

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

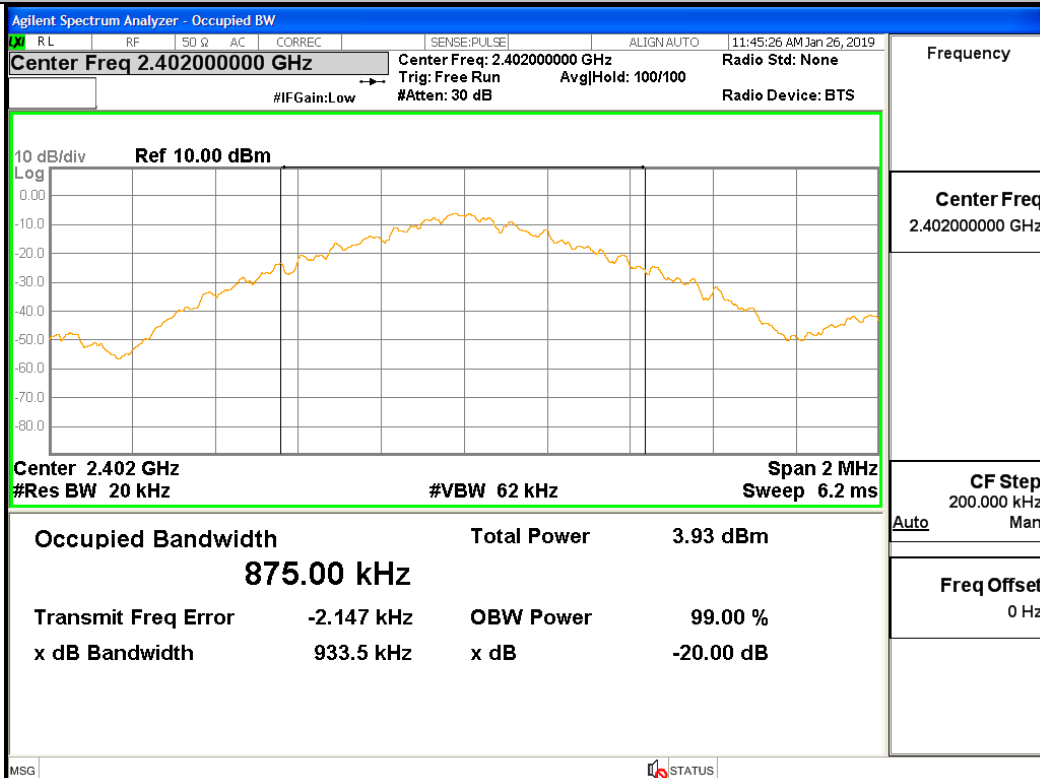
A.1 20 dB Bandwidth

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

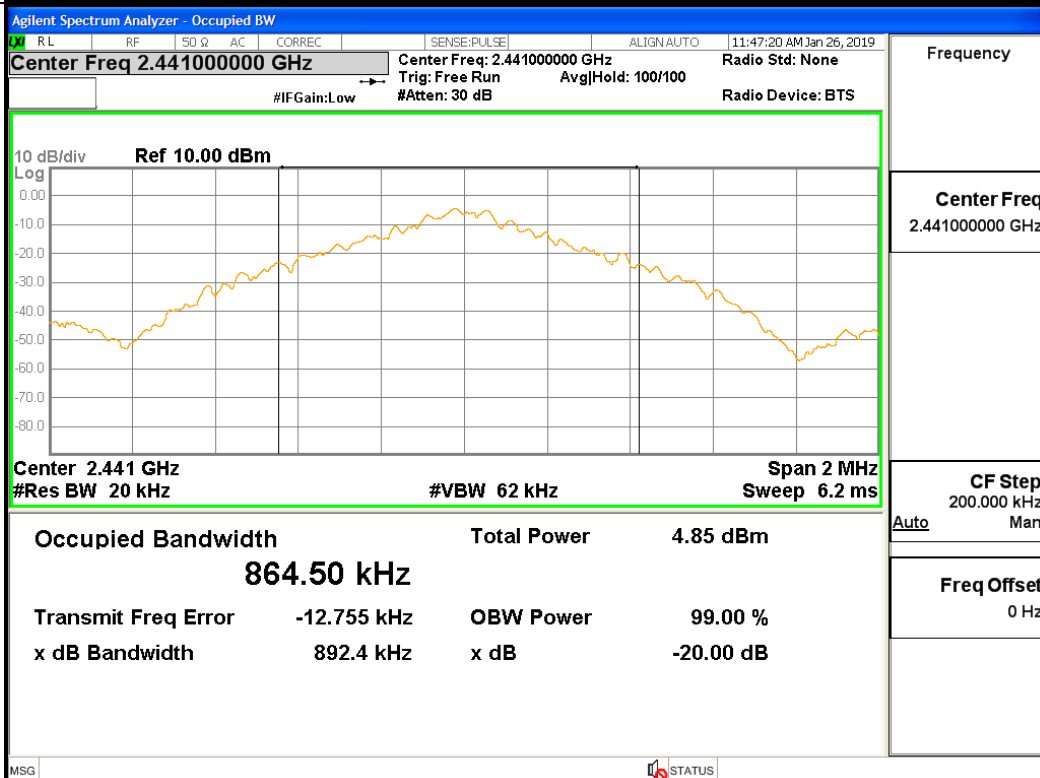
Test Graph

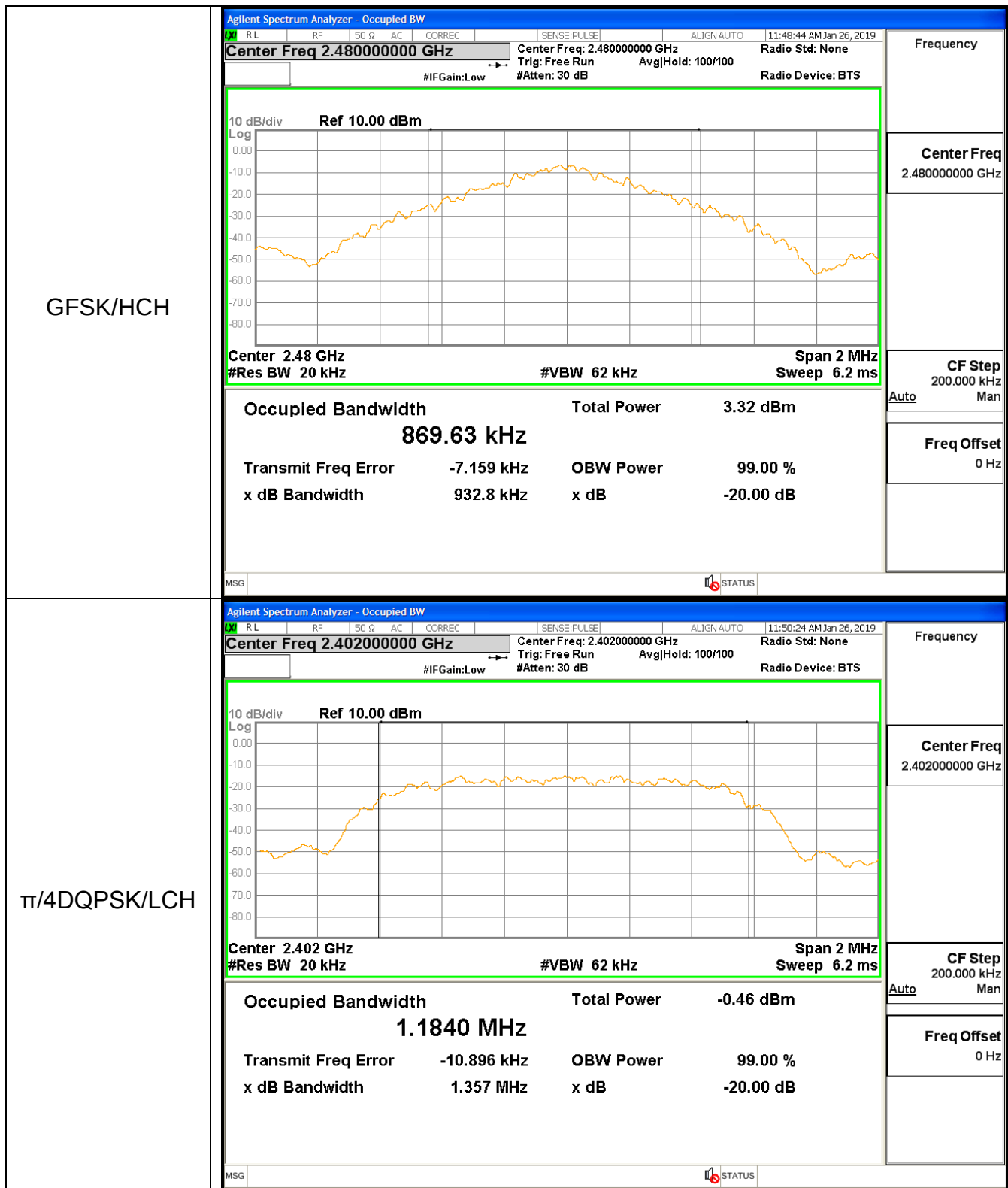
Graphs

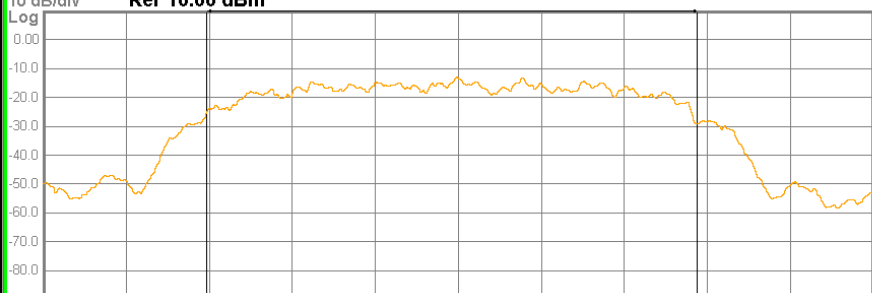
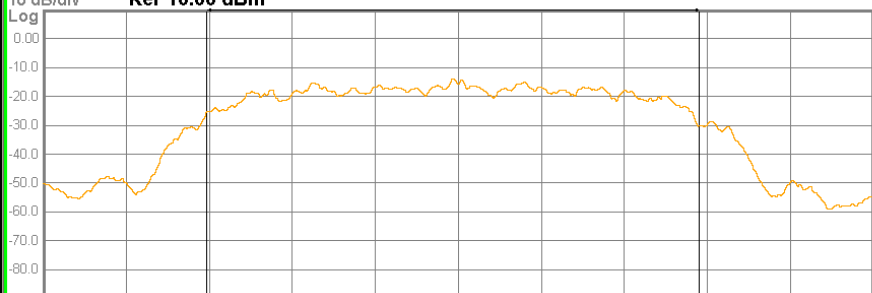
GFSK/LCH



GFSK/MCH





π /4DQPSK/MCH	Agilent Spectrum Analyzer - Occupied BW										Frequency	
	RLRF50 Ω ACCORREC				SENSE:PULSE		ALIGN:AUTO		11:52:28 AM Jan 26, 2019		Center Freq 2.441000000 GHz	
	Center Freq 2.441000000 GHz				Center Freq: 2.441000000 GHz		Radio Std: None					
	#IFGain:Low				#Trig: Free Run		Avg/Hold: 100/100		Radio Device: BTS			
												
	Center 2.441 GHz				#Res BW 20 kHz				#VBW 62 kHz		Span 2 MHz	
	Sweep 6.2 ms				Occupied Bandwidth				Total Power		0.39 dBm	
	1.1747 MHz				Transmit Freq Error				-13.464 kHz		OBW Power	
	x dB Bandwidth				1.343 MHz				x dB		-20.00 dB	
	MSG				STATUS							
π /4DQPSK/HCH	Agilent Spectrum Analyzer - Occupied BW										Frequency	
	RLRF50 Ω ACCORREC				SENSE:PULSE		ALIGN:AUTO		11:53:55 AM Jan 26, 2019		Center Freq 2.480000000 GHz	
	Center Freq 2.480000000 GHz				Center Freq: 2.480000000 GHz		Radio Std: None					
	#IFGain:Low				#Trig: Free Run		Avg/Hold: 100/100		Radio Device: BTS			
												
	Center 2.48 GHz				#Res BW 20 kHz				#VBW 62 kHz		Span 2 MHz	
	Sweep 6.2 ms				Occupied Bandwidth				Total Power		-0.83 dBm	
	1.1802 MHz				Transmit Freq Error				-11.697 kHz		OBW Power	
	x dB Bandwidth				1.334 MHz				x dB		-20.00 dB	
	MSG				STATUS							

Center Freq 2.480000000 GHz

Center Freq: 2.480000000 GHz

Radio Std: None

#IFGain:Low

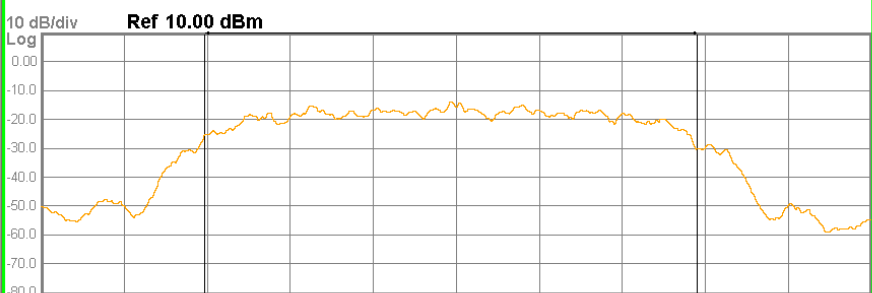
Trig: Free Run

Avg/Hold: 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

1.1802 MHz

Total Power

-0.83 dBm

Transmit Freq Error

-11.697 kHz

OBW Power

99.00 %

x dB Bandwidth

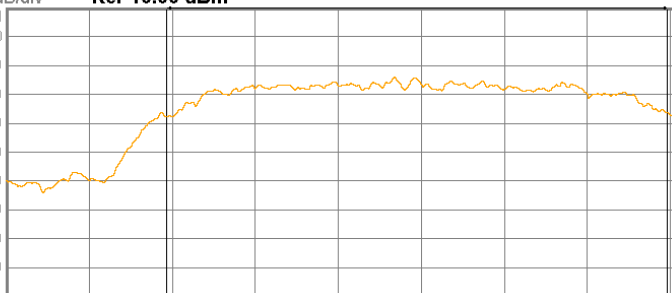
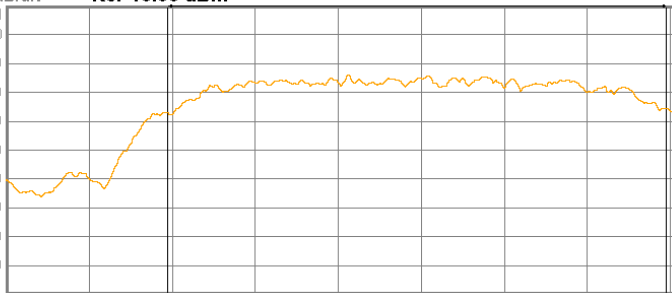
1.334 MHz

x dB

-20.00 dB

MSG

STATUS

8DPSK/LCH	Agilent Spectrum Analyzer - Occupied BW										Frequency	
	RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN:AUTO 11:56:13 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										Center Freq 2.402000000 GHz	
	10 dB/div Ref 10.00 dBm Log 										CF Step 200.000 kHz Auto Man	
	Center 2.402 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms										Freq Offset 0 Hz	
	Occupied Bandwidth 1.2028 MHz Total Power -0.36 dBm Transmit Freq Error -10.511 kHz OBW Power 99.00 % x dB Bandwidth 1.343 MHz x dB -20.00 dB											
MSG STATUS												
8DPSK/MCH	Agilent Spectrum Analyzer - Occupied BW										Frequency	
	RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN:AUTO 11:58:13 AM Jan 26, 2019 Center Freq 2.441000000 GHz Center Freq: 2.441000000 GHz Radio Std: None #IFGain:Low #Atten: 30 dB AvgHold: 100/100 Radio Device: BTS										Center Freq 2.441000000 GHz	
	10 dB/div Ref 10.00 dBm Log 										CF Step 200.000 kHz Auto Man	
	Center 2.441 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms										Freq Offset 0 Hz	
	Occupied Bandwidth 1.1976 MHz Total Power 0.31 dBm Transmit Freq Error -9.594 kHz OBW Power 99.00 % x dB Bandwidth 1.341 MHz x dB -20.00 dB											
MSG STATUS												

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

Log

Center 2.441 GHz

#Res BW 20 kHz

#VBW 62 kHz

Span 2 MHz

Sweep 6.2 ms

Occupied Bandwidth

1.1976 MHz

Total Power

0.31 dBm

Transmit Freq Error

-9.594 kHz

OBW Power

99.00 %

x dB Bandwidth

1.341 MHz

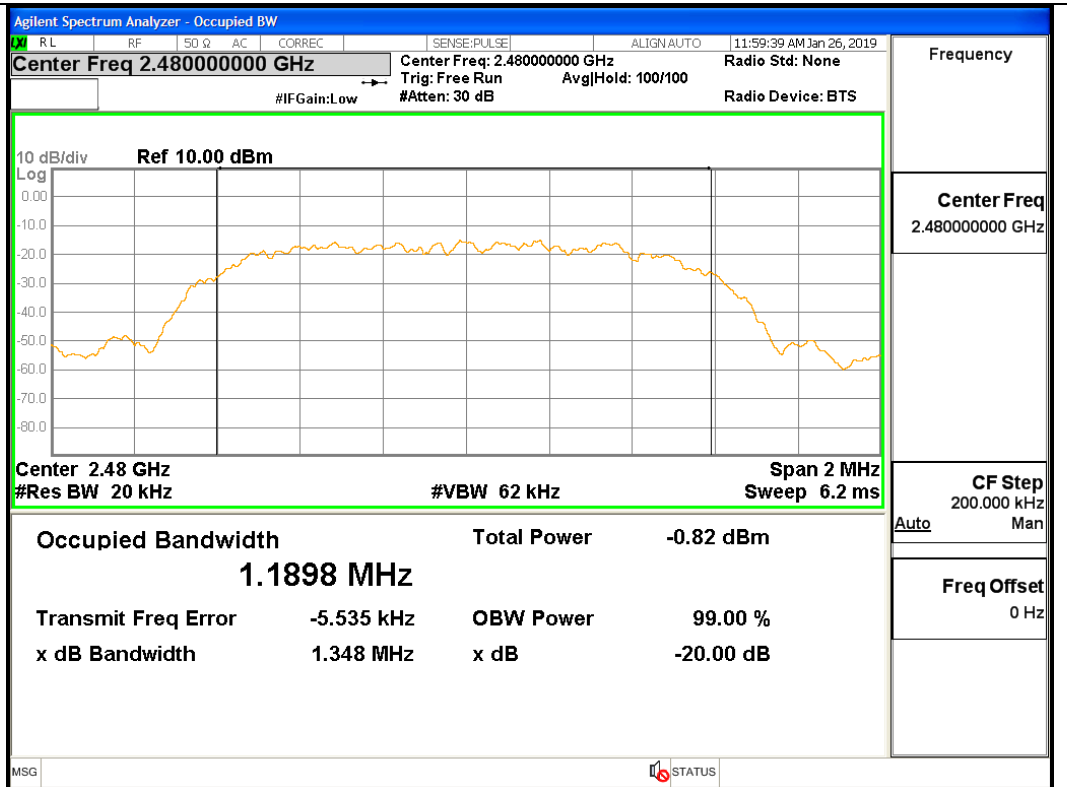
x dB

-20.00 dB

MSG

STATUS

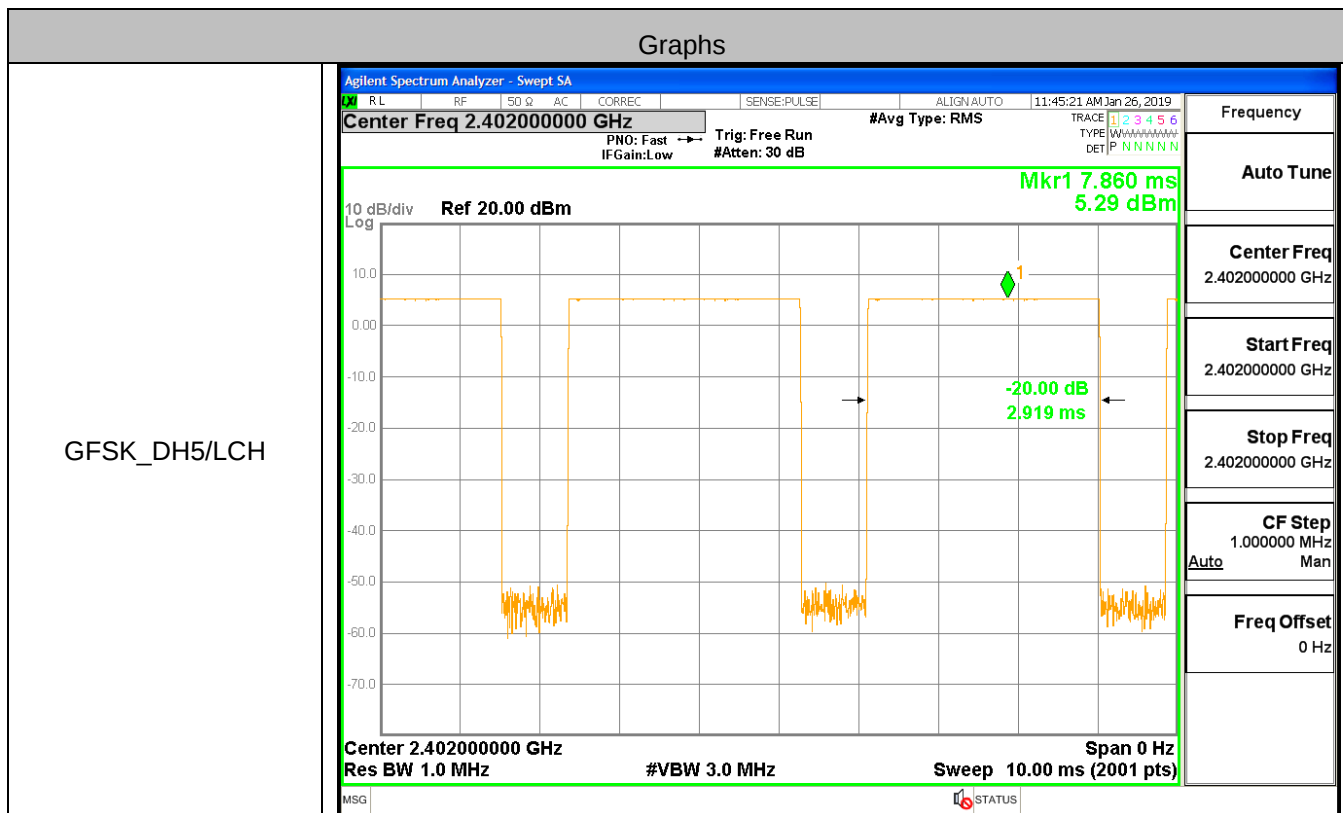
8DPSK/HCH

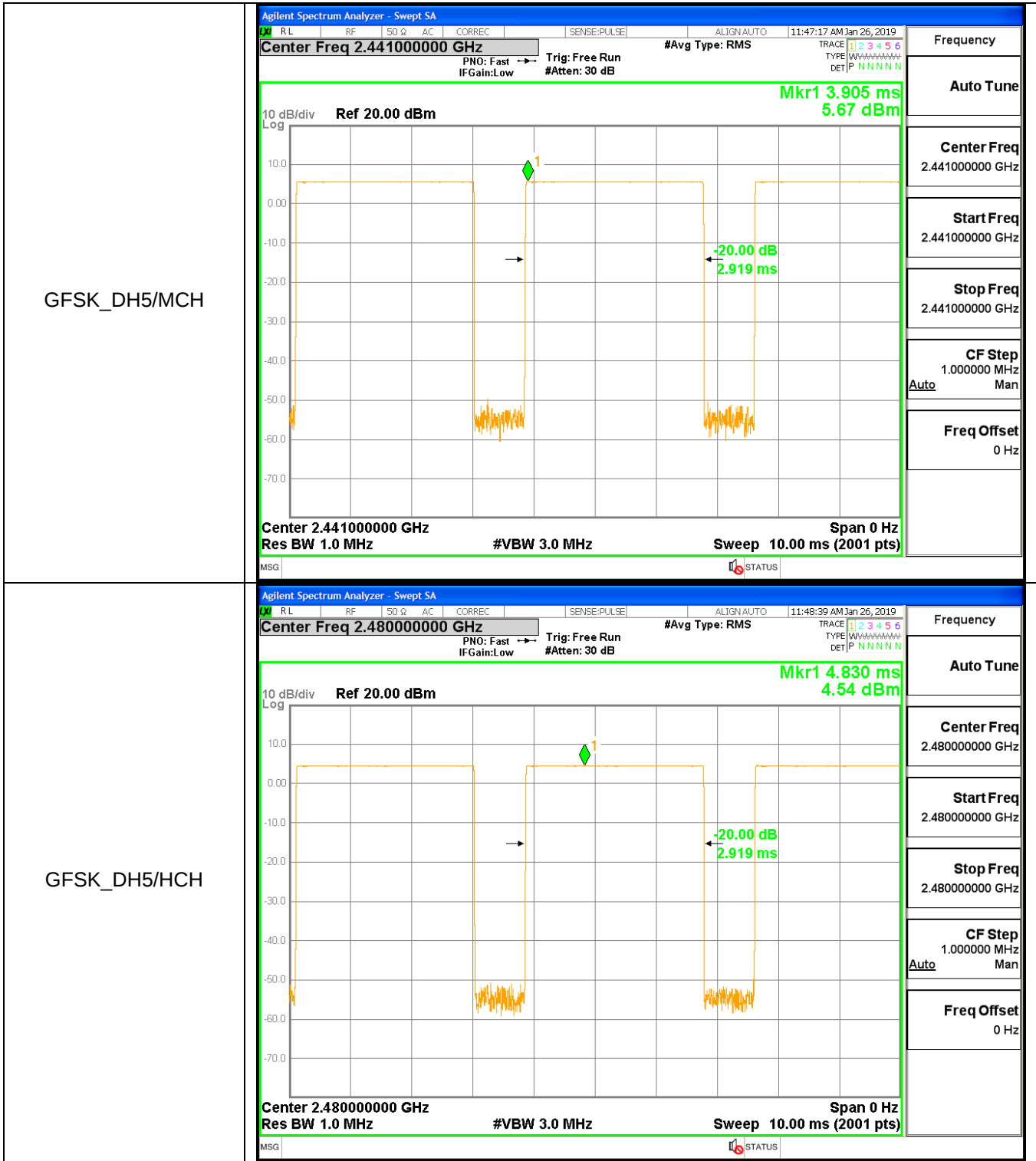


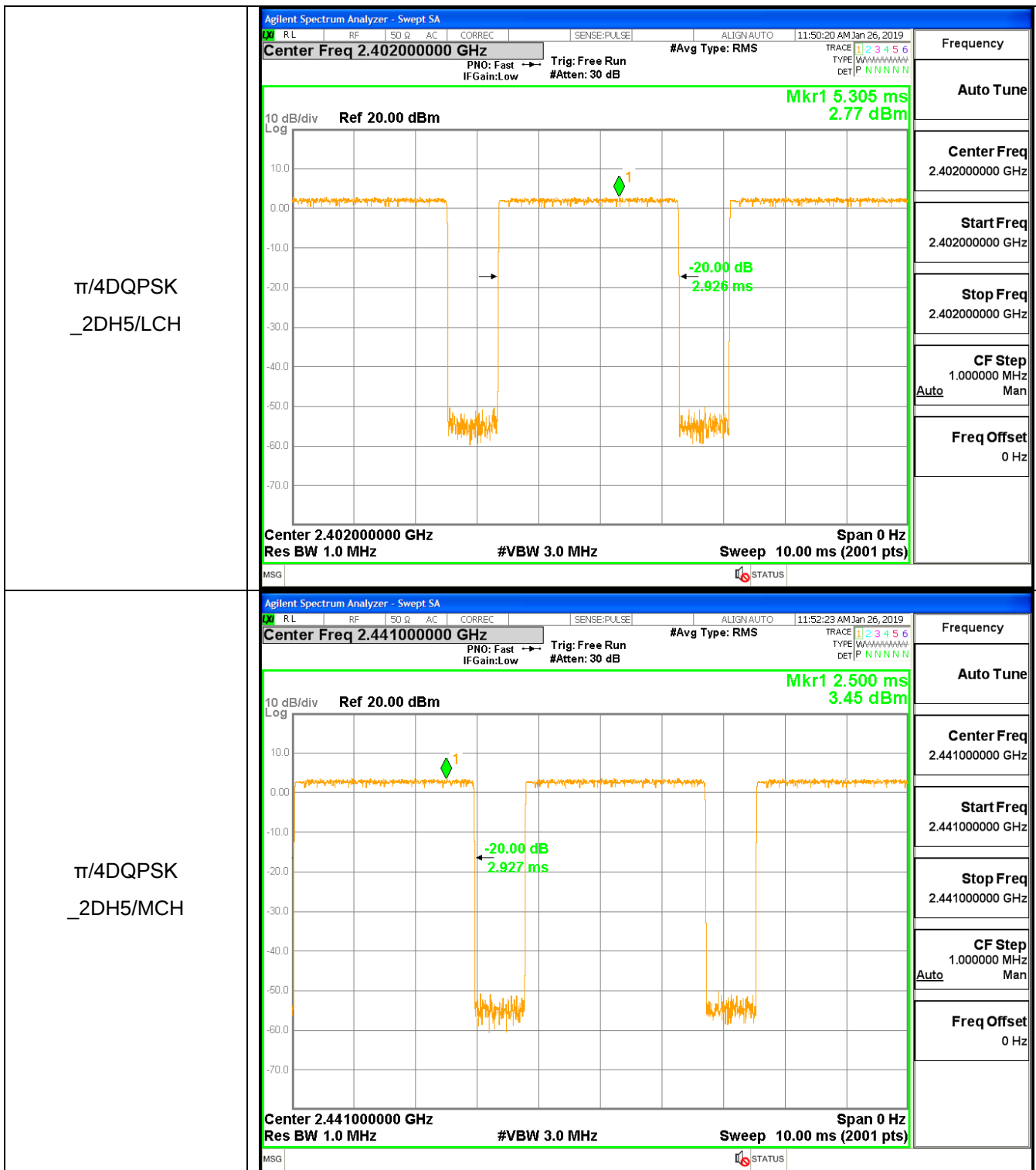
A.2 Dwell Time

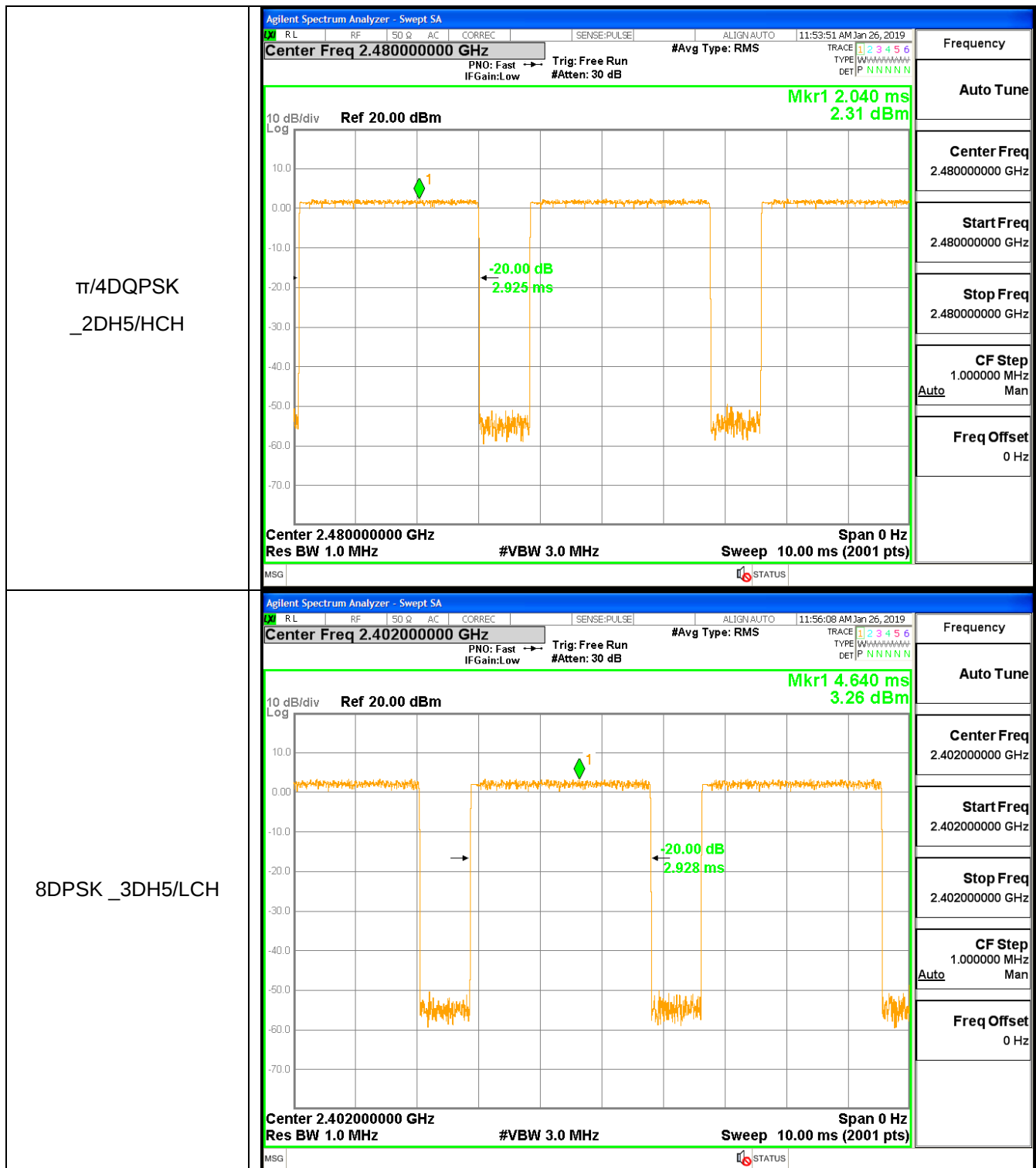
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002919	106.7	0.311464	0.4	PASS
GFSK	DH5	MCH	0.002919	106.7	0.311439	0.4	PASS
GFSK	DH5	HCH	0.002919	106.7	0.311422	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002926	106.7	0.312253	0.4	PASS
$\pi/4$ DQPSK	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

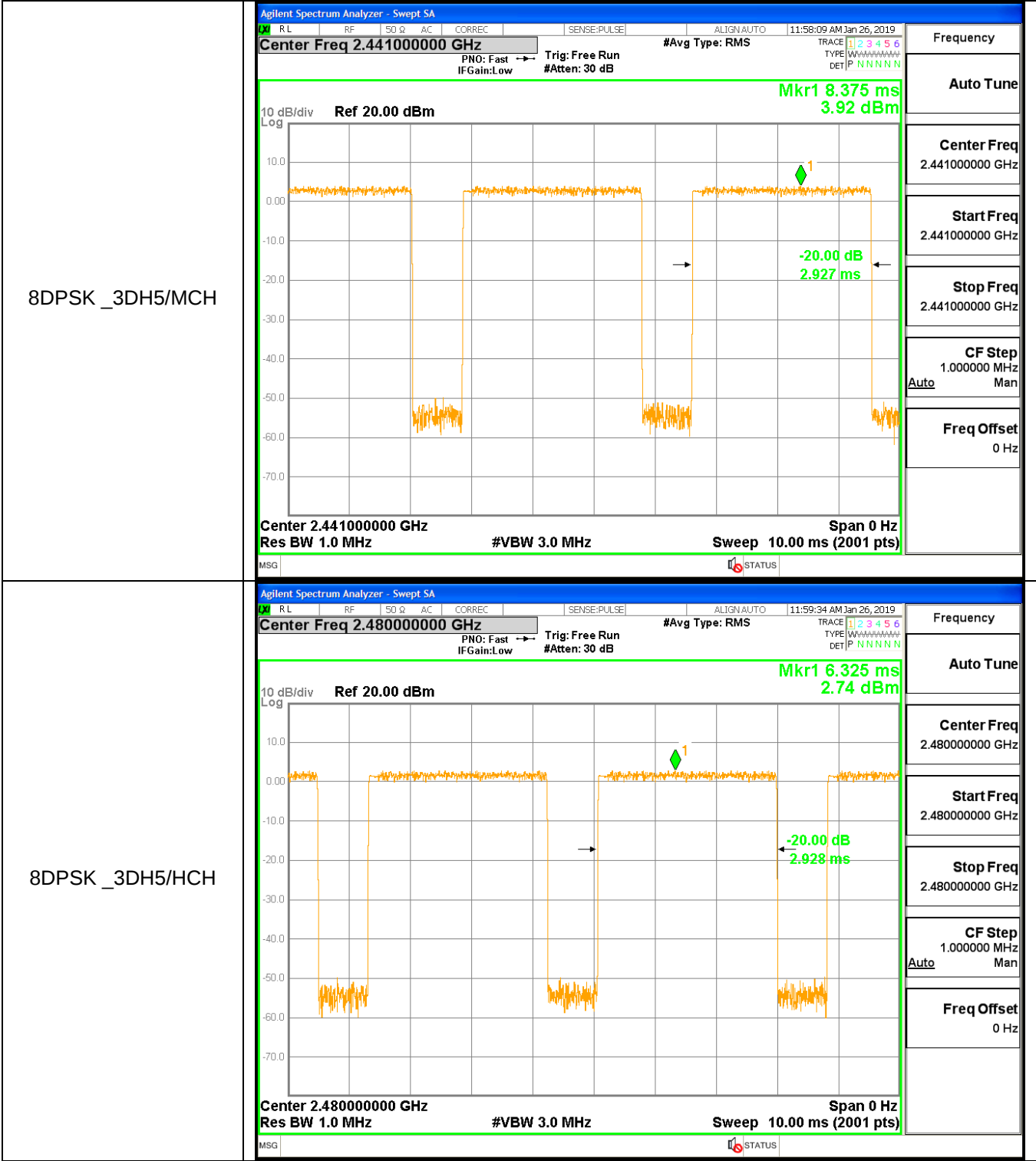
Test Graph









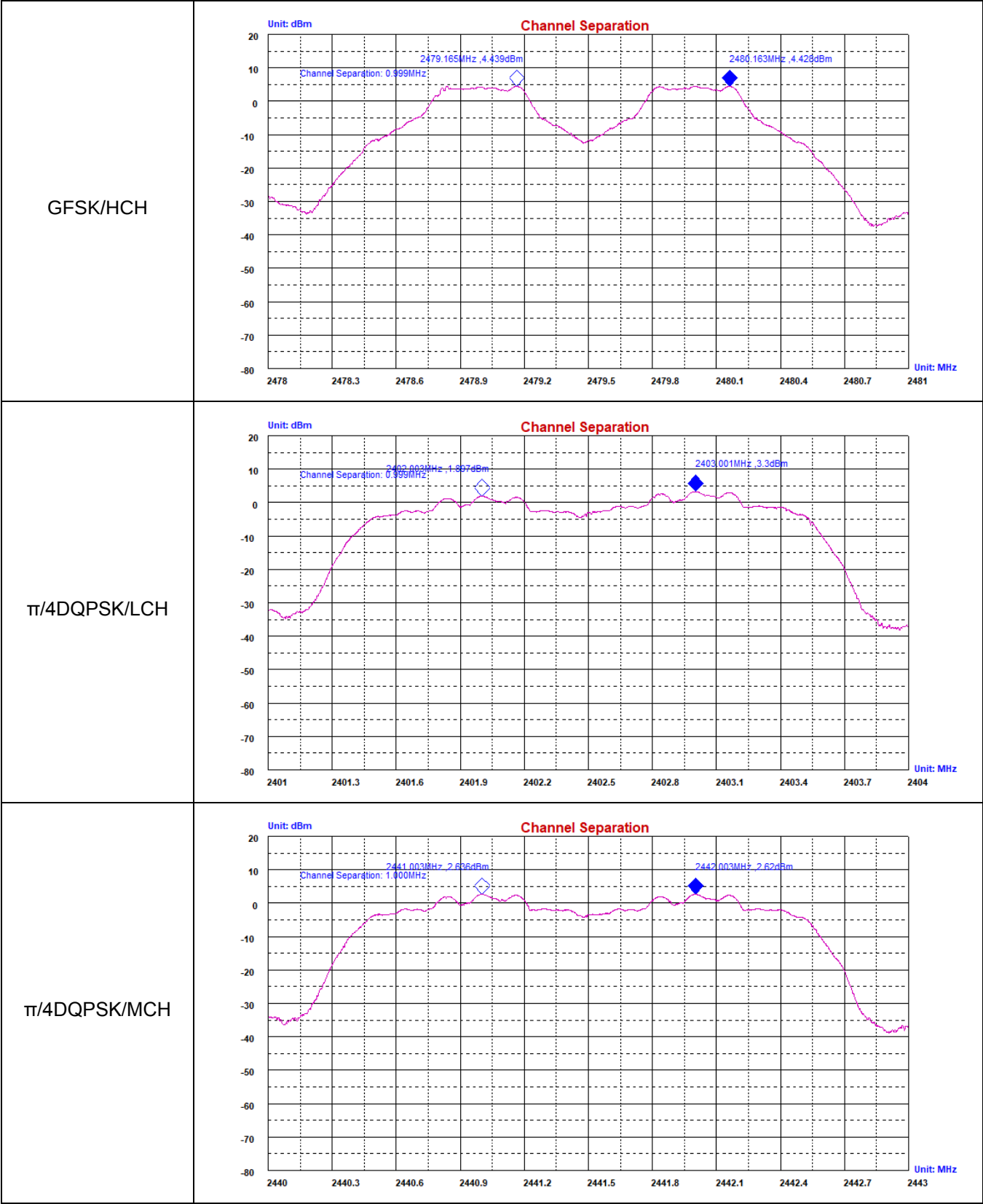


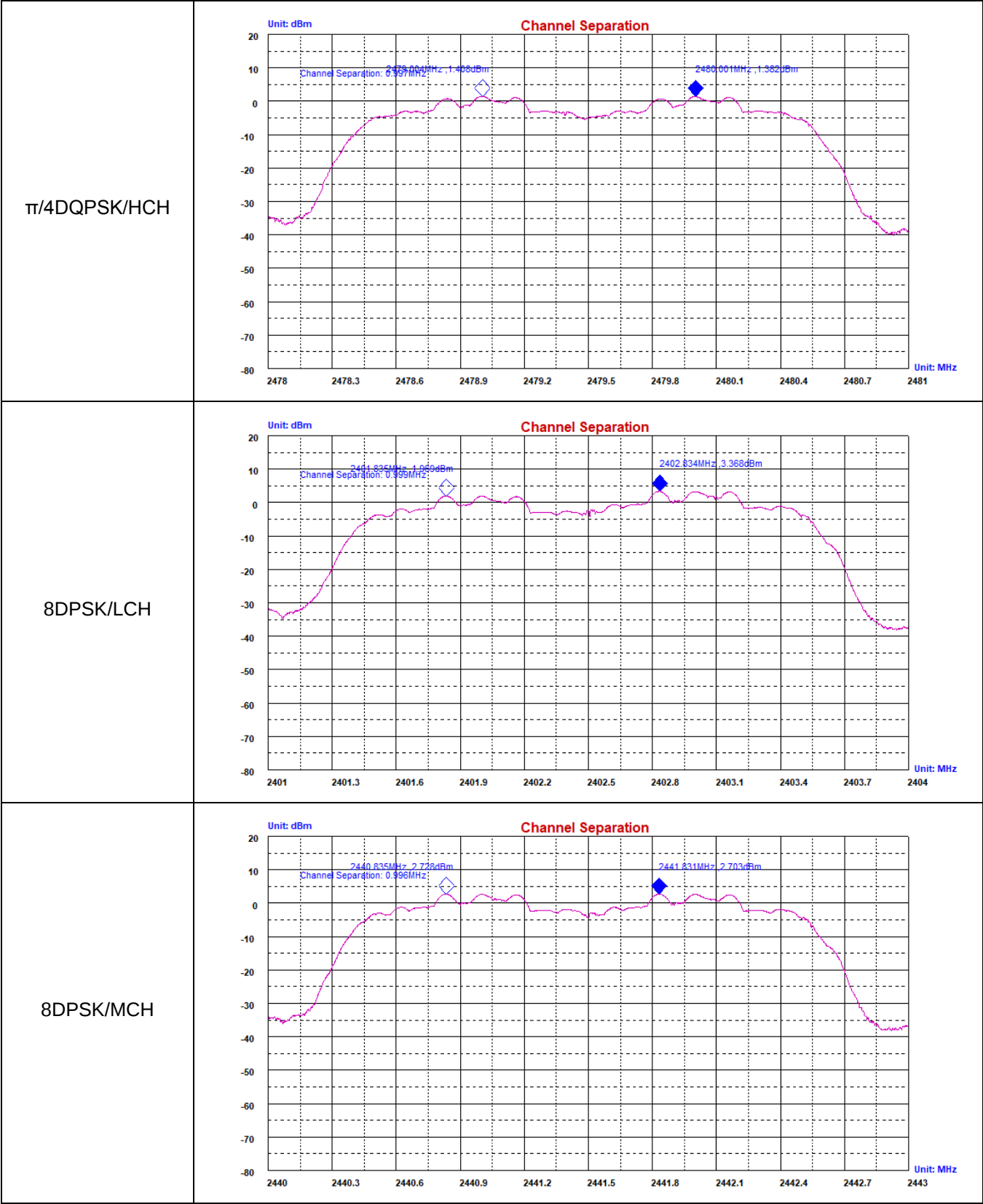
A.3 Carrier Frequency Separation

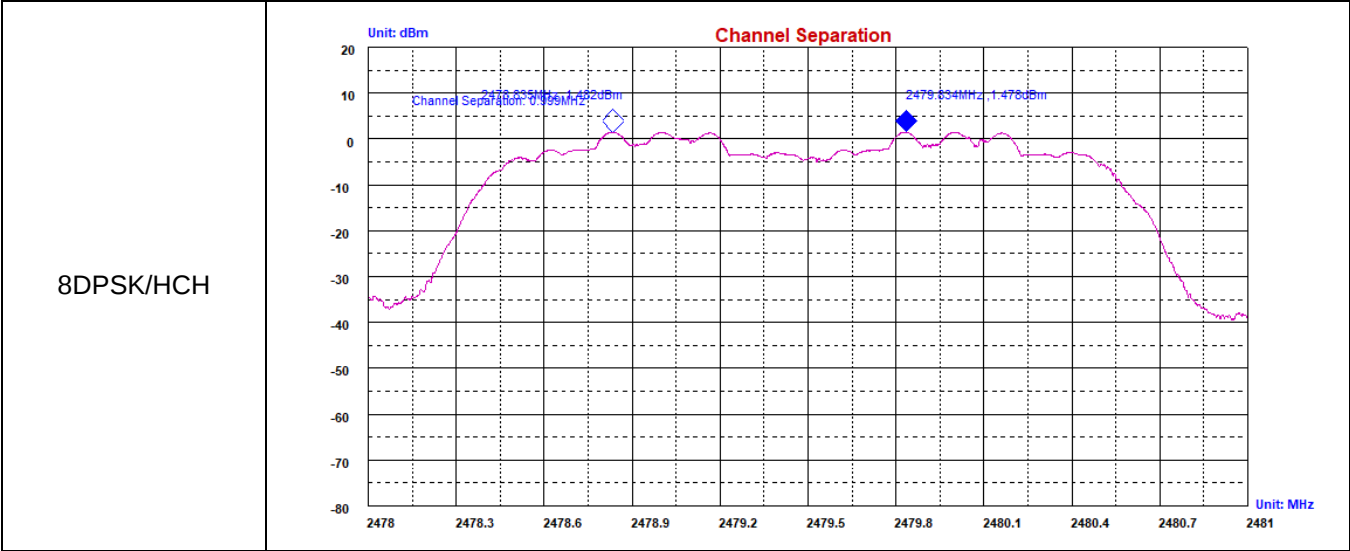
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.000	0.642	PASS
GFSK	MCH	1.001	0.625	PASS
GFSK	HCH	0.999	0.643	PASS
$\pi/4$ DQPSK	LCH	0.999	0.889	PASS
$\pi/4$ DQPSK	MCH	1.000	0.899	PASS
$\pi/4$ DQPSK	HCH	0.997	0.899	PASS
8DPSK	LCH	0.999	0.885	PASS
8DPSK	MCH	0.996	0.896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

Test Graph





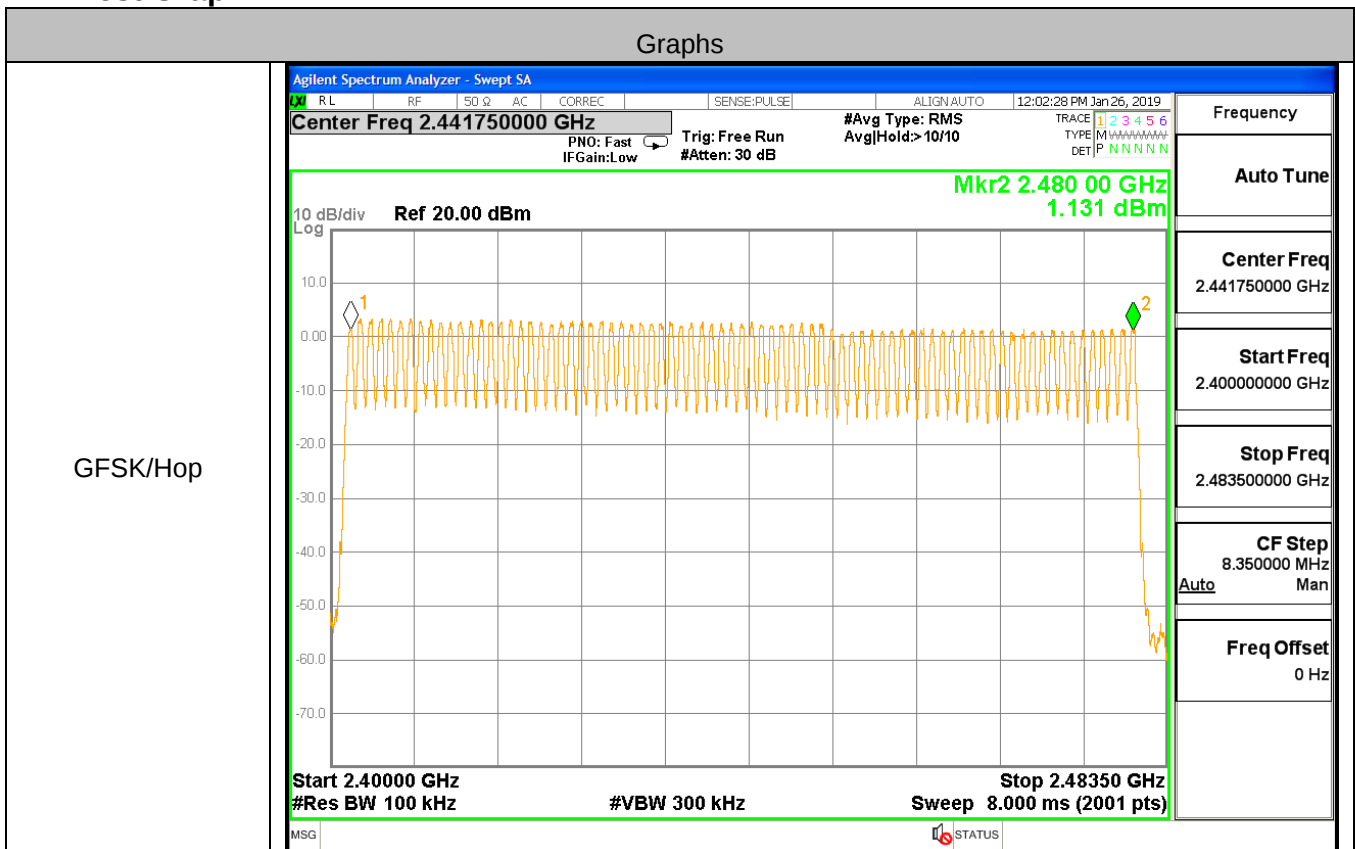


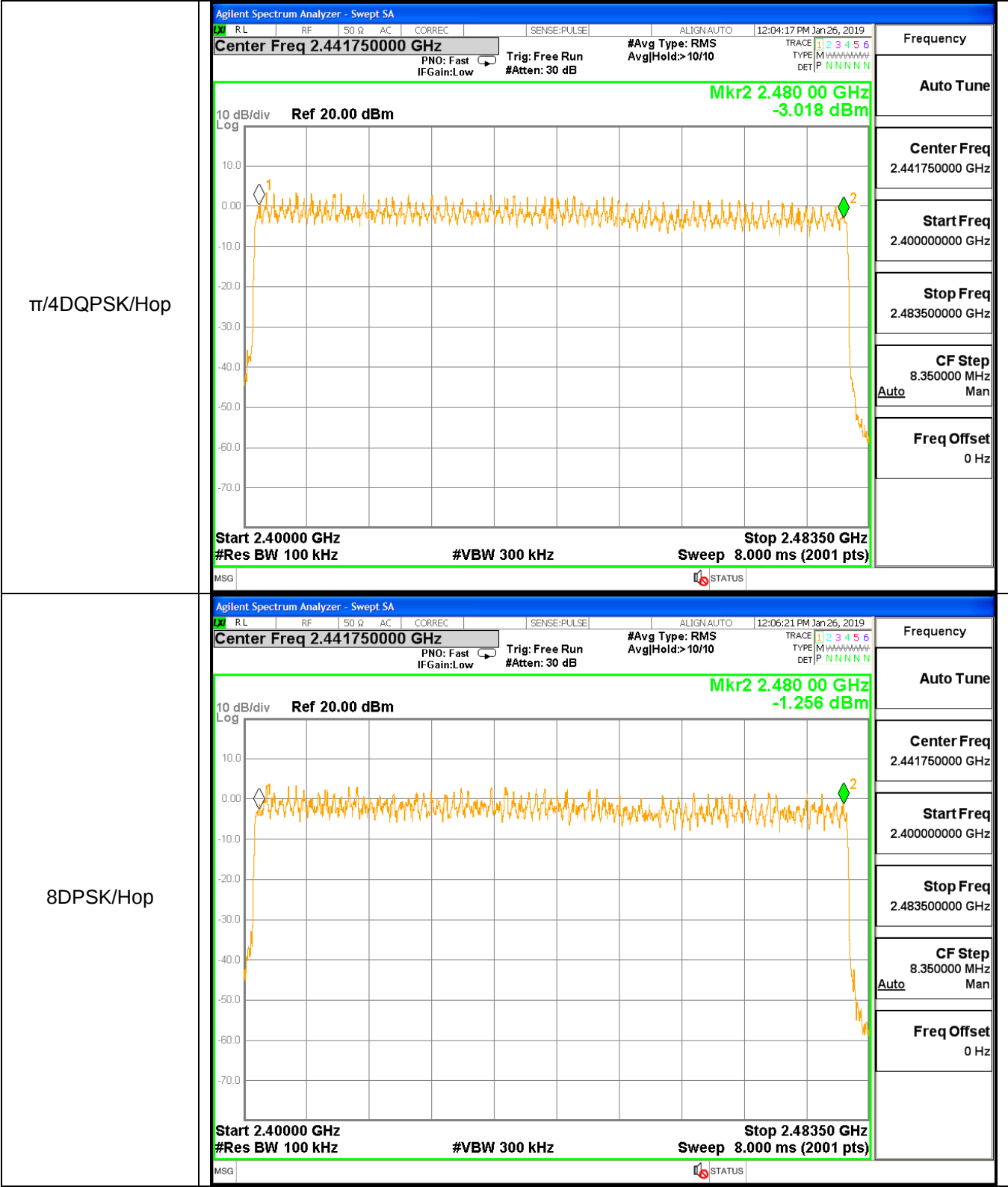


A.4 Hopping Channel Number

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

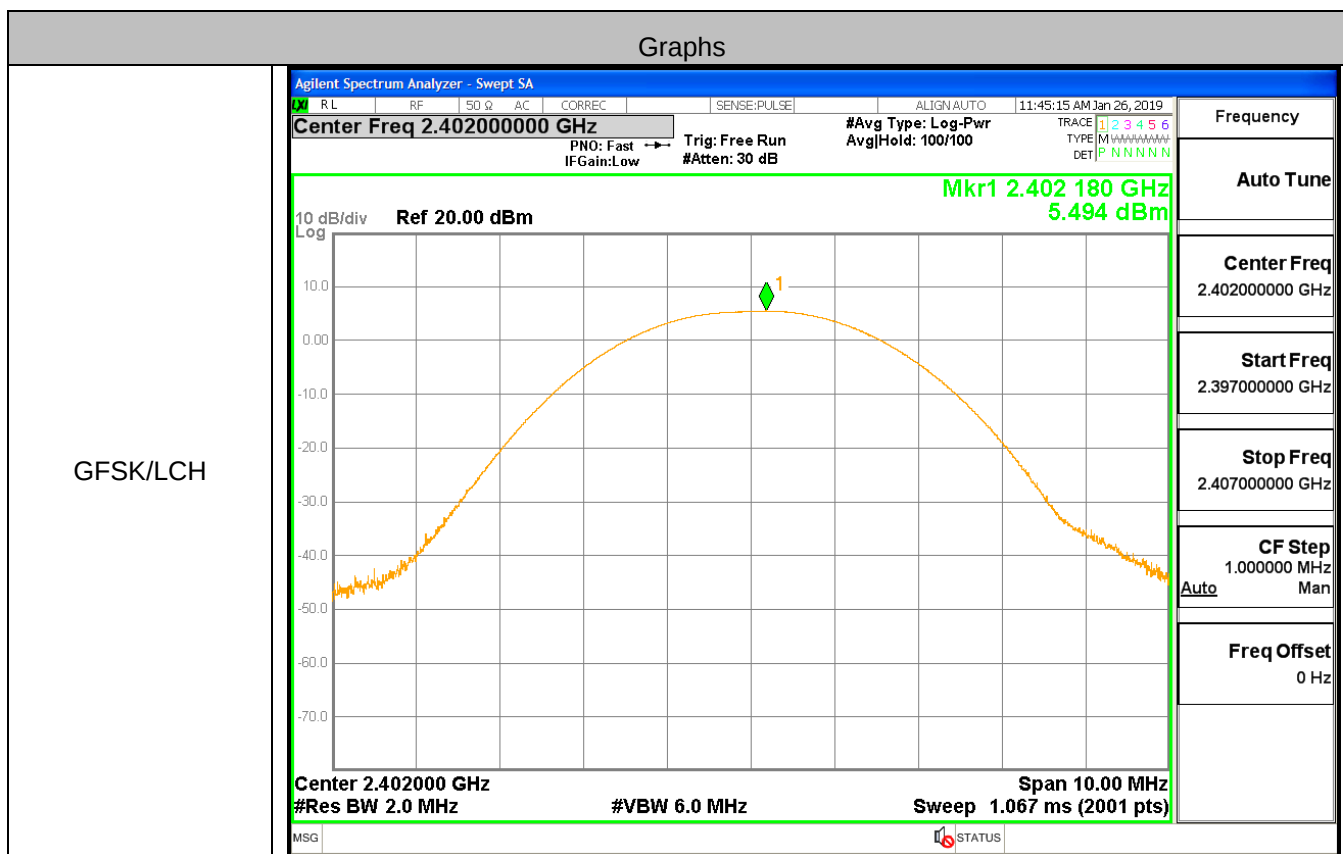


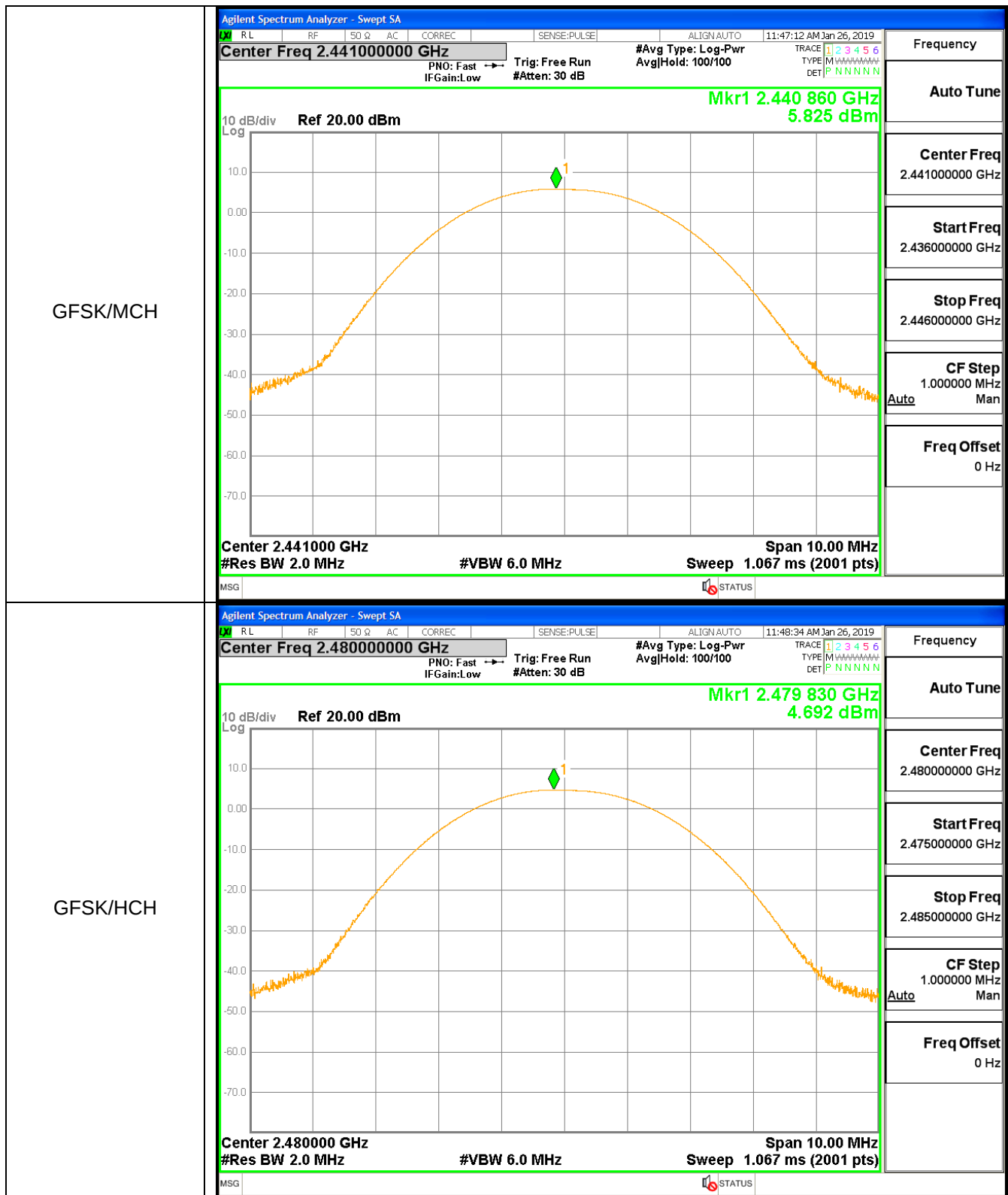


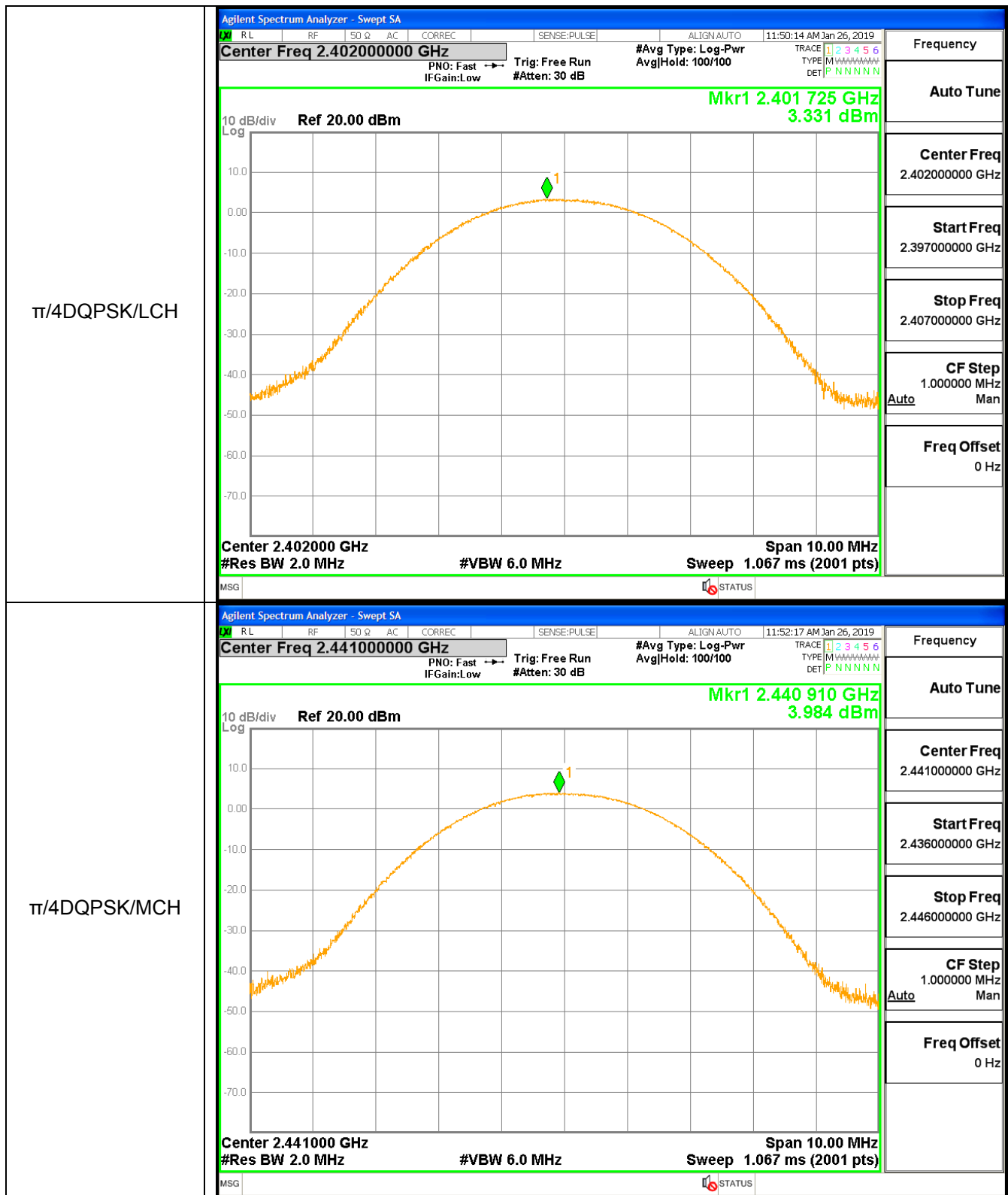
A.5 Conducted Peak Output Power

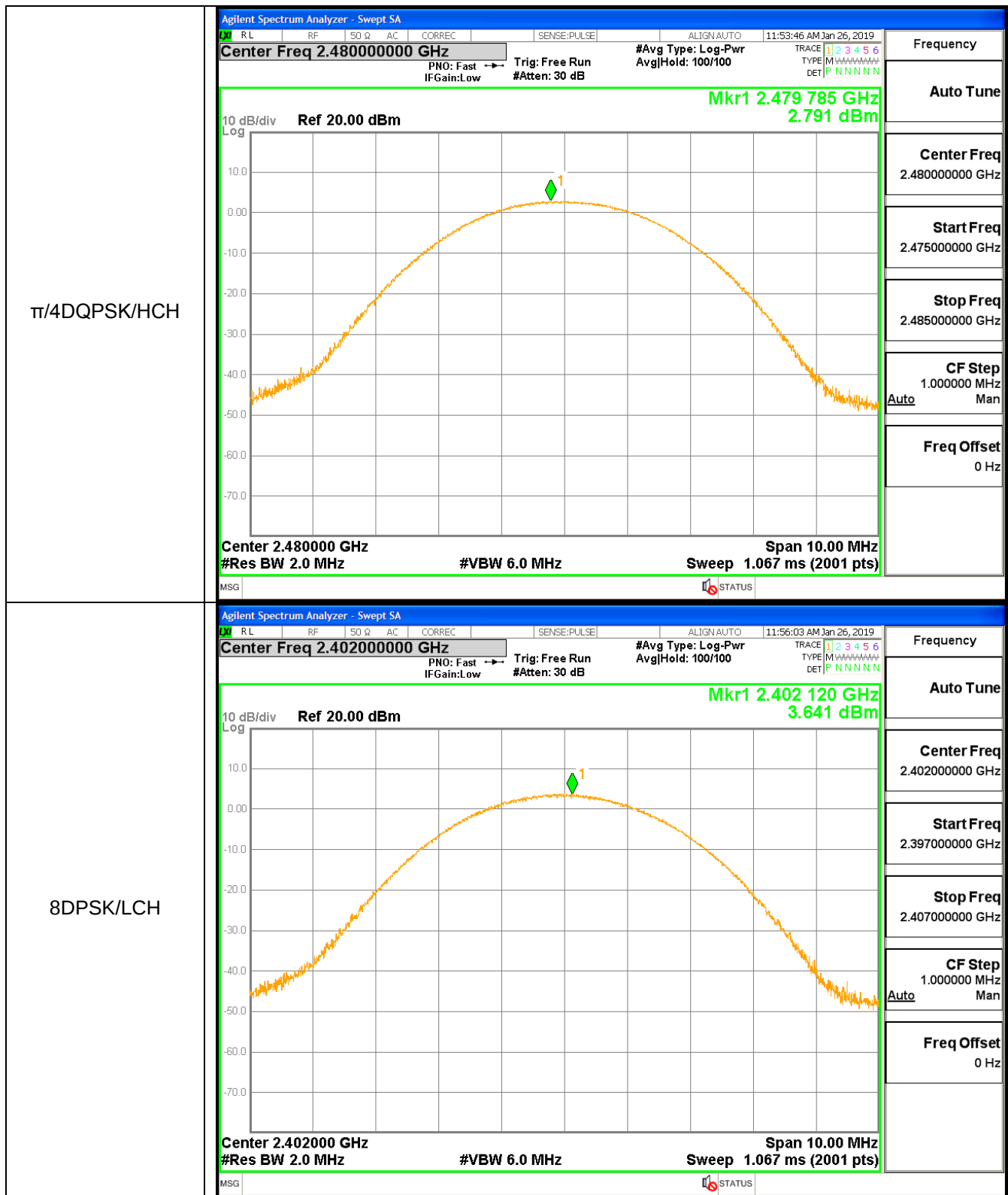
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	5.494	21	PASS
GFSK	MCH	5.825	21	PASS
GFSK	HCH	4.692	21	PASS
$\pi/4$ DQPSK	LCH	3.331	21	PASS
$\pi/4$ DQPSK	MCH	3.984	21	PASS
$\pi/4$ DQPSK	HCH	2.791	21	PASS
8DPSK	LCH	3.641	21	PASS
8DPSK	MCH	4.357	21	PASS
8DPSK	HCH	3.170	21	PASS

Test Graph









Frequency

Auto Tune

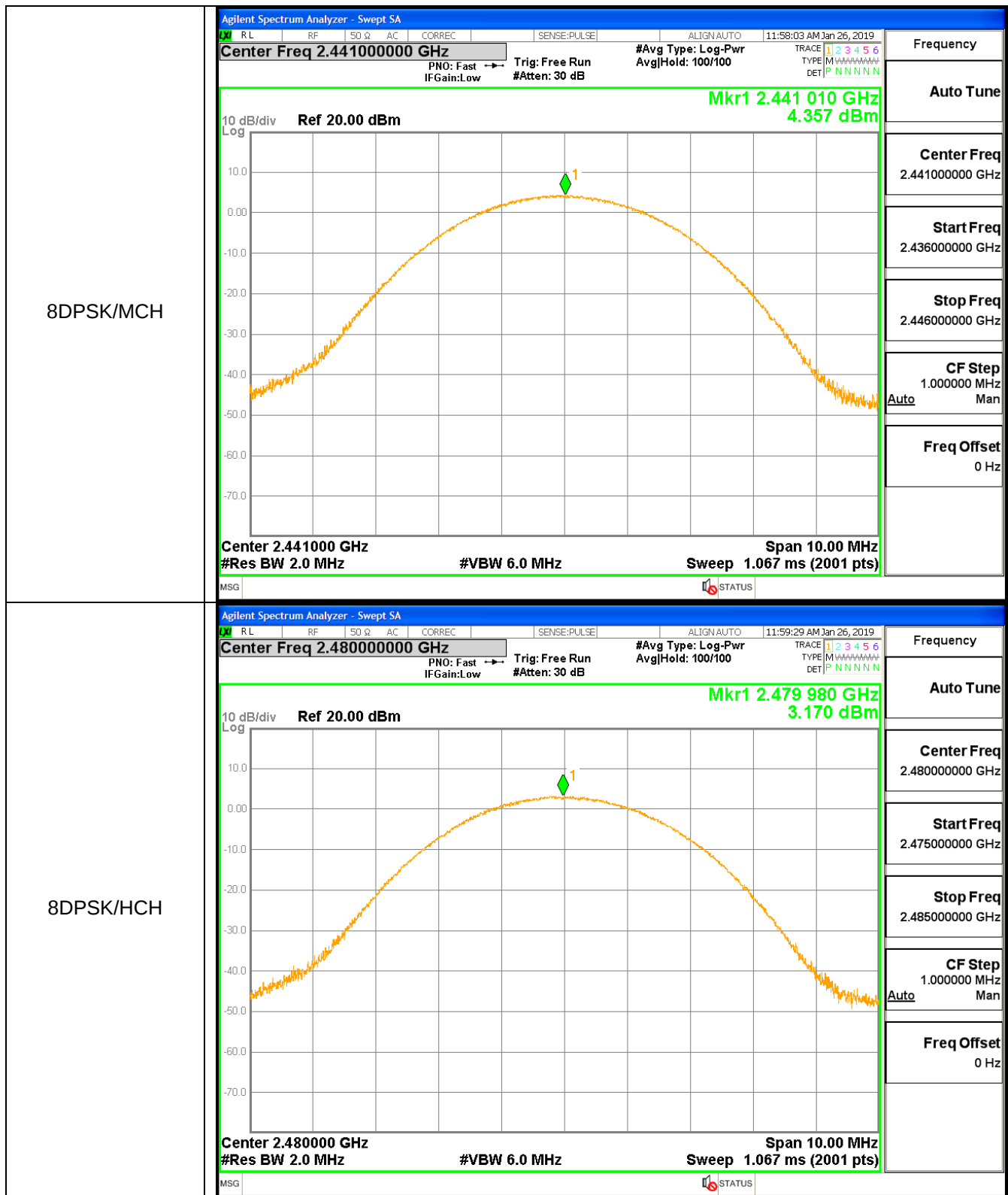
Center Freq
2.480000000 GHz

Start Freq
2.475000000 GHz

Stop Freq
2.485000000 GHz

CF Step
1.000000 MHz
Auto Man

Freq Offset
0 Hz



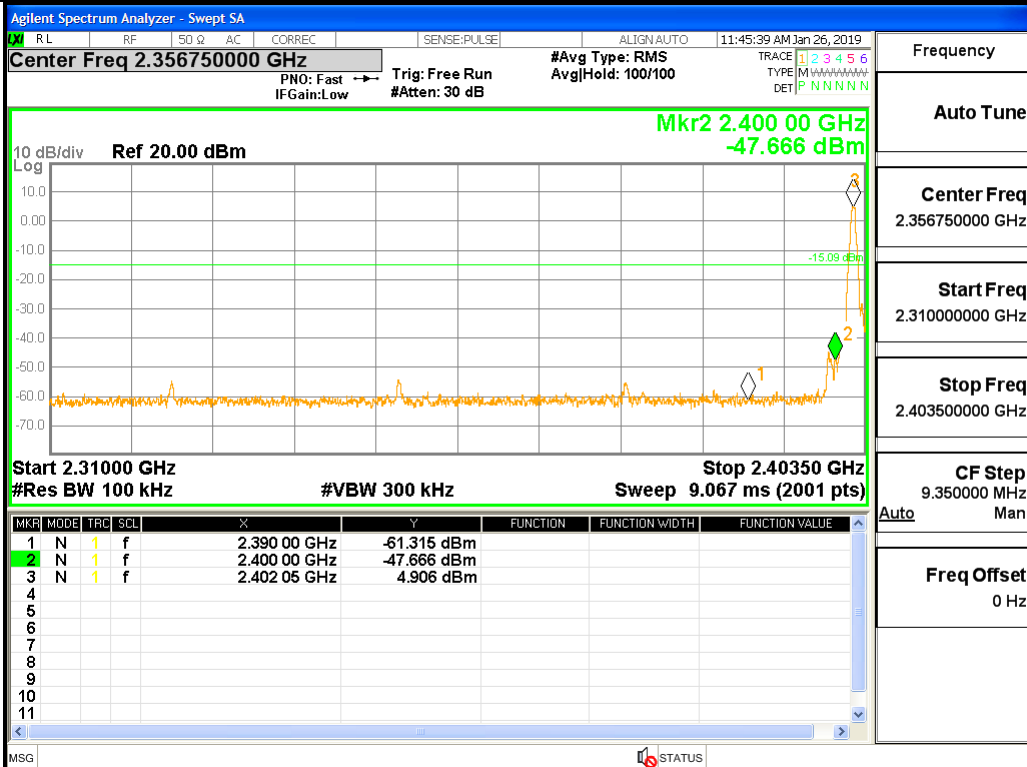
A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2390	4.906	-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

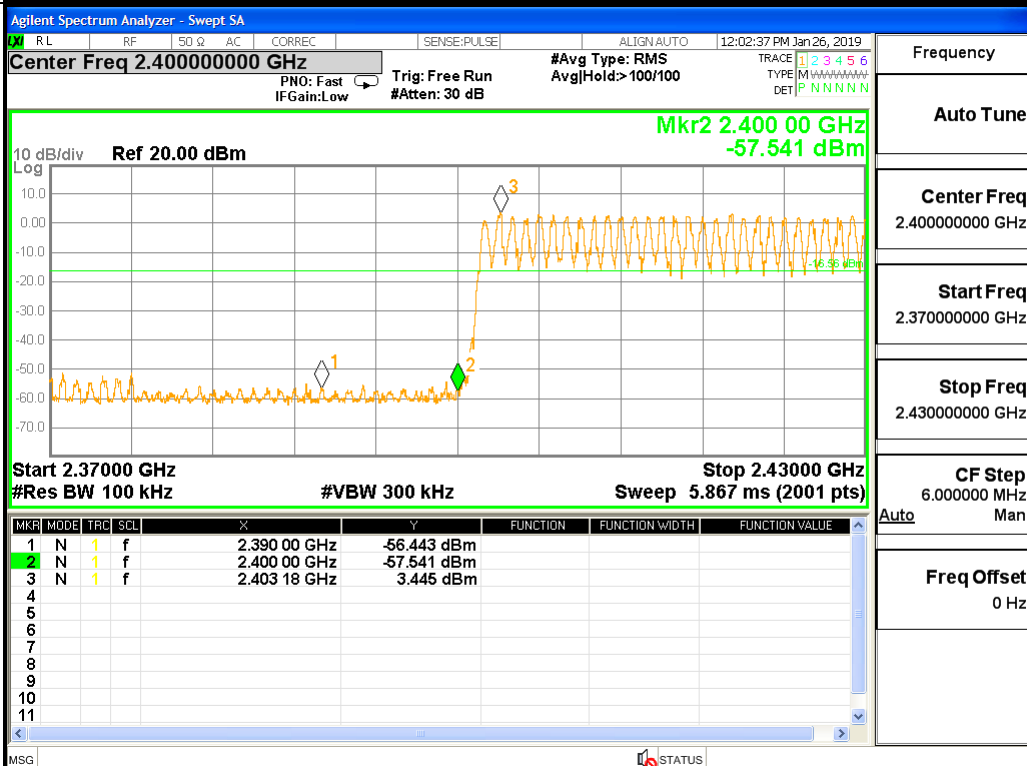
Test Graph

Graphs

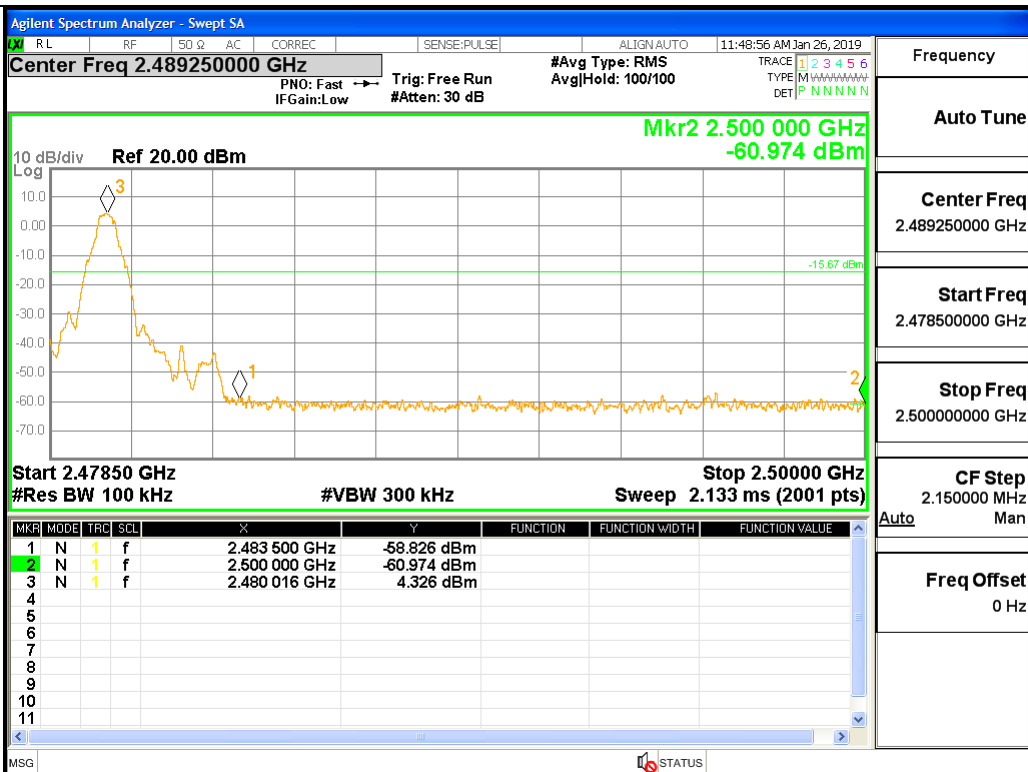
GFSK/LCH/No Hop



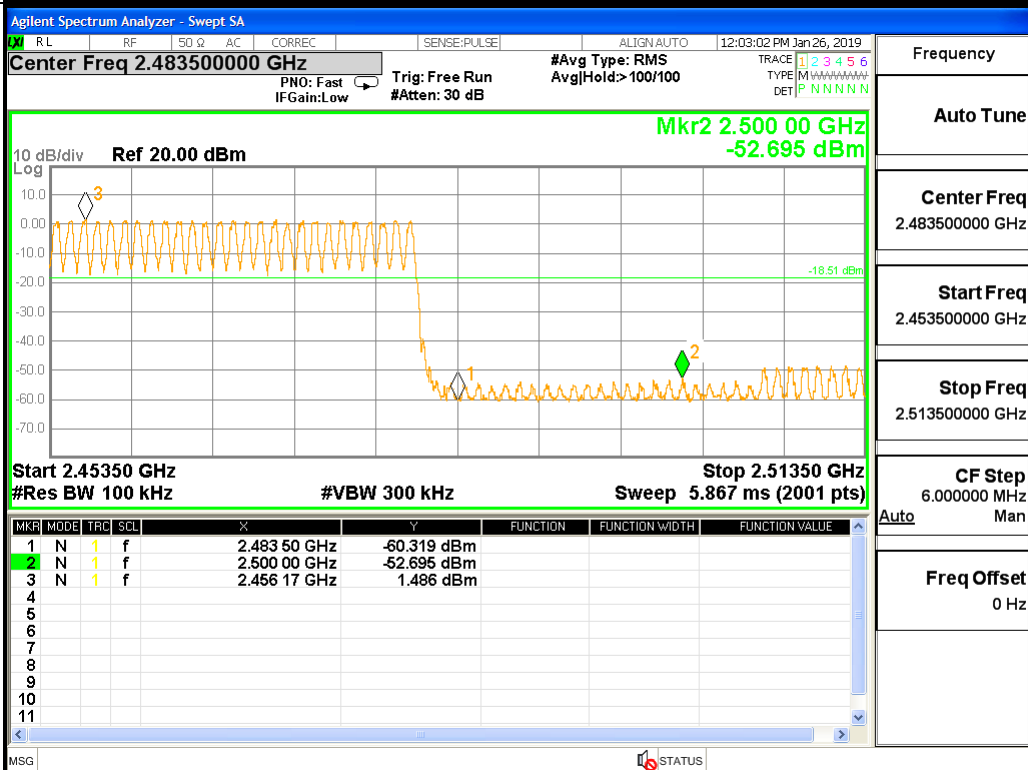
GFSK/LCH/Hop



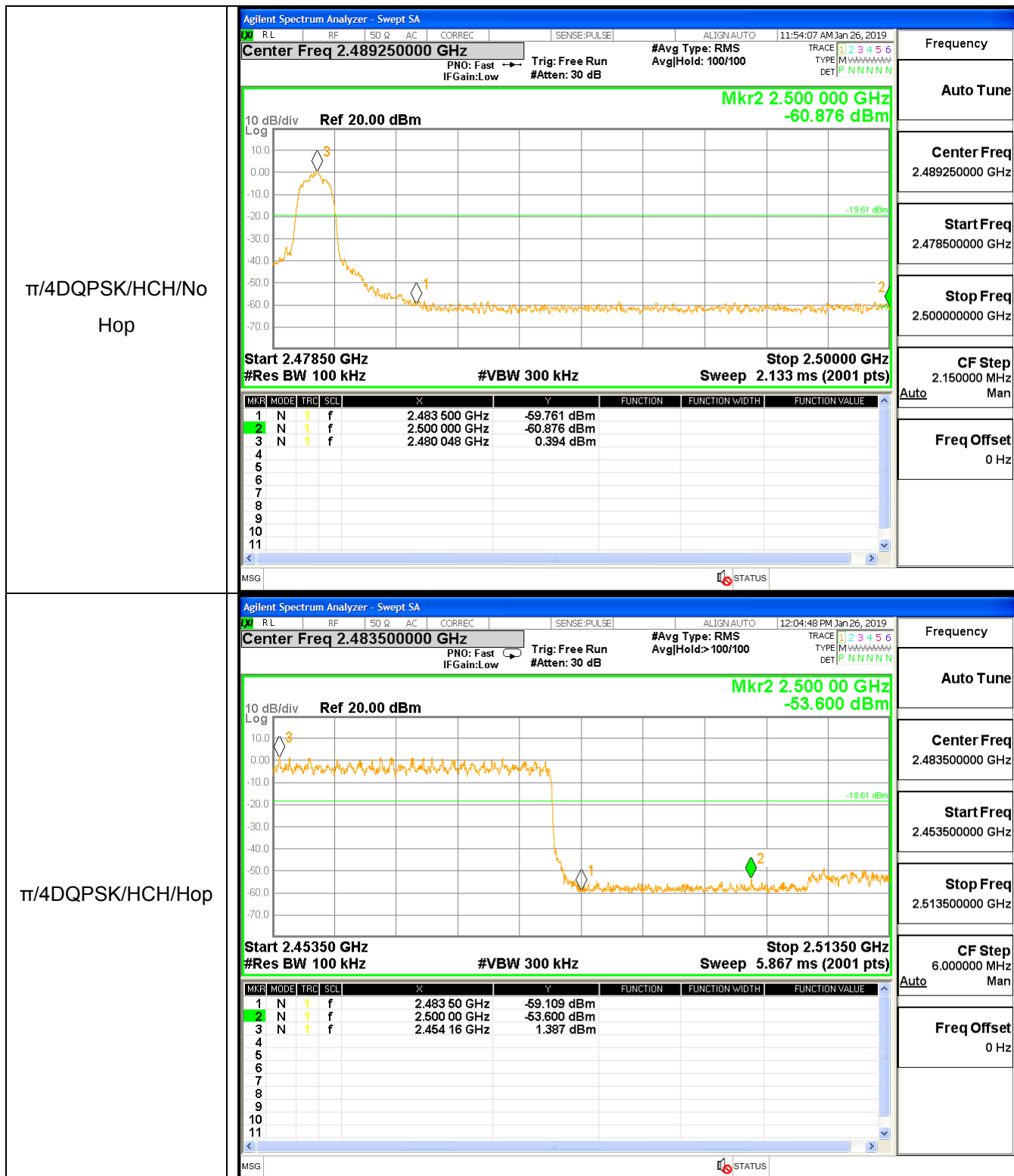
GFSK/HCH/No Hop



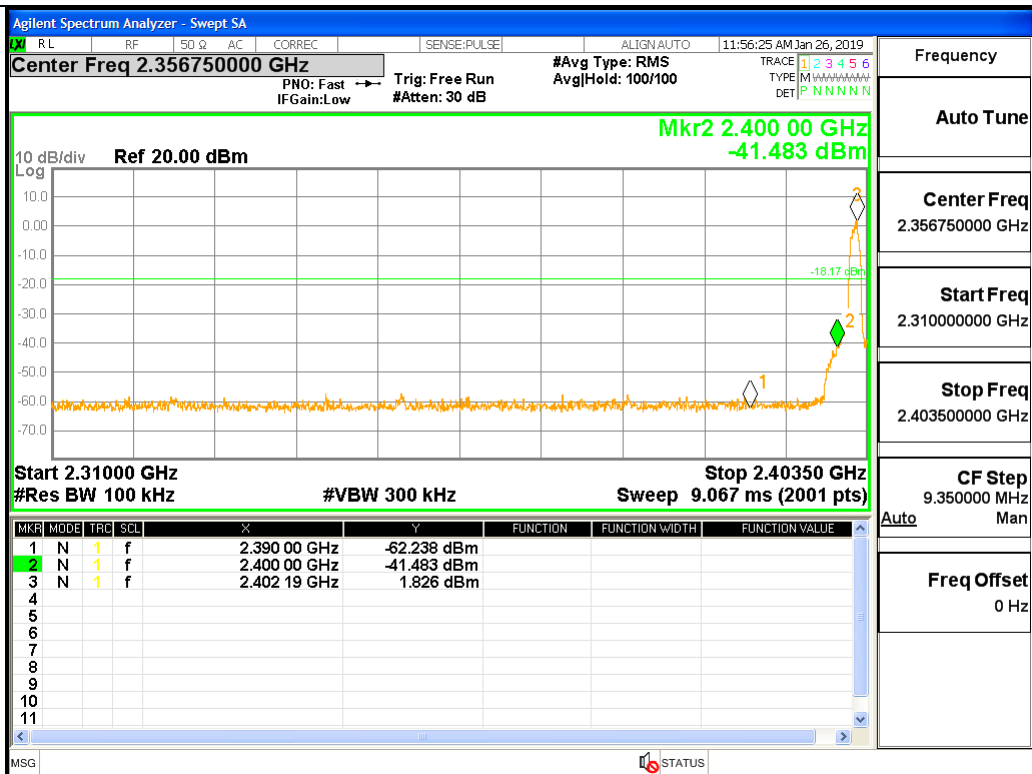
GFSK/HCH/Hop



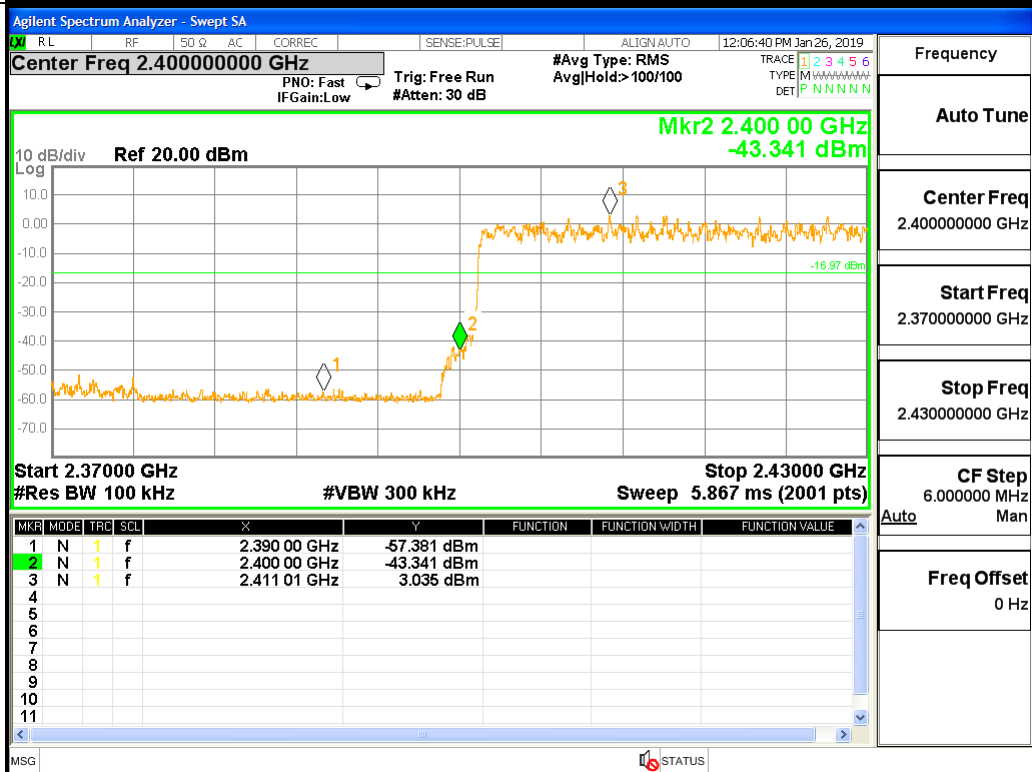


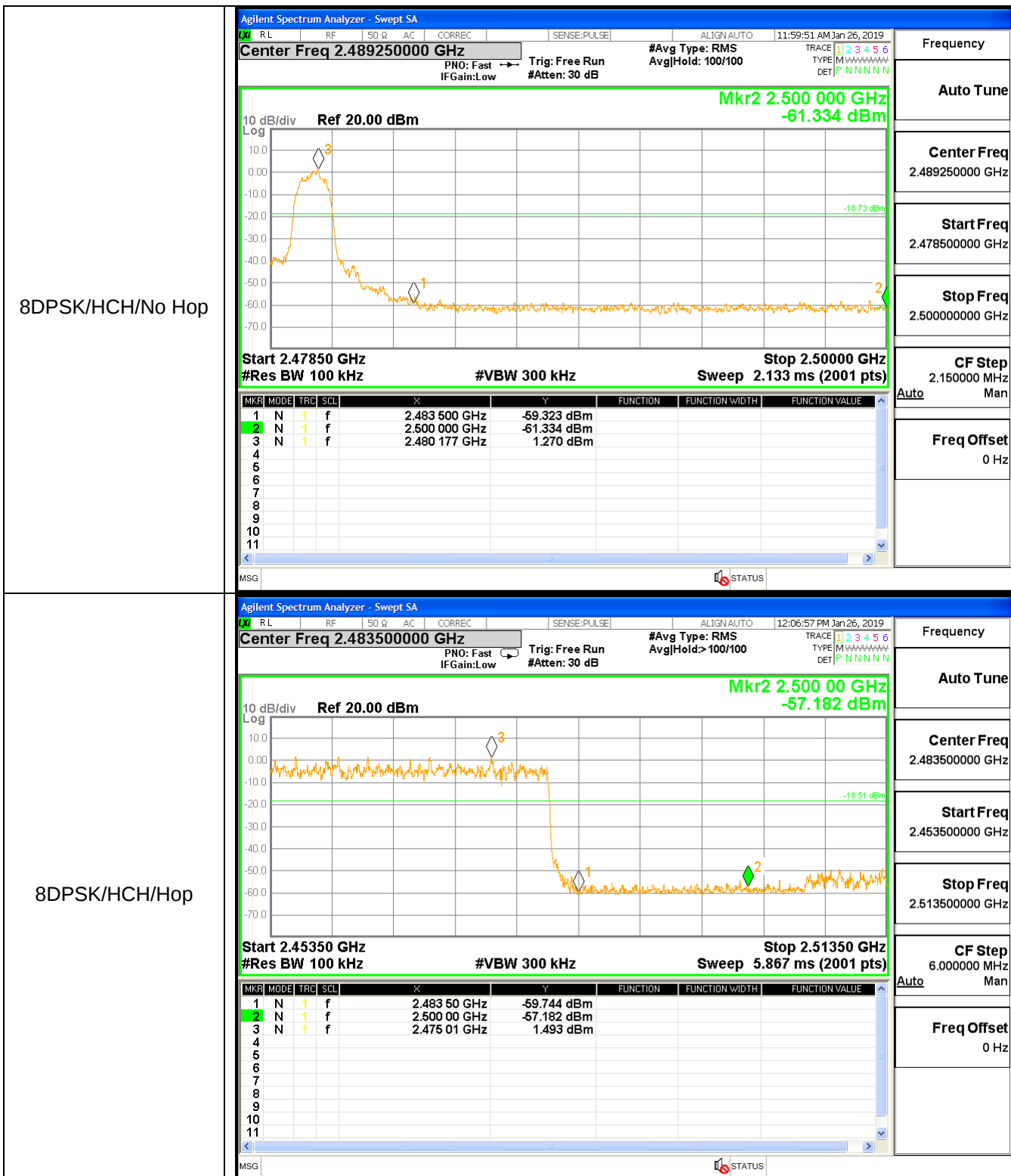


8DPSK/LCH/No Hop

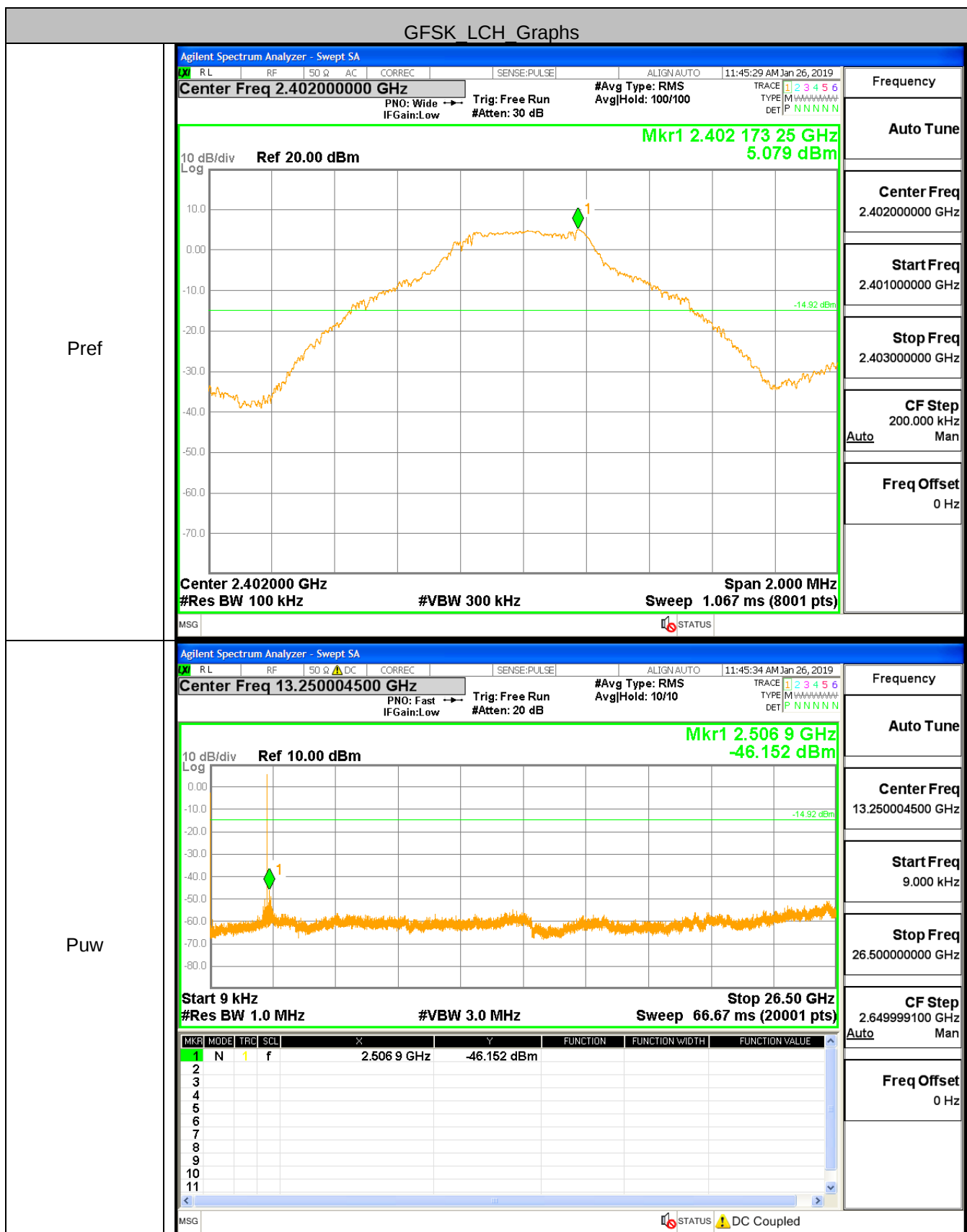


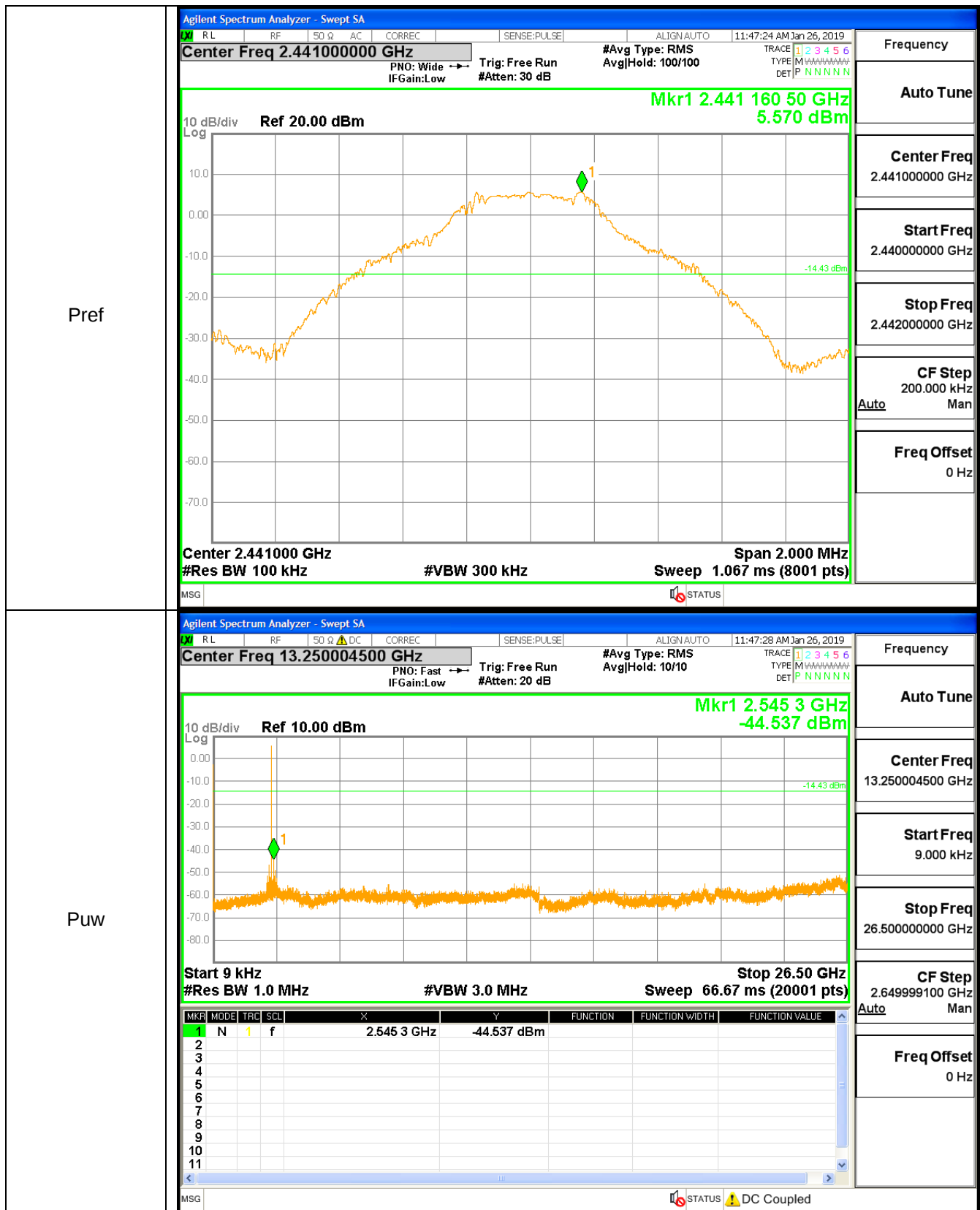
8DPSK/LCH/Hop





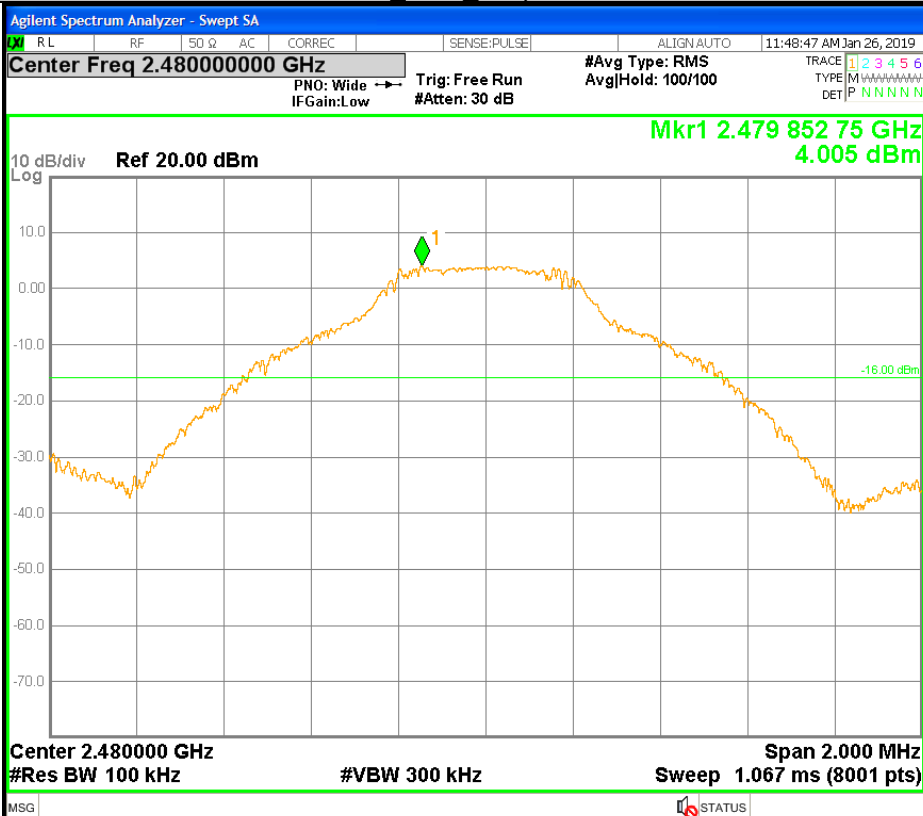
A.7 RF Conducted Spurious Emissions Test Graph



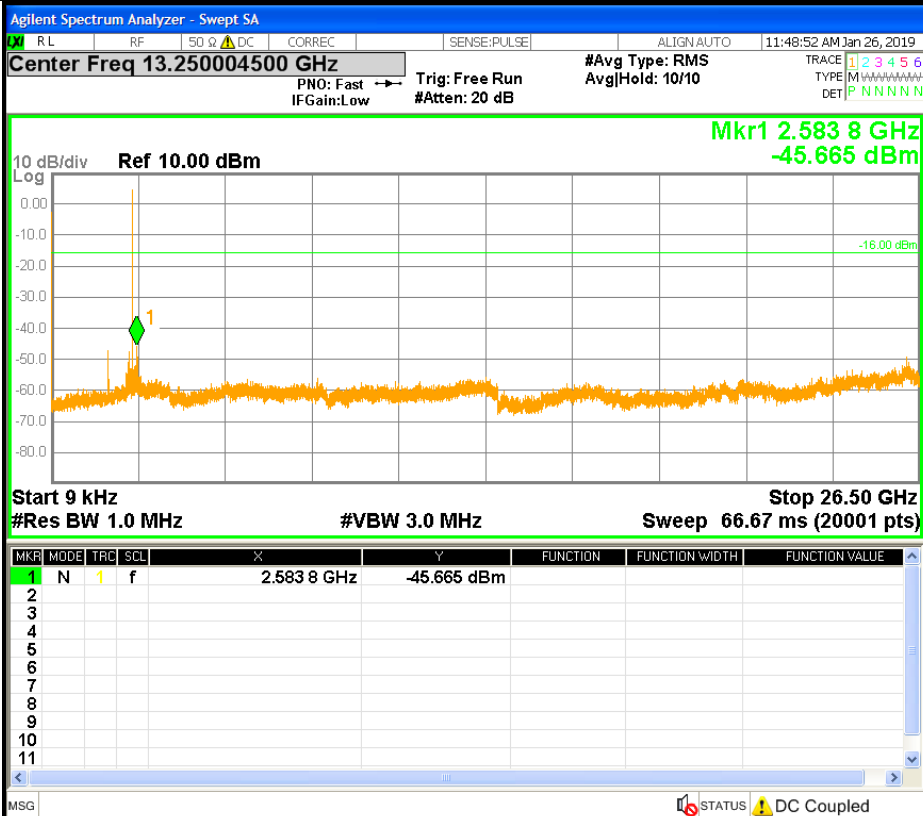


GFSK HCH Graphs

Pref

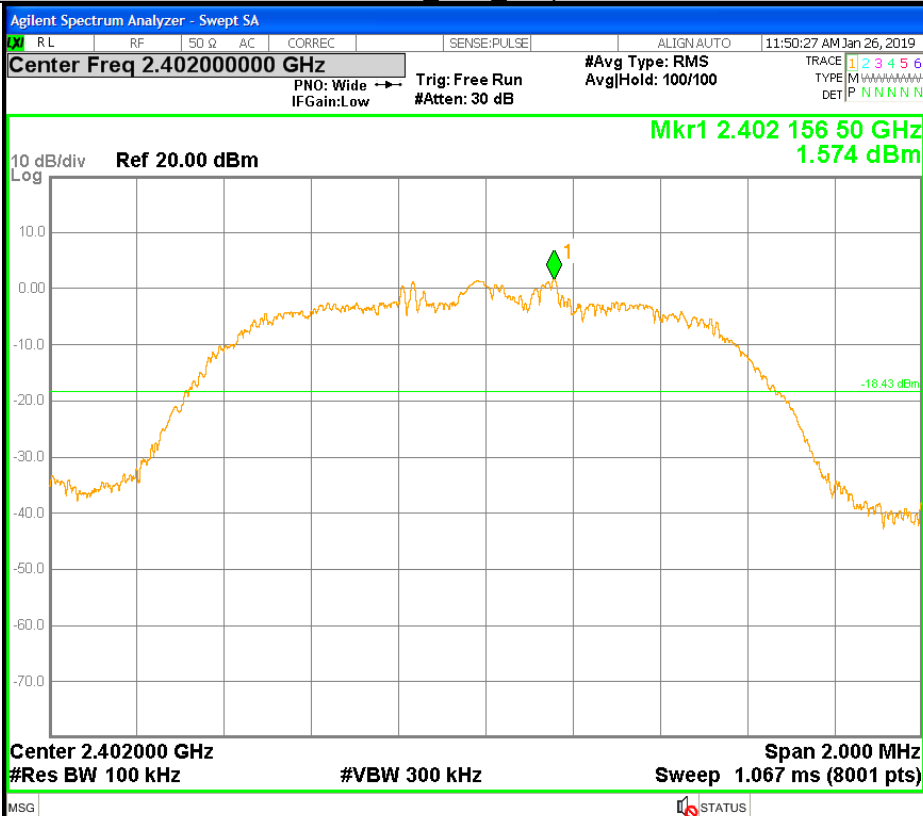


Puw

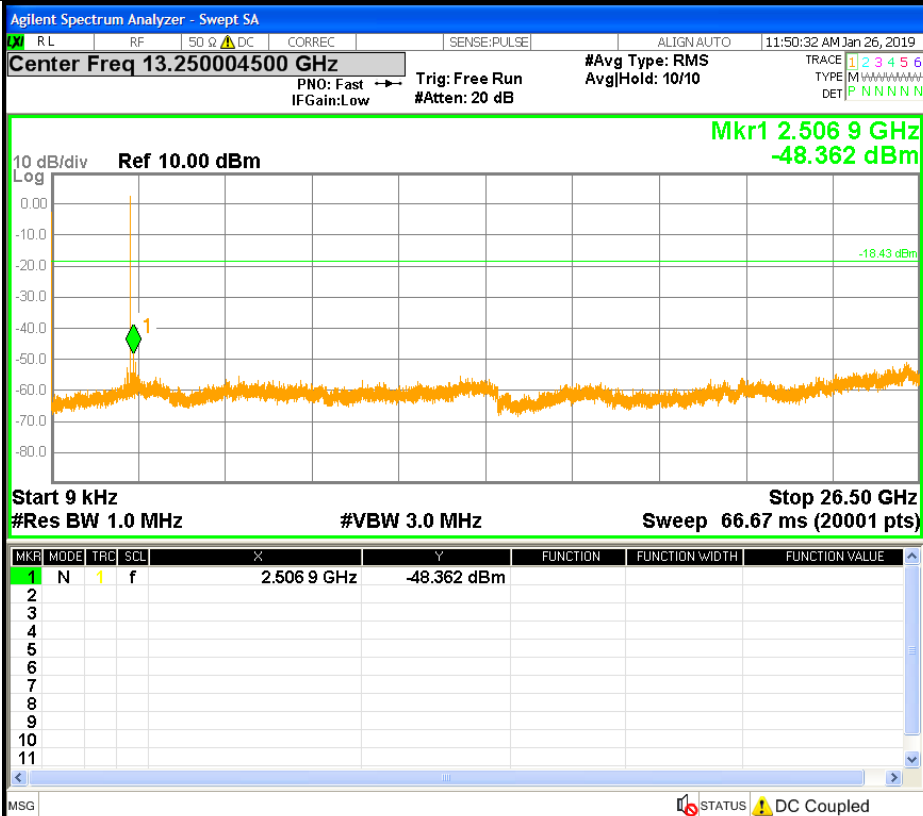


$\pi/4$ DQPSK LCH Graphs

Pref

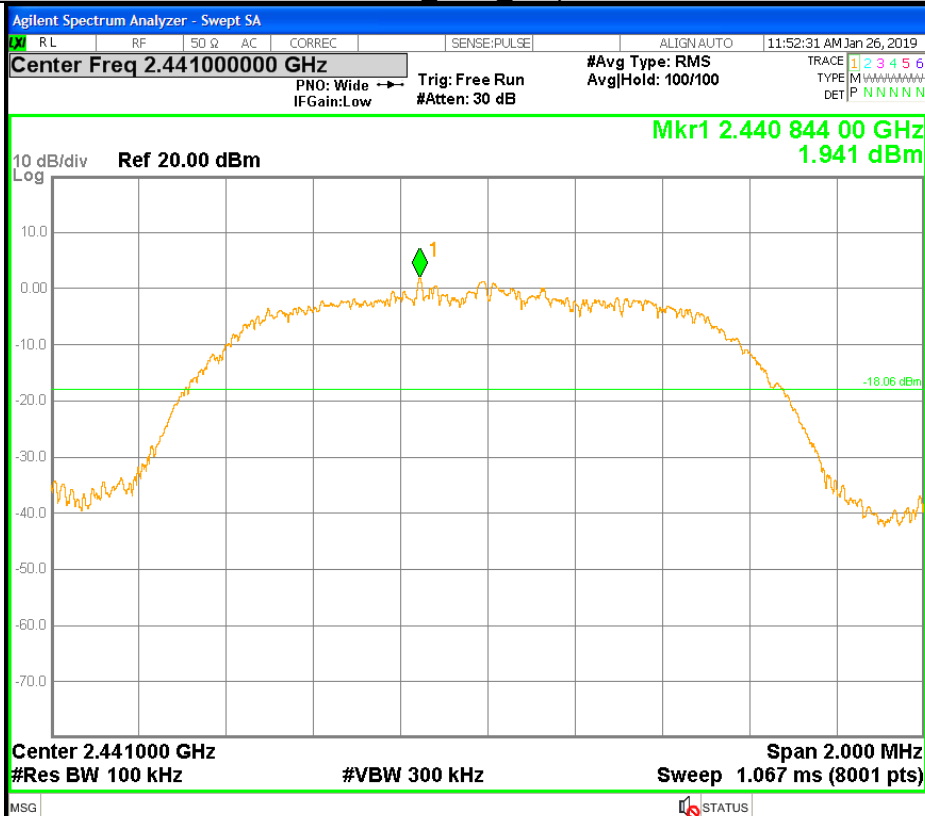


Puw



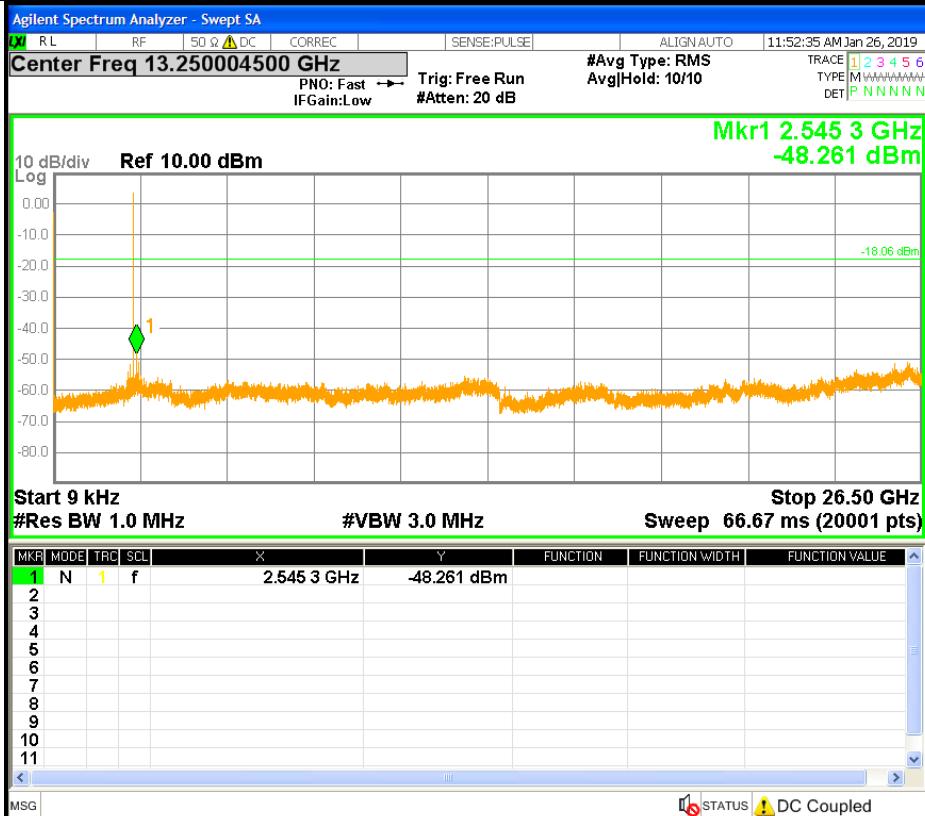
$\pi/4$ DQPSK MCH Graphs

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

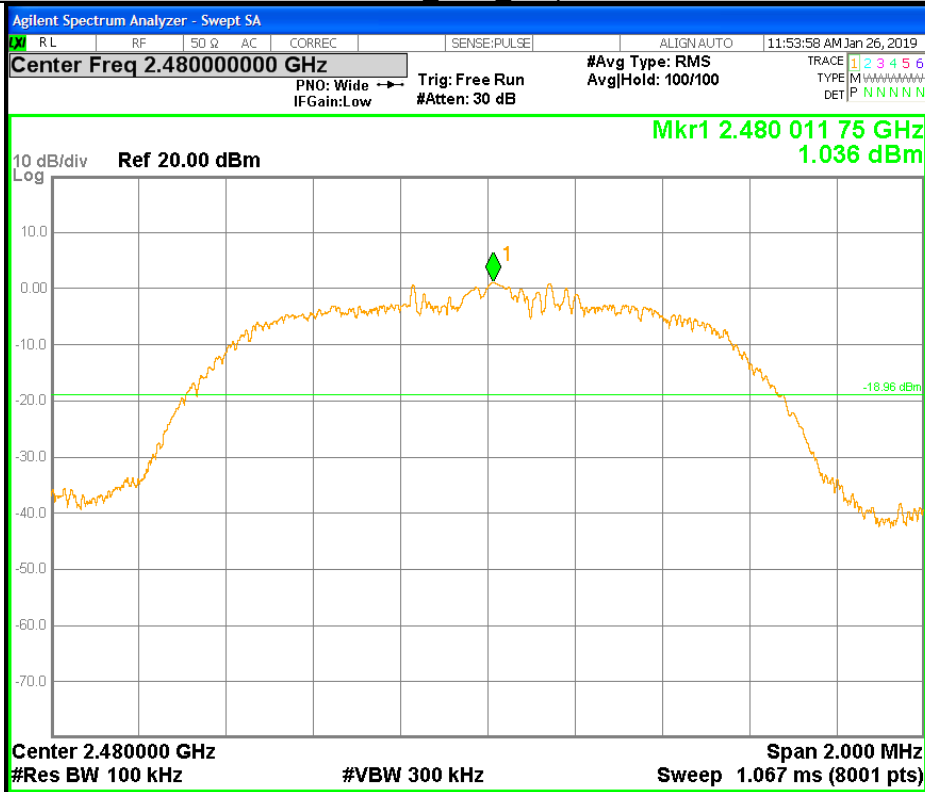
Puw



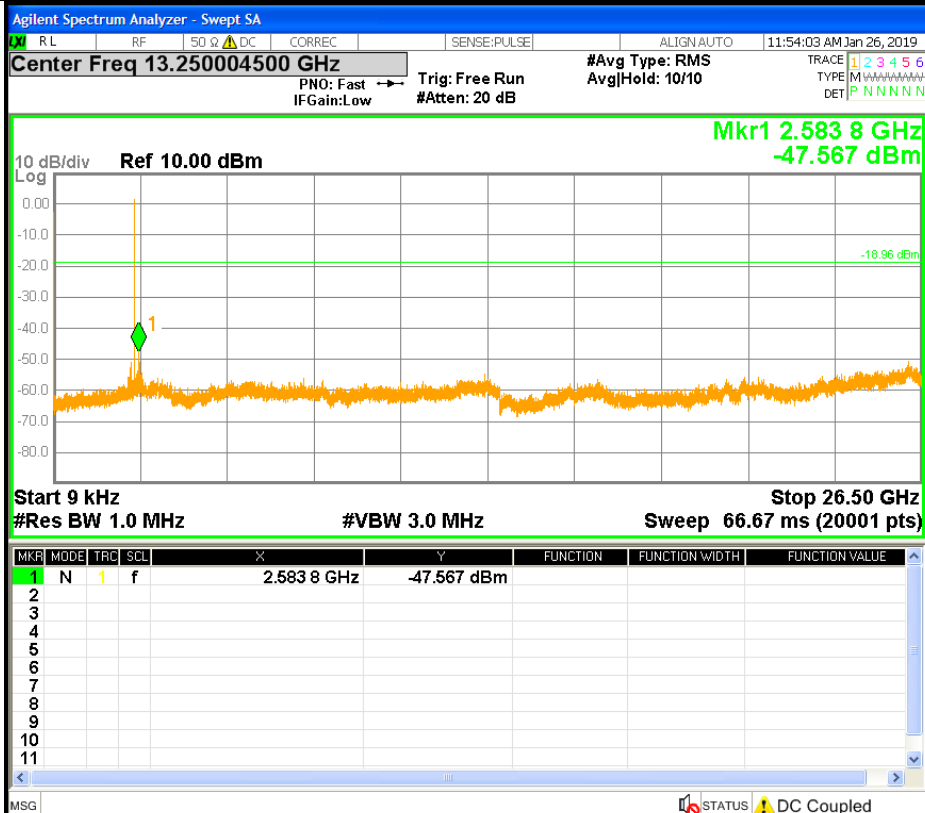
Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto Man
Freq Offset 0 Hz

$\pi/4$ DQPSK HCH Graphs

Pref

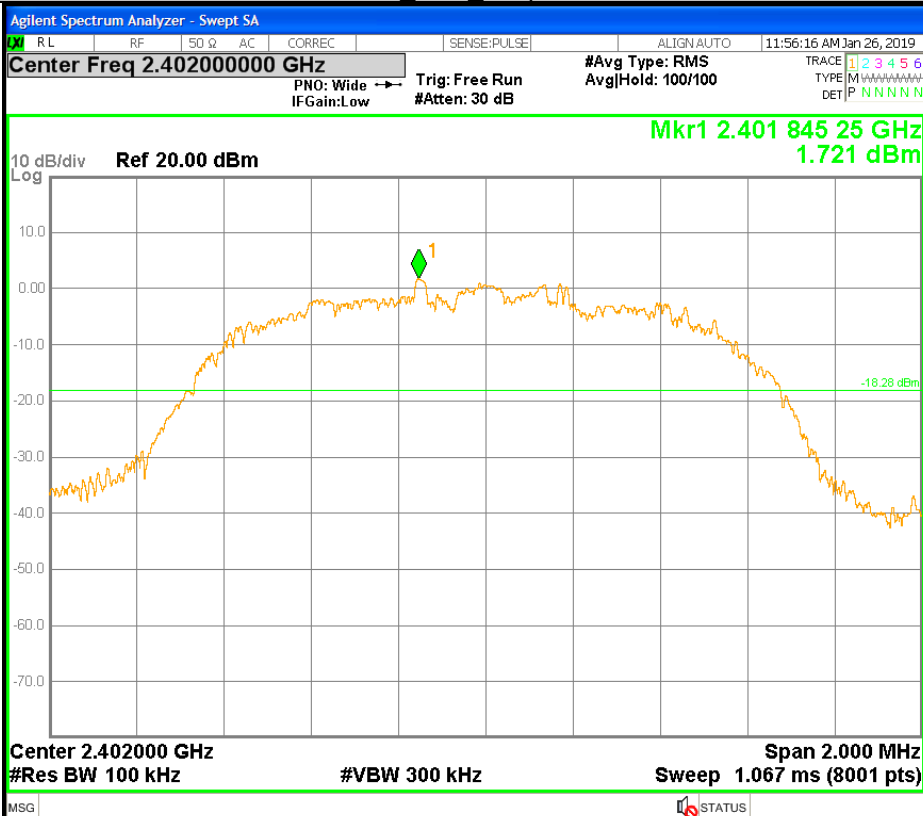


Puw

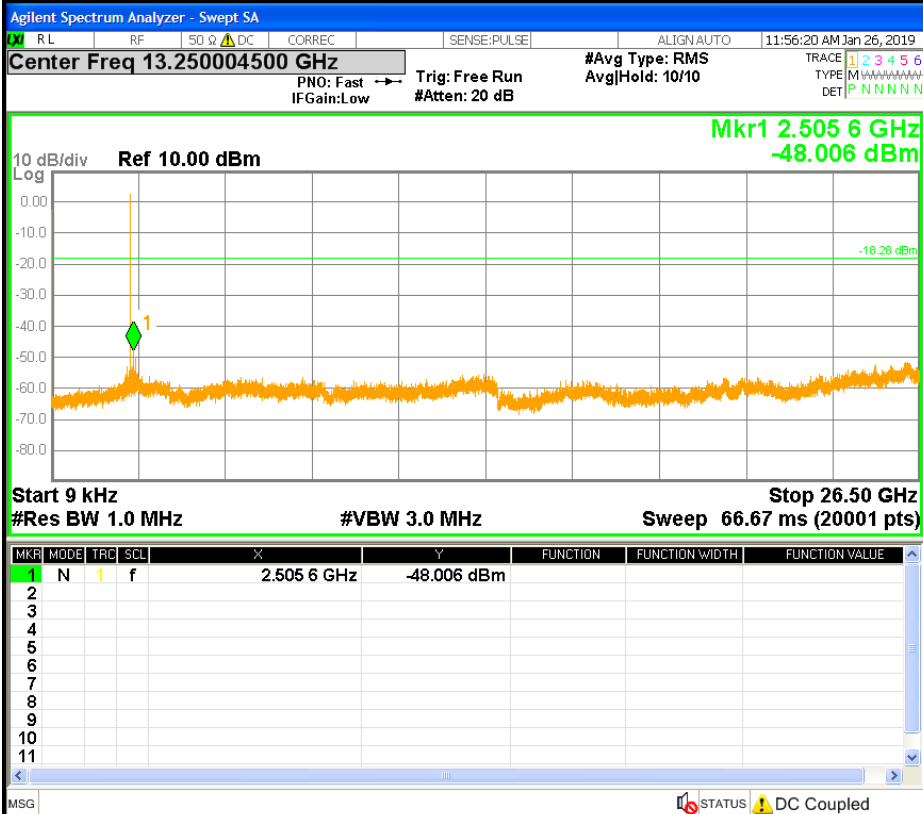


8DPSK LCH Graphs

Pref

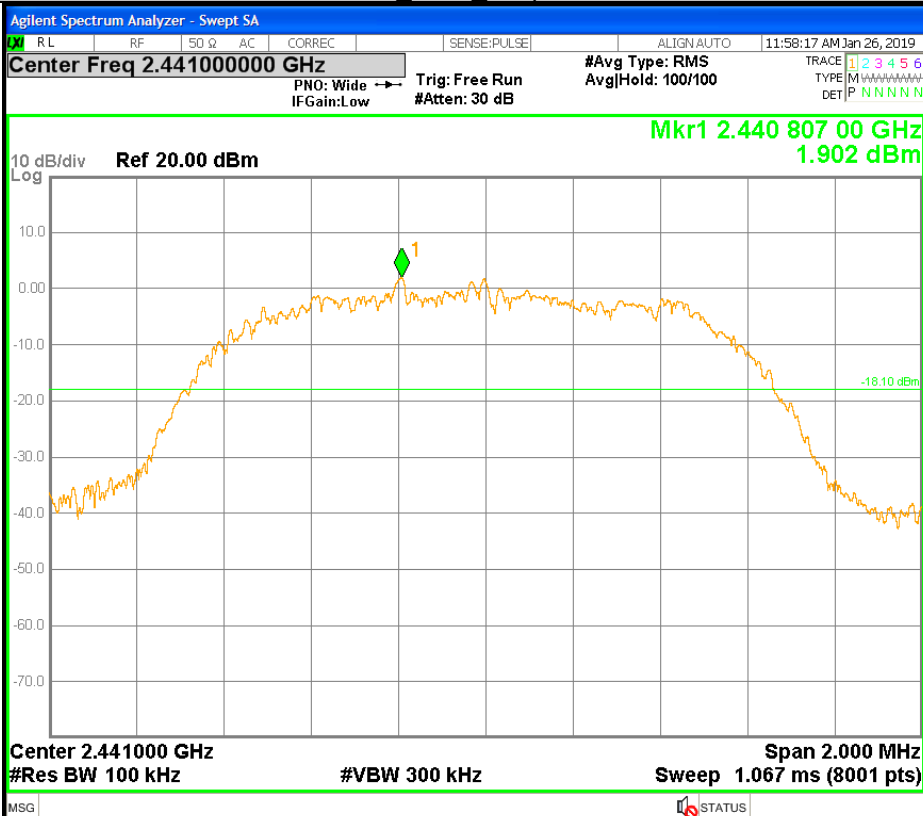


Puw

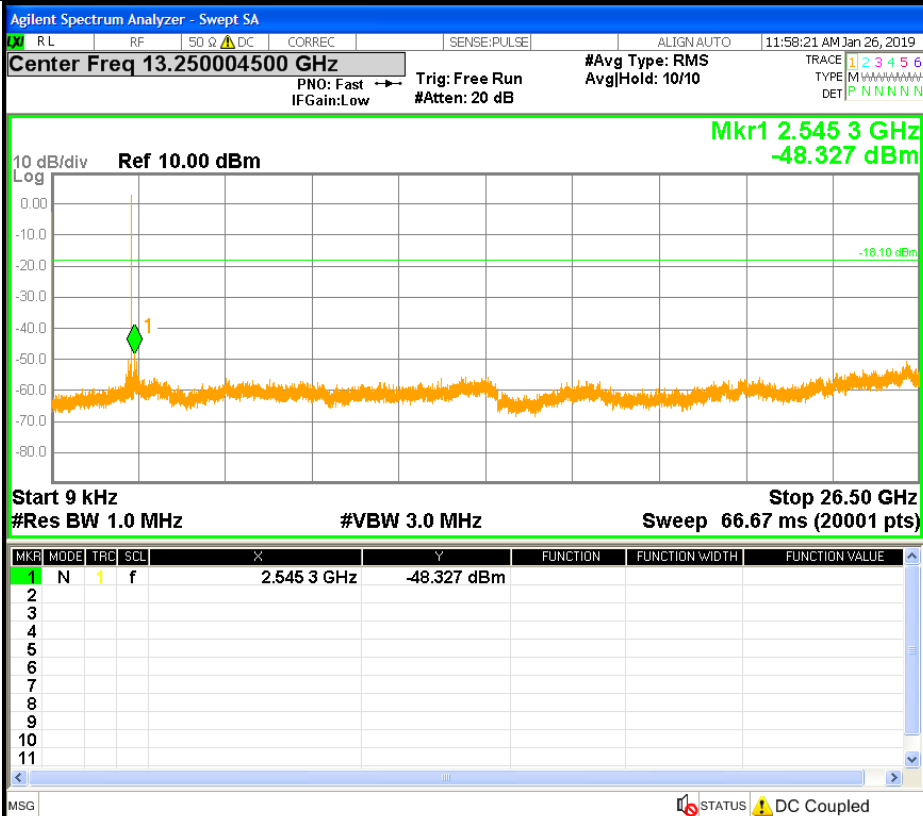


8DPSK MCH Graphs

Pref

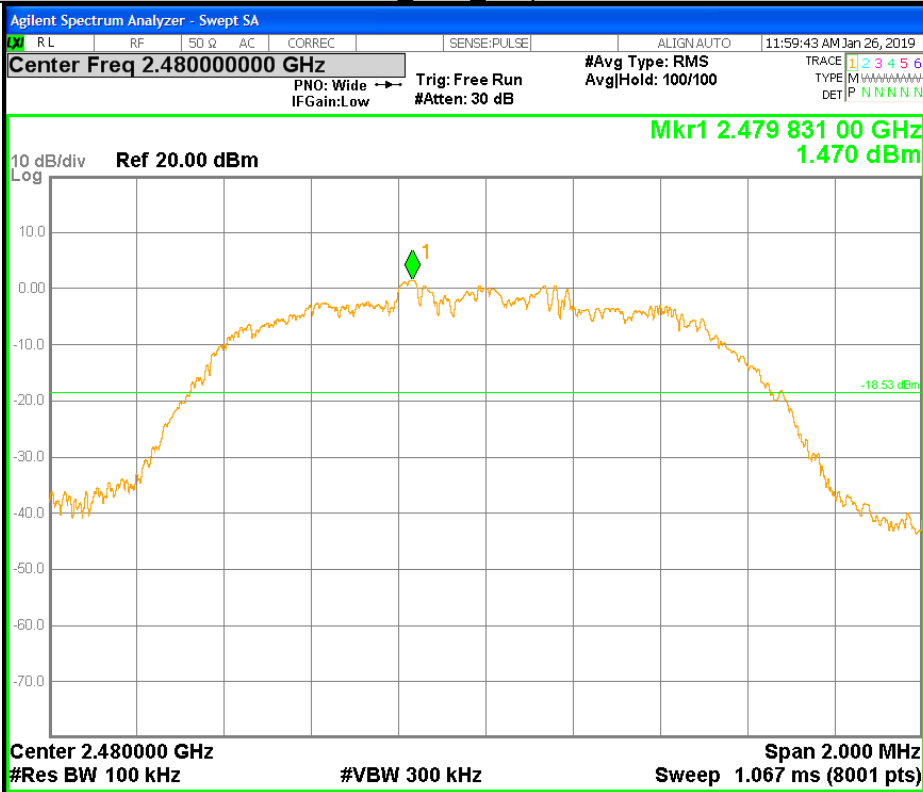


Puw

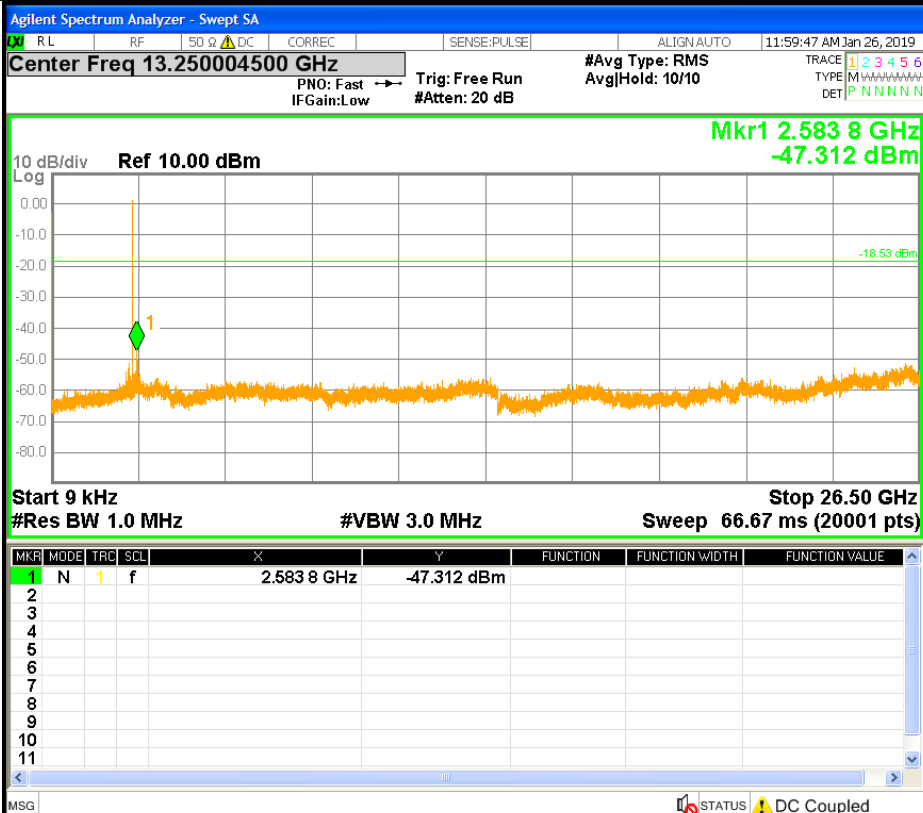


8DPSK HCH Graphs

Pref



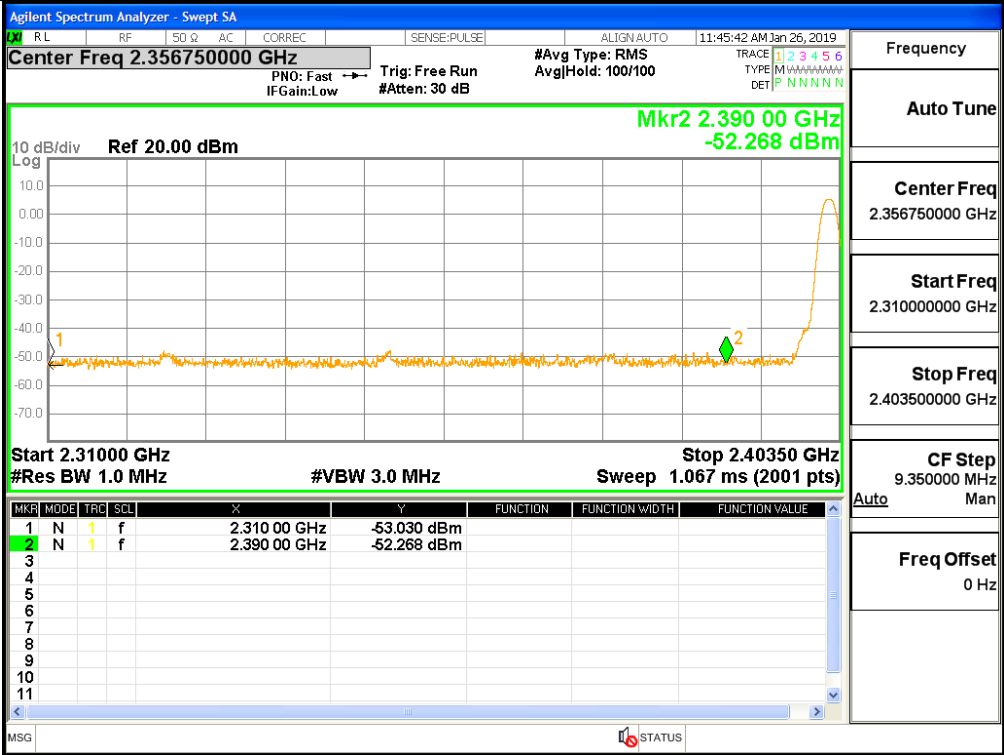
Puw



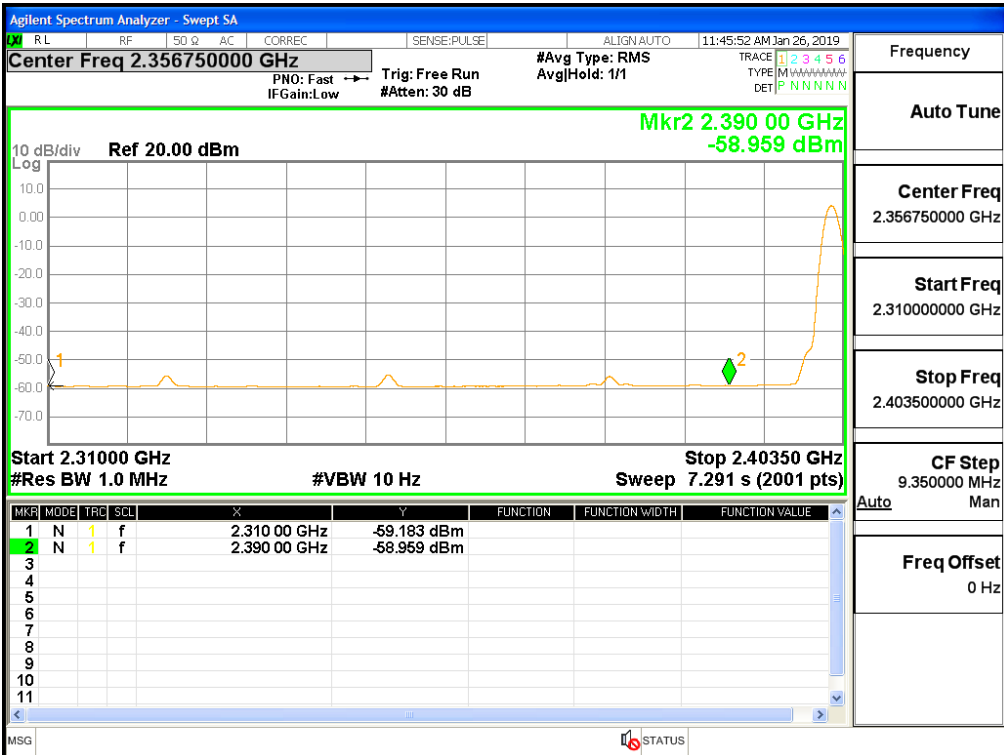
A.8 Restrict-band band-edge measurements

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

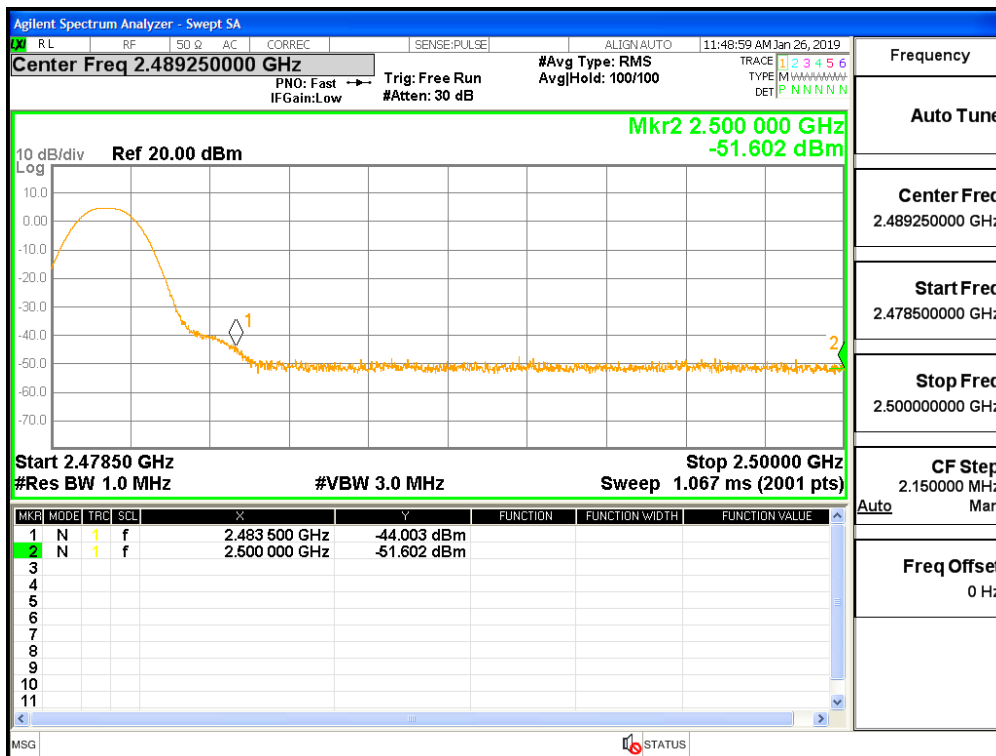
Restrict-band band-edge measurements_2402_PEAK_DH5



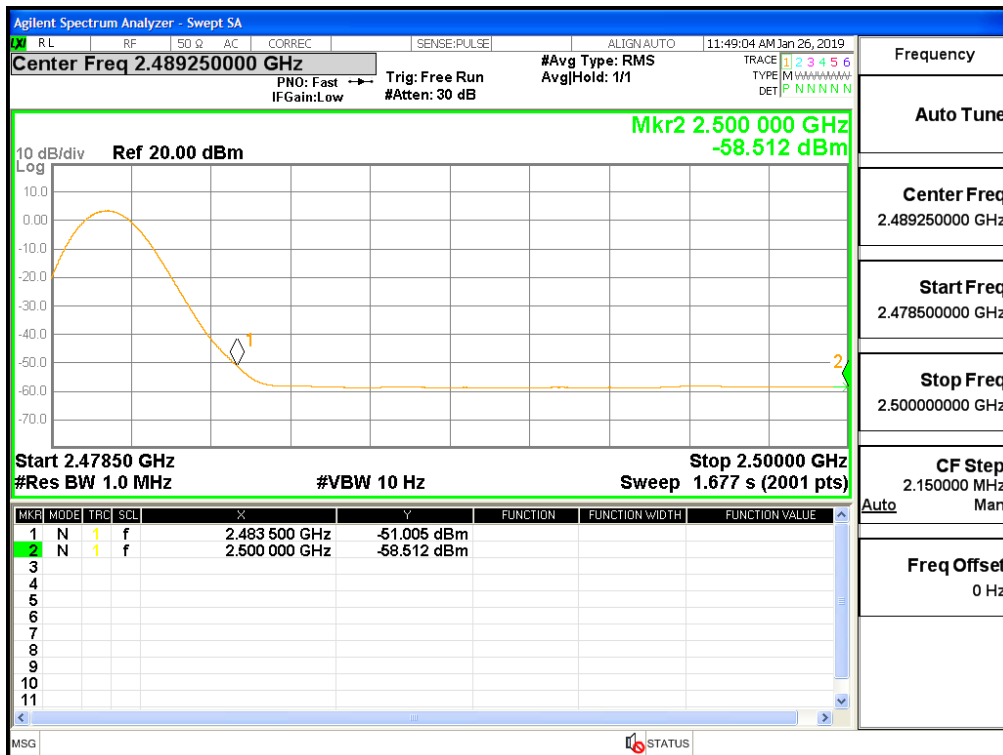
Restrict-band band-edge measurements_2402_AV_DH5



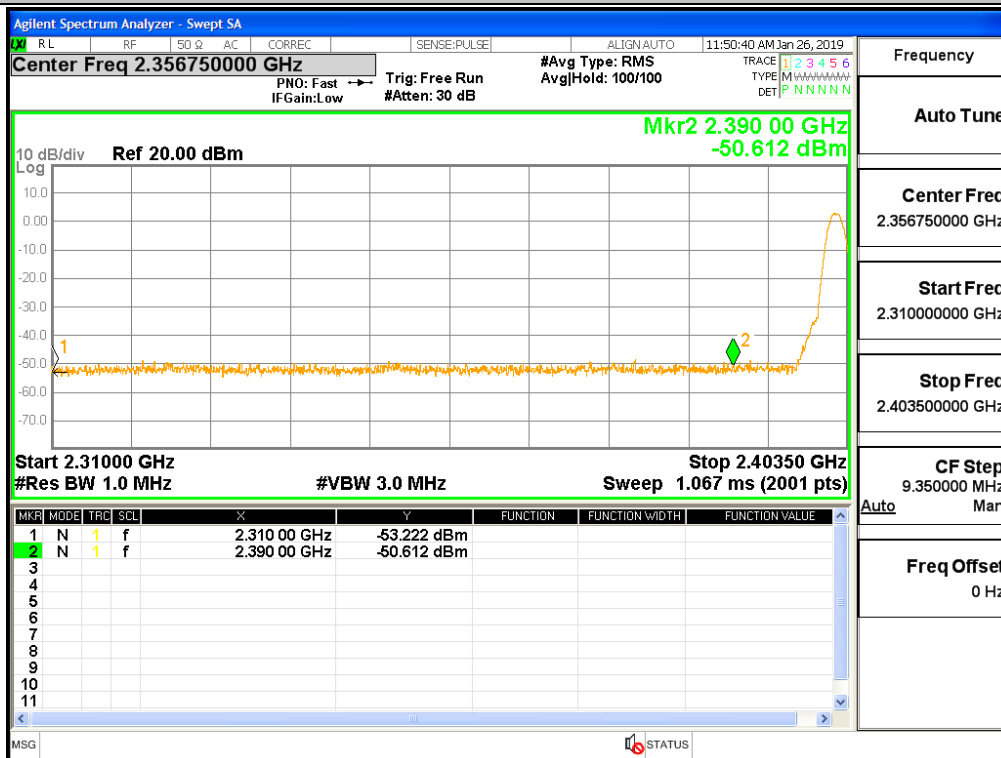
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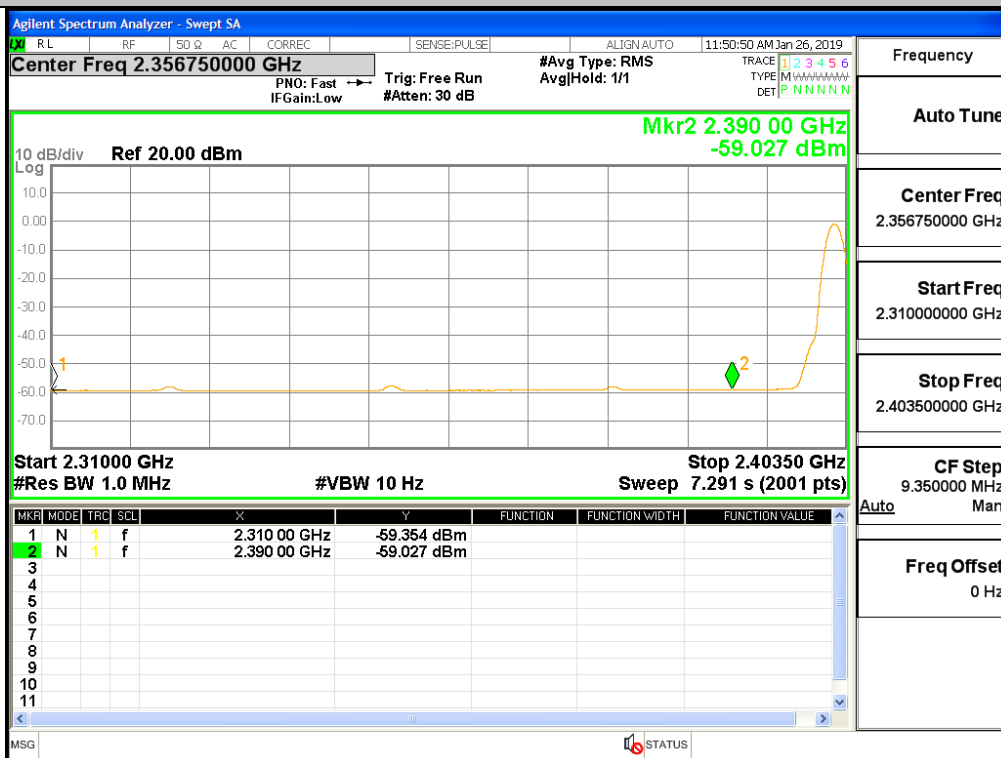
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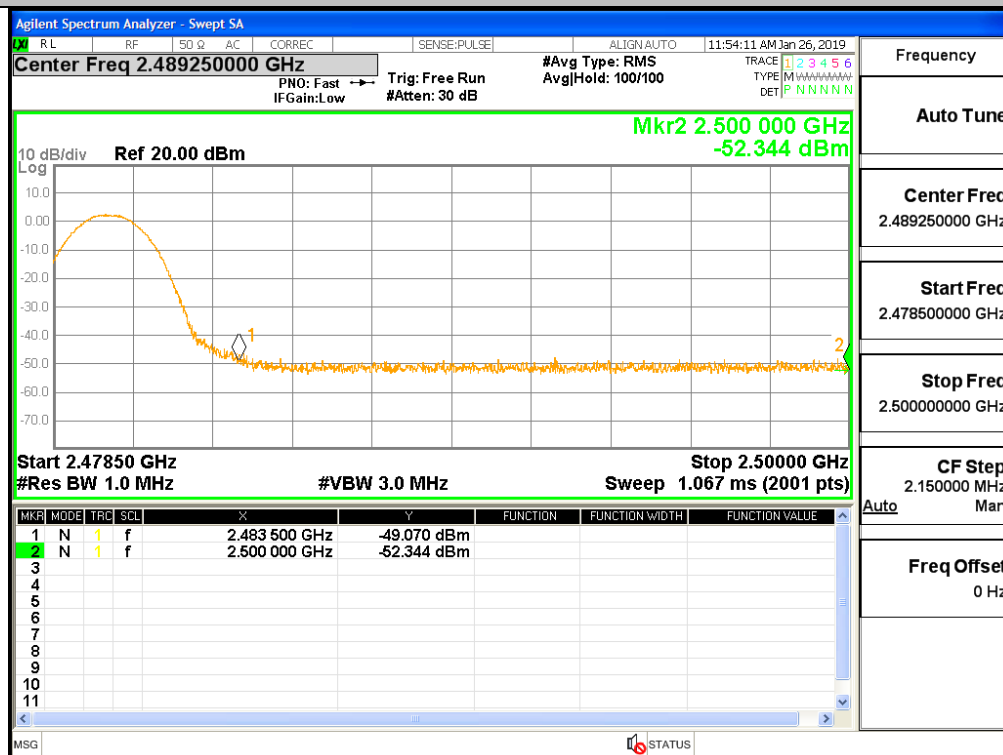
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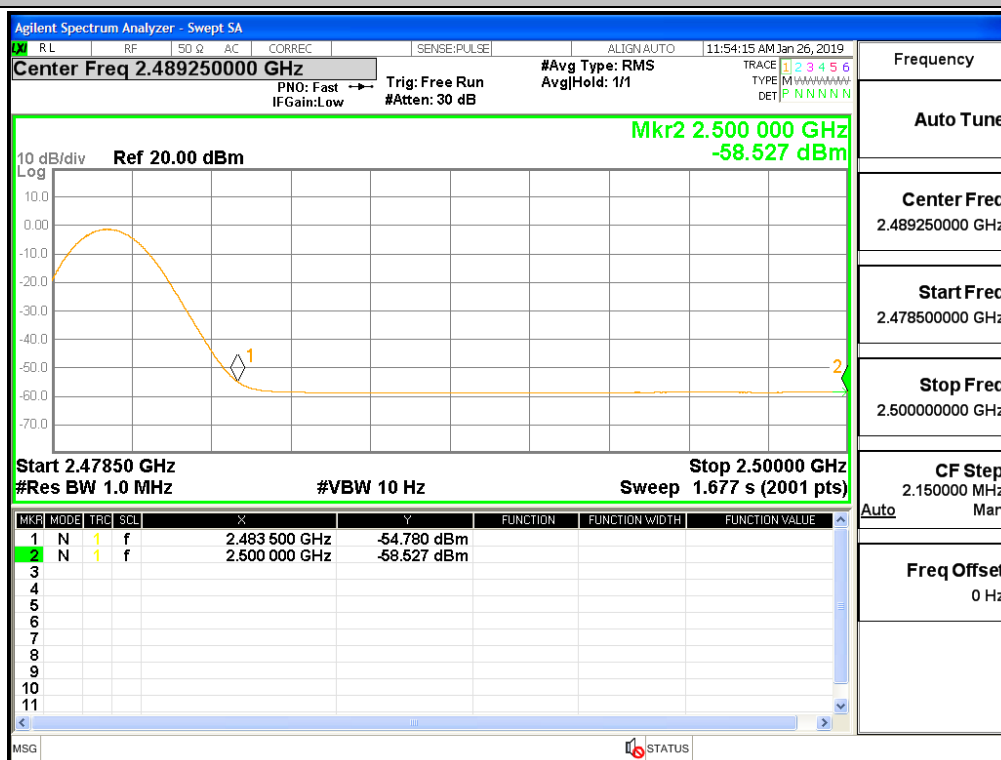
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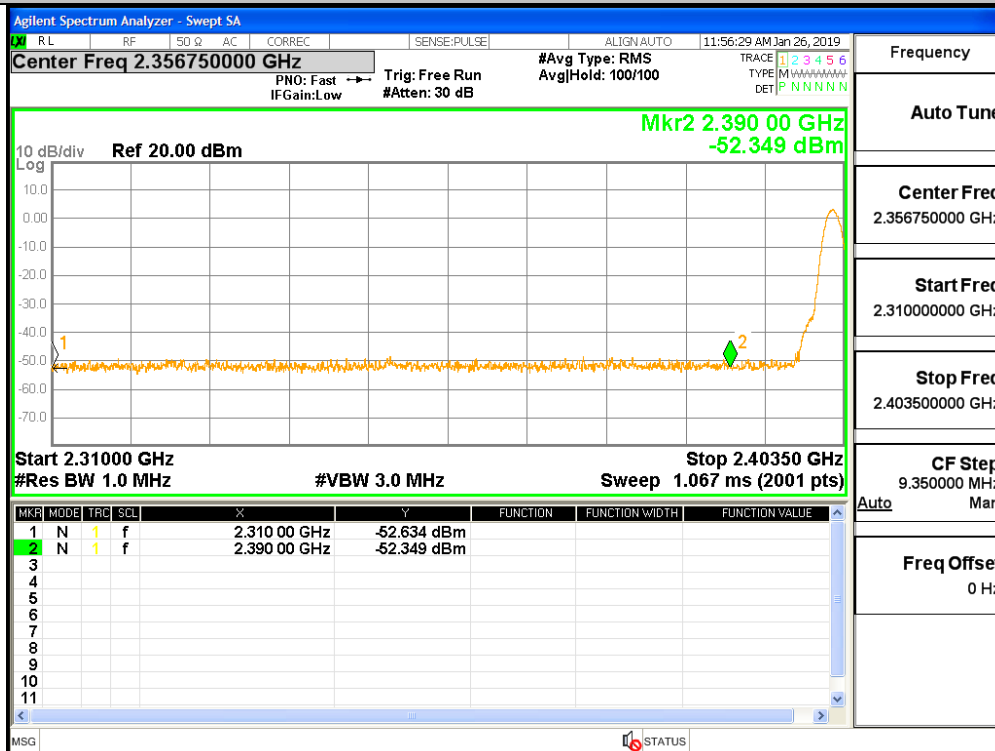
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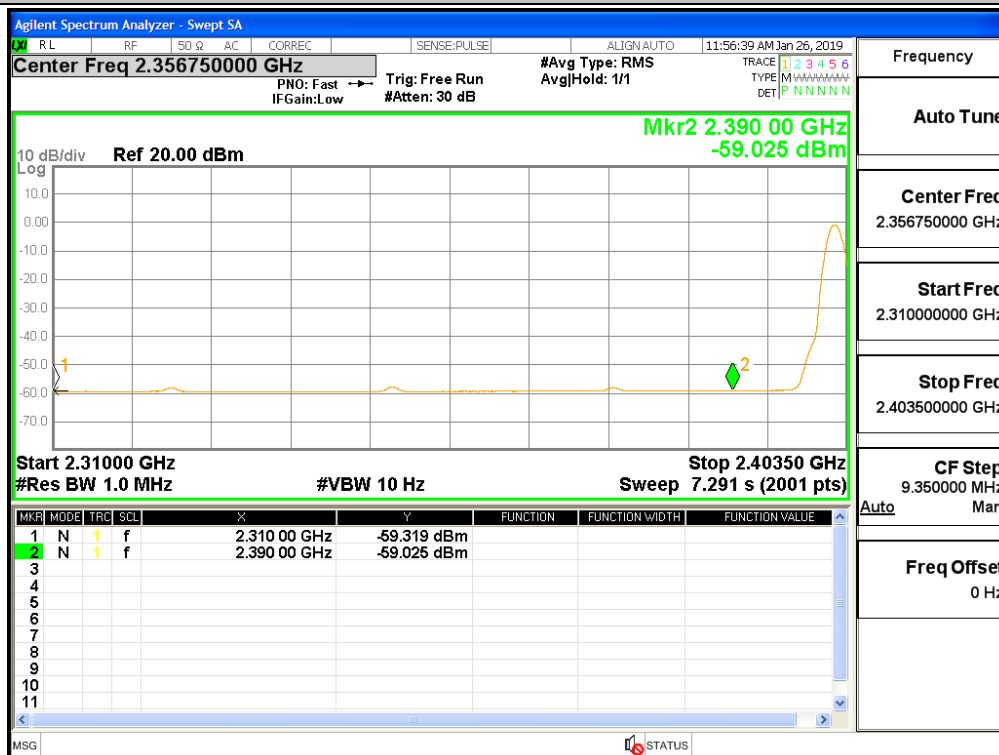
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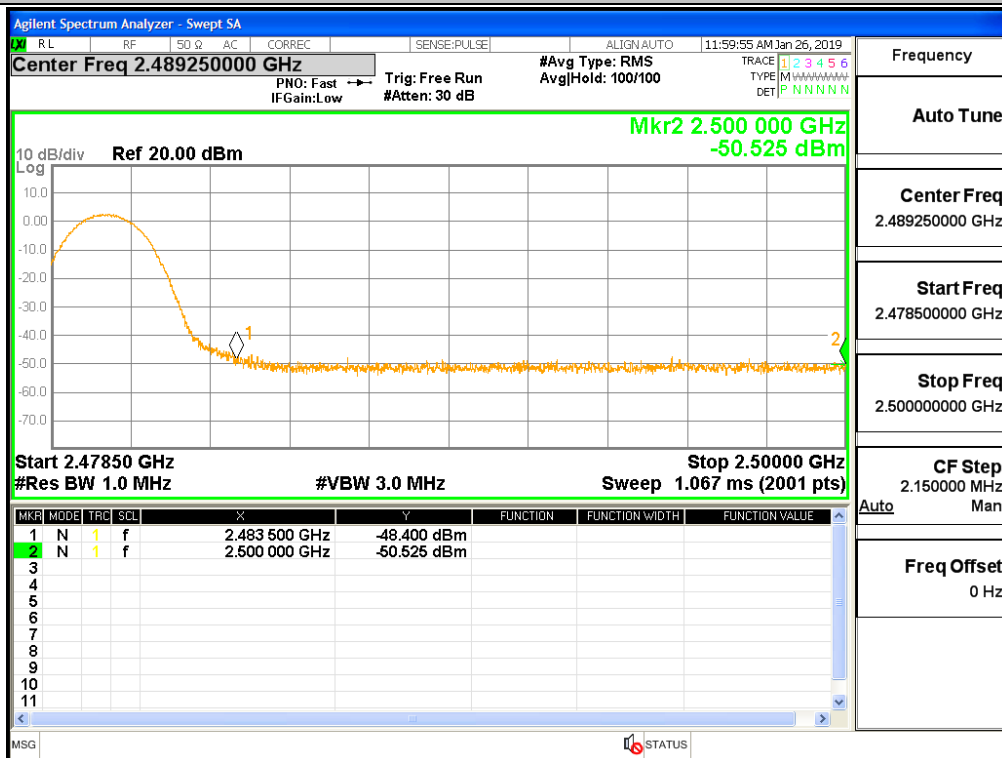
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

