

## Appendix A

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

**Product Name: Notebook**

**Trade Mark: EMATIC**

**Test Model: EWT148**

#### Environmental Conditions

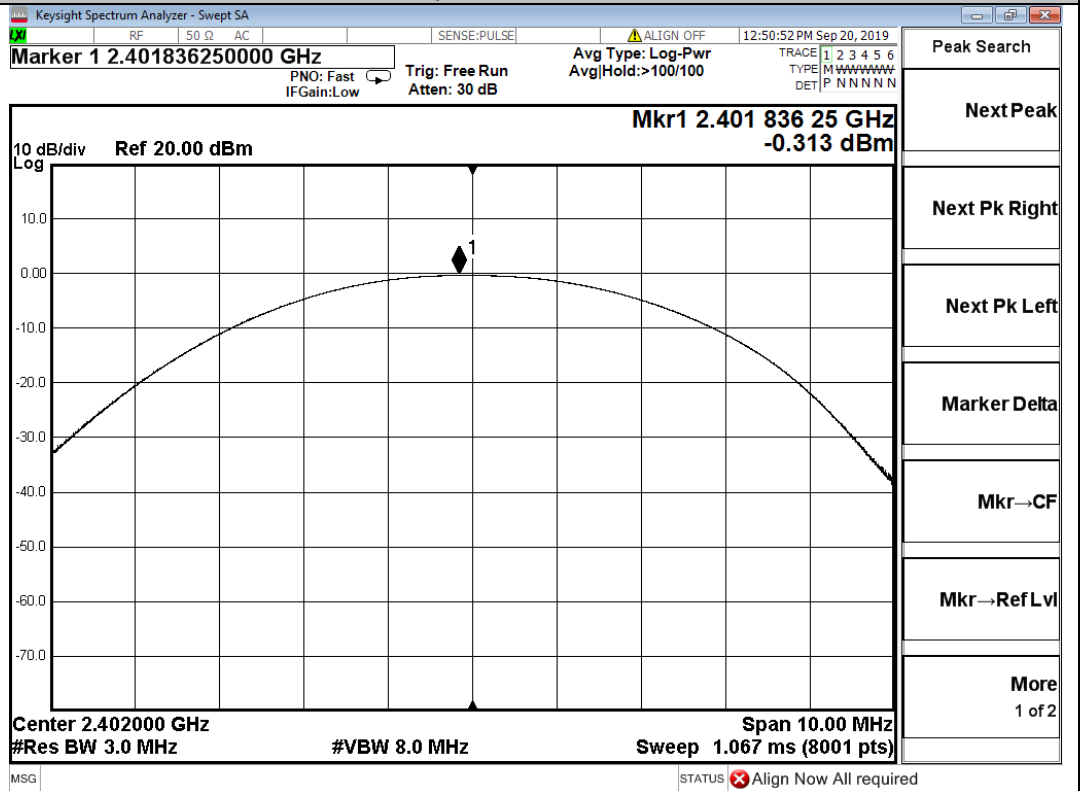
|                    |             |
|--------------------|-------------|
| Temperature:       | 23.6 ° C    |
| Relative Humidity: | 57%         |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | CHUANG WANG |
| Supervised by:     | JAYDEN ZHUO |

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

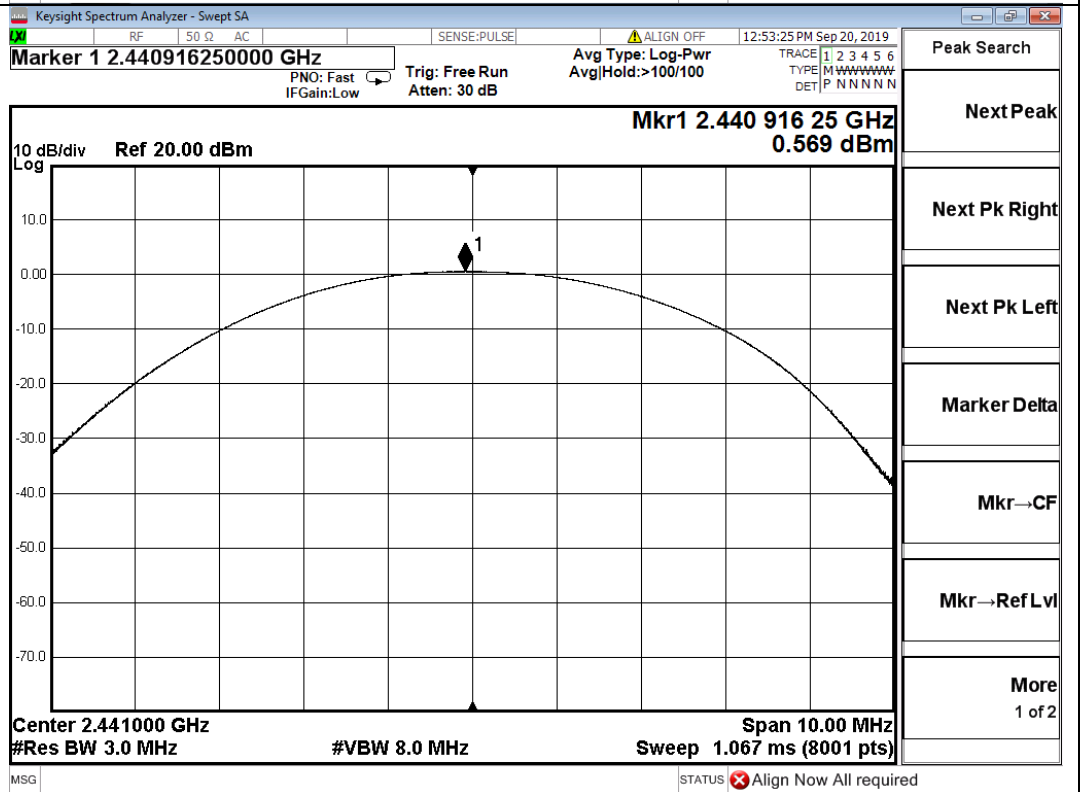
| Mode          | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK          | LCH      | -0.313                          | 21          | PASS    |
|               | MCH      | 0.569                           | 21          | PASS    |
|               | HCH      | 1.460                           | 21          | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.177                           | 21          | PASS    |
|               | MCH      | 1.977                           | 21          | PASS    |
|               | HCH      | 2.950                           | 21          | PASS    |
| 8DPSK         | LCH      | 2.512                           | 21          | PASS    |
|               | MCH      | 3.109                           | 21          | PASS    |
|               | HCH      | 3.981                           | 21          | PASS    |

Test Graphs

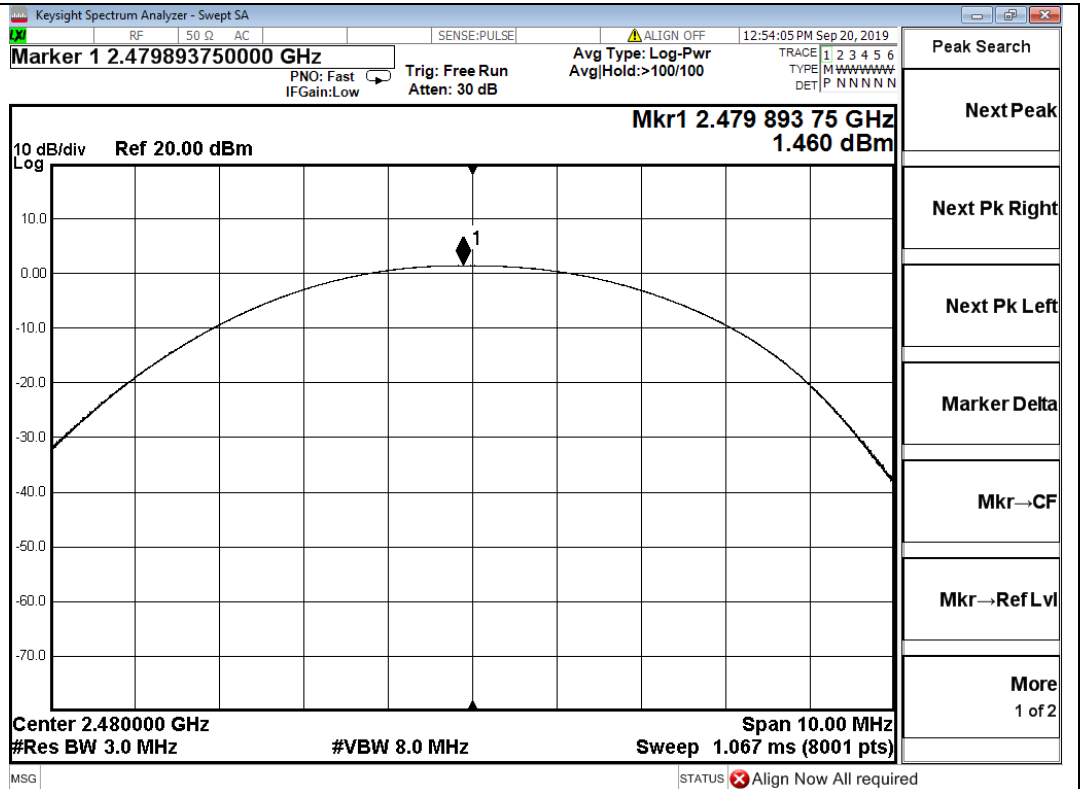
GFSK/LCH



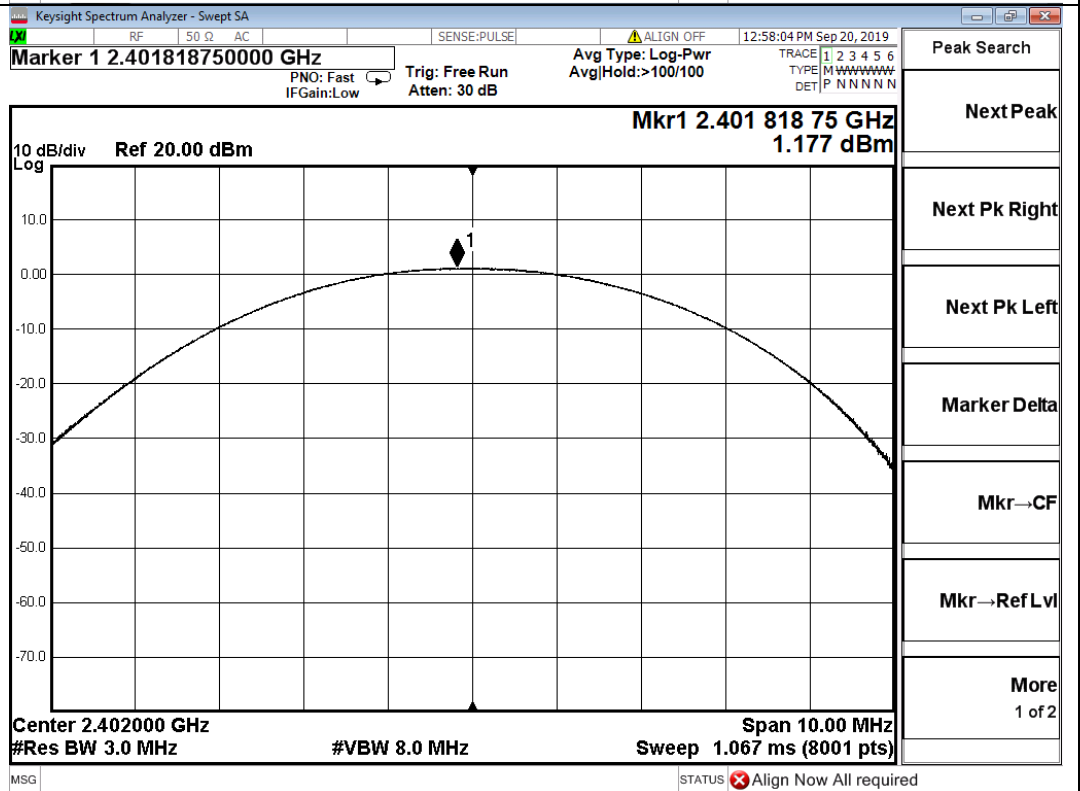
GFSK/MCH



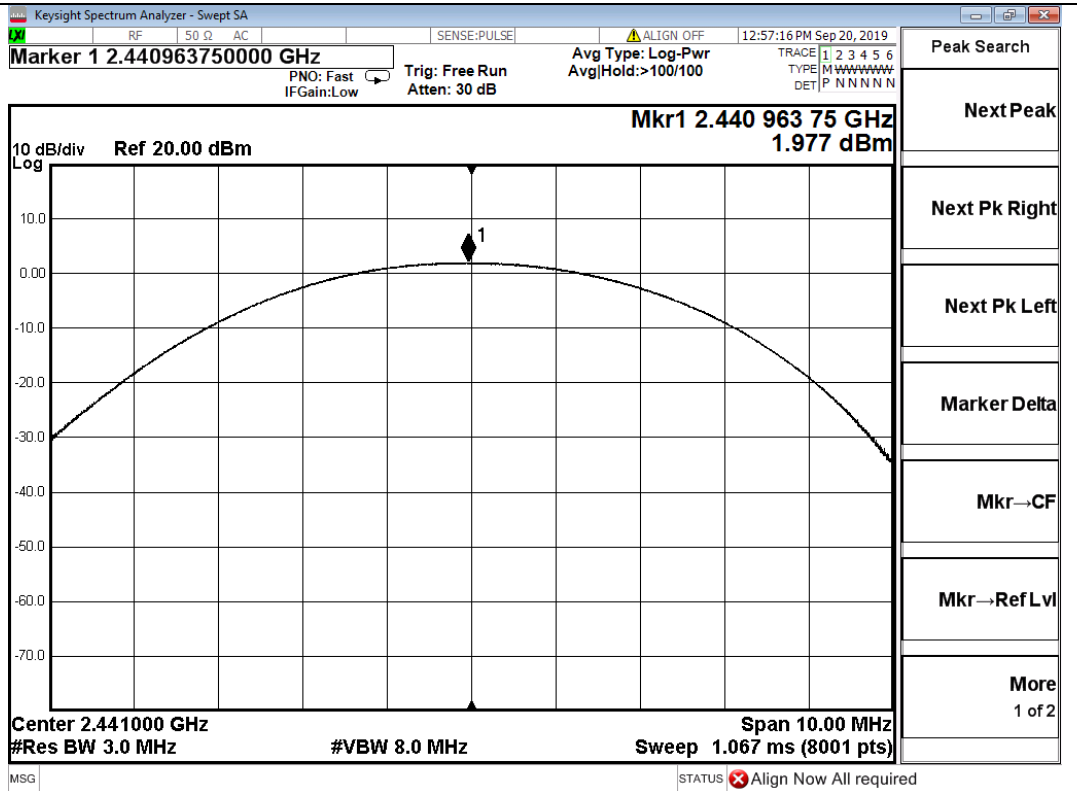
GFSK/HCH



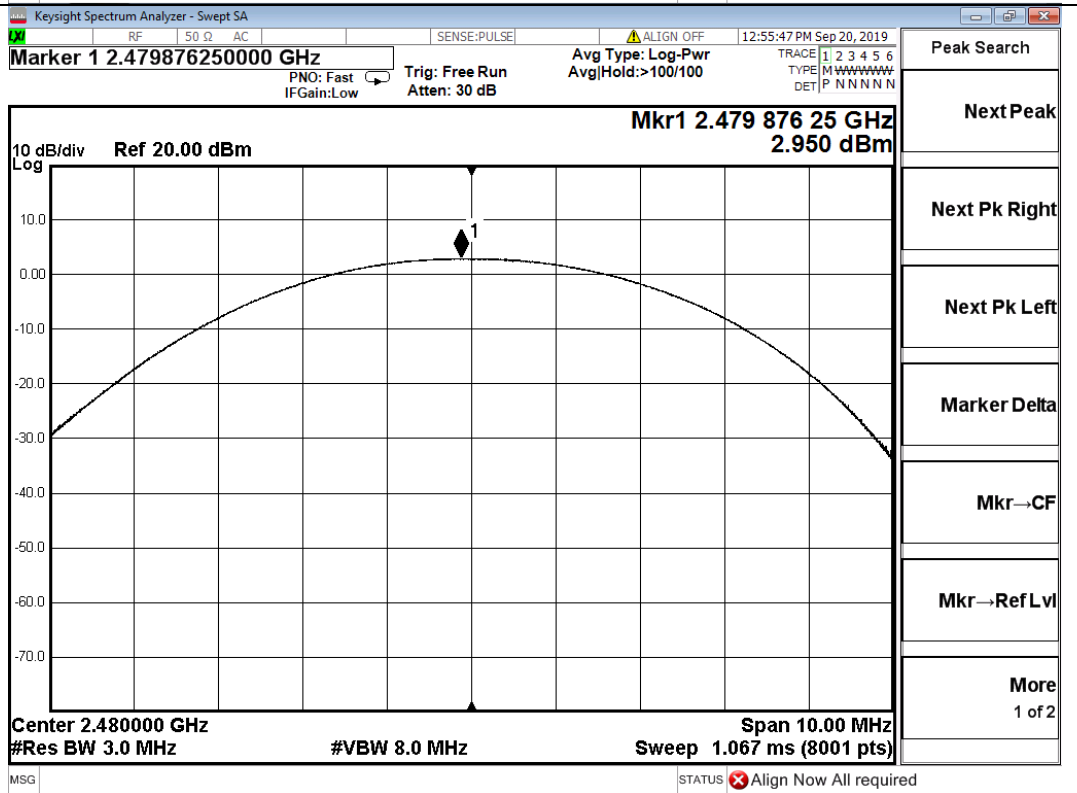
$\pi$ /4DQPSK/LCH



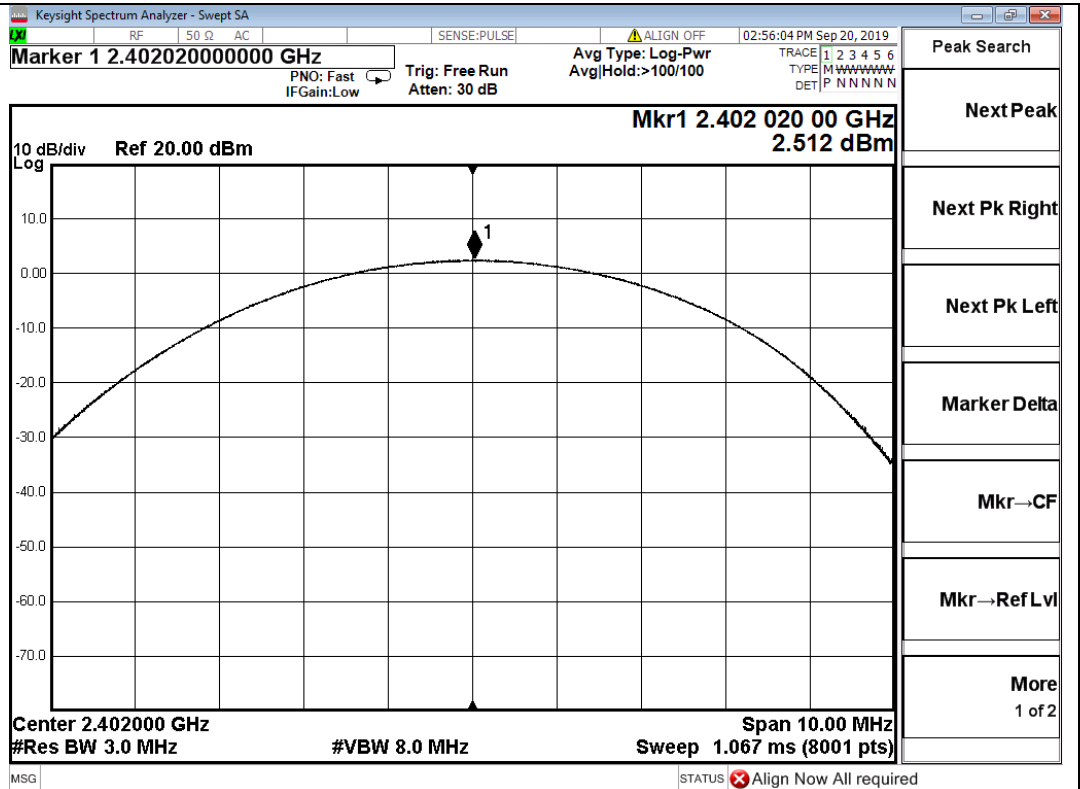
$\pi/4$ DQPSK/MCH



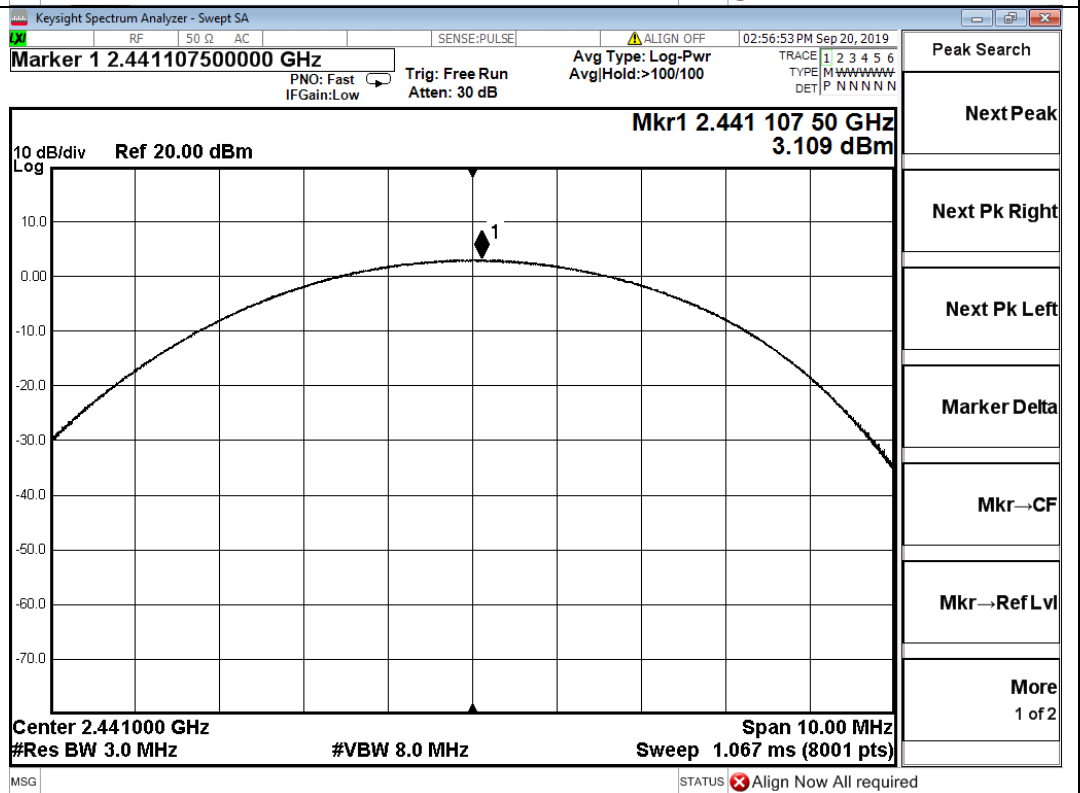
$\pi/4$ DQPSK/HCH

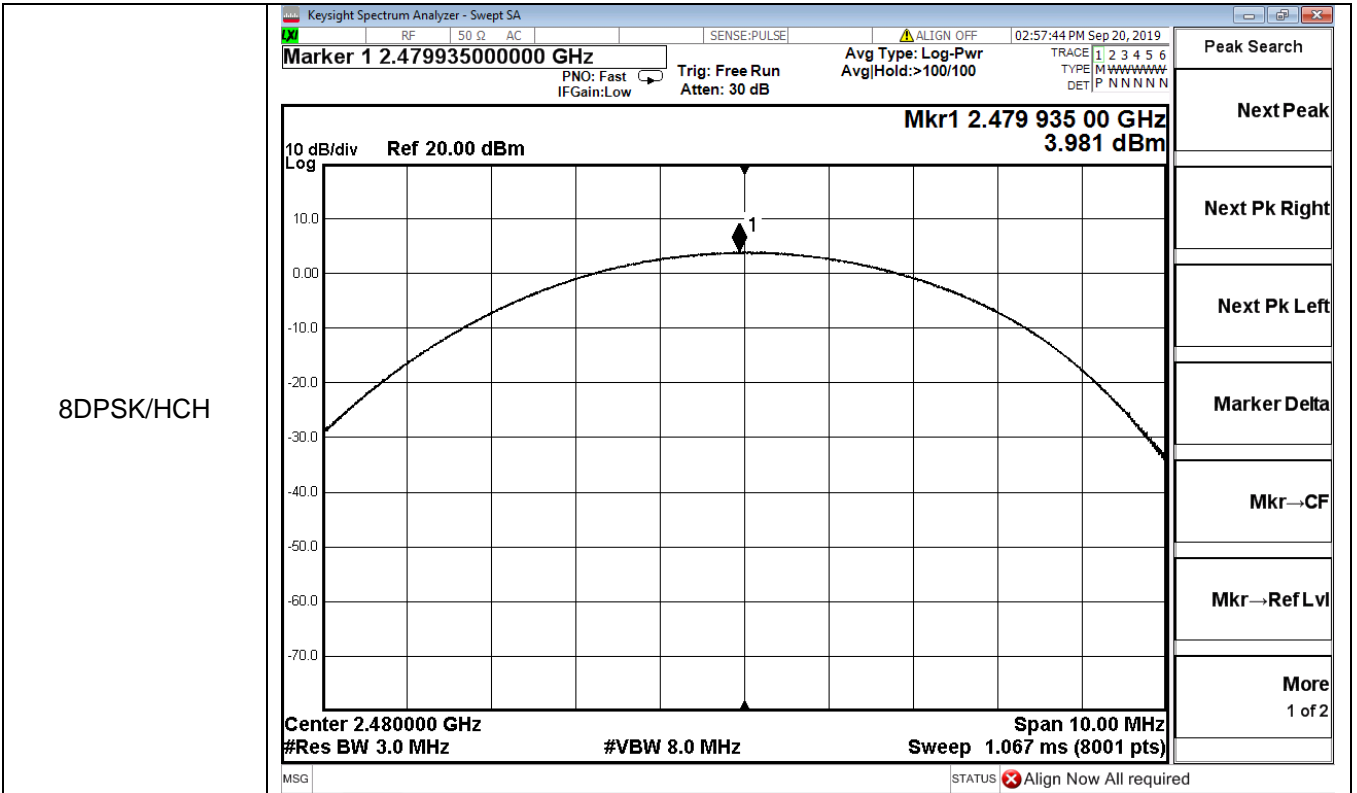


8DPSK/LCH



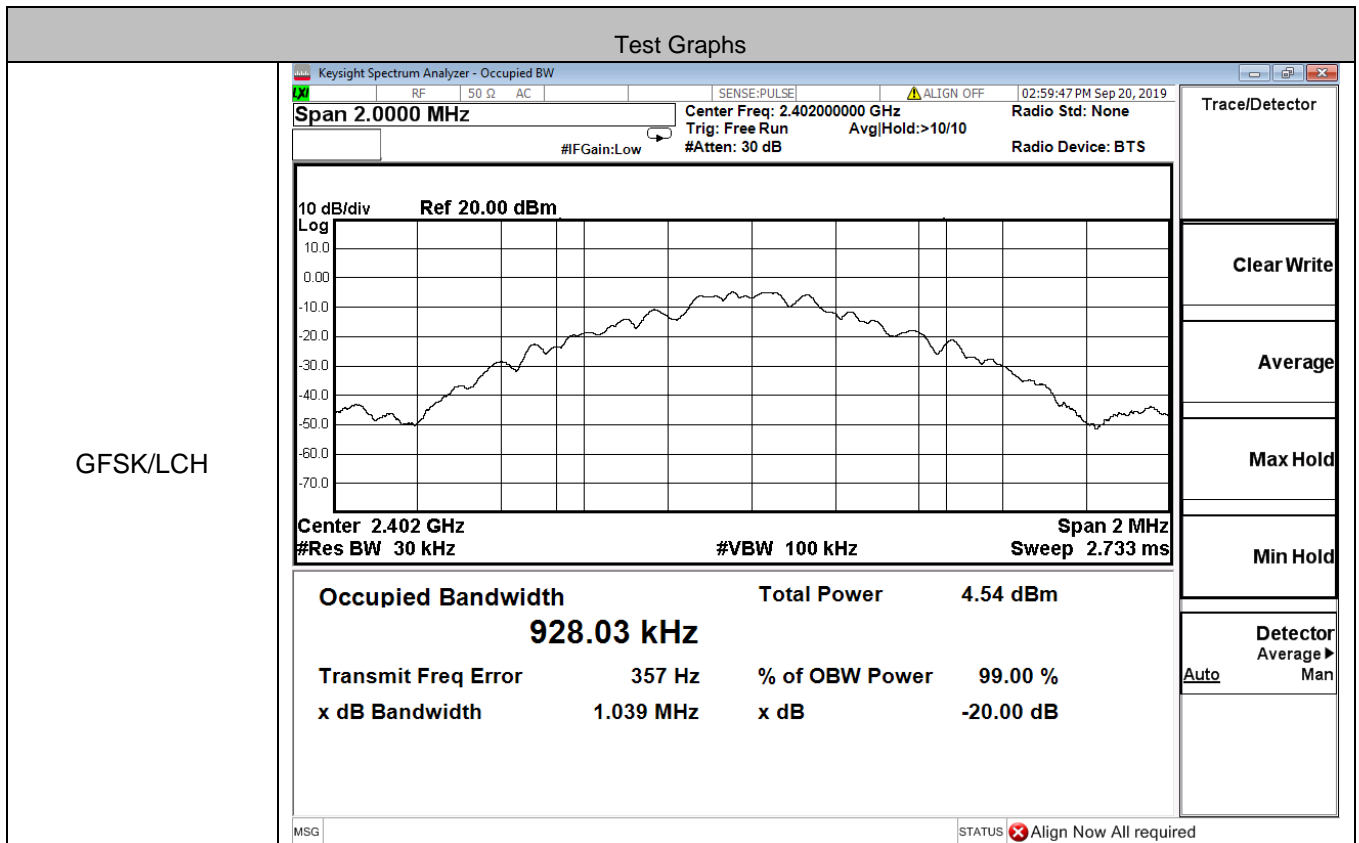
8DPSK/MCH





**A.2 99% and 20dB Bandwidth**

| Mode     | Channel. | 99% Bandwidth [MHz] | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|----------|----------|---------------------|----------------------|---------------|---------|
| GFSK     | LCH      | 0.92803             | 1.039                | Not Specified | PASS    |
|          | MCH      | 0.92845             | 1.039                | Not Specified | PASS    |
|          | HCH      | 0.92912             | 1.040                | Not Specified | PASS    |
| π/4DQPSK | LCH      | 1.1918              | 1.345                | Not Specified | PASS    |
|          | MCH      | 1.1923              | 1.346                | Not Specified | PASS    |
|          | HCH      | 1.1920              | 1.346                | Not Specified | PASS    |
| 8DPSK    | LCH      | 1.2314              | 1.365                | Not Specified | PASS    |
|          | MCH      | 1.2330              | 1.365                | Not Specified | PASS    |
|          | HCH      | 1.2324              | 1.364                | Not Specified | PASS    |



GFSK/MCH

Center Freq 2.441000000 GHz

Center Freq: 2.441000000 GHz

Trig: Free Run

#IFGain: Low

#Atten: 30 dB

Radio Std: None

Radio Device: BTS

10 dB/div Ref 20.00 dBm

Center 2.441 GHz Span 2 MHz

#Res BW 30 kHz #VBW 100 kHz Sweep 2.733 ms

|                     |             |                        |
|---------------------|-------------|------------------------|
| Occupied Bandwidth  | Total Power | 5.20 dBm               |
| <b>928.45 kHz</b>   |             |                        |
| Transmit Freq Error | -777 Hz     | % of OBW Power 99.00 % |
| x dB Bandwidth      | 1.039 MHz   | x dB -20.00 dB         |

Trace/Detector

MSG

STATUS ✖ Align Now All required

GFSK/HCH

Center Freq 2.480000000 GHz

Center Freq: 2.480000000 GHz

Trig: Free Run

#IFGain: Low

#Atten: 30 dB

Radio Std: None

Radio Device: BTS

10 dB/div Ref 20.00 dBm

Center 2.48 GHz Span 2 MHz

#Res BW 30 kHz #VBW 100 kHz Sweep 2.733 ms

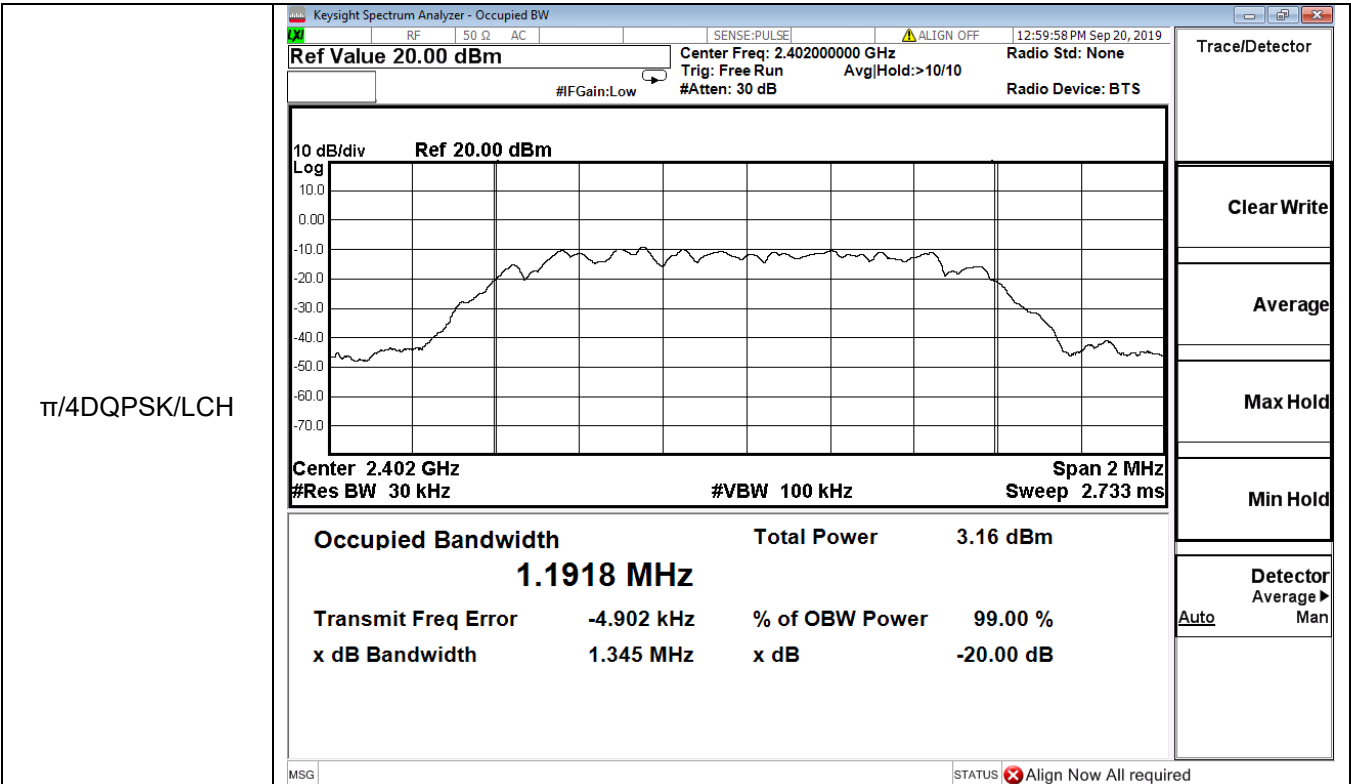
|                     |             |                        |
|---------------------|-------------|------------------------|
| Occupied Bandwidth  | Total Power | 6.06 dBm               |
| <b>929.12 kHz</b>   |             |                        |
| Transmit Freq Error | -842 Hz     | % of OBW Power 99.00 % |
| x dB Bandwidth      | 1.040 MHz   | x dB -20.00 dB         |

Frequency

MSG

STATUS ✖ Align Now All required





π/4DQPSK/LCH

Trace/Detector

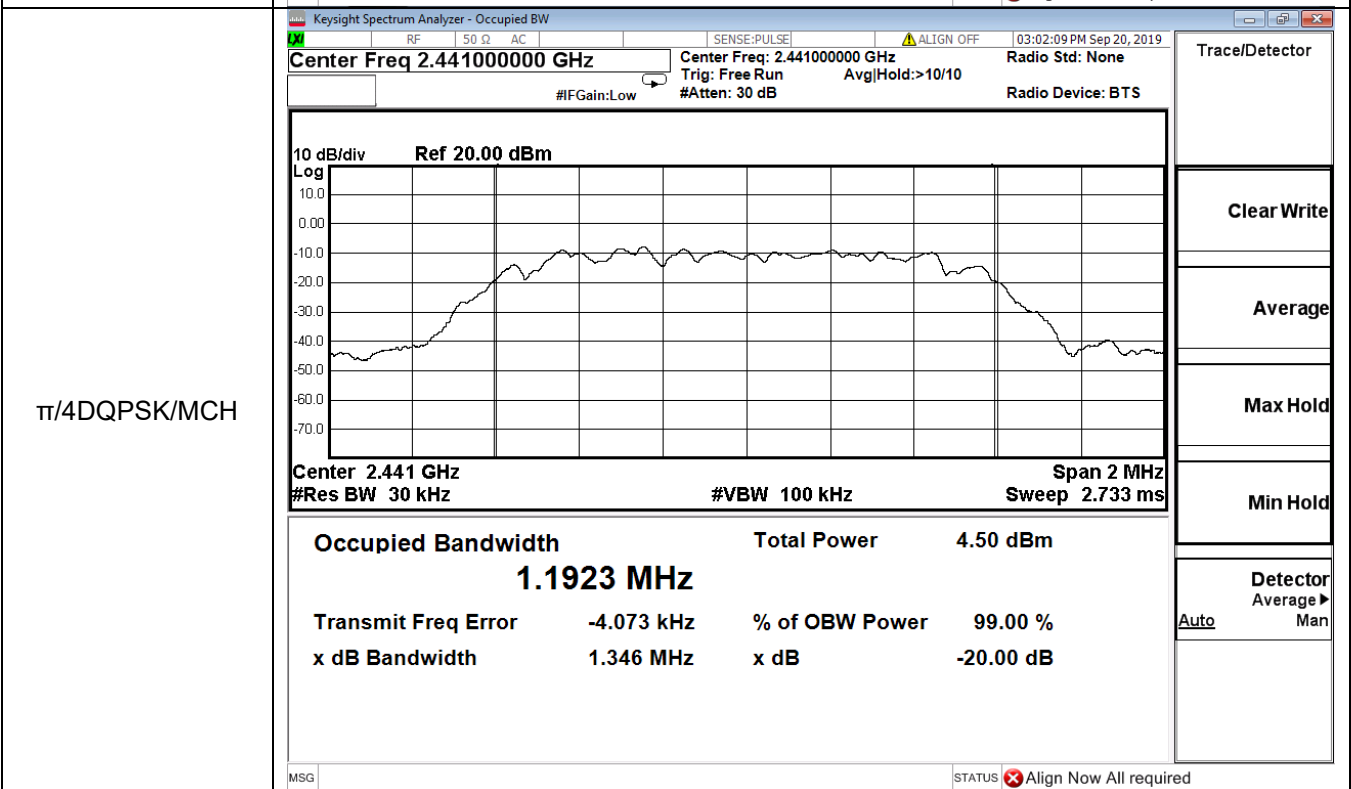
Clear Write

Average

Max Hold

Min Hold

Detector Average  
 Auto Man



π/4DQPSK/MCH

Trace/Detector

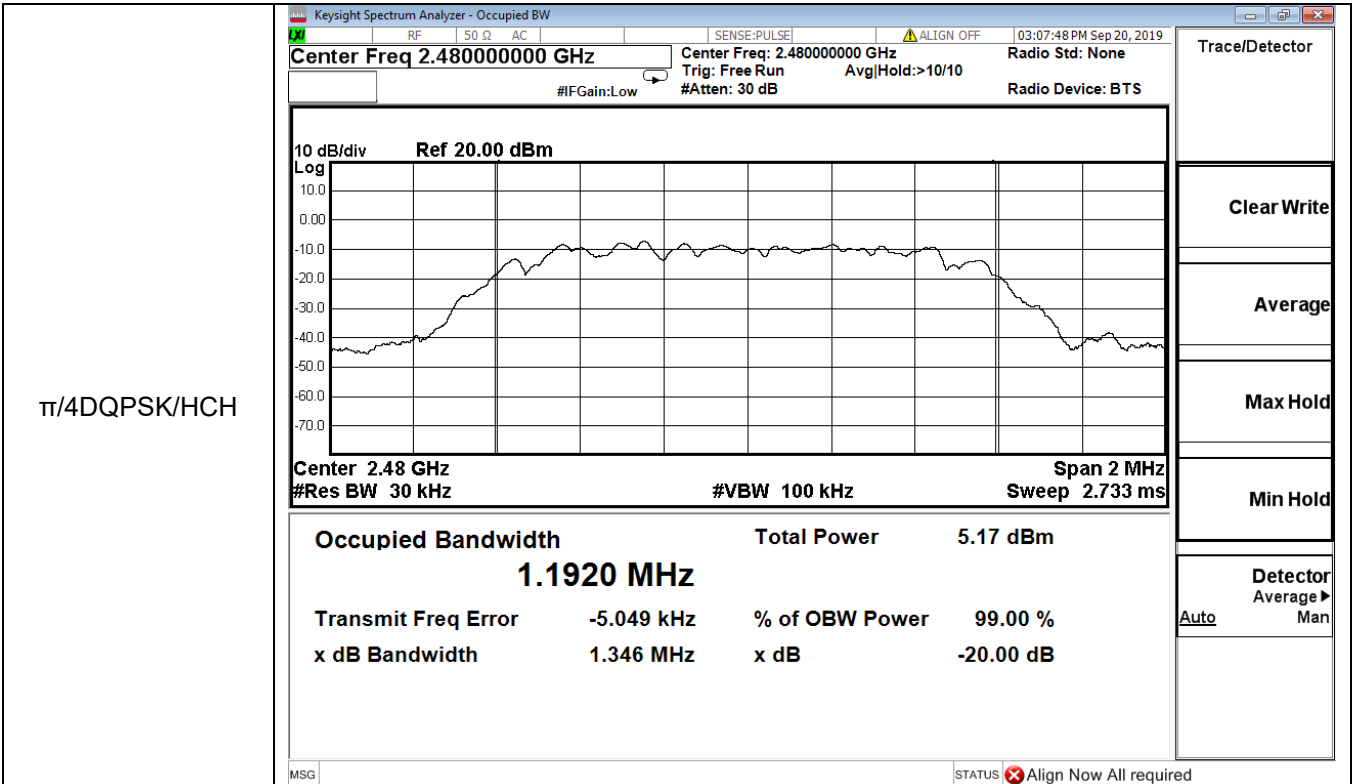
Clear Write

Average

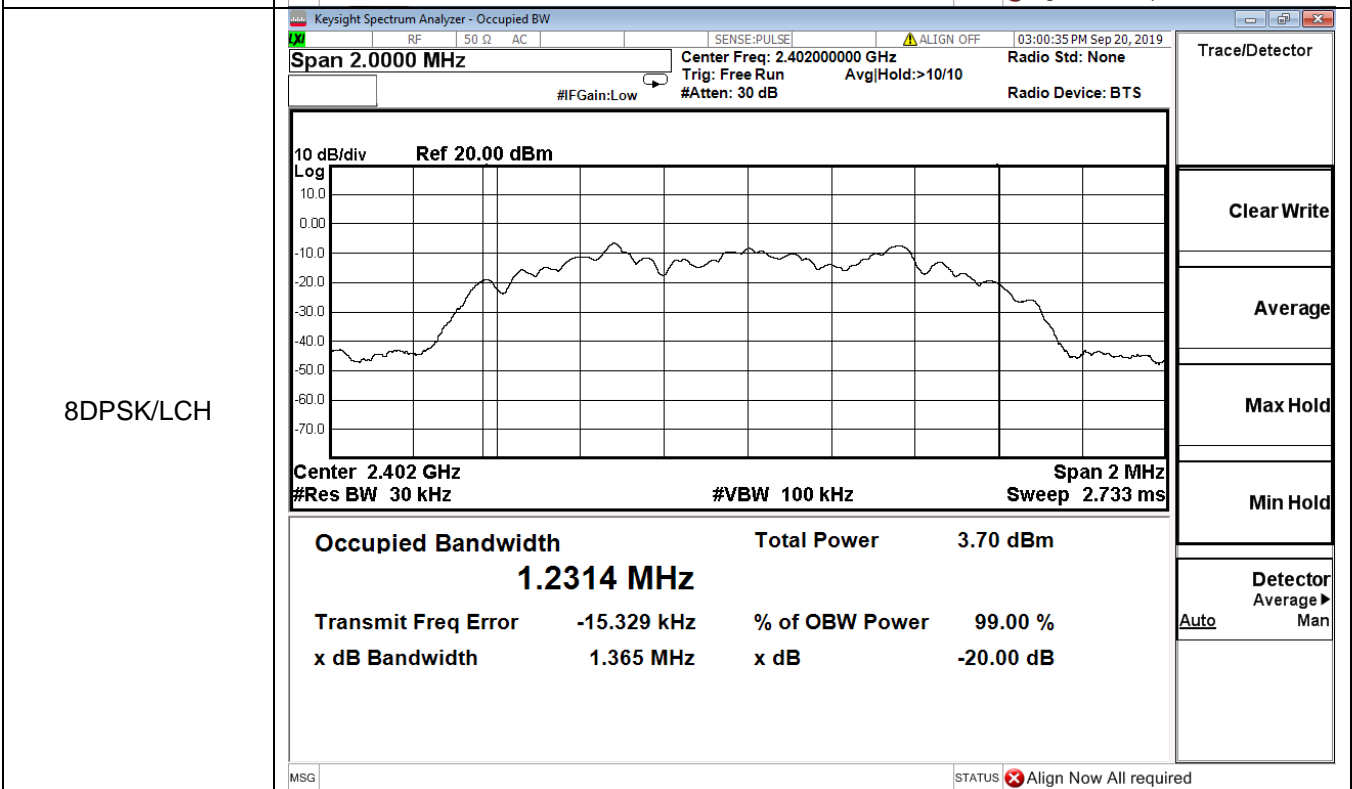
Max Hold

Min Hold

Detector Average  
 Auto Man

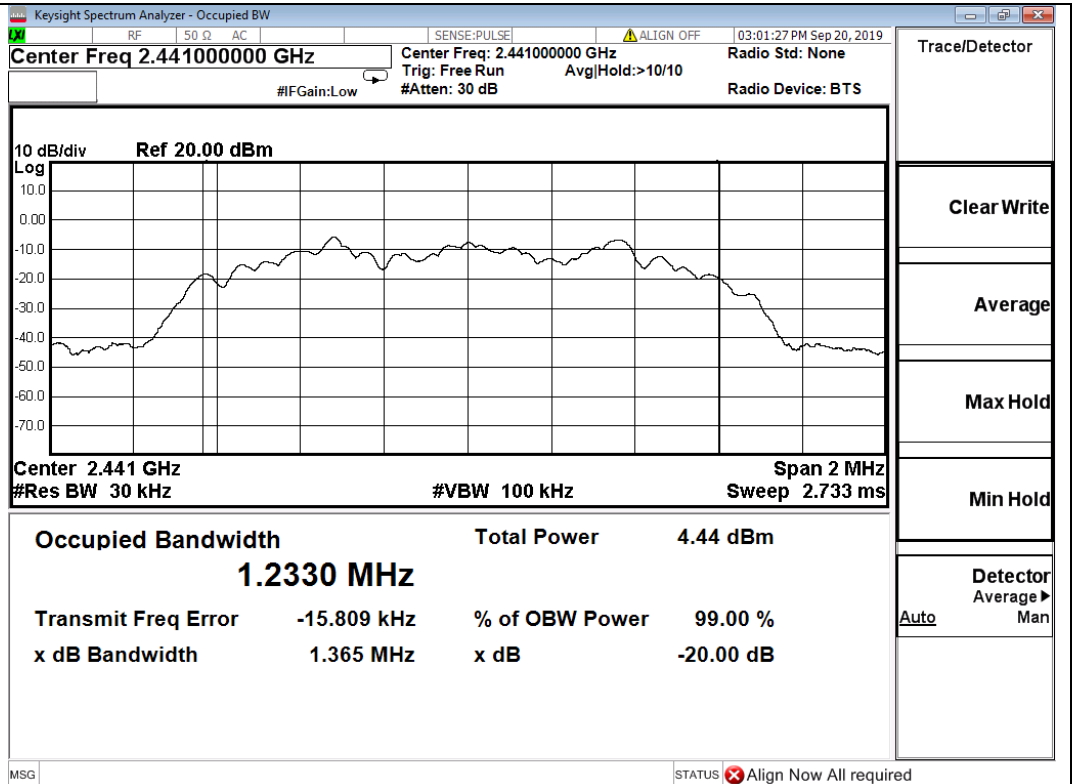


π/4DQPSK/HCH

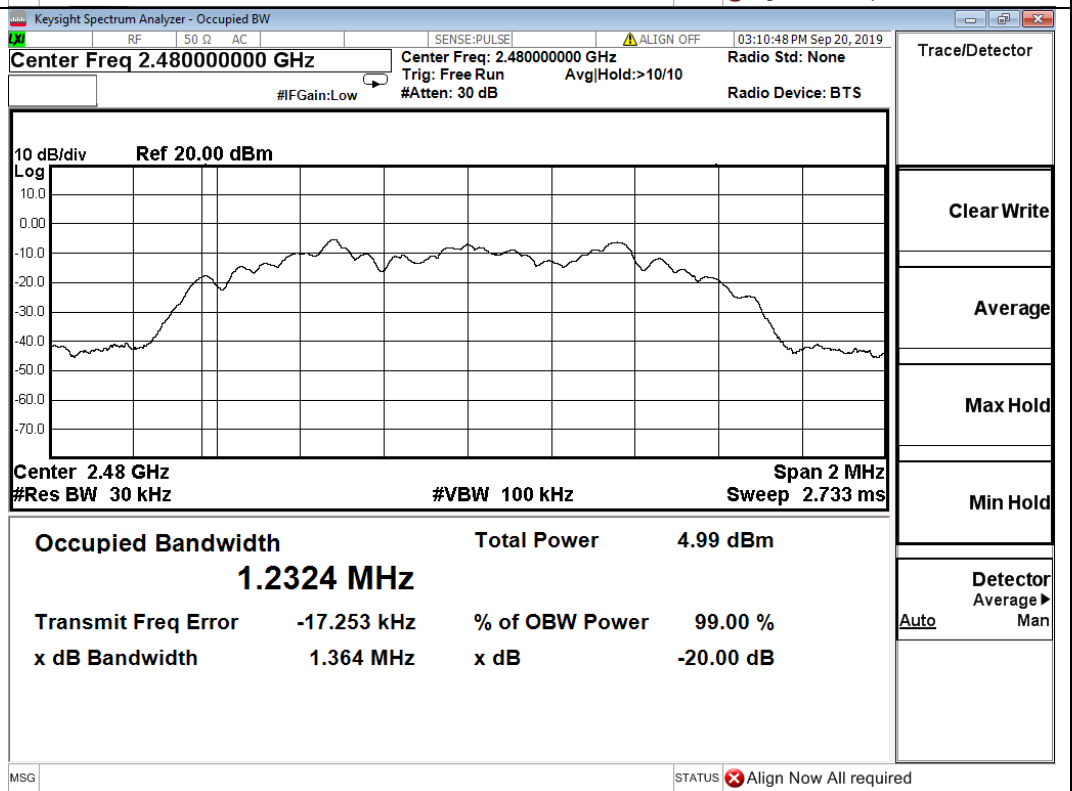


8DPSK/LCH

8DPSK/MCH

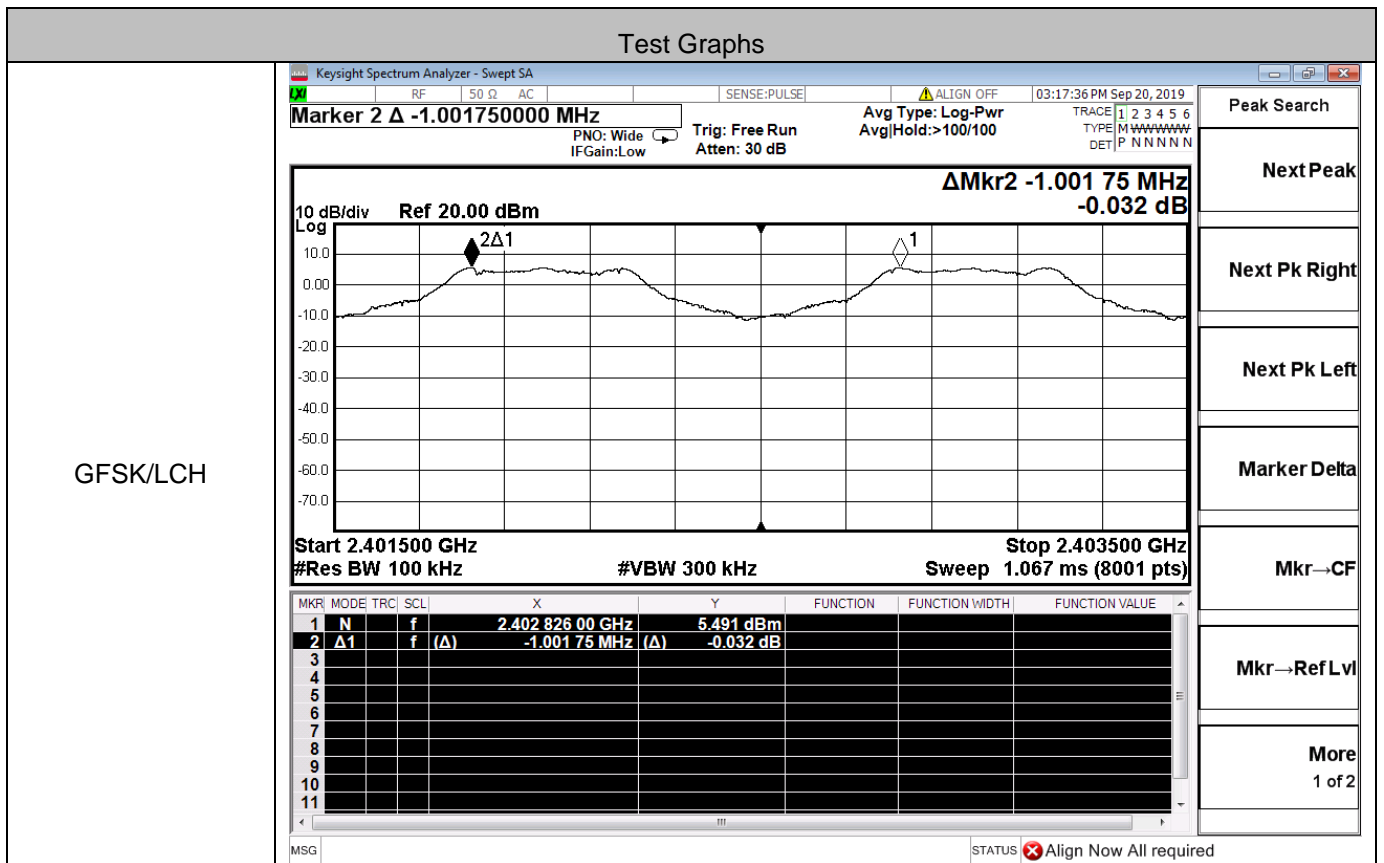


8DPSK/HCH

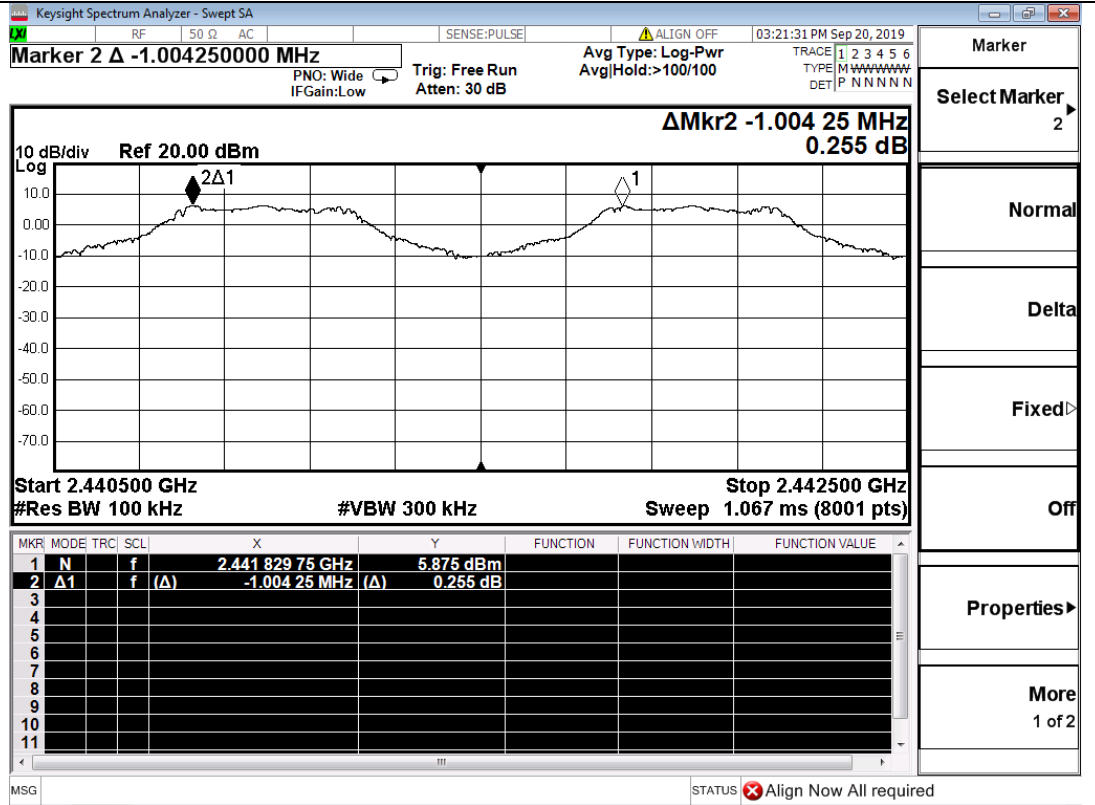


### A.3 Carrier Frequency Separation

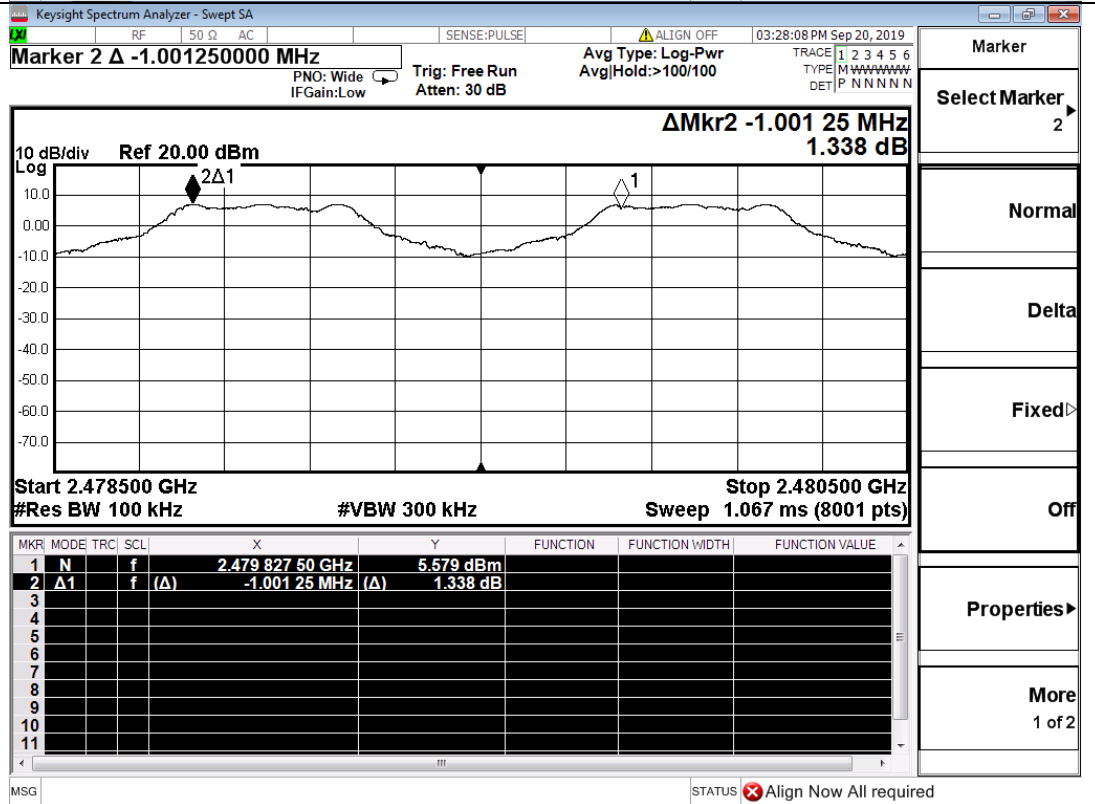
| Mode     | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz]<br>2/3*20dB<br>Bandwidth | Verdict |
|----------|----------|------------------------------------|--------------------------------------|---------|
| GFSK     | LCH      | 1.002                              | 0.693                                | PASS    |
|          | MCH      | 1.004                              | 0.693                                | PASS    |
|          | HCH      | 1.001                              | 0.693                                | PASS    |
| π/4DQPSK | LCH      | 0.999                              | 0.897                                | PASS    |
|          | MCH      | 1.002                              | 0.897                                | PASS    |
|          | HCH      | 1.001                              | 0.897                                | PASS    |
| 8DPSK    | LCH      | 0.999                              | 0.910                                | PASS    |
|          | MCH      | 1.001                              | 0.910                                | PASS    |
|          | HCH      | 0.998                              | 0.909                                | PASS    |



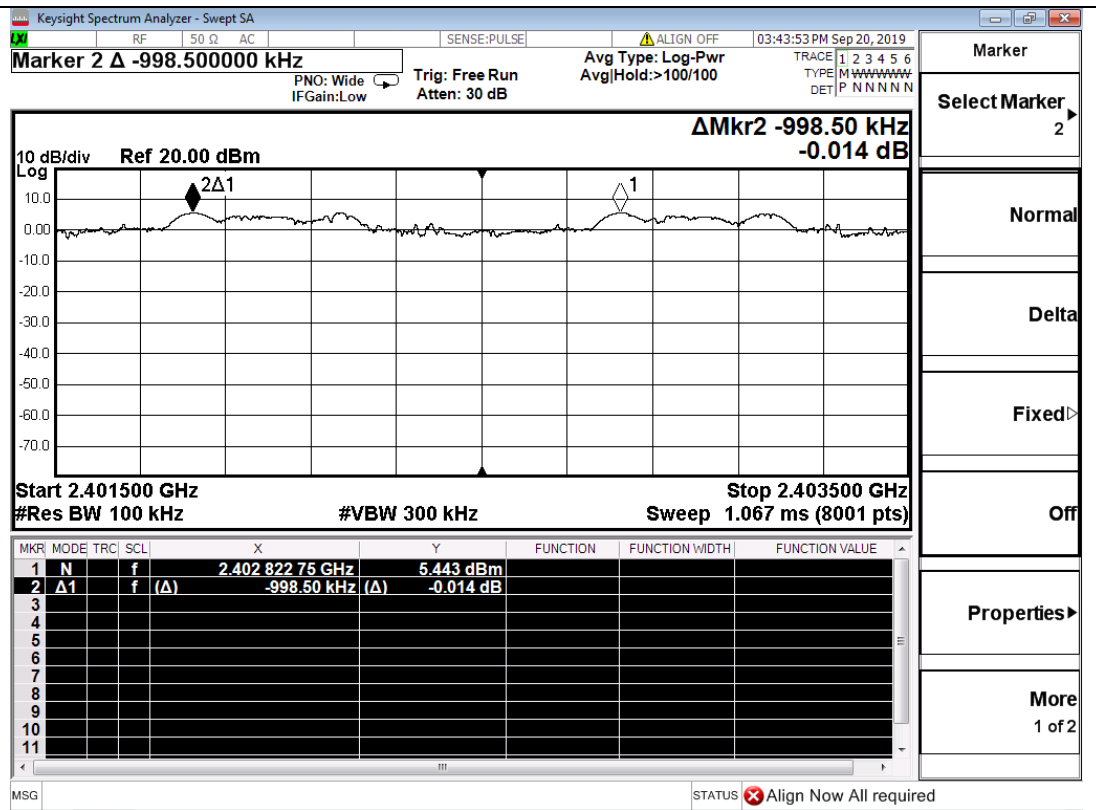
GFSK/MCH



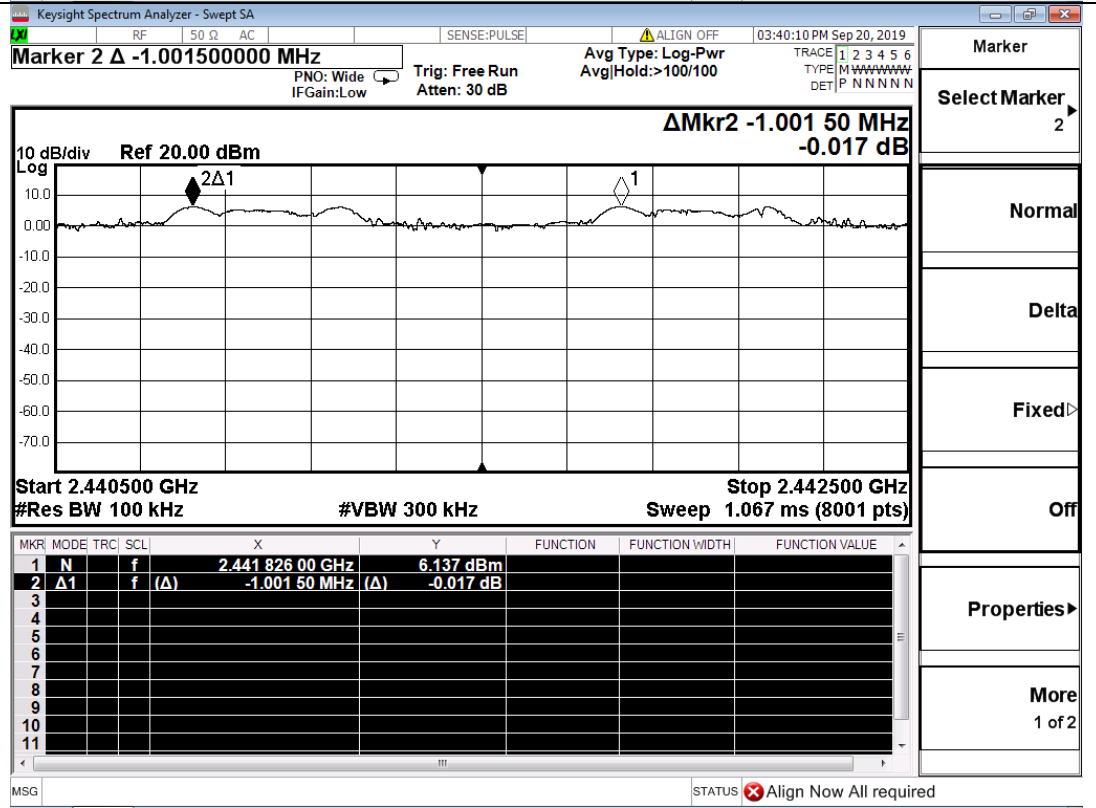
GFSK/HCH



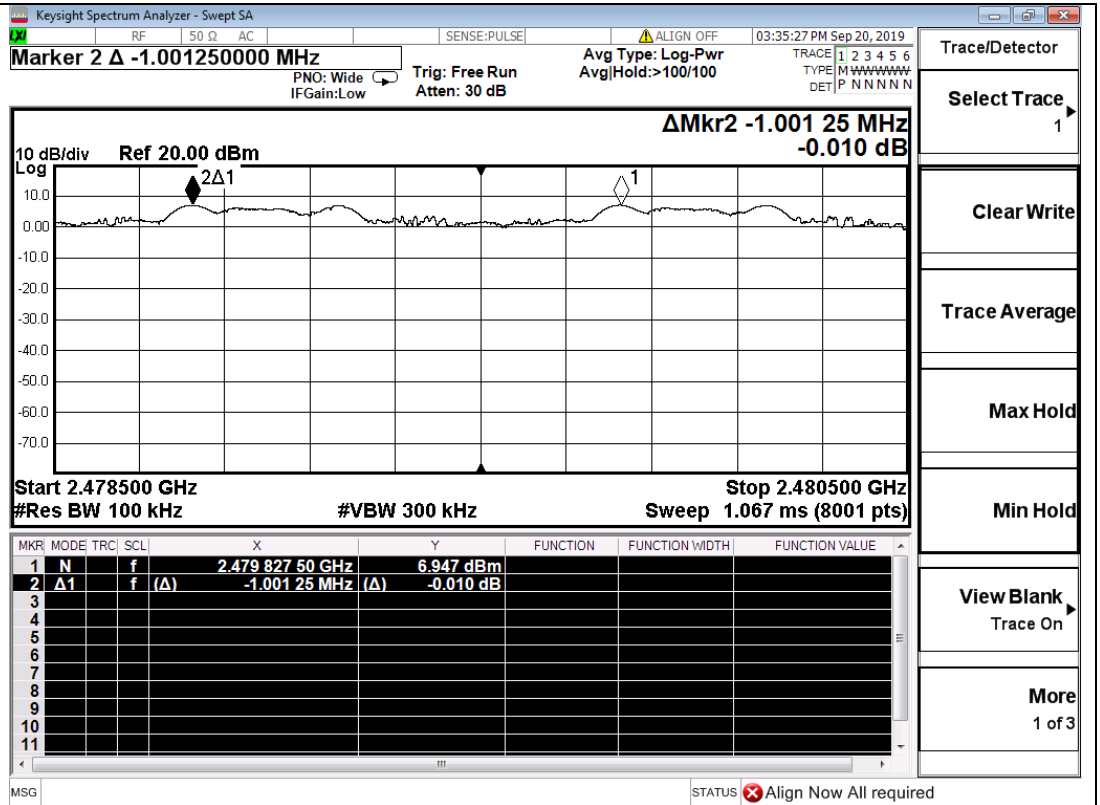
$\pi/4$ DQPSK/LCH



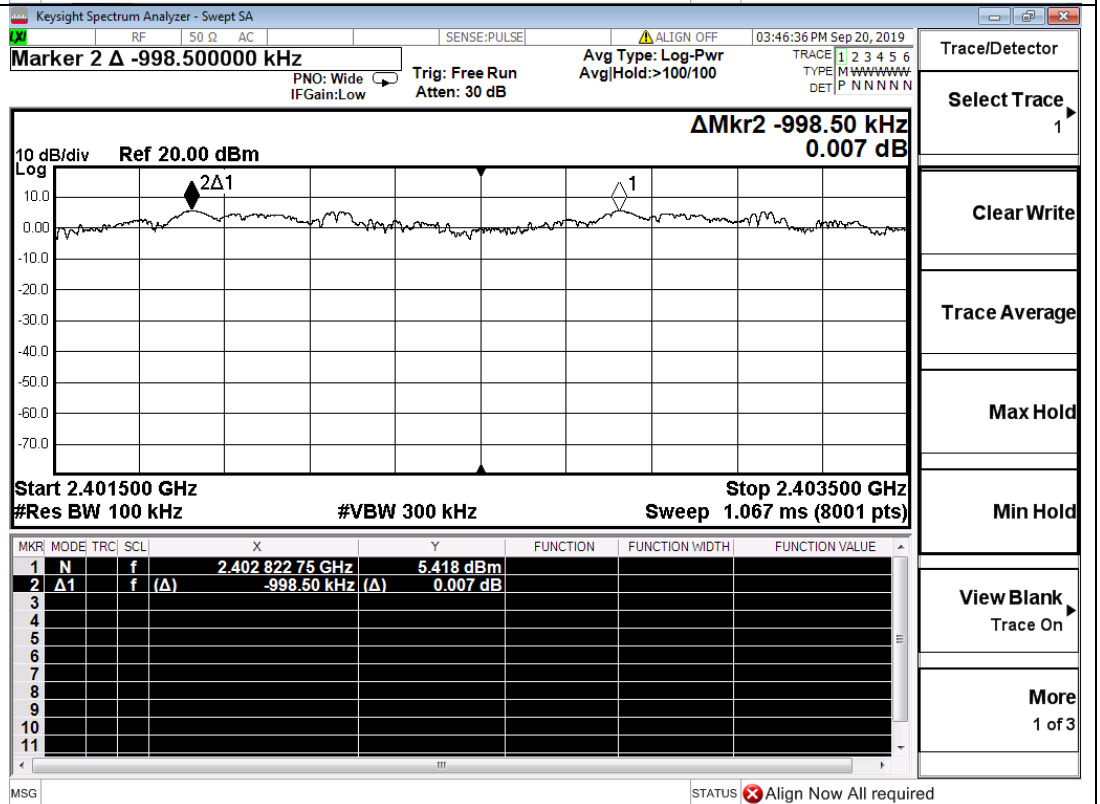
$\pi/4$ DQPSK/MCH



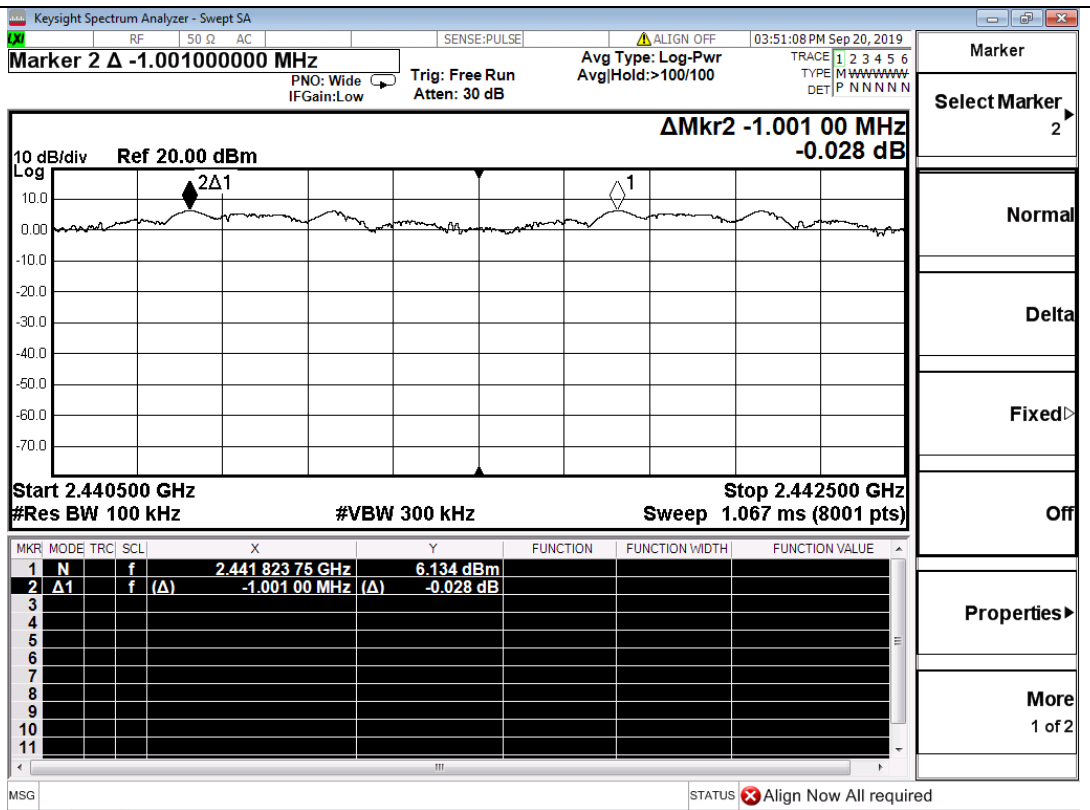
$\pi/4$ DQPSK/HCH



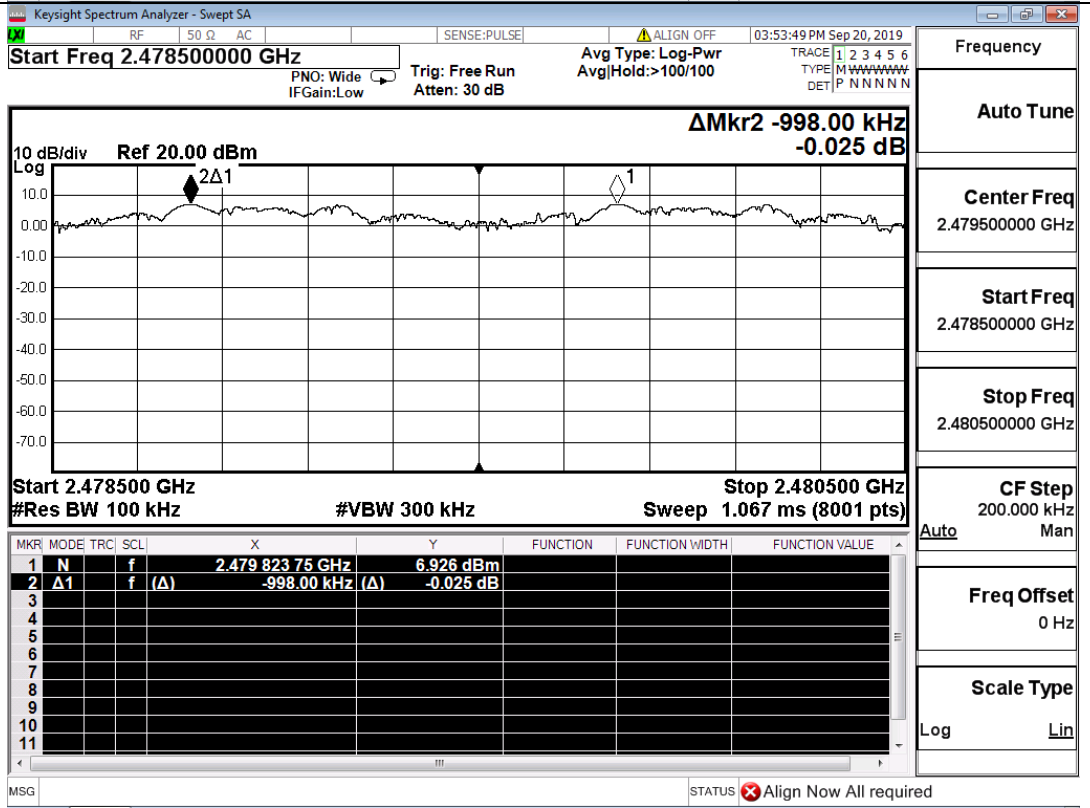
8DPSK/LCH



8DPSK/MCH



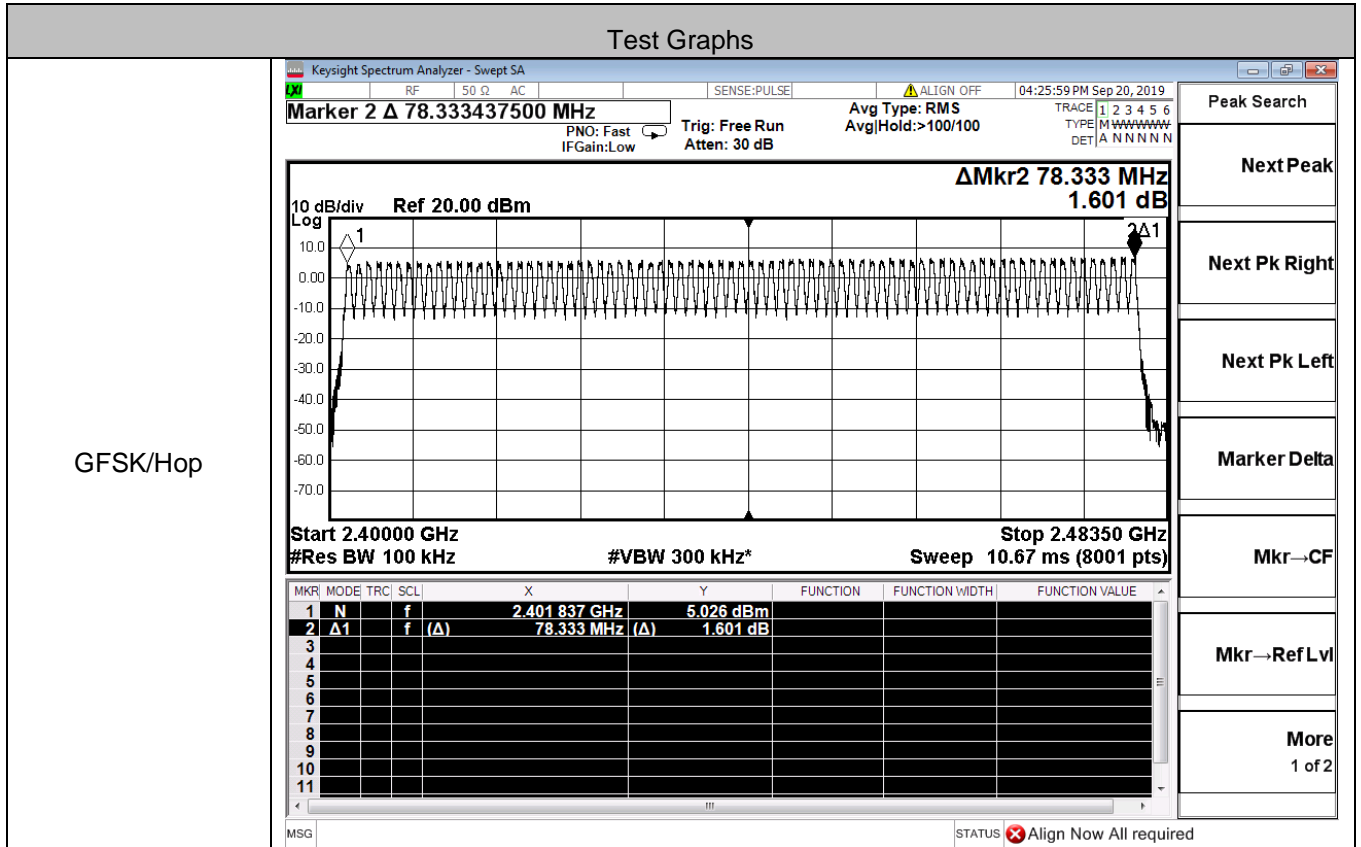
8DPSK/HCH





### A.4 Hopping Channel Number

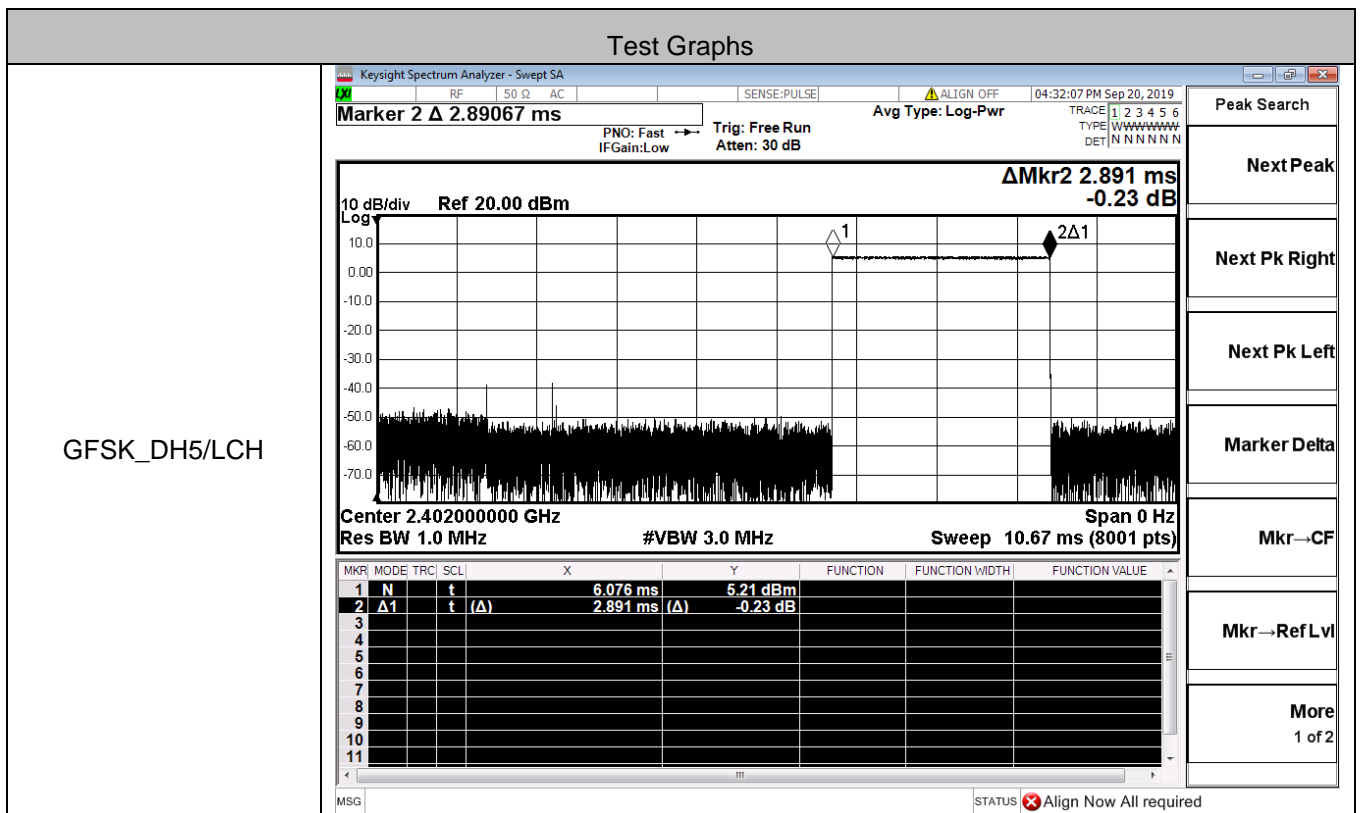
| Mode          | Channel. | Number of Hopping Channel [N] | Limit [N] | Verdict |
|---------------|----------|-------------------------------|-----------|---------|
| GFSK          | Hop      | 79                            | >=15      | PASS    |
| $\pi/4$ DQPSK | Hop      | 79                    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



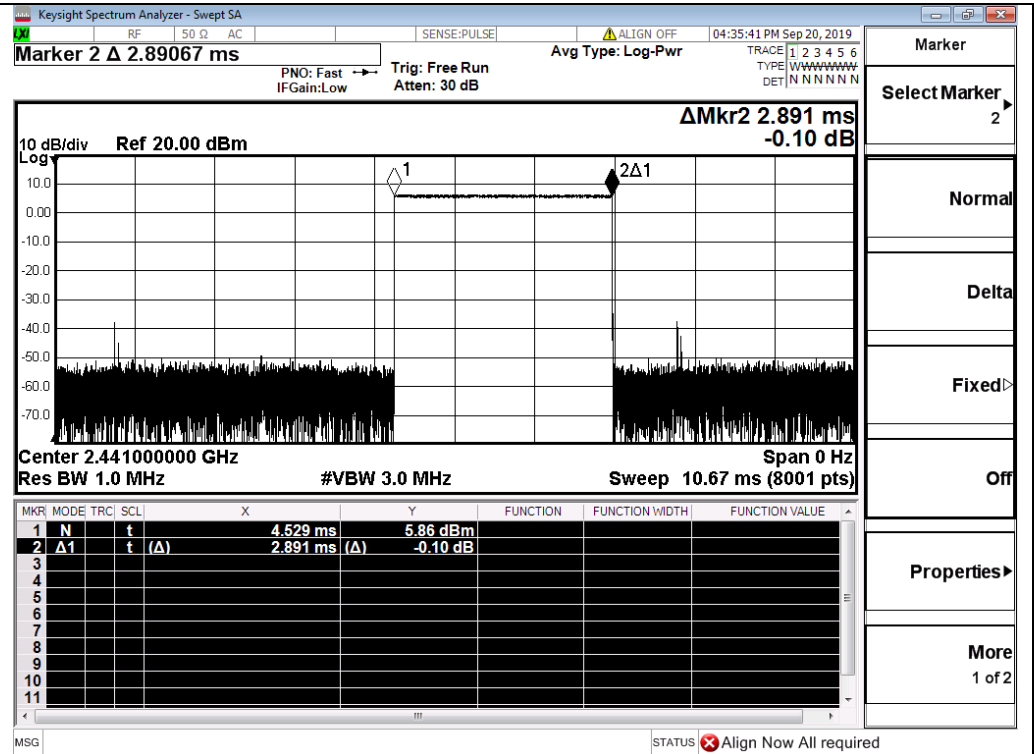


### A.5 Dwell Time

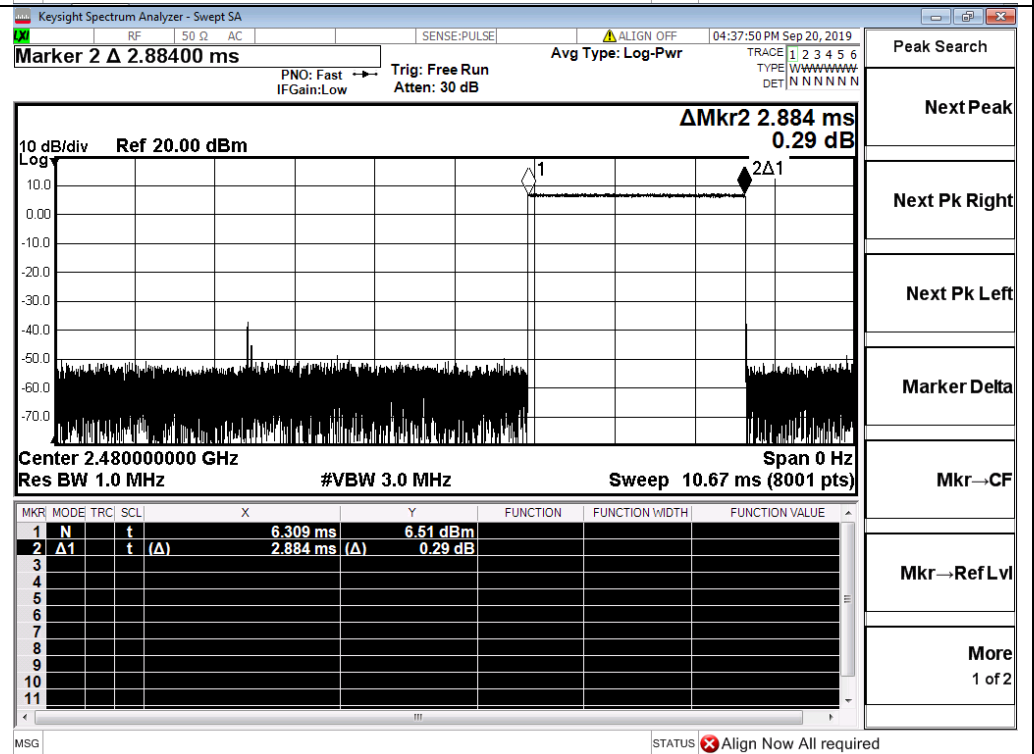
| Mode     | Packet | Channel | Burst Width [ms/hop/ch] | Total Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|----------|--------|---------|-------------------------|--------------------|---------------|-----------|---------|
| GFSK     | DH5    | LCH     | 2.89                    | 106.7              | 0.308         | 0.4       | PASS    |
|          | DH5    | MCH     | 2.89                    | 106.7              | 0.308         | 0.4       | PASS    |
|          | DH5    | HCH     | 2.88                    | 106.7              | 0.307         | 0.4       | PASS    |
| π/4DQPSK | 2DH5   | LCH     | 2.89                    | 106.7              | 0.308         | 0.4       | PASS    |
|          | 2DH5   | MCH     | 2.90                    | 106.7              | 0.309         | 0.4       | PASS    |
|          | 2DH5   | HCH     | 2.90                    | 106.7              | 0.309         | 0.4       | PASS    |
| 8DPSK    | 3DH5   | LCH     | 2.89                    | 106.7              | 0.308         | 0.4       | PASS    |
|          | 3DH5   | MCH     | 2.88                    | 106.7              | 0.307         | 0.4       | PASS    |
|          | 3DH5   | HCH     | 2.88                    | 106.7              | 0.307         | 0.4       | PASS    |



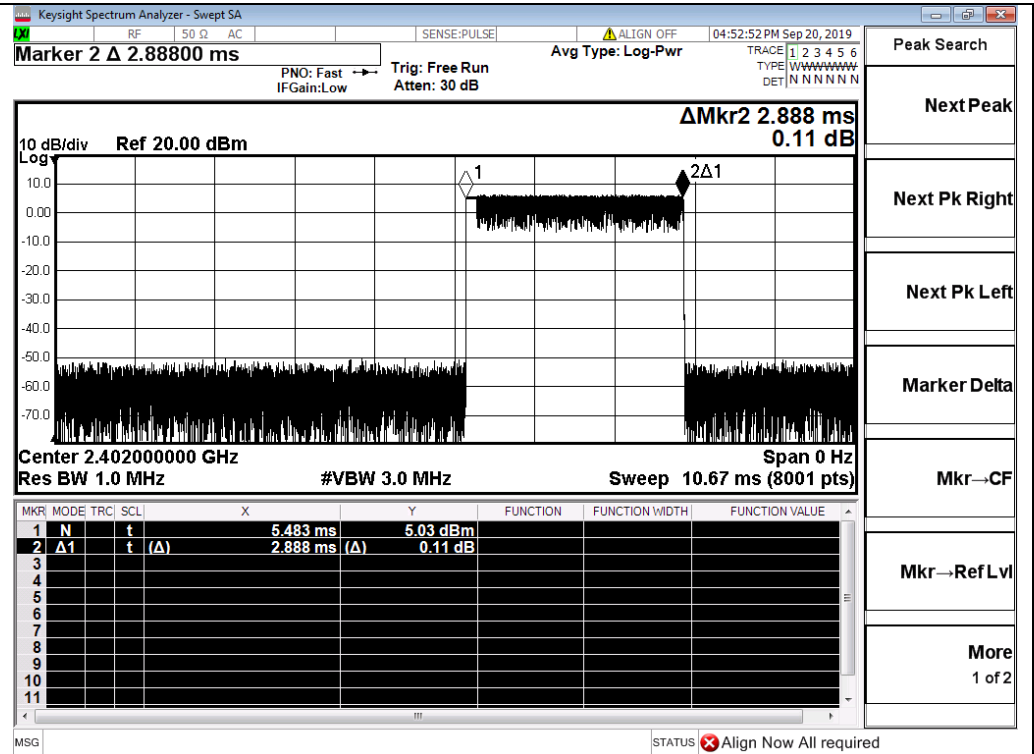
GFSK\_DH5/MCH



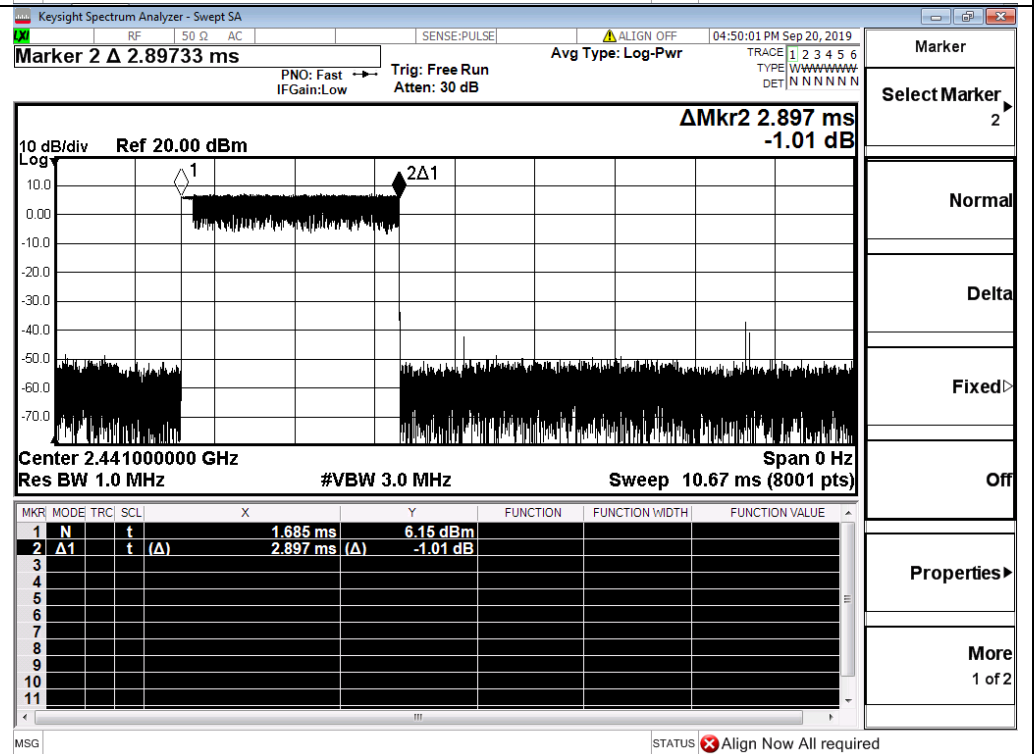
GFSK\_DH5/HCH



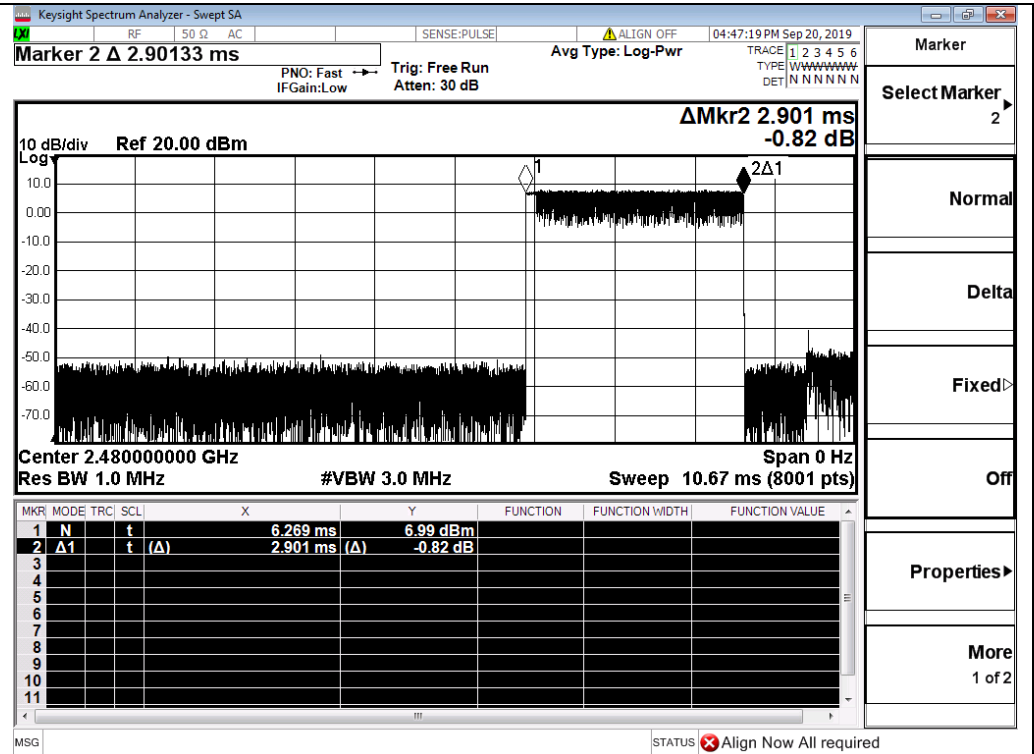
$\pi/4$ DQPSK  
\_2DH5/LCH



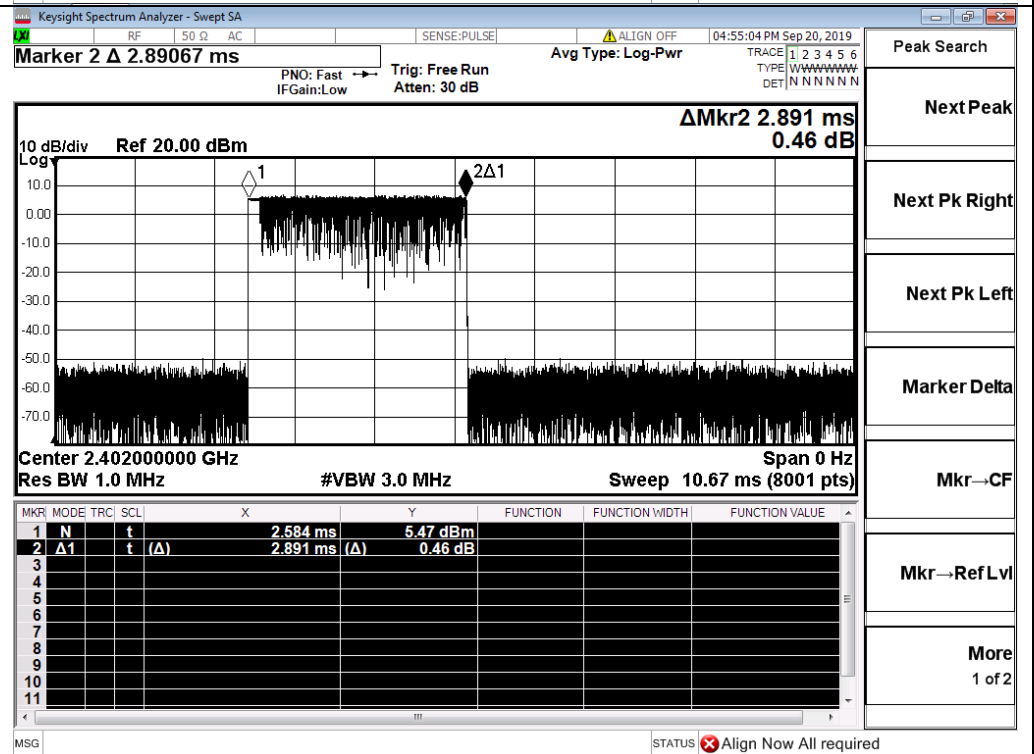
$\pi/4$ DQPSK  
\_2DH5/MCH



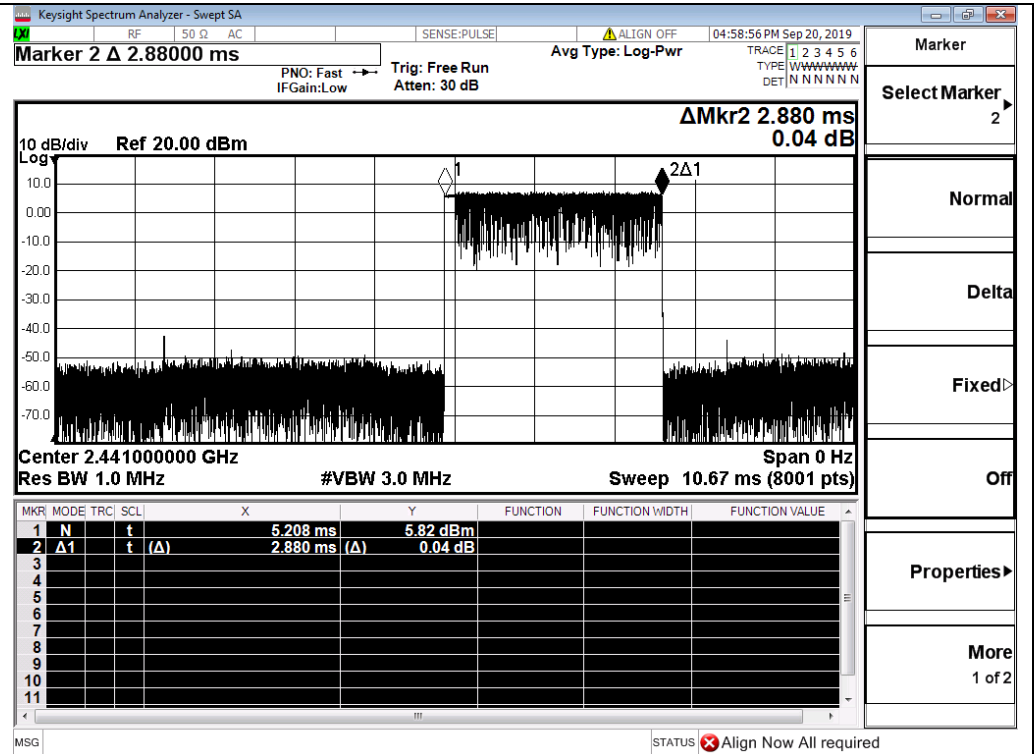
$\pi/4$ DQPSK  
\_2DH5/HCH



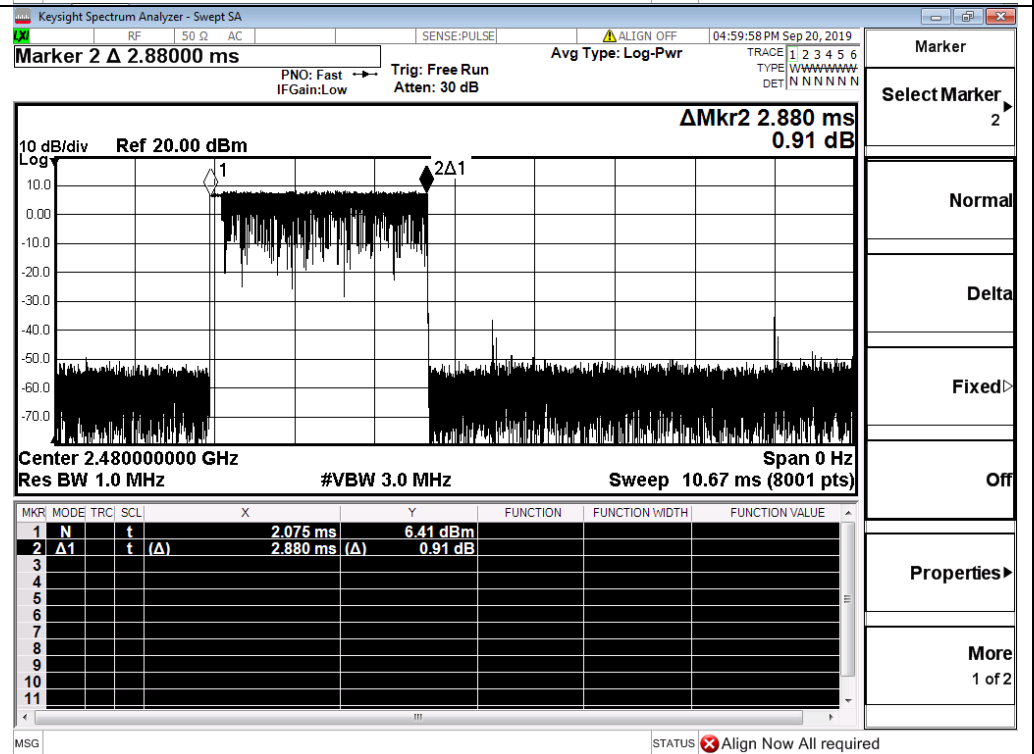
8DPSK \_3DH5/LCH



8DPSK\_3DH5/MCH



8DPSK\_3DH5/HCH



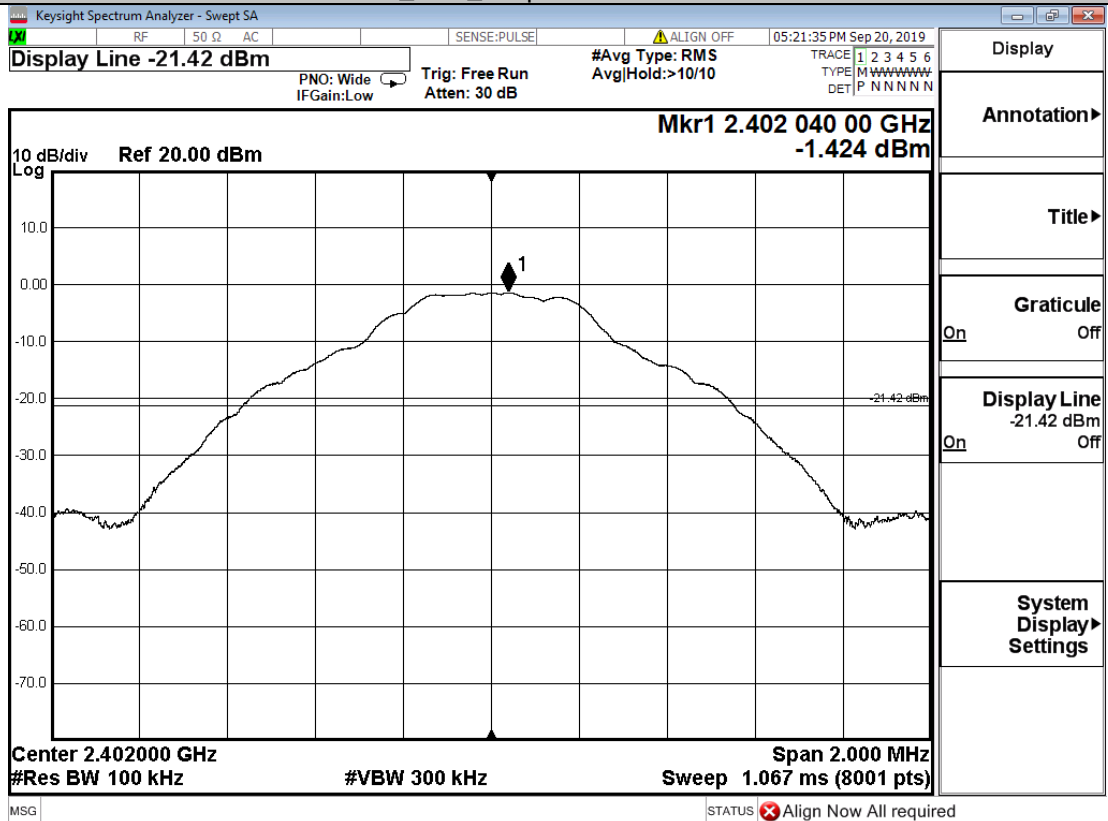
### A.6 RF Conducted Spurious Emissions

| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | -1.424     | -46.394          | -21.42      | PASS    |
|               | MCH     | -0.540     | -49.778          | -20.54      | PASS    |
|               | HCH     | 0.362      | -49.047          | -19.64      | PASS    |
| $\pi/4$ DQPSK | LCH     | -3.839     | -47.531          | -23.84      | PASS    |
|               | MCH     | -3.102     | -47.809          | -23.10      | PASS    |
|               | HCH     | -2.246     | -48.879          | -22.25      | PASS    |
| 8DPSK         | LCH     | -3.346     | -49.696          | -23.35      | PASS    |
|               | MCH     | -2.495     | -49.196          | -22.50      | PASS    |
|               | HCH     | -1.636     | -45.682          | -21.64      | PASS    |

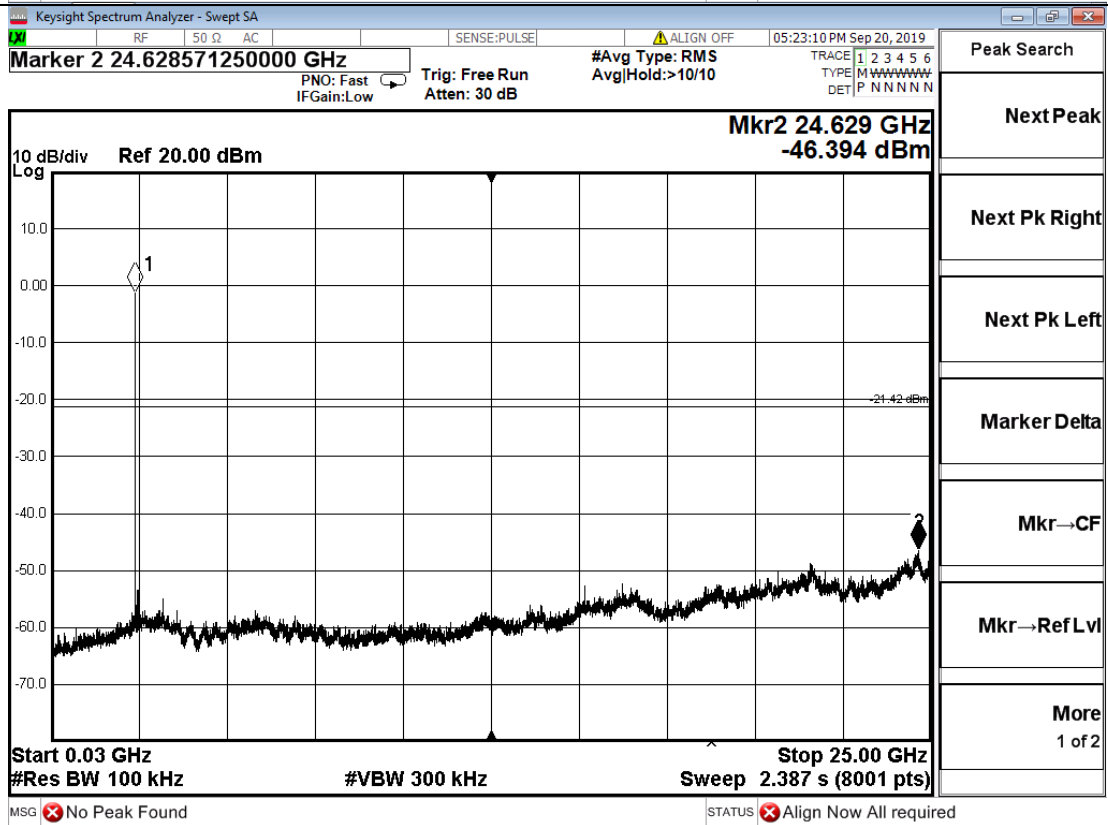


GFSK\_LCH\_Graphs

Pref

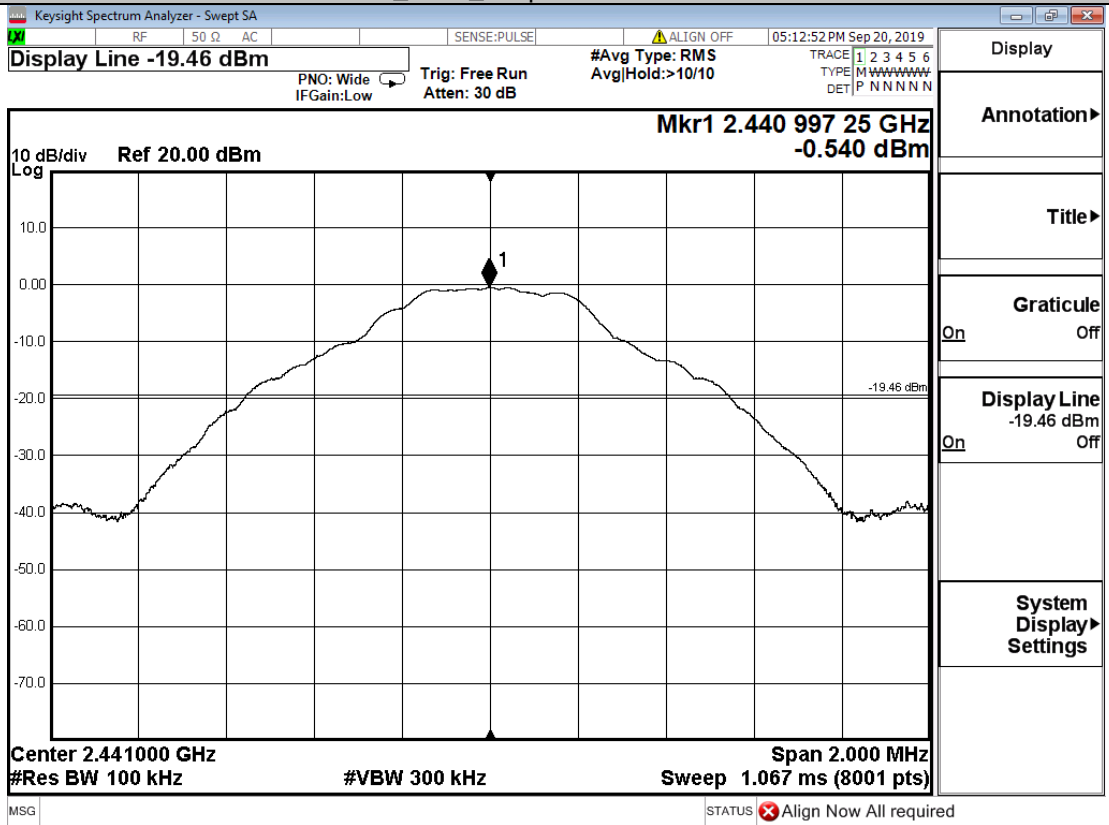


Puw

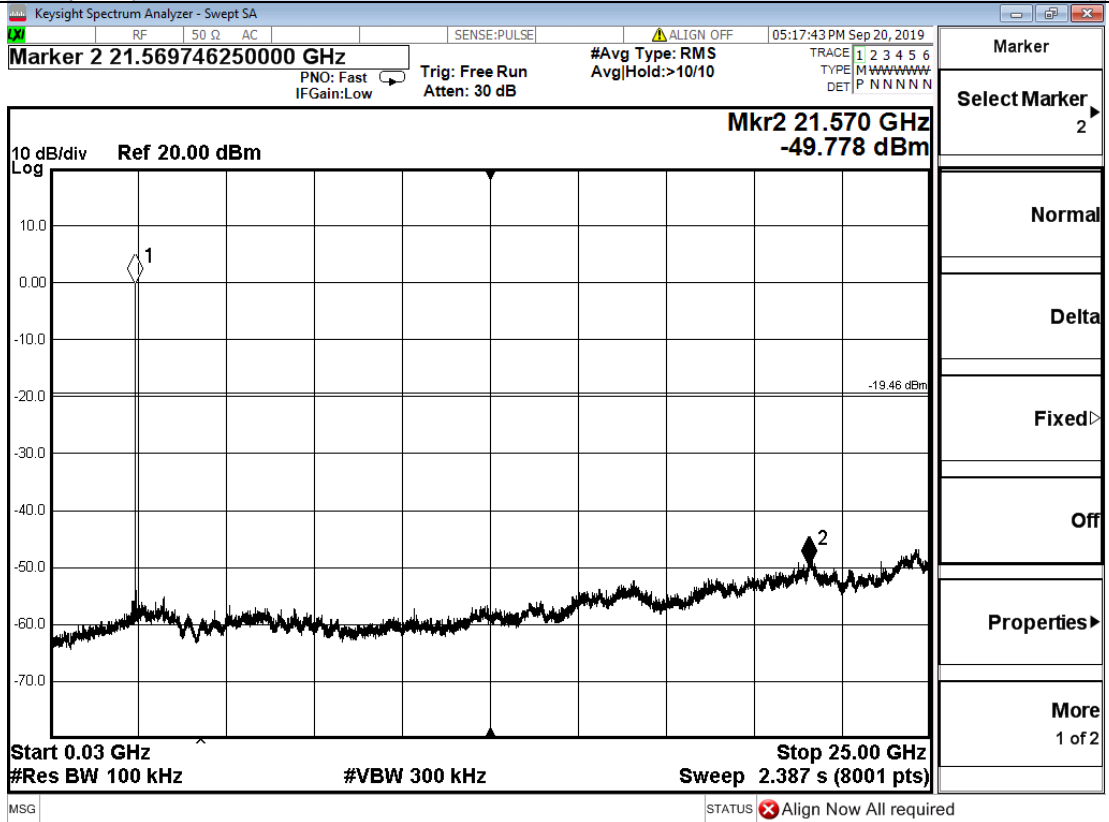


GFSK\_MCH\_Graphs

Pref

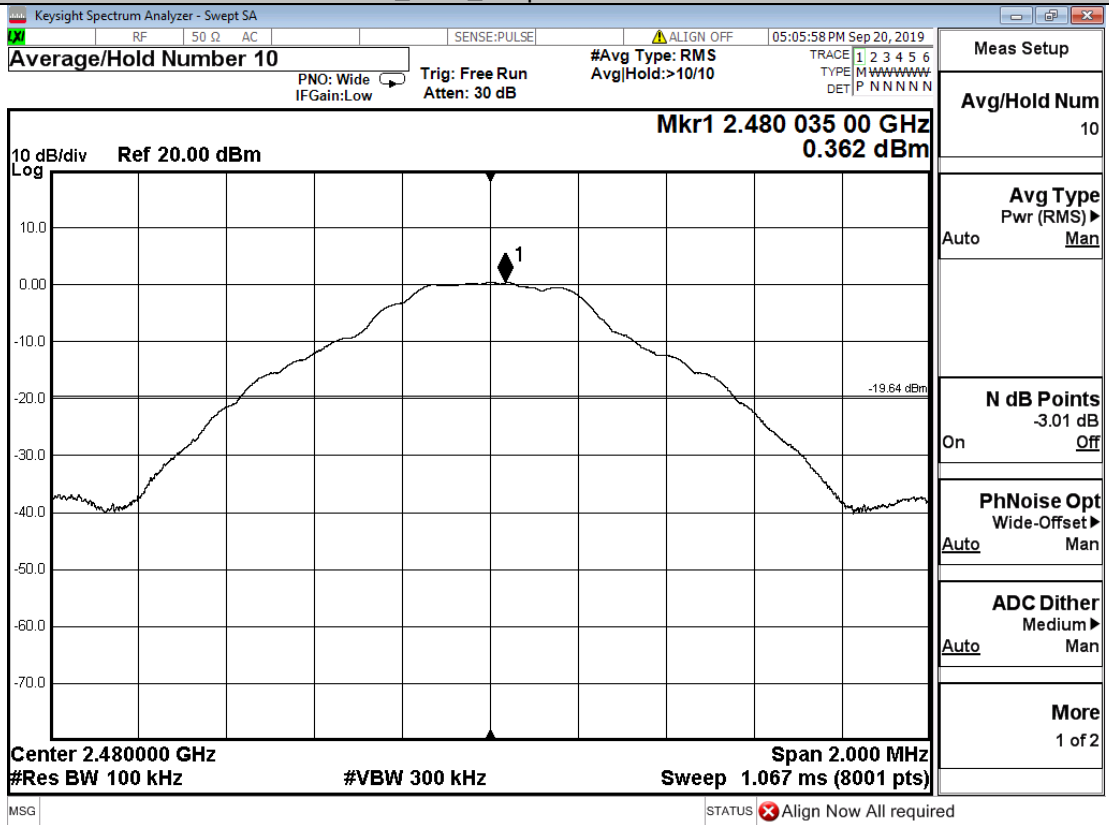


Puw

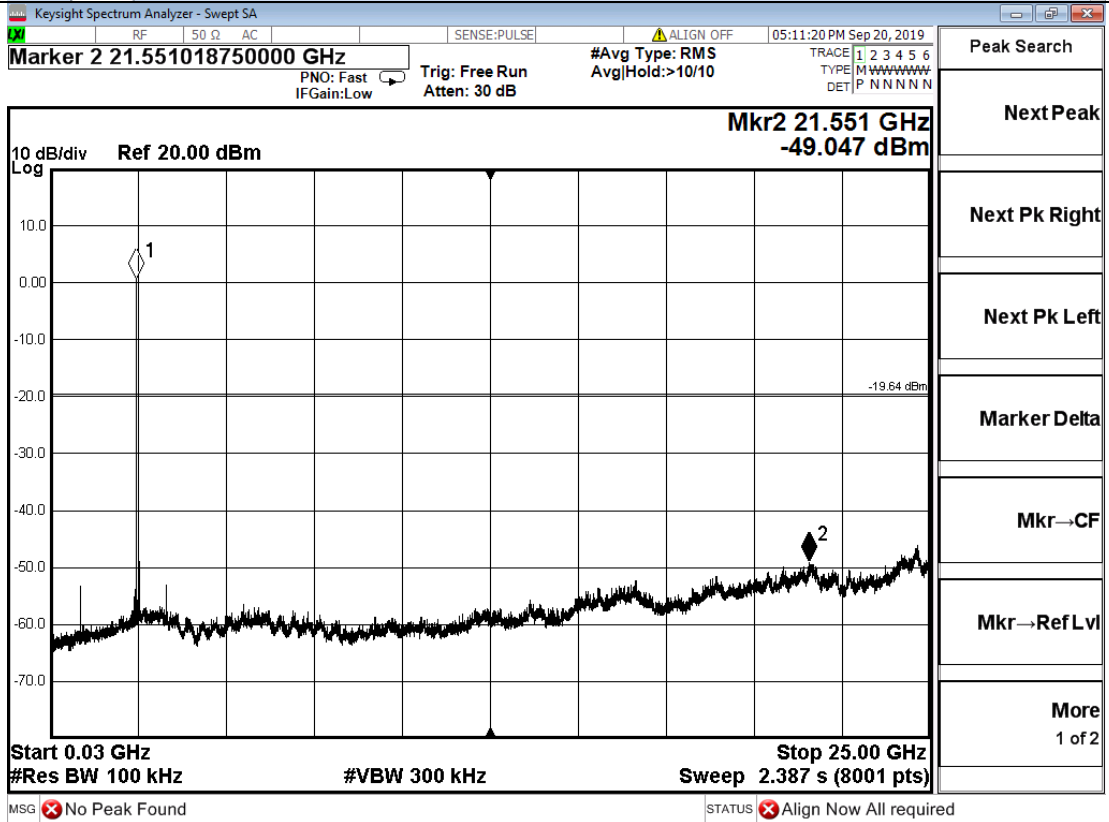


GFSK\_HCH\_Graphs

Pref

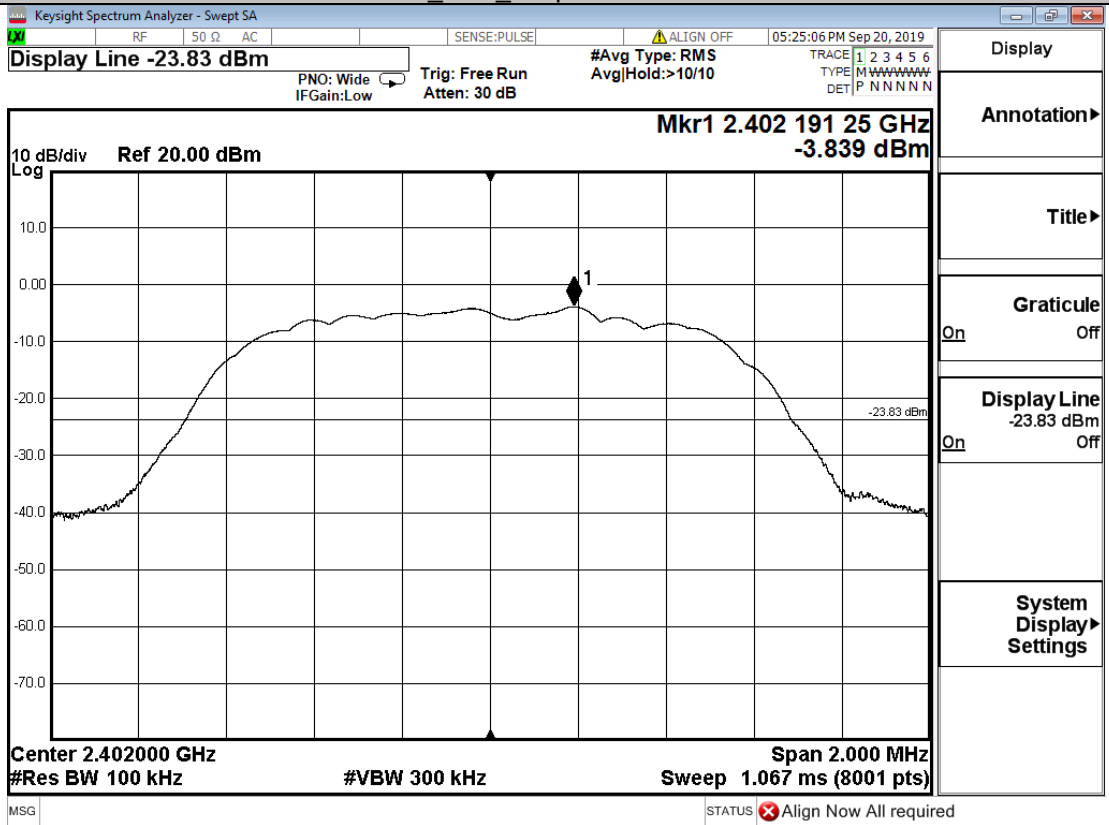


Puw

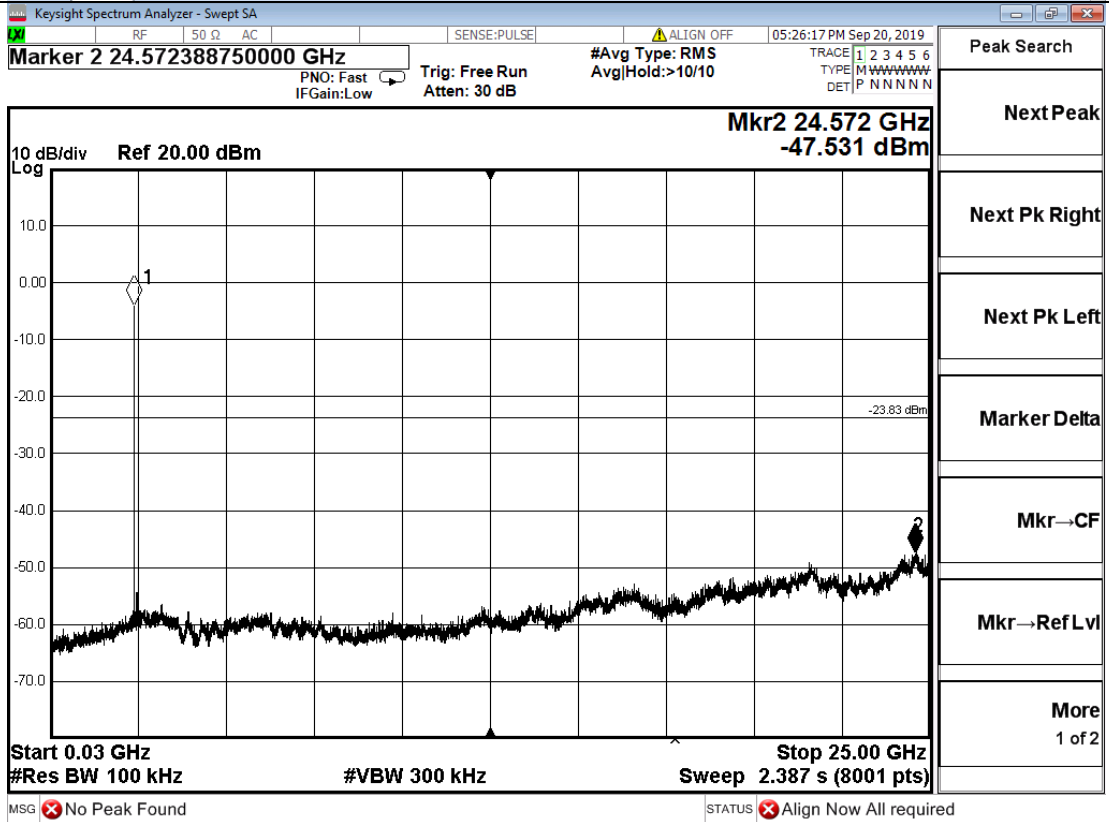


$\pi/4$ DQPSK\_LCH\_Graphs

Pref



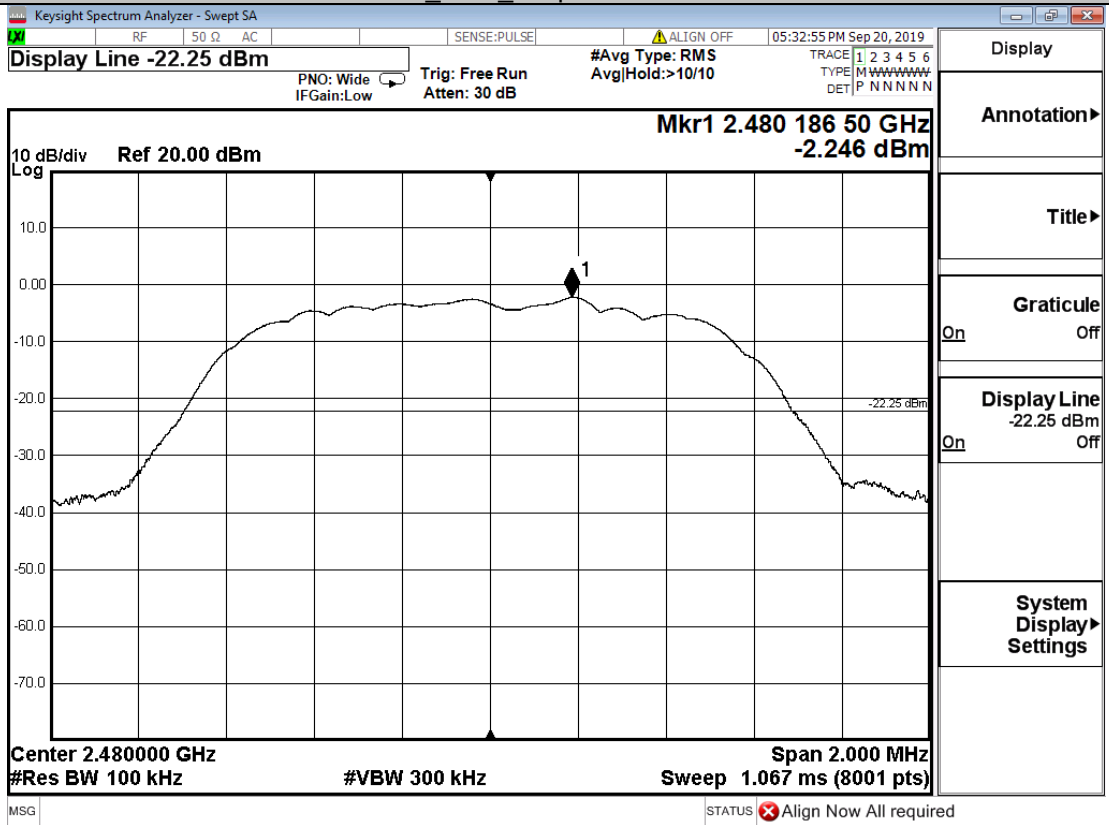
Puw



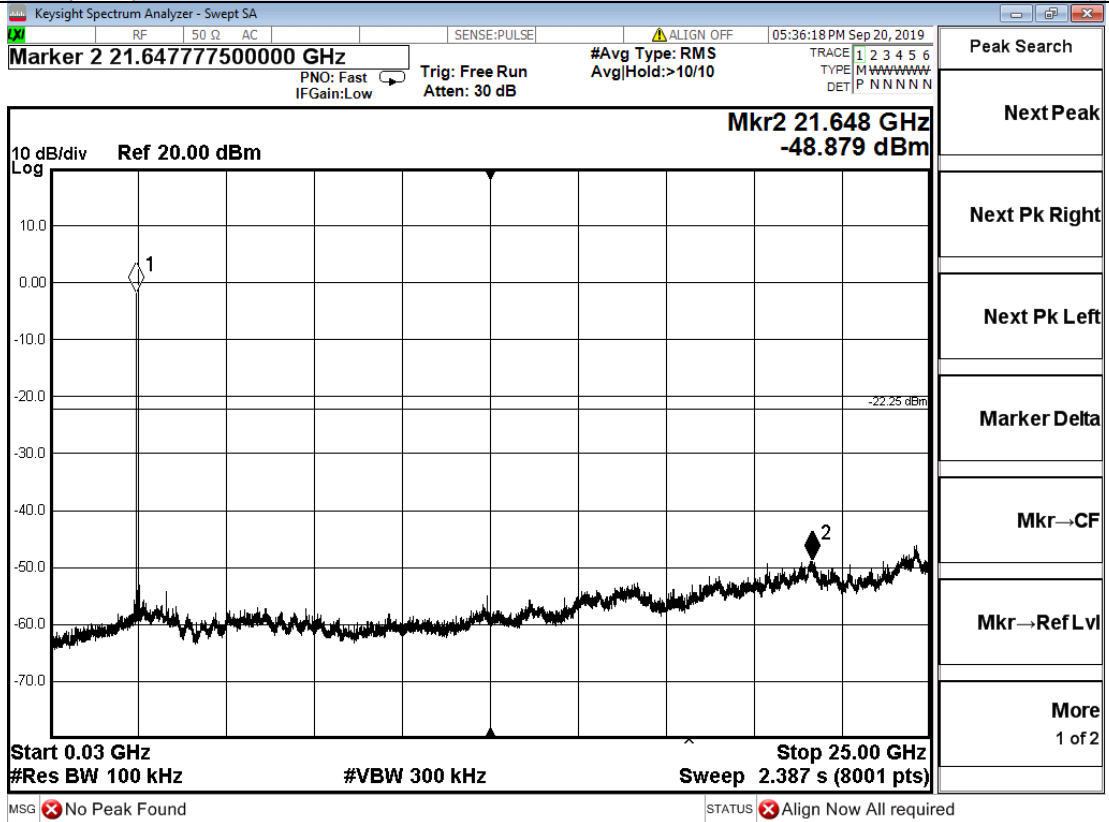


$\pi/4$ DQPSK\_HCH\_Graphs

Pref



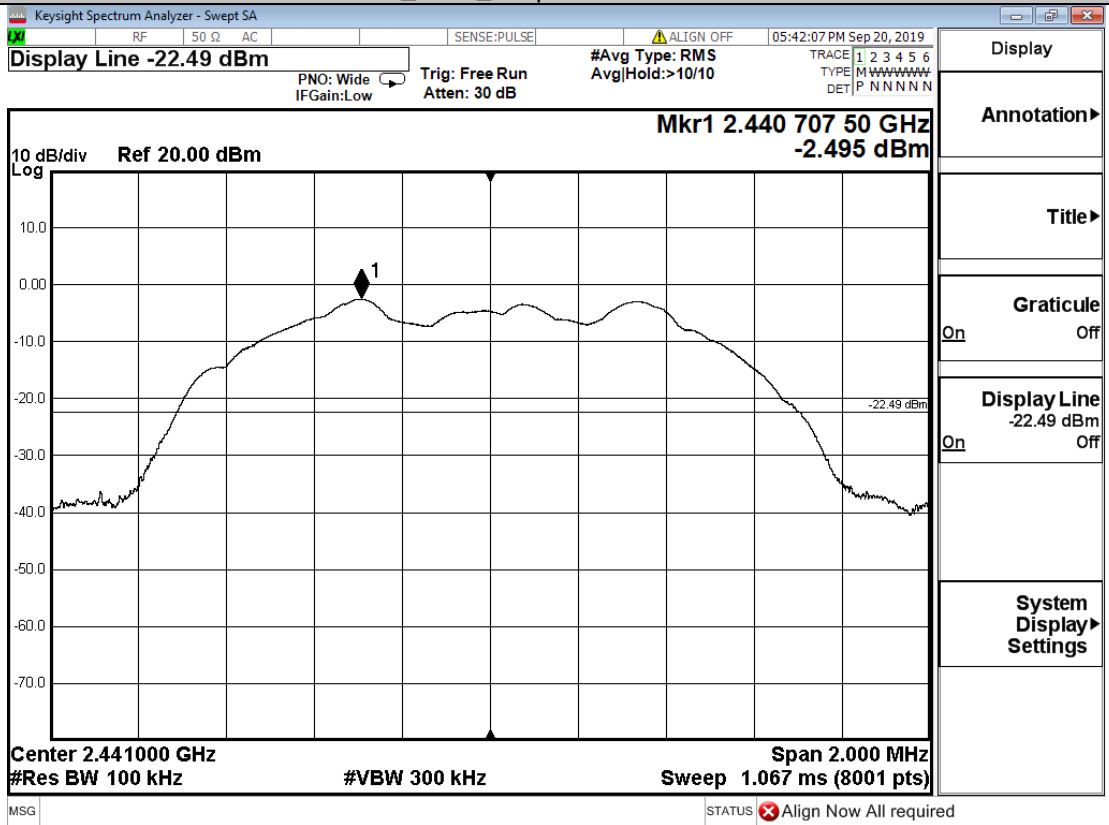
Puw



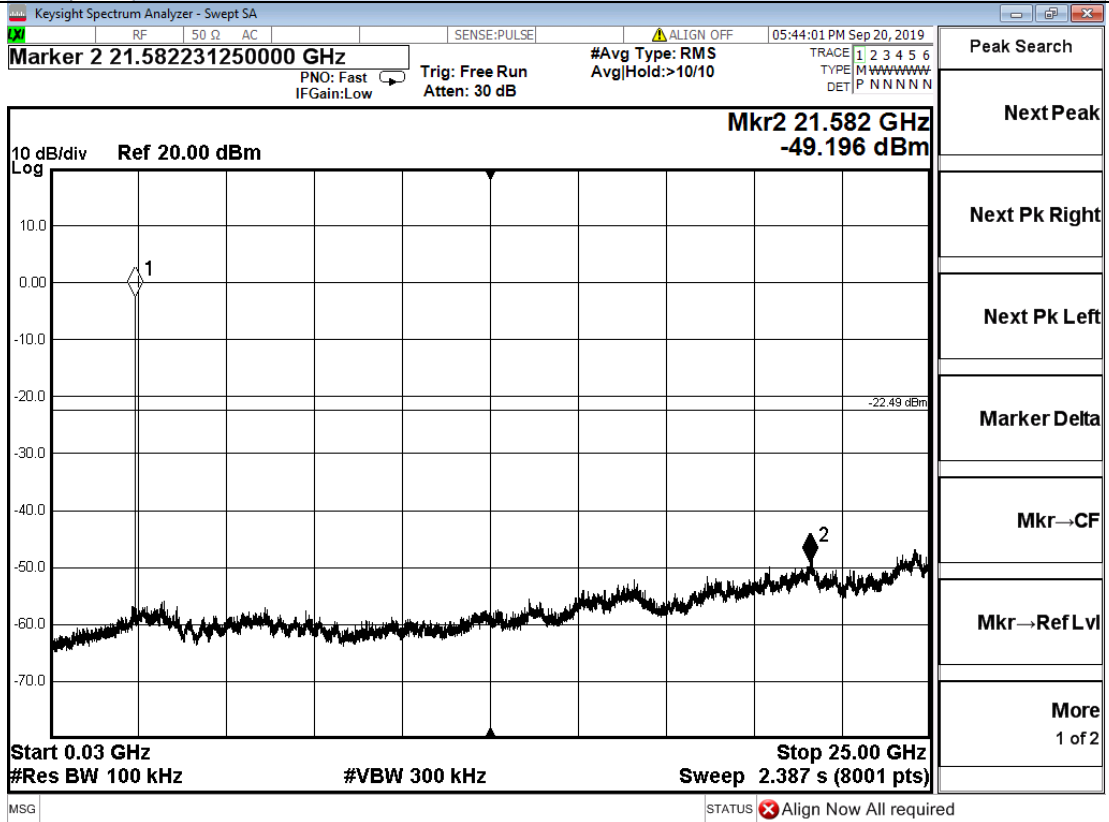


8DPSK\_MCH\_Graphs

Pref



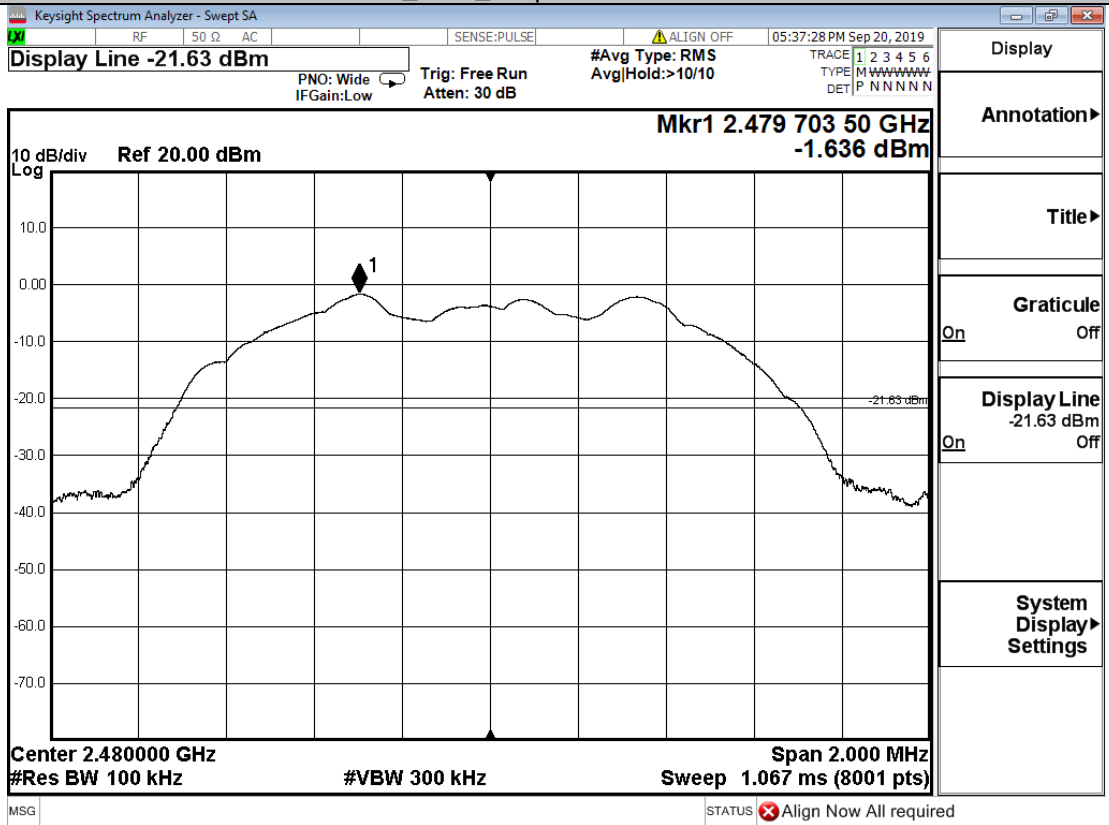
Puw



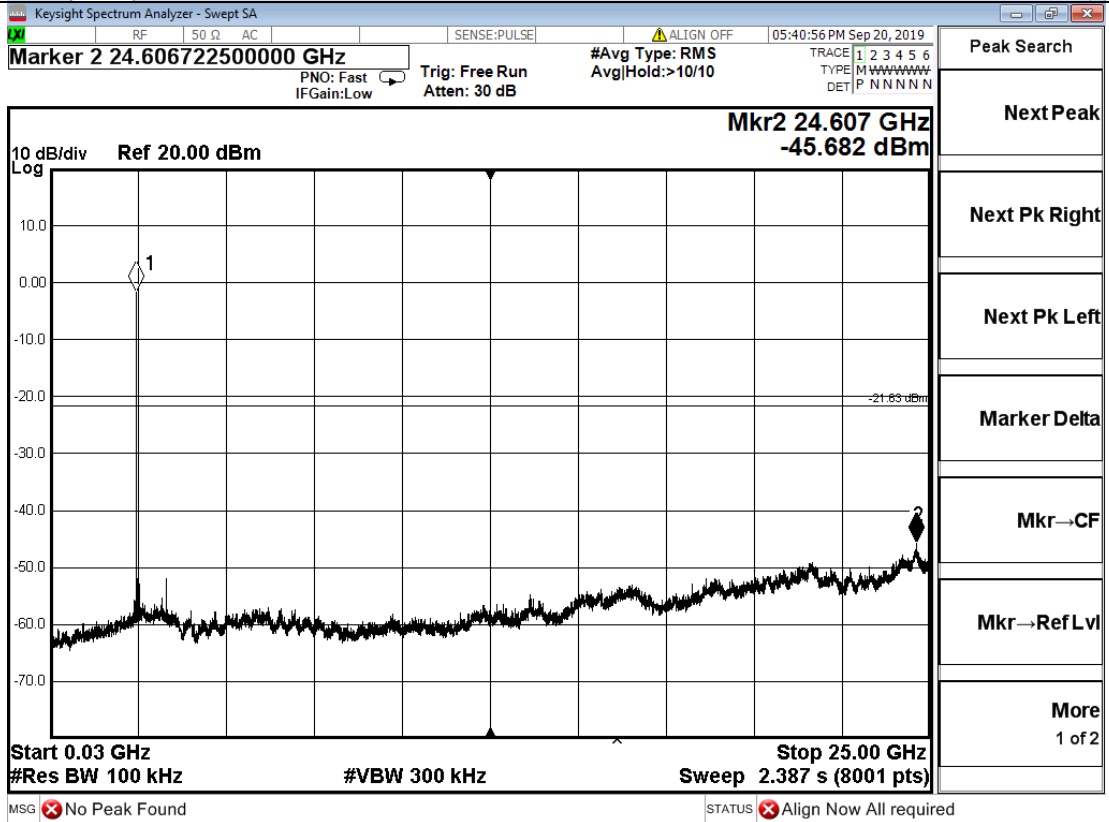


8DPSK\_HCH\_Graphs

Pref



Puw

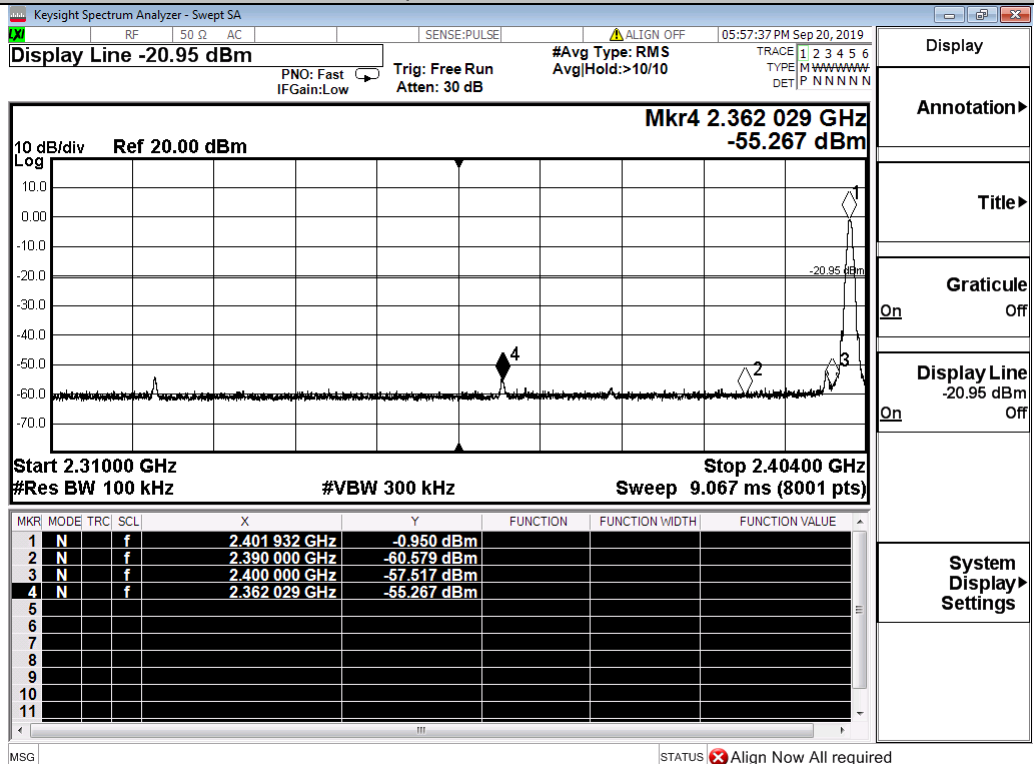


### A.7 Band-edge for RF Conducted Emissions

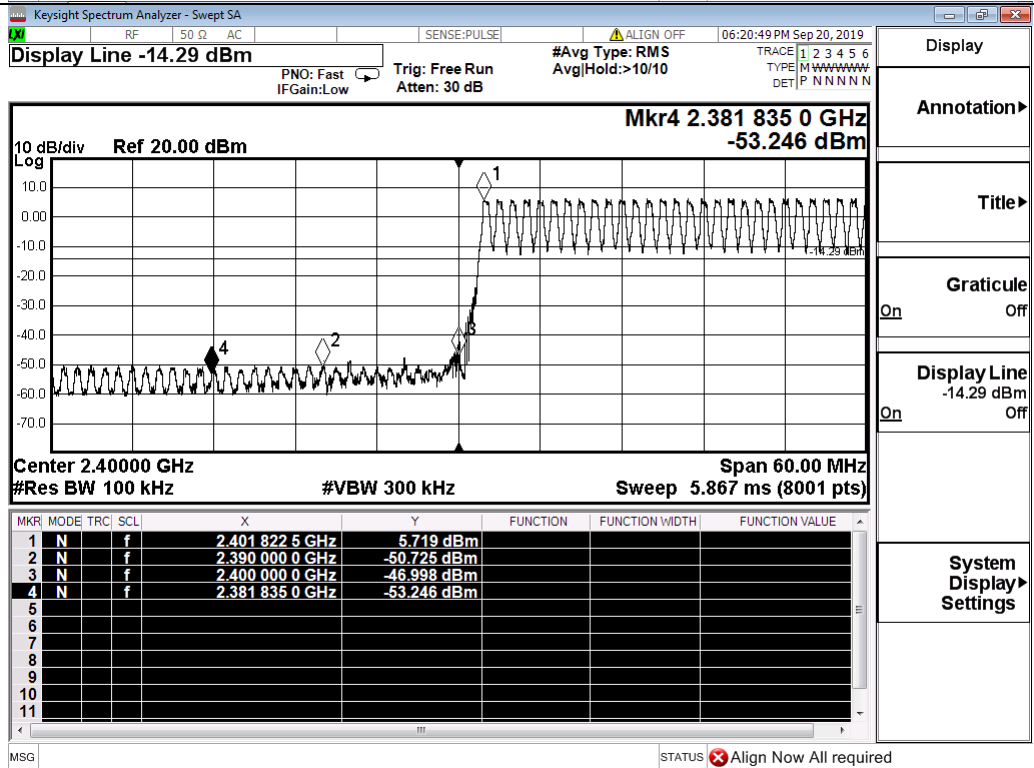
| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | -0.950              | Off               | -55.267                  | -20.95      | PASS    |
|               |         |                         | 5.719               | On                | -46.998                  | -14.28      | PASS    |
|               | HCH     | 2480                    | 0.674               | Off               | -56.892                  | -19.33      | PASS    |
|               |         |                         | 7.002               | On                | -47.266                  | -13.00      | PASS    |
| $\pi/4$ DQPSK | LCH     | 2402                    | -3.321              | Off               | -54.654                  | -23.32      | PASS    |
|               |         |                         | 5.326               | On                | -42.571                  | -14.67      | PASS    |
|               | HCH     | 2480                    | -1.753              | Off               | -58.570                  | -21.75      | PASS    |
|               |         |                         | 7.256               | On                | -47.975                  | -12.74      | PASS    |
| 8DPSK         | LCH     | 2402                    | -3.156              | Off               | -54.069                  | -23.16      | PASS    |
|               |         |                         | 5.845               | On                | -44.450                  | -14.16      | PASS    |
|               | HCH     | 2480                    | -1.736              | Off               | -58.580                  | -21.74      | PASS    |
|               |         |                         | 7.251               | On                | -45.203                  | -12.75      | PASS    |

Test Graphs

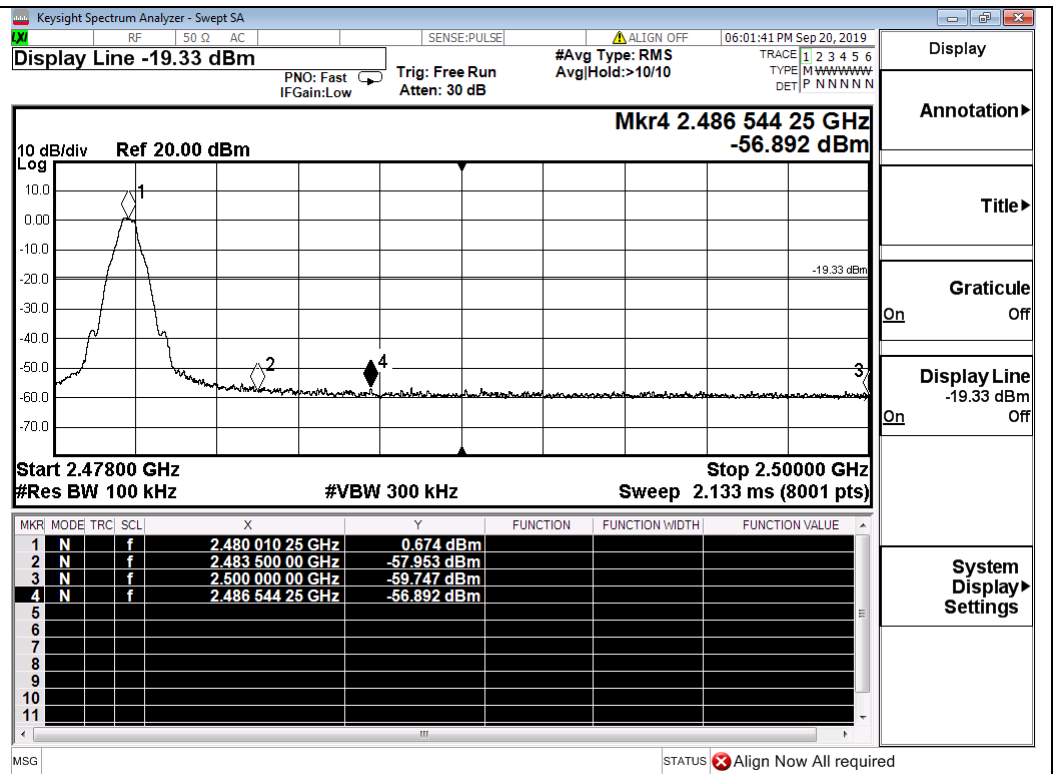
GFSK/LCH/No Hop



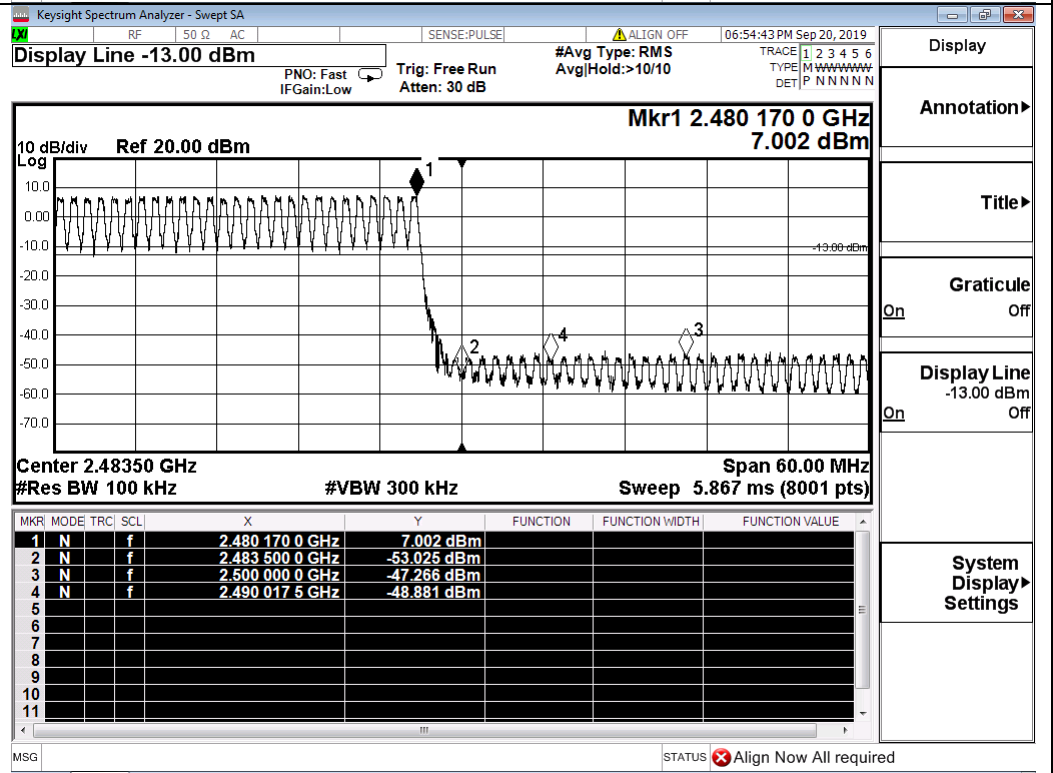
GFSK/LCH/Hop



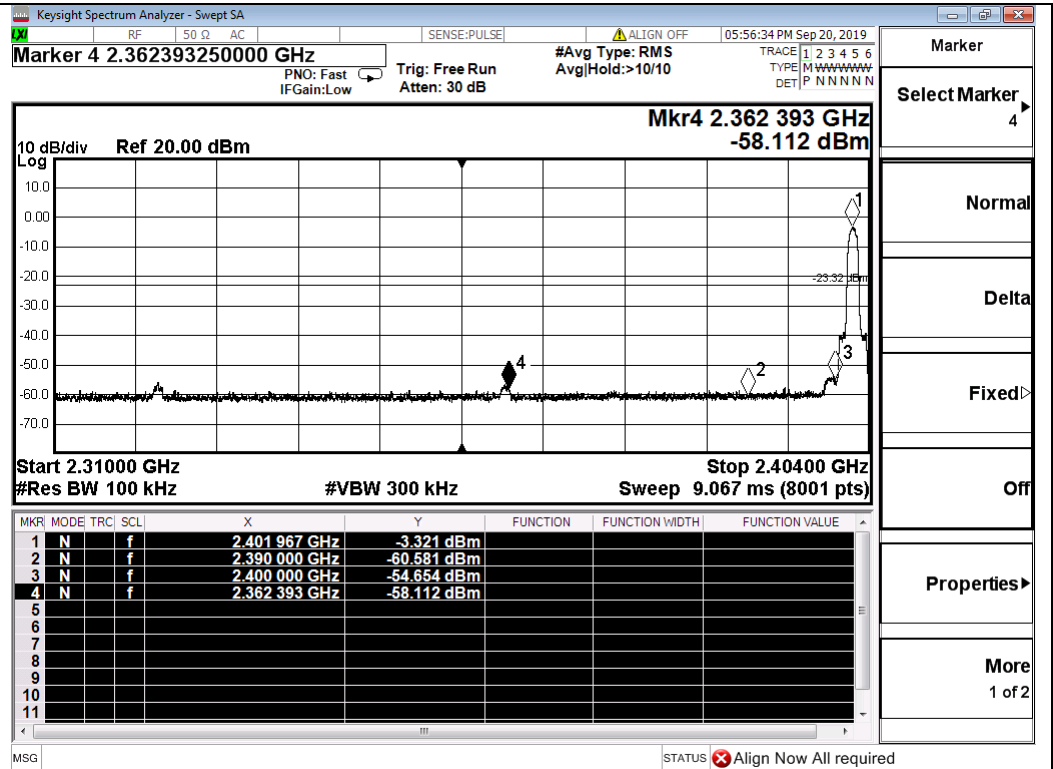
GFSK/HCH/No Hop



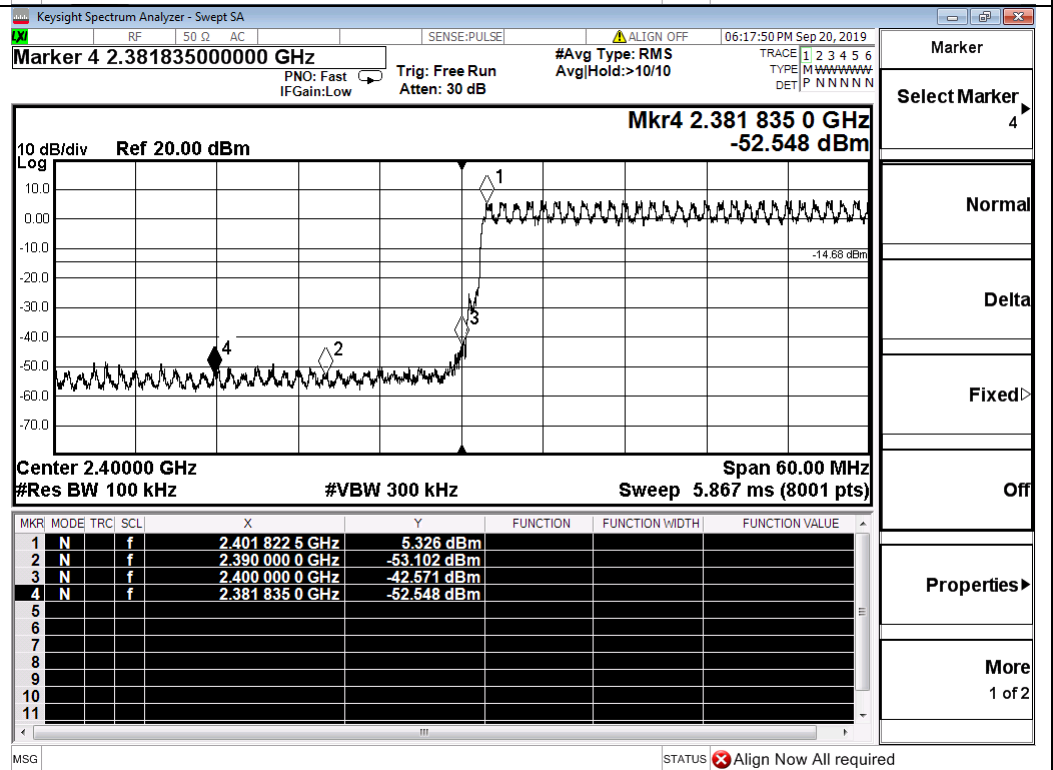
GFSK/HCH/Hop



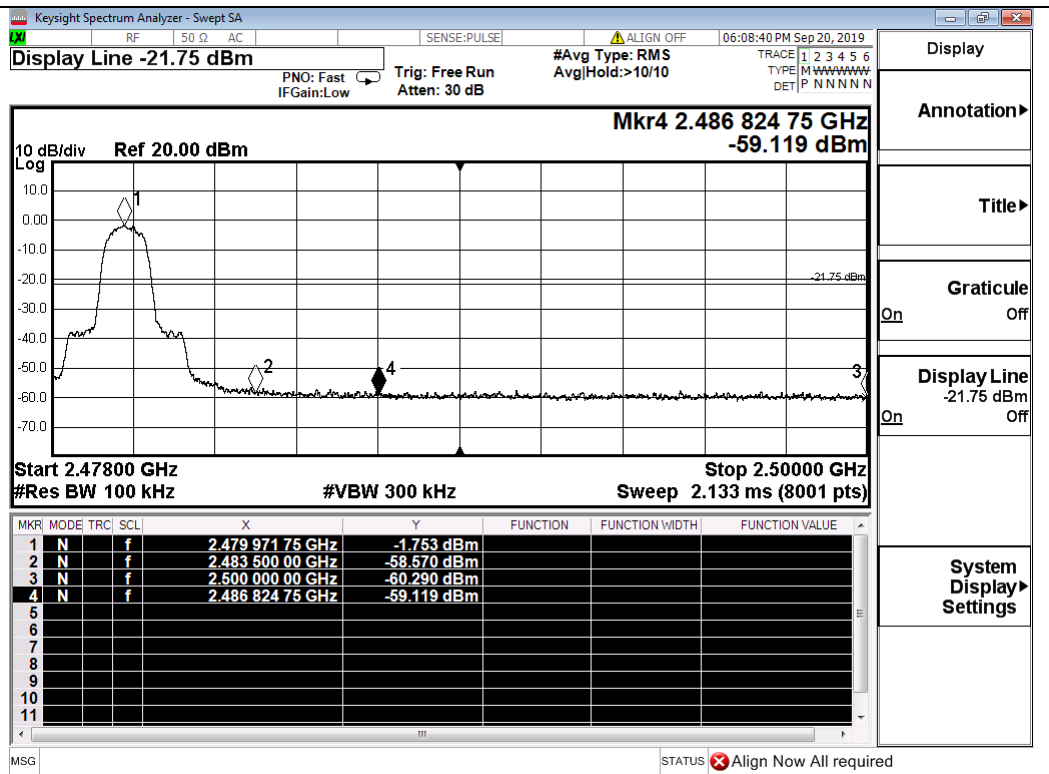
$\pi/4$ DQPSK/LCH/No Hop



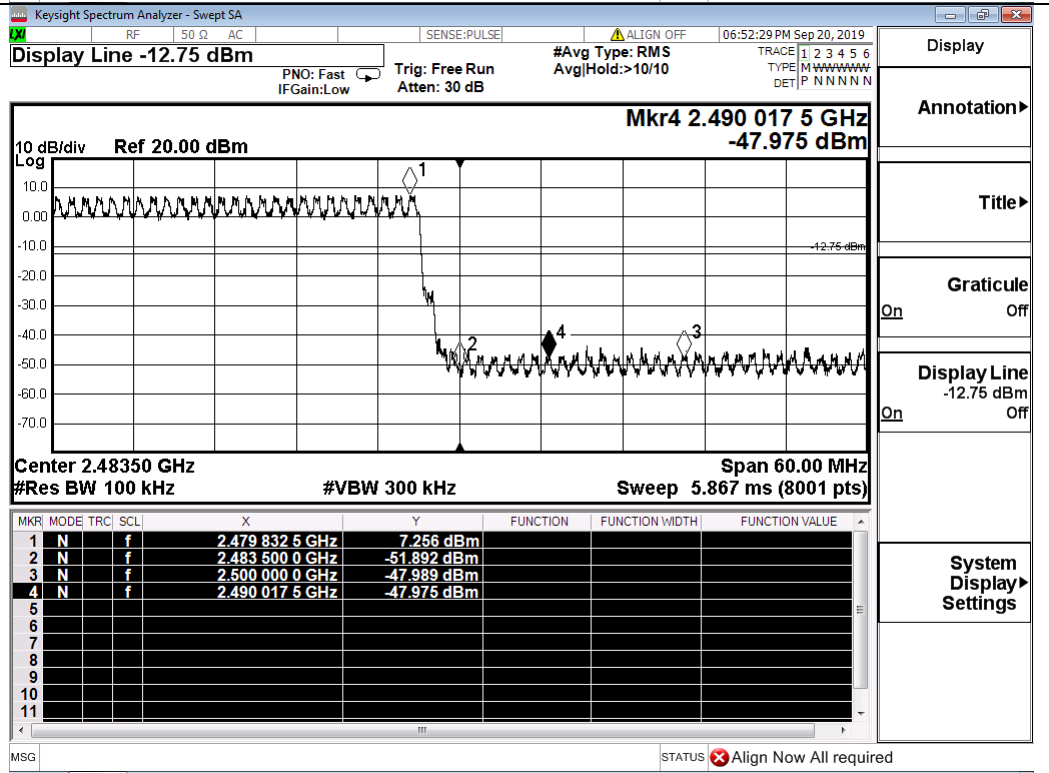
$\pi/4$ DQPSK/LCH/Hop



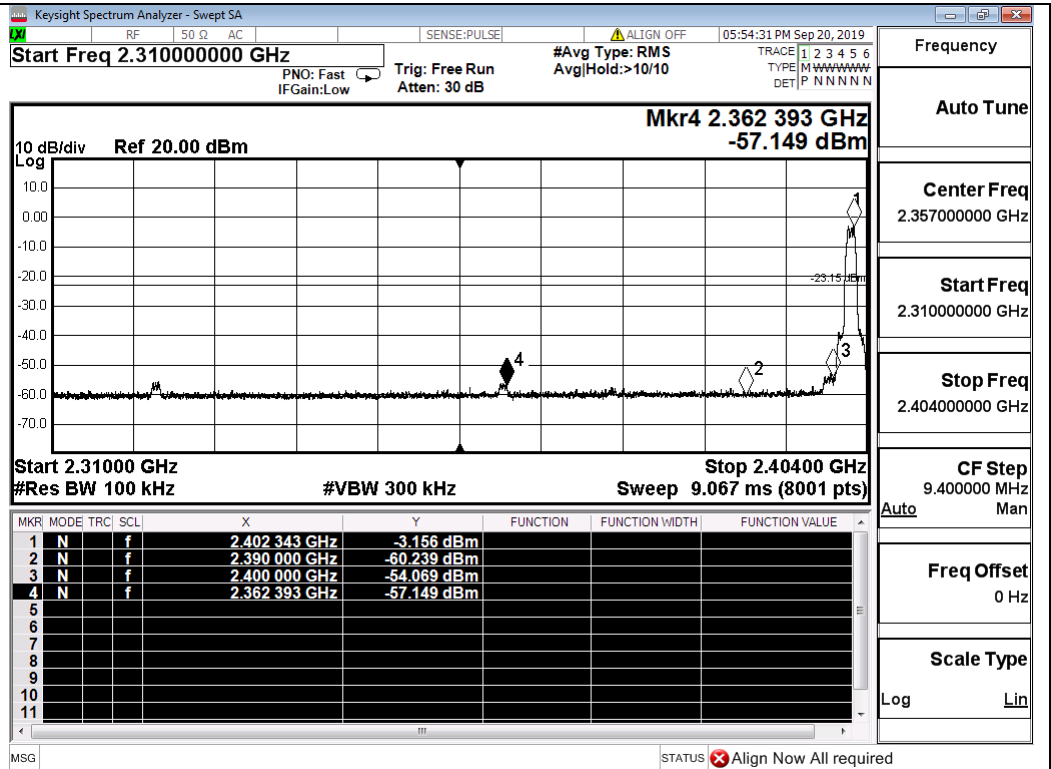
$\pi$ /4DQPSK/HCH/No Hop



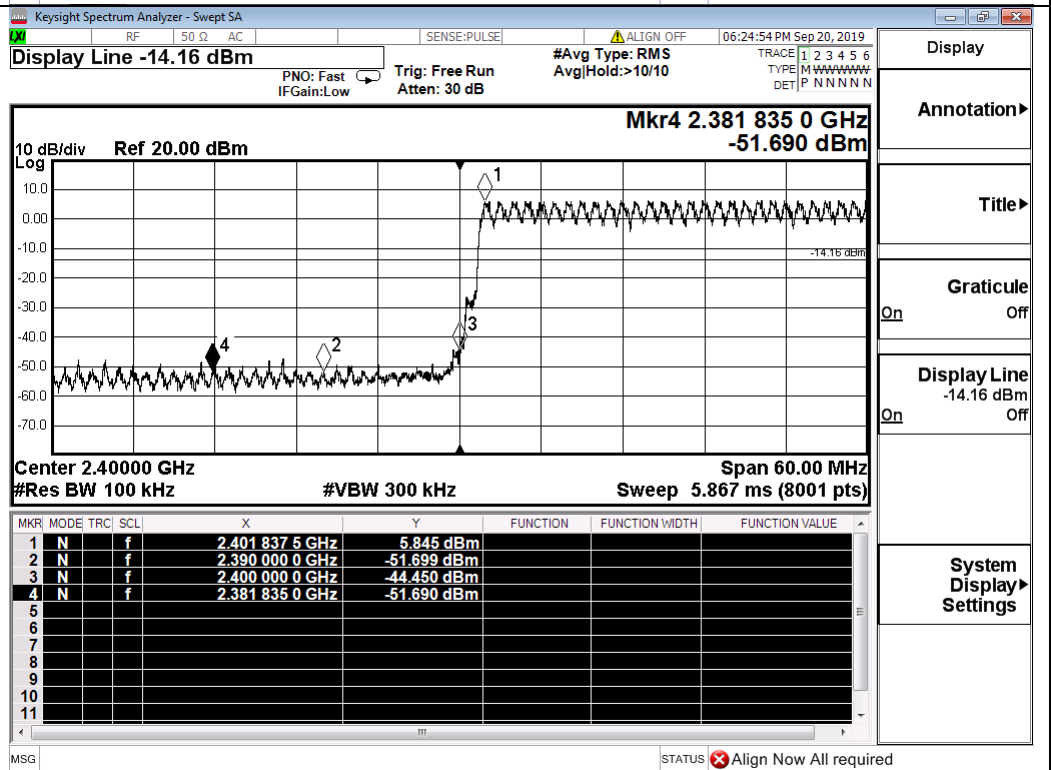
$\pi$ /4DQPSK/HCH/Hop



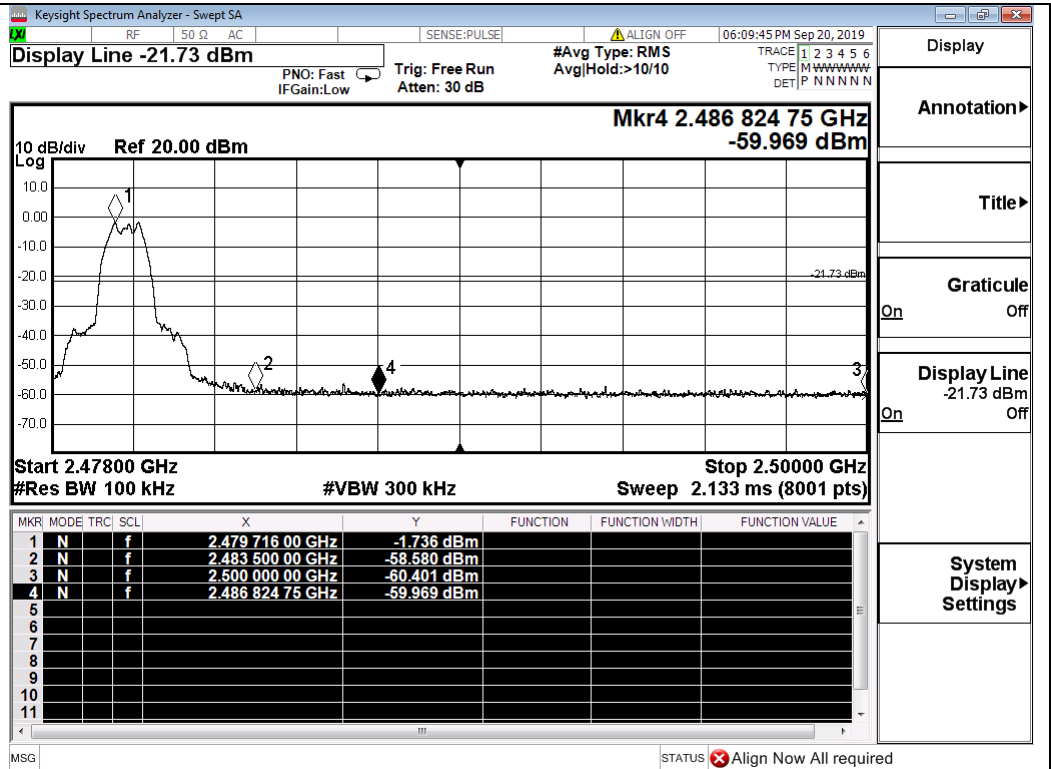
8DPSK/LCH/No Hop



8DPSK/LCH/Hop

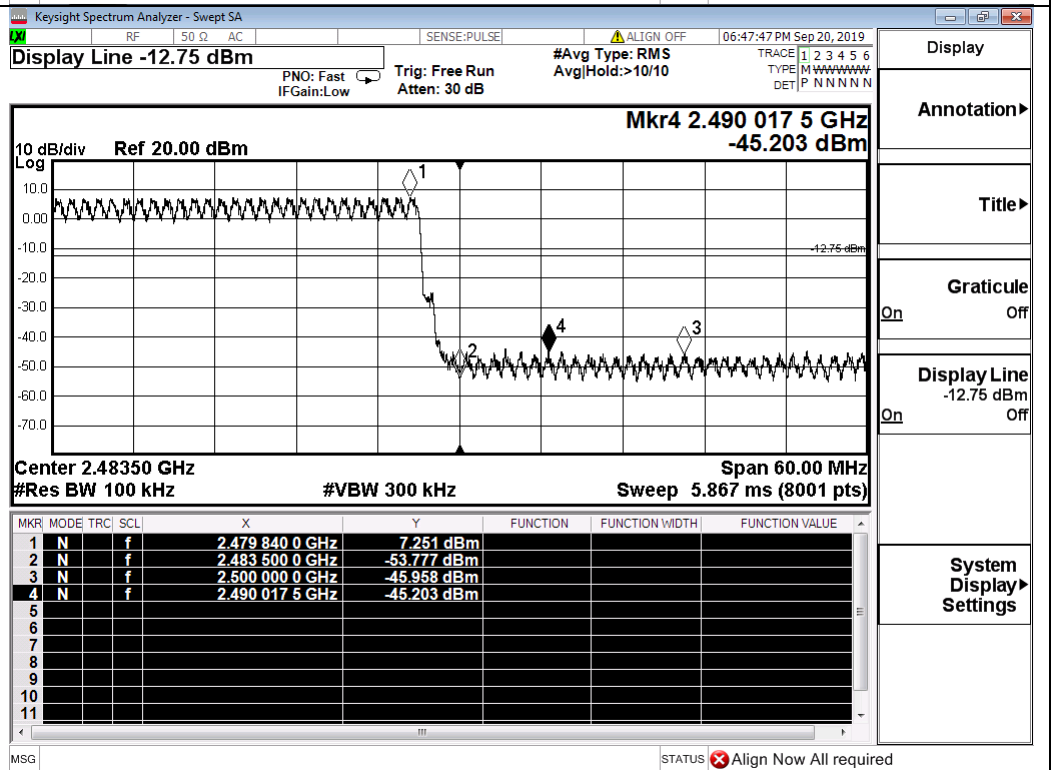


8DPSK/HCH/No Hop



- Display
- Annotation
- Title
- Graticule  
On Off
- Display Line  
-21.73 dBm  
On Off
- System Display  
Settings

8DPSK/HCH/Hop



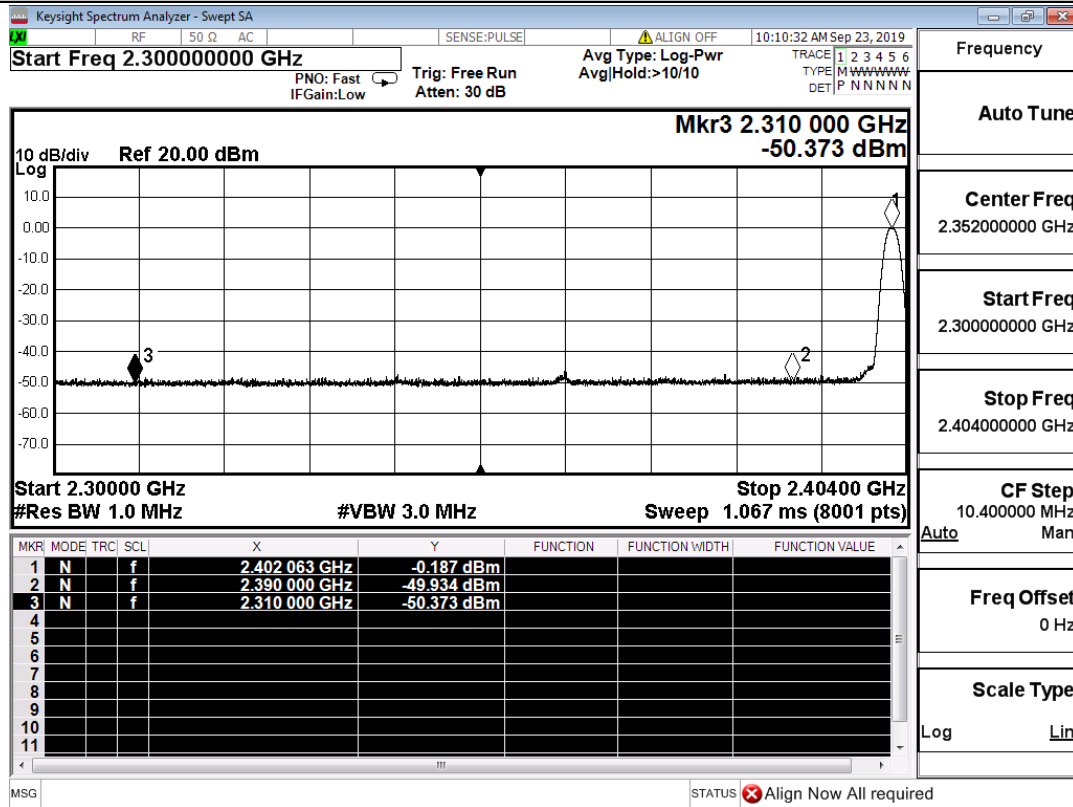
- Display
- Annotation
- Title
- Graticule  
On Off
- Display Line  
-12.75 dBm  
On Off
- System Display  
Settings



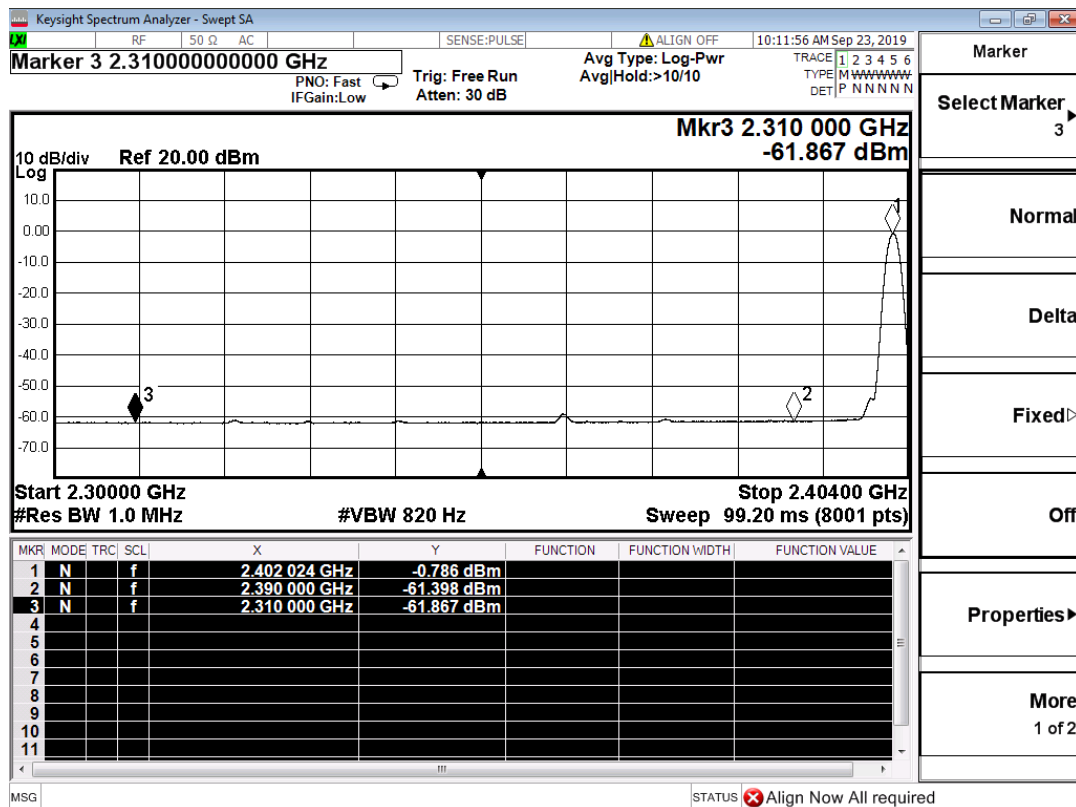
### A.8 Restrict-band band-edge measurements

| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain  | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|-------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -50.373     | 2.000 | 0             | 46.86      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -61.867     | 2.000 | 0             | 35.36      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -49.934     | 2.000 | 0             | 47.30      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -61.398     | 2.000 | 0             | 35.83      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -49.072     | 2.000 | 0             | 48.16      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -59.622     | 2.000 | 0             | 37.61      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -49.850     | 2.000 | 0             | 47.38      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -60.995     | 2.000 | 0             | 36.24      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -50.939     | 2.000 | 0             | 46.29      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -61.930     | 2.000 | 0             | 35.30      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -49.116     | 2.000 | 0             | 48.11      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -61.381     | 2.000 | 0             | 35.85      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -48.558     | 2.000 | 0             | 48.67      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -59.575     | 2.000 | 0             | 37.66      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -49.204     | 2.000 | 0             | 48.03      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -61.015     | 2.000 | 0             | 36.22      | AV       | 54             | PASS    |
| 8DPSK         | Off     | 2310.0 | -51.082     | 2.000 | 0             | 46.15      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -62.104     | 2.000 | 0             | 35.13      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -49.556     | 2.000 | 0             | 47.67      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -61.484     | 2.000 | 0             | 35.75      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -48.530     | 2.000 | 0             | 48.70      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -59.638     | 2.000 | 0             | 37.59      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -50.296     | 2.000 | 0             | 46.93      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -60.935     | 2.000 | 0             | 36.30      | AV       | 54             | PASS    |

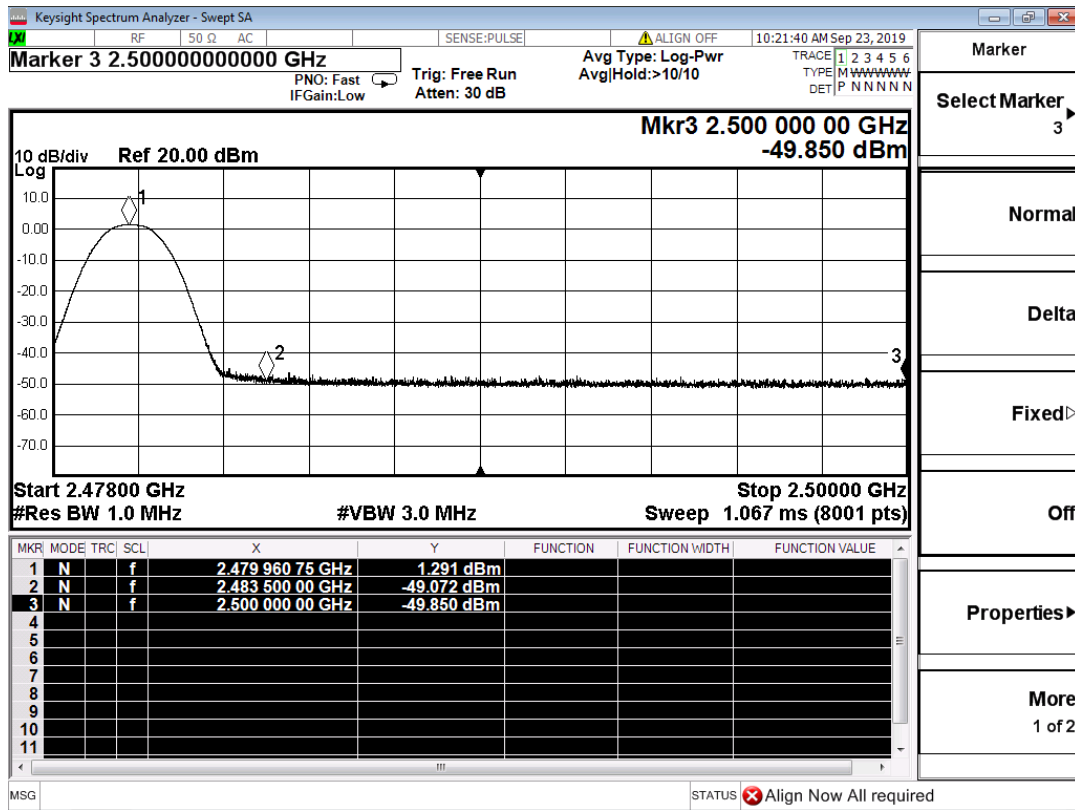
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



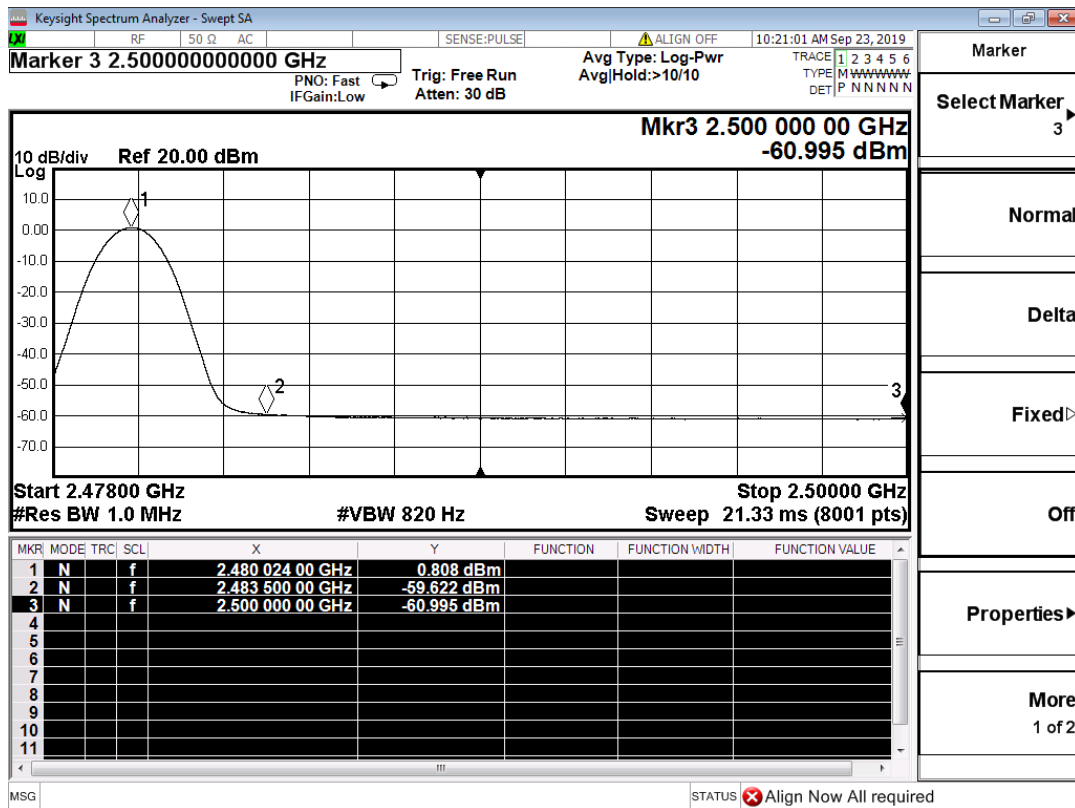
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



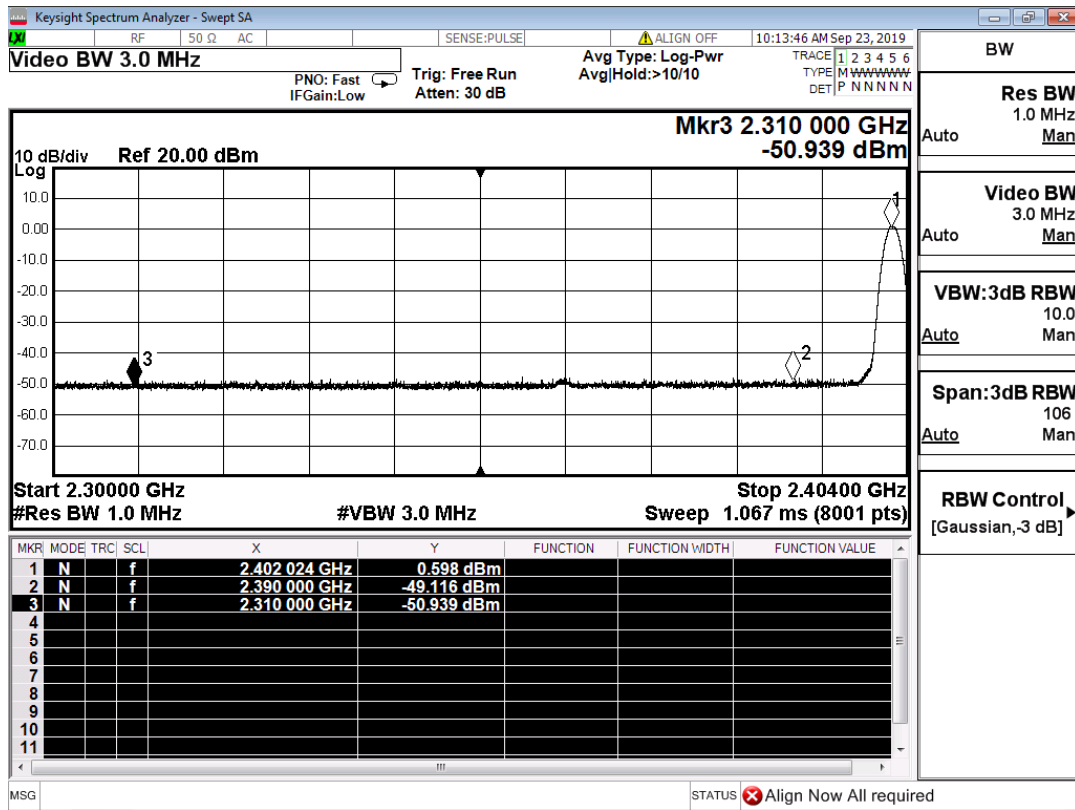
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



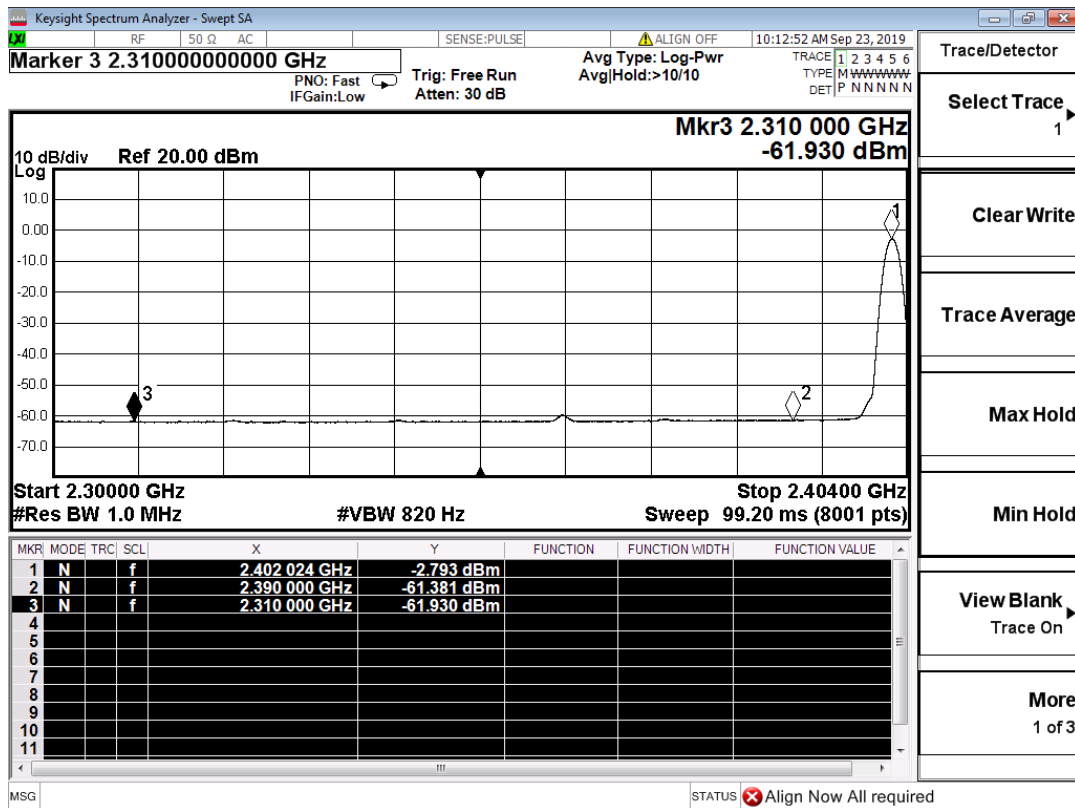
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



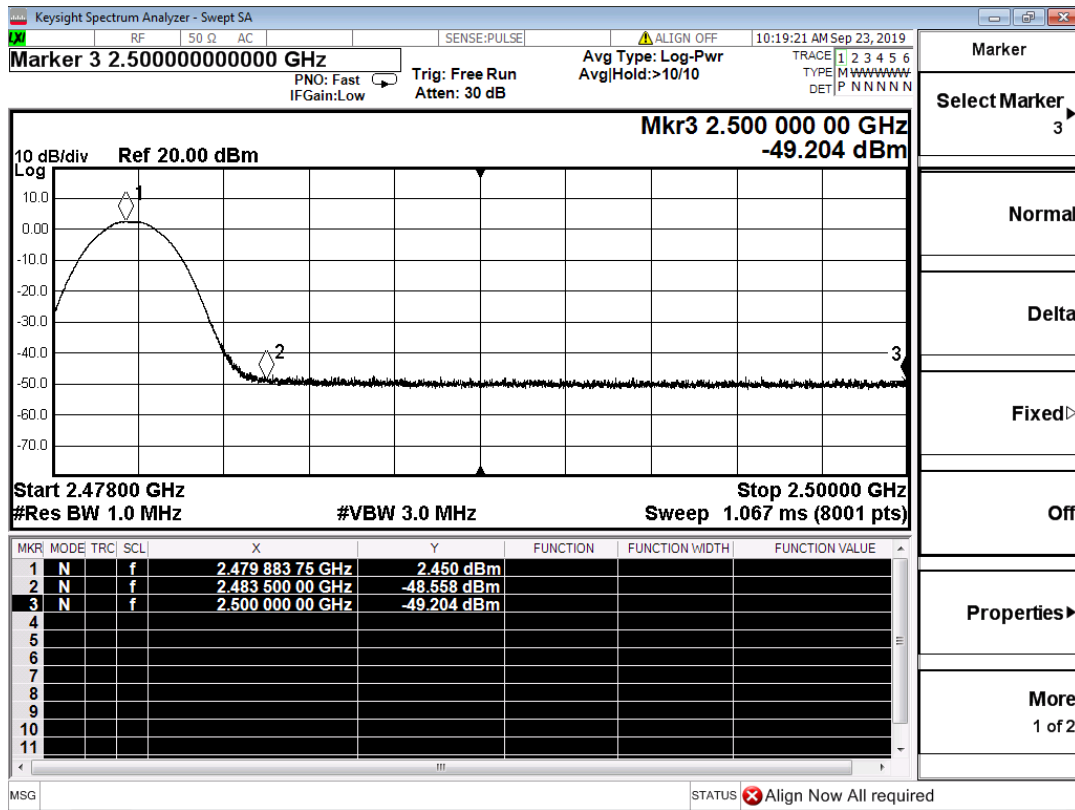
**Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (Low Channel)**



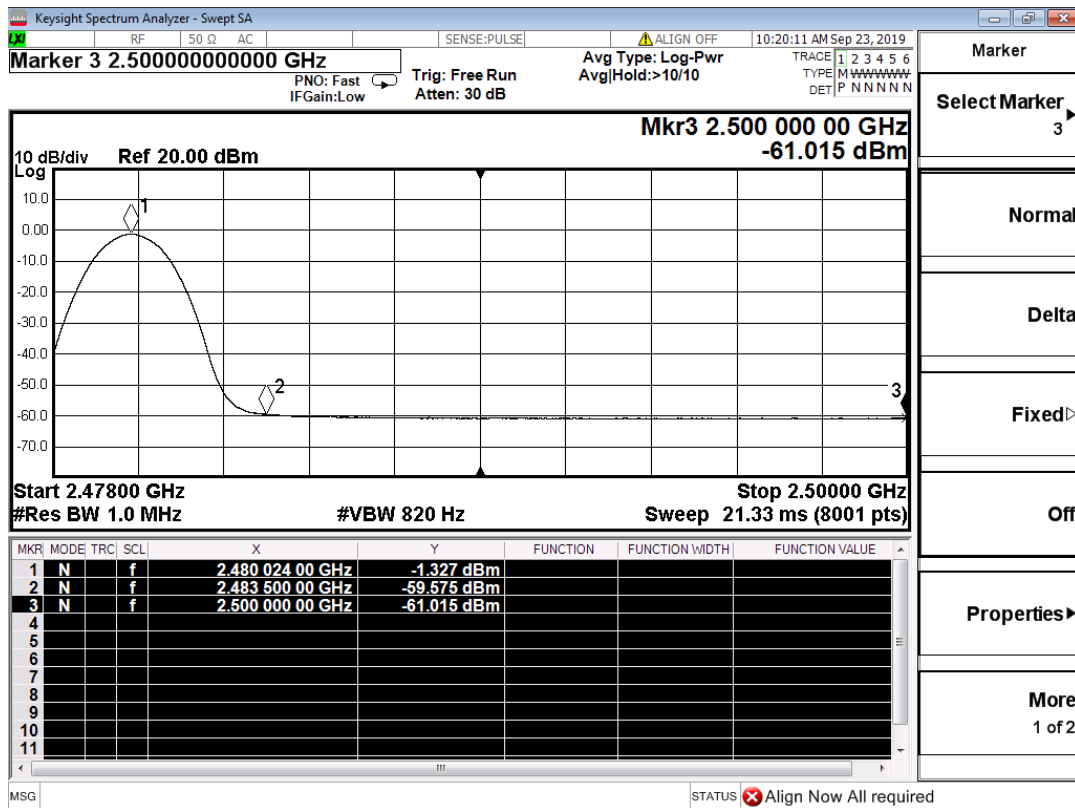
**Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (Low Channel)**



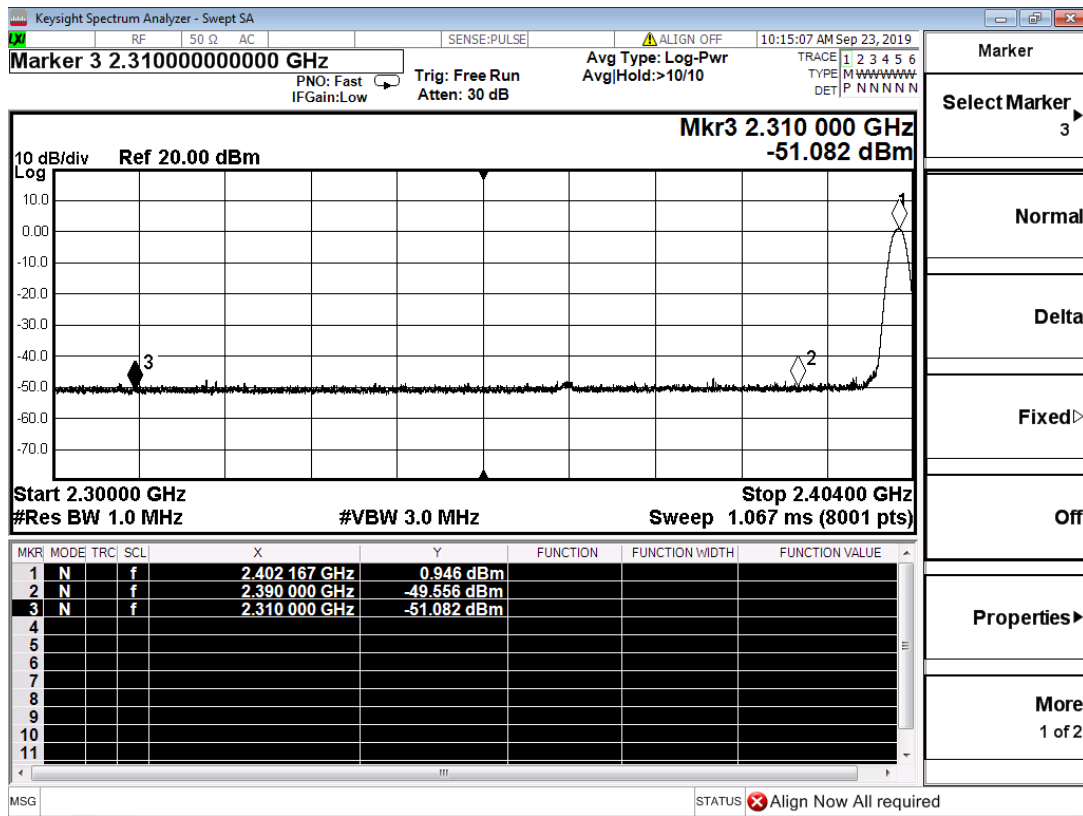
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



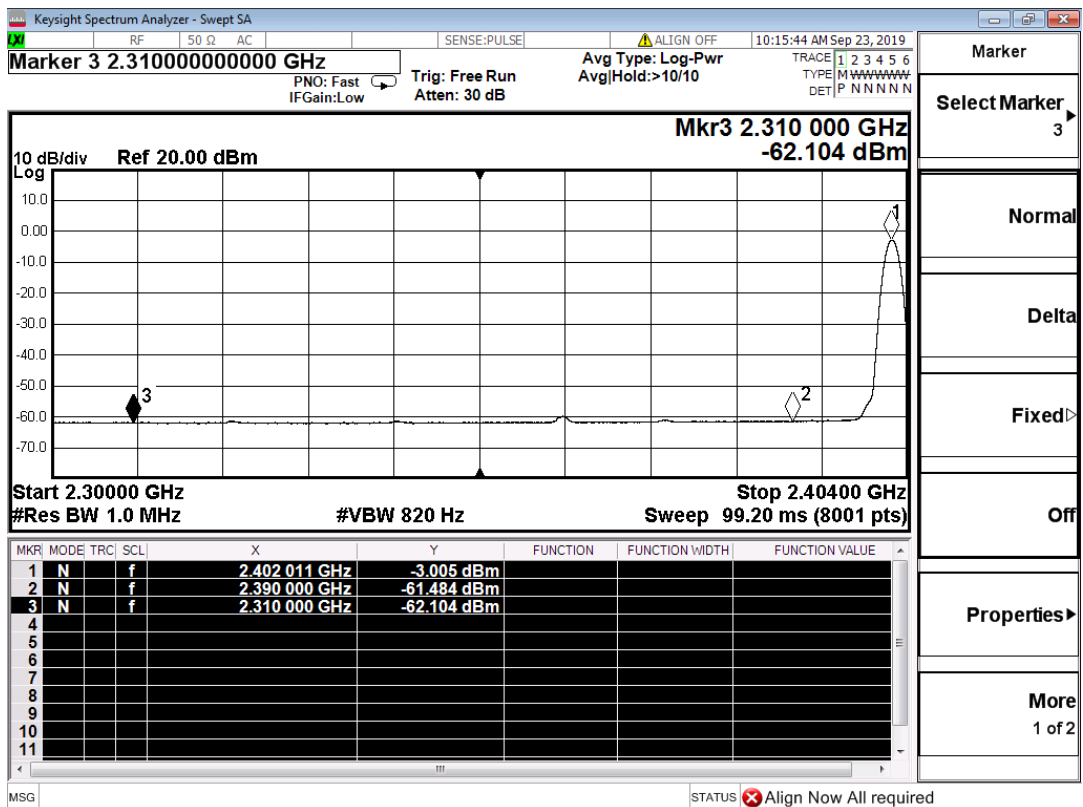
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



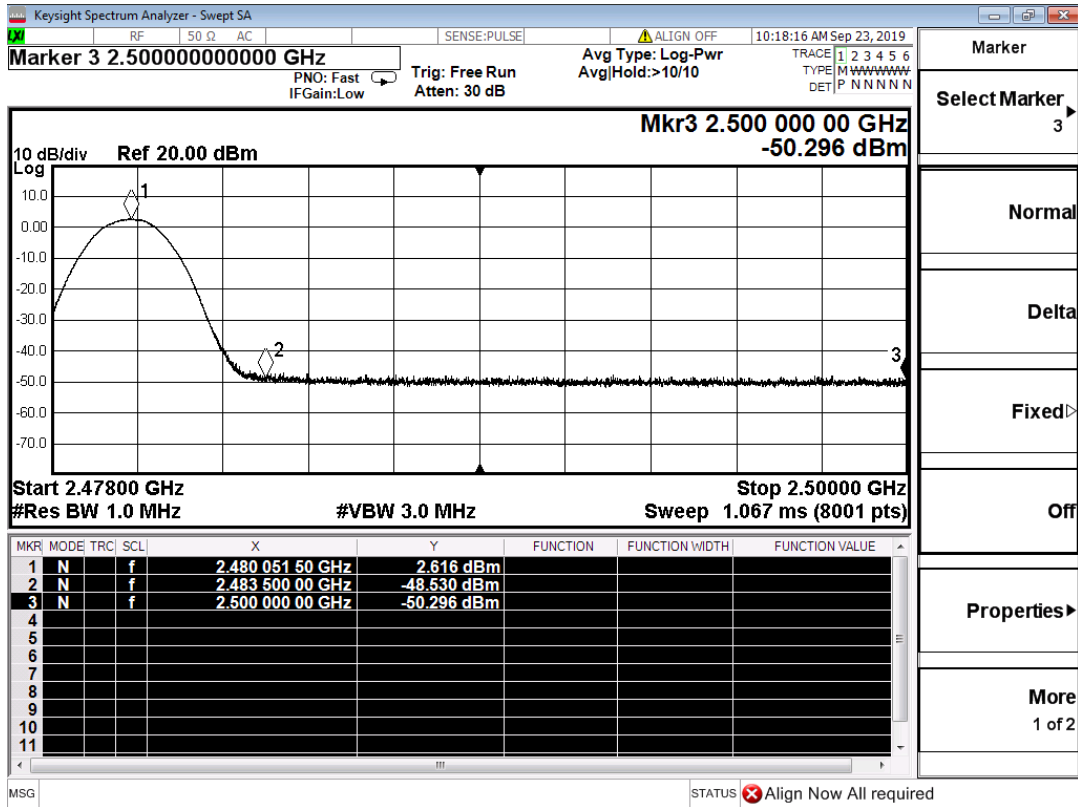
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



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)

