

Appendix A

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

Product Name: iConnect Round

Trade Mark: iConnect By Timex

Test Model: M03Z

Environmental Conditions

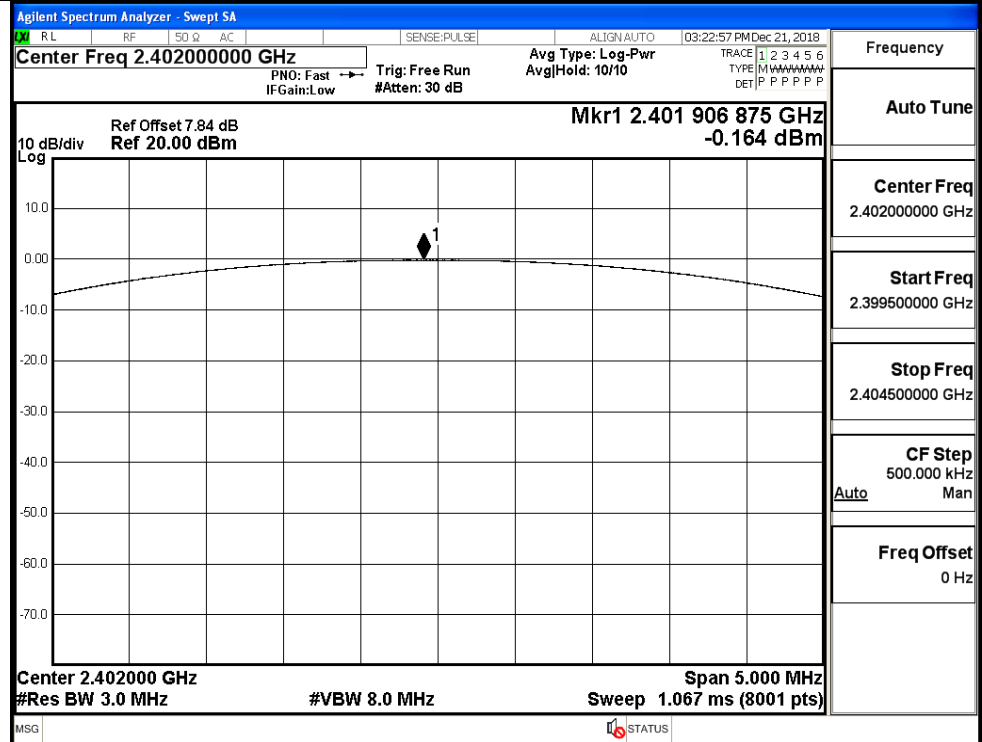
Temperature:	24.3 ° C
Relative Humidity:	53.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

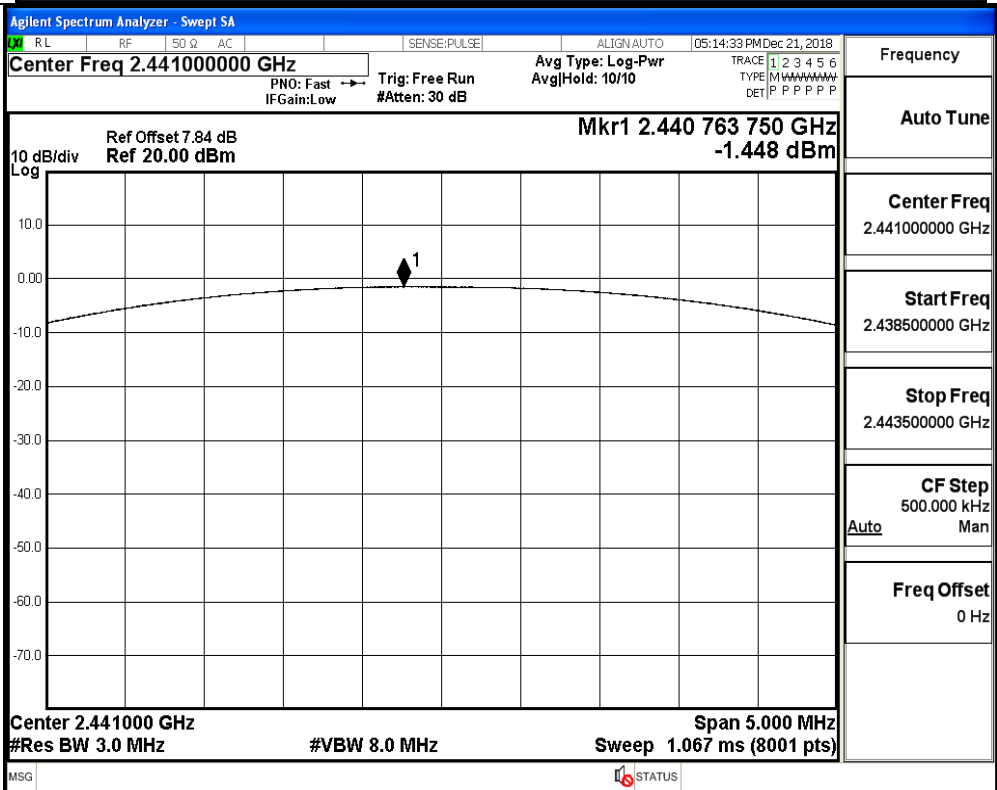
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.164	21	PASS
	MCH	-1.448	21	PASS
	HCH	-1.160	21	PASS
$\pi/4$ DQPSK	LCH	-0.792	21	PASS
	MCH	-0.264	21	PASS
	HCH	0.369	21	PASS
8DPSK	LCH	-0.733	21	PASS
	MCH	-0.153	21	PASS
	HCH	0.567	21	PASS

Test Graphs

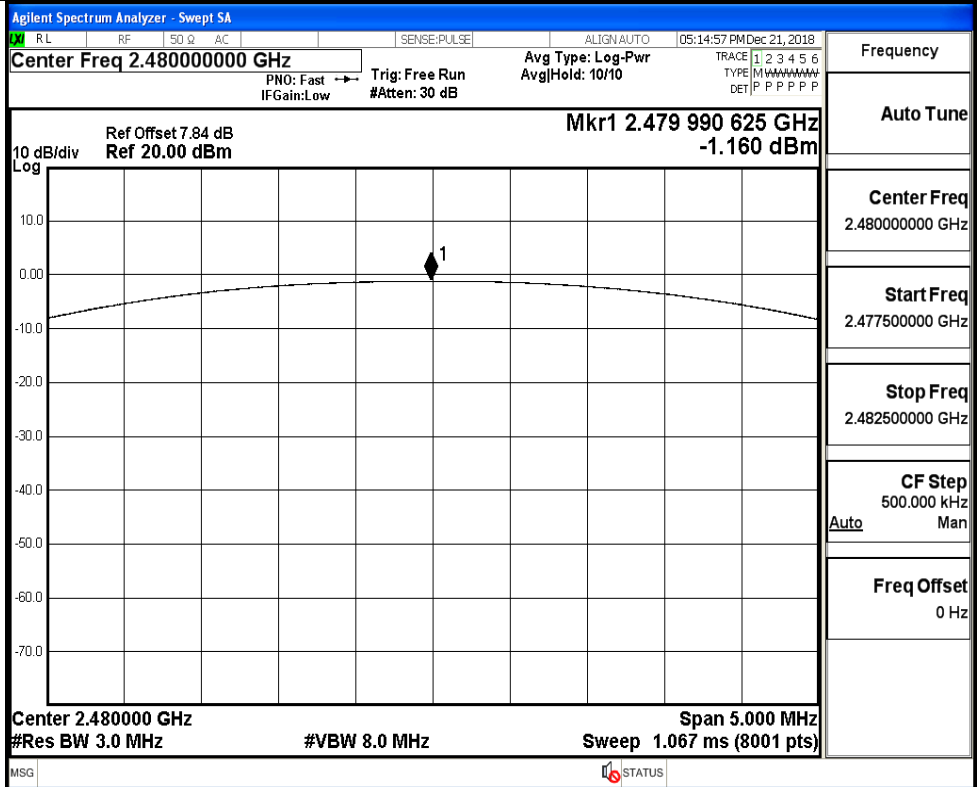
GFSK/LCH



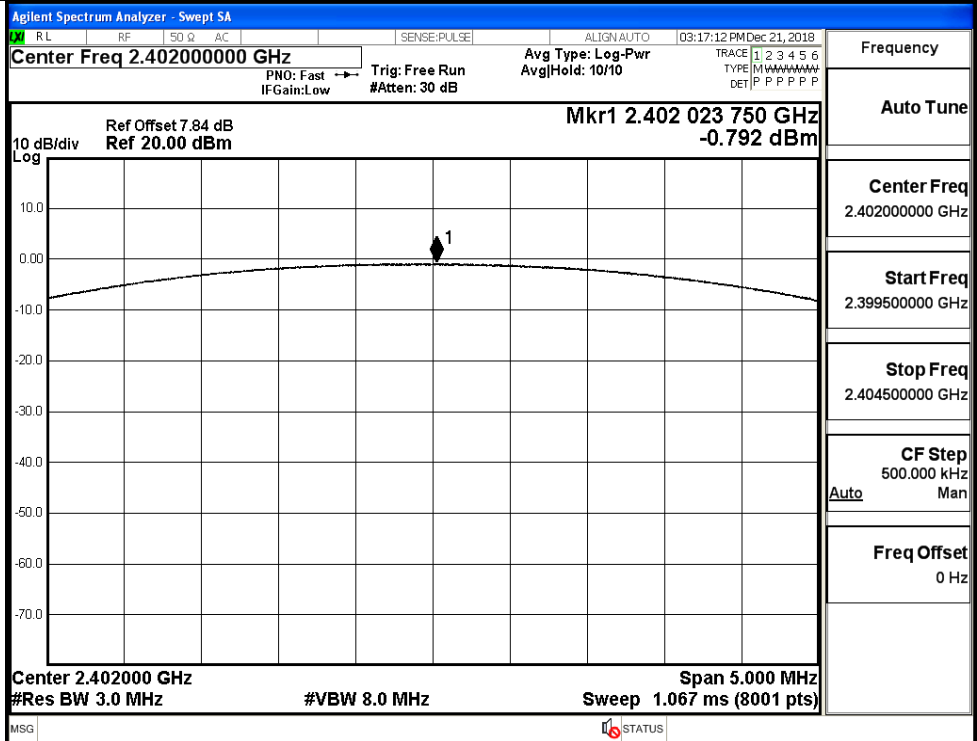
GFSK/MCH

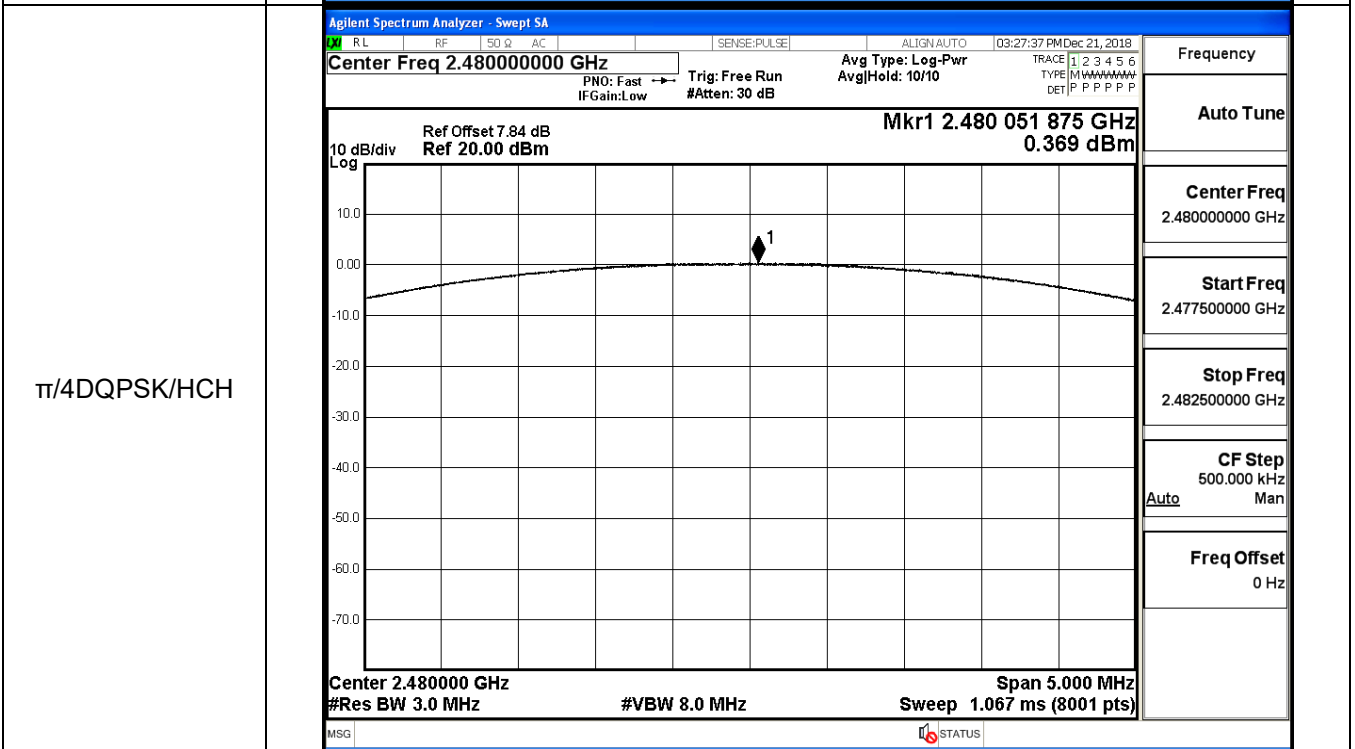
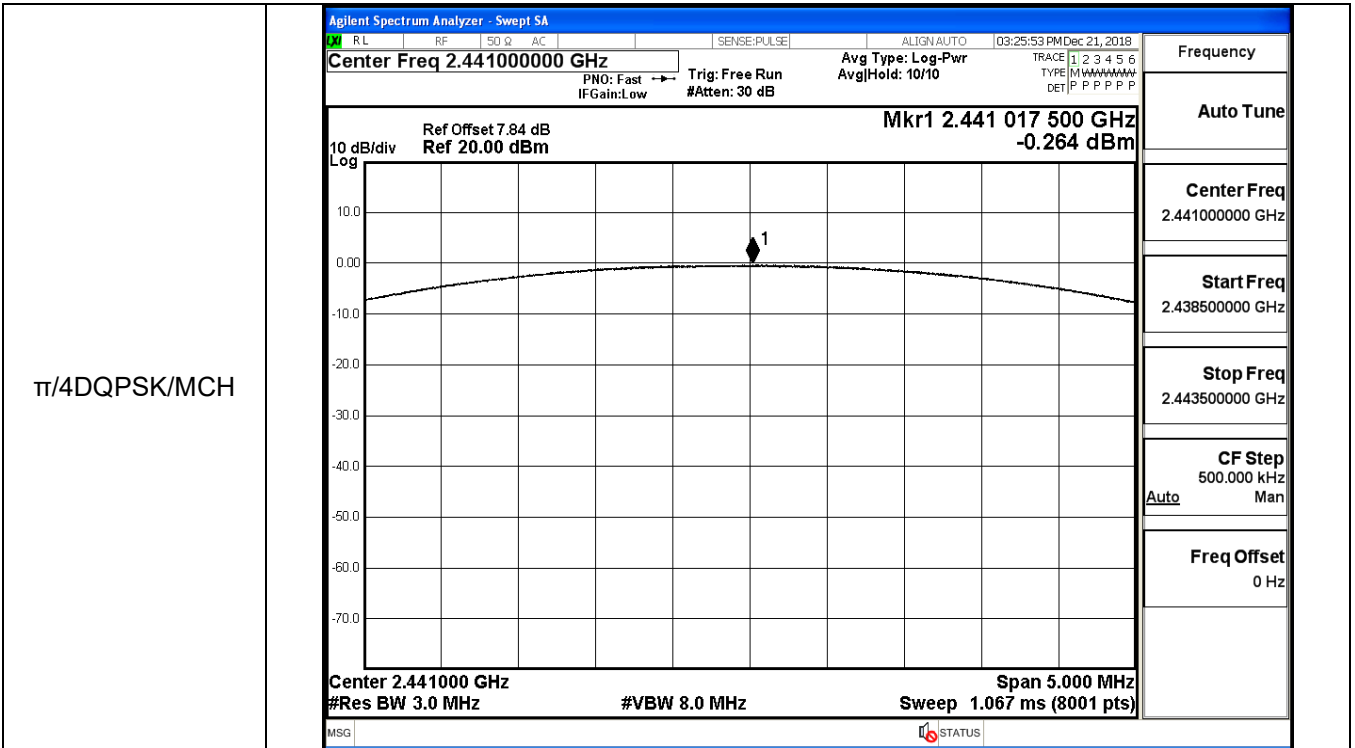


GFSK/HCH

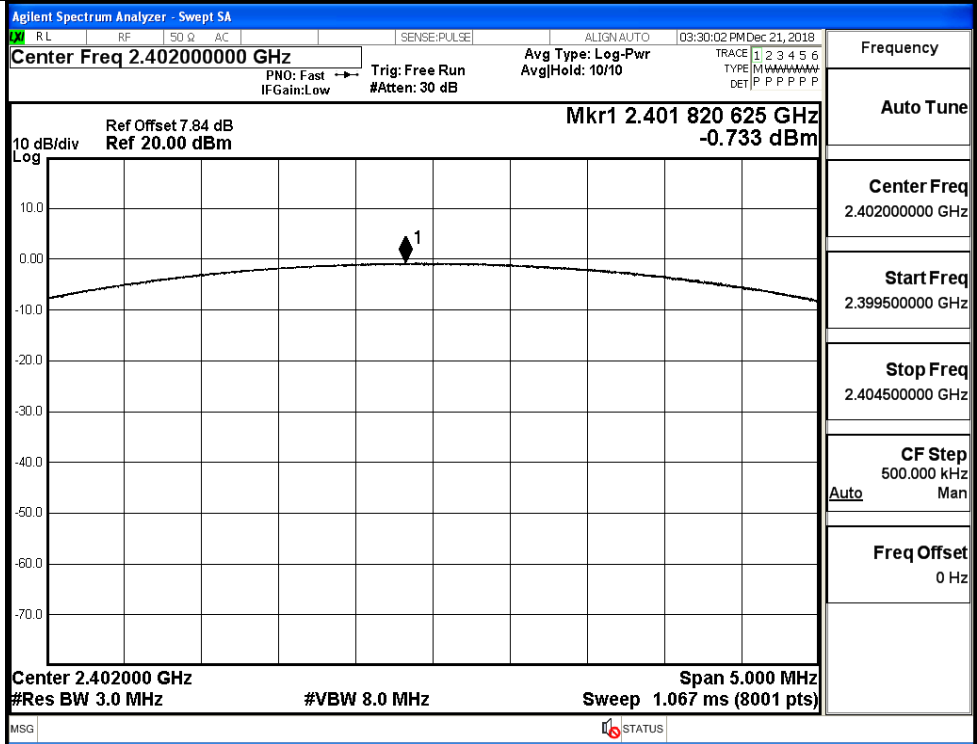


π /4DQPSK/LCH

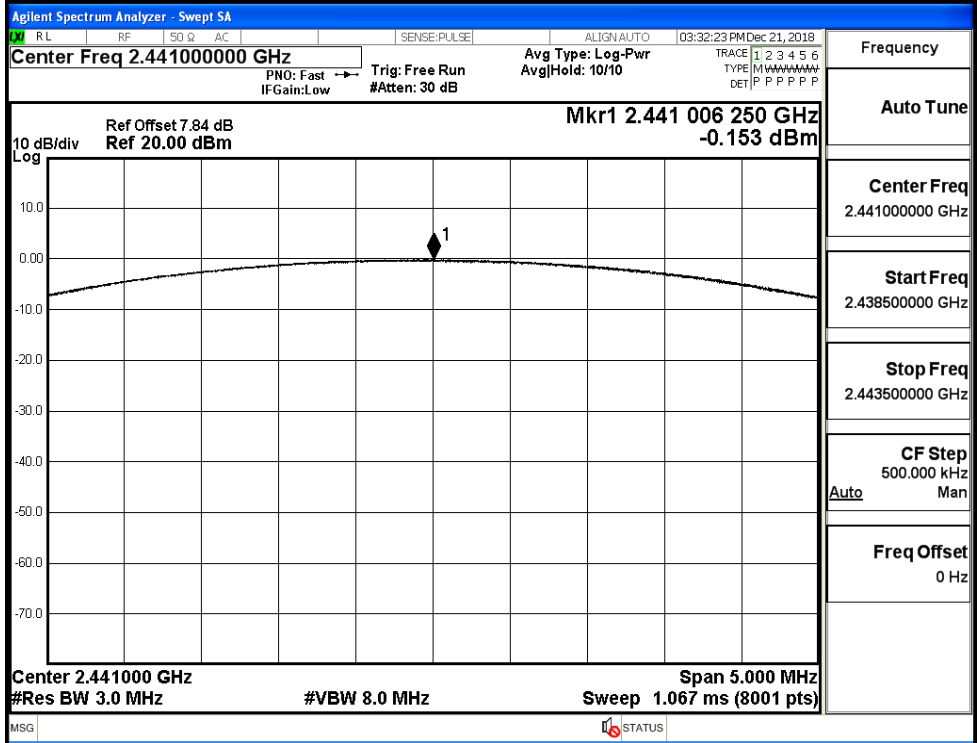




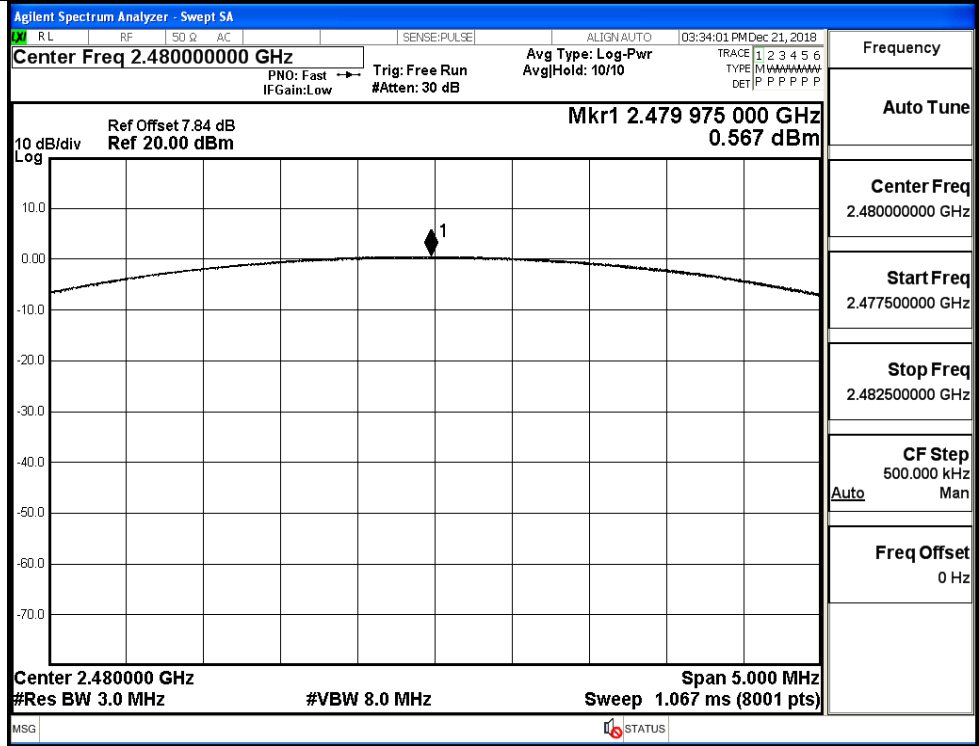
8DPSK/LCH



8DPSK/MCH

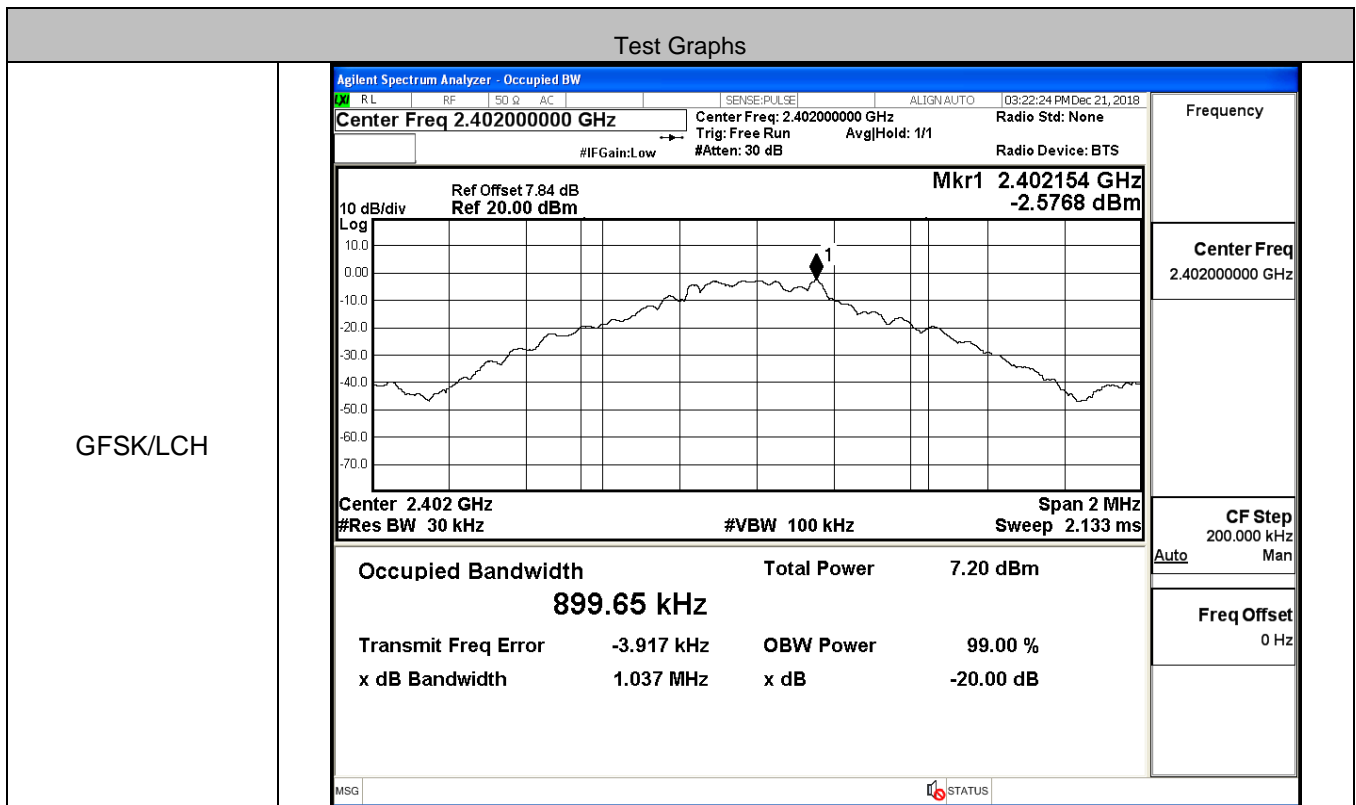


8DPSK/HCH

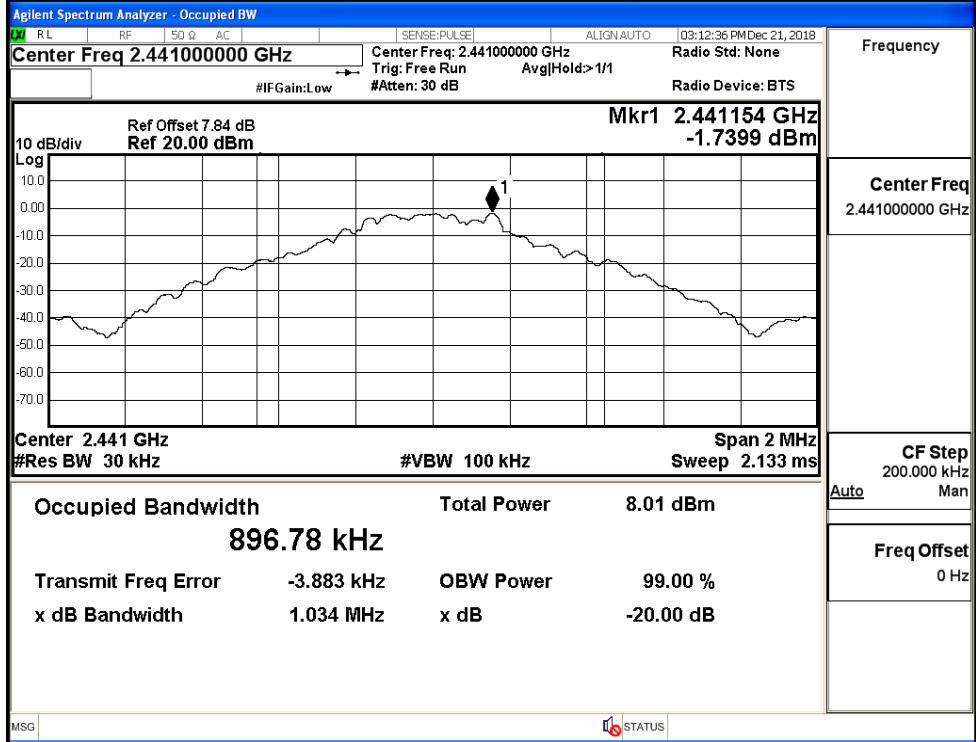


A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89965	1.037	Not Specified	PASS
	MCH	0.89678	1.034	Not Specified	PASS
	HCH	0.90007	1.038	Not Specified	PASS
π/4DQPSK	LCH	1.1752	1.308	Not Specified	PASS
	MCH	1.1707	1.290	Not Specified	PASS
	HCH	1.1698	1.289	Not Specified	PASS
8DPSK	LCH	1.1853	1.306	Not Specified	PASS
	MCH	1.1801	1.296	Not Specified	PASS
	HCH	1.1793	1.295	Not Specified	PASS

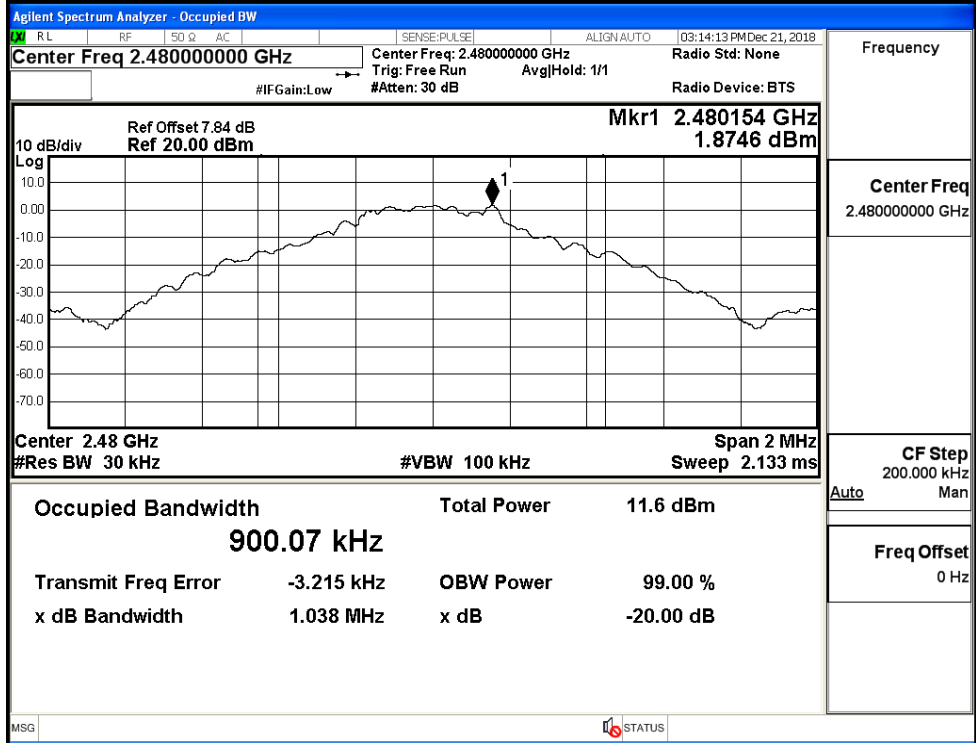


GFSK/MCH



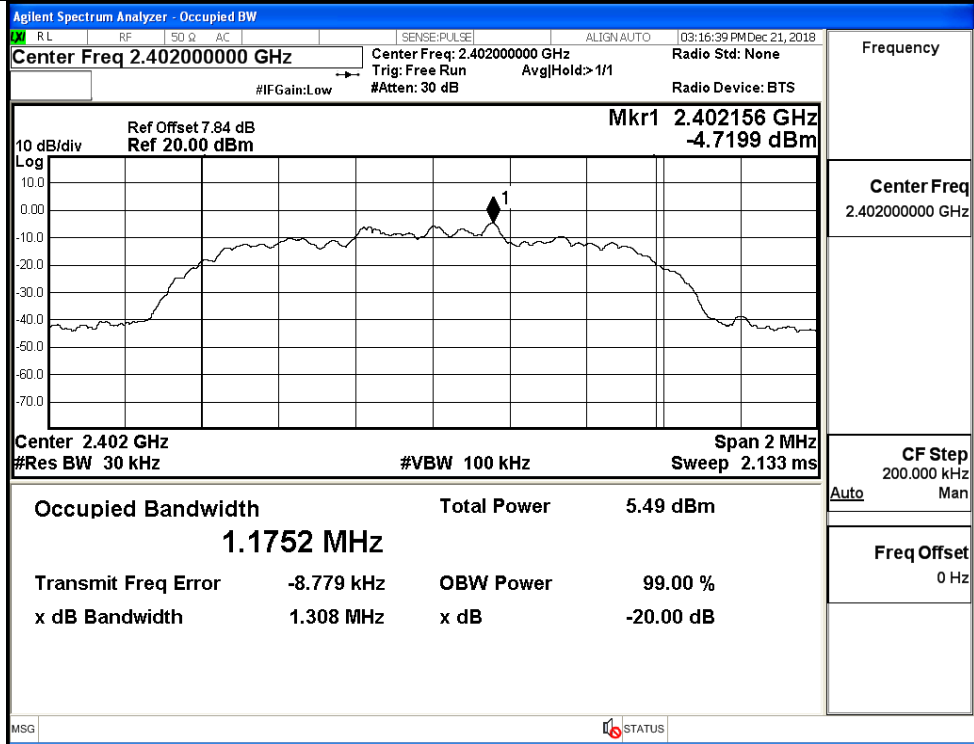
Frequency	2.44100000 GHz
Center Freq	2.44100000 GHz
CF Step	200.000 kHz Auto Man
Freq Offset	0 Hz

GFSK/HCH

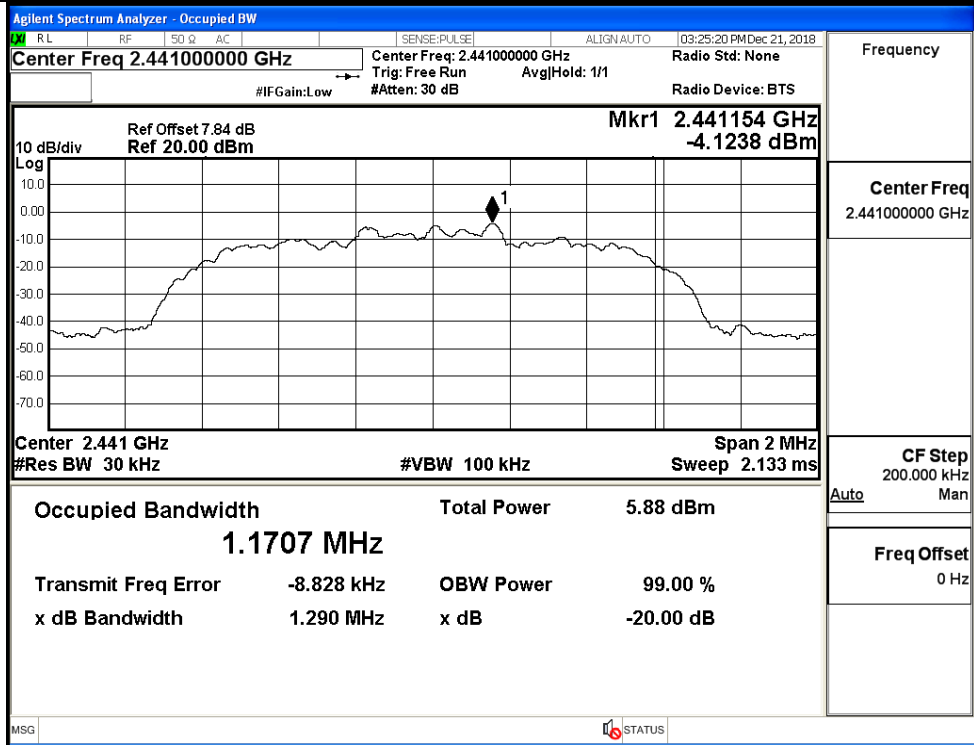


Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	200.000 kHz Auto Man
Freq Offset	0 Hz

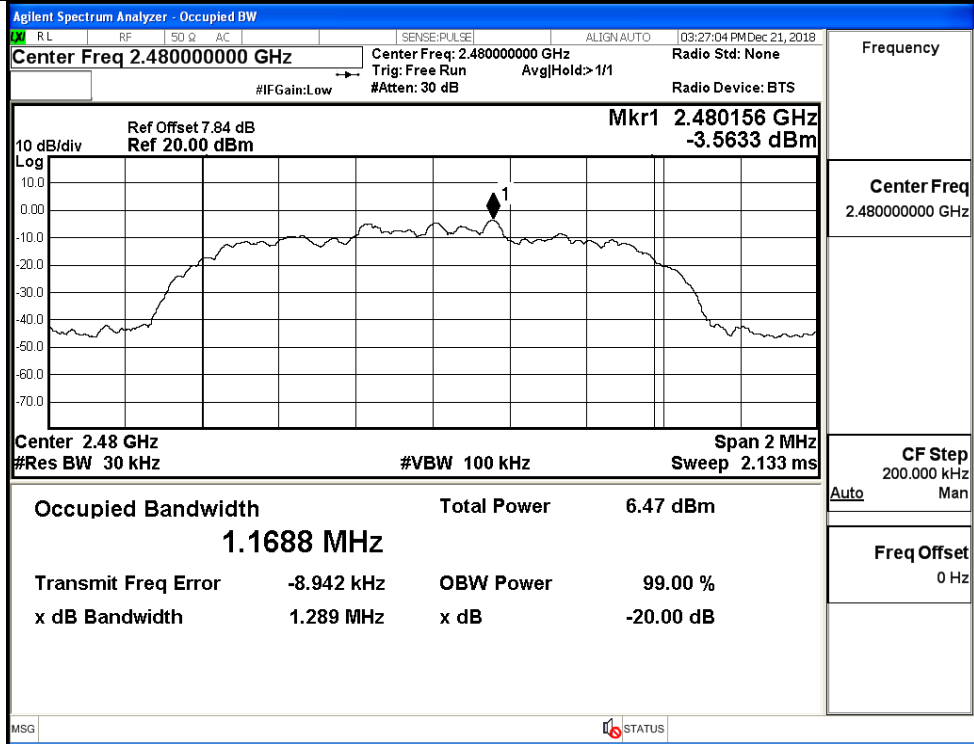
$\pi/4$ DQPSK/LCH



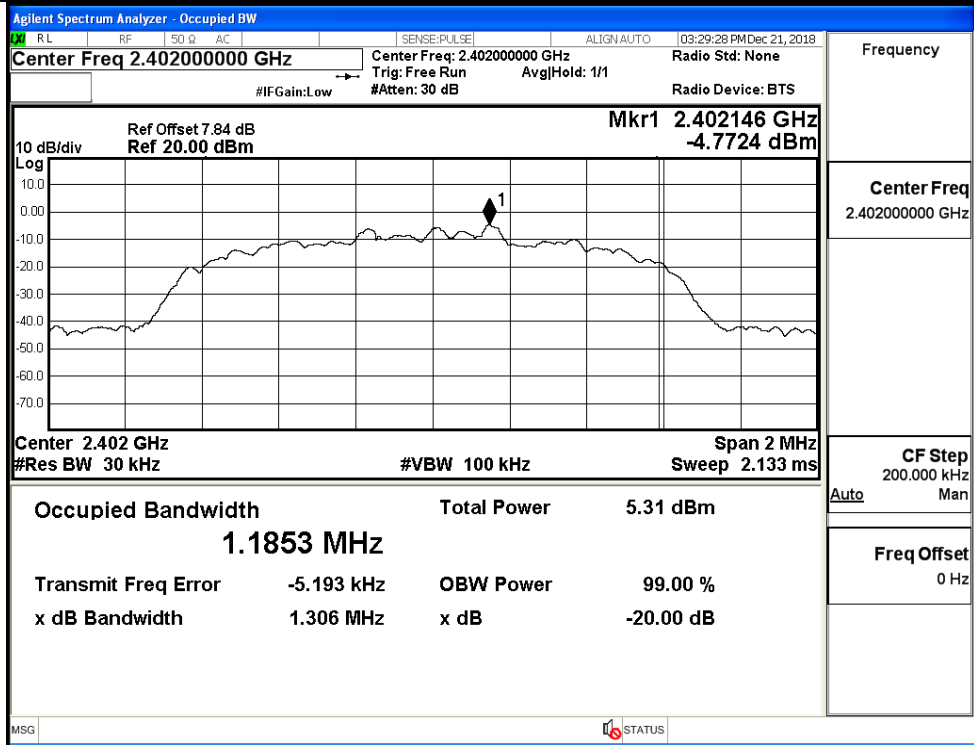
$\pi/4$ DQPSK/MCH



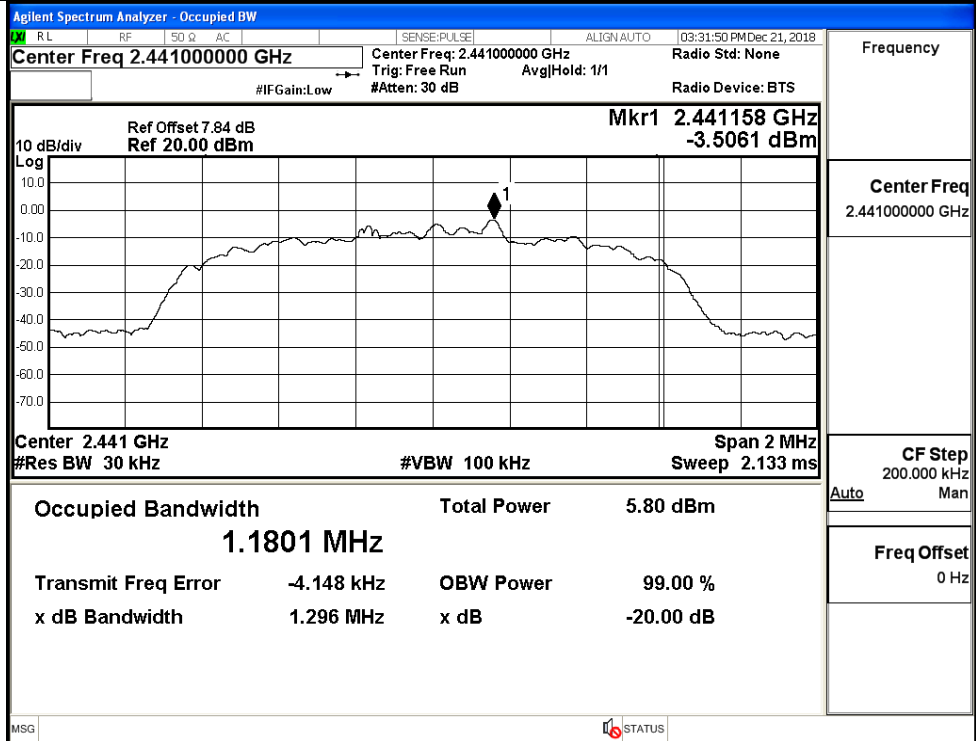
$\pi/4$ DQPSK/HCH



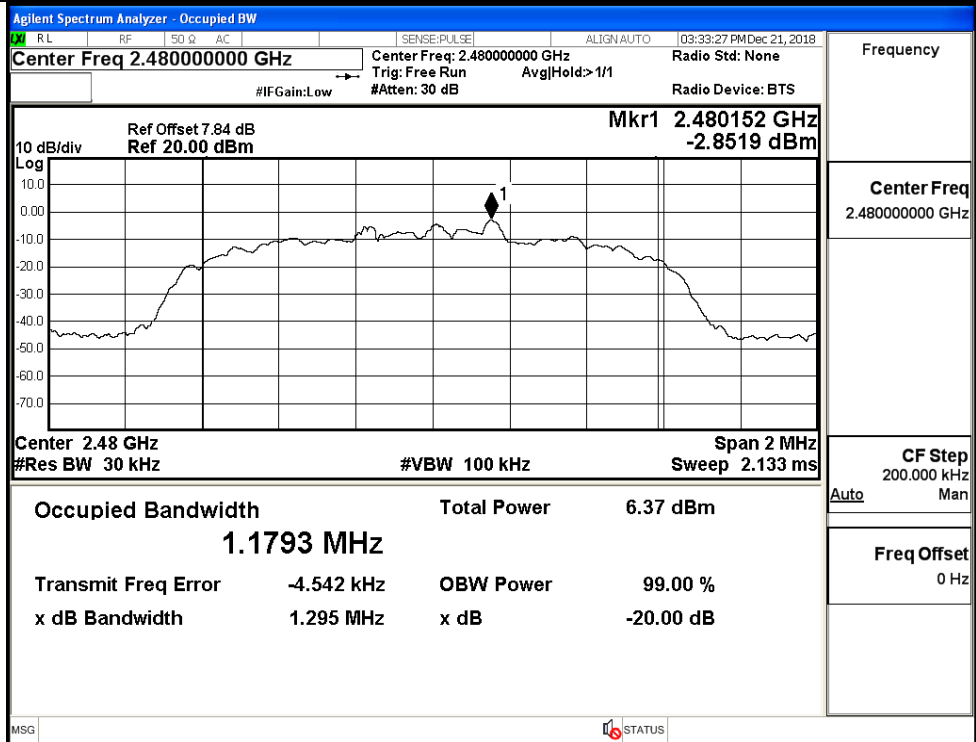
8DPSK/LCH



8DPSK/MCH

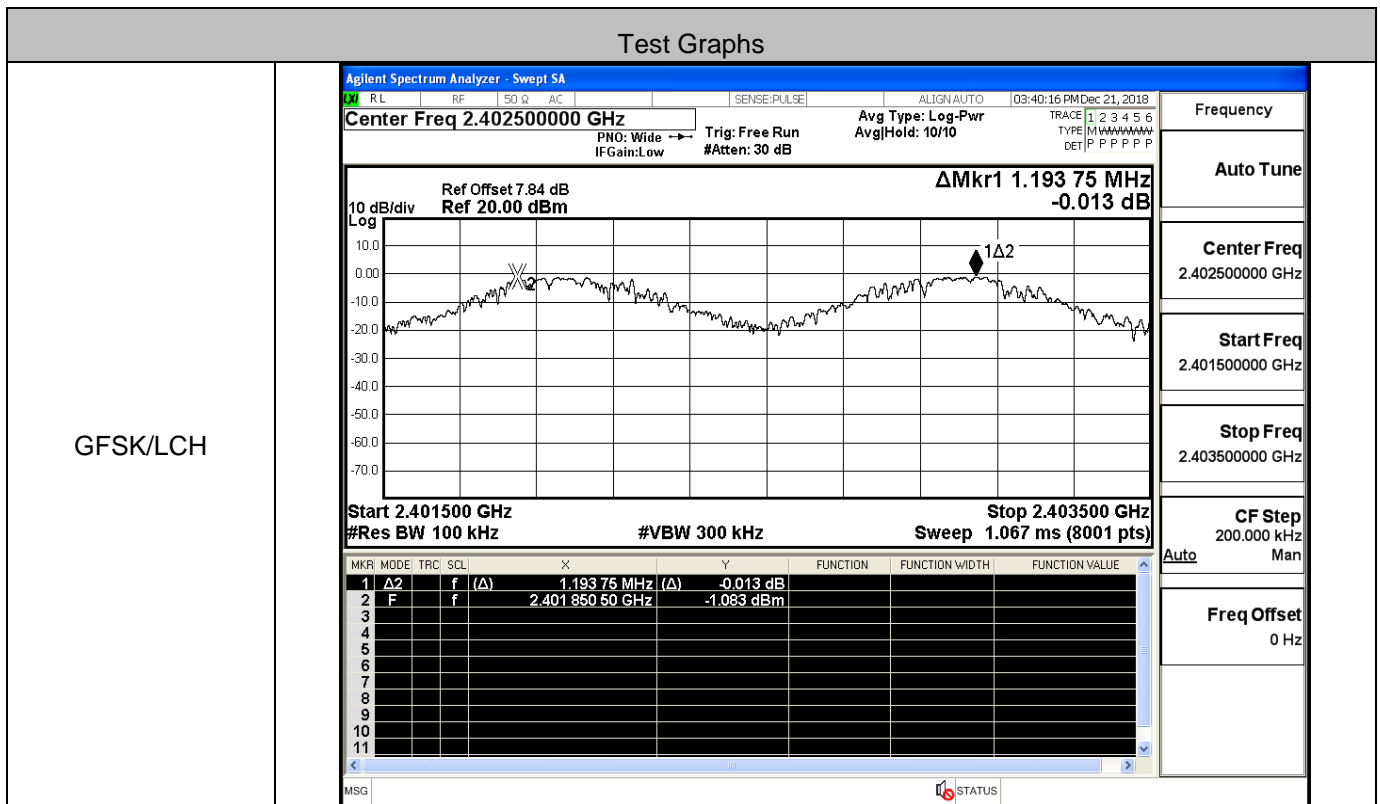


8DPSK/HCH

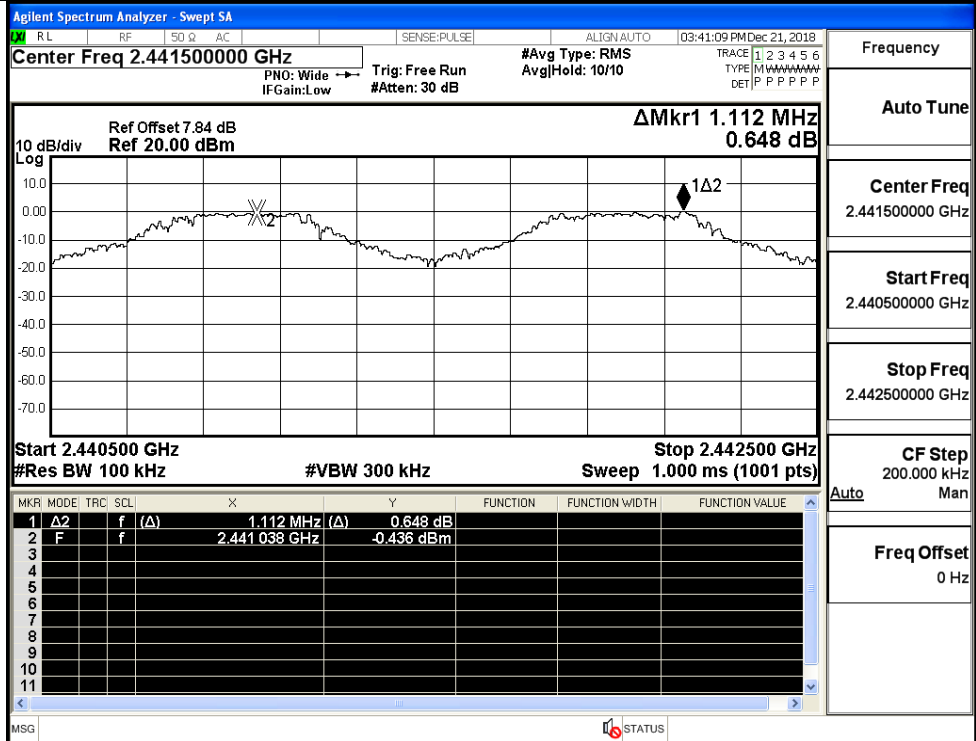


A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.194	0.692	PASS
	MCH	1.112	0.692	PASS
	HCH	1.138	0.692	PASS
π/4DQPSK	LCH	1.014	0.872	PASS
	MCH	1.004	0.872	PASS
	HCH	1.108	0.872	PASS
8DPSK	LCH	1.226	0.871	PASS
	MCH	0.982	0.871	PASS
	HCH	1.242	0.871	PASS



GFSK/MCH



Frequency

Auto Tune

Center Freq
2.441500000 GHz

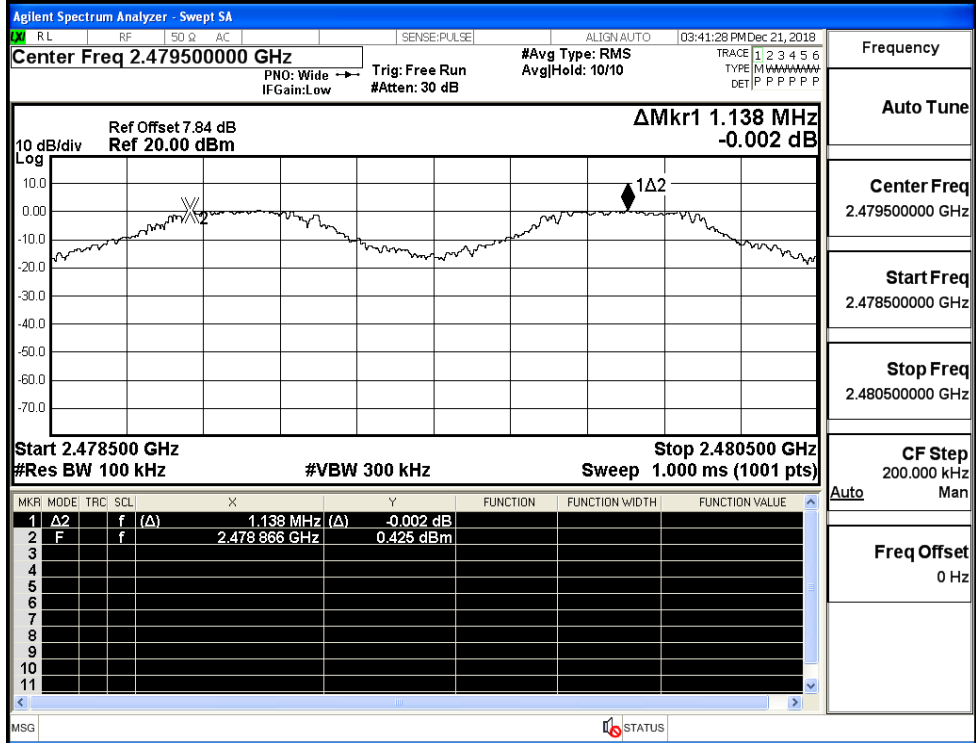
Start Freq
2.440500000 GHz

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

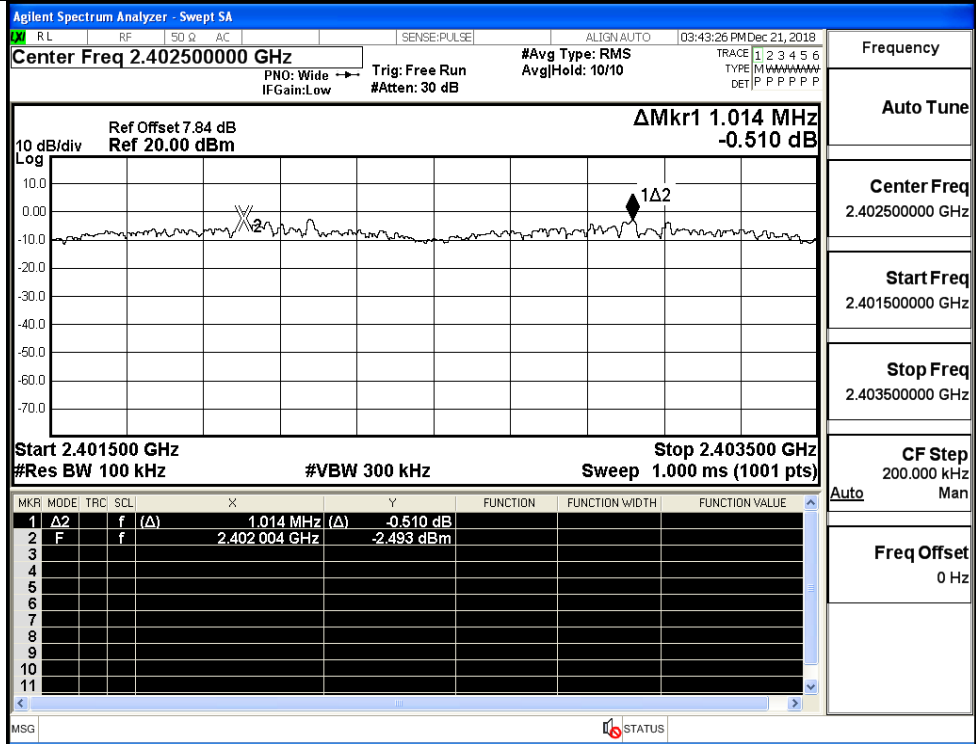
Start Freq
2.478500000 GHz

Stop Freq
2.480500000 GHz

CF Step
200.000 kHz
Auto Man

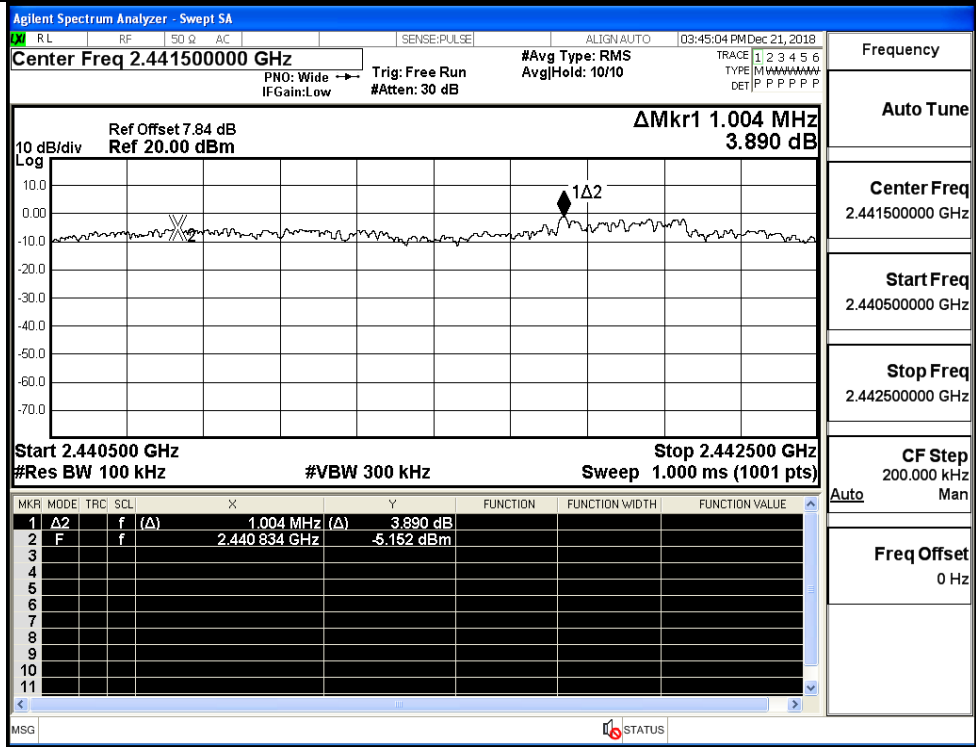
Freq Offset
0 Hz

$\pi/4$ DQPSK/LCH



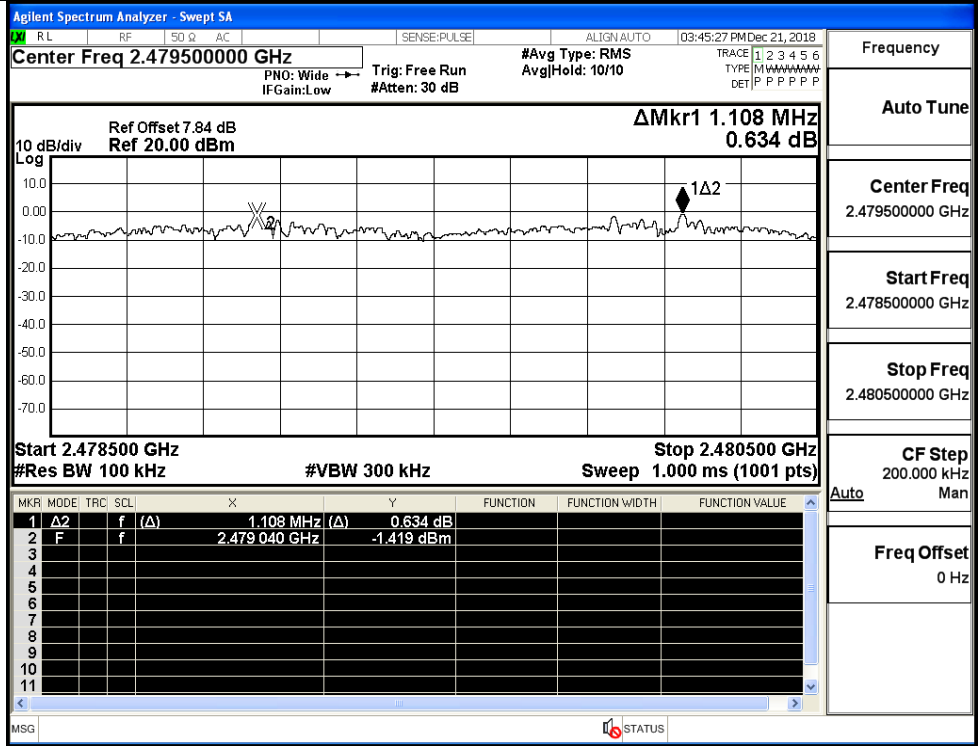
Frequency	2.402500000 GHz
Auto Tune	
Center Freq	2.402500000 GHz
Start Freq	2.401500000 GHz
Stop Freq	2.403500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK/MCH

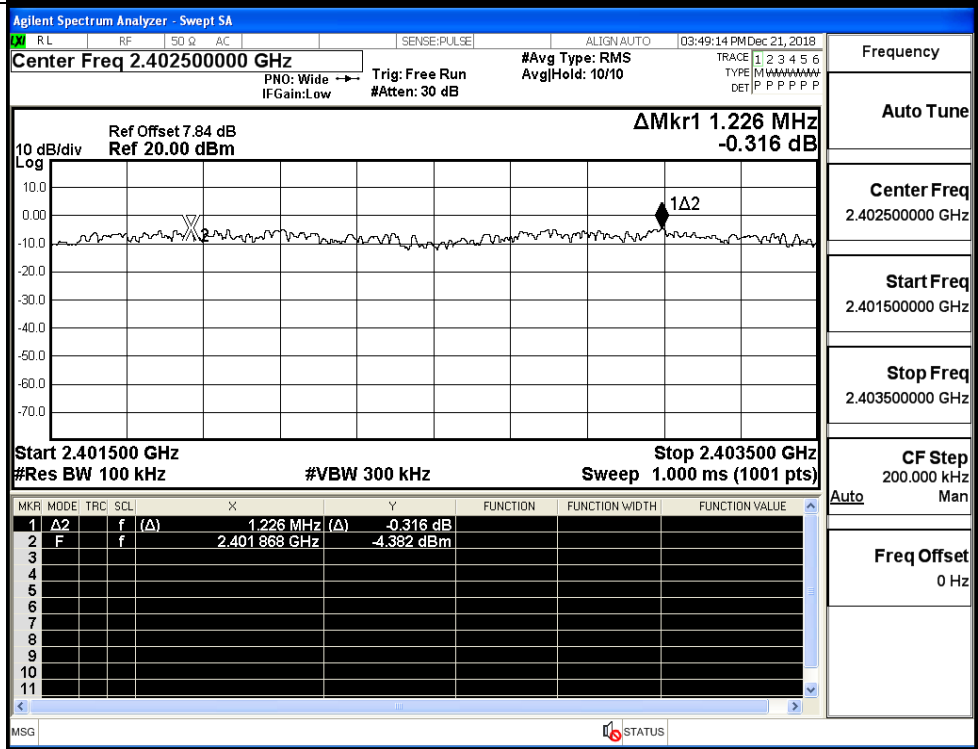


Frequency	2.441500000 GHz
Auto Tune	
Center Freq	2.441500000 GHz
Start Freq	2.440500000 GHz
Stop Freq	2.442500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

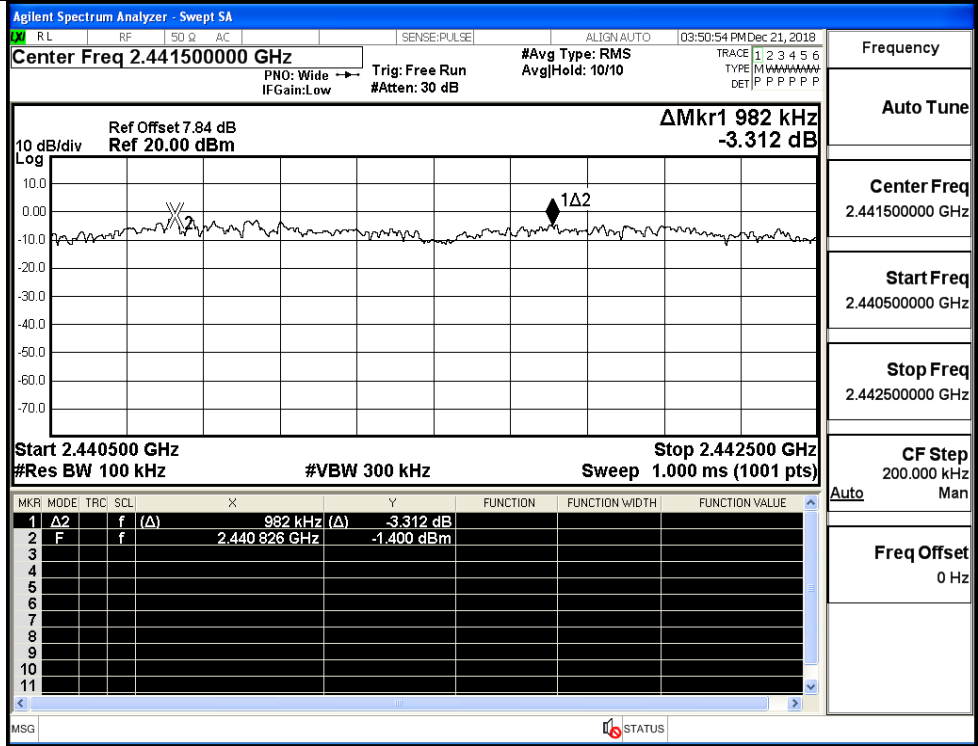
π/4DQPSK/HCH



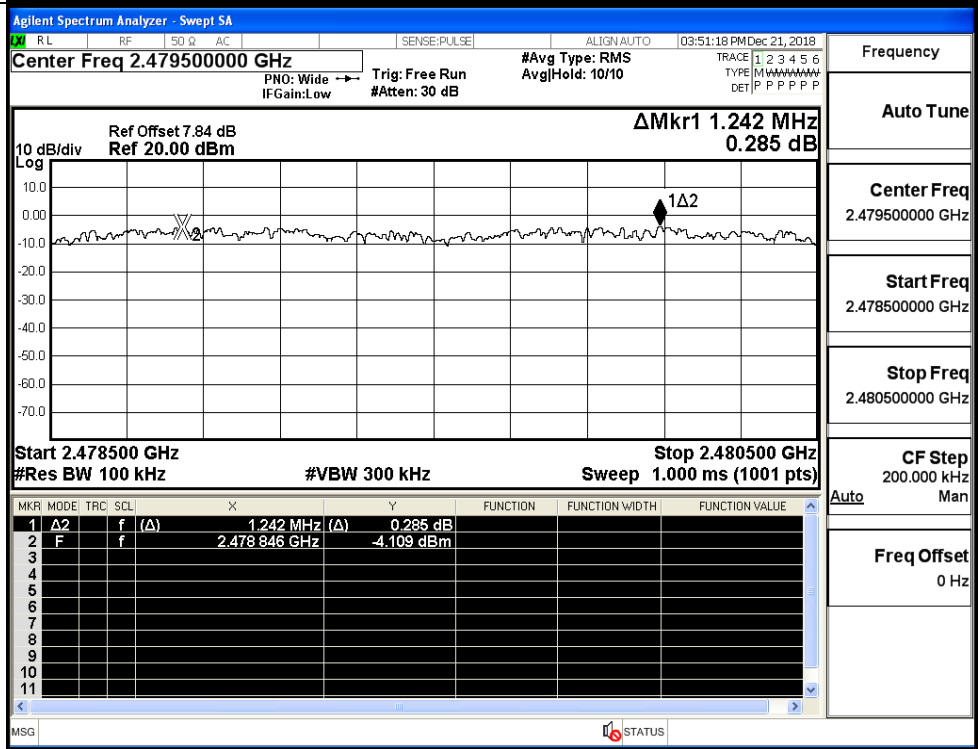
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



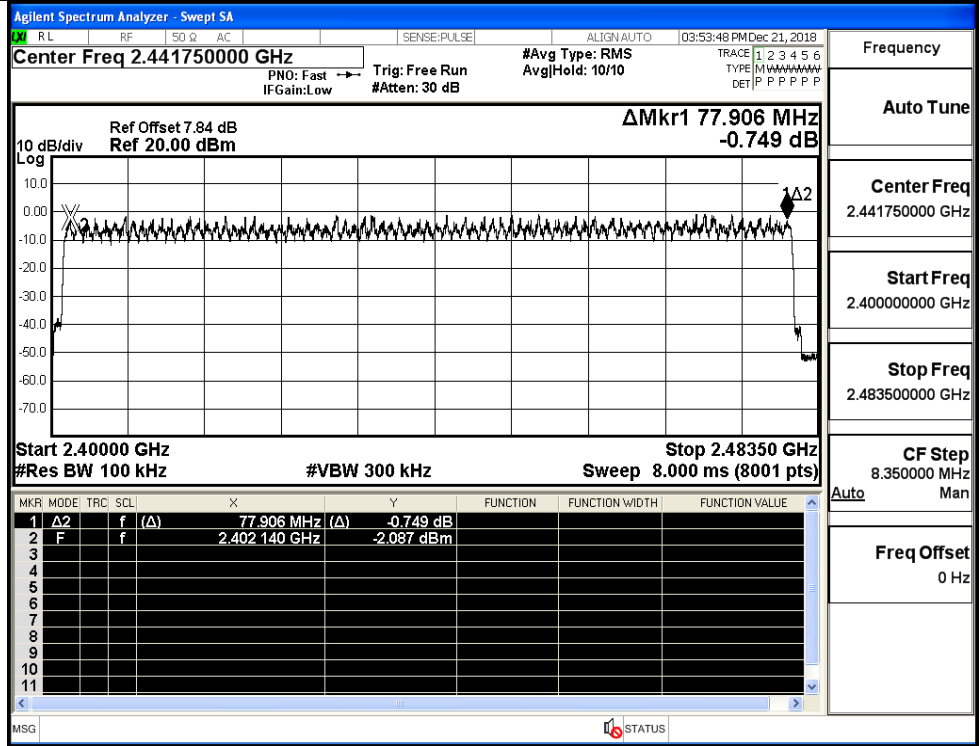
A.4 Hopping Channel Number

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

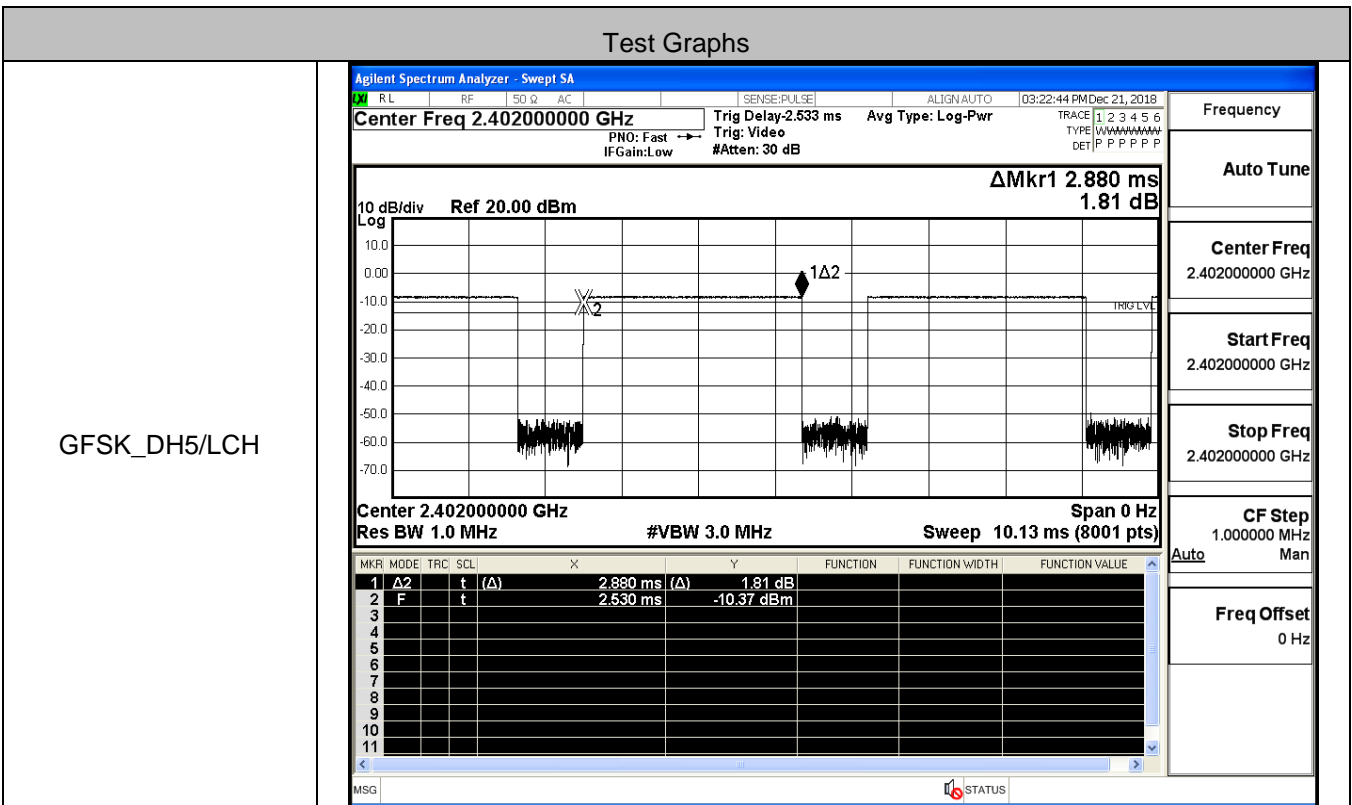
GFSK/Hop		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.441750000 GHz</p> <p>Start Freq 2.400000000 GHz</p> <p>Stop Freq 2.483500000 GHz</p> <p>CF Step 8.350000 MHz Man</p> <p>Freq Offset 0 Hz</p>																									
	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.84 dB Ref 20.00 dBm</p> <p>ΔMkr1 78.104 MHz 0.988 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>78.104 MHz</td> <td>(Δ)</td> <td>0.988 dB</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402004 GHz</td> <td></td> <td>-0.518 dBm</td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	78.104 MHz	(Δ)	0.988 dB			2	F	f		2.402004 GHz		-0.518 dBm	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																			
1	Δ 2	f	(Δ)	78.104 MHz	(Δ)	0.988 dB																					
2	F	f		2.402004 GHz		-0.518 dBm																					
$\pi/4$ DQPSK/Hop		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.441750000 GHz</p> <p>Start Freq 2.400000000 GHz</p> <p>Stop Freq 2.483500000 GHz</p> <p>CF Step 8.350000 MHz Man</p> <p>Freq Offset 0 Hz</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 77.958 MHz -0.965 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>77.958 MHz</td> <td>(Δ)</td> <td>-0.965 dB</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401879 GHz</td> <td></td> <td>-3.388 dBm</td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	77.958 MHz	(Δ)	-0.965 dB			2	F	f		2.401879 GHz		-3.388 dBm	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																			
1	Δ 2	f	(Δ)	77.958 MHz	(Δ)	-0.965 dB																					
2	F	f		2.401879 GHz		-3.388 dBm																					

8DPSK/Hop

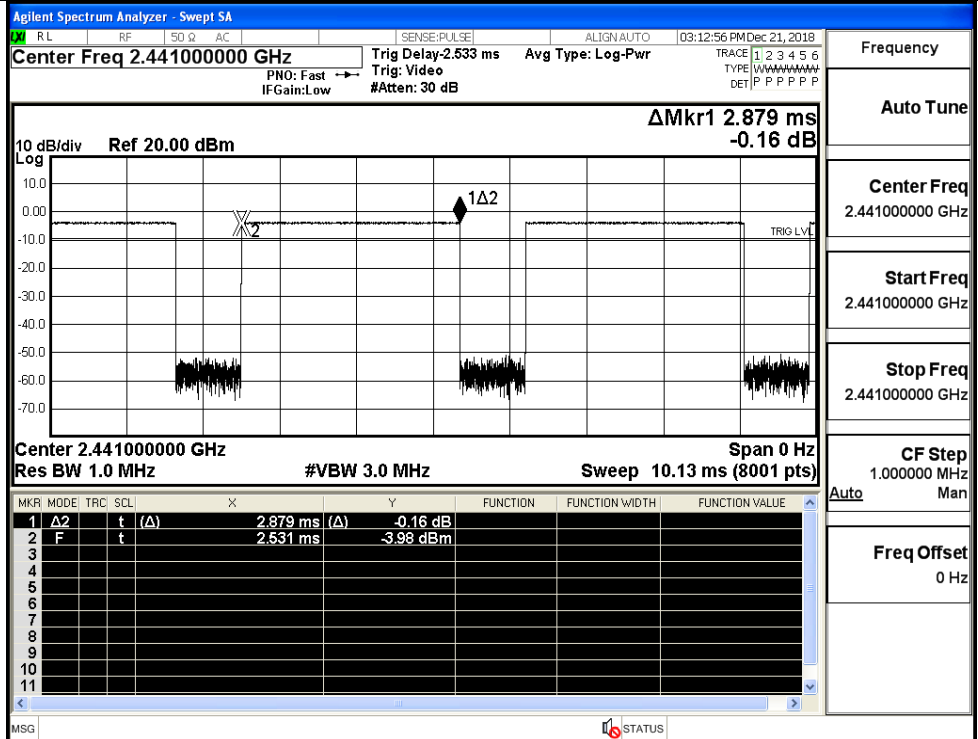


A.5 Dwell Time

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

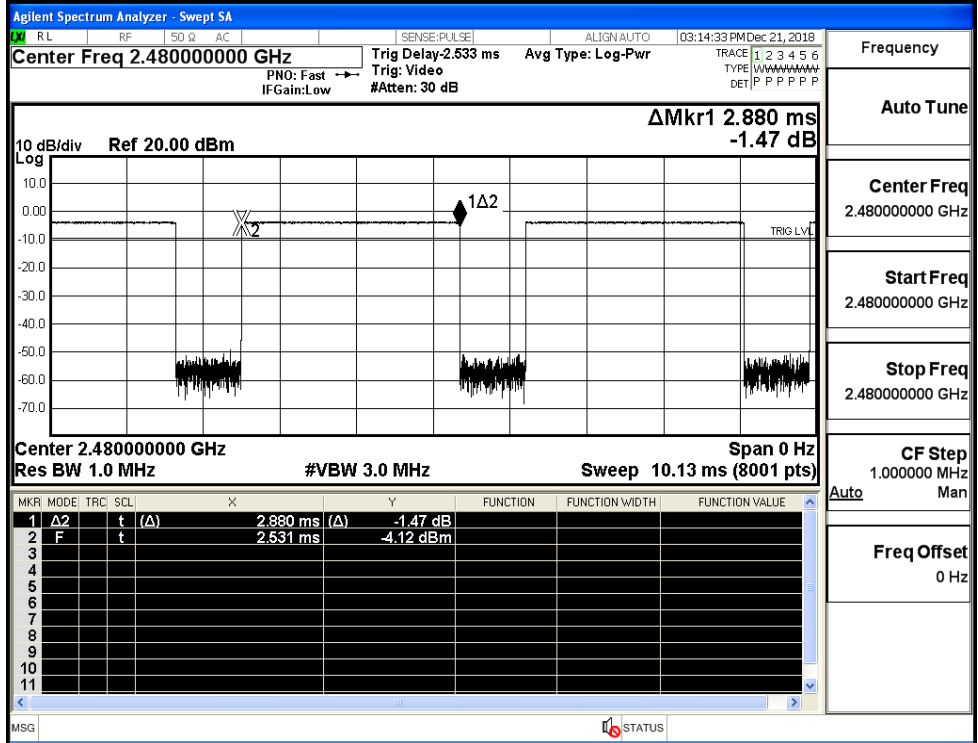
Start Freq 2.441000000 GHz

Stop Freq 2.441000000 GHz

CF Step 1.000000 MHz

Freq Offset 0 Hz

GFSK_DH5/HCH



Frequency

Auto Tune

Center Freq 2.480000000 GHz

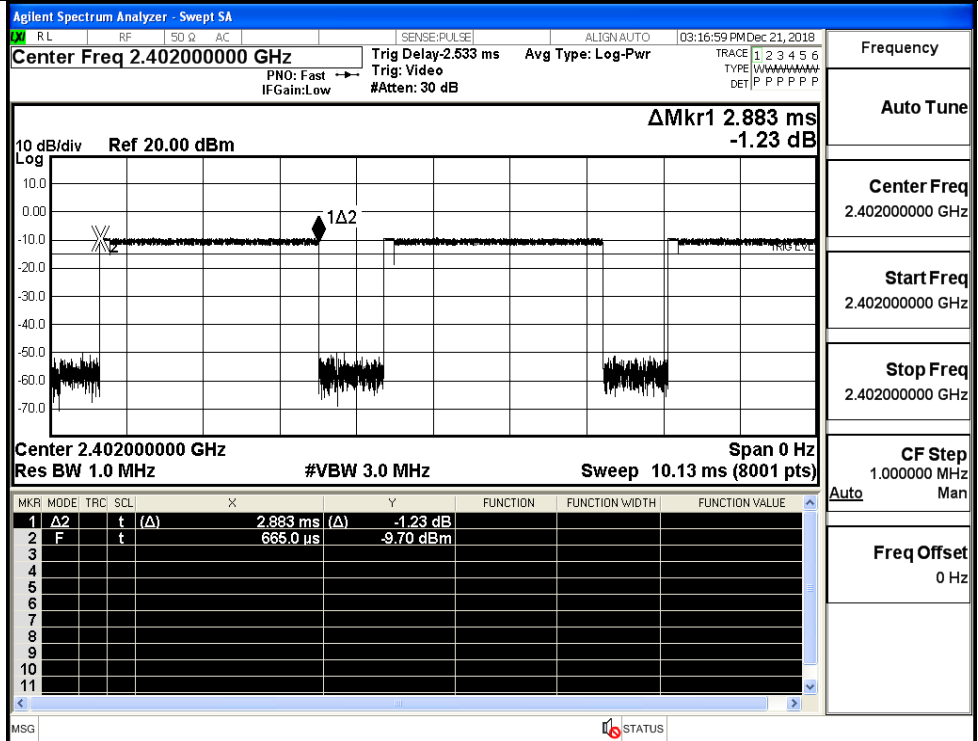
Start Freq 2.480000000 GHz

Stop Freq 2.480000000 GHz

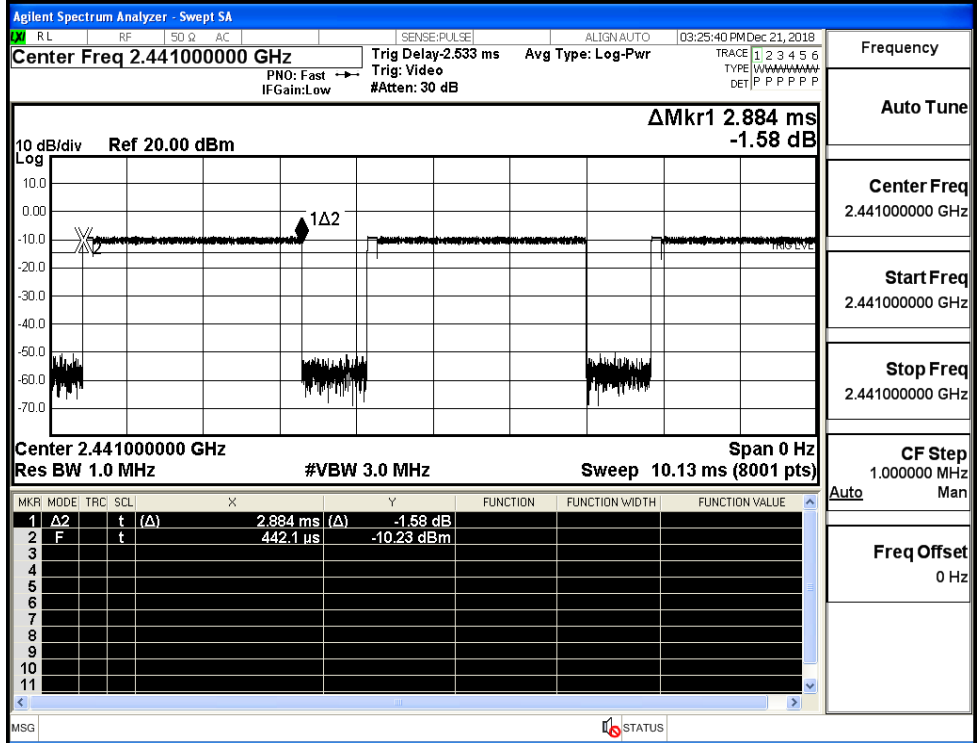
CF Step 1.000000 MHz

Freq Offset 0 Hz

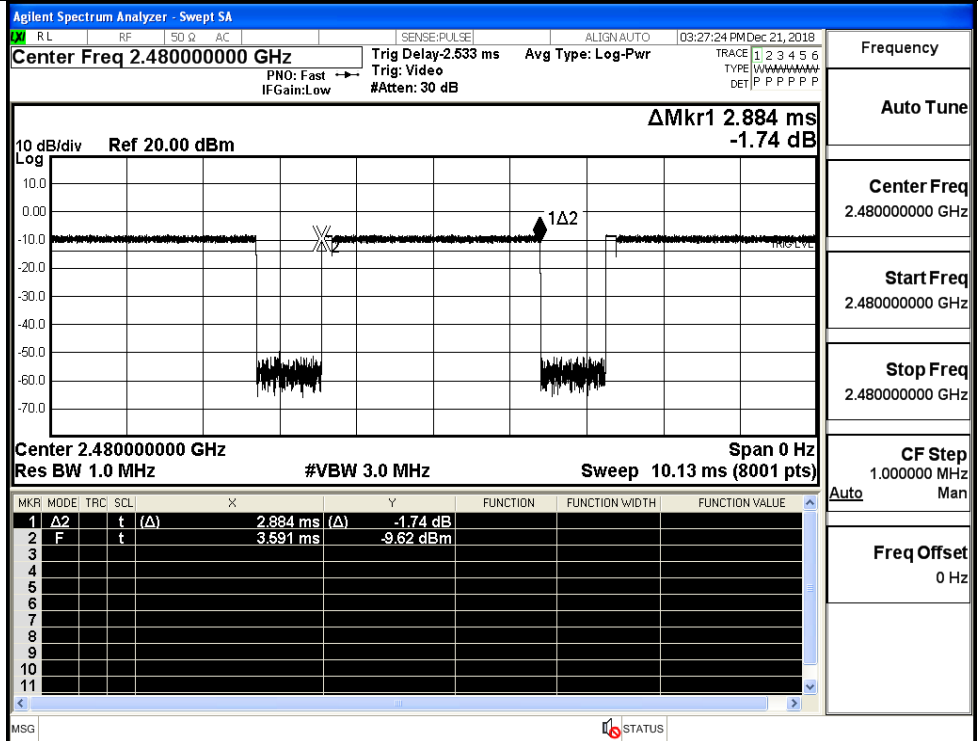
$\pi/4$ DQPSK
_2DH5/LCH



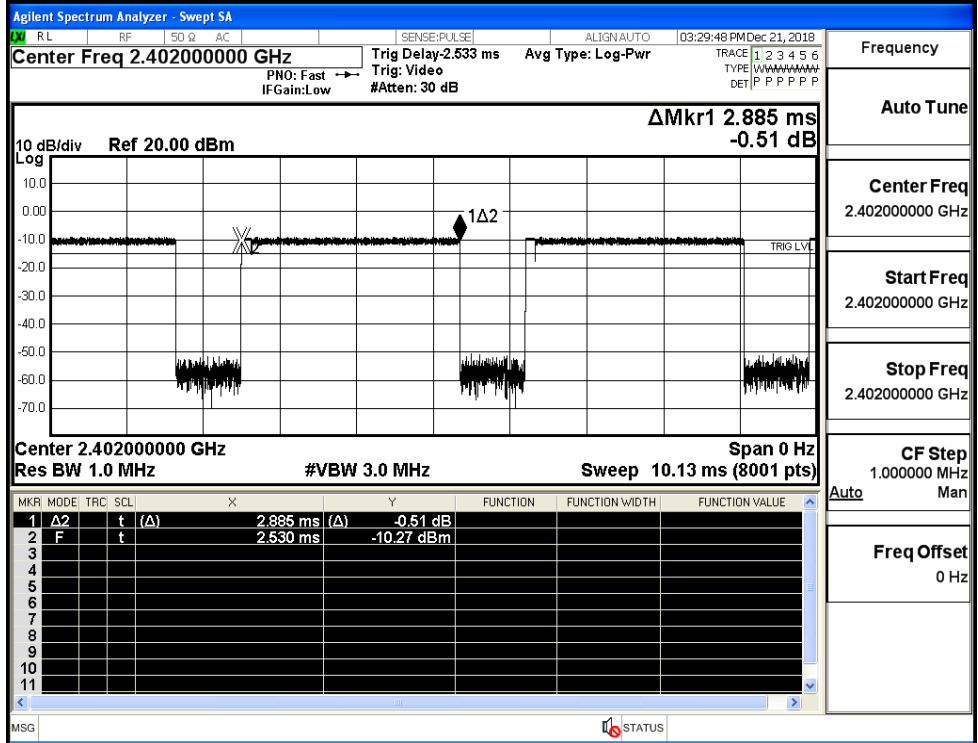
$\pi/4$ DQPSK
_2DH5/MCH



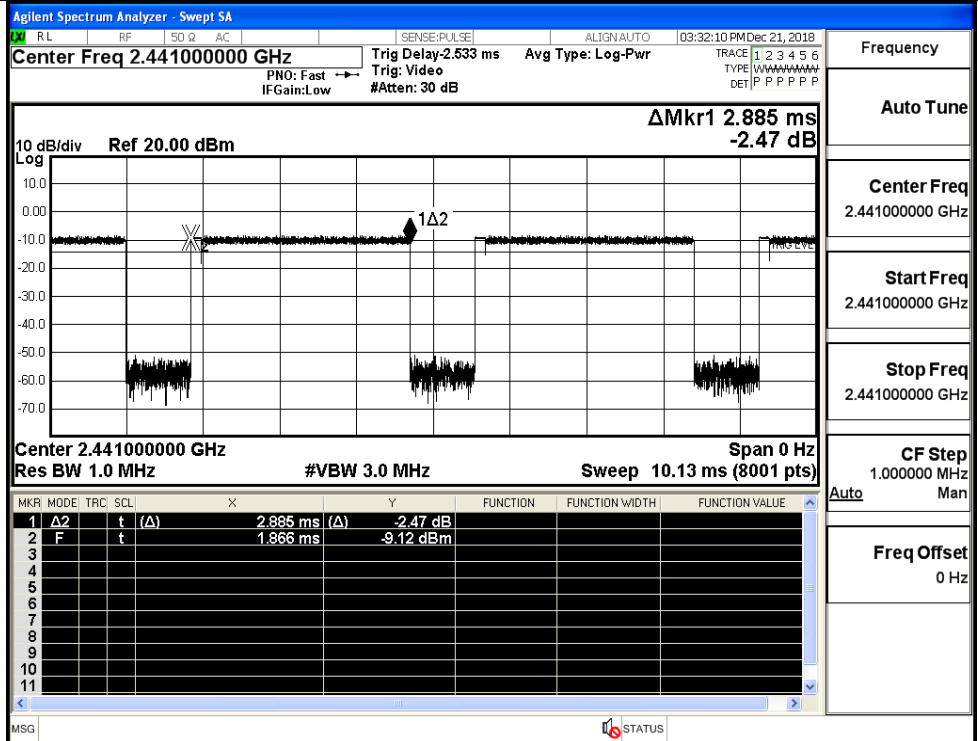
$\pi/4$ DQPSK
_2DH5/HCH



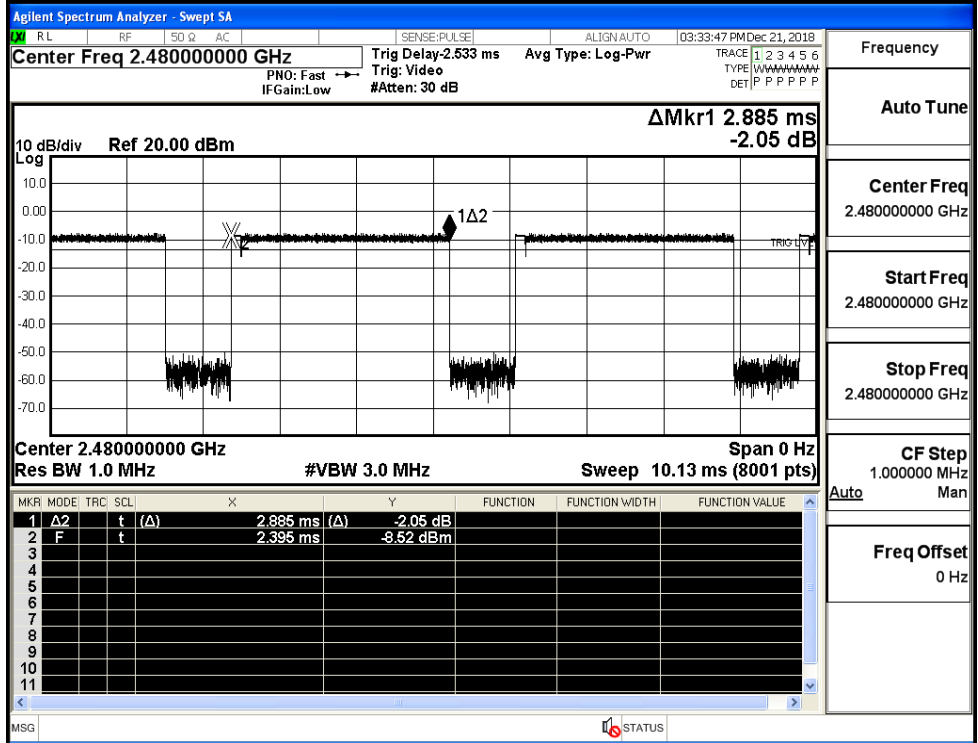
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

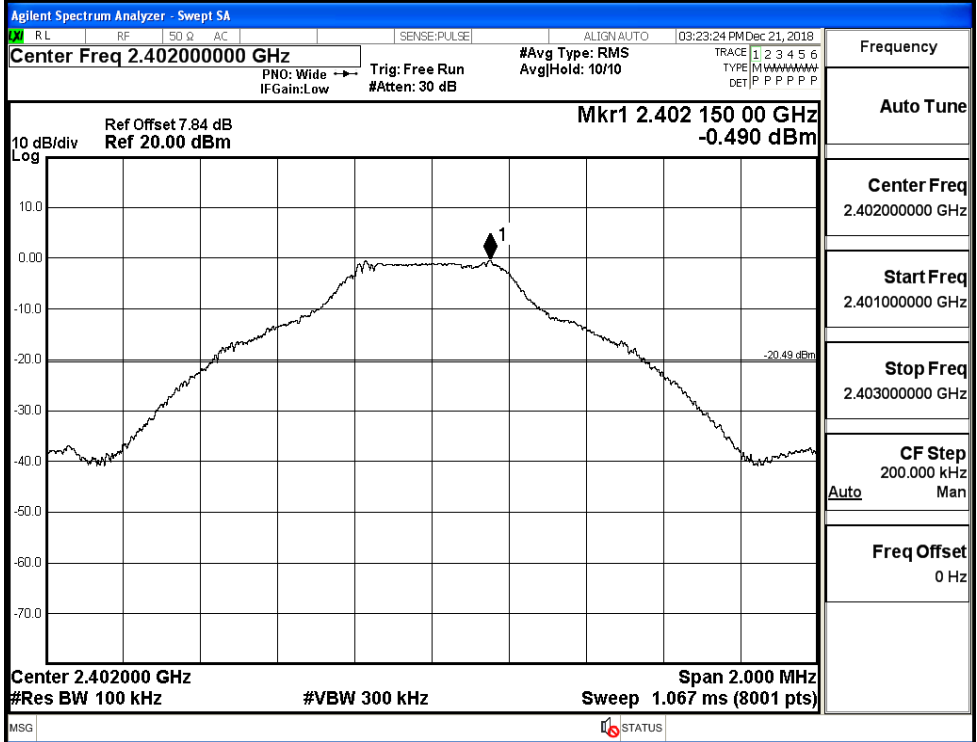


A.6 RF Conducted Spurious Emissions

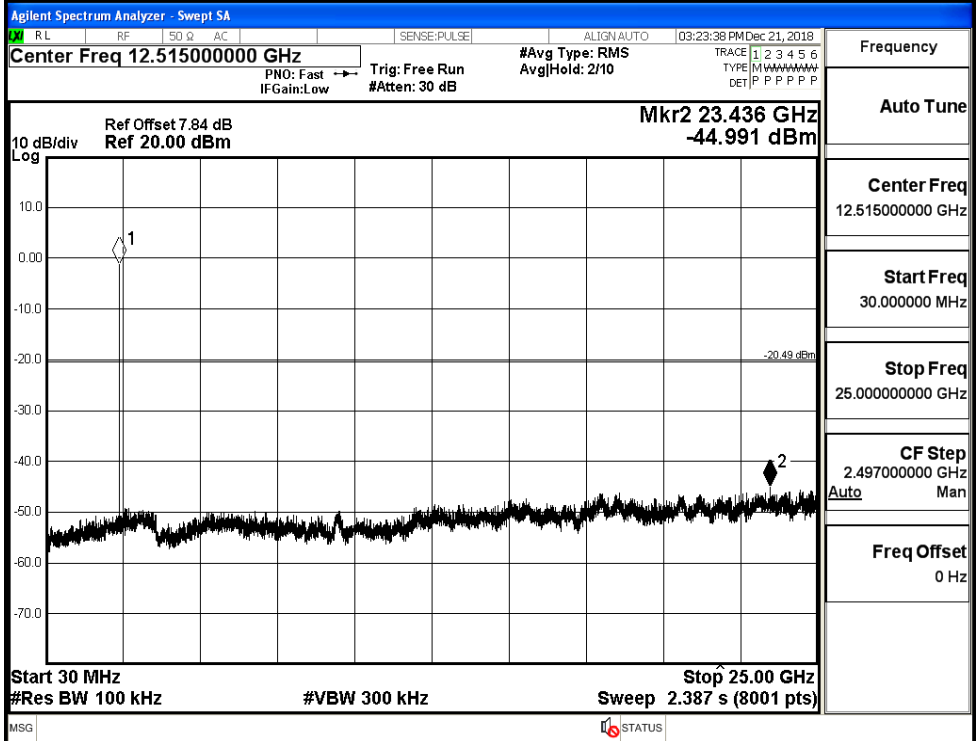
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.49	-44.991	-20.490	PASS
	MCH	3.88	-45.445	-16.120	PASS
	HCH	3.856	-45.021	-16.144	PASS
$\pi/4$ DQPSK	LCH	-1.761	-44.642	-21.761	PASS
	MCH	-1.769	-44.045	-21.769	PASS
	HCH	-0.981	-44.000	-20.981	PASS
8DPSK	LCH	-1.758	-45.034	-21.758	PASS
	MCH	-1.358	-45.052	-21.358	PASS
	HCH	-0.662	-44.599	-20.662	PASS

GFSK_LCH_Graphs

Pref

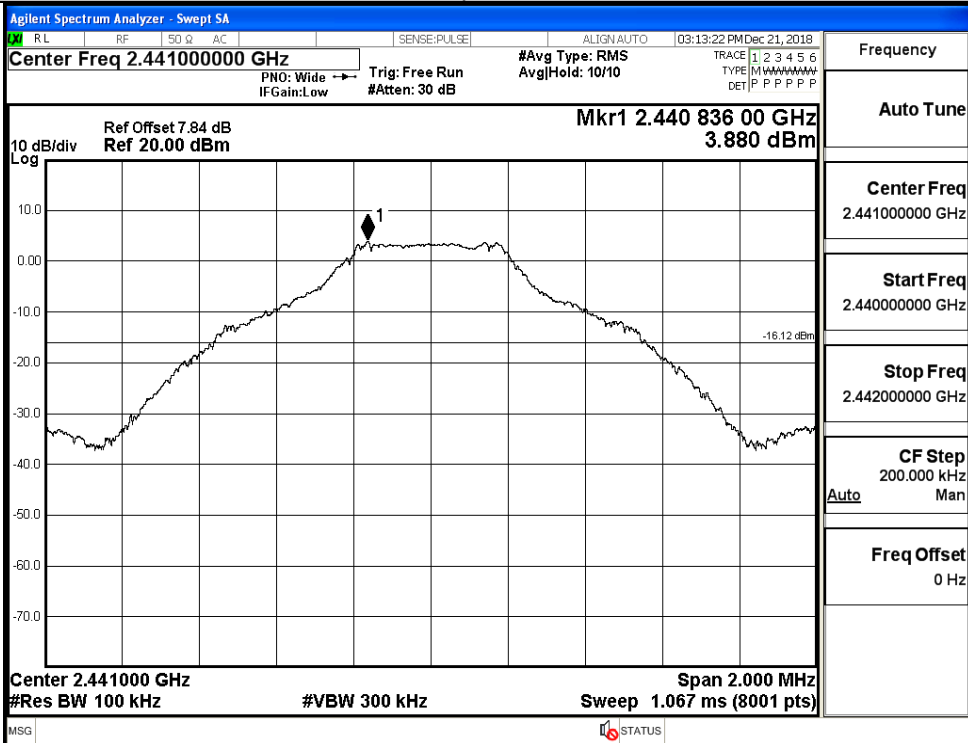


Puw

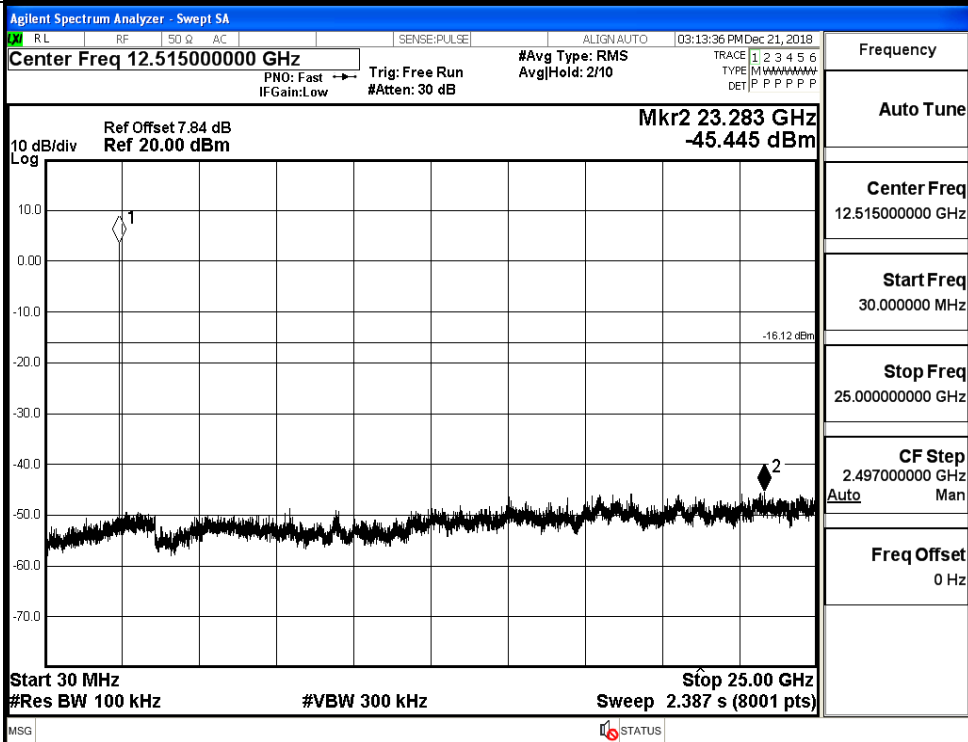


GFSK_MCH_Graphs

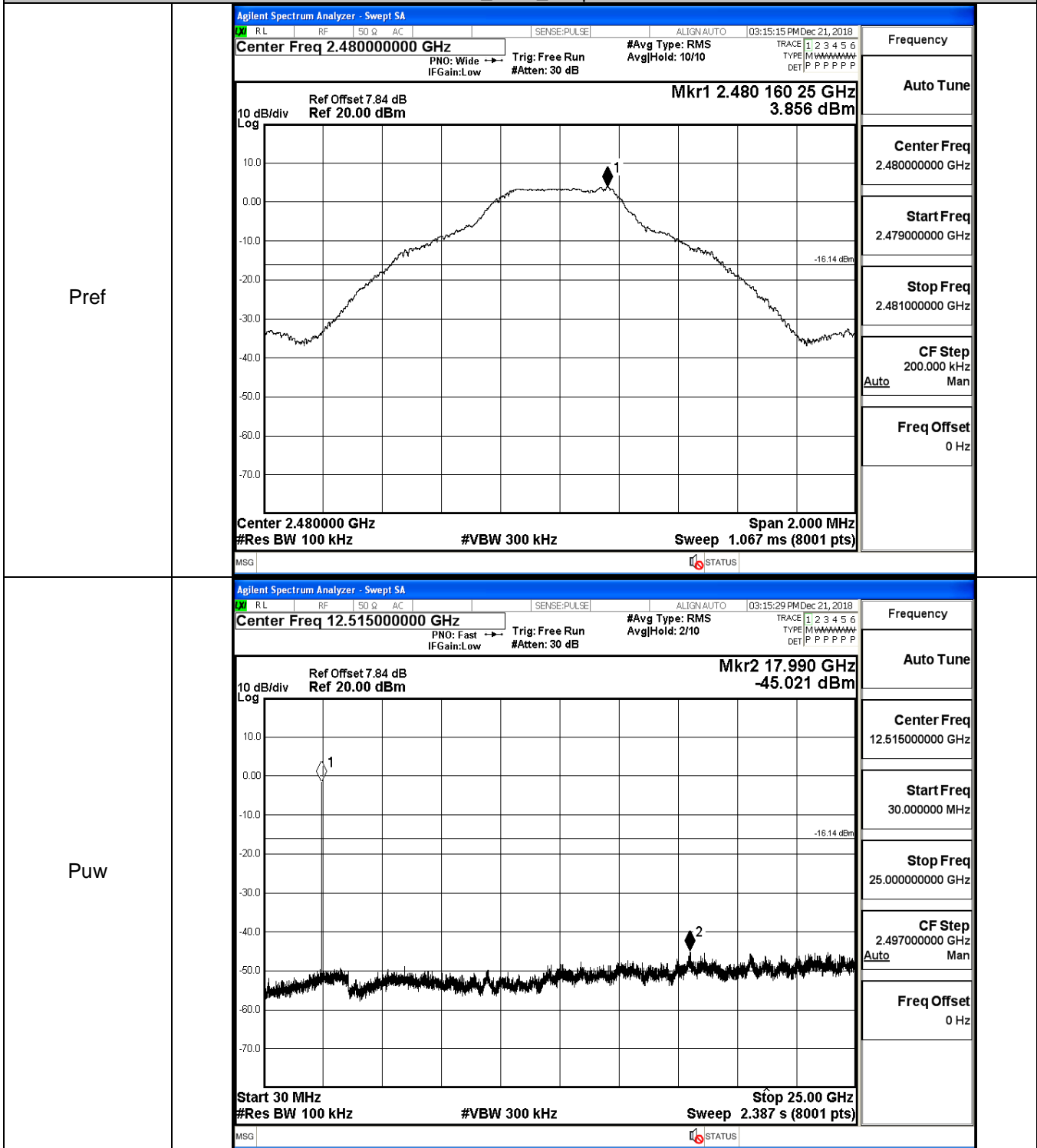
Pref



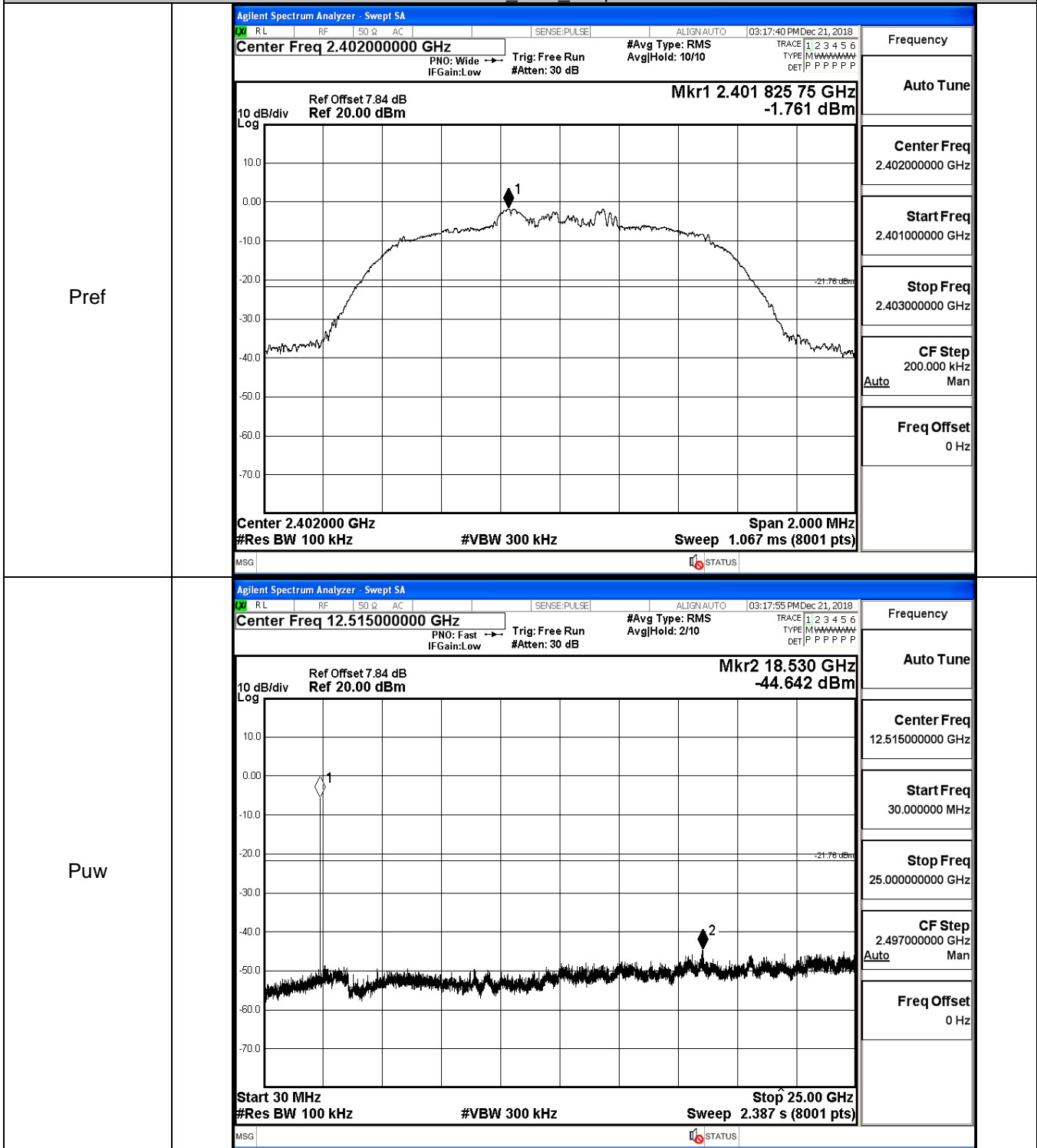
Puw



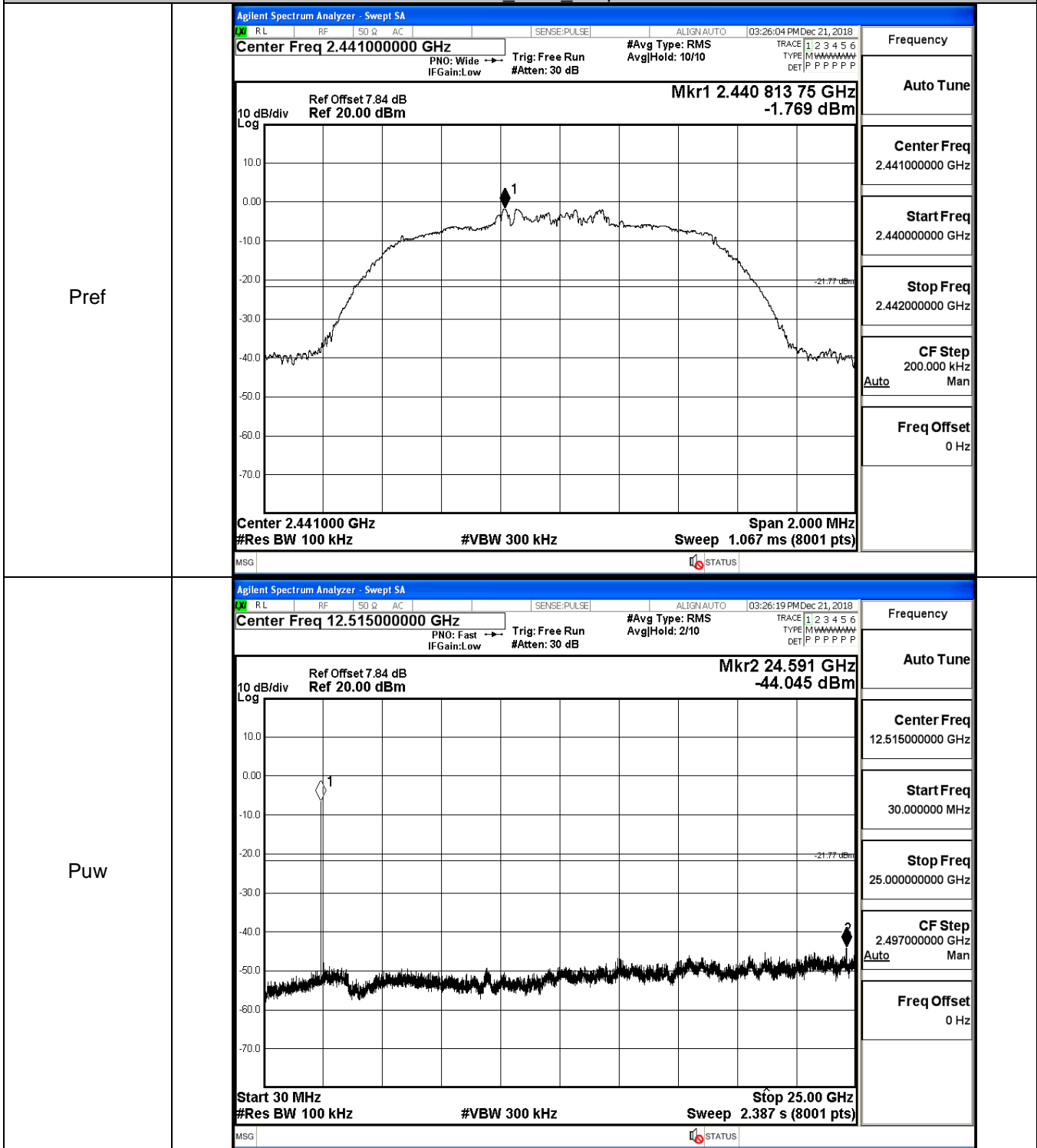
GFSK_HCH_Graphs



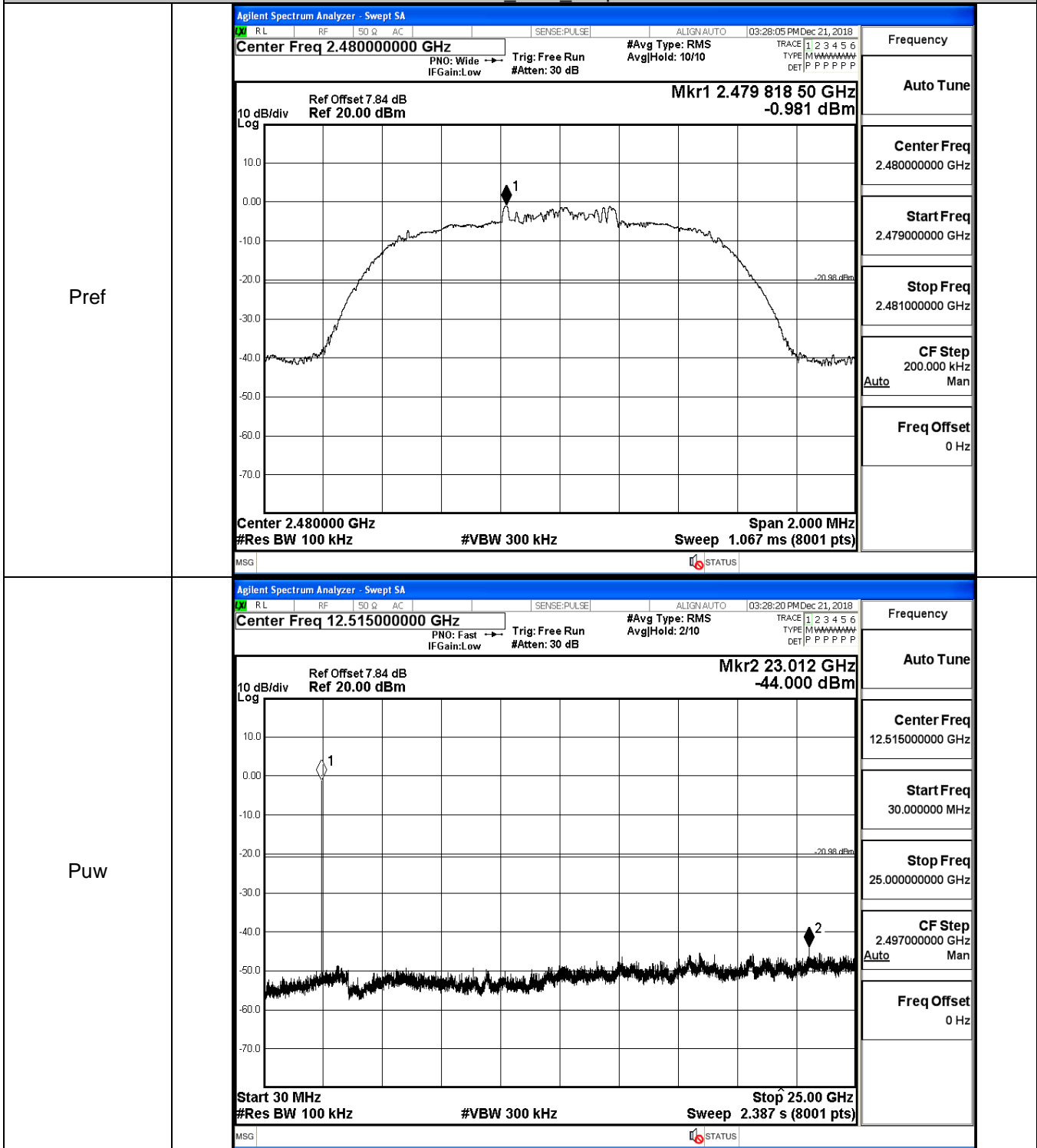
$\pi/4$ DQPSK LCH_Graphs



$\pi/4$ DQPSK_MCH_Graphs

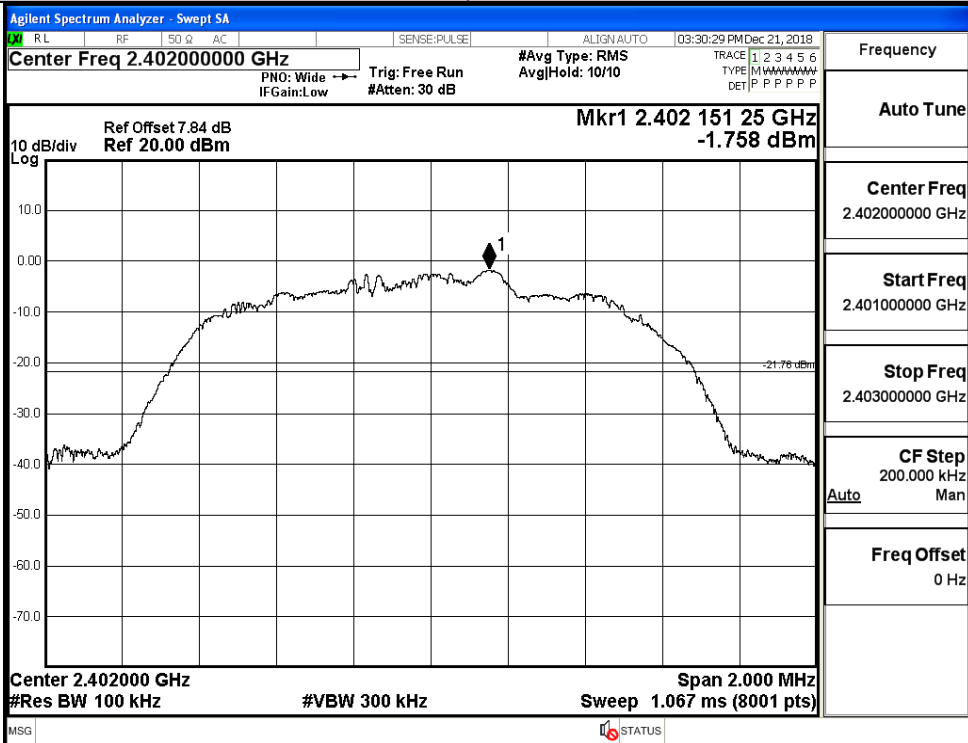


$\pi/4$ DQPSK_HCH_Graphs

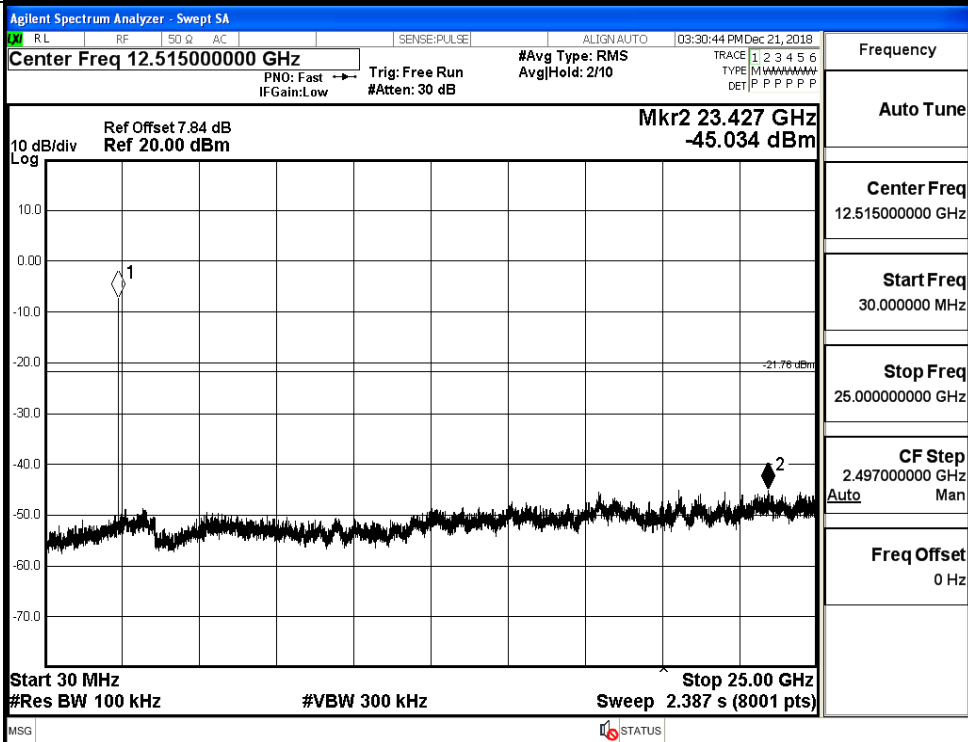


8DPSK_LCH_Graphs

Pref

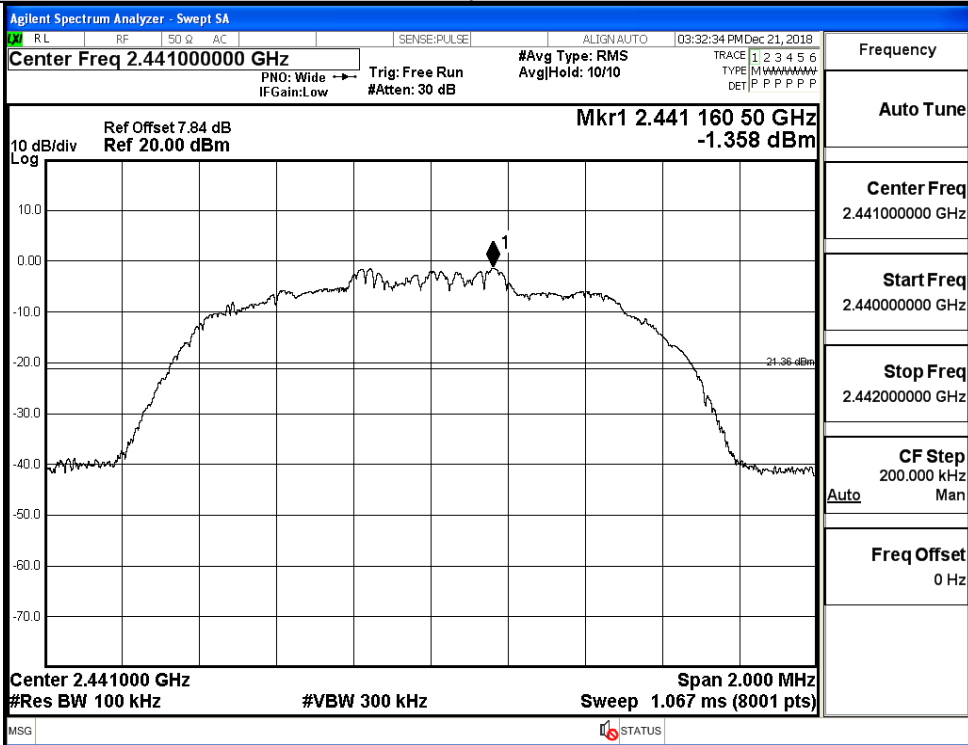


Puw

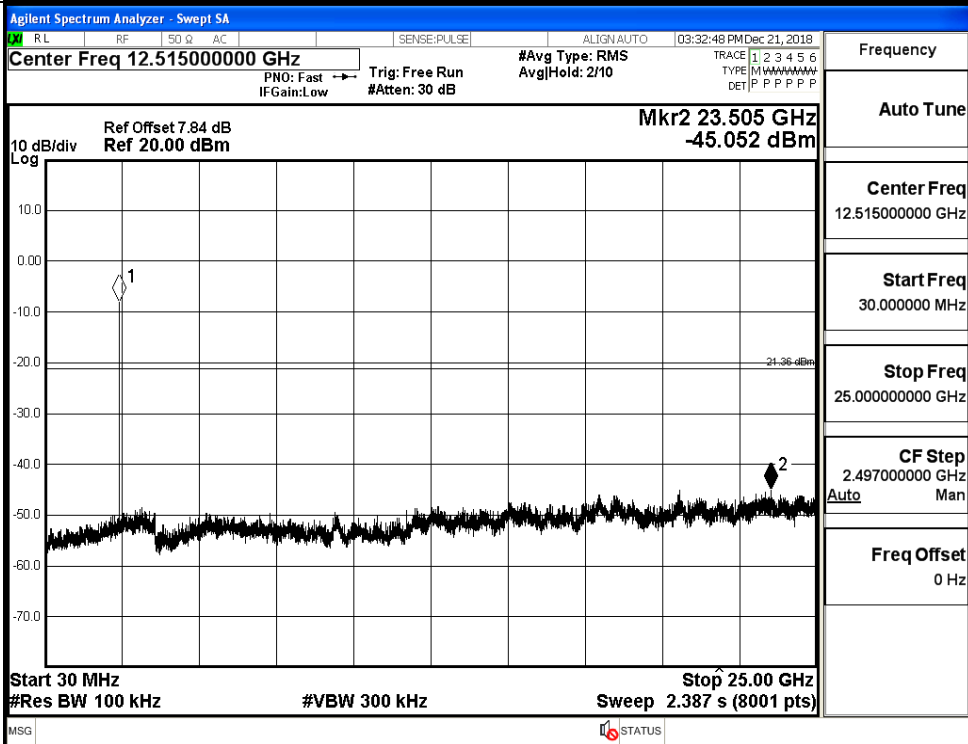


8DPSK_MCH_Graphs

Pref

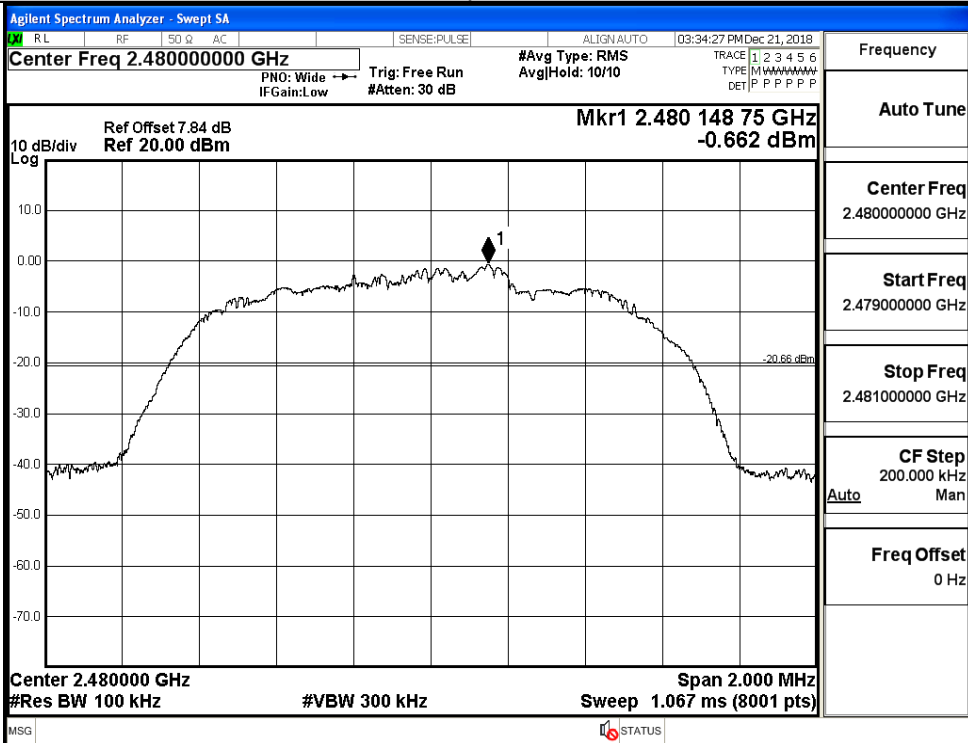


Puw

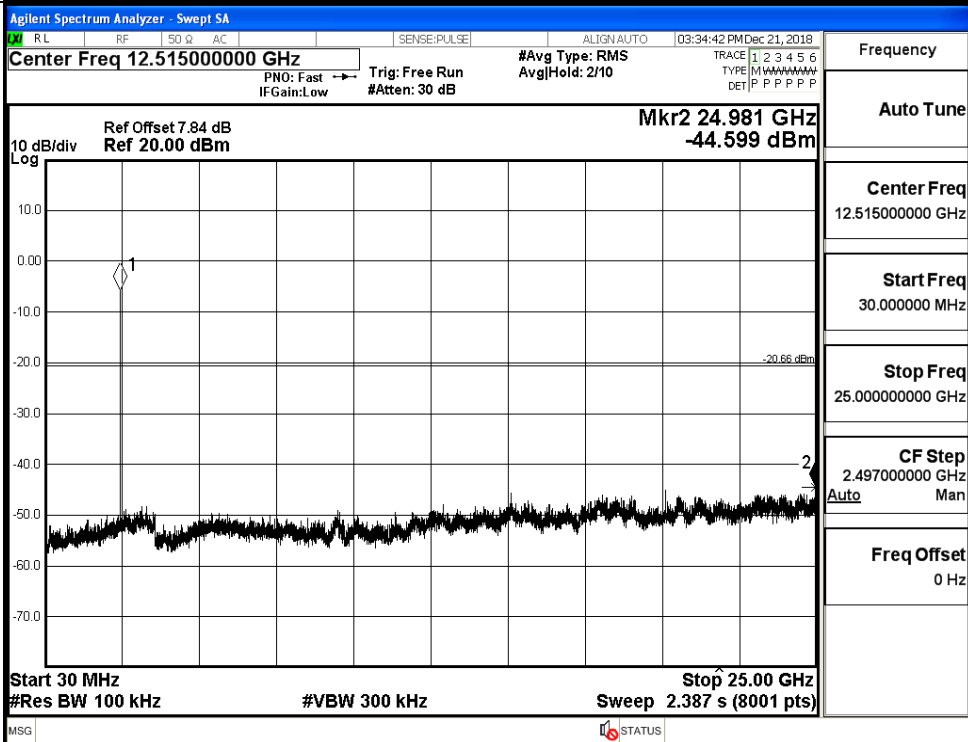


8DPSK_HCH_Graphs

Pref



Puw

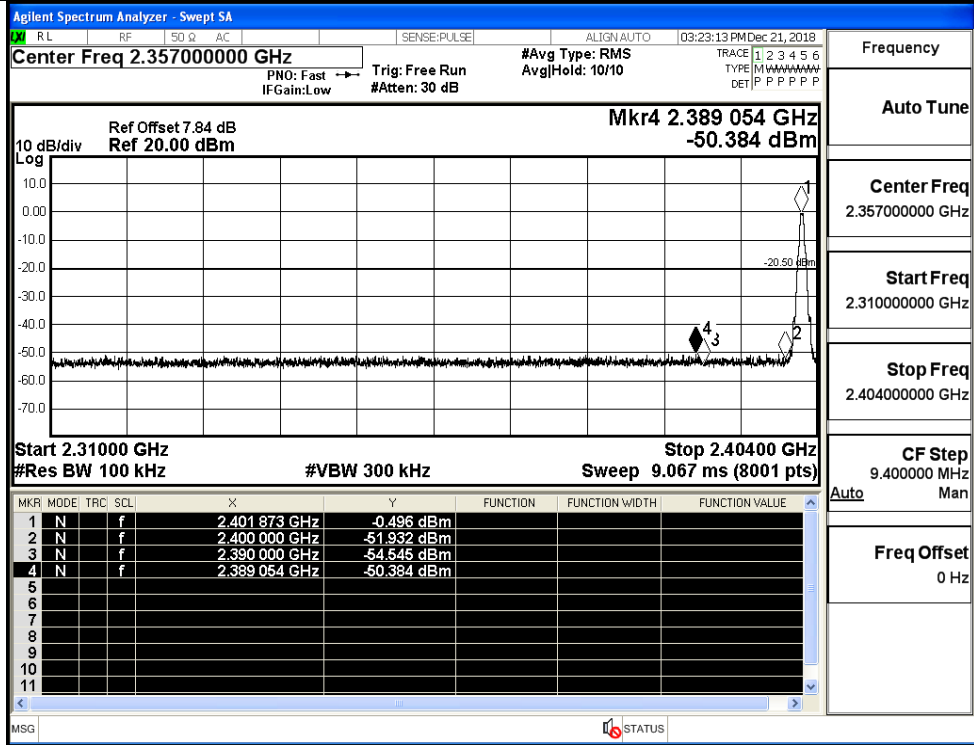


A.7 Band-edge for RF Conducted Emissions

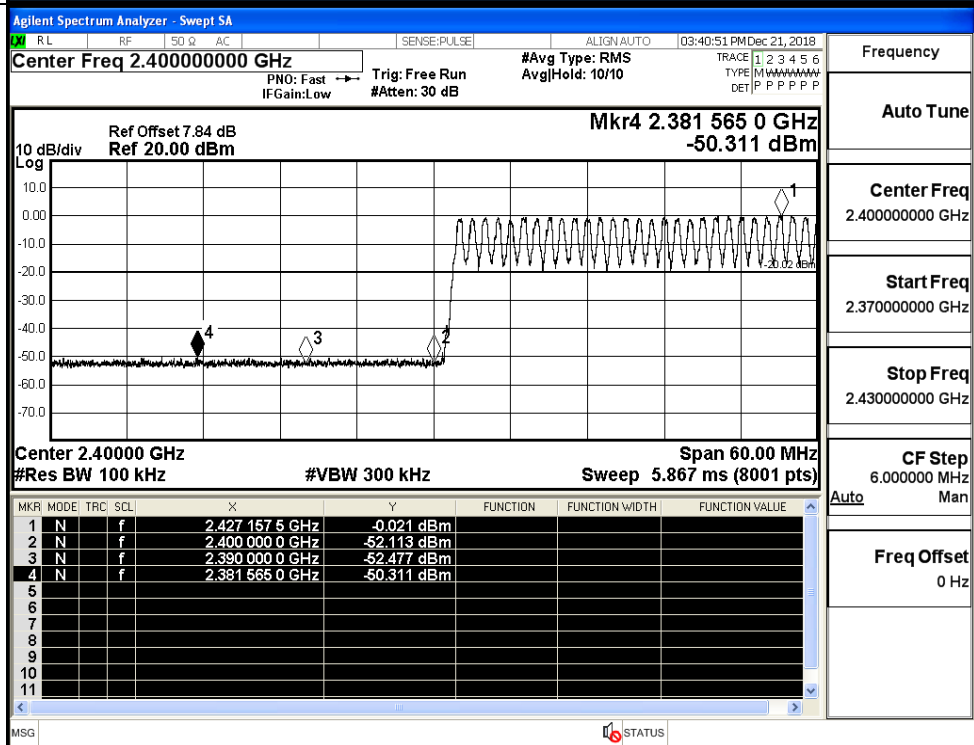
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.496	Off	-50.384	-20.5	PASS
			-0.021	On	-50.311	-20.02	PASS
	HCH	2480	3.948	Off	-50.309	-16.05	PASS
			0.797	On	-49.841	-19.2	PASS
$\pi/4$ DQPSK	LCH	2402	-1.656	Off	-50.270	-21.66	PASS
			-1.625	On	-49.204	-21.63	PASS
	HCH	2480	-1.034	Off	-49.980	-21.03	PASS
			-0.746	On	-49.327	-20.75	PASS
8DPSK	LCH	2402	-1.748	Off	-50.401	-21.75	PASS
			-1.609	On	-50.086	-21.61	PASS
	HCH	2480	-0.621	Off	-49.828	-20.62	PASS
			-0.734	On	-49.303	-20.73	PASS

Test Graphs

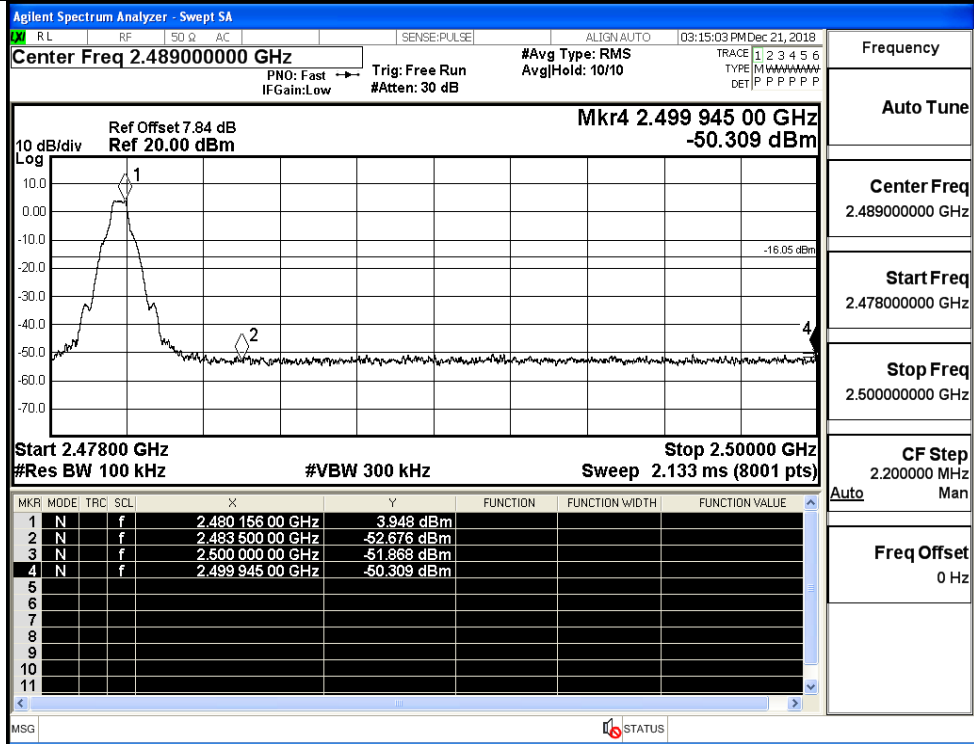
GFSK/LCH/No Hop



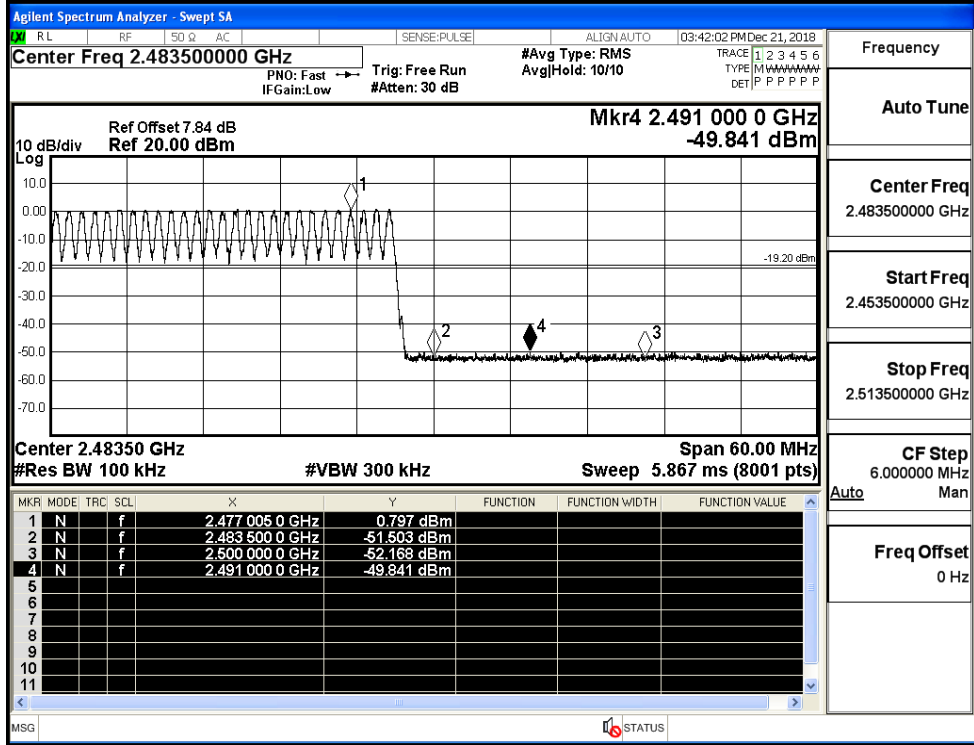
GFSK/LCH/Hop



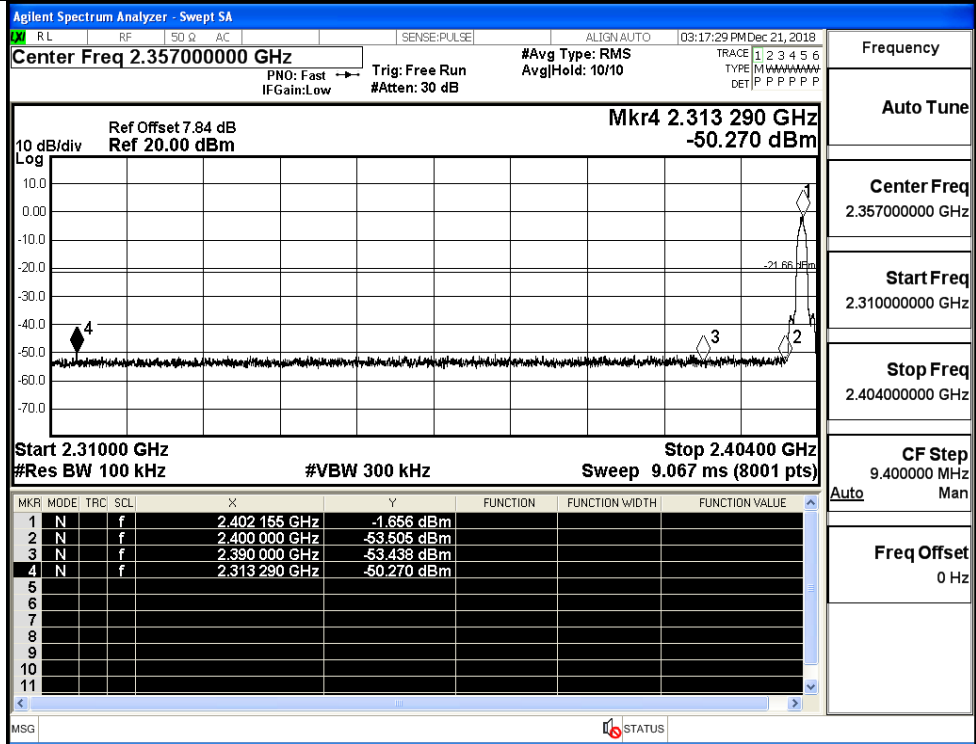
GFSK/HCH/No Hop



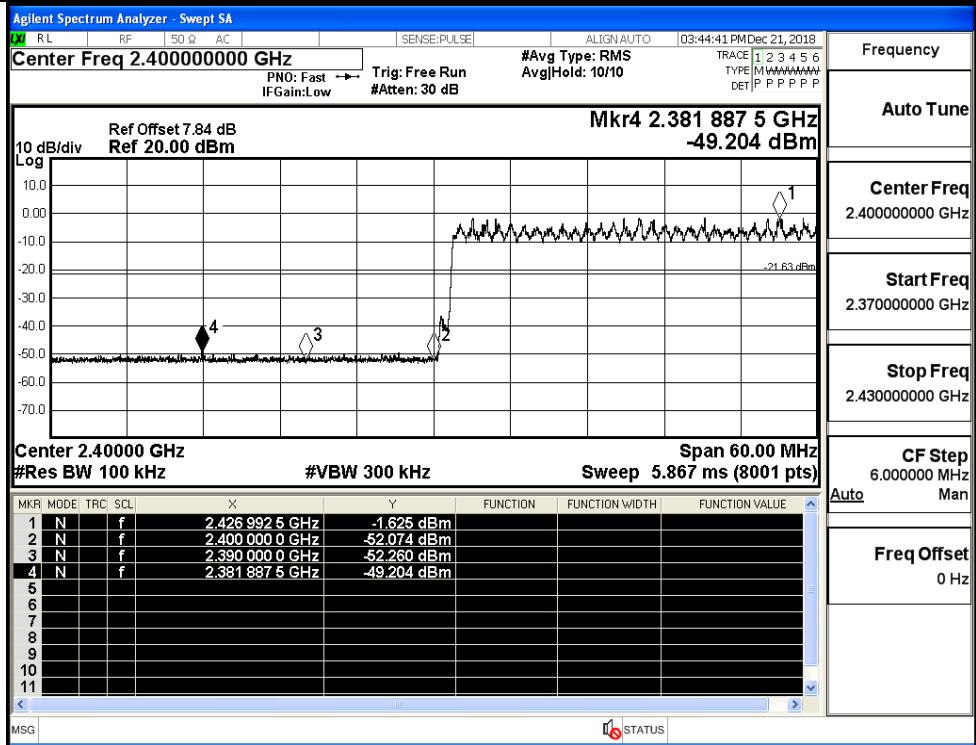
GFSK/HCH/Hop



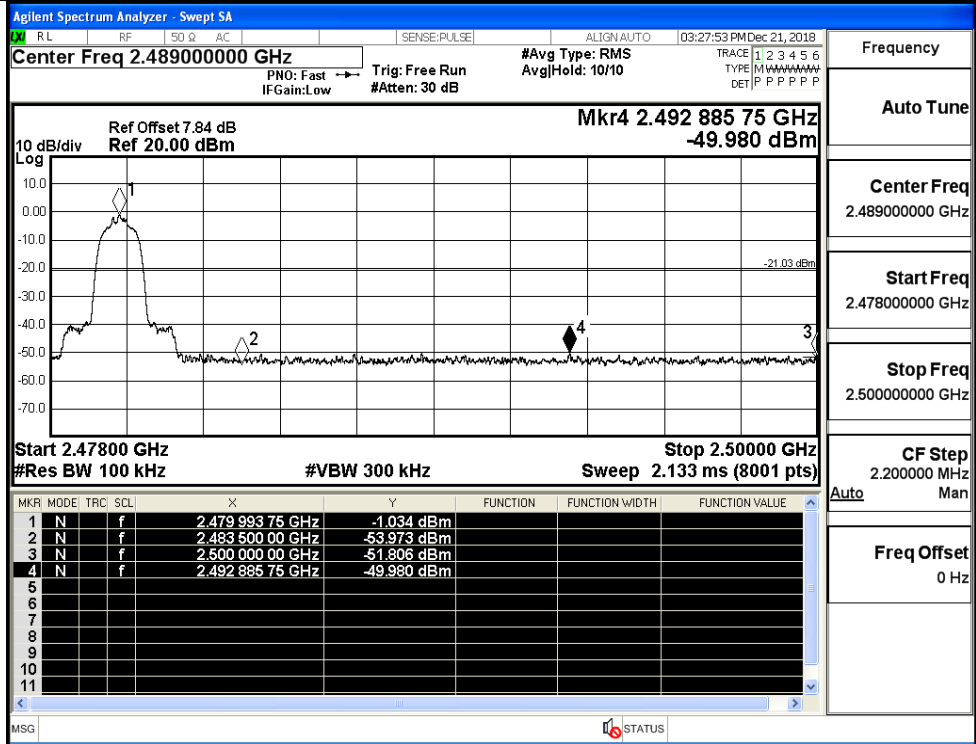
$\pi/4$ DQPSK/LCH/No
Hop



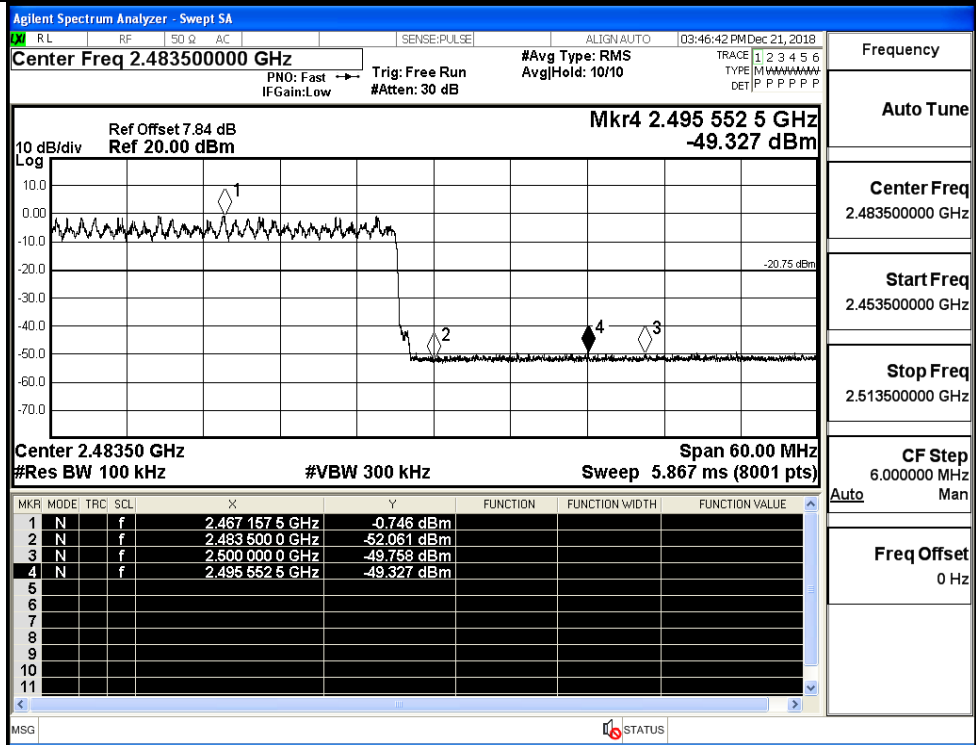
$\pi/4$ DQPSK/LCH/Hop



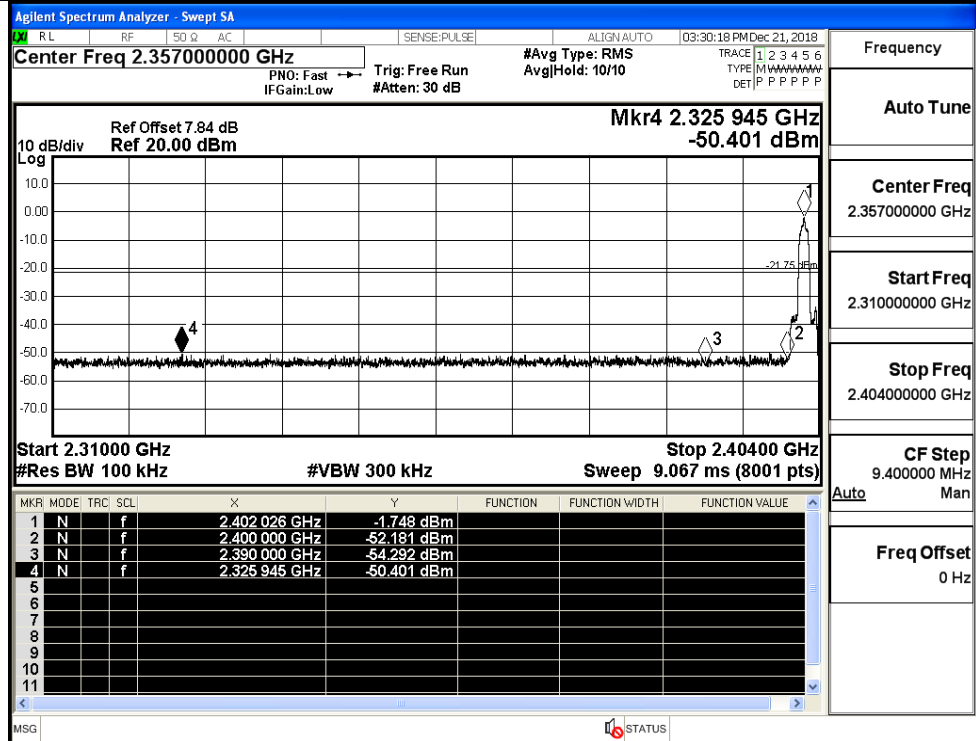
π /4DQPSK/HCH/No
Hop



π /4DQPSK/HCH/Hop

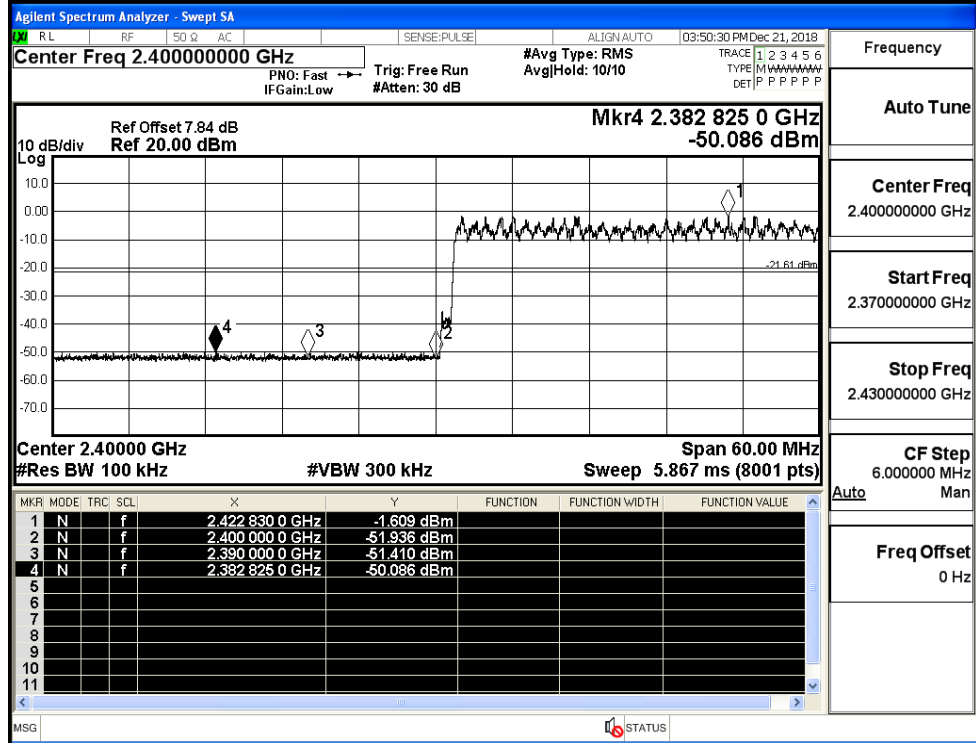


8DPSK/LCH/No Hop



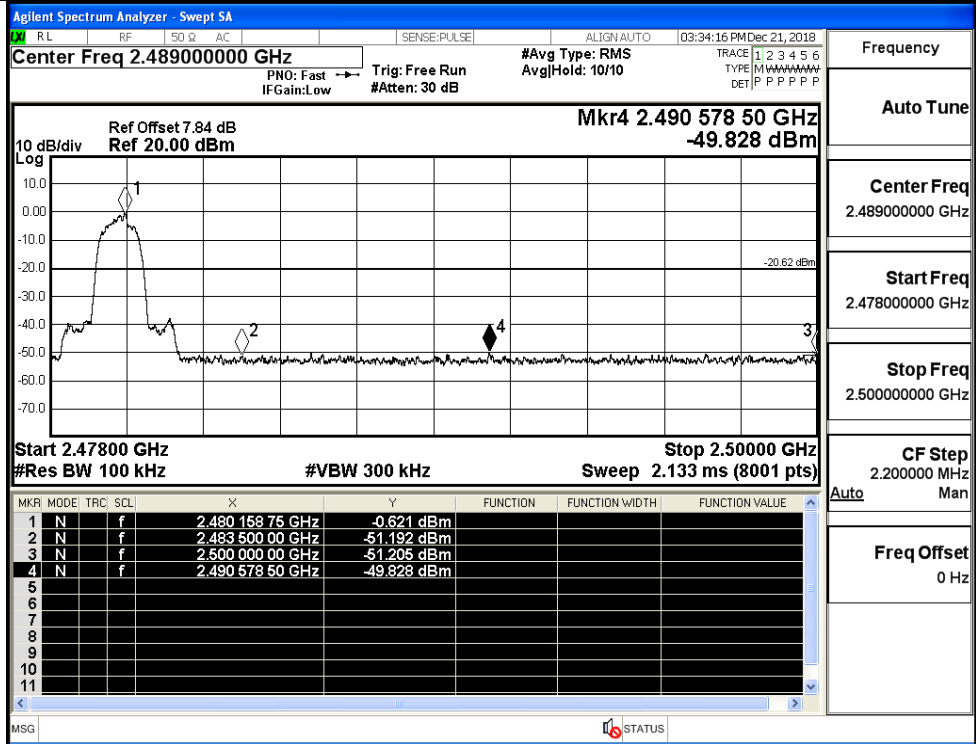
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Freq Offset	0 Hz

8DPSK/LCH/Hop



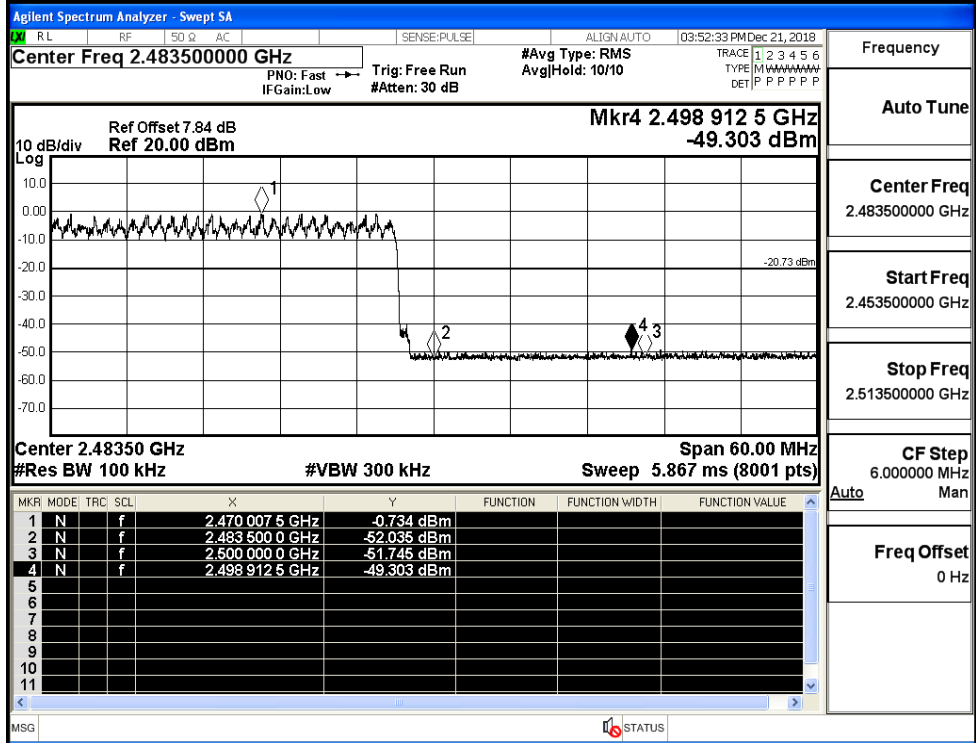
Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

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

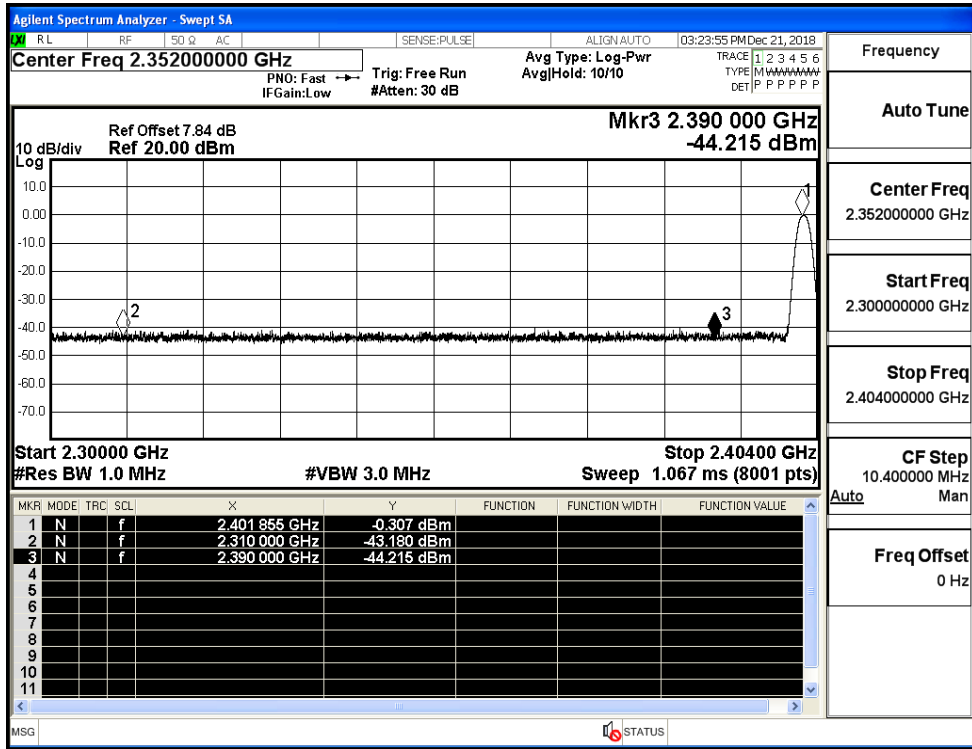


Frequency
Auto Tune
Center Freq 2.483500000 GHz
Start Freq 2.453500000 GHz
Stop Freq 2.513500000 GHz
CF Step 6.000000 MHz
Freq Offset 0 Hz

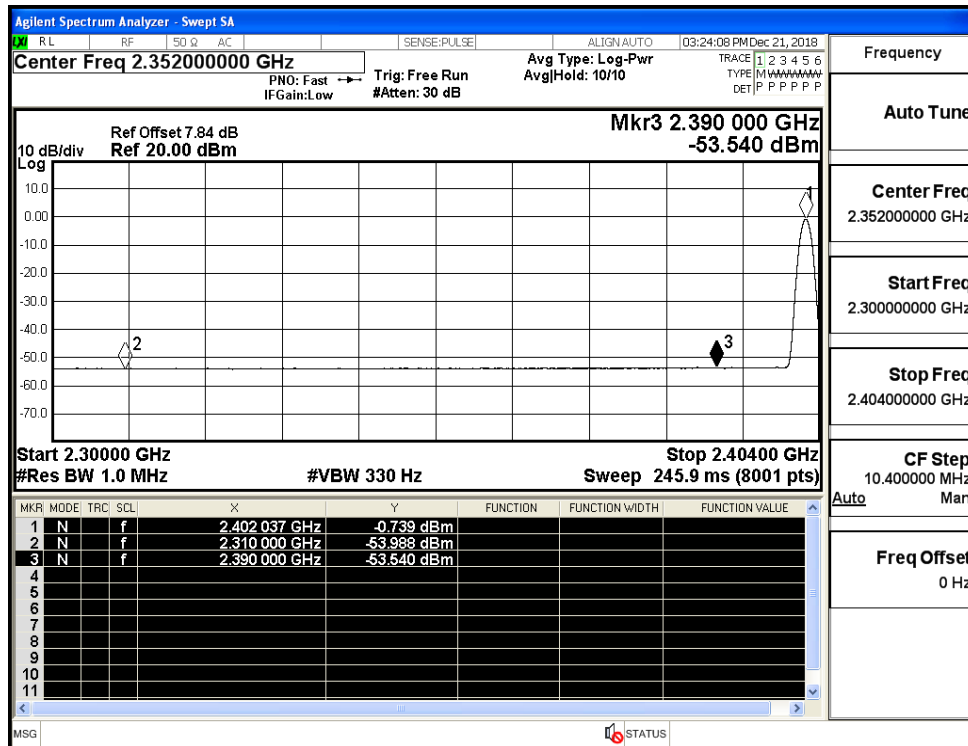
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.18	2.0	0	54.08	PEAK	74	PASS
	Off	2310.0	-53.99	2.0	0	43.27	AV	54	PASS
	Off	2390.0	-44.22	2.0	0	53.04	PEAK	74	PASS
	Off	2390.0	-53.54	2.0	0	43.72	AV	54	PASS
	Off	2483.5	-42.96	2.0	0	54.3	PEAK	74	PASS
	Off	2483.5	-53.37	2.0	0	43.89	AV	54	PASS
	Off	2500.0	-43.16	2.0	0	54.1	PEAK	74	PASS
	Off	2500.0	-53.35	2.0	0	43.91	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.29	2.0	0	53.97	PEAK	74	PASS
	Off	2310.0	-53.87	2.0	0	43.39	AV	54	PASS
	Off	2390.0	-42.94	2.0	0	54.32	PEAK	74	PASS
	Off	2390.0	-53.67	2.0	0	43.59	AV	54	PASS
	Off	2483.5	-43.31	2.0	0	53.95	PEAK	74	PASS
	Off	2483.5	-53.43	2.0	0	43.83	AV	54	PASS
	Off	2500.0	-42.61	2.0	0	54.65	PEAK	74	PASS
	Off	2500.0	-53.32	2.0	0	43.94	AV	54	PASS
8DPSK	Off	2310.0	-42.49	2.0	0	54.77	PEAK	74	PASS
	Off	2310.0	-53.82	2.0	0	43.44	AV	54	PASS
	Off	2390.0	-43.49	2.0	0	53.77	PEAK	74	PASS
	Off	2390.0	-53.74	2.0	0	43.52	AV	54	PASS
	Off	2483.5	-44.52	2.0	0	52.74	PEAK	74	PASS
	Off	2483.5	-53.35	2.0	0	43.91	AV	54	PASS
	Off	2500.0	-42.21	2.0	0	55.05	PEAK	74	PASS
	Off	2500.0	-53.36	2.0	0	43.9	AV	54	PASS

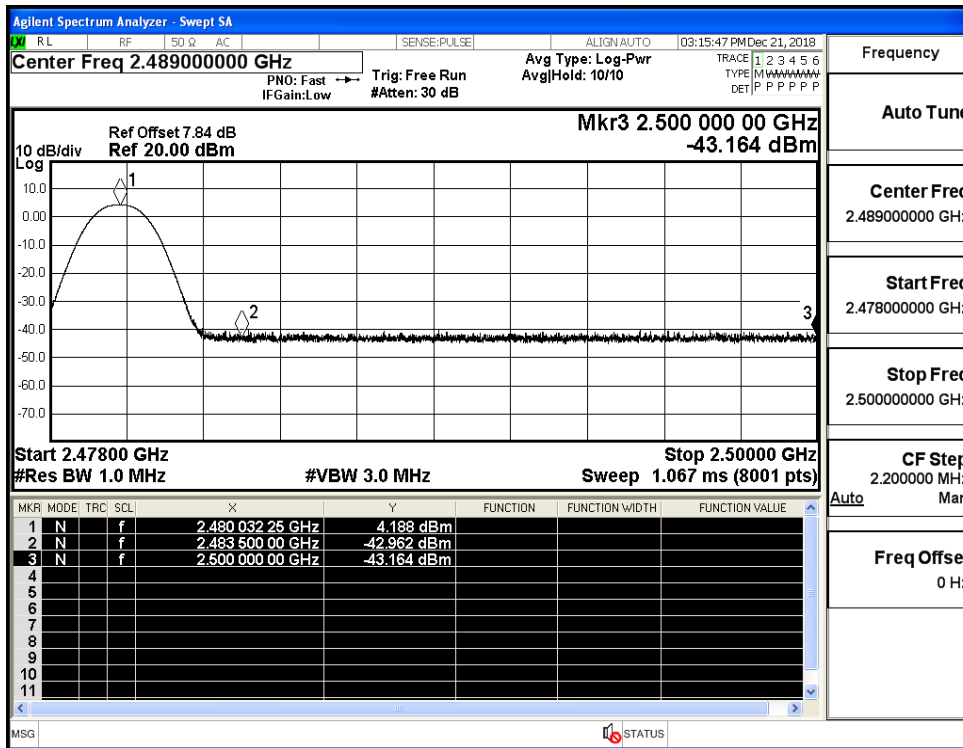
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



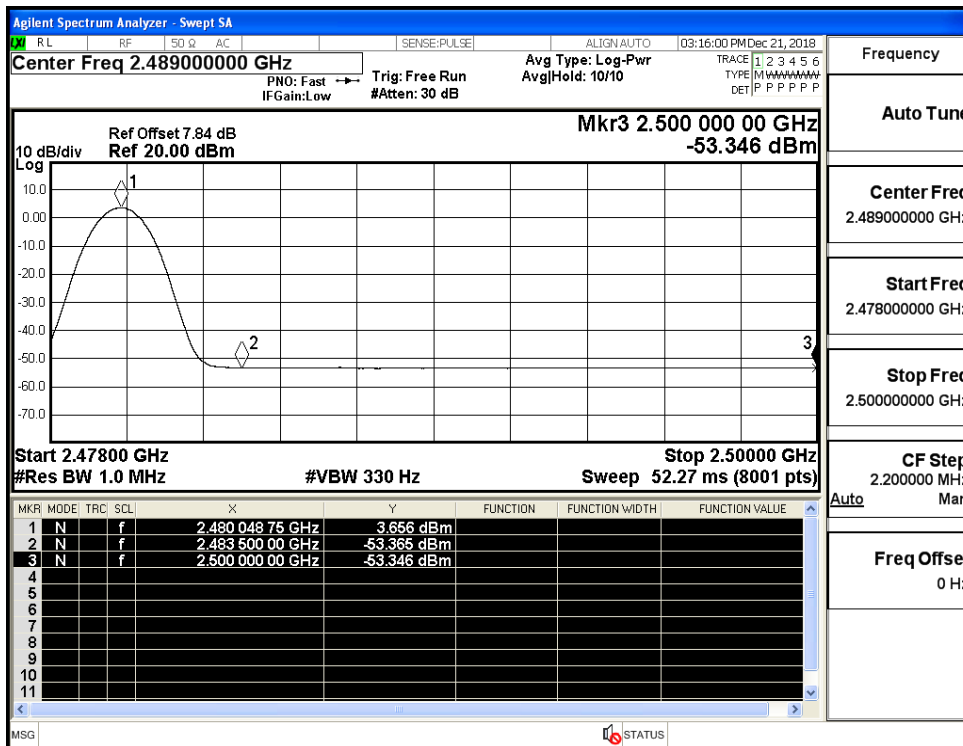
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



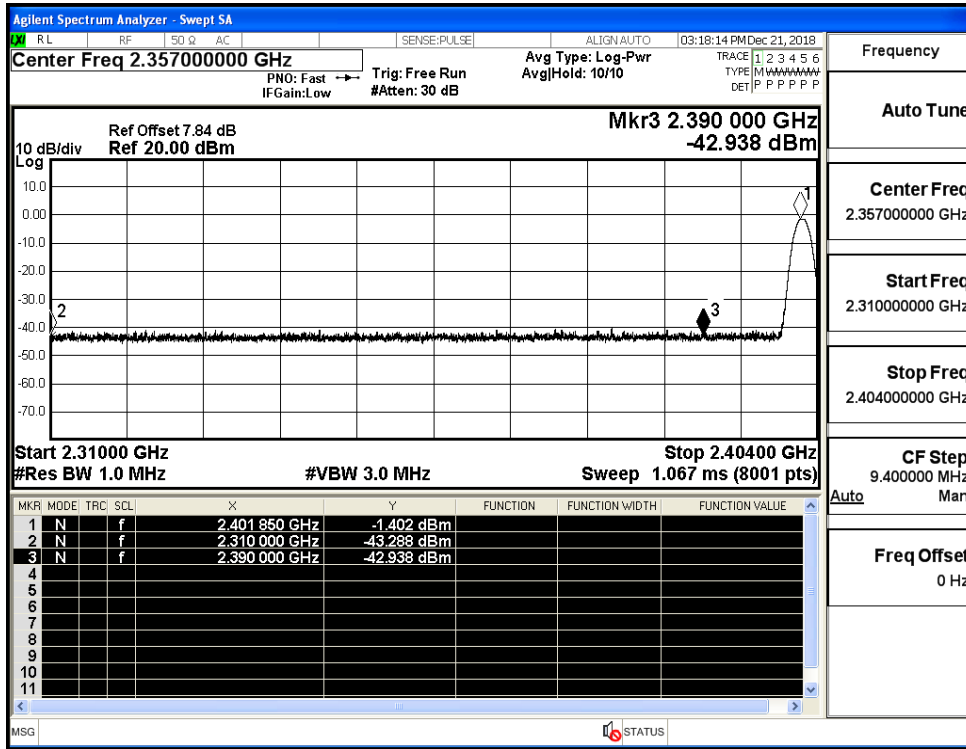
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



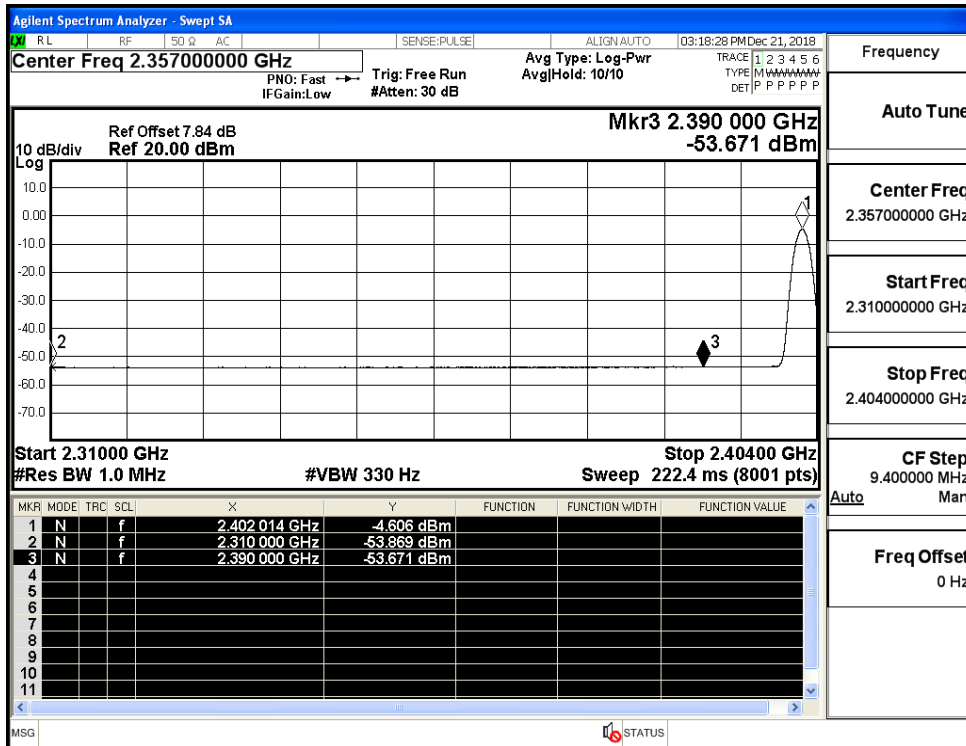
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



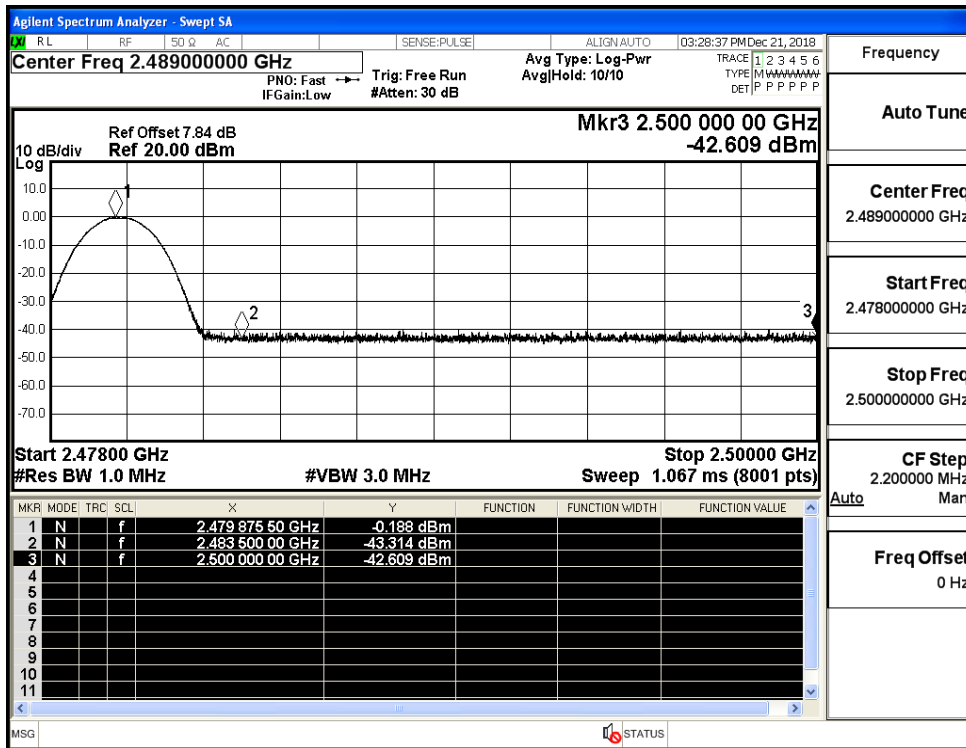
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



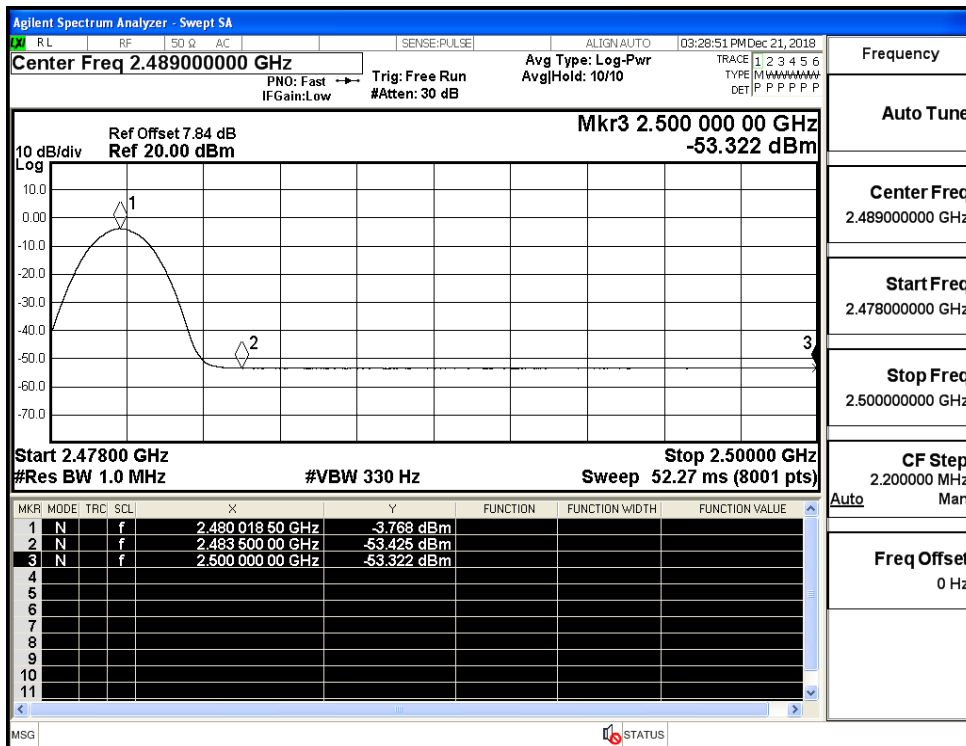
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



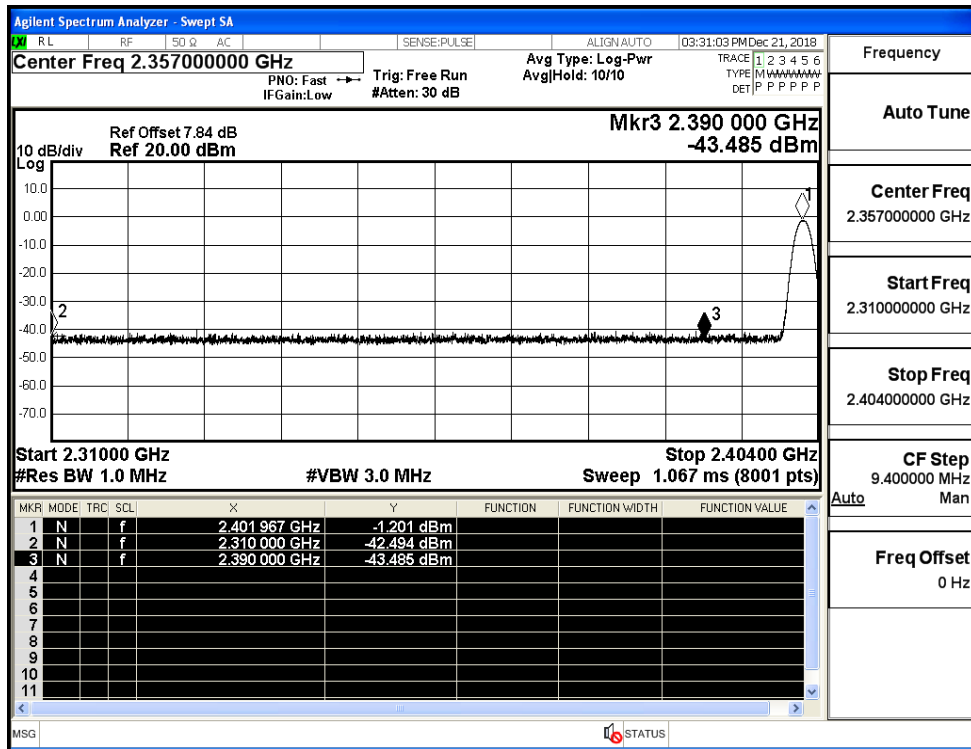
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)



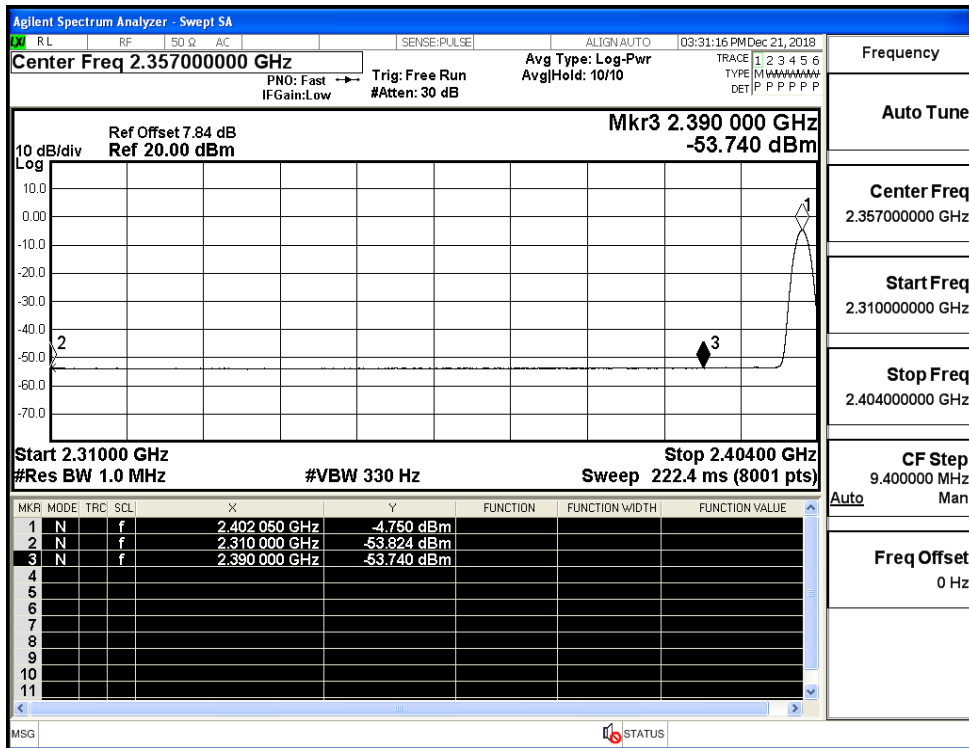
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)



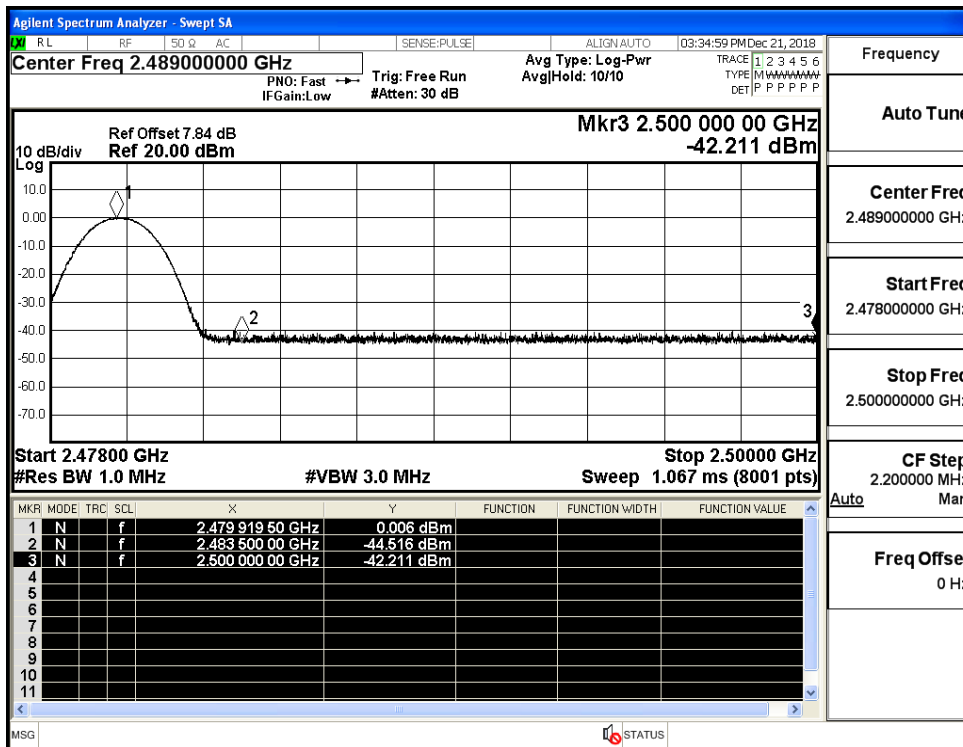
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

