859              | On                | -49.077                  | -20.86      | PASS    |
|               | HCH     | 2480                    | -2.007              | Off               | -37.561                  | -22.01      | PASS    |
|               |         |                         | -1.298              | On                | -38.196                  | -21.3       | PASS    |

## Test Graphs

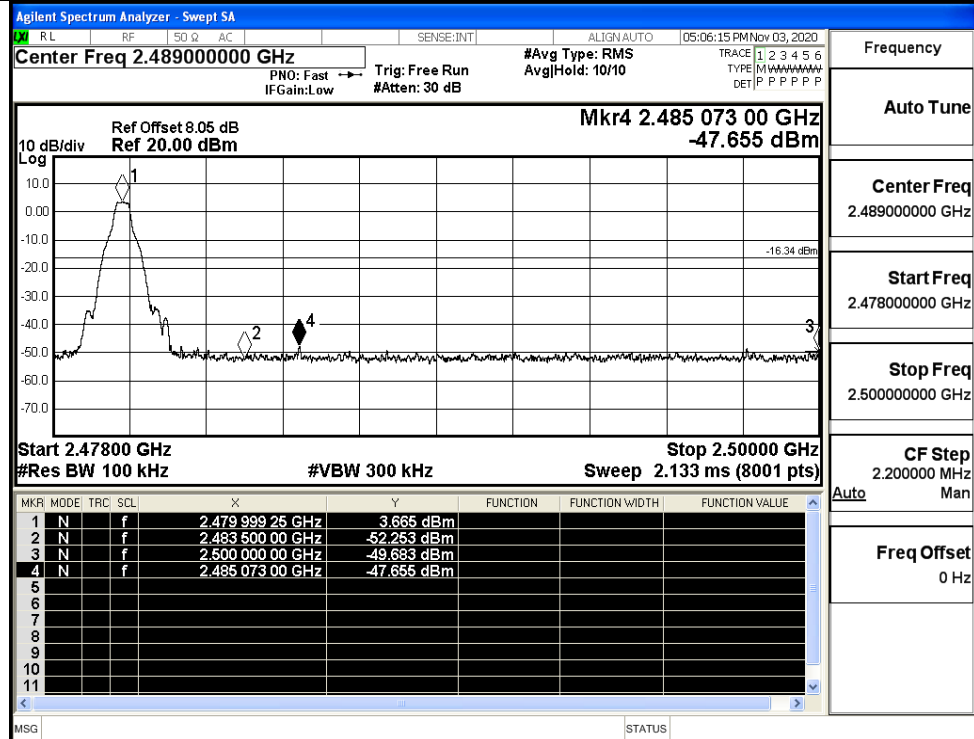
GFSK/LCH/No Hop



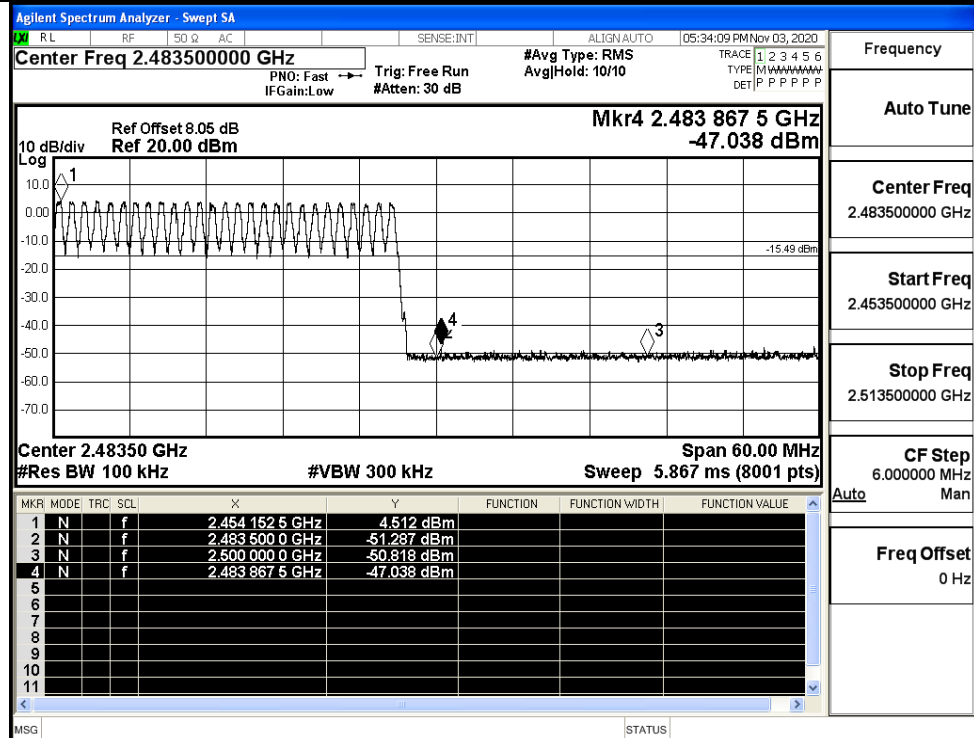
GFSK/LCH/Hop



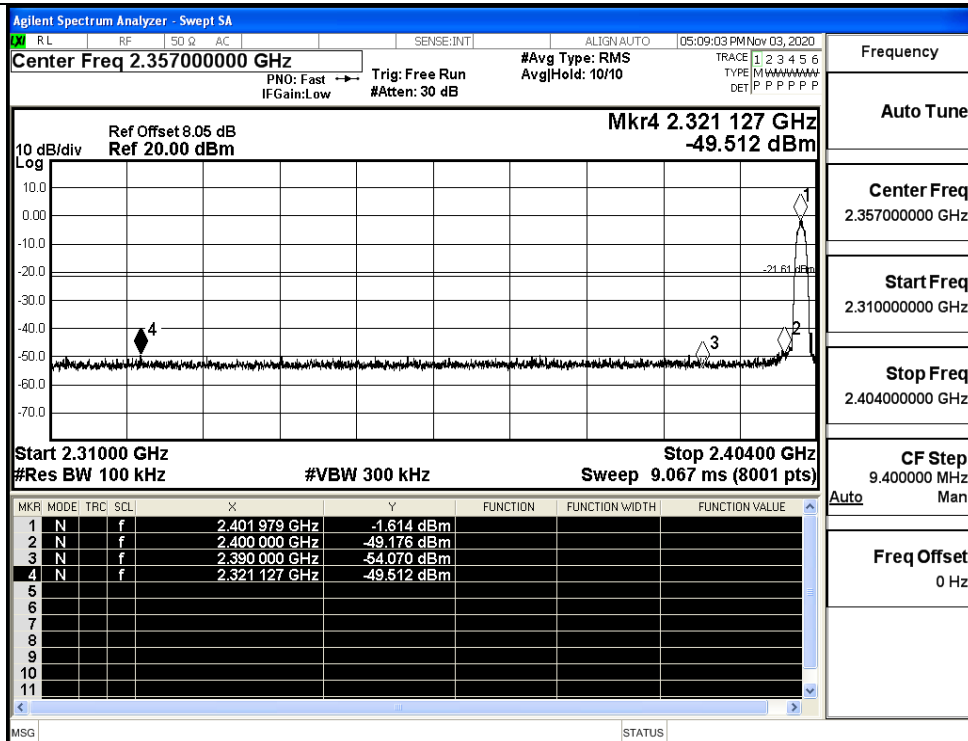
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq  
2.357000000 GHz

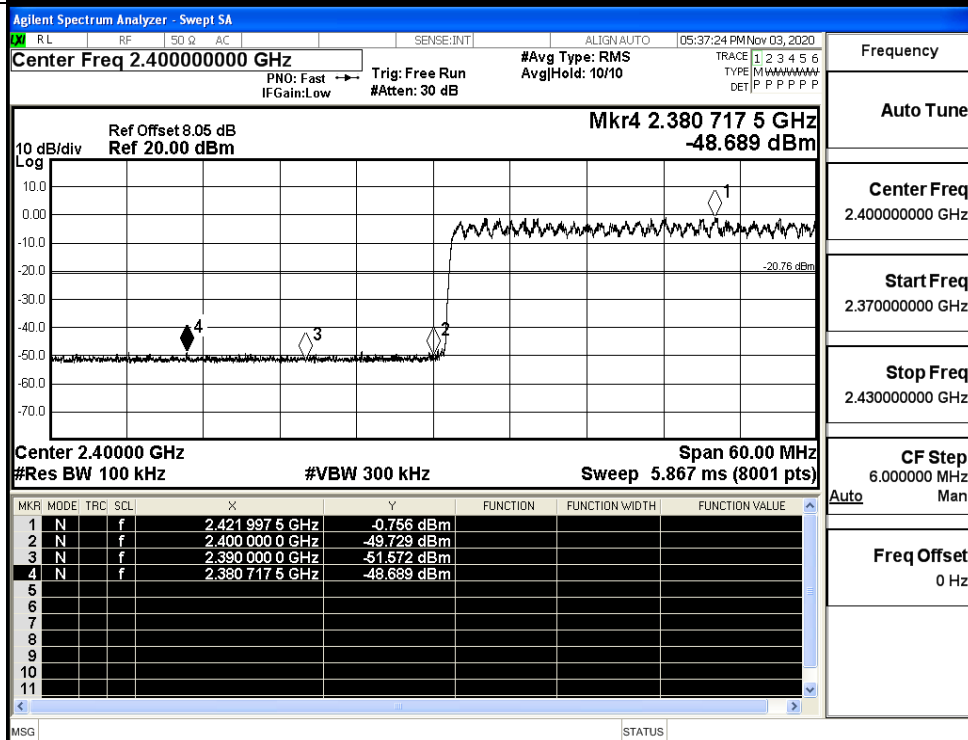
Start Freq  
2.310000000 GHz

Stop Freq  
2.404000000 GHz

CF Step  
9.400000 MHz  
Auto Man

Freq Offset  
0 Hz

$\pi/4$ DQPSK/LCH/Hop



Frequency

Auto Tune

Center Freq  
2.400000000 GHz

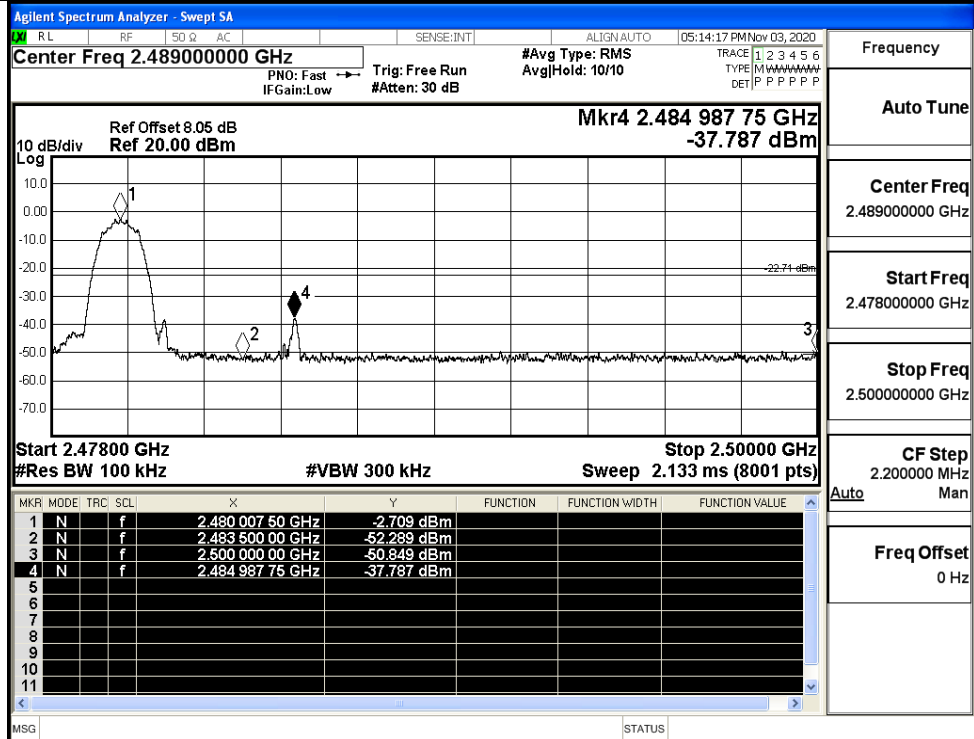
Start Freq  
2.370000000 GHz

Stop Freq  
2.430000000 GHz

CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

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



Frequency

Auto Tune

Center Freq  
2.489000000 GHz

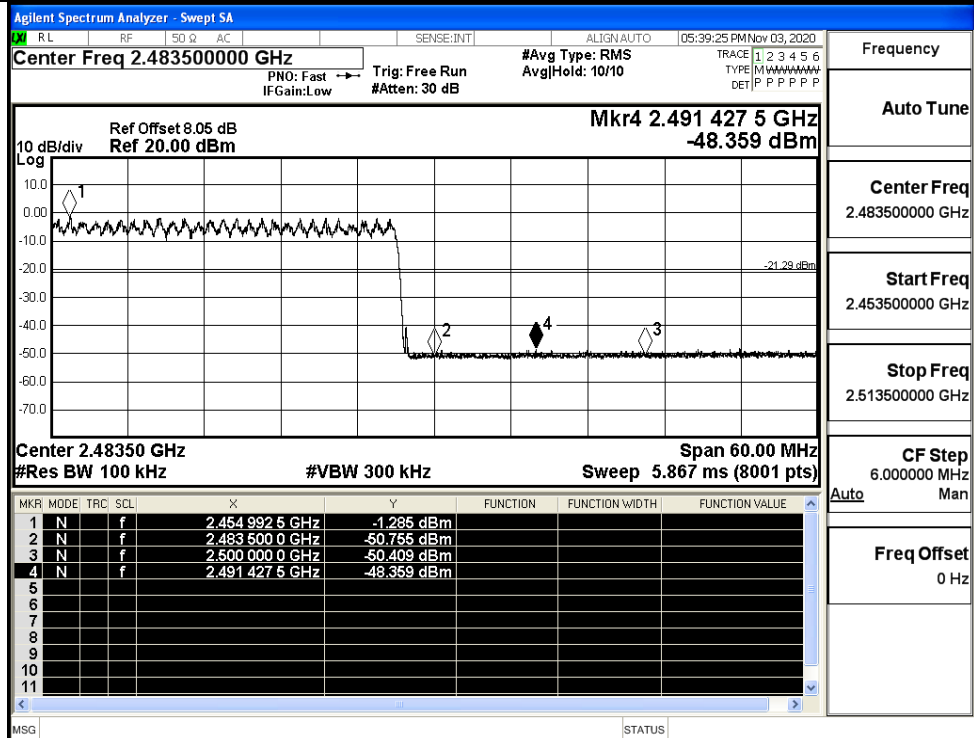
Start Freq  
2.478000000 GHz

Stop Freq  
2.500000000 GHz

CF Step  
2.200000 MHz  
Auto Man

Freq Offset  
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq  
2.483500000 GHz

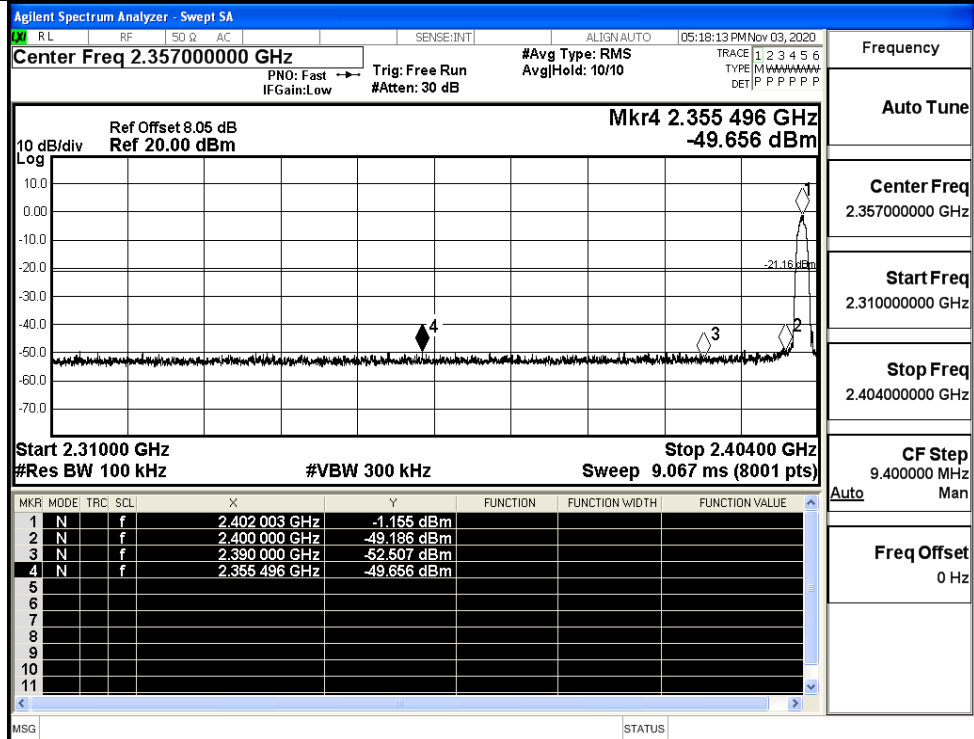
Start Freq  
2.453500000 GHz

Stop Freq  
2.513500000 GHz

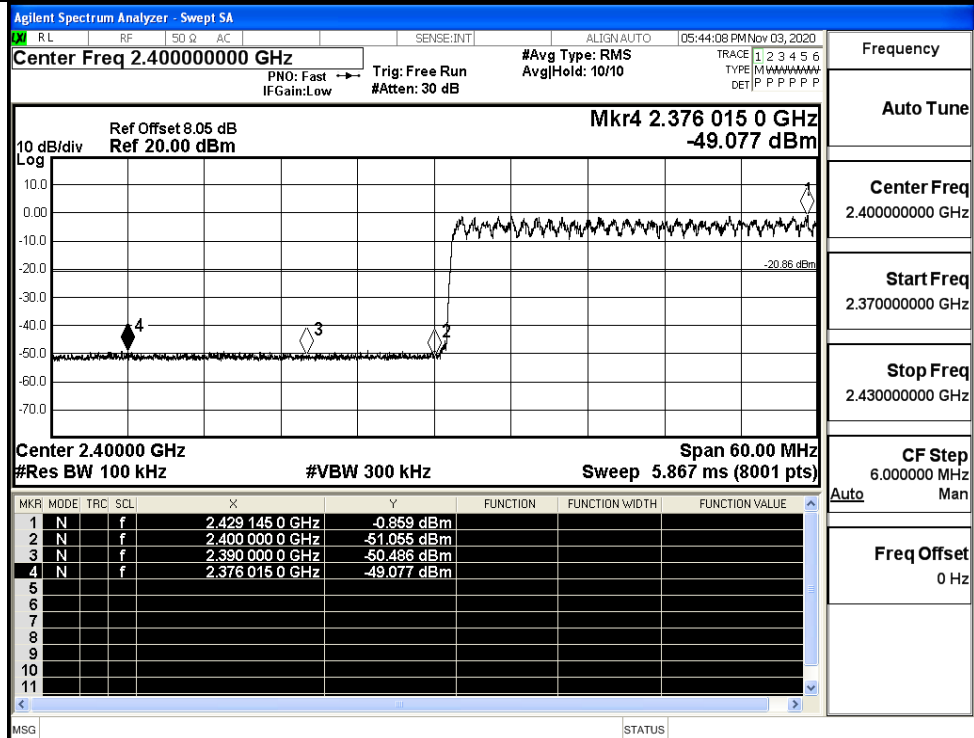
CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

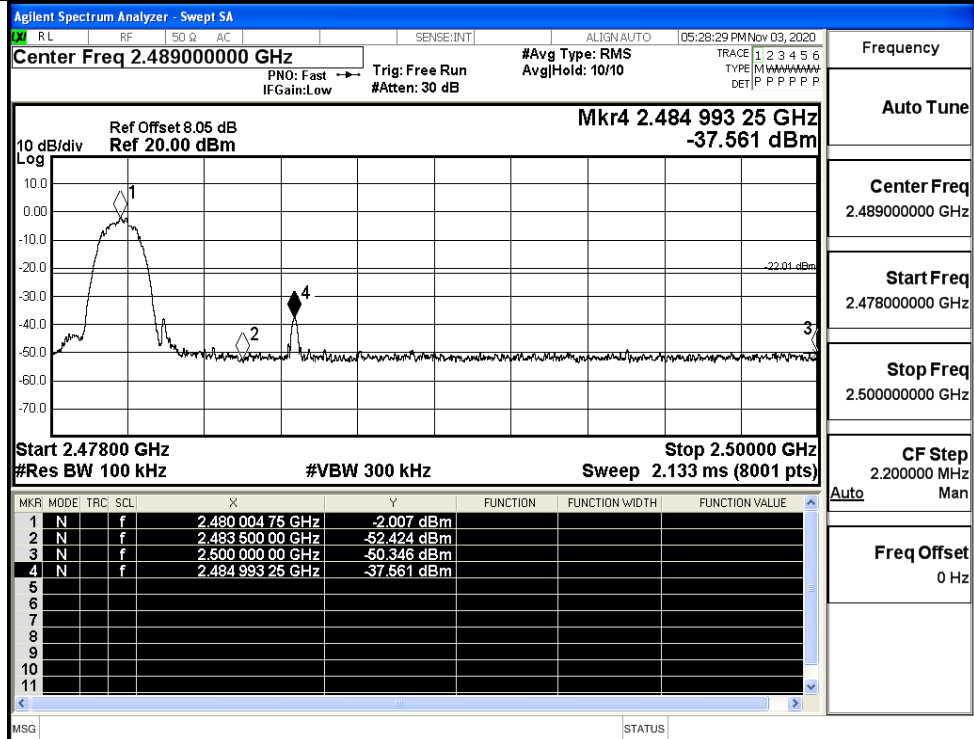
8DPSK/LCH/No Hop



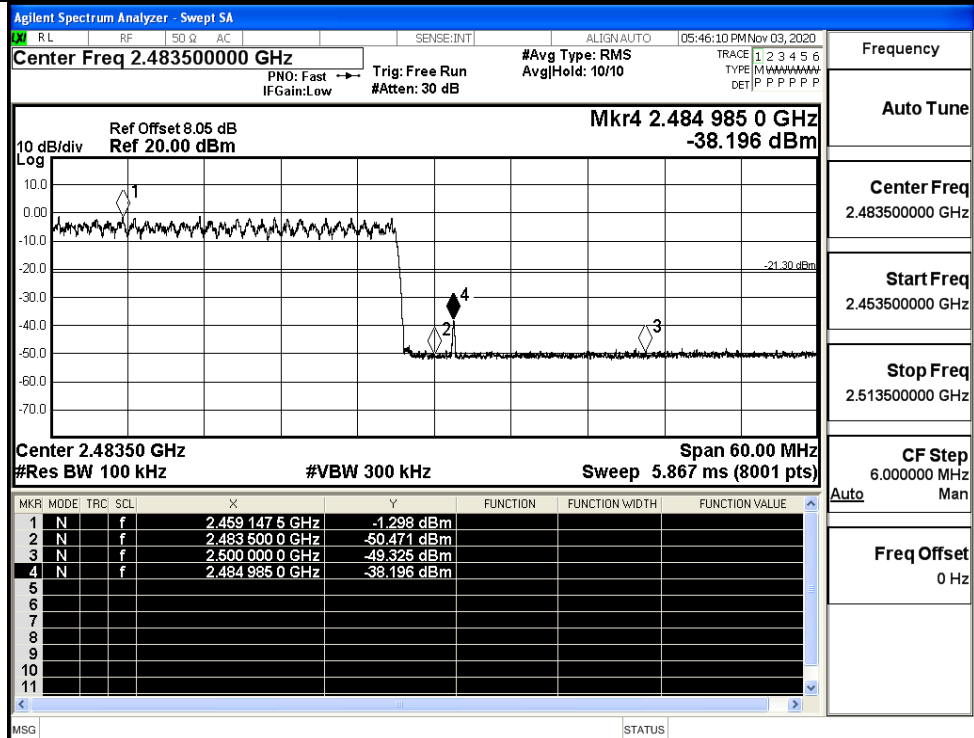
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



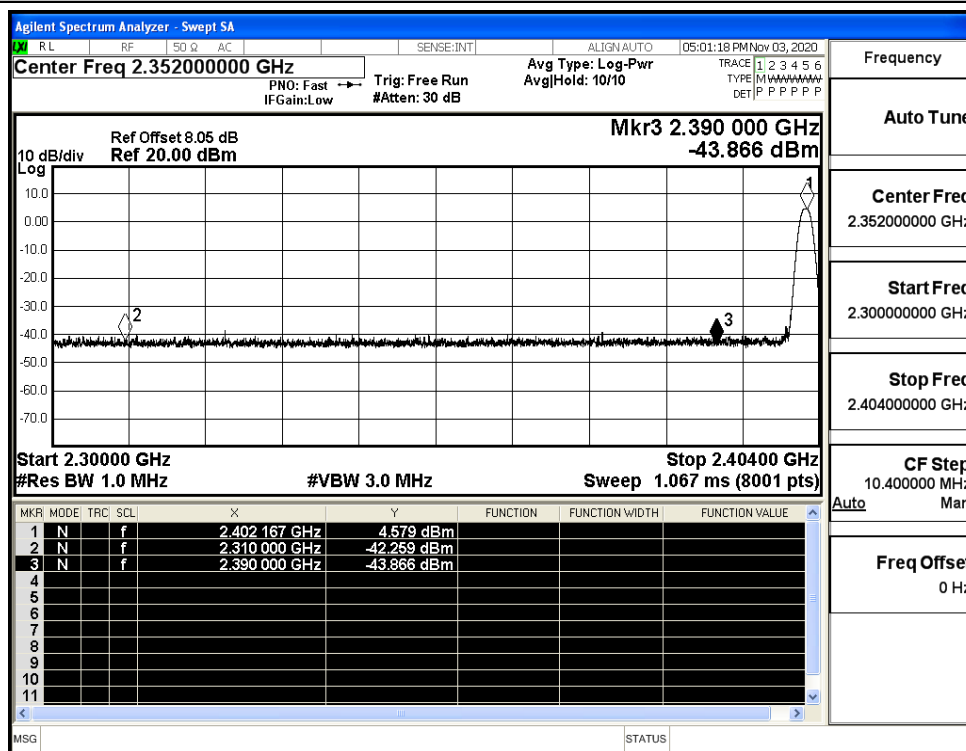
8DPSK/HCH/Hop



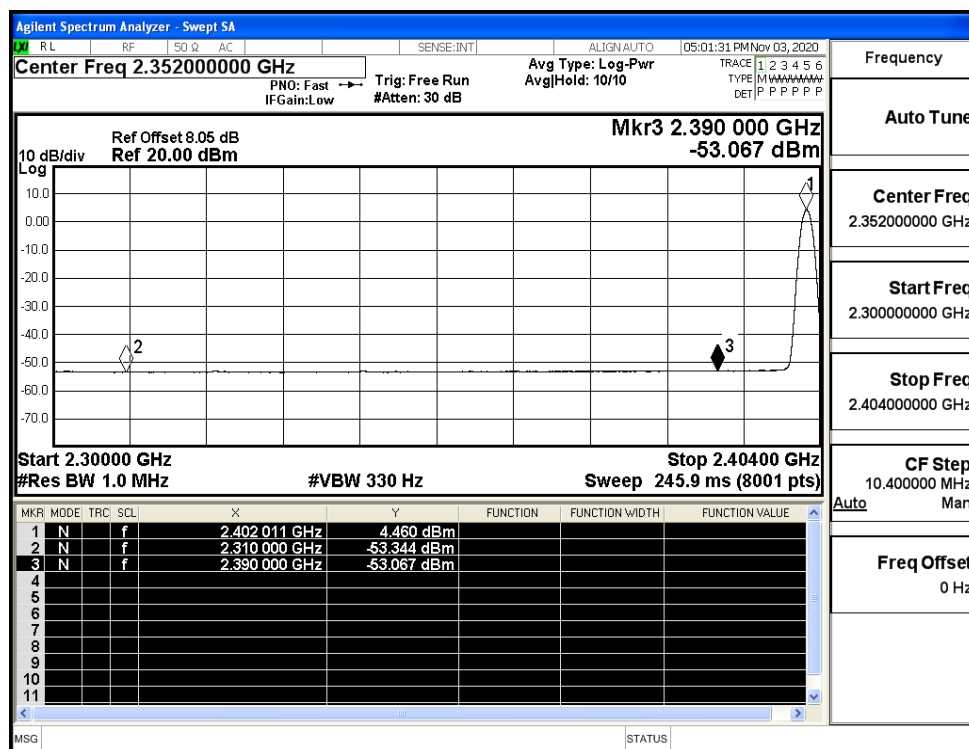
## A.8 Restrict-band band-edge measurements

| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -42.26      | 2.0  | 0             | 54.97      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.34      | 2.0  | 0             | 43.89      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.87      | 2.0  | 0             | 53.36      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.07      | 2.0  | 0             | 44.16      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -42.49      | 2.0  | 0             | 54.74      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.20      | 2.0  | 0             | 45.03      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -42.93      | 2.0  | 0             | 54.30      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.33      | 2.0  | 0             | 44.90      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -42.74      | 2.0  | 0             | 54.49      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.37      | 2.0  | 0             | 43.86      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.19      | 2.0  | 0             | 54.04      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.03      | 2.0  | 0             | 44.20      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -40.75      | 2.0  | 0             | 56.48      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.30      | 2.0  | 0             | 44.93      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -43.10      | 2.0  | 0             | 54.13      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.33      | 2.0  | 0             | 44.90      | AV       | 54             | PASS    |
| 8DPSK         | Off     | 2310.0 | -43.31      | 2.0  | 0             | 53.92      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.31      | 2.0  | 0             | 43.92      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -42.77      | 2.0  | 0             | 54.46      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -52.94      | 2.0  | 0             | 44.29      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -42.10      | 2.0  | 0             | 55.13      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.22      | 2.0  | 0             | 45.01      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -40.78      | 2.0  | 0             | 56.45      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.33      | 2.0  | 0             | 44.90      | AV       | 54             | PASS    |

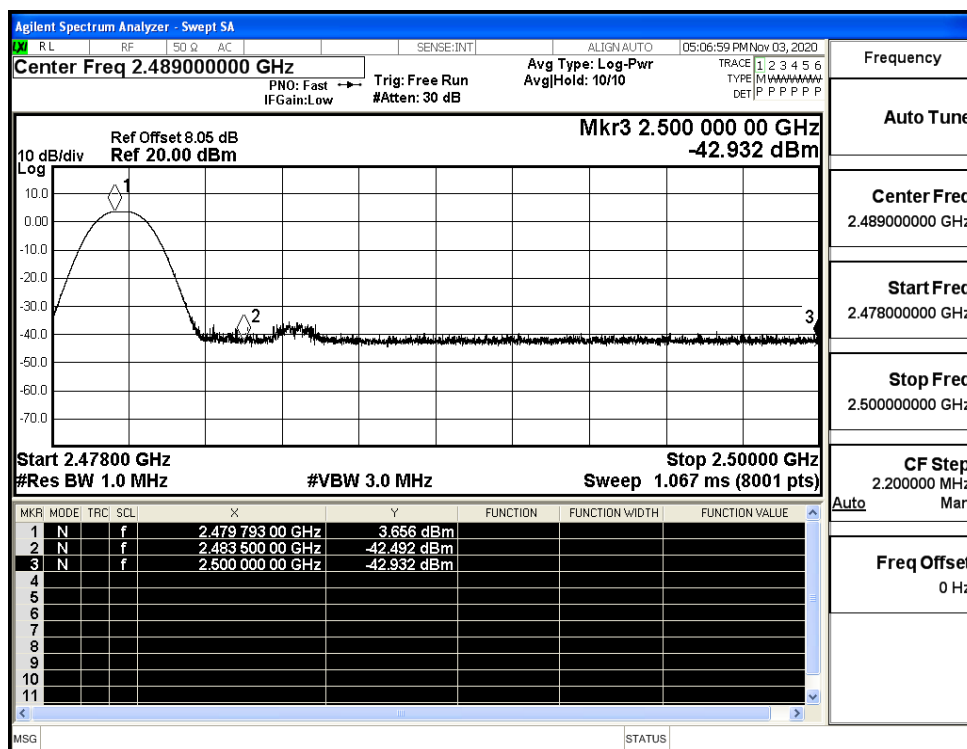
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



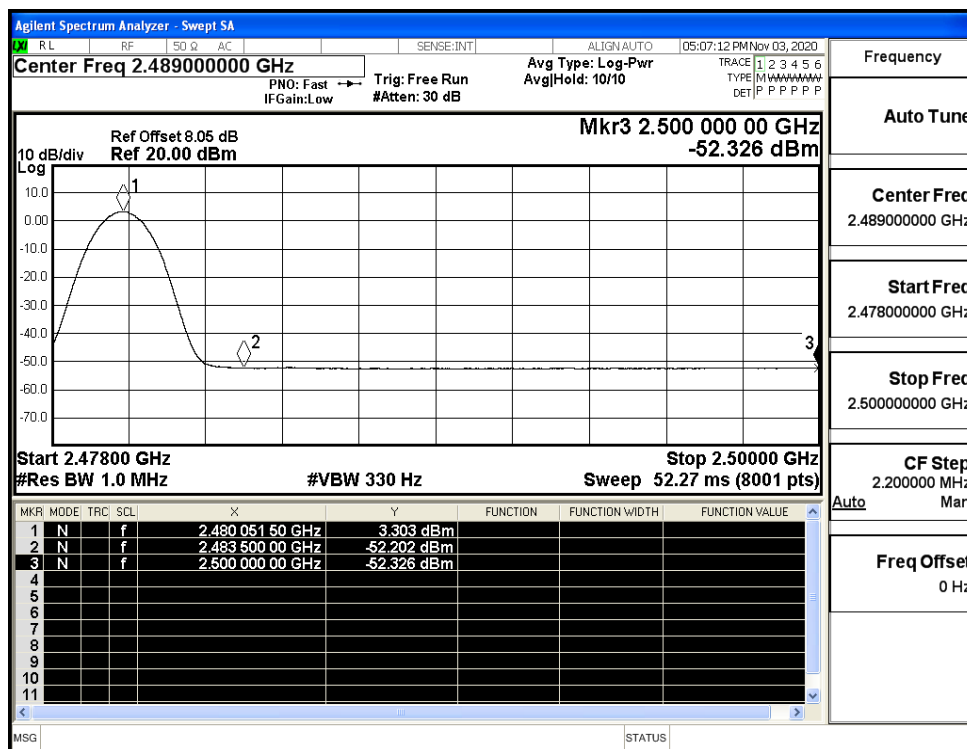
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)

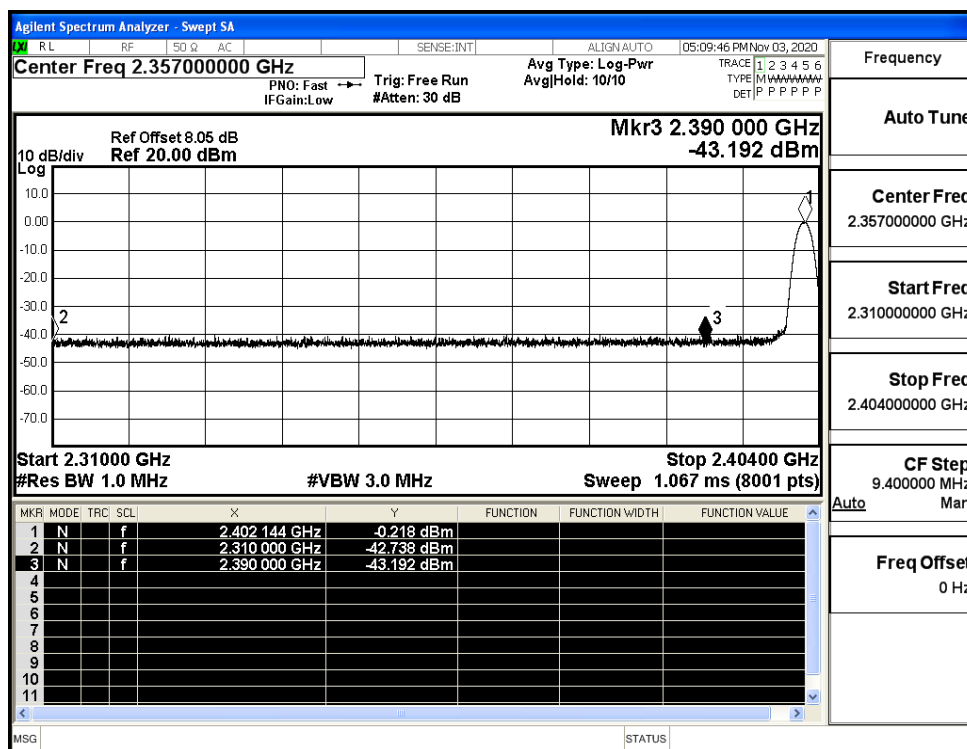
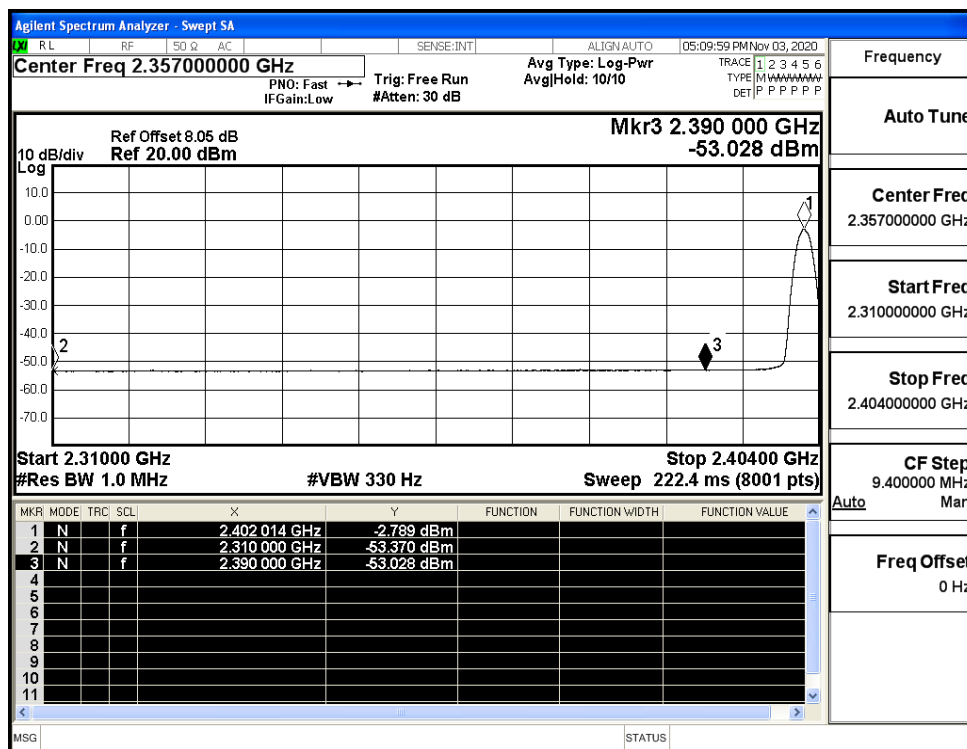


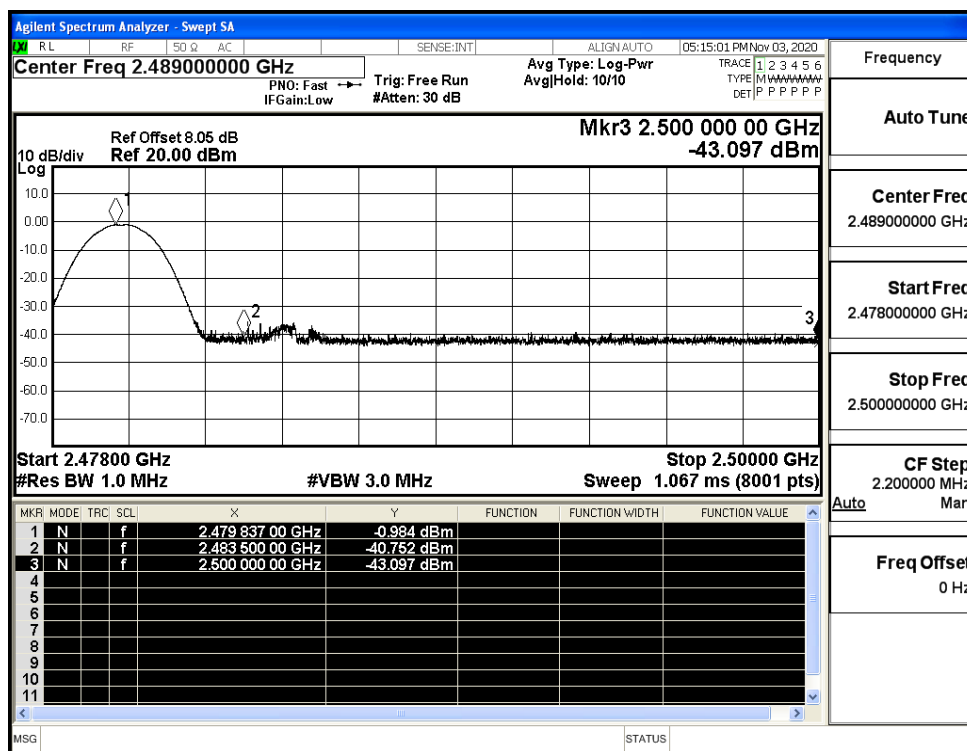
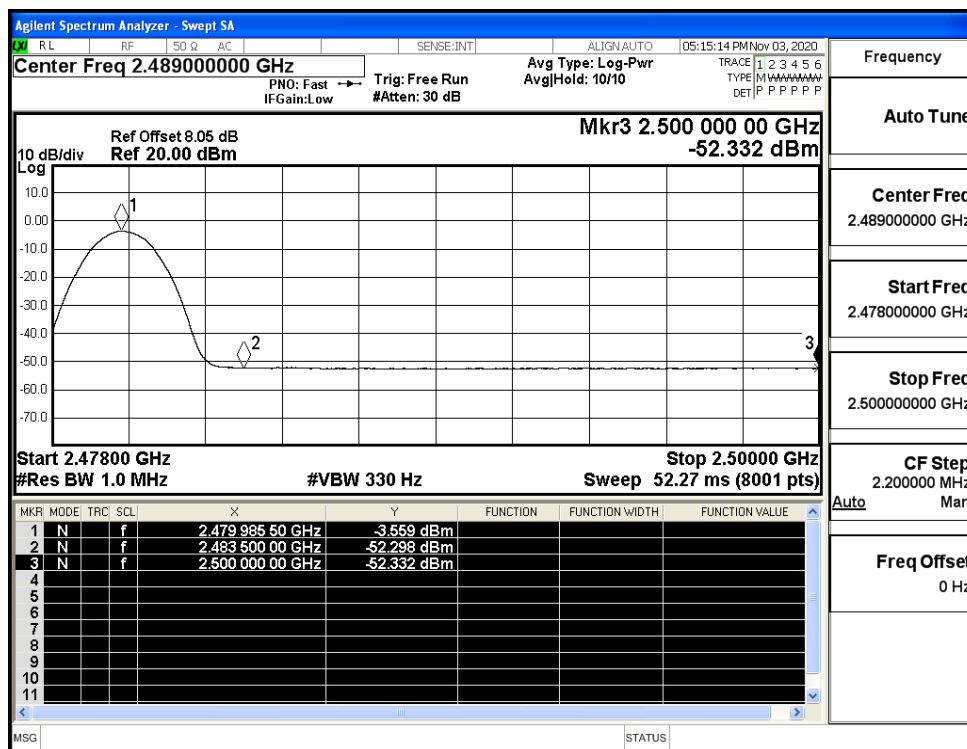
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



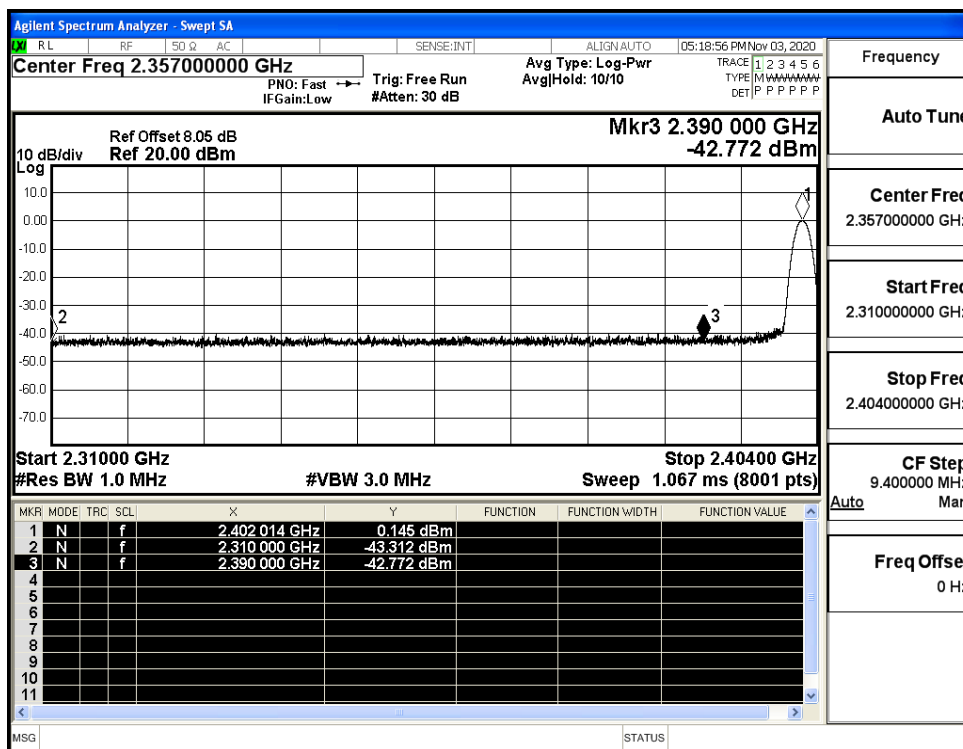
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



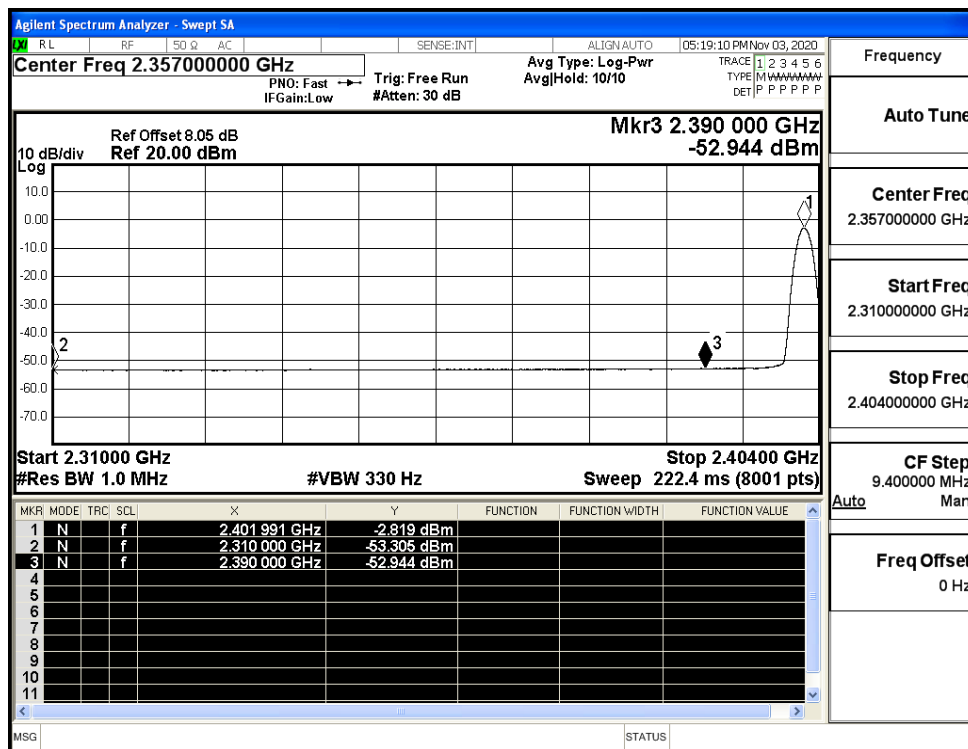
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)

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

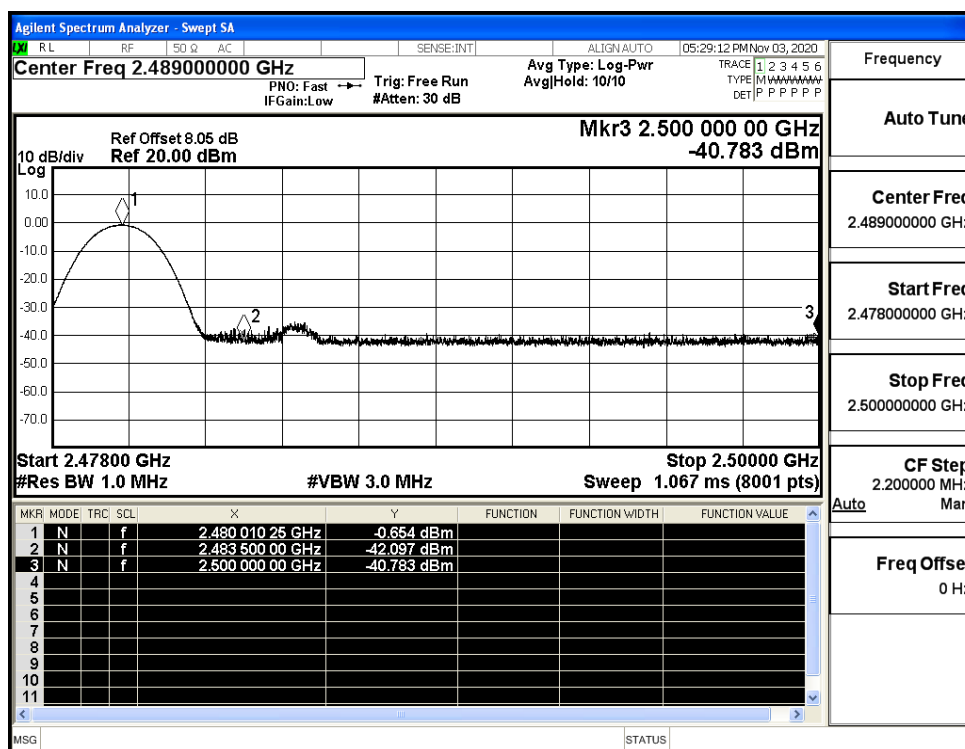
## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



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



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



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

