

Appendix A

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

Product Name: Bluetooth earbuds

Trade Mark: N/A

Test Model: D05

FCC ID: 2AJN6-D05

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 22.7° C |
| Relative Humidity: | 50% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Gary Qian |
| Supervised by: | Eden Hu |

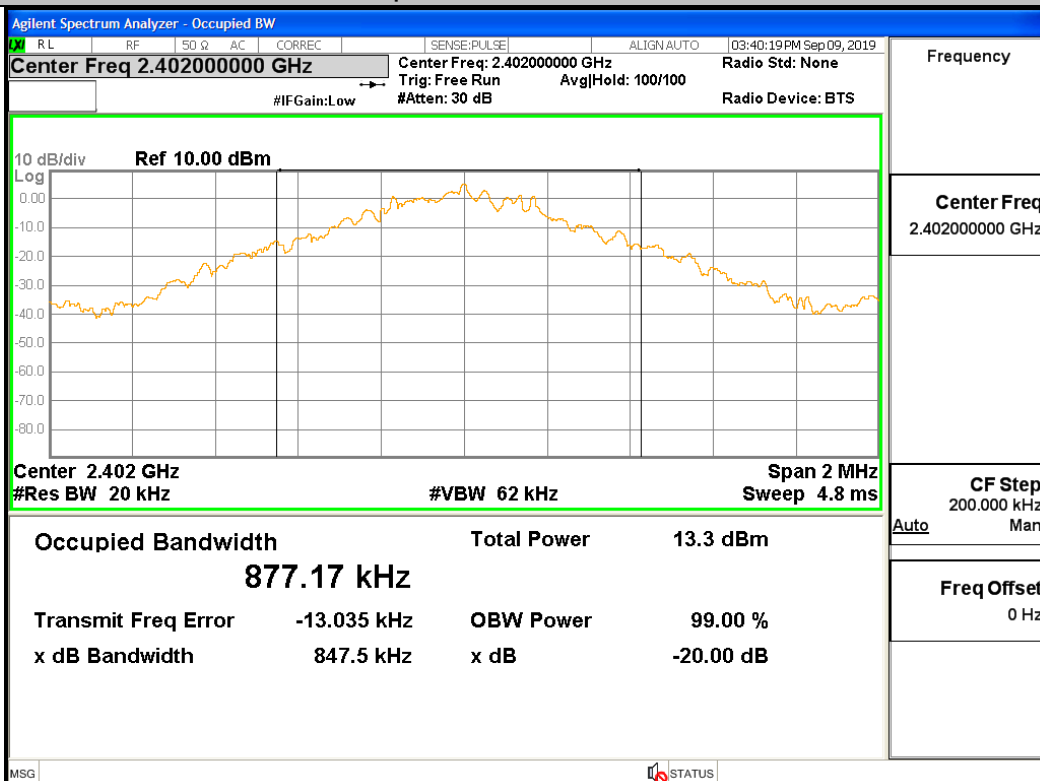
A.1 20 dB Bandwidth

| Mode | Channel. | 20dB Bandwidth [MHz] | Limit(MHz) | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK | LCH | 0.848 | Not Specified | PASS |
| GFSK | MCH | 0.853 | Not Specified | PASS |
| GFSK | HCH | 0.796 | Not Specified | PASS |
| $\pi/4$ DQPSK | LCH | 1.204 | Not Specified | PASS |
| $\pi/4$ DQPSK | MCH | 1.204 | Not Specified | PASS |
| $\pi/4$ DQPSK | HCH | 1.201 | Not Specified | PASS |
| 8DPSK | LCH | 1.246 | Not Specified | PASS |
| 8DPSK | MCH | 1.245 | Not Specified | PASS |
| 8DPSK | HCH | 1.332 | Not Specified | PASS |

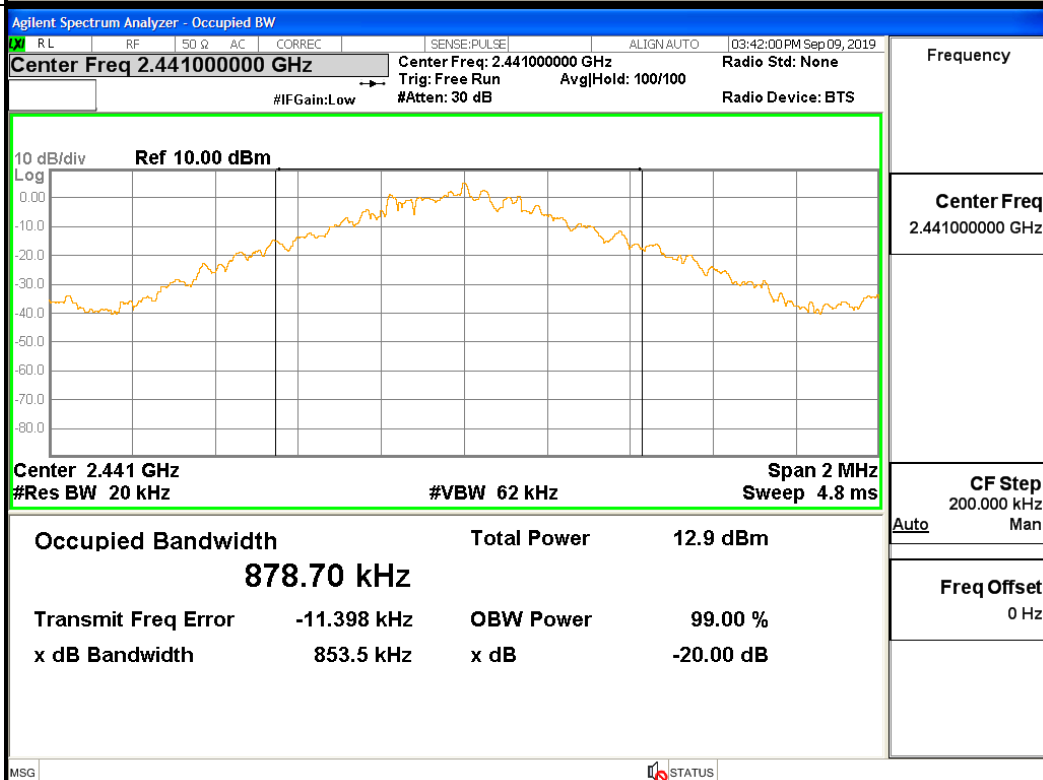
Test Graph

Graphs

GFSK/LCH



GFSK/MCH

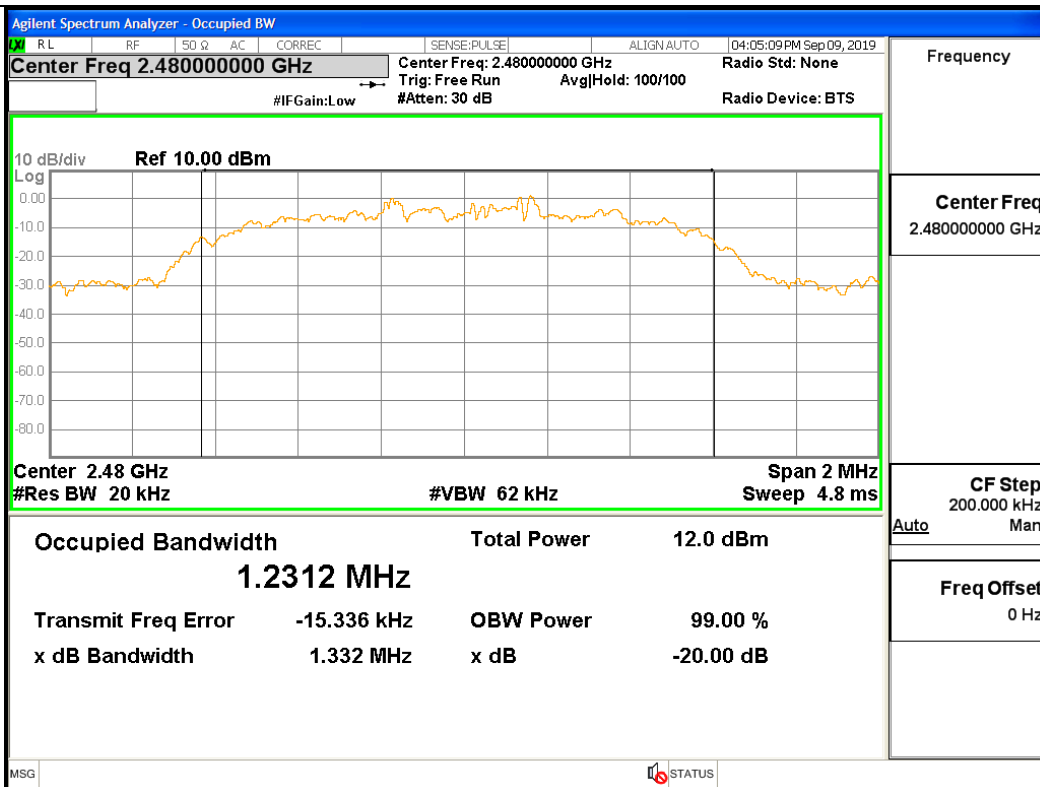


| | | |
|----------|--|--|
| GFSK/HCH | <div>Agilent Spectrum Analyzer - Occupied BW</div> <div> <div>RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN AUTO 03:43:40 PM Sep 09, 2019</div> <div>Center Freq 2.480000000 GHz Center Freq: 2.480000000 GHz Radio Std: None</div> <div>#IFGain:Low #Atten: 30 dB AvgHold: 100/100 Radio Device: BTS</div> </div> <div> </div> <div> <div>Center 2.48 GHz Span 2 MHz</div> <div>#Res BW 20 kHz #VBW 62 kHz Sweep 4.8 ms</div> </div> <div> <div>Occupied Bandwidth Total Power 12.6 dBm</div> <div>883.87 kHz</div> <div>Transmit Freq Error -8.439 kHz OBW Power 99.00 %</div> <div>x dB Bandwidth 795.9 kHz x dB -20.00 dB</div> </div> <div>MSG STATUS</div> | <div>Frequency</div> <div>Center Freq 2.480000000 GHz</div> <div>CF Step 200.000 kHz</div> <div>Auto Man</div> <div>Freq Offset 0 Hz</div> |
| | <div>Agilent Spectrum Analyzer - Occupied BW</div> <div> <div>RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN AUTO 03:47:46 PM Sep 09, 2019</div> <div>Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None</div> <div>#IFGain:Low #Atten: 30 dB AvgHold: 100/100 Radio Device: BTS</div> </div> <div> </div> <div> <div>Center 2.402 GHz Span 2 MHz</div> <div>#Res BW 20 kHz #VBW 62 kHz Sweep 4.8 ms</div> </div> <div> <div>Occupied Bandwidth Total Power 13.0 dBm</div> <div>1.2096 MHz</div> <div>Transmit Freq Error -3.411 kHz OBW Power 99.00 %</div> <div>x dB Bandwidth 1.204 MHz x dB -20.00 dB</div> </div> <div>MSG STATUS</div> | <div>Frequency</div> <div>Center Freq 2.402000000 GHz</div> <div>CF Step 200.000 kHz</div> <div>Auto Man</div> <div>Freq Offset 0 Hz</div> |





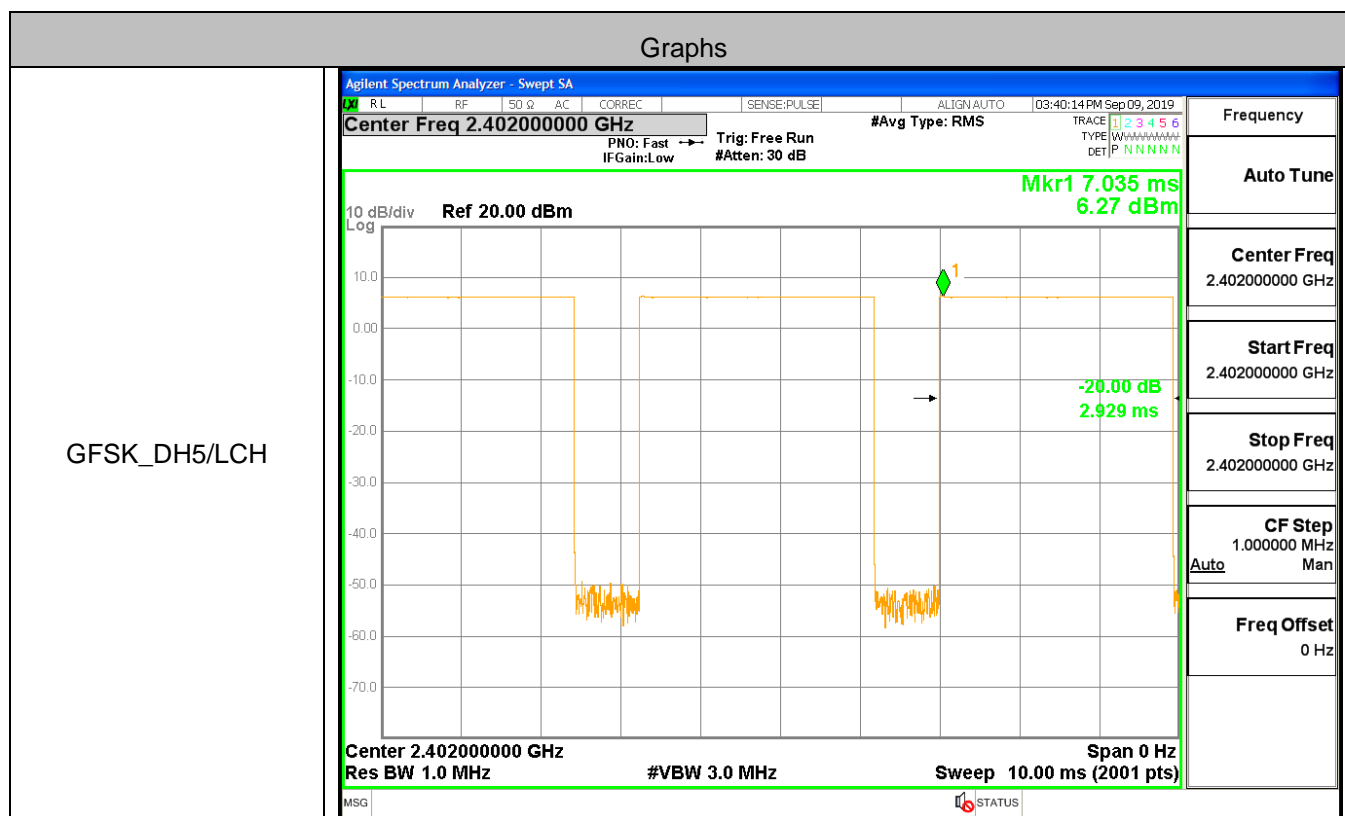
8DPSK/HCH

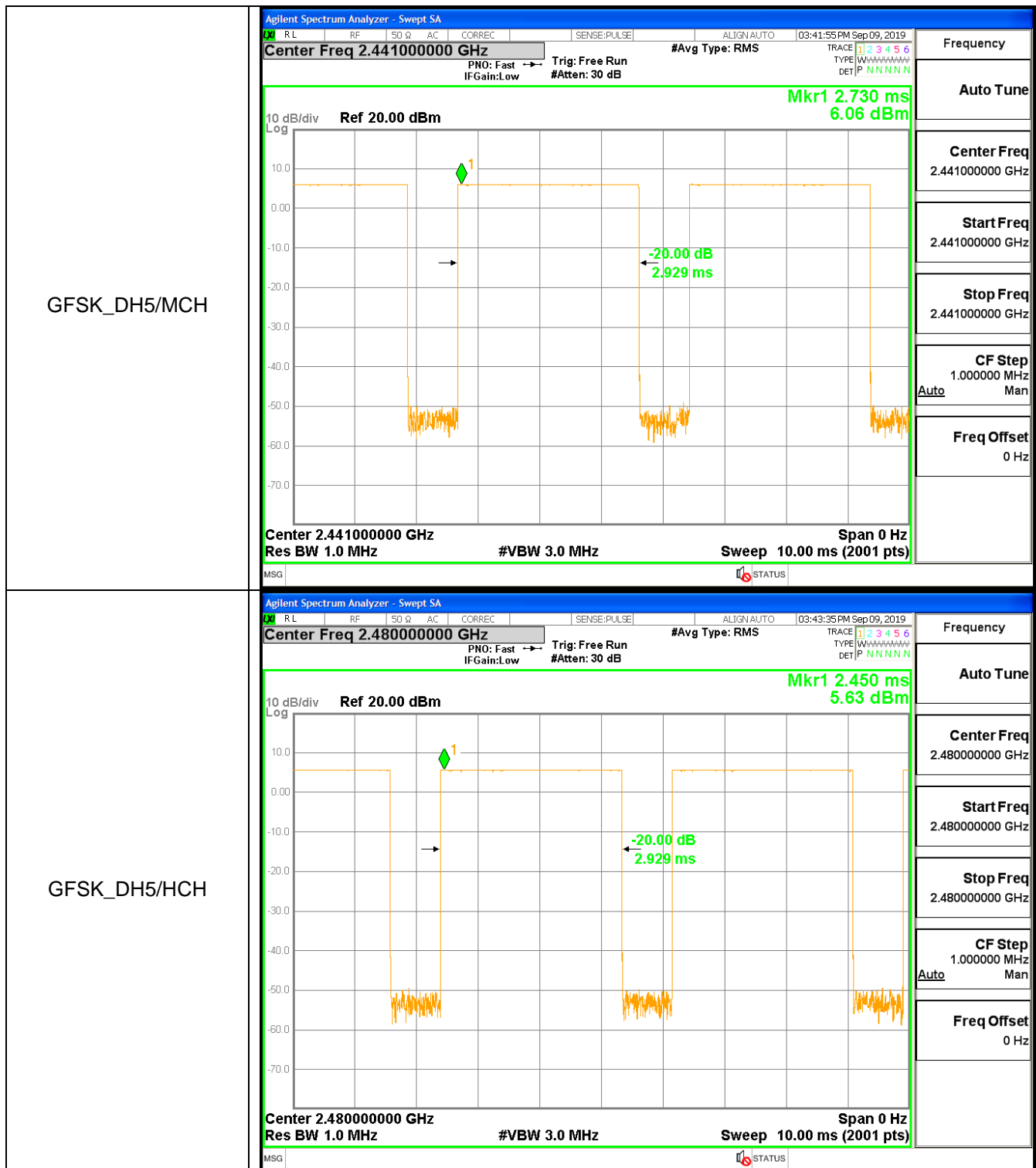


A.2 Dwell Time

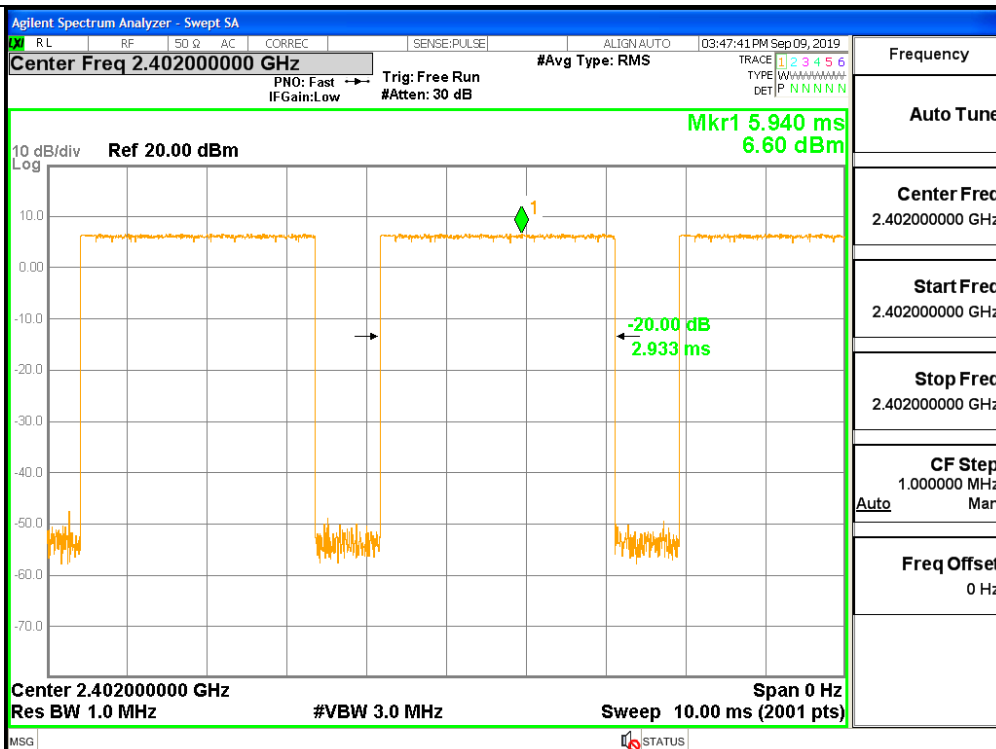
| Mode | Packet | Channel | Burst Width [s/hop/ch] | Total Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|------------------------|--------------------|---------------|-----------|---------|
| GFSK | DH5 | LCH | 0.002929 | 106.7 | 0.312485 | 0.4 | PASS |
| GFSK | DH5 | MCH | 0.002929 | 106.7 | 0.312478 | 0.4 | PASS |
| GFSK | DH5 | HCH | 0.002929 | 106.7 | 0.312488 | 0.4 | PASS |
| $\pi/4$ DQPSK | 2DH5 | LCH | 0.002933 | 106.7 | 0.312974 | 0.4 | PASS |
| $\pi/4$ DQPSK | 2DH5 | MCH | 0.002935 | 106.7 | 0.313149 | 0.4 | PASS |
| $\pi/4$ DQPSK | 2DH5 | HCH | 0.002934 | 106.7 | 0.313034 | 0.4 | PASS |
| 8DPSK | 3DH5 | LCH | 0.002937 | 106.7 | 0.313326 | 0.4 | PASS |
| 8DPSK | 3DH5 | MCH | 0.002938 | 106.7 | 0.313482 | 0.4 | PASS |
| 8DPSK | 3DH5 | HCH | 0.002938 | 106.7 | 0.313494 | 0.4 | PASS |

Test Graph

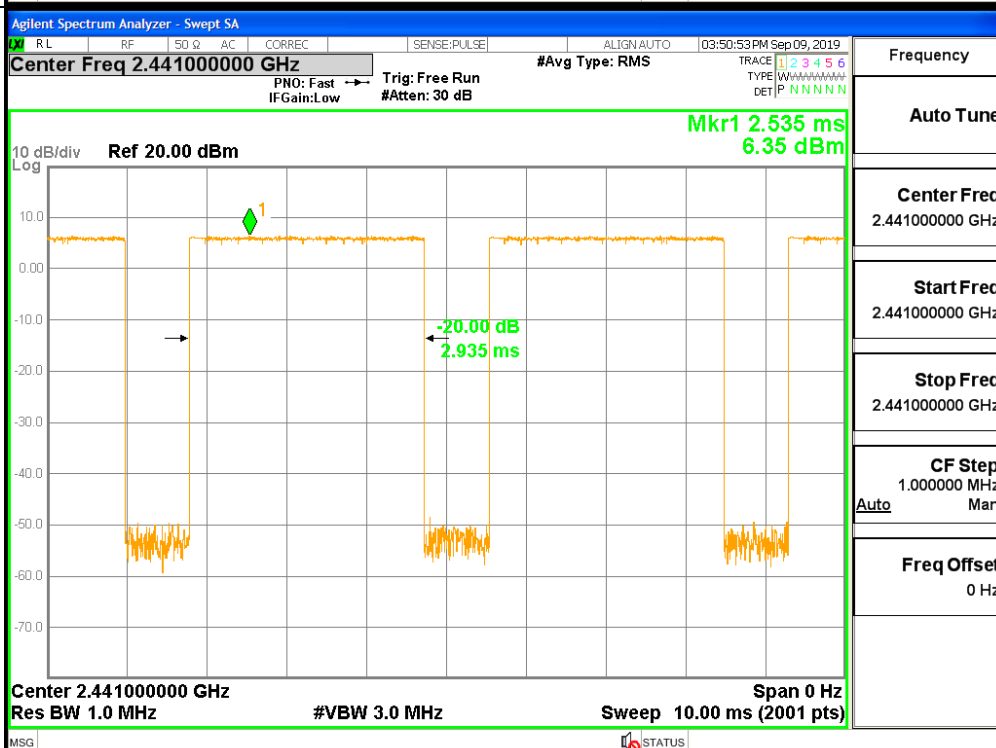




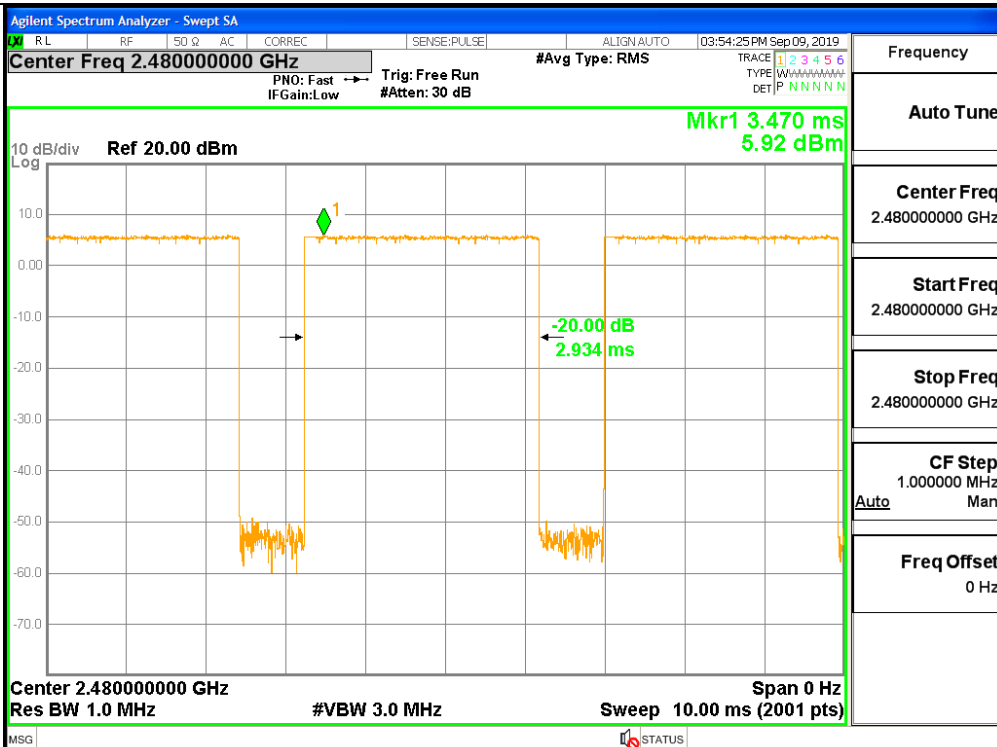
$\pi/4$ DQPSK
_2DH5/LCH



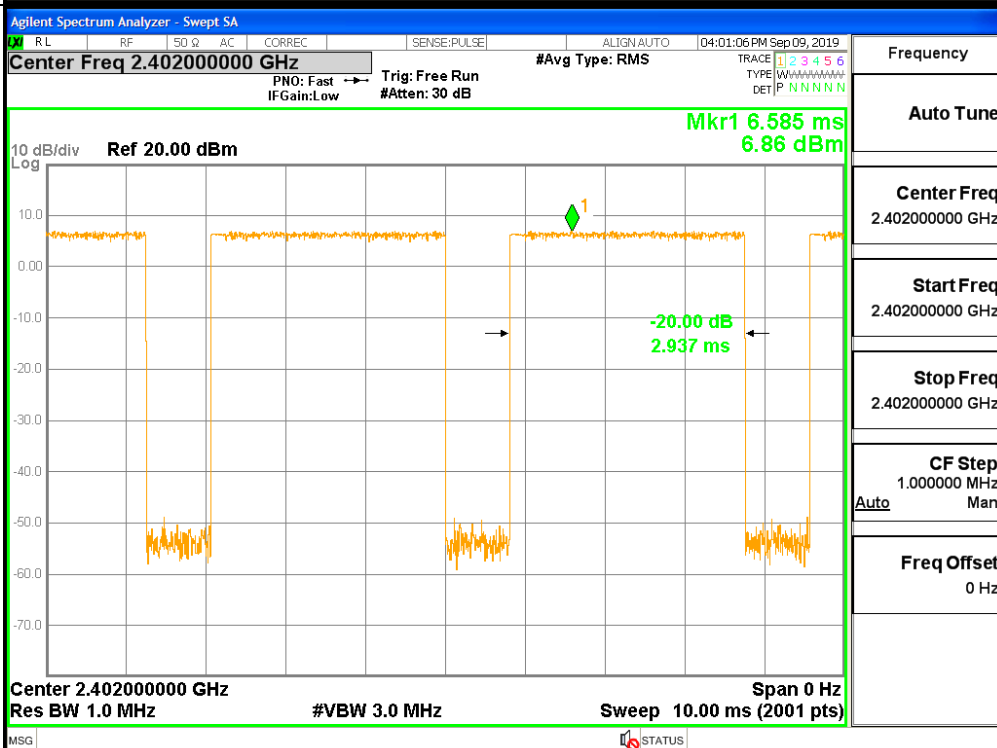
$\pi/4$ DQPSK
_2DH5/MCH

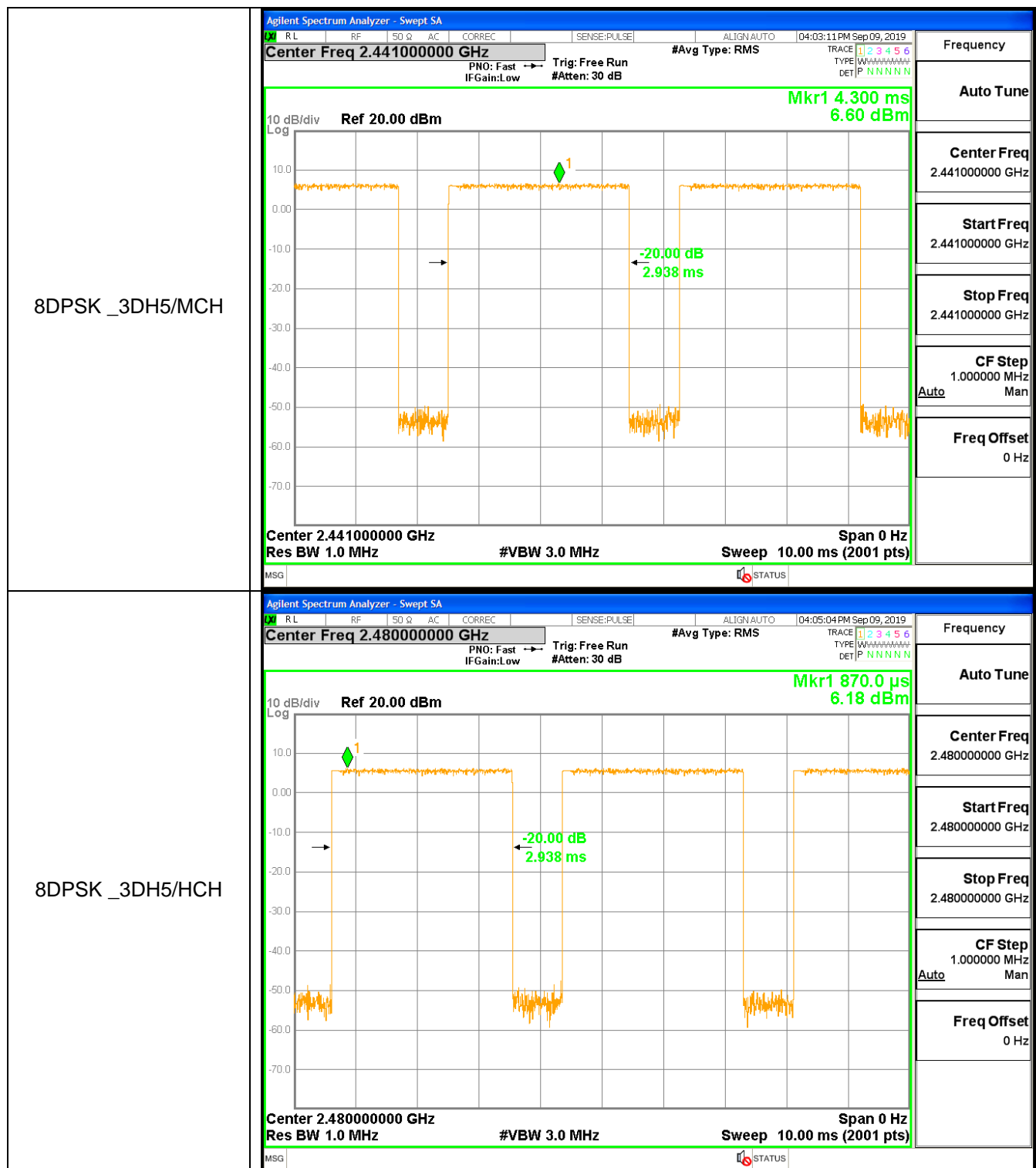


$\pi/4$ DQPSK
_2DH5/HCH



8DPSK _3DH5/LCH

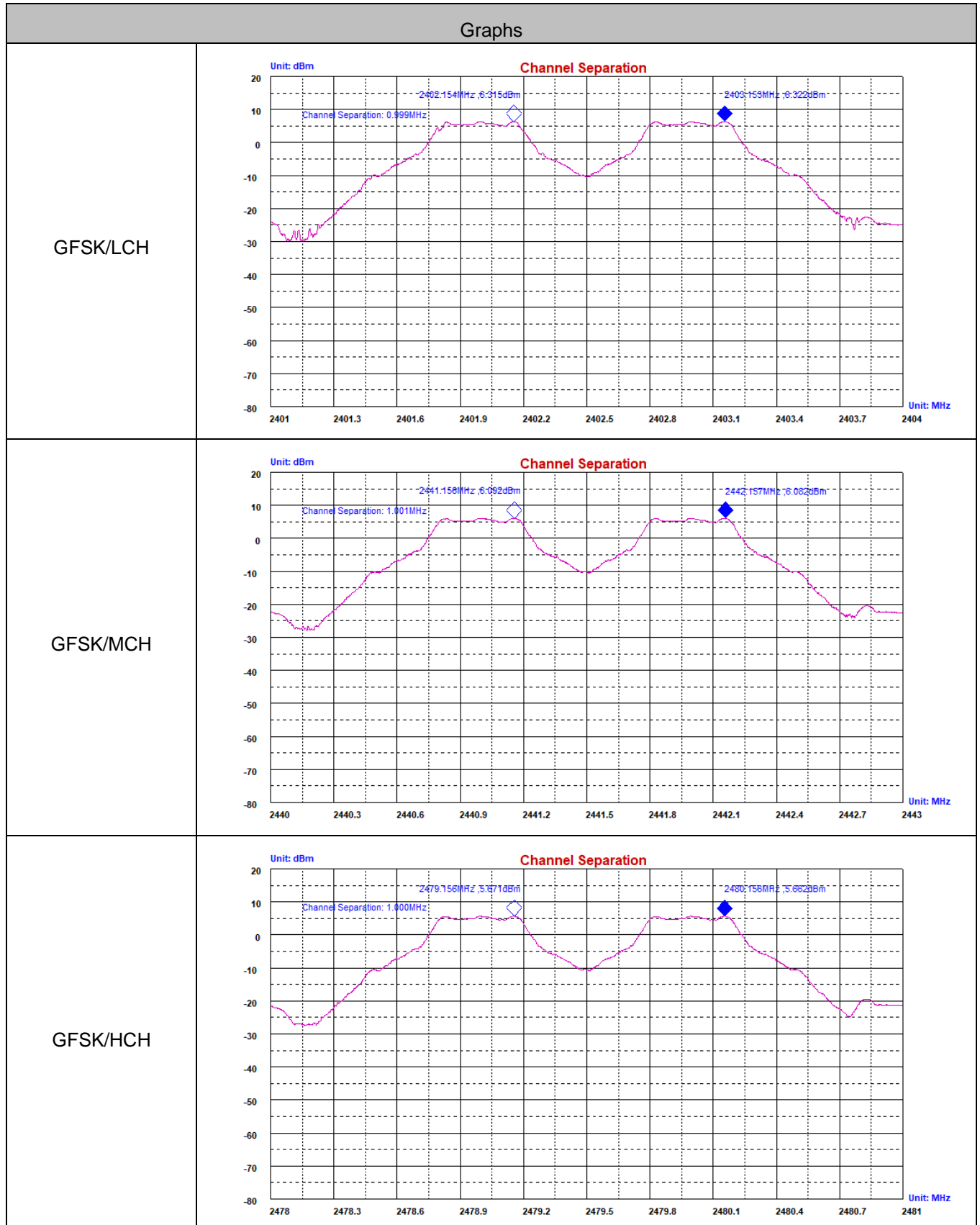


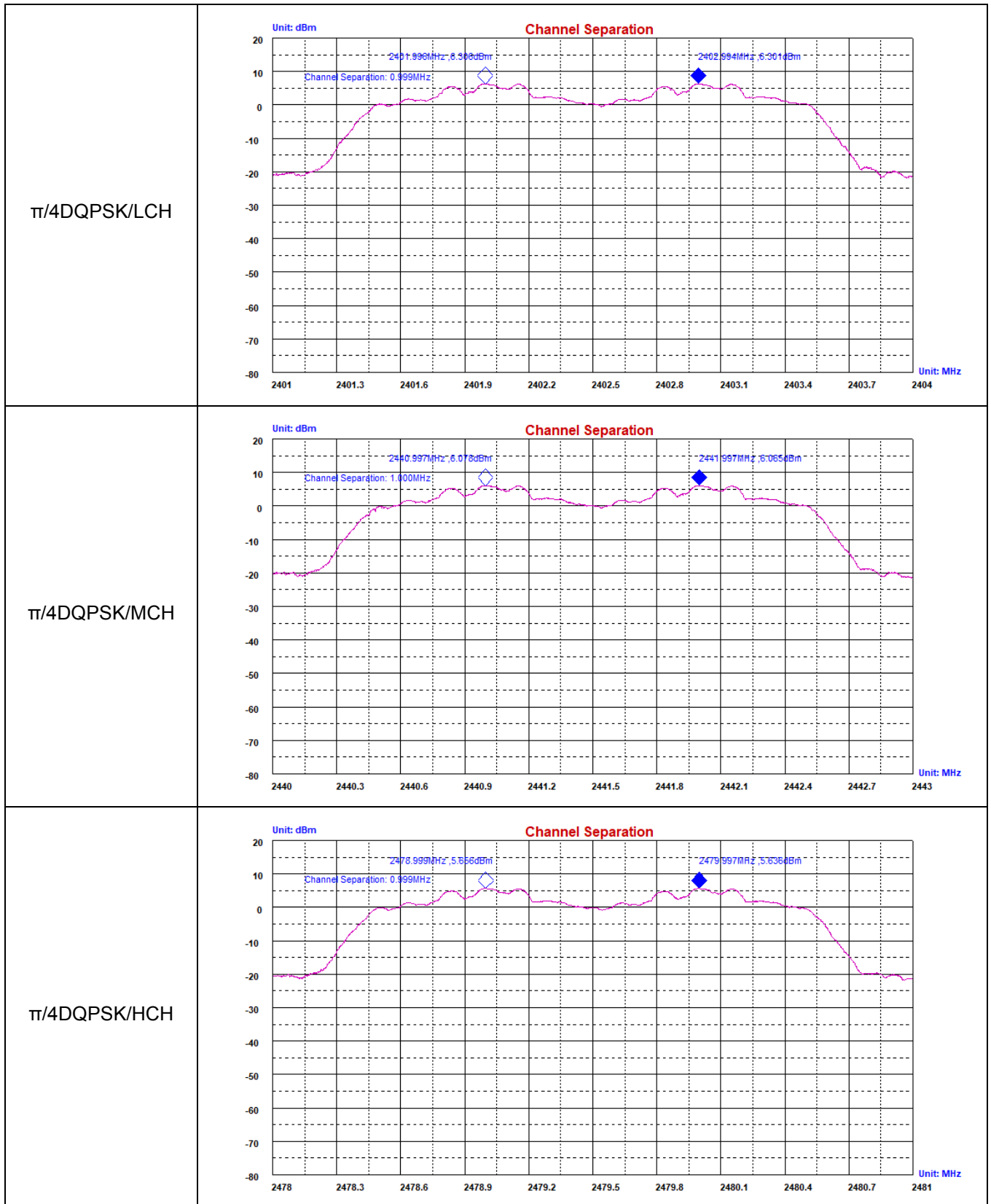


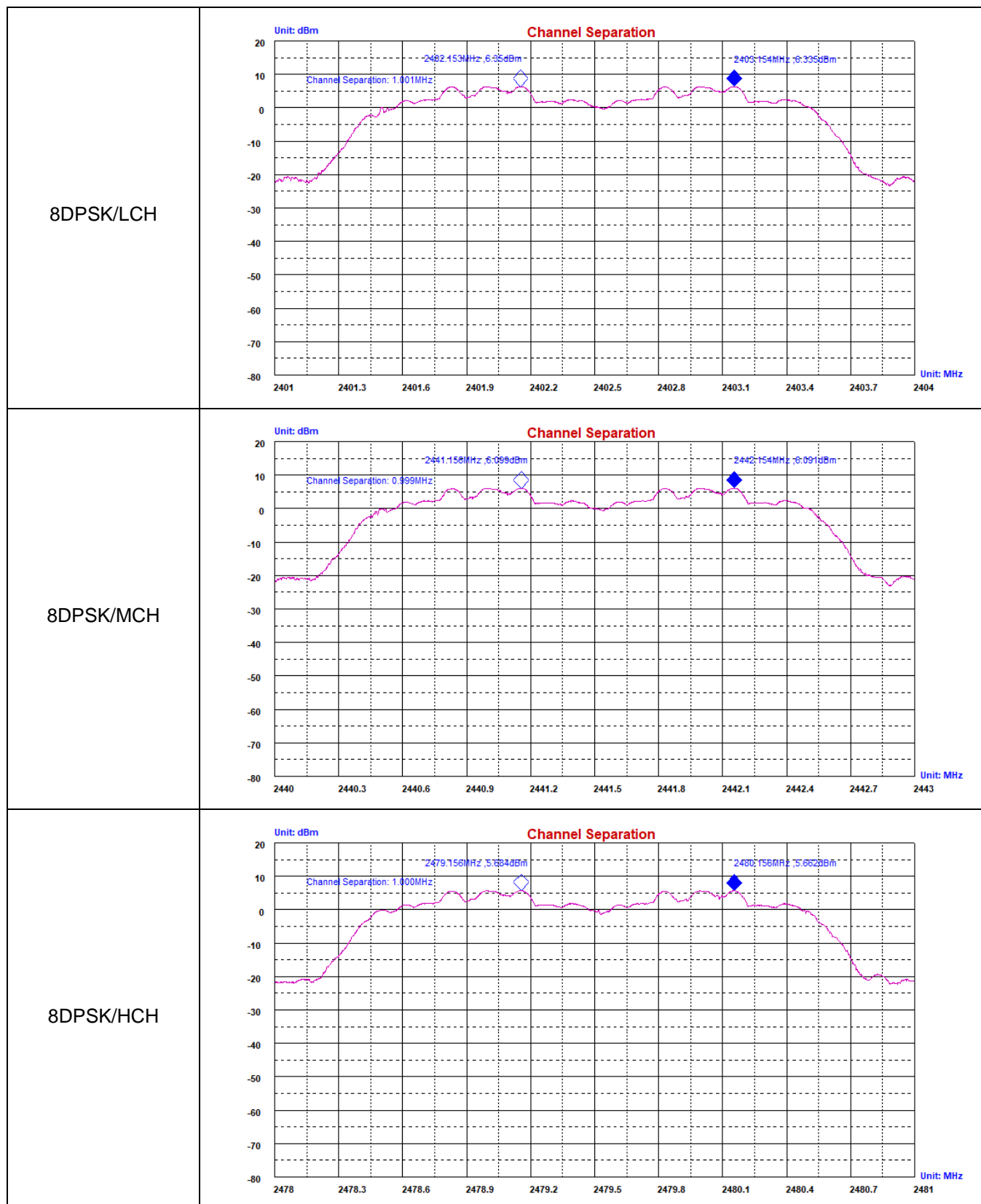
A.3 Carrier Frequency Separation

| Mode | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|---------------------------------------|----------------|---------|
| GFSK | LCH | 0.999 | 0.565 | PASS |
| GFSK | MCH | 1.001 | 0.569 | PASS |
| GFSK | HCH | 1.000 | 0.531 | PASS |
| $\pi/4$ DQPSK | LCH | 0.999 | 0.803 | PASS |
| $\pi/4$ DQPSK | MCH | 1.000 | 0.803 | PASS |
| $\pi/4$ DQPSK | HCH | 0.999 | 0.801 | PASS |
| 8DPSK | LCH | 1.001 | 0.831 | PASS |
| 8DPSK | MCH | 0.999 | 0.830 | PASS |
| 8DPSK | HCH | 1.000 | 0.888 | PASS |

Test Graph



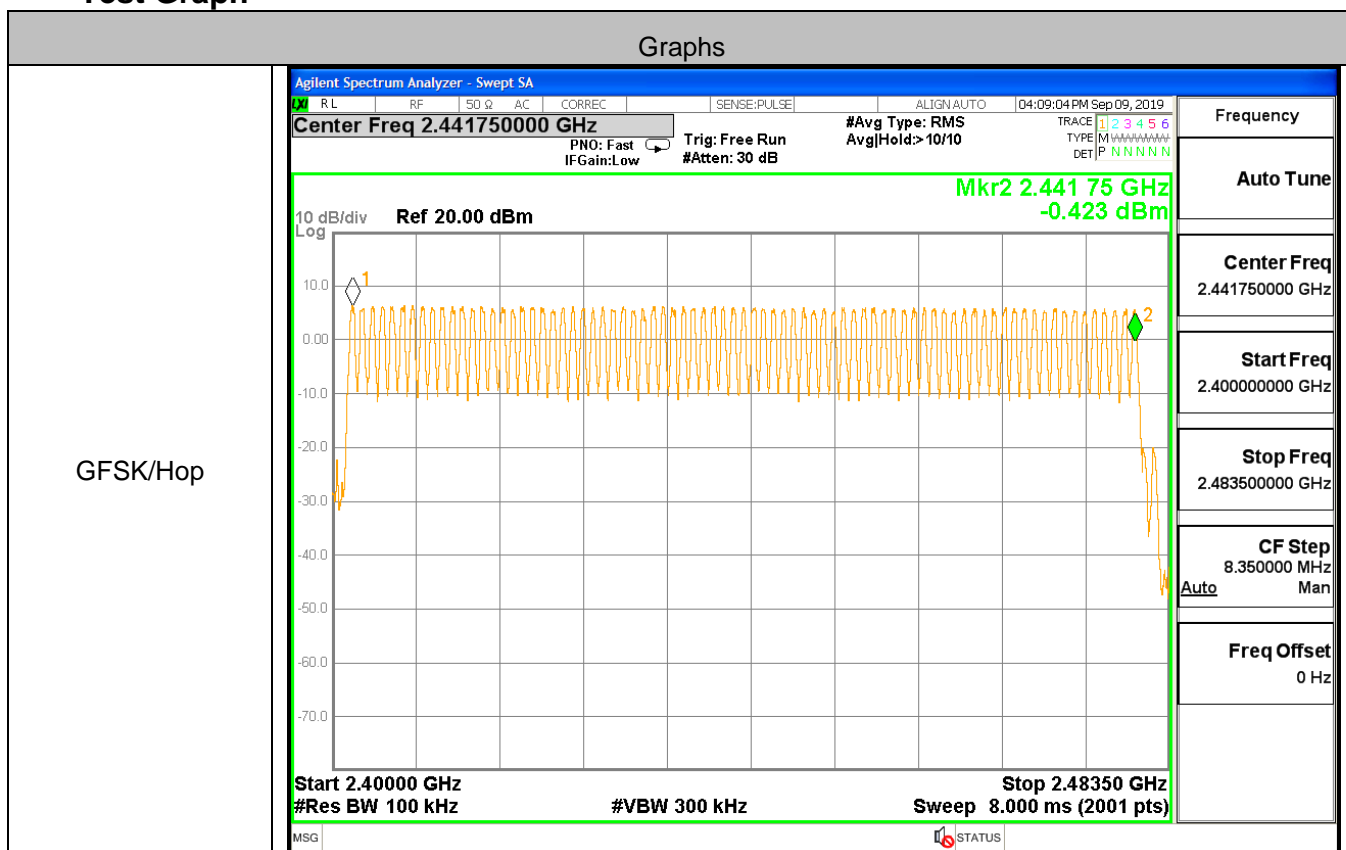


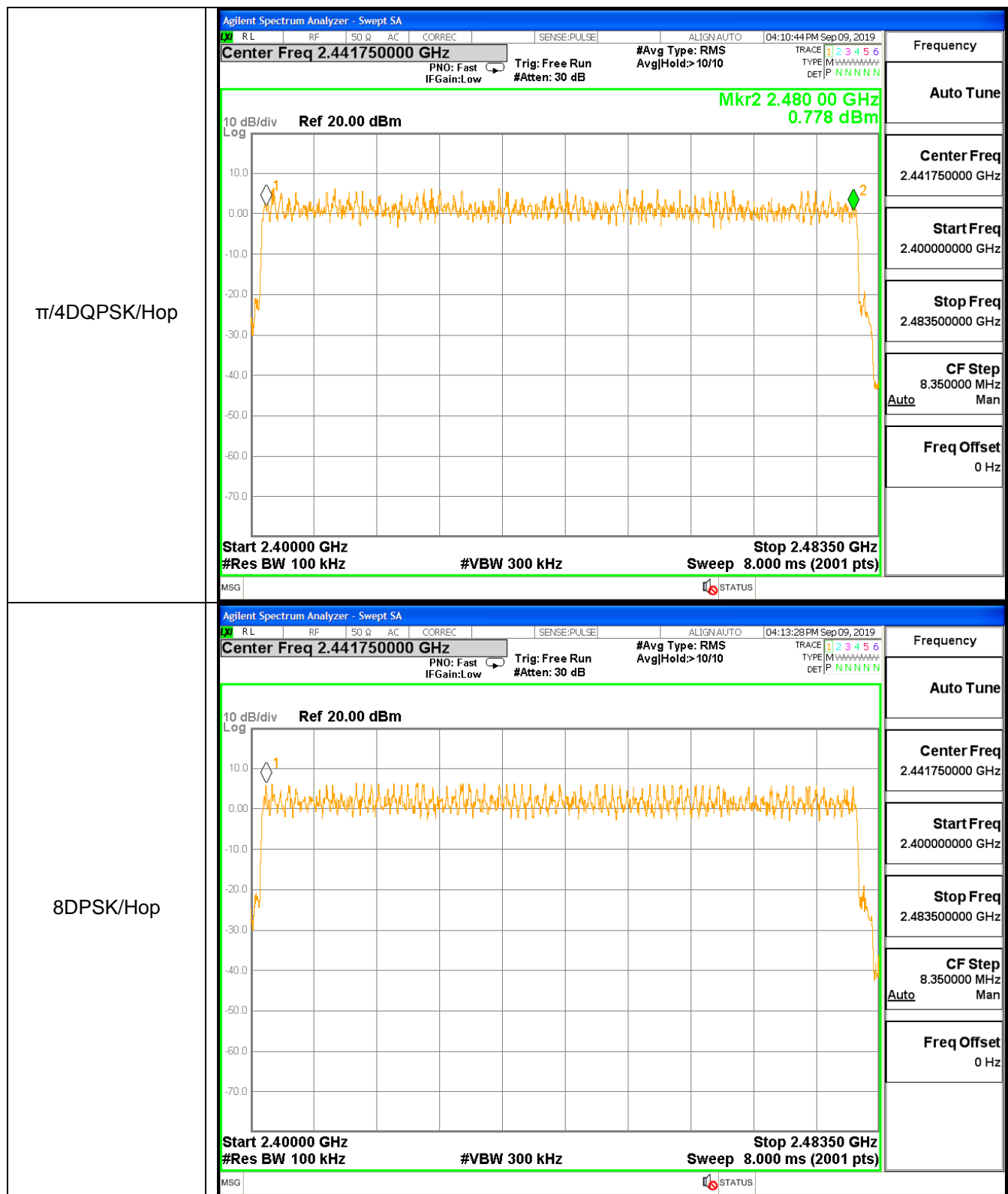


A.4 Hopping Channel Number

| 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 |

Test Graph

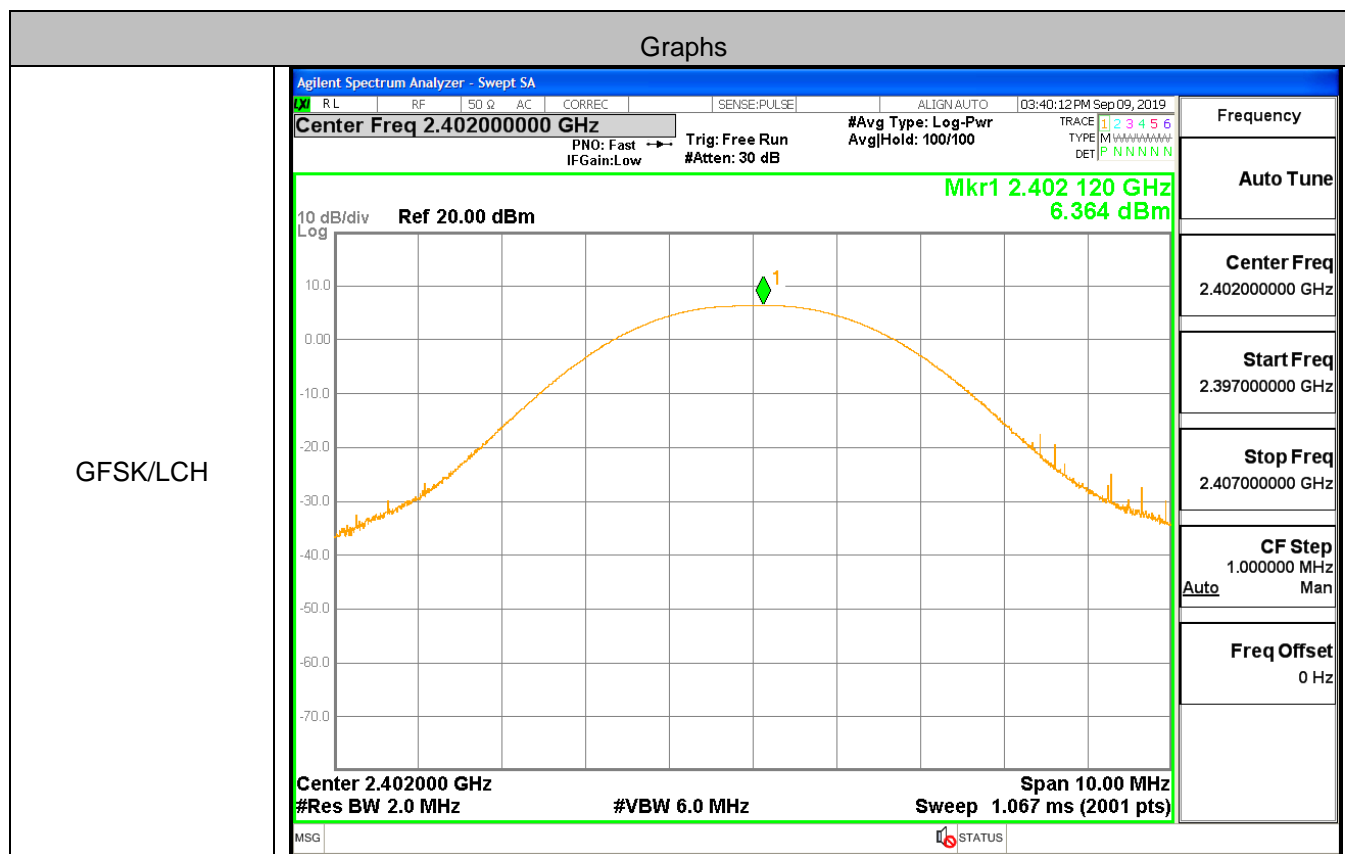


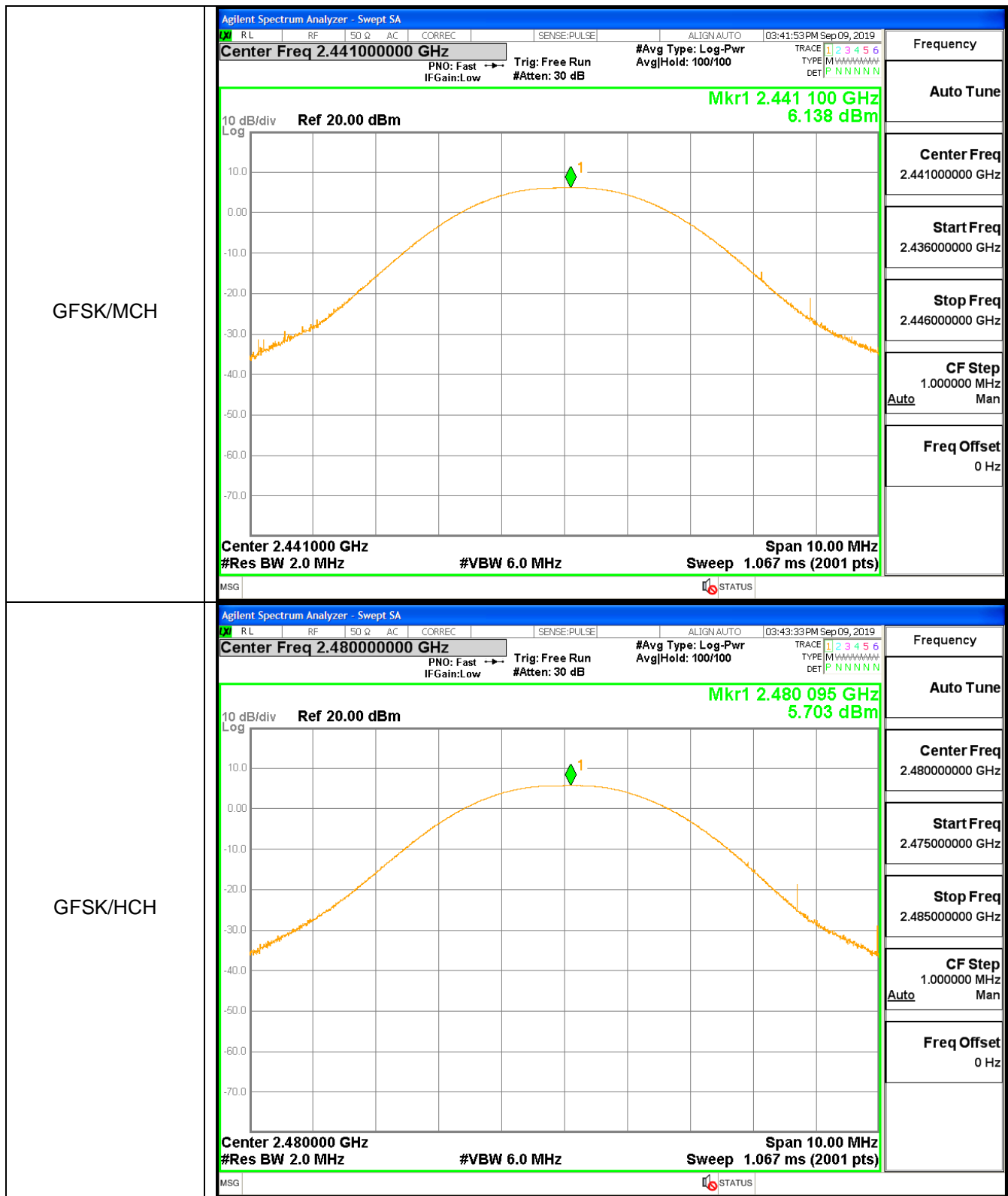


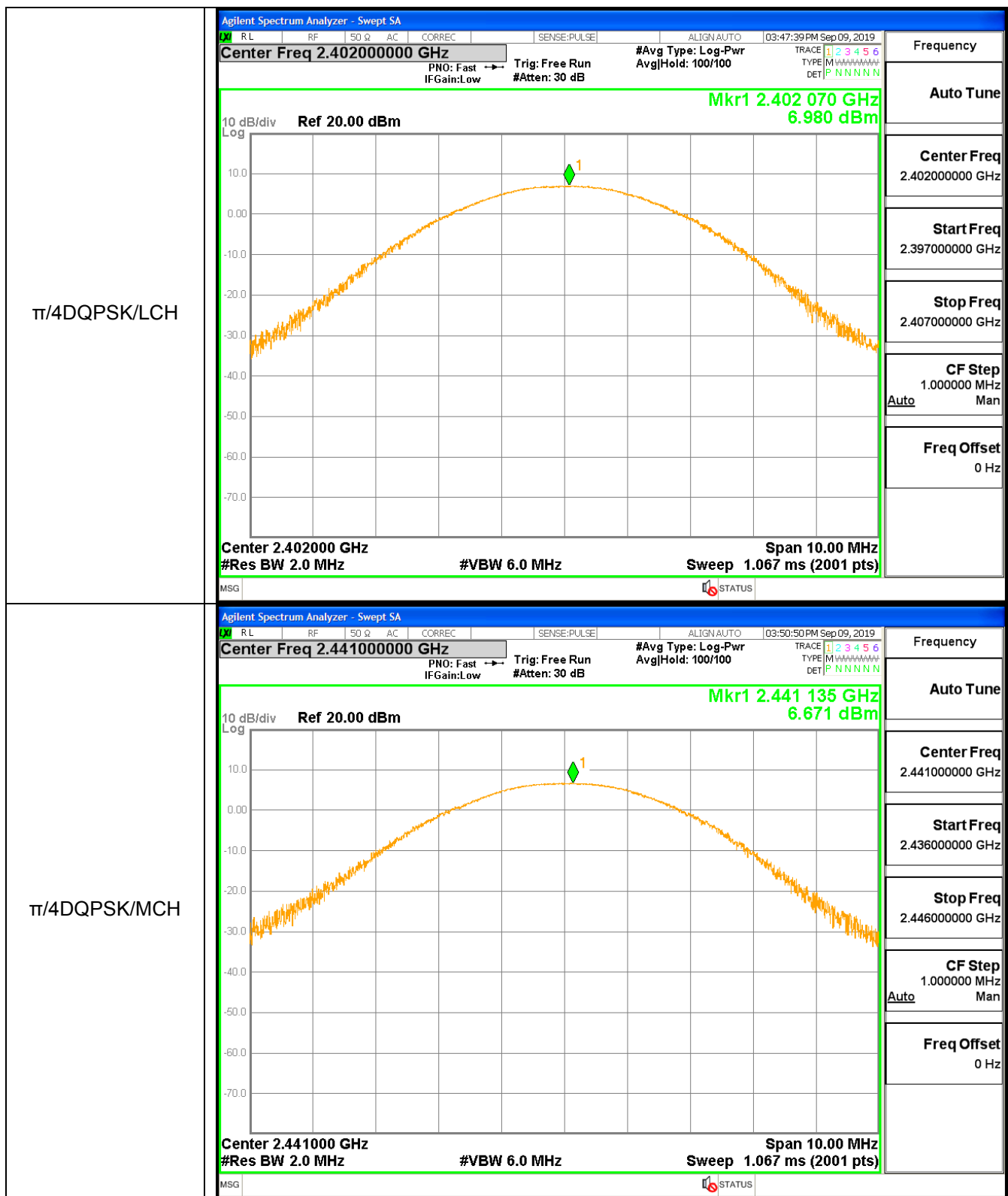
A.5 Conducted Peak Output Power

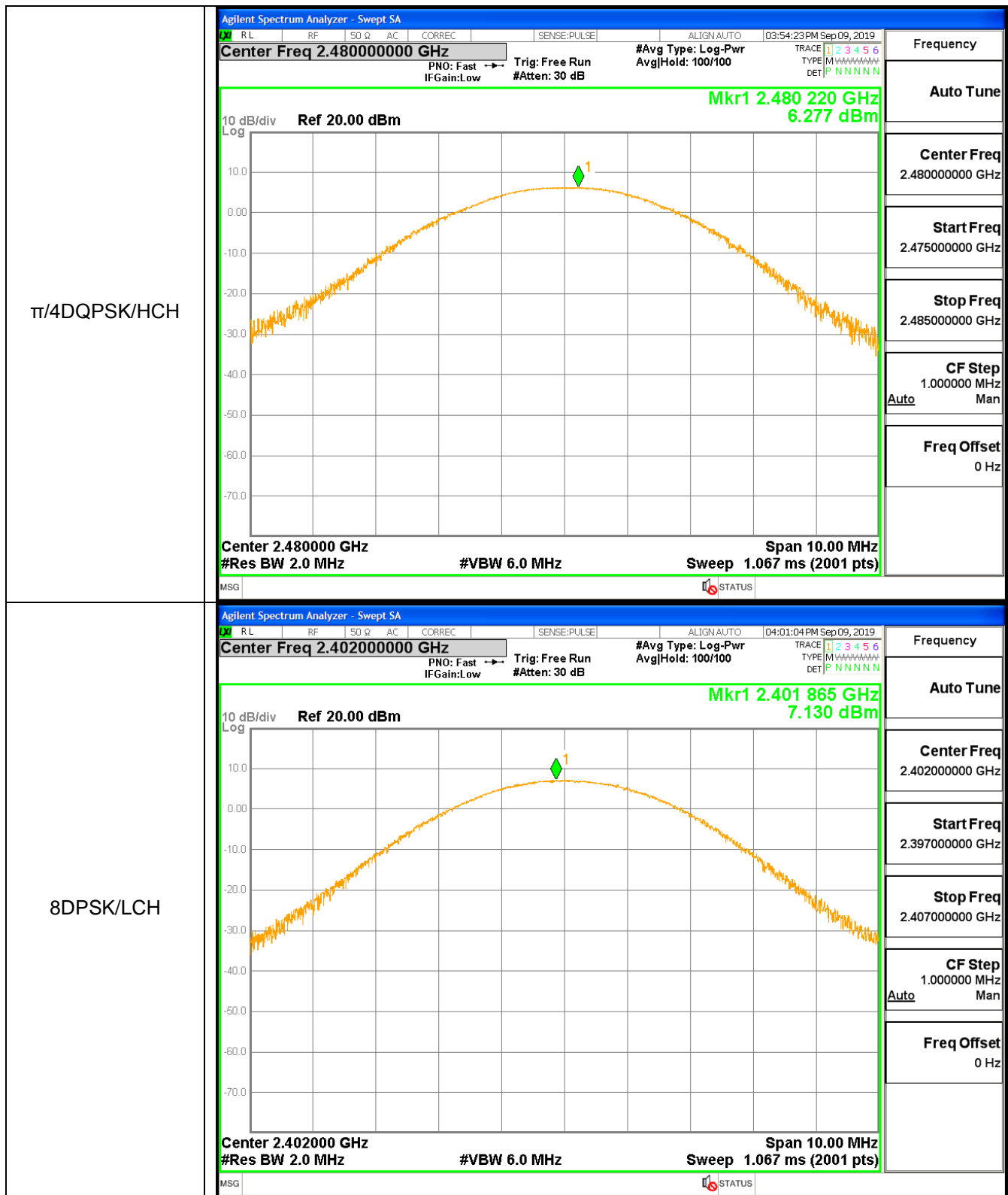
| Mode | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|------------------------------------|----------------|---------|
| GFSK | LCH | 6.364 | 21 | PASS |
| GFSK | MCH | 6.138 | 21 | PASS |
| GFSK | HCH | 5.703 | 21 | PASS |
| $\pi/4$ DQPSK | LCH | 6.980 | 21 | PASS |
| $\pi/4$ DQPSK | MCH | 6.671 | 21 | PASS |
| $\pi/4$ DQPSK | HCH | 6.277 | 21 | PASS |
| 8DPSK | LCH | 7.130 | 21 | PASS |
| 8DPSK | MCH | 6.837 | 21 | PASS |
| 8DPSK | HCH | 6.439 | 21 | PASS |

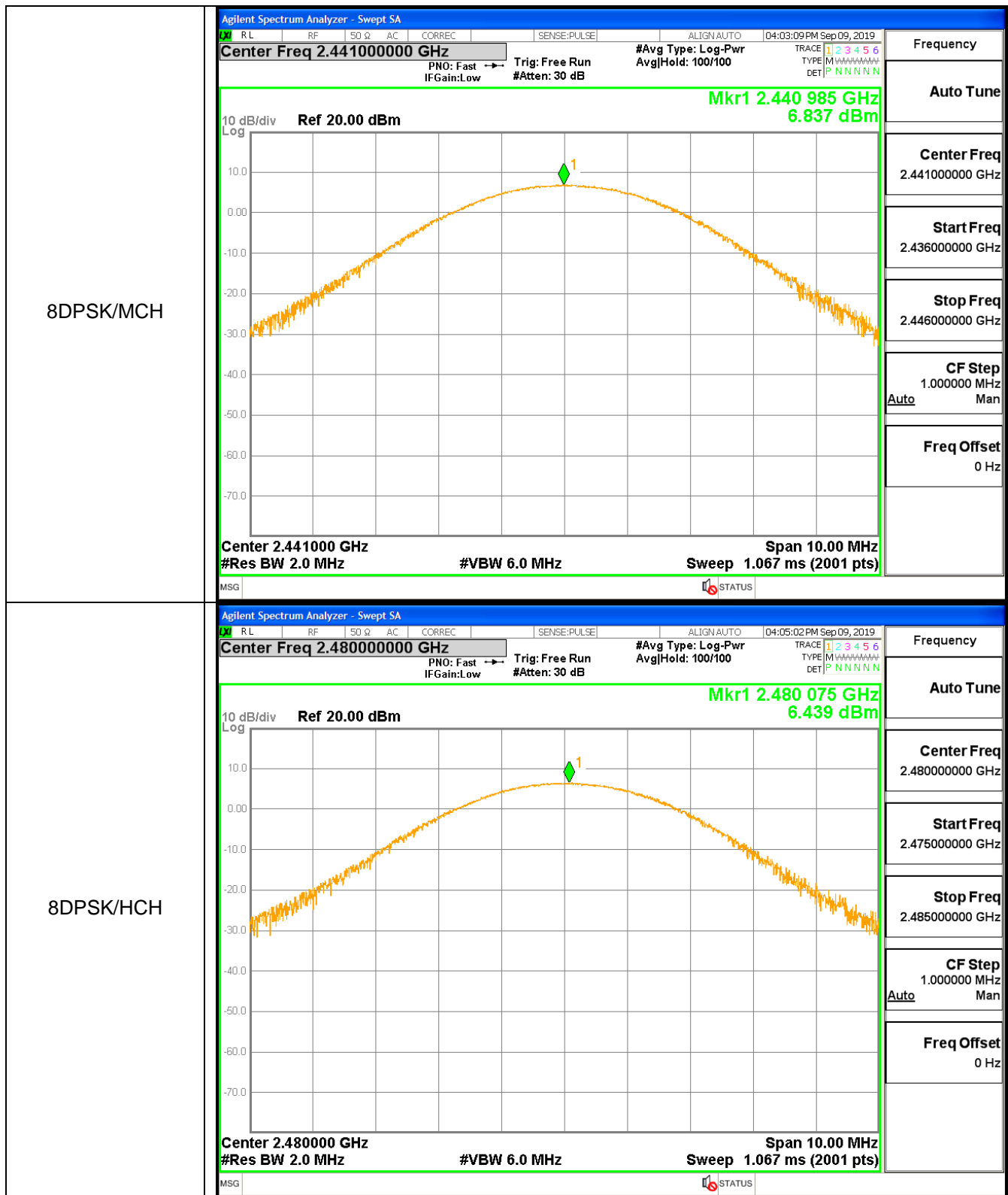
Test Graph











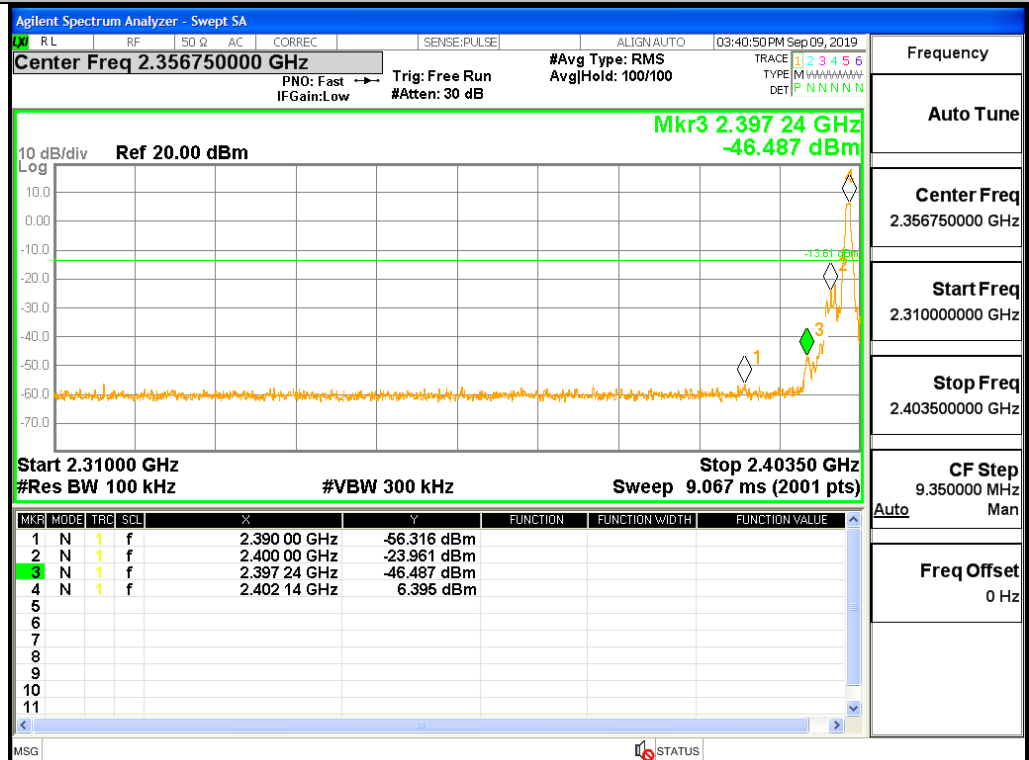
A.6 Band-edge for RF Conducted Emissions

| Type | Carrier Frequency(MHz) | Frequency(MHz) | Carrier Frequency Power [dBm] | Bandedge Peak(dBm) | Upper limit(dBm) | Conclusion |
|--------------|------------------------|----------------|-------------------------------|--------------------|------------------|------------|
| 1DH5 | 2402 | 2400 | 6.395 | -23.96 | -13.605 | Pass |
| 1DH5 | 2480 | 2483.51 | 5.169 | -41.784 | -14.831 | Pass |
| 2DH5 | 2402 | 2400 | 6.336 | -24.26 | -13.664 | Pass |
| 2DH5 | 2480 | 2483.993 | 5.564 | -40.762 | -14.436 | Pass |
| 3DH5 | 2402 | 2400 | 6.207 | -27.5 | -13.793 | Pass |
| 3DH5 | 2480 | 2483.5 | 5.701 | -38.83 | -14.299 | Pass |
| 1DH5-Hopping | 2402 | 2400 | 6.381 | -24.038 | -13.619 | Pass |
| 1DH5-Hopping | 2480 | 2483.5 | 5.994 | -41.677 | -14.006 | Pass |
| 2DH5-Hopping | 2402 | 2400 | 6.300 | -24.03 | -13.700 | Pass |
| 2DH5-Hopping | 2480 | 2483.5 | 5.784 | -40.12 | -14.216 | Pass |
| 3DH5-Hopping | 2402 | 2400 | 6.323 | -28.4 | -13.677 | Pass |
| 3DH5-Hopping | 2480 | 2483.5 | 5.943 | -42.01 | -14.057 | Pass |

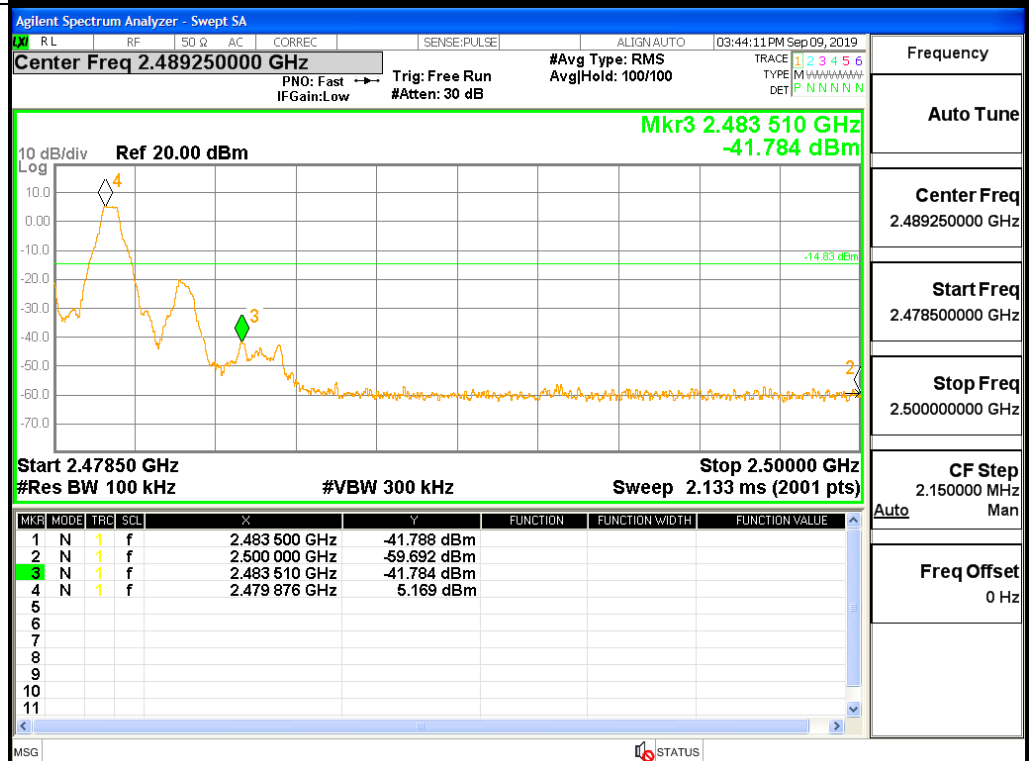
Test Graph

Graphs

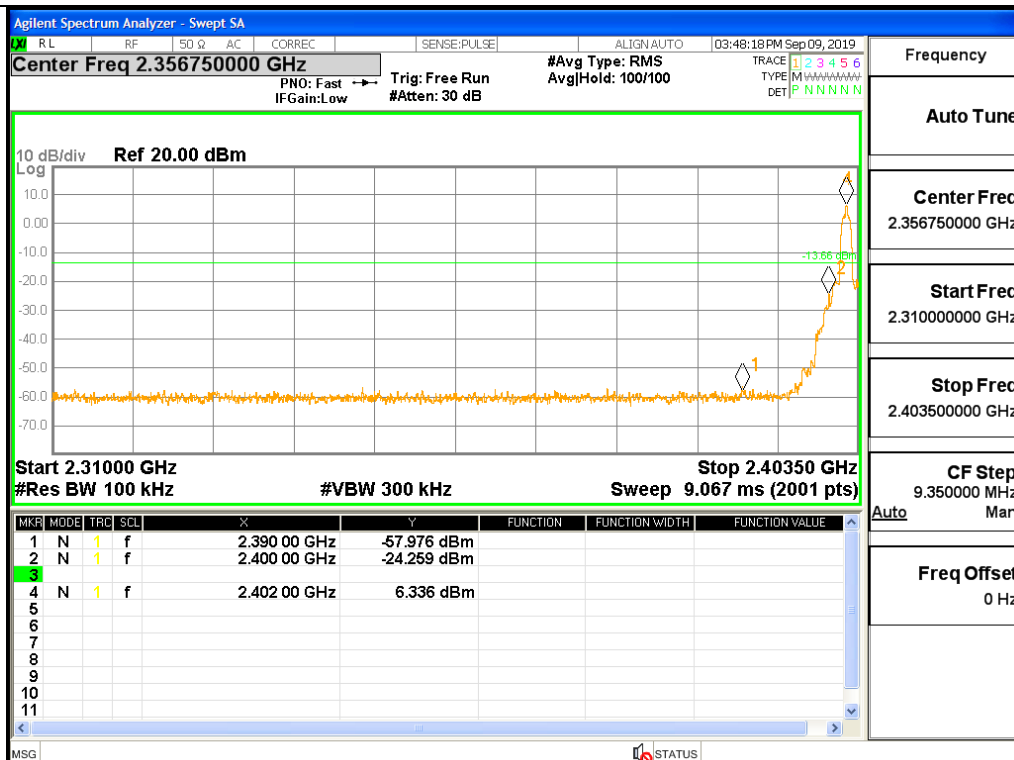
GFSK/LCH/No Hop



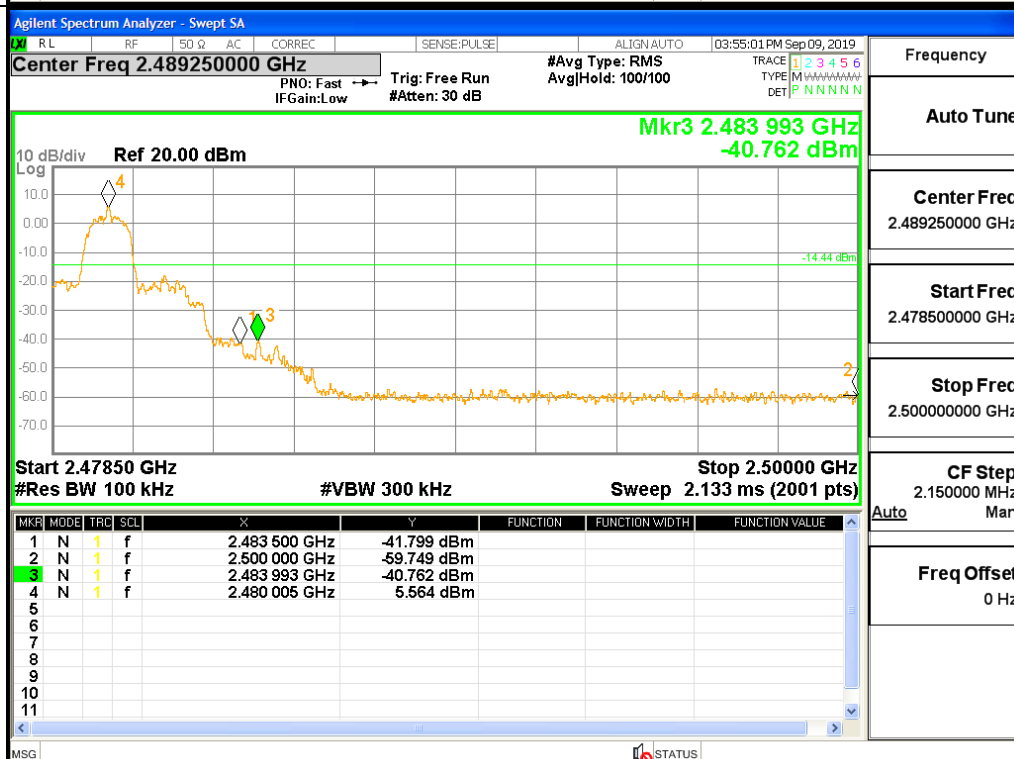
GFSK/HCH/No Hop



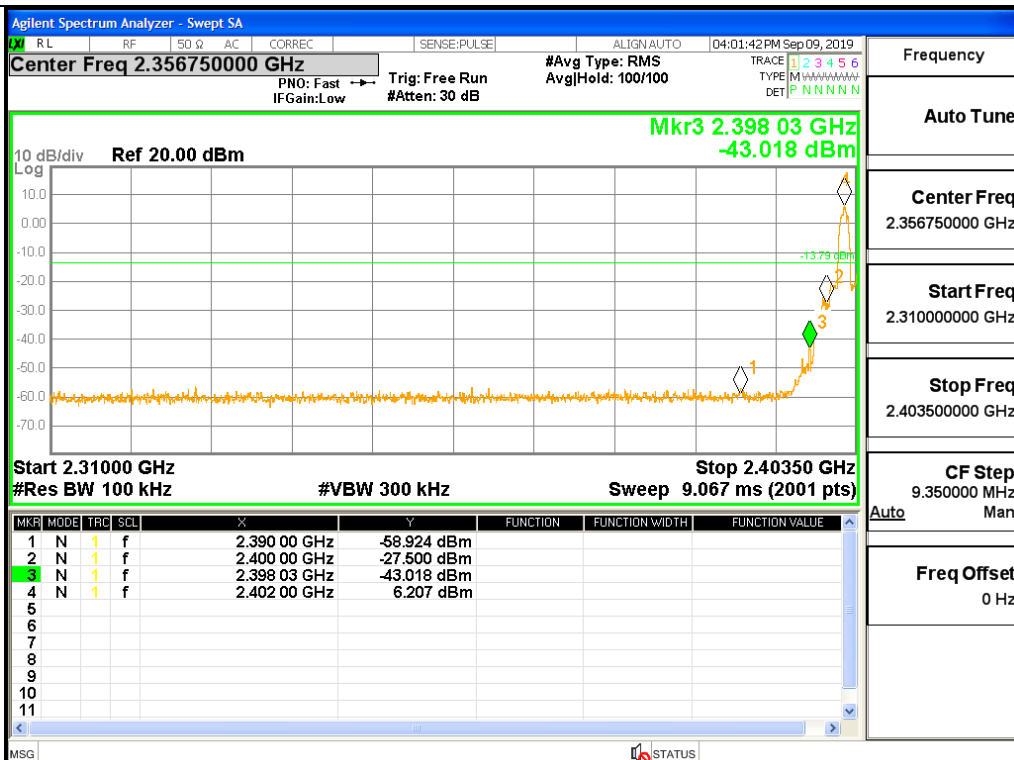
π /4DQPSK/LCH/No
Hop



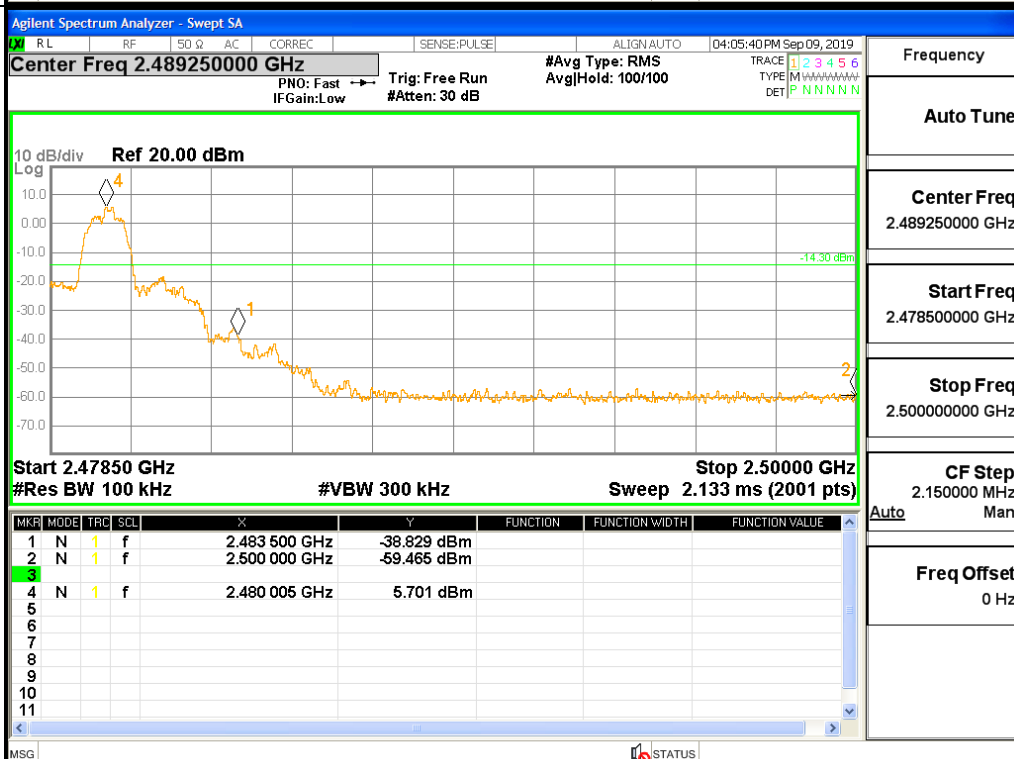
π /4DQPSK/HCH/No
Hop



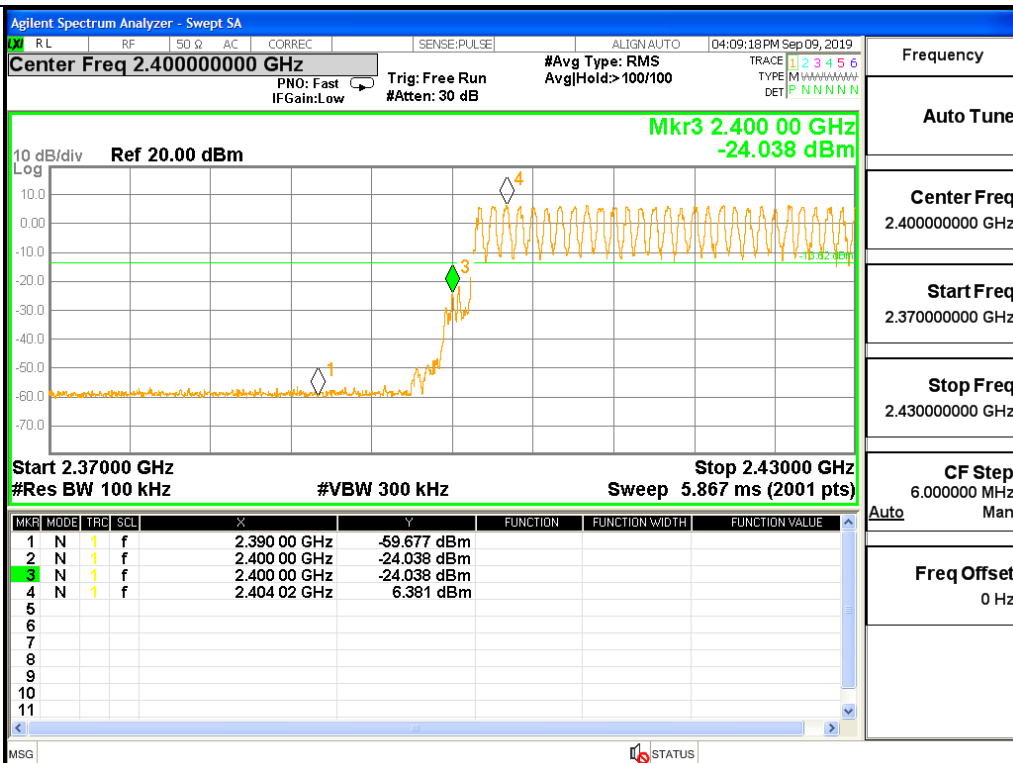
8DPSK/LCH/No Hop



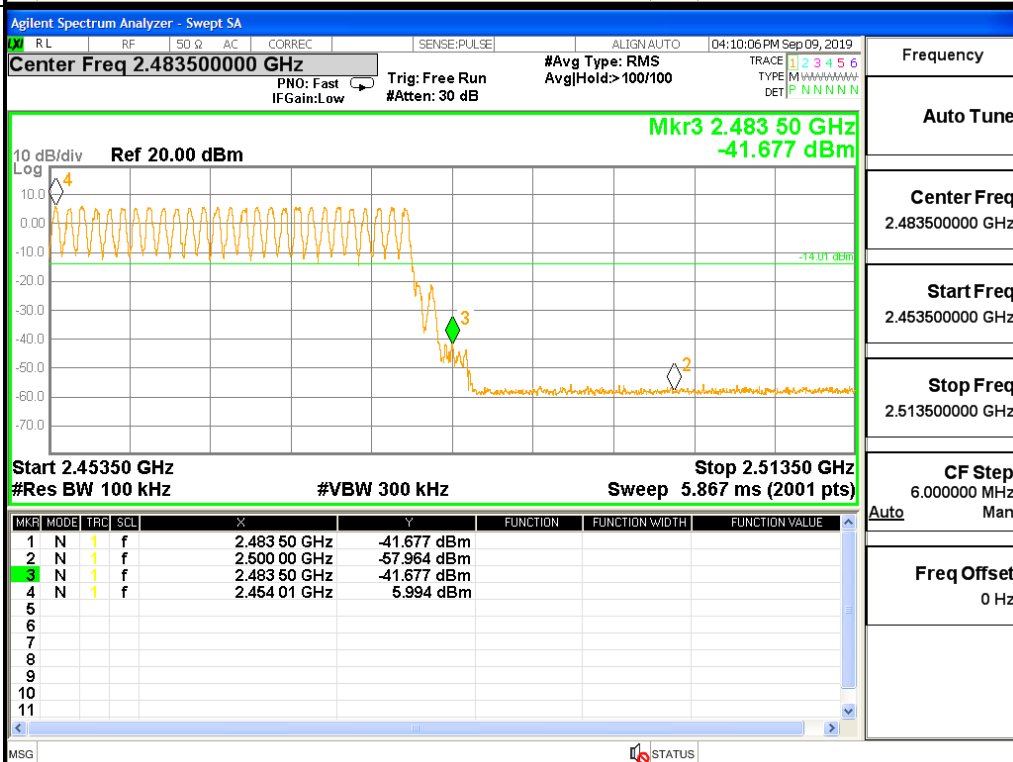
8DPSK/HCH/No Hop



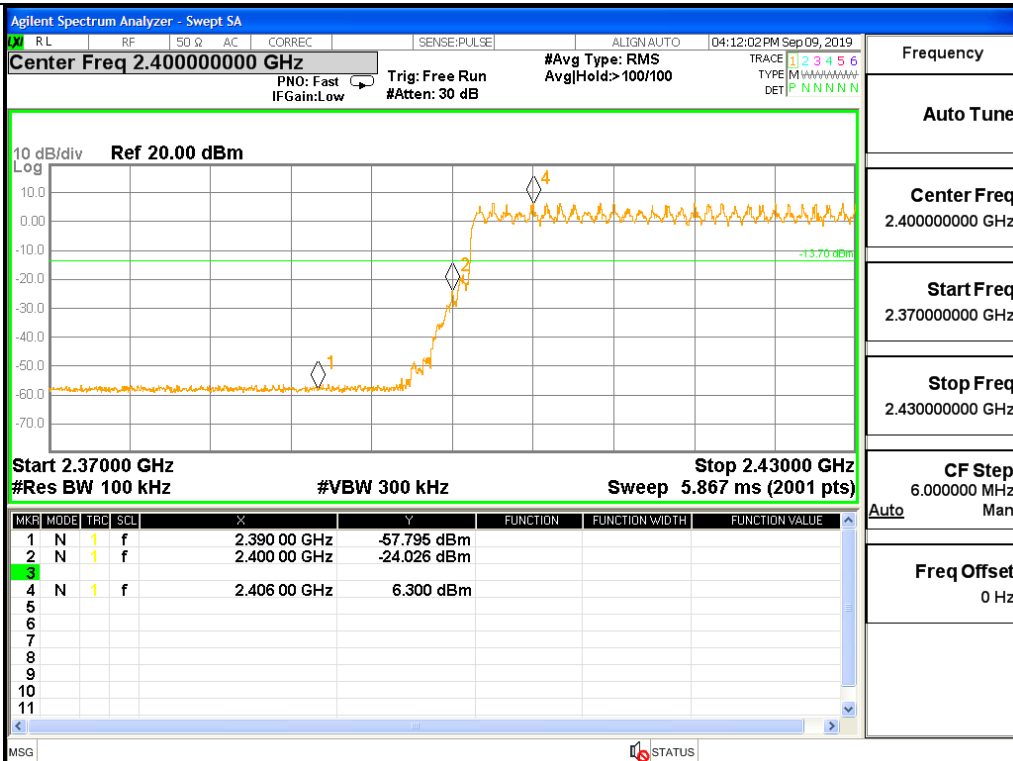
GFSK/LCH/Hop



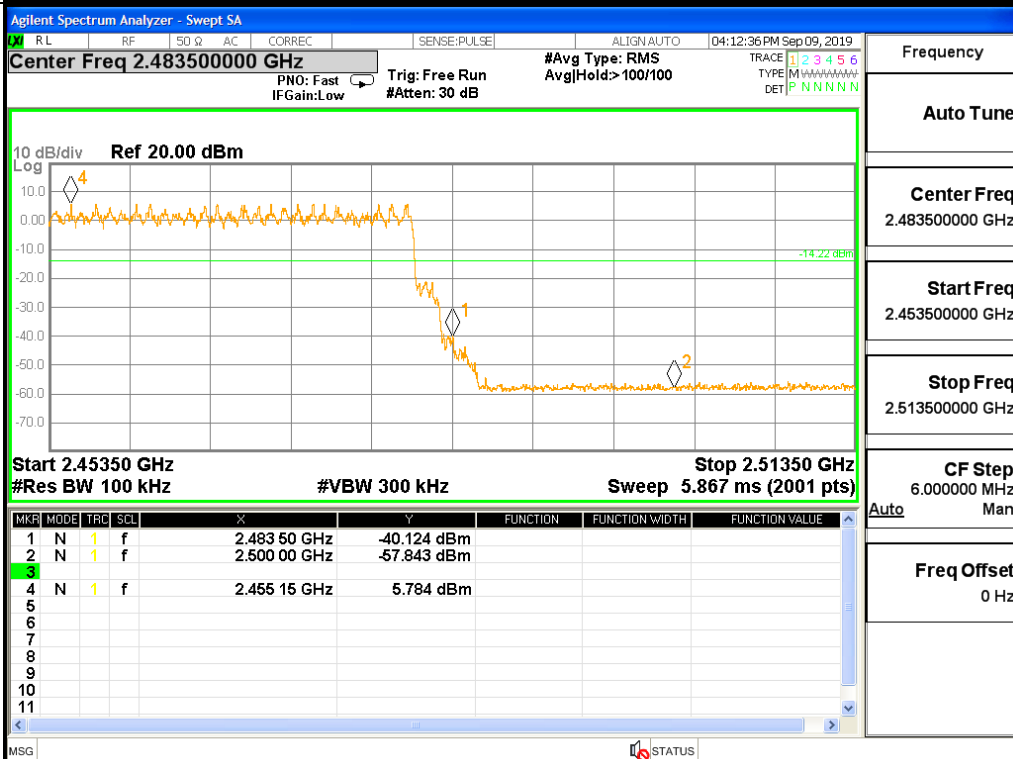
GFSK/HCH/Hop



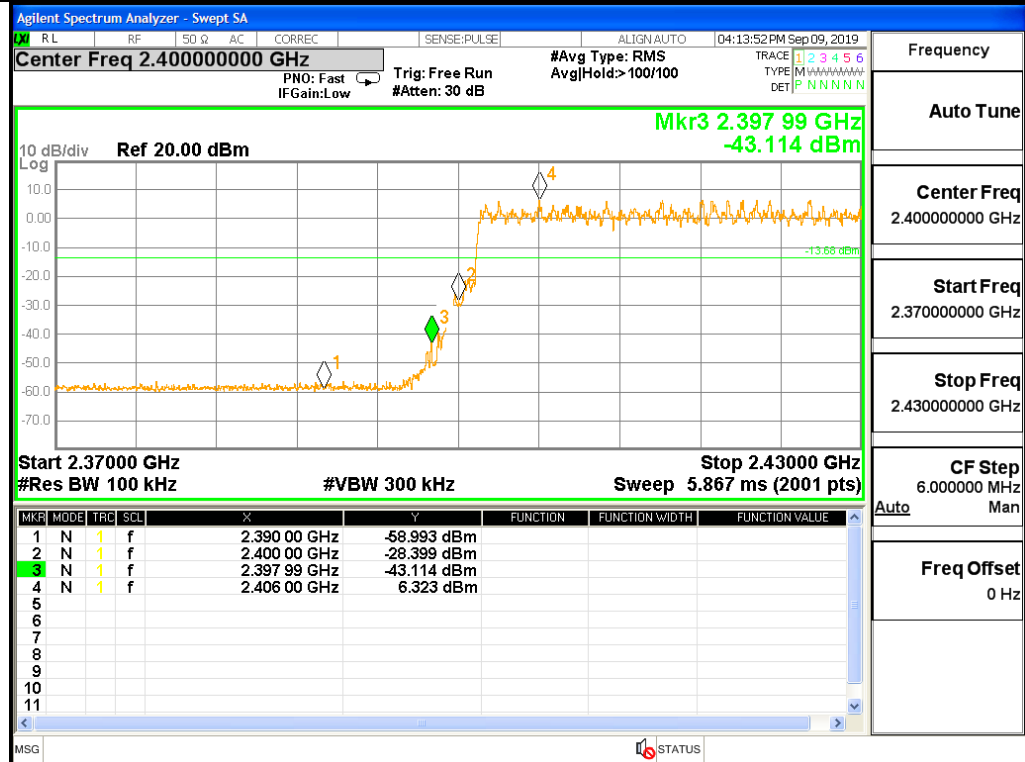
$\pi/4$ DQPSK/LCH/Hop



$\pi/4$ DQPSK/HCH/Hop

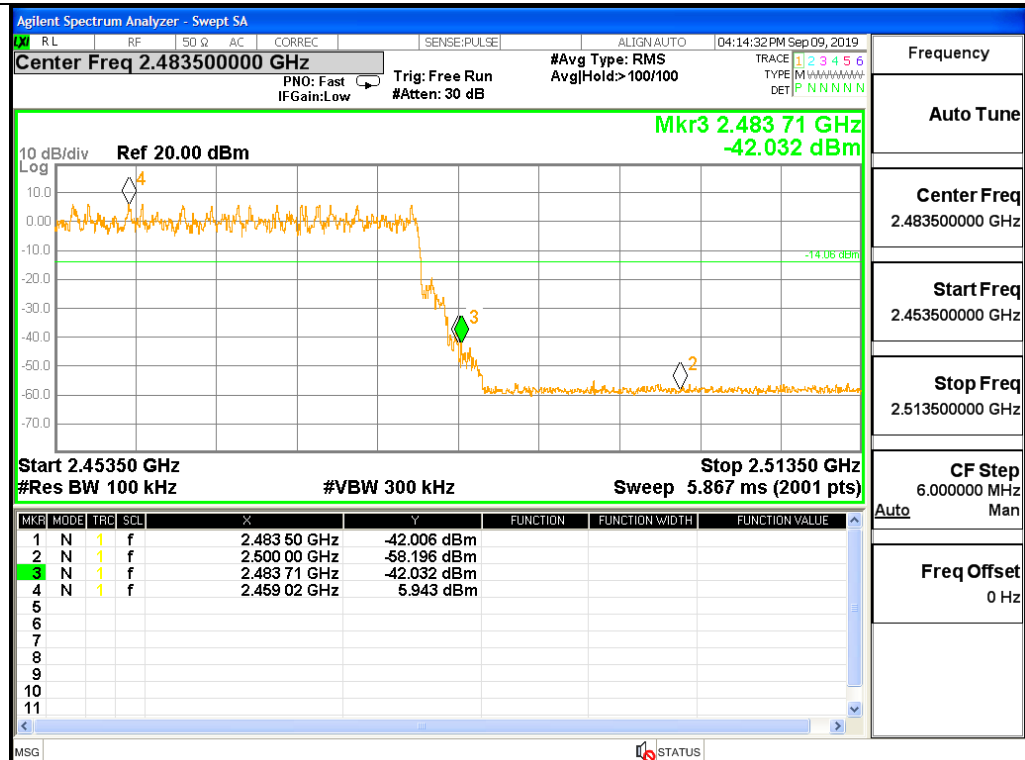


8DPSK/LCH/Hop

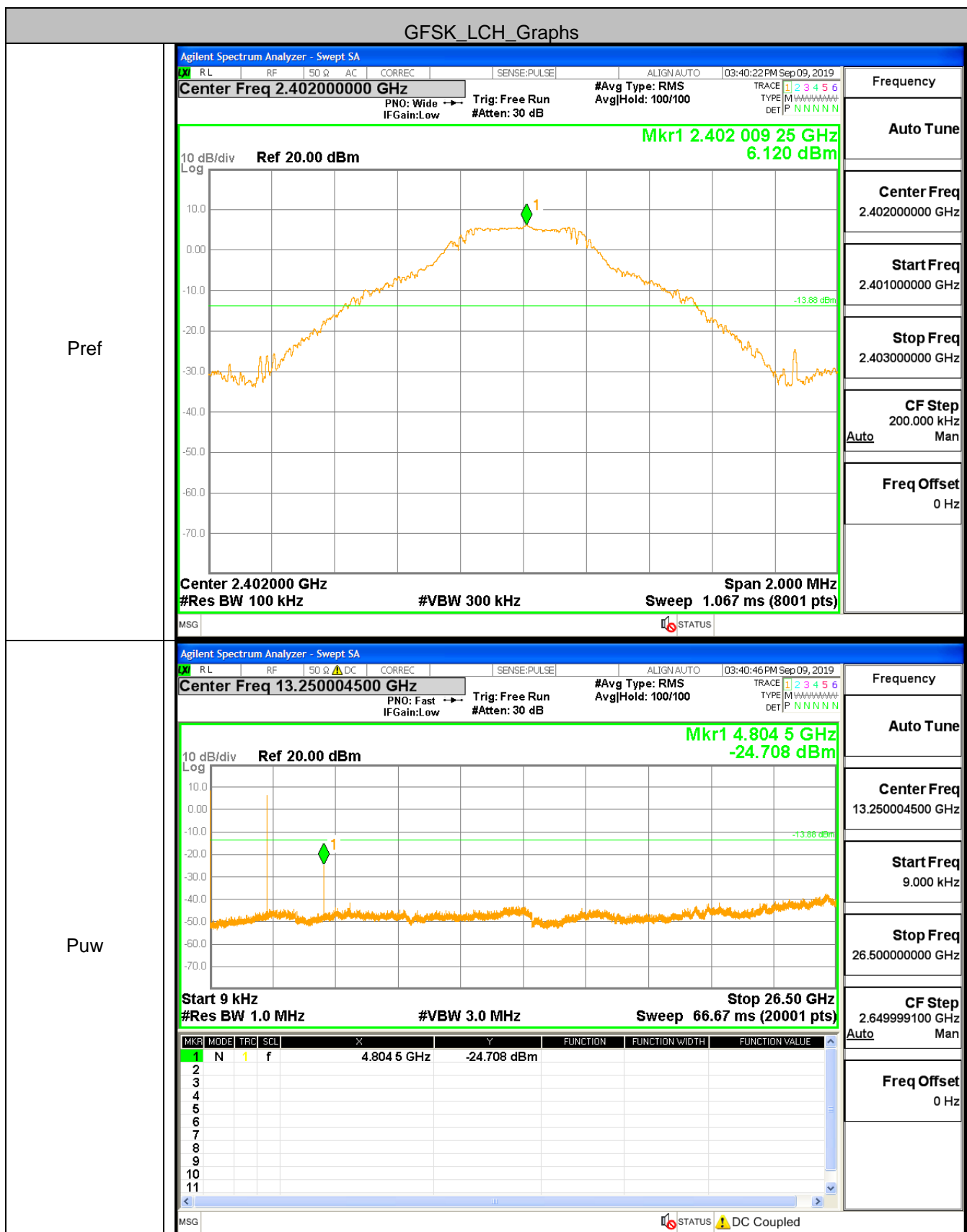


V

8DPSK/HCH/Hop

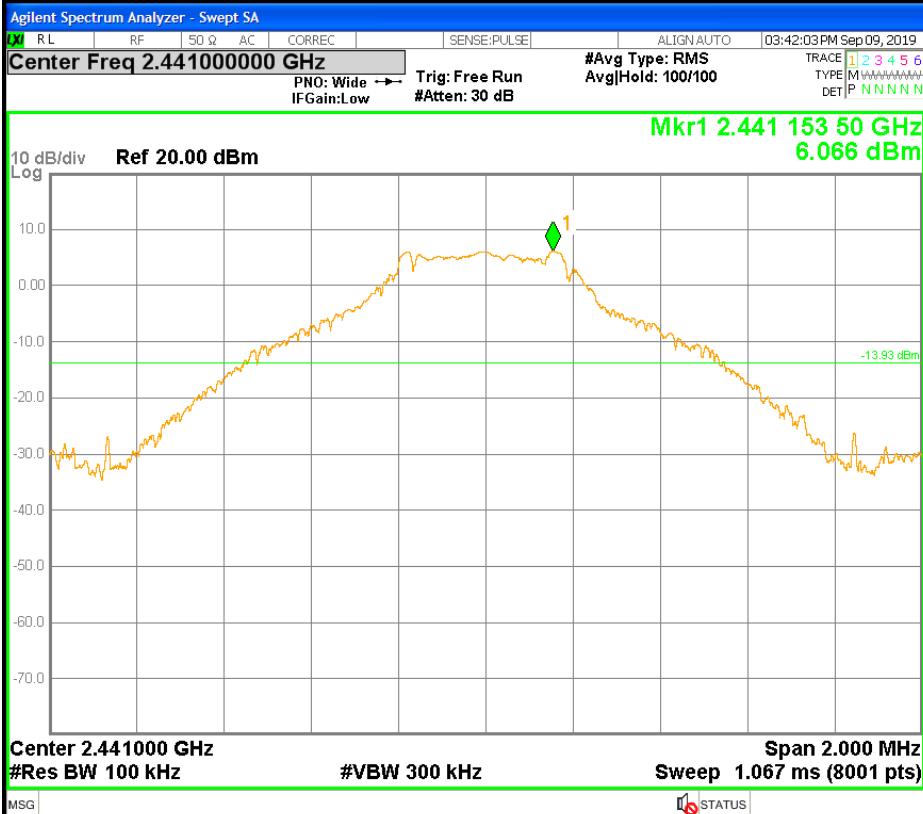


A.7 RF Conducted Spurious Emissions Test Graph



GFSK_MCH_Graphs

Pref



Frequency

Auto Tune

Center Freq
2.441000000 GHz

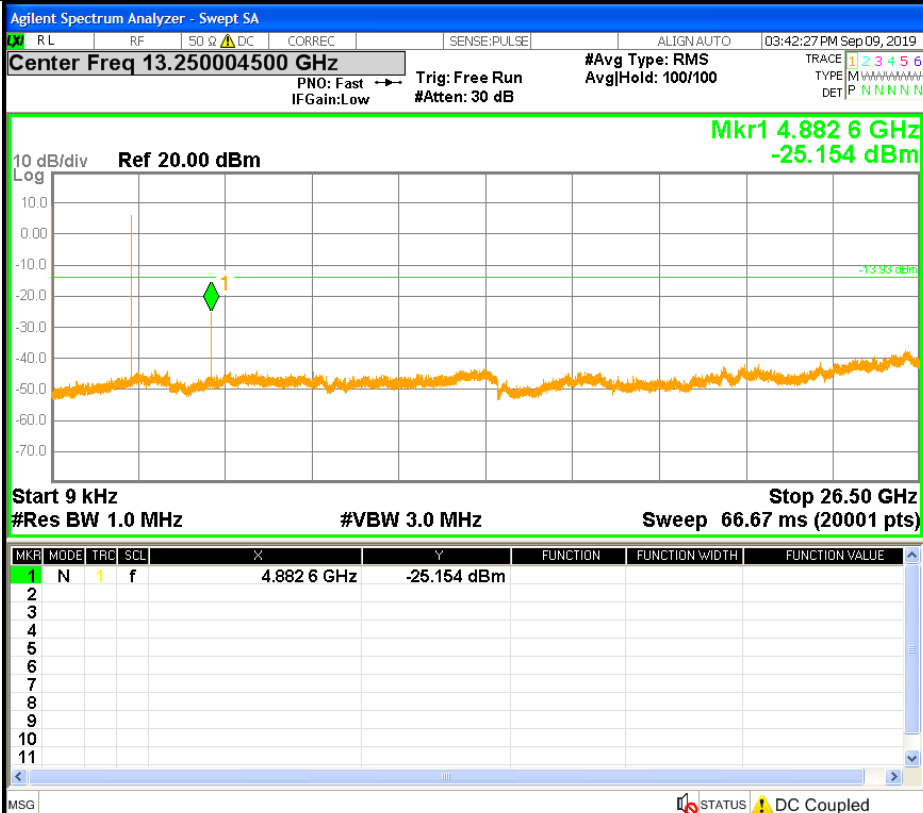
Start Freq
2.440000000 GHz

Stop Freq
2.442000000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

Puw



Frequency

Auto Tune

Center Freq
13.250004500 GHz

Start Freq
9.000 kHz

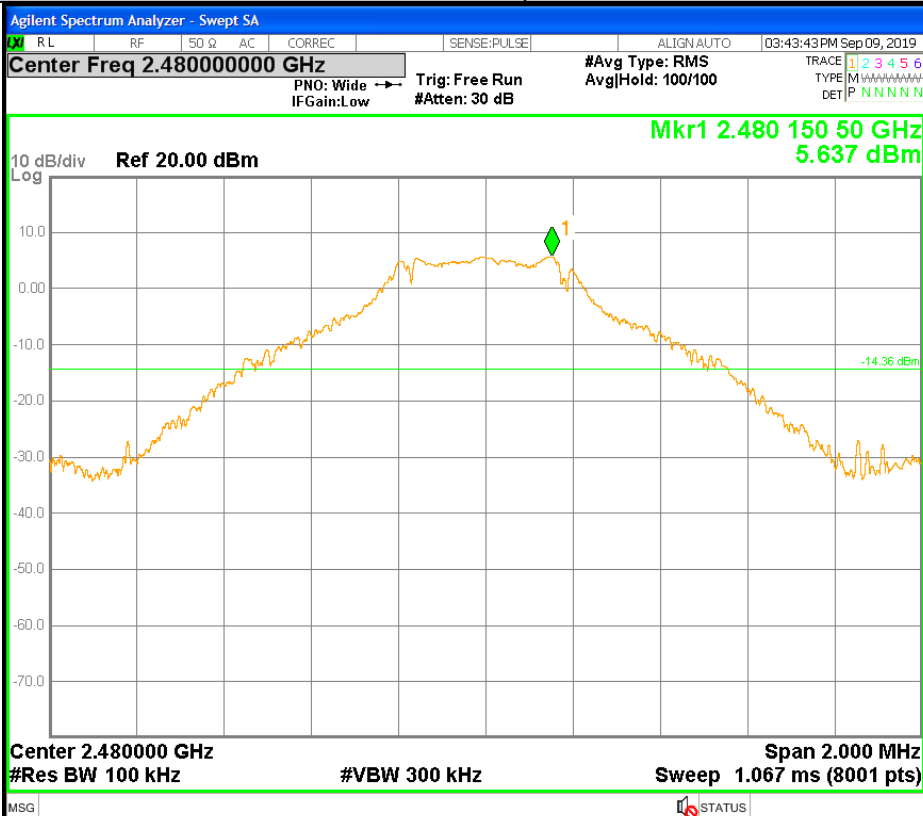
Stop Freq
26.500000000 GHz

CF Step
2.649999100 GHz
Auto Man

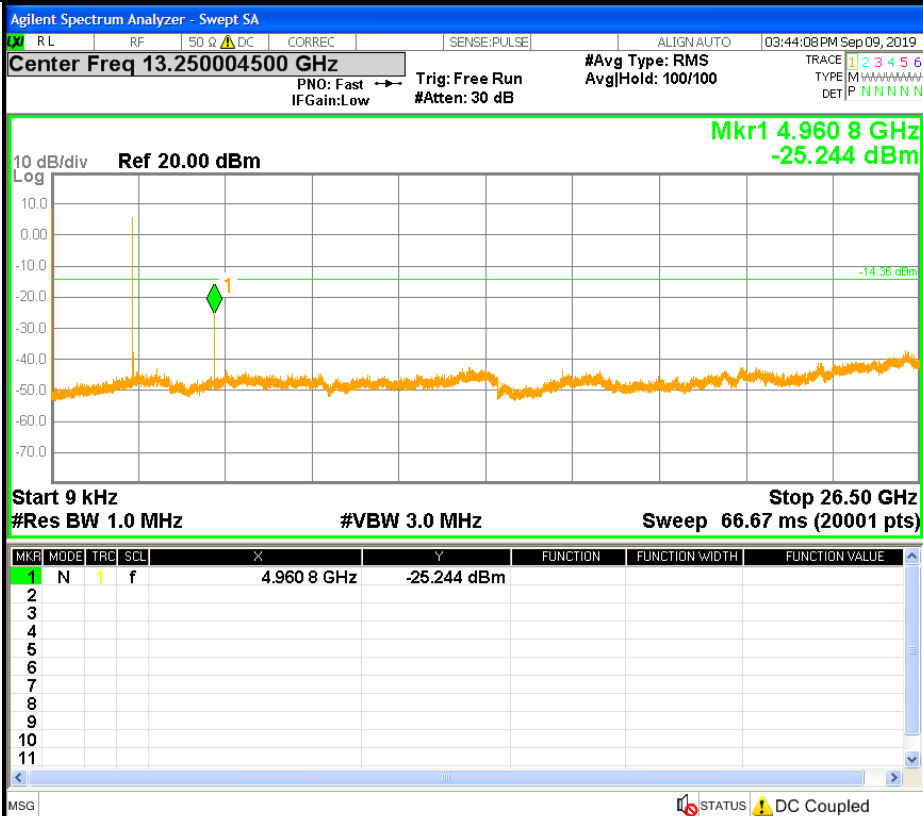
Freq Offset
0 Hz

GFSK_HCH_Graphs

Pref

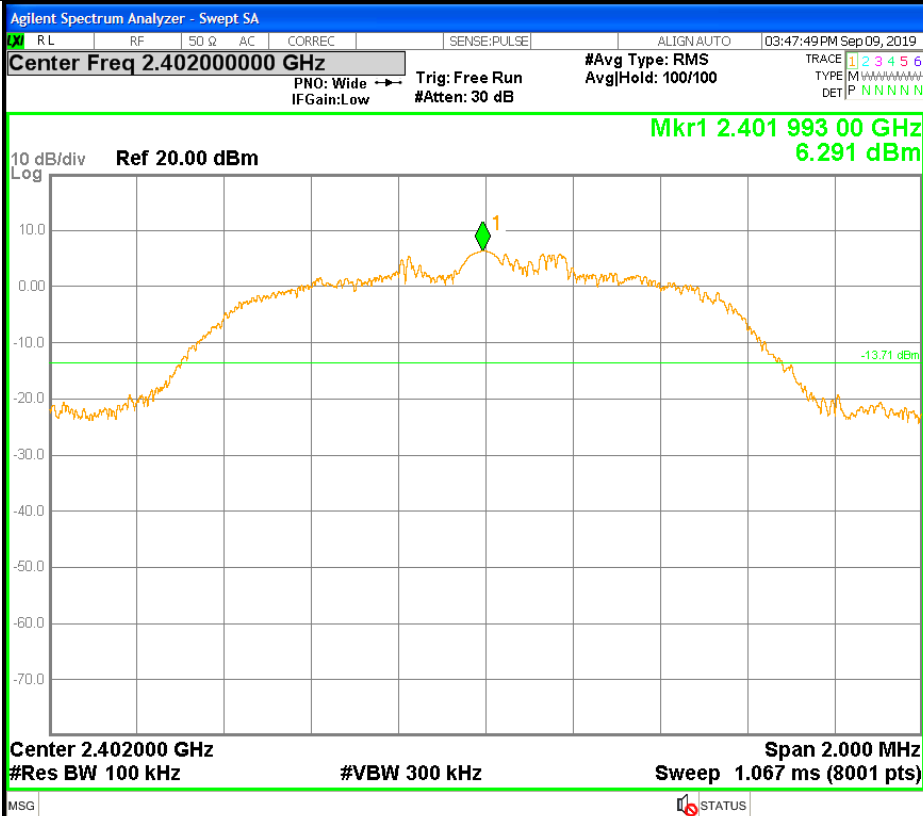


Puw

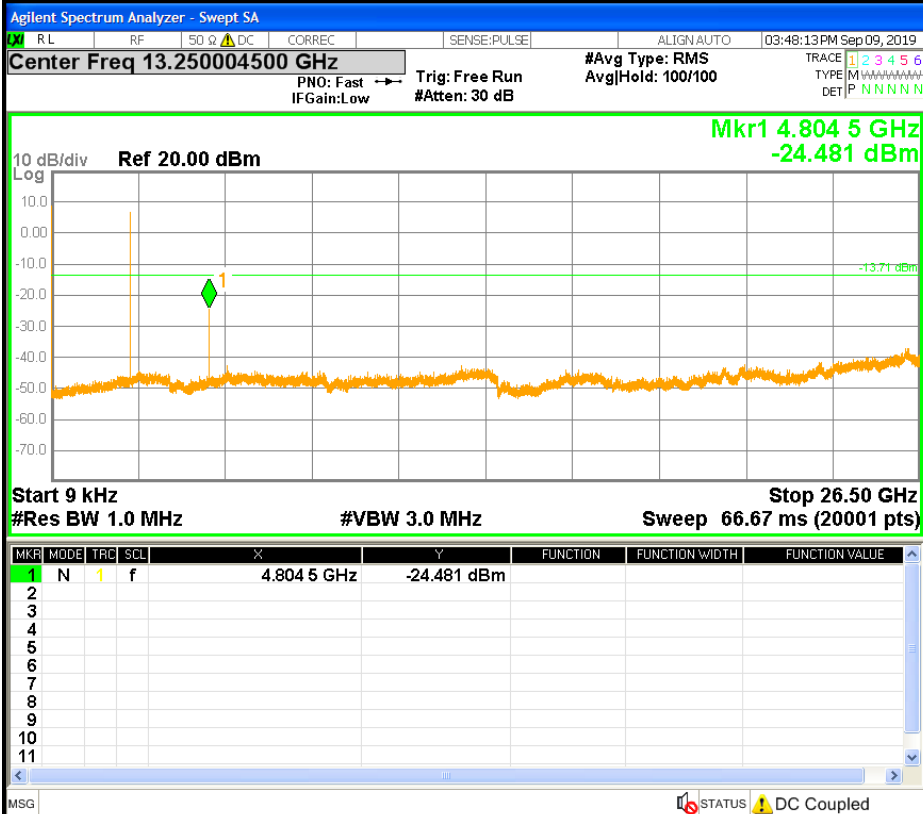


$\pi/4$ DQPSK LCH Graphs

Pref

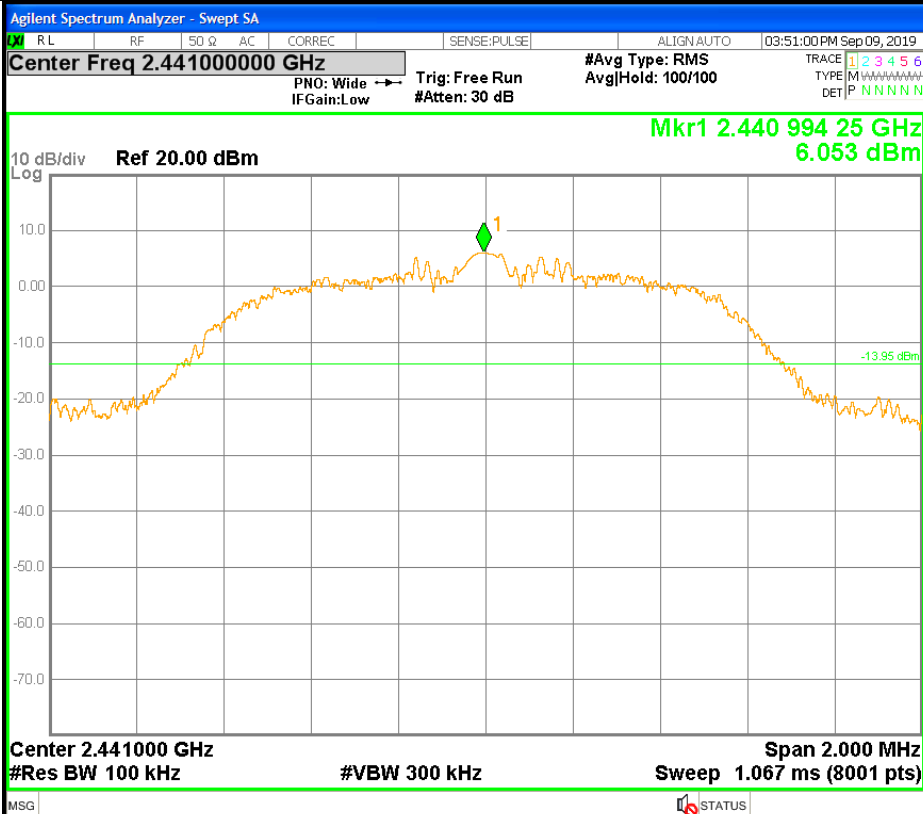


Puw

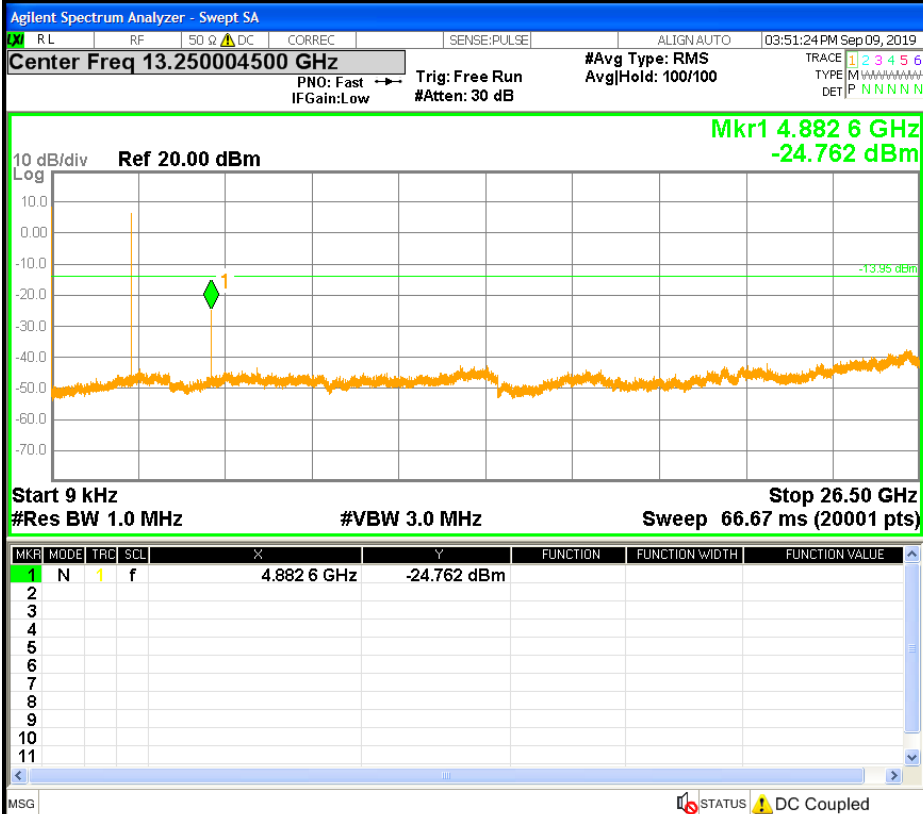


$\pi/4$ DQPSK MCH Graphs

Pref

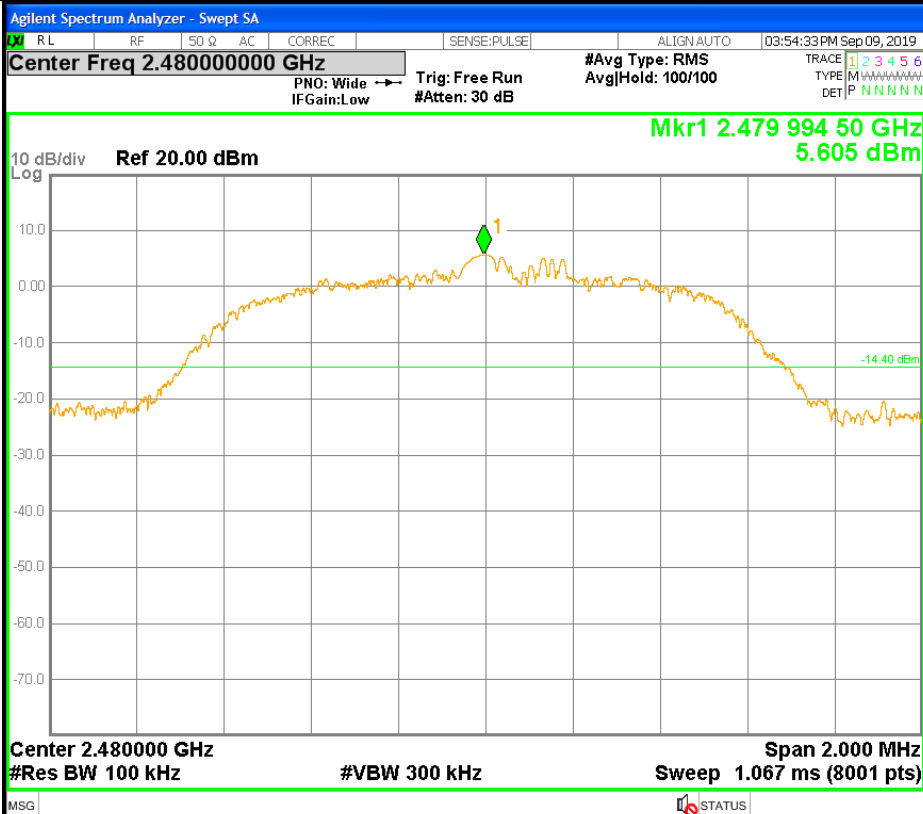


Puw

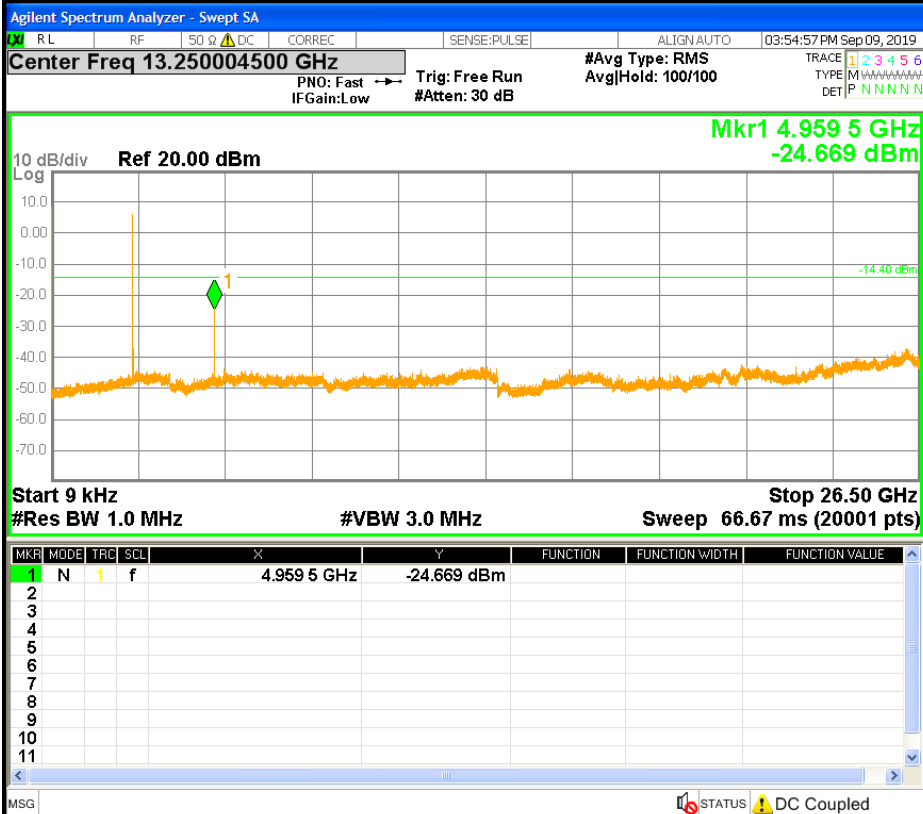


$\pi/4$ DQPSK HCH Graphs

Pref

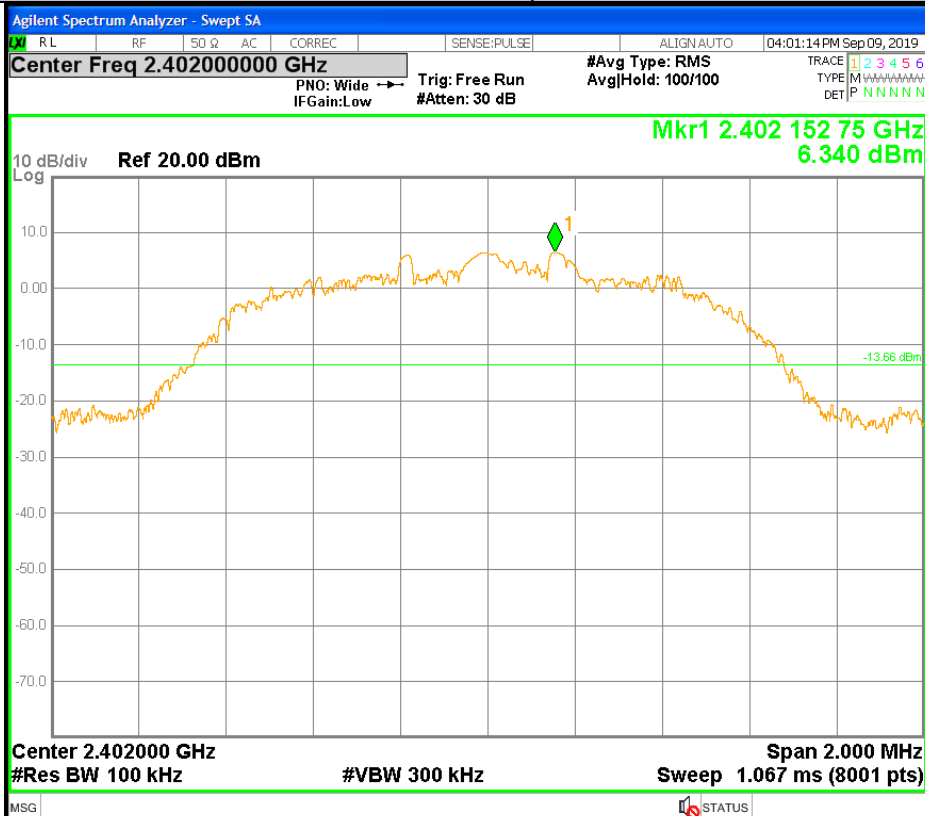


Puw

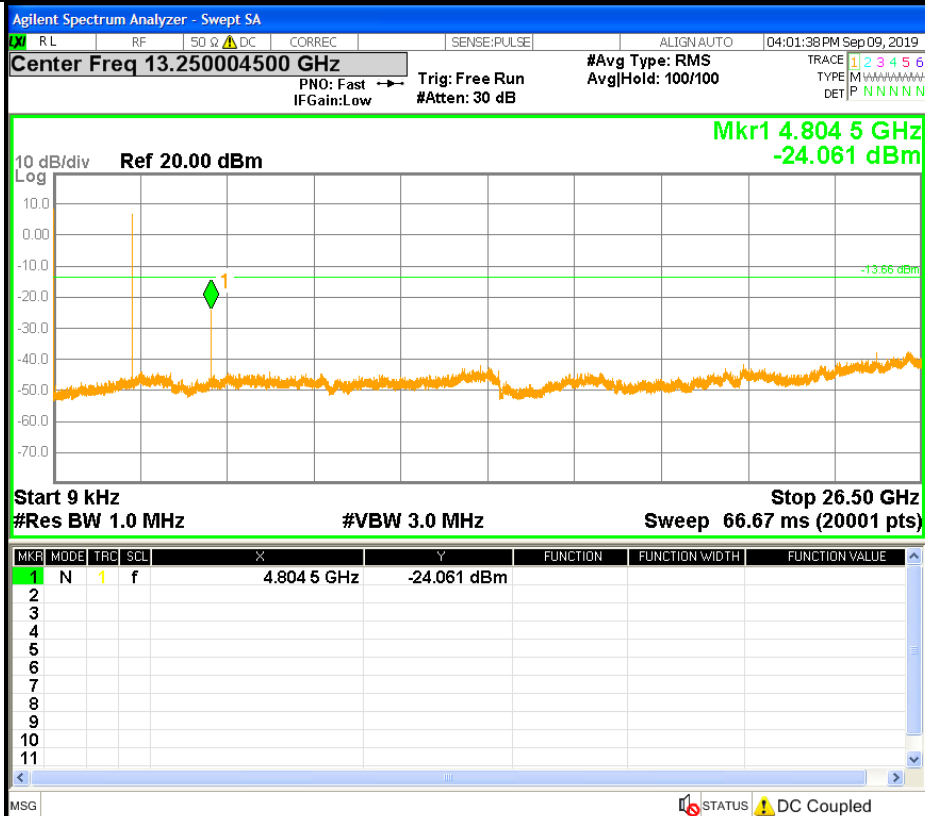


8DPSK_LCH_Graphs

Pref

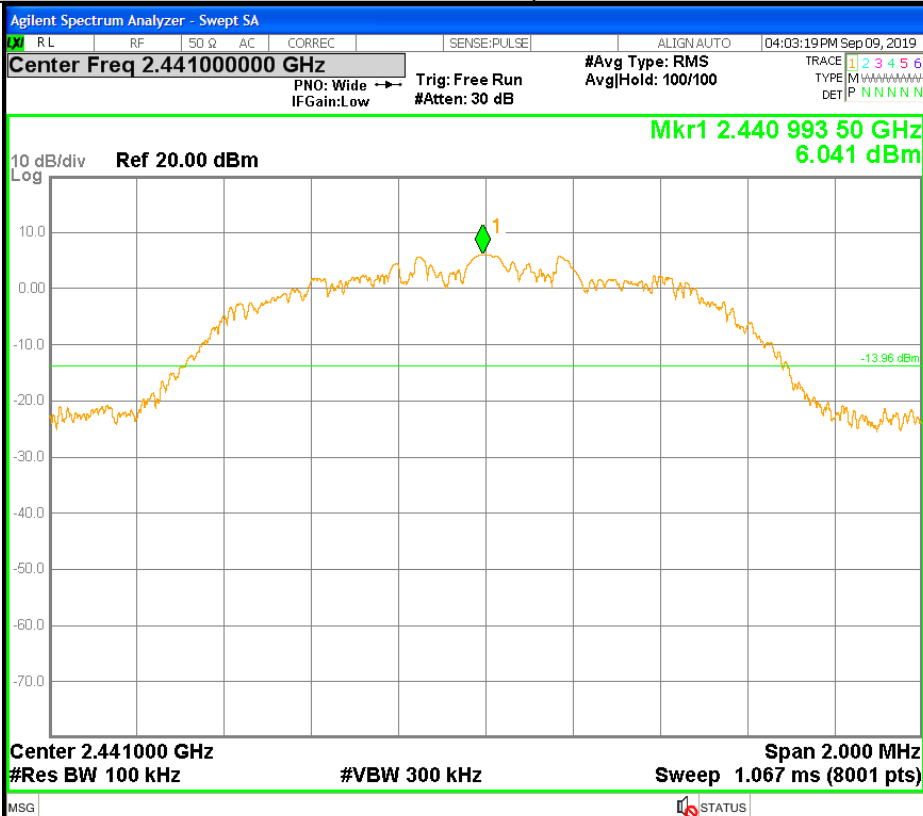


Puw

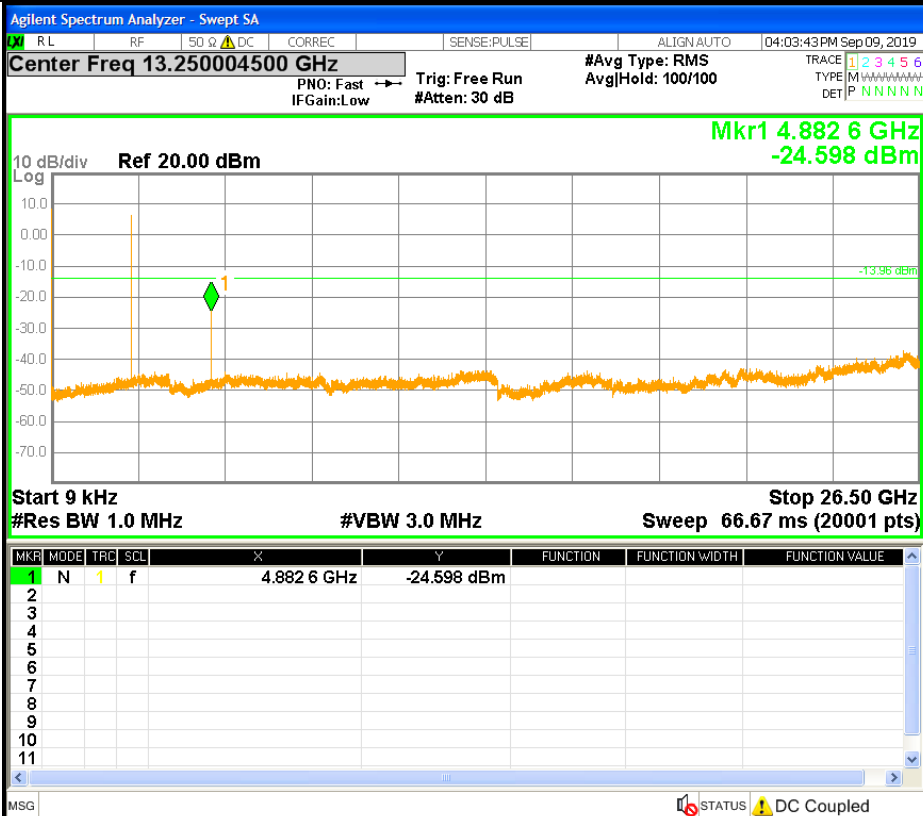


8DPSK_MCH_Graphs

Pref

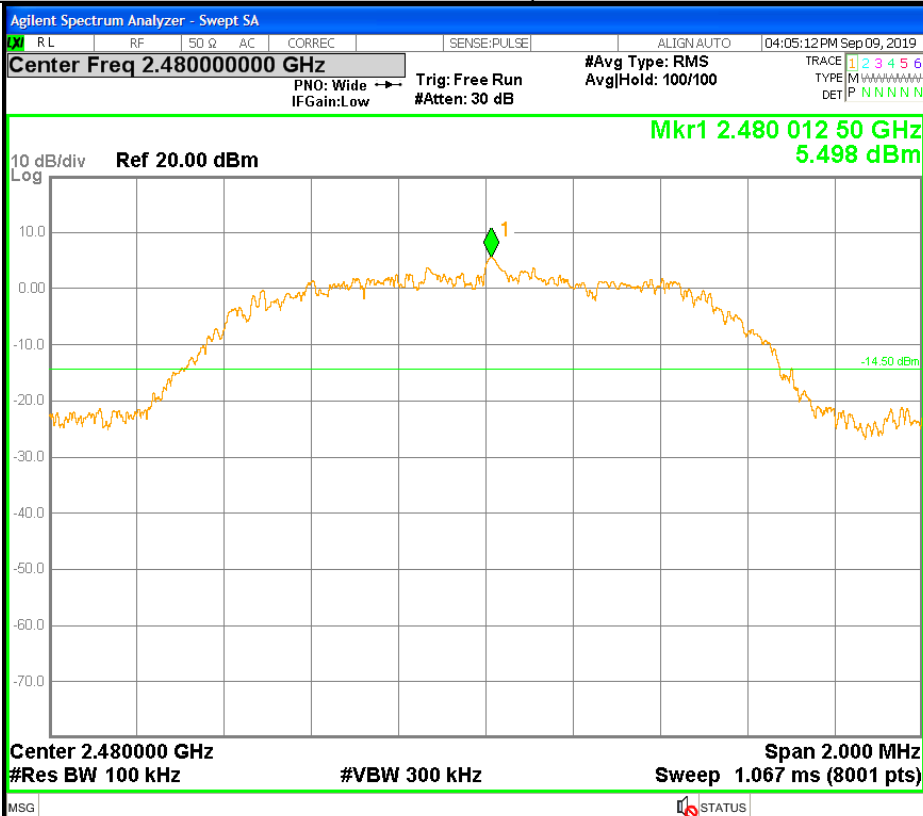


Puw

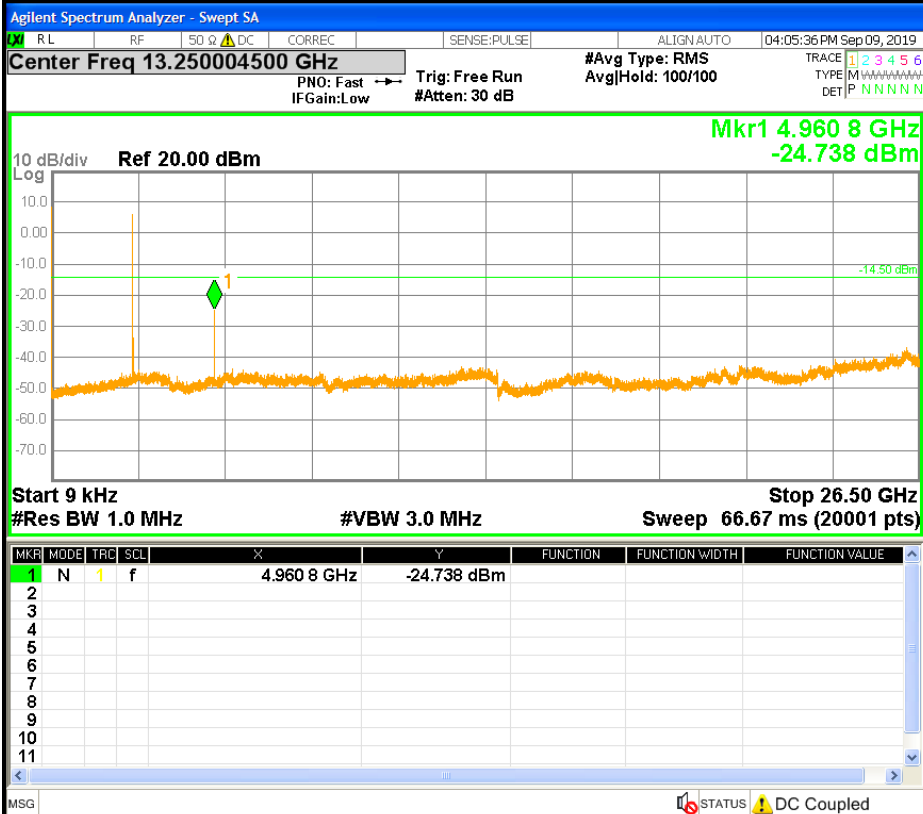


8DPSK_HCH_Graphs

Pref



Puw

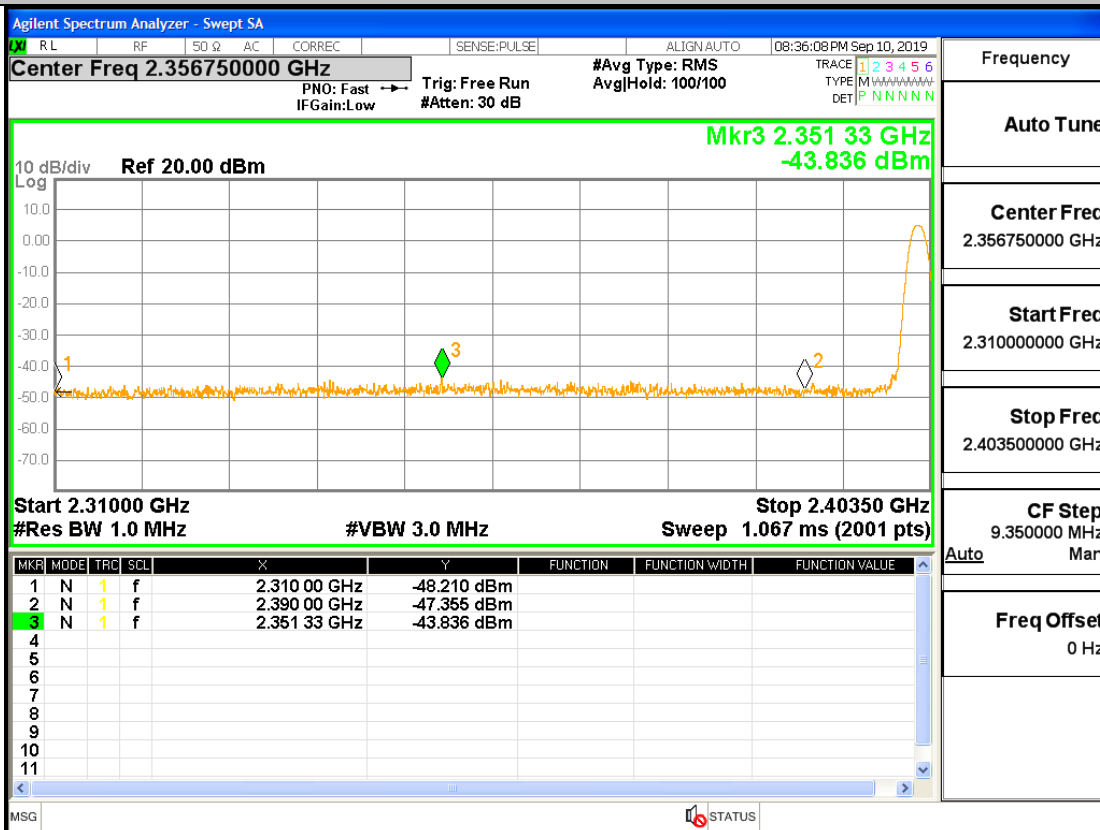


A.8 Restrict-band band-edge measurements

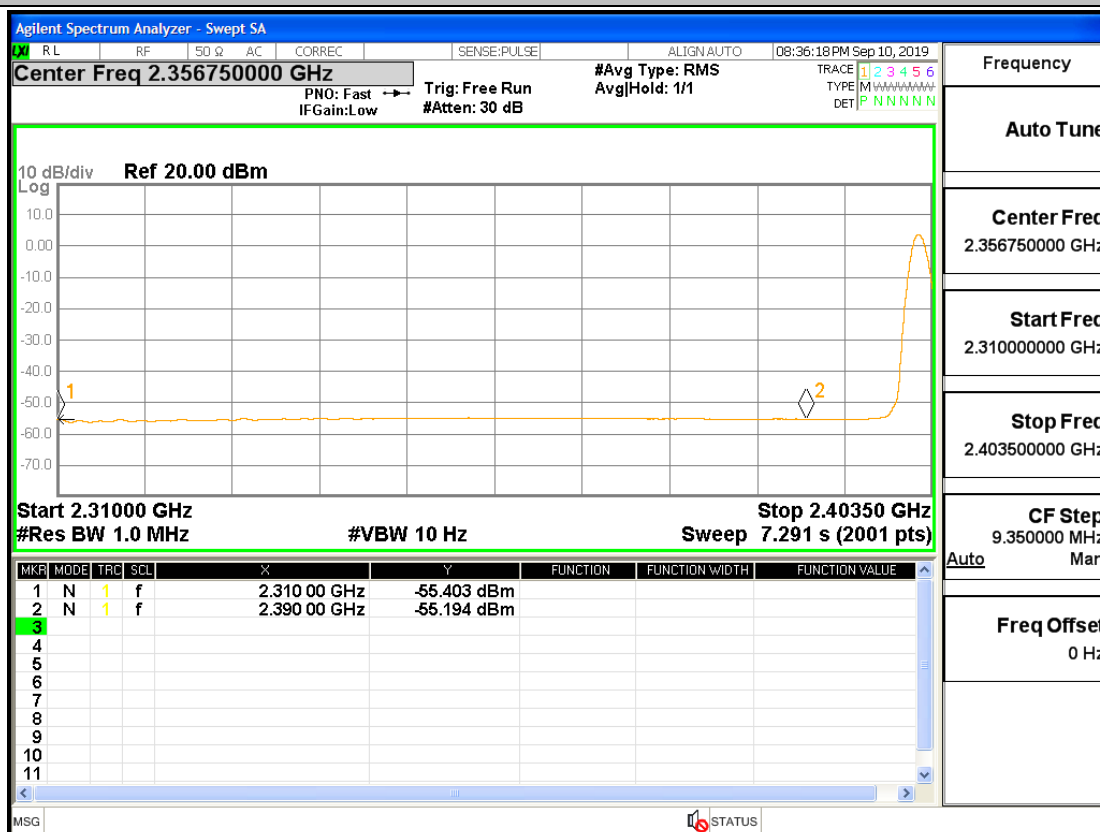
| Type | Carrier Frequency (MHz) | Frequency(M Hz) | Gain | Ground Factor | Peak Value(dBm) | E [dBuV/m] | Limit [dBuV/m] | Conclusion |
|------|-------------------------|-----------------|------|---------------|-----------------|------------|----------------|------------|
| 1DH5 | 2402 | 2351.33 | 2.00 | 0.00 | -43.84 | 53.36 | 74 | Pass |
| 1DH5 | 2480 | 2483.50 | 2.00 | 0.00 | -44.73 | 52.47 | 74 | Pass |
| 2DH5 | 2402 | 2380.92 | 2.00 | 0.00 | -44.41 | 52.79 | 74 | Pass |
| 2DH5 | 2480 | 2483.50 | 2.00 | 0.00 | -47.04 | 50.16 | 74 | Pass |
| 3DH5 | 2402 | 2390.00 | 2.00 | 0.00 | -47.62 | 49.58 | 74 | Pass |
| 3DH5 | 2480 | 2483.50 | 2.00 | 0.00 | -46.84 | 50.36 | 74 | Pass |

| Type | Carrier Frequency (MHz) | Frequency(M Hz) | Gain | Ground Factor | Average Value(dBm) | E [dBuV/m] | Limit [dBuV/m] | Conclusion |
|------|-------------------------|-----------------|------|---------------|--------------------|------------|----------------|------------|
| 1DH5 | 2402 | 2351.33 | 2.00 | 0.00 | -55.19 | 42.01 | 54 | Pass |
| 1DH5 | 2480 | 2483.50 | 2.00 | 0.00 | -52.78 | 44.42 | 54 | Pass |
| 2DH5 | 2402 | 2380.92 | 2.00 | 0.00 | -55.60 | 41.60 | 54 | Pass |
| 2DH5 | 2480 | 2483.50 | 2.00 | 0.00 | -52.72 | 44.48 | 54 | Pass |
| 3DH5 | 2402 | 2390.00 | 2.00 | 0.00 | -55.58 | 41.62 | 54 | Pass |
| 3DH5 | 2480 | 2483.50 | 2.00 | 0.00 | -52.72 | 44.48 | 54 | Pass |

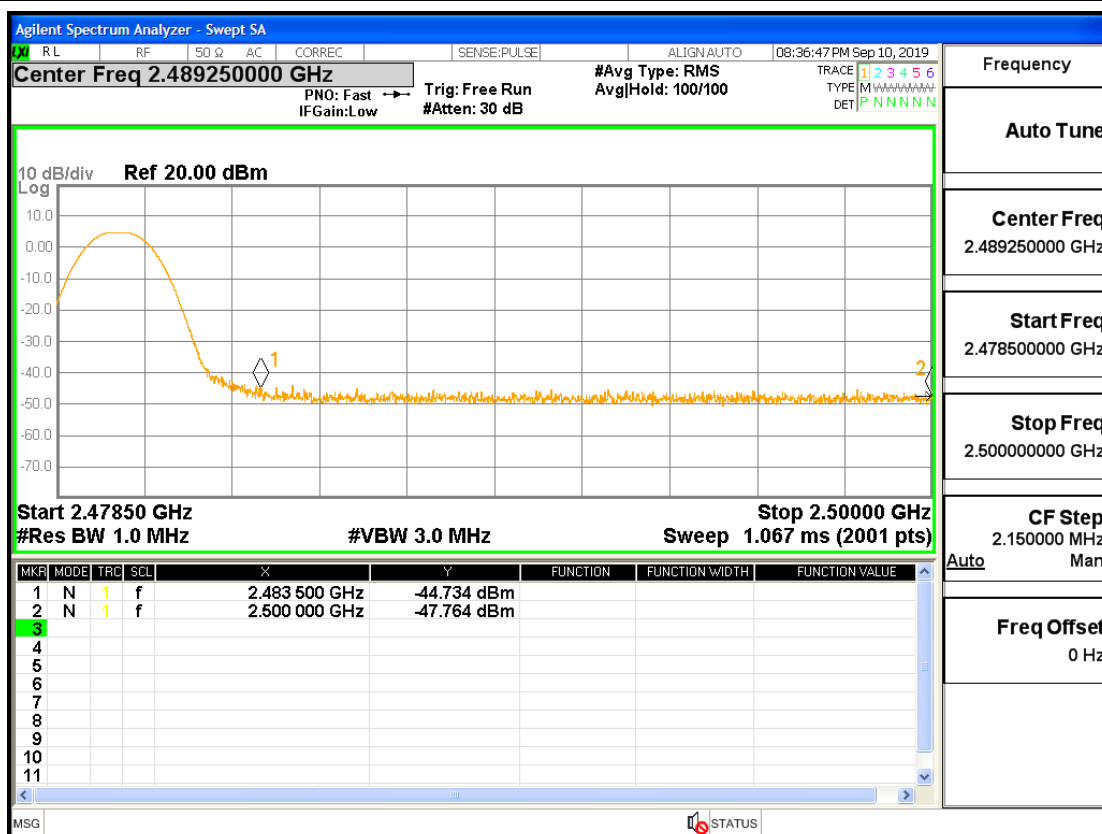
Restrict-band band-edge measurements_2402_PEAK_DH5



Restrict-band band-edge measurements_2402_AV_DH5



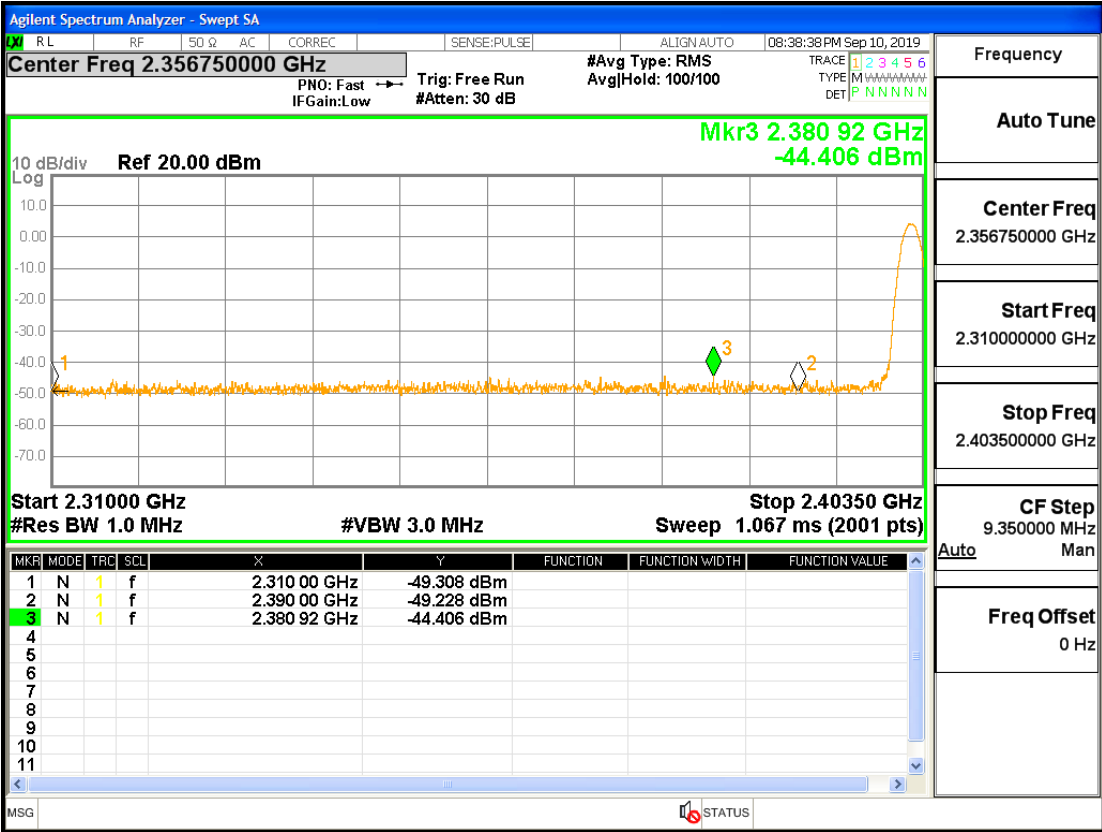
Restrict-band band-edge measurements_2480_PEAK_DH5



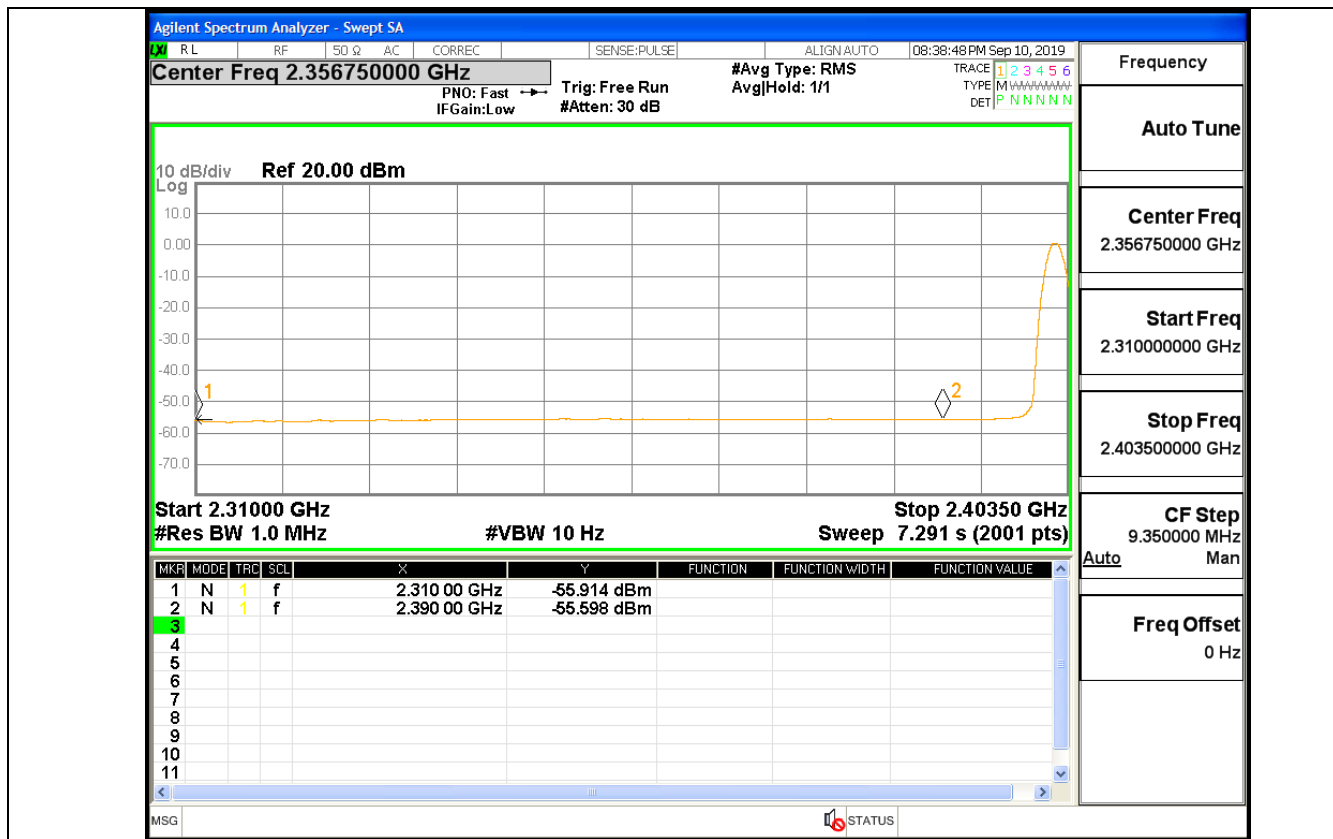
Restrict-band band-edge measurements_2480_AV_DH5



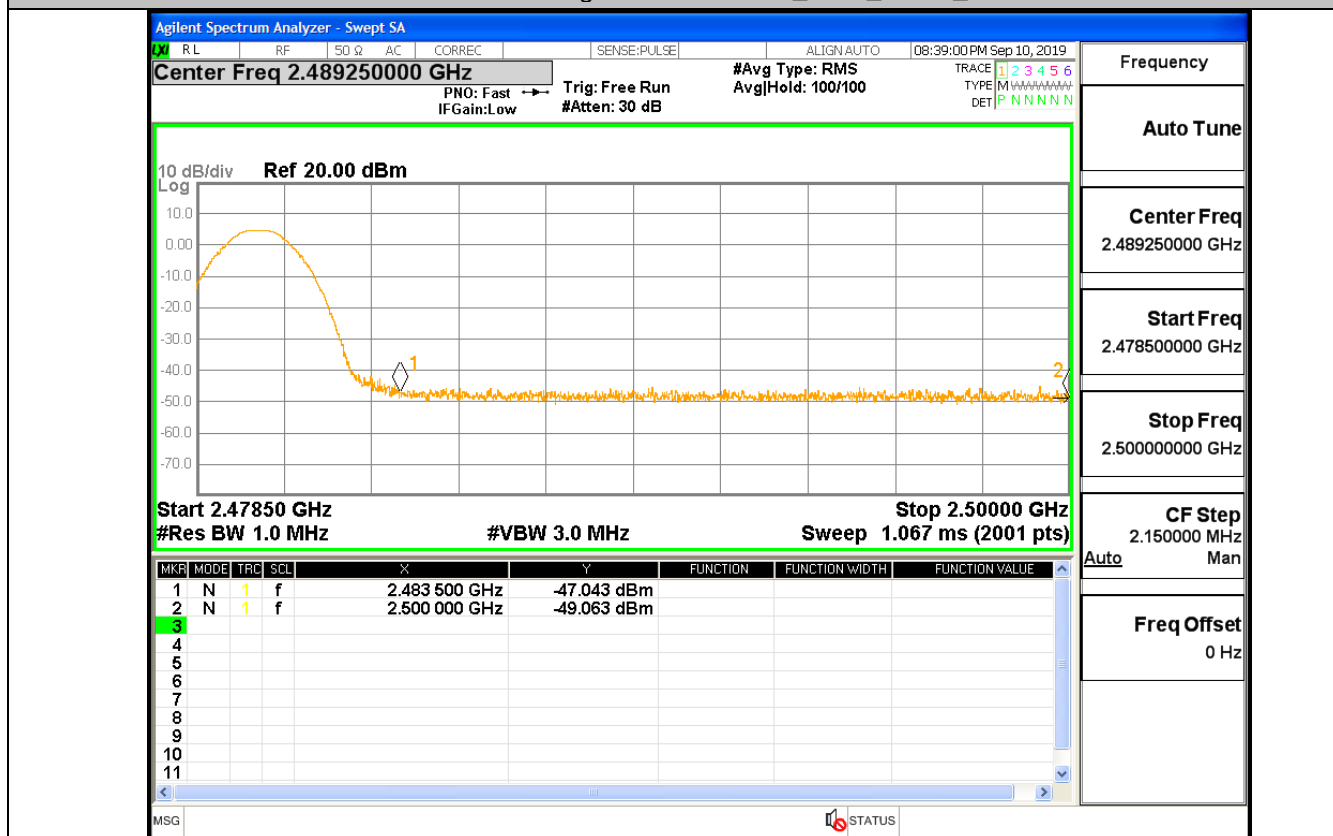
Restrict-band band-edge measurements_2402_PEAK_2DH5



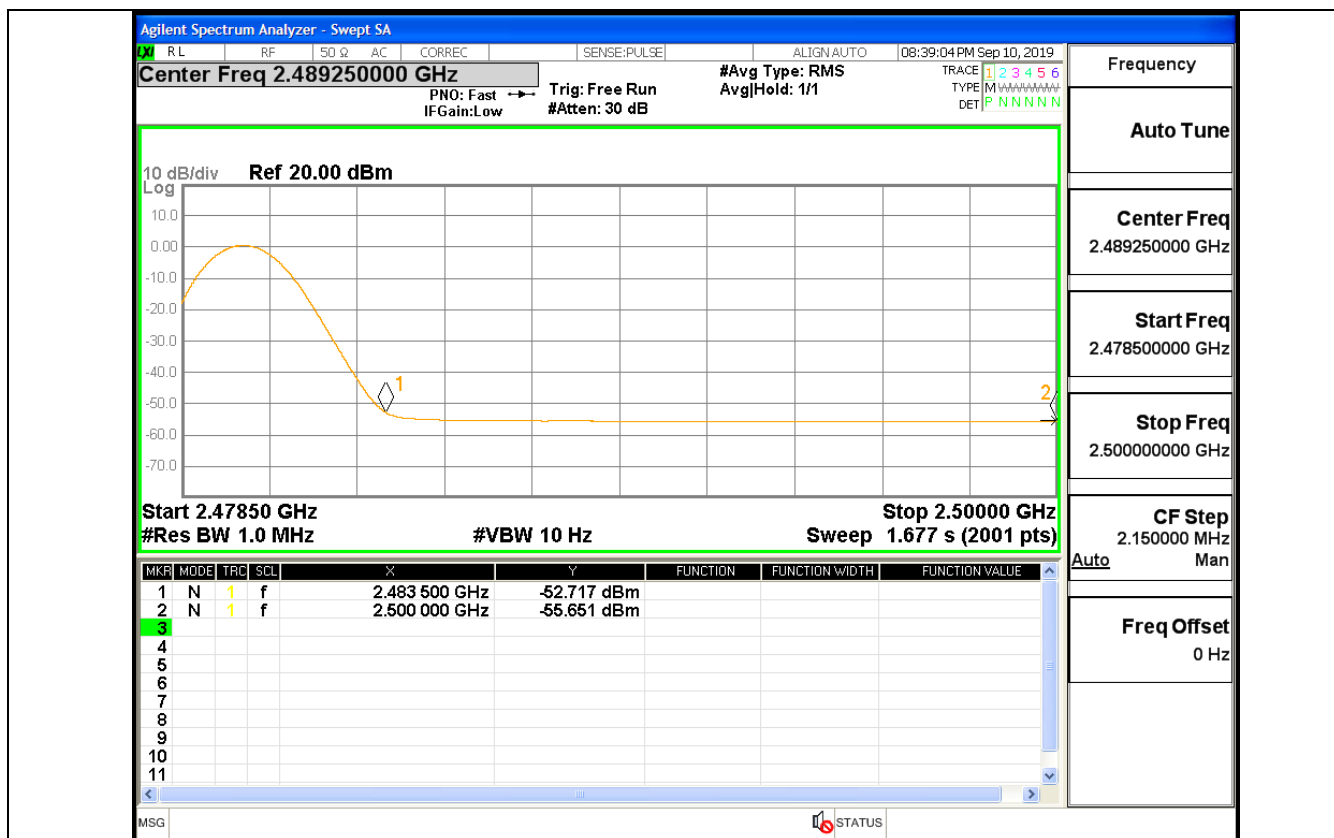
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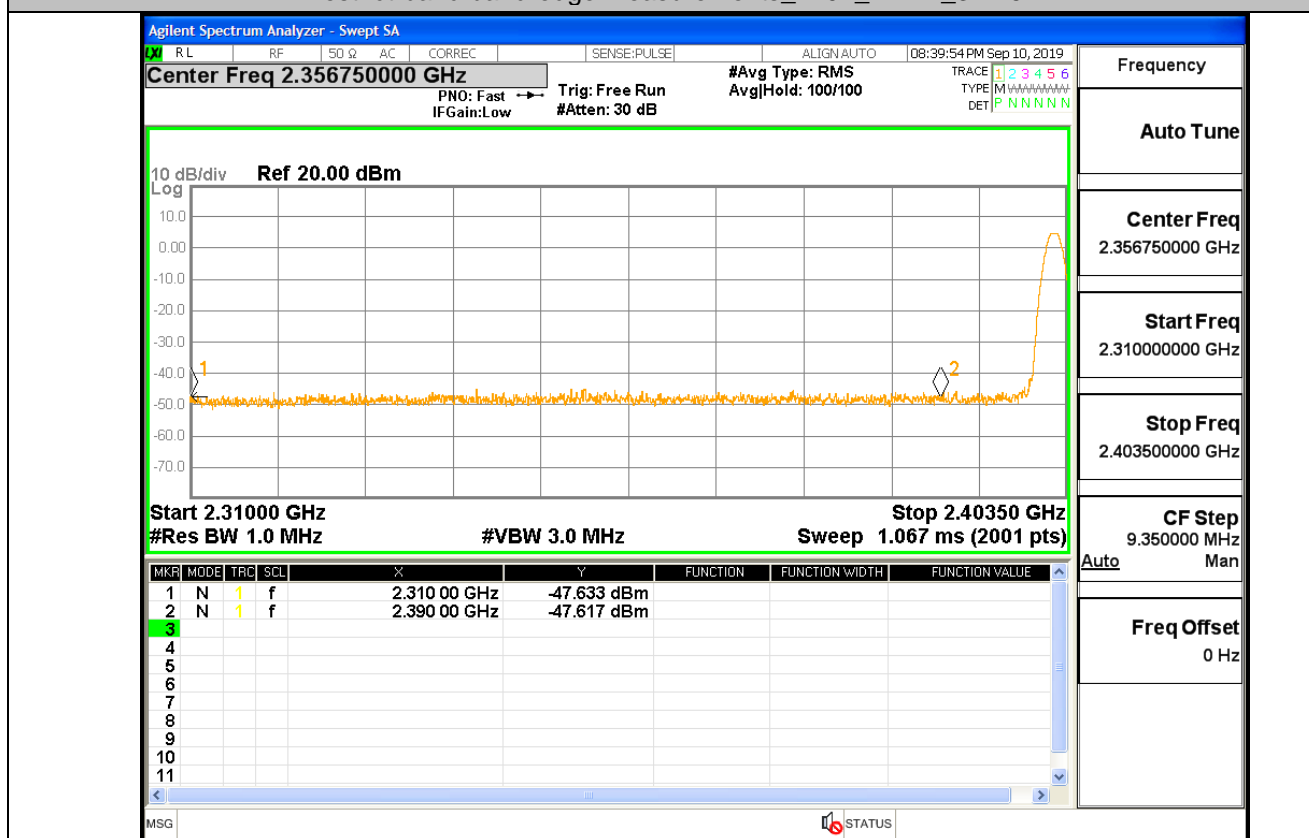
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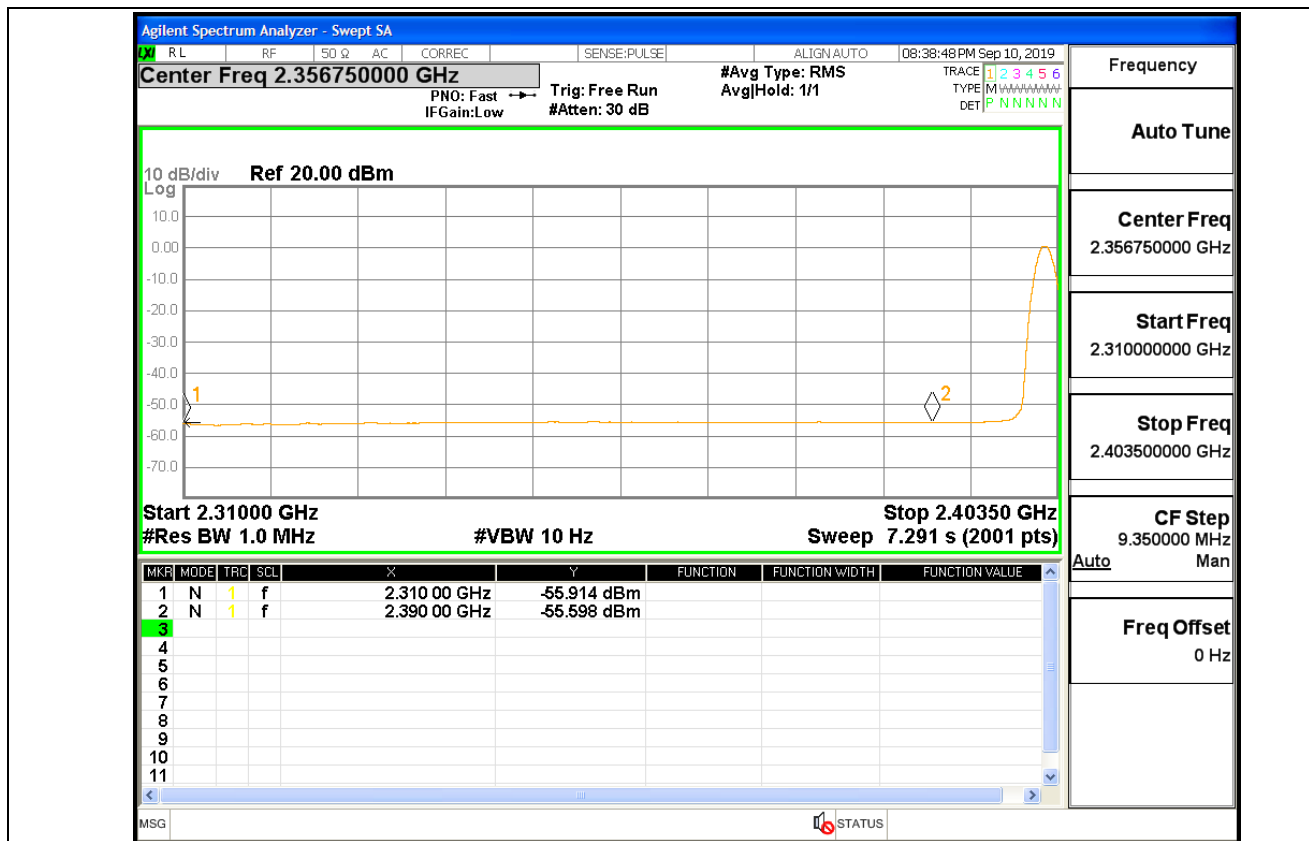
Restrict-band band-edge measurements_2480_AV_2DH5



Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5

