

Appendix A

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

Product Name: MJ-80

Trade Mark: N/A

Test Model: MJ-80B

Environmental Conditions

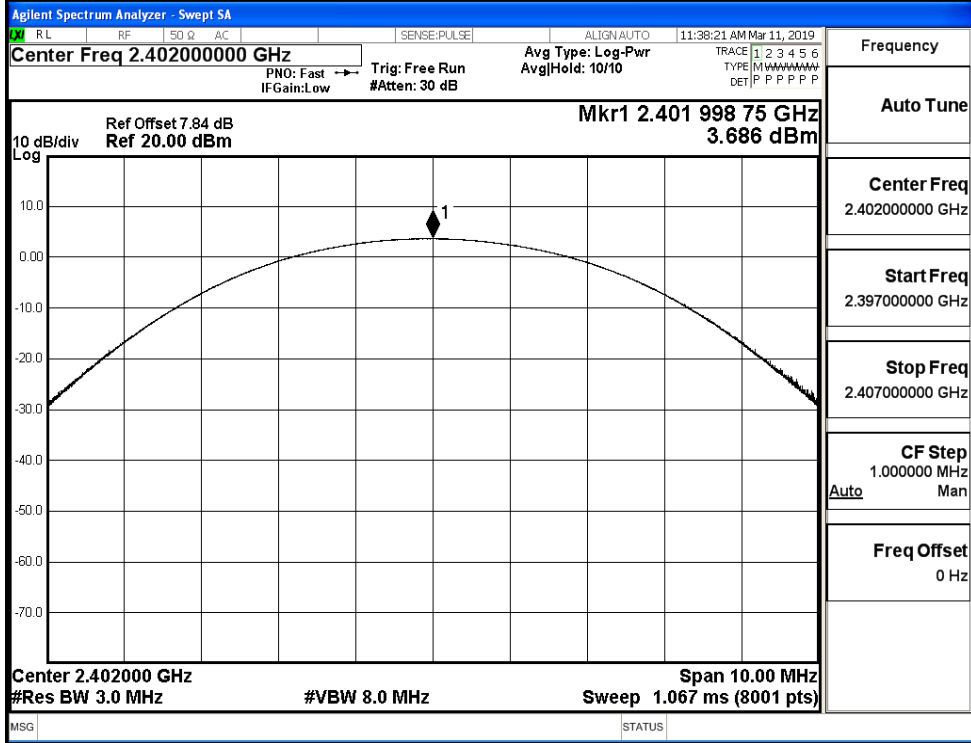
Temperature:	23.2 °C
Relative Humidity:	53.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Tom Liu

A.1 Maximum Conducted Peak Output Power

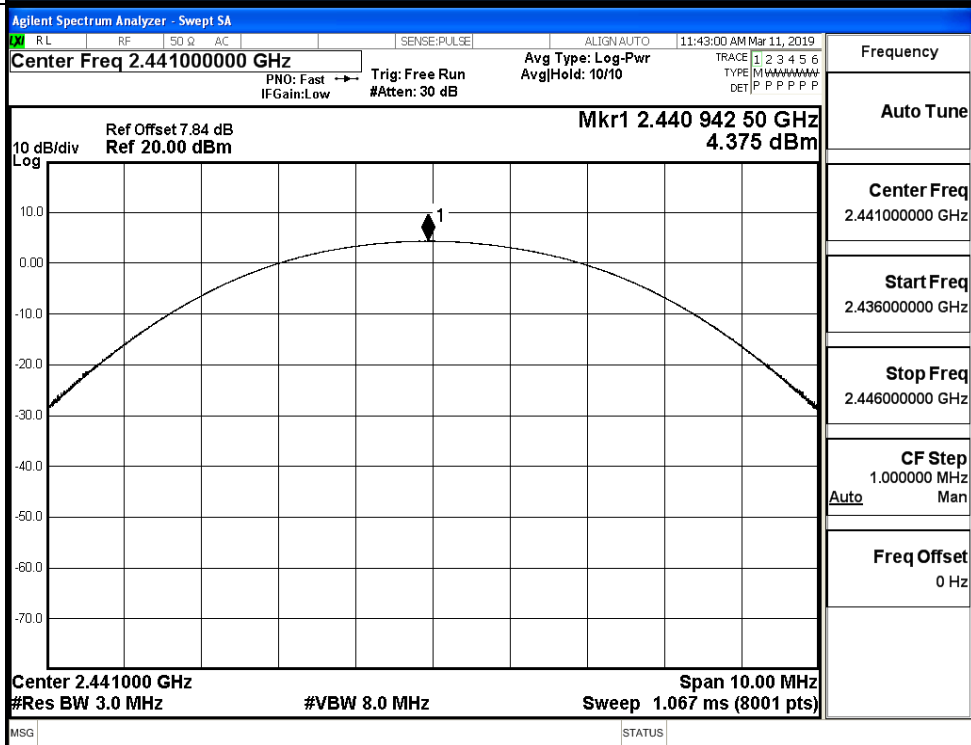
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.686	21	PASS
	MCH	4.375	21	PASS
	HCH	4.097	21	PASS
$\pi/4$ DQPSK	LCH	2.639	21	PASS
	MCH	3.615	21	PASS
	HCH	3.671	21	PASS
8DPSK	LCH	2.625	21	PASS
	MCH	3.998	21	PASS
	HCH	3.936	21	PASS

Test Graphs

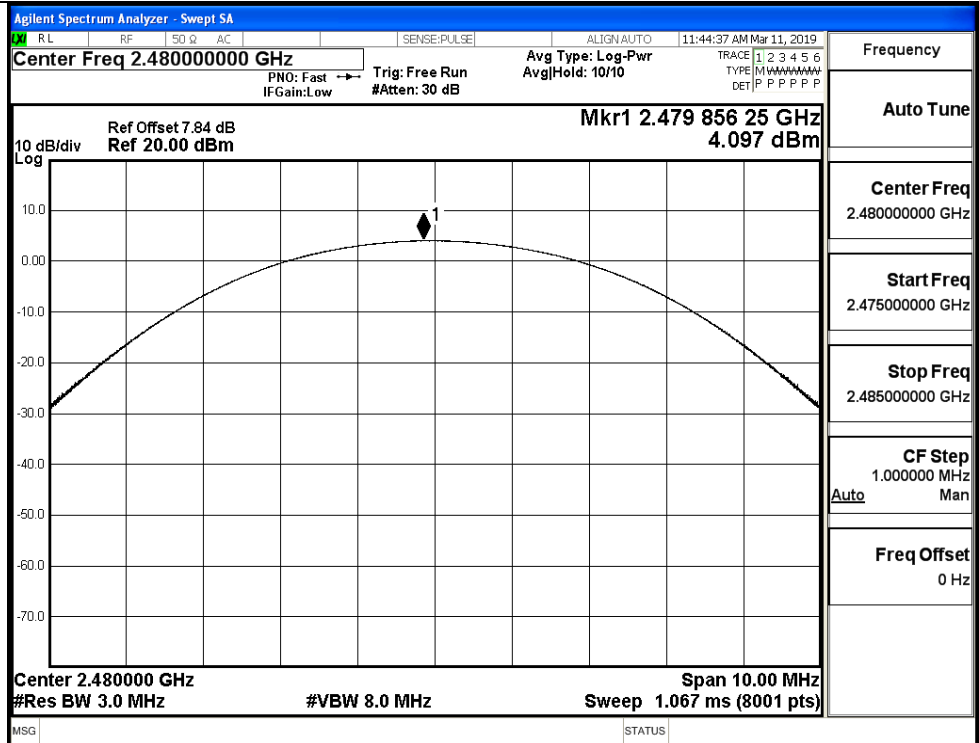
GFSK/LCH



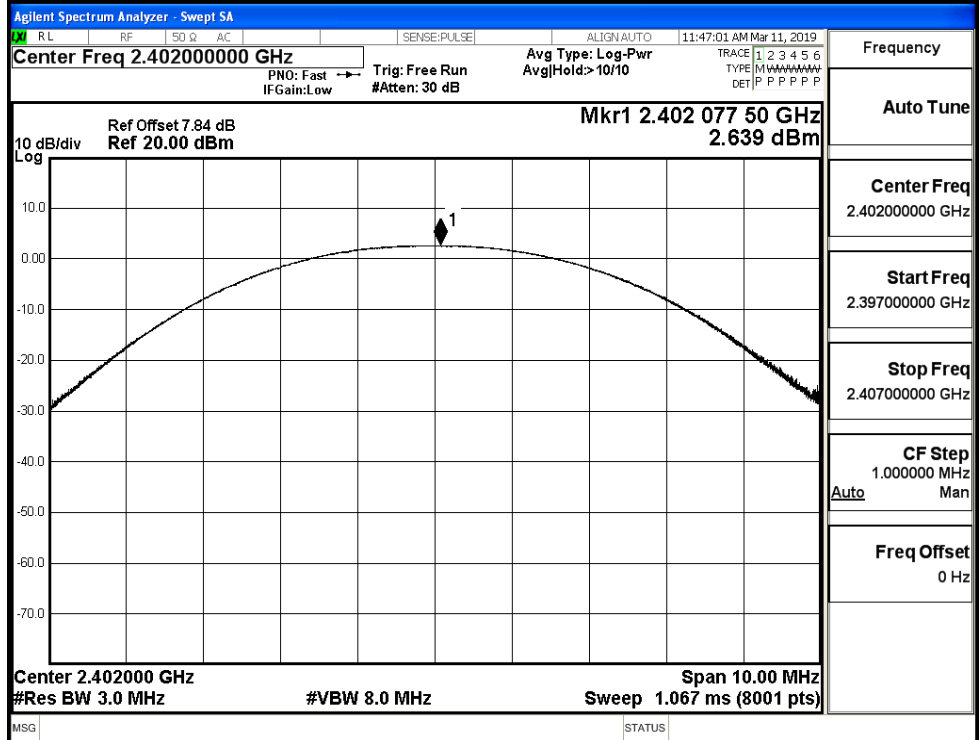
GFSK/MCH



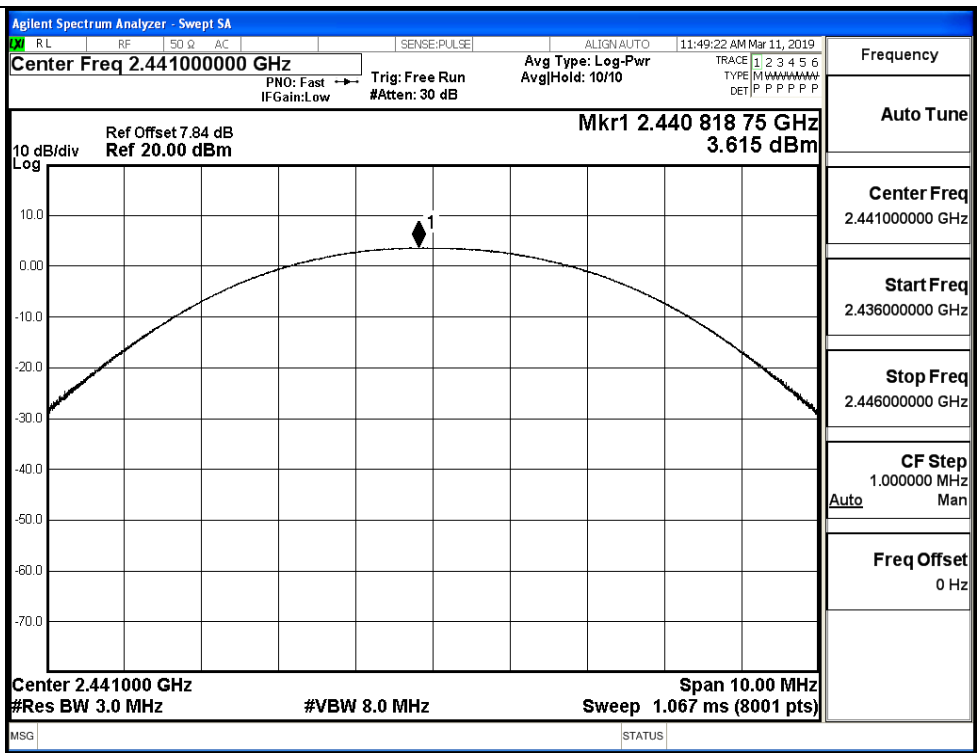
GFSK/HCH



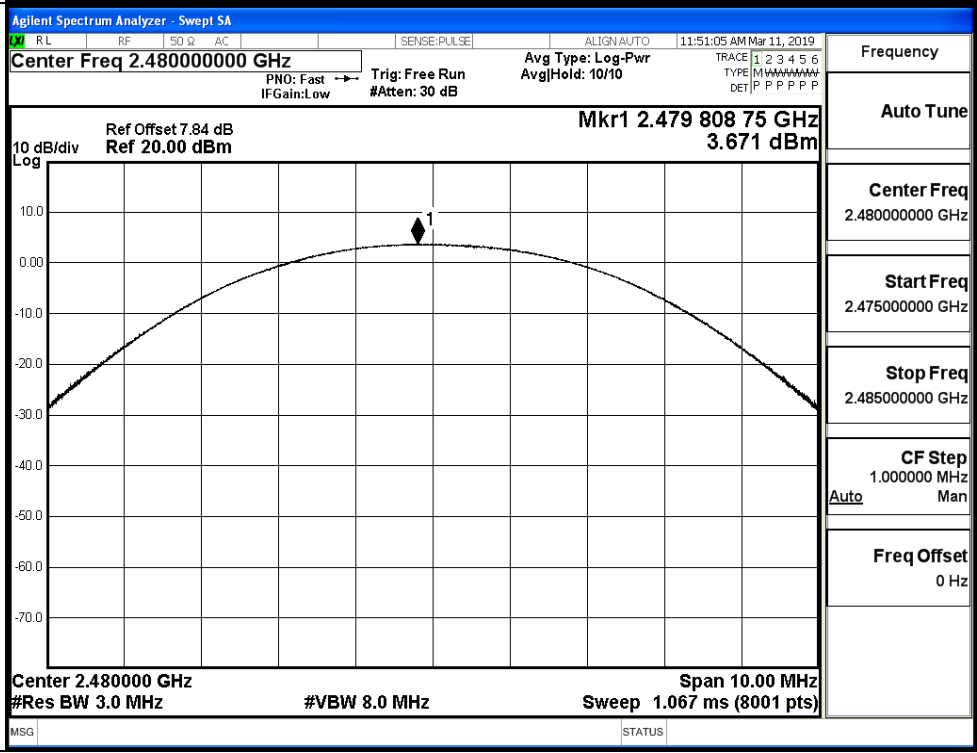
π /4DQPSK/LCH



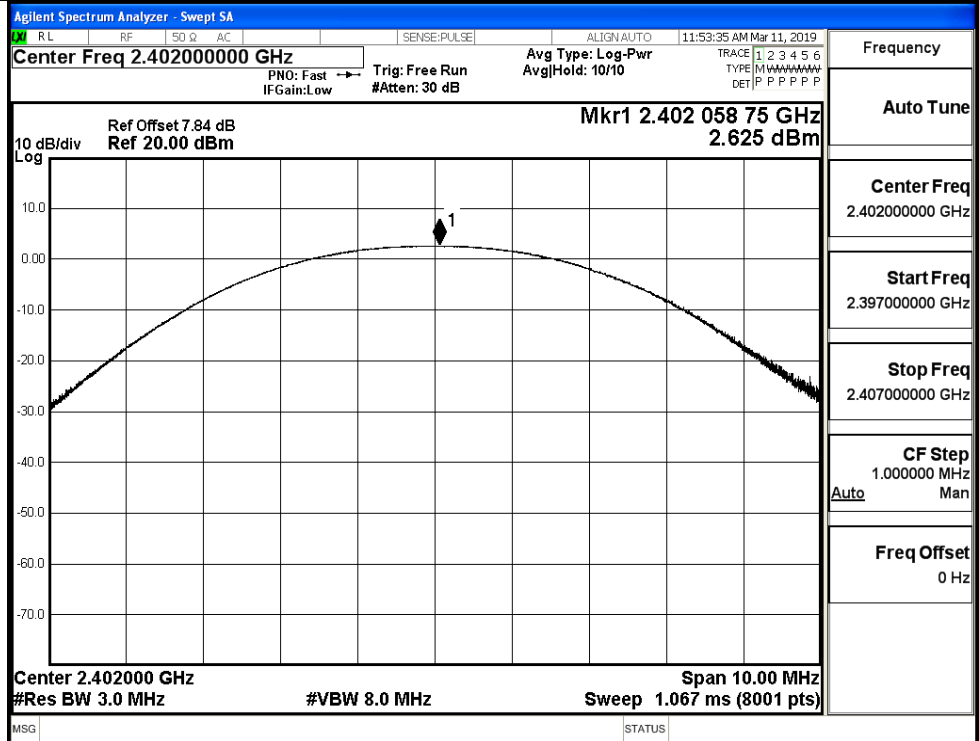
π /4DQPSK/MCH



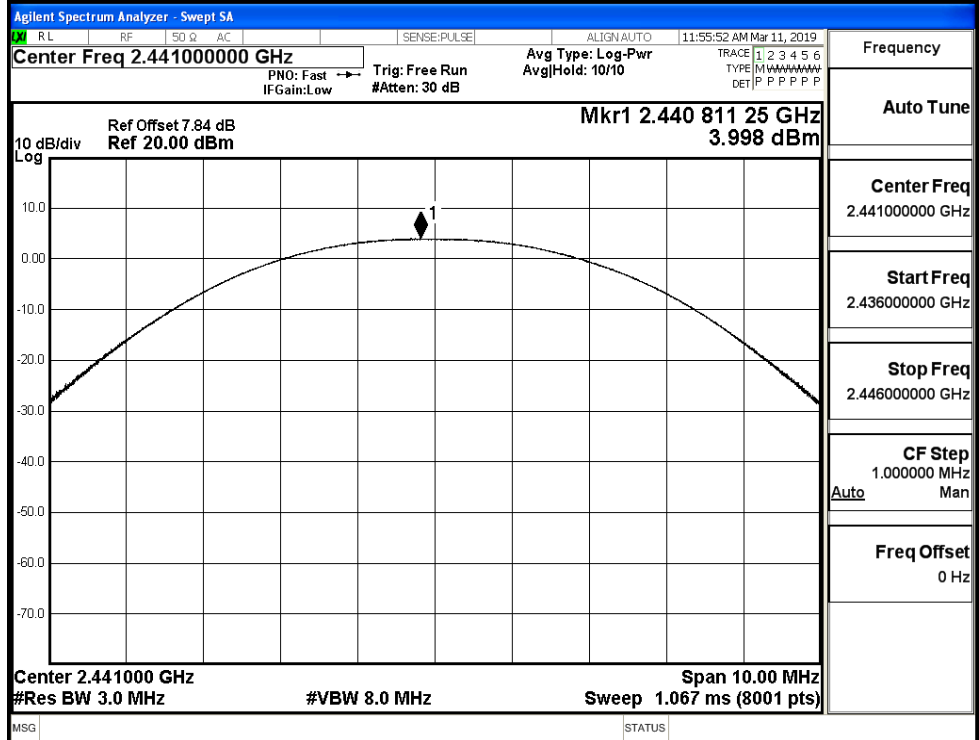
π /4DQPSK/HCH



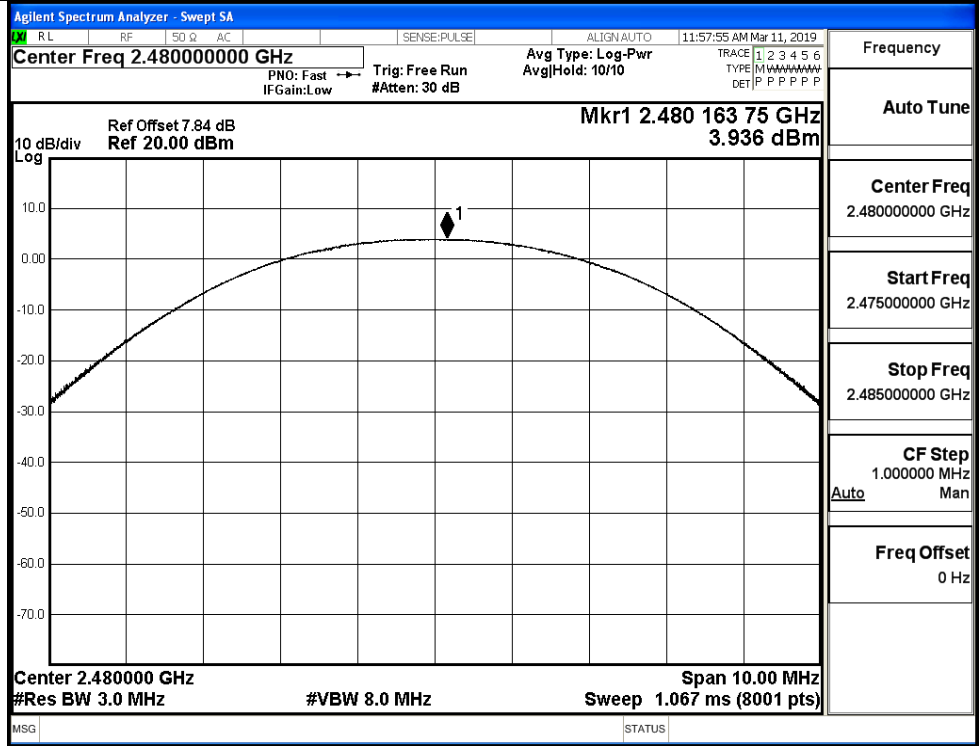
8DPSK/LCH



8DPSK/MCH

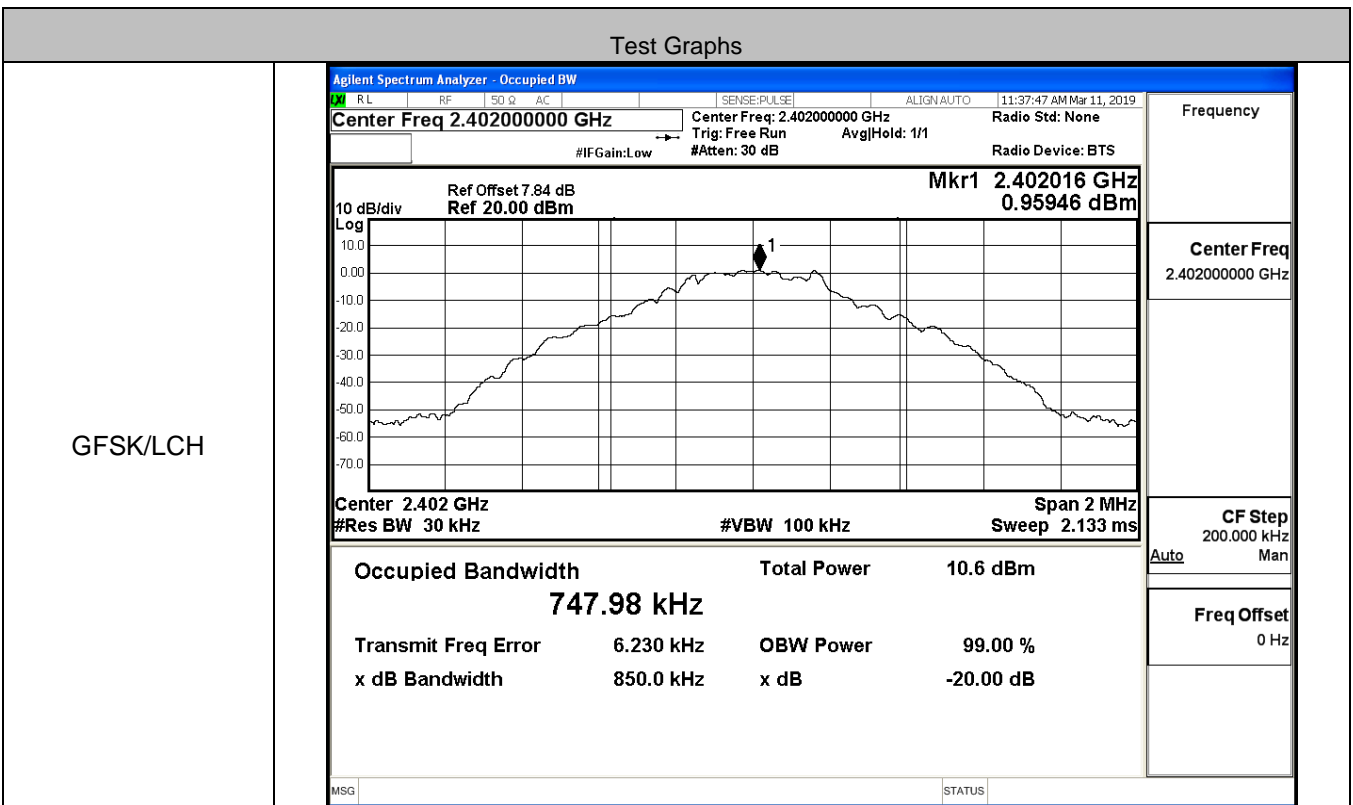


8DPSK/HCH

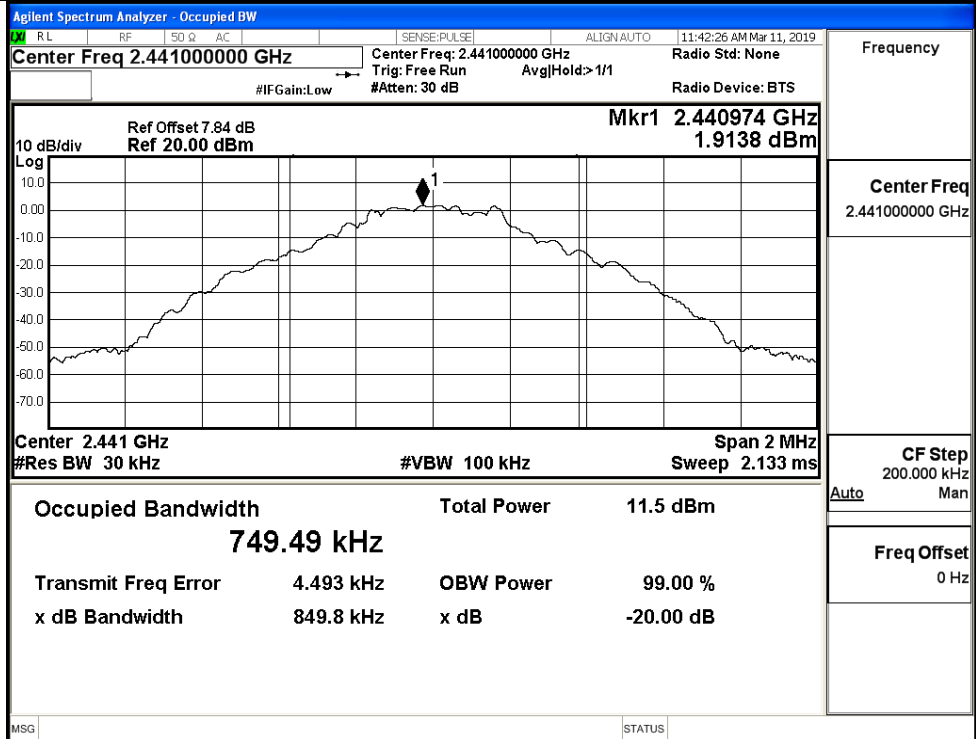


A.2 99% and 20dB Bandwidth

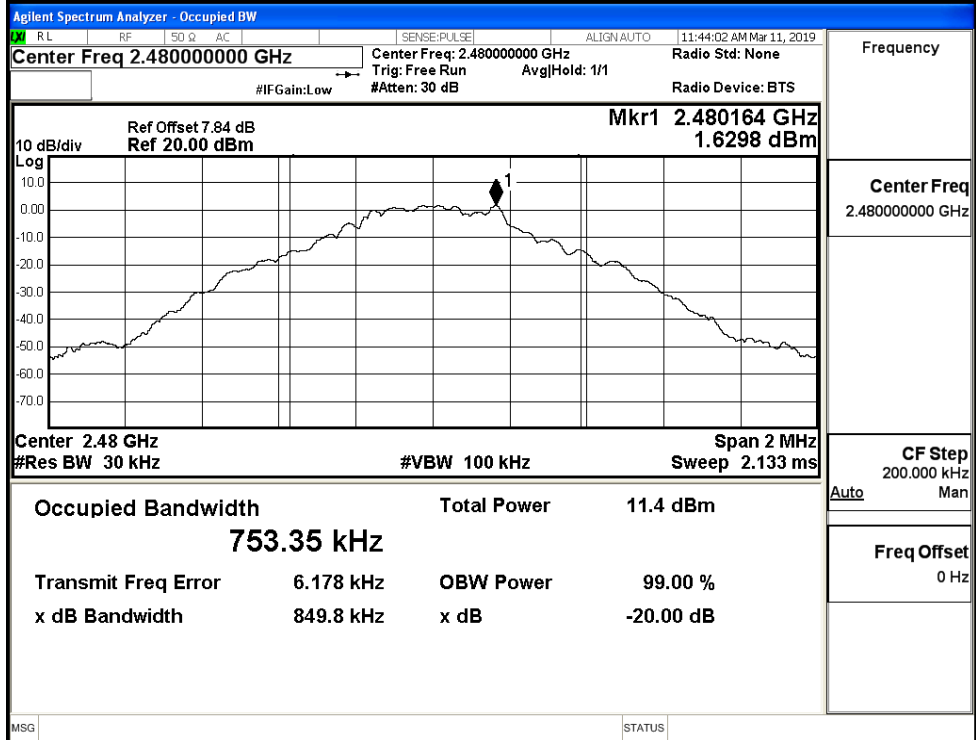
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.74798	0.8500	Not Specified	PASS
	MCH	0.74949	0.8498	Not Specified	PASS
	HCH	0.75335	0.8498	Not Specified	PASS
π/4DQPSK	LCH	1.1438	1.269	Not Specified	PASS
	MCH	1.1466	1.268	Not Specified	PASS
	HCH	1.483	1.271	Not Specified	PASS
8DPSK	LCH	1.1527	1.271	Not Specified	PASS
	MCH	1.1514	1.269	Not Specified	PASS
	HCH	1.1586	1.276	Not Specified	PASS



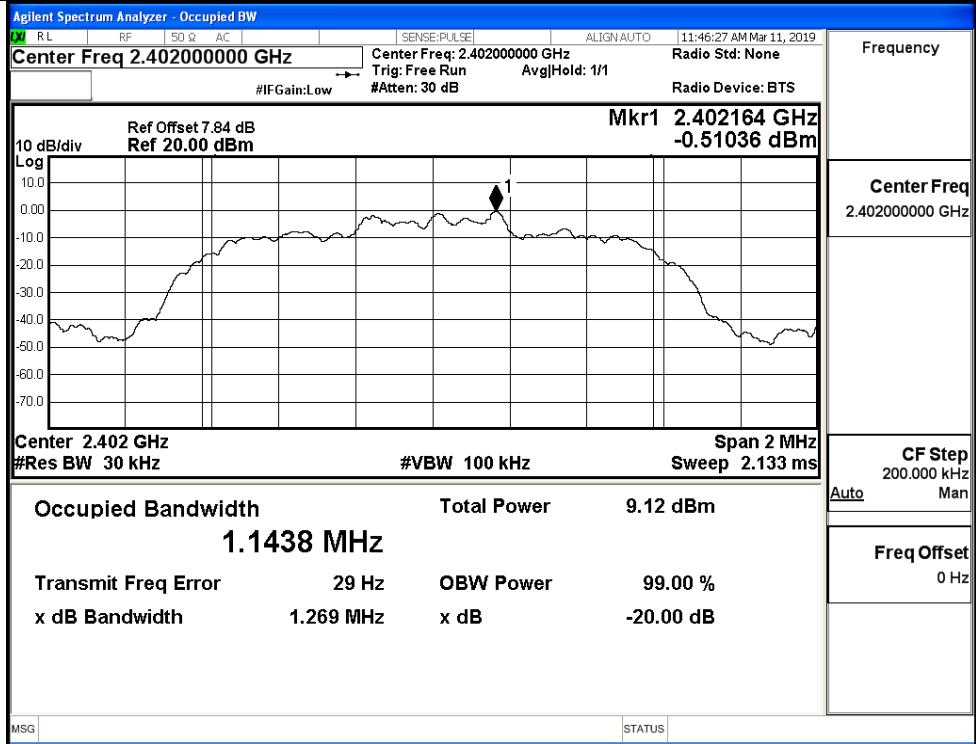
GFSK/MCH



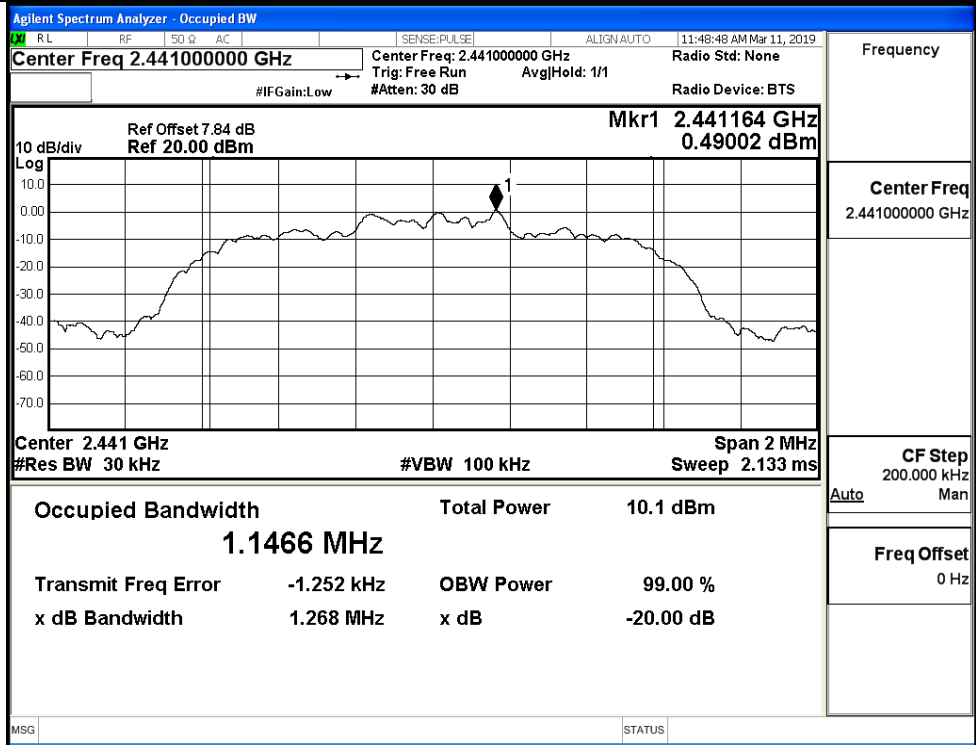
GFSK/HCH



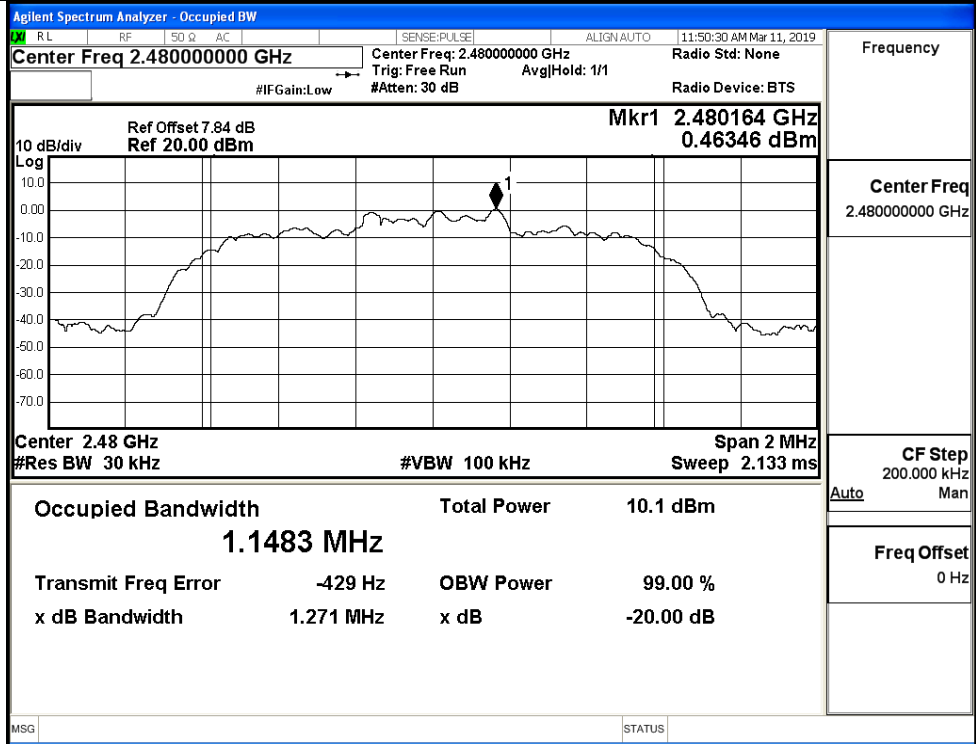
$\pi/4$ DQPSK/LCH



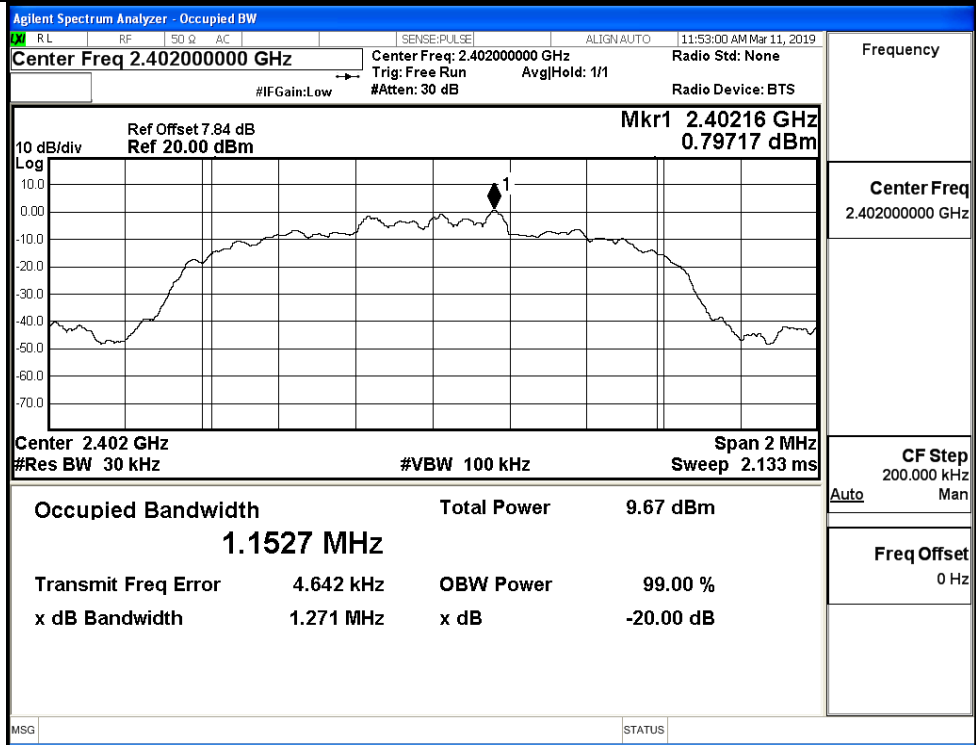
$\pi/4$ DQPSK/MCH



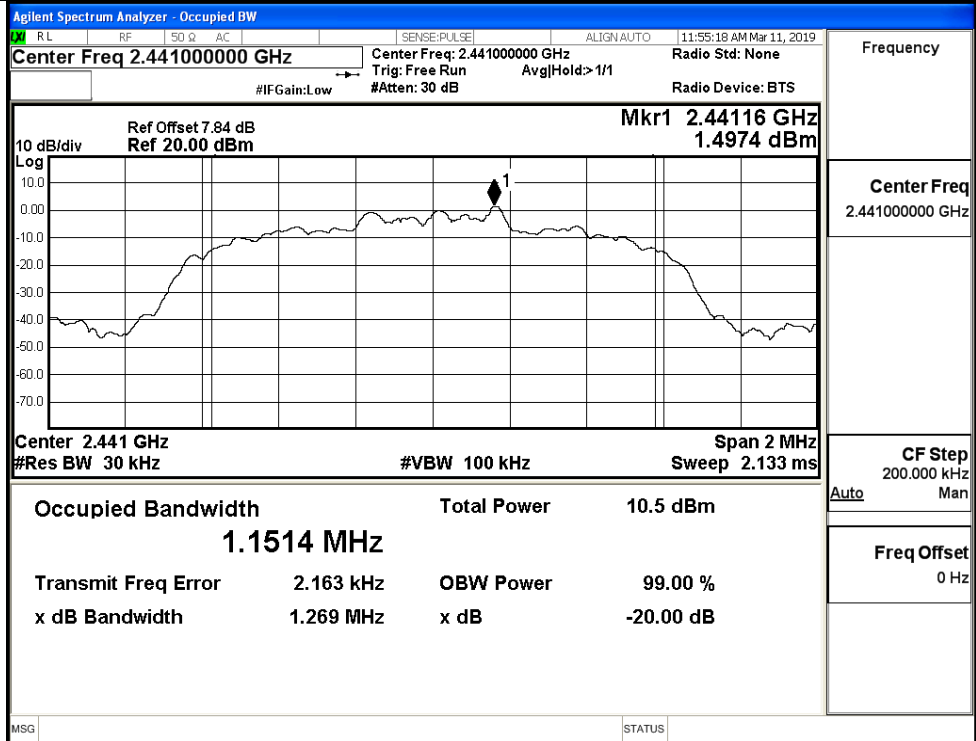
$\pi/4$ DQPSK/HCH



8DPSK/LCH

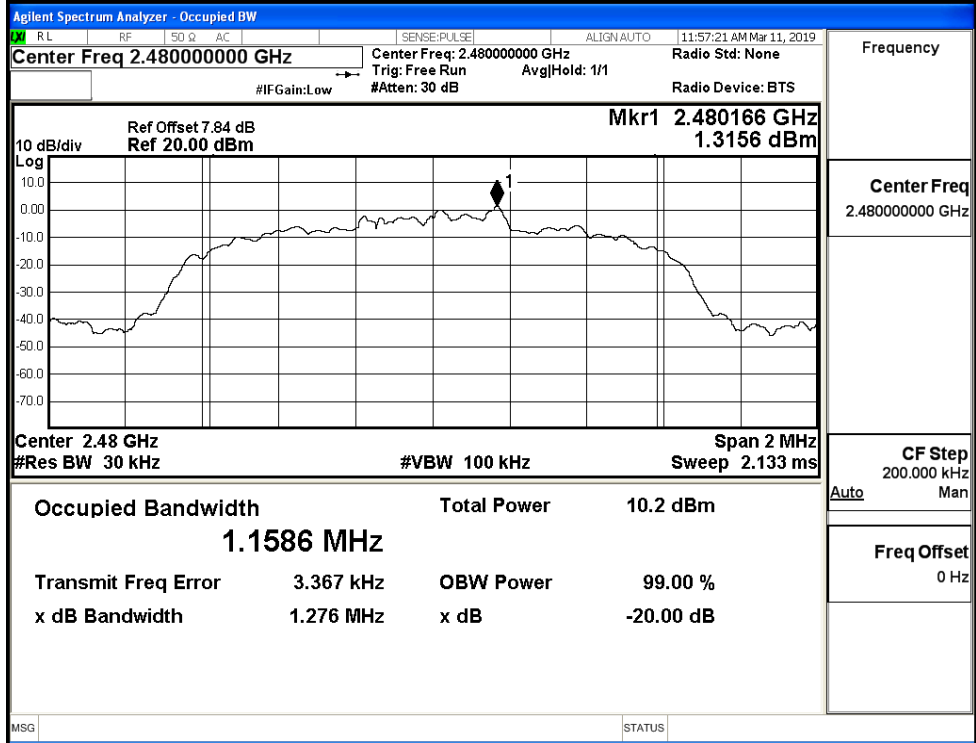


8DPSK/MCH



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

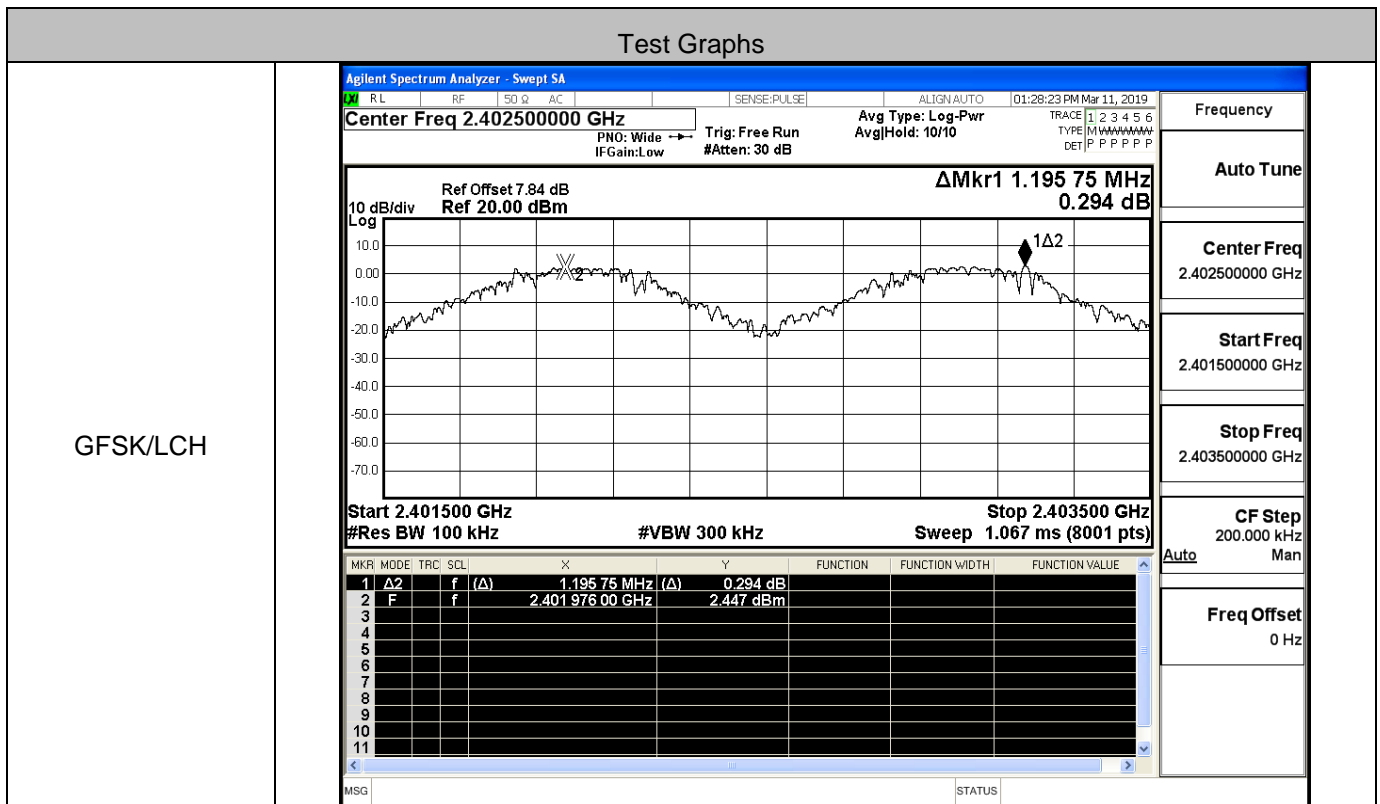
8DPSK/HCH



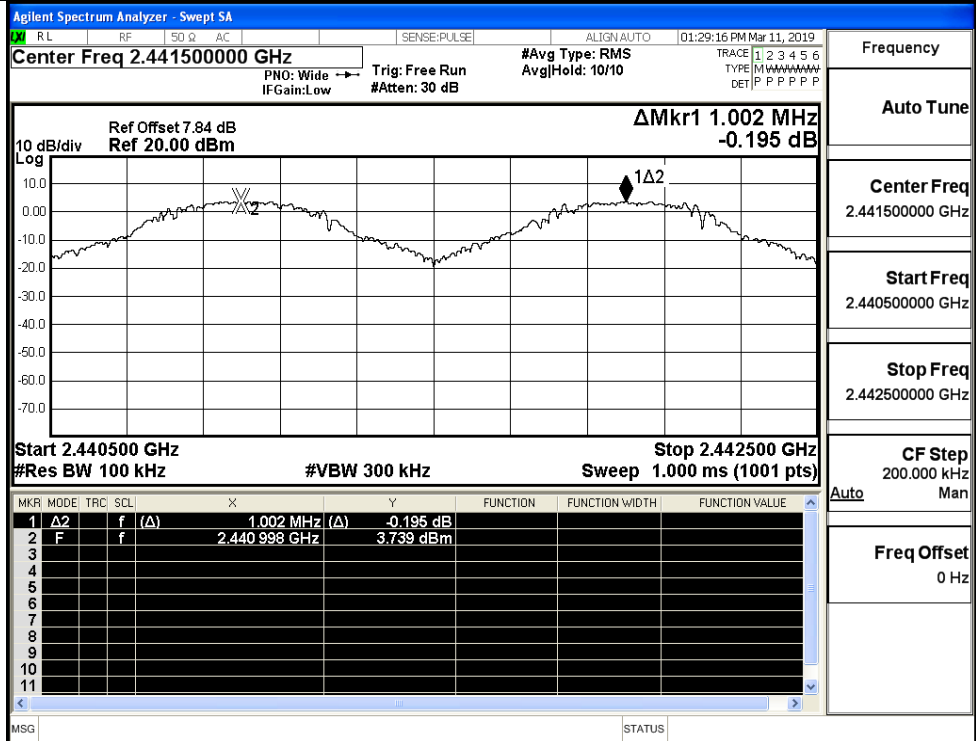
Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.196	0.567	PASS
	MCH	1.002	0.567	PASS
	HCH	0.804	0.567	PASS
π/4DQPSK	LCH	1.220	0.847	PASS
	MCH	0.858	0.847	PASS
	HCH	1.012	0.847	PASS
8DPSK	LCH	0.984	0.851	PASS
	MCH	1.024	0.851	PASS
	HCH	0.872	0.851	PASS

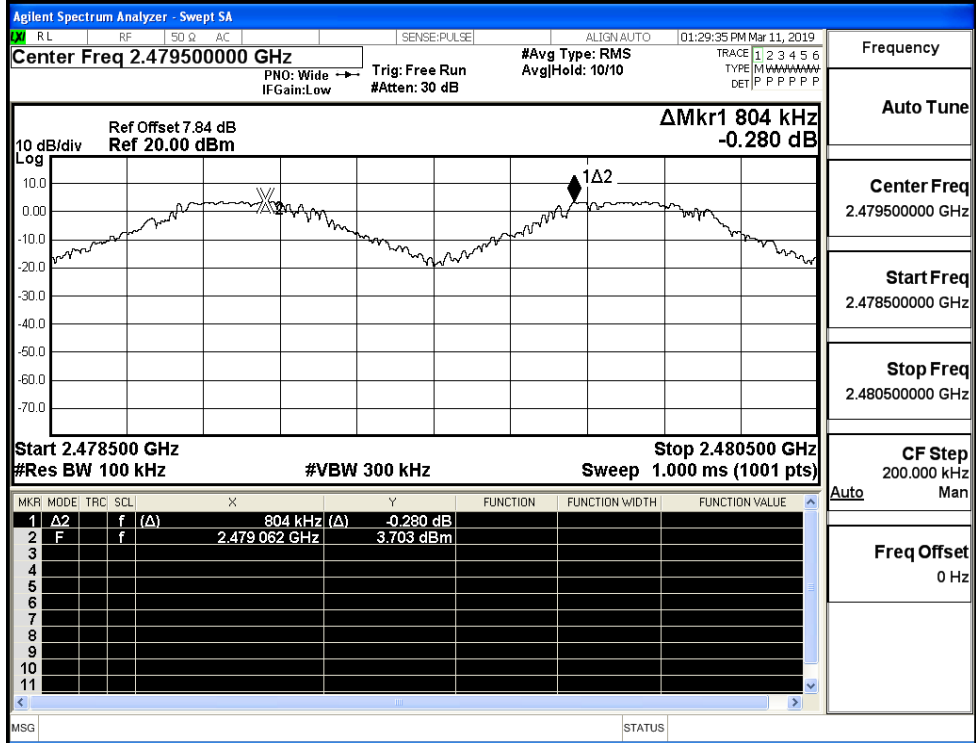


GFSK/MCH



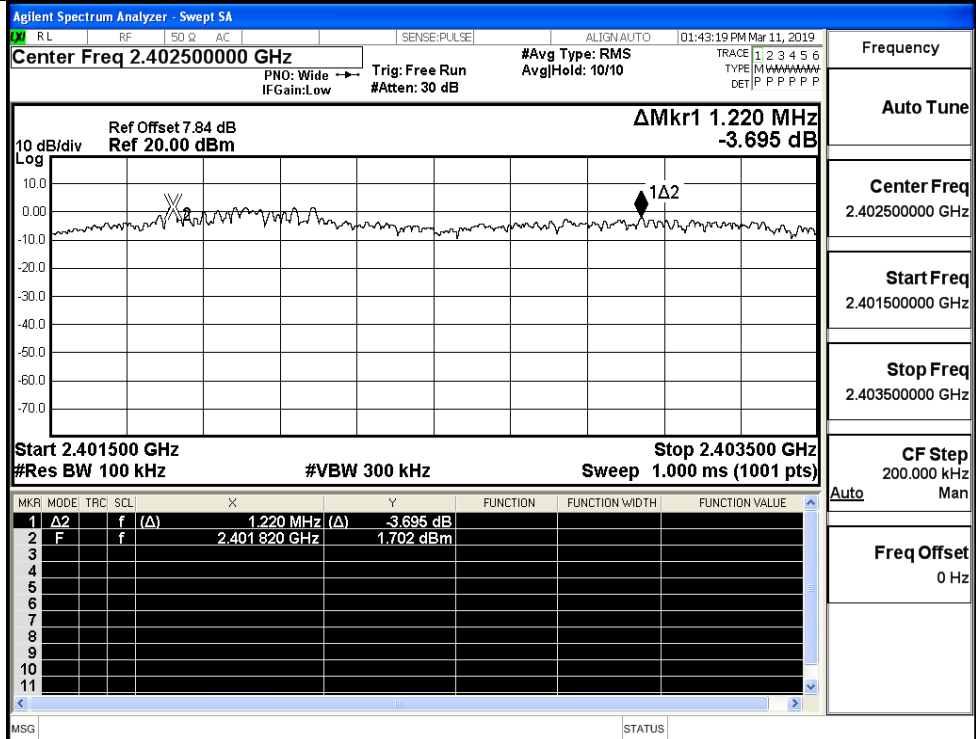
Frequency
Auto Tune
Center Freq
2.441500000 GHz
Start Freq
2.440500000 GHz
Stop Freq
2.442500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

GFSK/HCH

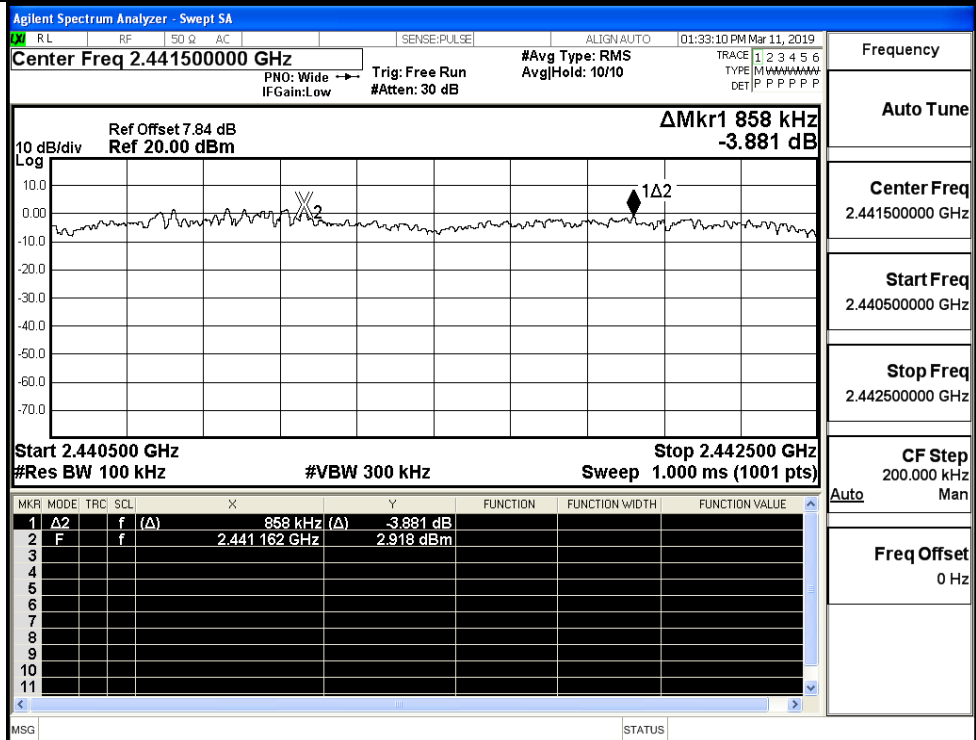


Frequency
Auto Tune
Center Freq
2.479500000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.480500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

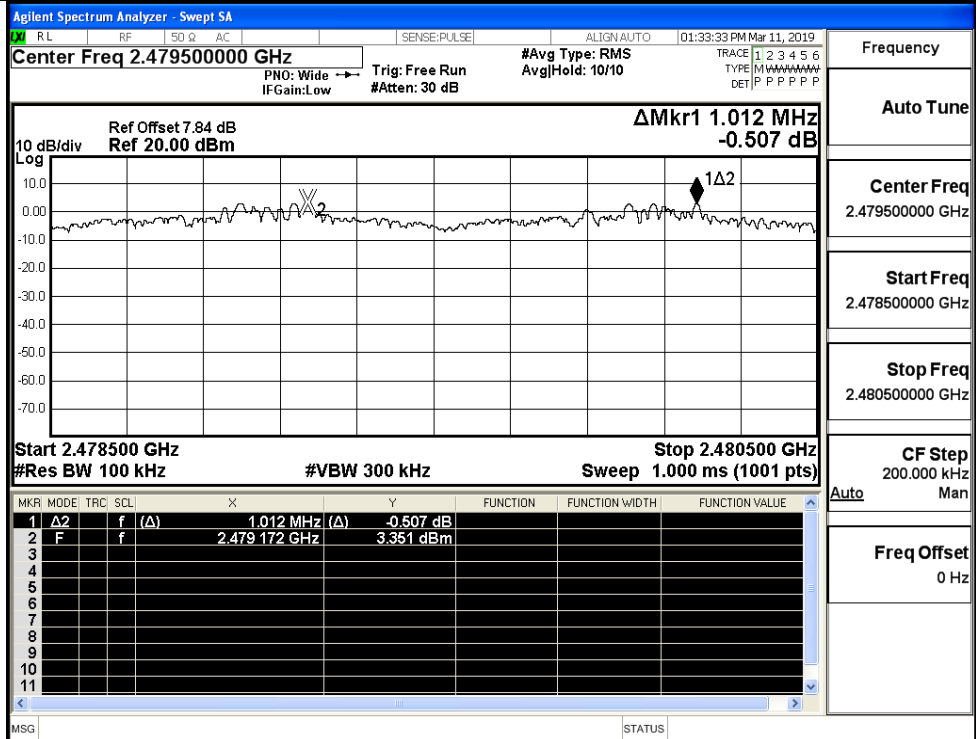
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

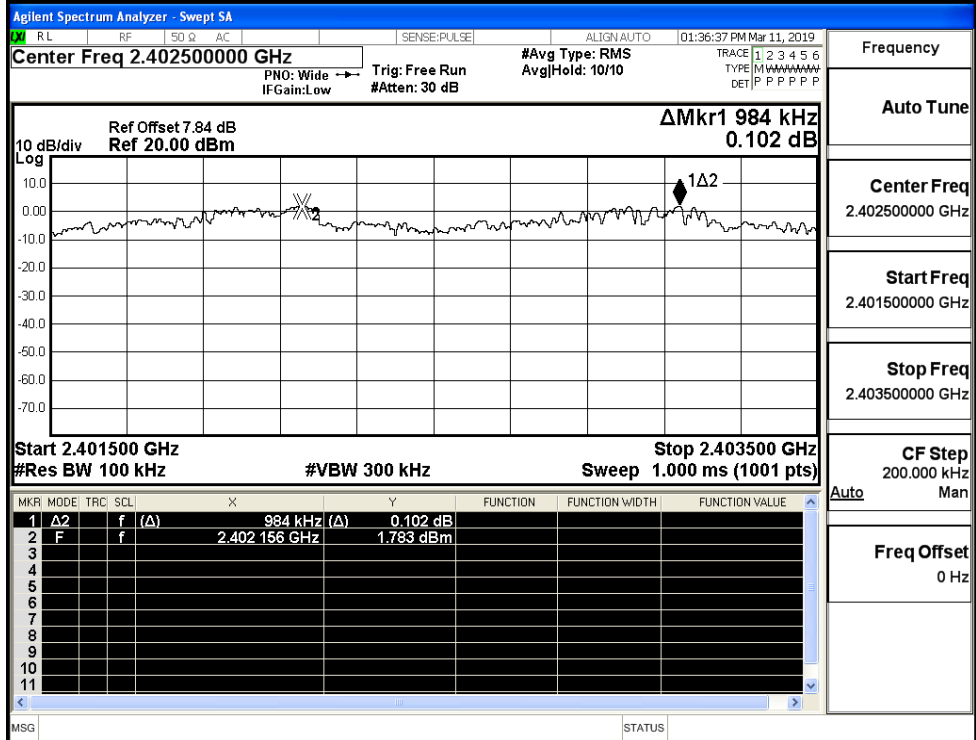


π/4DQPSK/HCH



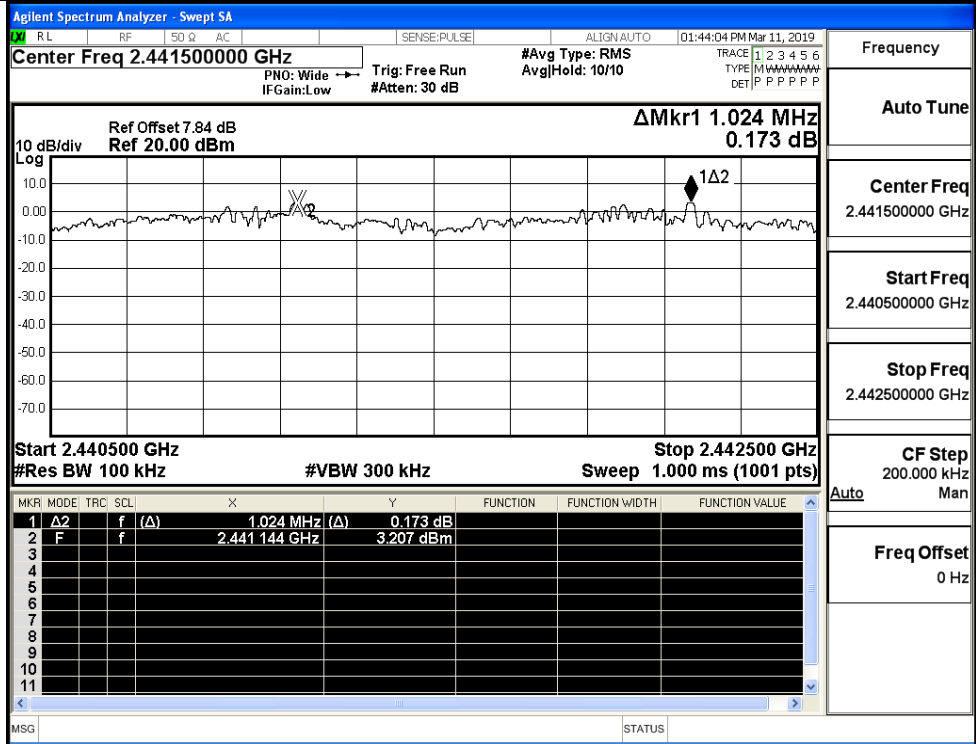
Frequency
Auto Tune
Center Freq
2.479500000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.480500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

8DPSK/LCH

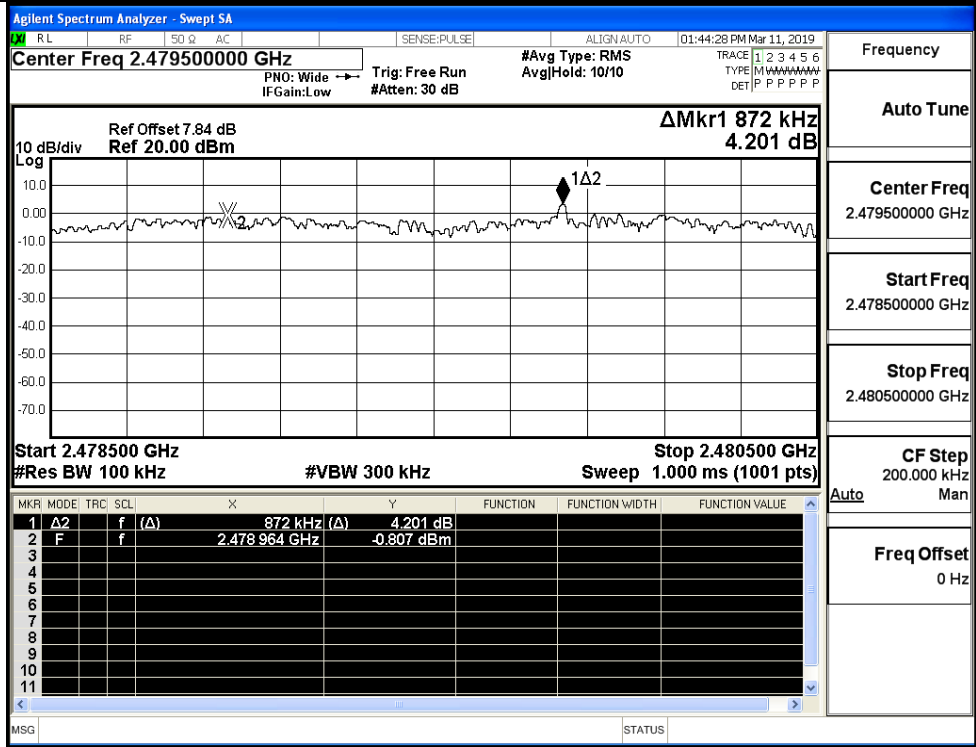


Frequency
Auto Tune
Center Freq
2.402500000 GHz
Start Freq
2.401500000 GHz
Stop Freq
2.403500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

8DPSK/MCH



8DPSK/HCH



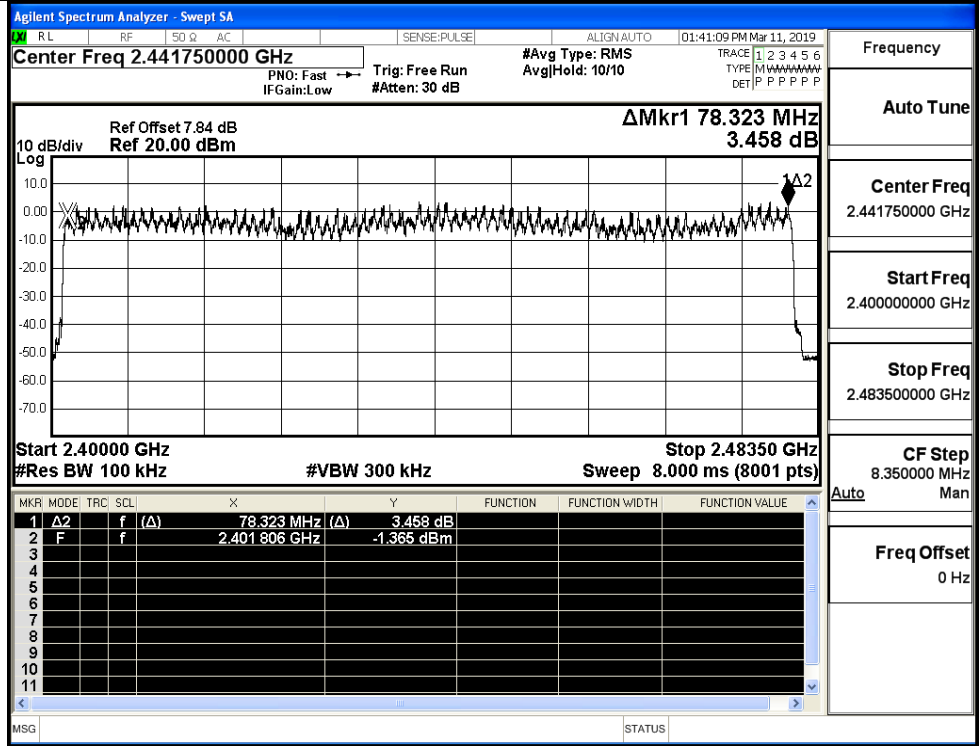
A.4 Hopping Channel Number

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

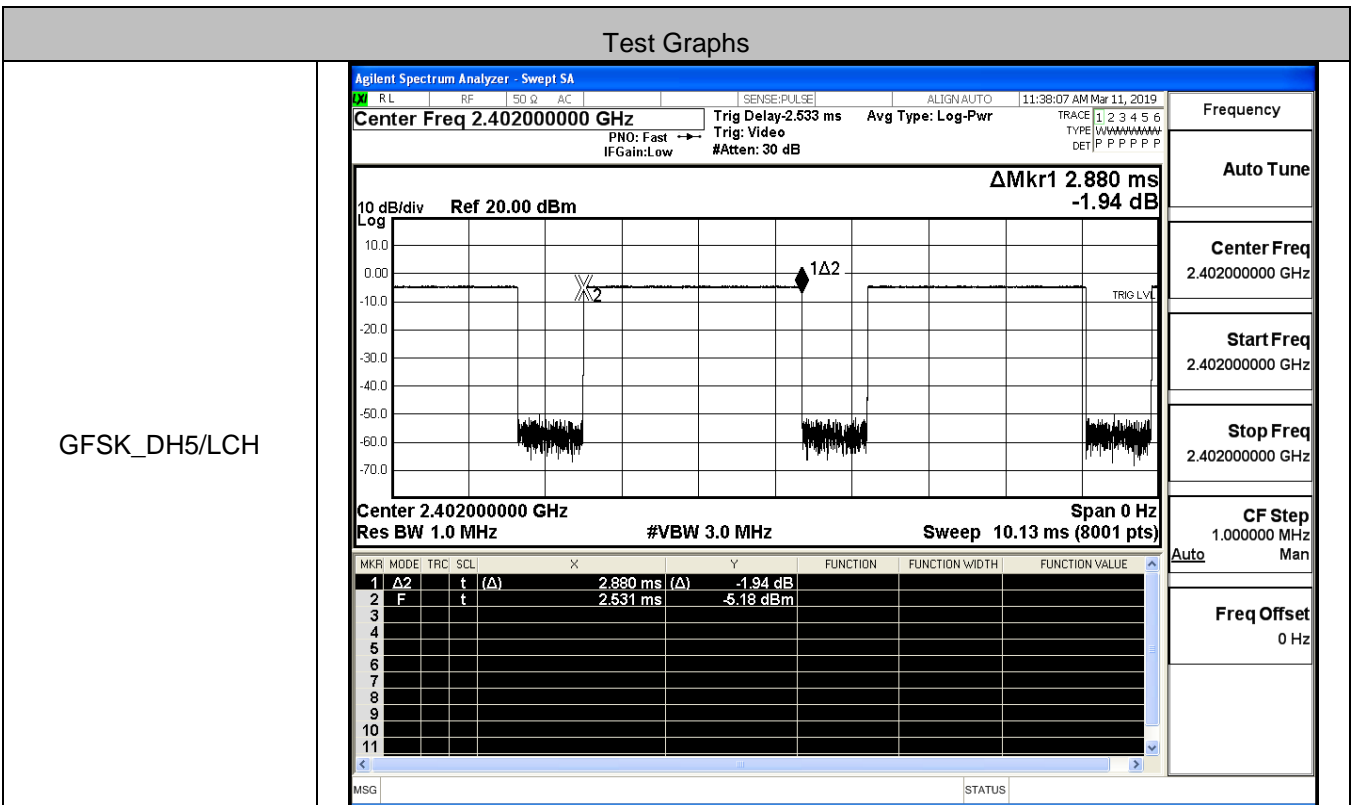
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.84 dB Ref 20.00 dBm</p> <p>ΔMkr1 77.979 MHz 1.038 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <tr> <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>Δ2</td> <td>f</td> <td>(Δ)</td> <td>77.979 MHz (Δ)</td> <td>1.038 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401994 GHz</td> <td>2.690 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	77.979 MHz (Δ)	1.038 dB				2	F	f		2.401994 GHz	2.690 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	77.979 MHz (Δ)	1.038 dB																							
2	F	f		2.401994 GHz	2.690 dBm																							
<p>$\pi/4$DQPSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.84 dB Ref 20.00 dBm</p> <p>ΔMkr1 78.208 MHz 5.647 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>Δ2</td> <td>f</td> <td>(Δ)</td> <td>78.208 MHz (Δ)</td> <td>5.647 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401853 GHz</td> <td>-2.298 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	78.208 MHz (Δ)	5.647 dB				2	F	f		2.401853 GHz	-2.298 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	78.208 MHz (Δ)	5.647 dB																							
2	F	f		2.401853 GHz	-2.298 dBm																							

8DPSK/Hop

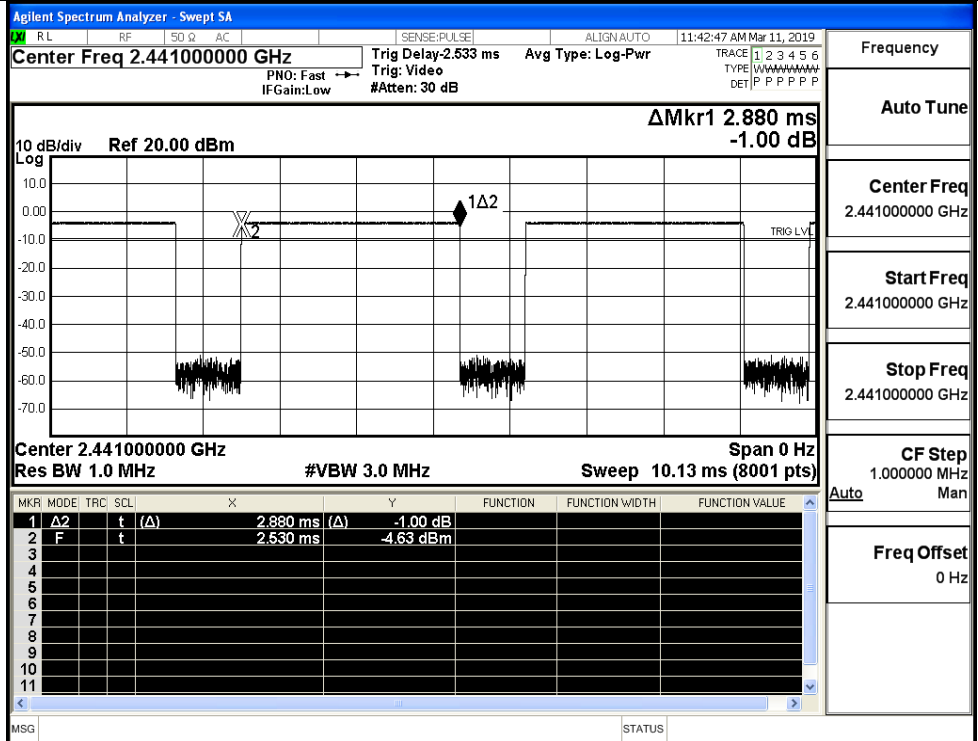


A.5 Dwell Time

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

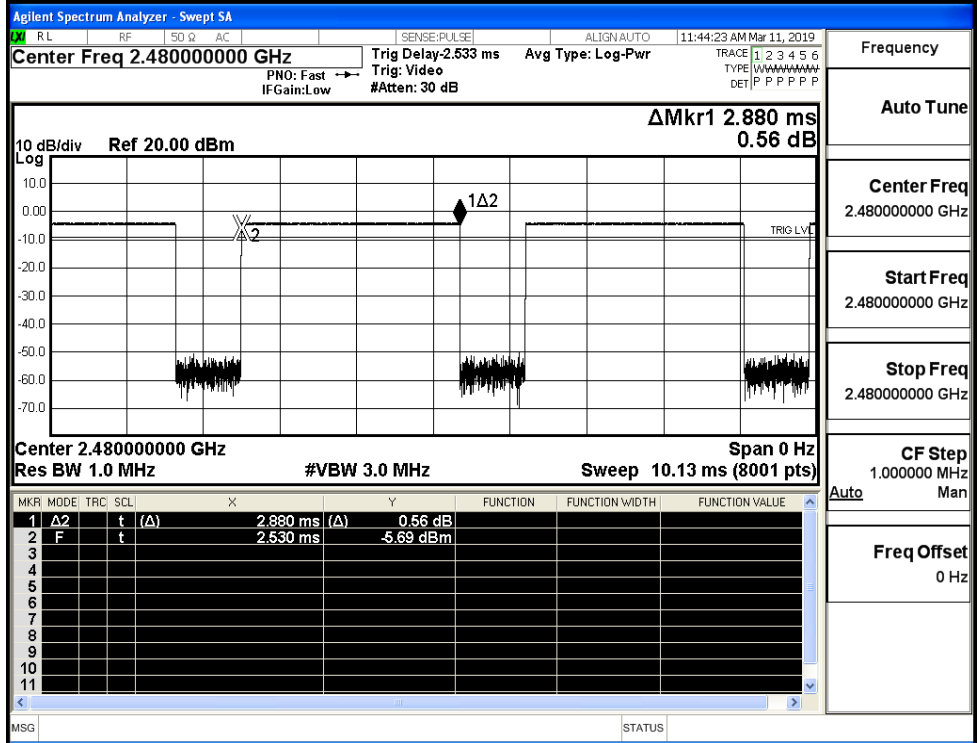


GFSK_DH5/MCH



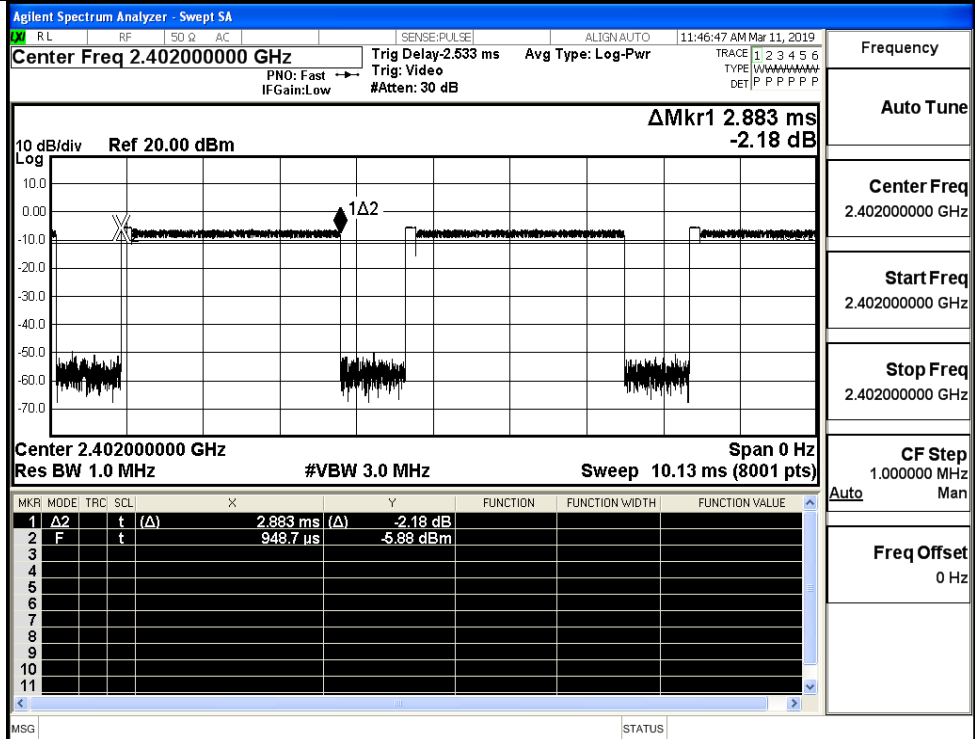
Frequency	
Auto Tune	
Center Freq	2.441000000 GHz
Start Freq	2.441000000 GHz
Stop Freq	2.441000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

GFSK_DH5/HCH

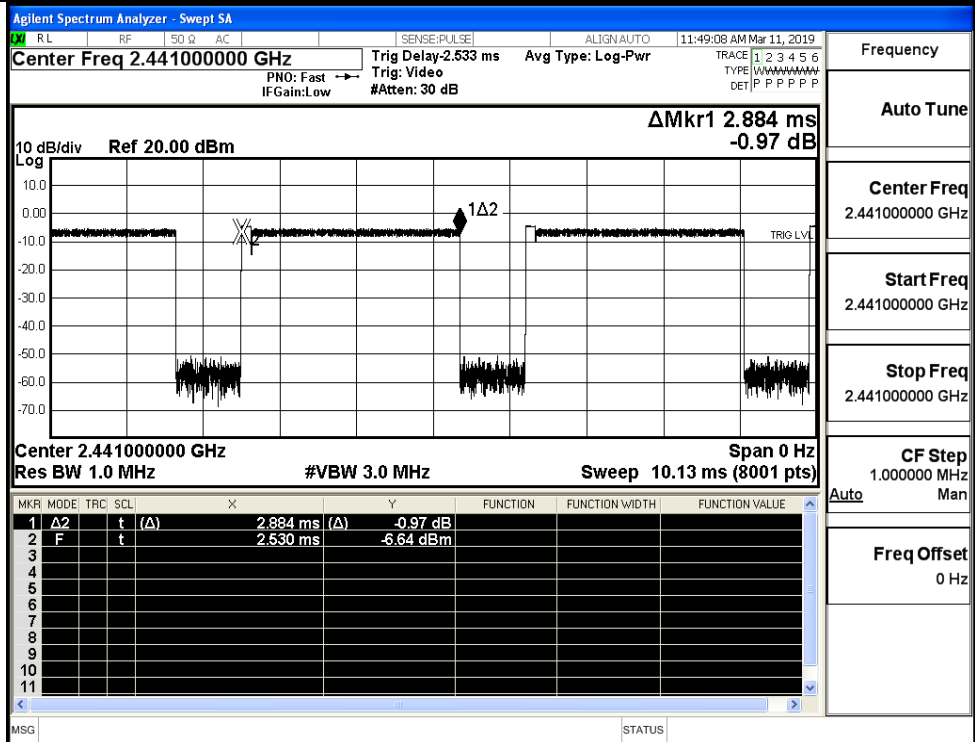


Frequency	
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

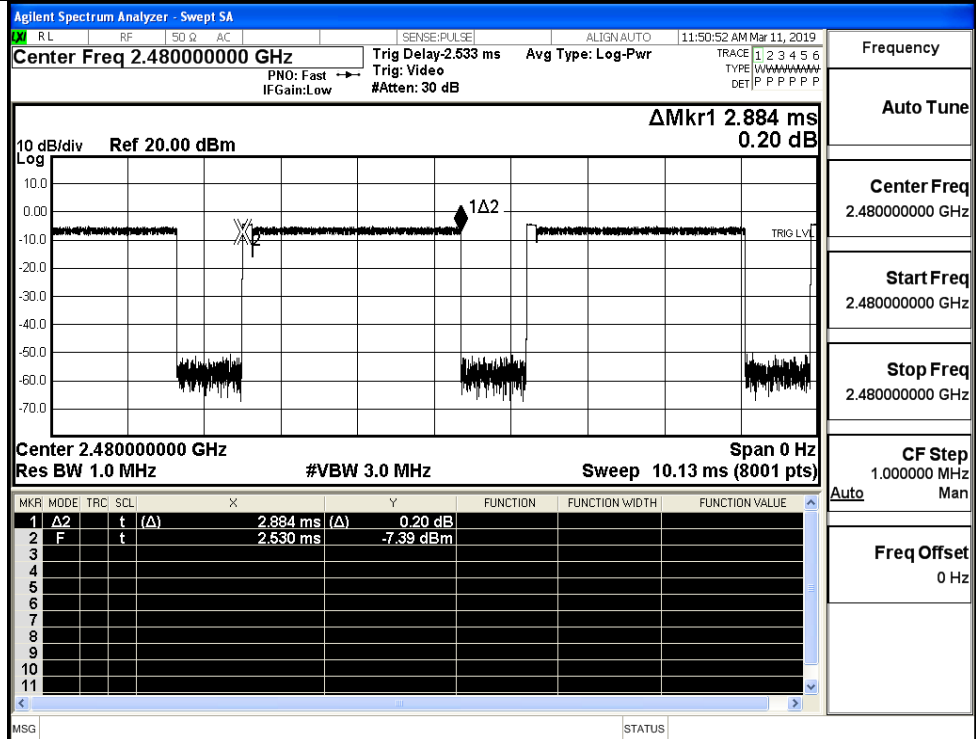
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH

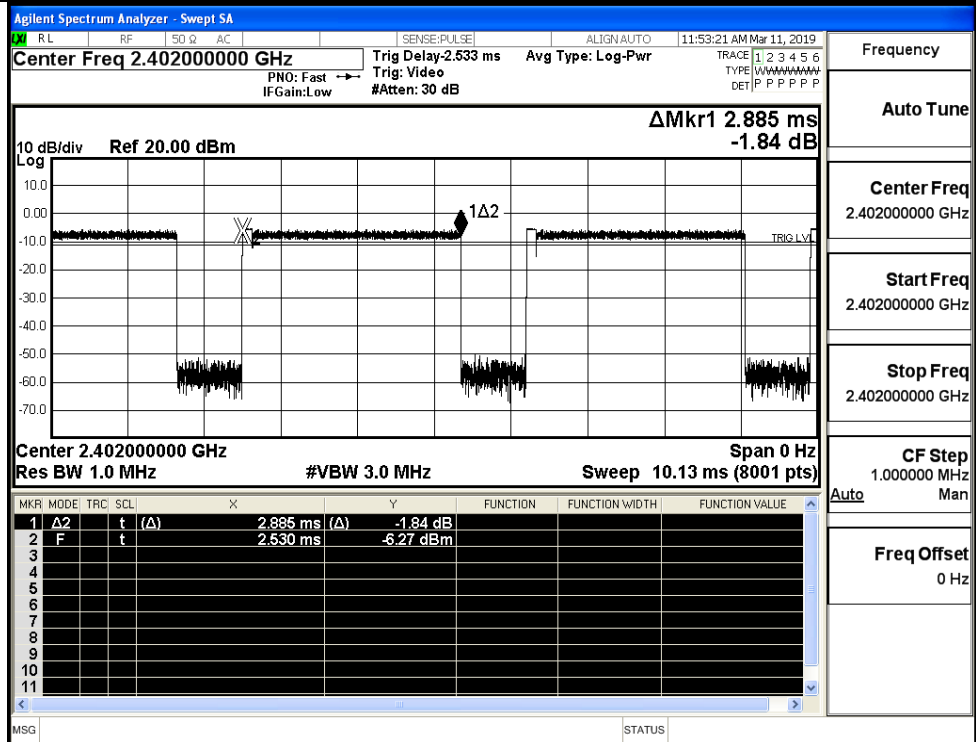


$\pi/4$ DQPSK
_2DH5/HCH



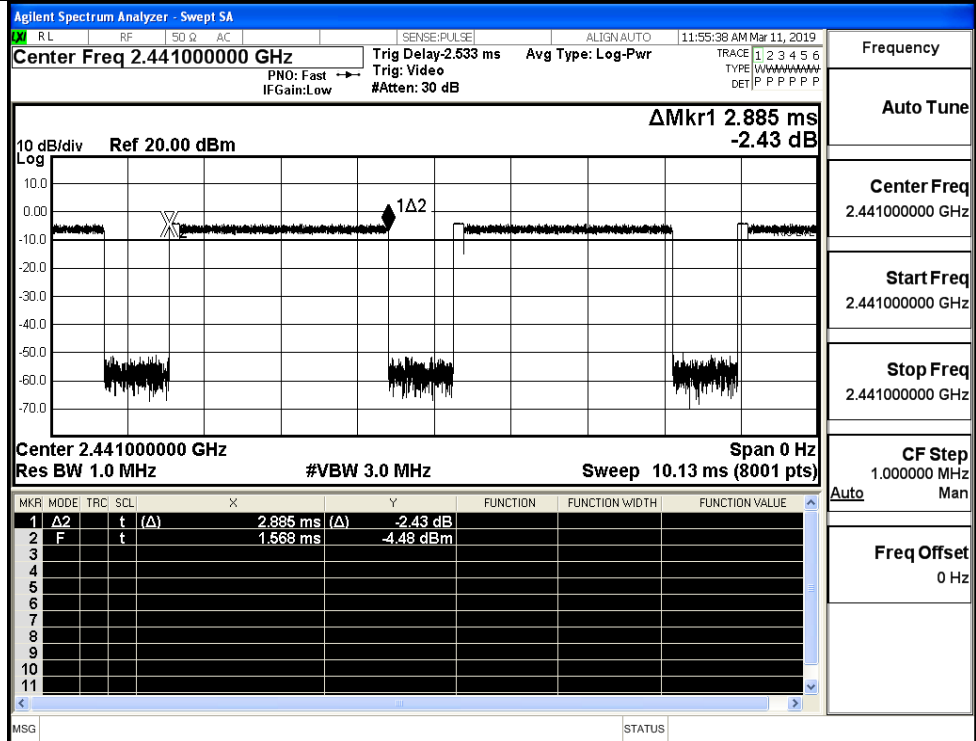
Frequency	2.480000000 GHz
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK_3DH5/LCH

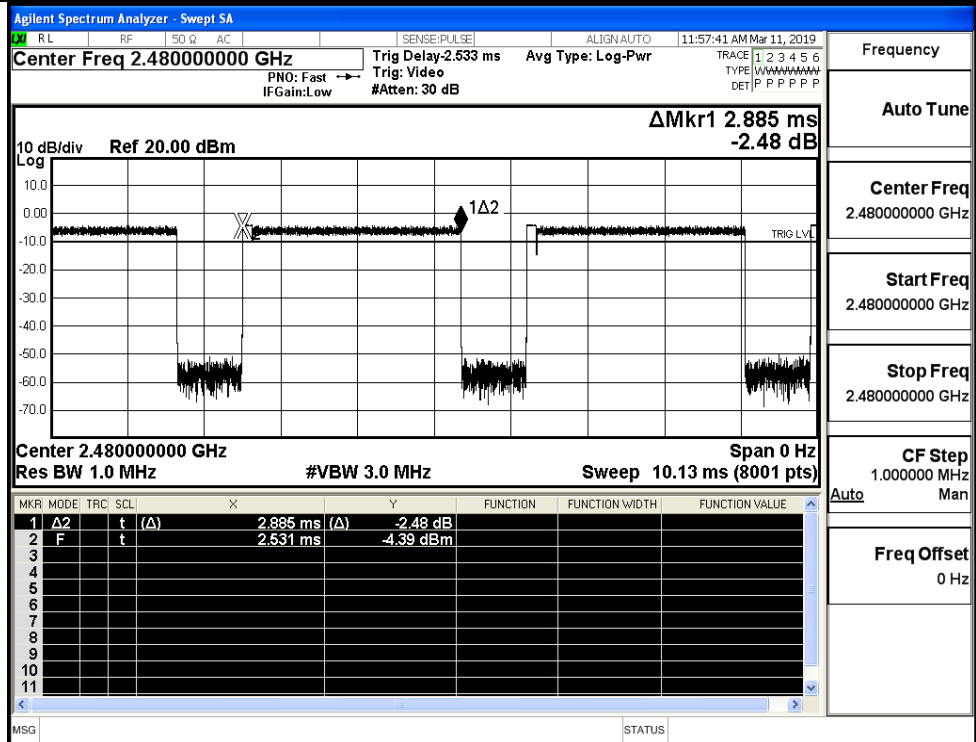


Frequency	2.402000000 GHz
Auto Tune	
Center Freq	2.402000000 GHz
Start Freq	2.402000000 GHz
Stop Freq	2.402000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

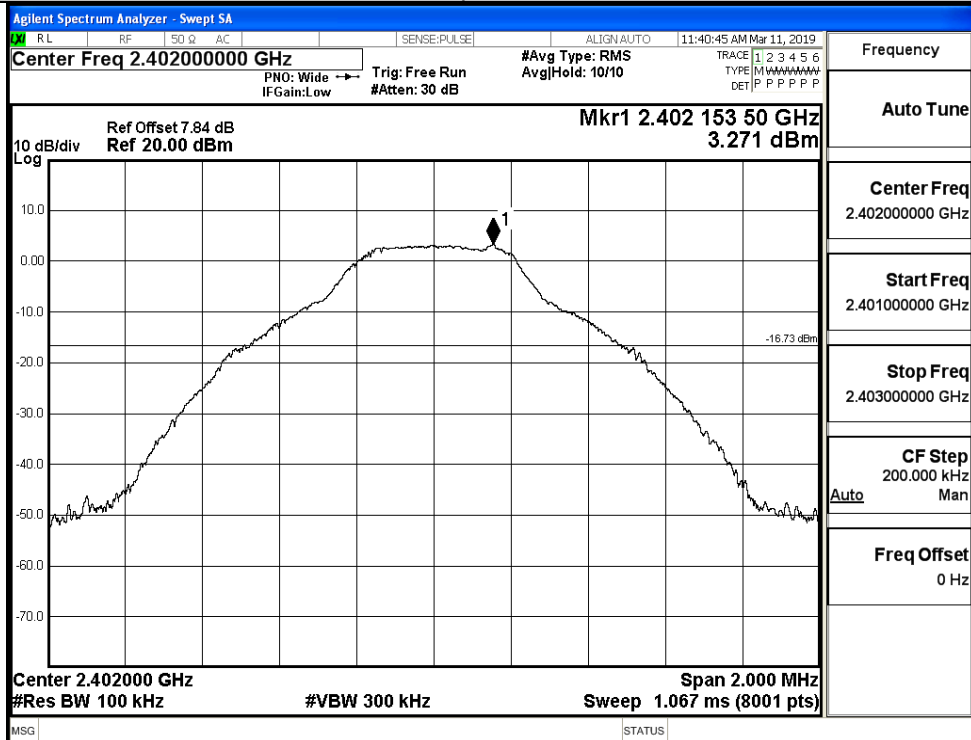


A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.271	-45.378	-16.729	PASS
	MCH	4.639	-45.373	-15.361	PASS
	HCH	3.931	-45.271	-16.069	PASS
$\pi/4$ DQPSK	LCH	2.174	-43.769	-17.826	PASS
	MCH	2.67	-44.259	-17.330	PASS
	HCH	2.966	-44.822	-17.034	PASS
8DPSK	LCH	3.116	-44.783	-16.884	PASS
	MCH	3.643	-44.737	-16.357	PASS
	HCH	3.644	-44.838	-16.356	PASS

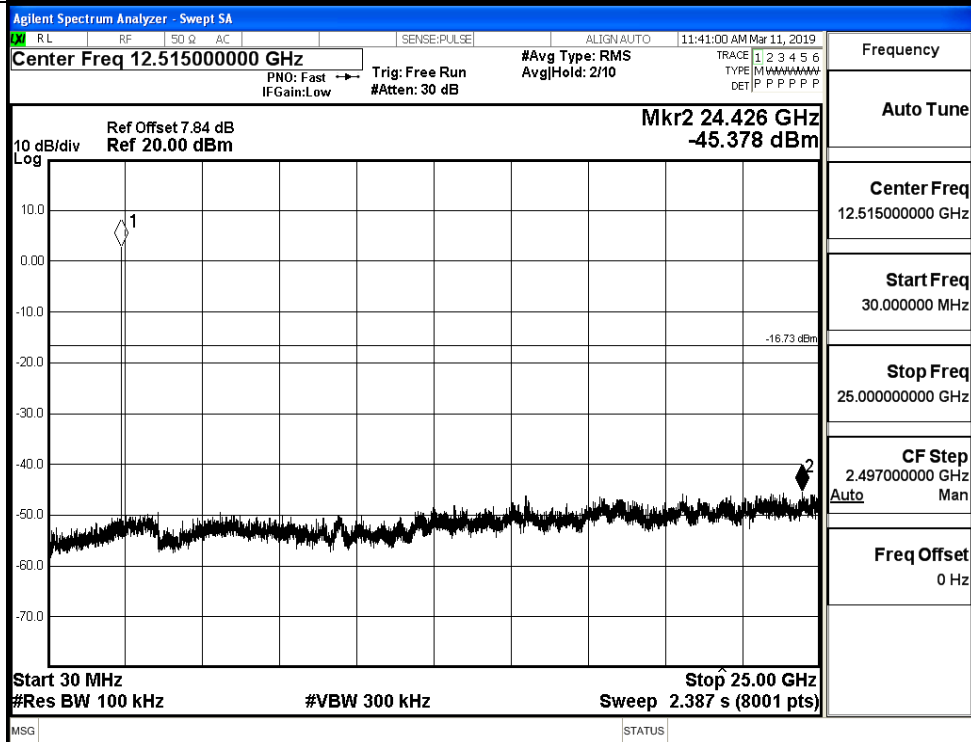
GFSK_LCH_Graphs

Pref



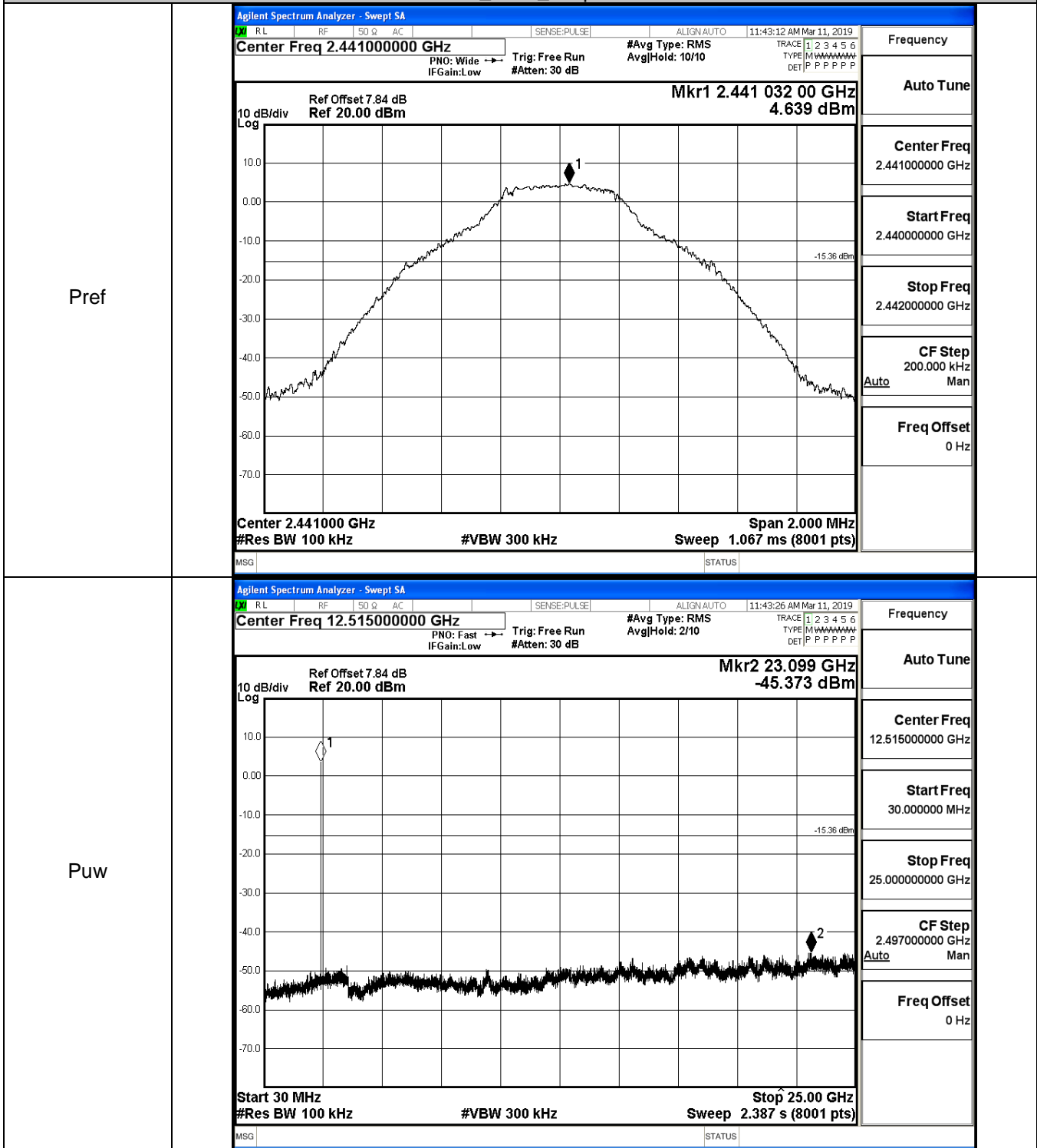
Frequency	Auto Tune
Center Freq	2.402000000 GHz
Start Freq	2.401000000 GHz
Stop Freq	2.403000000 GHz
CF Step	200.000 kHz Auto Man
Freq Offset	0 Hz

Puw

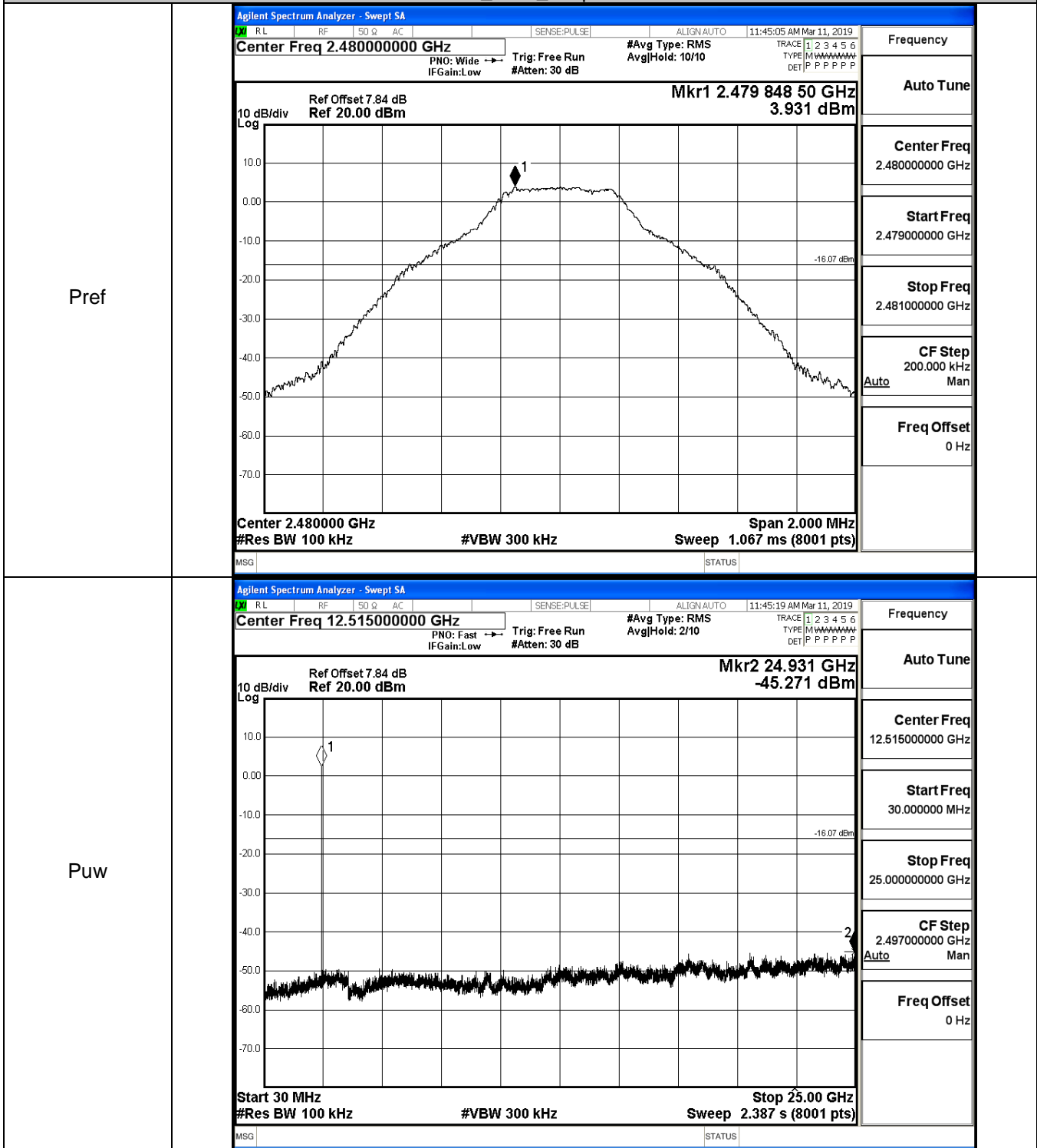


Frequency	Auto Tune
Center Freq	12.515000000 GHz
Start Freq	30.0000000 MHz
Stop Freq	25.000000000 GHz
CF Step	2.497000000 GHz Auto Man
Freq Offset	0 Hz

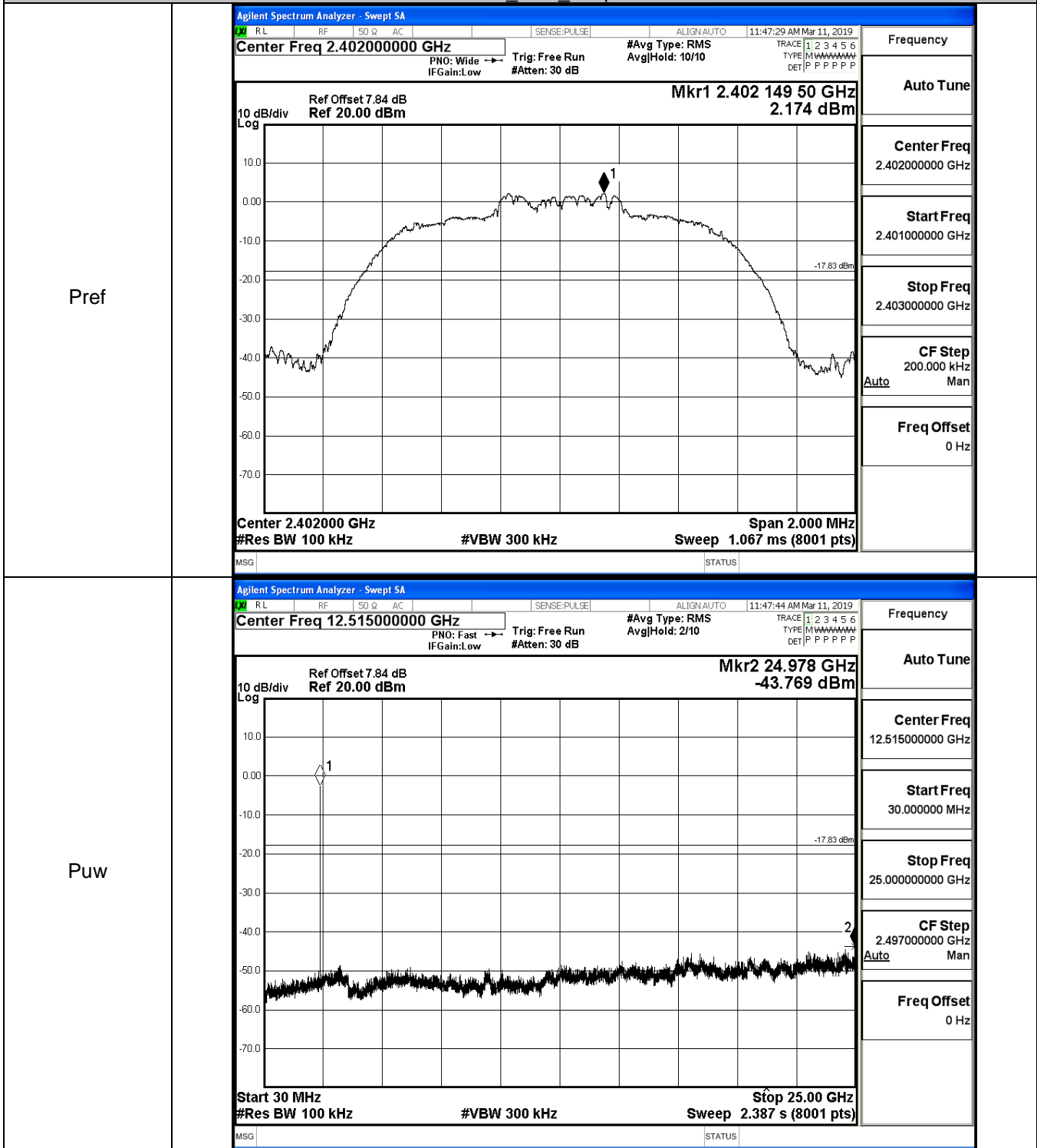
GFSK_MCH_Graphs



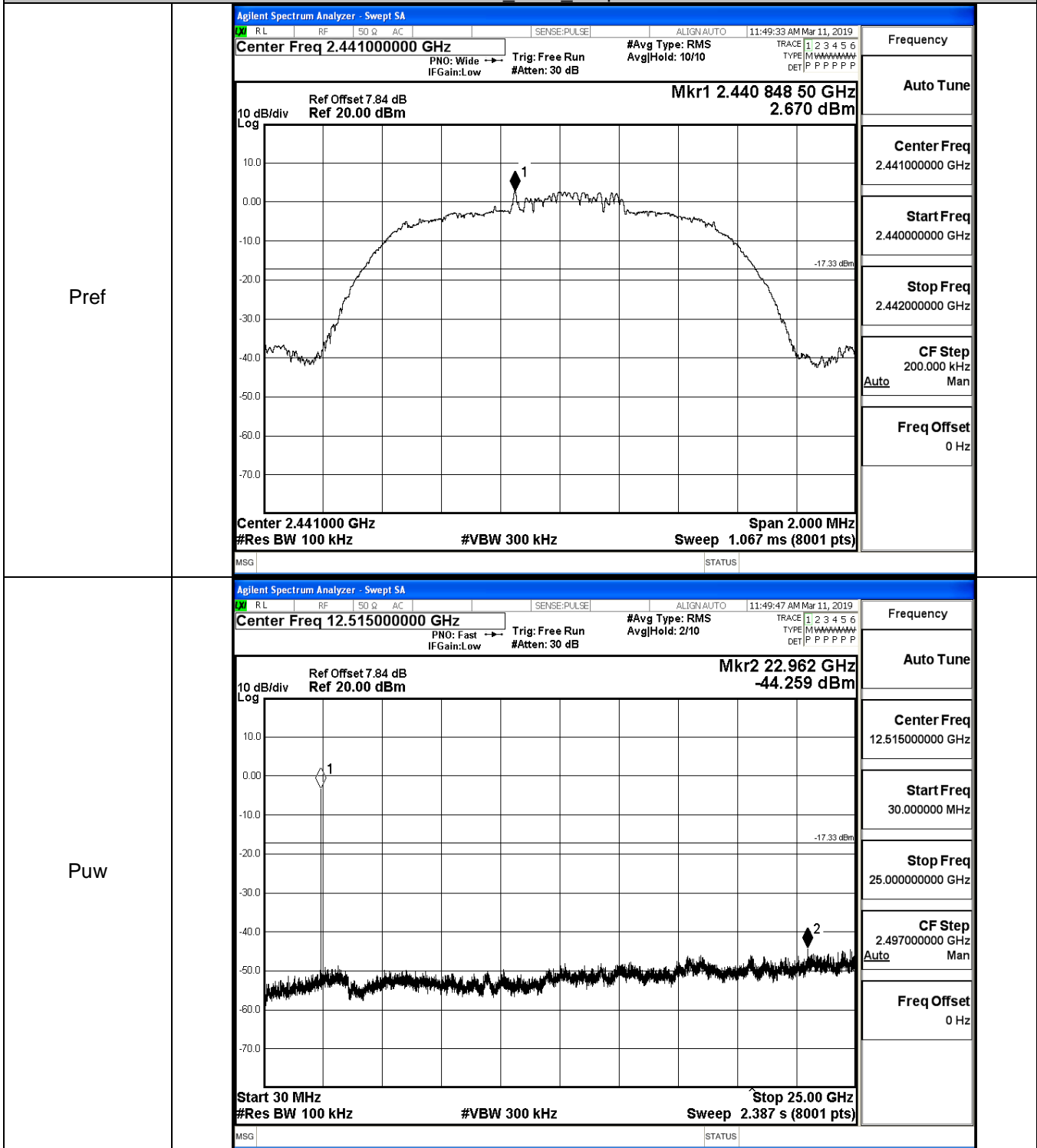
GFSK_HCH_Graphs



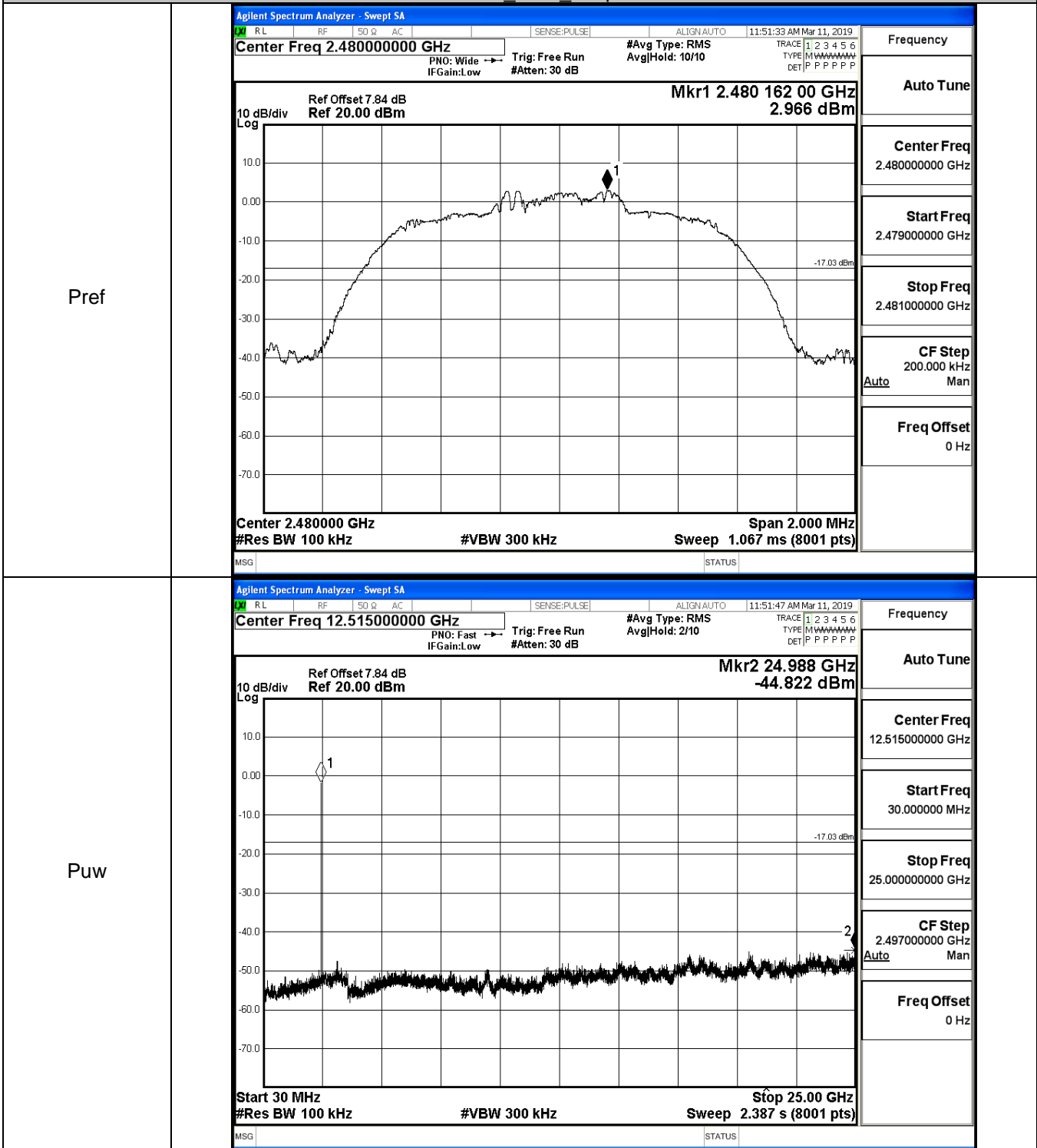
$\pi/4$ DQPSK LCH_Graphs



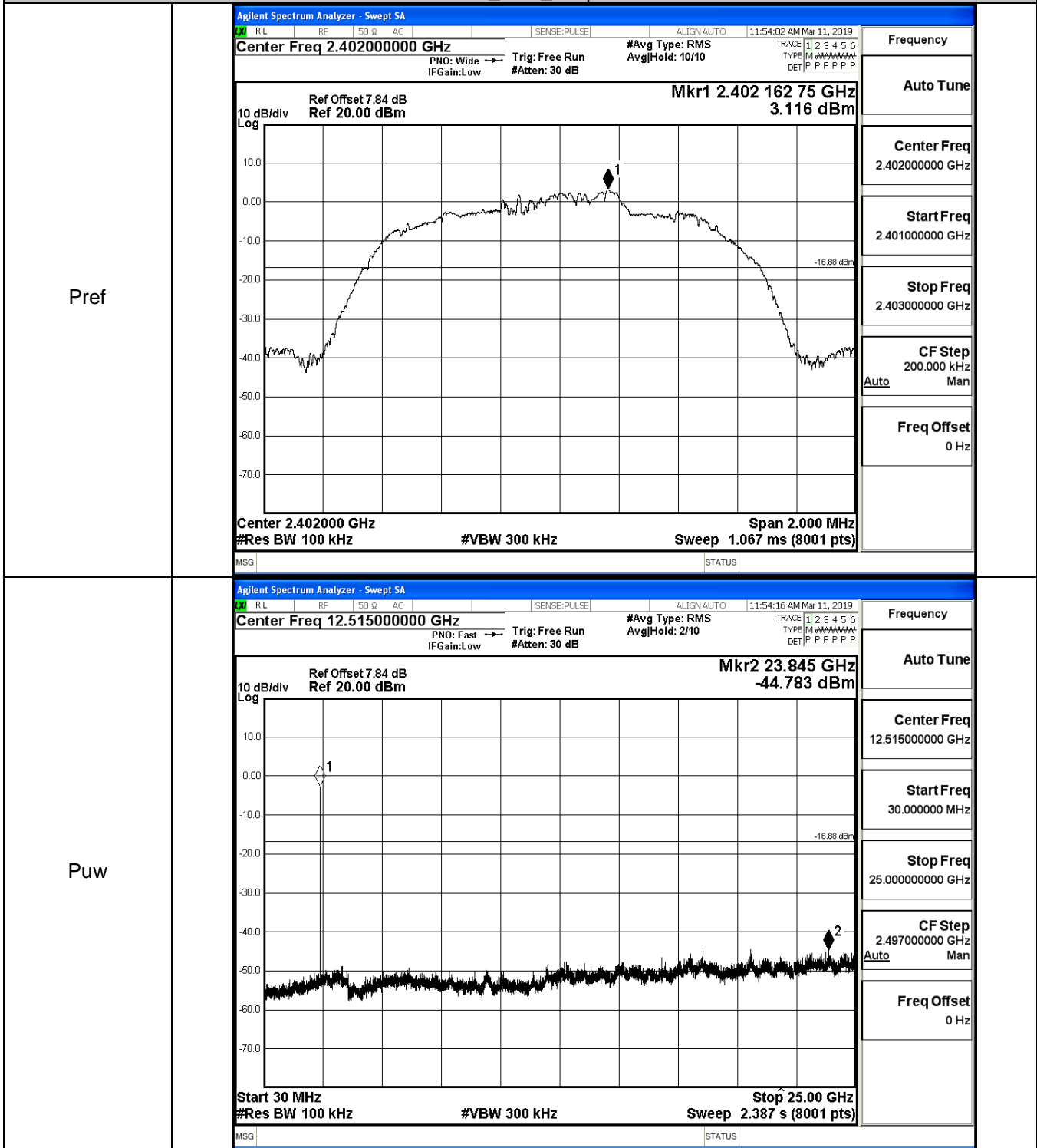
$\pi/4$ DQPSK_MCH_Graphs



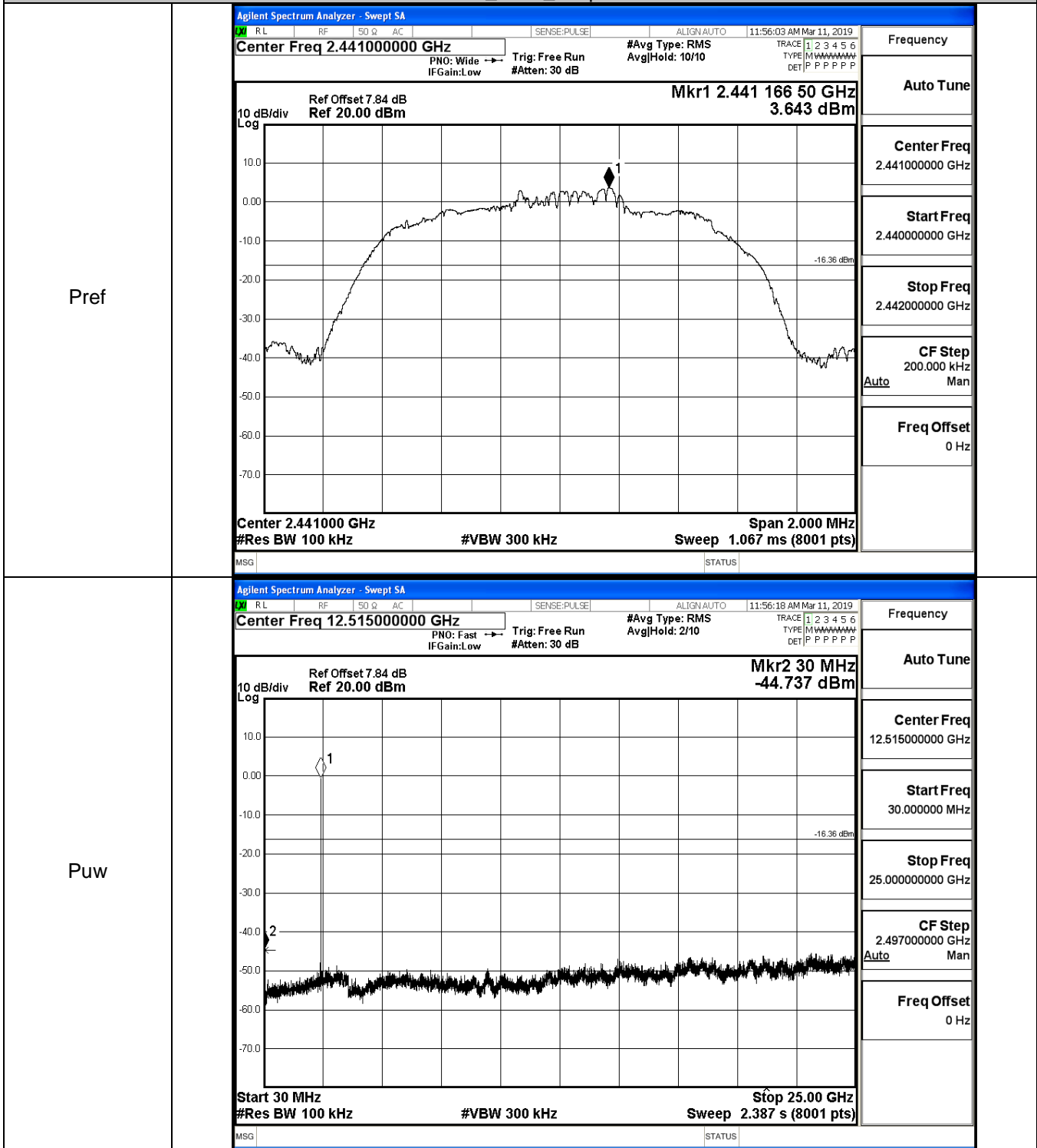
$\pi/4$ DQPSK_HCH_Graphs



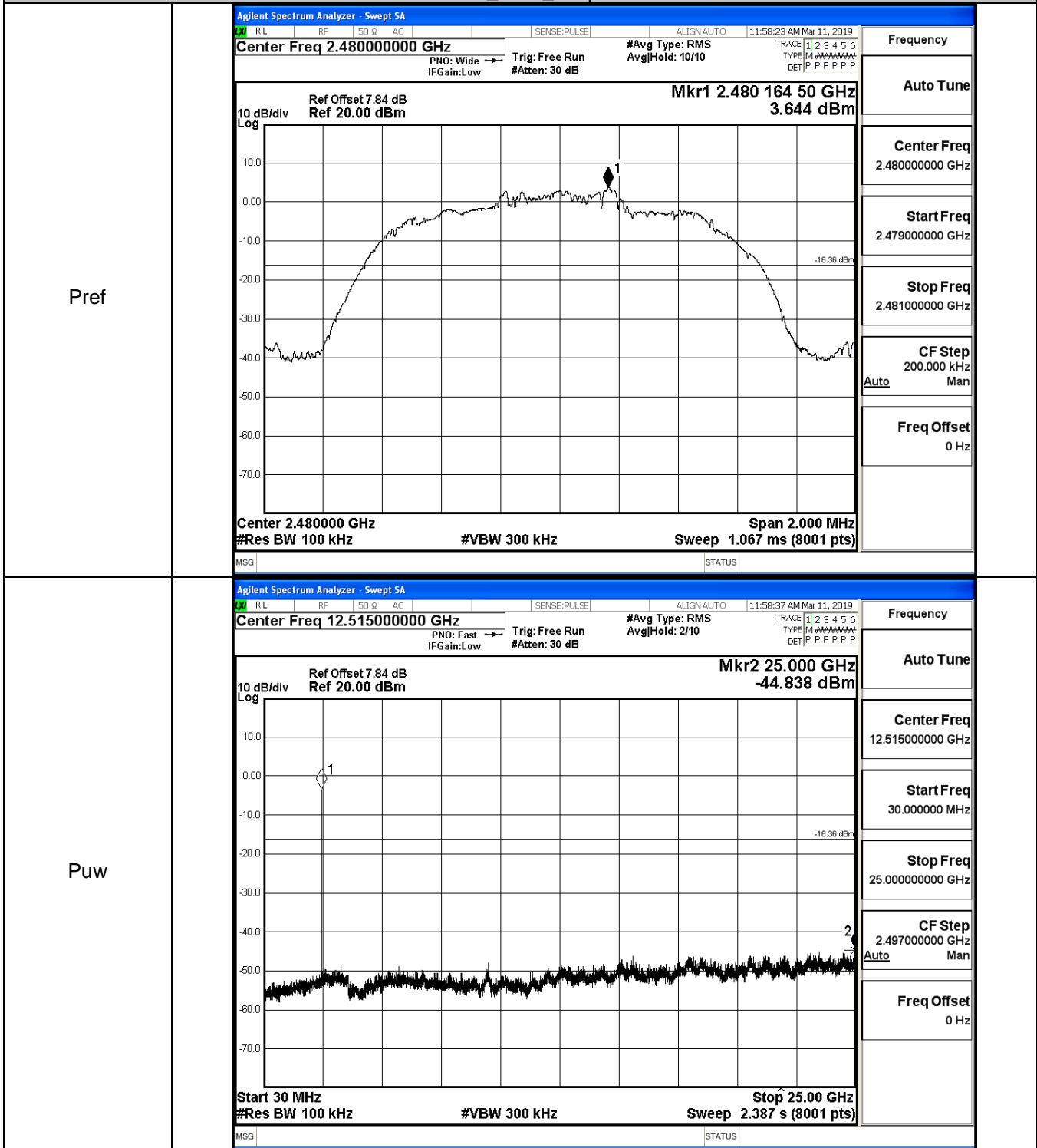
8DPSK_LCH_Graphs



8DPSK_MCH_Graphs



8DPSK_HCH_Graphs

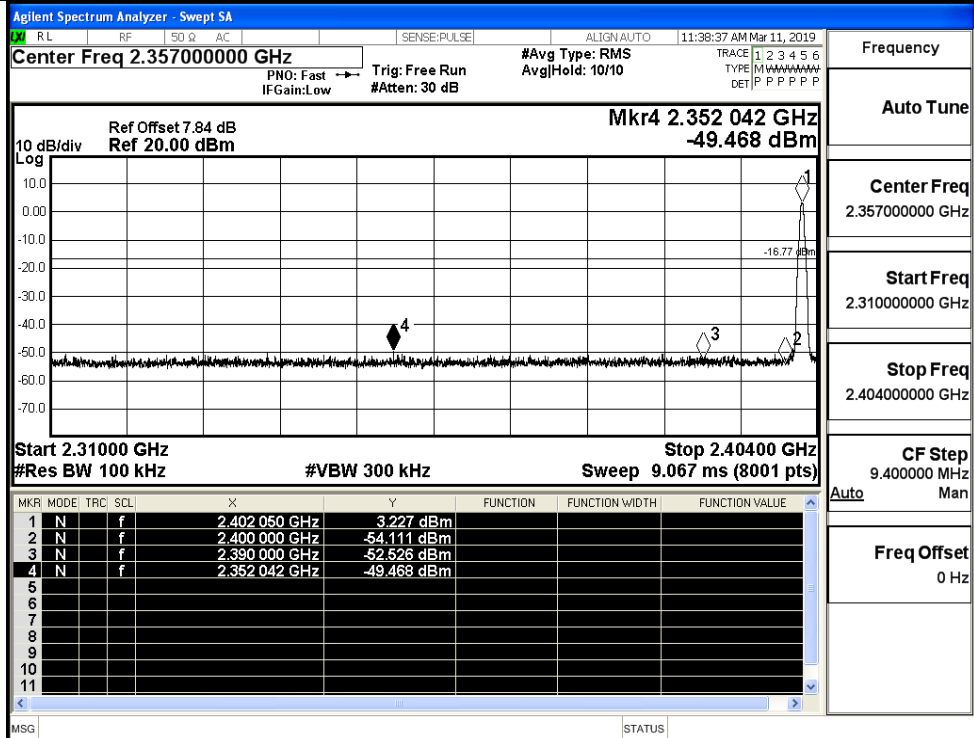


A.7 Band-edge for RF Conducted Emissions

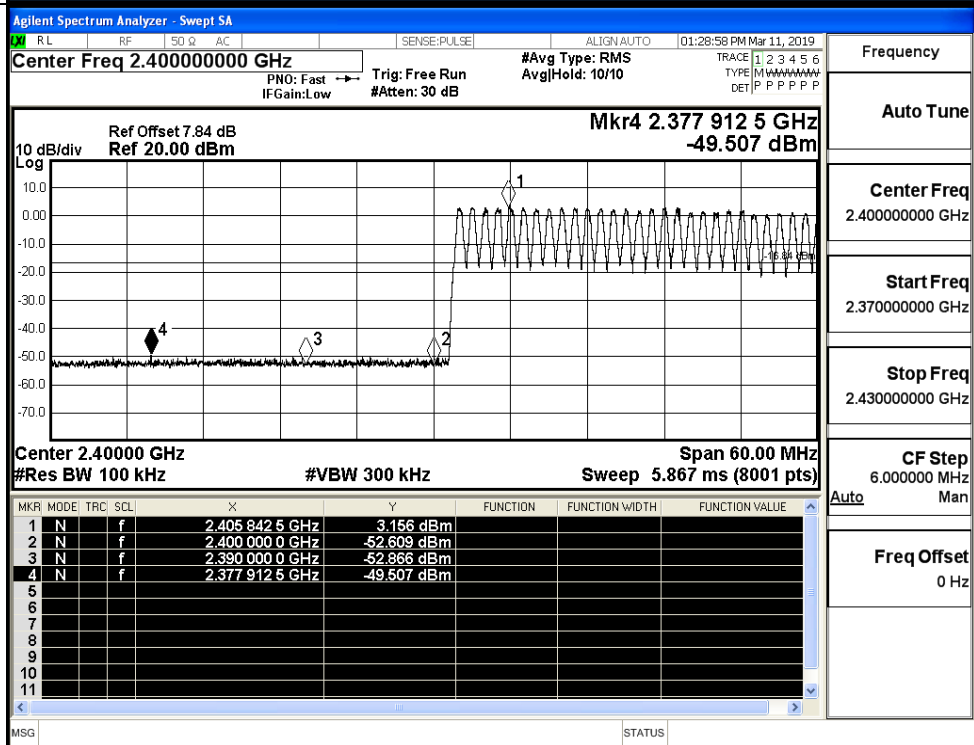
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.227	Off	-49.468	-16.77	PASS
			3.156	On	-49.507	-16.84	PASS
	HCH	2480	4.042	Off	-50.374	-15.96	PASS
			4.108	On	-48.469	-15.89	PASS
$\pi/4$ DQPSK	LCH	2402	2.366	Off	-49.772	-17.63	PASS
			2.591	On	-49.533	-17.41	PASS
	HCH	2480	3.941	Off	-49.975	-16.06	PASS
			3.689	On	-49.198	-16.31	PASS
8DPSK	LCH	2402	2.999	Off	-50.107	-17	PASS
			2.624	On	-49.753	-17.38	PASS
	HCH	2480	3.680	Off	-49.758	-16.32	PASS
			3.597	On	-49.409	-16.4	PASS

Test Graphs

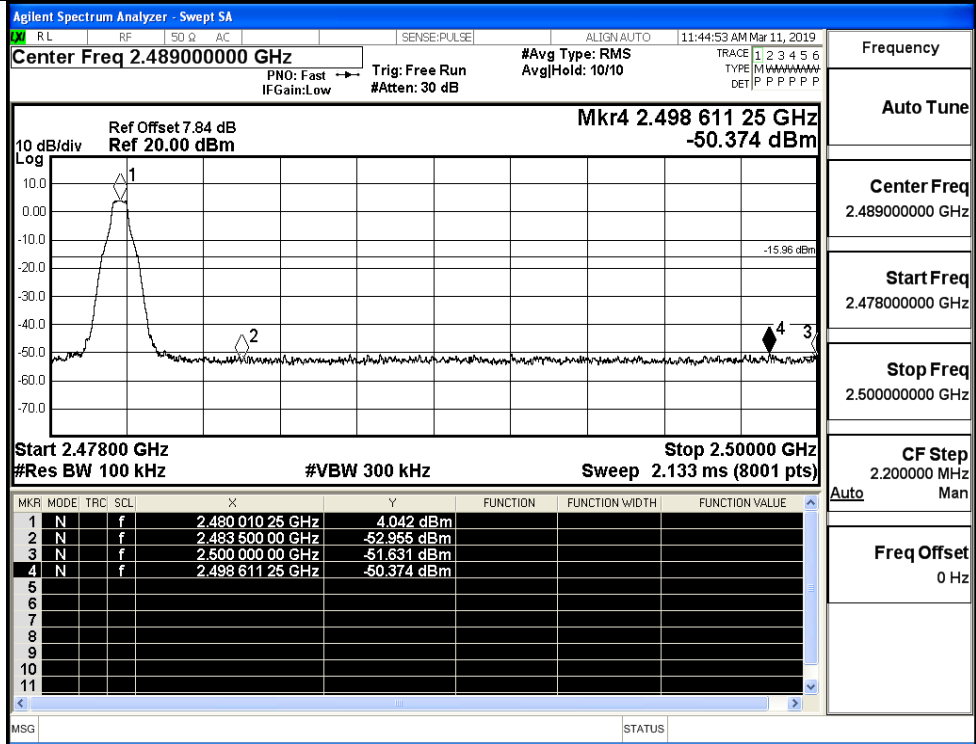
GFSK/LCH/No Hop



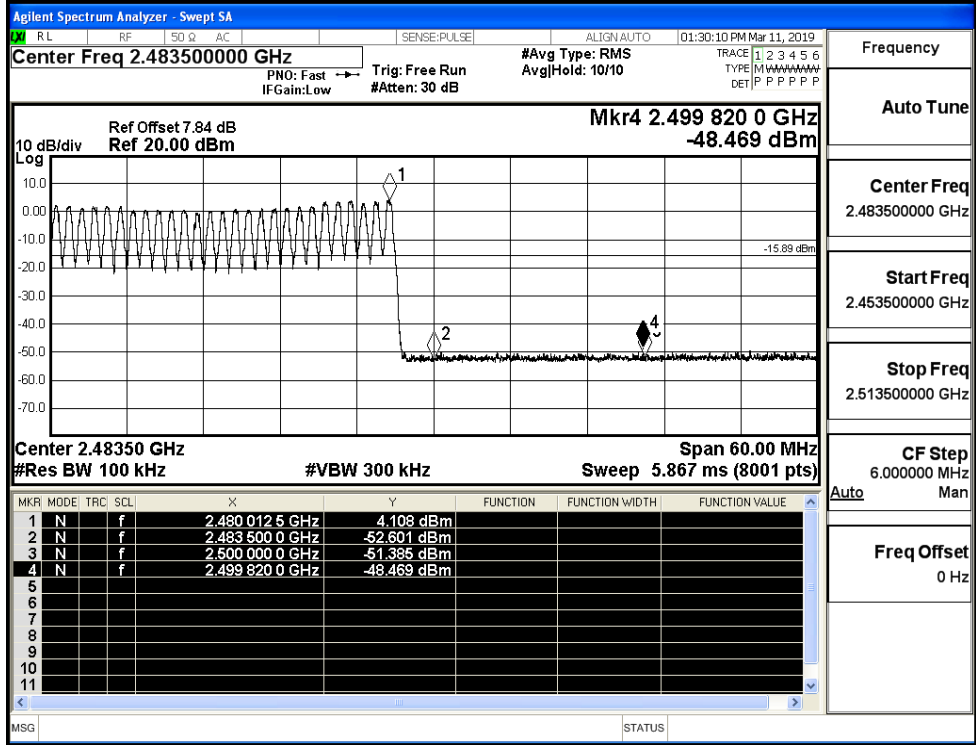
GFSK/LCH/Hop



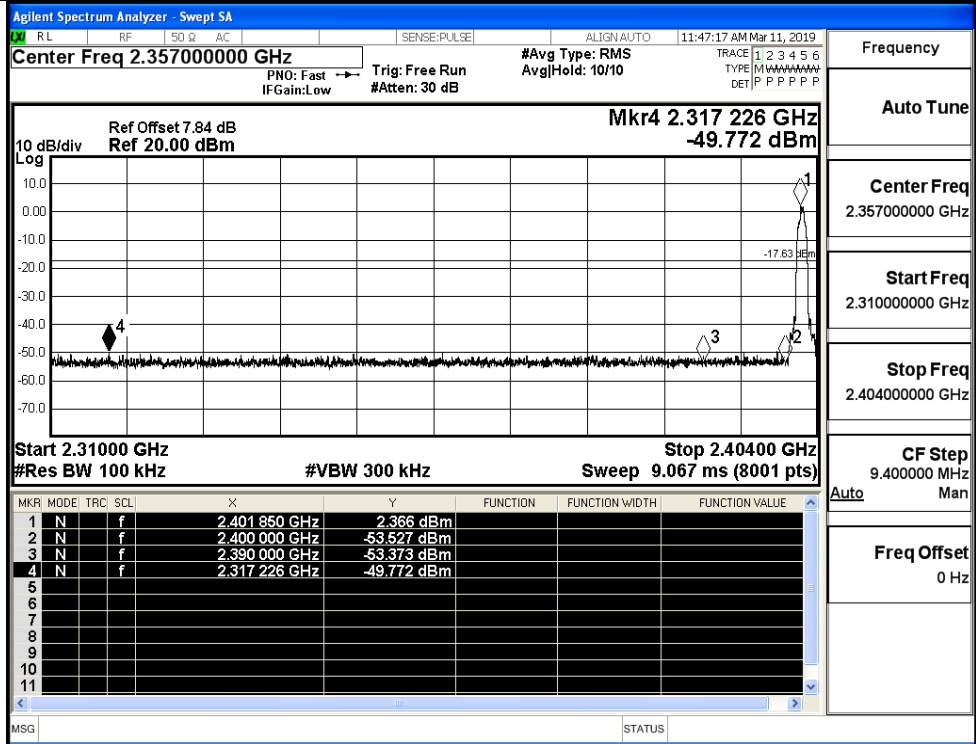
GFSK/HCH/No Hop



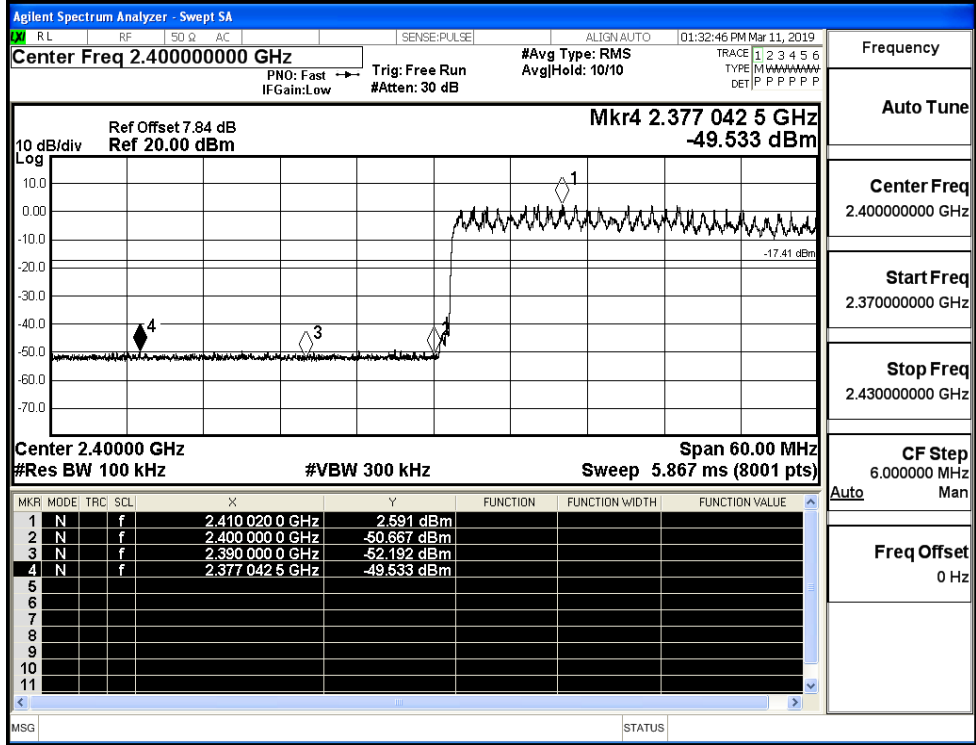
GFSK/HCH/Hop



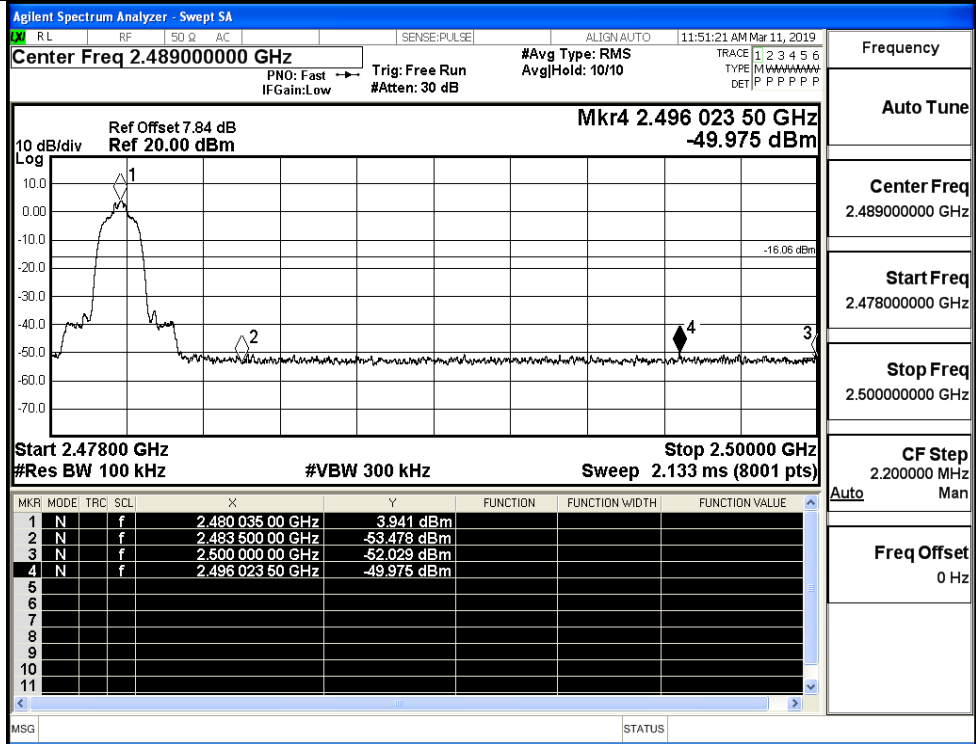
$\pi/4$ DQPSK/LCH/No Hop



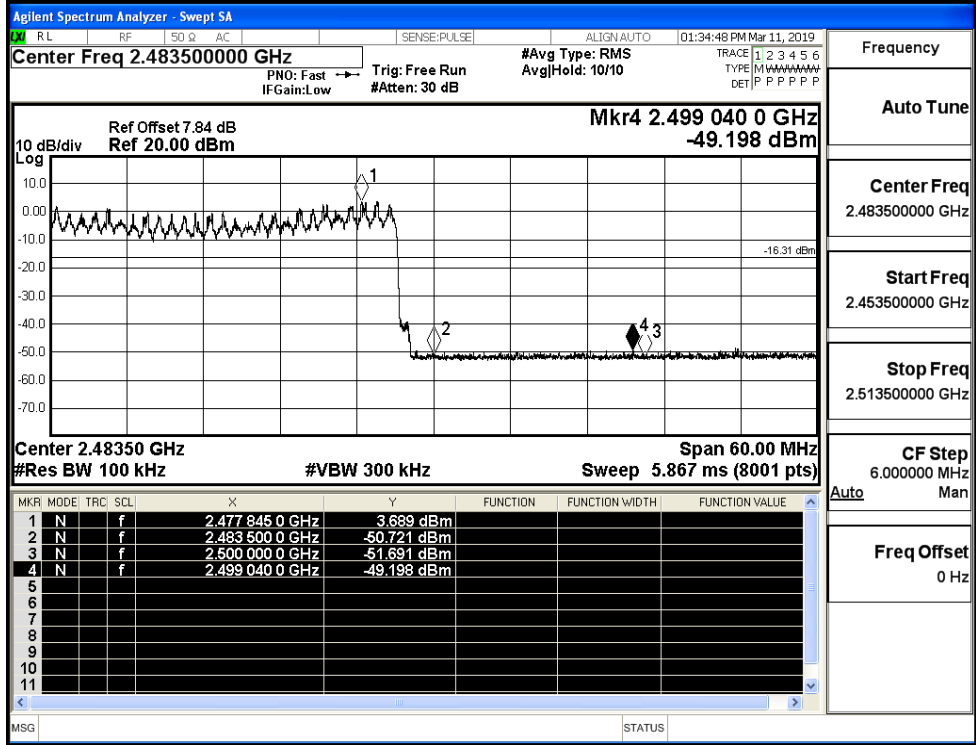
$\pi/4$ DQPSK/LCH/Hop



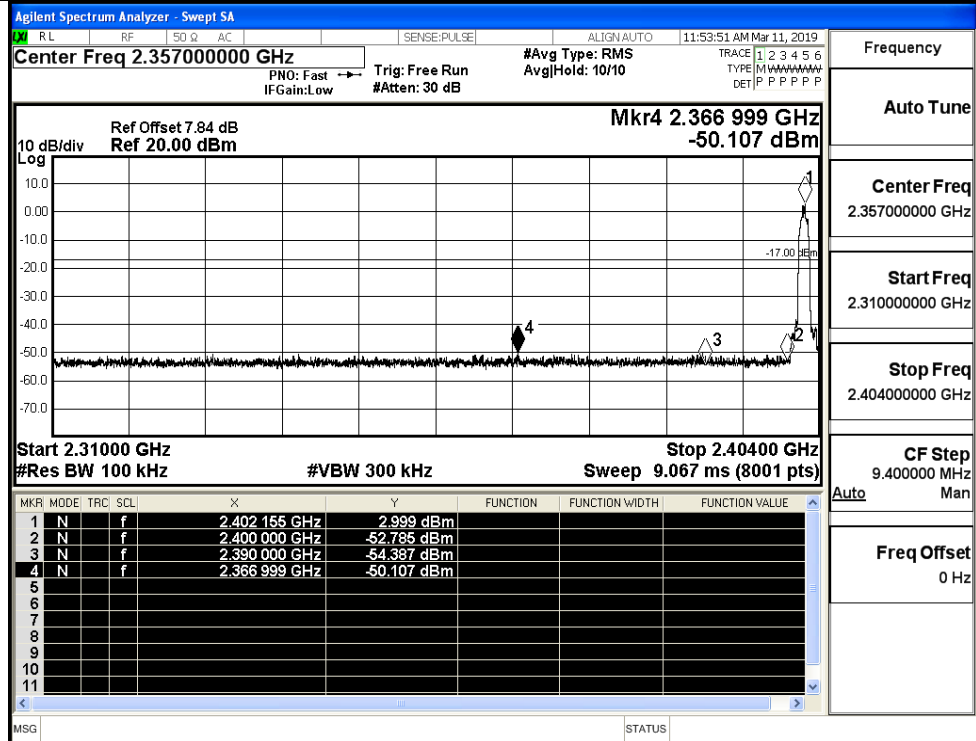
$\pi/4$ DQPSK/HCH/No Hop



$\pi/4$ DQPSK/HCH/Hop

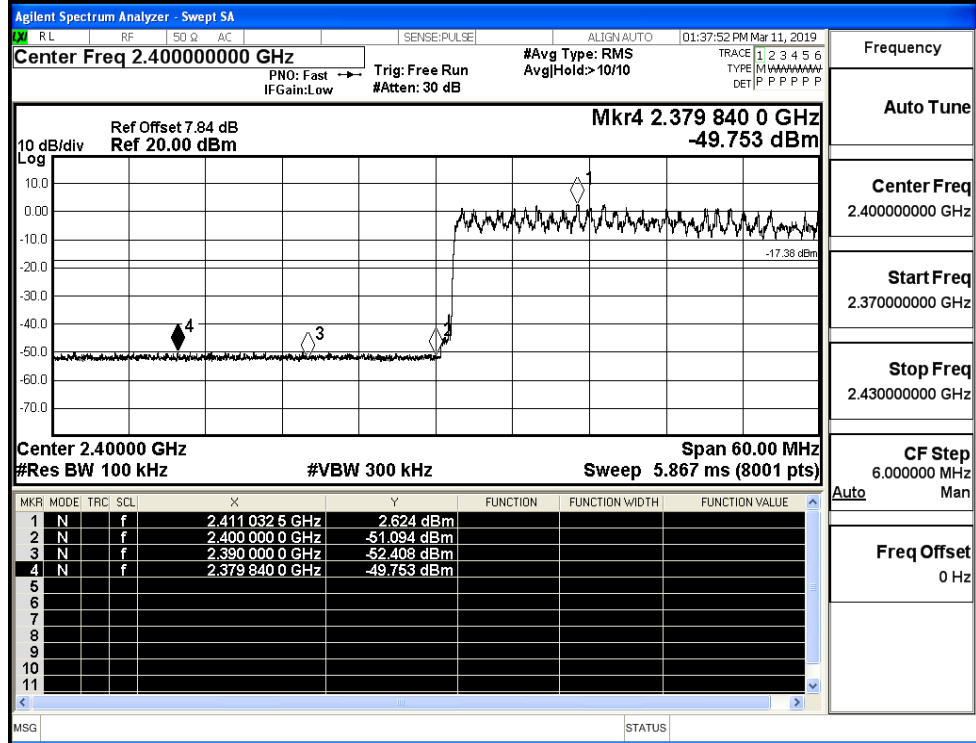


8DPSK/LCH/No Hop



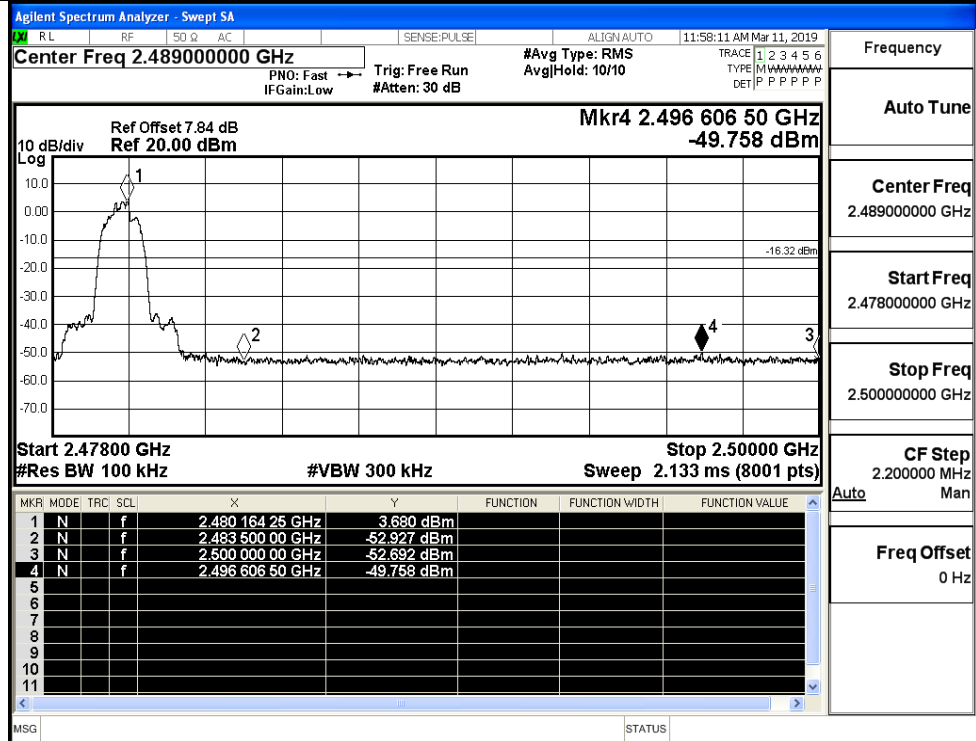
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/LCH/Hop



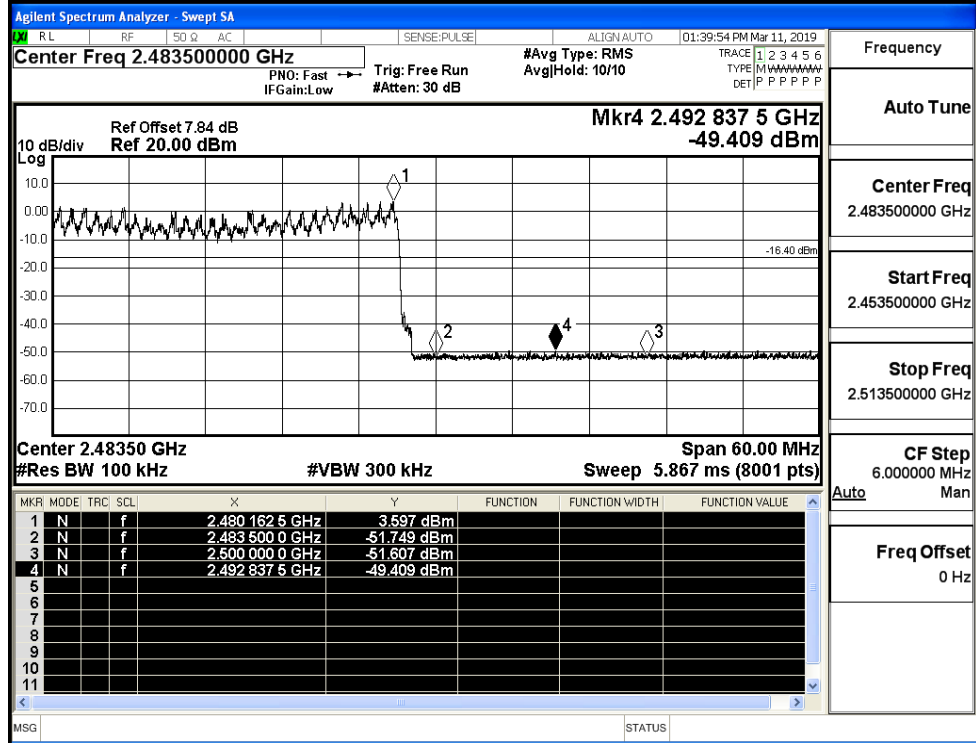
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.370000000 GHz
Stop Freq
2.430000000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

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
Auto Man
Freq Offset
0 Hz

8DPSK/HCH/Hop

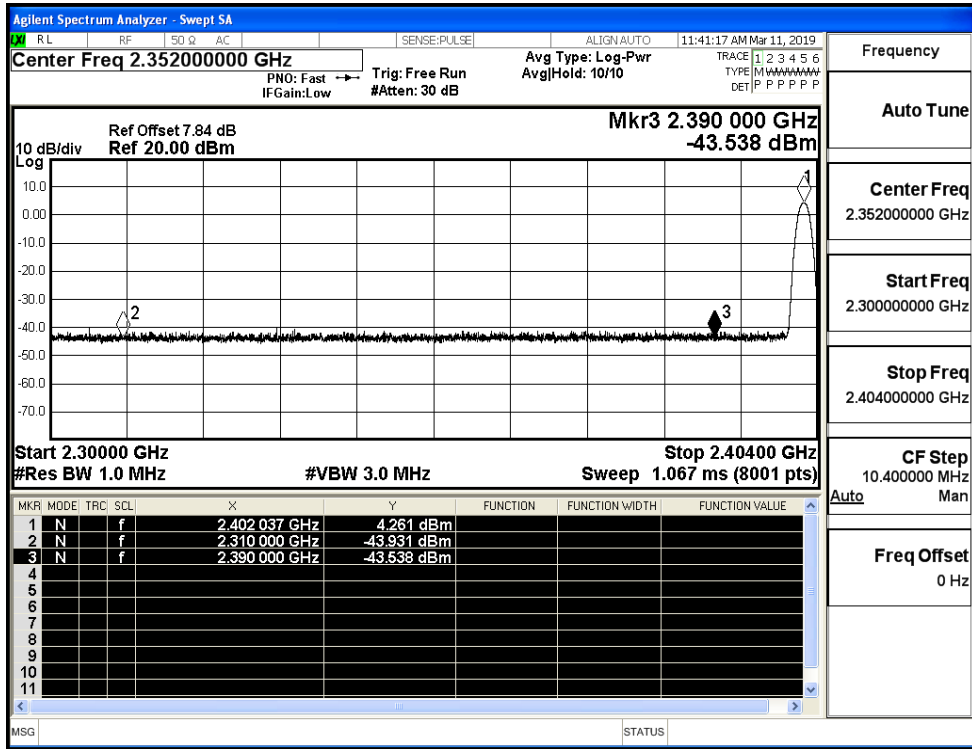


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

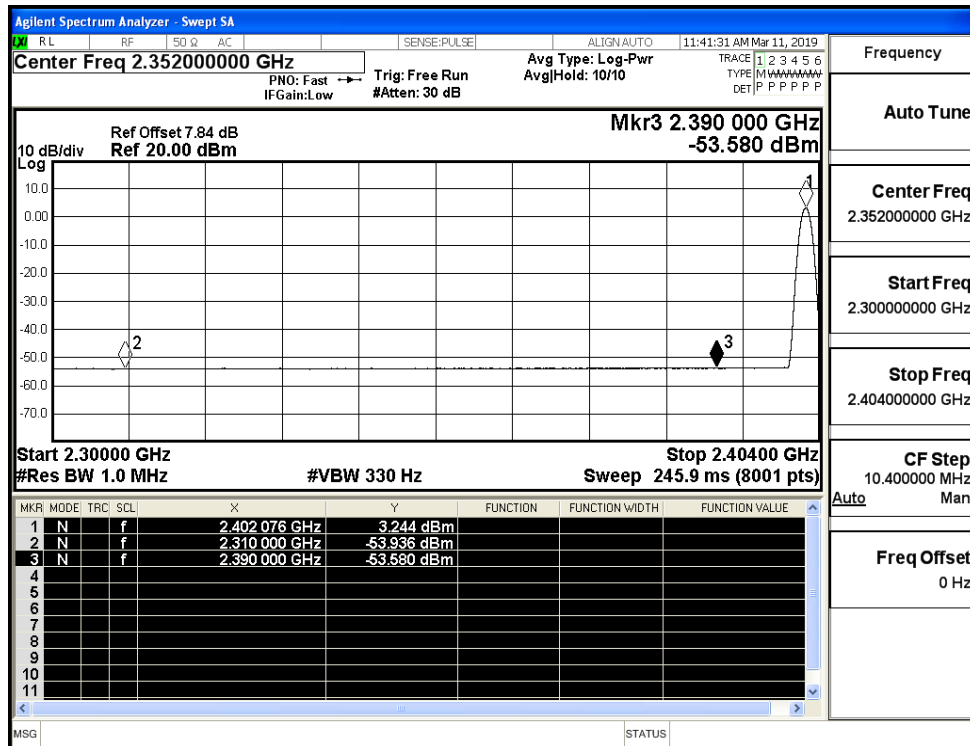
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.93	2.0	0	53.33	PEAK	74	PASS
	Off	2310.0	-53.94	2.0	0	43.32	AV	54	PASS
	Off	2390.0	-43.54	2.0	0	53.72	PEAK	74	PASS
	Off	2390.0	-53.58	2.0	0	43.68	AV	54	PASS
	Off	2483.5	-41.84	2.0	0	55.42	PEAK	74	PASS
	Off	2483.5	-53.41	2.0	0	43.84	AV	54	PASS
	Off	2500.0	-43.64	2.0	0	53.62	PEAK	74	PASS
	Off	2500.0	-53.36	2.0	0	43.89	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.87	2.0	0	53.39	PEAK	74	PASS
	Off	2310.0	-54.08	2.0	0	43.18	AV	54	PASS
	Off	2390.0	-43.28	2.0	0	53.98	PEAK	74	PASS
	Off	2390.0	-53.59	2.0	0	43.67	AV	54	PASS
	Off	2483.5	-43.07	2.0	0	54.19	PEAK	74	PASS
	Off	2483.5	-53.26	2.0	0	43.99	AV	54	PASS
	Off	2500.0	-43.12	2.0	0	54.14	PEAK	74	PASS
	Off	2500.0	-53.36	2.0	0	43.90	AV	54	PASS
8DPSK	Off	2310.0	-43.87	2.0	0	53.39	PEAK	74	PASS
	Off	2310.0	-53.95	2.0	0	43.31	AV	54	PASS
	Off	2390.0	-43.47	2.0	0	53.79	PEAK	74	PASS
	Off	2390.0	-53.67	2.0	0	43.59	AV	54	PASS
	Off	2483.5	-42.54	2.0	0	54.71	PEAK	74	PASS
	Off	2483.5	-53.36	2.0	0	43.90	AV	54	PASS
	Off	2500.0	-43.04	2.0	0	54.22	PEAK	74	PASS
	Off	2500.0	-53.24	2.0	0	44.02	AV	54	PASS

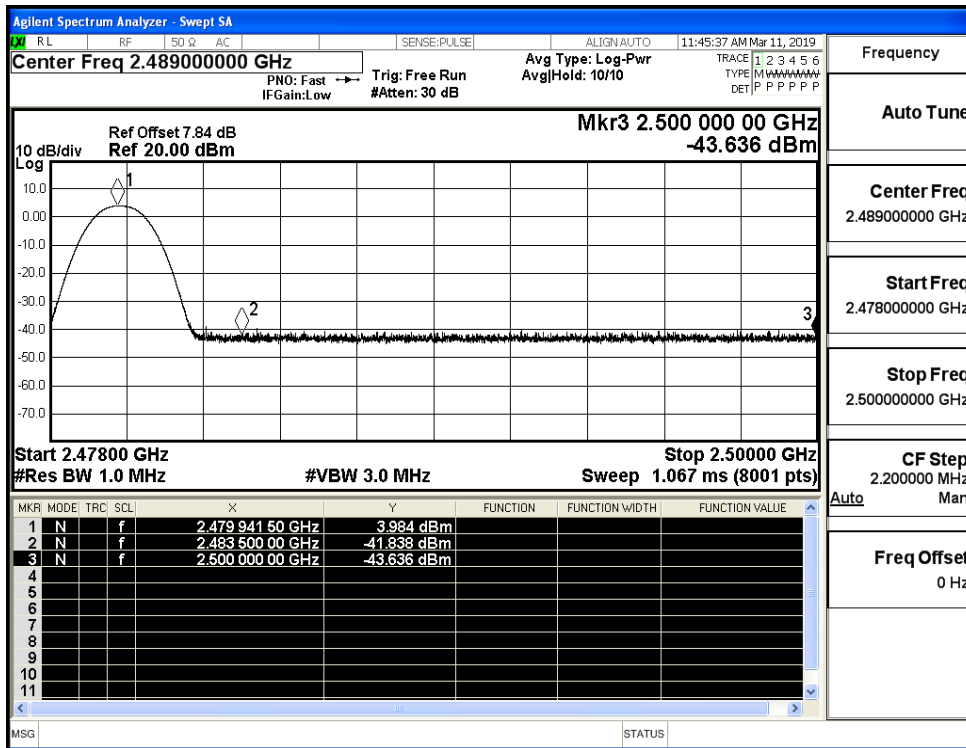
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



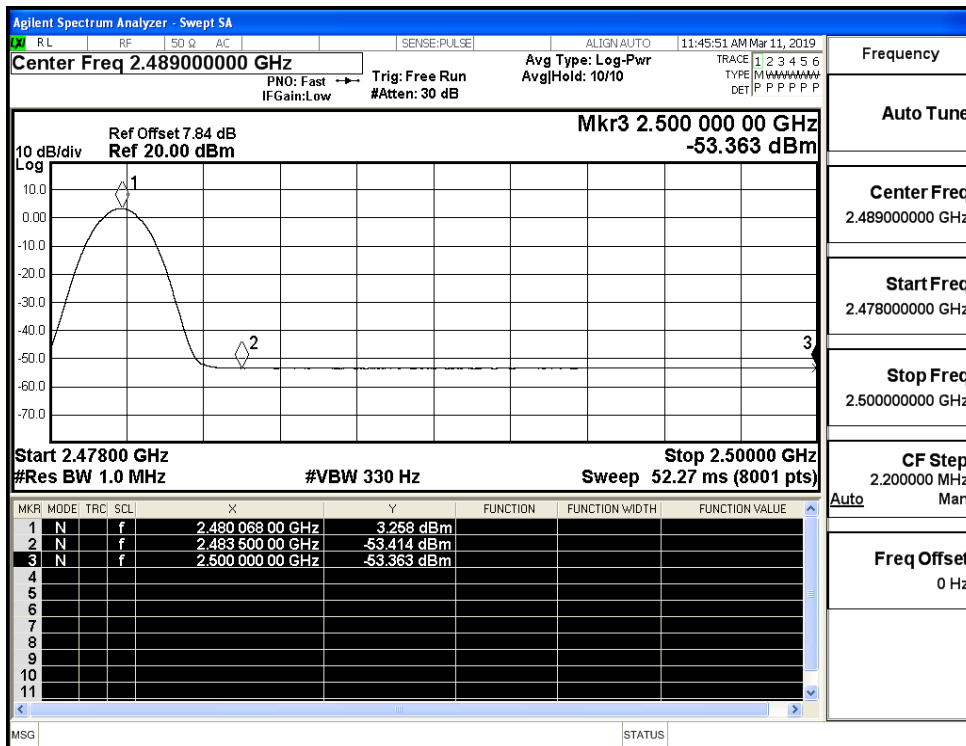
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



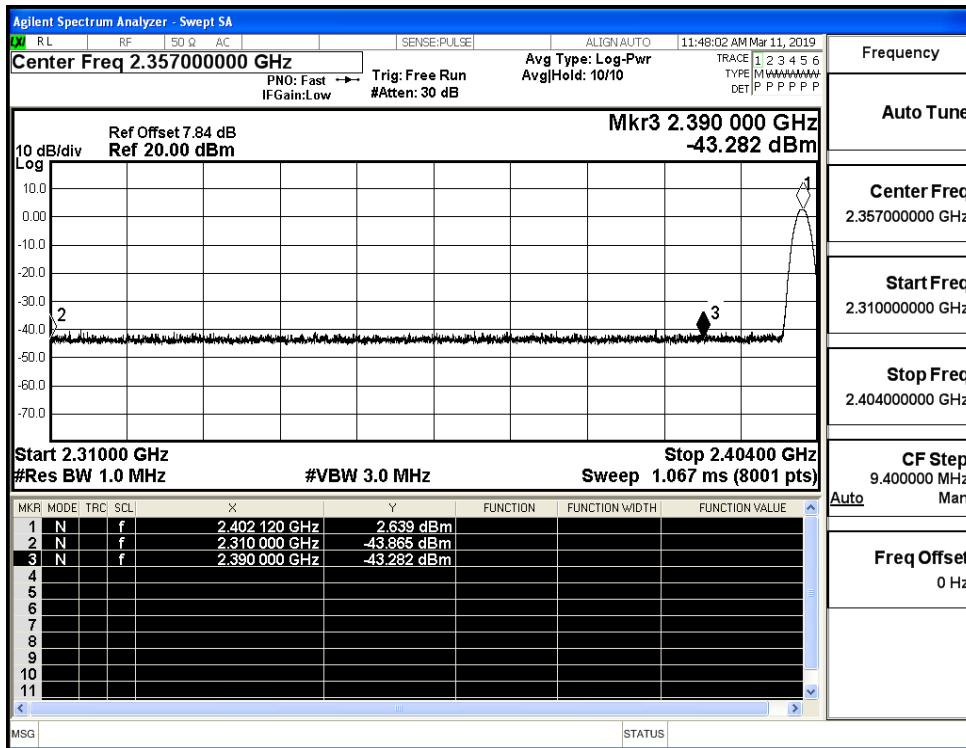
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



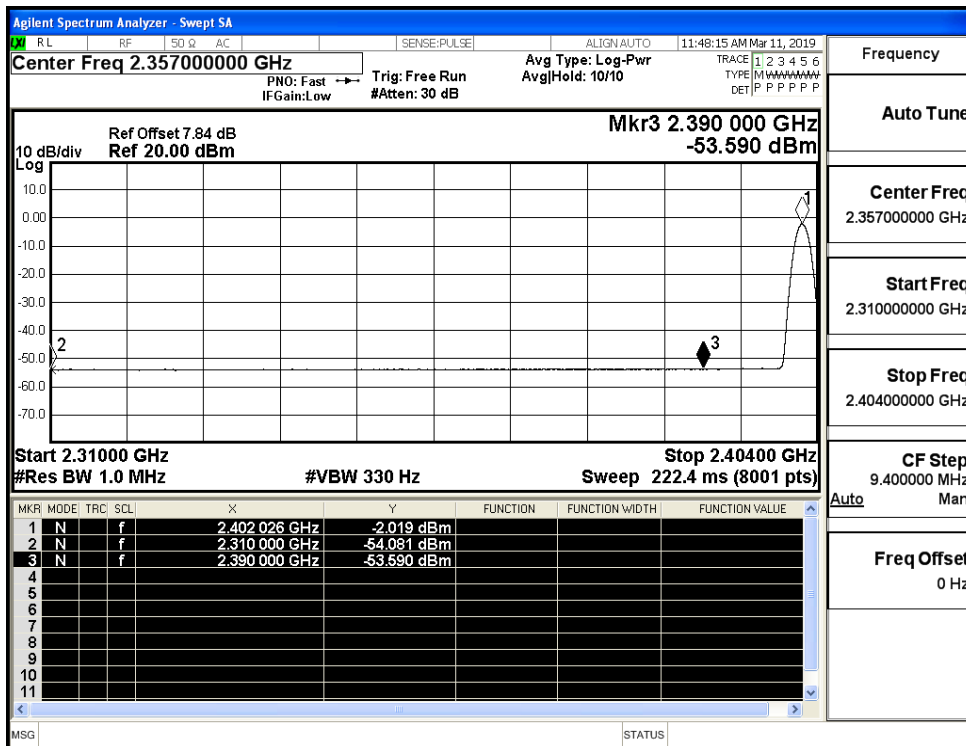
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



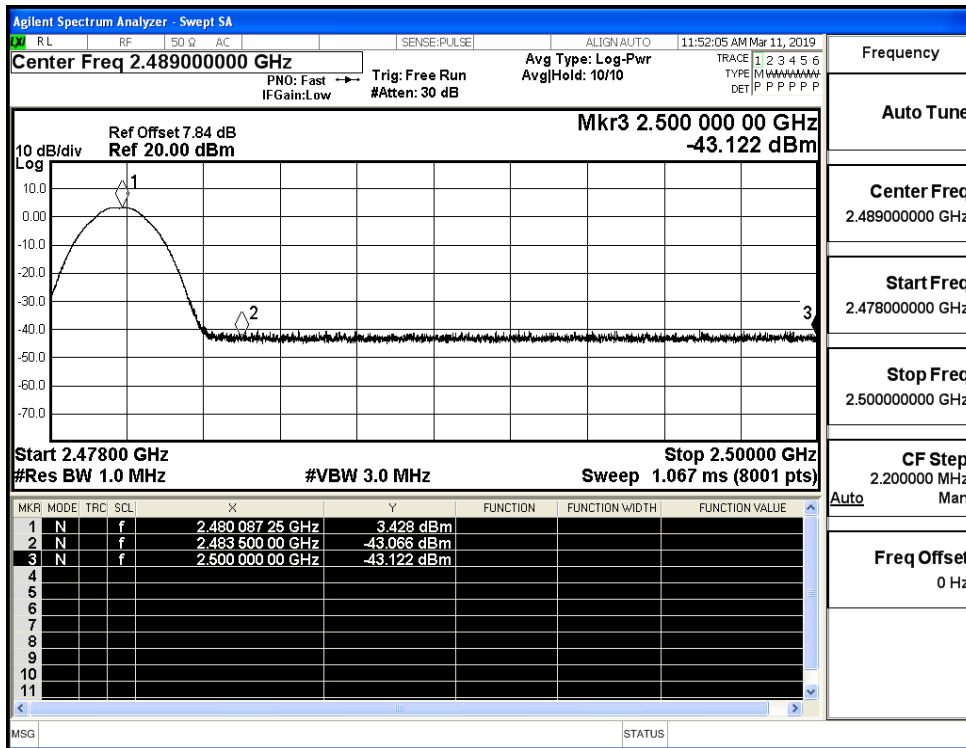
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



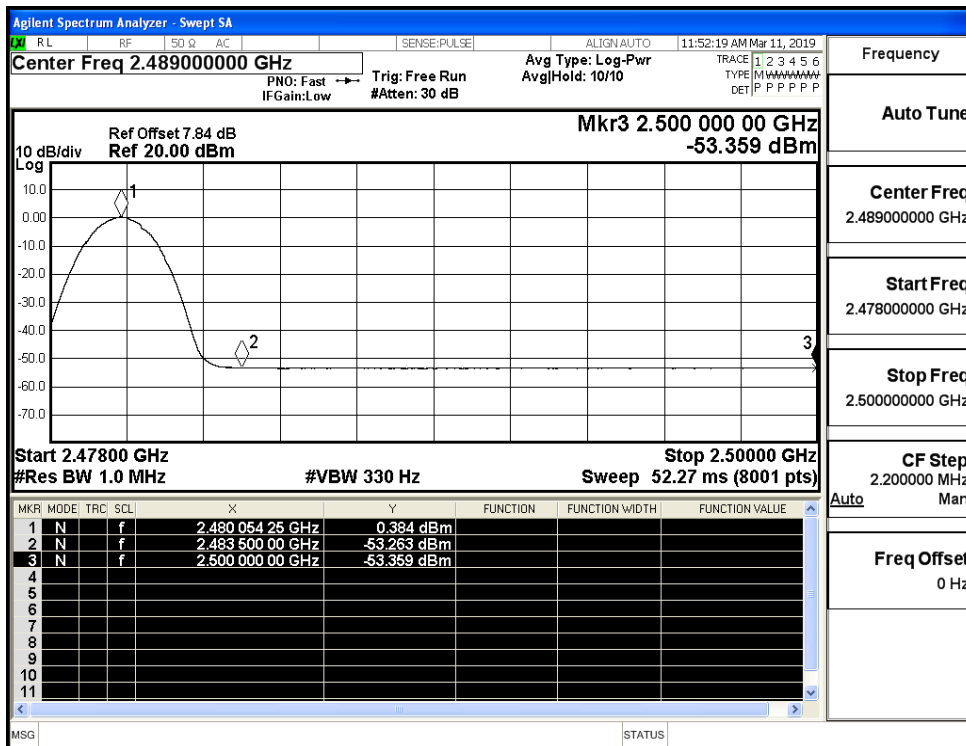
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



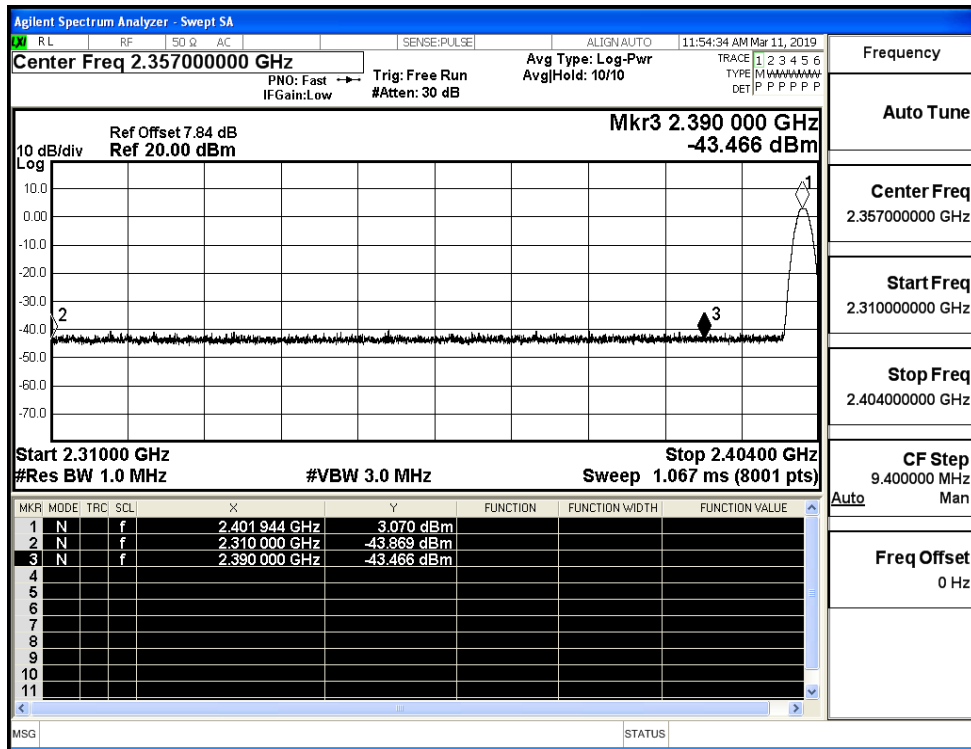
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)



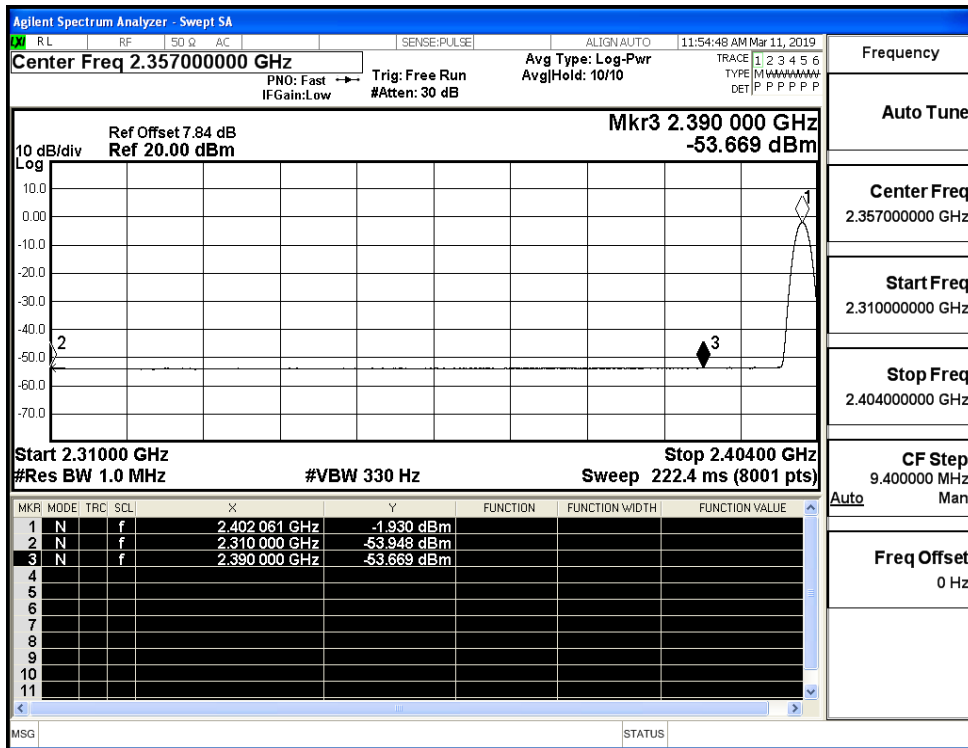
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)



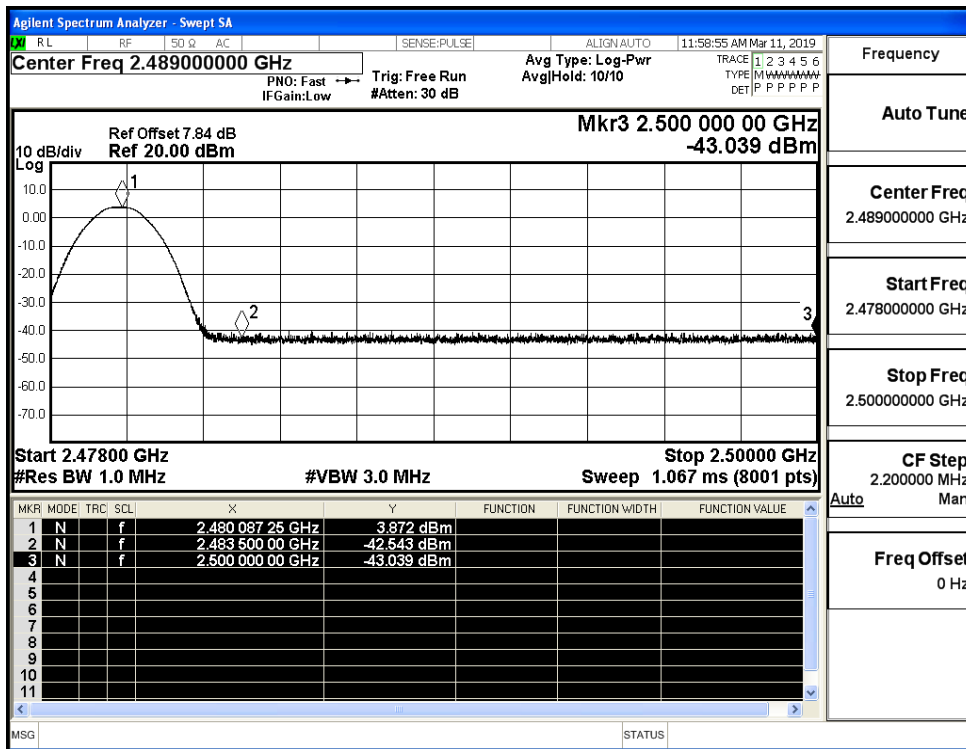
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

