

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

Product Name: Bluetooth Earphones

Trade Mark: Altec Lansing

Test Model: MZW101

FCC ID: 2AL9B-MZW101

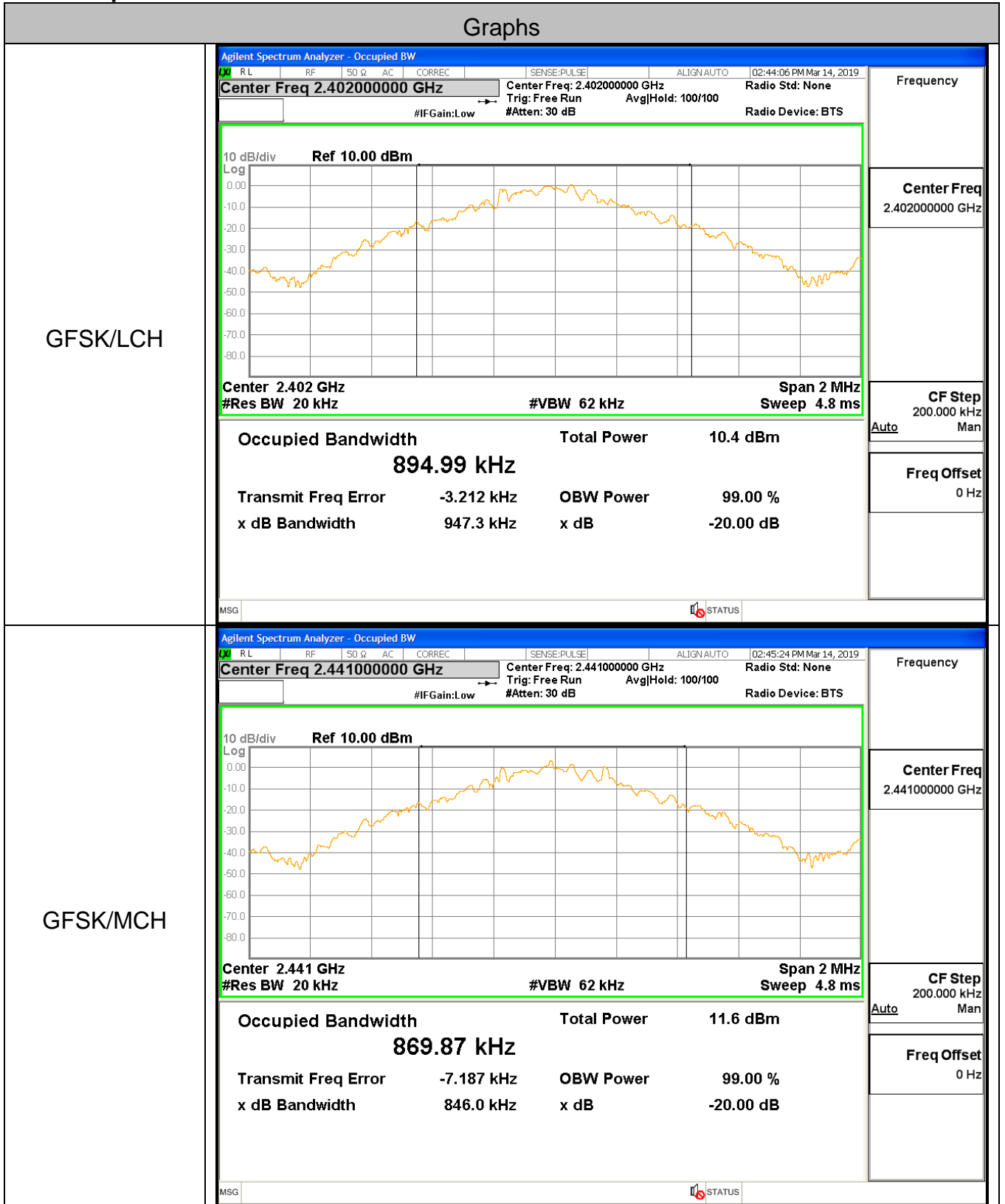
Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 23.2 °C |
| Relative Humidity: | 55% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Gary Qian |
| Supervised by: | Eden Hu |

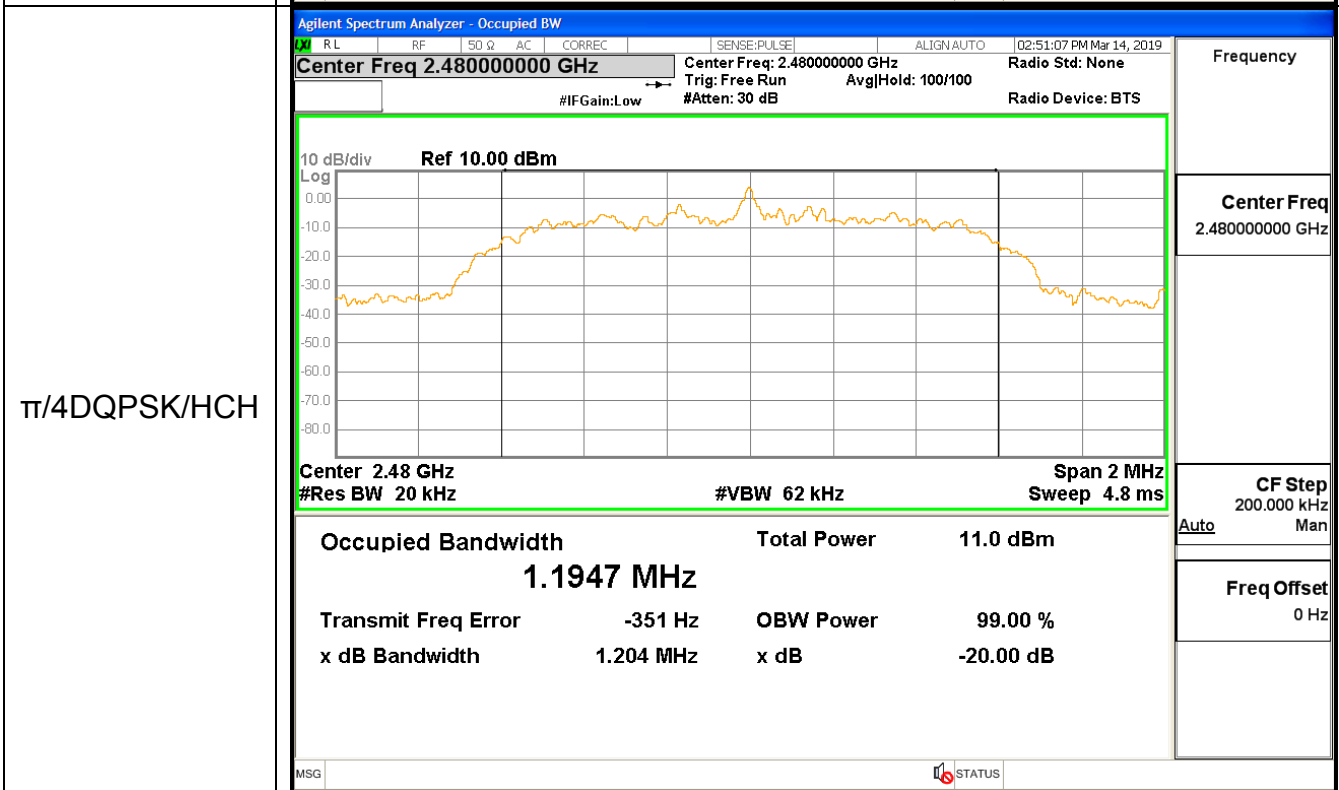
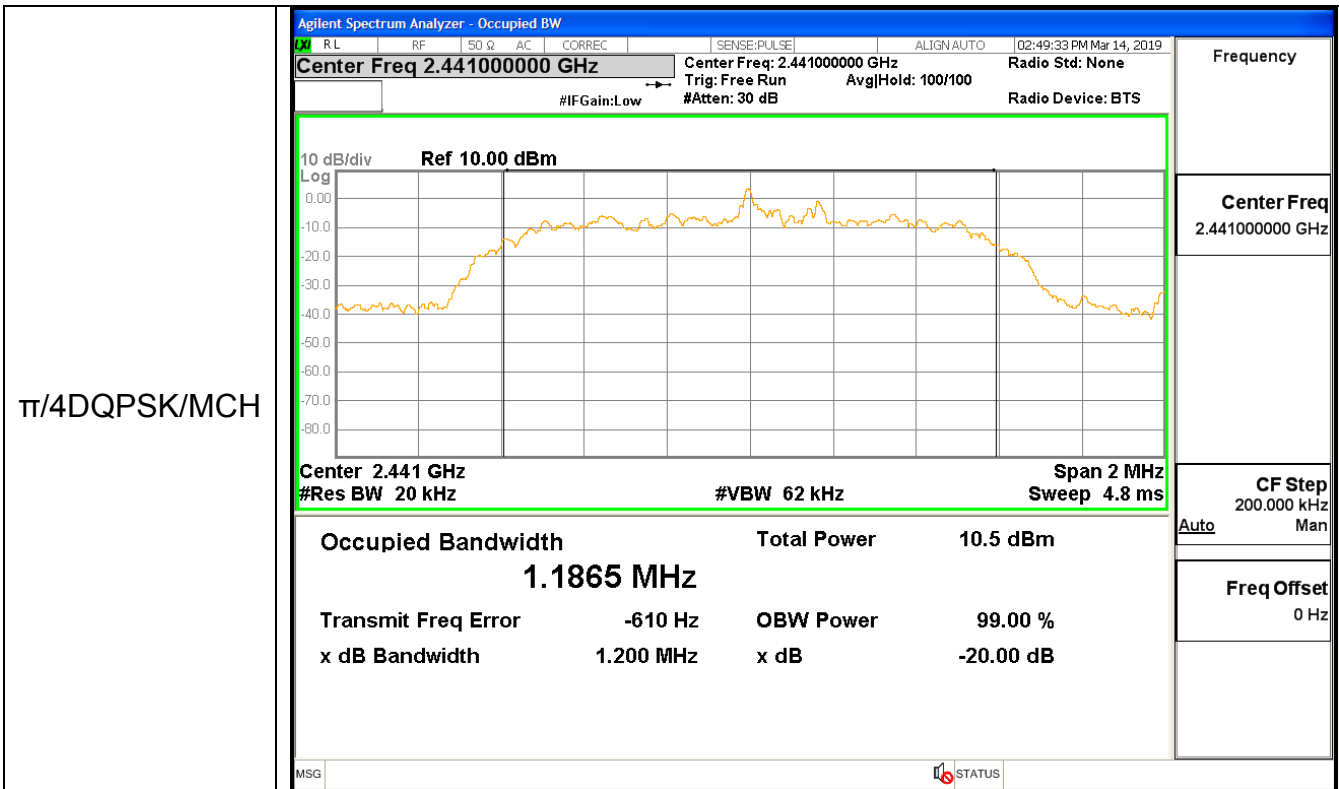
A.1 20 dB Bandwidth

| Mode | Channel. | 20dB Bandwidth [MHz] | Limit(MHz) | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK | LCH | 0.947 | Not Specified | PASS |
| GFSK | MCH | 0.846 | Not Specified | PASS |
| GFSK | HCH | 0.800 | Not Specified | PASS |
| $\pi/4$ DQPSK | LCH | 1.201 | Not Specified | PASS |
| $\pi/4$ DQPSK | MCH | 1.200 | Not Specified | PASS |
| $\pi/4$ DQPSK | HCH | 1.204 | Not Specified | PASS |

Test Graph



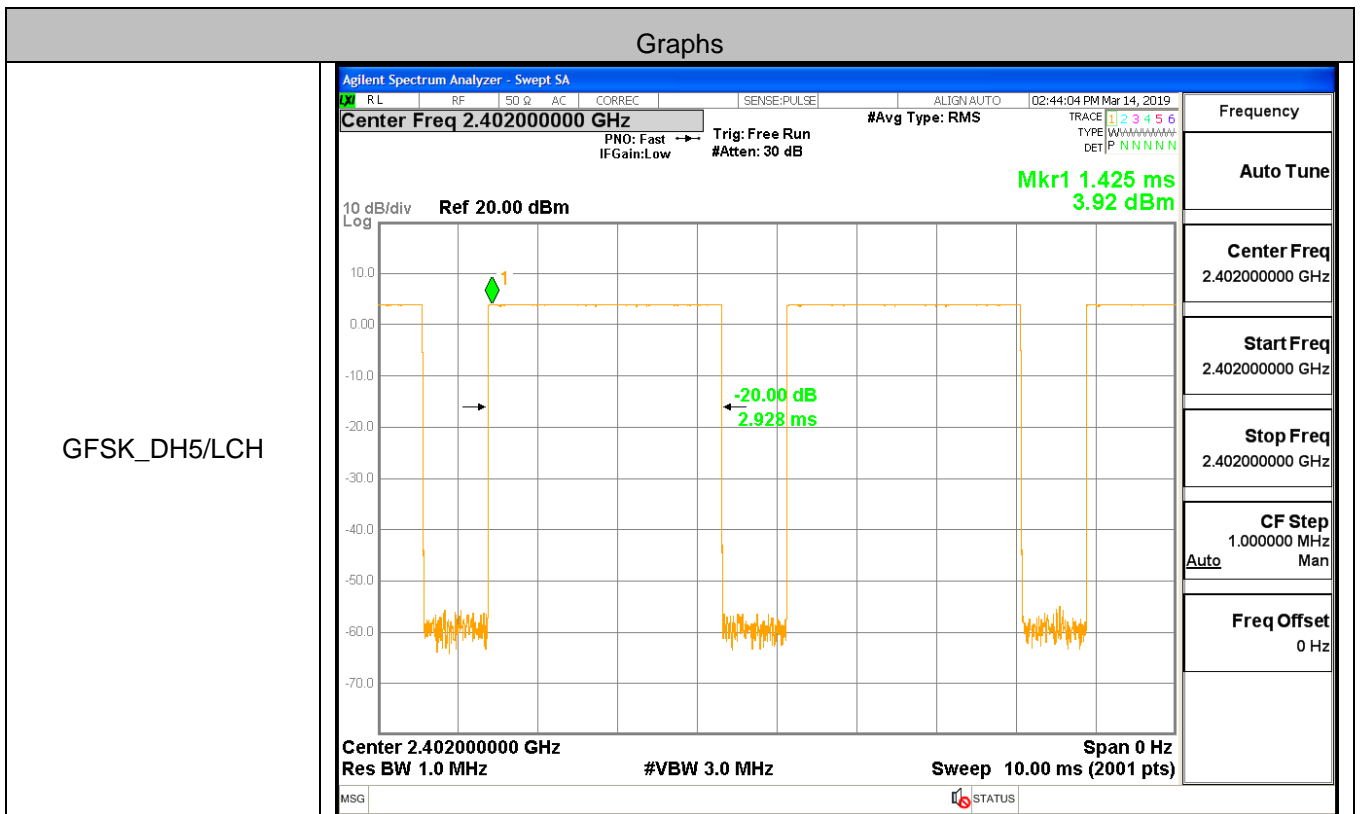
| | | |
|--|--|--|
| <p style="text-align: center; font-size: 24px;">GFSK/HCH</p> | <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.48000000 GHz Center Freq: 2.480000000 GHz Radio Std: None</p> <p>#IFGain:Low Trig: Free Run AvgHold: 100/100 #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref 10.00 dBm</p> <p>Center 2.48 GHz Span 2 MHz</p> <p>#Res BW 20 kHz #VBW 62 kHz Sweep 4.8 ms</p> <p>Occupied Bandwidth Total Power 12.1 dBm</p> <p style="text-align: center; font-size: 18px;">870.65 kHz</p> <p>Transmit Freq Error -4.398 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 800.2 kHz x dB -20.00 dB</p> | <p>Frequency</p> <p>Center Freq 2.48000000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Freq Offset 0 Hz</p> |
| | <p style="text-align: center; font-size: 24px;">$\pi/4$DQPSK/LCH</p> | <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None</p> <p>#IFGain:Low Trig: Free Run AvgHold: 100/100 #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref 10.00 dBm</p> <p>Center 2.402 GHz Span 2 MHz</p> <p>#Res BW 20 kHz #VBW 62 kHz Sweep 4.8 ms</p> <p>Occupied Bandwidth Total Power 9.59 dBm</p> <p style="text-align: center; font-size: 18px;">1.1828 MHz</p> <p>Transmit Freq Error -1.429 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 1.201 MHz x dB -20.00 dB</p> |

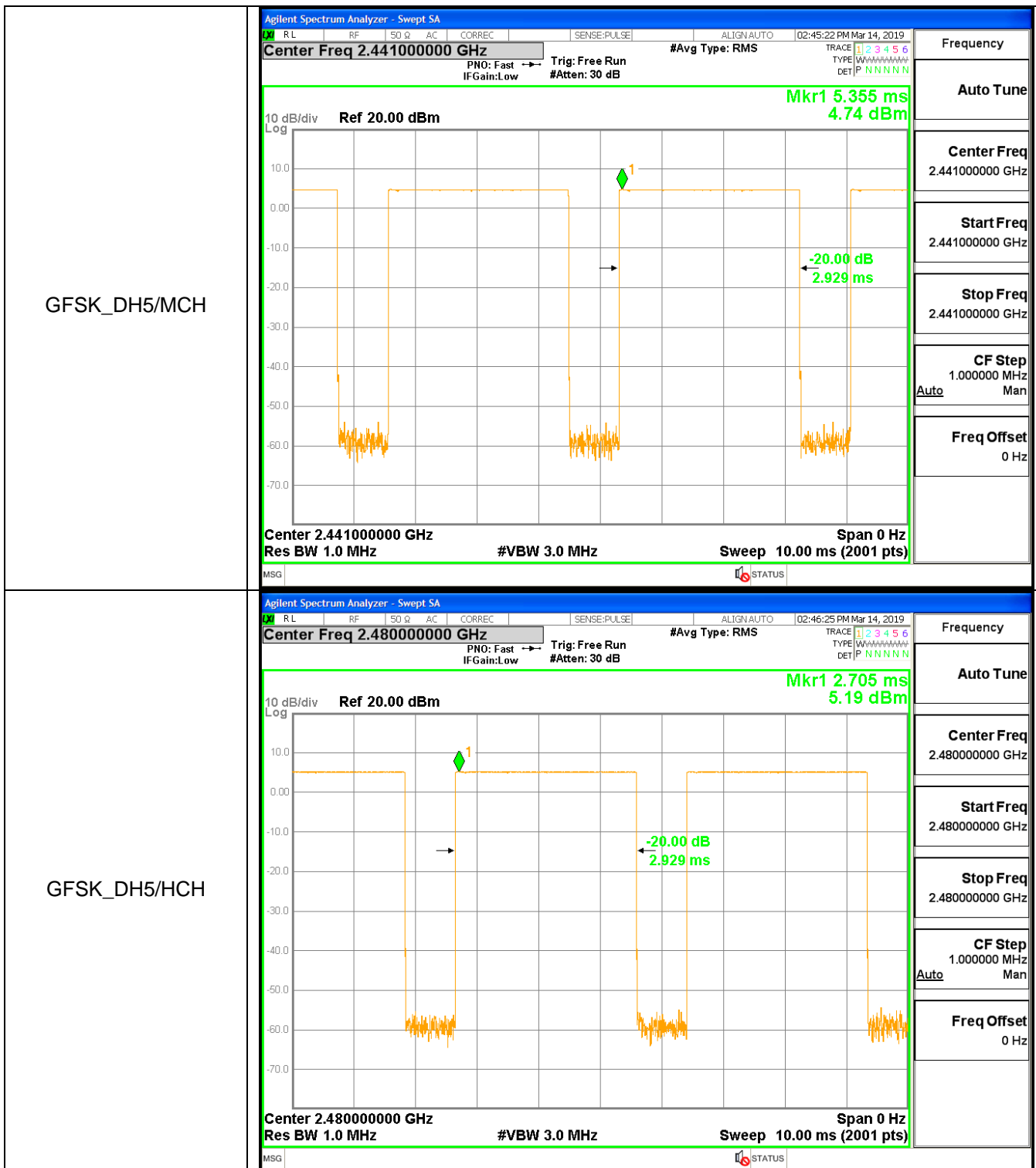


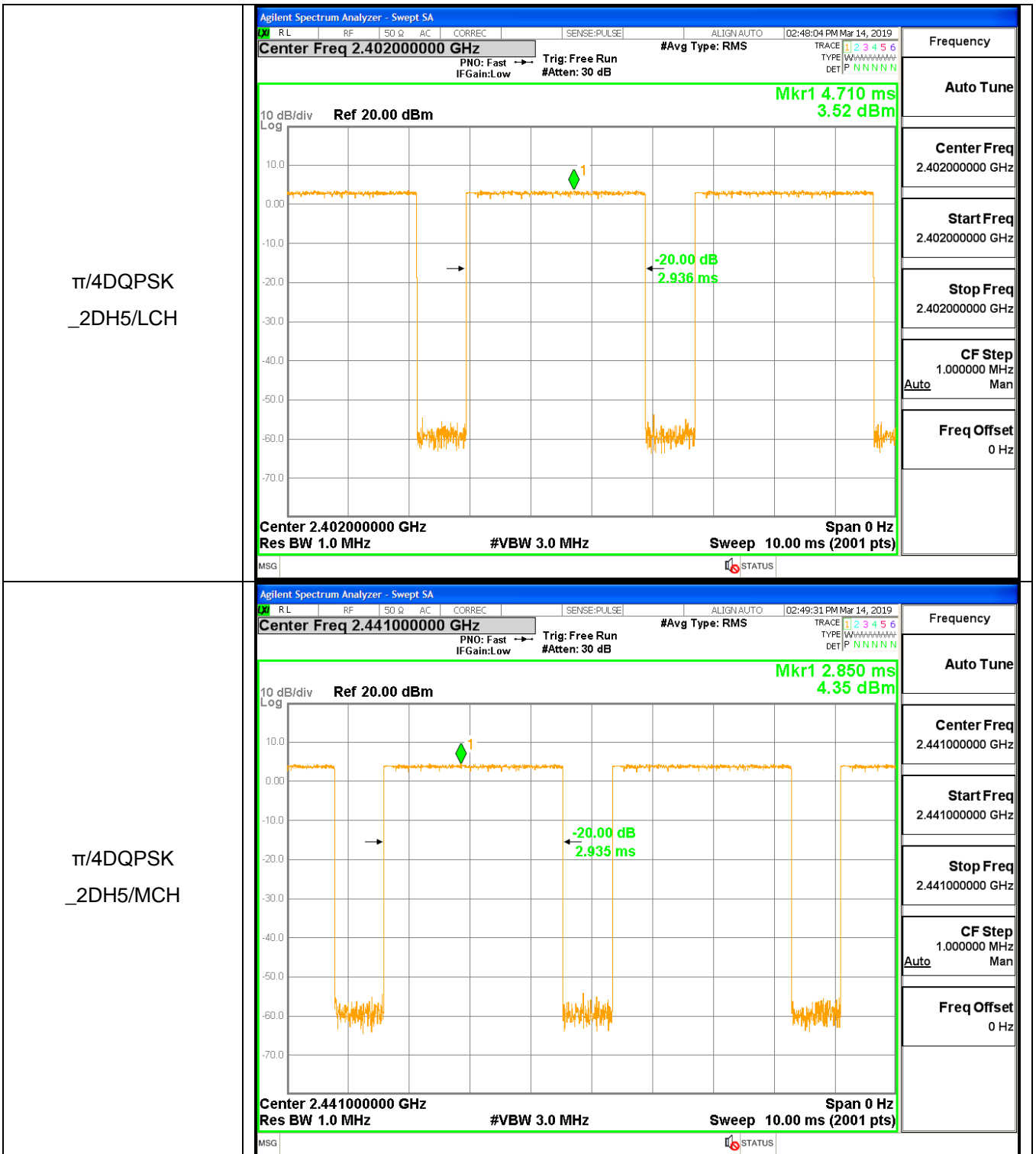
A.2 Dwell Time

| Mode | Packet | Channel | Burst Width [s/hop/ch] | Total Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|------------------------|--------------------|---------------|-----------|---------|
| GFSK | DH5 | LCH | 0.002928 | 106.7 | 0.31242 | 0.4 | PASS |
| GFSK | DH5 | MCH | 0.002929 | 106.7 | 0.312472 | 0.4 | PASS |
| GFSK | DH5 | HCH | 0.002929 | 106.7 | 0.312493 | 0.4 | PASS |
| $\pi/4$ DQPSK | 2DH5 | LCH | 0.002936 | 106.7 | 0.313274 | 0.4 | PASS |
| $\pi/4$ DQPSK | 2DH5 | MCH | 0.002935 | 106.7 | 0.31312 | 0.4 | PASS |
| $\pi/4$ DQPSK | 2DH5 | HCH | 0.002933 | 106.7 | 0.31295 | 0.4 | PASS |

Test Graph





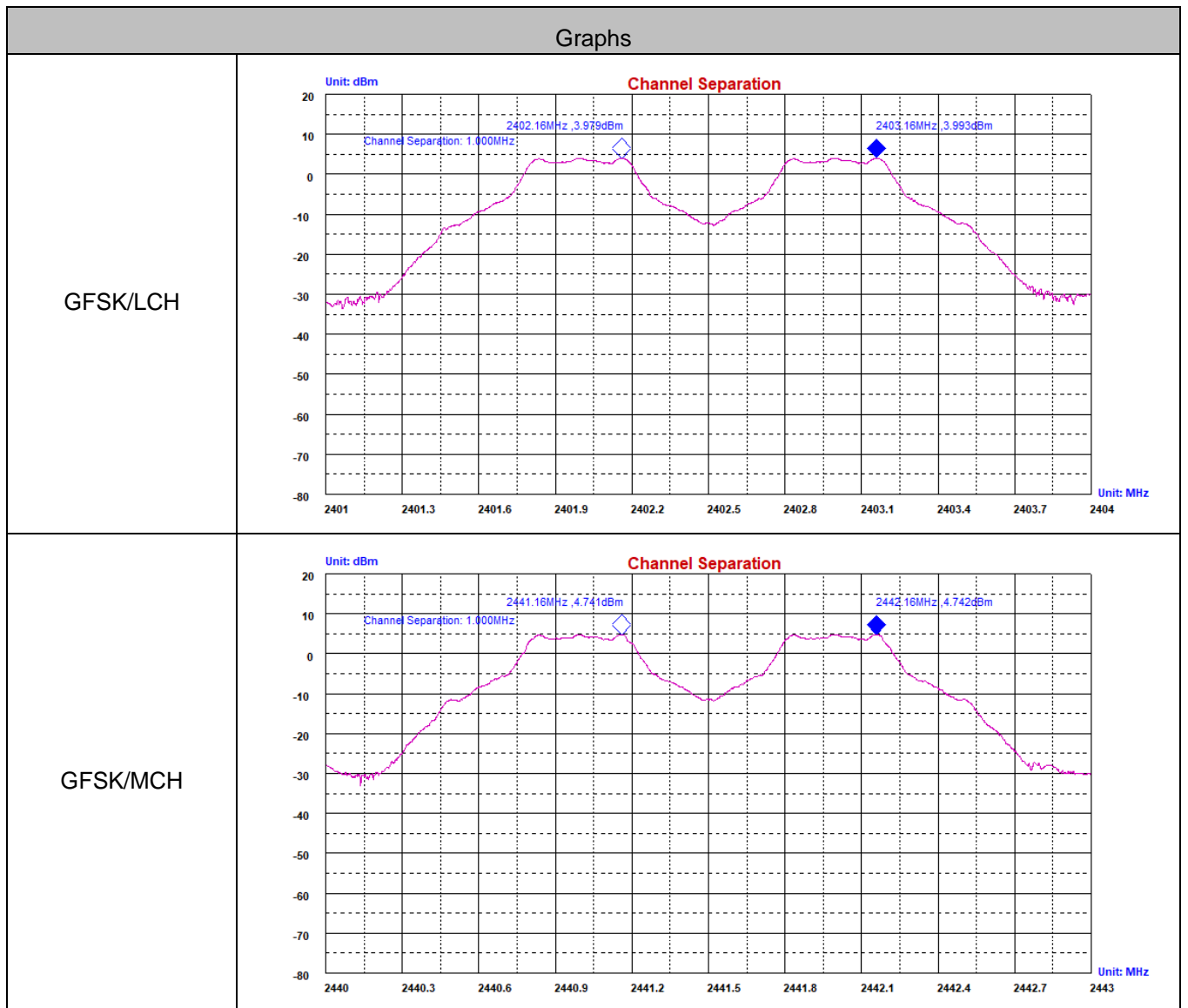


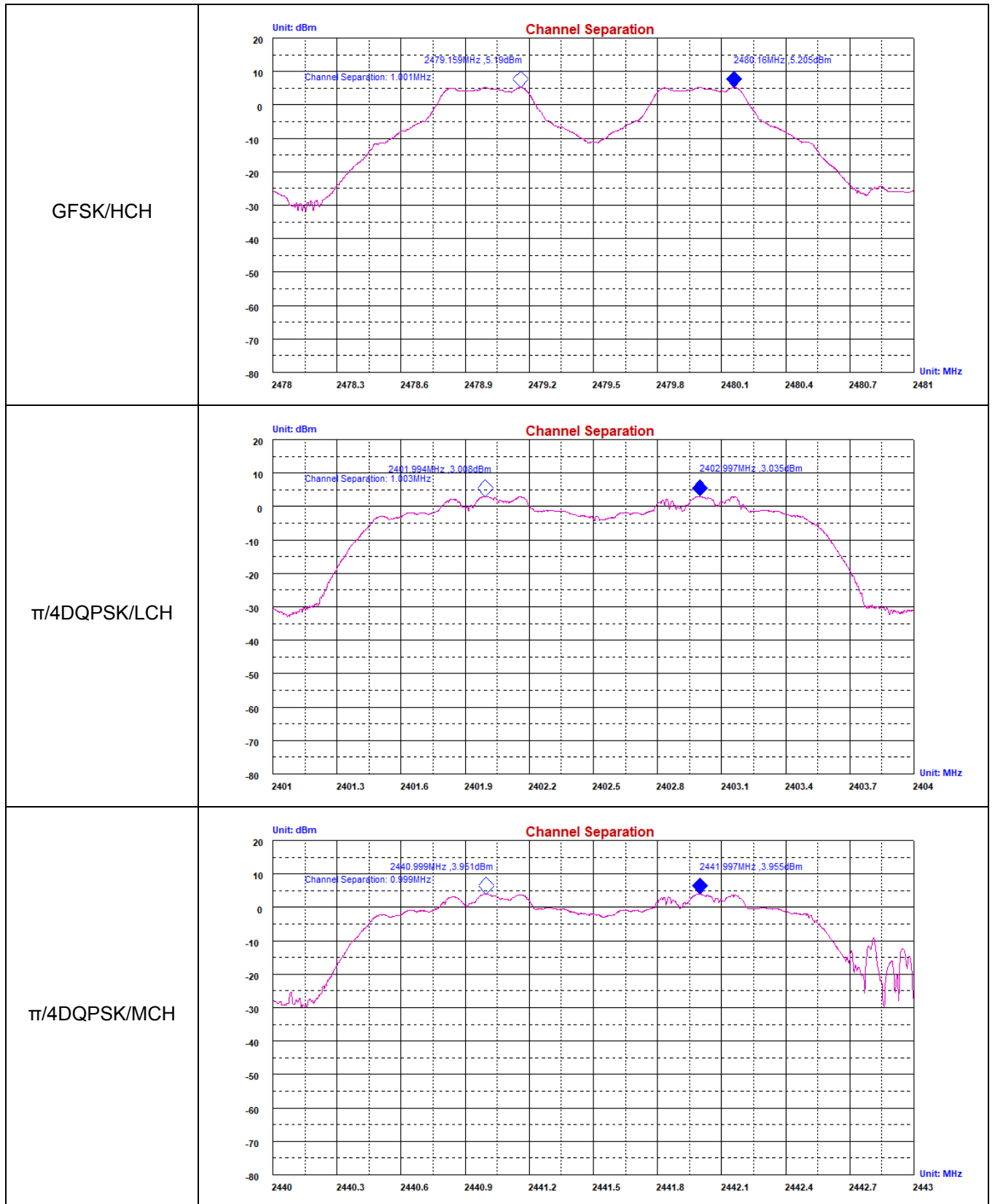


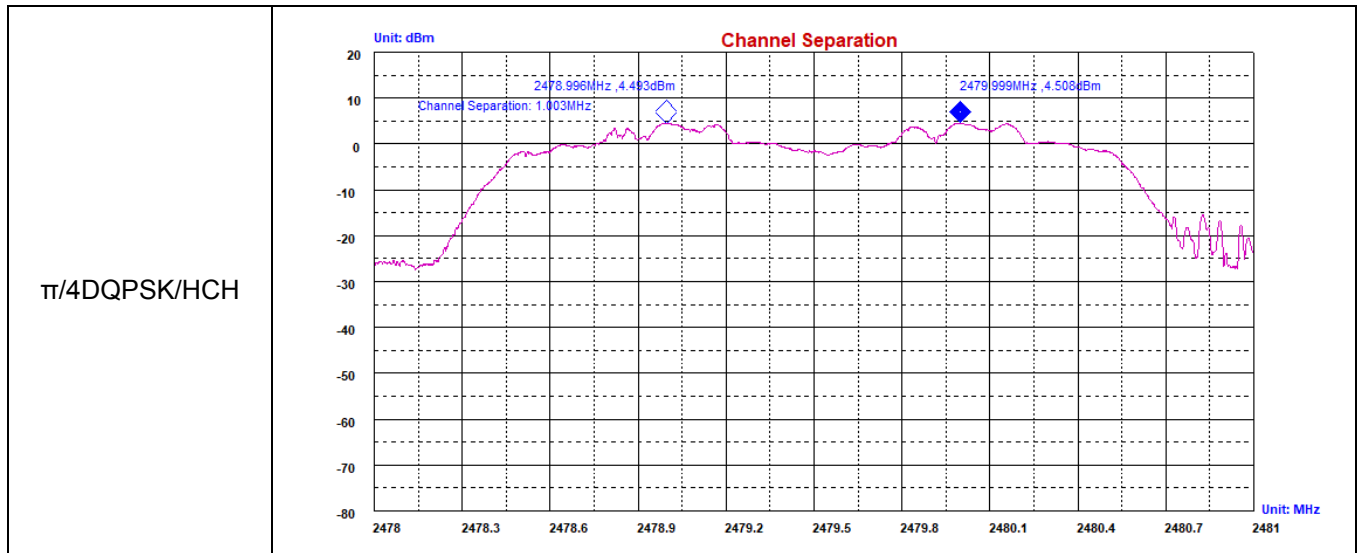
A.3 Carrier Frequency Separation

| Mode | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK | LCH | 1.000 | 0.631 | PASS |
| GFSK | MCH | 1.000 | 0.564 | PASS |
| GFSK | HCH | 1.001 | 0.533 | PASS |
| $\pi/4$ DQPSK | LCH | 1.003 | 0.801 | PASS |
| $\pi/4$ DQPSK | MCH | 0.999 | 0.800 | PASS |
| $\pi/4$ DQPSK | HCH | 1.003 | 0.803 | PASS |

Test Graph



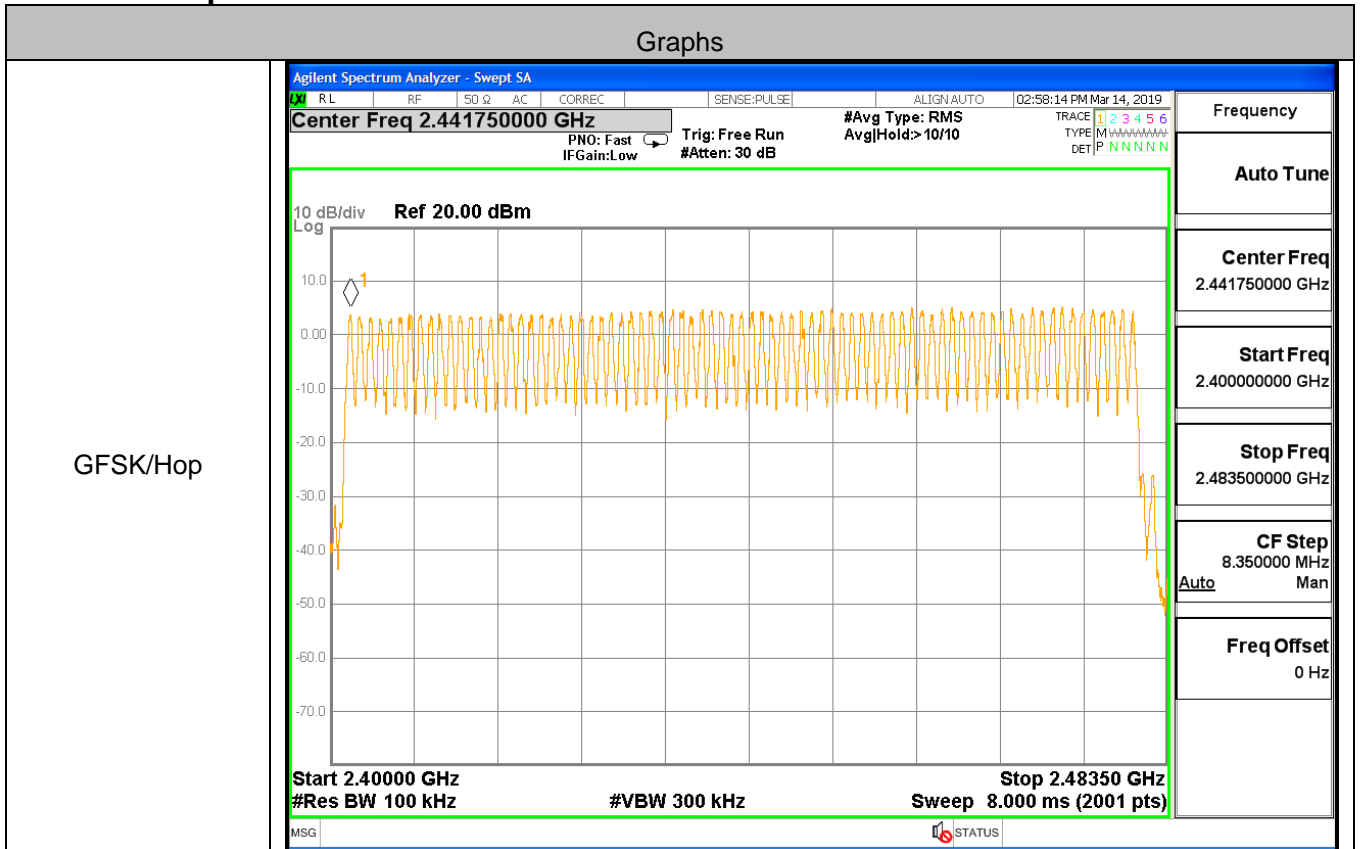


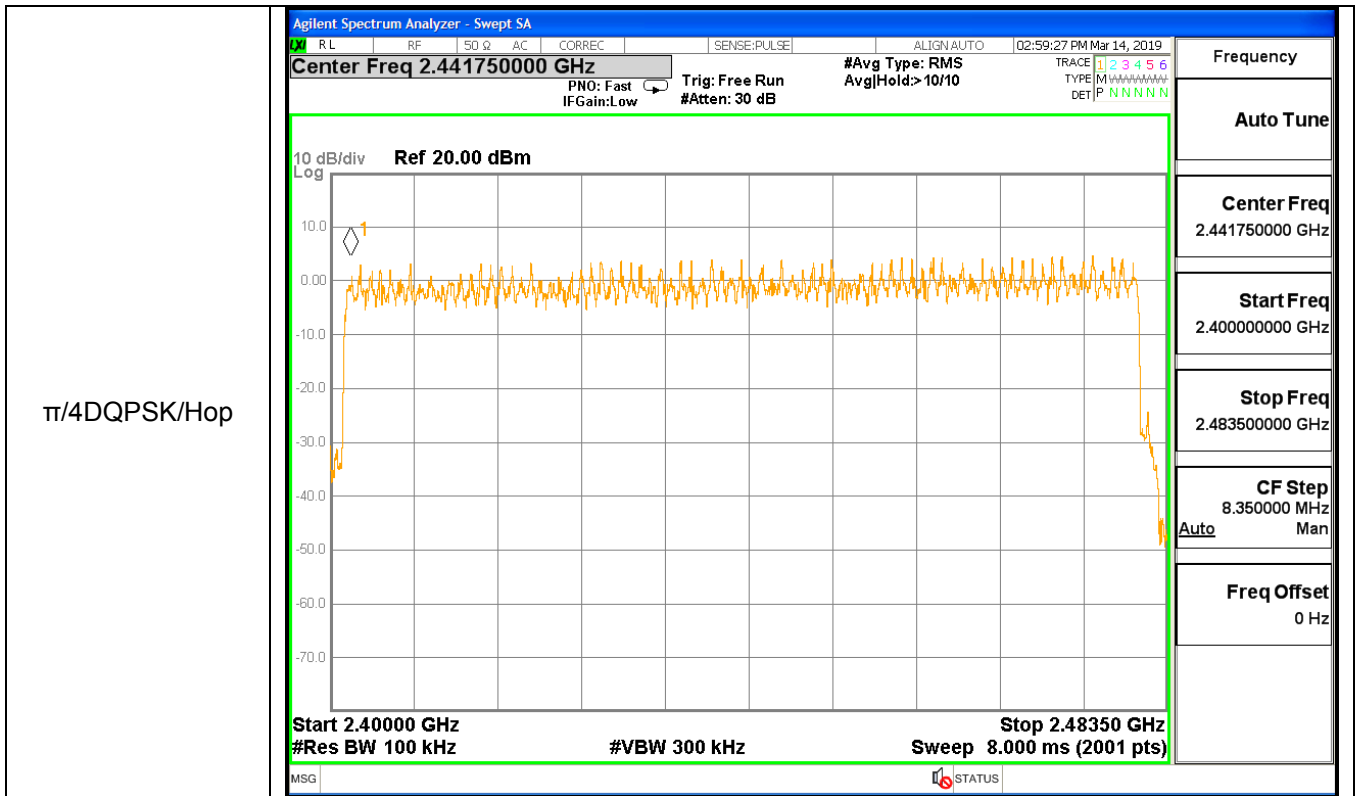


A.4 Hopping Channel Number

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

Test Graph

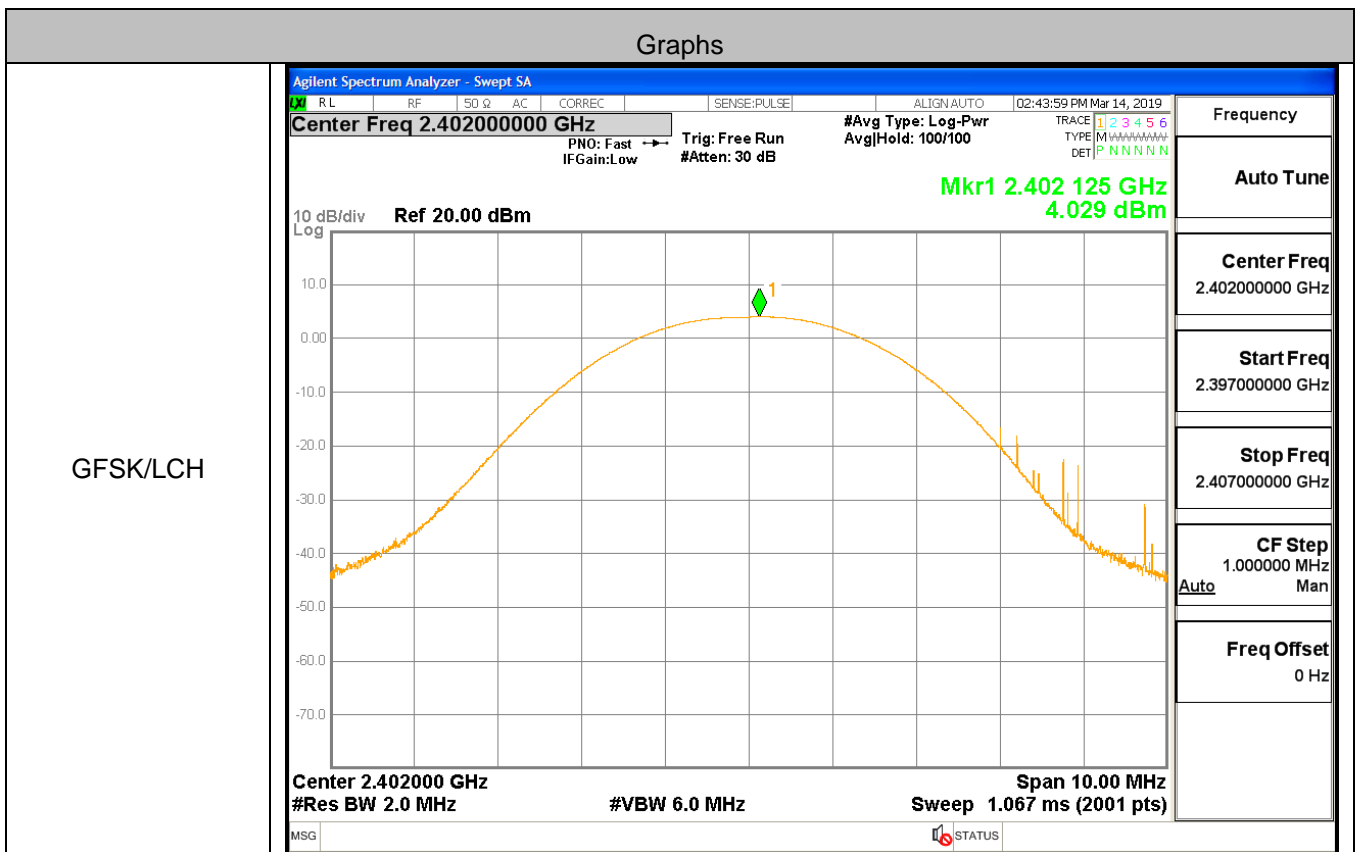


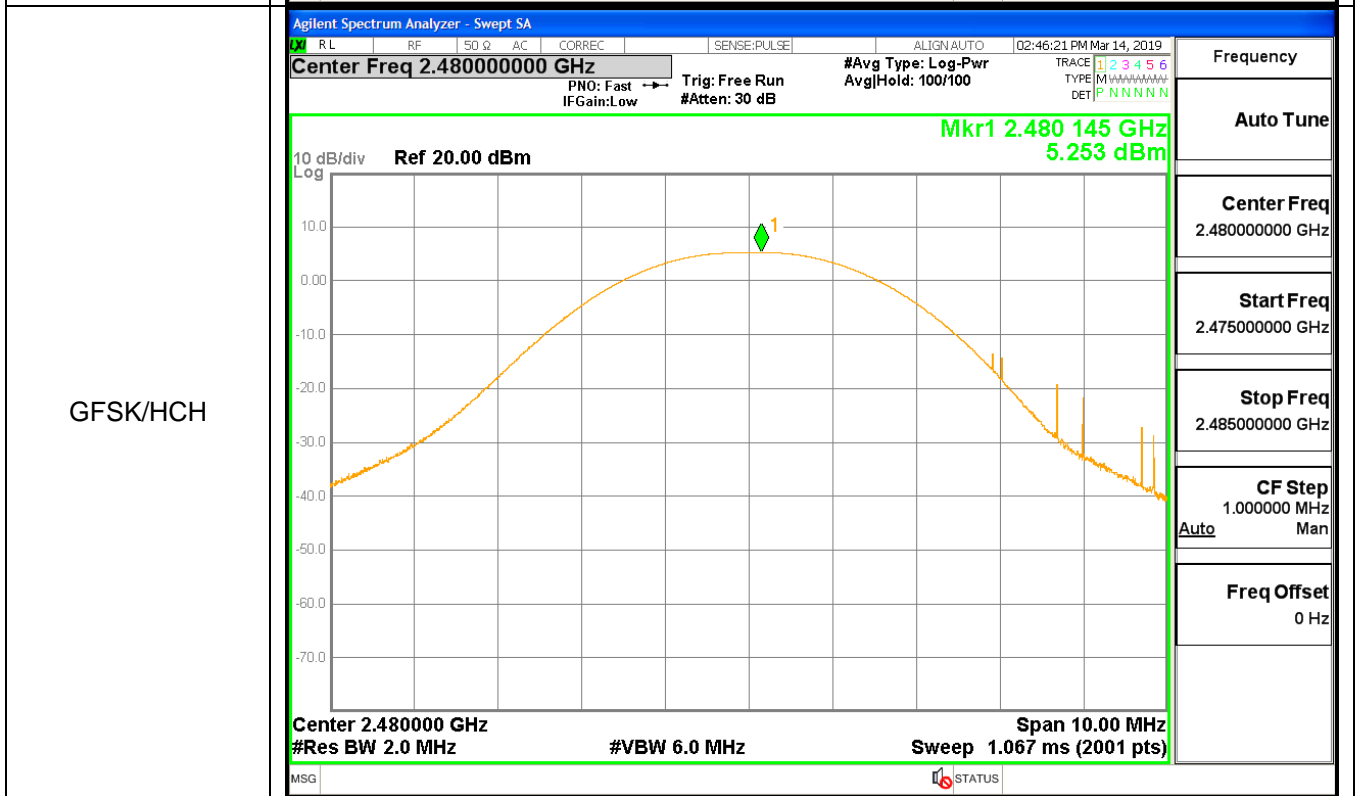
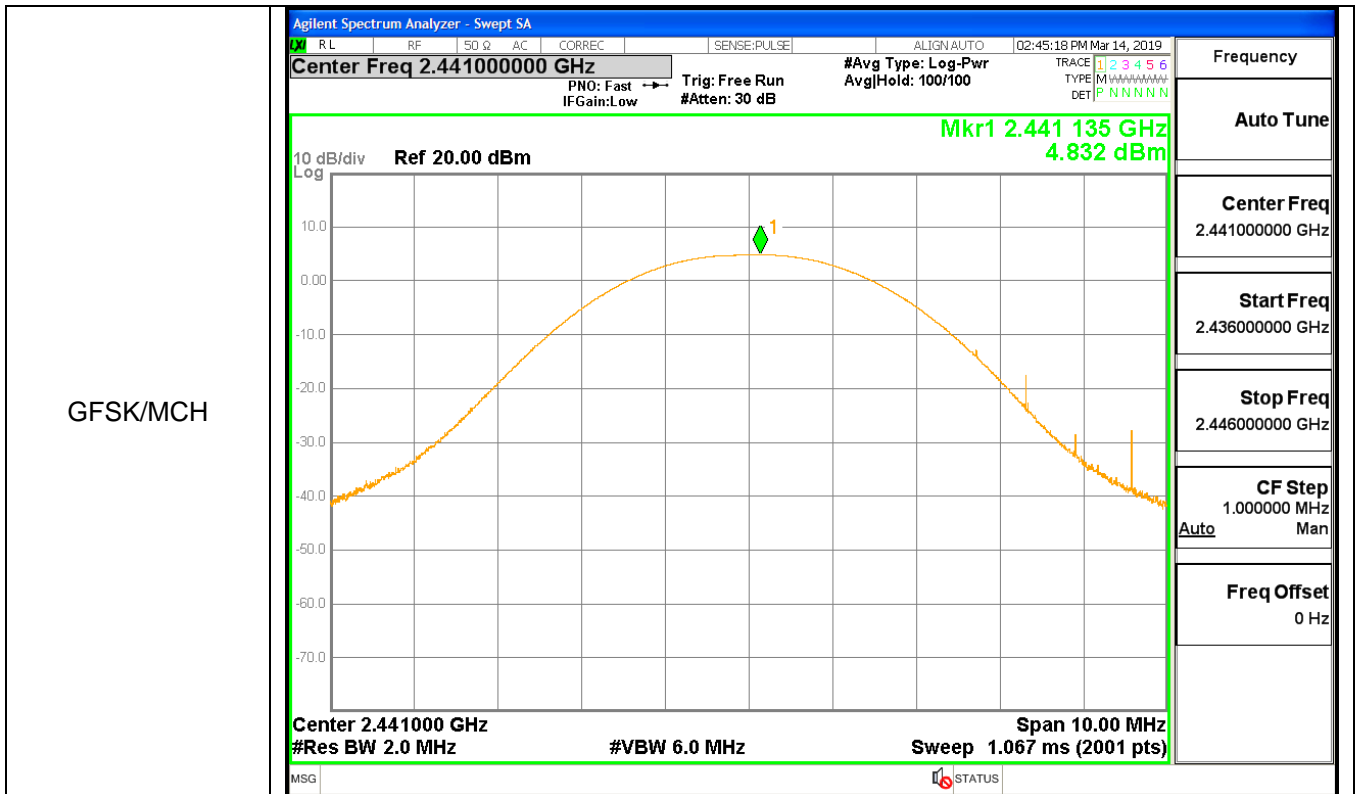


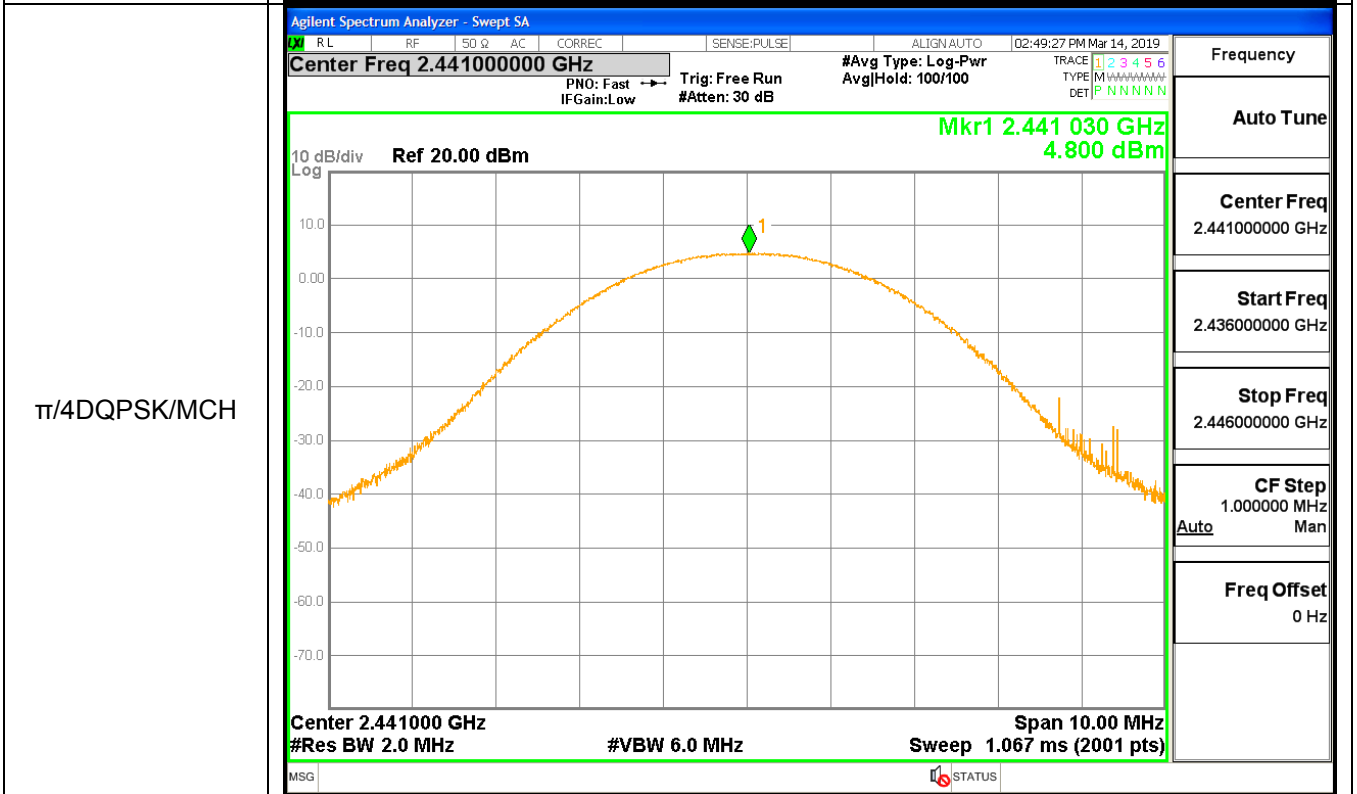
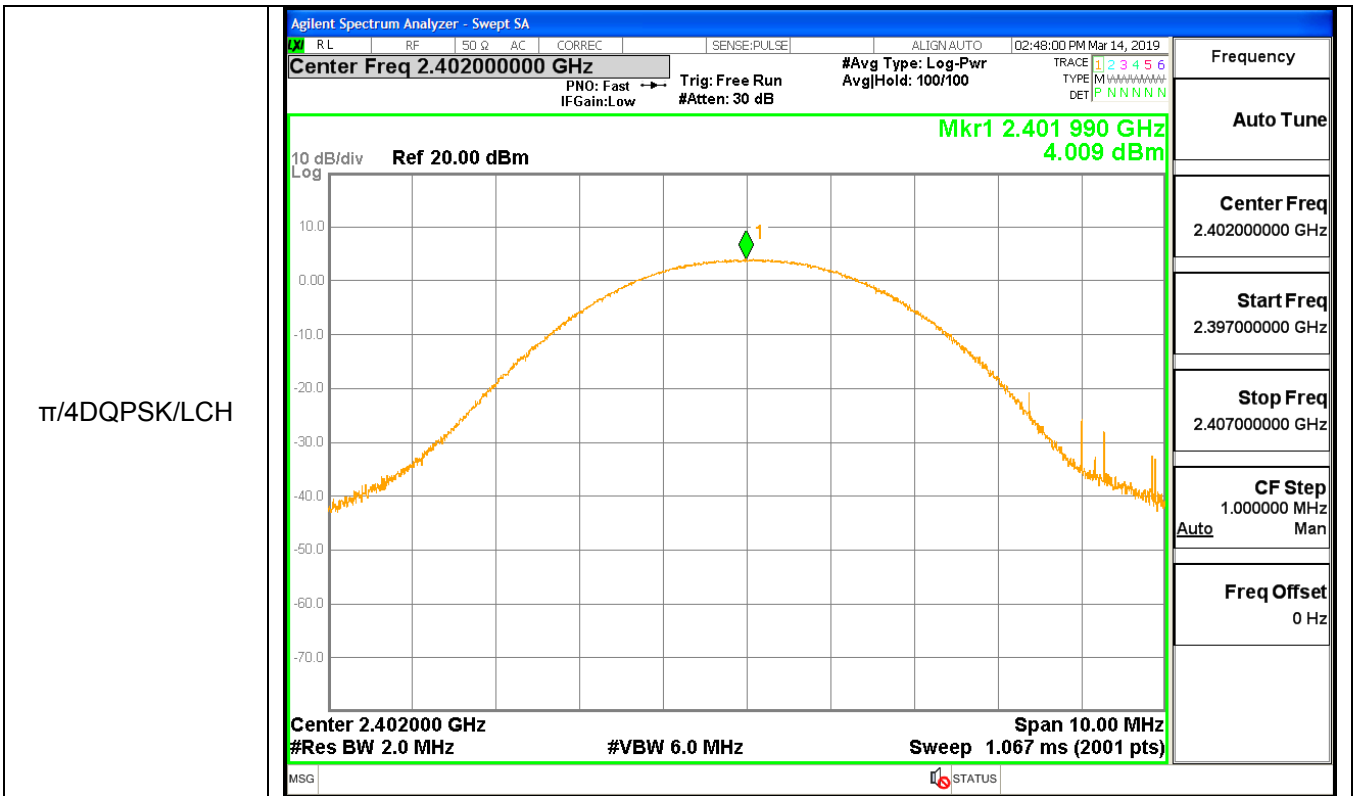
A.5 Conducted Peak Output Power

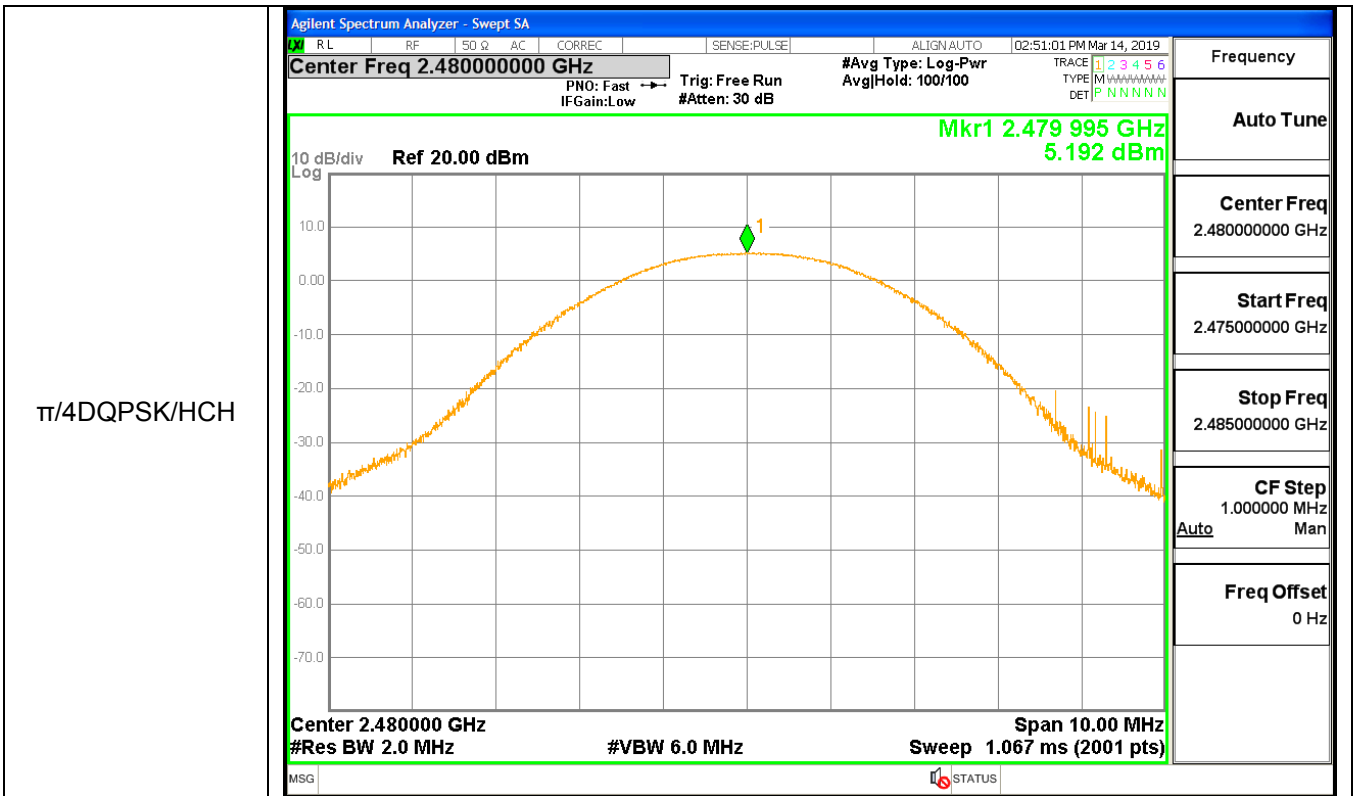
| Mode | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK | LCH | 4.029 | 21 | PASS |
| GFSK | MCH | 4.832 | 21 | PASS |
| GFSK | HCH | 5.253 | 21 | PASS |
| $\pi/4$ DQPSK | LCH | 4.009 | 21 | PASS |
| $\pi/4$ DQPSK | MCH | 4.800 | 21 | PASS |
| $\pi/4$ DQPSK | HCH | 5.192 | 21 | PASS |

Test Graph





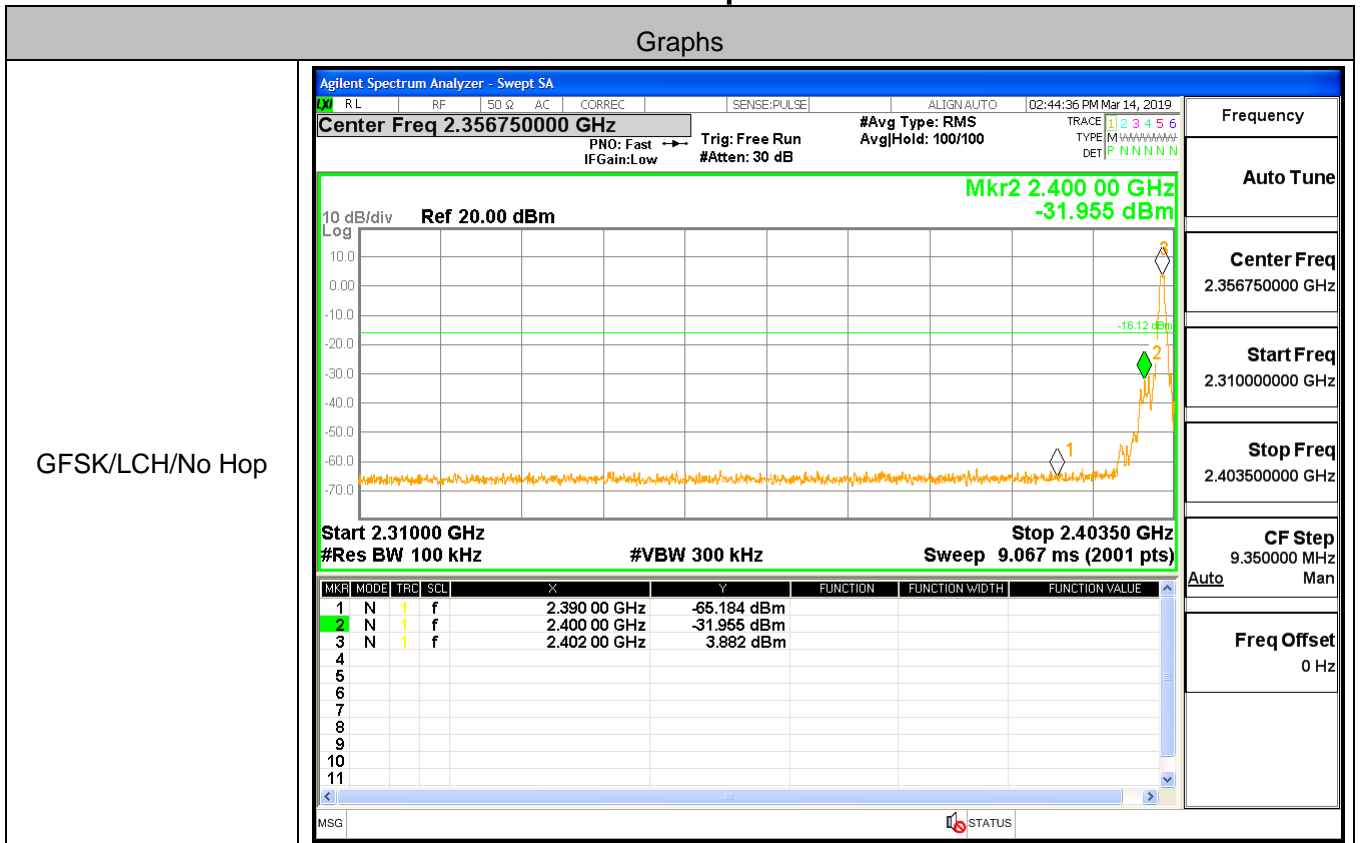


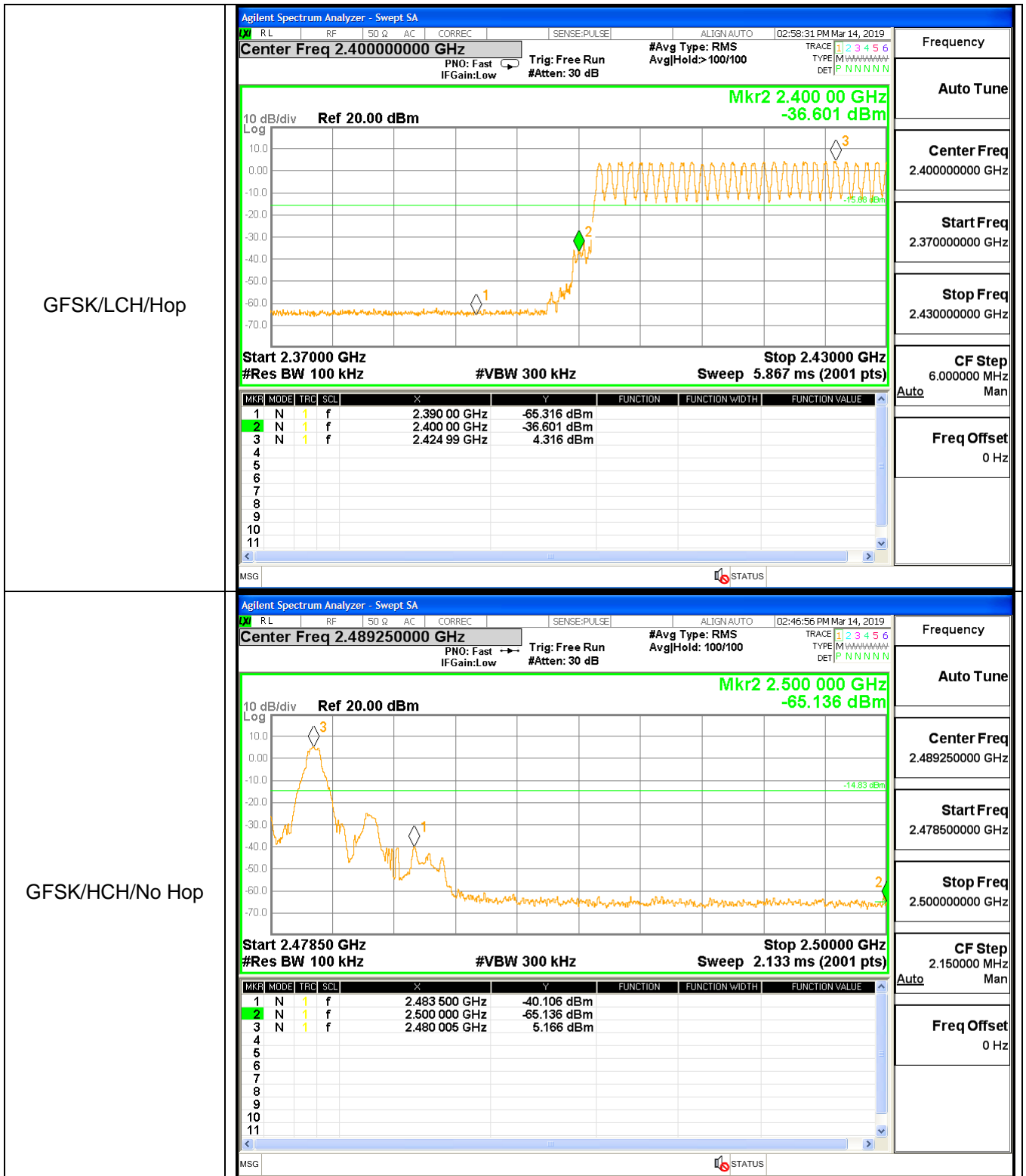


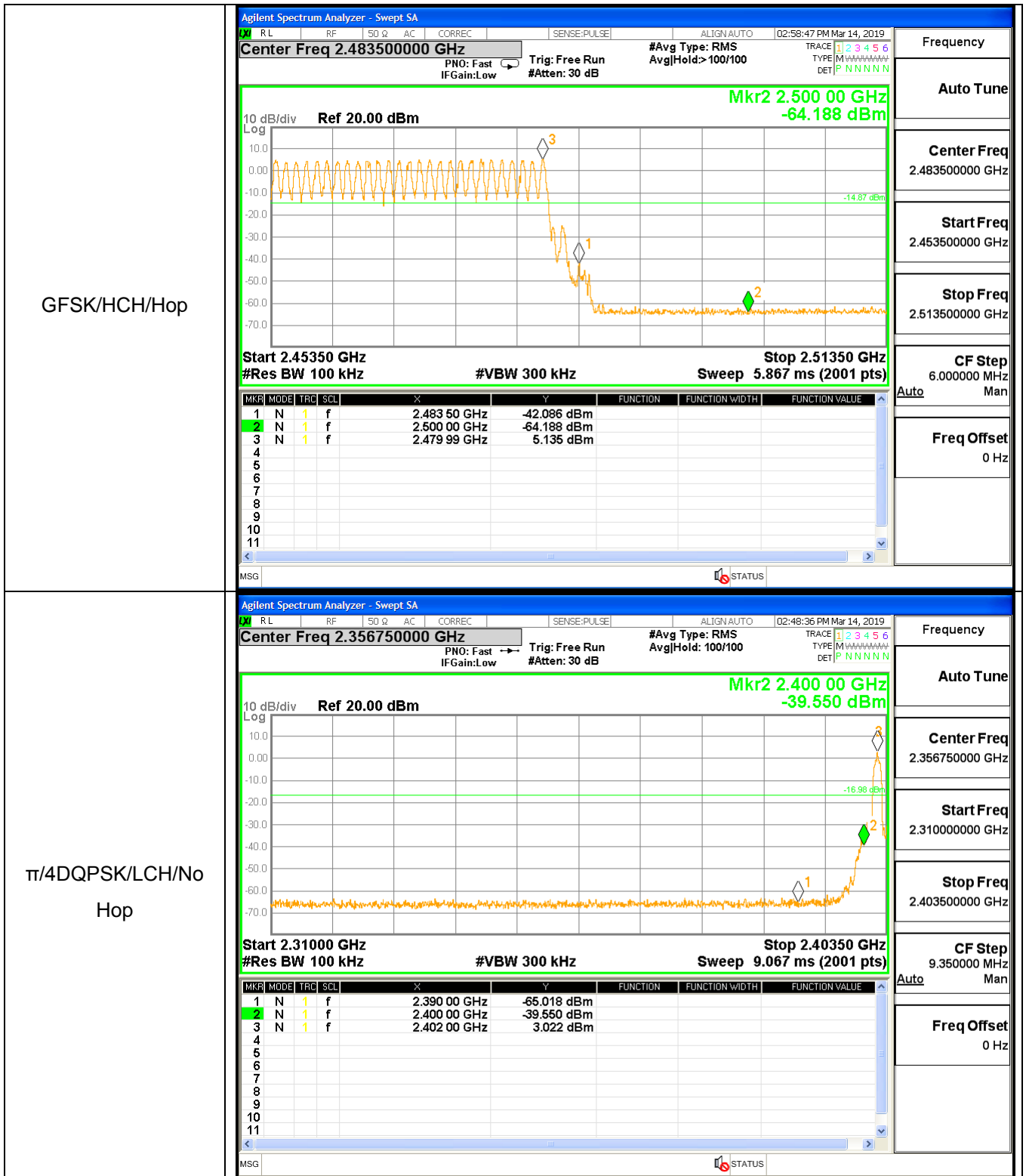
A.6 Band-edge for RF Conducted Emissions

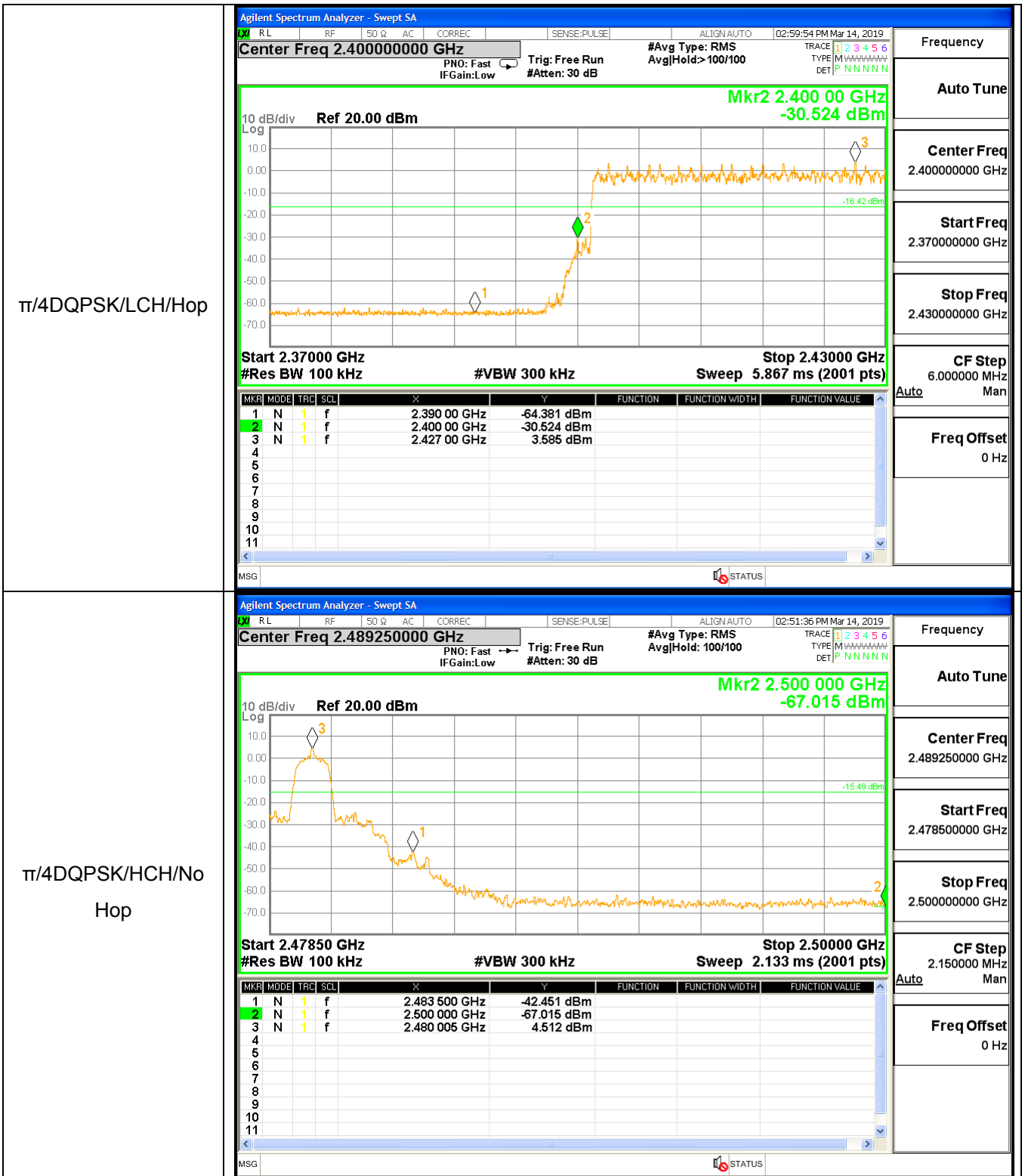
| Type | Carrier Frequency(MHz) | Frequency(MHz) | Carrier Frequency Power [dBm] | Bandedge Peak(dBm) | Upper limit(dBm) | Conclusion |
|--------------|------------------------|----------------|-------------------------------|--------------------|------------------|------------|
| 1DH5 | 2402 | 2390 | 3.88 | -65.18 | -16.12 | Pass |
| 1DH5 | 2402 | 2400 | 3.88 | -31.96 | -16.12 | Pass |
| 1DH5-Hopping | 2402 | 2390 | 4.32 | -65.32 | -15.68 | Pass |
| 1DH5-Hopping | 2402 | 2400 | 4.32 | -36.60 | -15.68 | Pass |
| 1DH5 | 2480 | 2483.5 | 5.17 | -40.11 | -14.83 | Pass |
| 1DH5 | 2480 | 2500 | 5.17 | -65.14 | -14.83 | Pass |
| 1DH5-Hopping | 2480 | 2483.5 | 5.14 | -42.09 | -14.87 | Pass |
| 1DH5-Hopping | 2480 | 2500 | 5.14 | -64.19 | -14.87 | Pass |
| 2DH5 | 2402 | 2390 | 3.02 | -65.02 | -16.98 | Pass |
| 2DH5 | 2402 | 2400 | 3.02 | -39.55 | -16.98 | Pass |
| 2DH5-Hopping | 2402 | 2390 | 3.59 | -51.15 | -15.69 | Pass |
| 2DH5-Hopping | 2402 | 2400 | 3.59 | -63.69 | -15.69 | Pass |
| 2DH5 | 2480 | 2483.5 | 4.51 | -42.45 | -15.49 | Pass |
| 2DH5 | 2480 | 2500 | 4.51 | -67.02 | -15.49 | Pass |
| 2DH5-Hopping | 2480 | 2483.5 | 4.31 | -64.38 | -16.42 | Pass |
| 2DH5-Hopping | 2480 | 2500 | 4.31 | -30.52 | -16.42 | Pass |

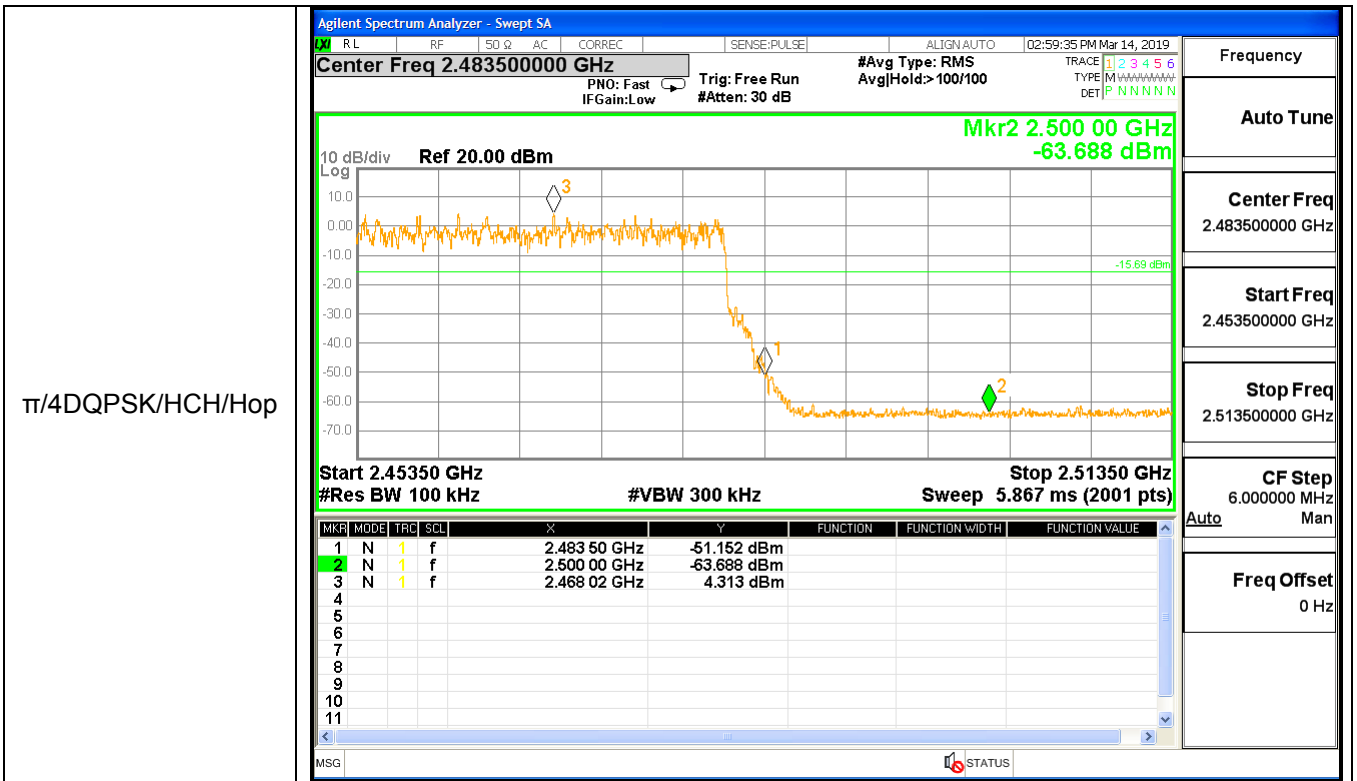
Test Graph







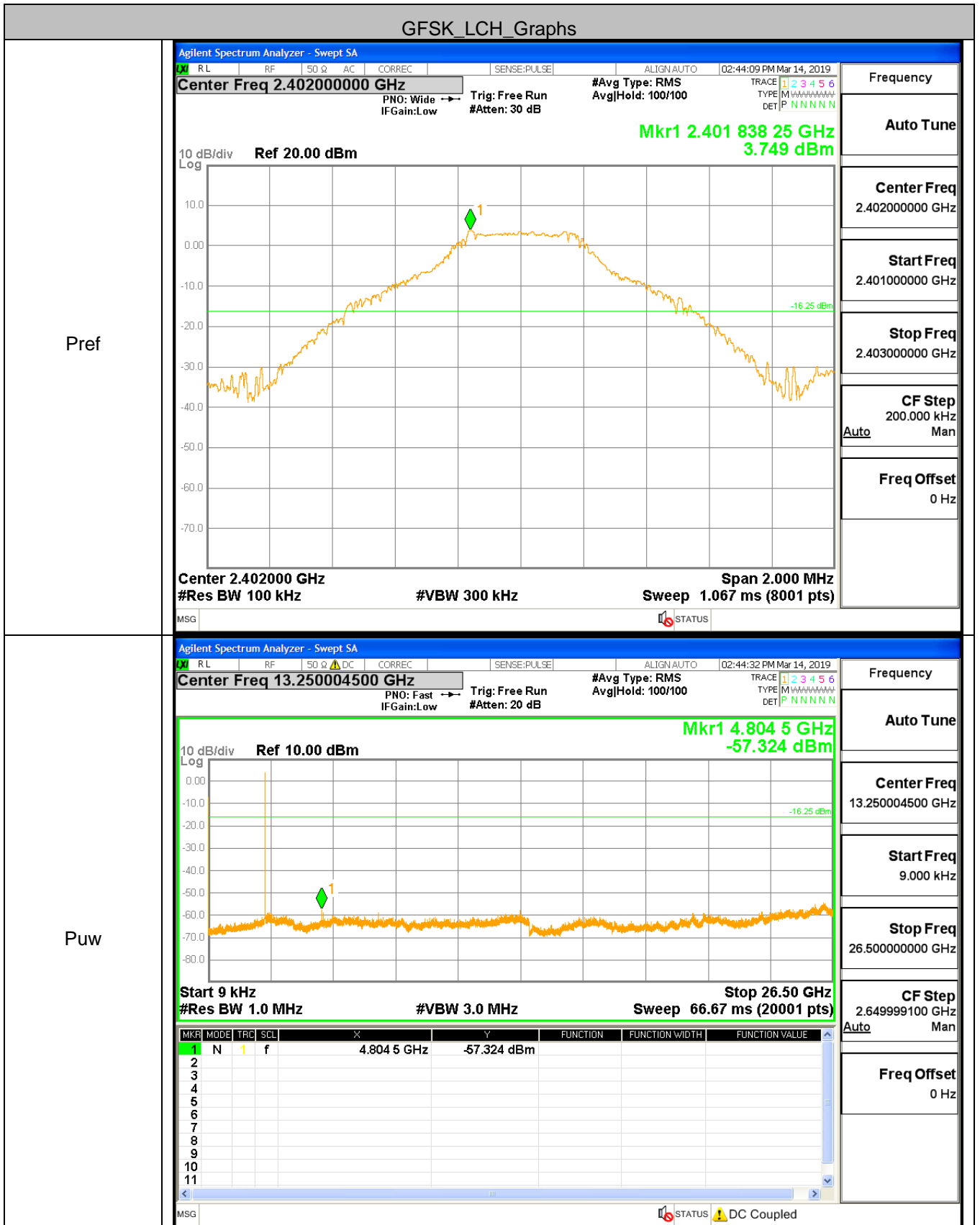




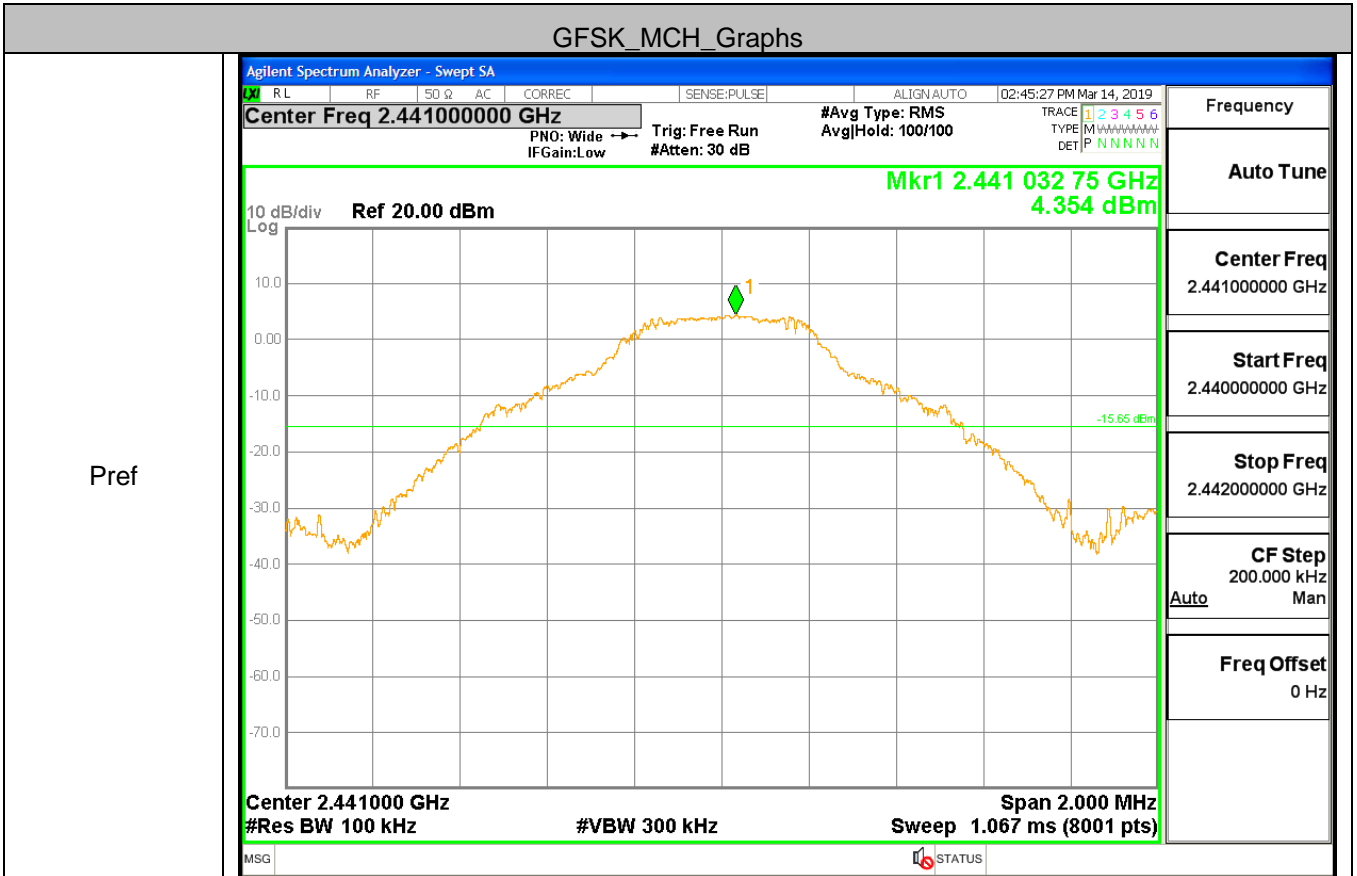
MSG

STATUS

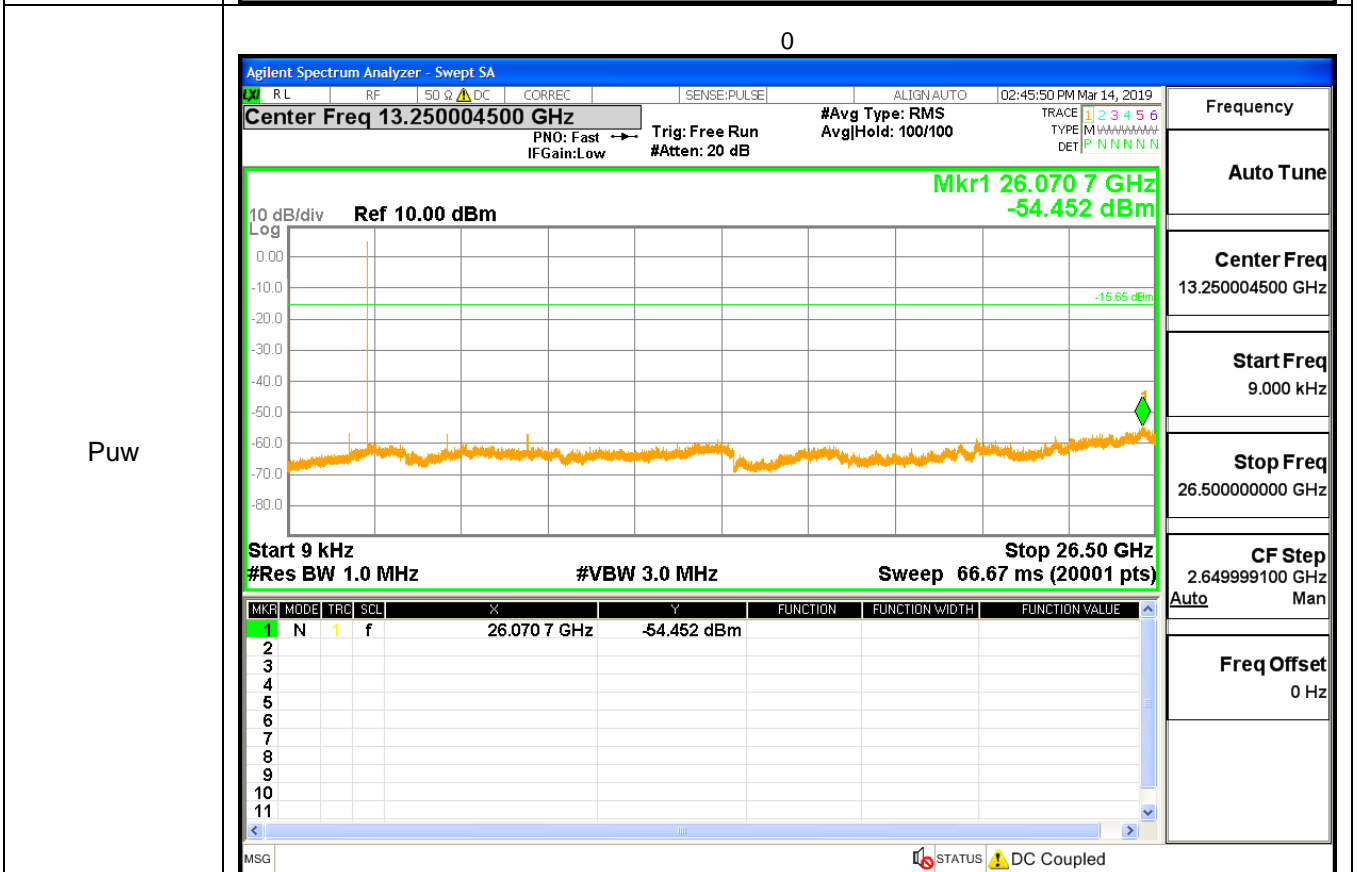
A.7 RF Conducted Spurious Emissions Test Graph



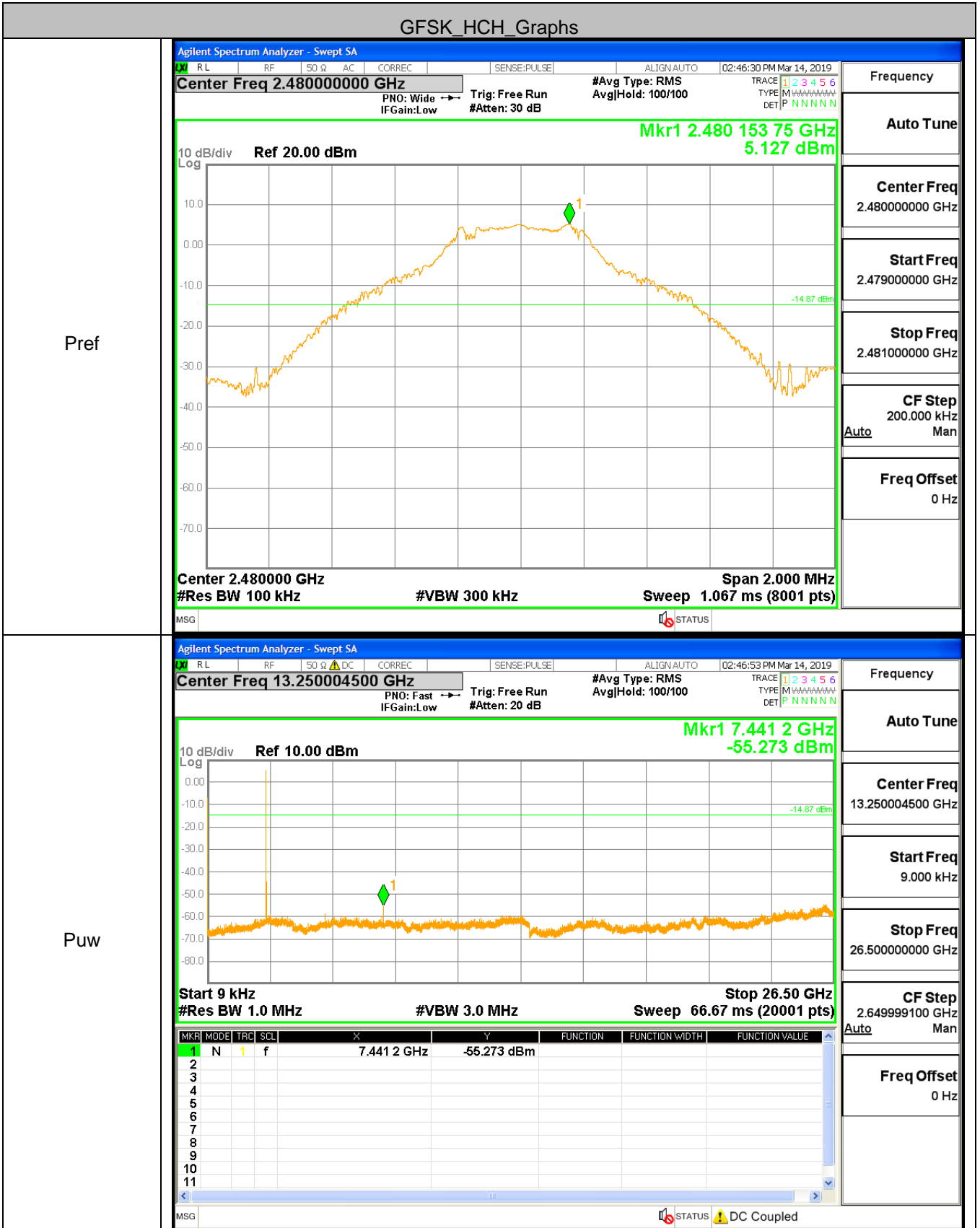
GFSK_MCH_Graphs



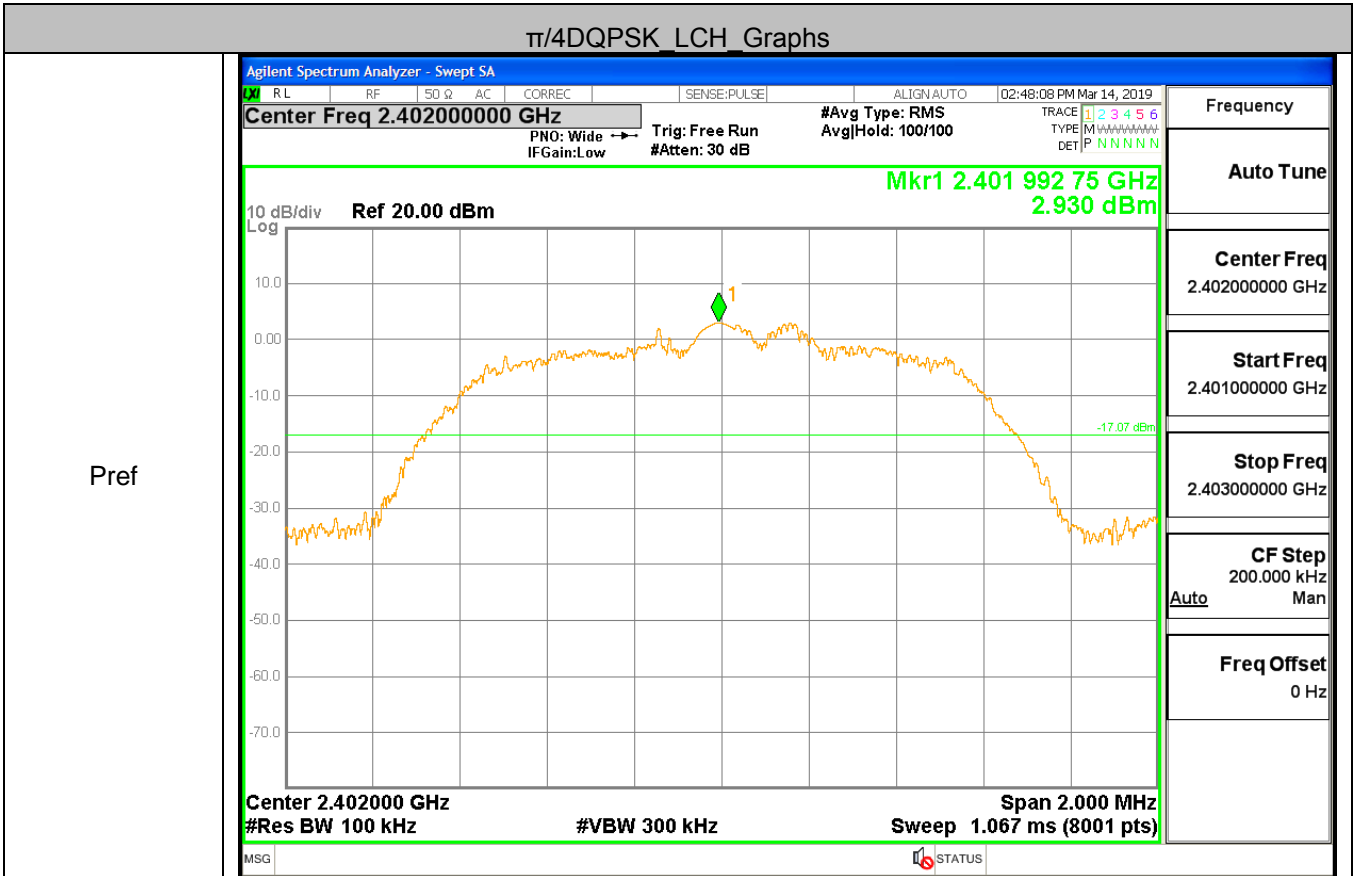
0



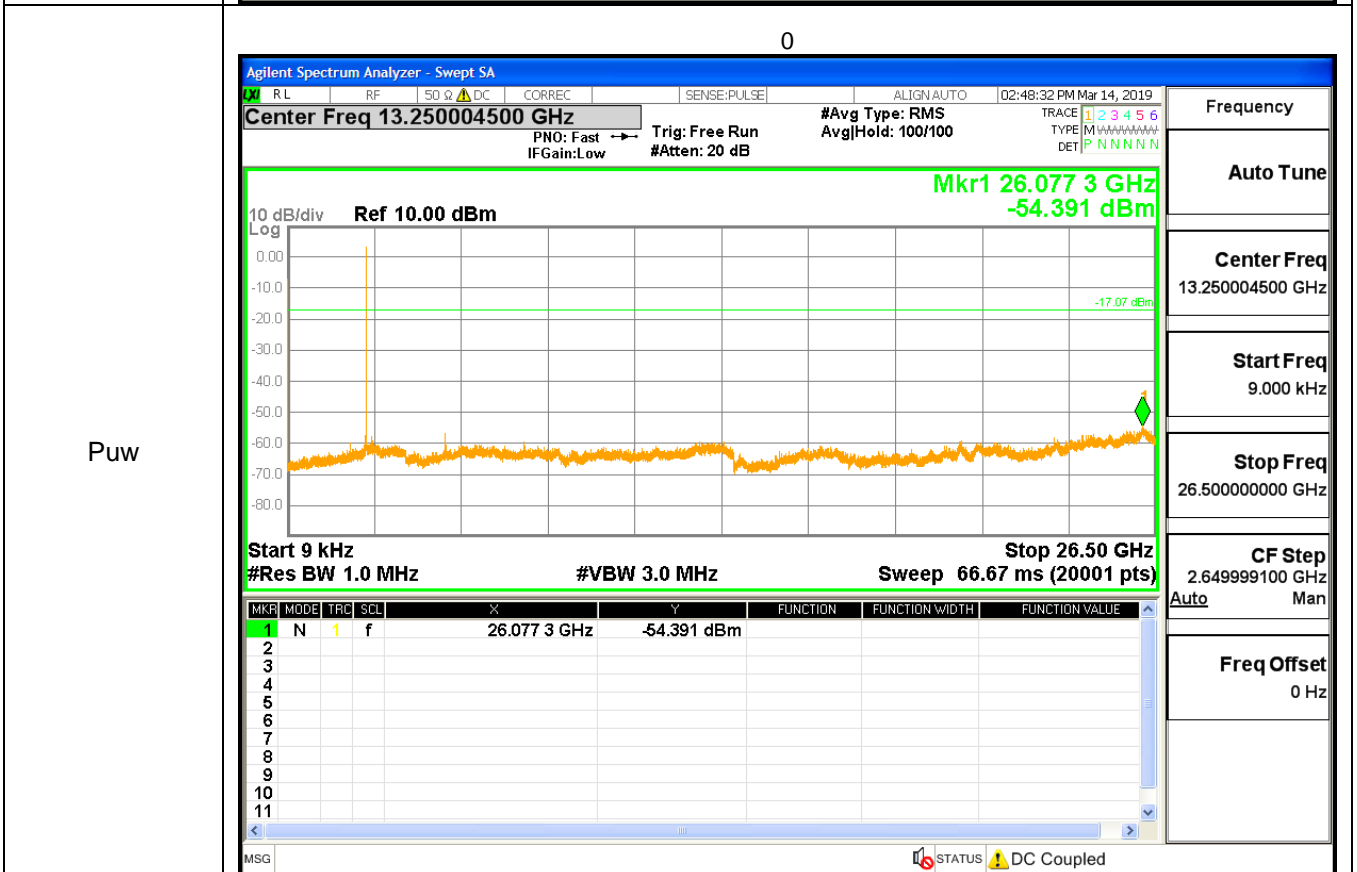
GFSK_HCH_Graphs



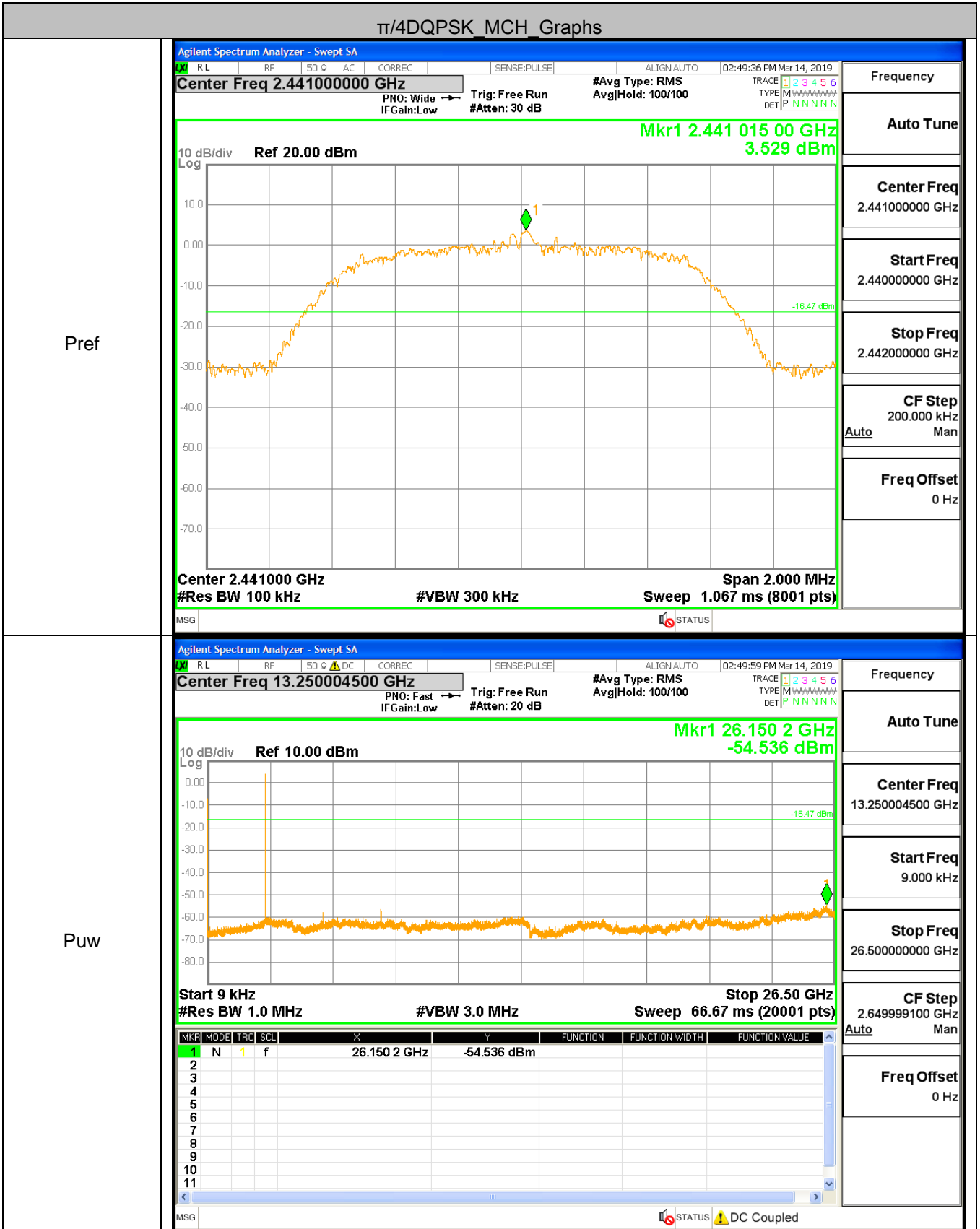
$\pi/4$ DQPSK LCH Graphs



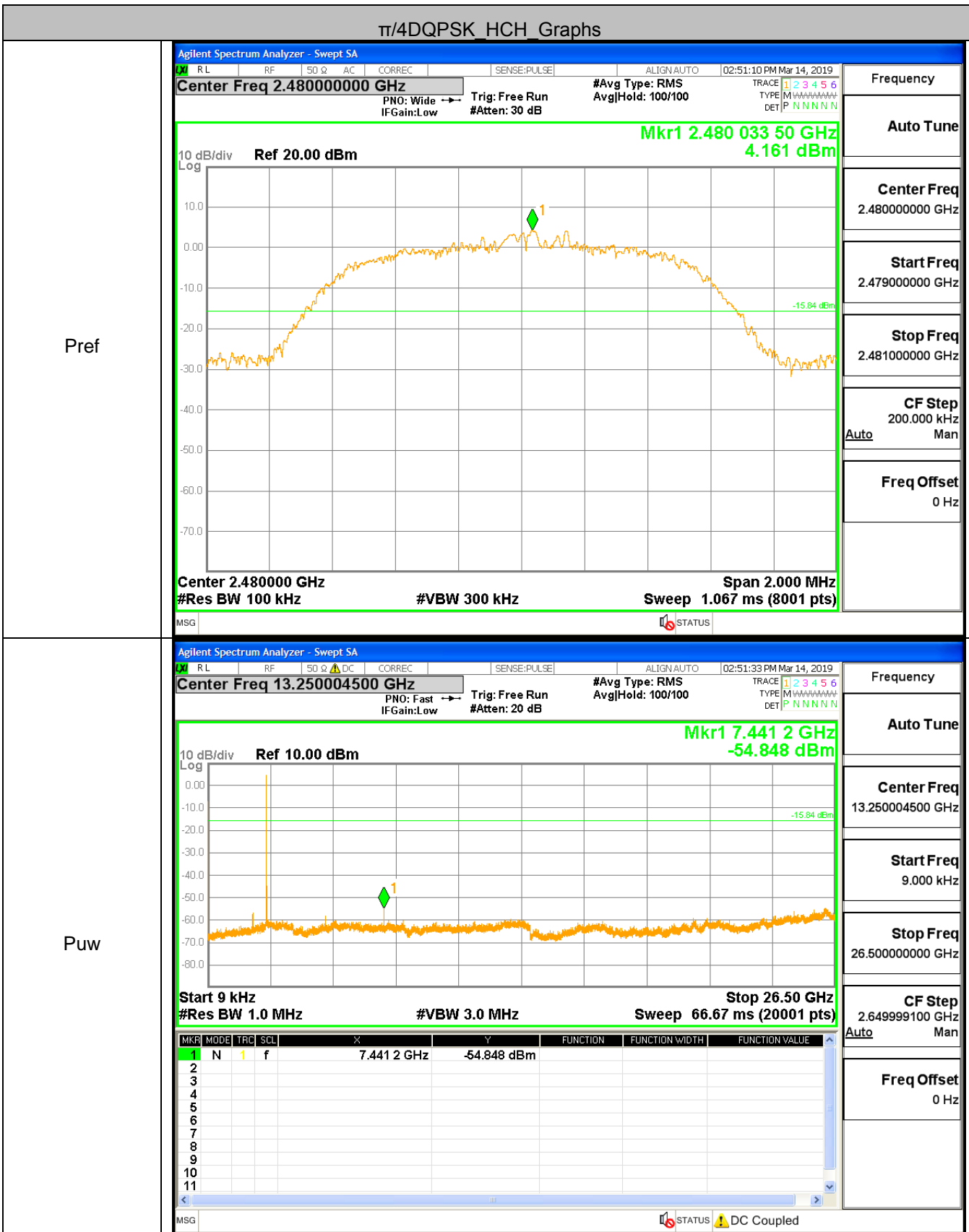
0



$\pi/4$ DQPSK MCH Graphs



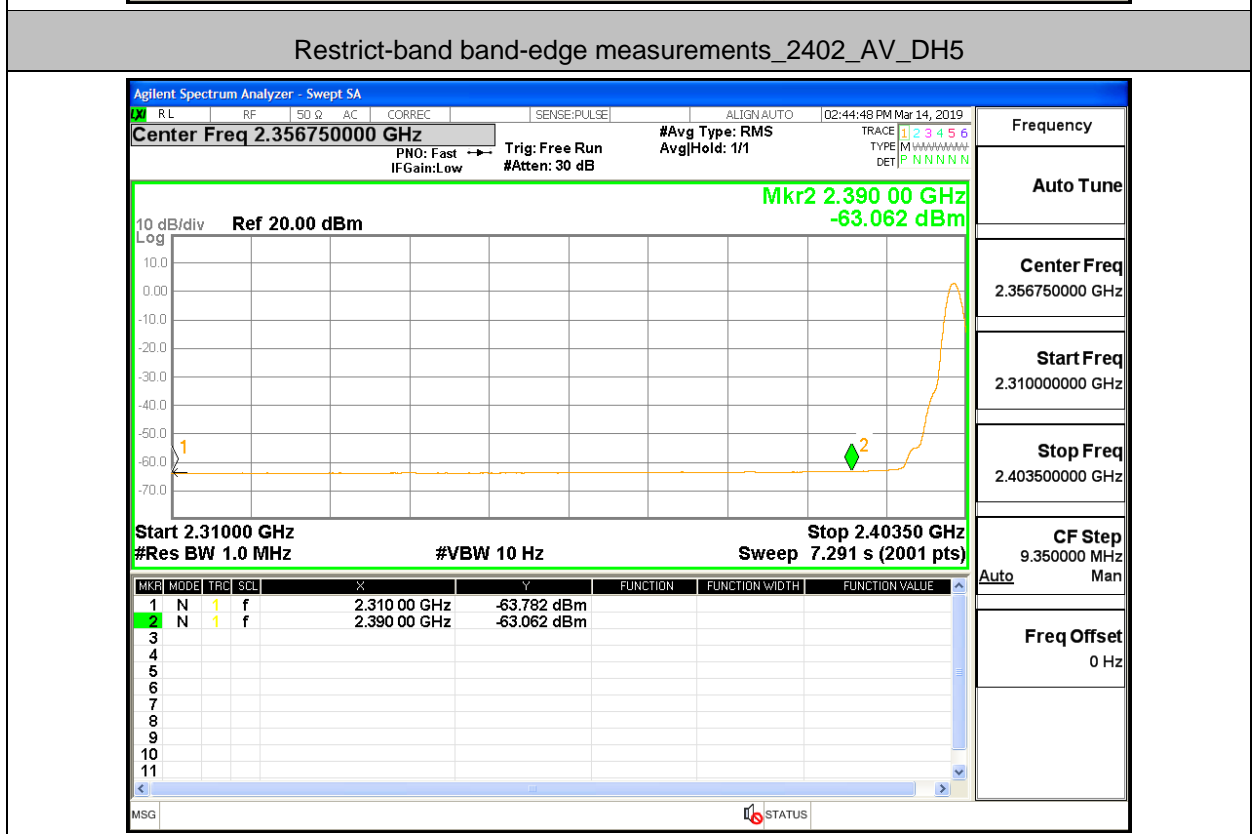
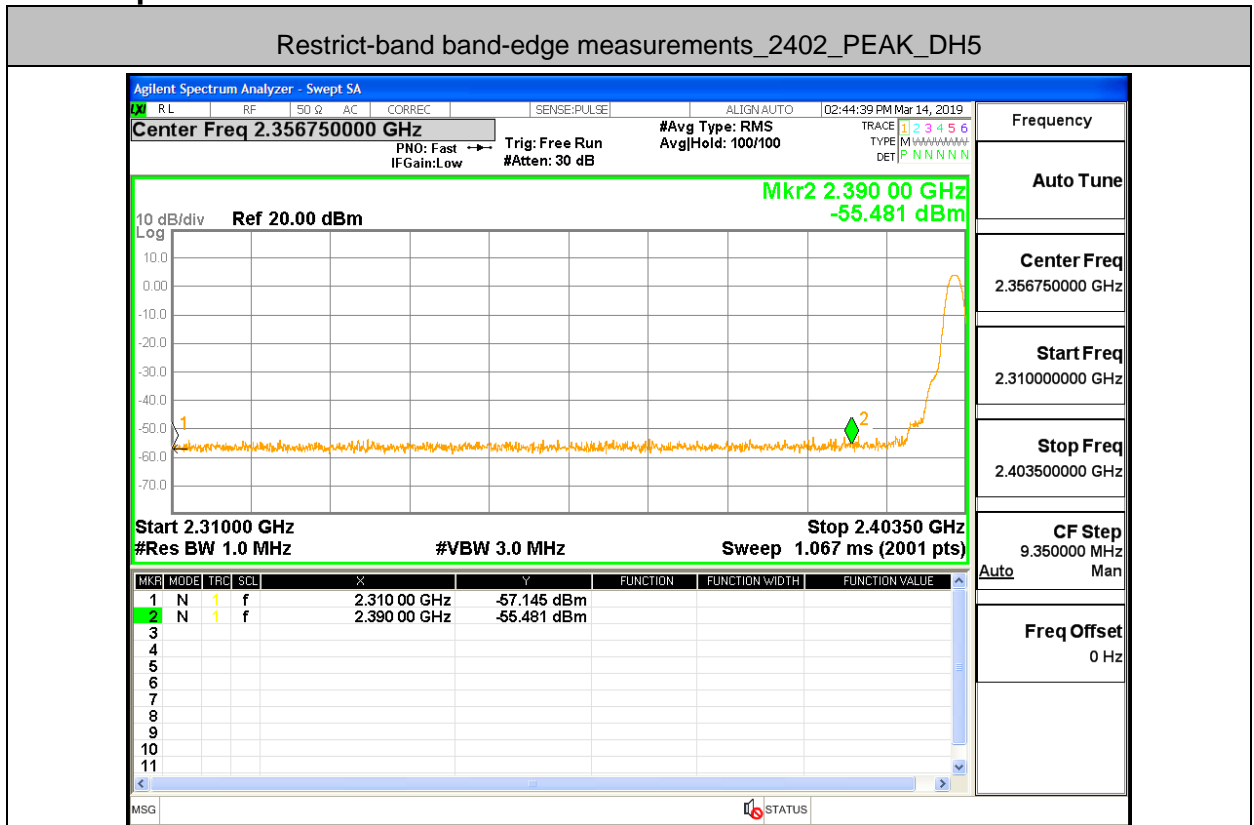
$\pi/4$ DQPSK HCH Graphs



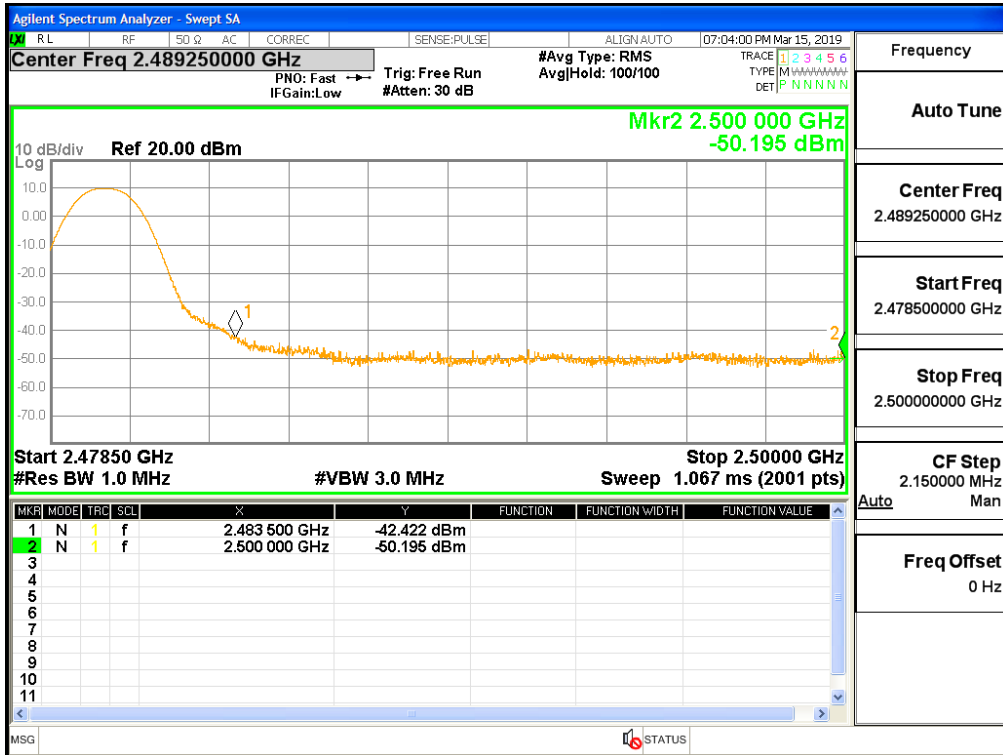
A.8 Restrict-band measurements

| Type | Carrier Frequency (MHz) | Frequency(MHz) | Gain | Ground Factor | Peak Value(dBm) | E [dBuV/m] | Limit [dBuV/m] | Average Value(dBm) | E [dBuV/m] | Limit [dBuV/m] | Conclusion |
|------|-------------------------|----------------|------|---------------|-----------------|------------|----------------|--------------------|------------|----------------|------------|
| 1DH5 | 2402 | 2310 | 2.00 | 0.00 | -57.14 | 40.06 | 74 | -63.78 | 33.42 | 54 | Pass |
| 1DH5 | 2402 | 2390 | 2.00 | 0.00 | -55.48 | 41.72 | 74 | -63.06 | 34.14 | 54 | Pass |
| 1DH5 | 2480 | 2483.5 | 2.00 | 0.00 | -42.42 | 54.78 | 74 | -47.75 | 49.45 | 54 | Pass |
| 1DH5 | 2480 | 2500 | 2.00 | 0.00 | -50.2 | 47 | 74 | -57.66 | 39.54 | 54 | Pass |
| 2DH5 | 2402 | 2310 | 2.00 | 0.00 | -50.92 | 46.28 | 74 | -58.86 | 38.34 | 54 | Pass |
| 2DH5 | 2402 | 2390 | 2.00 | 0.00 | -51.78 | 45.42 | 74 | -58.41 | 38.79 | 54 | Pass |
| 2DH5 | 2480 | 2483.5 | 2.00 | 0.00 | -43.65 | 53.55 | 74 | -50.3 | 46.9 | 54 | Pass |
| 2DH5 | 2480 | 2500 | 2.00 | 0.00 | -50.89 | 46.31 | 74 | -57.8 | 39.4 | 54 | Pass |

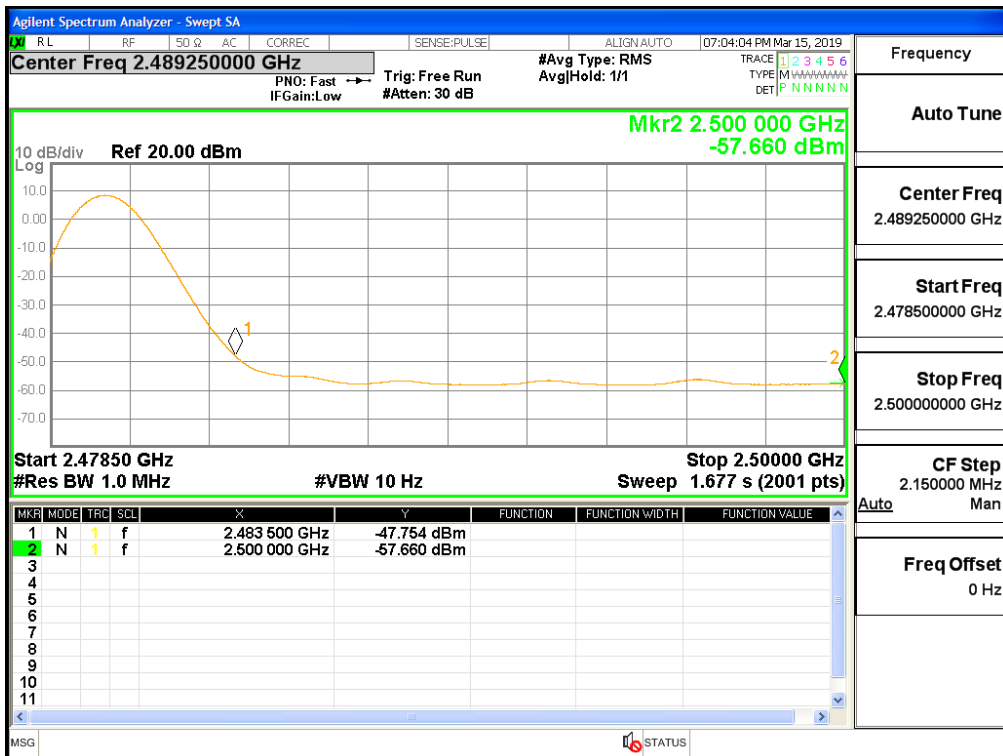
Test Graph



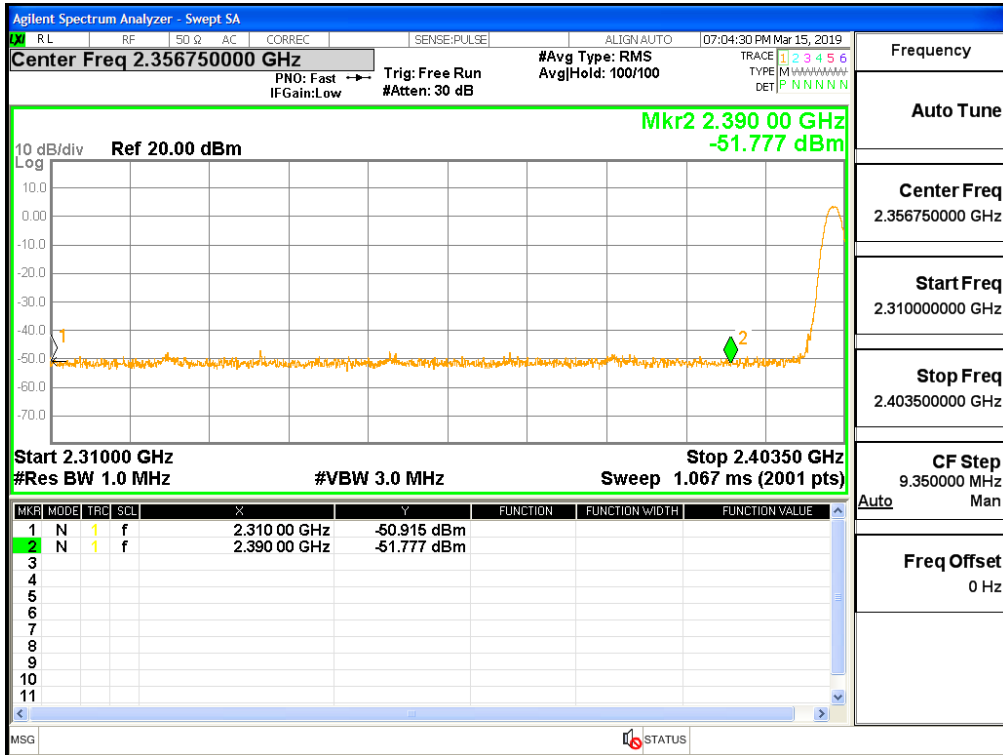
Restrict-band band-edge measurements_2480_PEAK_DH5



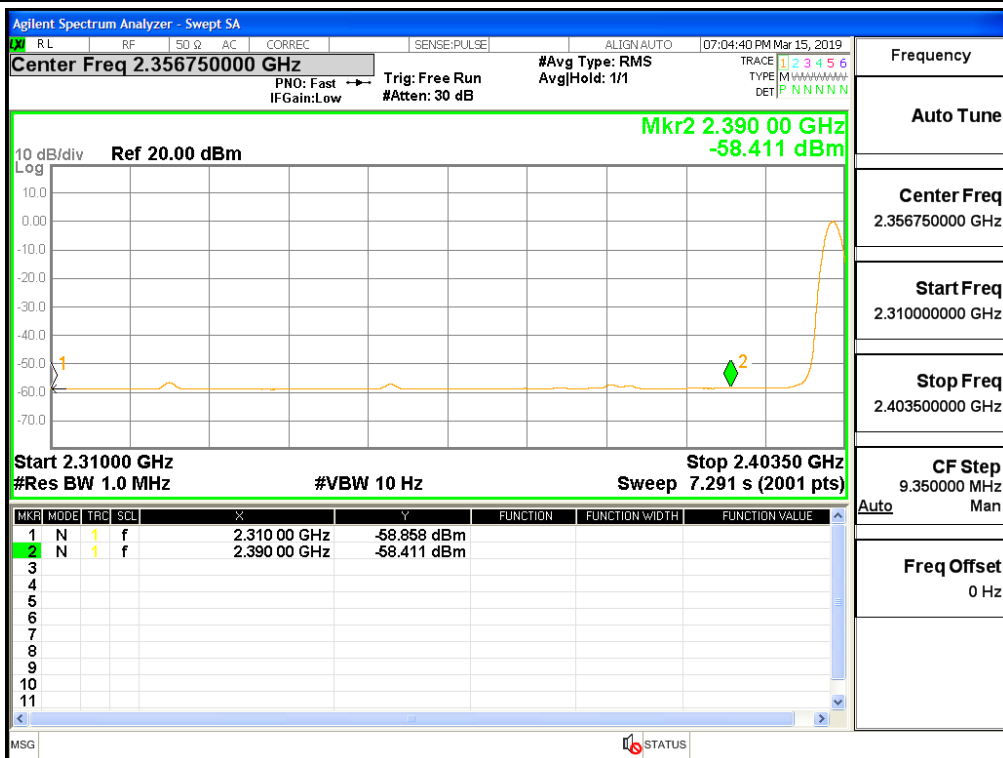
Restrict-band band-edge measurements_2480_AV_DH5



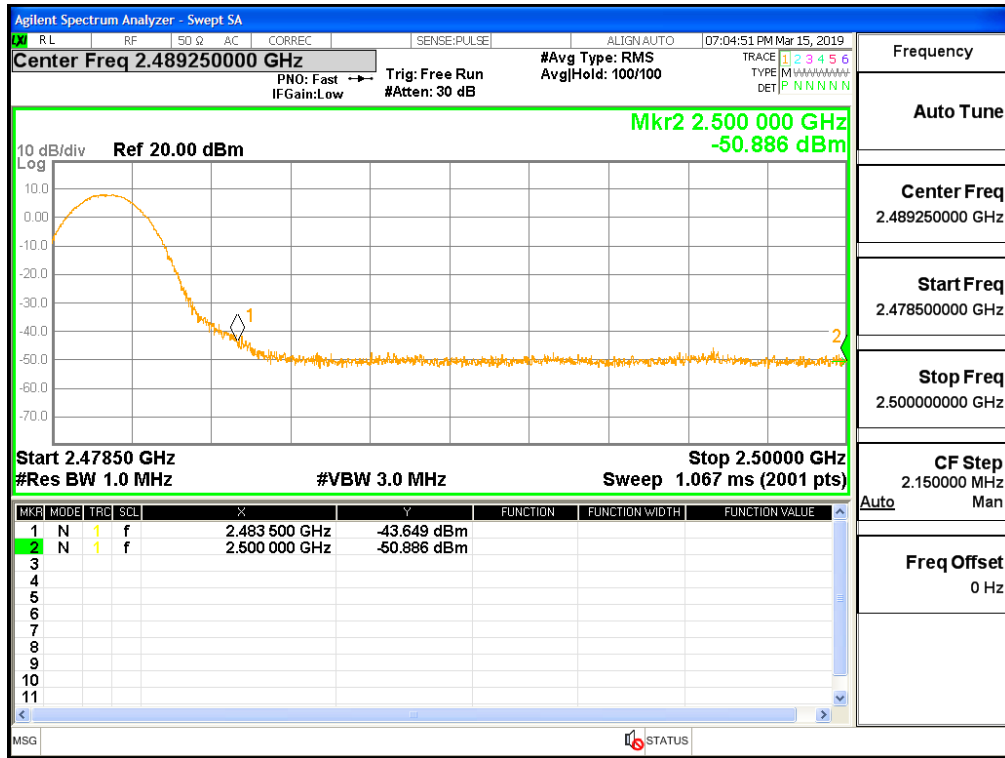
Restrict-band band-edge measurements_2402_PEAK_2DH5



Restrict-band band-edge measurements_2402_AV_2DH5



Restrict-band band-edge measurements_2480_PEAK_2DH5



Restrict-band band-edge measurements_2480_AV_2DH5

