

## Appendix A

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

Product Name: Multi-Function Light with Wireless Speaker

Trade Mark: N/A

Test Model: UE2881

#### Environmental Conditions

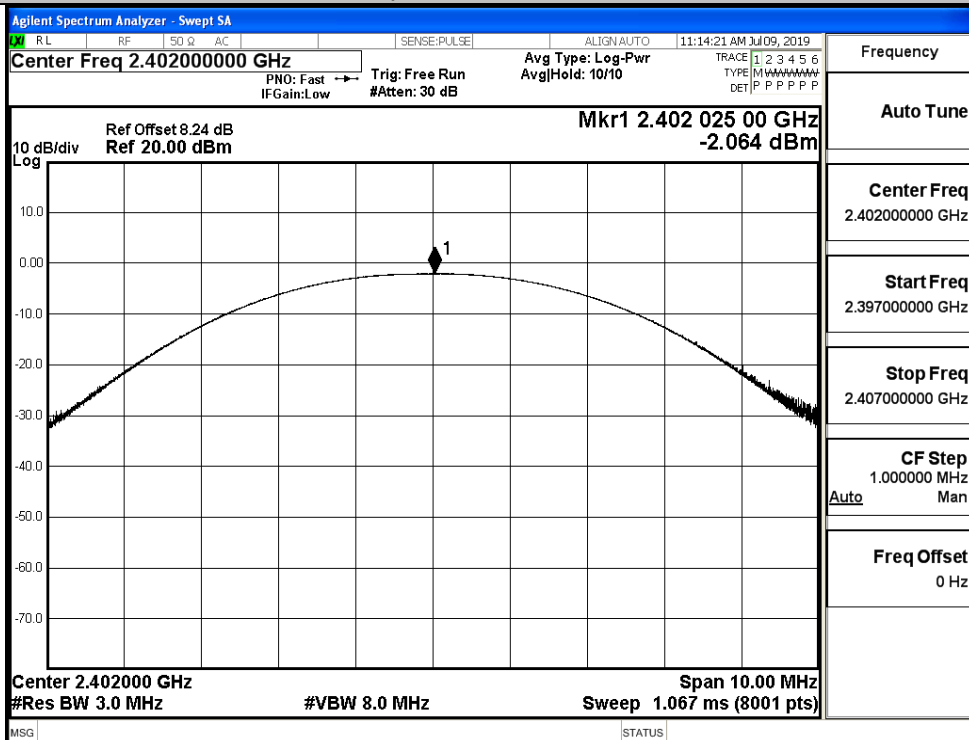
|                    |             |
|--------------------|-------------|
| Temperature:       | 24.6° C     |
| Relative Humidity: | 53.7%       |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | JERRY.ZENG  |
| Supervised by:     | Wang.Chuang |

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

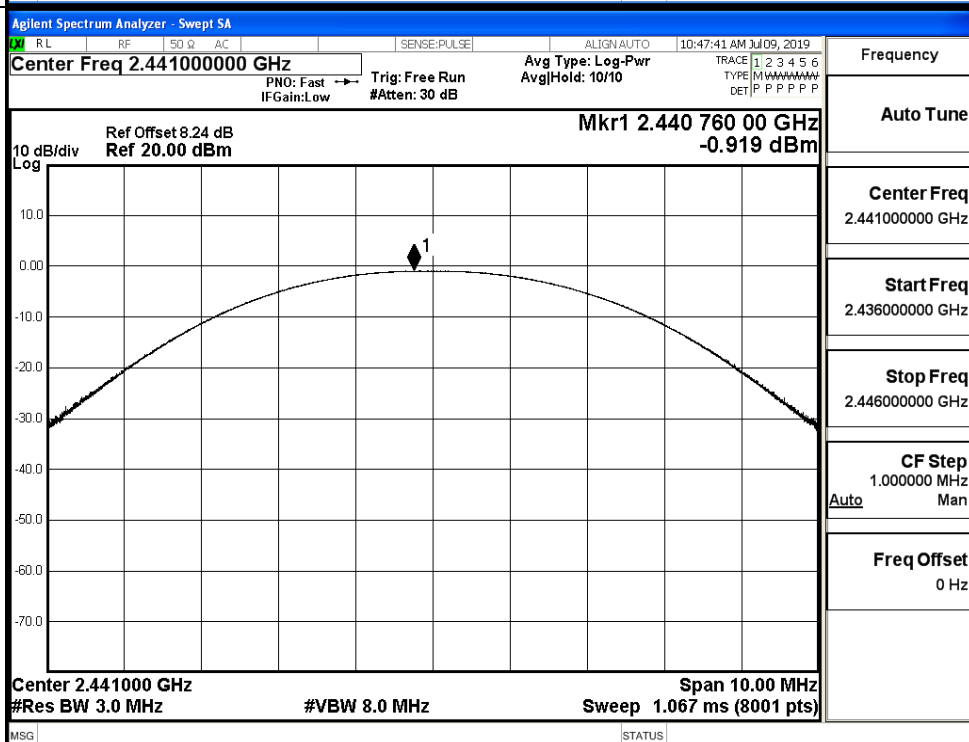
| Mode          | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK          | LCH      | -2.064                          | 30          | PASS    |
|               | MCH      | -0.919                          | 30          | PASS    |
|               | HCH      | -1.465                          | 30          | PASS    |
| $\pi/4$ DQPSK | LCH      | -2.498                          | 21          | PASS    |
|               | MCH      | -1.176                          | 21          | PASS    |
|               | HCH      | -1.927                          | 21          | PASS    |

## Test Graphs

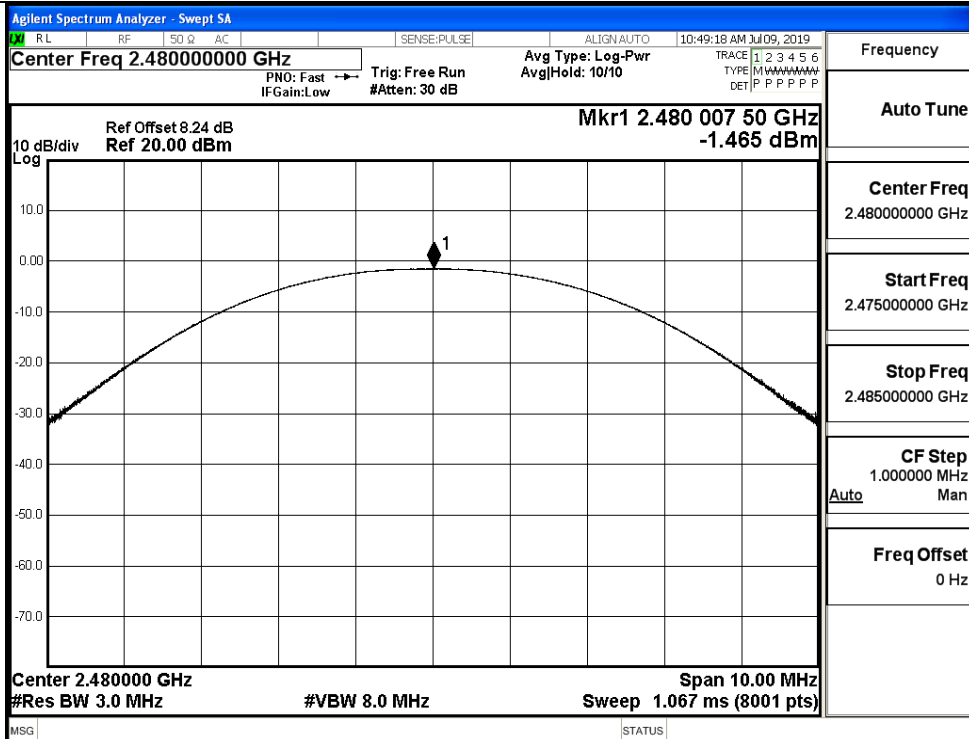
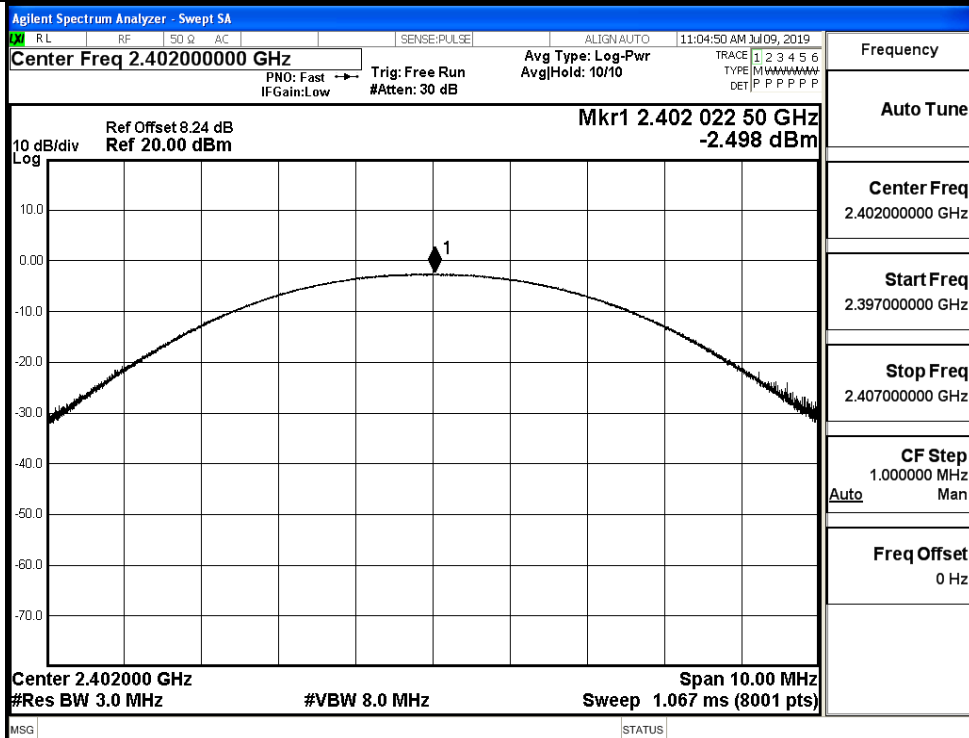
GFSK/LCH

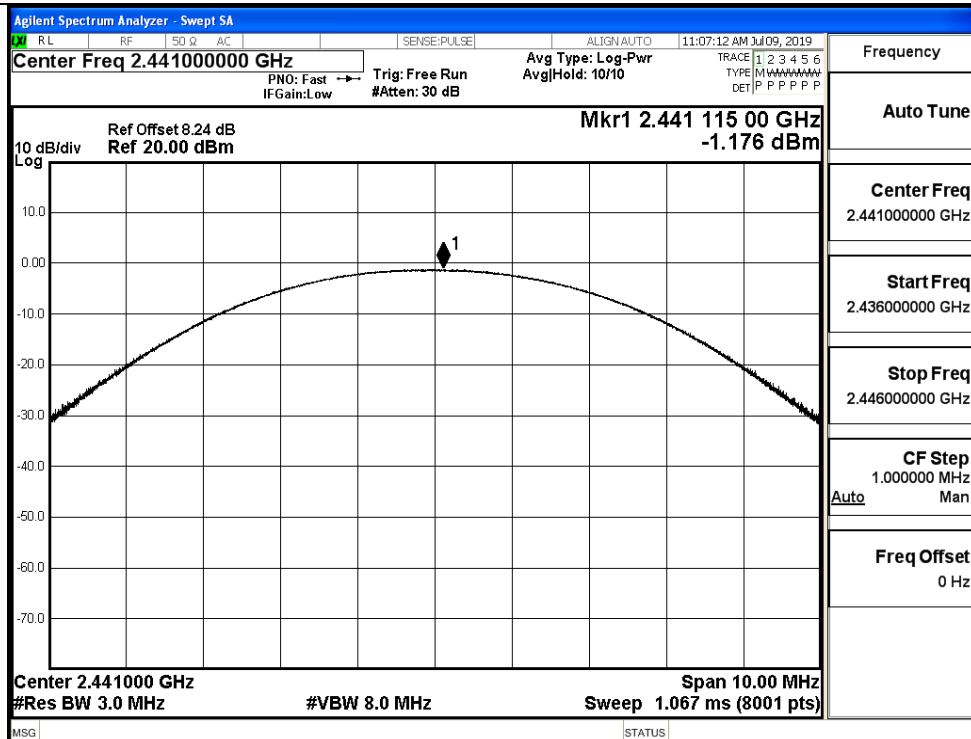
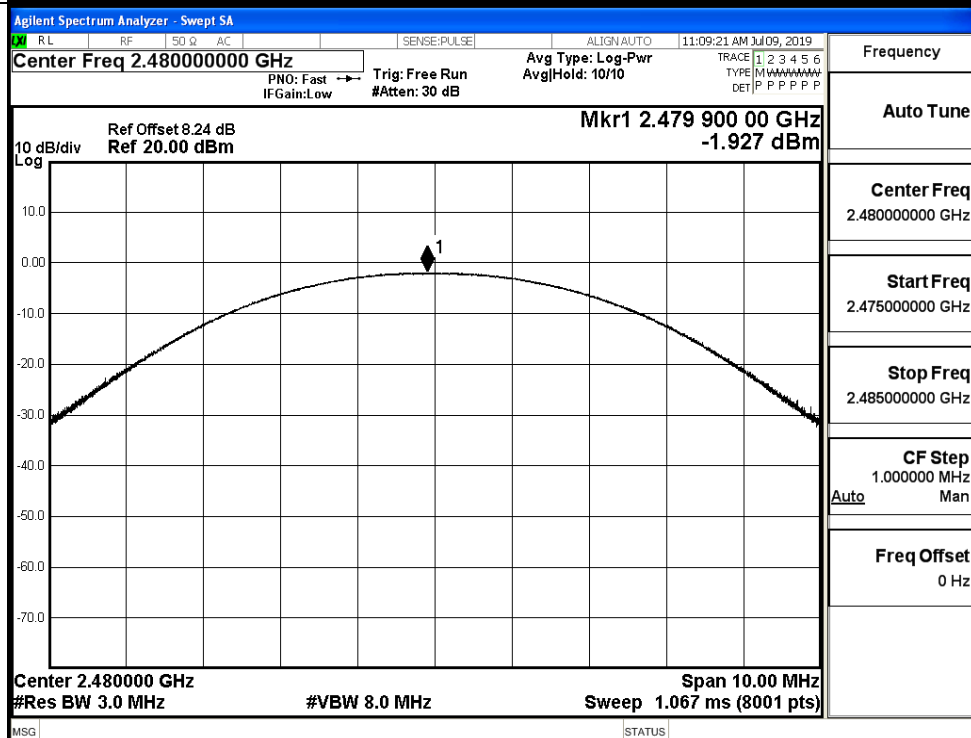


GFSK/MCH



GFSK/HCH

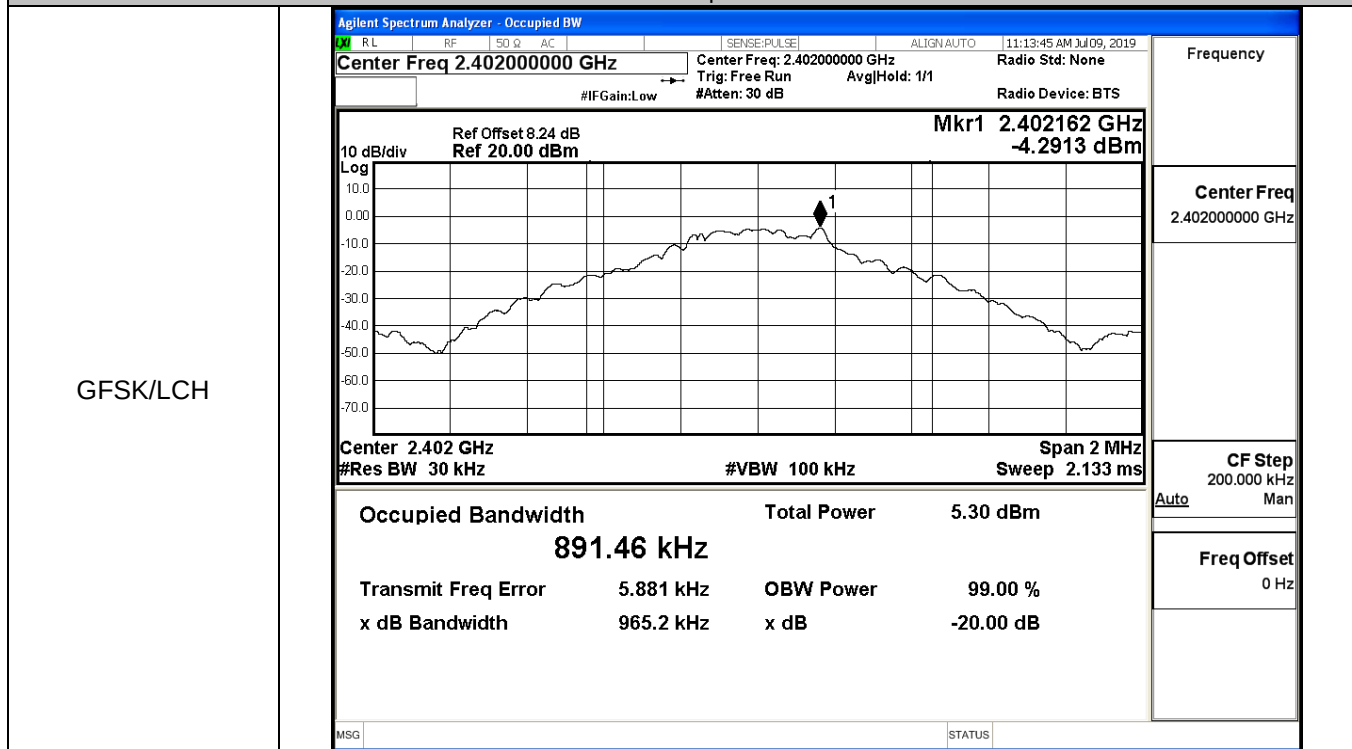
 $\pi$ /4DQPSK/LCH

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

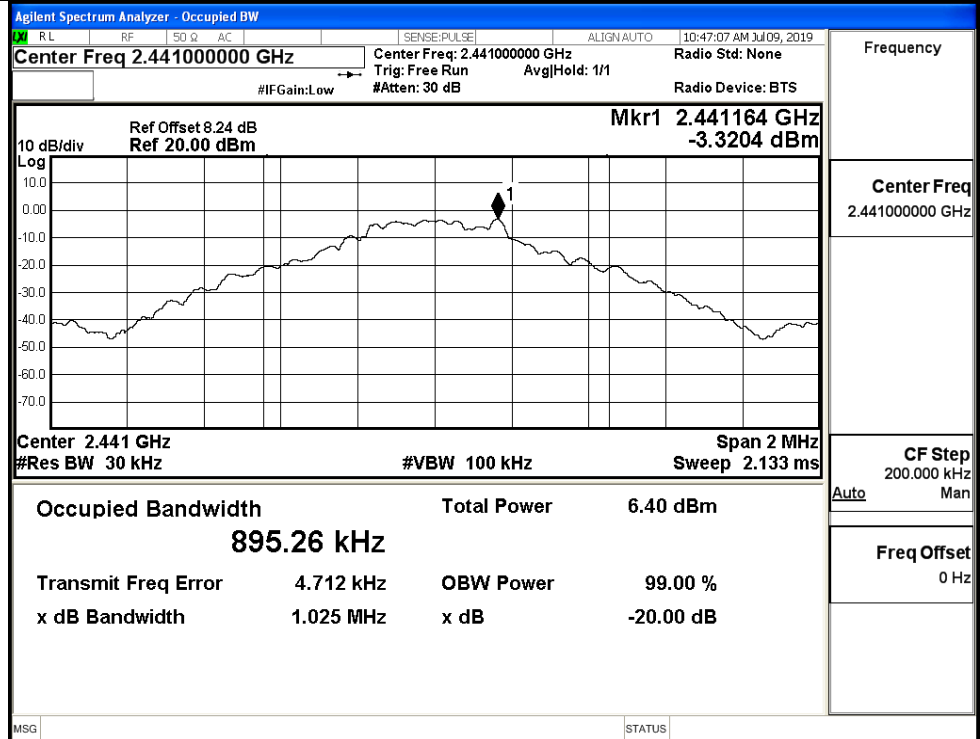
## A.2 20dB Bandwidth

| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.9652               | Not Specified | PASS    |
|               | MCH      | 1.025                | Not Specified | PASS    |
|               | HCH      | 1.025                | Not Specified | PASS    |
| $\pi$ /4DQPSK | LCH      | 1.313                | Not Specified | PASS    |
|               | MCH      | 1.291                | Not Specified | PASS    |
|               | HCH      | 1.291                | Not Specified | PASS    |

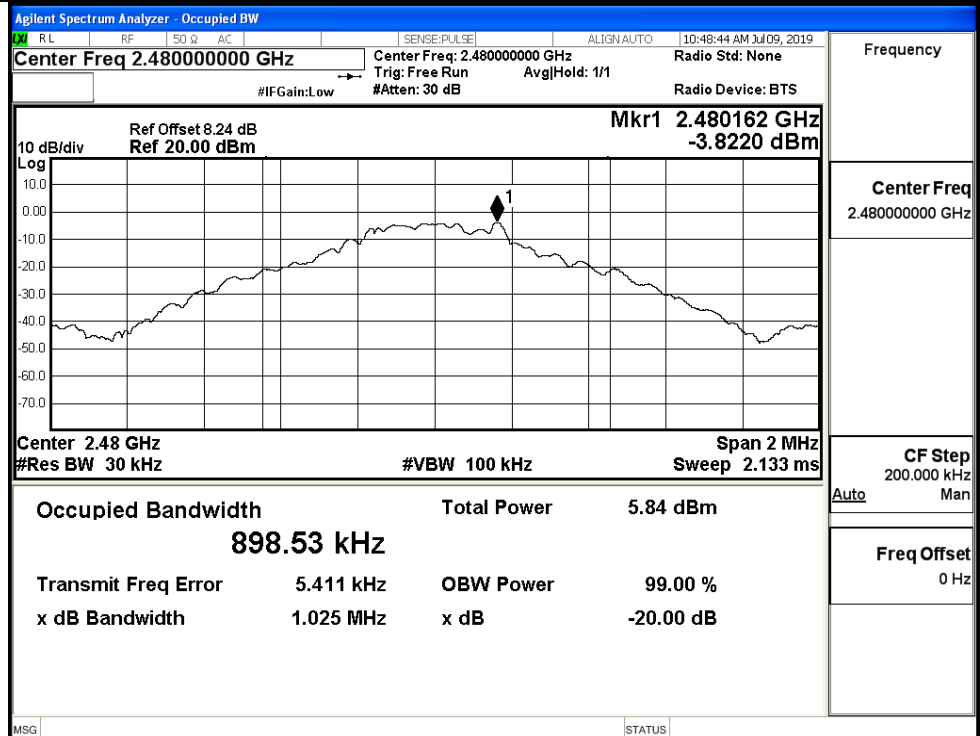
## Test Graphs

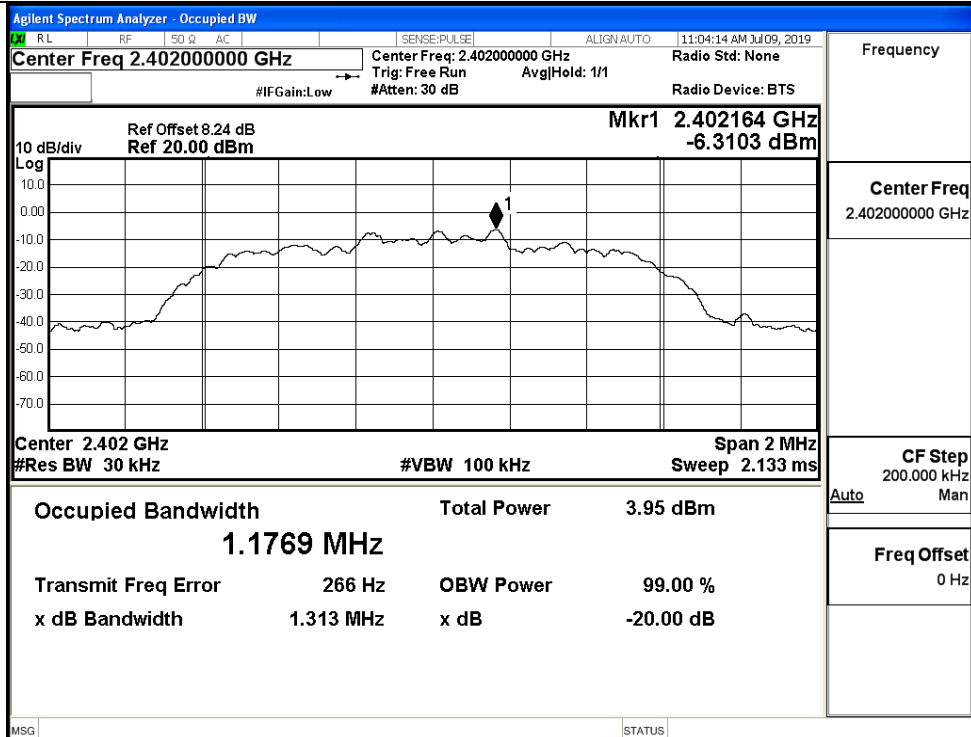
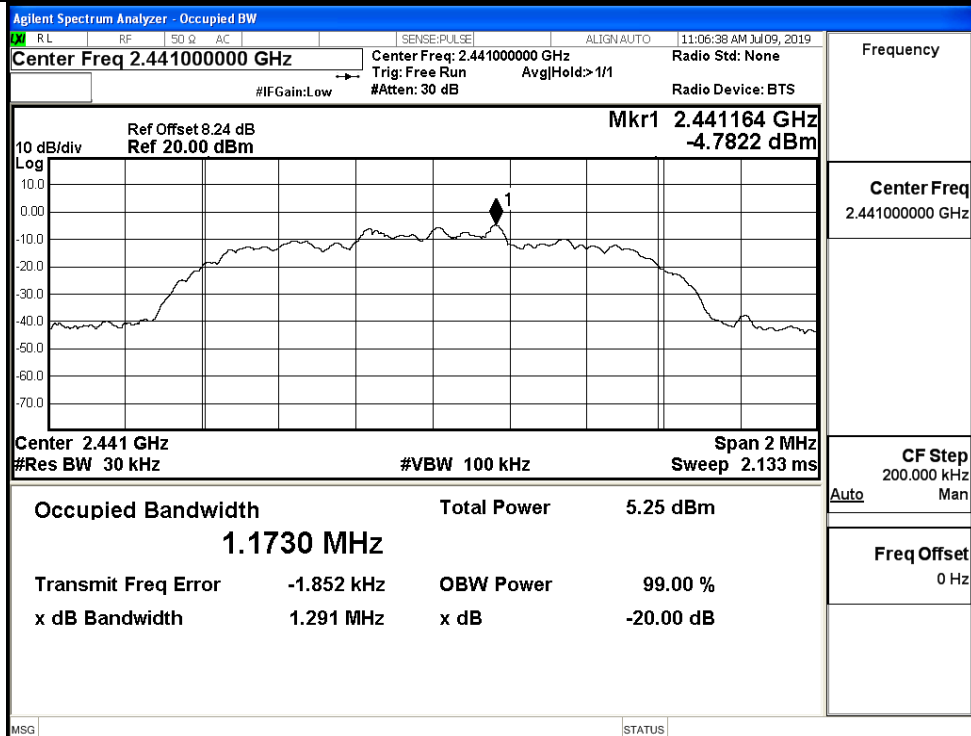


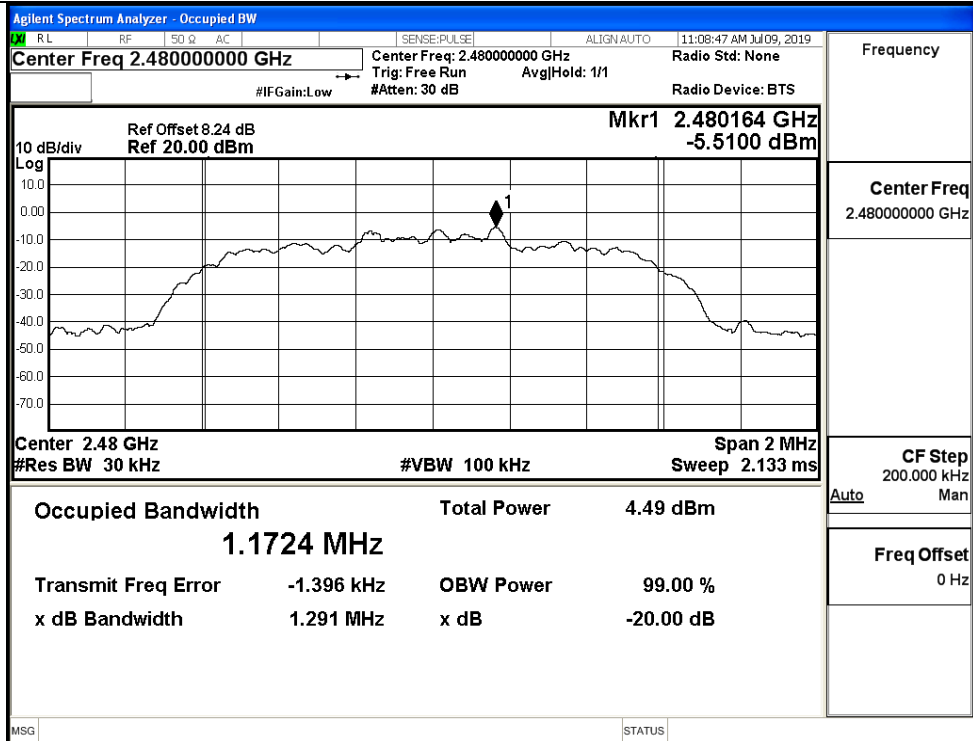
GFSK/MCH



GFSK/HCH



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

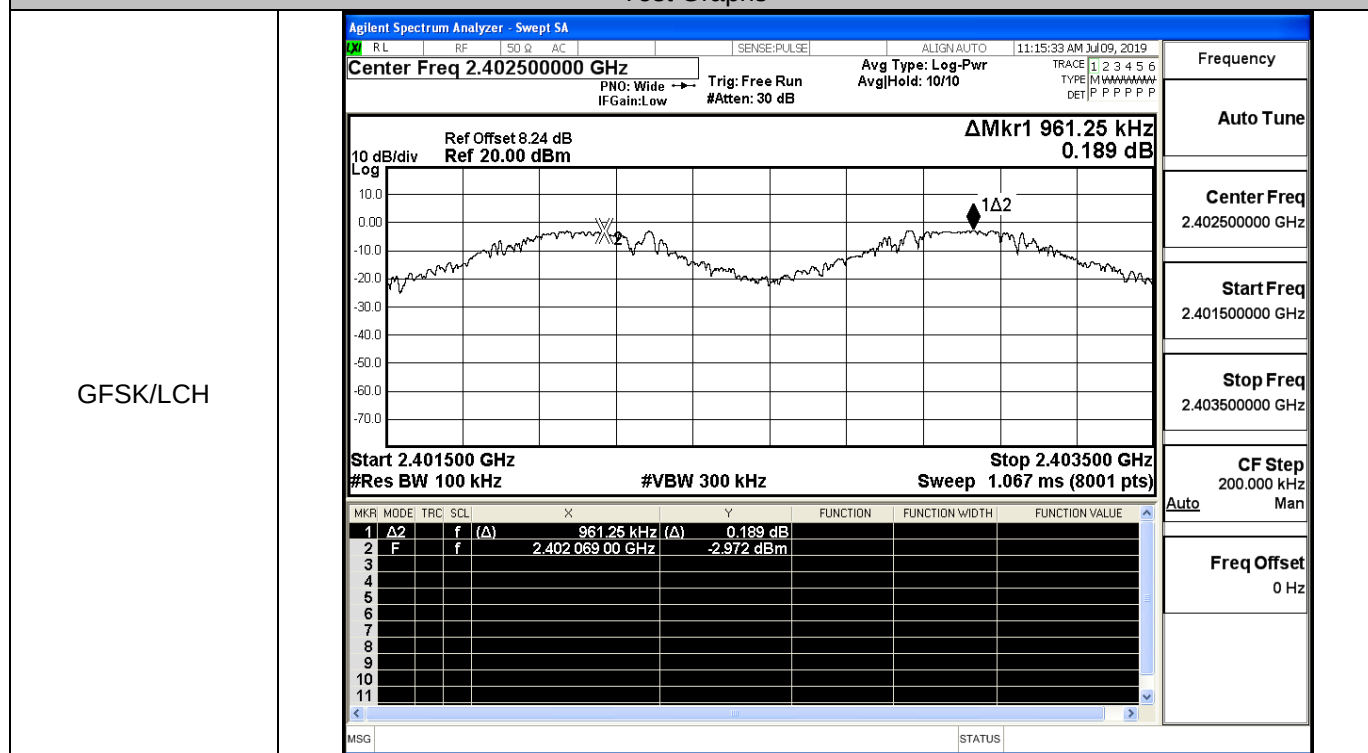
$\pi/4$ DQPSK/HCH



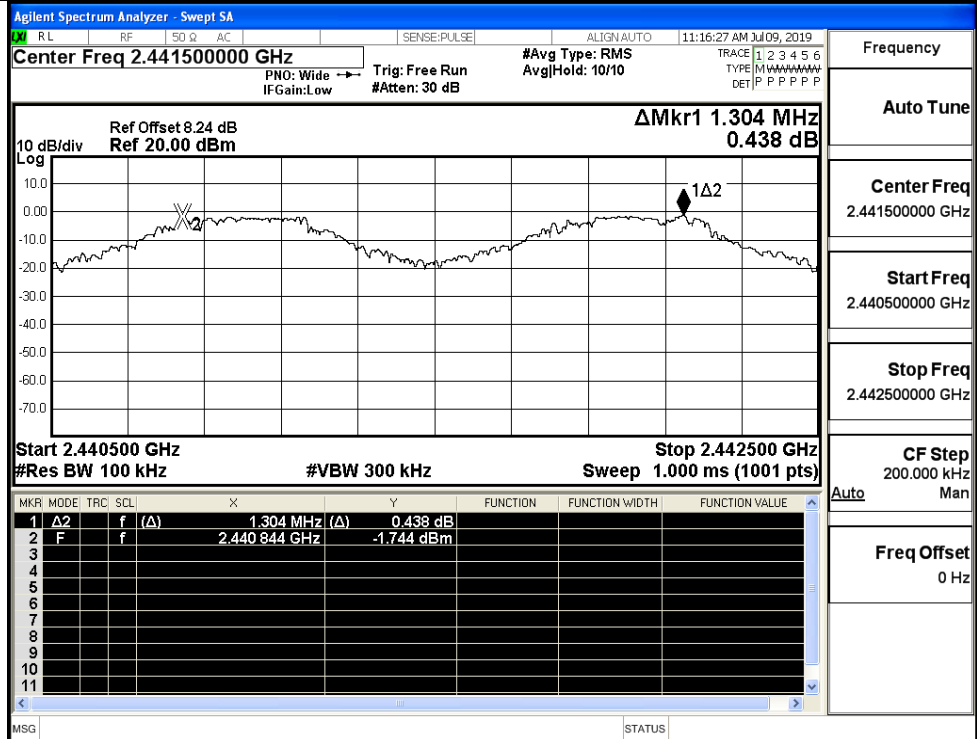
## A.3 Carrier Frequency Separation

| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK          | LCH      | 0.961                              | 0.683       | PASS    |
|               | MCH      | 1.304                              | 0.683       | PASS    |
|               | HCH      | 1.002                              | 0.683       | PASS    |
| $\pi$ /4DQPSK | LCH      | 0.928                              | 0.875       | PASS    |
|               | MCH      | 0.998                              | 0.875       | PASS    |
|               | HCH      | 1.152                              | 0.875       | PASS    |

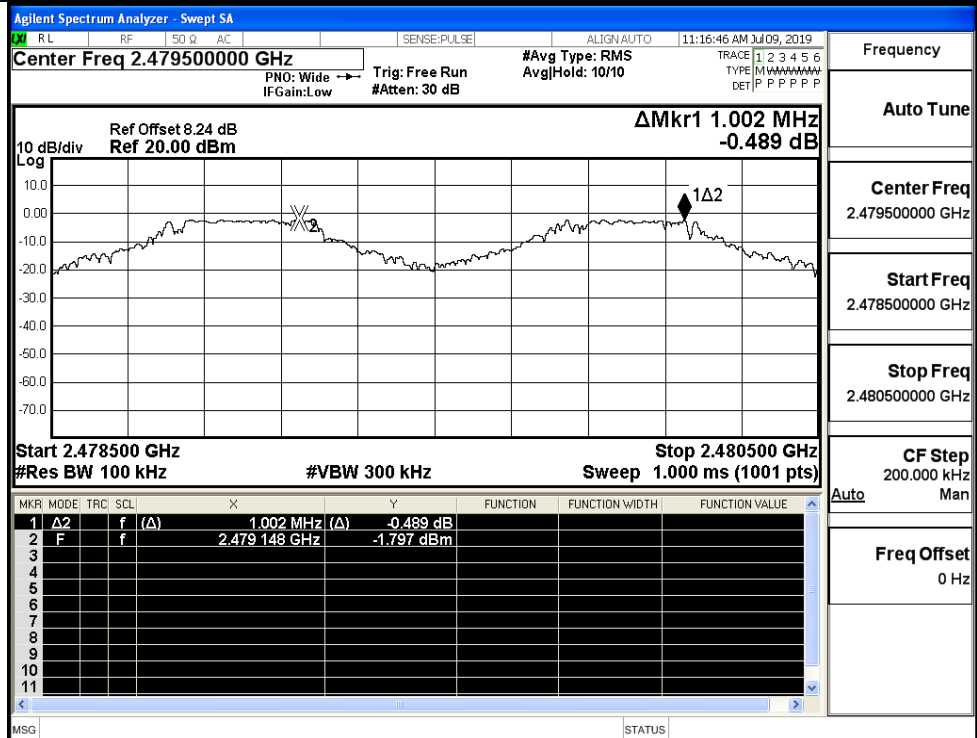
Test Graphs

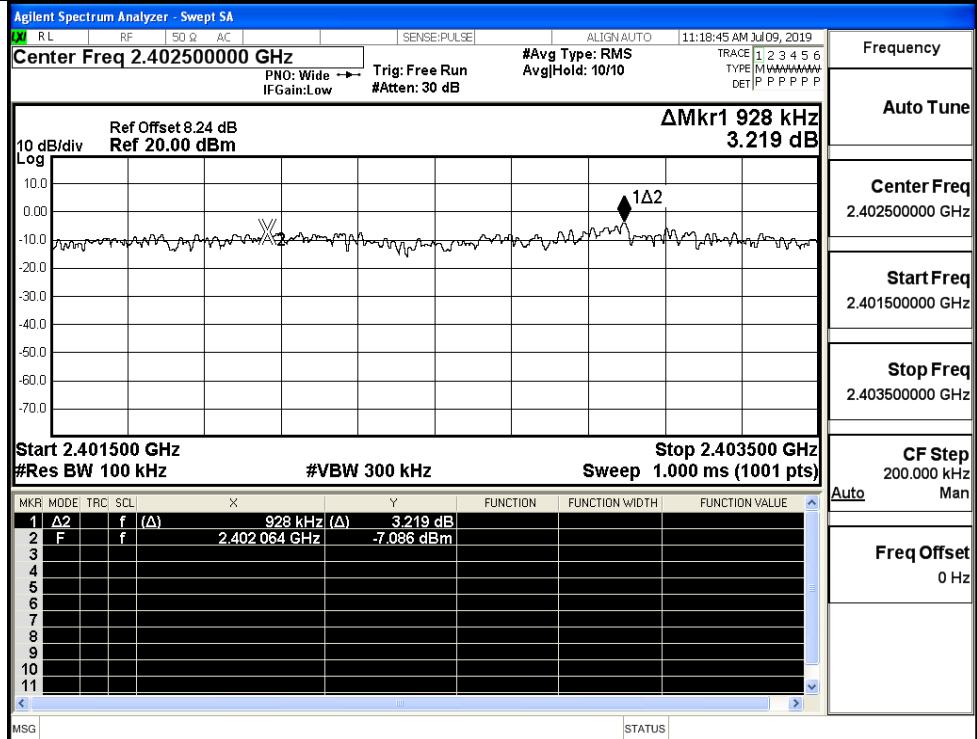
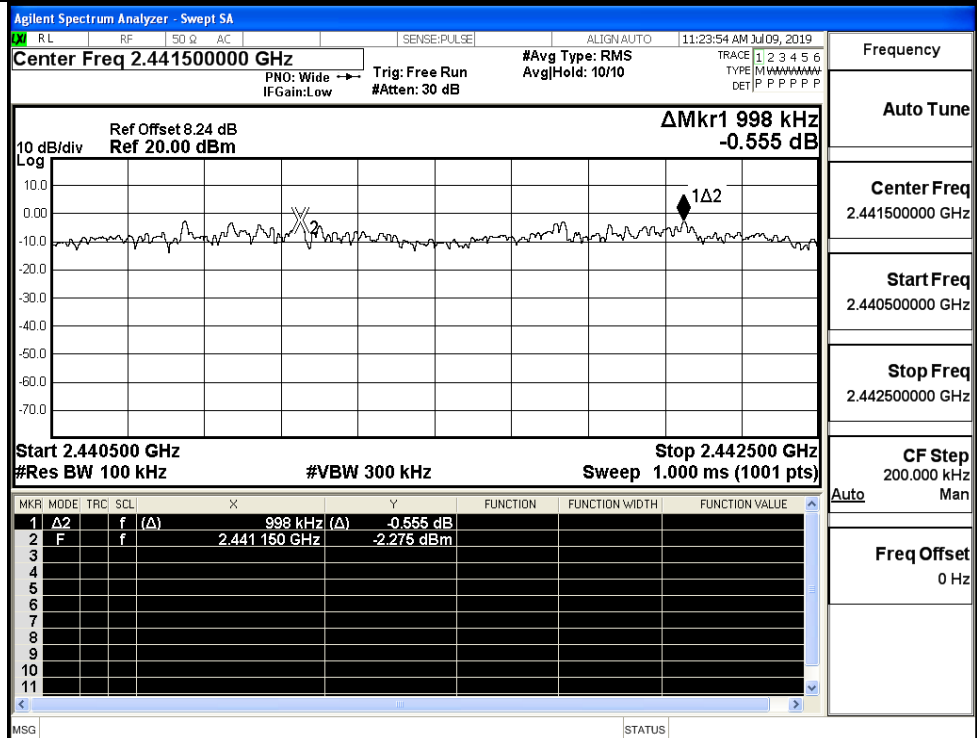


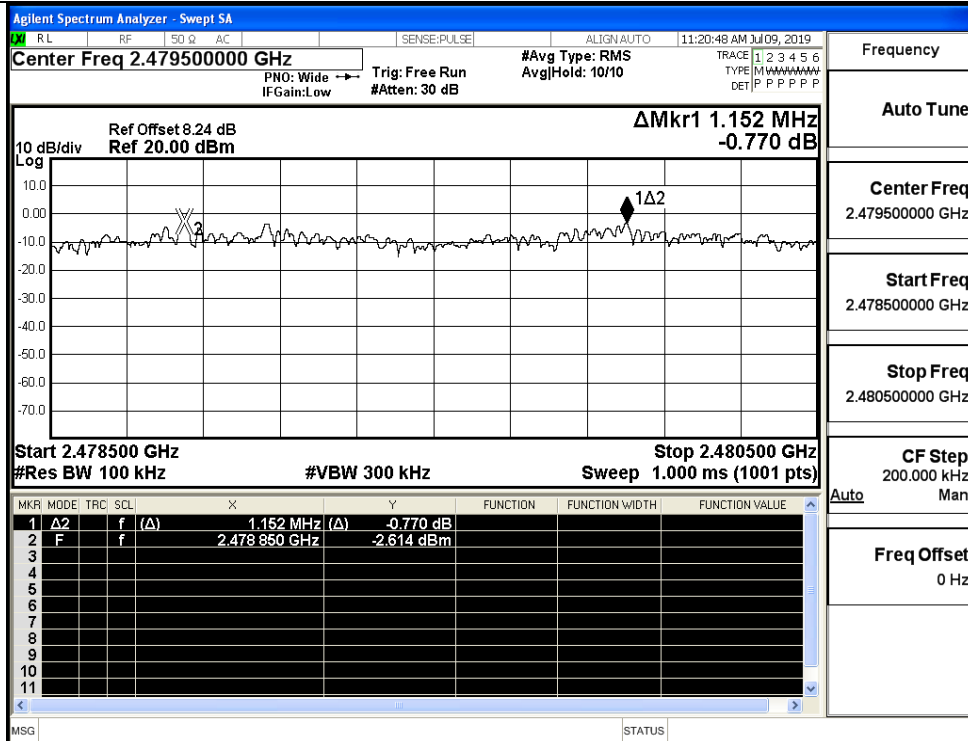
GFSK/MCH



GFSK/HCH



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

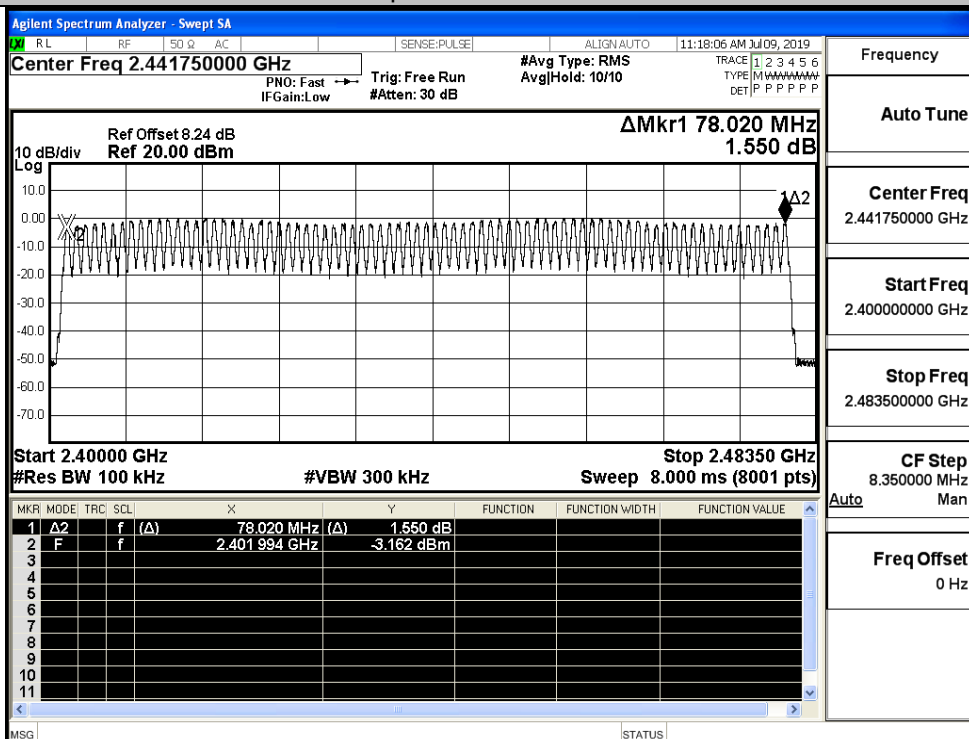
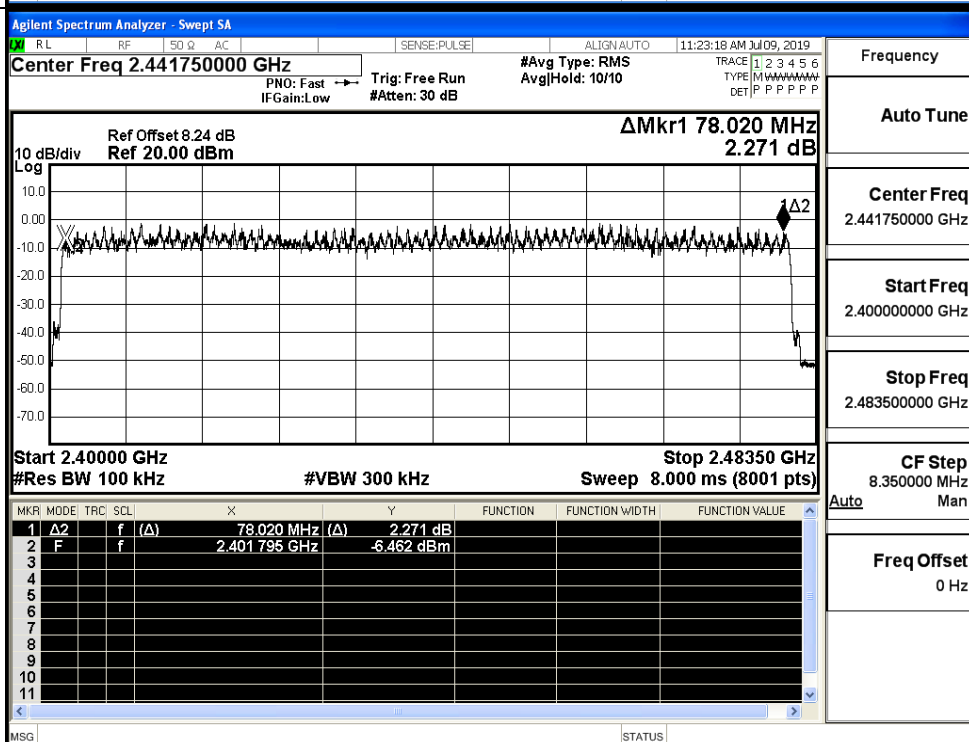
$\pi/4$ DQPSK/HCH

## 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    |
| 8DPSK         | Hop      | 79                            | $\geq 15$ | PASS    |

## Test Graphs

GFSK/Hop

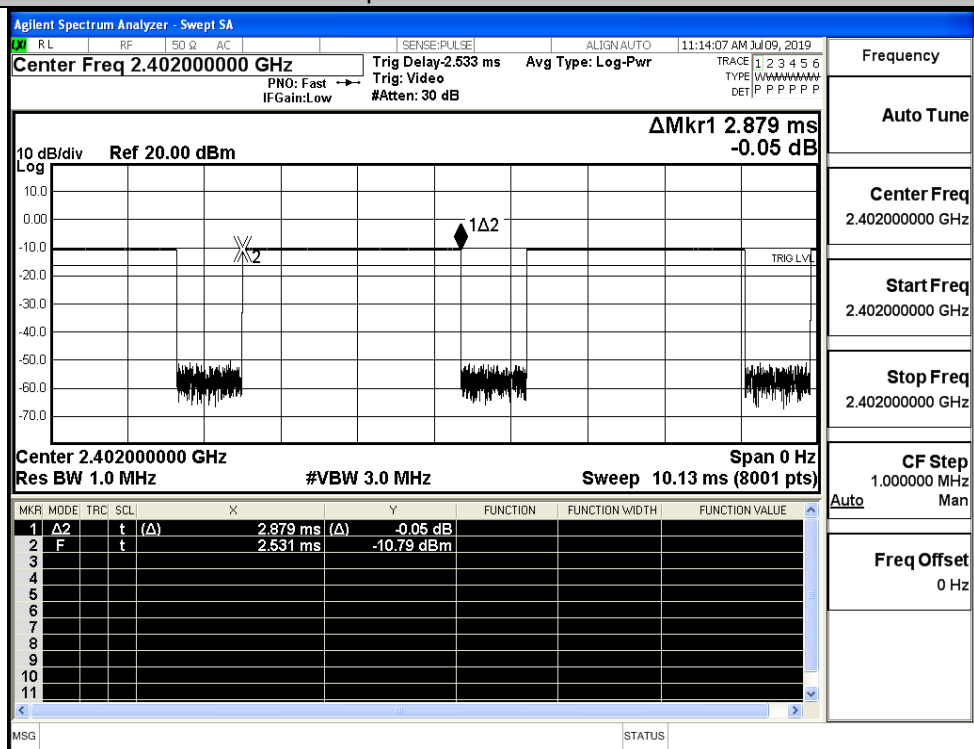
 $\pi/4$ DQPSK/Hop

## A.5 Dwell Time

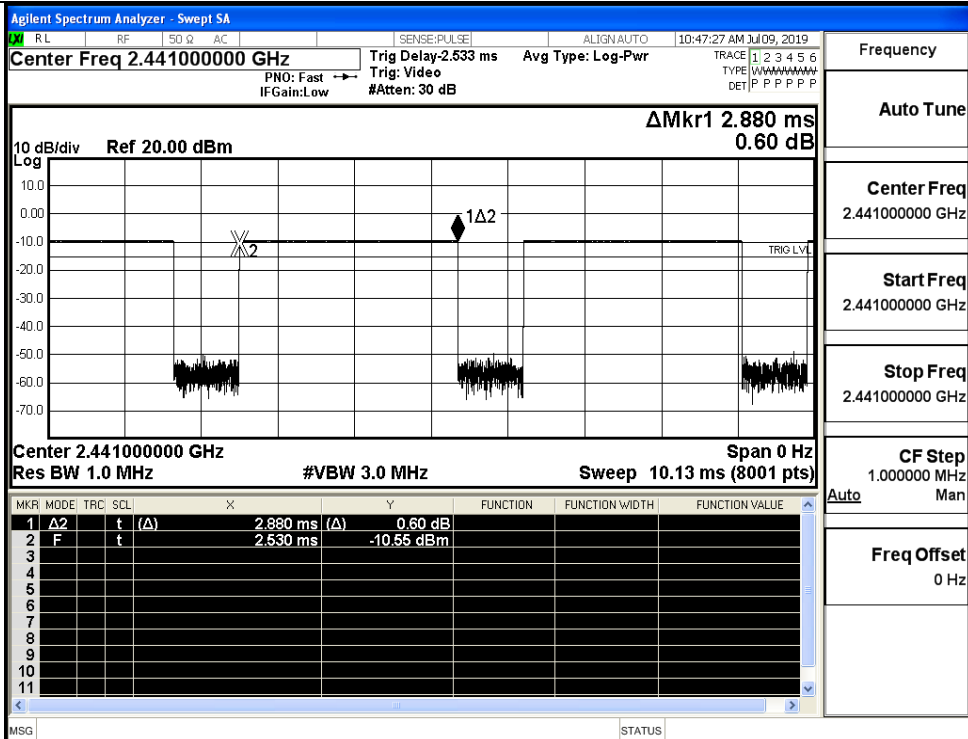
| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|---------------|-----------|---------|
| GFSK          | DH5    | LCH     | 2.88   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

## Test Graphs

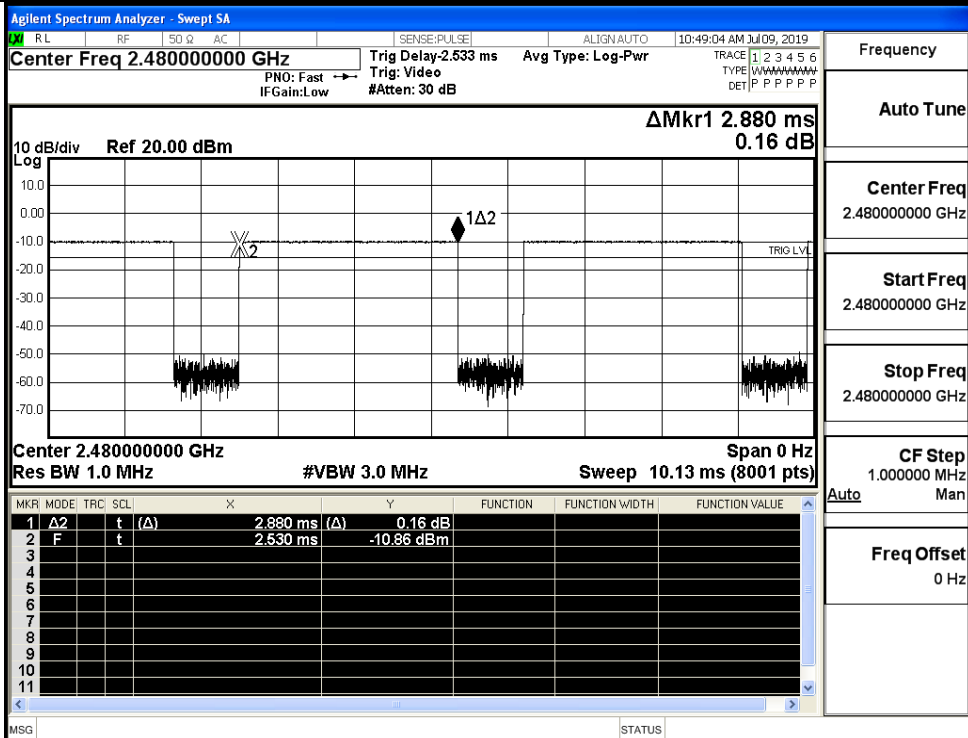
GFSK\_DH5/LCH



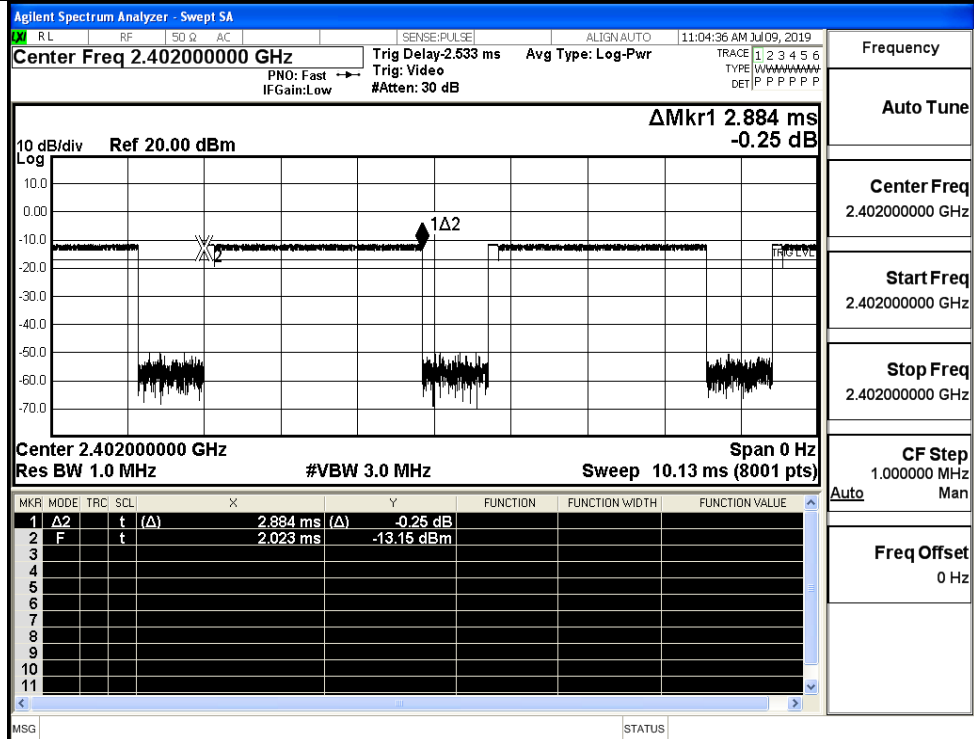
GFSK\_DH5/MCH



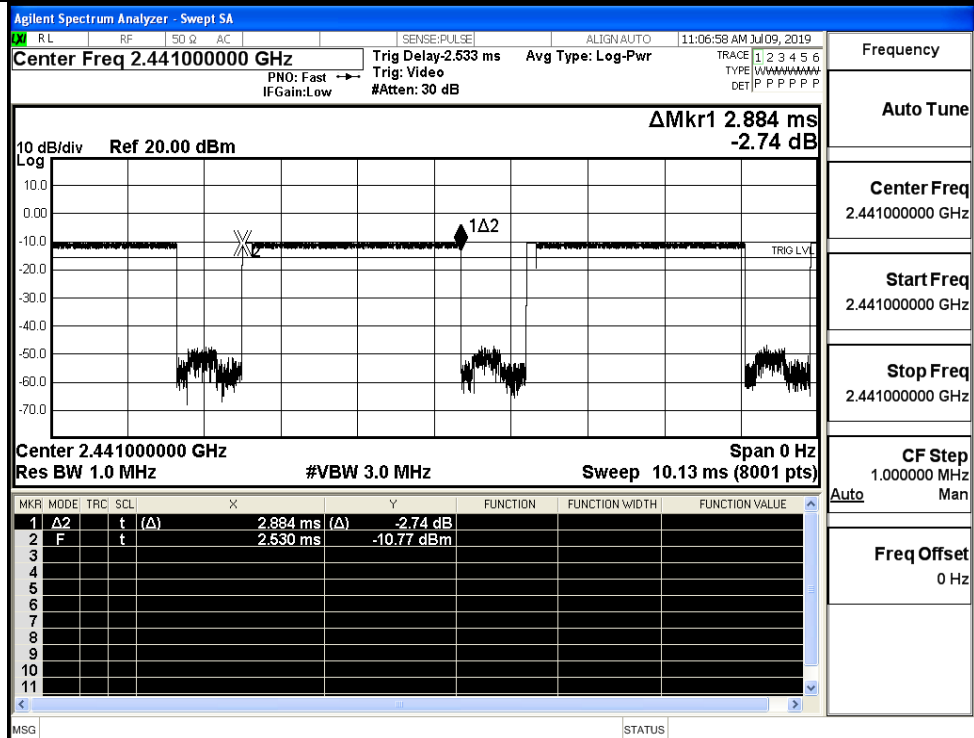
GFSK\_DH5/HCH



$\pi/4$ DQPSK  
\_2DH5/LCH

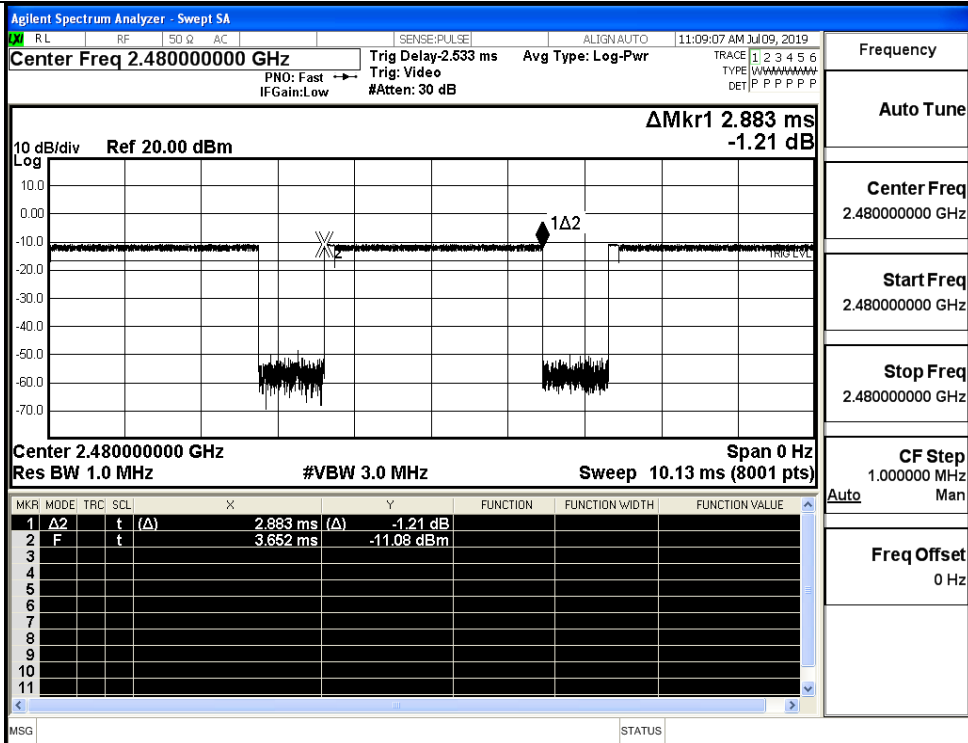


$\pi/4$ DQPSK  
\_2DH5/MCH



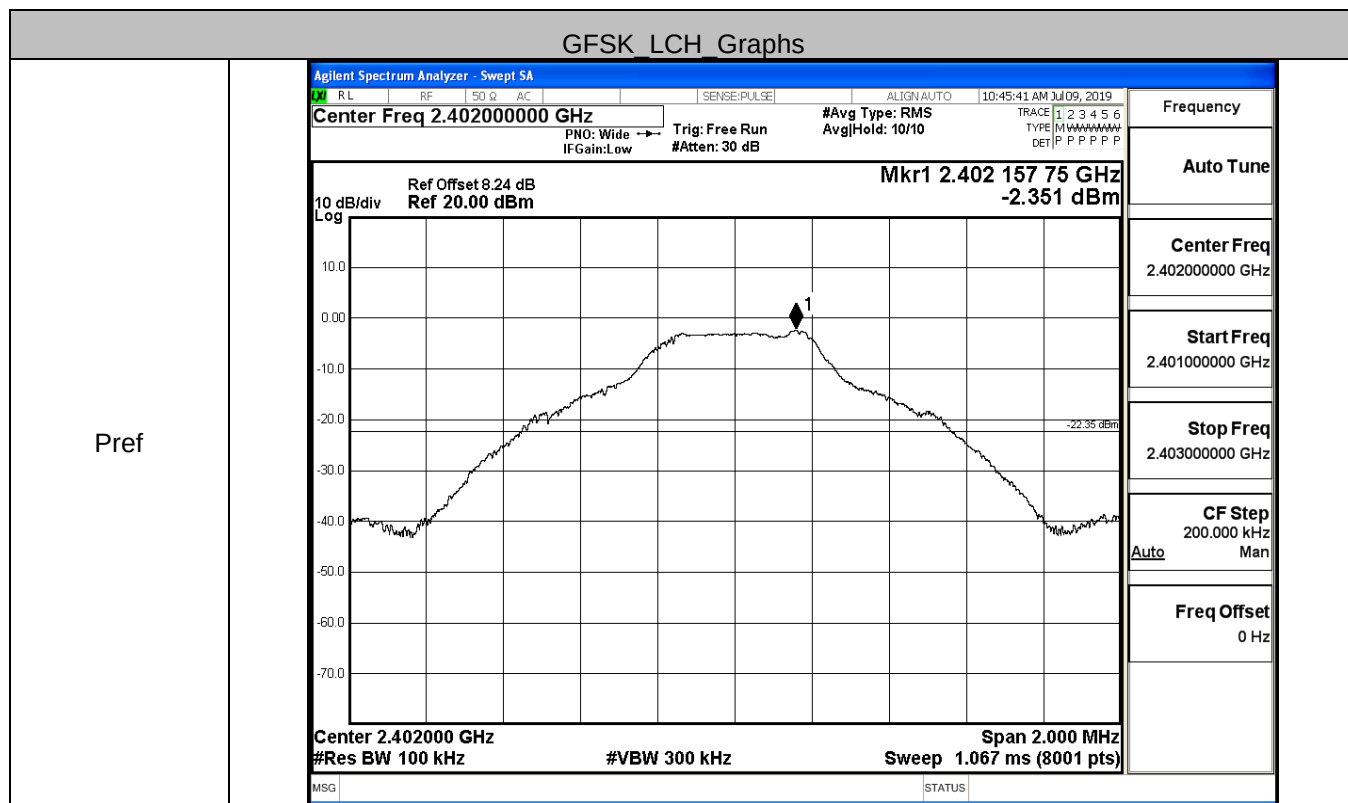


$\pi/4$ DQPSK  
\_2DH5/HCH



## A.6 RF Conducted Spurious Emissions

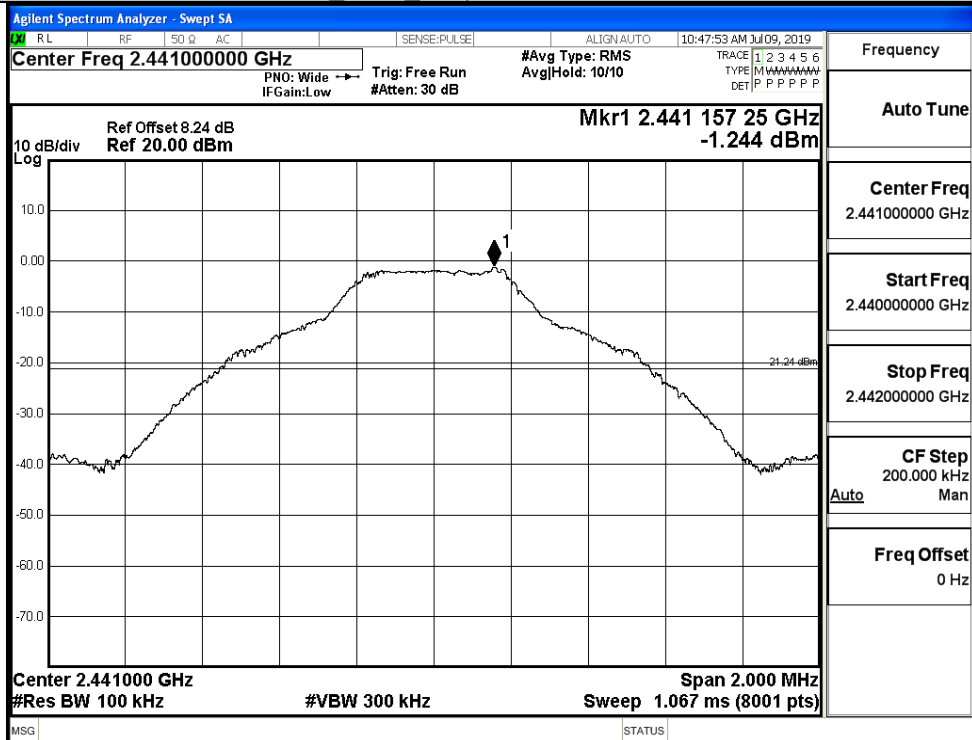
| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | -2.351     | -44.358          | -22.351     | PASS    |
|               | MCH     | -1.244     | -44.387          | -21.244     | PASS    |
|               | HCH     | -1.748     | -44.856          | -21.748     | PASS    |
| $\pi/4$ DQPSK | LCH     | -3.621     | -44.241          | -23.621     | PASS    |
|               | MCH     | -2.023     | -45.137          | -22.023     | PASS    |
|               | HCH     | -3.394     | -44.058          | -23.394     | PASS    |



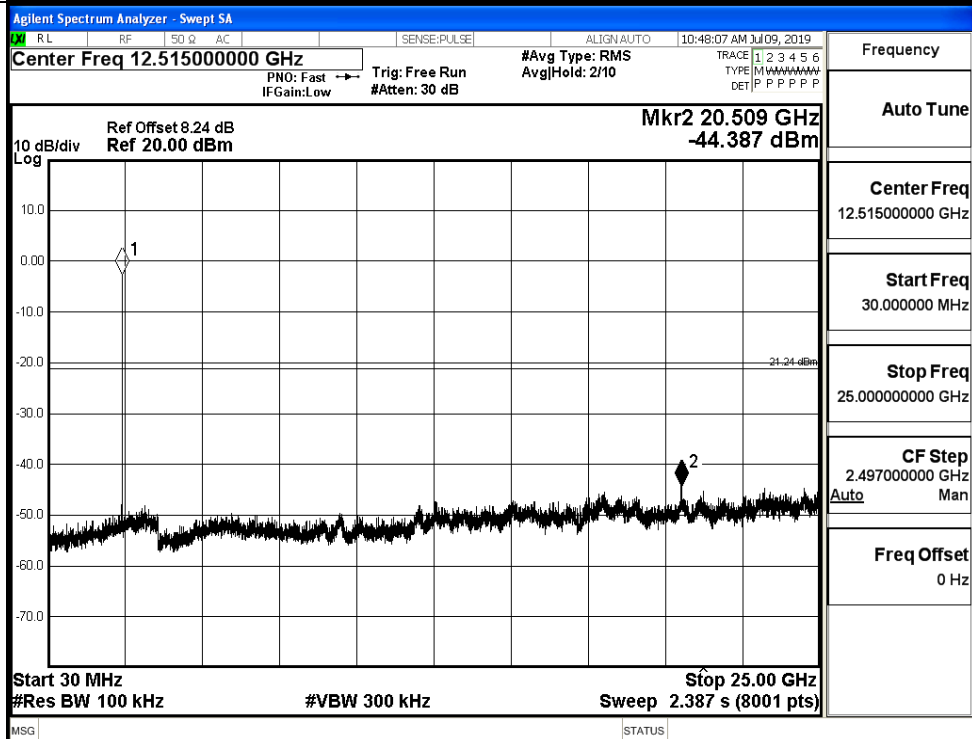


## GFSK\_MCH\_Graphs

Pref

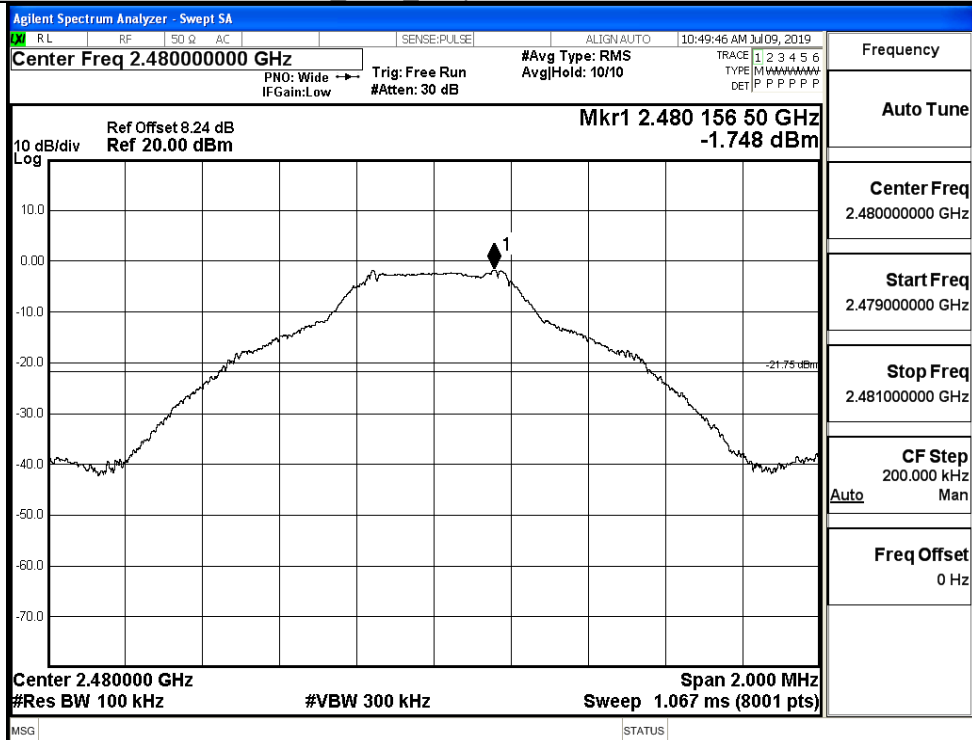


Puw

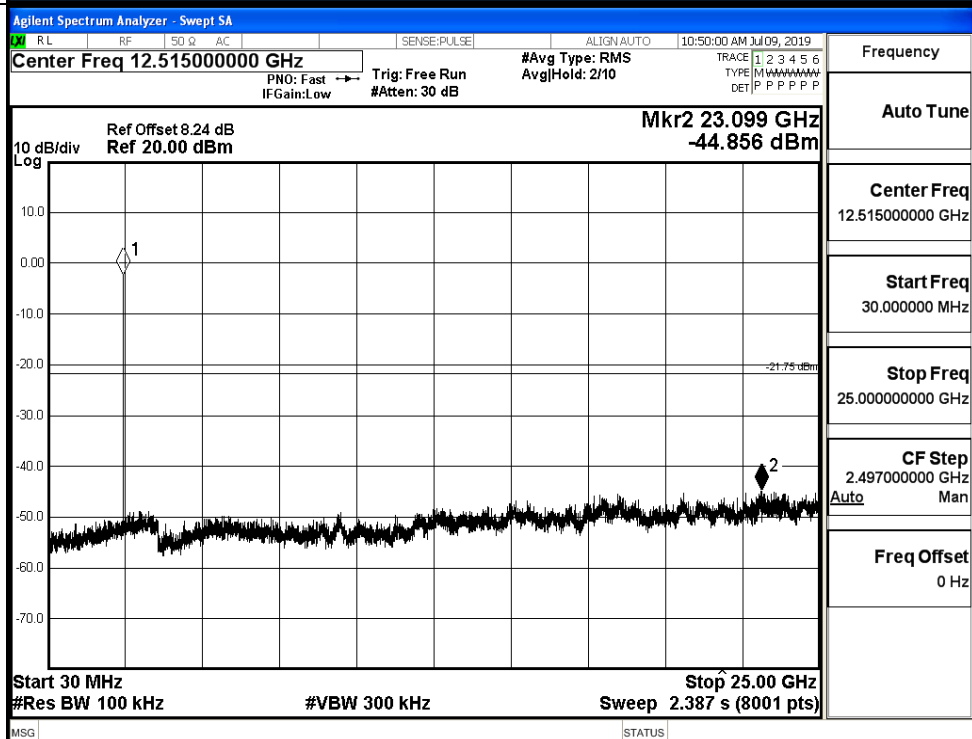


## GFSK HCH Graphs

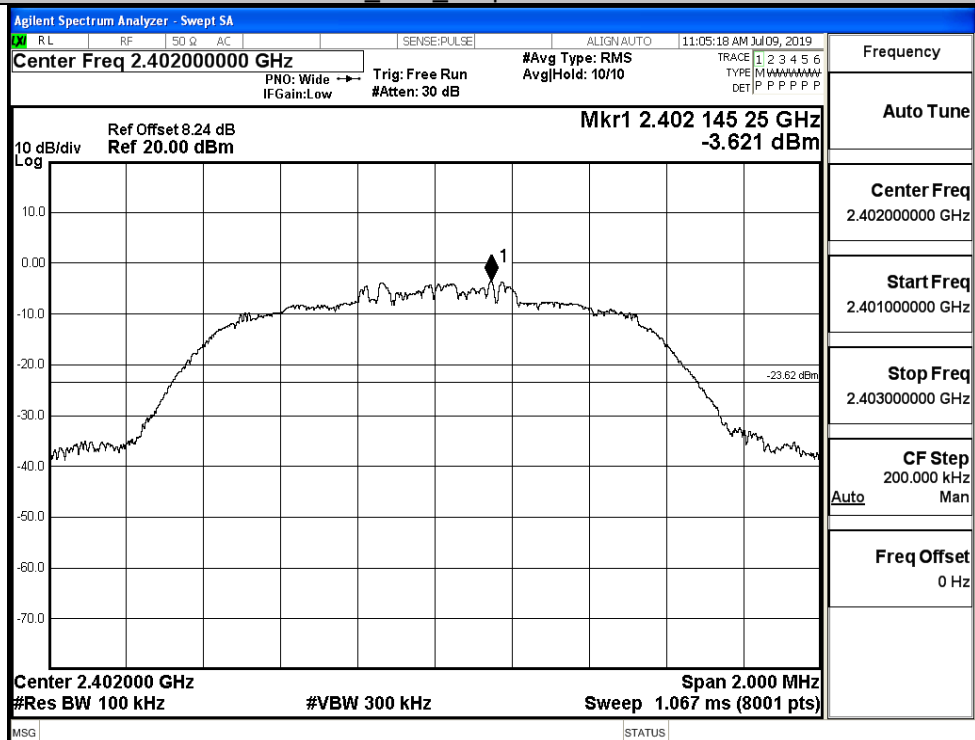
Pref



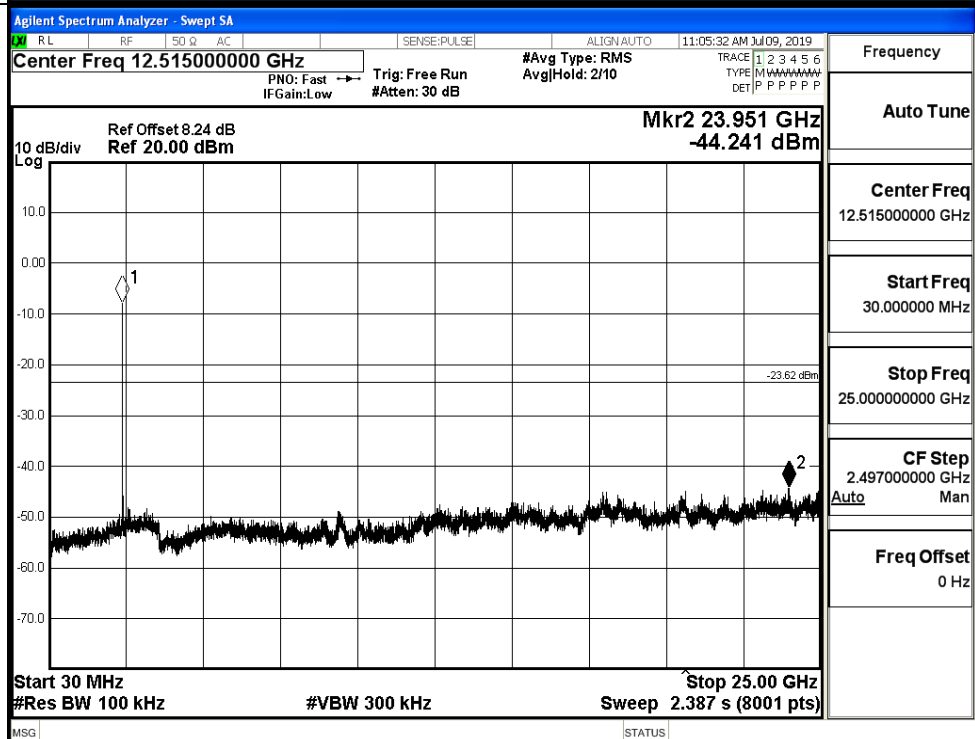
Puw



Pref

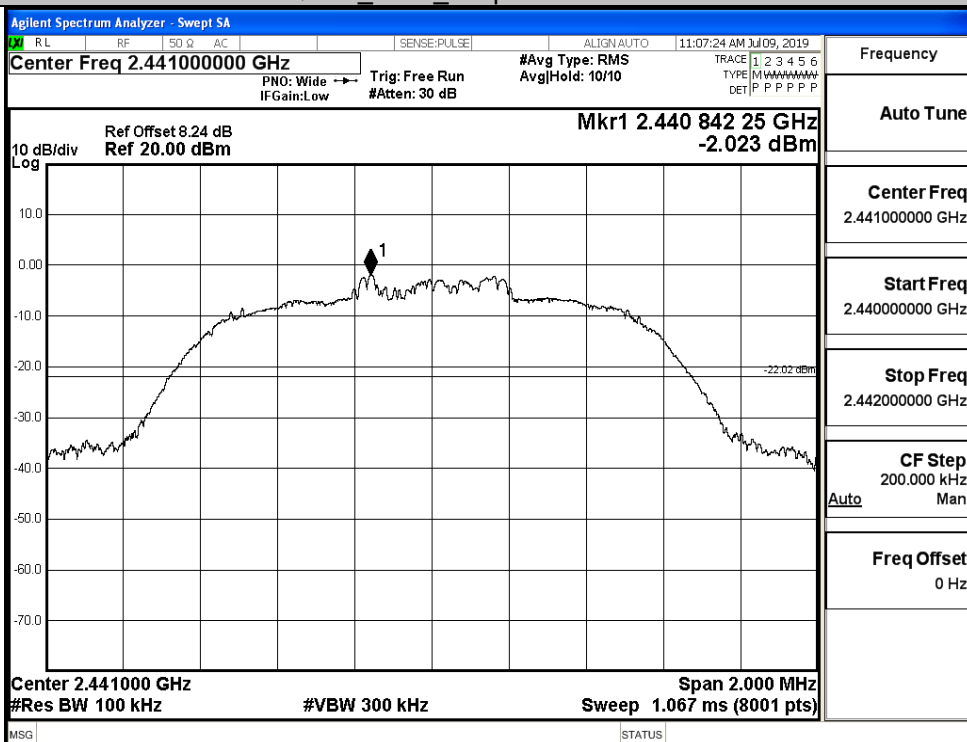


Puw

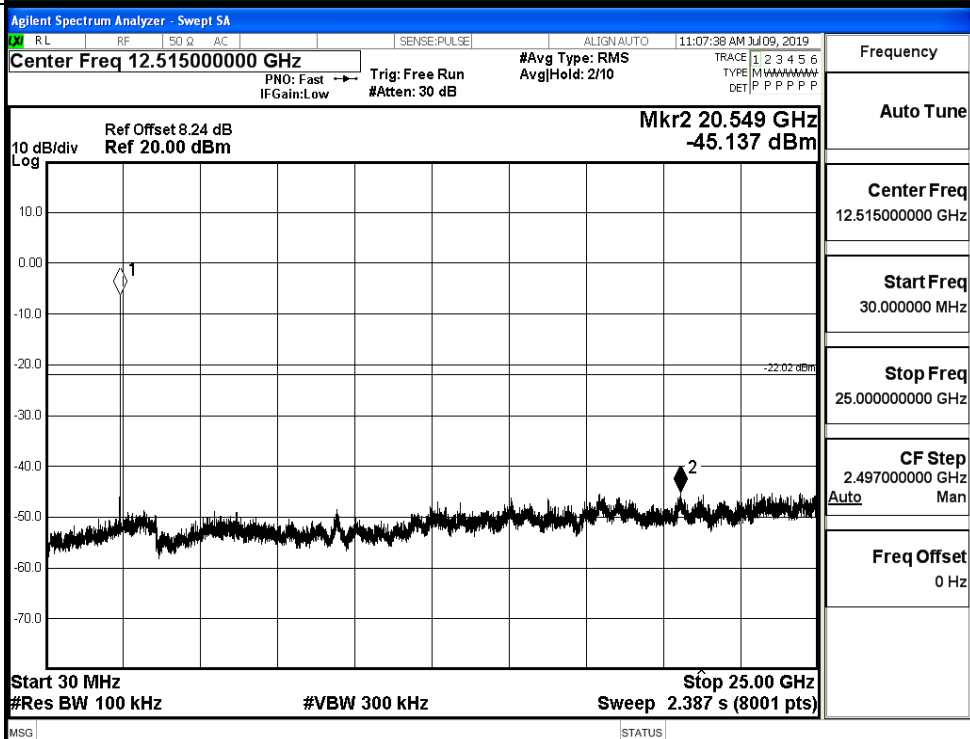


$\pi$ /4DQPSK\_MCH\_Graphs

Pref

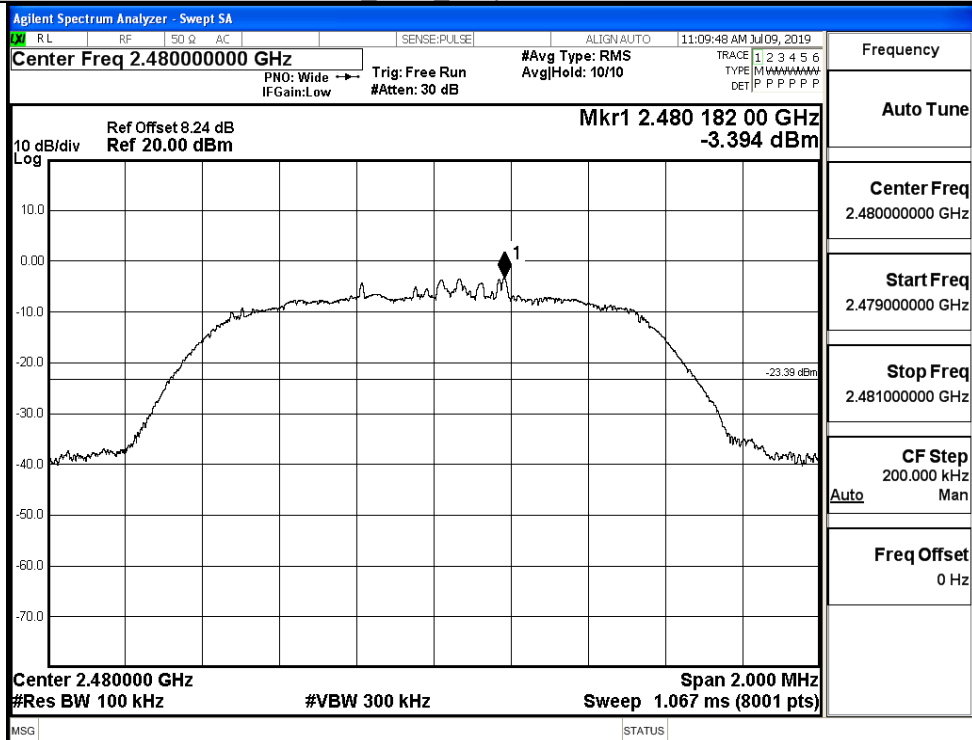


Puw

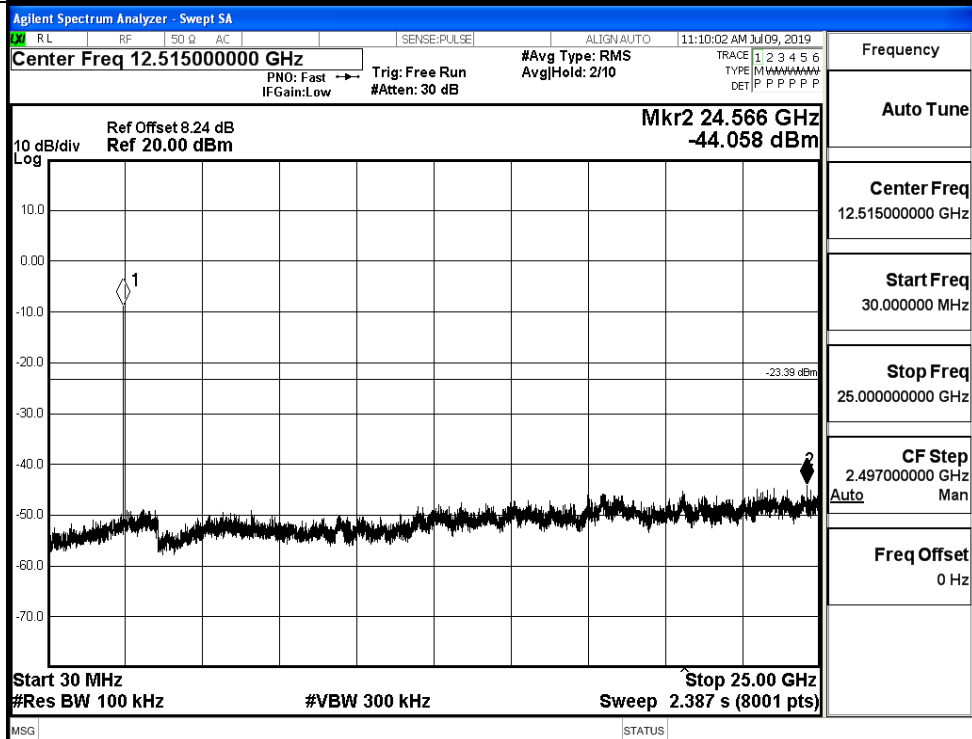


$\pi$ /4DQPSK\_HCH\_Graphs

Pref



Puw



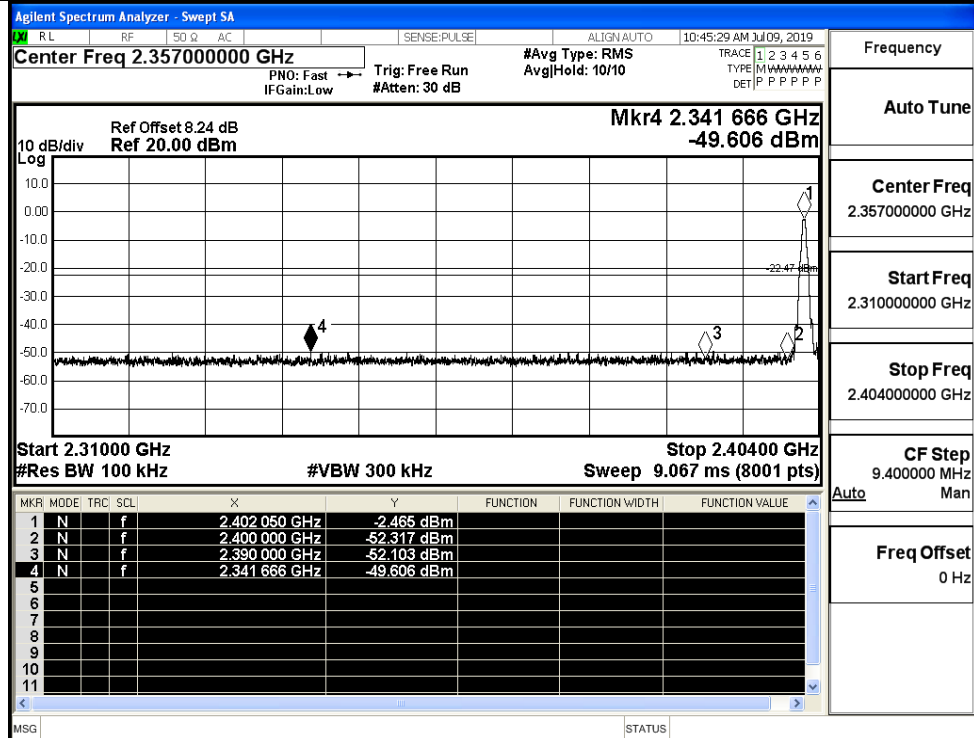


## A.7 Band-edge for RF Conducted Emissions

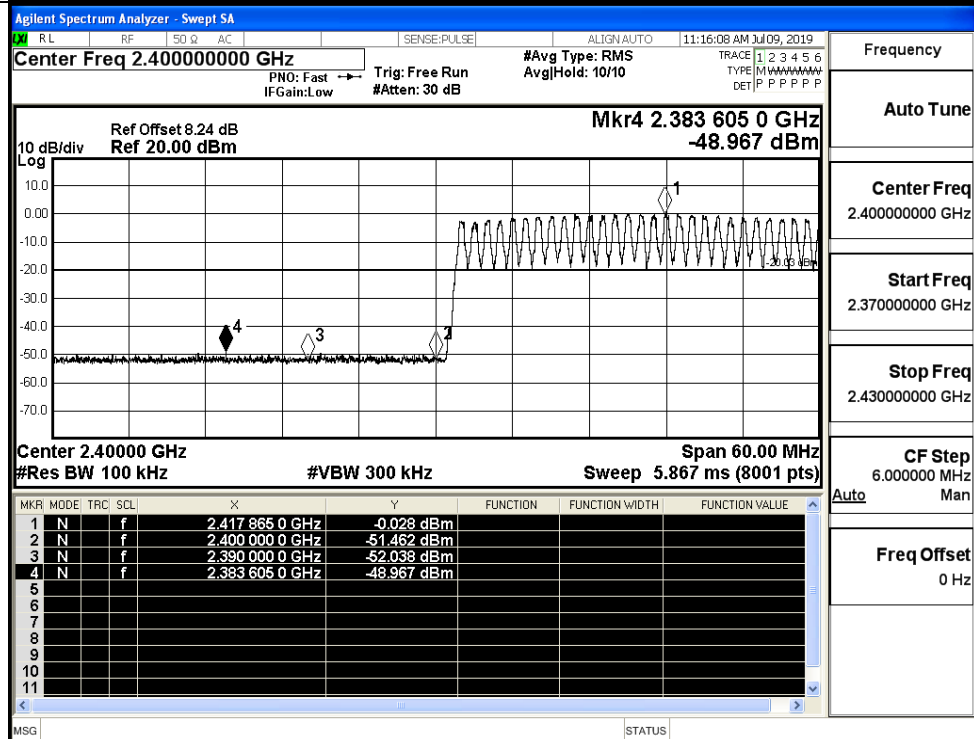
| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | -2.465              | Off               | -49.606                  | -22.47      | PASS    |
|               |         |                         | -0.028              | On                | -48.967                  | -20.03      | PASS    |
|               | HCH     | 2480                    | -1.649              | Off               | -48.926                  | -21.65      | PASS    |
|               |         |                         | 0.198               | On                | -49.475                  | -19.8       | PASS    |
| $\pi/4$ DQPSK | LCH     | 2402                    | -3.296              | Off               | -49.728                  | -23.3       | PASS    |
|               |         |                         | -1.194              | On                | -48.579                  | -21.19      | PASS    |
|               | HCH     | 2480                    | -2.854              | Off               | -49.437                  | -22.85      | PASS    |
|               |         |                         | -0.991              | On                | -48.635                  | -20.99      | PASS    |

## Test Graphs

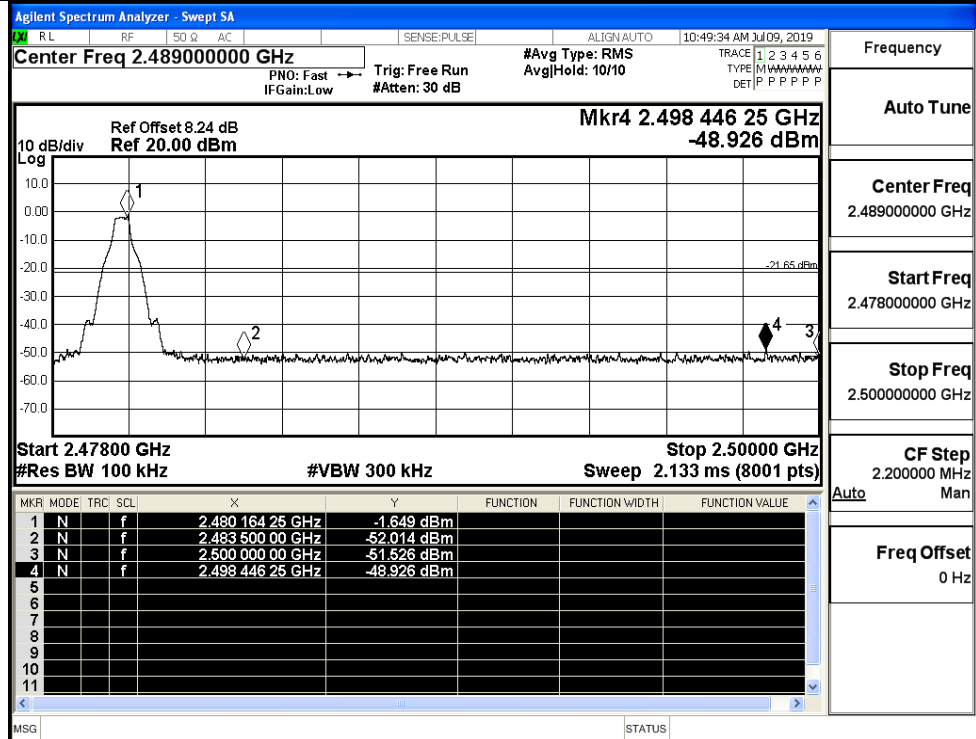
GFSK/LCH/No Hop



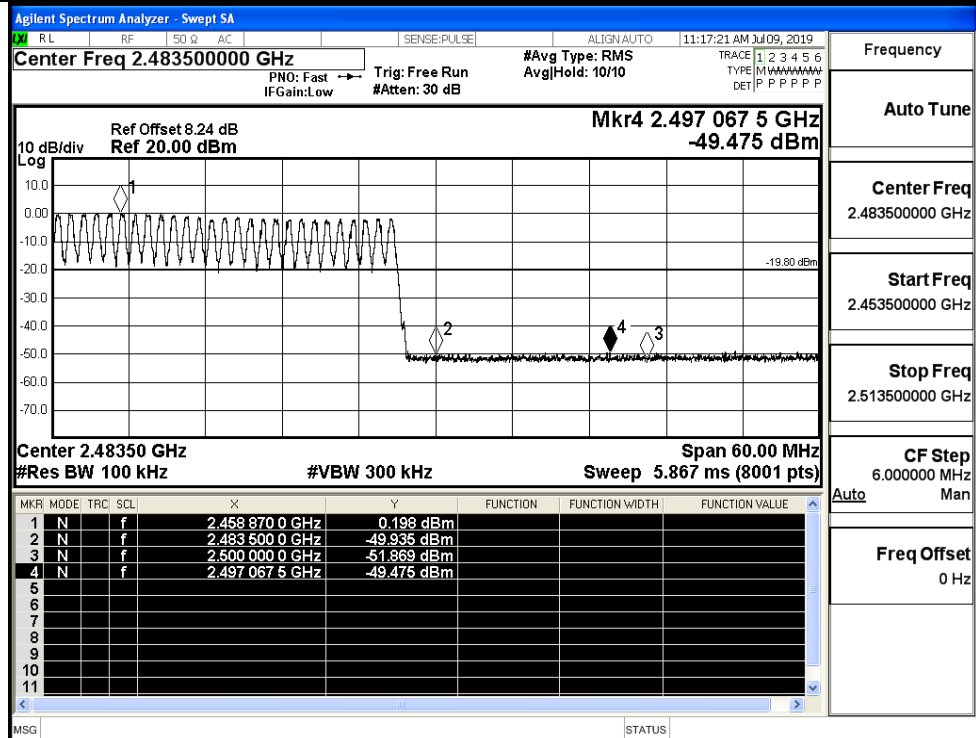
GFSK/LCH/Hop



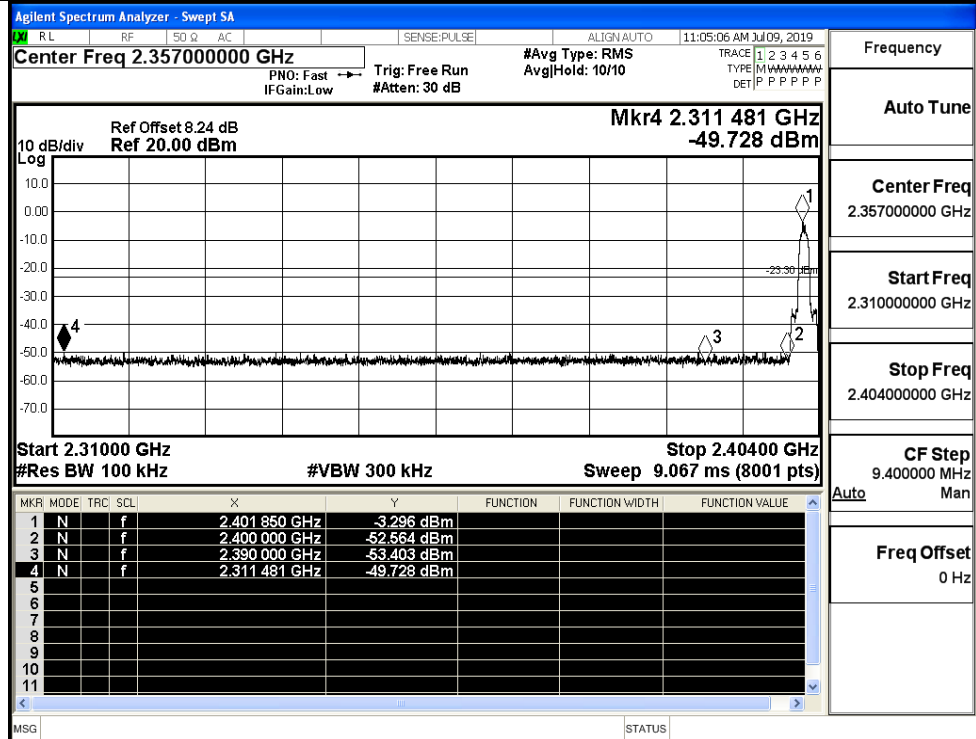
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq  
2.357000000 GHz

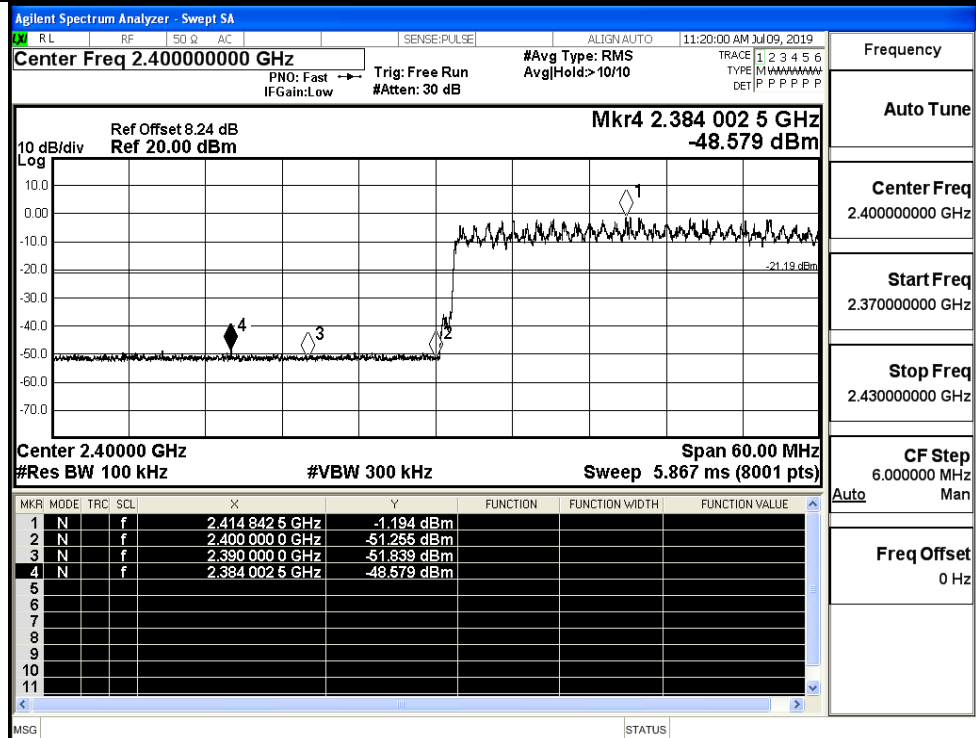
Start Freq  
2.310000000 GHz

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

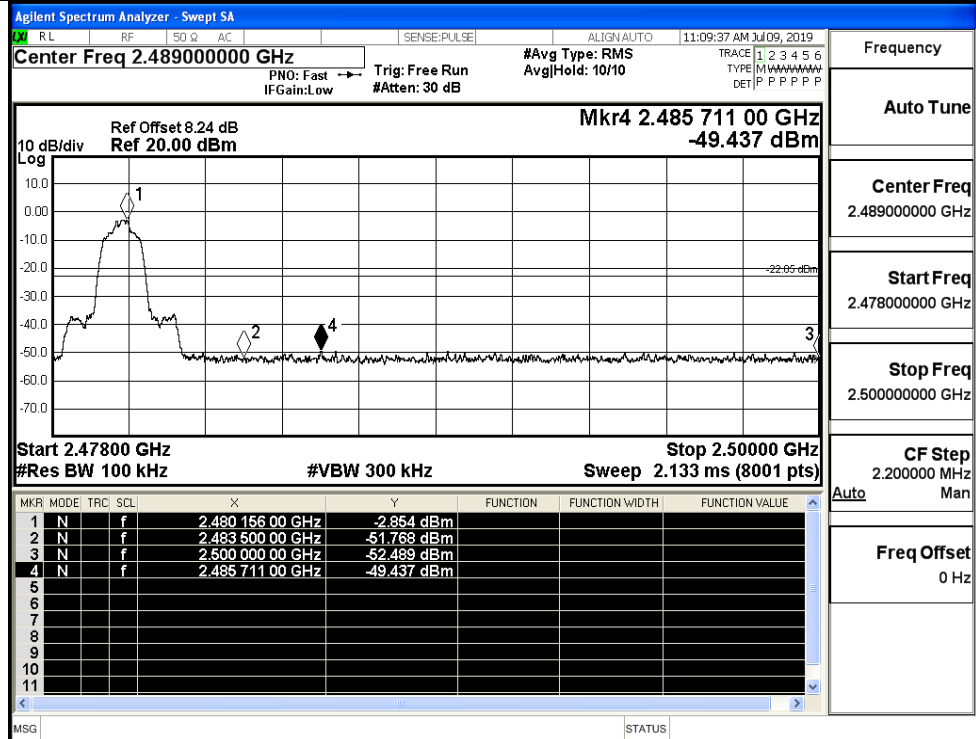
Start Freq  
2.370000000 GHz

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

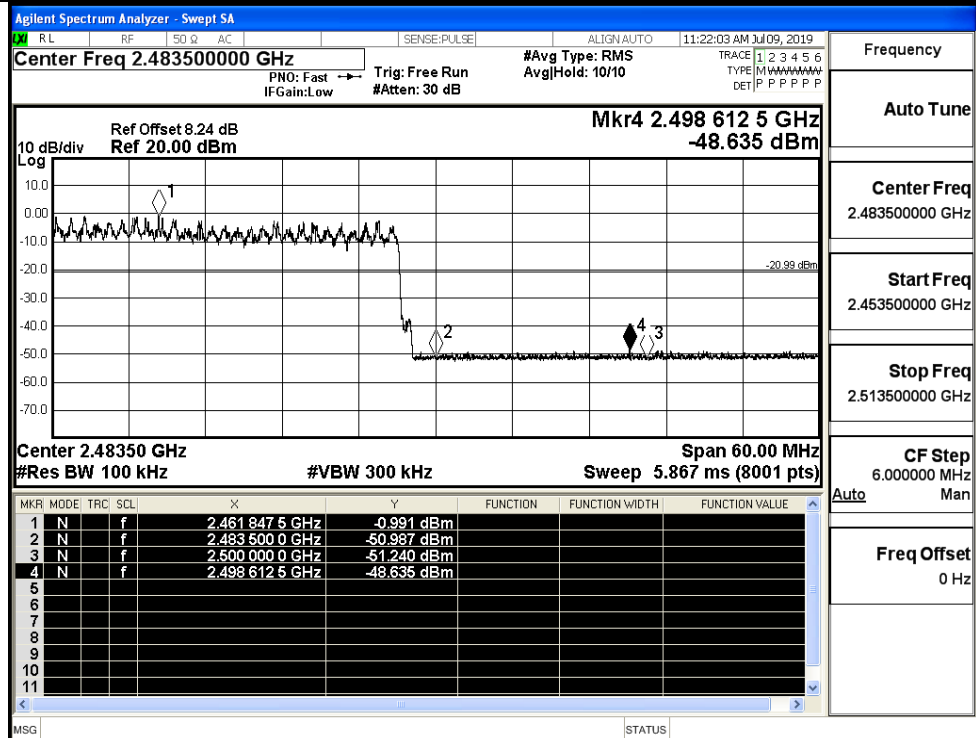
Start Freq  
2.478000000 GHz

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

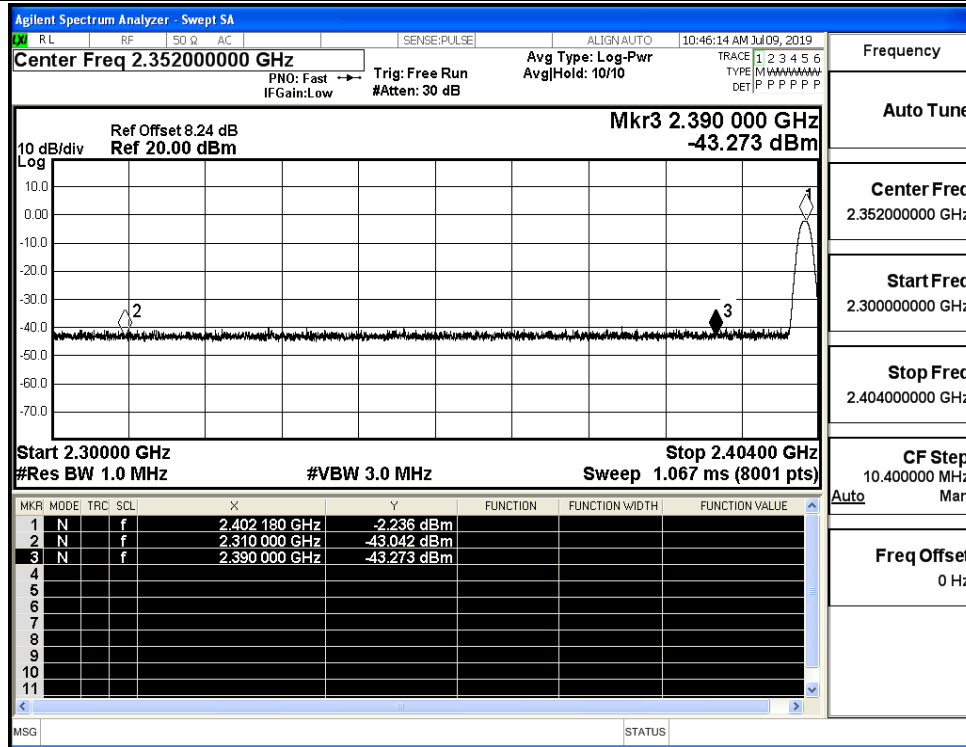
CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

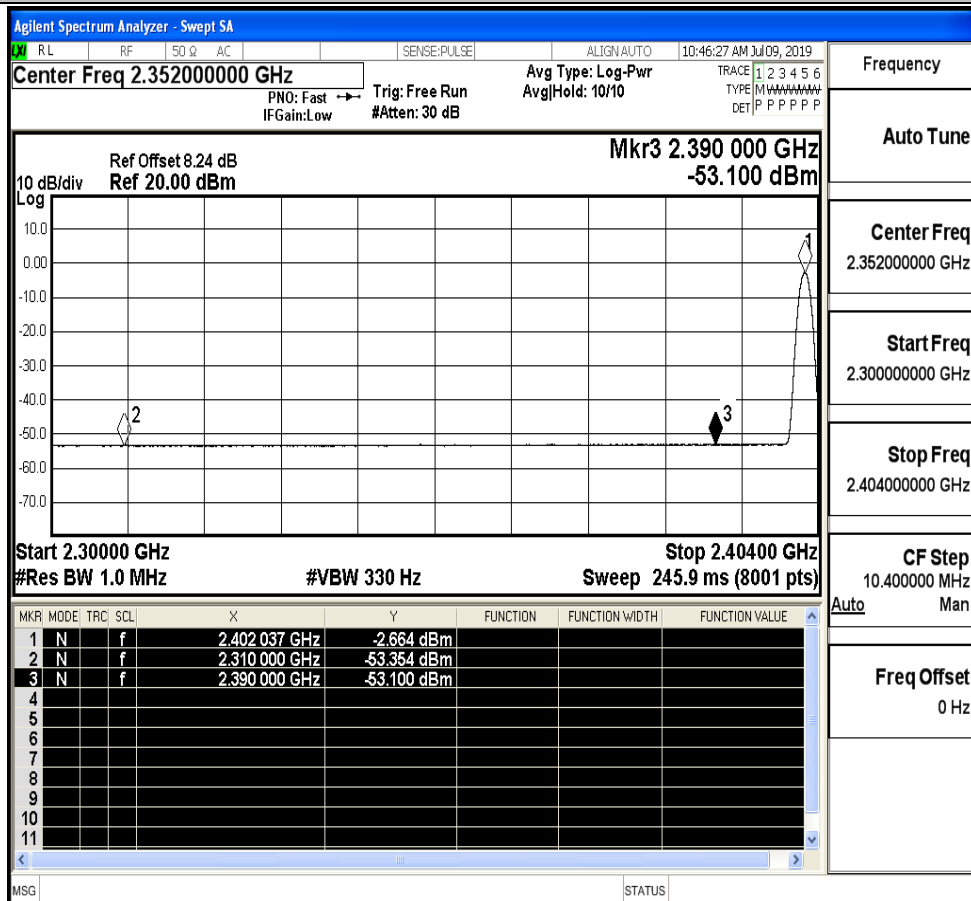
## A.8 Restrict-band band-edge measurements

| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -43.04      | 2.0  | 0             | 54.22      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.35      | 2.0  | 0             | 43.90      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.27      | 2.0  | 0             | 53.98      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -53.10      | 2.0  | 0             | 44.16      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.12      | 2.0  | 0             | 54.14      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.75      | 2.0  | 0             | 44.51      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -43.88      | 2.0  | 0             | 53.38      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.69      | 2.0  | 0             | 44.57      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -42.69      | 2.0  | 0             | 54.57      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -53.40      | 2.0  | 0             | 43.86      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -43.31      | 2.0  | 0             | 53.95      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -52.98      | 2.0  | 0             | 44.28      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.15      | 2.0  | 0             | 54.11      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -52.75      | 2.0  | 0             | 44.51      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -41.92      | 2.0  | 0             | 55.34      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -52.80      | 2.0  | 0             | 44.45      | AV       | 54             | PASS    |

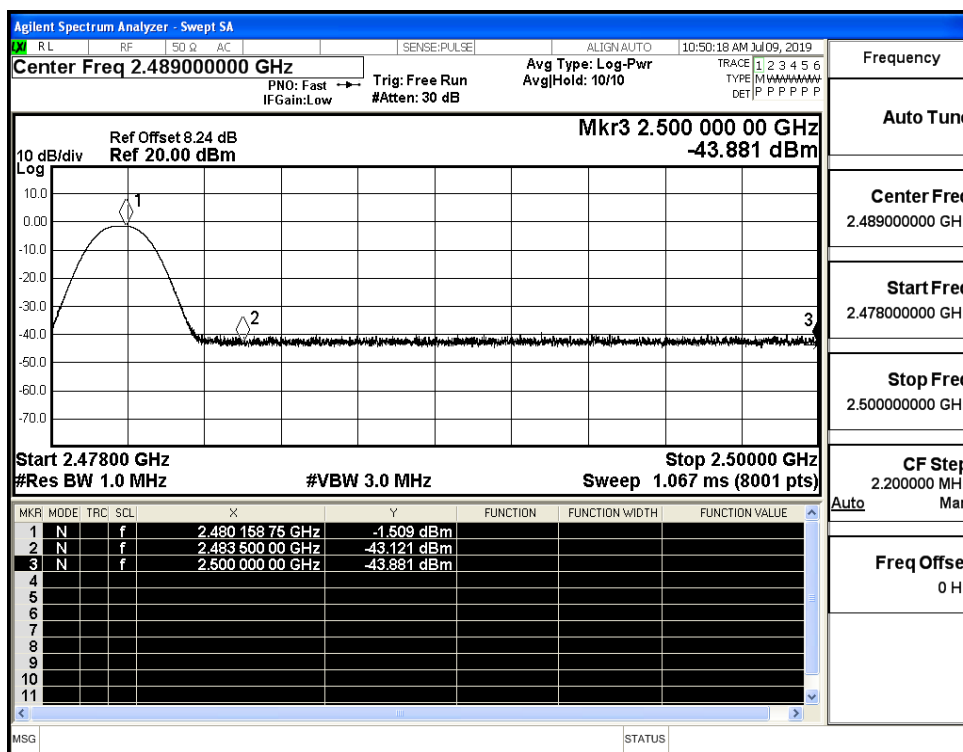
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



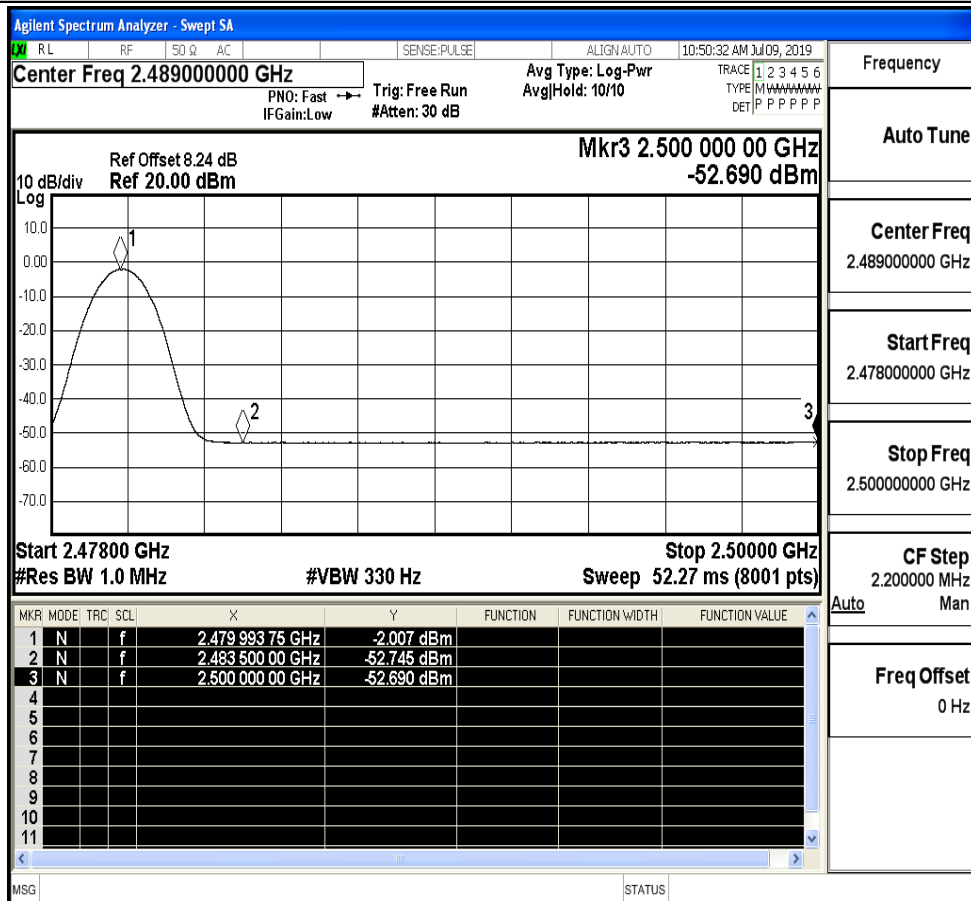
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



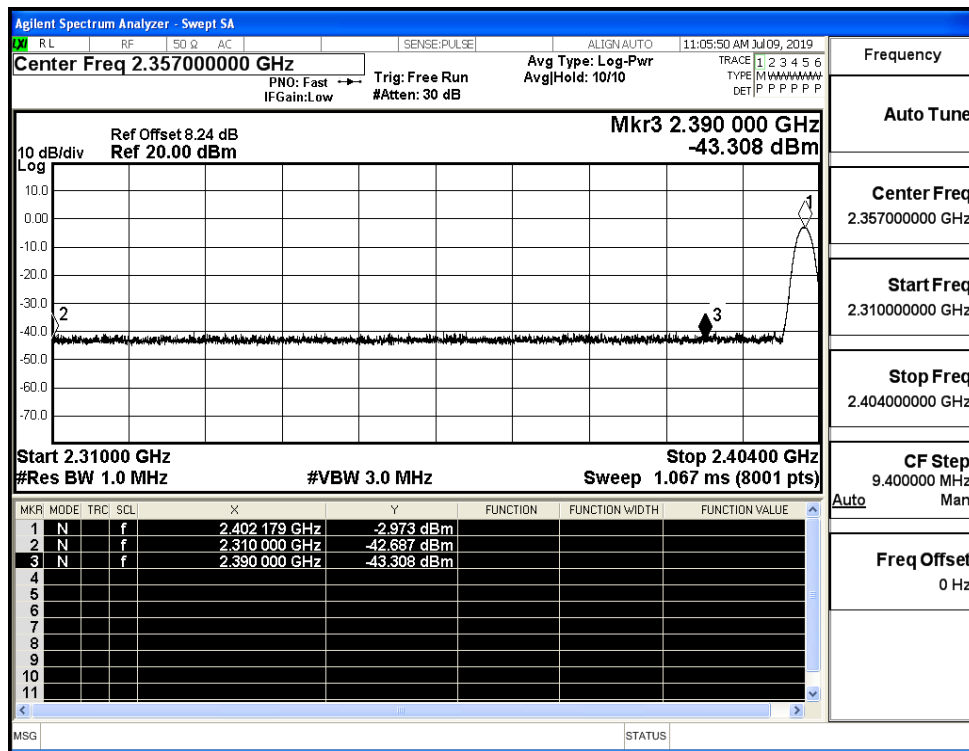
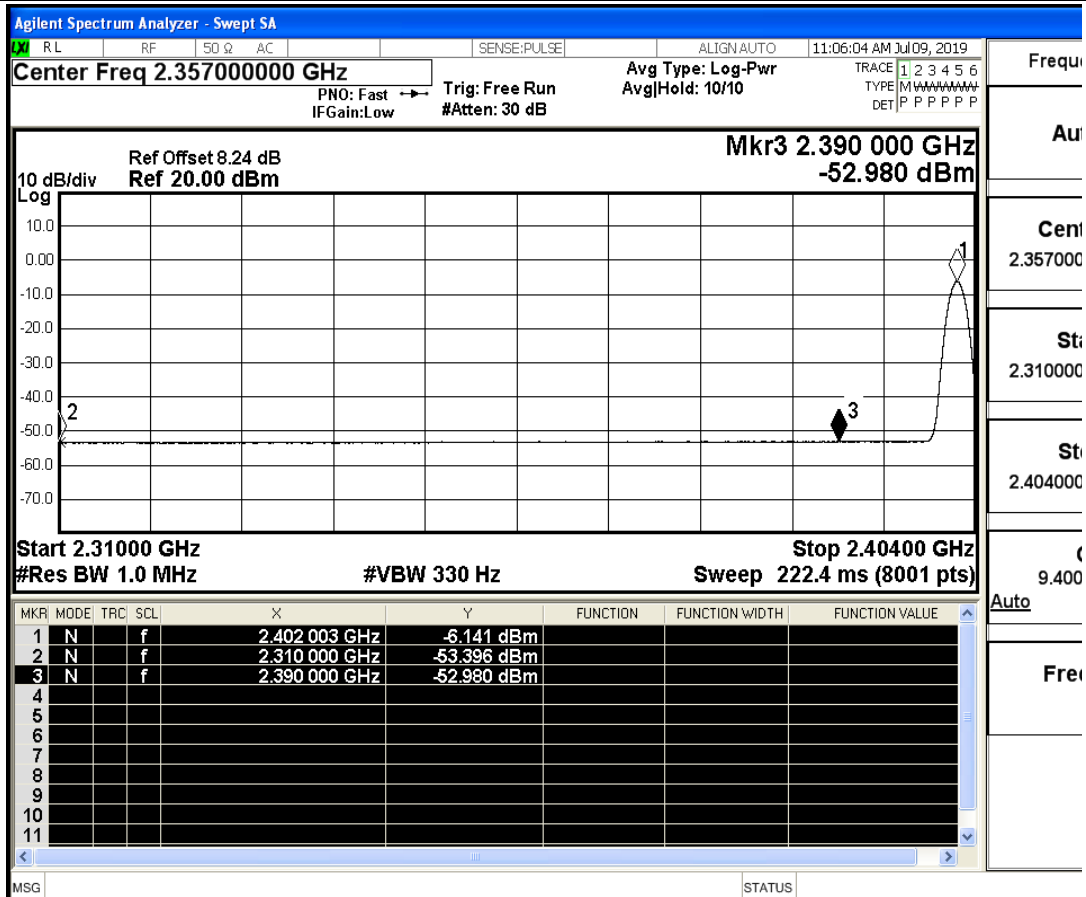
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



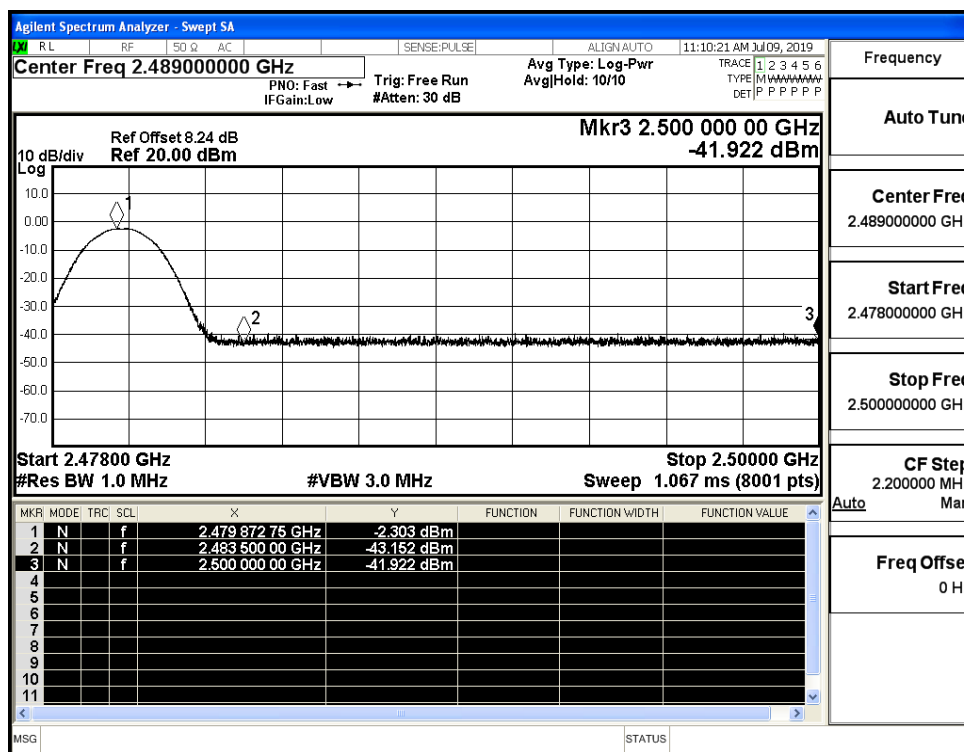
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)





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)

