

Appendix A

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

Product Name: Bluetooth Headphones

Trade Mark: Muze,Vivitar

Test Model: MUZ4001

FCC ID: 2AL9B-MUZ4001

Environmental Conditions

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

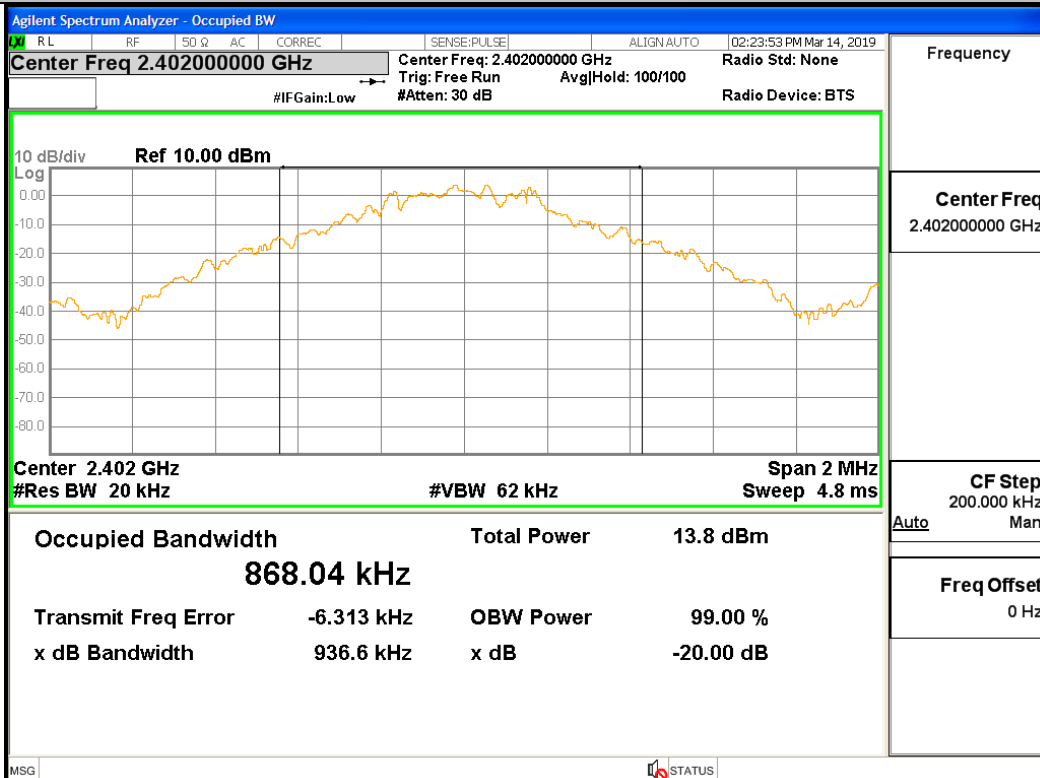
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.937	Not Specified	PASS
GFSK	MCH	0.859	Not Specified	PASS
GFSK	HCH	0.887	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.199	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.203	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.325	Not Specified	PASS
8DPSK	LCH	1.236	Not Specified	PASS
8DPSK	MCH	1.239	Not Specified	PASS
8DPSK	HCH	1.242	Not Specified	PASS

Test Graph

Graphs

GFSK/LCH



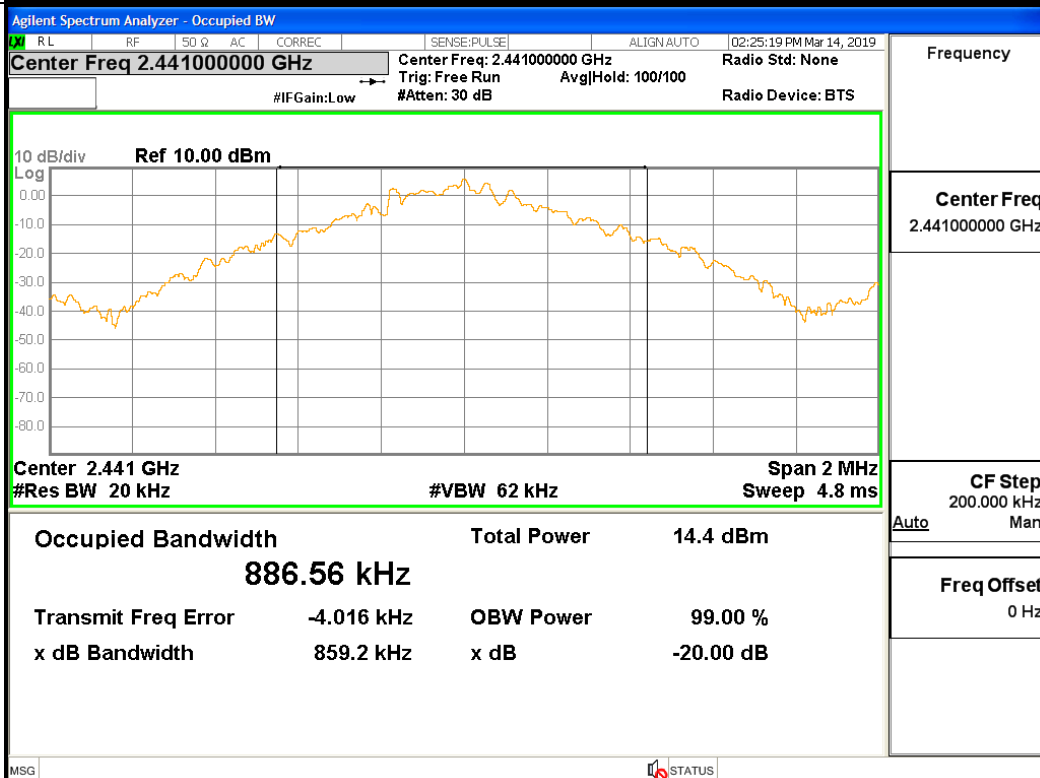
Frequency

Center Freq
2.40200000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

GFSK/MCH

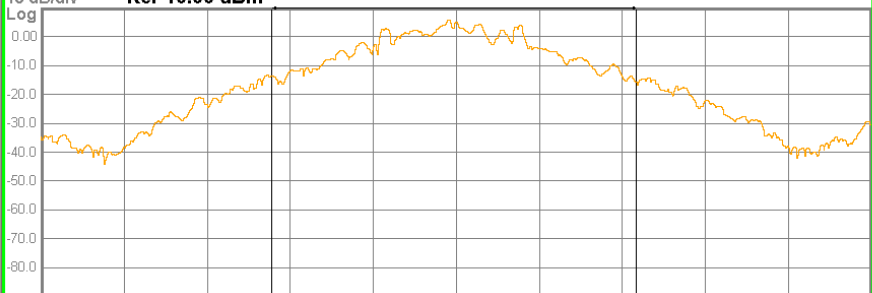
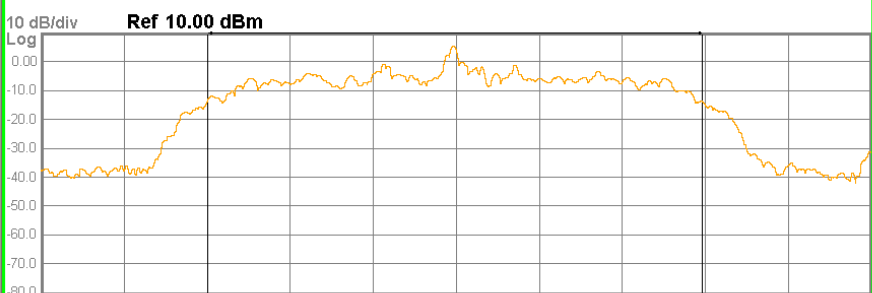


Frequency

Center Freq
2.44100000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

GFSK/HCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN:AUTO 02:26:39 PM Mar 14, 2019 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 #Atten: 30 dB 10 dB/div Ref 10.00 dBm  Center 2.48 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 4.8 ms Occupied Bandwidth 874.13 kHz Total Power 15.0 dBm Transmit Freq Error -4.749 kHz OBW Power 99.00 % x dB Bandwidth 886.6 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
	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN:AUTO 02:28:13 PM Mar 14, 2019 Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None #IFGain:Low Trig: Free Run Avg/Hold: 100/100 Radio Device: BTS #Atten: 30 dB 10 dB/div Ref 10.00 dBm  Center 2.402 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 4.8 ms Occupied Bandwidth 1.1852 MHz Total Power 12.5 dBm Transmit Freq Error -1.368 kHz OBW Power 99.00 % x dB Bandwidth 1.199 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

$\pi/4$ DQPSK/MCH	Agilent Spectrum Analyzer - Occupied BW							Frequency		
	RL RF 50 Ω AC CORREC			SENSE:PULSE		ALIGN:AUTO		02:29:39 PM Mar 14, 2019		
	Center Freq 2.441000000 GHz			Center Freq: 2.441000000 GHz		Radio Std: None		Center Freq 2.441000000 GHz		
	#IFGain:Low			#Atten: 30 dB		Avg/Hold: 100/100		Radio Device: BTS		
								CF Step 200.000 kHz		
Center 2.441 GHz							Span 2 MHz		Auto	
#Res BW 20 kHz							#VBW 62 kHz		Man	
Sweep 4.8 ms									Freq Offset 0 Hz	
Occupied Bandwidth							Total Power		13.5 dBm	
1.1859 MHz										
Transmit Freq Error							-515 Hz		OBW Power	
x dB Bandwidth							1.203 MHz		x dB	
							99.00 %		-20.00 dB	
MSG							STATUS			

$\pi/4$ DQPSK/HCH	Agilent Spectrum Analyzer - Occupied BW							Frequency		
	RL RF 50 Ω AC CORREC			SENSE:PULSE		ALIGN:AUTO		02:30:50 PM Mar 14, 2019		
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	#IFGain:Low			#Atten: 30 dB		Avg/Hold: 100/100		Radio Device: BTS		
								CF Step 200.000 kHz		
Center 2.48 GHz							Span 2 MHz		Auto	
#Res BW 20 kHz							#VBW 62 kHz		Man	
Sweep 4.8 ms									Freq Offset 0 Hz	
Occupied Bandwidth							Total Power		13.6 dBm	
1.1990 MHz										
Transmit Freq Error							325 Hz		OBW Power	
x dB Bandwidth							1.325 MHz		x dB	
							99.00 %		-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

#Atten: 30 dB

10 dB/div

Ref 10.00 dBm

Center 2.48 GHz

#Res BW 20 kHz

#VBW 62 kHz

Span 2 MHz

Sweep 4.8 ms

Occupied Bandwidth

1.1990 MHz

Total Power

13.6 dBm

Transmit Freq Error

325 Hz

OBW Power

99.00 %

x dB Bandwidth

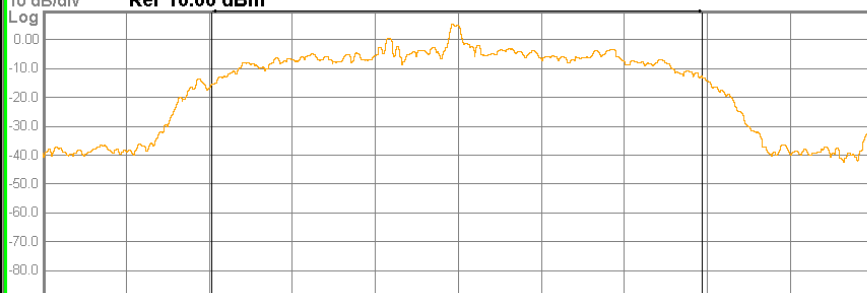
1.325 MHz

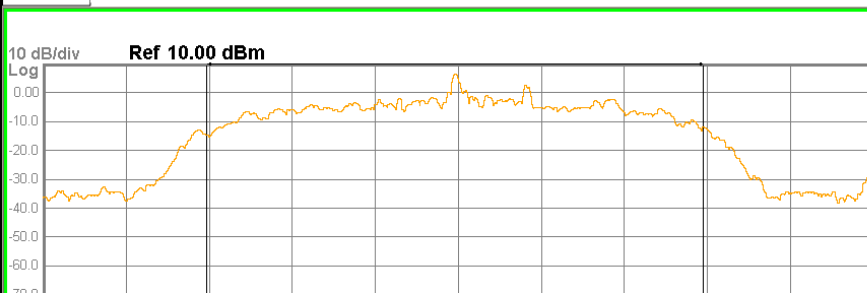
x dB

-20.00 dB

MSG

STATUS

8DPSK/LCH	Agilent Spectrum Analyzer - Occupied BW							Frequency	
	X R L RF 50 Ω AC CORREC			SENSE:PULSE		ALIGN AUTO	02:32:33 PM Mar 14, 2019		
	Center Freq 2.402000000 GHz			Center Freq: 2.402000000 GHz		Radio Std: None		Center Freq 2.402000000 GHz	
				Trig: Free Run		Avg/Hold: 100/100			
	#IFGain:Low			#Atten: 30 dB		Radio Device: BTS			
10 dB/div Ref 10.00 dBm Log 							CF Step 200.000 kHz Auto Man		
Center 2.402 GHz			#VBW 62 kHz		Span 2 MHz Sweep 4.8 ms				
Occupied Bandwidth 1.1775 MHz Total Power 12.7 dBm							Freq Offset 0 Hz		
Transmit Freq Error -2.521 kHz OBW Power 99.00 %									
x dB Bandwidth 1.236 MHz x dB -20.00 dB									
MSG							STATUS		

8DPSK/MCH	Agilent Spectrum Analyzer - Occupied BW							Frequency	
	X R L RF 50 Ω AC CORREC			SENSE:PULSE		ALIGN AUTO	02:34:03 PM Mar 14, 2019		
	Center Freq 2.441000000 GHz			Center Freq: 2.441000000 GHz		Radio Std: None		Center Freq 2.441000000 GHz	
				Trig: Free Run		Avg/Hold: 100/100			
	#IFGain:Low			#Atten: 30 dB		Radio Device: BTS			
10 dB/div Ref 10.00 dBm Log 							CF Step 200.000 kHz Auto Man		
Center 2.441 GHz			#VBW 62 kHz		Span 2 MHz Sweep 4.8 ms				
Occupied Bandwidth 1.1935 MHz Total Power 13.6 dBm							Freq Offset 0 Hz		
Transmit Freq Error -6.383 kHz OBW Power 99.00 %									
x dB Bandwidth 1.239 MHz x dB -20.00 dB									
MSG							STATUS		

Center Freq 2.441000000 GHz

Center Freq: 2.441000000 GHz

Radio Std: None

#IFGain:Low

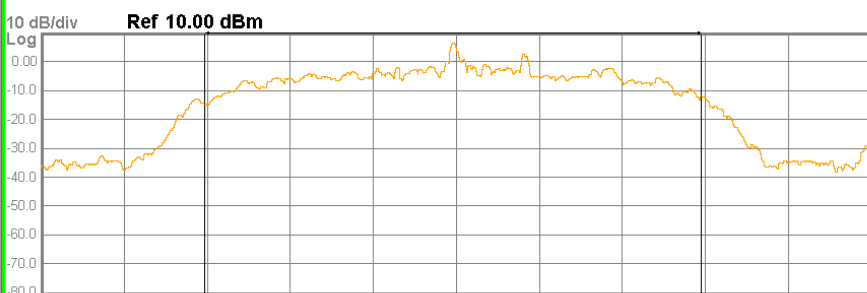
#Atten: 30 dB

AvgHold: 100/100

Radio Device: BTS

10 dB/div

Ref 10.00 dBm



Center 2.441 GHz

#Res BW 20 kHz

#VBW 62 kHz

Span 2 MHz

Sweep 4.8 ms

Occupied Bandwidth

1.1935 MHz

Total Power

13.6 dBm

Transmit Freq Error

-6.383 kHz

OBW Power

99.00 %

x dB Bandwidth

1.239 MHz

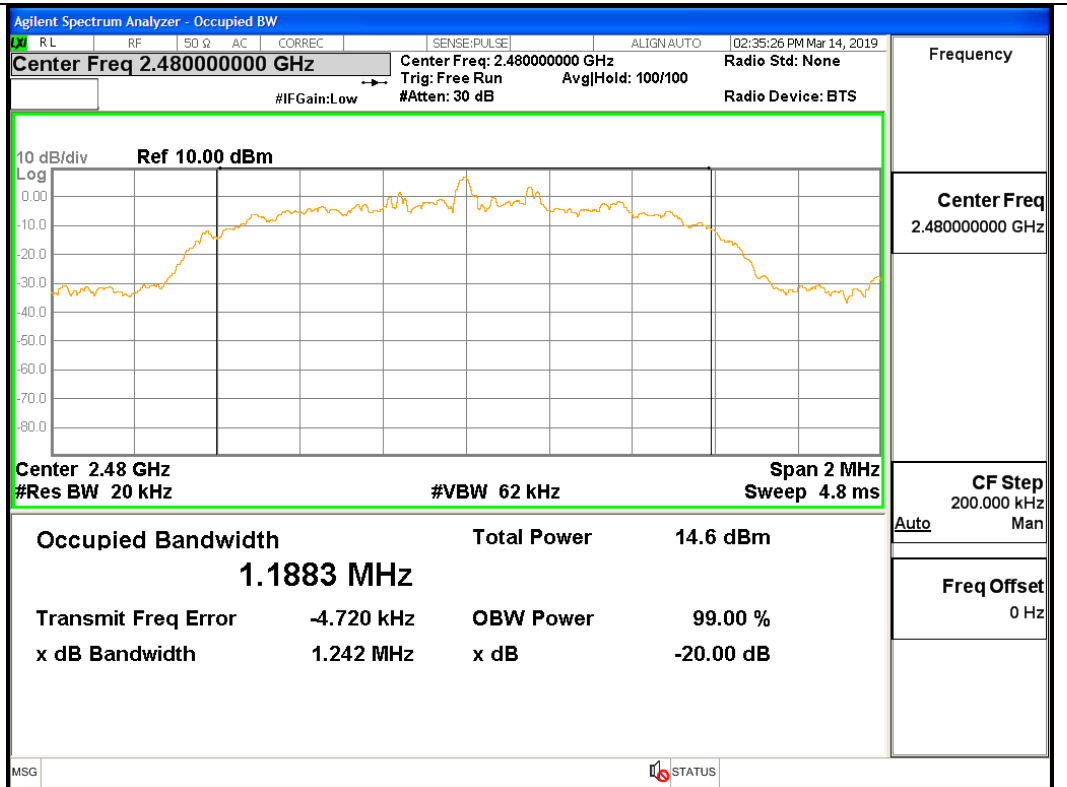
x dB

-20.00 dB

MSG

STATUS

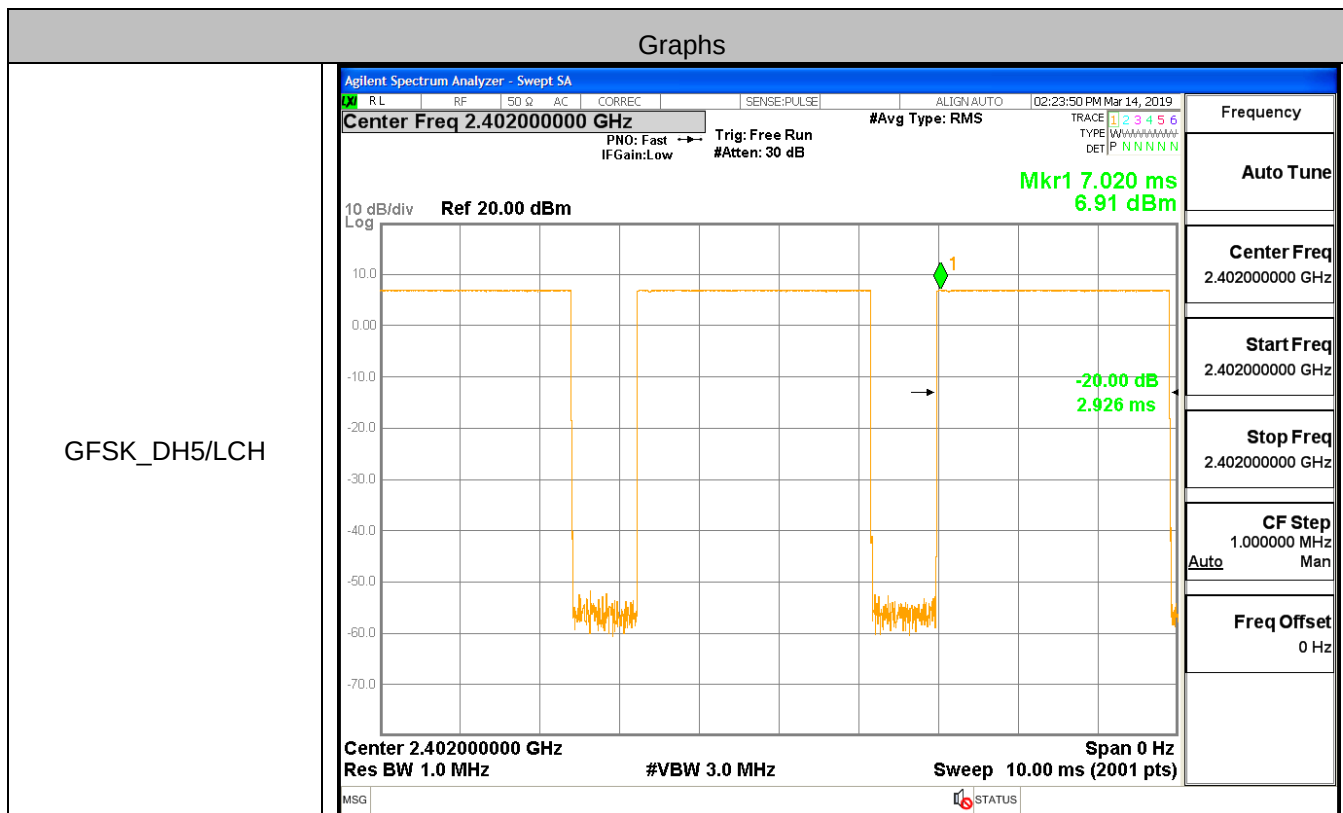
8DPSK/HCH

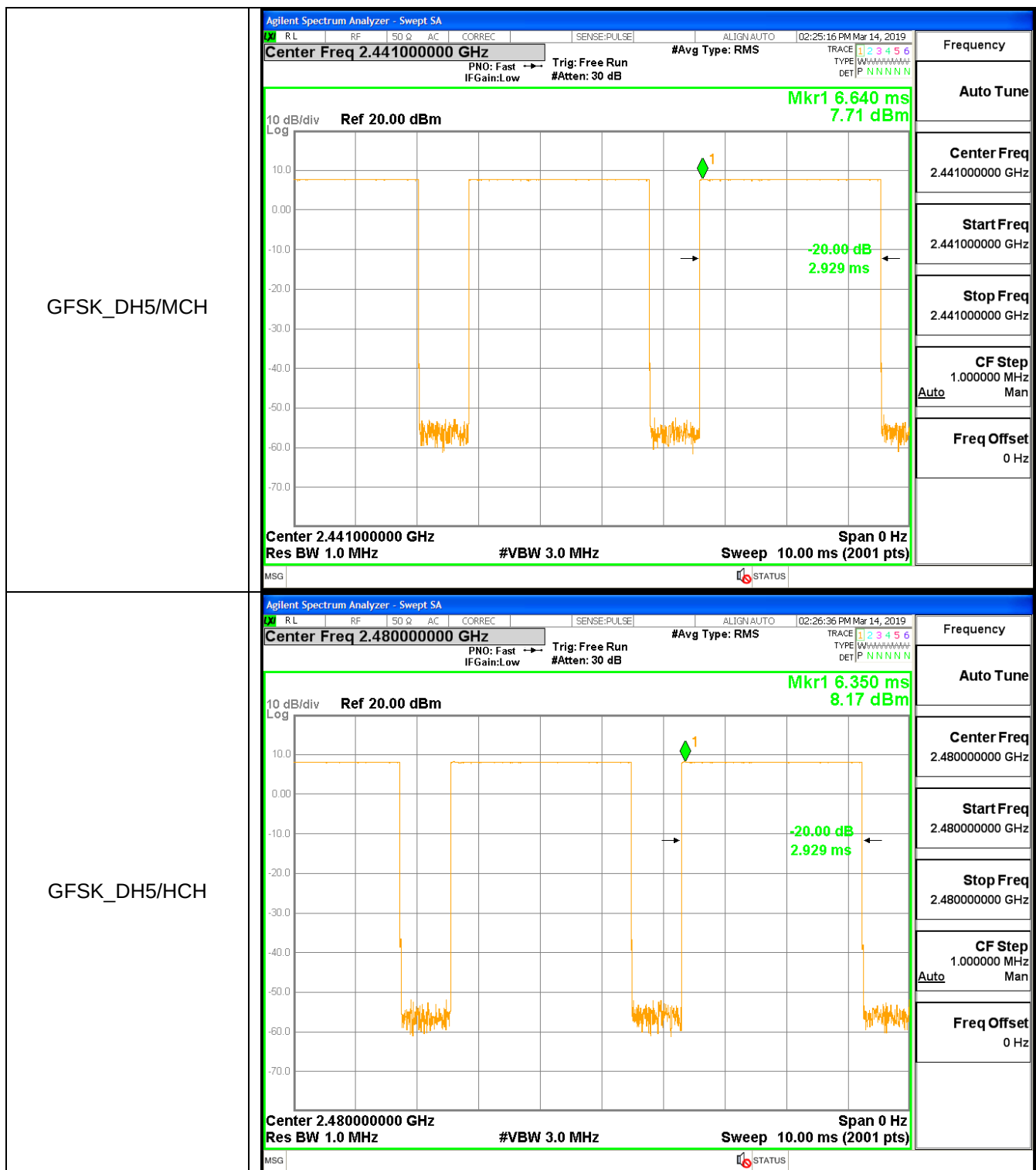


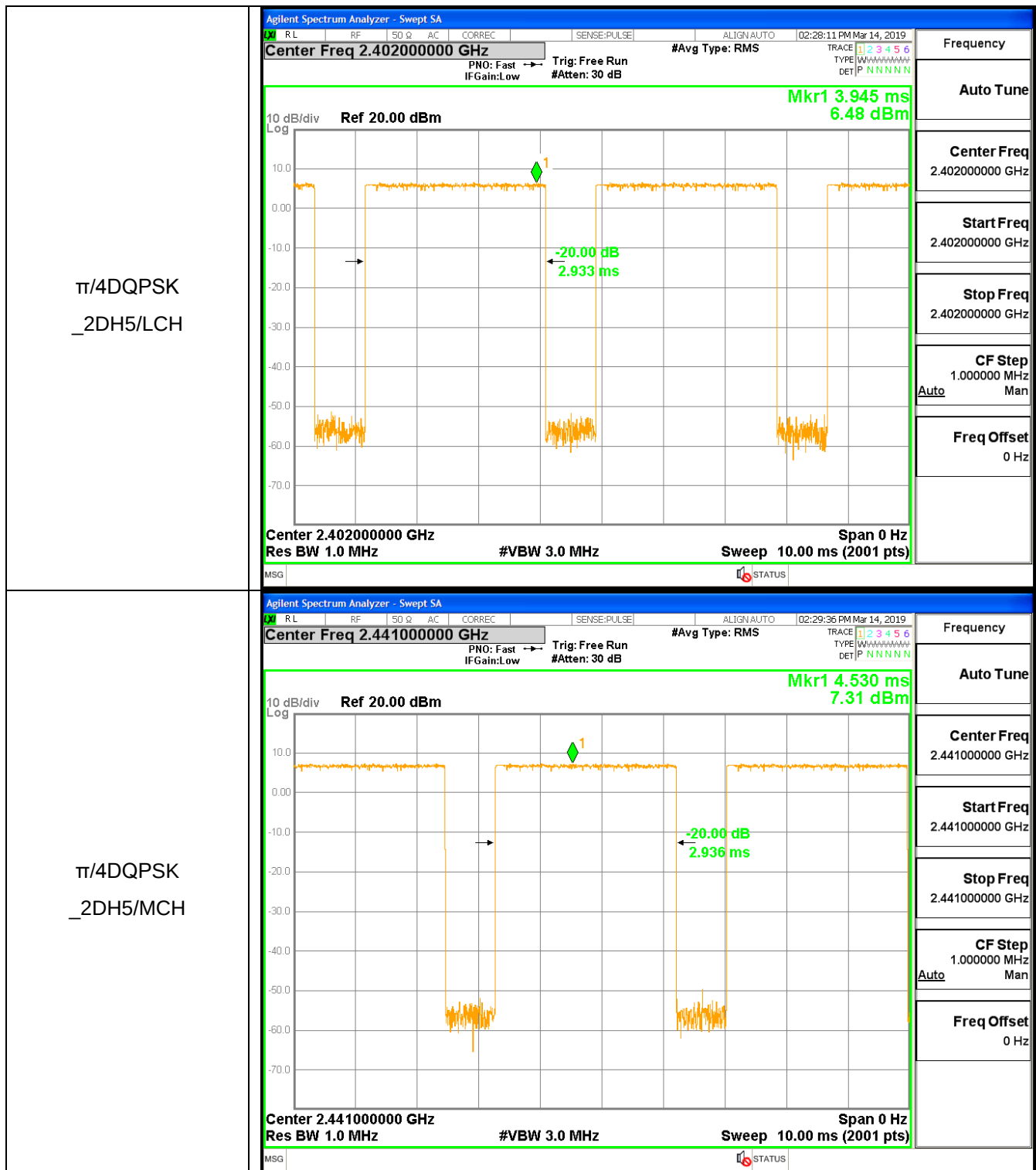
A.2 Dwell Time

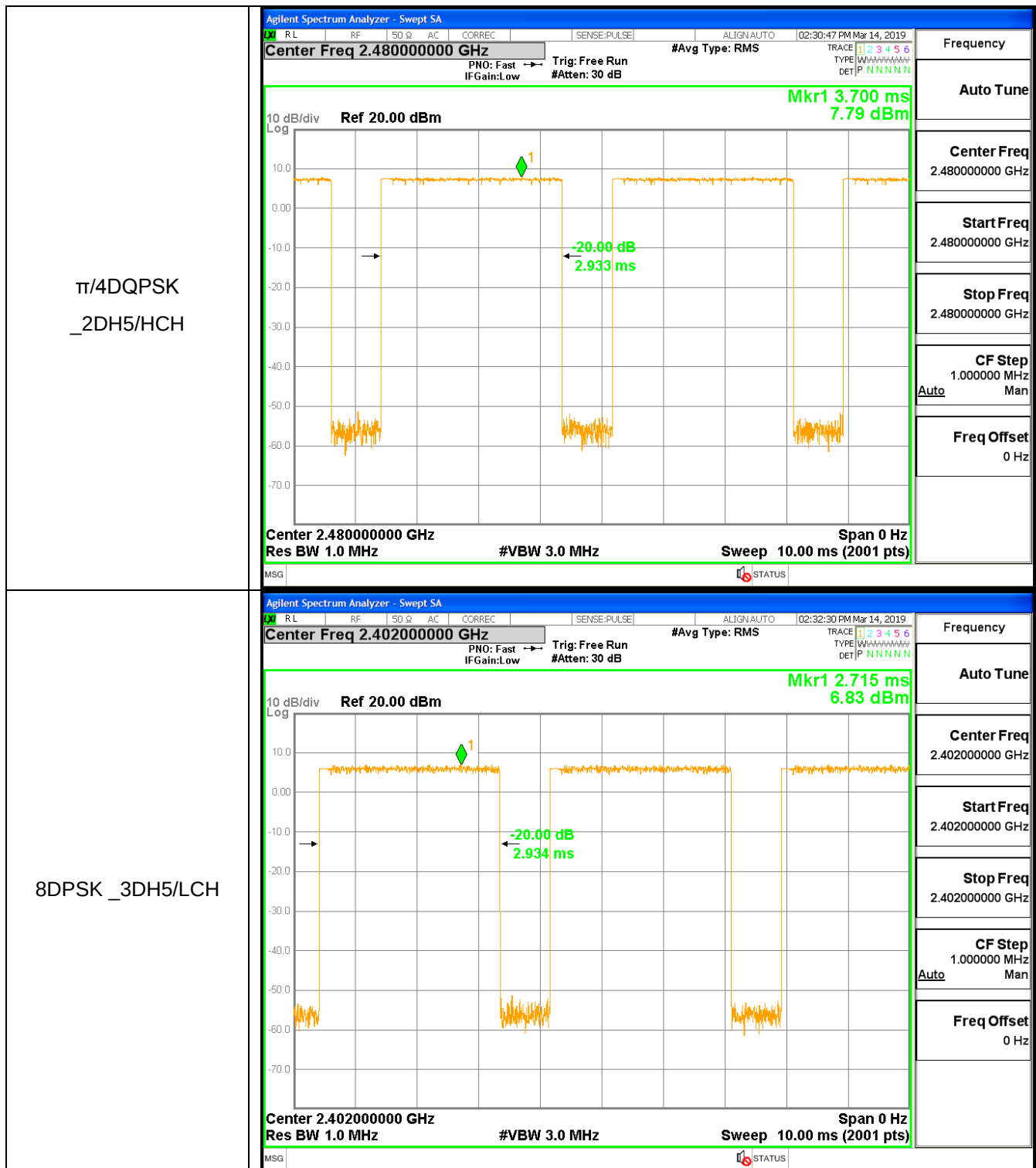
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002926	106.7	0.312195	0.4	PASS
GFSK	DH5	MCH	0.002929	106.7	0.312485	0.4	PASS
GFSK	DH5	HCH	0.002929	106.7	0.312488	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002933	106.7	0.312953	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002936	106.7	0.313289	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002933	106.7	0.312966	0.4	PASS
8DPSK	3DH5	LCH	0.002934	106.7	0.313076	0.4	PASS
8DPSK	3DH5	MCH	0.002937	106.7	0.313326	0.4	PASS
8DPSK	3DH5	HCH	0.002936	106.7	0.313249	0.4	PASS

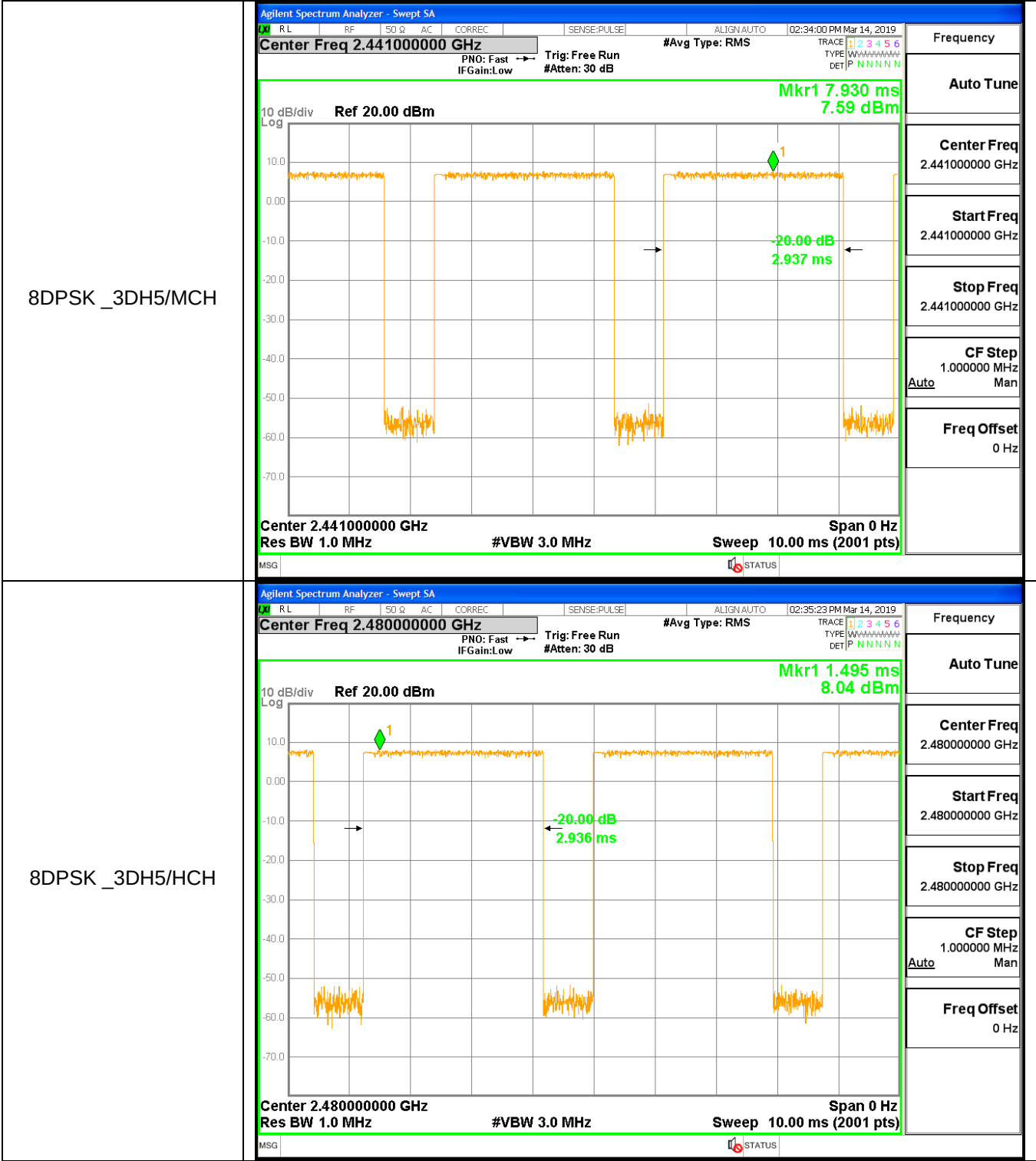
Test Graph







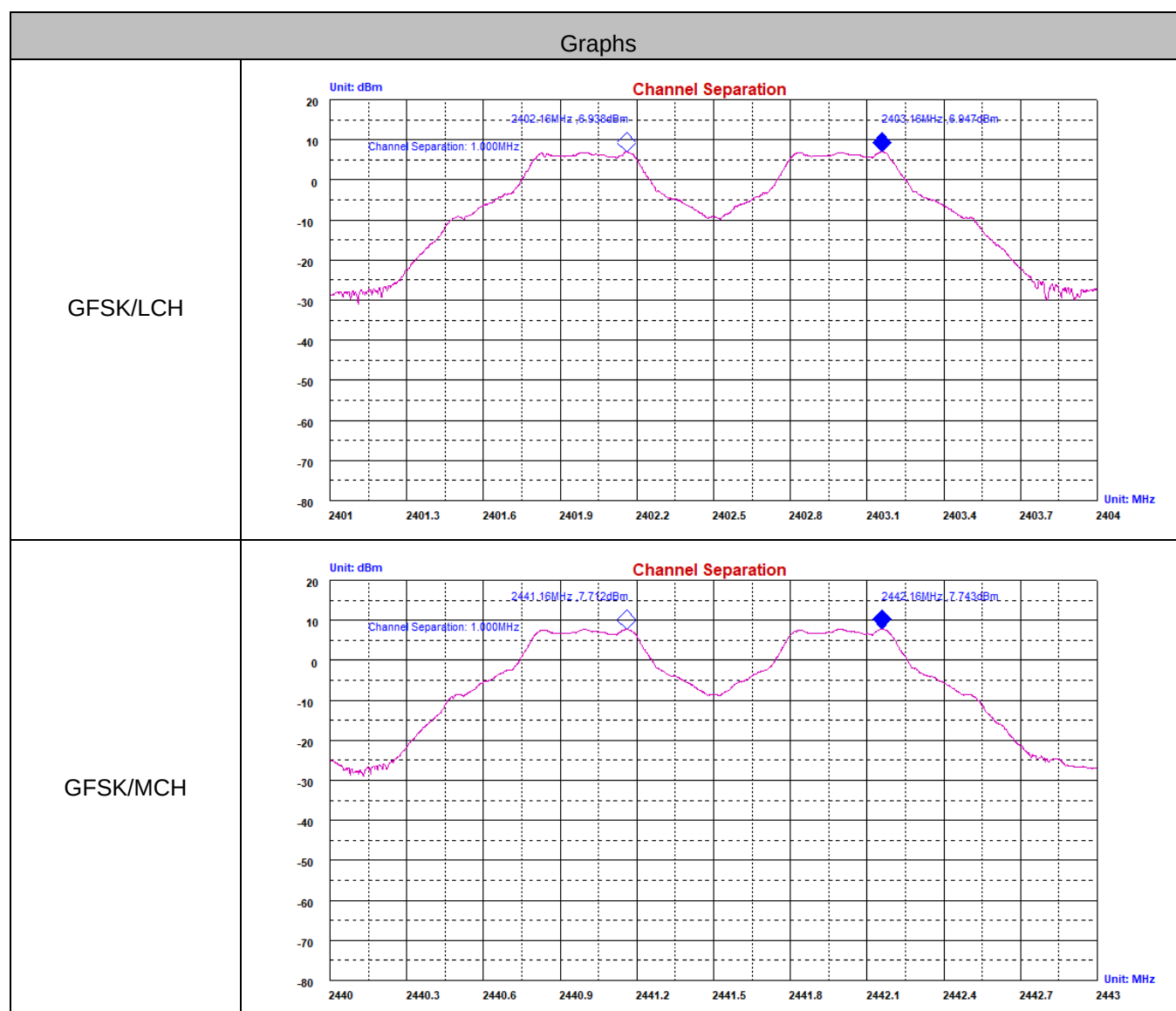


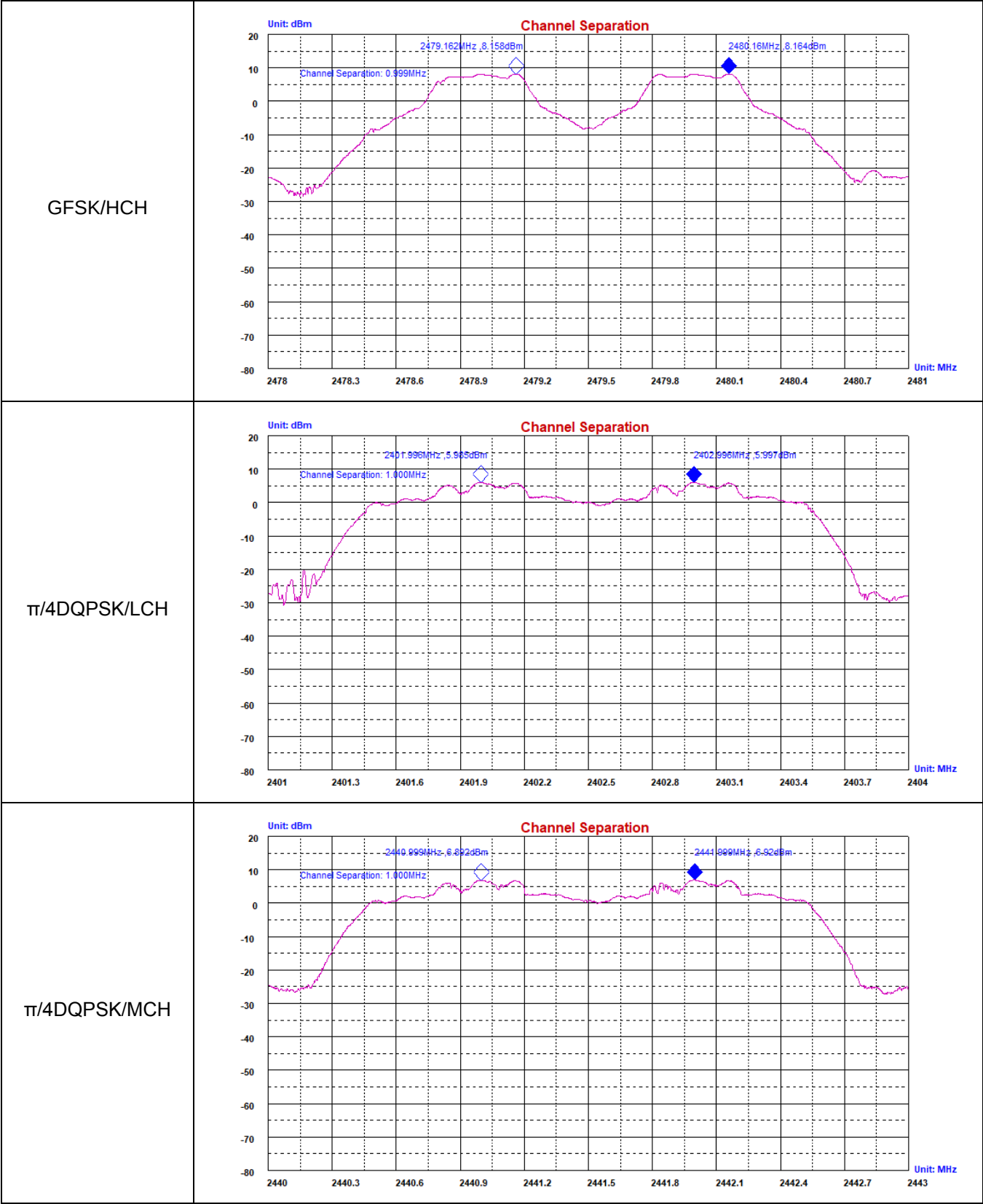


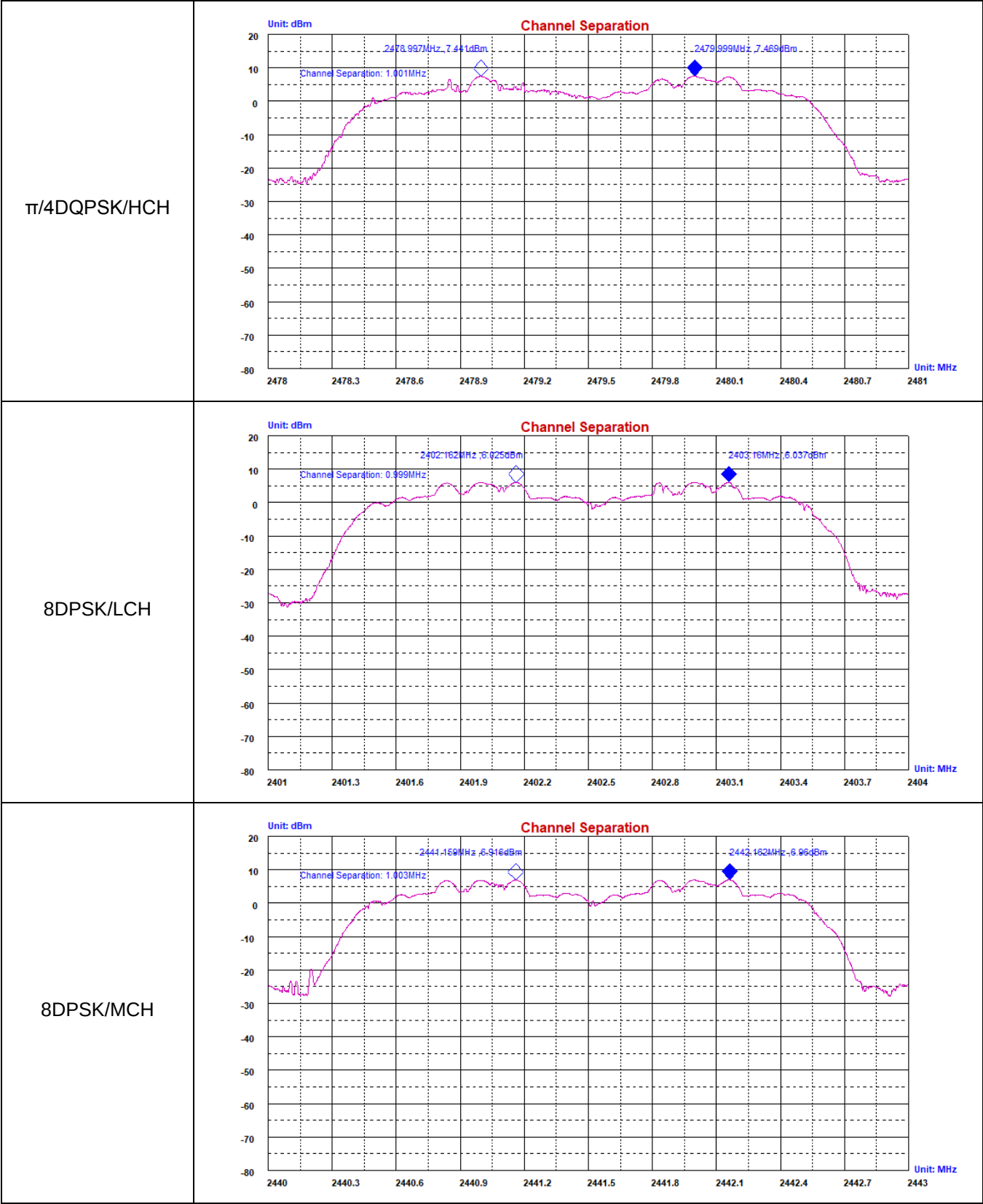
A.3 Carrier Frequency Separation

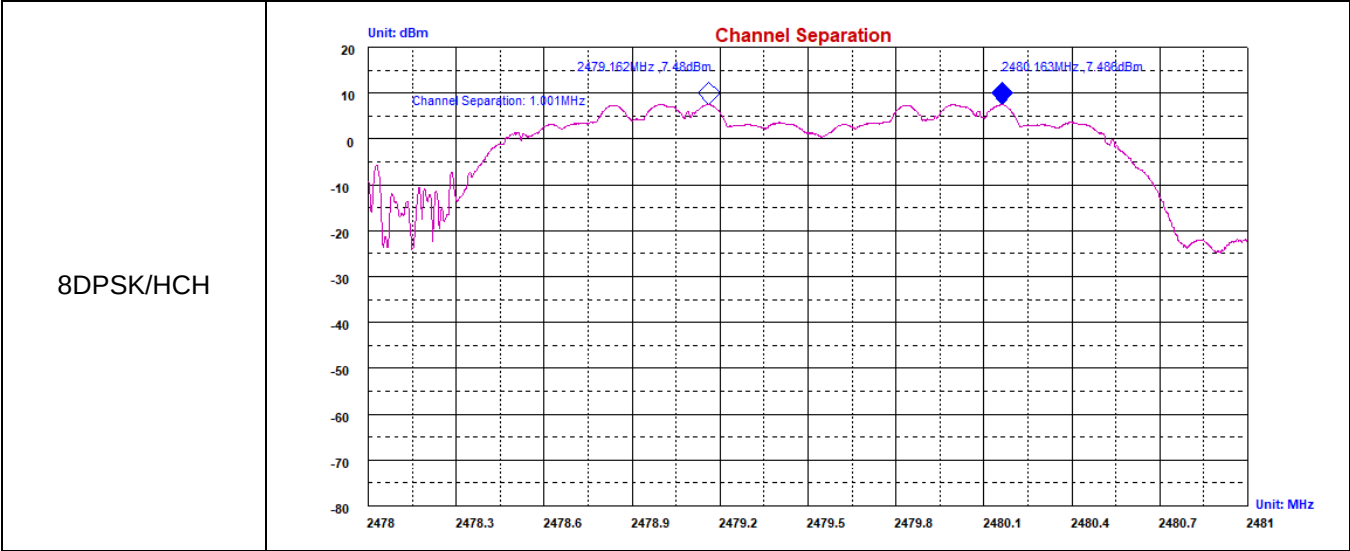
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.000	0.625	PASS
GFSK	MCH	1.000	0.573	PASS
GFSK	HCH	0.999	0.591	PASS
$\pi/4$ DQPSK	LCH	1.000	0.799	PASS
$\pi/4$ DQPSK	MCH	1.000	0.802	PASS
$\pi/4$ DQPSK	HCH	1.001	0.883	PASS
8DPSK	LCH	0.999	0.824	PASS
8DPSK	MCH	1.003	0.826	PASS
8DPSK	HCH	1.001	0.828	PASS

Test Graph





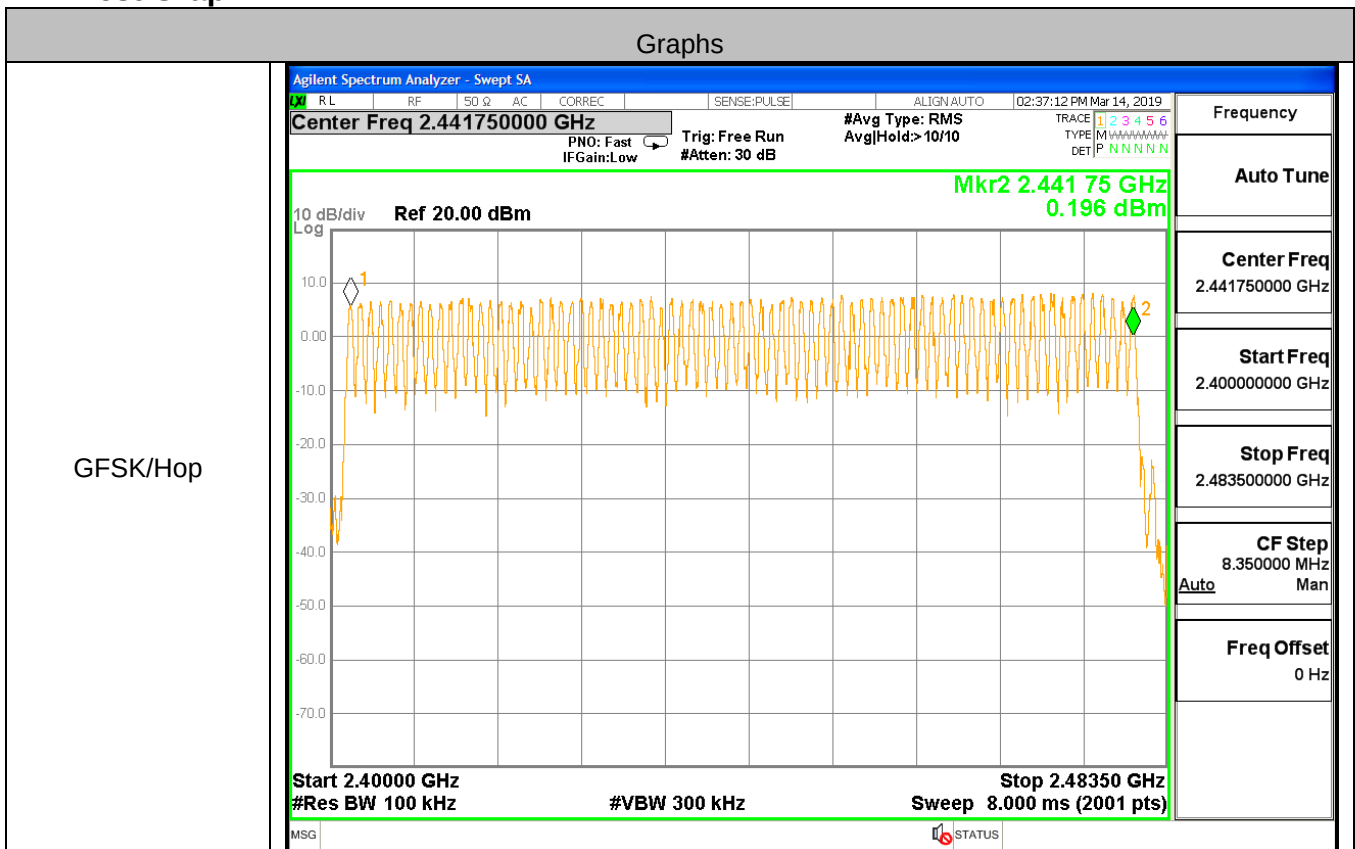


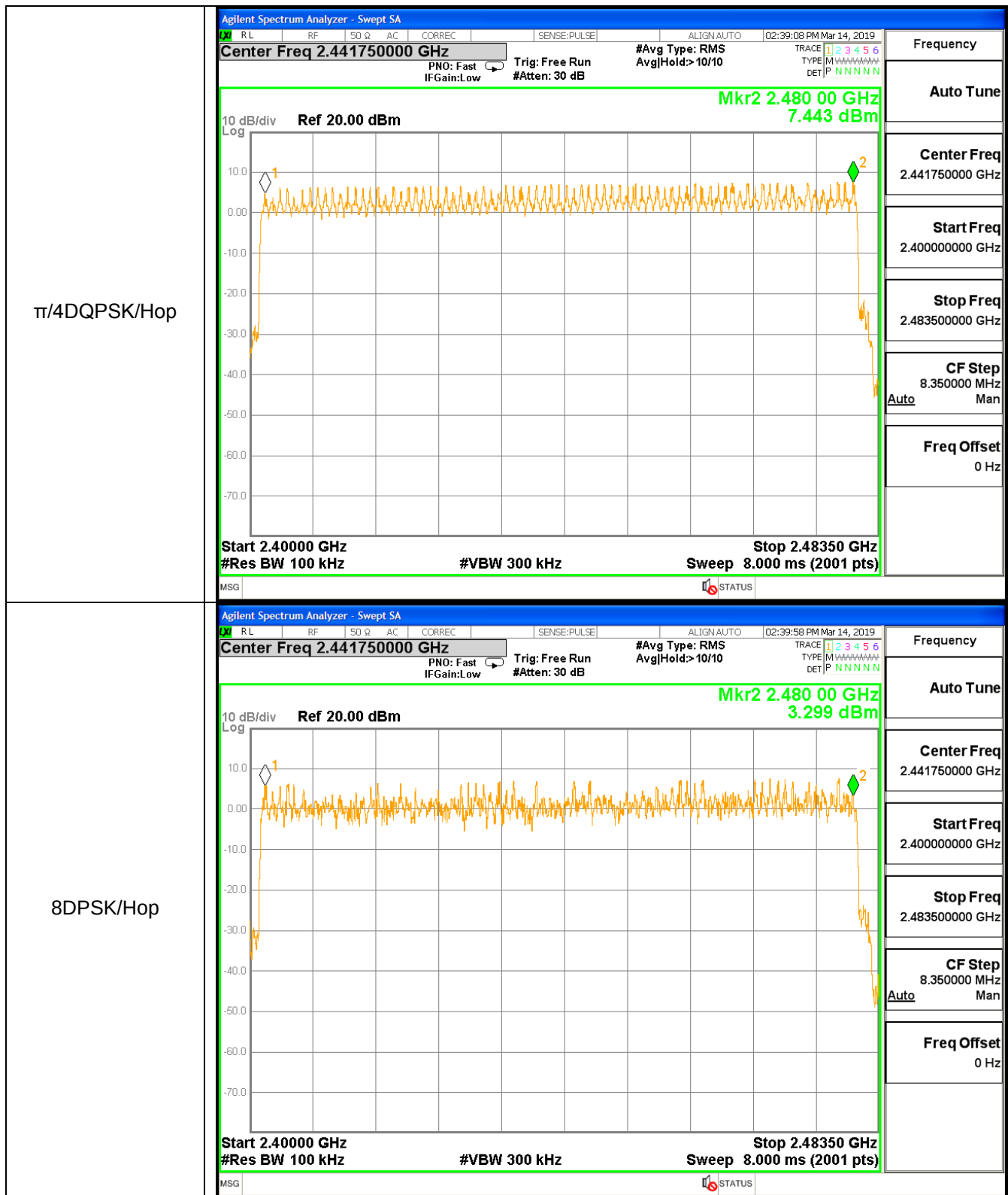


A.4 Hopping Channel Number

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

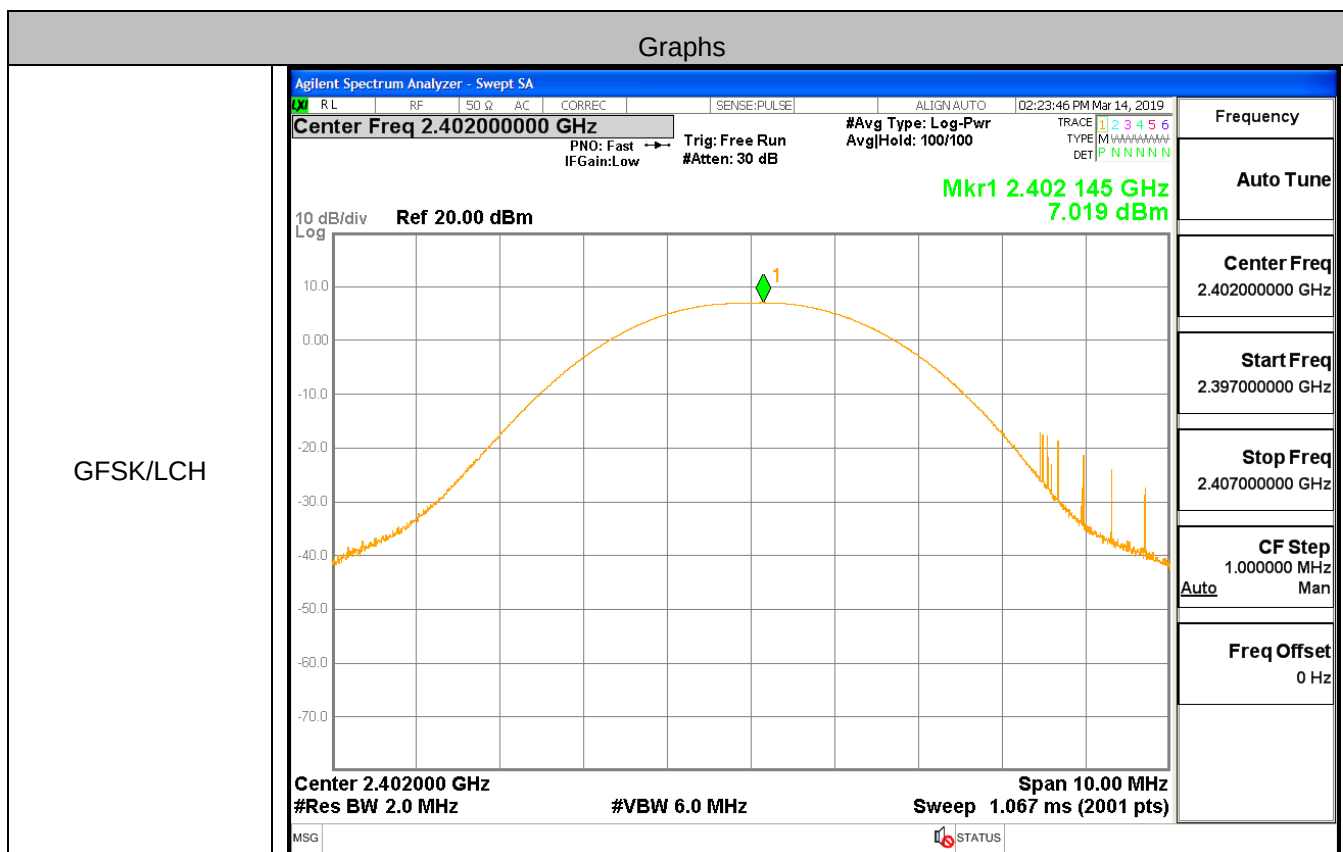


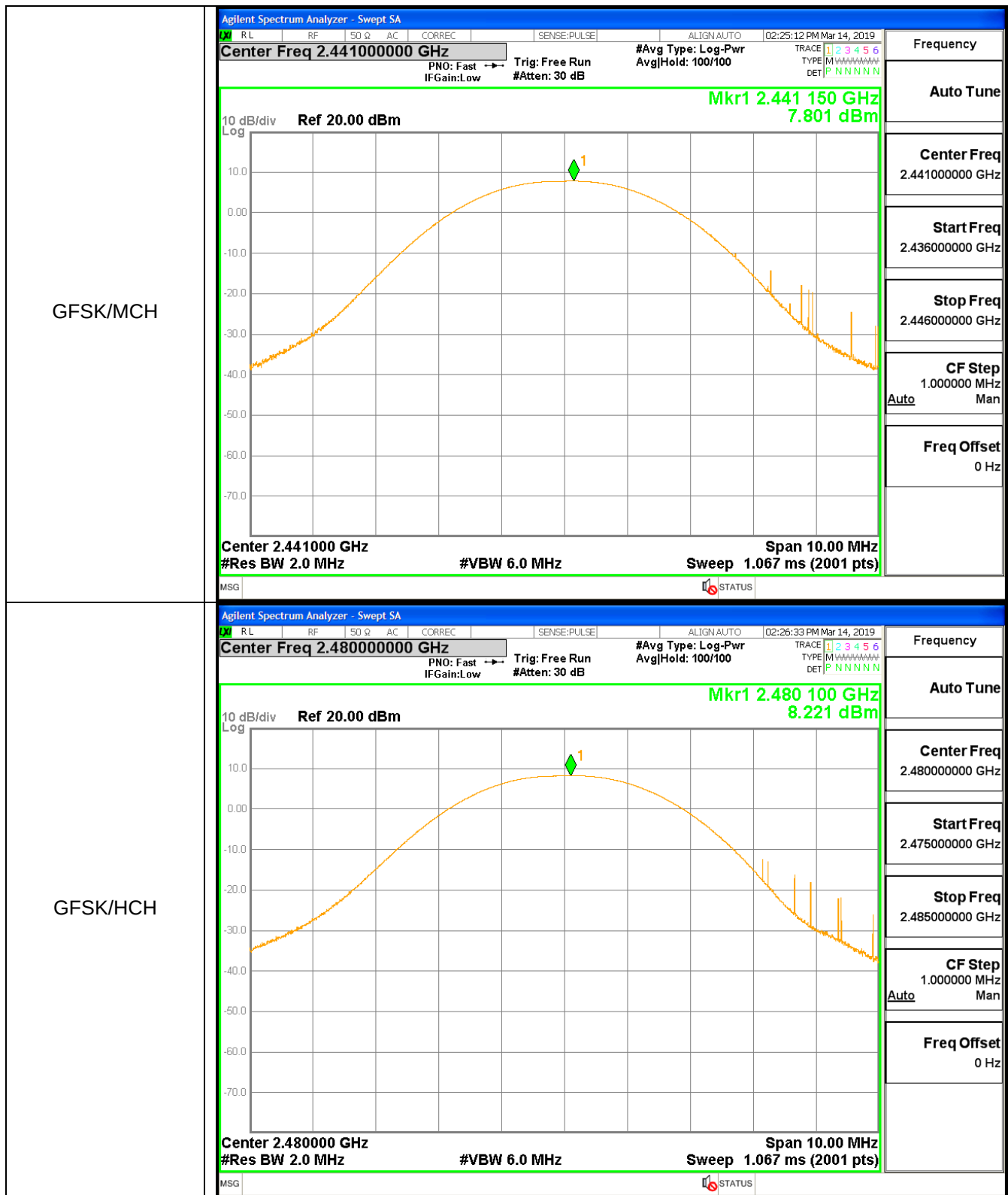


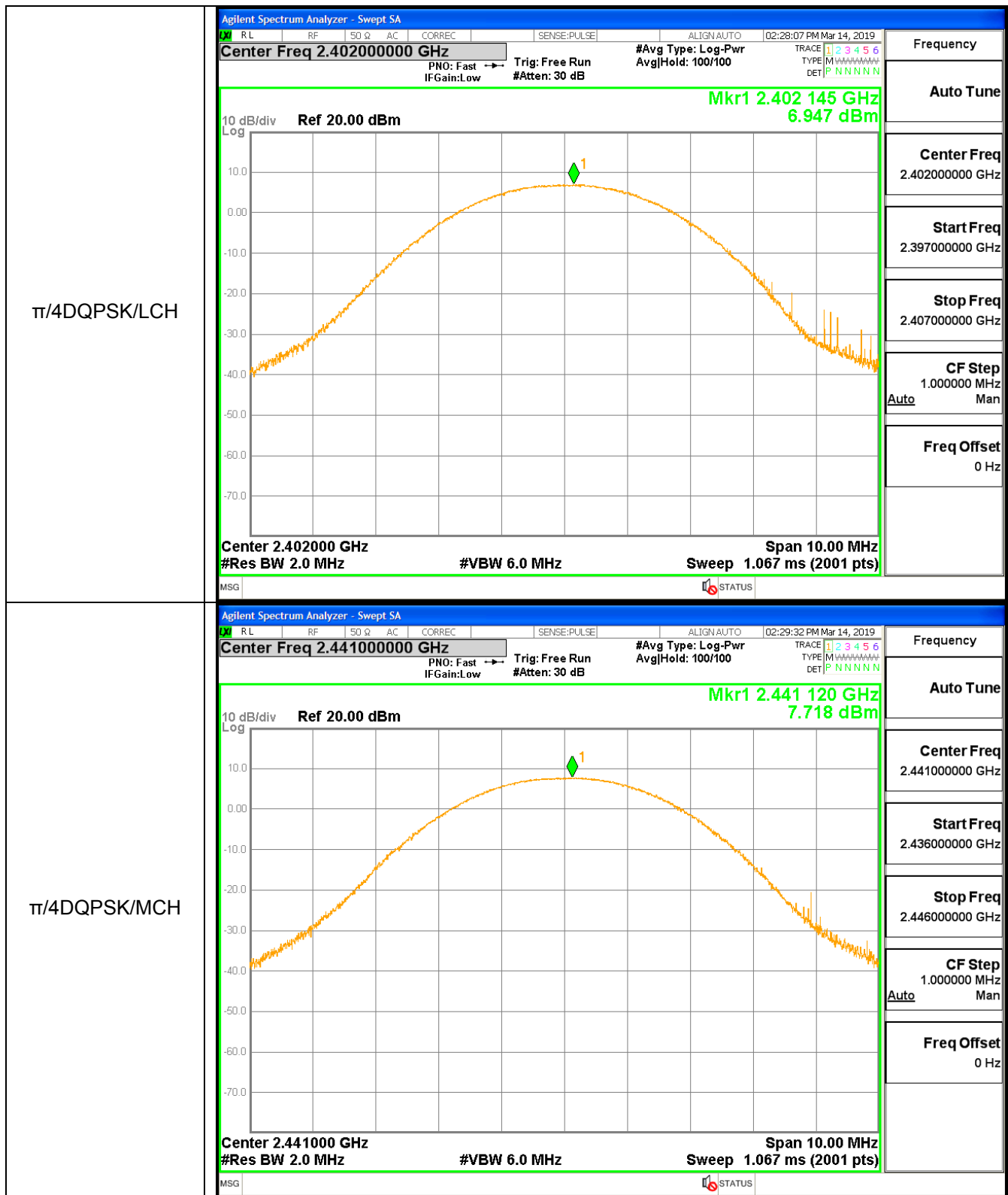
A.5 Conducted Peak Output Power

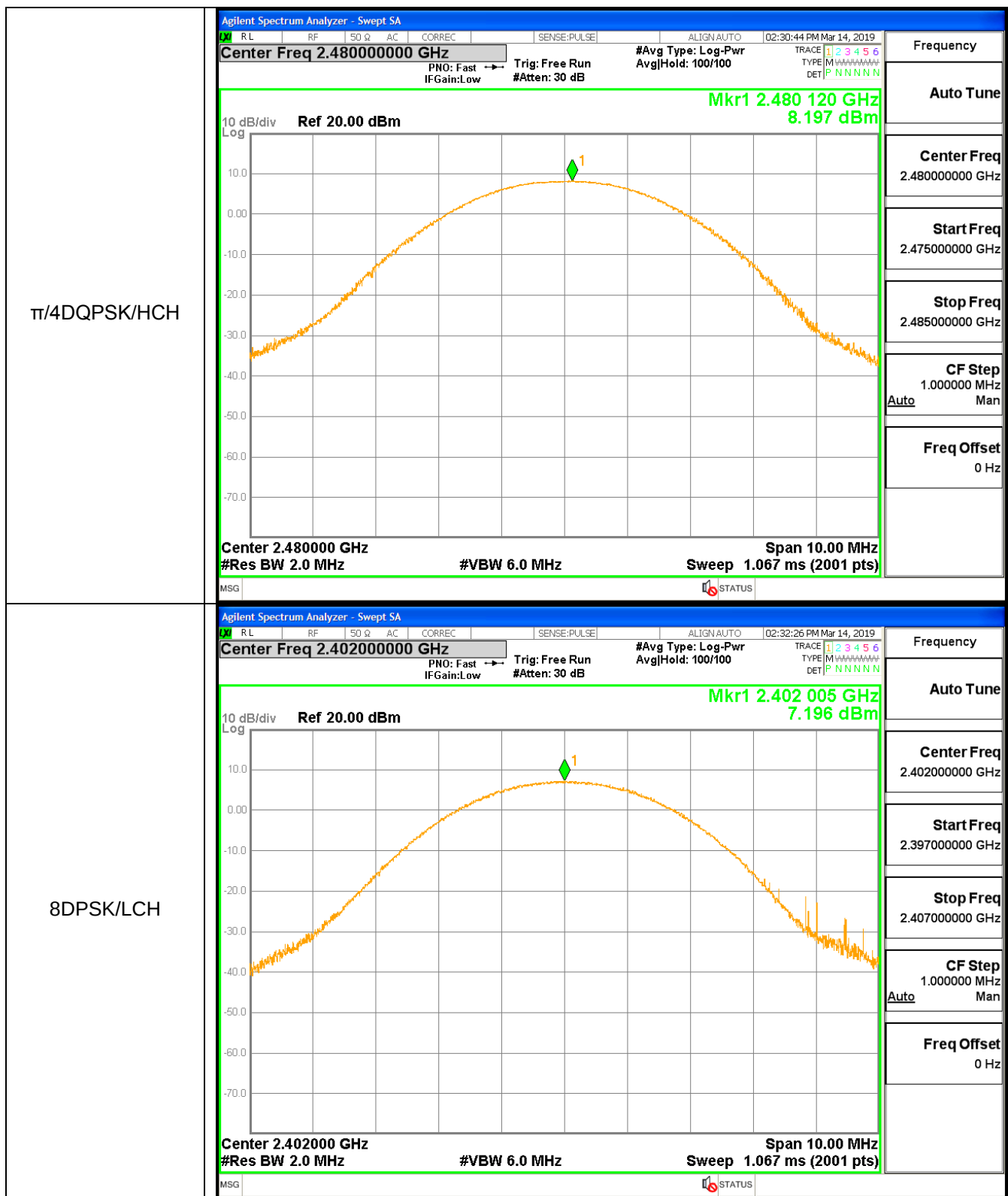
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	7.019	21	PASS
GFSK	MCH	7.801	21	PASS
GFSK	HCH	8.221	21	PASS
$\pi/4$ DQPSK	LCH	6.947	21	PASS
$\pi/4$ DQPSK	MCH	7.718	21	PASS
$\pi/4$ DQPSK	HCH	8.197	21	PASS
8DPSK	LCH	7.196	21	PASS
8DPSK	MCH	7.925	21	PASS
8DPSK	HCH	8.315	21	PASS

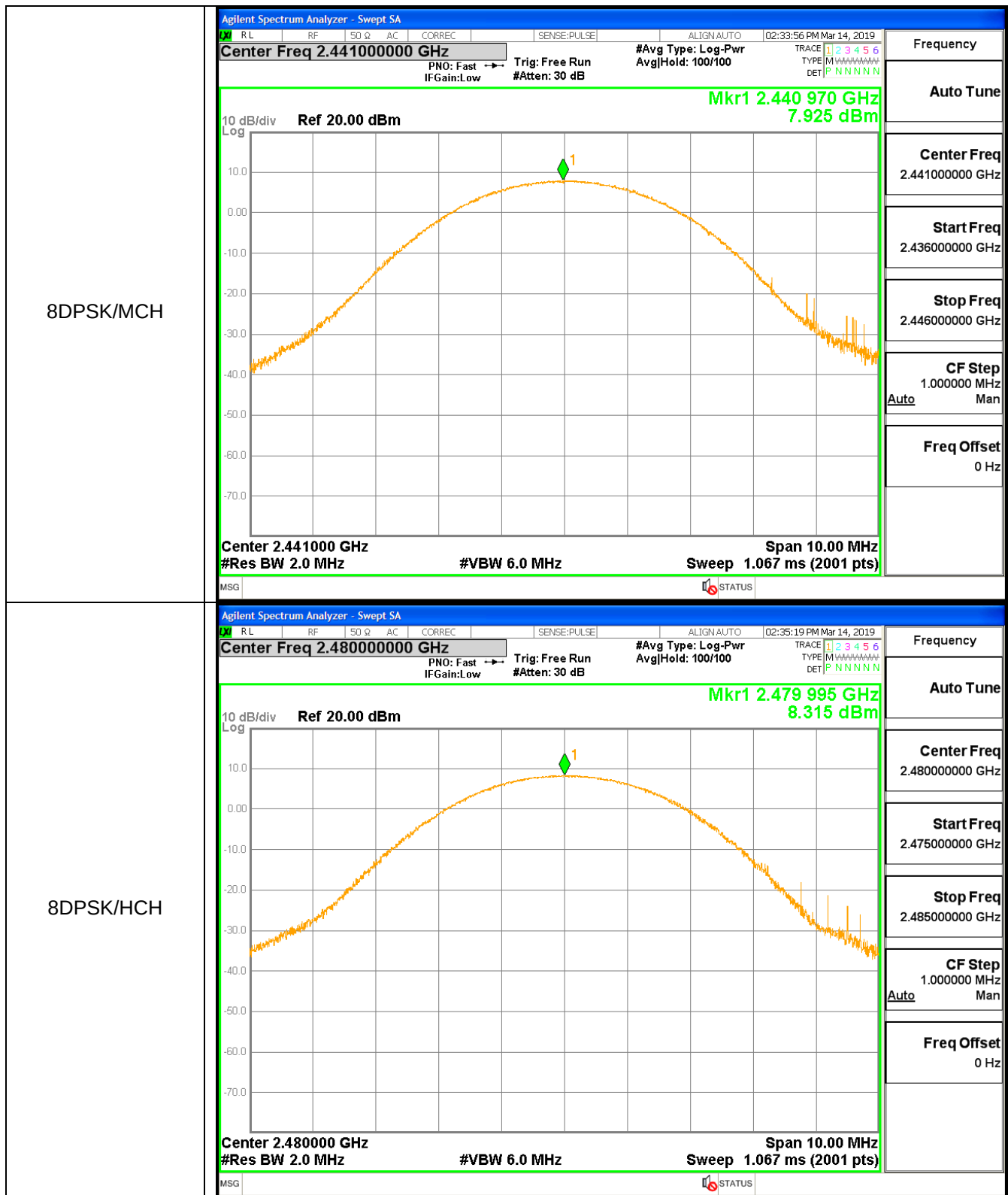
Test Graph











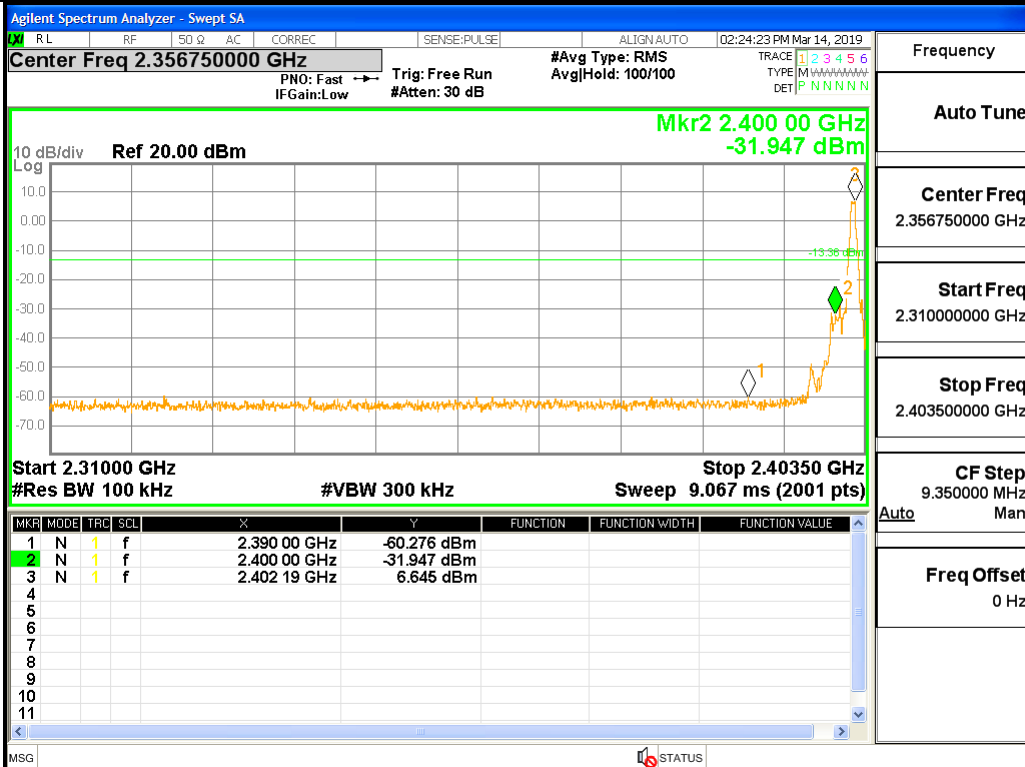
A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2390	6.65	-60.28	-13.36	Pass
1DH5	2402	2400	6.65	-31.95	-13.36	Pass
1DH5-Hopping	2402	2390	7.41	-61.37	-12.59	Pass
1DH5-Hopping	2402	2400	7.41	-28.64	-12.59	Pass
1DH5	2480	2483.5	8.19	-38.10	-11.82	Pass
1DH5	2480	2500	8.19	-62.54	-11.82	Pass
1DH5-Hopping	2480	2483.5	8.06	-39.43	-11.94	Pass
1DH5-Hopping	2480	2500	8.06	-60.94	-11.94	Pass
2DH5	2402	2390	2.91	-63.66	-17.09	Pass
2DH5	2402	2400	2.91	-27.30	-17.09	Pass
2DH5-Hopping	2480	2483.5	7.51	-44.30	-12.49	Pass
2DH5-Hopping	2480	2500	7.51	-60.18	-12.49	Pass
2DH5	2480	2483.5	7.51	-44.32	-12.49	Pass
2DH5	2480	2500	7.51	-62.30	-12.49	Pass
2DH5-Hopping	2402	2390	6.16	-62.01	-13.84	Pass
2DH5-Hopping	2402	2400	6.16	-36.50	-13.84	Pass
3DH5	2402	2390	4.75	-63.06	-15.25	Pass
3DH5	2402	2400	4.75	-31.26	-15.25	Pass
3DH5-Hopping	2402	2390	6.06	-61.55	-13.94	Pass
3DH5-Hopping	2402	2400	6.06	-35.02	-13.94	Pass
3DH5	2480	2483.5	7.54	-41.50	-12.47	Pass
3DH5	2480	2500	7.54	-61.97	-12.47	Pass
3DH5-Hopping	2480	2483.5	7.51	-40.88	-12.49	Pass
3DH5-Hopping	2480	2500	7.51	-60.85	-12.49	Pass

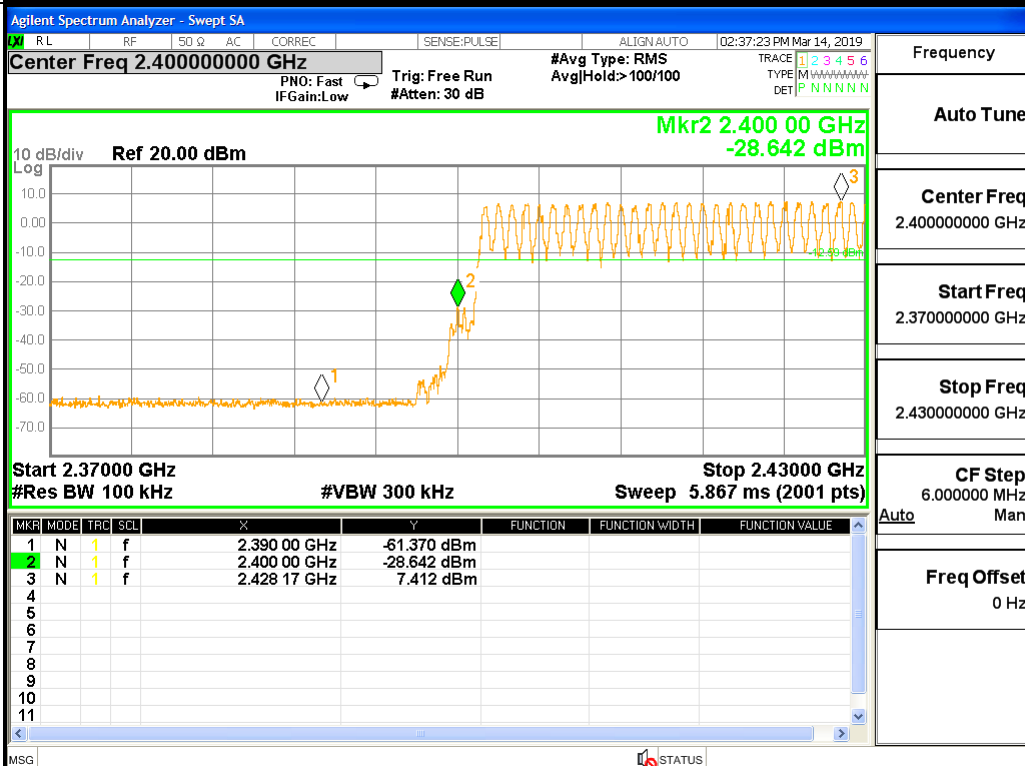
Test Graph

Graphs

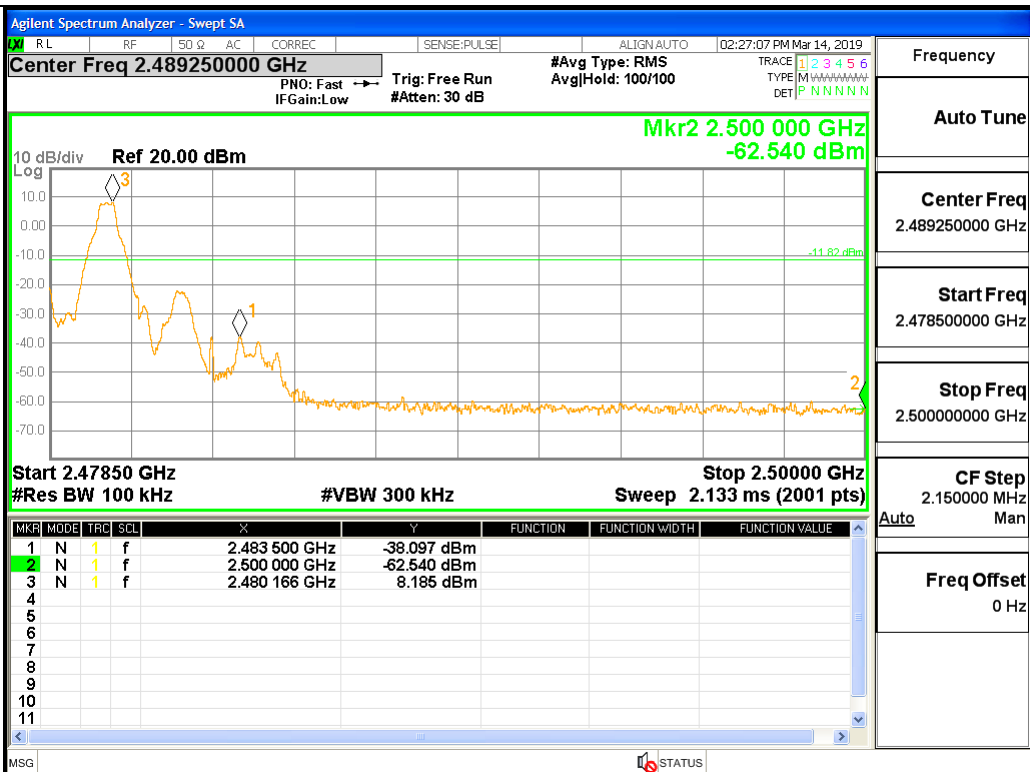
GFSK/LCH/No Hop



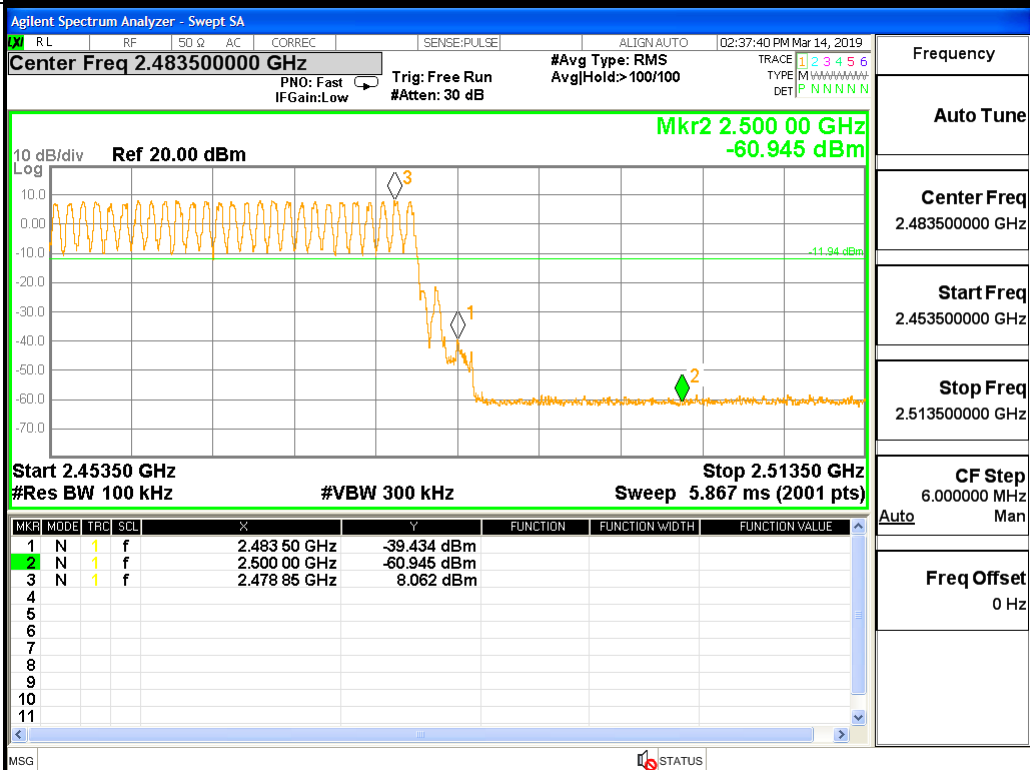
GFSK/LCH/Hop

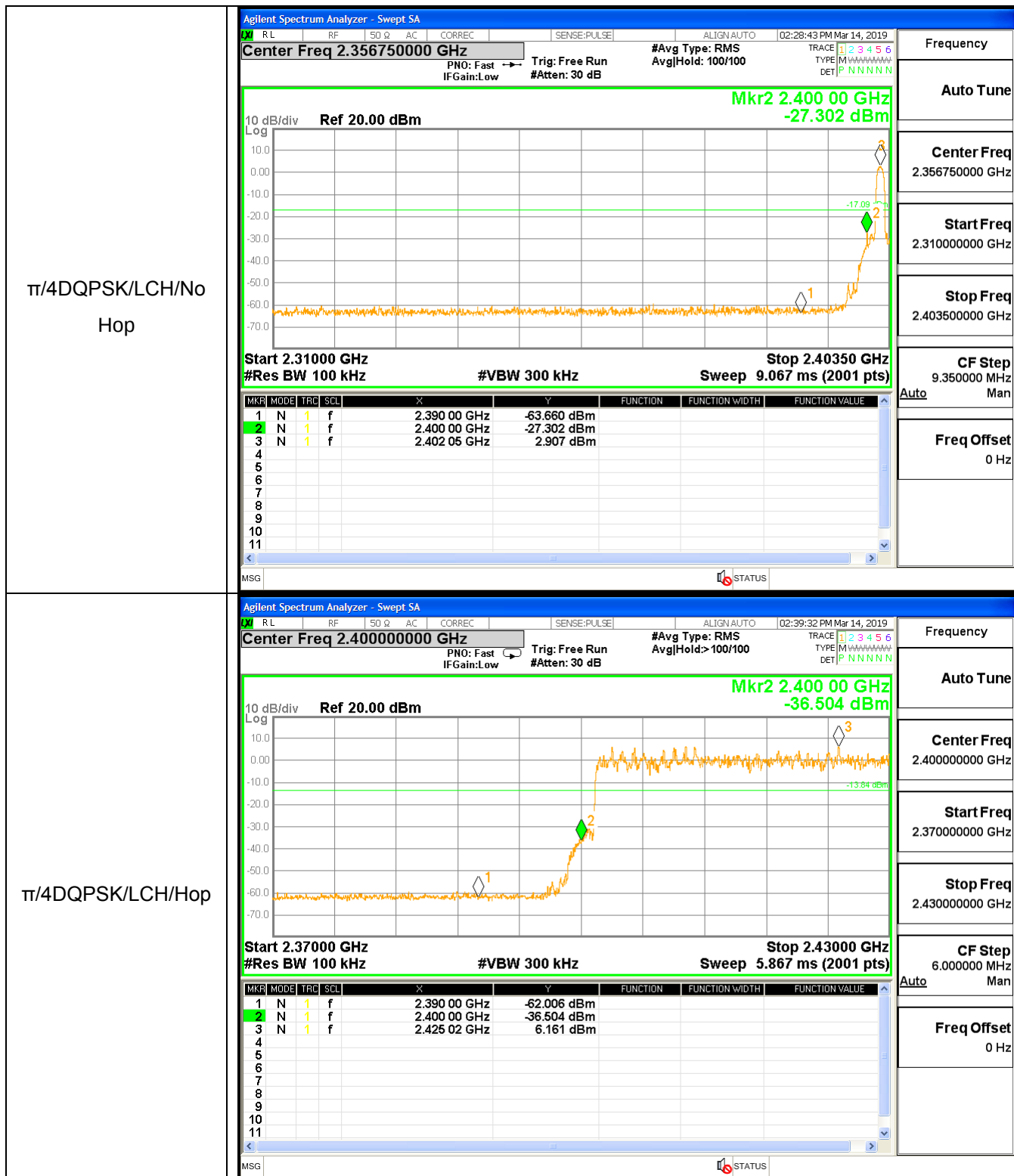


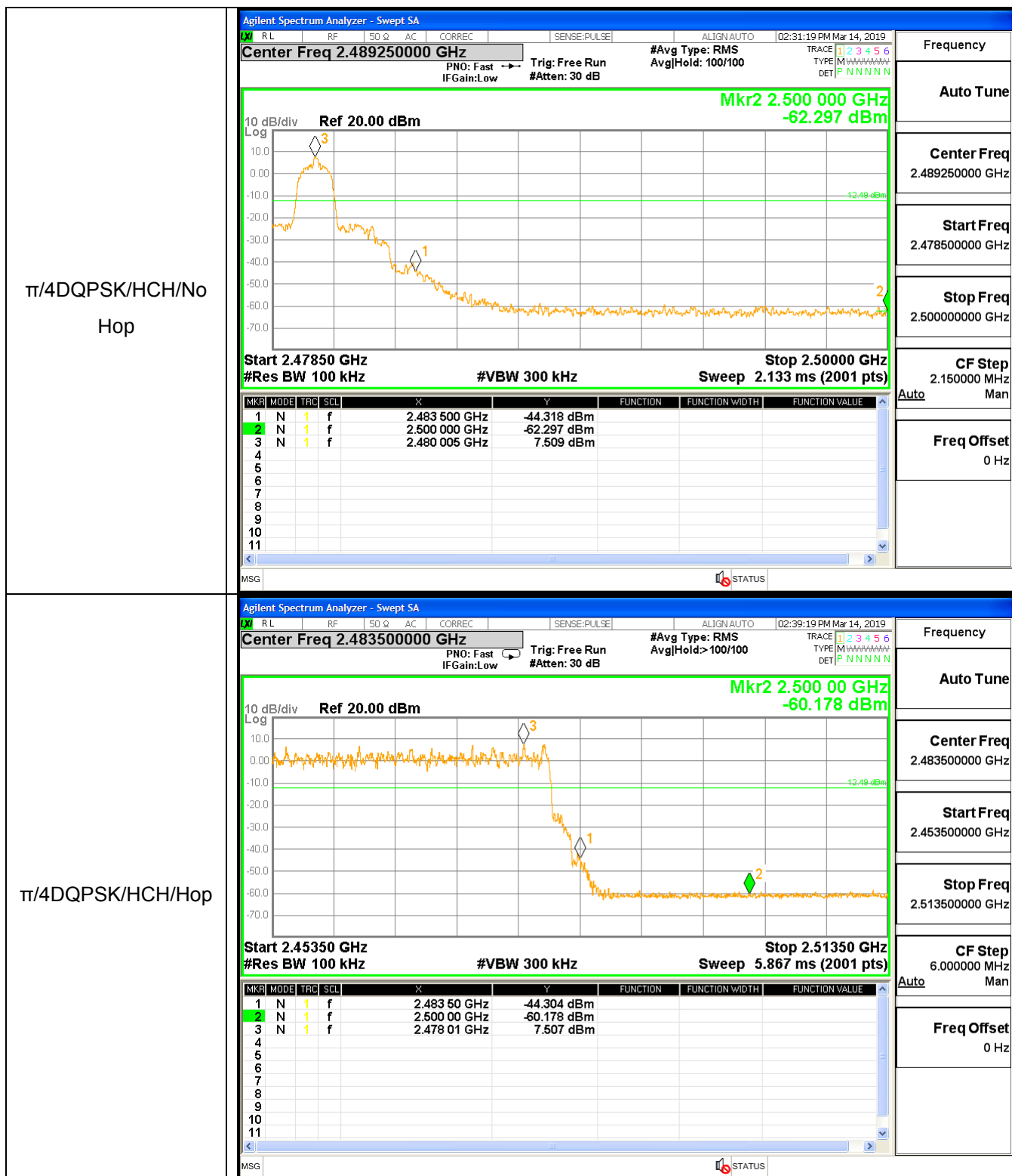
GFSK/HCH/No Hop

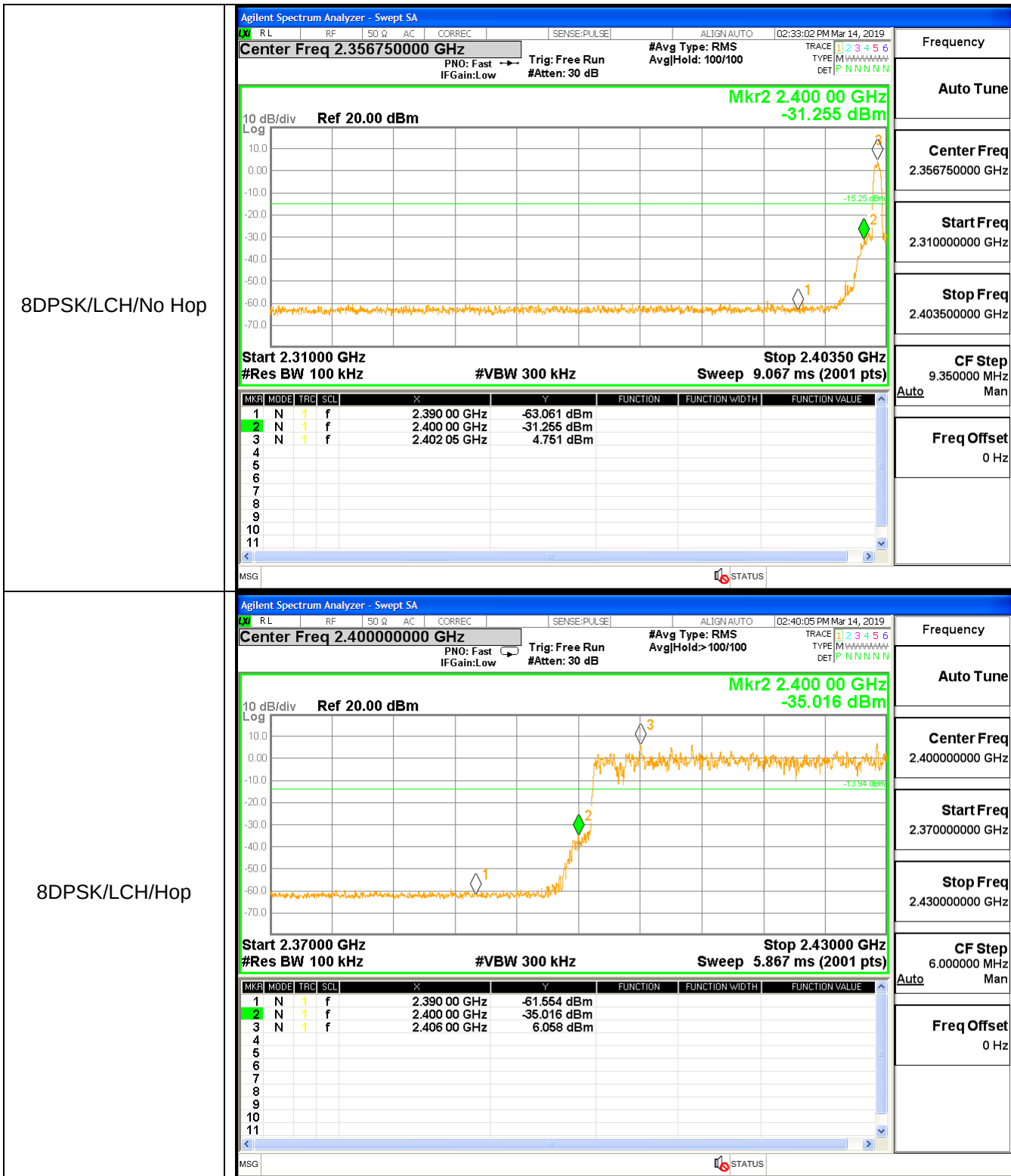


GFSK/HCH/Hop

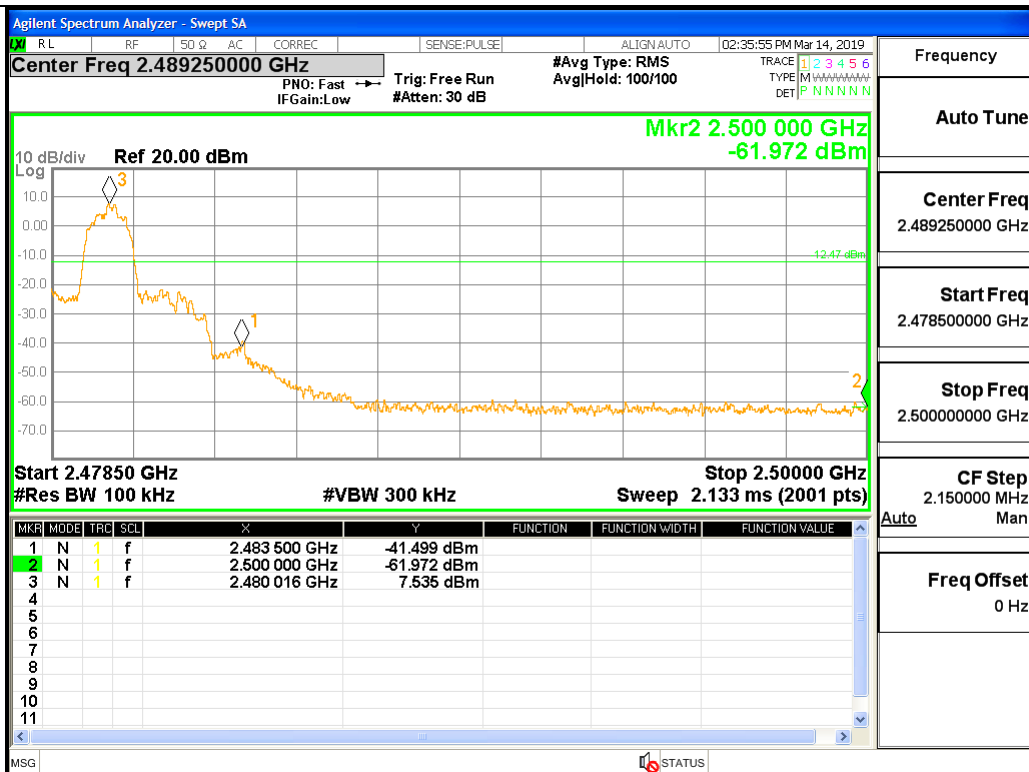




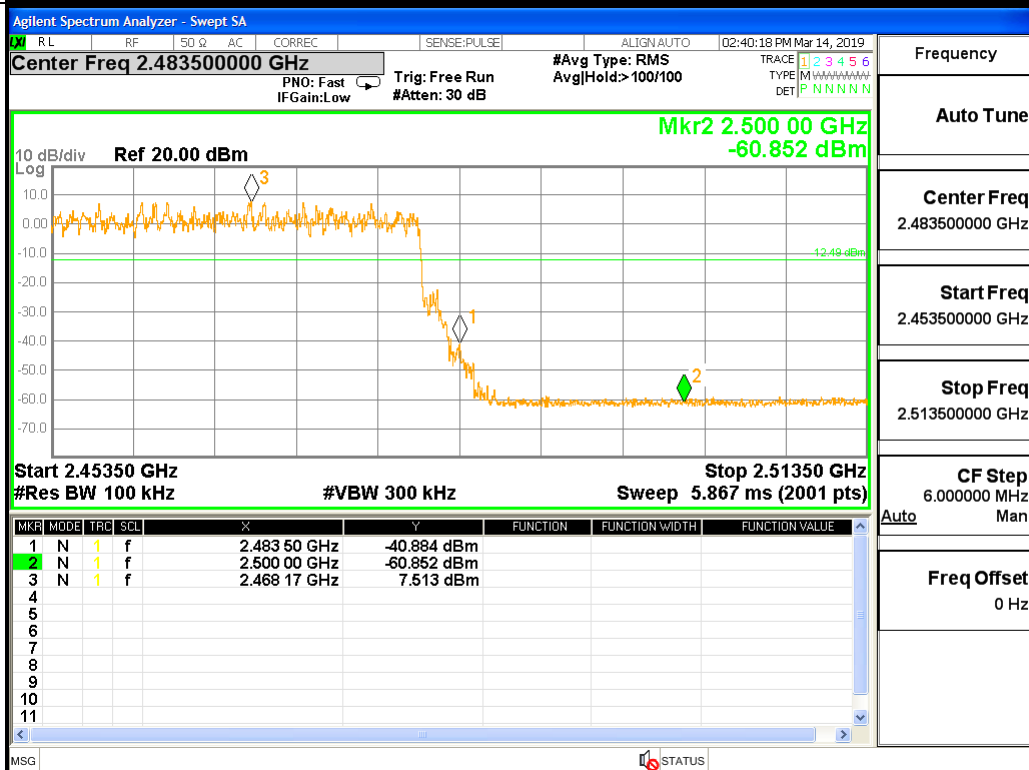




8DPSK/HCH/No Hop

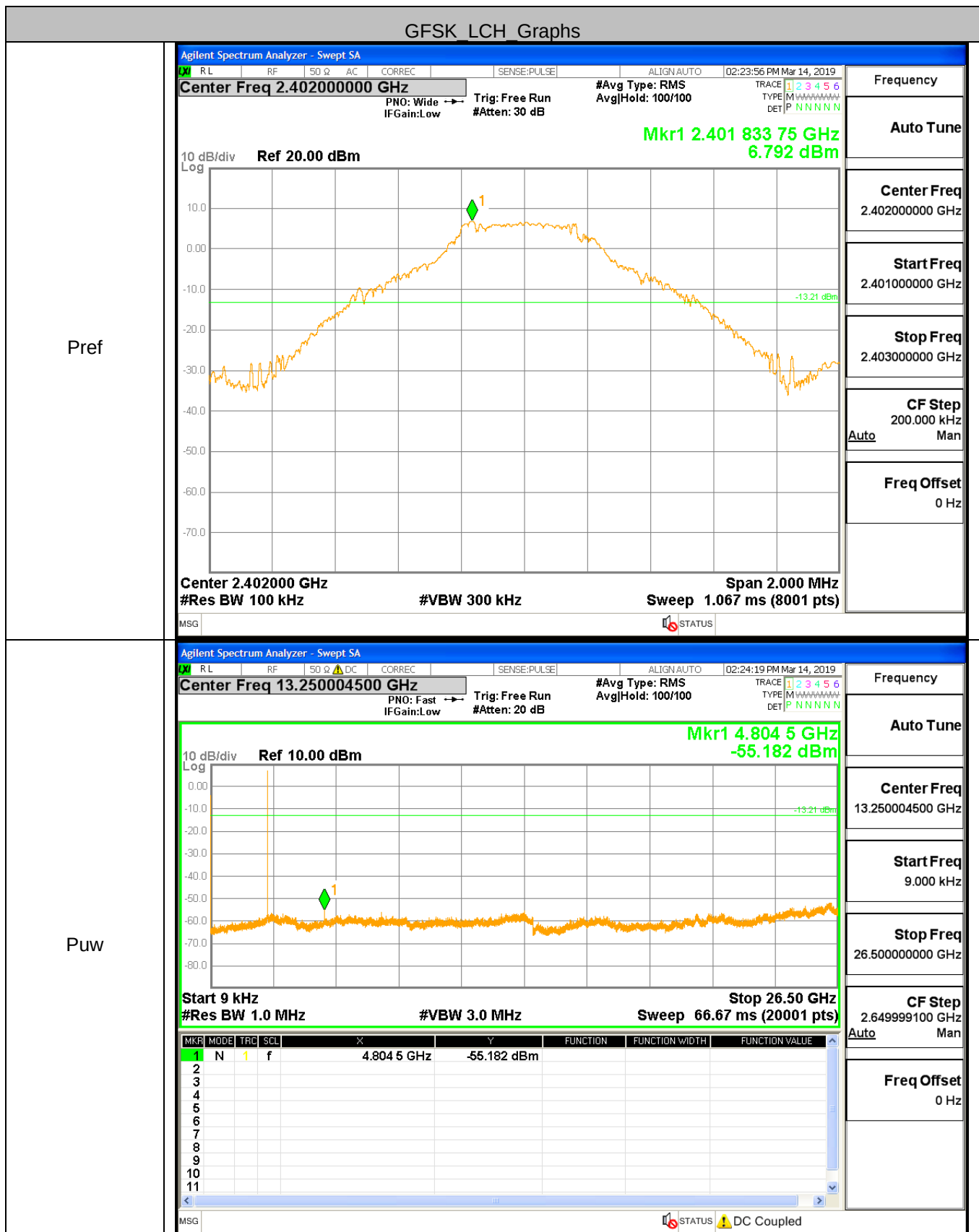


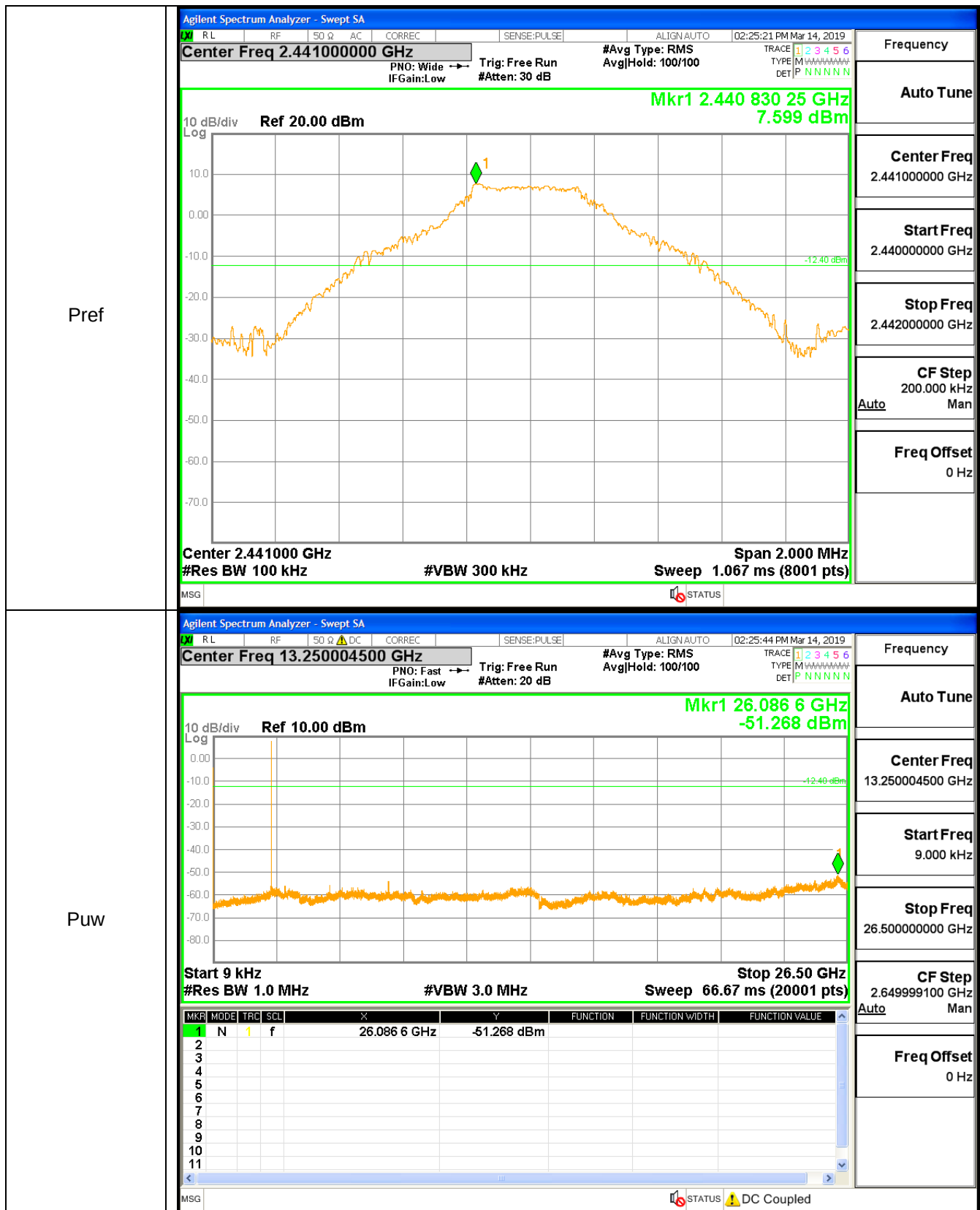
8DPSK/HCH/Hop



A.7 RF Conducted Spurious Emissions

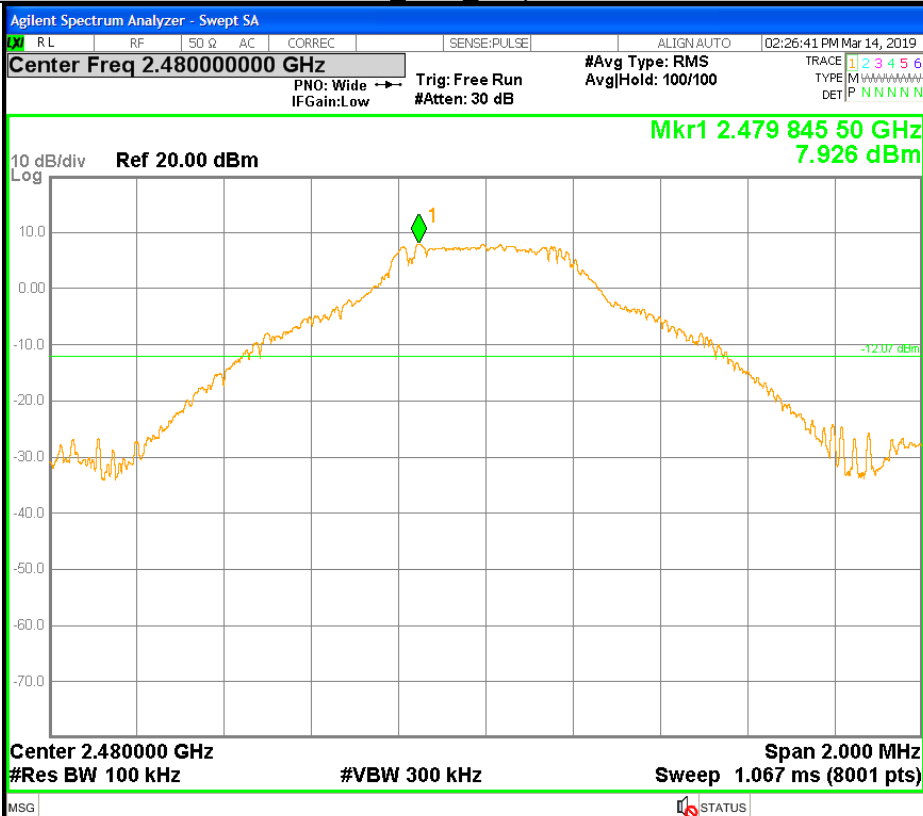
Test Graph



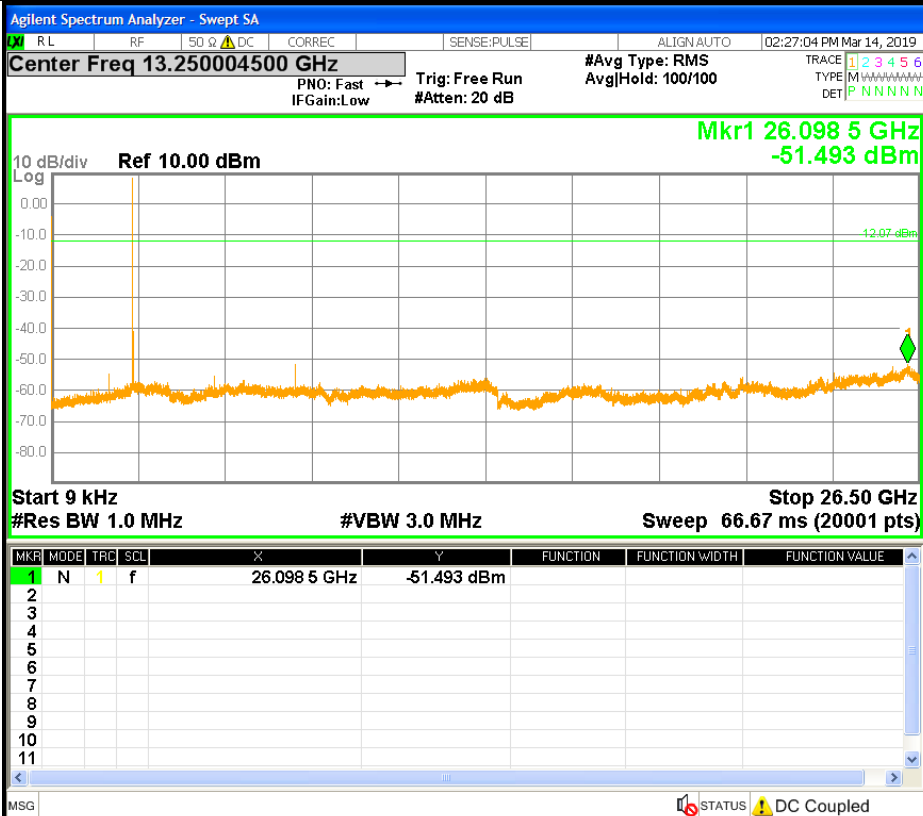


GFSK HCH Graphs

Pref

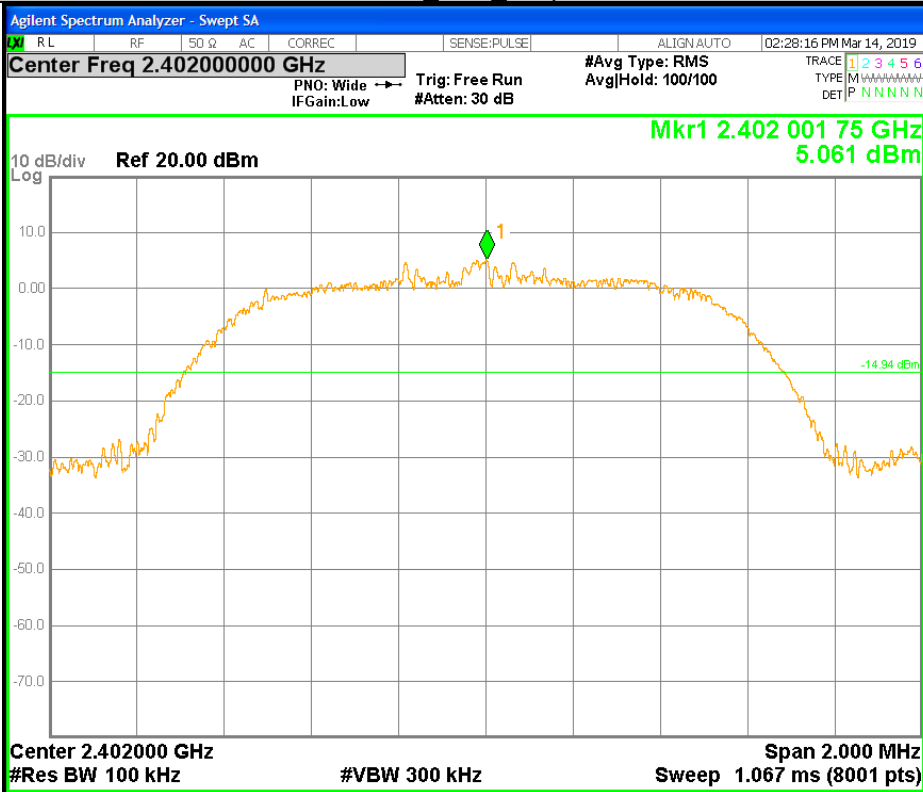


Puw

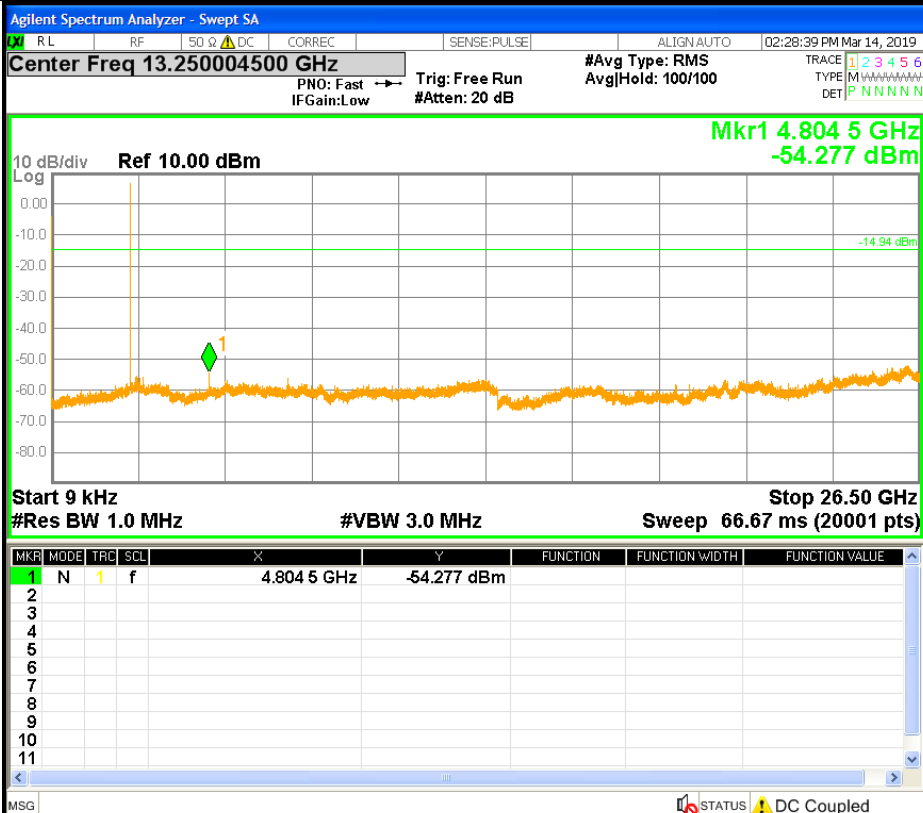


$\pi/4$ DQPSK LCH Graphs

Pref

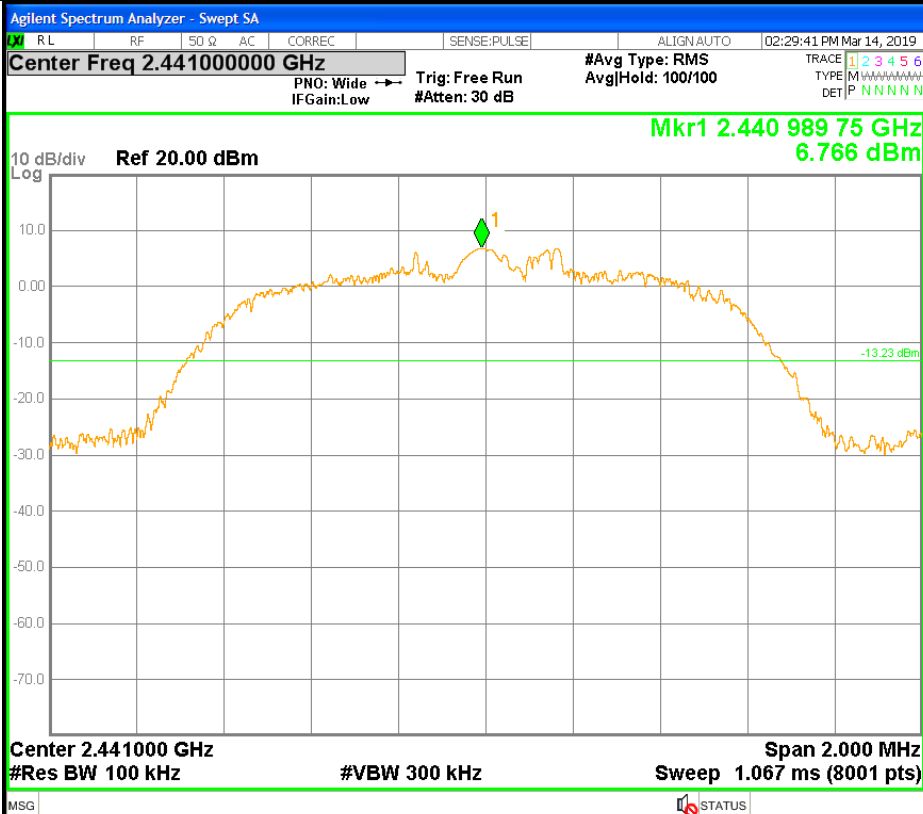


Puw

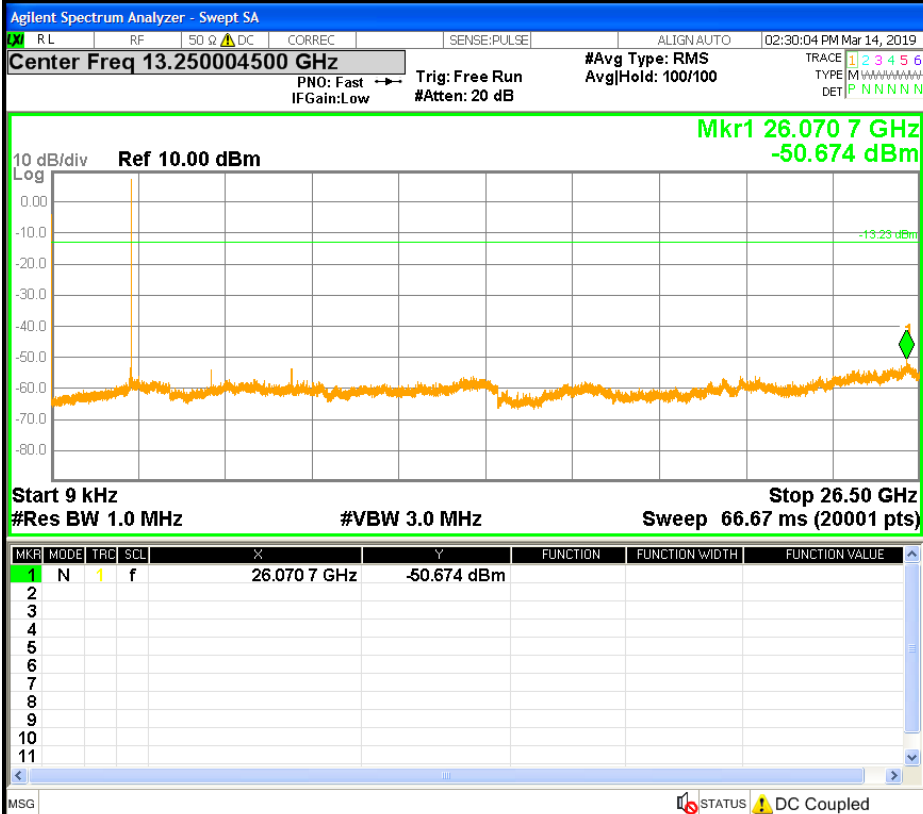


$\pi/4$ DQPSK MCH Graphs

Pref

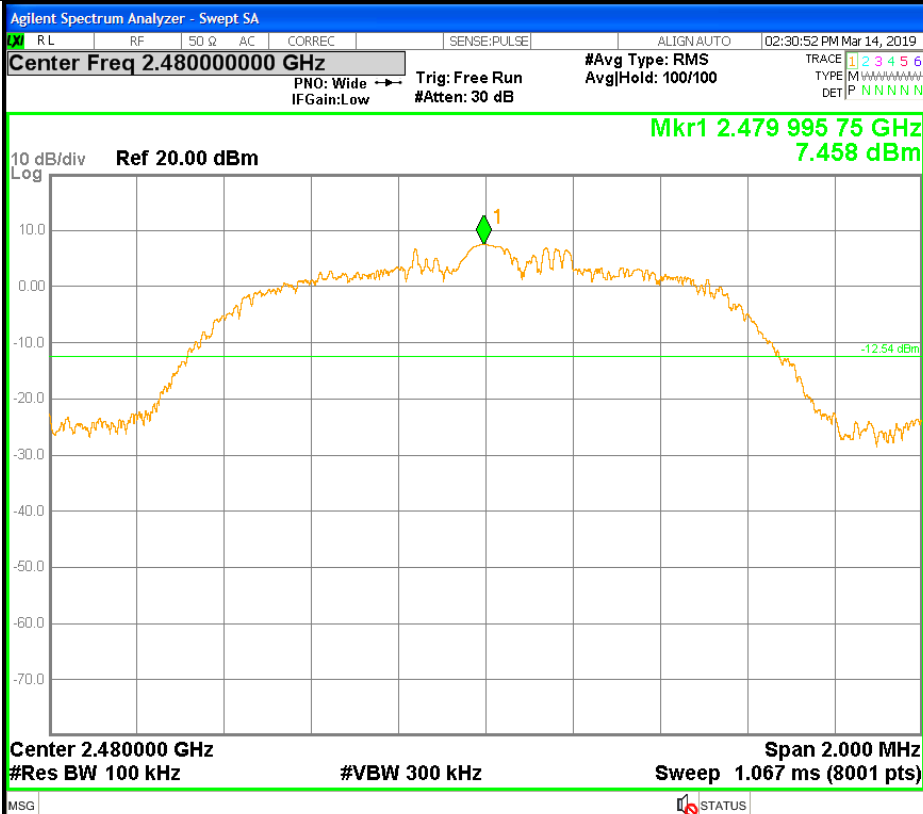


Puw

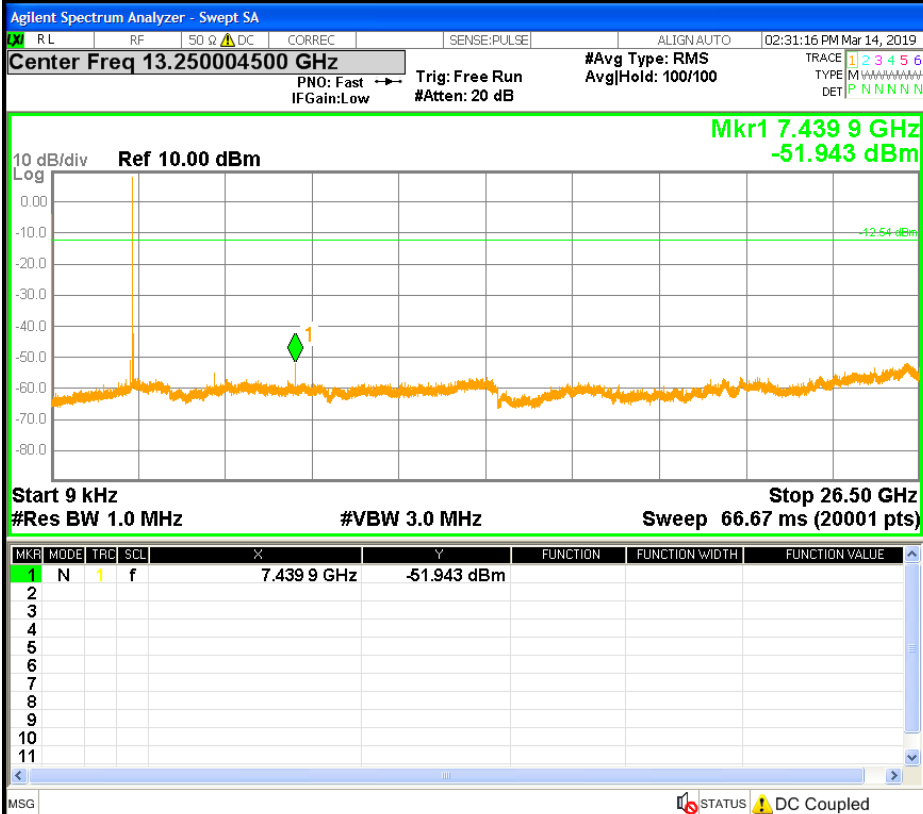


$\pi/4$ DQPSK HCH Graphs

Pref

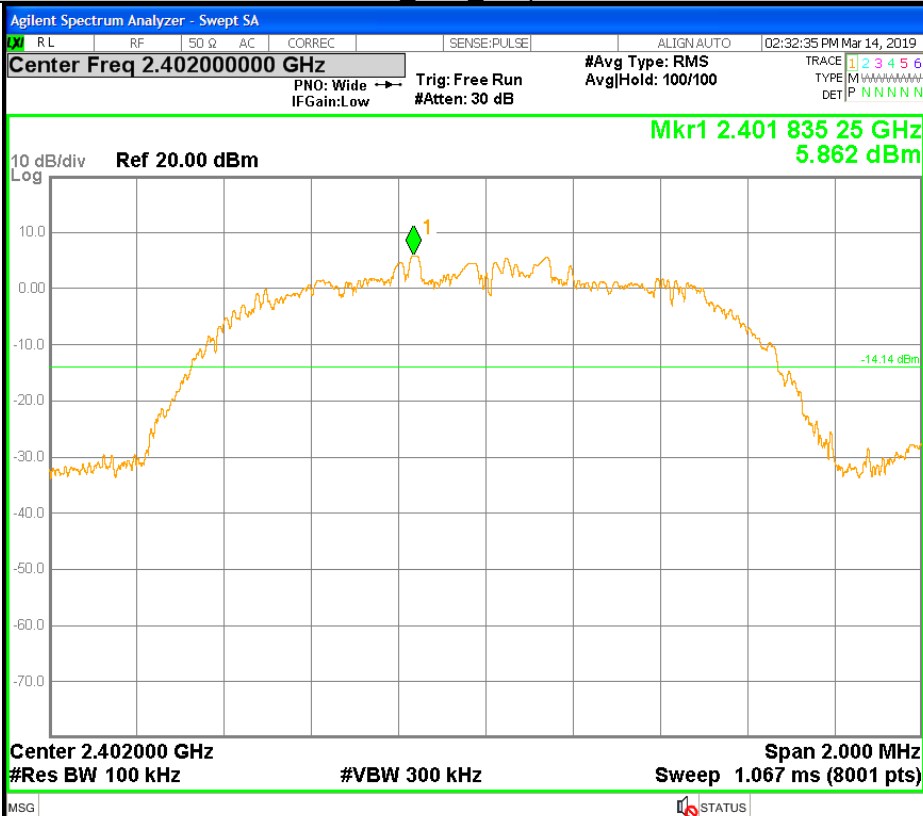


Puw

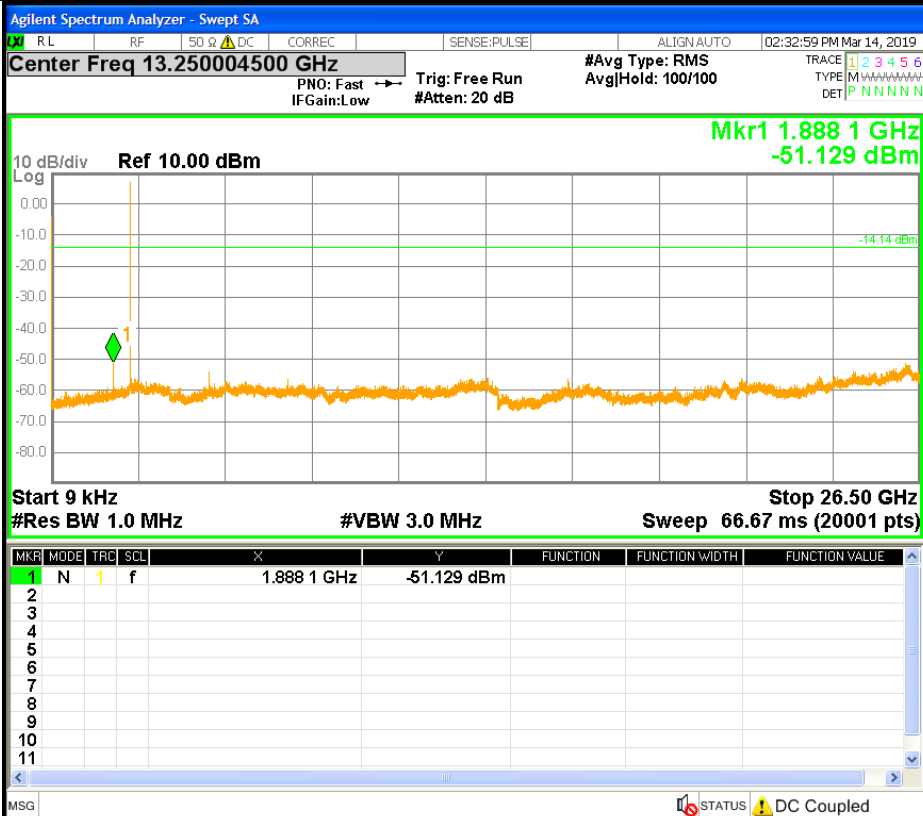


8DPSK LCH Graphs

Pref

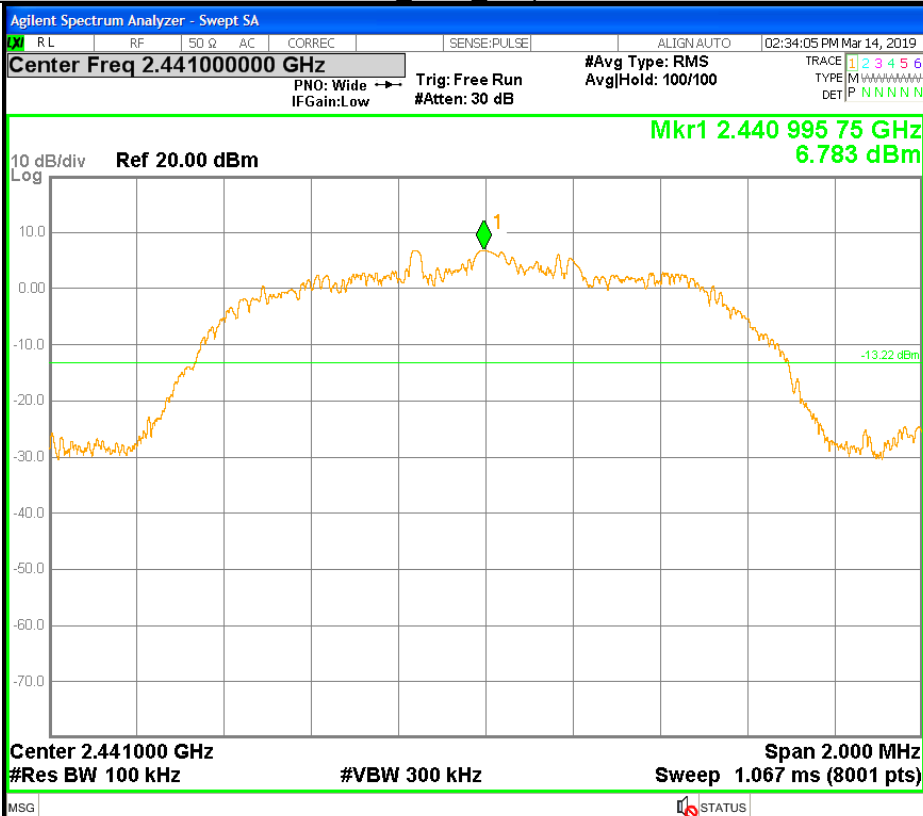


Puw



8DPSK MCH Graphs

Pref



Frequency

Auto Tune

Center Freq
2.441000000 GHz

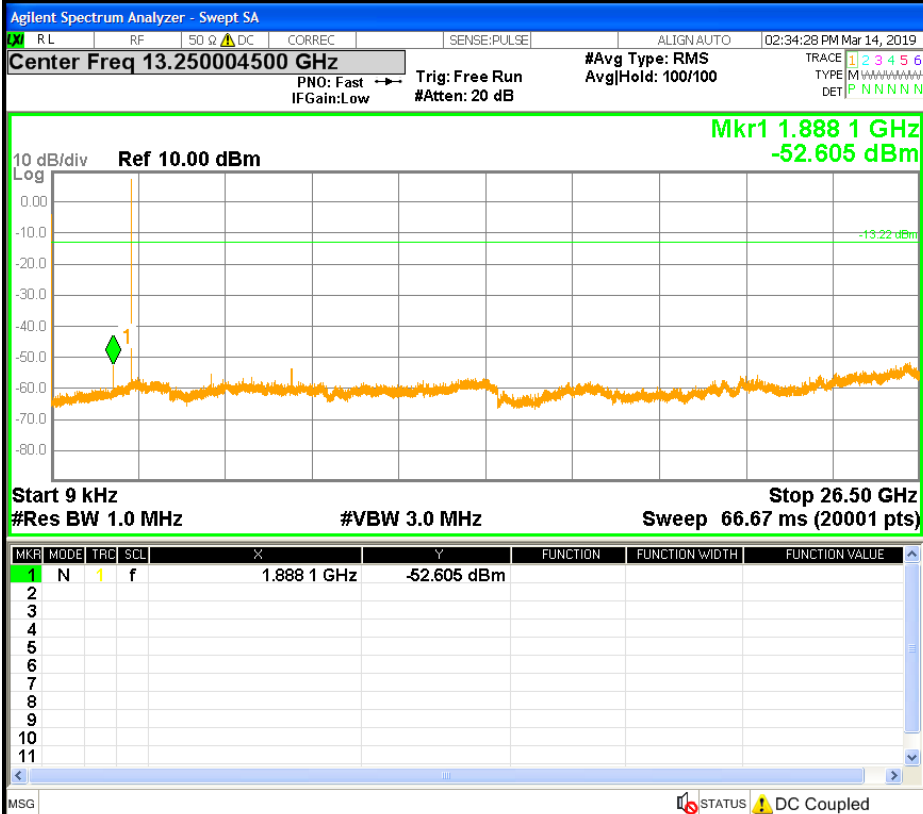
Start Freq
2.440000000 GHz

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

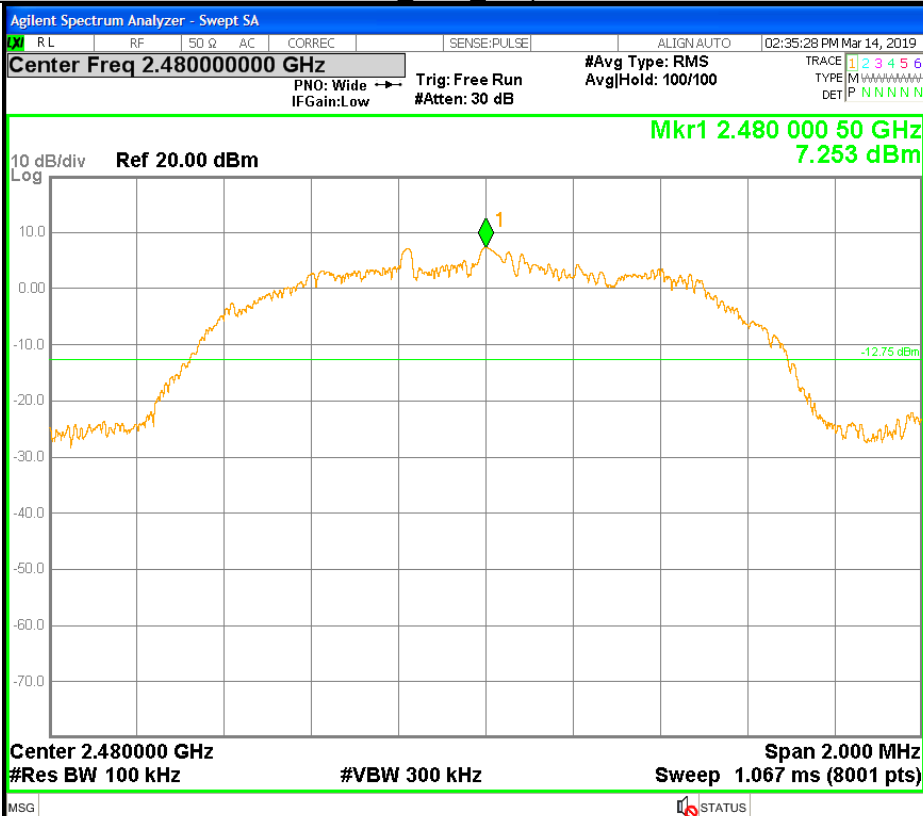
Stop Freq
26.500000000 GHz

CF Step
2.649999100 GHz
Auto Man

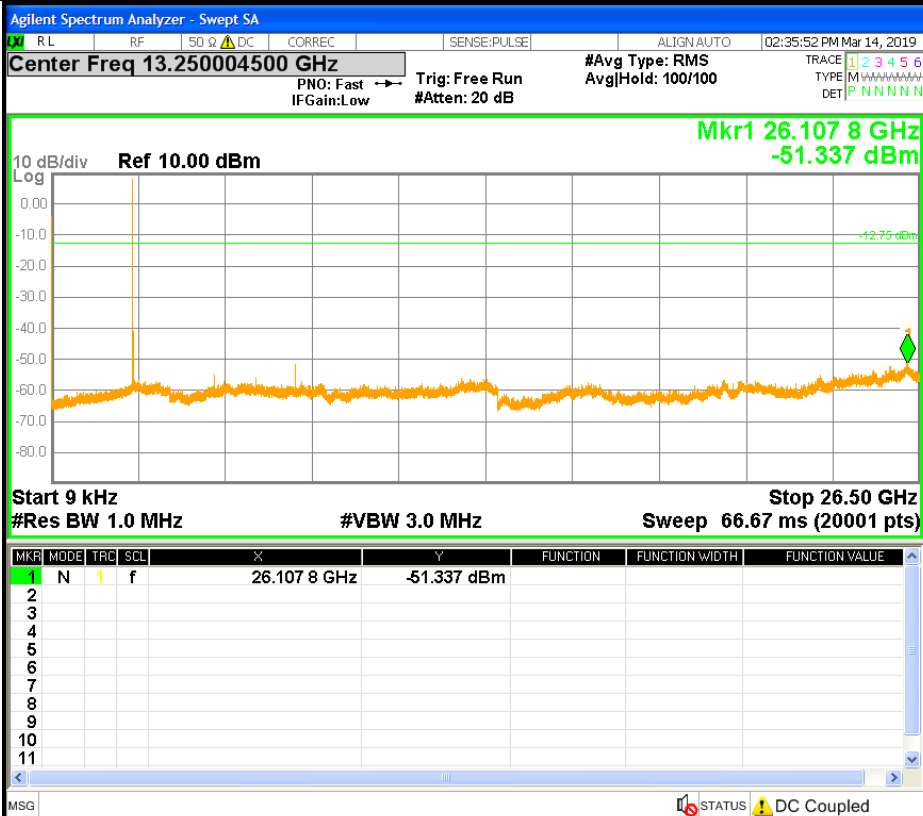
Freq Offset
0 Hz

8DPSK HCH Graphs

Pref



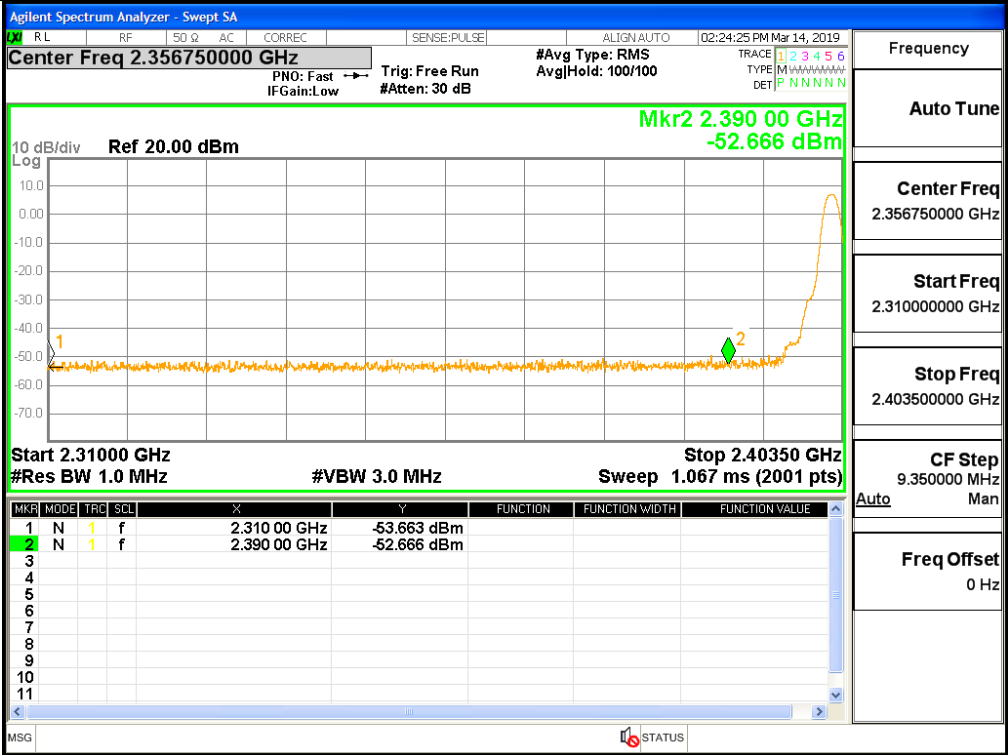
Puw



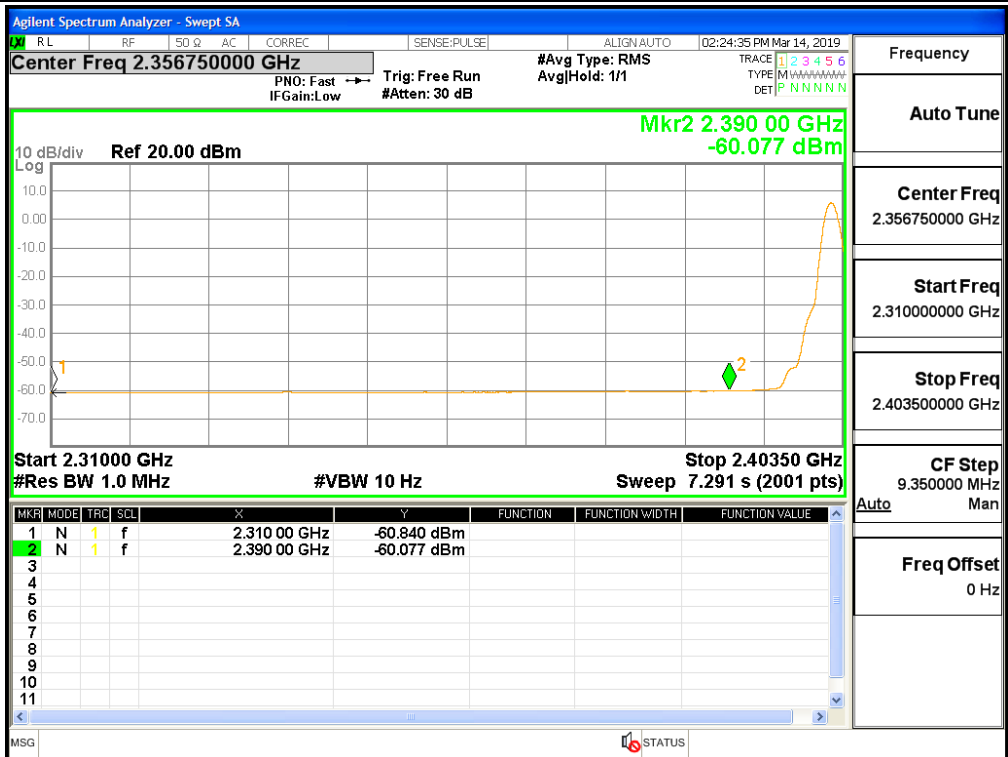
A.8 Restrict-band band-edge measurements

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	-53.66	46.98	74	-60.84	38.66	54	Pass
1DH5	2402	2390	2.00	0.00	-52.67	44.88	74	-60.08	38.7	54	Pass
1DH5	2480	2483.5	2.00	0.00	-34.11	52.06	74	-38.76	46.7	54	Pass
1DH5	2480	2500	2.00	0.00	-53.35	46.34	74	-59.77	39.22	54	Pass
2DH5	2402	2310	2.00	0.00	-54.75	45.46	74	-60.8	38.42	54	Pass
2DH5	2402	2390	2.00	0.00	-53.02	46.04	74	-60.21	38.65	54	Pass
2DH5	2480	2483.5	2.00	0.00	-34.72	48.4	74	-39.9	42.92	54	Pass
2DH5	2480	2500	2.00	0.00	-53.16	46.82	74	-59.8	39.18	54	Pass
3DH5	2402	2310	2.00	0.00	-54.53	43.97	74	-60.86	38.39	54	Pass
3DH5	2402	2390	2.00	0.00	-52.62	45.69	74	-60.25	38.63	54	Pass
3DH5	2480	2483.5	2.00	0.00	-31.43	49.62	74	-39.94	43.04	54	Pass
3DH5	2480	2500	2.00	0.00	-53.35	46.38	74	-59.83	39.15	54	Pass

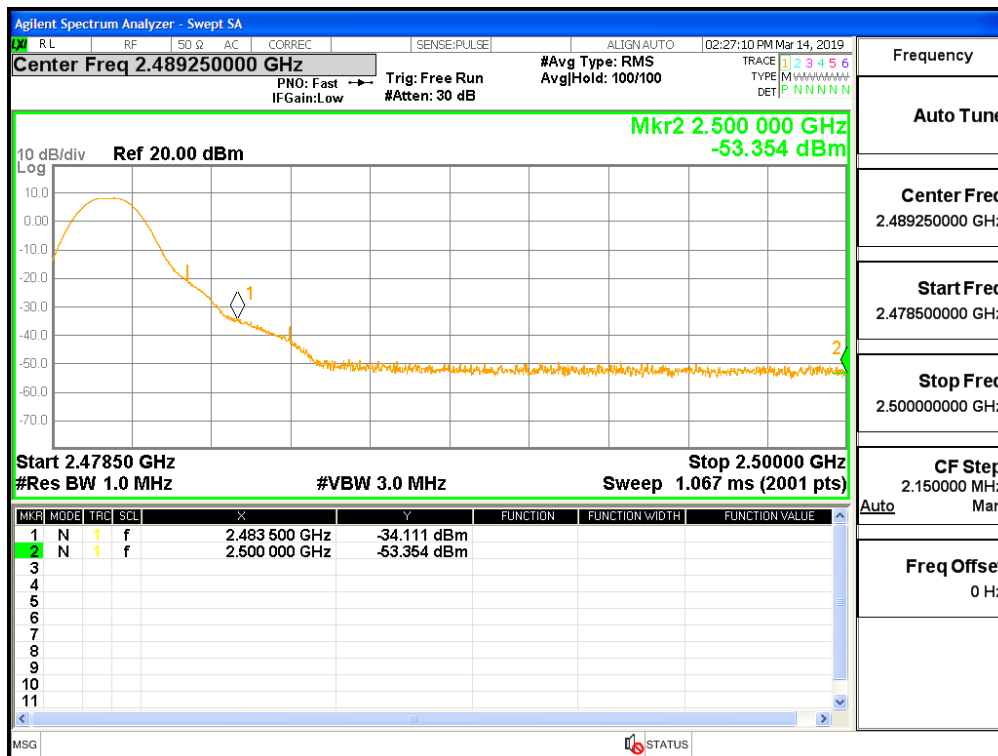
Restrict-band band-edge measurements_2402_PEAK_DH5



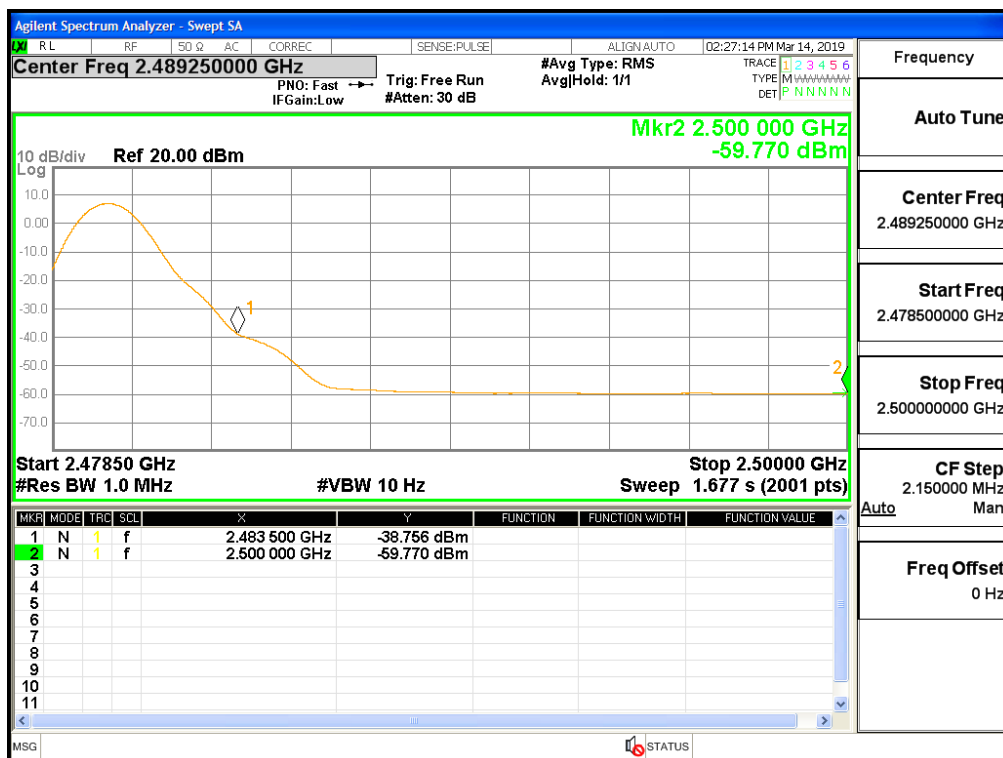
Restrict-band band-edge measurements_2402_AV_DH5



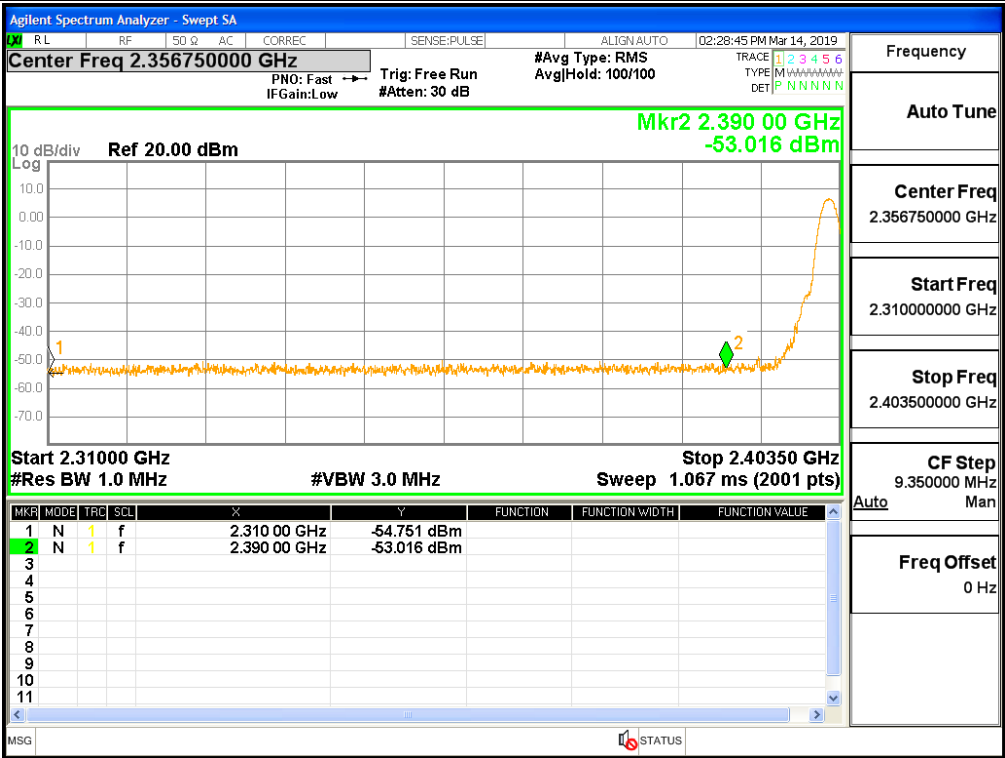
Restrict-band band-edge measurements_2480_PEAK_DH5



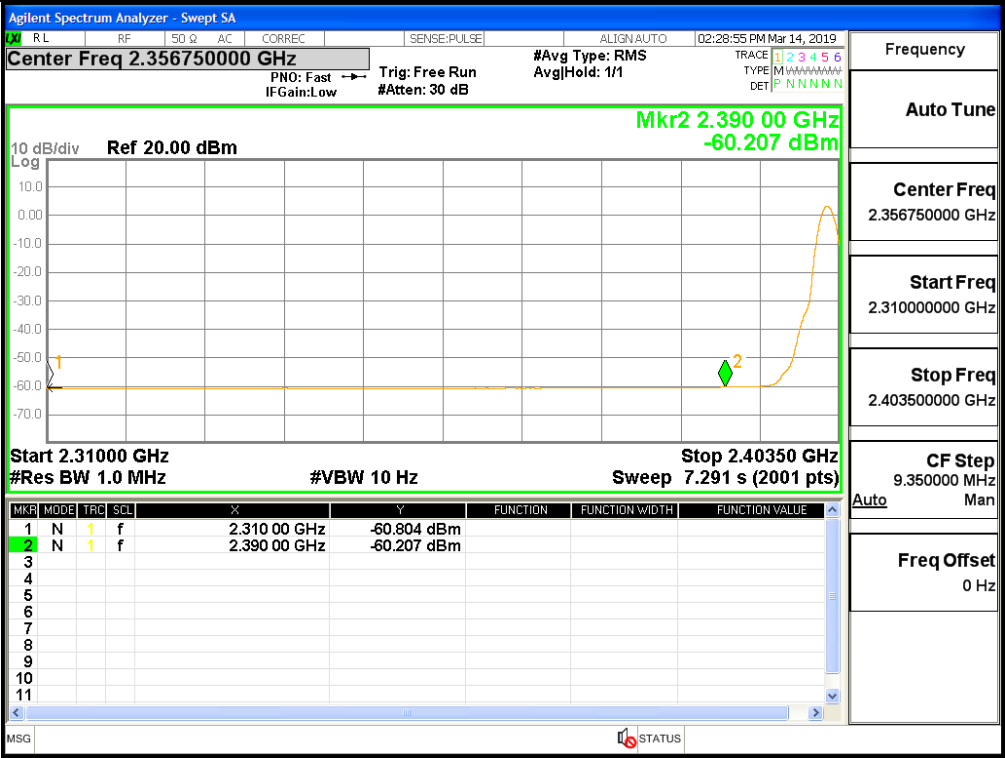
Restrict-band band-edge measurements_2480_AV_DH5



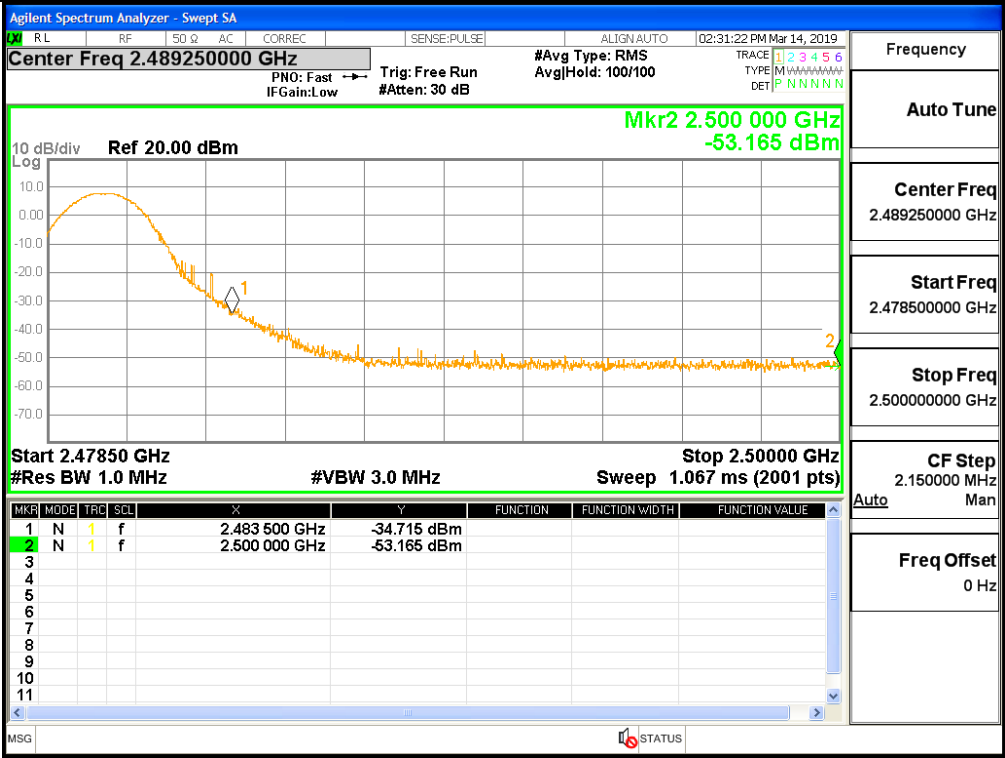
Restrict-band band-edge measurements_2402_PEAK_2DH5



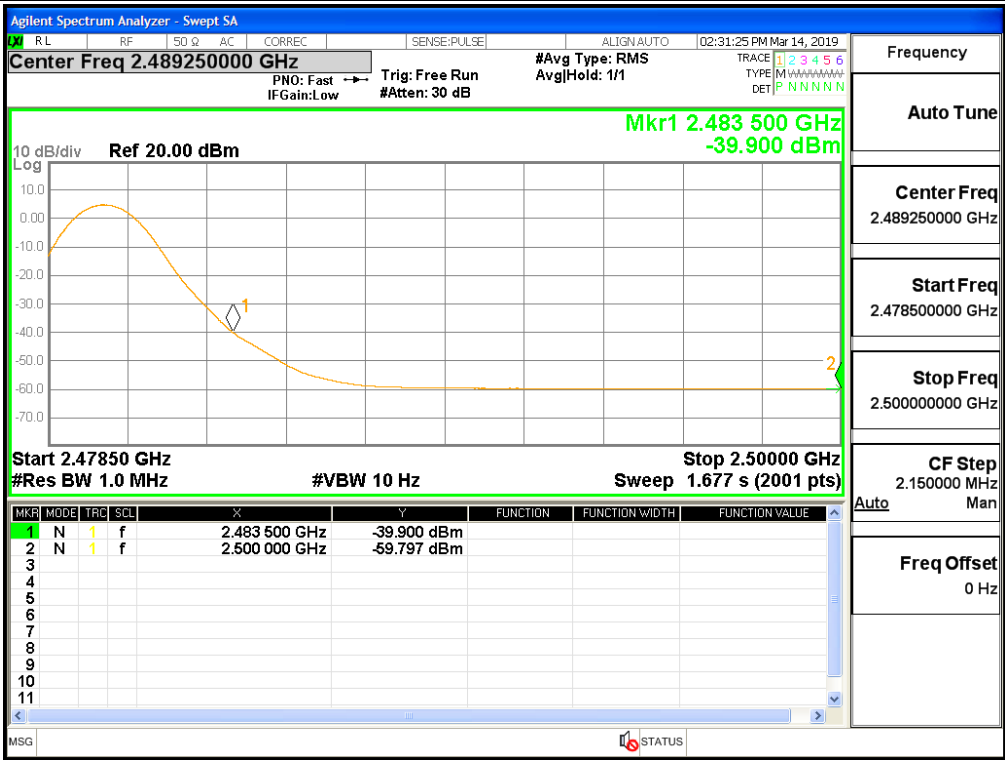
Restrict-band band-edge measurements_2402_AV_2DH5



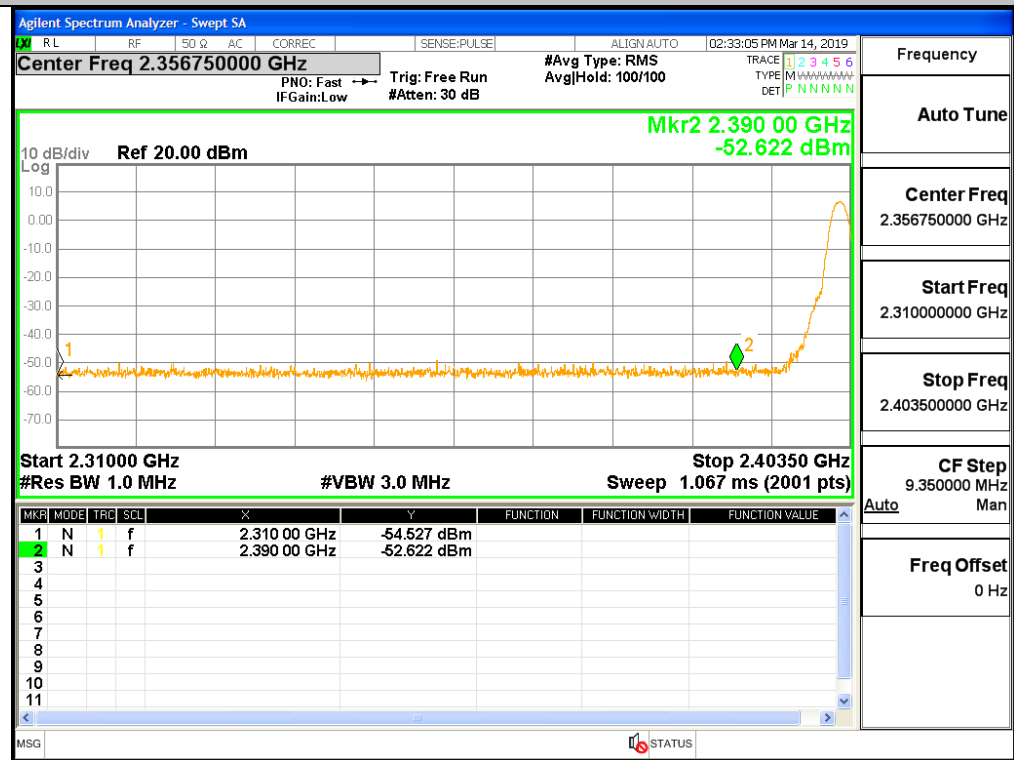
Restrict-band band-edge measurements_2480_PEAK_2DH5



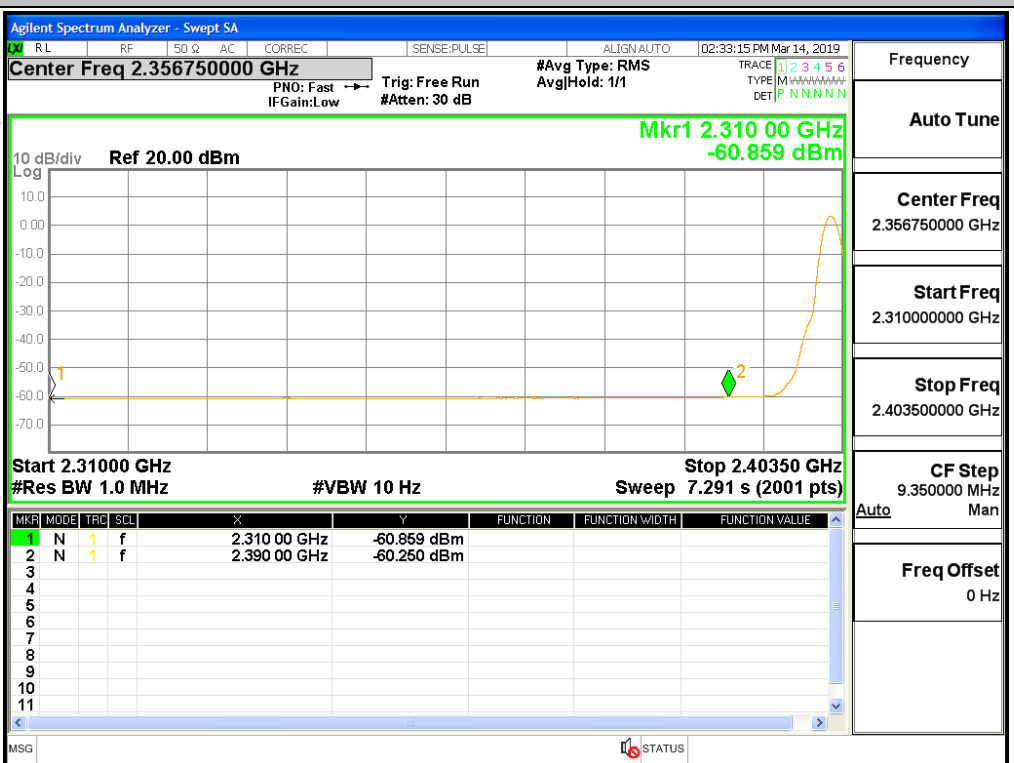
Restrict-band band-edge measurements_2480_AV_2DH5



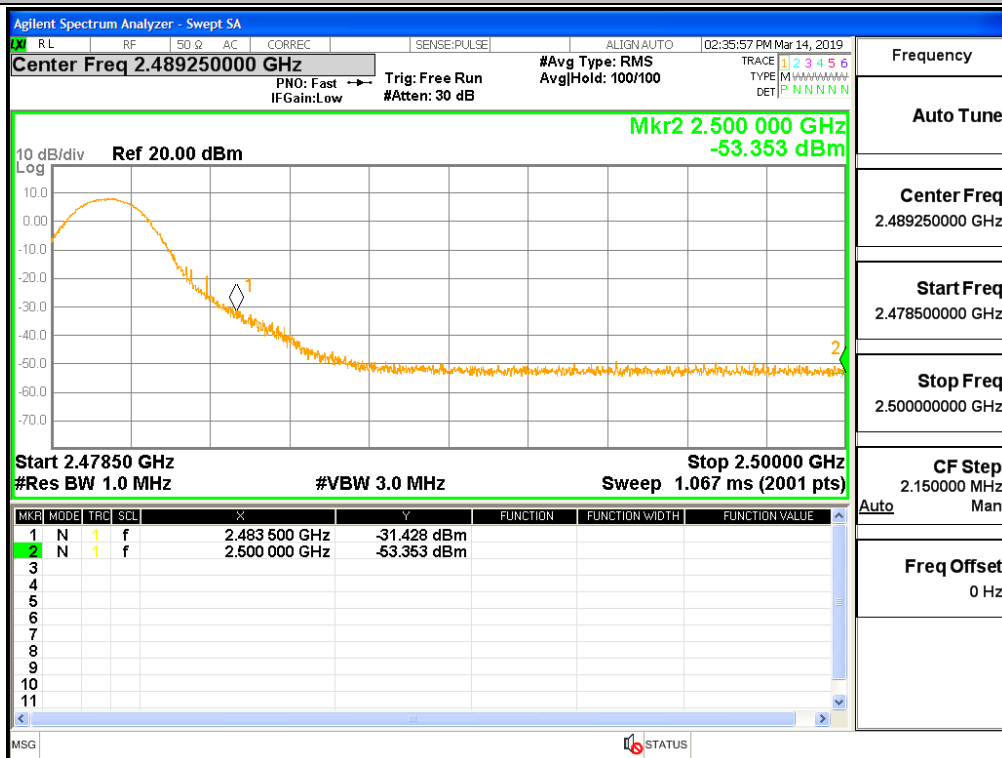
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

