

Appendix A

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

Product Name: B83

Trade Mark: Haoda

Test Model: ZN-802

FCC ID: 2AR8U-ZN802

Environmental Conditions

Temperature:	22.5 ° C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

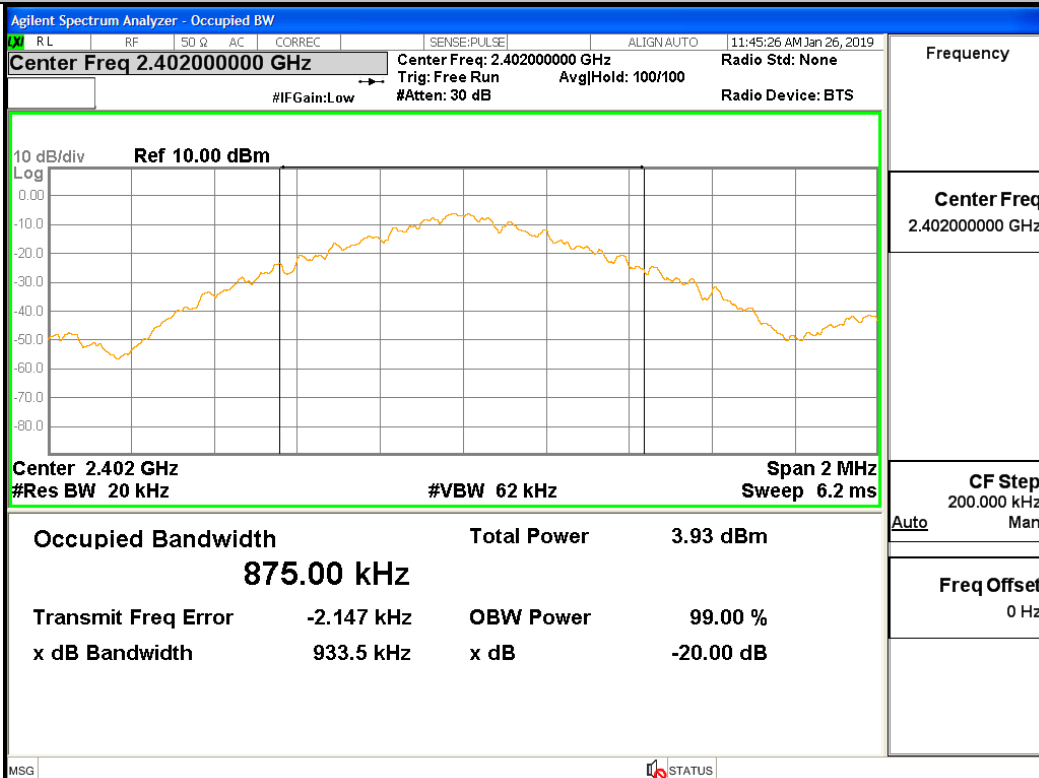
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.934	Not Specified	PASS
GFSK	MCH	0.892	Not Specified	PASS
GFSK	HCH	0.933	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.357	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.343	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.334	Not Specified	PASS
8DPSK	LCH	1.343	Not Specified	PASS
8DPSK	MCH	1.341	Not Specified	PASS
8DPSK	HCH	1.348	Not Specified	PASS

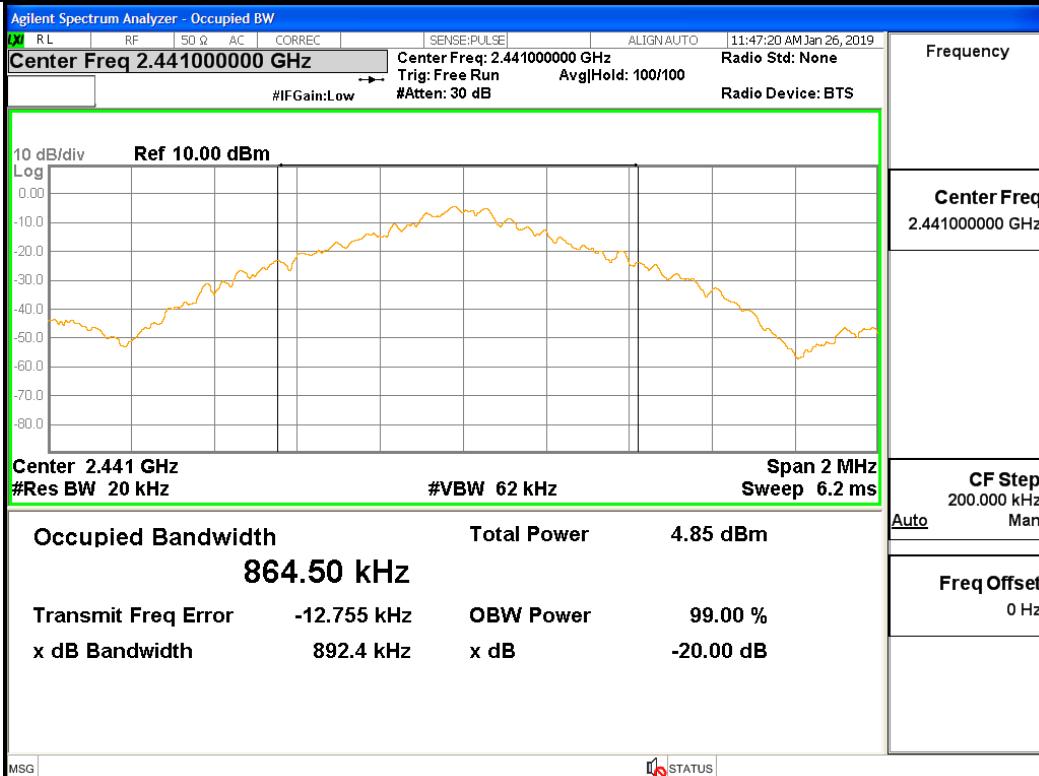
Test Graph

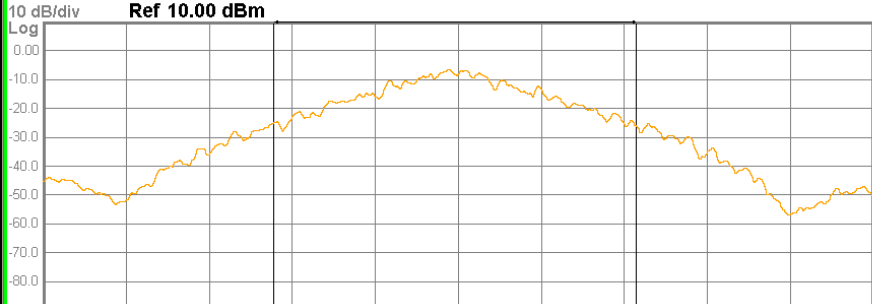
Graphs

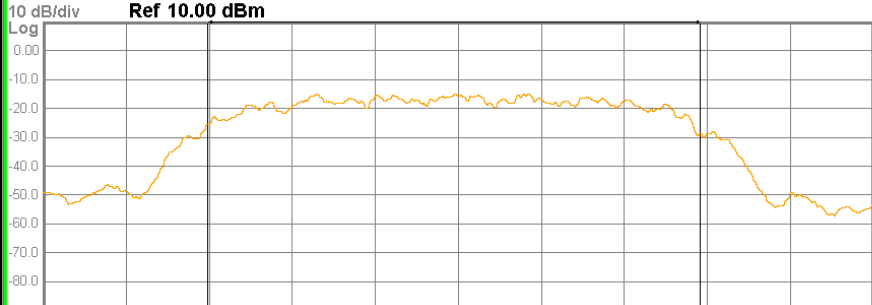
GFSK/LCH



GFSK/MCH



GFSK/HCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN:AUTO 11:48:44 AM Jan 26, 2019 Center Freq 2.480000000 GHz Center Freq: 2.480000000 GHz Radio Std: None #IFGain:Low #Atten: 30 dB AvgHold: 100/100 Radio Device: BTS 10 dB/div Ref 10.00 dBm  Center 2.48 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms Occupied Bandwidth 869.63 kHz Total Power 3.32 dBm Transmit Freq Error -7.159 kHz OBW Power 99.00 % x dB Bandwidth 932.8 kHz x dB -20.00 dB MSG STATUS						Frequency Center Freq 2.480000000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz

π/4DQPSK/LCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN:AUTO 11:50:24 AM Jan 26, 2019 Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None #IFGain:Low #Atten: 30 dB AvgHold: 100/100 Radio Device: BTS 10 dB/div Ref 10.00 dBm  Center 2.402 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms Occupied Bandwidth 1.1840 MHz Total Power -0.46 dBm Transmit Freq Error -10.896 kHz OBW Power 99.00 % x dB Bandwidth 1.357 MHz x dB -20.00 dB MSG STATUS						Frequency Center Freq 2.402000000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz

Center Freq 2.402000000 GHz

Center Freq: 2.402000000 GHz

Radio Std: None

#IFGain:Low

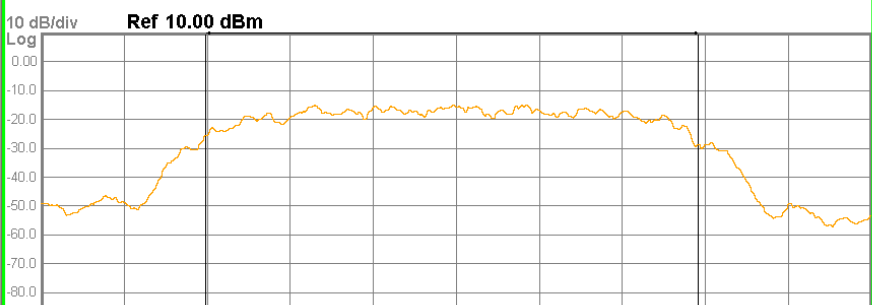
#Atten: 30 dB

AvgHold: 100/100

Radio Device: BTS

10 dB/div

Ref 10.00 dBm



Center 2.402 GHz

#Res BW 20 kHz

#VBW 62 kHz

Span 2 MHz

Sweep 6.2 ms

Occupied Bandwidth

1.1840 MHz

Total Power

-0.46 dBm

Transmit Freq Error

-10.896 kHz

OBW Power

99.00 %

x dB Bandwidth

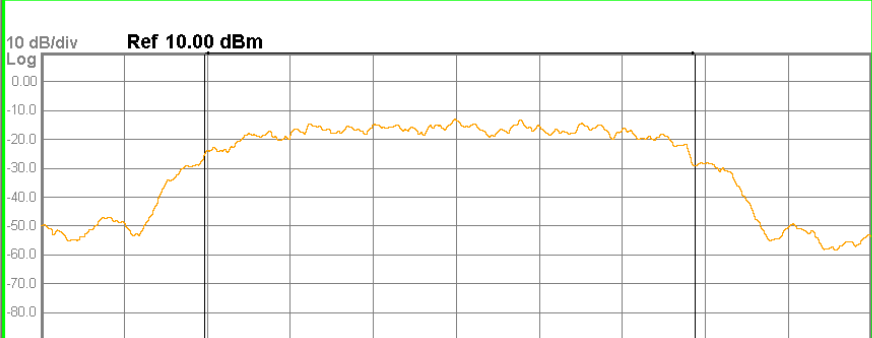
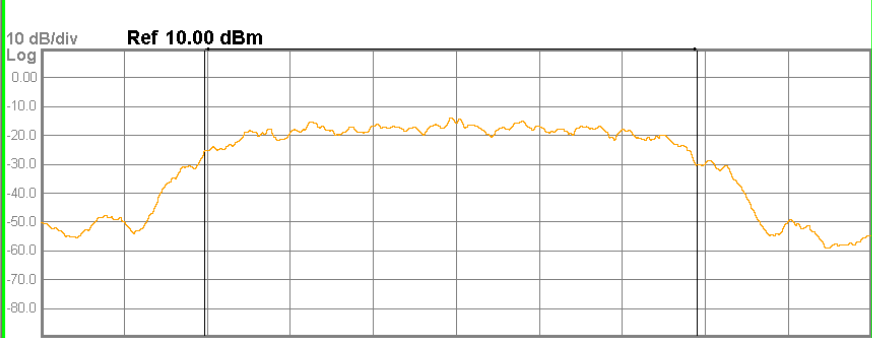
1.357 MHz

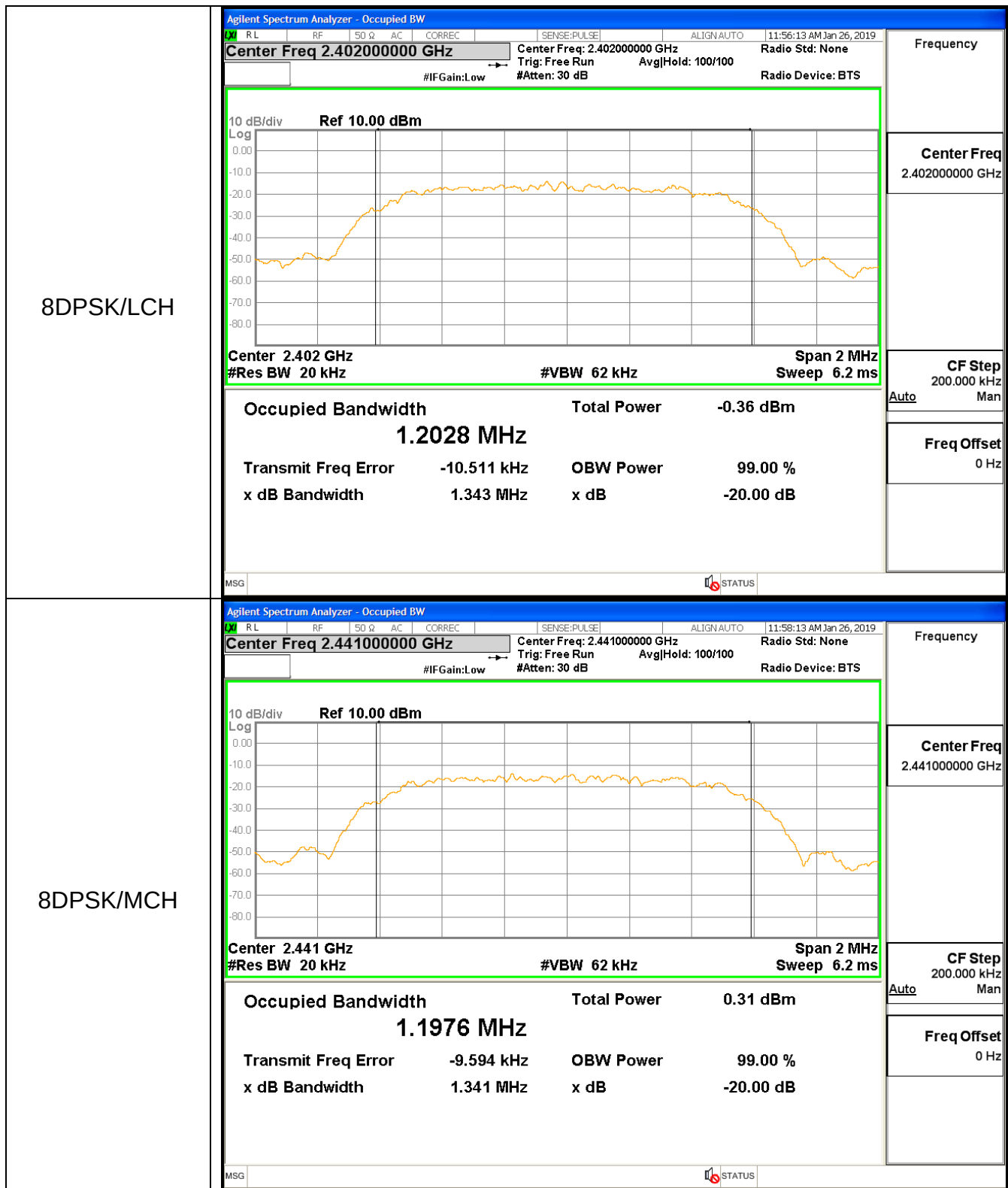
x dB

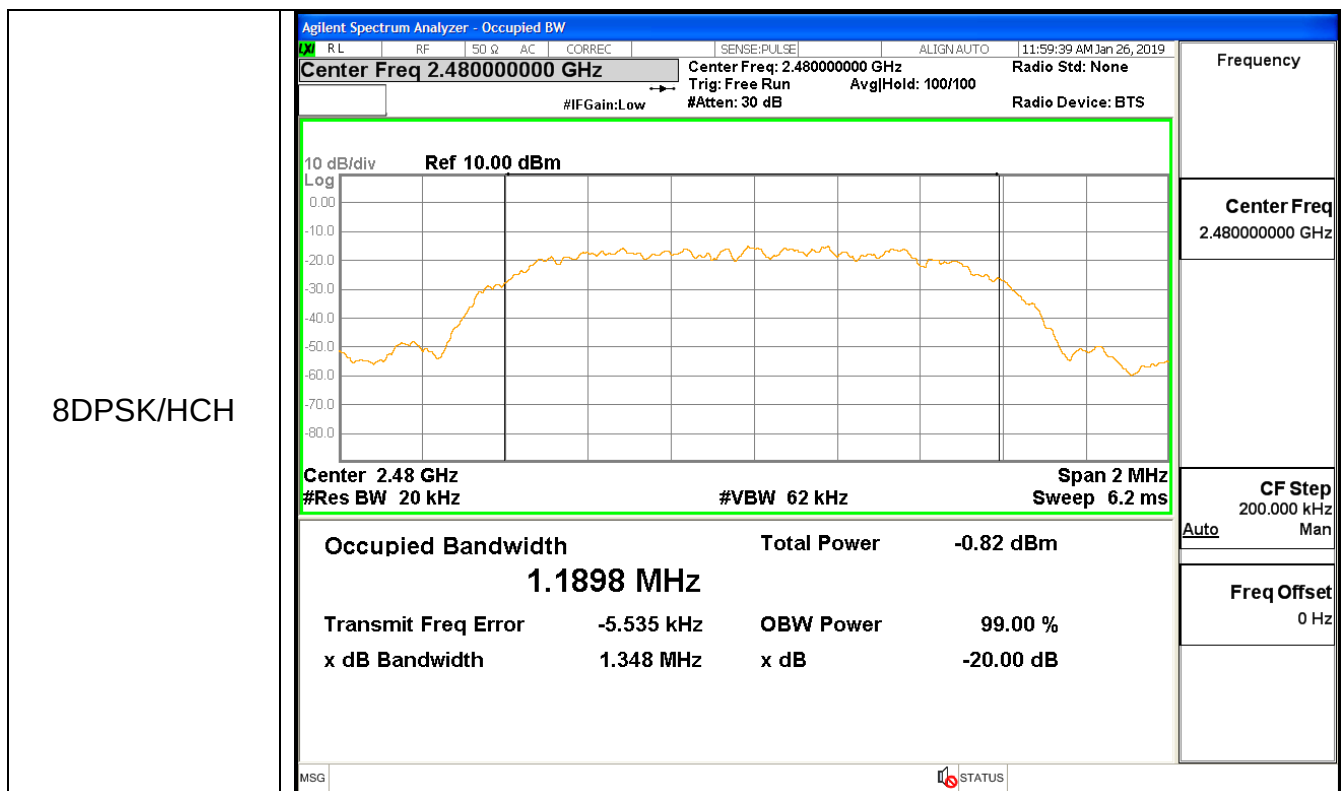
-20.00 dB

MSG

STATUS

π/4DQPSK/MCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.441000000 GHz Center Freq: 2.441000000 GHz Trig: Free Run #IFGain: Low #Atten: 30 dB Radio Std: None Avg Hold: 100/100 Radio Device: BTS  10 dB/div Log Ref 10.00 dBm Center 2.441 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms Occupied Bandwidth 1.1747 MHz Total Power 0.39 dBm Transmit Freq Error -13.464 kHz OBW Power 99.00 % x dB Bandwidth 1.343 MHz x dB -20.00 dB MSG STATUS	Frequency Center Freq 2.441000000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz
π/4DQPSK/HCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.480000000 GHz Center Freq: 2.480000000 GHz Trig: Free Run #IFGain: Low #Atten: 30 dB Radio Std: None Avg Hold: 100/100 Radio Device: BTS  10 dB/div Log Ref 10.00 dBm Center 2.48 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms Occupied Bandwidth 1.1802 MHz Total Power -0.83 dBm Transmit Freq Error -11.697 kHz OBW Power 99.00 % x dB Bandwidth 1.334 MHz x dB -20.00 dB MSG STATUS	Frequency Center Freq 2.480000000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz

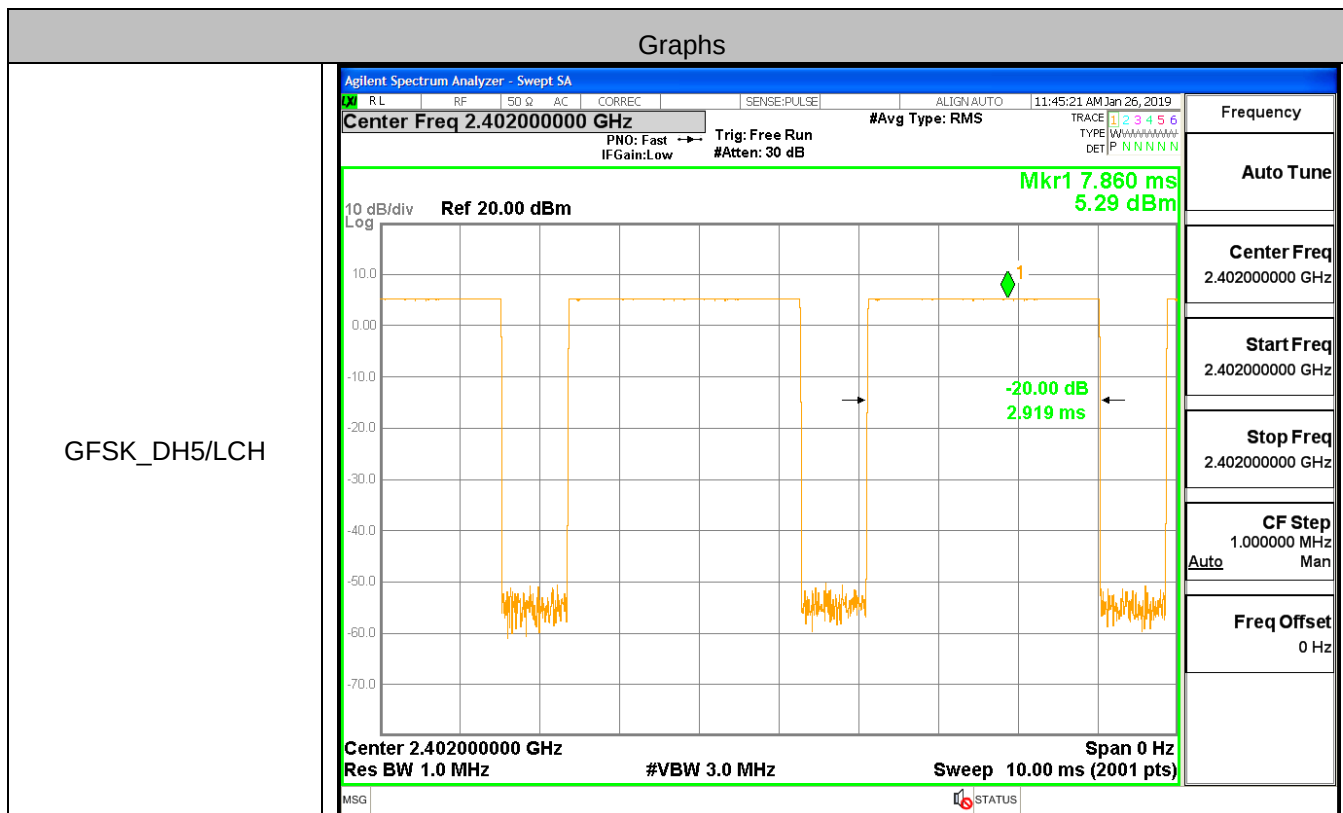


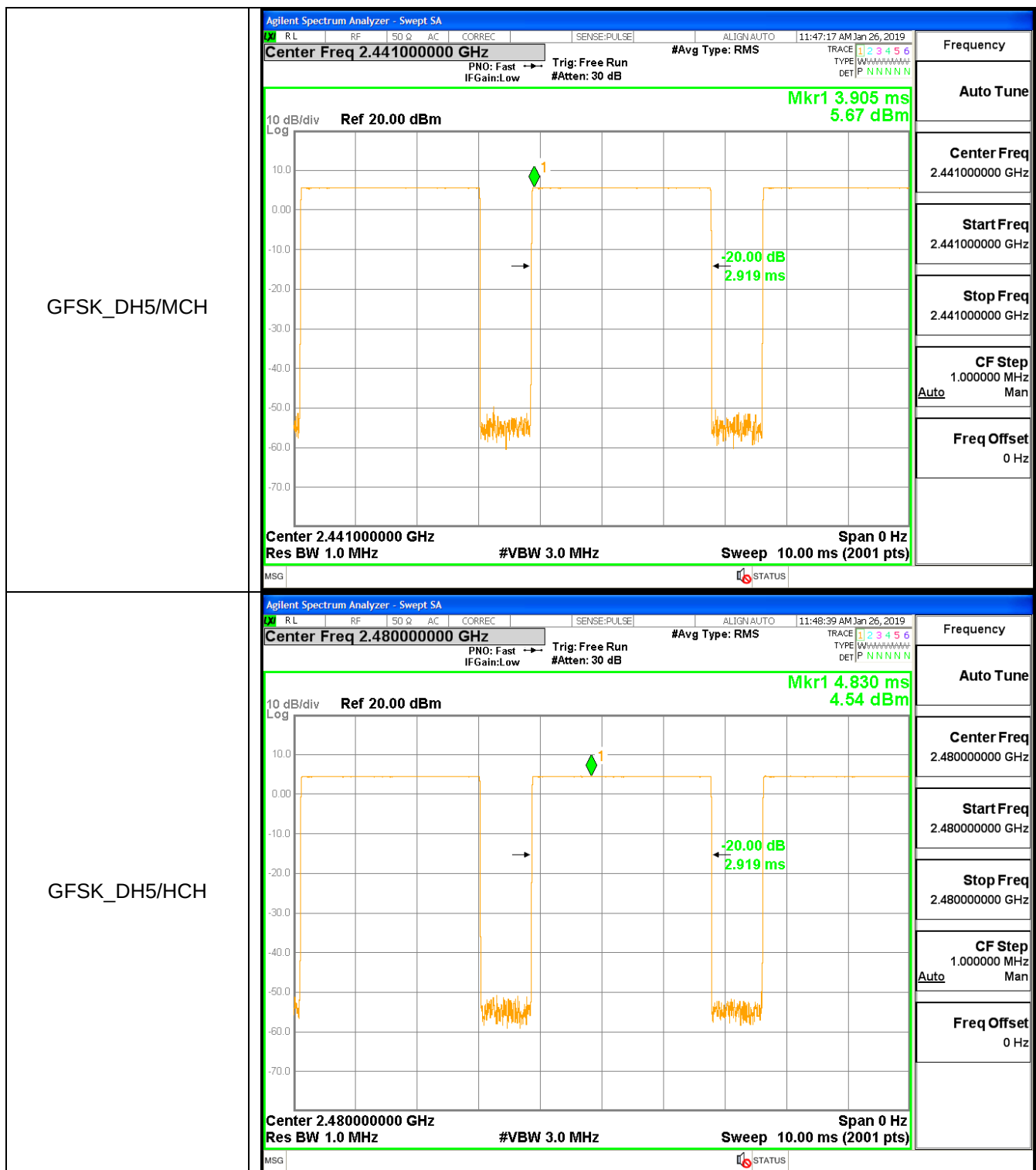


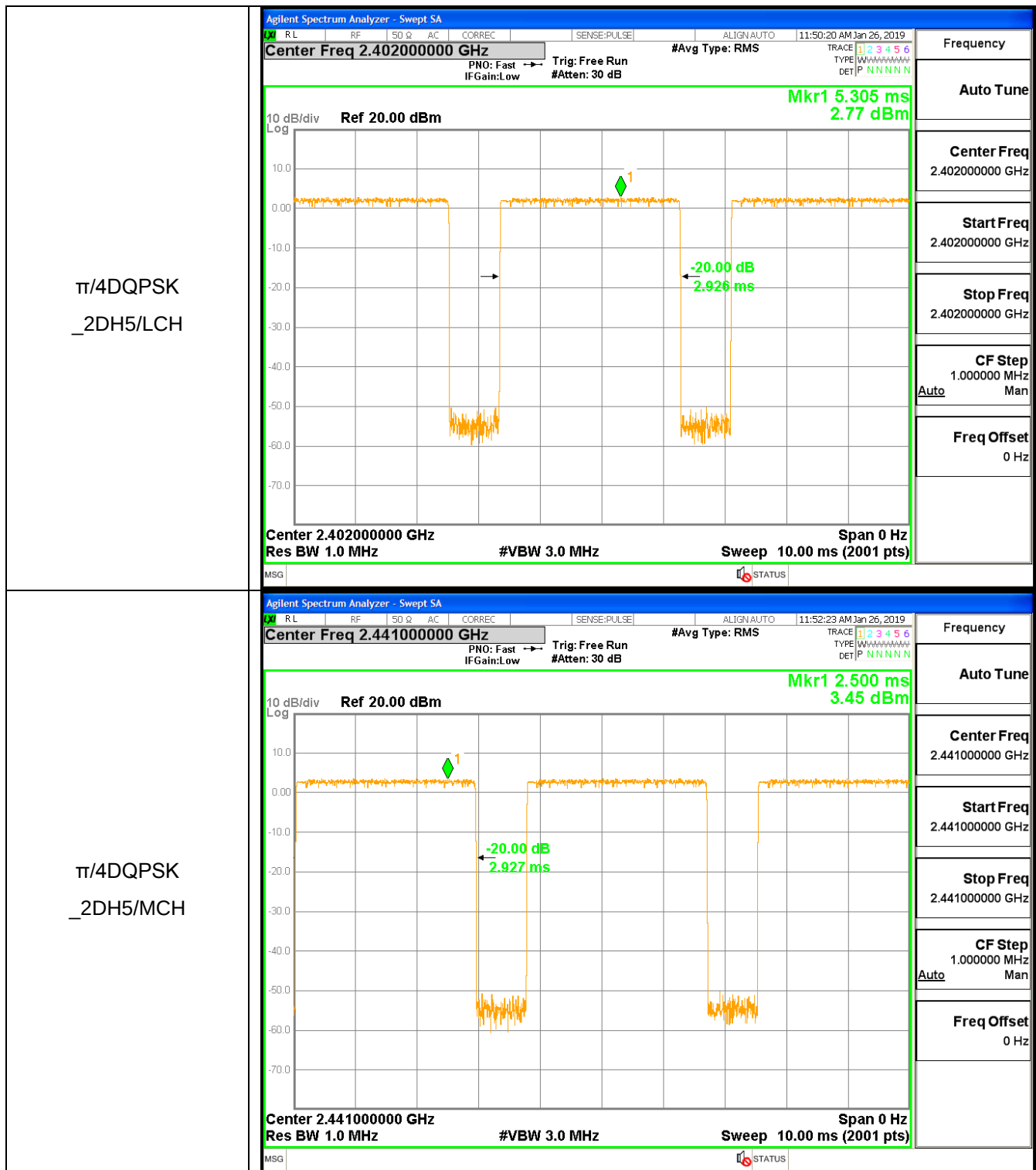
A.2 Dwell Time

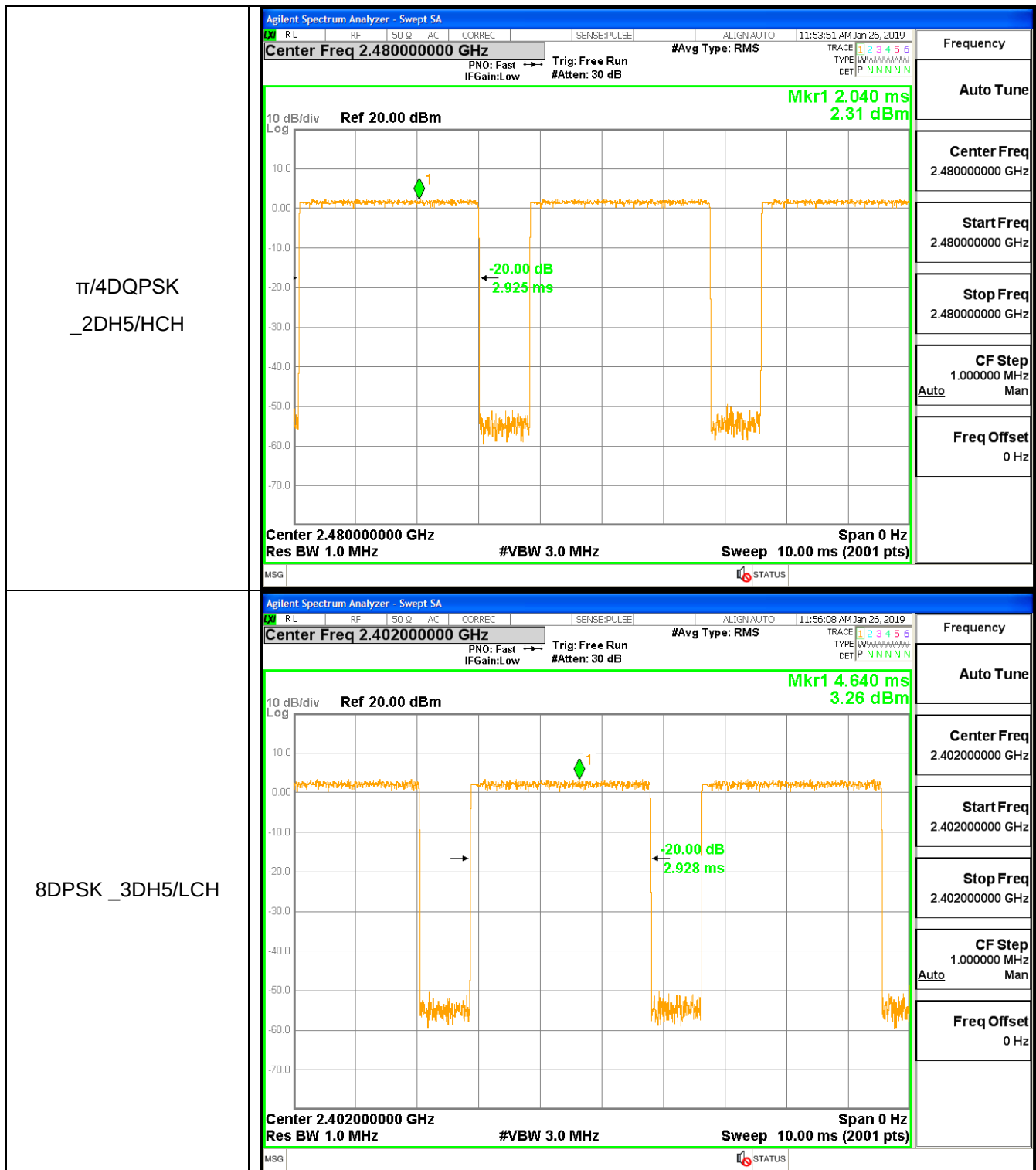
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002919	106.7	0.311464	0.4	PASS
GFSK	DH5	MCH	0.002919	106.7	0.311439	0.4	PASS
GFSK	DH5	HCH	0.002919	106.7	0.311422	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002926	106.7	0.312253	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002927	106.7	0.312287	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002925	106.7	0.31214	0.4	PASS
8DPSK	3DH5	LCH	0.002928	106.7	0.312369	0.4	PASS
8DPSK	3DH5	MCH	0.002927	106.7	0.312289	0.4	PASS
8DPSK	3DH5	HCH	0.002928	106.7	0.31239	0.4	PASS

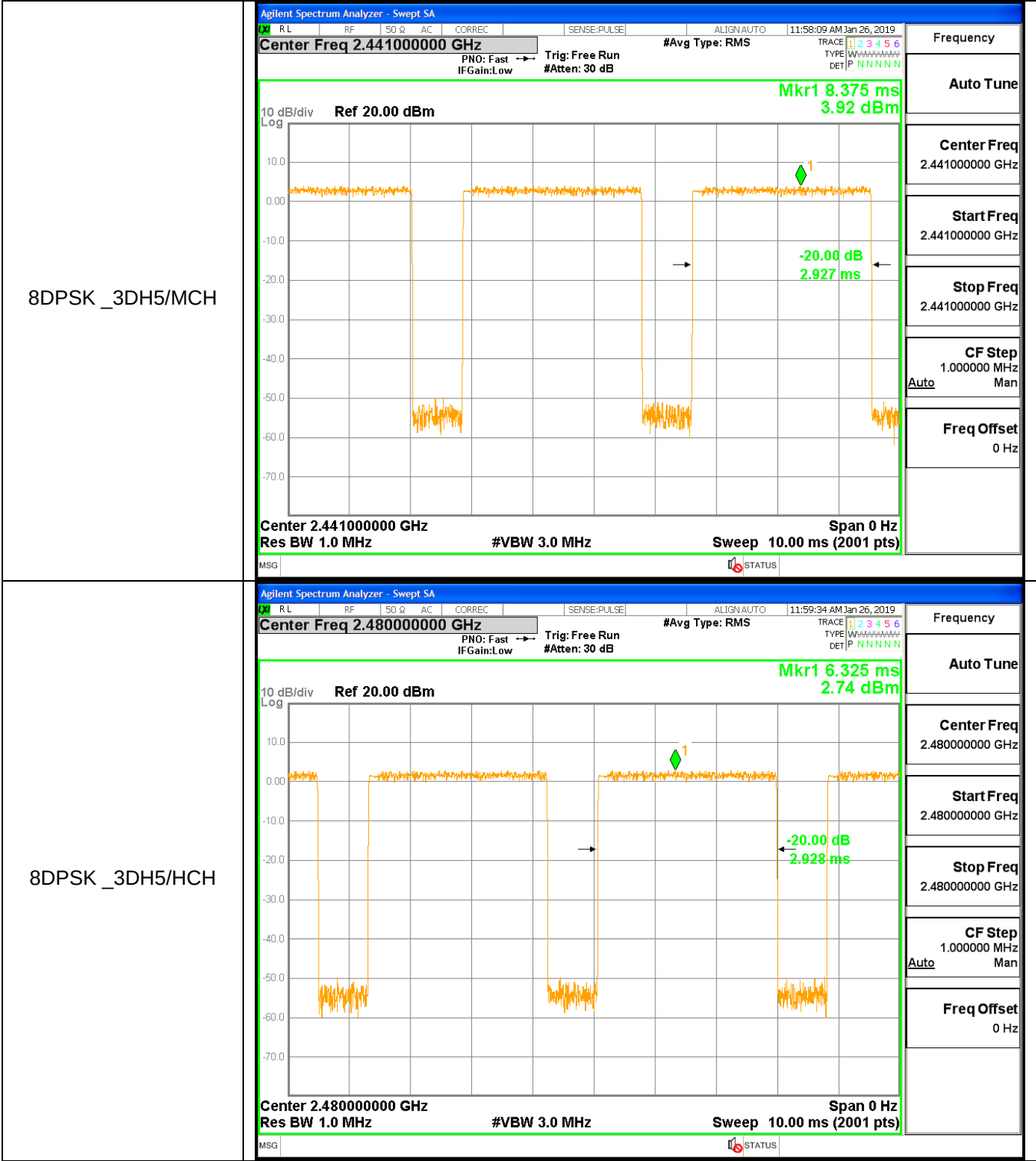
Test Graph









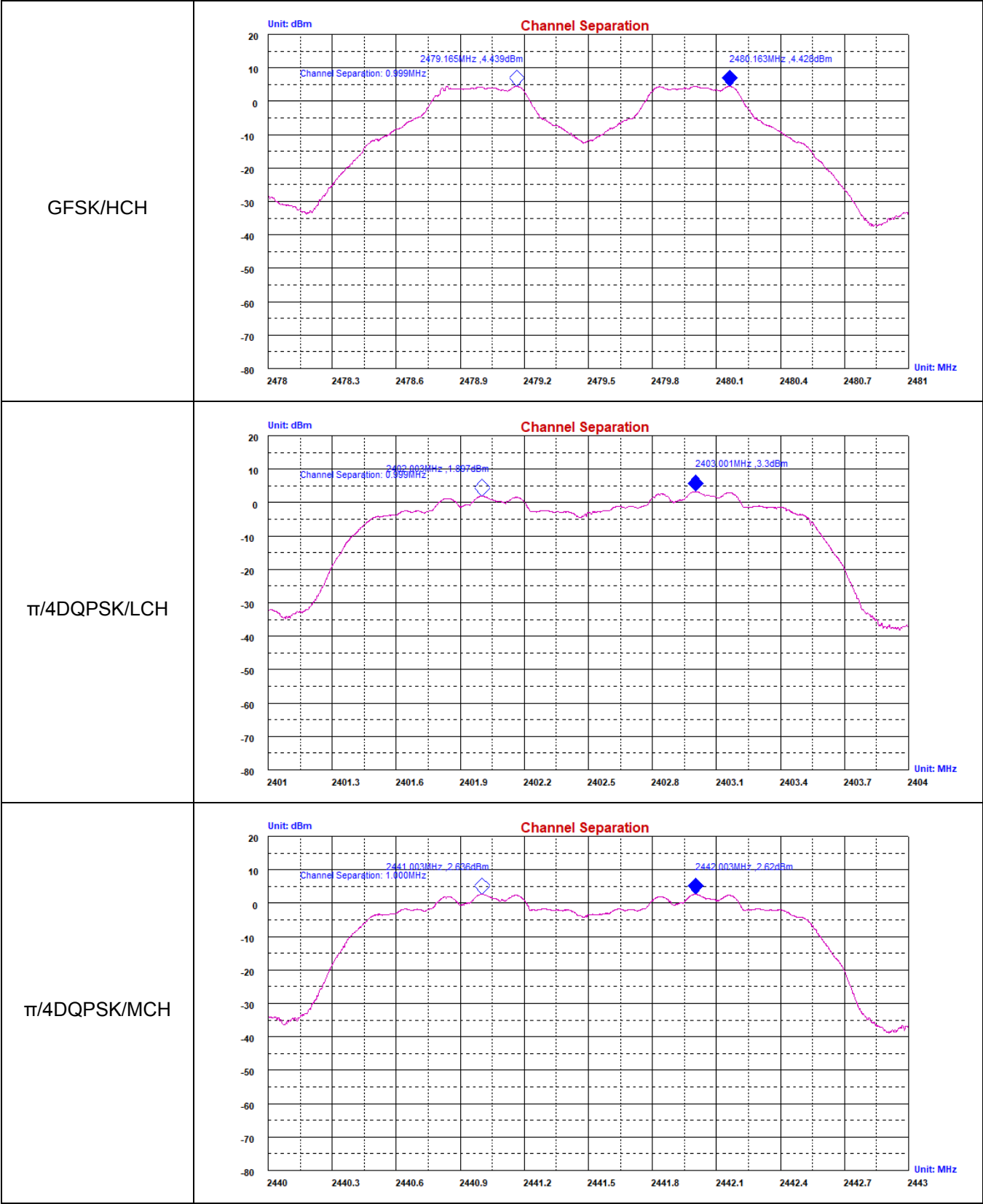


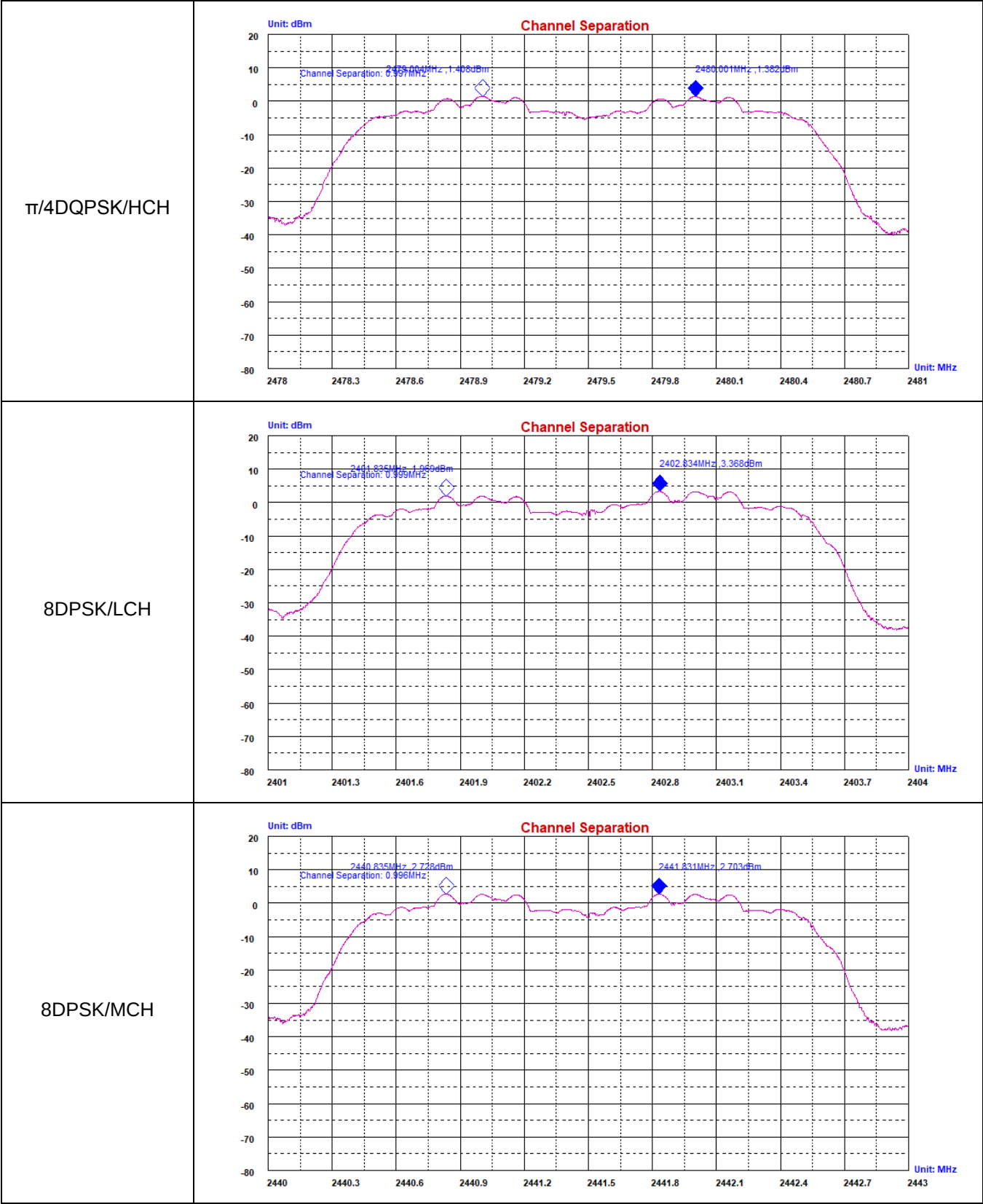
A.3 Carrier Frequency Separation

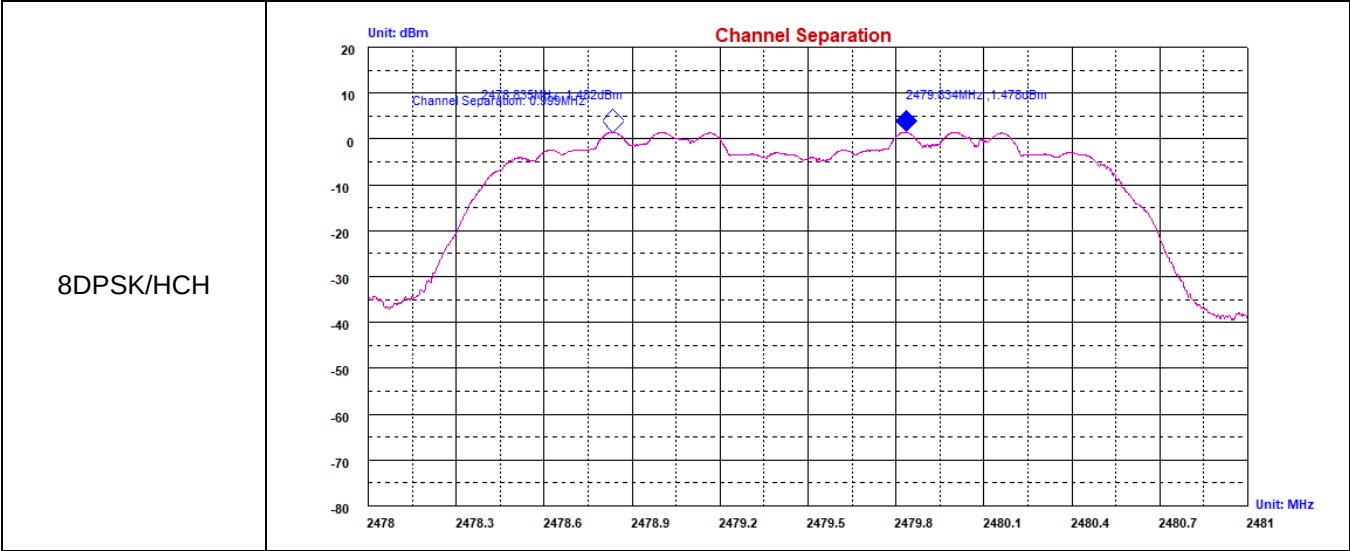
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.000	0.642	PASS
GFSK	MCH	1.001	0.625	PASS
GFSK	HCH	0.999	0.643	PASS
$\pi/4$ DQPSK	LCH	0.999	0.889	PASS
$\pi/4$ DQPSK	MCH	1.000	0.899	PASS
$\pi/4$ DQPSK	HCH	0.997	0.899	PASS
8DPSK	LCH	0.999	0.885	PASS
8DPSK	MCH	0.996	0.896	PASS
8DPSK	HCH	0.999	0.895	PASS

Test Graph





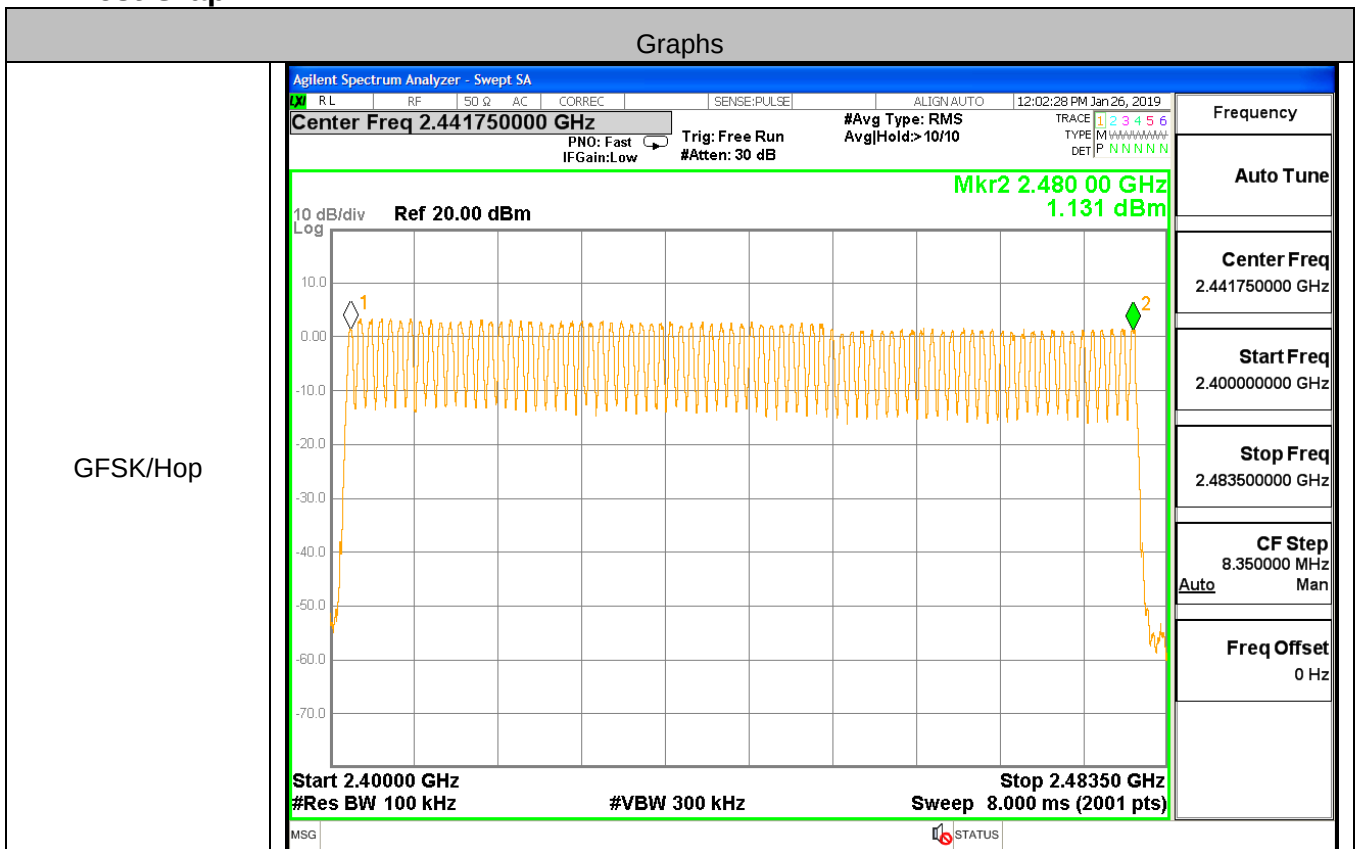


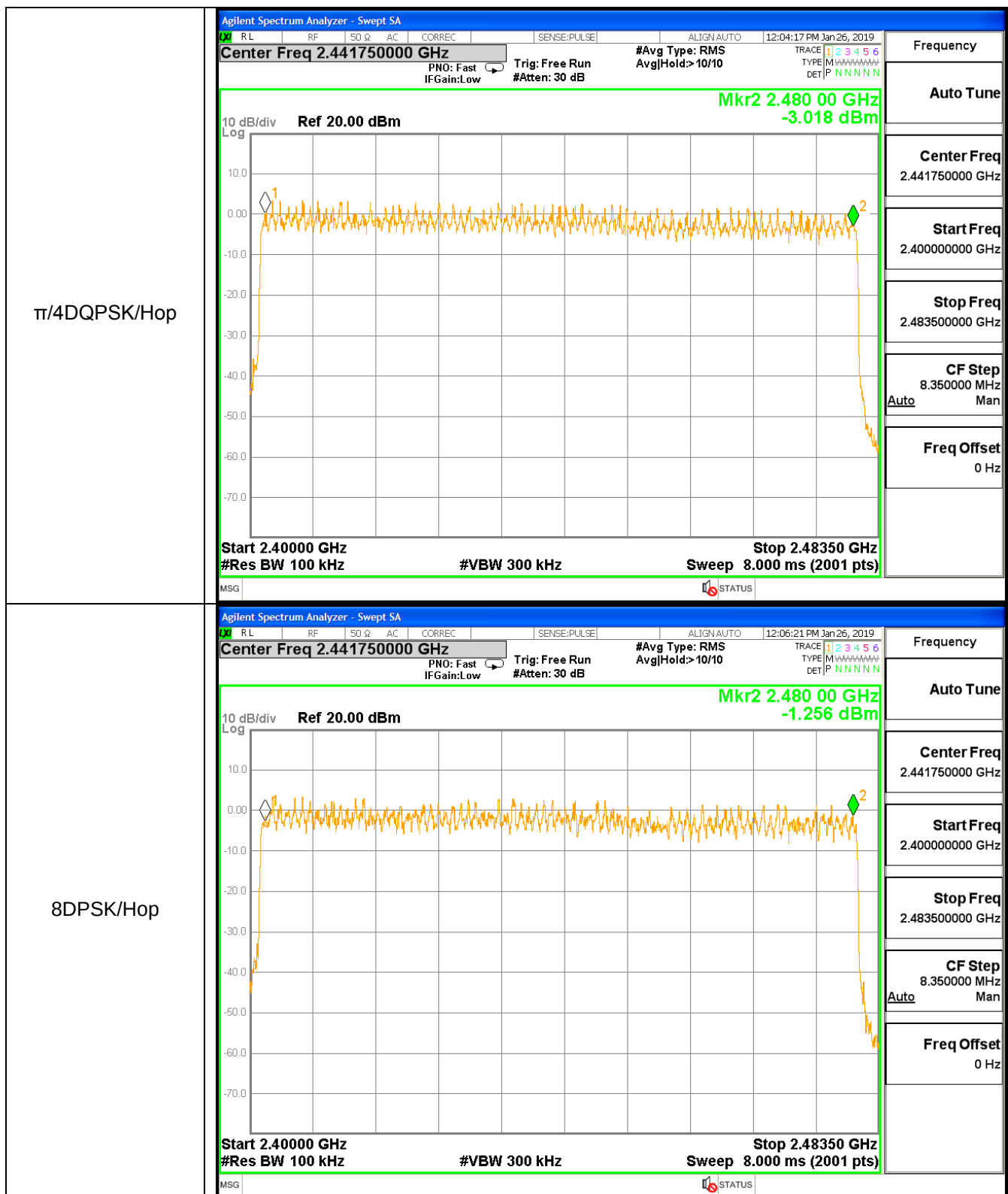


A.4 Hopping Channel Number

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

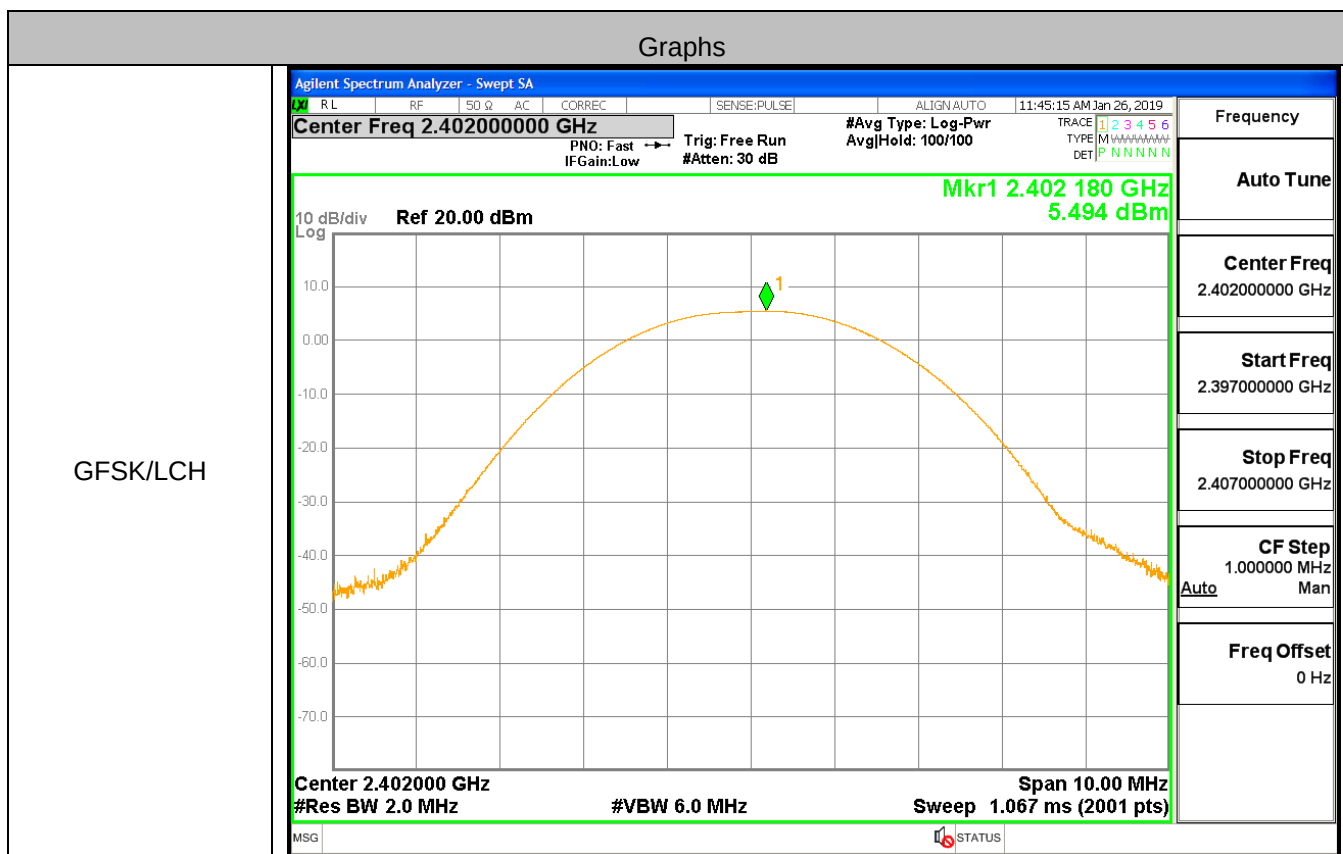


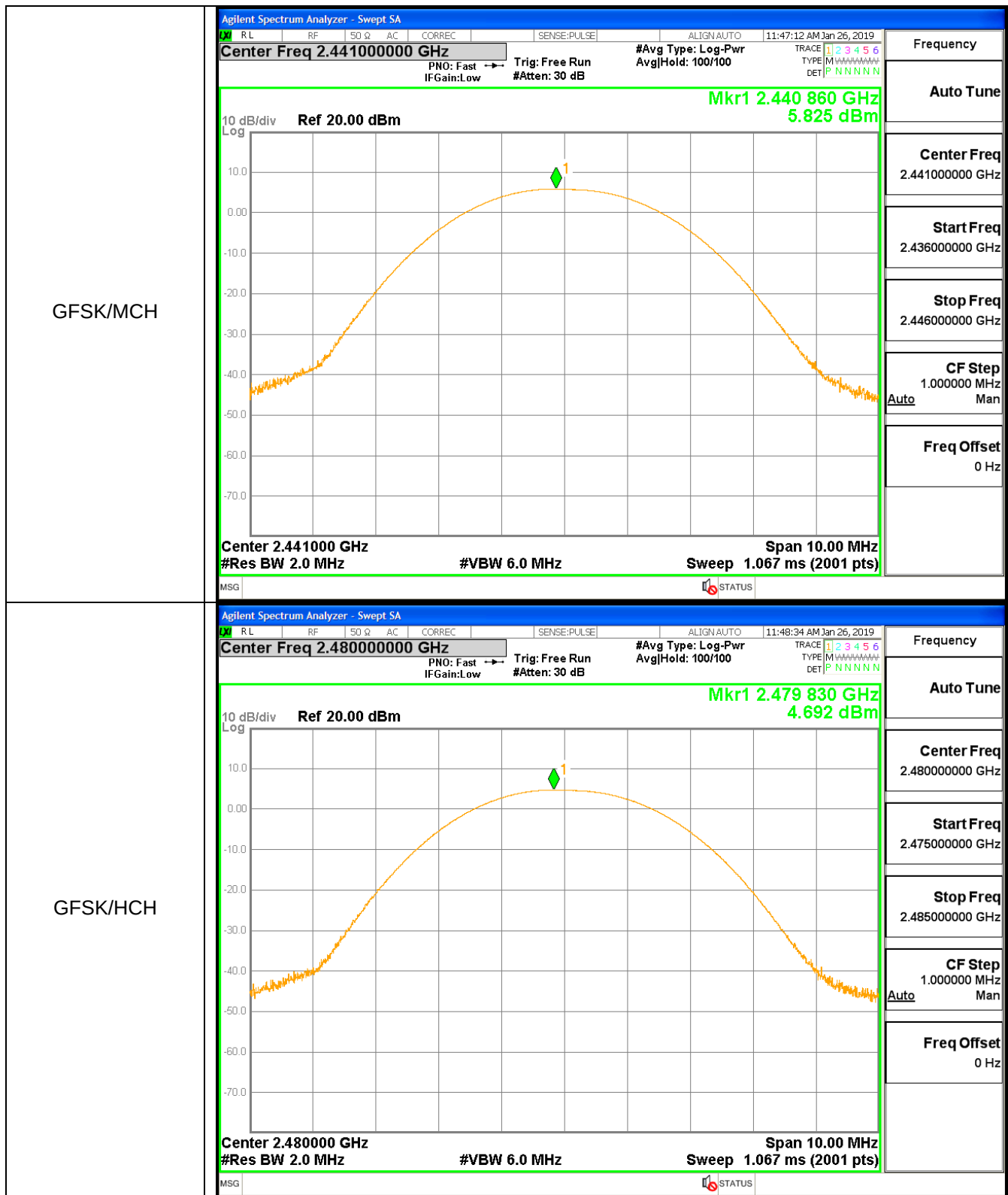


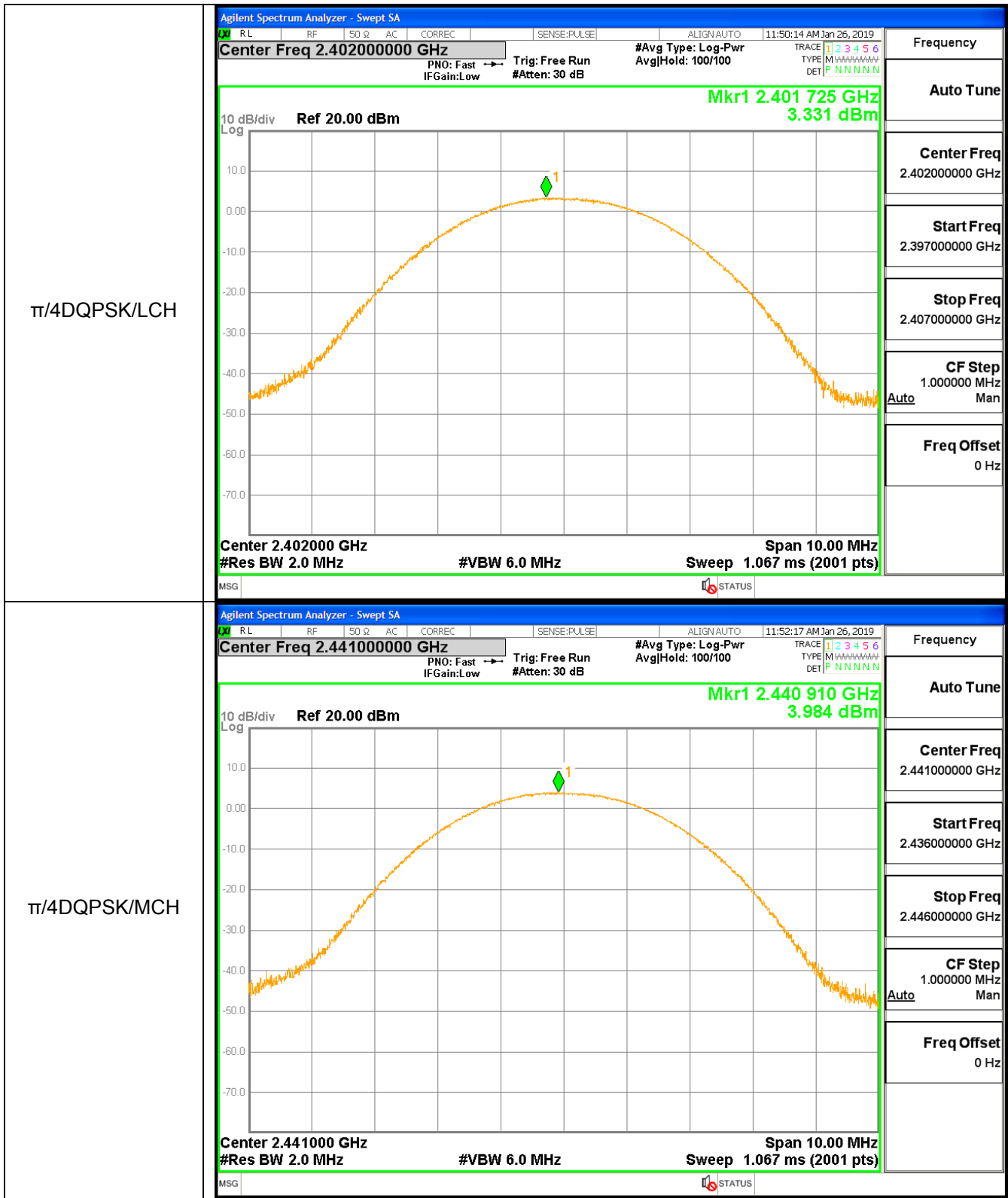
A.5 Conducted Peak Output Power

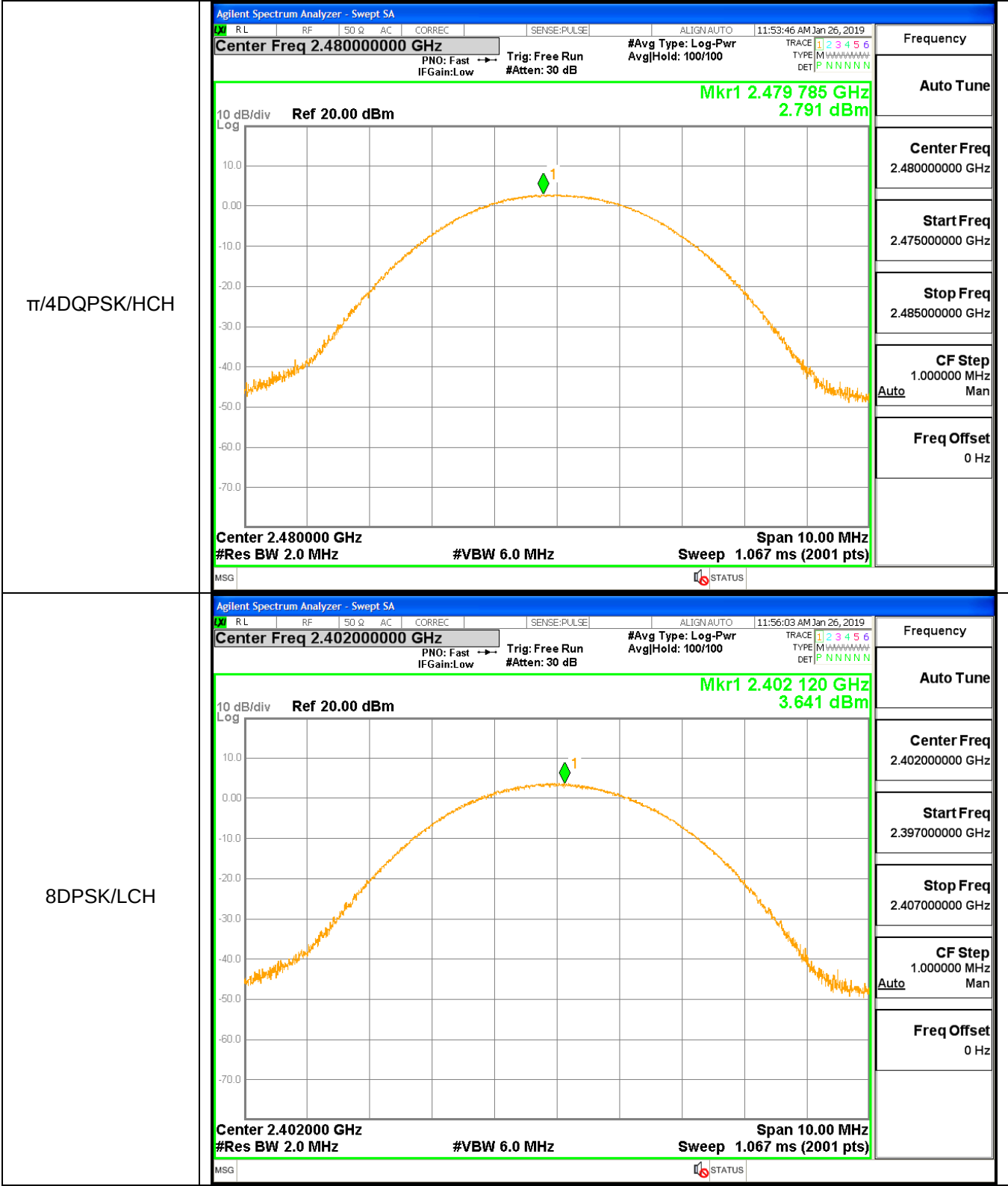
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	5.494	21	PASS
GFSK	MCH	5.825	21	PASS
GFSK	HCH	4.692	21	PASS
$\pi/4$ DQPSK	LCH	3.331	21	PASS
$\pi/4$ DQPSK	MCH	3.984	21	PASS
$\pi/4$ DQPSK	HCH	2.791	21	PASS
8DPSK	LCH	3.641	21	PASS
8DPSK	MCH	4.357	21	PASS
8DPSK	HCH	3.170	21	PASS

Test Graph





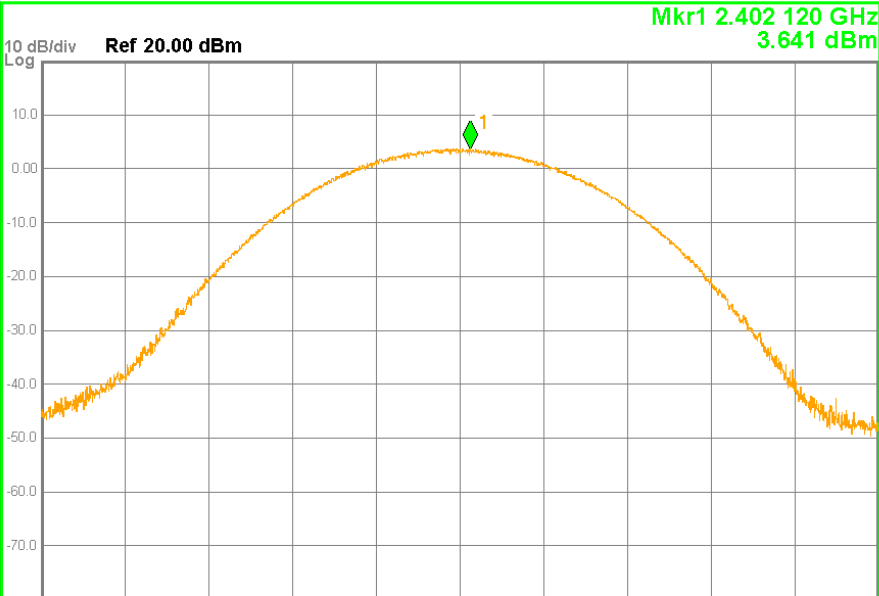




10 dB/div
Log

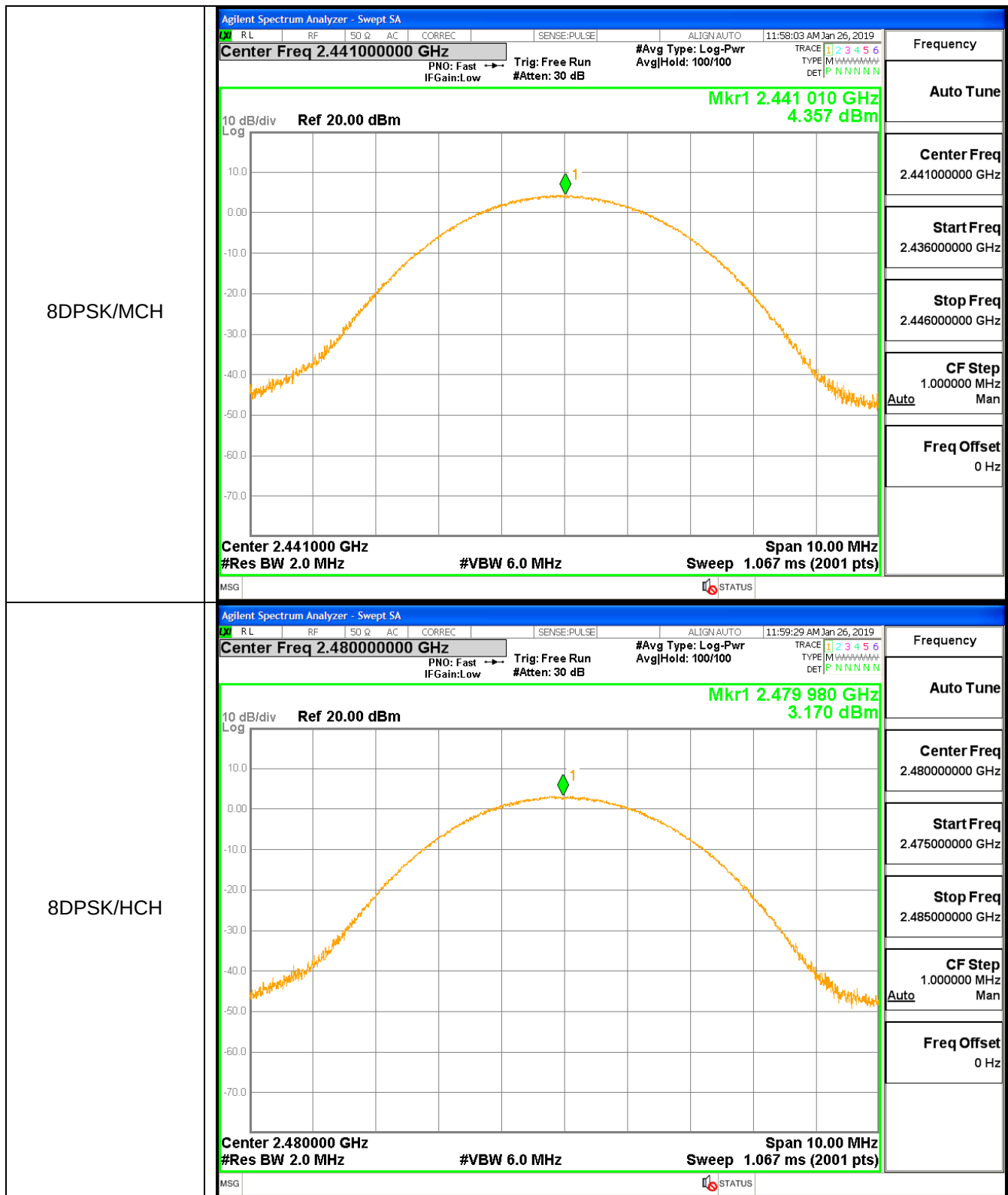
Ref 20.00 dBm

Mkr1 2.402 120 GHz
3.641 dBm



Center 2.402000 GHz #Res BW 2.0 MHz #VBW 6.0 MHz Span 10.00 MHz Sweep 1.067 ms (2001 pts)

MSG STATUS



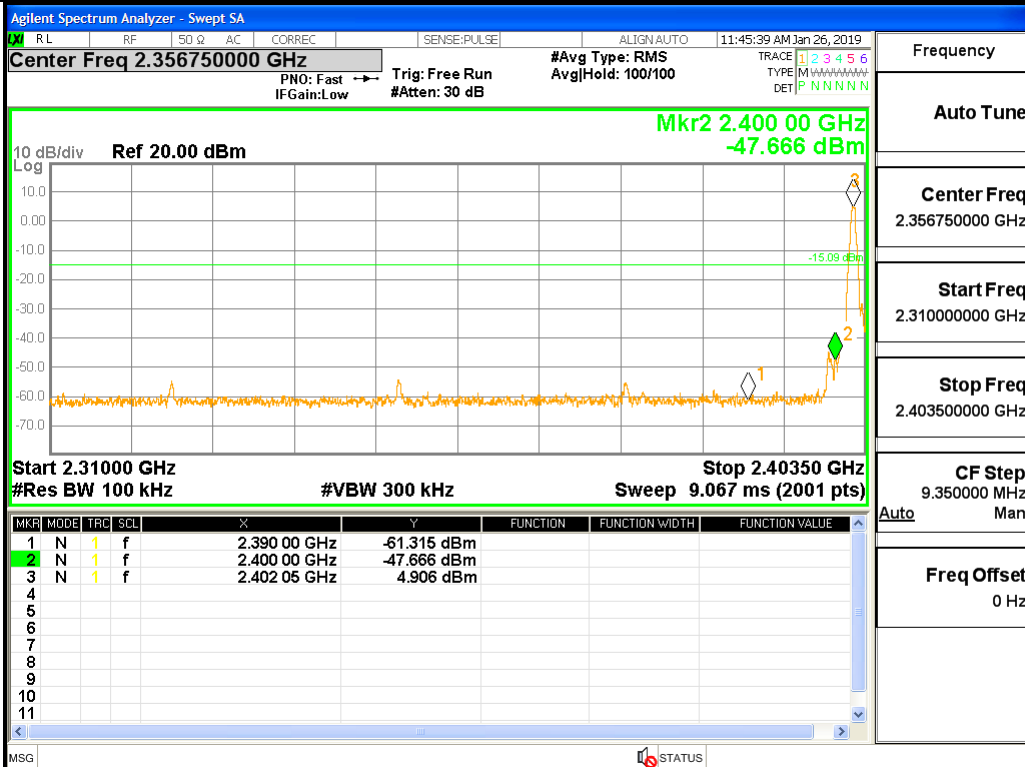
A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2390	4.906	-61.32	-15.094	Pass
1DH5	2402	2400	4.906	-47.67	-15.094	Pass
1DH5-Hopping	2402	2390	3.445	-56.44	-16.555	Pass
1DH5-Hopping	2402	2400	3.445	-57.54	-16.555	Pass
1DH5	2480	2483.5	4.326	-58.83	-15.674	Pass
1DH5	2480	2500	4.326	-60.97	-15.674	Pass
1DH5-Hopping	2480	2483.5	1.486	-60.32	-18.514	Pass
1DH5-Hopping	2480	2500	1.486	-55.53	-18.514	Pass
2DH5	2402	2390	0.139	-61.02	-19.861	Pass
2DH5	2402	2400	0.139	-42.27	-19.861	Pass
2DH5-Hopping	2480	2483.5	1.387	-59.11	-18.613	Pass
2DH5-Hopping	2480	2500	1.387	-53.6	-18.613	Pass
2DH5	2480	2483.5	0.394	-59.76	-19.606	Pass
2DH5	2480	2500	0.394	-60.88	-19.606	Pass
2DH5-Hopping	2402	2390	2.949	-58.9	-17.051	Pass
2DH5-Hopping	2402	2400	2.949	-43.29	-17.051	Pass
3DH5	2402	2390	1.826	-62.24	-18.174	Pass
3DH5	2402	2400	1.826	-41.48	-18.174	Pass
3DH5-Hopping	2402	2390	3.035	-57.38	-16.965	Pass
3DH5-Hopping	2402	2400	3.035	-43.34	-16.965	Pass
3DH5	2480	2483.5	1.27	-59.32	-18.73	Pass
3DH5	2480	2500	1.27	-61.33	-18.73	Pass
3DH5-Hopping	2480	2483.5	1.493	-59.74	-18.507	Pass
3DH5-Hopping	2480	2500	1.493	-57.18	-18.507	Pass

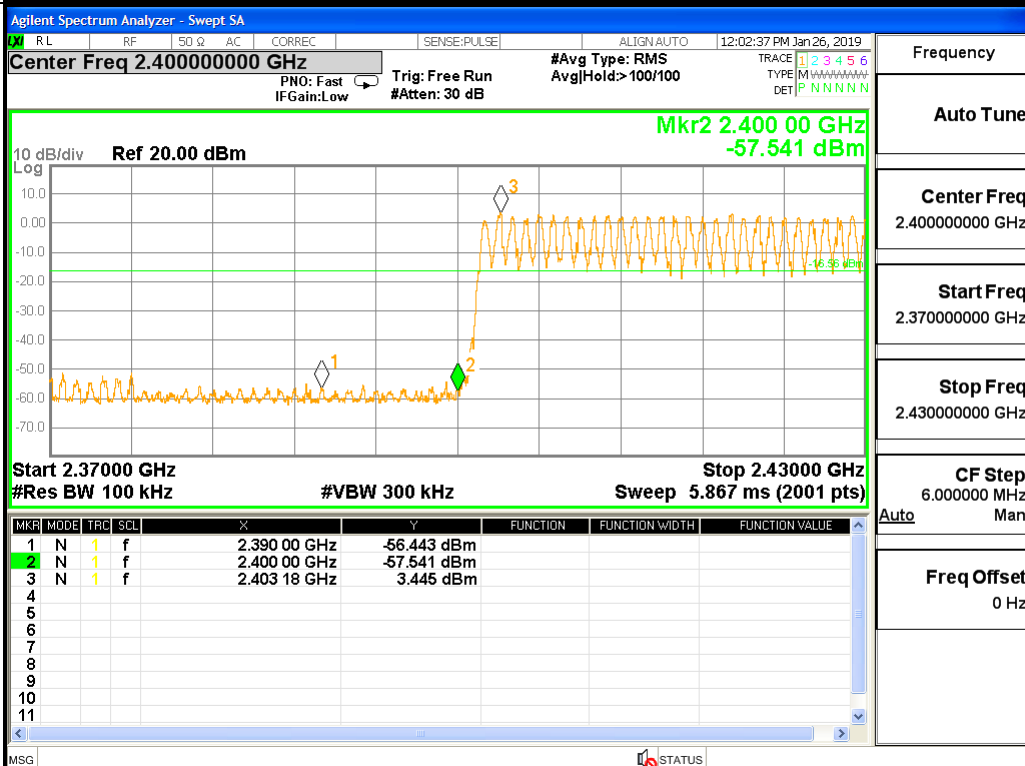
Test Graph

Graphs

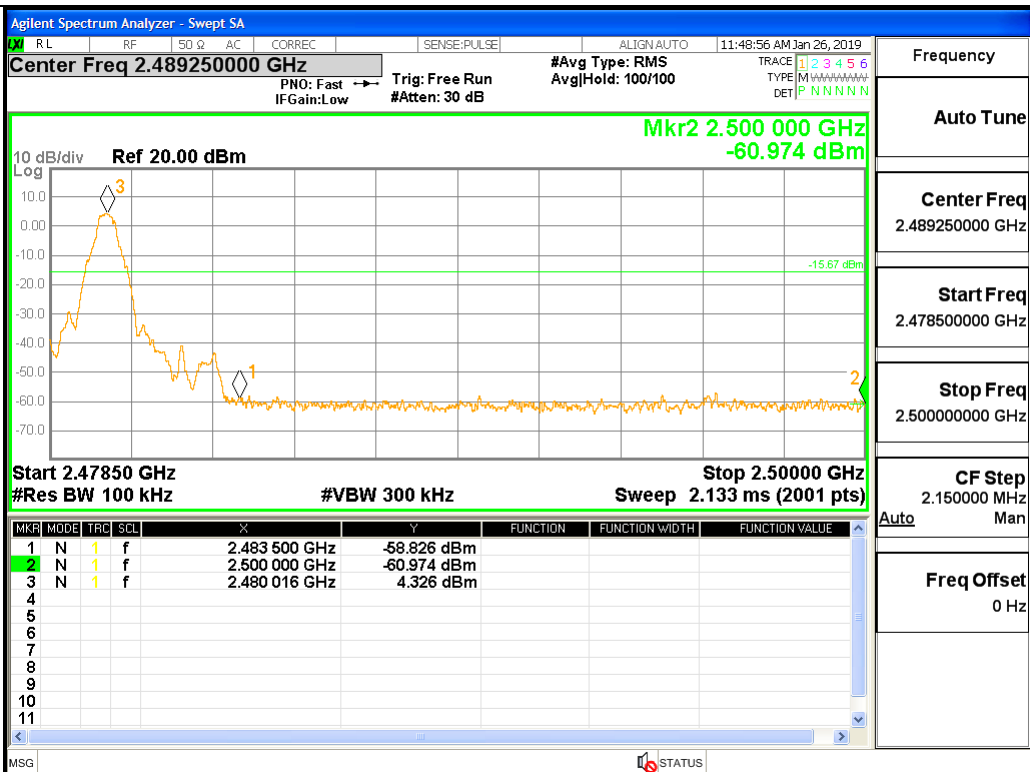
GFSK/LCH/No Hop



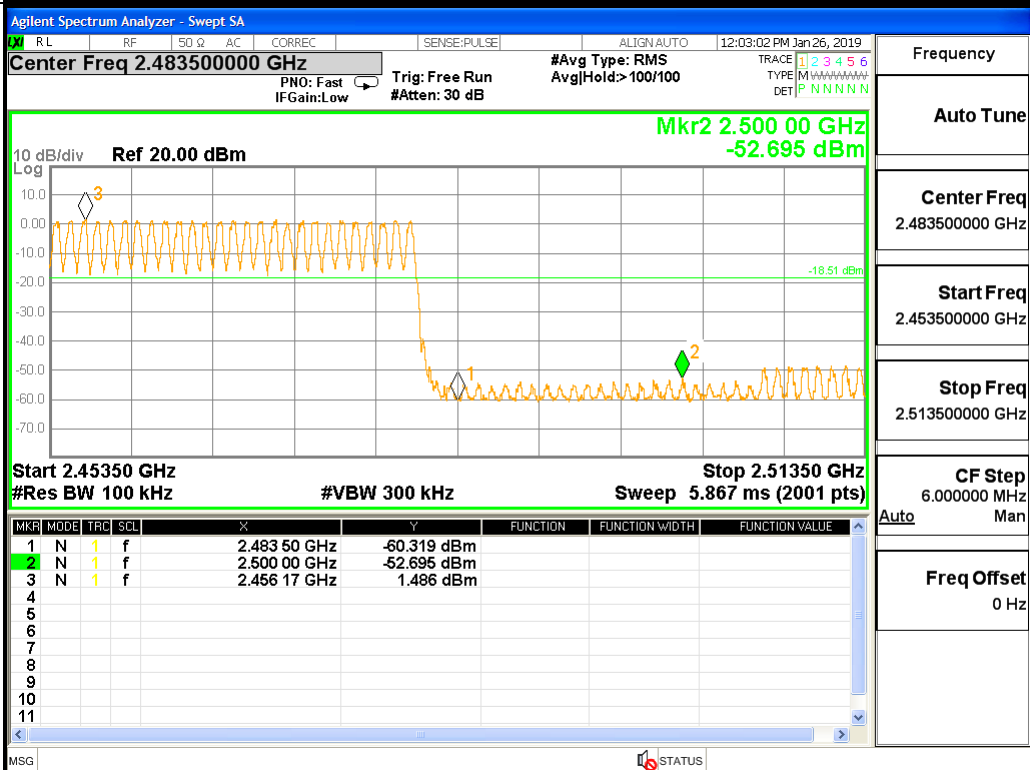
GFSK/LCH/Hop



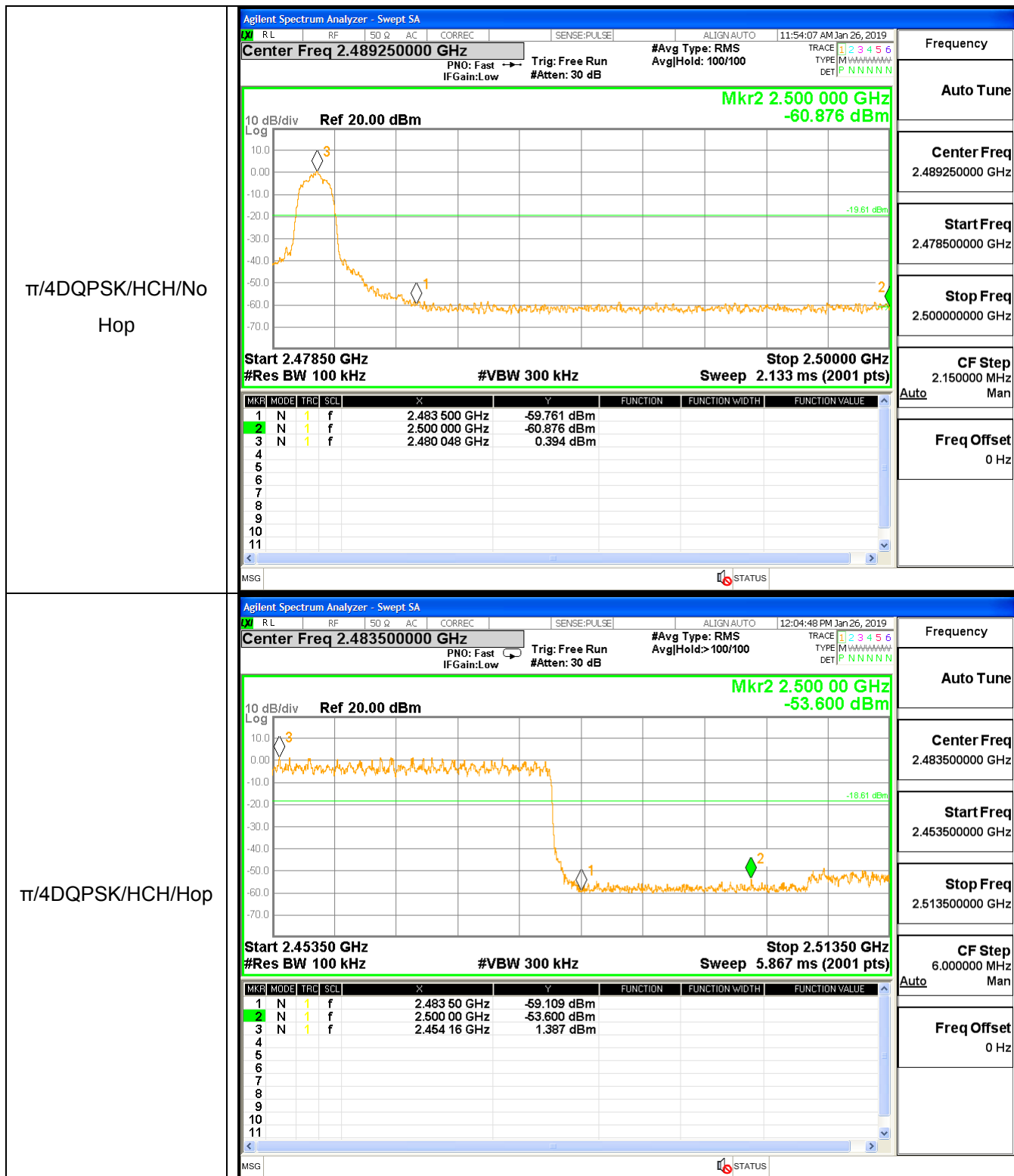
GFSK/HCH/No Hop



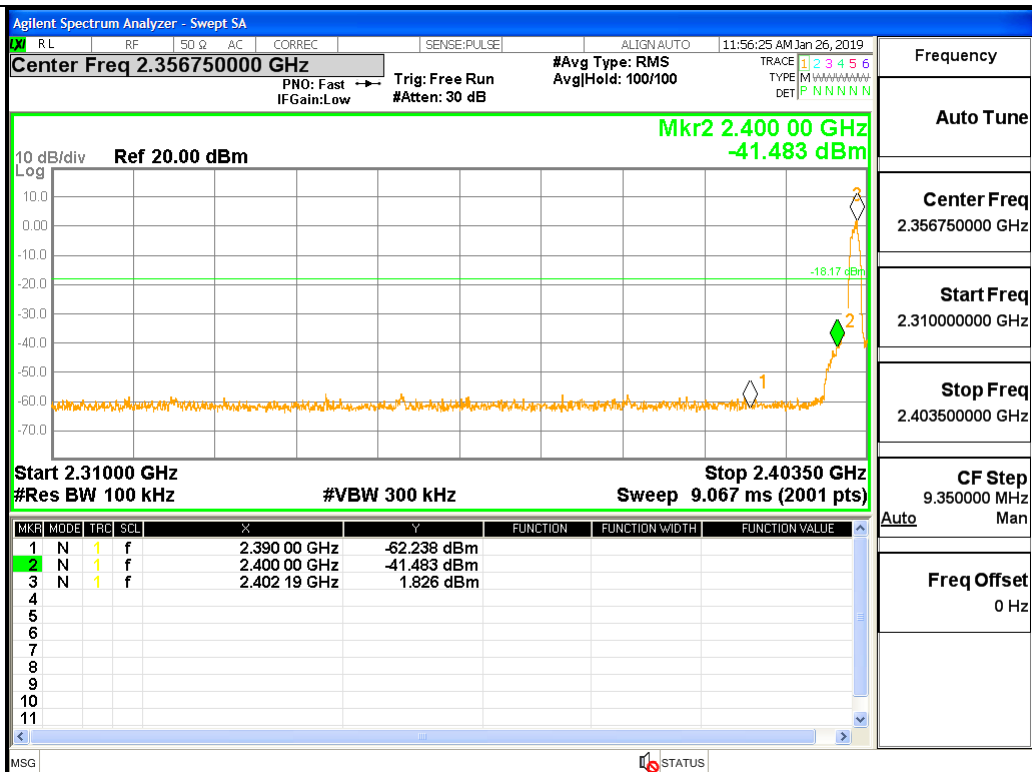
GFSK/HCH/Hop



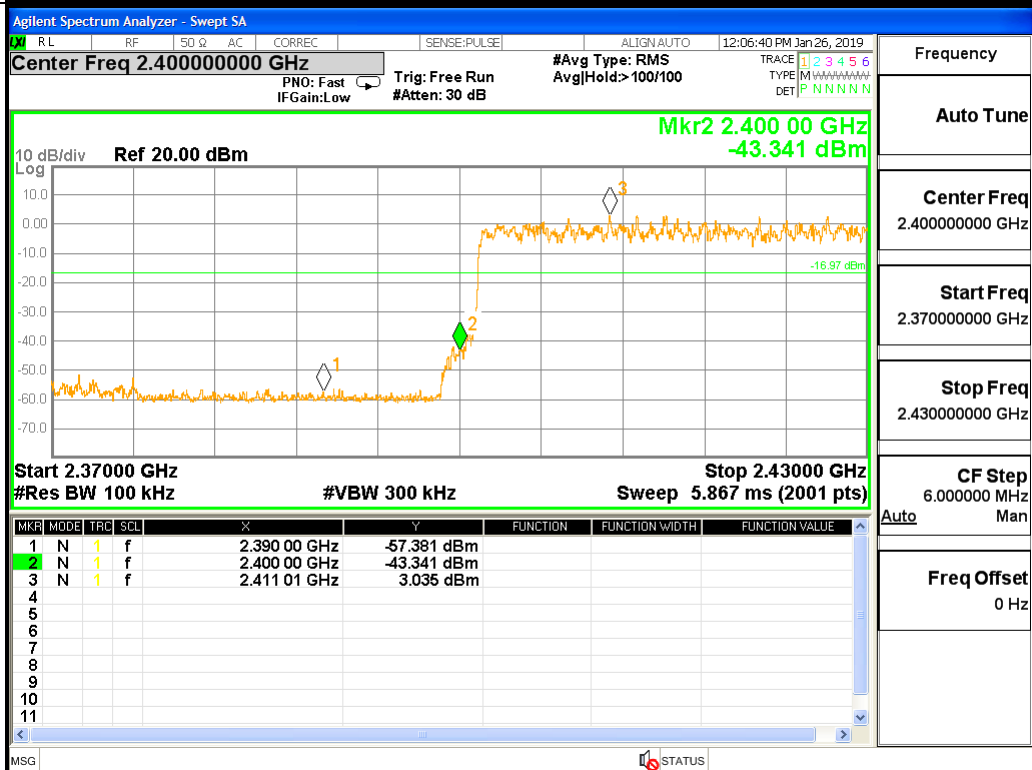


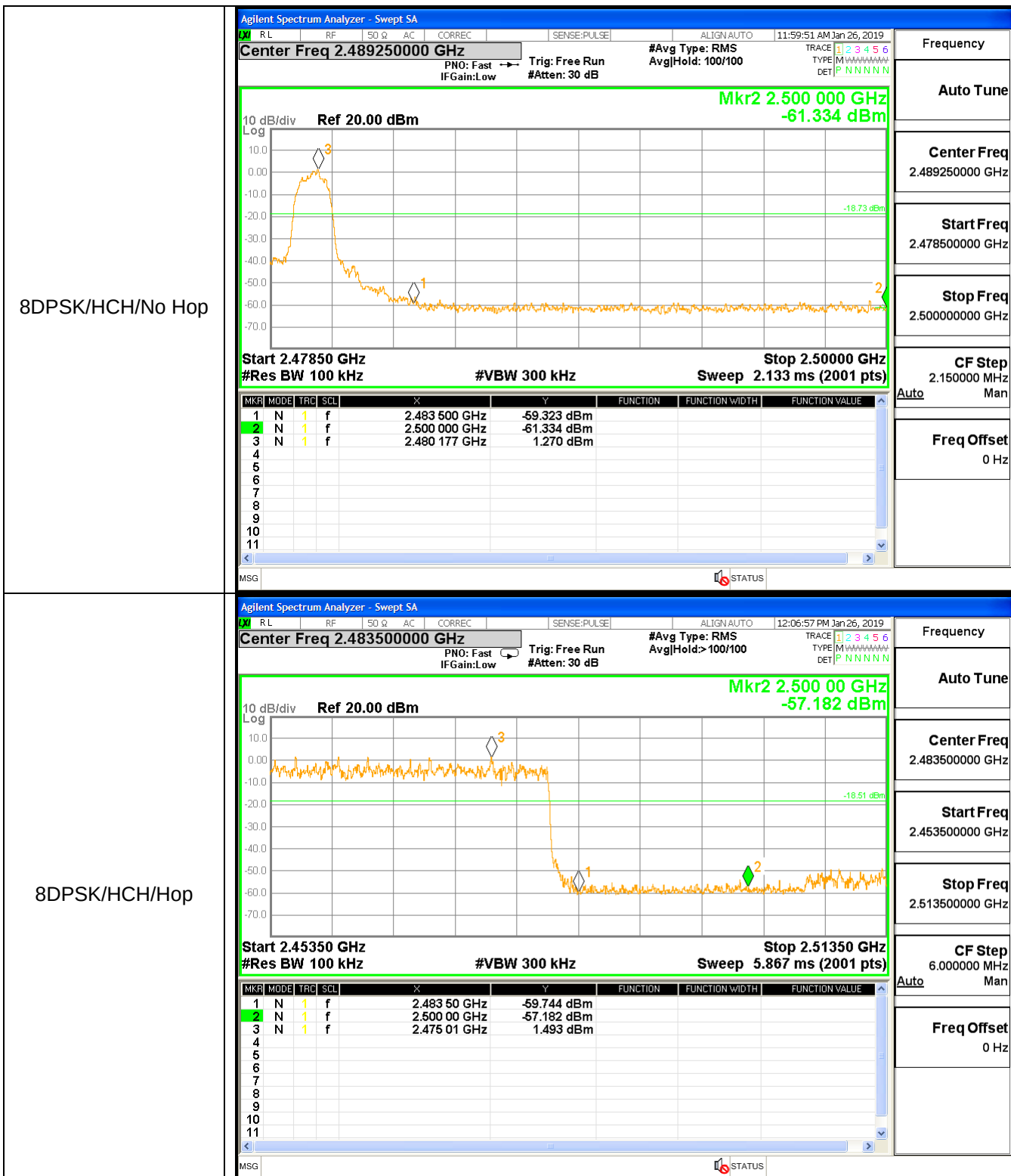


8DPSK/LCH/No Hop

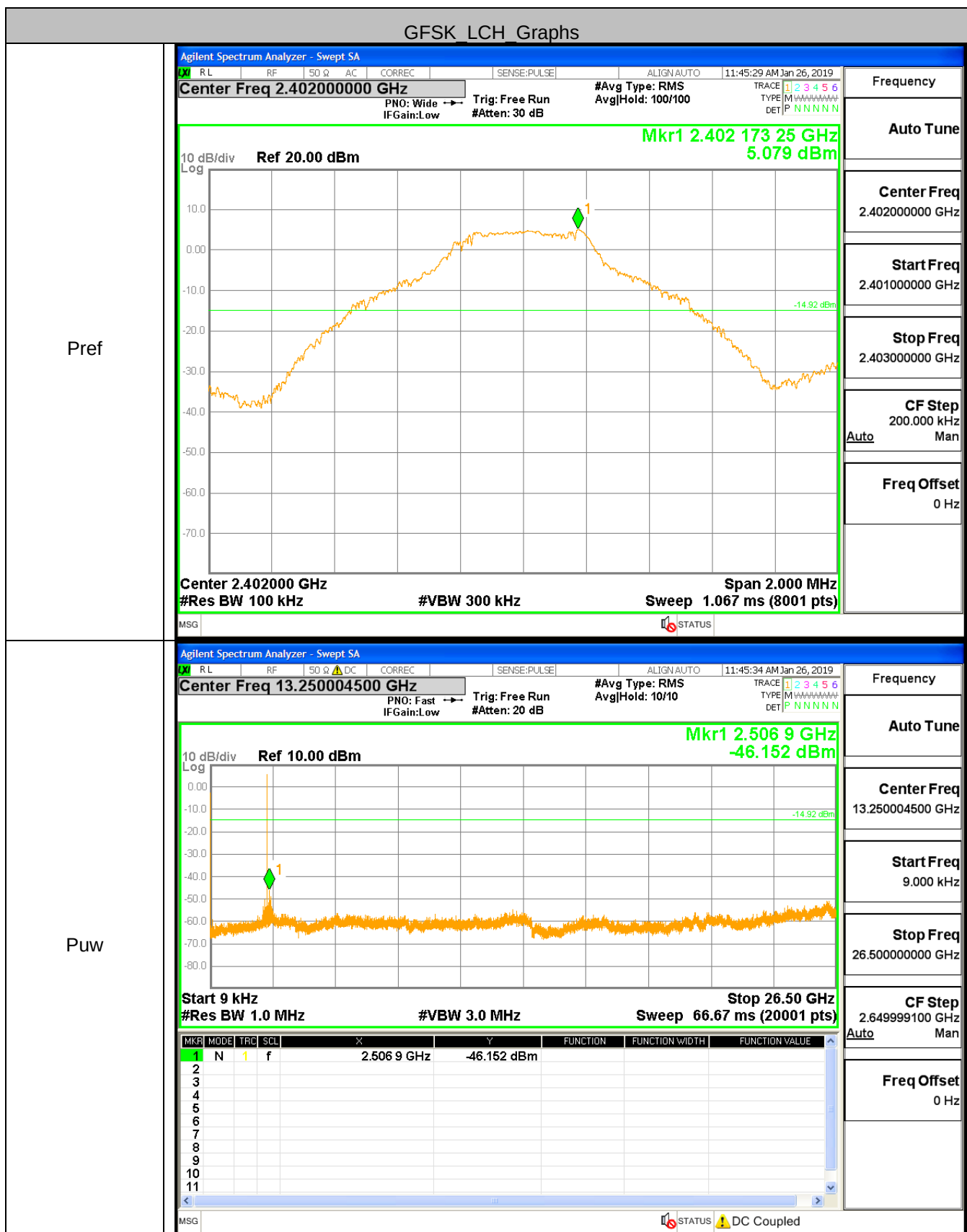


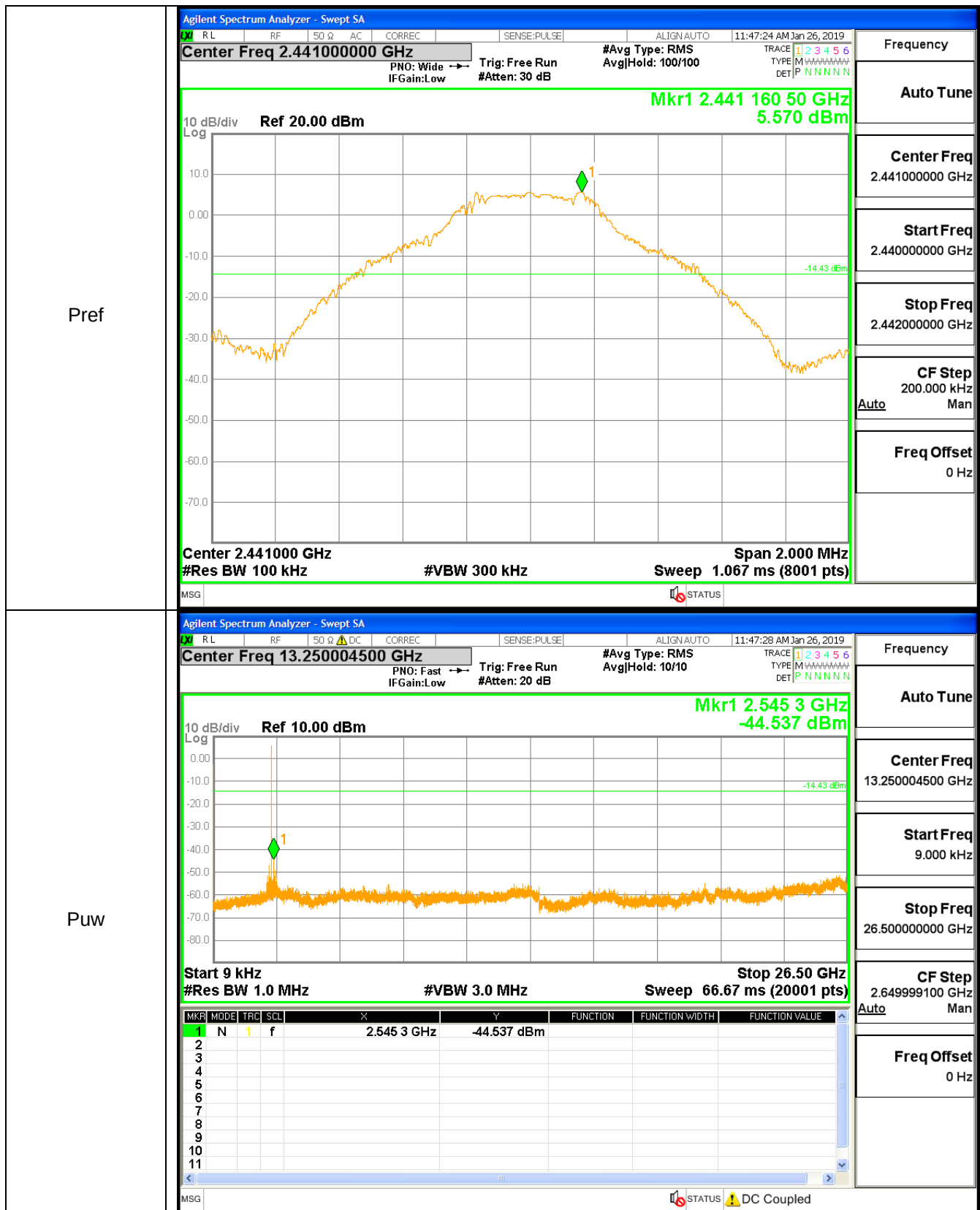
8DPSK/LCH/Hop





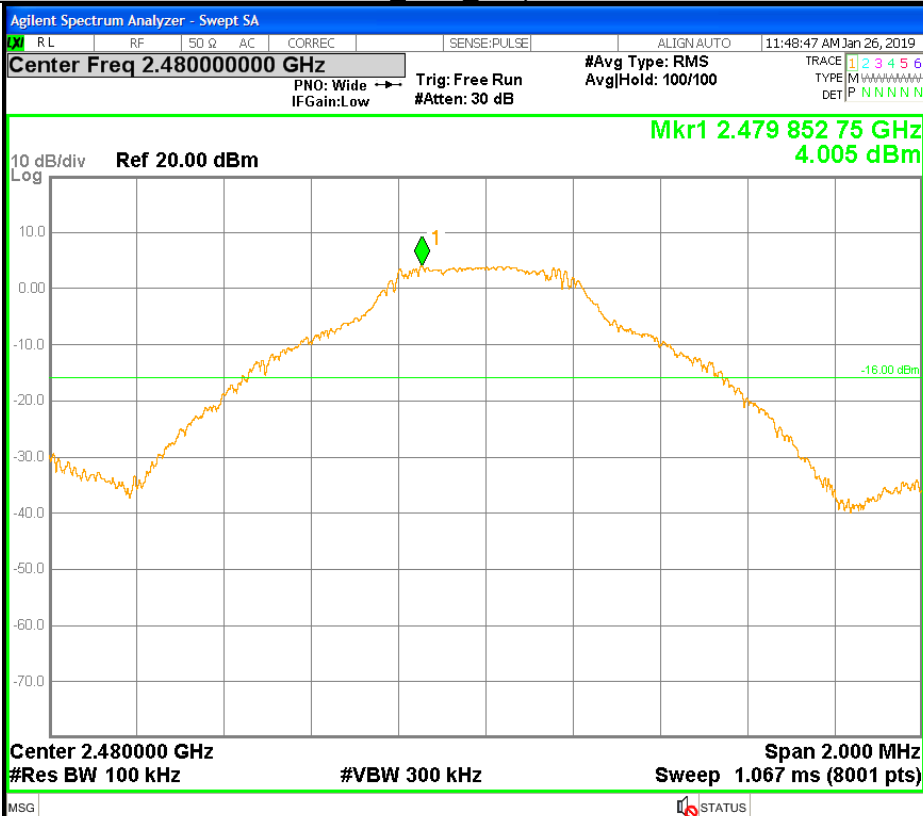
A.7 RF Conducted Spurious Emissions Test Graph



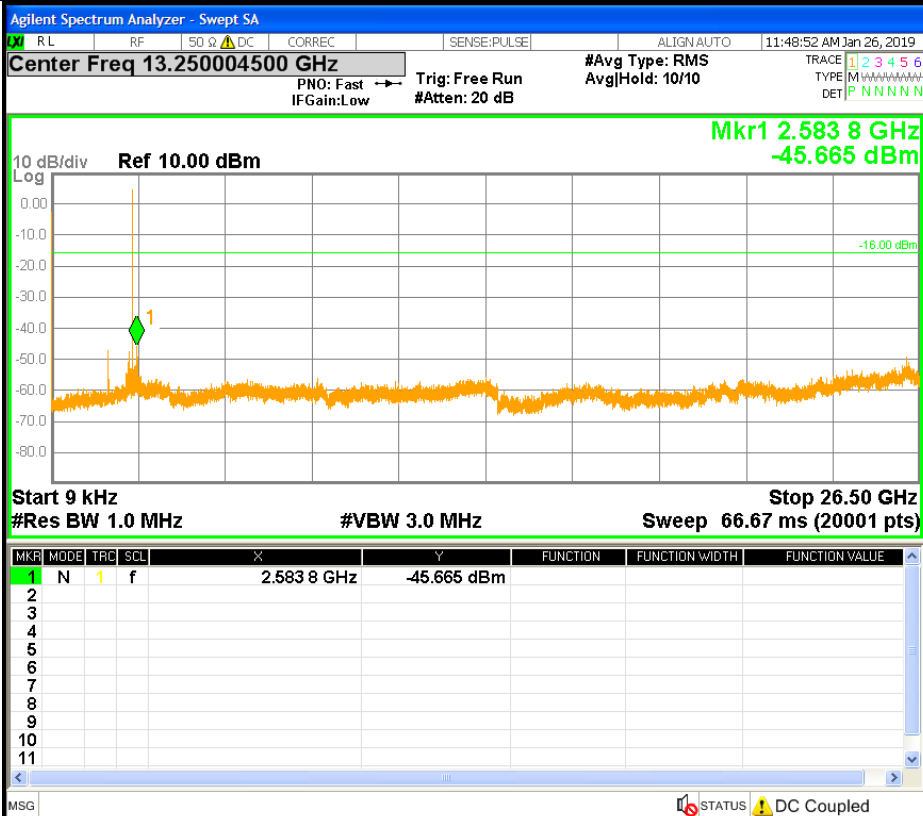


GFSK HCH Graphs

Pref

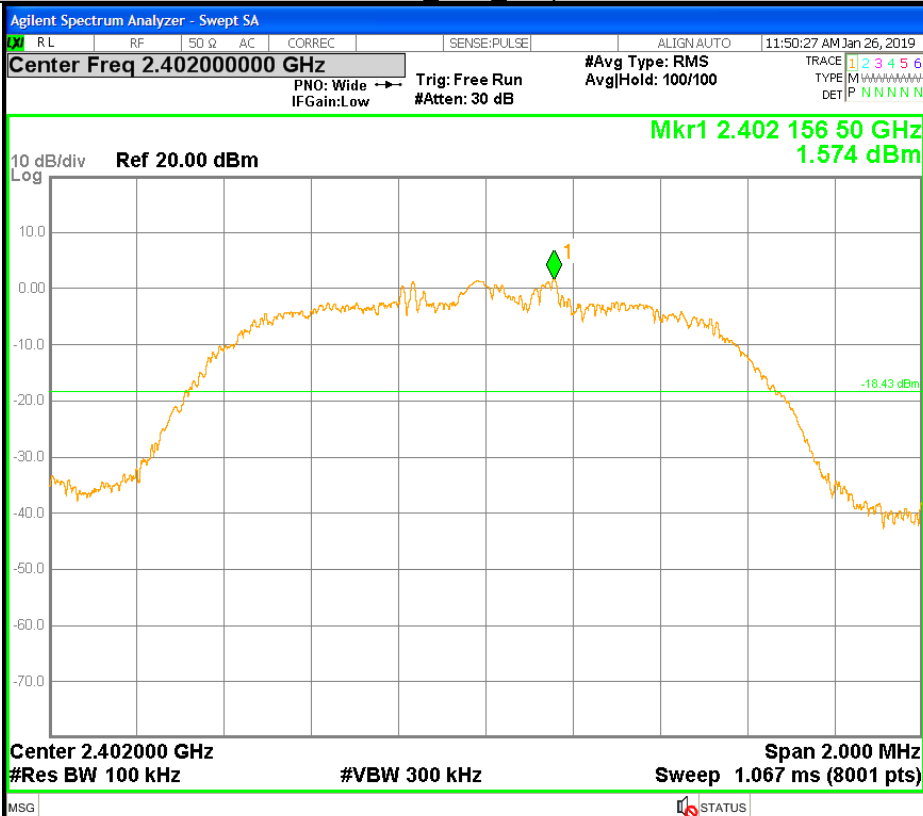


Puw

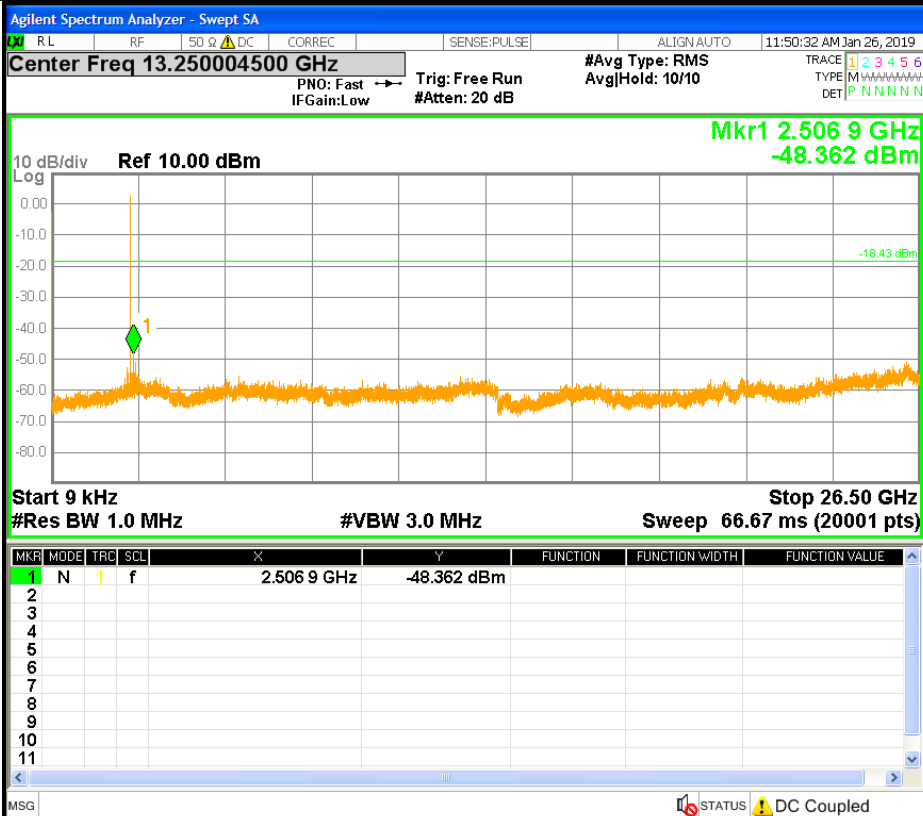


$\pi/4$ DQPSK LCH Graphs

Pref

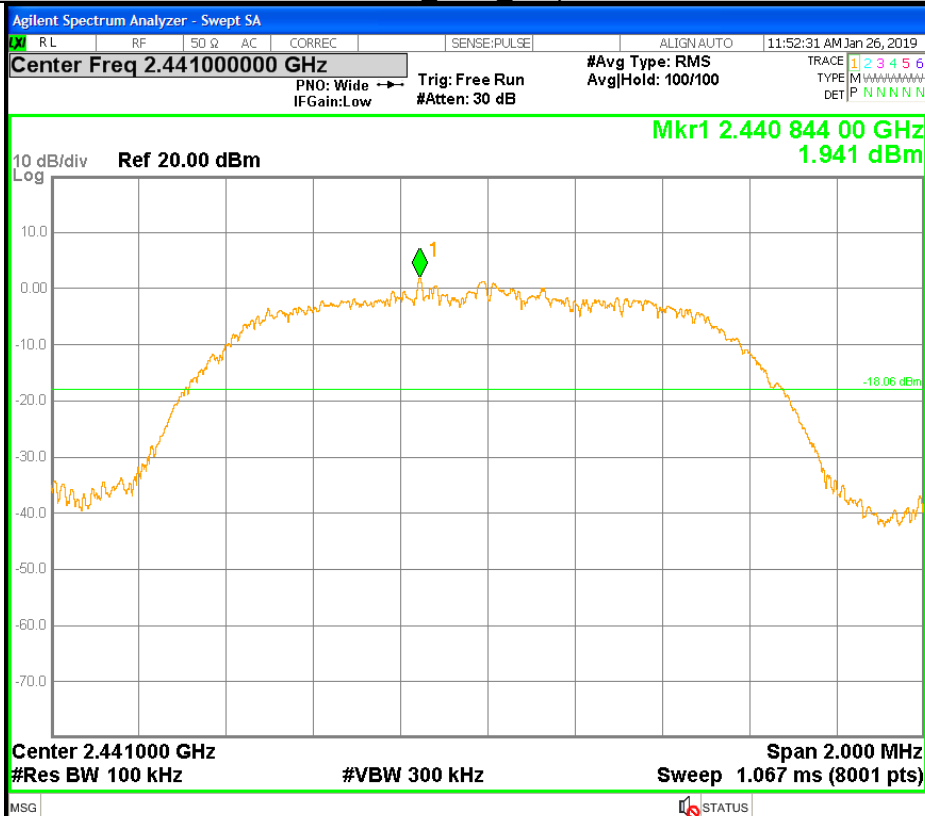


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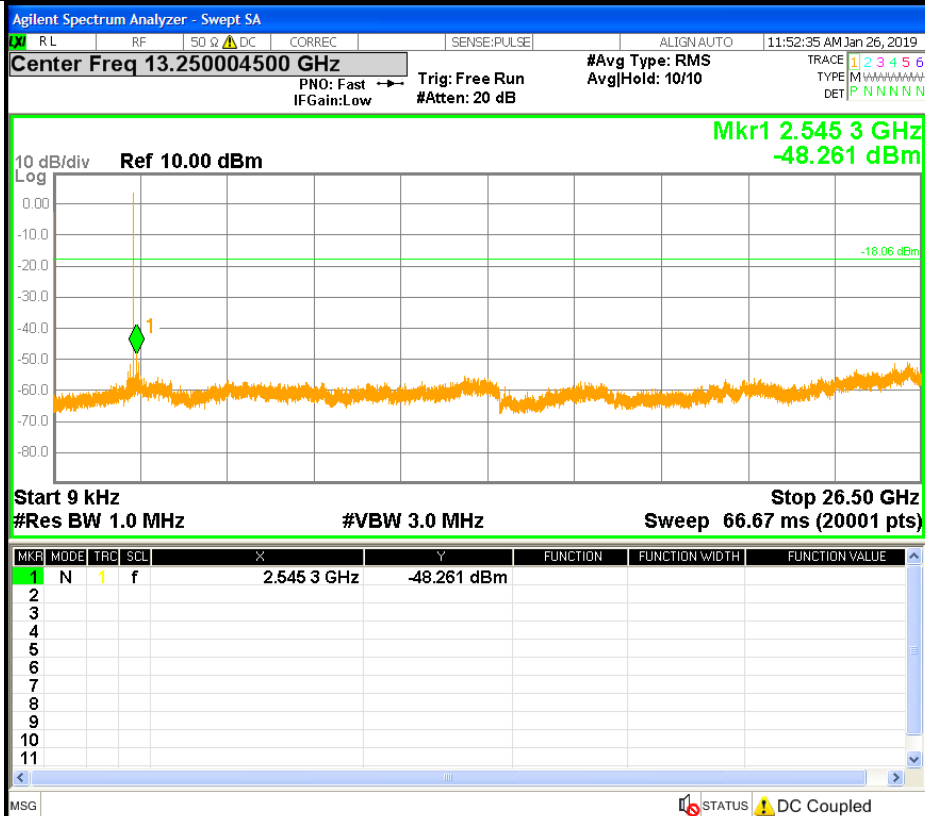


$\pi/4$ DQPSK MCH Graphs

Pref

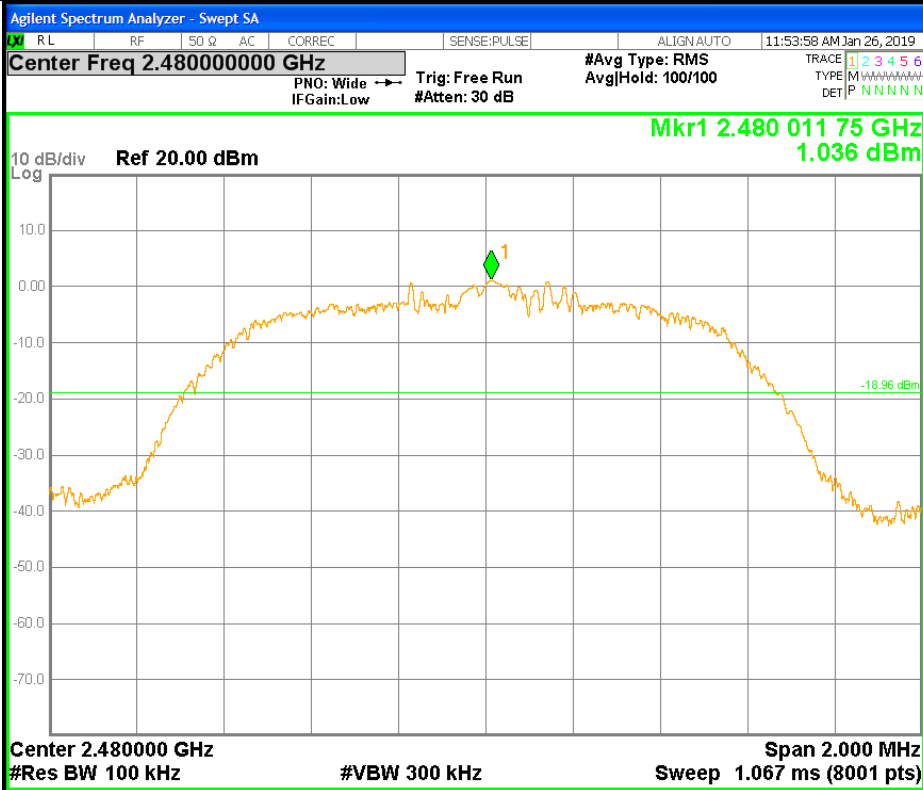


Puw

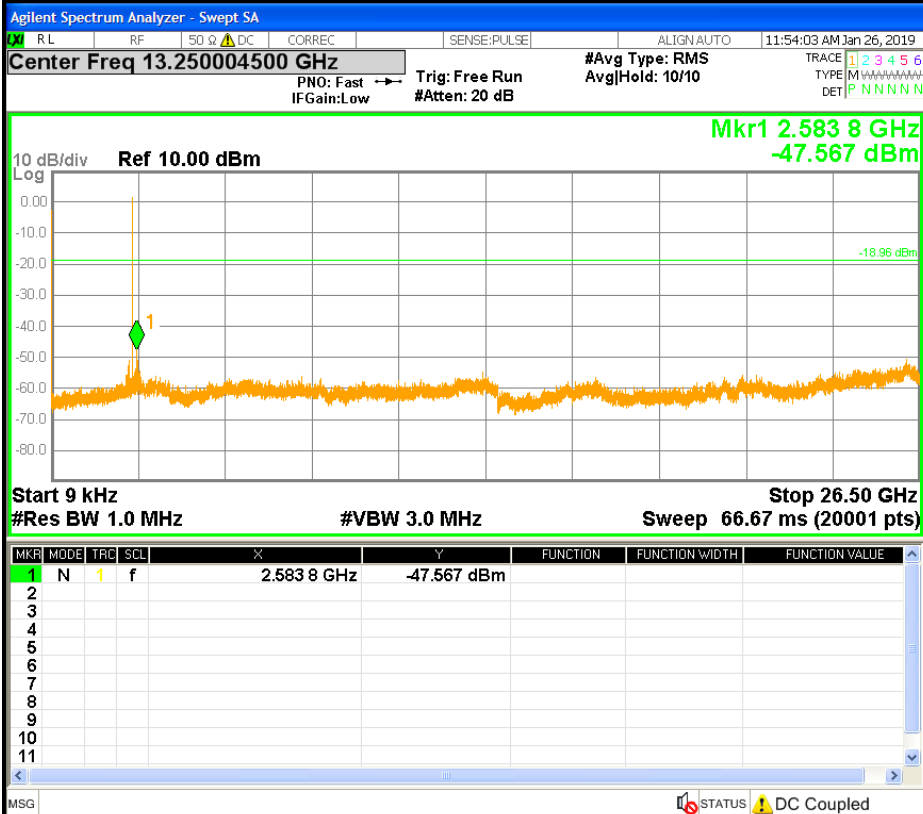


$\pi/4$ DQPSK HCH Graphs

Pref

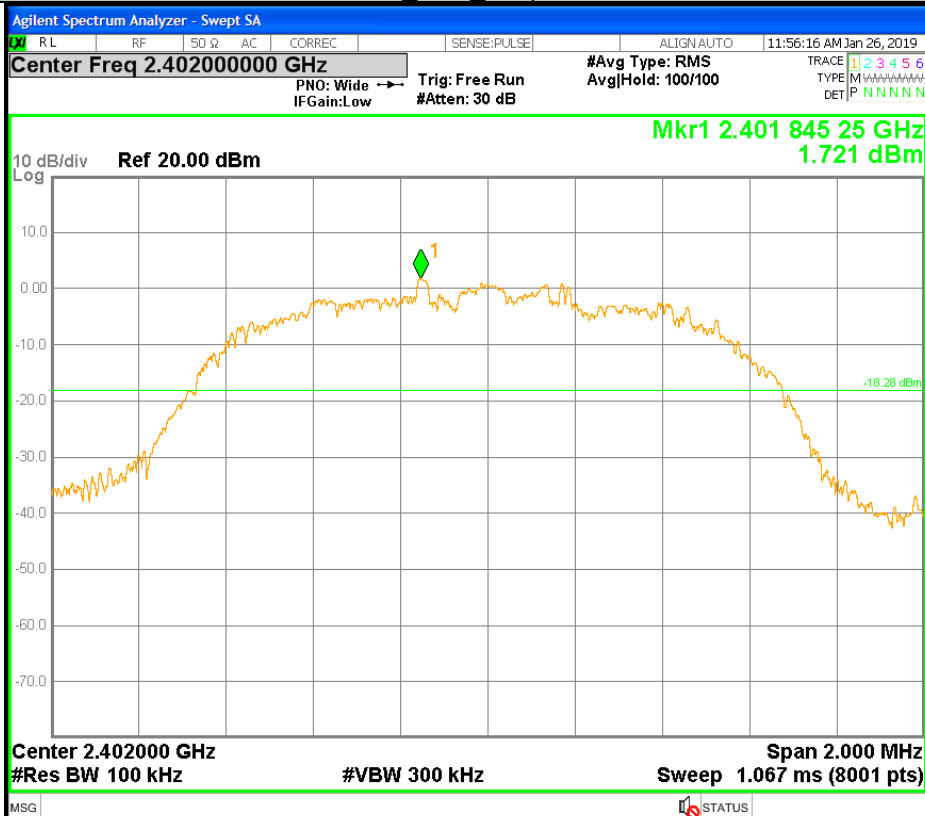


Puw

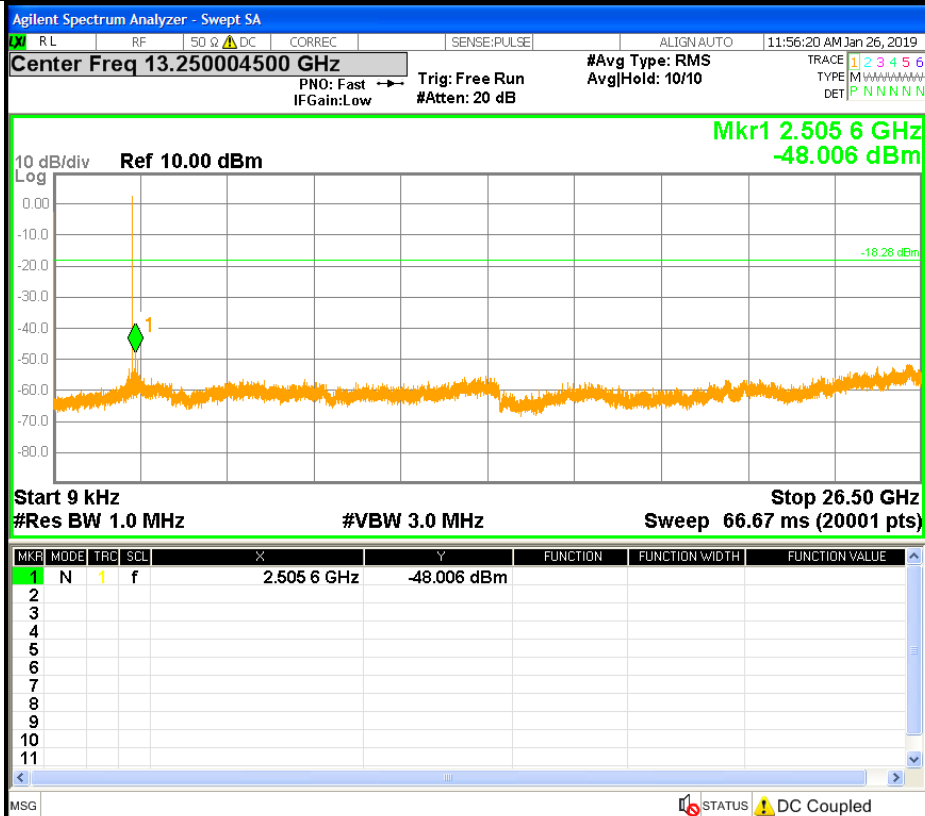


8DPSK LCH Graphs

Pref

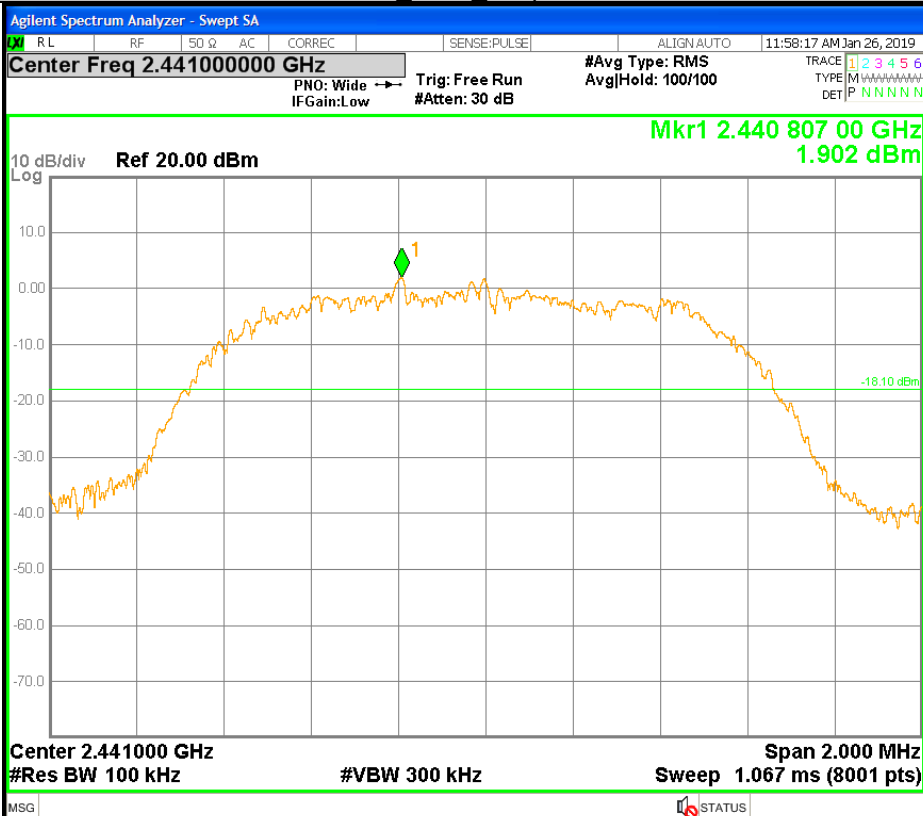


Puw

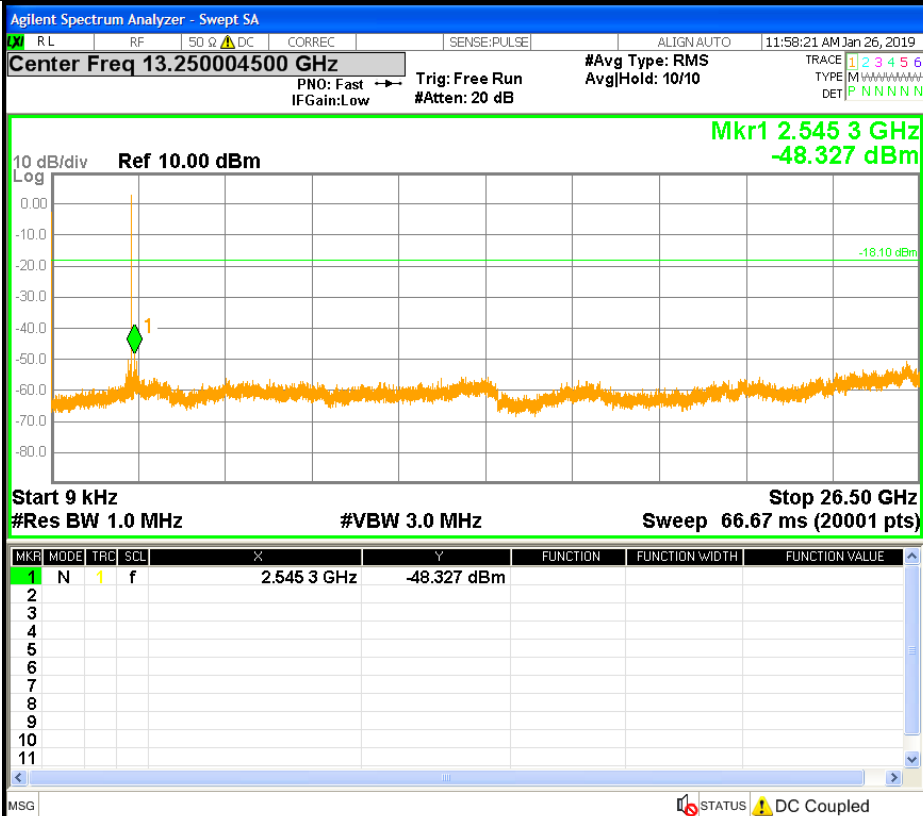


8DPSK MCH Graphs

Pref

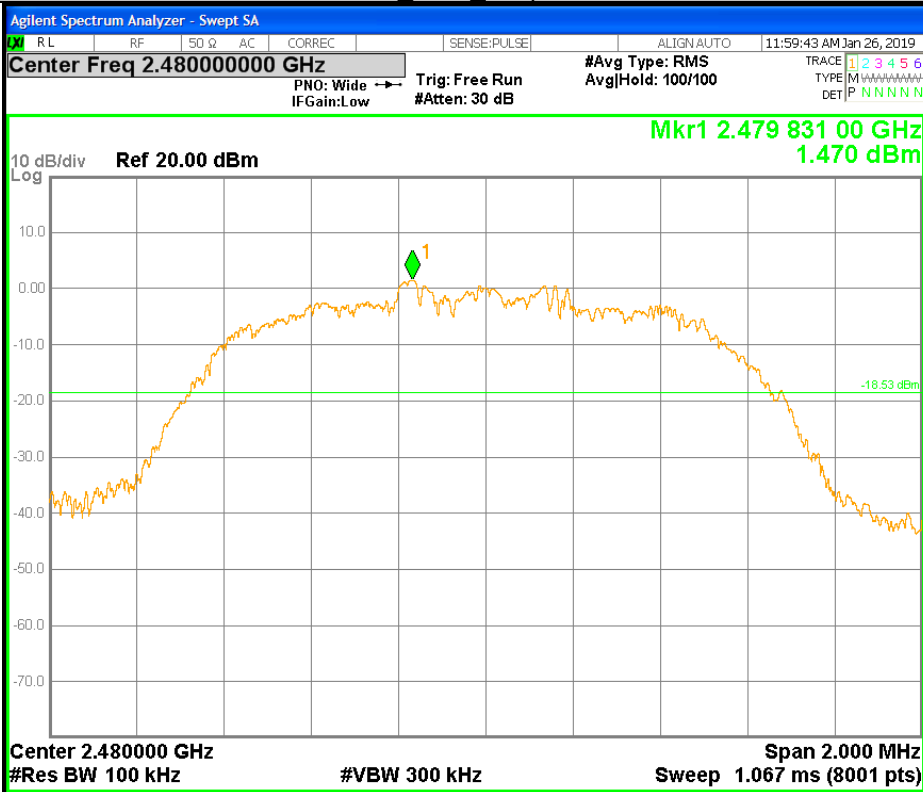


Puw

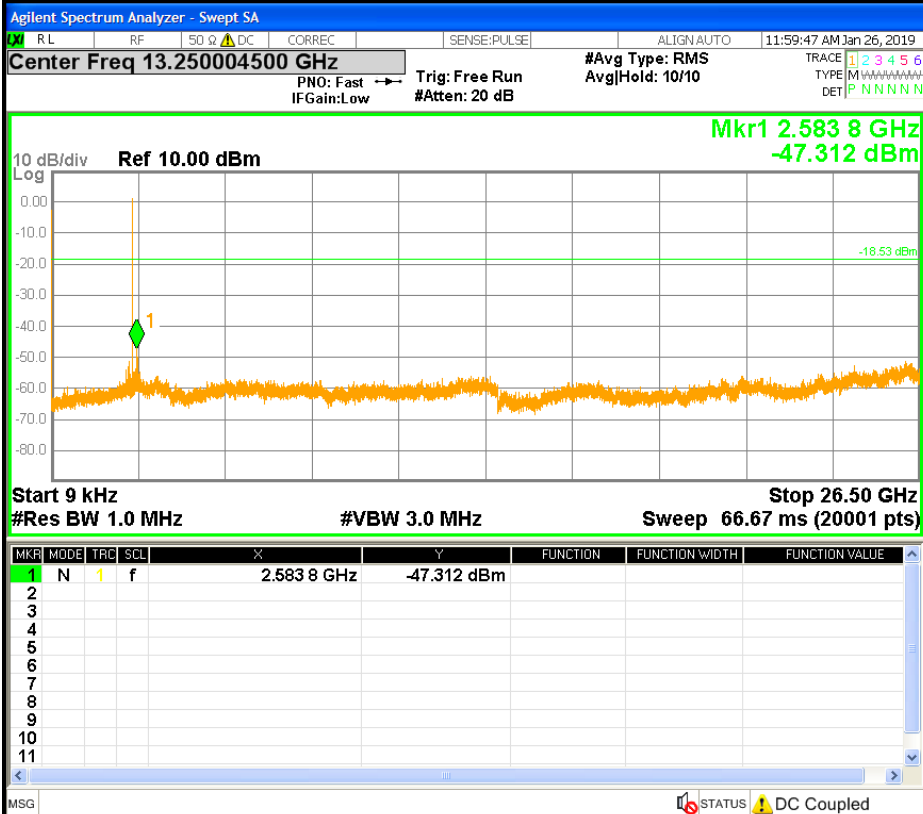


8DPSK HCH Graphs

Pref



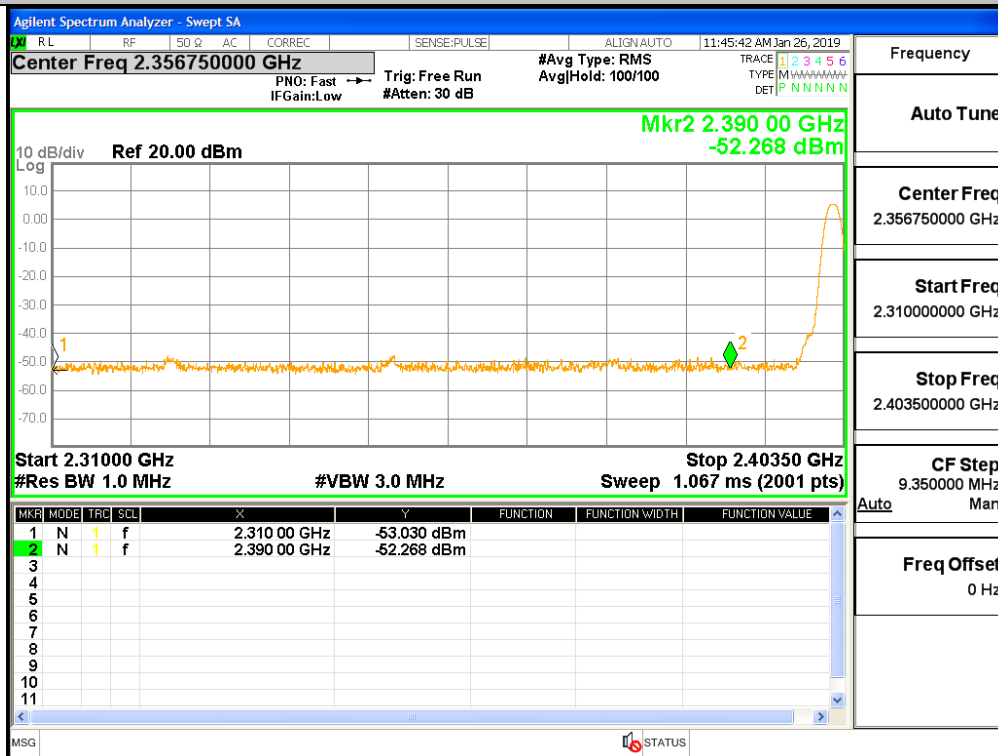
Puw



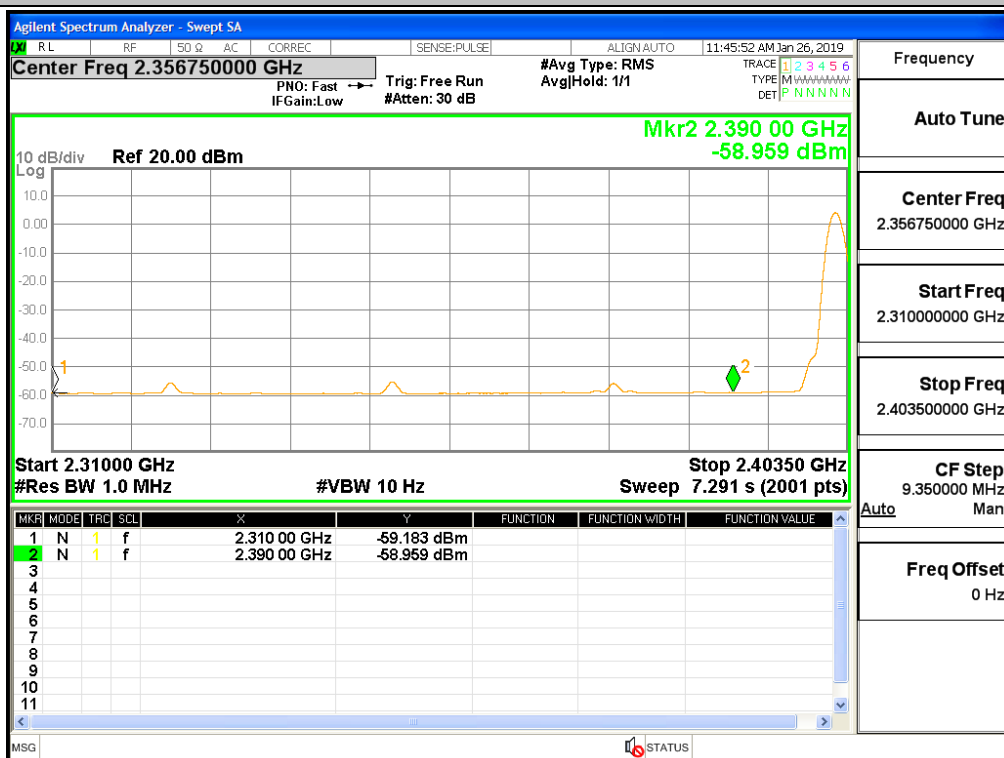
A.8 Restrict-band band-edge measurements

Type	Carrier Frequency (MHz)	Frequency(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	-53.03	44.17	74	-59.18	38.02	54	Pass
1DH5	2402	2390	2.00	0.00	-52.27	44.93	74	-58.96	38.24	54	Pass
1DH5	2480	2483.5	2.00	0.00	-44	53.2	74	-51	46.2	54	Pass
1DH5	2480	2500	2.00	0.00	-51.6	45.6	74	-58.51	38.69	54	Pass
2DH5	2402	2310	2.00	0.00	-53.22	43.98	74	-59.35	37.85	54	Pass
2DH5	2402	2390	2.00	0.00	-50.61	46.59	74	-59.03	38.17	54	Pass
2DH5	2480	2483.5	2.00	0.00	-49.07	48.13	74	-54.78	42.42	54	Pass
2DH5	2480	2500	2.00	0.00	-52.34	44.86	74	-58.53	38.67	54	Pass
3DH5	2402	2310	2.00	0.00	-52.63	44.57	74	-59.32	37.88	54	Pass
3DH5	2402	2390	2.00	0.00	-52.35	44.85	74	-59.02	38.18	54	Pass
3DH5	2480	2483.5	2.00	0.00	-48.4	48.8	74	-54.67	42.53	54	Pass
3DH5	2480	2500	2.00	0.00	-50.52	46.68	74	-58.52	38.68	54	Pass

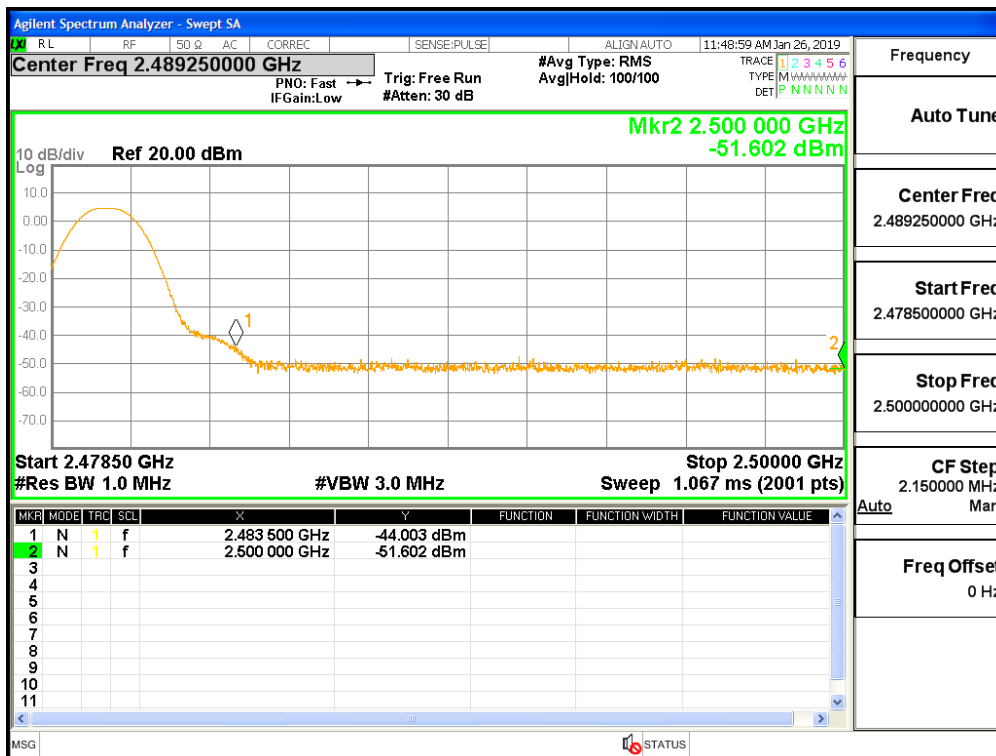
Restrict-band band-edge measurements_2402_PEAK_DH5



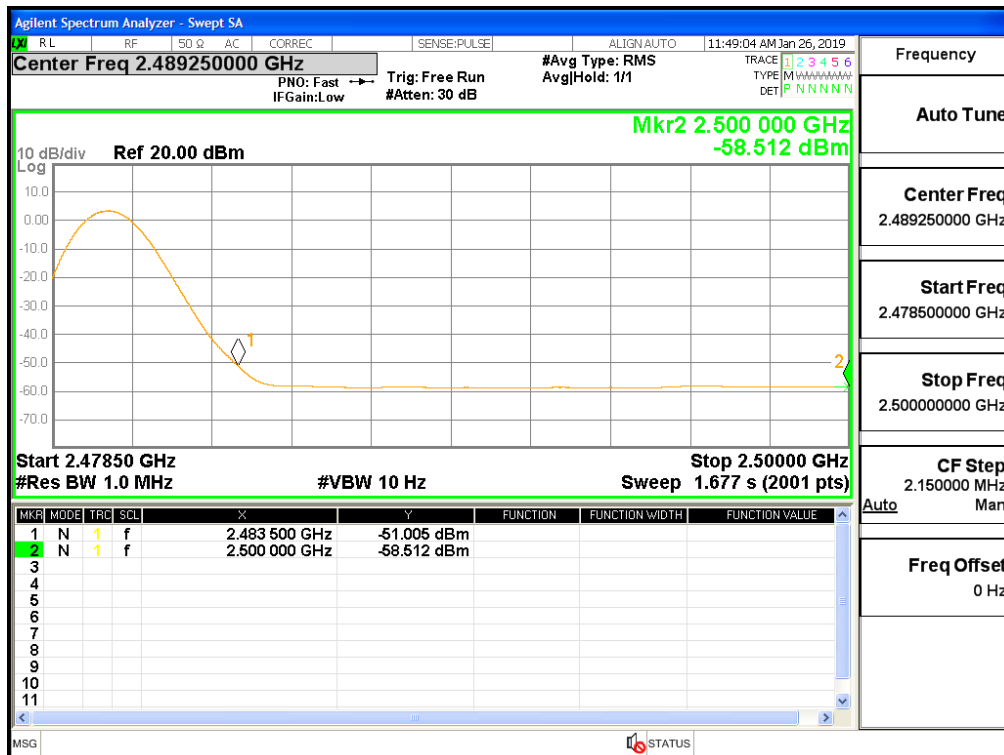
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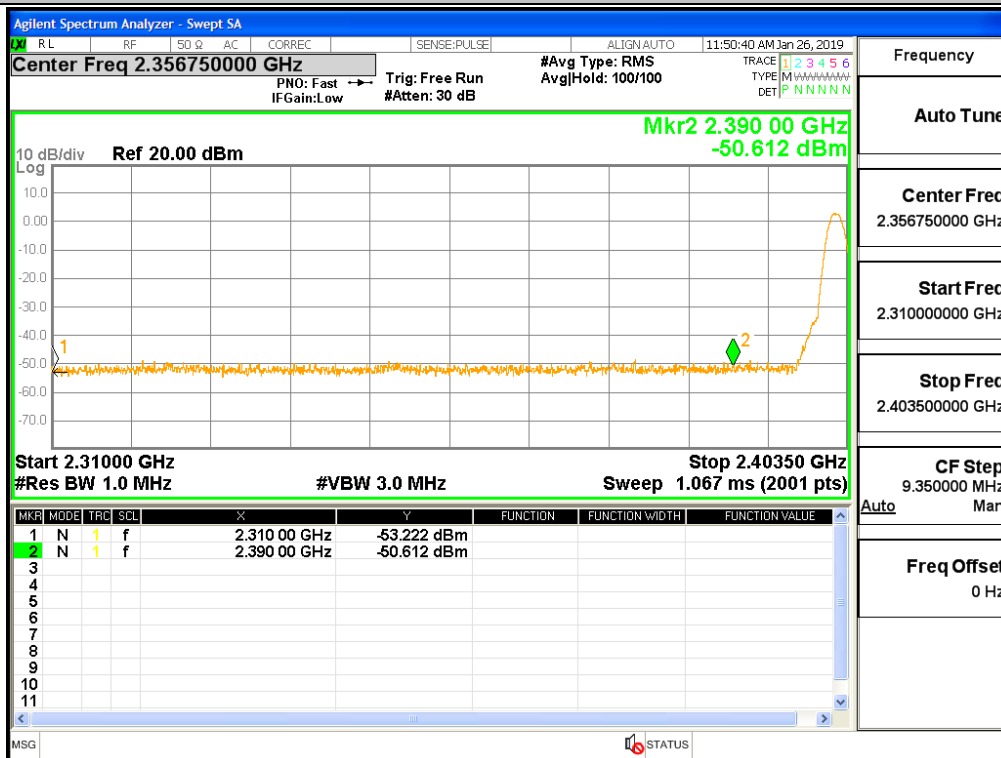
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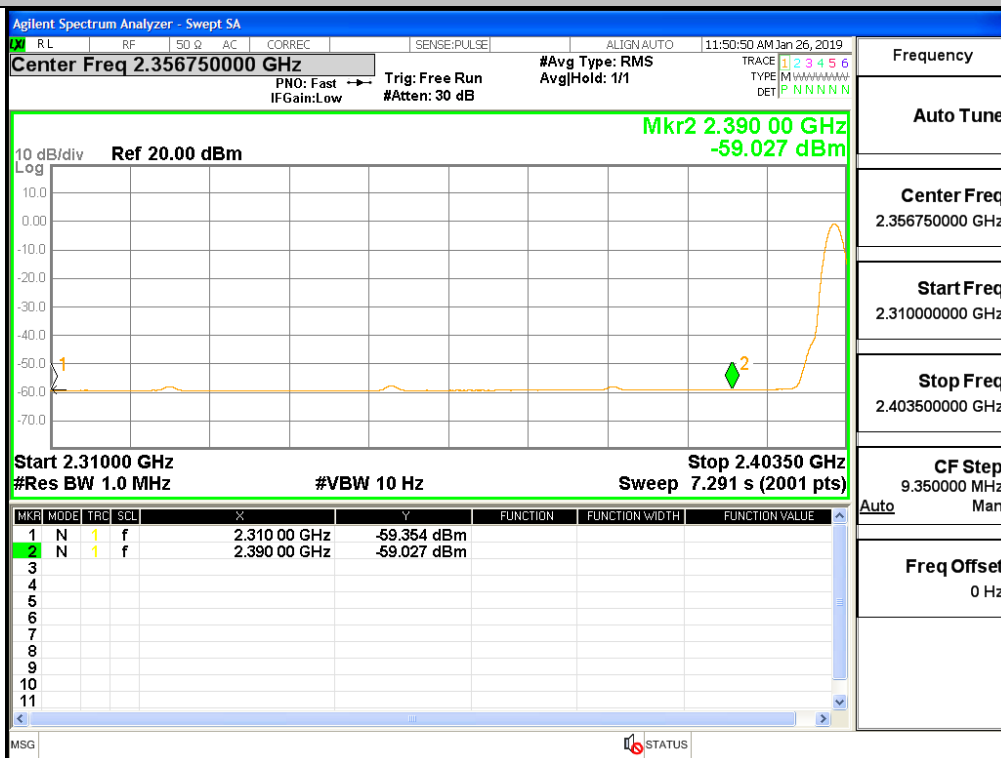
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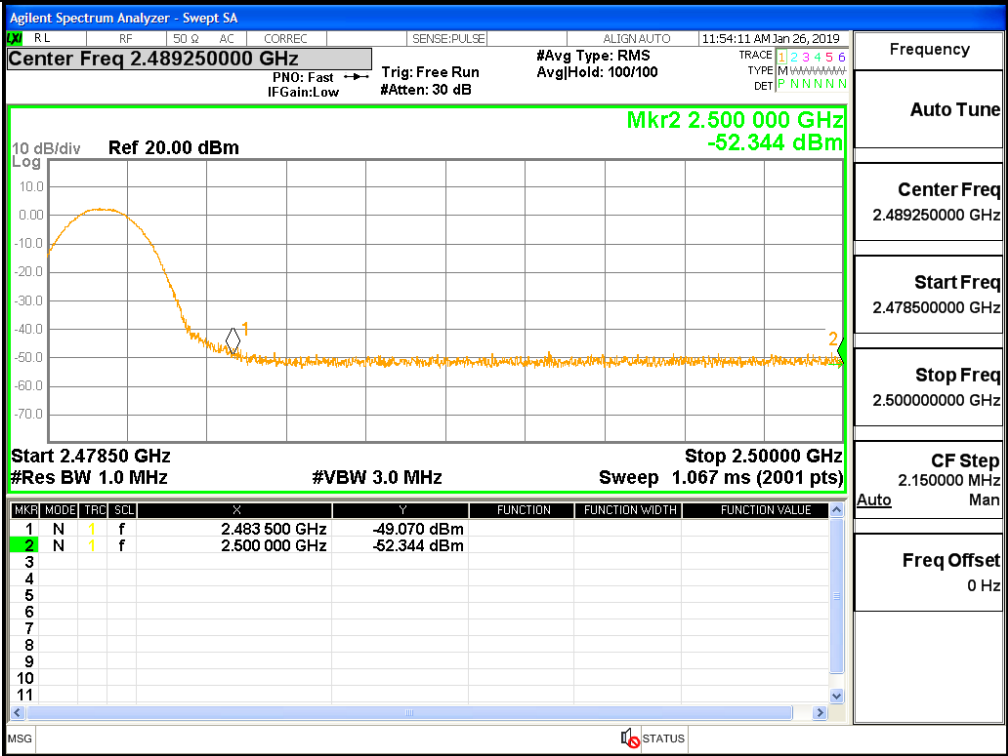
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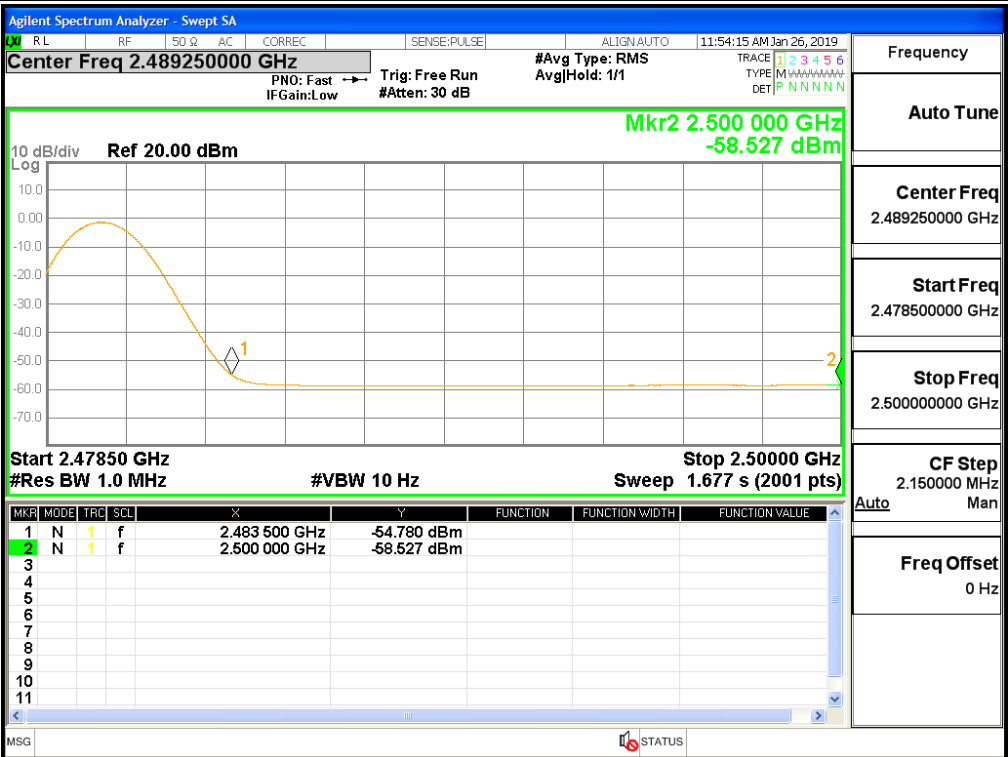
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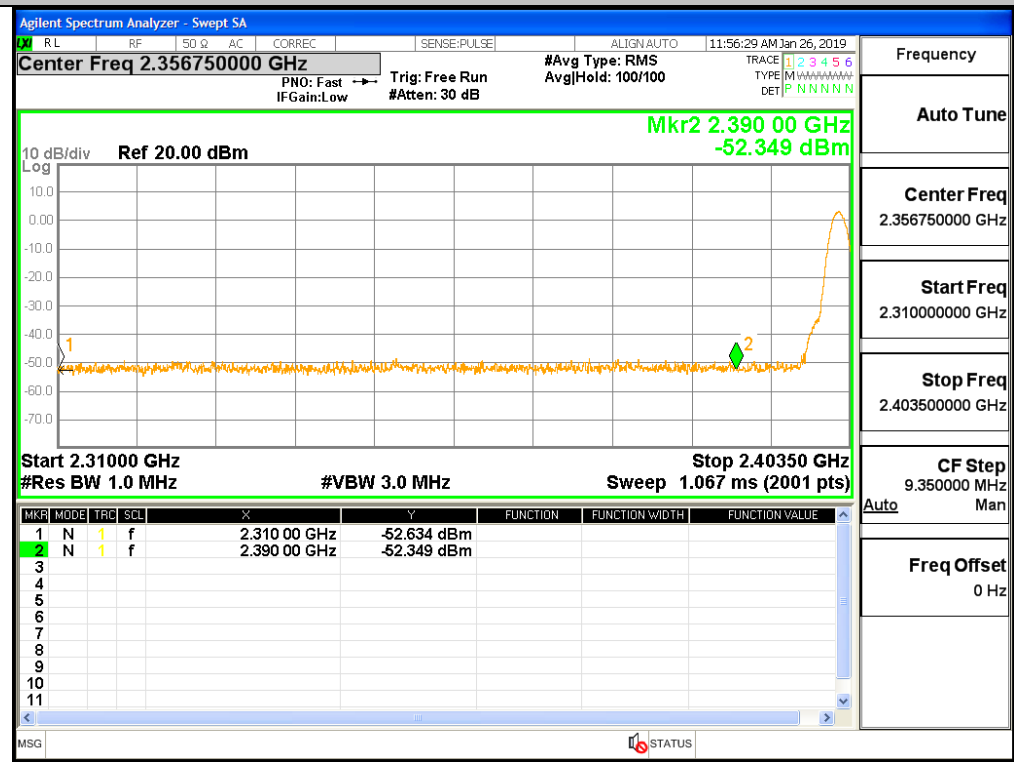
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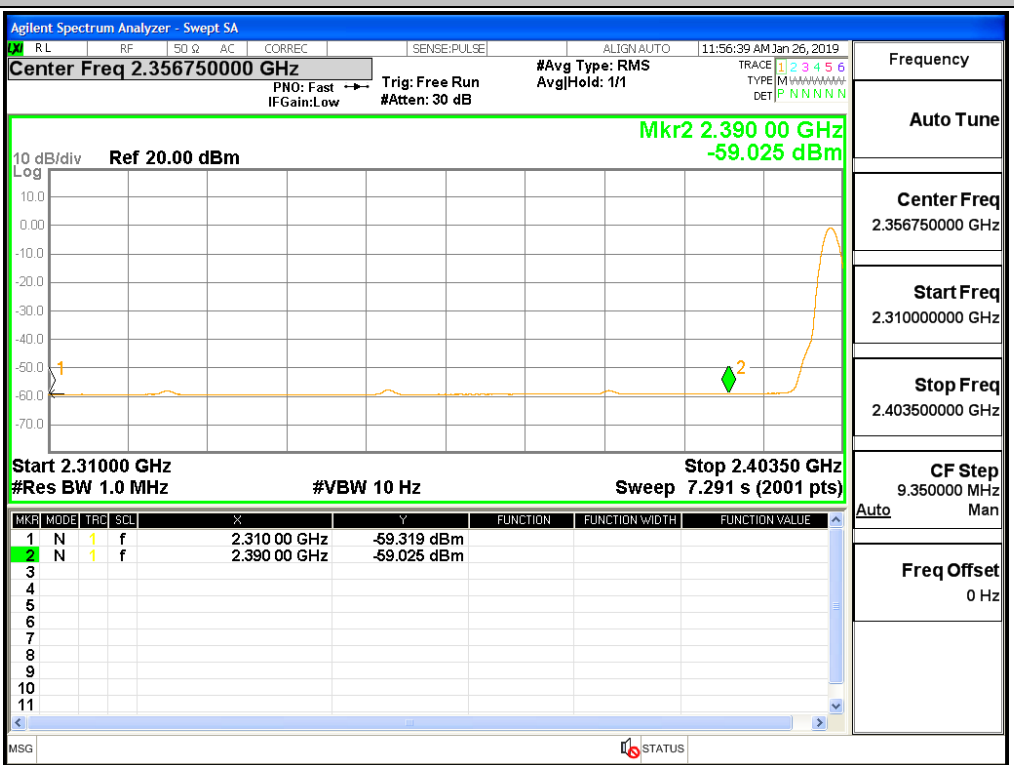
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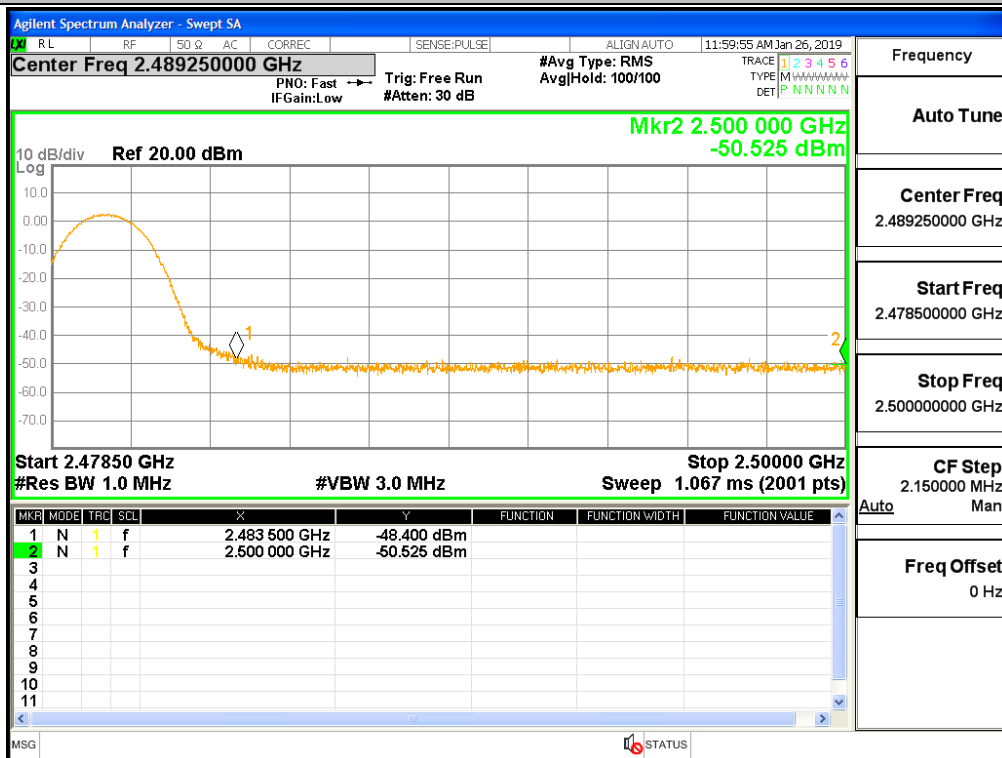
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Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

