

## Appendix A

### RF Test Data for BT V4.2(BDR/EDR) (Conducted Measurement)

Product Name: Wi-Fi Module

Trade Mark: N/A

Test Model: EWN-1638ACX2AA

#### Environmental Conditions

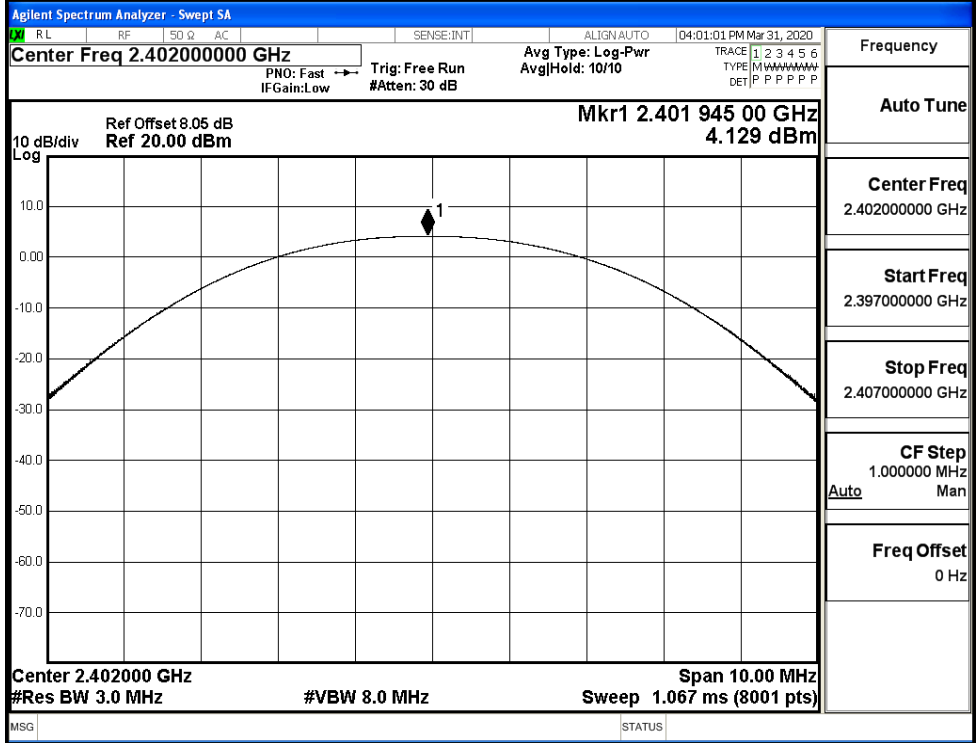
Temperature:	22.8°C
Relative Humidity:	51.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Jack Liu
Supervised by:	Li Huan

#### A.1 Maximum Conducted Peak Output Power

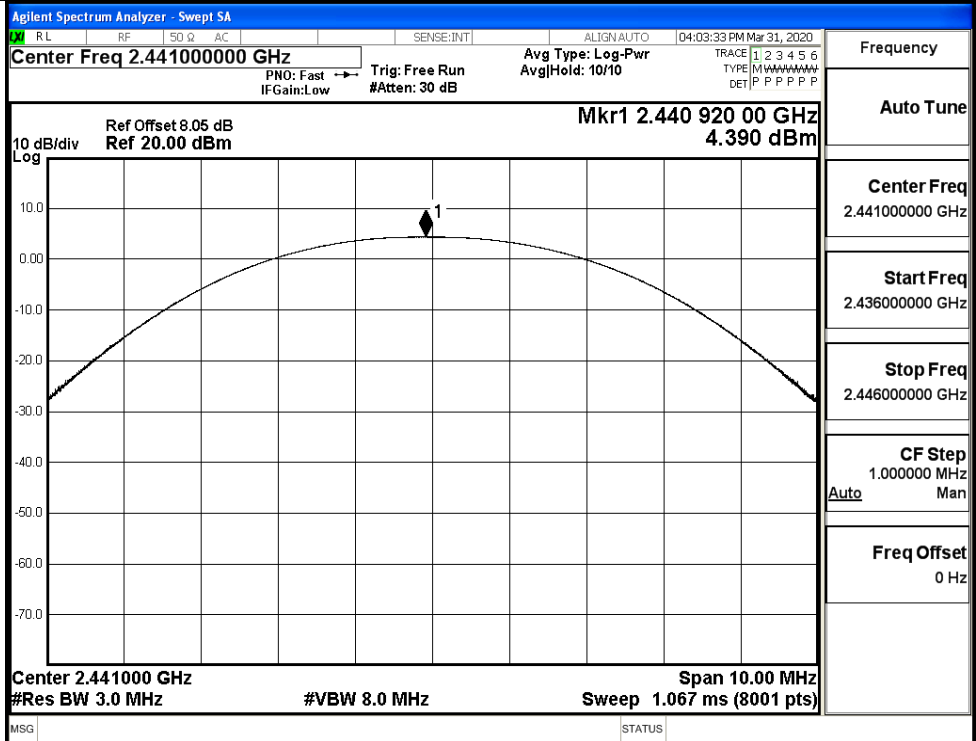
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.129	21	PASS
	MCH	4.390	21	PASS
	HCH	4.113	21	PASS
$\pi/4$ DQPSK	LCH	5.466	21	PASS
	MCH	5.812	21	PASS
	HCH	5.633	21	PASS
8DPSK	LCH	6.123	21	PASS
	MCH	6.387	21	PASS
	HCH	6.079	21	PASS

Test Graphs

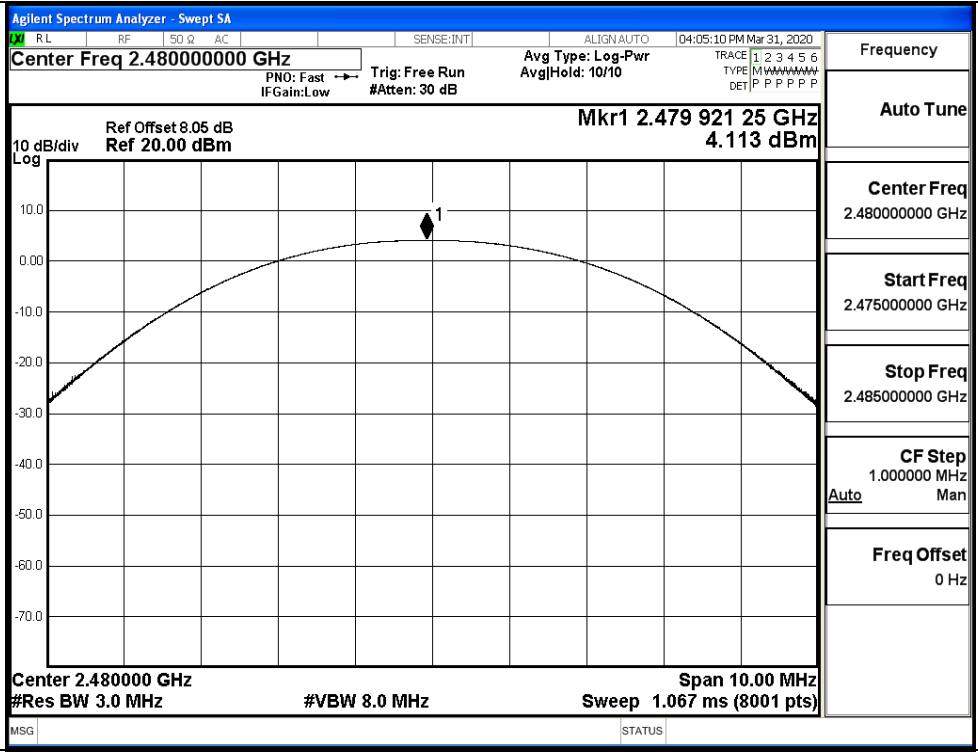
GFSK/LCH



GFSK/MCH

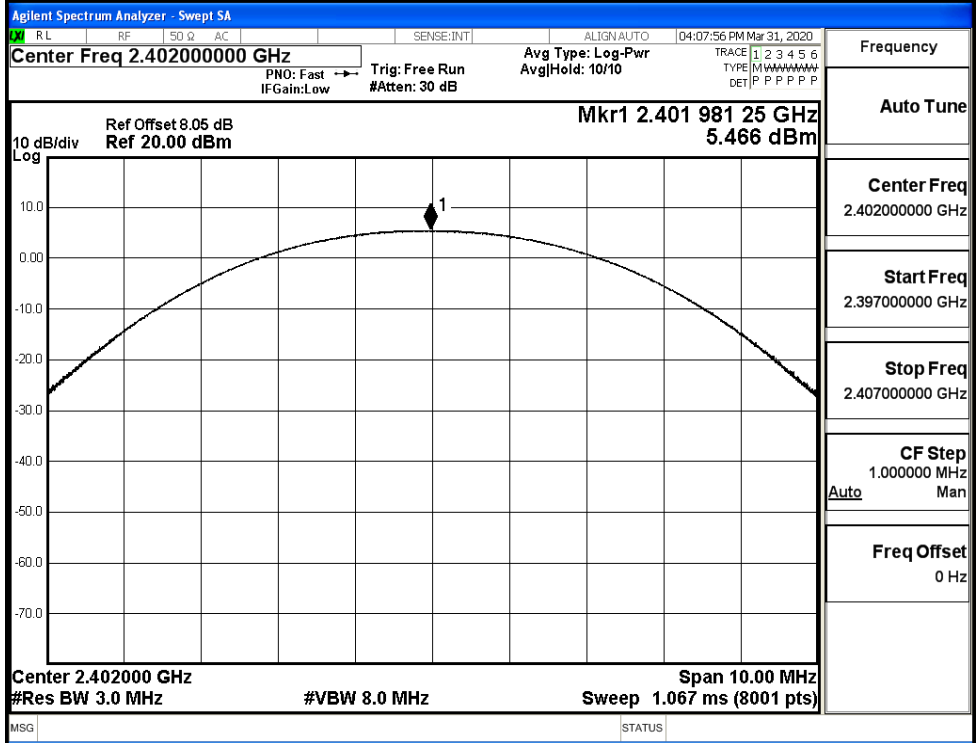


GFSK/HCH



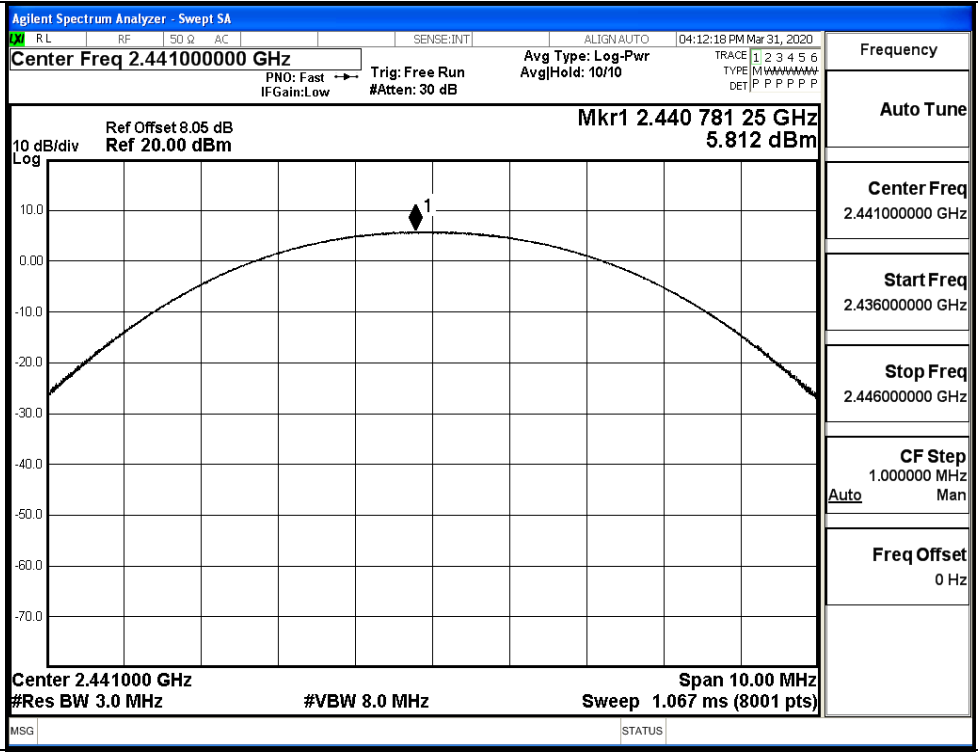
Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.475000000 GHz
Stop Freq 2.485000000 GHz
CF Step 1.000000 MHz Auto Man
Freq Offset 0 Hz

$\pi/4$ DQPSK/LCH

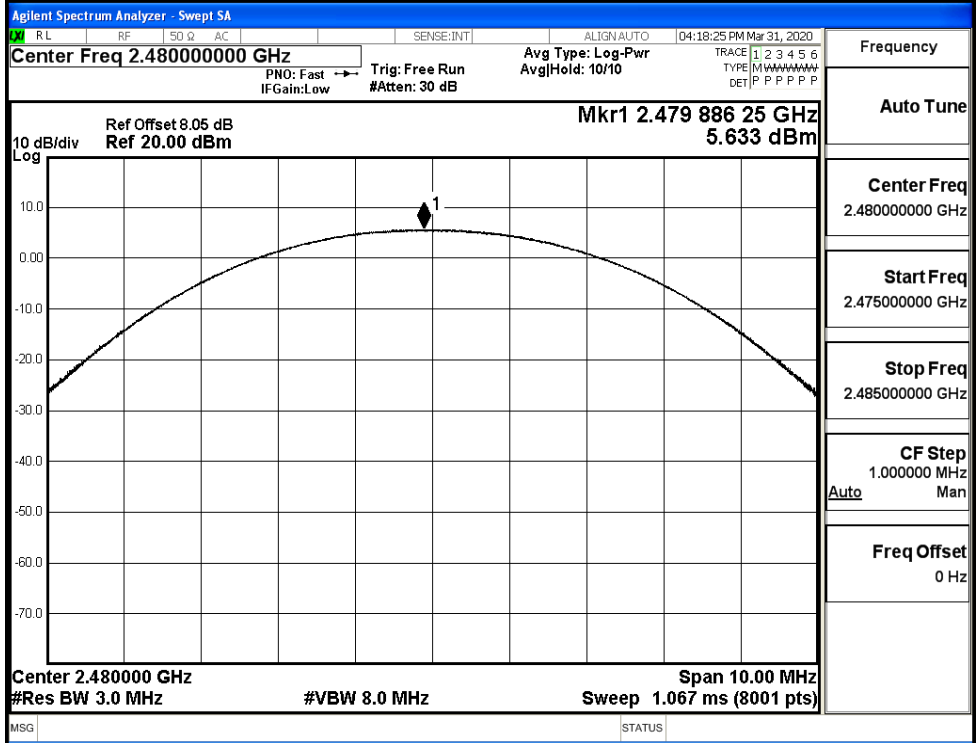


Frequency
Auto Tune
Center Freq 2.402000000 GHz
Start Freq 2.397000000 GHz
Stop Freq 2.407000000 GHz
CF Step 1.000000 MHz Auto Man
Freq Offset 0 Hz

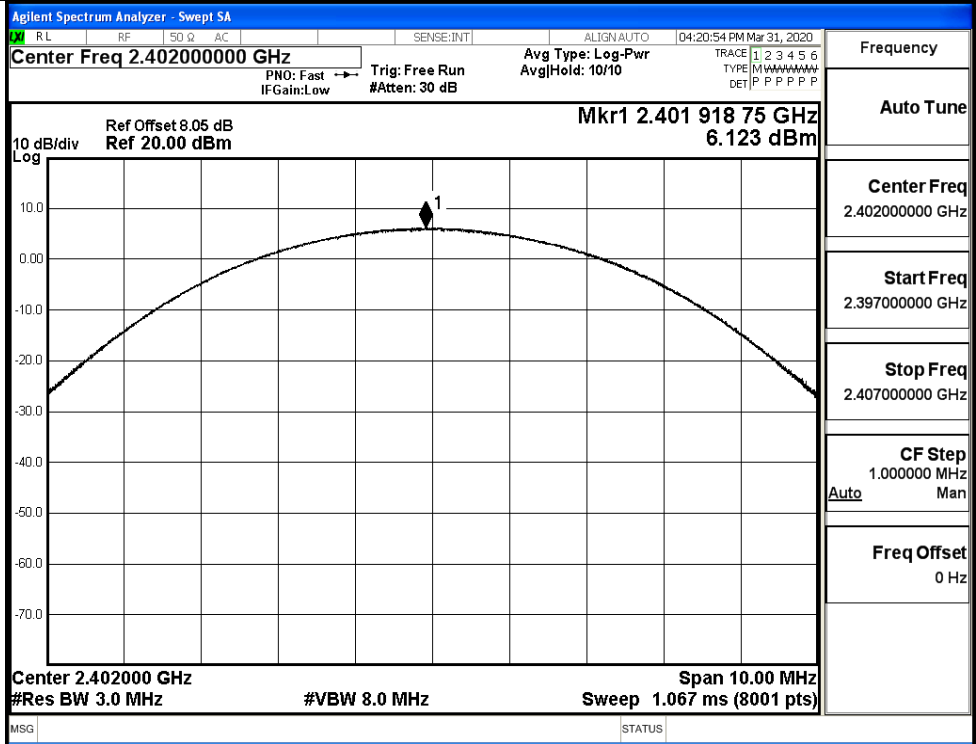
$\pi$ /4DQPSK/MCH



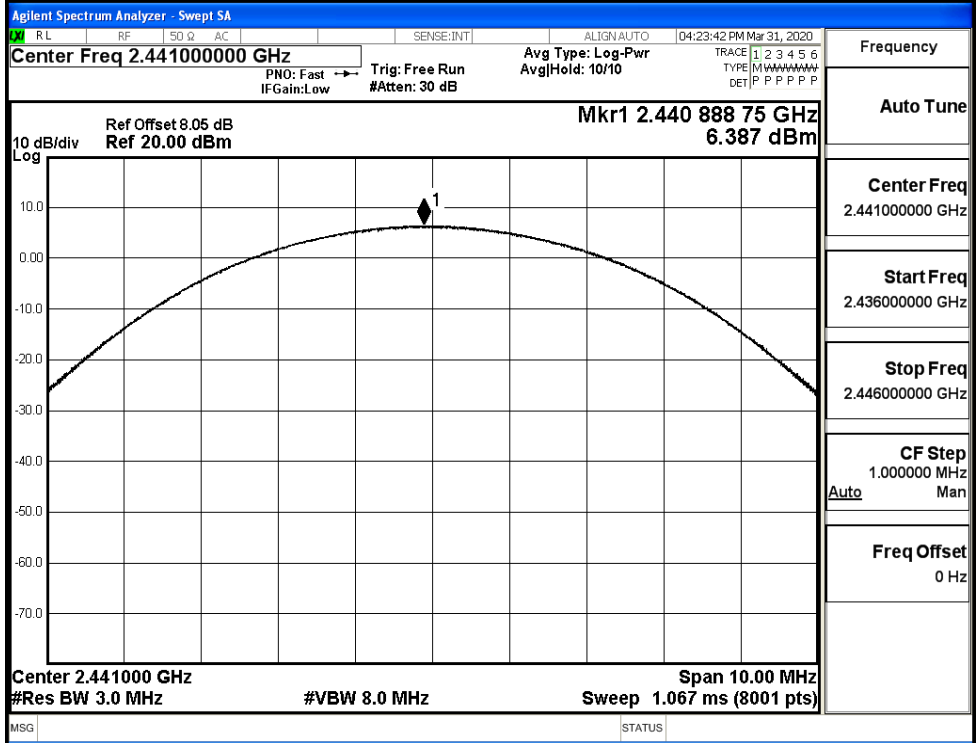
$\pi$ /4DQPSK/HCH



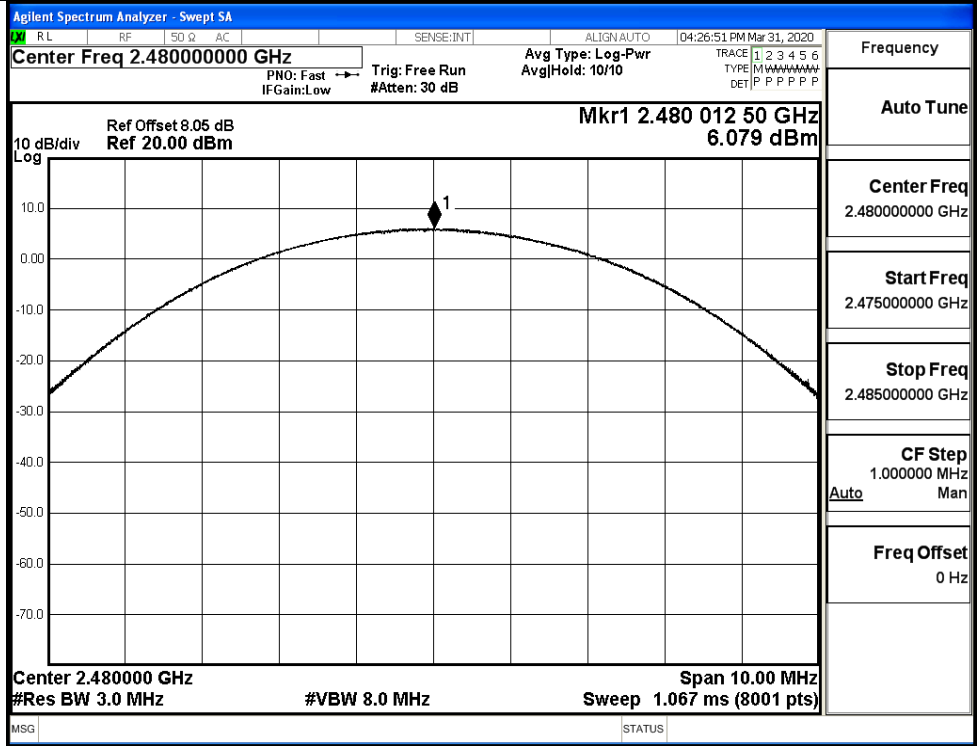
8DPSK/LCH



8DPSK/MCH

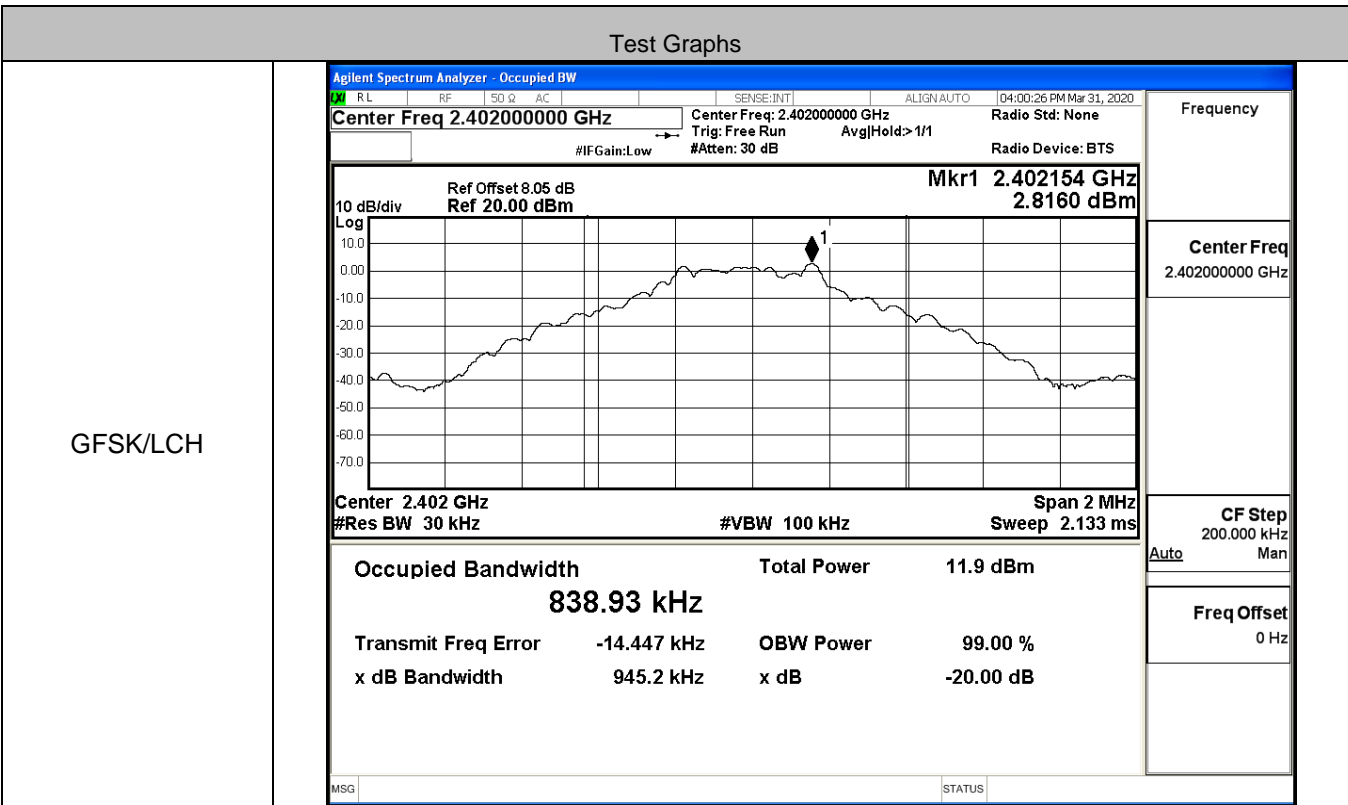


8DPSK/HCH

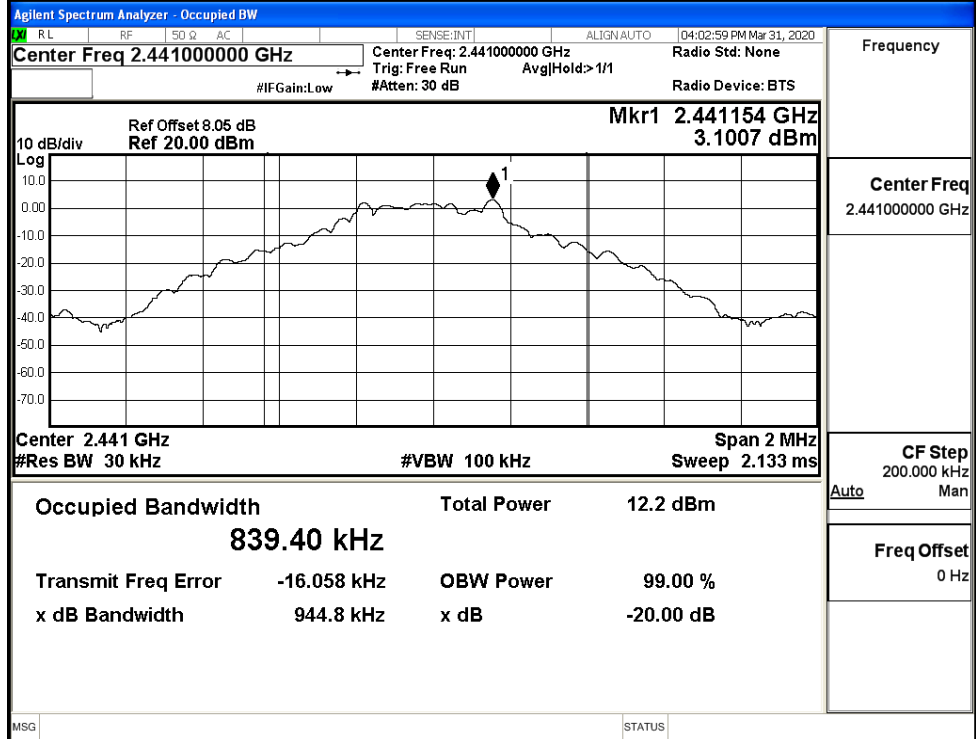


**A.2 20dB Bandwidth**

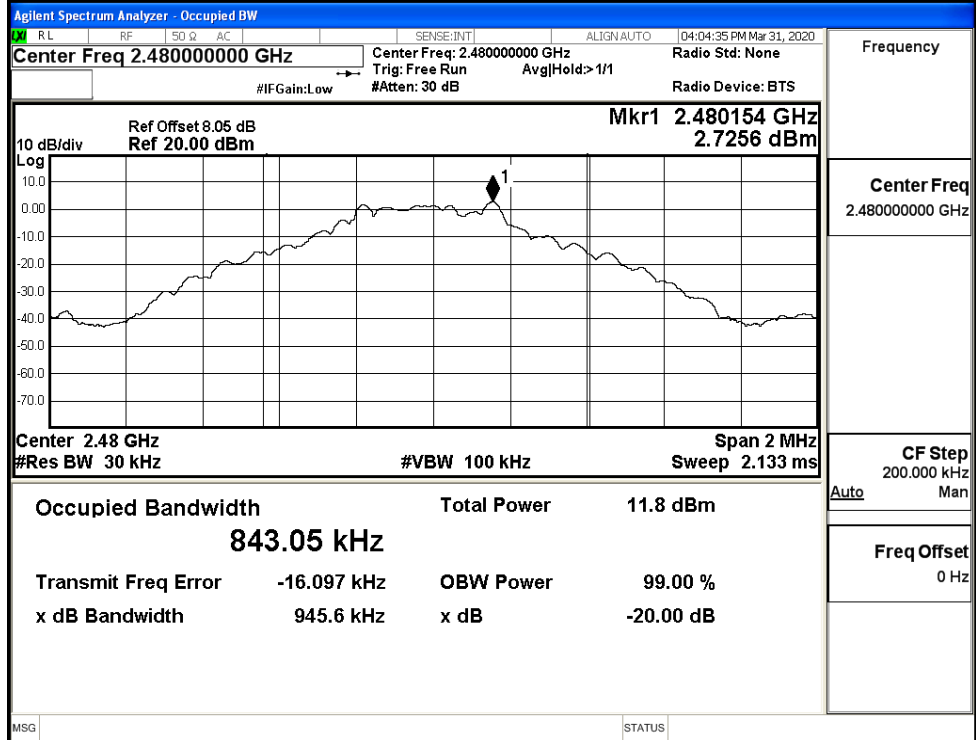
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9452	Not Specified	PASS
	MCH	0.9448	Not Specified	PASS
	HCH	0.9456	Not Specified	PASS
π/4DQPSK	LCH	1.288	Not Specified	PASS
	MCH	1.289	Not Specified	PASS
	HCH	1.288	Not Specified	PASS
8DPSK	LCH	1.296	Not Specified	PASS
	MCH	1.295	Not Specified	PASS
	HCH	1.296	Not Specified	PASS



GFSK/MCH

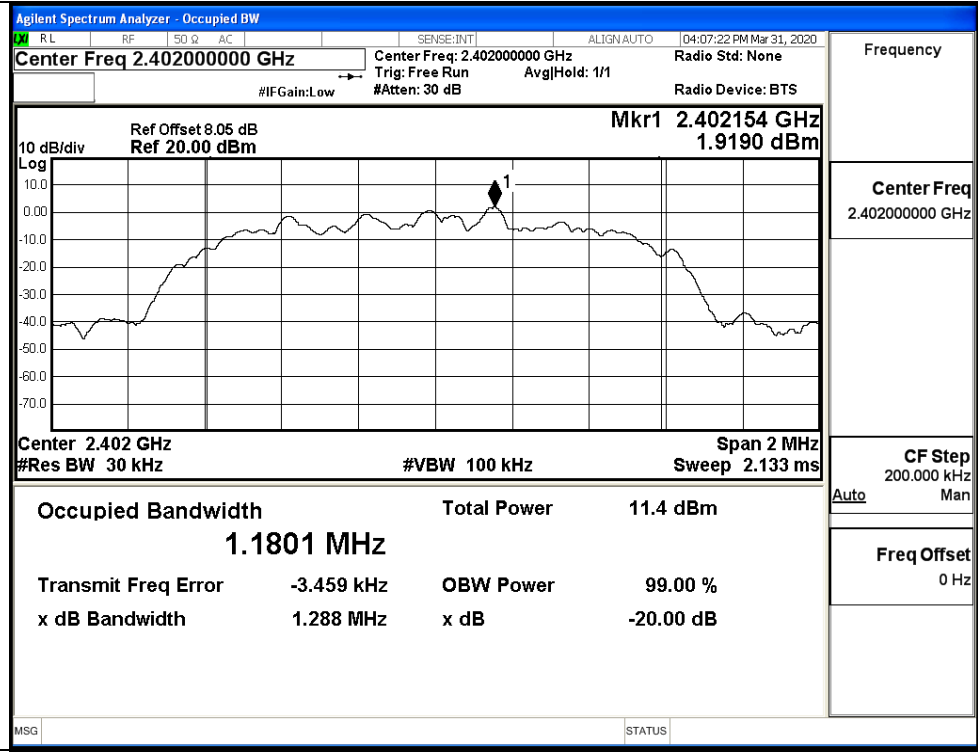


GFSK/HCH

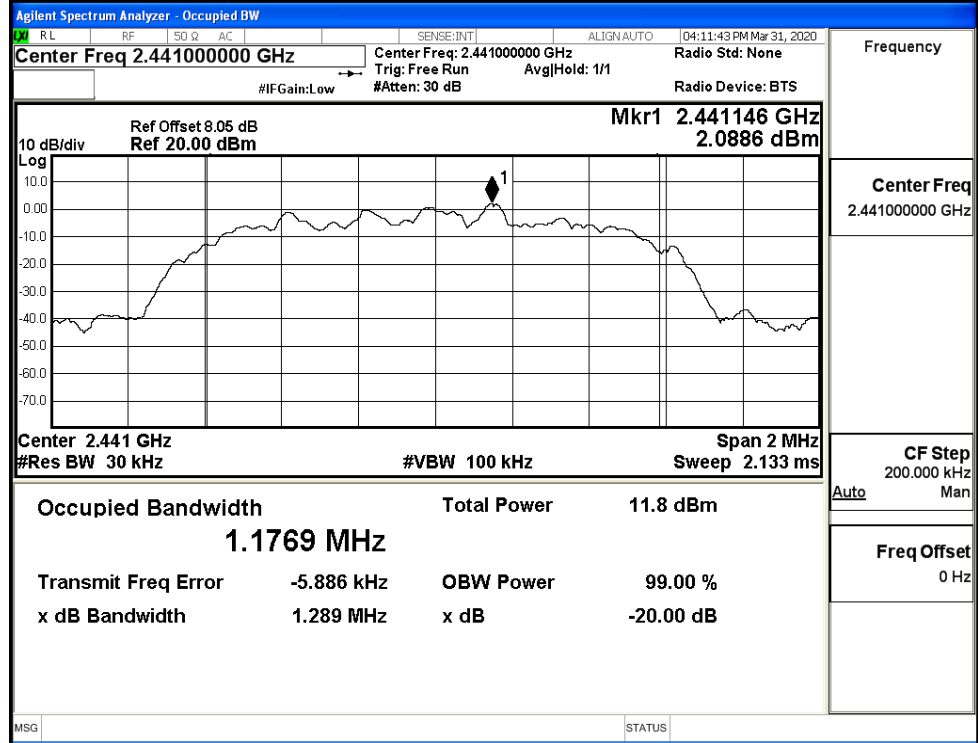




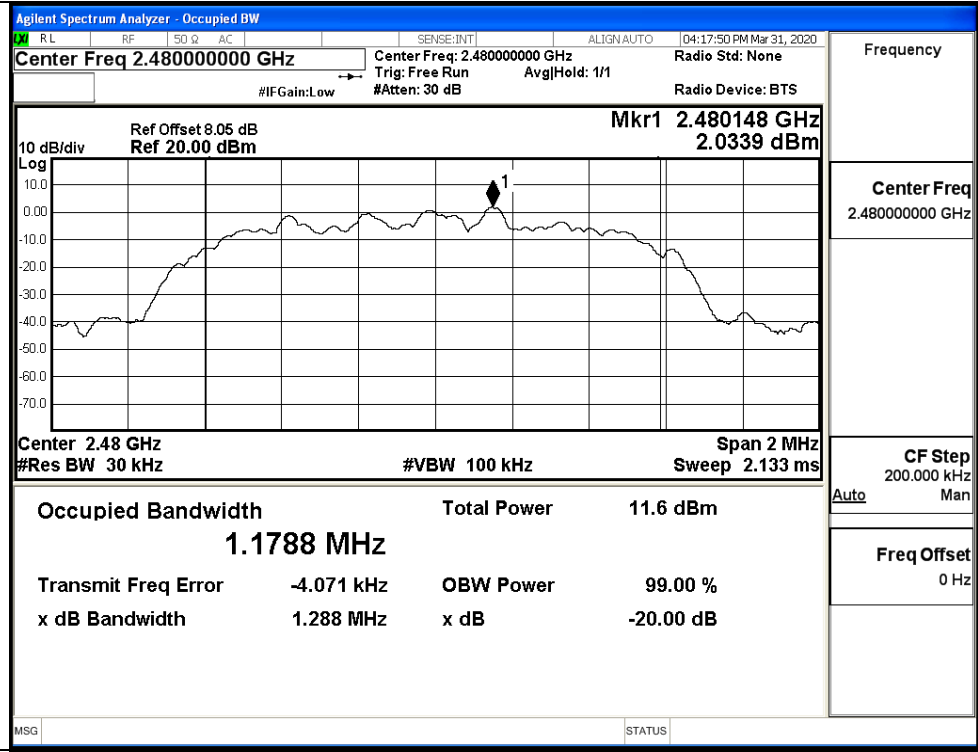
$\pi/4$ DQPSK/LCH



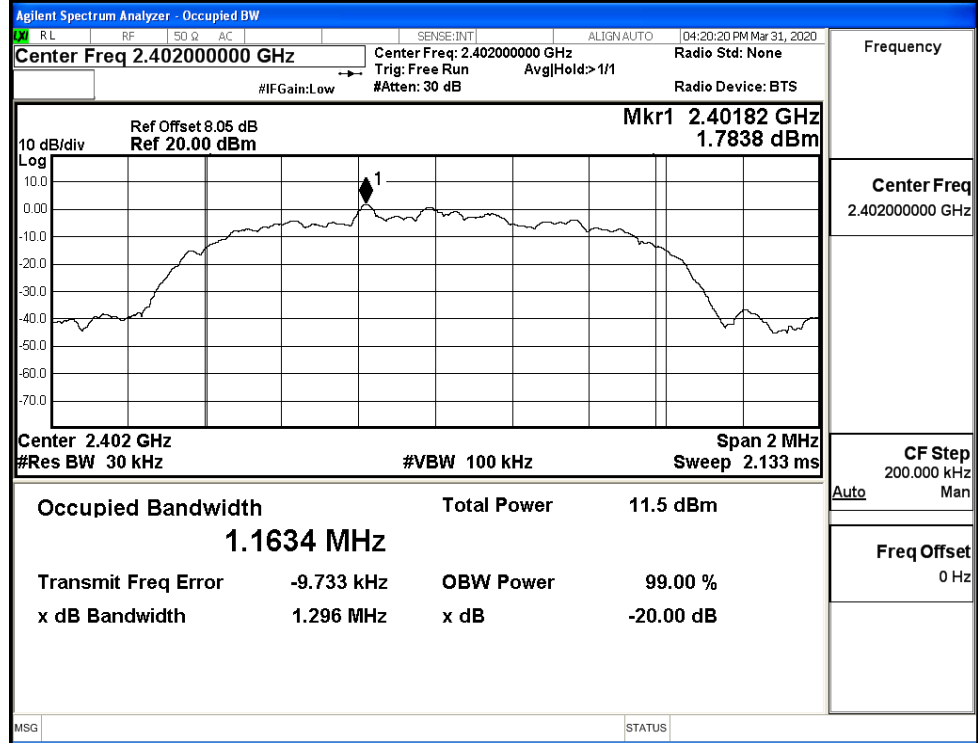
$\pi/4$ DQPSK/MCH



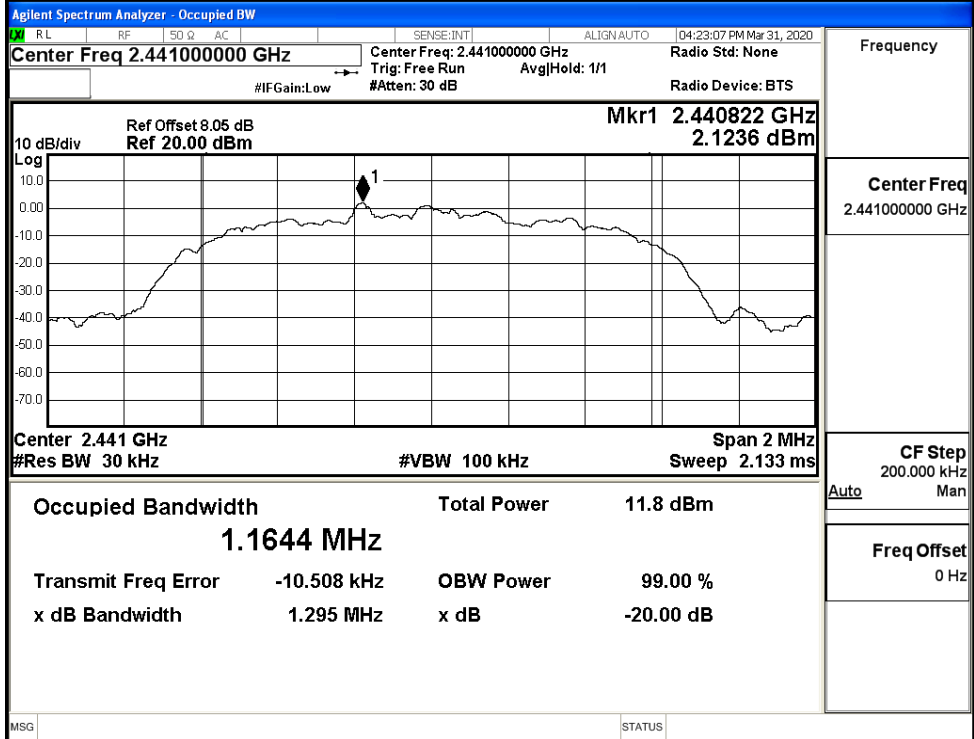
$\pi/4$ DQPSK/HCH



8DPSK/LCH

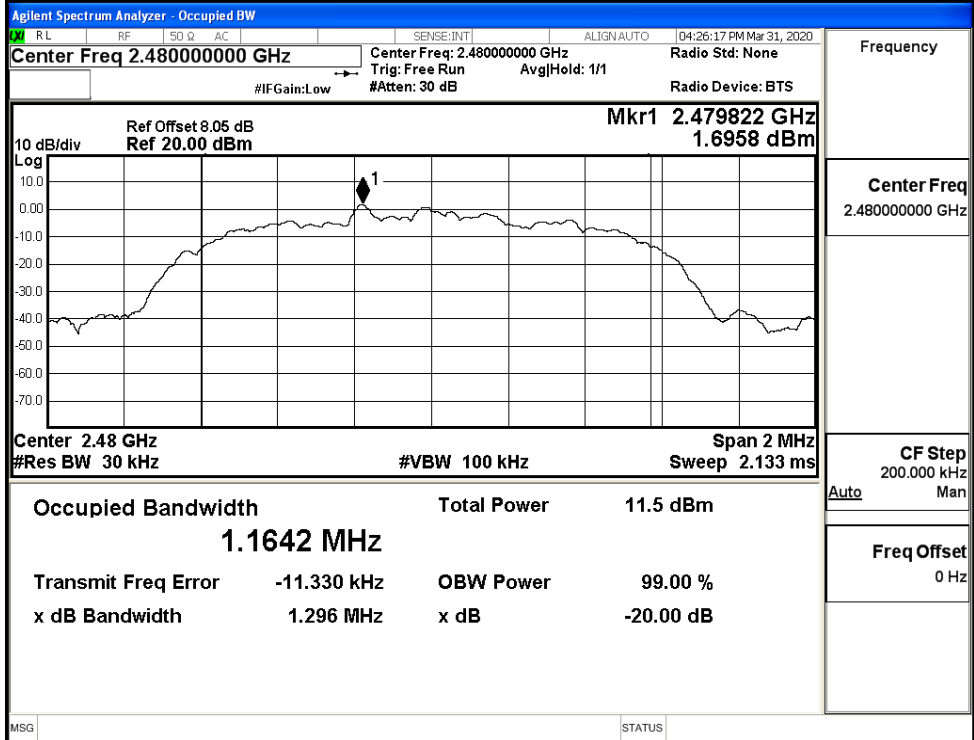


8DPSK/MCH



Frequency	2.441000000 GHz
Center Freq	2.441000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

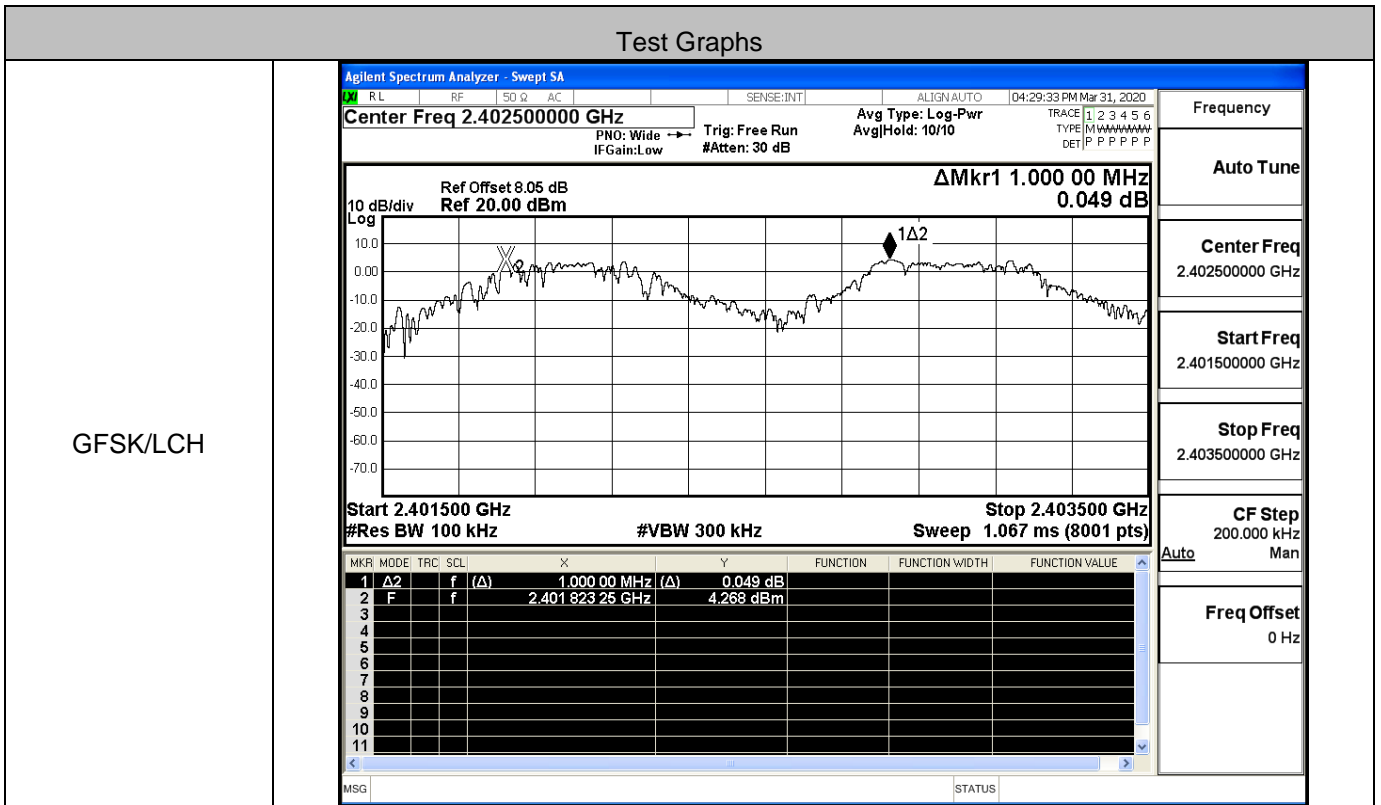
8DPSK/HCH



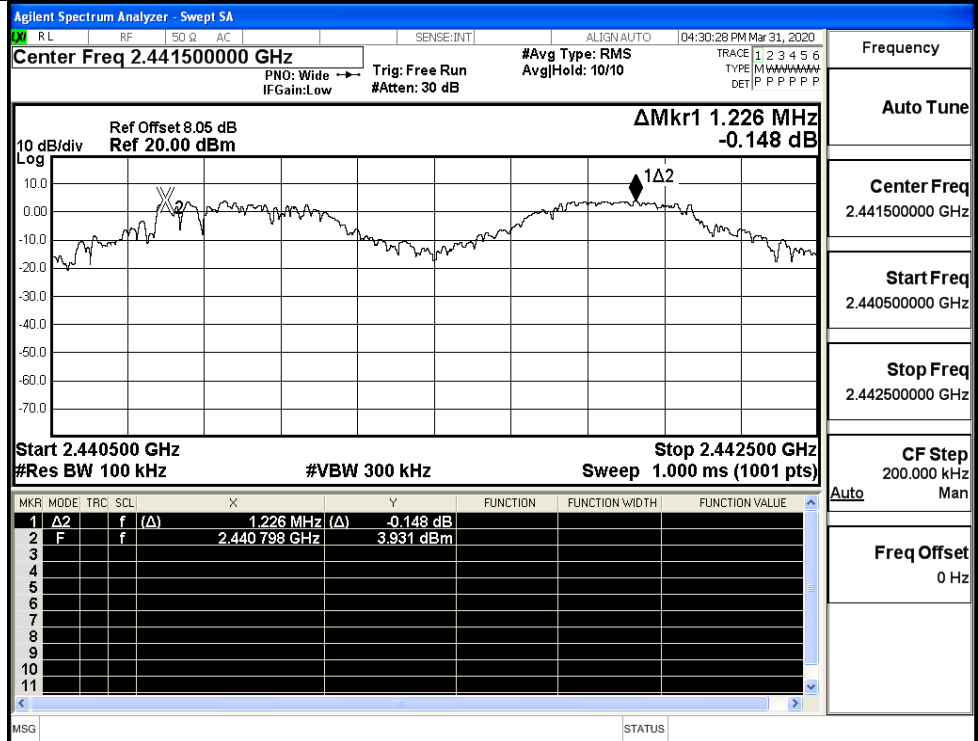
Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

### A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.000	0.630	PASS
	MCH	1.226	0.630	PASS
	HCH	1.022	0.630	PASS
π/4DQPSK	LCH	1.008	0.859	PASS
	MCH	1.112	0.859	PASS
	HCH	1.208	0.859	PASS
8DPSK	LCH	0.976	0.864	PASS
	MCH	0.932	0.864	PASS
	HCH	1.012	0.864	PASS



GFSK/MCH



Frequency

Auto Tune

Center Freq  
2.441500000 GHz

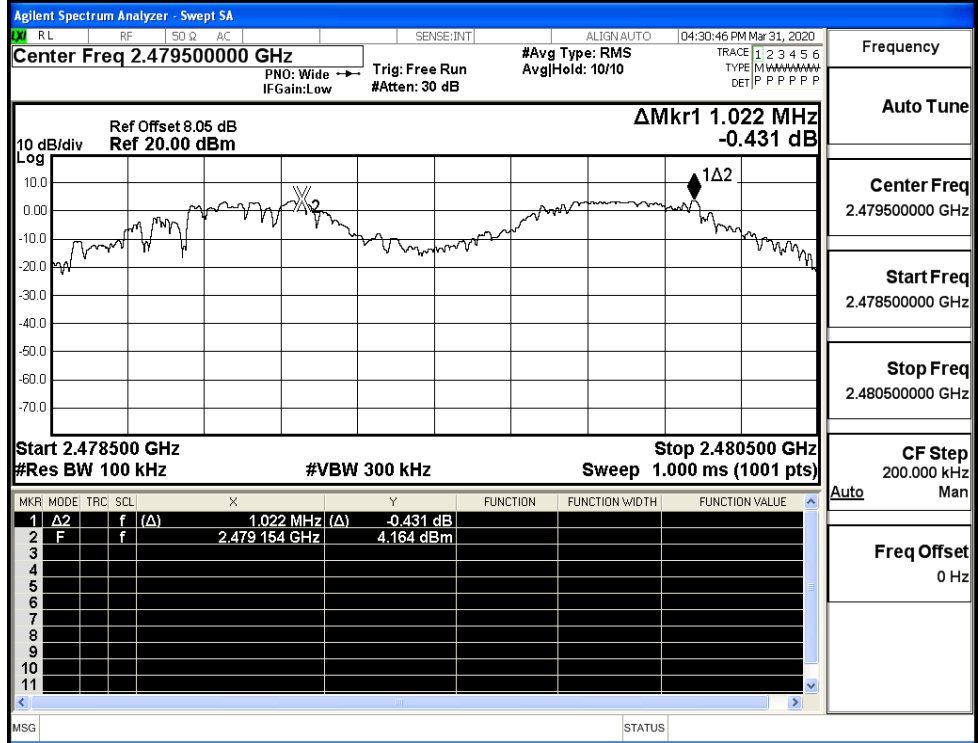
Start Freq  
2.440500000 GHz

Stop Freq  
2.442500000 GHz

CF Step  
200.000 kHz

Freq Offset  
0 Hz

GFSK/HCH



Frequency

Auto Tune

Center Freq  
2.479500000 GHz

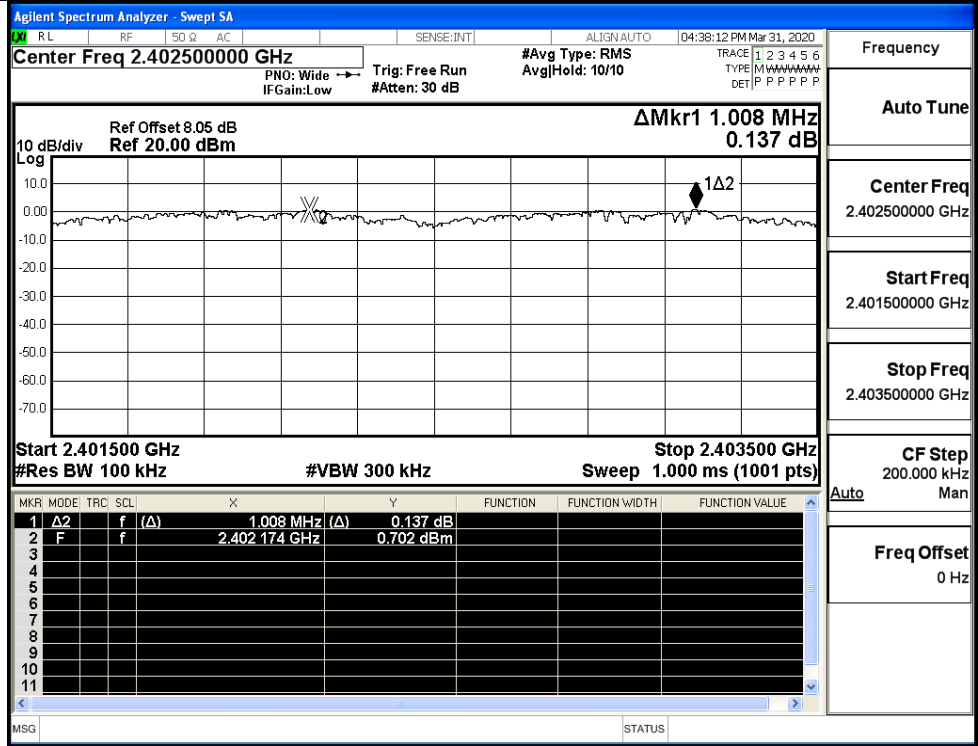
Start Freq  
2.478500000 GHz

Stop Freq  
2.480500000 GHz

CF Step  
200.000 kHz

Freq Offset  
0 Hz

$\pi/4$ DQPSK/LCH



Frequency

Auto Tune

Center Freq  
2.402500000 GHz

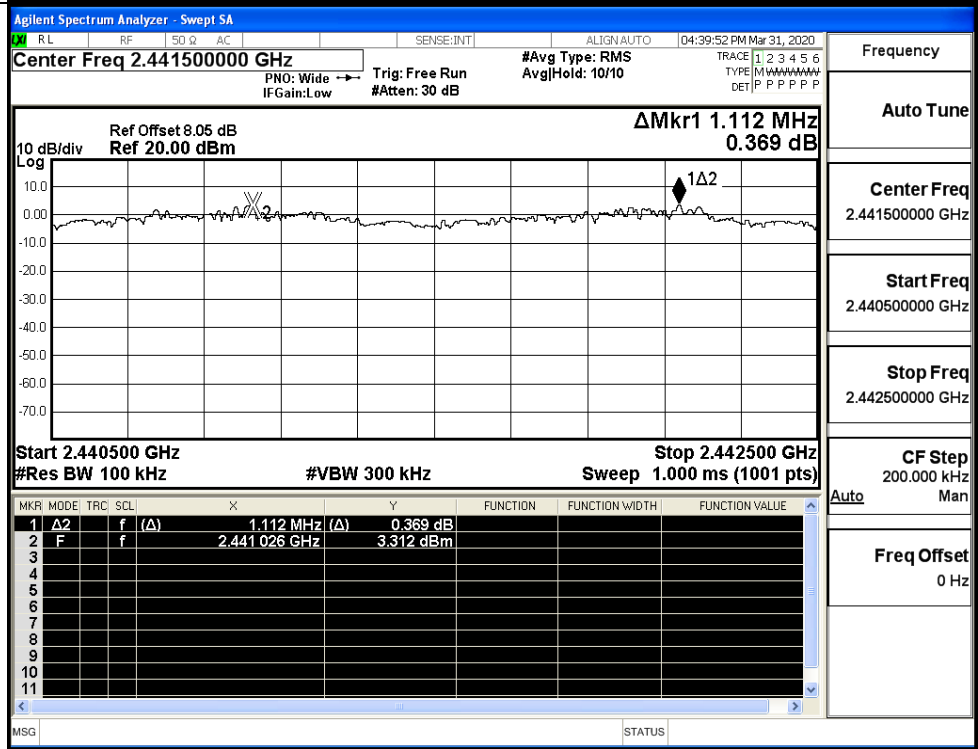
Start Freq  
2.401500000 GHz

Stop Freq  
2.403500000 GHz

CF Step  
200.000 kHz

Freq Offset  
0 Hz

$\pi/4$ DQPSK/MCH



Frequency

Auto Tune

Center Freq  
2.441500000 GHz

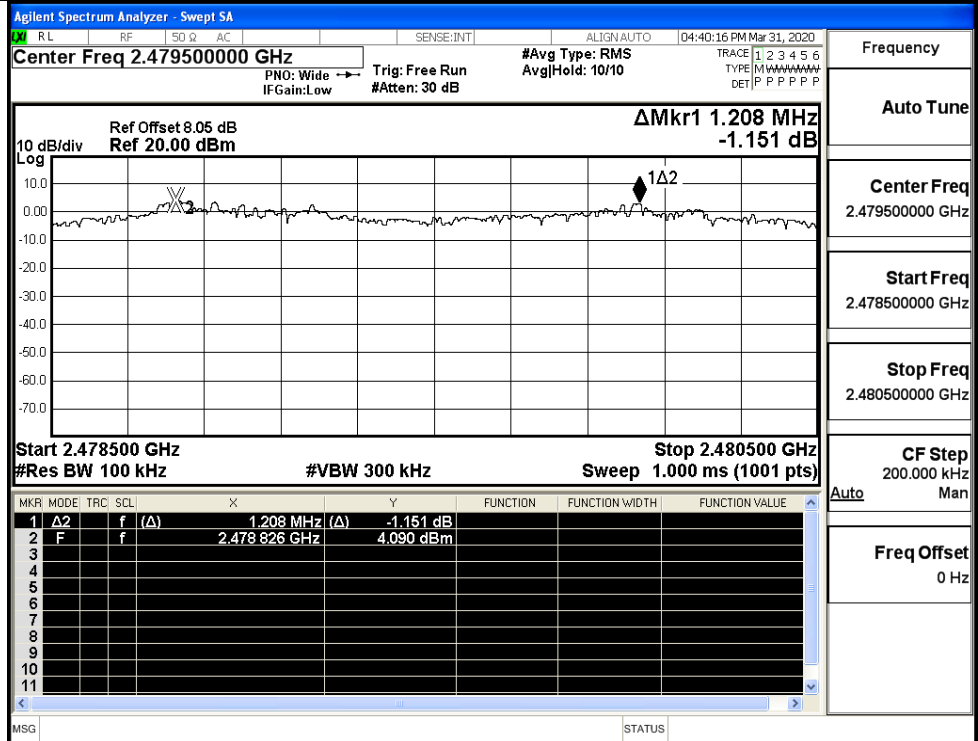
Start Freq  
2.440500000 GHz

Stop Freq  
2.442500000 GHz

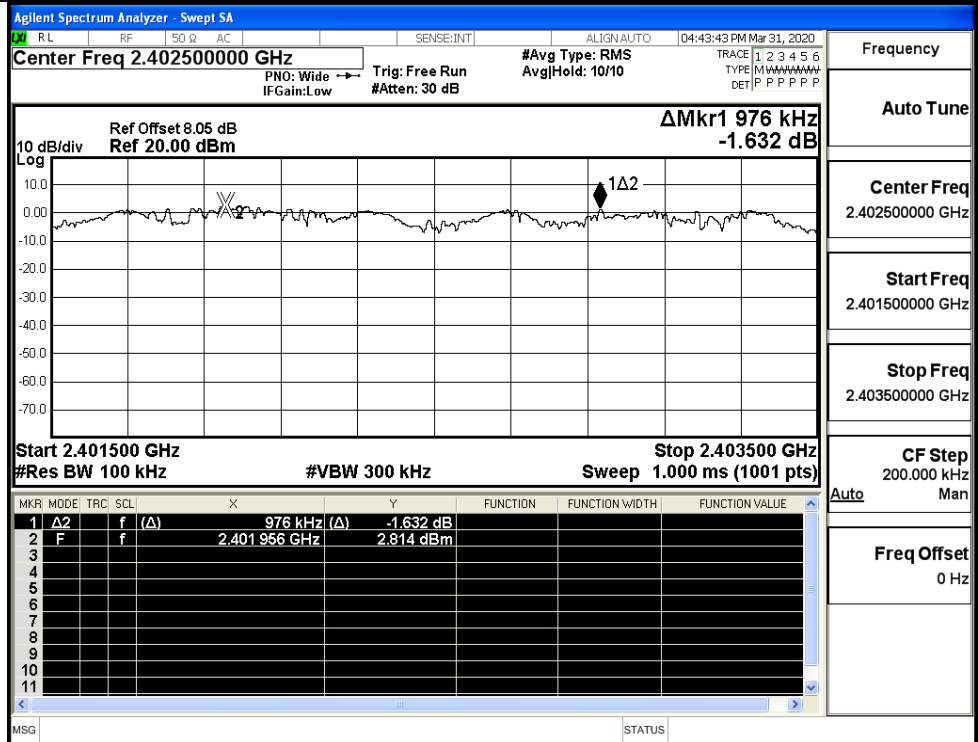
CF Step  
200.000 kHz

Freq Offset  
0 Hz

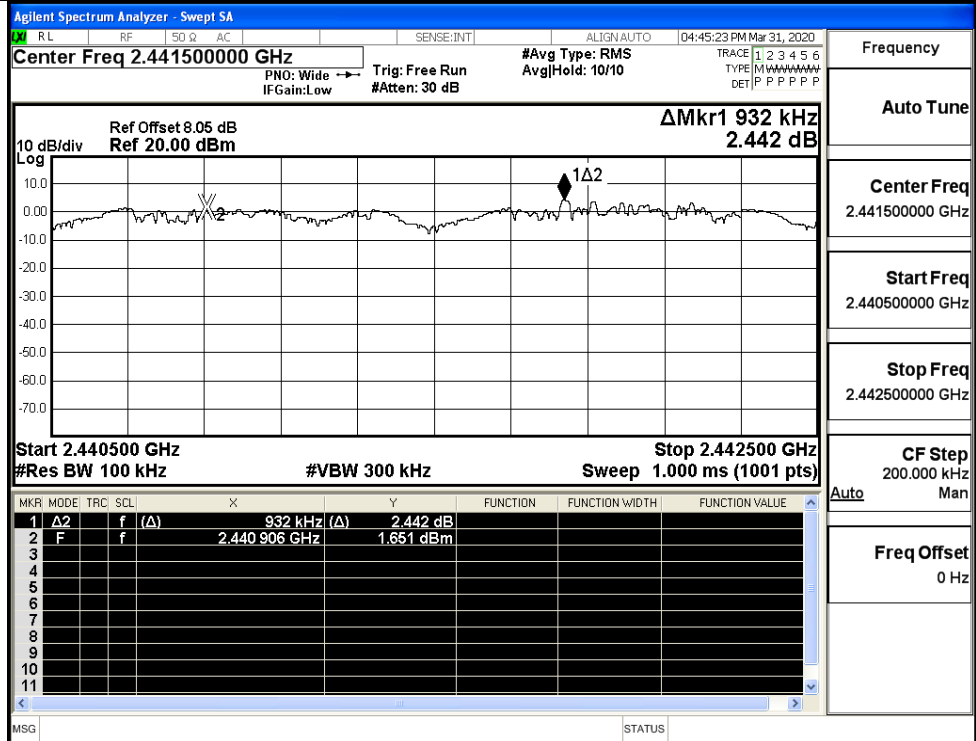
π/4DQPSK/HCH



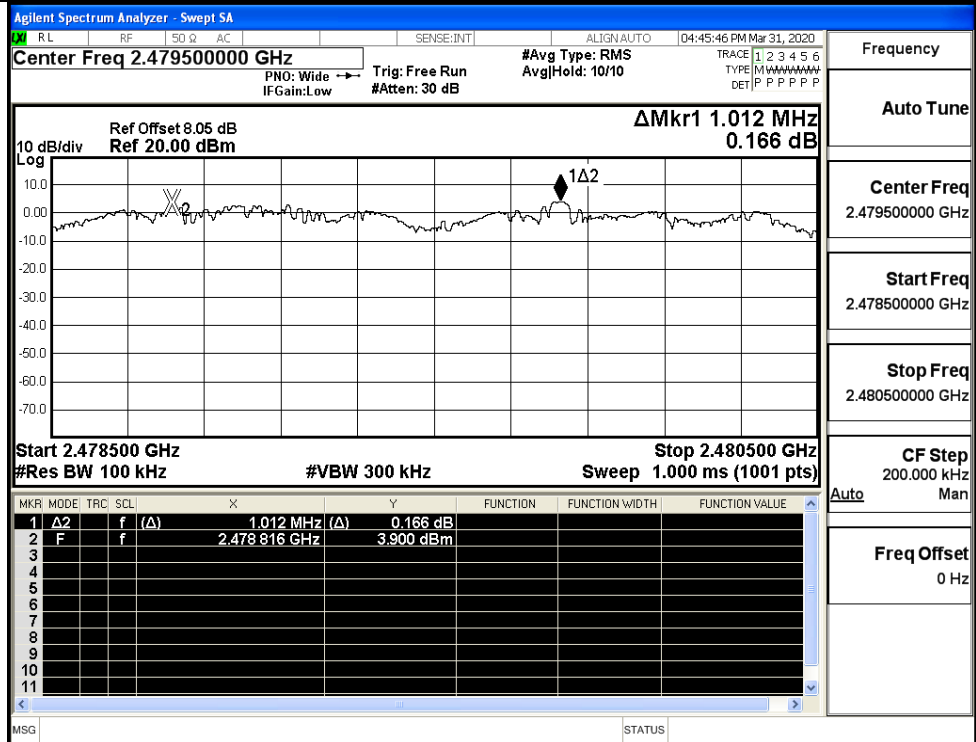
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH





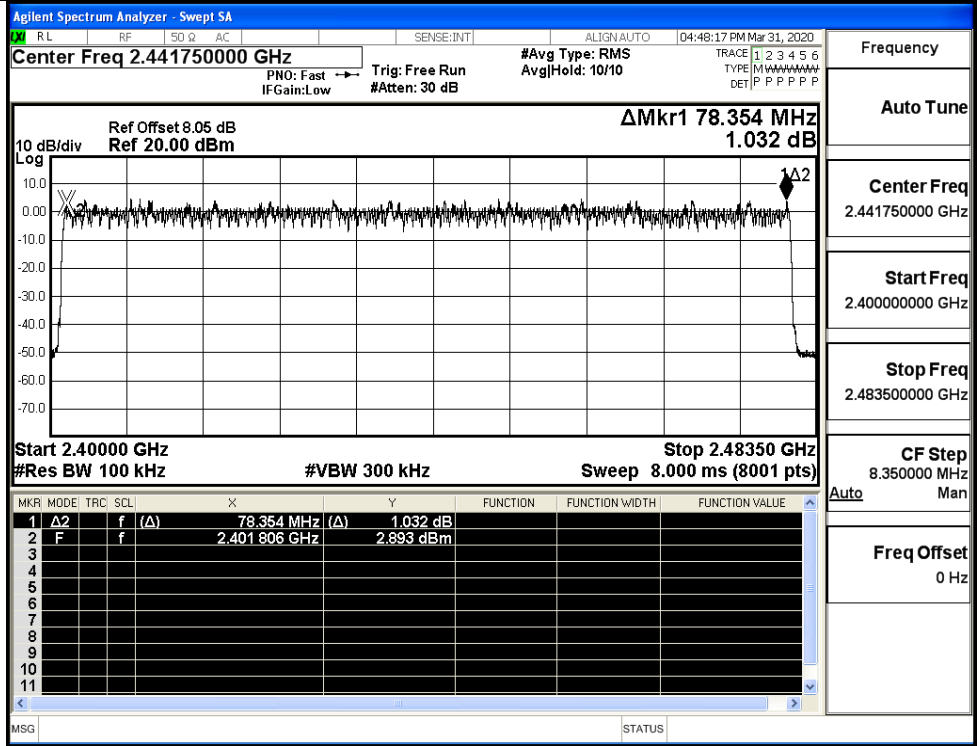
### A.4 Hopping Channel Number

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 Graphs

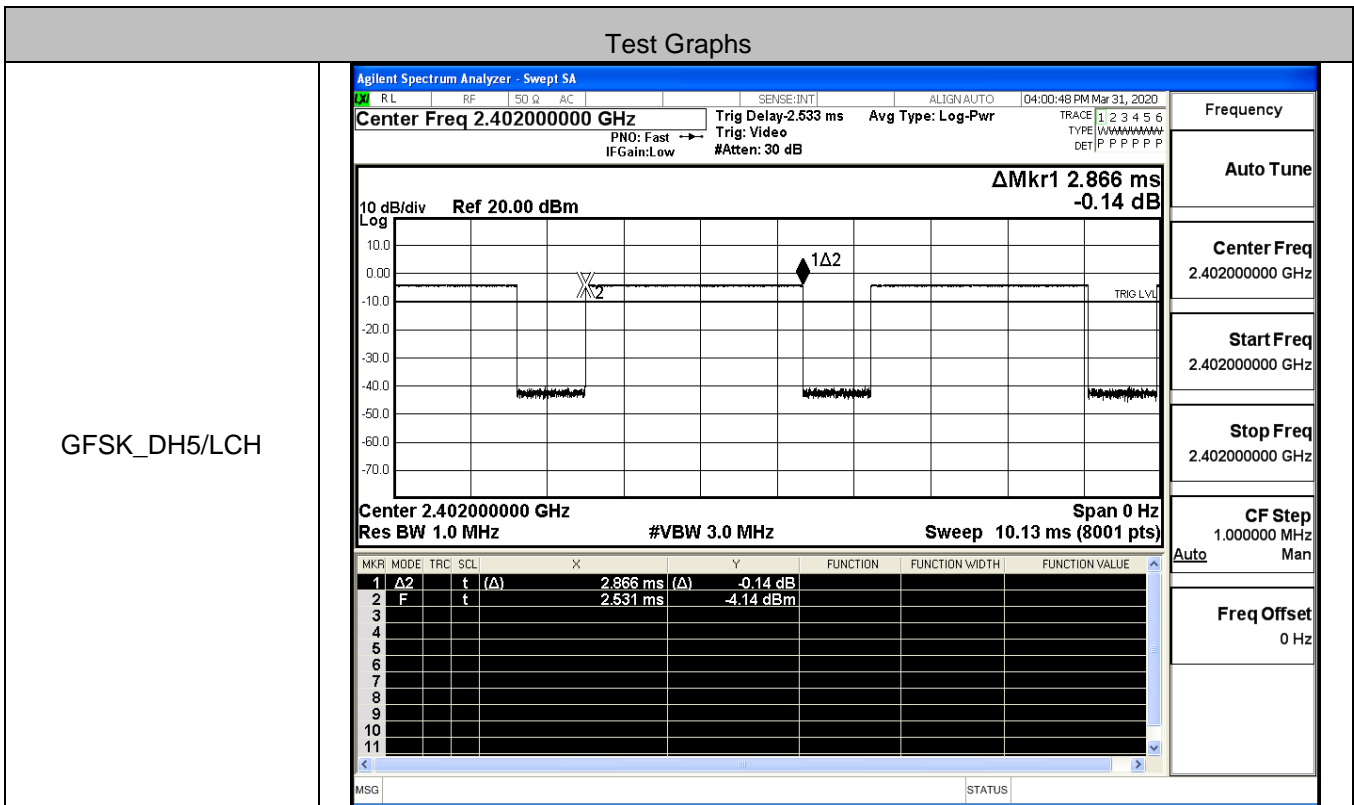
GFSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.441750000 GHz                  Ref Offset 8.05 dB Ref 20.00 dBm                  ΔMkr1 77.958 MHz 0.406 dB                  Start 2.40000 GHz Stop 2.48350 GHz                  #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Δ2</td> <td>f</td> <td>(Δ)</td> <td>77.958 MHz (Δ)</td> <td>0.406 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>(Δ)</td> <td>2.402 014 GHz</td> <td>3.113 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	77.958 MHz (Δ)	0.406 dB				2	F	f	(Δ)	2.402 014 GHz	3.113 dBm				Frequency Auto Tune Center Freq 2.441750000 GHz Start Freq 2.400000000 GHz Stop Freq 2.483500000 GHz CF Step 8.350000 MHz Auto Man Freq Offset 0 Hz
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	Δ2	f	(Δ)	77.958 MHz (Δ)	0.406 dB																								
2	F	f	(Δ)	2.402 014 GHz	3.113 dBm																								
$\pi/4$ DQPSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.441750000 GHz                  Ref Offset 8.05 dB Ref 20.00 dBm                  ΔMkr1 77.979 MHz -0.009 dB                  Start 2.40000 GHz Stop 2.48350 GHz                  #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Δ2</td> <td>f</td> <td>(Δ)</td> <td>77.979 MHz (Δ)</td> <td>-0.009 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>(Δ)</td> <td>2.401 962 GHz</td> <td>1.323 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	77.979 MHz (Δ)	-0.009 dB				2	F	f	(Δ)	2.401 962 GHz	1.323 dBm				Frequency Auto Tune Center Freq 2.441750000 GHz Start Freq 2.400000000 GHz Stop Freq 2.483500000 GHz CF Step 8.350000 MHz Auto Man Freq Offset 0 Hz
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	Δ2	f	(Δ)	77.979 MHz (Δ)	-0.009 dB																								
2	F	f	(Δ)	2.401 962 GHz	1.323 dBm																								

8DPSK/Hop

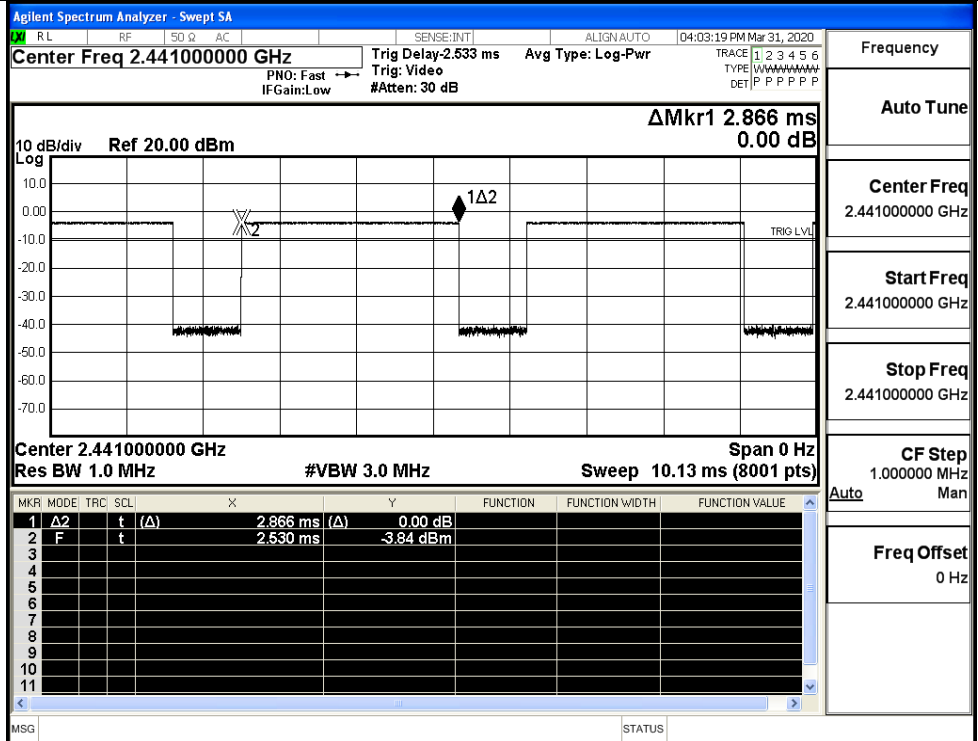


### A.5 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
π/4DQPSK	2DH5	LCH	2.87	106.7	0.015	0.4	PASS
	2DH5	MCH	2.87	106.7	0.015	0.4	PASS
	2DH5	HCH	2.87	106.7	0.015	0.4	PASS
8DPSK	3DH5	LCH	2.87	106.7	0.015	0.4	PASS
	3DH5	MCH	2.87	106.7	0.307	0.4	PASS
	3DH5	HCH	2.87	106.7	0.015	0.4	PASS

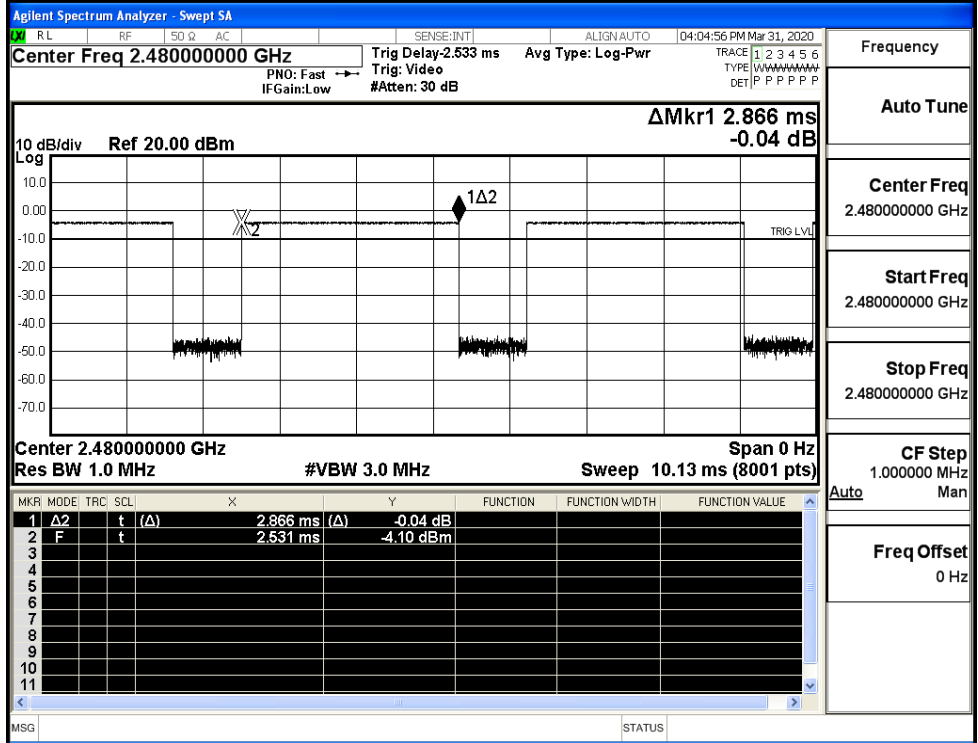


GFSK\_DH5/MCH



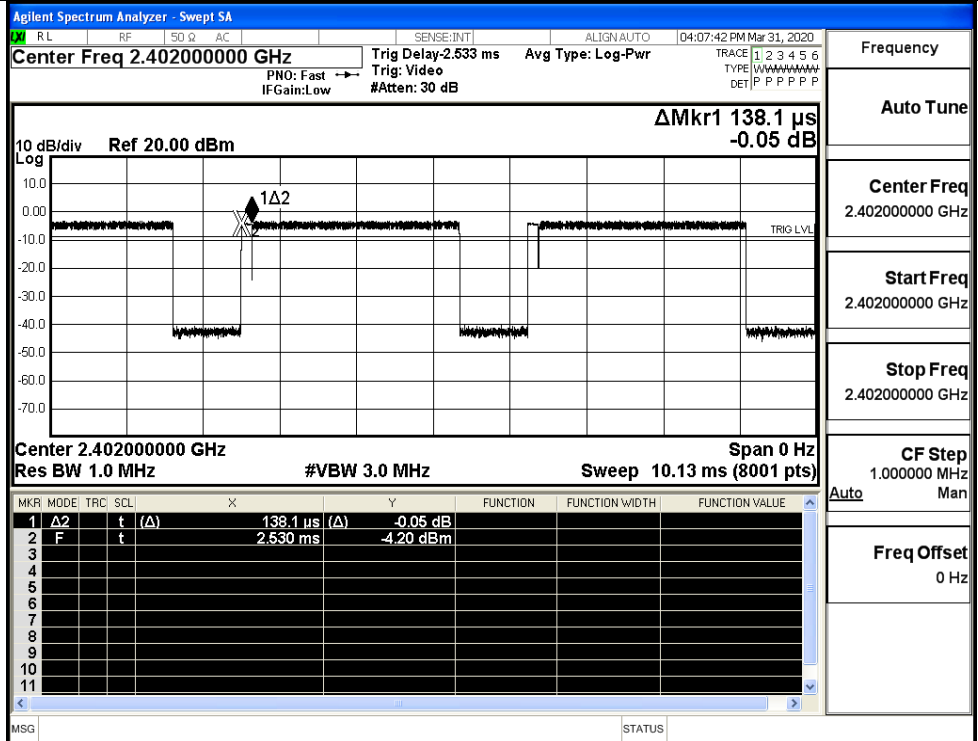
Frequency	2.441000000 GHz
Auto Tune	
Center Freq	2.441000000 GHz
Start Freq	2.441000000 GHz
Stop Freq	2.441000000 GHz
CF Step	1.000000 MHz
Freq Offset	0 Hz

GFSK\_DH5/HCH



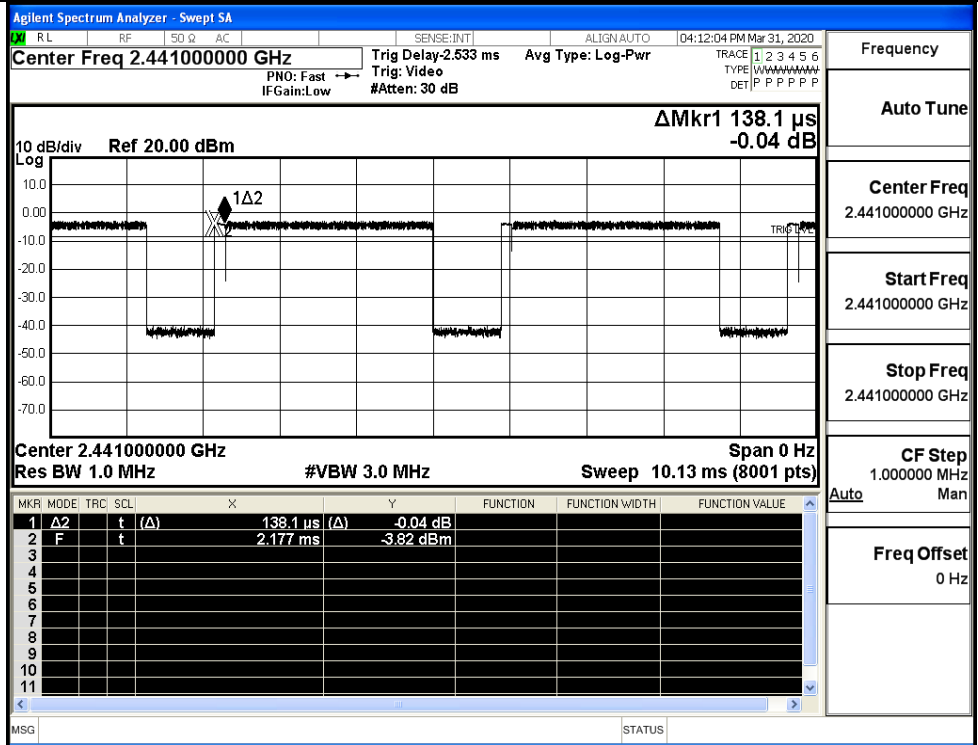
Frequency	2.480000000 GHz
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Freq Offset	0 Hz

$\pi/4$ DQPSK  
\_2DH5/LCH



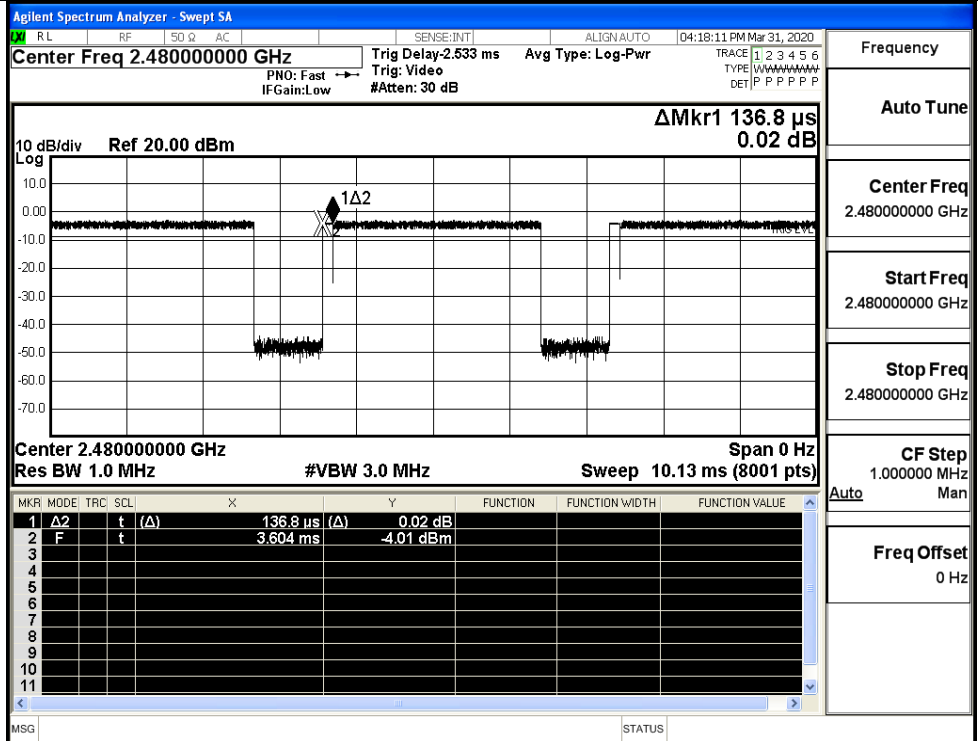
Frequency	2.40200000 GHz
Auto Tune	
Center Freq	2.40200000 GHz
Start Freq	2.40200000 GHz
Stop Freq	2.40200000 GHz
CF Step	1.000000 MHz
Freq Offset	0 Hz

$\pi/4$ DQPSK  
\_2DH5/MCH



Frequency	2.44100000 GHz
Auto Tune	
Center Freq	2.44100000 GHz
Start Freq	2.44100000 GHz
Stop Freq	2.44100000 GHz
CF Step	1.000000 MHz
Freq Offset	0 Hz

$\pi$ /4DQPSK  
\_2DH5/HCH



Frequency

Auto Tune

Center Freq  
2.480000000 GHz

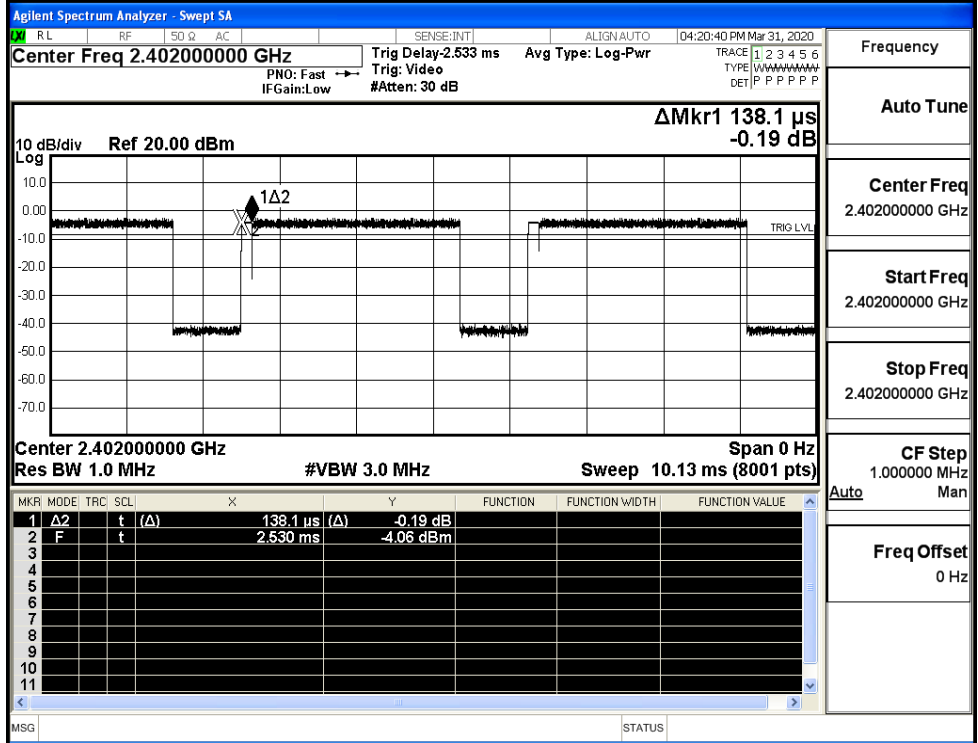
Start Freq  
2.480000000 GHz

Stop Freq  
2.480000000 GHz

CF Step  
1.000000 MHz  
Auto Man

Freq Offset  
0 Hz

8DPSK\_3DH5/LCH



Frequency

Auto Tune

Center Freq  
2.402000000 GHz

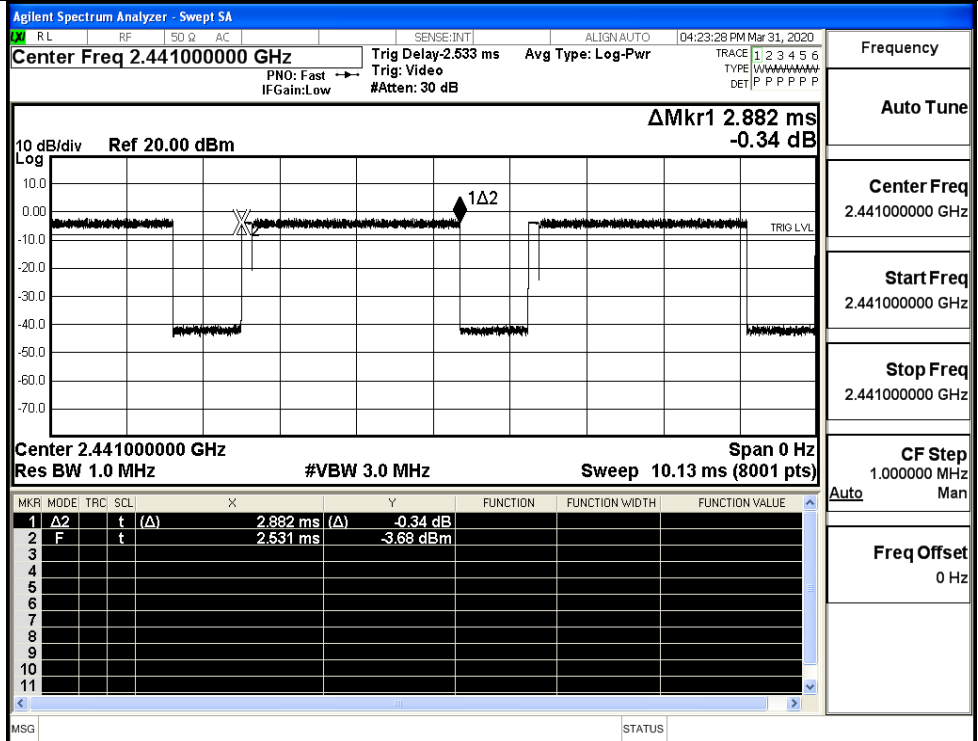
Start Freq  
2.402000000 GHz

Stop Freq  
2.402000000 GHz

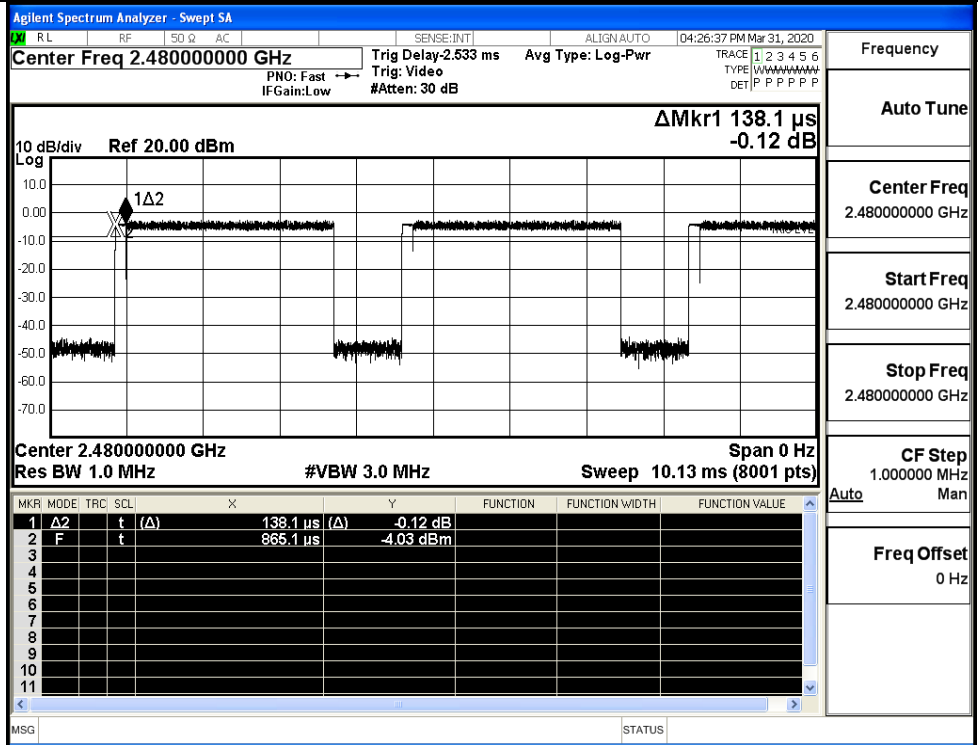
CF Step  
1.000000 MHz  
Auto Man

Freq Offset  
0 Hz

8DPSK\_3DH5/MCH

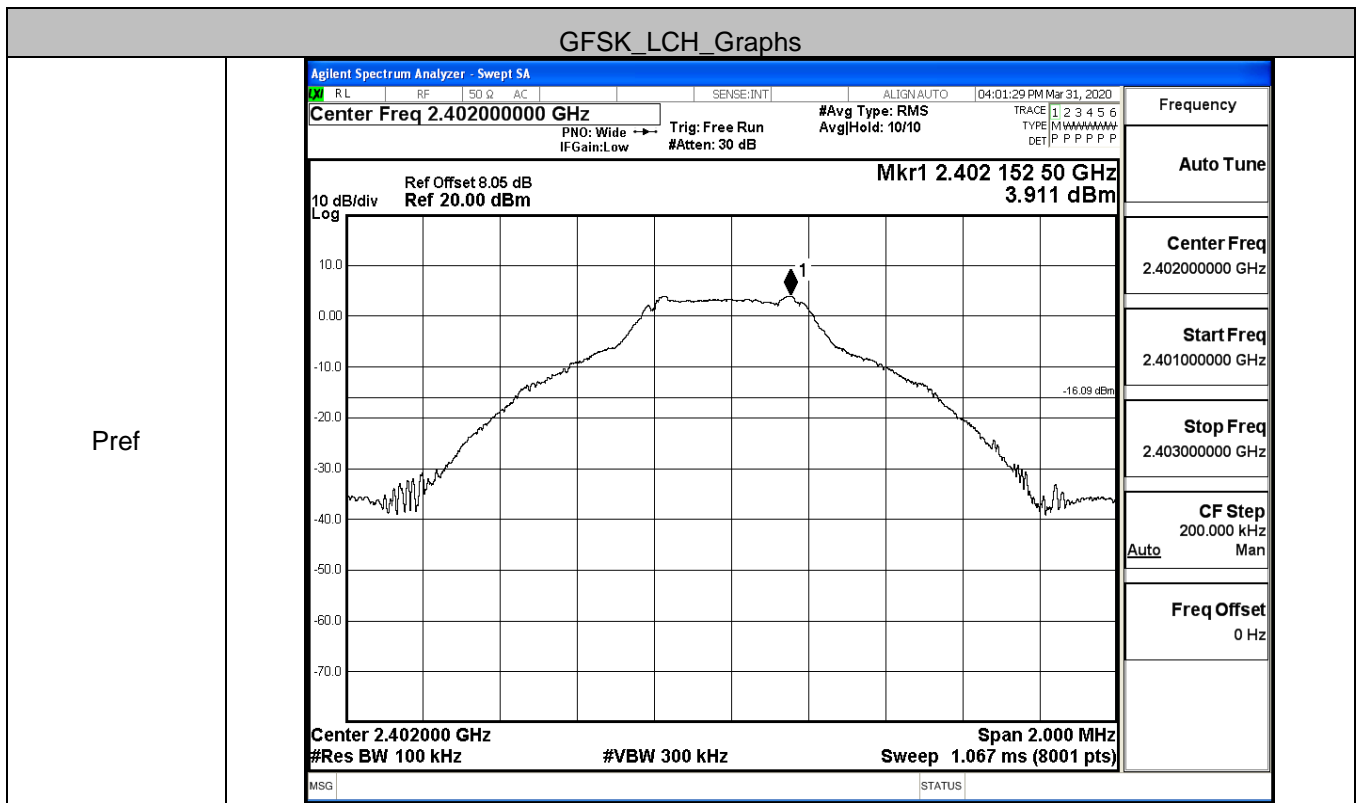


8DPSK\_3DH5/HCH



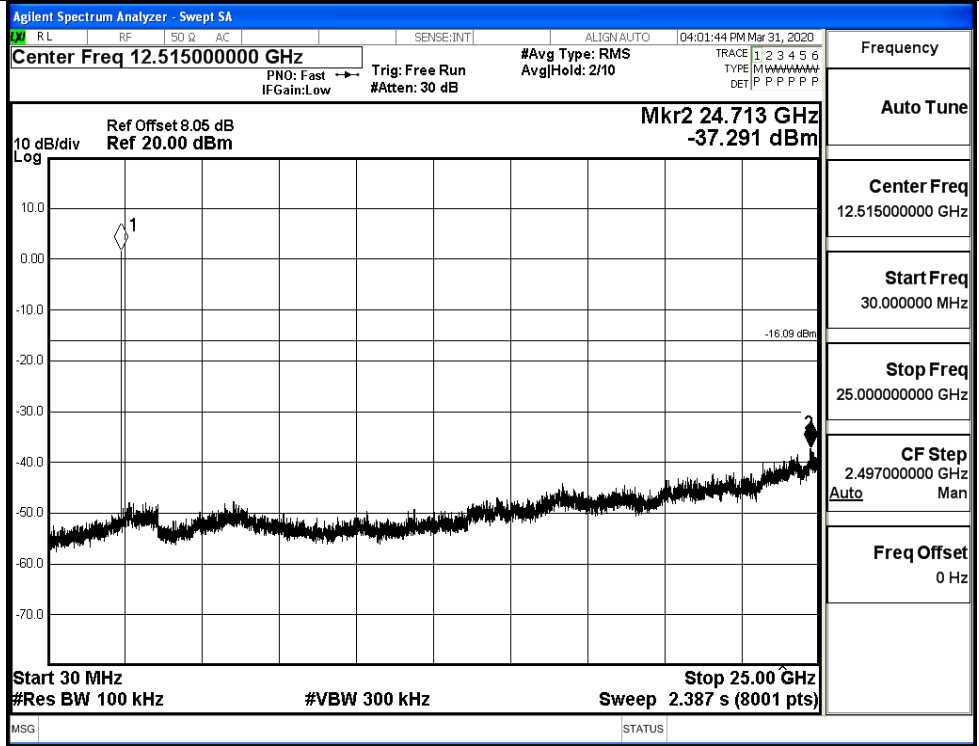
### A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.911	-37.291	-16.089	PASS
	MCH	4.187	-36.661	-15.813	PASS
	HCH	3.866	-36.371	-16.134	PASS
$\pi/4$ DQPSK	LCH	3.866	-36.361	-16.134	PASS
	MCH	4.21	-36.306	-15.790	PASS
	HCH	3.913	-37.726	-16.087	PASS
8DPSK	LCH	3.886	-37.618	-16.114	PASS
	MCH	4.262	-37.700	-15.738	PASS
	HCH	3.971	-37.391	-16.029	PASS

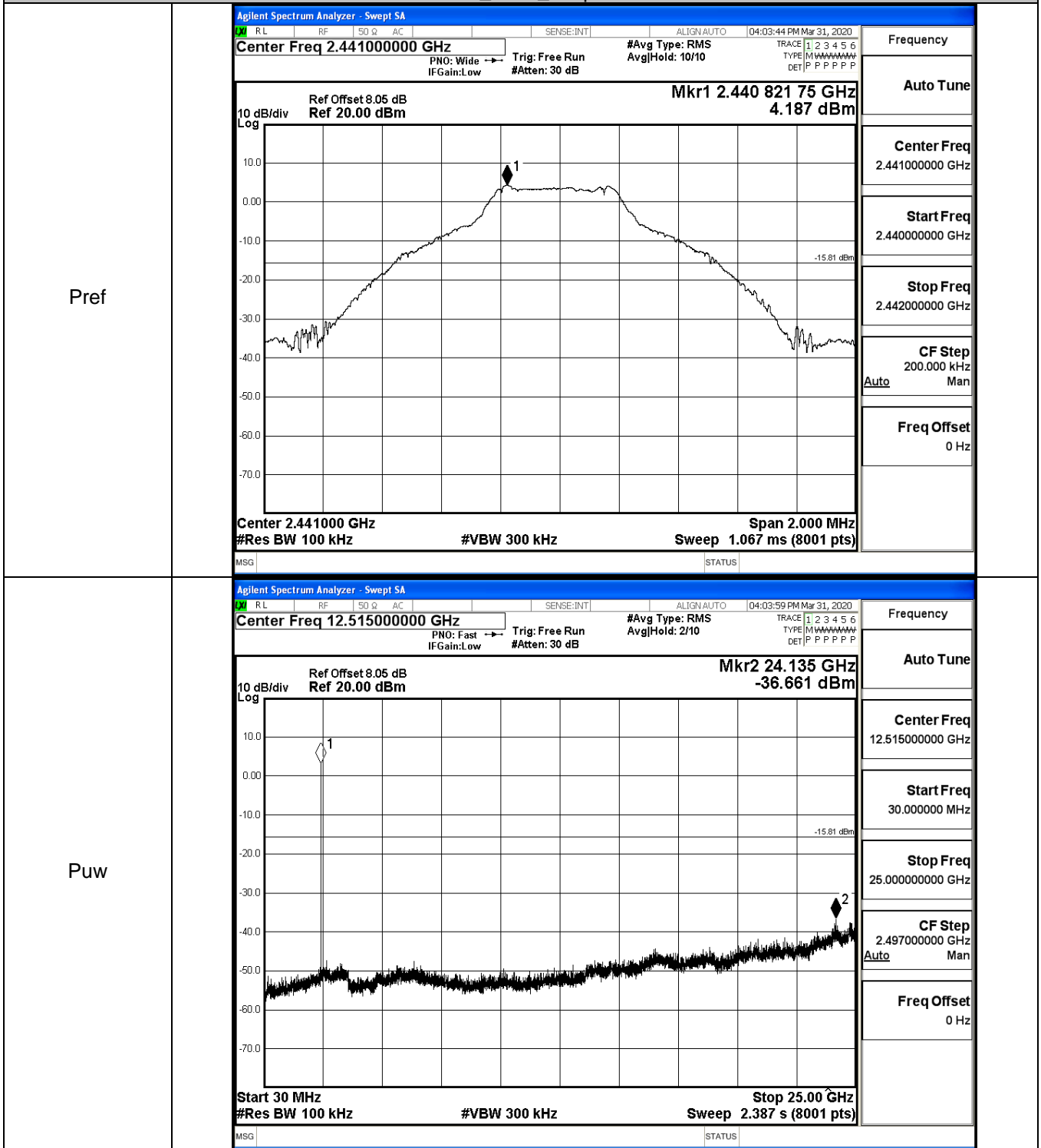




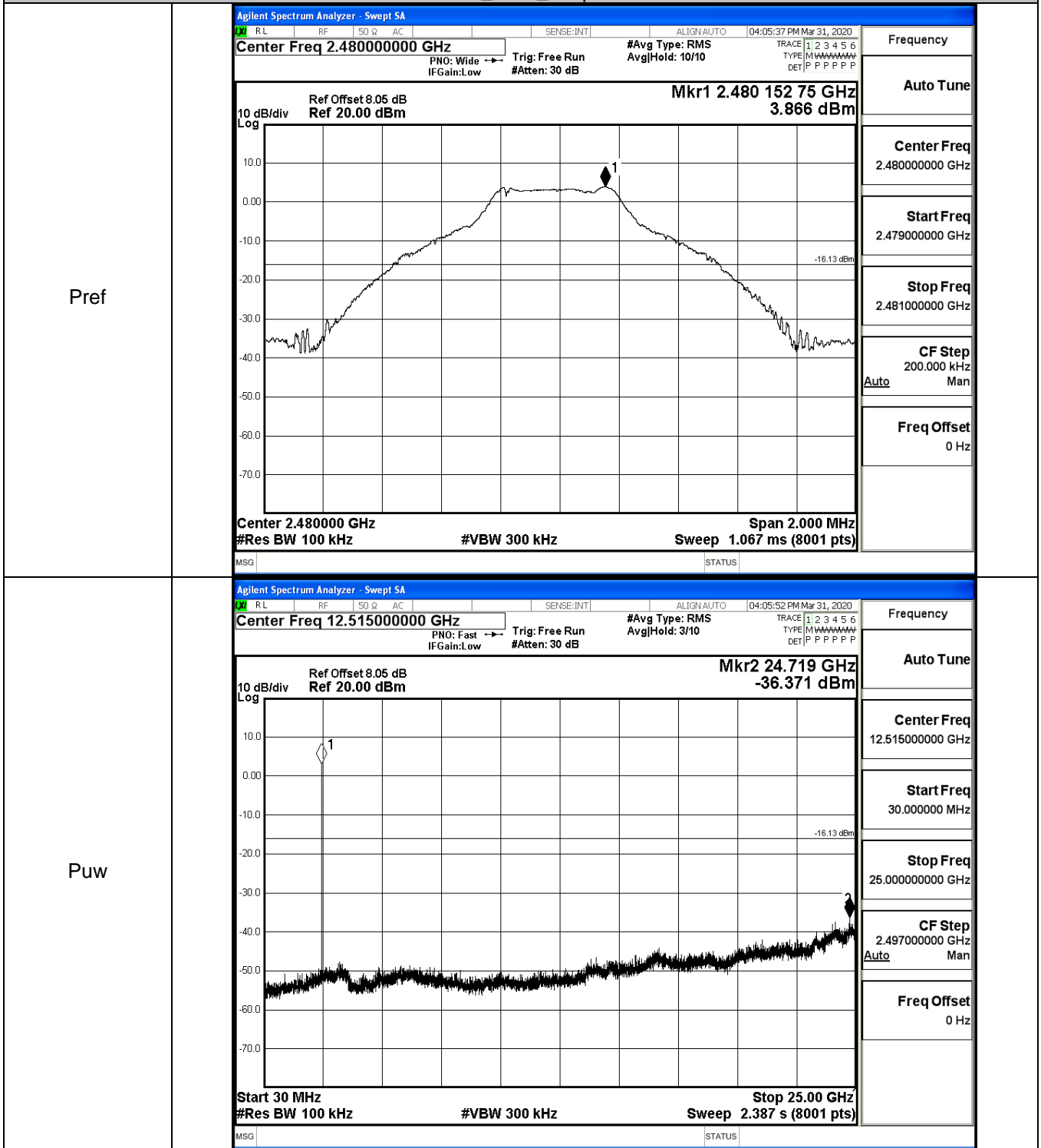
Puw



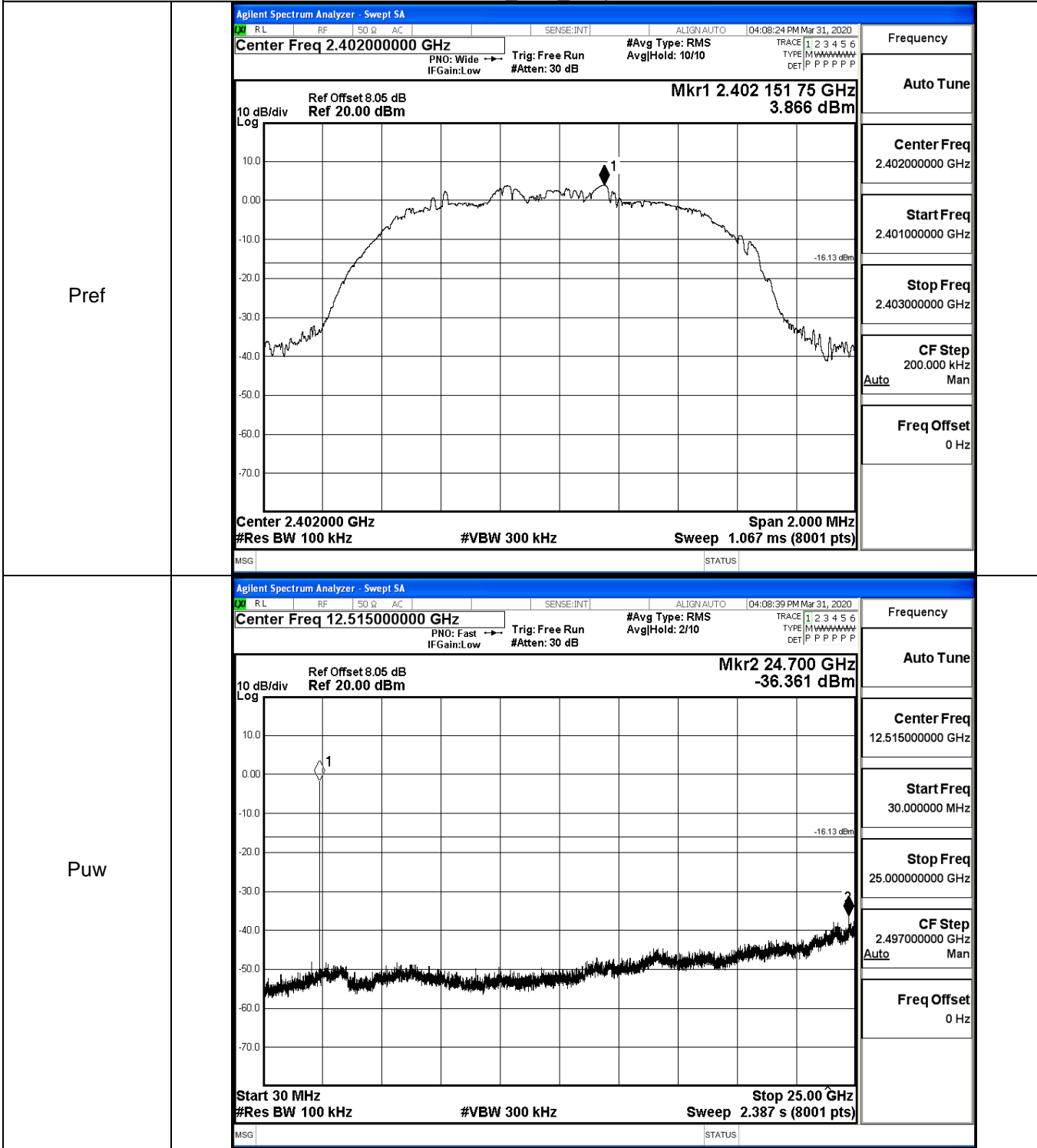
GFSK\_MCH\_Graphs



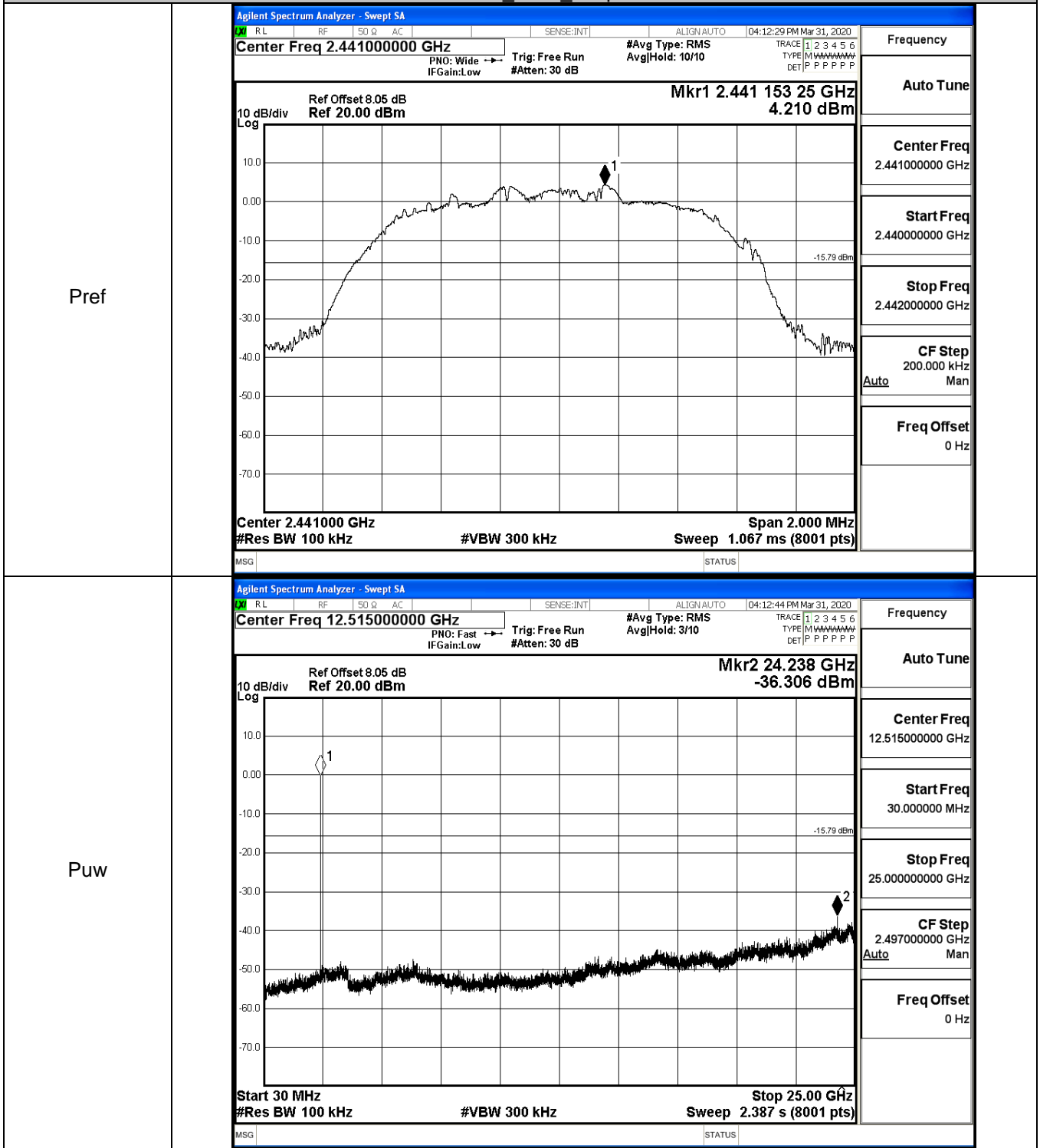
GFSK\_HCH\_Graphs



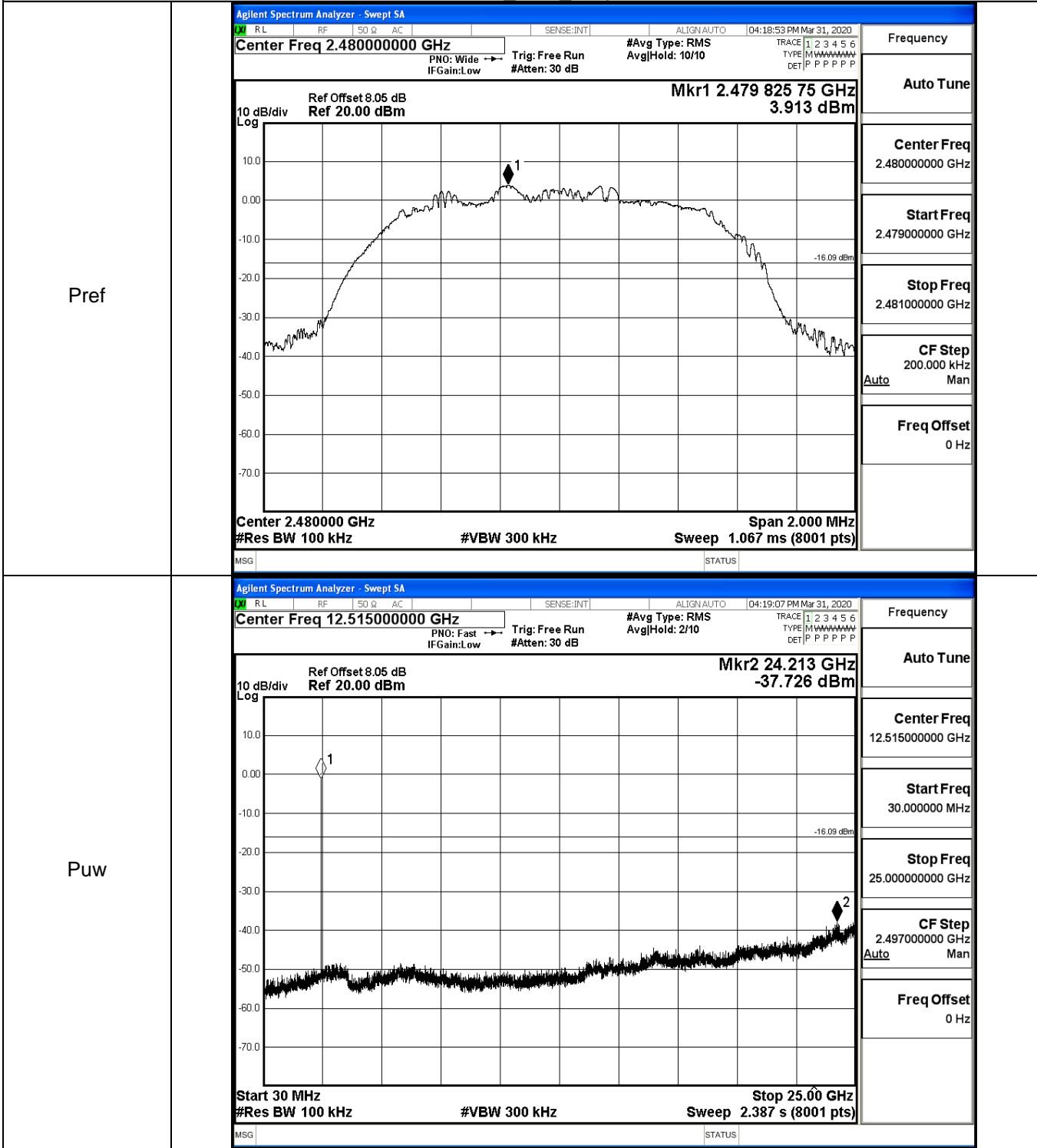
$\pi/4$ DQPSK\_LCH\_Graphs



$\pi$ /4DQPSK\_MCH\_Graphs

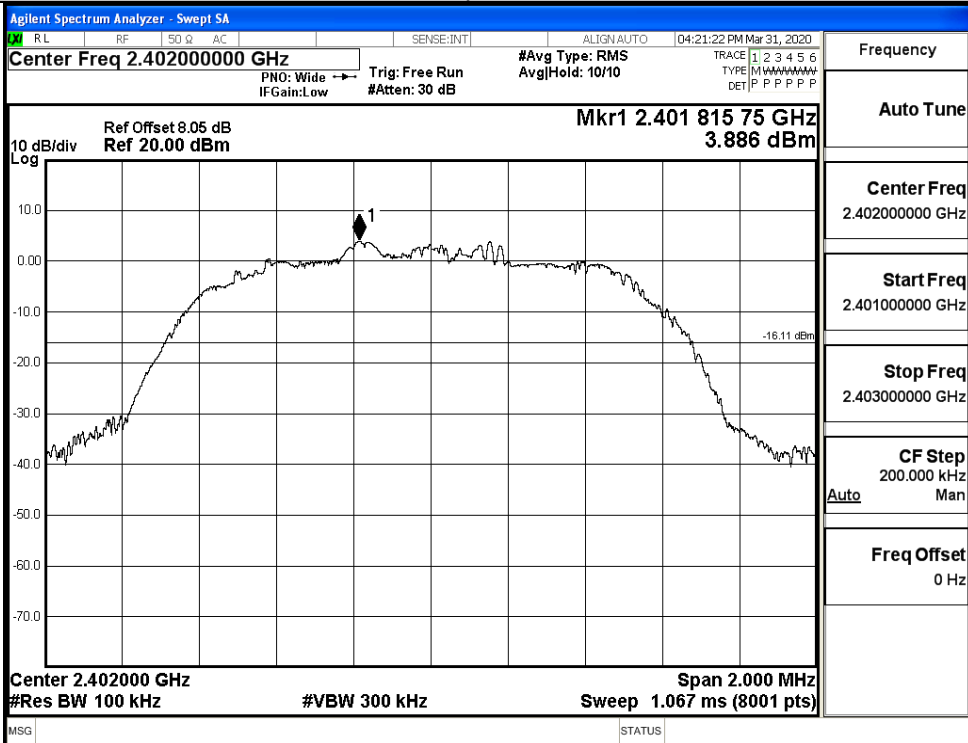


$\pi/4$ DQPSK\_HCH\_Graphs

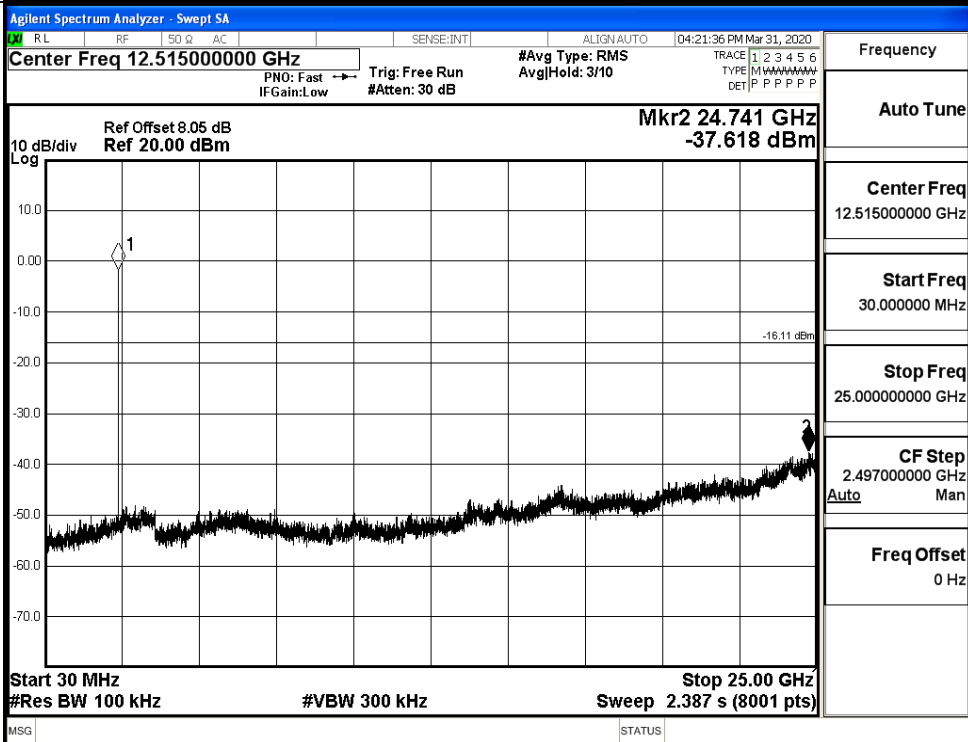


8DPSK\_LCH\_Graphs

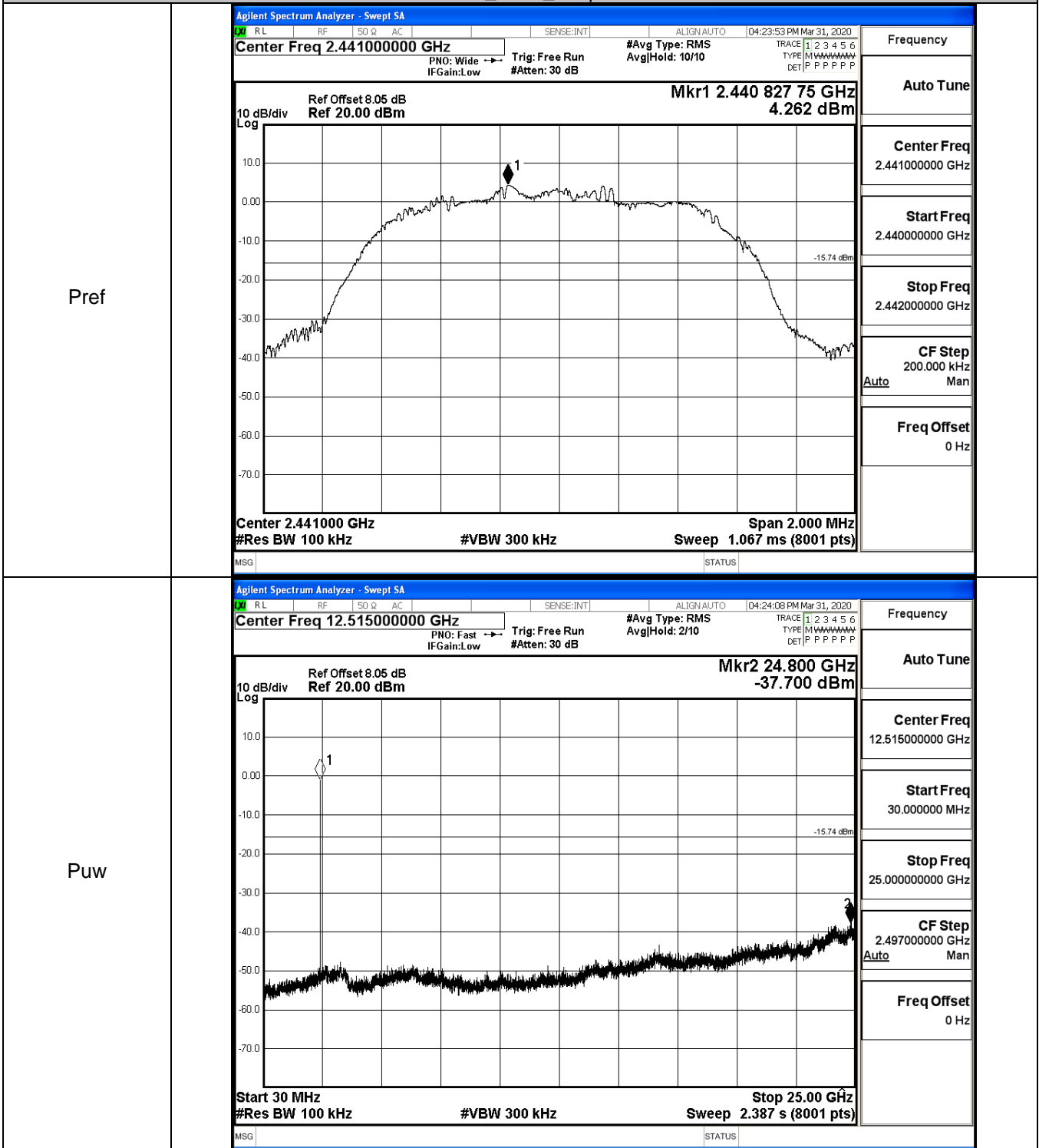
Pref



Puw



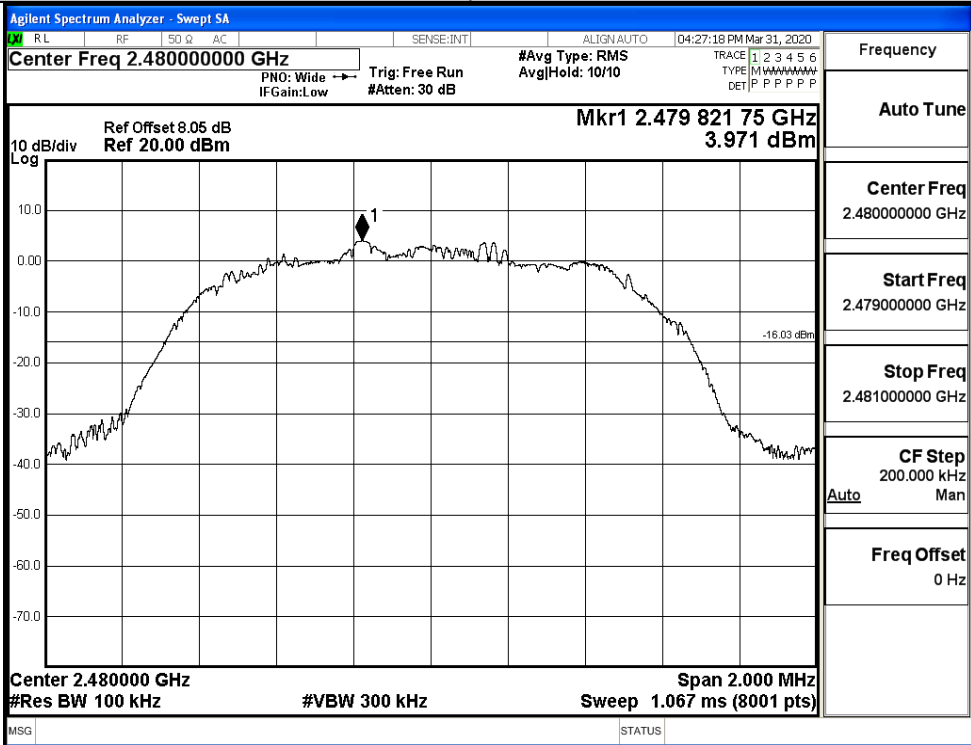
8DPSK\_MCH\_Graphs



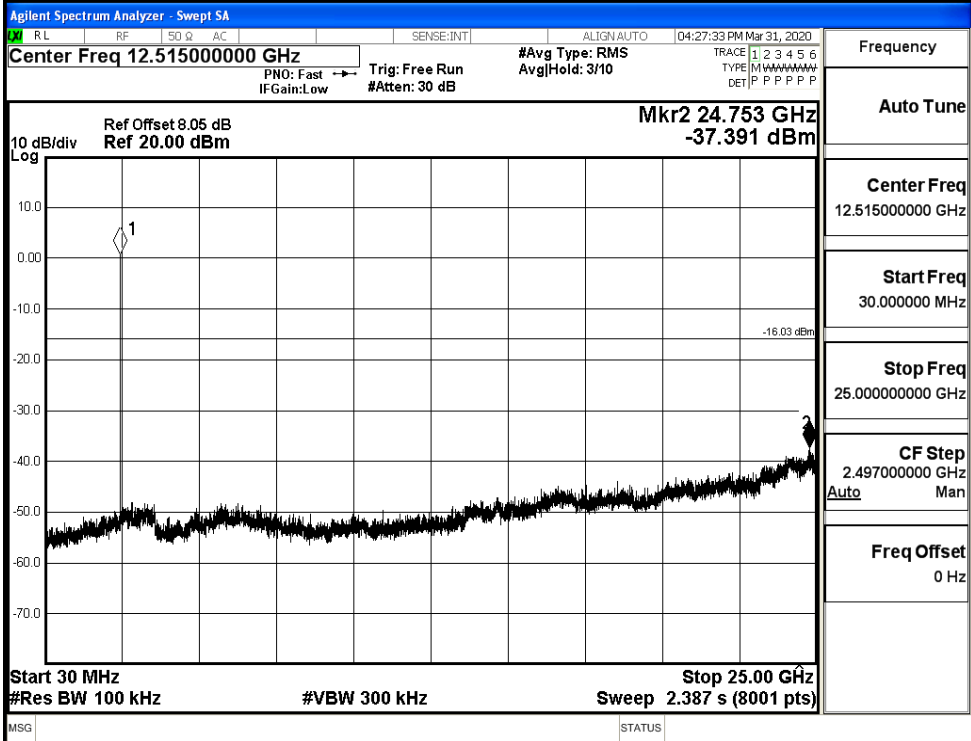


8DPSK\_HCH\_Graphs

Pref



Puw

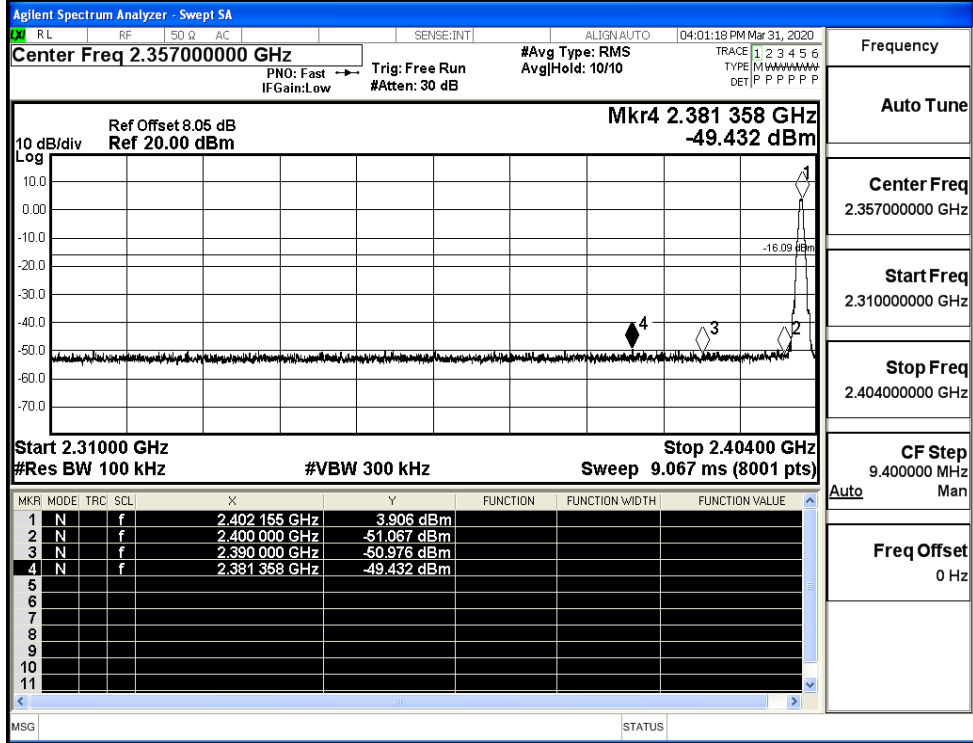


### A.7 Band-edge for RF Conducted Emissions

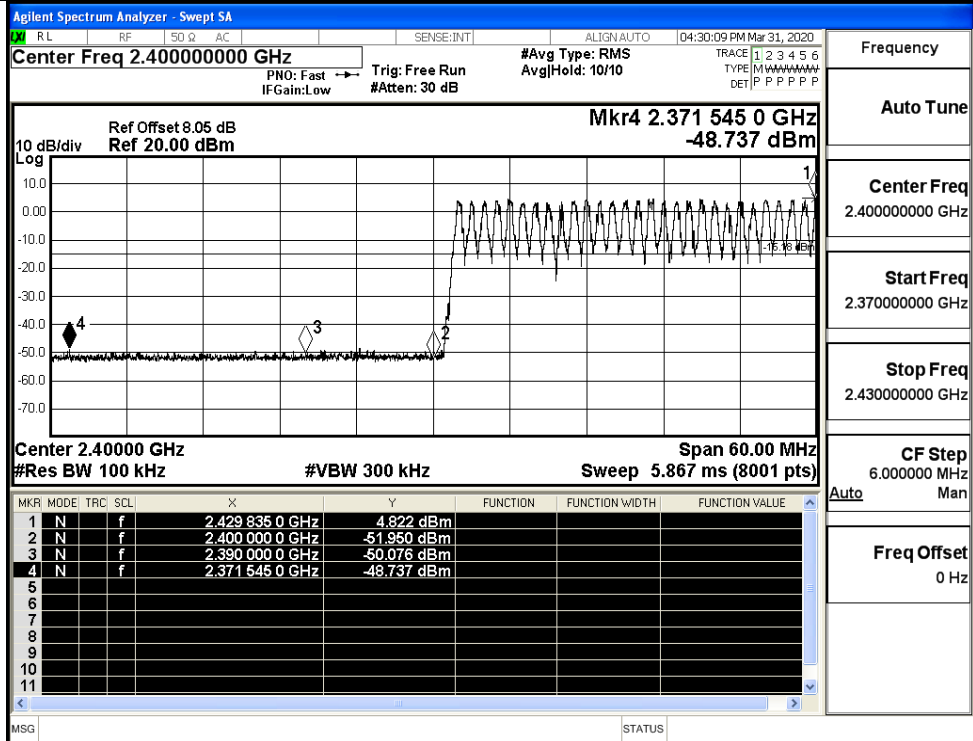
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.906	Off	-49.432	-16.09	PASS
			4.822	On	-48.737	-15.18	PASS
	HCH	2480	3.906	Off	-48.753	-16.09	PASS
			5.105	On	-48.959	-14.9	PASS
$\pi/4$ DQPSK	LCH	2402	3.741	Off	-49.652	-16.26	PASS
			4.577	On	-48.654	-15.42	PASS
	HCH	2480	4.003	Off	-48.351	-16	PASS
			4.596	On	-48.555	-15.4	PASS
8DPSK	LCH	2402	4.022	Off	-48.982	-15.98	PASS
			4.539	On	-48.879	-15.46	PASS
	HCH	2480	4.041	Off	-48.257	-15.96	PASS
			4.817	On	-48.600	-15.18	PASS

Test Graphs

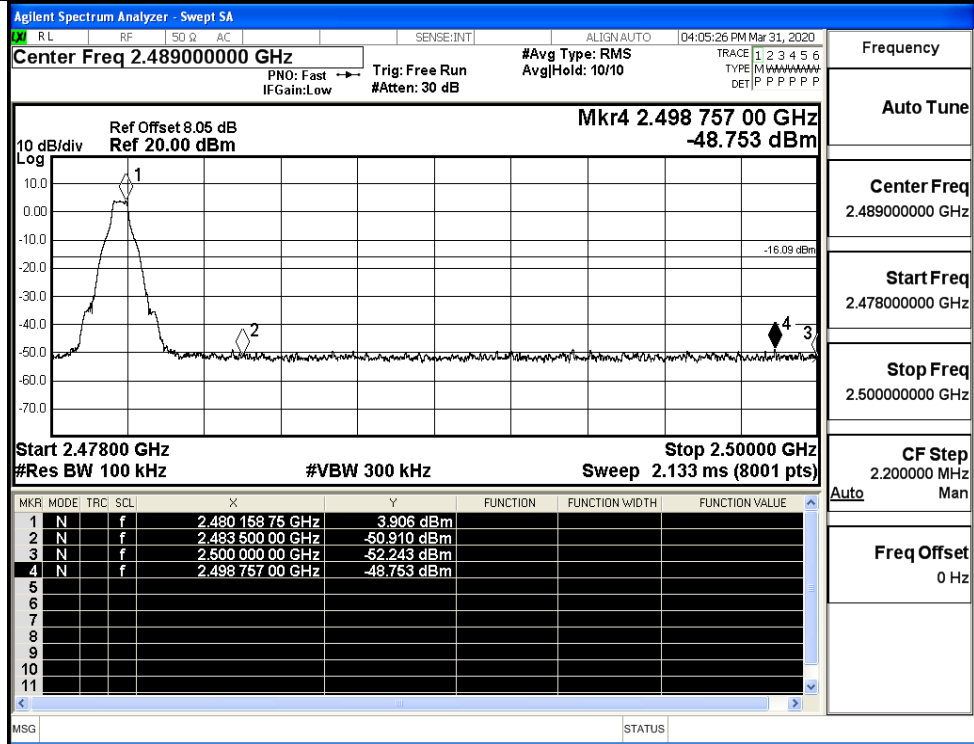
GFSK/LCH/No Hop



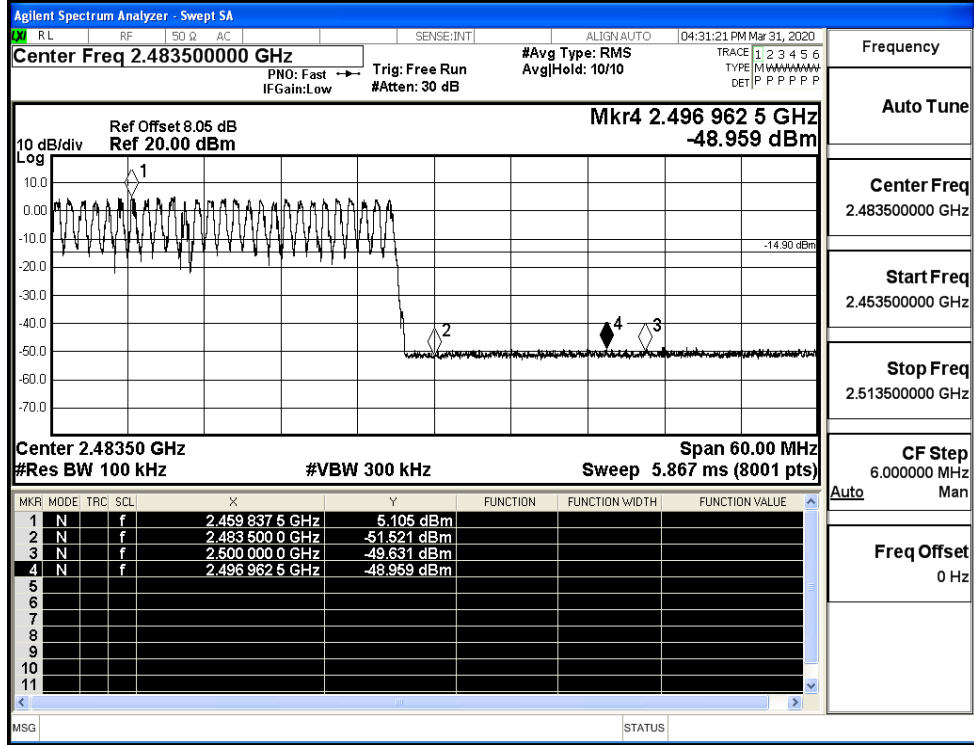
GFSK/LCH/Hop



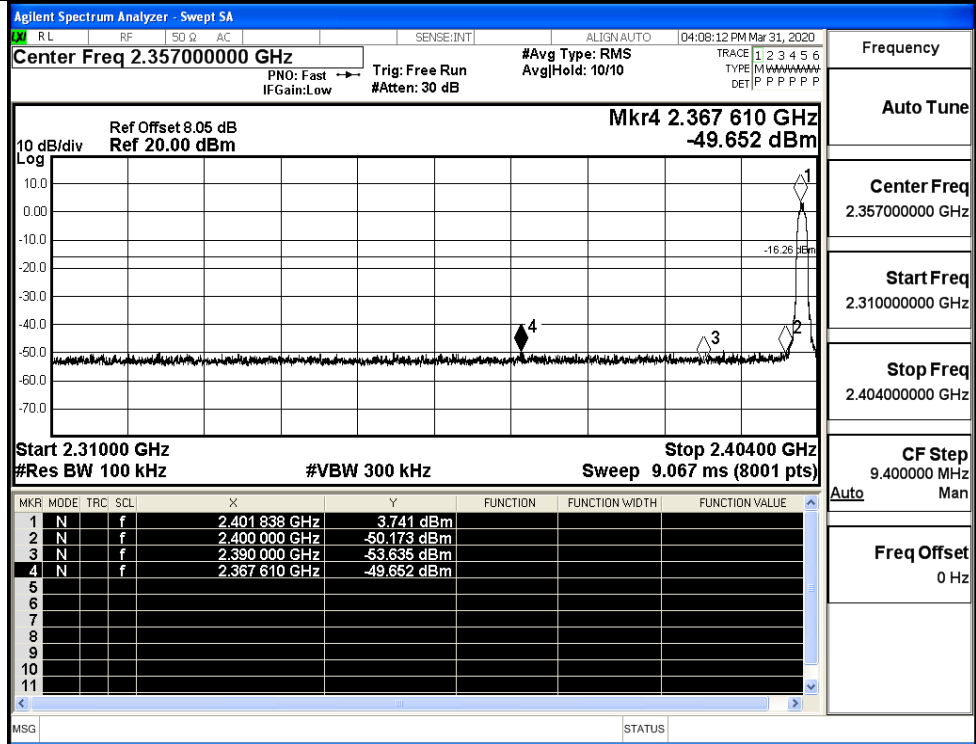
GFSK/HCH/No Hop



GFSK/HCH/Hop

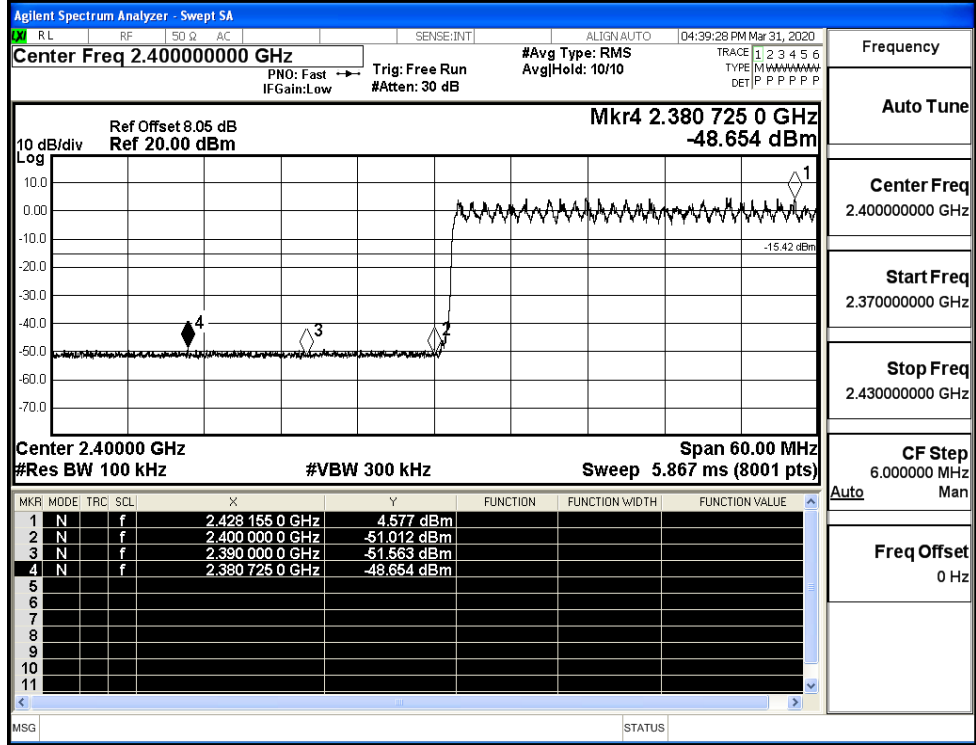


$\pi/4$ DQPSK/LCH/No  
Hop



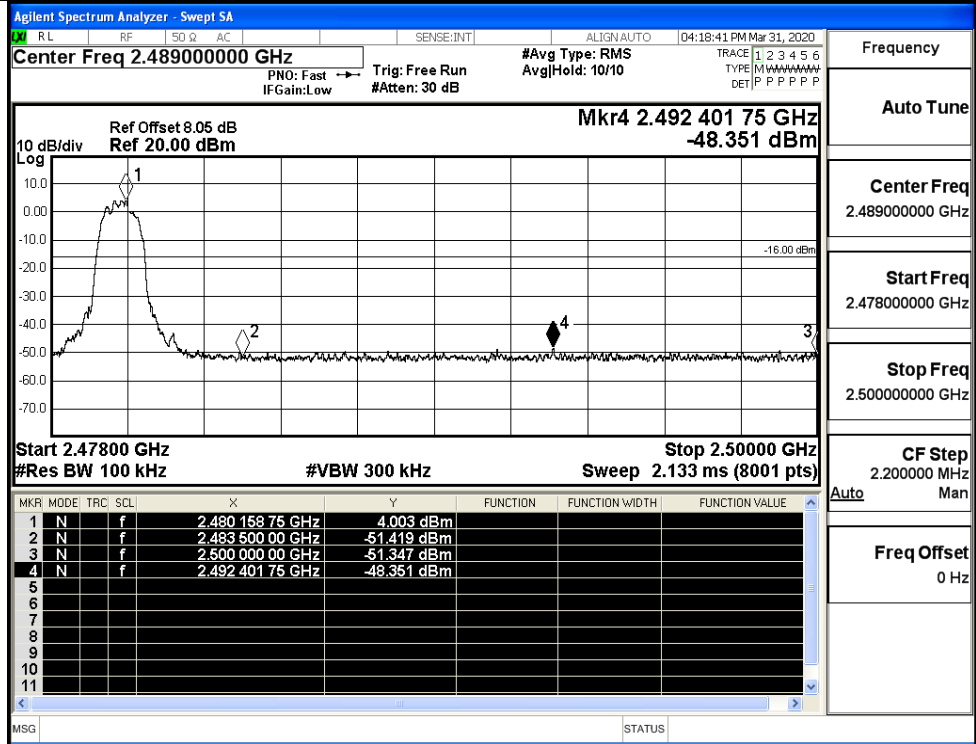
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Freq Offset	0 Hz

$\pi/4$ DQPSK/LCH/Hop

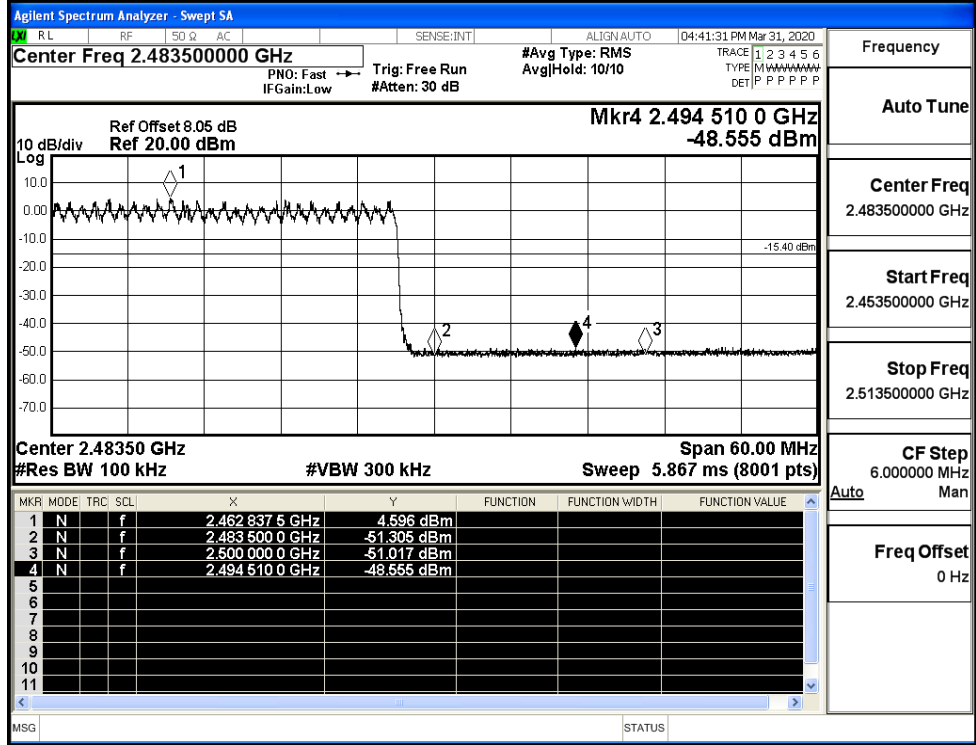


Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

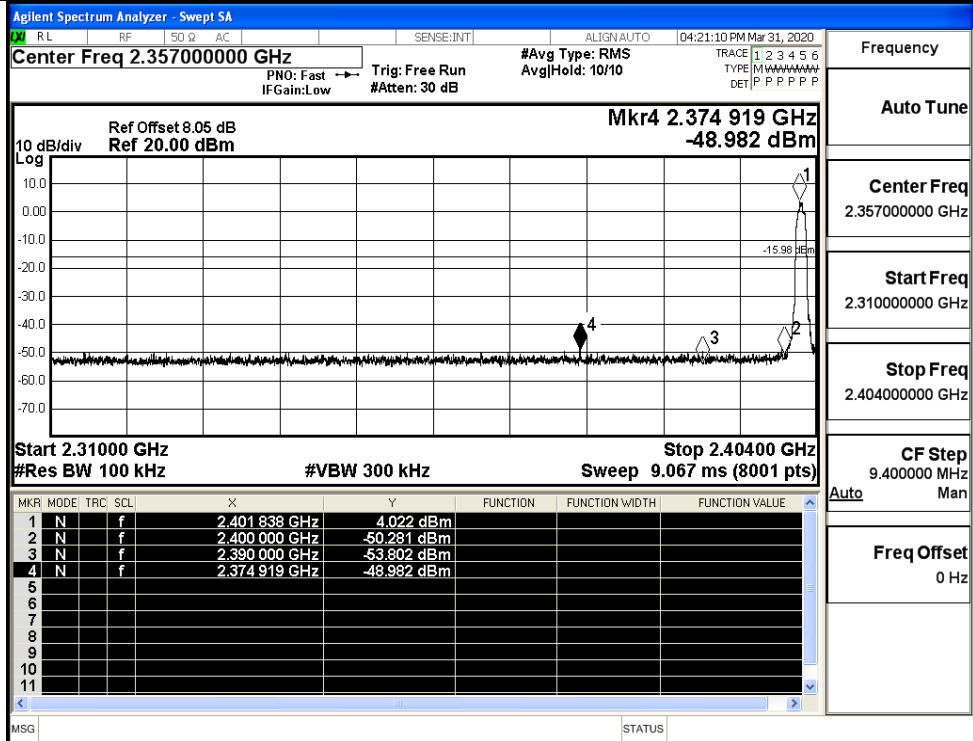
$\pi/4$ DQPSK/HCH/No  
Hop



$\pi/4$ DQPSK/HCH/Hop



8DPSK/LCH/No Hop



Frequency

Auto Tune

Center Freq  
2.357000000 GHz

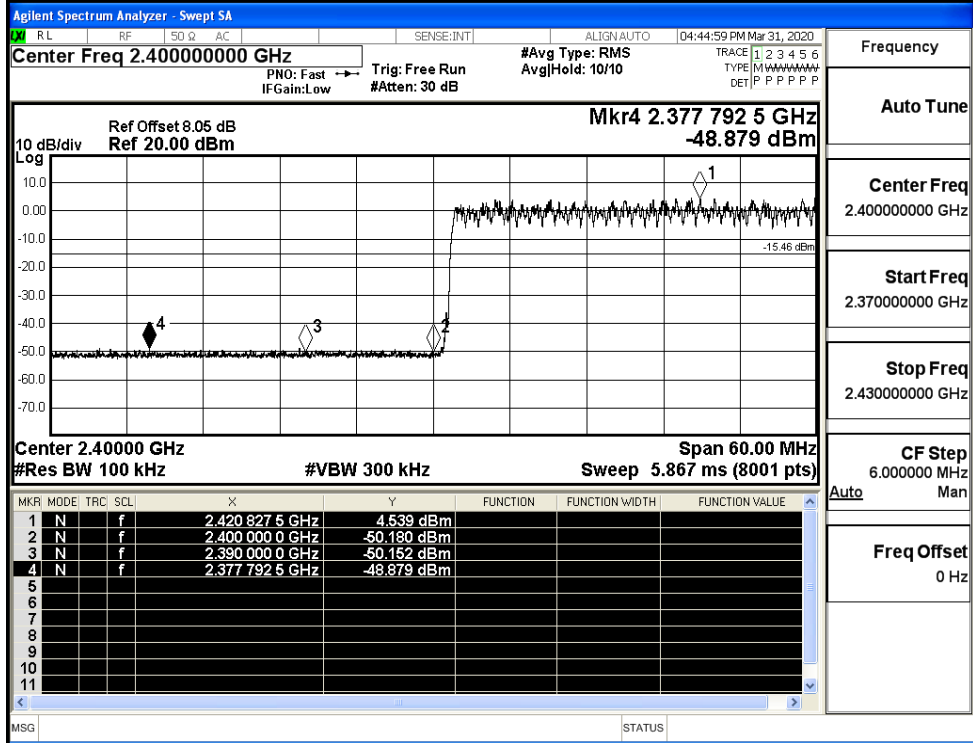
Start Freq  
2.310000000 GHz

Stop Freq  
2.404000000 GHz

CF Step  
9.400000 MHz  
Auto Man

Freq Offset  
0 Hz

8DPSK/LCH/Hop



Frequency

Auto Tune

Center Freq  
2.400000000 GHz

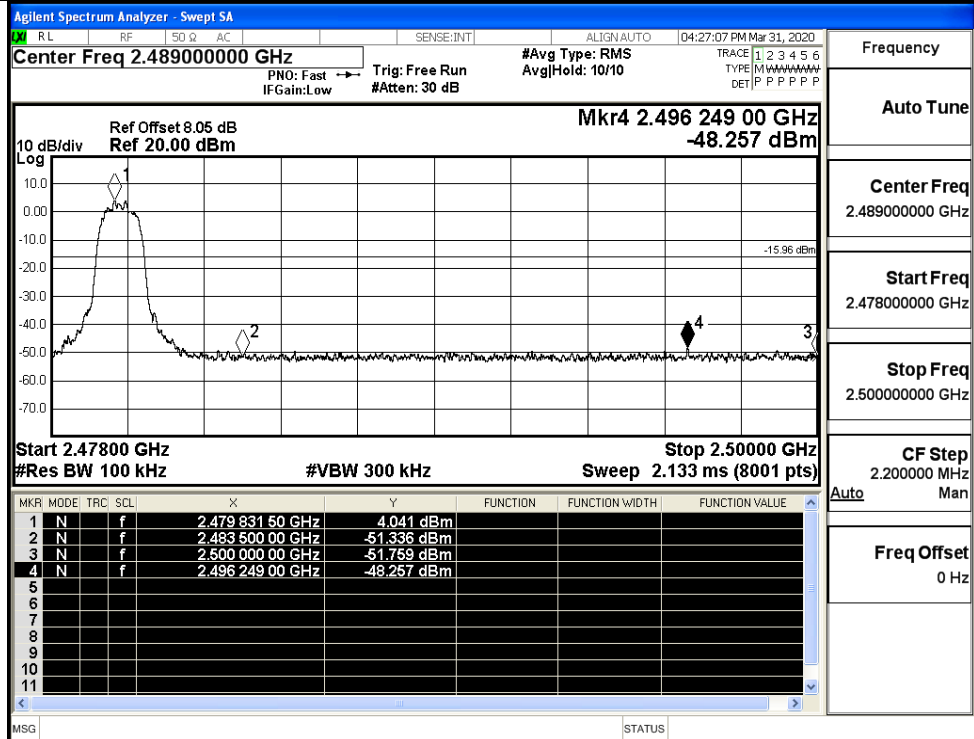
Start Freq  
2.370000000 GHz

Stop Freq  
2.430000000 GHz

CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

8DPSK/HCH/No Hop



Frequency

Auto Tune

Center Freq  
2.489000000 GHz

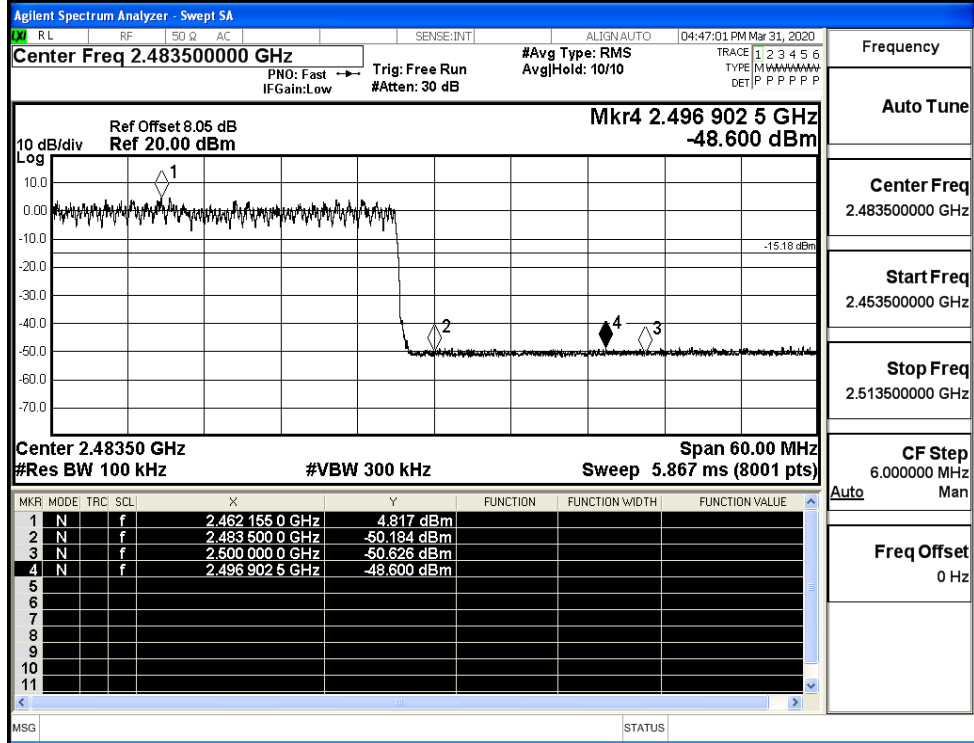
Start Freq  
2.478000000 GHz

Stop Freq  
2.500000000 GHz

CF Step  
2.200000 MHz

Freq Offset  
0 Hz

8DPSK/HCH/Hop



Frequency

Auto Tune

Center Freq  
2.483500000 GHz

Start Freq  
2.453500000 GHz

Stop Freq  
2.513500000 GHz

CF Step  
6.000000 MHz

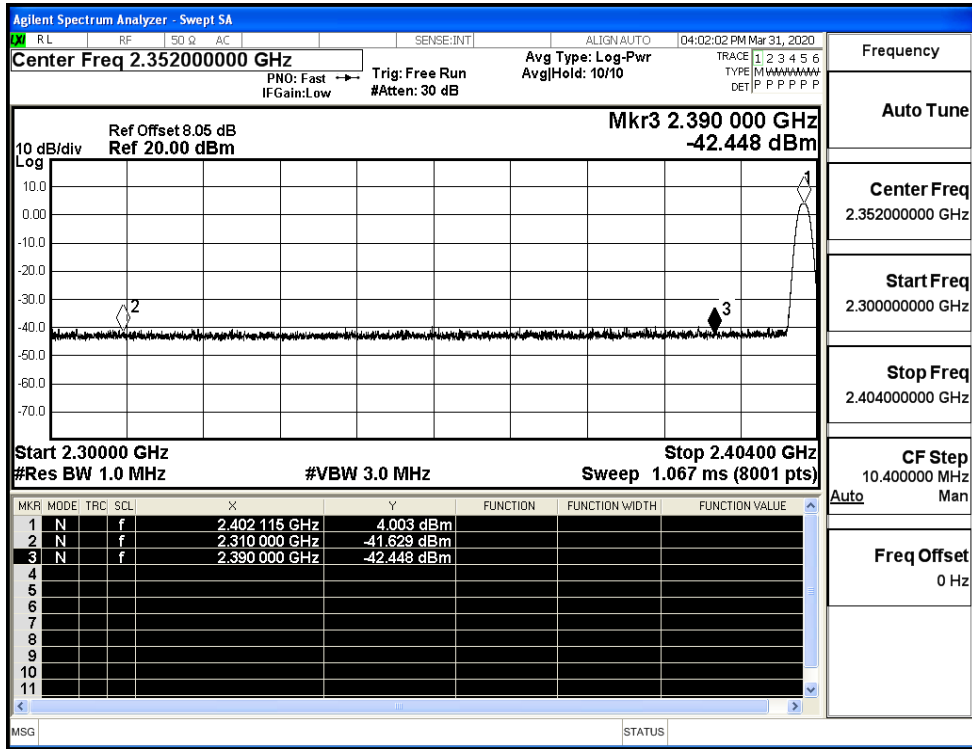
Freq Offset  
0 Hz



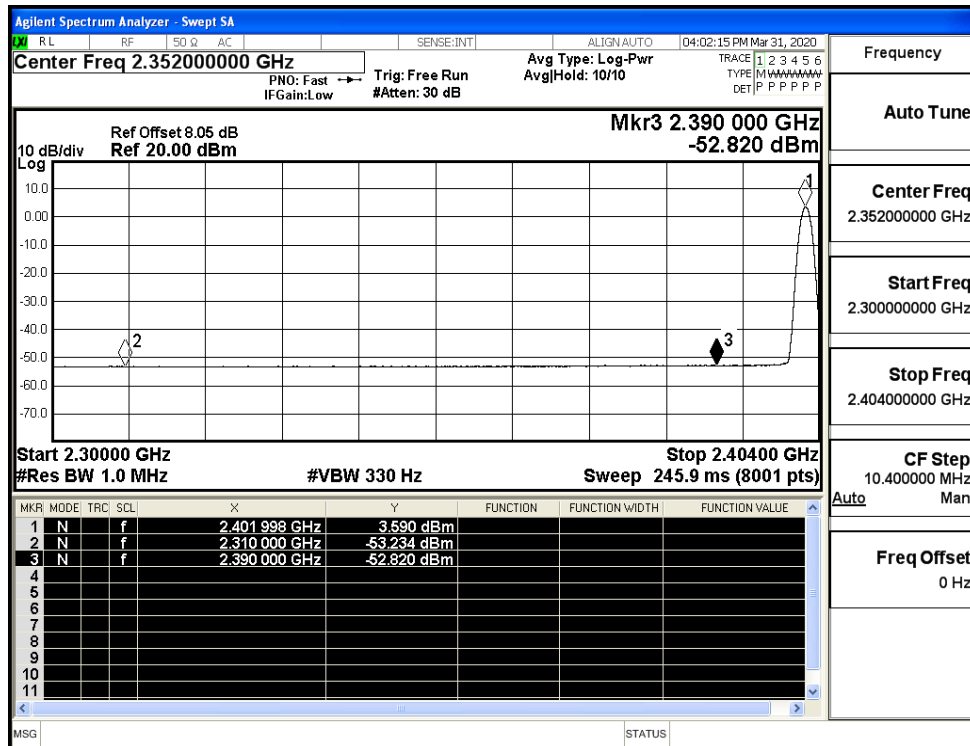
**A.8 Restrict-band band-edge measurements**

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-41.63	2.0	0	55.63	PEAK	74	PASS
	Off	2310.0	-53.23	2.0	0	44.03	AV	54	PASS
	Off	2390.0	-42.45	2.0	0	54.81	PEAK	74	PASS
	Off	2390.0	-52.82	2.0	0	44.44	AV	54	PASS
	Off	2483.5	-41.26	2.0	a0	56.00	PEAK	74	PASS
	Off	2483.5	-52.13	2.0	0	45.13	AV	54	PASS
	Off	2500.0	-42.82	2.0	0	54.44	PEAK	74	PASS
	Off	2500.0	-52.23	2.0	0	45.03	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.98	2.0	0	54.28	PEAK	74	PASS
	Off	2310.0	-53.34	2.0	0	43.92	AV	54	PASS
	Off	2390.0	-42.73	2.0	0	54.53	PEAK	74	PASS
	Off	2390.0	-52.87	2.0	0	44.39	AV	54	PASS
	Off	2483.5	-42.03	2.0	0	55.23	PEAK	74	PASS
	Off	2483.5	-52.21	2.0	0	45.05	AV	54	PASS
	Off	2500.0	-41.72	2.0	0	55.54	PEAK	74	PASS
	Off	2500.0	-52.23	2.0	0	45.03	AV	54	PASS
8DPSK	Off	2310.0	-42.76	2.0	0	54.50	PEAK	74	PASS
	Off	2310.0	-53.29	2.0	0	43.97	AV	54	PASS
	Off	2390.0	-42.89	2.0	0	54.37	PEAK	74	PASS
	Off	2390.0	-52.85	2.0	0	44.41	AV	54	PASS
	Off	2483.5	-42.65	2.0	0	54.61	PEAK	74	PASS
	Off	2483.5	-52.00	2.0	0	45.26	AV	54	PASS
	Off	2500.0	-42.13	2.0	0	55.13	PEAK	74	PASS
	Off	2500.0	-52.27	2.0	0	44.99	AV	54	PASS

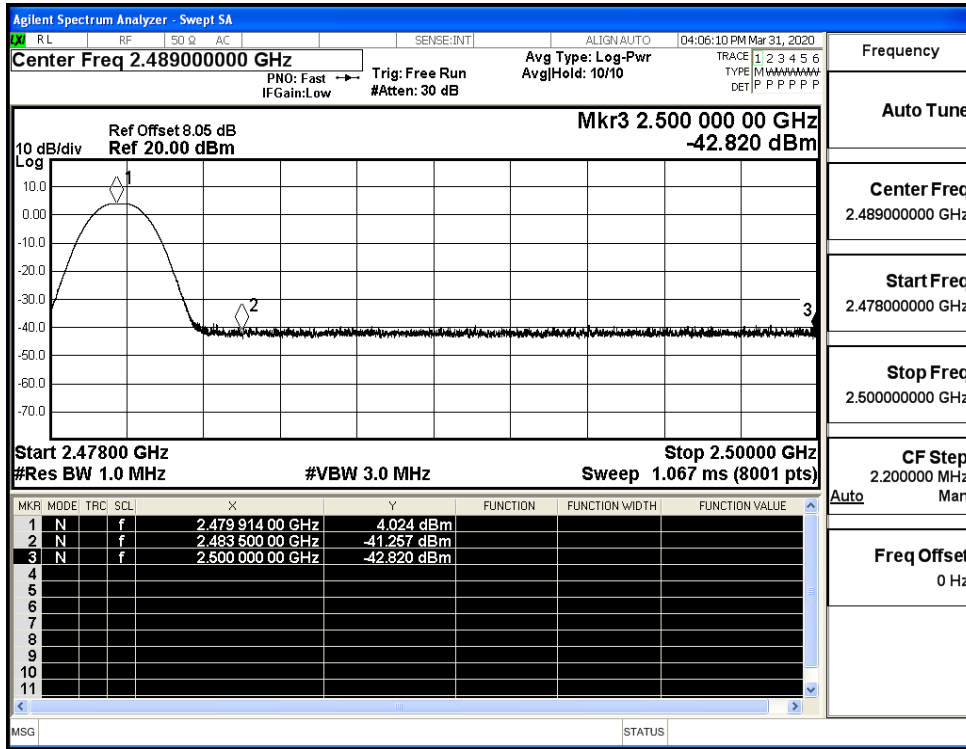
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



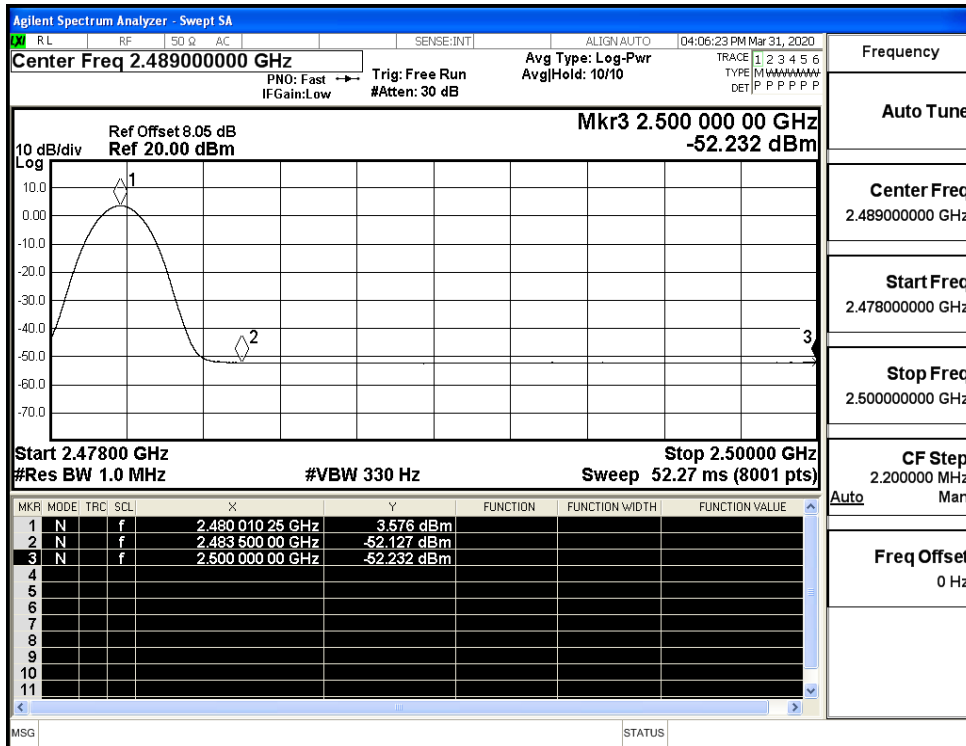
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



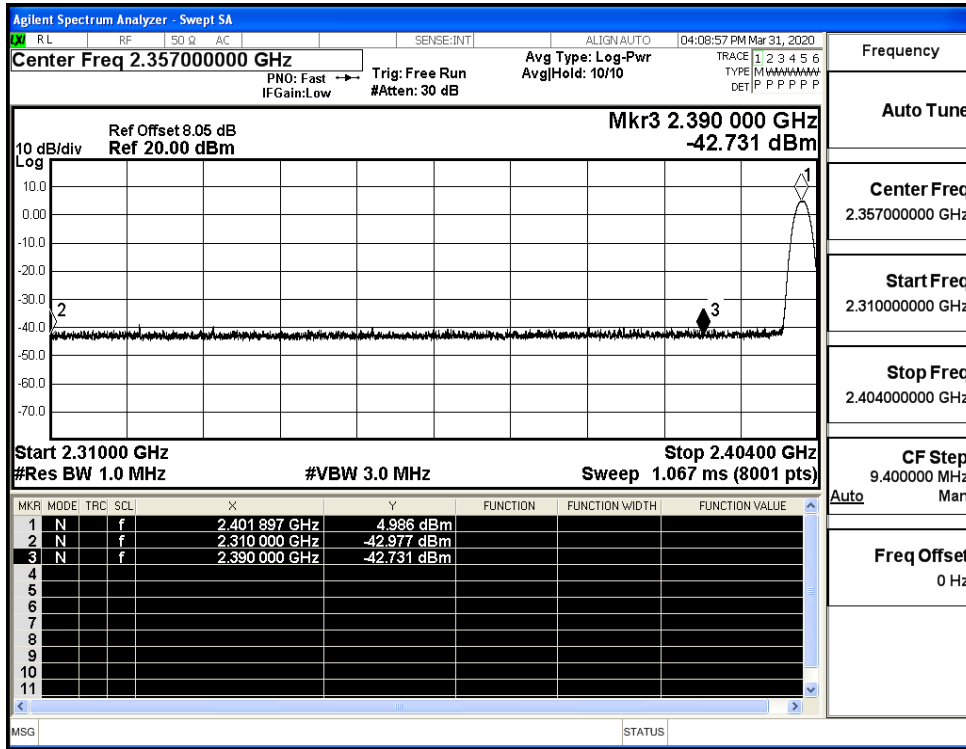
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



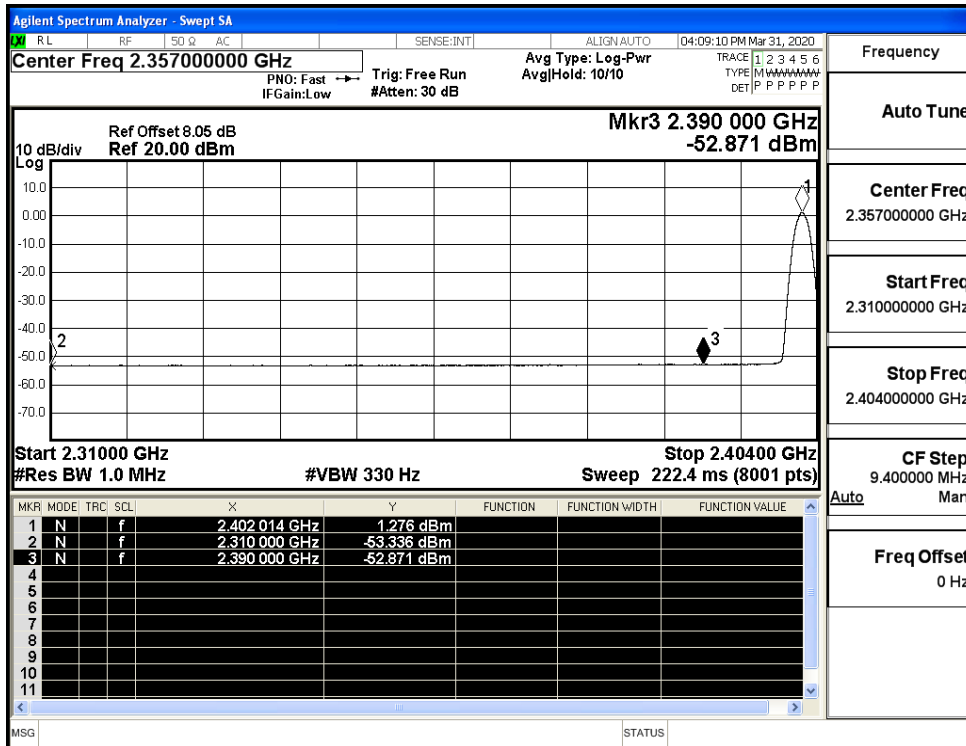
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



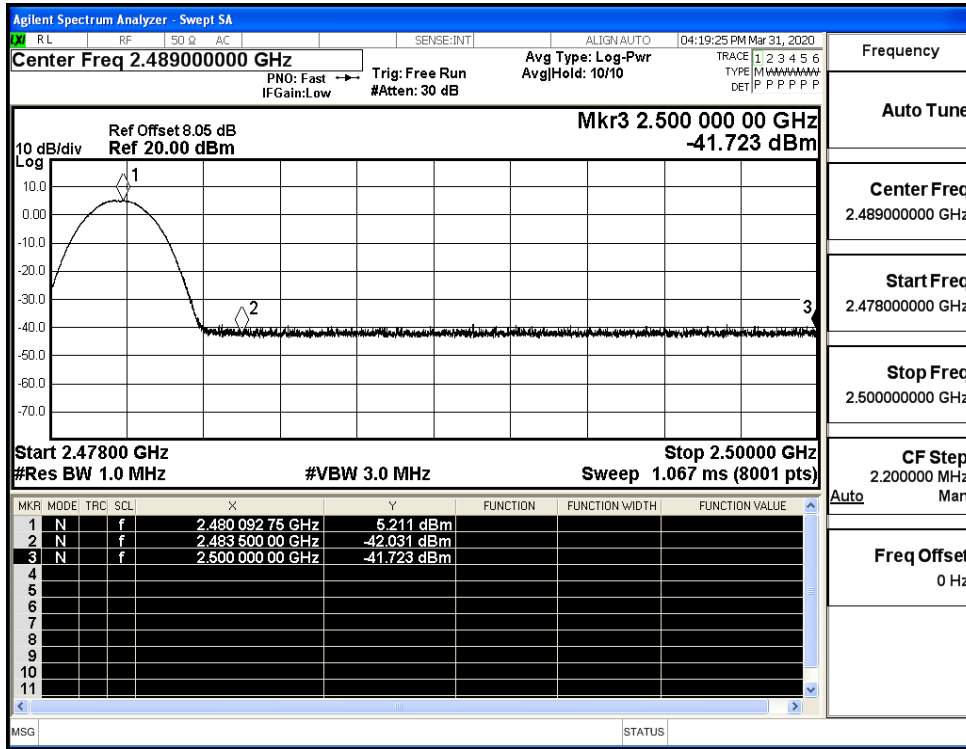
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)



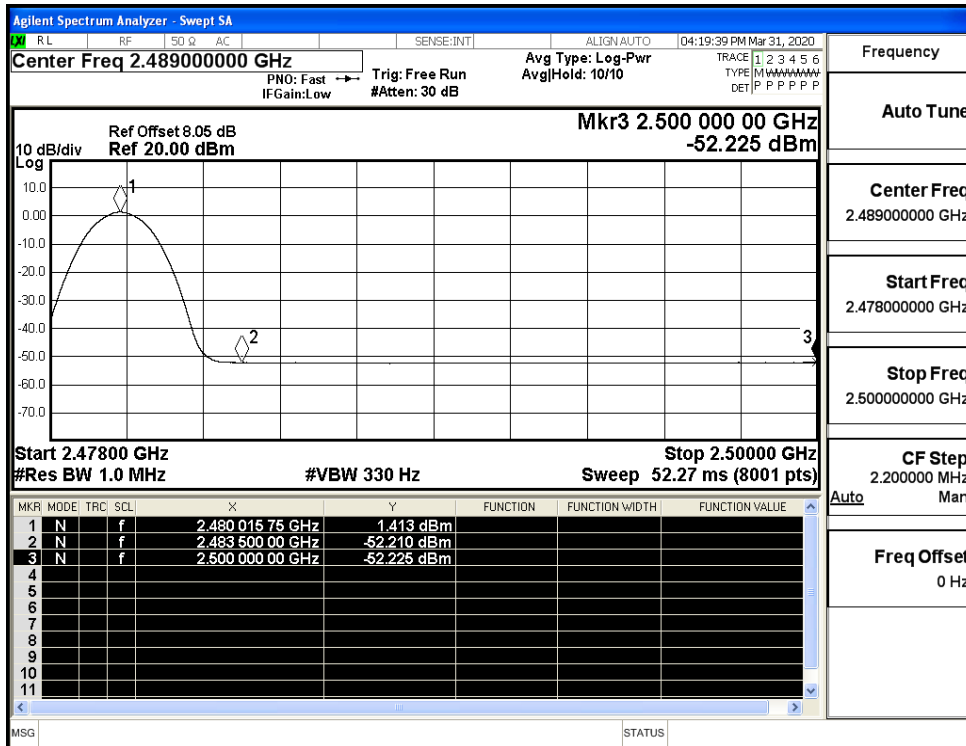
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)



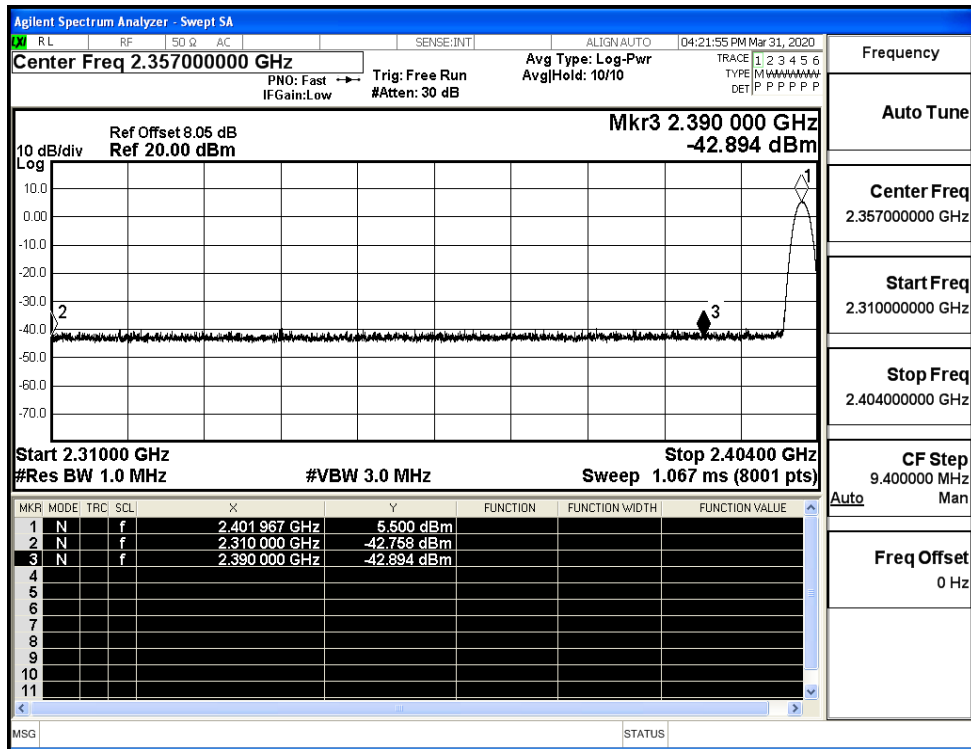
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



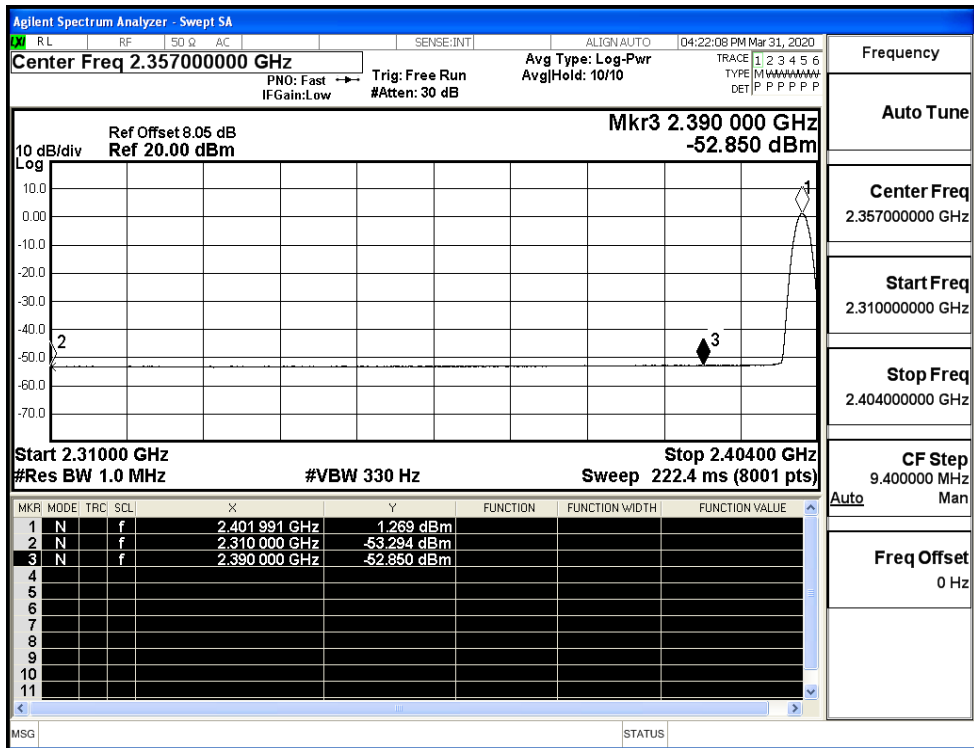
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



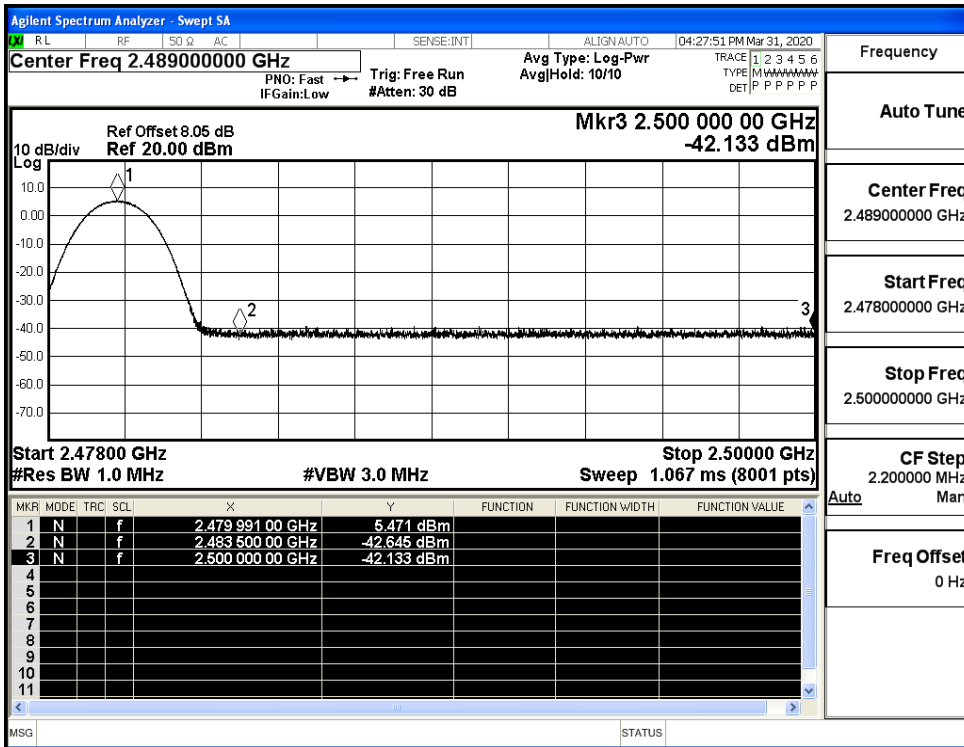
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (Low Channel)



Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (High Channel)



Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (High Channel)

