

Appendix A

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

Product Name: Lapbook

Trade Mark: Fusion5

Test Model: T90B+ Pro

Environmental Conditions

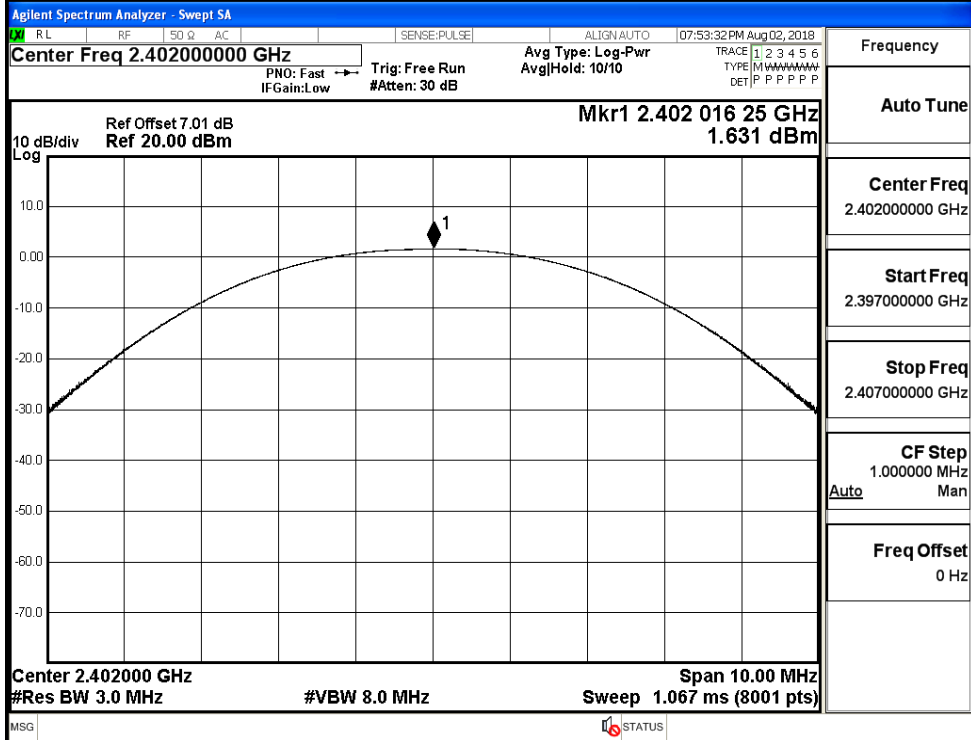
Temperature:	24.6 ° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Tom.Liu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

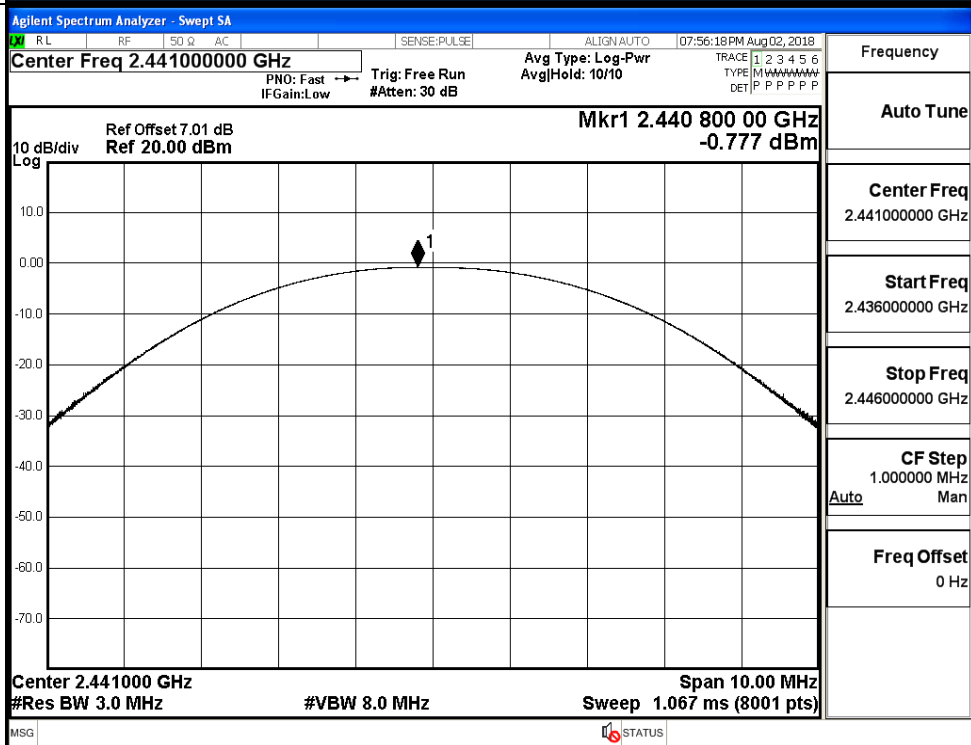
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.631	21	PASS
	MCH	-0.777	21	PASS
	HCH	-0.182	21	PASS
$\pi/4$ DQPSK	LCH	0.572	21	PASS
	MCH	-1.245	21	PASS
	HCH	-0.858	21	PASS
8DPSK	LCH	0.674	21	PASS
	MCH	-1.166	21	PASS
	HCH	-0.848	21	PASS

Test Graphs

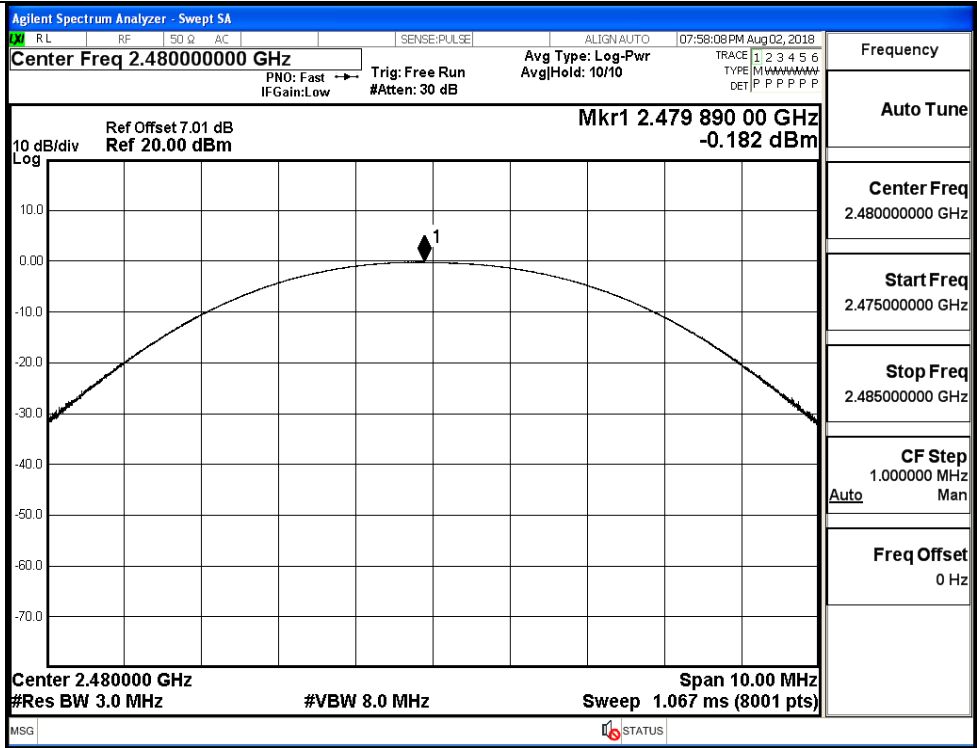
GFSK/LCH



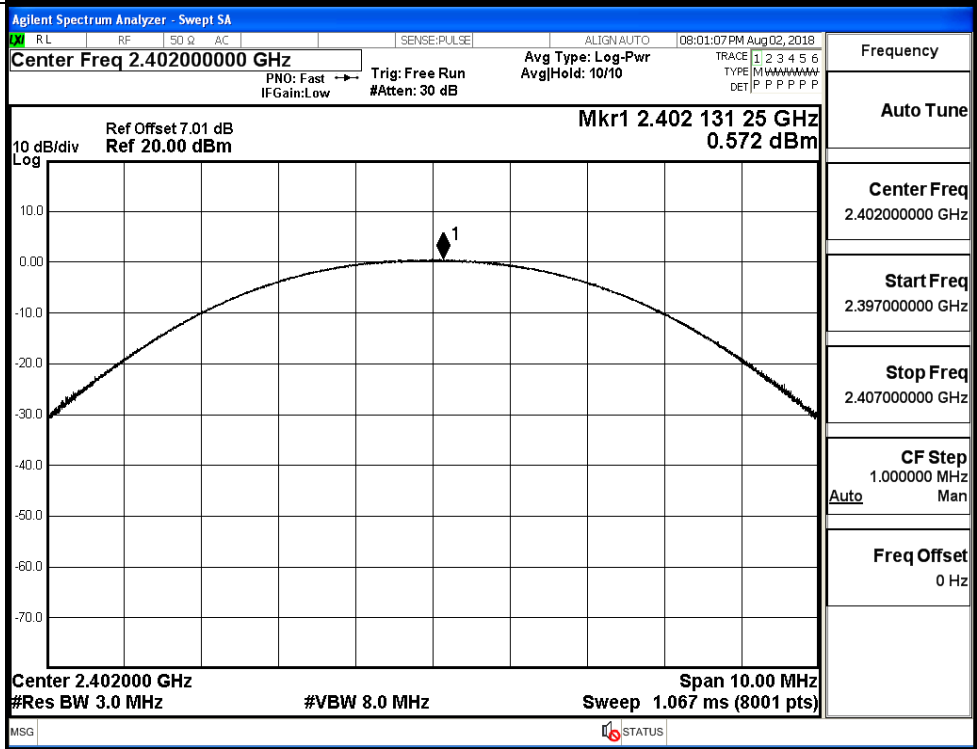
GFSK/MCH



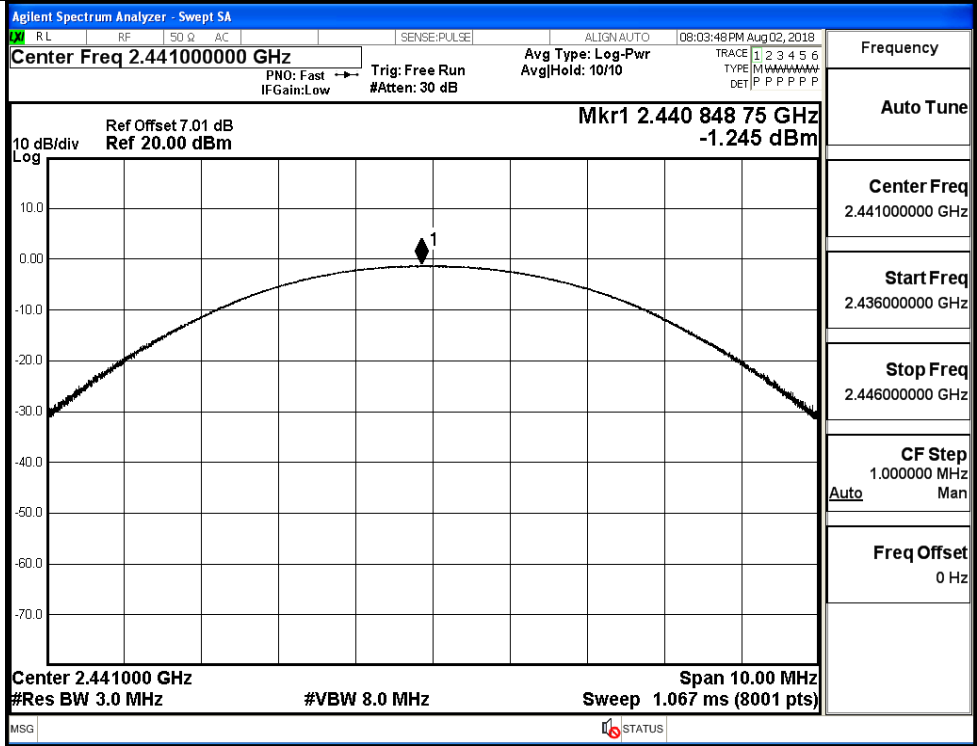
GFSK/HCH



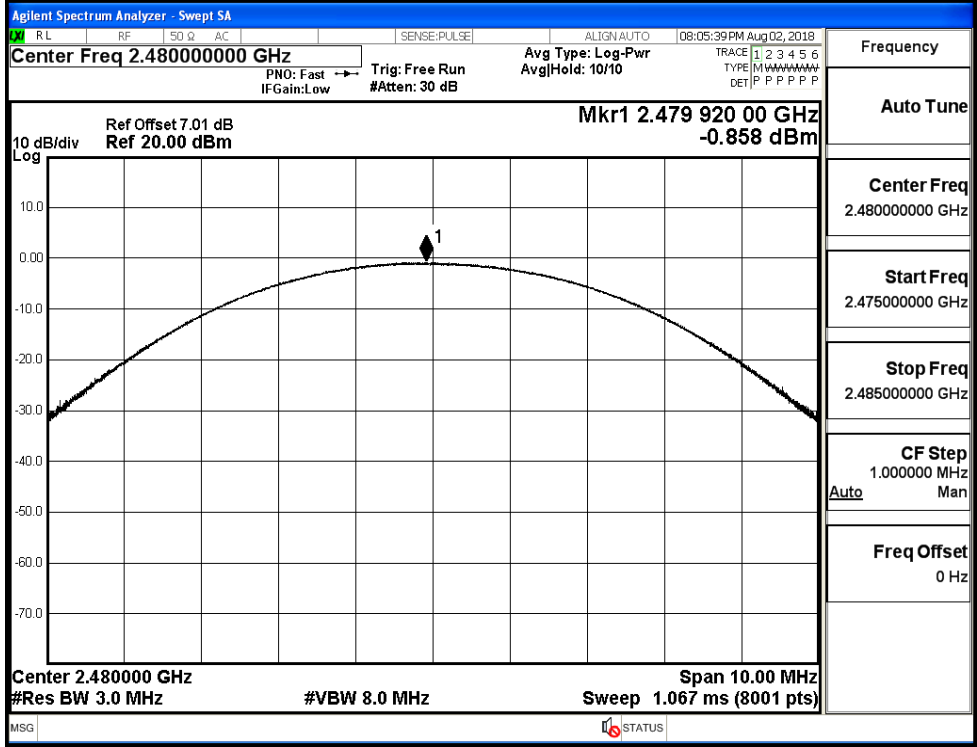
π /4DQPSK/LCH



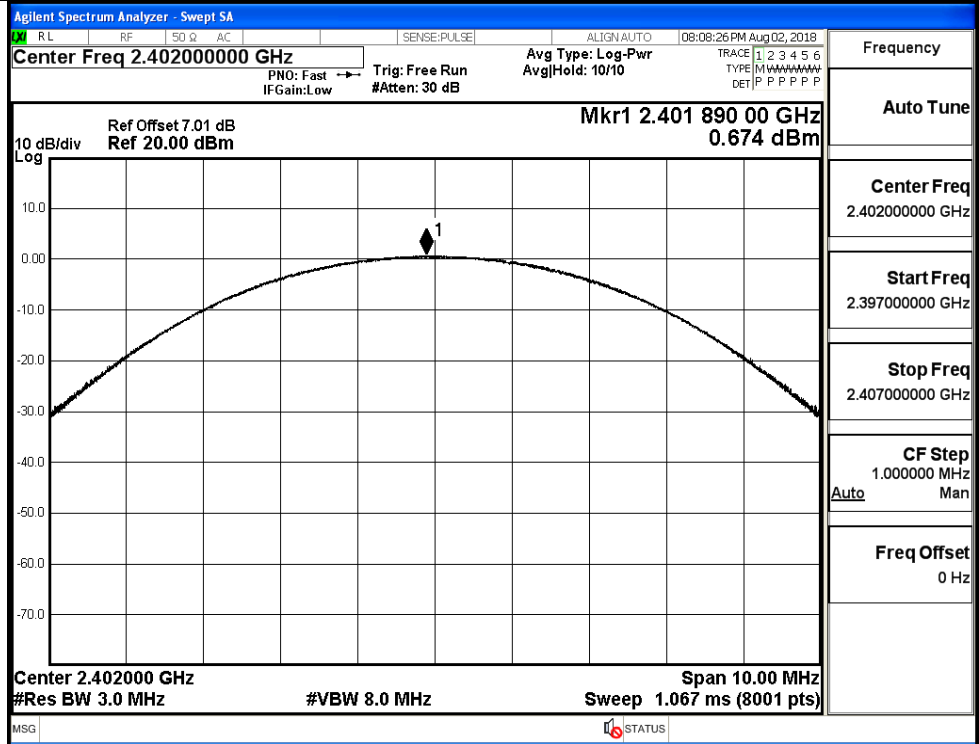
π /4DQPSK/MCH



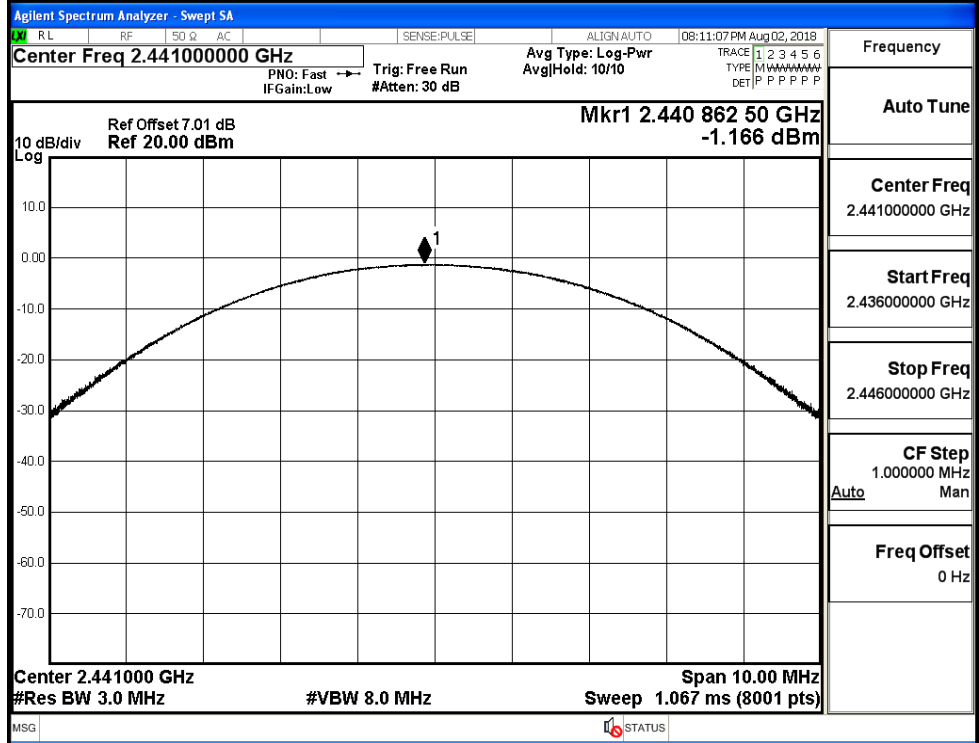
π /4DQPSK/HCH



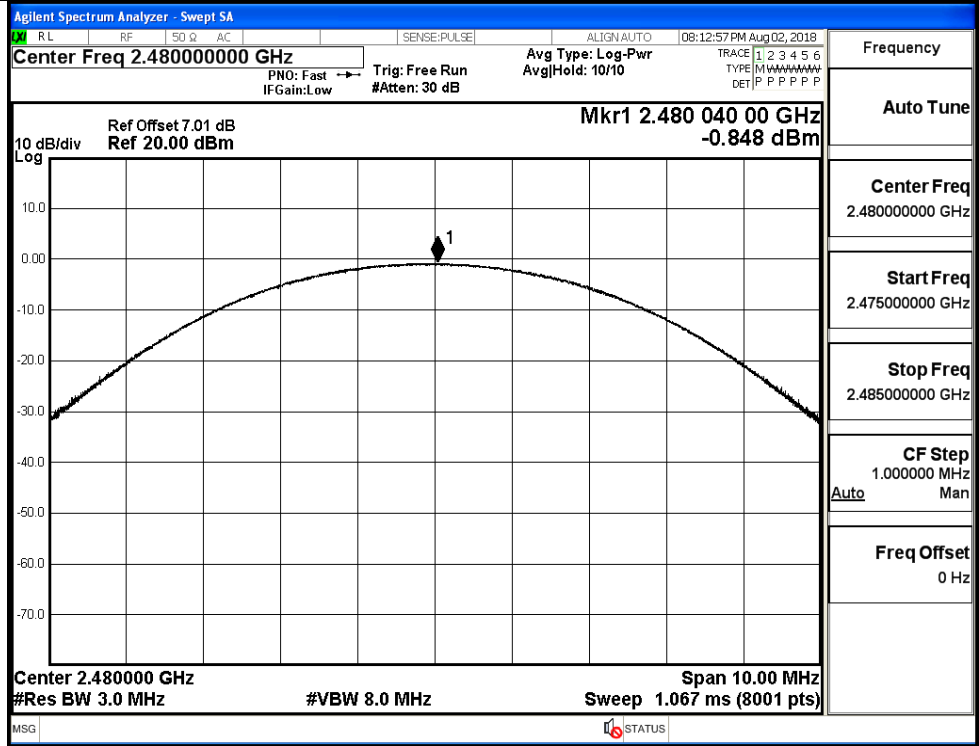
8DPSK/LCH



8DPSK/MCH

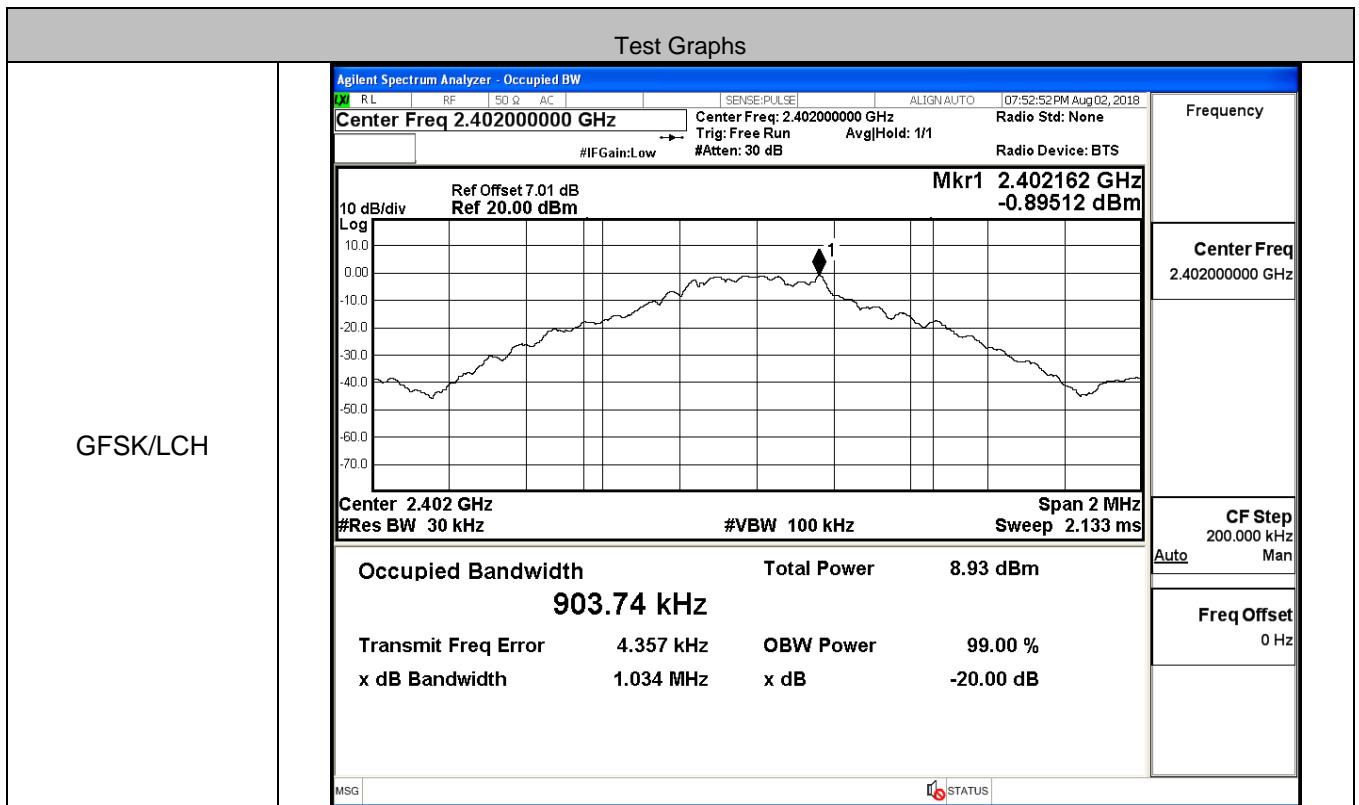


8DPSK/HCH

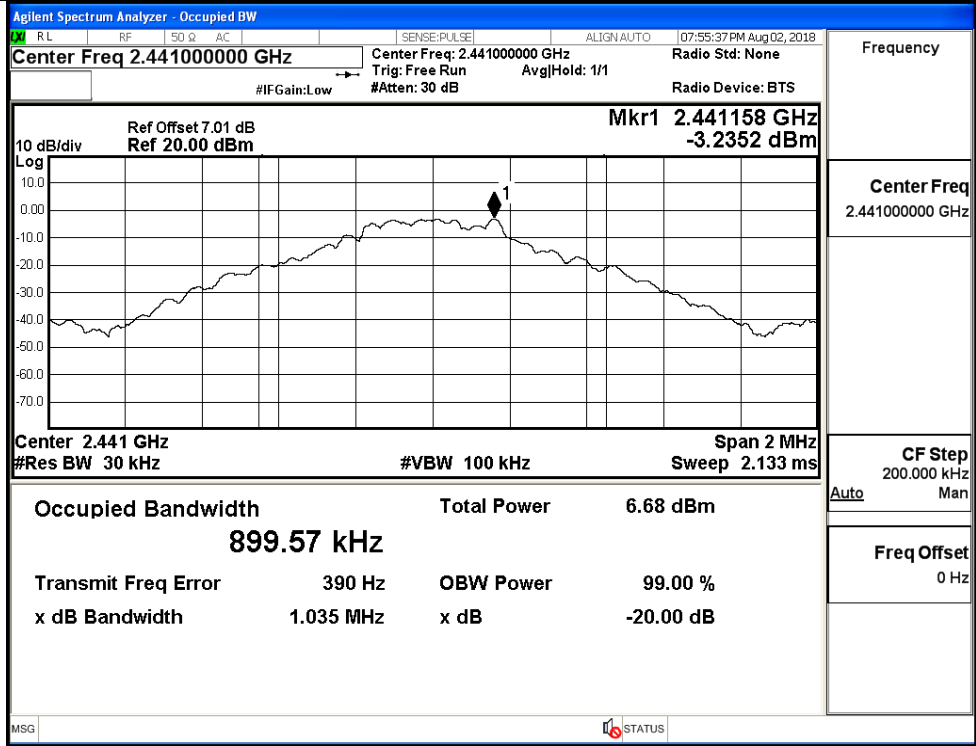


A.2 99% and 20dB Bandwidth

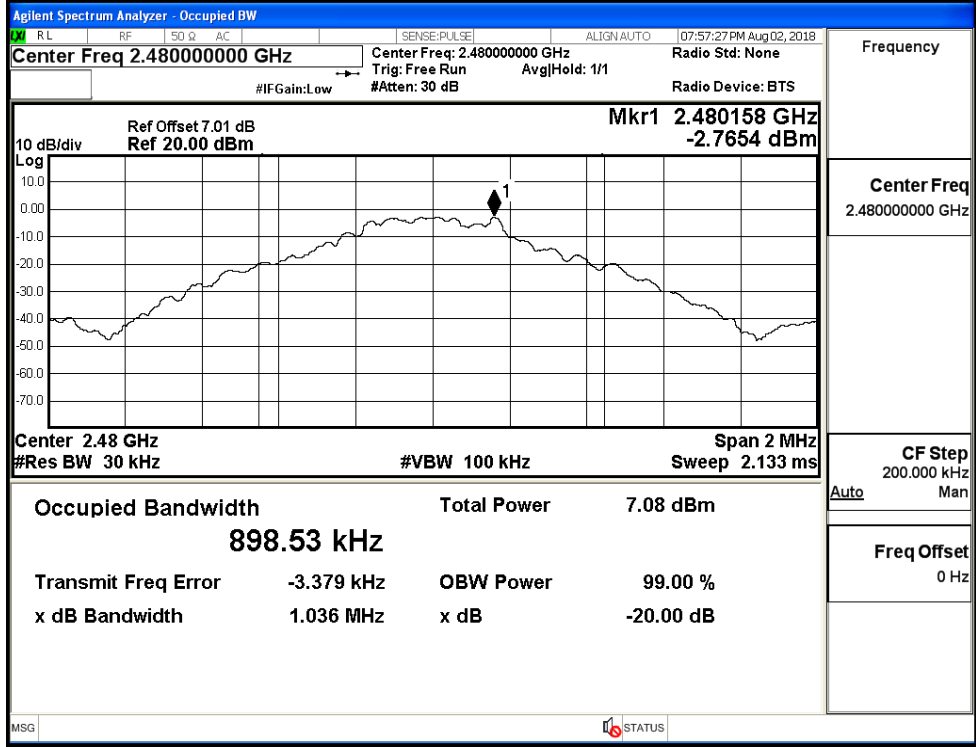
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.90374	1.034	Not Specified	PASS
	MCH	0.89957	1.035	Not Specified	PASS
	HCH	0.89853	1.036	Not Specified	PASS
π/4DQPSK	LCH	1.1710	1.289	Not Specified	PASS
	MCH	1.1844	1.316	Not Specified	PASS
	HCH	1.1717	1.289	Not Specified	PASS
8DPSK	LCH	1.1769	1.284	Not Specified	PASS
	MCH	1.1939	1.300	Not Specified	PASS
	HCH	1.1719	1.293	Not Specified	PASS



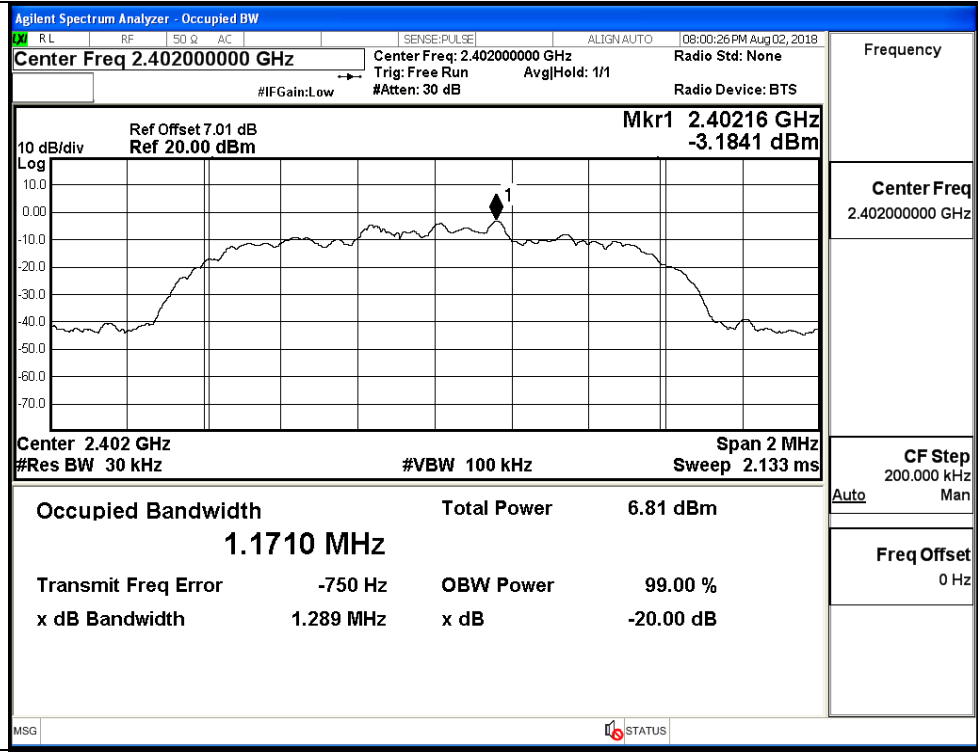
GFSK/MCH



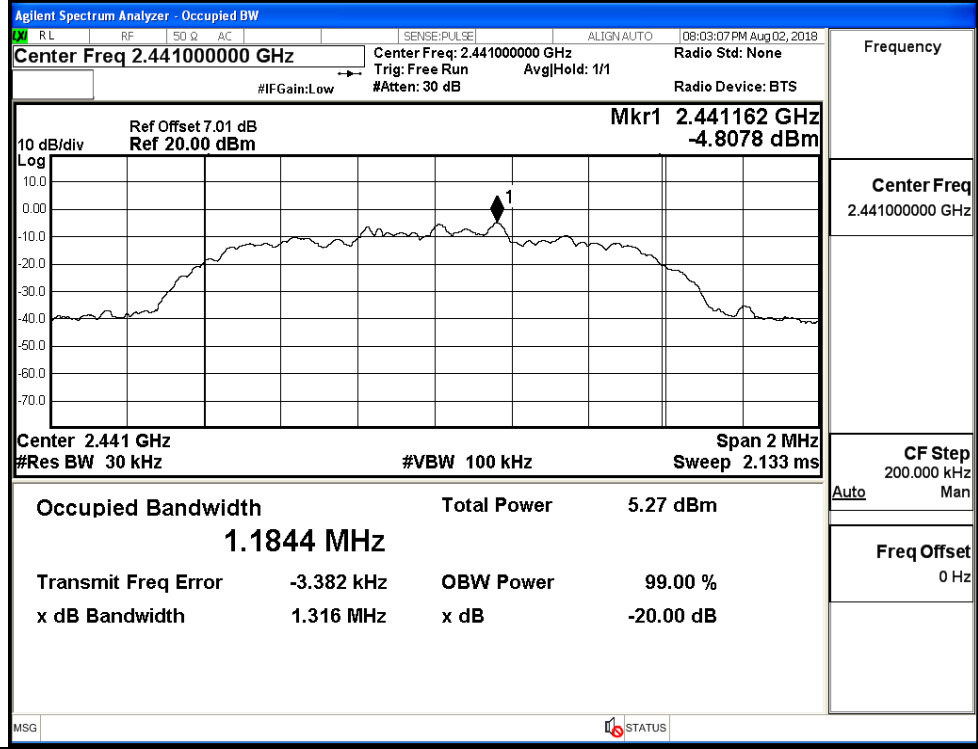
GFSK/HCH



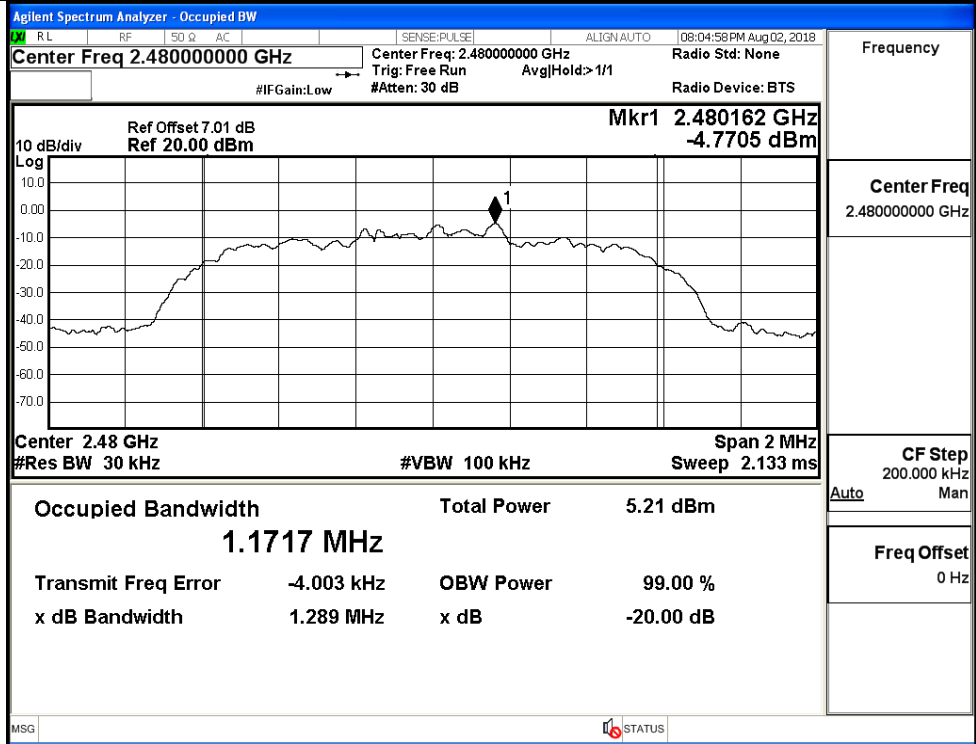
$\pi/4$ DQPSK/LCH



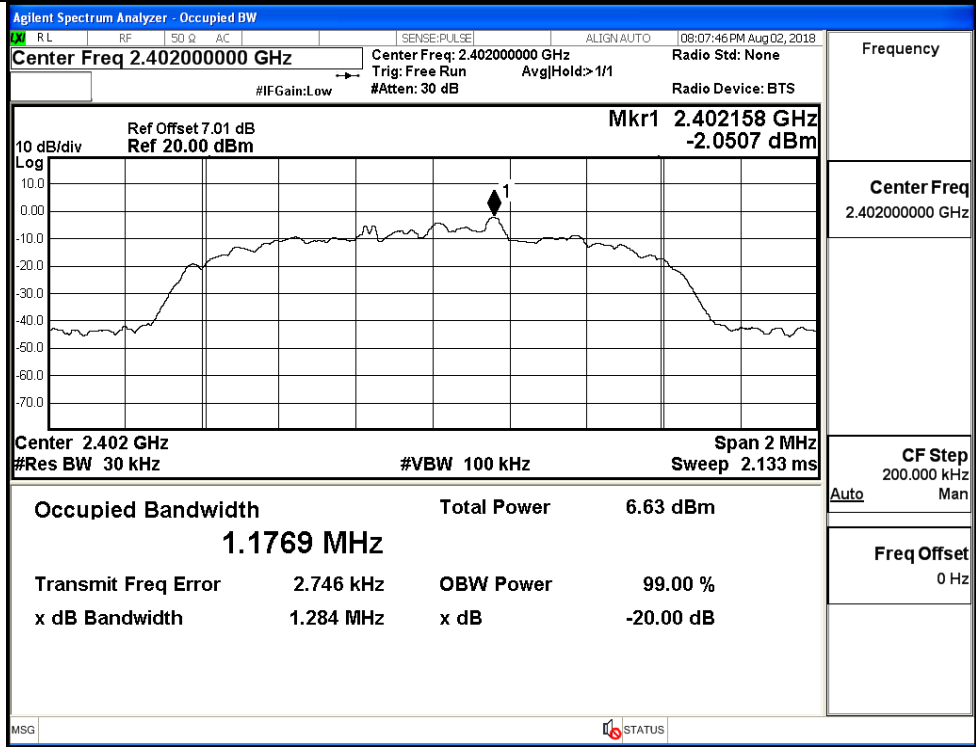
$\pi/4$ DQPSK/MCH



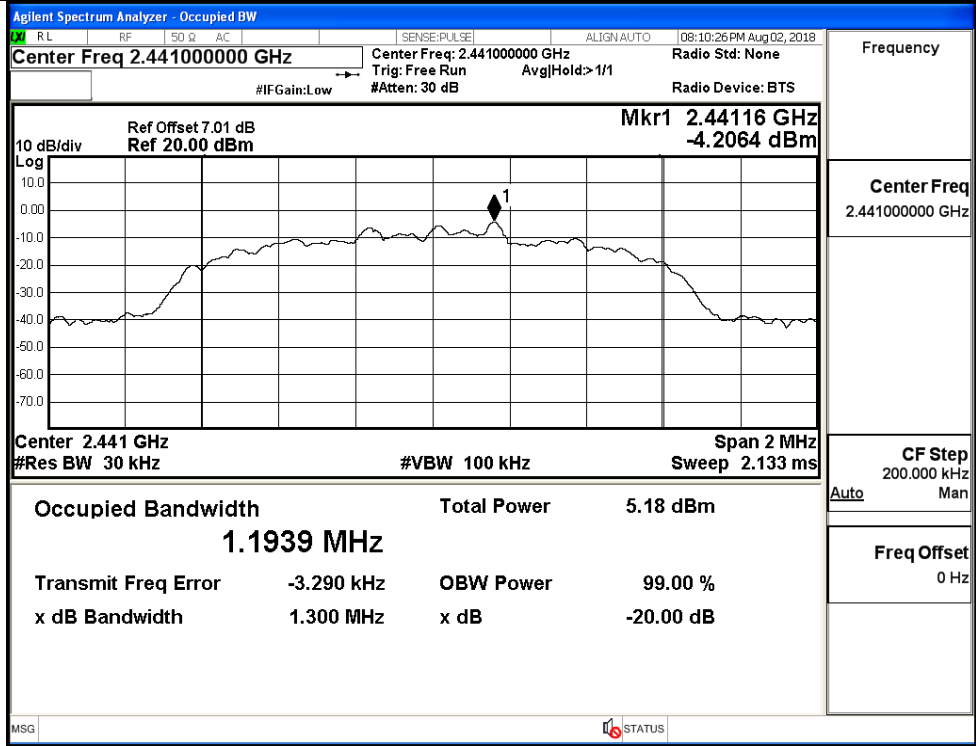
$\pi/4$ DQPSK/HCH



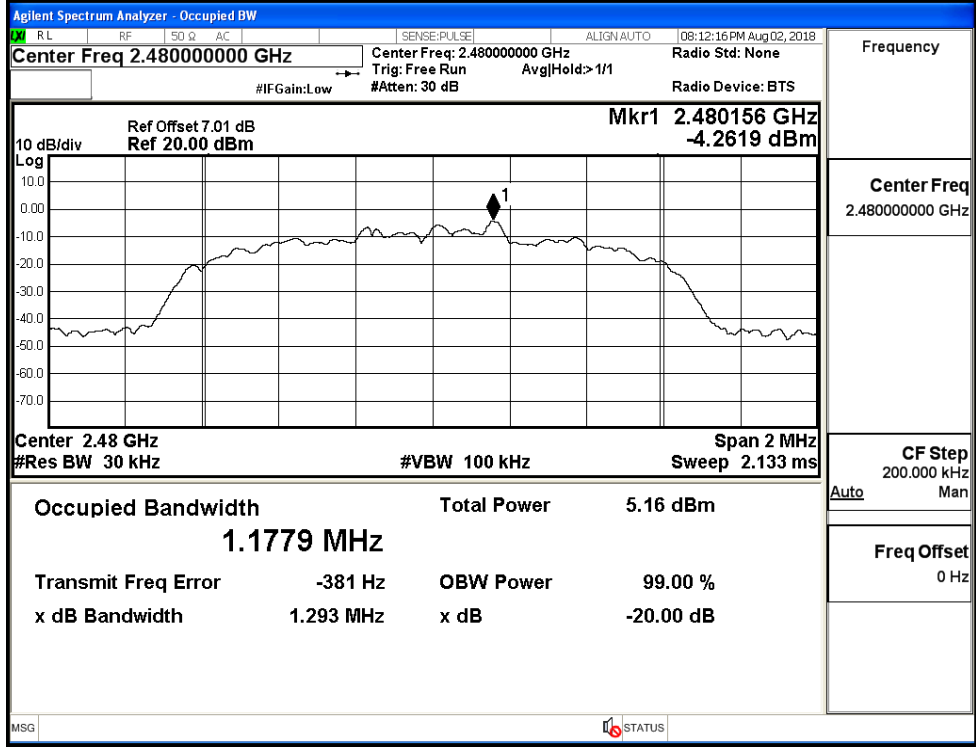
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



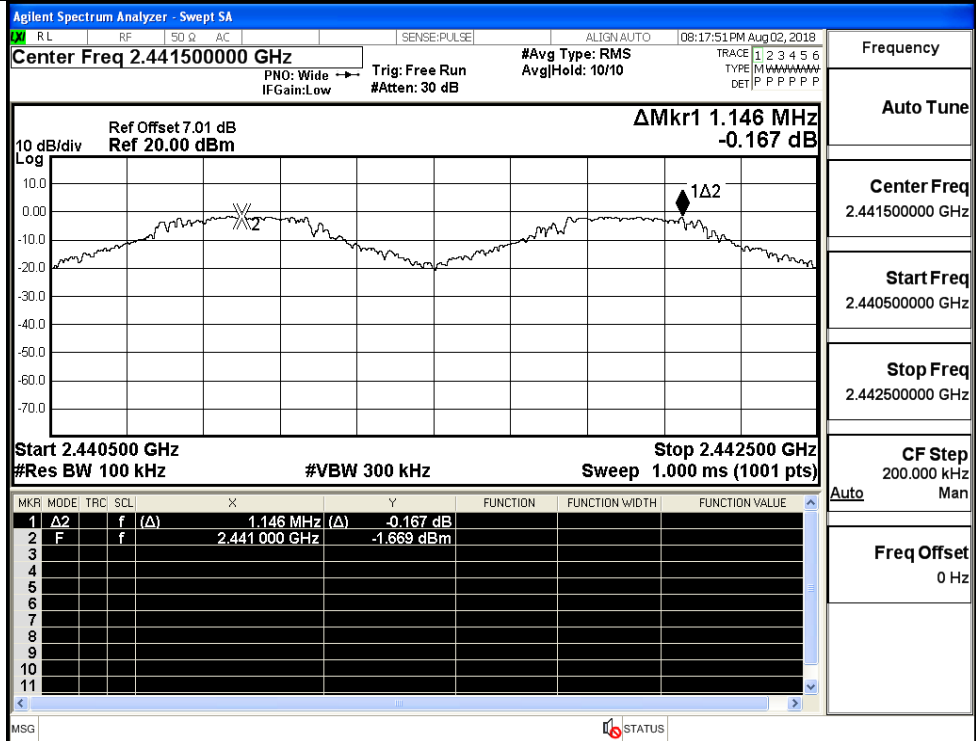
A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.825	0.691	PASS
	MCH	1.146	0.691	PASS
	HCH	0.990	0.691	PASS
π/4DQPSK	LCH	0.948	0.877	PASS
	MCH	0.944	0.877	PASS
	HCH	1.076	0.877	PASS
8DPSK	LCH	1.272	0.867	PASS
	MCH	1.192	0.867	PASS
	HCH	0.978	0.867	PASS

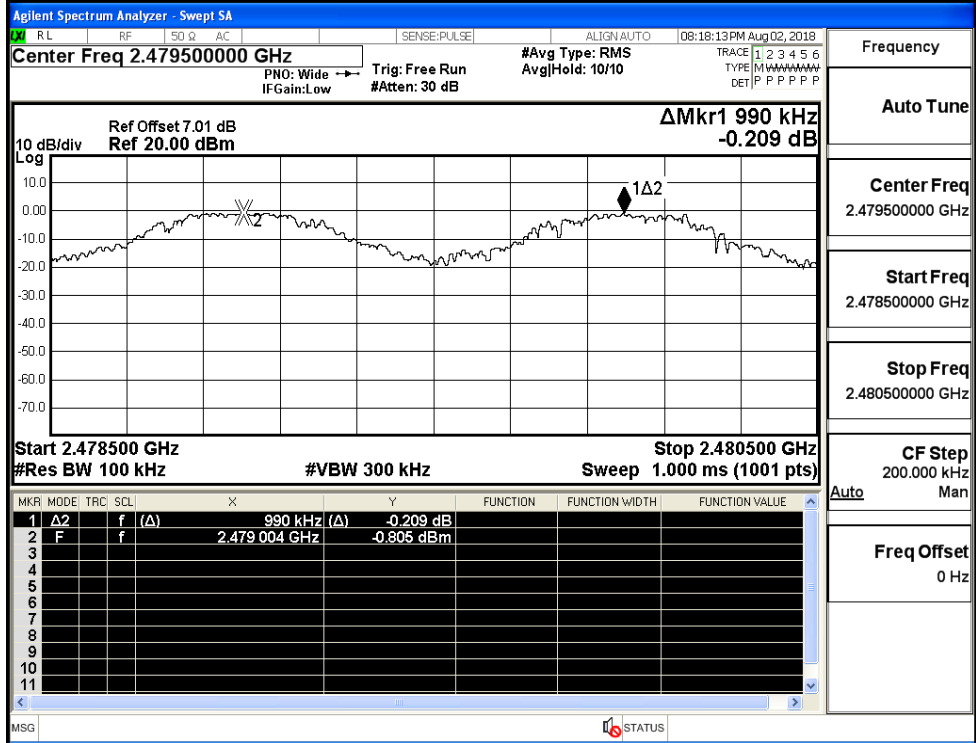
Test Graphs

GFSK/LCH		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.402500000 GHz</p> <p>Start Freq 2.401500000 GHz</p> <p>Stop Freq 2.403500000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Auto Man</p> <p>Freq Offset 0 Hz</p>
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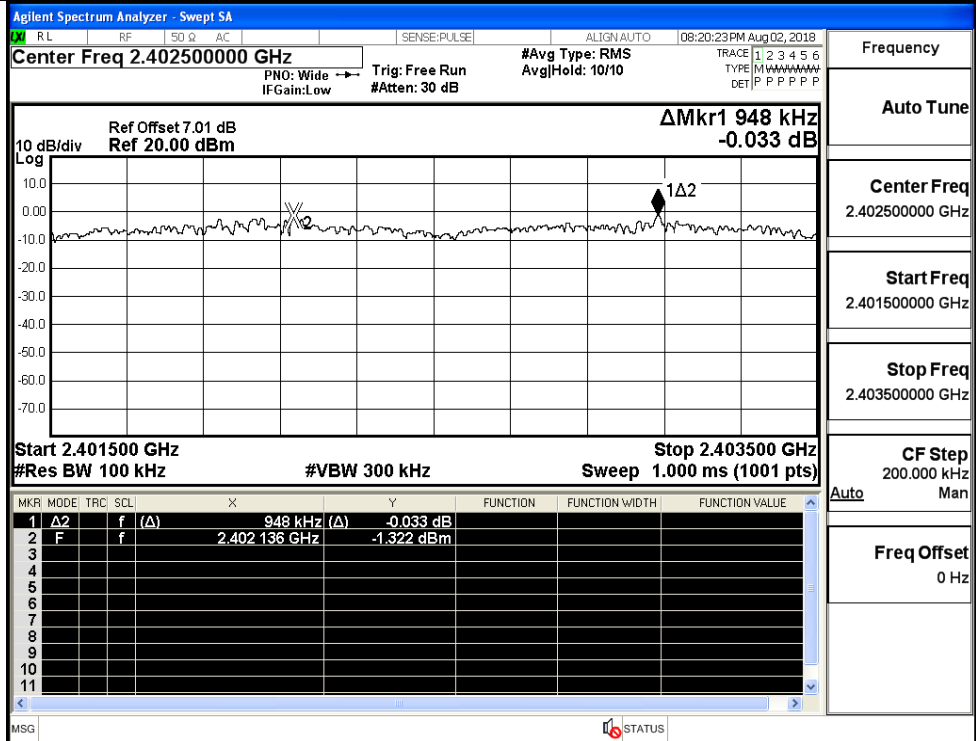
GFSK/MCH



GFSK/HCH



$\pi/4$ DQPSK/LCH



Frequency

Auto Tune

Center Freq
2.402500000 GHz

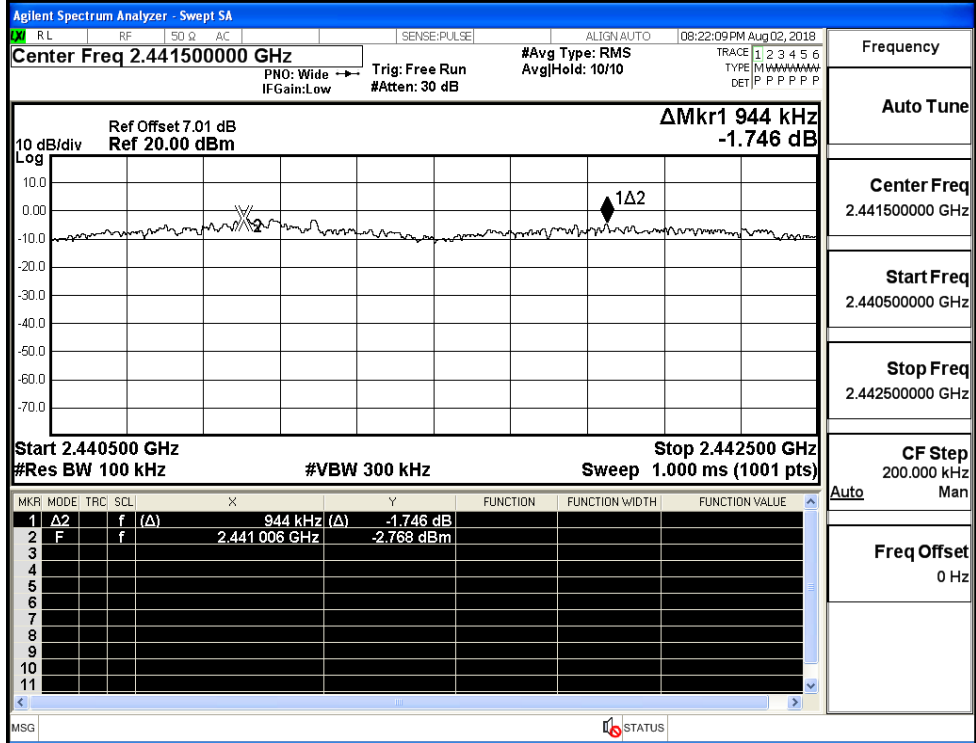
Start Freq
2.401500000 GHz

Stop Freq
2.403500000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

$\pi/4$ DQPSK/MCH



Frequency

Auto Tune

Center Freq
2.441500000 GHz

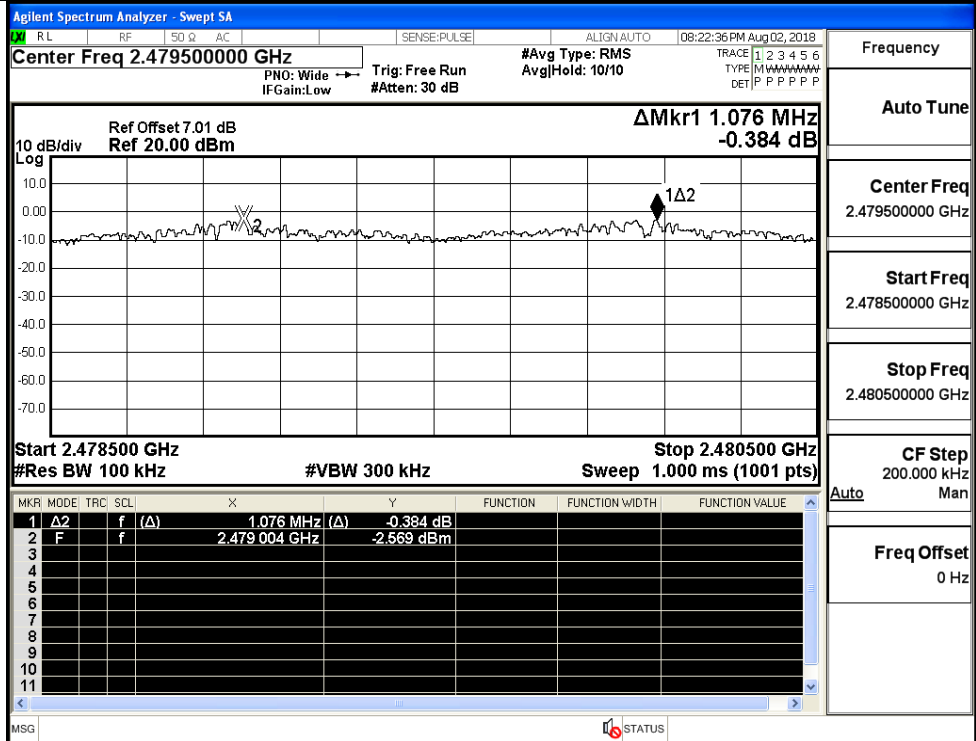
Start Freq
2.440500000 GHz

Stop Freq
2.442500000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

π/4DQPSK/HCH



Frequency

Auto Tune

Center Freq
2.479500000 GHz

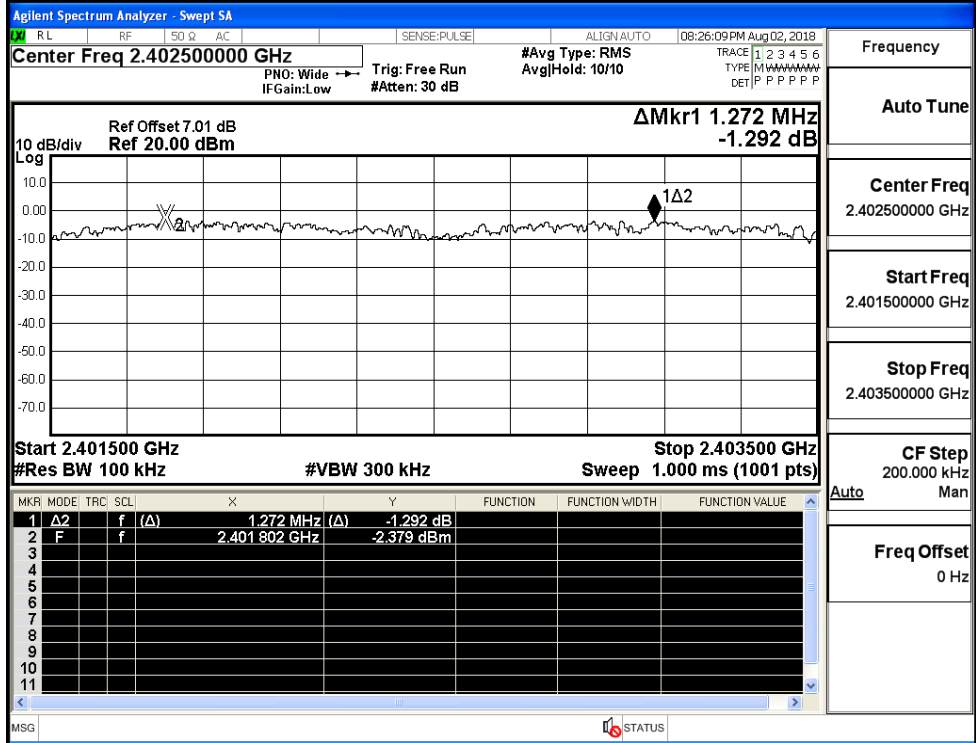
Start Freq
2.478500000 GHz

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

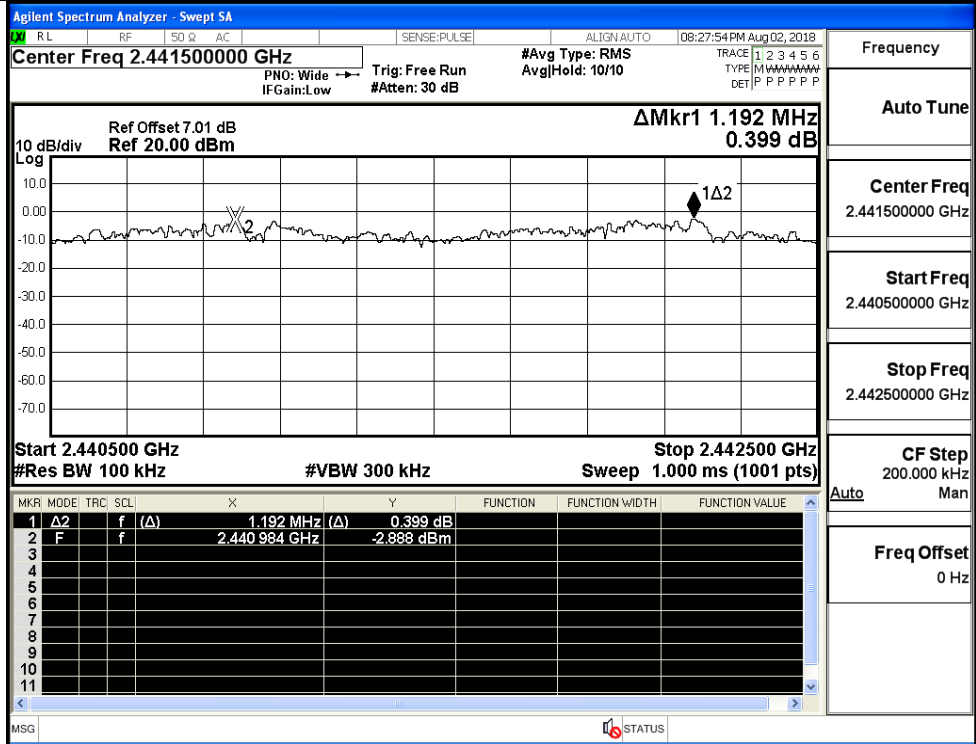
Start Freq
2.401500000 GHz

Stop Freq
2.403500000 GHz

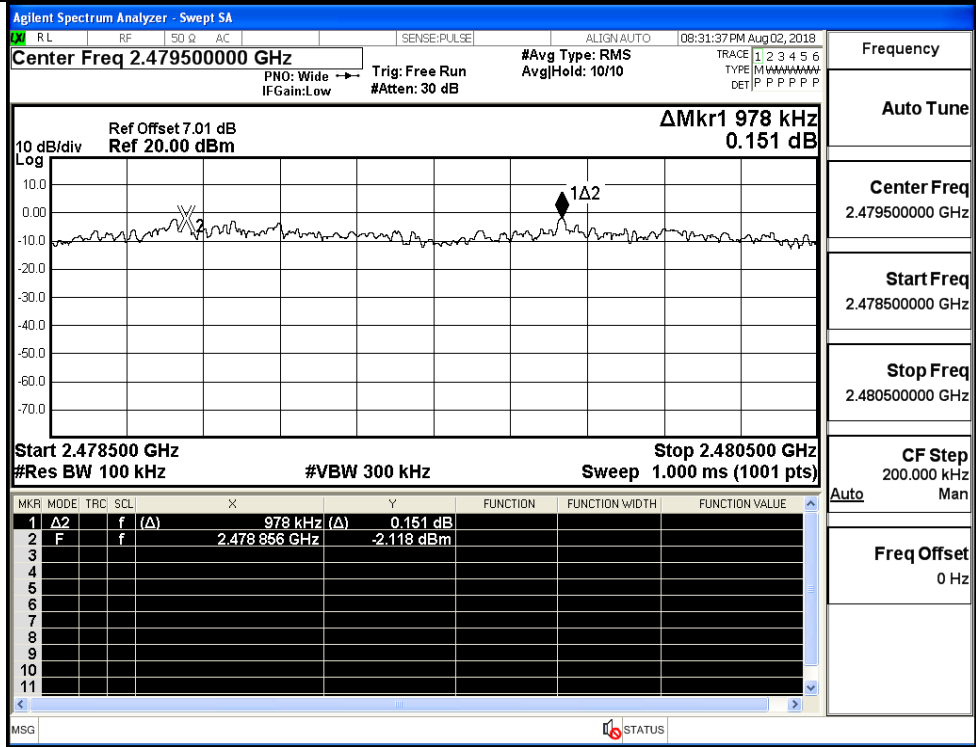
CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

8DPSK/MCH



8DPSK/HCH



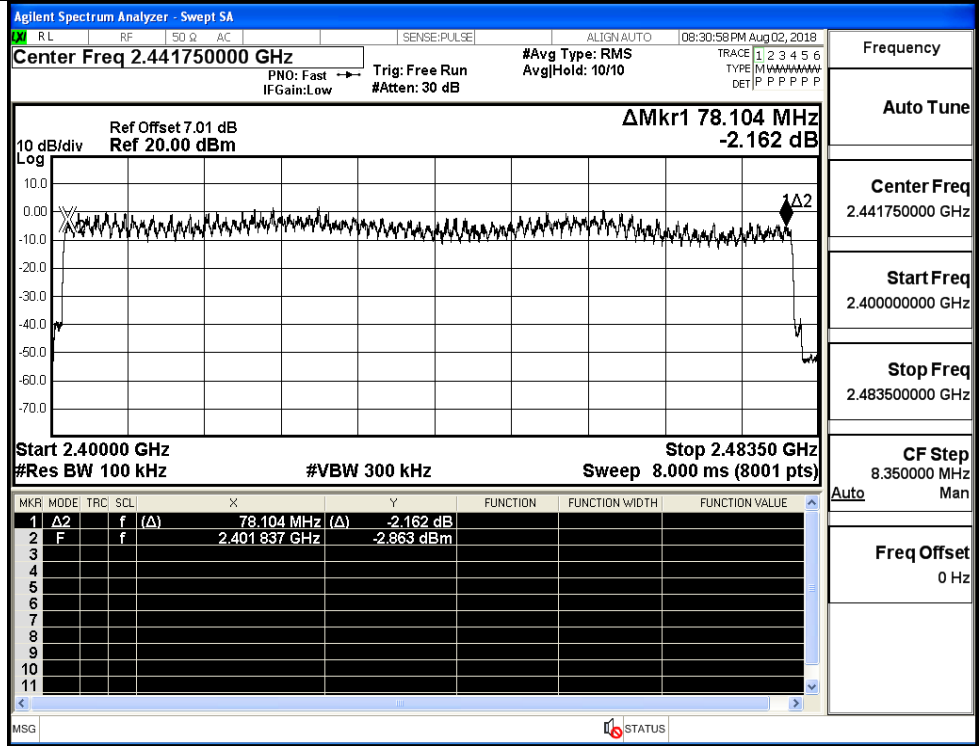
A.4 Hopping Channel Number

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

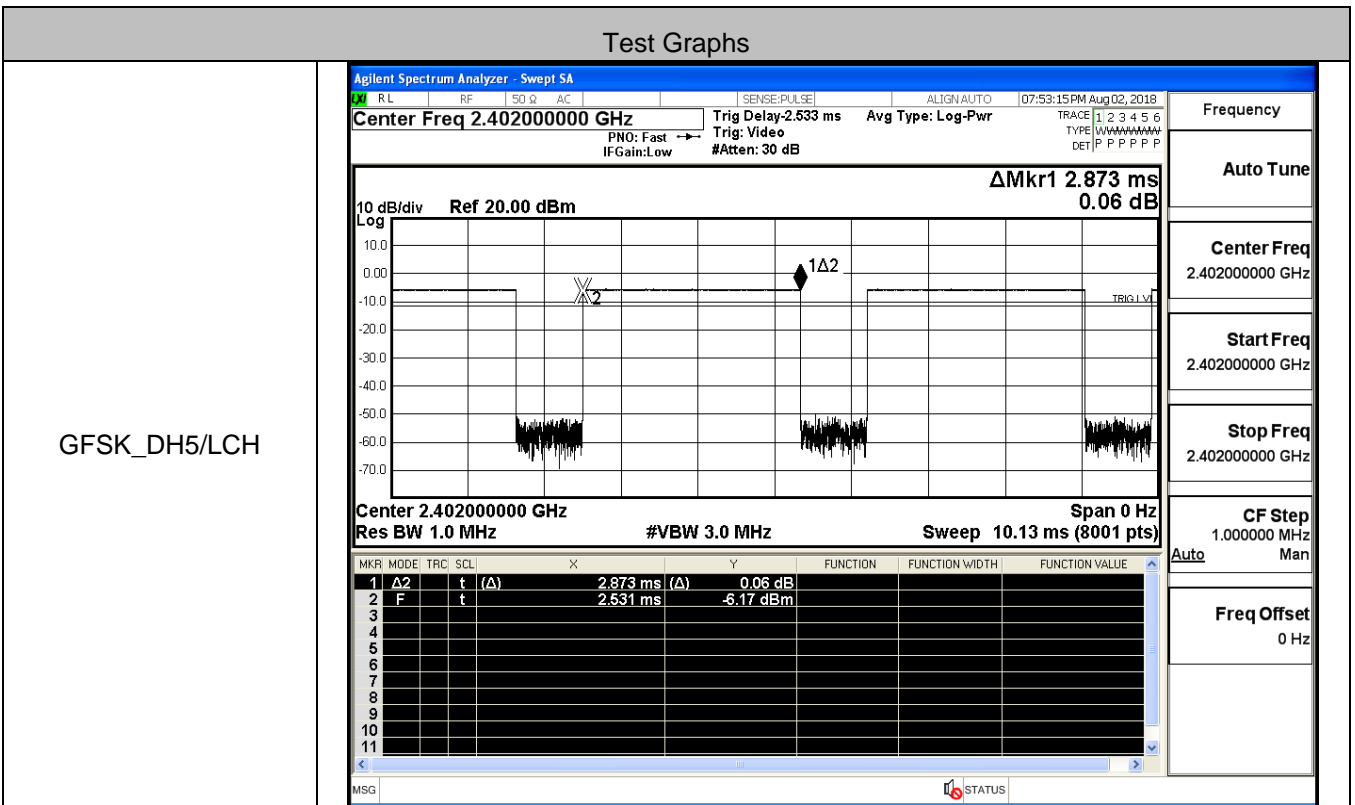
GFSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.441750000 GHz Ref Offset 7.01 dB Ref 20.00 dBm ΔMkr1 77.958 MHz -1.652 dB Start 2.40000 GHz Stop 2.48350 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <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>-1.652 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402004 GHz</td> <td>0.683 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	77.958 MHz (Δ)	-1.652 dB				2	F	f		2.402004 GHz	0.683 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ2	f	(Δ)	77.958 MHz (Δ)	-1.652 dB																							
2	F	f		2.402004 GHz	0.683 dBm																							
$\pi/4$ DQPSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.441750000 GHz Ref Offset 7.01 dB Ref 20.00 dBm ΔMkr1 77.791 MHz -0.804 dB Start 2.40000 GHz Stop 2.48350 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <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>77.791 MHz (Δ)</td> <td>-0.804 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402046 GHz</td> <td>-1.335 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	77.791 MHz (Δ)	-0.804 dB				2	F	f		2.402046 GHz	-1.335 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ2	f	(Δ)	77.791 MHz (Δ)	-0.804 dB																							
2	F	f		2.402046 GHz	-1.335 dBm																							

8DPSK/Hop

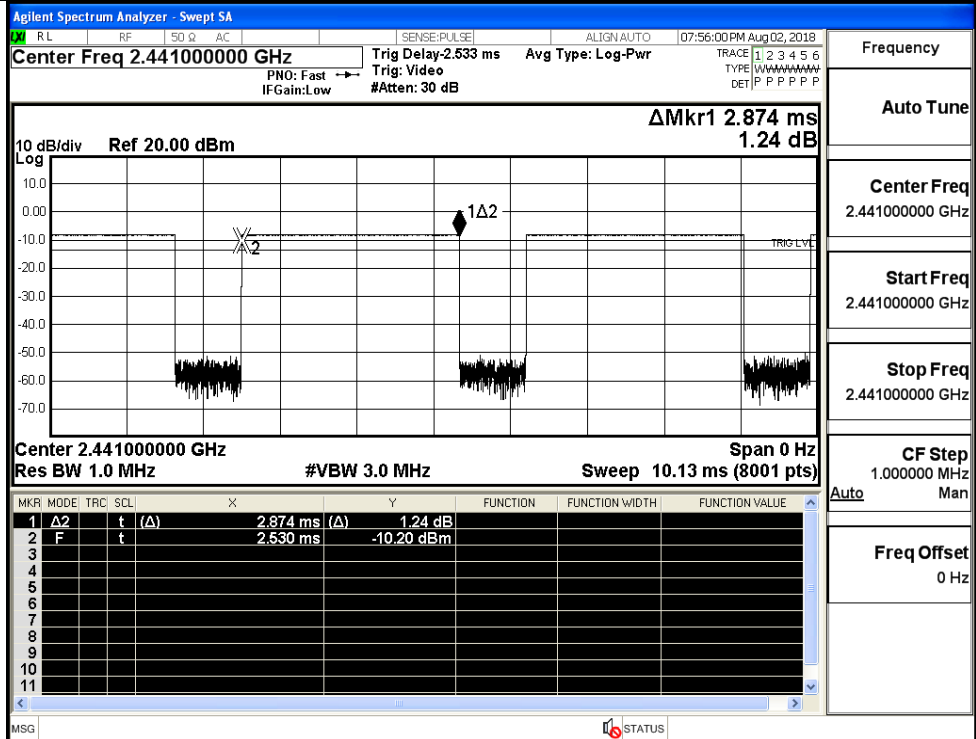


A.5 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	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	2.88	106.7	0.307	0.4	PASS
	3DH5	MCH	2.88	106.7	0.307	0.4	PASS
	3DH5	HCH	2.88	106.7	0.307	0.4	PASS



GFSK_DH5/MCH



Frequency

Auto Tune

Center Freq 2.441000000 GHz

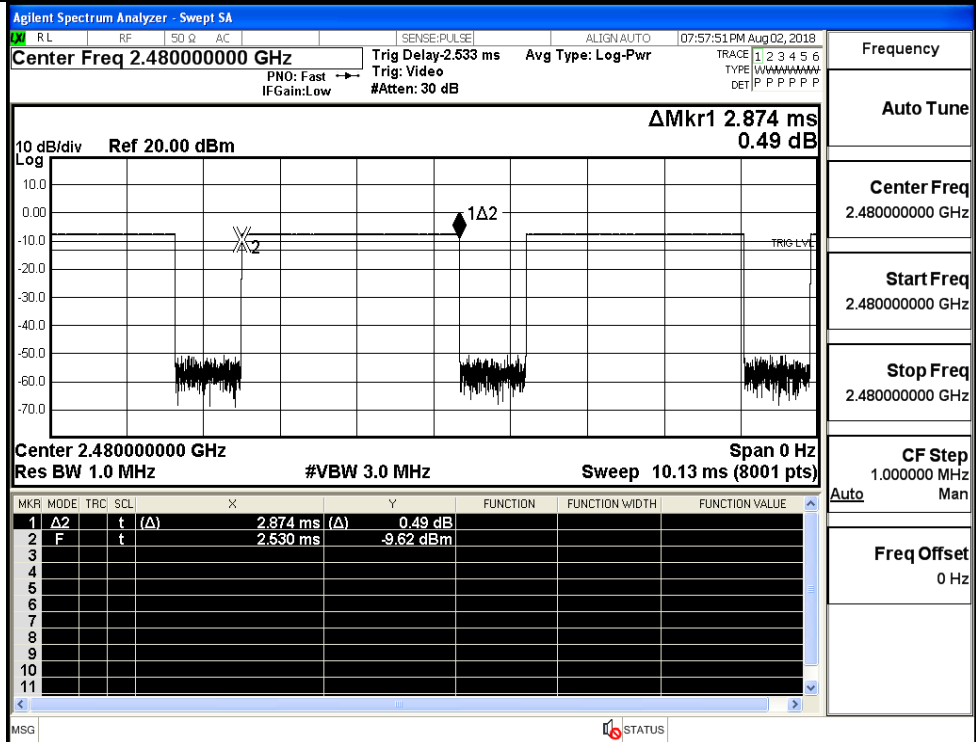
Start Freq 2.441000000 GHz

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

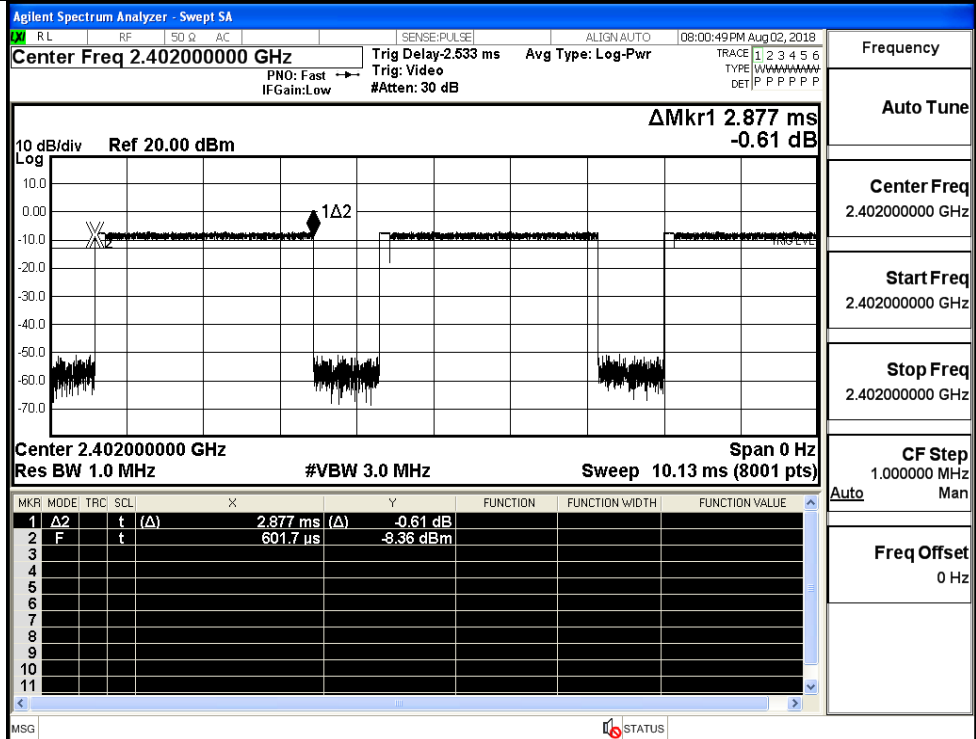
Start Freq 2.480000000 GHz

Stop Freq 2.480000000 GHz

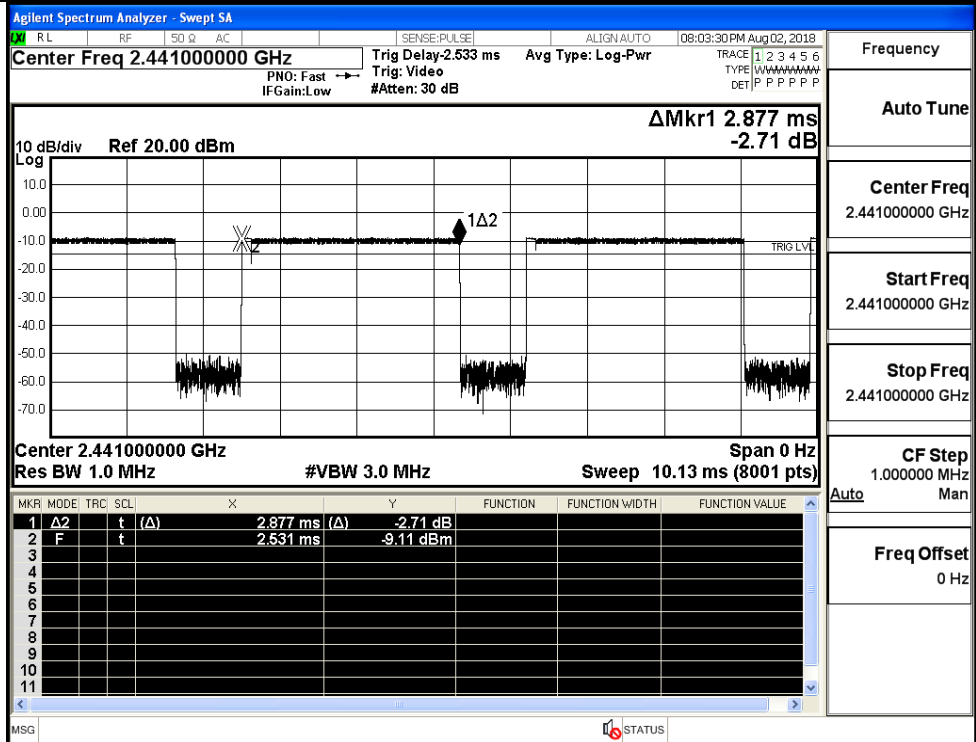
CF Step 1.000000 MHz

Freq Offset 0 Hz

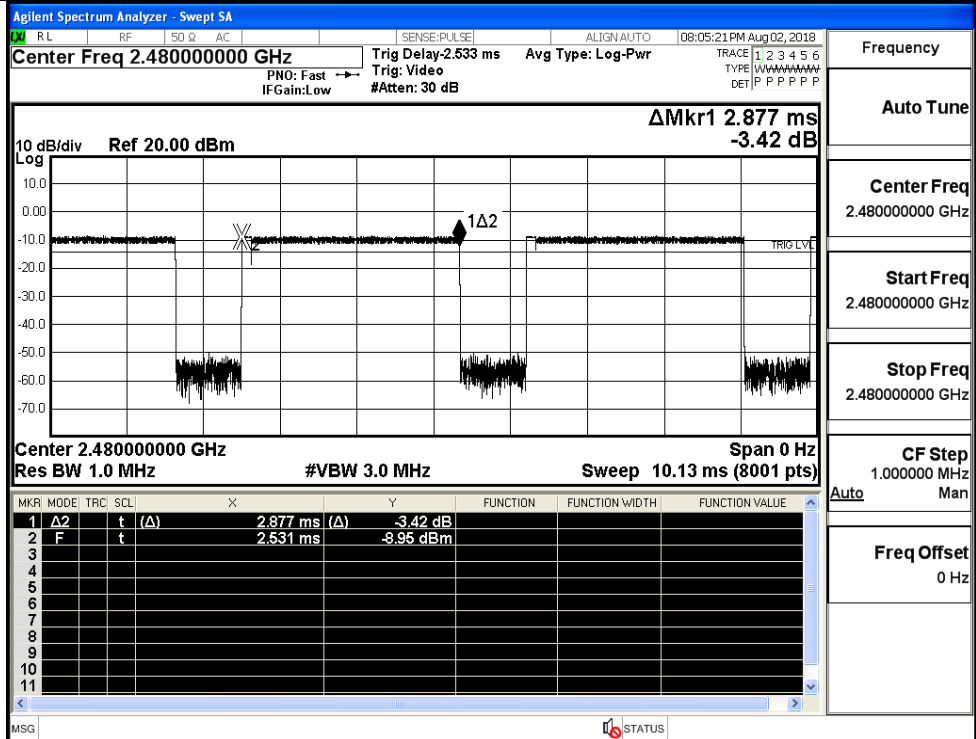
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



$\pi/4$ DQPSK
_2DH5/HCH



Frequency

Auto Tune

Center Freq
2.480000000 GHz

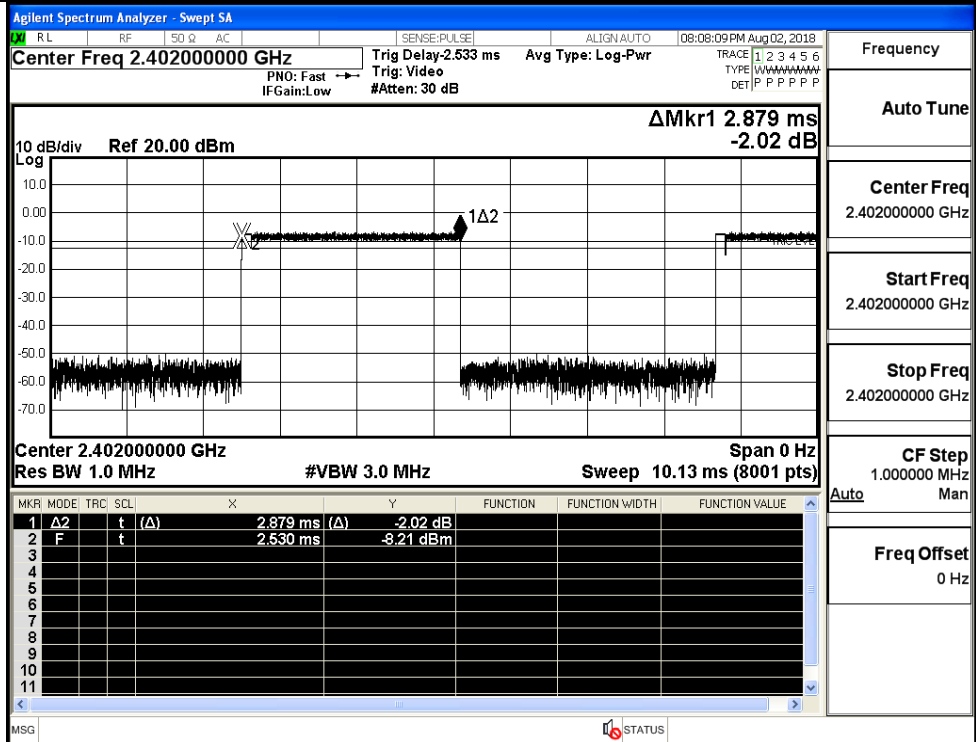
Start Freq
2.480000000 GHz

Stop Freq
2.480000000 GHz

CF Step
1.000000 MHz
Auto Man

Freq Offset
0 Hz

8DPSK_3DH5/LCH



Frequency

Auto Tune

Center Freq
2.402000000 GHz

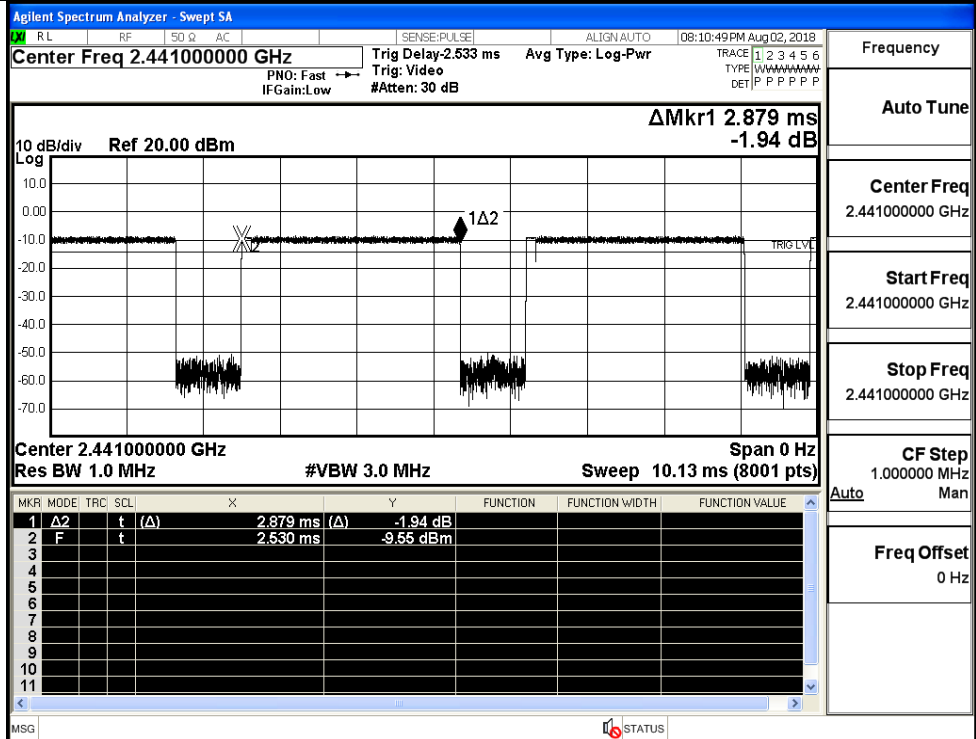
Start Freq
2.402000000 GHz

Stop Freq
2.402000000 GHz

CF Step
1.000000 MHz
Auto Man

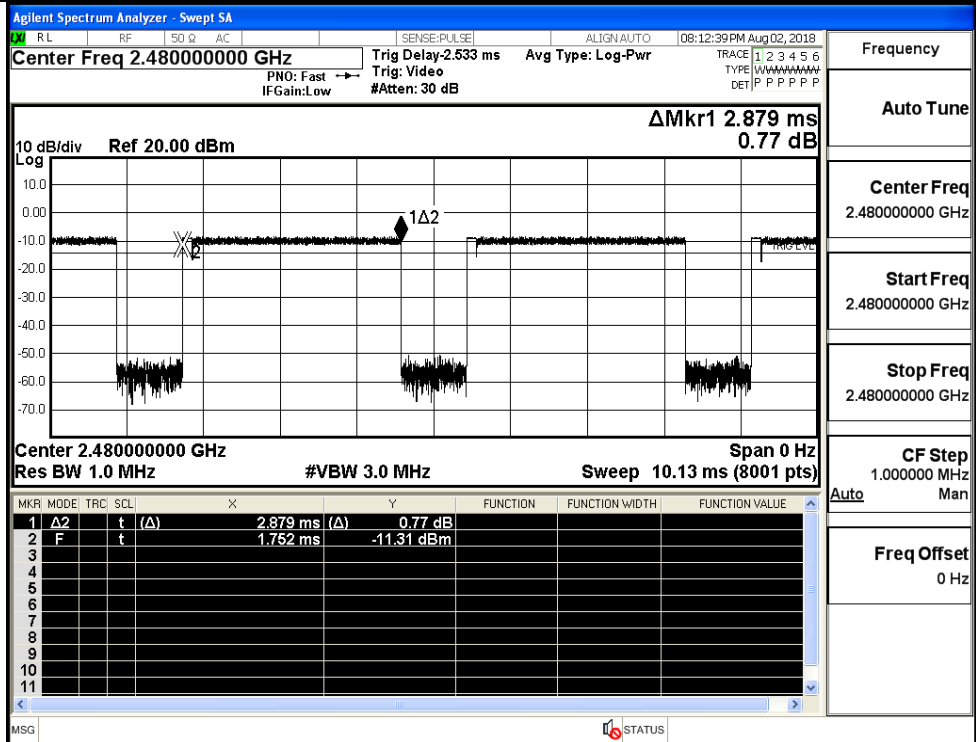
Freq Offset
0 Hz

8DPSK_3DH5/MCH



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



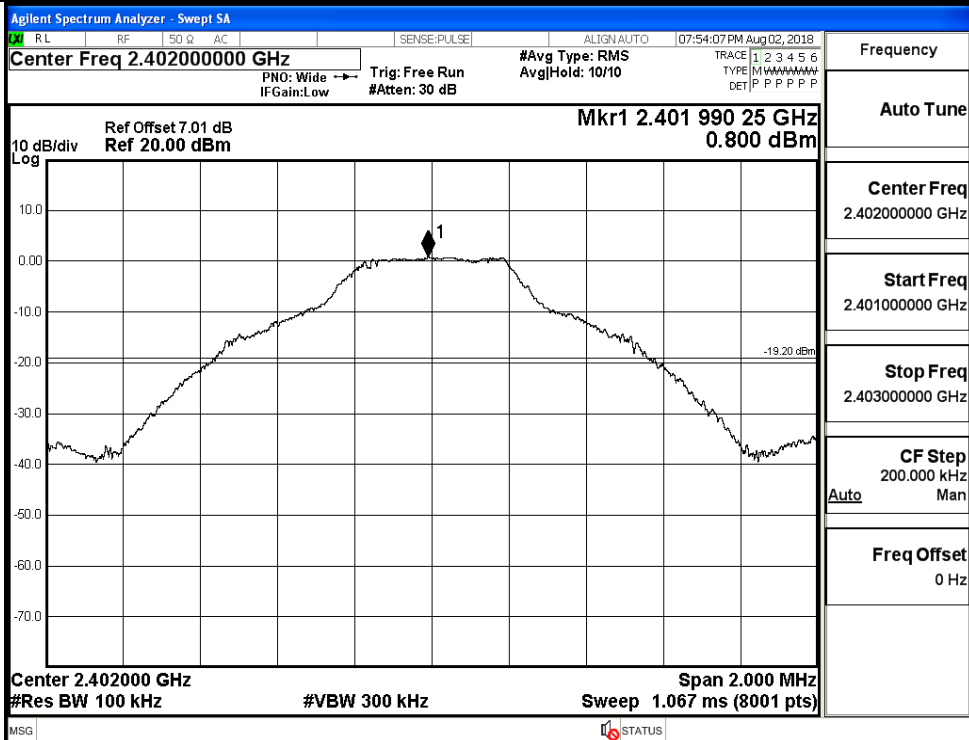
Frequency	
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

A.6 RF Conducted Spurious Emissions

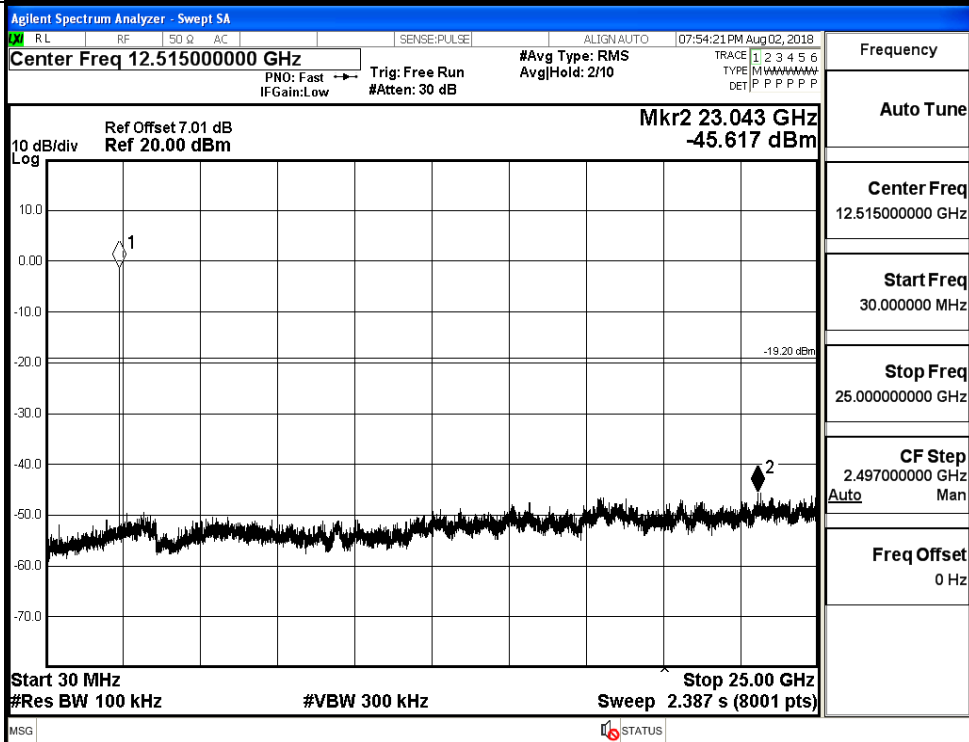
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.8	-45.617	-19.200	PASS
	MCH	-1.46	-46.261	-21.460	PASS
	HCH	-0.541	-45.339	-20.541	PASS
$\pi/4$ DQPSK	LCH	-0.526	-46.410	-20.526	PASS
	MCH	-2.425	-46.010	-22.425	PASS
	HCH	-1.815	-45.338	-21.815	PASS
8DPSK	LCH	-0.431	-45.054	-20.431	PASS
	MCH	-2.059	-45.976	-22.059	PASS
	HCH	-2.178	-45.744	-22.178	PASS

GFSK_LCH_Graphs

Pref

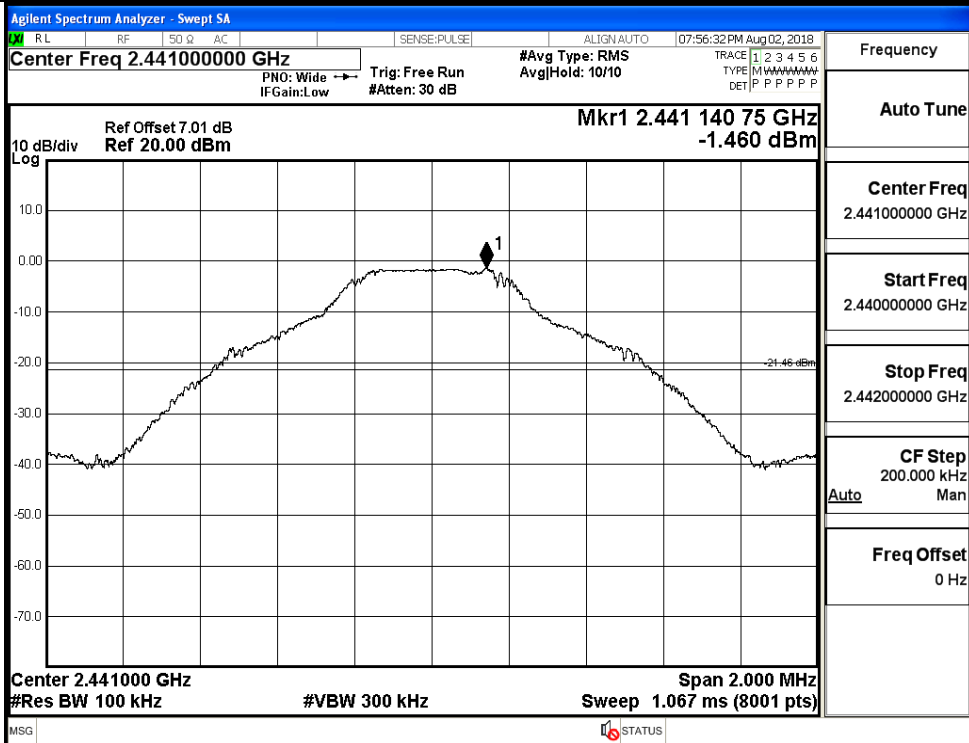


Puw

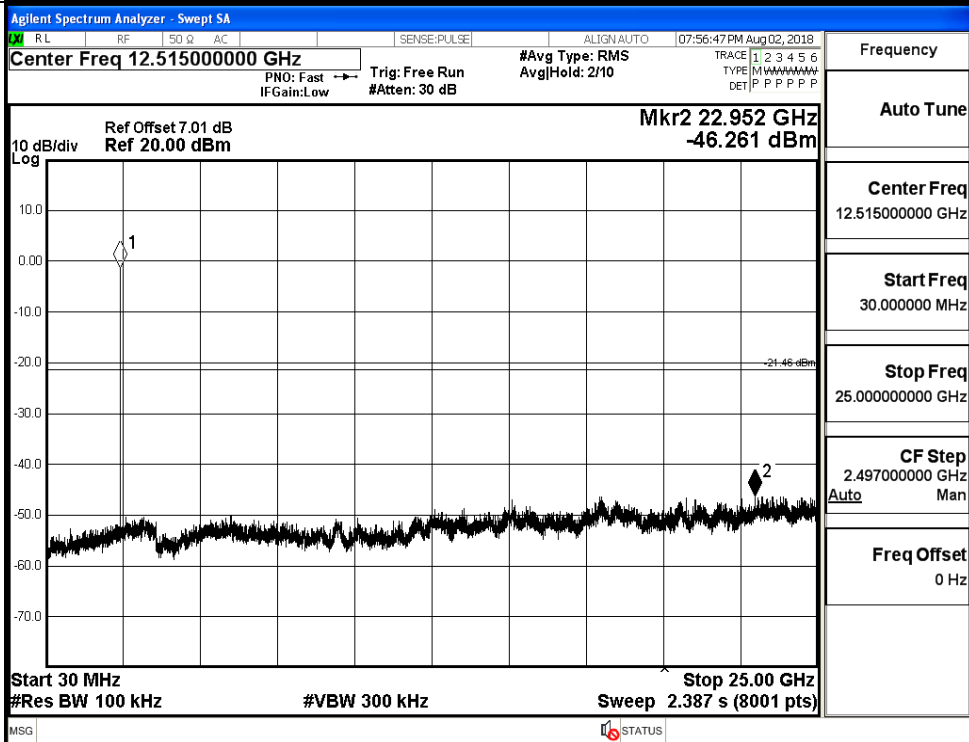


GFSK_MCH_Graphs

Pref

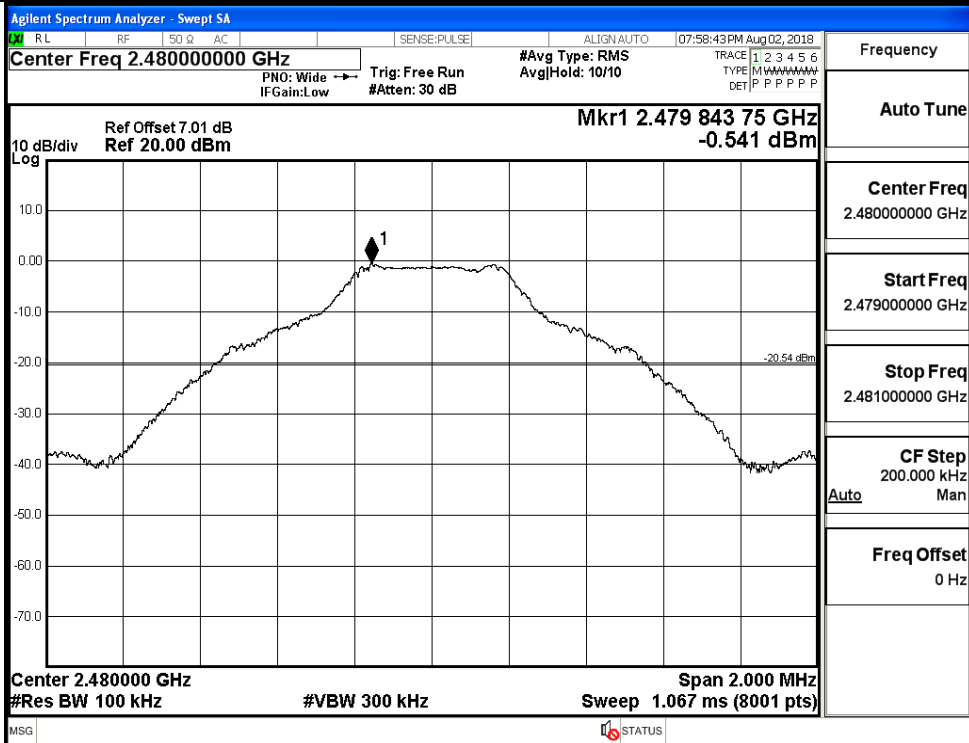


Puw

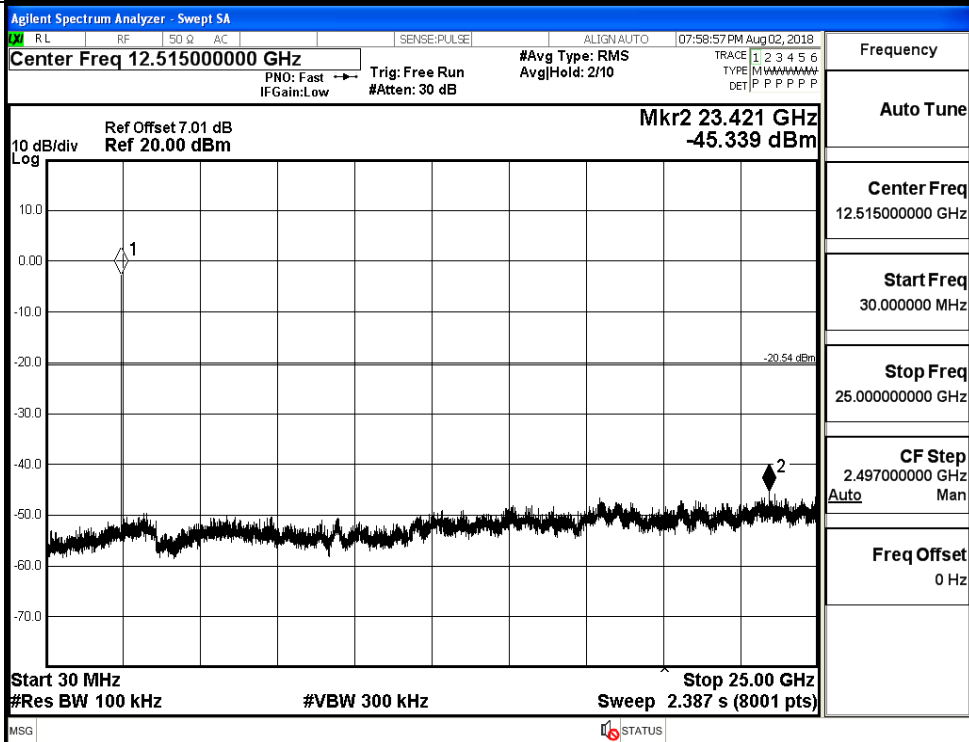


GFSK_HCH_Graphs

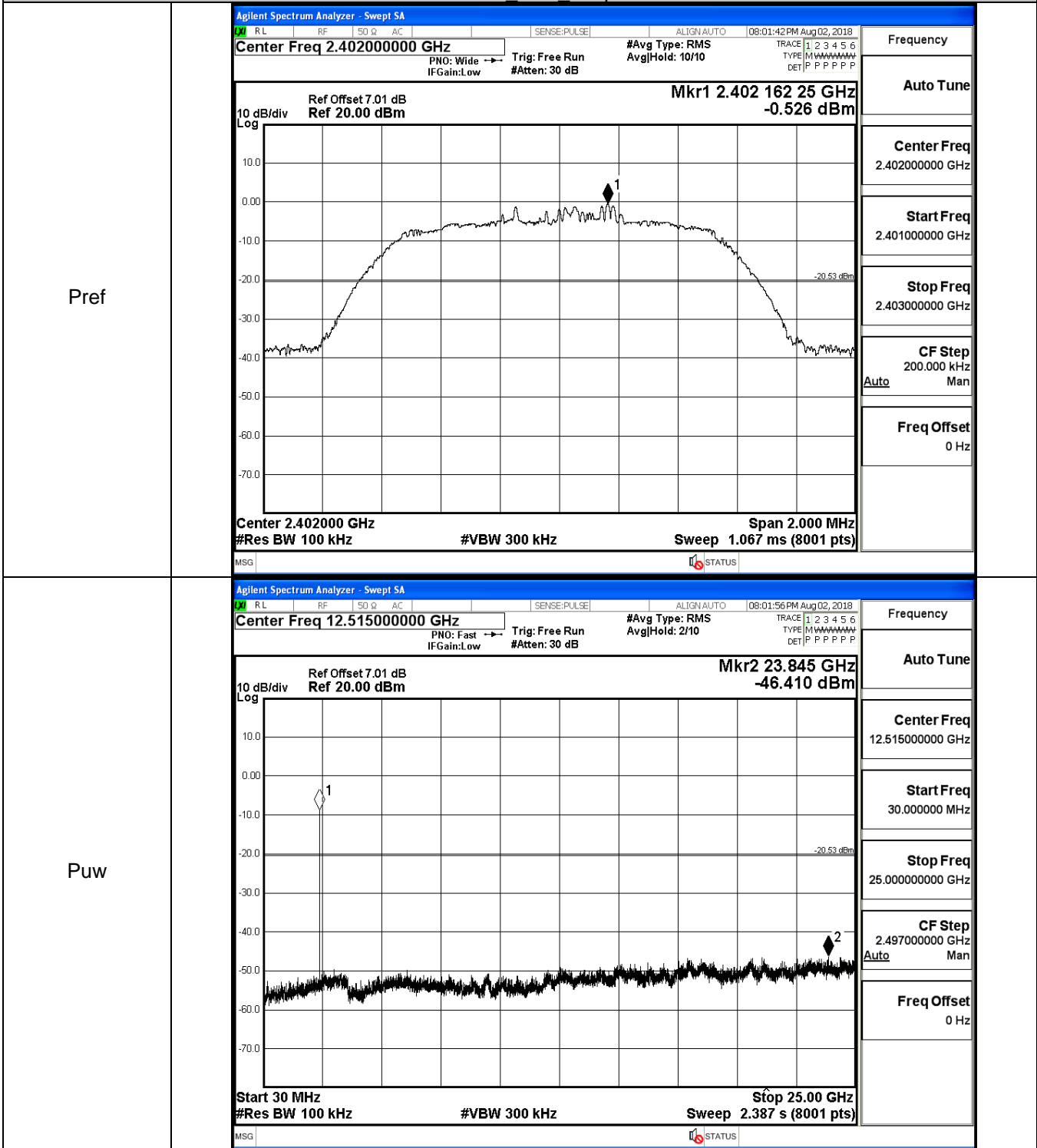
Pref



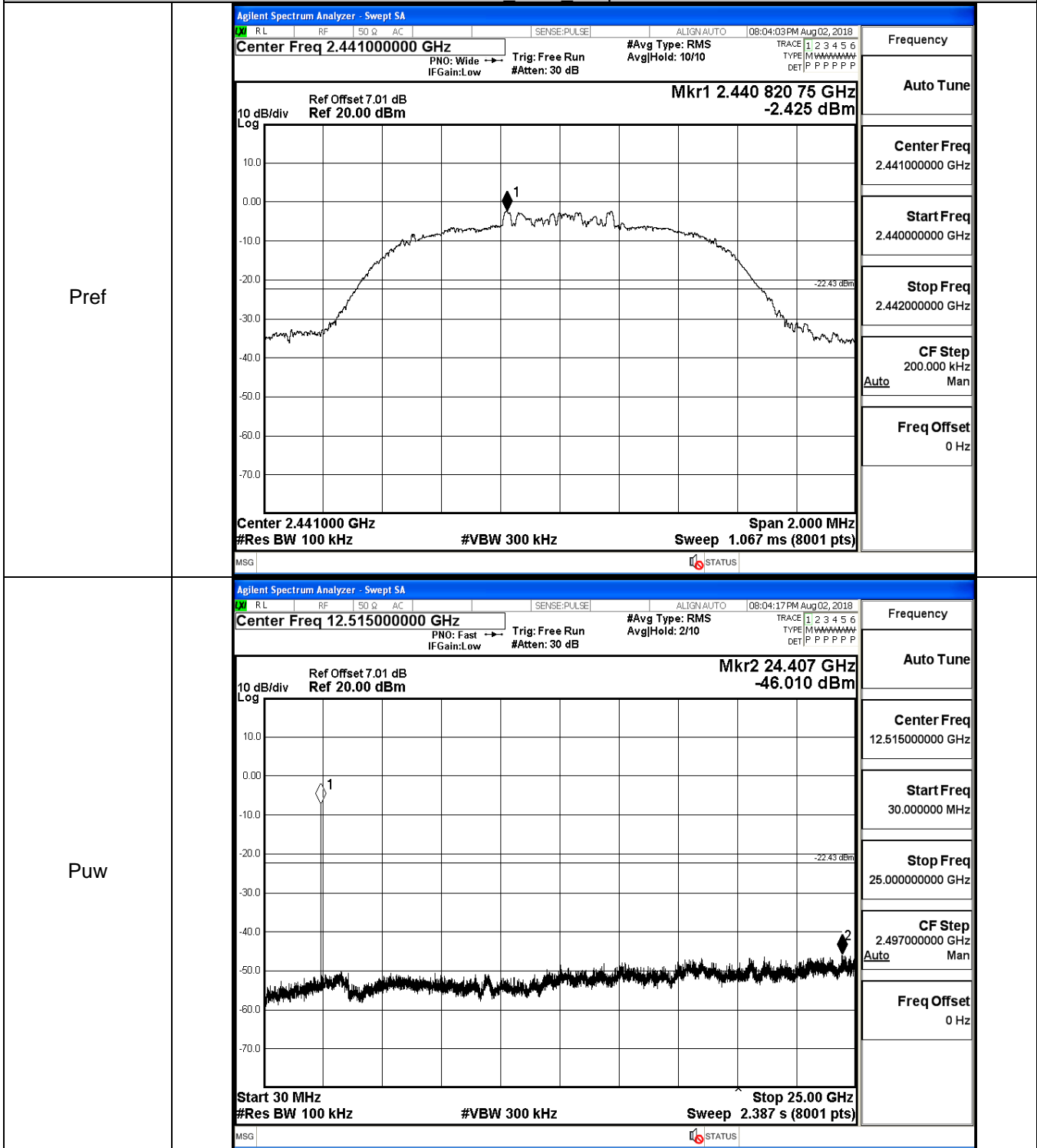
Puw



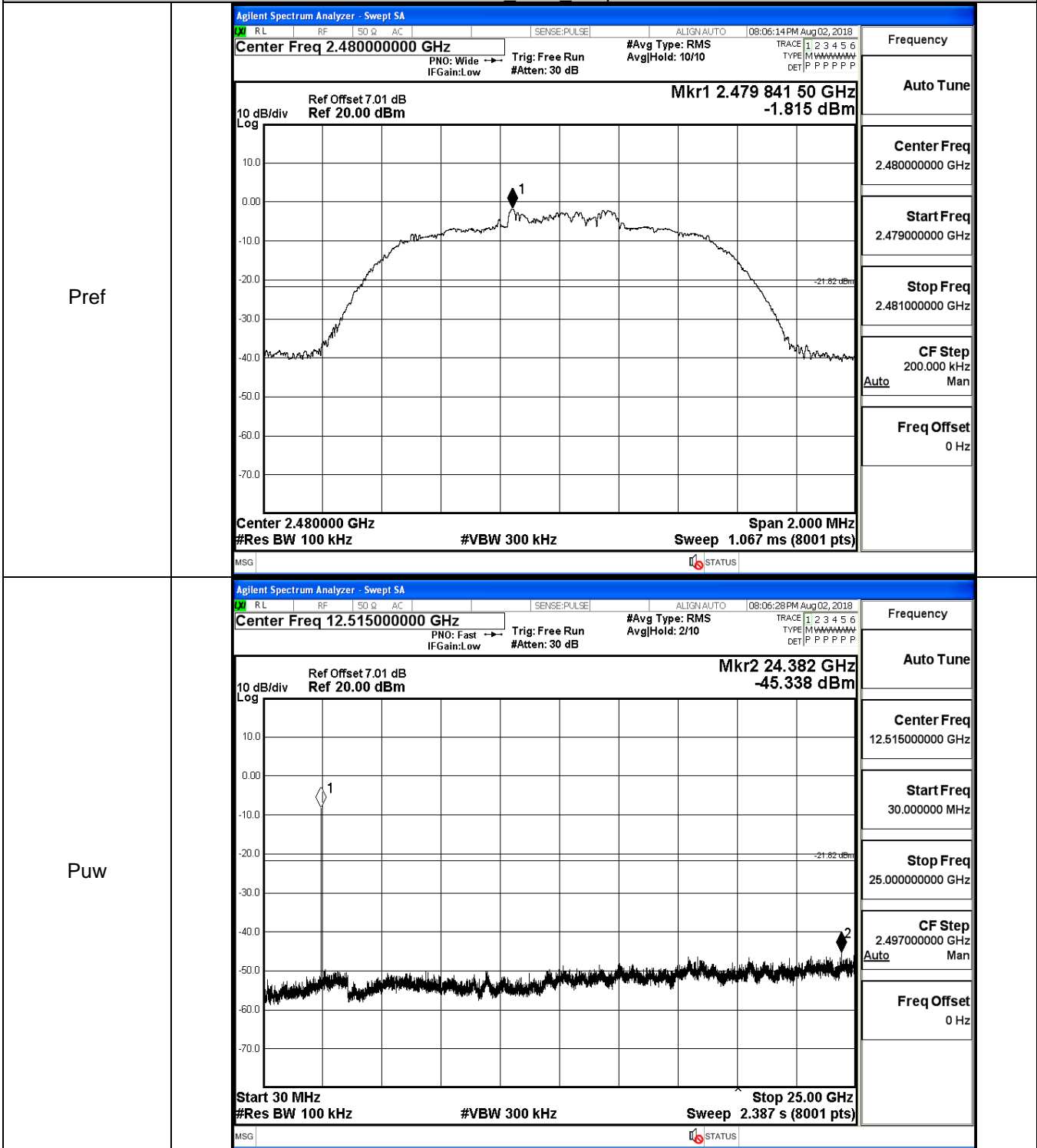
$\pi/4$ DQPSK LCH Graphs



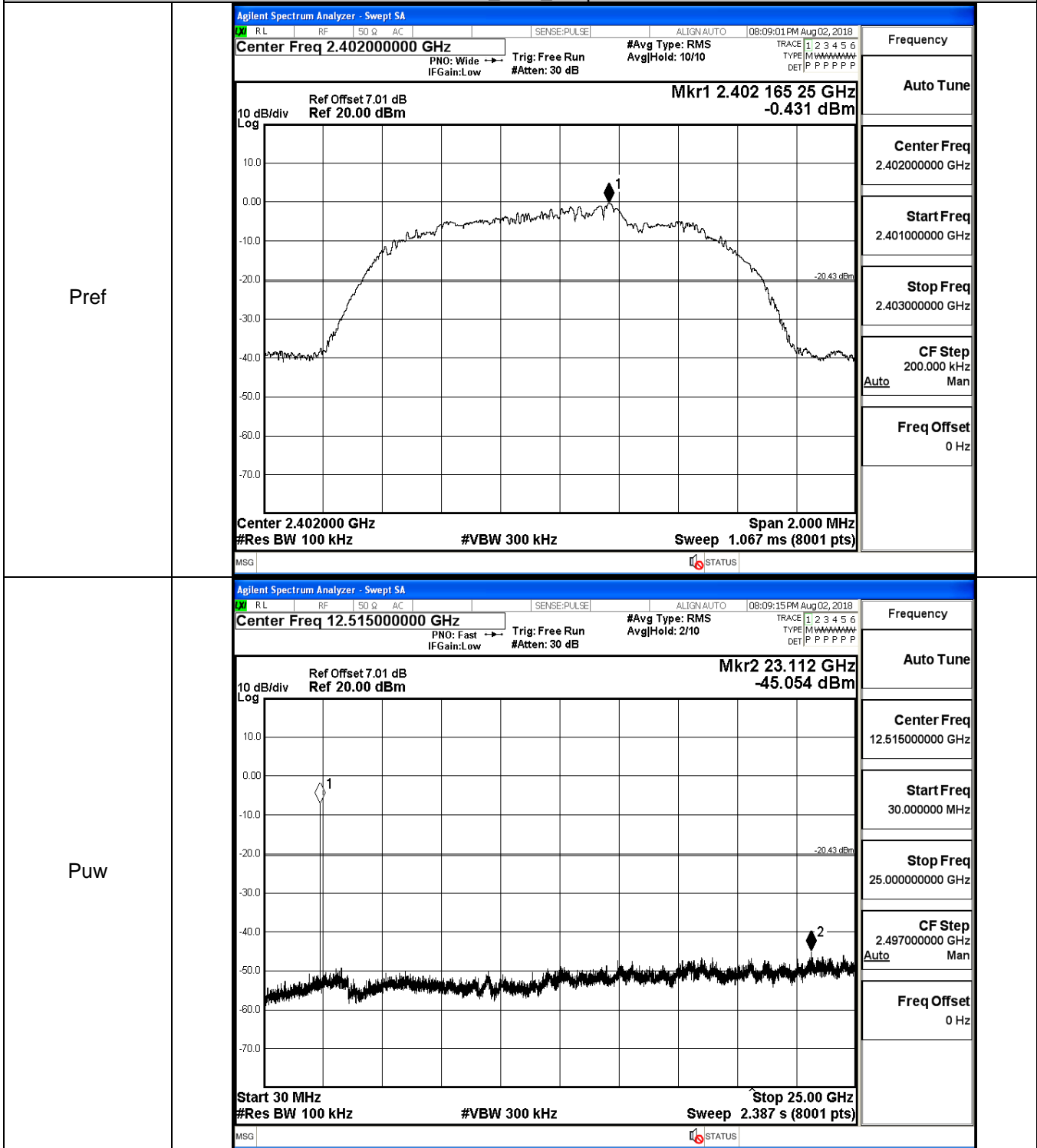
$\pi/4$ DQPSK MCH Graphs



$\pi/4$ DQPSK HCH Graphs

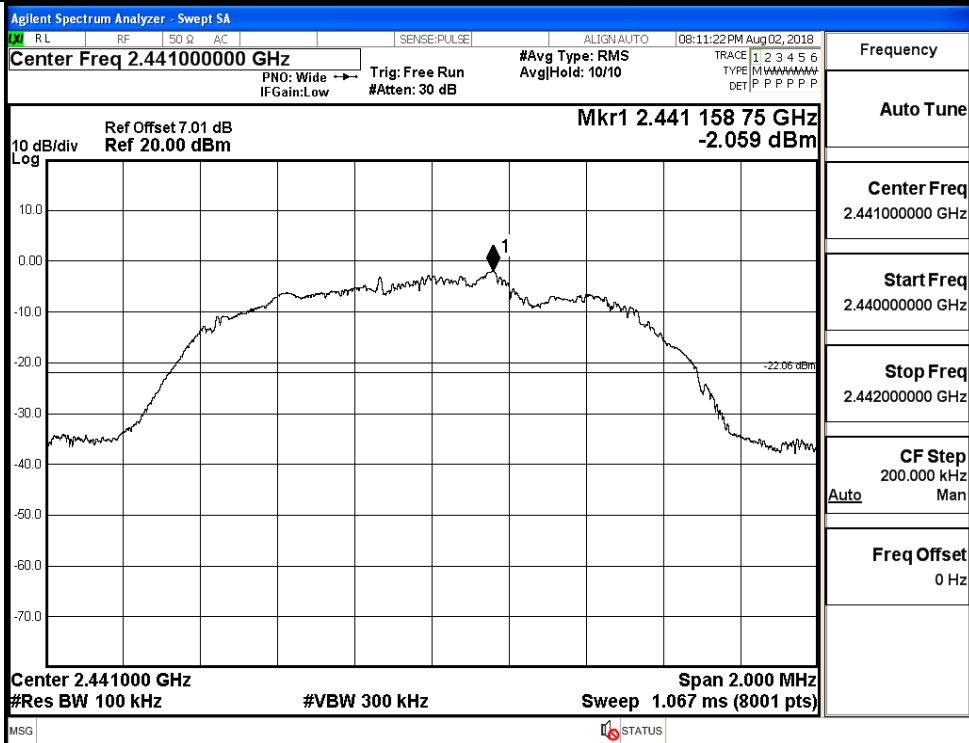


8DPSK_LCH_Graphs

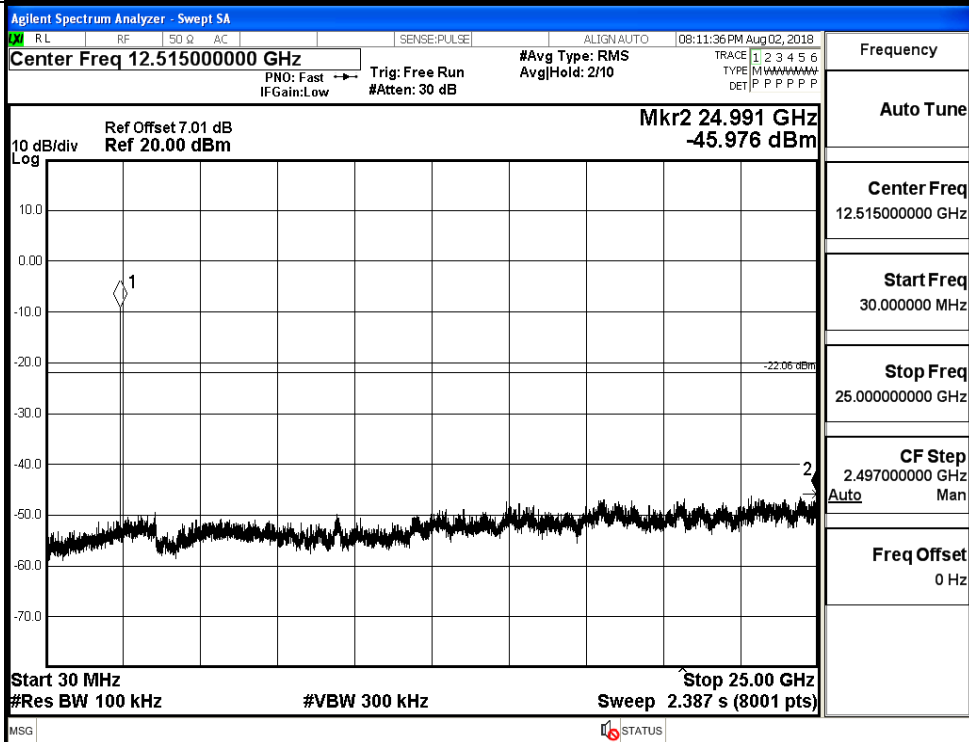


8DPSK_MCH_Graphs

Pref

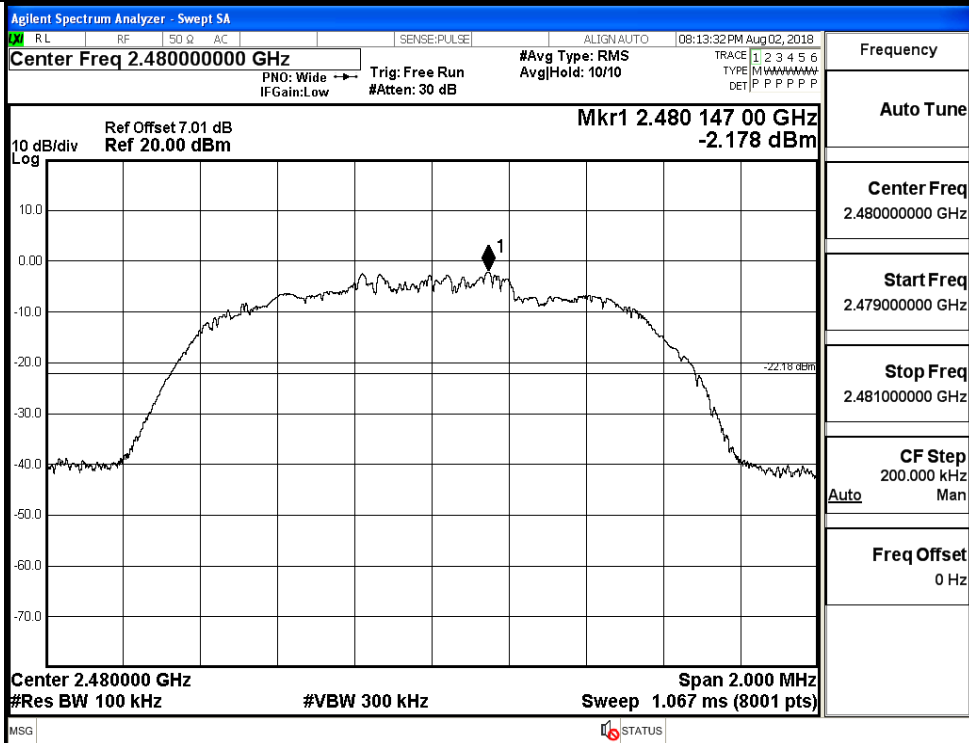


Puw

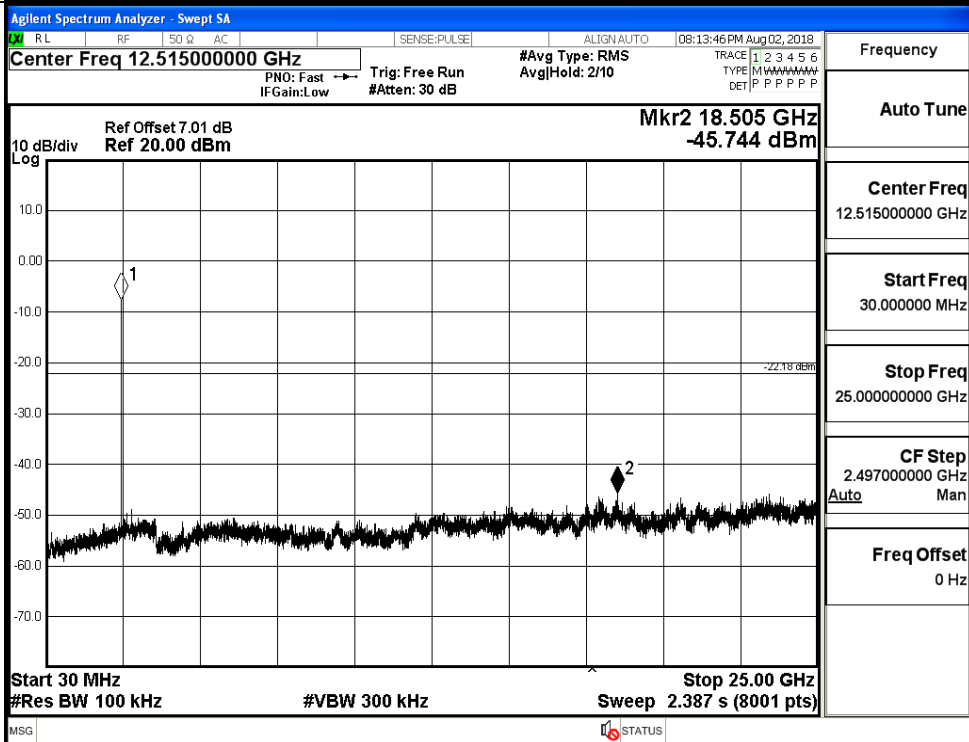


8DPSK_HCH_Graphs

Pref



Puw

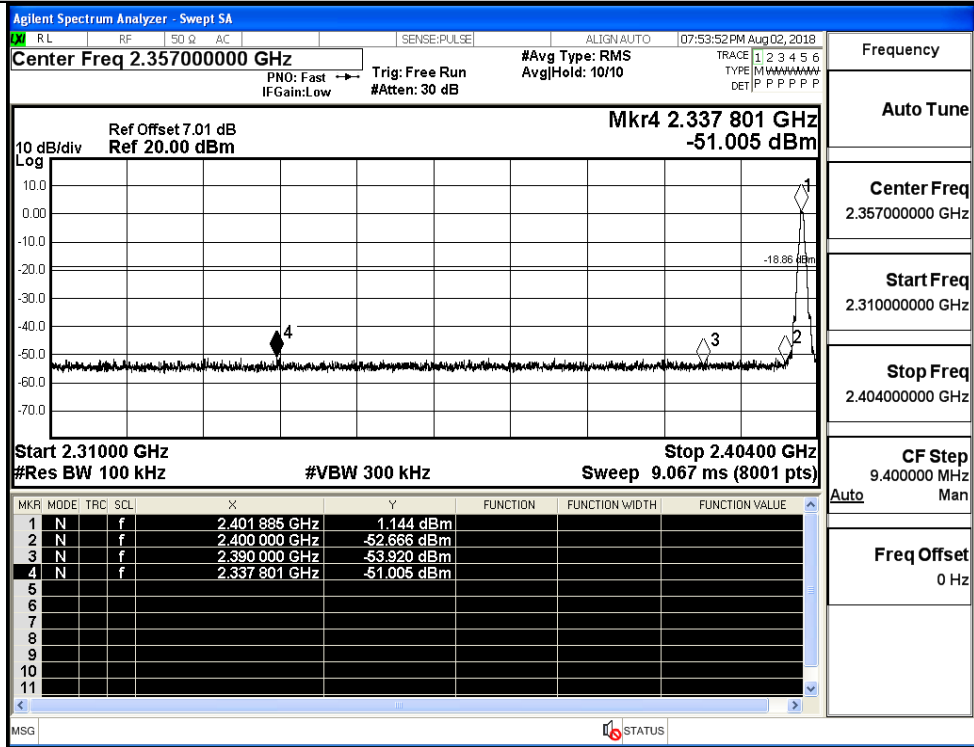


A.7 Band-edge for RF Conducted Emissions

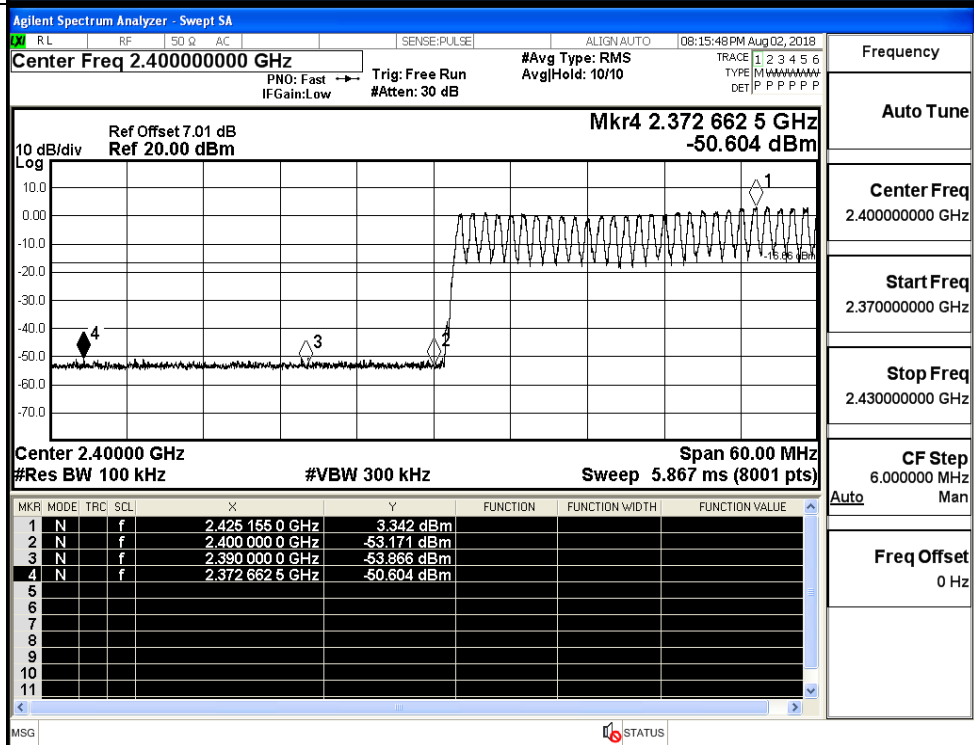
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.144	Off	-51.005	-18.86	PASS
			3.342	On	-50.604	-16.66	PASS
	HCH	2480	-0.681	Off	-51.051	-20.68	PASS
			2.533	On	-50.797	-17.47	PASS
$\pi/4$ DQPSK	LCH	2402	-1.324	Off	-50.671	-21.32	PASS
			1.959	On	-50.420	-18.04	PASS
	HCH	2480	-1.824	Off	-50.748	-21.82	PASS
			0.678	On	-50.308	-19.32	PASS
8DPSK	LCH	2402	-0.861	Off	-51.081	-20.86	PASS
			1.898	On	-49.757	-18.1	PASS
	HCH	2480	-1.968	Off	-50.984	-21.97	PASS
			0.863	On	-50.248	-19.14	PASS

Test Graphs

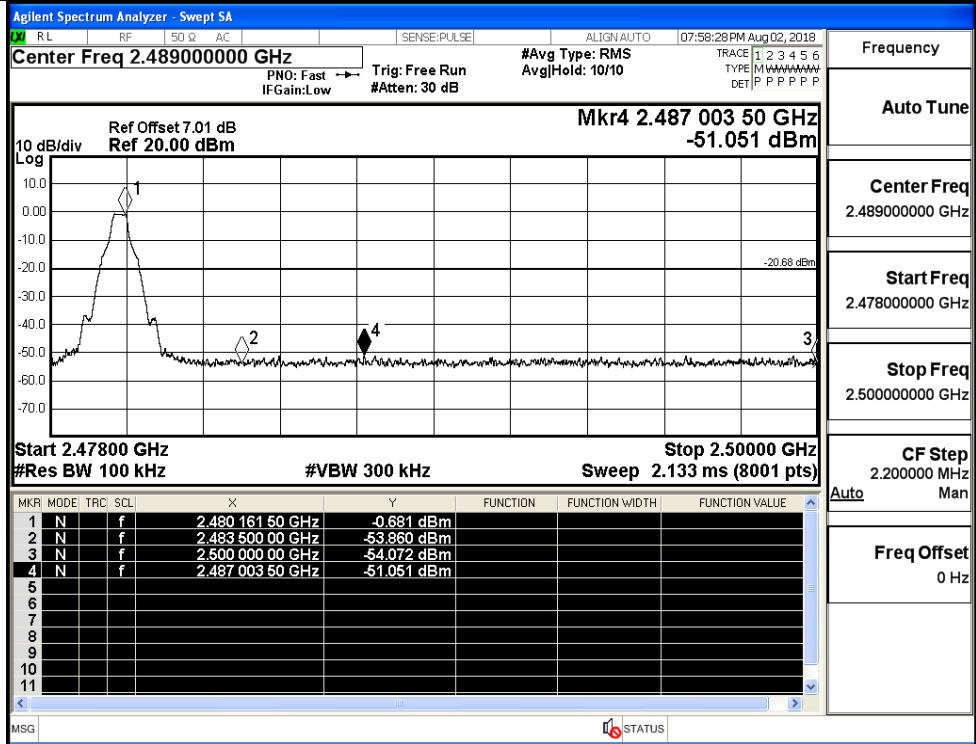
GFSK/LCH/No Hop



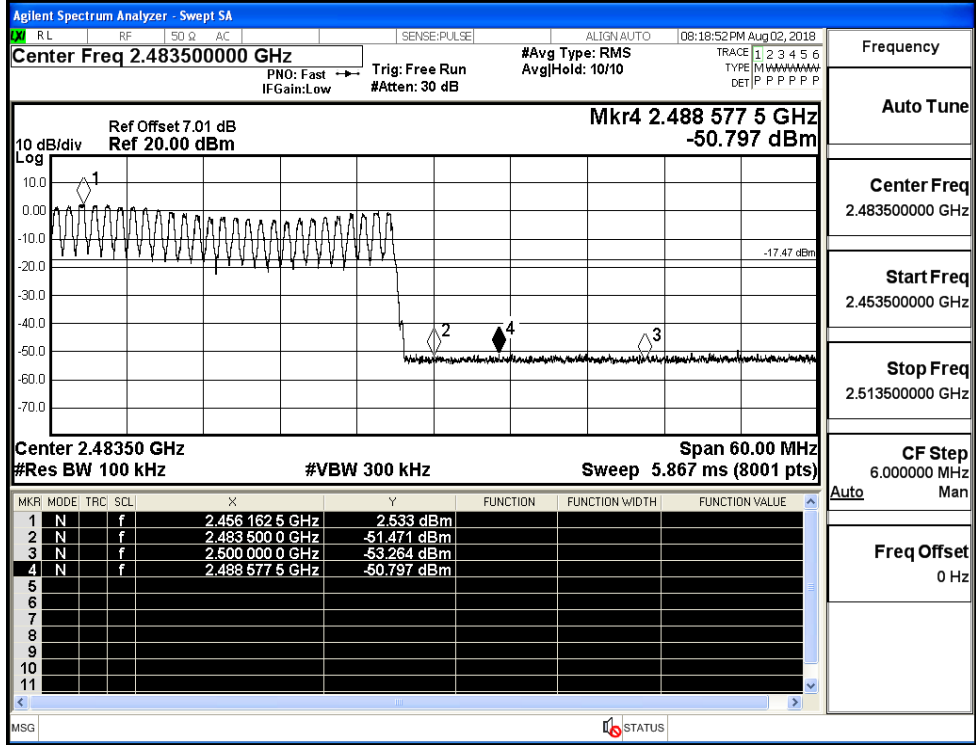
GFSK/LCH/Hop



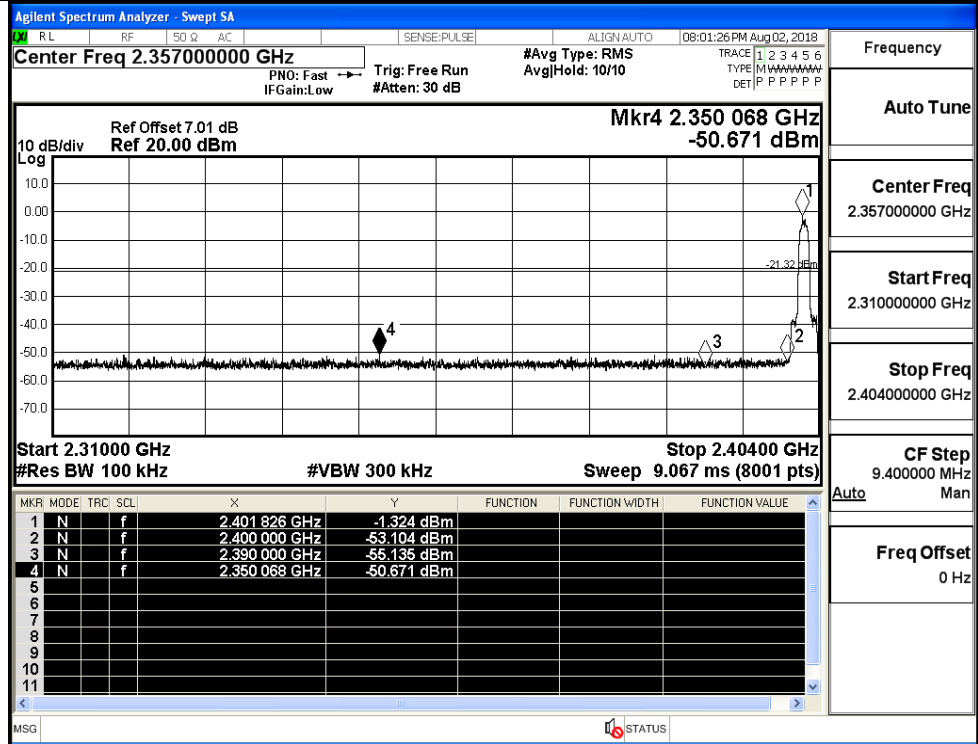
GFSK/HCH/No Hop



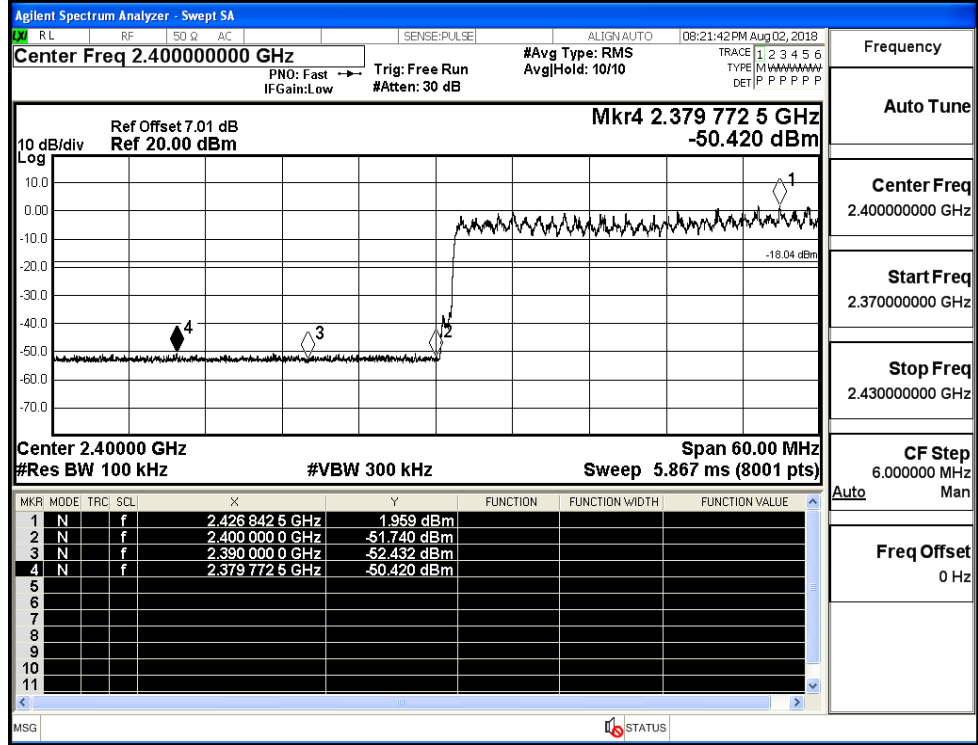
GFSK/HCH/Hop



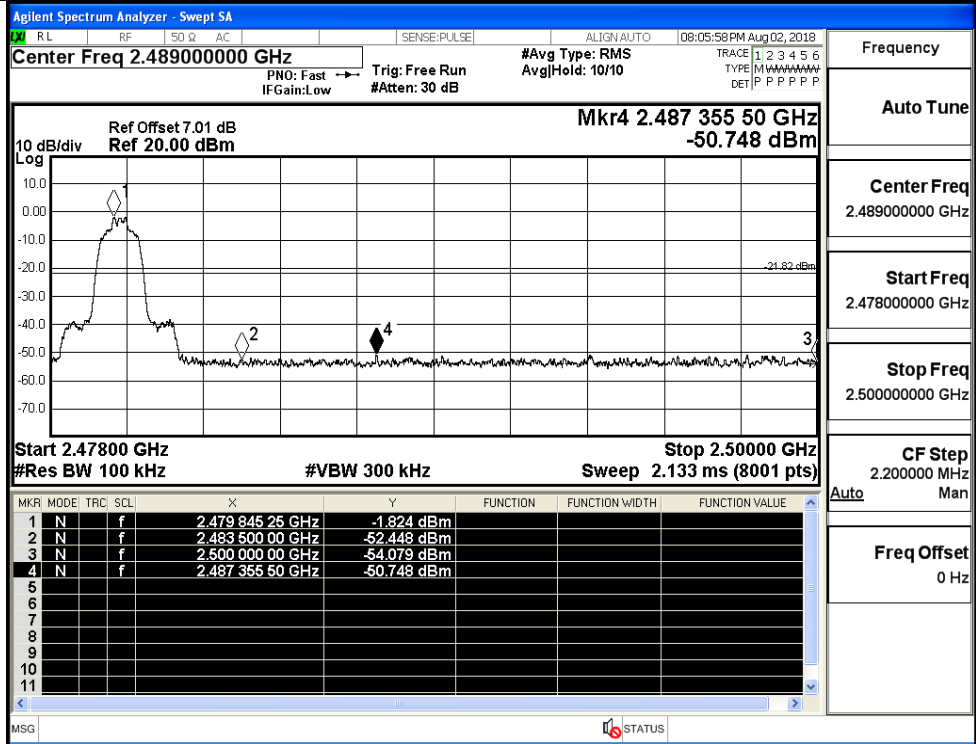
$\pi/4$ DQPSK/LCH/No
Hop



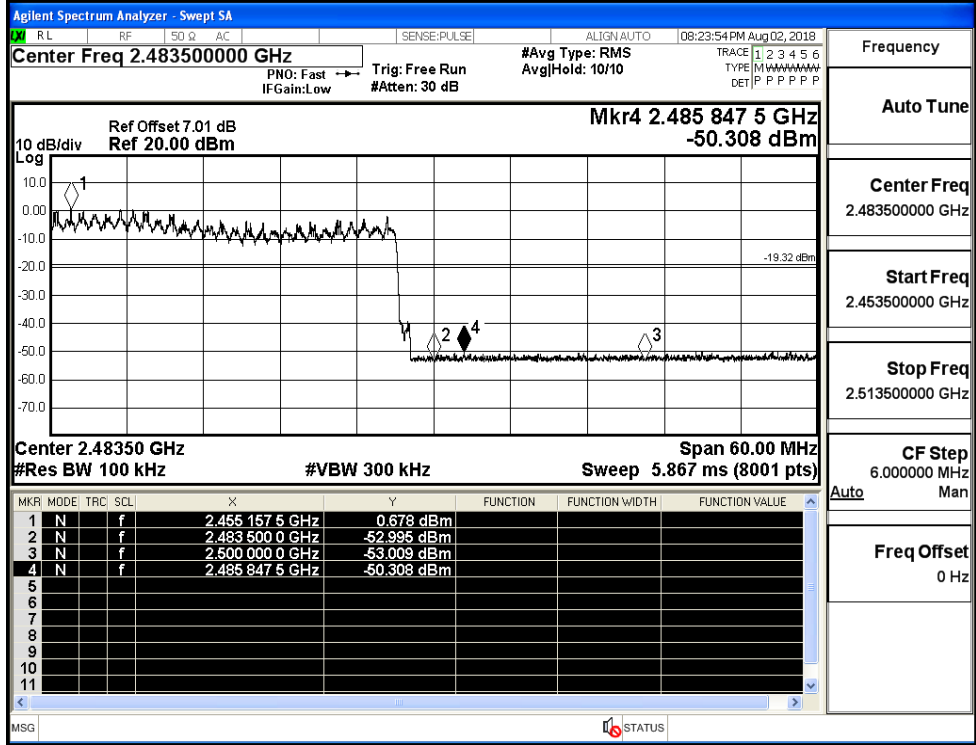
$\pi/4$ DQPSK/LCH/Hop



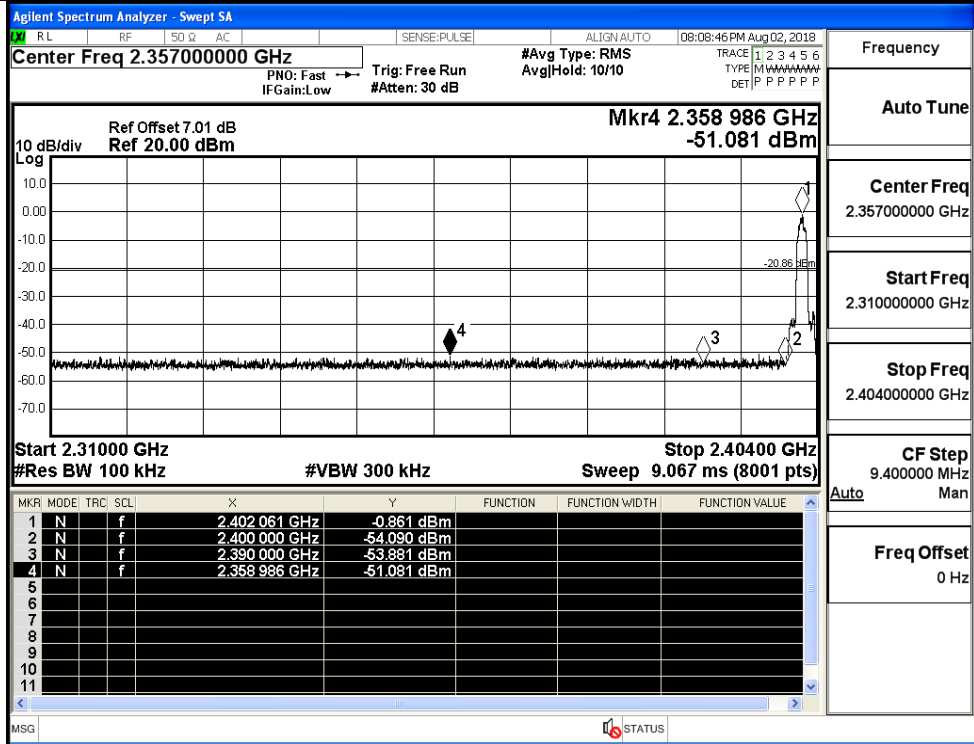
π /4DQPSK/HCH/No Hop



π /4DQPSK/HCH/Hop



8DPSK/LCH/No Hop



Frequency

Auto Tune

Center Freq
2.357000000 GHz

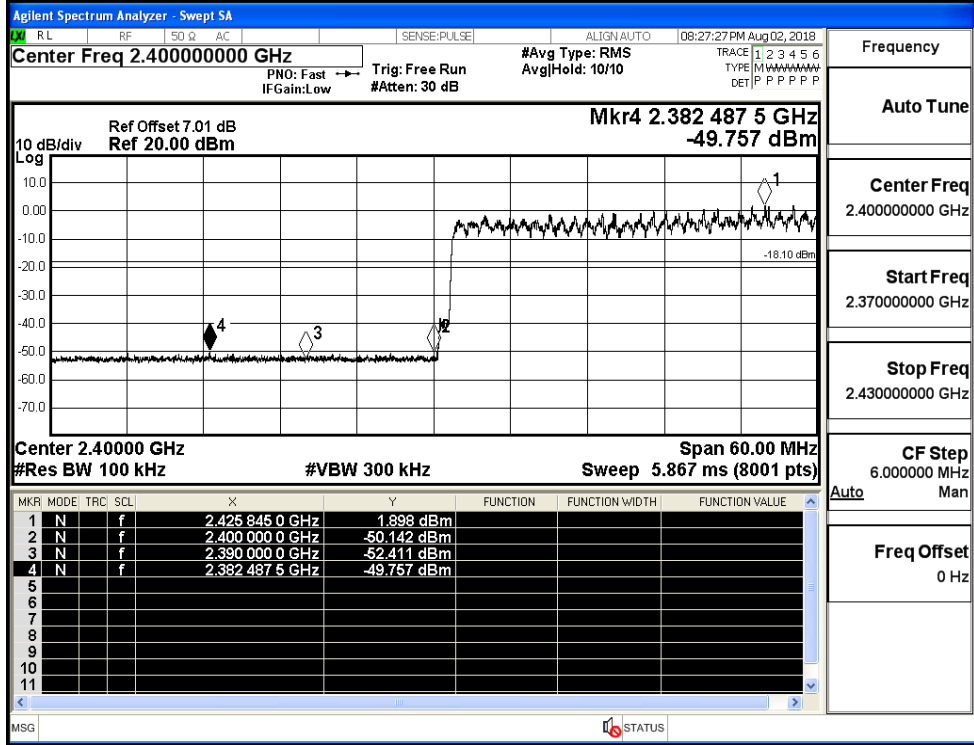
Start Freq
2.310000000 GHz

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

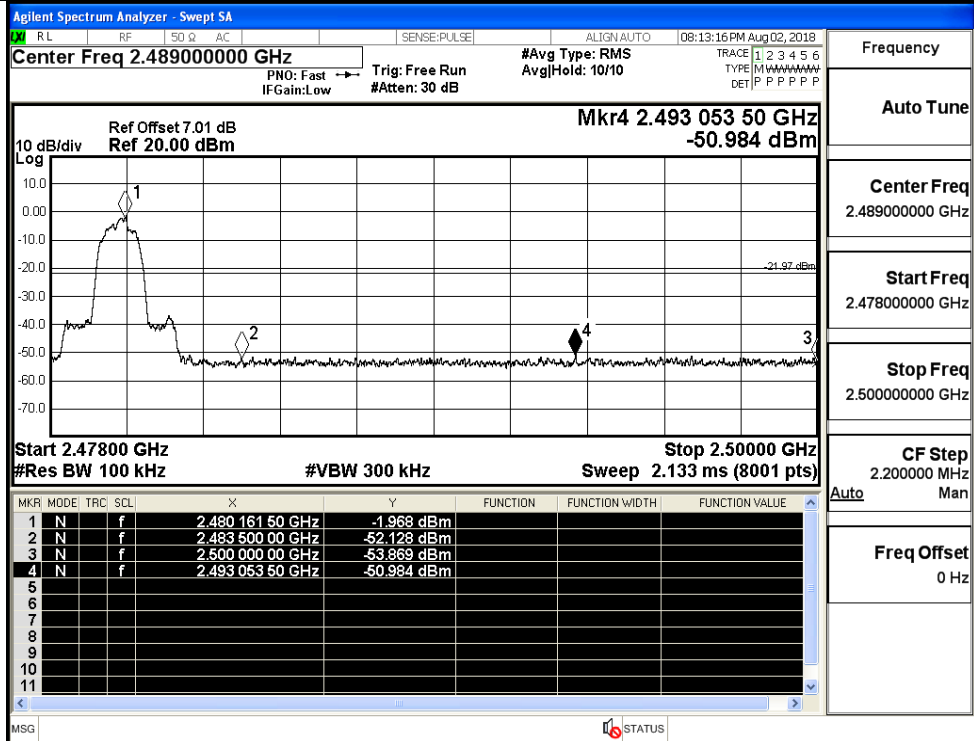
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz

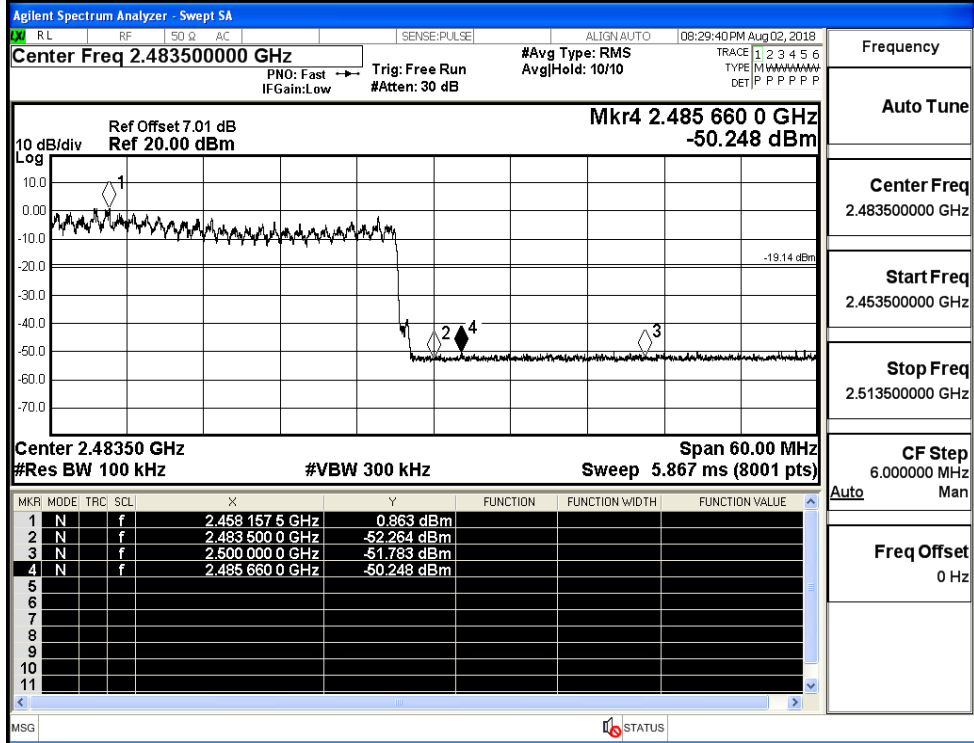
Freq Offset
0 Hz

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
Auto Man
Freq Offset
0 Hz

8DPSK/HCH/Hop

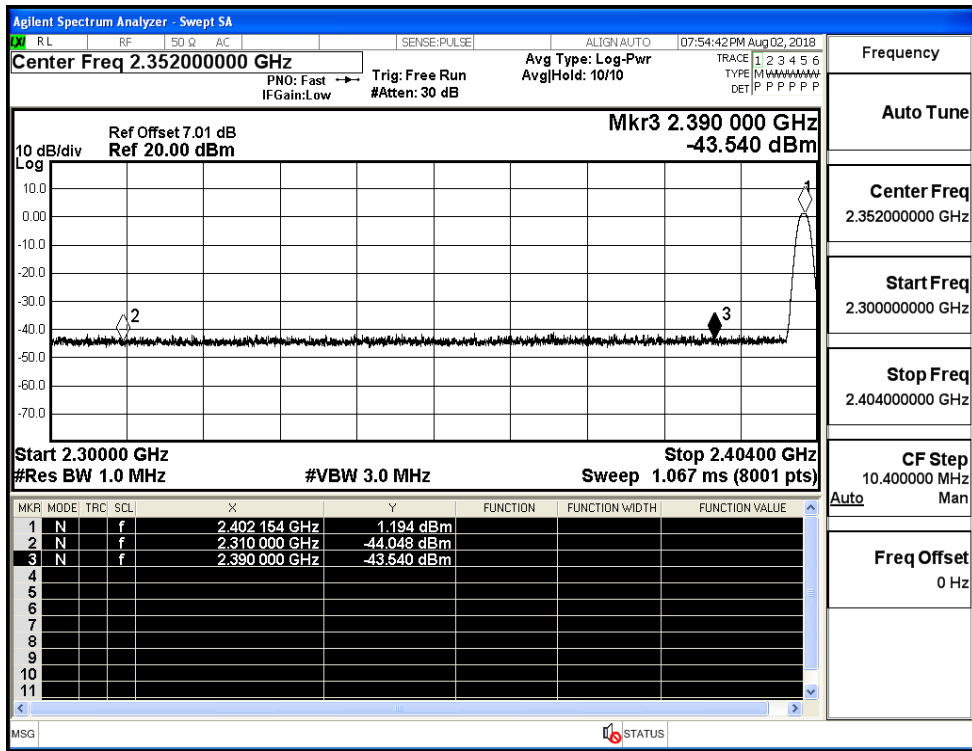


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

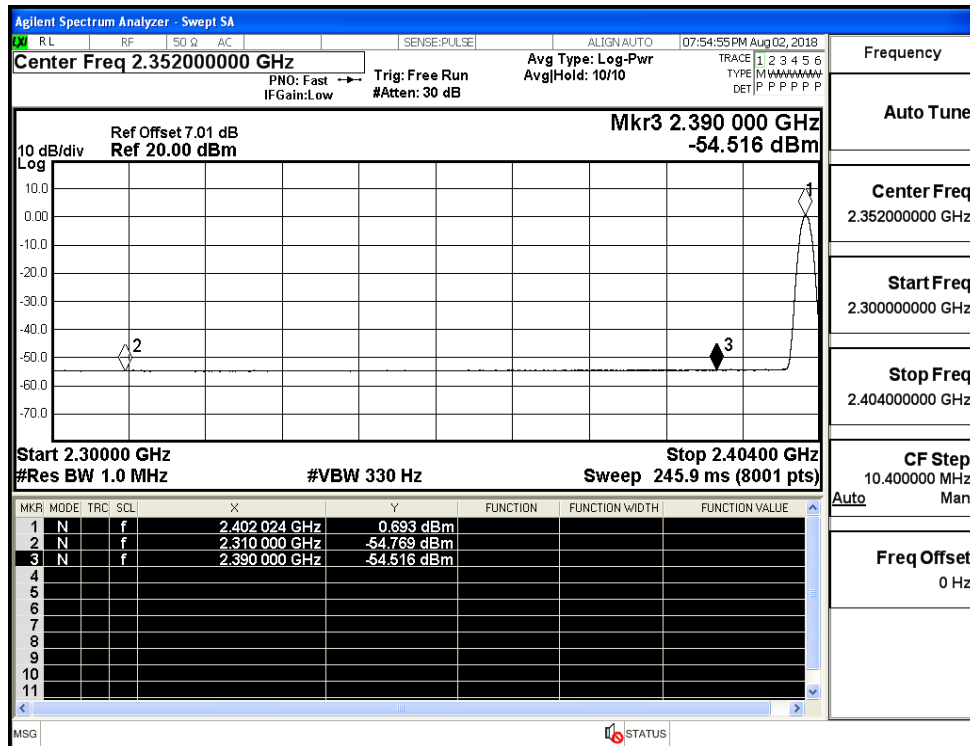
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.05	2.0	0	51.21	PEAK	74	PASS
	Off	2310.0	-54.77	2.0	0	40.49	AV	54	PASS
	Off	2390.0	-43.54	2.0	0	51.72	PEAK	74	PASS
	Off	2390.0	-54.52	2.0	0	40.74	AV	54	PASS
	Off	2483.5	-45.30	2.0	0	49.95	PEAK	74	PASS
	Off	2483.5	-54.21	2.0	0	41.05	AV	54	PASS
	Off	2500.0	-44.38	2.0	0	50.88	PEAK	74	PASS
	Off	2500.0	-54.00	2.0	0	41.26	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-45.00	2.0	0	50.26	PEAK	74	PASS
	Off	2310.0	-54.71	2.0	0	40.55	AV	54	PASS
	Off	2390.0	-43.61	2.0	0	51.65	PEAK	74	PASS
	Off	2390.0	-54.37	2.0	0	40.88	AV	54	PASS
	Off	2483.5	-44.36	2.0	0	50.90	PEAK	74	PASS
	Off	2483.5	-53.97	2.0	0	41.29	AV	54	PASS
	Off	2500.0	-43.74	2.0	0	51.52	PEAK	74	PASS
	Off	2500.0	-54.15	2.0	0	41.11	AV	54	PASS
8DPSK	Off	2310.0	-43.72	2.0	0	51.54	PEAK	74	PASS
	Off	2310.0	-54.69	2.0	0	40.57	AV	54	PASS
	Off	2390.0	-44.84	2.0	0	50.42	PEAK	74	PASS
	Off	2390.0	-54.46	2.0	0	40.79	AV	54	PASS
	Off	2483.5	-44.42	2.0	0	50.84	PEAK	74	PASS
	Off	2483.5	-54.14	2.0	0	41.12	AV	54	PASS
	Off	2500.0	-44.27	2.0	0	50.98	PEAK	74	PASS
	Off	2500.0	-54.02	2.0	0	41.24	AV	54	PASS

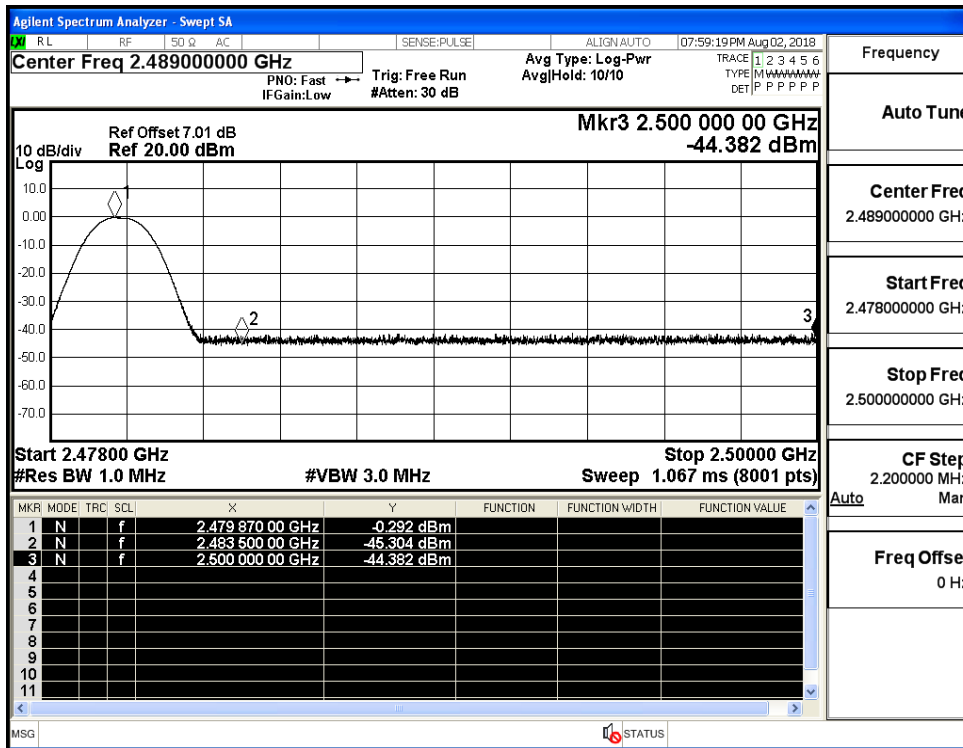
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



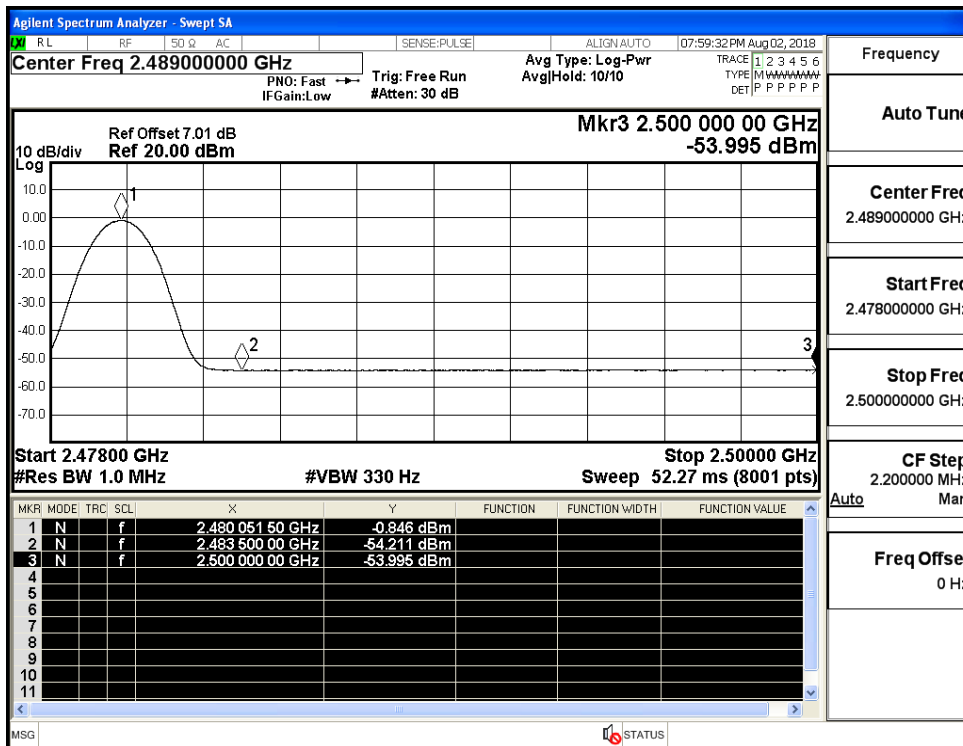
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



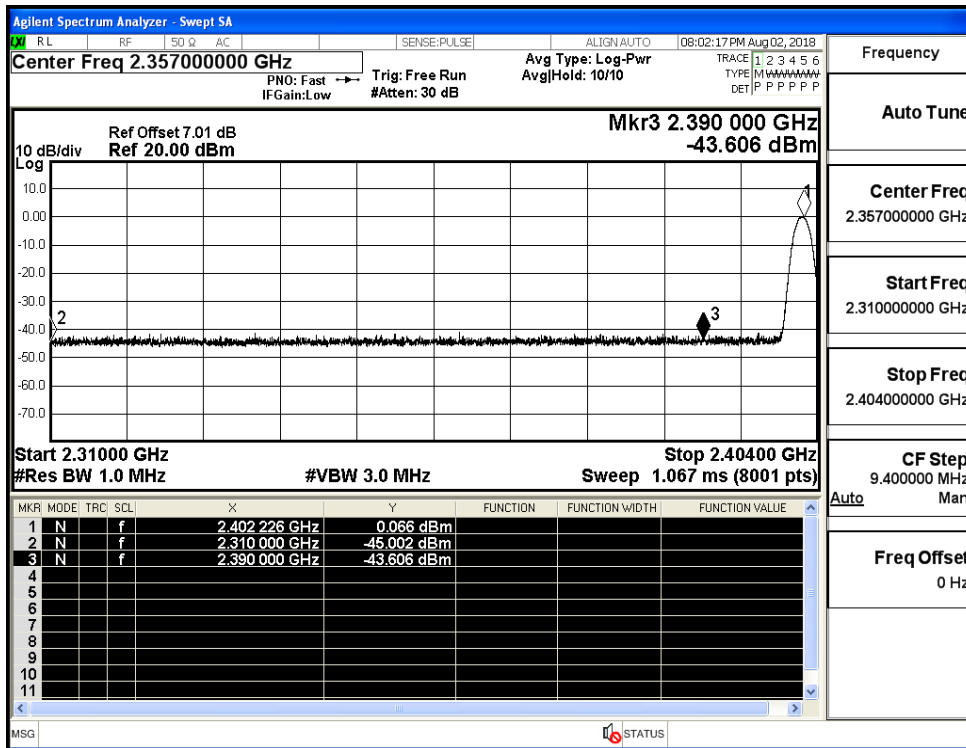
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



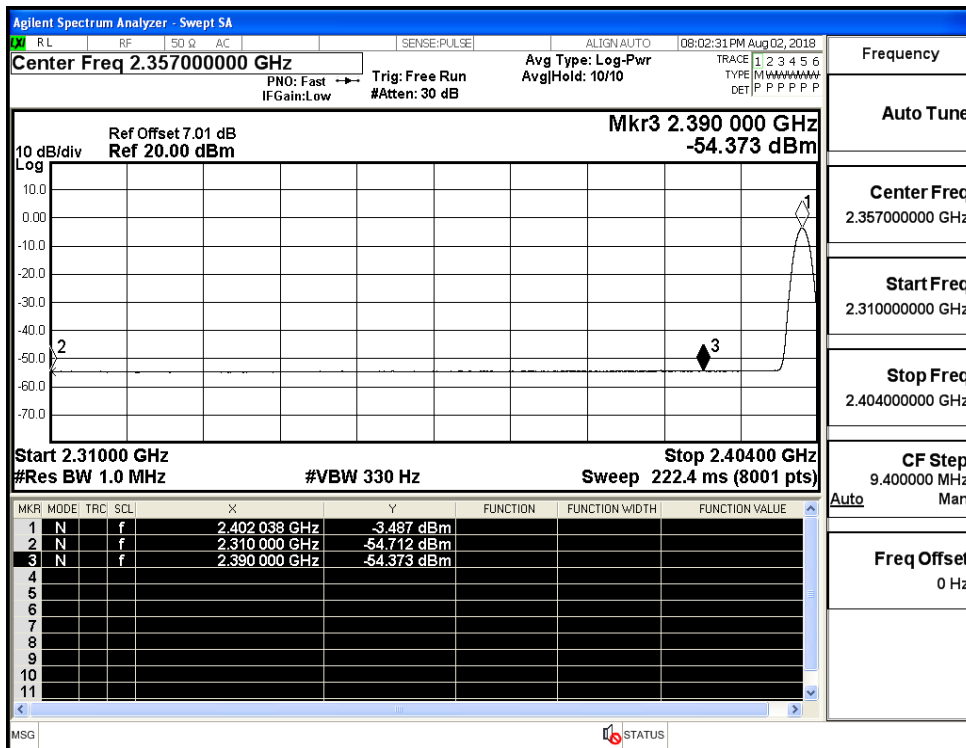
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



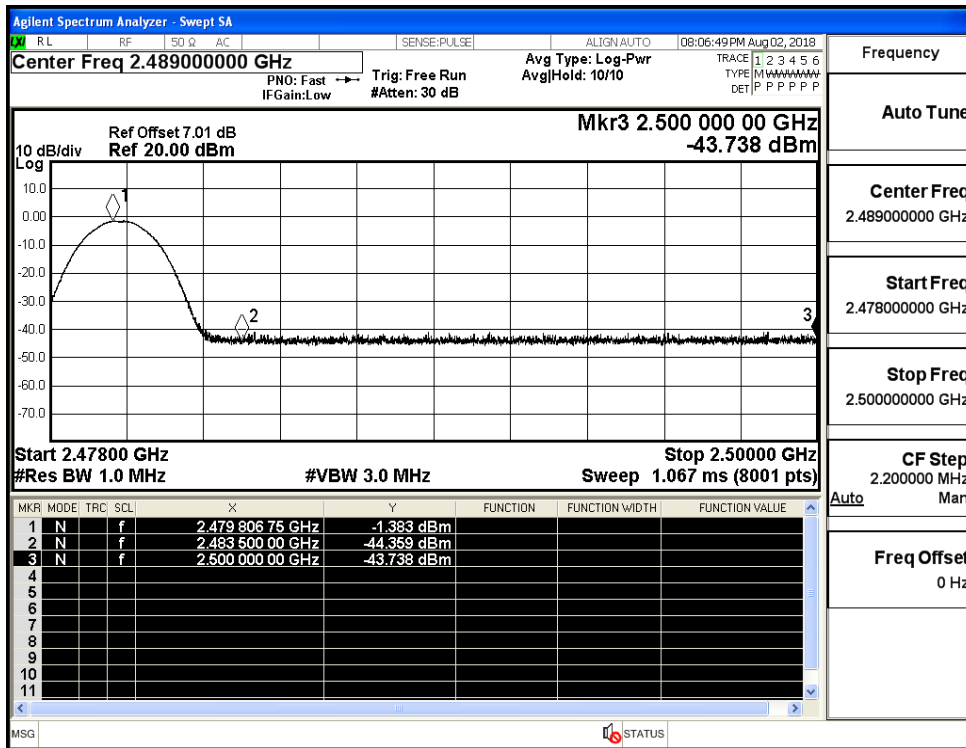
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



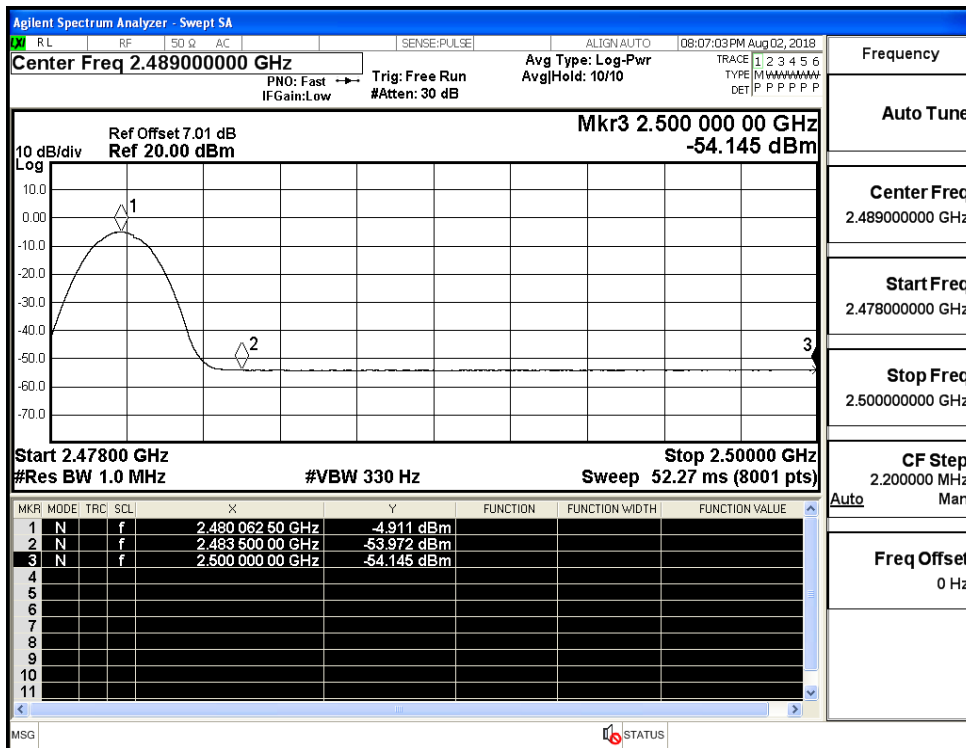
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



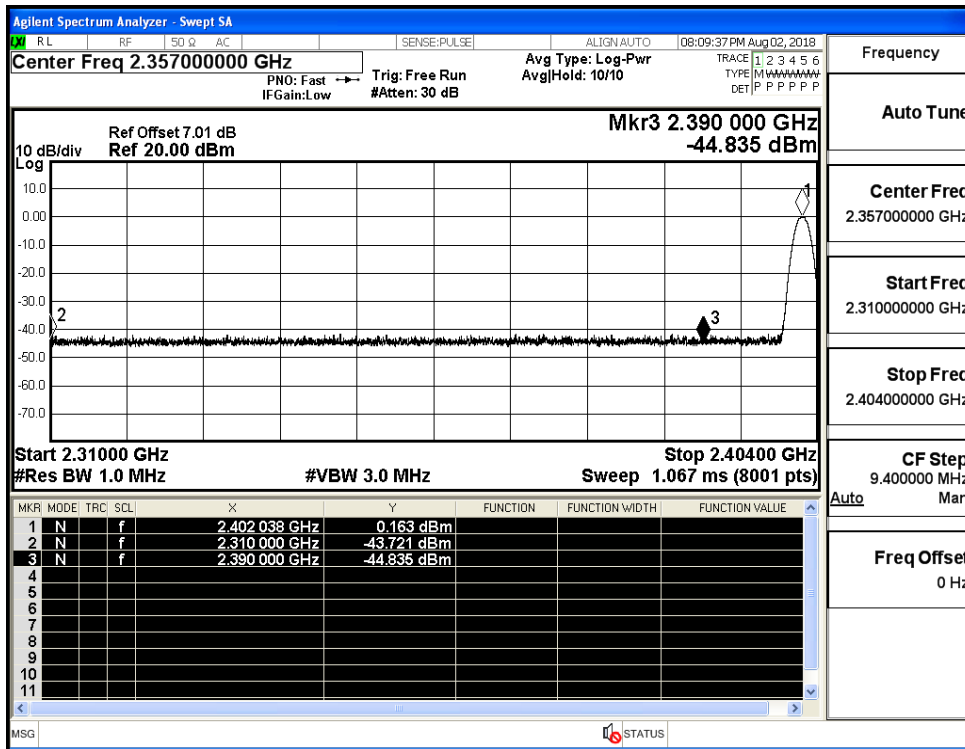
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



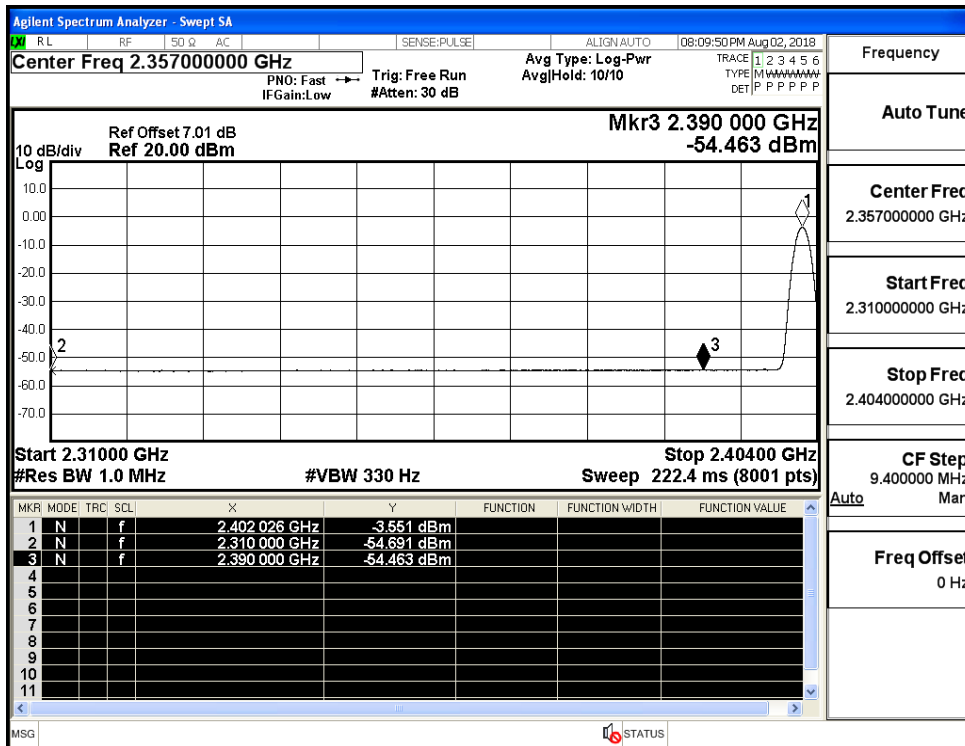
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



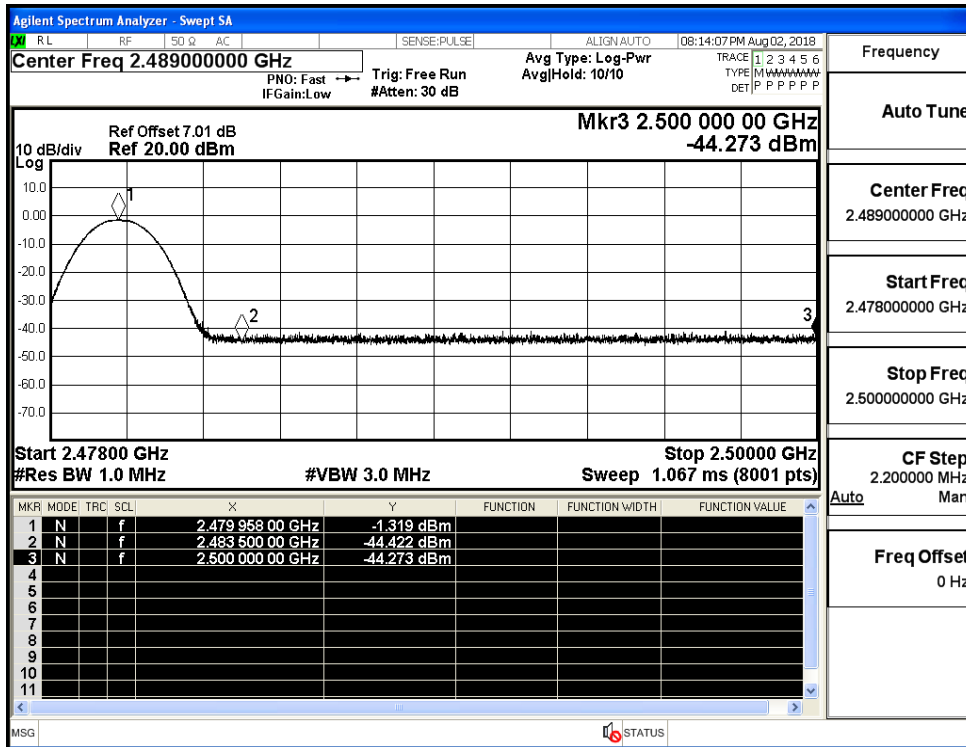
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

