

## Appendix A

### RF Test Data for BT V2.1 (BDR/EDR) (Conducted Measurement)

Product Name: Bluetooth Speaker

Trade Mark: iHip

Test Model: FDJAMBAR

#### Environmental Conditions

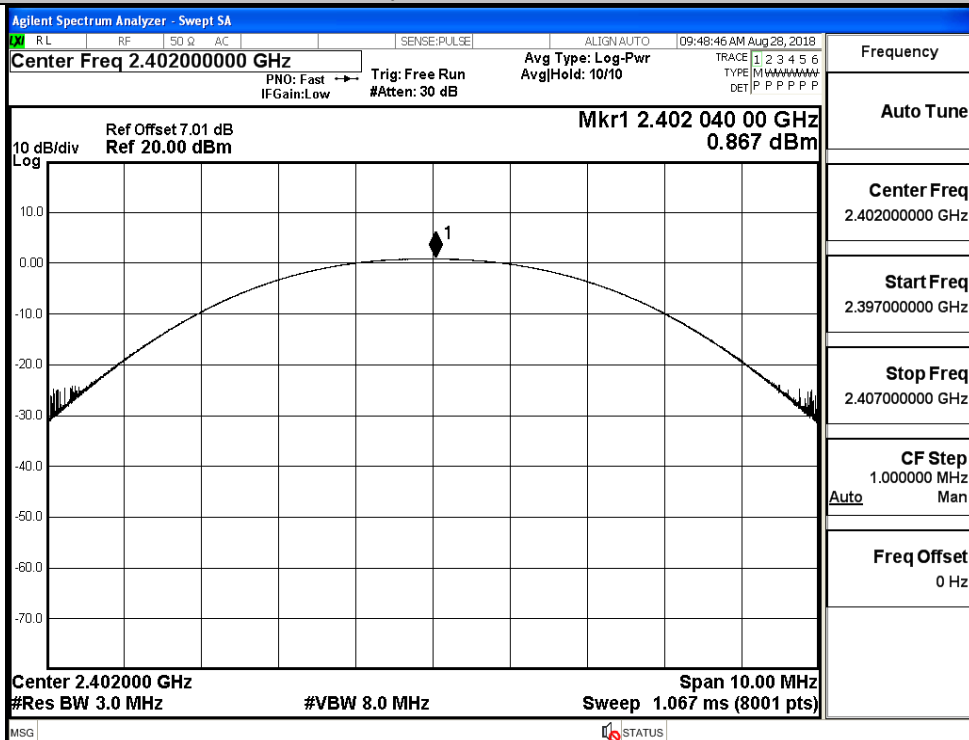
|                    |             |
|--------------------|-------------|
| Temperature:       | 24.4 ° C    |
| Relative Humidity: | 52.8%       |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | Diamond Lu  |
| Supervised by:     | Jayden Zhuo |

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

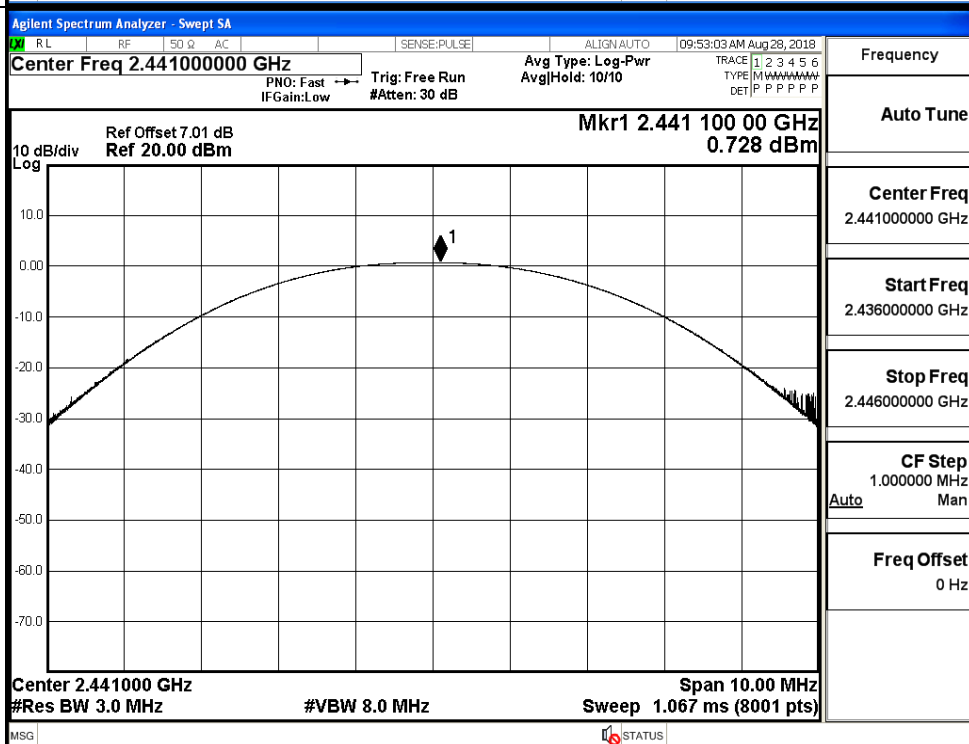
| Mode          | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK          | LCH      | 0.867                           | 21          | PASS    |
|               | MCH      | 0.728                           | 21          | PASS    |
|               | HCH      | 0.517                           | 21          | PASS    |
| $\pi/4$ DQPSK | LCH      | 0.635                           | 21          | PASS    |
|               | MCH      | 0.541                           | 21          | PASS    |
|               | HCH      | 0.299                           | 21          | PASS    |

## Test Graphs

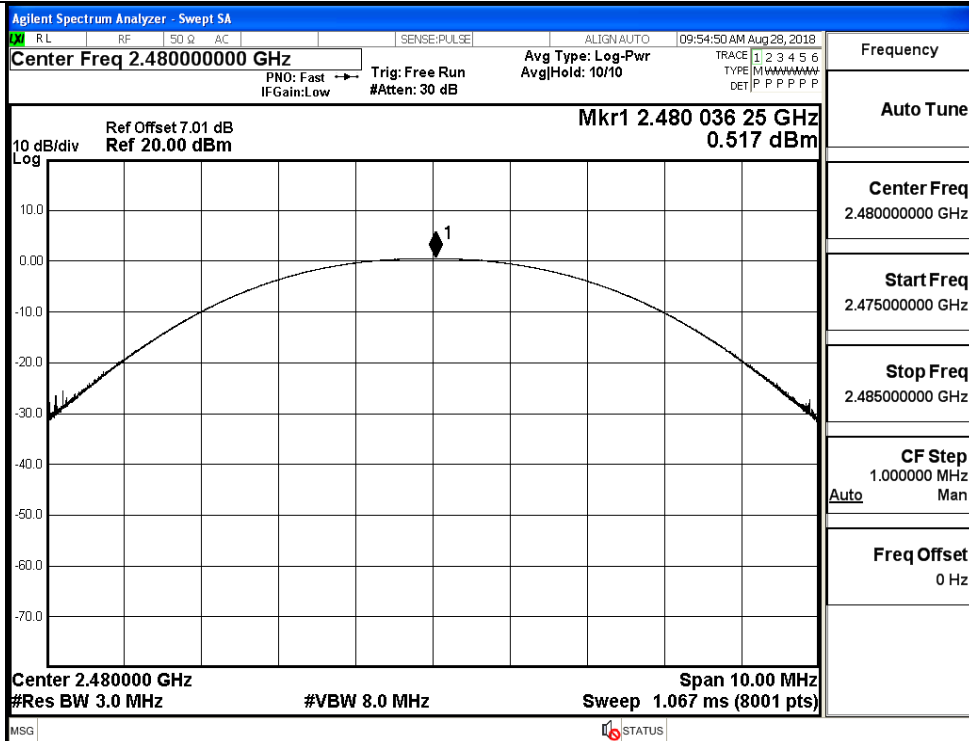
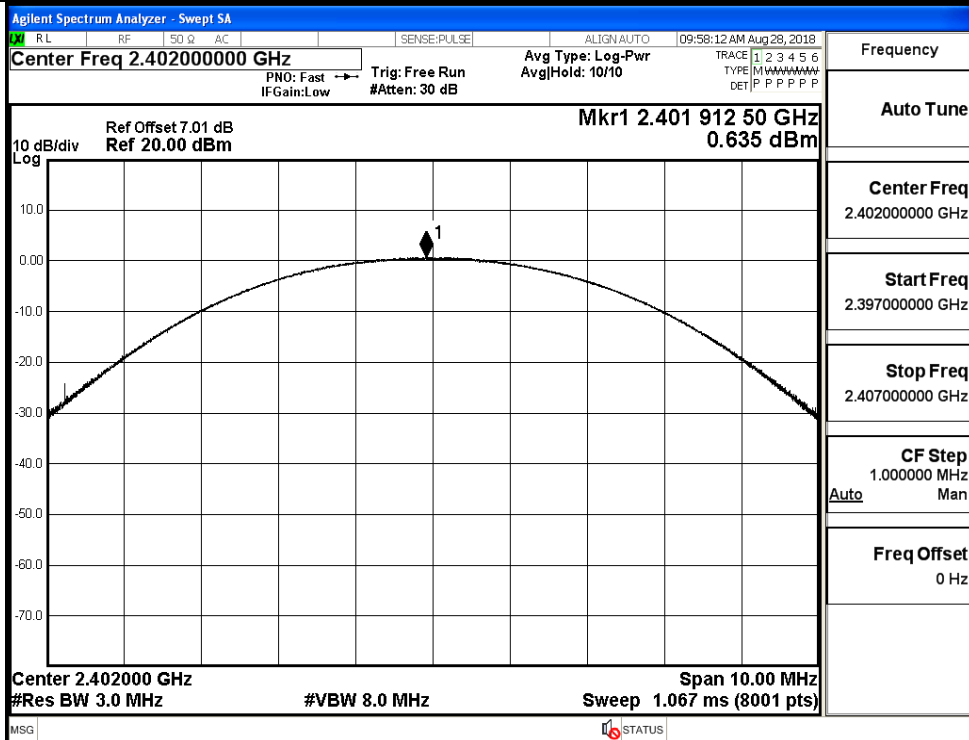
GFSK/LCH

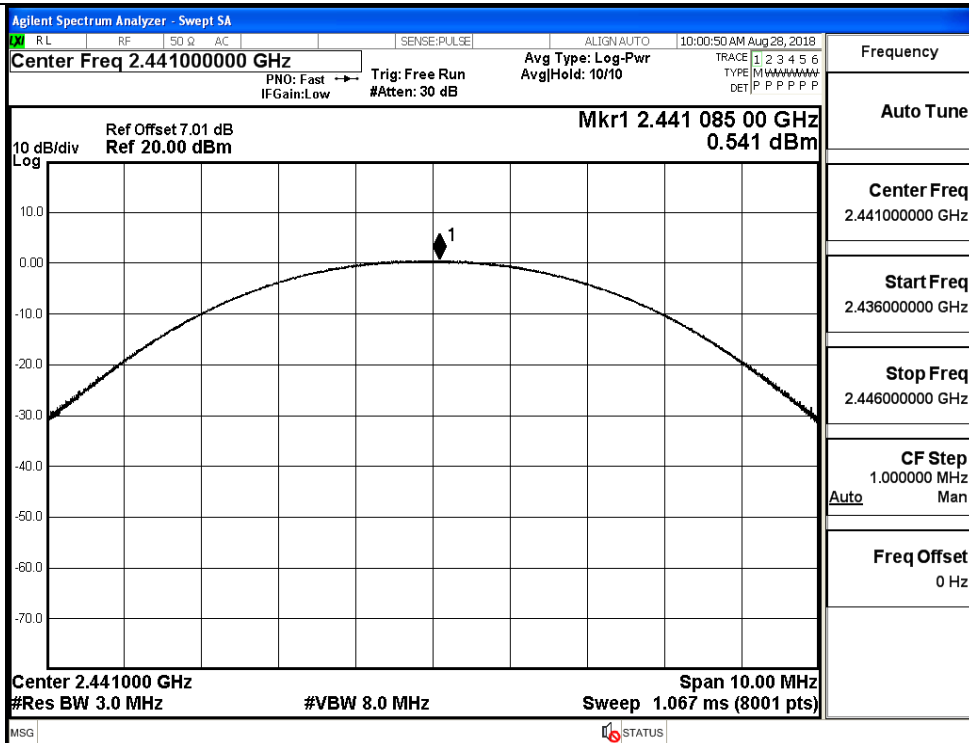
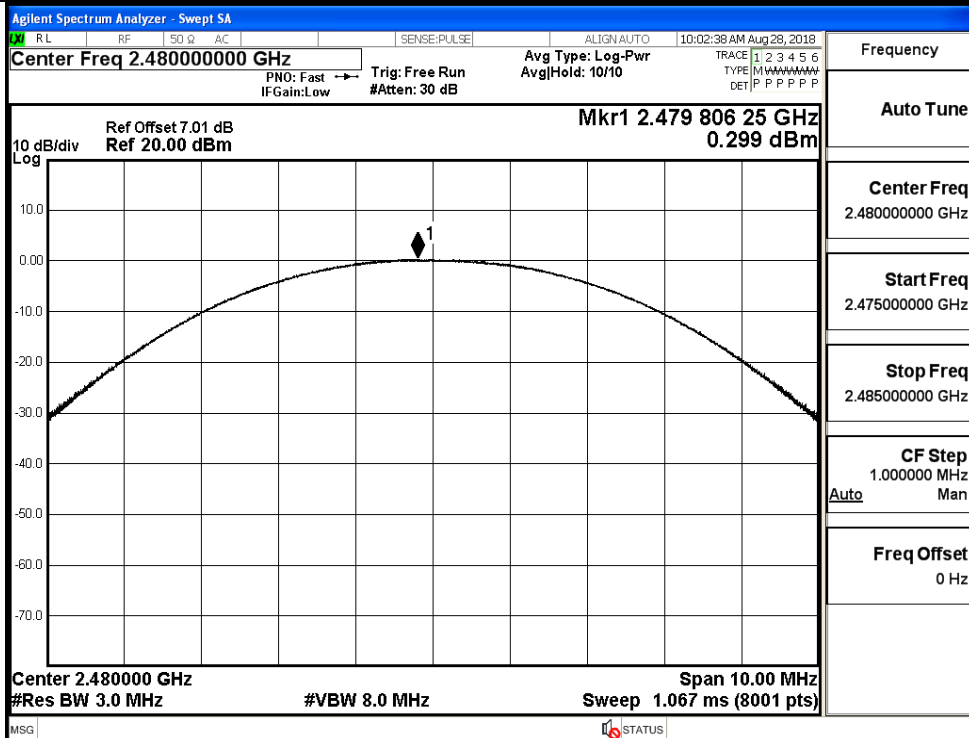


GFSK/MCH



GFSK/HCH

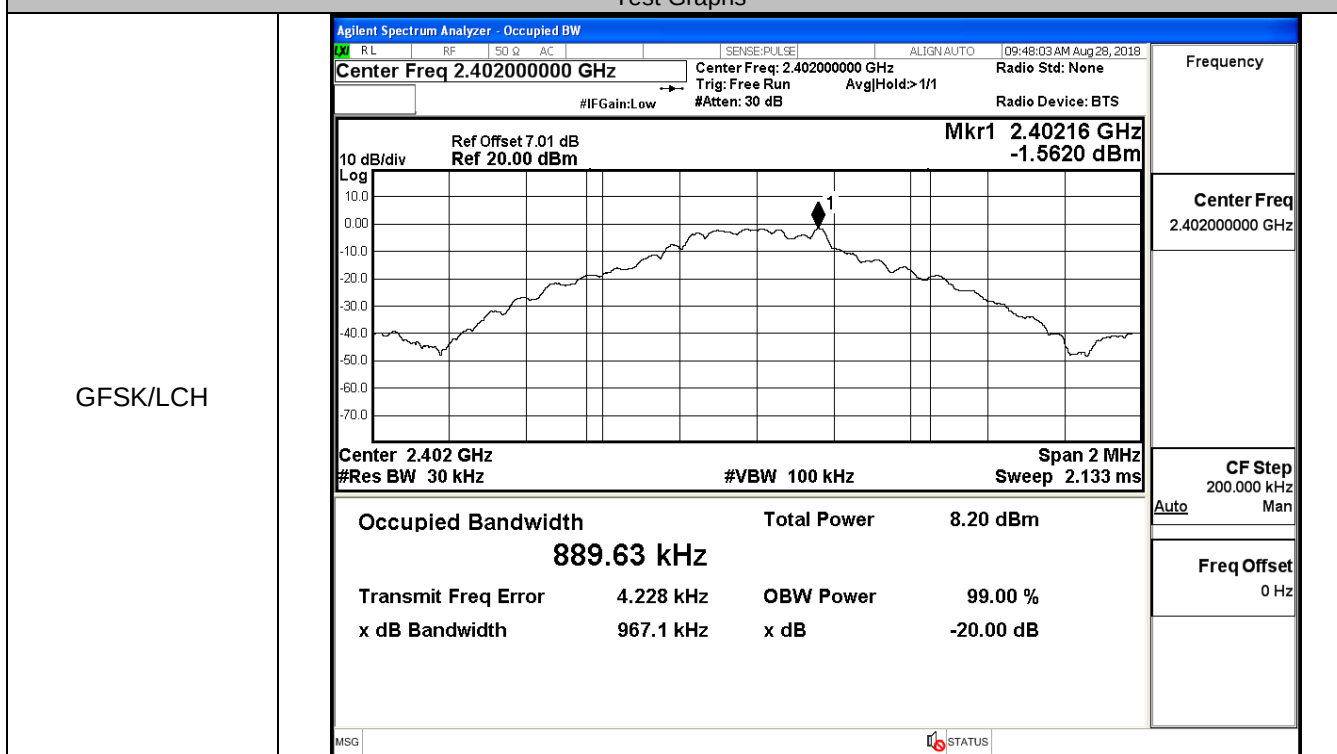
 $\pi$ /4DQPSK/LCH

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

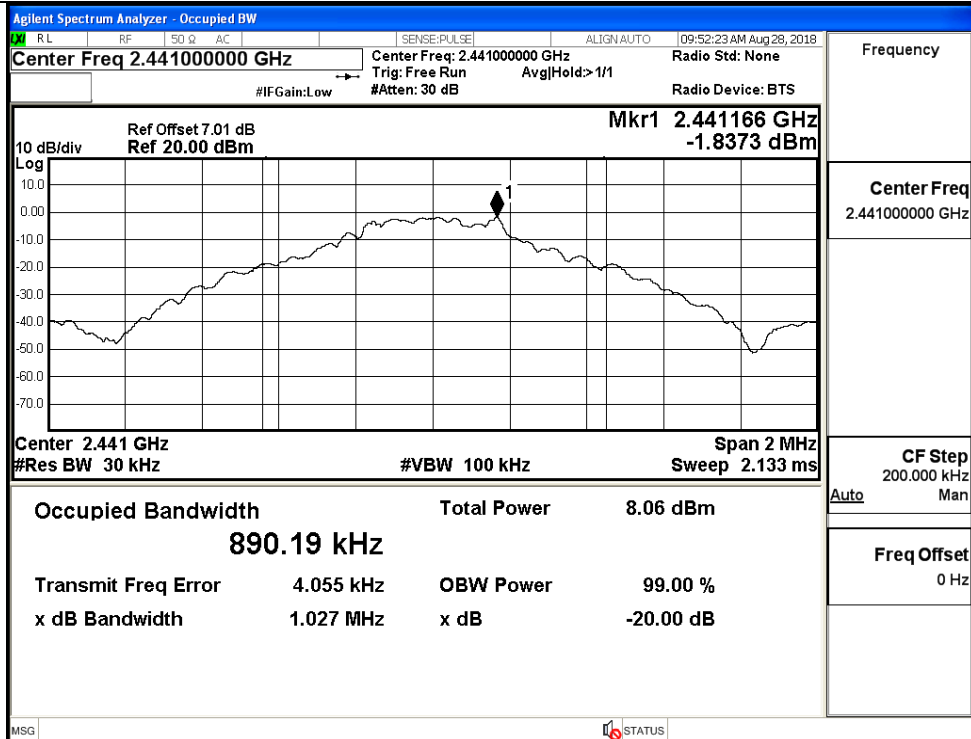
## A.2 99% and 20dB Bandwidth

| Mode          | Channel. | 99% Bandwidth [MHz] | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|---------------------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.88963             | 0.9671               | Not Specified | PASS    |
|               | MCH      | 0.89019             | 1.027                | Not Specified | PASS    |
|               | HCH      | 0.89058             | 1.023                | Not Specified | PASS    |
| $\pi$ /4DQPSK | LCH      | 1.1671              | 1.290                | Not Specified | PASS    |
|               | MCH      | 1.1673              | 1.287                | Not Specified | PASS    |
|               | HCH      | 1.1673              | 1.289                | Not Specified | PASS    |

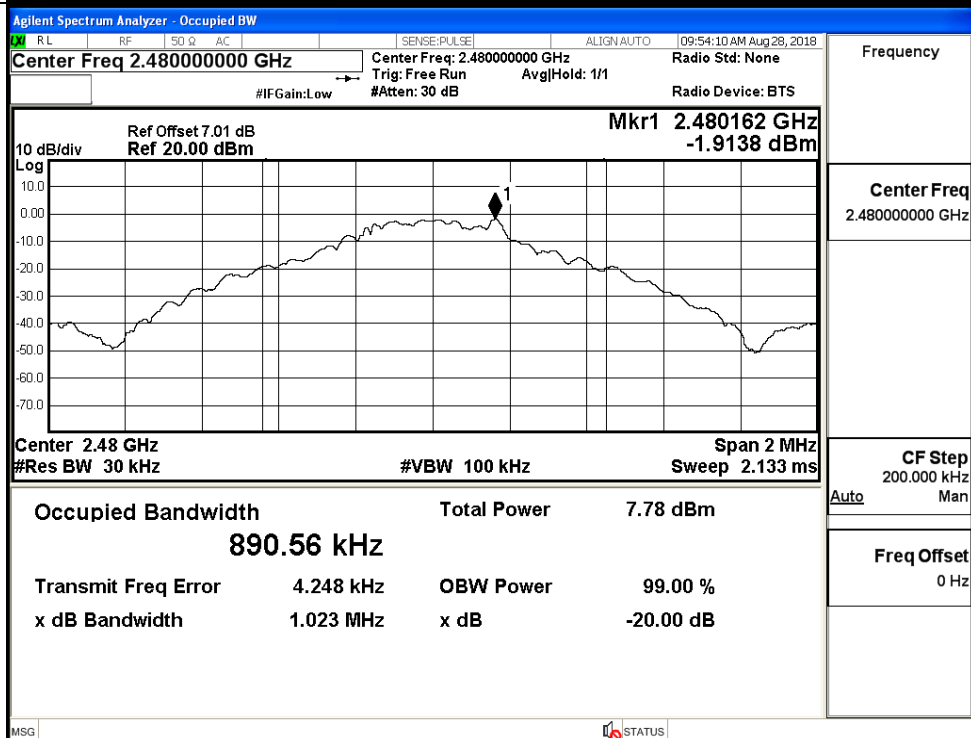
Test Graphs

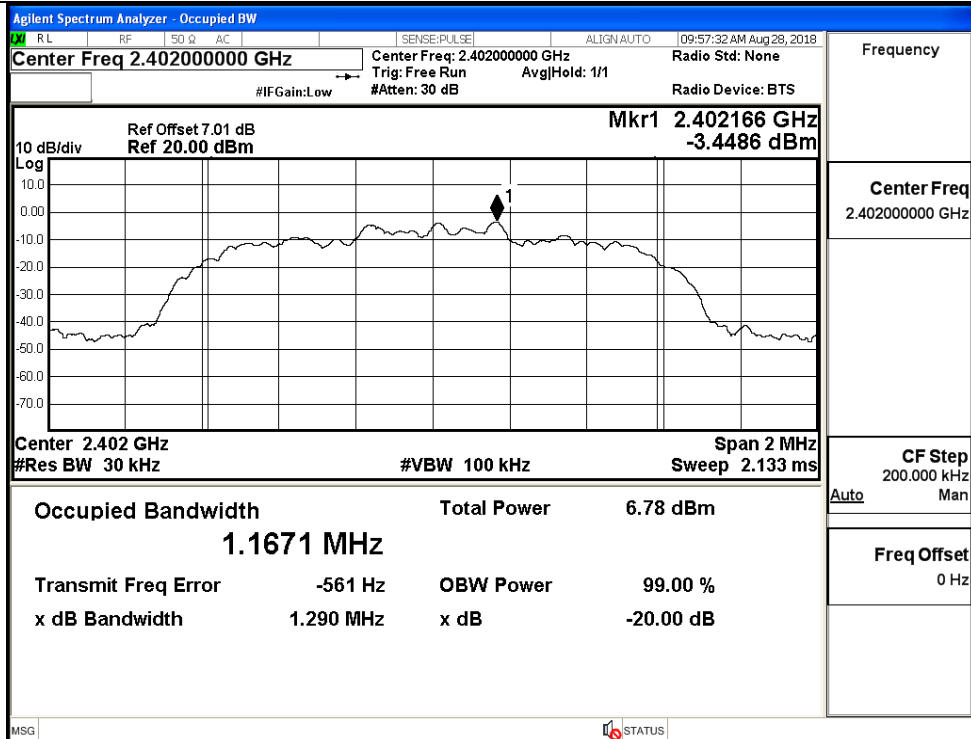
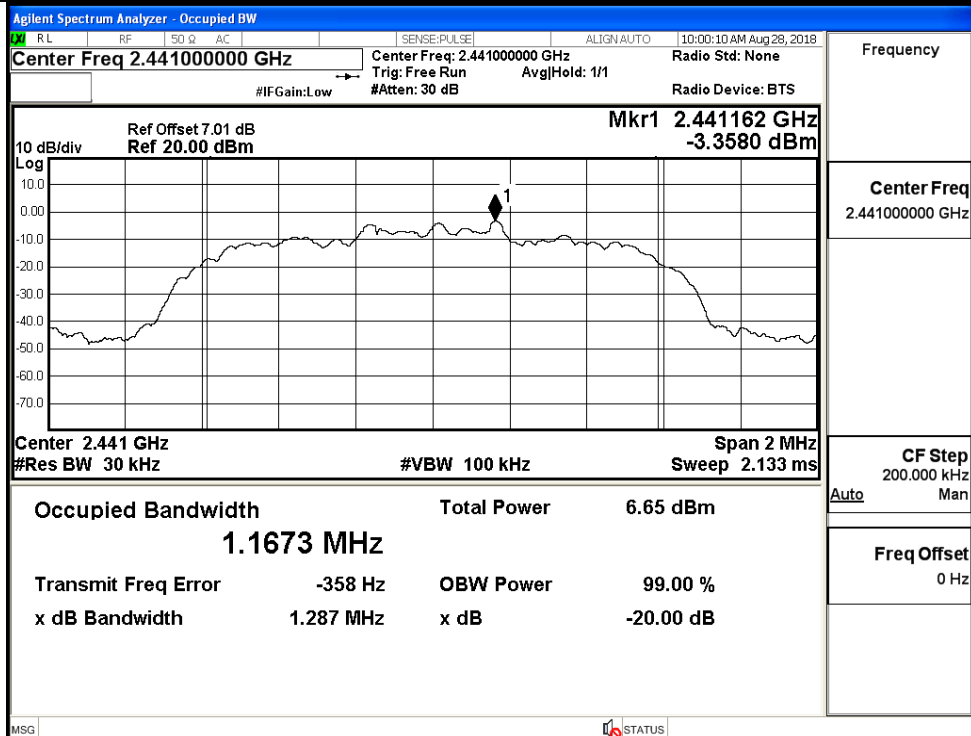


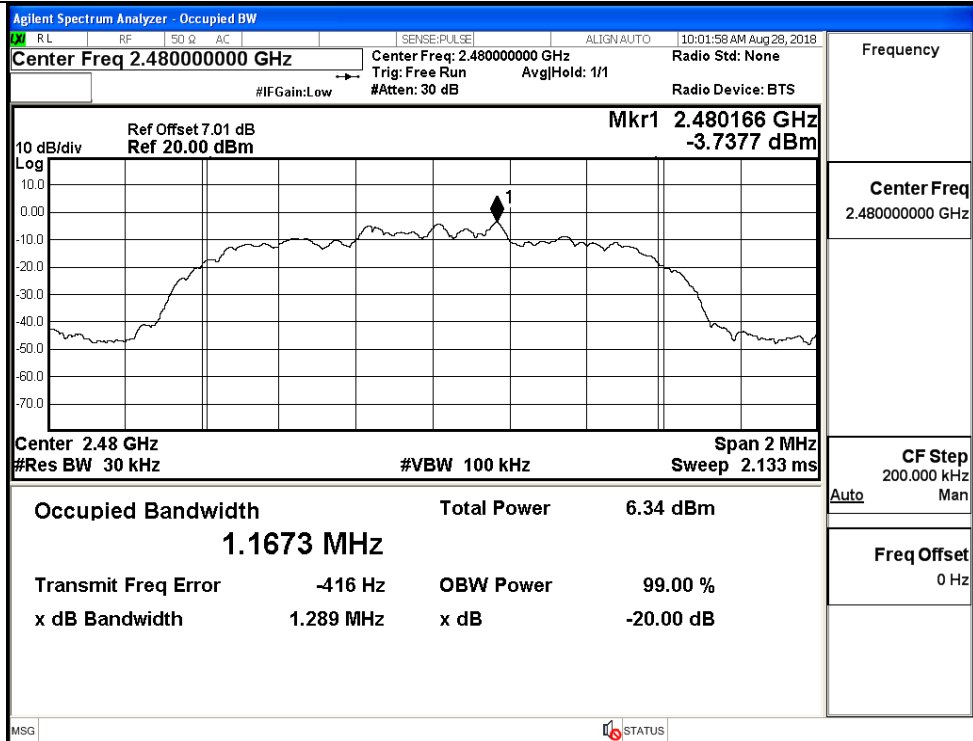
GFSK/MCH



GFSK/HCH



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

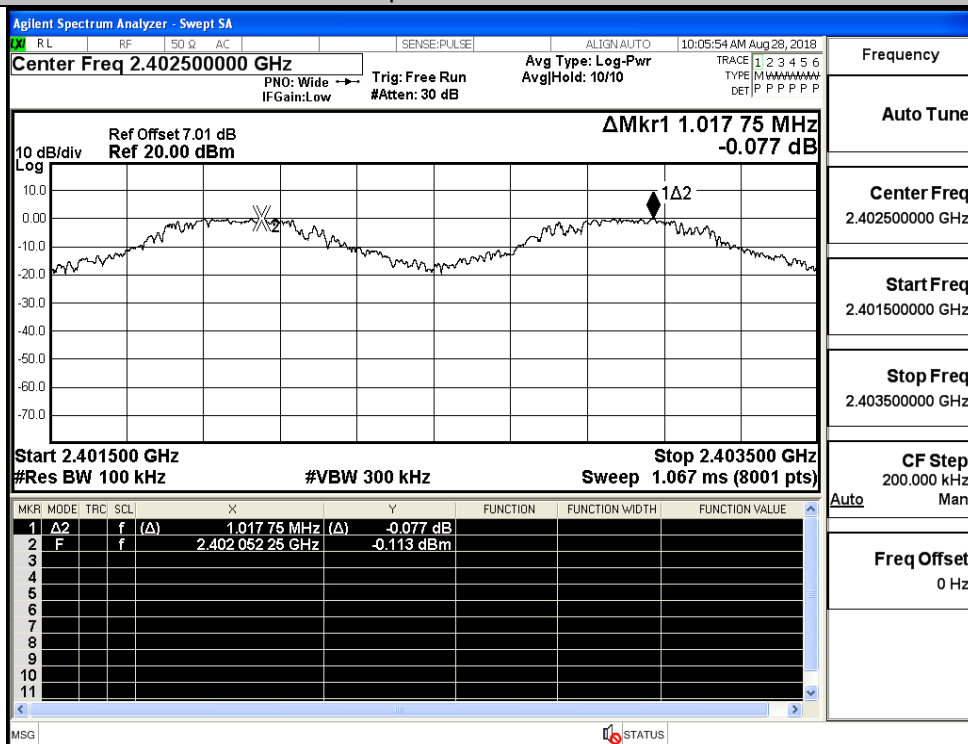
$\pi/4$ DQPSK/HCH

## A.3 Carrier Frequency Separation

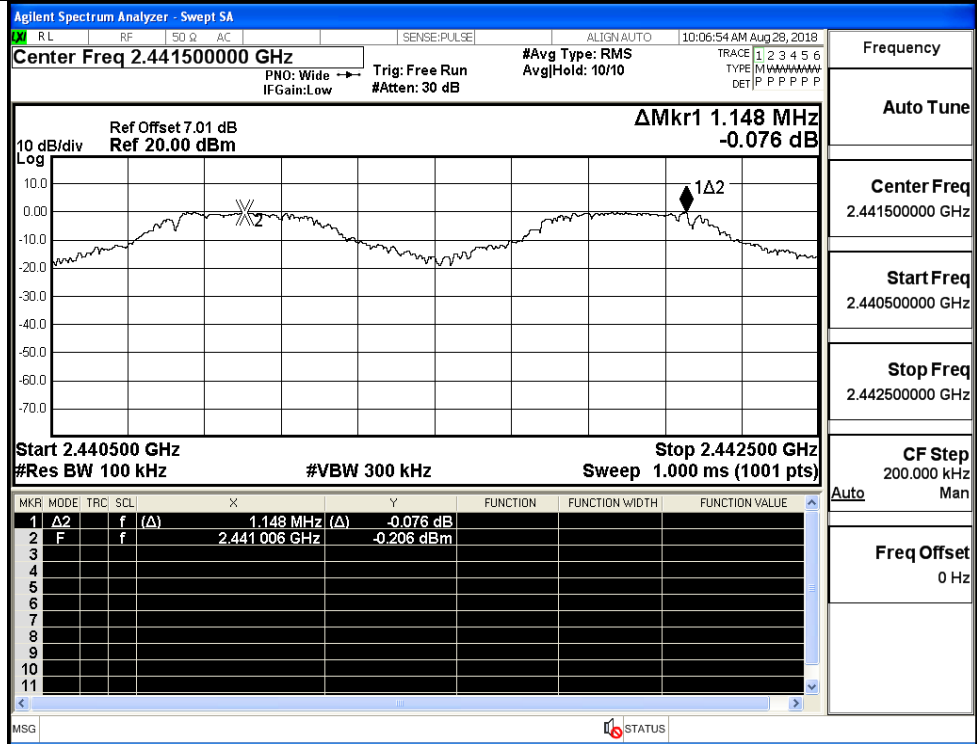
| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK          | LCH      | 1.018                              | 0.685       | PASS    |
|               | MCH      | 1.148                              | 0.685       | PASS    |
|               | HCH      | 0.974                              | 0.685       | PASS    |
| $\pi$ /4DQPSK | LCH      | 1.168                              | 0.860       | PASS    |
|               | MCH      | 1.112                              | 0.860       | PASS    |
|               | HCH      | 1.182                              | 0.860       | PASS    |

Test Graphs

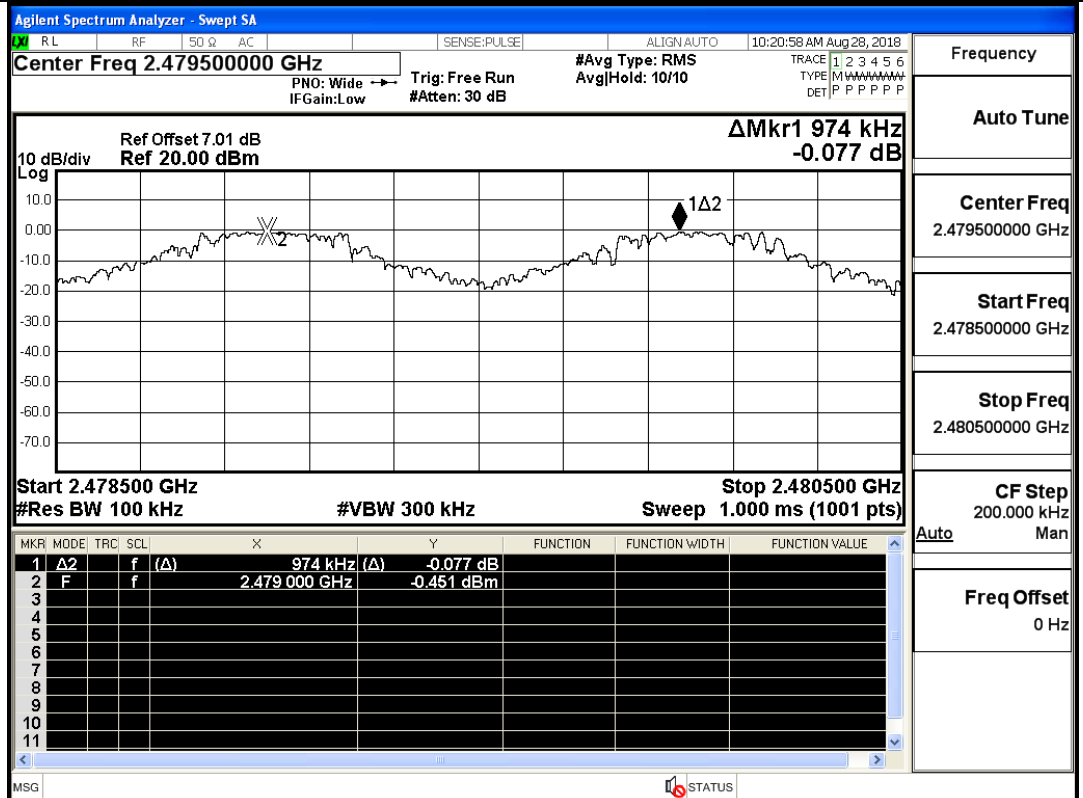
GFSK/LCH

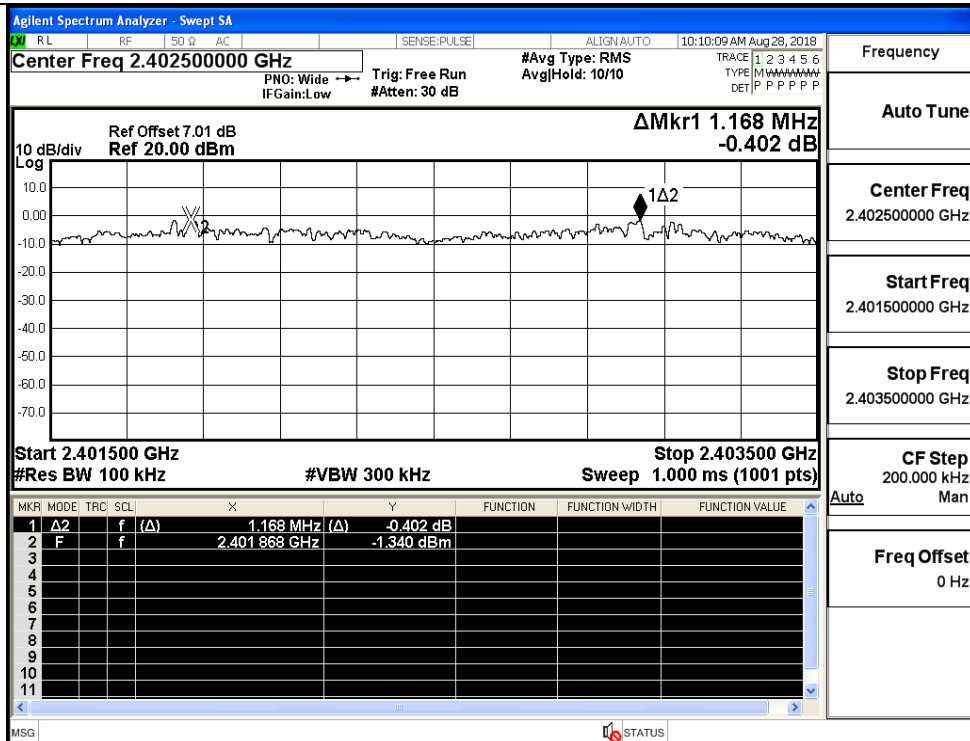
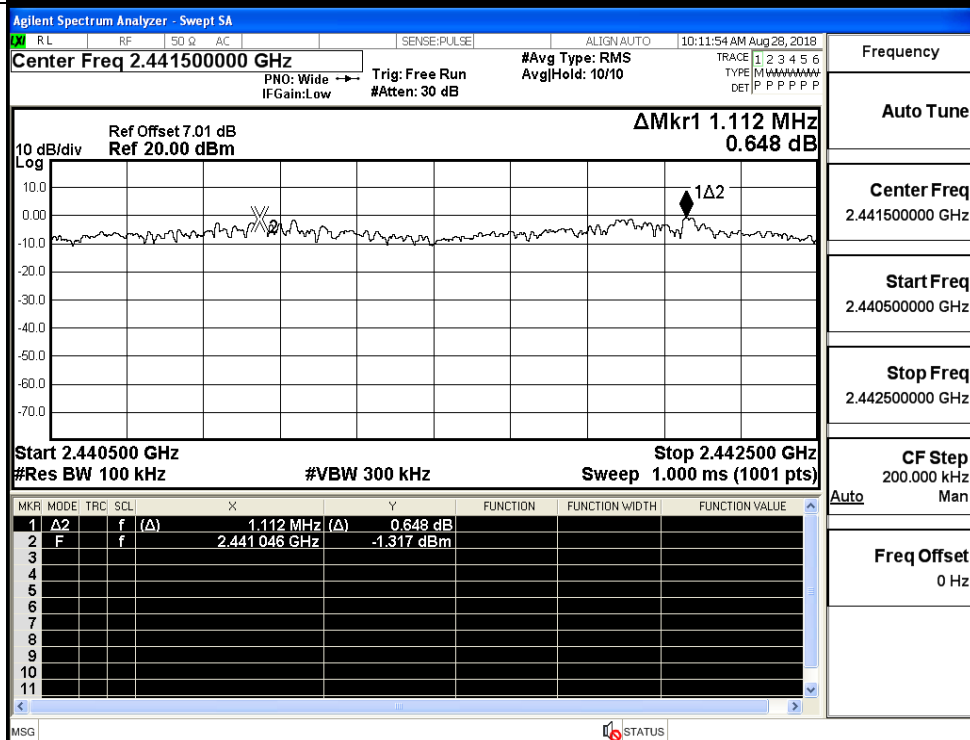


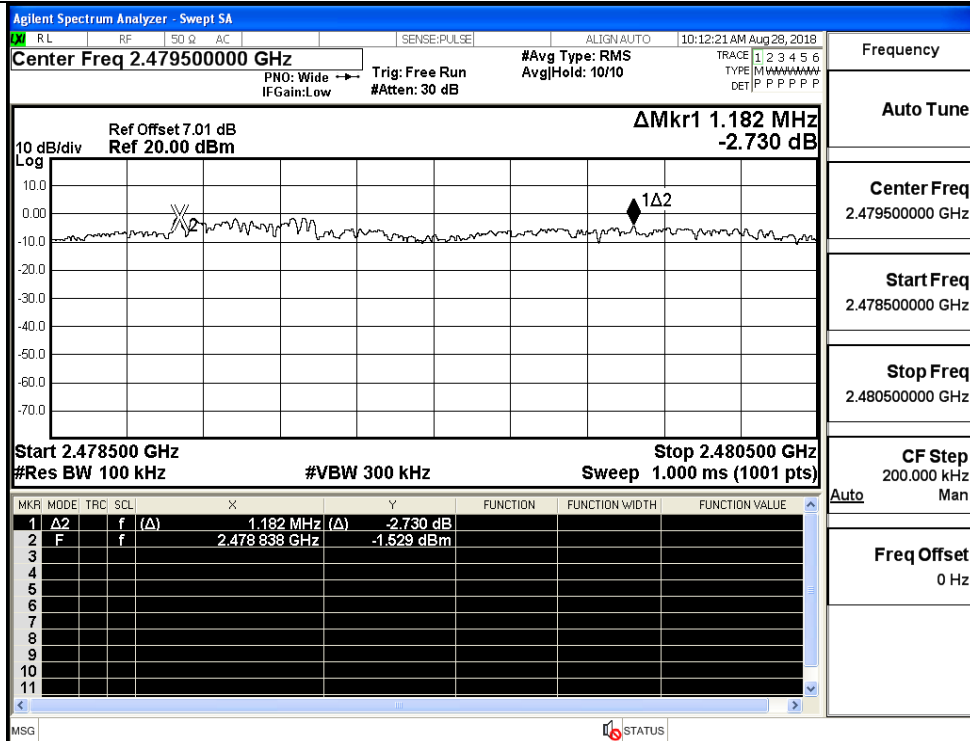
GFSK/MCH



GFSK/HCH



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

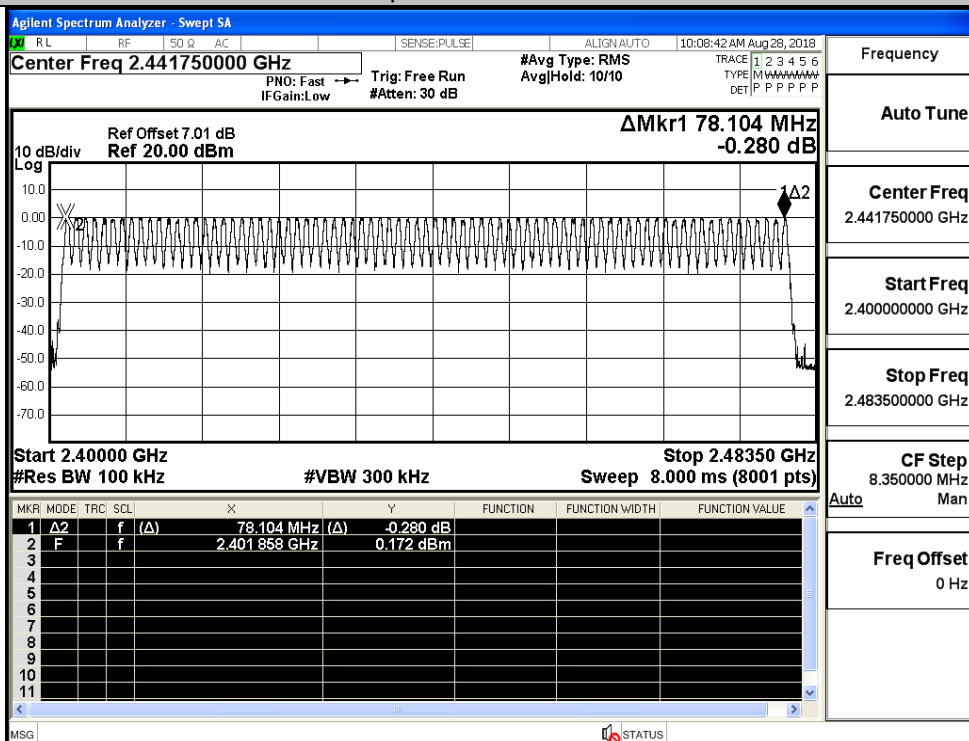
$\pi/4$ DQPSK/HCH

## 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    |

## Test Graphs

GFSK/Hop



Frequency

Auto Tune

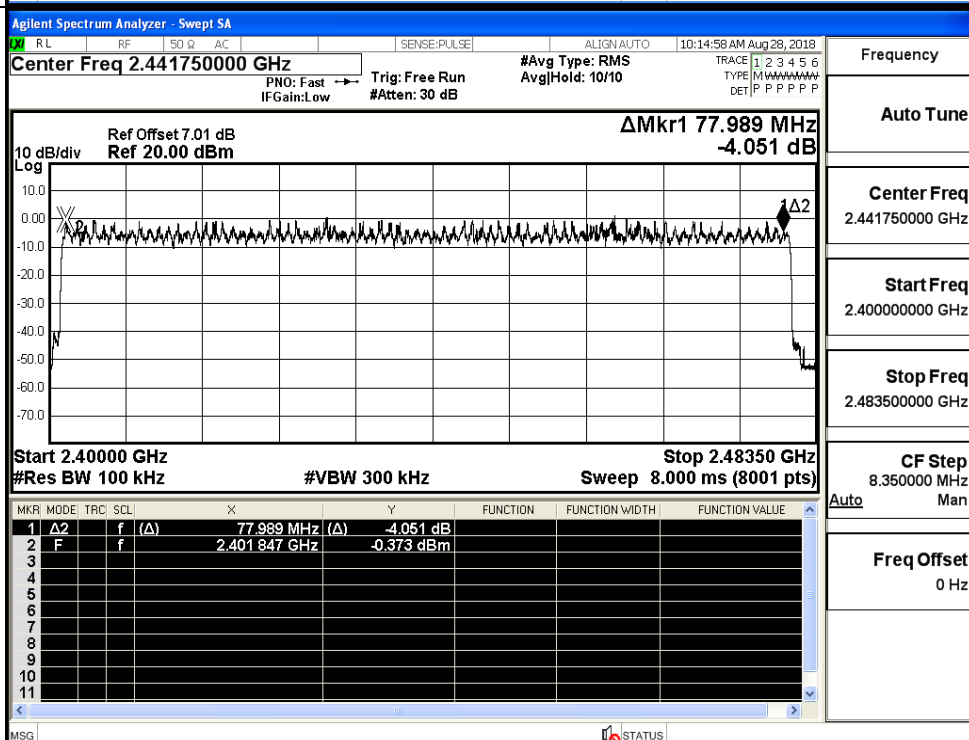
Center Freq  
2.441750000 GHz

Start Freq  
2.400000000 GHz

Stop Freq  
2.483500000 GHz

CF Step  
8.350000 MHz  
Man

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  
Man

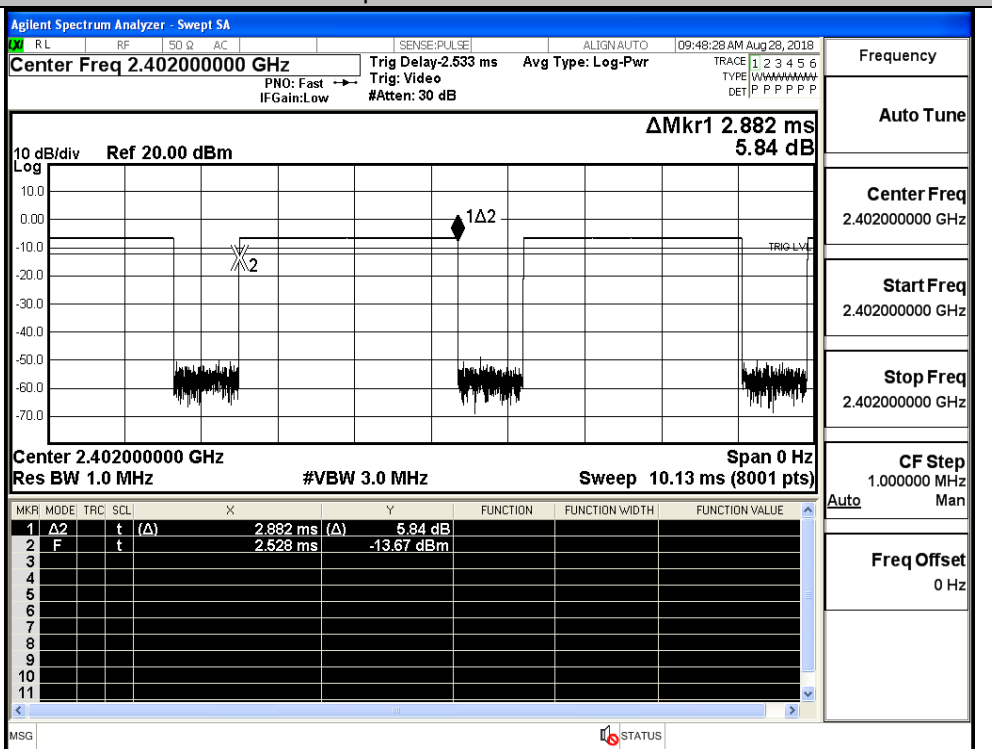
Freq Offset  
0 Hz

## A.5 Dwell Time

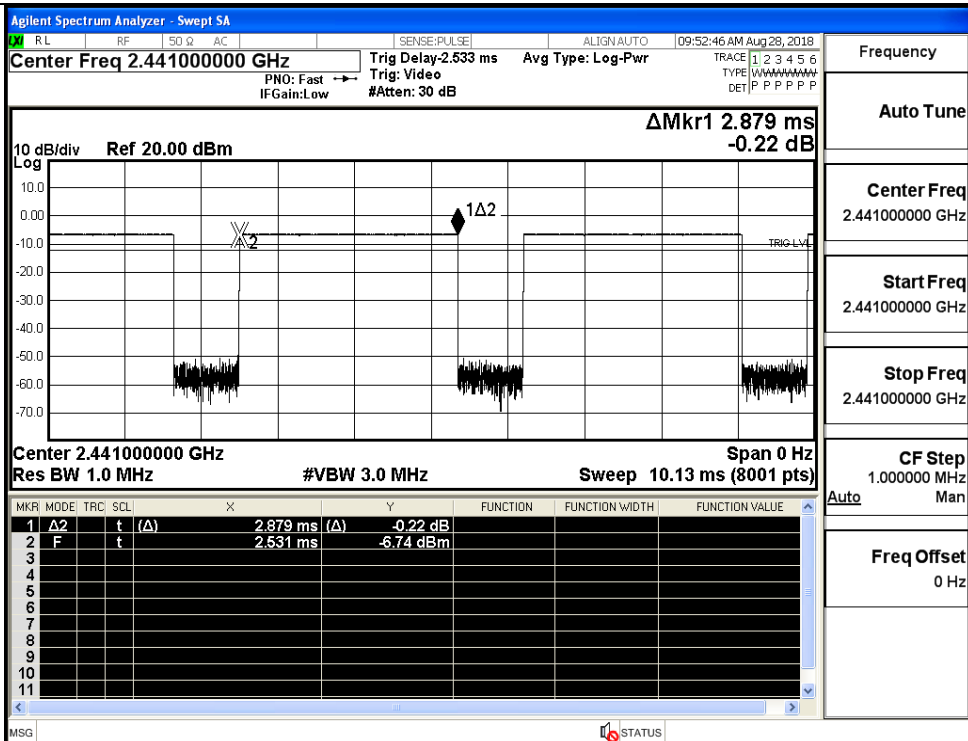
| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|---------------|-----------|---------|
| GFSK          | DH5    | LCH     | 2.88   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

## Test Graphs

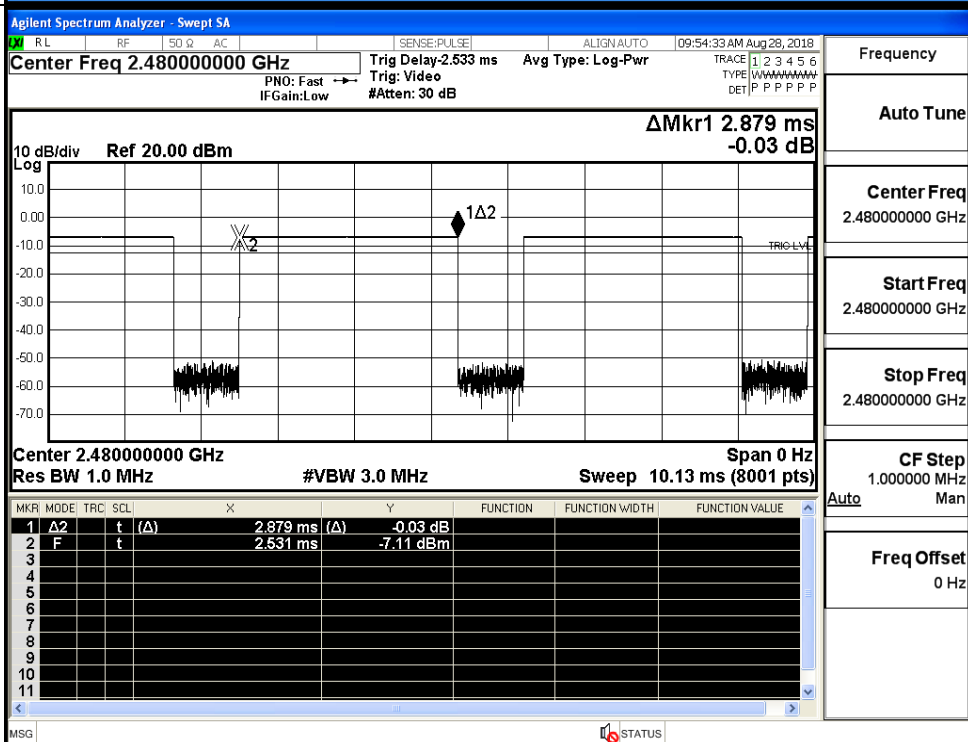
GFSK\_DH5/LCH



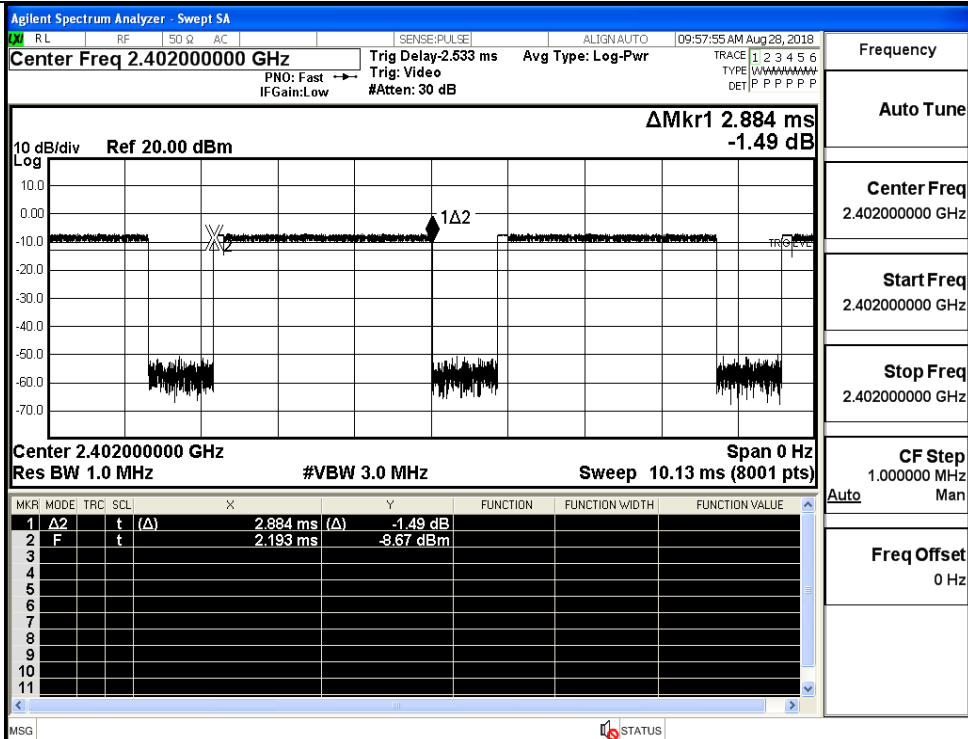
GFSK\_DH5/MCH



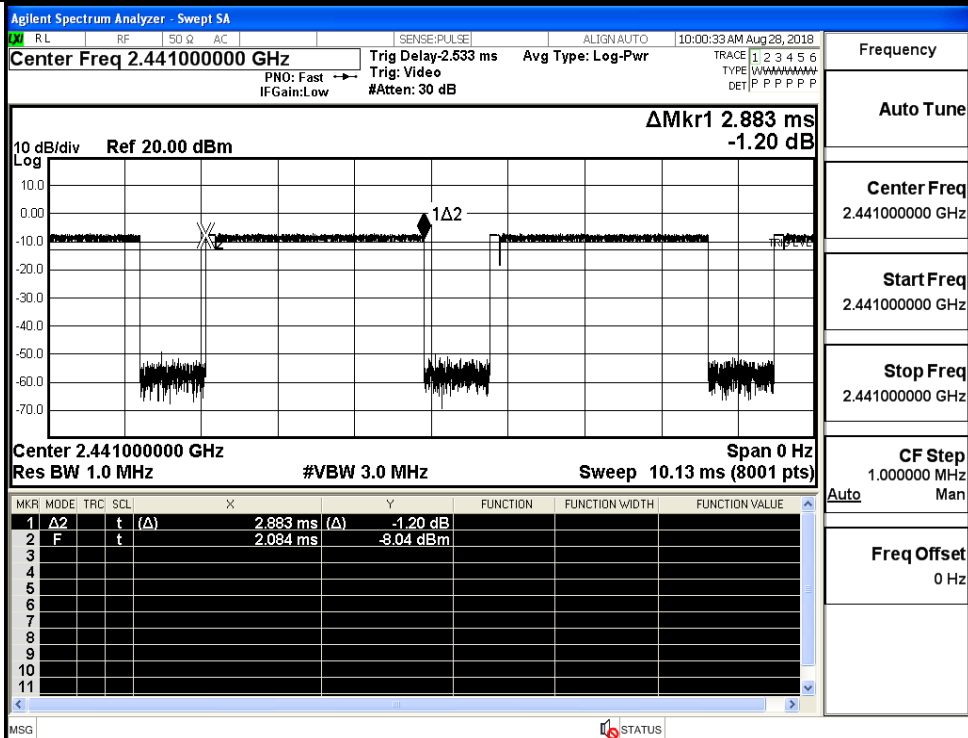
GFSK\_DH5/HCH



$\pi/4$ DQPSK  
\_2DH5/LCH



$\pi/4$ DQPSK  
\_2DH5/MCH



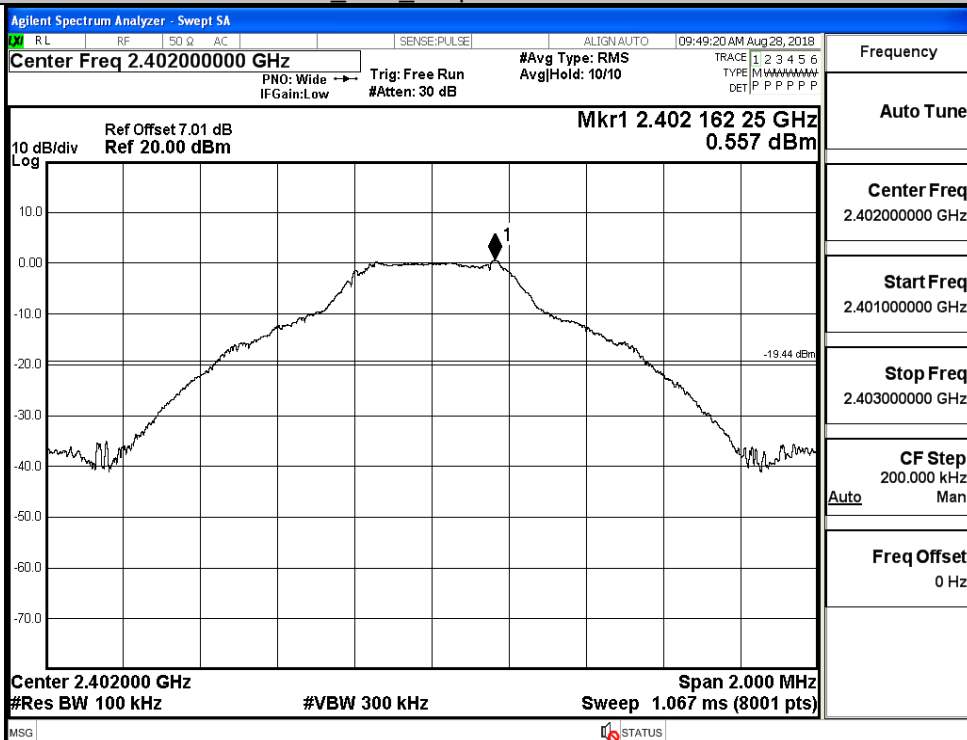
[illegible]

## A.6 RF Conducted Spurious Emissions

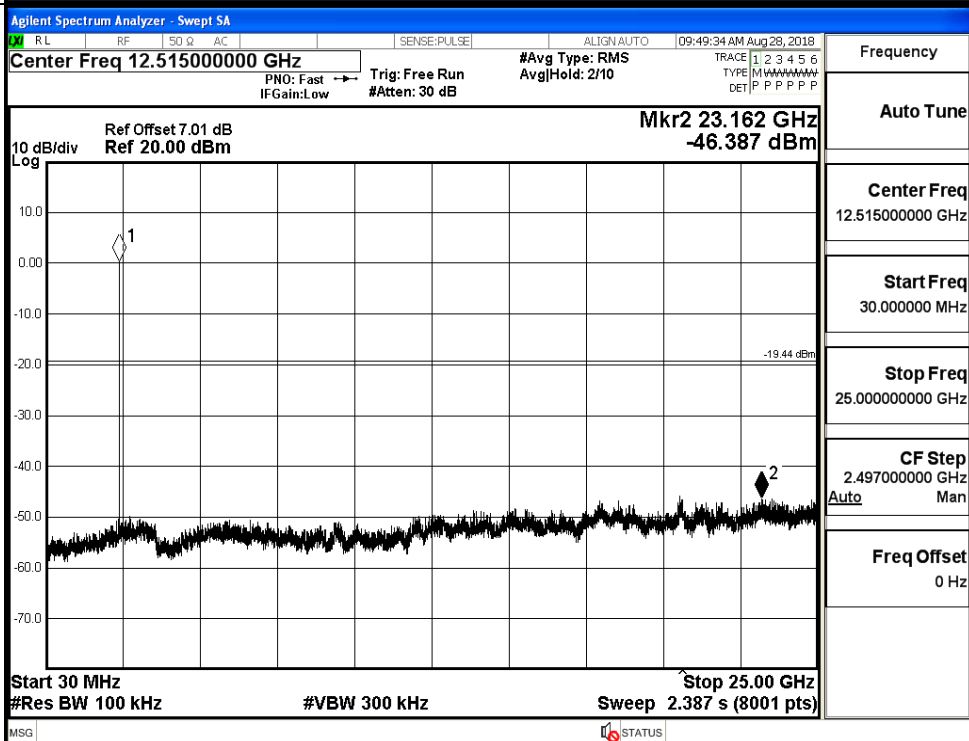
| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | 0.557      | -46.387          | -19.443     | PASS    |
|               | MCH     | 0.374      | -45.743          | -19.626     | PASS    |
|               | HCH     | 0.174      | -45.856          | -19.826     | PASS    |
| $\pi/4$ DQPSK | LCH     | -0.571     | -45.896          | -20.571     | PASS    |
|               | MCH     | -0.716     | -45.113          | -20.716     | PASS    |
|               | HCH     | -0.898     | -45.479          | -20.898     | PASS    |

## GFSK LCH Graphs

Pref

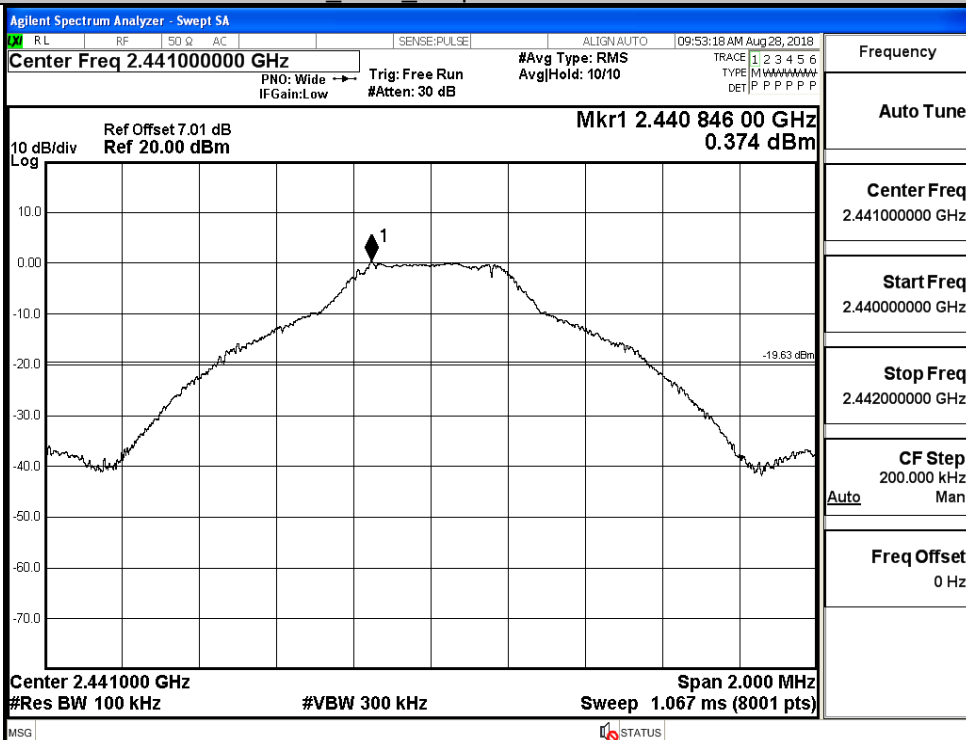


Puw

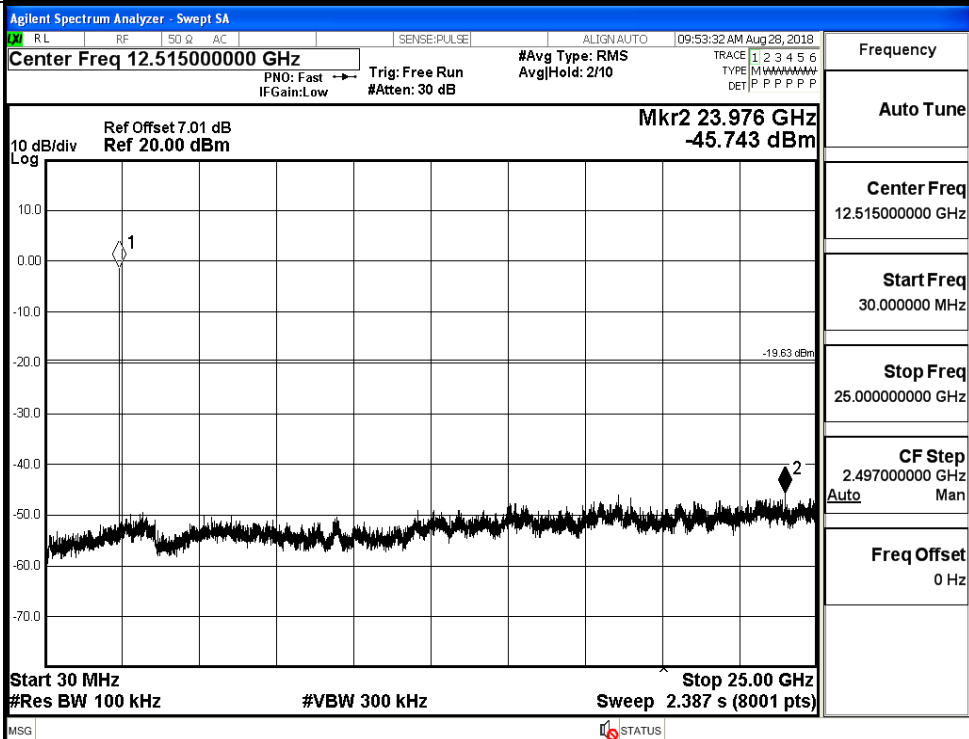


## GFSK\_MCH\_Graphs

Pref

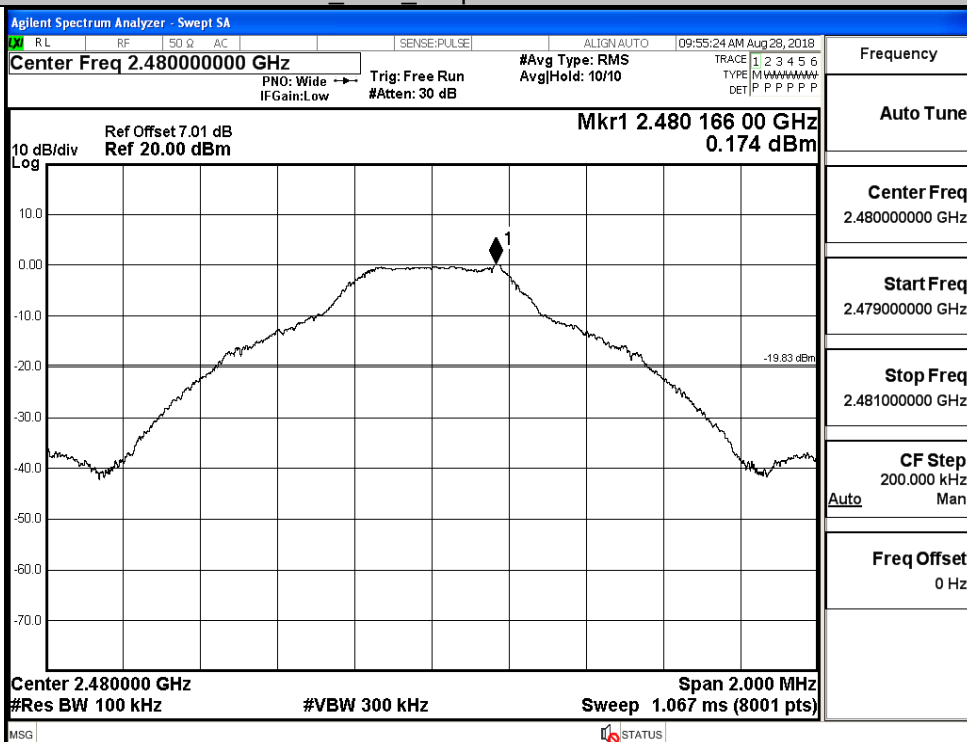


Puw

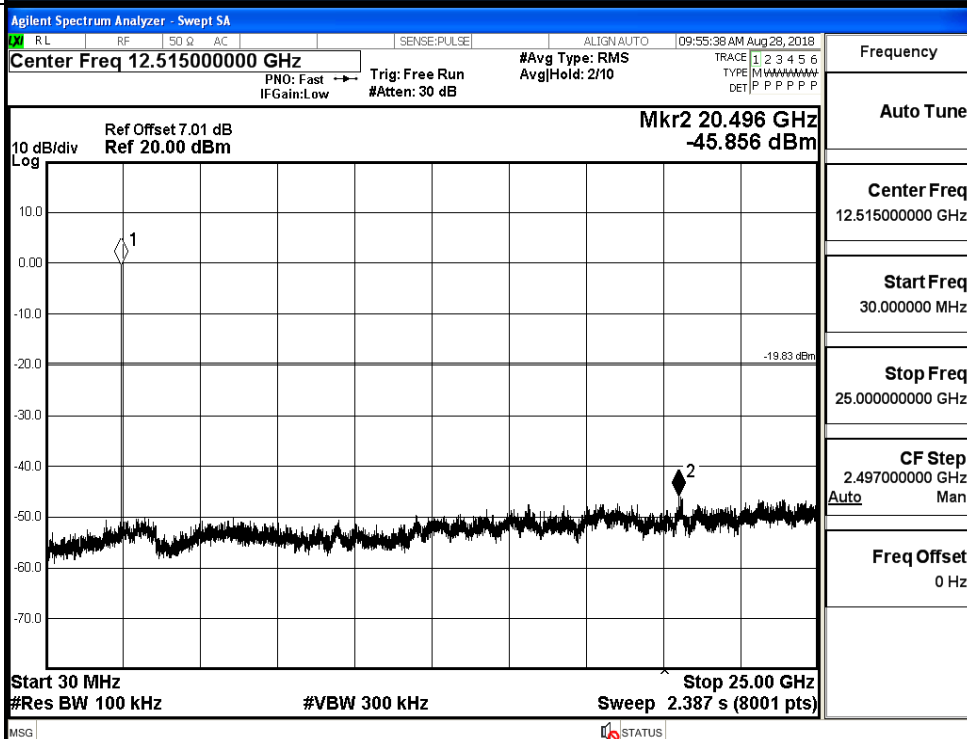


## GFSK\_HCH\_Graphs

Pref

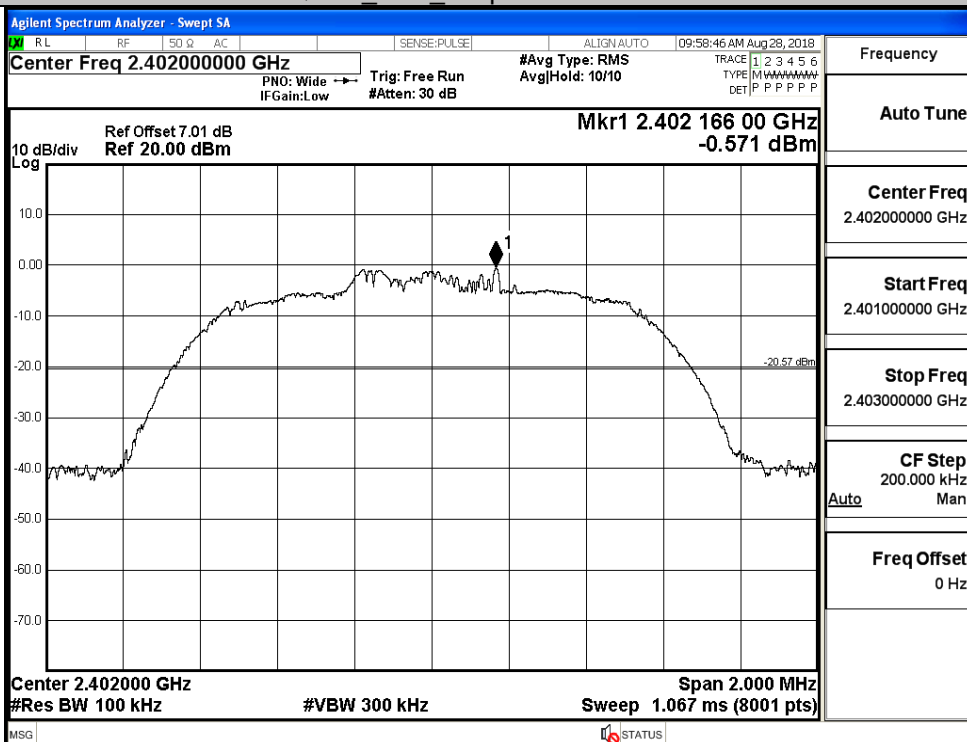


Puw

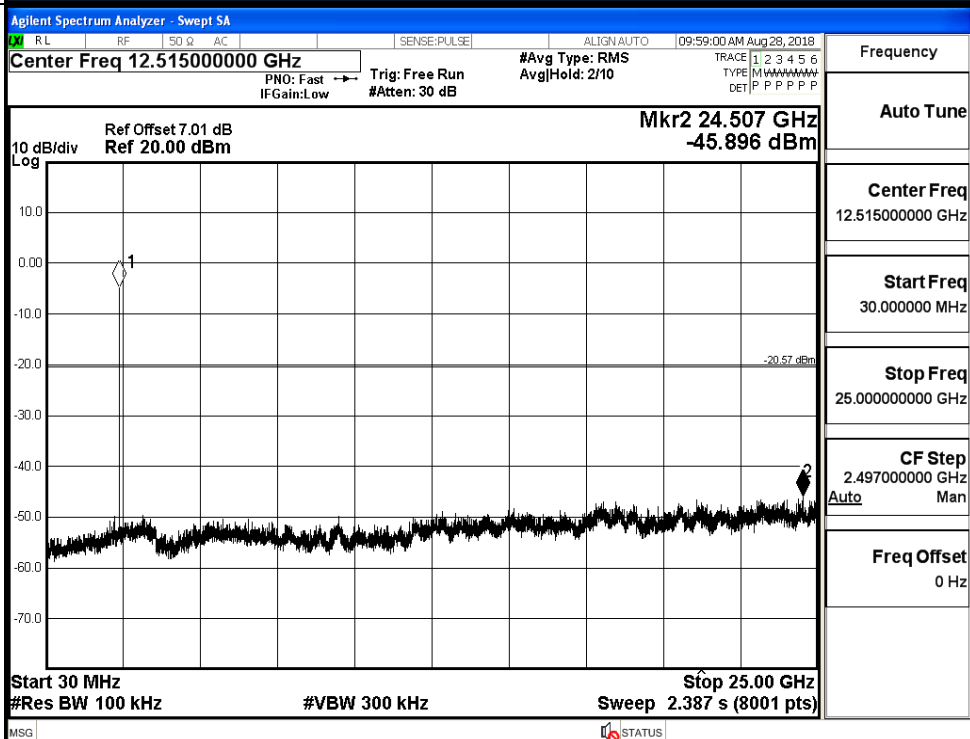


$\pi$ /4DQPSK LCH\_Graphs

Pref

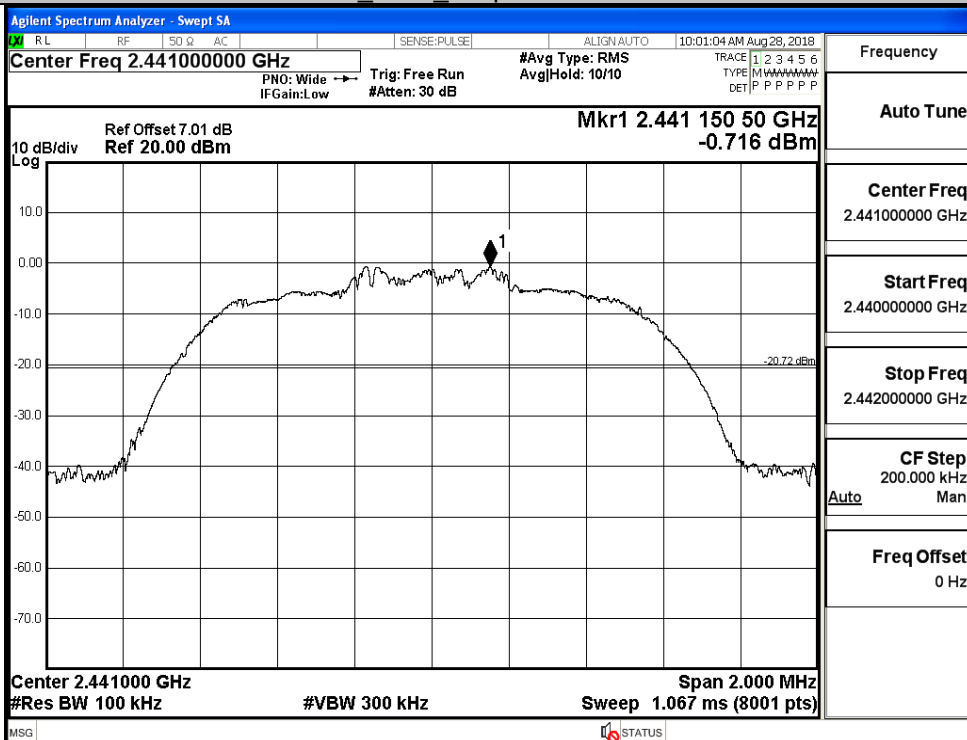


Puw

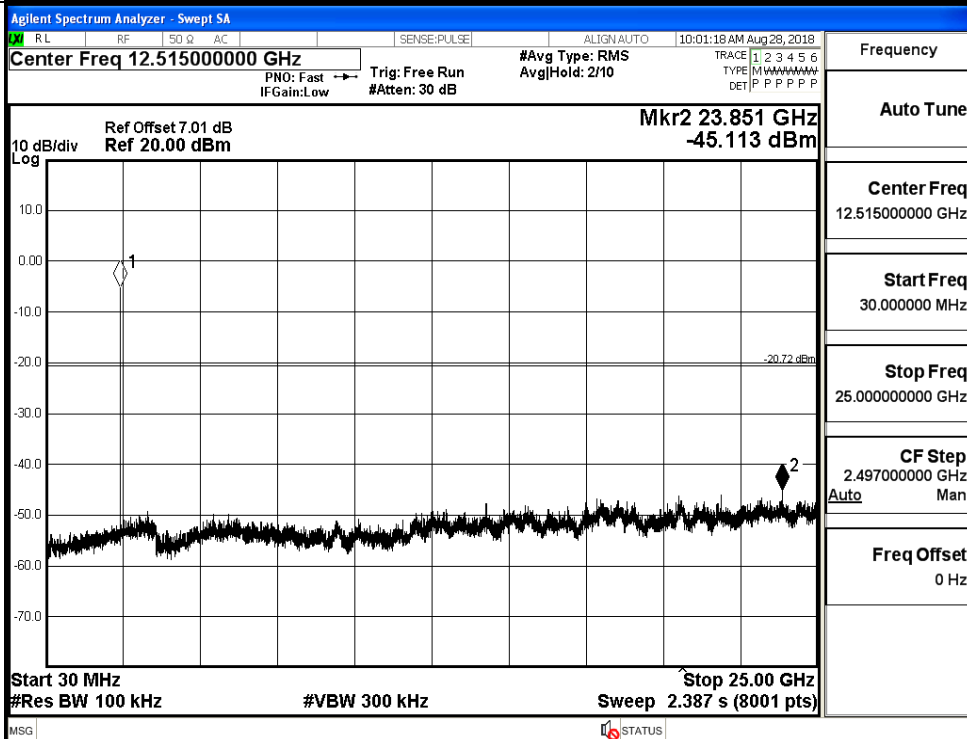


$\pi$ /4DQPSK\_MCH\_Graphs

Pref

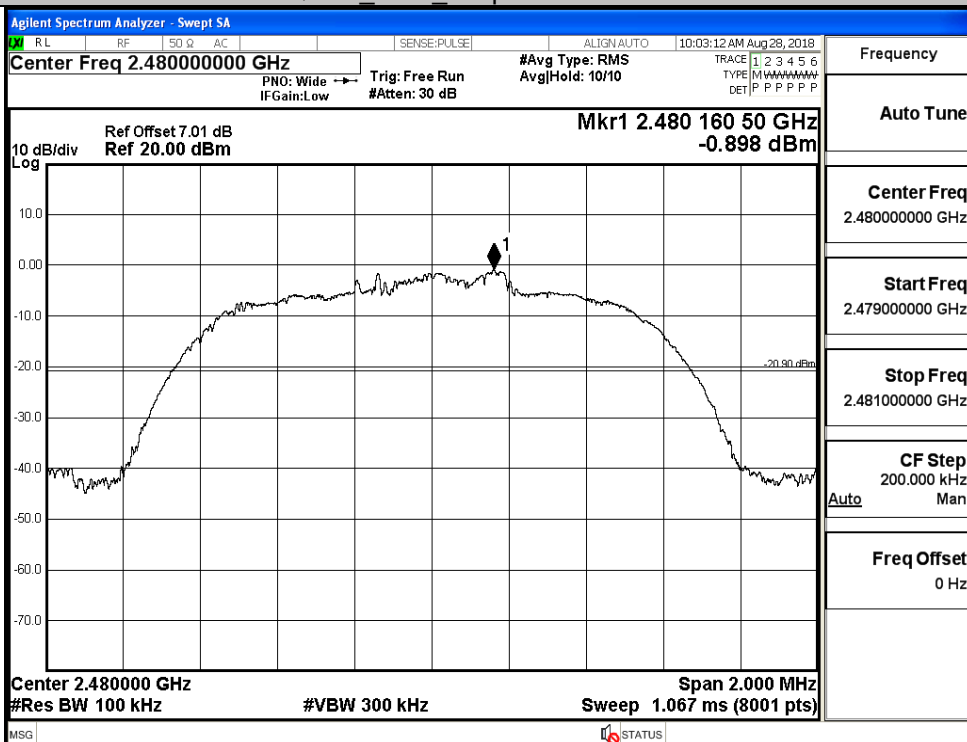


Puw

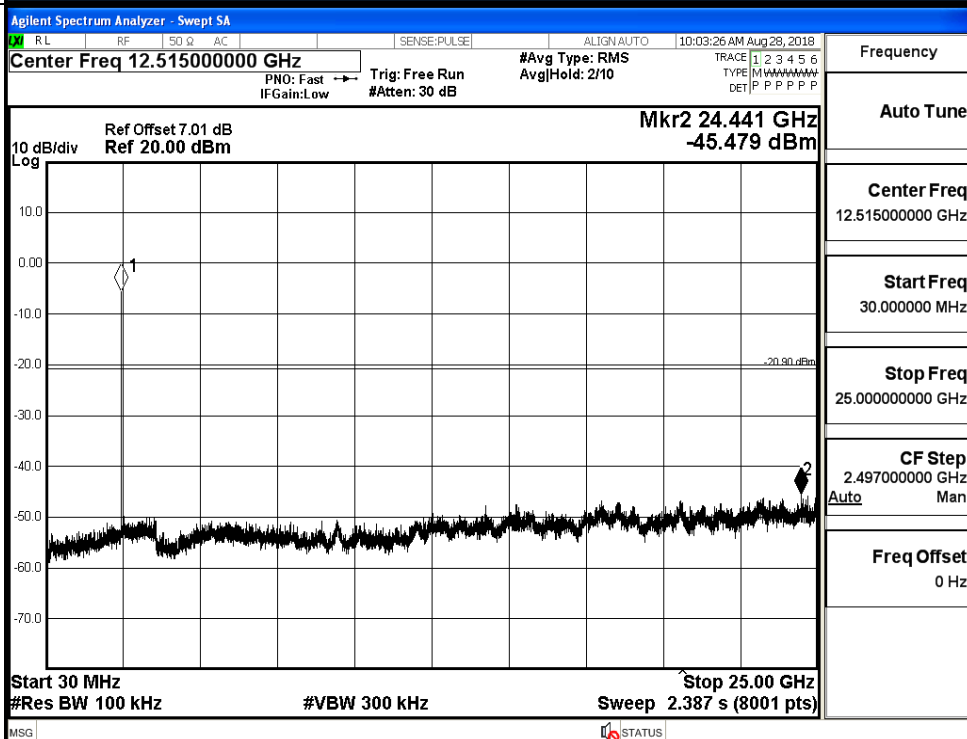


$\pi/4$ DQPSK\_HCH\_Graphs

Pref



Puw

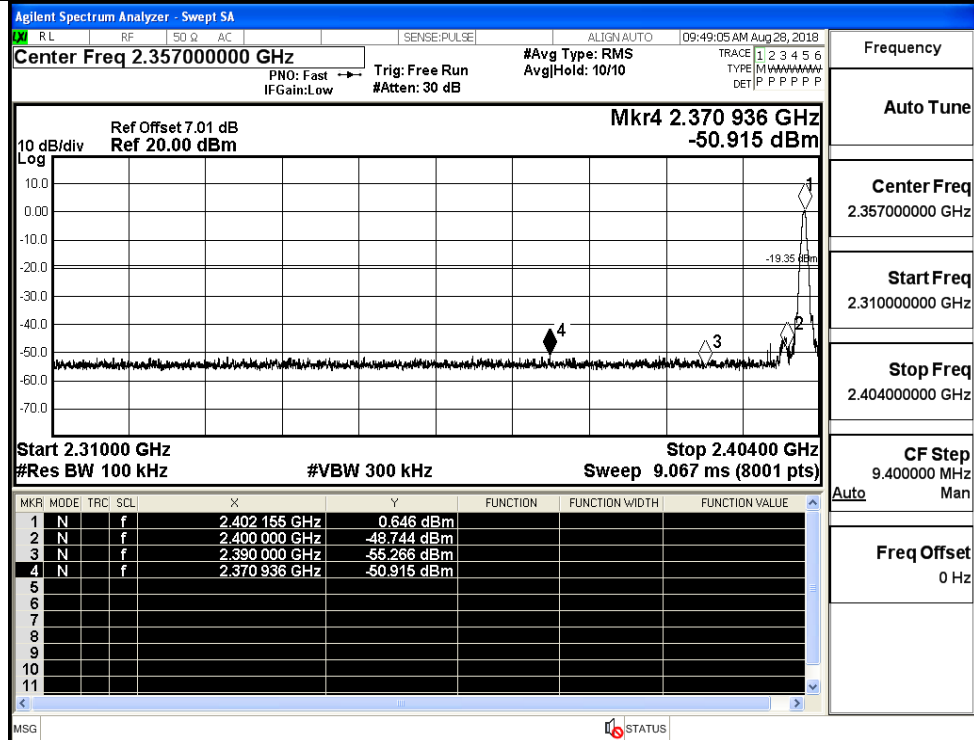


## A.7 Band-edge for RF Conducted Emissions

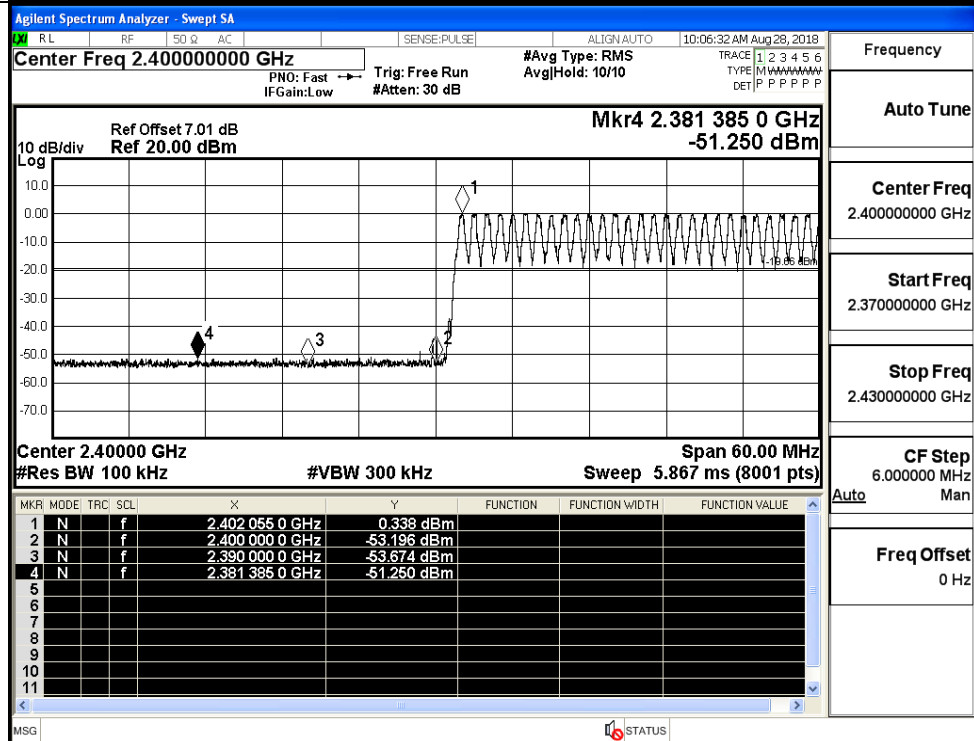
| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | 0.646               | Off               | -50.915                  | -19.35      | PASS    |
|               |         |                         | 0.338               | On                | -51.250                  | -19.66      | PASS    |
|               | HCH     | 2480                    | 0.007               | Off               | -50.470                  | -19.99      | PASS    |
|               |         |                         | 0.217               | On                | -50.903                  | -19.78      | PASS    |
| $\pi/4$ DQPSK | LCH     | 2402                    | -0.405              | Off               | -50.868                  | -20.41      | PASS    |
|               |         |                         | -0.511              | On                | -50.596                  | -20.51      | PASS    |
|               | HCH     | 2480                    | -0.800              | Off               | -36.155                  | -20.8       | PASS    |
|               |         |                         | -0.830              | On                | -50.962                  | -18.78      | PASS    |

## Test Graphs

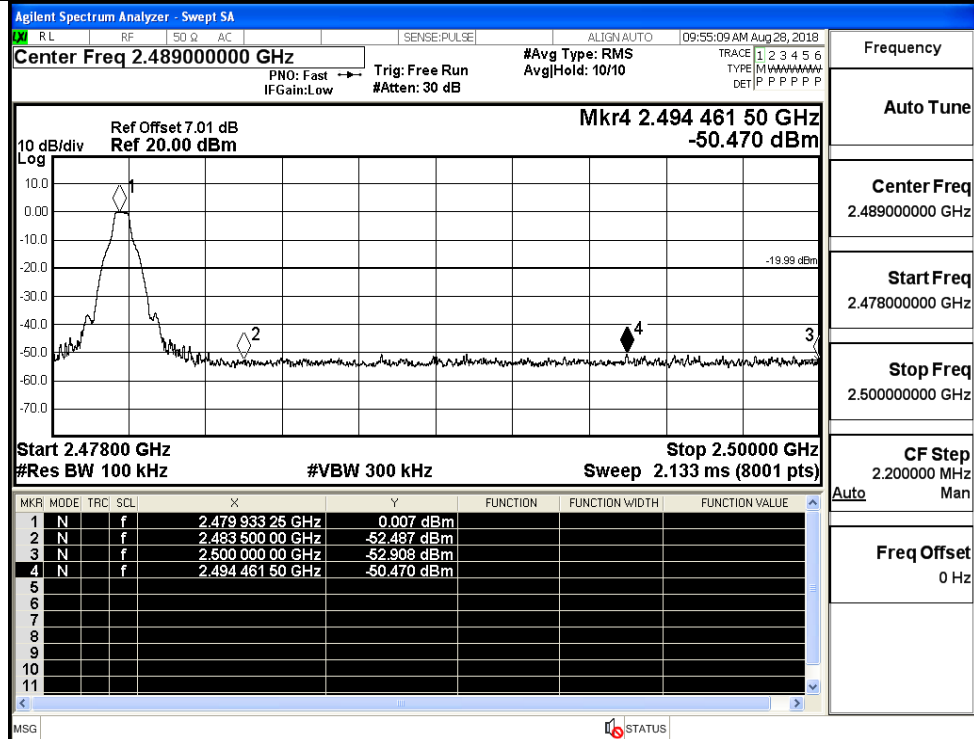
GFSK/LCH/No Hop



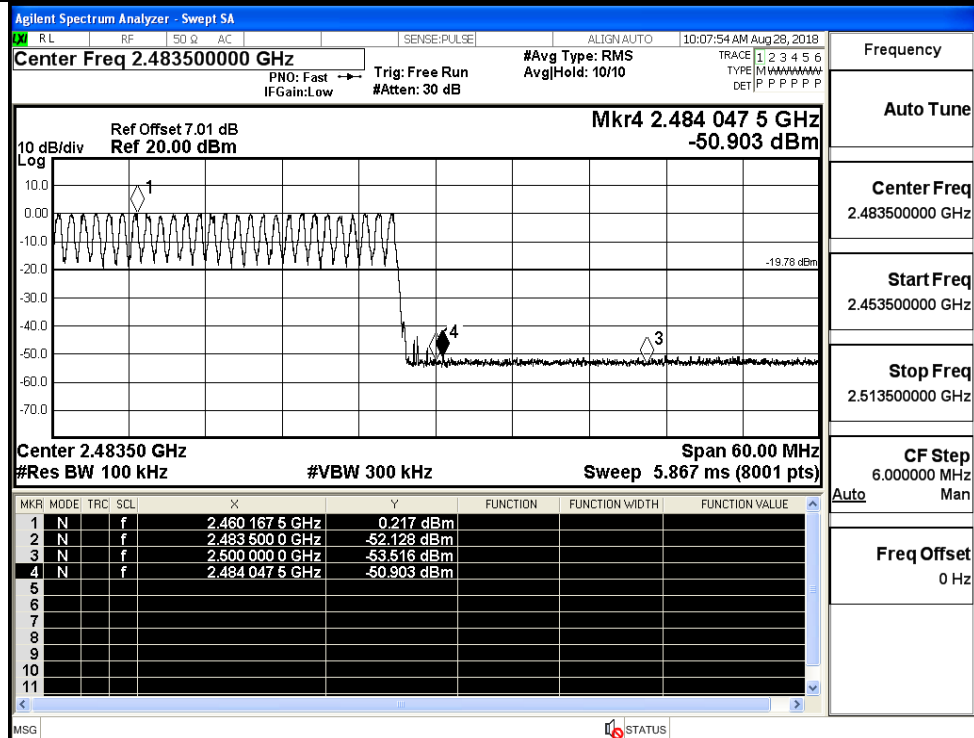
GFSK/LCH/Hop



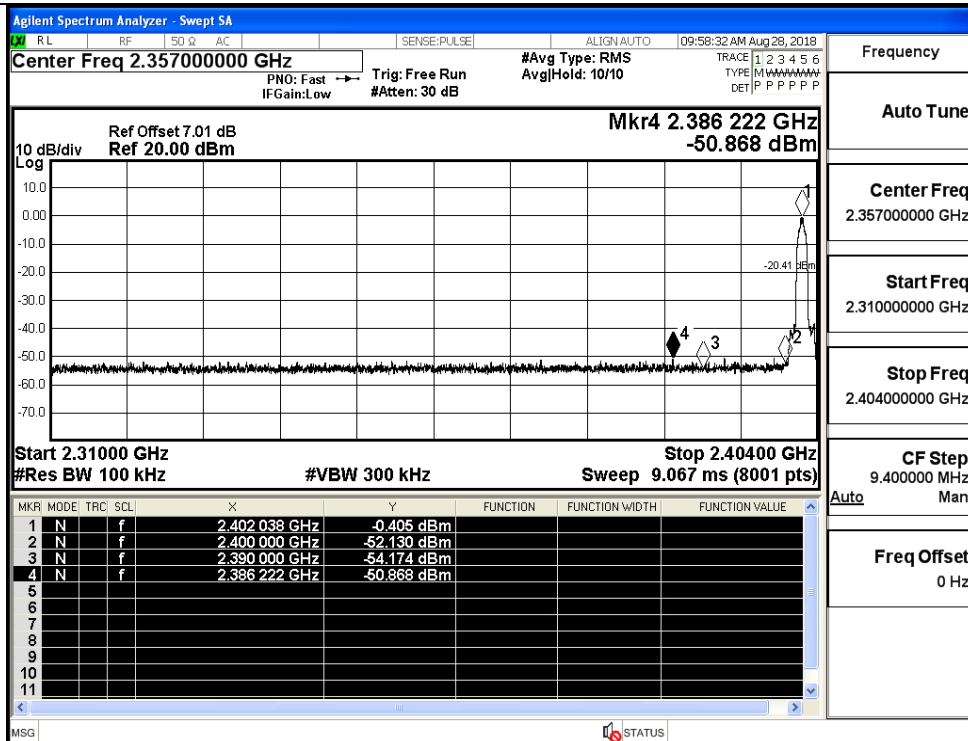
GFSK/HCH/No Hop



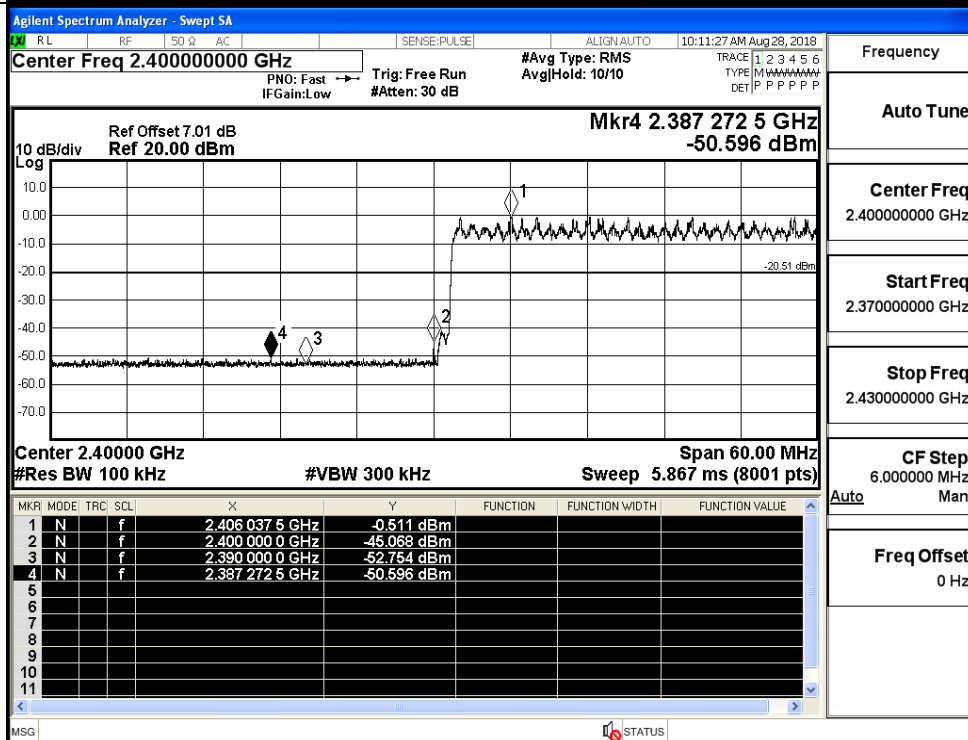
GFSK/HCH/Hop



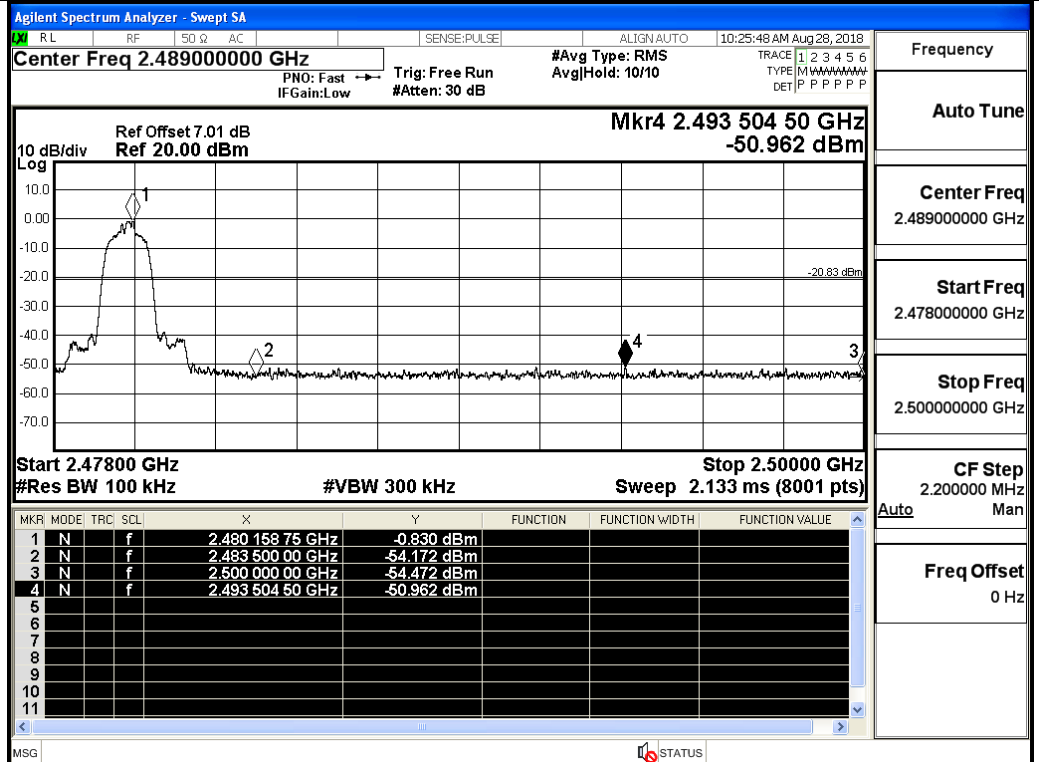
$\pi/4$ DQPSK/LCH/No  
Hop



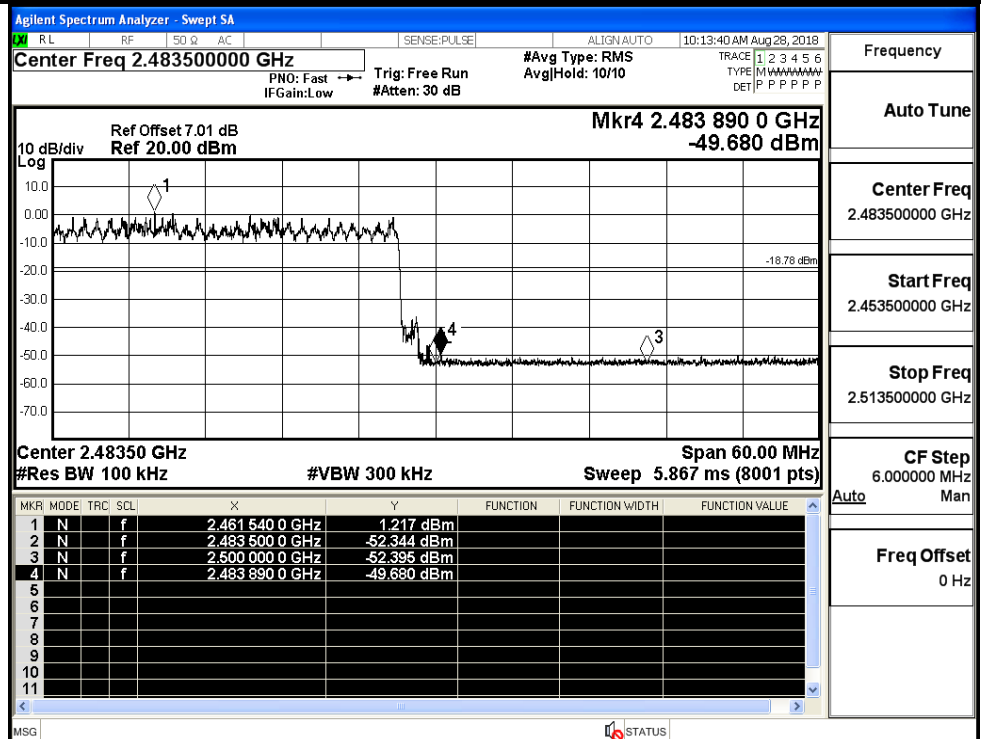
$\pi/4$ DQPSK/LCH/Hop



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



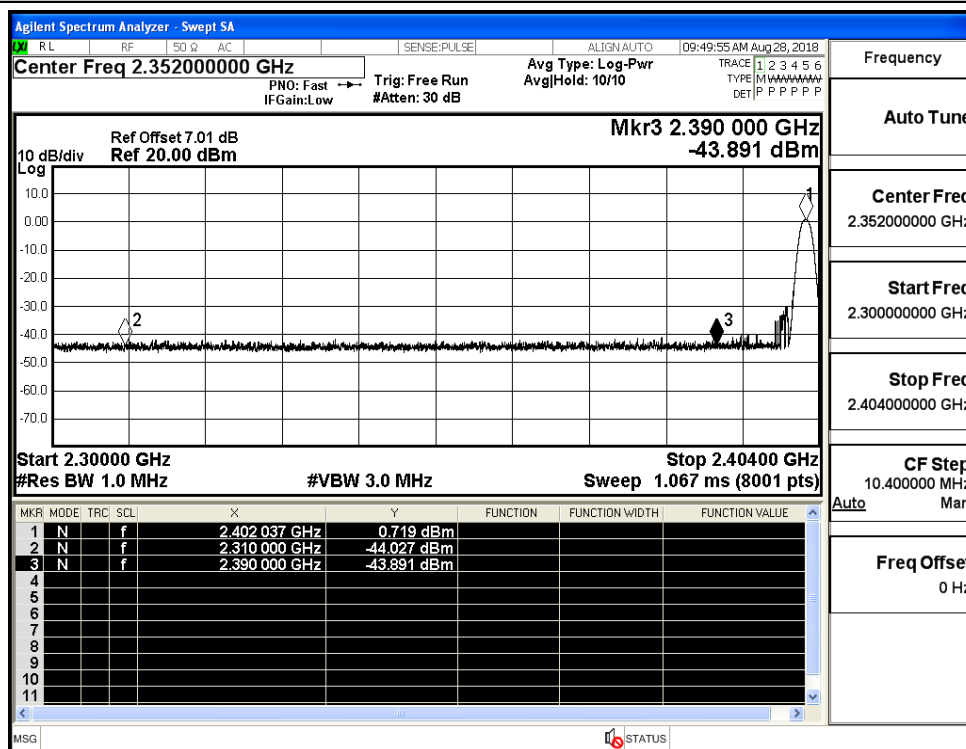
$\pi/4$ DQPSK/HCH/Hop



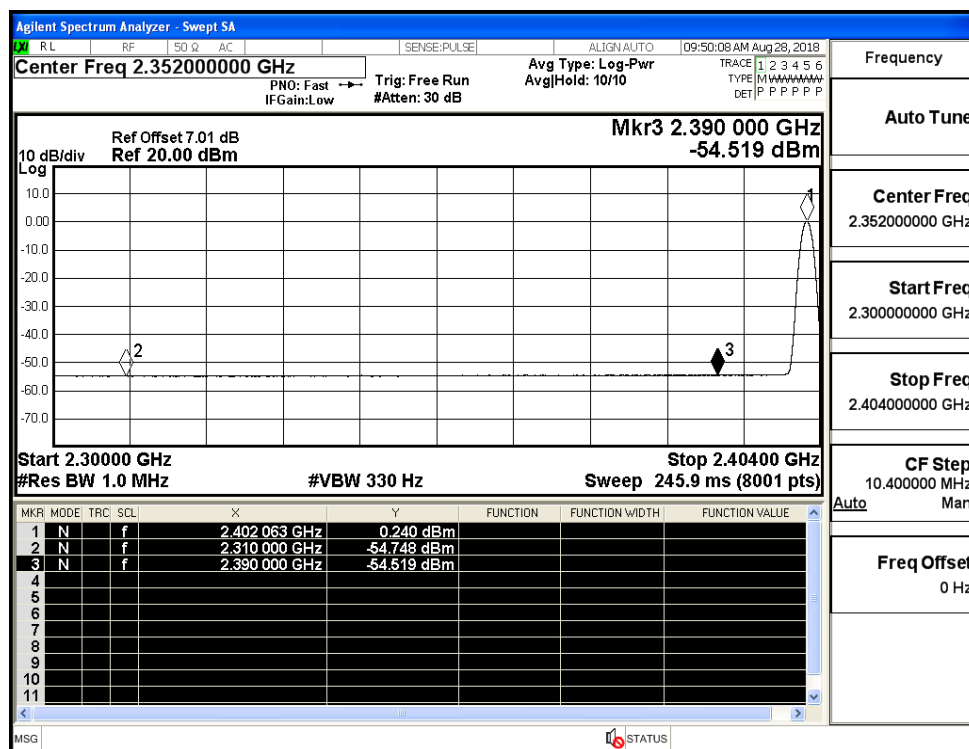
## A.8 Restrict-band band-edge measurements

| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -44.03      | 2.0  | 0             | 51.23      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -54.75      | 2.0  | 0             | 40.51      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.89      | 2.0  | 0             | 51.37      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -54.52      | 2.0  | 0             | 40.74      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.95      | 2.0  | 0             | 51.31      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -54.15      | 2.0  | 0             | 41.10      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -43.30      | 2.0  | 0             | 51.95      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -53.97      | 2.0  | 0             | 41.29      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -44.19      | 2.0  | 0             | 51.07      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -54.80      | 2.0  | 0             | 40.46      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -42.17      | 2.0  | 0             | 53.09      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -54.37      | 2.0  | 0             | 40.89      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -44.13      | 2.0  | 0             | 51.13      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -54.14      | 2.0  | 0             | 41.12      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -44.07      | 2.0  | 0             | 51.19      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -54.07      | 2.0  | 0             | 41.19      | AV       | 54             | PASS    |

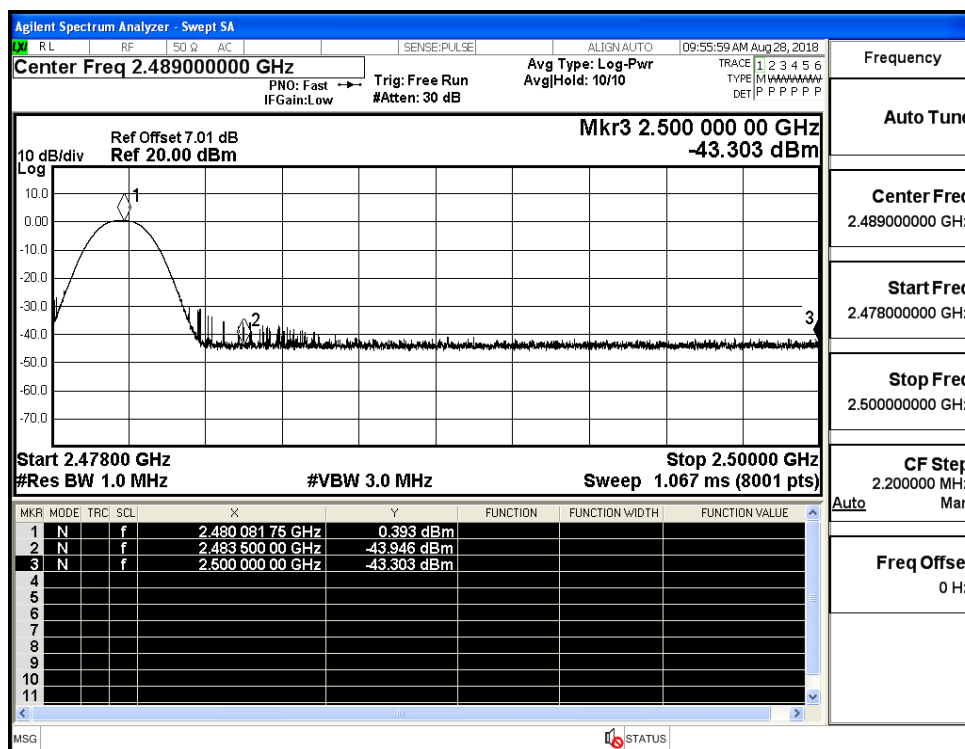
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



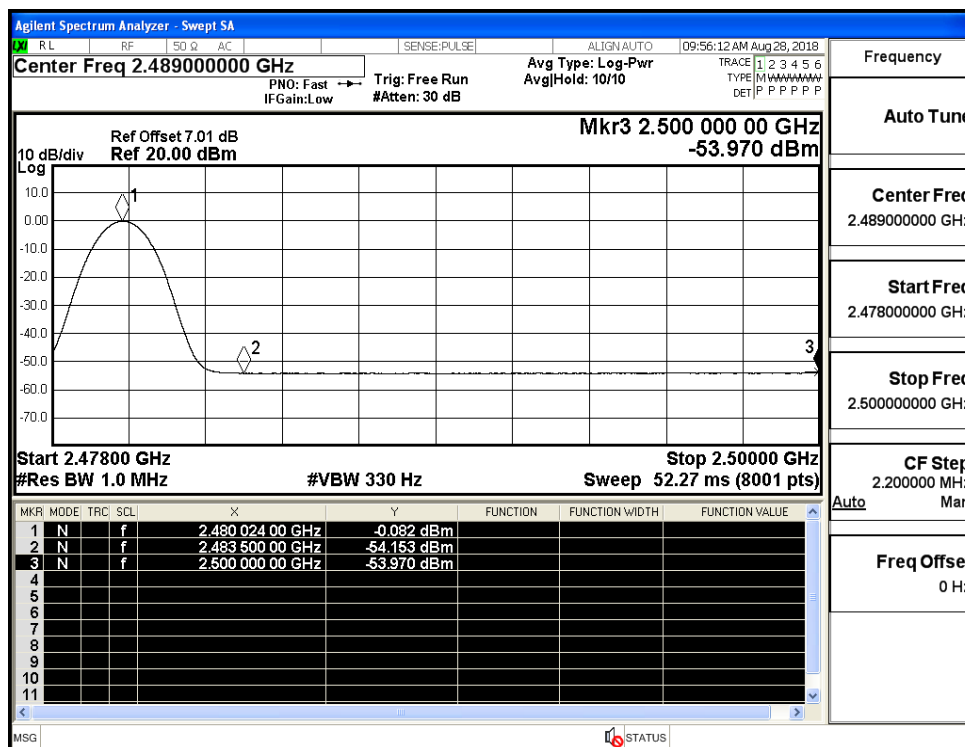
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)

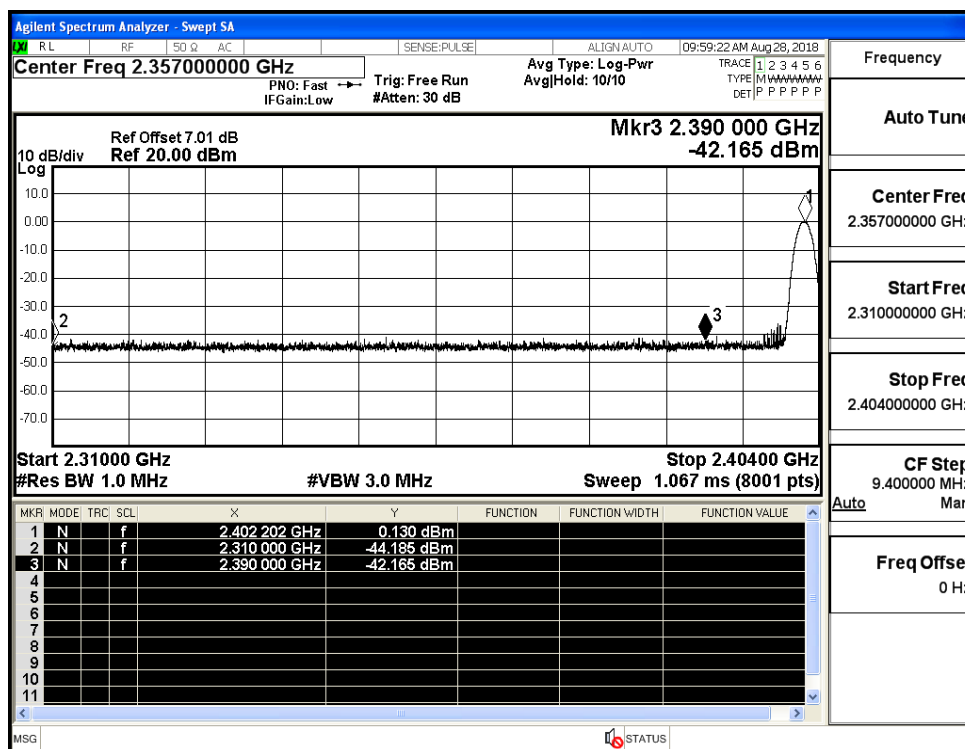
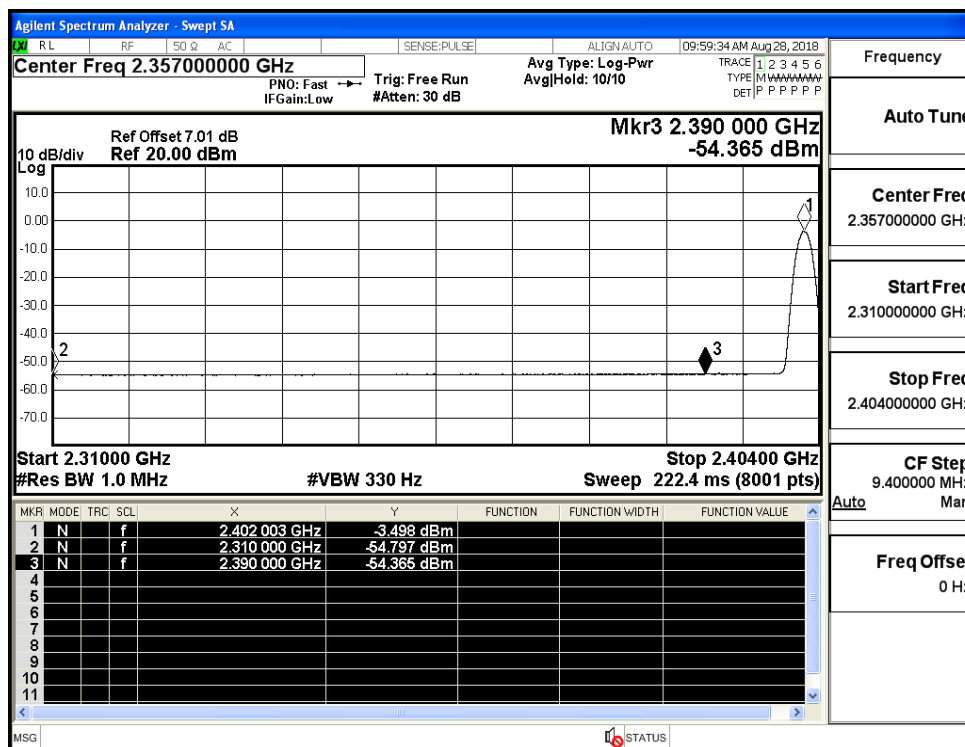


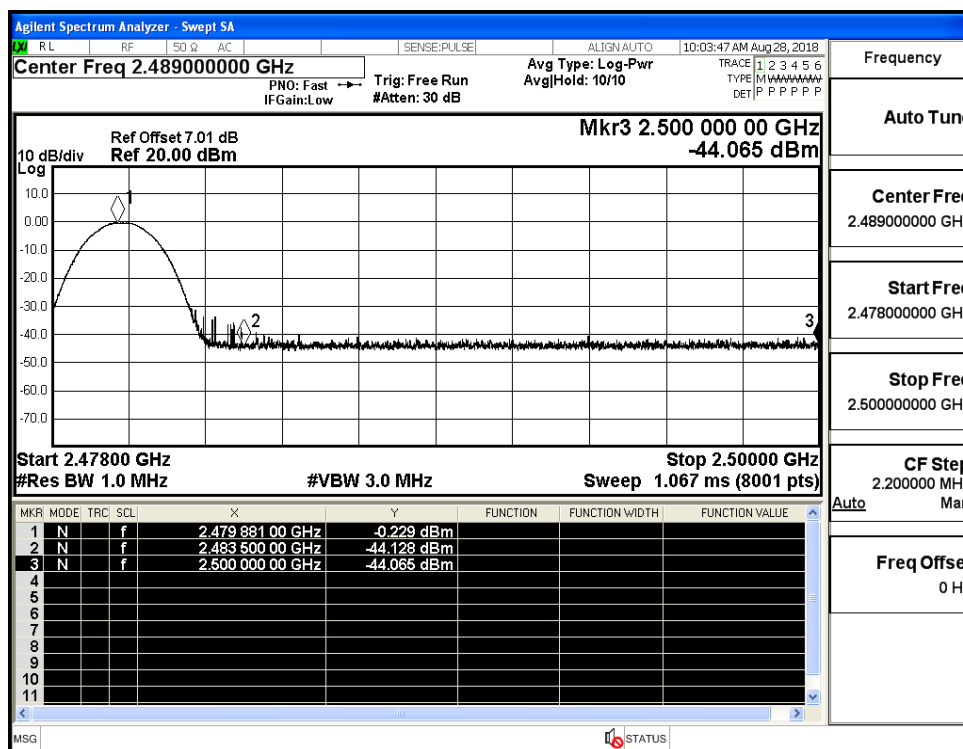
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



## 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)