

Appendix A

RF Test Data for BT V5.0(BDR/EDR) (Conducted Measurement)

Product Name: True wireless stereo

Trade Mark: ABKO

Test Model: E10

Environmental Conditions

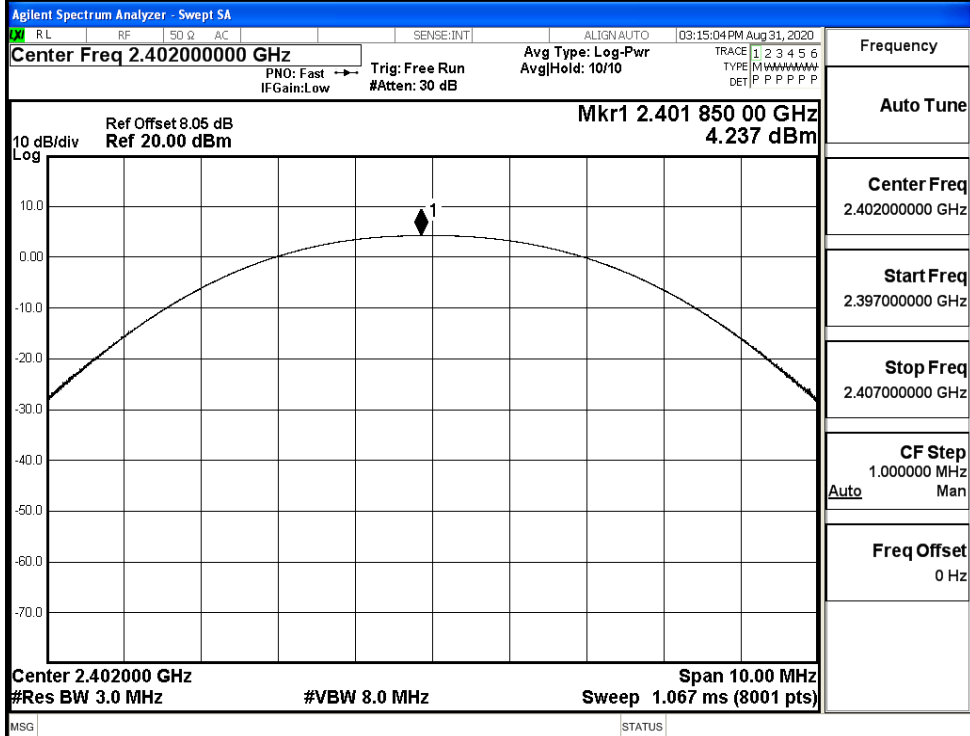
Temperature:	23.6 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Carl Fu
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

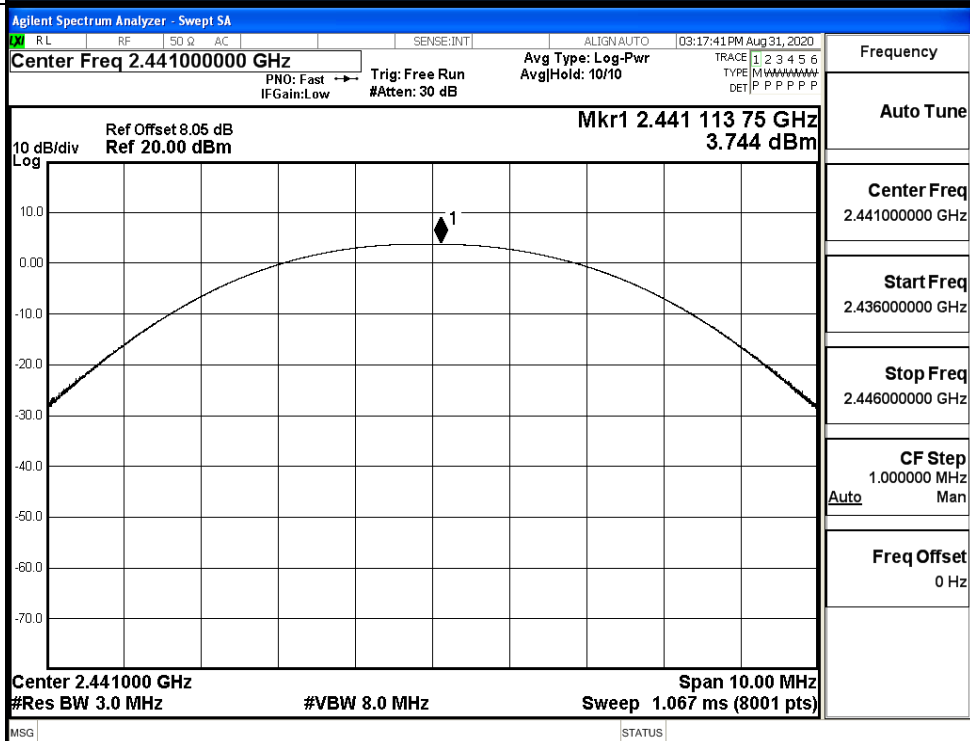
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.237	21	PASS
	MCH	3.744	21	PASS
	HCH	3.900	21	PASS
$\pi/4$ DQPSK	LCH	3.666	21	PASS
	MCH	3.050	21	PASS
	HCH	3.118	21	PASS
8DPSK	LCH	3.683	21	PASS
	MCH	3.102	21	PASS
	HCH	3.217	21	PASS

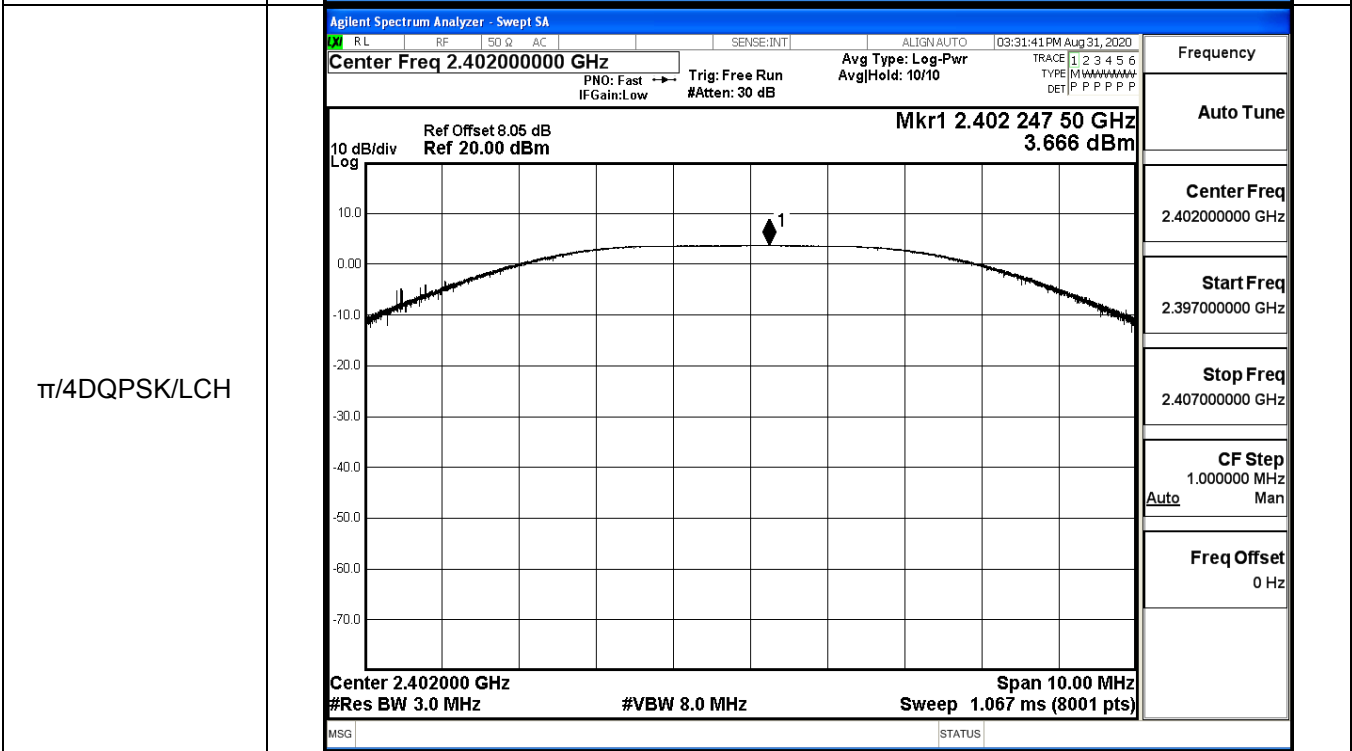
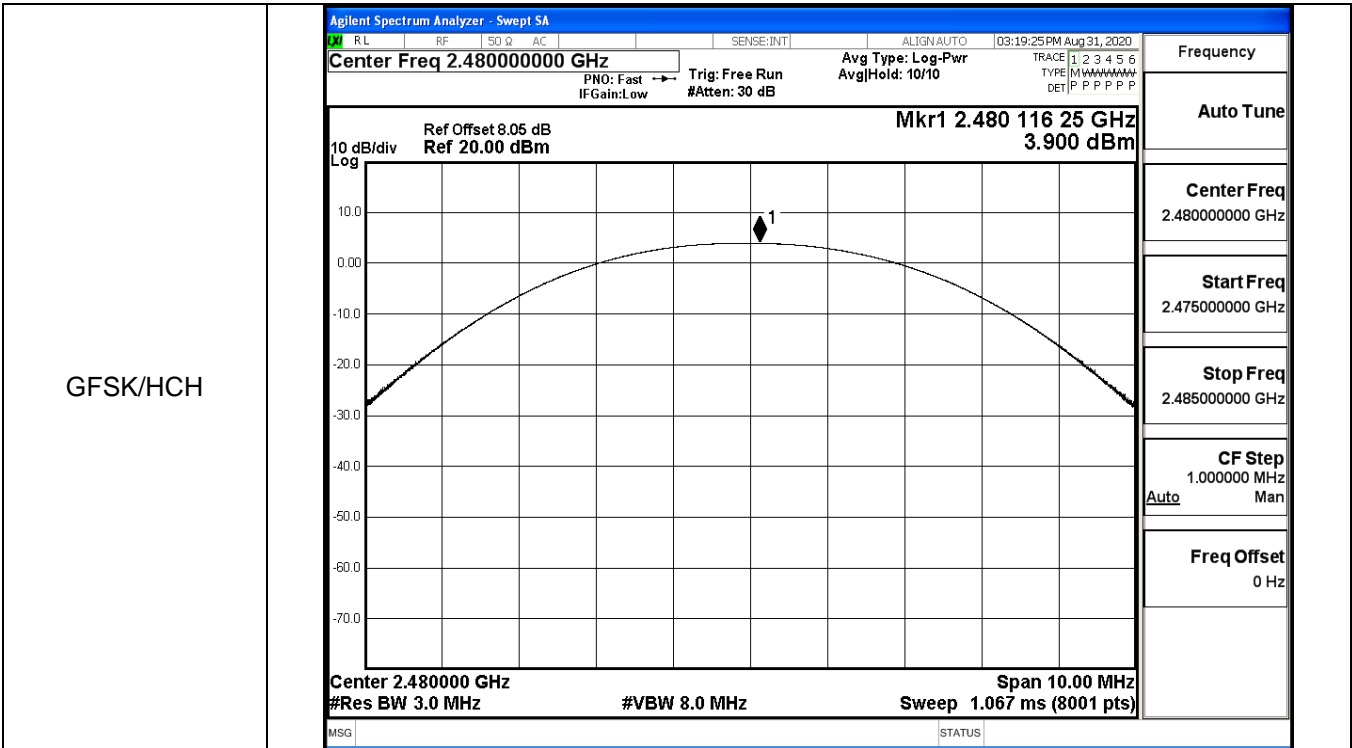
Test Graphs

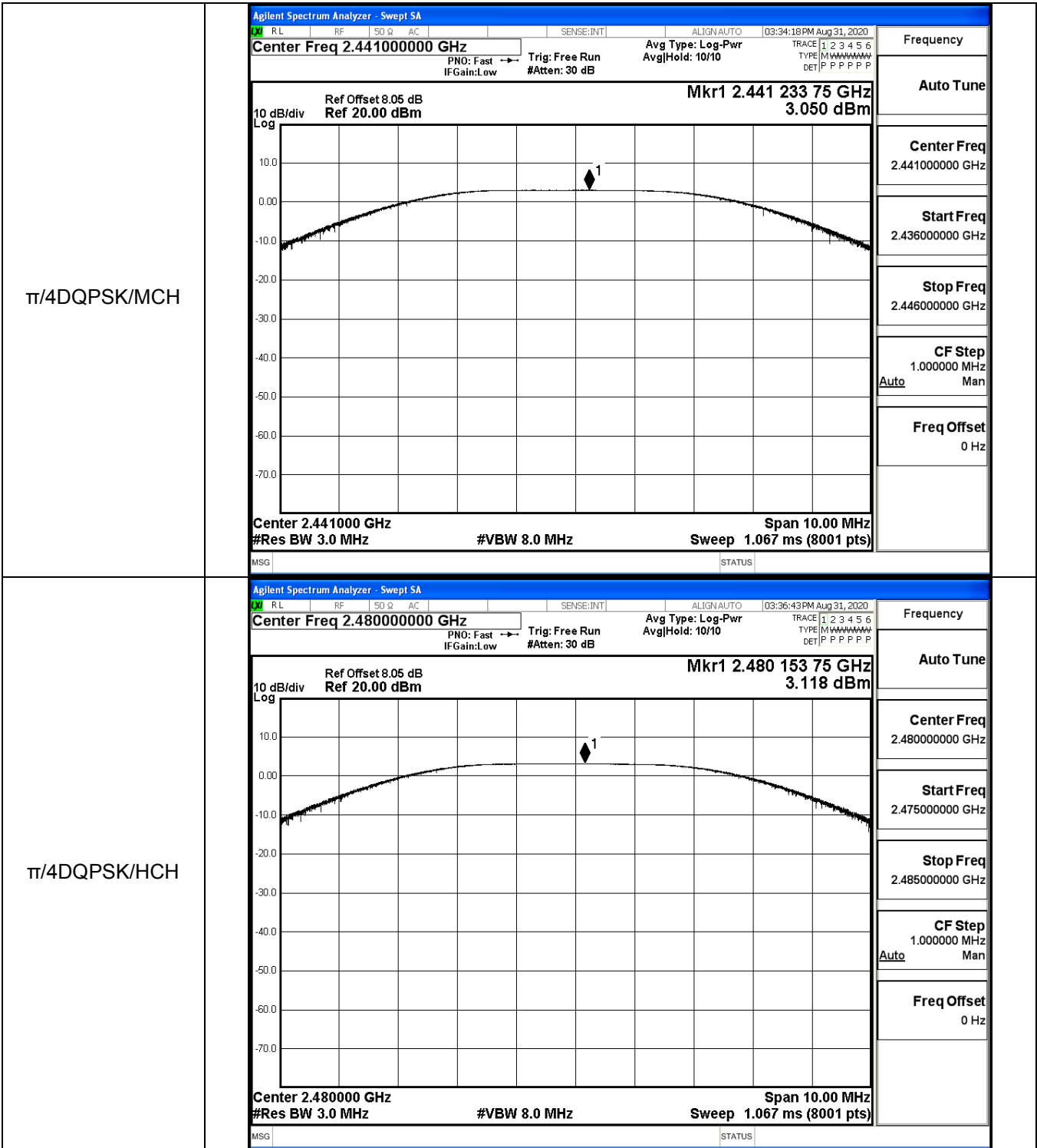
GFSK/LCH



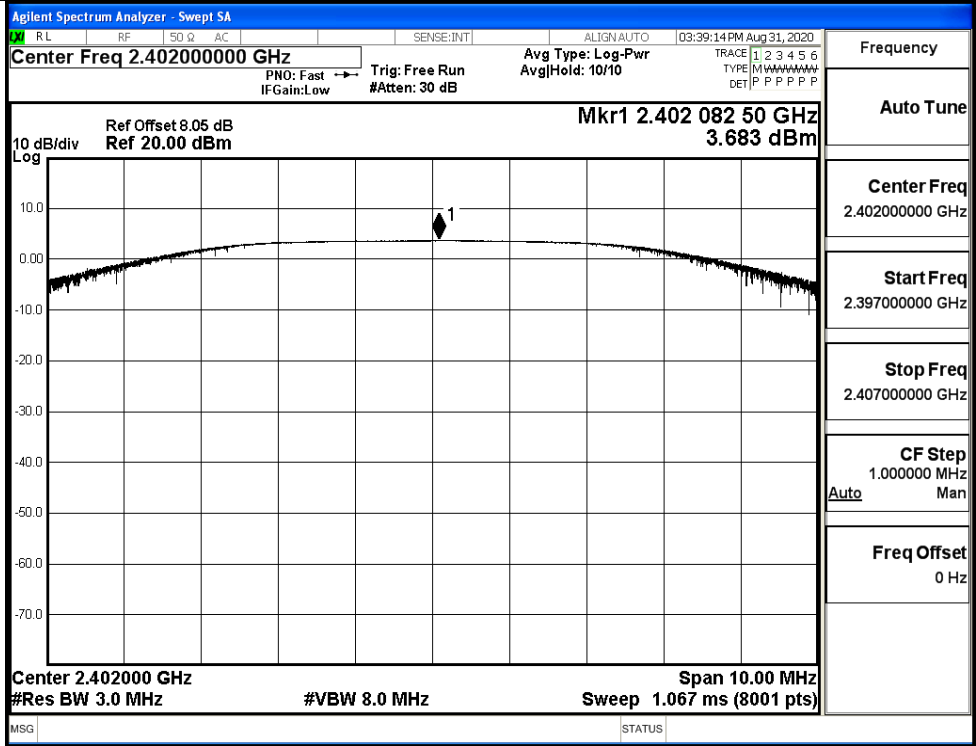
GFSK/MCH



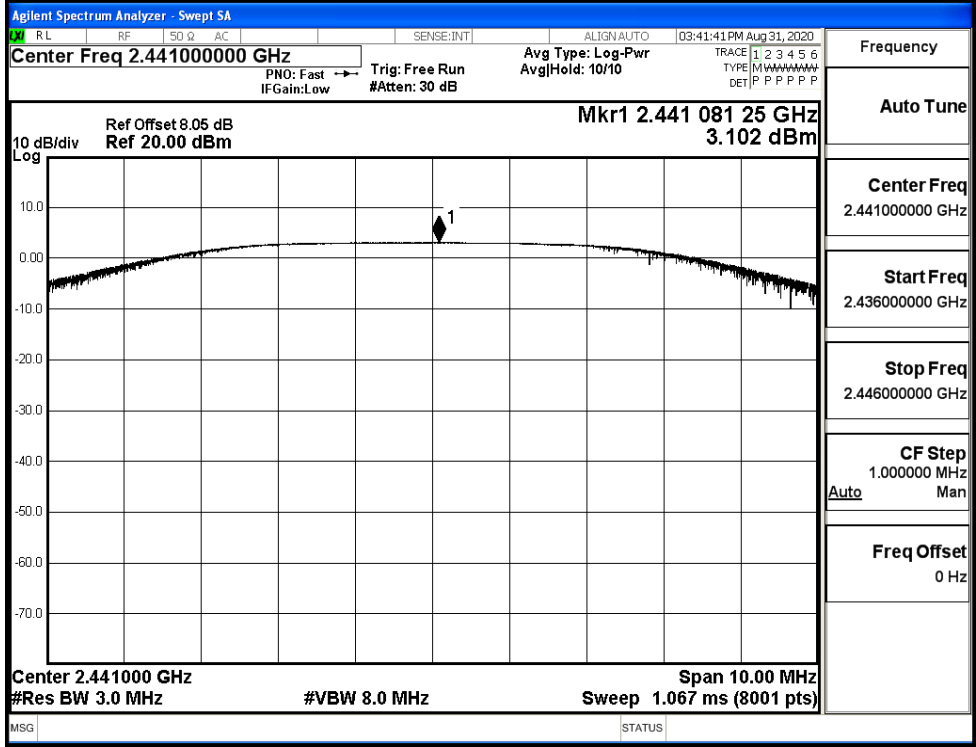




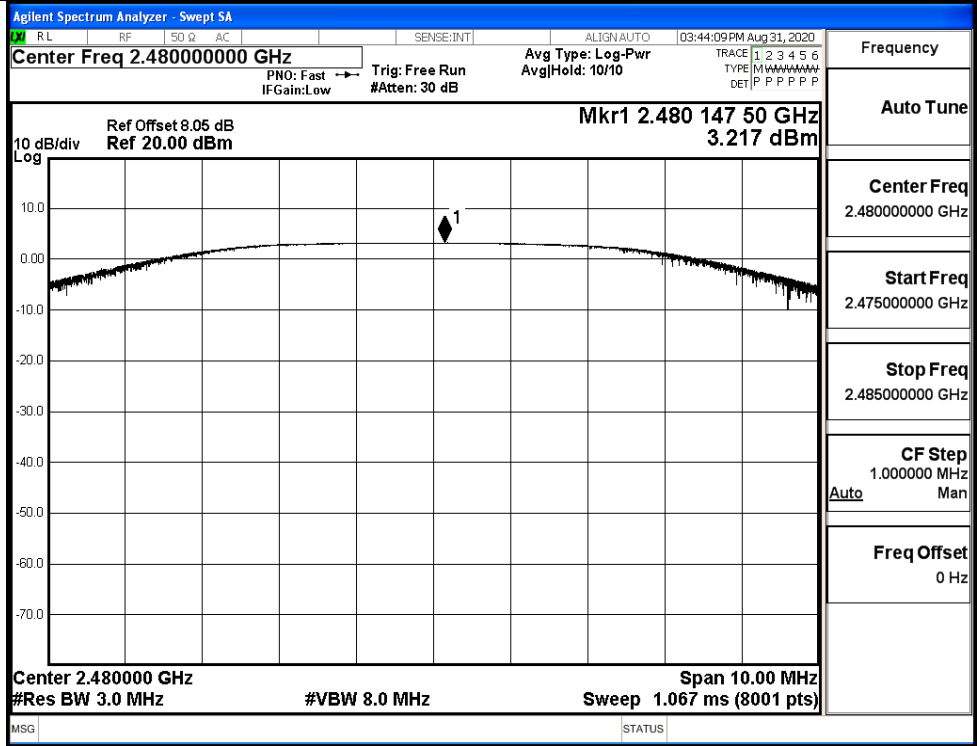
8DPSK/LCH



8DPSK/MCH

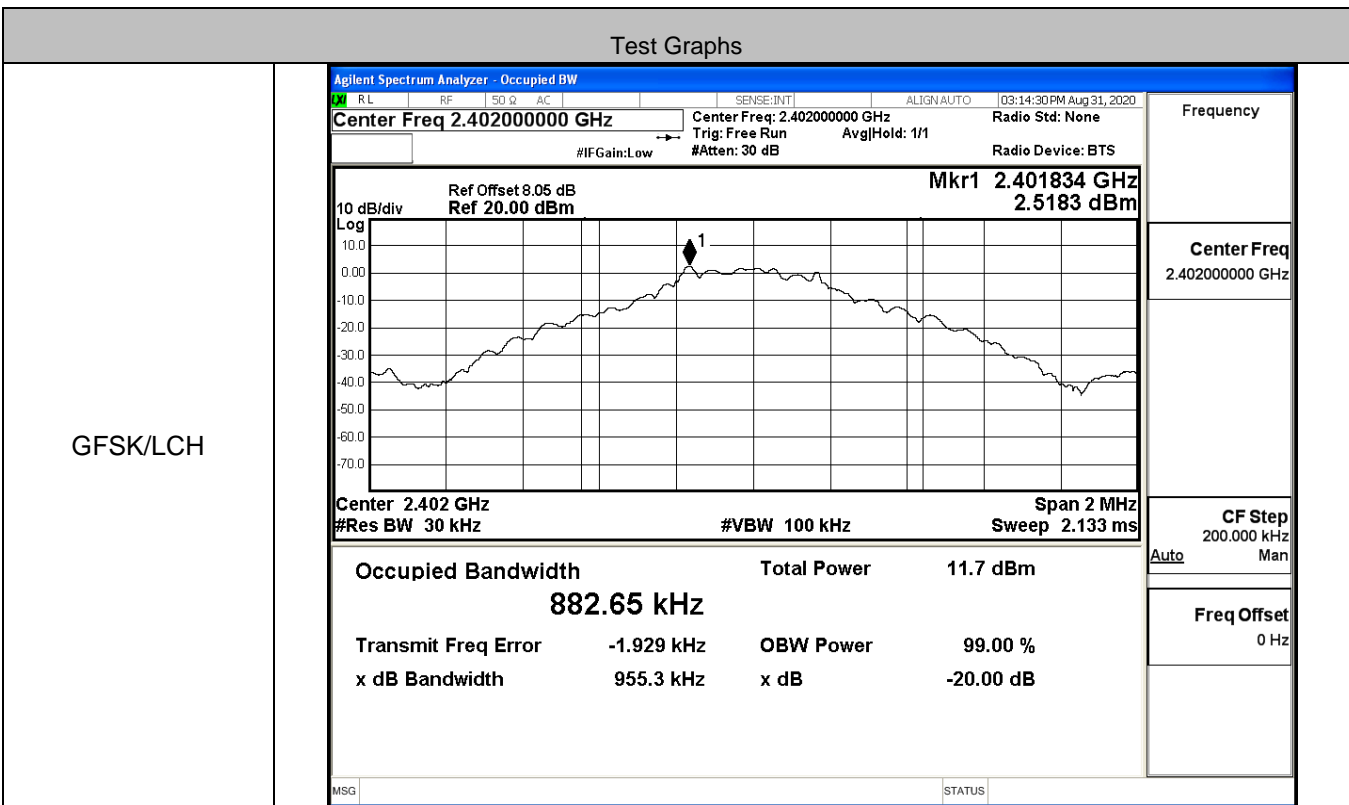


8DPSK/HCH

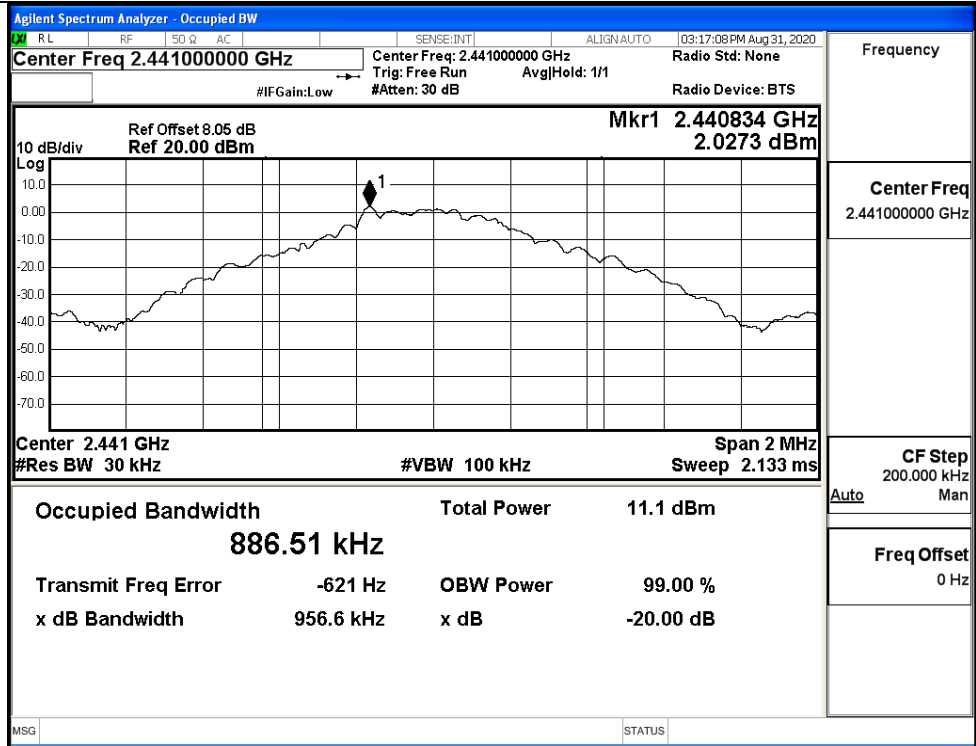


A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9553	Not Specified	PASS
	MCH	0.9566	Not Specified	PASS
	HCH	0.9564	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.861	Not Specified	PASS
	MCH	1.745	Not Specified	PASS
	HCH	1.905	Not Specified	PASS
8DPSK	LCH	1.885	Not Specified	PASS
	MCH	1.883	Not Specified	PASS
	HCH	1.881	Not Specified	PASS

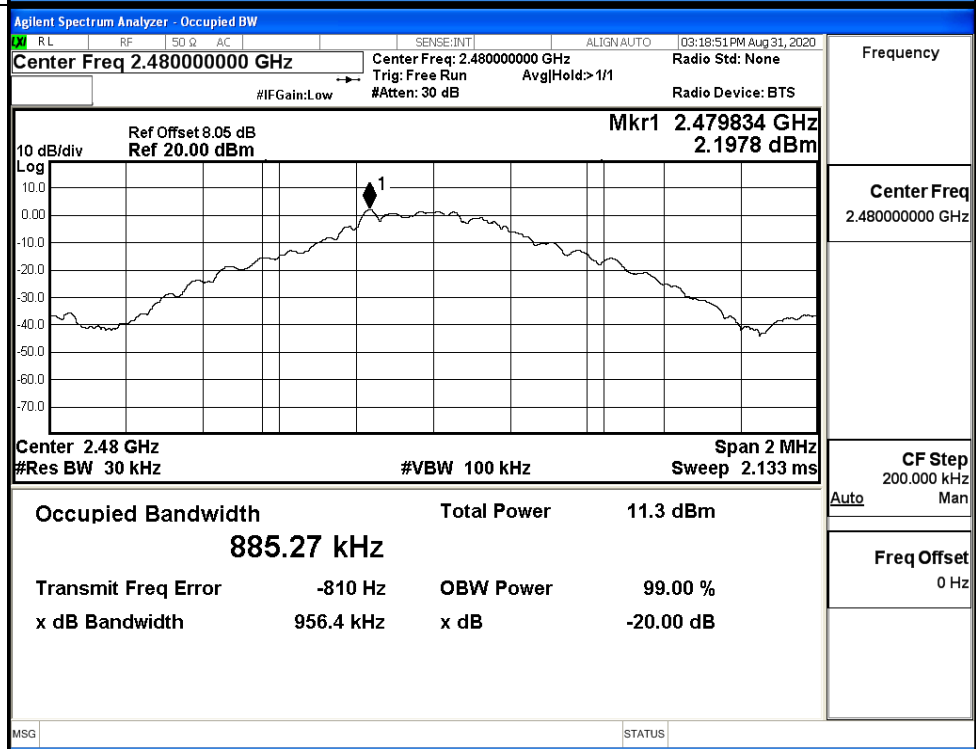


GFSK/MCH



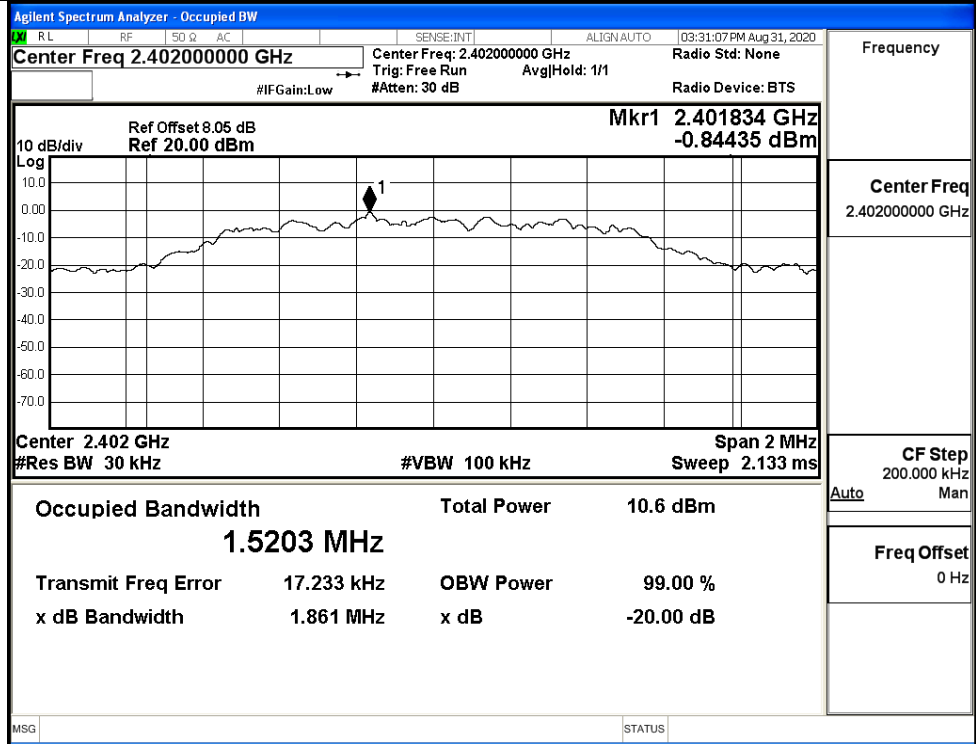
Frequency	2.441000000 GHz
Center Freq	2.441000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

GFSK/HCH



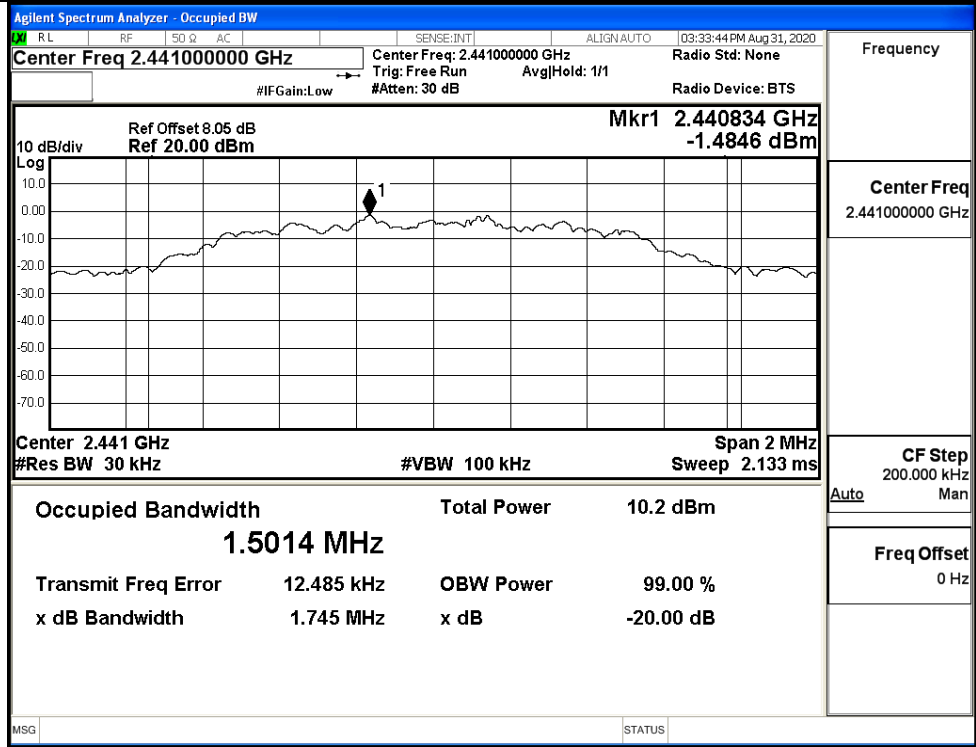
Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK/LCH



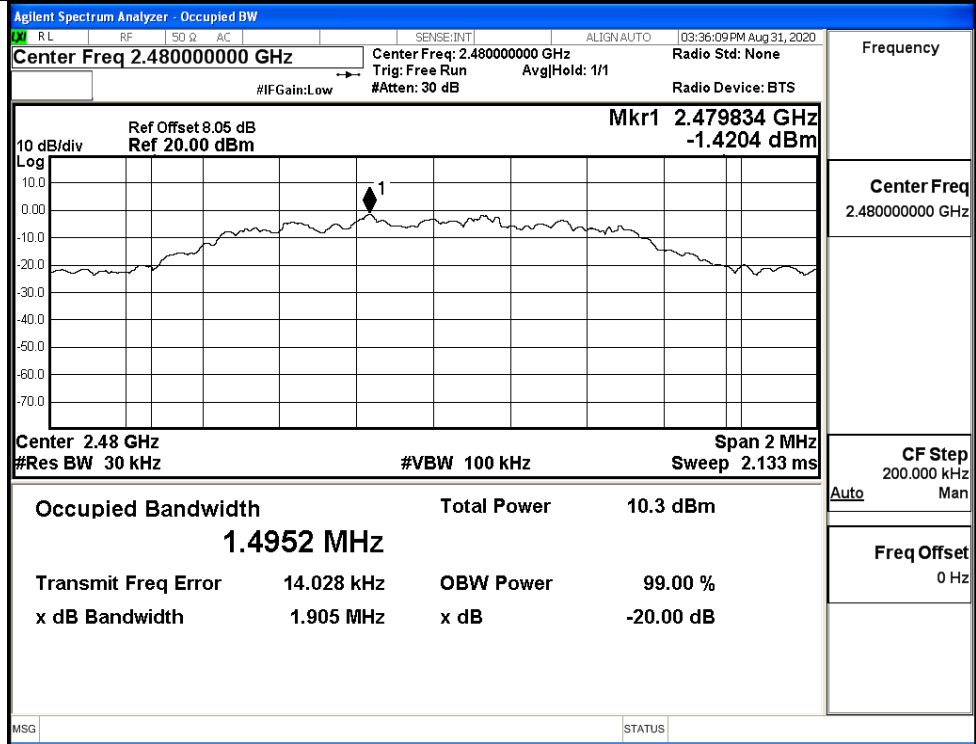
Frequency	2.40200000 GHz
Center Freq	2.40200000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK/MCH

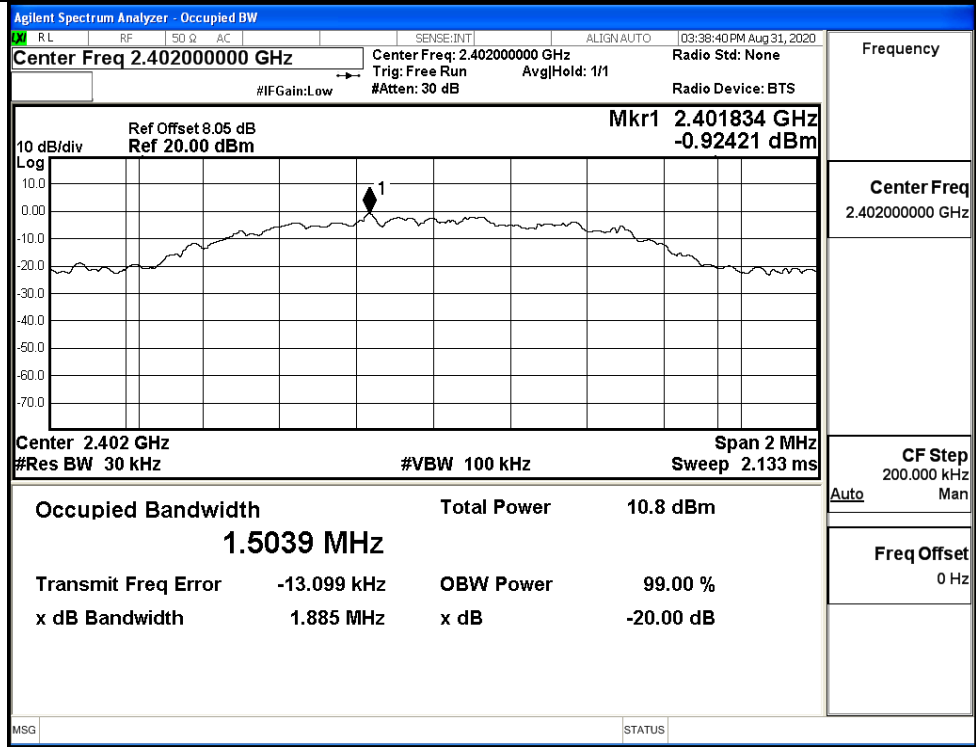


Frequency	2.44100000 GHz
Center Freq	2.44100000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

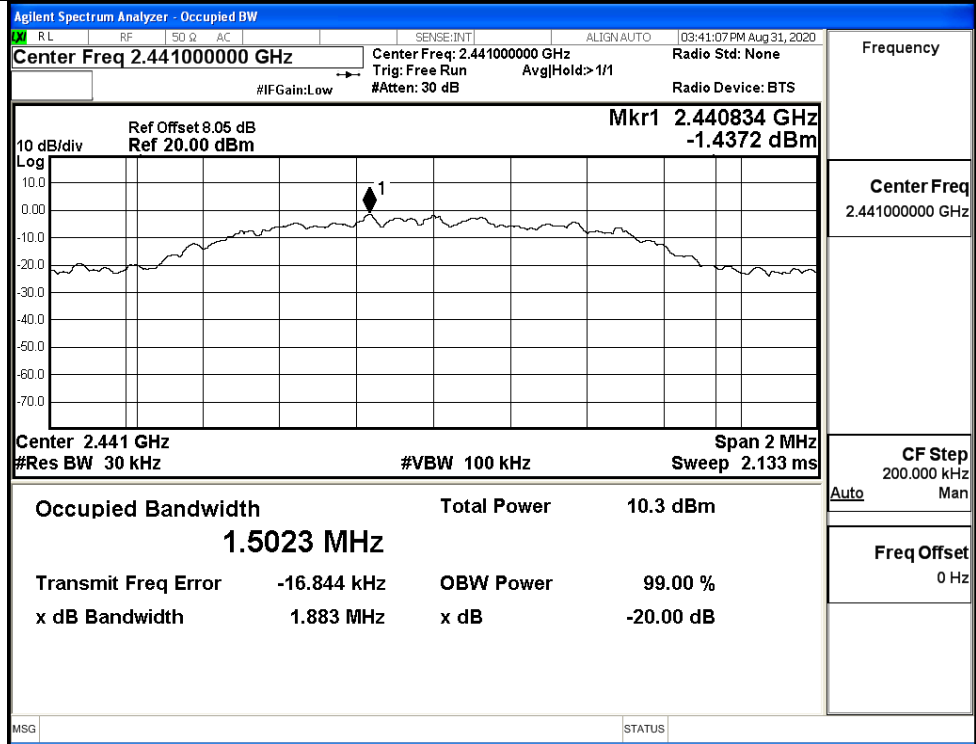
$\pi/4$ DQPSK/HCH



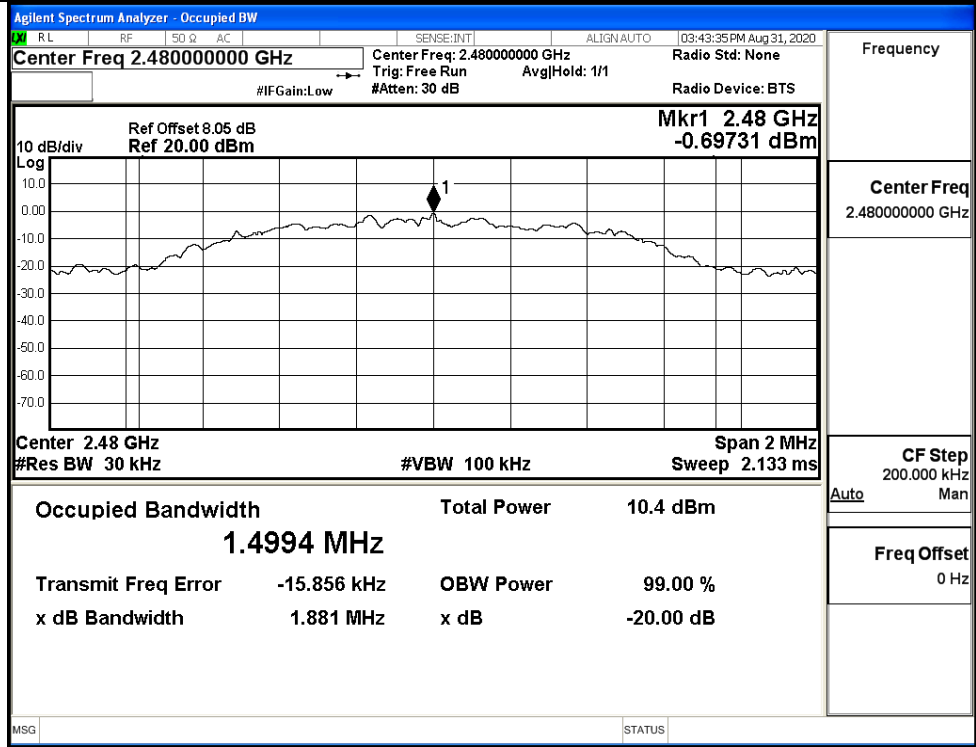
8DPSK/LCH



8DPSK/MCH

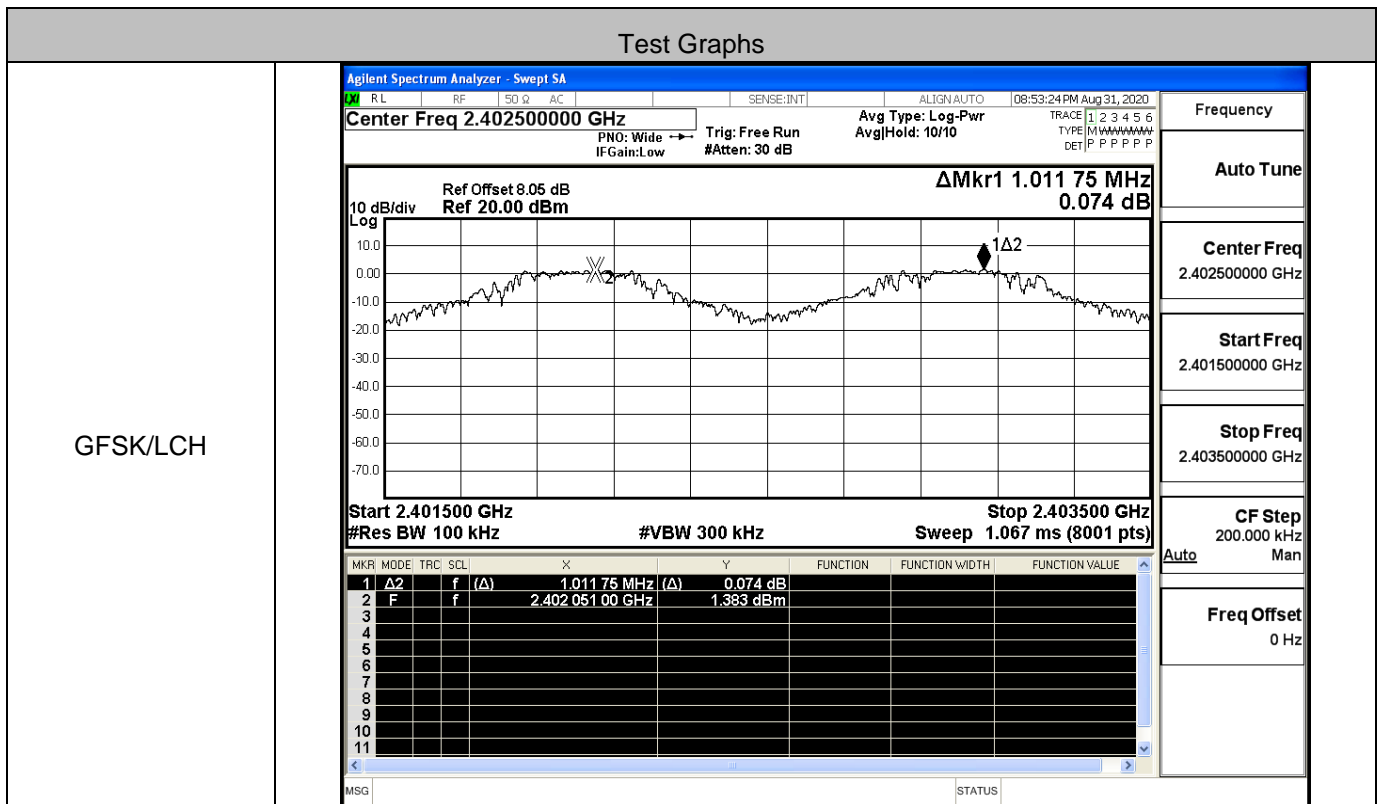


8DPSK/HCH

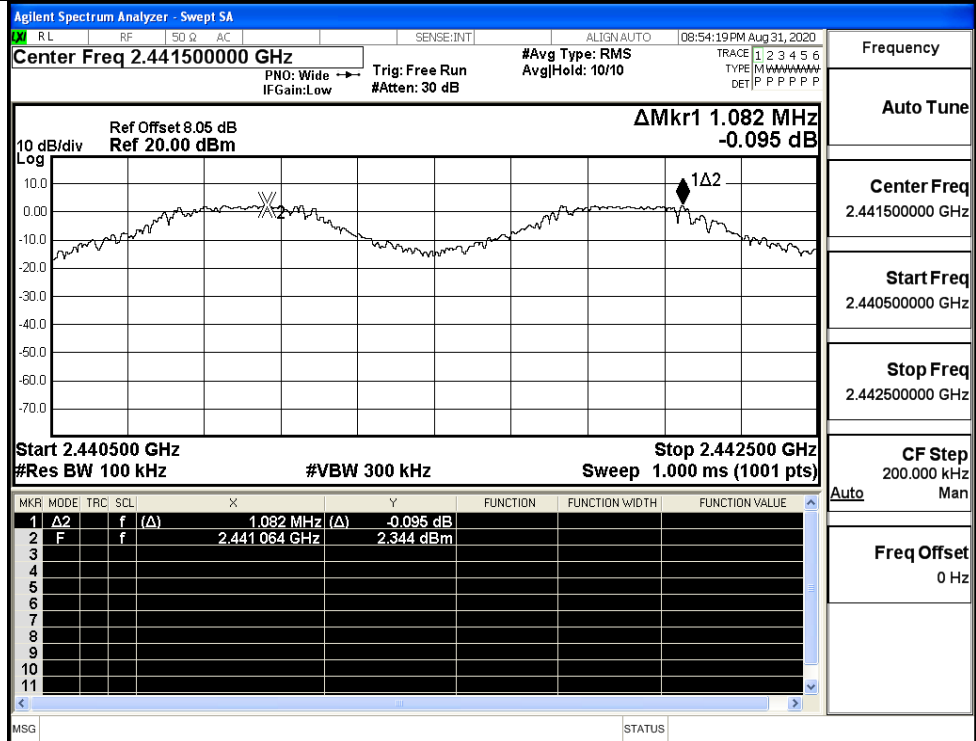


A.3 Carrier Frequency Separation

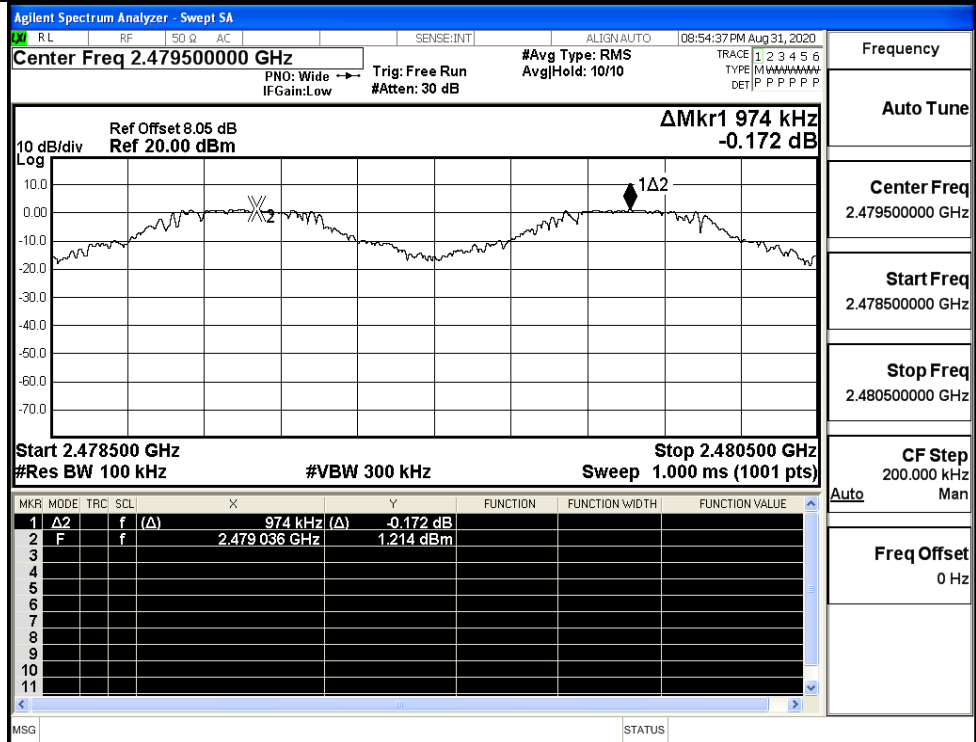
Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.012	0.638	PASS
	MCH	1.082	0.638	PASS
	HCH	0.974	0.638	PASS
π/4DQPSK	LCH	1.170	0.863	PASS
	MCH	1.058	0.863	PASS
	HCH	0.954	0.863	PASS
8DPSK	LCH	1.054	0.863	PASS
	MCH	0.920	0.863	PASS
	HCH	1.262	0.863	PASS



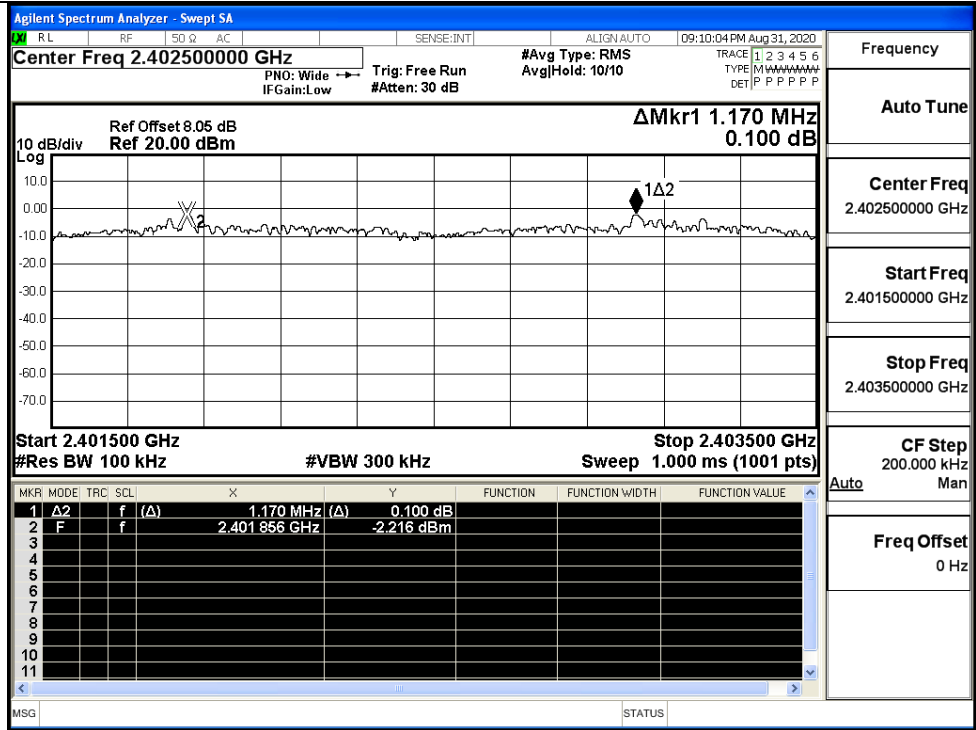
GFSK/MCH



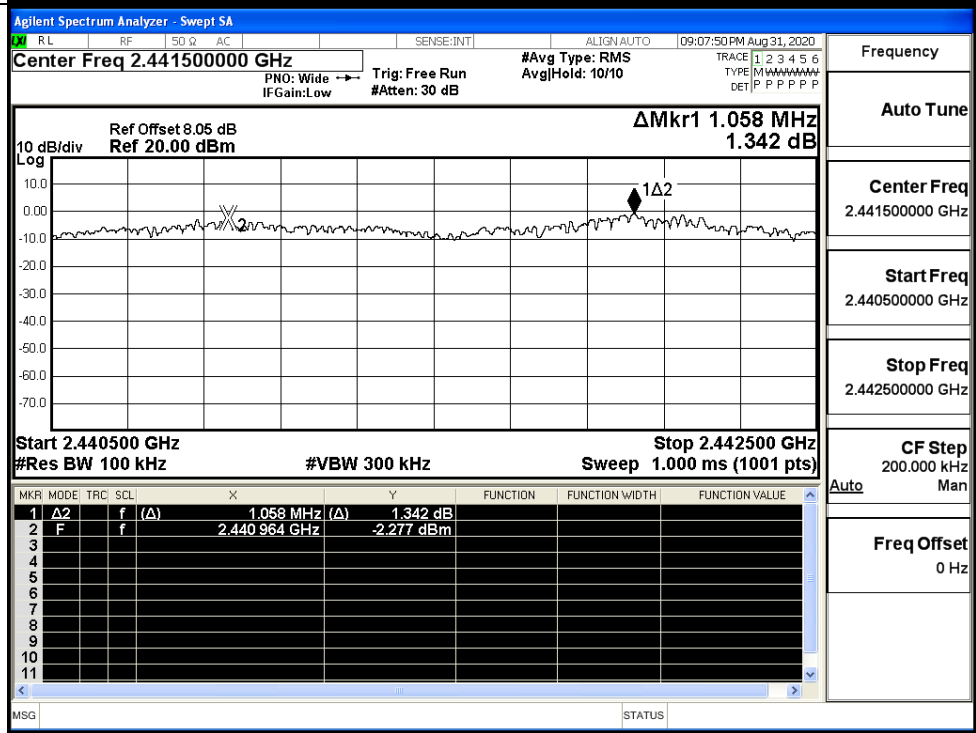
GFSK/HCH



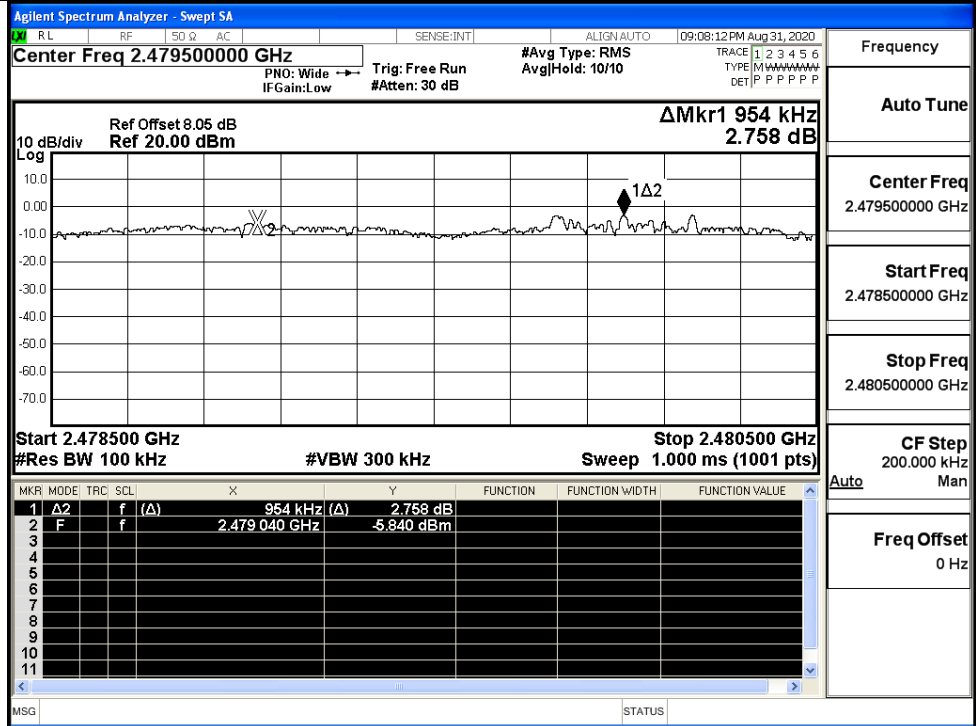
$\pi/4$ DQPSK/LCH



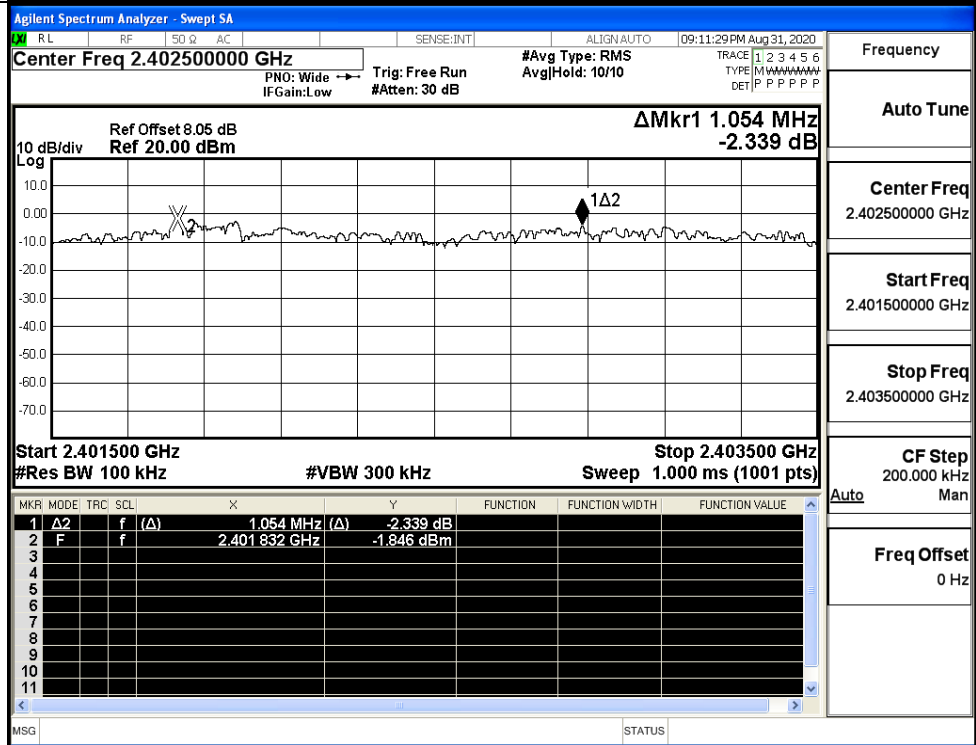
$\pi/4$ DQPSK/MCH



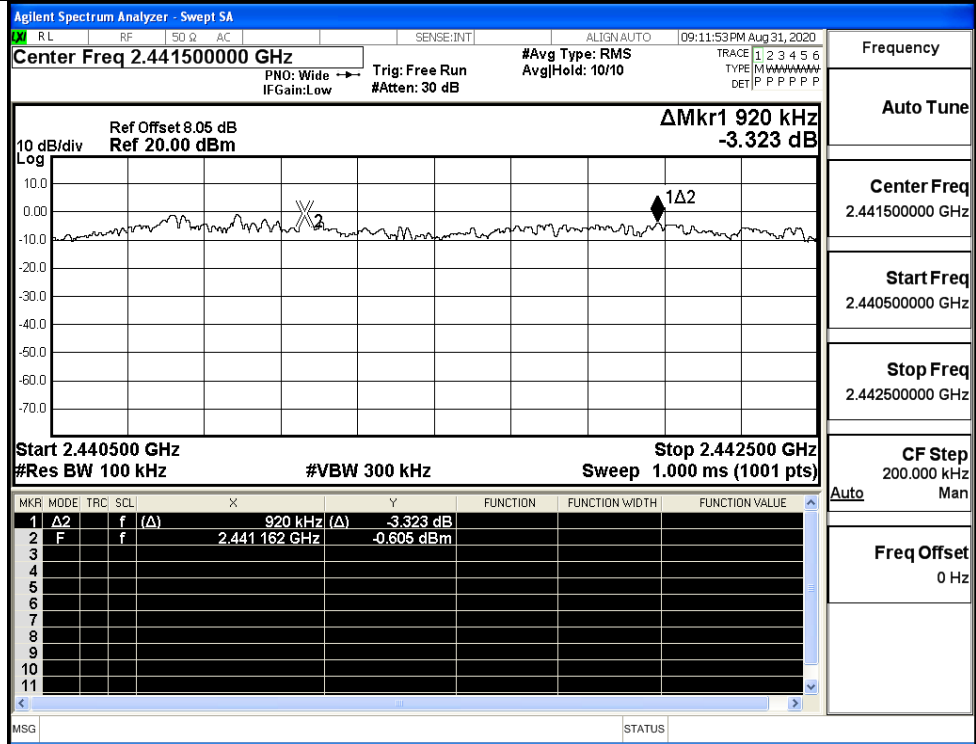
π/4DQPSK/HCH



8DPSK/LCH

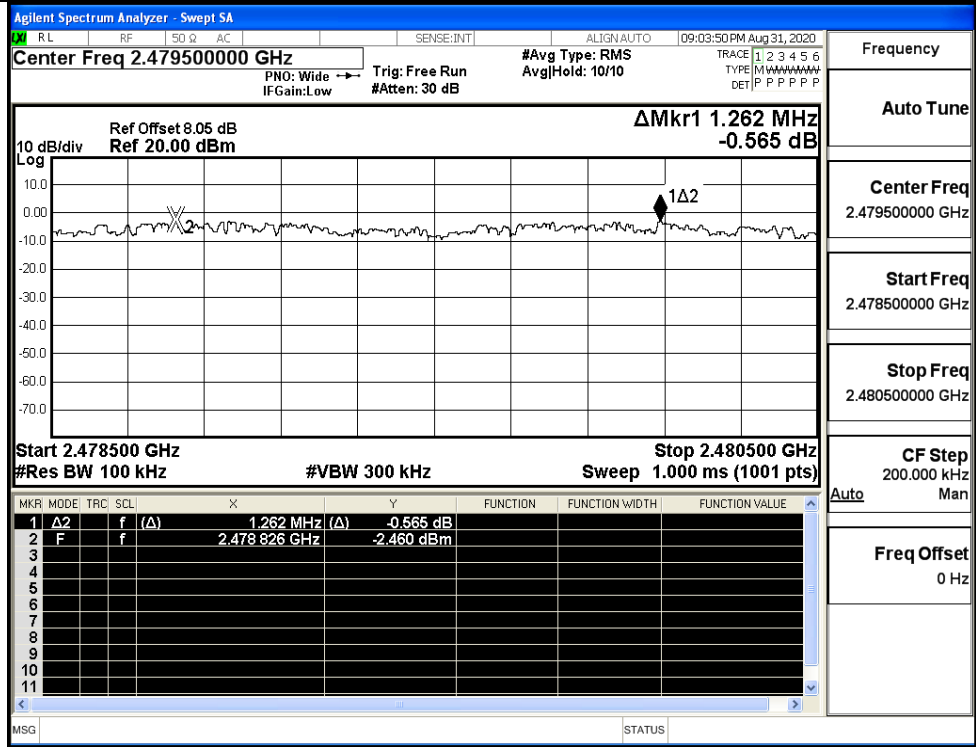


8DPSK/MCH



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

8DPSK/HCH



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

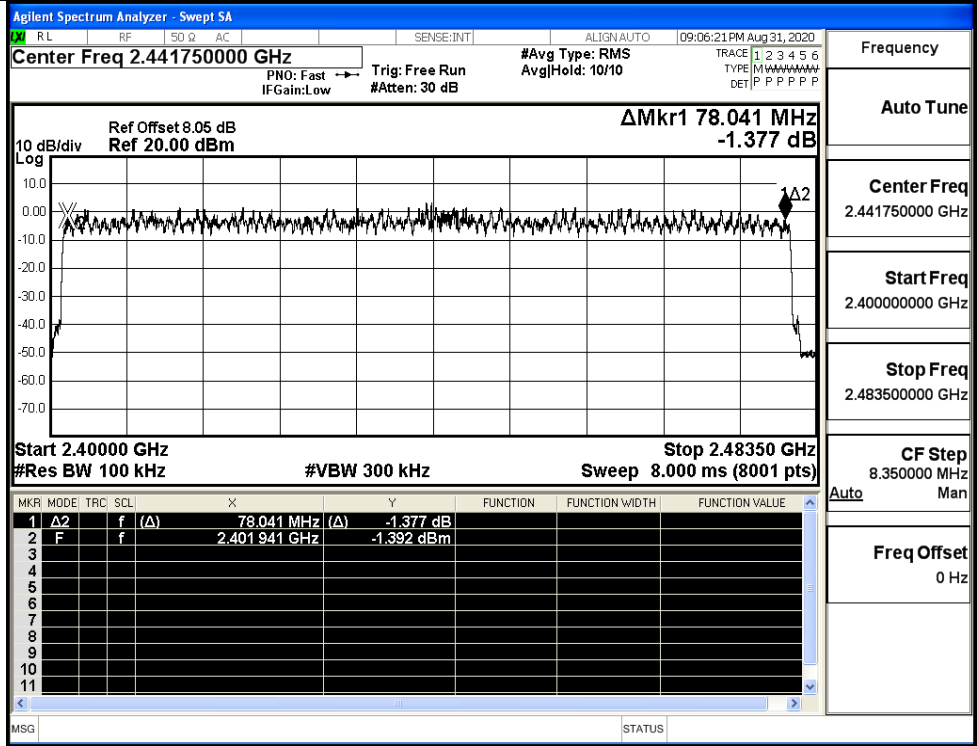
A.4 Hopping Channel Number

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

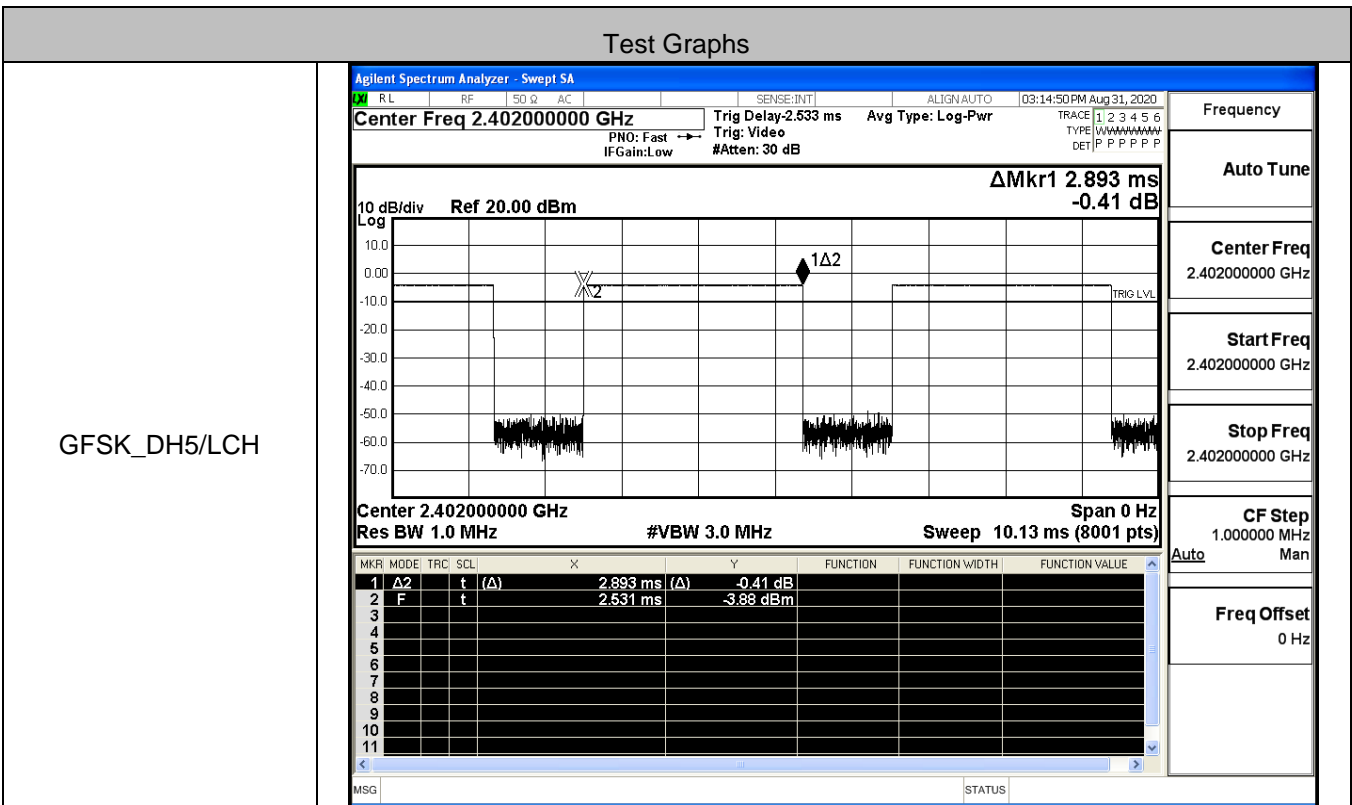
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>ΔMkr1 77.968 MHz -0.021 dB</p> <p>Start 2.40000 GHz Stop 2.48350 GHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <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>77.968 MHz (Δ)</td> <td>-0.021 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>(Δ)</td> <td>2.401 983 GHz</td> <td>1.553 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)	77.968 MHz (Δ)	-0.021 dB				2	F	f	(Δ)	2.401 983 GHz	1.553 dBm				<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 Auto Man</p> <p>Freq Offset 0 Hz</p>
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	Δ 2	f	(Δ)	77.968 MHz (Δ)	-0.021 dB																								
2	F	f	(Δ)	2.401 983 GHz	1.553 dBm																								
<p>$\pi/4$DQPSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>ΔMkr1 78.020 MHz 0.022 dB</p> <p>Start 2.40000 GHz Stop 2.48350 GHz</p> <p>#Res BW 100 kHz #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>0.022 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>(Δ)</td> <td>2.401 795 GHz</td> <td>-3.190 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)	0.022 dB				2	F	f	(Δ)	2.401 795 GHz	-3.190 dBm				<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 Auto Man</p> <p>Freq Offset 0 Hz</p>
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	Δ 2	f	(Δ)	78.020 MHz (Δ)	0.022 dB																								
2	F	f	(Δ)	2.401 795 GHz	-3.190 dBm																								

8DPSK/Hop

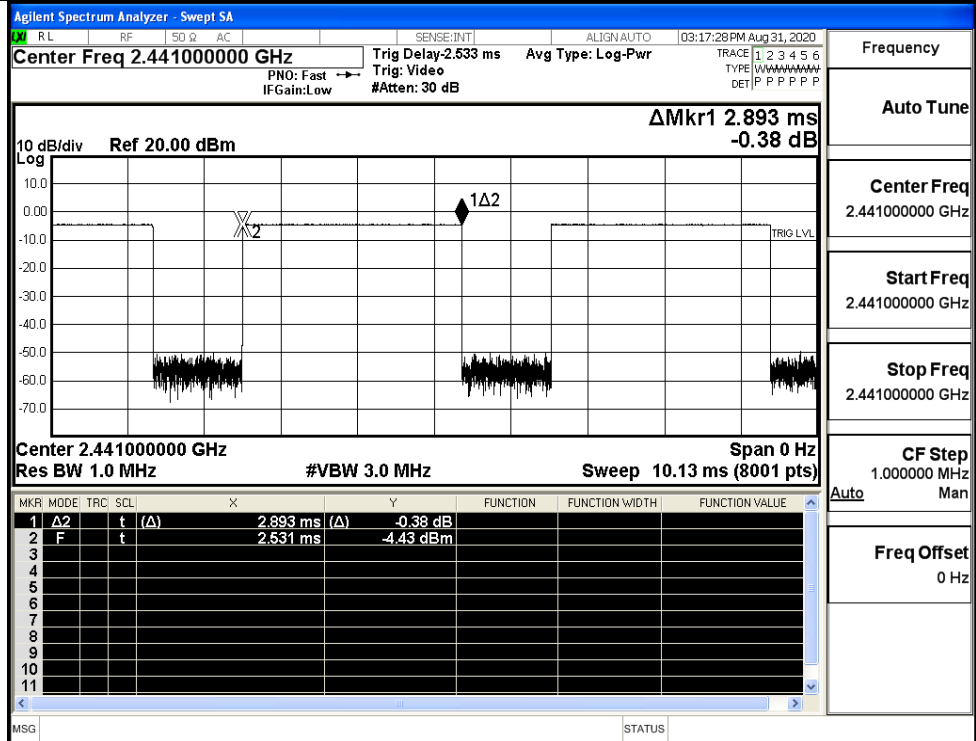


A.5 Dwell Time

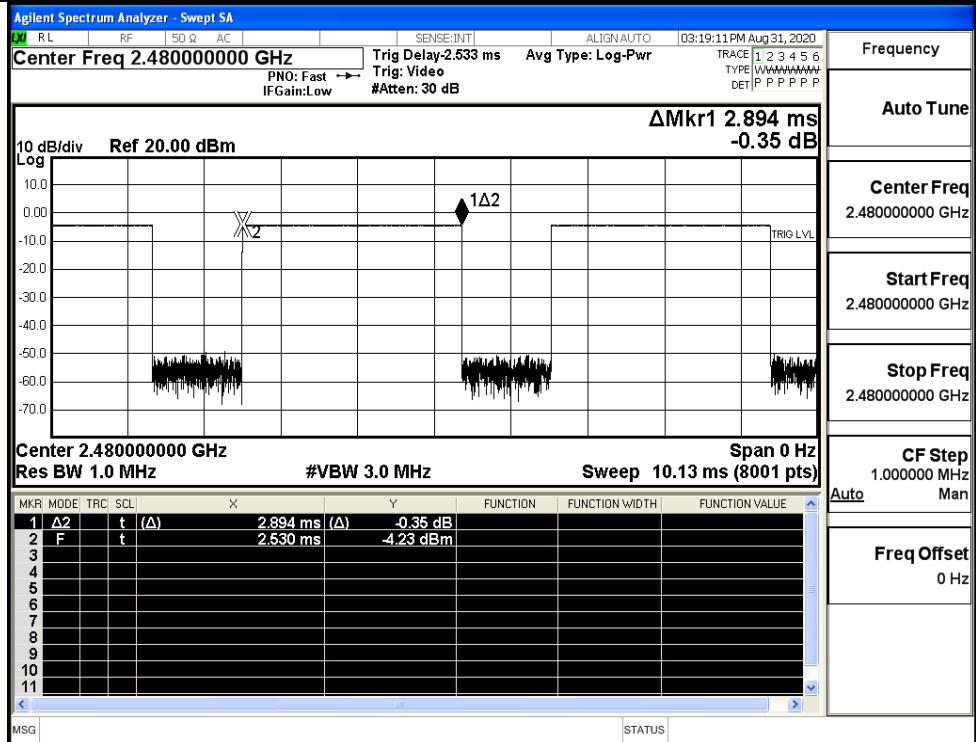
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.89	106.7	0.308	0.4	PASS
	DH5	MCH	2.89	106.7	0.308	0.4	PASS
	DH5	HCH	2.89	106.7	0.308	0.4	PASS
π/4DQPSK	2DH5	LCH	2.89	106.7	0.31	0.4	PASS
	2DH5	MCH	2.89	106.7	0.31	0.4	PASS
	2DH5	HCH	2.89	106.7	0.31	0.4	PASS
8DPSK	3DH5	LCH	2.89	106.7	0.31	0.4	PASS
	3DH5	MCH	2.89	106.7	0.31	0.4	PASS
	3DH5	HCH	2.89	106.7	0.31	0.4	PASS



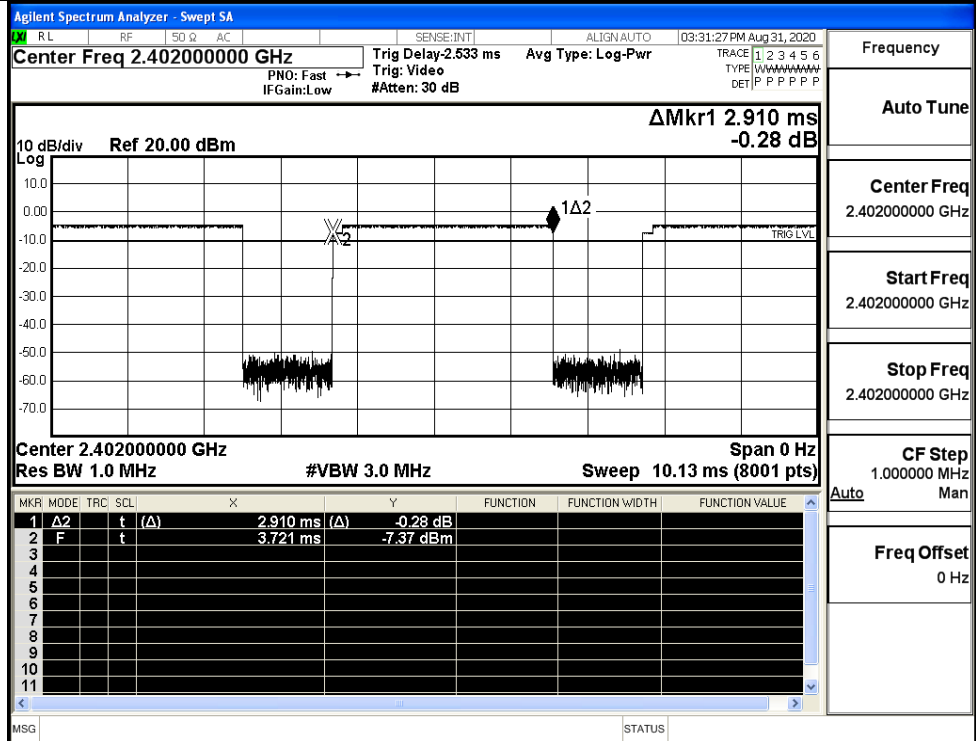
GFSK_DH5/MCH



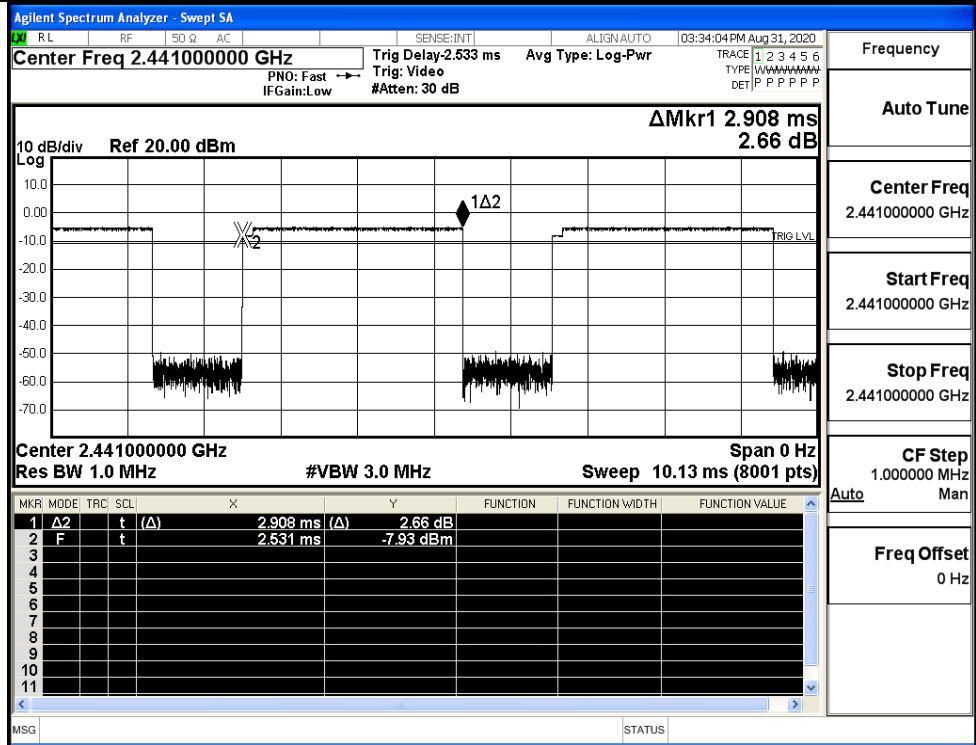
GFSK_DH5/HCH



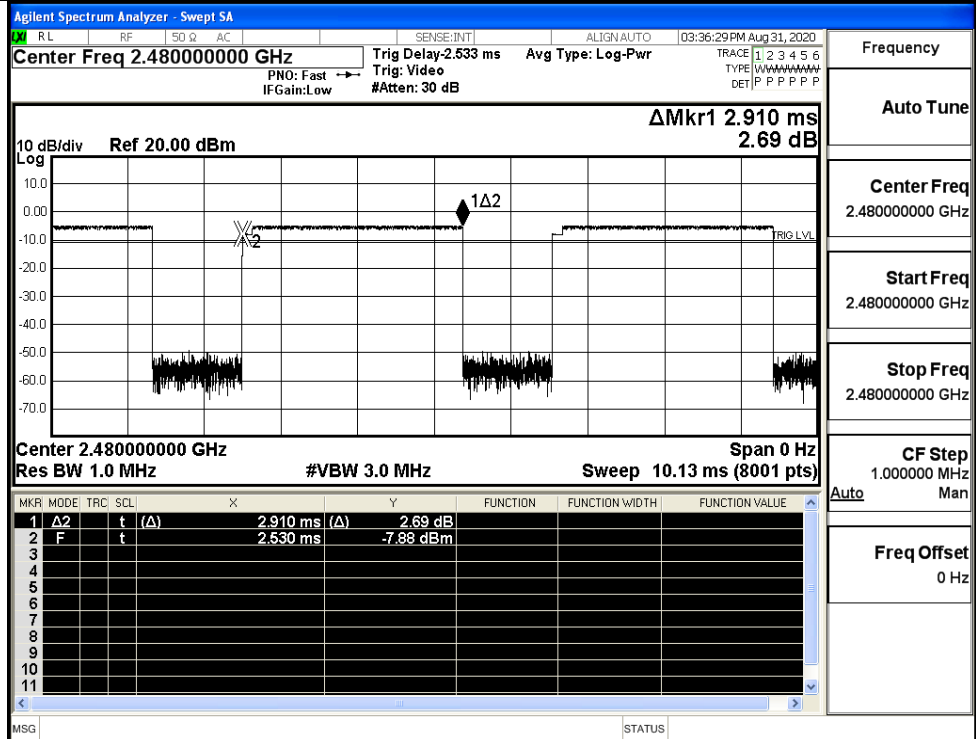
$\pi/4$ DQPSK
_2DH5/LCH



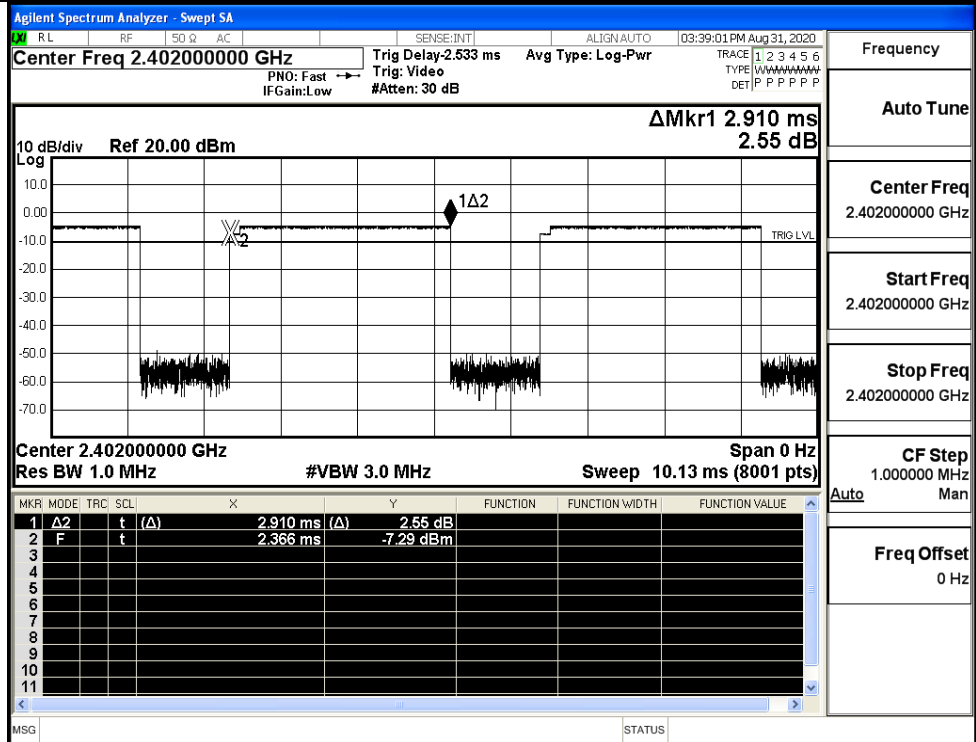
$\pi/4$ DQPSK
_2DH5/MCH



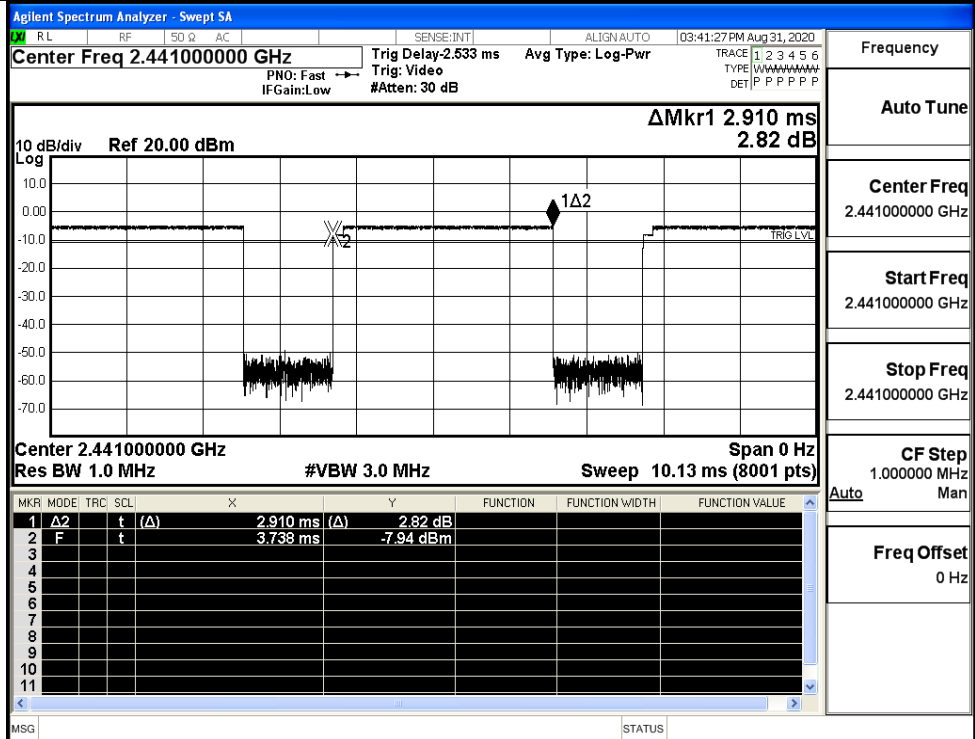
$\pi/4$ DQPSK
_2DH5/HCH



8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



Frequency

Auto Tune

Center Freq
2.441000000 GHz

Start Freq
2.441000000 GHz

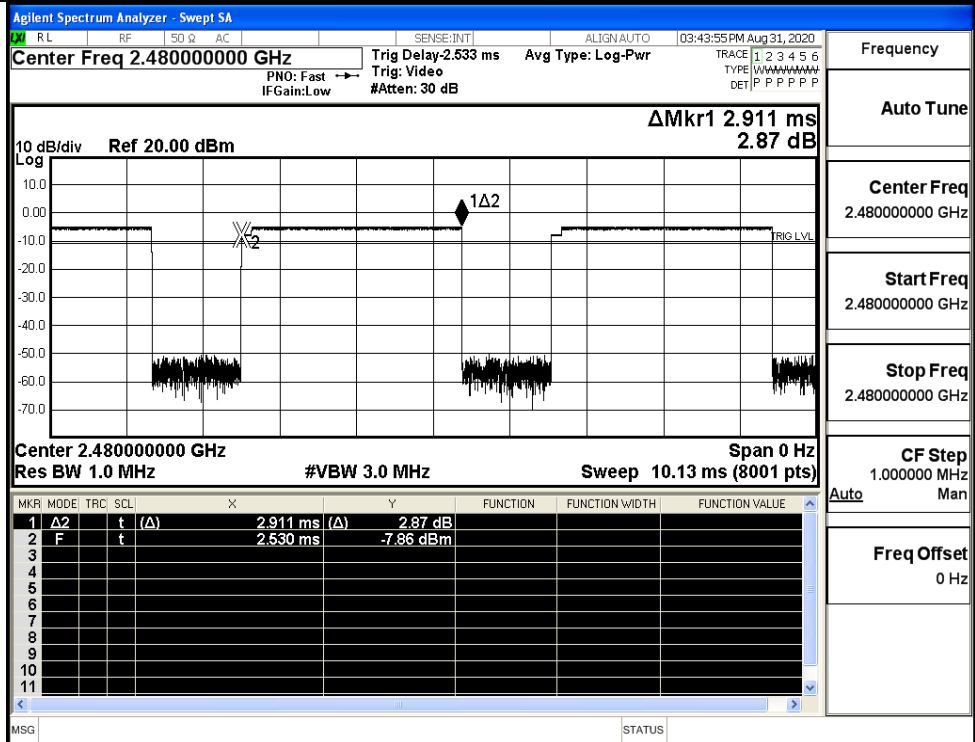
Stop Freq
2.441000000 GHz

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

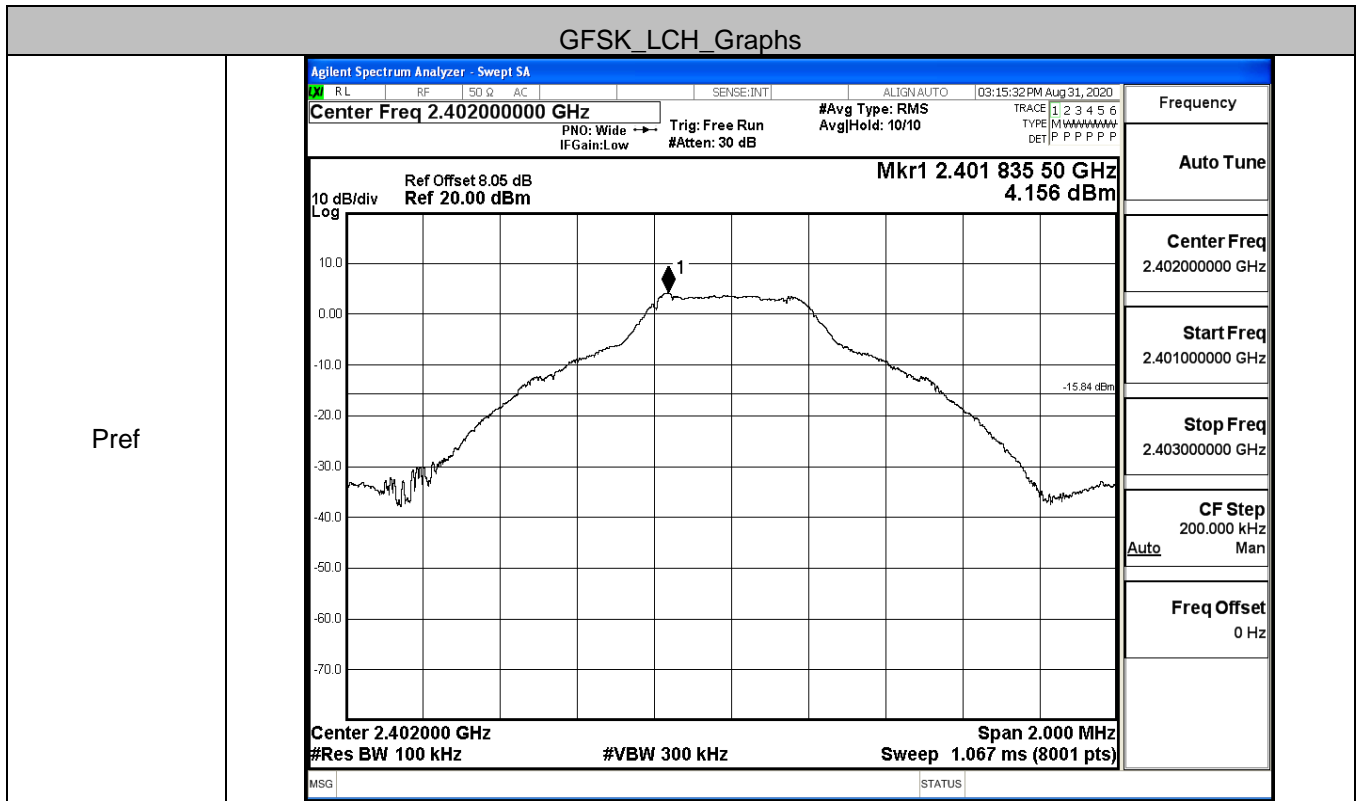
Auto Man

Freq Offset
0 Hz

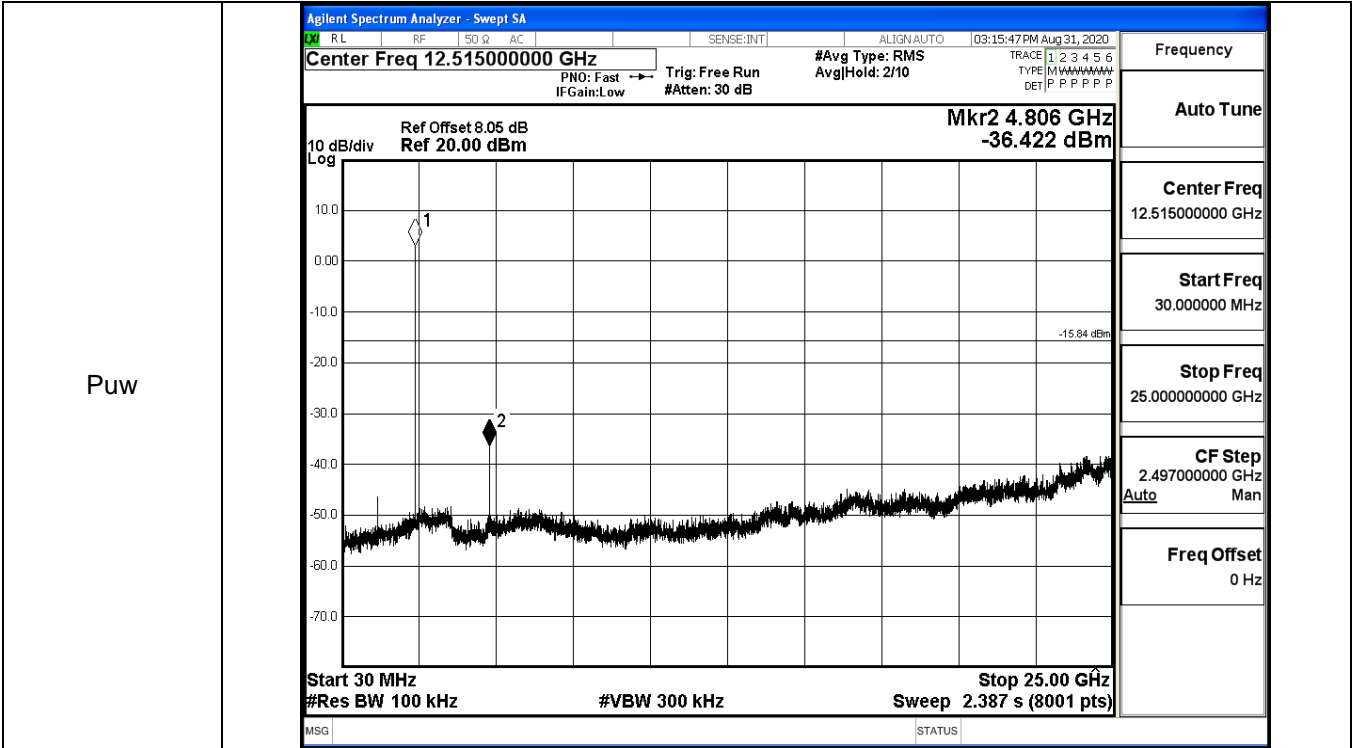
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.156	-36.422	-15.844	PASS
	MCH	3.621	-35.278	-16.379	PASS
	HCH	3.578	-31.851	-16.422	PASS
$\pi/4$ DQPSK	LCH	1.672	-36.688	-18.328	PASS
	MCH	2.465	-37.646	-17.535	PASS
	HCH	2.391	-35.760	-17.609	PASS
8DPSK	LCH	2.325	-38.133	-17.675	PASS
	MCH	2.491	-37.767	-17.509	PASS
	HCH	2.558	-37.598	-17.442	PASS

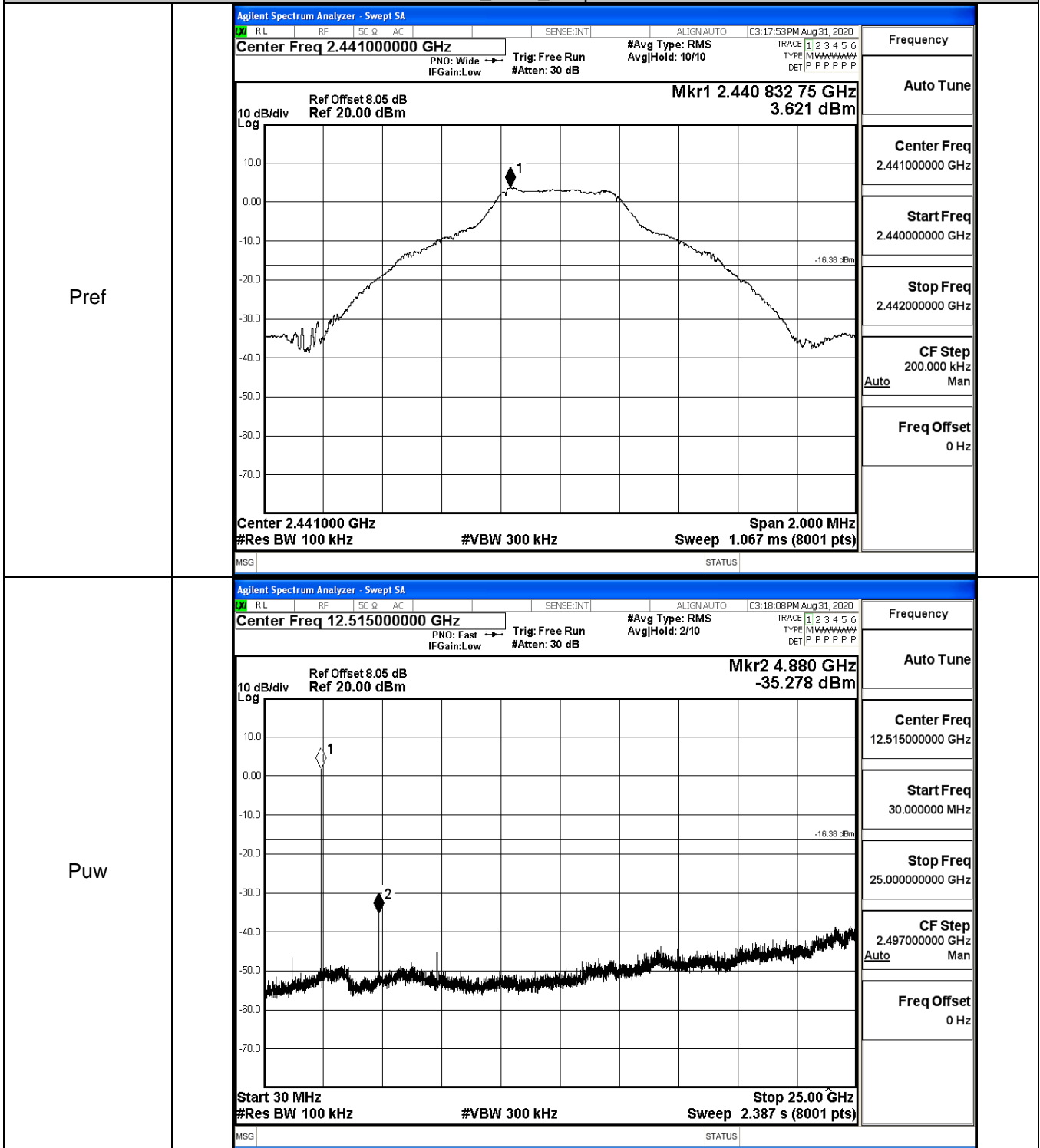
GFSK_LCH_Graphs



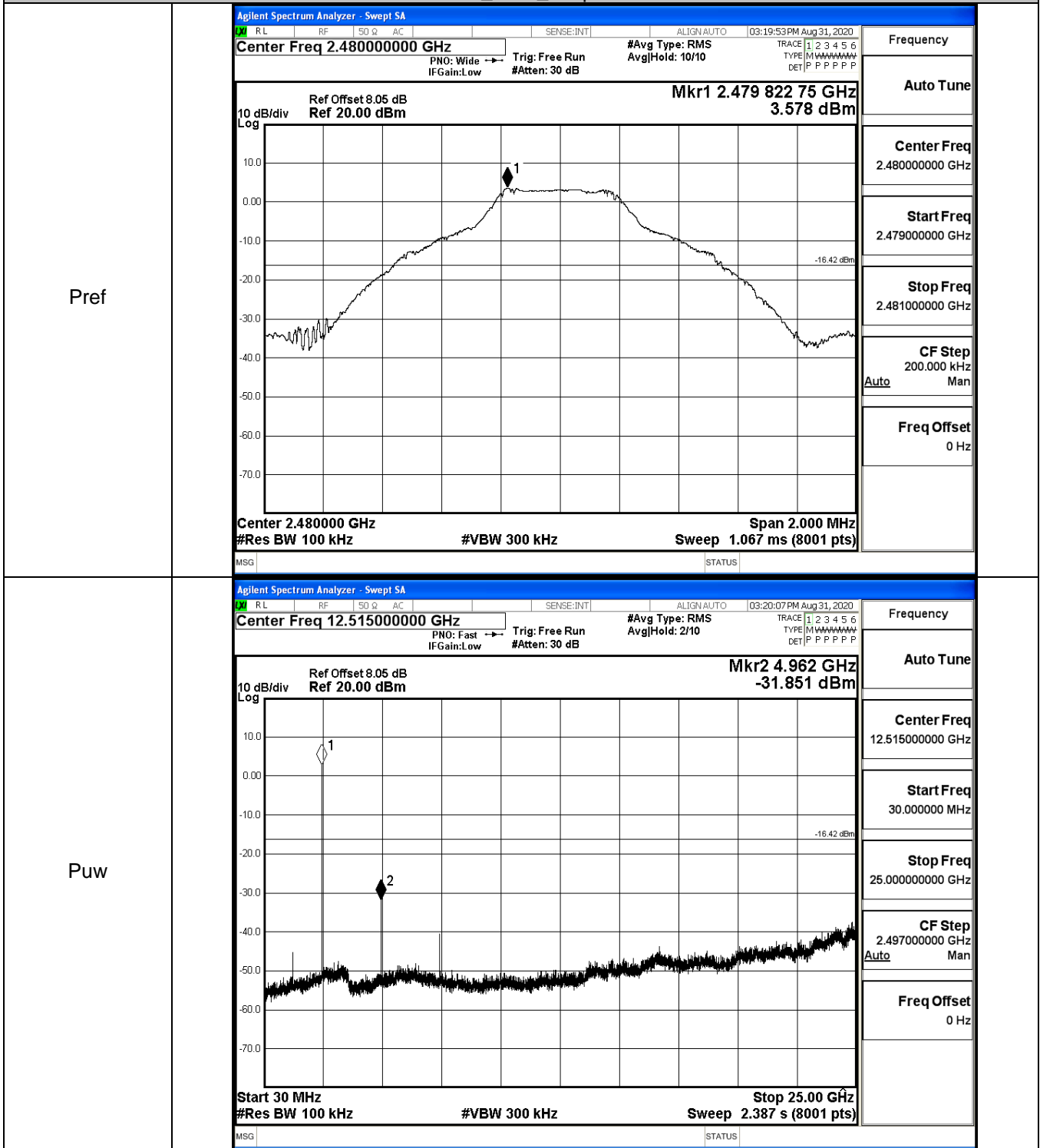
Pref



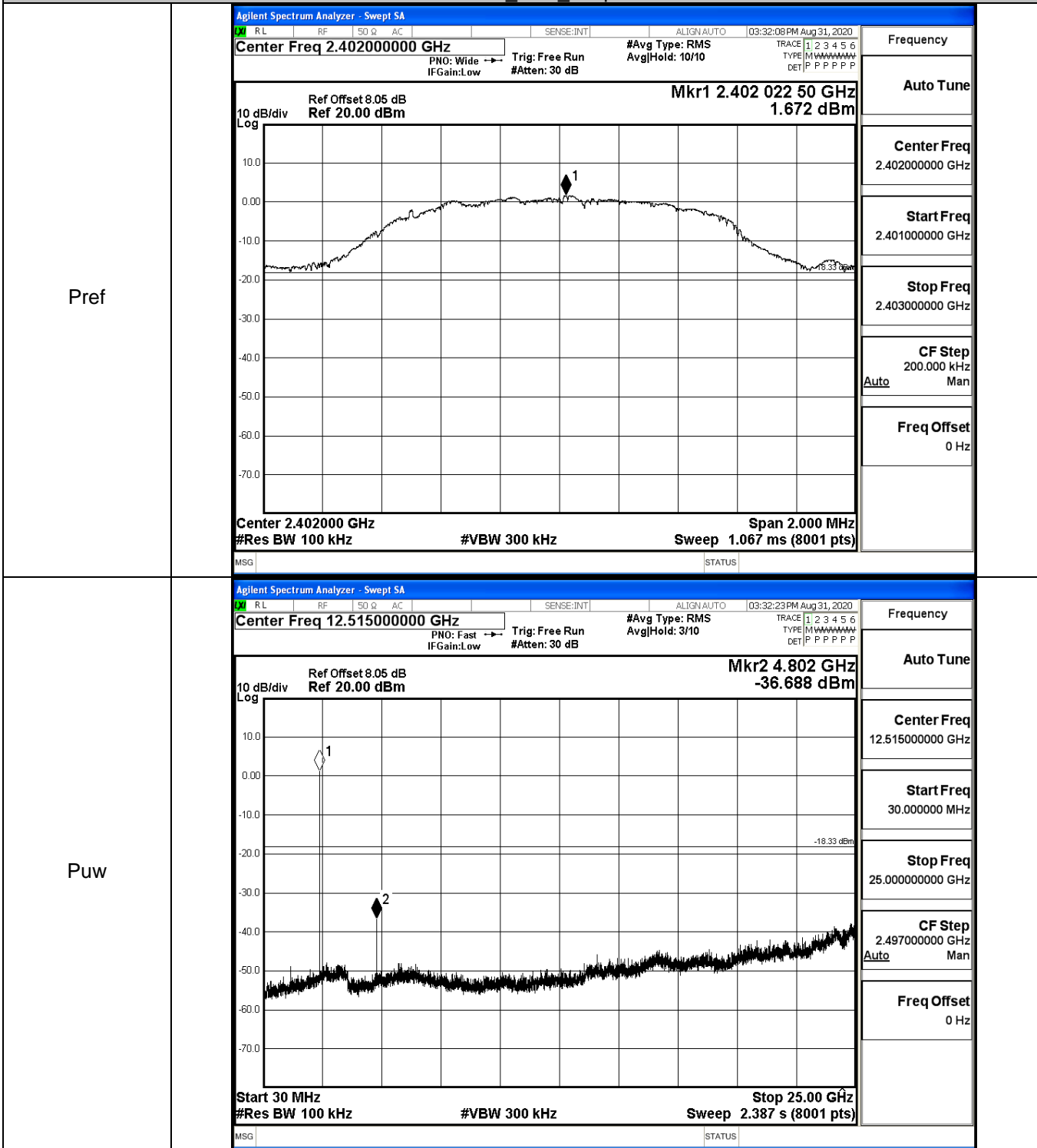
GFSK_MCH_Graphs



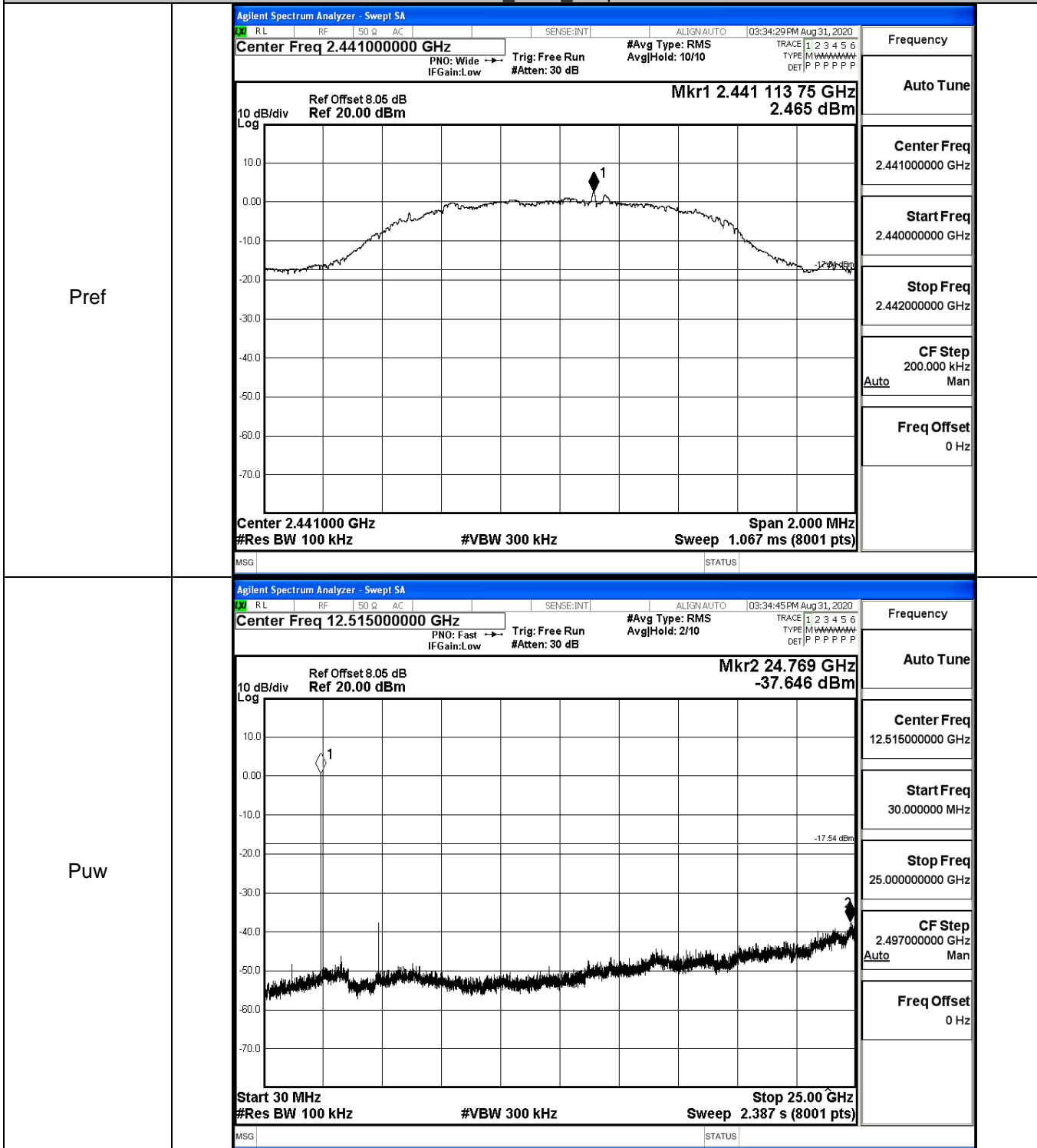
GFSK_HCH_Graphs



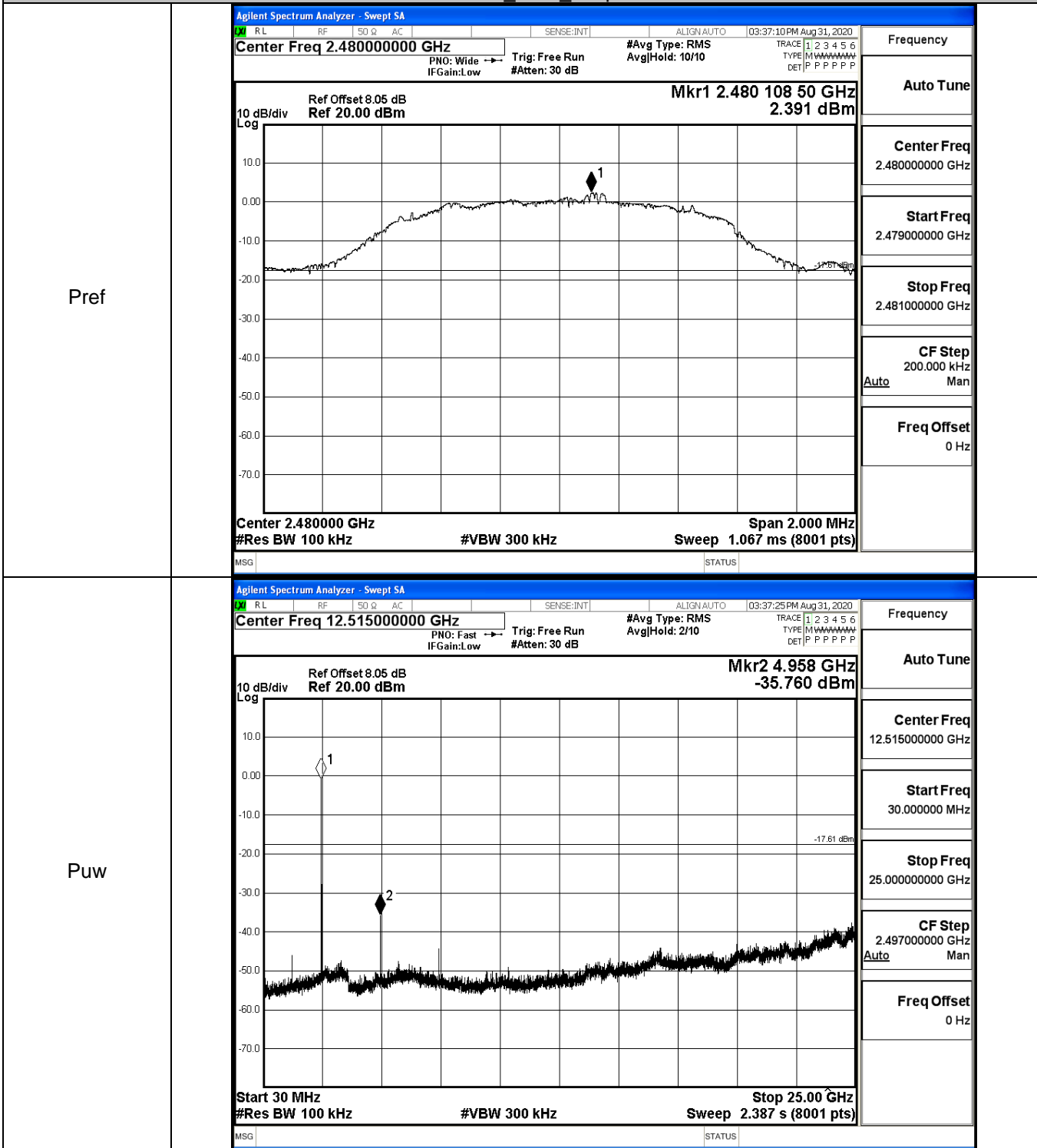
$\pi/4$ DQPSK_LCH_Graphs



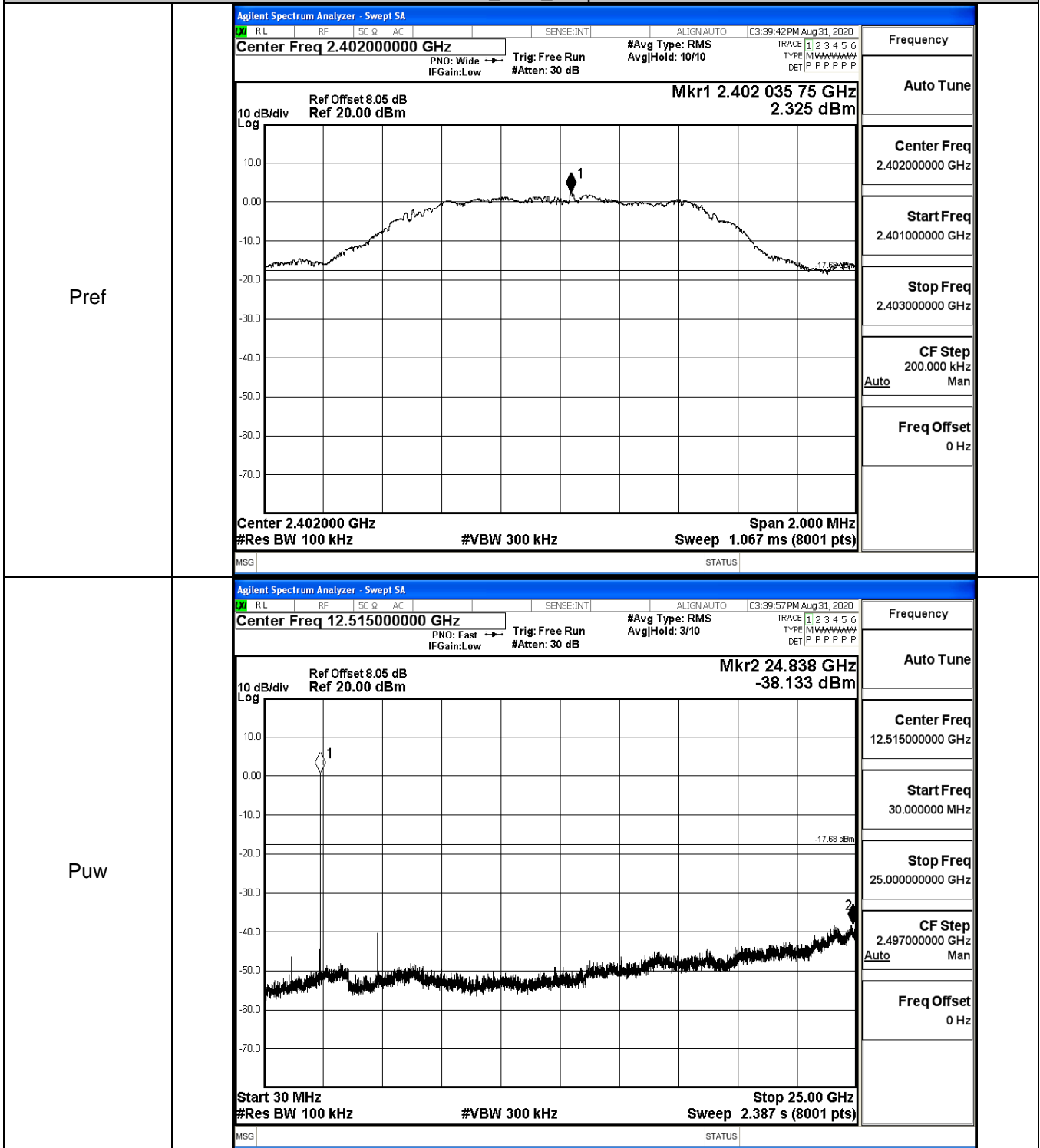
$\pi/4$ DQPSK_MCH_Graphs



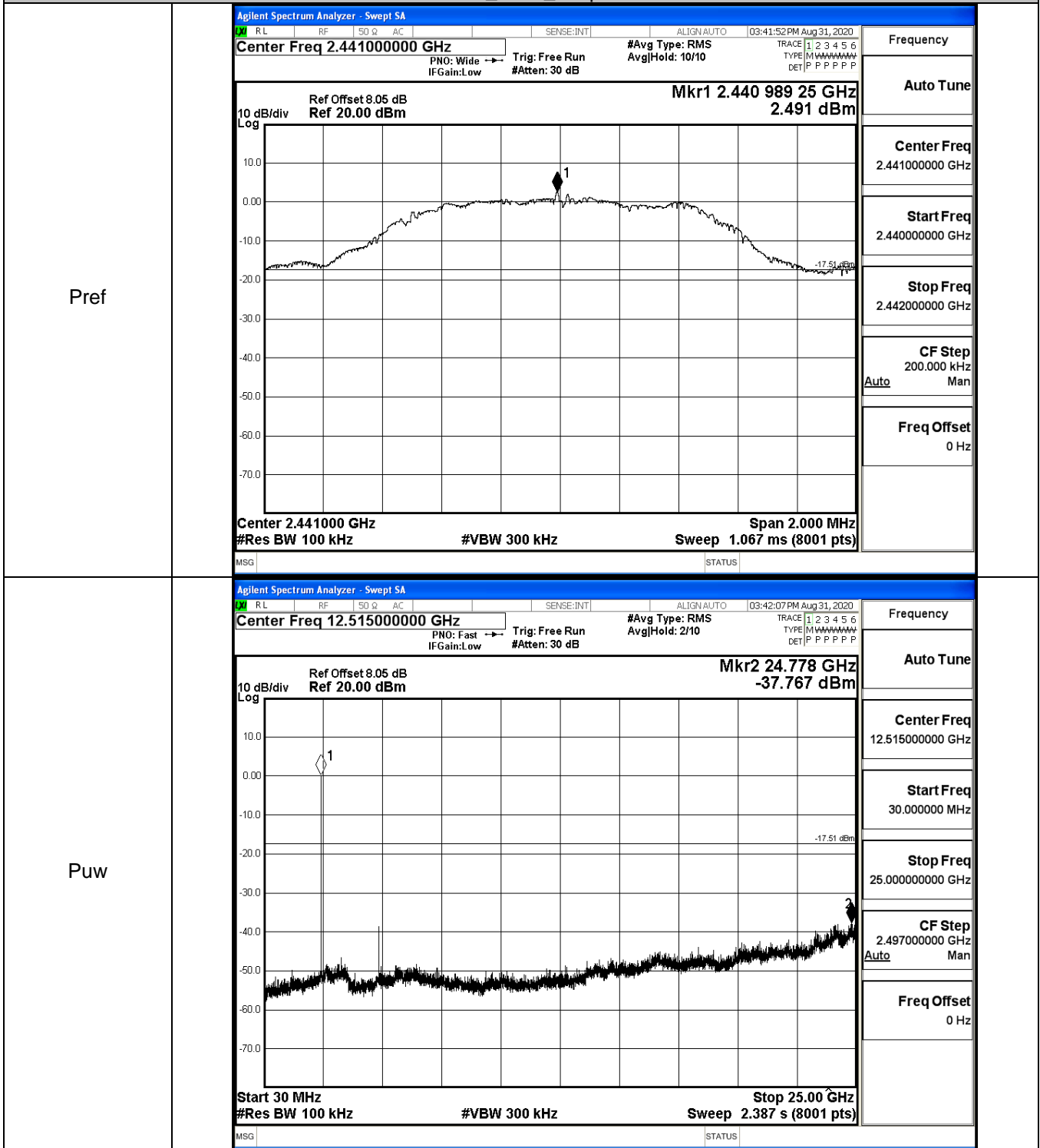
$\pi/4$ DQPSK_HCH_Graphs



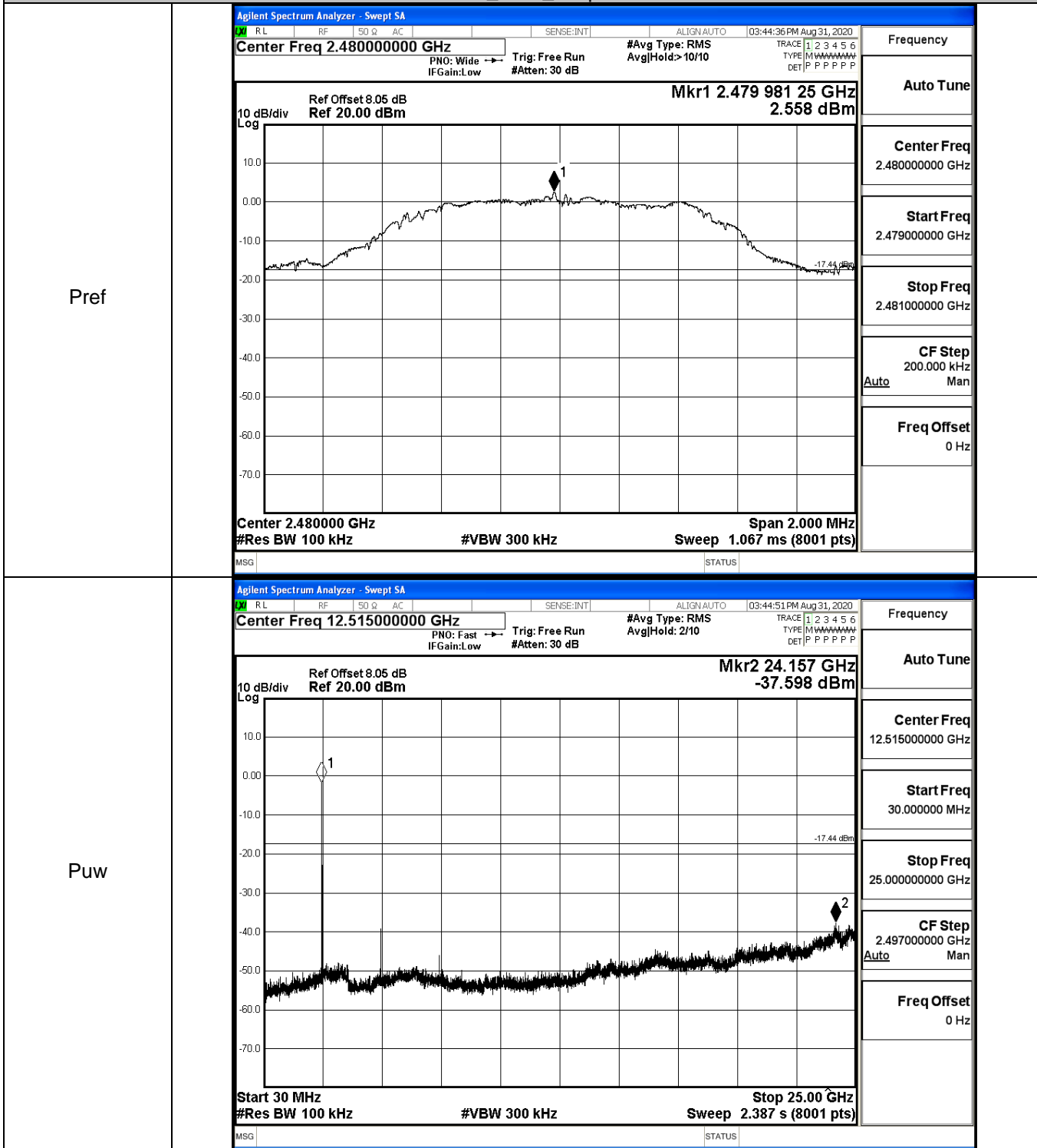
8DPSK_LCH_Graphs



8DPSK_MCH_Graphs



8DPSK_HCH_Graphs

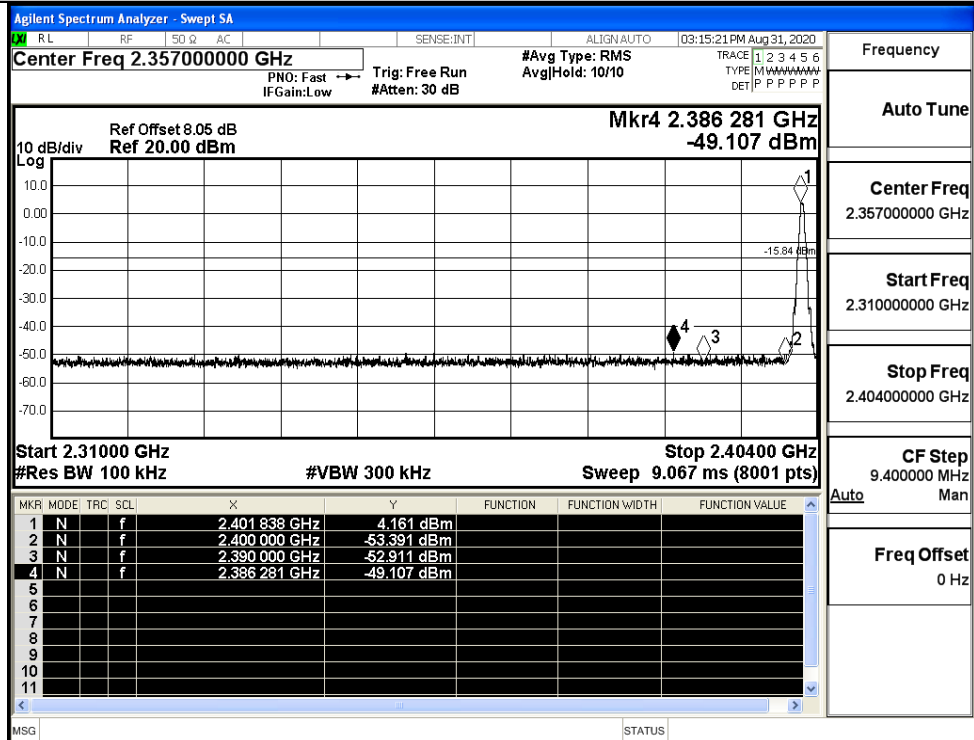


A.7 Band-edge for RF Conducted Emissions

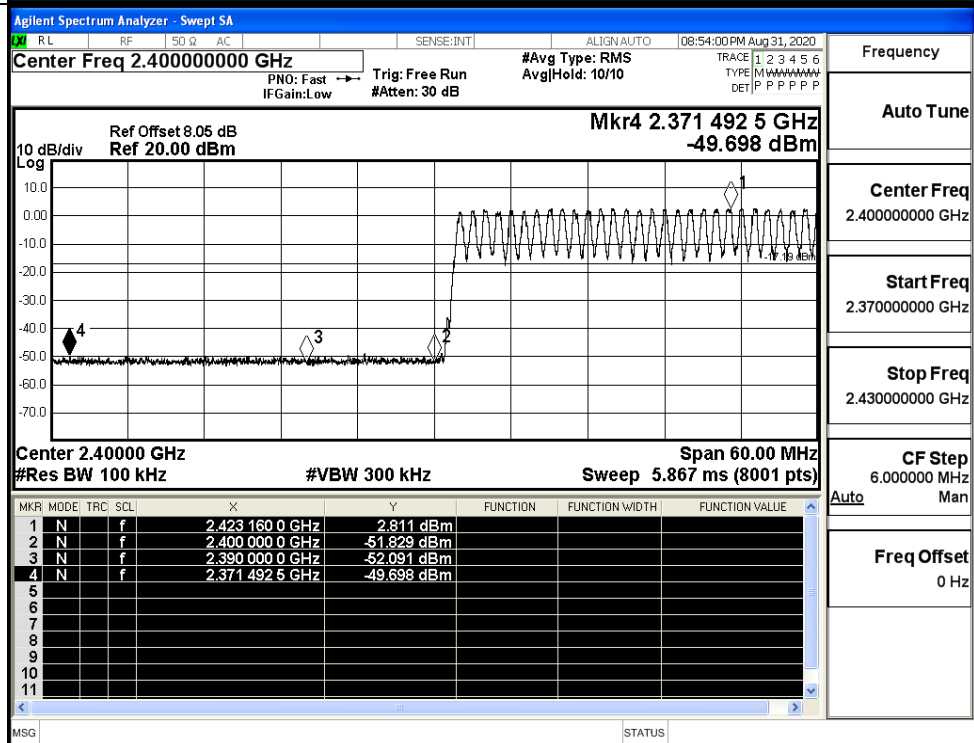
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	4.161	Off	-49.107	-15.84	PASS
			2.811	On	-49.698	-17.19	PASS
	HCH	2480	3.812	Off	-49.037	-16.19	PASS
			2.676	On	-49.013	-17.32	PASS
$\pi/4$ DQPSK	LCH	2402	1.583	Off	-49.144	-18.42	PASS
			1.456	On	-48.733	-18.54	PASS
	HCH	2480	2.859	Off	-33.991	-17.14	PASS
			1.091	On	-47.438	-18.91	PASS
8DPSK	LCH	2402	2.823	Off	-48.544	-17.18	PASS
			1.410	On	-49.029	-18.59	PASS
	HCH	2480	2.773	Off	-29.524	-17.23	PASS
			1.325	On	-48.725	-18.68	PASS

Test Graphs

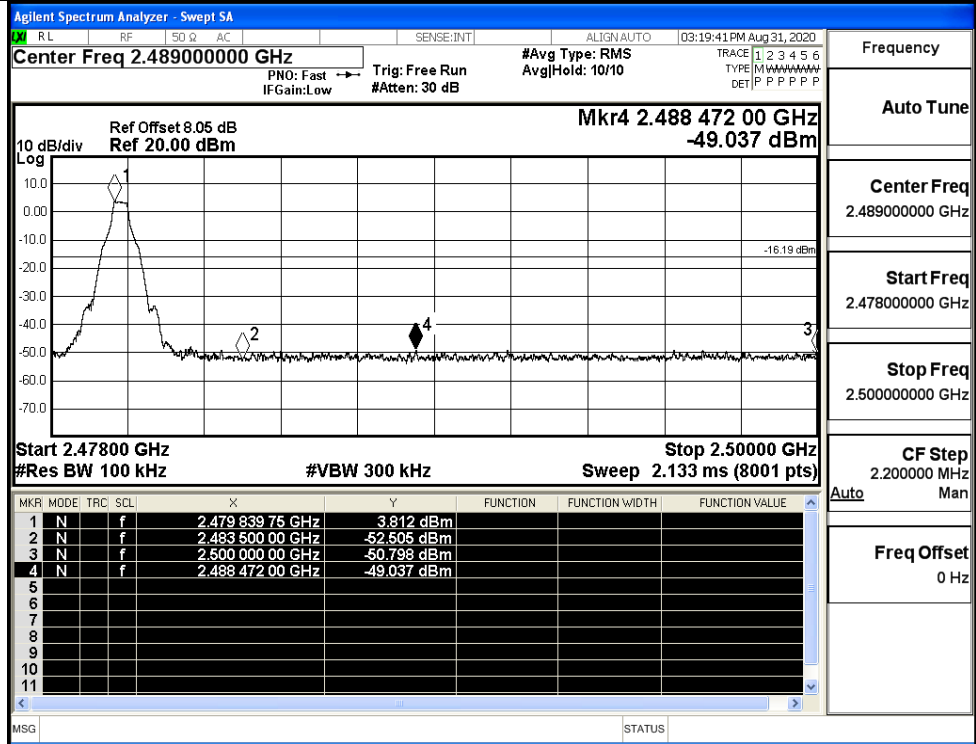
GFSK/LCH/No Hop



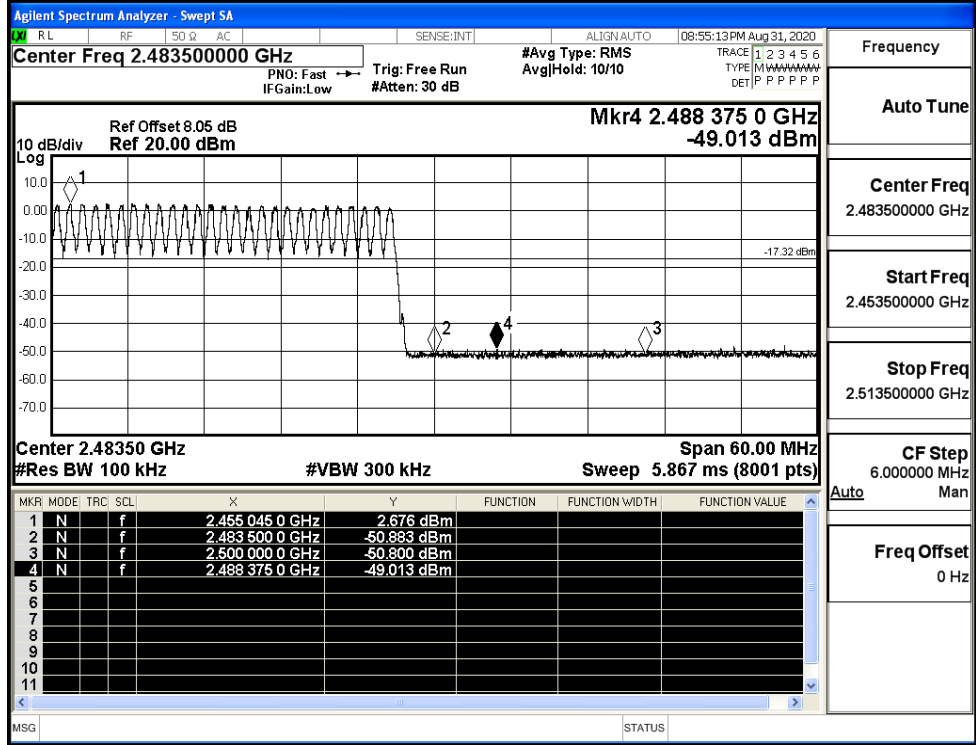
GFSK/LCH/Hop



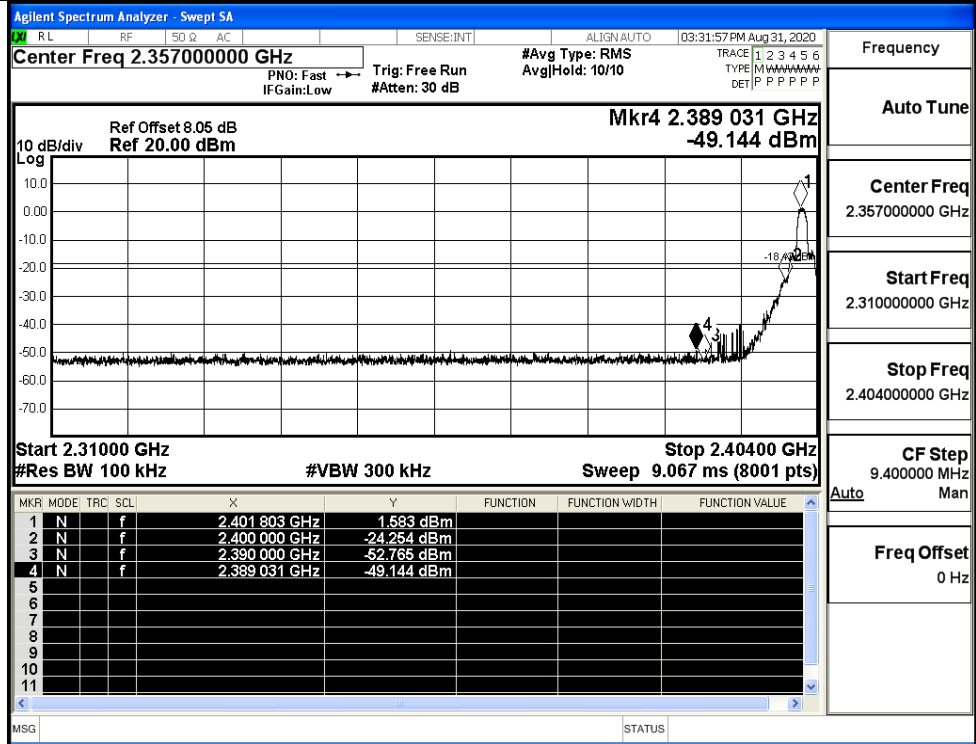
GFSK/HCH/No Hop



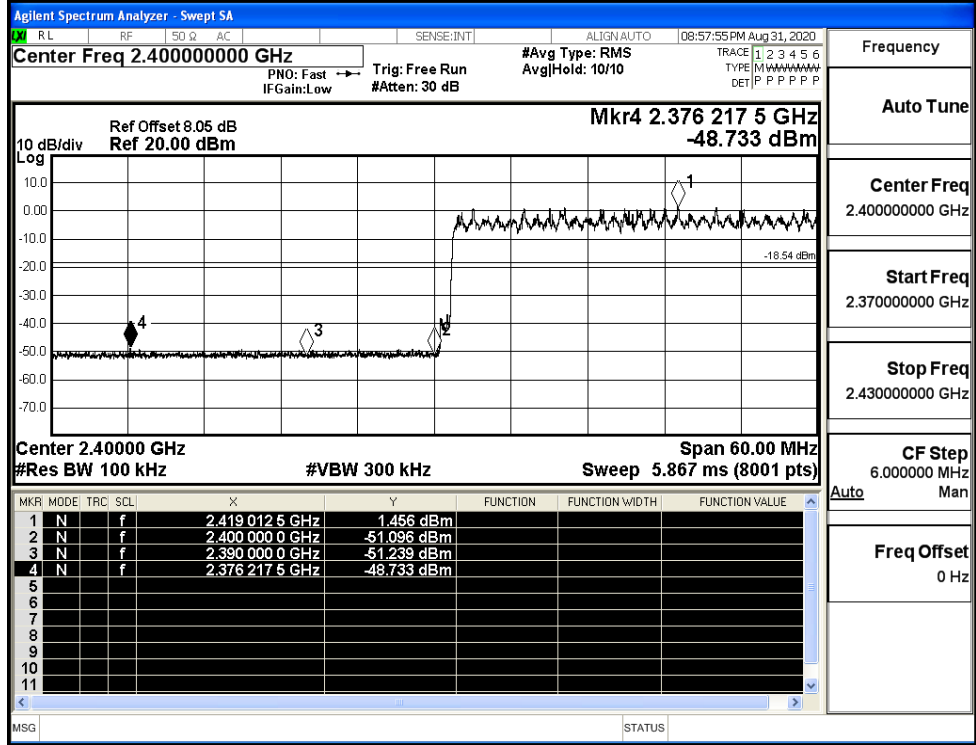
GFSK/HCH/Hop



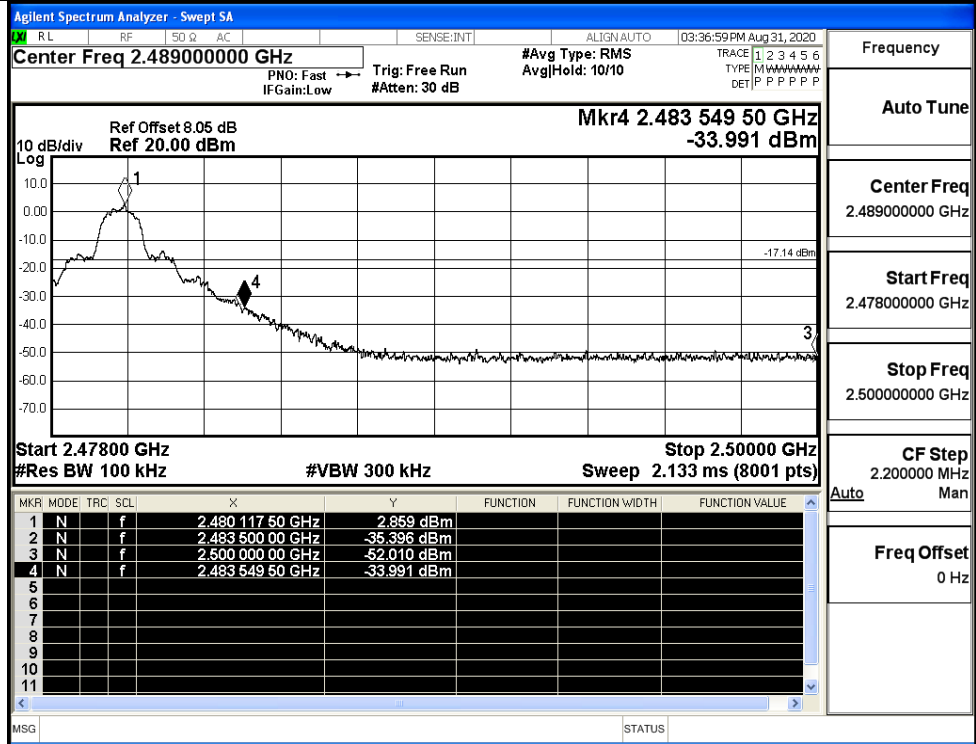
$\pi/4$ DQPSK/LCH/No
Hop



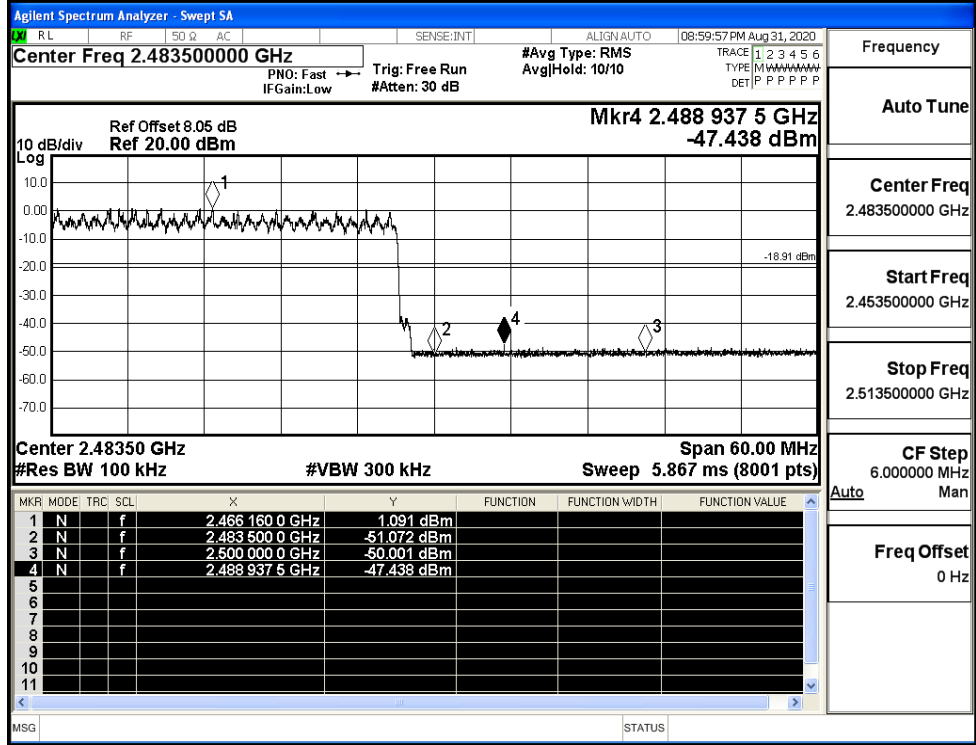
$\pi/4$ DQPSK/LCH/Hop



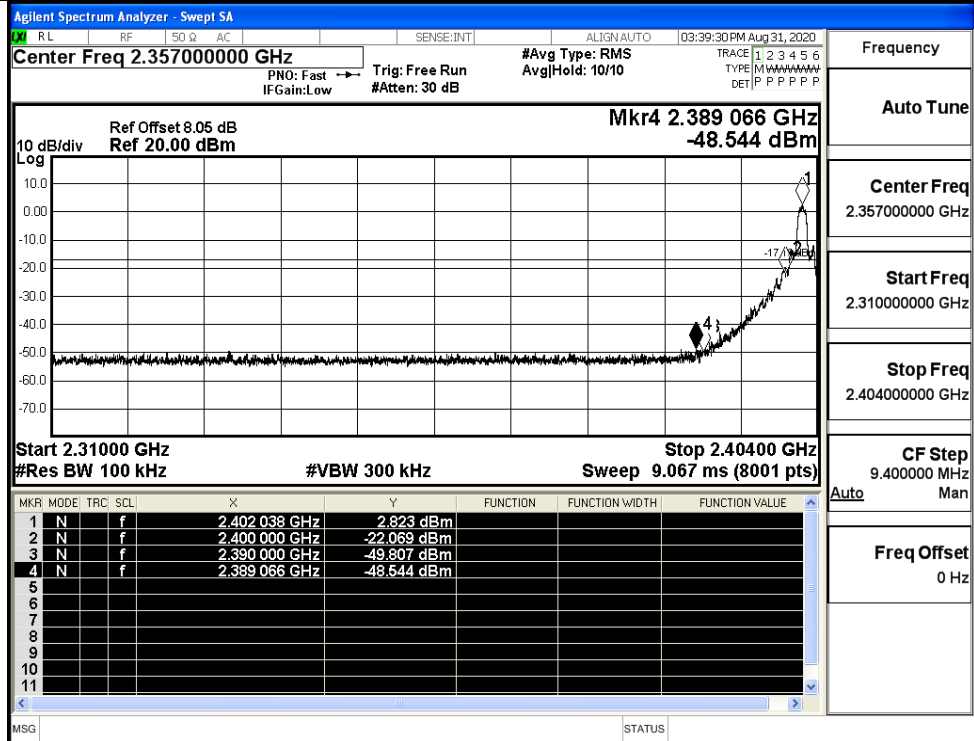
π /4DQPSK/HCH/No
Hop



π /4DQPSK/HCH/Hop

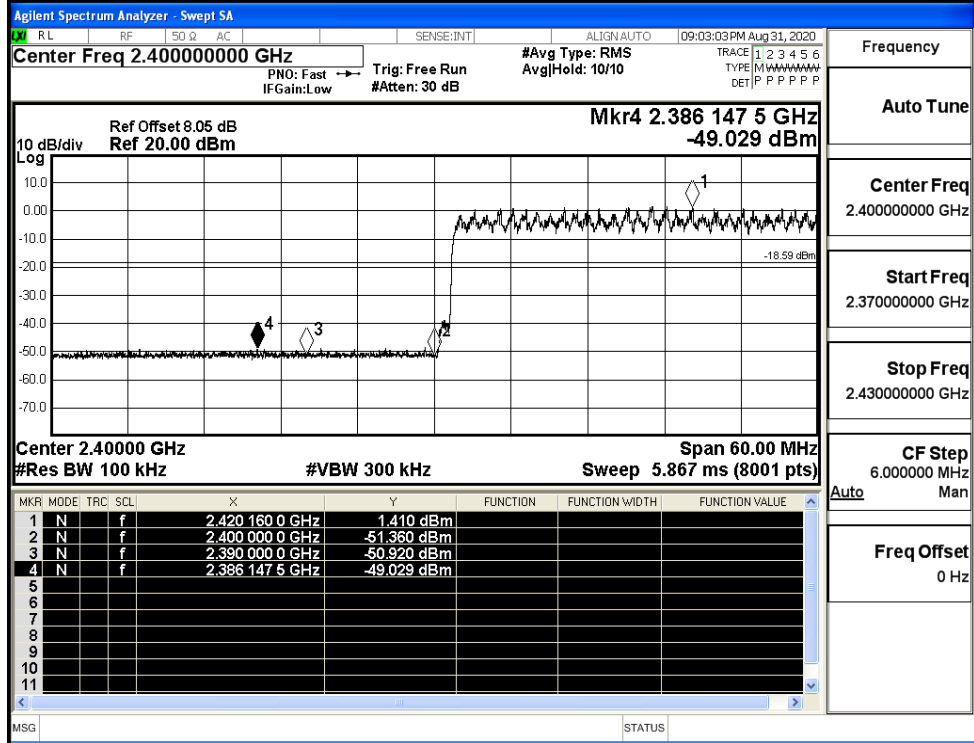


8DPSK/LCH/No Hop



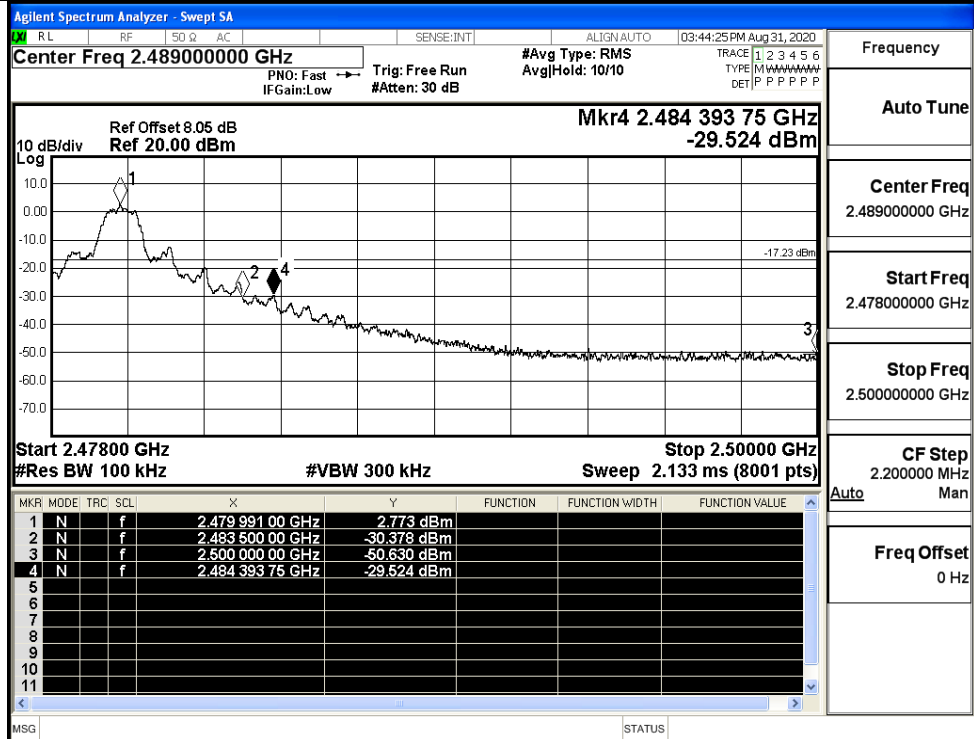
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/LCH/Hop



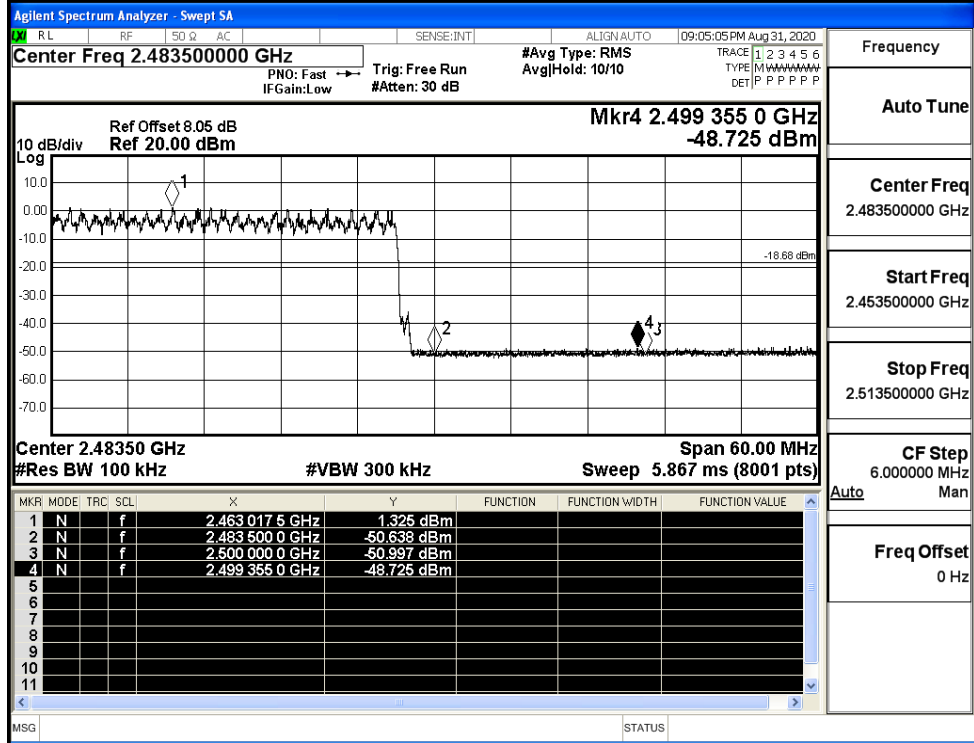
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.370000000 GHz
Stop Freq
2.430000000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

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
Freq Offset
0 Hz

8DPSK/HCH/Hop

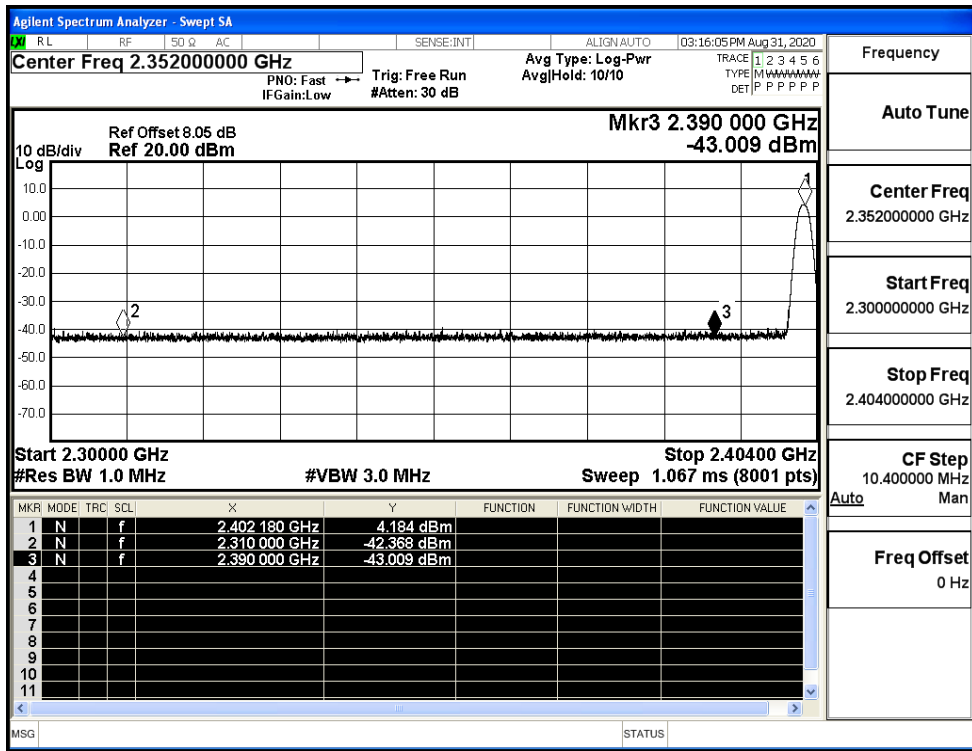


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Freq Offset
0 Hz

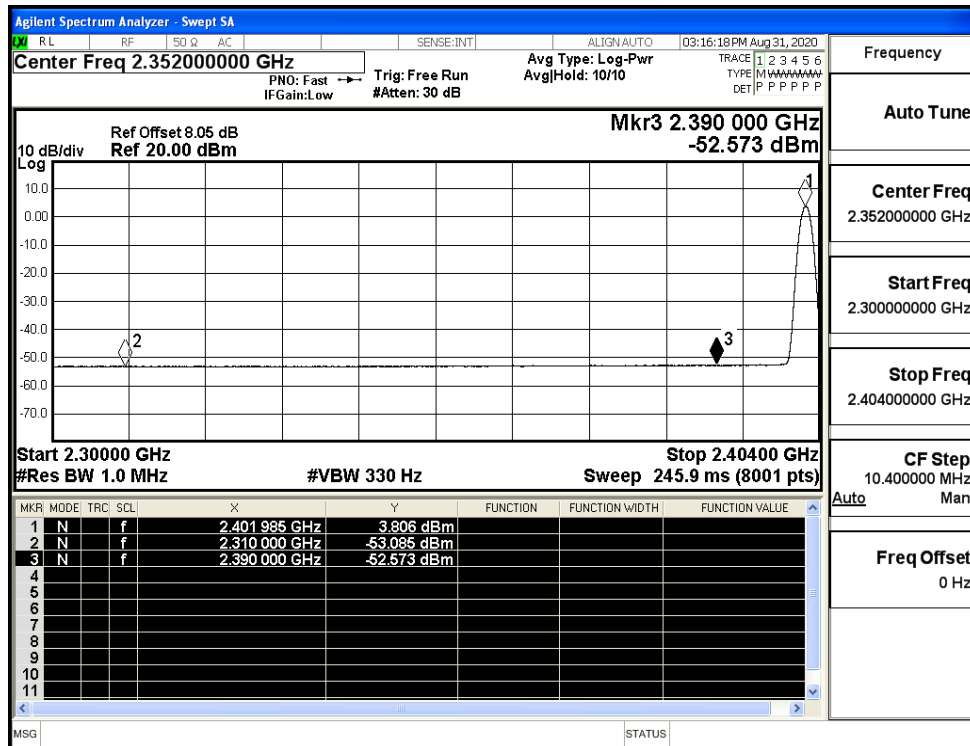
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.37	2.0	0	52.89	PEAK	74	PASS
	Off	2310.0	-53.09	2.0	0	42.17	AV	54	PASS
	Off	2390.0	-43.01	2.0	0	52.25	PEAK	74	PASS
	Off	2390.0	-52.57	2.0	0	42.68	AV	54	PASS
	Off	2483.5	-41.32	2.0	0	53.94	PEAK	74	PASS
	Off	2483.5	-52.06	2.0	0	43.20	AV	54	PASS
	Off	2500.0	-41.57	2.0	0	53.68	PEAK	74	PASS
	Off	2500.0	-52.16	2.0	0	43.10	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.93	2.0	0	52.33	PEAK	74	PASS
	Off	2310.0	-53.27	2.0	0	41.98	AV	54	PASS
	Off	2390.0	-41.67	2.0	0	53.59	PEAK	74	PASS
	Off	2390.0	-52.75	2.0	0	42.51	AV	54	PASS
	Off	2483.5	-42.39	2.0	0	52.87	PEAK	74	PASS
	Off	2483.5	-52.40	2.0	0	42.86	AV	54	PASS
	Off	2500.0	-41.11	2.0	0	54.15	PEAK	74	PASS
	Off	2500.0	-52.12	2.0	0	43.14	AV	54	PASS
8DPSK	Off	2310.0	-42.54	2.0	0	52.72	PEAK	74	PASS
	Off	2310.0	-53.27	2.0	0	41.99	AV	54	PASS
	Off	2390.0	-34.02	2.0	0	61.24	PEAK	74	PASS
	Off	2390.0	-52.19	2.0	0	43.07	AV	54	PASS
	Off	2483.5	-42.05	2.0	0	53.21	PEAK	74	PASS
	Off	2483.5	-52.34	2.0	0	42.92	AV	54	PASS
	Off	2500.0	-41.65	2.0	0	53.61	PEAK	74	PASS
	Off	2500.0	-52.20	2.0	0	43.06	AV	54	PASS

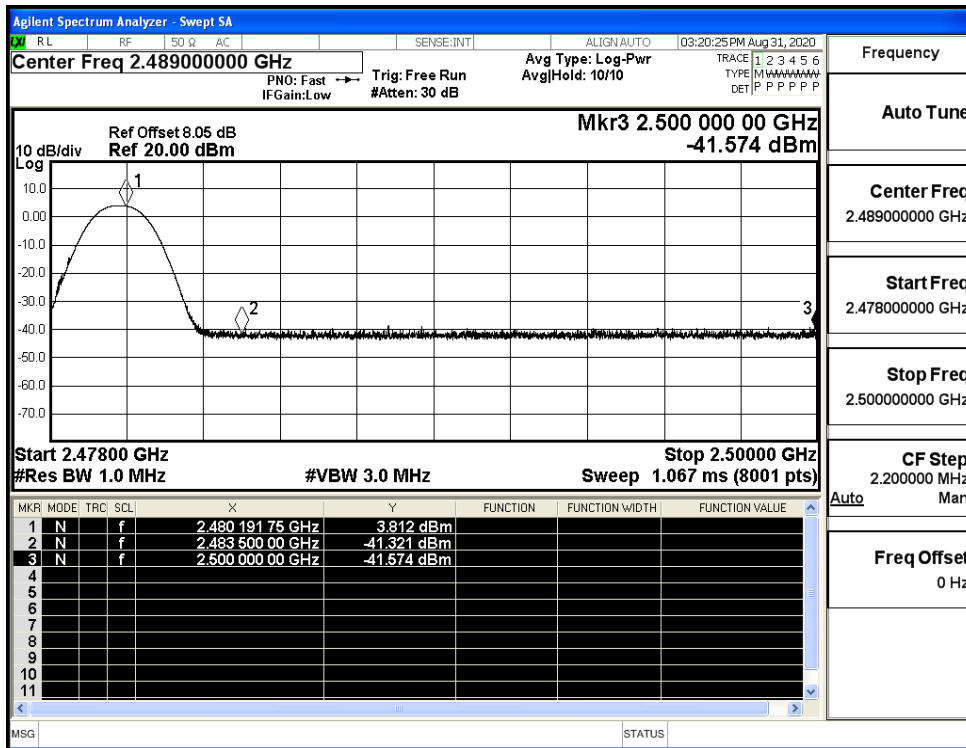
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



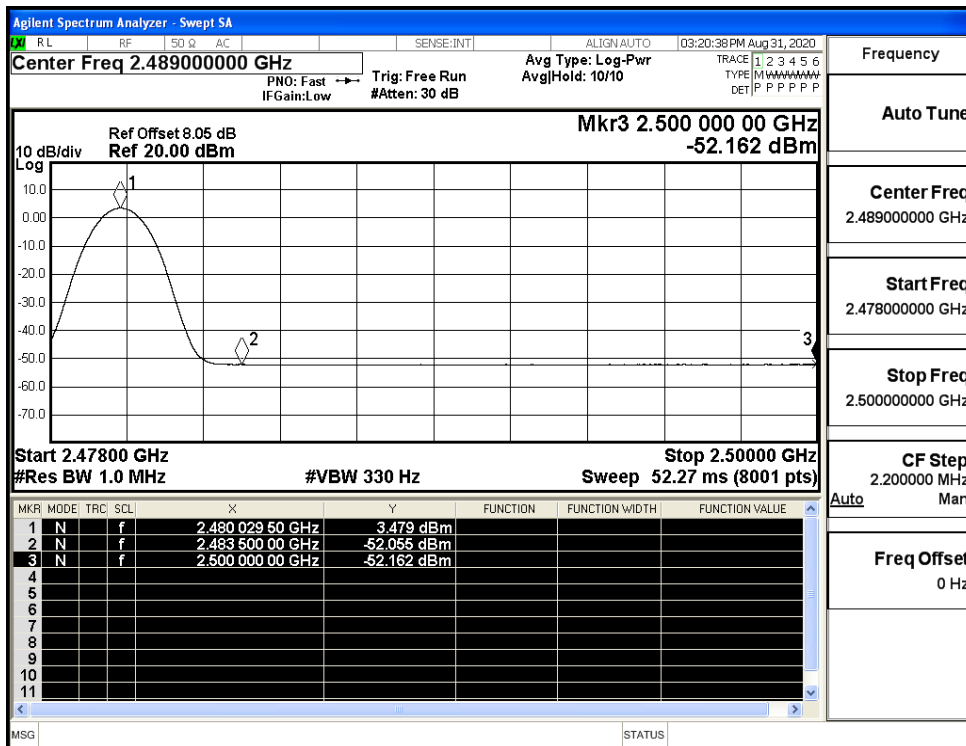
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



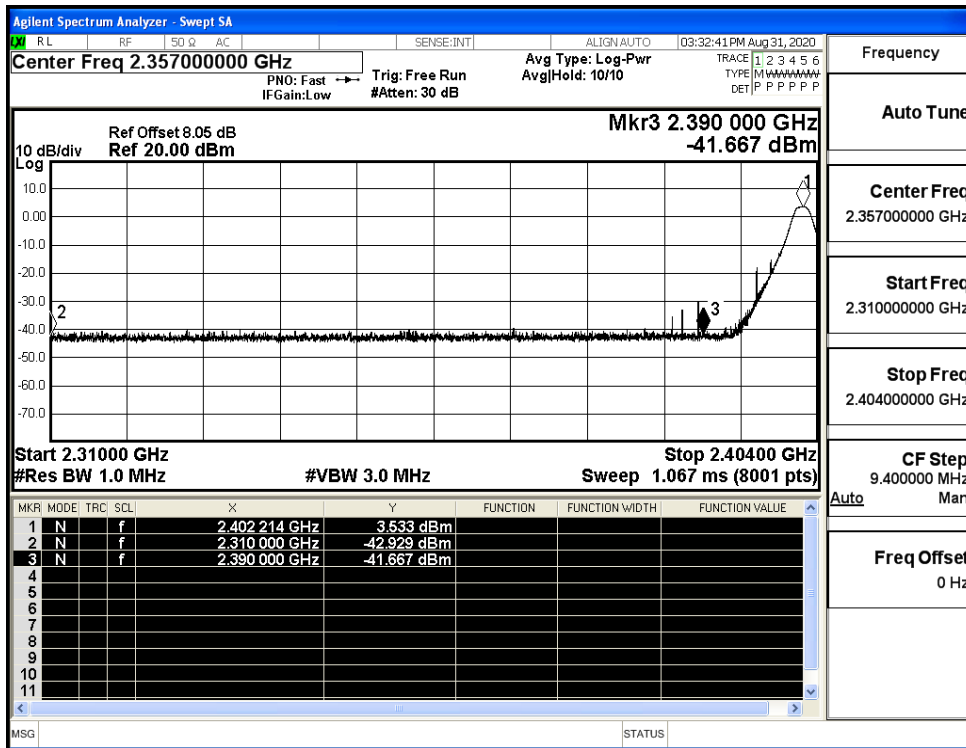
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



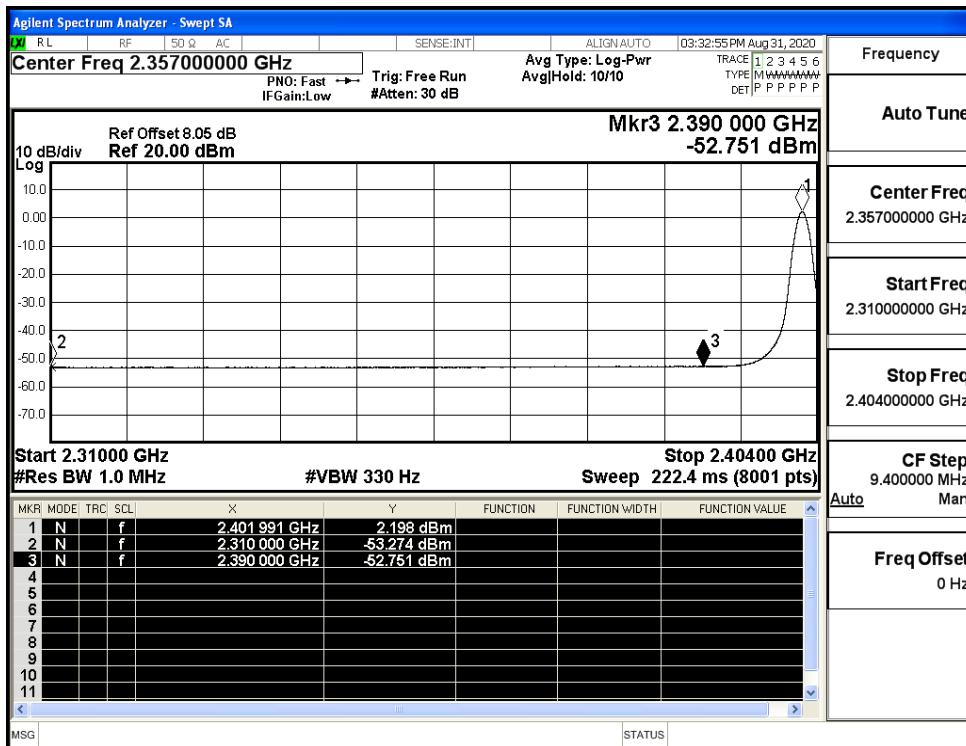
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



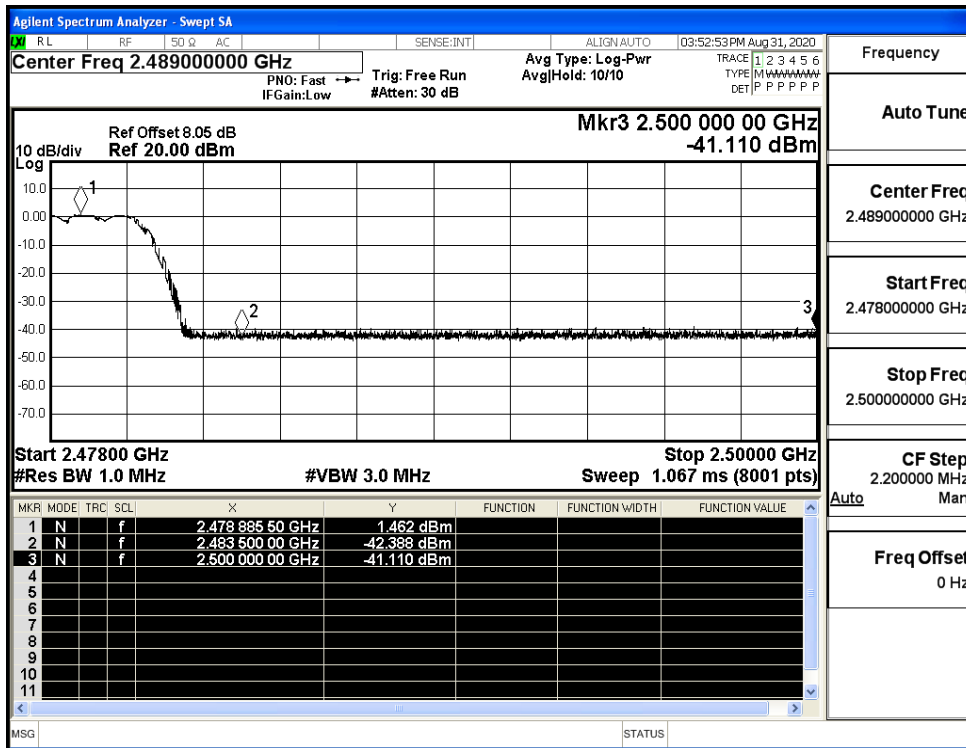
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



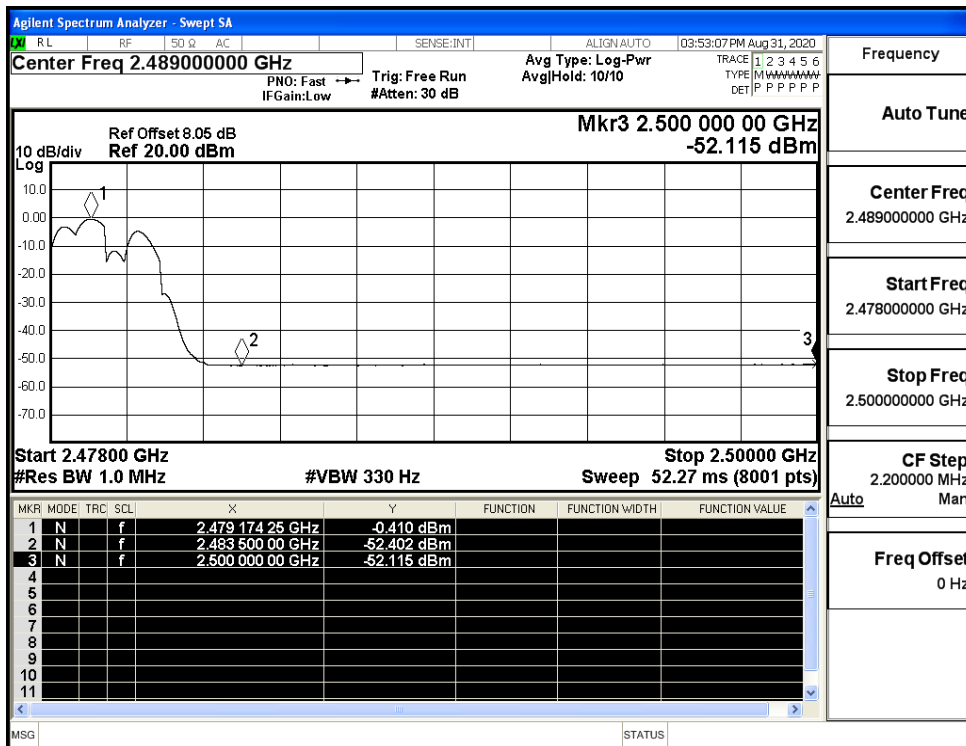
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



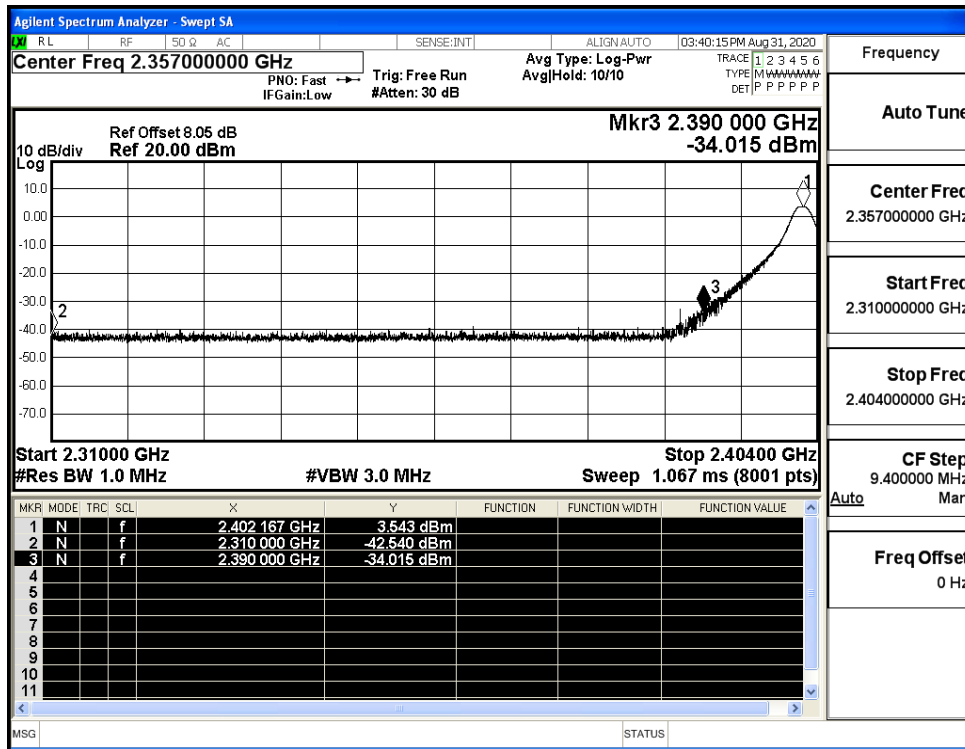
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



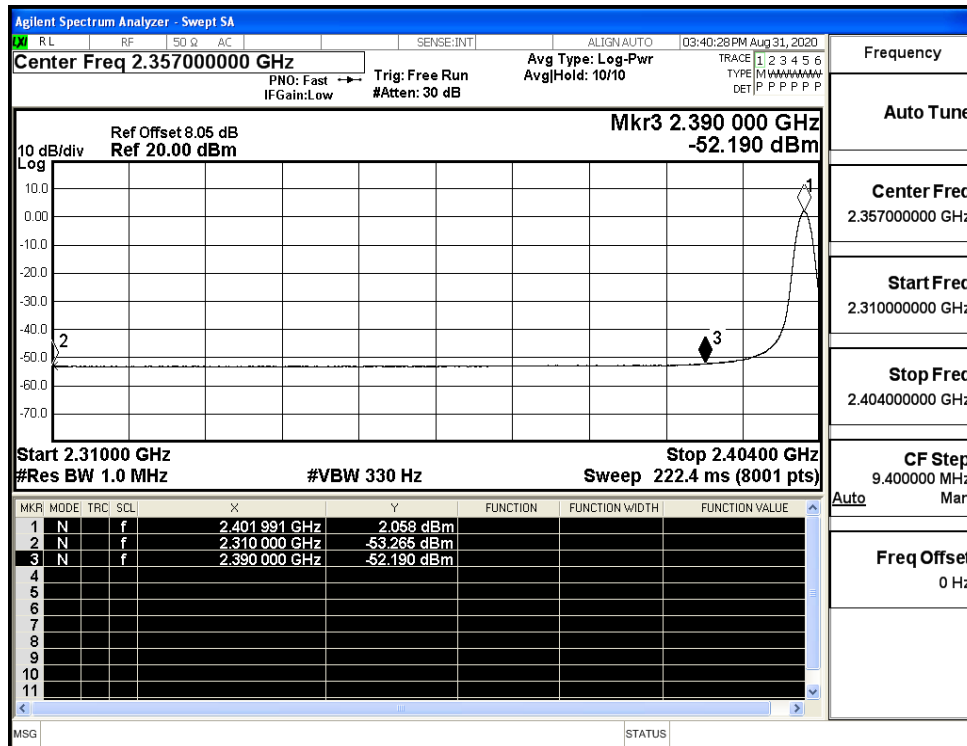
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



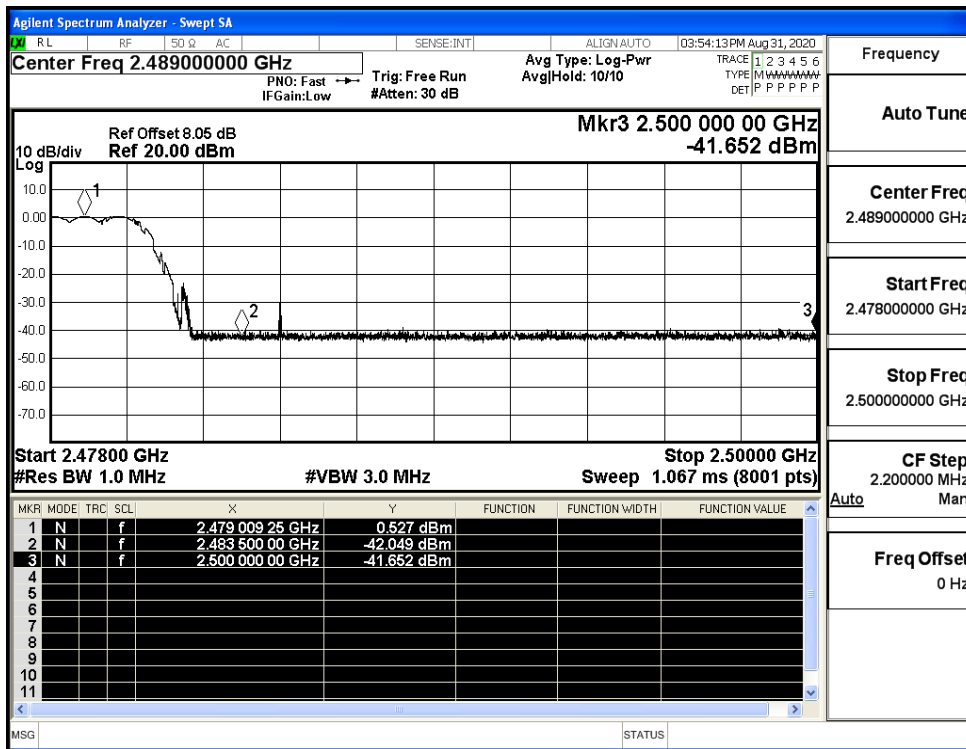
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

