

Appendix A

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

Product Name: iConnect Rectangle

Trade Mark: iConnect By Timex

Test Model: M03Y

Environmental Conditions

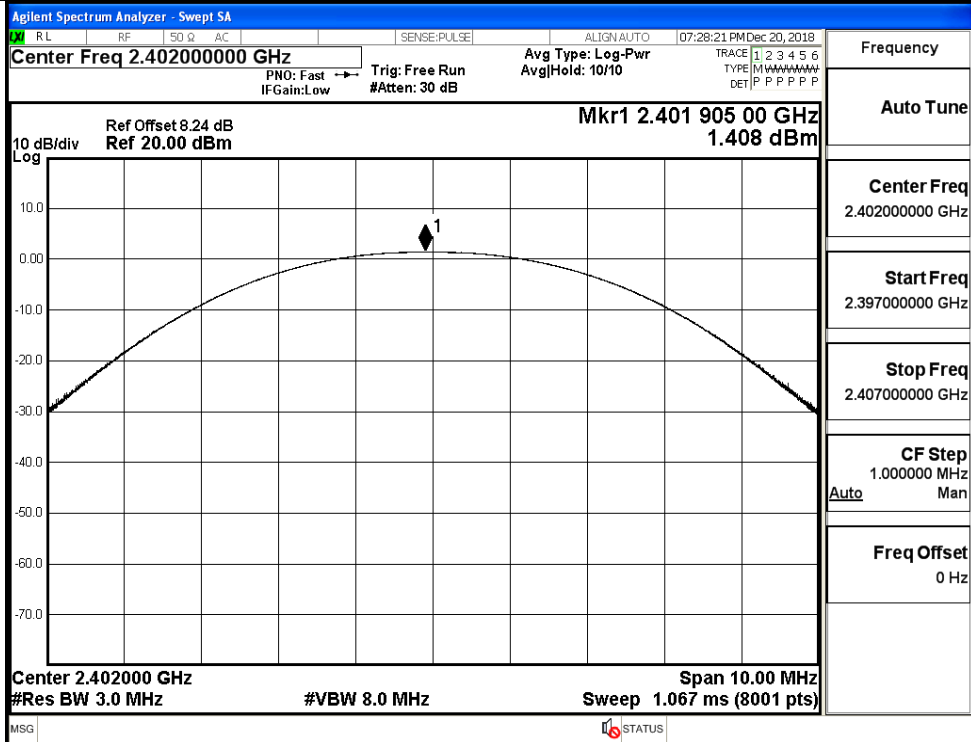
Temperature:	23.5 ° C
Relative Humidity:	53.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

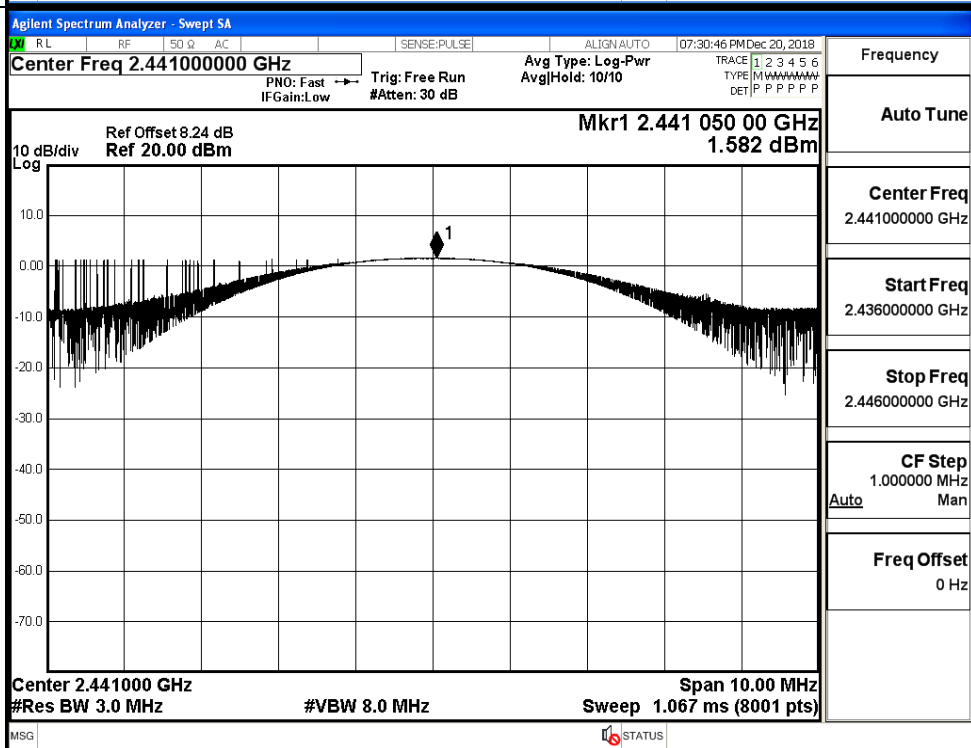
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.408	21	PASS
	MCH	1.582	21	PASS
	HCH	1.568	21	PASS
$\pi/4$ DQPSK	LCH	0.590	21	PASS
	MCH	1.050	21	PASS
	HCH	0.656	21	PASS
8DPSK	LCH	0.817	21	PASS
	MCH	0.945	21	PASS
	HCH	1.056	21	PASS

Test Graphs

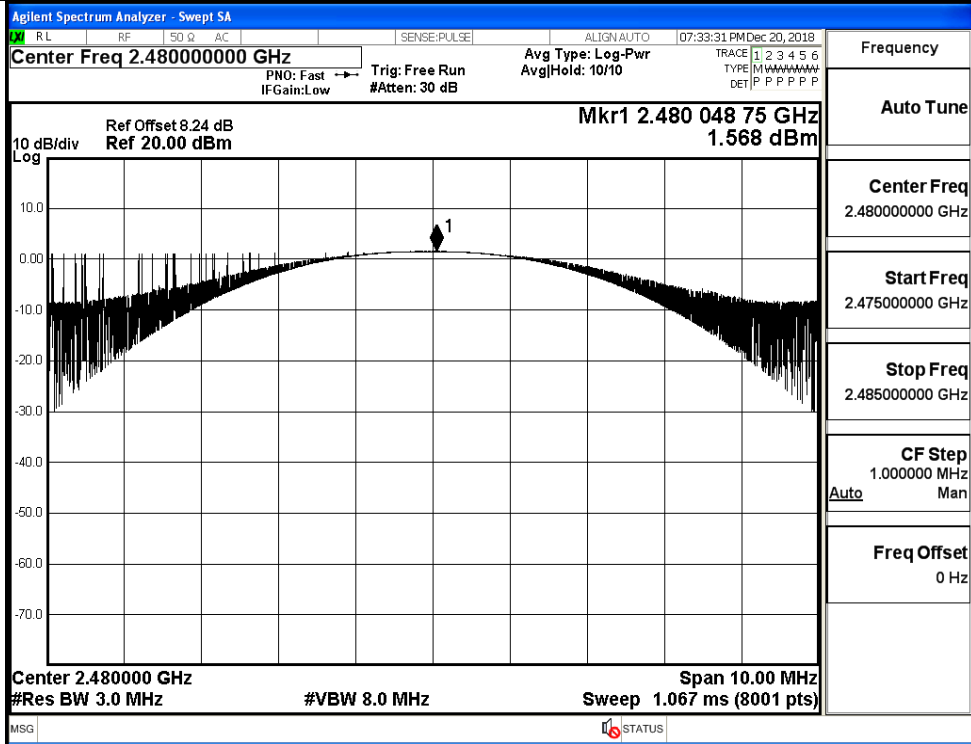
GFSK/LCH



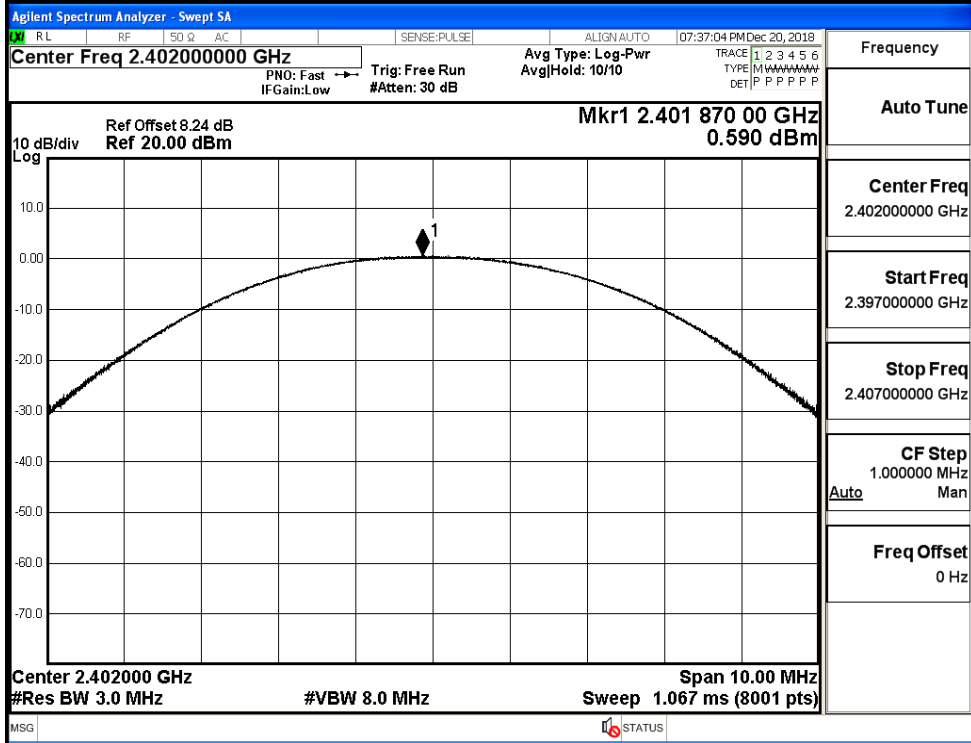
GFSK/MCH



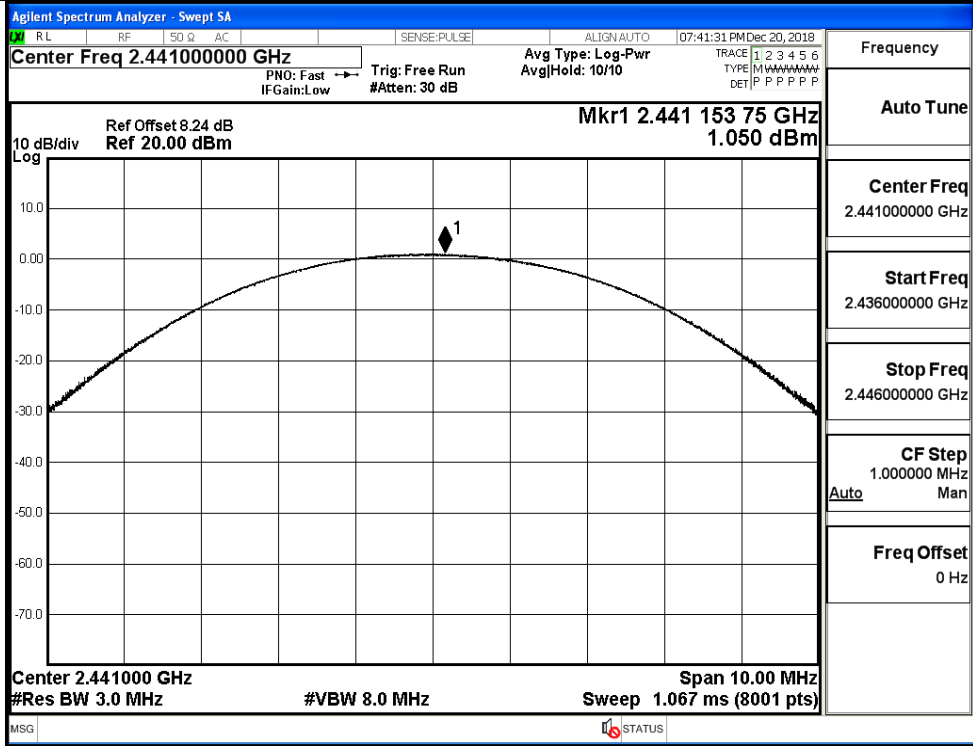
GFSK/HCH



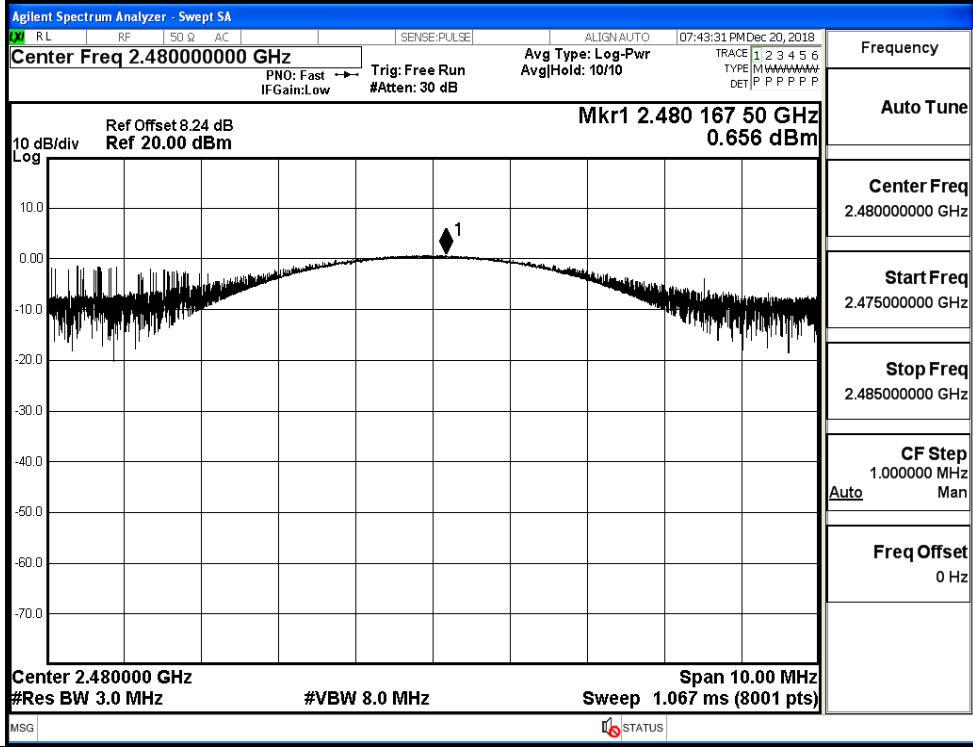
$\pi/4$ DQPSK/LCH



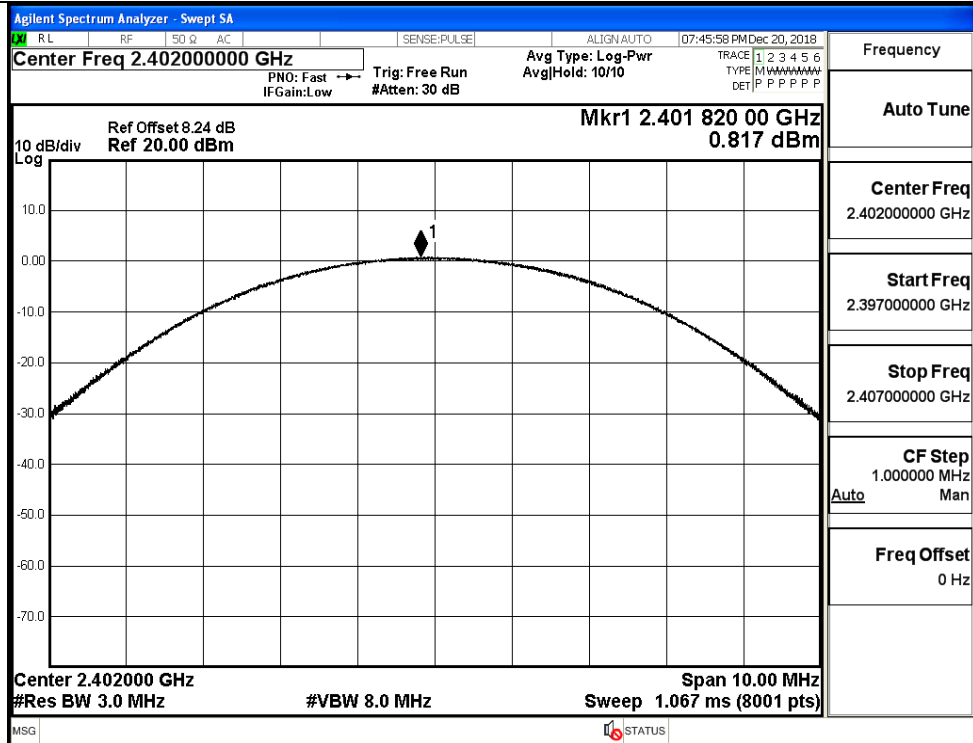
$\pi/4$ DQPSK/MCH



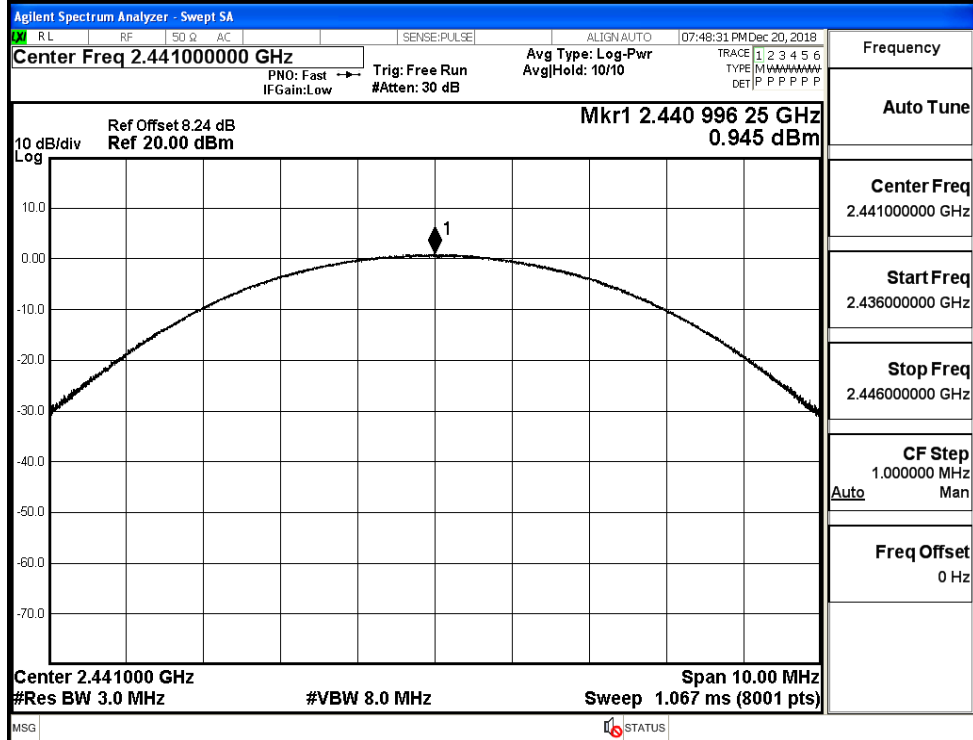
$\pi/4$ DQPSK/HCH



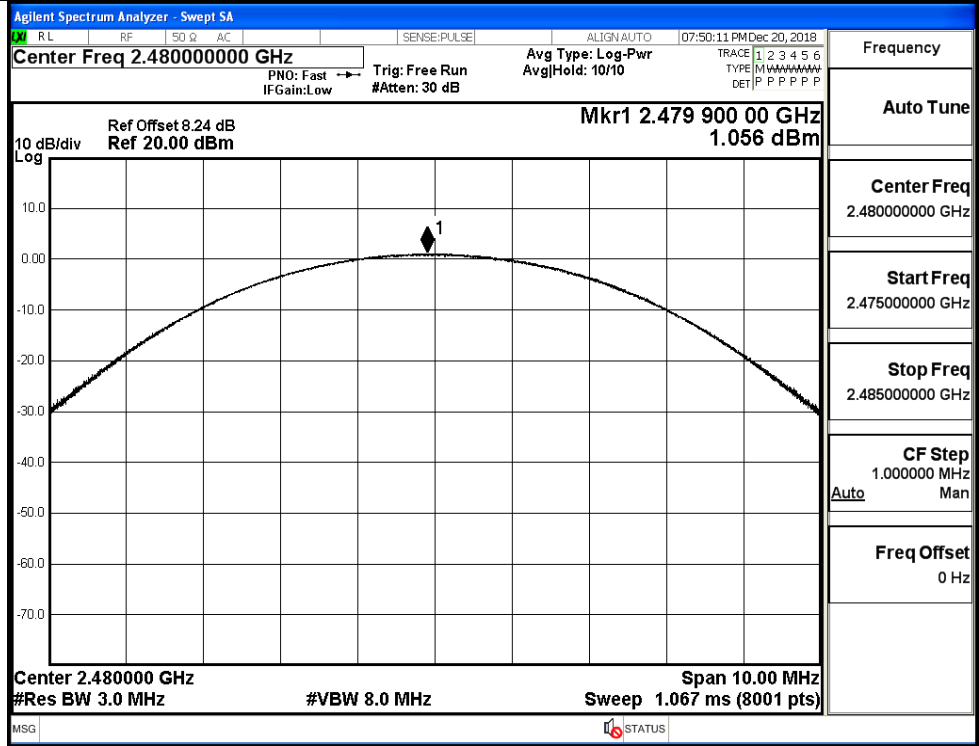
8DPSK/LCH



8DPSK/MCH

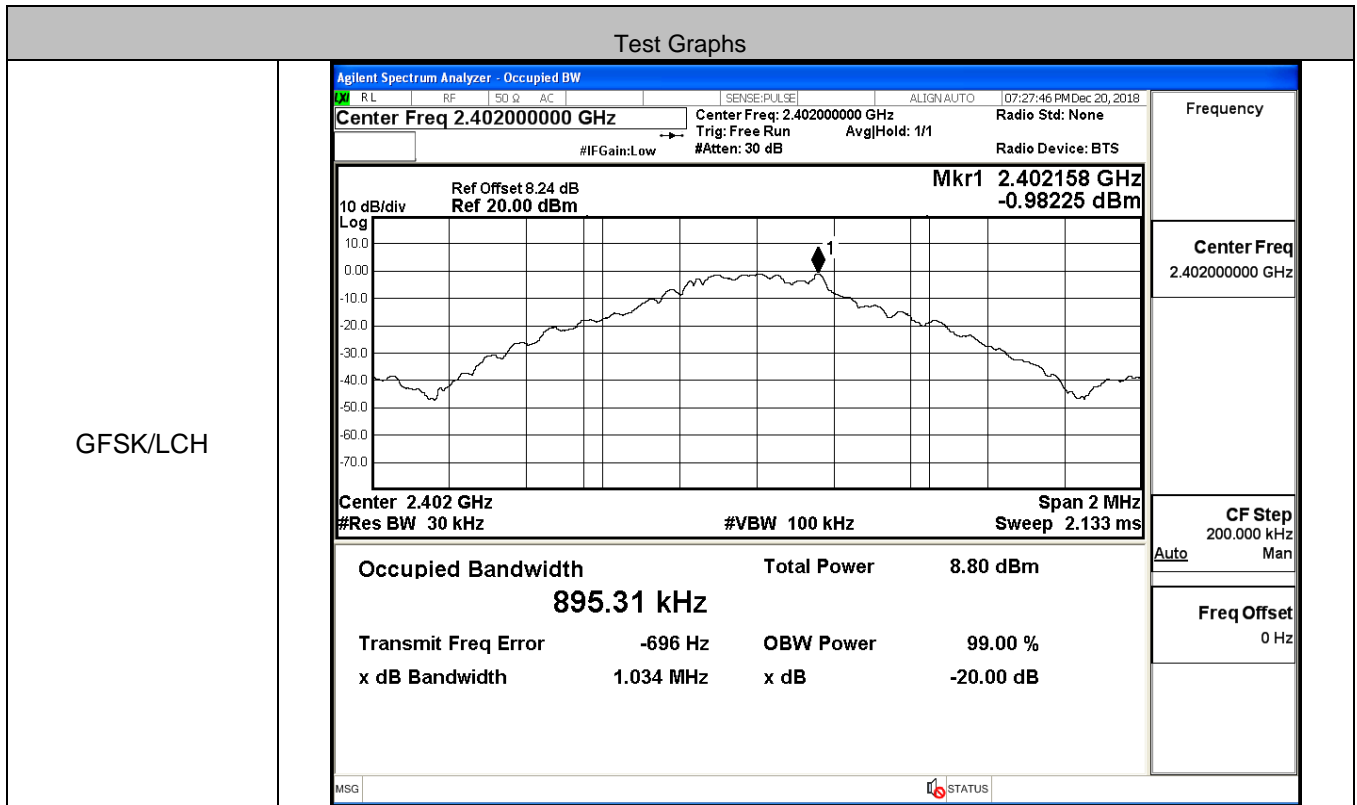


8DPSK/HCH

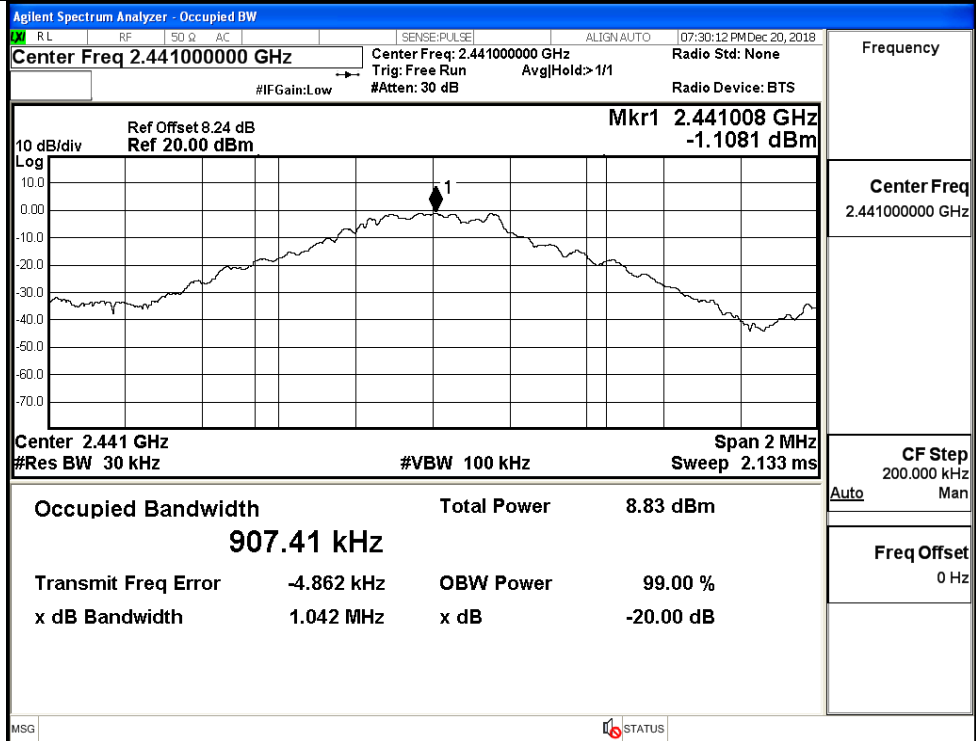


A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89531	1.034	Not Specified	PASS
	MCH	0.90741	1.042	Not Specified	PASS
	HCH	0.90647	1.037	Not Specified	PASS
π/4DQPSK	LCH	1.1691	1.291	Not Specified	PASS
	MCH	1.1721	1.290	Not Specified	PASS
	HCH	1.1817	1.287	Not Specified	PASS
8DPSK	LCH	1.1807	1.285	Not Specified	PASS
	MCH	1.1770	1.294	Not Specified	PASS
	HCH	1.1789	1.300	Not Specified	PASS



GFSK/MCH



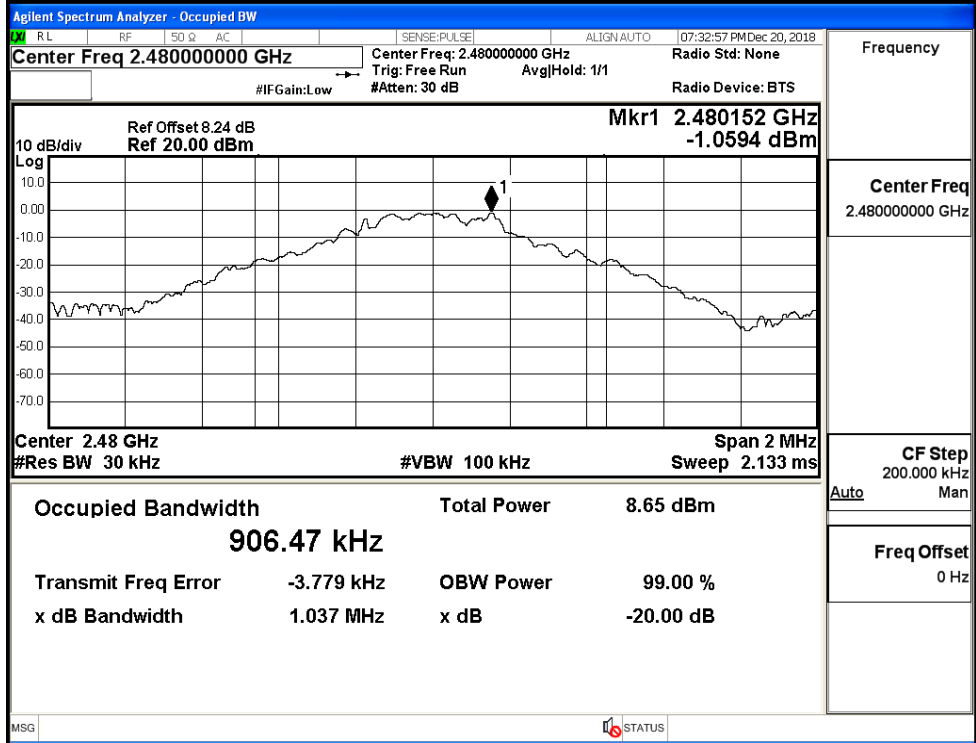
Frequency

Center Freq
2.441000000 GHz

CF Step
200.000 kHz

Freq Offset
0 Hz

GFSK/HCH



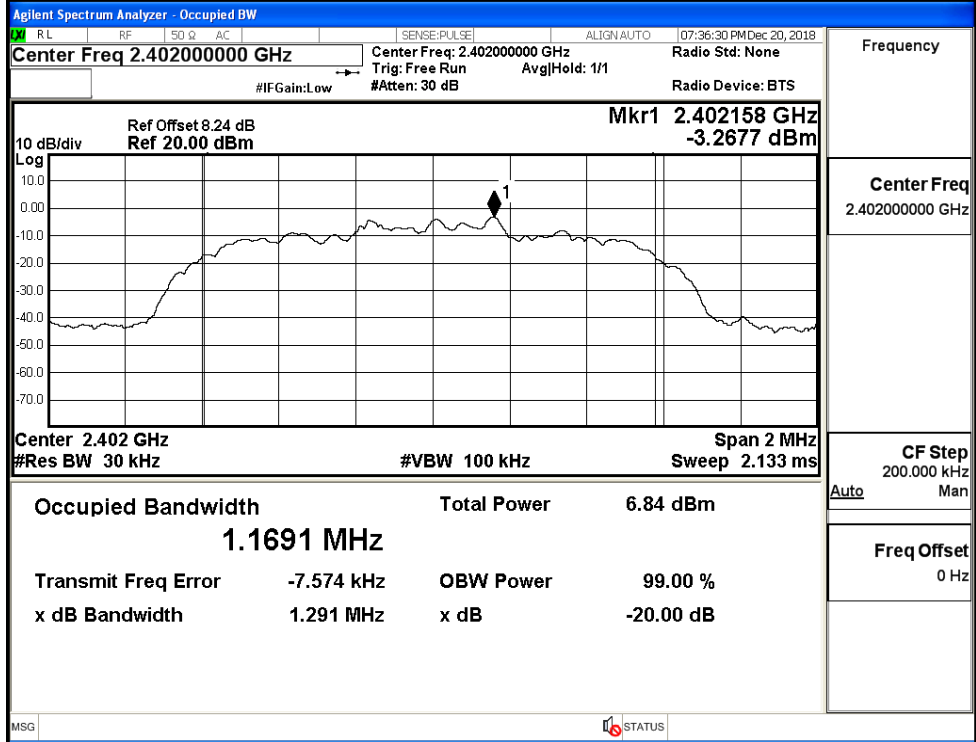
Frequency

Center Freq
2.480000000 GHz

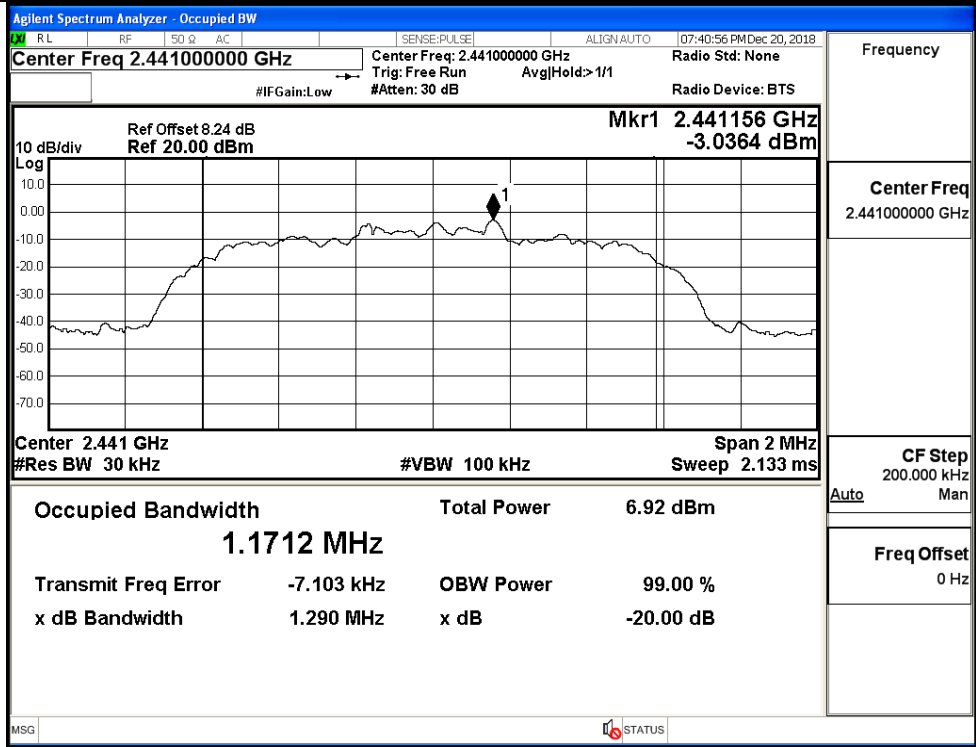
CF Step
200.000 kHz

Freq Offset
0 Hz

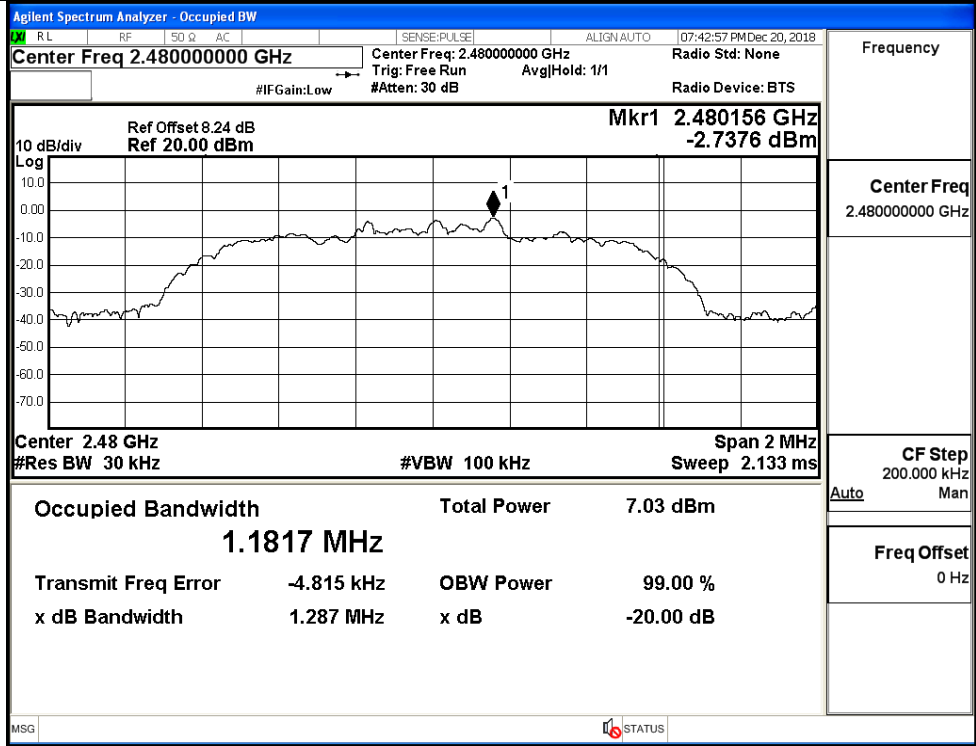
$\pi/4$ DQPSK/LCH



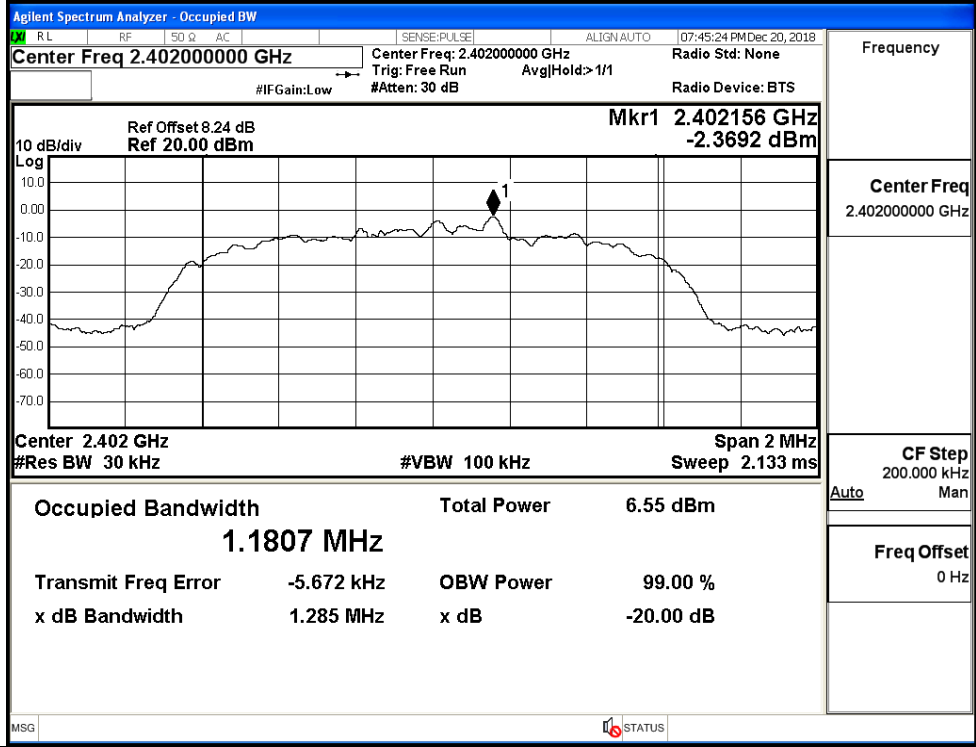
$\pi/4$ DQPSK/MCH



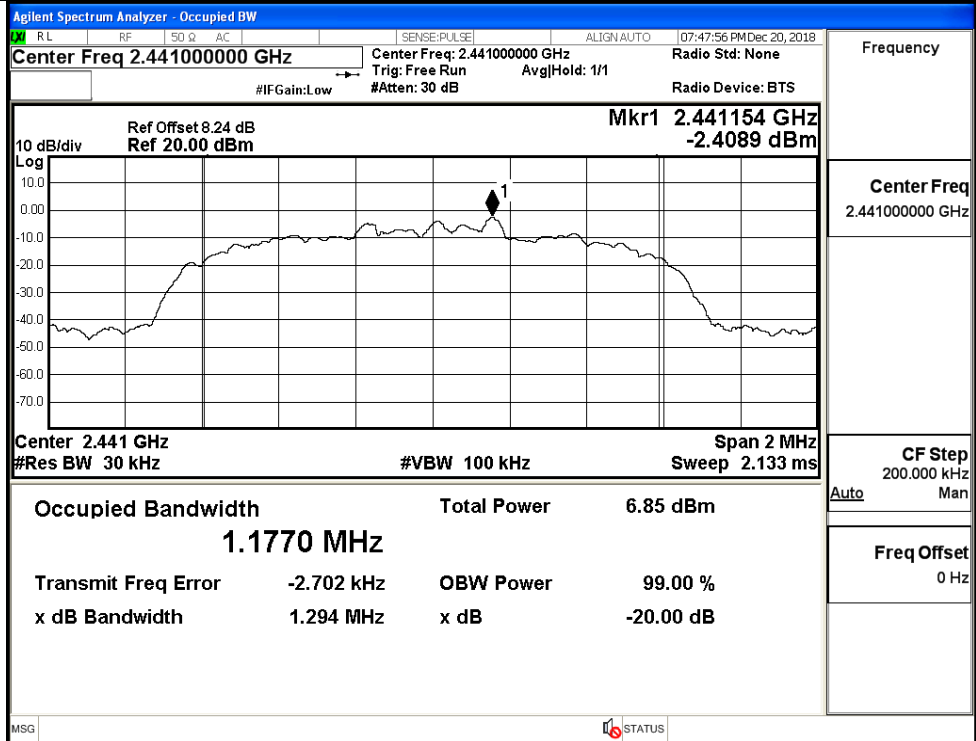
$\pi/4$ DQPSK/HCH



8DPSK/LCH

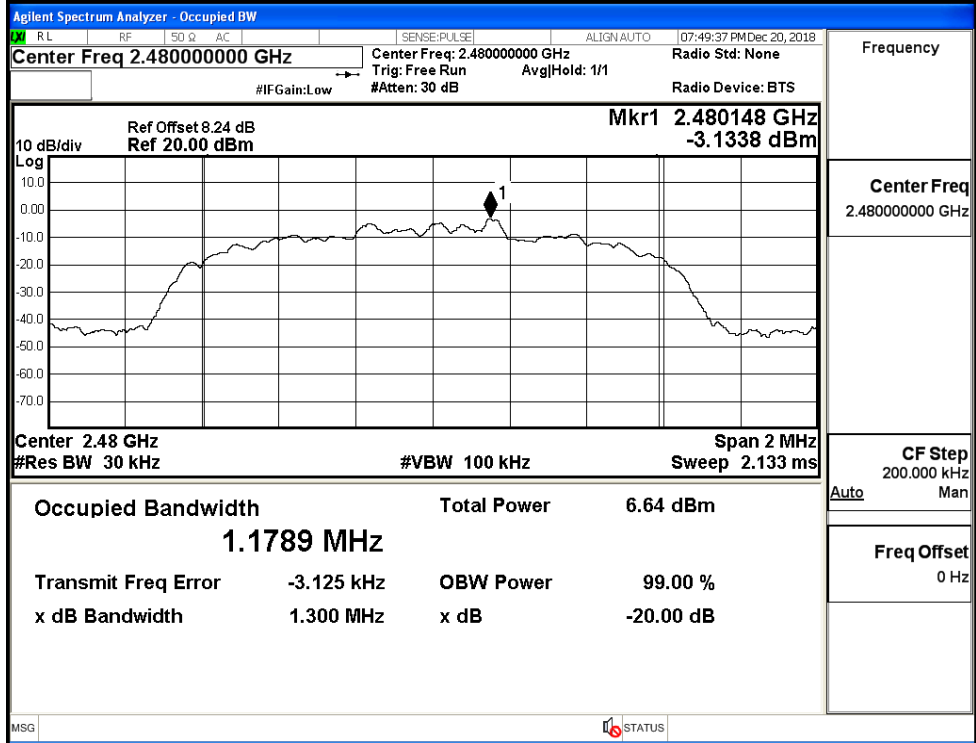


8DPSK/MCH



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

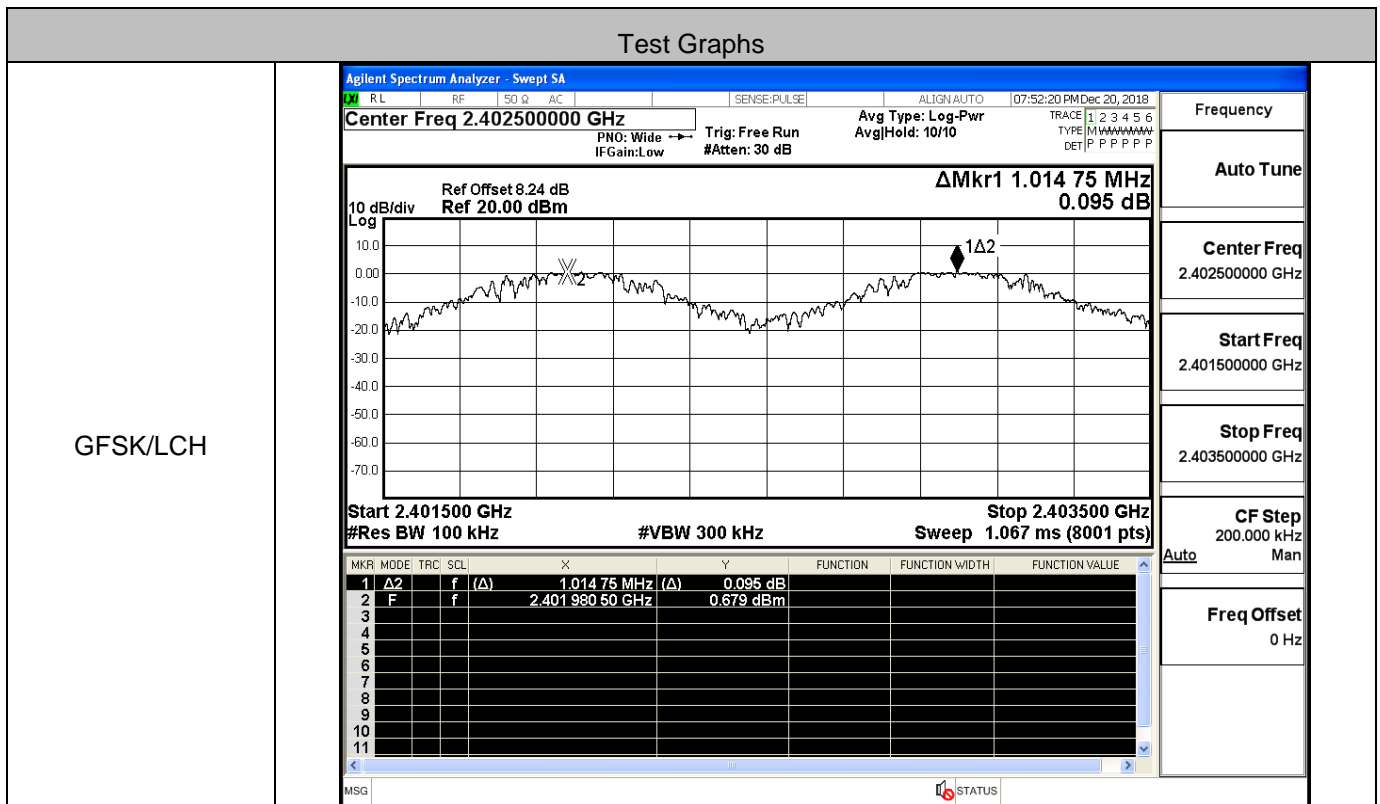
8DPSK/HCH



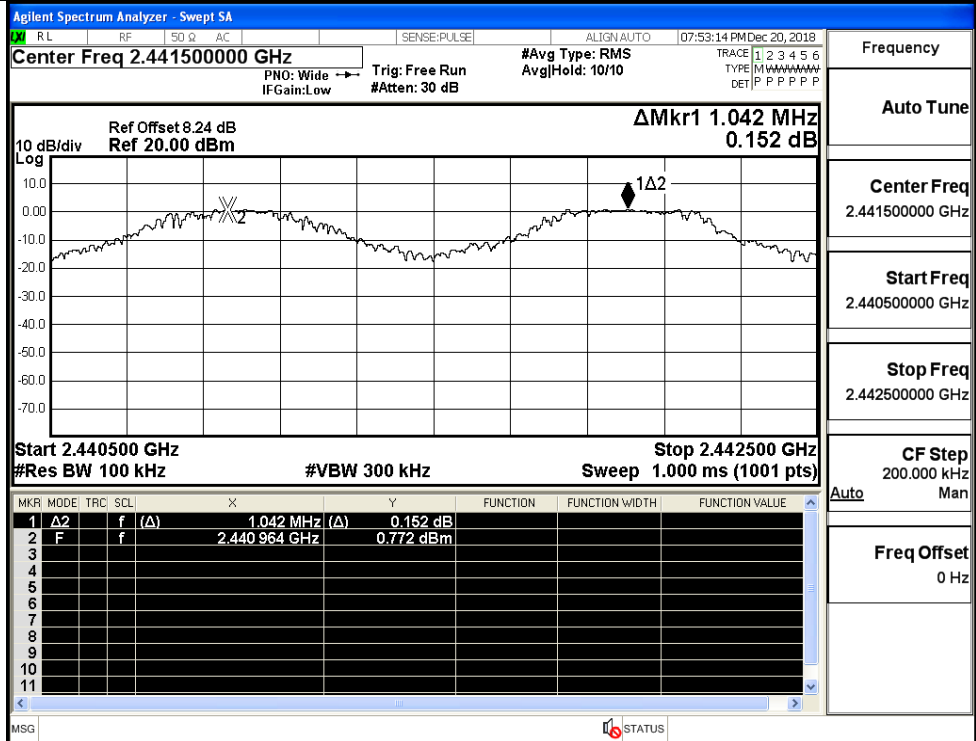
Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.015	0.695	PASS
	MCH	1.042	0.695	PASS
	HCH	1.016	0.695	PASS
π/4DQPSK	LCH	0.876	0.861	PASS
	MCH	1.168	0.861	PASS
	HCH	1.082	0.861	PASS
8DPSK	LCH	1.122	0.867	PASS
	MCH	1.082	0.867	PASS
	HCH	0.986	0.867	PASS



GFSK/MCH



Frequency

Auto Tune

Center Freq
2.441500000 GHz

Start Freq
2.440500000 GHz

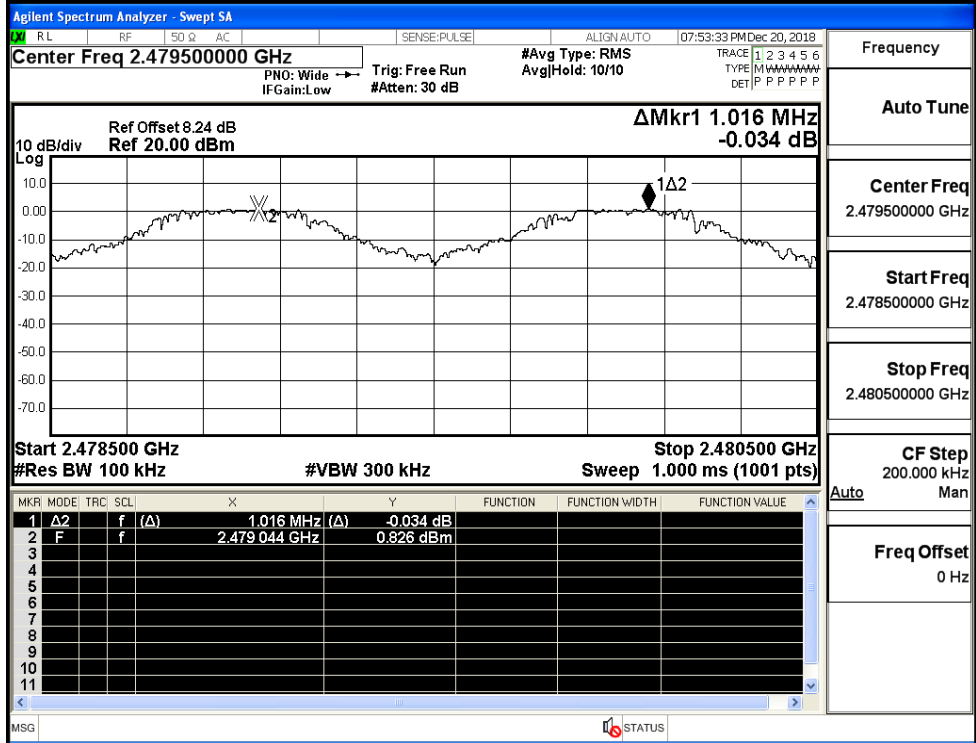
Stop Freq
2.442500000 GHz

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

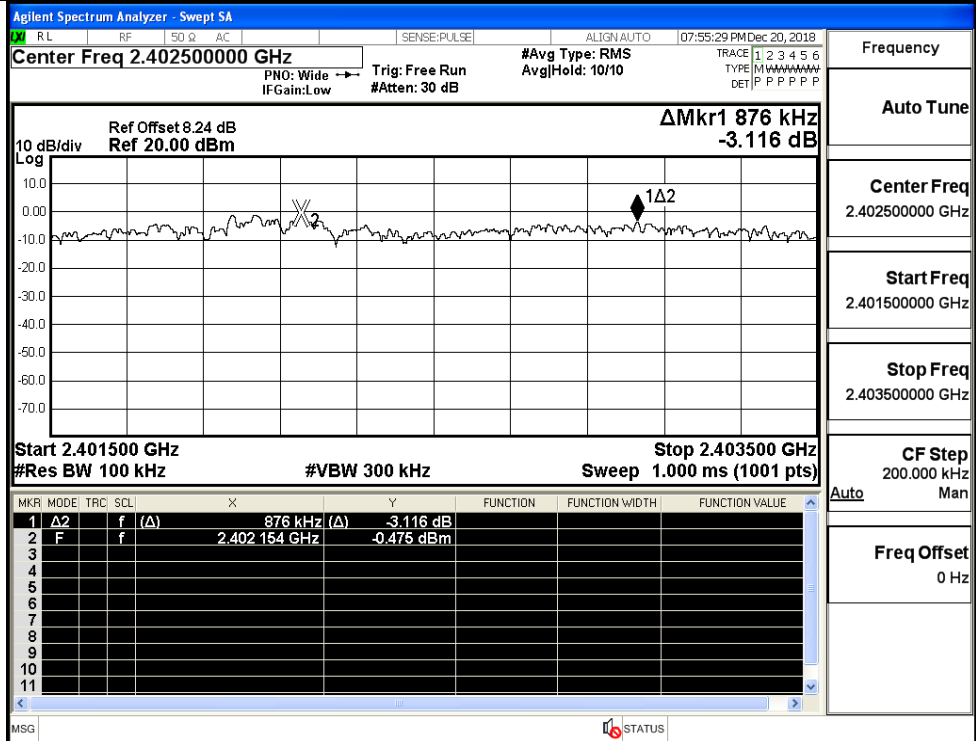
Stop Freq
2.480500000 GHz

CF Step
200.000 kHz

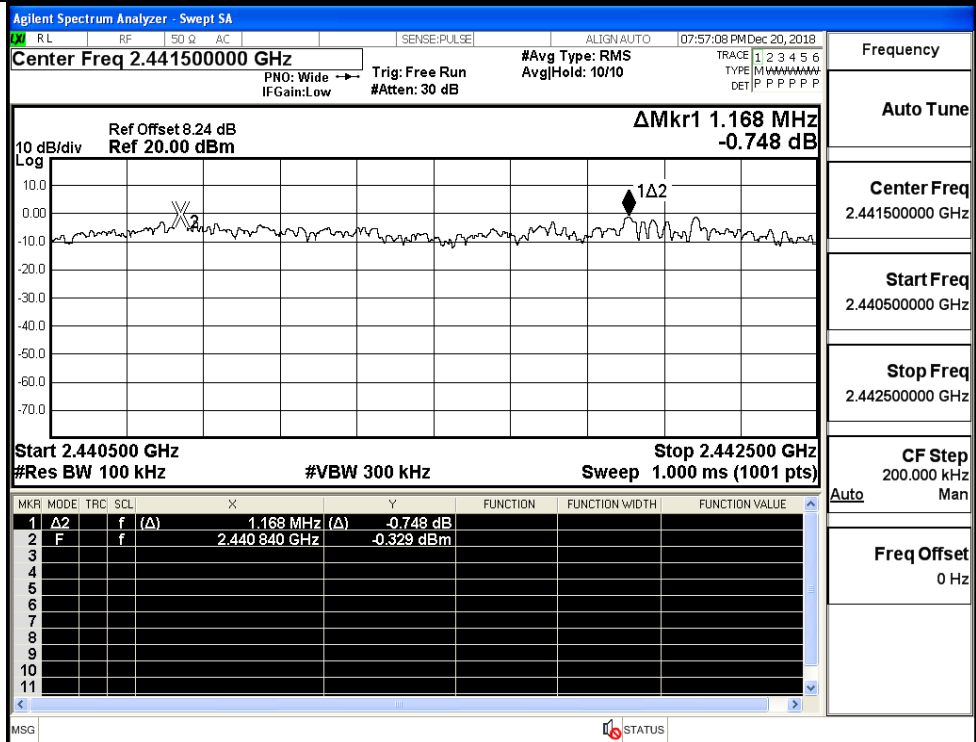
Auto Man

Freq Offset
0 Hz

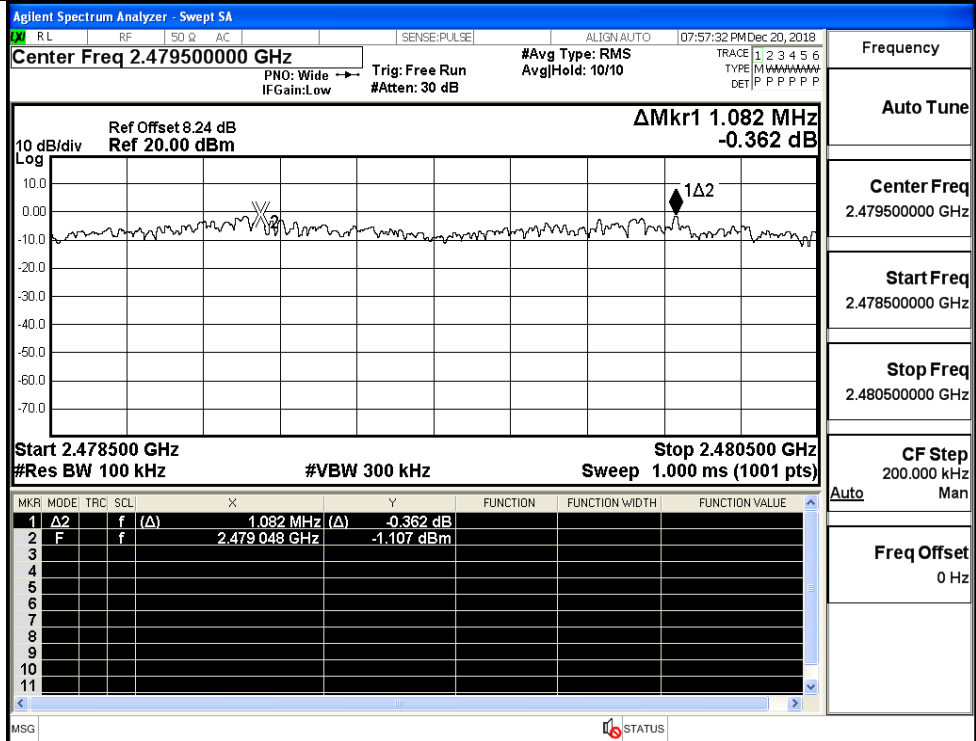
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

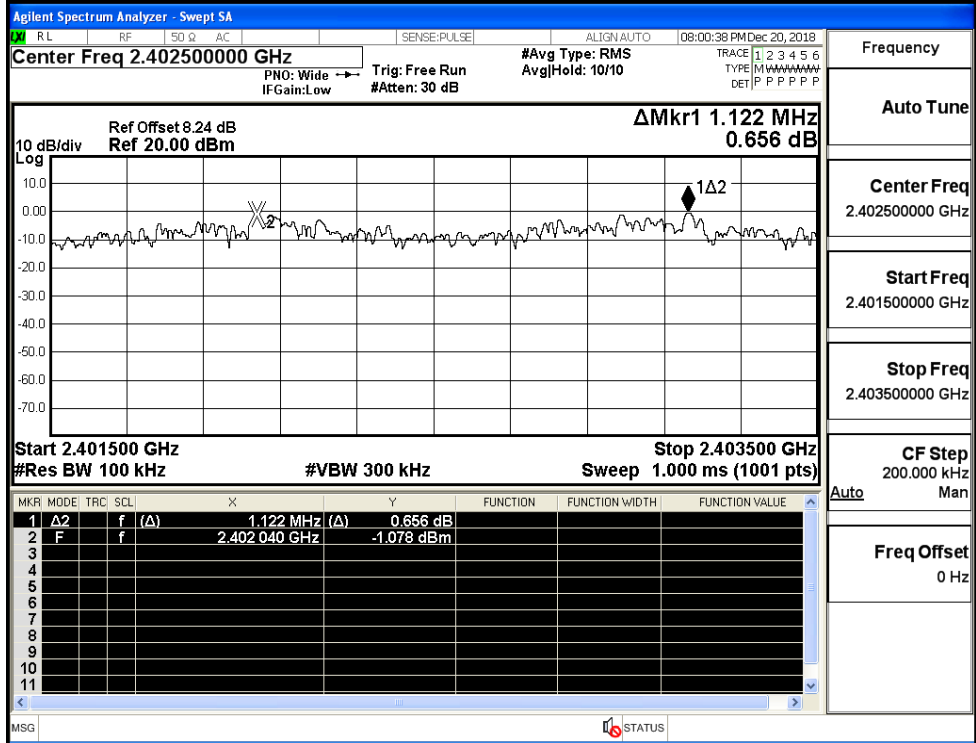


π/4DQPSK/HCH



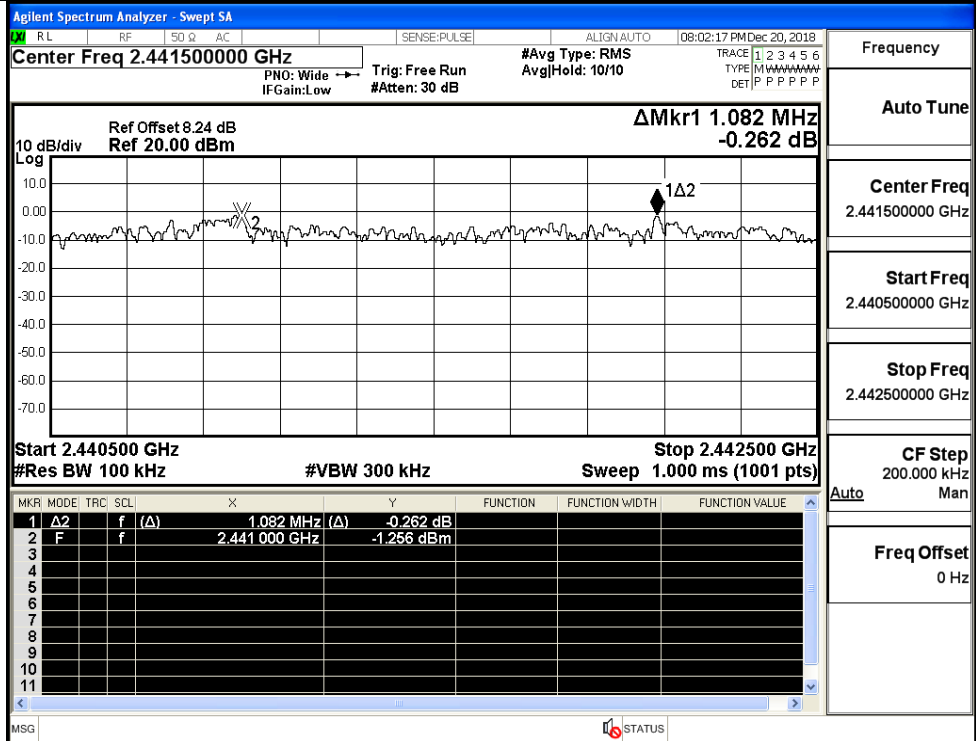
Frequency
Auto Tune
Center Freq
2.479500000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.480500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

8DPSK/LCH



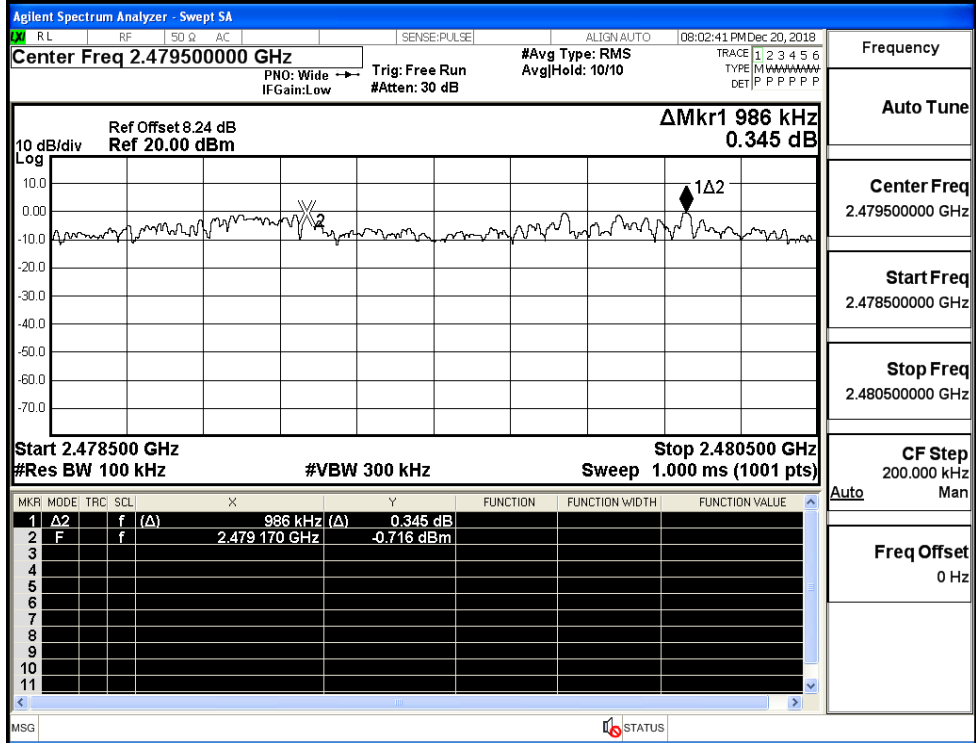
Frequency
Auto Tune
Center Freq
2.402500000 GHz
Start Freq
2.401500000 GHz
Stop Freq
2.403500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

8DPSK/MCH



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

8DPSK/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

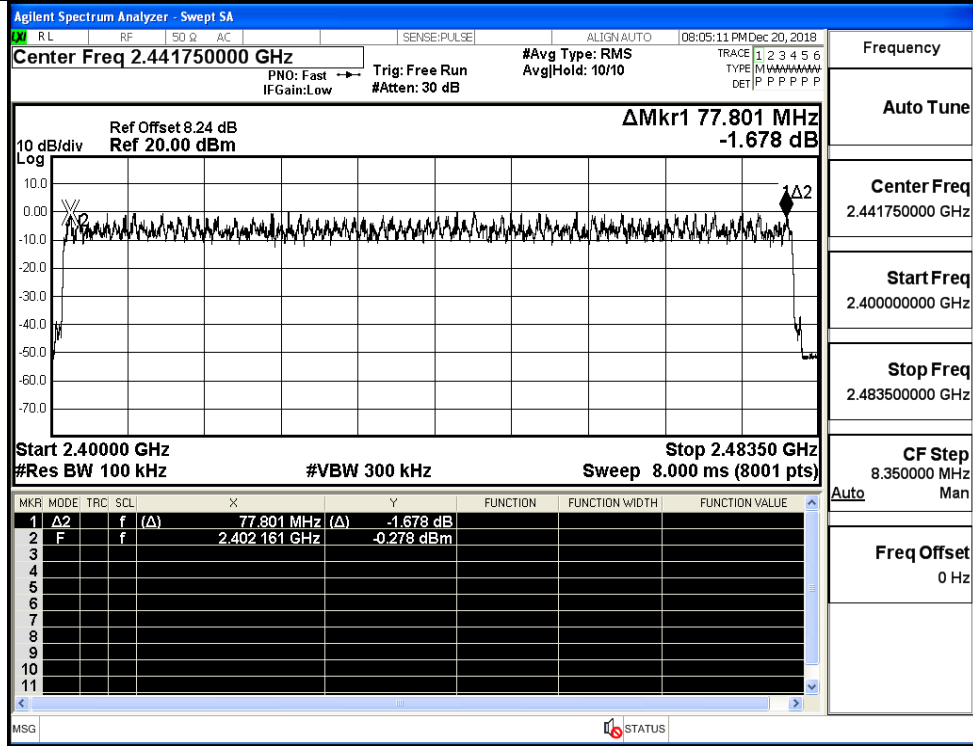
A.4 Hopping Channel Number

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

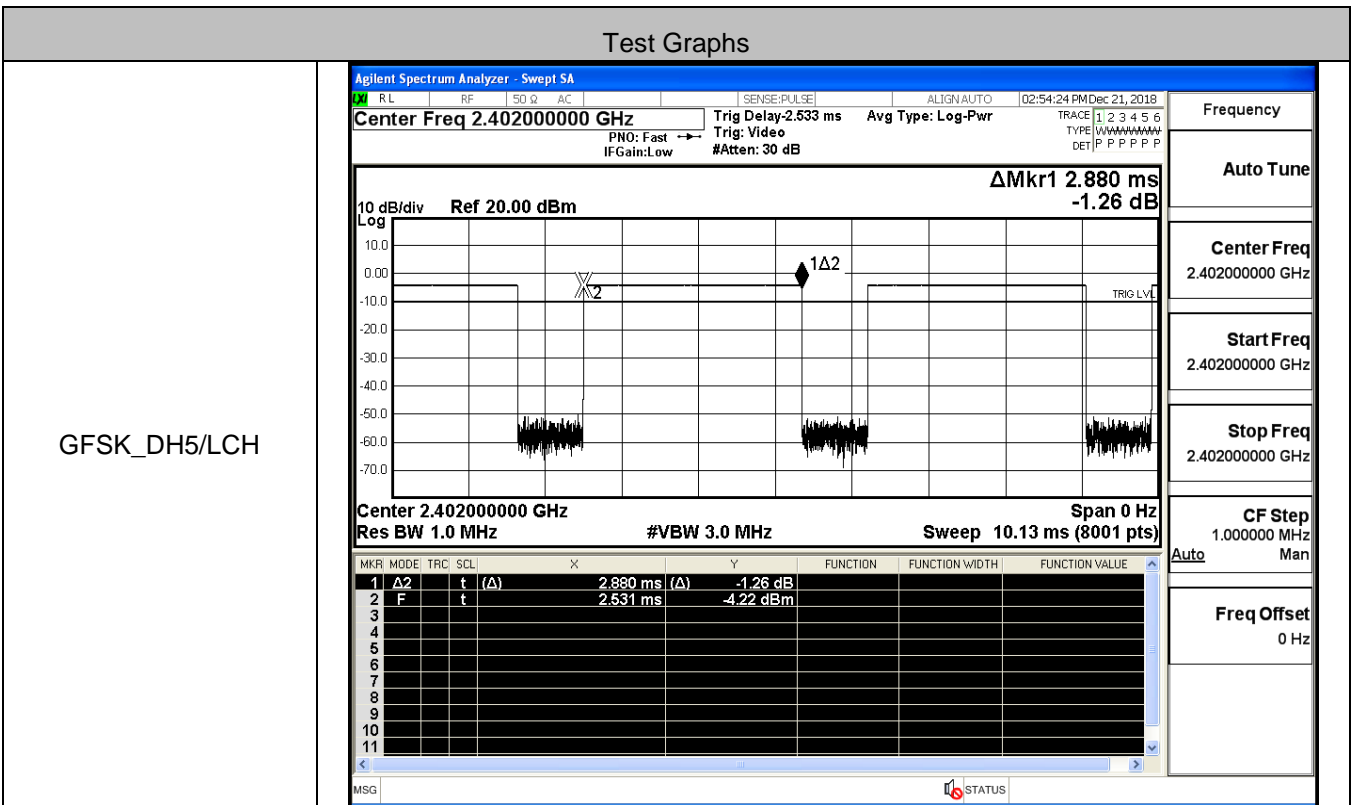
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.24 dB Ref 20.00 dBm</p> <p>ΔMkr1 78.020 MHz 1.021 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <tr> <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>78.020 MHz (Δ)</td> <td>1.021 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401973 GHz</td> <td>0.246 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)	78.020 MHz (Δ)	1.021 dB				2	F	f		2.401973 GHz	0.246 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	78.020 MHz (Δ)	1.021 dB																							
2	F	f		2.401973 GHz	0.246 dBm																							
<p>$\pi/4$DQPSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.24 dB Ref 20.00 dBm</p> <p>ΔMkr1 77.958 MHz 0.288 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 (Δ)</td> <td>0.288 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402077 GHz</td> <td>-2.560 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)	77.958 MHz (Δ)	0.288 dB				2	F	f		2.402077 GHz	-2.560 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	77.958 MHz (Δ)	0.288 dB																							
2	F	f		2.402077 GHz	-2.560 dBm																							

8DPSK/Hop

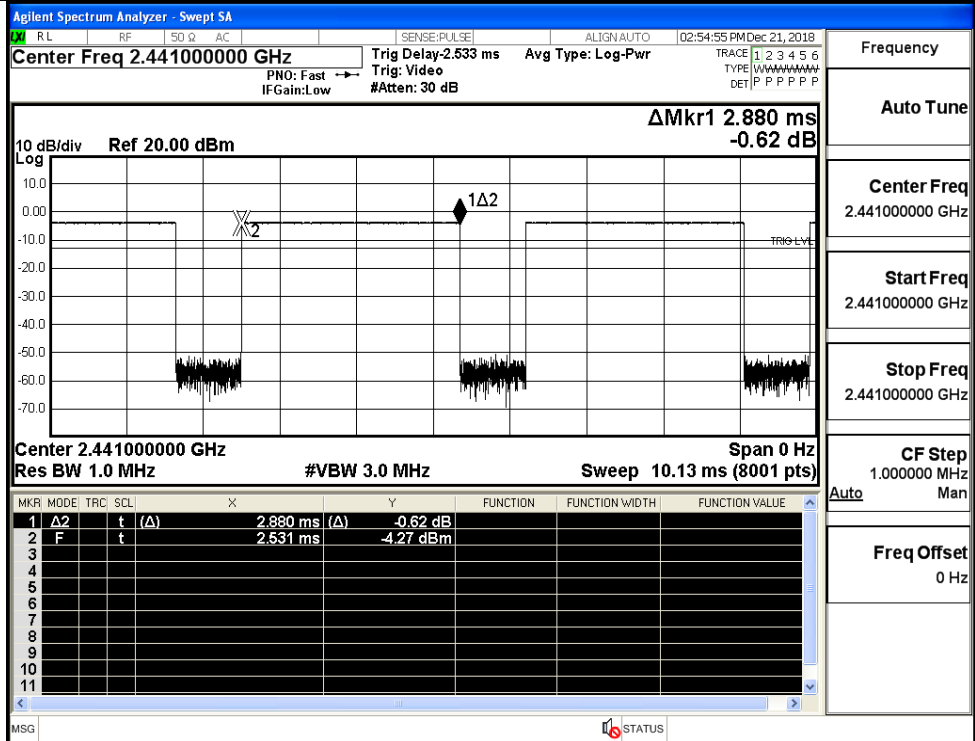


A.5 Dwell Time

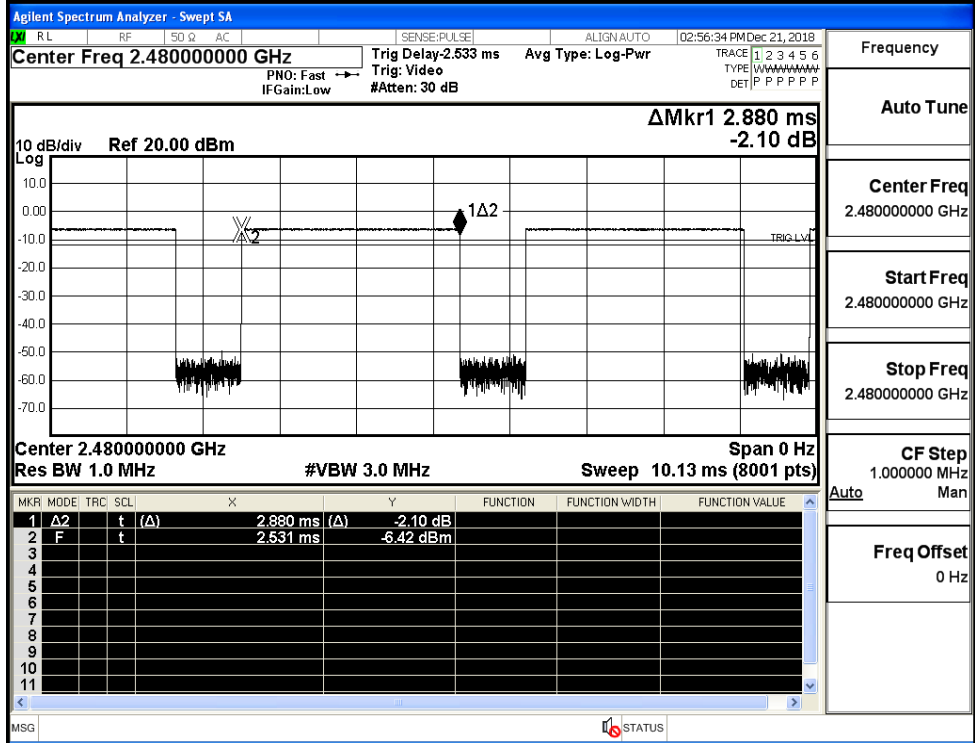
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7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



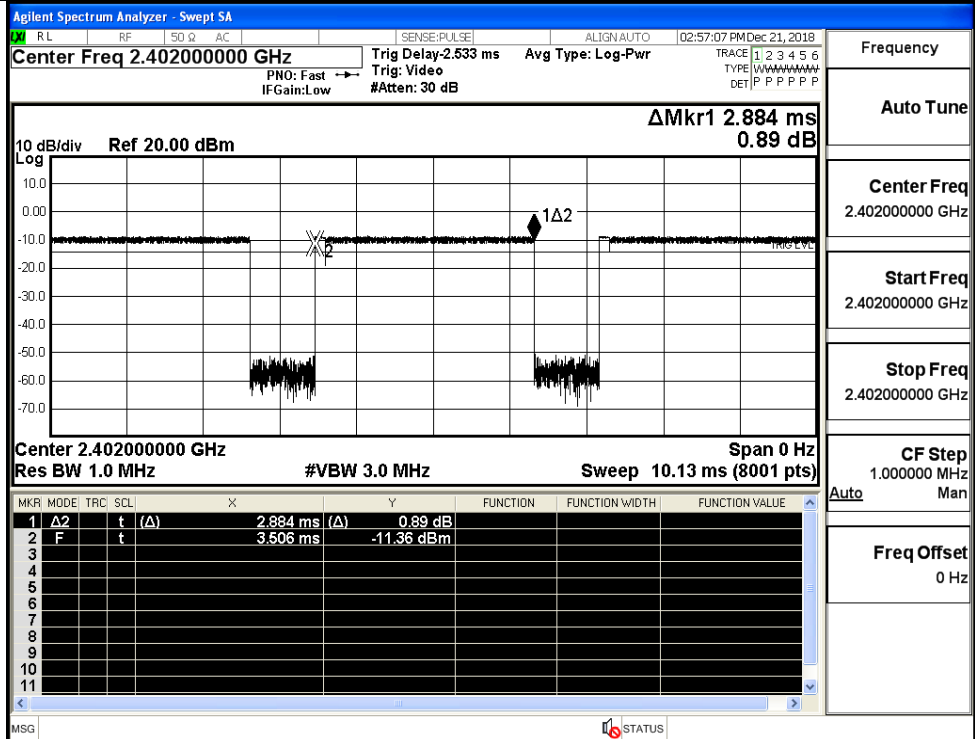
GFSK_DH5/MCH



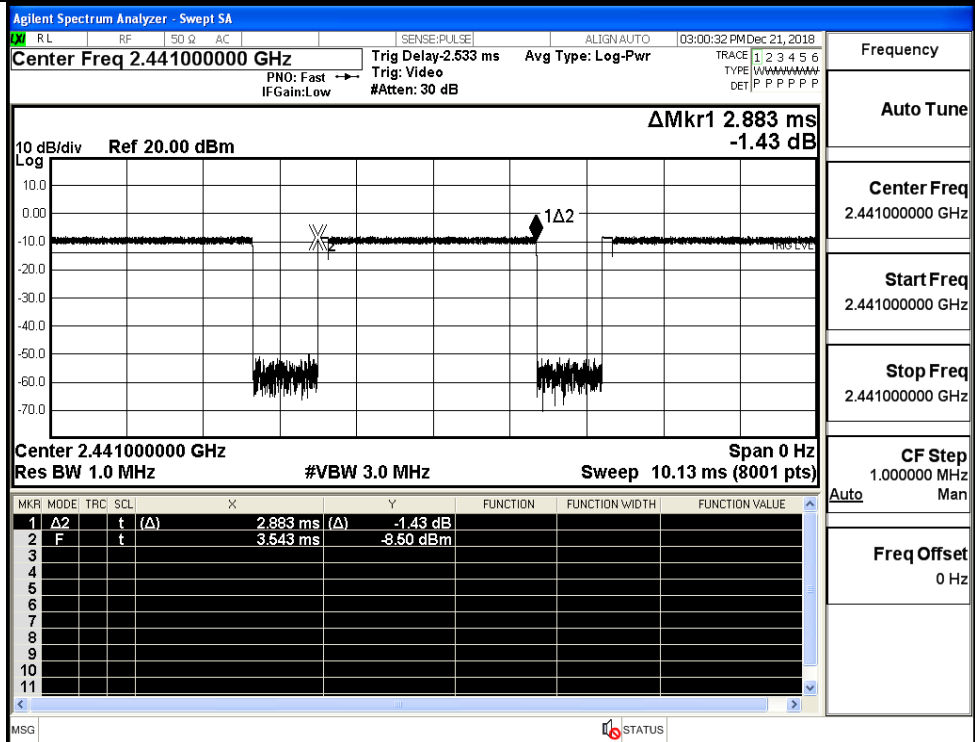
GFSK_DH5/HCH



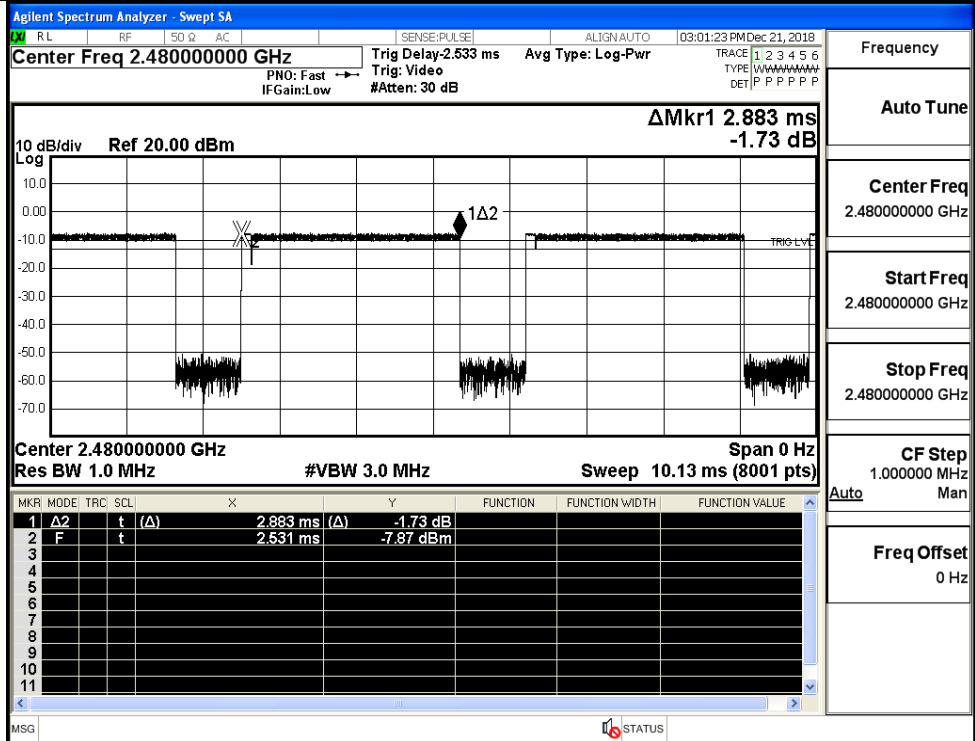
$\pi/4$ DQPSK
_2DH5/LCH



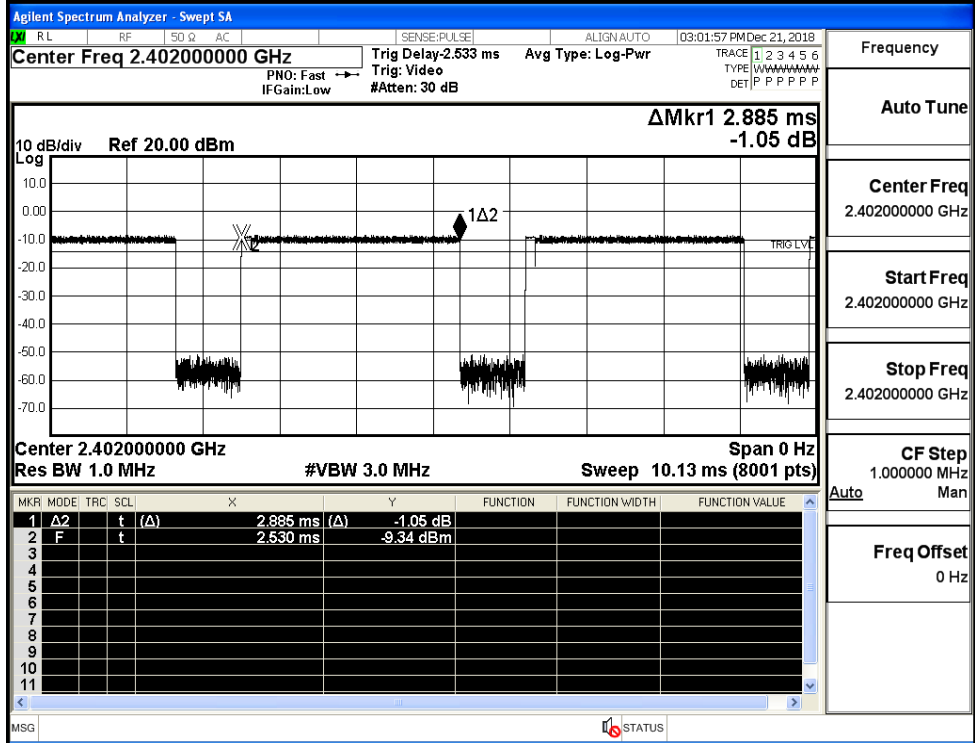
$\pi/4$ DQPSK
_2DH5/MCH



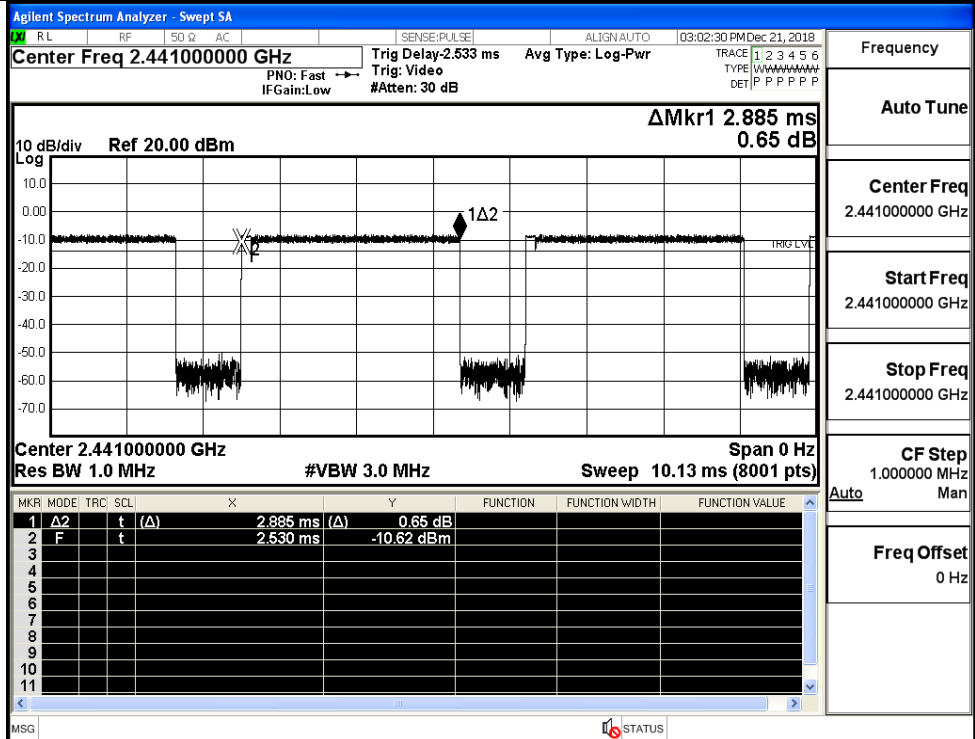
$\pi/4$ DQPSK
_2DH5/HCH



8DPSK_3DH5/LCH

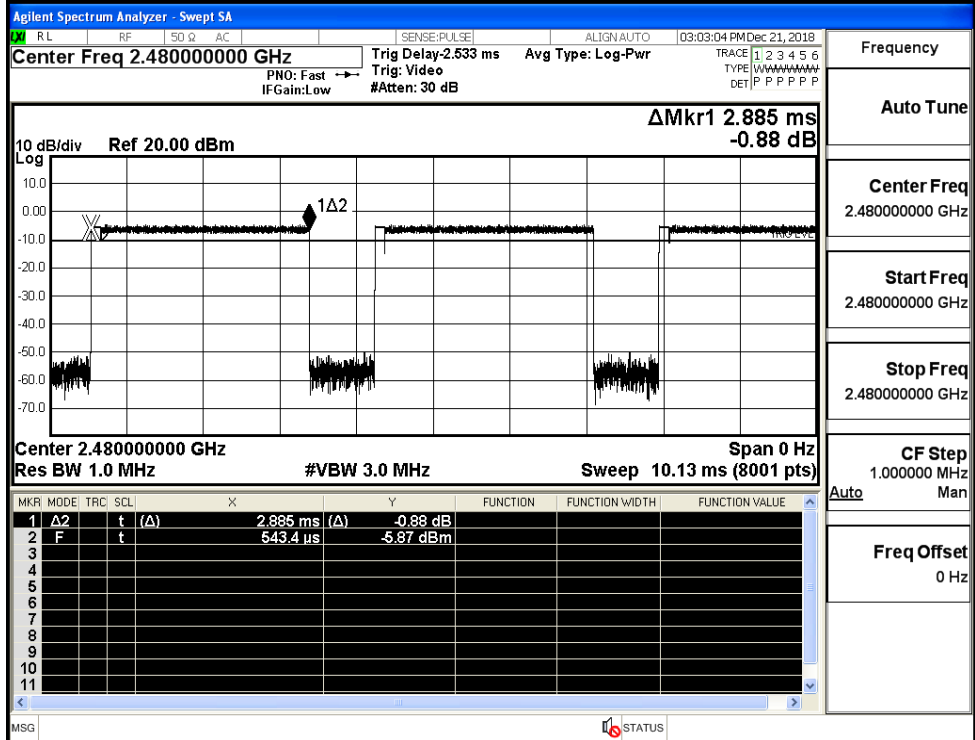


8DPSK_3DH5/MCH



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

8DPSK_3DH5/HCH



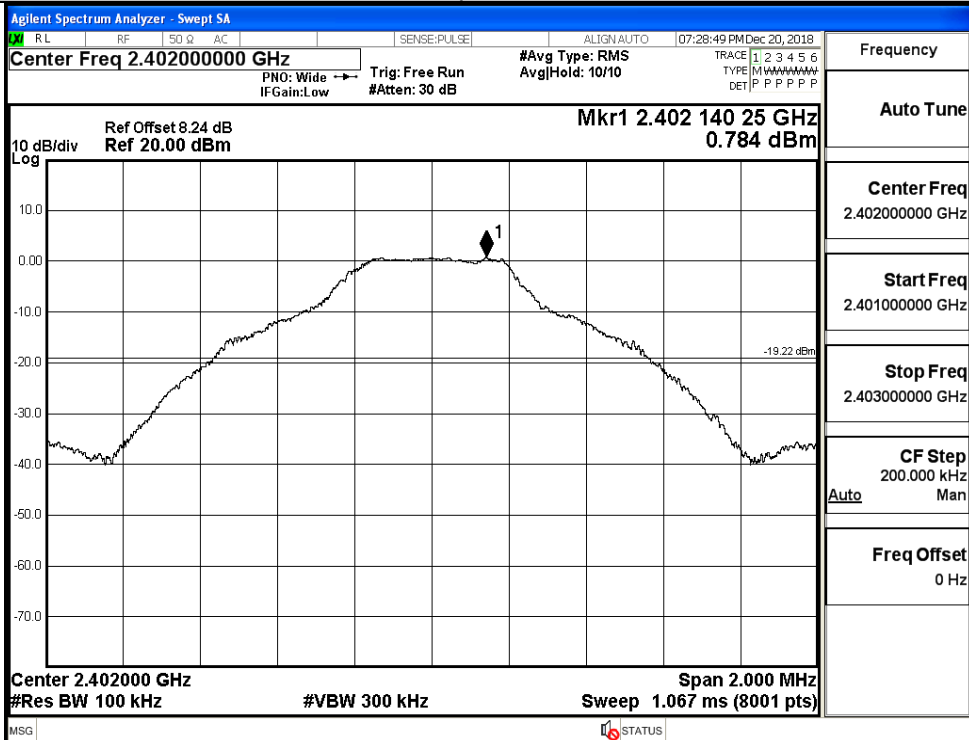
Frequency	
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

A.6 RF Conducted Spurious Emissions

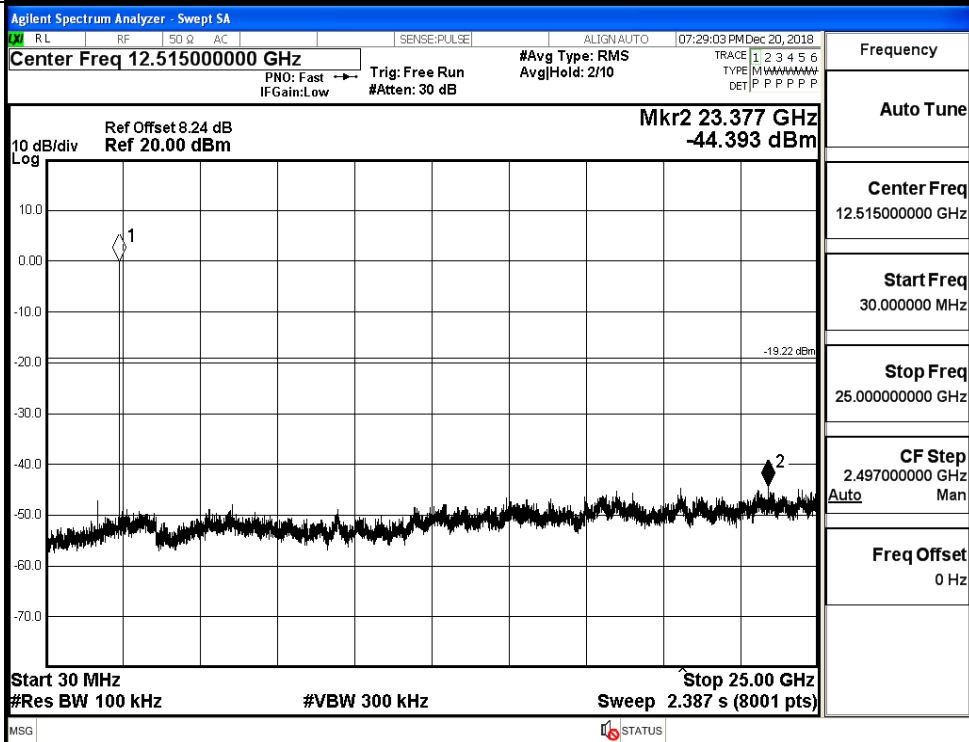
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.784	-44.393	-19.216	PASS
	MCH	1.249	-44.030	-18.751	PASS
	HCH	0.721	-44.197	-19.279	PASS
$\pi/4$ DQPSK	LCH	-0.503	-44.706	-20.503	PASS
	MCH	-0.125	-44.109	-20.125	PASS
	HCH	-1.058	-42.665	-21.058	PASS
8DPSK	LCH	-0.298	-44.394	-20.298	PASS
	MCH	-0.451	-44.419	-20.451	PASS
	HCH	-0.141	-44.369	-20.141	PASS

GFSK_LCH_Graphs

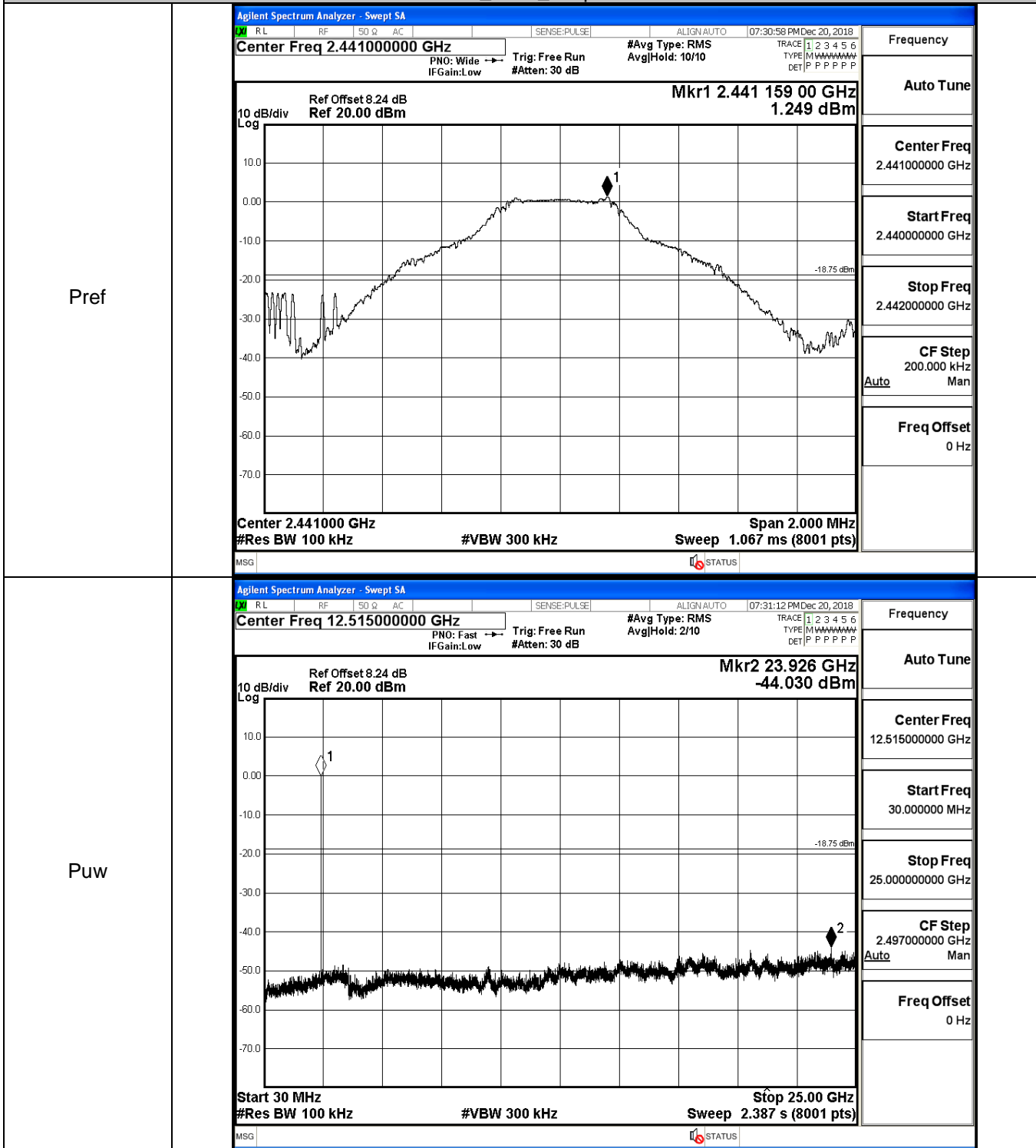
Pref



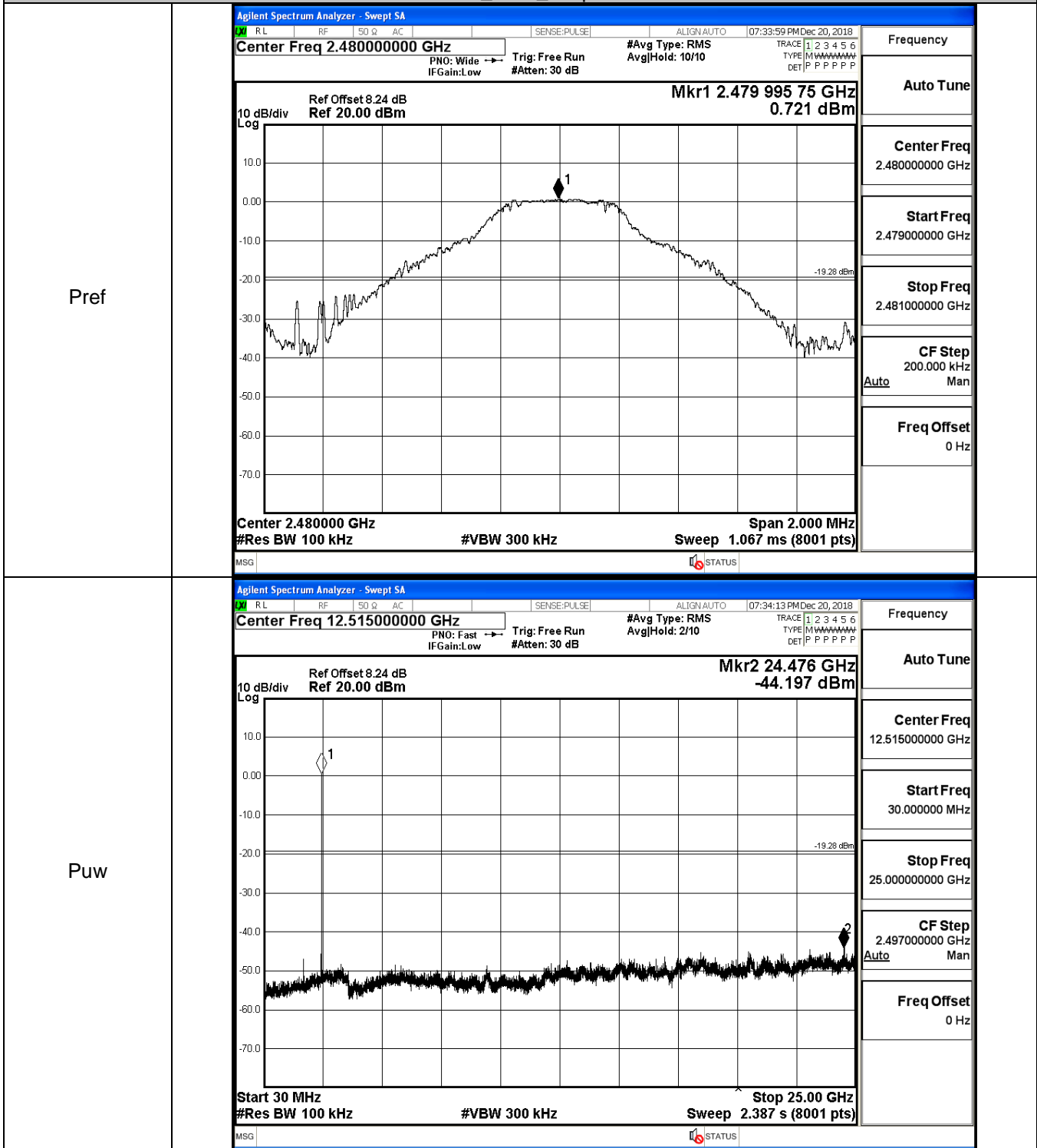
Puw



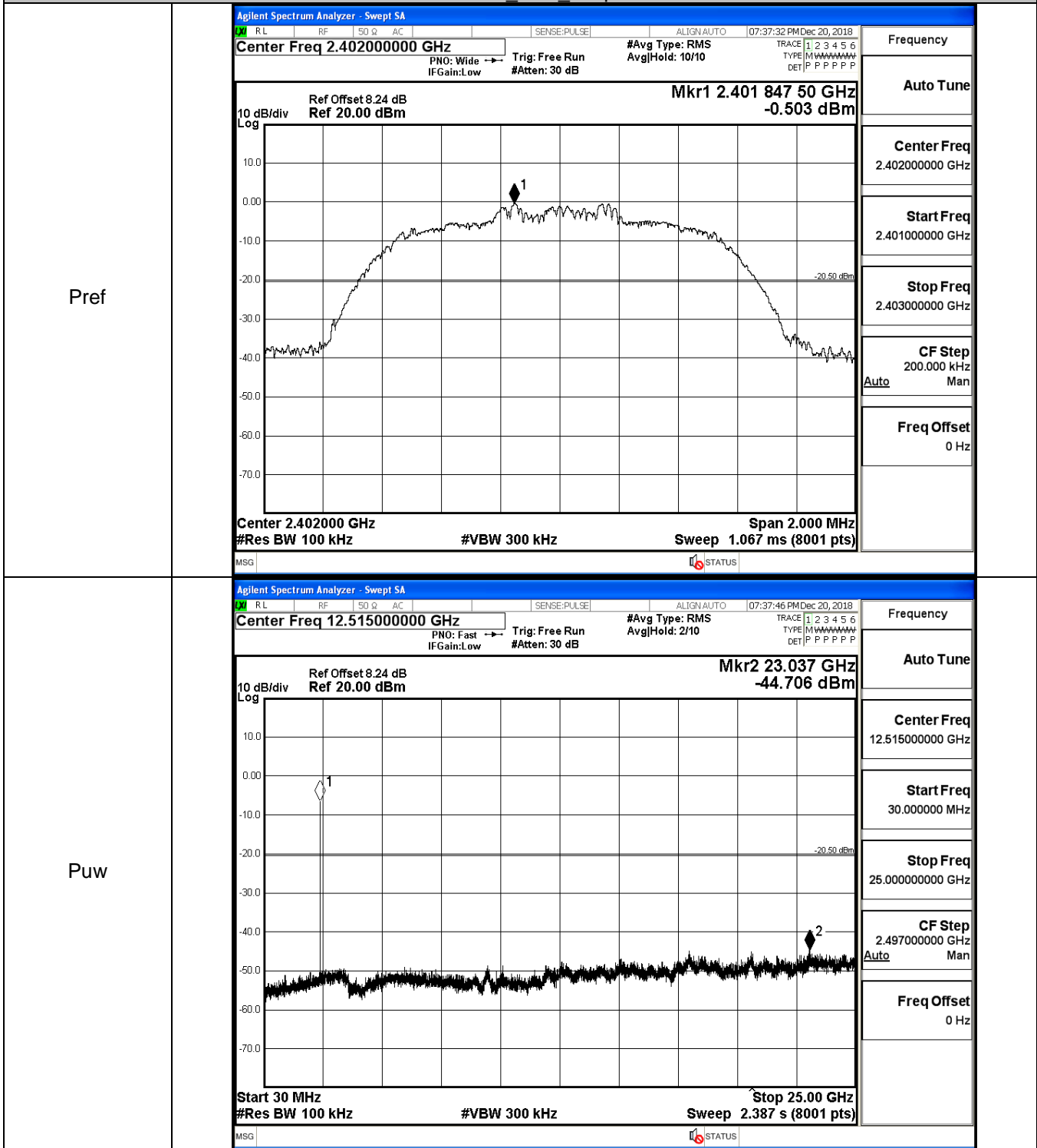
GFSK_MCH_Graphs



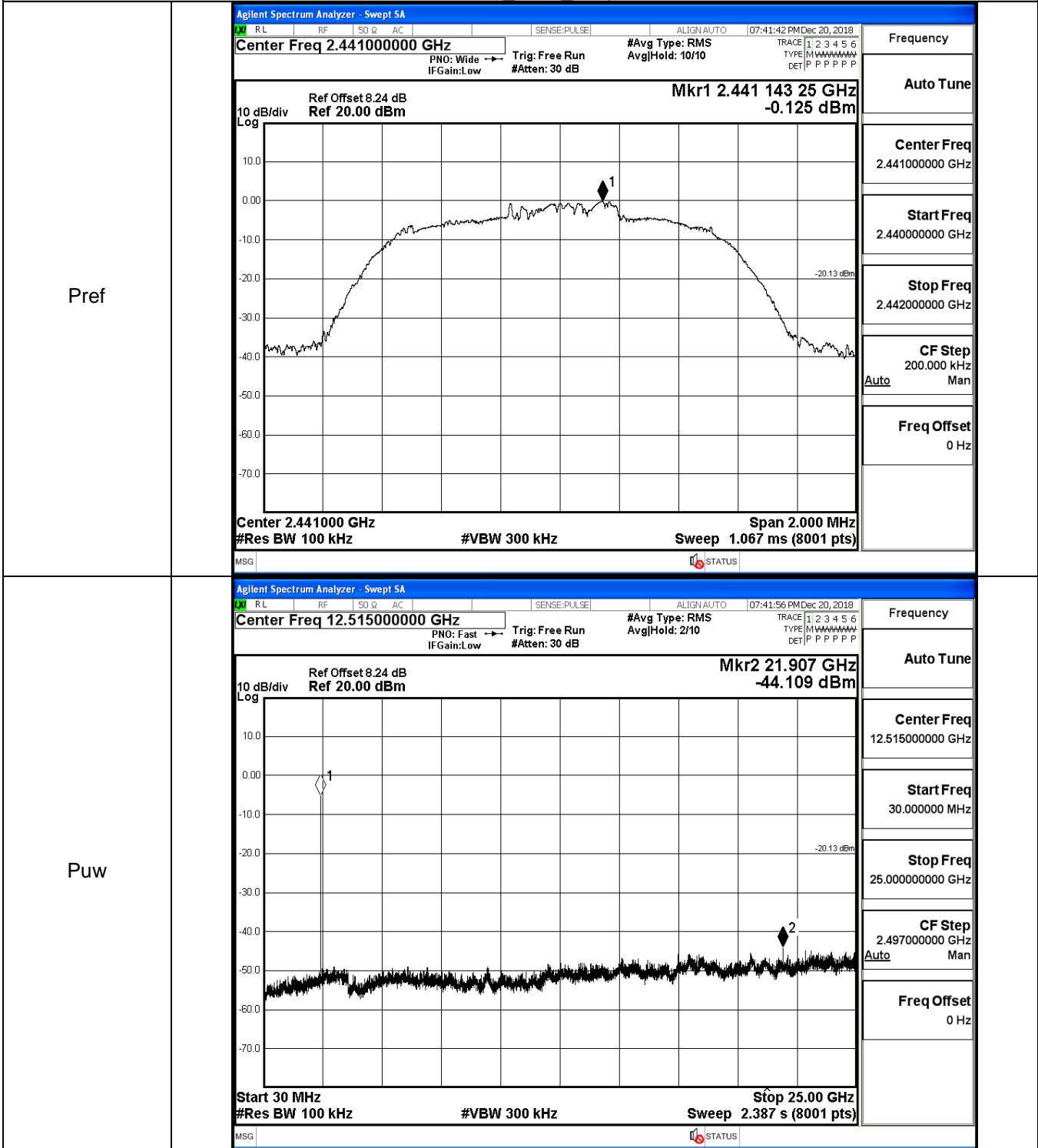
GFSK_HCH_Graphs



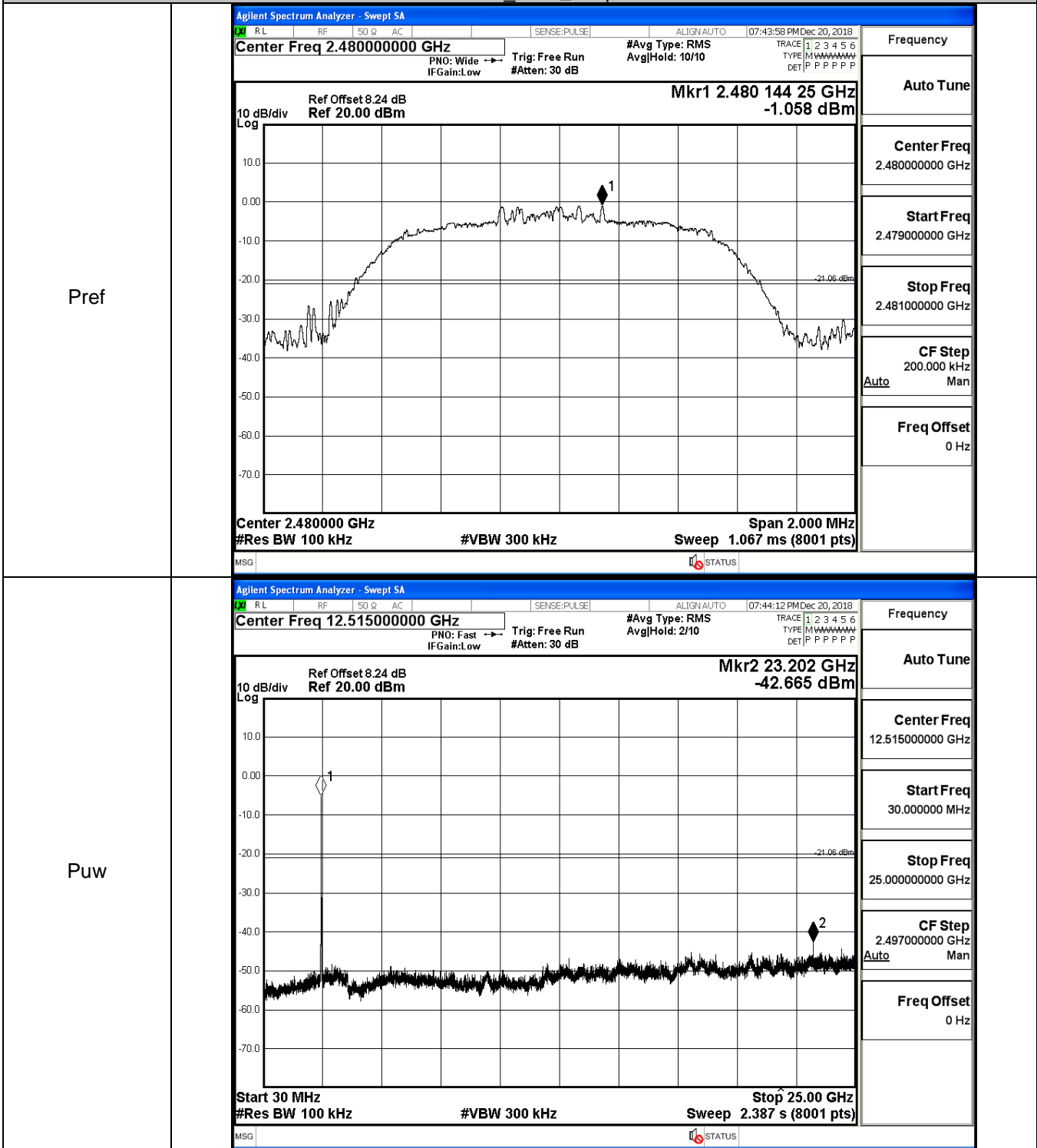
$\pi/4$ DQPSK LCH_Graphs



$\pi/4$ DQPSK_MCH_Graphs

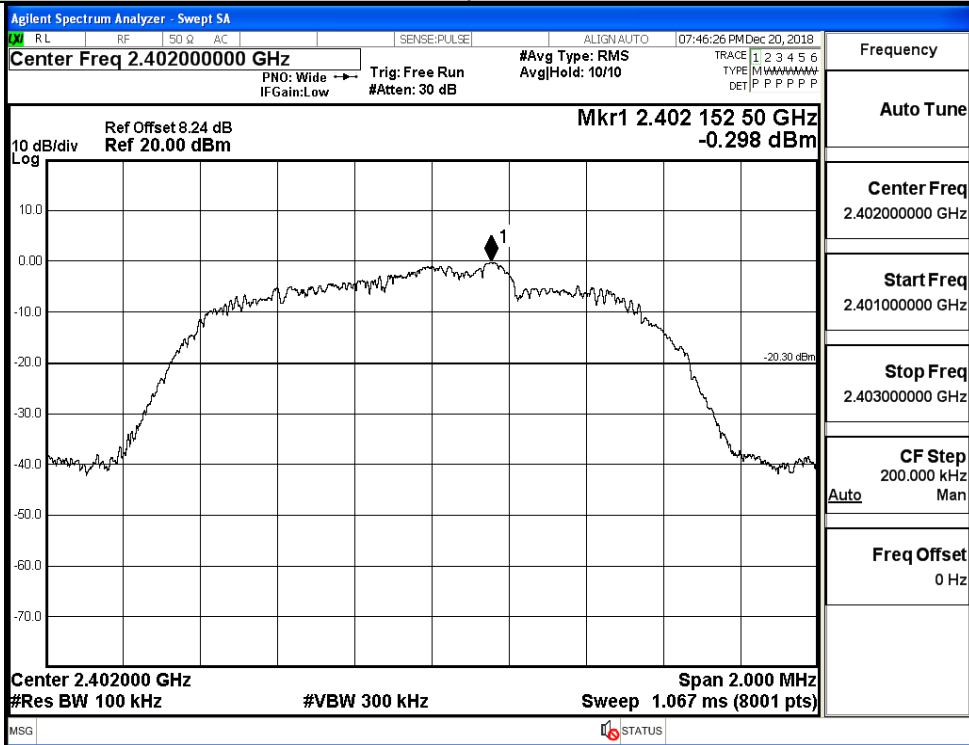


$\pi/4$ DQPSK_HCH_Graphs

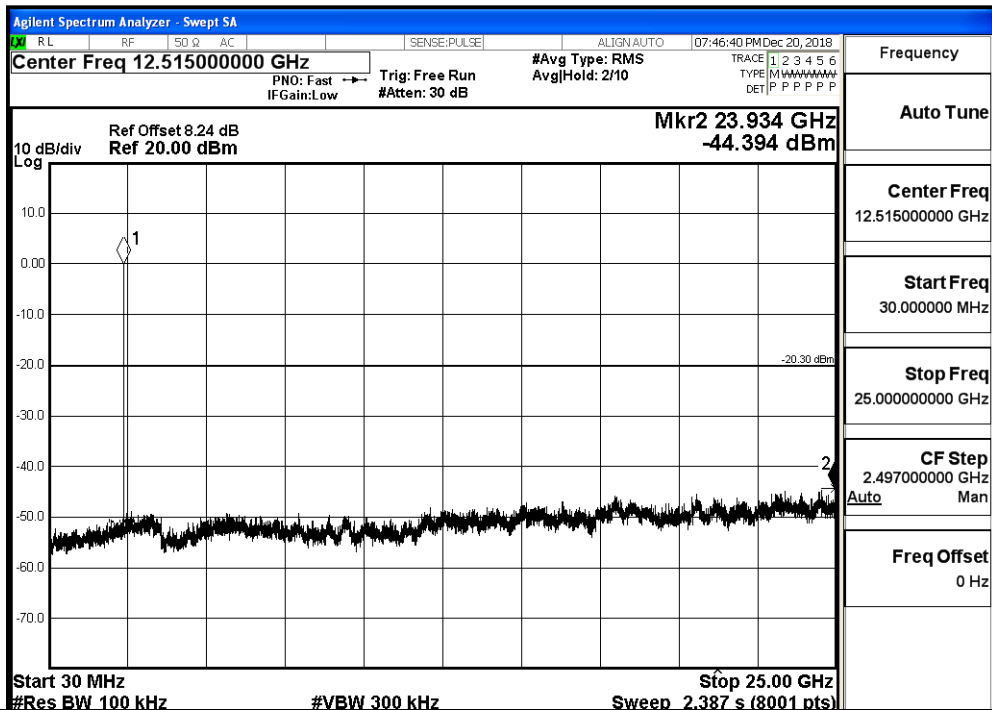


8DPSK_LCH_Graphs

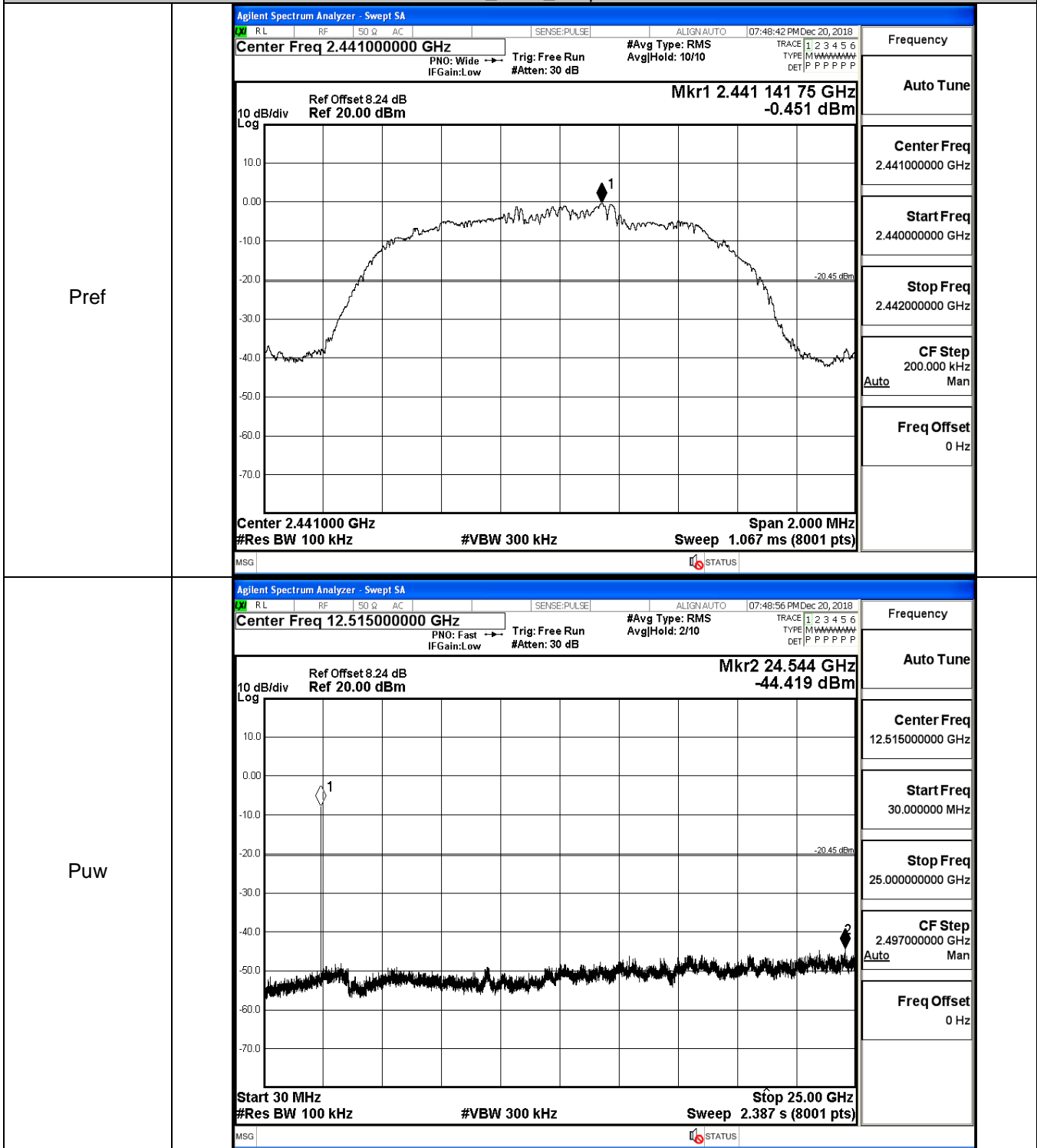
Pref



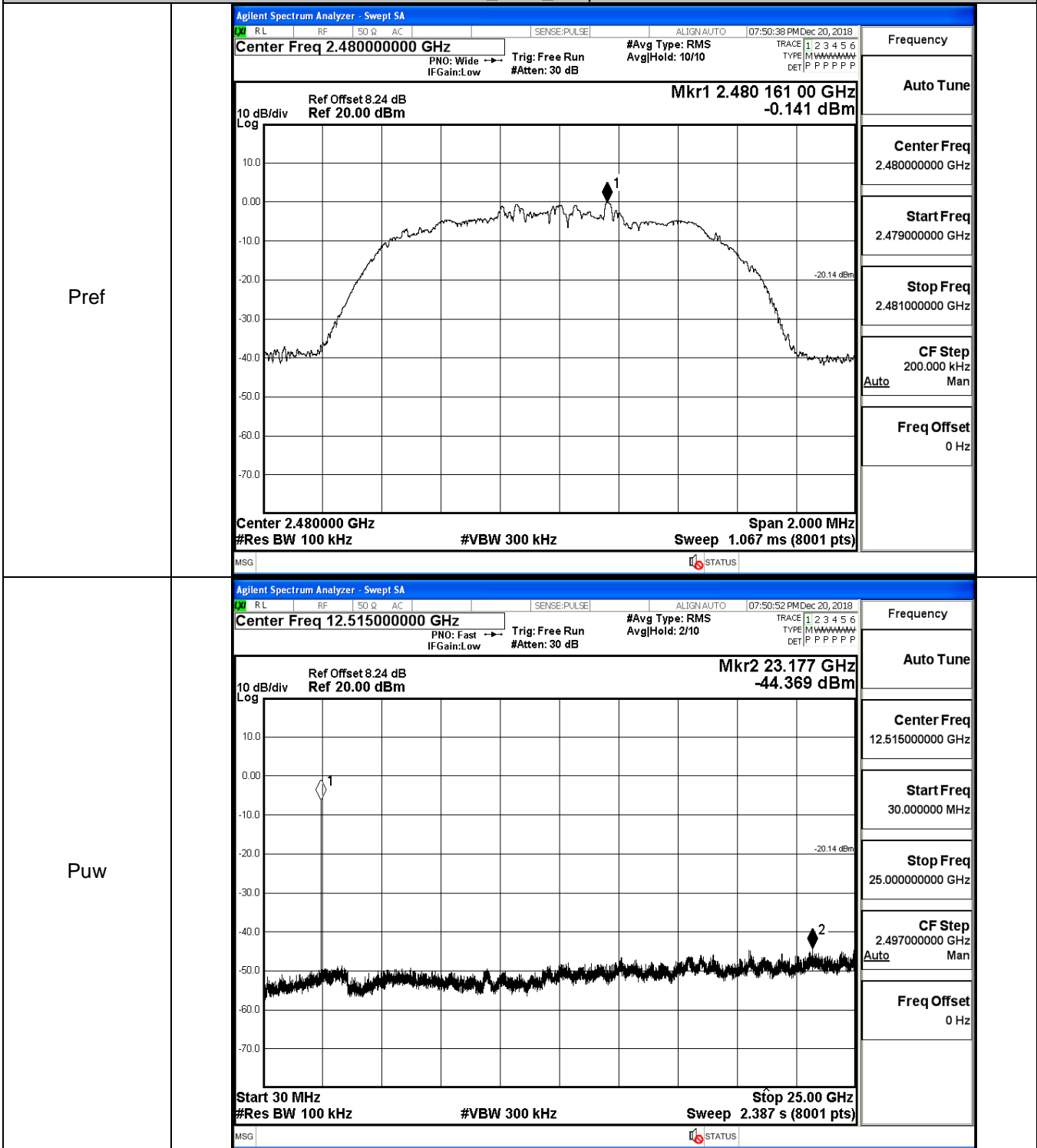
Puw



8DPSK_MCH_Graphs



8DPSK_HCH_Graphs

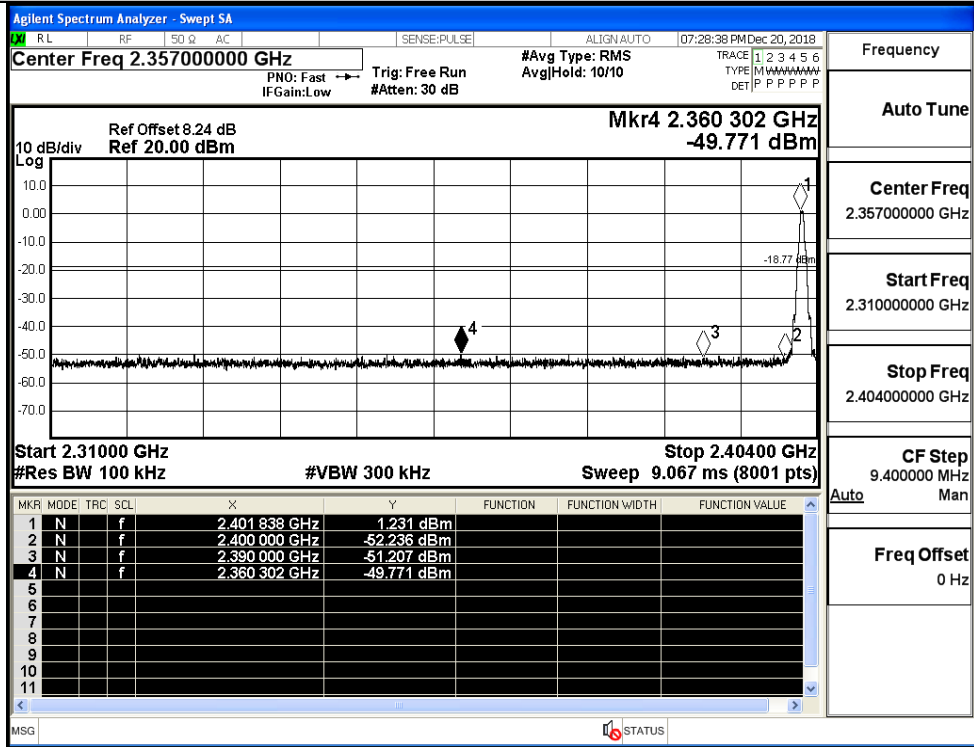


A.7 Band-edge for RF Conducted Emissions

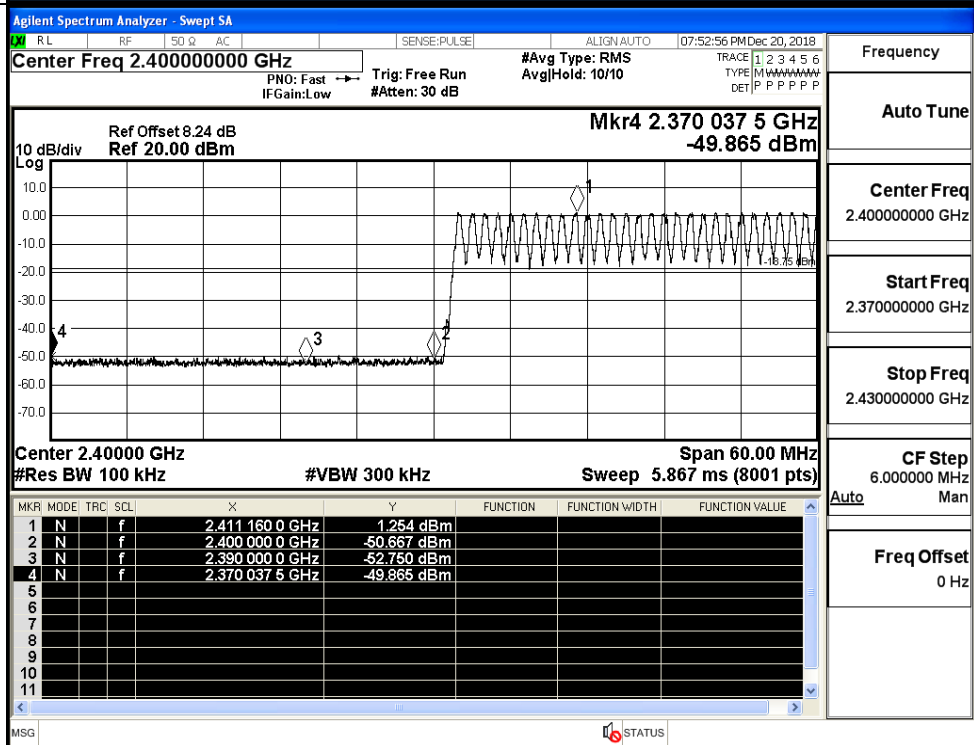
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.231	Off	-49.771	-18.77	PASS
			1.254	On	-49.865	-18.75	PASS
	HCH	2480	1.047	Off	-29.168	-18.95	PASS
			1.382	On	-49.377	-18.62	PASS
$\pi/4$ DQPSK	LCH	2402	-0.586	Off	-50.043	-20.59	PASS
			-0.304	On	-49.409	-20.3	PASS
	HCH	2480	-0.649	Off	-26.010	-20.65	PASS
			-0.304	On	-48.055	-20.3	PASS
8DPSK	LCH	2402	-2.758	Off	-49.974	-22.76	PASS
			-0.393	On	-49.280	-20.39	PASS
	HCH	2480	-0.062	Off	-49.530	-20.06	PASS
			-0.327	On	-49.000	-20.33	PASS

Test Graphs

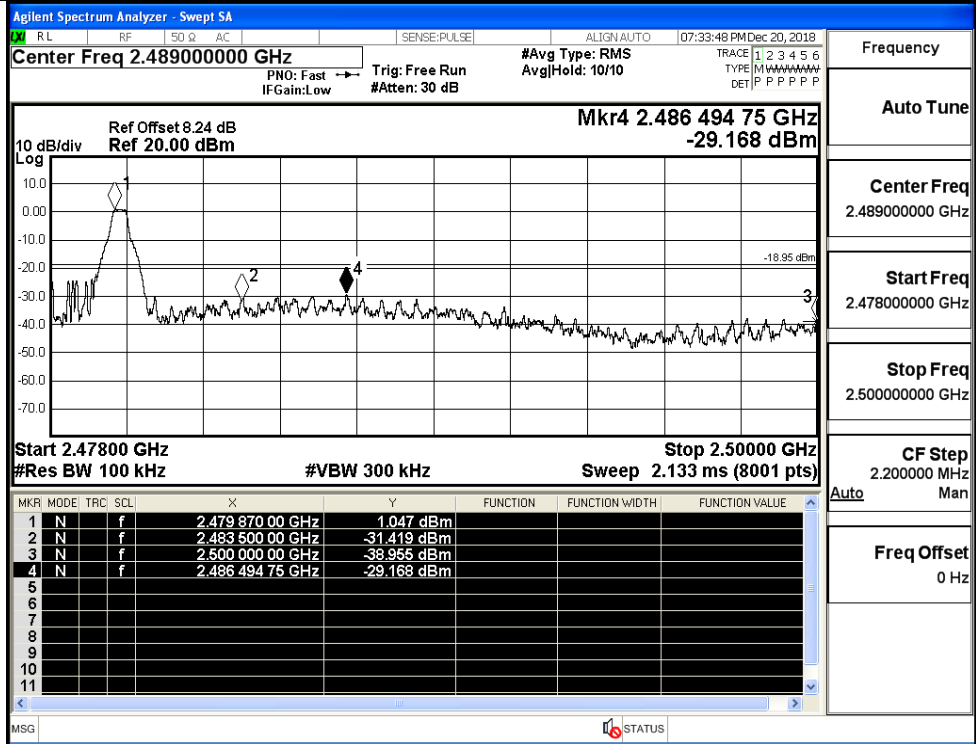
GFSK/LCH/No Hop



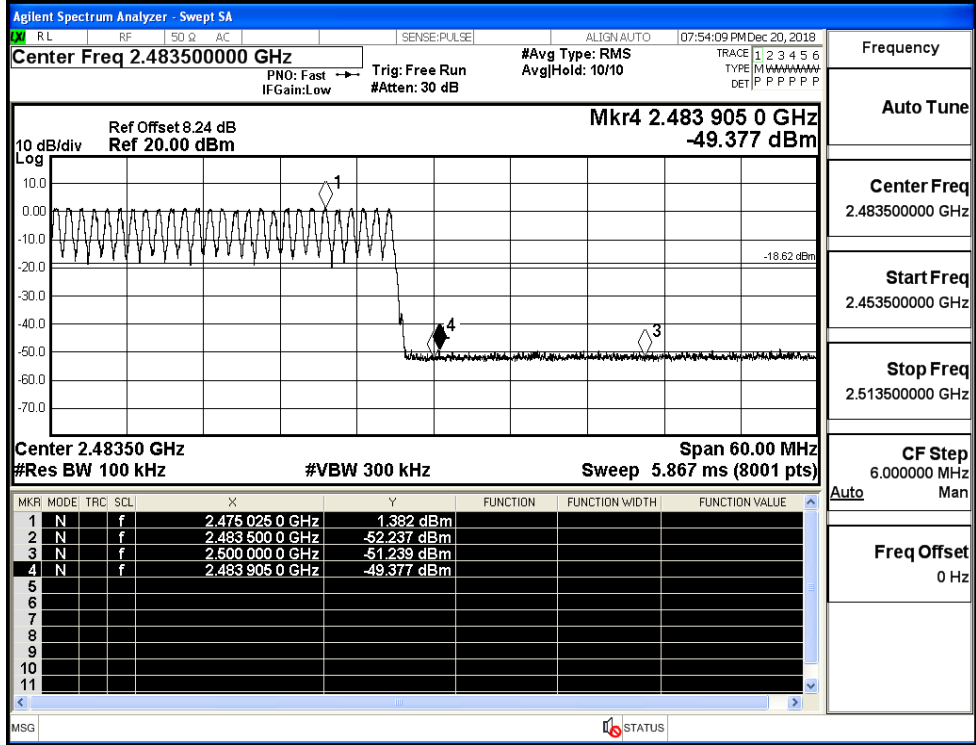
GFSK/LCH/Hop



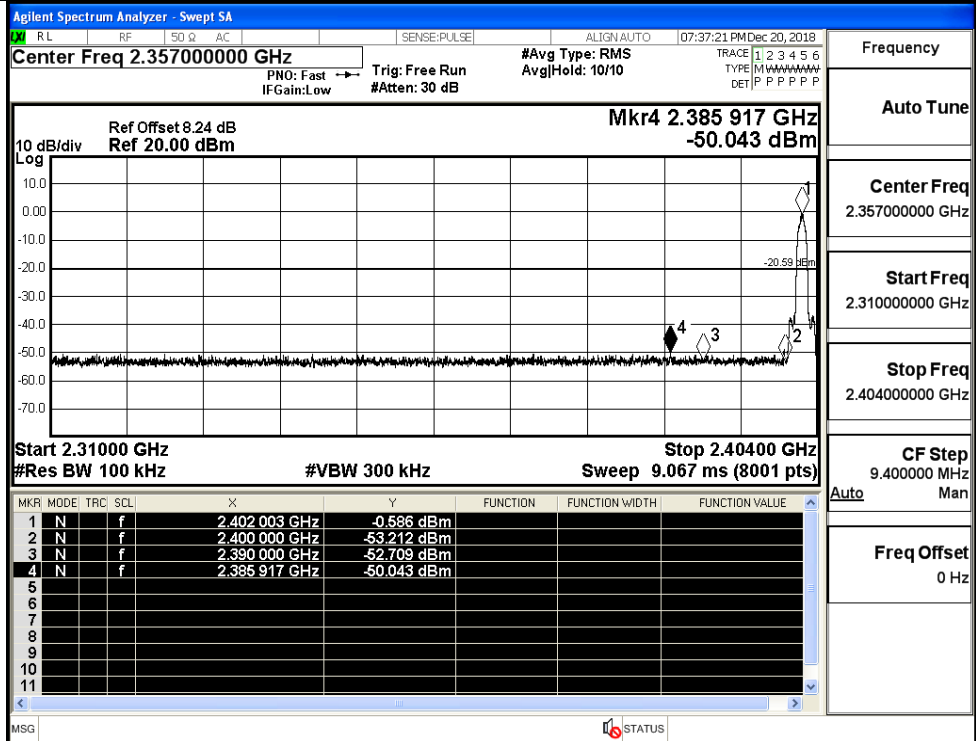
GFSK/HCH/No Hop



GFSK/HCH/Hop

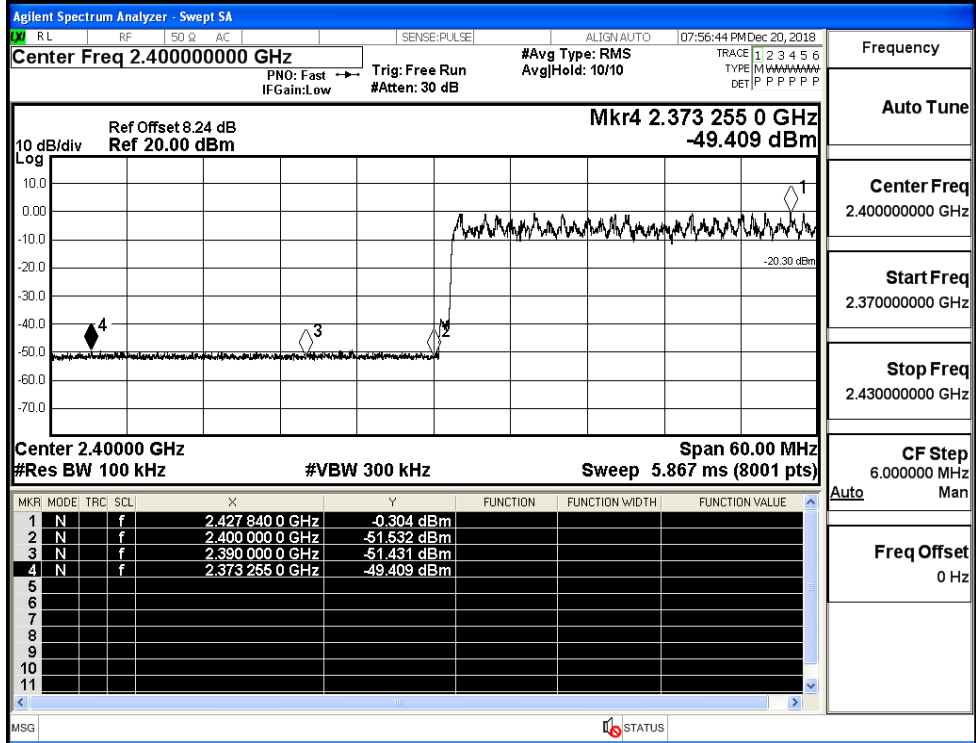


$\pi/4$ DQPSK/LCH/No
Hop



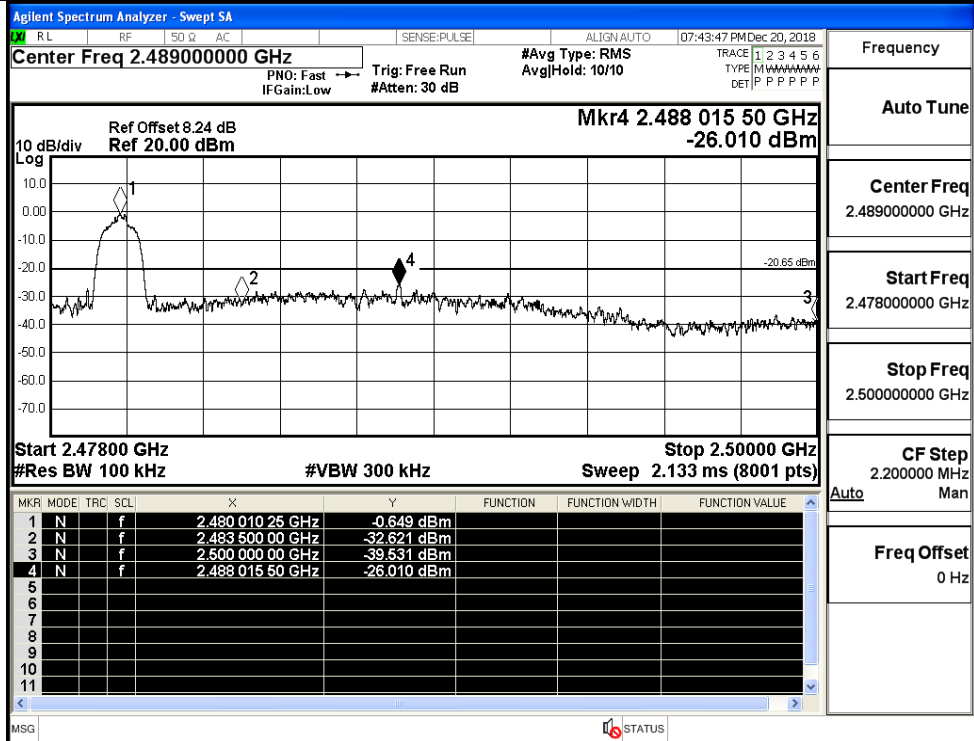
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ 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
Auto	Man
Freq Offset	0 Hz

π /4DQPSK/HCH/No
Hop



Frequency

Auto Tune

Center Freq
2.489000000 GHz

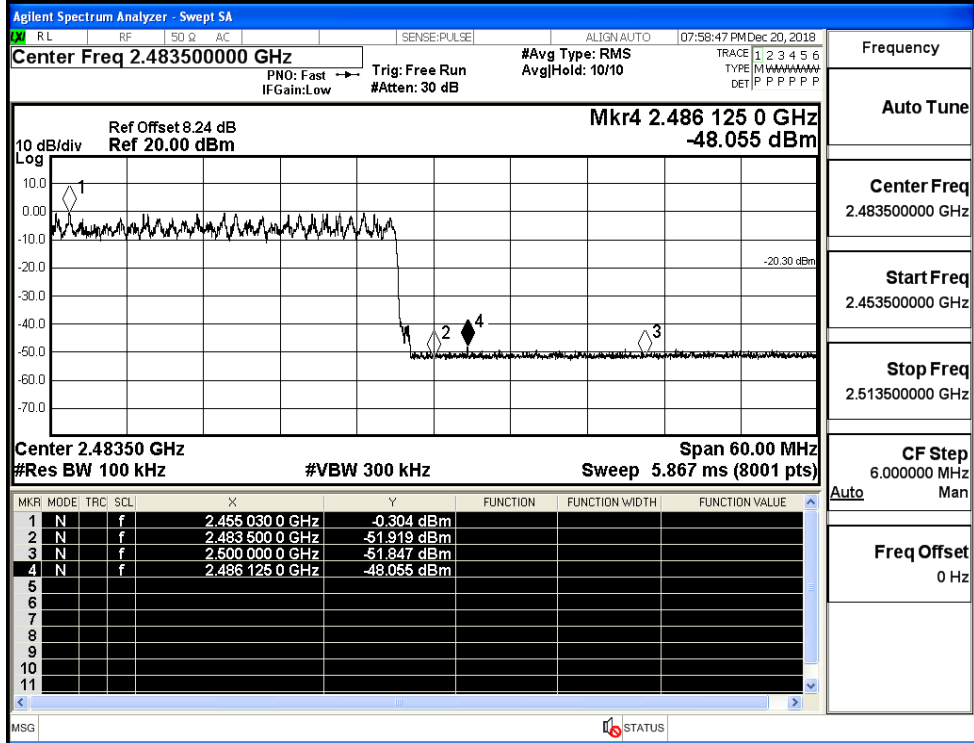
Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz

Freq Offset
0 Hz

π /4DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq
2.483500000 GHz

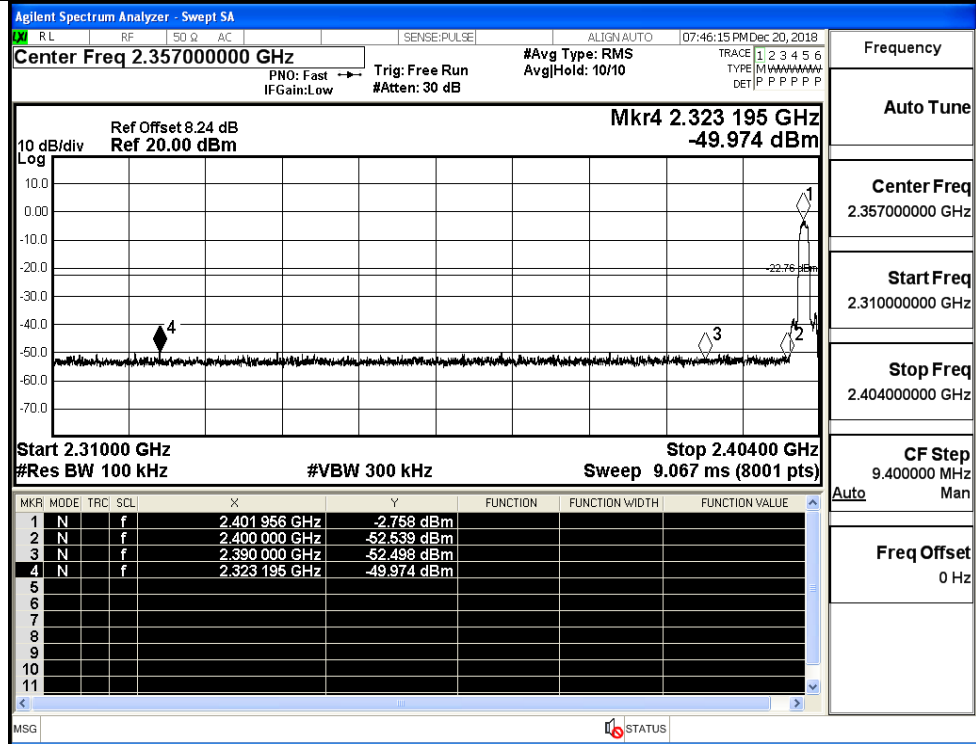
Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz

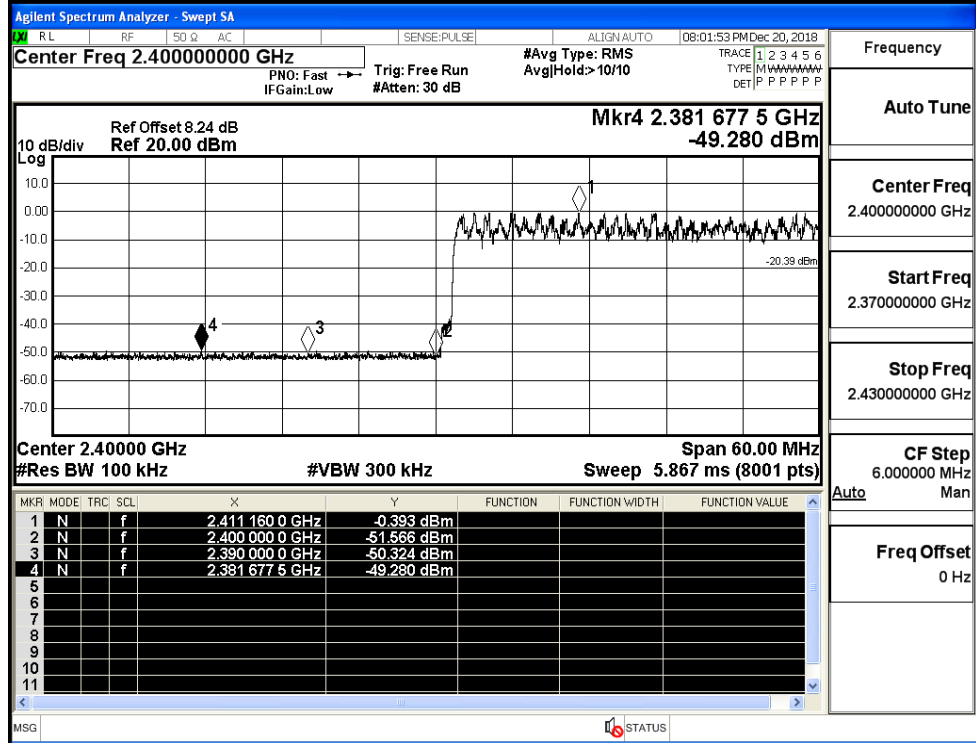
Freq Offset
0 Hz

8DPSK/LCH/No Hop



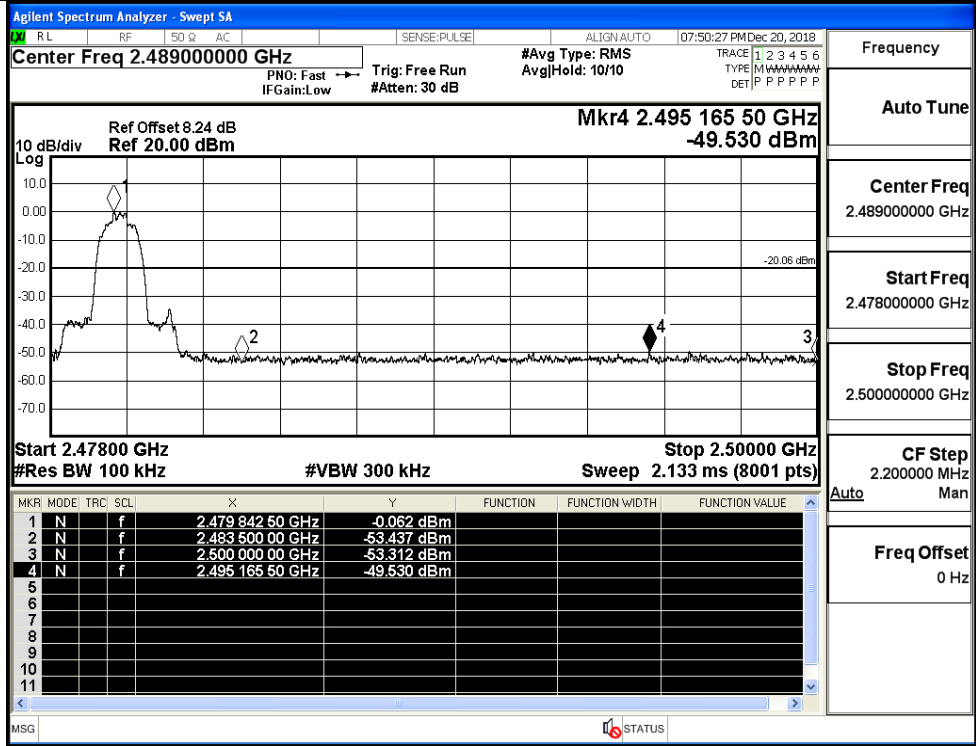
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Freq Offset	0 Hz

8DPSK/LCH/Hop



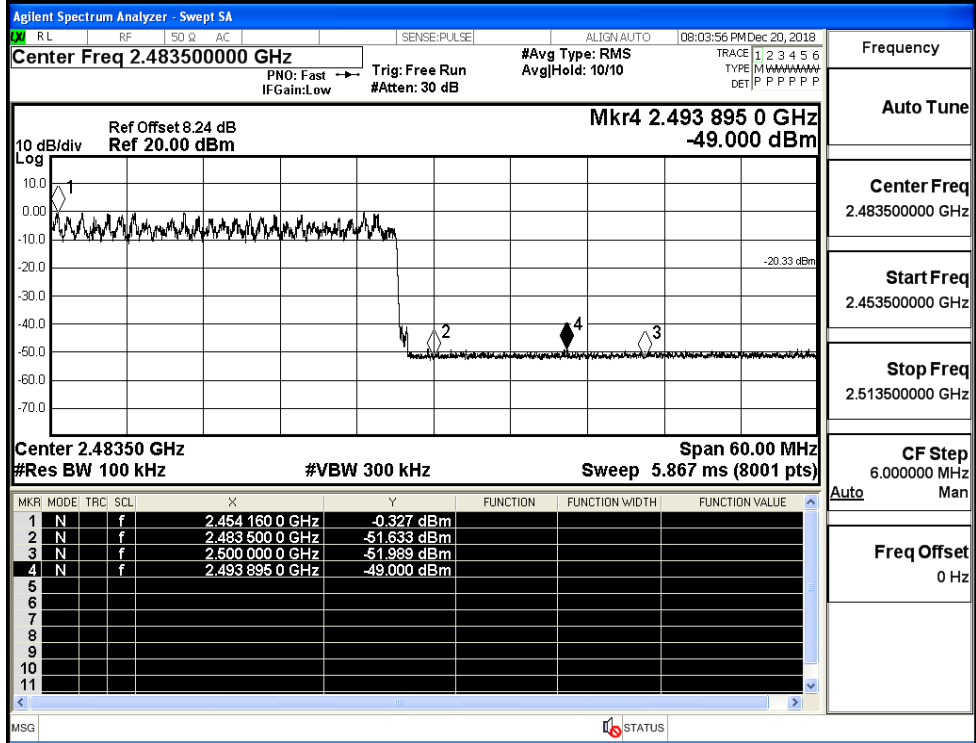
Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

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
Auto Man
Freq Offset
0 Hz

8DPSK/HCH/Hop

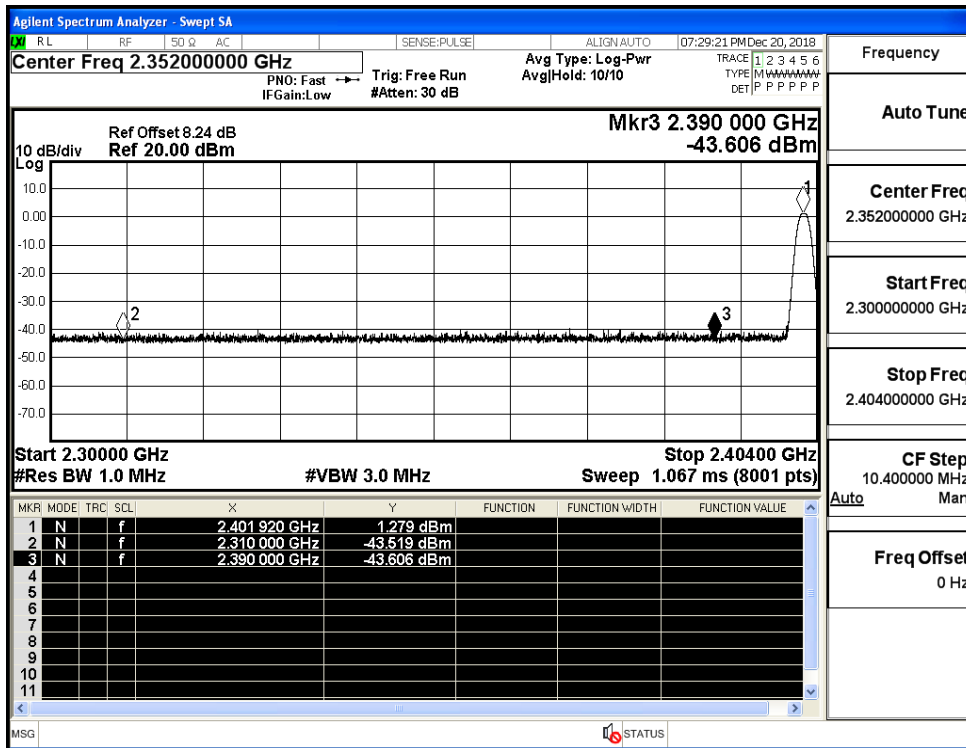


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

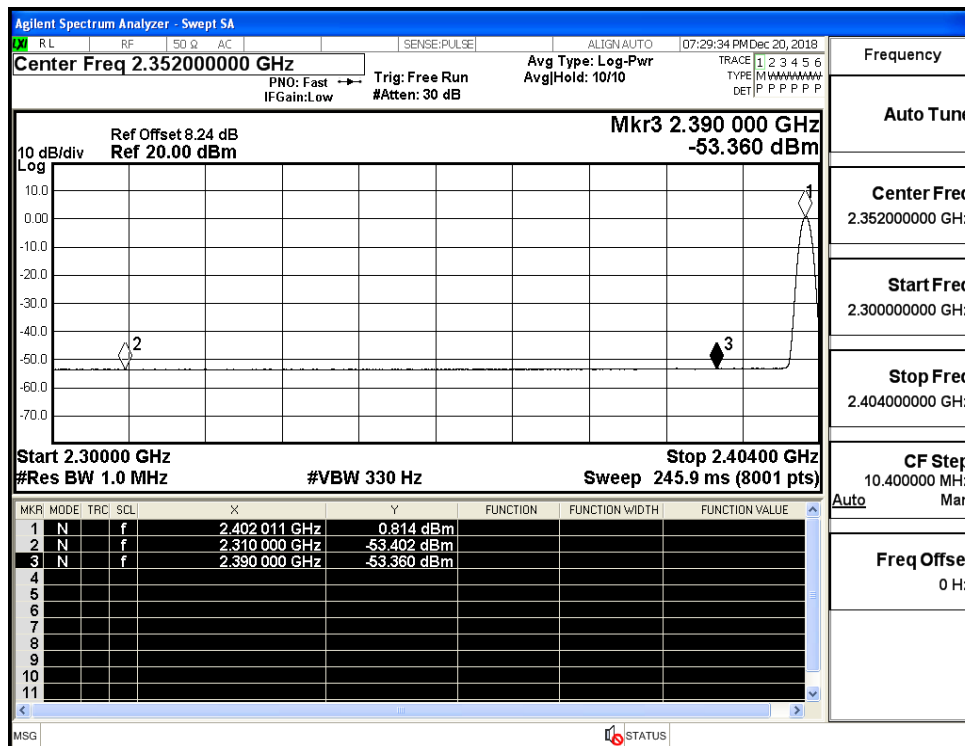
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.52	2.0	0	53.74	PEAK	74	PASS
	Off	2310.0	-53.40	2.0	0	43.86	AV	54	PASS
	Off	2390.0	-43.61	2.0	0	53.65	PEAK	74	PASS
	Off	2390.0	-53.36	2.0	0	43.9	AV	54	PASS
	Off	2483.5	-43.26	2.0	0	54.0	PEAK	74	PASS
	Off	2483.5	-53.03	2.0	0	44.23	AV	54	PASS
	Off	2500.0	-43.51	2.0	0	53.75	PEAK	74	PASS
	Off	2500.0	-52.89	2.0	0	44.37	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-41.90	2.0	0	55.36	PEAK	74	PASS
	Off	2310.0	-53.61	2.0	0	43.65	AV	54	PASS
	Off	2390.0	-42.42	2.0	0	54.84	PEAK	74	PASS
	Off	2390.0	-53.32	2.0	0	43.94	AV	54	PASS
	Off	2483.5	-41.81	2.0	0	55.45	PEAK	74	PASS
	Off	2483.5	-52.94	2.0	0	44.32	AV	54	PASS
	Off	2500.0	-42.18	2.0	0	55.08	PEAK	74	PASS
	Off	2500.0	-52.91	2.0	0	44.35	AV	54	PASS
8DPSK	Off	2310.0	-43.30	2.0	0	53.96	PEAK	74	PASS
	Off	2310.0	-53.57	2.0	0	43.69	AV	54	PASS
	Off	2390.0	-42.64	2.0	0	54.62	PEAK	74	PASS
	Off	2390.0	-53.23	2.0	0	44.03	AV	54	PASS
	Off	2483.5	-42.72	2.0	0	54.54	PEAK	74	PASS
	Off	2483.5	-52.91	2.0	0	44.35	AV	54	PASS
	Off	2500.0	-42.42	2.0	0	54.84	PEAK	74	PASS
	Off	2500.0	-52.90	2.0	0	44.36	AV	54	PASS

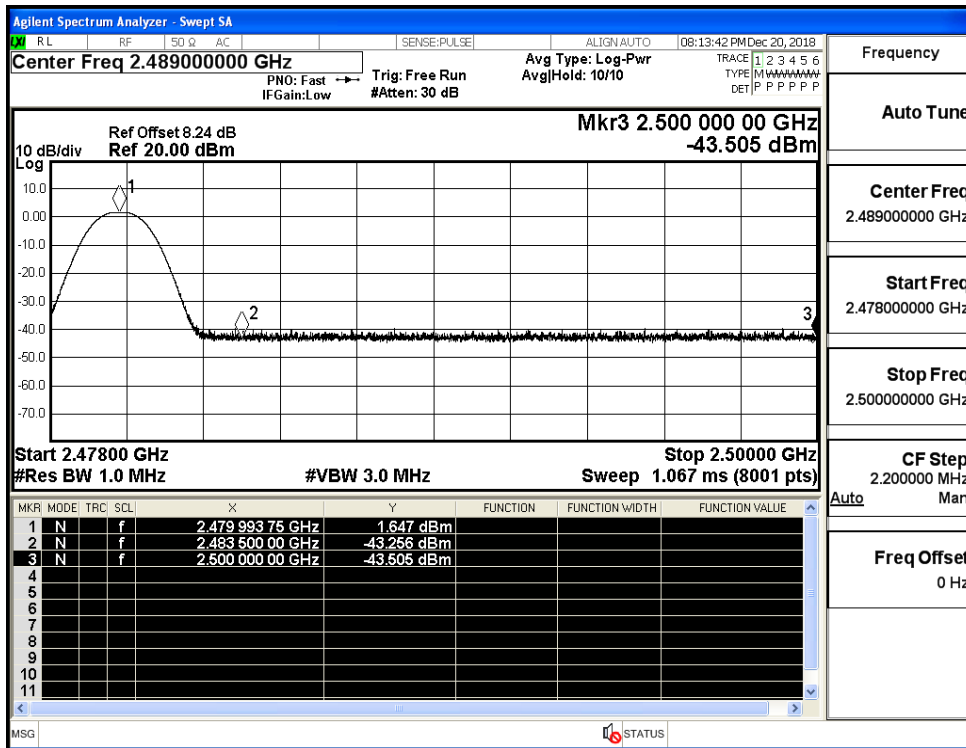
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



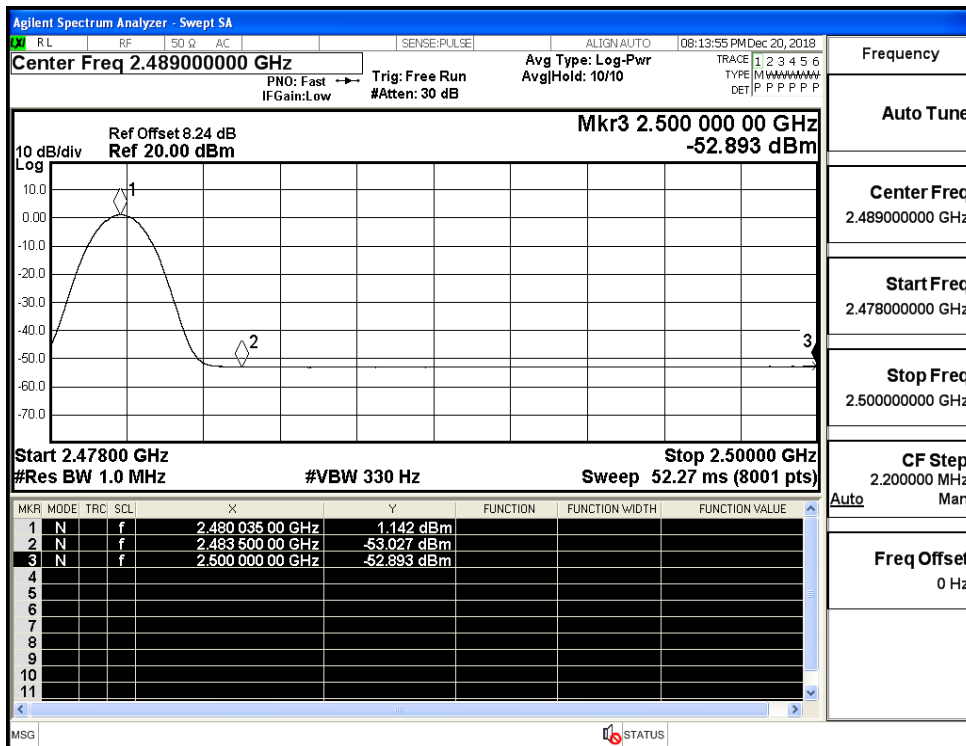
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



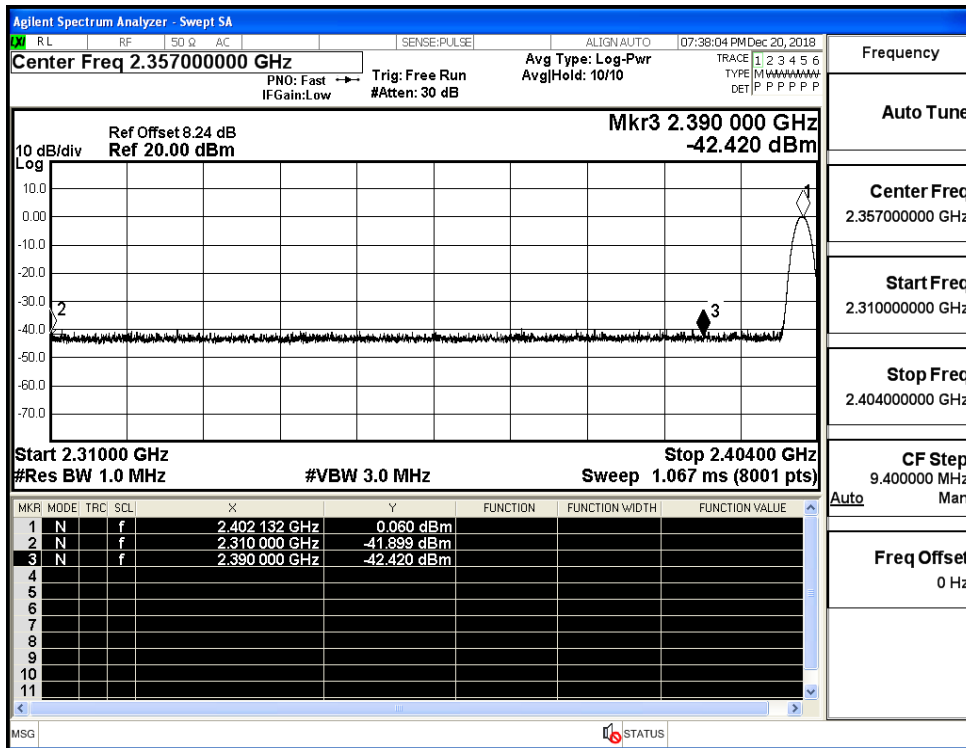
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



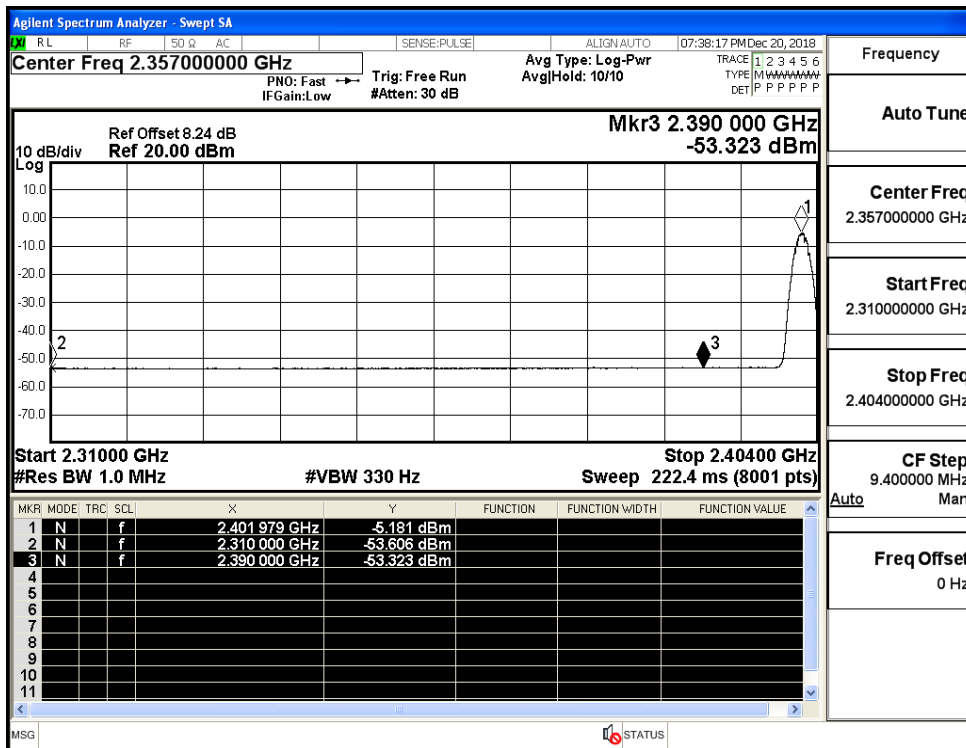
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



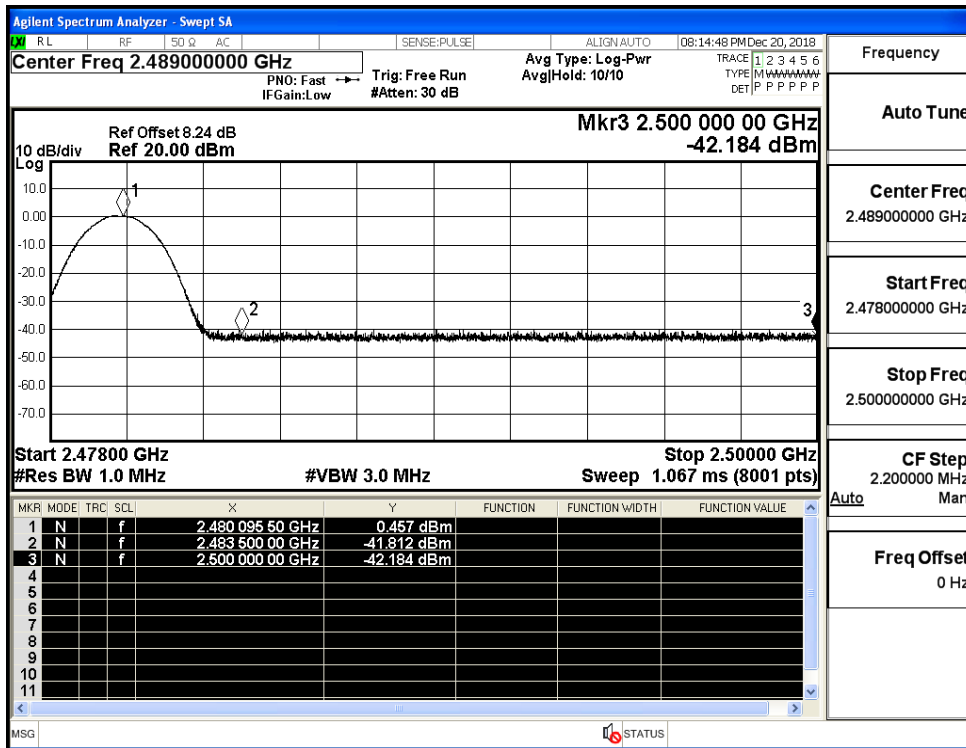
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



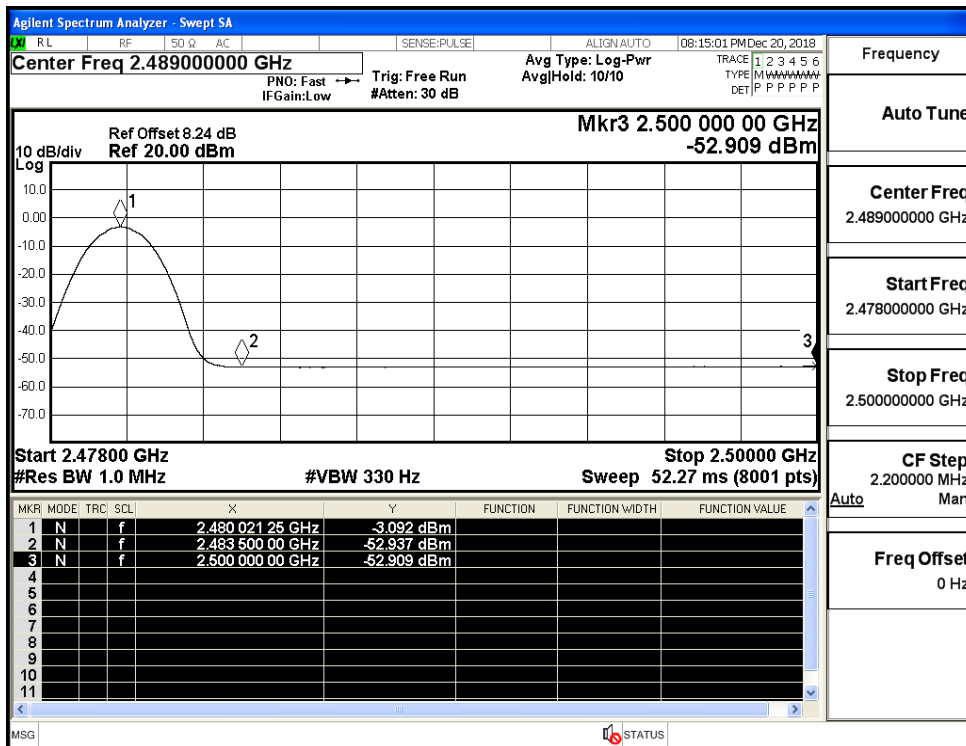
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



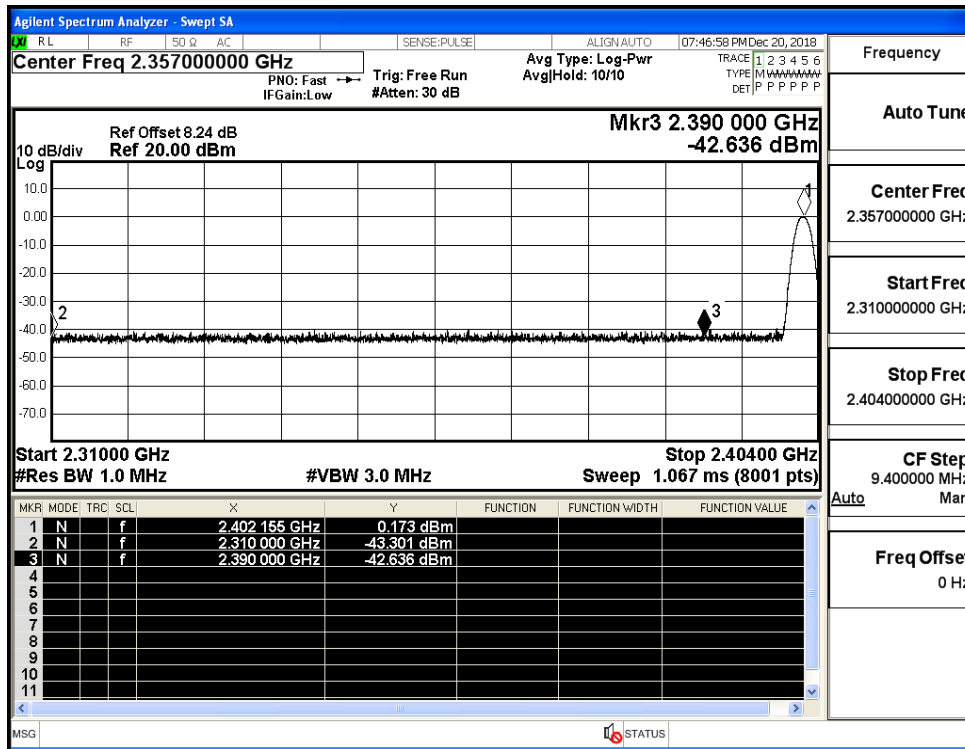
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)



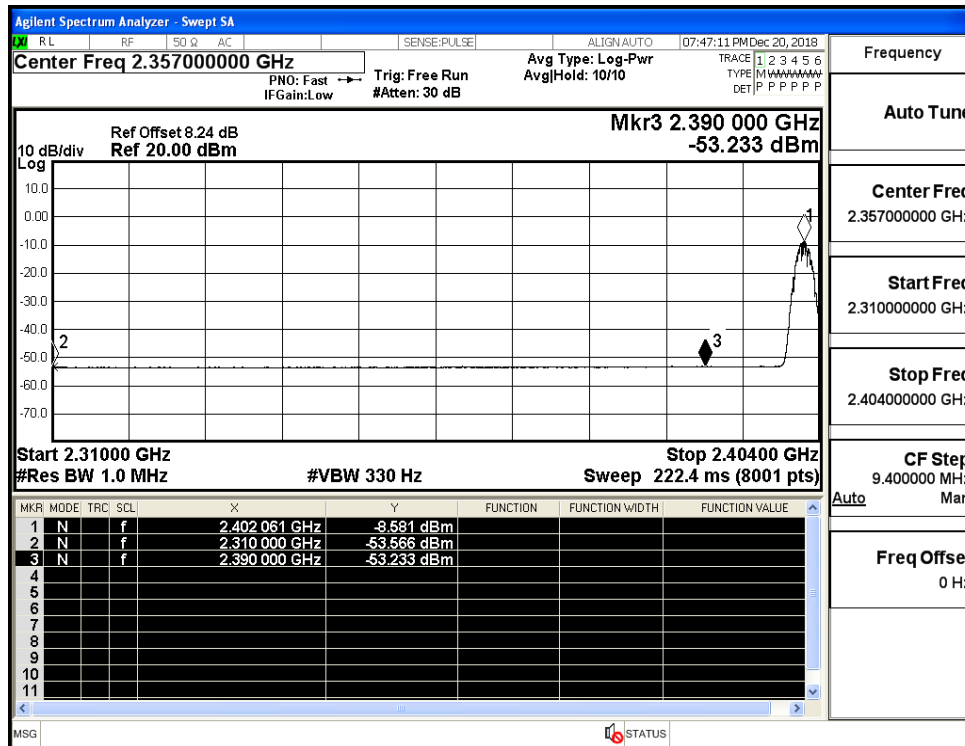
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)



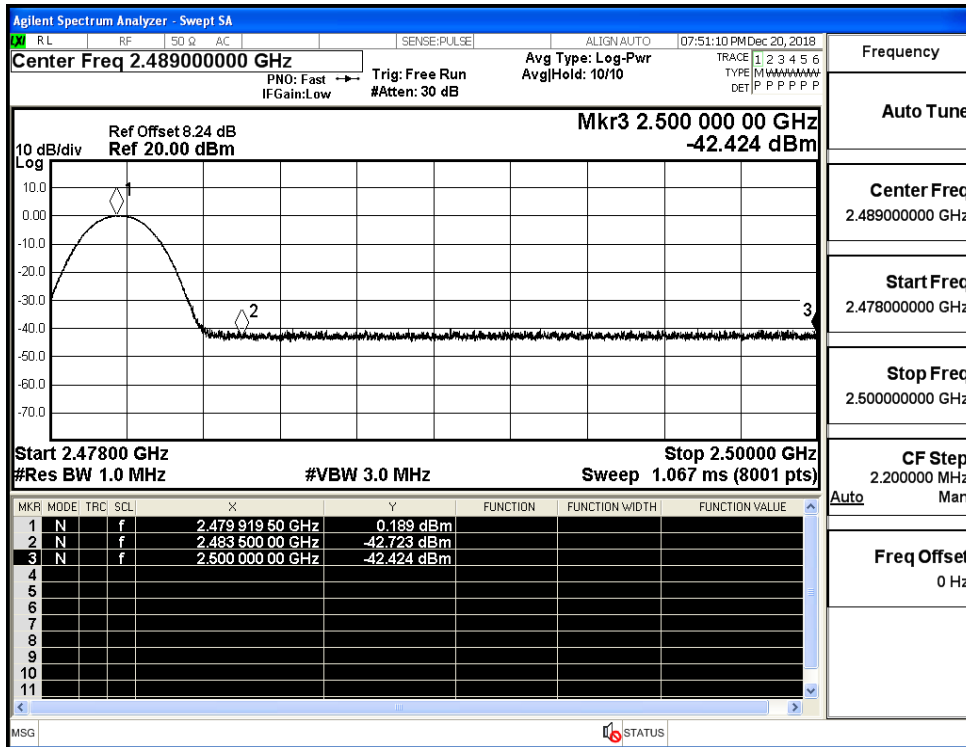
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

