

Appendix A

RF Test Data for BT V4.1(BDR/EDR) (Conducted Measurement)

Product Name: BT FM Transmitter with QC/ 1A Dual USB Ports and Handsfree Mic

Trade Mark: cigii

Test Model: BT88C

Environmental Conditions

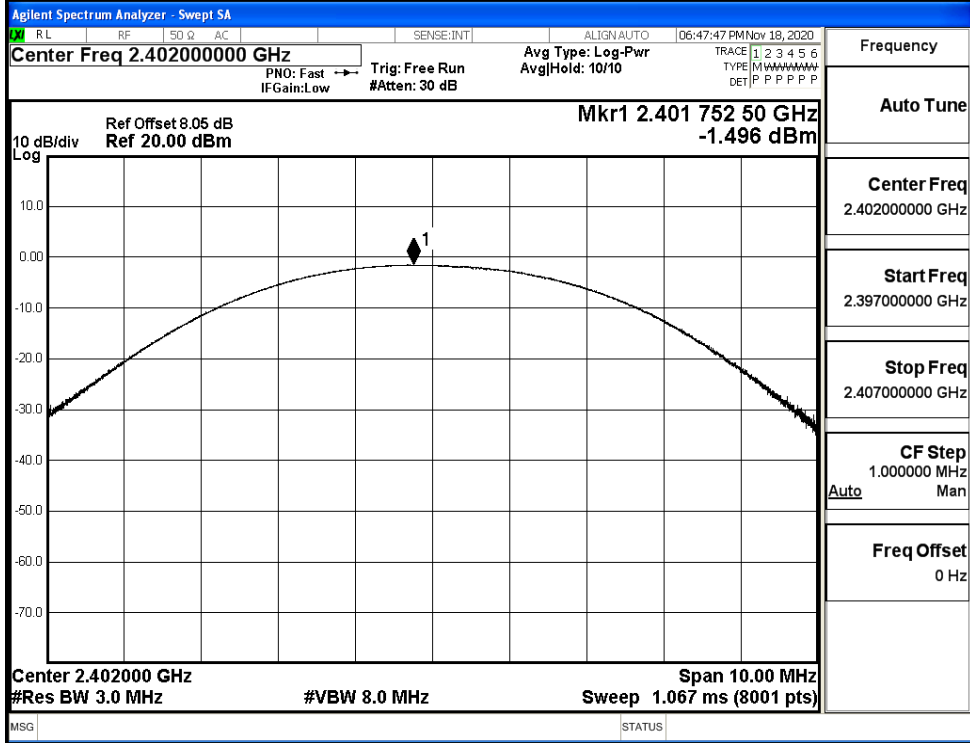
| | |
|--------------------|-----------|
| Temperature: | 23.8 ° C |
| Relative Humidity: | 52.1% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Ben Jin |
| Supervised by: | Li Huan |

A.1 Maxmum Conducted Peak Output Power

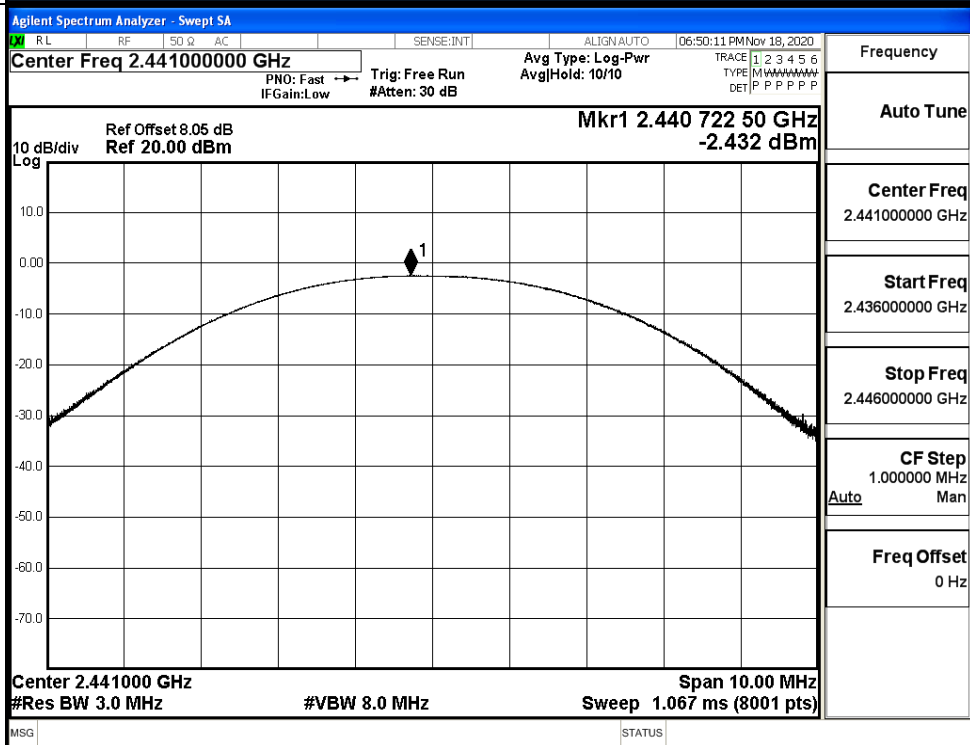
| Mode | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK | LCH | -1.496 | 30 | PASS |
| | MCH | -2.432 | 30 | PASS |
| | HCH | -3.951 | 30 | PASS |
| $\pi/4$ DQPSK | LCH | -1.397 | 21 | PASS |
| | MCH | -2.231 | 21 | PASS |
| | HCH | -3.764 | 21 | PASS |
| 8DPSK | LCH | -0.936 | 21 | PASS |
| | MCH | -1.599 | 21 | PASS |
| | HCH | -3.131 | 21 | PASS |

Test Graphs

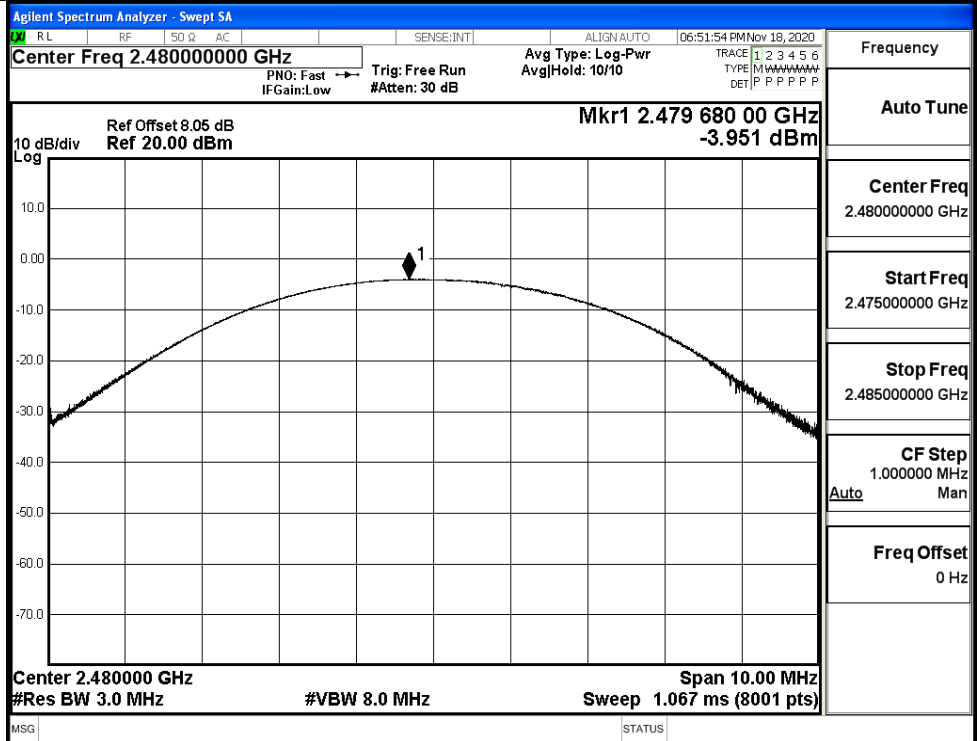
GFSK/LCH



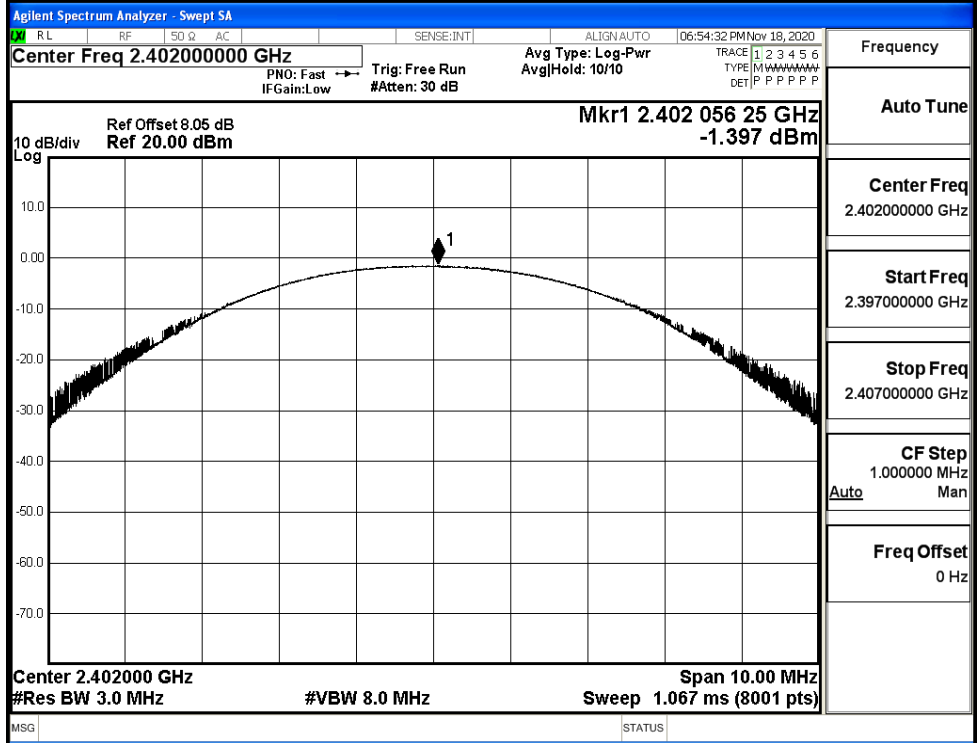
GFSK/MCH



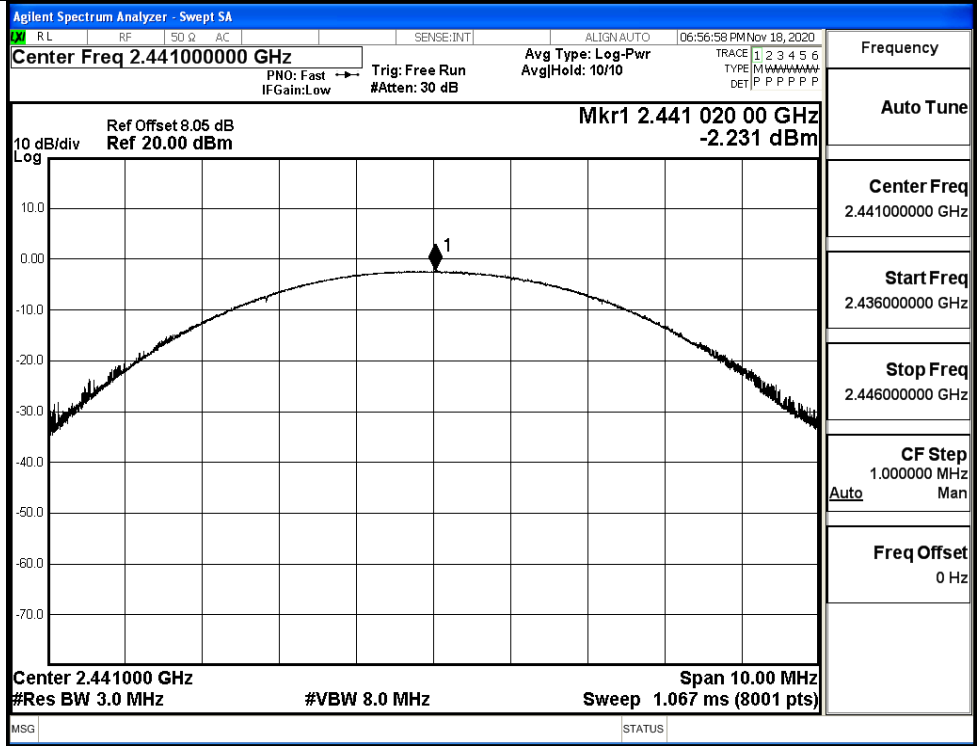
GFSK/HCH



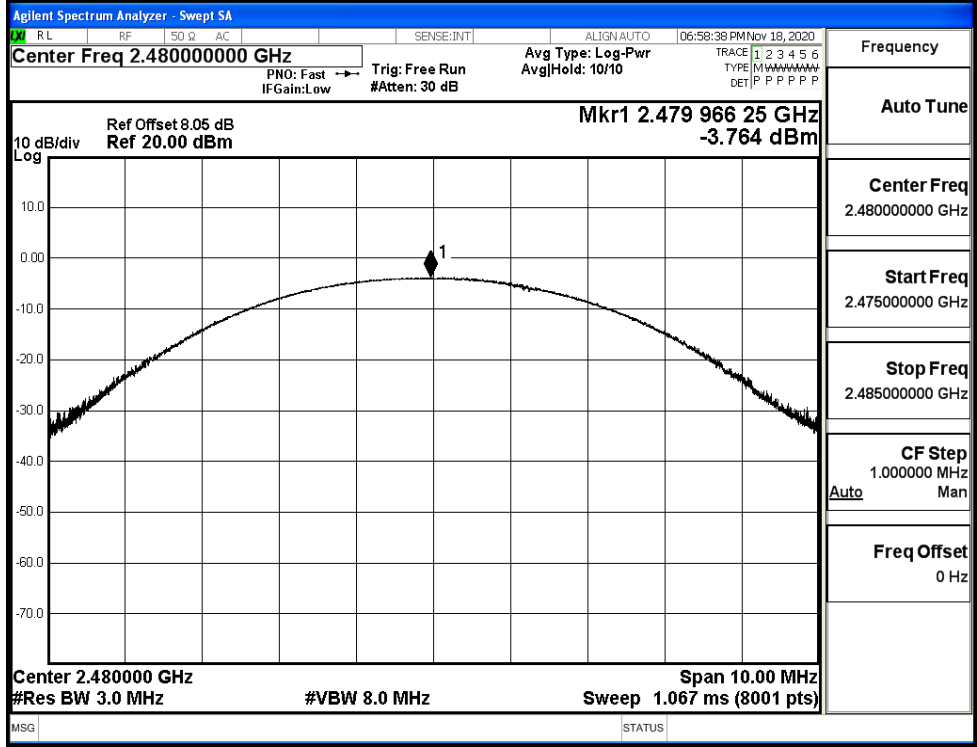
$\pi/4$ DQPSK/LCH



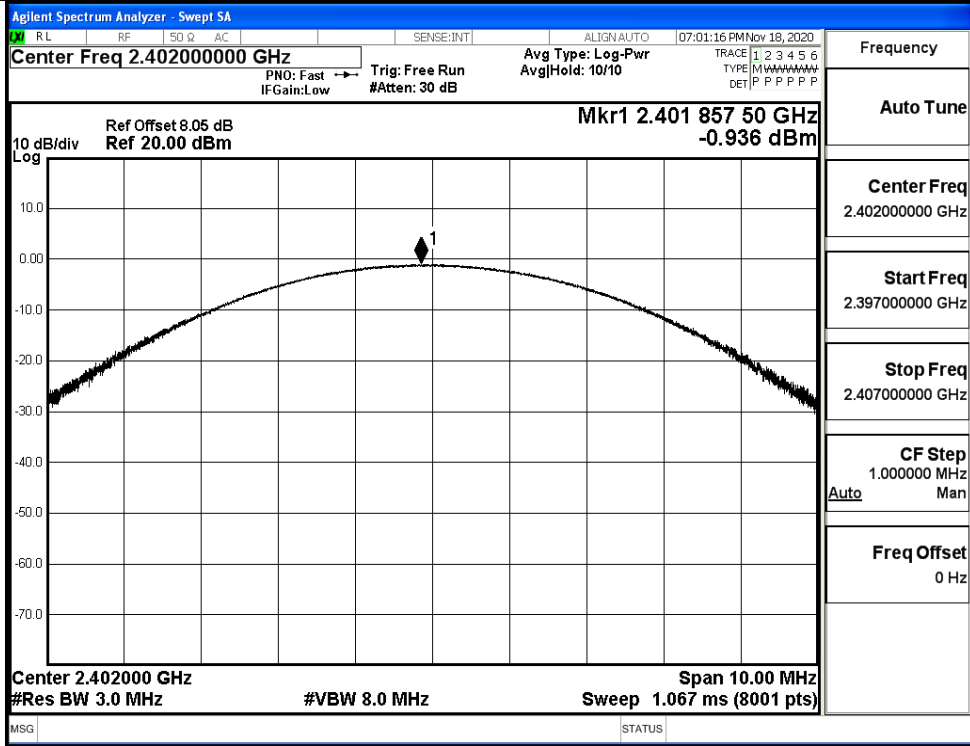
$\pi/4$ DQPSK/MCH



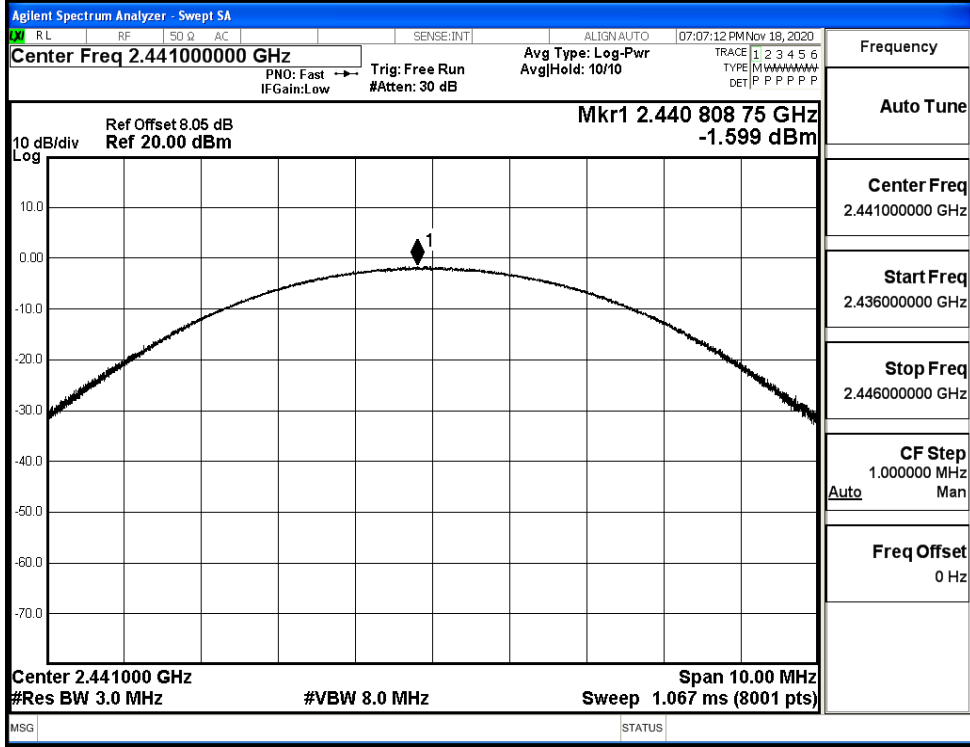
$\pi/4$ DQPSK/HCH



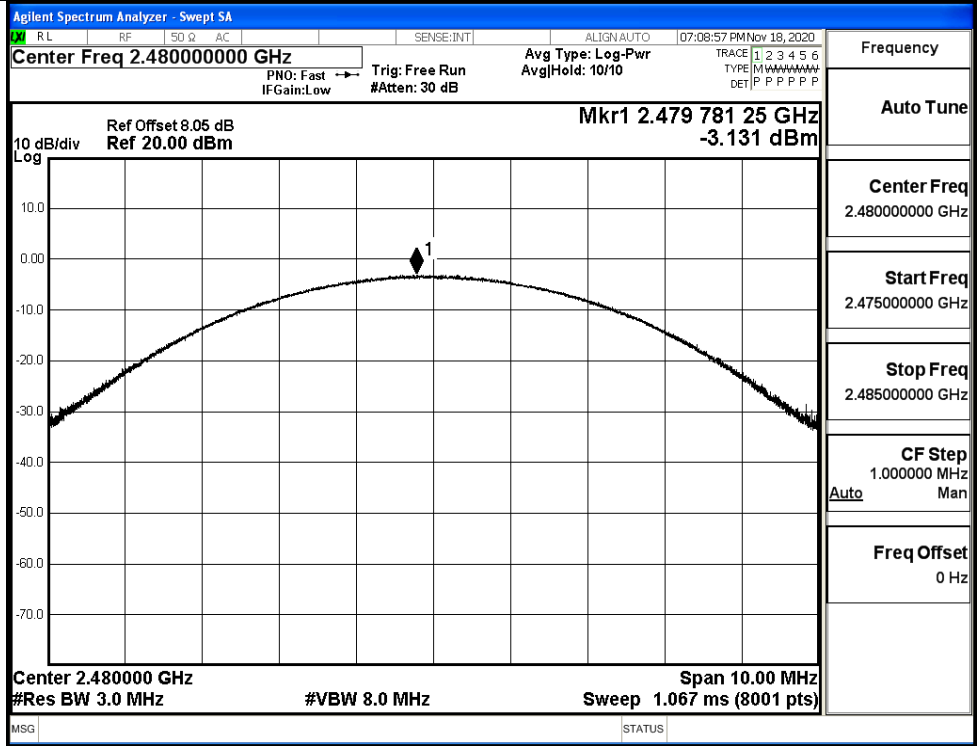
8DPSK/LCH



8DPSK/MCH

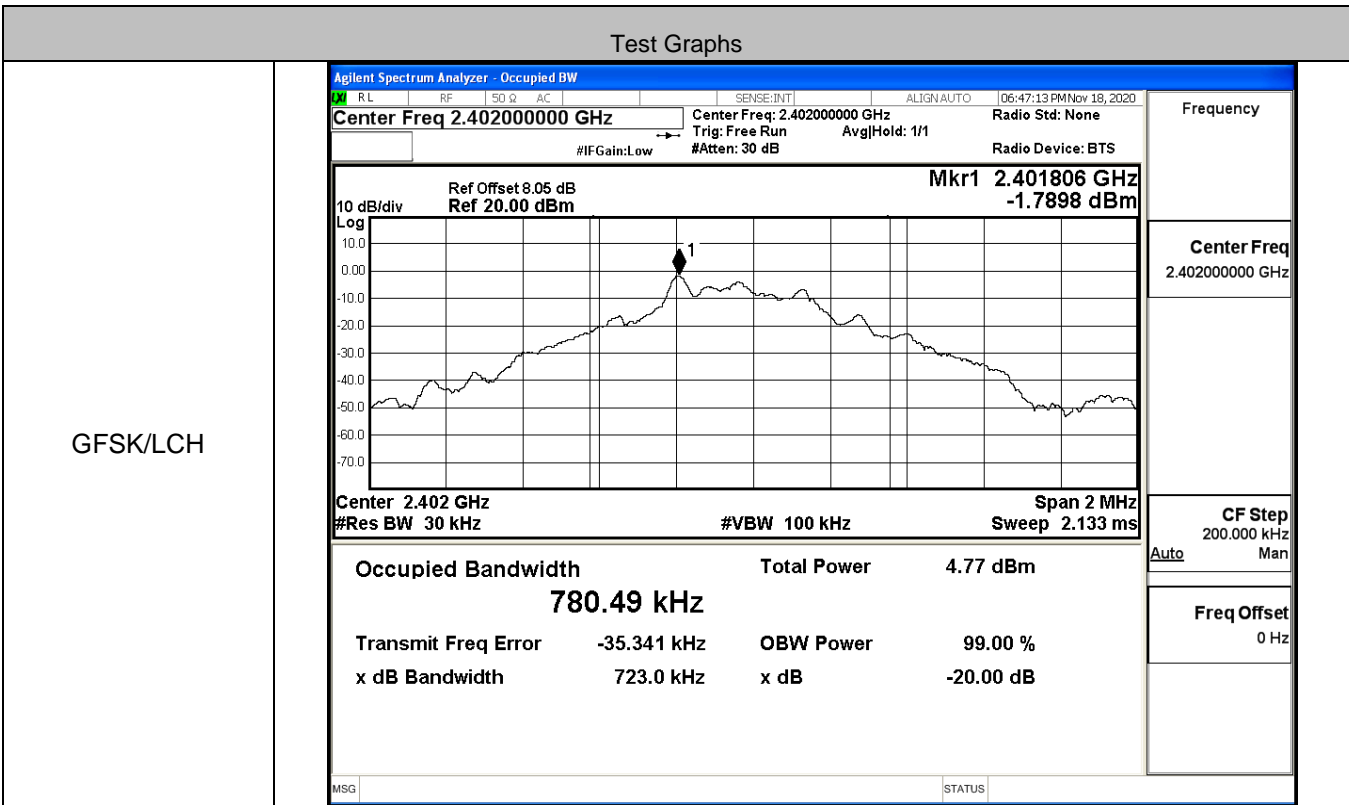


8DPSK/HCH



A.2 20dB Bandwidth

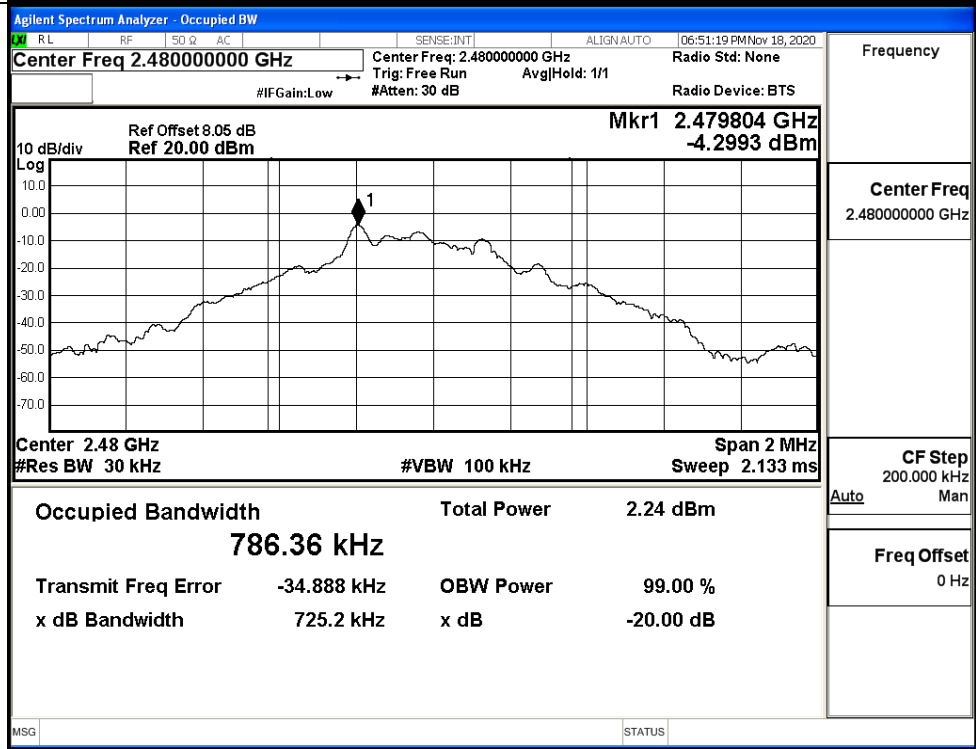
| Mode | Channel. | 20dB Bandwidth [MHz] | Limit [MHz] | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK | LCH | 0.7230 | Not Specified | PASS |
| | MCH | 0.7261 | Not Specified | PASS |
| | HCH | 0.7252 | Not Specified | PASS |
| $\pi/4$ DQPSK | LCH | 1.113 | Not Specified | PASS |
| | MCH | 1.117 | Not Specified | PASS |
| | HCH | 1.115 | Not Specified | PASS |
| 8DPSK | LCH | 1.270 | Not Specified | PASS |
| | MCH | 1.271 | Not Specified | PASS |
| | HCH | 1.272 | Not Specified | PASS |



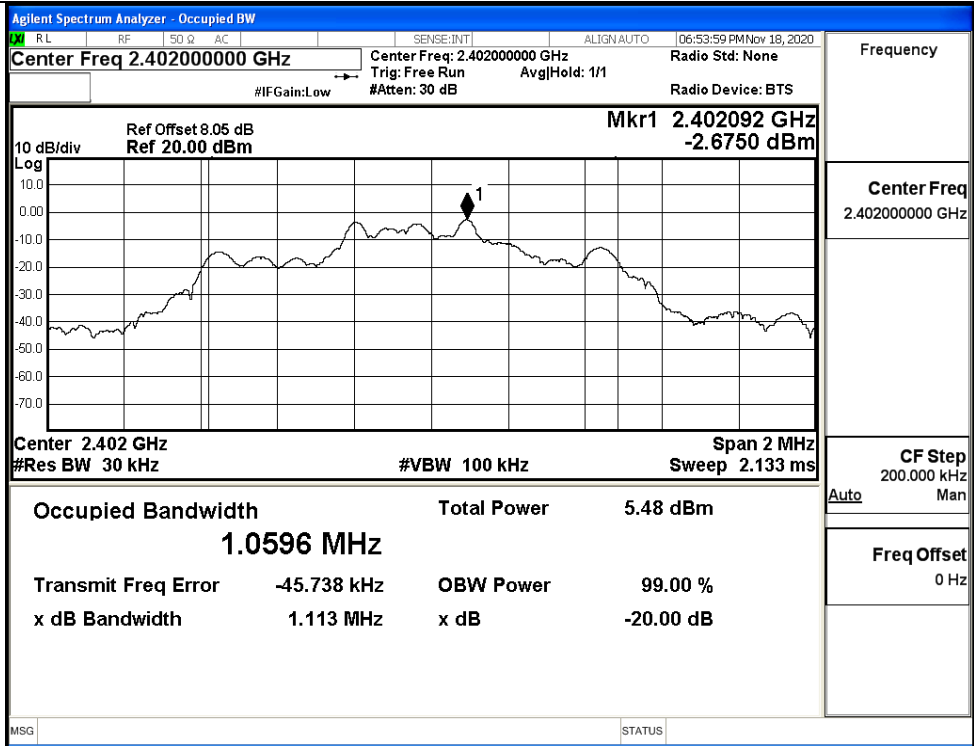
GFSK/MCH



GFSK/HCH

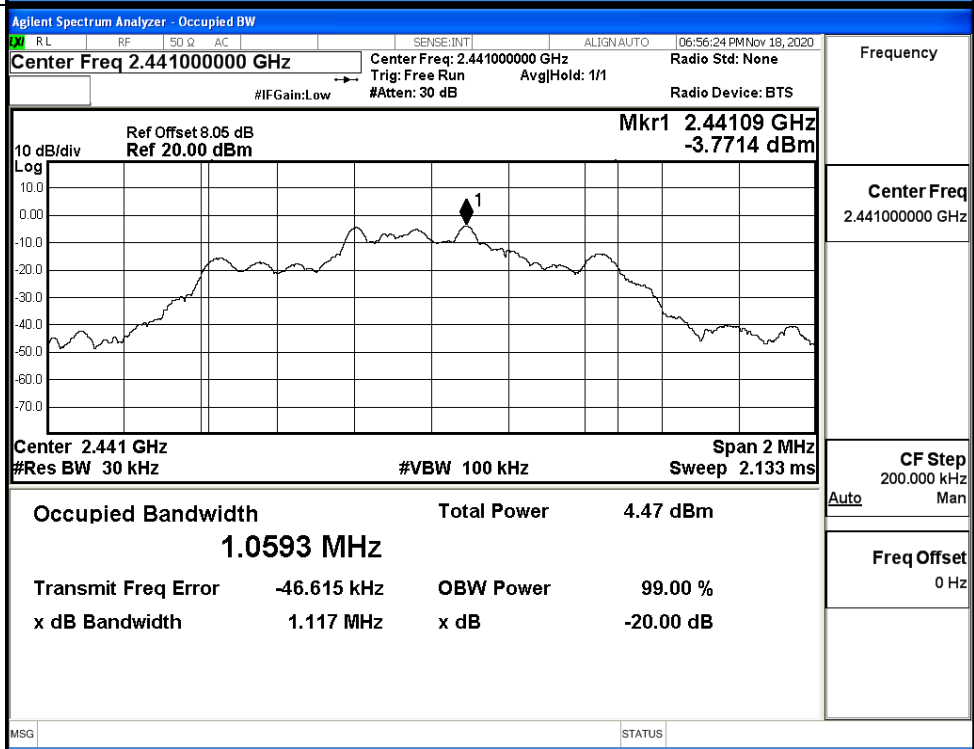


$\pi/4$ DQPSK/LCH



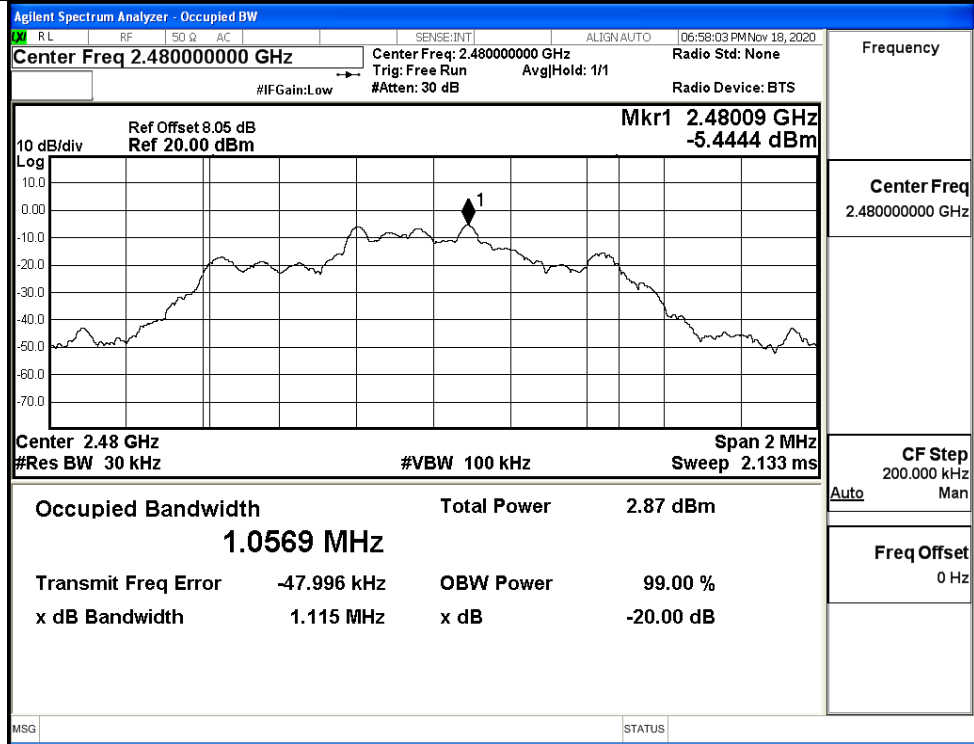
| | |
|-------------|----------------|
| Frequency | 2.40200000 GHz |
| Center Freq | 2.40200000 GHz |
| CF Step | 200.000 kHz |
| Auto | Man |
| Freq Offset | 0 Hz |

$\pi/4$ DQPSK/MCH

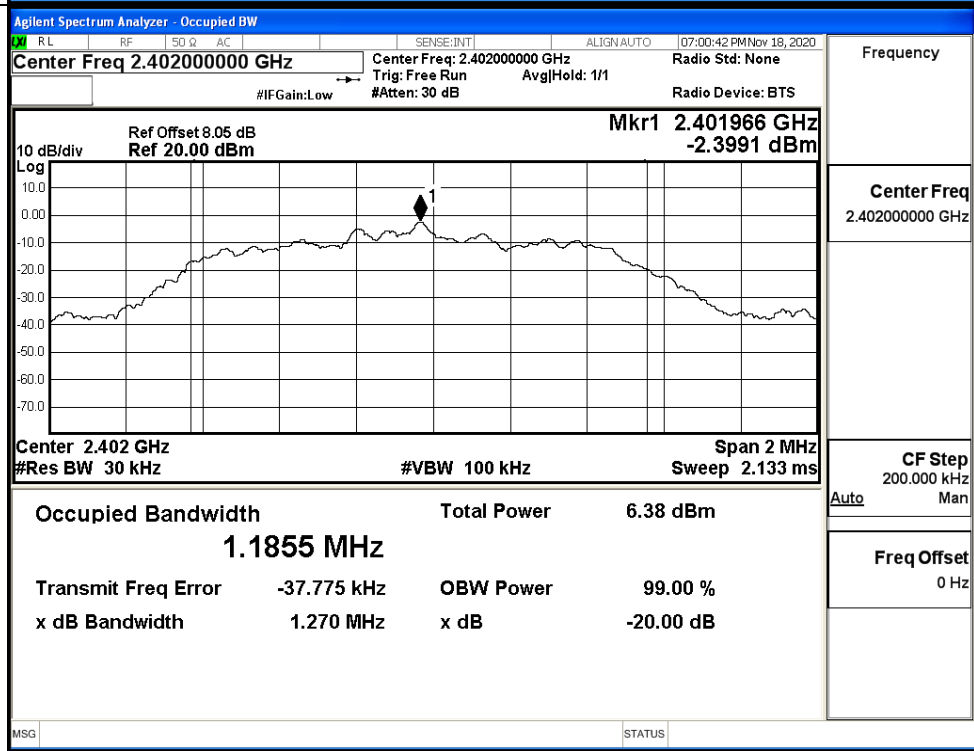


| | |
|-------------|----------------|
| Frequency | 2.44100000 GHz |
| Center Freq | 2.44100000 GHz |
| CF Step | 200.000 kHz |
| Auto | Man |
| Freq Offset | 0 Hz |

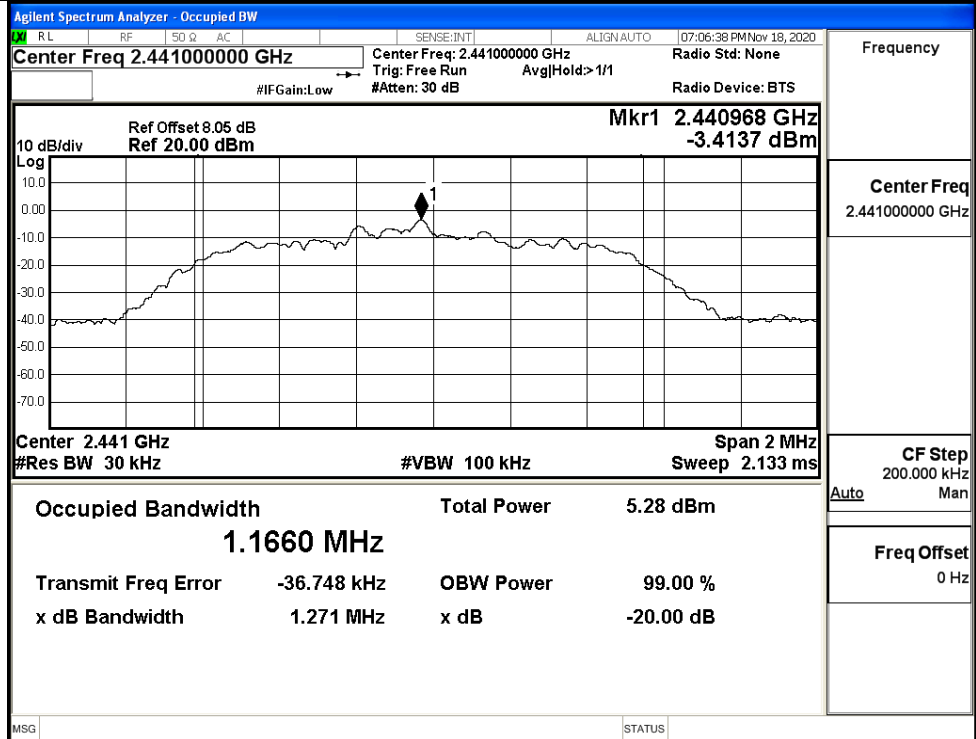
$\pi/4$ DQPSK/HCH



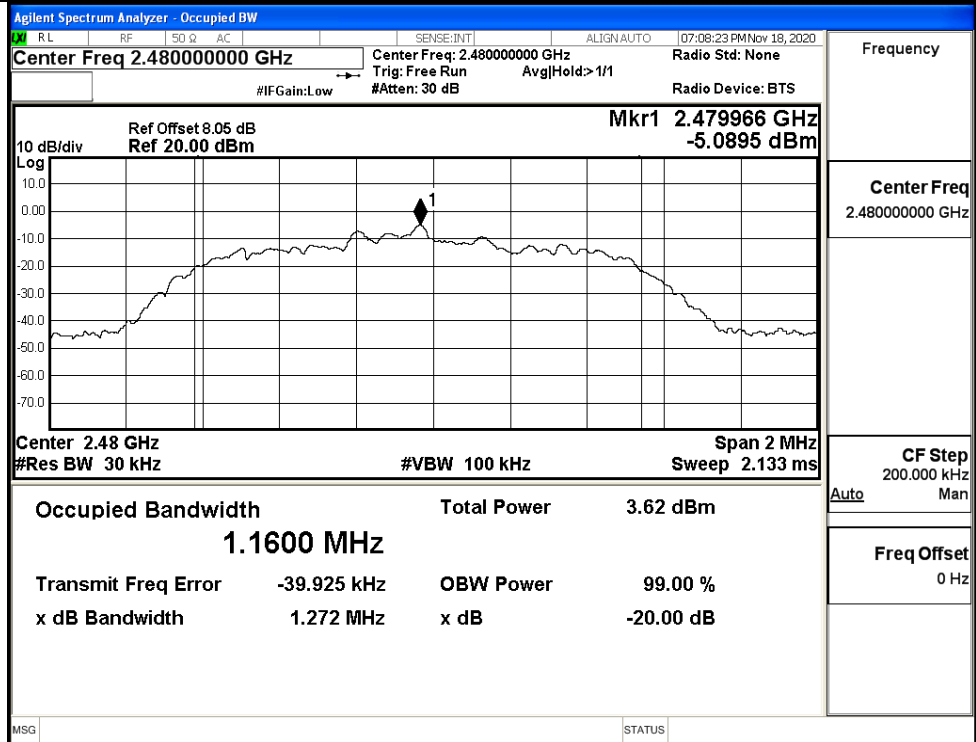
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



A.3 Carrier Frequency Separation

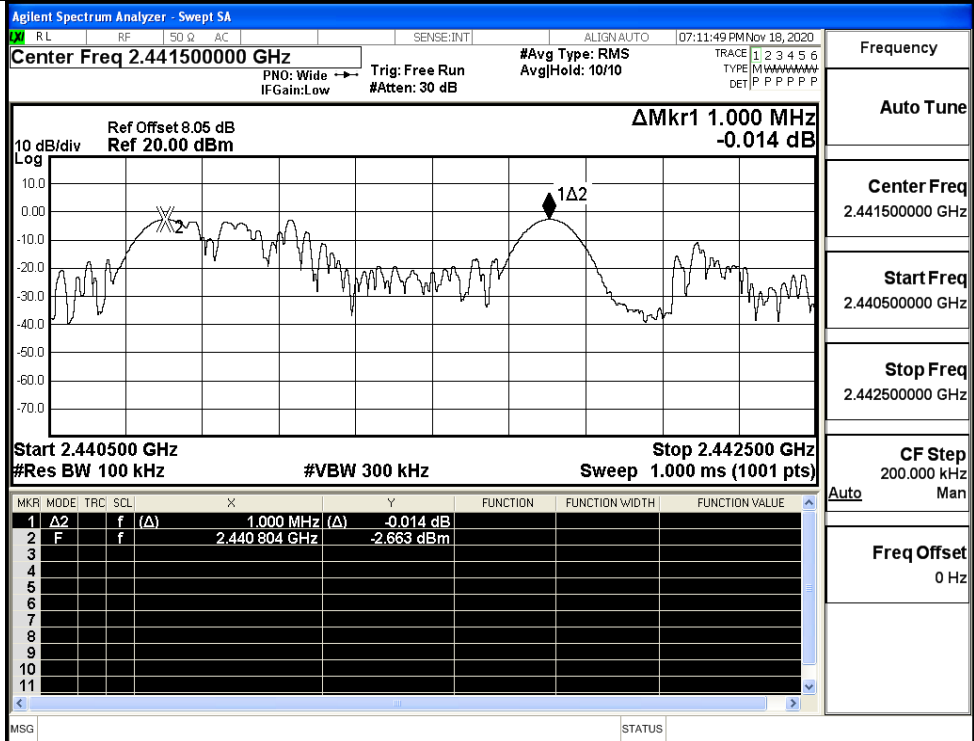
| Mode | Channel | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|----------|---------|------------------------------------|-------------|---------|
| GFSK | LCH | 0.999 | 0.484 | PASS |
| | MCH | 1.000 | 0.484 | PASS |
| | HCH | 1.004 | 0.484 | PASS |
| π/4DQPSK | LCH | 0.850 | 0.745 | PASS |
| | MCH | 0.840 | 0.745 | PASS |
| | HCH | 1.098 | 0.745 | PASS |
| 8DPSK | LCH | 1.006 | 0.848 | PASS |
| | MCH | 1.160 | 0.848 | PASS |
| | HCH | 0.848 | 0.848 | PASS |

Test Graphs

GFSK/LCH

| MKR | MODE | TRC | SCL | X | Y | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-----|----------------|------------|----------|----------------|----------------|
| 1 | Δ2 | f | (Δ) | 998.75 kHz (Δ) | -0.025 dB | | | |
| 2 | F | f | | 2.40180825 GHz | -1.705 dBm | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |

GFSK/MCH



Frequency

Auto Tune

Center Freq

2.441500000 GHz

Start Freq

2.440500000 GHz

Stop Freq

2.442500000 GHz

CF Step

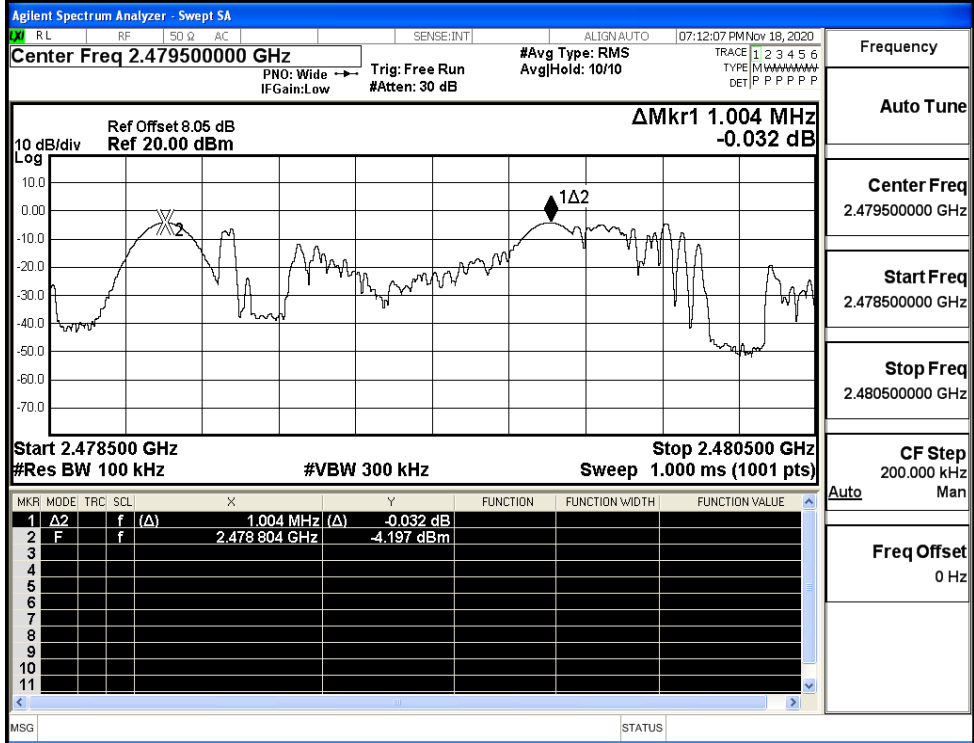
200.000 kHz

Auto

Freq Offset

0 Hz

GFSK/HCH



Frequency

Auto Tune

Center Freq

2.479500000 GHz

Start Freq

2.478500000 GHz

Stop Freq

2.480500000 GHz

CF Step

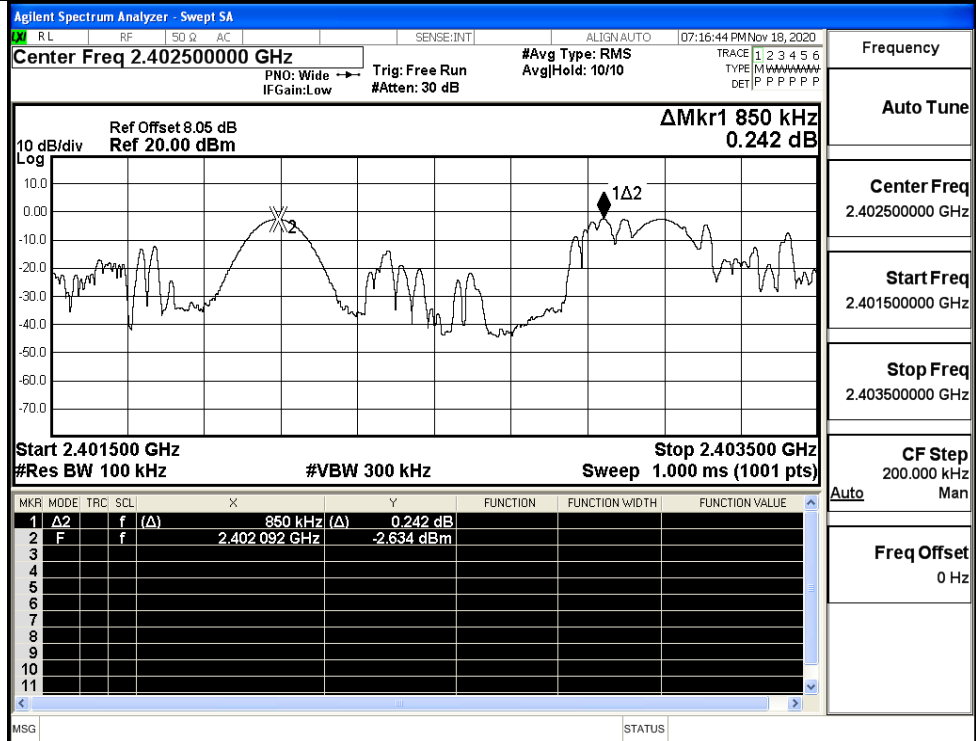
200.000 kHz

Auto

Freq Offset

0 Hz

$\pi/4$ DQPSK/LCH



Frequency

Auto Tune

Center Freq
2.402500000 GHz

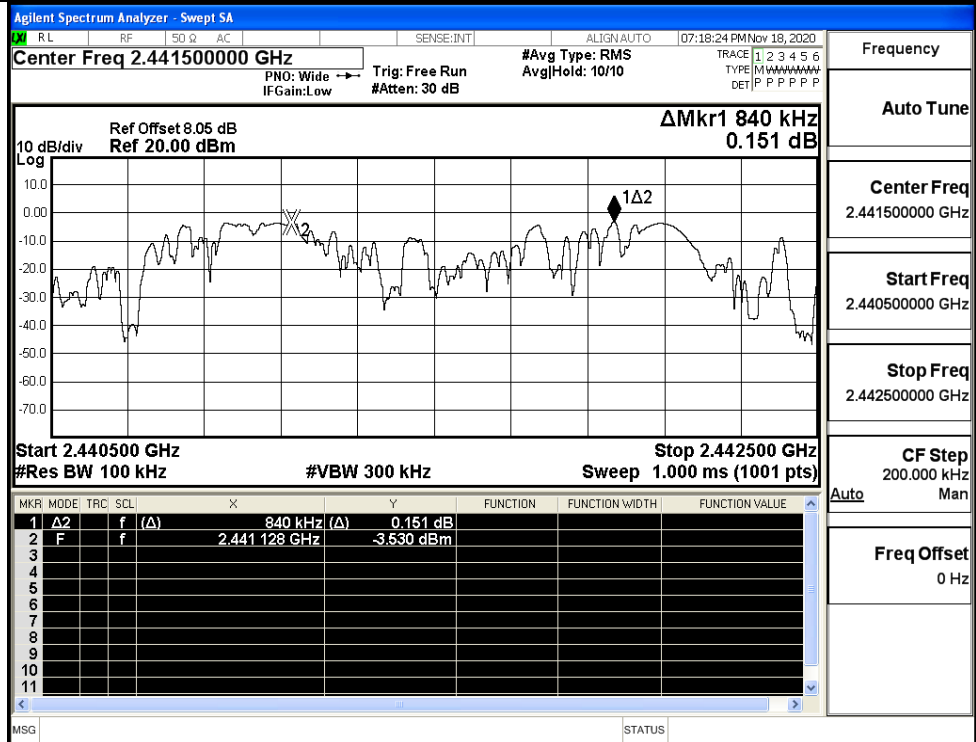
Start Freq
2.401500000 GHz

Stop Freq
2.403500000 GHz

CF Step
200.000 kHz

Freq Offset
0 Hz

$\pi/4$ DQPSK/MCH



Frequency

Auto Tune

Center Freq
2.441500000 GHz

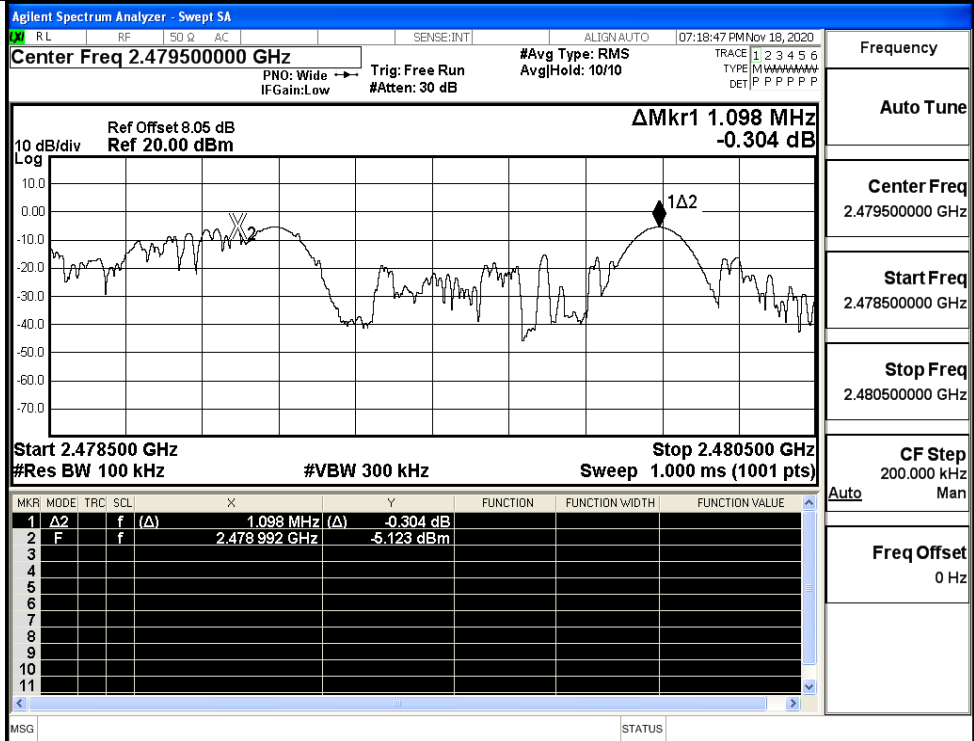
Start Freq
2.440500000 GHz

Stop Freq
2.442500000 GHz

CF Step
200.000 kHz

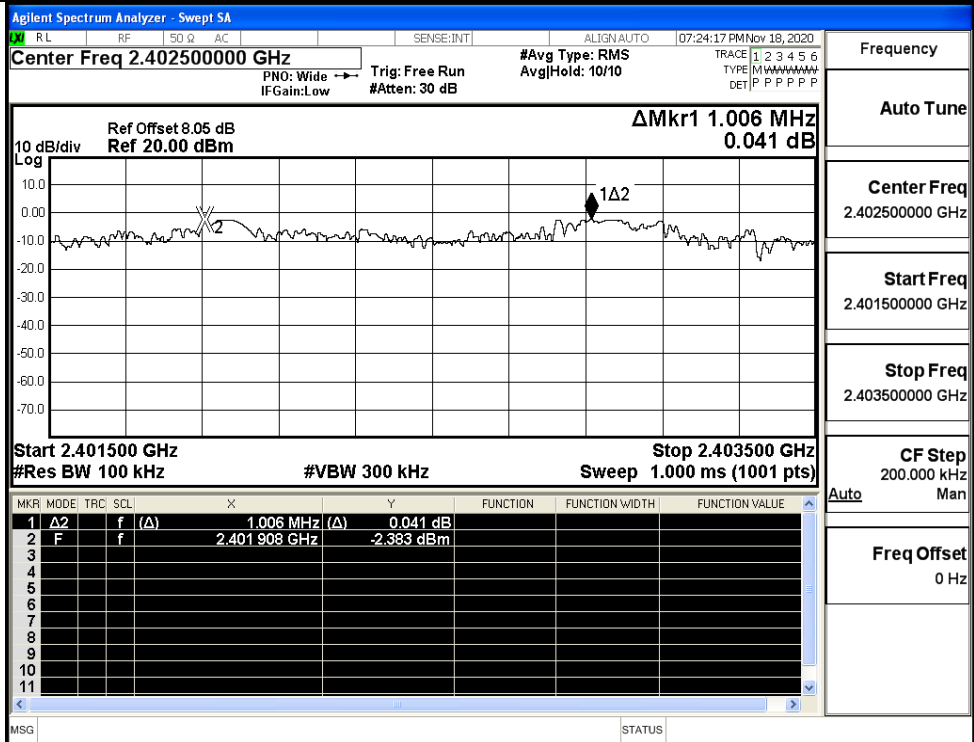
Freq Offset
0 Hz

π/4DQPSK/HCH

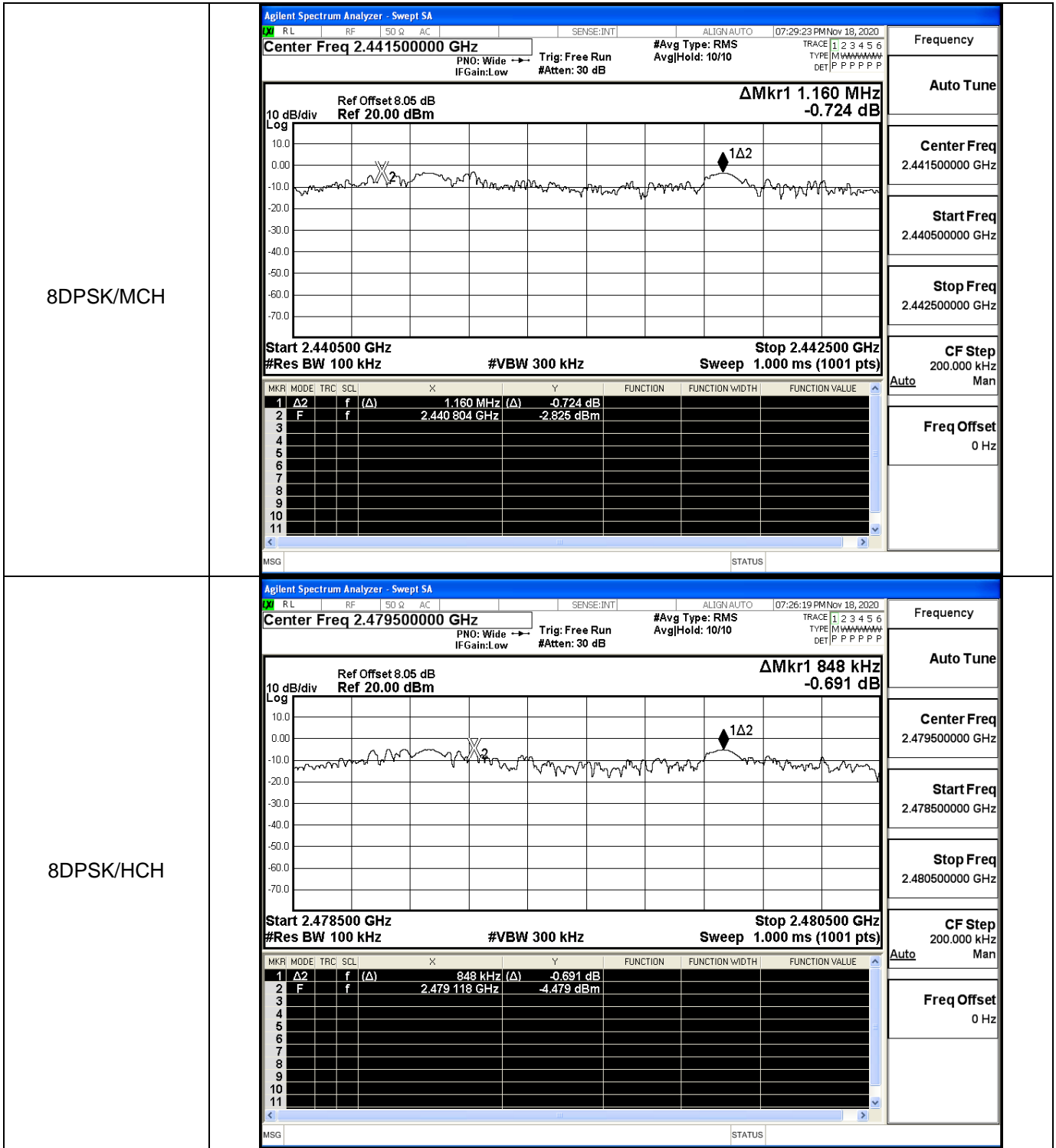


| |
|--------------------------------|
| Frequency |
| Auto Tune |
| Center Freq 2.479500000 GHz |
| Start Freq 2.478500000 GHz |
| Stop Freq 2.480500000 GHz |
| CF Step 200.000 kHz |
| Auto |
| Man |
| Freq Offset 0 Hz |

8DPSK/LCH



| |
|--------------------------------|
| Frequency |
| Auto Tune |
| Center Freq 2.402500000 GHz |
| Start Freq 2.401500000 GHz |
| Stop Freq 2.403500000 GHz |
| CF Step 200.000 kHz |
| Auto |
| Man |
| Freq Offset 0 Hz |

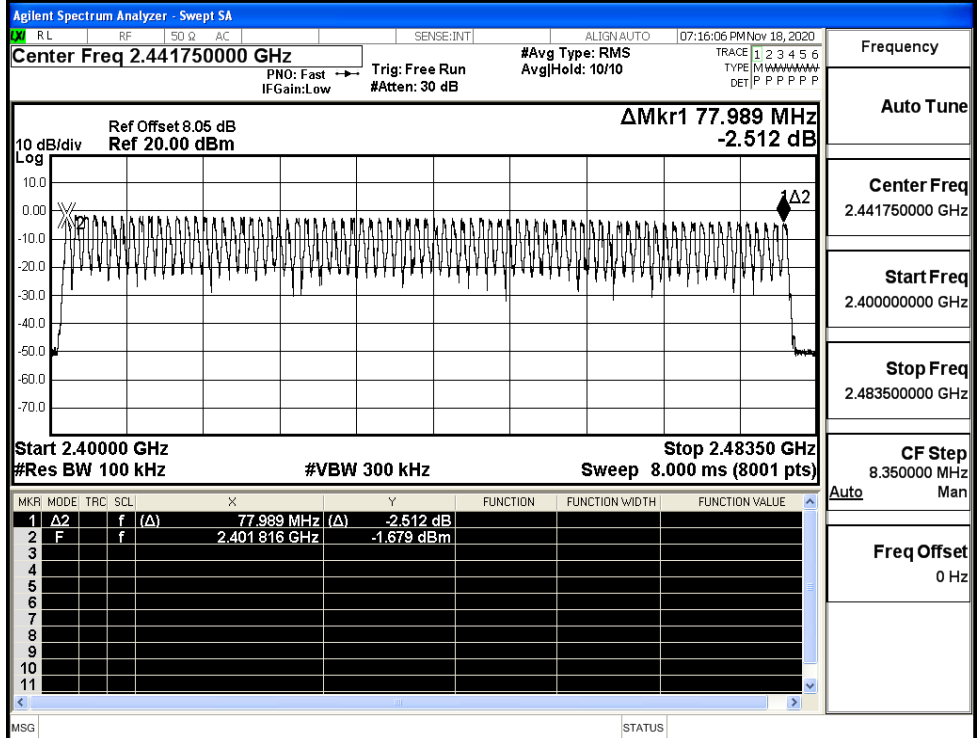


A.4 Hopping Channel Number

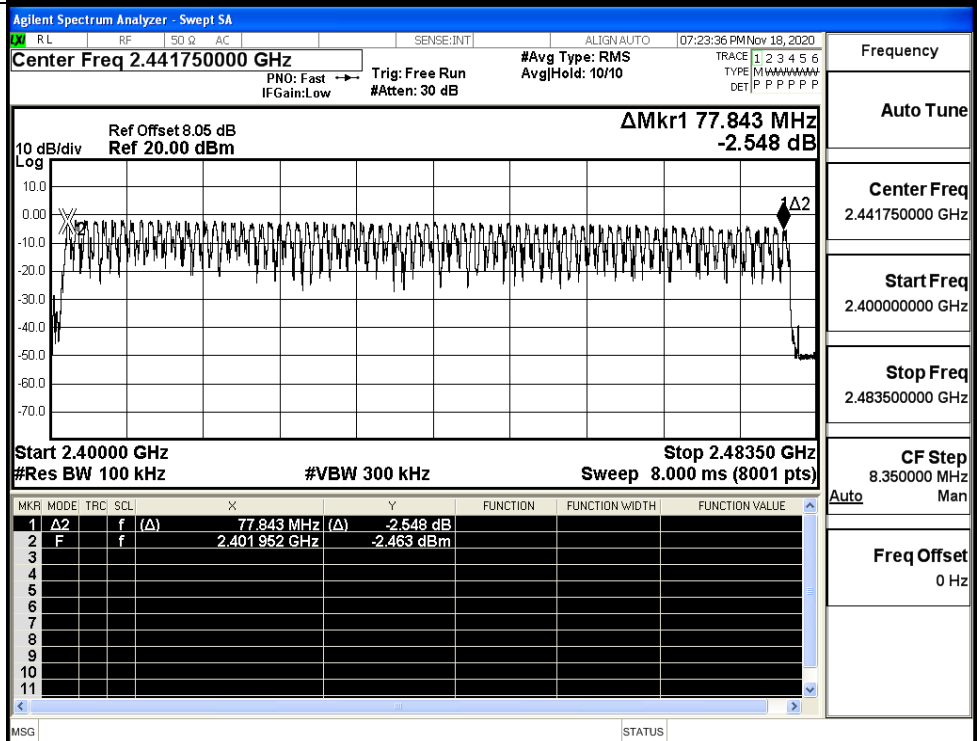
| Mode | Channel. | Number of Hopping Channel [N] | Limit [N] | Verdict |
|----------|----------|-------------------------------|-----------|---------|
| GFSK | Hop | 79 | >=15 | PASS |
| π/4DQPSK | Hop | 79 | >=15 | PASS |
| 8DPSK | Hop | 79 | >=15 | PASS |

Test Graphs

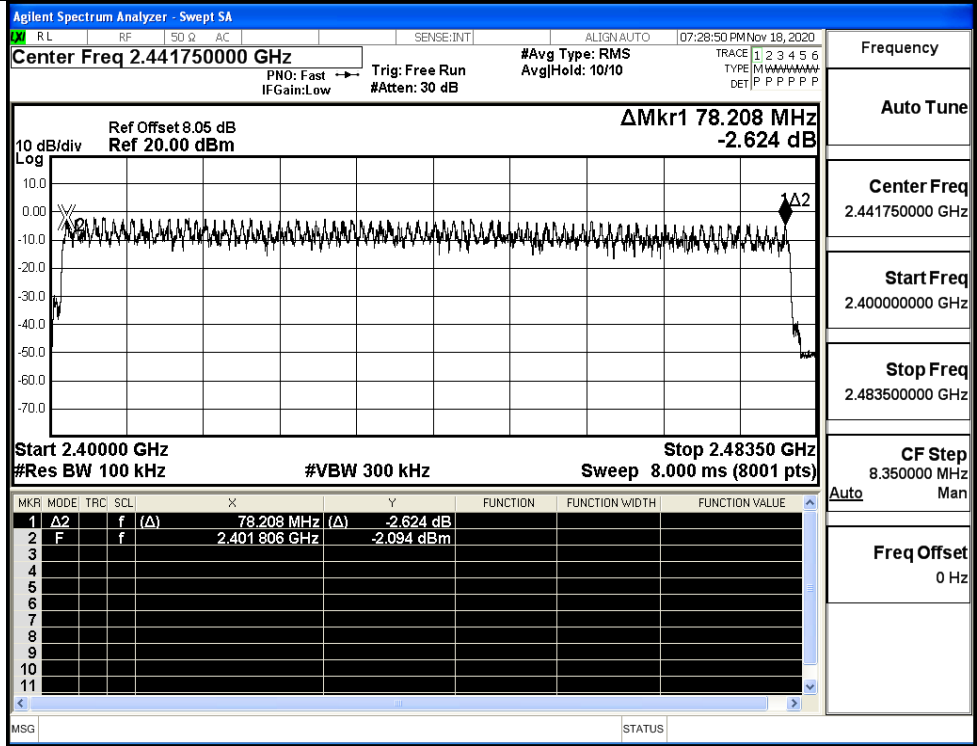
GFSK/Hop



π/4DQPSK/Hop

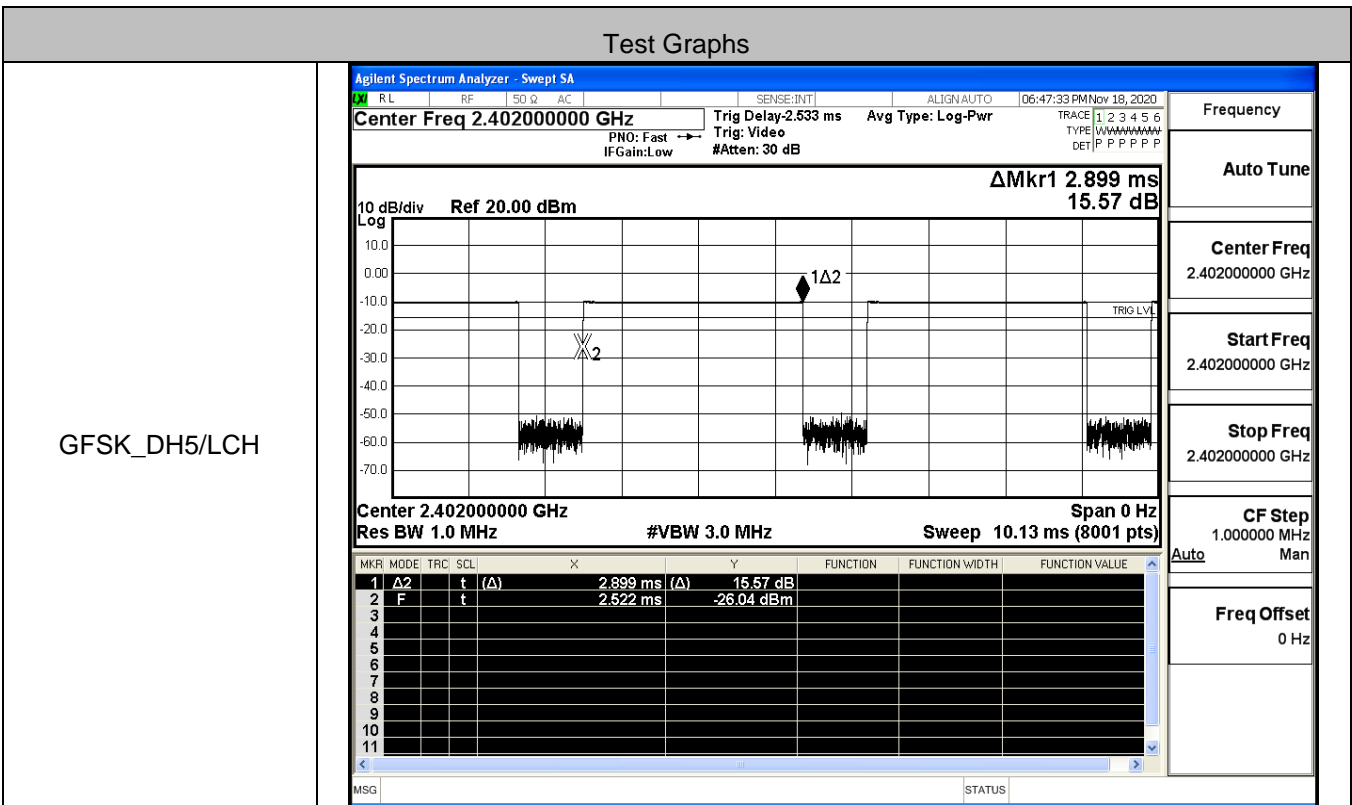


8DPSK/Hop

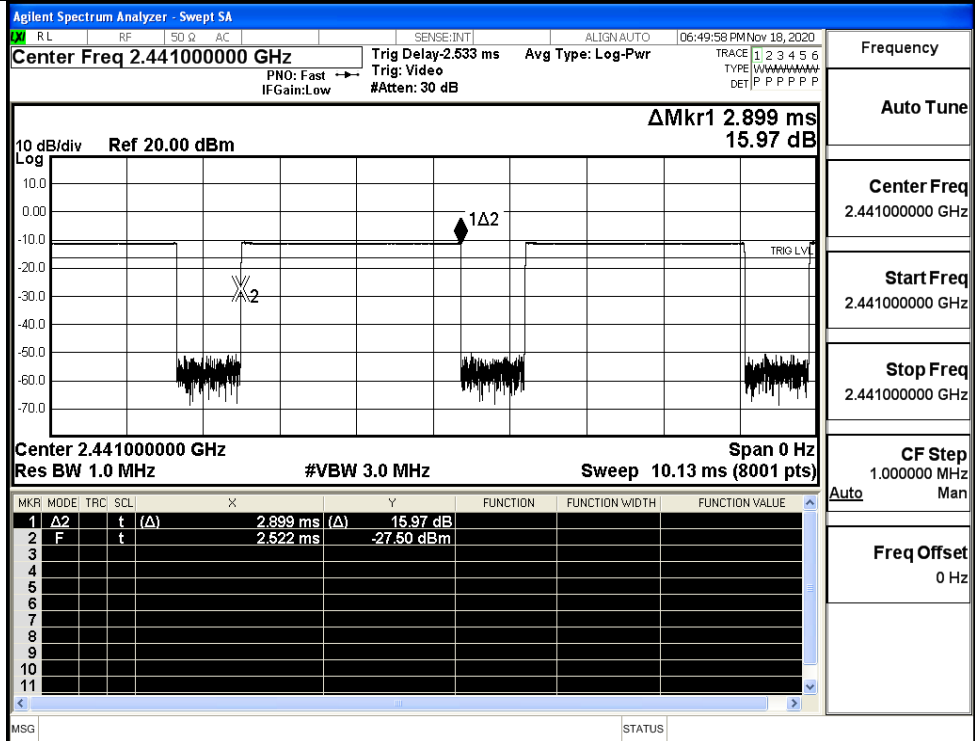


A.5 Dwell Time

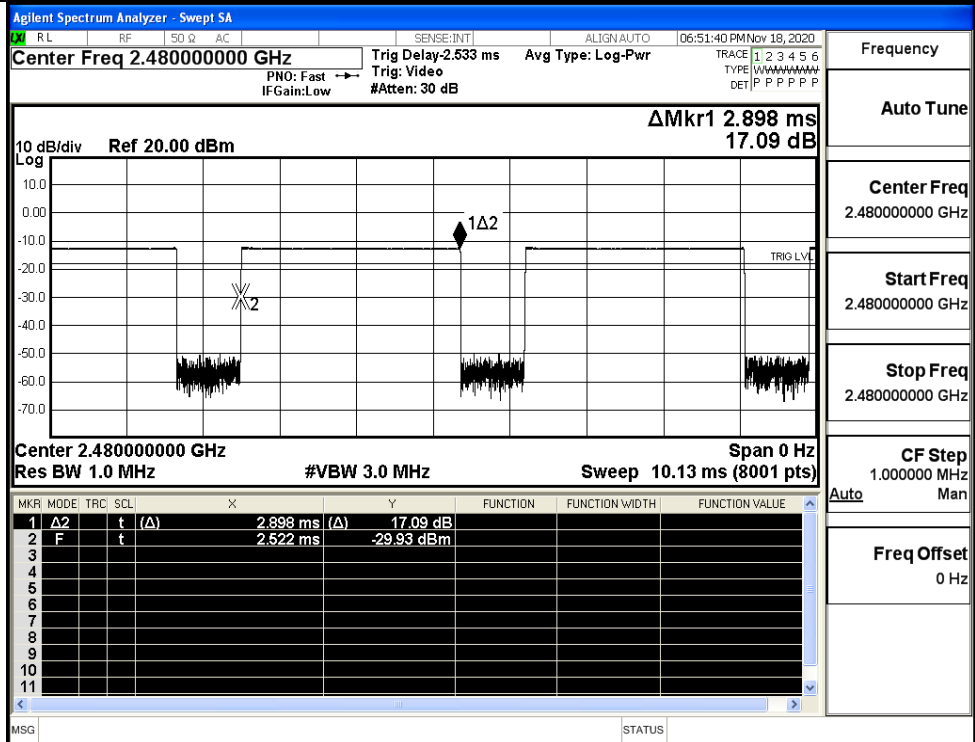
| Mode | Packet | Channel | Burst Width [ms/hop/ch] | Total Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|----------|--------|---------|-------------------------|--------------------|---------------|-----------|---------|
| GFSK | DH5 | LCH | 2.9 | 106.7 | 0.309 | 0.4 | PASS |
| | DH5 | MCH | 2.9 | 106.7 | 0.309 | 0.4 | PASS |
| | DH5 | HCH | 2.9 | 106.7 | 0.309 | 0.4 | PASS |
| π/4DQPSK | 2DH5 | LCH | 2.9 | 106.7 | 0.31 | 0.4 | PASS |
| | 2DH5 | MCH | 2.9 | 106.7 | 0.31 | 0.4 | PASS |
| | 2DH5 | HCH | 2.9 | 106.7 | 0.309 | 0.4 | PASS |
| 8DPSK | 3DH5 | LCH | 2.9 | 106.7 | 0.31 | 0.4 | PASS |
| | 3DH5 | MCH | 2.9 | 106.7 | 0.31 | 0.4 | PASS |
| | 3DH5 | HCH | 2.9 | 106.7 | 0.31 | 0.4 | PASS |



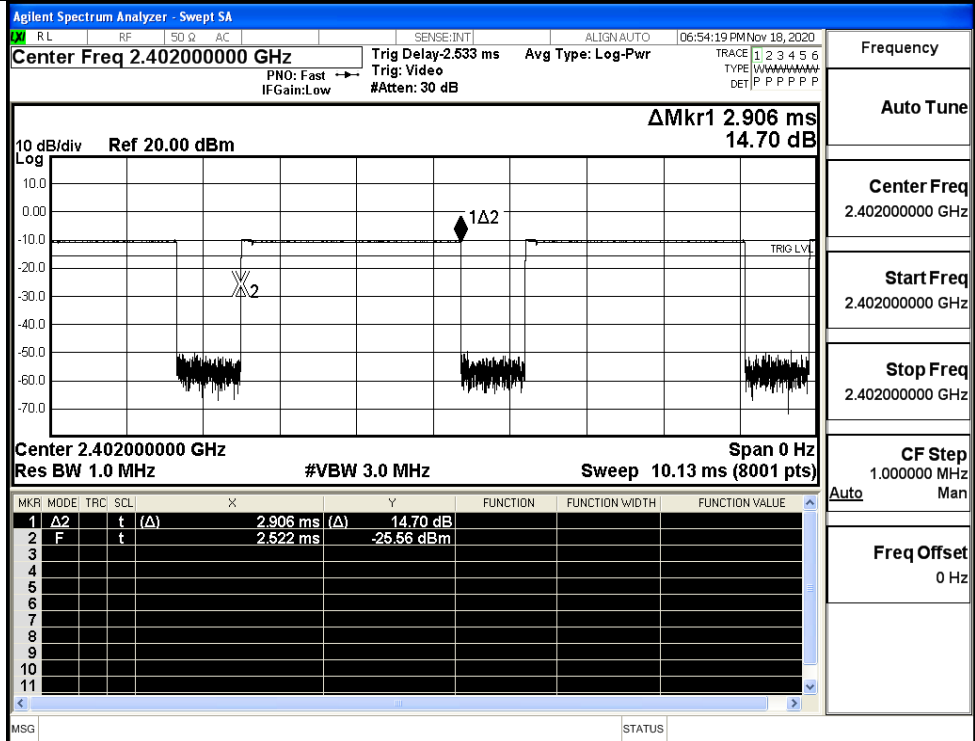
GFSK_DH5/MCH



GFSK_DH5/HCH

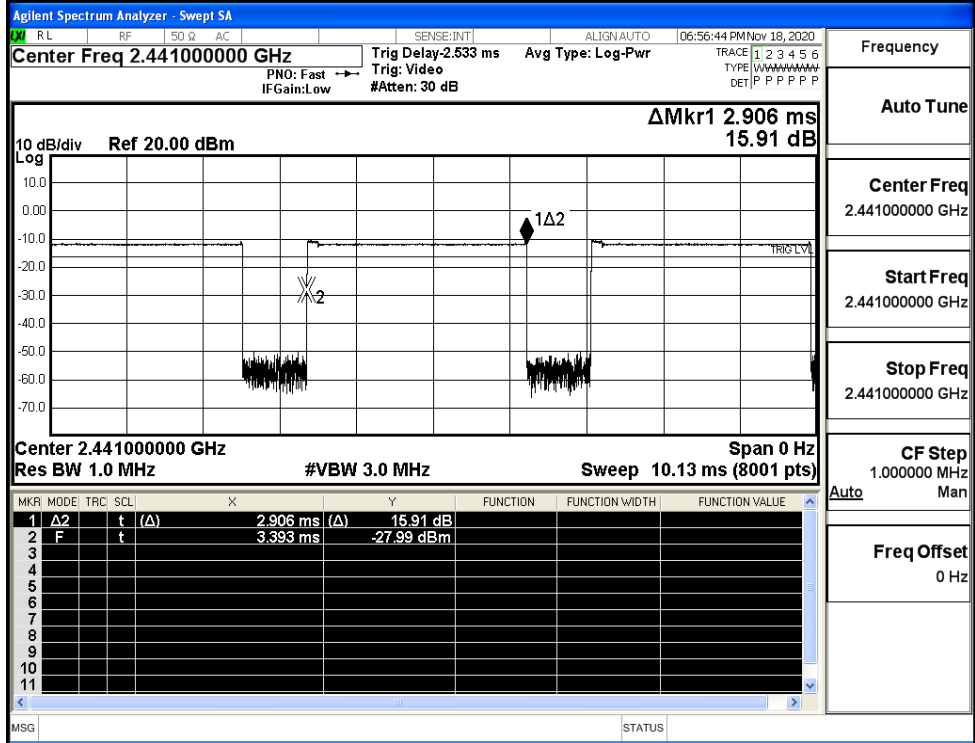


$\pi/4$ DQPSK
_2DH5/LCH



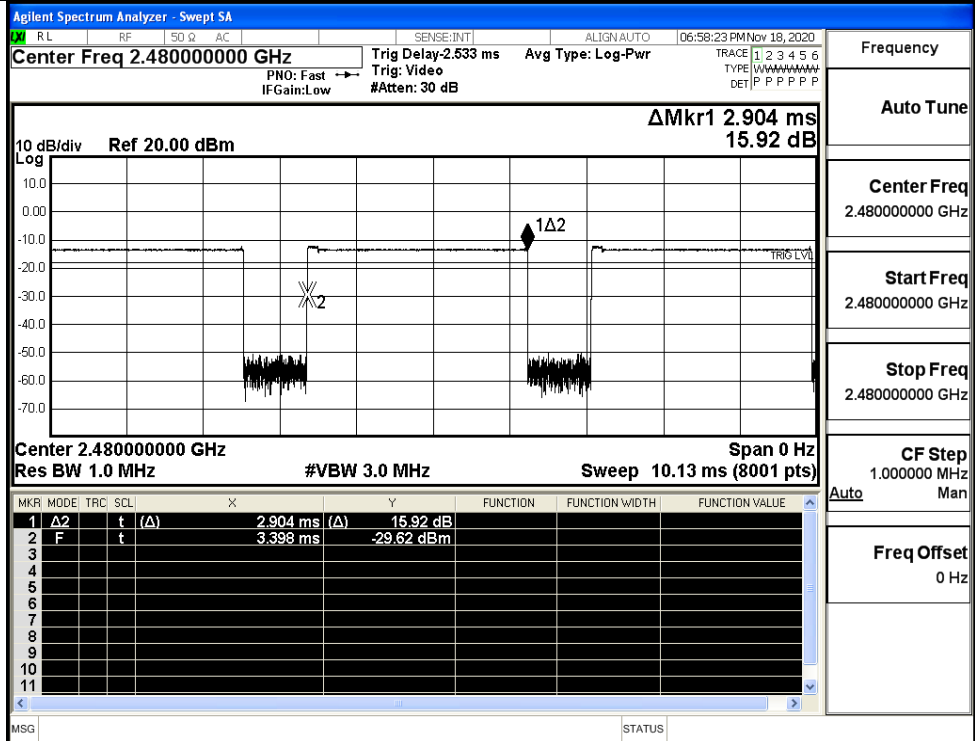
| | |
|-------------|-----------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.402000000 GHz |
| Start Freq | 2.402000000 GHz |
| Stop Freq | 2.402000000 GHz |
| CF Step | 1.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

$\pi/4$ DQPSK
_2DH5/MCH

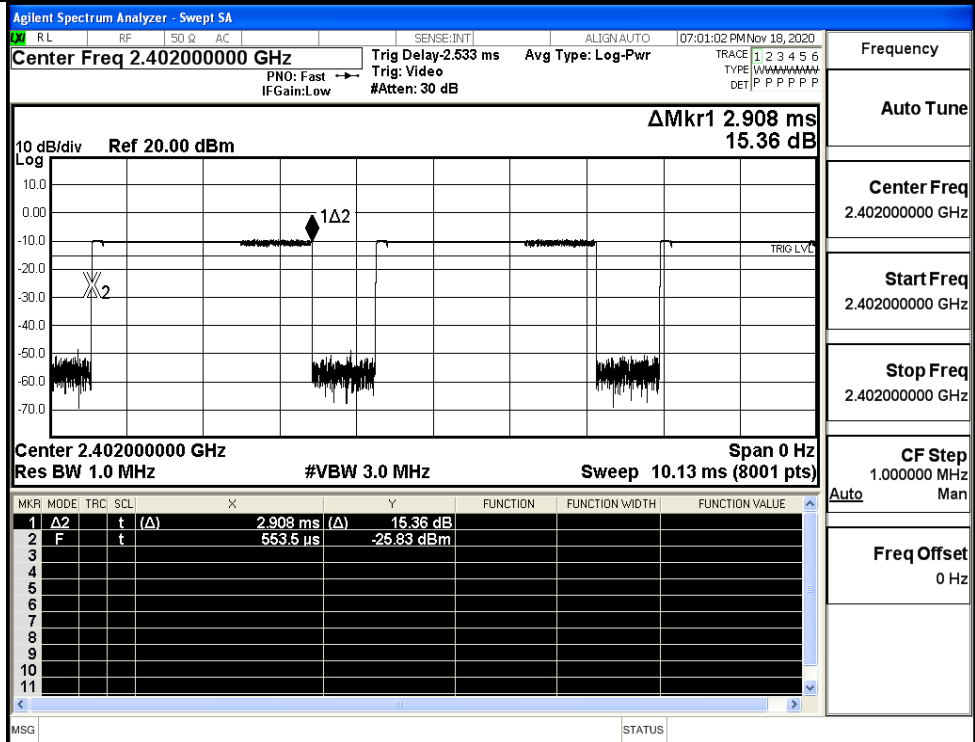


| | |
|-------------|-----------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.441000000 GHz |
| Start Freq | 2.441000000 GHz |
| Stop Freq | 2.441000000 GHz |
| CF Step | 1.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

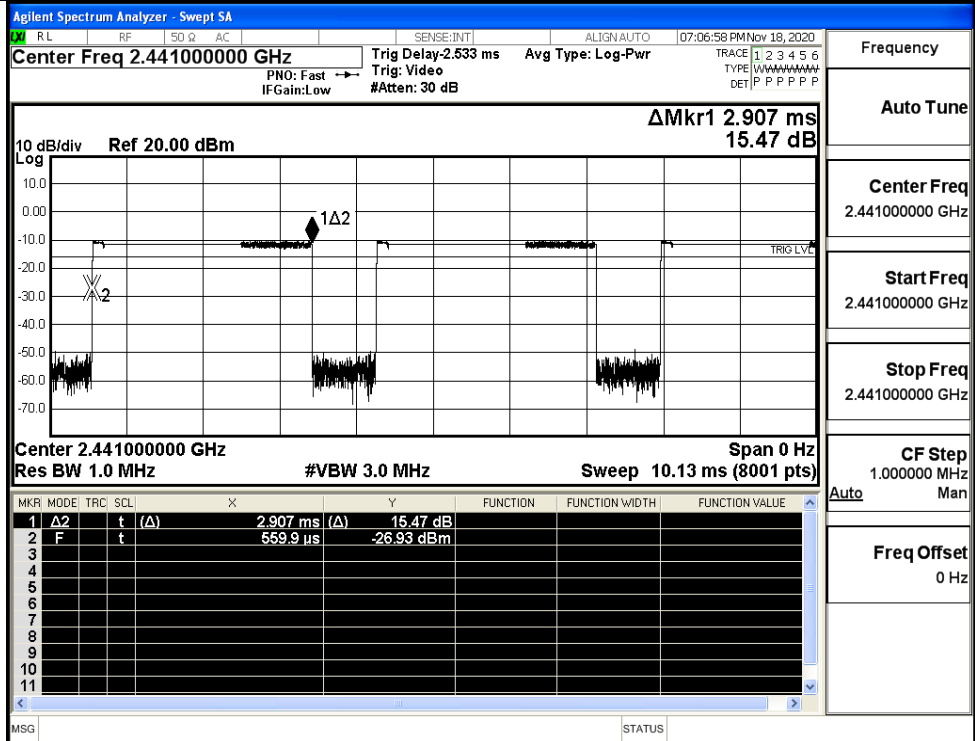
$\pi/4$ DQPSK
_2DH5/HCH



8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



Frequency

Auto Tune

Center Freq
2.441000000 GHz

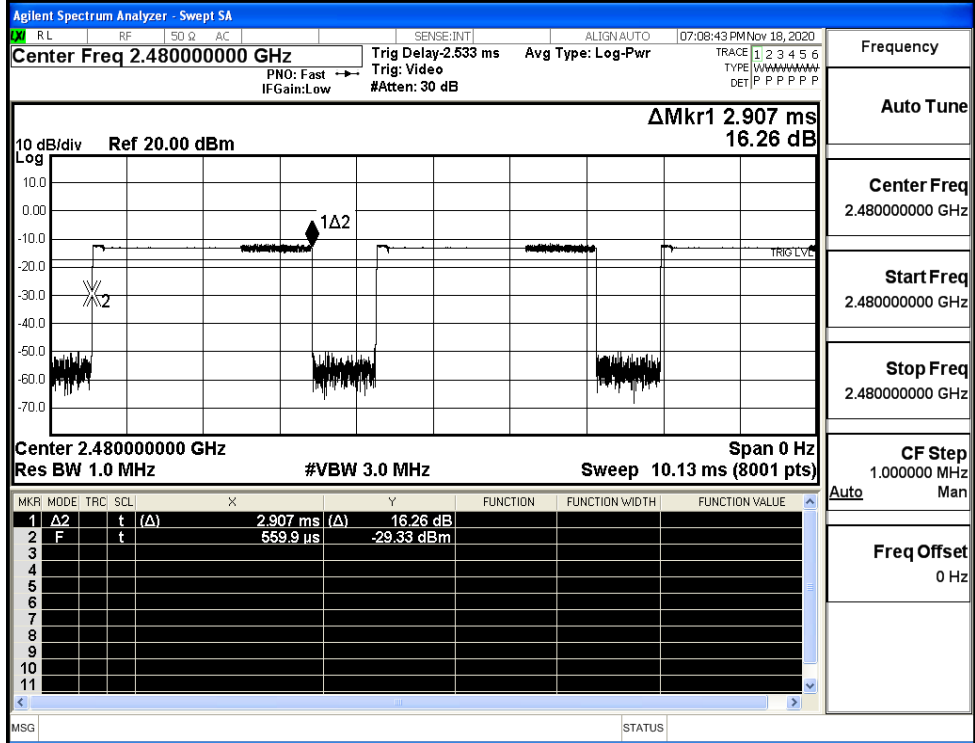
Start Freq
2.441000000 GHz

Stop Freq
2.441000000 GHz

CF Step
1.000000 MHz
Auto Man

Freq Offset
0 Hz

8DPSK_3DH5/HCH



Frequency

Auto Tune

Center Freq
2.480000000 GHz

Start Freq
2.480000000 GHz

Stop Freq
2.480000000 GHz

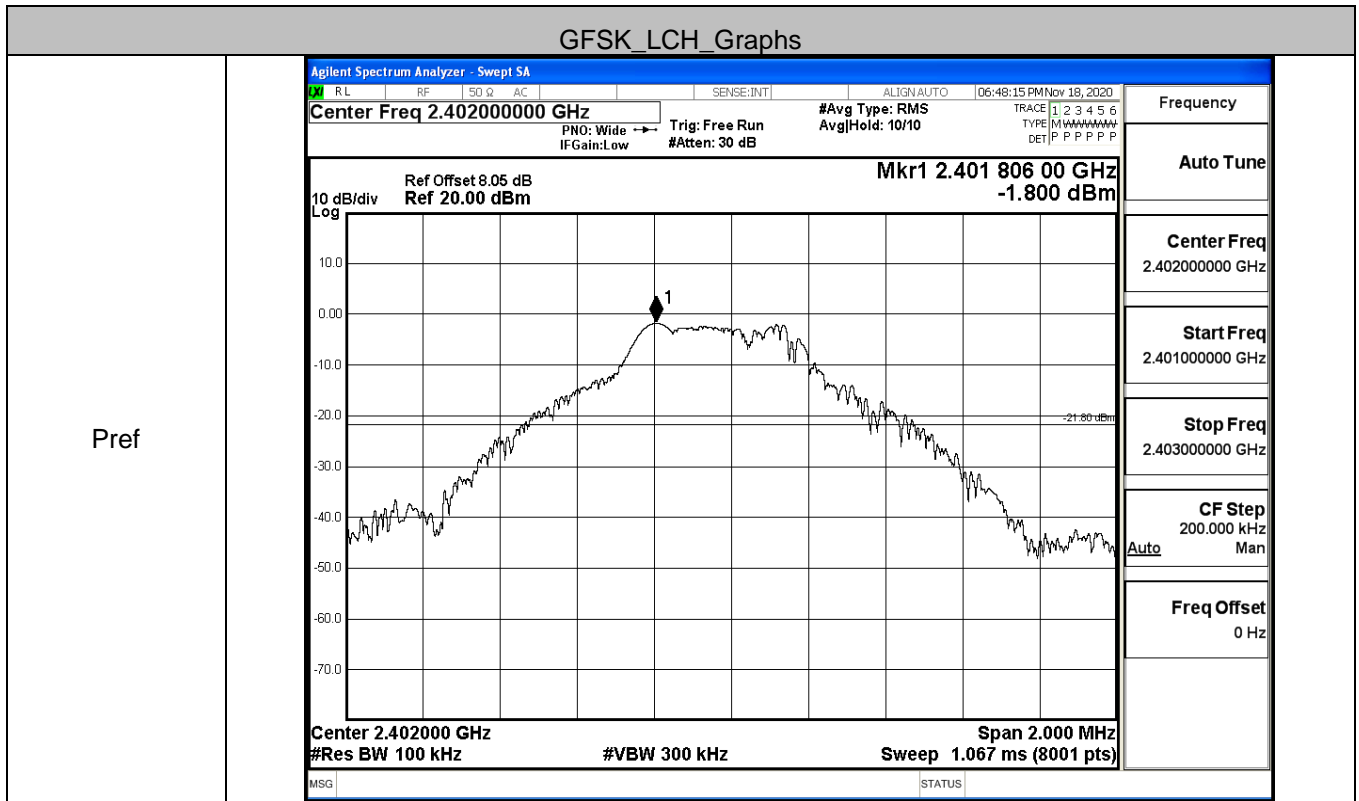
CF Step
1.000000 MHz
Auto Man

Freq Offset
0 Hz

A.6 RF Conducted Spurious Emissions

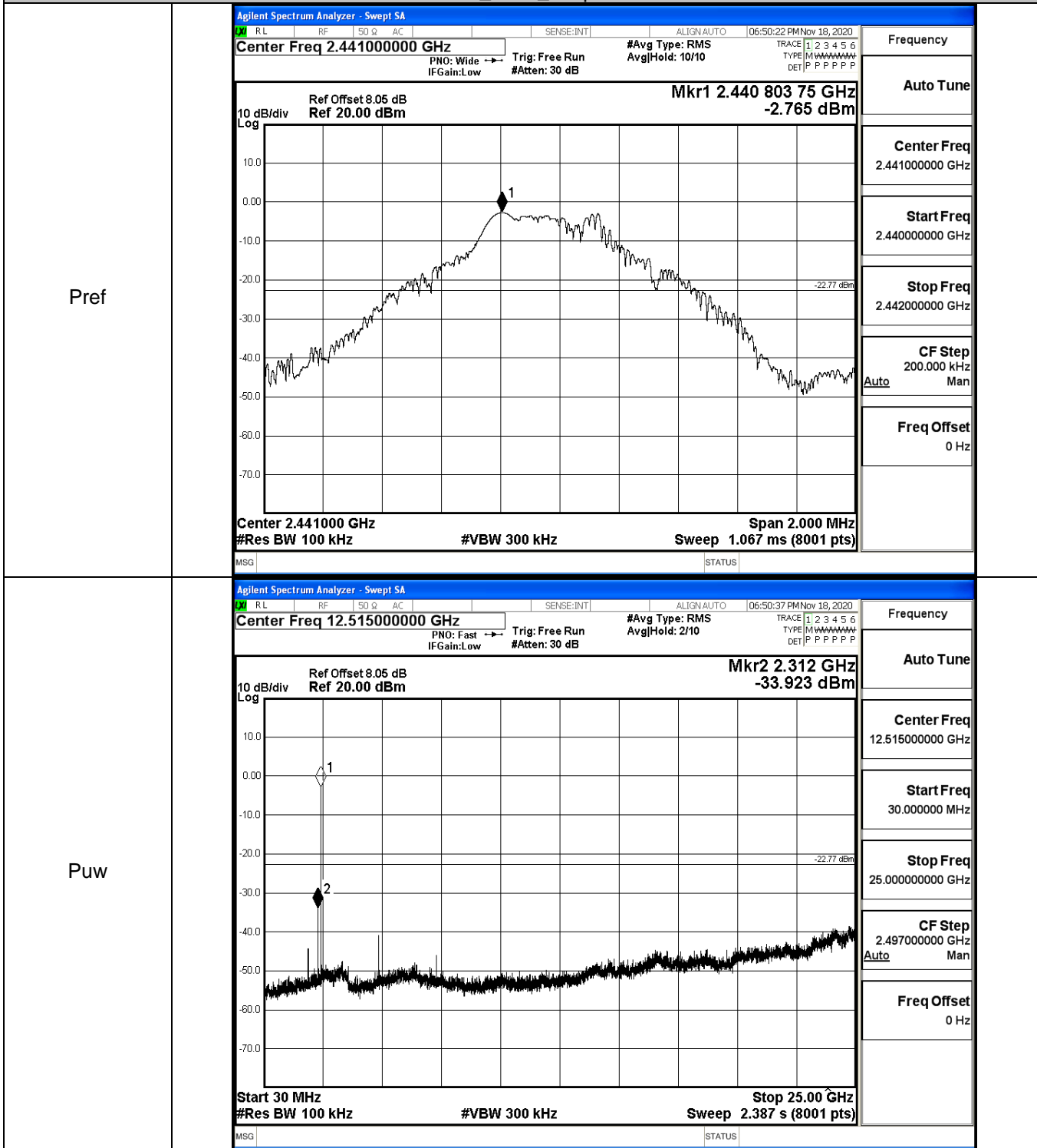
| Mode | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK | LCH | -1.8 | -36.947 | -21.800 | PASS |
| | MCH | -2.765 | -33.923 | -22.765 | PASS |
| | HCH | -4.308 | -33.117 | -24.308 | PASS |
| π /4DQPSK | LCH | -1.936 | -38.295 | -21.936 | PASS |
| | MCH | -2.873 | -32.670 | -22.873 | PASS |
| | HCH | -4.308 | -36.895 | -24.308 | PASS |
| 8DPSK | LCH | -1.807 | -38.078 | -21.807 | PASS |
| | MCH | -2.87 | -33.017 | -22.870 | PASS |
| | HCH | -4.445 | -29.492 | -24.445 | PASS |

GFSK_LCH_Graphs

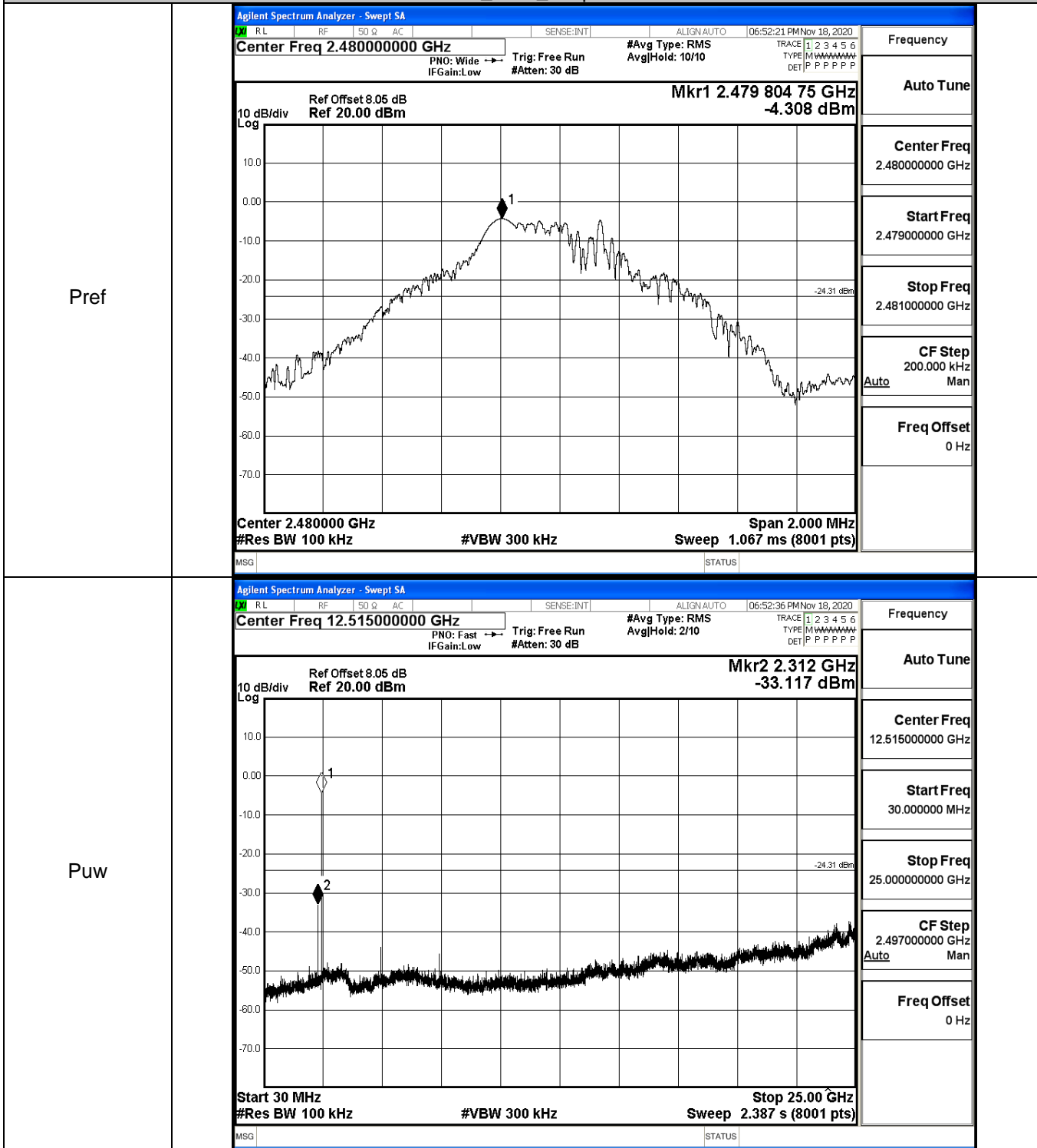


Pref

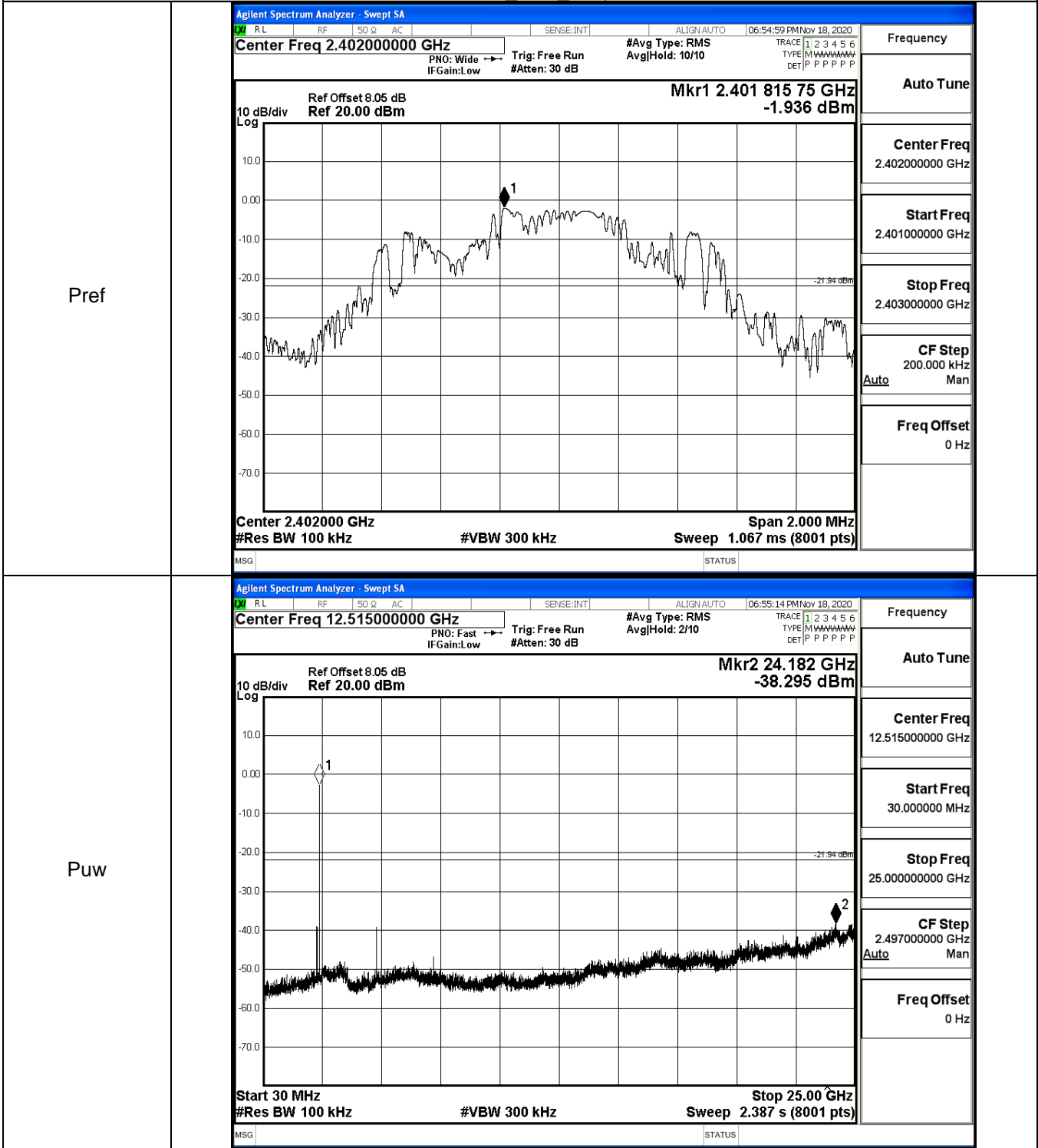
GFSK_MCH_Graphs



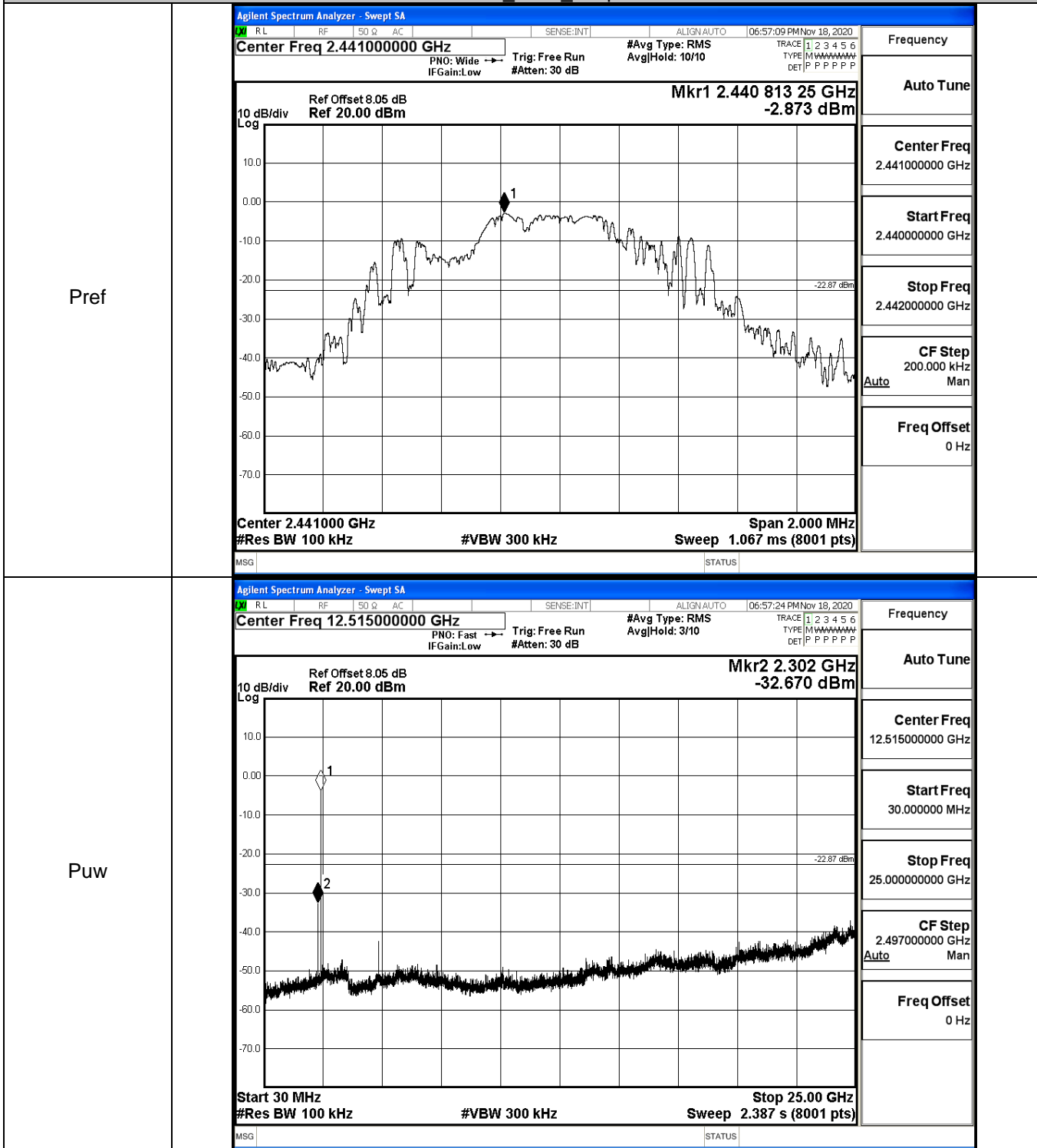
GFSK_HCH_Graphs



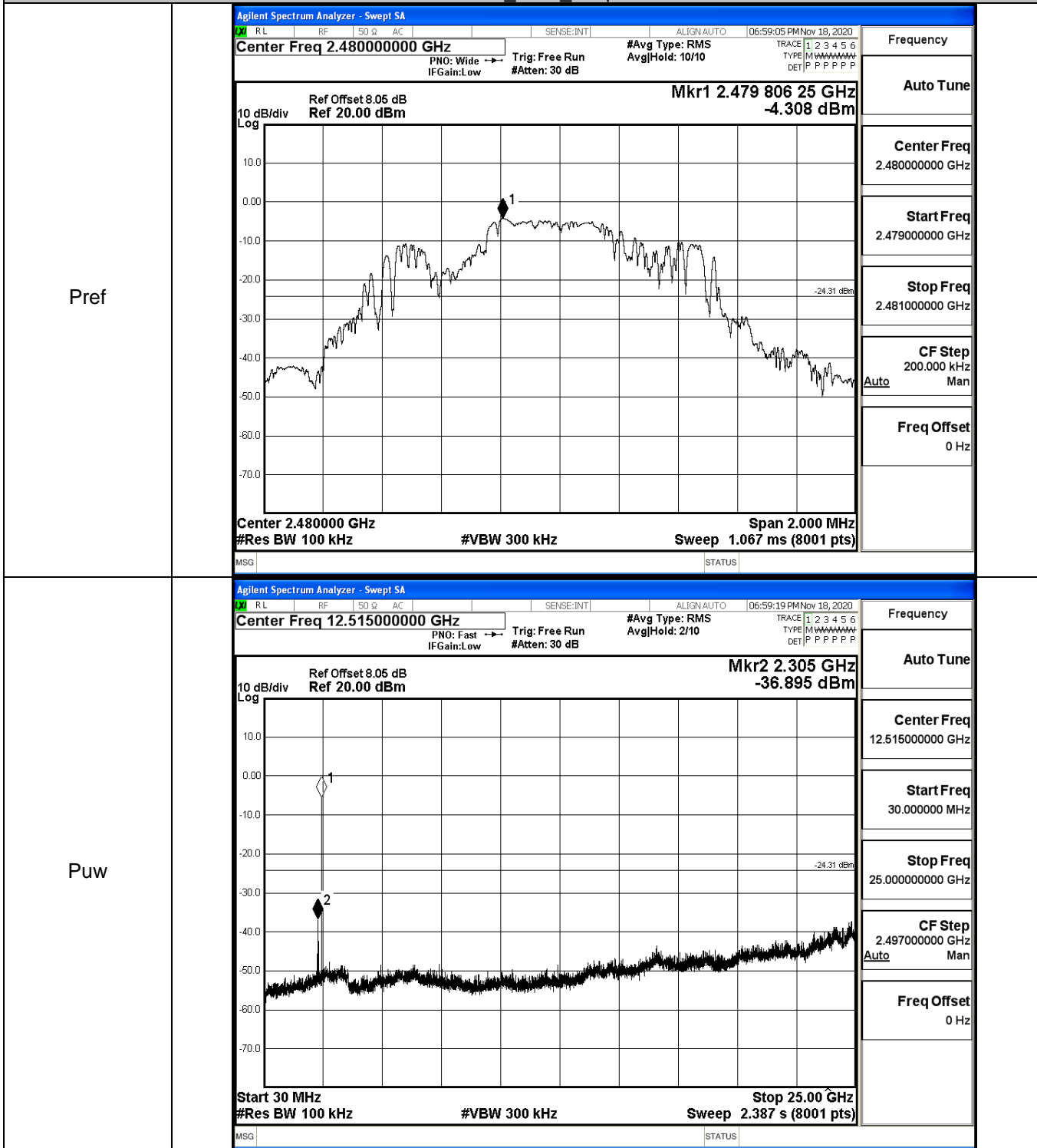
$\pi/4$ DQPSK_LCH_Graphs



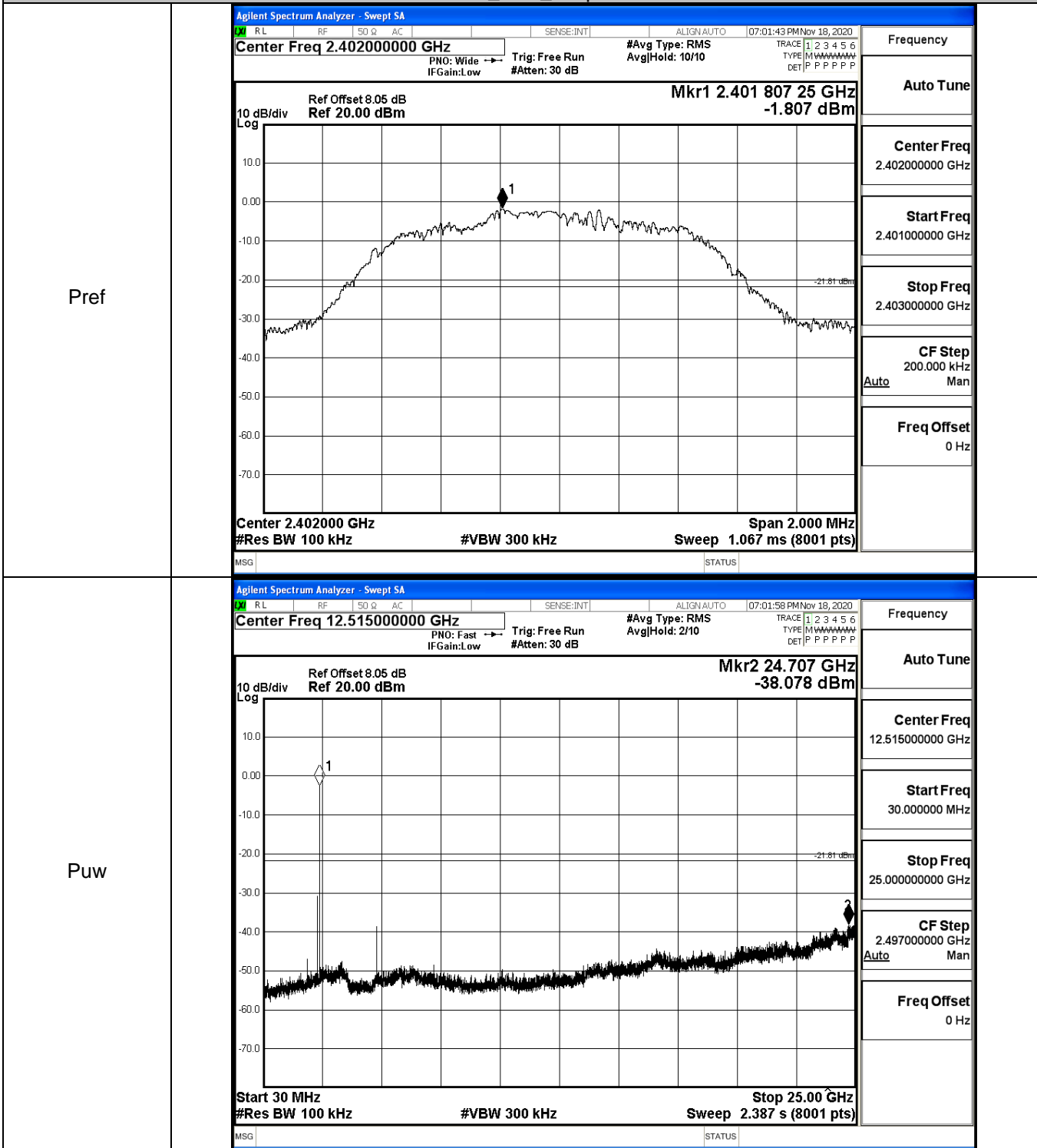
$\pi/4$ DQPSK_MCH_Graphs



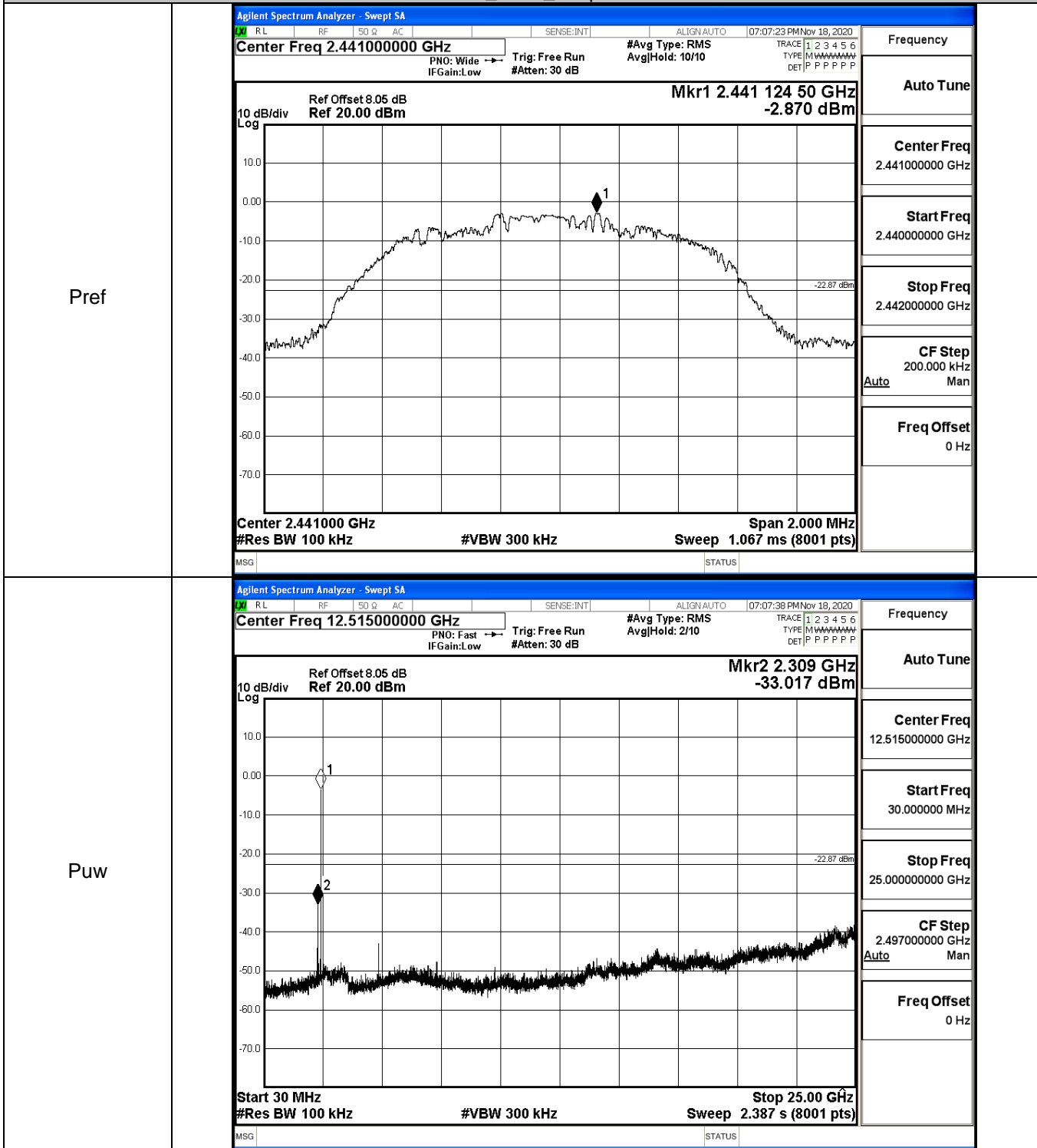
$\pi/4$ DQPSK_HCH_Graphs



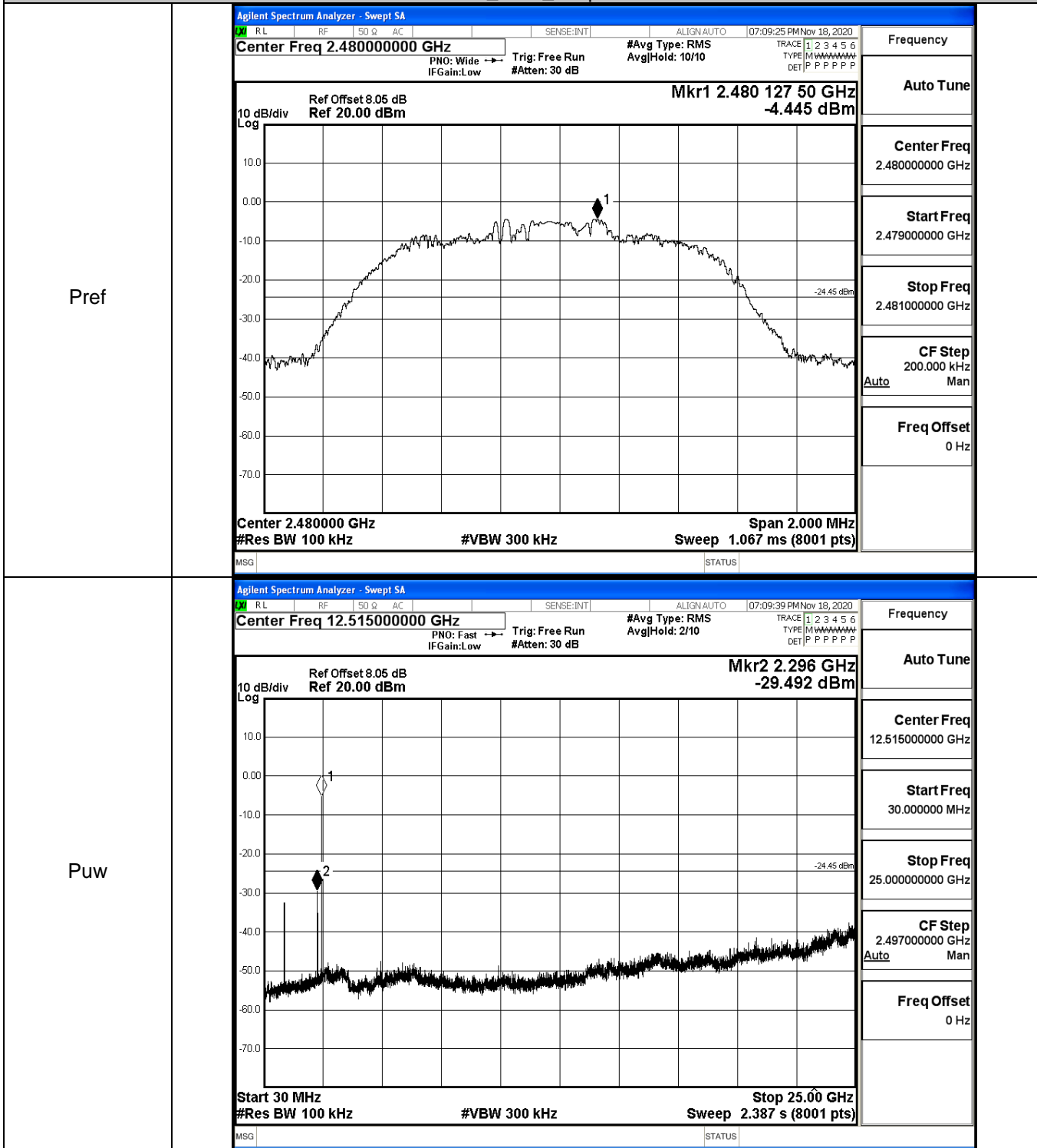
8DPSK_LCH_Graphs



8DPSK_MCH_Graphs



8DPSK_HCH_Graphs

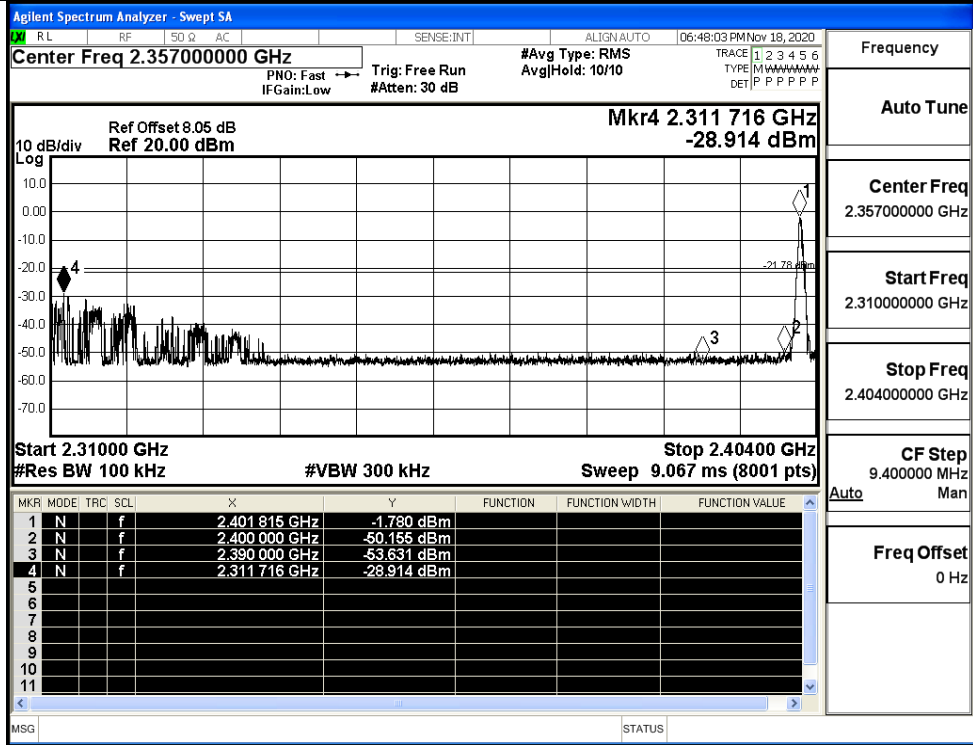


A.7 Band-edge for RF Conducted Emissions

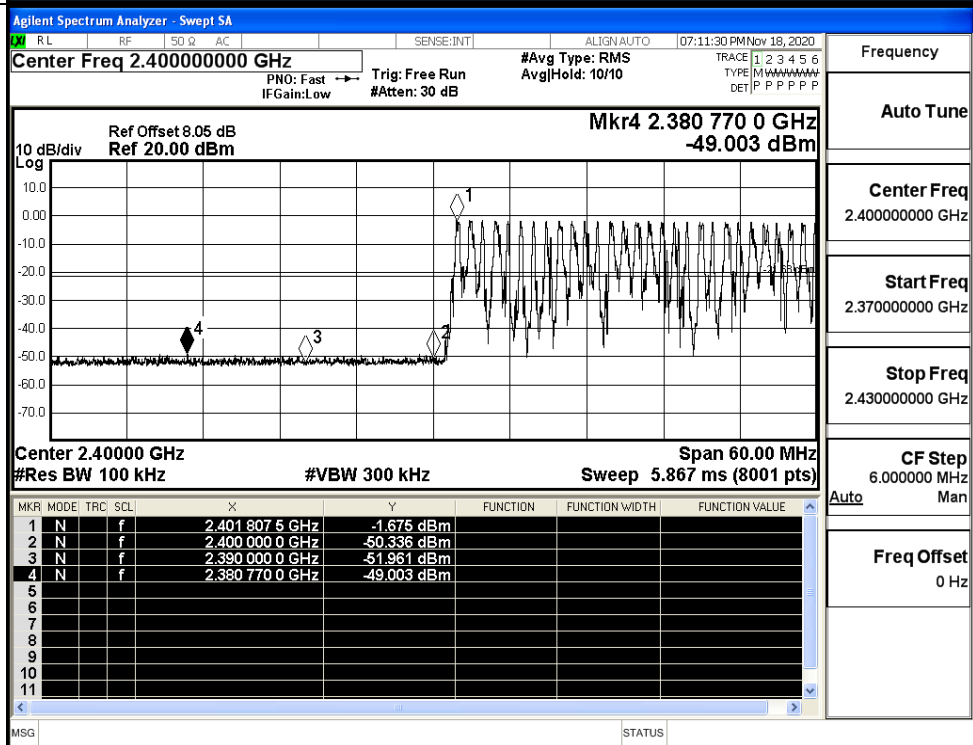
| Mode | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK | LCH | 2402 | -1.780 | Off | -28.914 | -21.78 | PASS |
| | | | -1.675 | On | -49.003 | -21.68 | PASS |
| | HCH | 2480 | -4.235 | Off | -49.252 | -24.24 | PASS |
| | | | -3.110 | On | -48.589 | -23.11 | PASS |
| $\pi/4$ DQPSK | LCH | 2402 | -2.402 | Off | -27.439 | -22.4 | PASS |
| | | | -1.777 | On | -49.037 | -21.78 | PASS |
| | HCH | 2480 | -4.520 | Off | -48.952 | -24.52 | PASS |
| | | | -3.144 | On | -48.472 | -23.14 | PASS |
| 8DPSK | LCH | 2402 | -2.322 | Off | -30.191 | -22.32 | PASS |
| | | | -1.810 | On | -48.678 | -21.81 | PASS |
| | HCH | 2480 | -4.109 | Off | -49.351 | -24.11 | PASS |
| | | | -3.252 | On | -48.765 | -23.25 | PASS |

Test Graphs

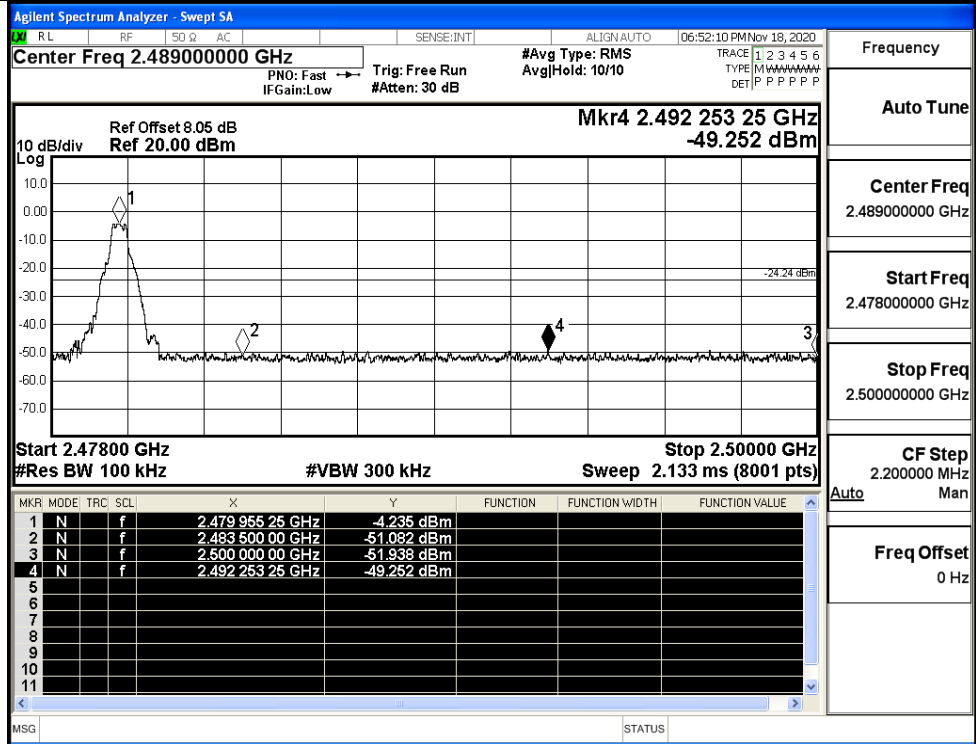
GFSK/LCH/No Hop



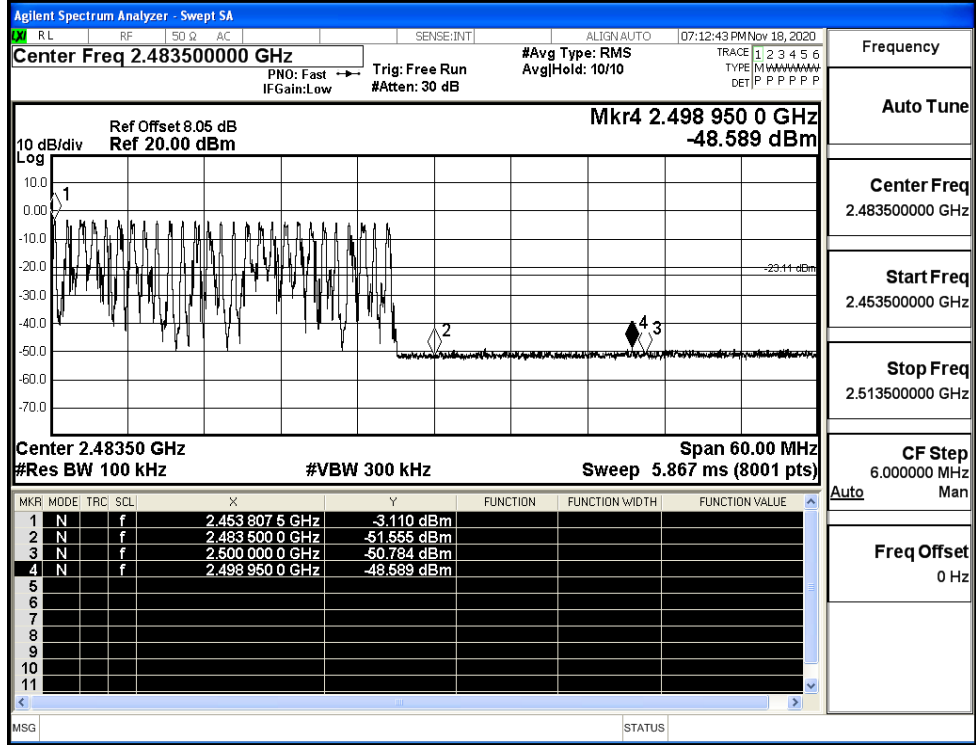
GFSK/LCH/Hop



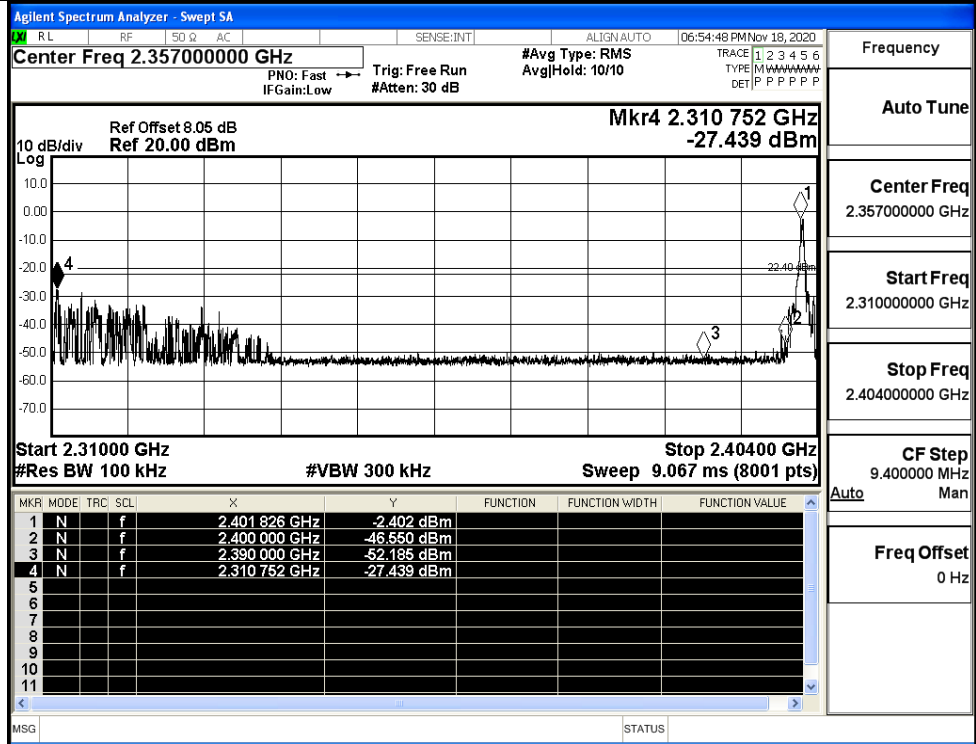
GFSK/HCH/No Hop



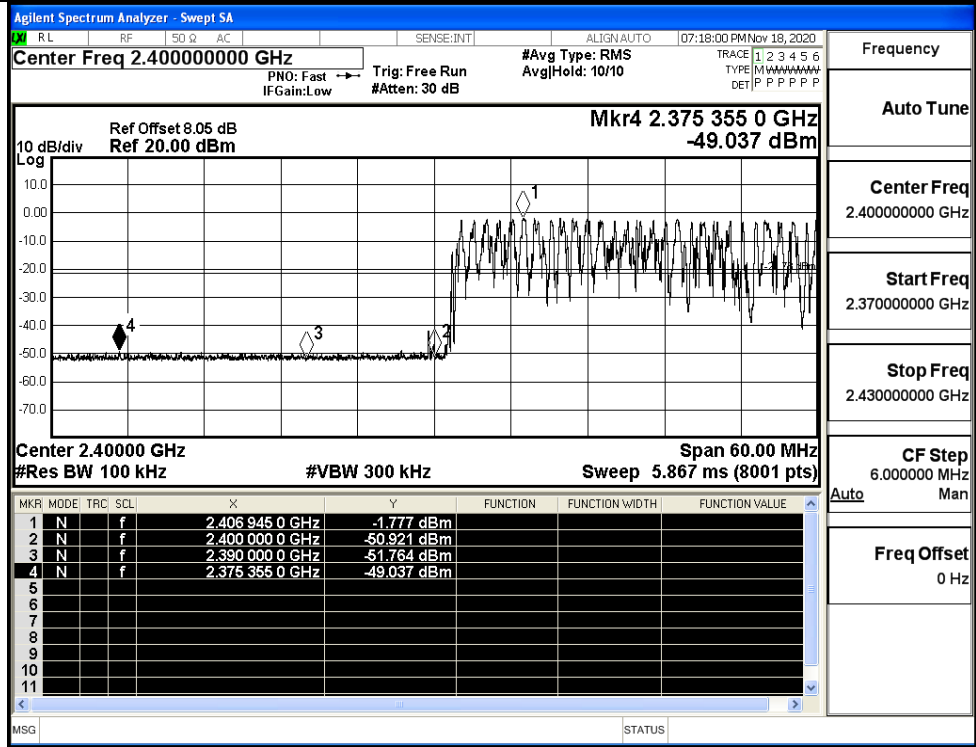
GFSK/HCH/Hop



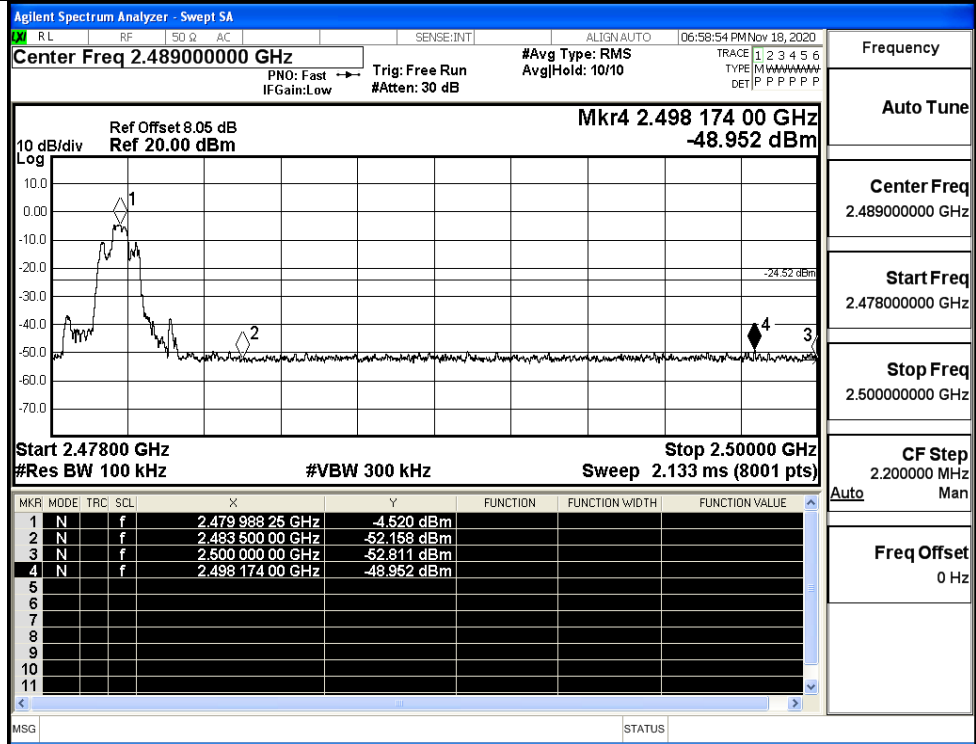
$\pi/4$ DQPSK/LCH/No Hop



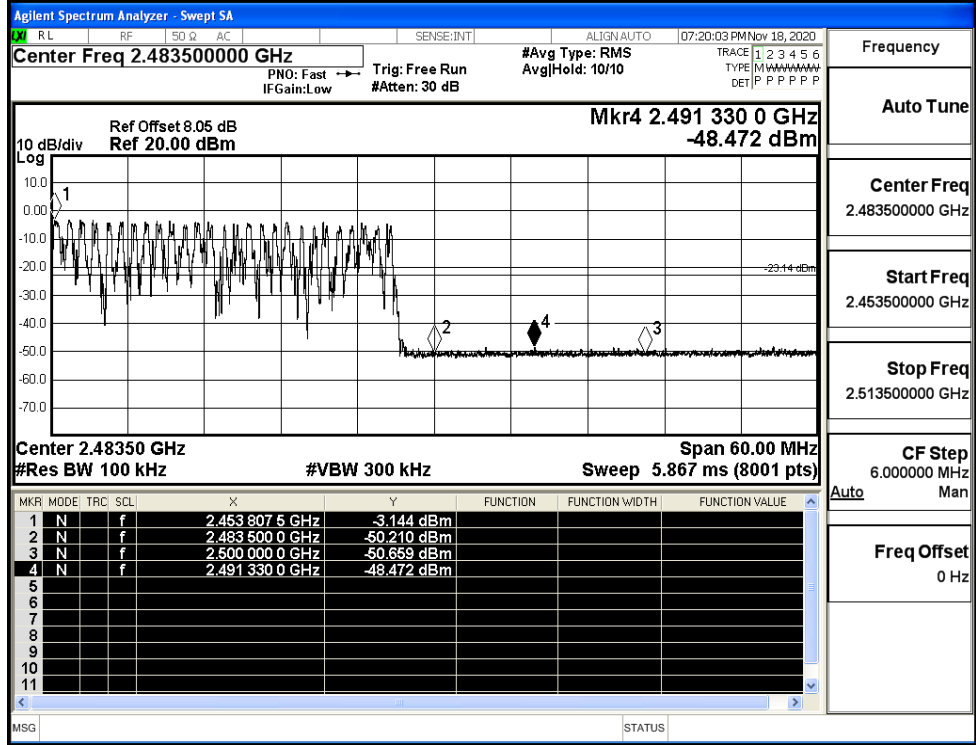
$\pi/4$ DQPSK/LCH/Hop



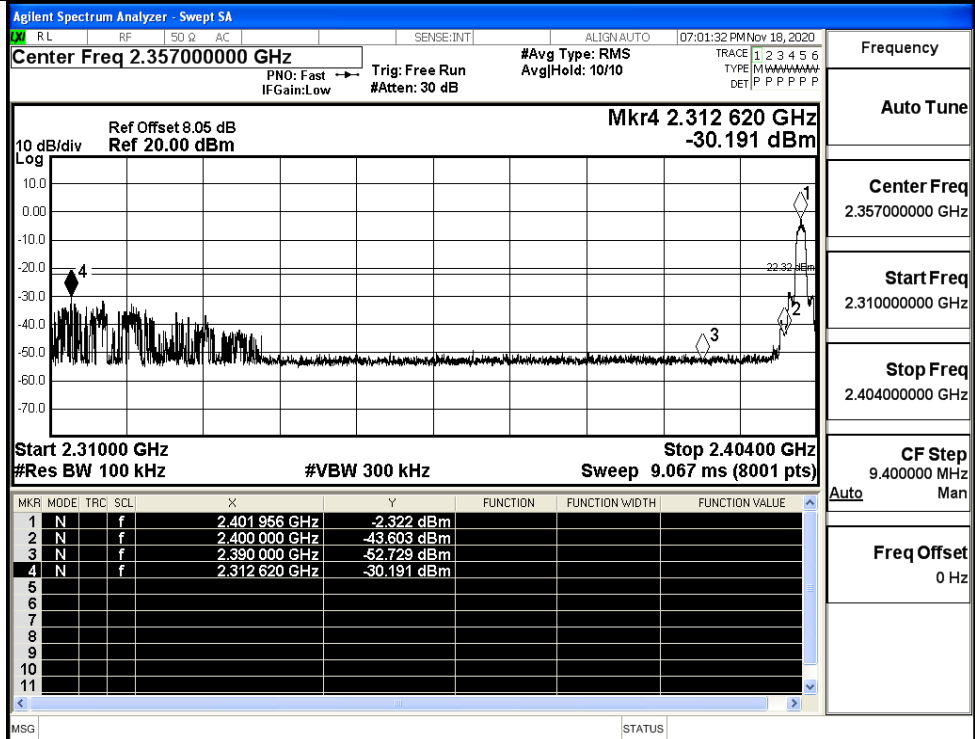
π /4DQPSK/HCH/No
Hop



π /4DQPSK/HCH/Hop

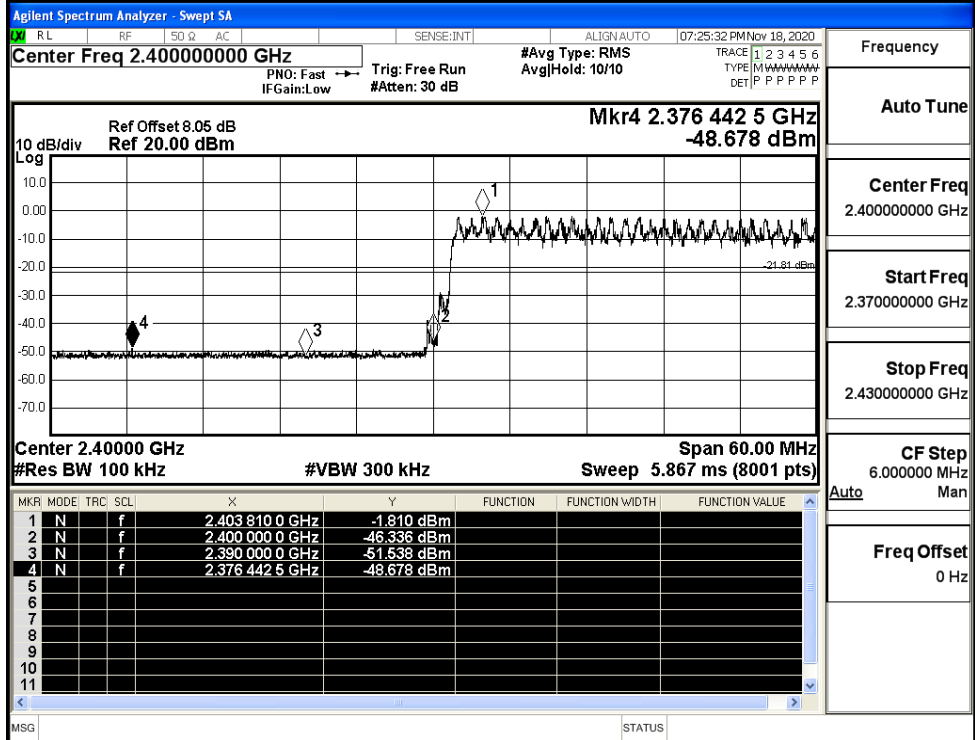


8DPSK/LCH/No Hop



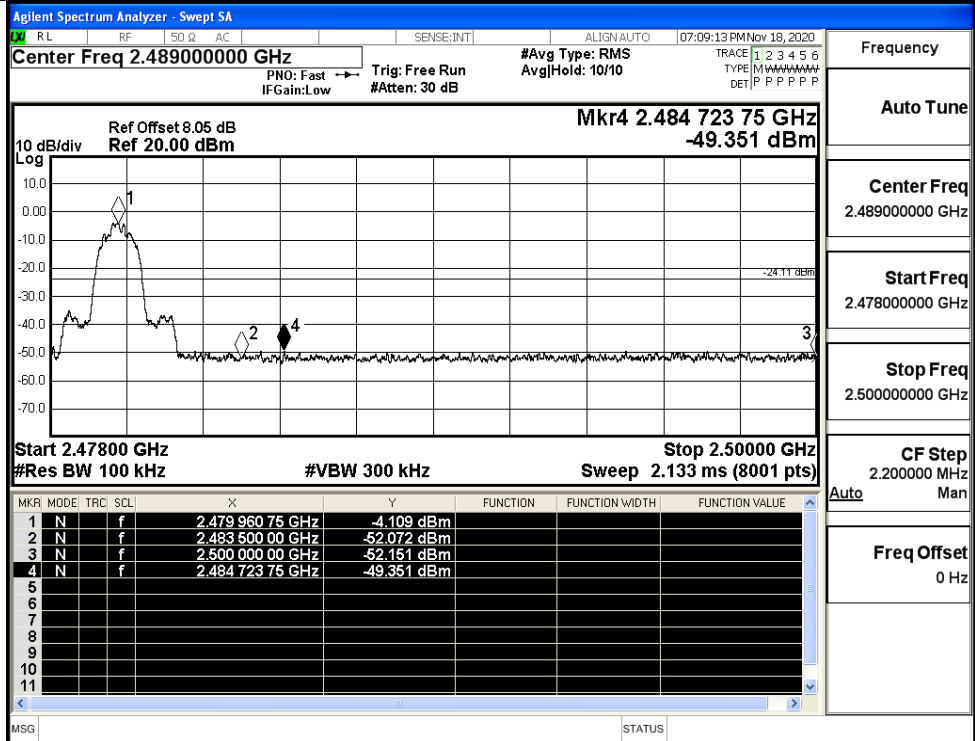
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/LCH/Hop



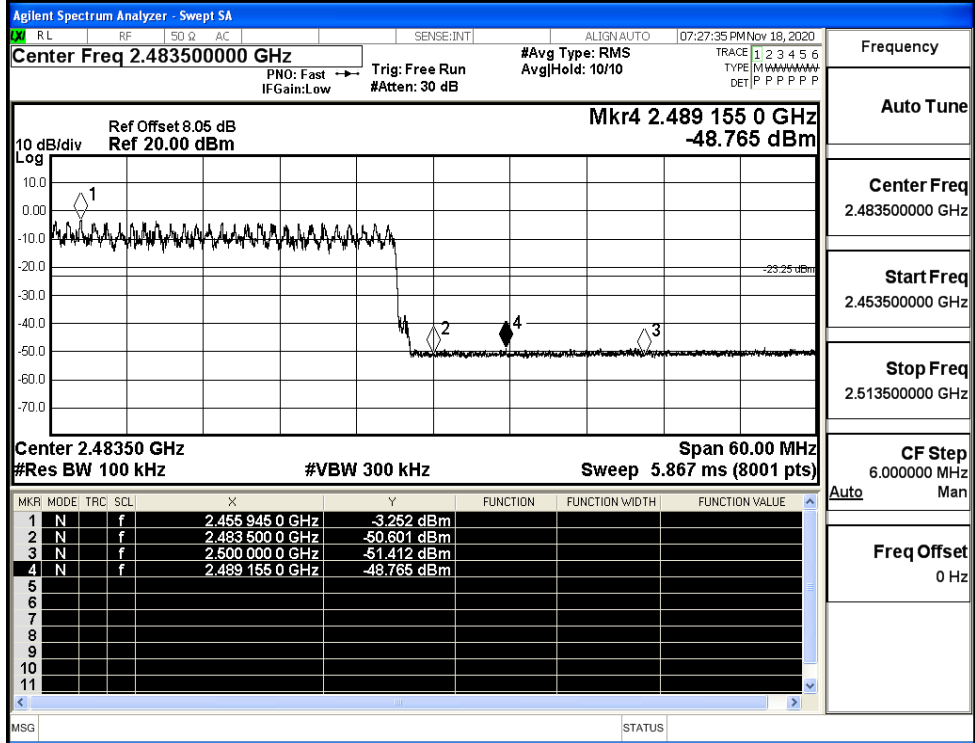
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.370000000 GHz
Stop Freq
2.430000000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/HCH/No Hop



| | |
|-------------|-----------------|
| Frequency | 2.489000000 GHz |
| Auto Tune | |
| Center Freq | 2.489000000 GHz |
| Start Freq | 2.478000000 GHz |
| Stop Freq | 2.500000000 GHz |
| CF Step | 2.200000 MHz |
| Freq Offset | 0 Hz |

8DPSK/HCH/Hop

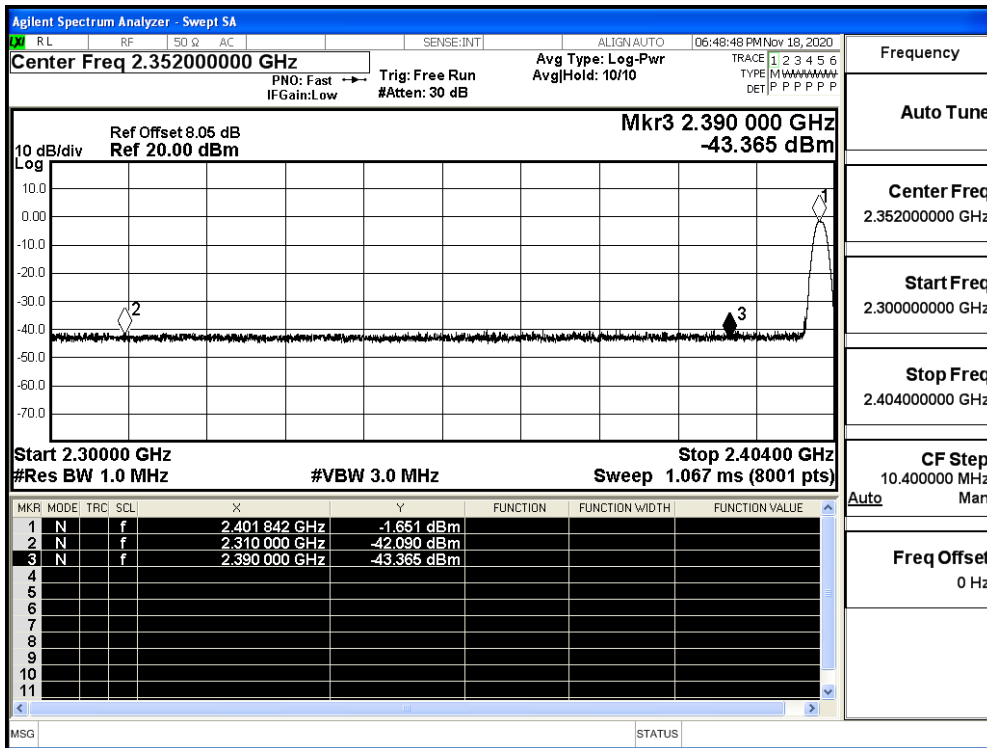


| | |
|-------------|-----------------|
| Frequency | 2.483500000 GHz |
| Auto Tune | |
| Center Freq | 2.483500000 GHz |
| Start Freq | 2.453500000 GHz |
| Stop Freq | 2.513500000 GHz |
| CF Step | 6.000000 MHz |
| Freq Offset | 0 Hz |

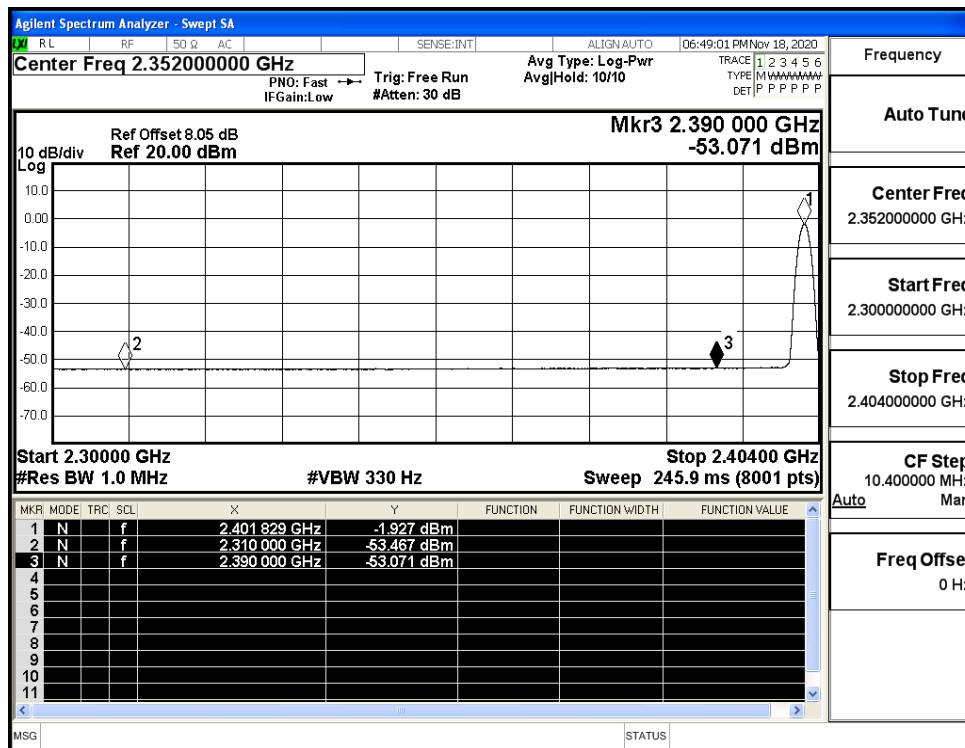
A.8 Restrict-band band-edge measurements

| Test Mode | Hopping | Freq. | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK | Off | 2310.0 | -42.09 | 2.0 | 0 | 55.17 | PEAK | 74 | PASS |
| | Off | 2310.0 | -53.47 | 2.0 | 0 | 43.79 | AV | 54 | PASS |
| | Off | 2390.0 | -43.37 | 2.0 | 0 | 53.89 | PEAK | 74 | PASS |
| | Off | 2390.0 | -53.07 | 2.0 | 0 | 44.19 | AV | 54 | PASS |
| | Off | 2483.5 | -42.00 | 2.0 | 0 | 55.26 | PEAK | 74 | PASS |
| | Off | 2483.5 | -52.54 | 2.0 | 0 | 44.72 | AV | 54 | PASS |
| | Off | 2500.0 | -41.25 | 2.0 | 0 | 56.01 | PEAK | 74 | PASS |
| | Off | 2500.0 | -52.43 | 2.0 | 0 | 44.83 | AV | 54 | PASS |
| $\pi/4$ DQPSK | Off | 2310.0 | -32.03 | 2.0 | 0 | 65.23 | PEAK | 74 | PASS |
| | Off | 2310.0 | -53.36 | 2.0 | 0 | 43.9 | AV | 54 | PASS |
| | Off | 2390.0 | -42.56 | 2.0 | 0 | 54.7 | PEAK | 74 | PASS |
| | Off | 2390.0 | -52.98 | 2.0 | 0 | 44.28 | AV | 54 | PASS |
| | Off | 2483.5 | -42.66 | 2.0 | 0 | 54.6 | PEAK | 74 | PASS |
| | Off | 2483.5 | -52.53 | 2.0 | 0 | 44.73 | AV | 54 | PASS |
| | Off | 2500.0 | -42.88 | 2.0 | 0 | 54.38 | PEAK | 74 | PASS |
| | Off | 2500.0 | -52.37 | 2.0 | 0 | 44.89 | AV | 54 | PASS |
| 8DPSK | Off | 2310.0 | -43.12 | 2.0 | 0 | 54.14 | PEAK | 74 | PASS |
| | Off | 2310.0 | -53.37 | 2.0 | 0 | 43.89 | AV | 54 | PASS |
| | Off | 2390.0 | -43.22 | 2.0 | 0 | 54.04 | PEAK | 74 | PASS |
| | Off | 2390.0 | -53.05 | 2.0 | 0 | 44.21 | AV | 54 | PASS |
| | Off | 2483.5 | -42.82 | 2.0 | 0 | 54.44 | PEAK | 74 | PASS |
| | Off | 2483.5 | -52.52 | 2.0 | 0 | 44.74 | AV | 54 | PASS |
| | Off | 2500.0 | -42.40 | 2.0 | 0 | 54.86 | PEAK | 74 | PASS |
| | Off | 2500.0 | -52.42 | 2.0 | 0 | 44.84 | AV | 54 | PASS |

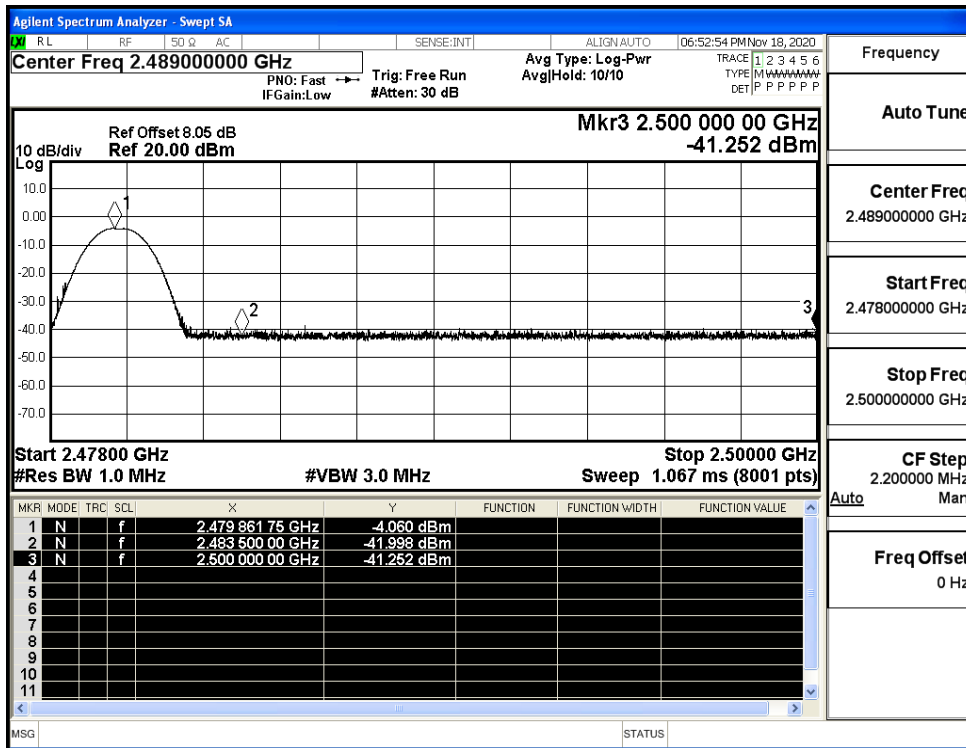
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



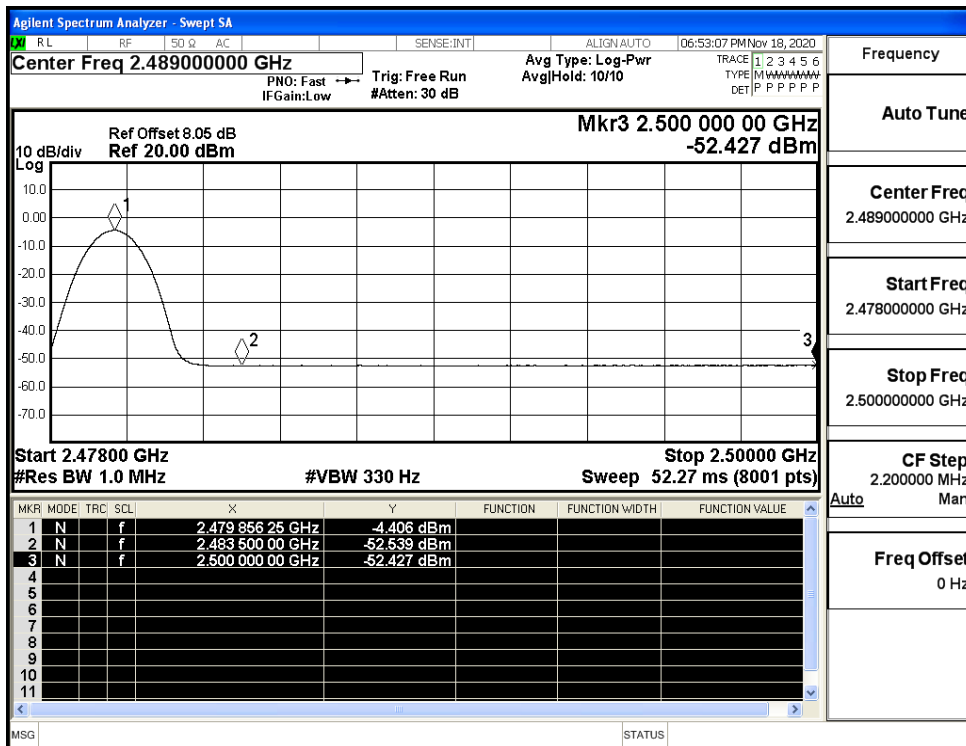
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



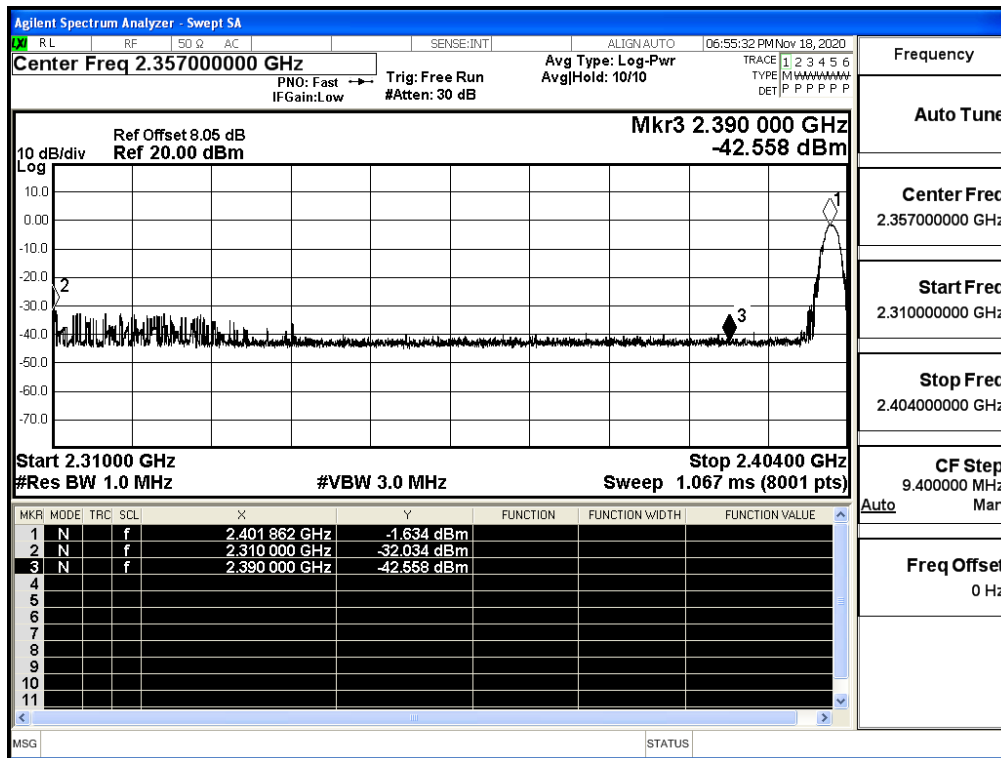
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



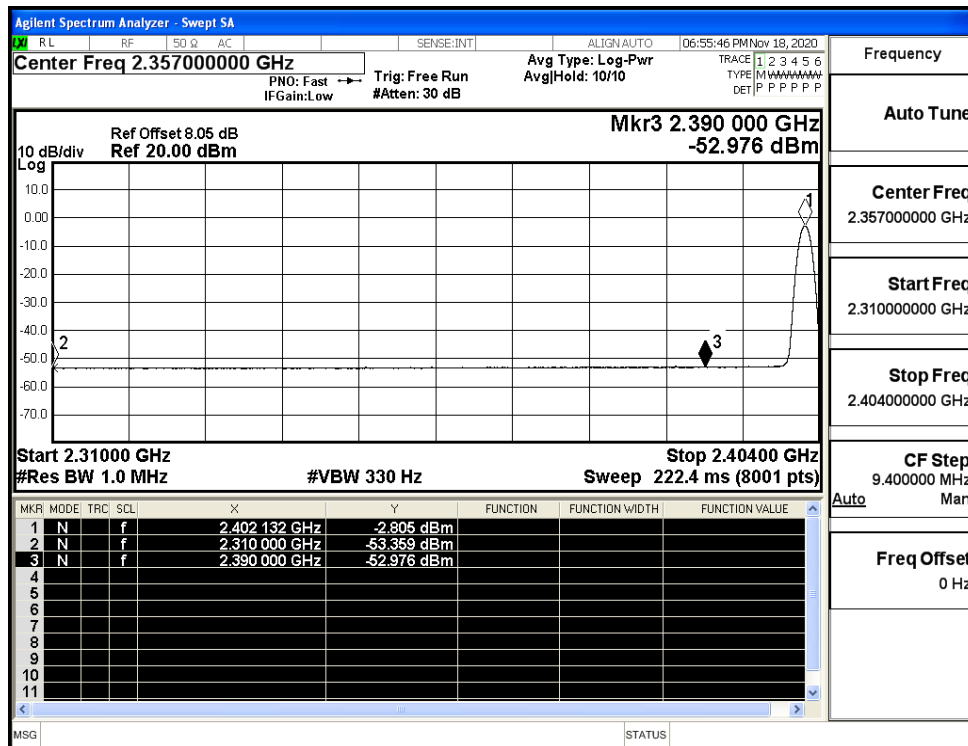
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



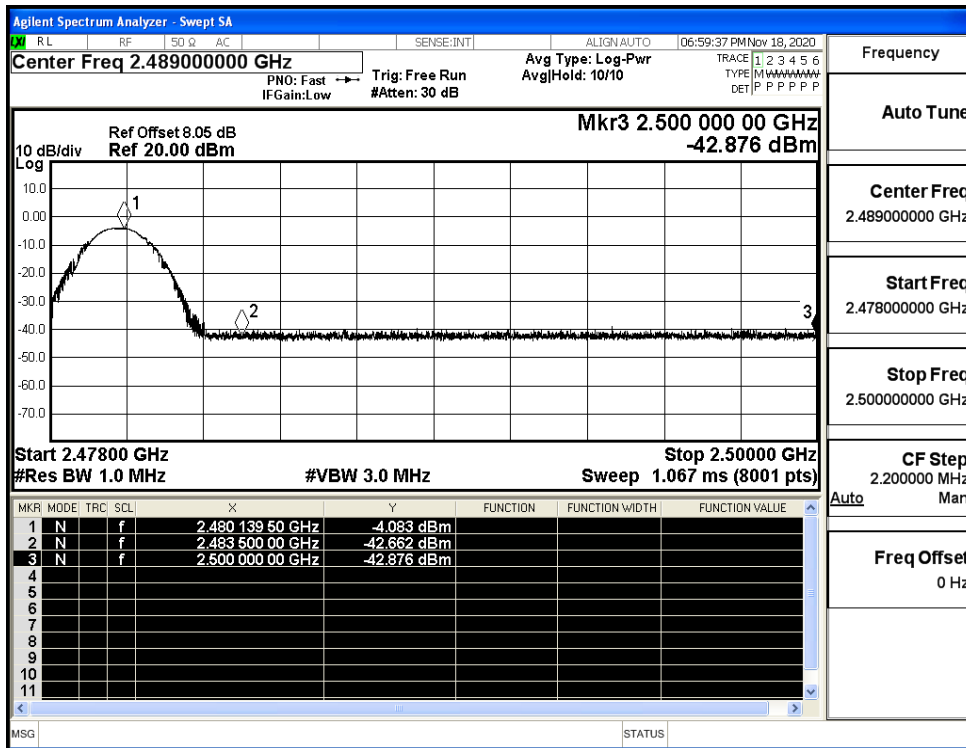
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



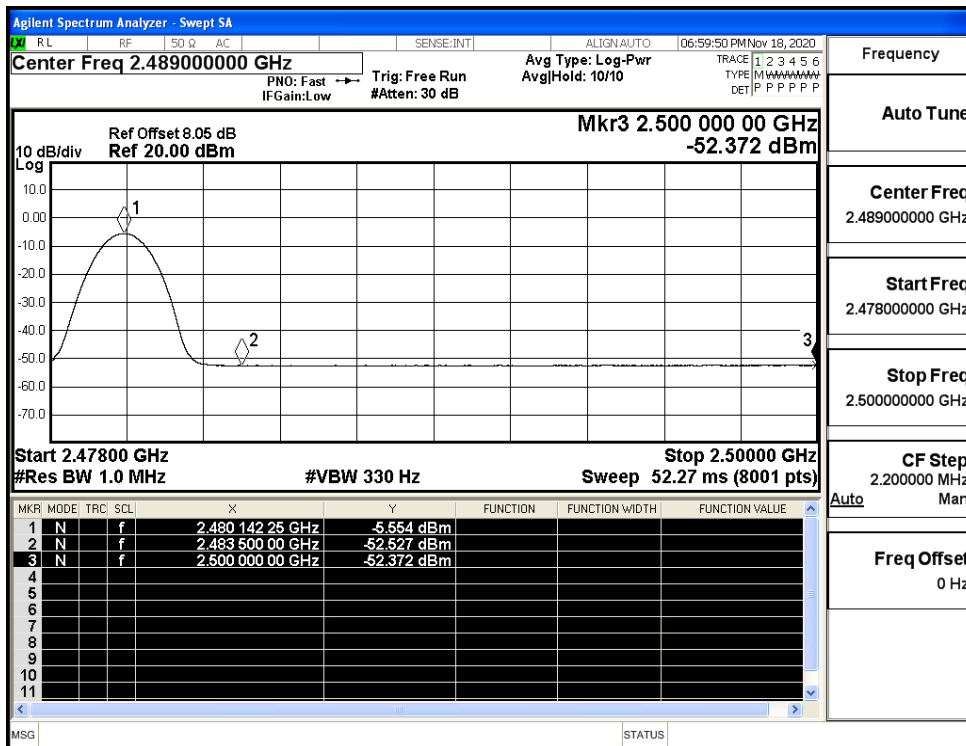
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



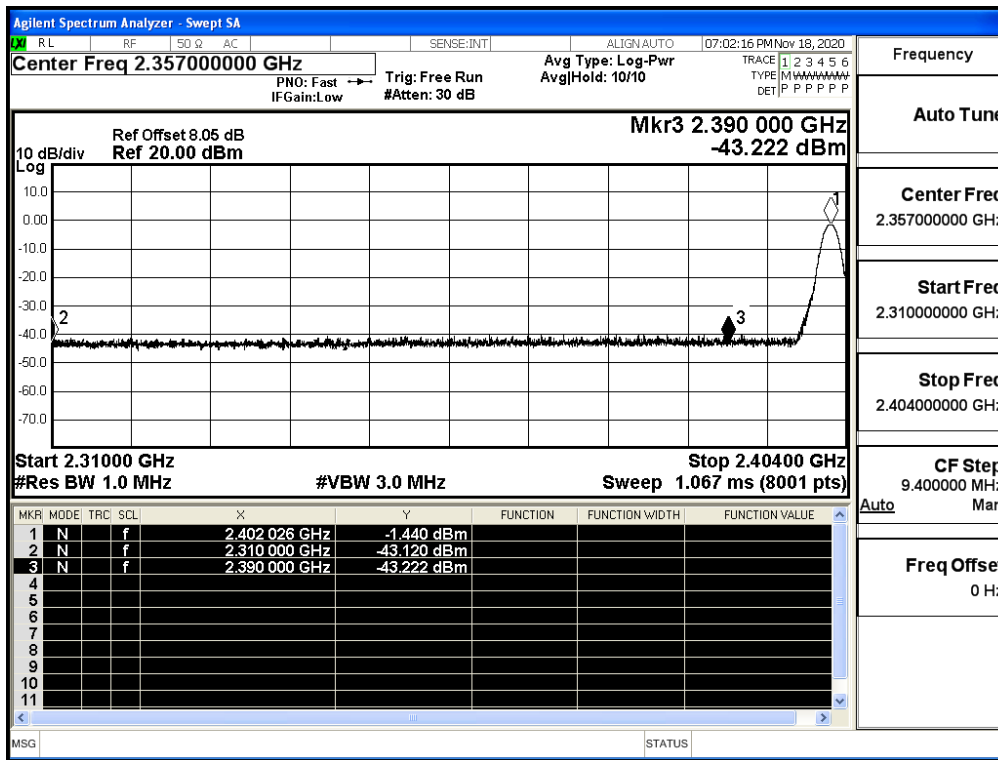
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



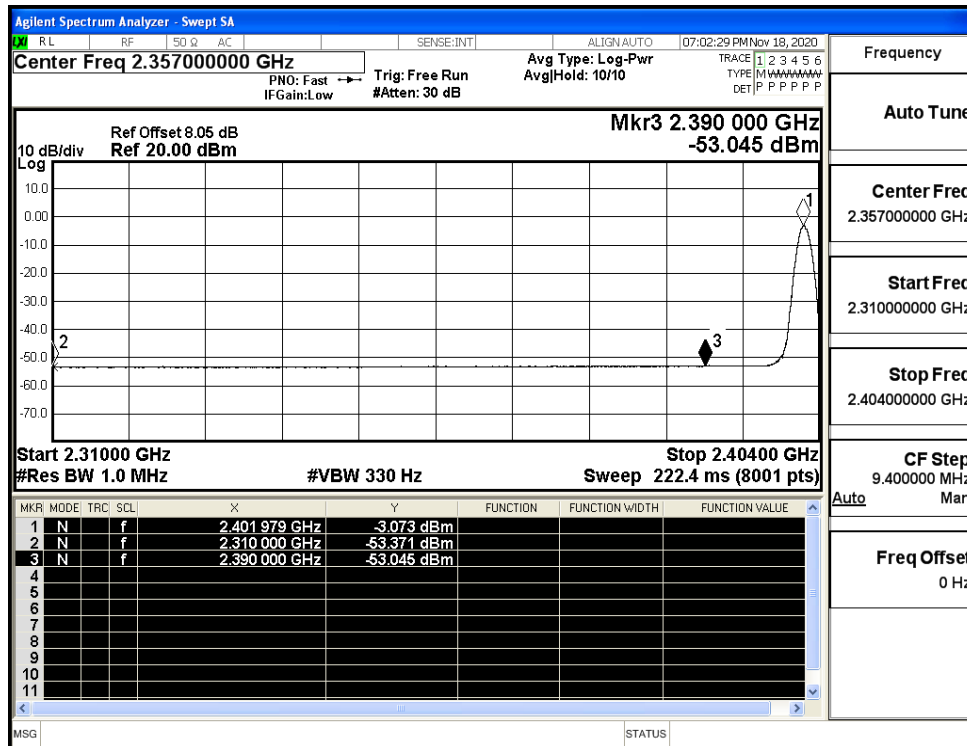
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



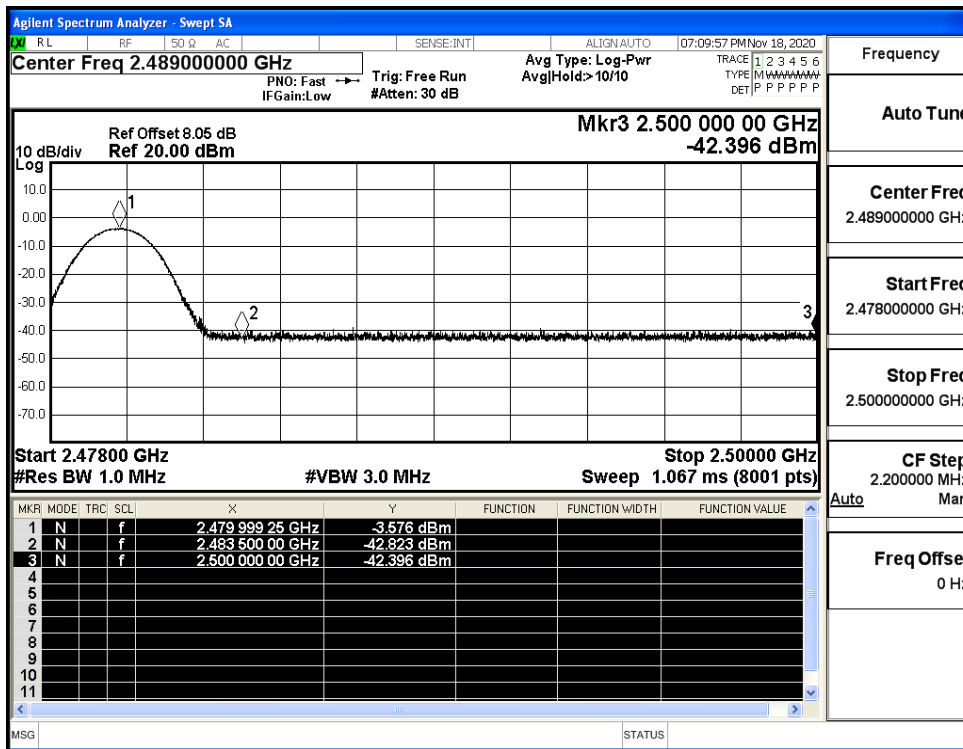
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (High Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)

