

Appendix A

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

Product Name: B86

Trade Mark: Haoda

Test Model: ZN-803

FCC ID: 2AR8U-ZN803

Environmental Conditions

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

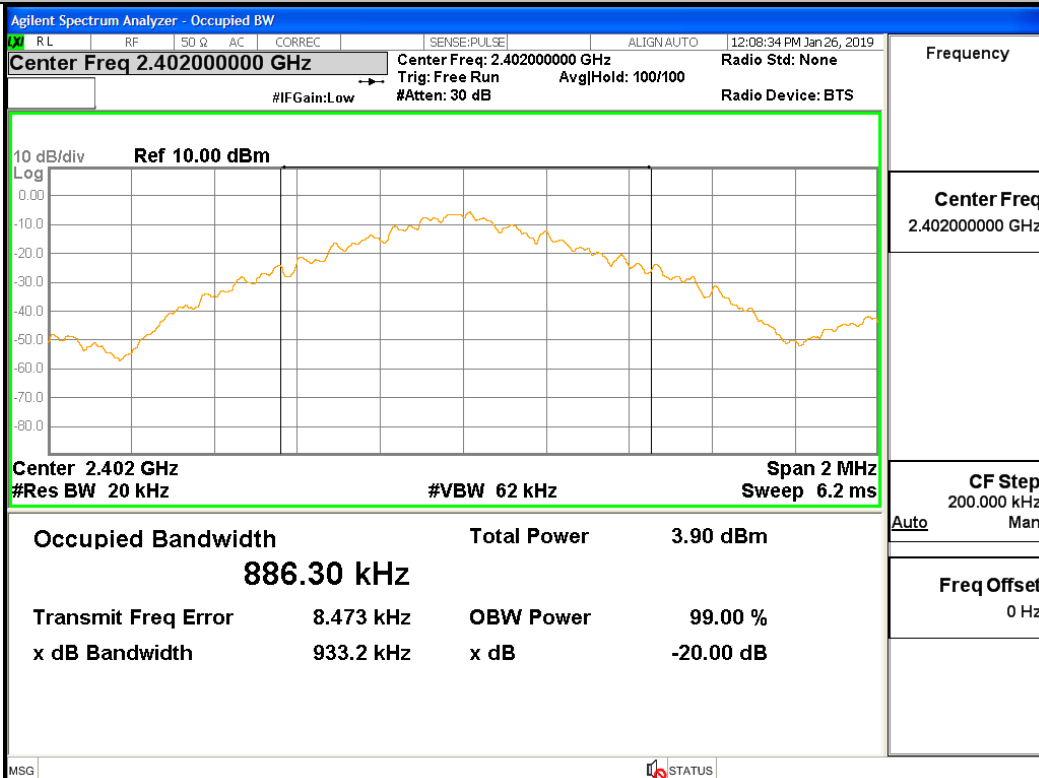
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.933	Not Specified	PASS
GFSK	MCH	0.941	Not Specified	PASS
GFSK	HCH	0.931	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.341	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.336	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.339	Not Specified	PASS
8DPSK	LCH	1.334	Not Specified	PASS
8DPSK	MCH	1.340	Not Specified	PASS
8DPSK	HCH	1.350	Not Specified	PASS

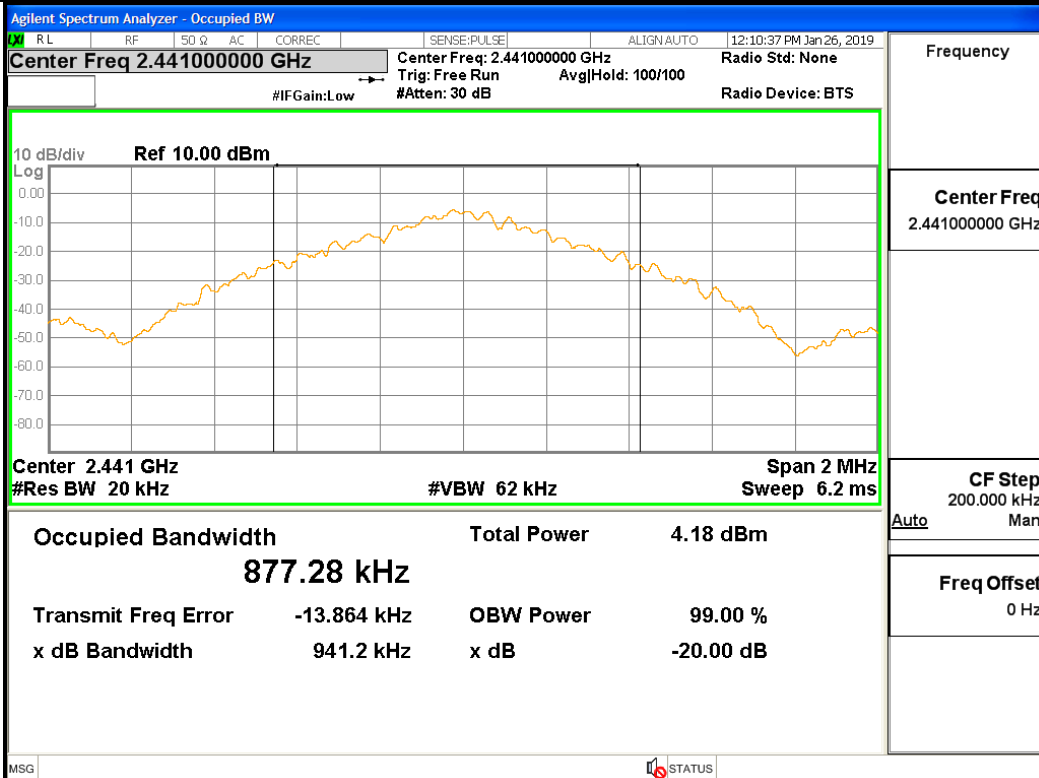
Test Graph

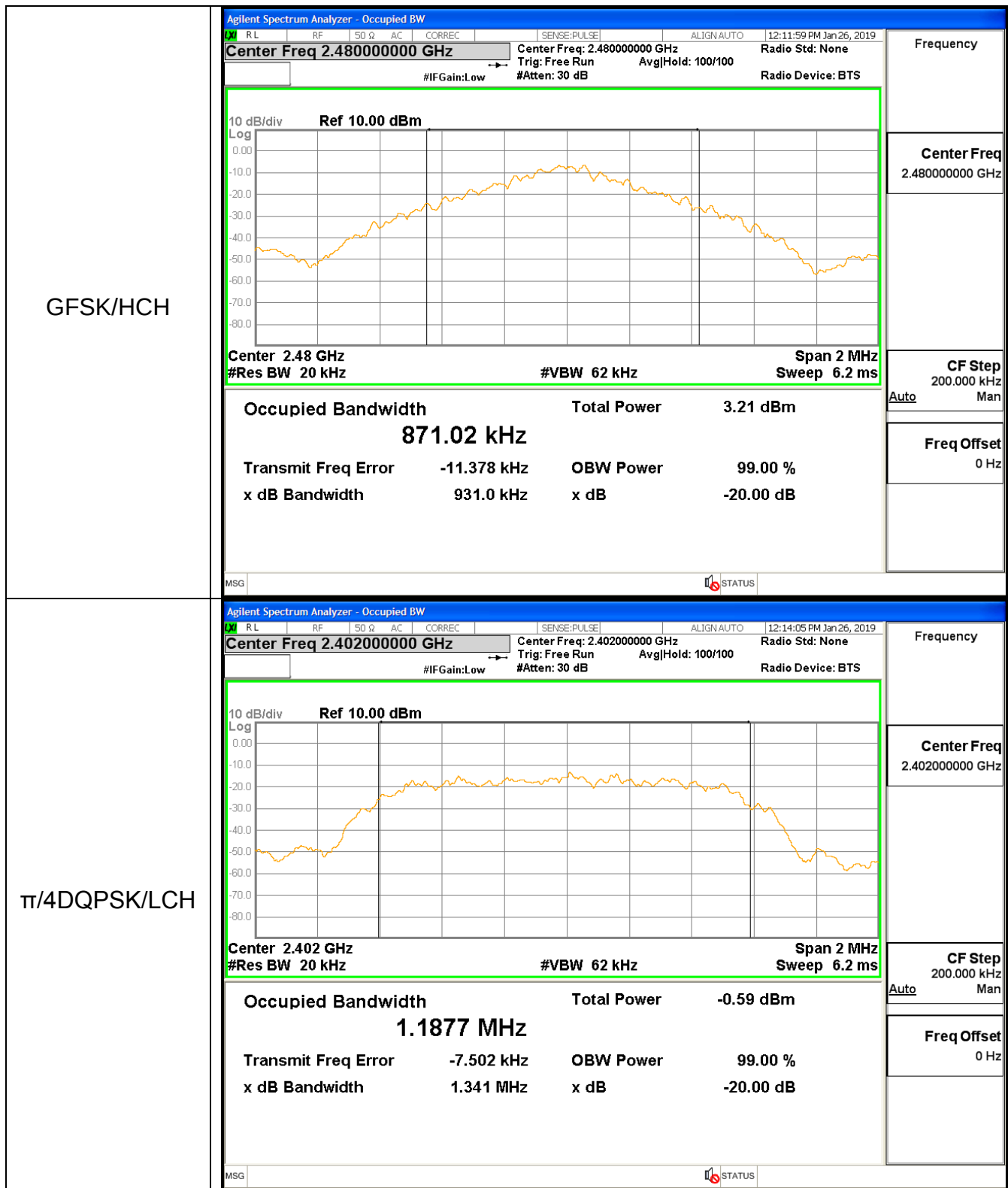
Graphs

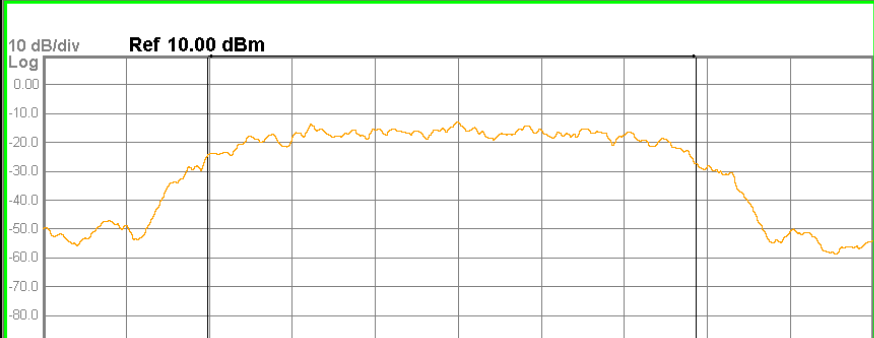
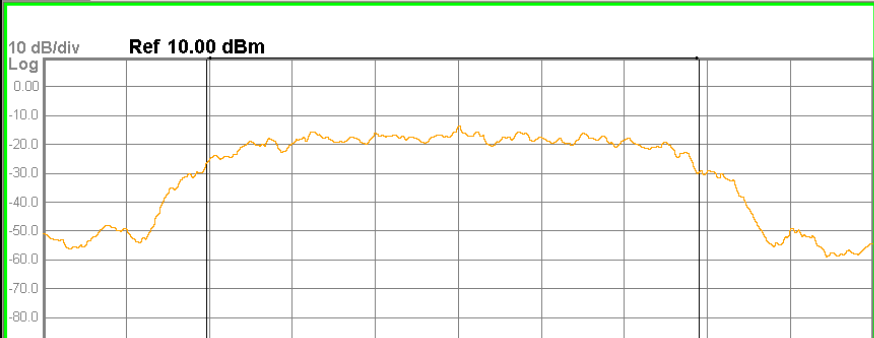
GFSK/LCH



GFSK/MCH





π/4DQPSK/MCH	Agilent Spectrum Analyzer - Occupied BW										Frequency	
	Center Freq 2.441000000 GHz Center Freq: 2.441000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS										Center Freq 2.441000000 GHz	
												
	Center 2.441 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms										CF Step 200.000 kHz	
	Occupied Bandwidth 1.1762 MHz Total Power 0.16 dBm										Auto	
	Transmit Freq Error -14.803 kHz OBW Power 99.00 %										Freq Offset 0 Hz	
	x dB Bandwidth 1.336 MHz x dB -20.00 dB											
	MSG STATUS											
	π/4DQPSK/HCH	Agilent Spectrum Analyzer - Occupied BW										Frequency
Center Freq 2.480000000 GHz Center Freq: 2.480000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS										Center Freq 2.480000000 GHz		
												
Center 2.48 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms										CF Step 200.000 kHz		
Occupied Bandwidth 1.1826 MHz Total Power -1.06 dBm										Auto		
Transmit Freq Error -11.247 kHz OBW Power 99.00 %										Freq Offset 0 Hz		
x dB Bandwidth 1.339 MHz x dB -20.00 dB												
MSG STATUS												

8DPSK/LCH	Agilent Spectrum Analyzer - Occupied BW				12:20:45 PM Jan 26, 2019				Frequency	
	Center Freq 2.402000000 GHz				Center Freq: 2.402000000 GHz				Center Freq 2.402000000 GHz	
8DPSK/MCH	Agilent Spectrum Analyzer - Occupied BW				12:22:27 PM Jan 26, 2019				Frequency	
	Center Freq 2.441000000 GHz				Center Freq: 2.441000000 GHz				Center Freq 2.441000000 GHz	

Center Freq 2.441000000 GHz

Center Freq: 2.441000000 GHz

Radio Std: None

#IFGain:Low

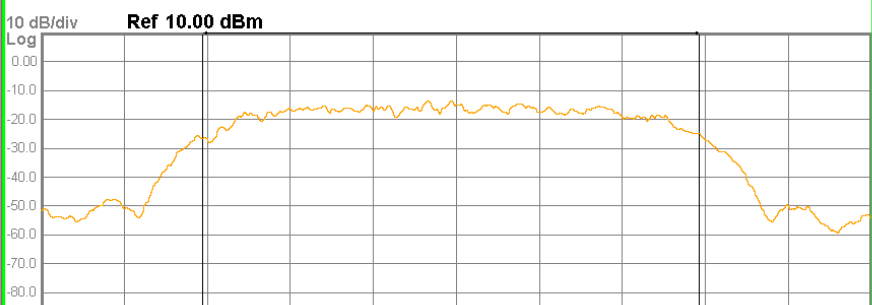
#Atten: 30 dB

AvgHold: 100/100

Radio Device: BTS

10 dB/div

Ref 10.00 dBm



Center 2.441 GHz

#Res BW 20 kHz

#VBW 62 kHz

Span 2 MHz

Sweep 6.2 ms

Occupied Bandwidth

1.1947 MHz

Total Power

0.31 dBm

Transmit Freq Error

-12.315 kHz

OBW Power

99.00 %

x dB Bandwidth

1.340 MHz

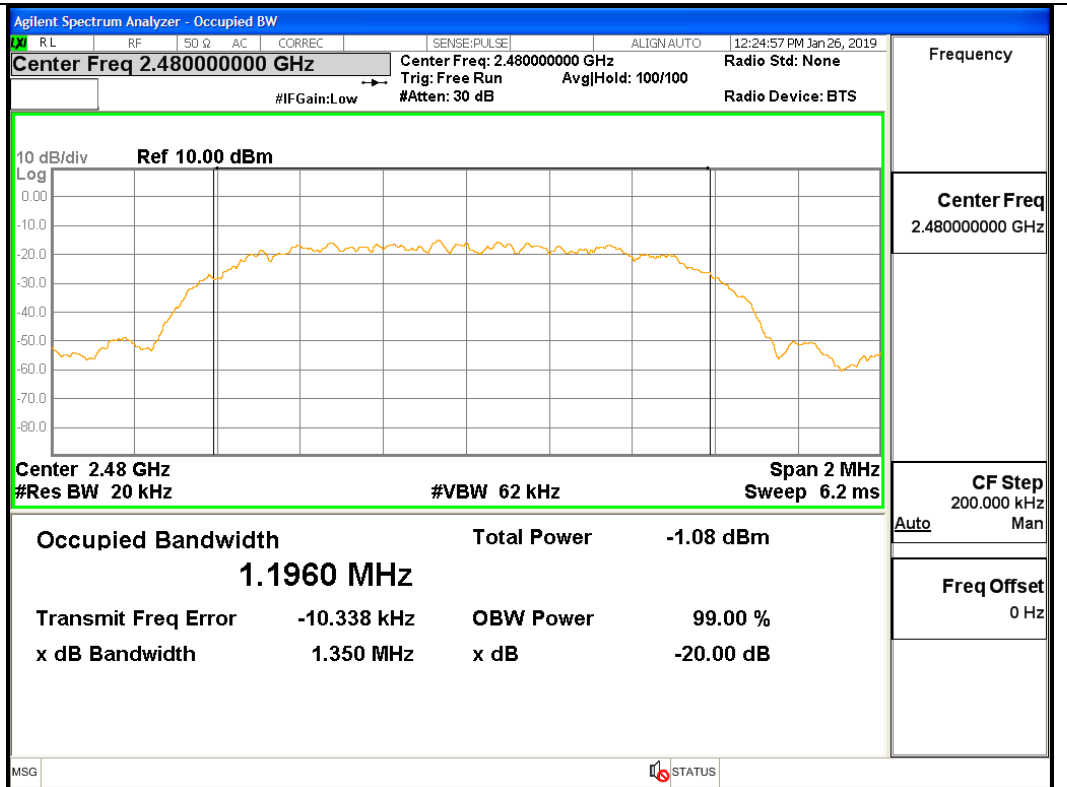
x dB

-20.00 dB

MSG

STATUS

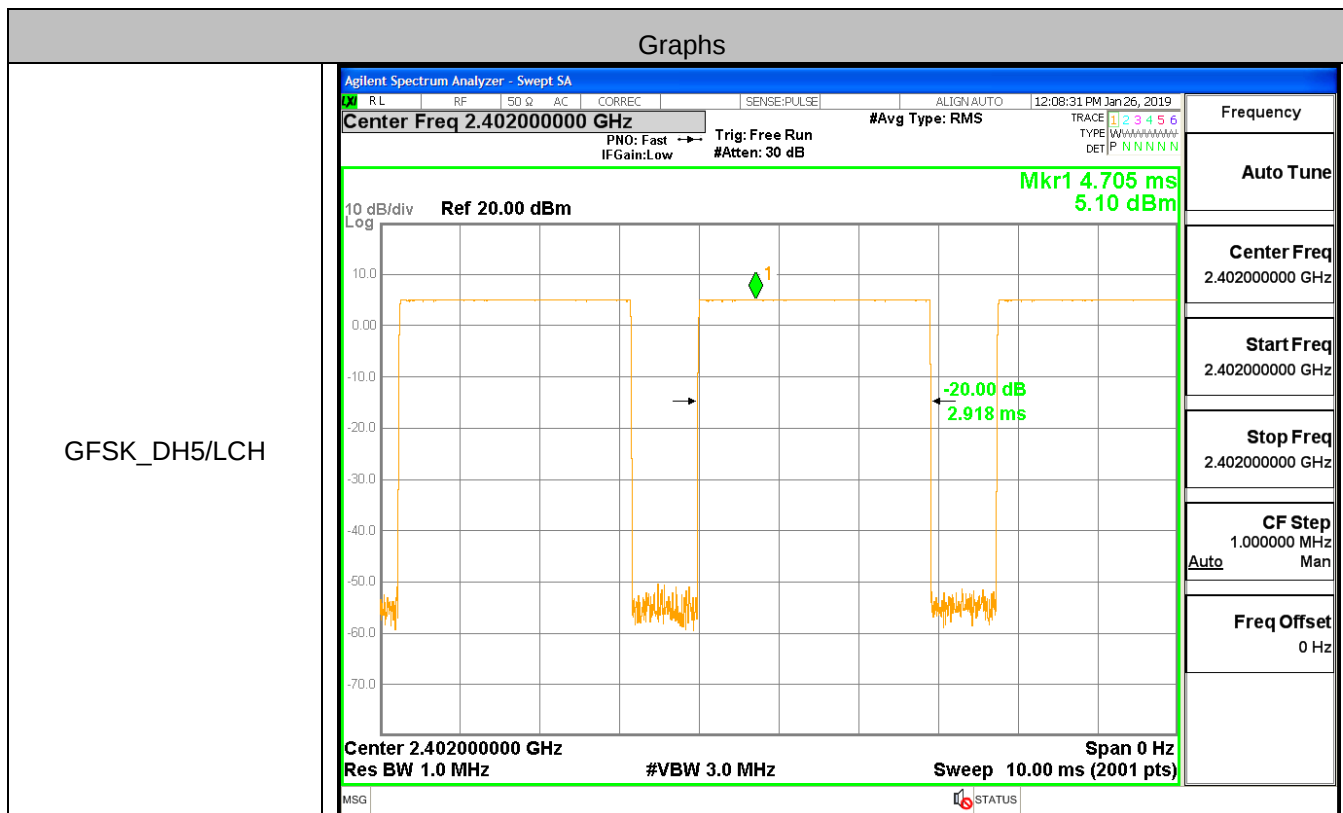
8DPSK/HCH

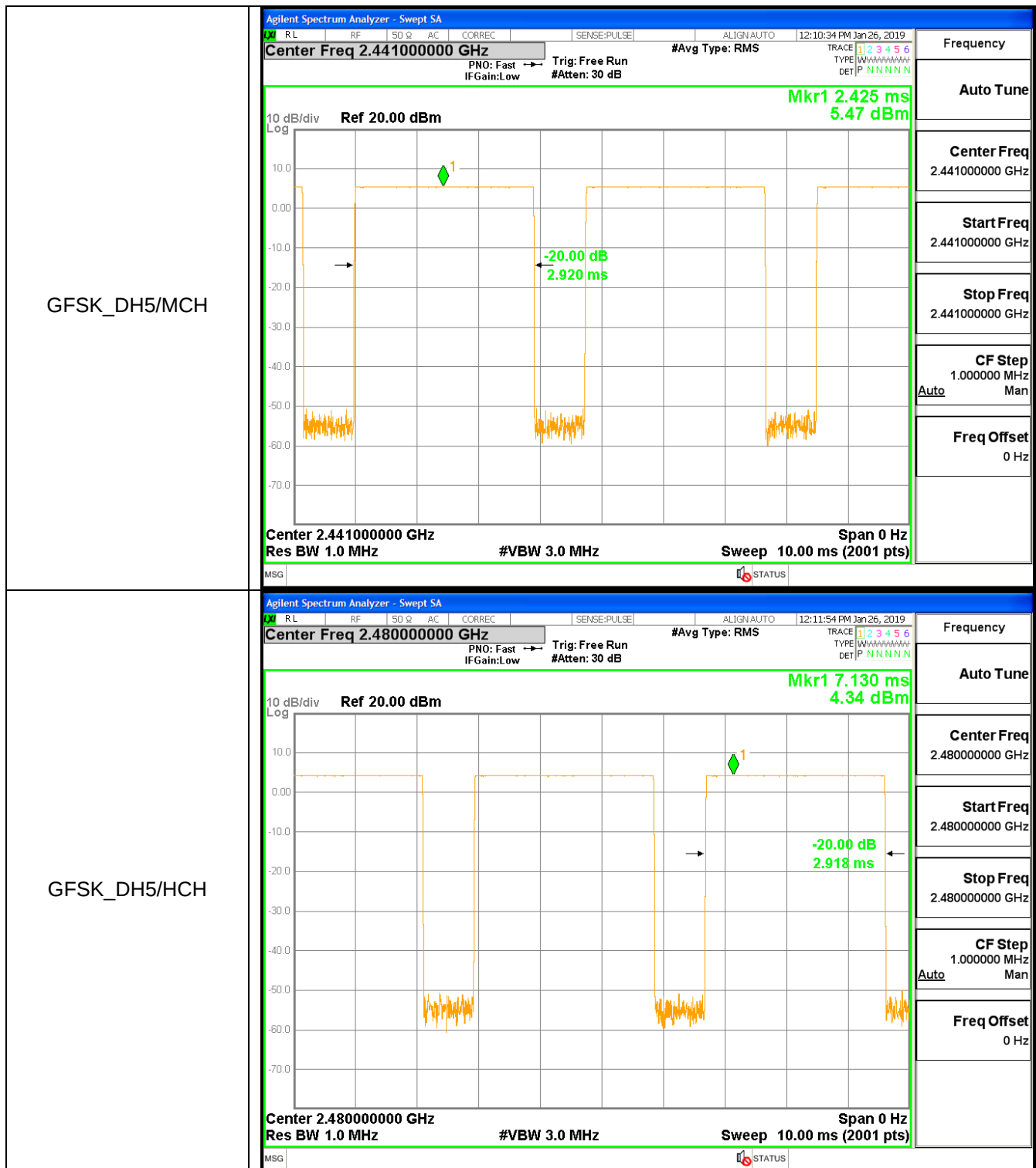


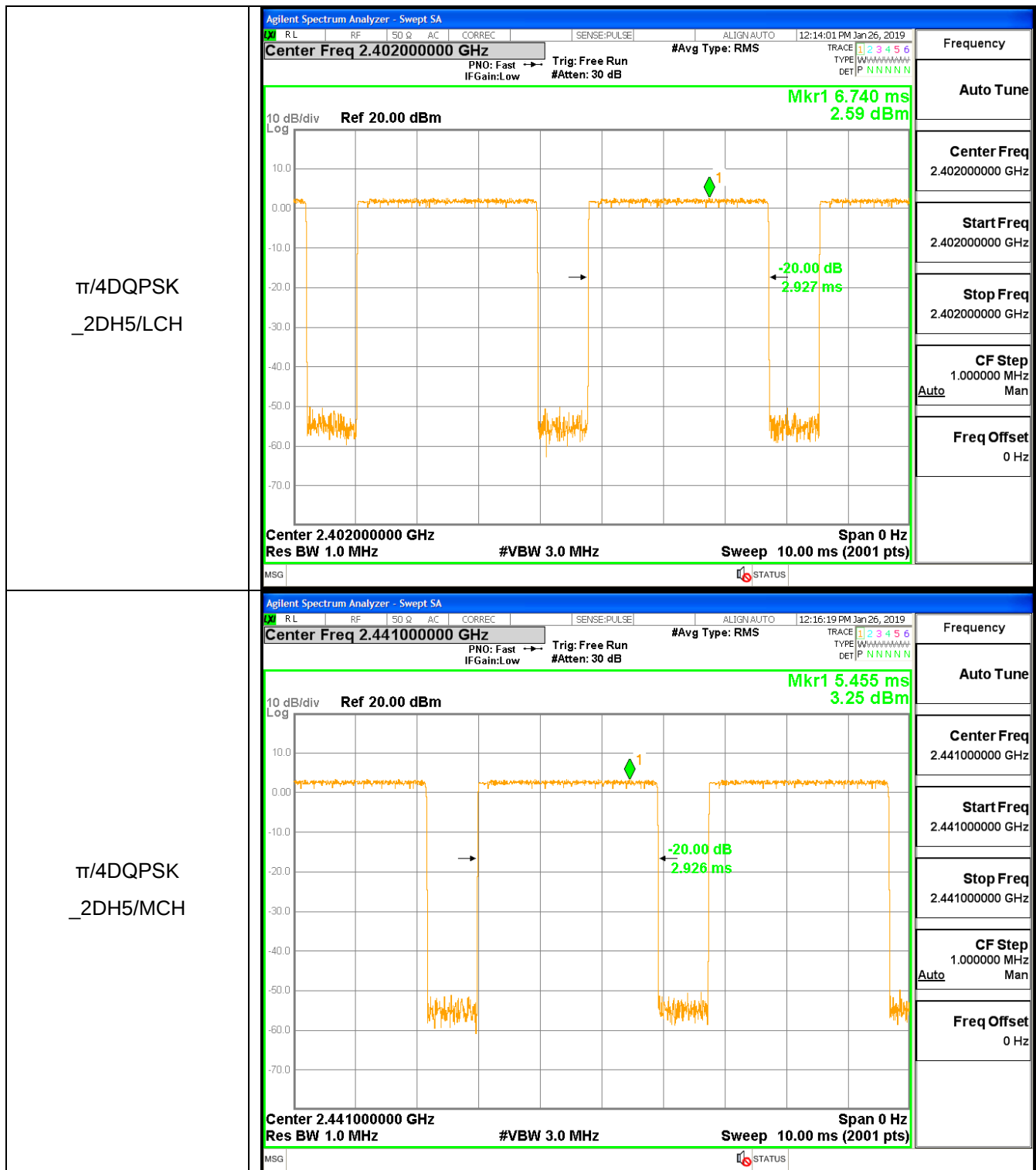
A.2 Dwell Time

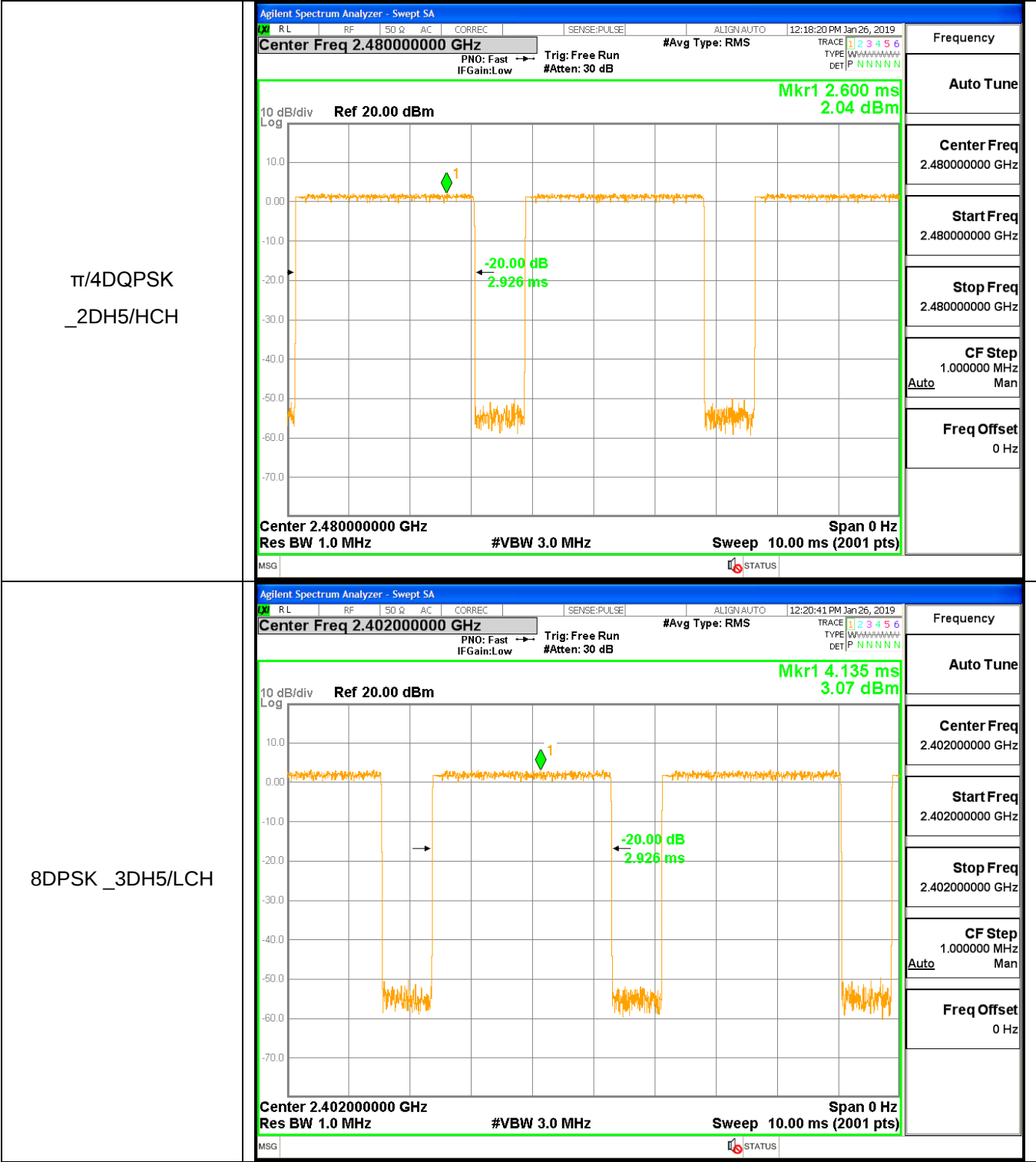
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002918	106.7	0.311381	0.4	PASS
GFSK	DH5	MCH	0.00292	106.7	0.311593	0.4	PASS
GFSK	DH5	HCH	0.002918	106.7	0.311384	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002927	106.7	0.312258	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002926	106.7	0.312228	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002926	106.7	0.312201	0.4	PASS
8DPSK	3DH5	LCH	0.002926	106.7	0.312245	0.4	PASS
8DPSK	3DH5	MCH	0.002927	106.7	0.312329	0.4	PASS
8DPSK	3DH5	HCH	0.002928	106.7	0.312381	0.4	PASS

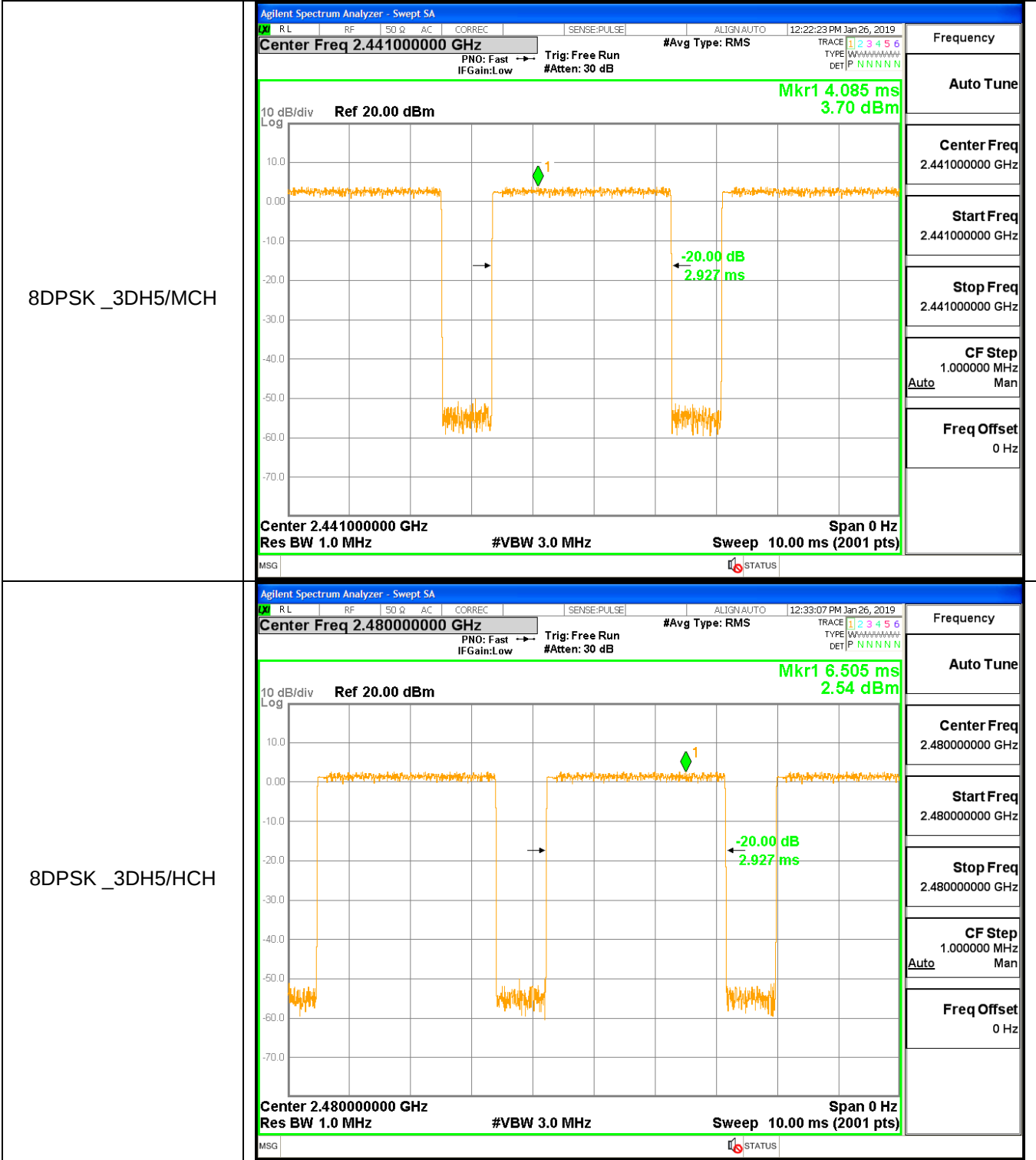
Test Graph









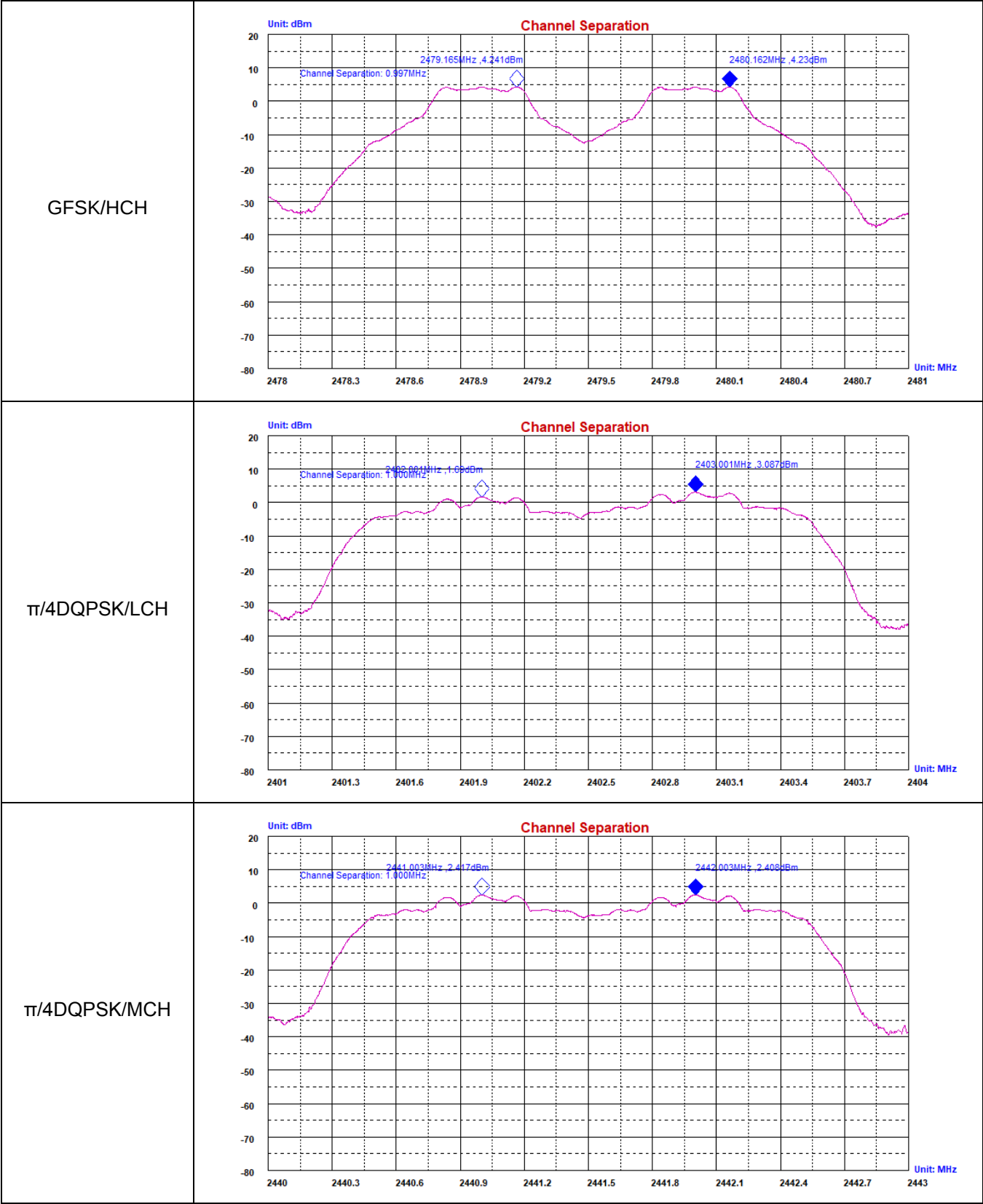


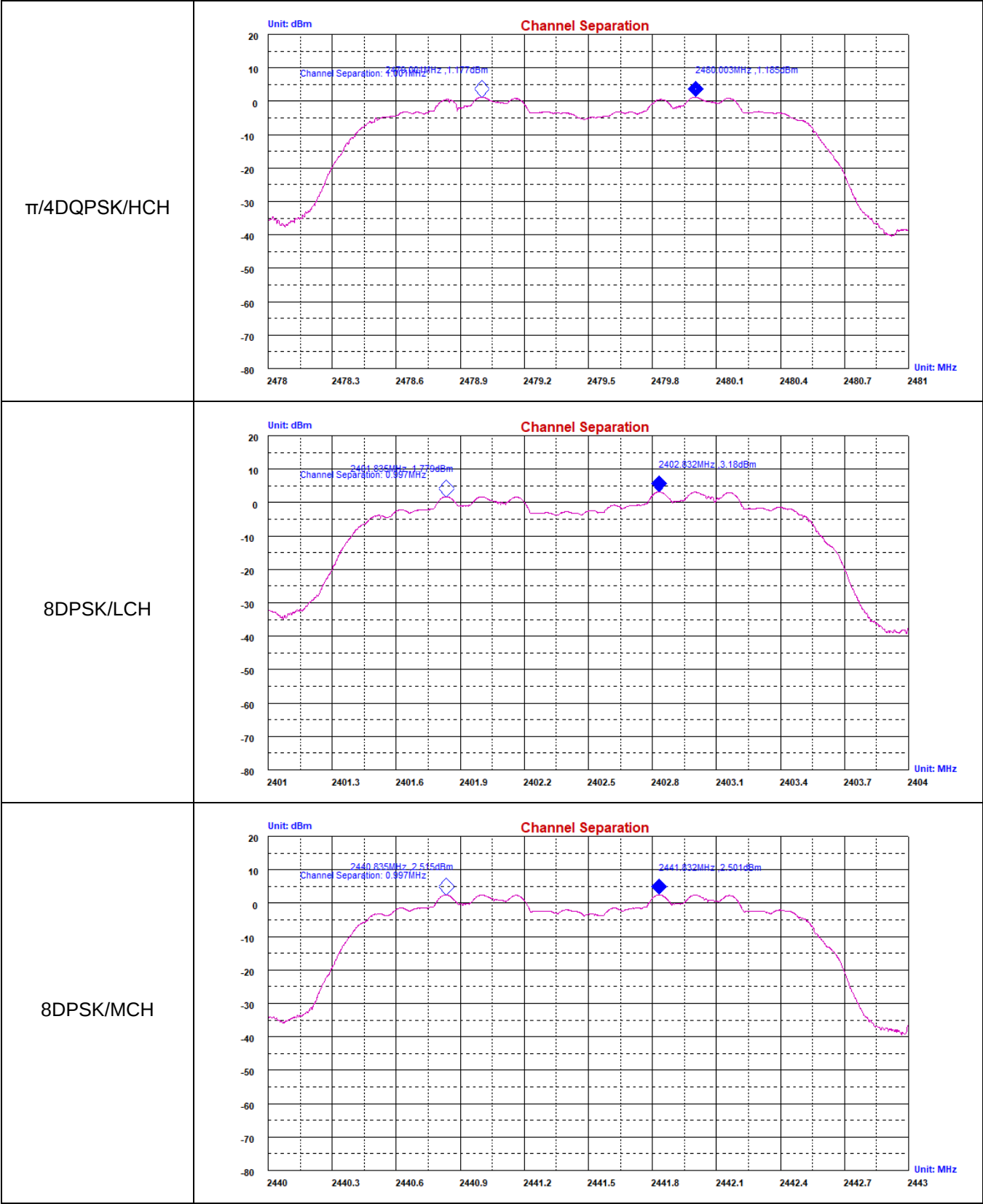
A.3 Carrier Frequency Separation

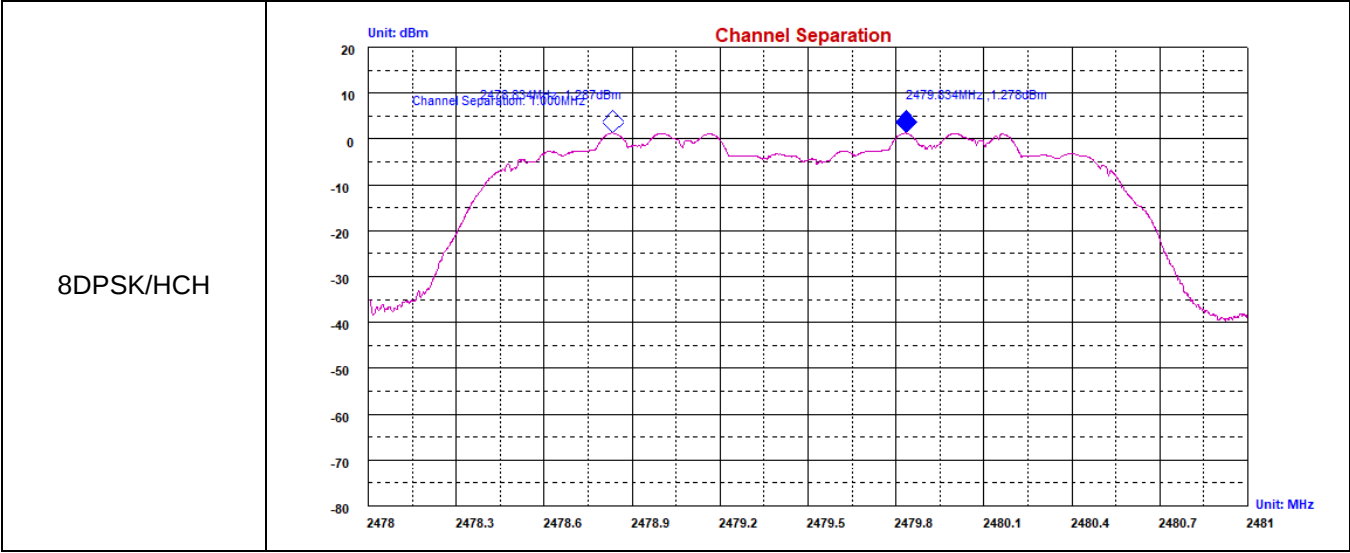
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.000	0.622	PASS
GFSK	MCH	0.999	0.627	PASS
GFSK	HCH	0.997	0.621	PASS
$\pi/4$ DQPSK	LCH	1.000	0.894	PASS
$\pi/4$ DQPSK	MCH	1.000	0.890	PASS
$\pi/4$ DQPSK	HCH	1.001	0.893	PASS
8DPSK	LCH	0.997	0.889	PASS
8DPSK	MCH	0.997	0.893	PASS
8DPSK	HCH	1.000	0.901	PASS

Test Graph





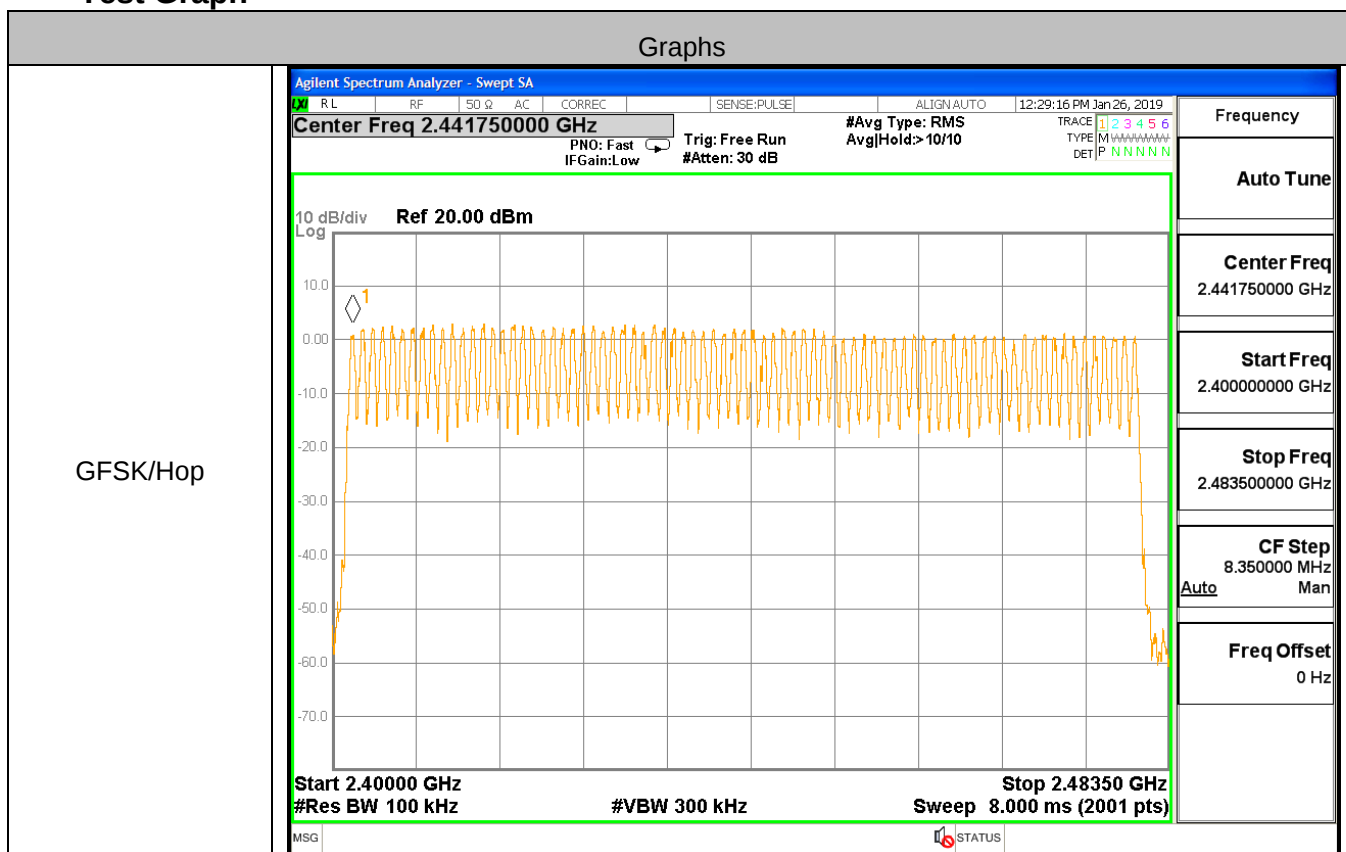


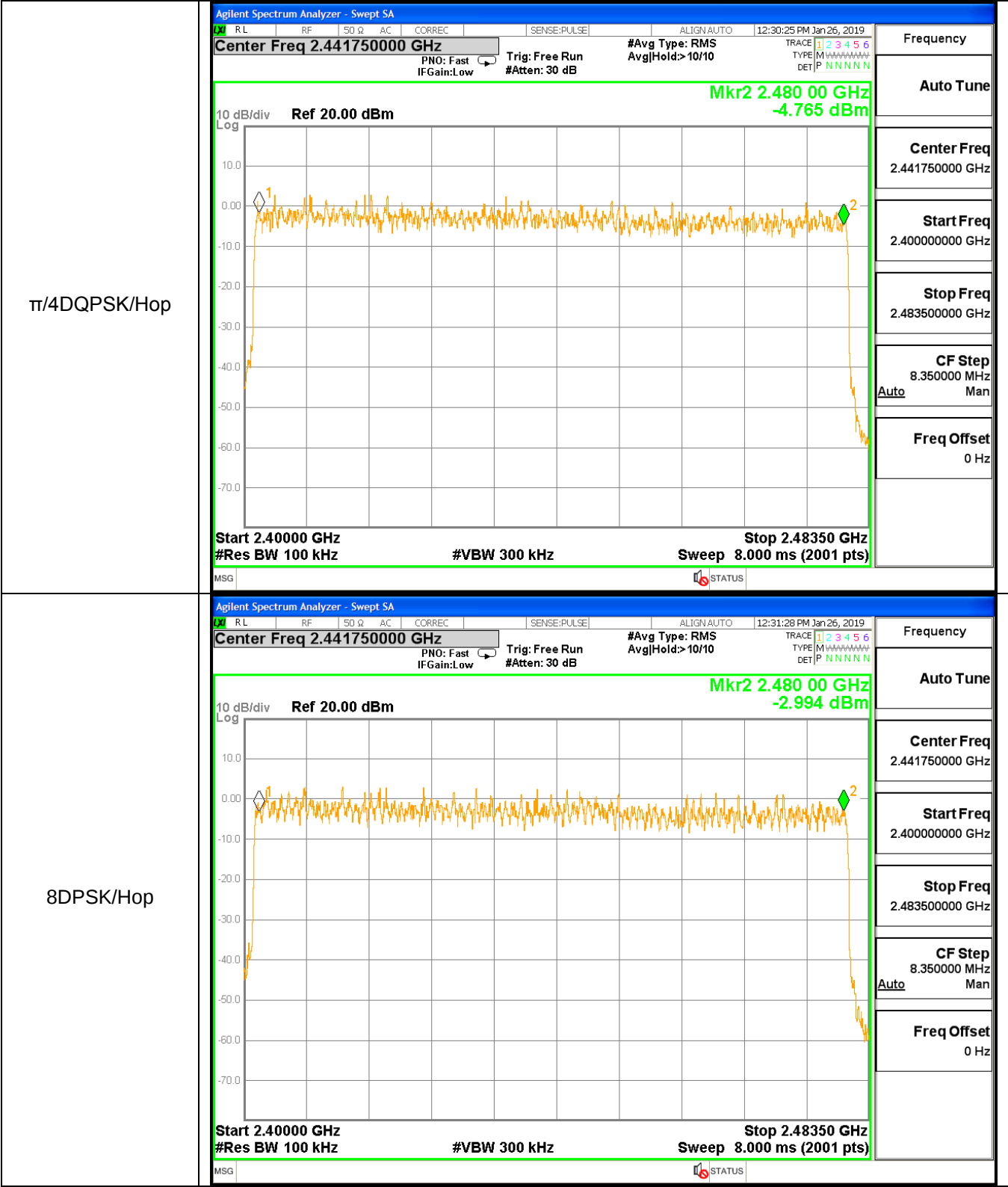


A.4 Hopping Channel Number

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

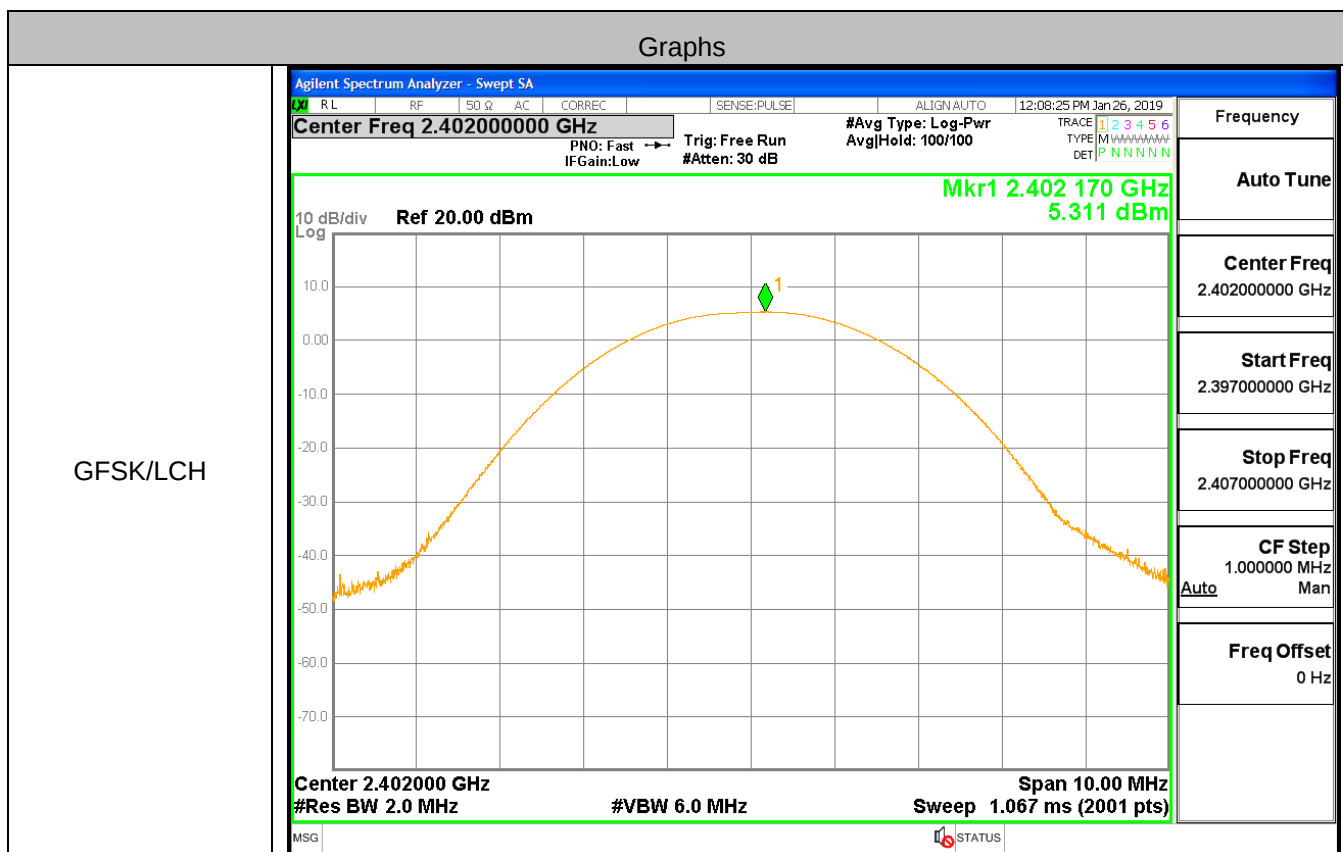


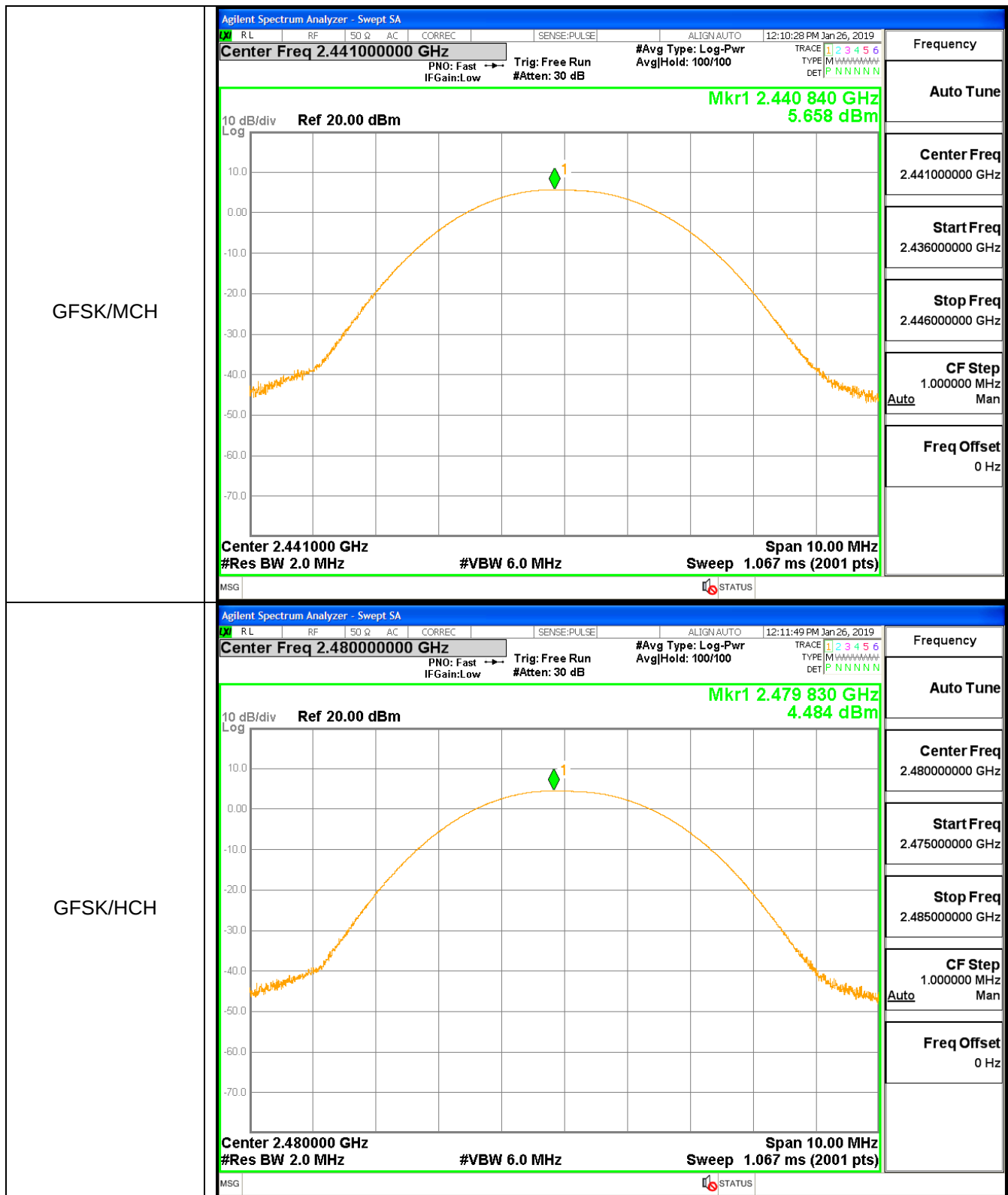


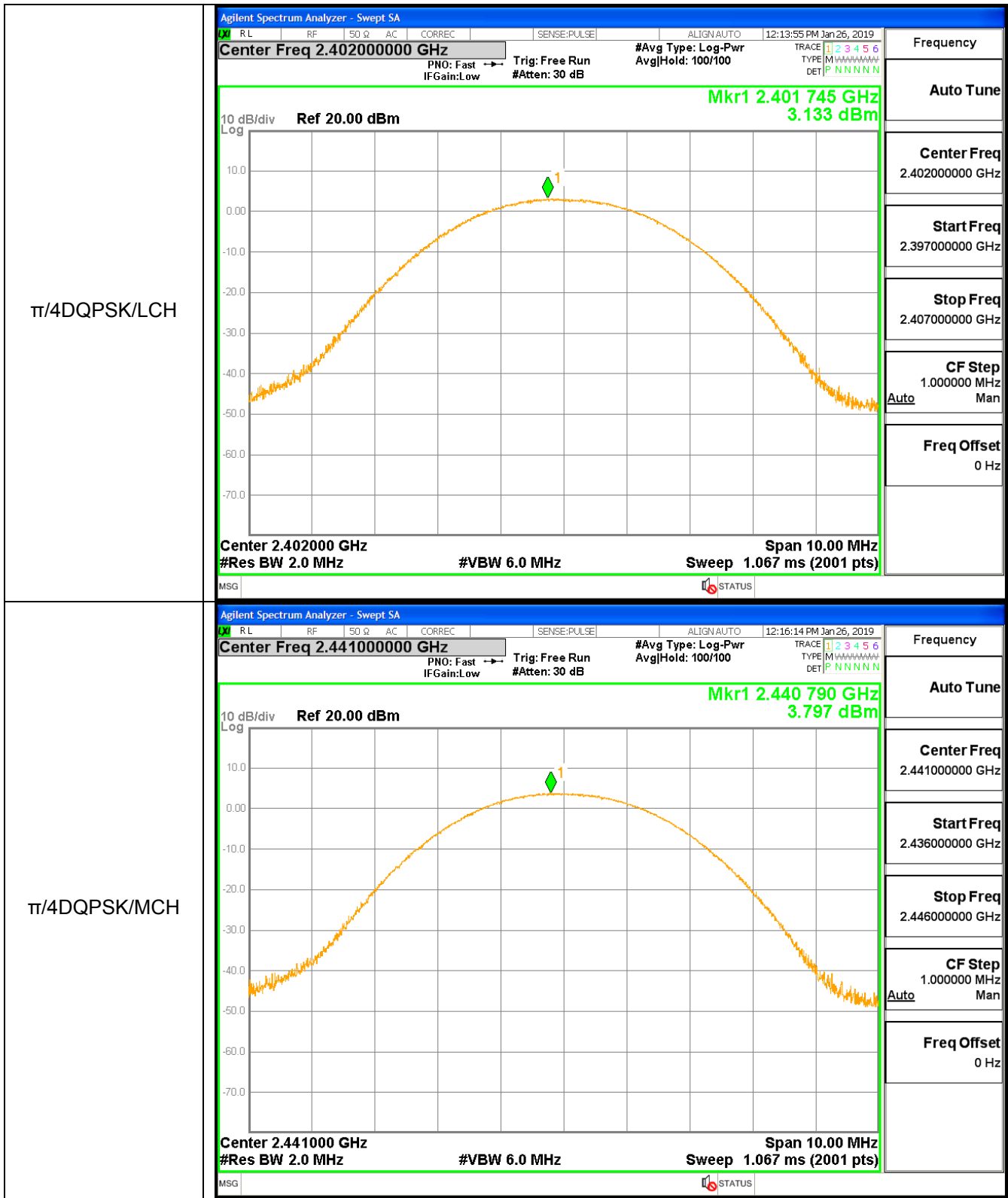
A.5 Conducted Peak Output Power

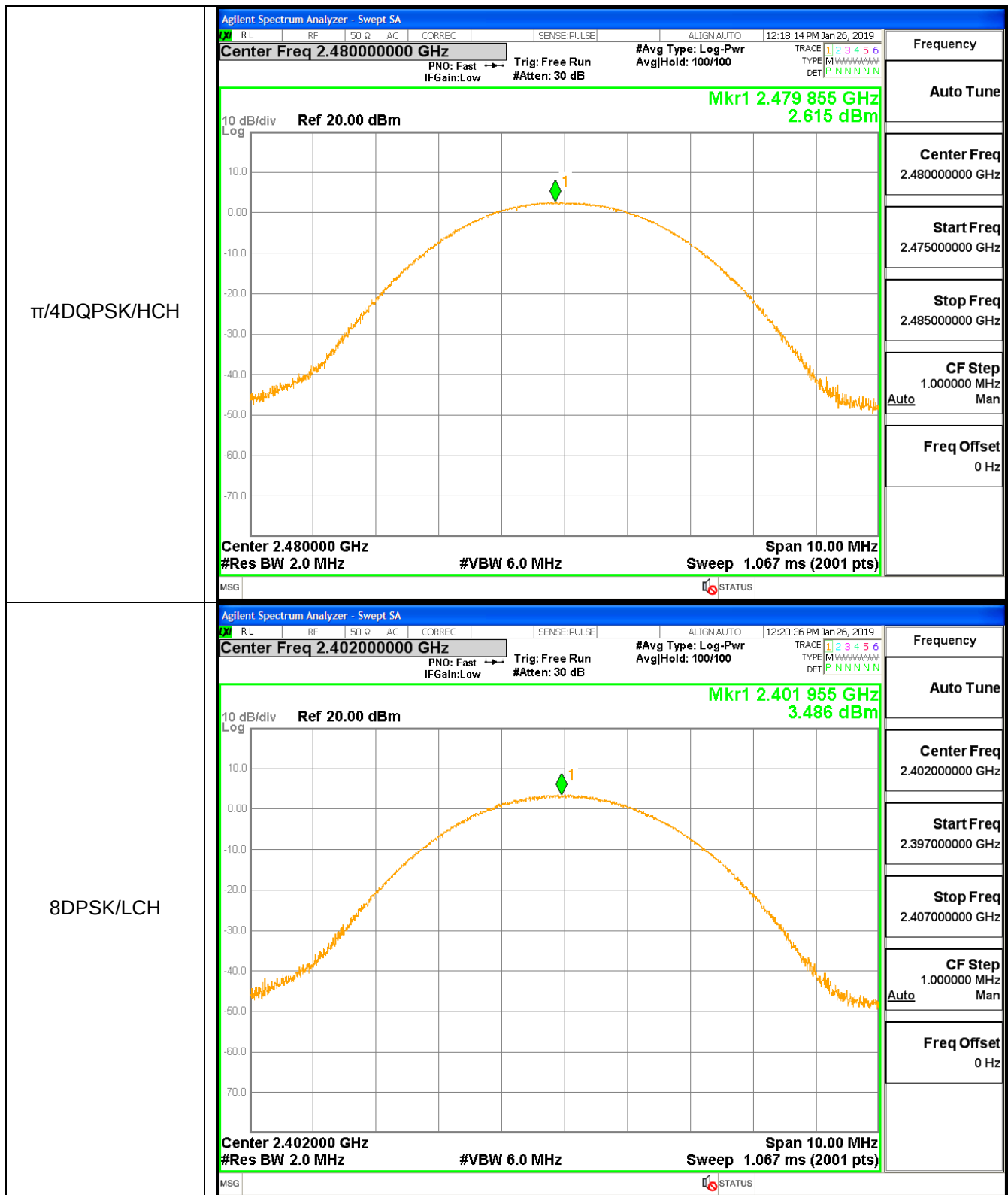
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	5.311	21	PASS
GFSK	MCH	5.658	21	PASS
GFSK	HCH	4.484	21	PASS
$\pi/4$ DQPSK	LCH	3.133	21	PASS
$\pi/4$ DQPSK	MCH	3.797	21	PASS
$\pi/4$ DQPSK	HCH	2.615	21	PASS
8DPSK	LCH	3.486	21	PASS
8DPSK	MCH	4.154	21	PASS
8DPSK	HCH	2.987	21	PASS

Test Graph









Frequency

Auto Tune

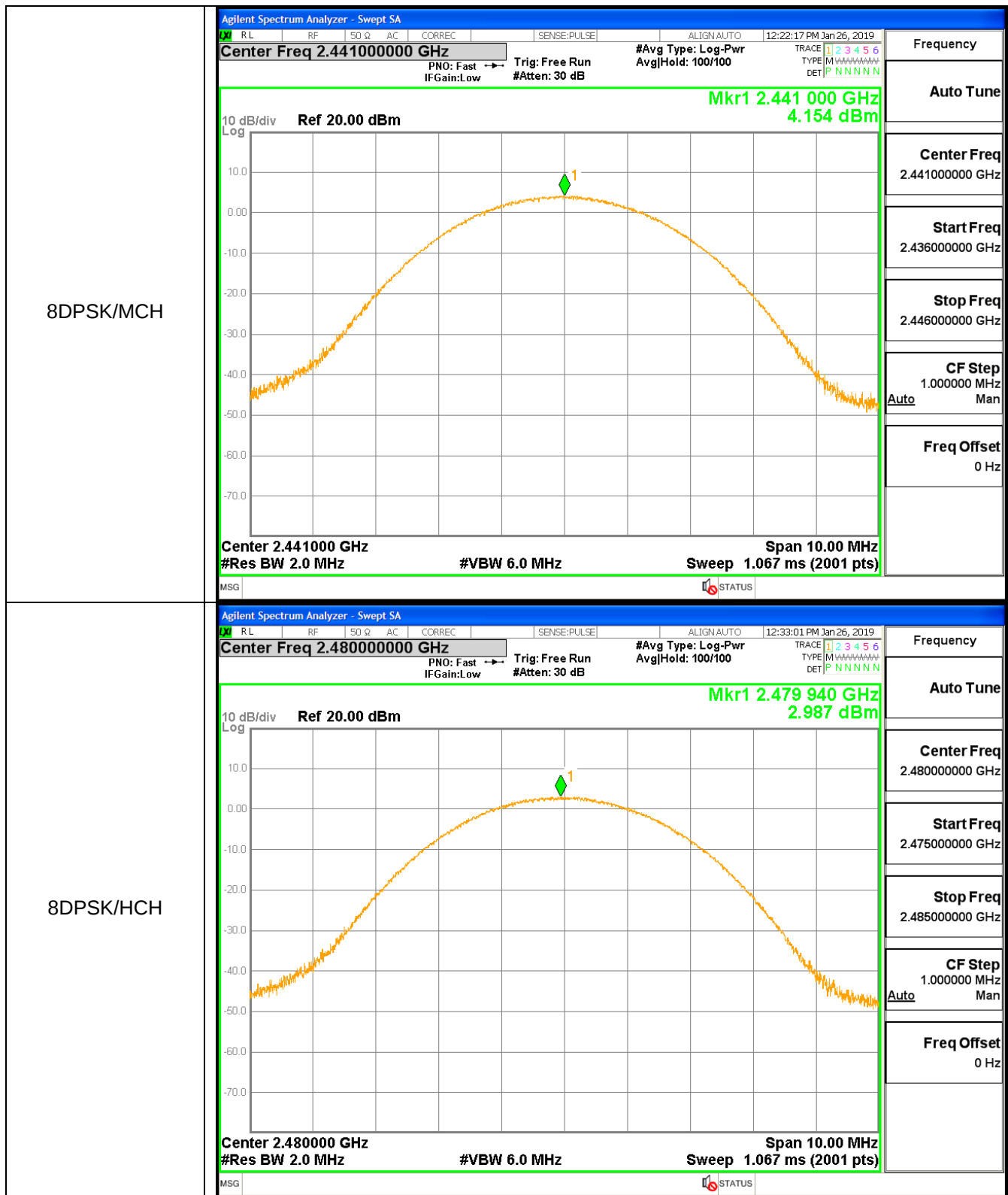
Center Freq
2.480000000 GHz

Start Freq
2.475000000 GHz

Stop Freq
2.485000000 GHz

CF Step
1.000000 MHz
Auto Man

Freq Offset
0 Hz



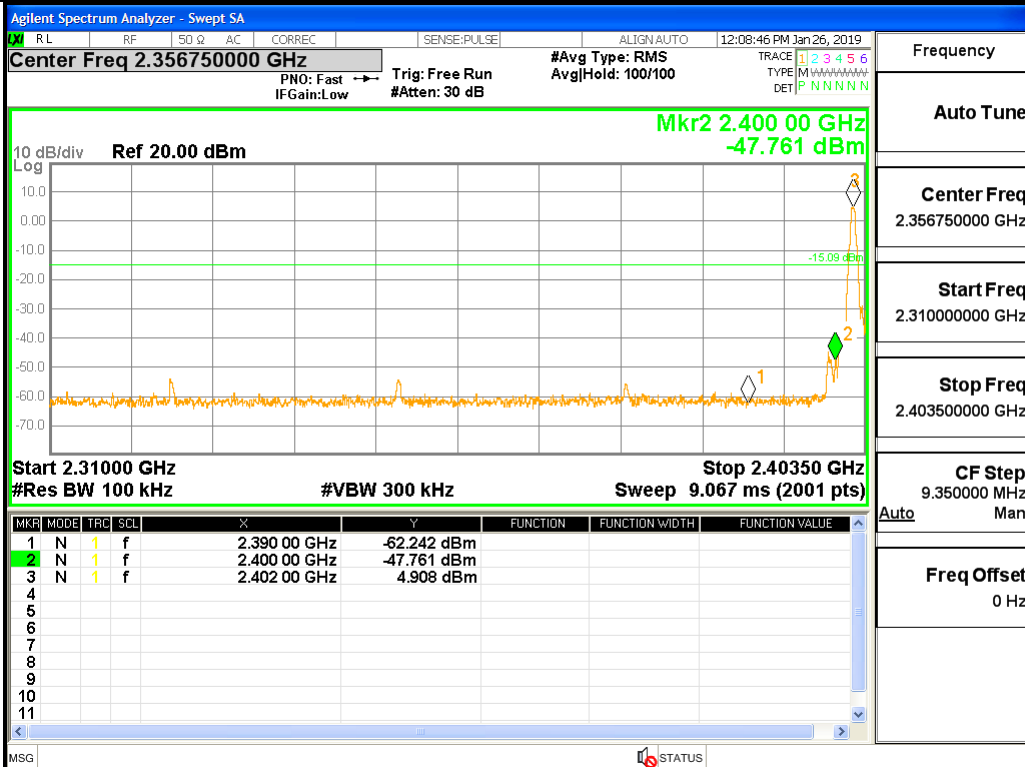
A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2390	4.908	-62.24	-15.092	Pass
1DH5	2402	2400	4.908	-47.76	-15.092	Pass
1DH5-Hopping	2402	2390	2.666	-57.41	-17.334	Pass
1DH5-Hopping	2402	2400	2.666	-57.36	-17.334	Pass
1DH5	2480	2483.5	4.082	-59.99	-15.918	Pass
1DH5	2480	2500	4.082	-58.36	-15.918	Pass
1DH5-Hopping	2480	2483.5	1.309	-60.07	-18.691	Pass
1DH5-Hopping	2480	2500	1.309	-55.68	-18.691	Pass
2DH5	2402	2390	1.761	-61.83	-18.239	Pass
2DH5	2402	2400	1.761	-37.04	-18.239	Pass
2DH5-Hopping	2480	2483.5	0.98	-59.07	-19.02	Pass
2DH5-Hopping	2480	2500	0.98	-58.7	-19.02	Pass
2DH5	2480	2483.5	0.574	-59.03	-19.426	Pass
2DH5	2480	2500	0.574	-62.07	-19.426	Pass
2DH5-Hopping	2402	2390	2.662	-58.91	-17.338	Pass
2DH5-Hopping	2402	2400	2.662	-45.75	-17.338	Pass
3DH5	2402	2390	0.193	-61.32	-19.807	Pass
3DH5	2402	2400	0.193	-42.35	-19.807	Pass
3DH5-Hopping	2402	2390	2.752	-59.09	-17.248	Pass
3DH5-Hopping	2402	2400	2.752	-44	-17.248	Pass
3DH5	2480	2483.5	1.069	-58.66	-18.931	Pass
3DH5	2480	2500	1.069	-60.96	-18.931	Pass
3DH5-Hopping	2480	2483.5	1.275	-60.24	-18.725	Pass
3DH5-Hopping	2480	2500	1.275	-59.48	-18.725	Pass

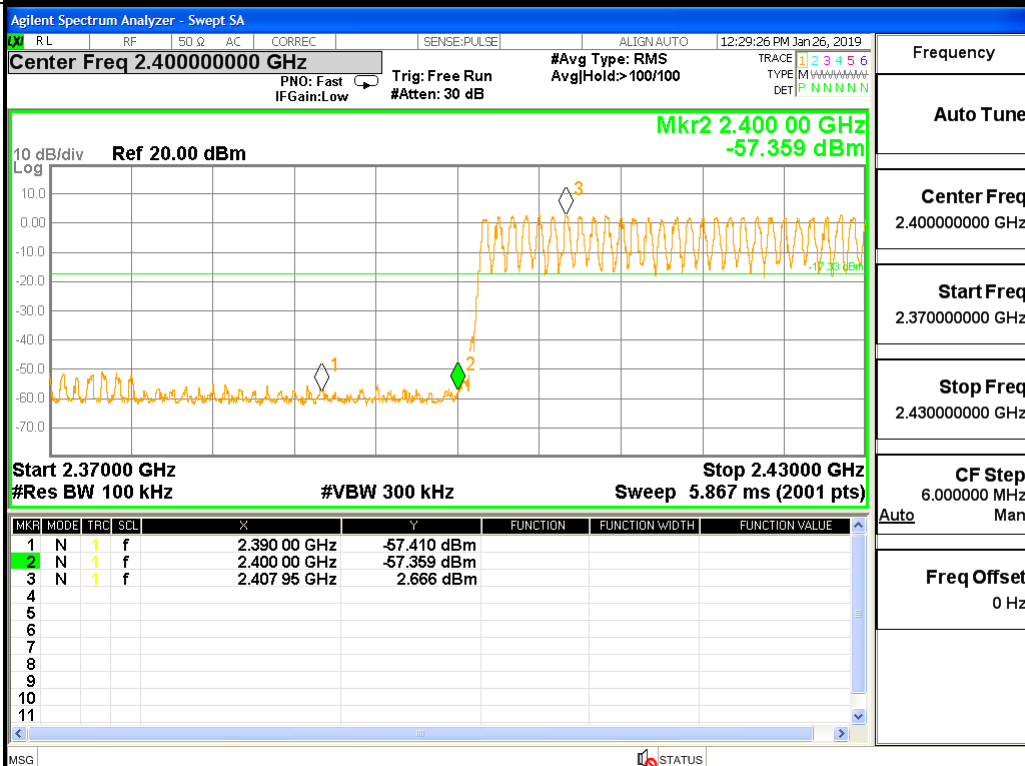
Test Graph

Graphs

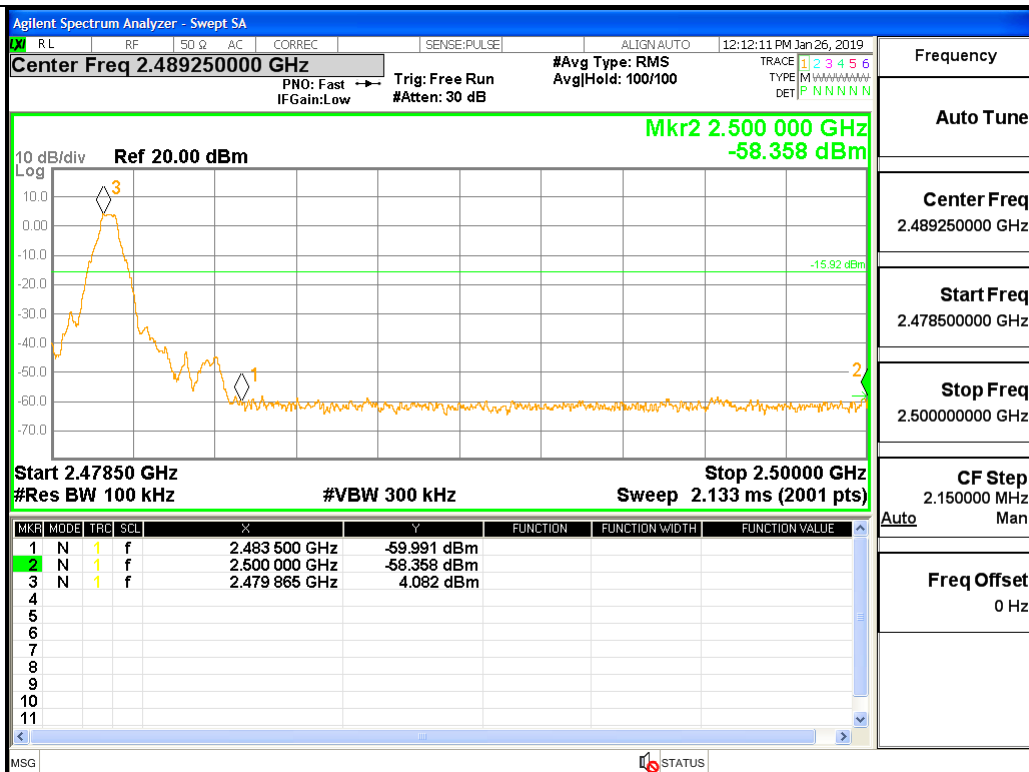
GFSK/LCH/No Hop



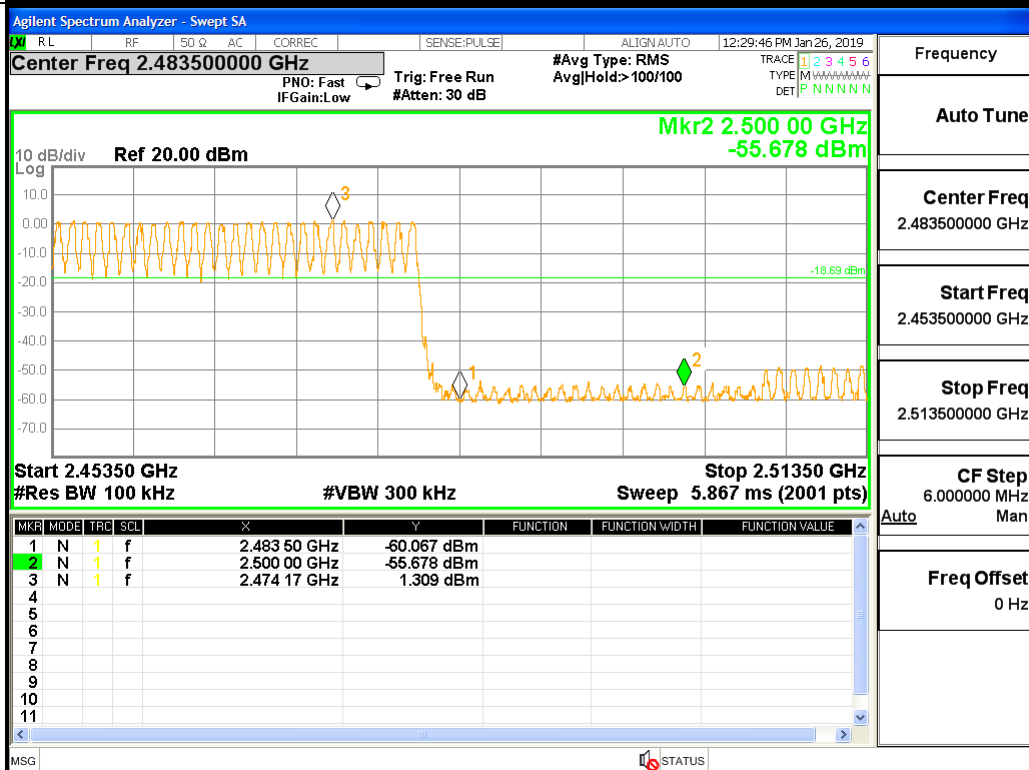
GFSK/LCH/Hop



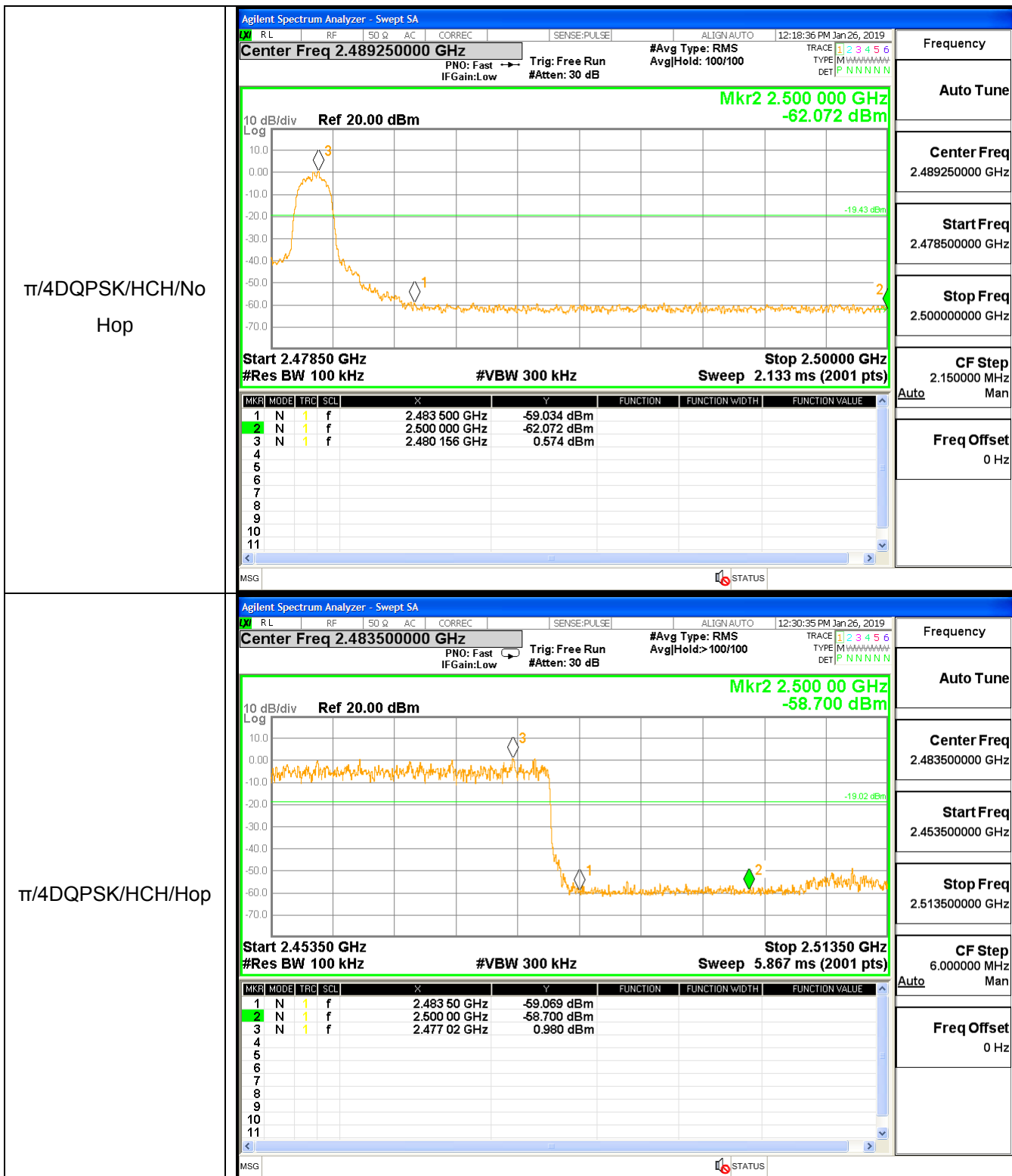
GFSK/HCH/No Hop

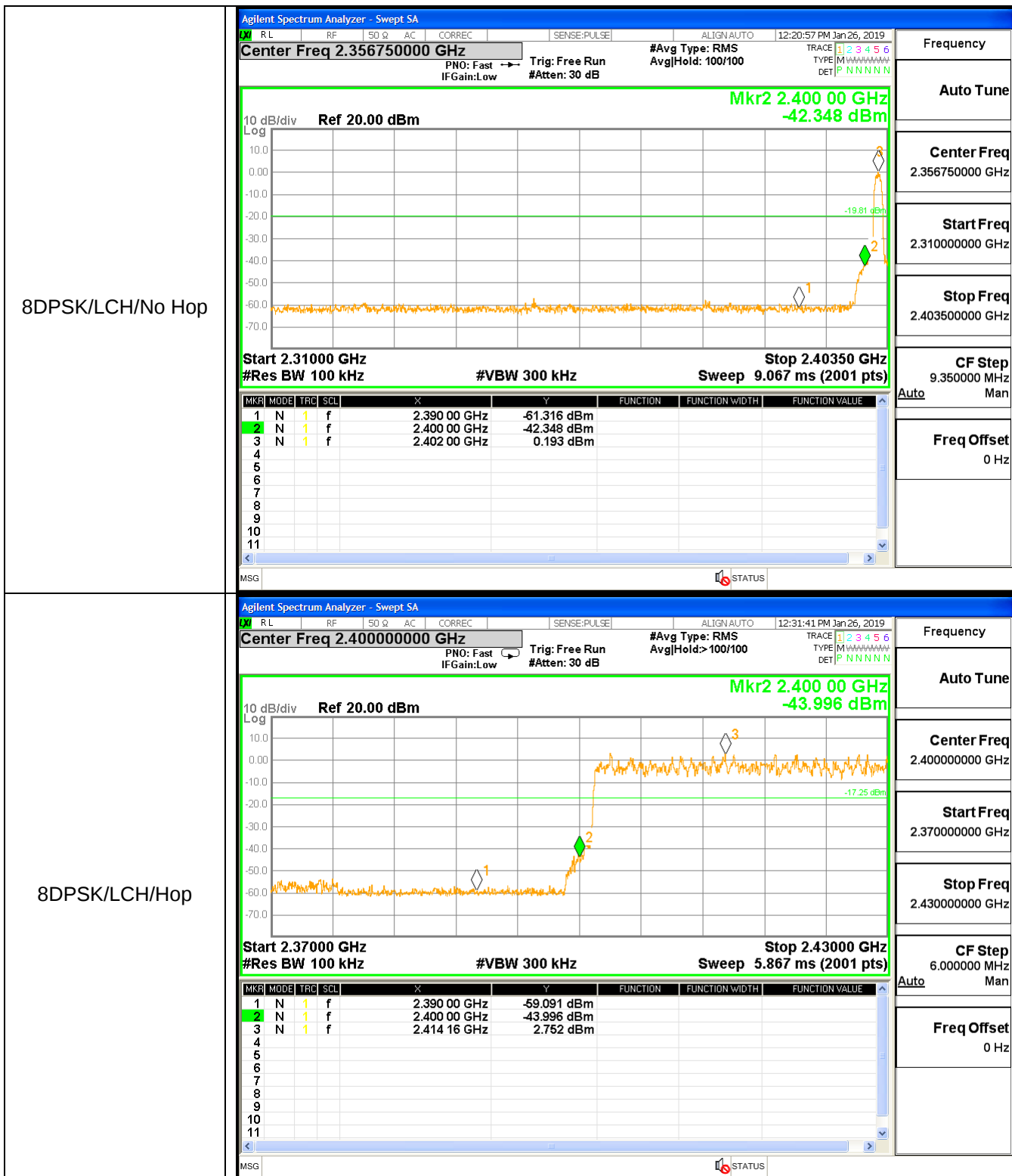


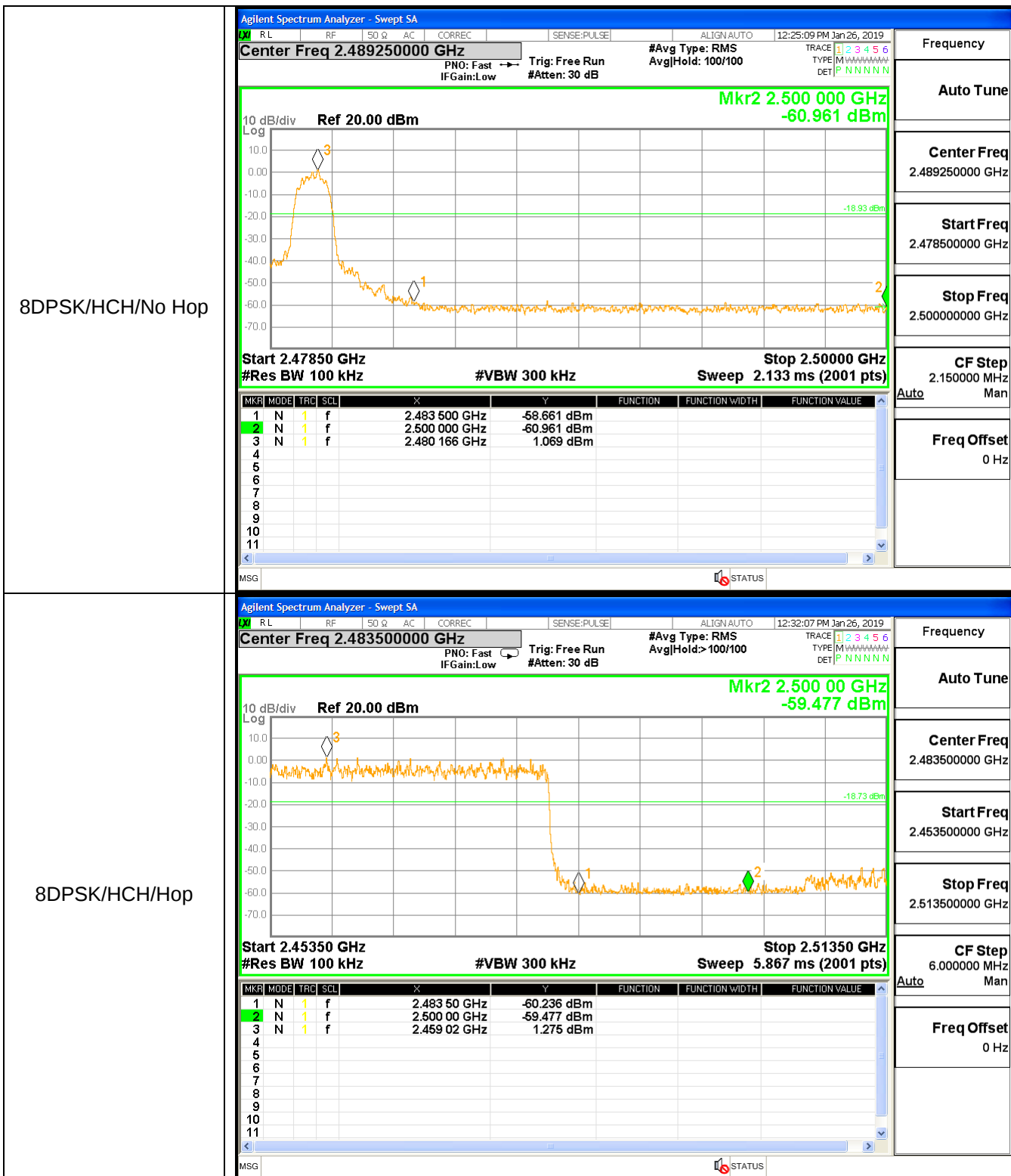
GFSK/HCH/Hop



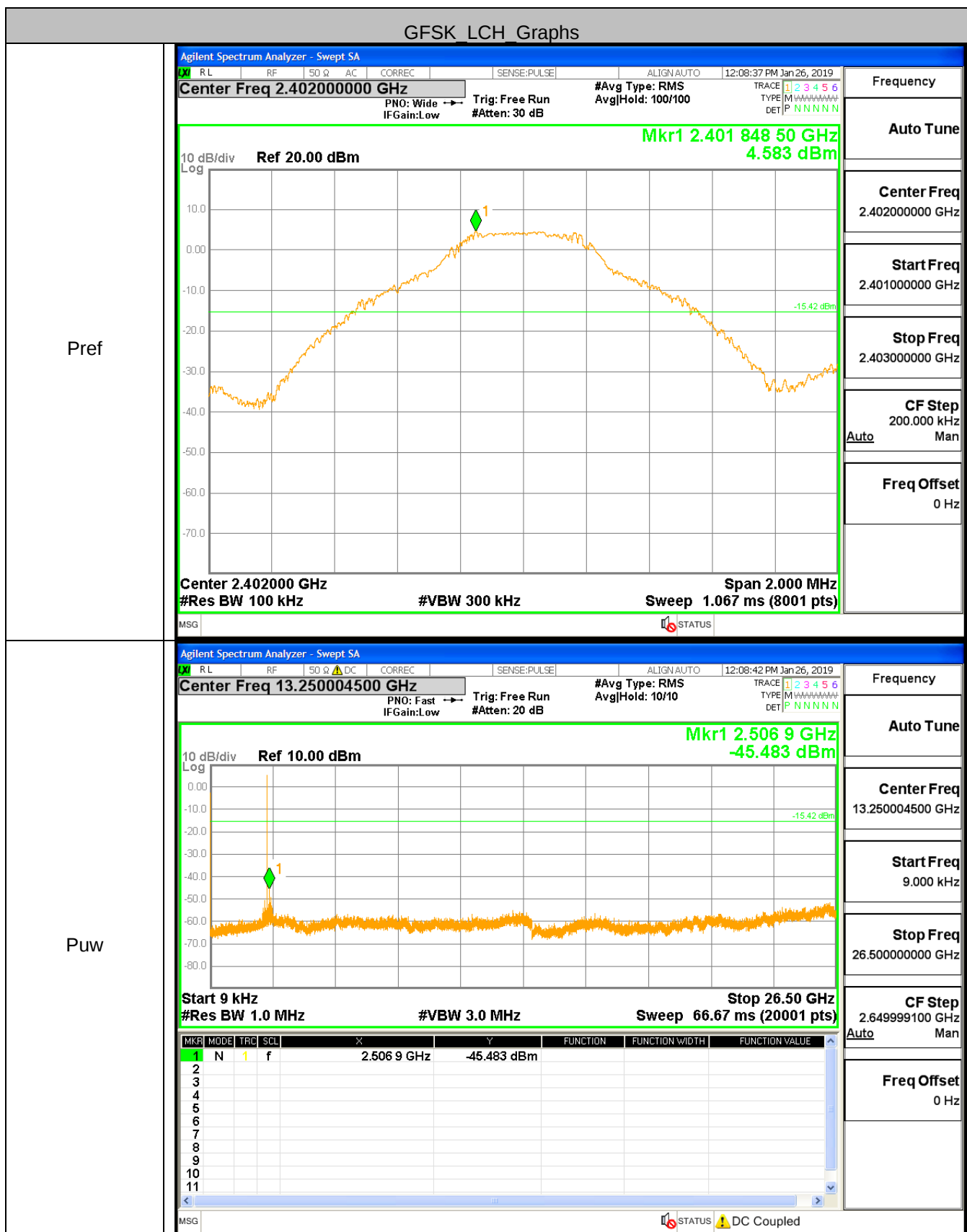


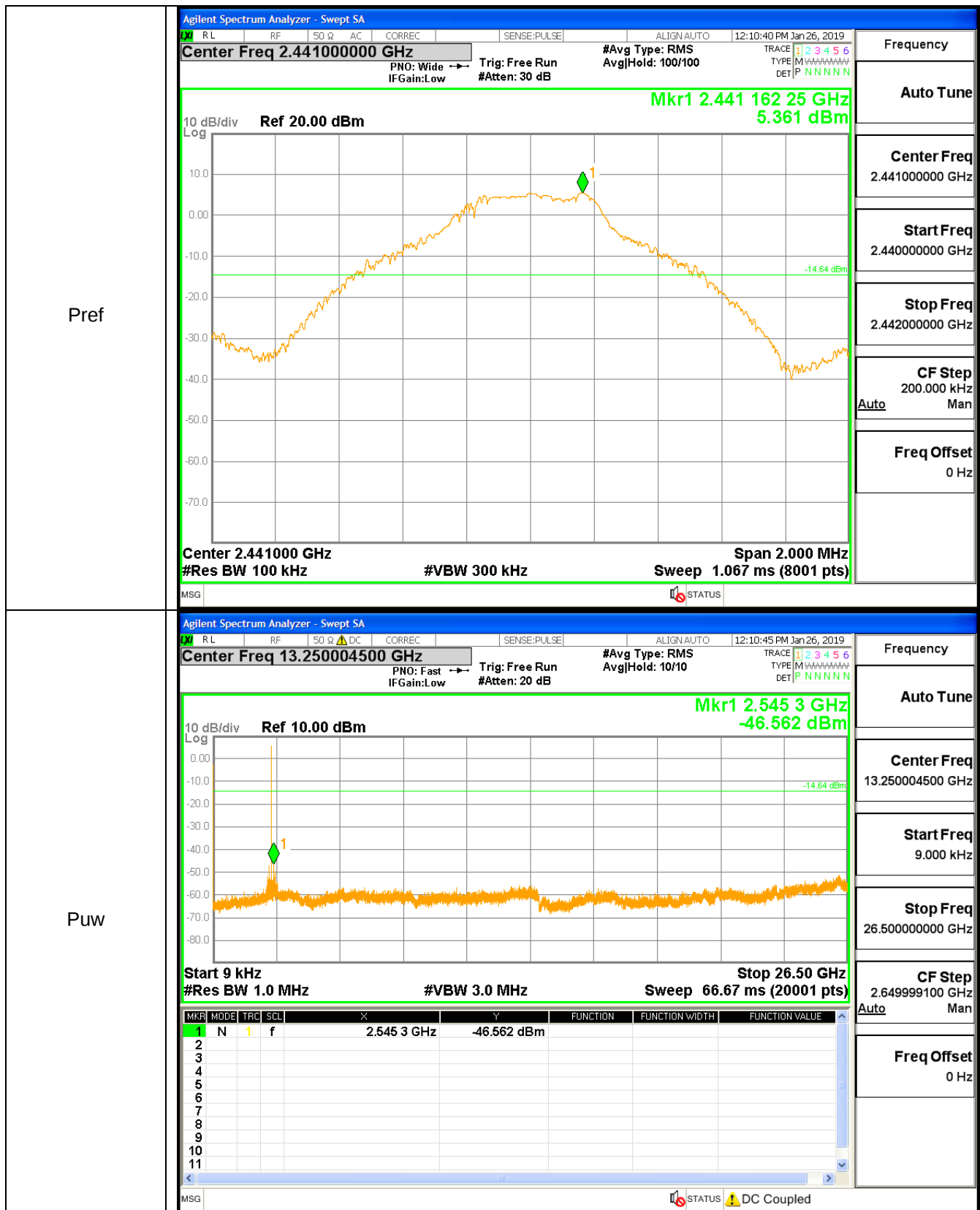






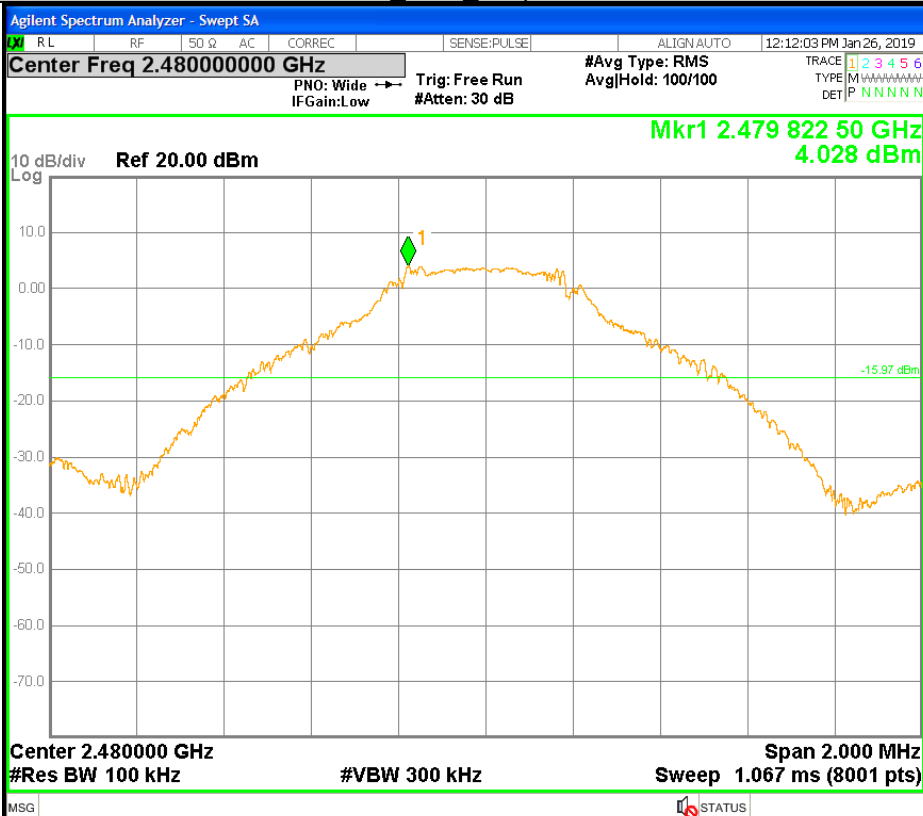
A.7 RF Conducted Spurious Emissions Test Graph



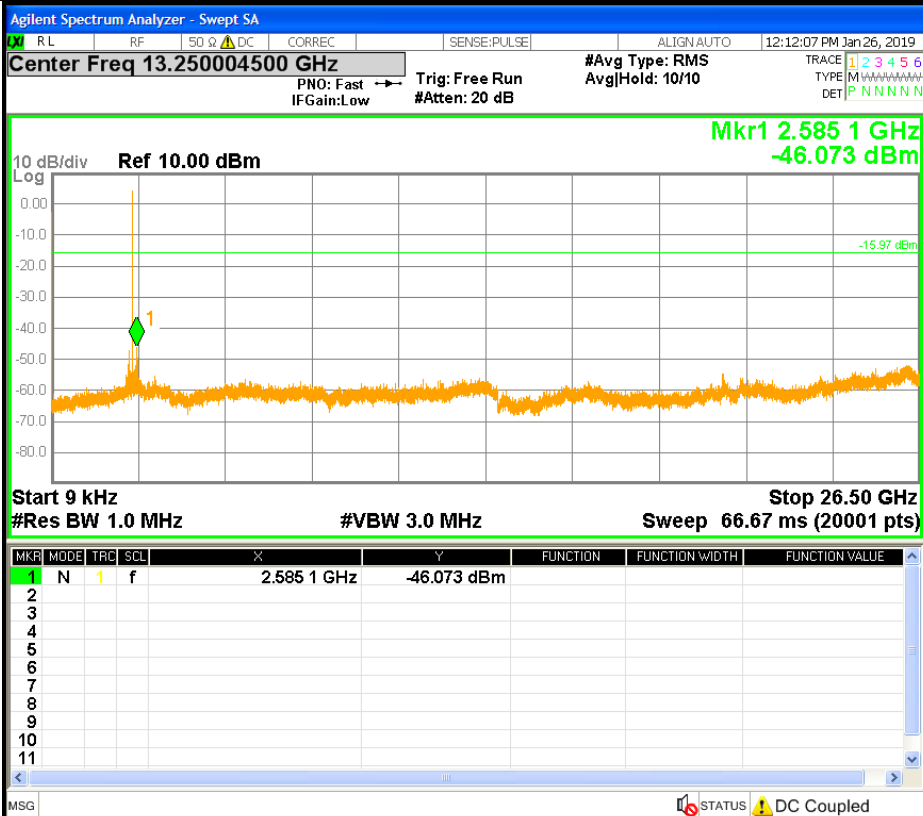


GFSK HCH Graphs

Pref

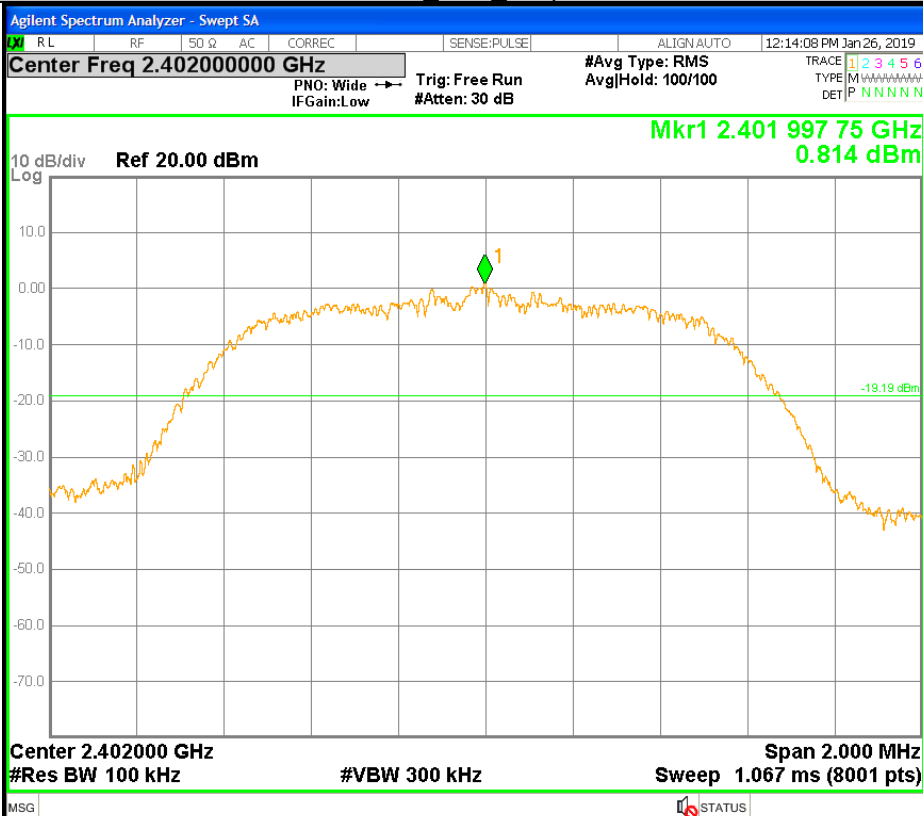


Puw

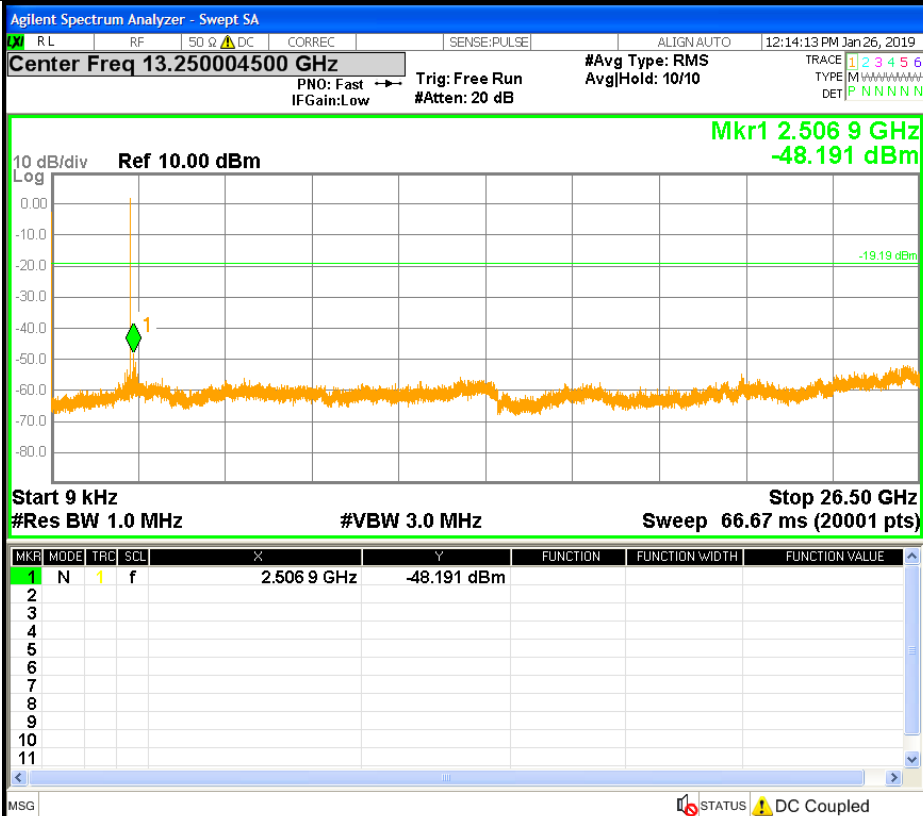


$\pi/4$ DQPSK LCH Graphs

Pref

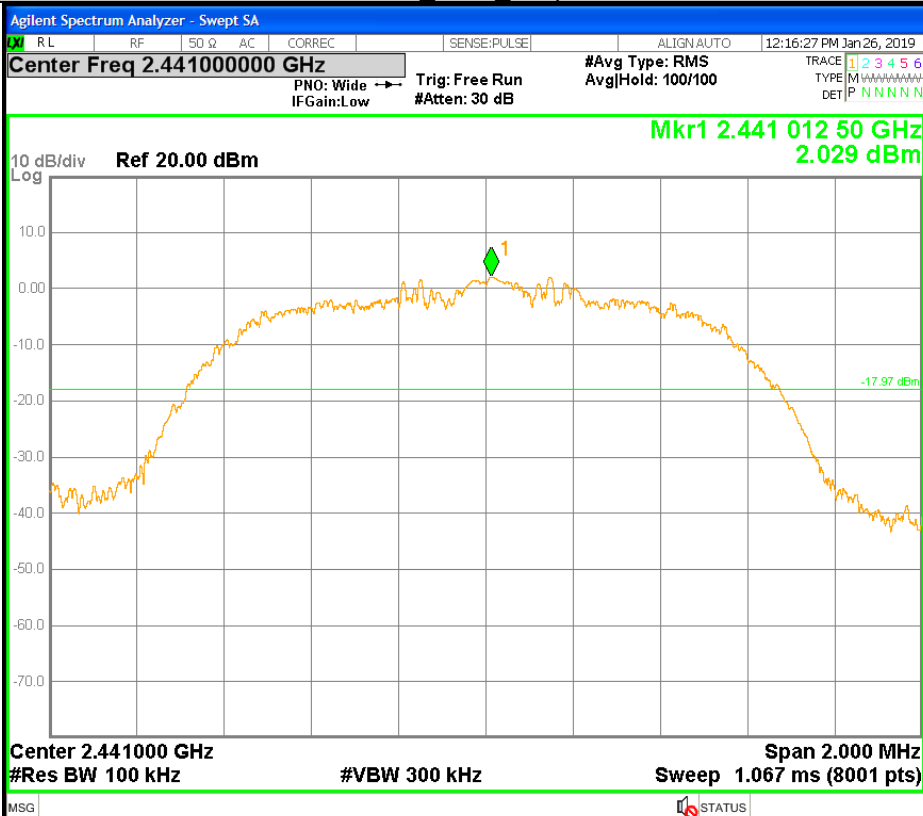


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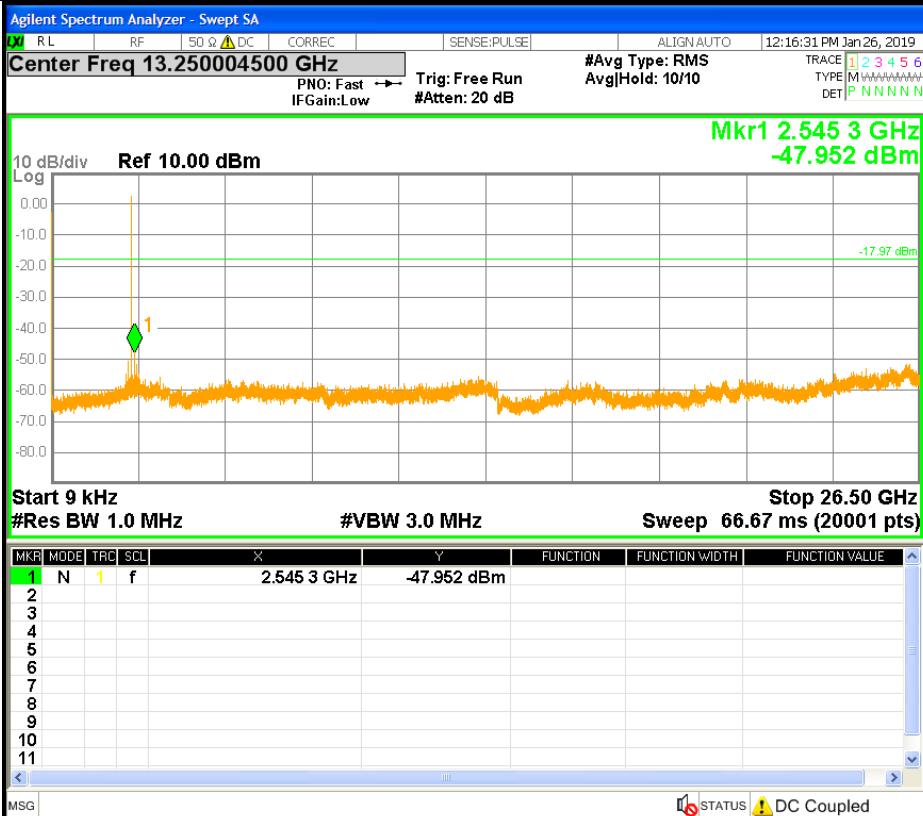


$\pi/4$ DQPSK MCH Graphs

Pref

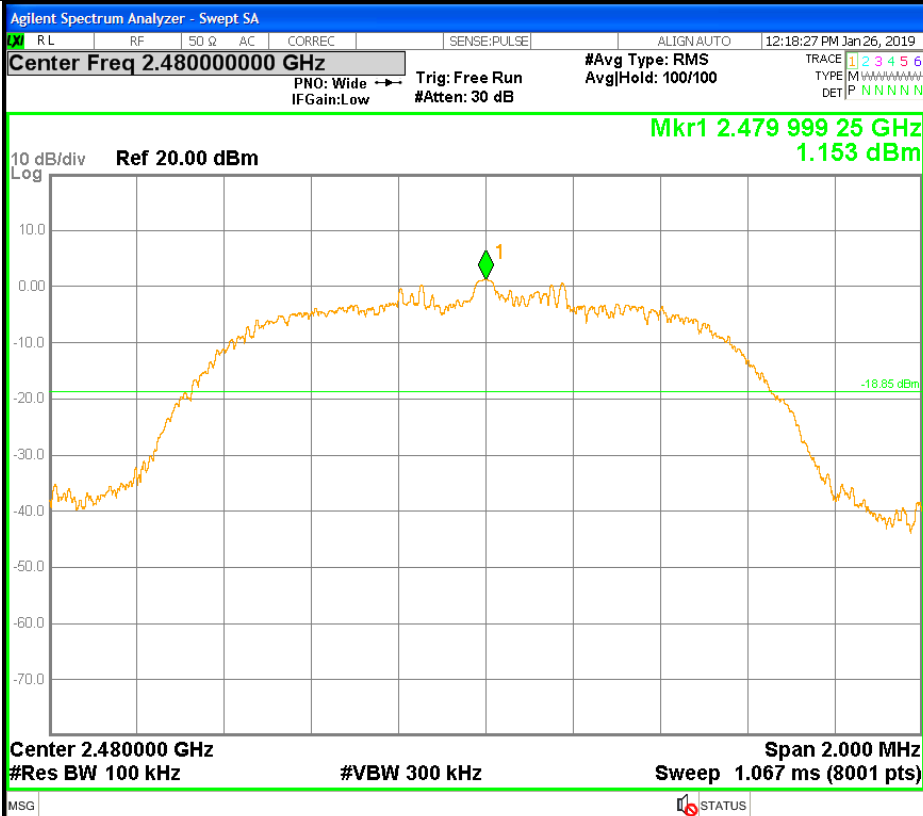


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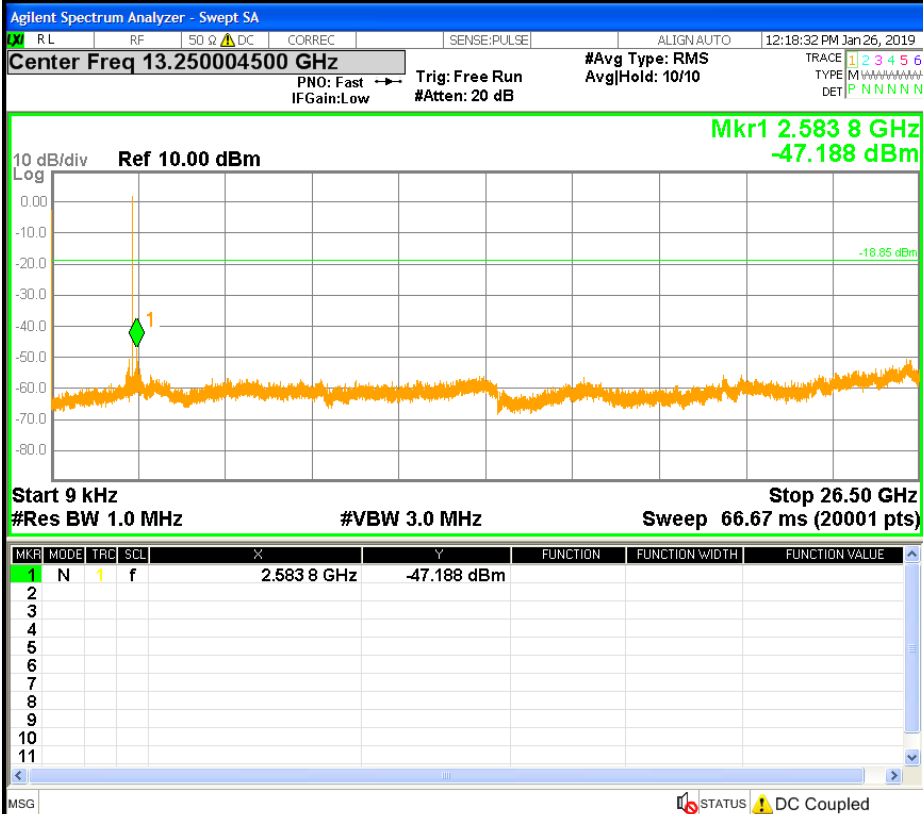


$\pi/4$ DQPSK HCH Graphs

Pref

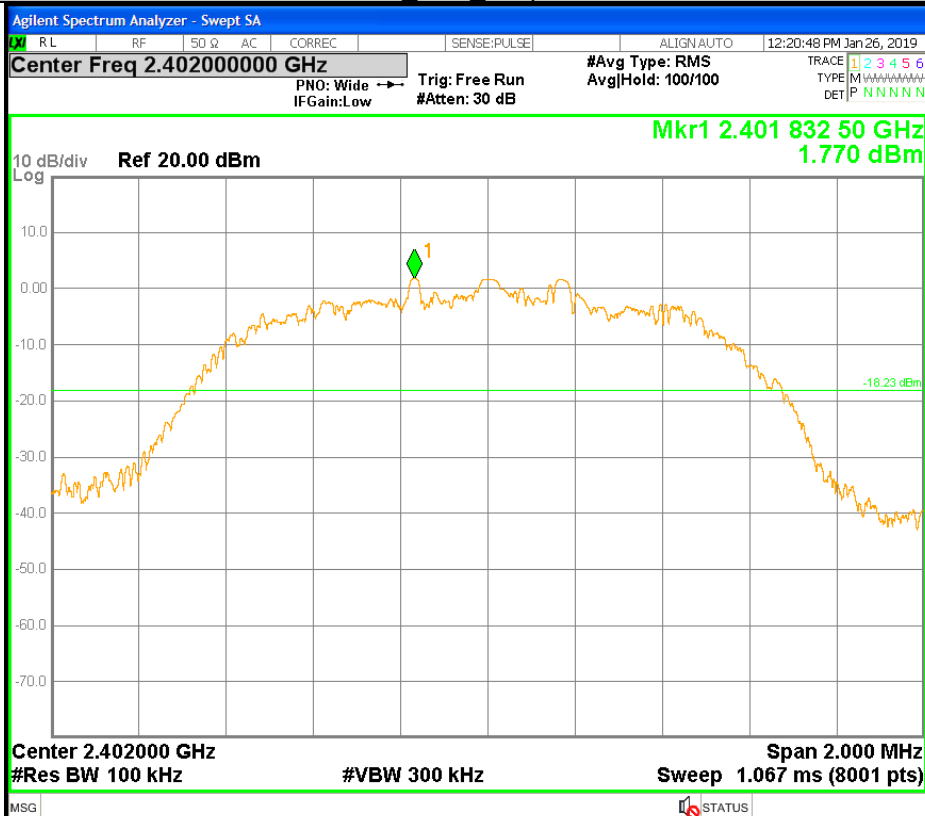


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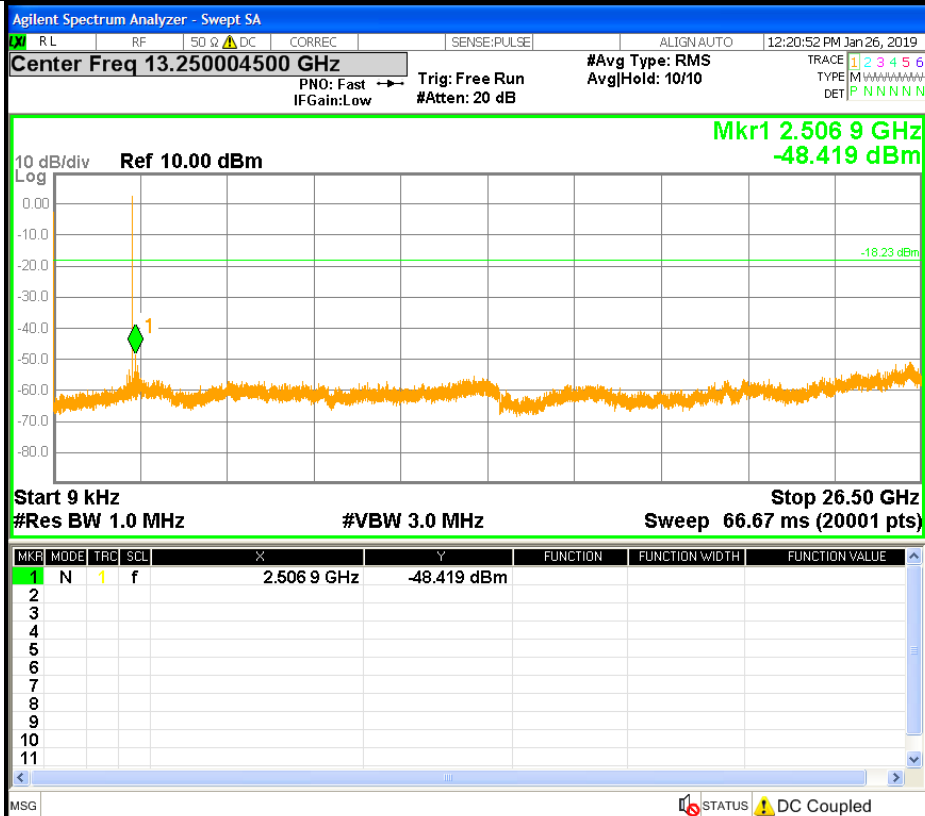


8DPSK LCH Graphs

Pref

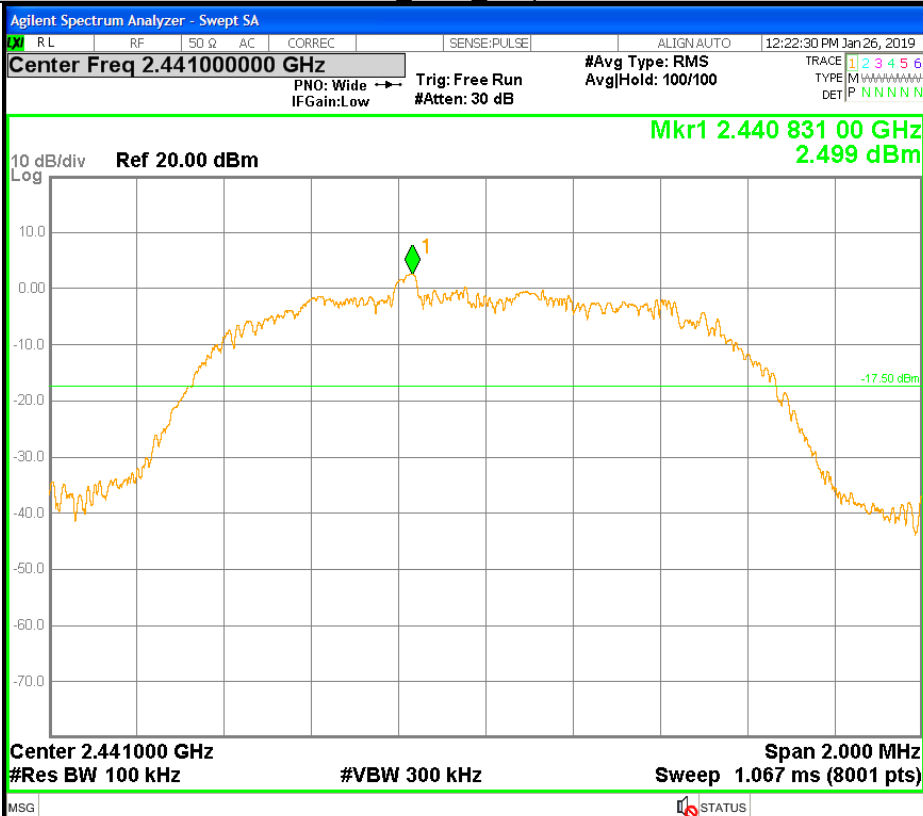


Puw

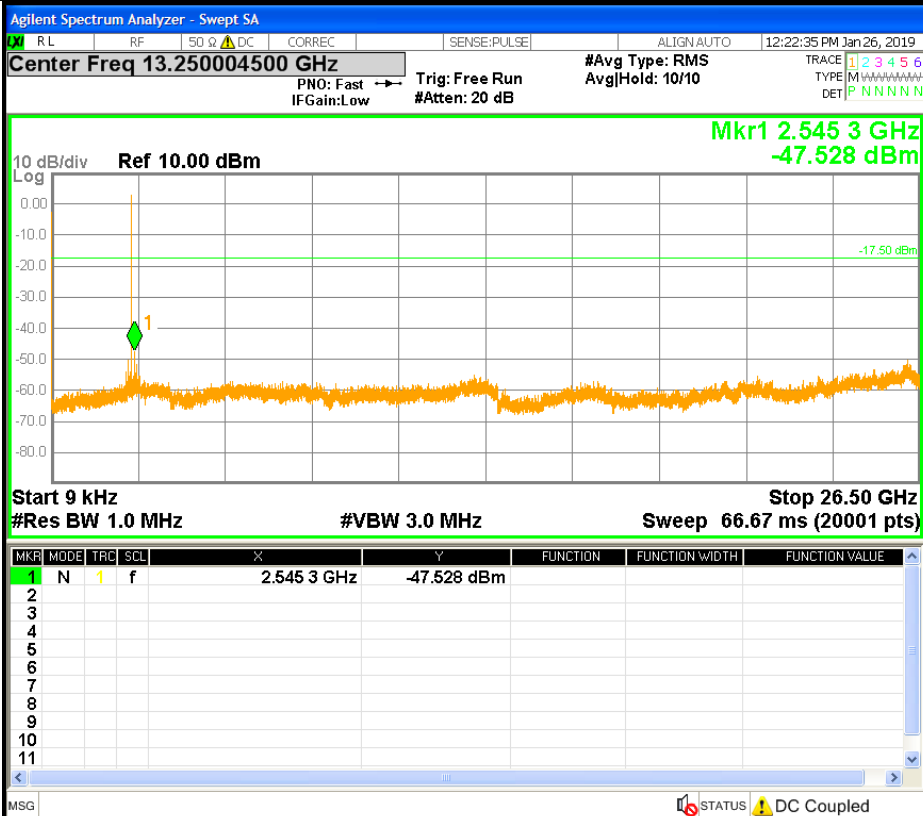


8DPSK MCH Graphs

Pref

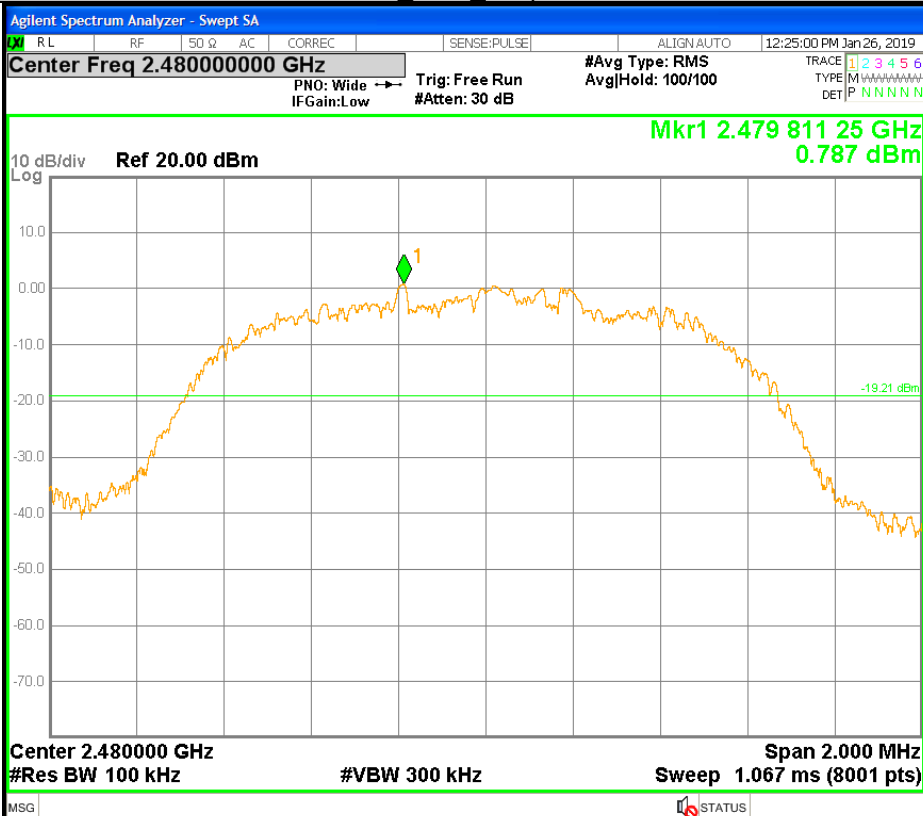


Puw

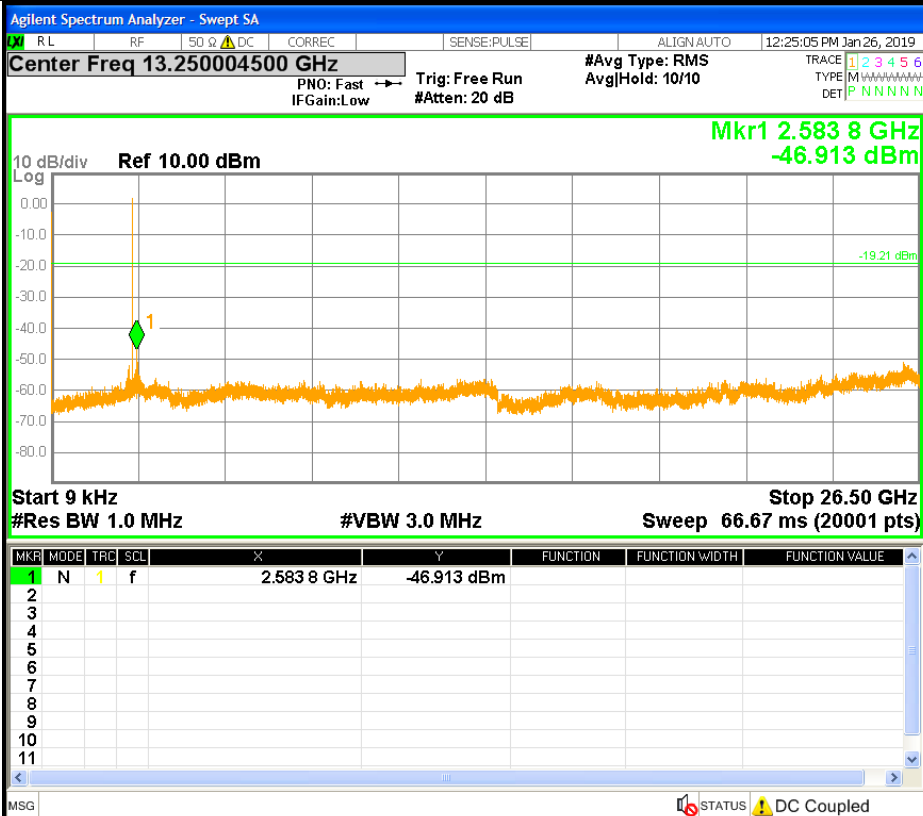


8DPSK HCH Graphs

Pref



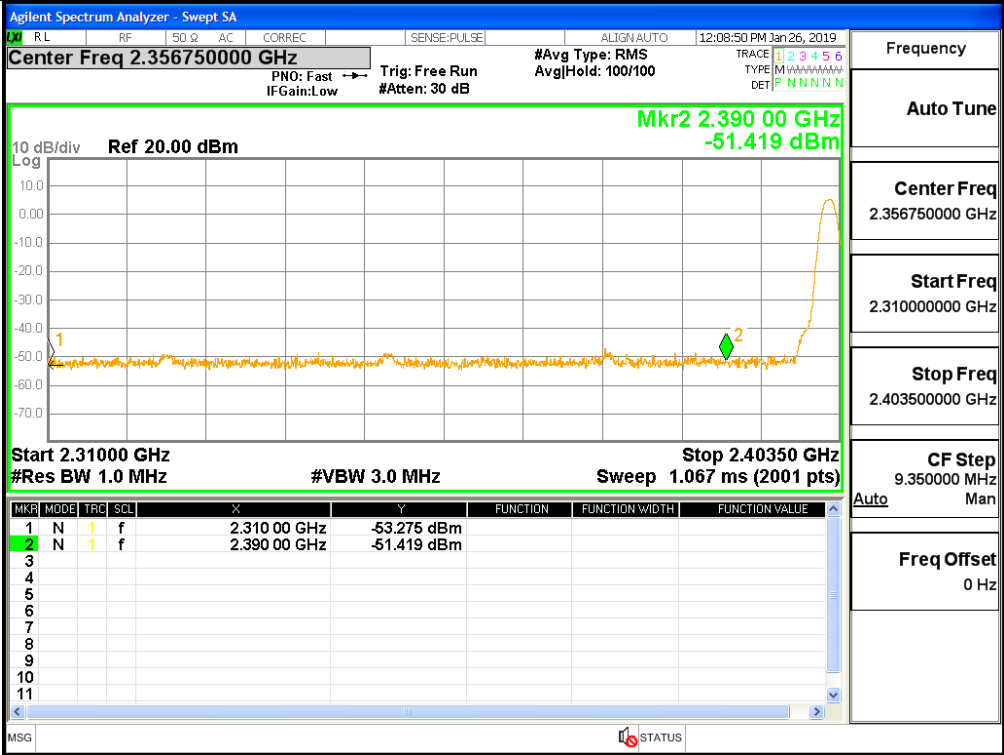
Puw



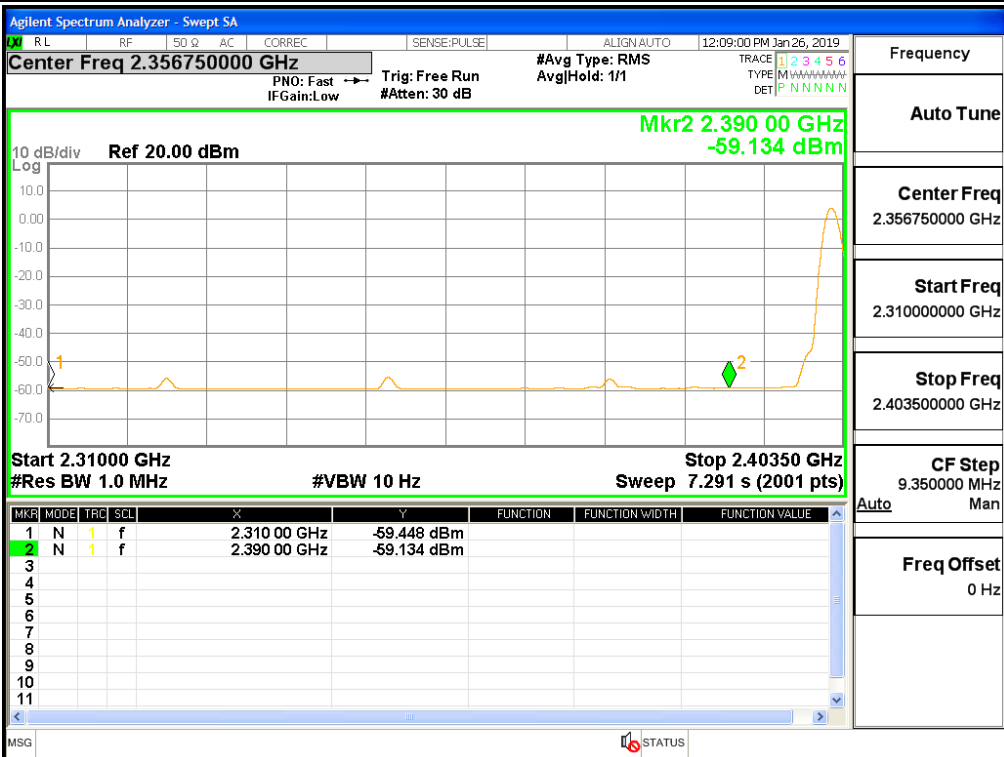
A.8 Restrict-band band-edge measurements

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	-53.28	43.92	74	-59.45	37.75	54	Pass
1DH5	2402	2390	2.00	0.00	-51.42	45.78	74	-59.13	38.07	54	Pass
1DH5	2480	2483.5	2.00	0.00	-45.51	51.69	74	-51.2	46	54	Pass
1DH5	2480	2500	2.00	0.00	-51.38	45.82	74	-58.71	38.49	54	Pass
2DH5	2402	2310	2.00	0.00	-52.34	44.86	74	-59.53	37.67	54	Pass
2DH5	2402	2390	2.00	0.00	-52.32	44.88	74	-59.25	37.95	54	Pass
2DH5	2480	2483.5	2.00	0.00	-49.29	47.91	74	-54.98	42.22	54	Pass
2DH5	2480	2500	2.00	0.00	-52.44	44.76	74	-58.73	38.47	54	Pass
3DH5	2402	2310	2.00	0.00	-51.42	45.78	74	-59.53	37.67	54	Pass
3DH5	2402	2390	2.00	0.00	-51.7	45.5	74	-59.27	37.93	54	Pass
3DH5	2480	2483.5	2.00	0.00	-48.43	48.77	74	-54.9	42.3	54	Pass
3DH5	2480	2500	2.00	0.00	-52.14	45.06	74	-58.76	38.44	54	Pass

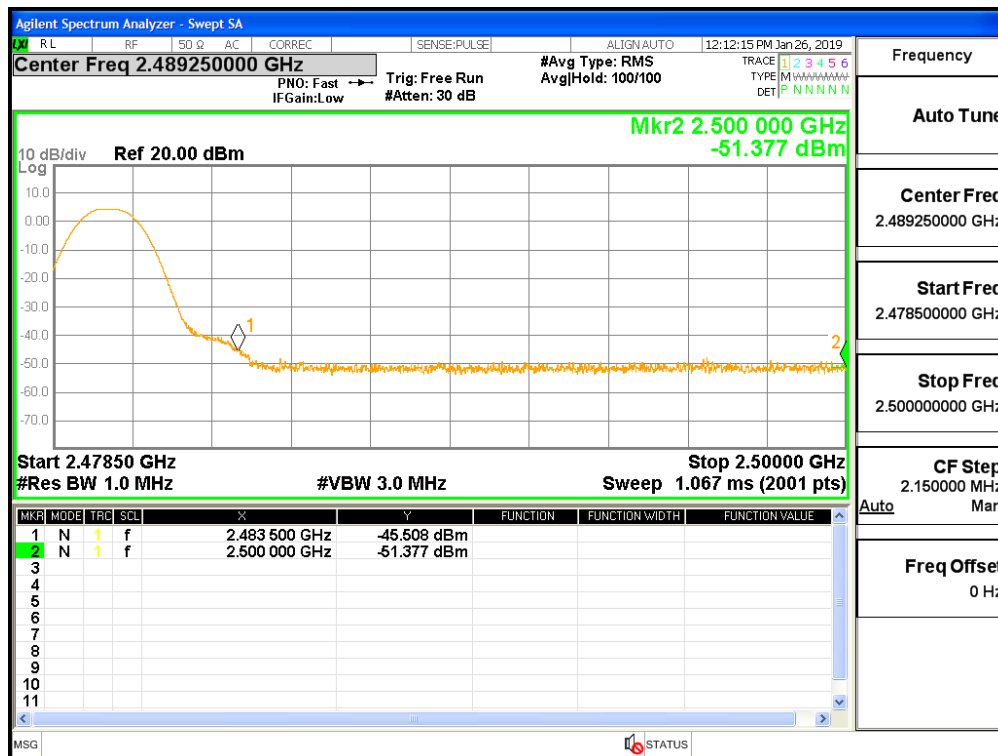
Restrict-band band-edge measurements_2402_PEAK_DH5



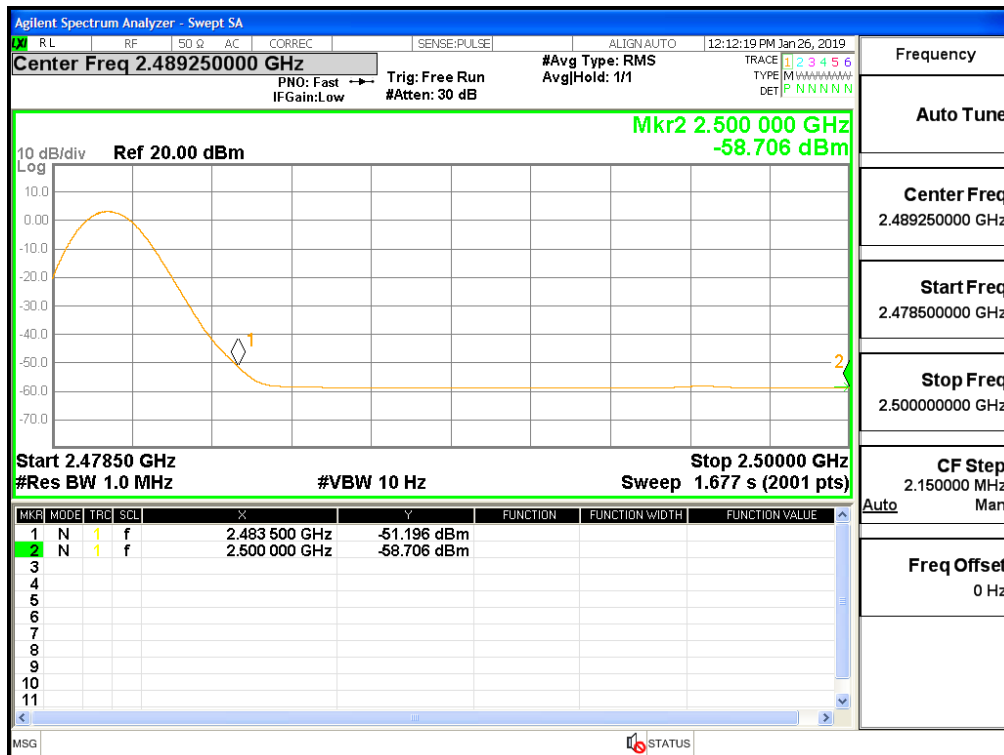
Restrict-band band-edge measurements_2402_AV_DH5



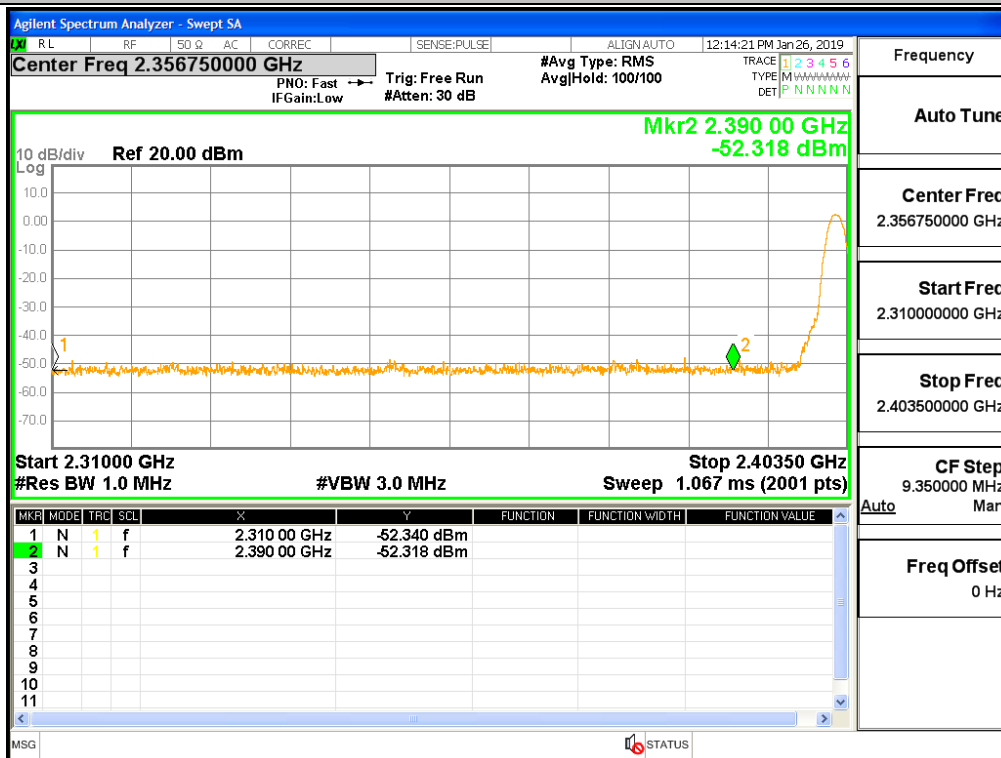
Restrict-band band-edge measurements_2480_PEAK_DH5



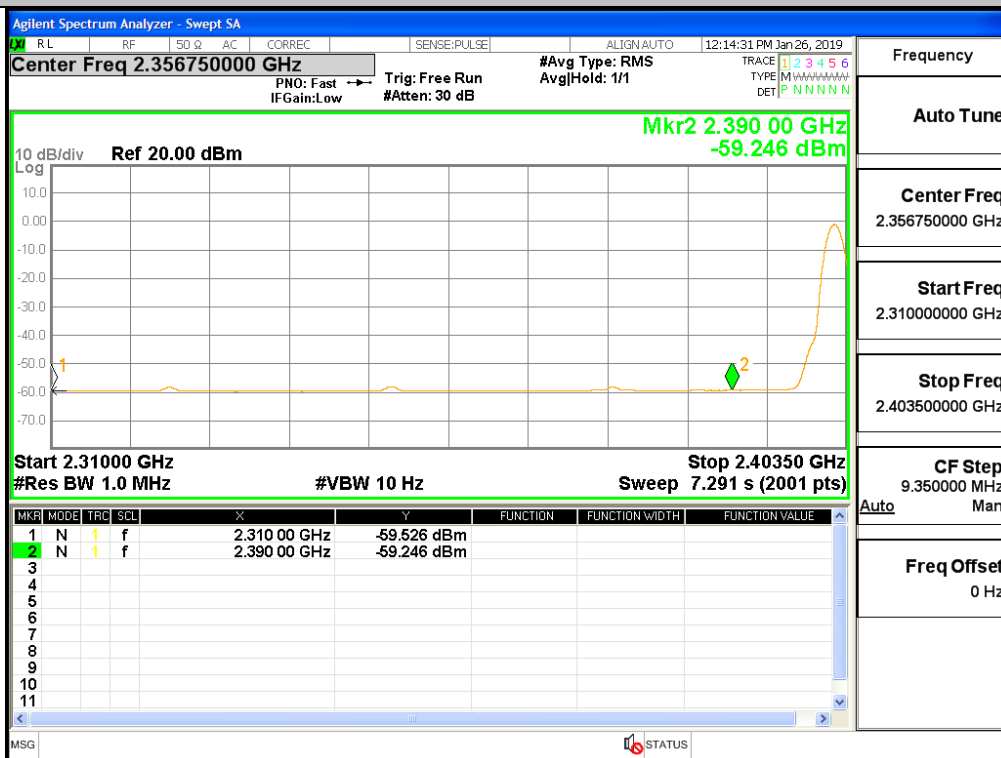
Restrict-band band-edge measurements_2480_AV_DH5



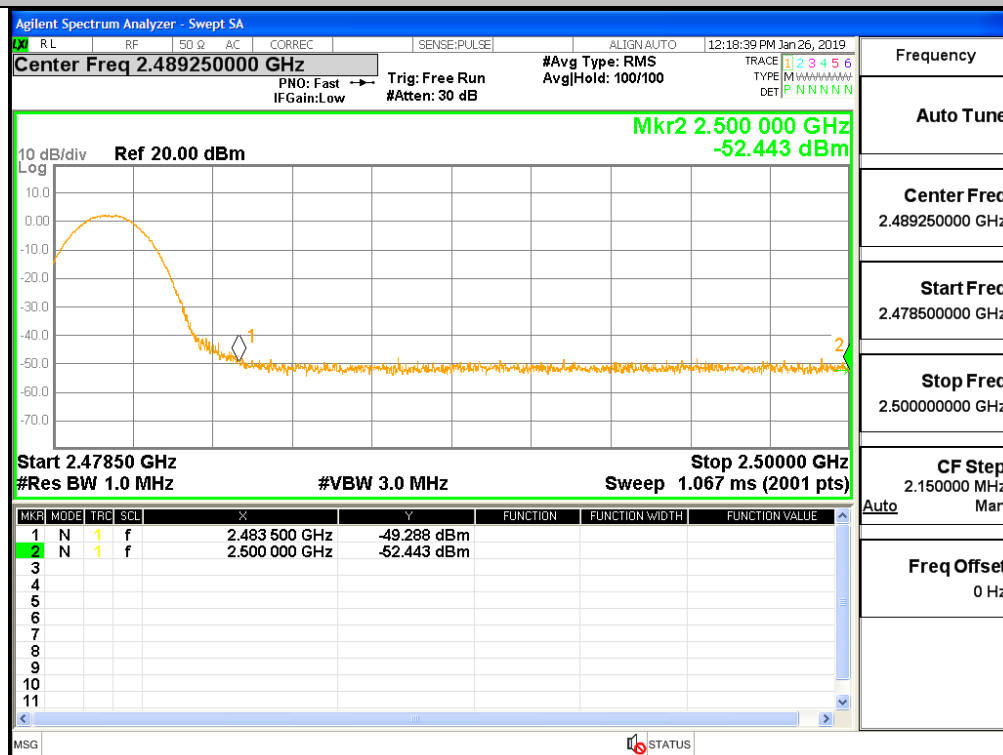
Restrict-band band-edge measurements_2402_PEAK_2DH5



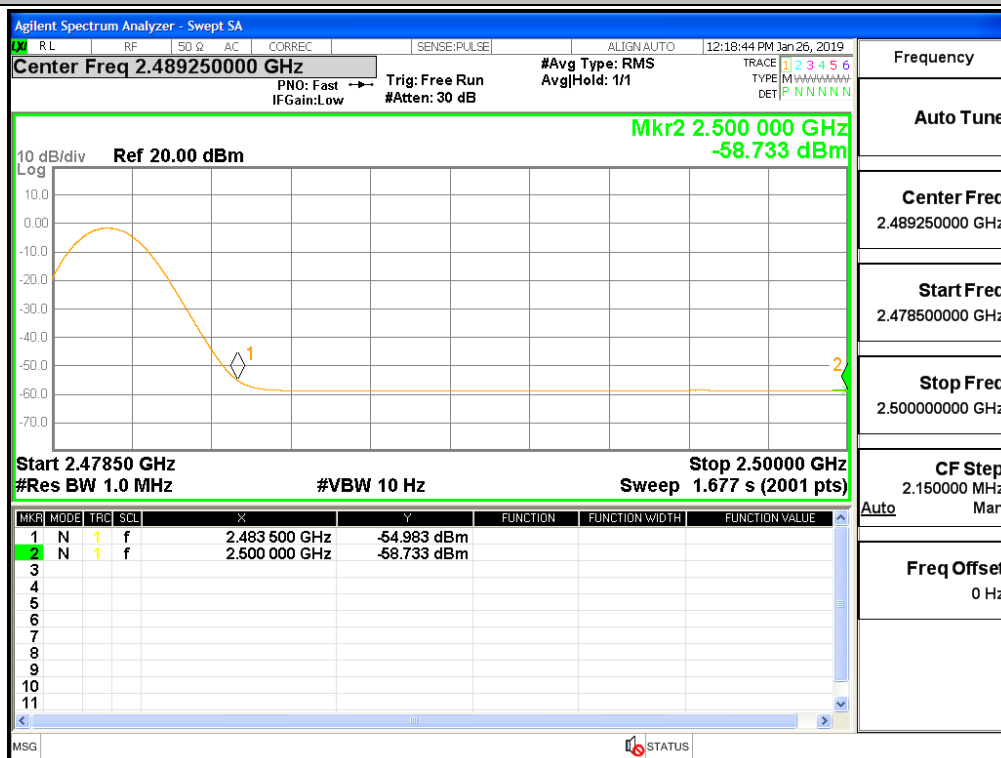
Restrict-band band-edge measurements_2402_AV_2DH5



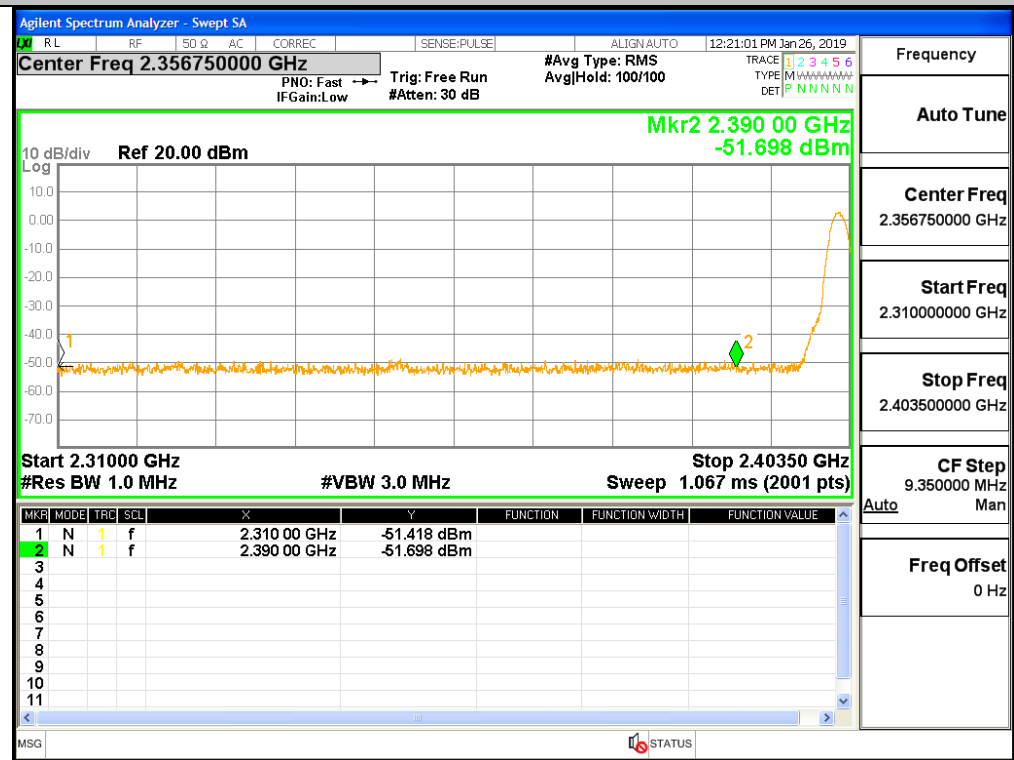
Restrict-band band-edge measurements 2480 PEAK 2DH5



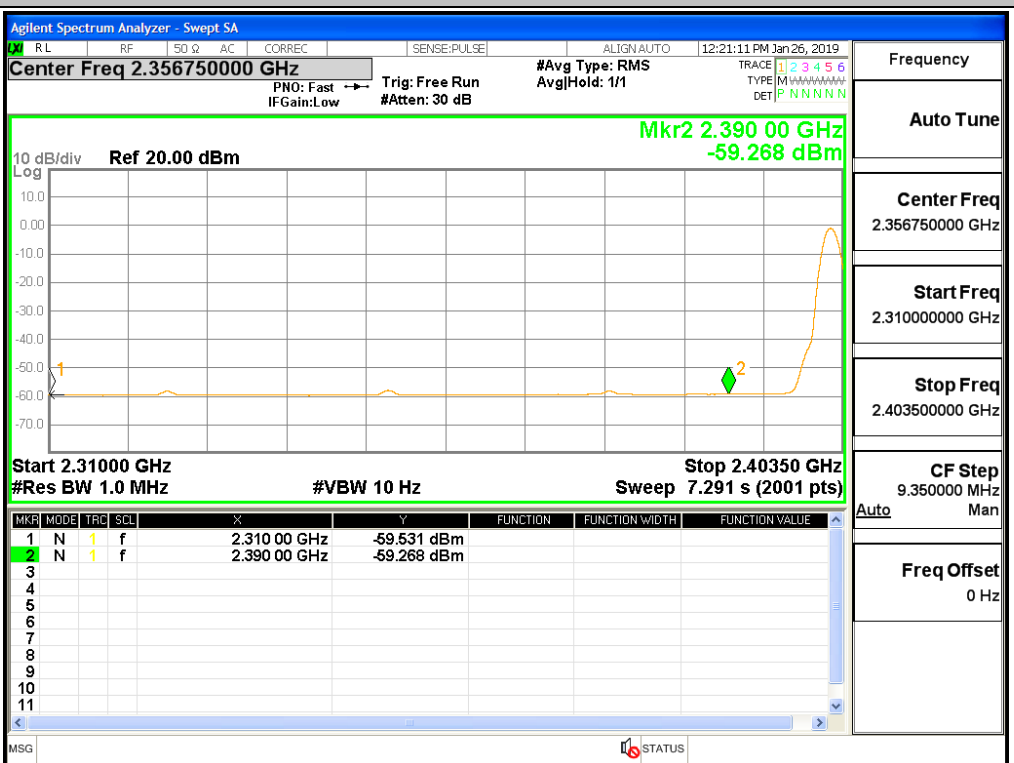
Restrict-band band-edge measurements 2480 AV 2DH5



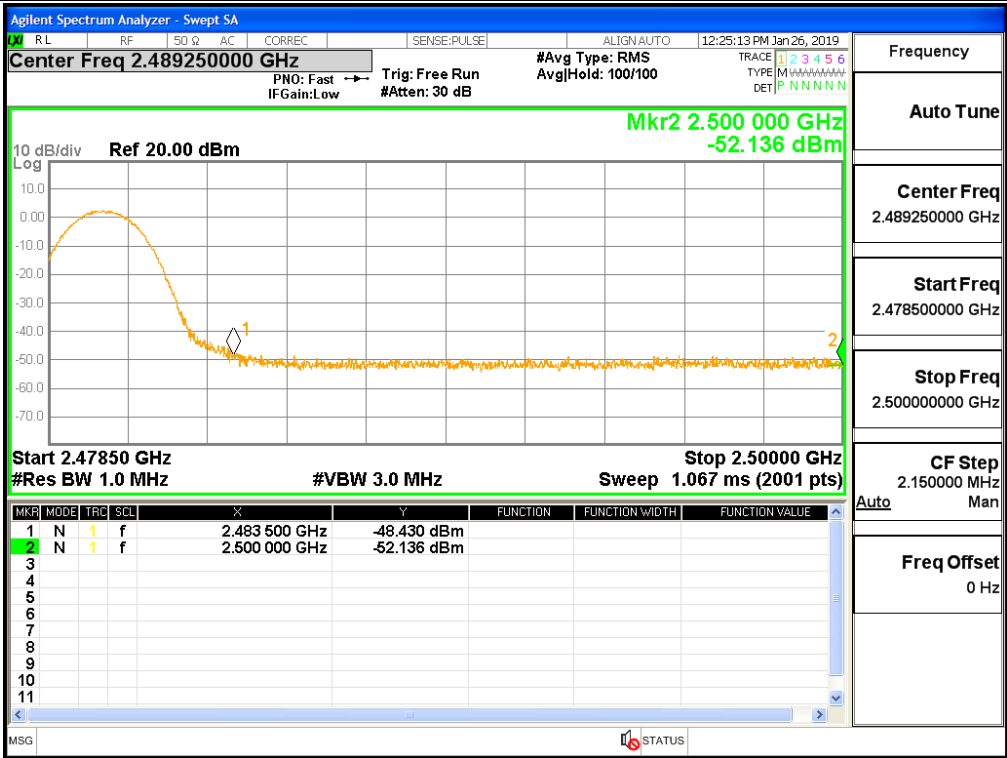
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

