

Appendix A

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

Product Name: Bluetooth Speaker

Trade Mark: N/A

Test Model: ANC-BS949R

Environmental Conditions

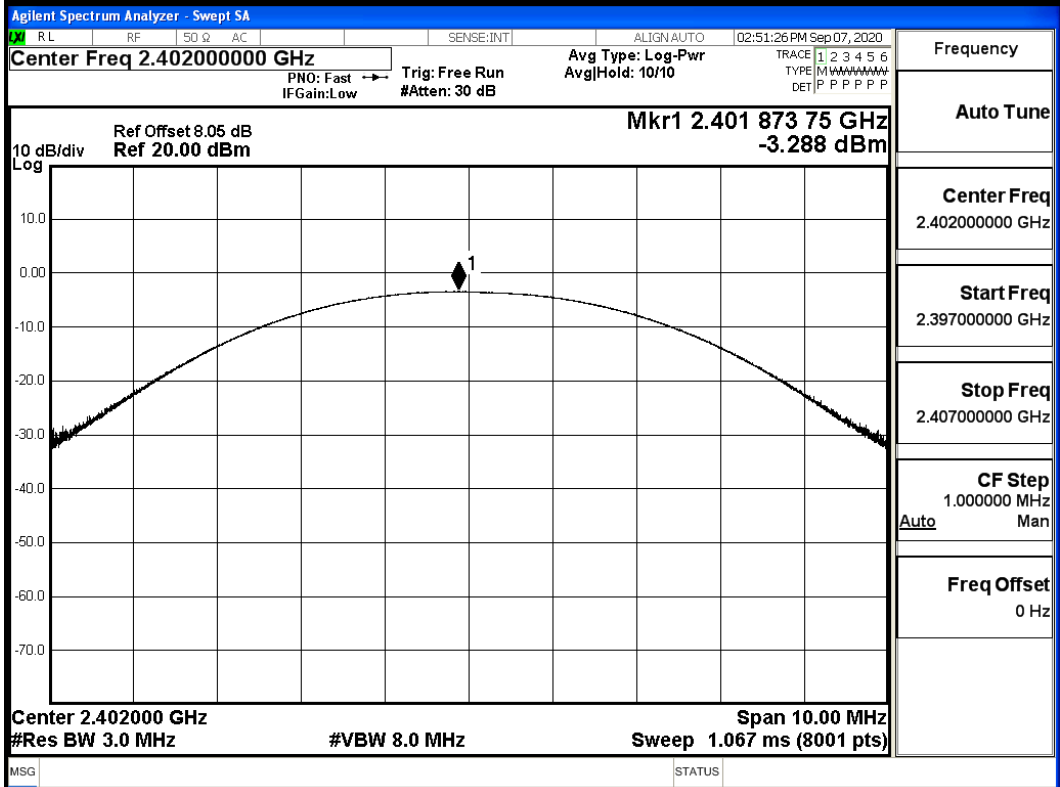
| | |
|--------------------|-----------|
| Temperature: | 25 ° C |
| Relative Humidity: | 50% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Jenny Wu |
| Supervised by: | Li Huan |

A.1 Maximum Conducted Peak Output Power

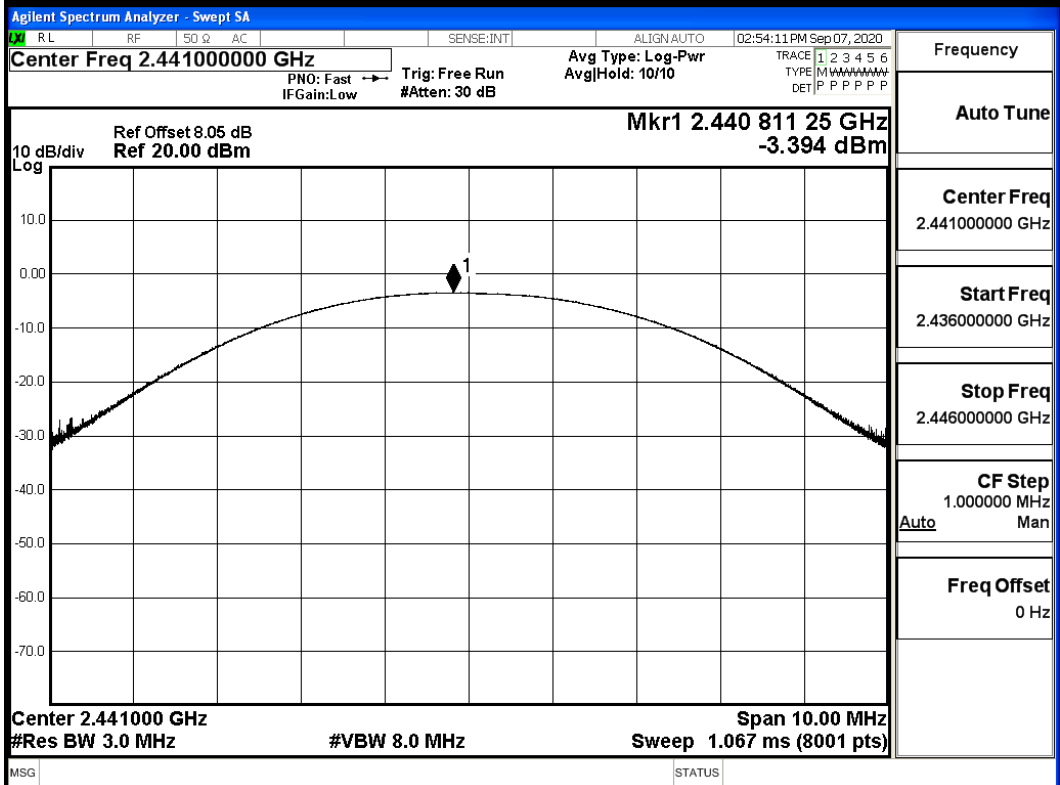
| Mode | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|----------|----------|---------------------------------|-------------|---------|
| GFSK | LCH | -3.288 | 21 | PASS |
| | MCH | -3.394 | 21 | PASS |
| | HCH | -3.657 | 21 | PASS |
| π/4DQPSK | LCH | -2.570 | 21 | PASS |
| | MCH | -2.690 | 21 | PASS |
| | HCH | -2.934 | 21 | PASS |

Test Graphs

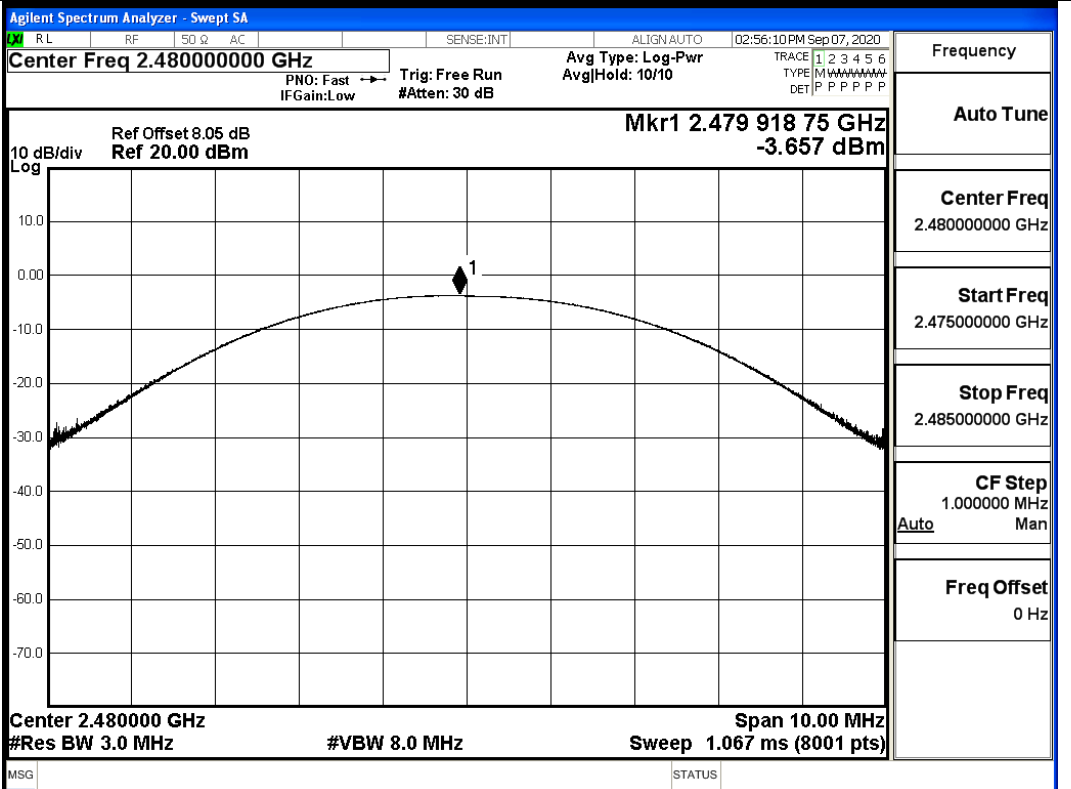
GFSK/LCH



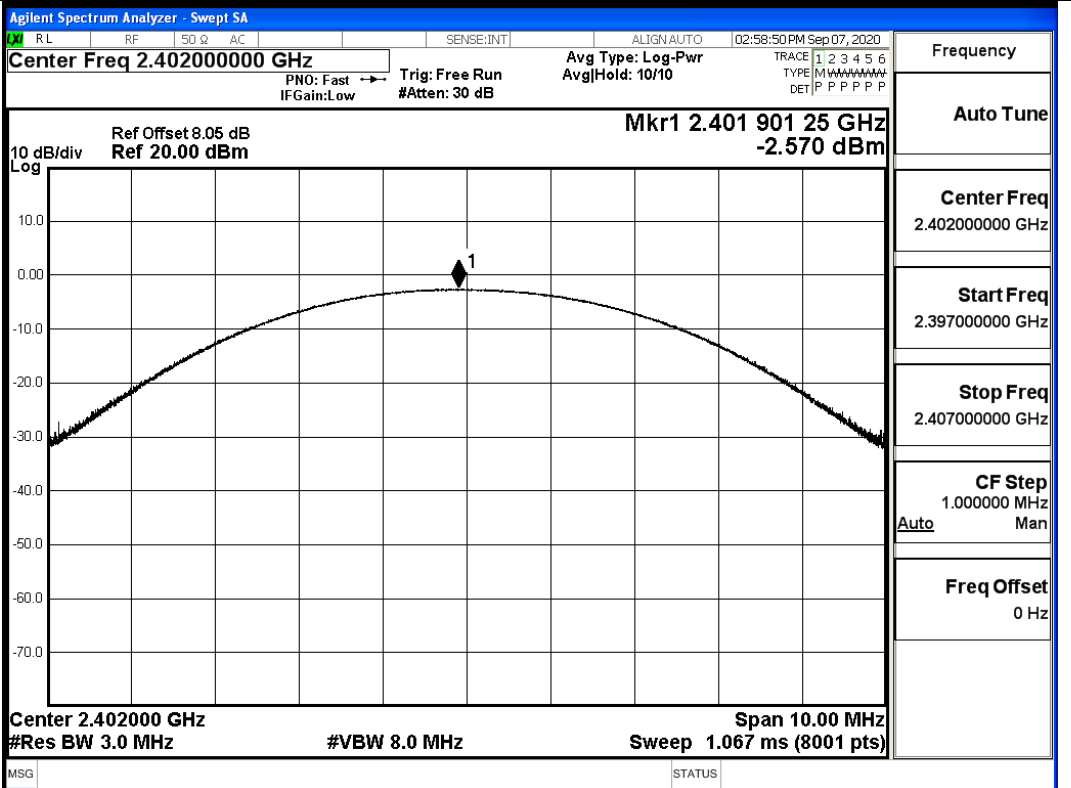
GFSK/MCH

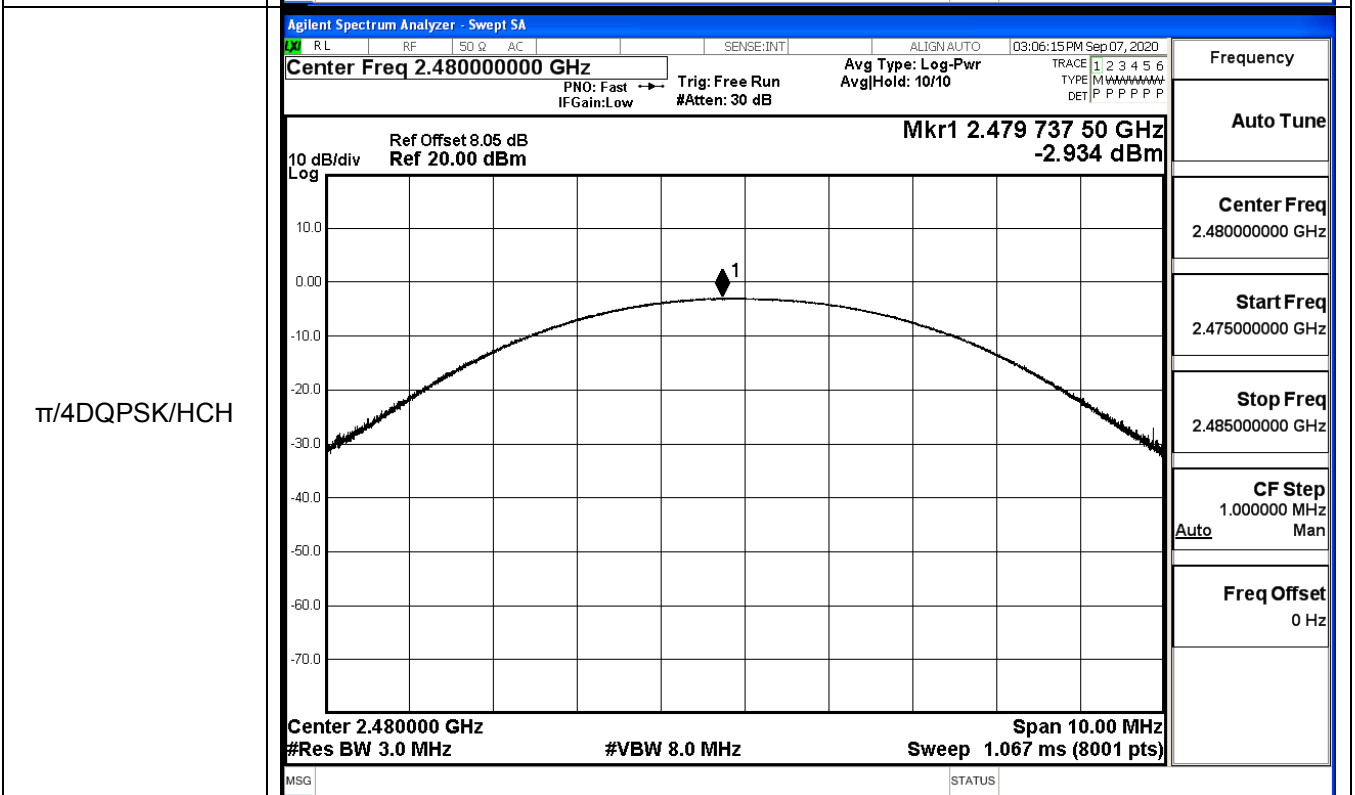
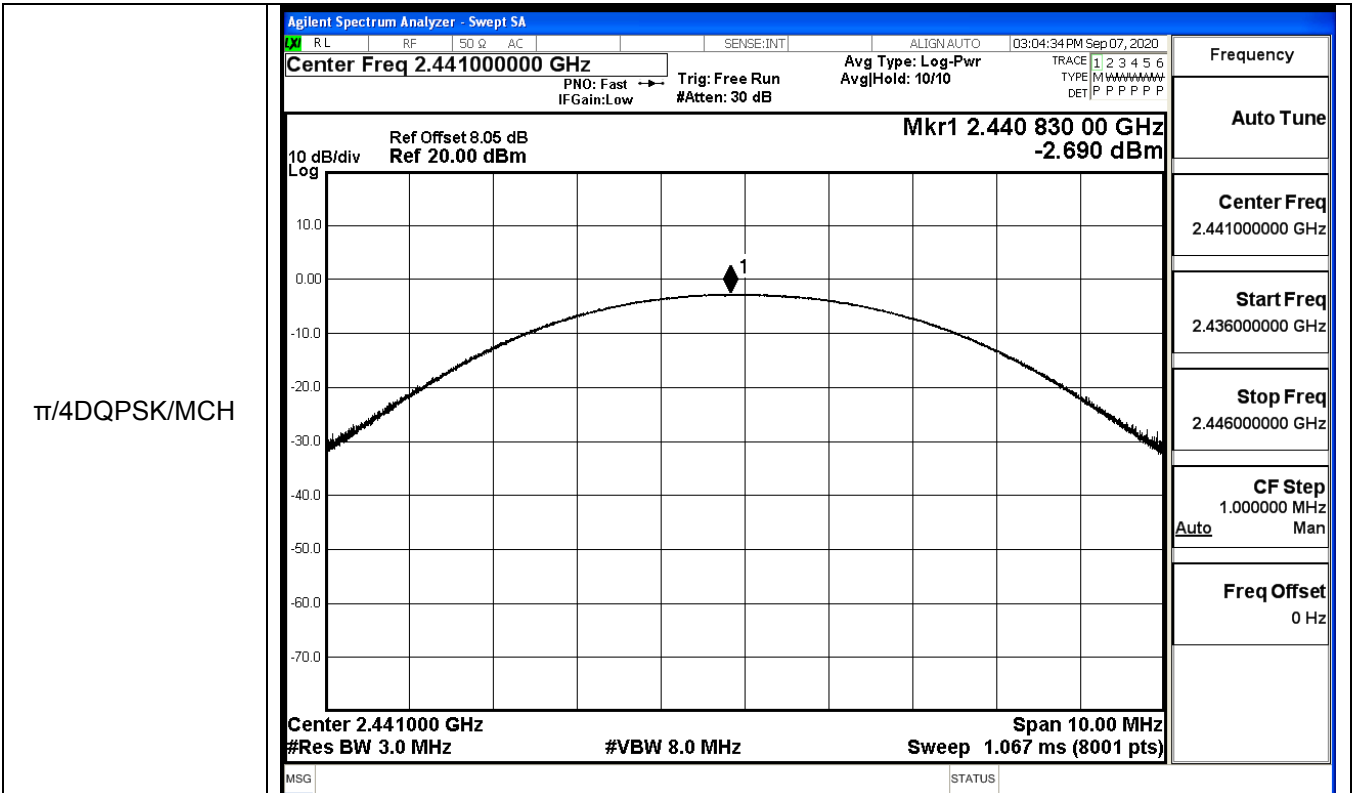


GFSK/HCH



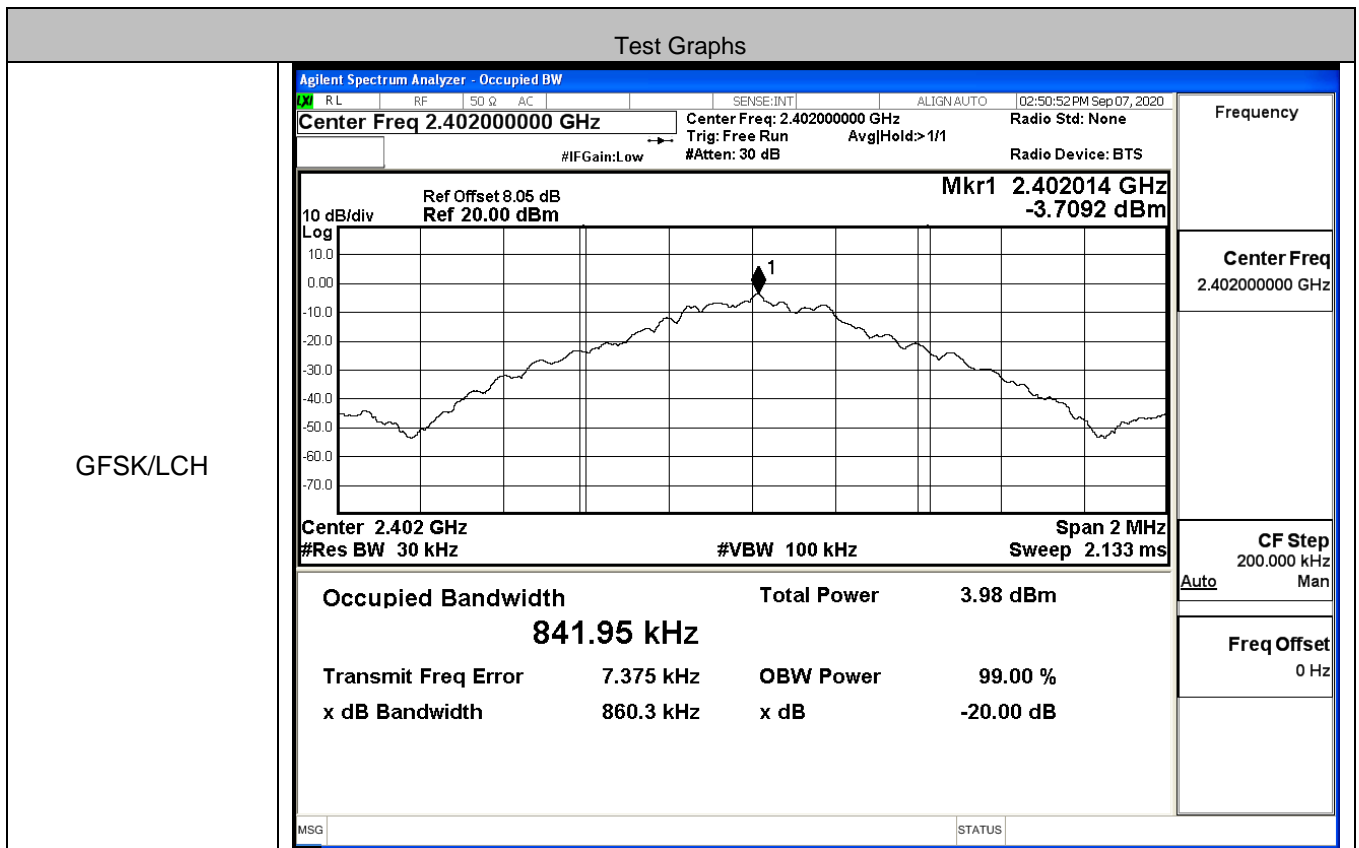
$\pi/4$ DQPSK/LCH



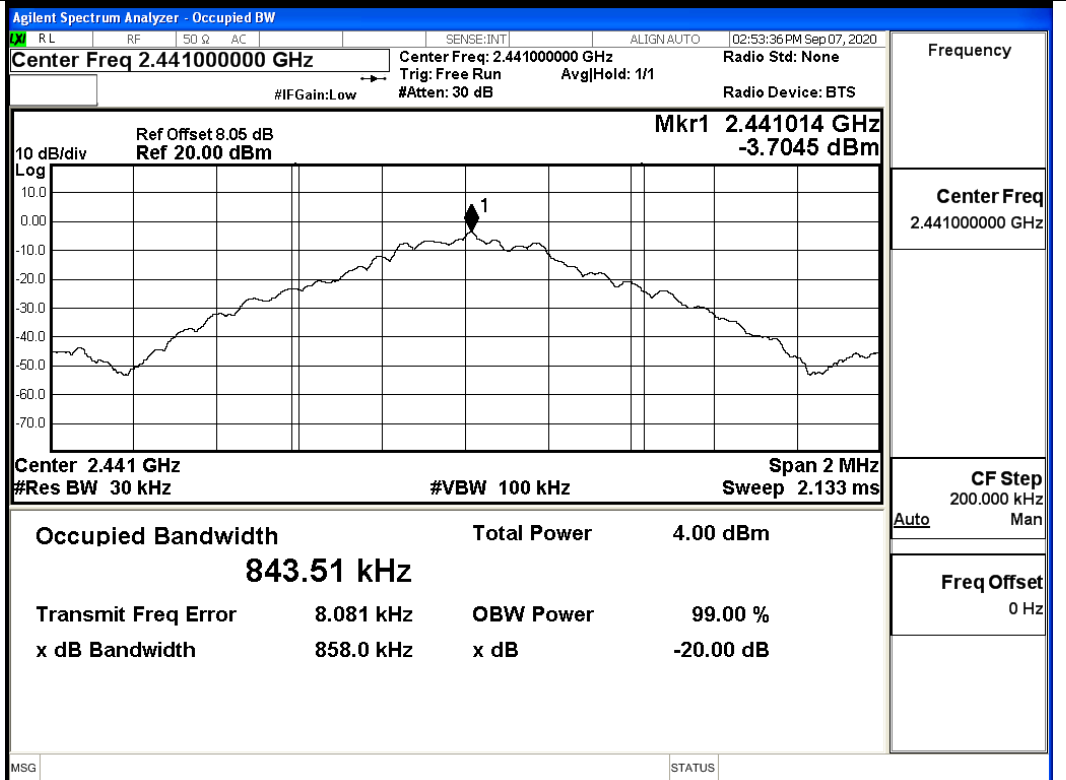


A.2 20dB Bandwidth

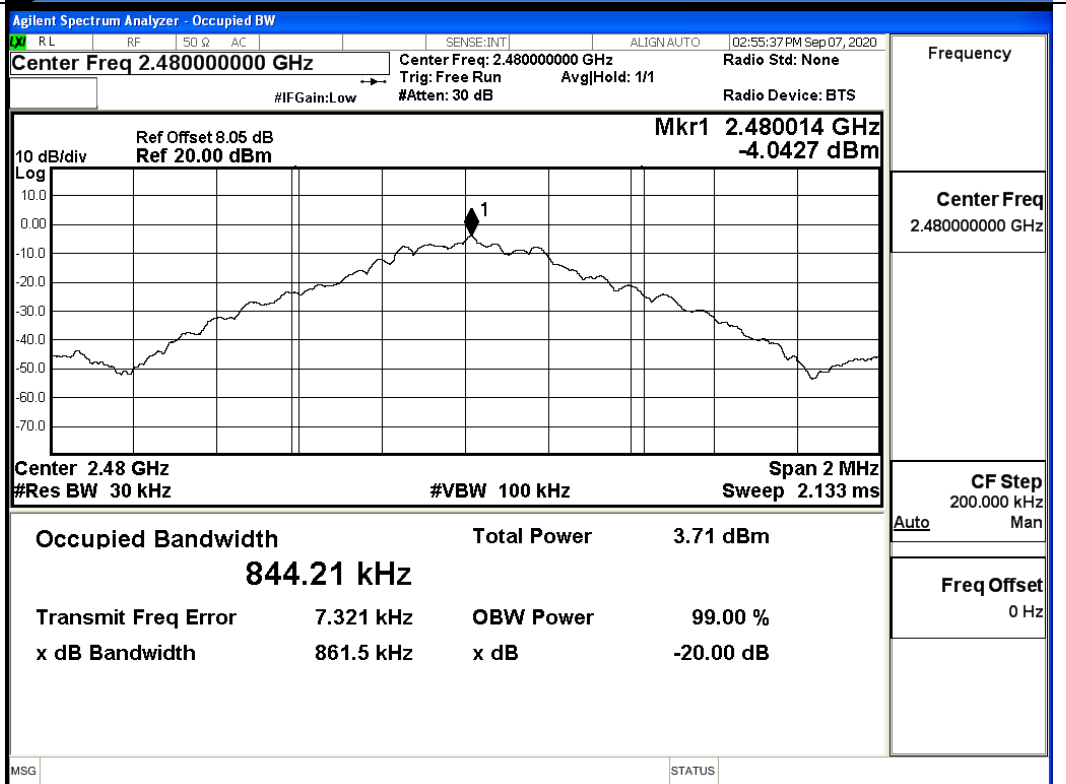
| Mode | Channel. | 20dB Bandwidth [MHz] | Limit [MHz] | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK | LCH | 0.8603 | Not Specified | PASS |
| | MCH | 0.8580 | Not Specified | PASS |
| | HCH | 0.8615 | Not Specified | PASS |
| $\pi/4$ DQPSK | LCH | 1.238 | Not Specified | PASS |
| | MCH | 1.240 | Not Specified | PASS |
| | HCH | 1.240 | Not Specified | PASS |

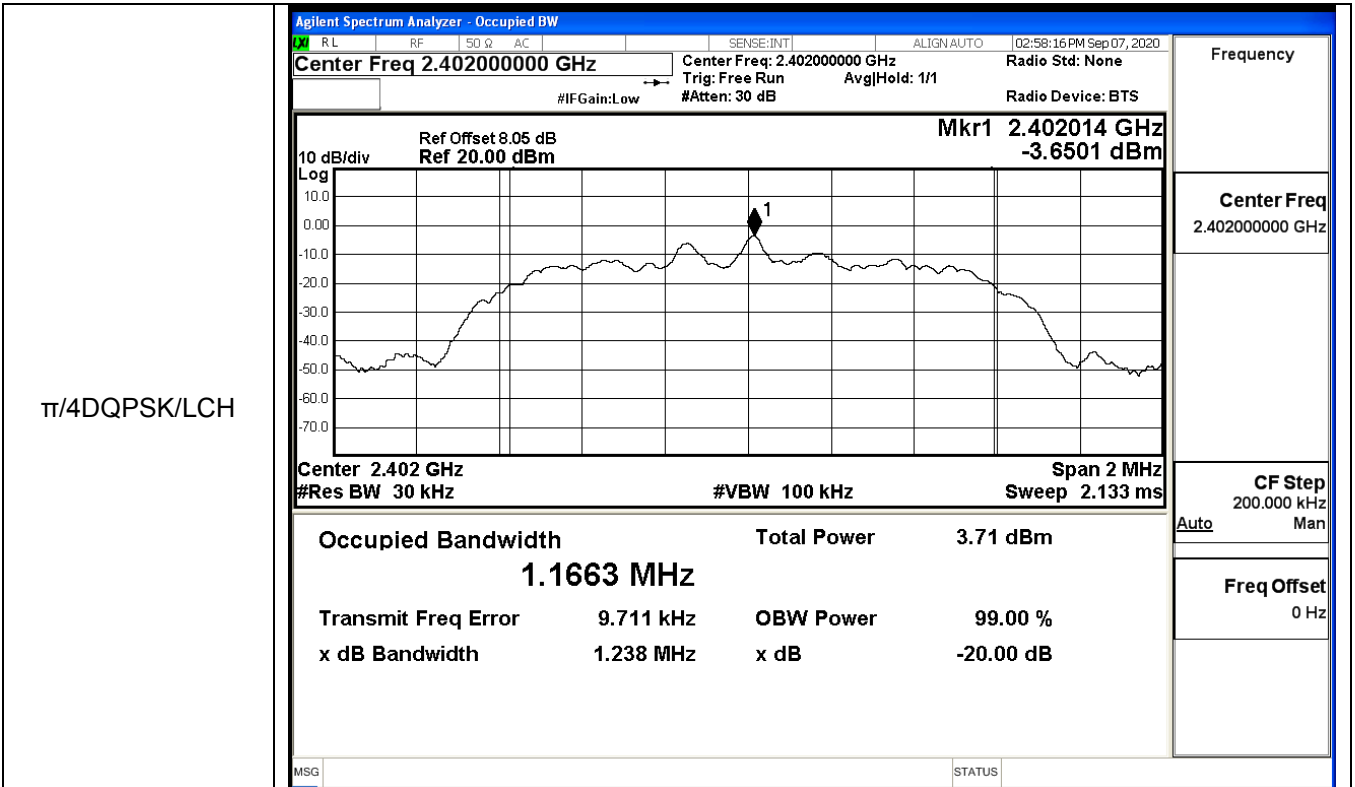


GFSK/MCH



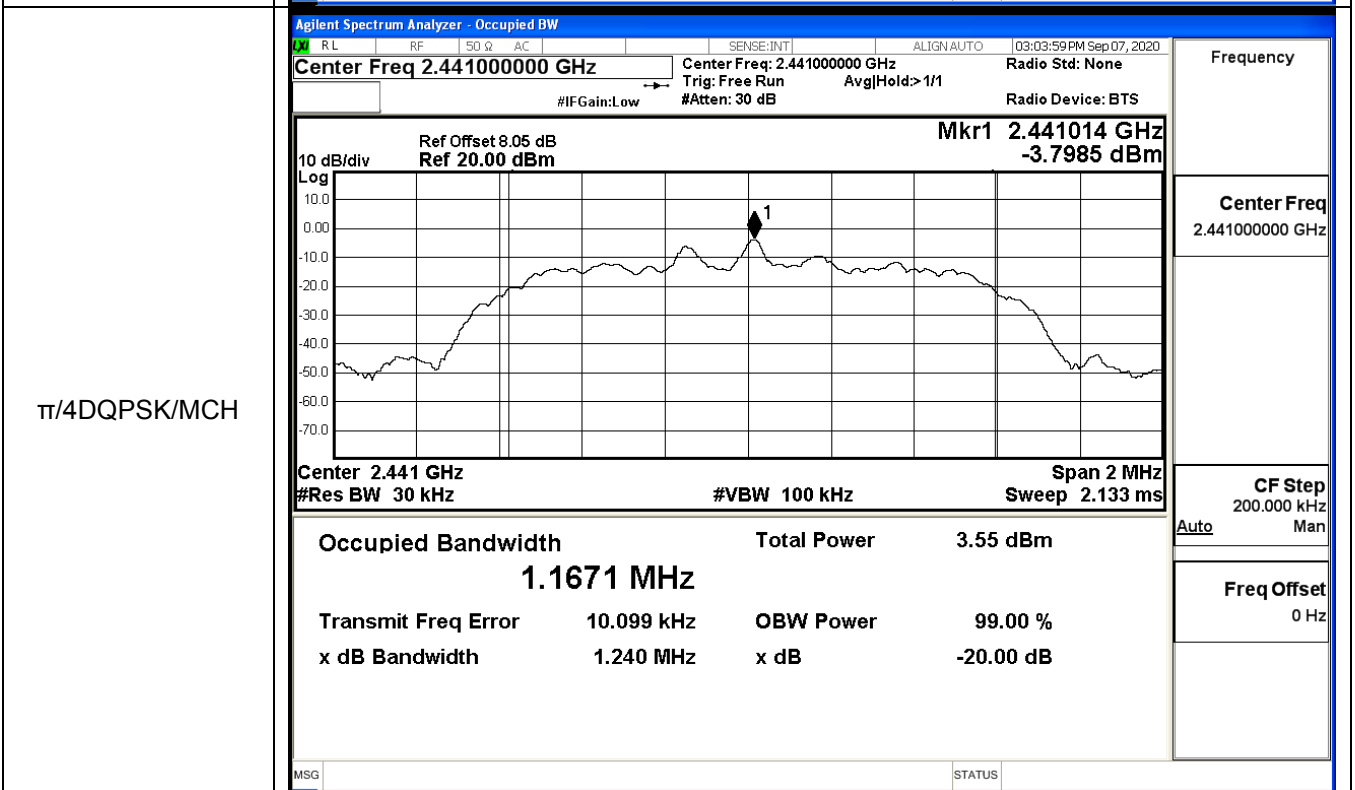
GFSK/HCH





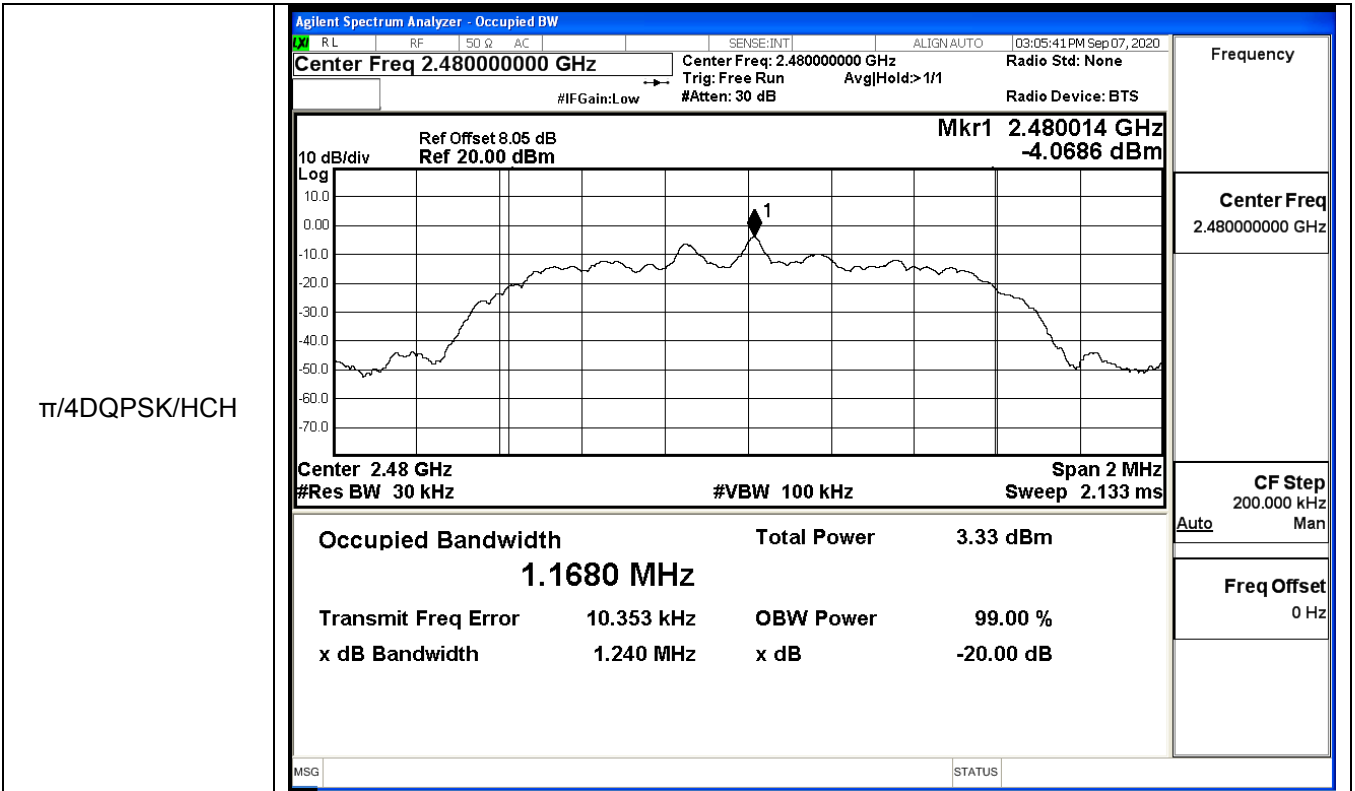
π/4DQPSK/LCH

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



π/4DQPSK/MCH

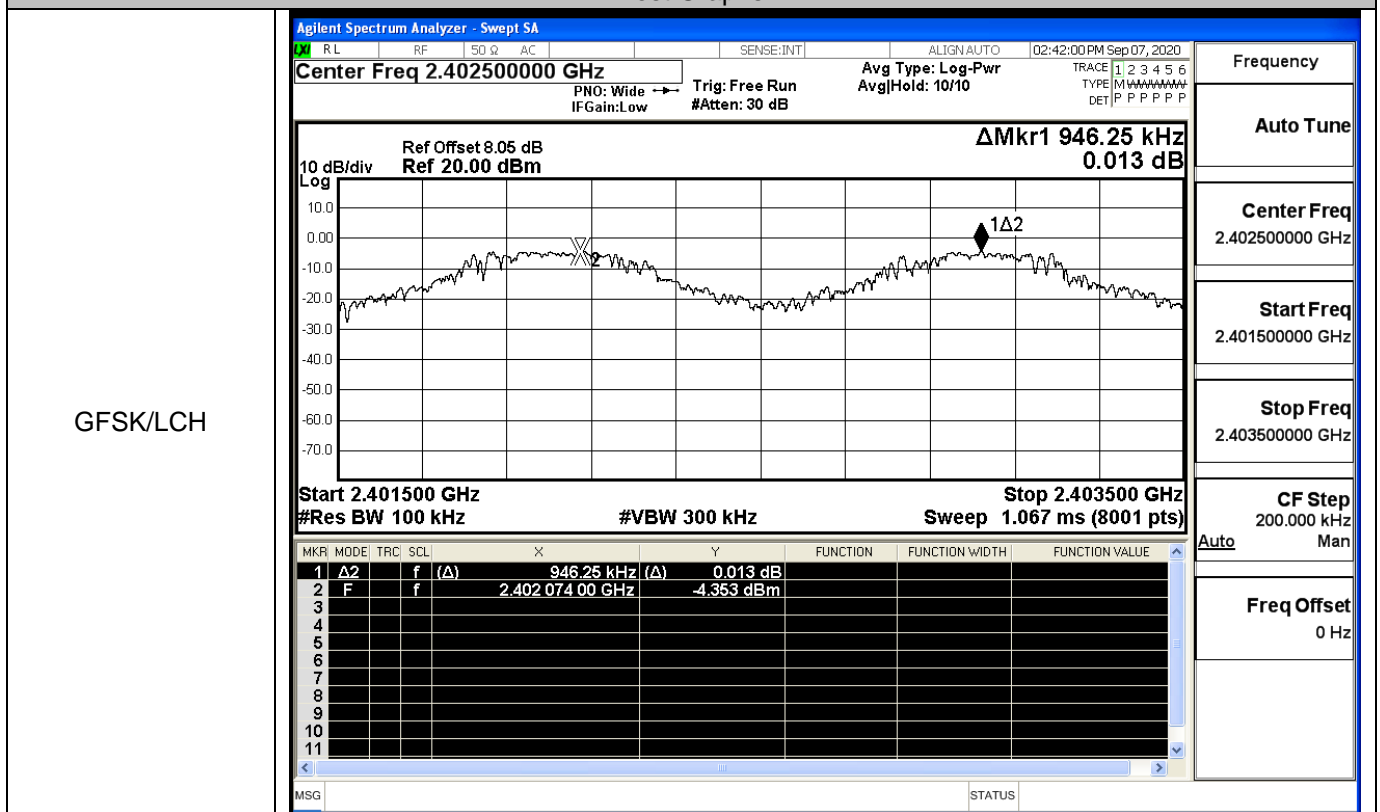
| | |
|-------------|-------------------------------|
| Frequency | Center Freq 2.44100000 GHz |
| CF Step | 200.000 kHz Auto Man |
| Freq Offset | 0 Hz |



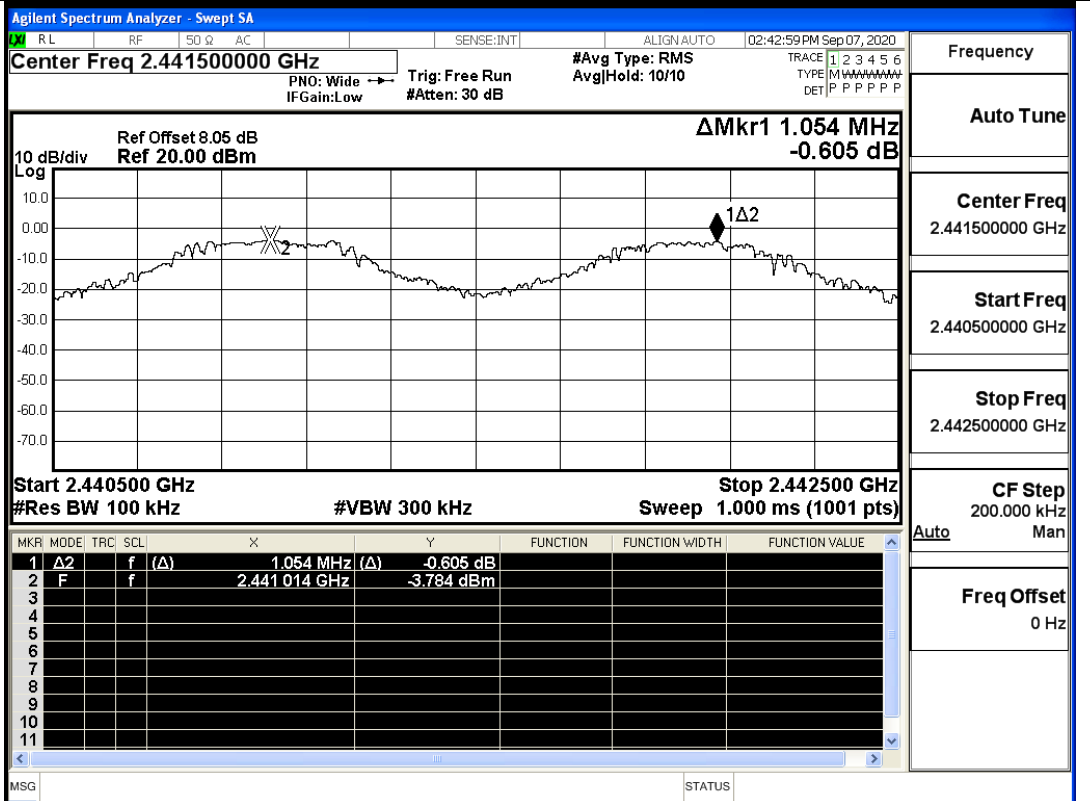
A.3 Carrier Frequency Separation

| Mode | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|----------|----------|------------------------------------|-------------|---------|
| GFSK | LCH | 0.946 | 0.574 | PASS |
| | MCH | 1.054 | 0.572 | PASS |
| | HCH | 0.846 | 0.574 | PASS |
| π/4DQPSK | LCH | 0.832 | 0.825 | PASS |
| | MCH | 0.878 | 0.827 | PASS |
| | HCH | 0.950 | 0.827 | PASS |

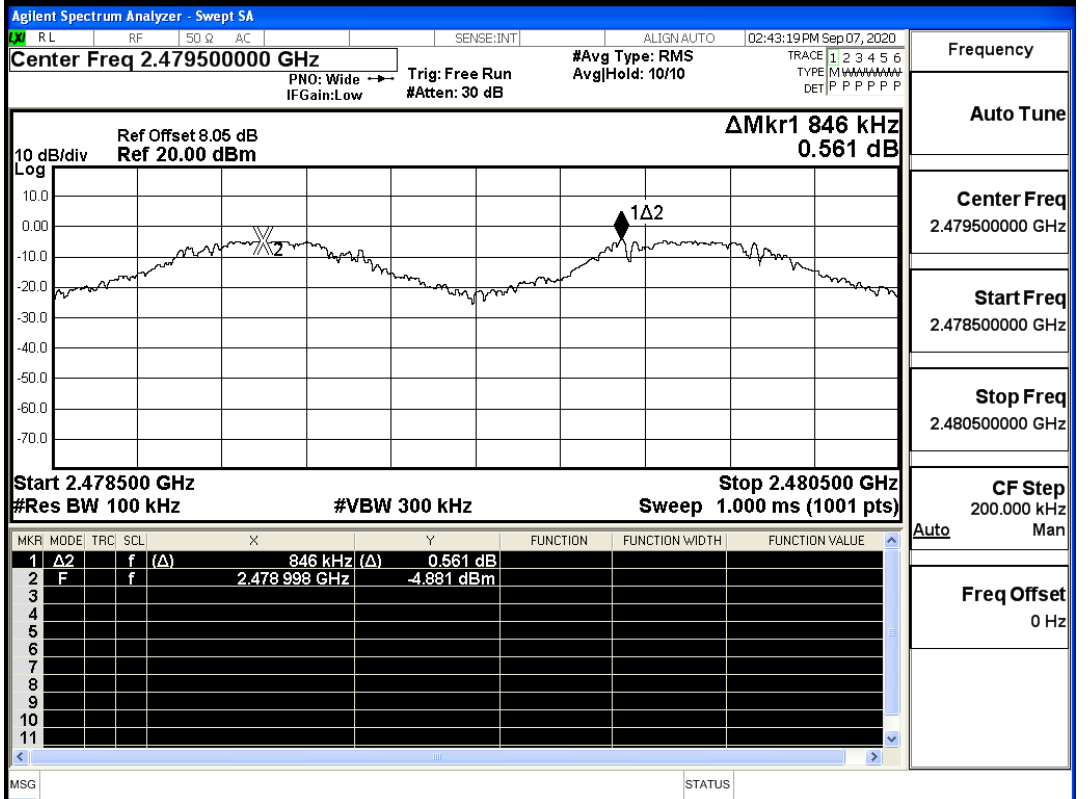
Test Graphs



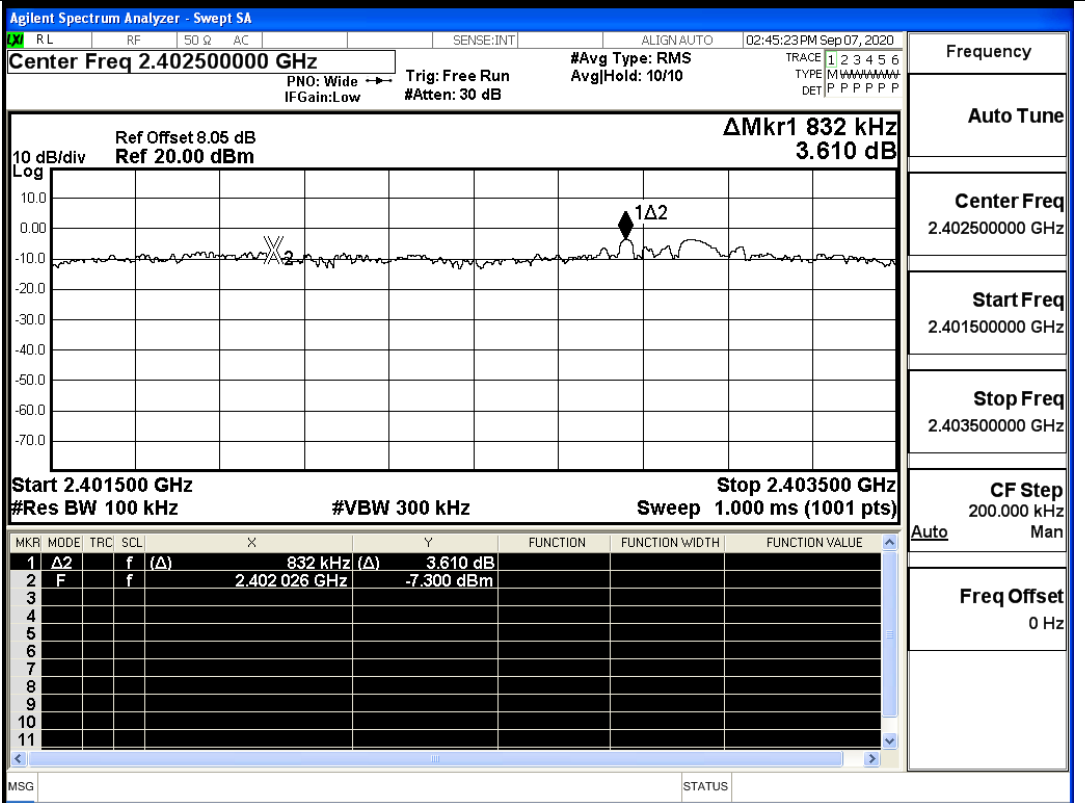
GFSK/MCH



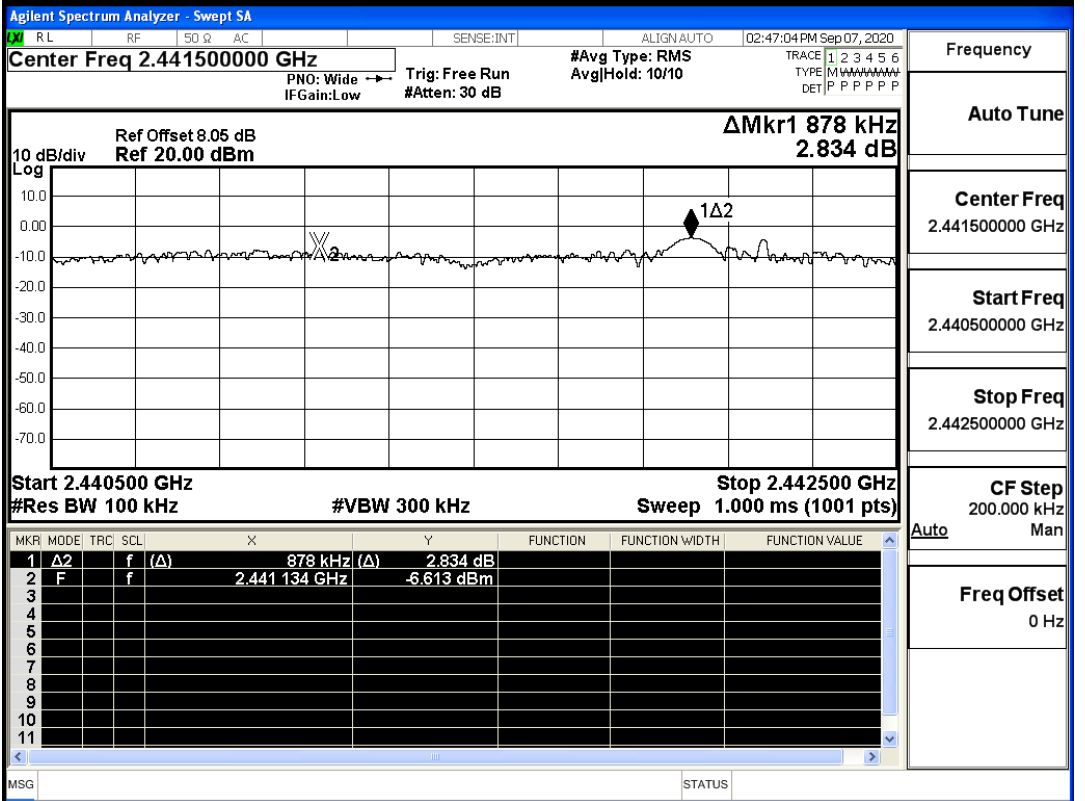
GFSK/HCH



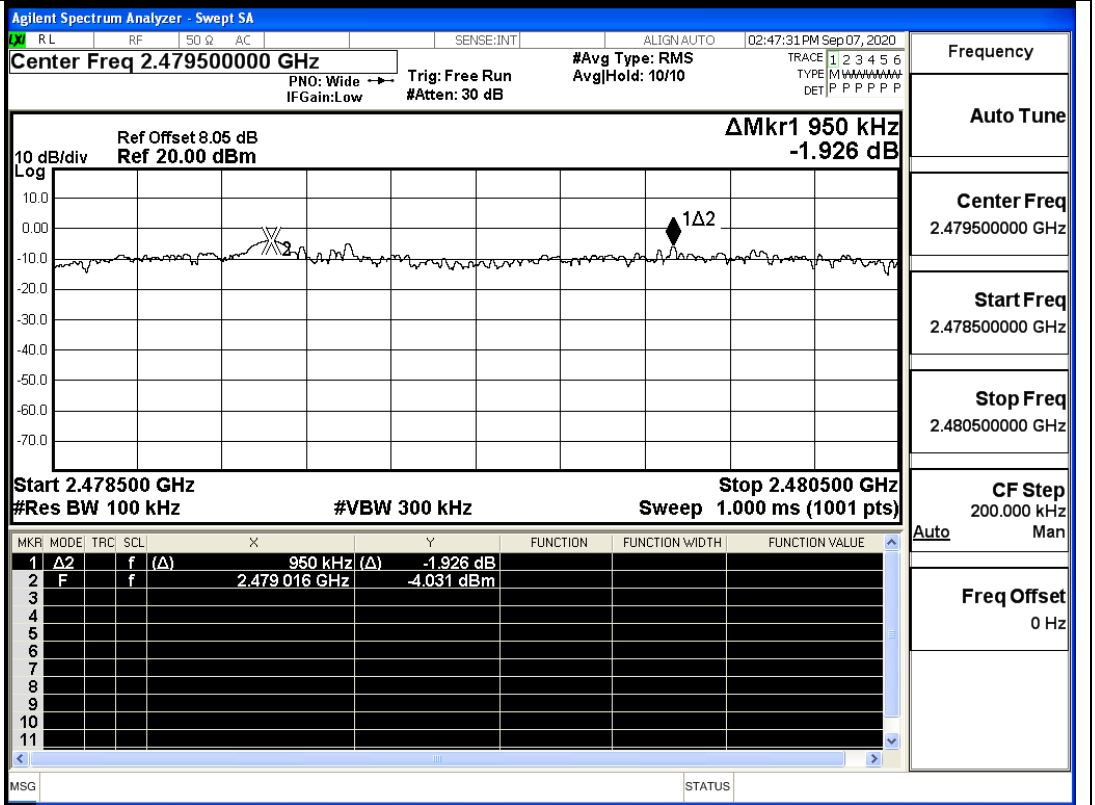
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

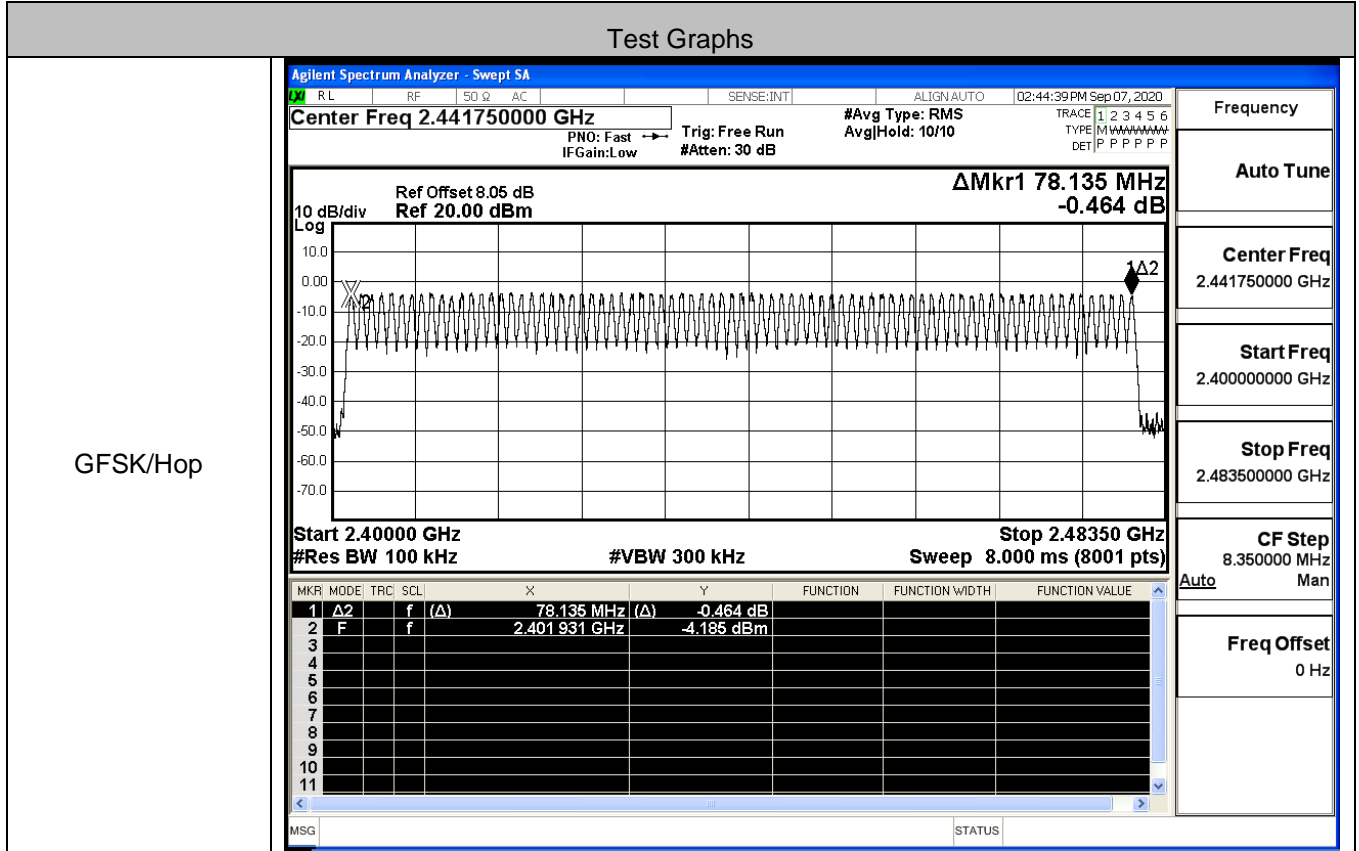


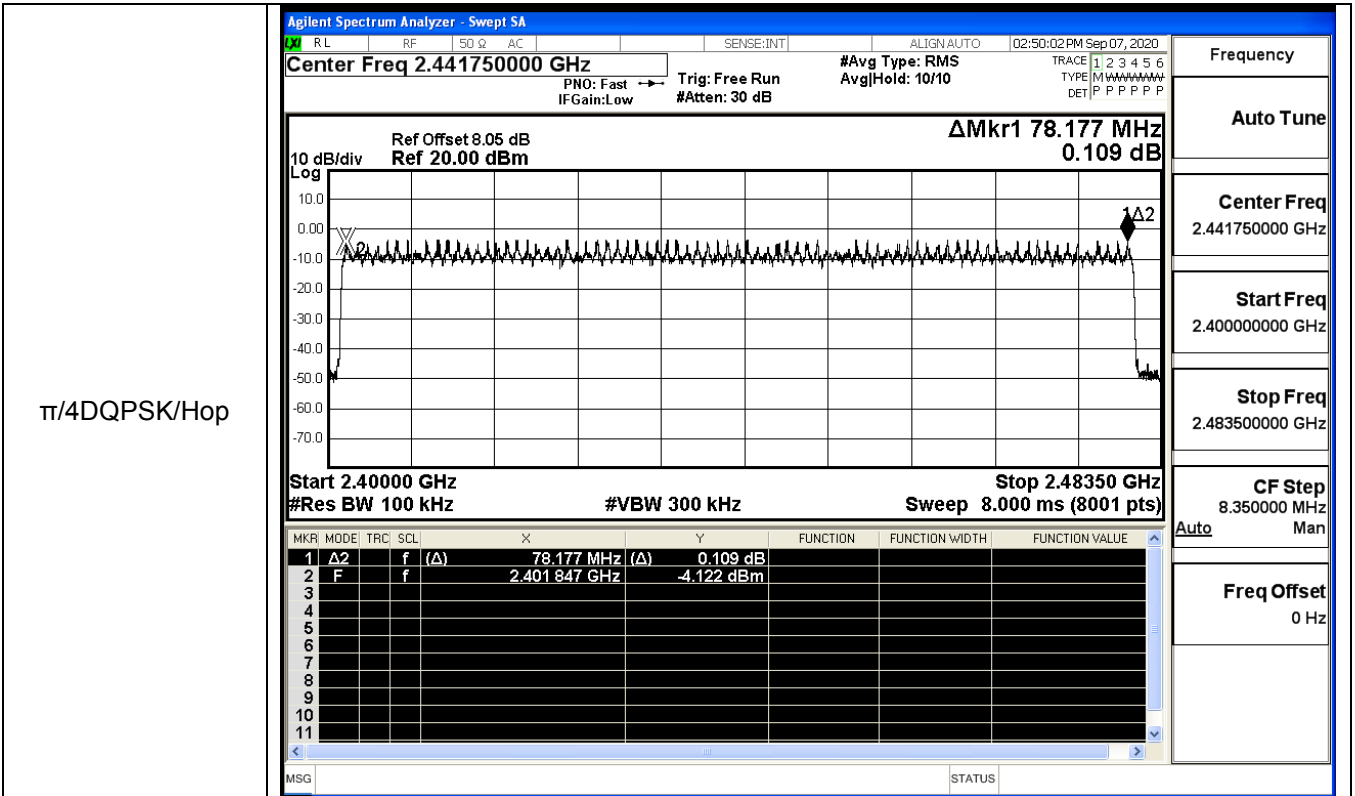
$\pi/4$ DQPSK/HCH



A.4 Hopping Channel Number

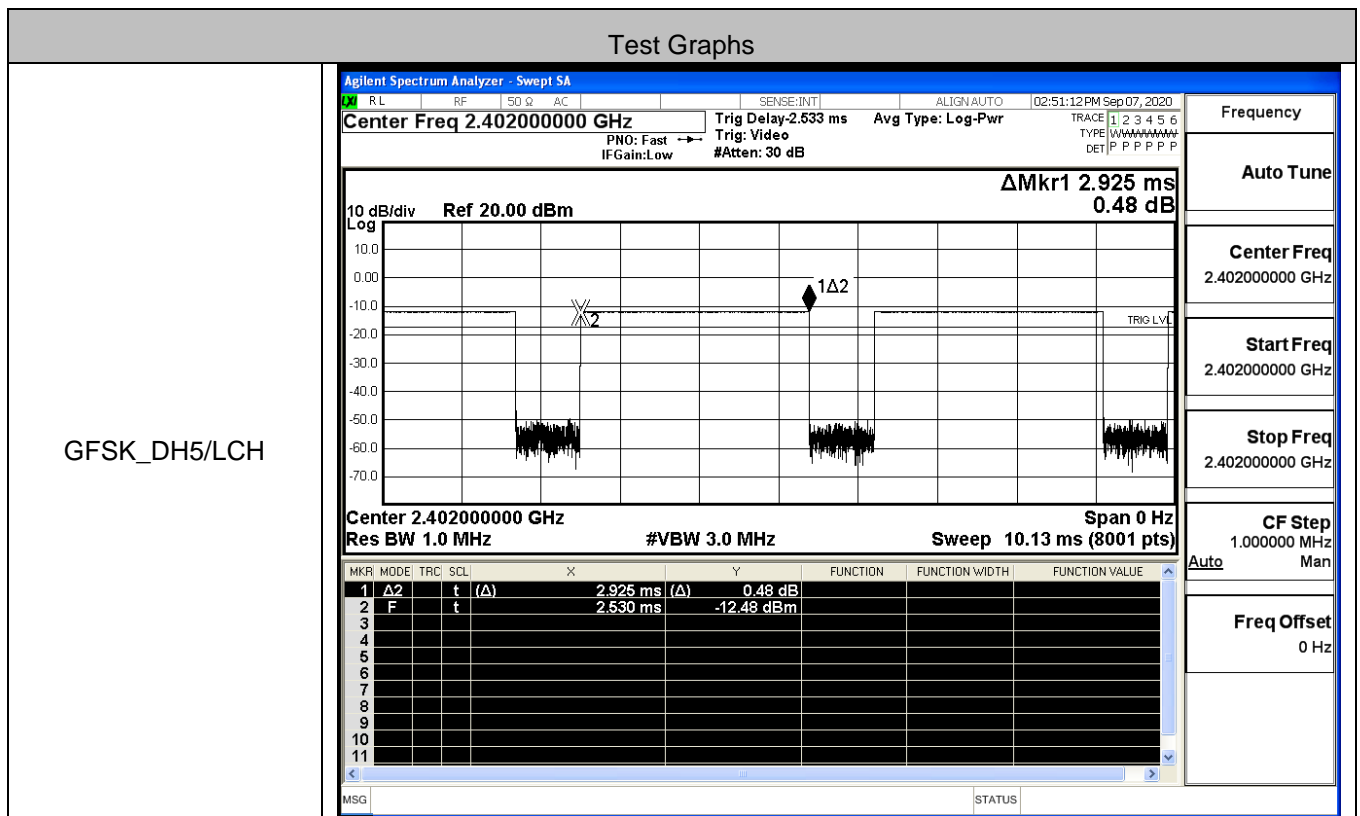
| Mode | Channel. | Number of Hopping Channel [N] | Limit [N] | Verdict |
|---------------|----------|-------------------------------|-----------|---------|
| GFSK | Hop | 79 | >=15 | PASS |
| $\pi/4$ DQPSK | Hop | 79 | >=15 | PASS |



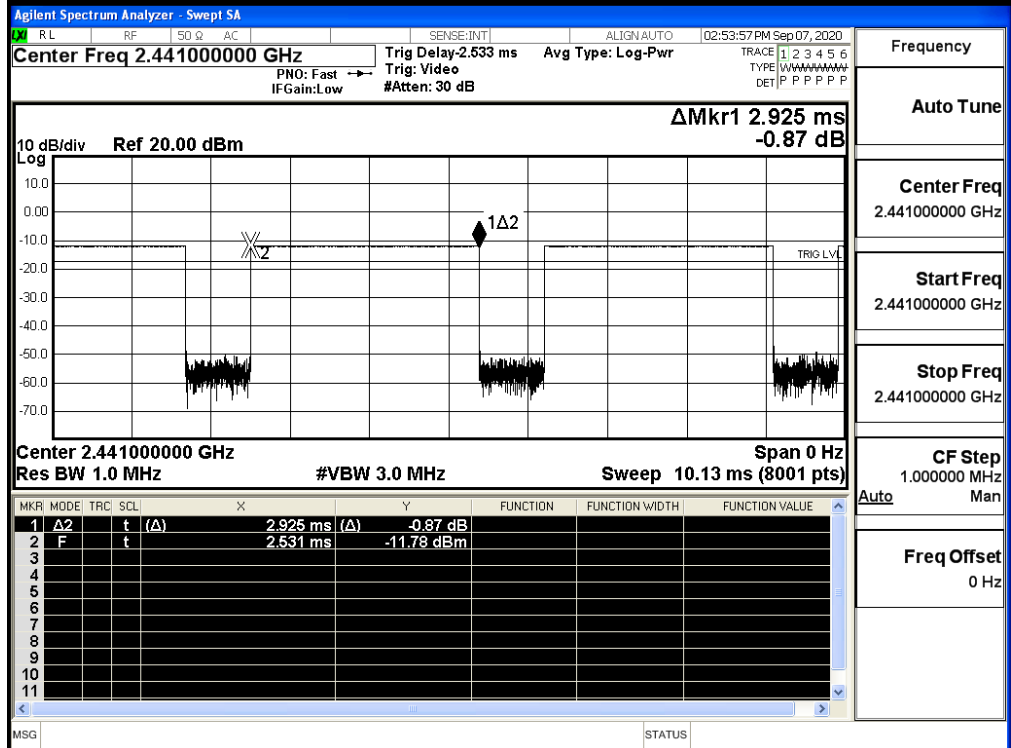


A.5 Dwell Time

| Mode | Packet | Channel | Burst Width [ms/hop/ch] | Total Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|-------------------------|--------------------|---------------|-----------|---------|
| GFSK | DH5 | LCH | 2.92 | 106.7 | 0.312 | 0.4 | PASS |
| | DH5 | MCH | 2.92 | 106.7 | 0.312 | 0.4 | PASS |
| | DH5 | HCH | 2.92 | 106.7 | 0.312 | 0.4 | PASS |
| $\pi/4$ DQPSK | 2DH5 | LCH | 2.92 | 106.7 | 0.313 | 0.4 | PASS |
| | 2DH5 | MCH | 2.92 | 106.7 | 0.313 | 0.4 | PASS |
| | 2DH5 | HCH | 2.92 | 106.7 | 0.313 | 0.4 | PASS |

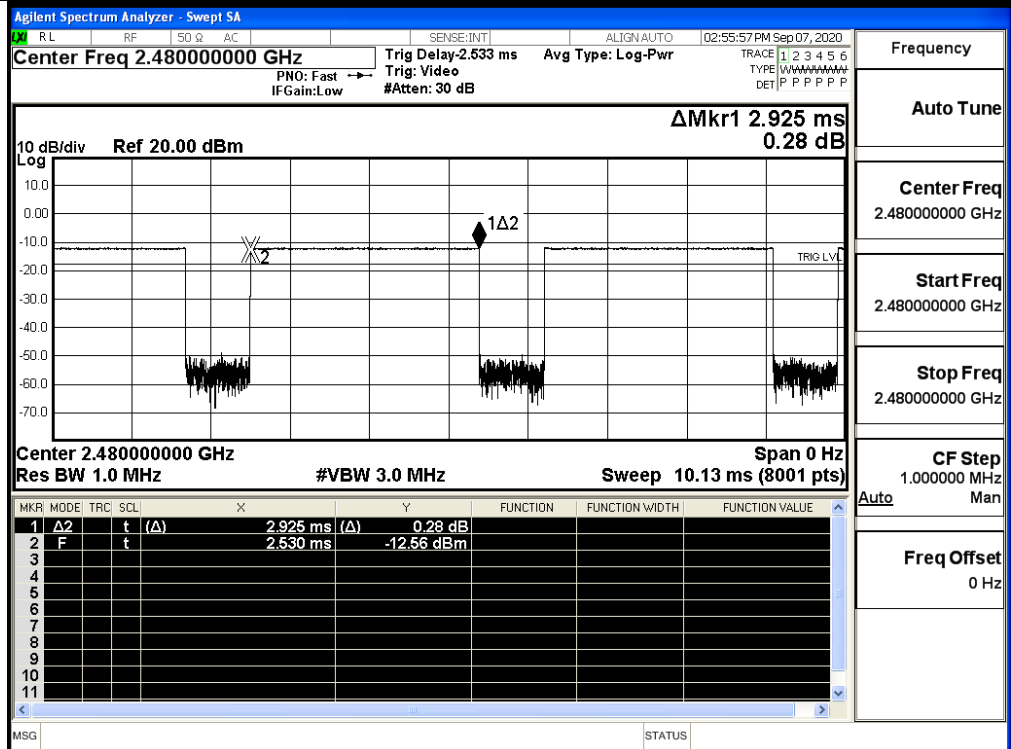


GFSK_DH5/MCH



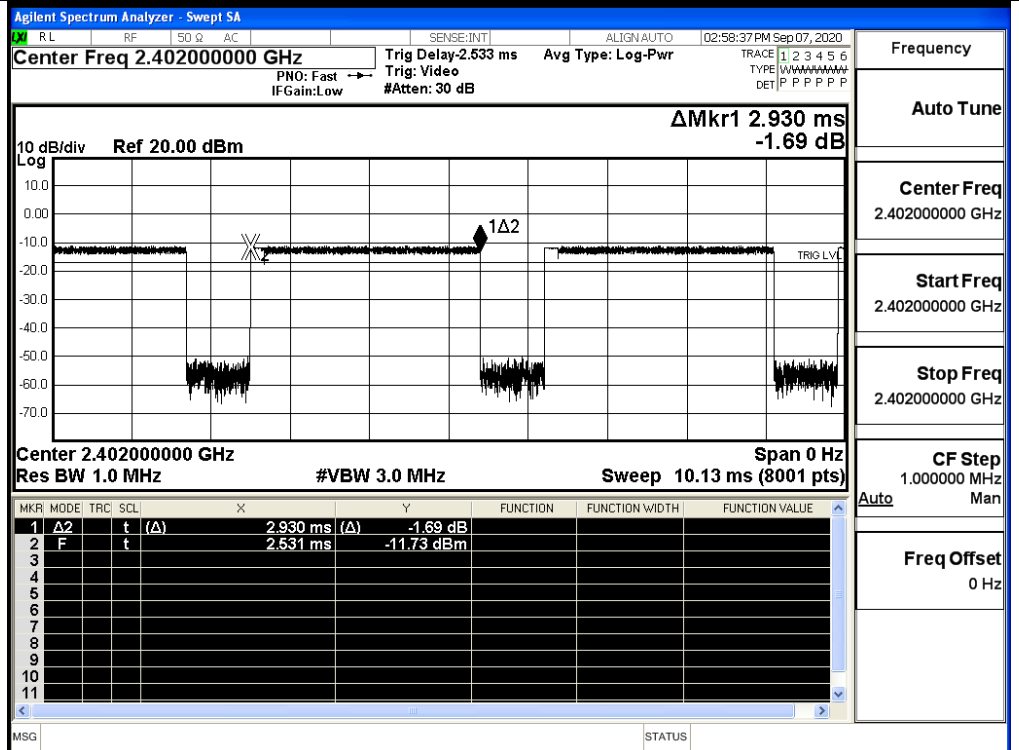
| | |
|-------------|-----------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.441000000 GHz |
| Start Freq | 2.441000000 GHz |
| Stop Freq | 2.441000000 GHz |
| CF Step | 1.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

GFSK_DH5/HCH

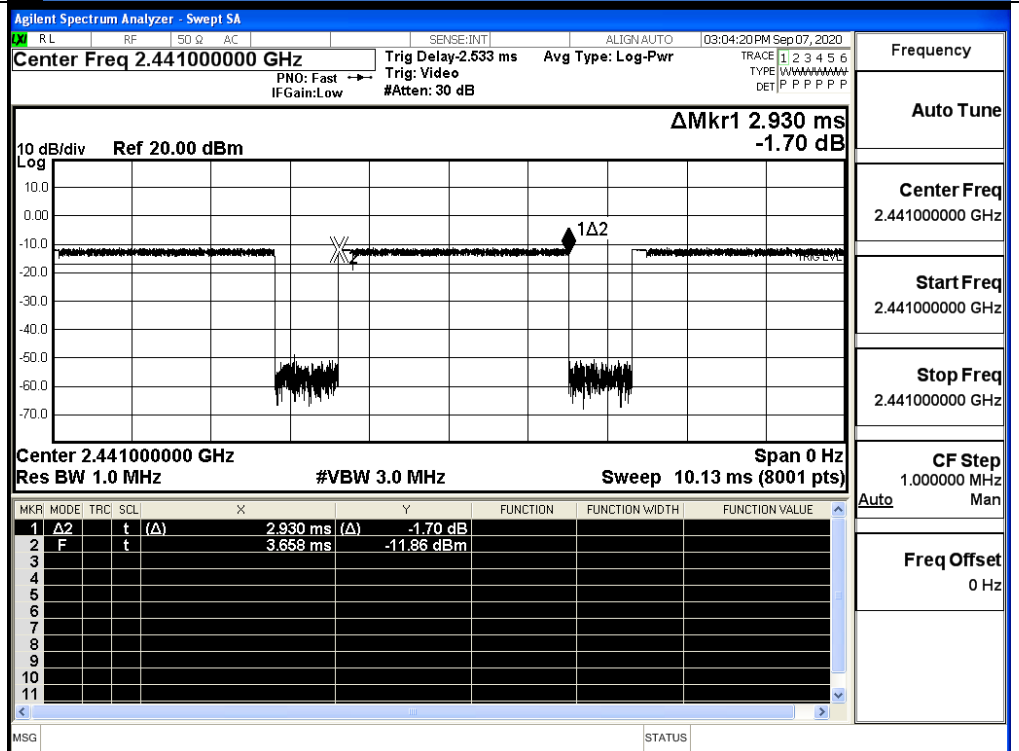


| | |
|-------------|-----------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.480000000 GHz |
| Start Freq | 2.480000000 GHz |
| Stop Freq | 2.480000000 GHz |
| CF Step | 1.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

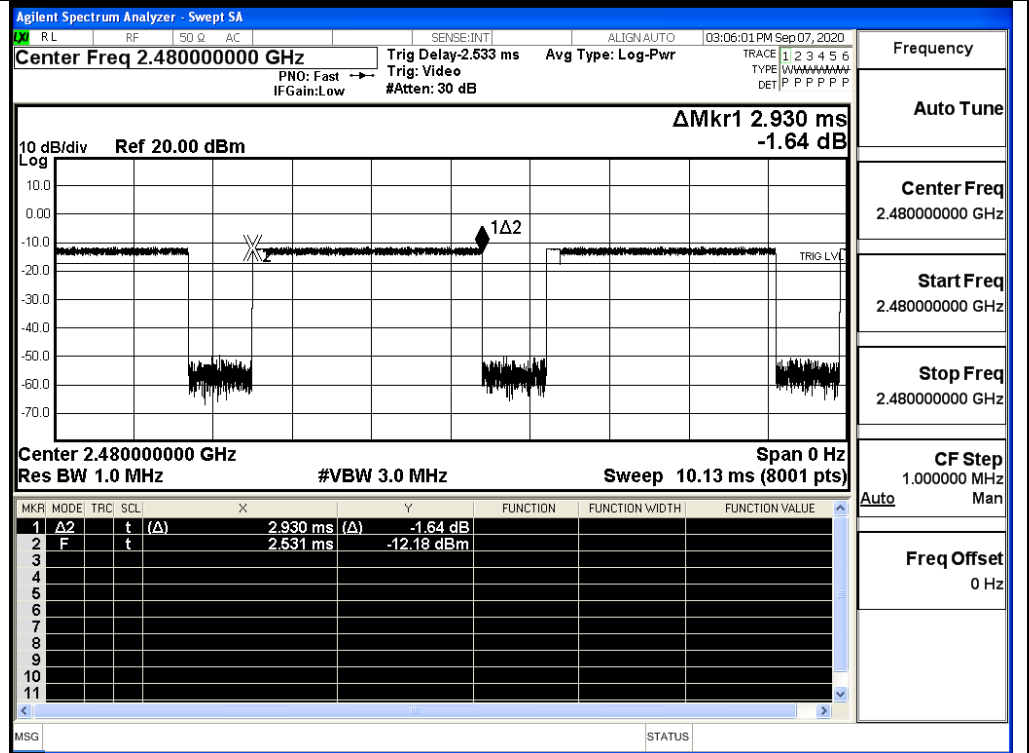
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH

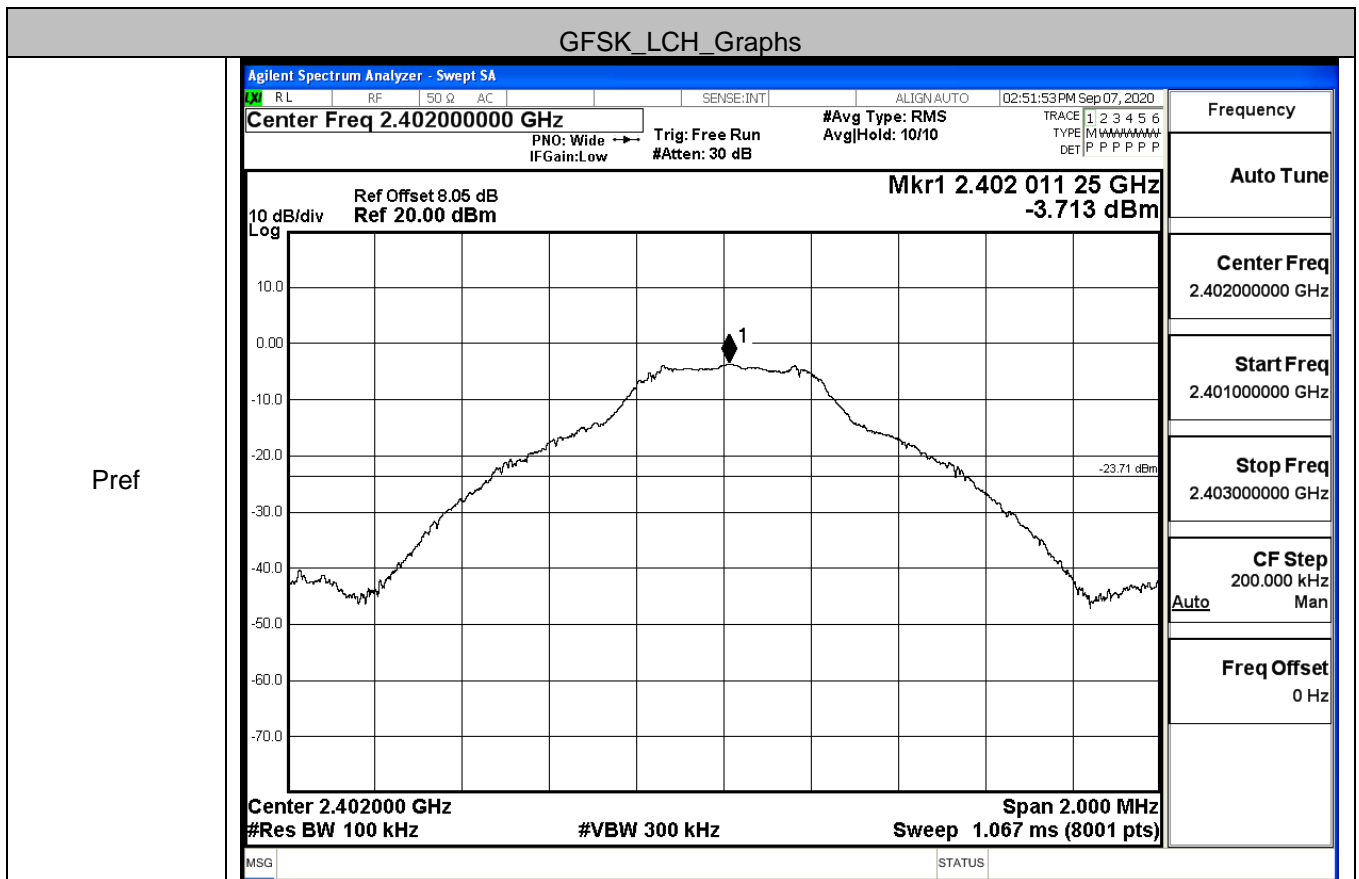


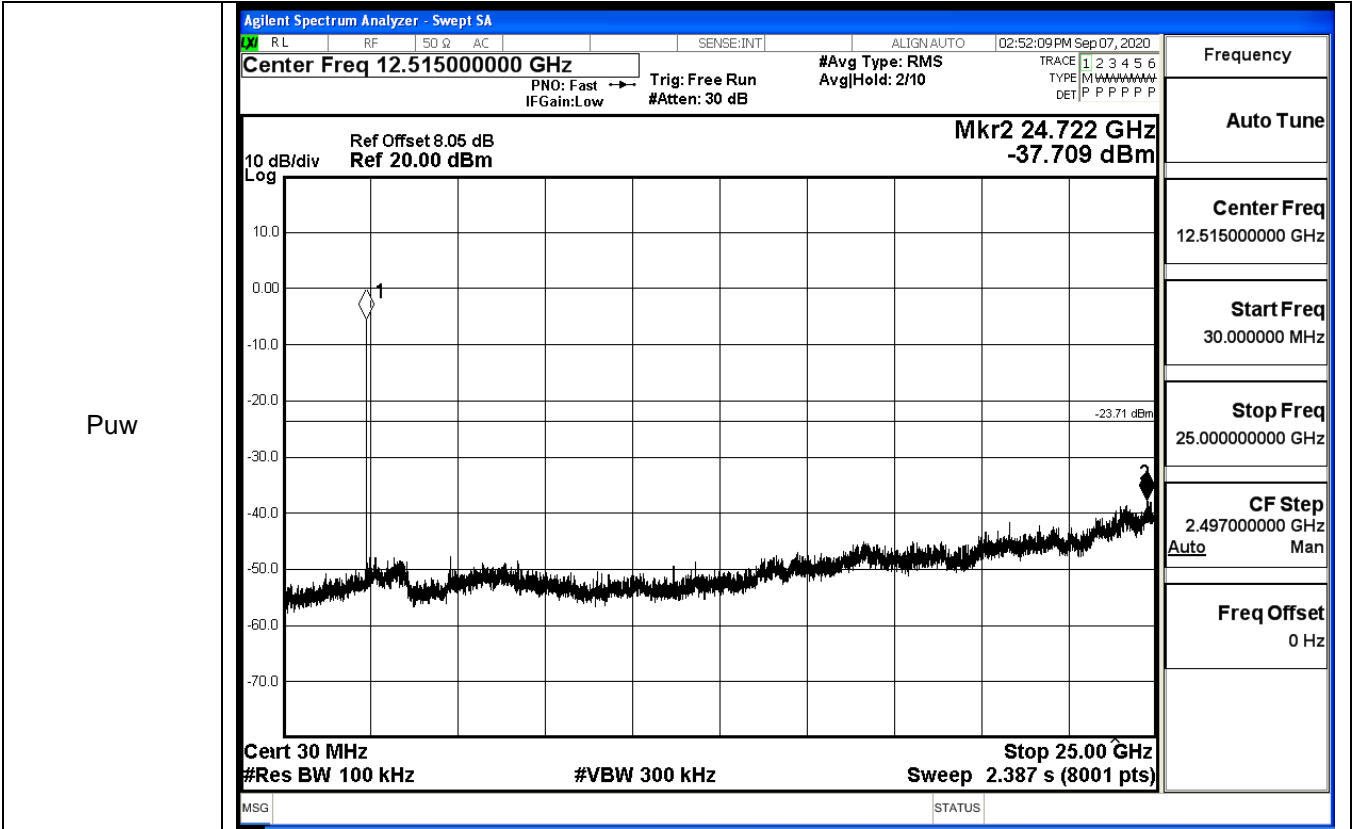
$\pi/4$ DQPSK
_2DH5/HCH



A.6 RF Conducted Spurious Emissions

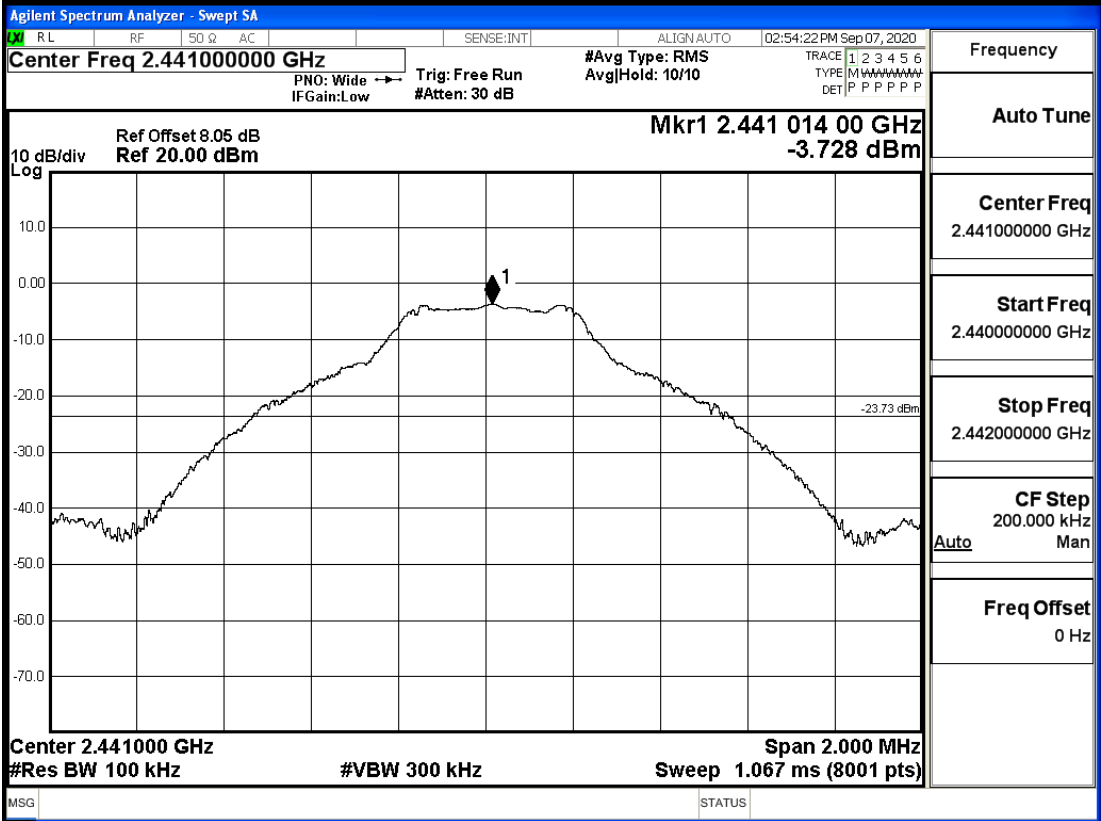
| Mode | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|----------|---------|------------|------------------|-------------|---------|
| GFSK | LCH | -3.713 | -37.709 | -23.713 | PASS |
| | MCH | -3.728 | -37.140 | -23.728 | PASS |
| | HCH | -3.985 | -38.129 | -23.985 | PASS |
| π/4DQPSK | LCH | -3.704 | -38.019 | -23.704 | PASS |
| | MCH | -3.754 | -36.958 | -23.754 | PASS |
| | HCH | -4.079 | -37.974 | -24.079 | PASS |



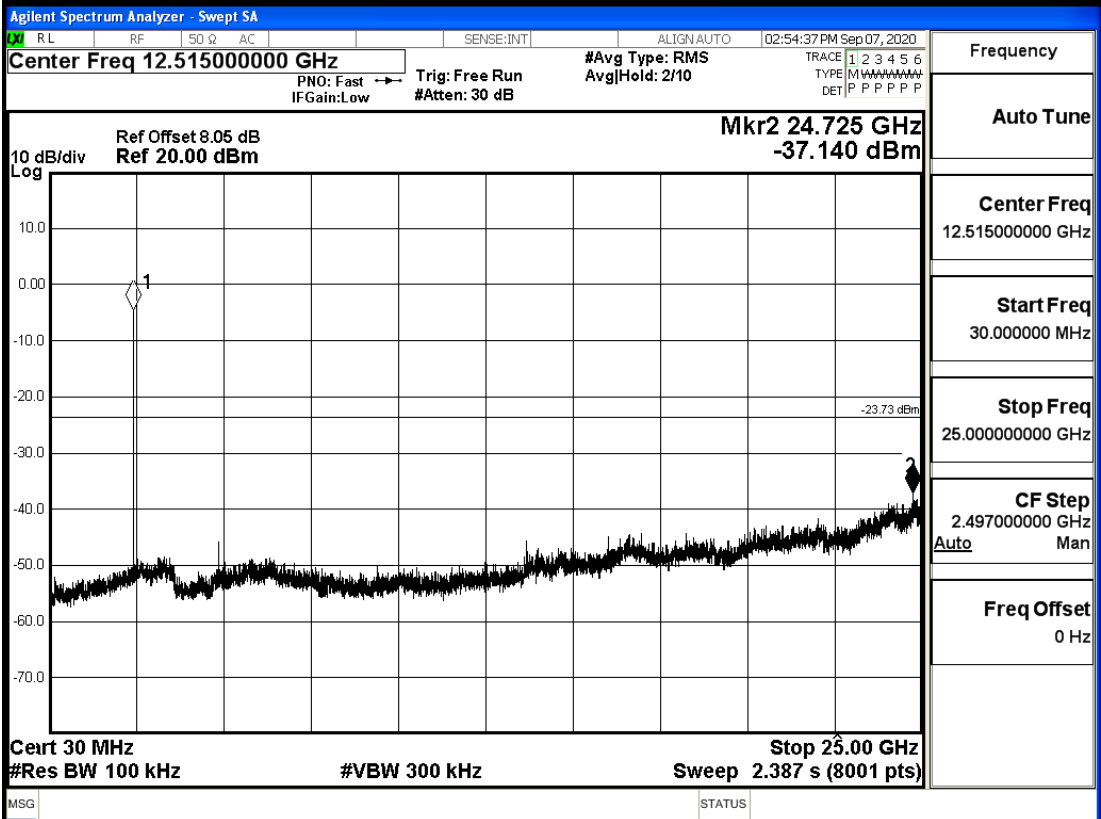


GFSK_MCH_Graphs

Pref

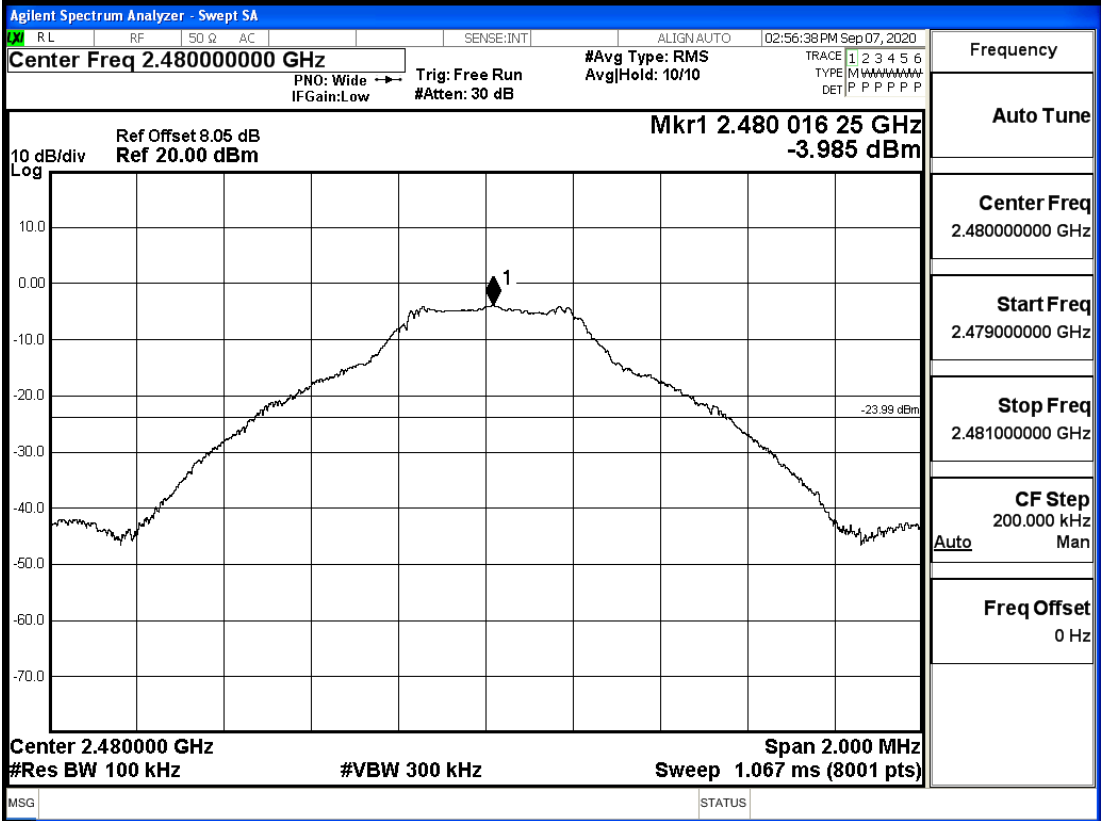


Puw

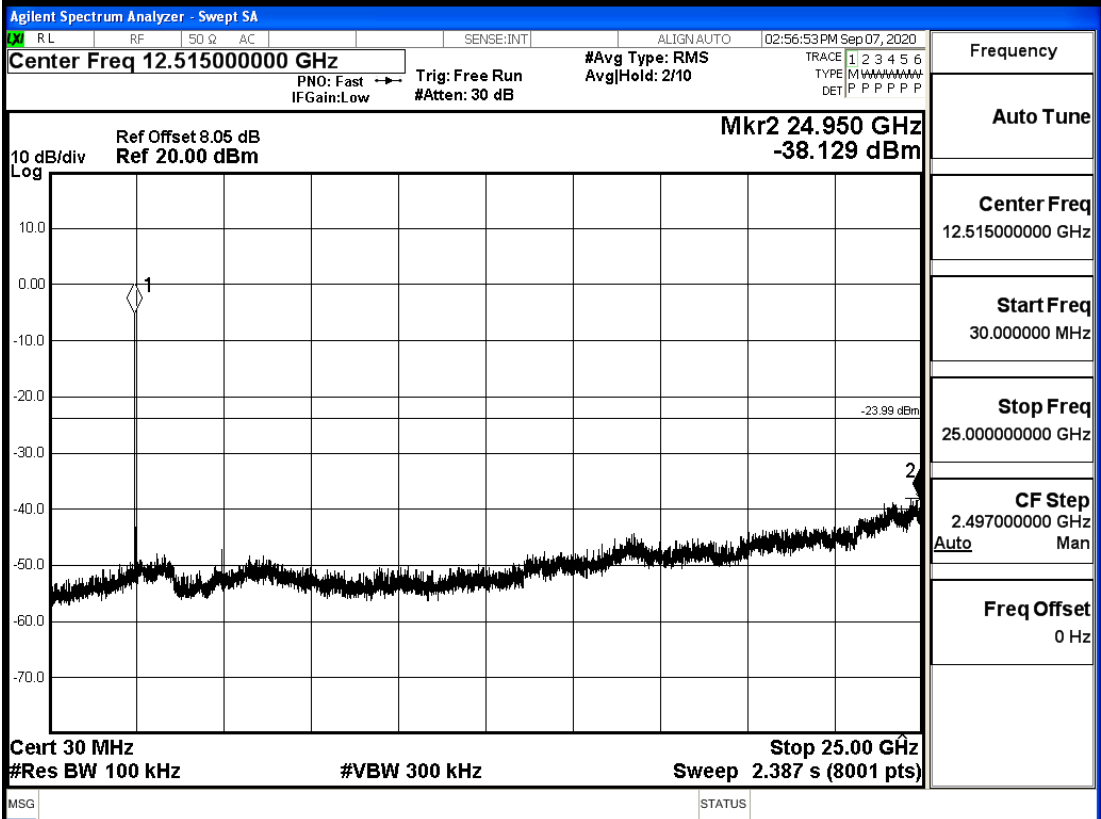


GFSK_HCH_Graphs

Pref

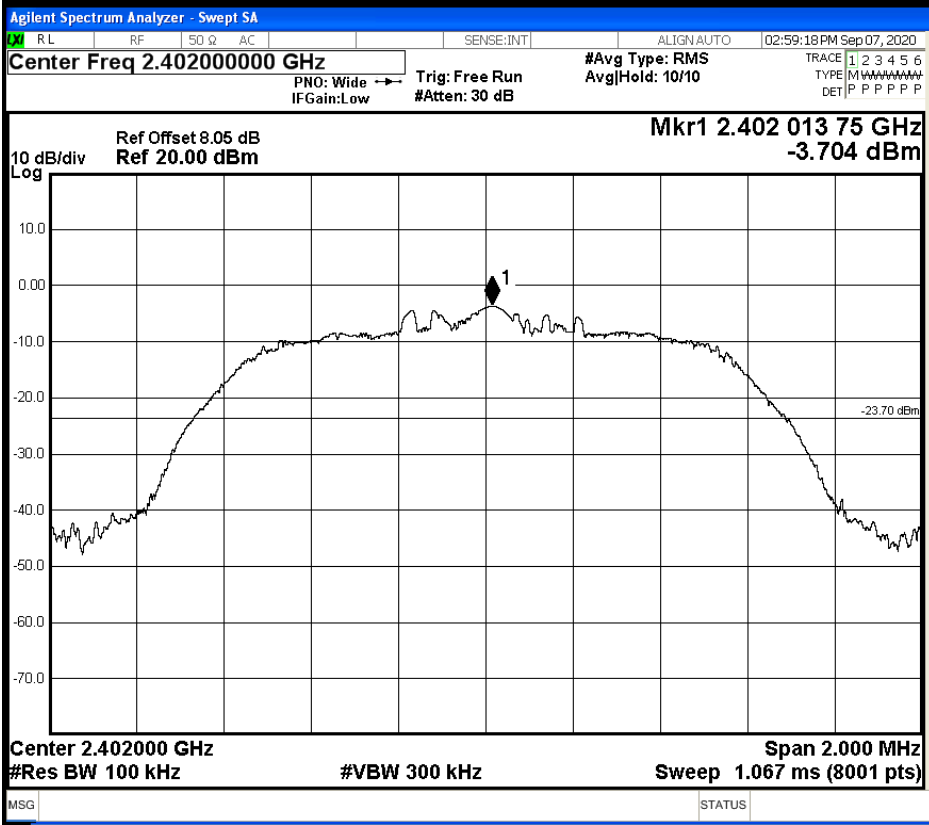


Puw



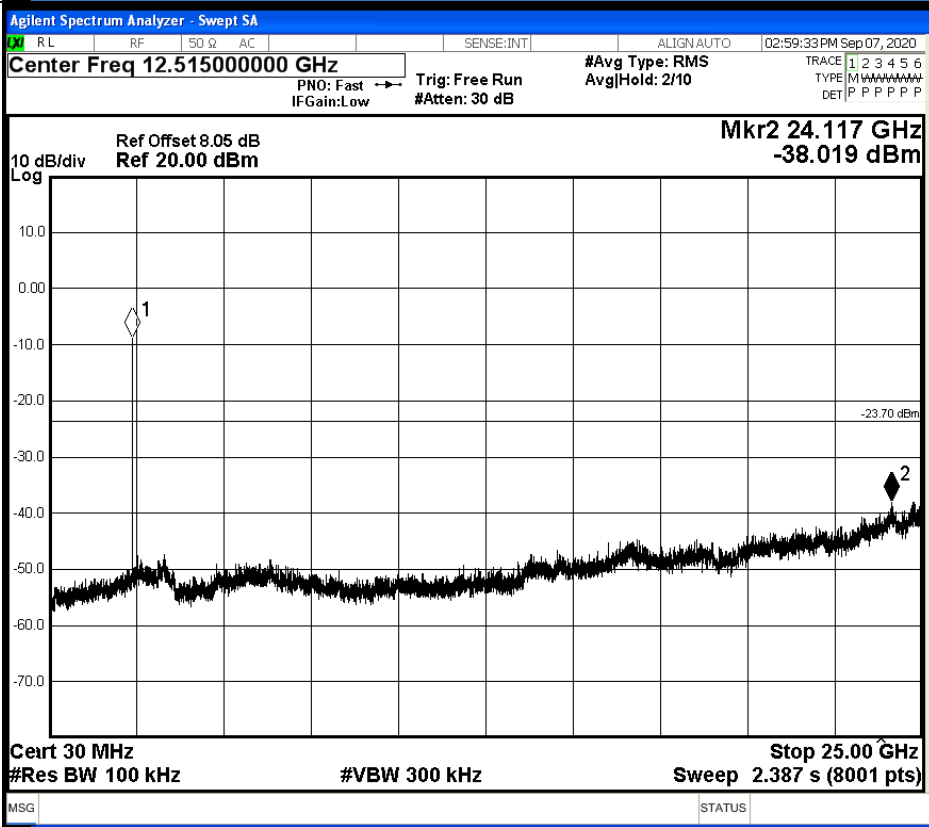
$\pi/4$ DQPSK_LCH_Graphs

Pref



| |
|------------------------------------|
| Frequency |
| Auto Tune |
| Center Freq 2.402000000 GHz |
| Start Freq 2.401000000 GHz |
| Stop Freq 2.403000000 GHz |
| CF Step 200.000 kHz Auto Man |
| Freq Offset 0 Hz |

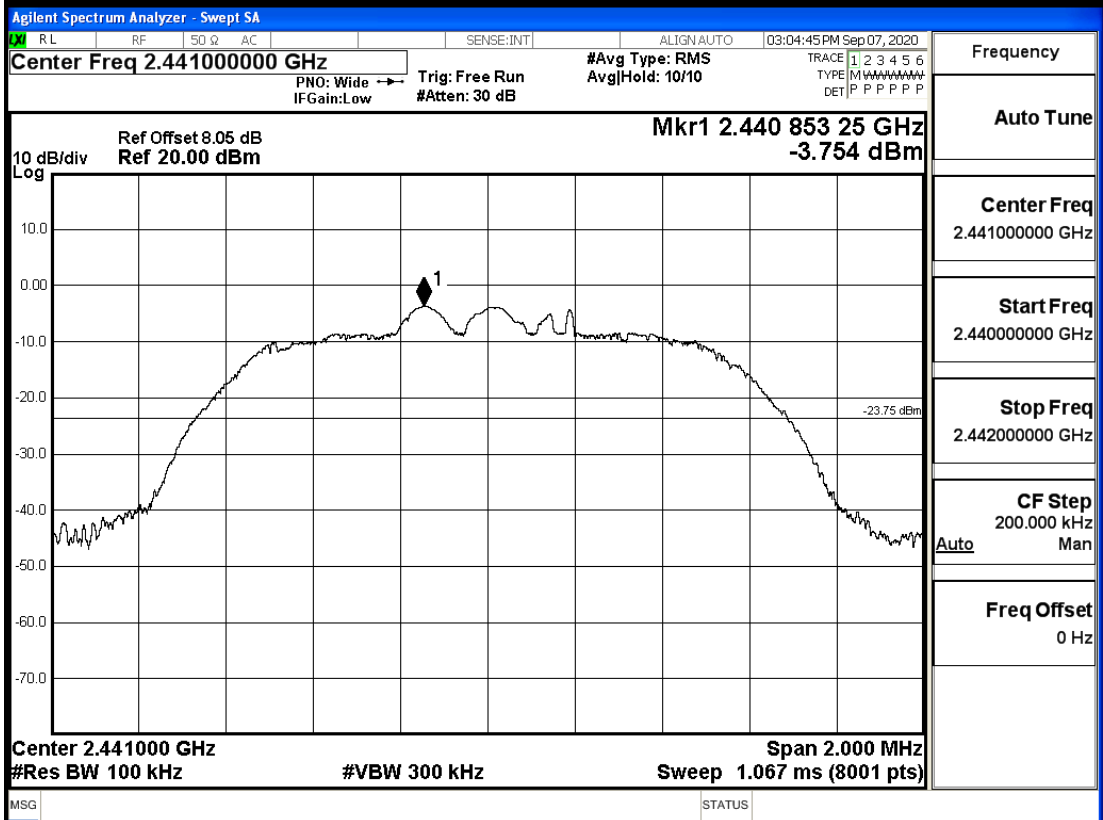
Puw



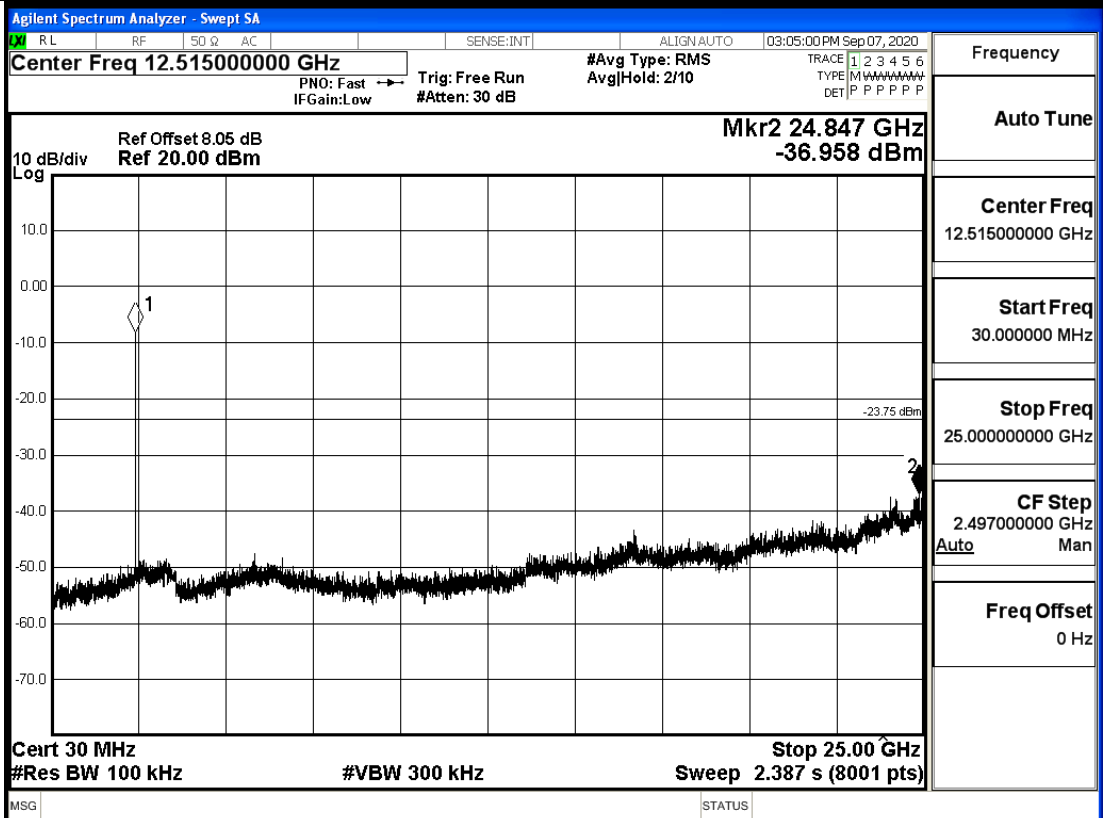
| |
|--|
| Frequency |
| Auto Tune |
| Center Freq 12.515000000 GHz |
| Start Freq 30.000000 MHz |
| Stop Freq 25.000000000 GHz |
| CF Step 2.497000000 GHz Auto Man |
| Freq Offset 0 Hz |

$\pi/4$ DQPSK_MCH_Graphs

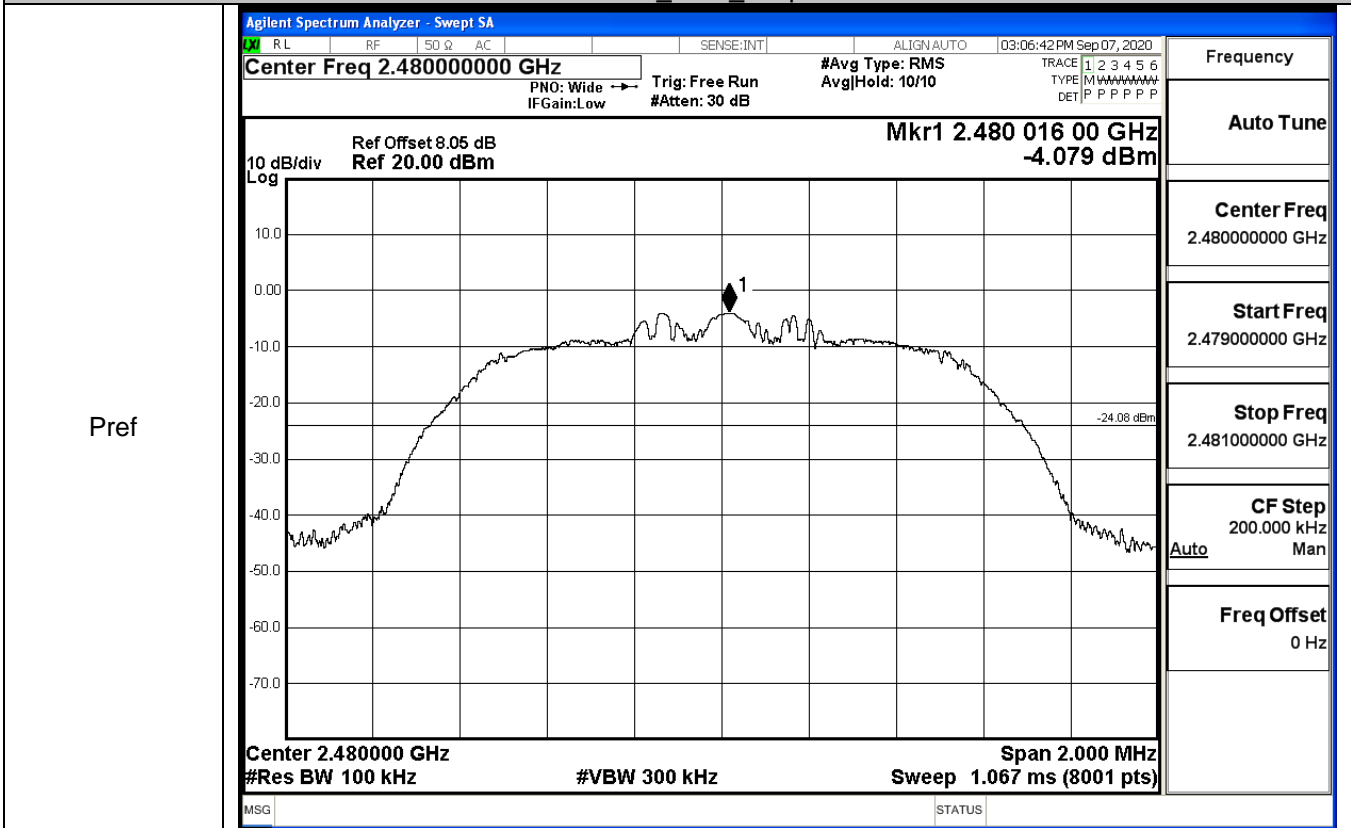
Pref



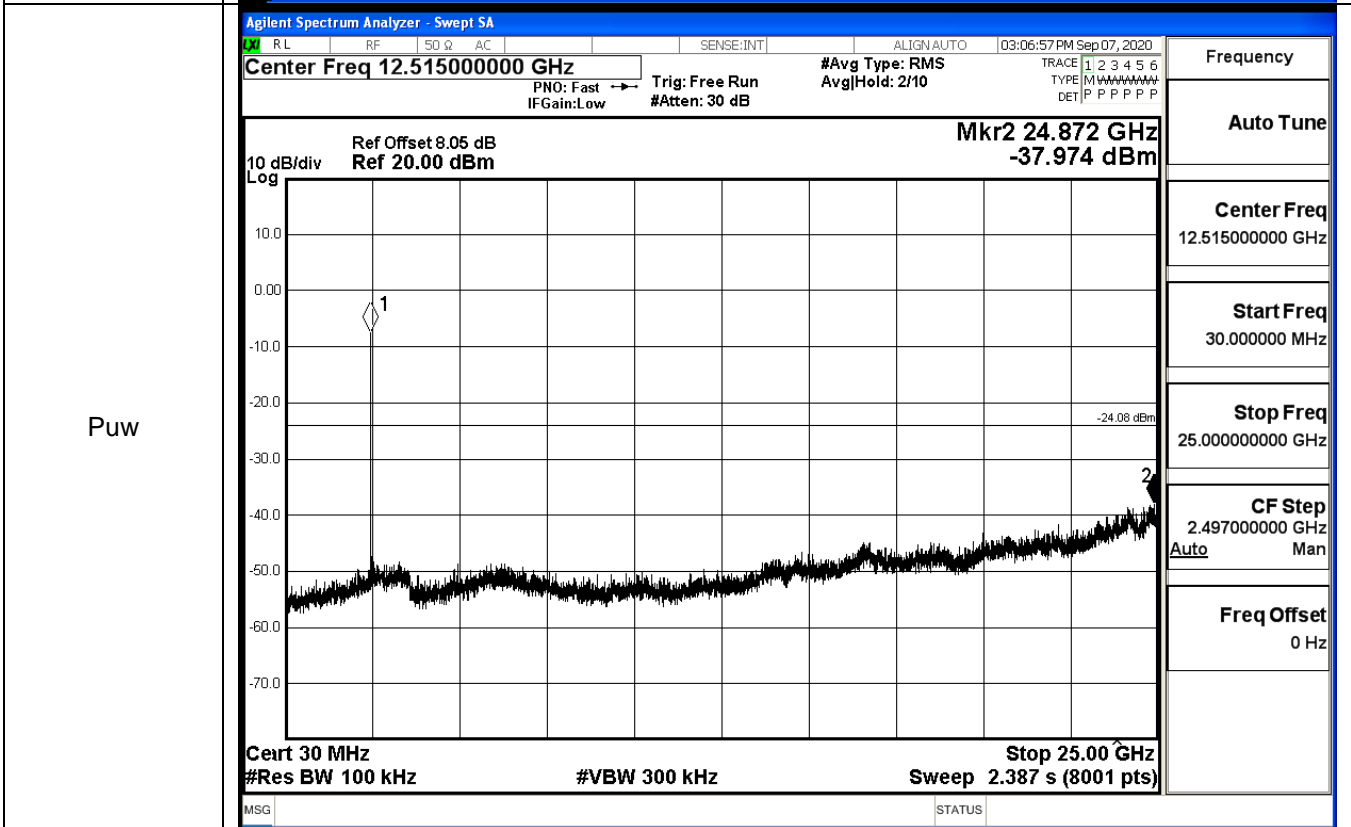
Puw



$\pi/4$ 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 | -3.693 | Off | -49.009 | -23.69 | PASS |
| | | | -3.583 | On | -49.305 | -23.58 | PASS |
| | HCH | 2480 | -3.937 | Off | -43.281 | -23.94 | PASS |
| | | | -3.765 | On | -45.266 | -23.77 | PASS |
| π/4DQPSK | LCH | 2402 | -4.366 | Off | -47.874 | -24.37 | PASS |
| | | | -3.507 | On | -48.832 | -23.51 | PASS |
| | HCH | 2480 | -3.999 | Off | -47.320 | -24 | PASS |
| | | | -3.625 | On | -48.402 | -23.63 | PASS |

Test Graphs

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.357000000 GHz #Avg Type: RMS
 PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB AvgJHold: 10/10

Ref Offset 8.05 dB Mkr 2.374 355 GHz
 Ref 20.00 dBm -49.009 dBm

10 dB/div Log

Start 2.31000 GHz Stop 2.40400 GHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 9.067 ms (8001 pts)

| MKR | MODE | TRC | SCL | X | Y | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-----|---------------|-------------|----------|----------------|----------------|
| 1 | N | f | | 2.402 014 GHz | -3.693 dBm | | | |
| 2 | N | f | | 2.400 000 GHz | -51.610 dBm | | | |
| 3 | N | f | | 2.390 000 GHz | -51.513 dBm | | | |
| 4 | N | f | | 2.374 355 GHz | -49.009 dBm | | | |

MSG STATUS

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

GFSK/LCH/No Hop

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.400000000 GHz #Avg Type: RMS
 PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB AvgJHold: 10/10

Ref Offset 8.05 dB Mkr4 2.387 340 0 GHz
 Ref 20.00 dBm -49.305 dBm

10 dB/div Log

Center 2.40000 GHz Span 60.00 MHz
 Res BW 100 kHz #VBW 300 kHz Sweep 5.867 ms (8001 pts)

| MKR | MODE | TRC | SCL | X | Y | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-----|-----------------|-------------|----------|----------------|----------------|
| 1 | N | f | | 2.416 020 0 GHz | -3.583 dBm | | | |
| 2 | N | f | | 2.400 000 0 GHz | -46.665 dBm | | | |
| 3 | N | f | | 2.390 000 0 GHz | -51.077 dBm | | | |
| 4 | N | f | | 2.387 340 0 GHz | -49.305 dBm | | | |

MSG STATUS

Frequency

Auto Tune

Center Freq
2.400000000 GHz

Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

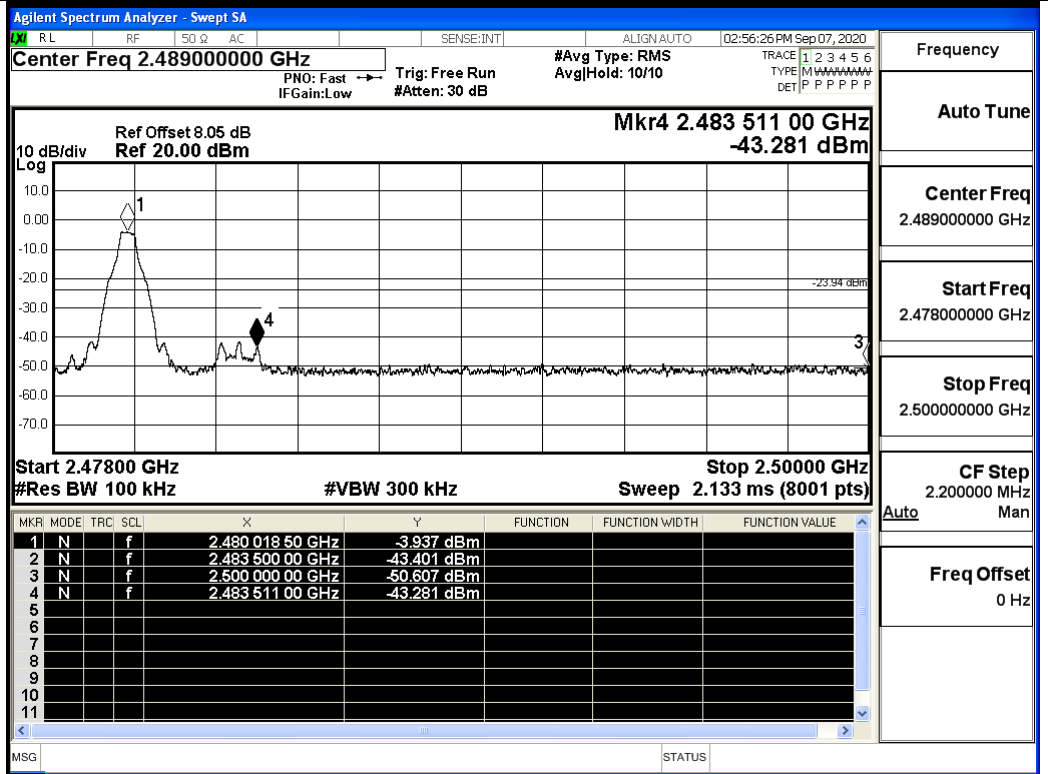
CF Step
6.000000 MHz

Auto Man

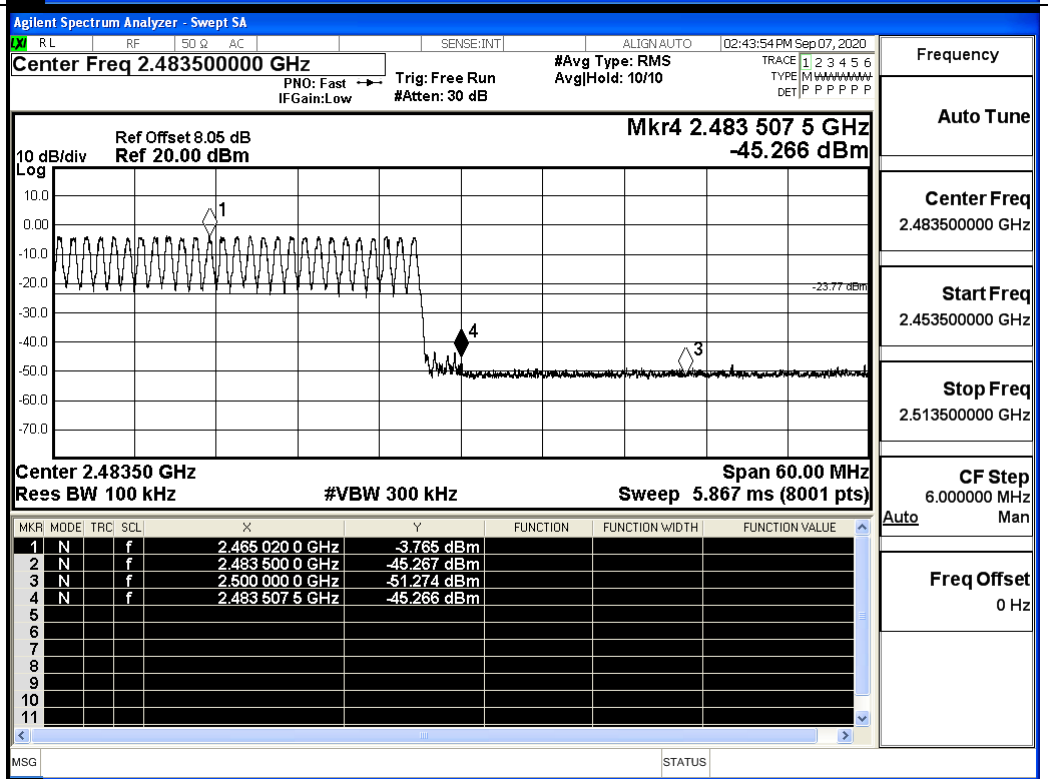
Freq Offset
0 Hz

GFSK/LCH/Hop

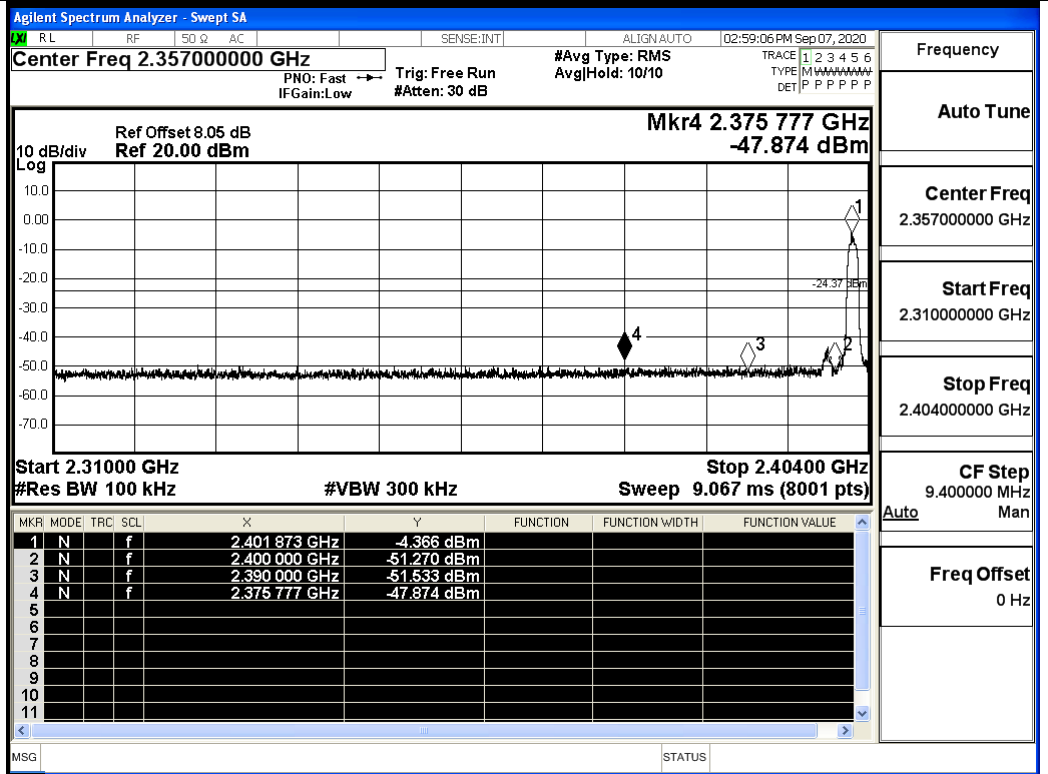
GFSK/HCH/No Hop



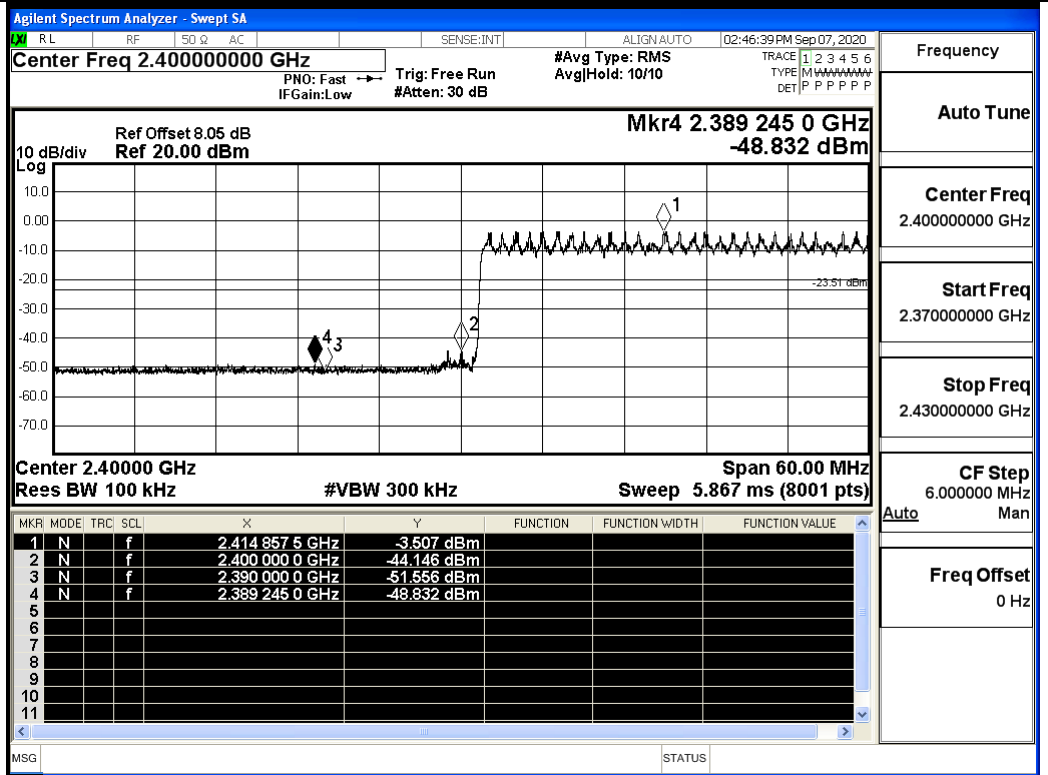
GFSK/HCH/Hop



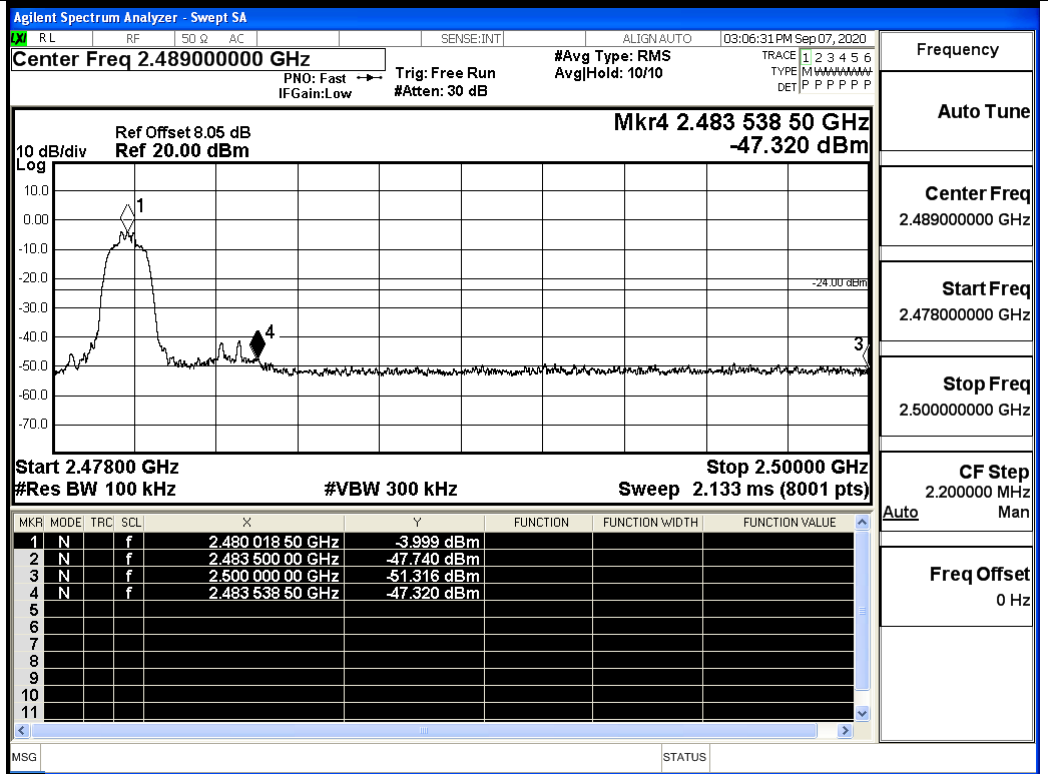
$\pi/4$ DQPSK/LCH/No
Hop



$\pi/4$ DQPSK/LCH/Hop

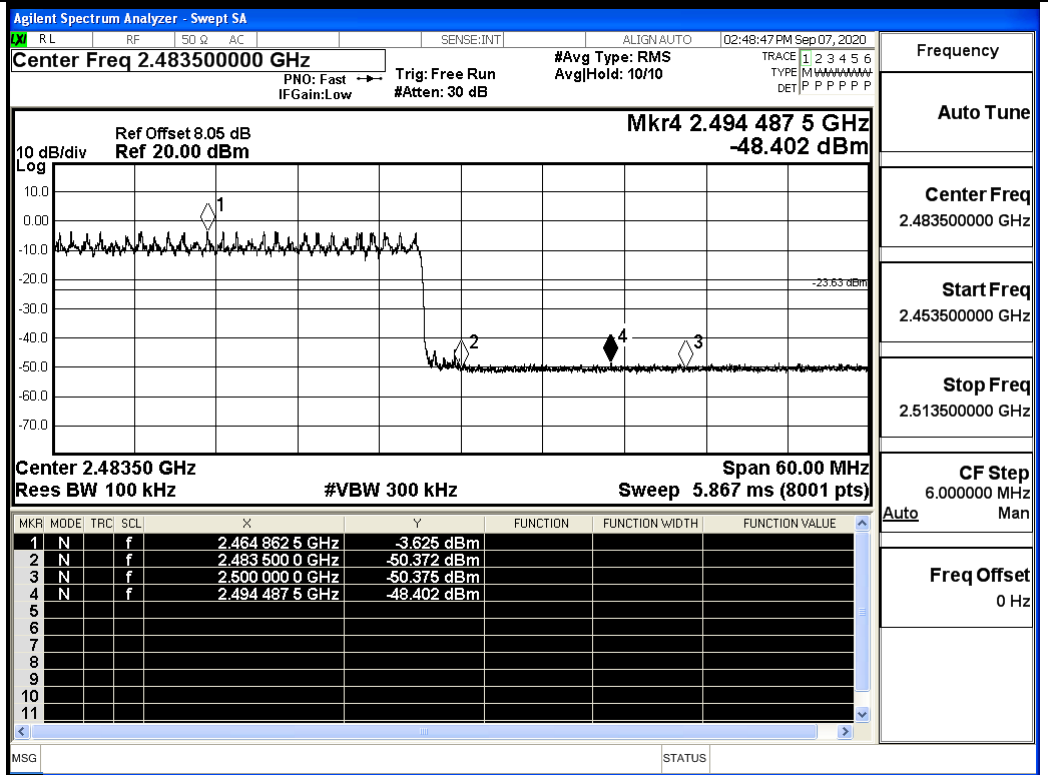


$\pi/4$ DQPSK/HCH/No
Hop



| | |
|-------------|-----------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.489000000 GHz |
| Start Freq | 2.478000000 GHz |
| Stop Freq | 2.500000000 GHz |
| CF Step | 2.2000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

$\pi/4$ DQPSK/HCH/Hop

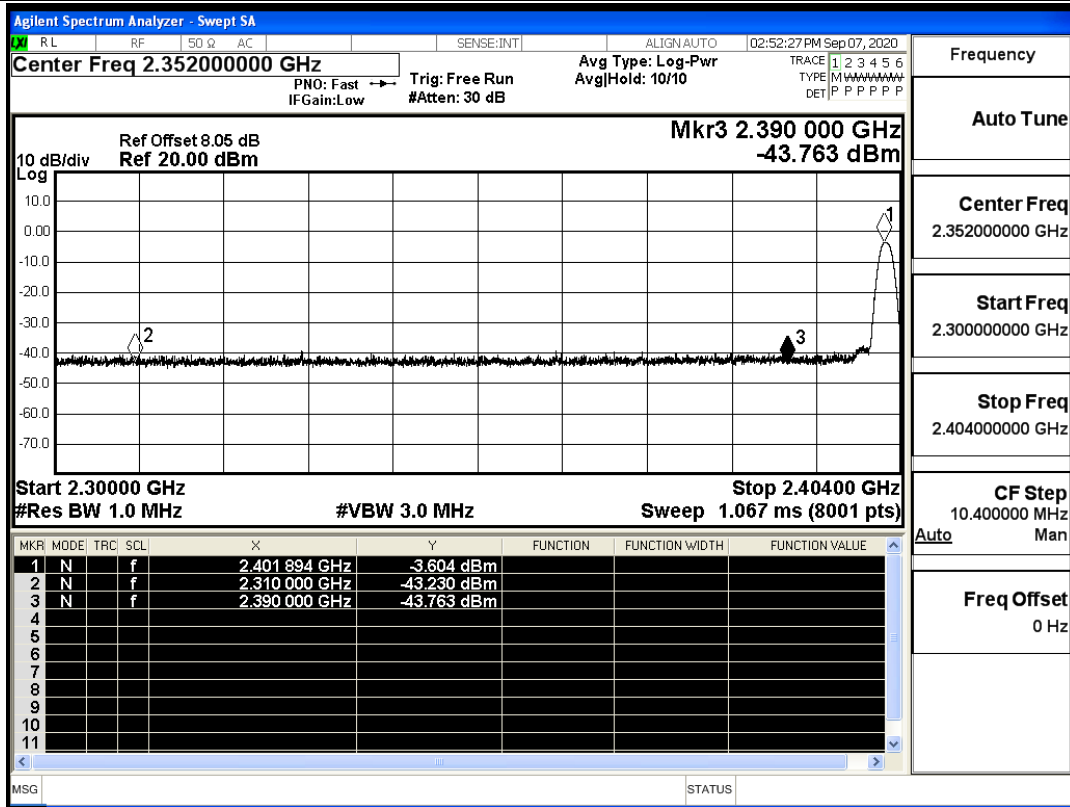


| | |
|-------------|-----------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.483500000 GHz |
| Start Freq | 2.453500000 GHz |
| Stop Freq | 2.513500000 GHz |
| CF Step | 6.0000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

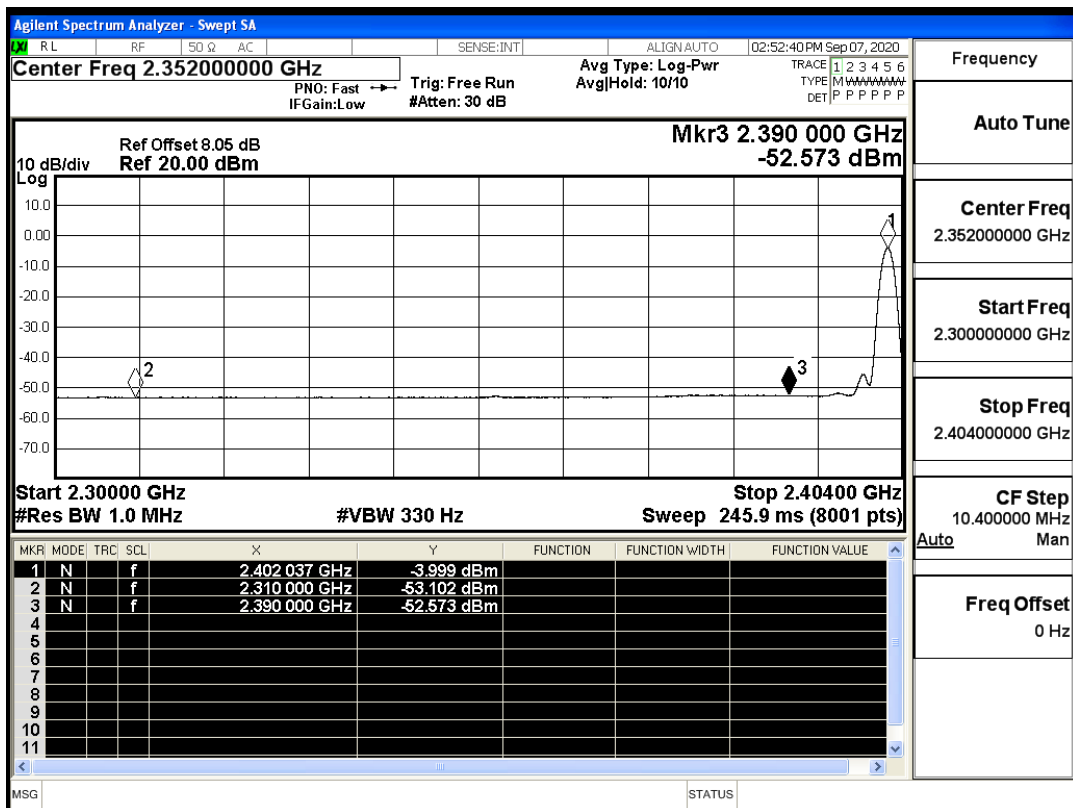
A.8 Restrict-band band-edge measurements

| Test Mode | Hopping | Freq. | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK | Off | 2310.0 | -43.23 | 2.0 | 0 | 52.03 | PEAK | 74 | PASS |
| | Off | 2310.0 | -53.10 | 2.0 | 0 | 42.16 | AV | 54 | PASS |
| | Off | 2390.0 | -43.76 | 2.0 | 0 | 51.49 | PEAK | 74 | PASS |
| | Off | 2390.0 | -52.57 | 2.0 | 0 | 42.68 | AV | 54 | PASS |
| | Off | 2483.5 | -38.50 | 2.0 | 0 | 56.76 | PEAK | 74 | PASS |
| | Off | 2483.5 | -46.94 | 2.0 | 0 | 48.31 | AV | 54 | PASS |
| | Off | 2500.0 | -41.64 | 2.0 | 0 | 53.62 | PEAK | 74 | PASS |
| | Off | 2500.0 | -51.89 | 2.0 | 0 | 43.36 | AV | 54 | PASS |
| $\pi/4$ DQPSK | Off | 2310.0 | -42.51 | 2.0 | 0 | 52.74 | PEAK | 74 | PASS |
| | Off | 2310.0 | -53.12 | 2.0 | 0 | 42.14 | AV | 54 | PASS |
| | Off | 2390.0 | -42.16 | 2.0 | 0 | 53.10 | PEAK | 74 | PASS |
| | Off | 2390.0 | -52.58 | 2.0 | 0 | 42.68 | AV | 54 | PASS |
| | Off | 2483.5 | -39.24 | 2.0 | 0 | 56.02 | PEAK | 74 | PASS |
| | Off | 2483.5 | -49.33 | 2.0 | 0 | 45.92 | AV | 54 | PASS |
| | Off | 2500.0 | -41.27 | 2.0 | 0 | 53.98 | PEAK | 74 | PASS |
| | Off | 2500.0 | -52.01 | 2.0 | 0 | 43.25 | AV | 54 | PASS |

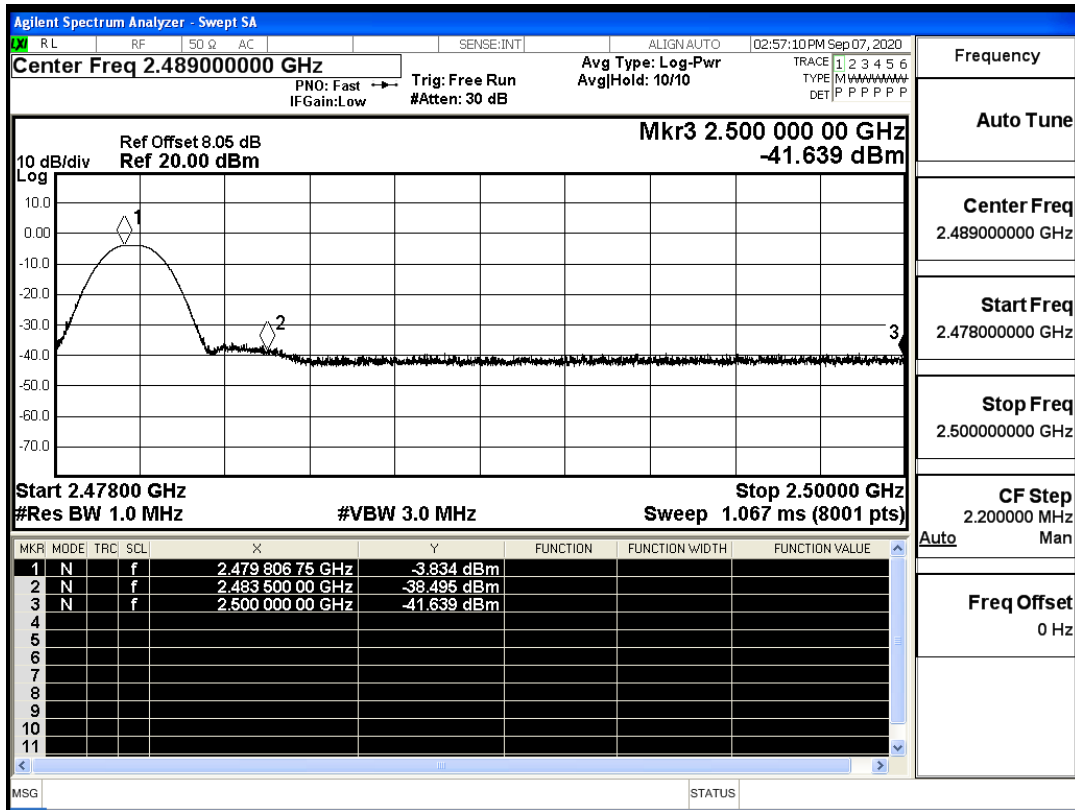
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



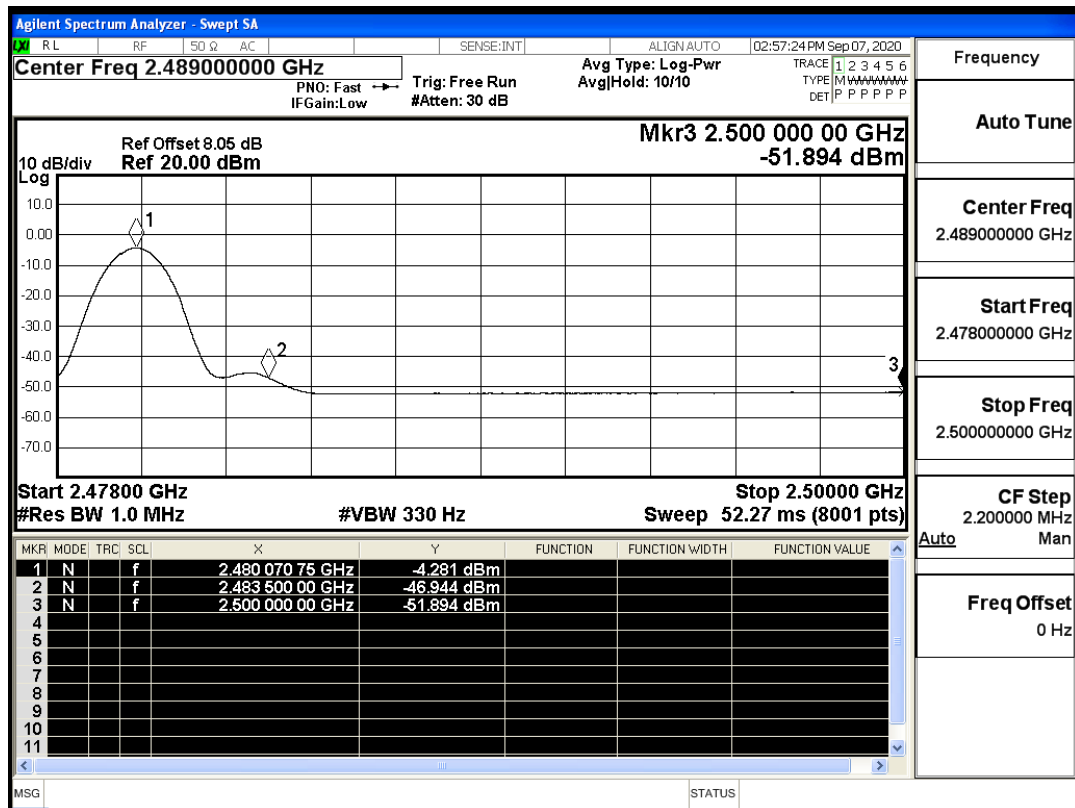
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



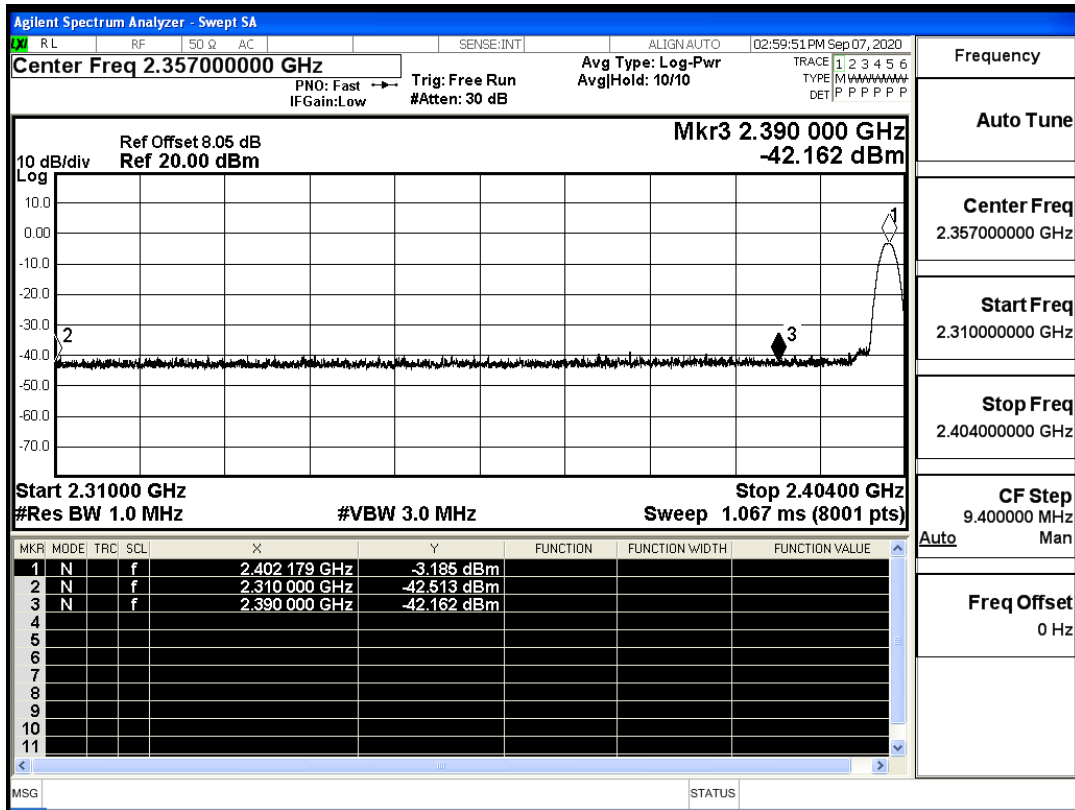
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



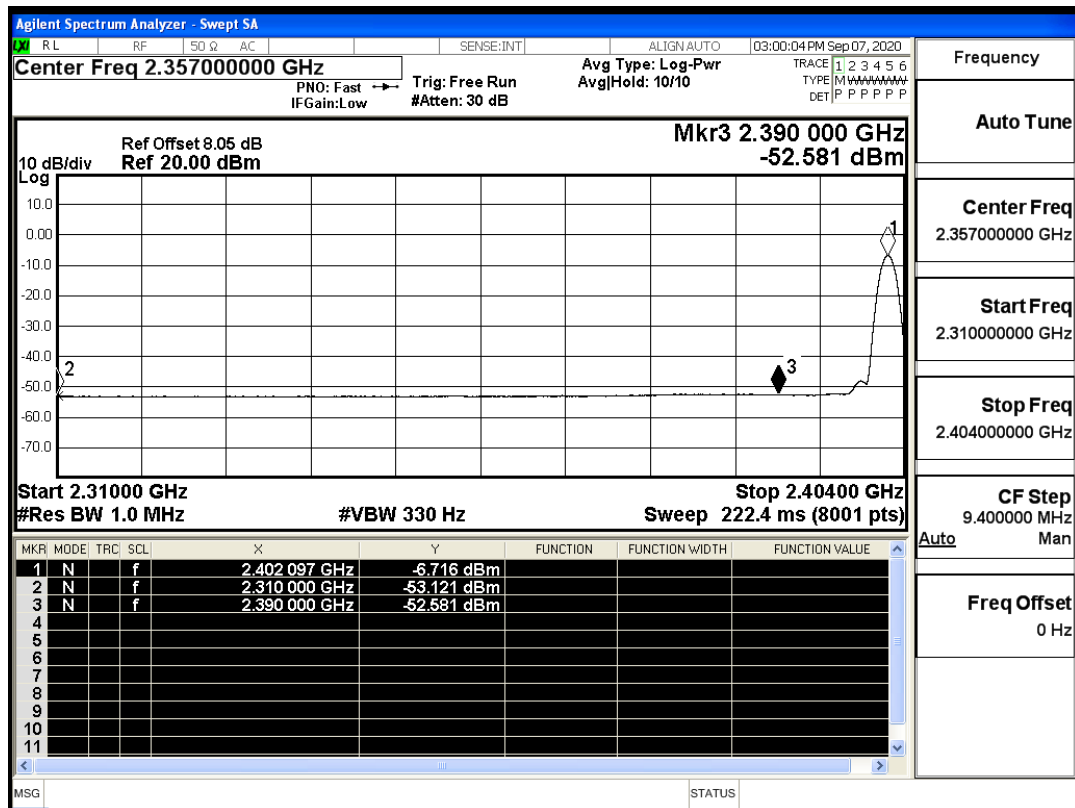
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



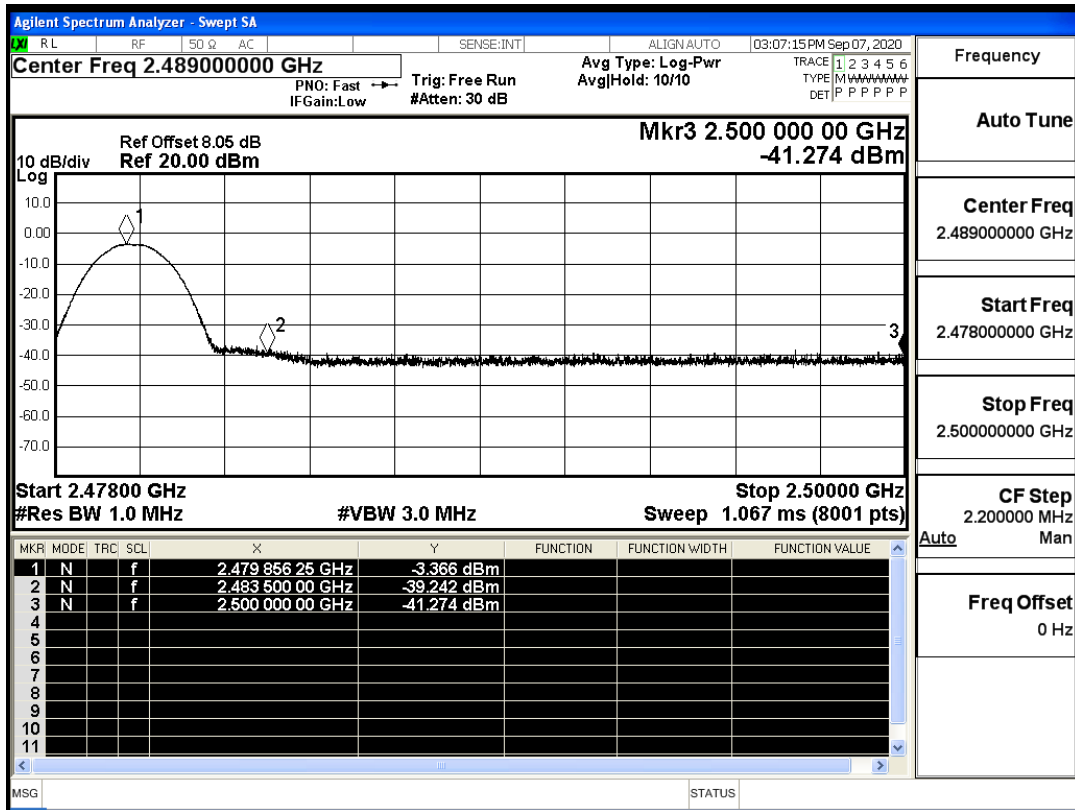
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



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)

