

## Appendix A

### RF Test Data for BT V4.0 (BDR/EDR) (Conducted Measurement)

Product Name: Dockin D Fine Bluetooth Speaker

Trade Mark: Dockin

Test Model: 15231

#### Environmental Conditions

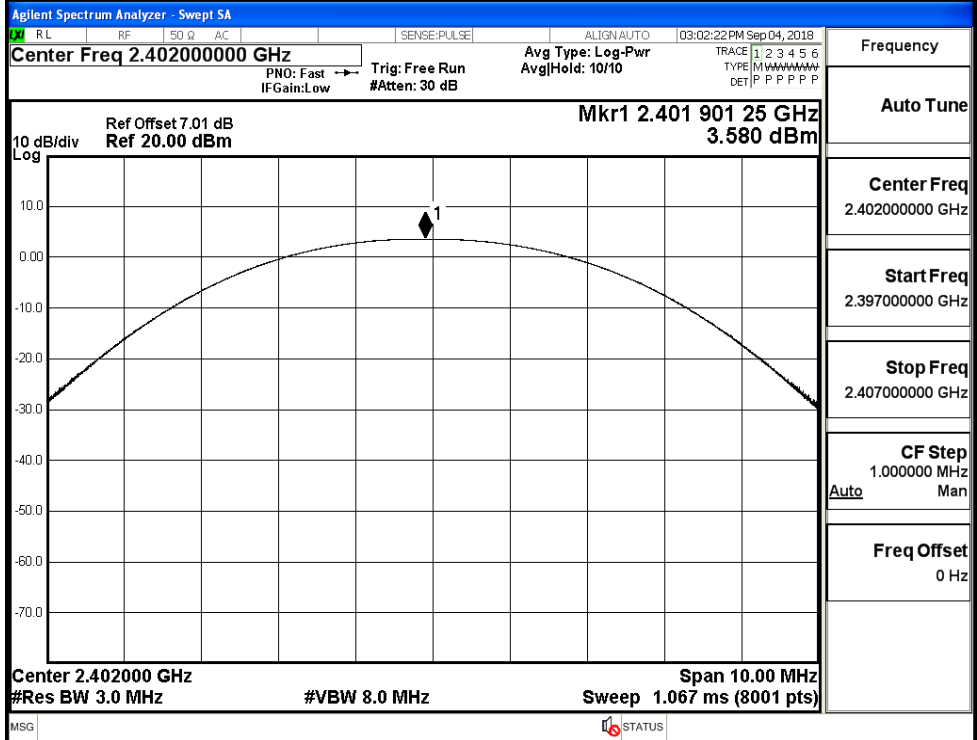
Temperature:	24.5 °C
Relative Humidity:	54.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina Xu
Supervised by:	Jayden.Zhuo

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

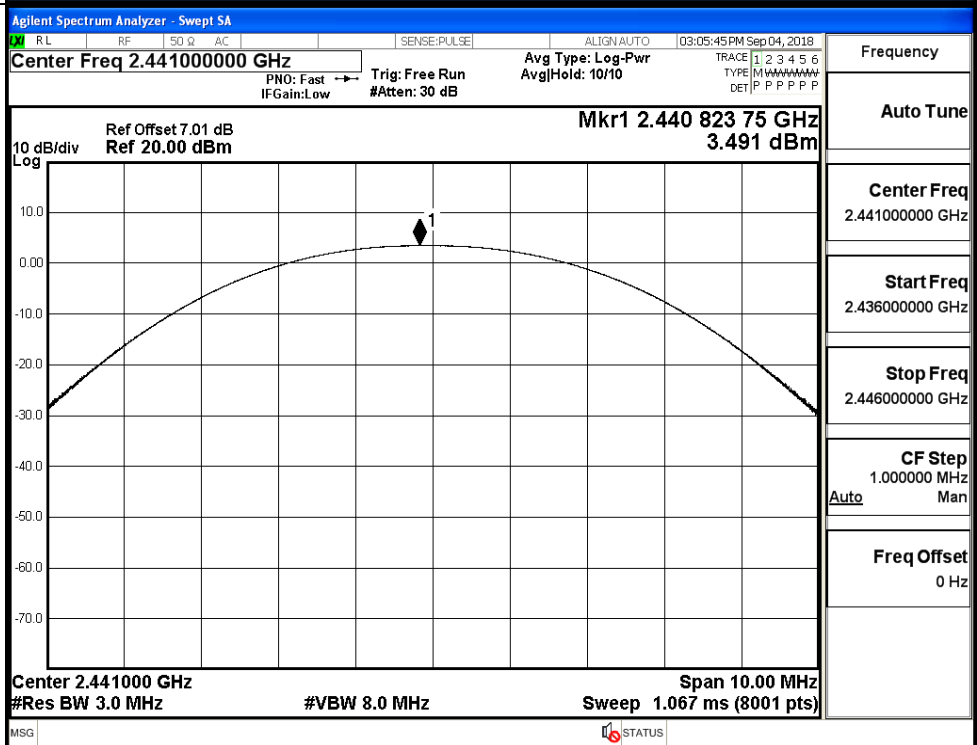
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.580	21	PASS
	MCH	3.491	21	PASS
	HCH	3.332	21	PASS
$\pi/4$ DQPSK	LCH	2.724	21	PASS
	MCH	2.571	21	PASS
	HCH	2.565	21	PASS
8DPSK	LCH	2.547	21	PASS
	MCH	2.438	21	PASS
	HCH	2.401	21	PASS

Test Graphs

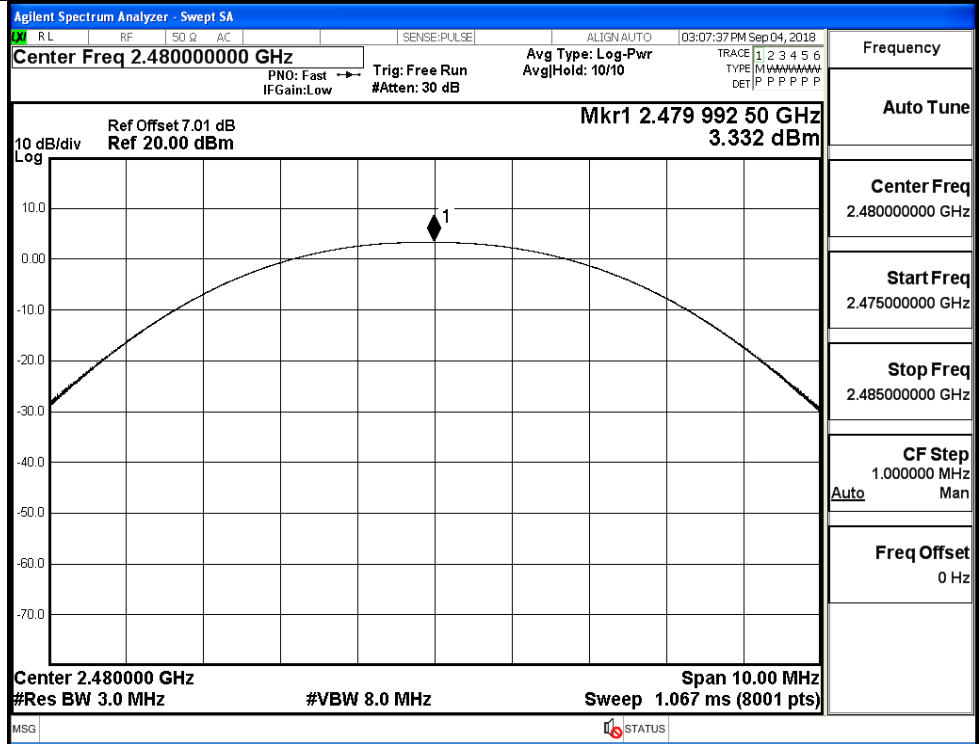
GFSK/LCH



GFSK/MCH

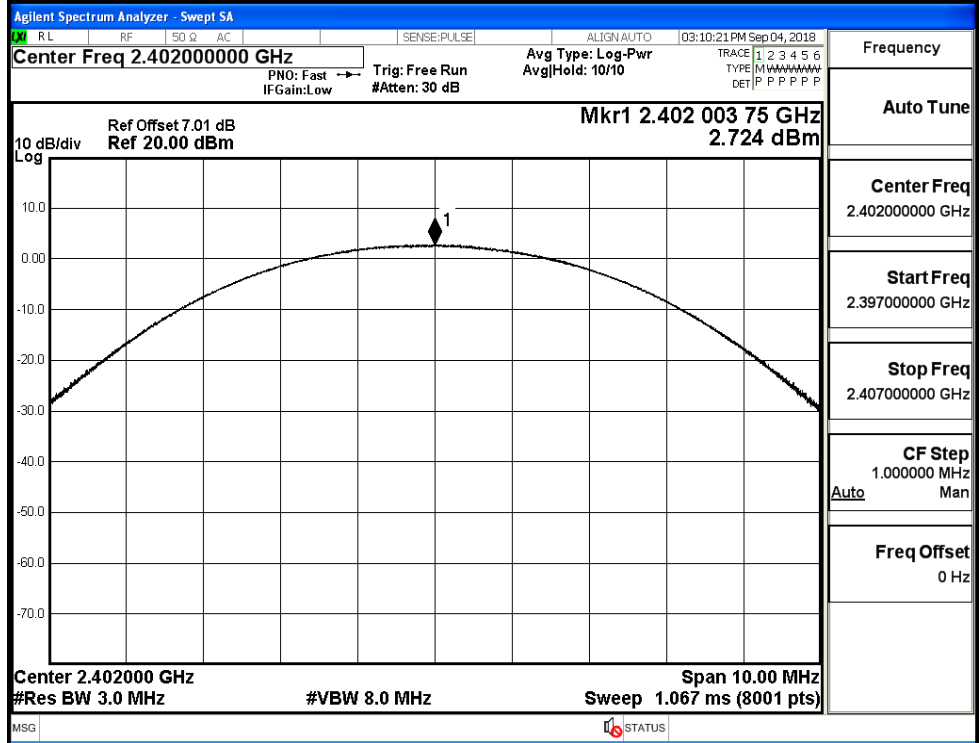


GFSK/HCH



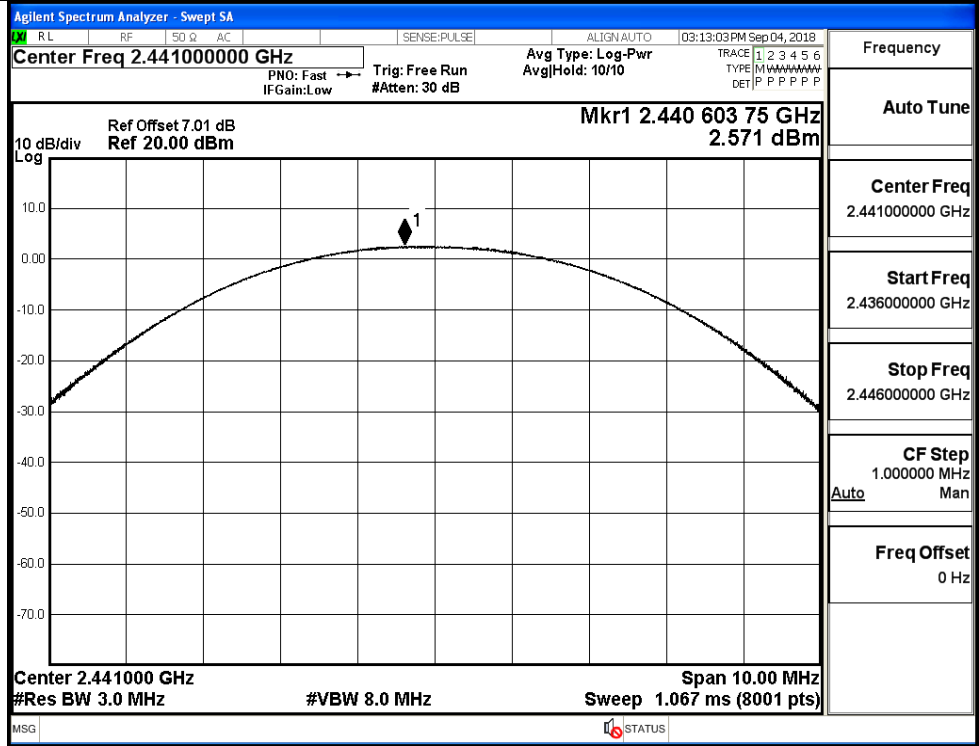
Frequency
Auto Tune
Center Freq 2.48000000 GHz
Start Freq 2.475000000 GHz
Stop Freq 2.485000000 GHz
CF Step 1.000000 MHz Auto Man
Freq Offset 0 Hz

$\pi$ /4DQPSK/LCH

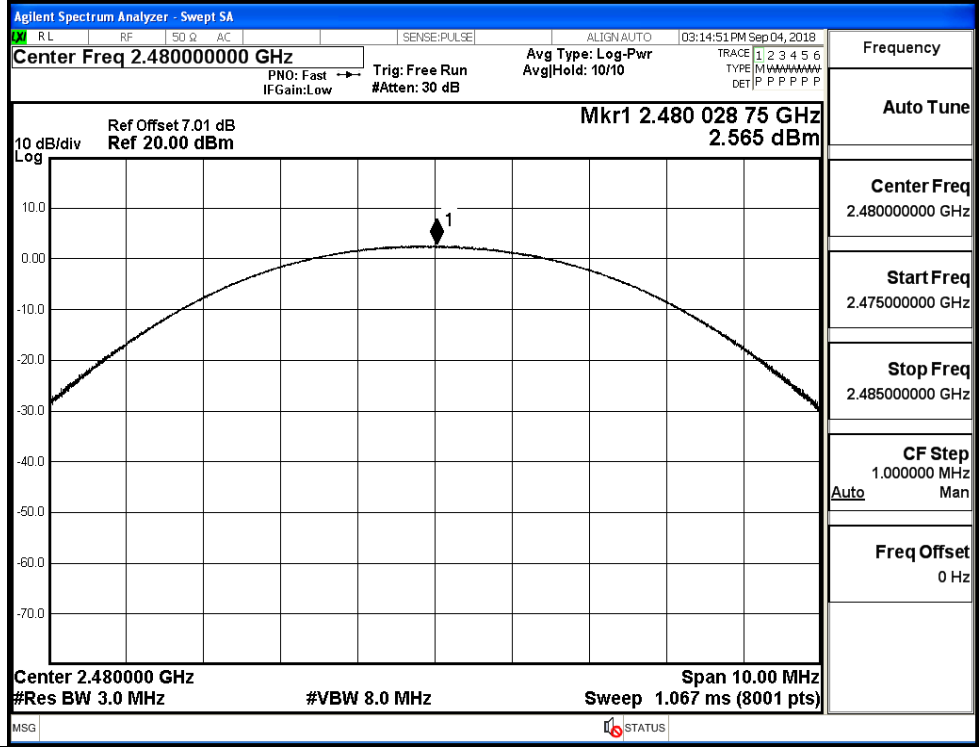


Frequency
Auto Tune
Center Freq 2.40200000 GHz
Start Freq 2.397000000 GHz
Stop Freq 2.407000000 GHz
CF Step 1.000000 MHz Auto Man
Freq Offset 0 Hz

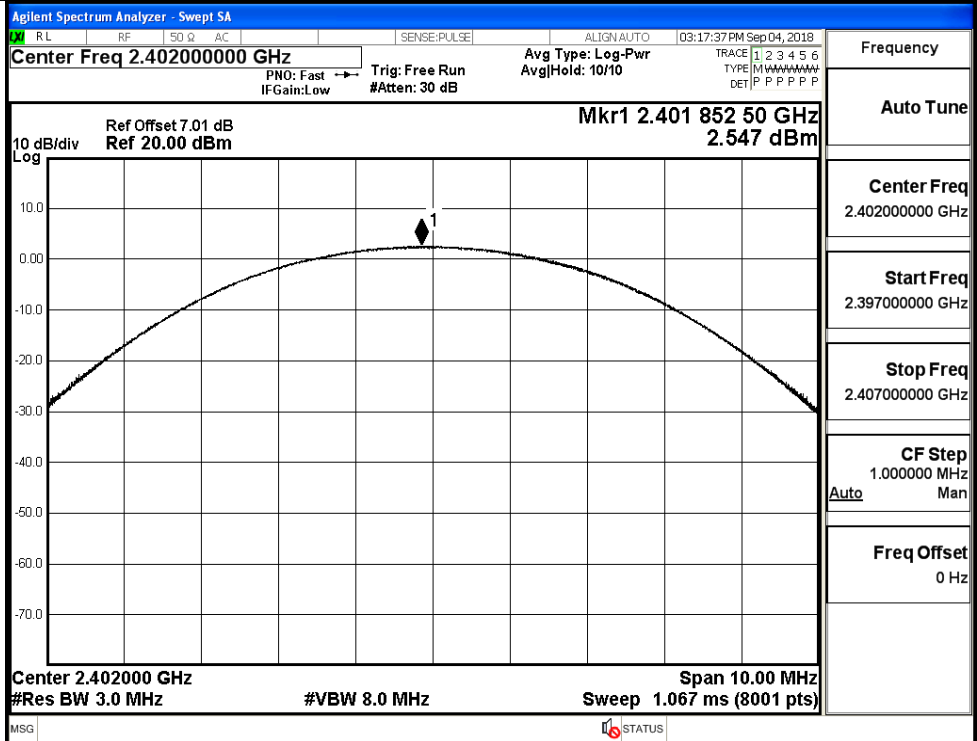
$\pi$ /4DQPSK/MCH



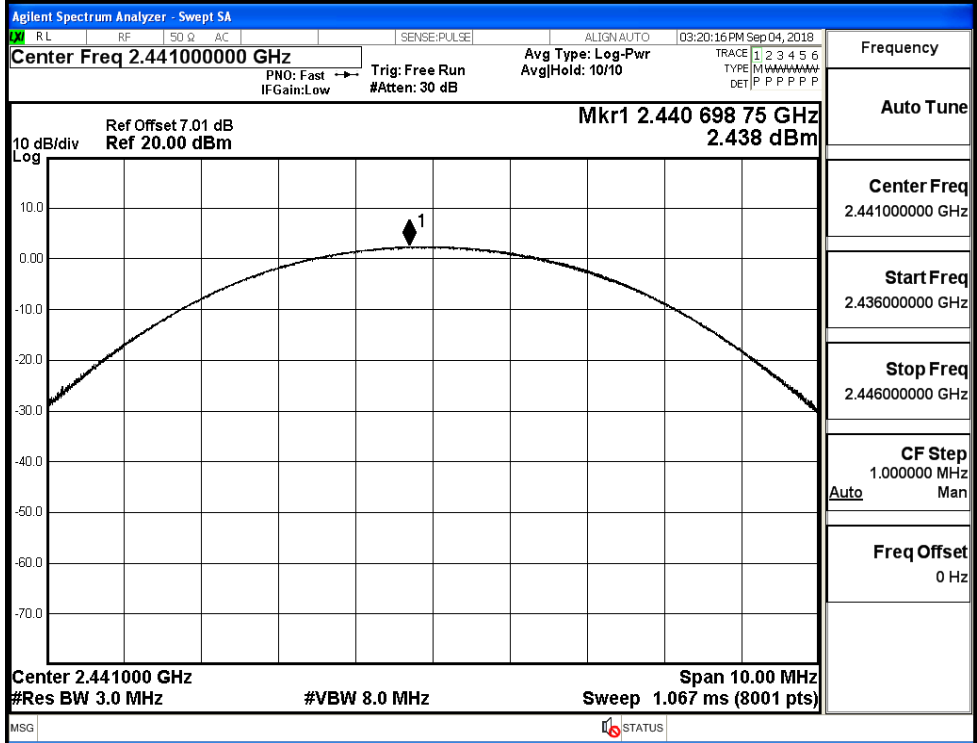
$\pi$ /4DQPSK/HCH



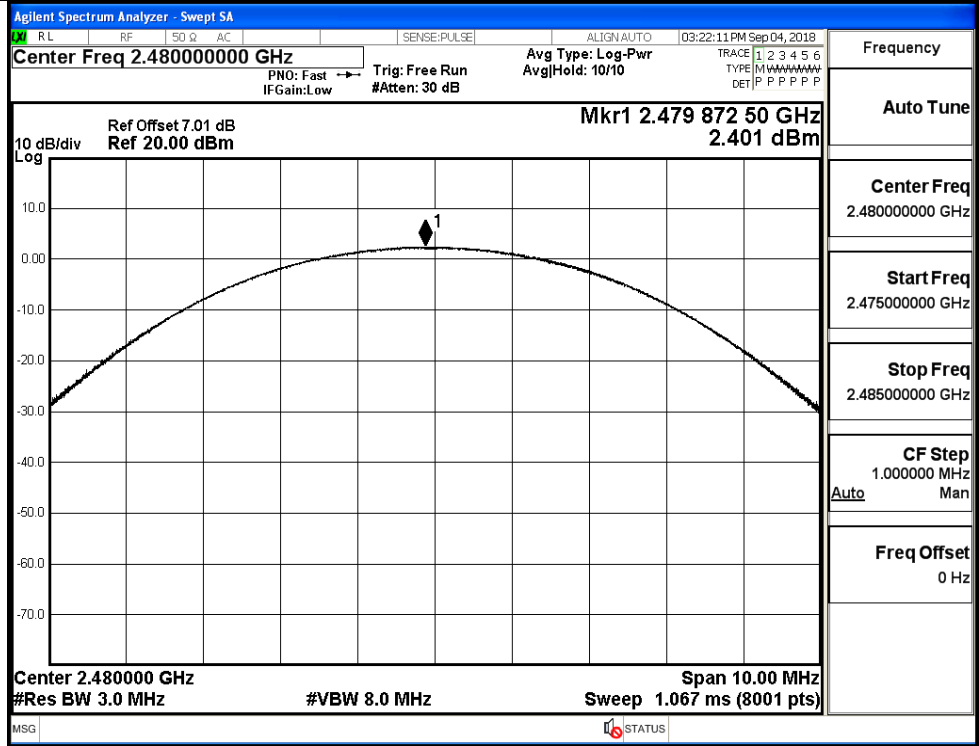
8DPSK/LCH



8DPSK/MCH

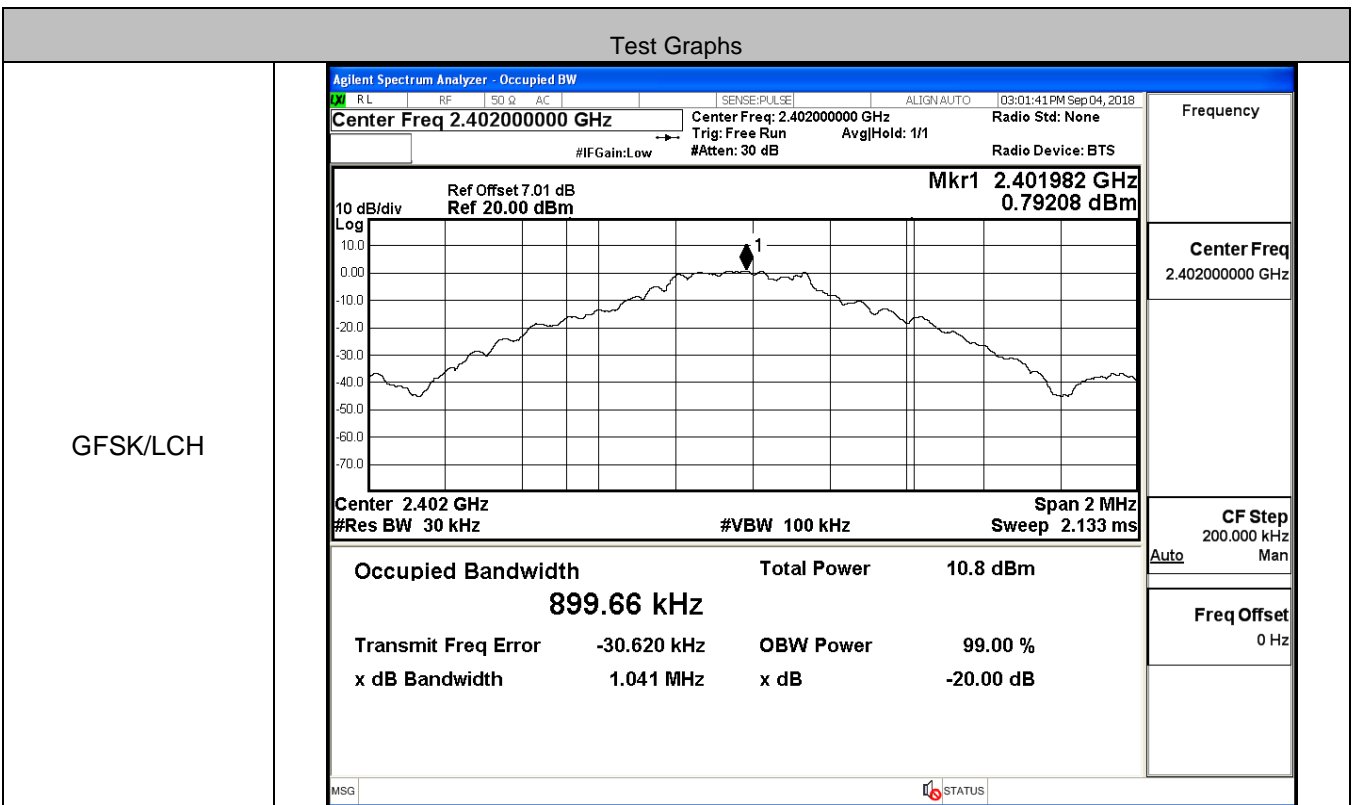


8DPSK/HCH

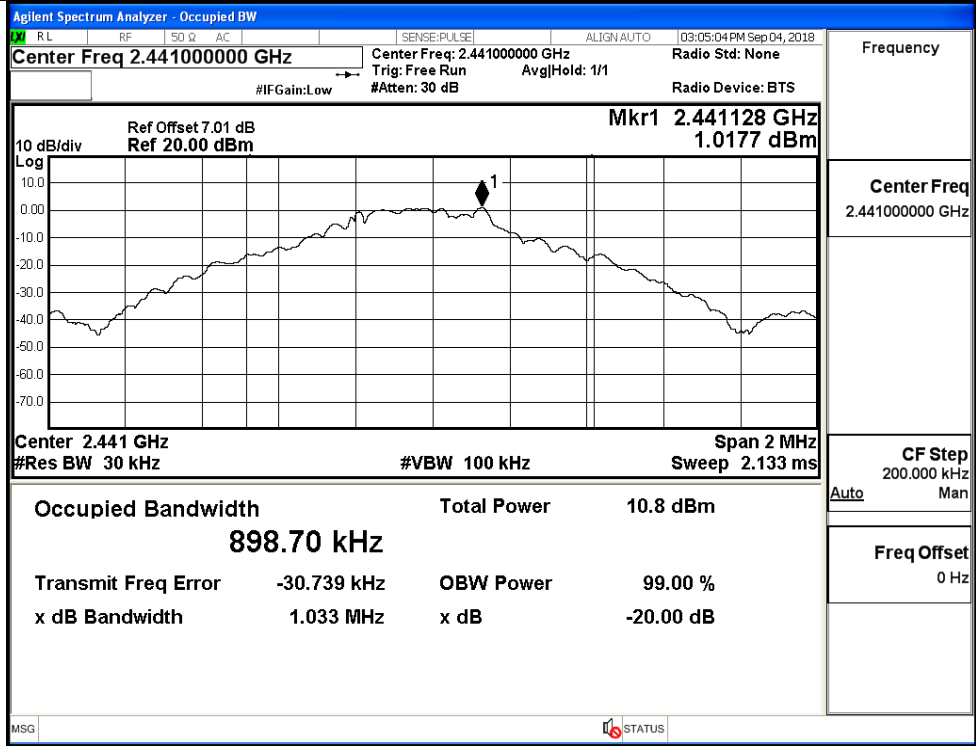


**A.2 99% and 20dB Bandwidth**

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89966	1.041	Not Specified	PASS
	MCH	0.89870	1.033	Not Specified	PASS
	HCH	0.89593	1.029	Not Specified	PASS
π/4DQPSK	LCH	1.1683	1.289	Not Specified	PASS
	MCH	1.1685	1.288	Not Specified	PASS
	HCH	1.1703	1.291	Not Specified	PASS
8DPSK	LCH	1.1803	1.308	Not Specified	PASS
	MCH	1.1783	1.292	Not Specified	PASS
	HCH	1.1811	1.296	Not Specified	PASS

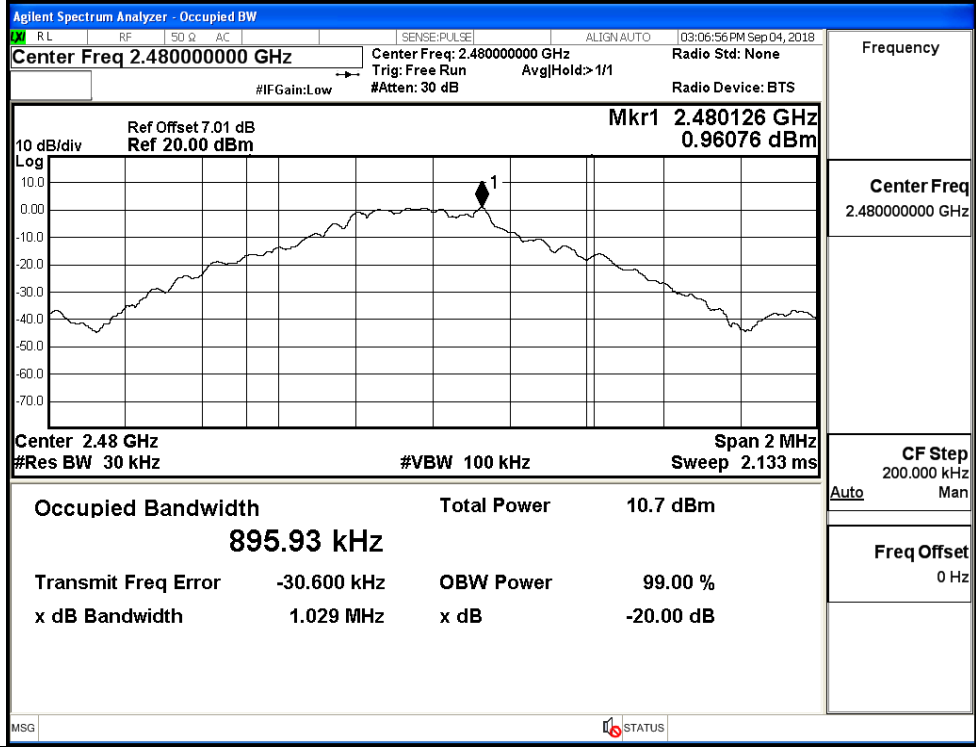


GFSK/MCH



Frequency	2.44100000 GHz
Center Freq	2.44100000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

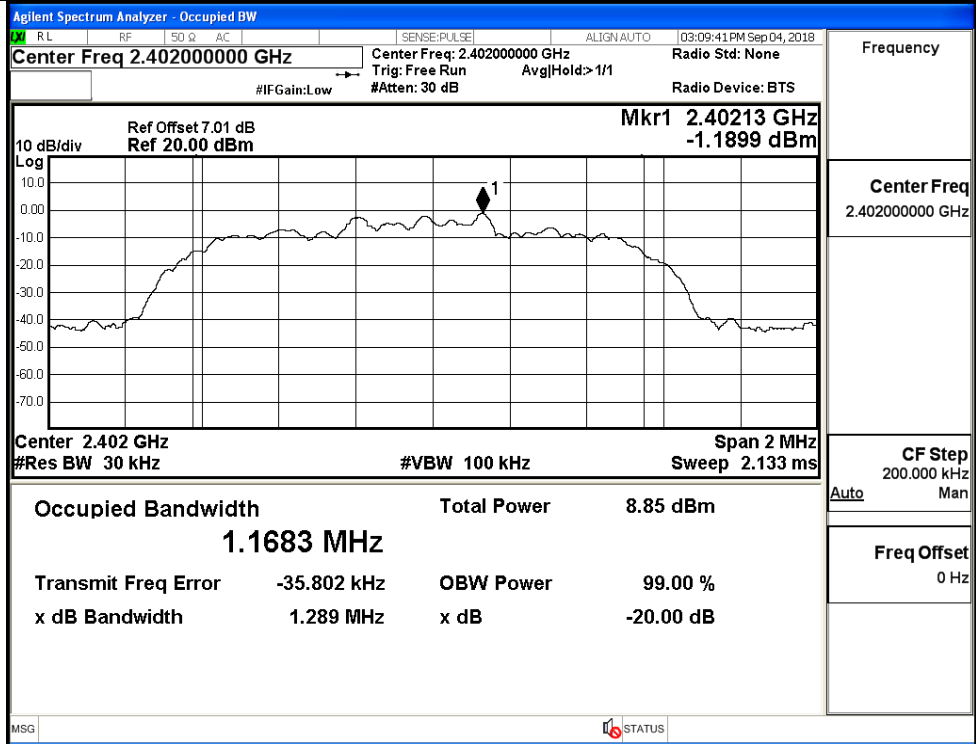
GFSK/HCH



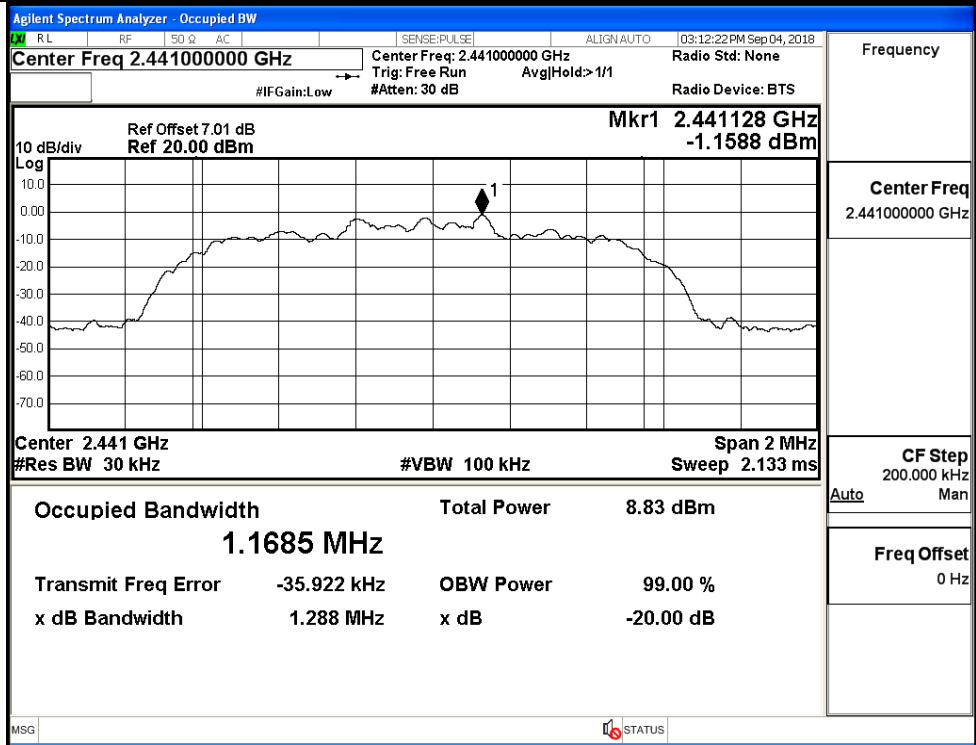
Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz



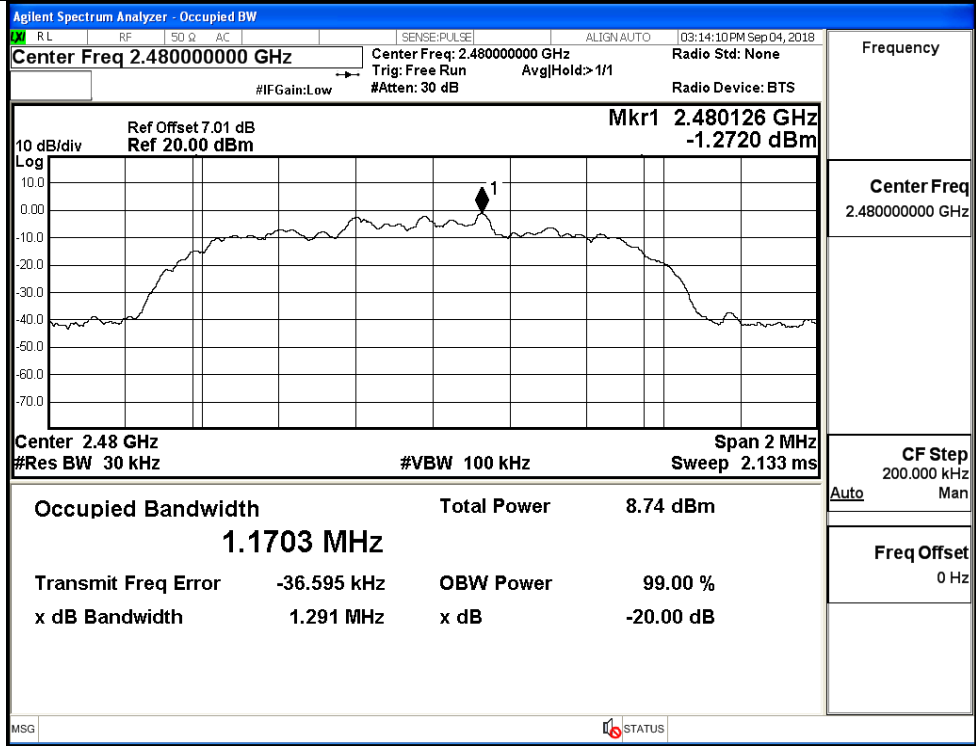
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

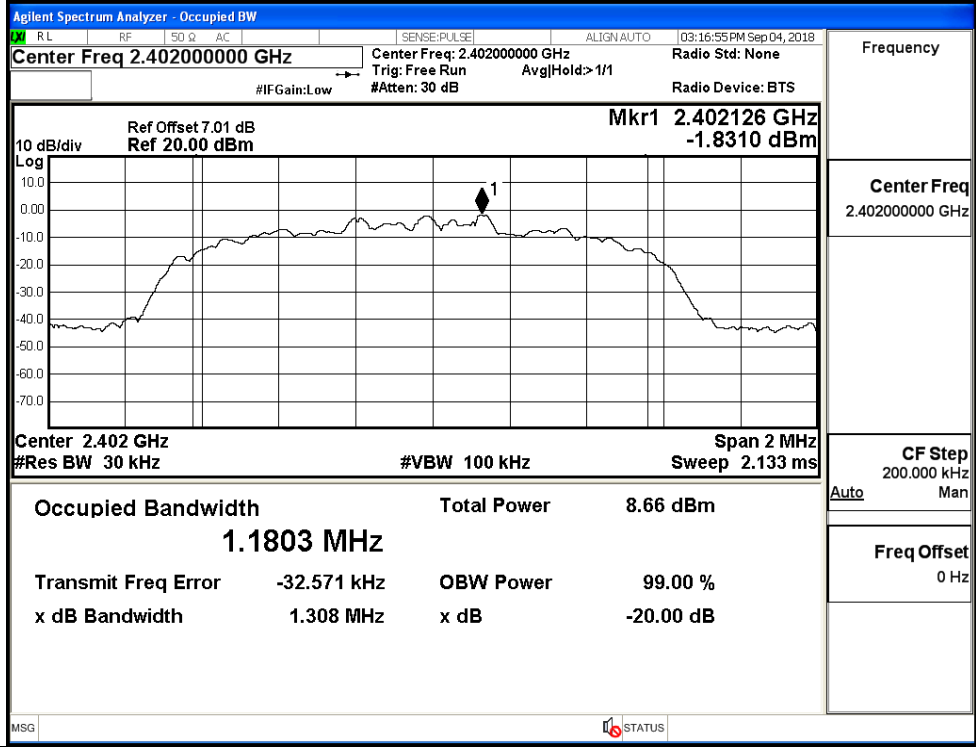


$\pi/4$ DQPSK/HCH



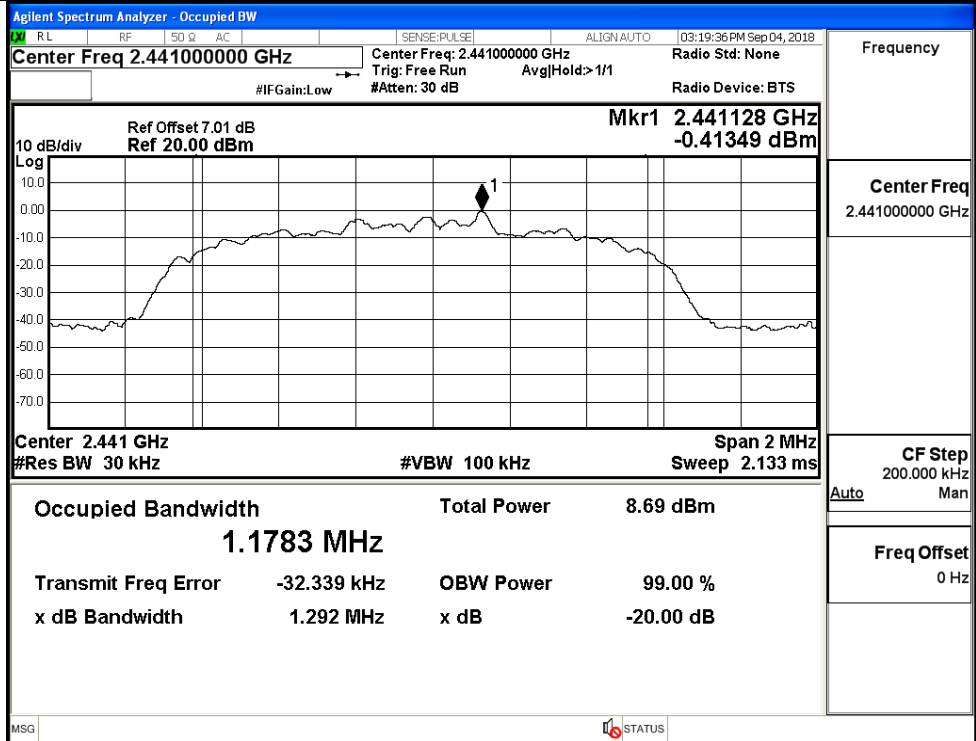
Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

8DPSK/LCH

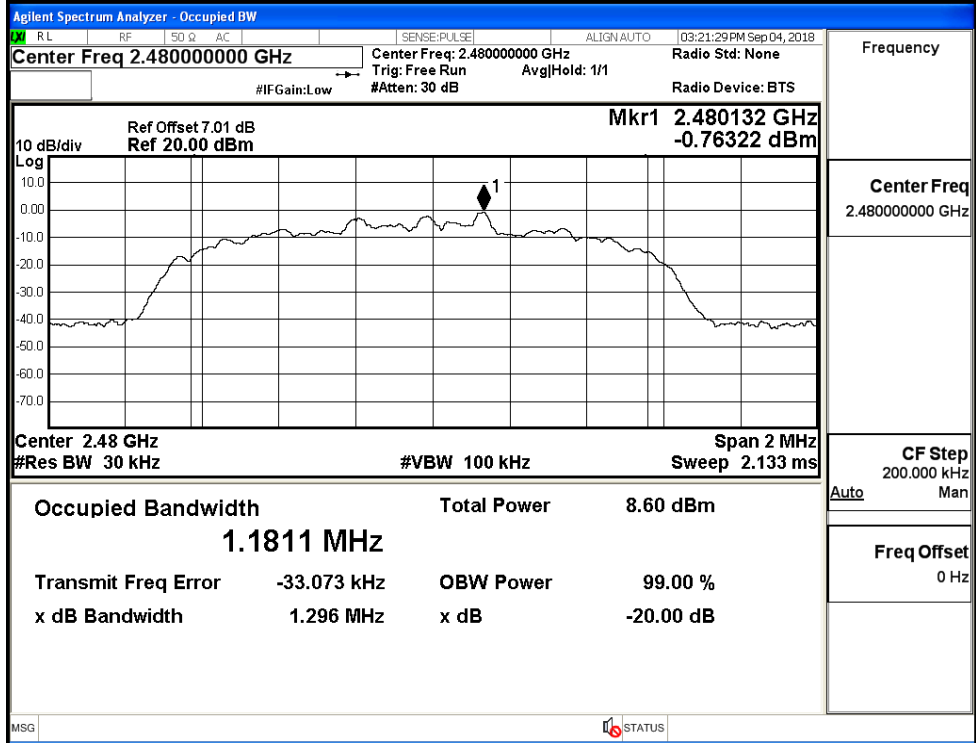


Frequency	2.40200000 GHz
Center Freq	2.40200000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

8DPSK/MCH

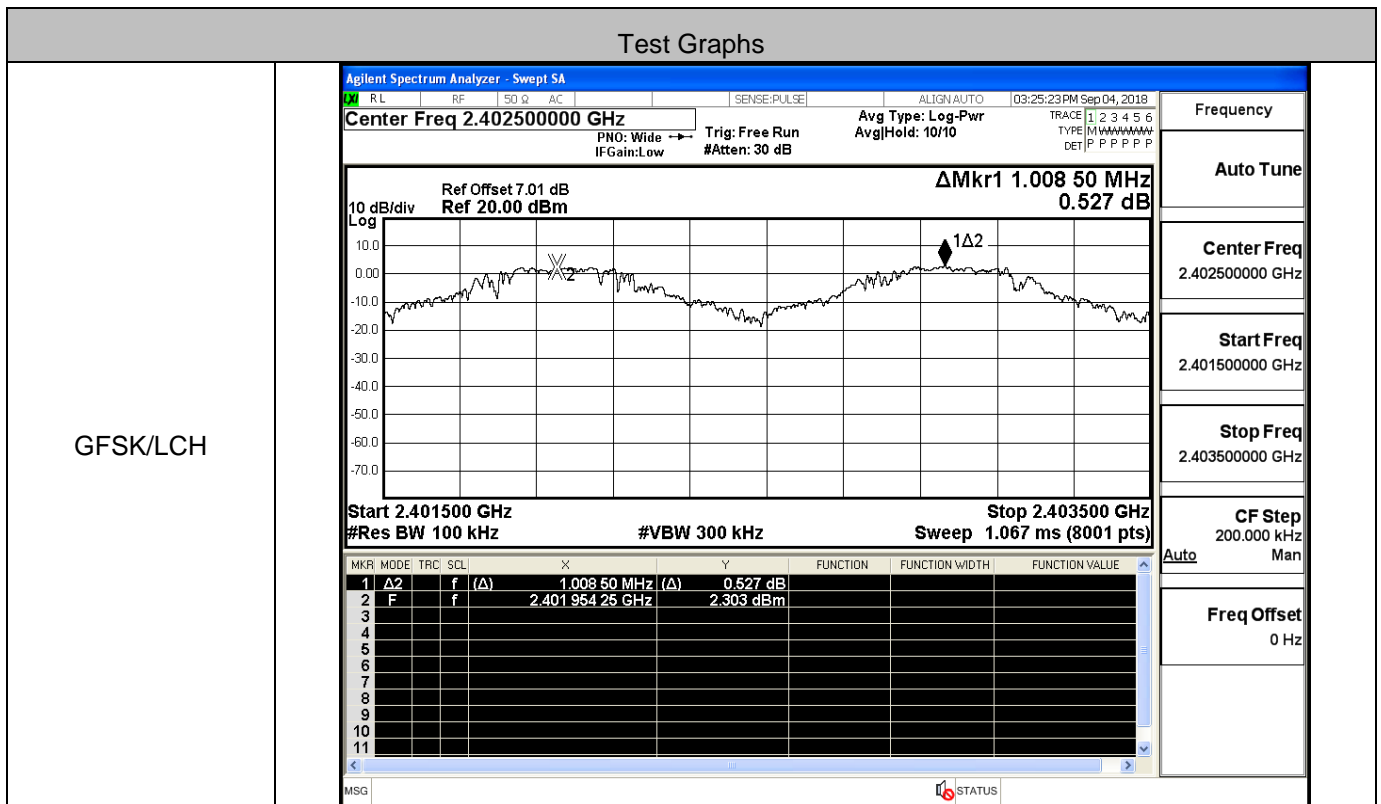


8DPSK/HCH

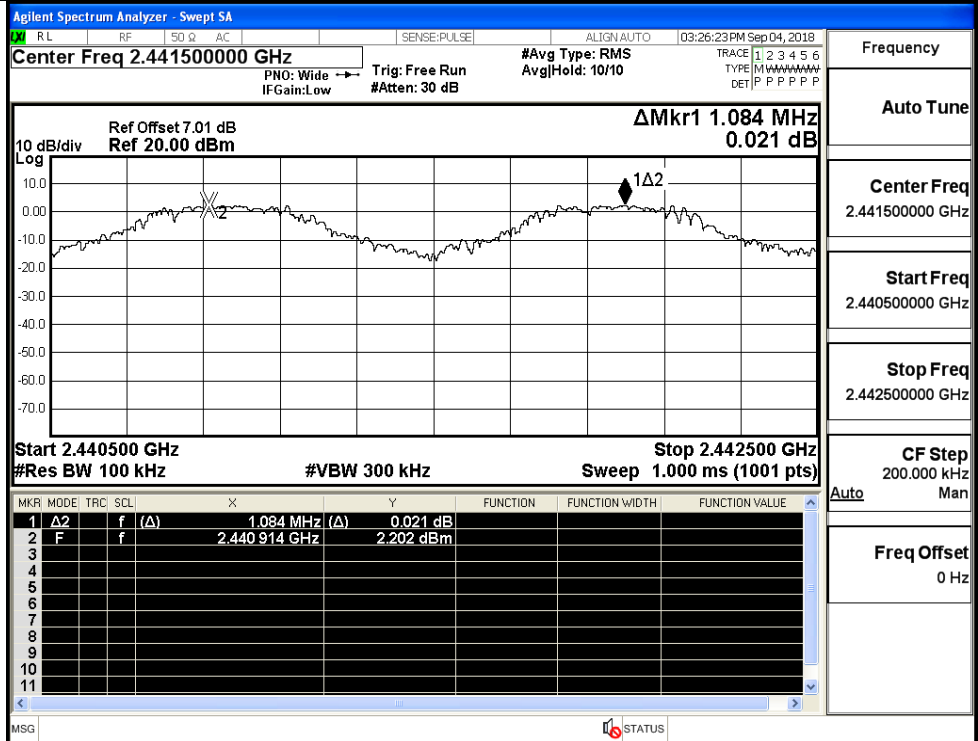


### A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.009	0.694	PASS
	MCH	1.084	0.694	PASS
	HCH	1.156	0.694	PASS
π/4DQPSK	LCH	1.226	0.861	PASS
	MCH	1.114	0.861	PASS
	HCH	1.172	0.861	PASS
8DPSK	LCH	1.176	0.872	PASS
	MCH	1.198	0.872	PASS
	HCH	1.336	0.872	PASS

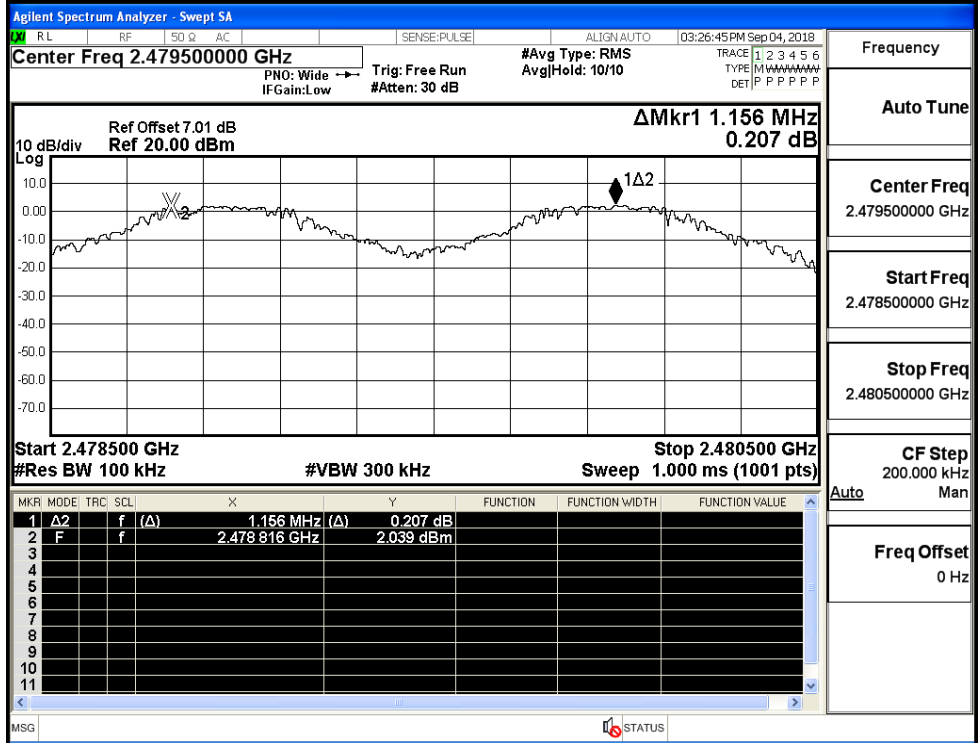


GFSK/MCH



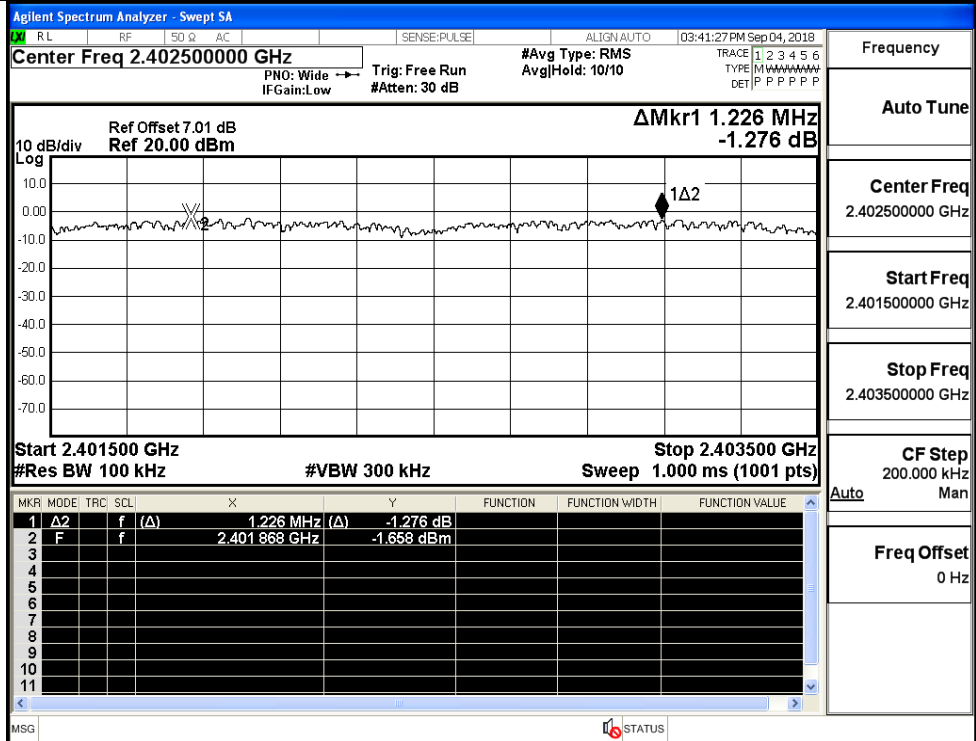
Frequency  
Auto Tune  
Center Freq  
2.441500000 GHz  
Start Freq  
2.440500000 GHz  
Stop Freq  
2.442500000 GHz  
CF Step  
200.000 kHz  
Auto  
Man  
Freq Offset  
0 Hz

GFSK/HCH



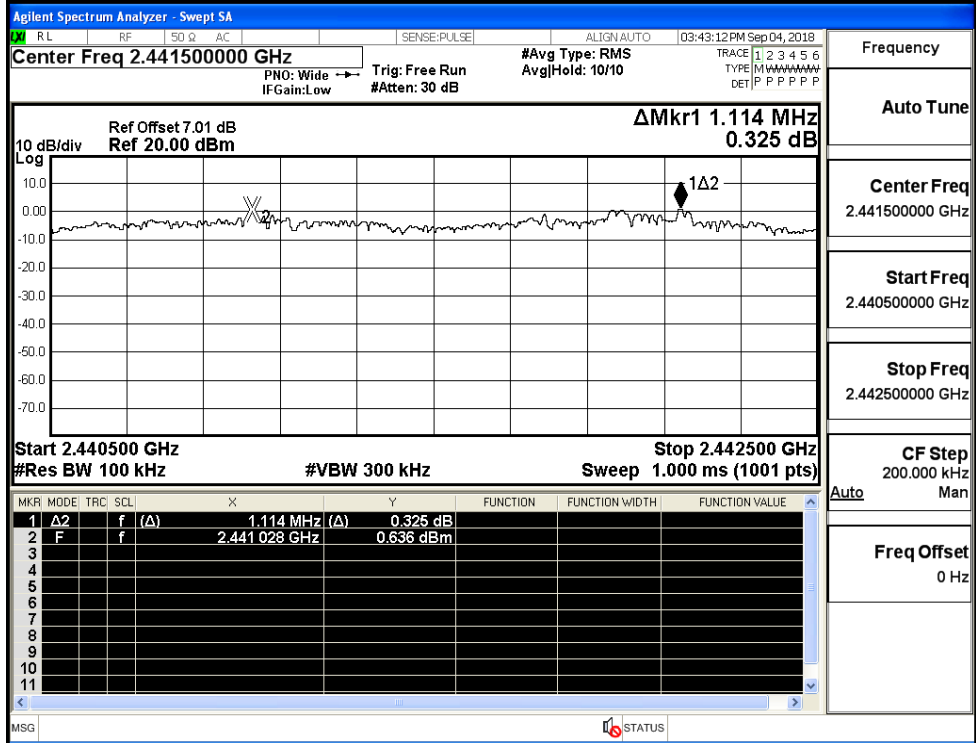
Frequency  
Auto Tune  
Center Freq  
2.479500000 GHz  
Start Freq  
2.478500000 GHz  
Stop Freq  
2.480500000 GHz  
CF Step  
200.000 kHz  
Auto  
Man  
Freq Offset  
0 Hz

$\pi/4$ DQPSK/LCH



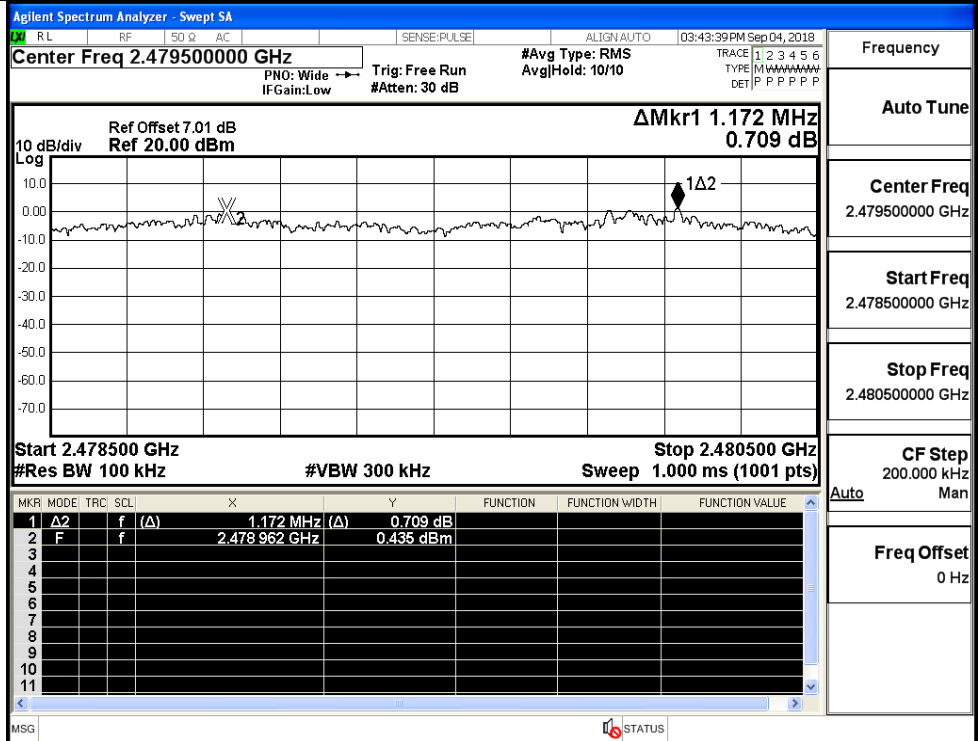
Frequency  
Auto Tune  
Center Freq  
2.40250000 GHz  
Start Freq  
2.40150000 GHz  
Stop Freq  
2.40350000 GHz  
CF Step  
200.000 kHz  
Auto  
Man  
Freq Offset  
0 Hz

$\pi/4$ DQPSK/MCH



Frequency  
Auto Tune  
Center Freq  
2.44150000 GHz  
Start Freq  
2.44050000 GHz  
Stop Freq  
2.44250000 GHz  
CF Step  
200.000 kHz  
Auto  
Man  
Freq Offset  
0 Hz

π/4DQPSK/HCH



Frequency

Auto Tune

Center Freq  
2.479500000 GHz

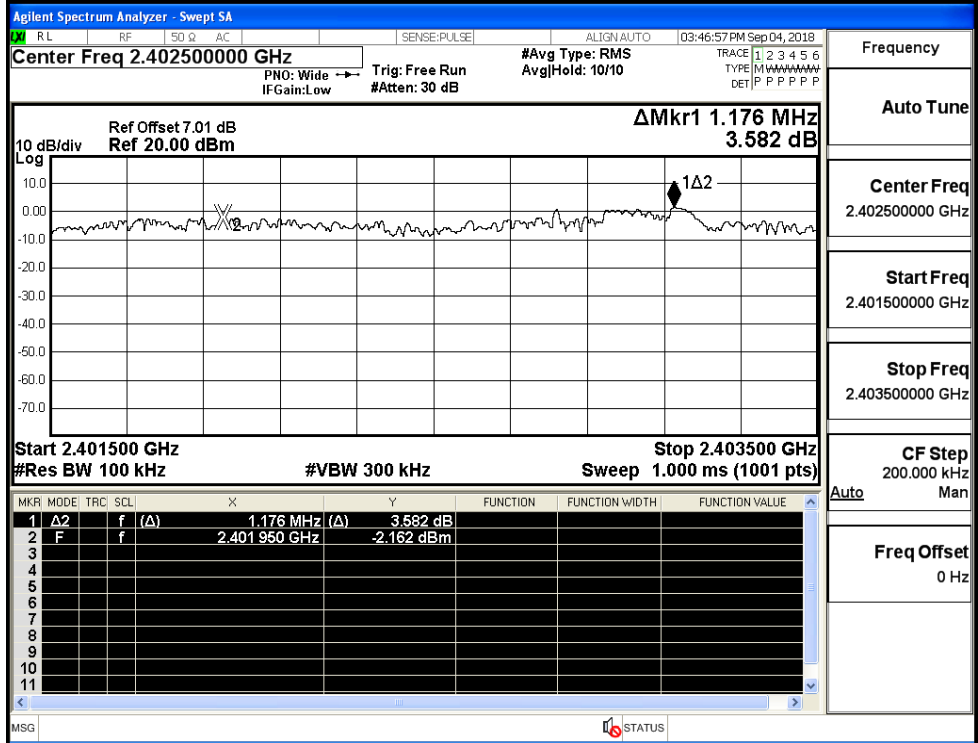
Start Freq  
2.478500000 GHz

Stop Freq  
2.480500000 GHz

CF Step  
200.000 kHz  
Auto Man

Freq Offset  
0 Hz

8DPSK/LCH



Frequency

Auto Tune

Center Freq  
2.402500000 GHz

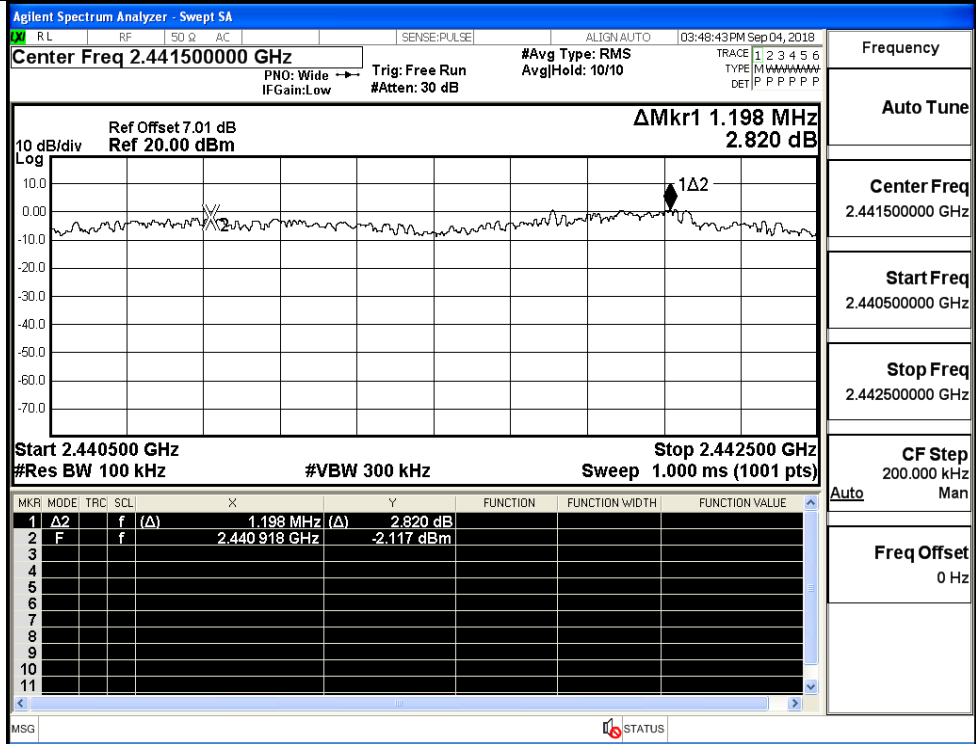
Start Freq  
2.401500000 GHz

Stop Freq  
2.403500000 GHz

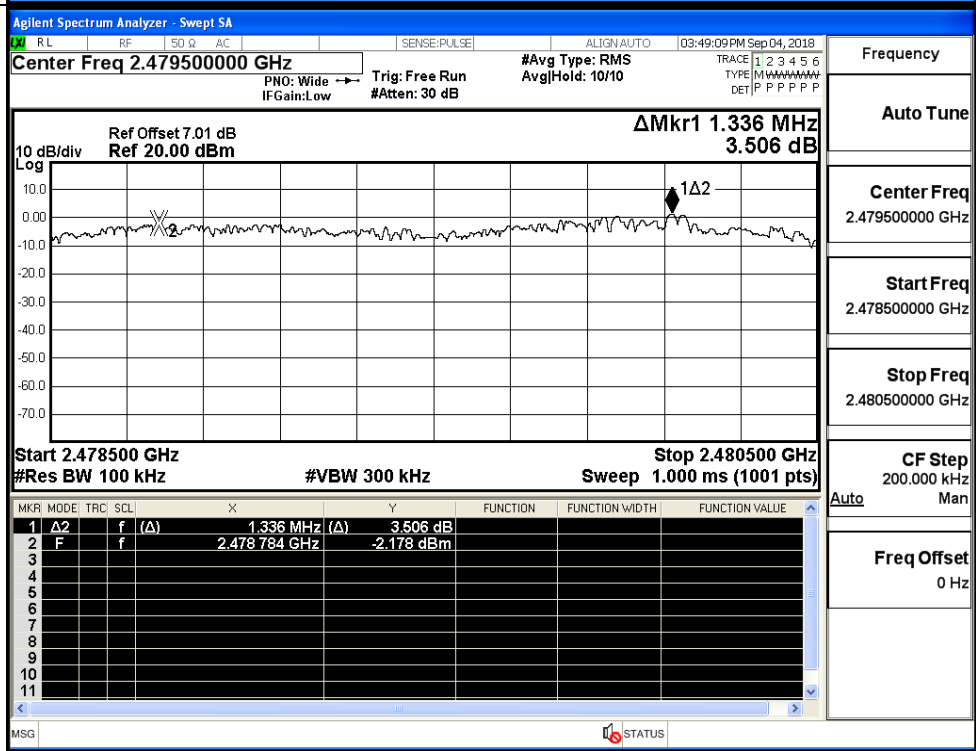
CF Step  
200.000 kHz  
Auto Man

Freq Offset  
0 Hz

8DPSK/MCH



8DPSK/HCH





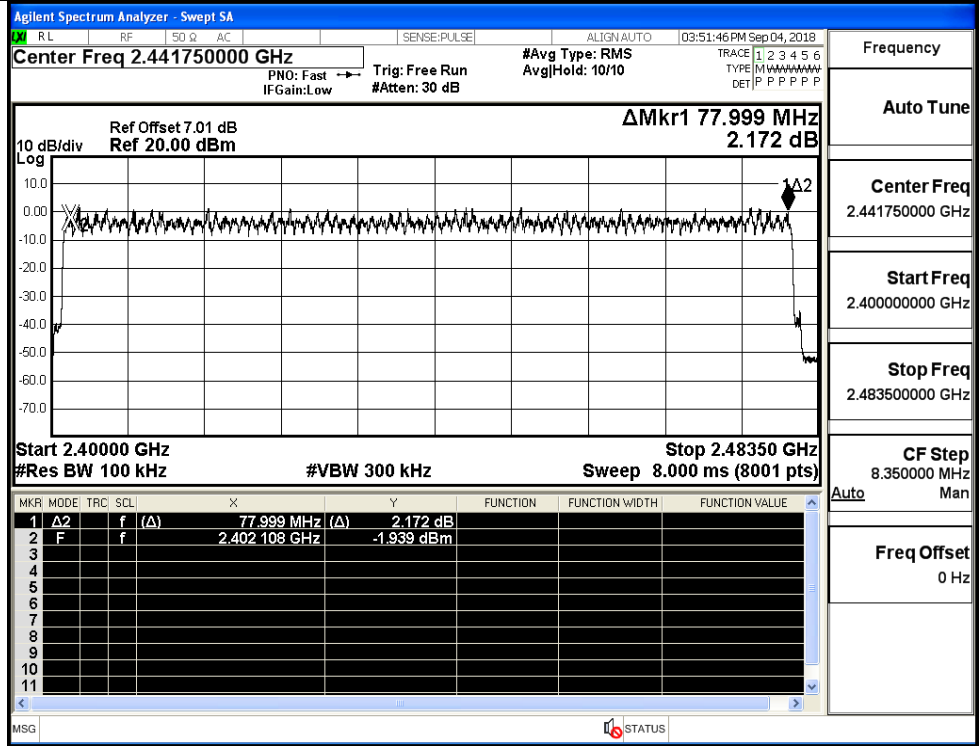
### A.4 Hopping Channel Number

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

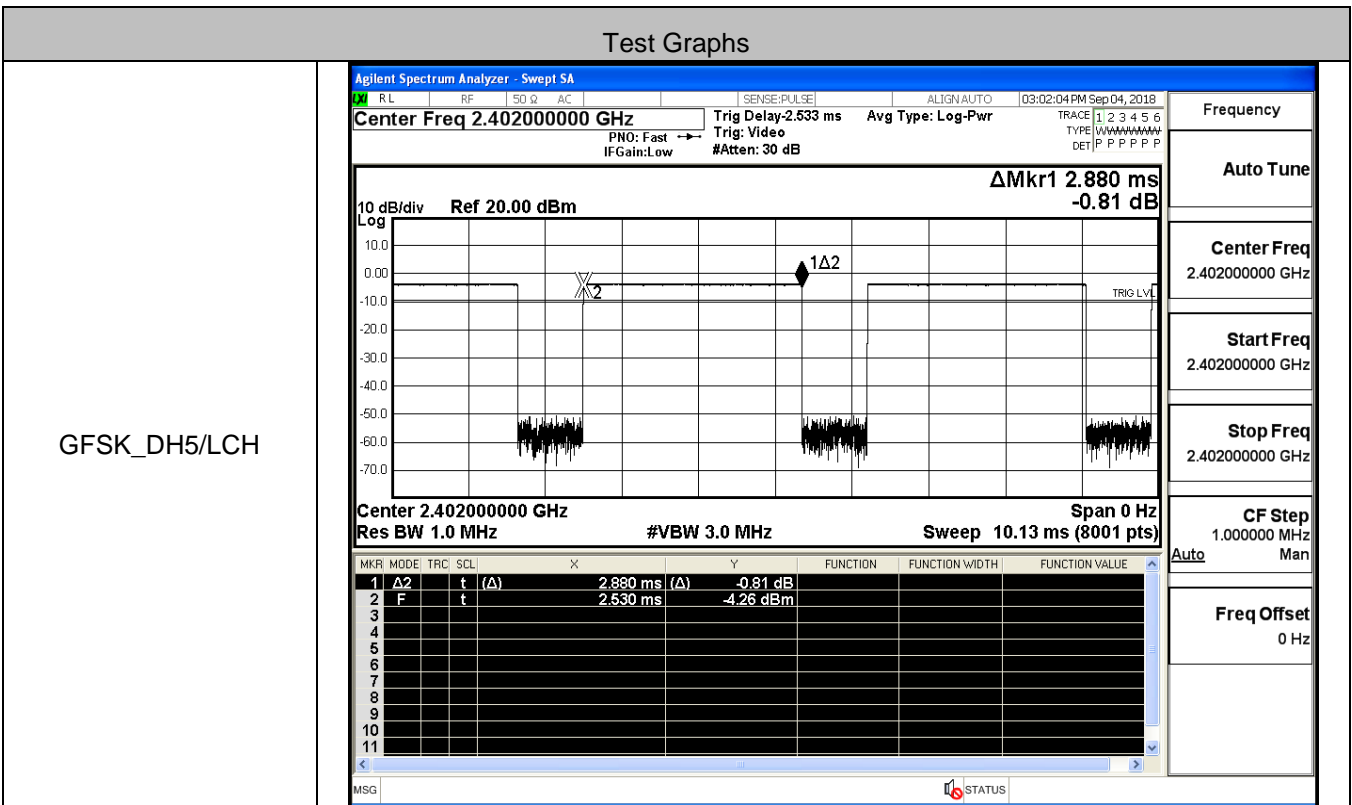
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.01 dB Ref 20.00 dBm</p> <p><math>\Delta</math>Mkr1 77.916 MHz -0.434 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <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><math>\Delta</math>2</td> <td>f</td> <td>(<math>\Delta</math>)</td> <td>77.916 MHz (<math>\Delta</math>)</td> <td>-0.434 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402129 GHz</td> <td>2.994 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$ 2	f	( $\Delta$ )	77.916 MHz ( $\Delta$ )	-0.434 dB				2	F	f		2.402129 GHz	2.994 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	$\Delta$ 2	f	( $\Delta$ )	77.916 MHz ( $\Delta$ )	-0.434 dB																							
2	F	f		2.402129 GHz	2.994 dBm																							
<p><math>\pi/4</math>DQPSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.01 dB Ref 20.00 dBm</p> <p><math>\Delta</math>Mkr1 78.177 MHz 2.478 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <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><math>\Delta</math>2</td> <td>f</td> <td>(<math>\Delta</math>)</td> <td>78.177 MHz (<math>\Delta</math>)</td> <td>2.478 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401785 GHz</td> <td>-2.245 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$ 2	f	( $\Delta$ )	78.177 MHz ( $\Delta$ )	2.478 dB				2	F	f		2.401785 GHz	-2.245 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	$\Delta$ 2	f	( $\Delta$ )	78.177 MHz ( $\Delta$ )	2.478 dB																							
2	F	f		2.401785 GHz	-2.245 dBm																							

8DPSK/Hop

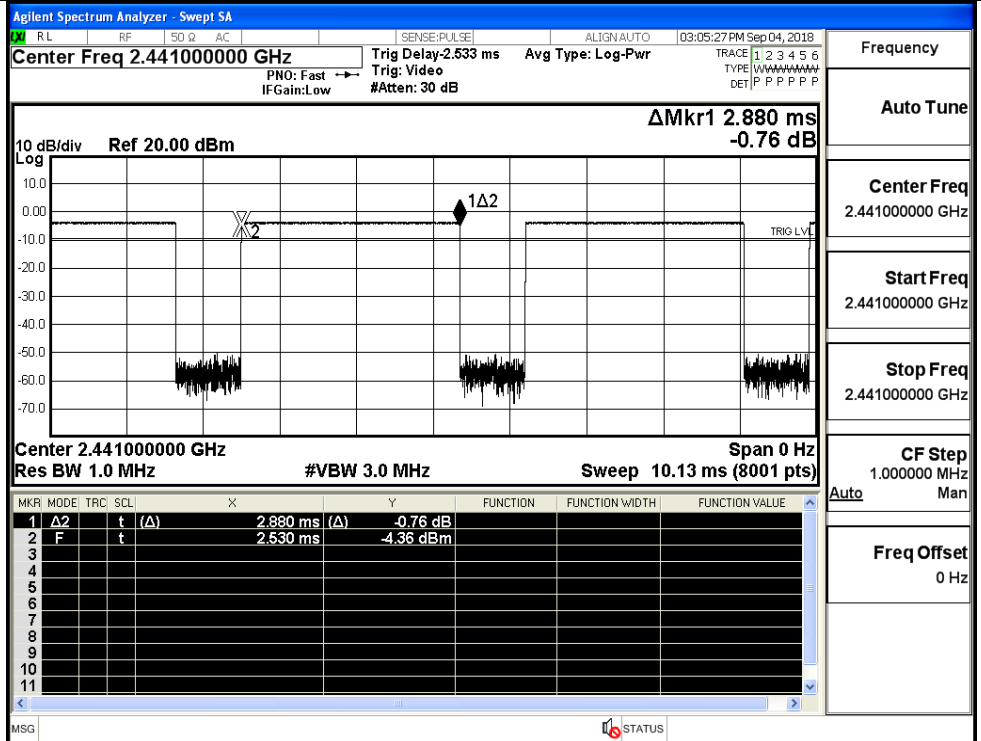


### A.5 Dwell Time

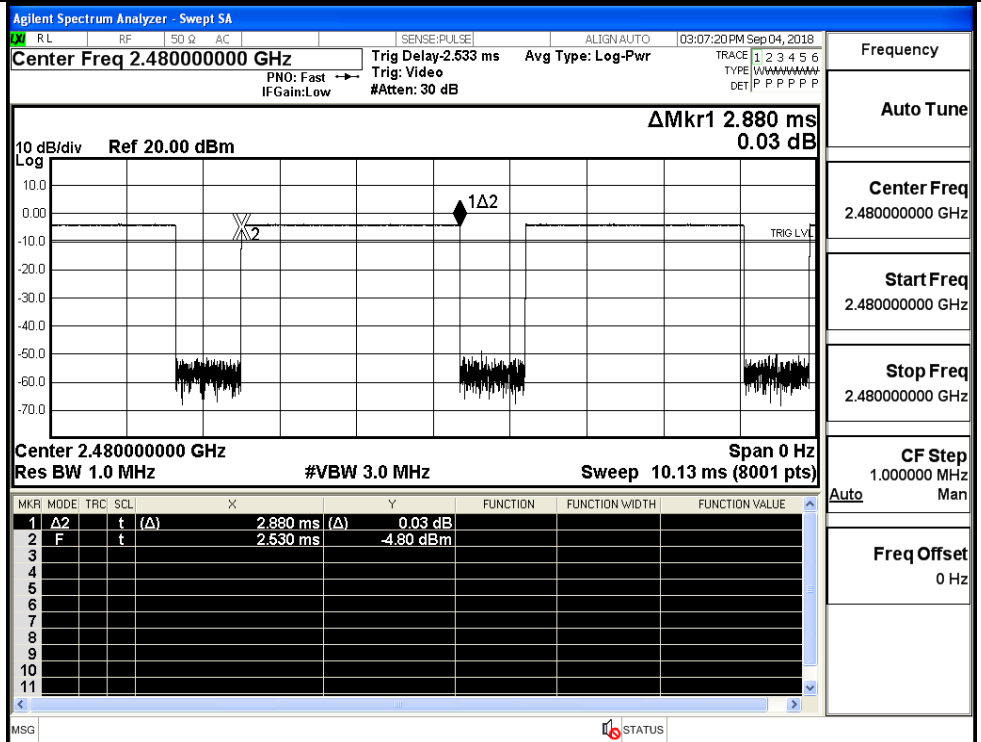
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.89	106.7	0.308	0.4	PASS
	3DH5	MCH	2.89	106.7	0.308	0.4	PASS
	3DH5	HCH	2.89	106.7	0.308	0.4	PASS



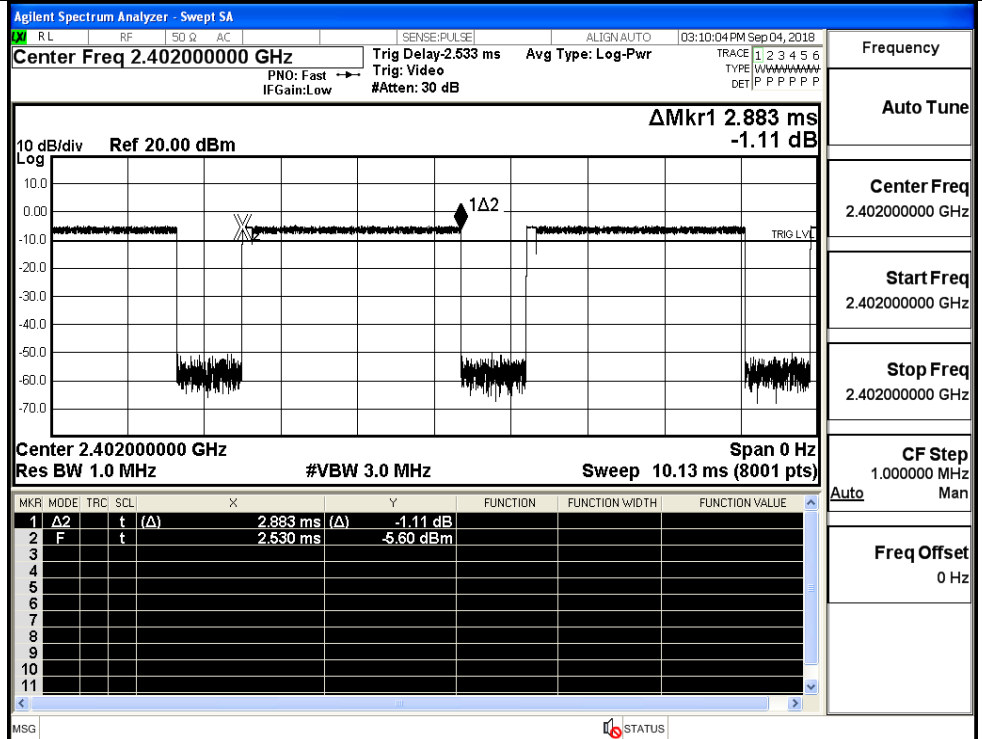
GFSK\_DH5/MCH



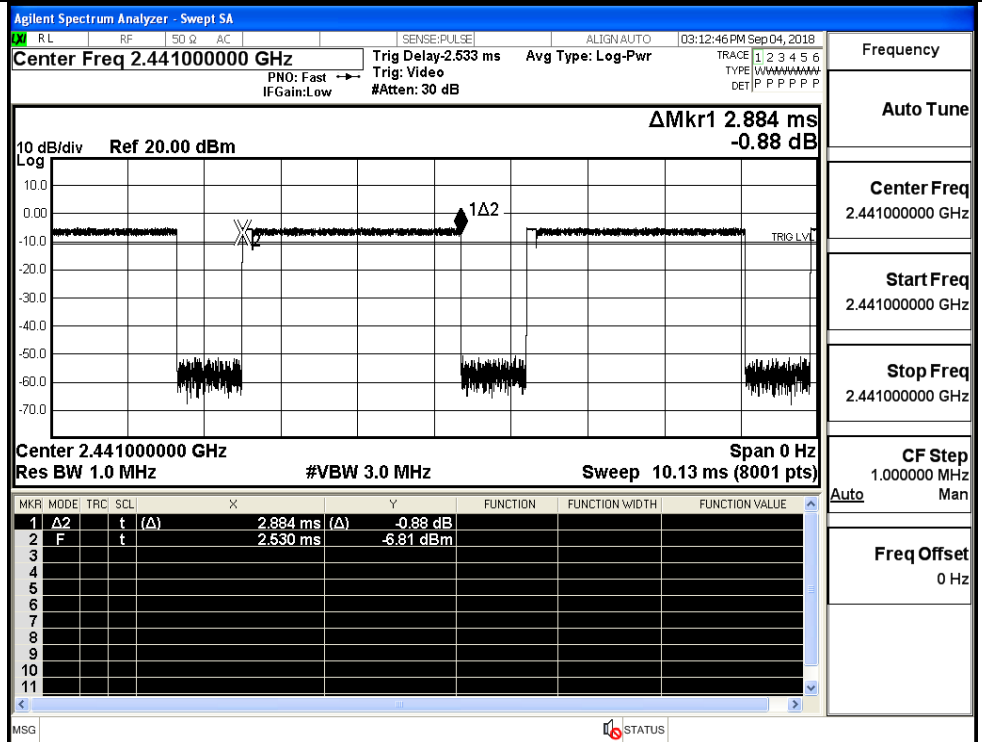
GFSK\_DH5/HCH



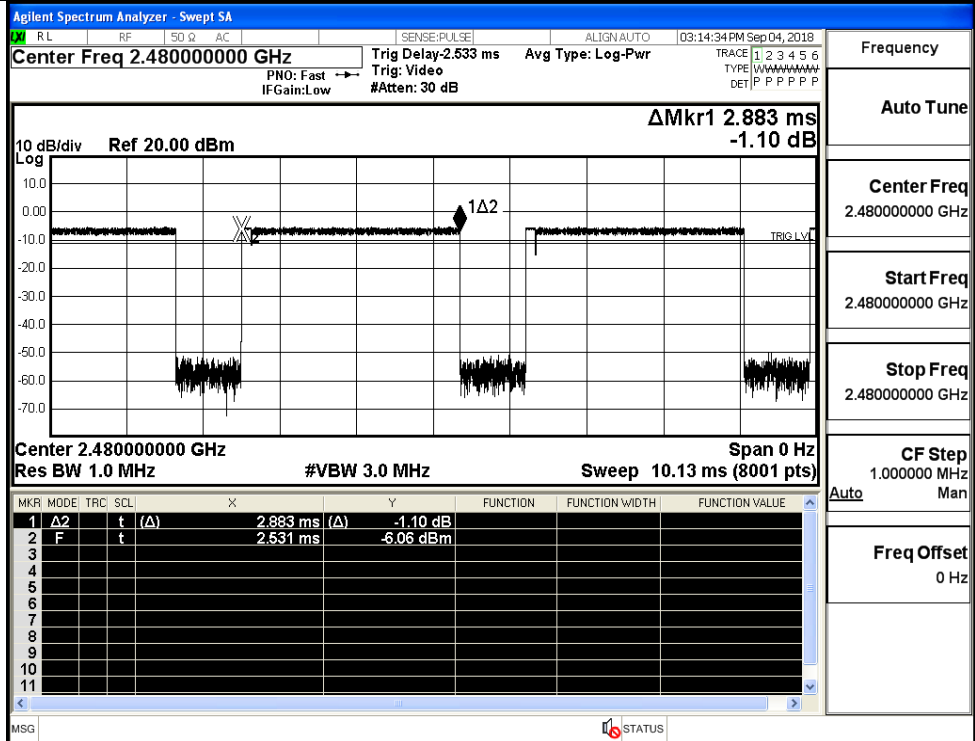
$\pi/4$ DQPSK  
\_2DH5/LCH



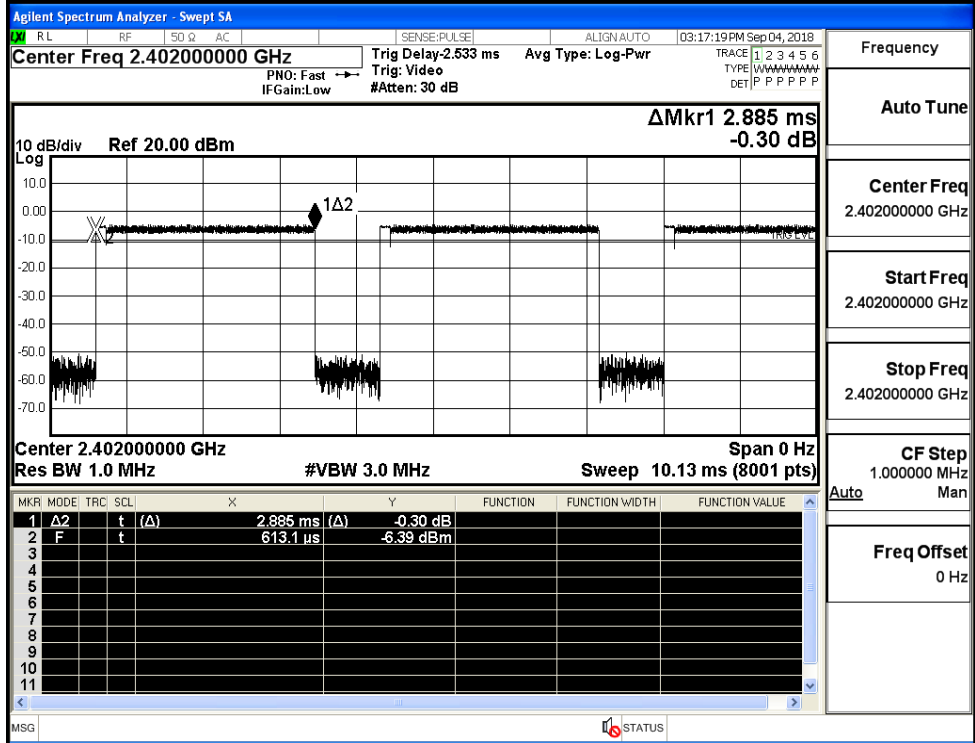
$\pi/4$ DQPSK  
\_2DH5/MCH



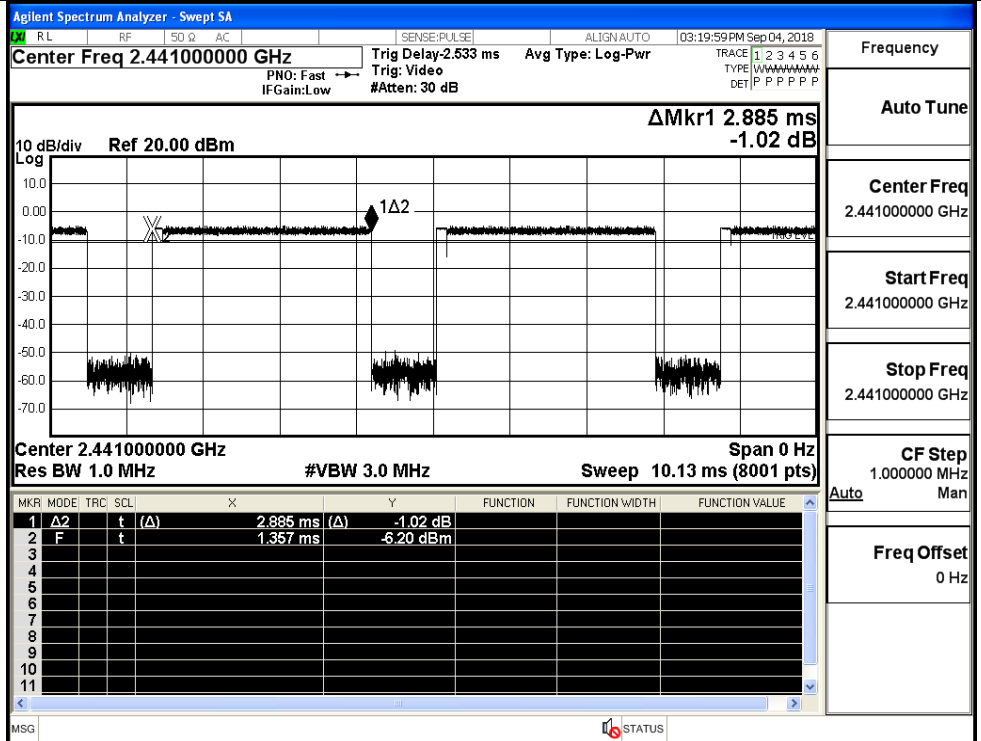
$\pi$ /4DQPSK  
\_2DH5/HCH



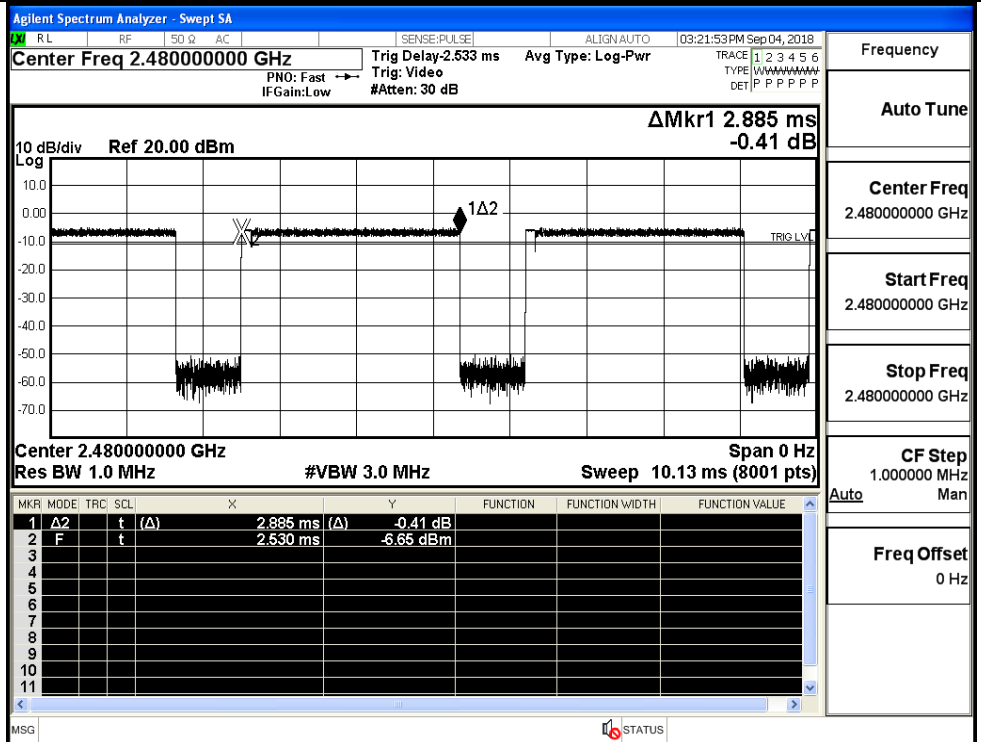
8DPSK\_3DH5/LCH



8DPSK\_3DH5/MCH



8DPSK\_3DH5/HCH



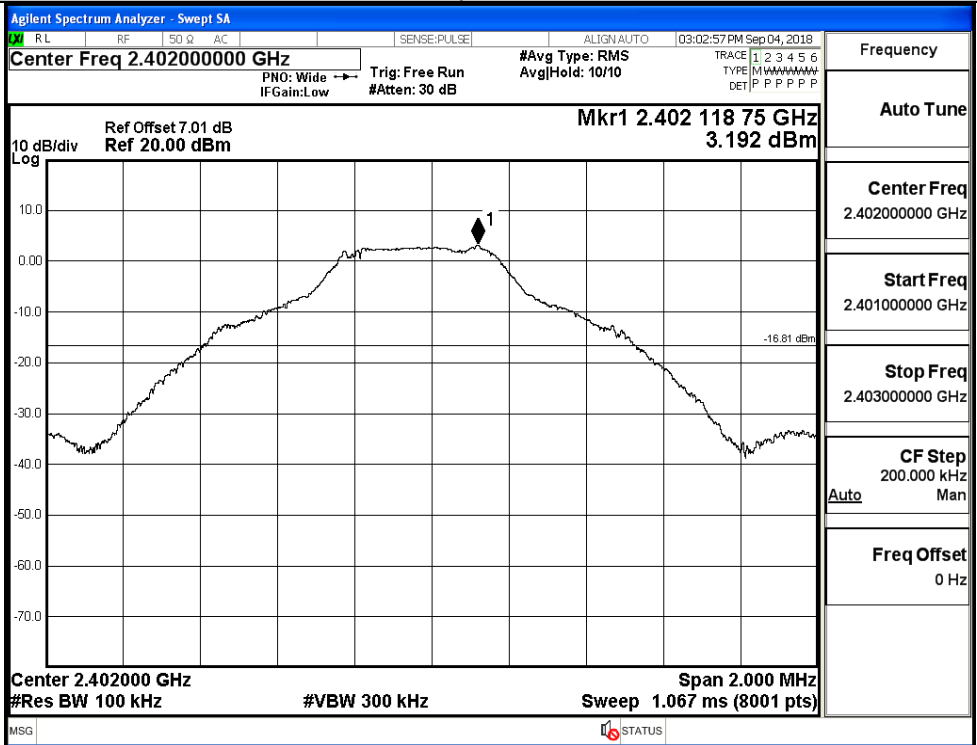
## A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.192	-45.859	-16.808	PASS
	MCH	3.172	-45.571	-16.828	PASS
	HCH	2.959	-45.699	-17.041	PASS
$\pi/4$ DQPSK	LCH	1.565	-44.959	-18.435	PASS
	MCH	0.942	-45.598	-19.058	PASS
	HCH	1.289	-46.212	-18.711	PASS
8DPSK	LCH	1.27	-45.384	-18.730	PASS
	MCH	1.005	-46.004	-18.995	PASS
	HCH	0.637	-45.286	-19.363	PASS

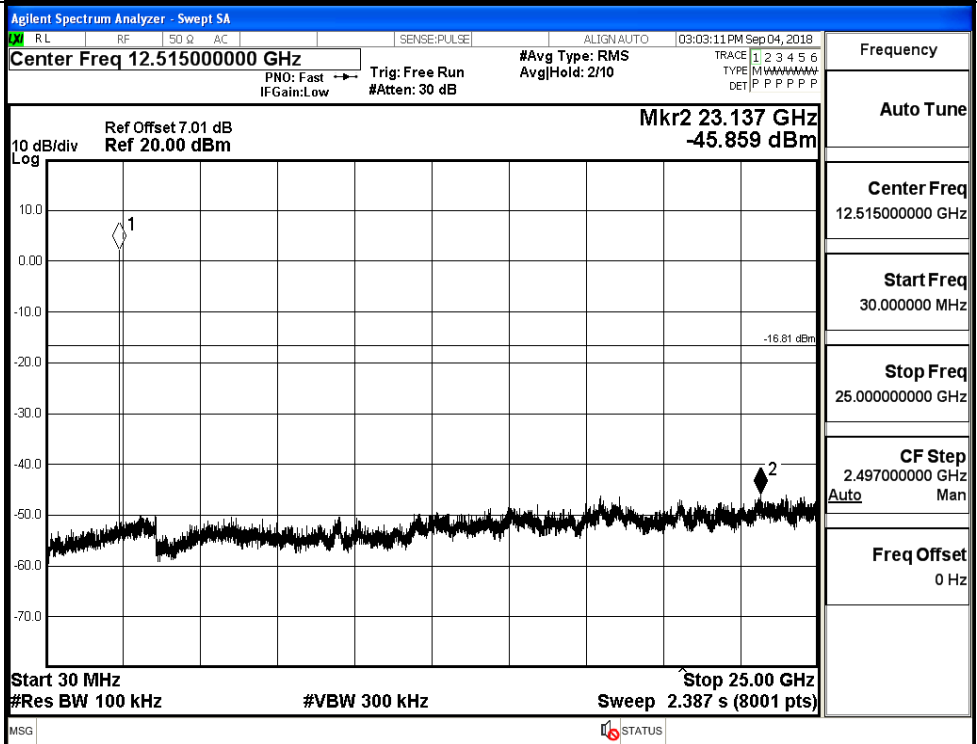


GFSK\_LCH\_Graphs

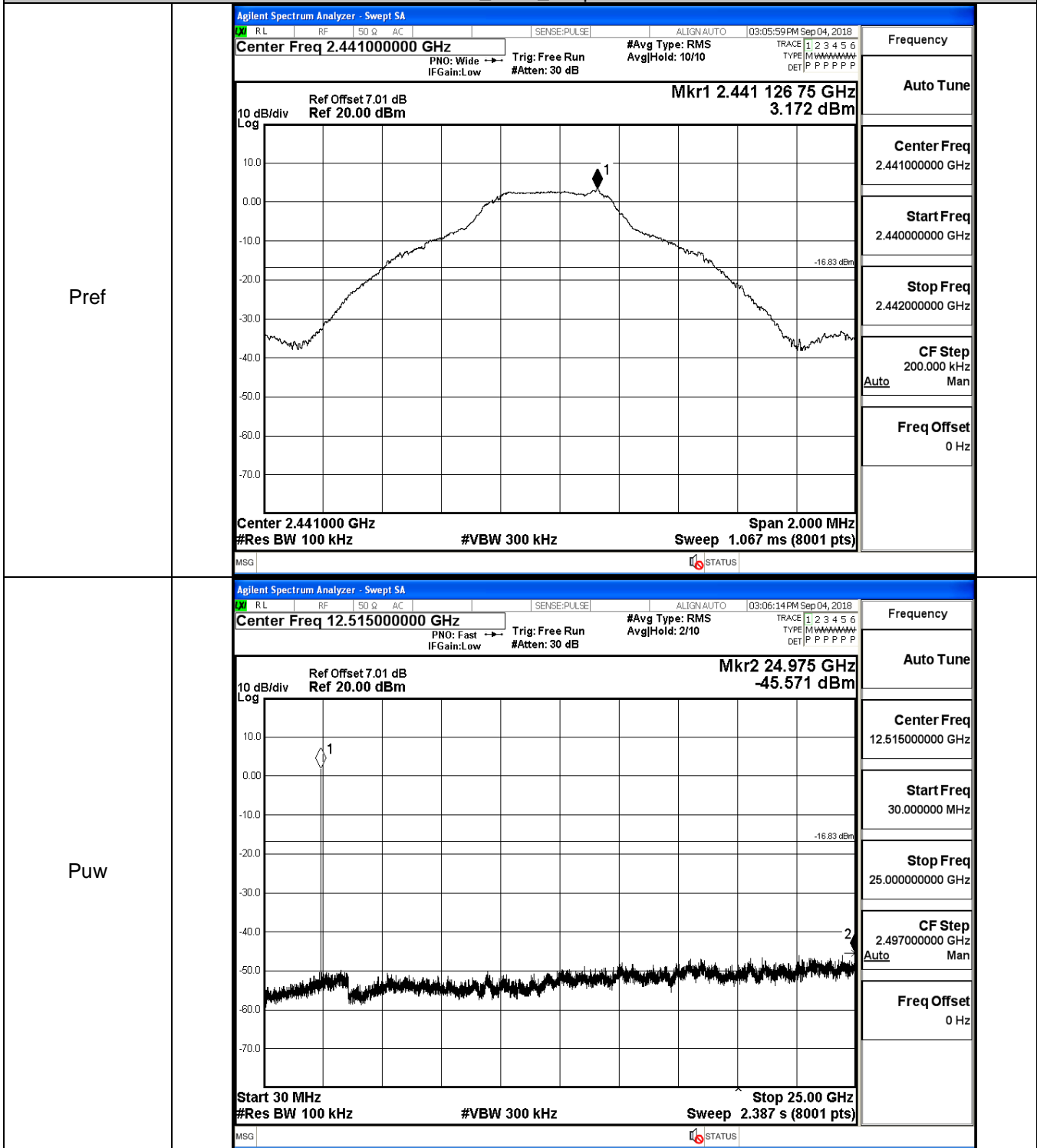
Pref



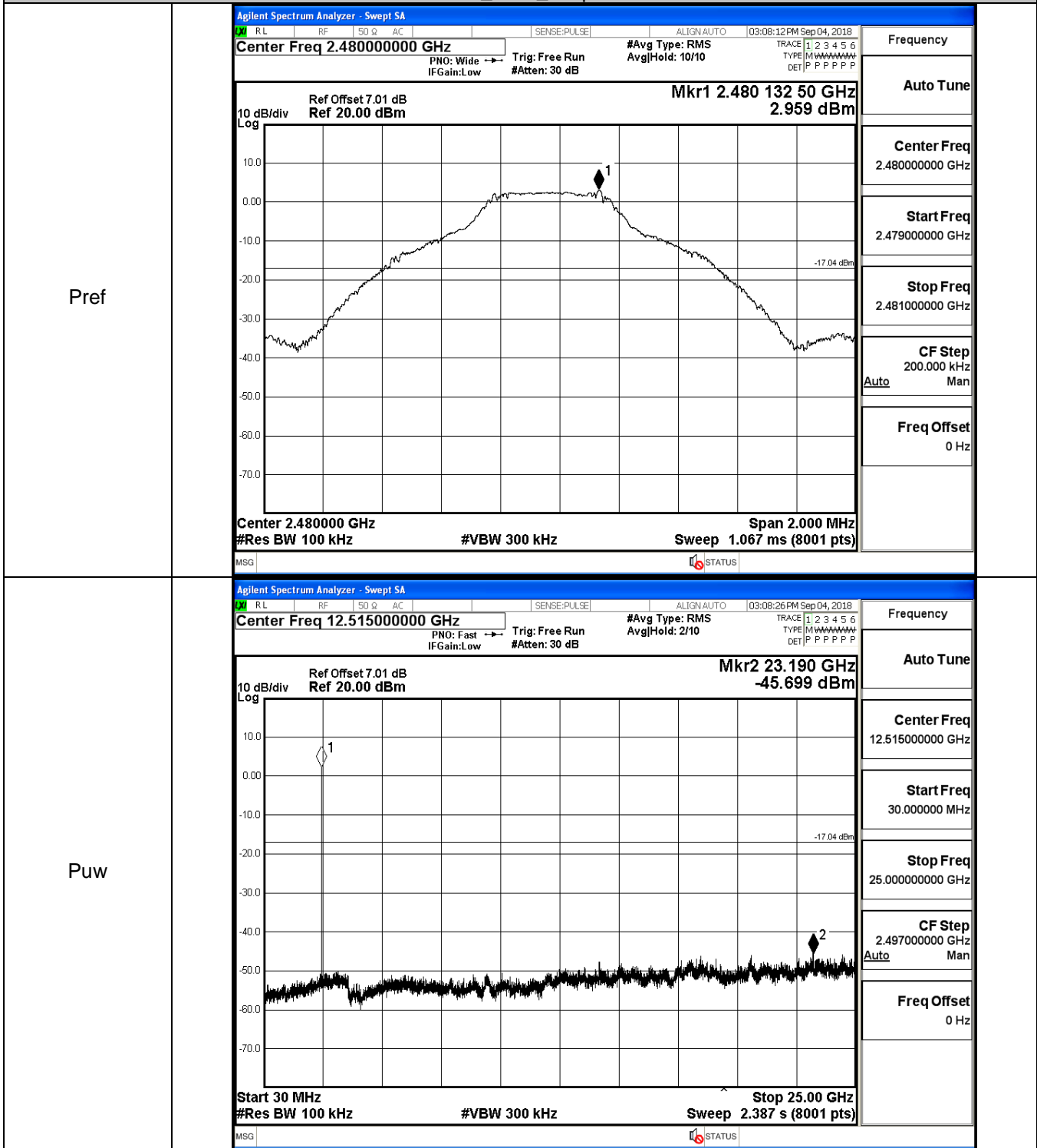
Puw



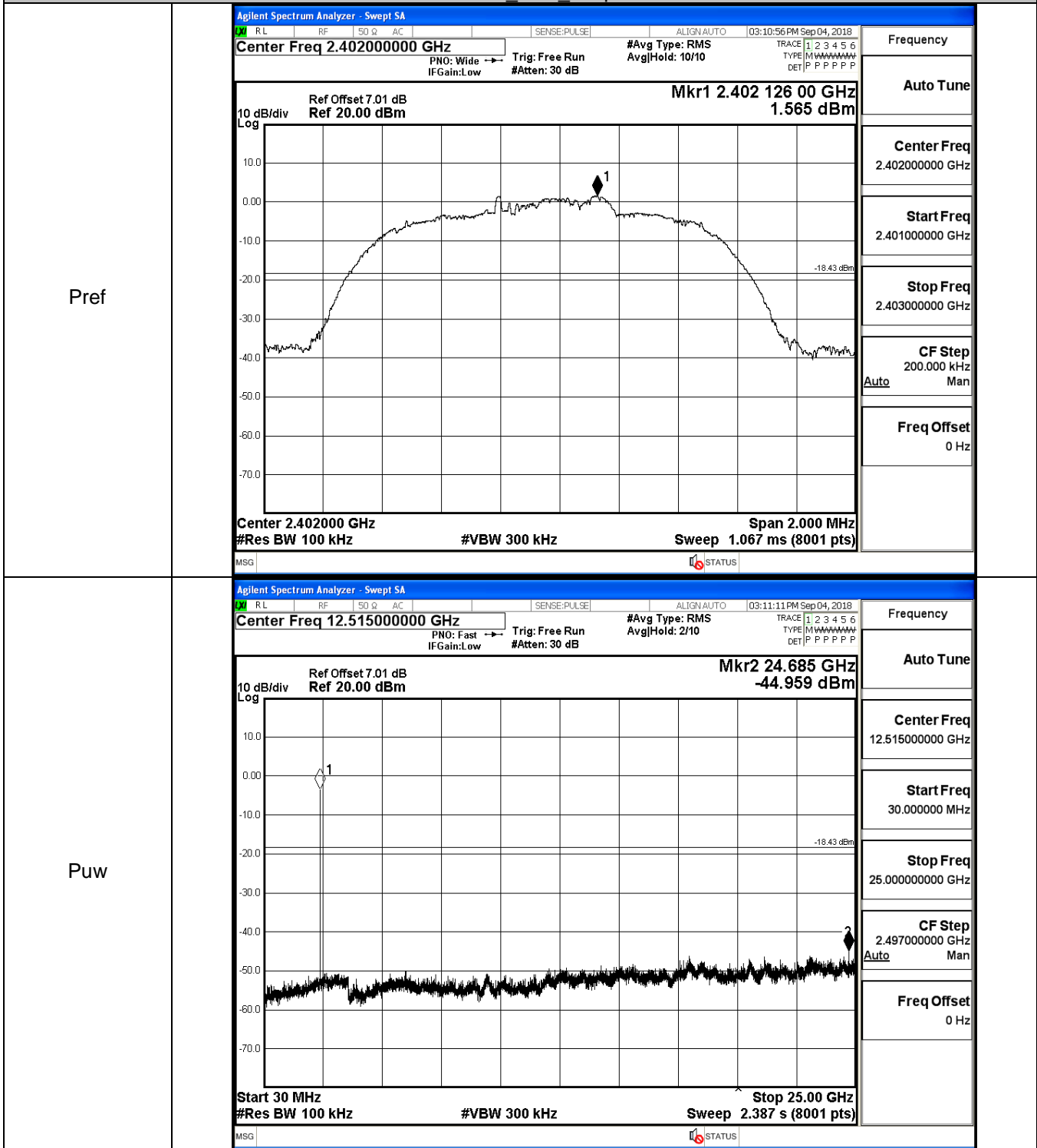
GFSK\_MCH\_Graphs



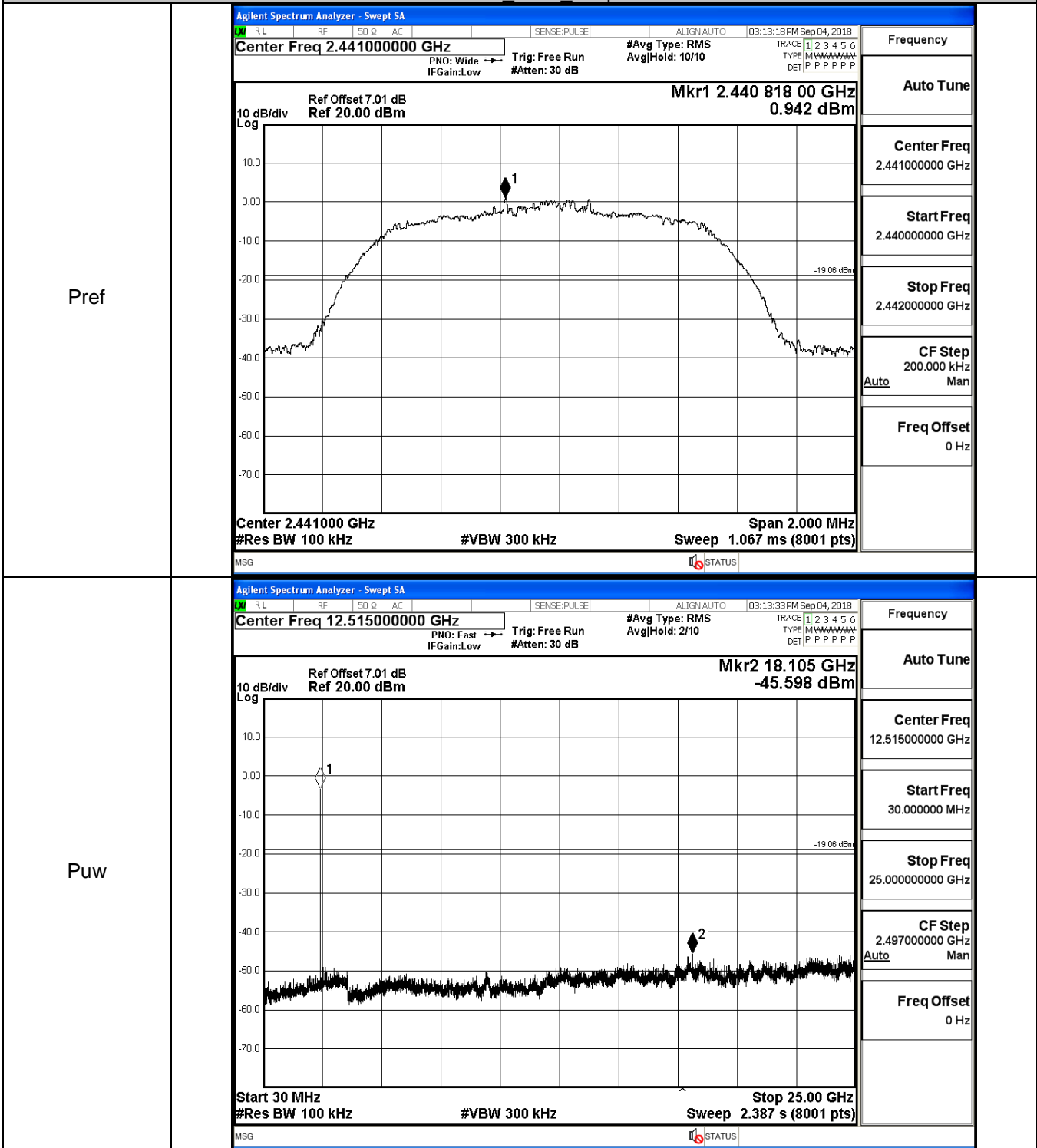
GFSK\_HCH\_Graphs



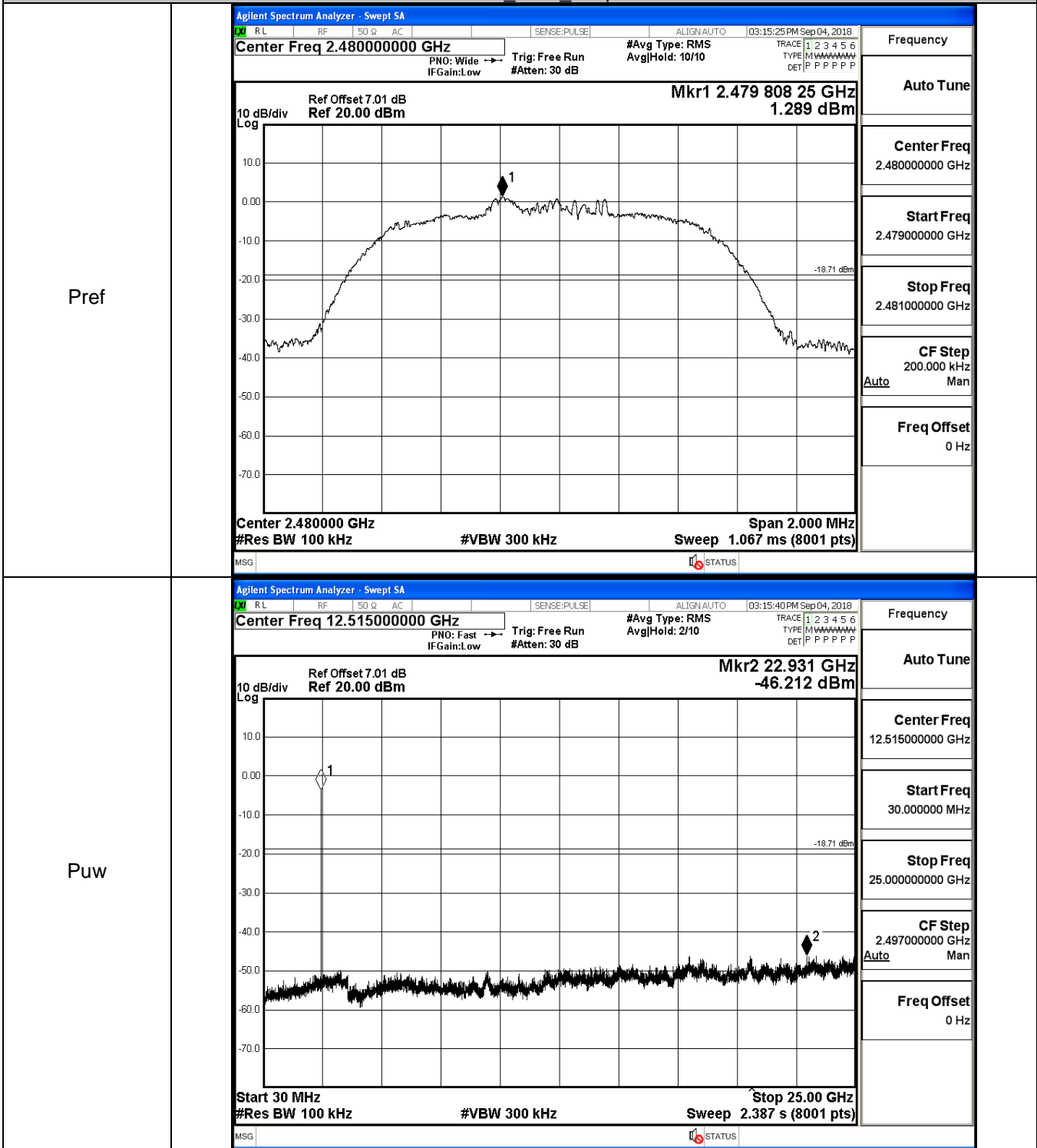
$\pi/4$ DQPSK LCH\_Graphs



$\pi/4$ DQPSK\_MCH\_Graphs

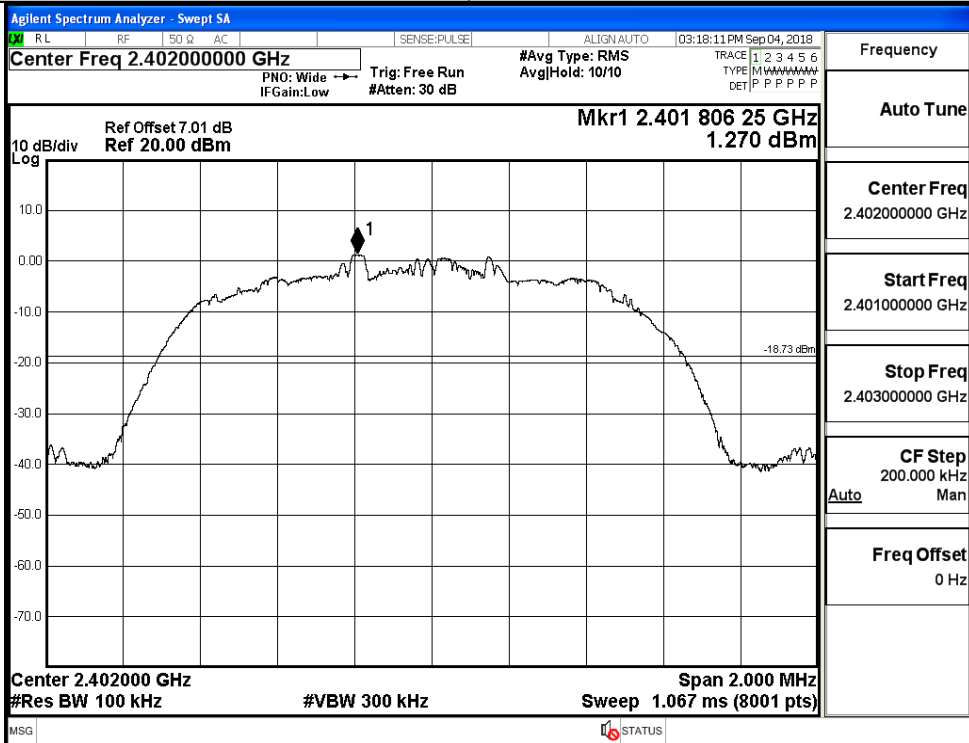


$\pi/4$ DQPSK\_HCH\_Graphs

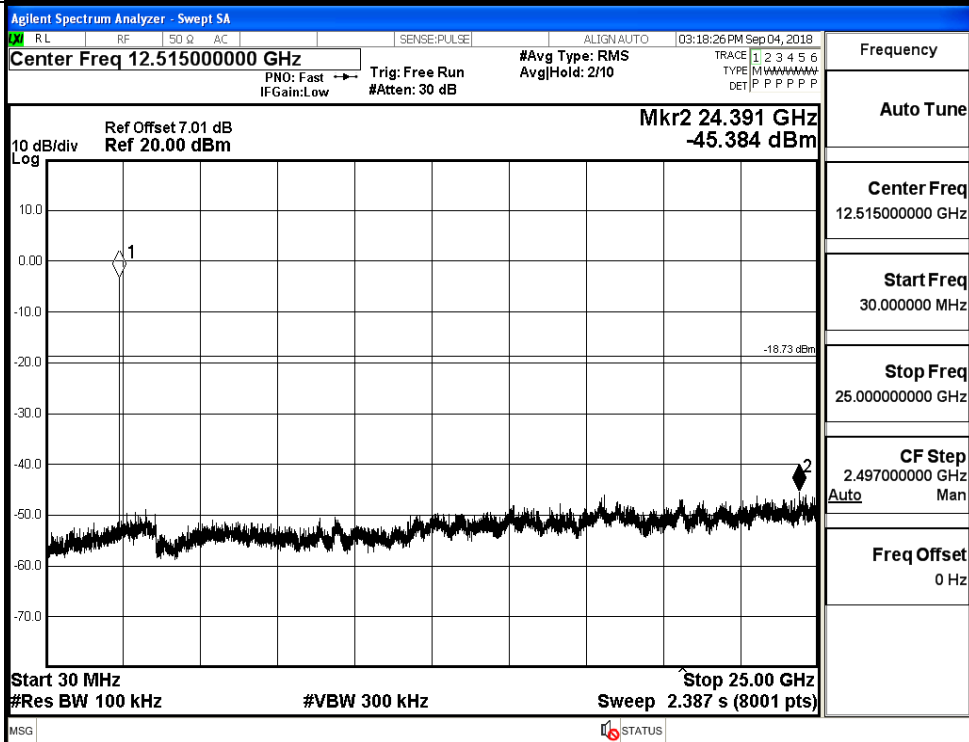


8DPSK\_LCH\_Graphs

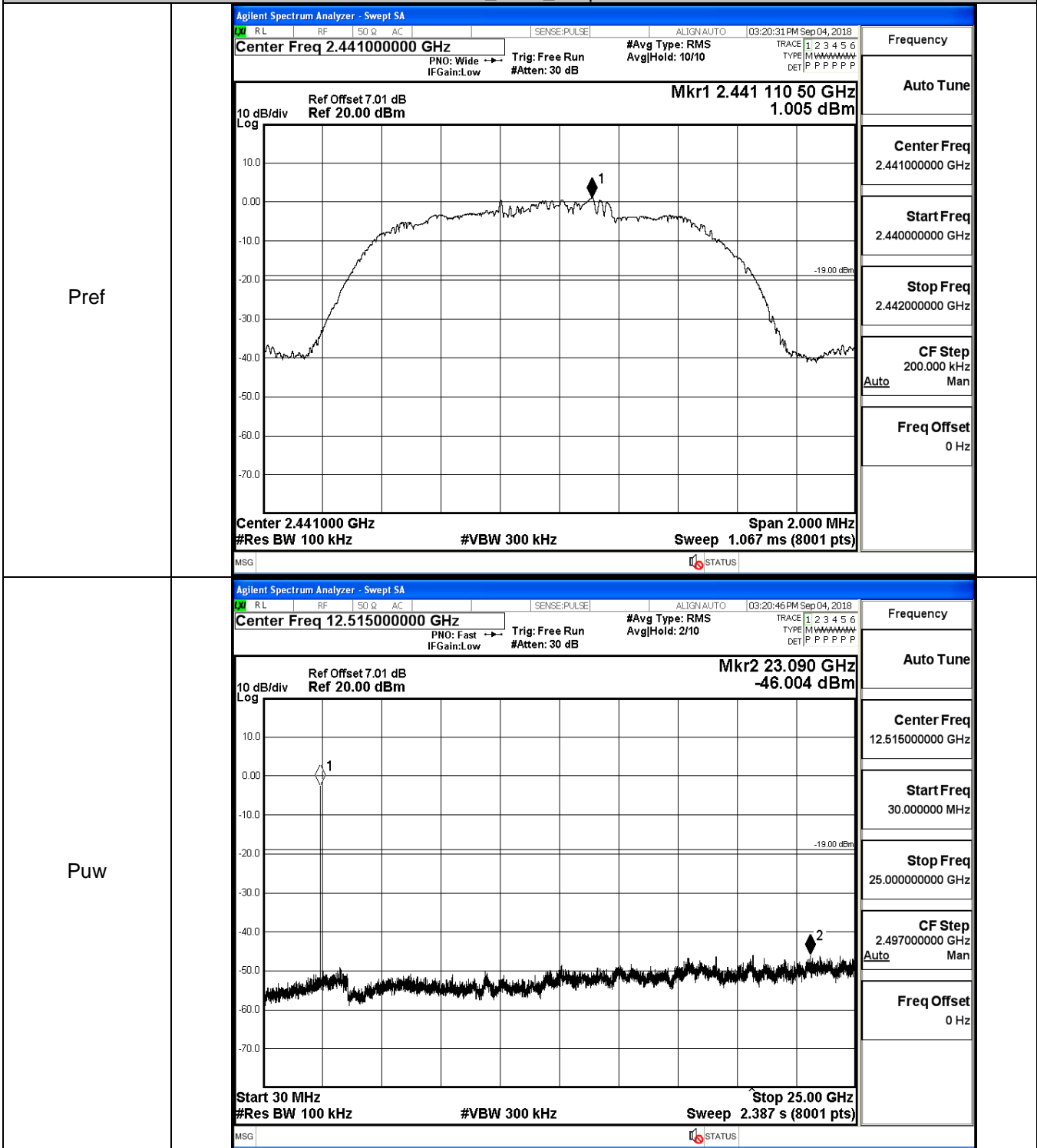
Pref



Puw



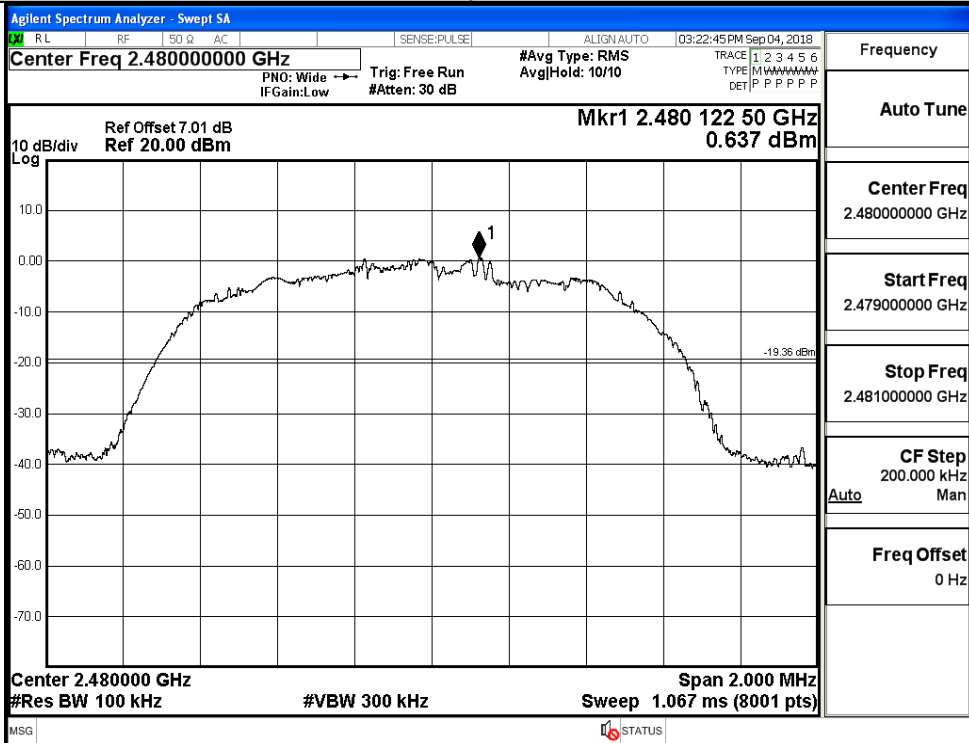
8DPSK\_MCH\_Graphs



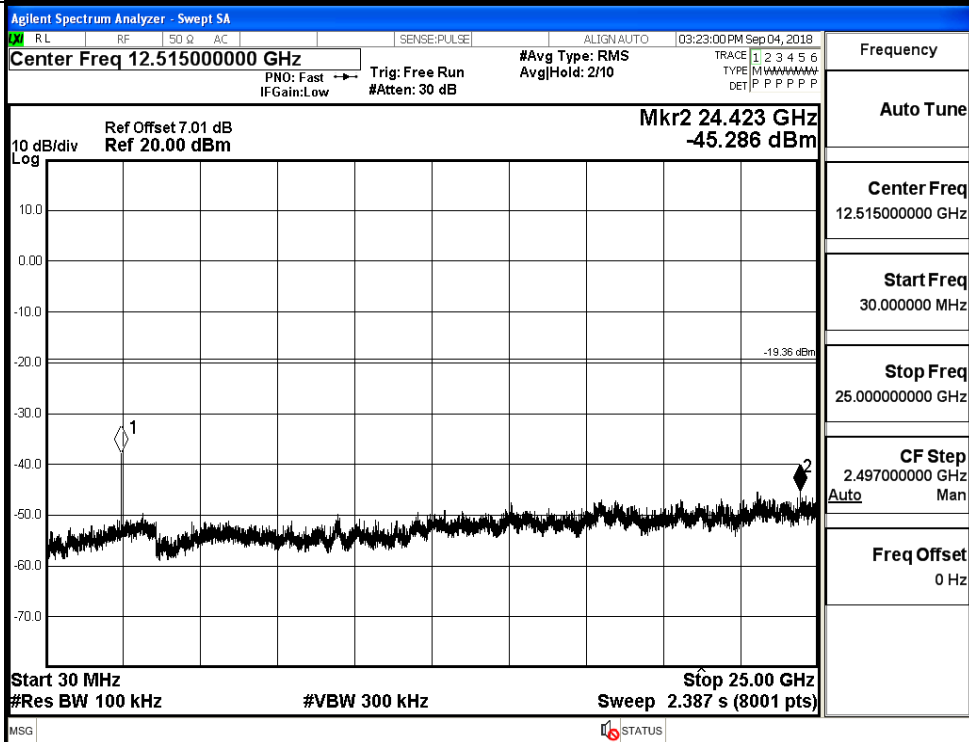


8DPSK\_HCH\_Graphs

Pref



Puw

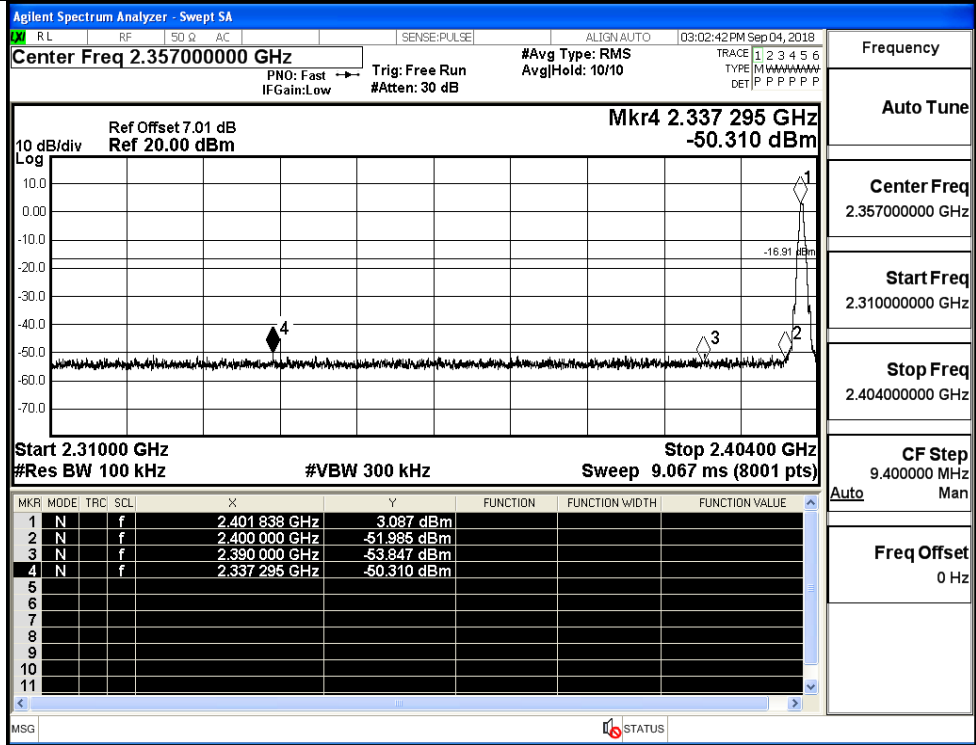


## A.7 Band-edge for RF Conducted Emissions

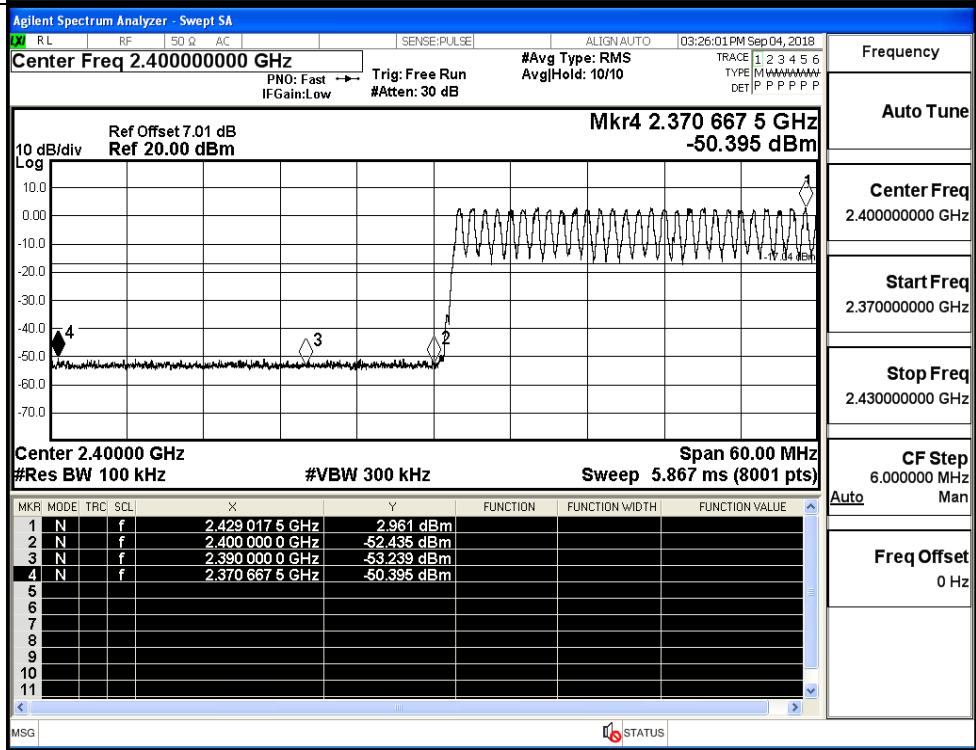
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.087	Off	-50.310	-16.91	PASS
			2.961	On	-50.395	-17.04	PASS
	HCH	2480	3.089	Off	-50.820	-16.91	PASS
			2.827	On	-50.121	-17.17	PASS
$\pi/4$ DQPSK	LCH	2402	-0.094	Off	-50.826	-20.09	PASS
			1.342	On	-50.694	-18.66	PASS
	HCH	2480	1.679	Off	-50.127	-18.32	PASS
			1.459	On	-50.391	-18.54	PASS
8DPSK	LCH	2402	1.679	Off	-50.167	-18.32	PASS
			1.219	On	-50.003	-18.78	PASS
	HCH	2480	0.498	Off	-50.060	-19.5	PASS
			1.445	On	-50.170	-18.56	PASS

Test Graphs

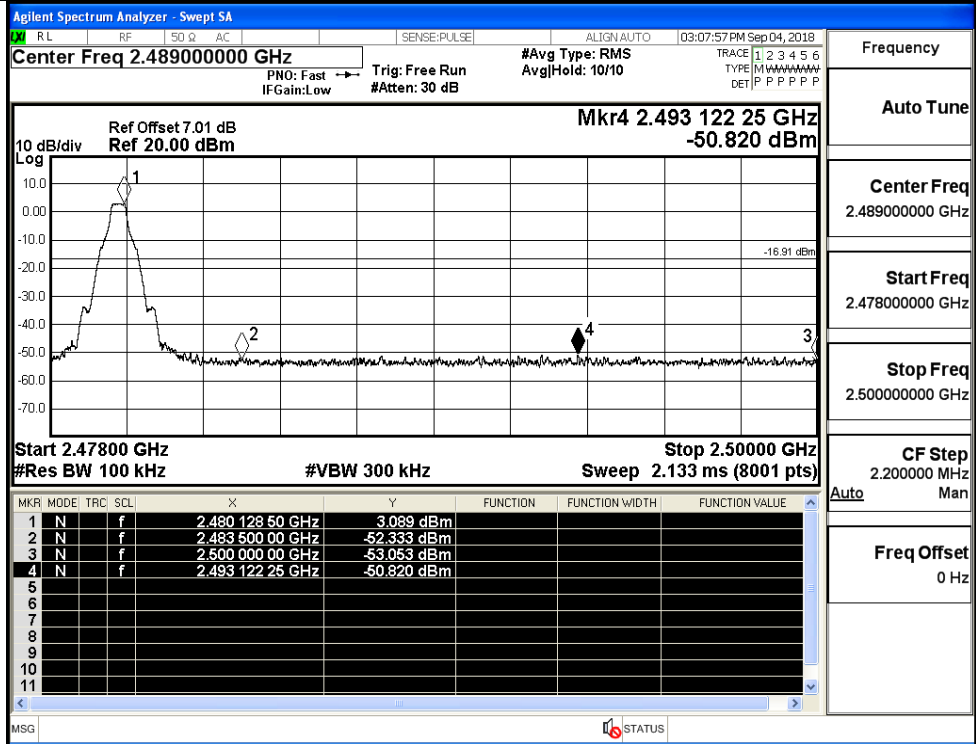
GFSK/LCH/No Hop



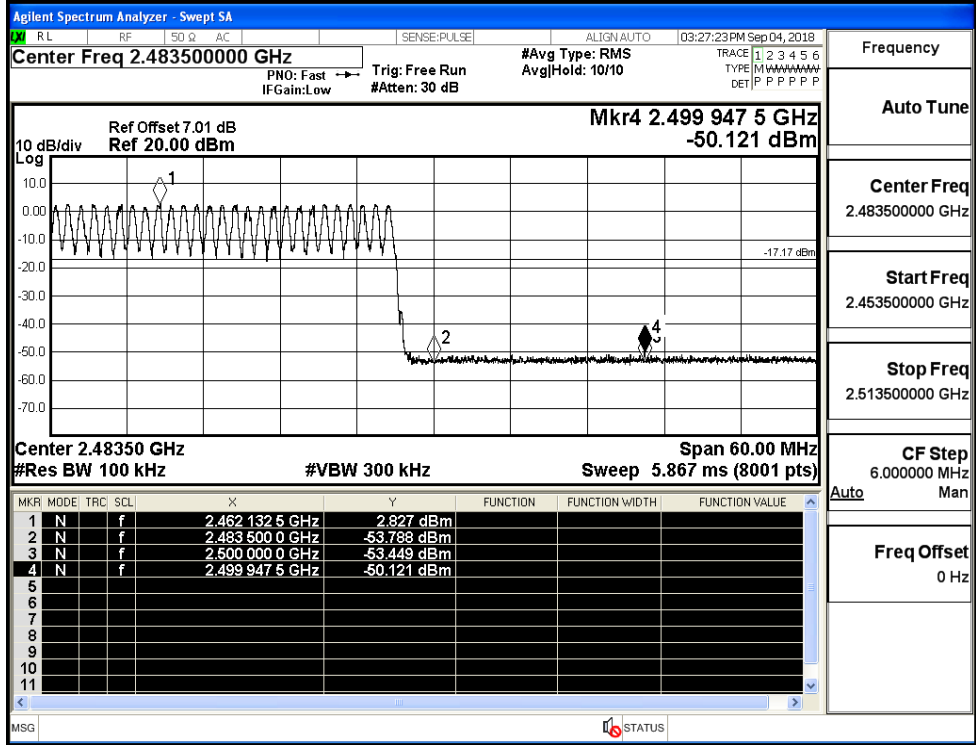
GFSK/LCH/Hop



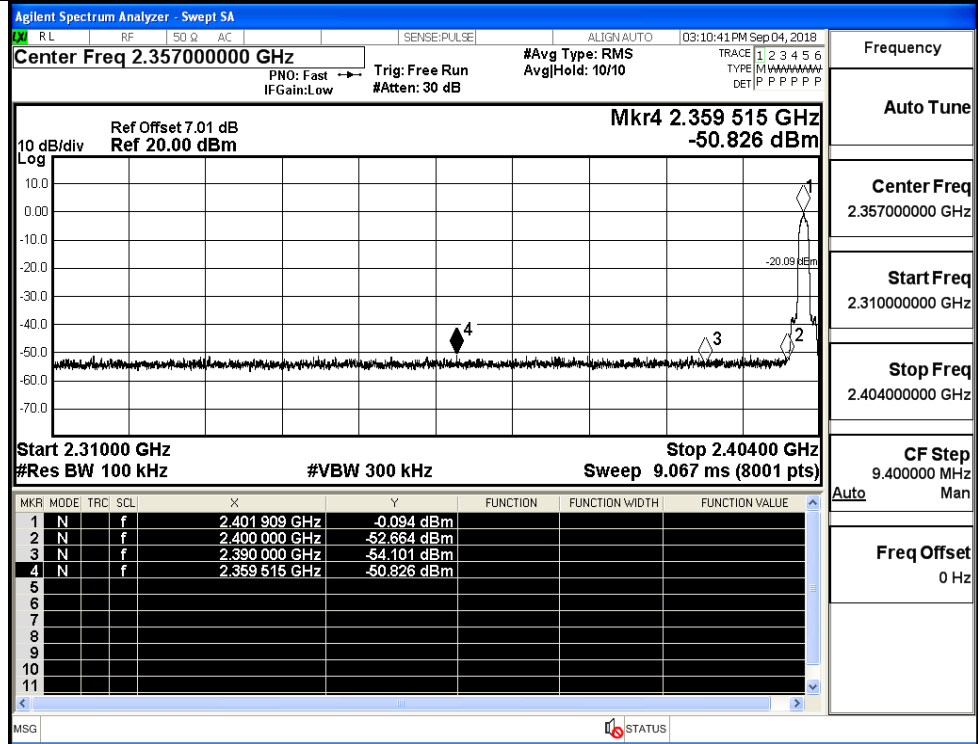
GFSK/HCH/No Hop



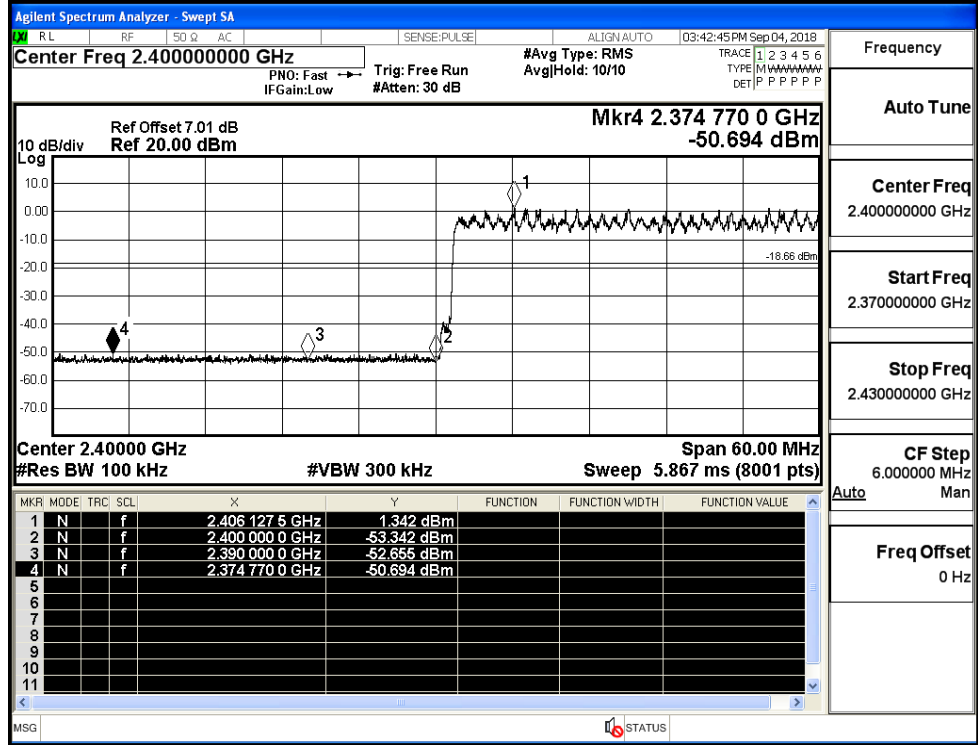
GFSK/HCH/Hop



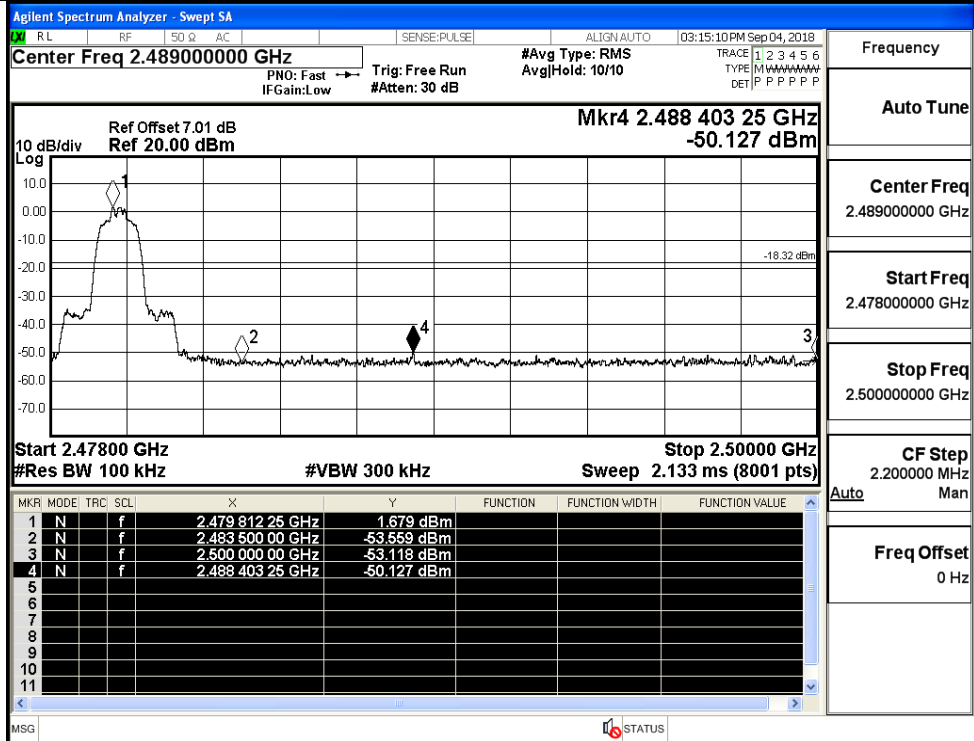
$\pi/4$ DQPSK/LCH/No  
Hop



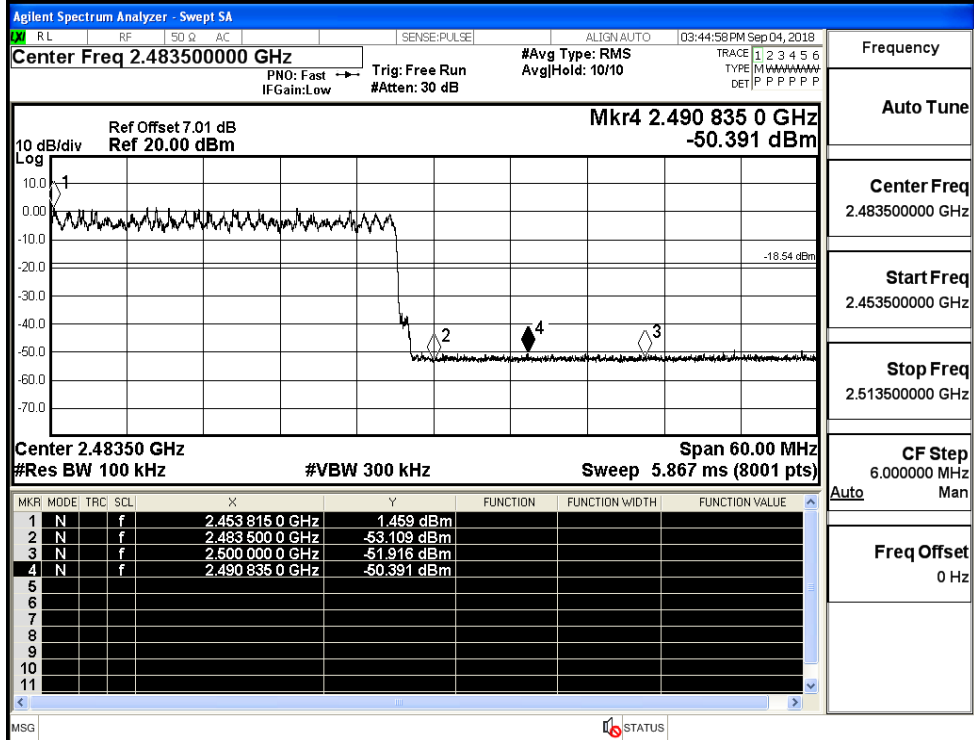
$\pi/4$ DQPSK/LCH/Hop



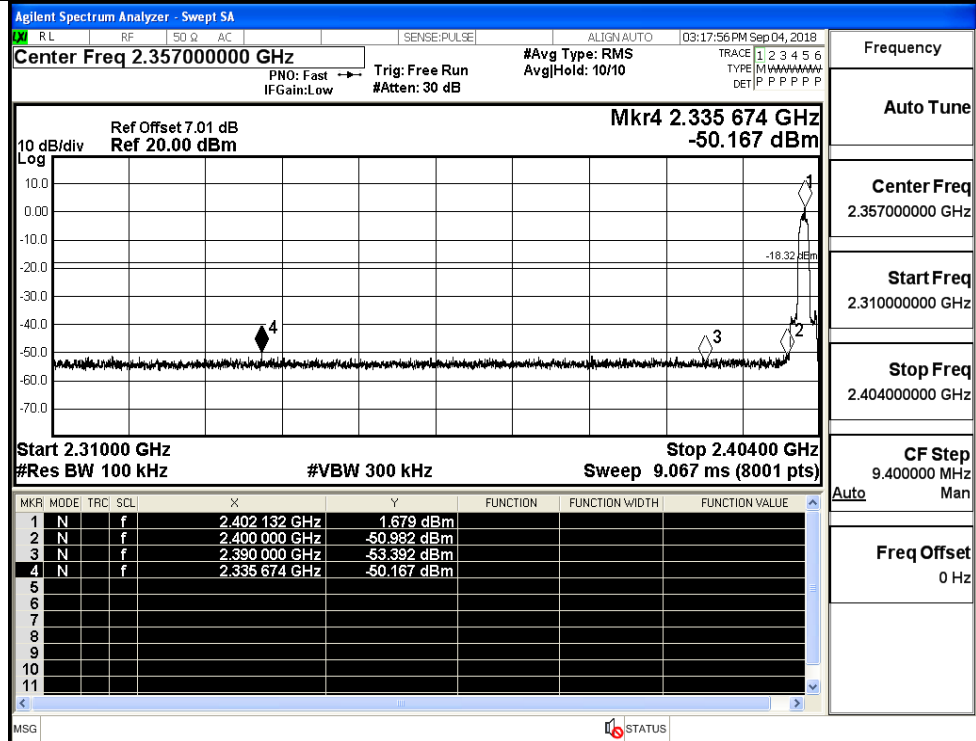
$\pi$ /4DQPSK/HCH/No  
Hop



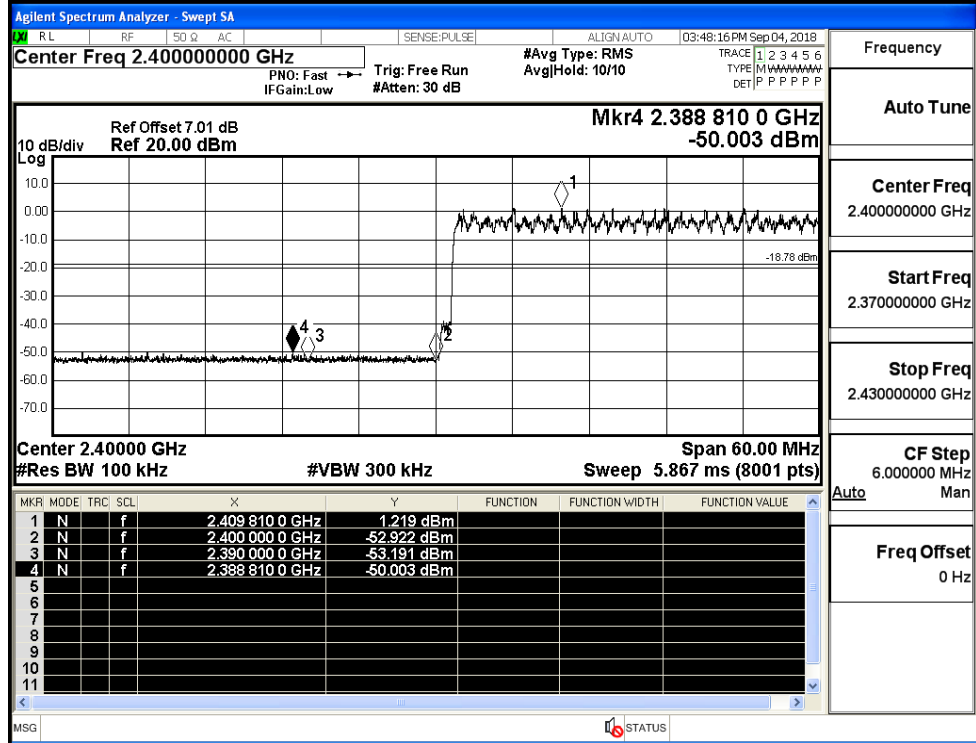
$\pi$ /4DQPSK/HCH/Hop



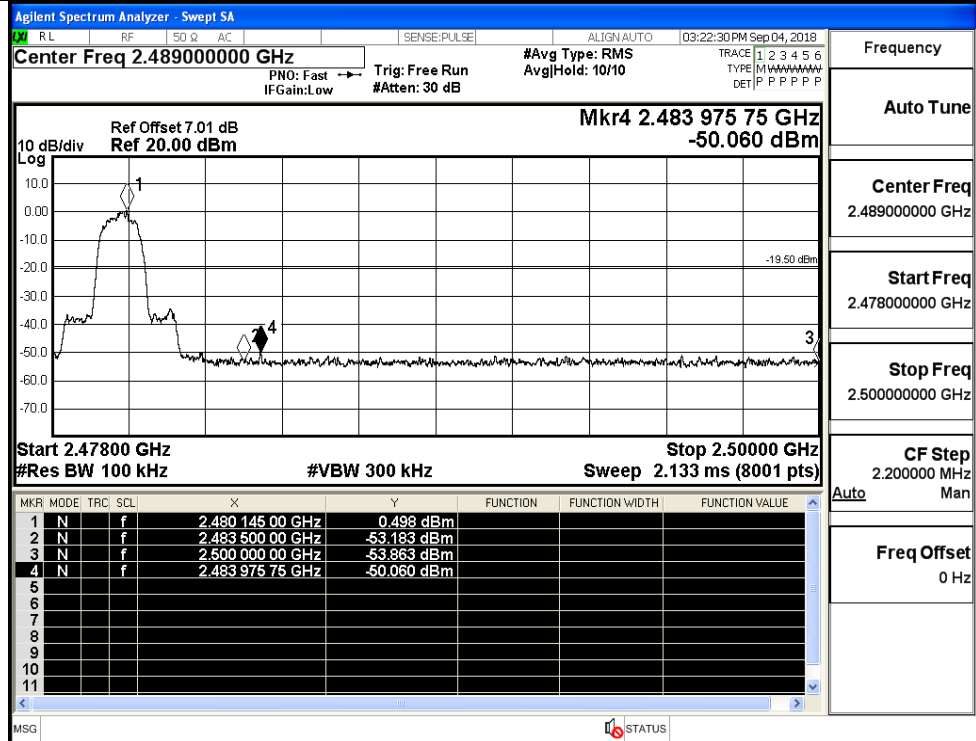
8DPSK/LCH/No Hop



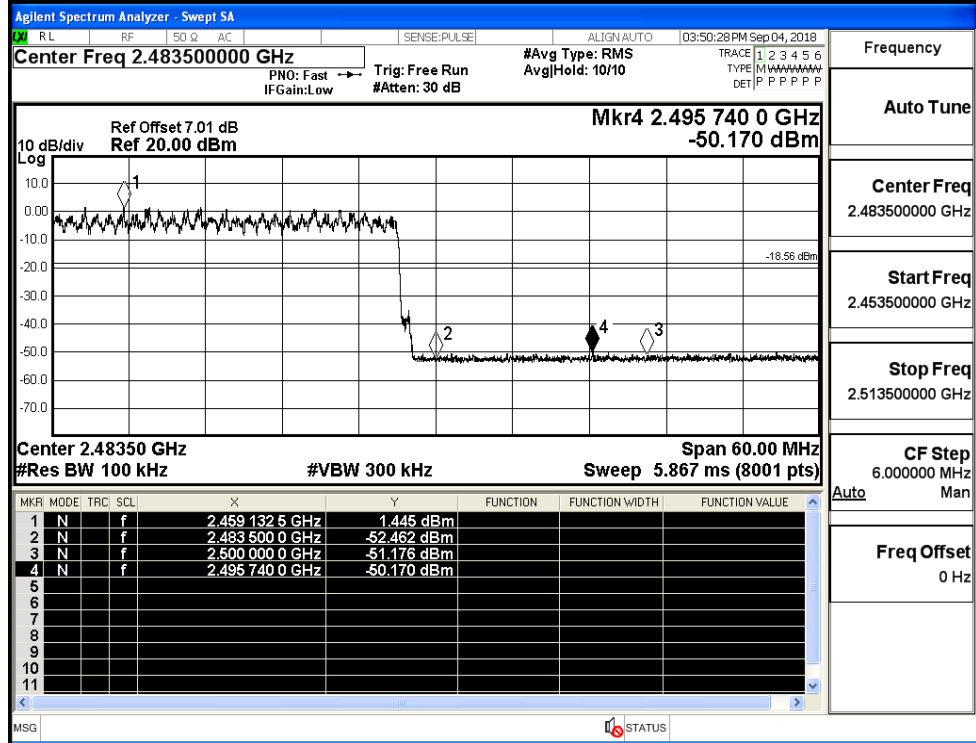
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



8DPSK/HCH/Hop

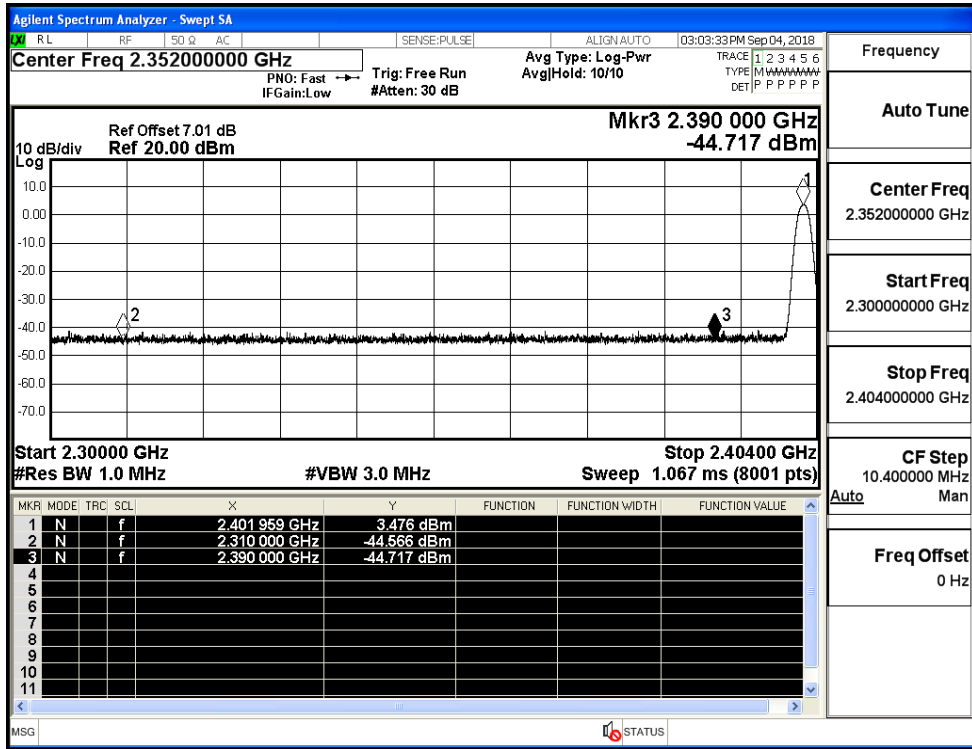




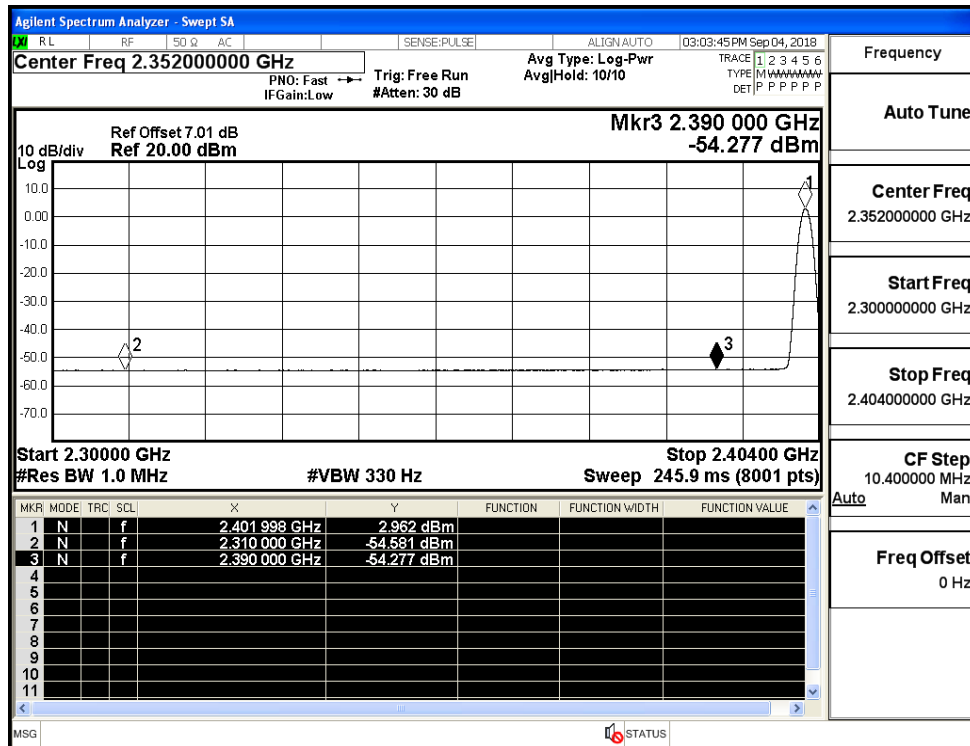
## A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.57	2.0	0	52.69	PEAK	74	PASS
	Off	2310.0	-54.58	2.0	0	42.68	AV	54	PASS
	Off	2390.0	-44.72	2.0	0	52.54	PEAK	74	PASS
	Off	2390.0	-54.28	2.0	0	42.98	AV	54	PASS
	Off	2483.5	-44.30	2.0	0	52.96	PEAK	74	PASS
	Off	2483.5	-53.88	2.0	0	43.38	AV	54	PASS
	Off	2500.0	-43.18	2.0	0	54.08	PEAK	74	PASS
	Off	2500.0	-53.95	2.0	0	43.31	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.96	2.0	0	52.30	PEAK	74	PASS
	Off	2310.0	-54.64	2.0	0	42.62	AV	54	PASS
	Off	2390.0	-43.67	2.0	0	53.59	PEAK	74	PASS
	Off	2390.0	-54.39	2.0	0	42.87	AV	54	PASS
	Off	2483.5	-44.36	2.0	0	52.89	PEAK	74	PASS
	Off	2483.5	-53.87	2.0	0	43.39	AV	54	PASS
	Off	2500.0	-44.57	2.0	0	52.69	PEAK	74	PASS
	Off	2500.0	-54.02	2.0	0	43.24	AV	54	PASS
8DPSK	Off	2310.0	-44.51	2.0	0	52.74	PEAK	74	PASS
	Off	2310.0	-54.64	2.0	0	42.62	AV	54	PASS
	Off	2390.0	-43.33	2.0	0	53.93	PEAK	74	PASS
	Off	2390.0	-54.34	2.0	0	42.92	AV	54	PASS
	Off	2483.5	-43.98	2.0	0	53.28	PEAK	74	PASS
	Off	2483.5	-53.74	2.0	0	43.52	AV	54	PASS
	Off	2500.0	-43.40	2.0	0	53.86	PEAK	74	PASS
	Off	2500.0	-54.00	2.0	0	43.26	AV	54	PASS

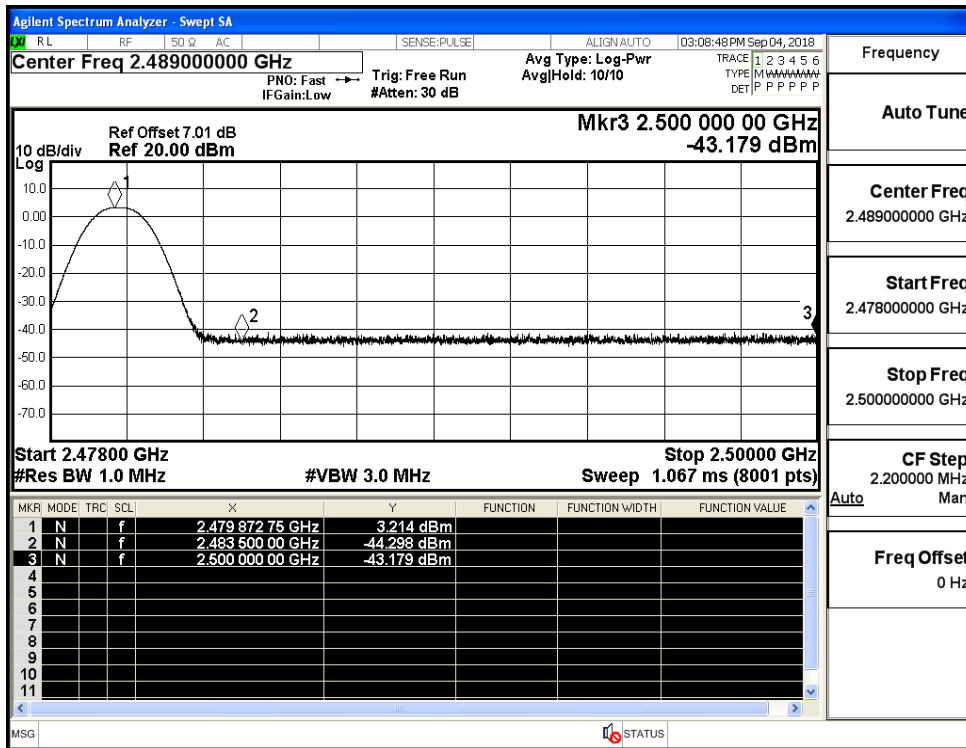
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



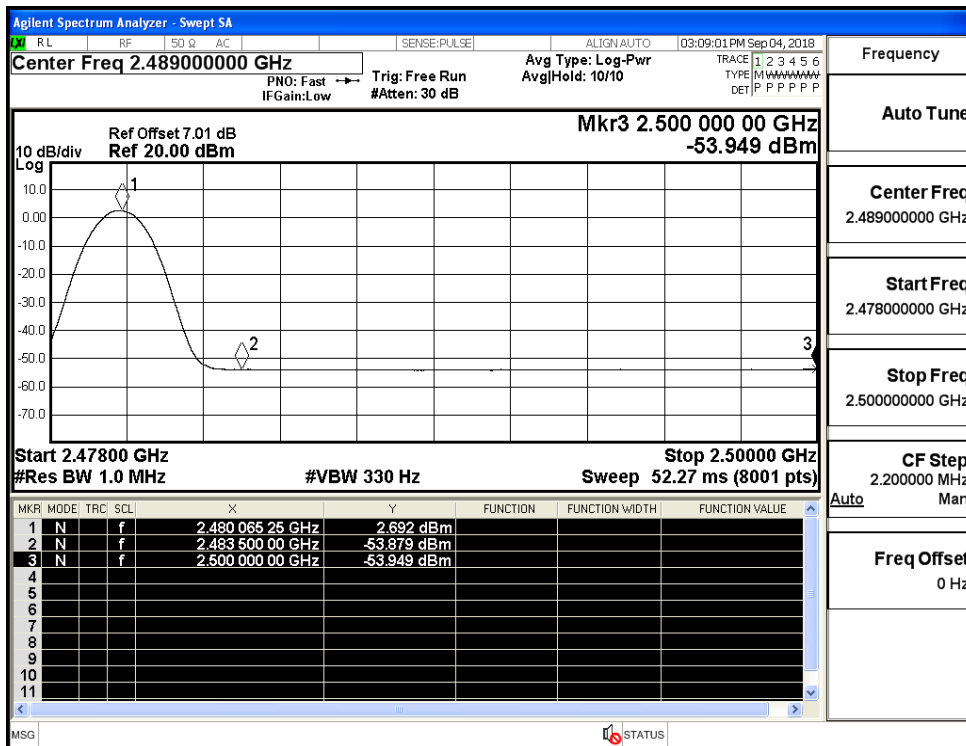
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



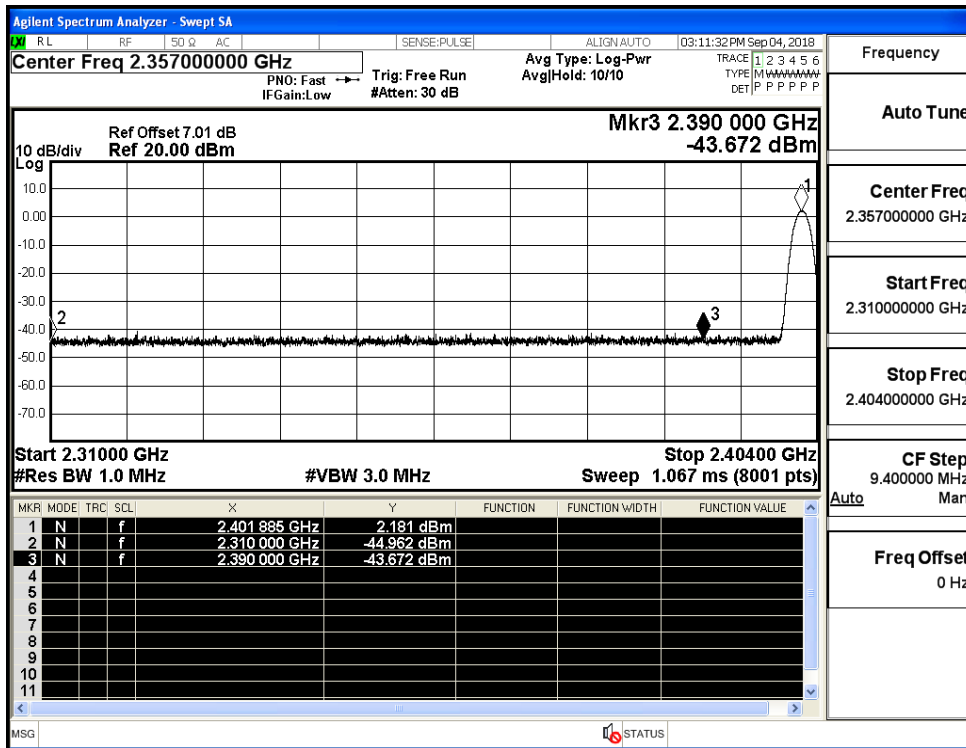
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



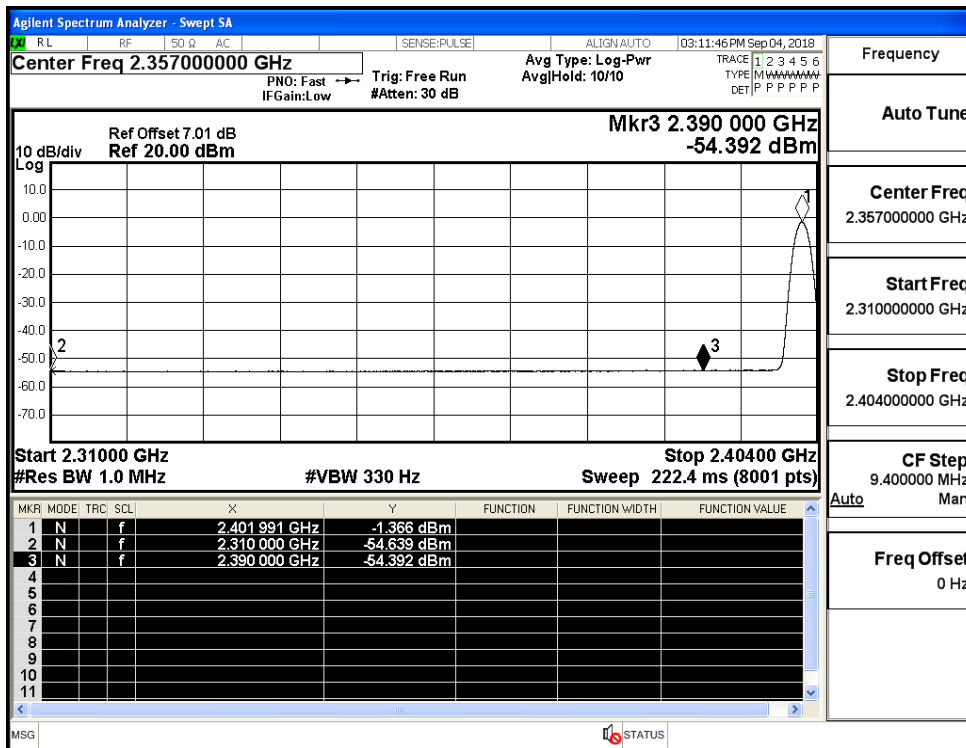
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



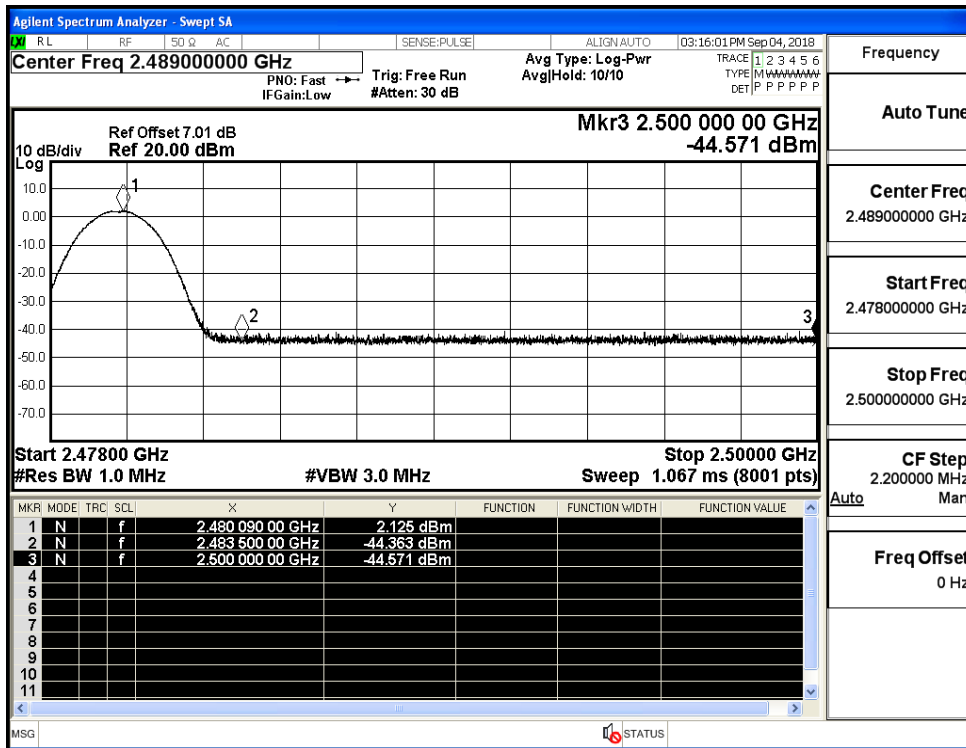
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)



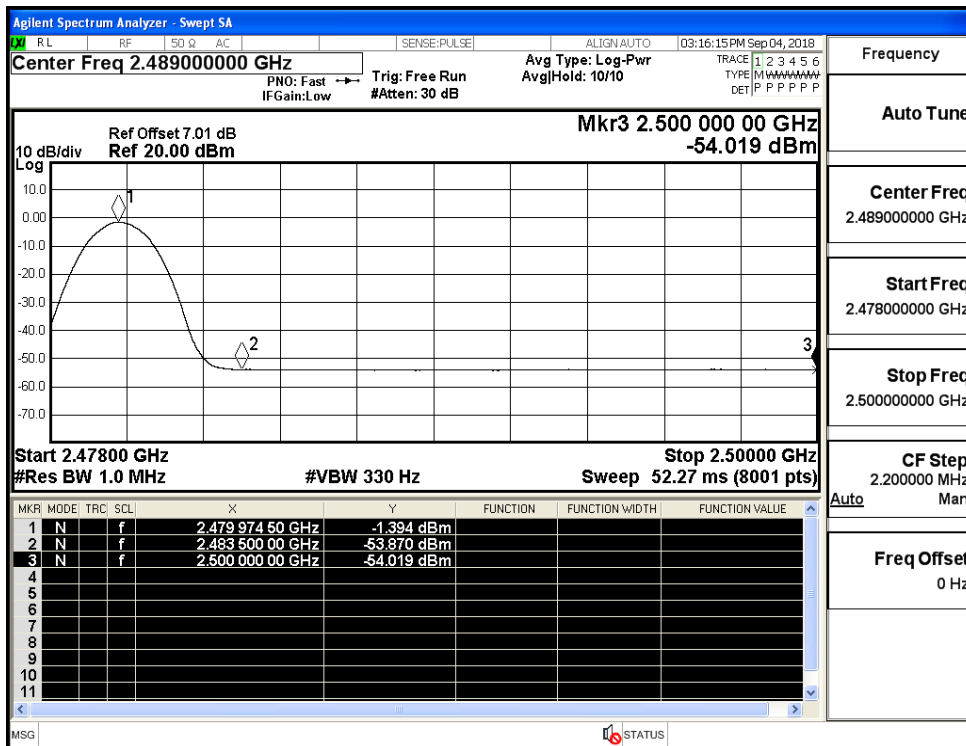
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)



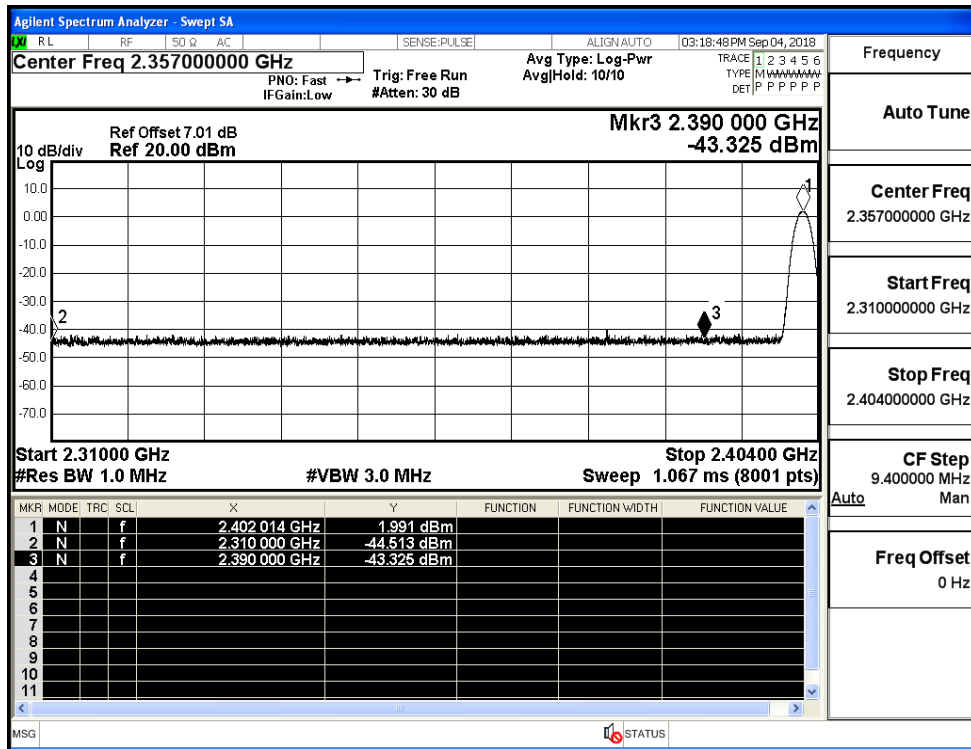
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



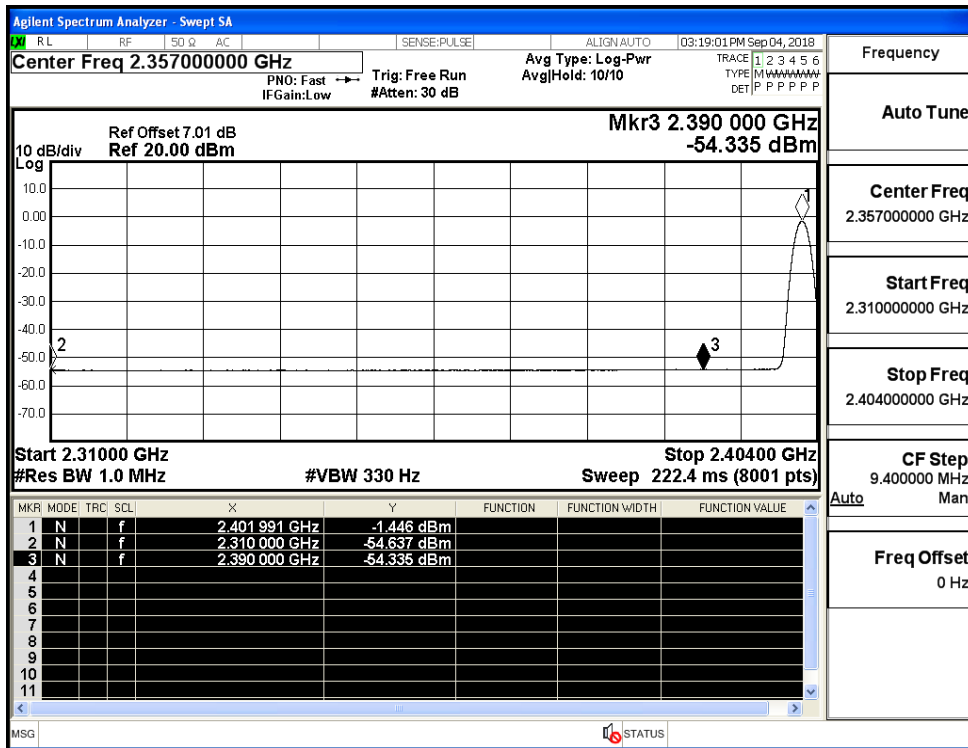
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



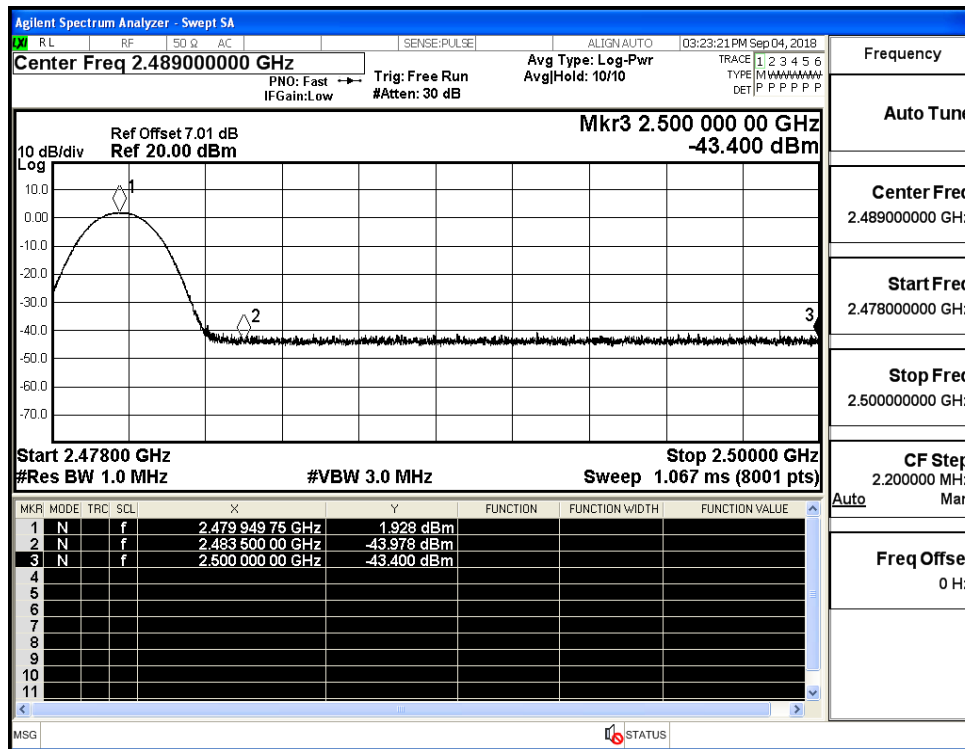
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



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)

