

Appendix A

RF Test Data for BT V3.0(BDR/EDR) (Conducted Measurement)

Product Name: LineaPro 7 Industrial

Trade Mark: LineaPro 7 Industrial

Test Model: LineaPro 7 Industrial

Environmental Conditions

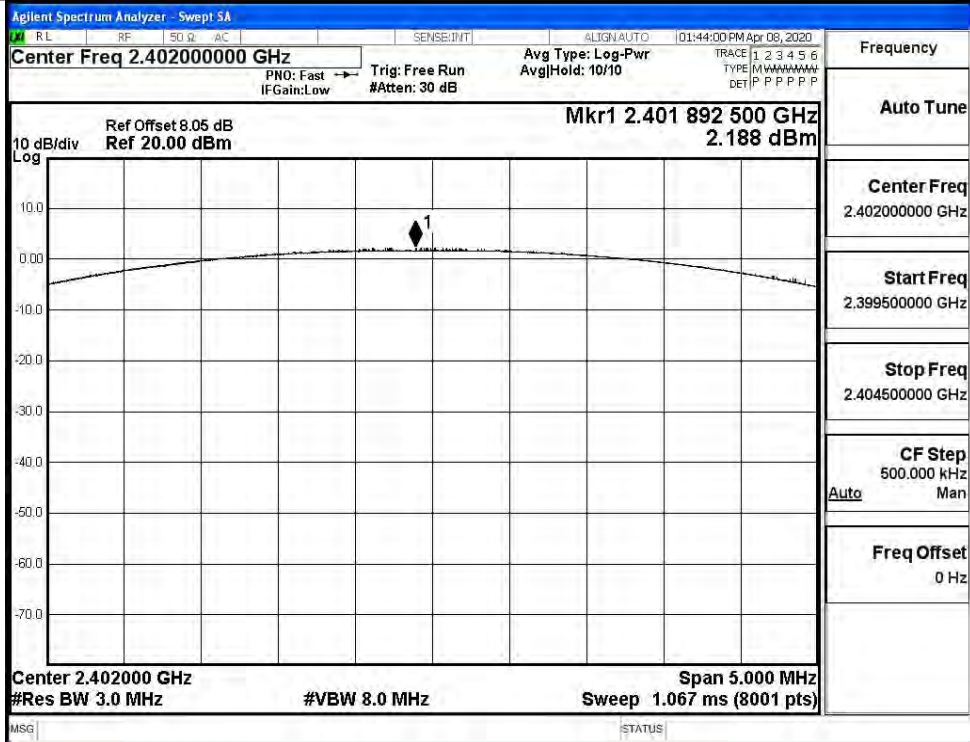
Temperature:	23.6 °C
Relative Humidity:	53.9%
ATM Pressure:	100.0 kPa
Test Engineer:	QUXIN
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

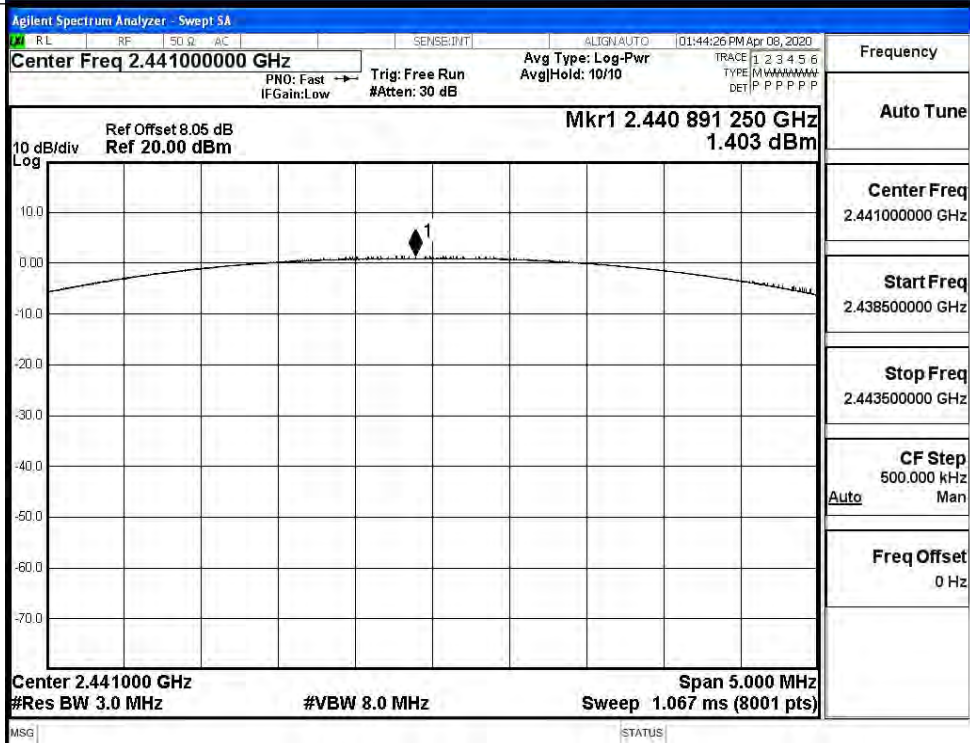
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.188	30	PASS
	MCH	1.403	30	PASS
	HCH	1.219	30	PASS
$\pi/4$ DQPSK	LCH	2.215	21	PASS
	MCH	1.444	21	PASS
	HCH	-0.183	21	PASS
8DPSK	LCH	2.291	21	PASS
	MCH	1.493	21	PASS
	HCH	-0.117	21	PASS

Test Graphs

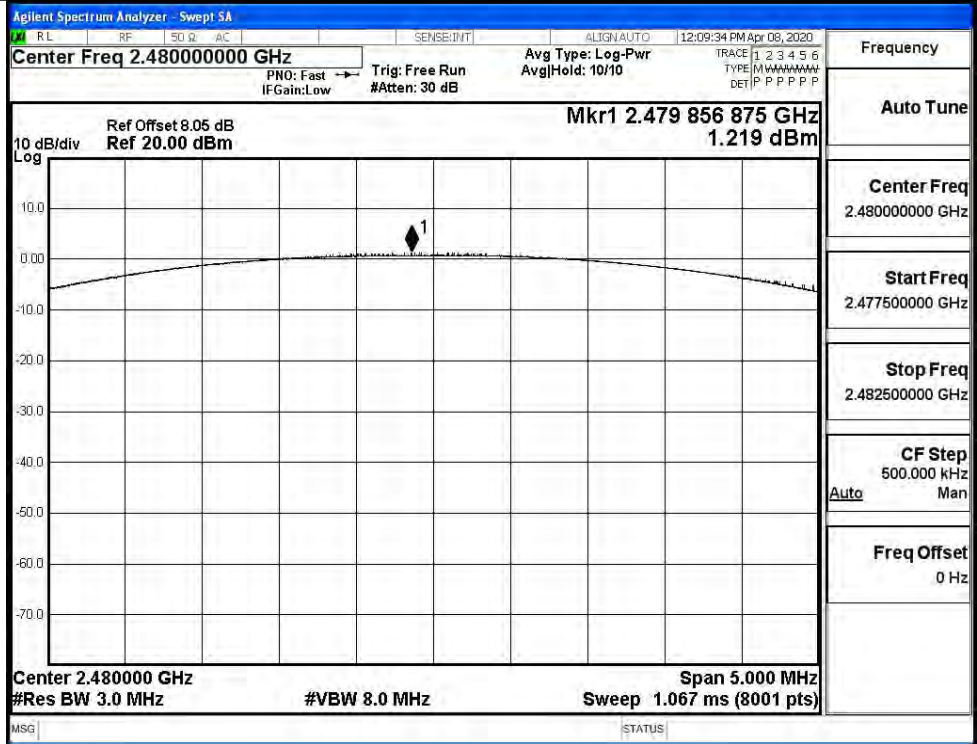
GFSK/LCH



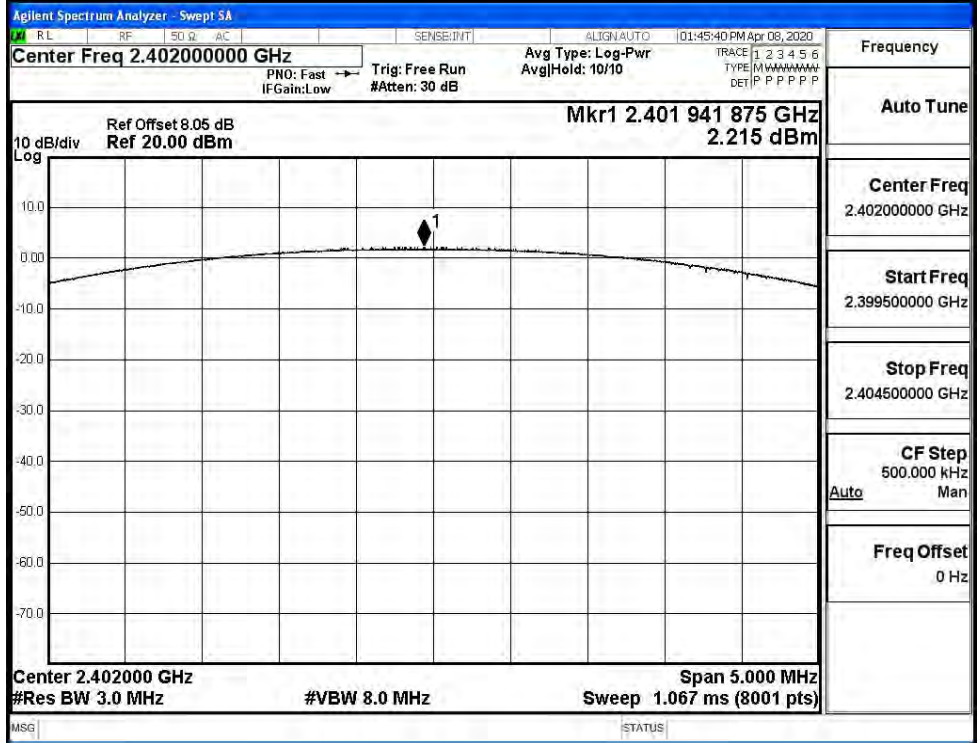
GFSK/MCH



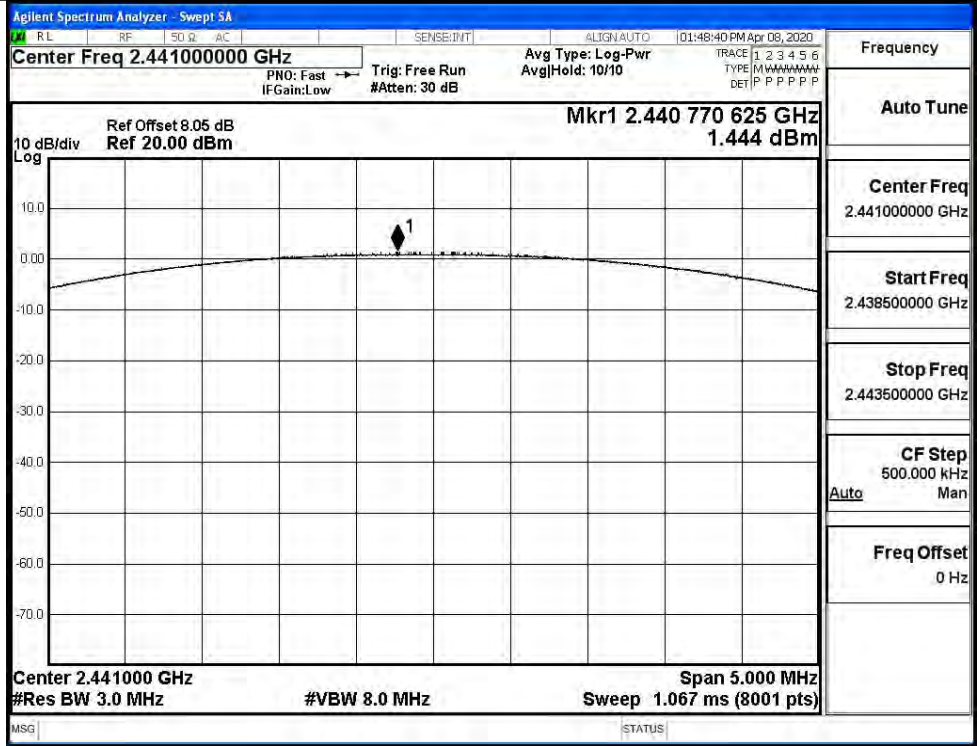
GFSK/HCH



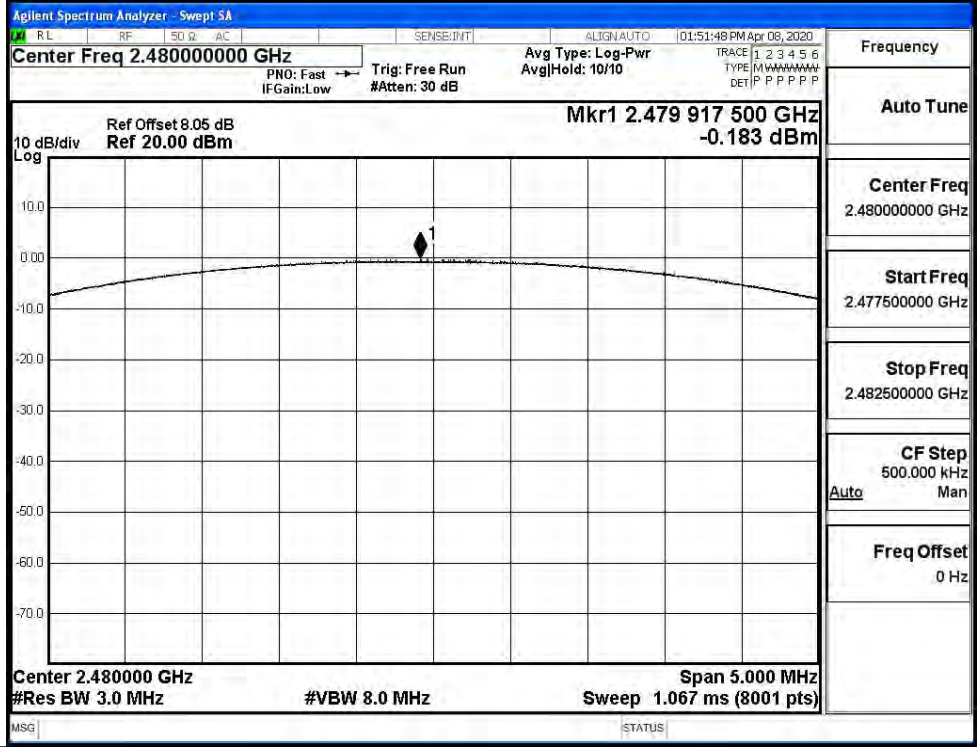
$\pi/4$ DQPSK/LCH



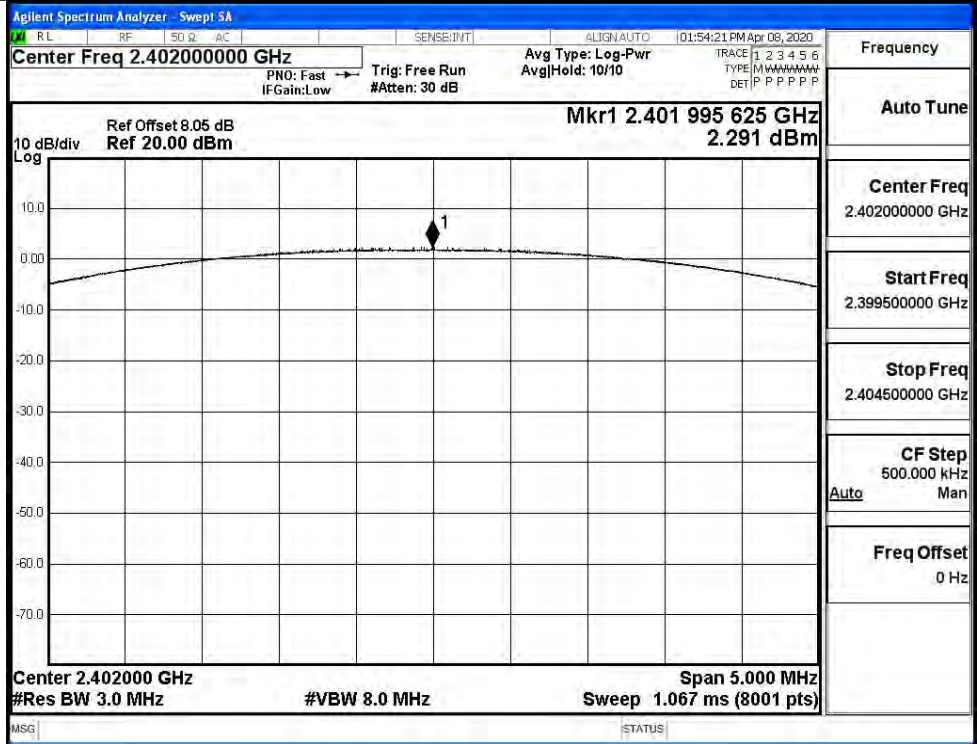
π /4DQPSK/MCH



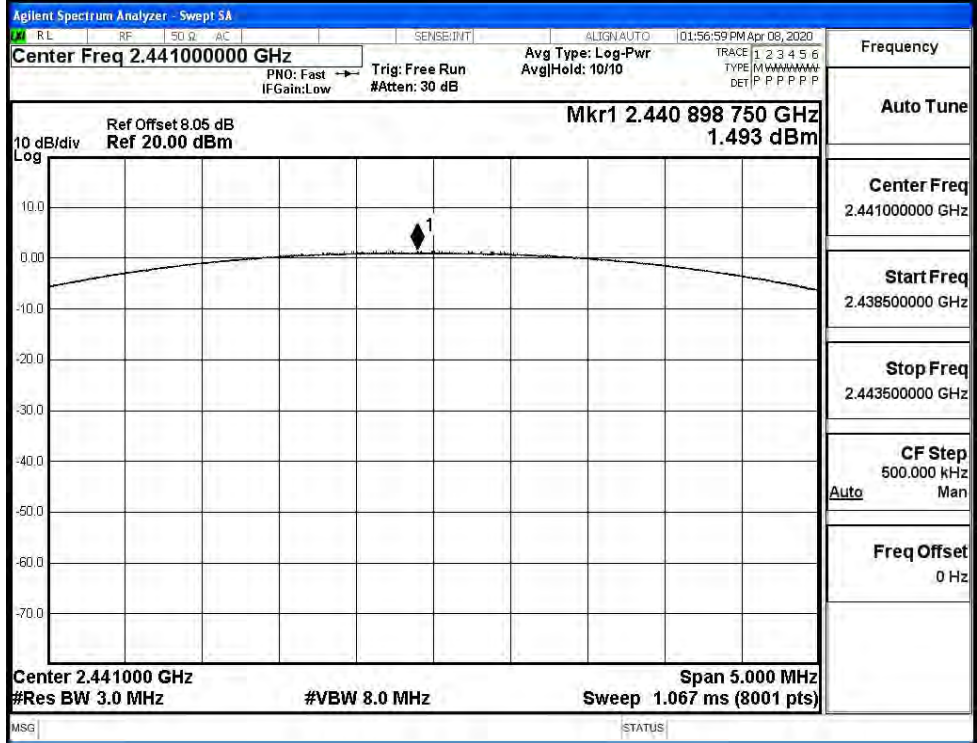
π /4DQPSK/HCH



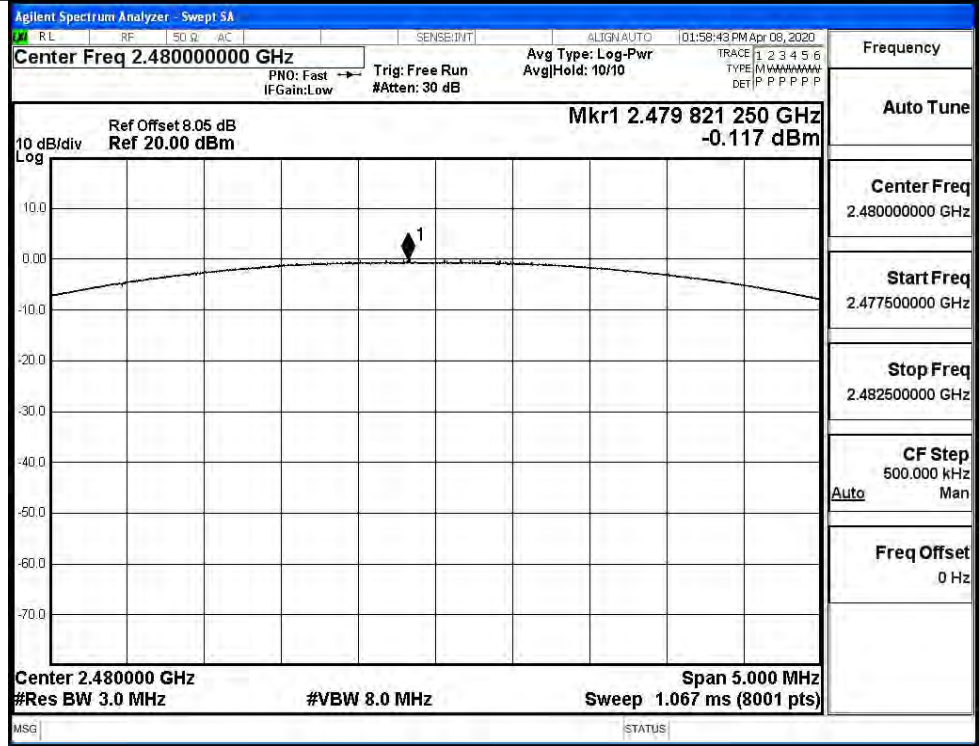
8DPSK/LCH



8DPSK/MCH

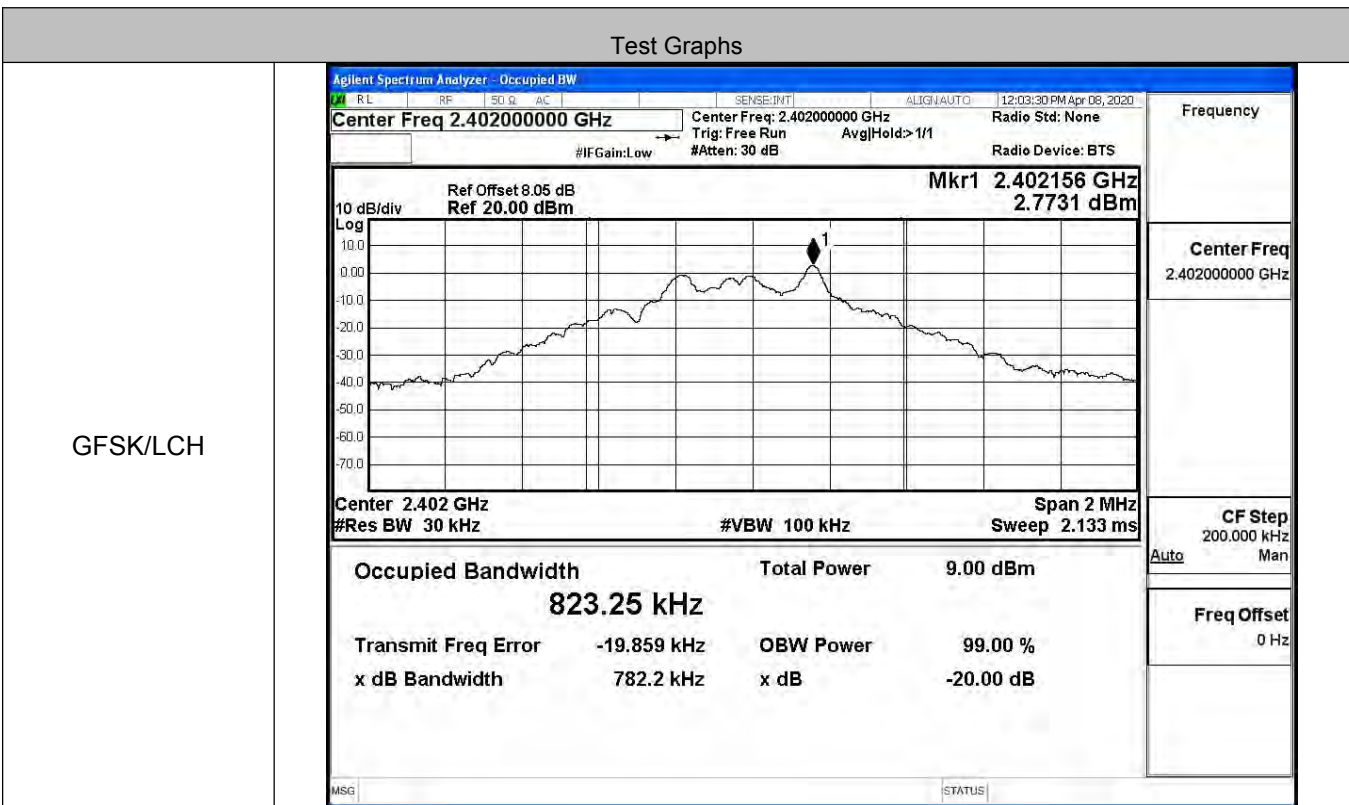


8DPSK/HCH



A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.7822	Not Specified	PASS
	MCH	0.7785	Not Specified	PASS
	HCH	0.7789	Not Specified	PASS
π/4DQPSK	LCH	1.223	Not Specified	PASS
	MCH	1.224	Not Specified	PASS
	HCH	1.224	Not Specified	PASS
8DPSK	LCH	1.226	Not Specified	PASS
	MCH	1.227	Not Specified	PASS
	HCH	1.228	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

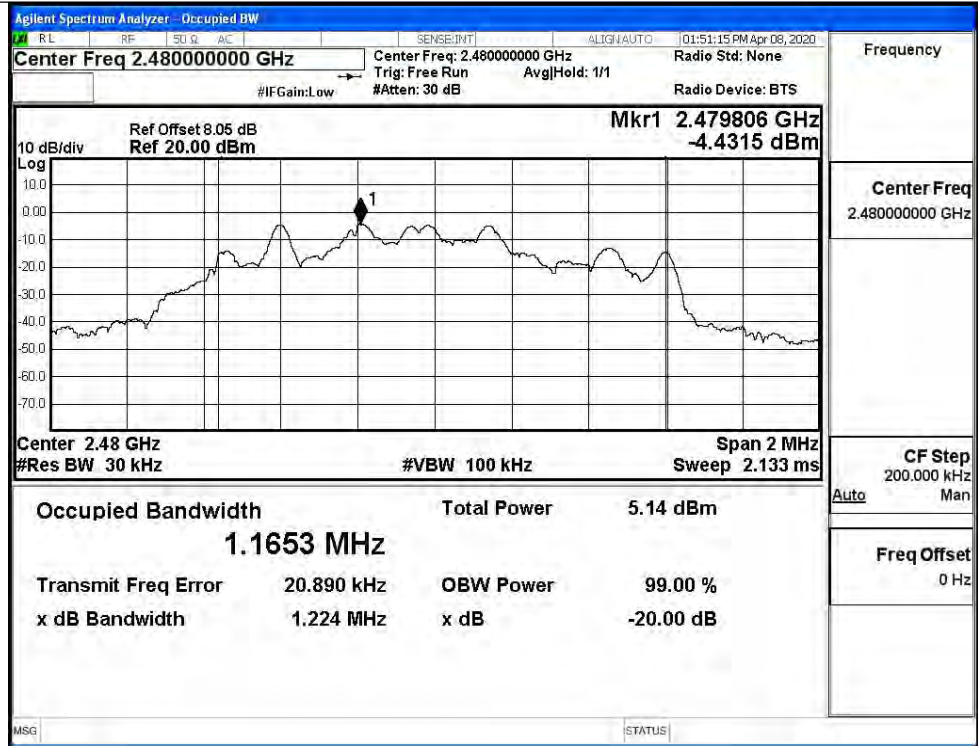
GFSK/HCH



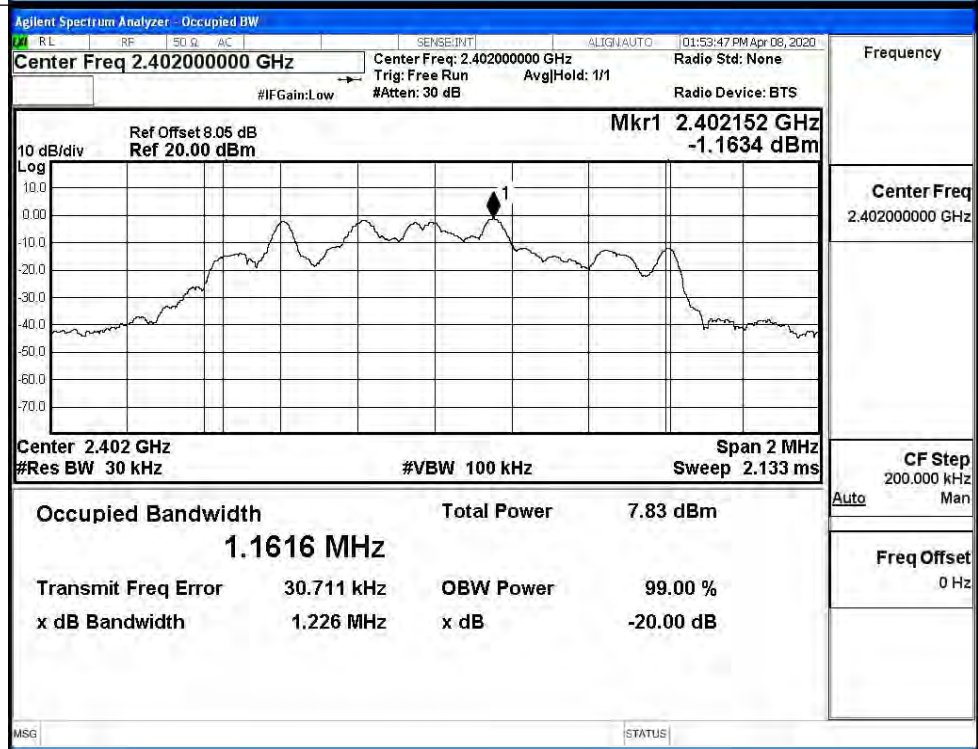
Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

<p>π/4DQPSK/LCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz</p> <p>Mkr1 2.401822 GHz -2.0791 dBm</p> <p>Occupied Bandwidth 1.1694 MHz</p> <p>Total Power 7.54 dBm</p> <p>Transmit Freq Error 27.885 kHz</p> <p>x dB Bandwidth 1.223 MHz</p>	<p>Frequency</p> <p>Center Freq 2.40200000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Freq Offset 0 Hz</p>
<p>π/4DQPSK/MCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.44100000 GHz</p> <p>Mkr1 2.440812 GHz -2.7484 dBm</p> <p>Occupied Bandwidth 1.1711 MHz</p> <p>Total Power 6.74 dBm</p> <p>Transmit Freq Error 22.681 kHz</p> <p>x dB Bandwidth 1.224 MHz</p>	<p>Frequency</p> <p>Center Freq 2.44100000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Freq Offset 0 Hz</p>

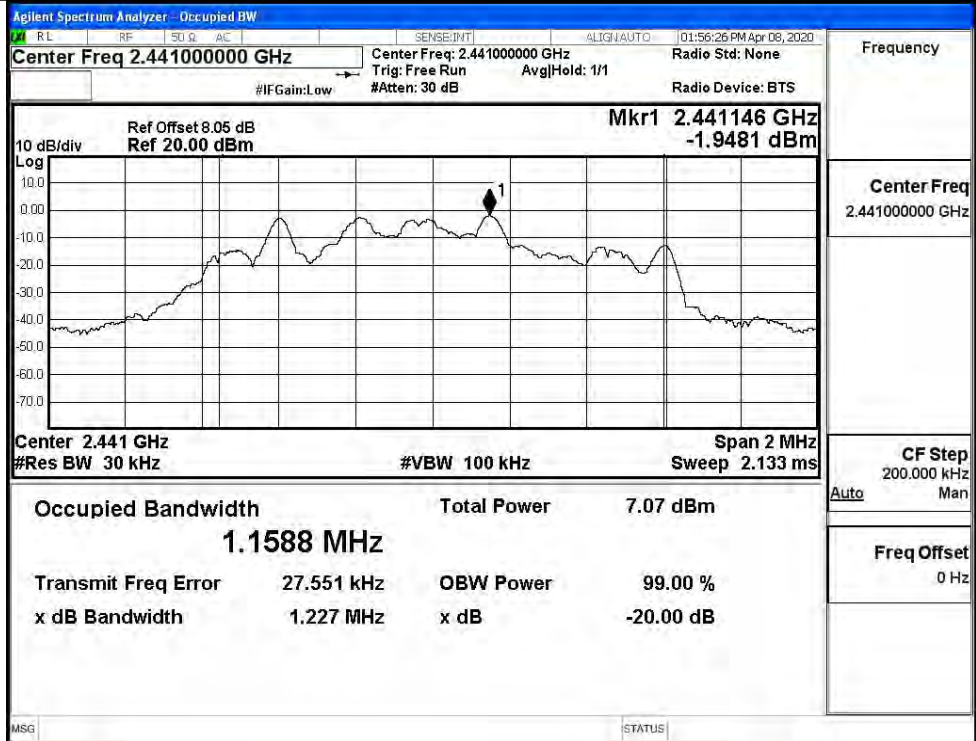
$\pi/4$ DQPSK/HCH



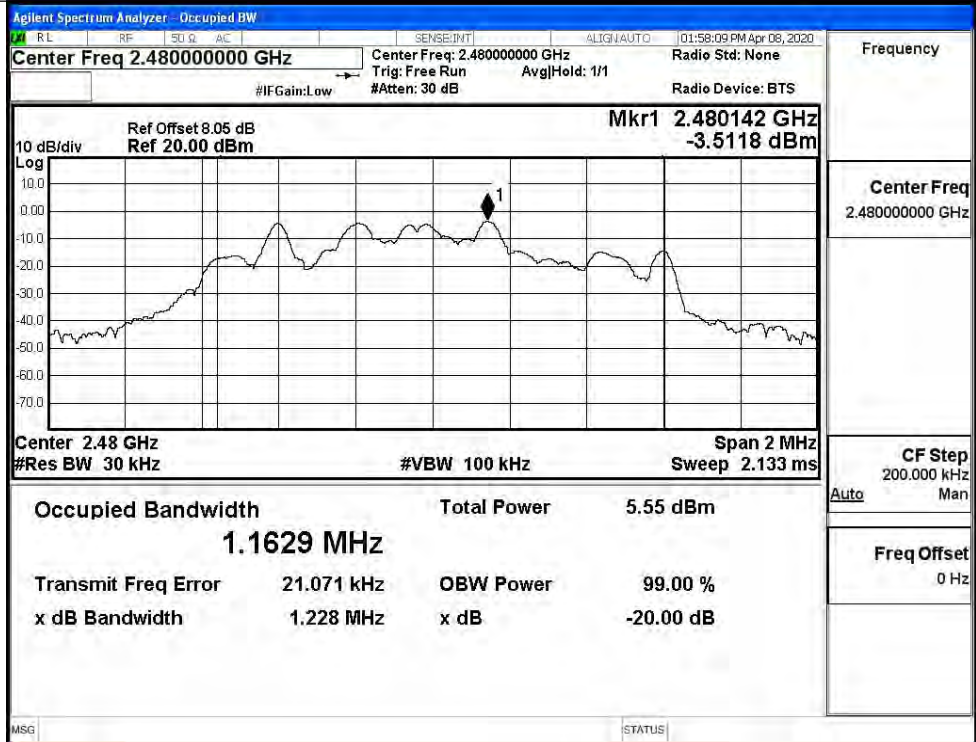
8DPSK/LCH



8DPSK/MCH

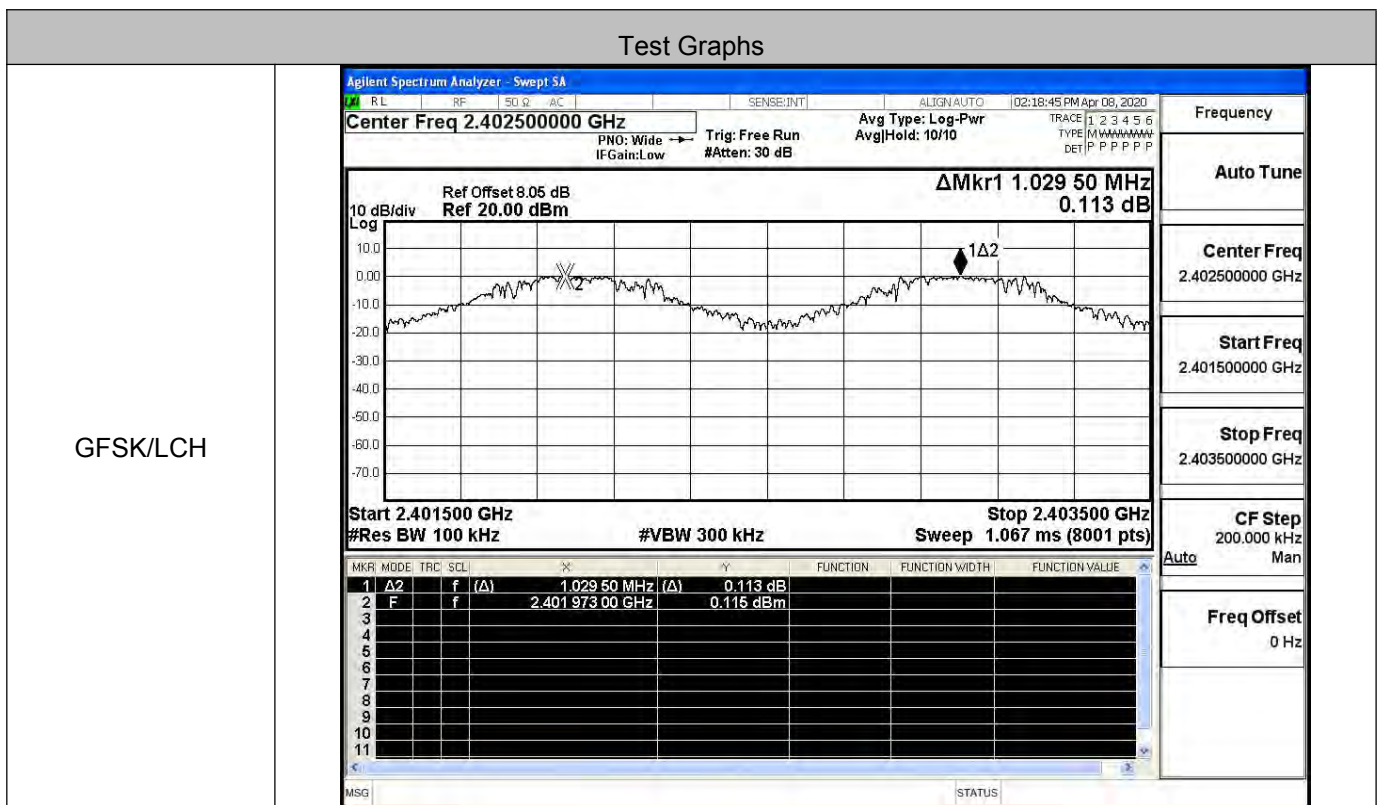


8DPSK/HCH

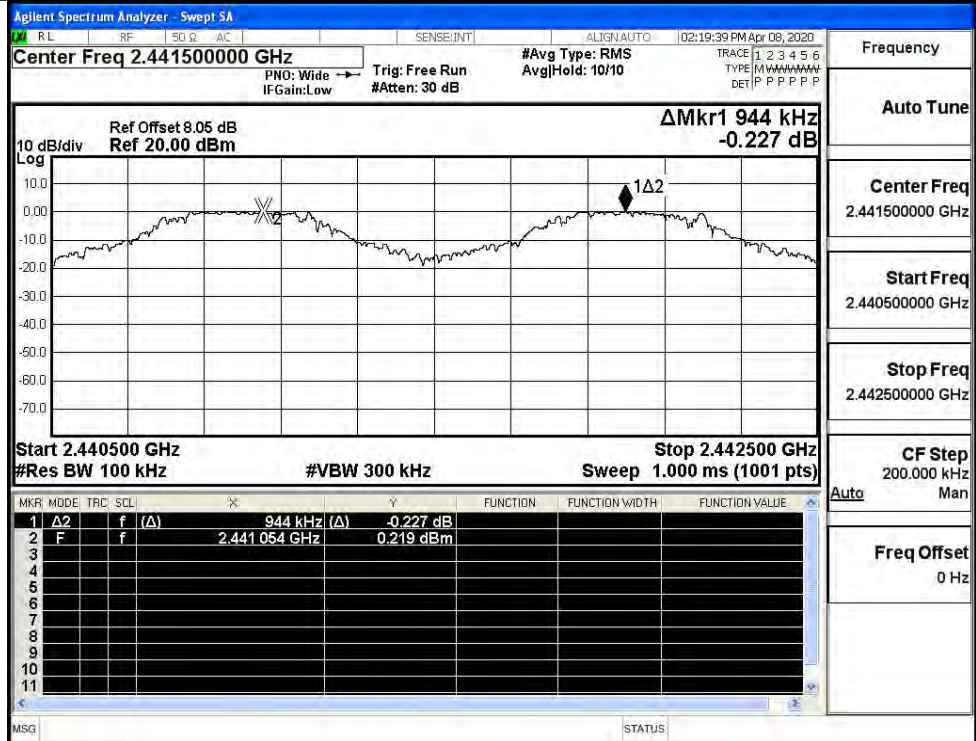


A.3 Carrier Frequency Separation

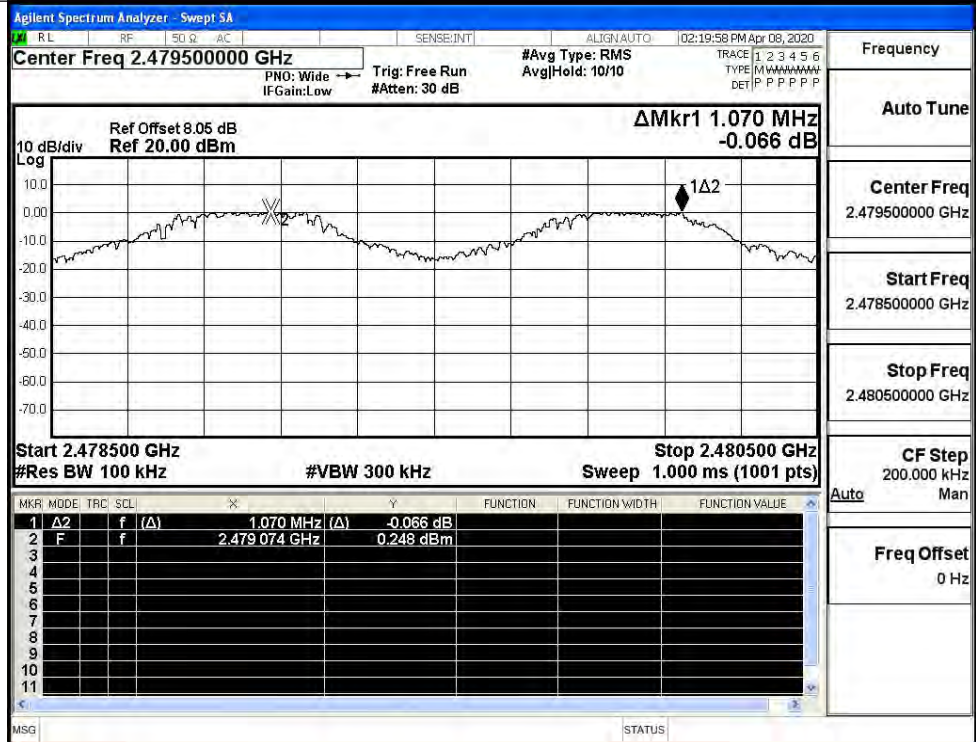
Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.030	0.522	PASS
	MCH	0.944	0.519	PASS
	HCH	1.070	0.519	PASS
$\pi/4$ DQPSK	LCH	0.964	0.815	PASS
	MCH	0.866	0.816	PASS
	HCH	0.858	0.816	PASS
8DPSK	LCH	1.056	0.817	PASS
	MCH	1.270	0.818	PASS
	HCH	1.002	0.819	PASS



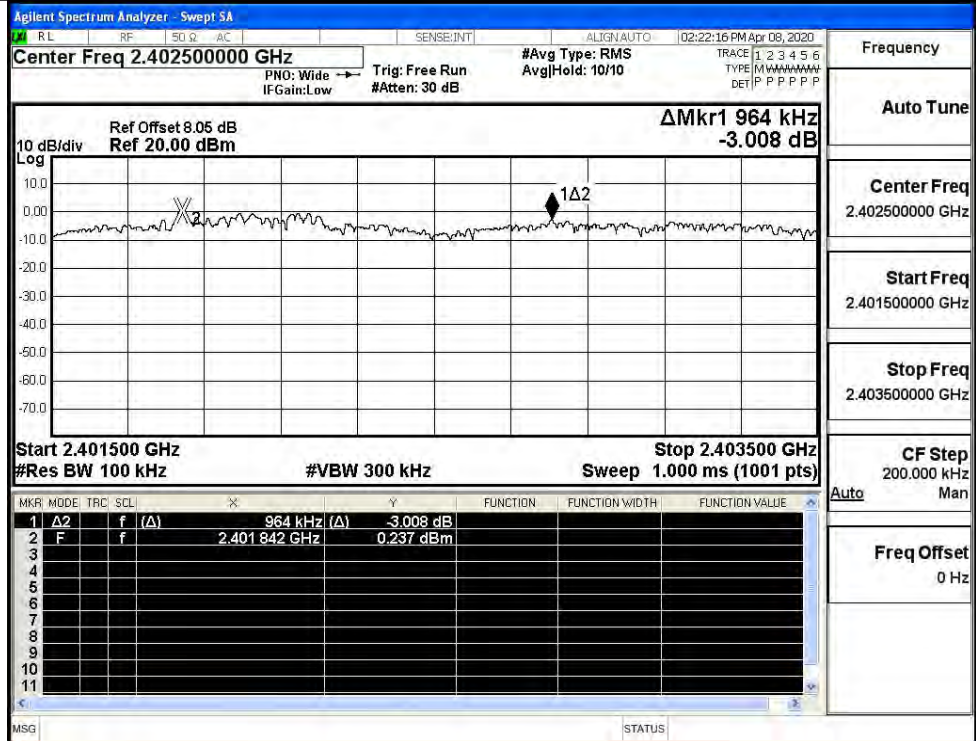
GFSK/MCH



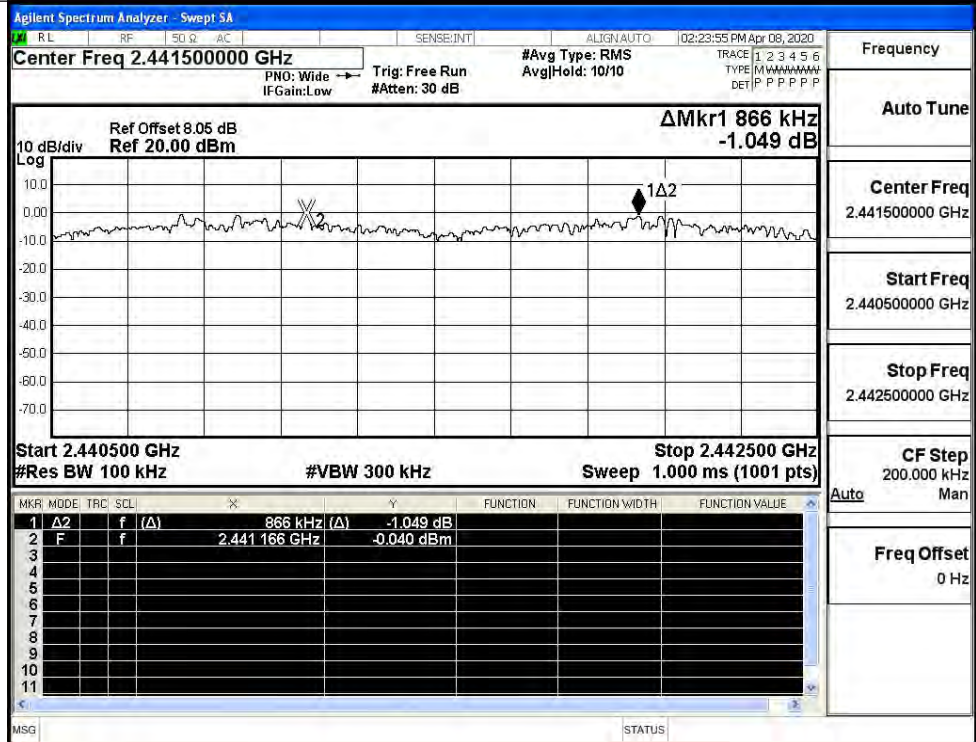
GFSK/HCH



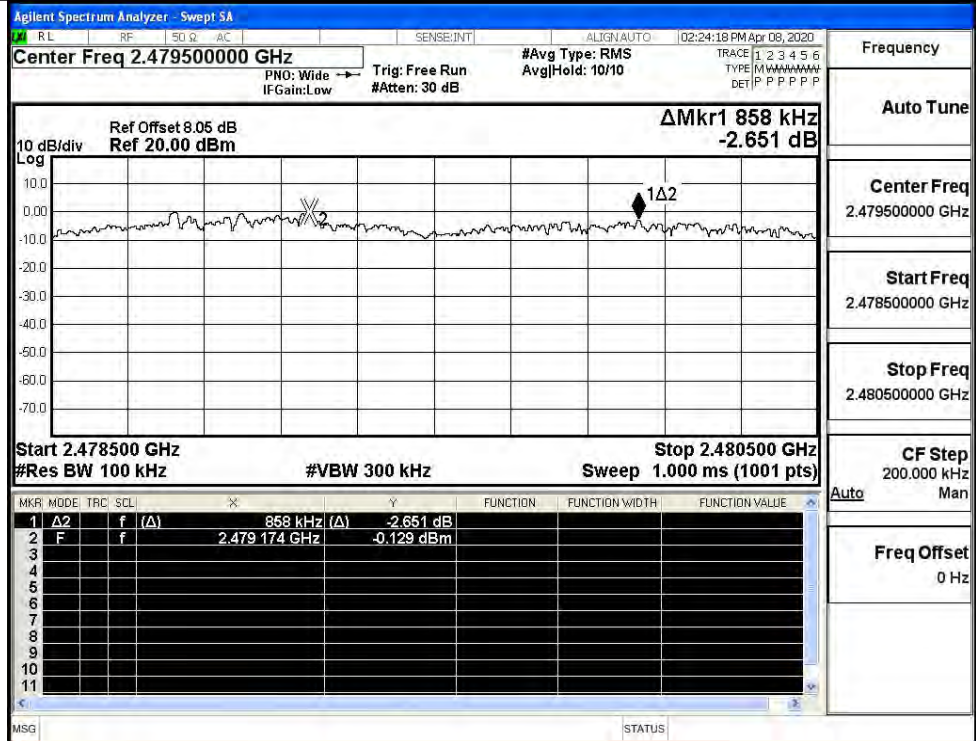
$\pi/4$ DQPSK/LCH



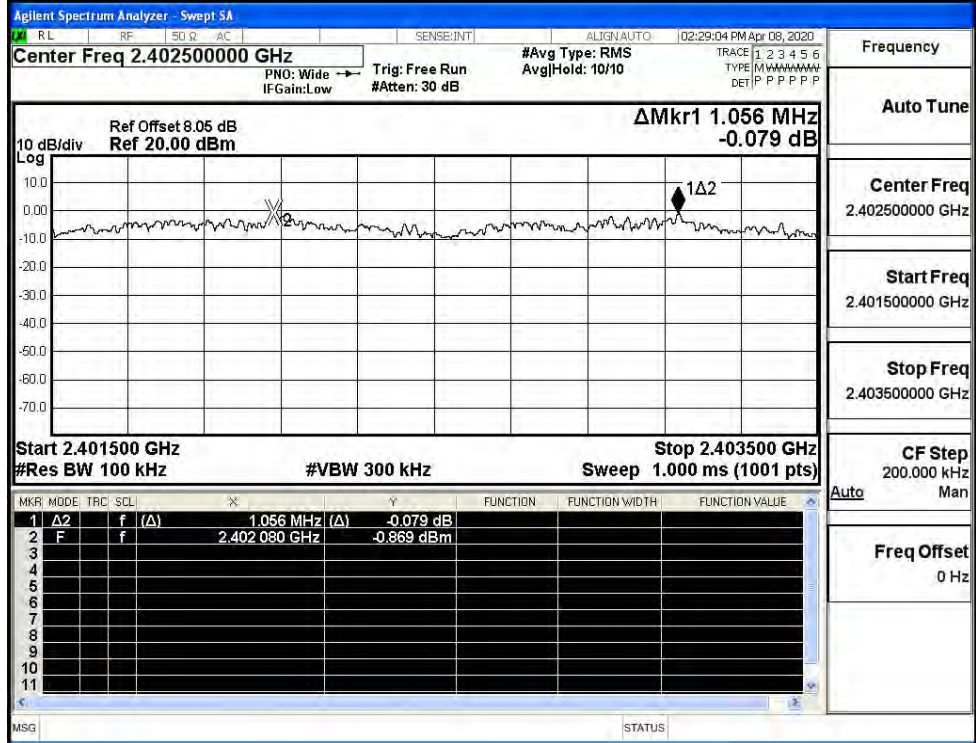
$\pi/4$ DQPSK/MCH



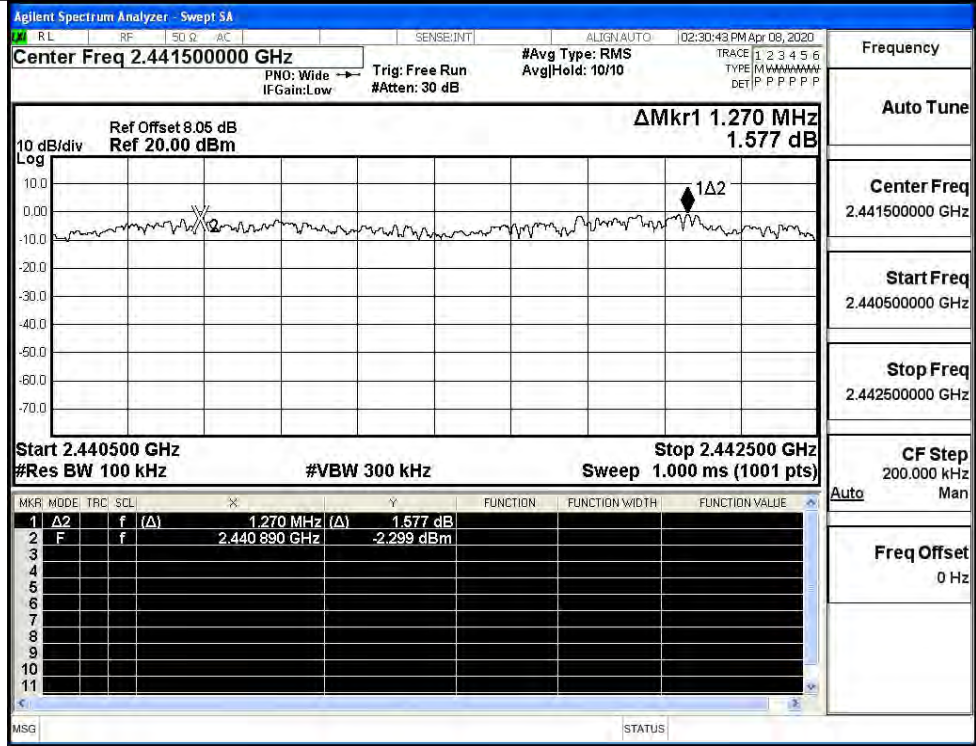
π/4DQPSK/HCH



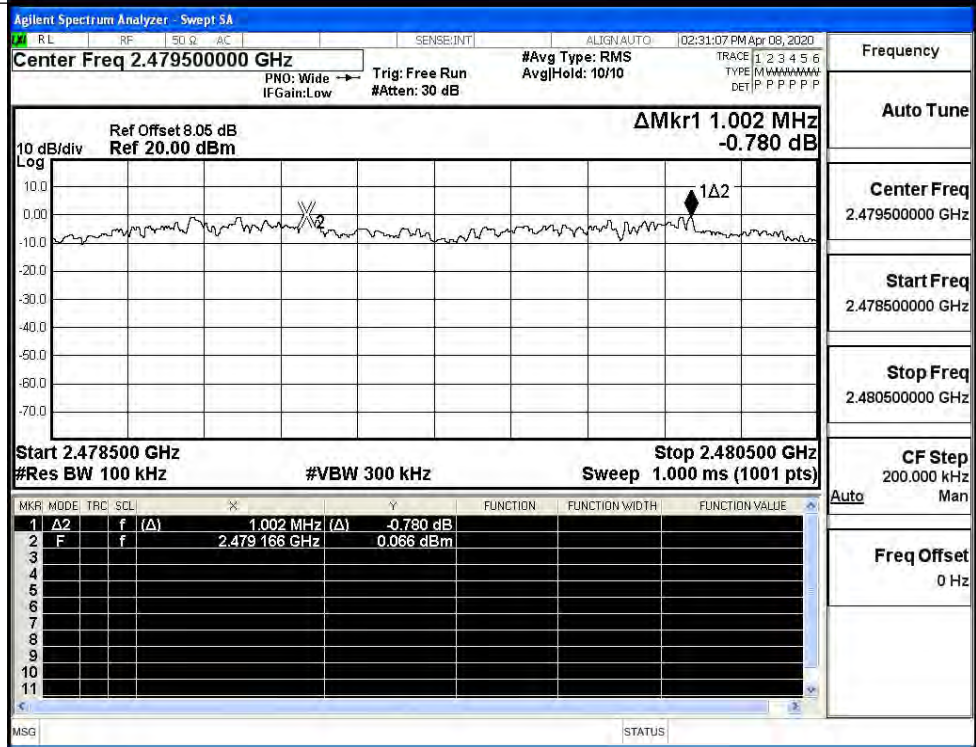
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



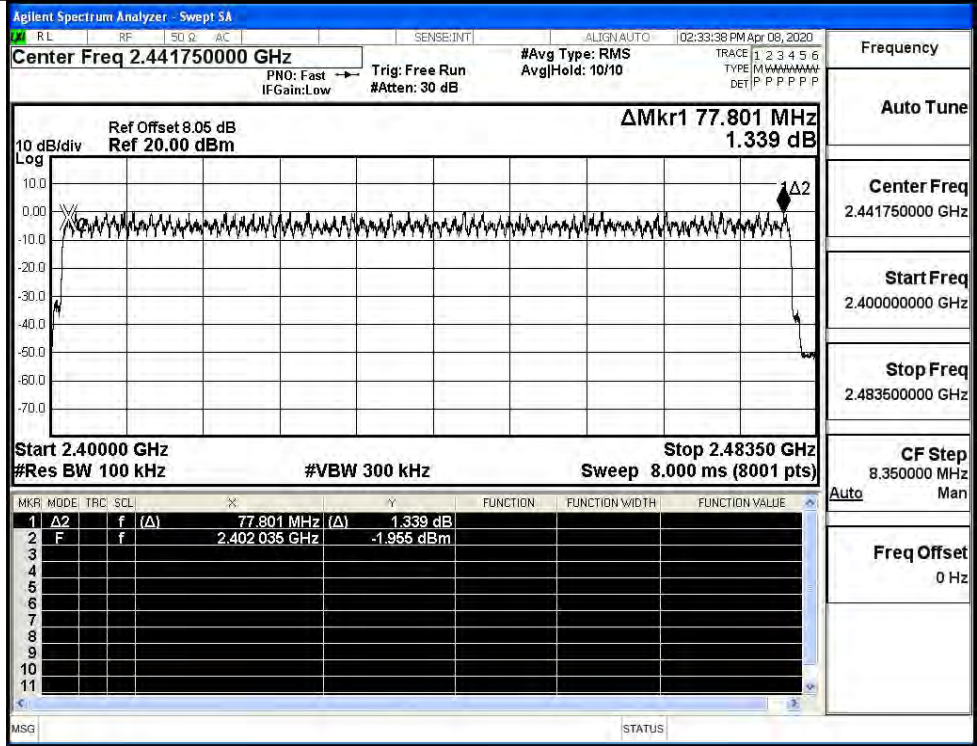
A.4 Hopping Channel Number

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

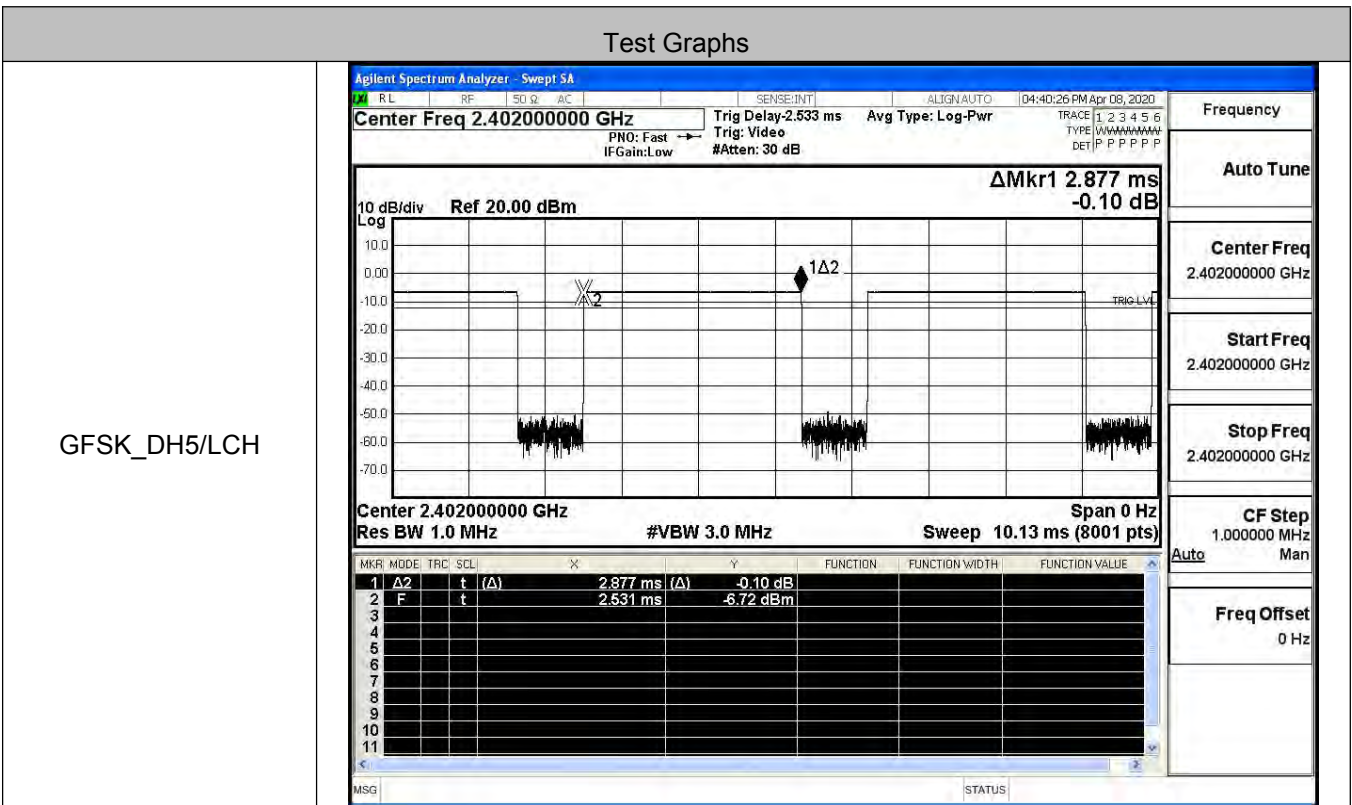
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>ΔMkr1 77.864 MHz 0.874 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <tr> <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>77.864 MHz</td> <td>(Δ)</td> <td>0.874 dB</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402181 GHz</td> <td></td> <td>-0.118 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)	77.864 MHz	(Δ)	0.874 dB			2	F	f		2.402181 GHz		-0.118 dBm		
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	77.864 MHz	(Δ)	0.874 dB																						
2	F	f		2.402181 GHz		-0.118 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 78.031 MHz -1.336 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>78.031 MHz</td> <td>(Δ)</td> <td>-1.336 dB</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402088 GHz</td> <td></td> <td>-0.944 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)	78.031 MHz	(Δ)	-1.336 dB			2	F	f		2.402088 GHz		-0.944 dBm		
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	78.031 MHz	(Δ)	-1.336 dB																						
2	F	f		2.402088 GHz		-0.944 dBm																						

8DPSK/Hop

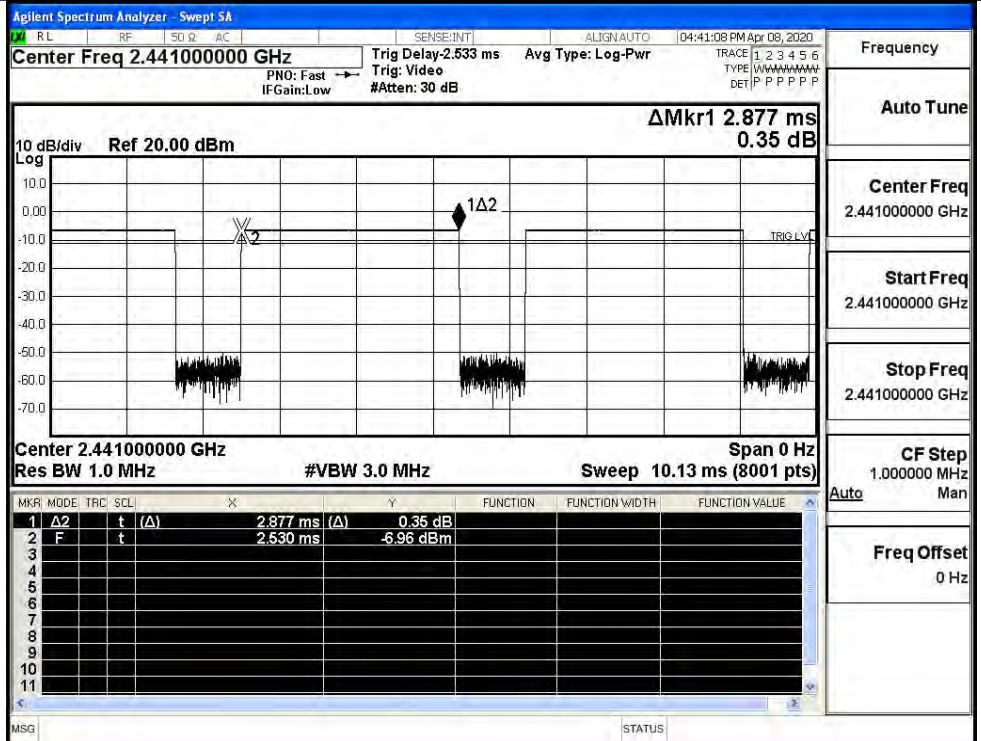


A.5 Dwell Time

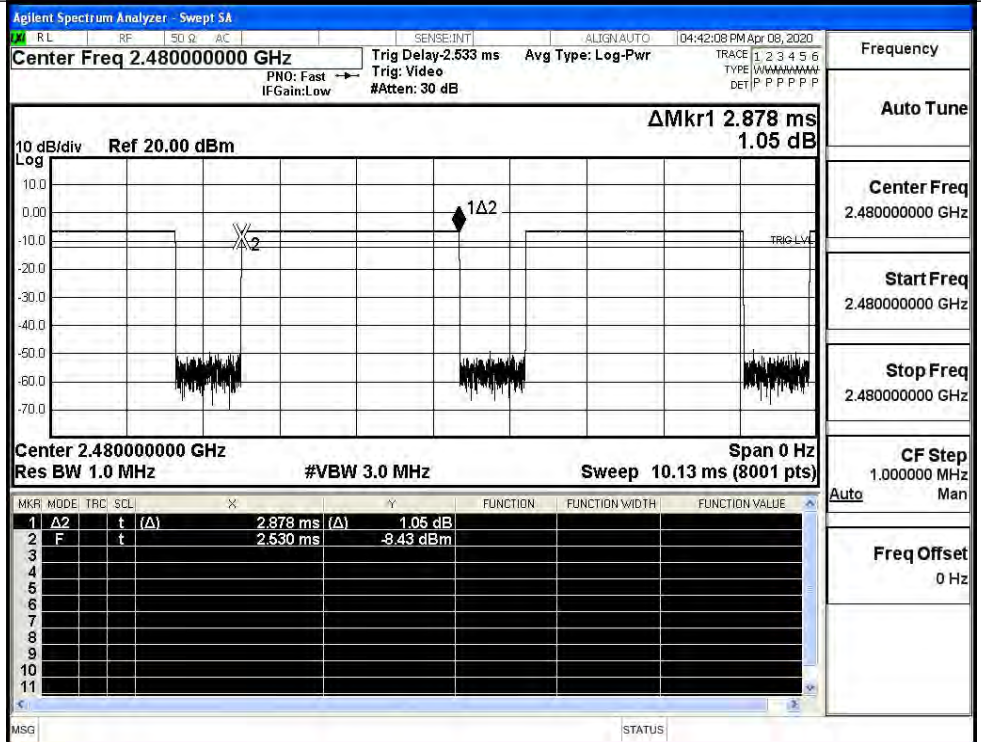
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.82	106.7	0.087	0.4	PASS
	DH5	MCH	0.82	106.7	0.087	0.4	PASS
	DH5	HCH	0.82	106.7	0.087	0.4	PASS
π/4DQPSK	2DH5	LCH	0.82	106.7	0.013	0.4	PASS
	2DH5	MCH	0.82	106.7	0.013	0.4	PASS
	2DH5	HCH	0.82	106.7	0.013	0.4	PASS
8DPSK	3DH5	LCH	0.82	106.7	0.013	0.4	PASS
	3DH5	MCH	0.82	106.7	0.013	0.4	PASS
	3DH5	HCH	0.82	106.7	0.087	0.4	PASS



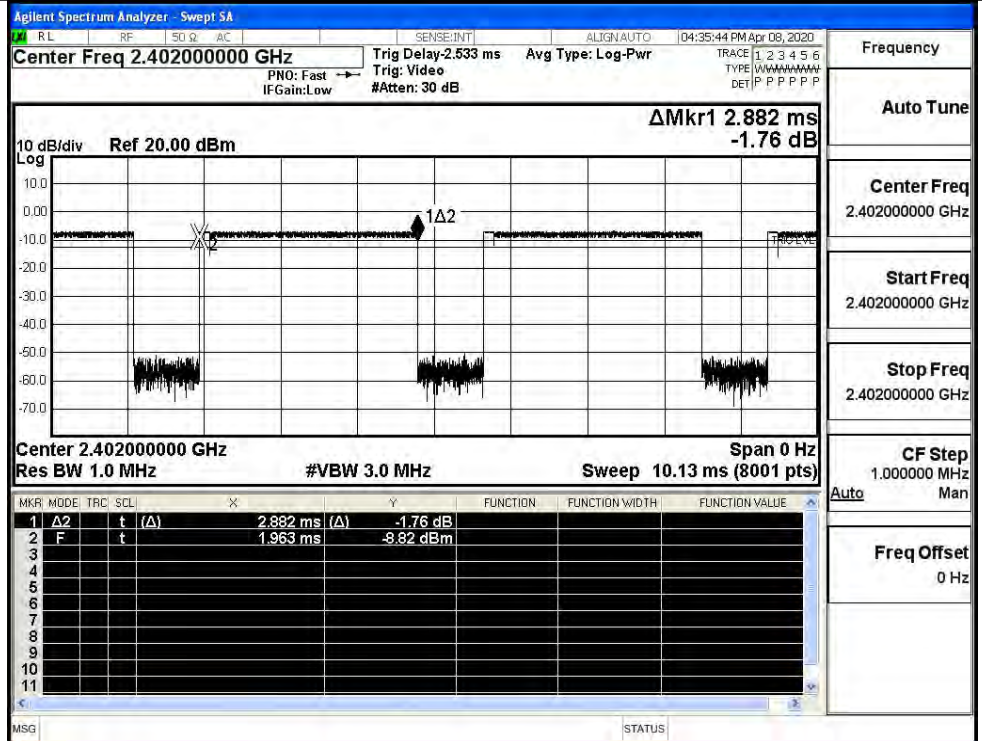
GFSK_DH5/MCH



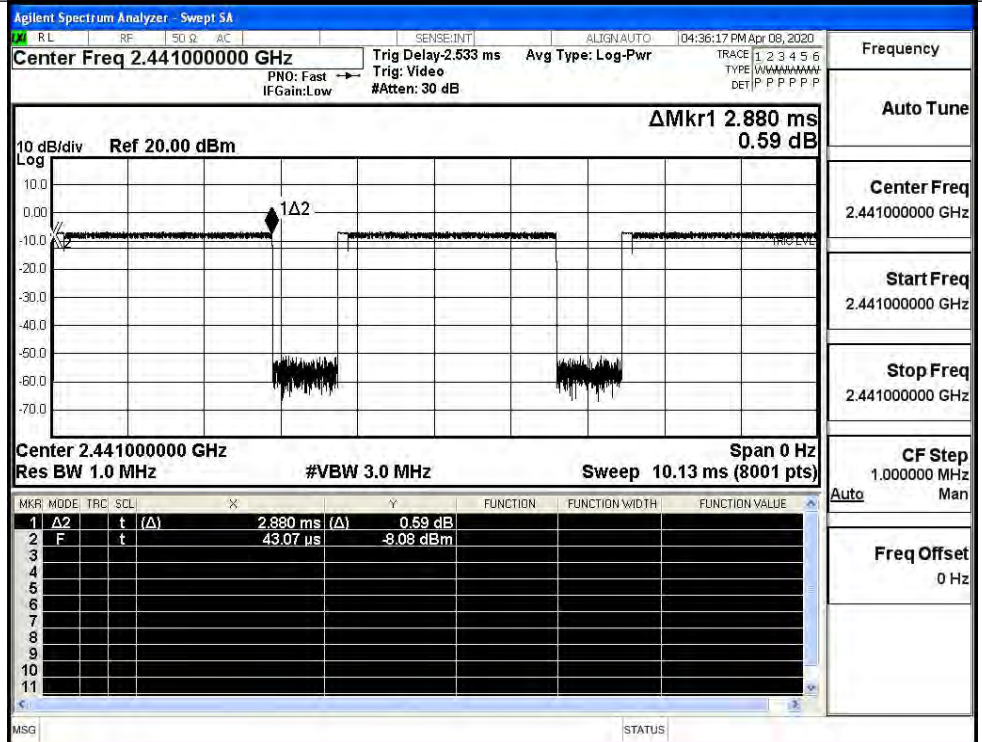
GFSK_DH5/HCH



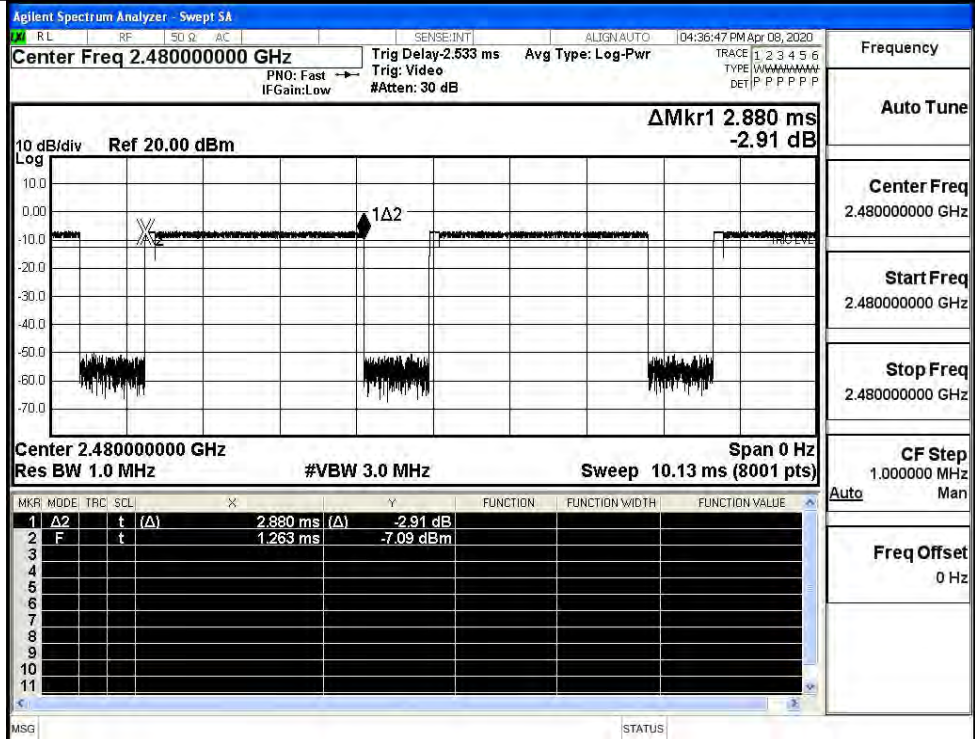
$\pi/4$ DQPSK
_2DH5/LCH



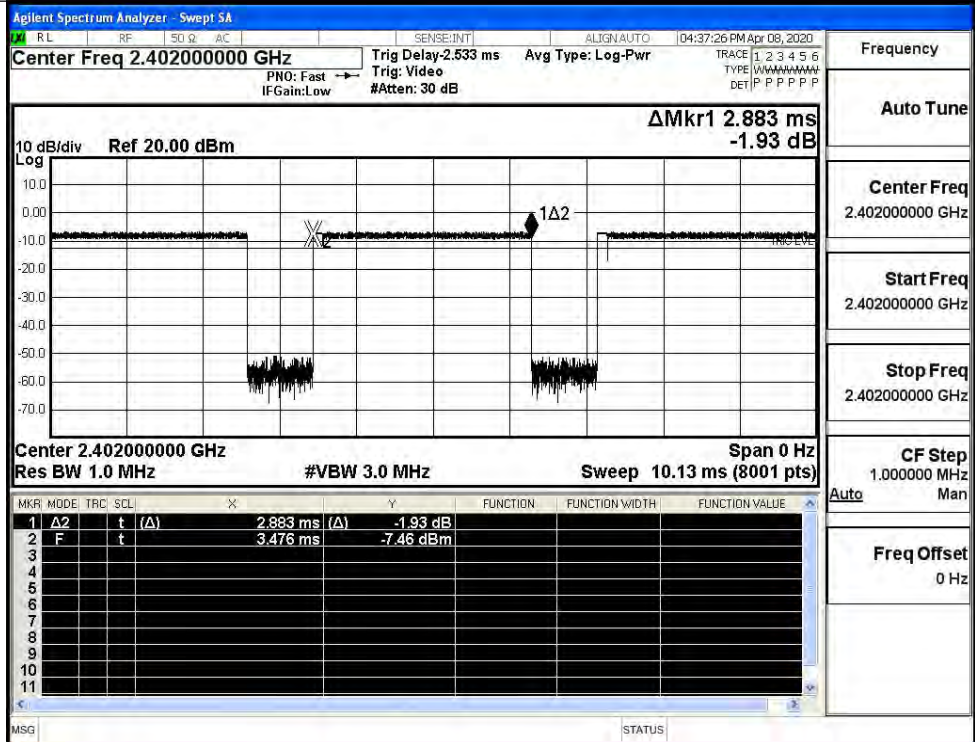
$\pi/4$ DQPSK
_2DH5/MCH



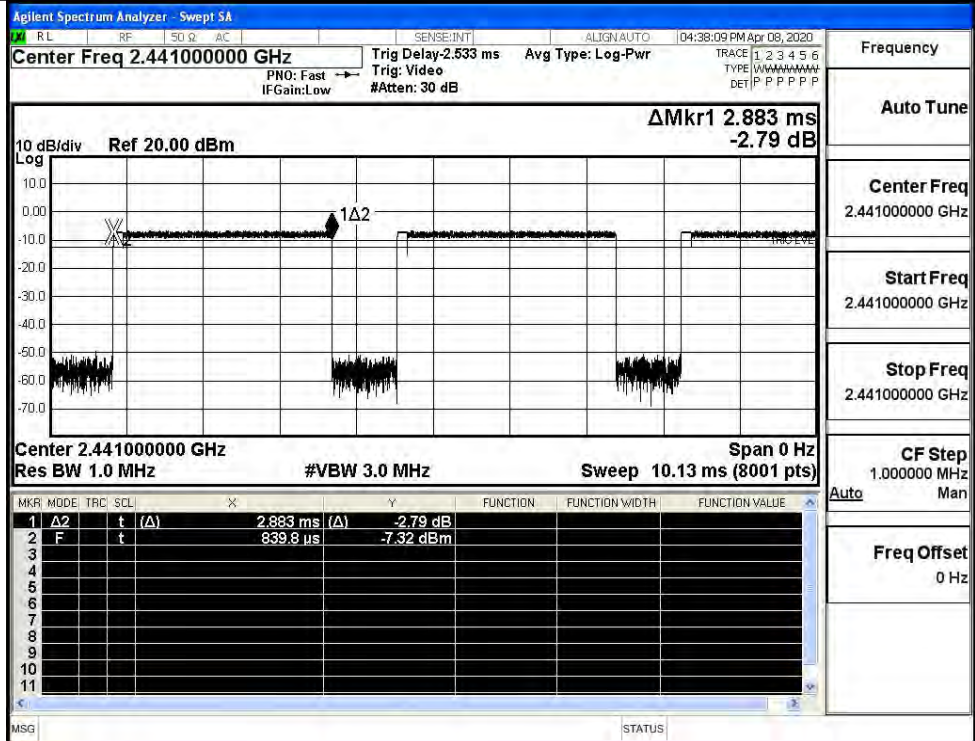
$\pi/4$ DQPSK
_2DH5/HCH



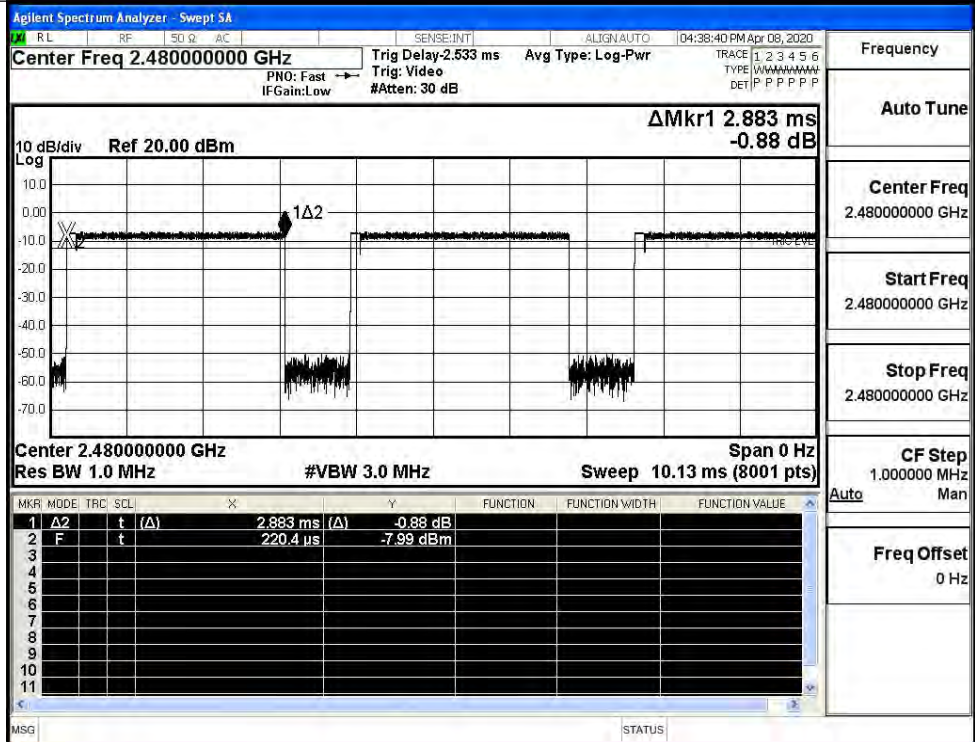
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



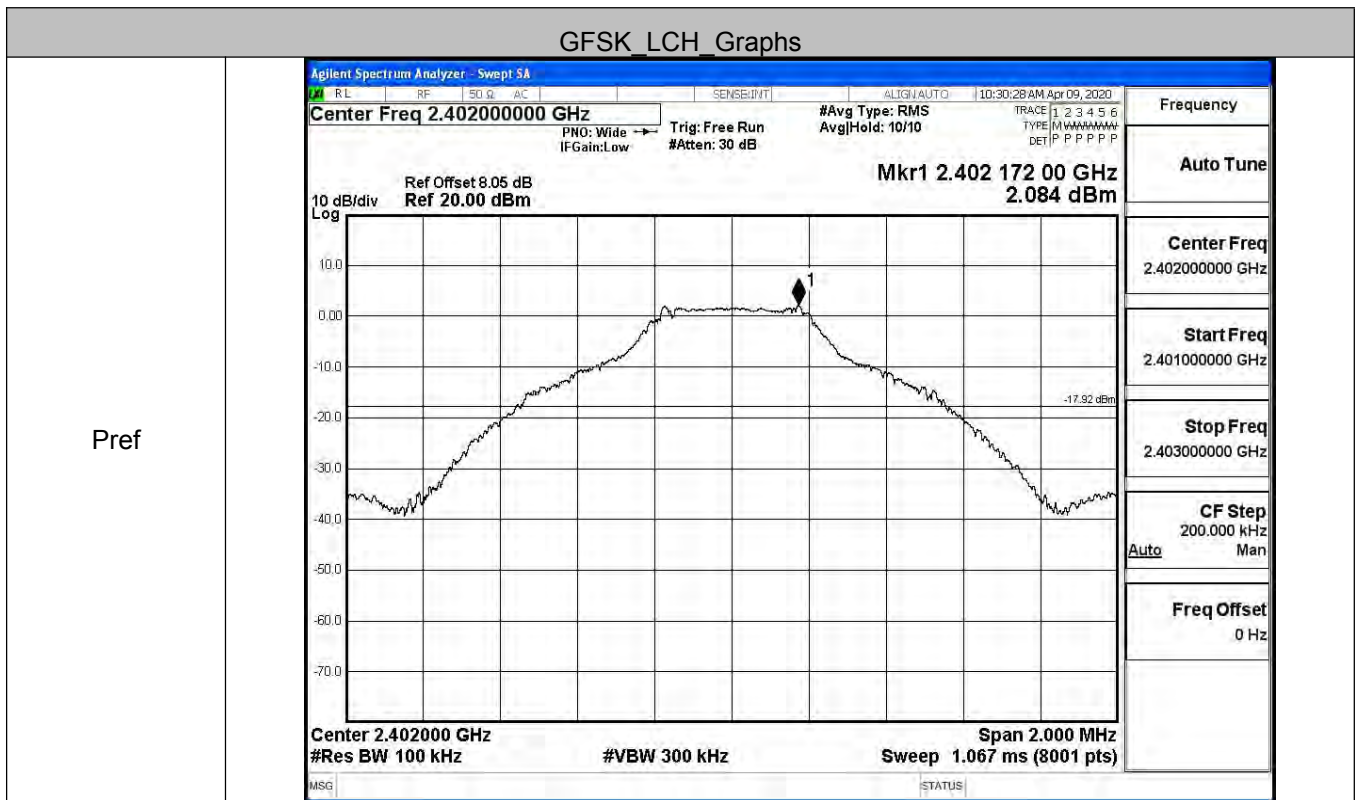
8DPSK_3DH5/HCH



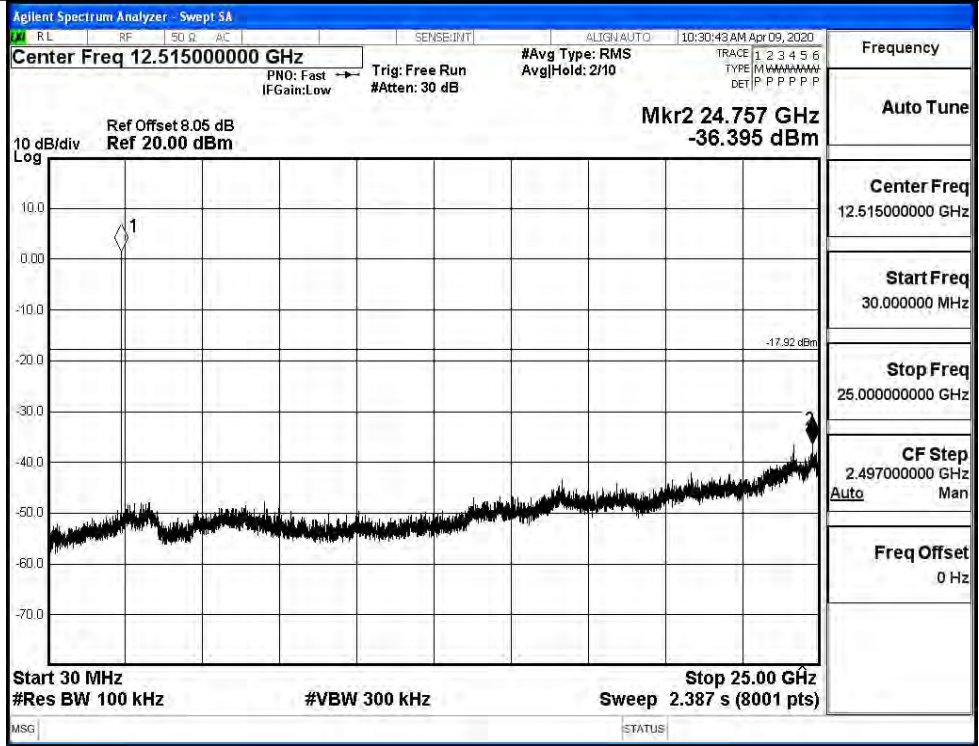
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.084	-36.395	-17.916	PASS
	MCH	2.000	-36.463	-18.000	PASS
	HCH	2.099	-37.402	-17.901	PASS
π/4DQPSK	LCH	1.539	-35.927	-18.461	PASS
	MCH	1.369	-36.640	-18.631	PASS
	HCH	1.458	-37.676	-18.542	PASS
8DPSK	LCH	1.518	-37.069	-18.482	PASS
	MCH	1.412	-37.039	-18.588	PASS
	HCH	1.262	-37.837	-18.738	PASS

GFSK LCH Graphs

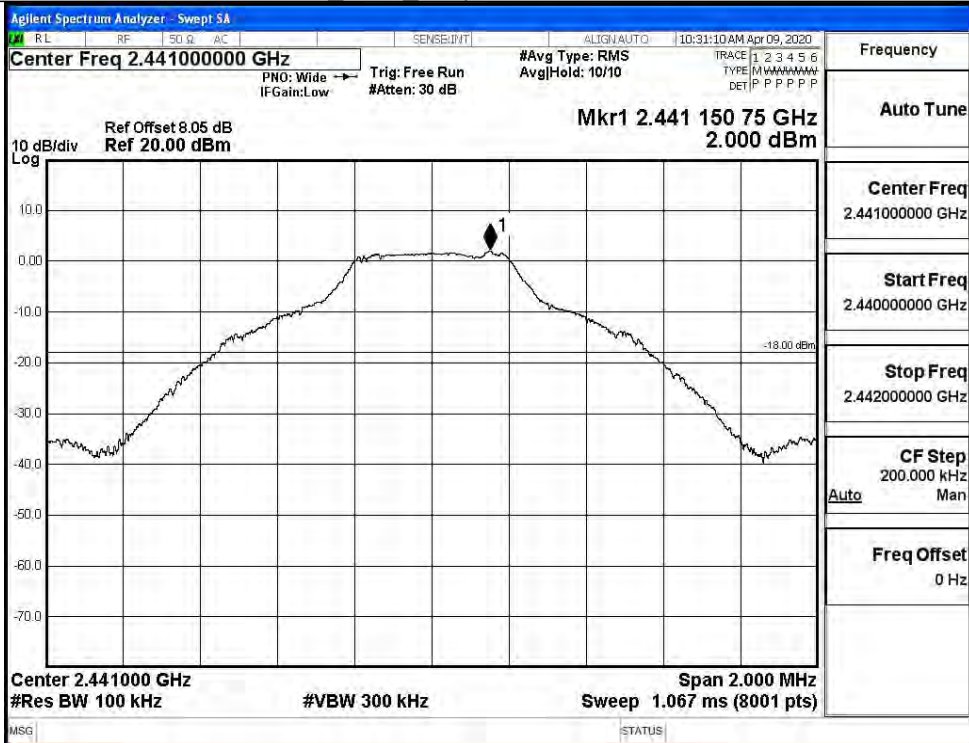


P_{uw}

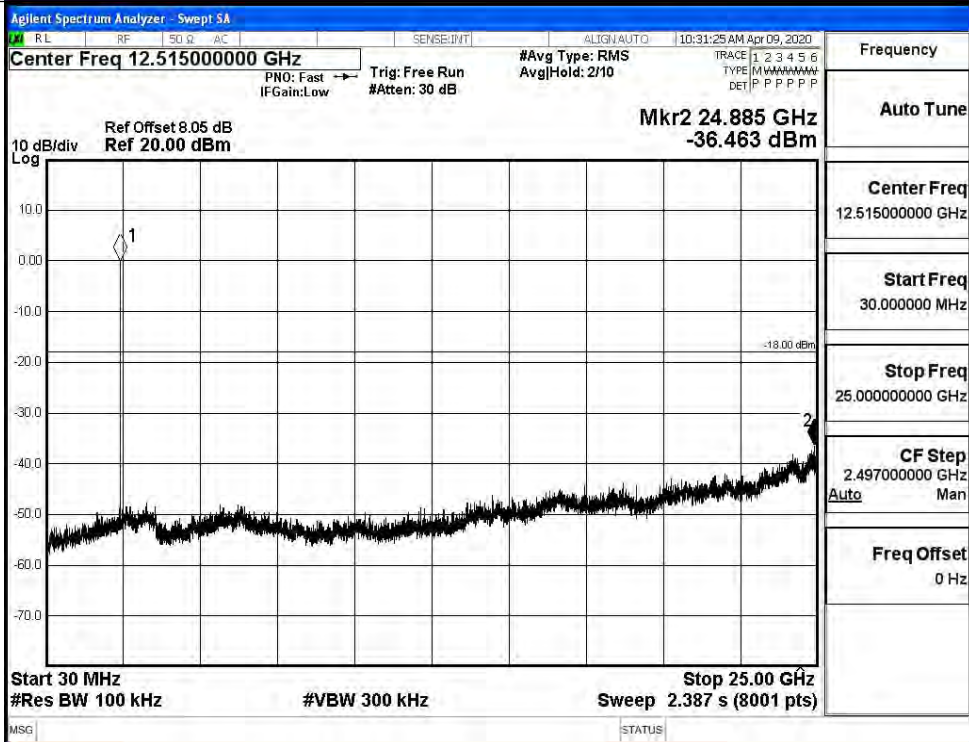


GFSK_MCH_Graphs

Pref

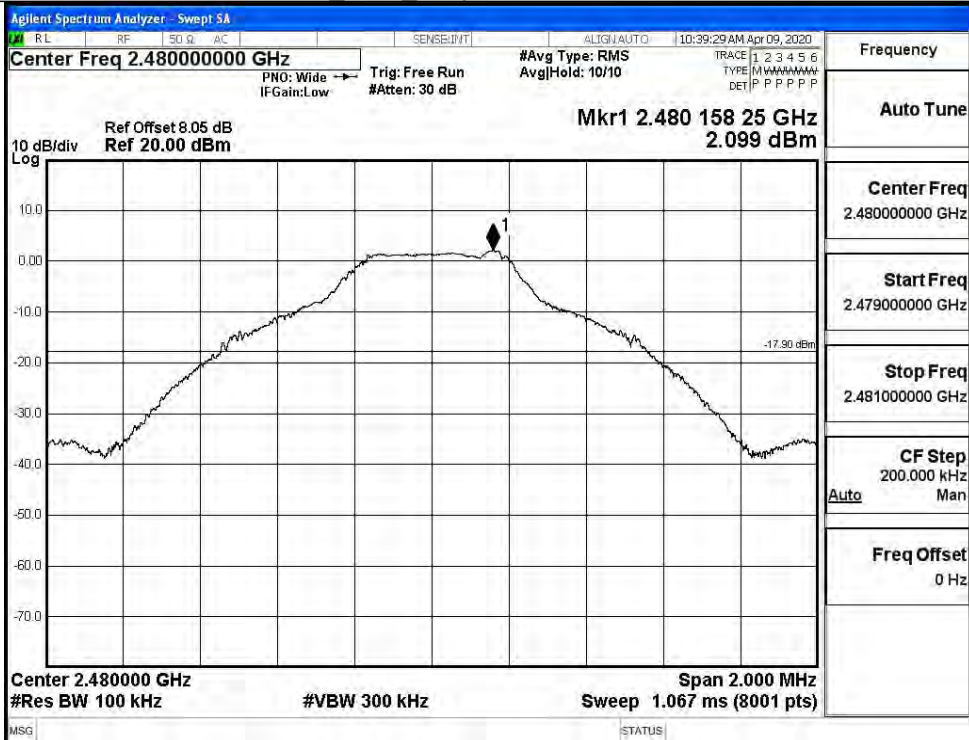


Puw

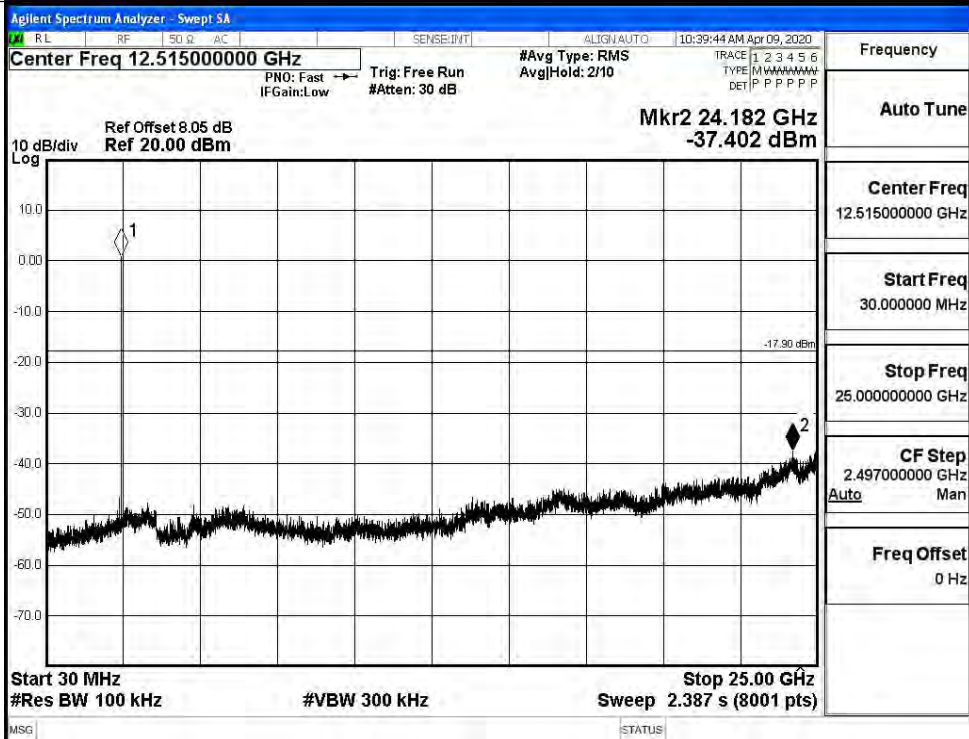


GFSK_HCH_Graphs

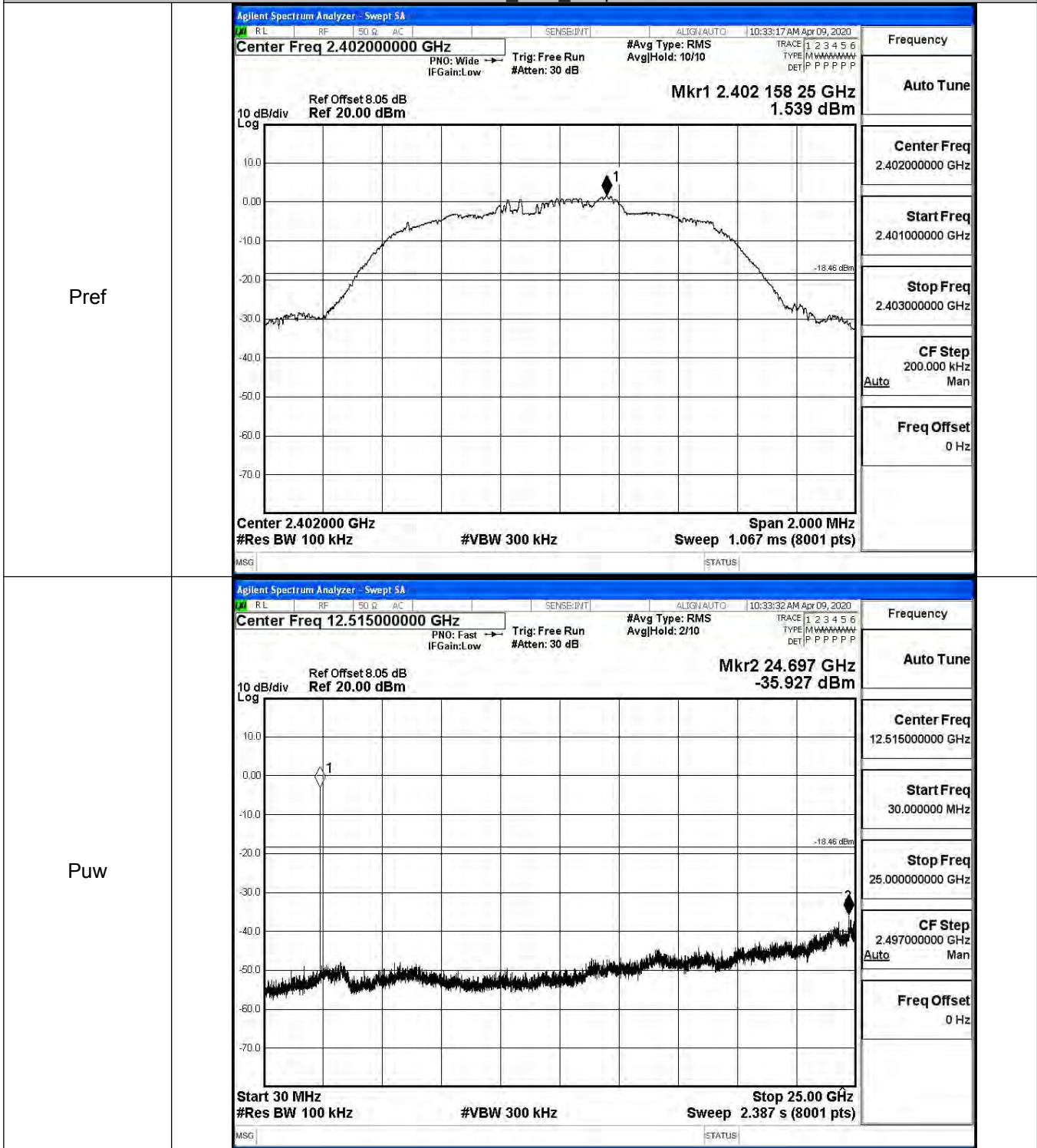
Pref



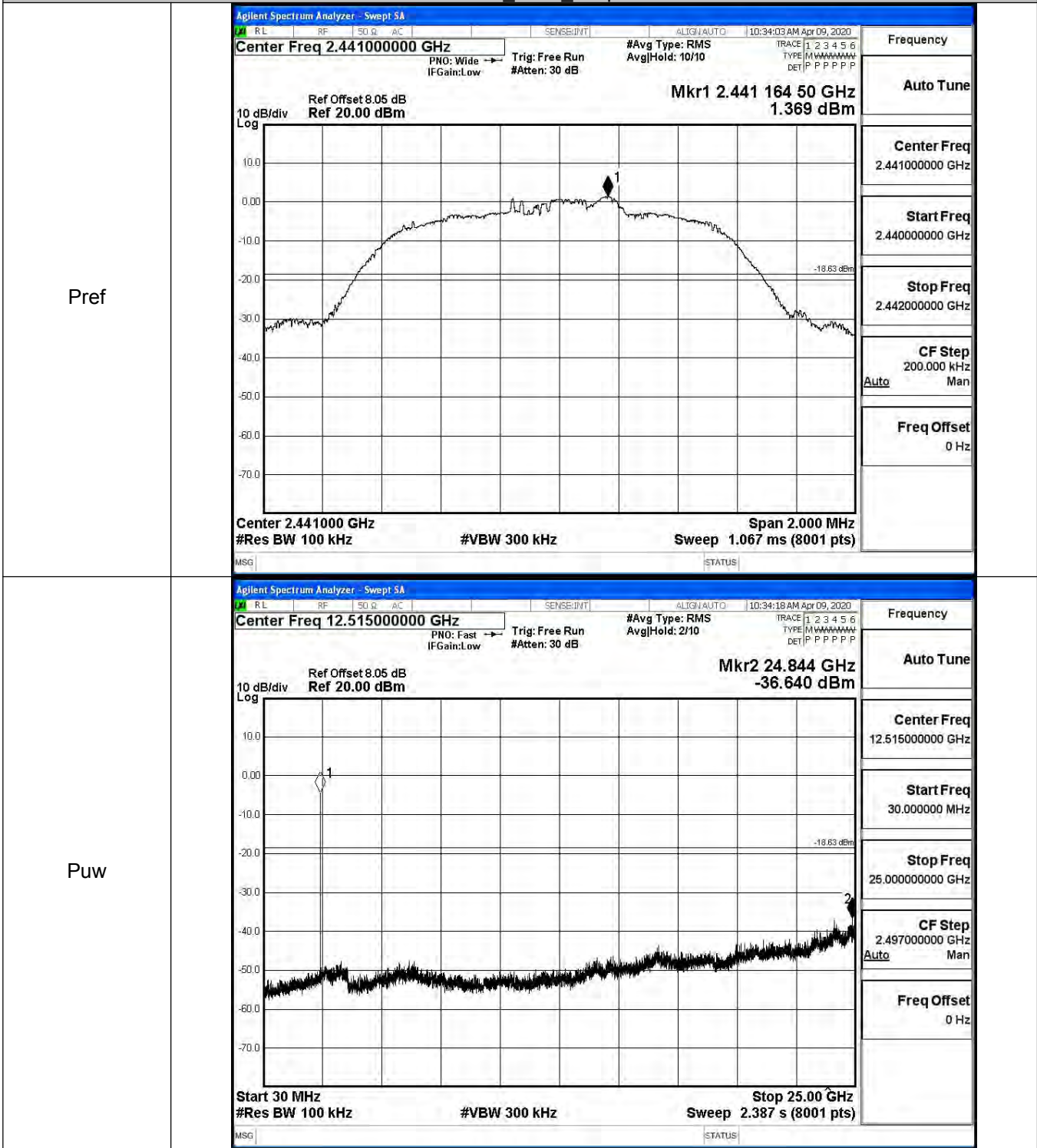
Puw



$\pi/4$ DQPSK_LCH_Graphs

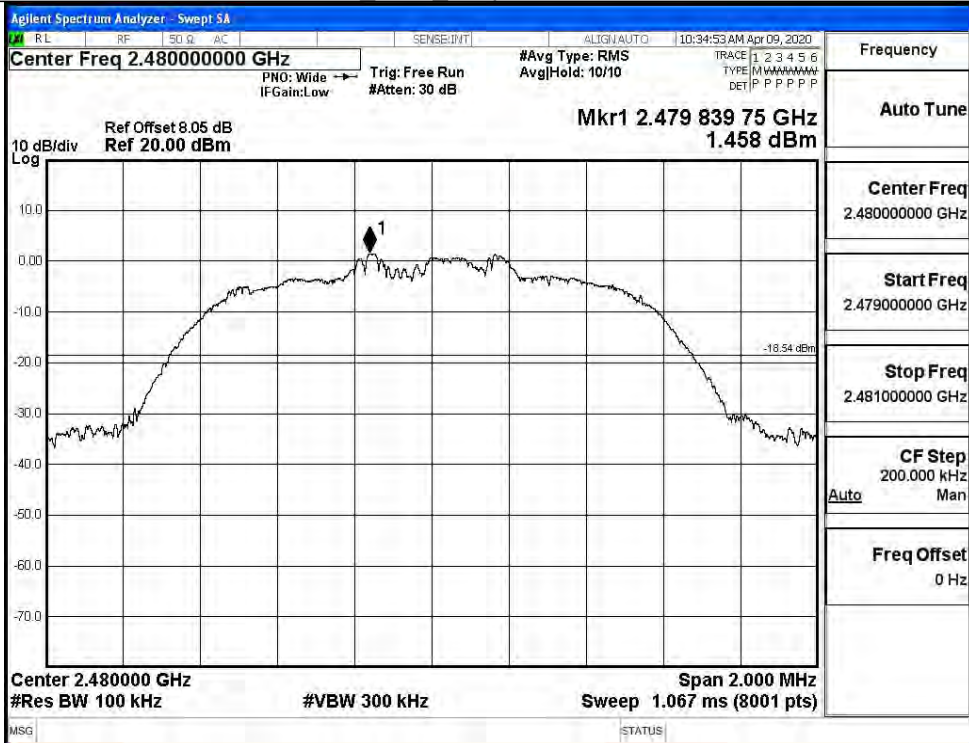


$\pi/4$ DQPSK_MCH_Graphs

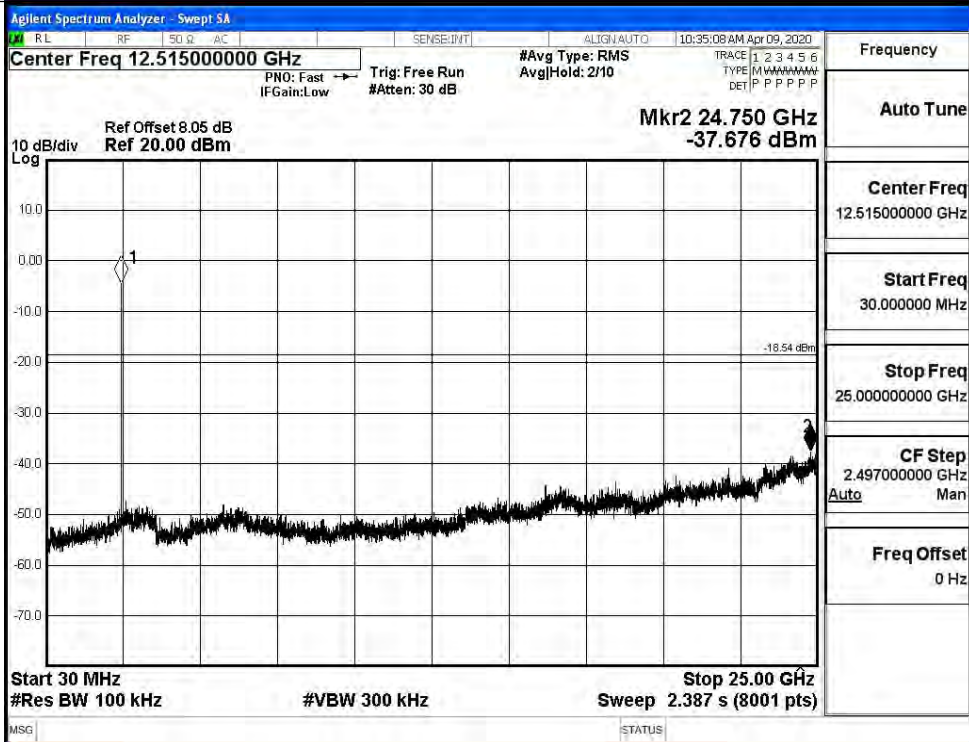


$\pi/4$ DQPSK_HCH_Graphs

Pref

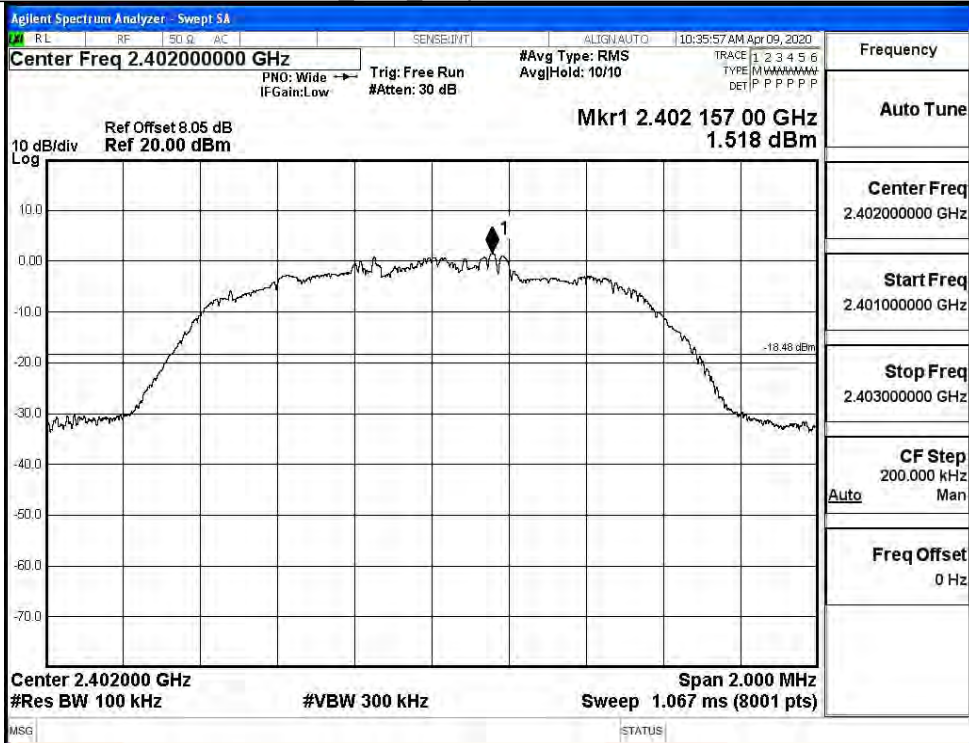


Puw

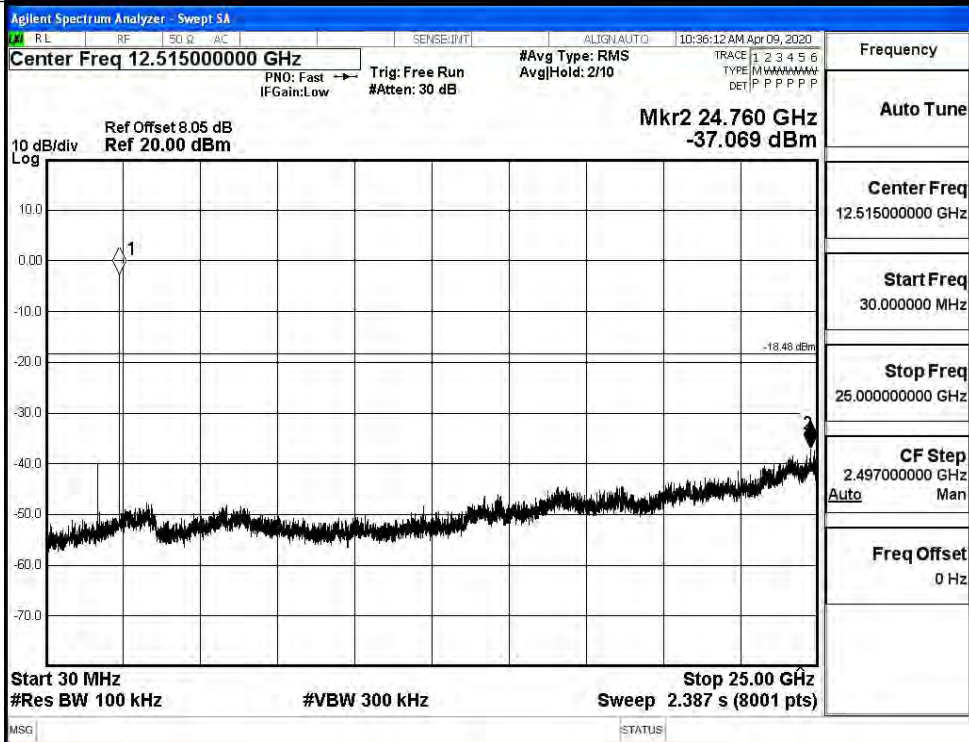


8DPSK_LCH_Graphs

Pref

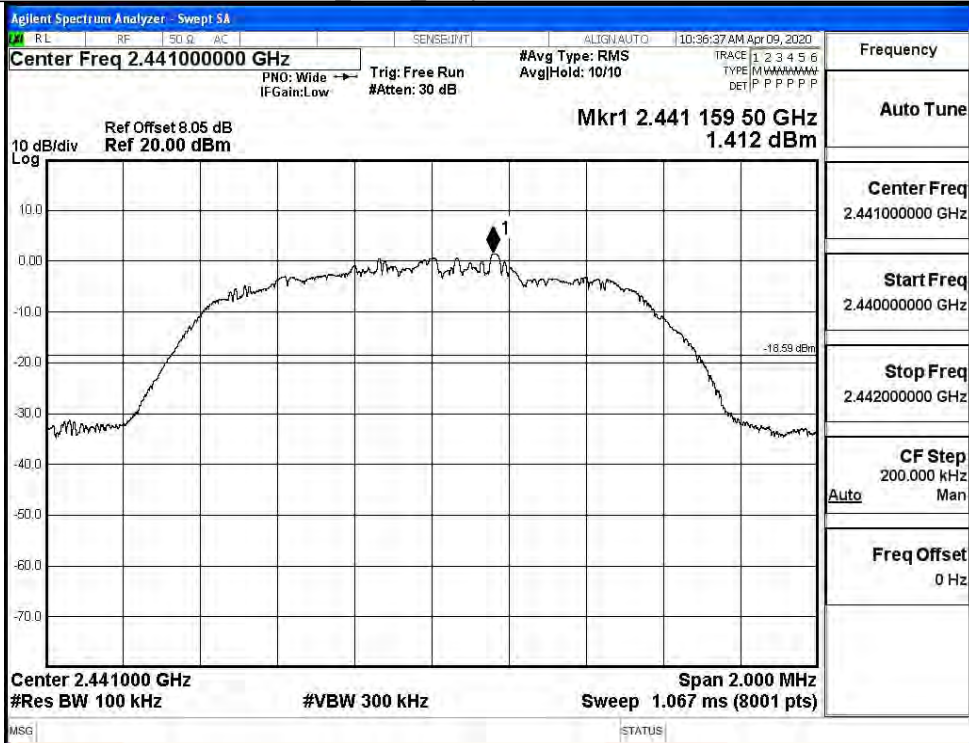


Puw

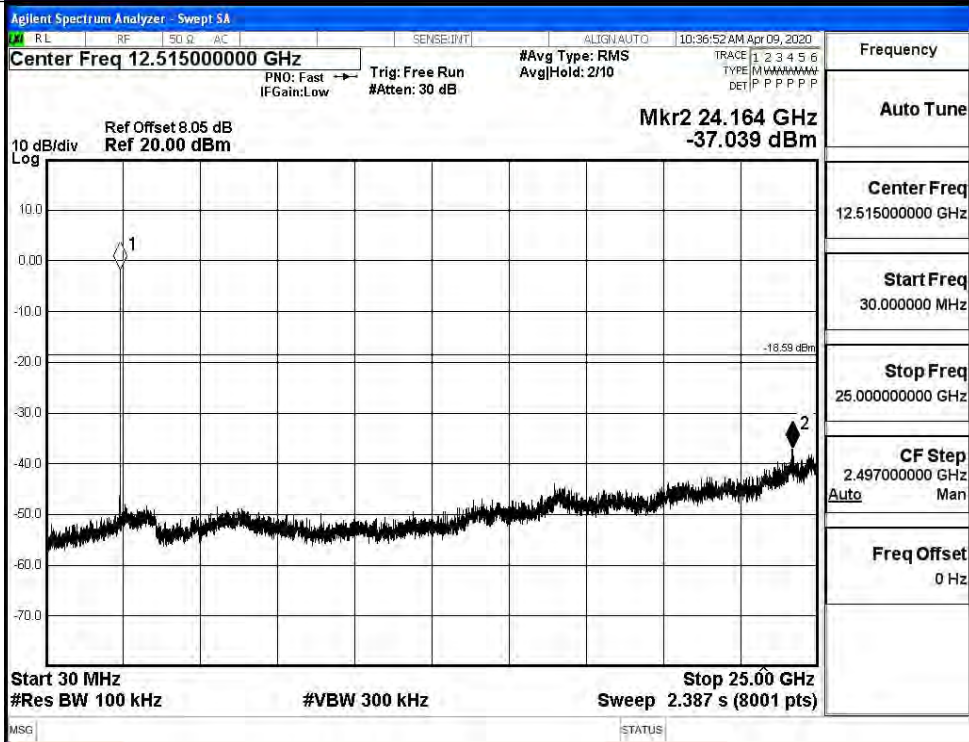


8DPSK_MCH_Graphs

Pref

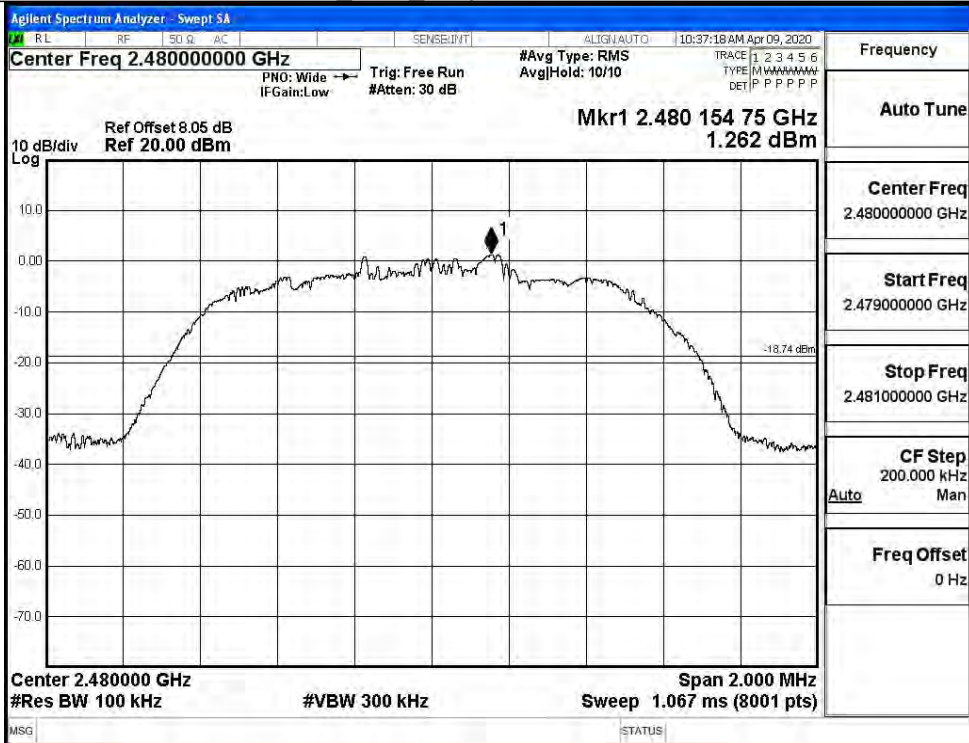


Puw

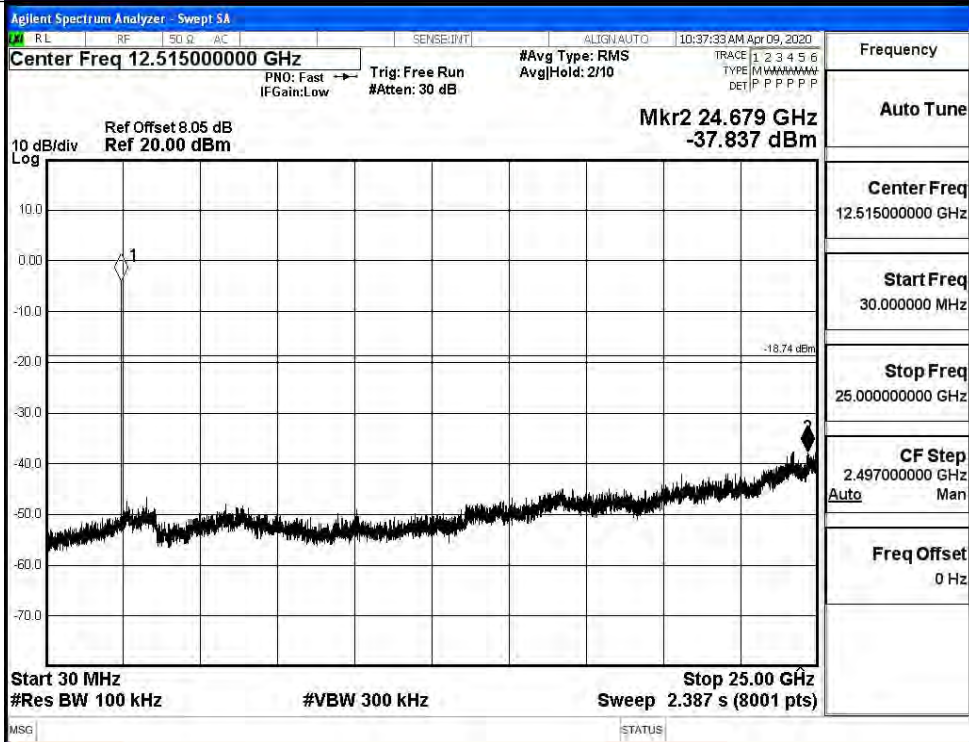


8DPSK_HCH_Graphs

Pref



Puw

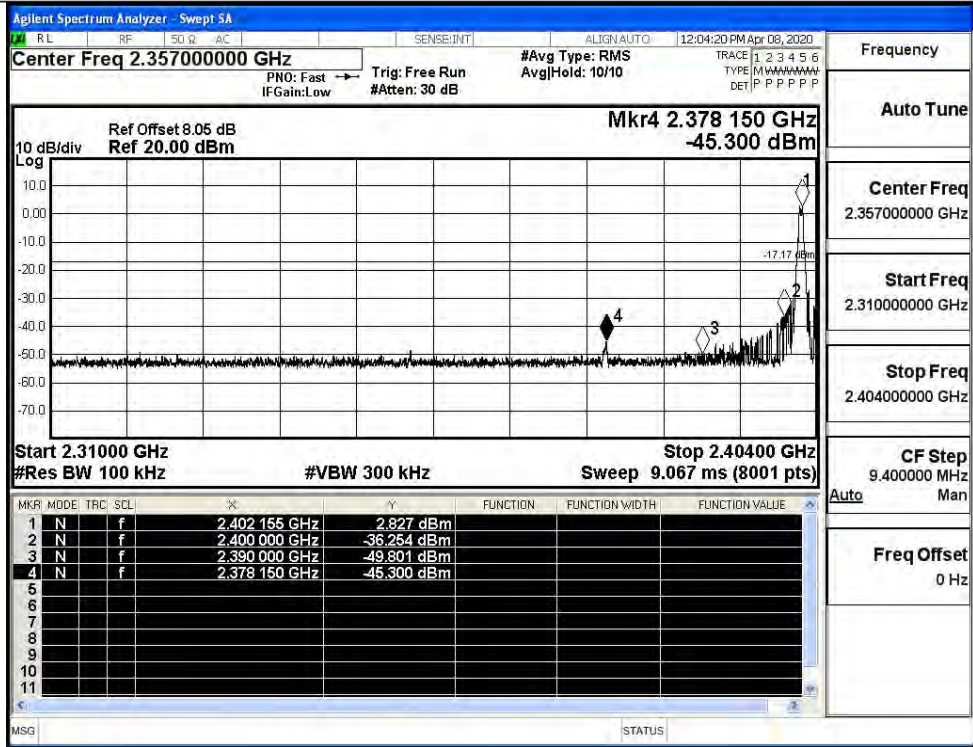


A.7 Band-edge for RF Conducted Emissions

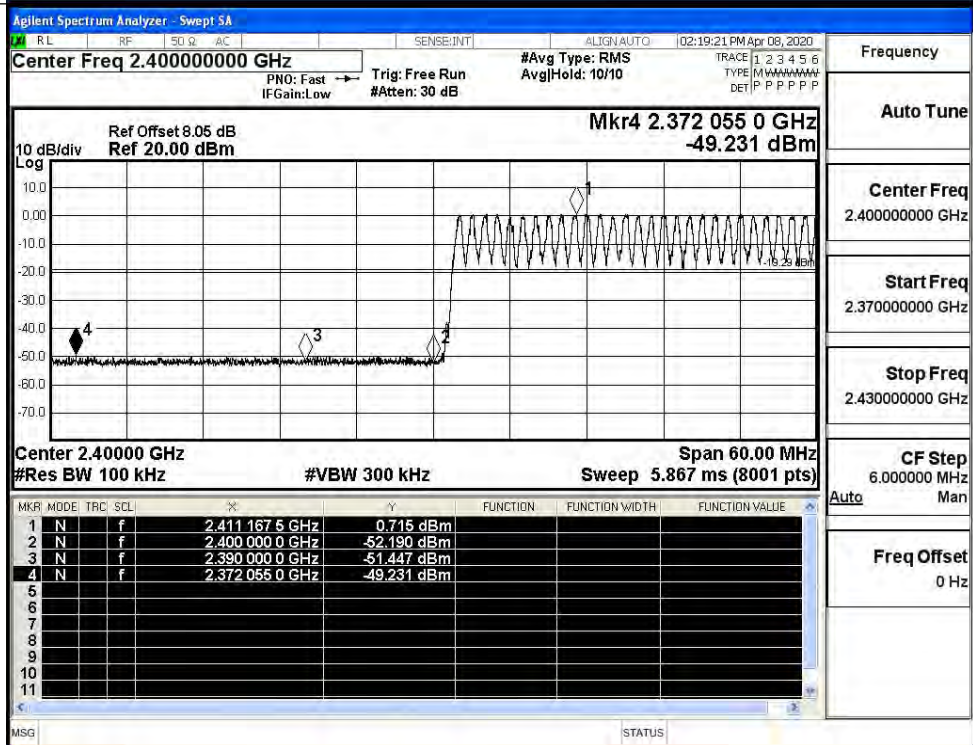
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	2.827	Off	-45.300	-17.17	PASS
			0.715	On	-49.231	-19.29	PASS
	HCH	2480	0.569	Off	-41.225	-19.43	PASS
			0.961	On	-48.672	-19.04	PASS
π/4DQPSK	LCH	2402	1.500	Off	-47.962	-18.5	PASS
			0.127	On	-49.284	-19.87	PASS
	HCH	2480	-0.914	Off	-48.776	-20.91	PASS
			0.154	On	-48.485	-19.85	PASS
8DPSK	LCH	2402	1.621	Off	-46.869	-18.38	PASS
			0.014	On	-49.134	-19.99	PASS
	HCH	2480	-0.777	Off	-48.653	-20.78	PASS
			0.026	On	-48.339	-19.97	PASS

Test Graphs

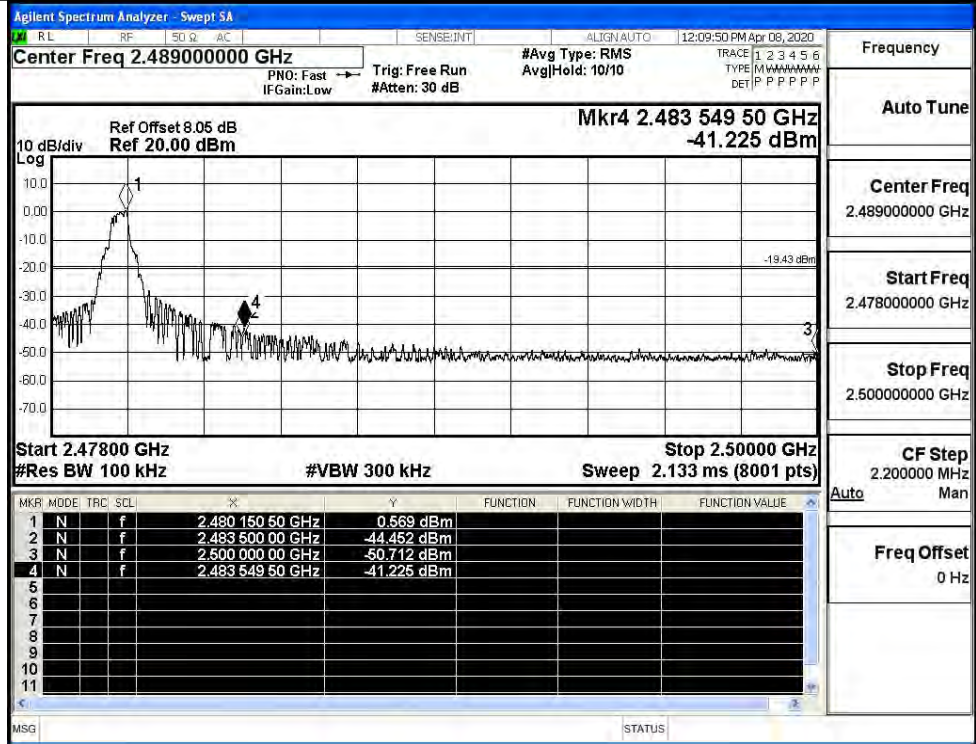
GFSK/LCH/No Hop



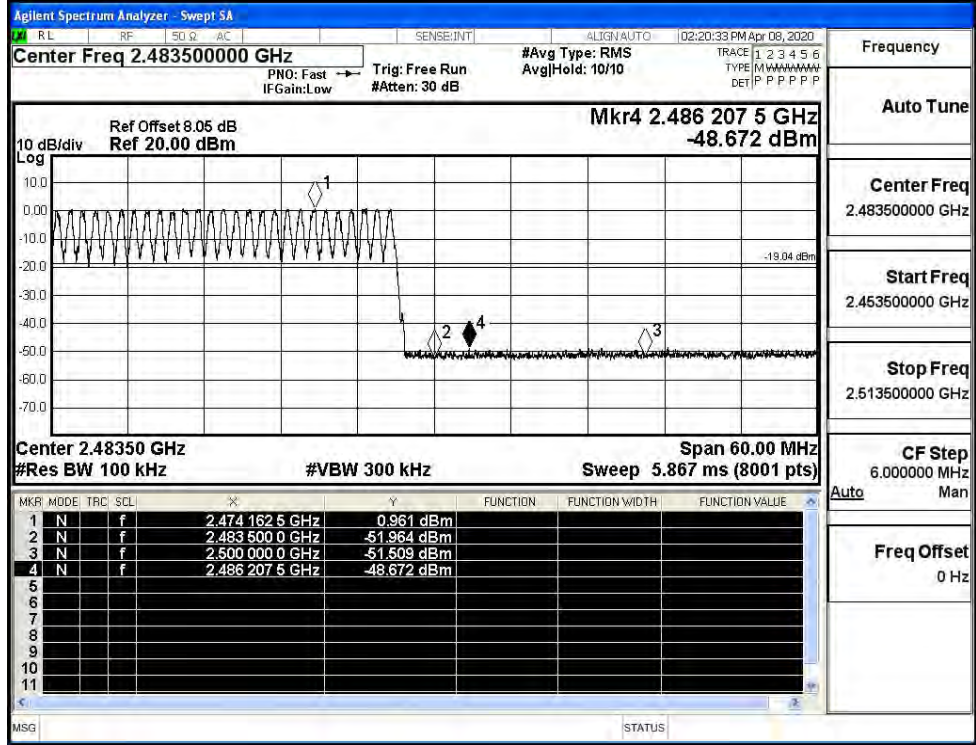
GFSK/LCH/Hop



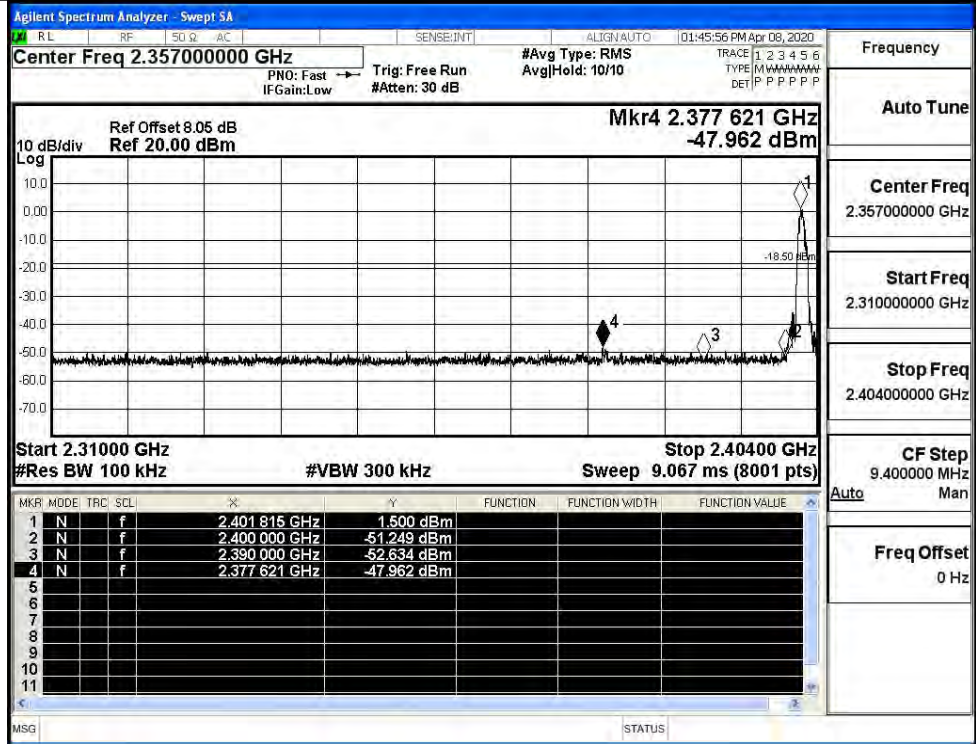
GFSK/HCH/No Hop



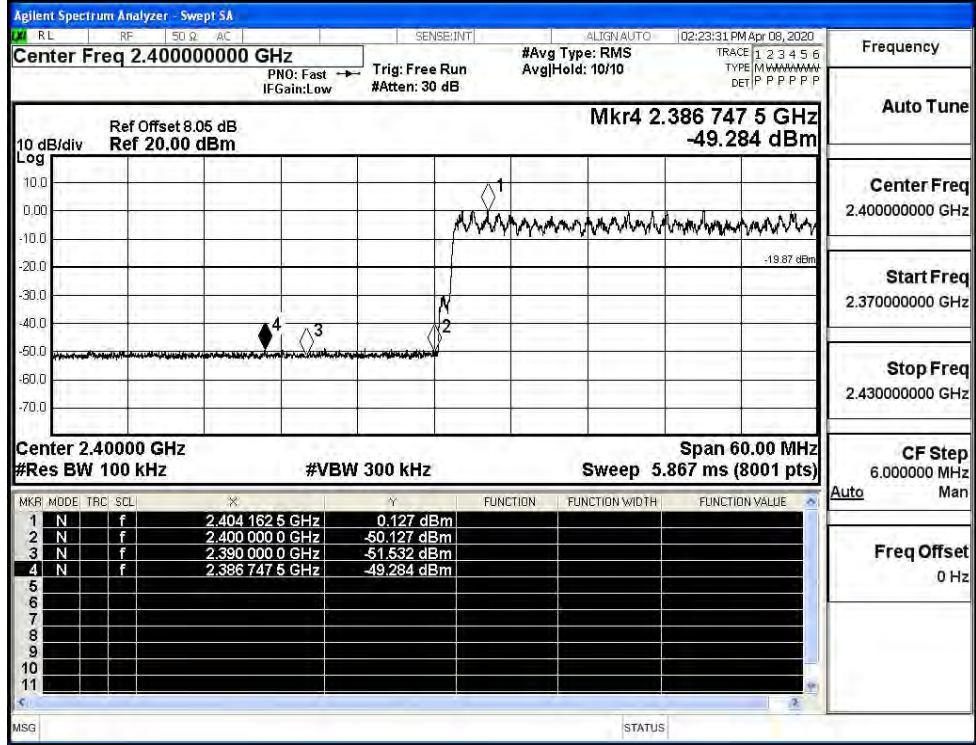
GFSK/HCH/Hop



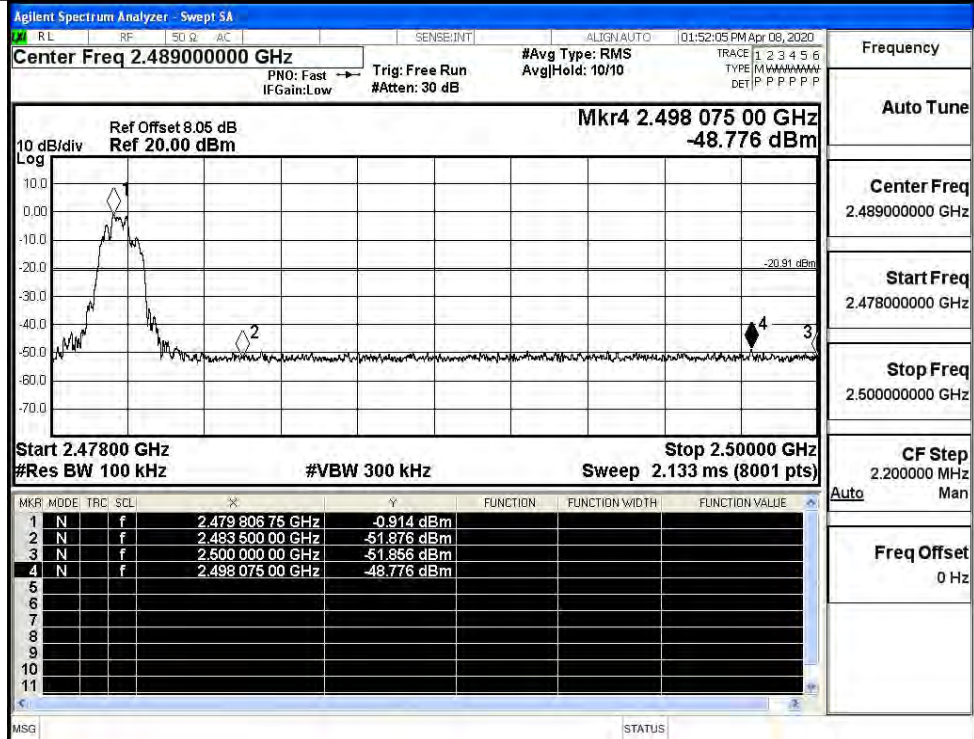
$\pi/4$ DQPSK/LCH/No Hop



$\pi/4$ DQPSK/LCH/Hop

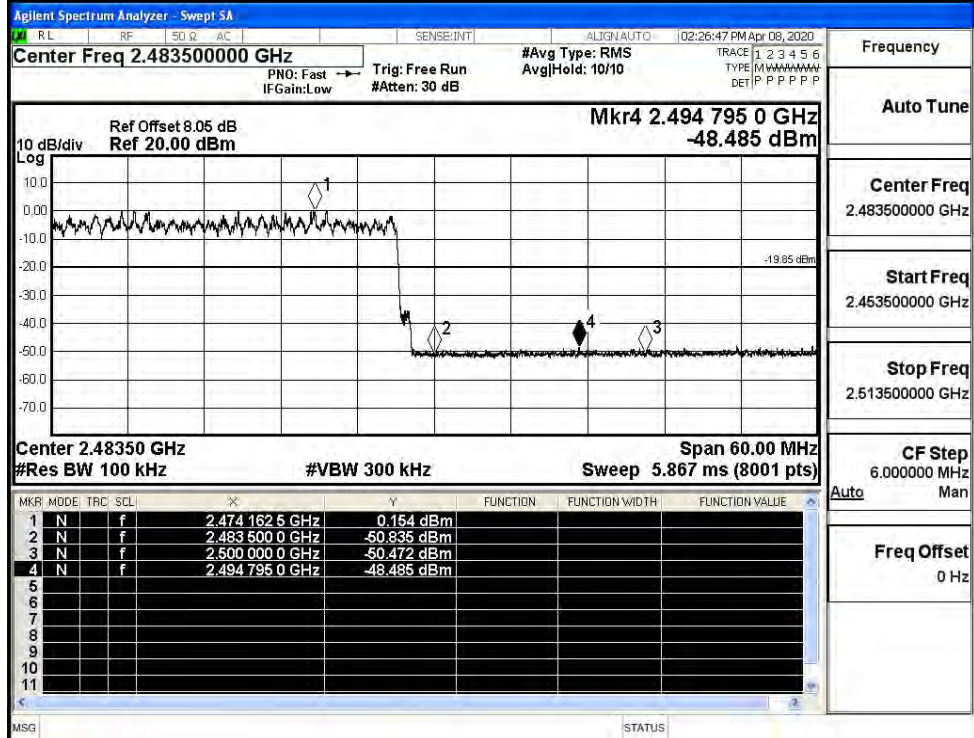


$\pi/4$ DQPSK/HCH/No
Hop



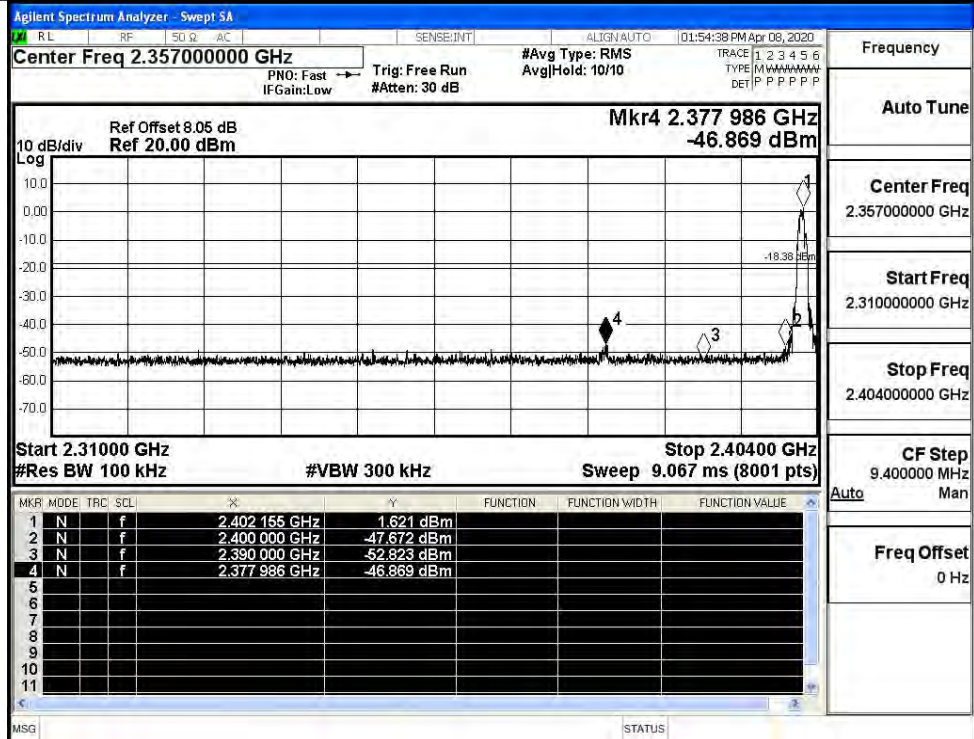
Frequency	2.489000000 GHz
Auto Tune	
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Freq Offset	0 Hz

$\pi/4$ DQPSK/HCH/Hop



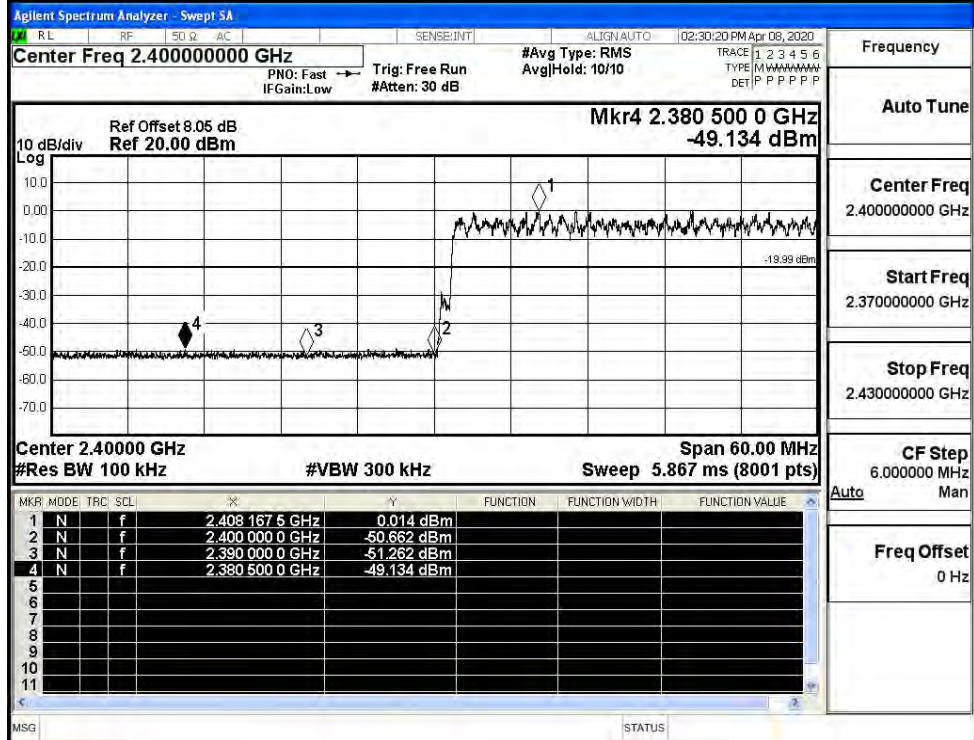
Frequency	2.483500000 GHz
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

8DPSK/LCH/No Hop



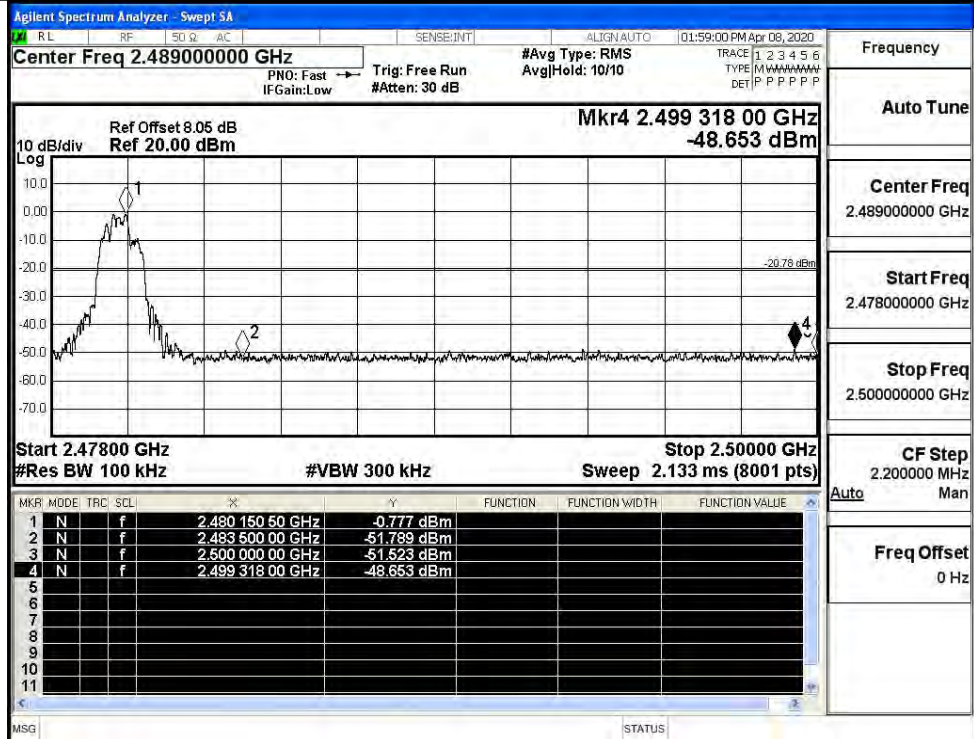
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK/LCH/Hop



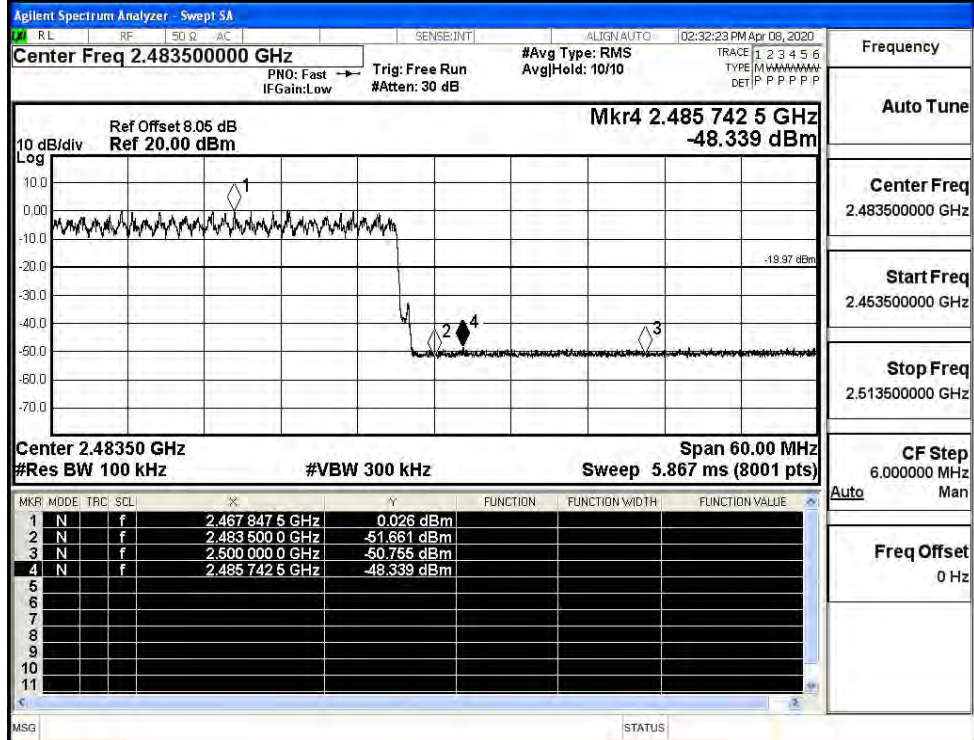
Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK/HCH/No Hop



Frequency	2.489000000 GHz
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

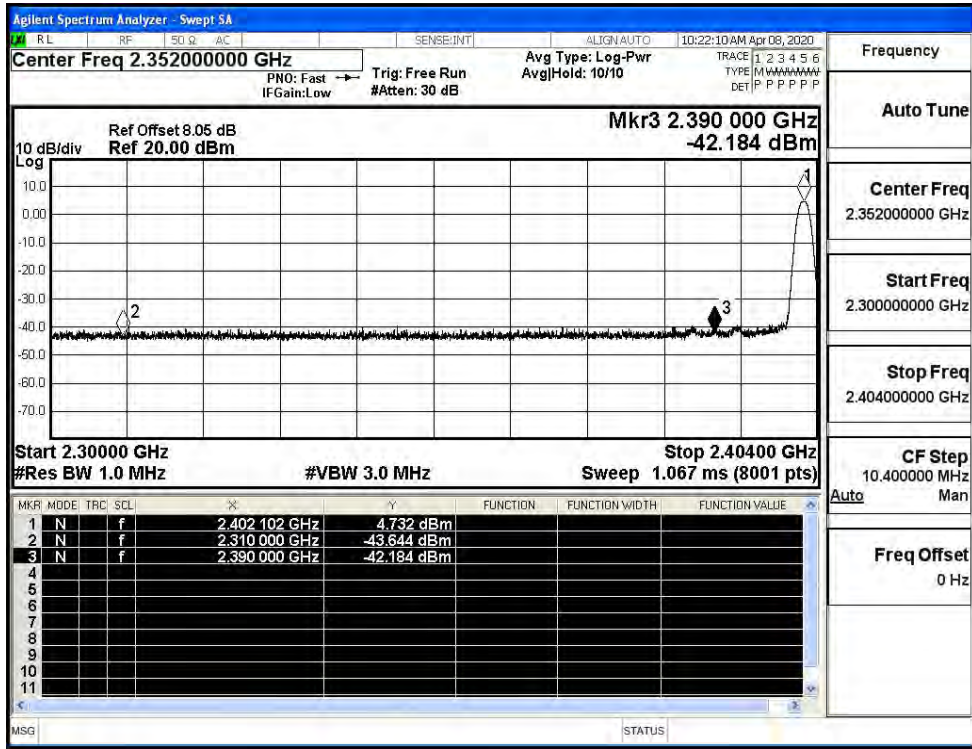


Frequency	2.483500000 GHz
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

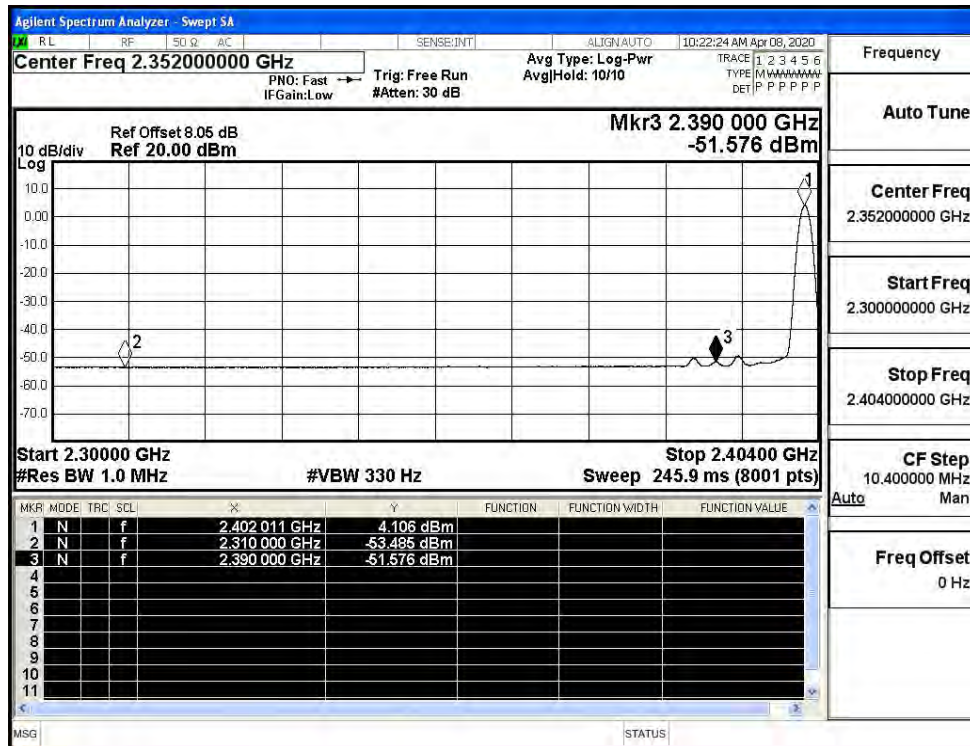
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.64	2.0	0	53.59	PEAK	74	PASS
	Off	2310.0	-53.49	2.0	0	43.74	AV	54	PASS
	Off	2390.0	-42.18	2.0	0	55.05	PEAK	74	PASS
	Off	2390.0	-51.58	2.0	0	45.65	AV	54	PASS
	Off	2483.5	-40.94	2.0	0	56.29	PEAK	74	PASS
	Off	2483.5	-50.38	2.0	0	46.85	AV	54	PASS
	Off	2500.0	-41.93	2.0	0	55.30	PEAK	74	PASS
	Off	2500.0	-52.41	2.0	0	44.82	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.17	2.0	0	53.06	PEAK	74	PASS
	Off	2310.0	-53.44	2.0	0	43.79	AV	54	PASS
	Off	2390.0	-43.37	2.0	0	53.86	PEAK	74	PASS
	Off	2390.0	-53.15	2.0	0	44.08	AV	54	PASS
	Off	2483.5	-43.55	2.0	0	53.68	PEAK	74	PASS
	Off	2483.5	-52.56	2.0	0	44.67	AV	54	PASS
	Off	2500.0	-41.81	2.0	0	55.42	PEAK	74	PASS
	Off	2500.0	-52.41	2.0	0	44.82	AV	54	PASS
8DPSK	Off	2310.0	-42.76	2.0	0	54.47	PEAK	74	PASS
	Off	2310.0	-53.39	2.0	0	43.84	AV	54	PASS
	Off	2390.0	-42.96	2.0	0	54.27	PEAK	74	PASS
	Off	2390.0	-53.07	2.0	0	44.16	AV	54	PASS
	Off	2483.5	-41.58	2.0	0	55.65	PEAK	74	PASS
	Off	2483.5	-52.55	2.0	0	44.68	AV	54	PASS
	Off	2500.0	-42.53	2.0	0	54.70	PEAK	74	PASS
	Off	2500.0	-52.42	2.0	0	44.81	AV	54	PASS

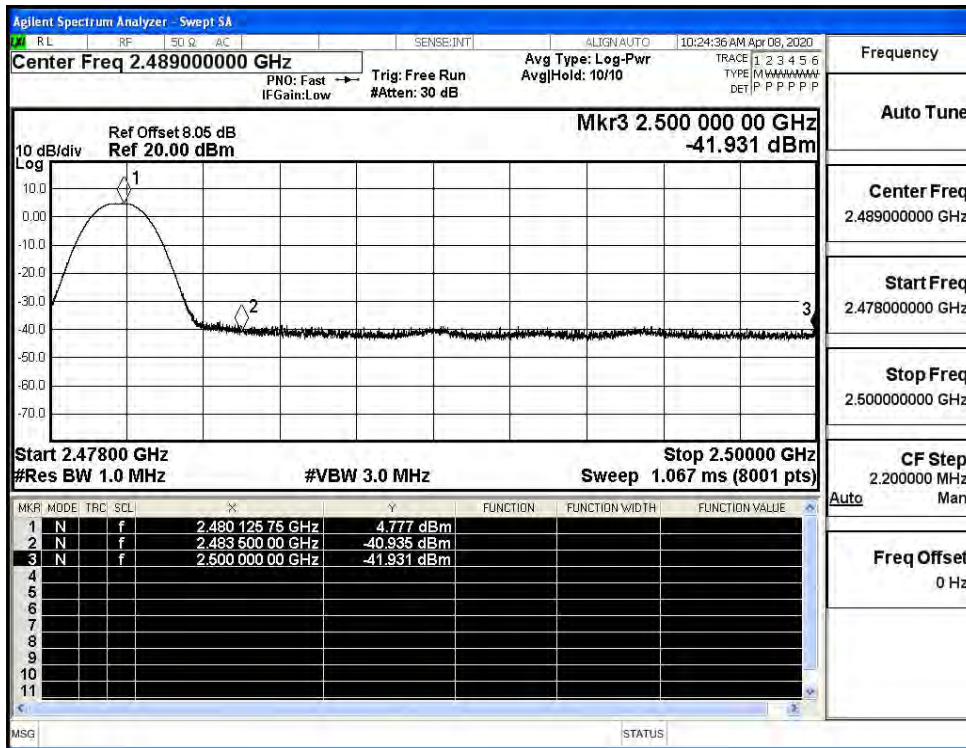
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



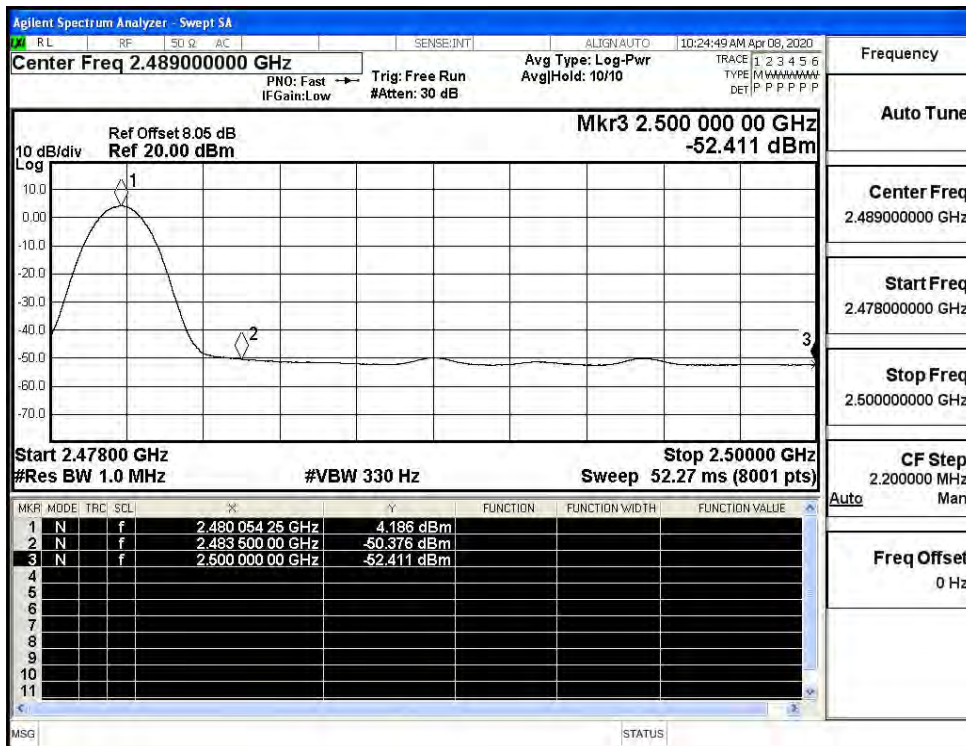
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



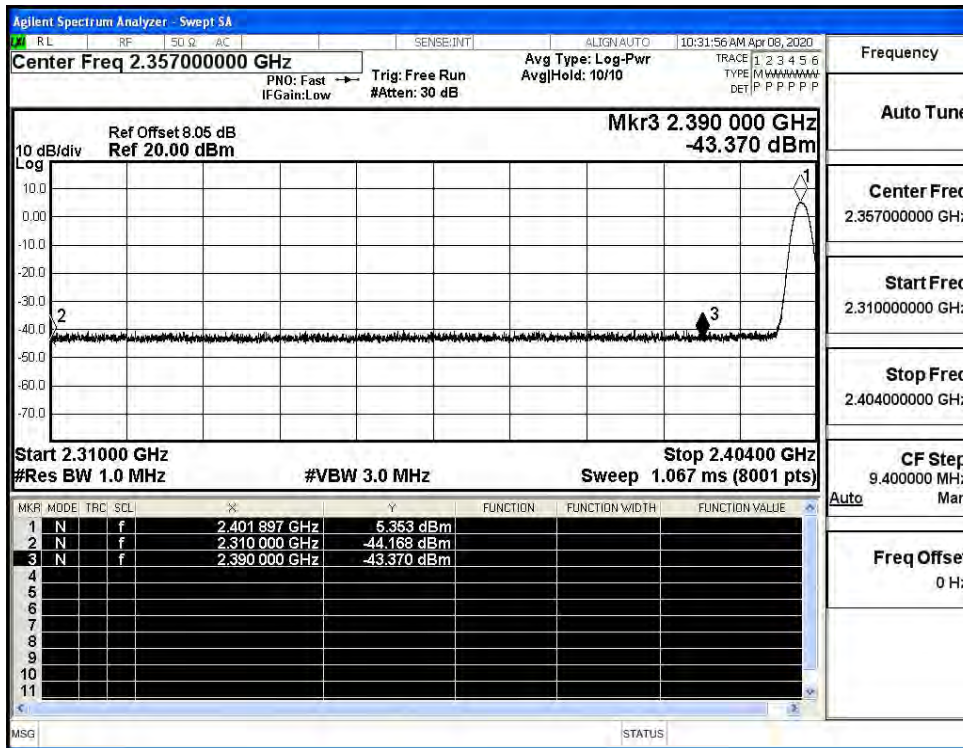
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



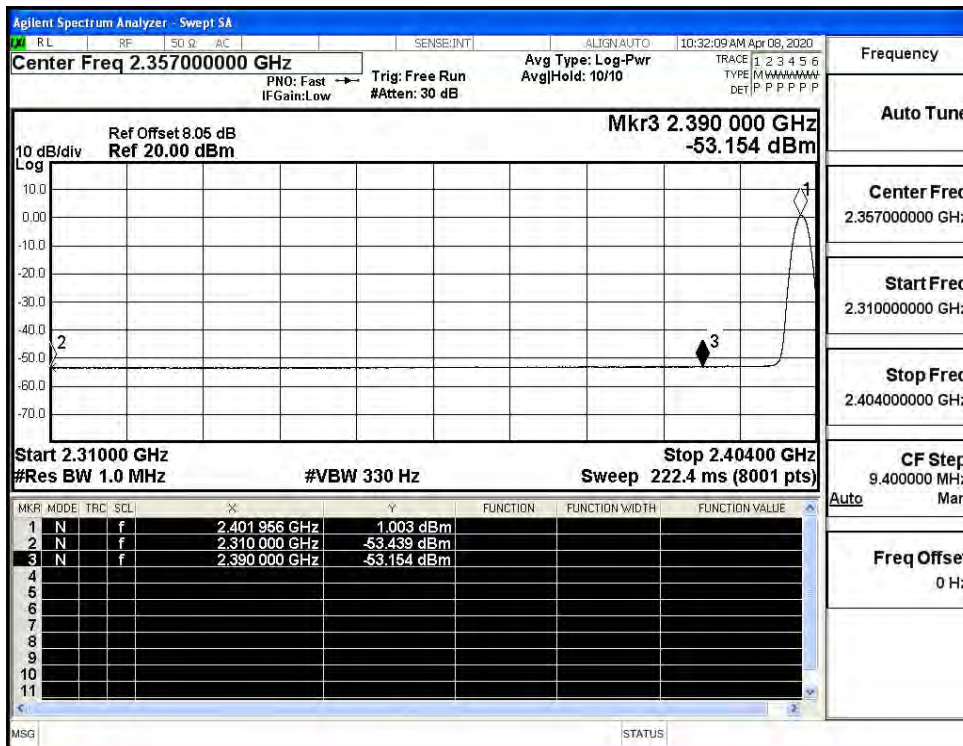
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



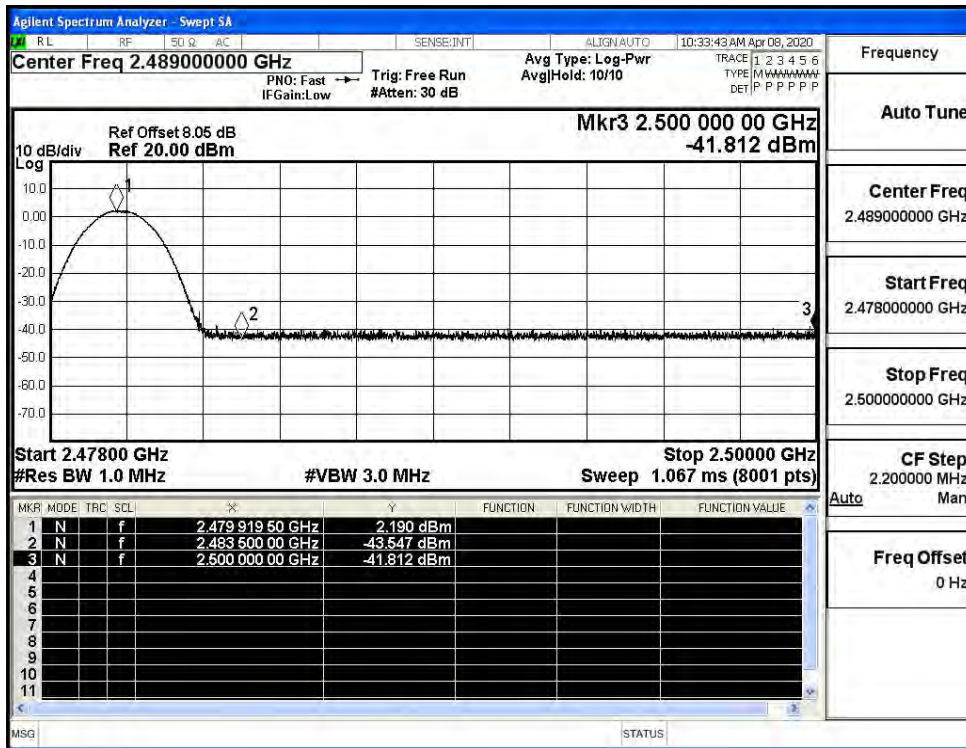
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



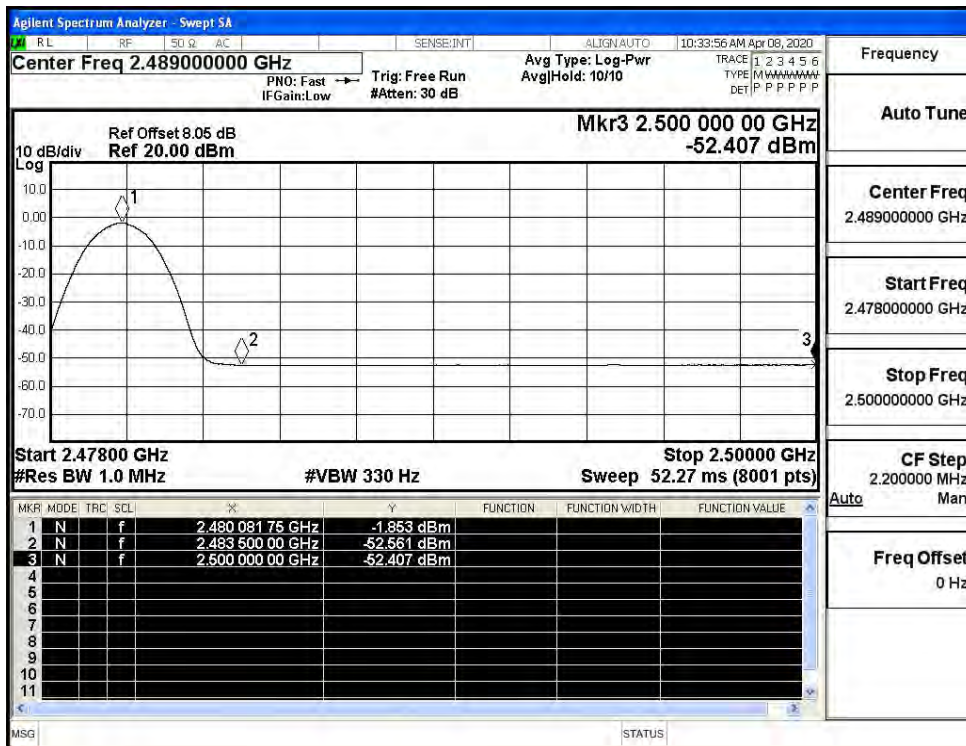
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



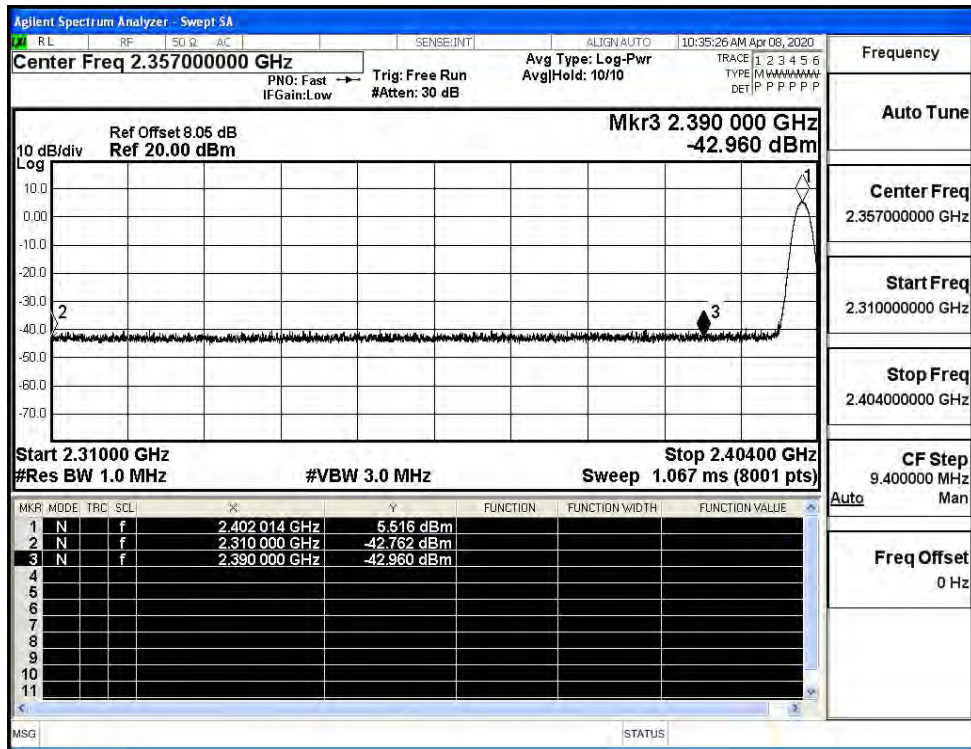
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)



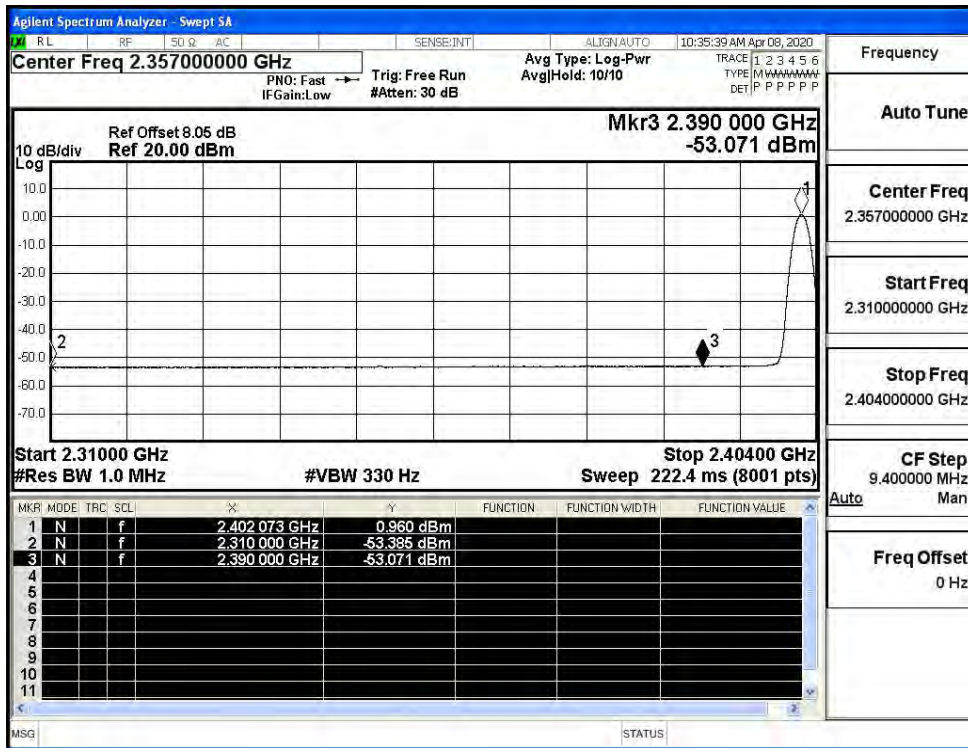
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)



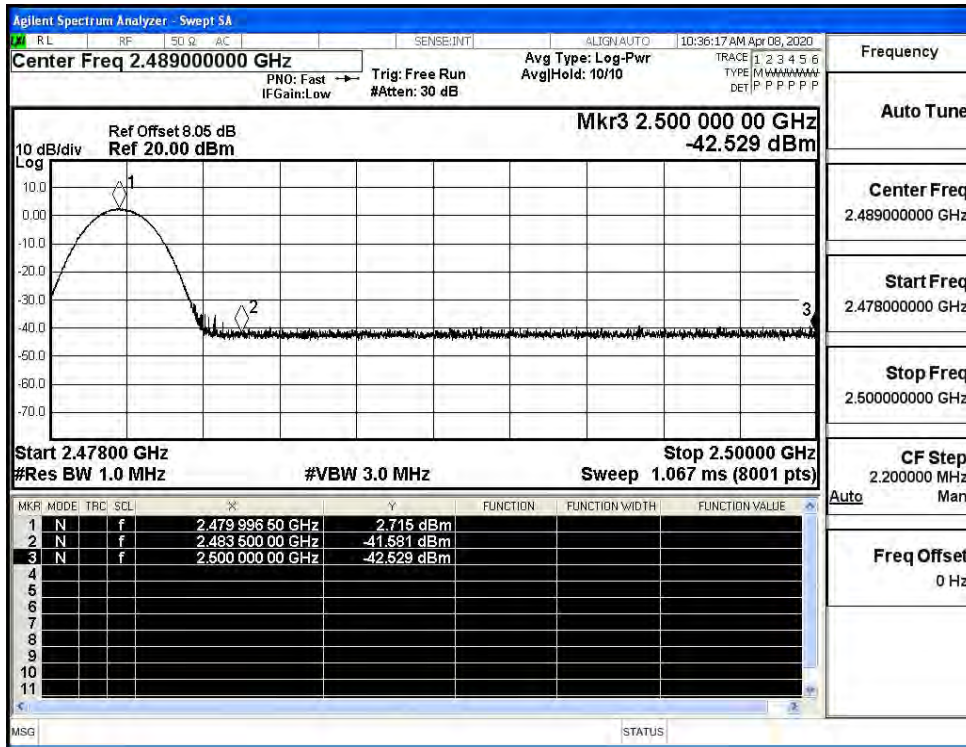
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

