

Appendix A

RF Test Data for BT V5.0(DSS) (Conducted Measurement)

Product Name: True Wireless Stereo Earphones

Trade Mark: iHome

Test Model: HM-AU-BE-218

Environmental Conditions

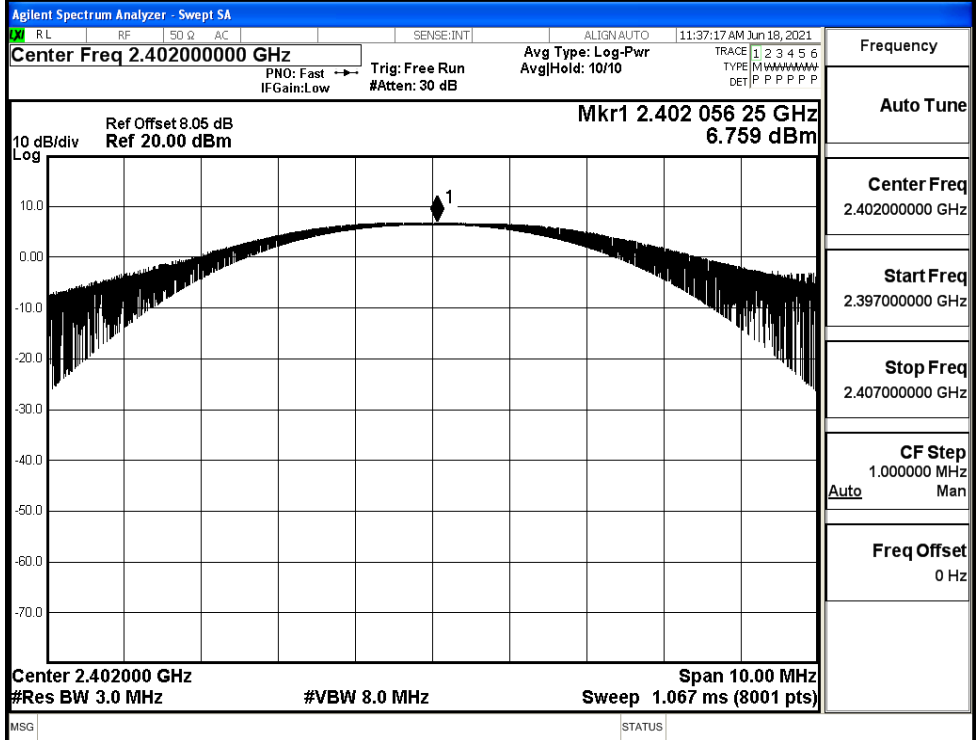
Temperature:	21.5°C
Relative Humidity:	52.7°C
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Li
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

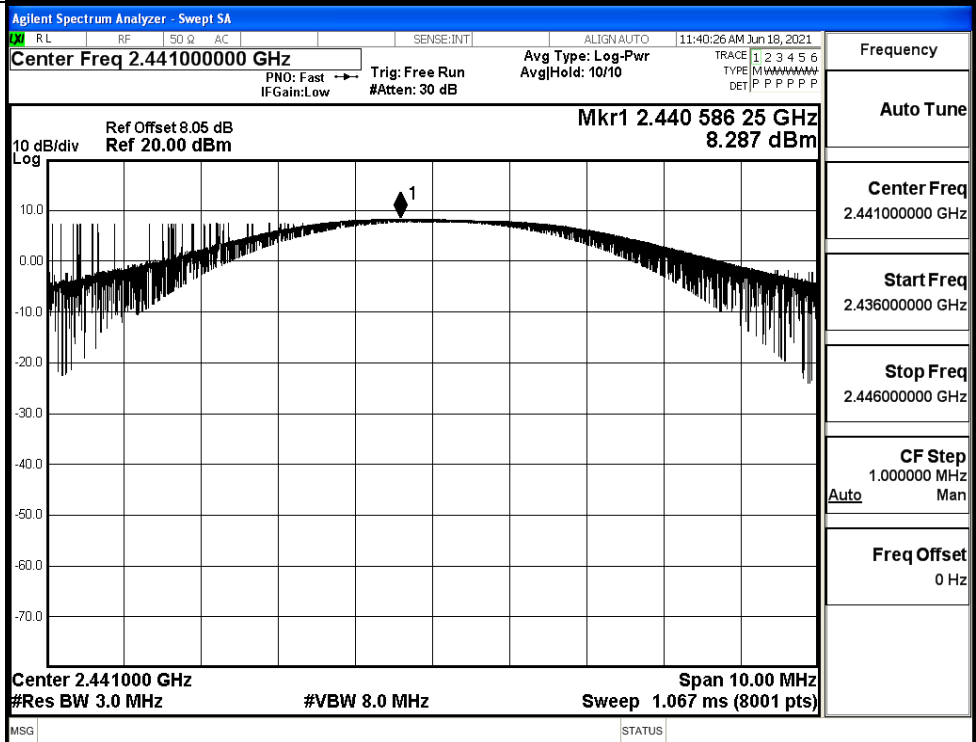
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	6.759	21	PASS
	MCH	8.287	21	PASS
	HCH	6.673	21	PASS
$\pi/4$ DQPSK	LCH	5.594	21	PASS
	MCH	6.949	21	PASS
	HCH	5.406	21	PASS
8DPSK	LCH	5.697	21	PASS
	MCH	6.930	21	PASS
	HCH	5.428	21	PASS

Test Graphs

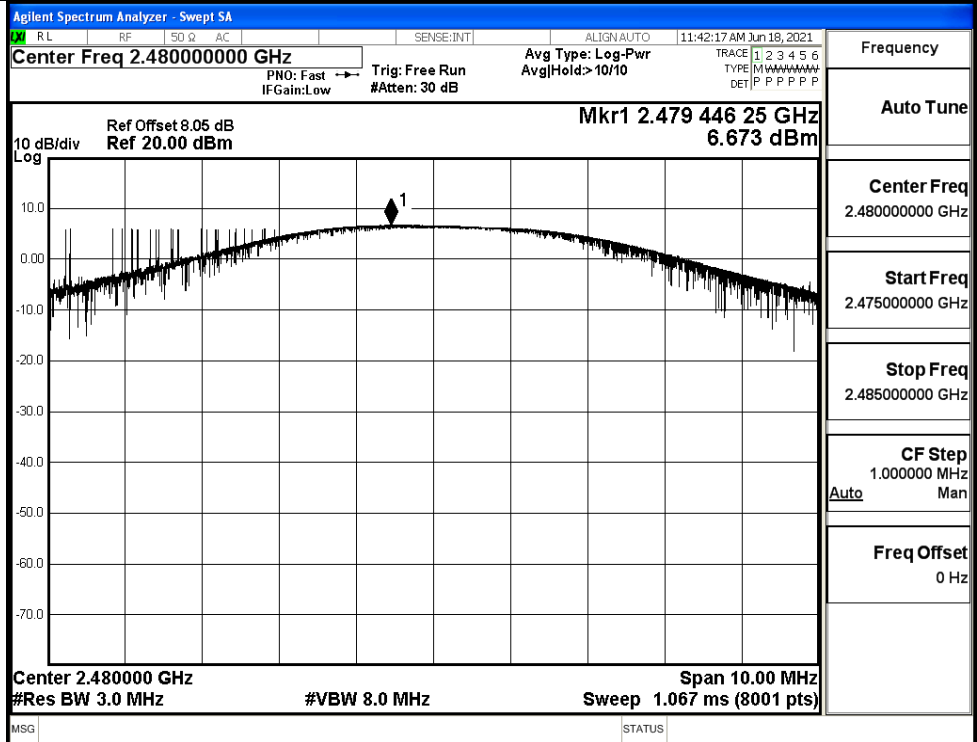
GFSK/LCH



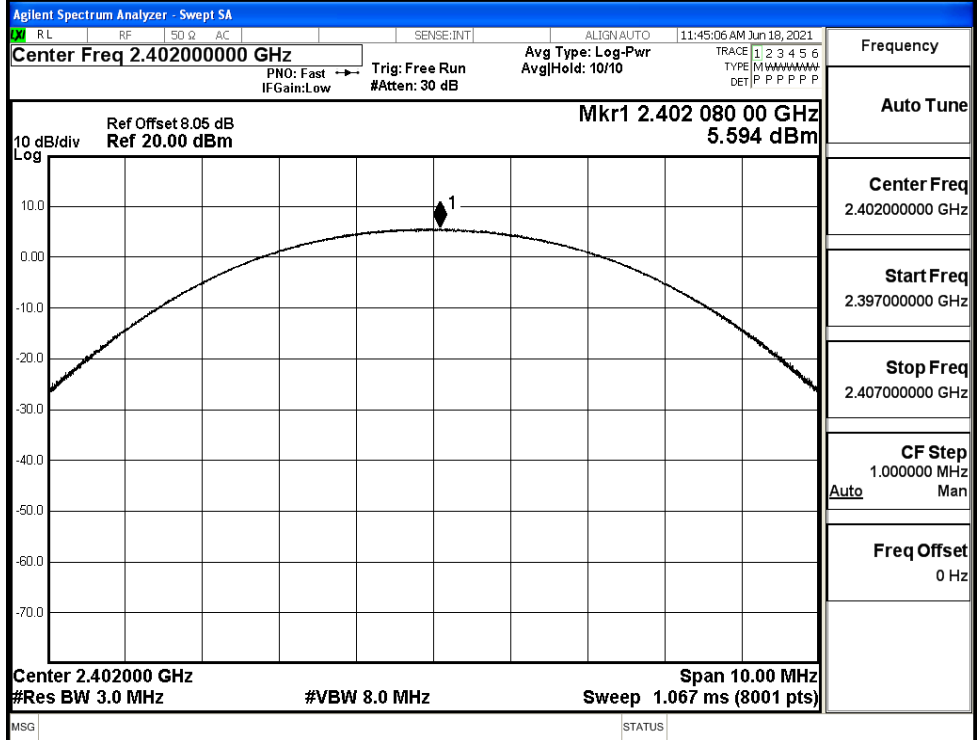
GFSK/MCH



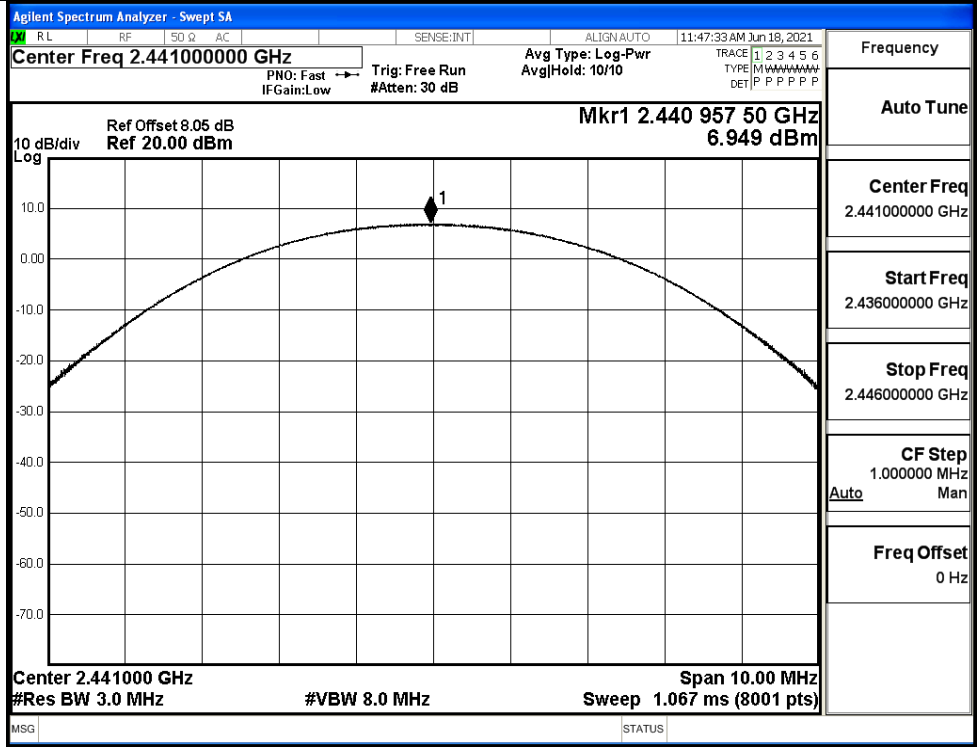
GFSK/HCH



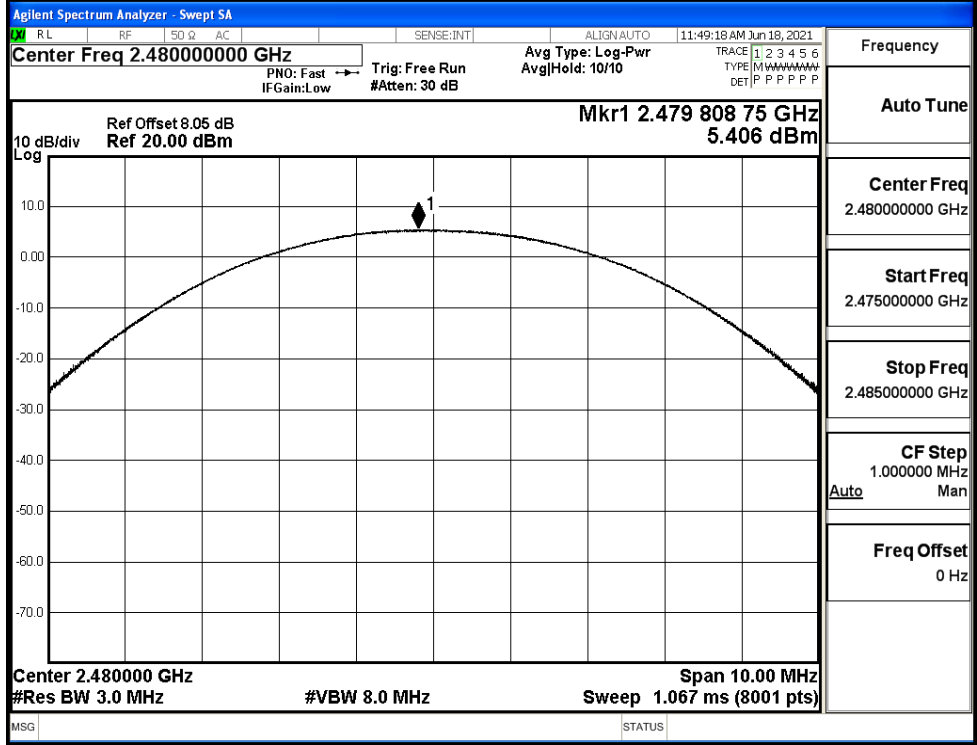
$\pi/4$ DQPSK/LCH



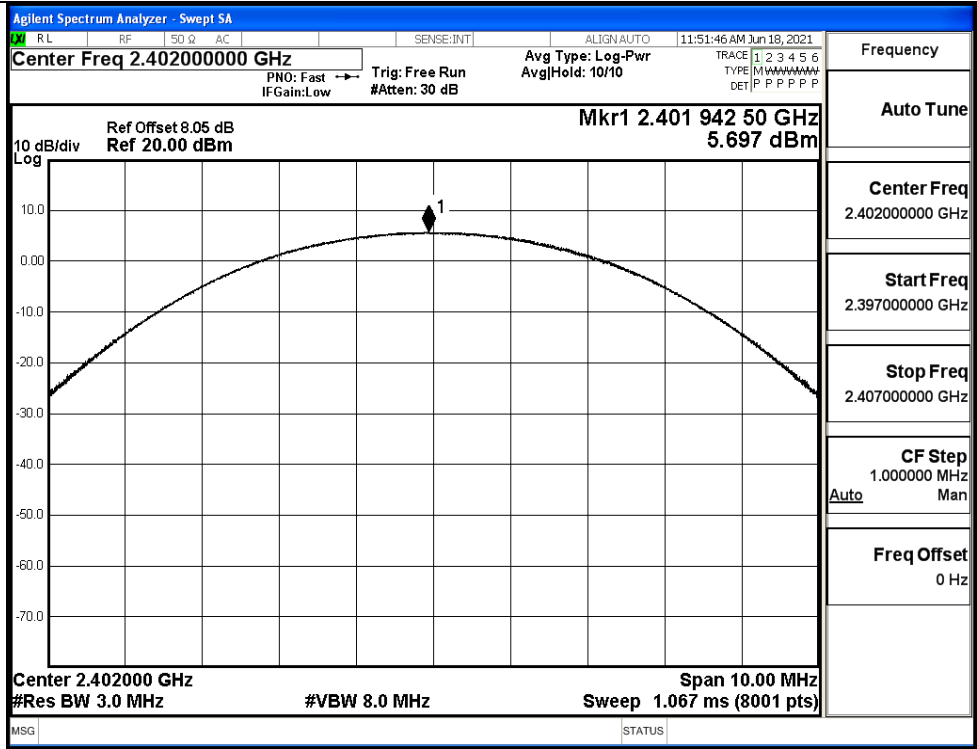
π /4DQPSK/MCH



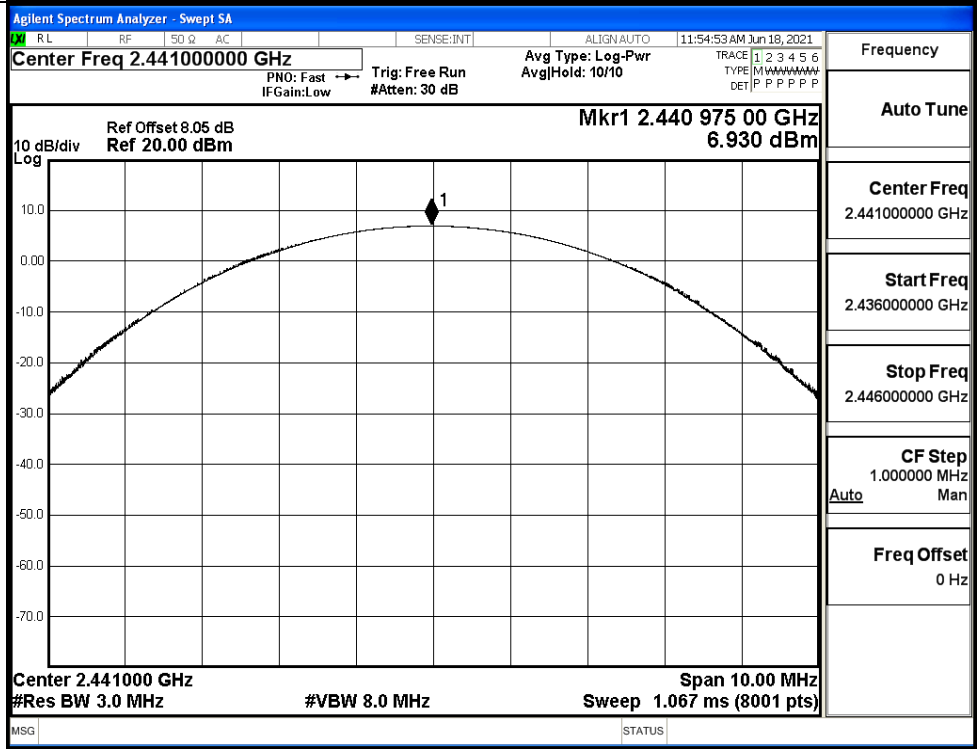
π /4DQPSK/HCH



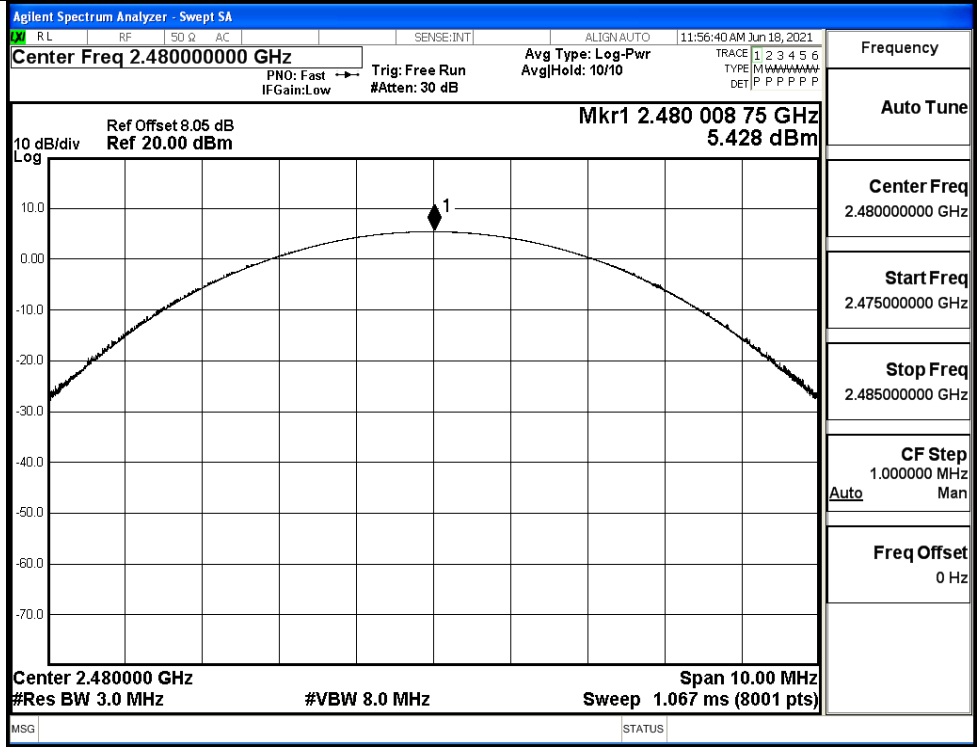
8DPSK/LCH



8DPSK/MCH

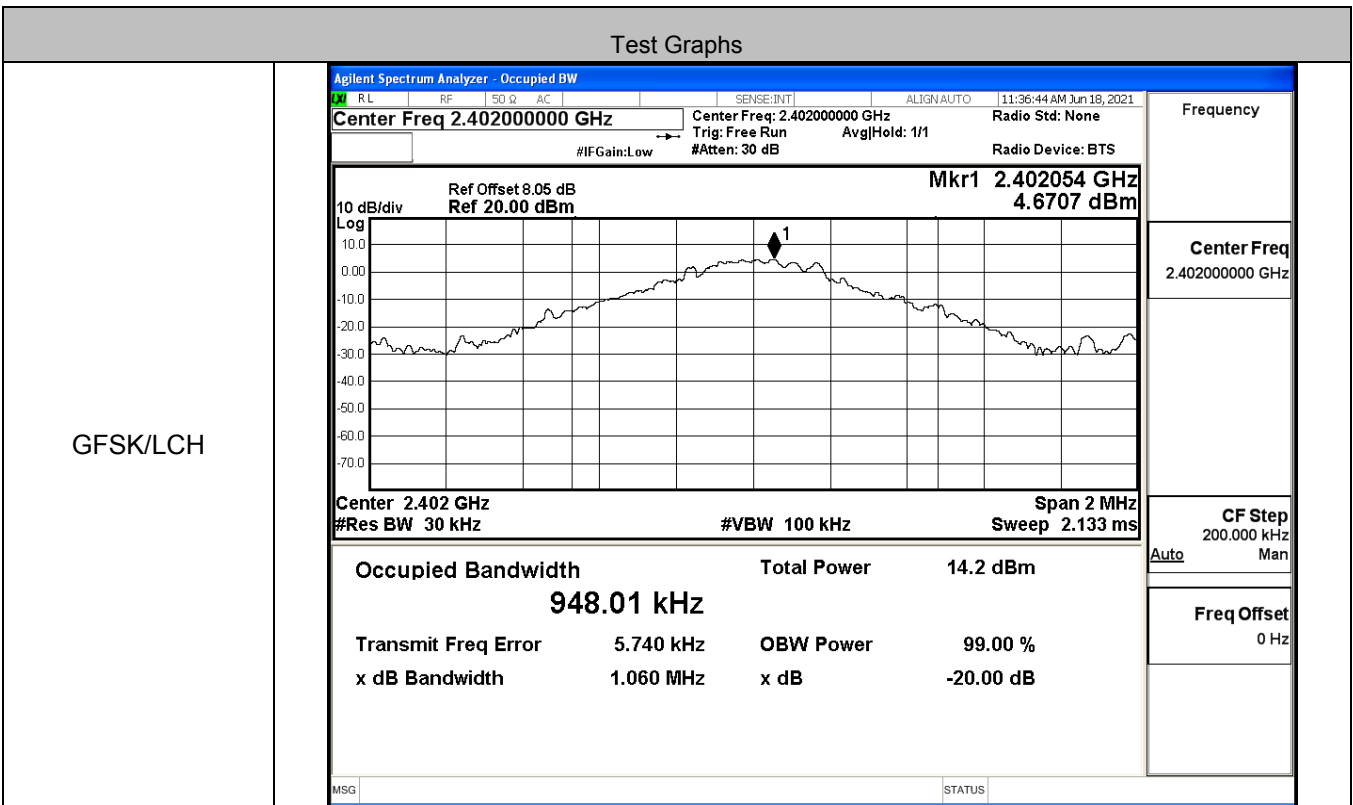


8DPSK/HCH

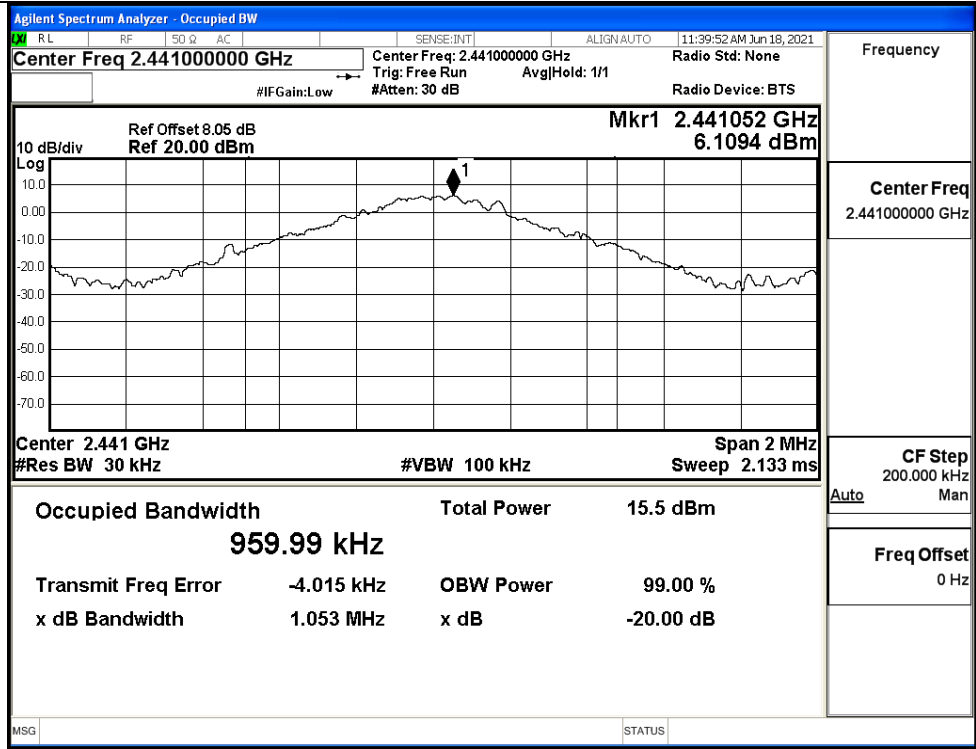


A.2 20dB Bandwidth

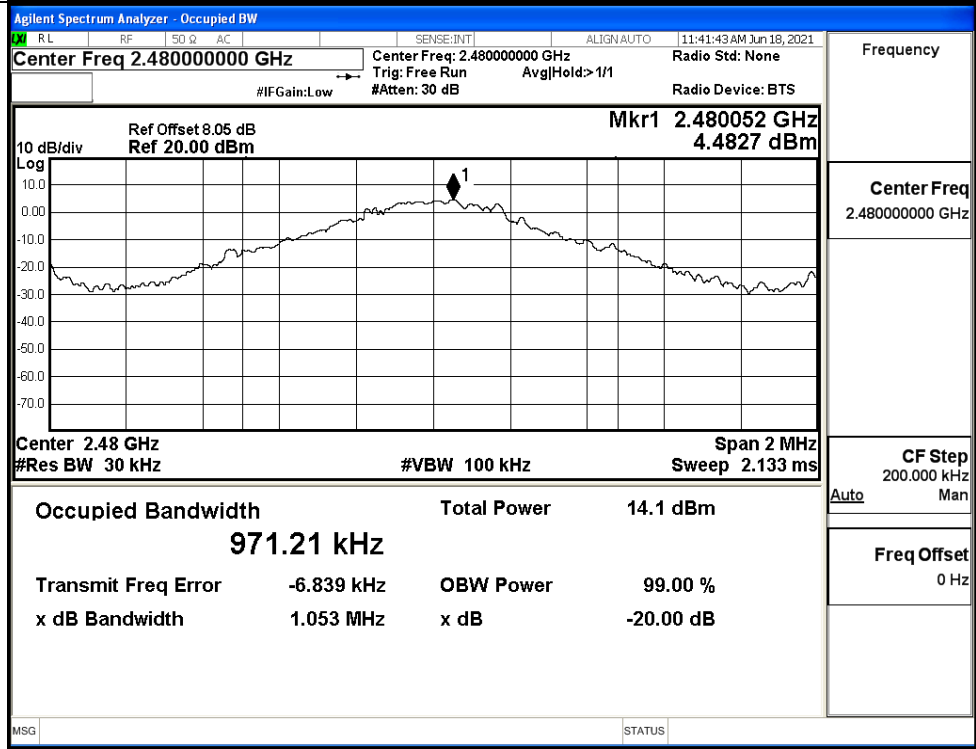
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.060	Not Specified	PASS
	MCH	1.053	Not Specified	PASS
	HCH	1.053	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.289	Not Specified	PASS
	MCH	1.289	Not Specified	PASS
	HCH	1.288	Not Specified	PASS
8DPSK	LCH	1.290	Not Specified	PASS
	MCH	1.204	Not Specified	PASS
	HCH	1.206	Not Specified	PASS



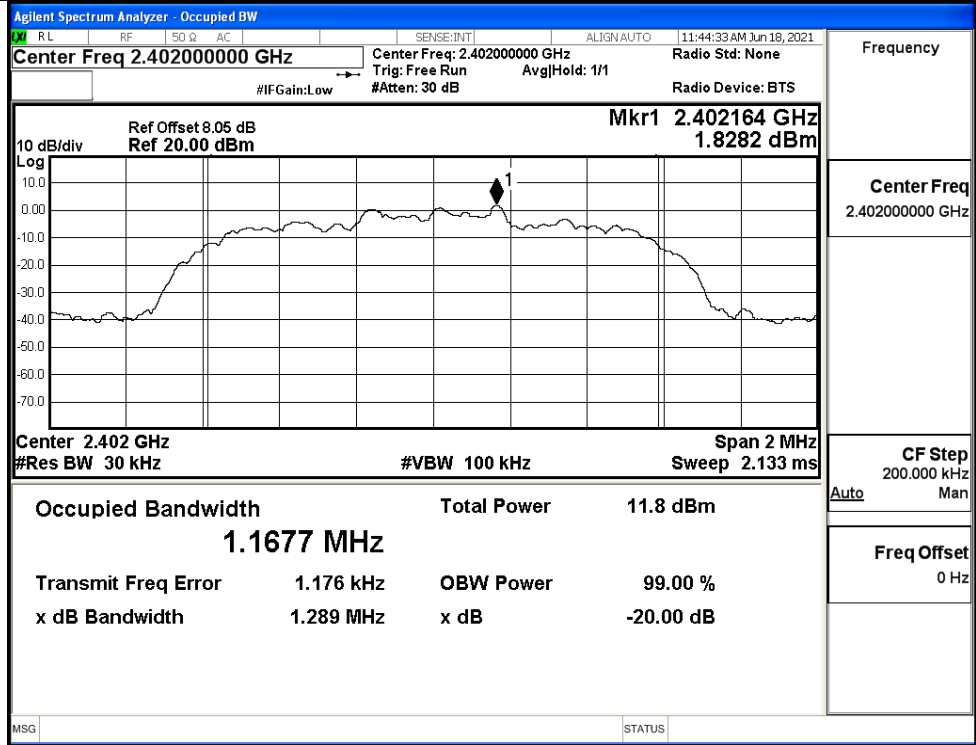
GFSK/MCH



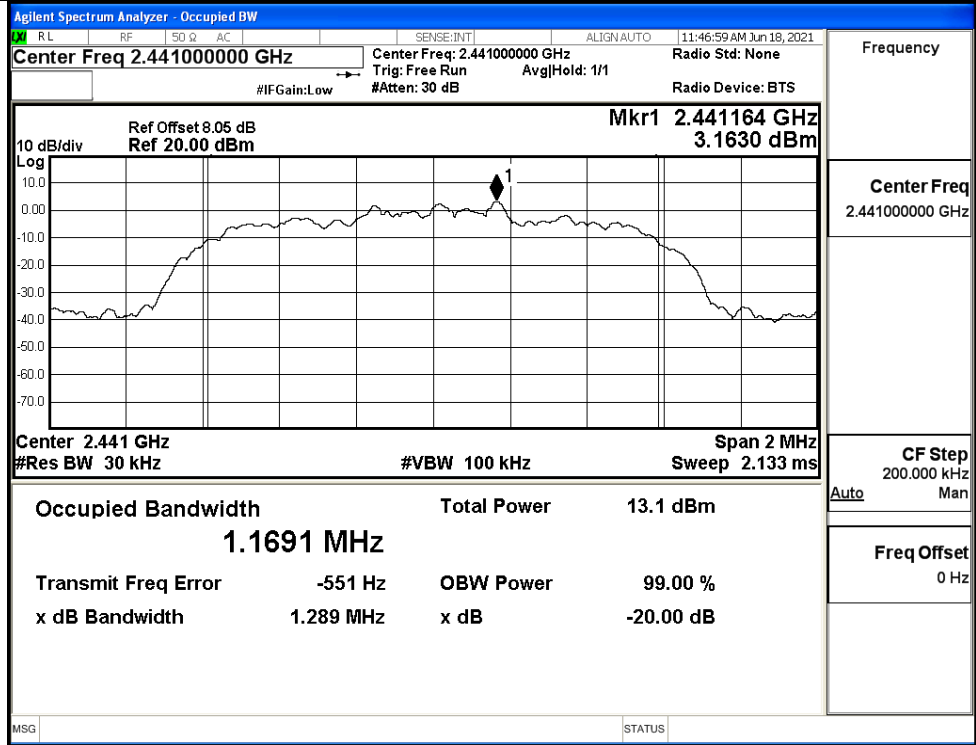
GFSK/HCH



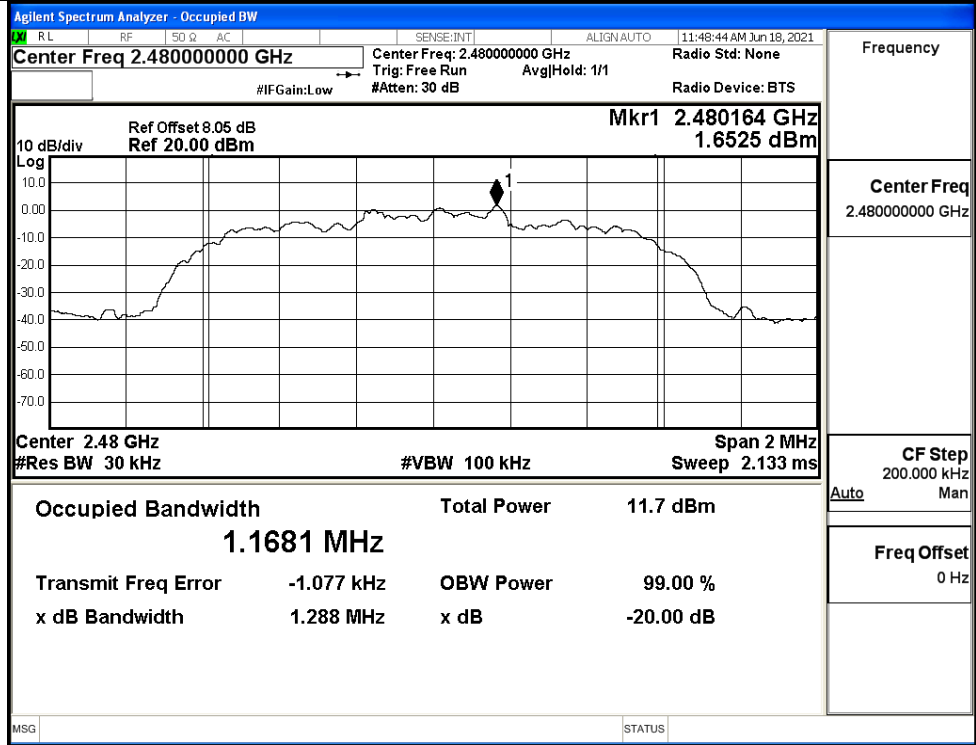
$\pi/4$ DQPSK/LCH



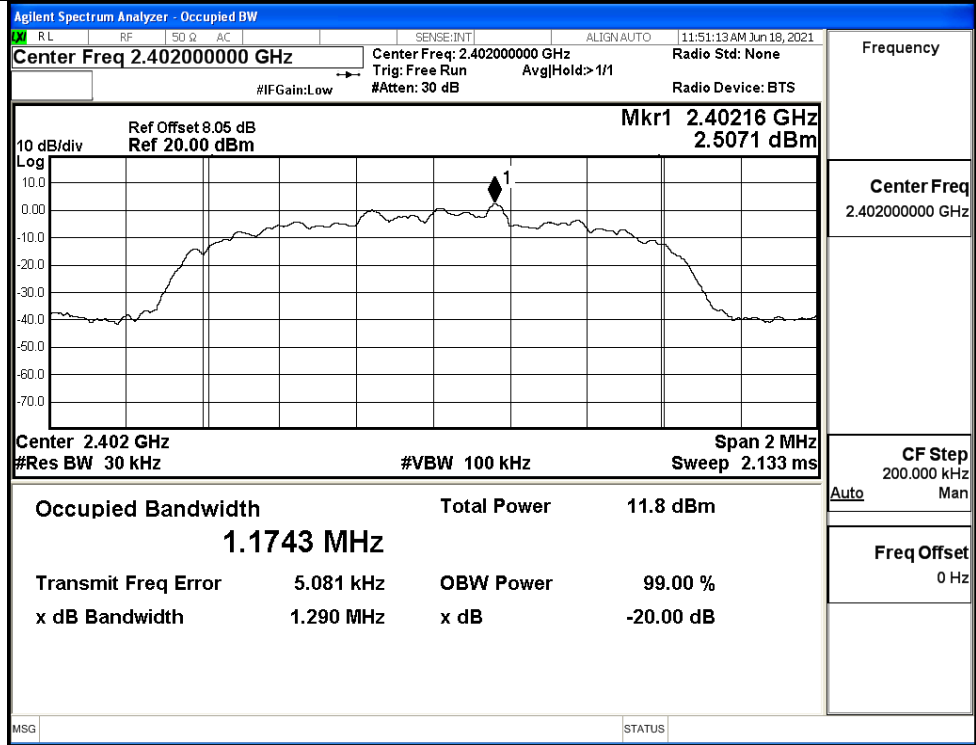
$\pi/4$ DQPSK/MCH



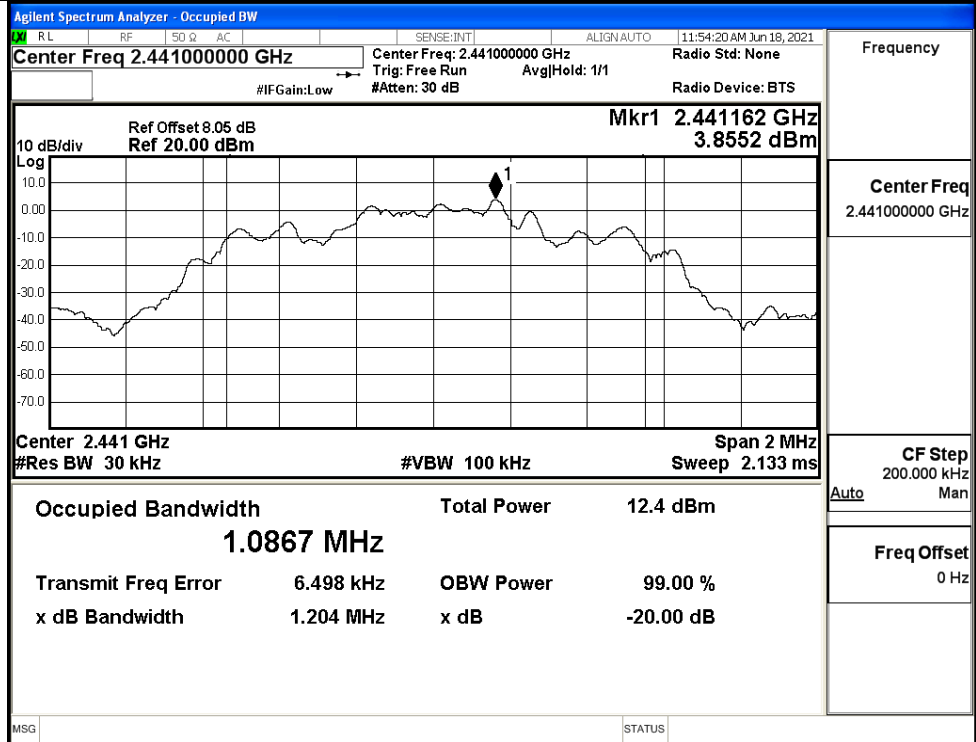
$\pi/4$ DQPSK/HCH



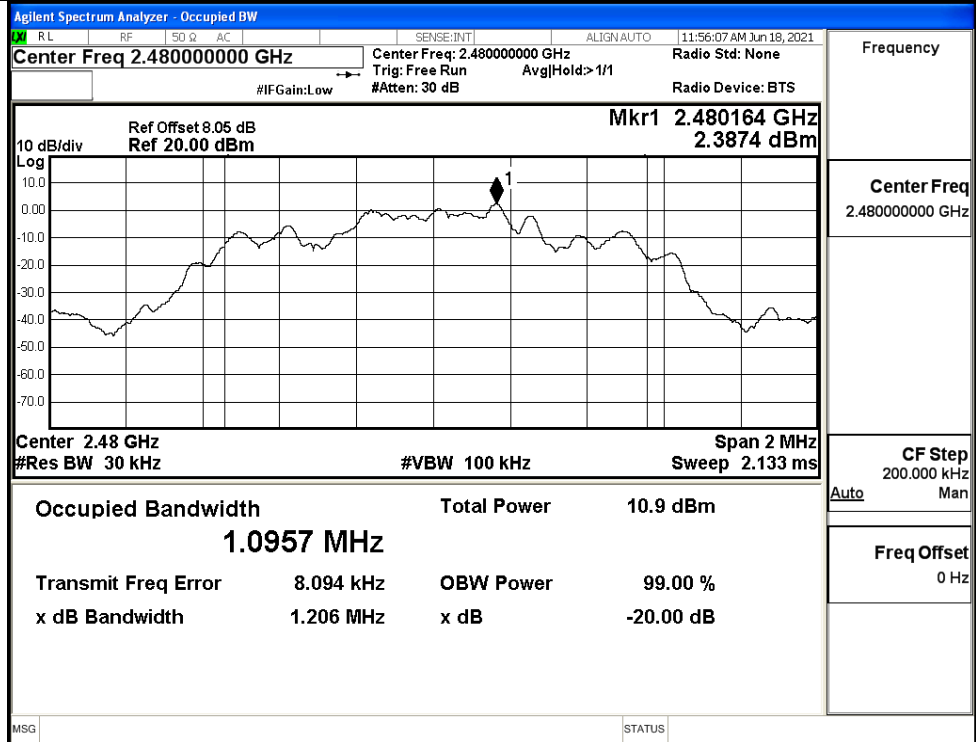
8DPSK/LCH



8DPSK/MCH

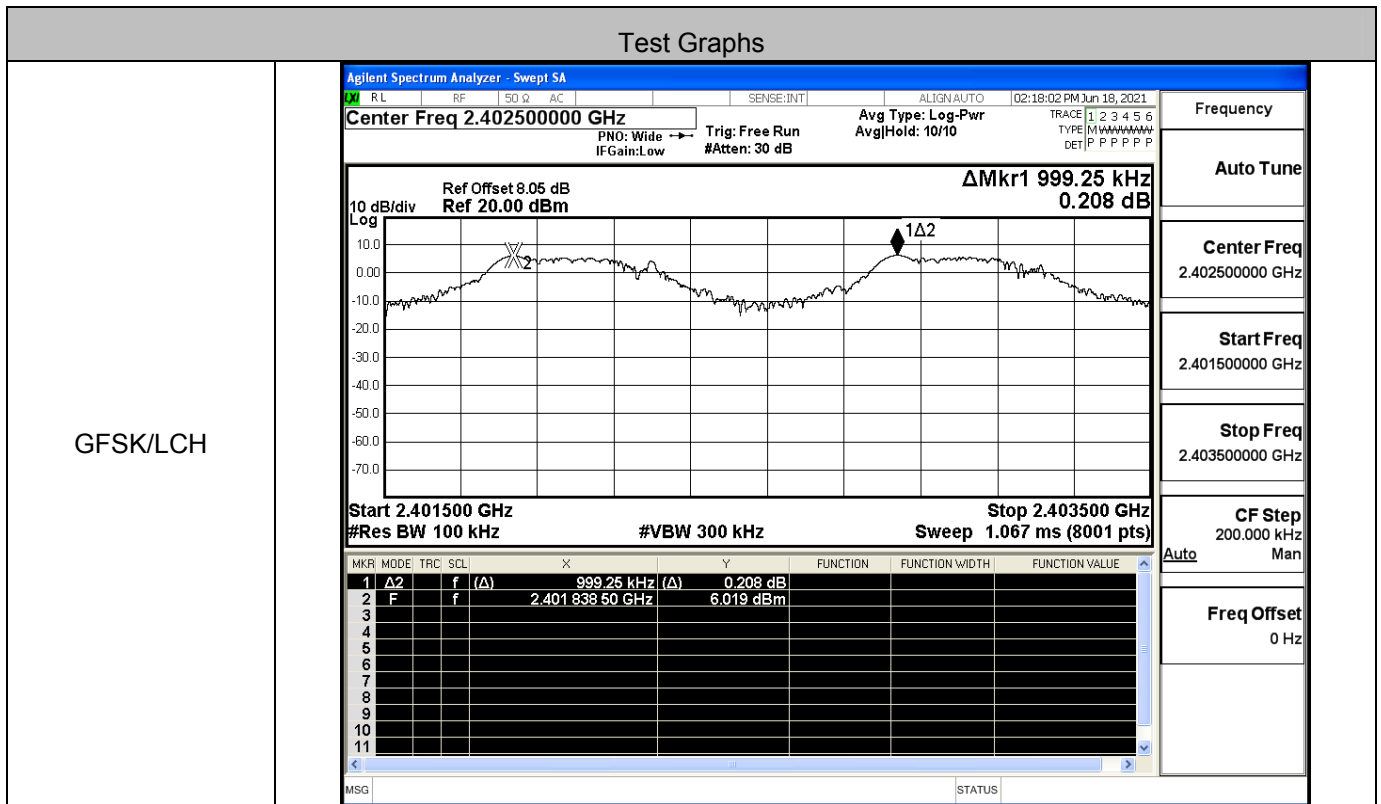


8DPSK/HCH

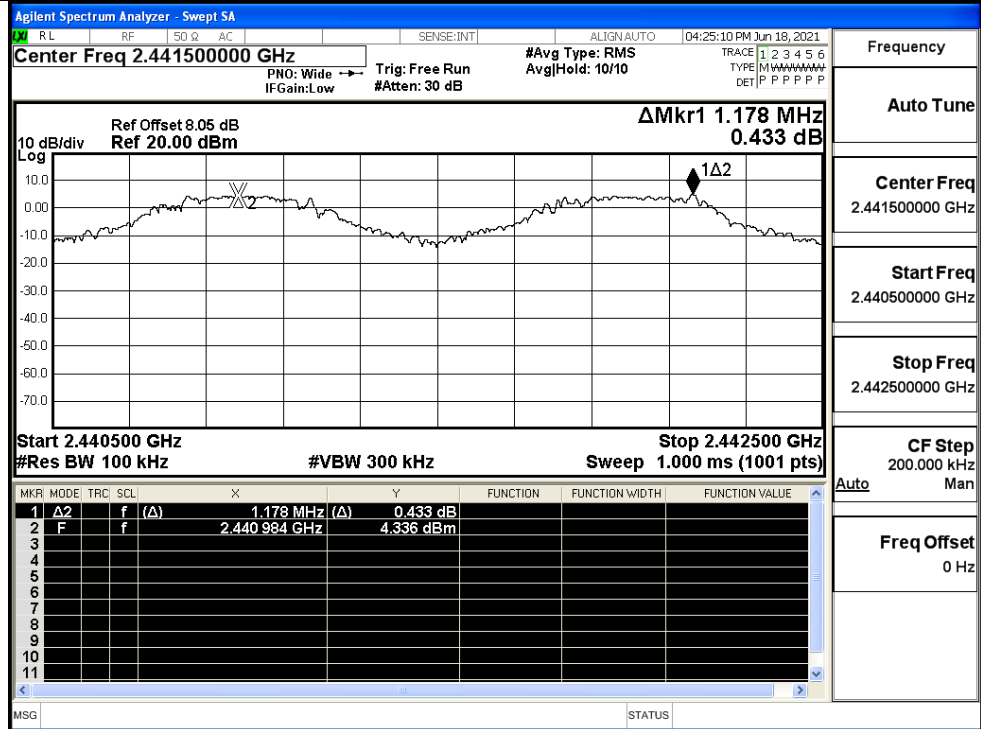


A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.999	0.707	PASS
	MCH	1.178	0.707	PASS
	HCH	1.216	0.707	PASS
π/4DQPSK	LCH	1.146	0.859	PASS
	MCH	1.178	0.859	PASS
	HCH	1.250	0.859	PASS
8DPSK	LCH	0.998	0.860	PASS
	MCH	1.074	0.860	PASS
	HCH	1.190	0.860	PASS



GFSK/MCH



Frequency

Auto Tune

Center Freq
2.441500000 GHz

Start Freq
2.440500000 GHz

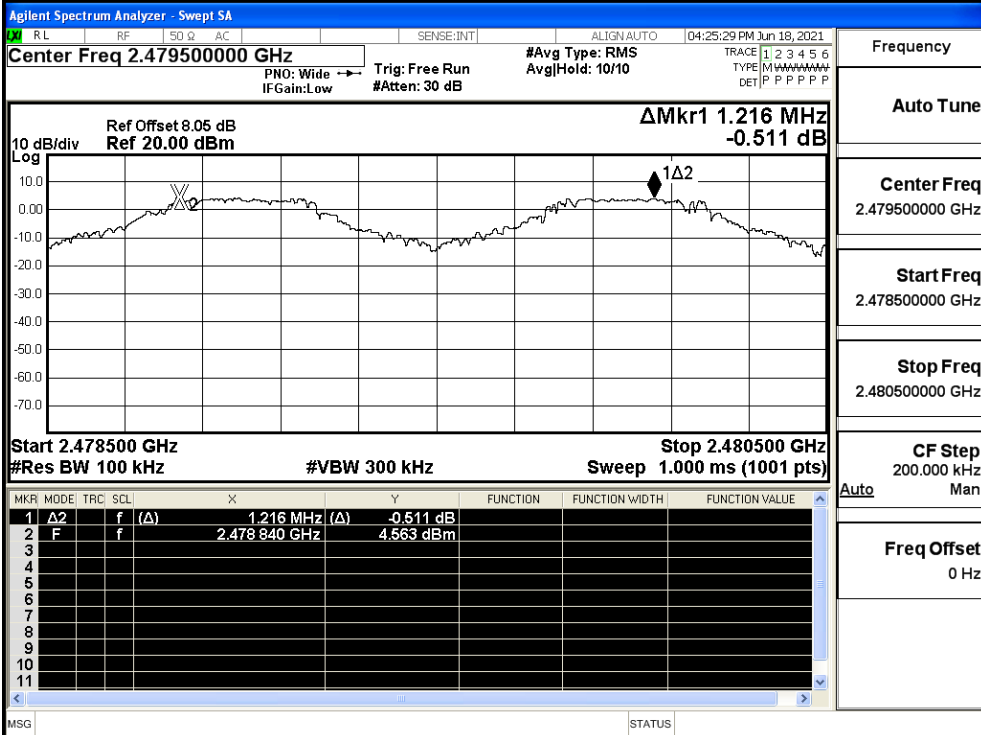
Stop Freq
2.442500000 GHz

CF Step
200.000 kHz

Auto Man

Freq Offset
0 Hz

GFSK/HCH



Frequency

Auto Tune

Center Freq
2.479500000 GHz

Start Freq
2.478500000 GHz

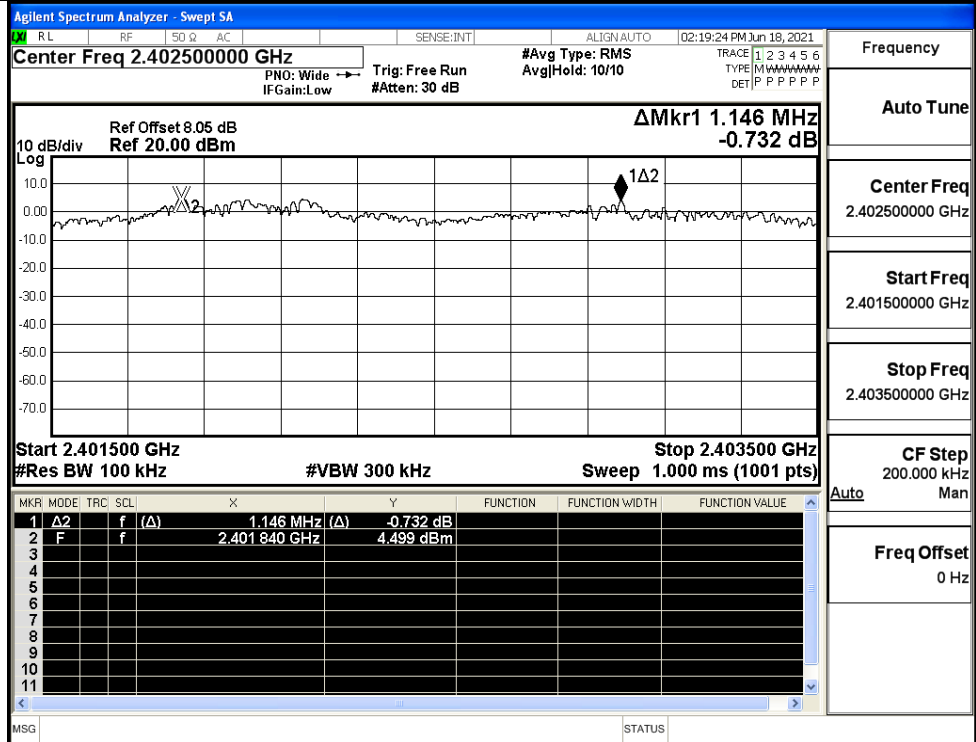
Stop Freq
2.480500000 GHz

CF Step
200.000 kHz

Auto Man

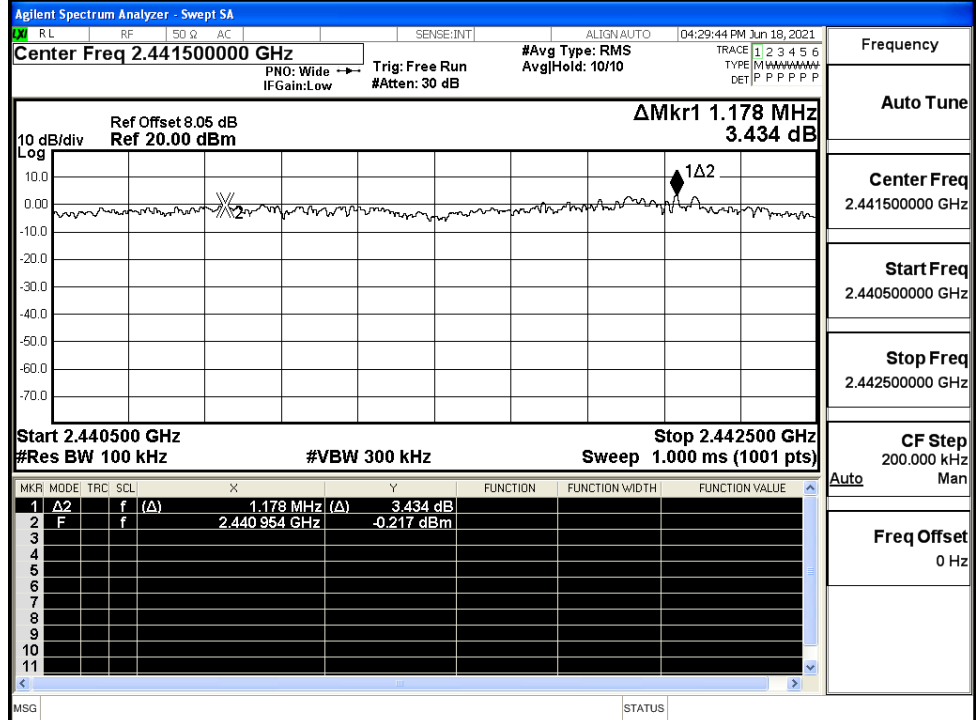
Freq Offset
0 Hz

$\pi/4$ DQPSK/LCH



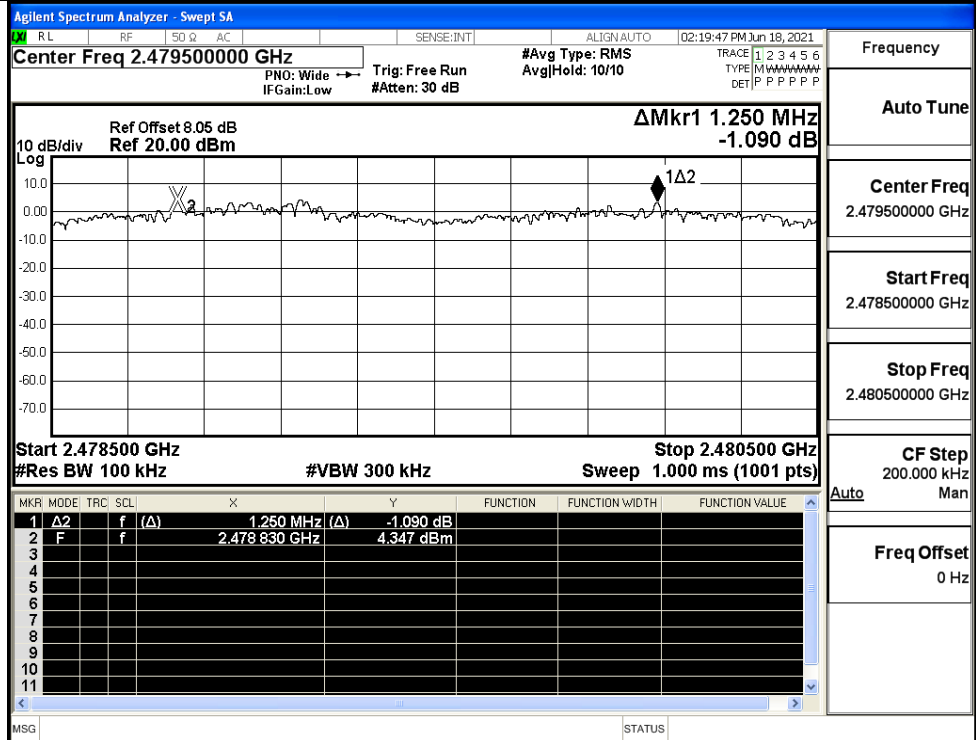
Frequency
Auto Tune
Center Freq
2.40250000 GHz
Start Freq
2.40150000 GHz
Stop Freq
2.40350000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

$\pi/4$ DQPSK/MCH



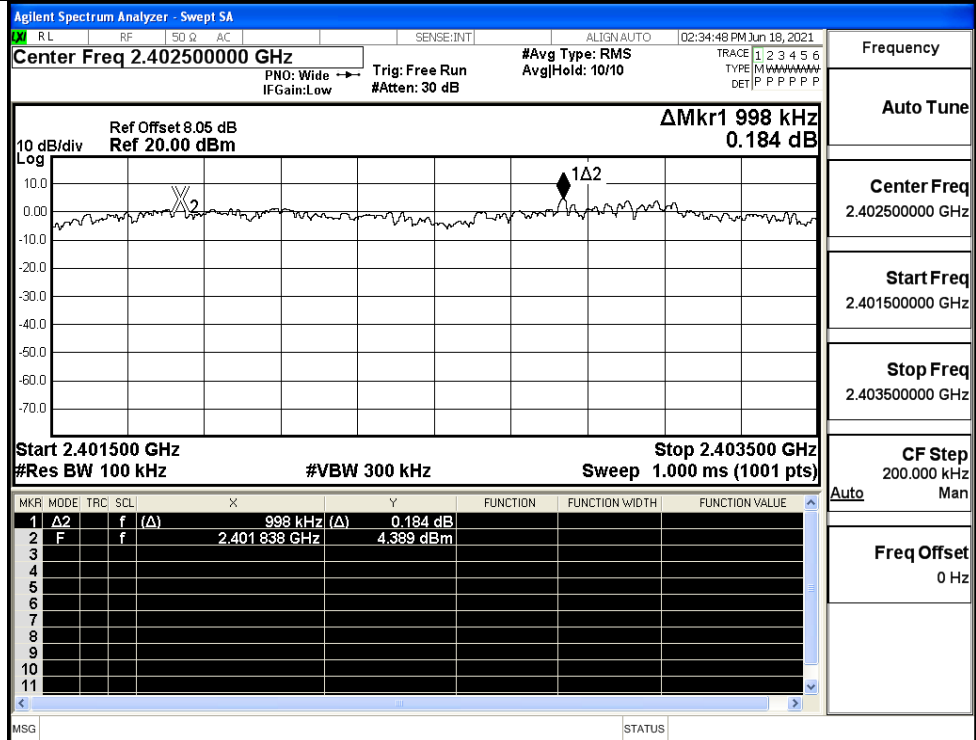
Frequency
Auto Tune
Center Freq
2.44150000 GHz
Start Freq
2.44050000 GHz
Stop Freq
2.44250000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

π/4DQPSK/HCH



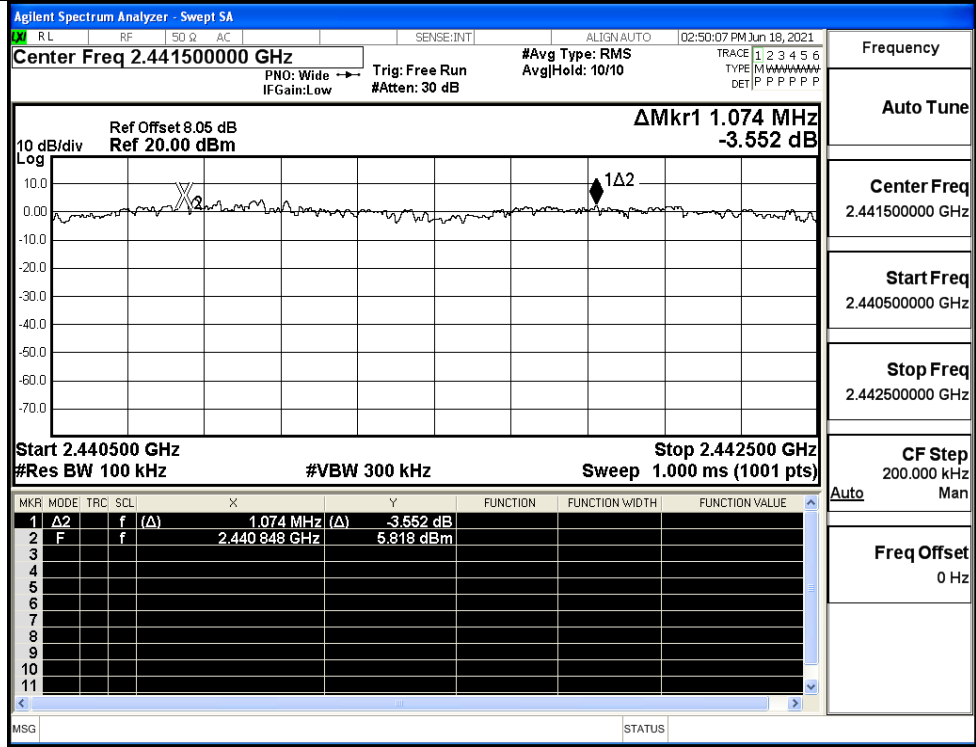
Frequency
Auto Tune
Center Freq
2.479500000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.480500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

8DPSK/LCH



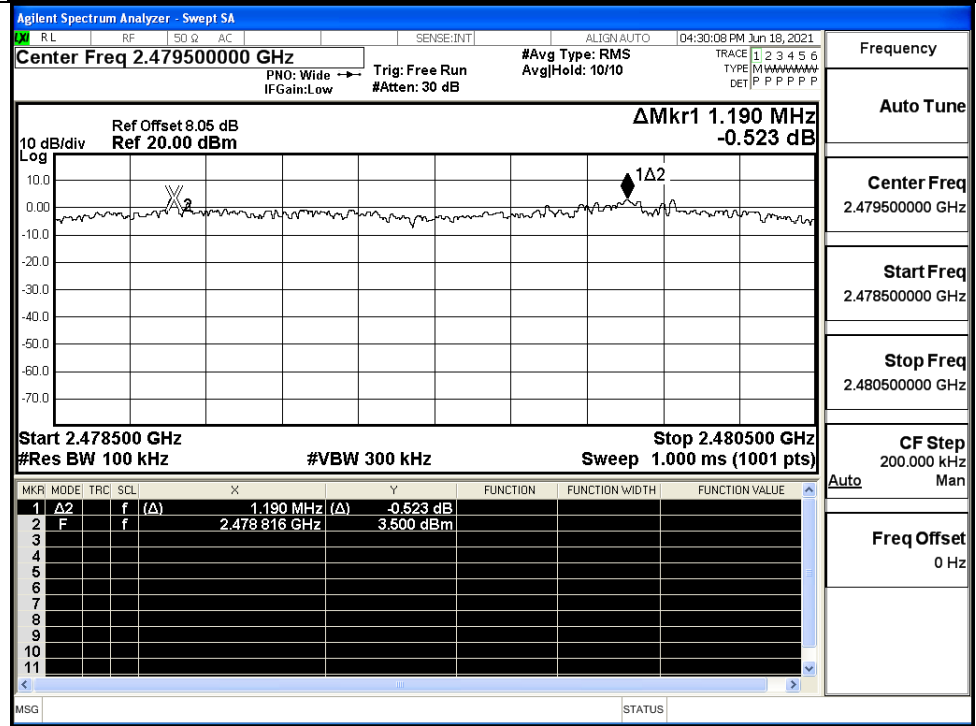
Frequency
Auto Tune
Center Freq
2.402500000 GHz
Start Freq
2.401500000 GHz
Stop Freq
2.403500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

8DPSK/MCH



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	2.479500000 GHz
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

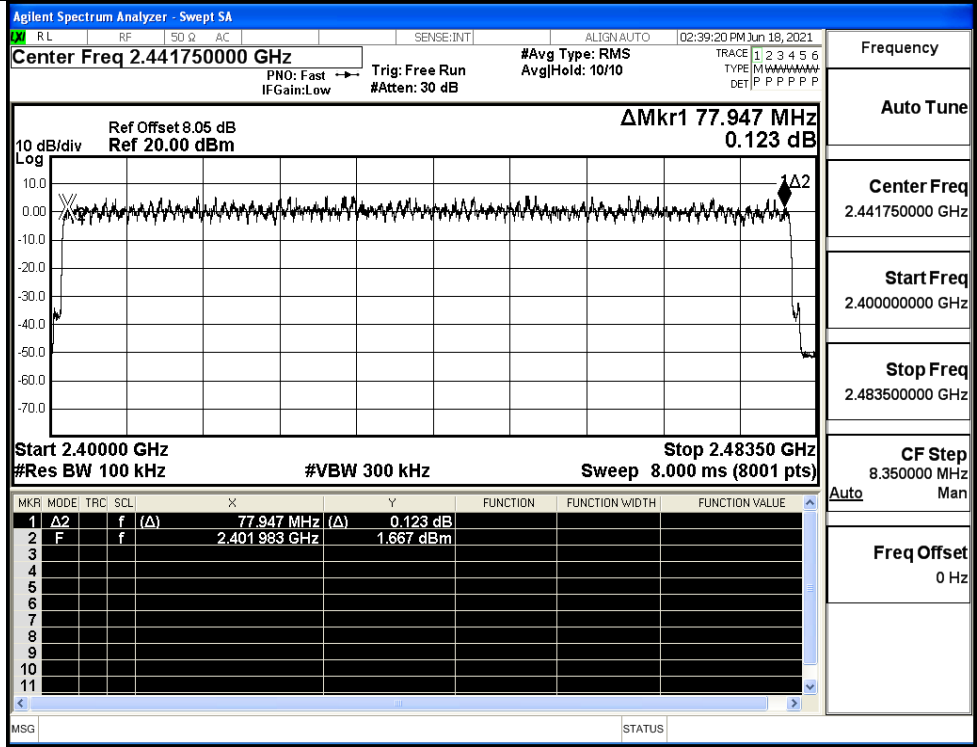
A.4 Hopping Channel Number

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

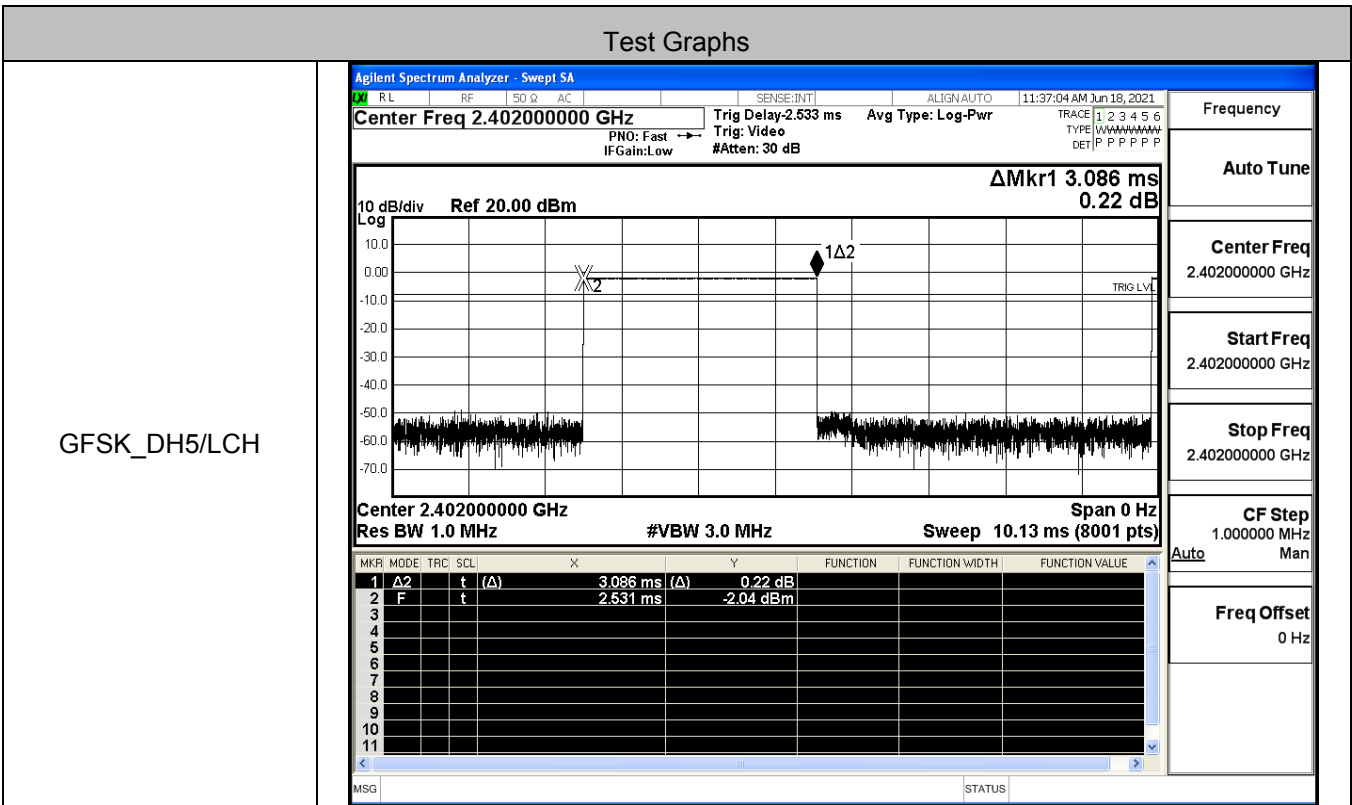
GFSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.441750000 GHz Ref Offset 8.05 dB Ref 20.00 dBm ΔMkr1 77.853 MHz 0.147 dB Start 2.40000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.48350 GHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <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>77.853 MHz</td> <td>(Δ)</td> <td></td> <td></td> <td>0.147 dB</td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402150 GHz</td> <td></td> <td></td> <td></td> <td>4.424 dBm</td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	77.853 MHz	(Δ)			0.147 dB	2	F	f		2.402150 GHz				4.424 dBm
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	77.853 MHz	(Δ)			0.147 dB																				
2	F	f		2.402150 GHz				4.424 dBm																				
$\pi/4$ DQPSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.441750000 GHz Ref Offset 8.05 dB Ref 20.00 dBm ΔMkr1 77.843 MHz -0.852 dB Start 2.40000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.48350 GHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <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>77.843 MHz</td> <td>(Δ)</td> <td></td> <td></td> <td>-0.852 dB</td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402046 GHz</td> <td></td> <td></td> <td></td> <td>1.335 dBm</td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	77.843 MHz	(Δ)			-0.852 dB	2	F	f		2.402046 GHz				1.335 dBm
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	77.843 MHz	(Δ)			-0.852 dB																				
2	F	f		2.402046 GHz				1.335 dBm																				

8DPSK/Hop

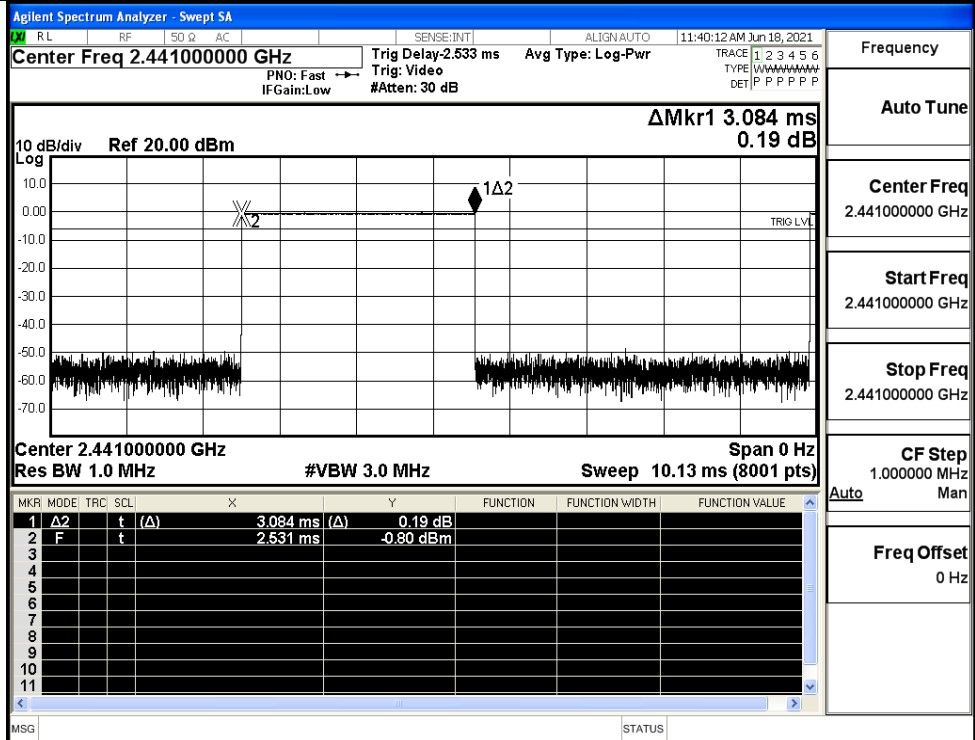


A.5 Dwell Time

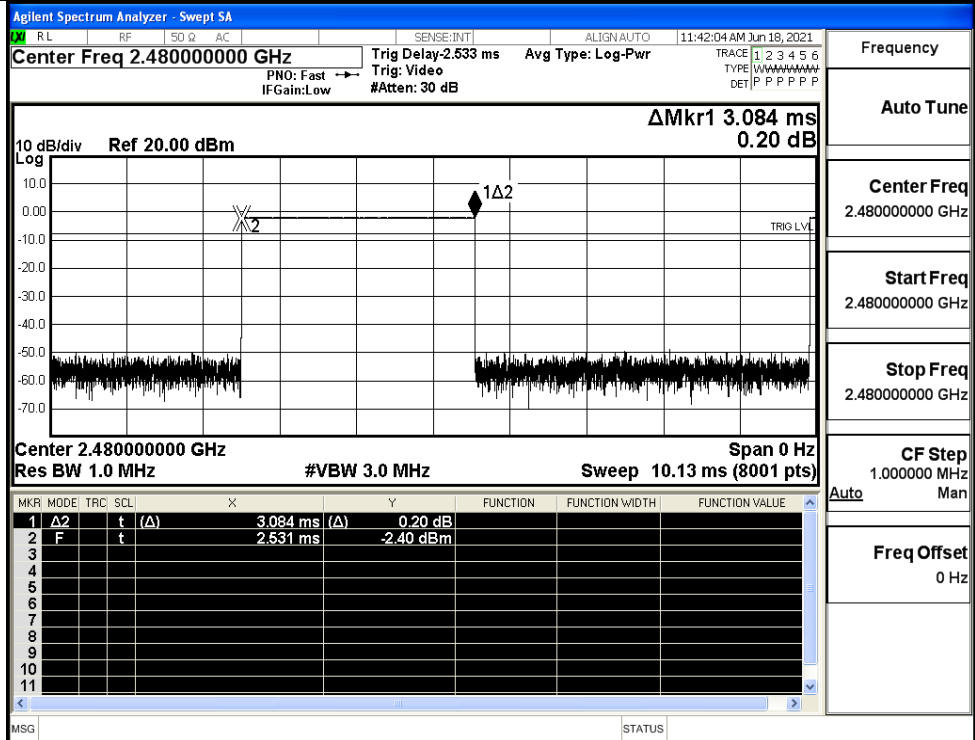
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	3.09	106.7	0.33	0.4	PASS
	DH5	MCH	3.08	106.7	0.329	0.4	PASS
	DH5	HCH	3.08	106.7	0.329	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	3.09	106.7	0.307	0.4	PASS
	2DH5	MCH	3.08	106.7	0.307	0.4	PASS
	2DH5	HCH	3.08	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	3.09	106.7	0.308	0.4	PASS
	3DH5	MCH	3.08	106.7	0.308	0.4	PASS
	3DH5	HCH	3.08	106.7	0.308	0.4	PASS



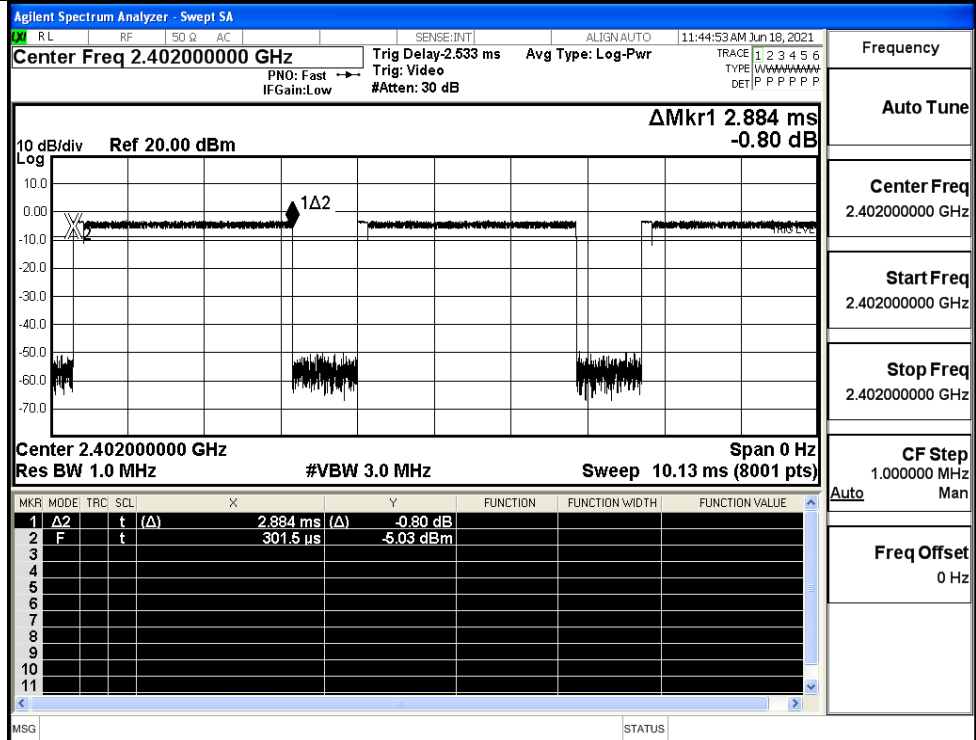
GFSK_DH5/MCH



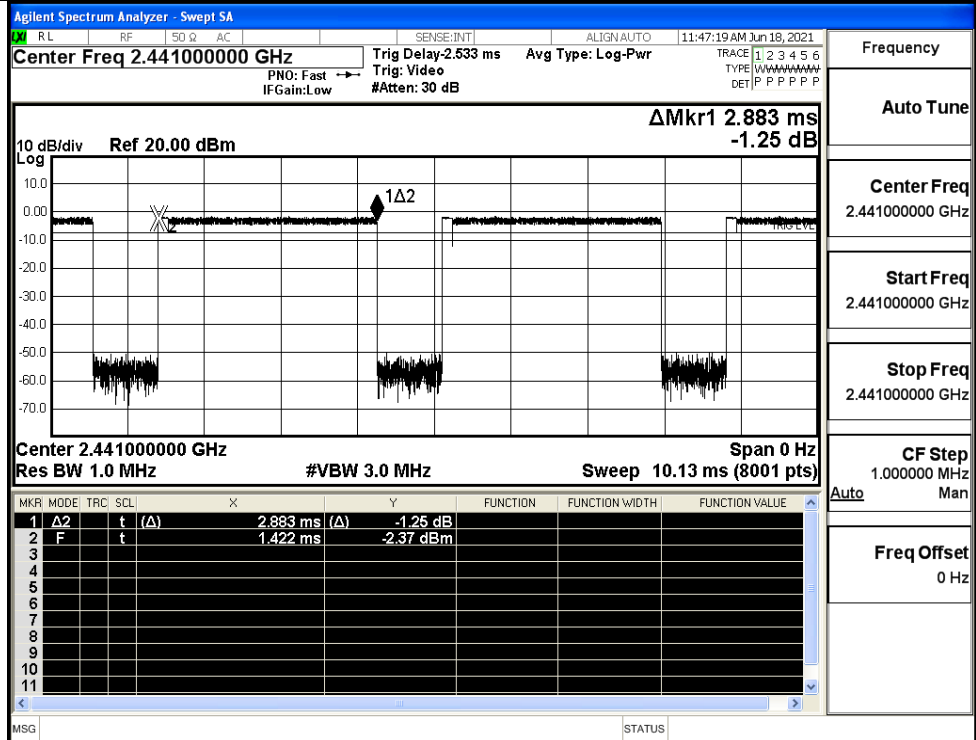
GFSK_DH5/HCH



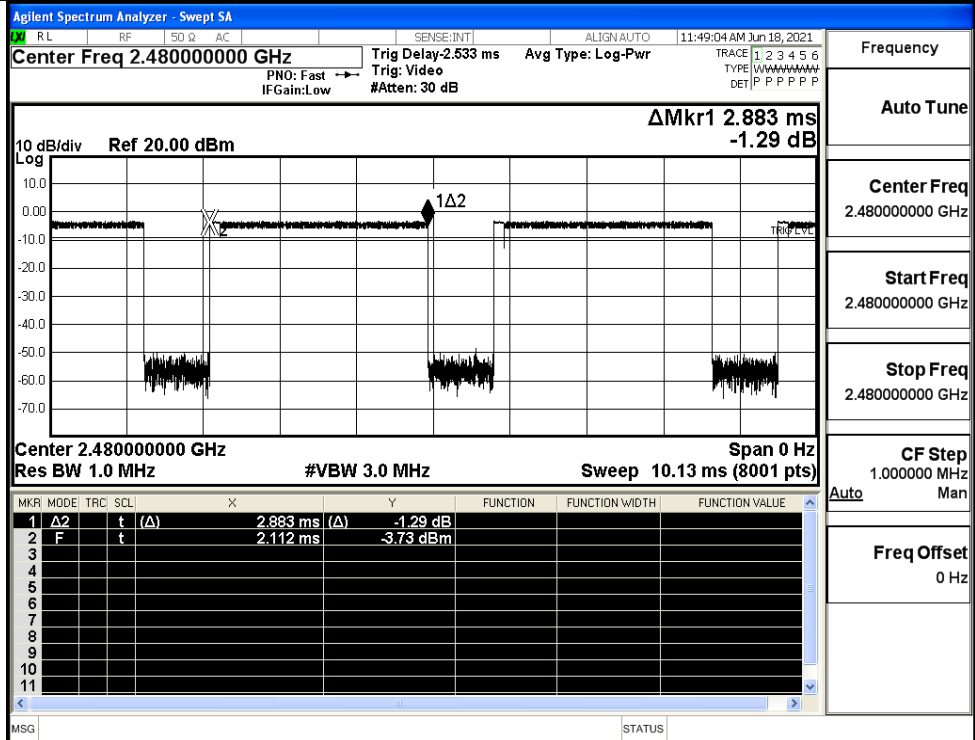
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH

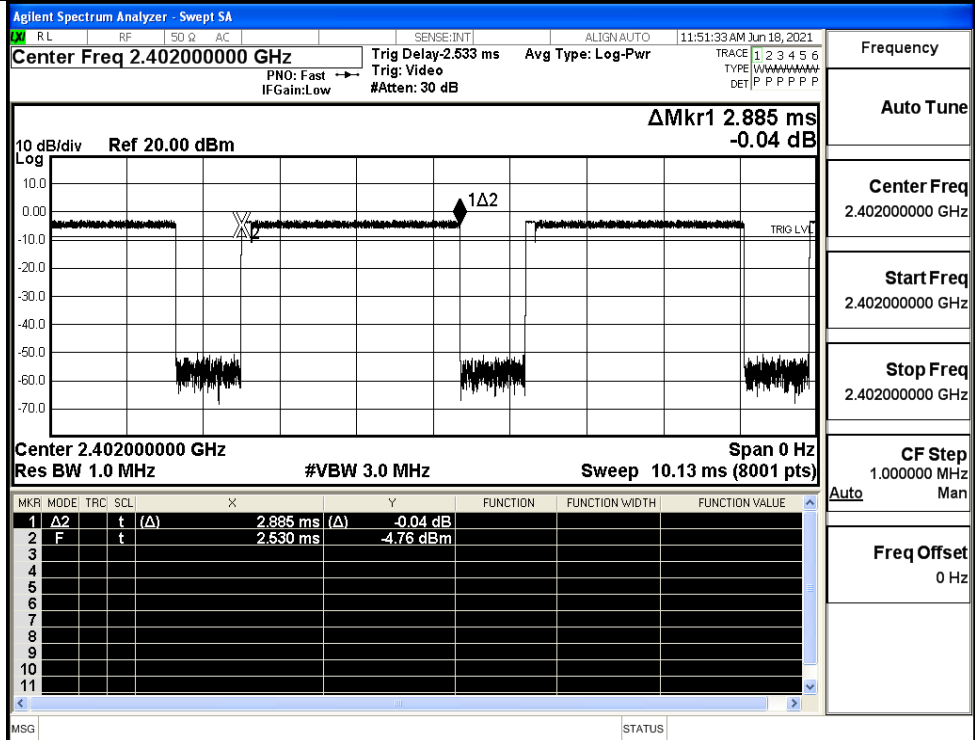


$\pi/4$ DQPSK
_2DH5/HCH



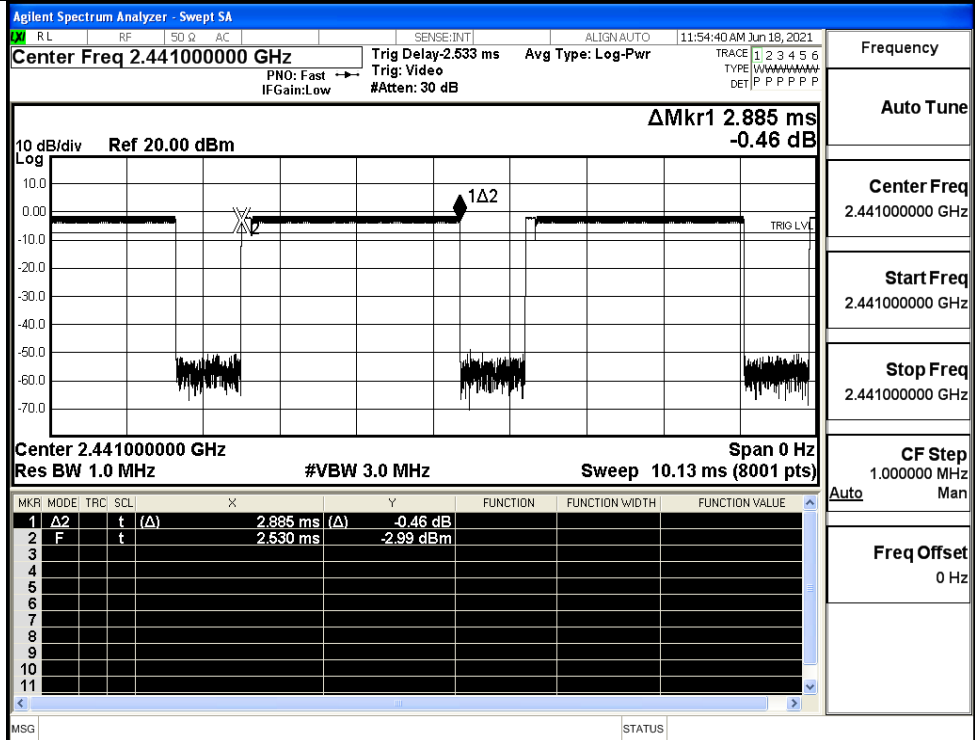
Frequency	2.480000000 GHz
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK_3DH5/LCH

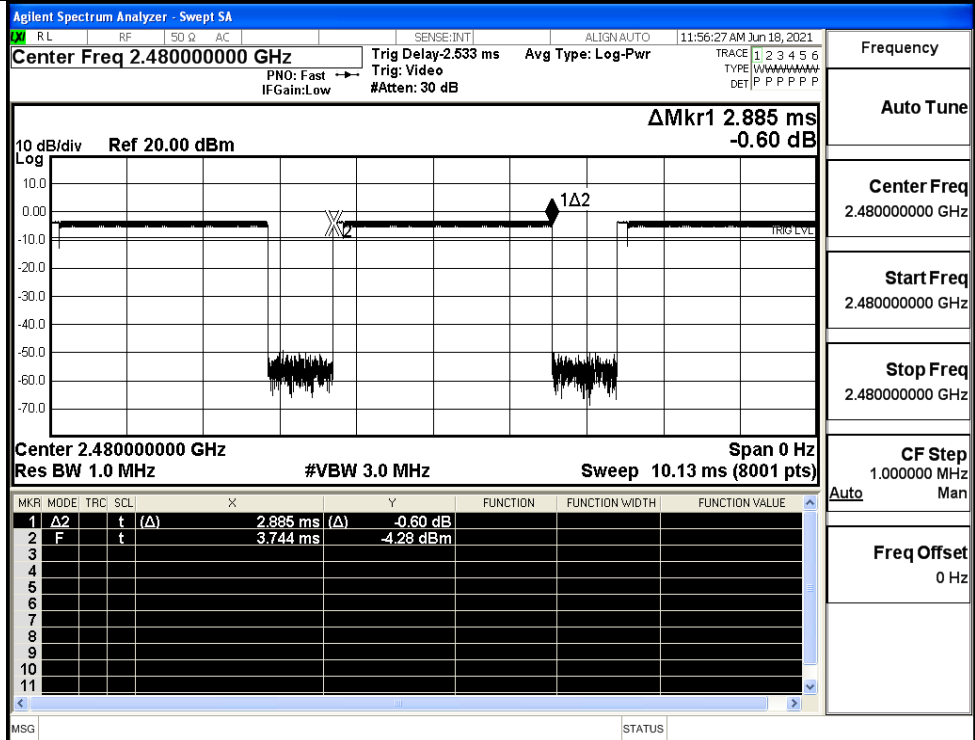


Frequency	2.402000000 GHz
Auto Tune	
Center Freq	2.402000000 GHz
Start Freq	2.402000000 GHz
Stop Freq	2.402000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK_3DH5/MCH



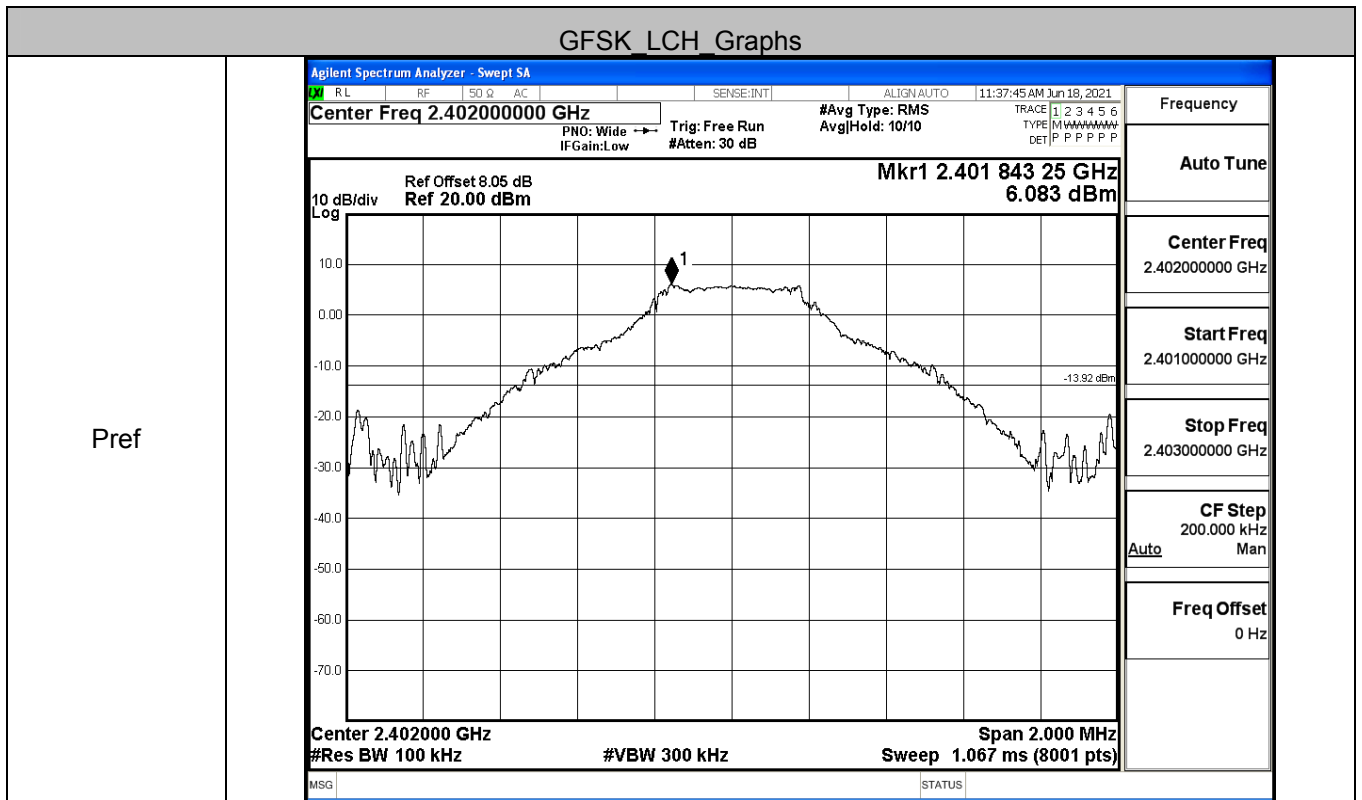
8DPSK_3DH5/HCH

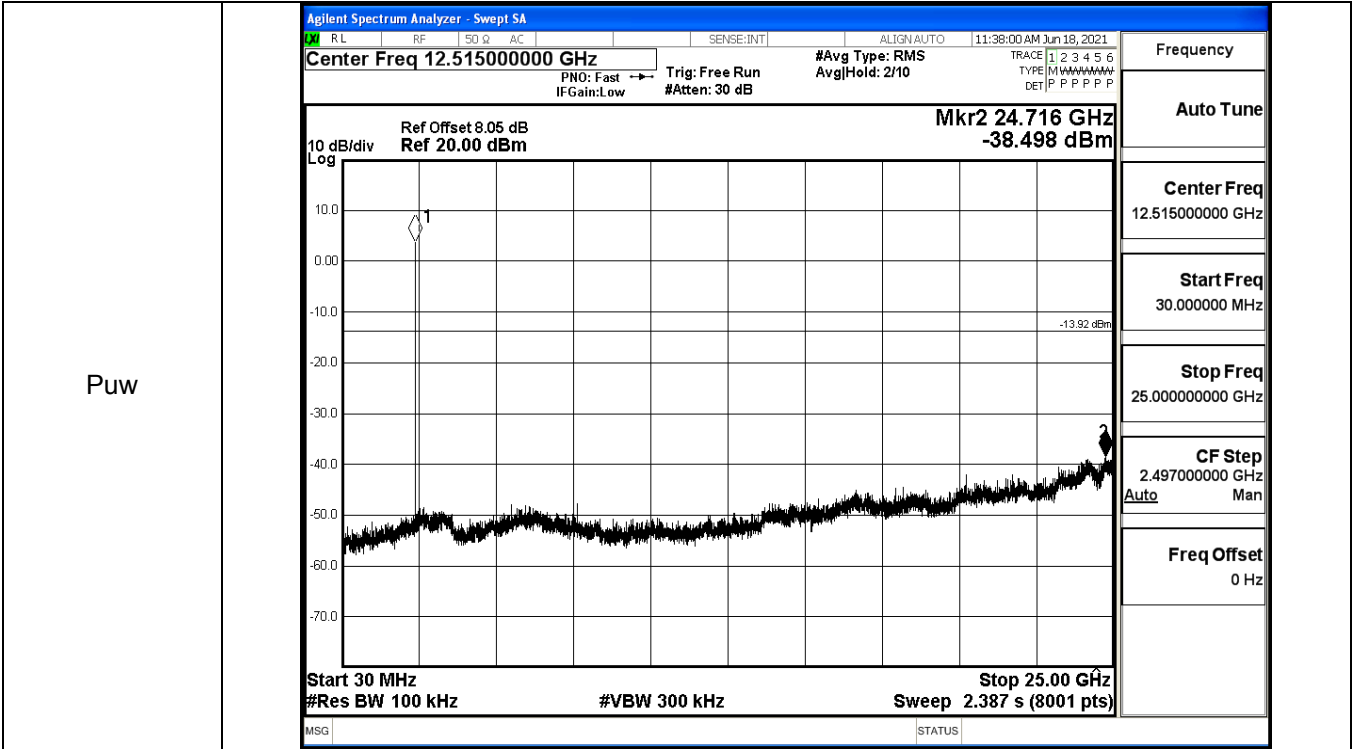


A.6 RF Conducted Spurious Emissions

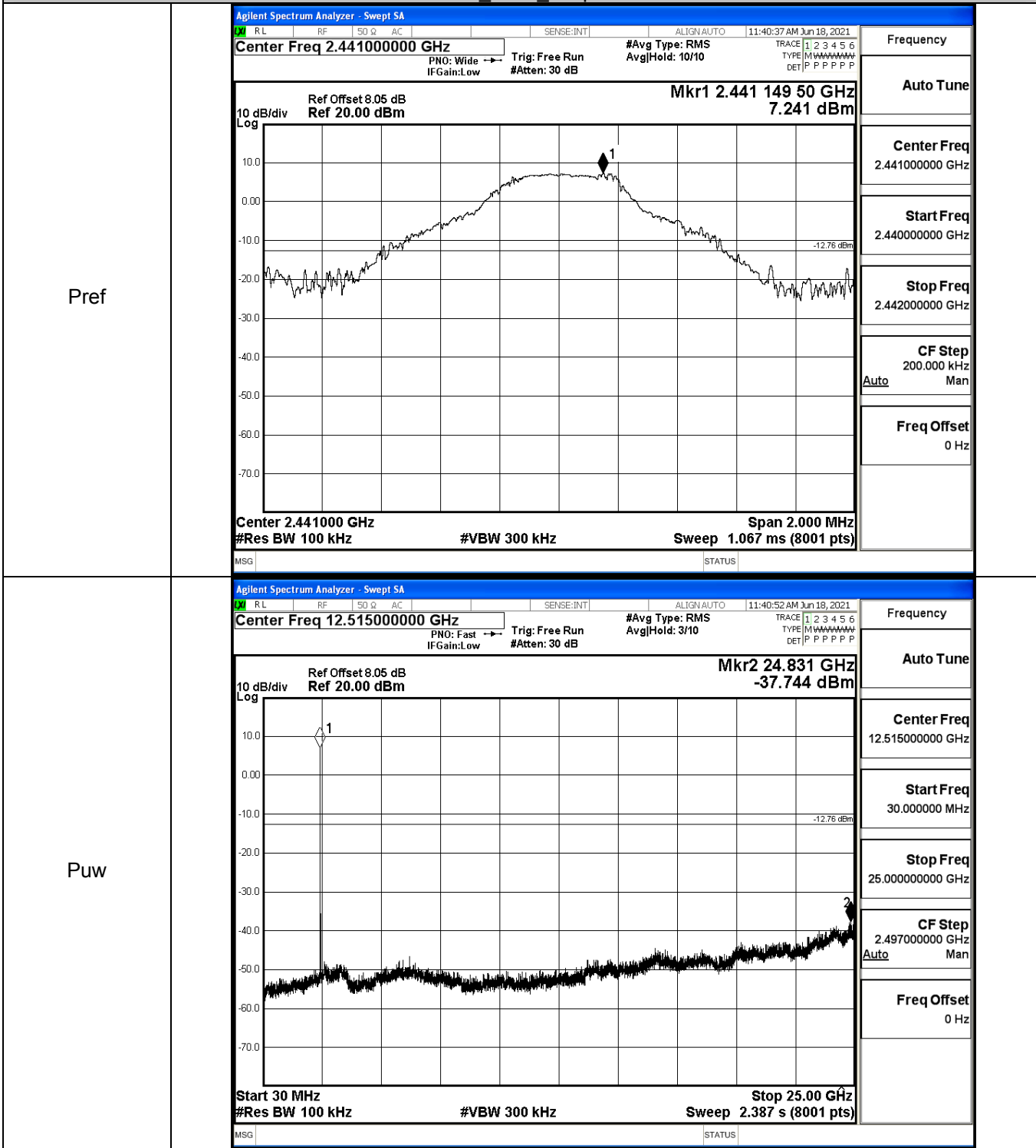
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	6.083	-38.498	-13.917	PASS
	MCH	7.241	-37.744	-12.759	PASS
	HCH	5.949	-38.109	-14.051	PASS
$\pi/4$ DQPSK	LCH	4.492	-37.224	-15.508	PASS
	MCH	5.207	-37.113	-14.793	PASS
	HCH	4.278	-37.851	-15.722	PASS
8DPSK	LCH	4.348	-37.086	-15.652	PASS
	MCH	5.976	-37.956	-14.024	PASS
	HCH	4.495	-38.031	-15.505	PASS

GFSK LCH Graphs

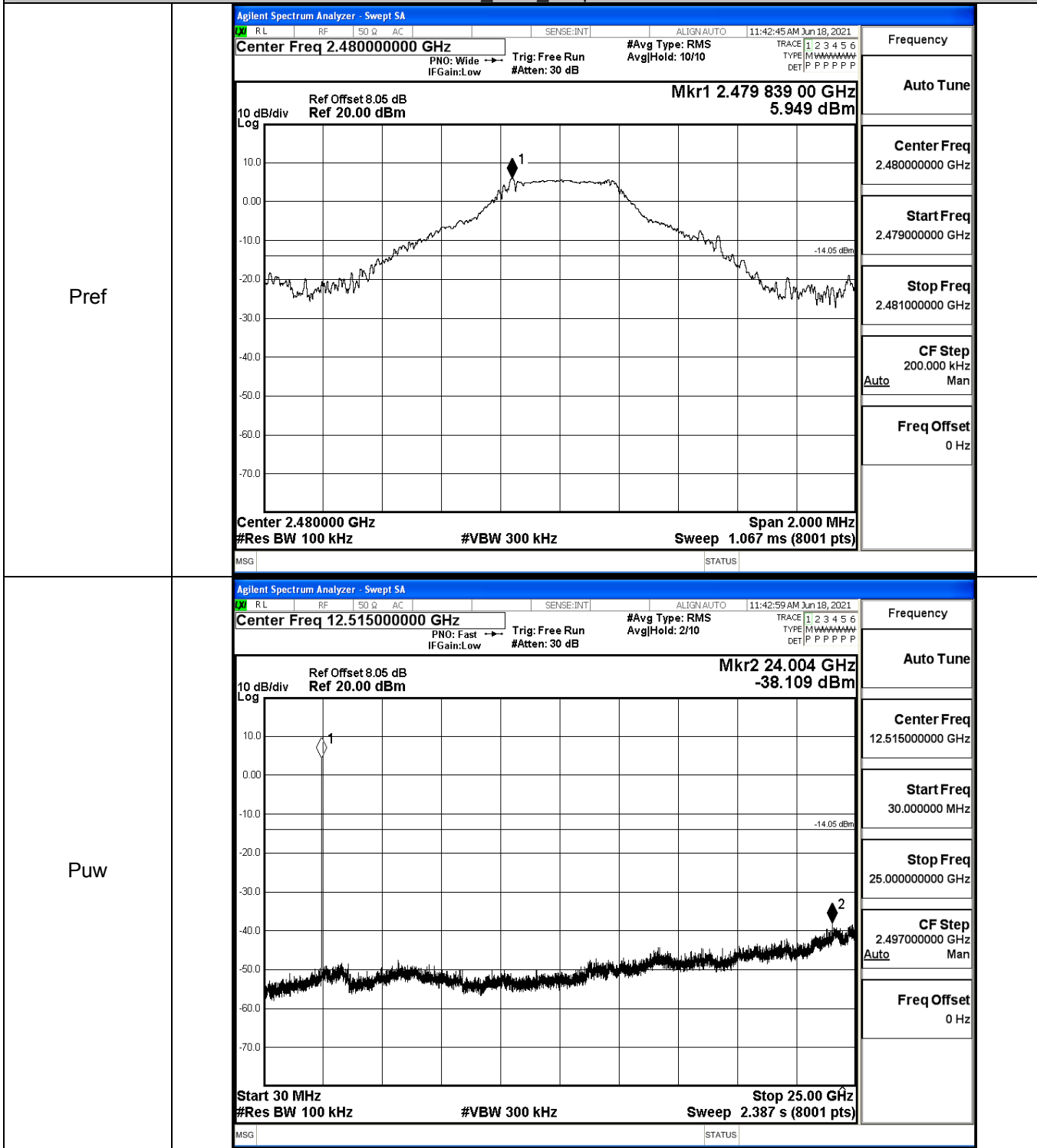




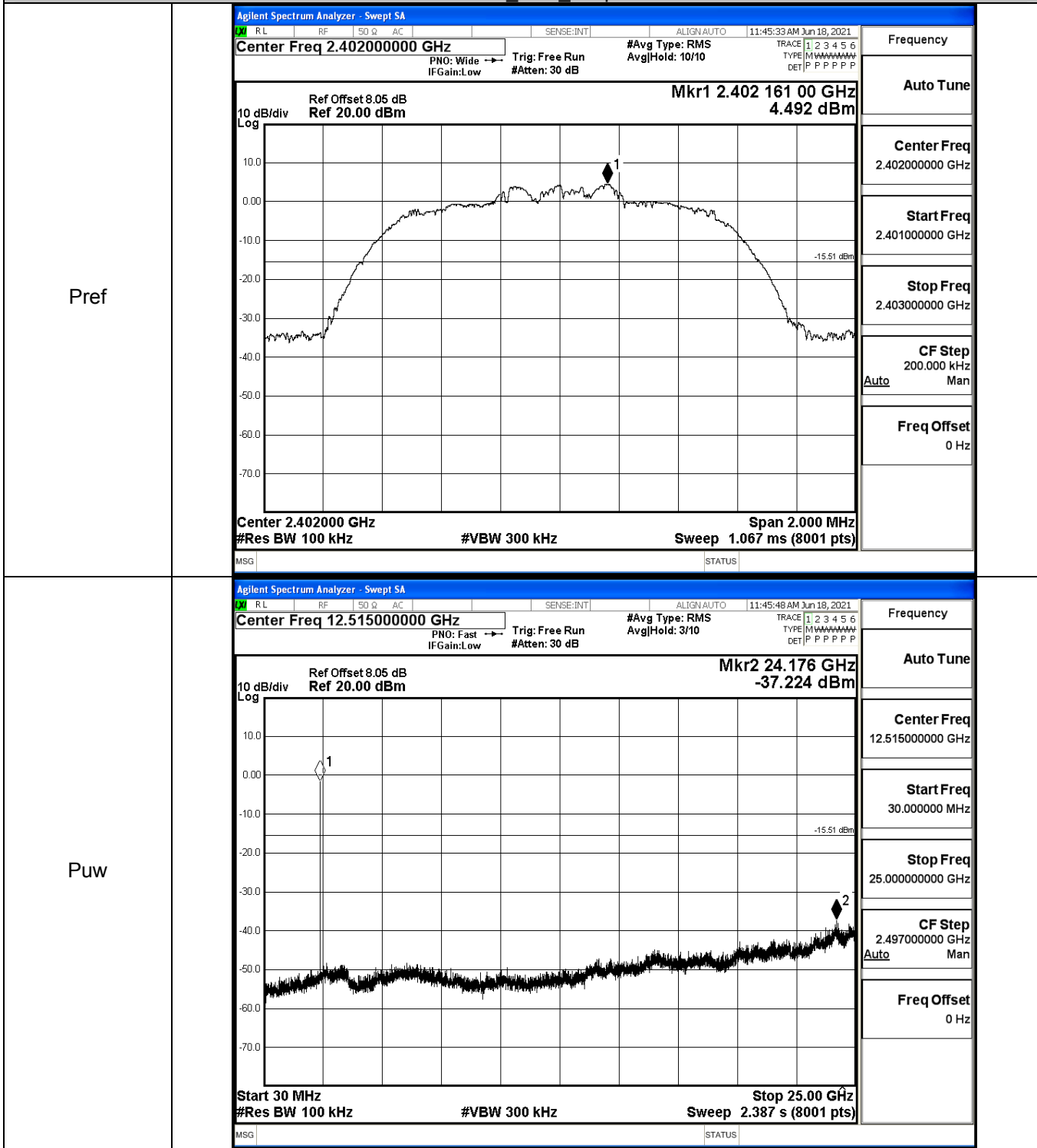
GFSK_MCH_Graphs



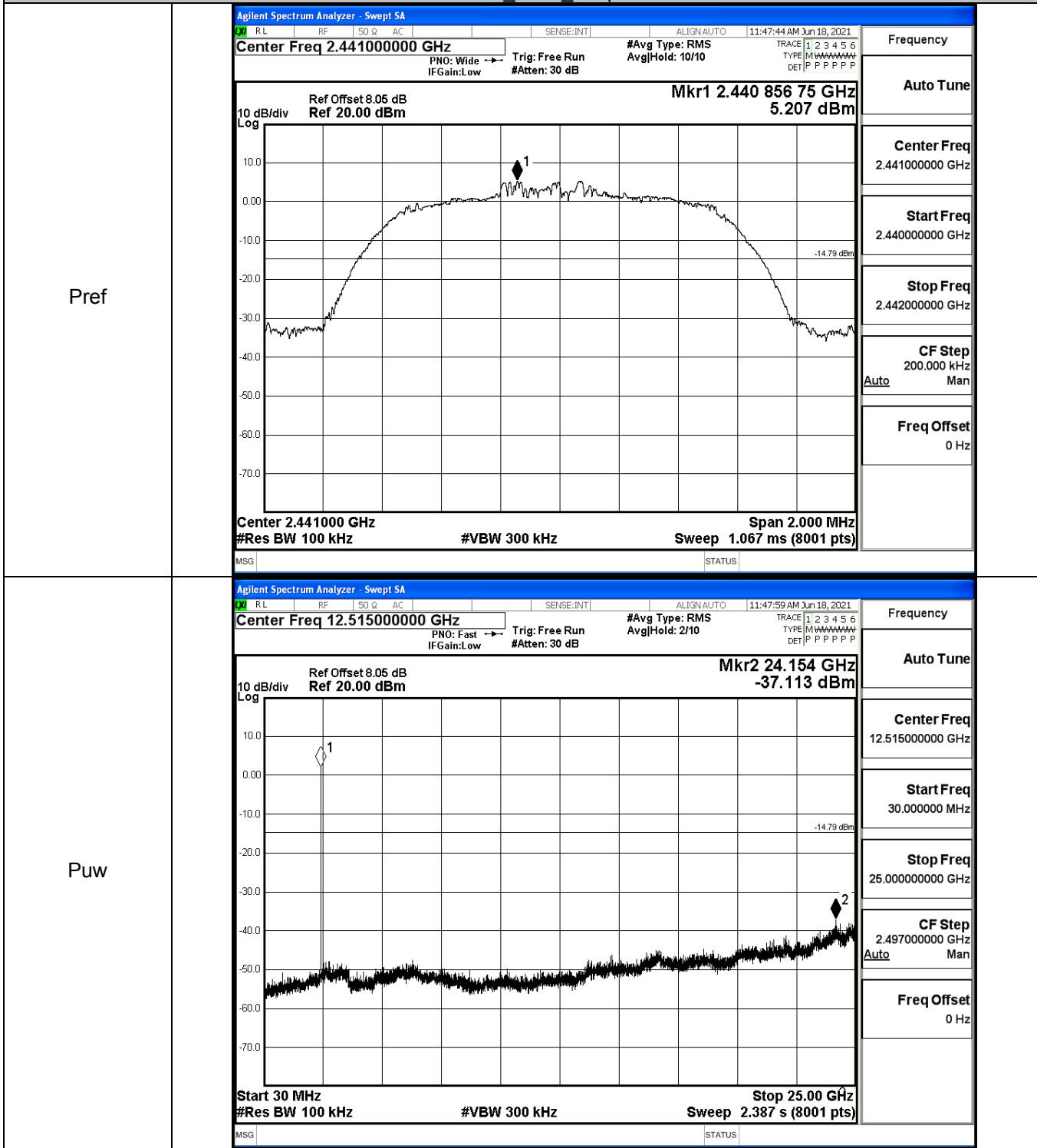
GFSK_HCH_Graphs



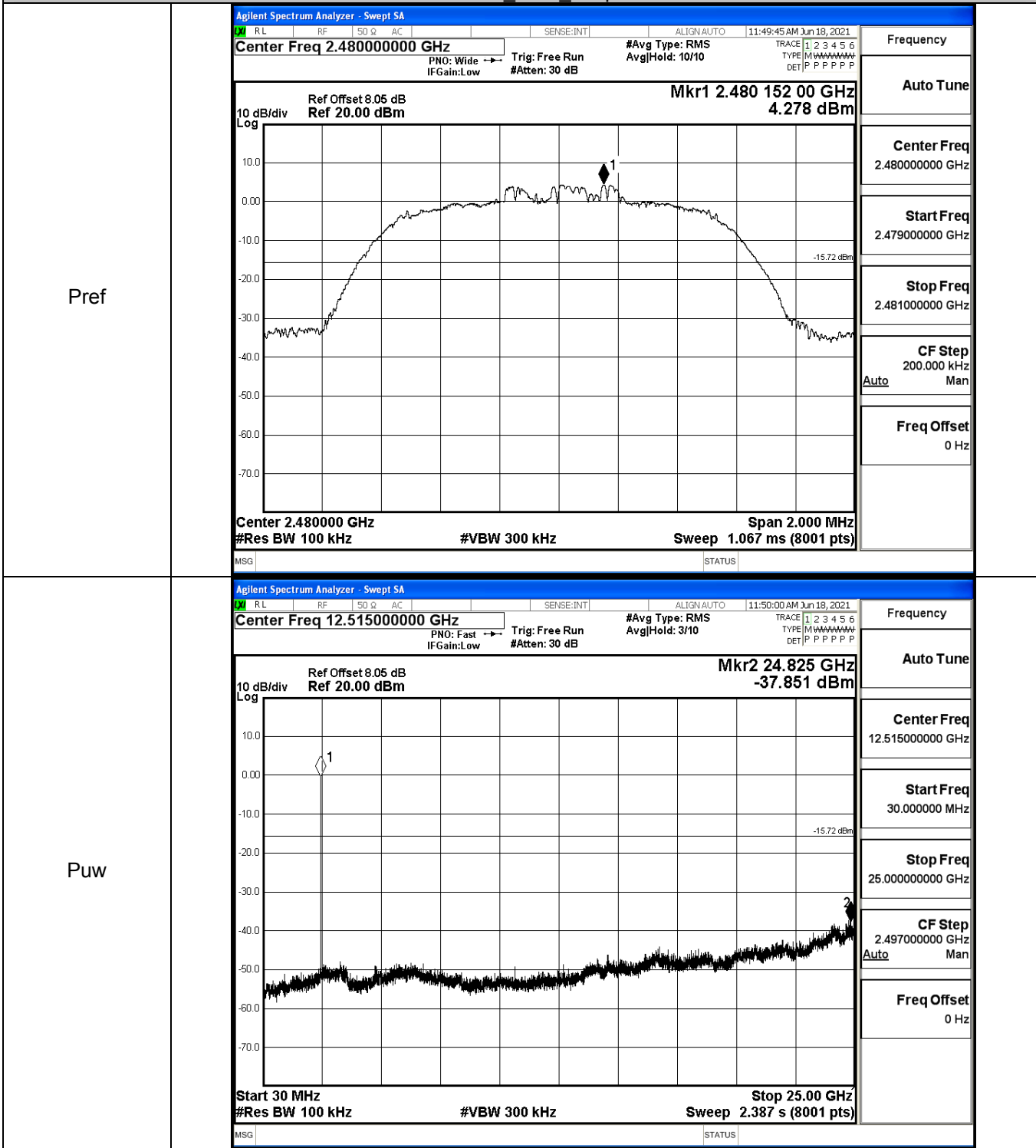
$\pi/4$ DQPSK_LCH_Graphs



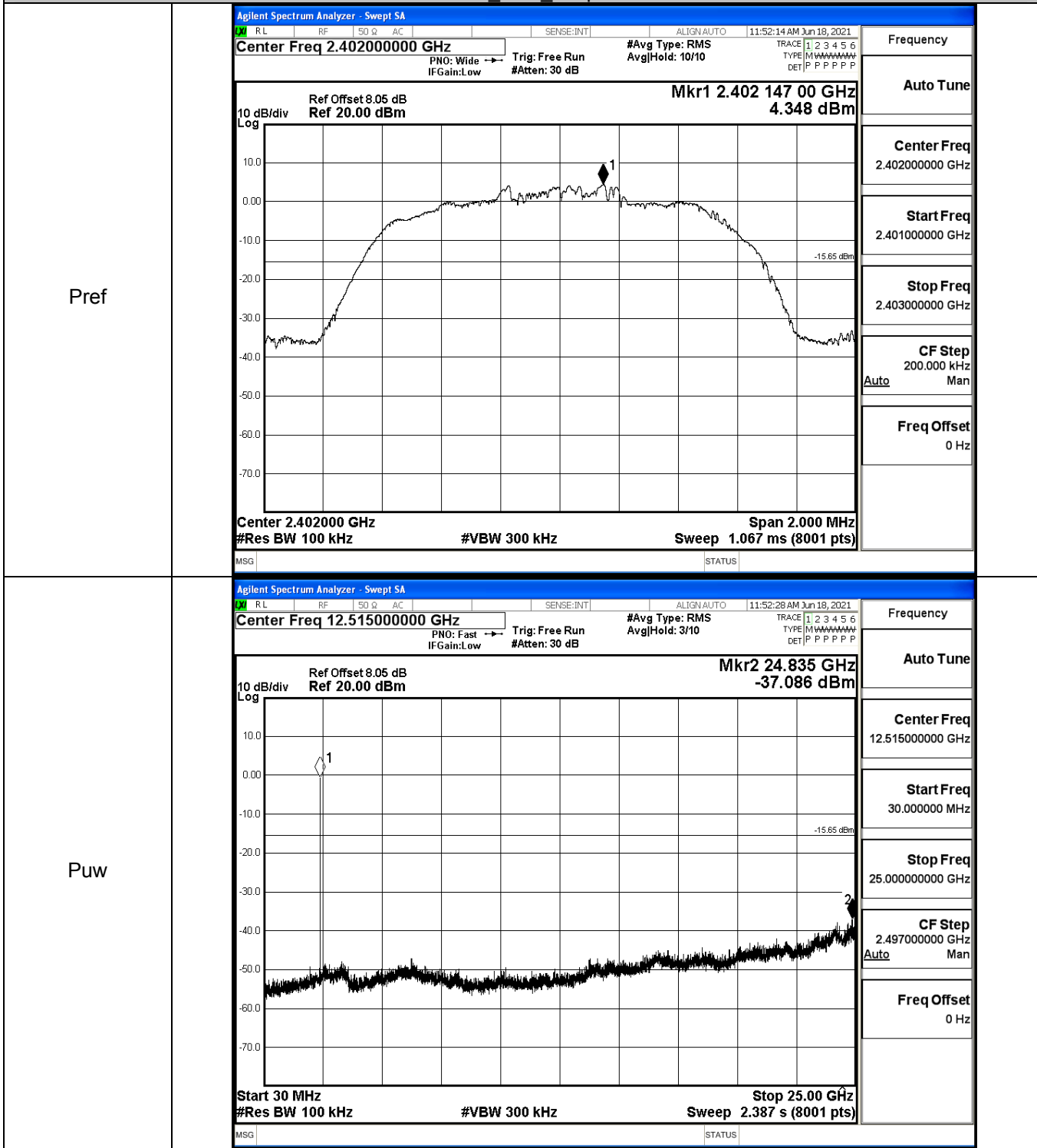
$\pi/4$ DQPSK_MCH_Graphs



$\pi/4$ DQPSK_HCH_Graphs

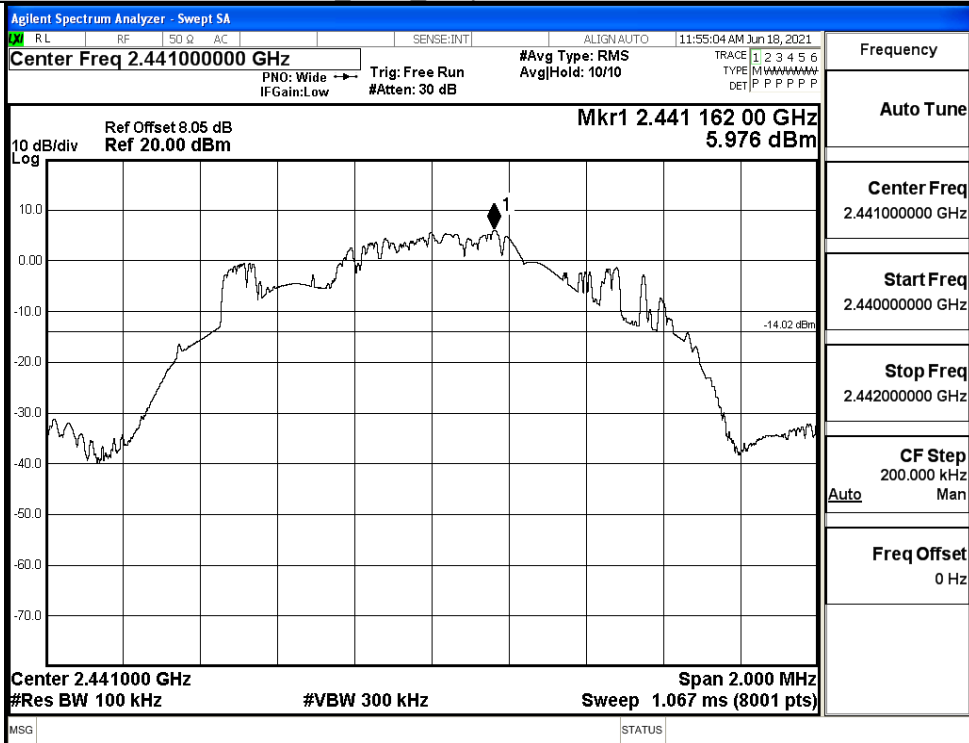


8DPSK_LCH_Graphs

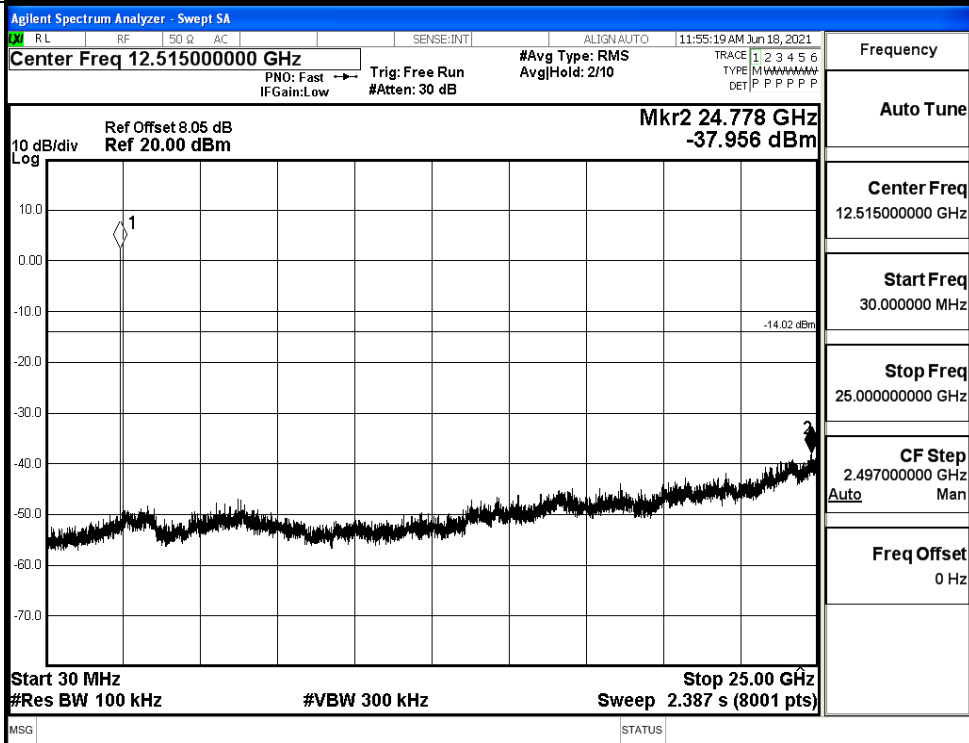


8DPSK_MCH_Graphs

Pref

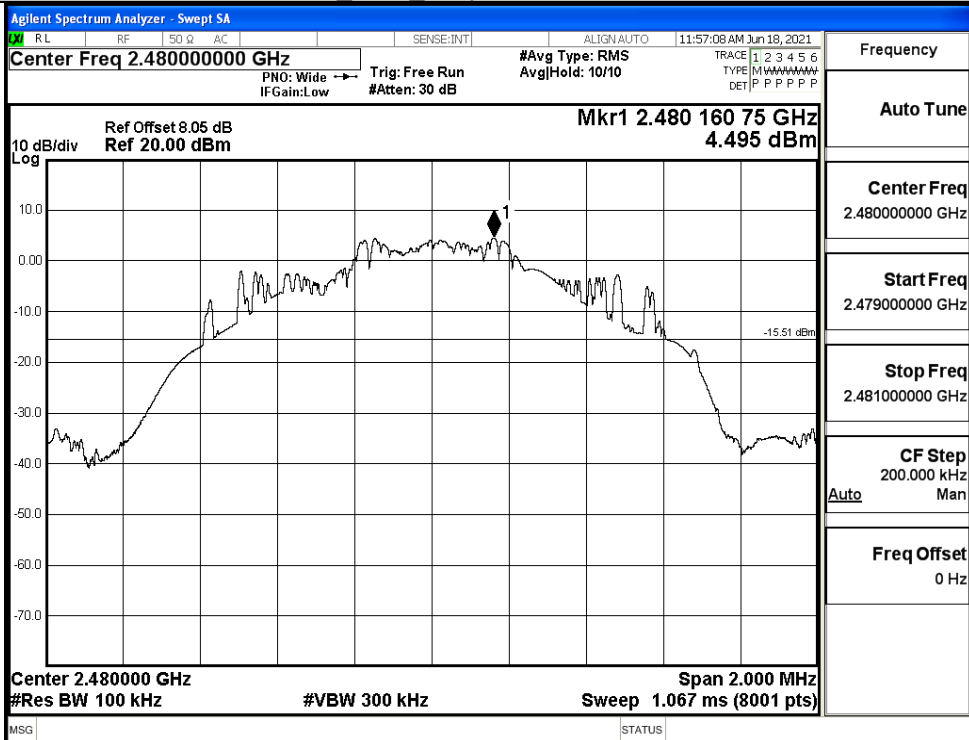


Puw

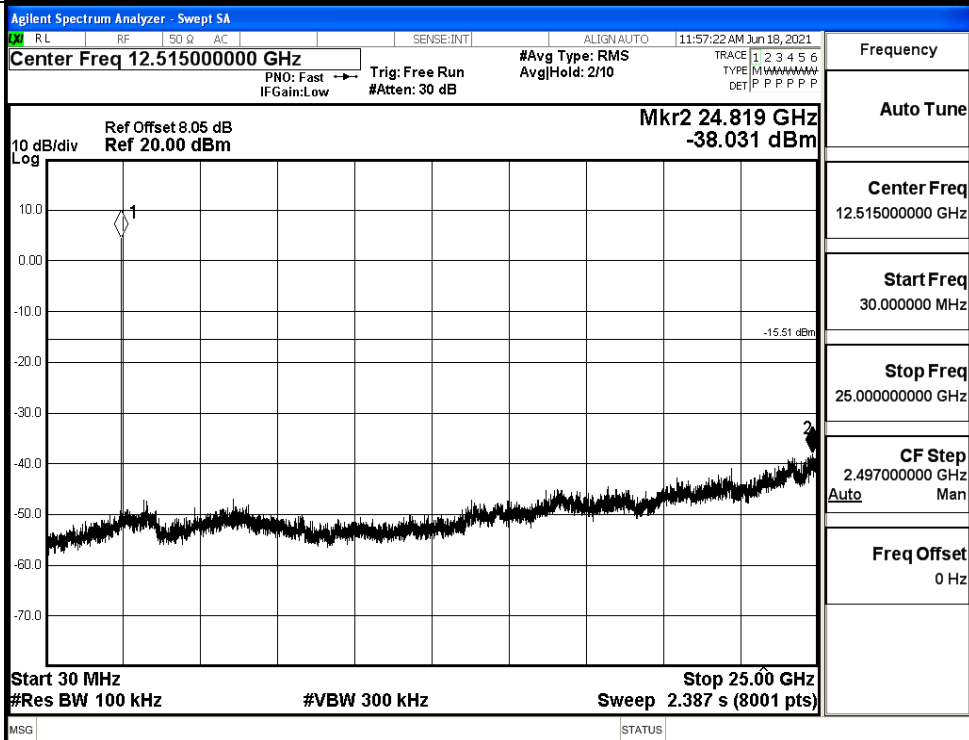


8DPSK_HCH_Graphs

Pref



Puw

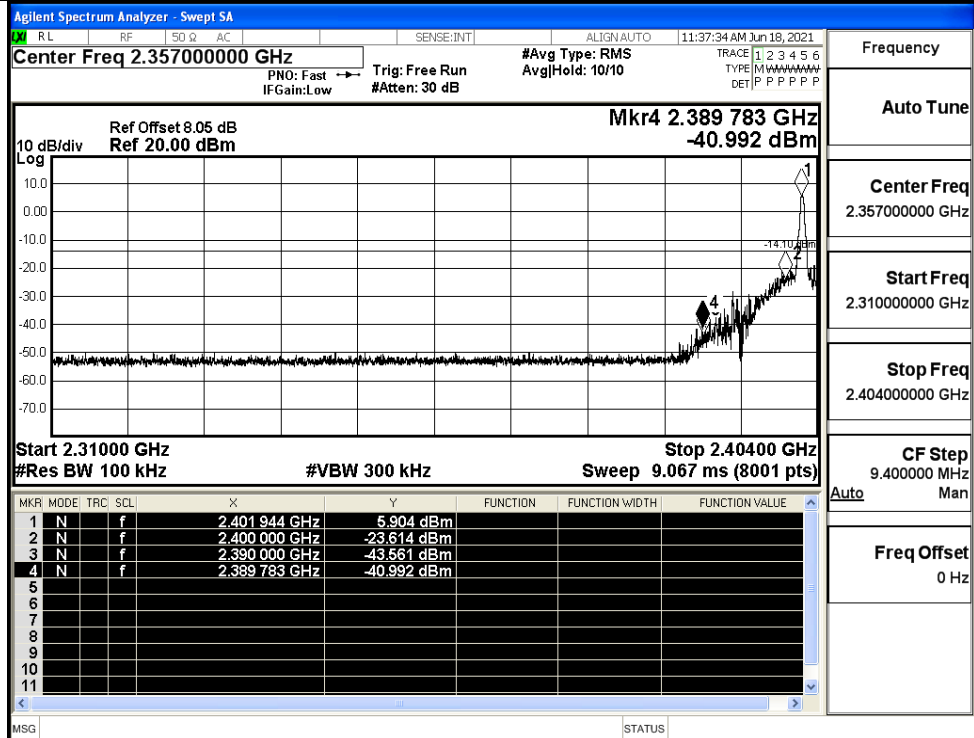


A.7 Band-edge for RF Conducted Emissions

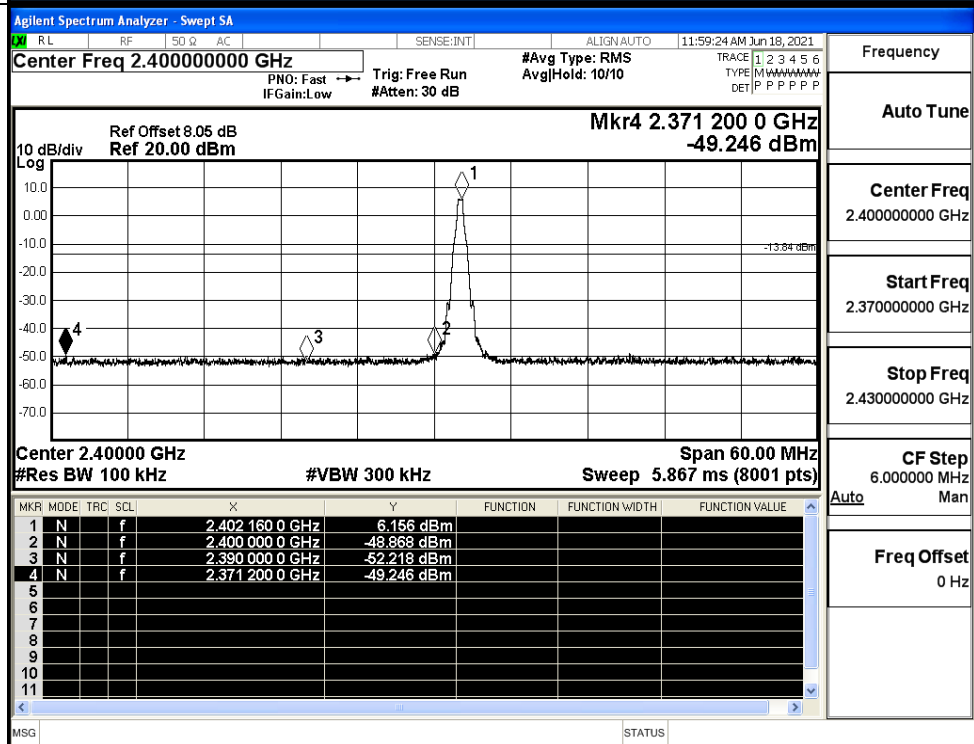
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	5.904	Off	-40.992	-14.1	PASS
			6.156	On	-49.246	-13.84	PASS
	HCH	2480	5.886	Off	-24.094	-14.11	PASS
			7.034	On	-48.490	-12.97	PASS
$\pi/4$ DQPSK	LCH	2402	4.571	Off	-49.179	-15.43	PASS
			6.165	On	-49.191	-13.84	PASS
	HCH	2480	4.231	Off	-48.705	-15.77	PASS
			5.500	On	-48.925	-14.5	PASS
8DPSK	LCH	2402	4.602	Off	-48.430	-15.4	PASS
			5.836	On	-48.832	-14.16	PASS
	HCH	2480	4.661	Off	-48.532	-15.34	PASS
			5.668	On	-48.781	-14.33	PASS

Test Graphs

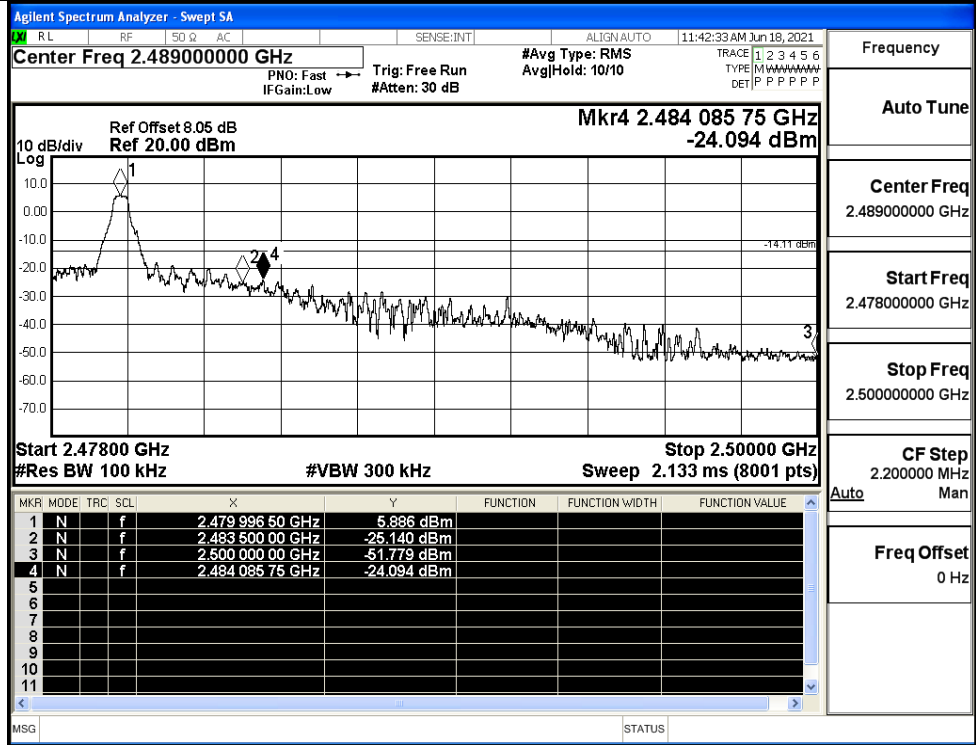
GFSK/LCH/No Hop



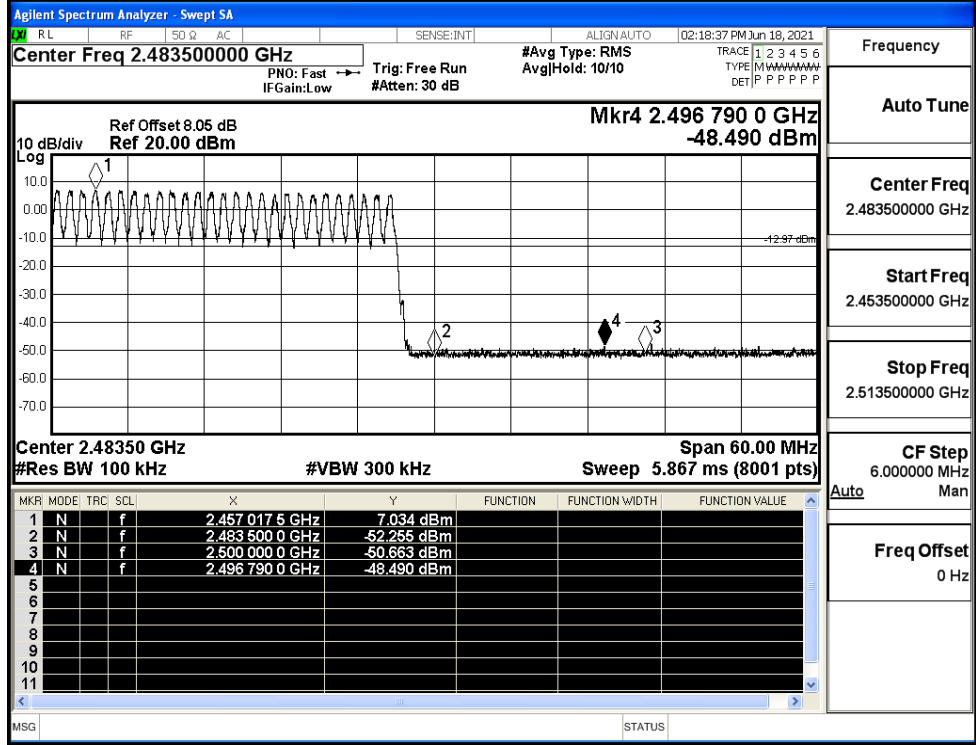
GFSK/LCH/Hop



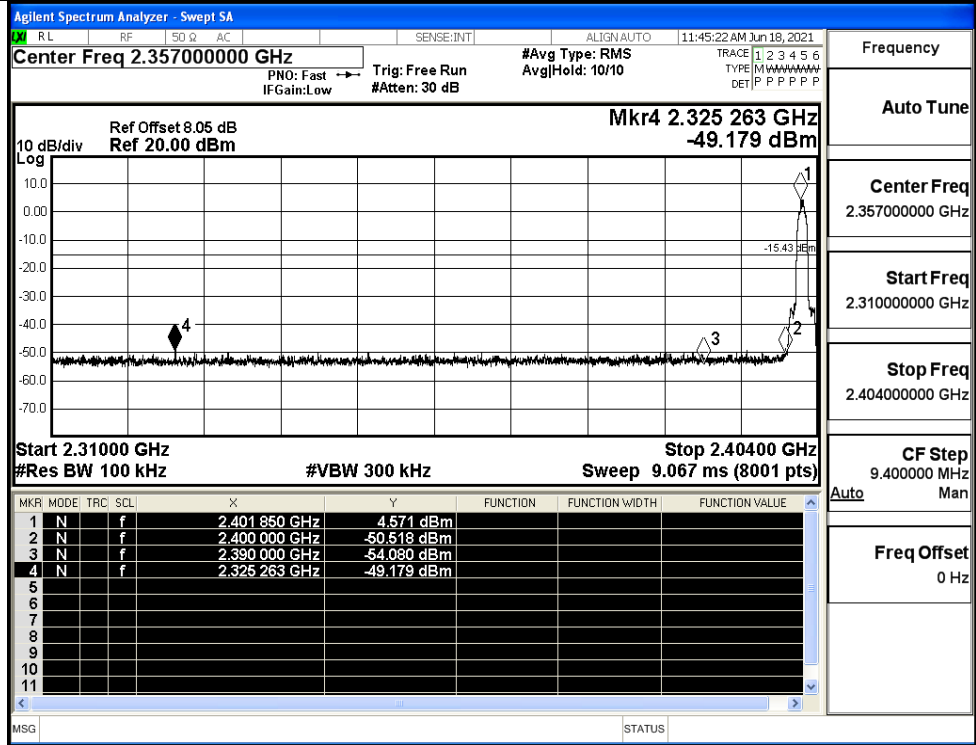
GFSK/HCH/No Hop



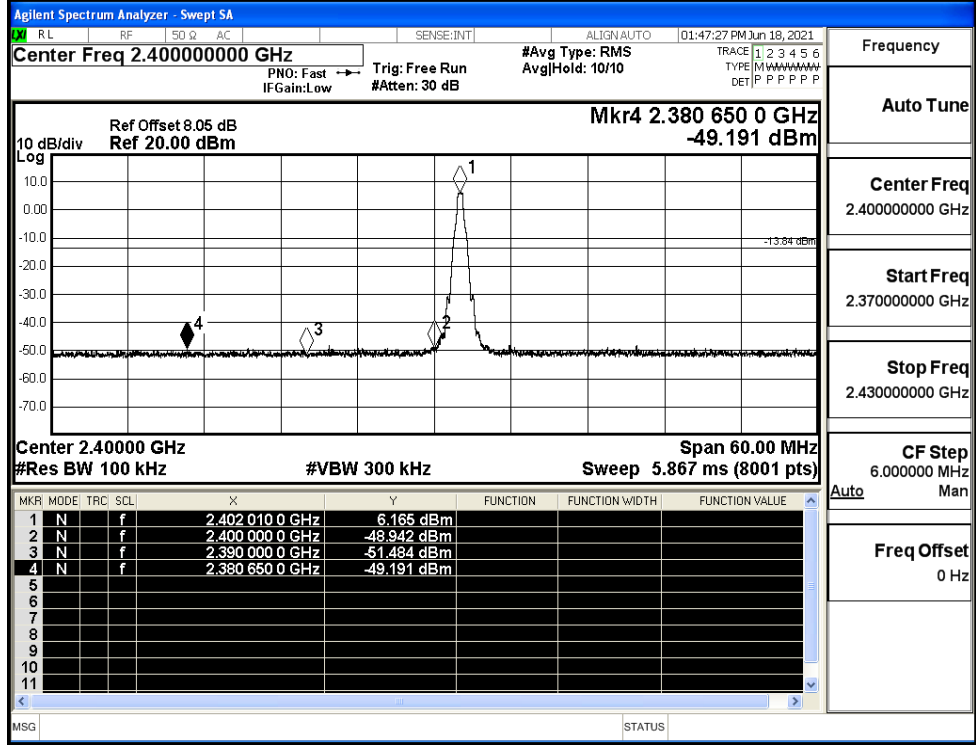
GFSK/HCH/Hop



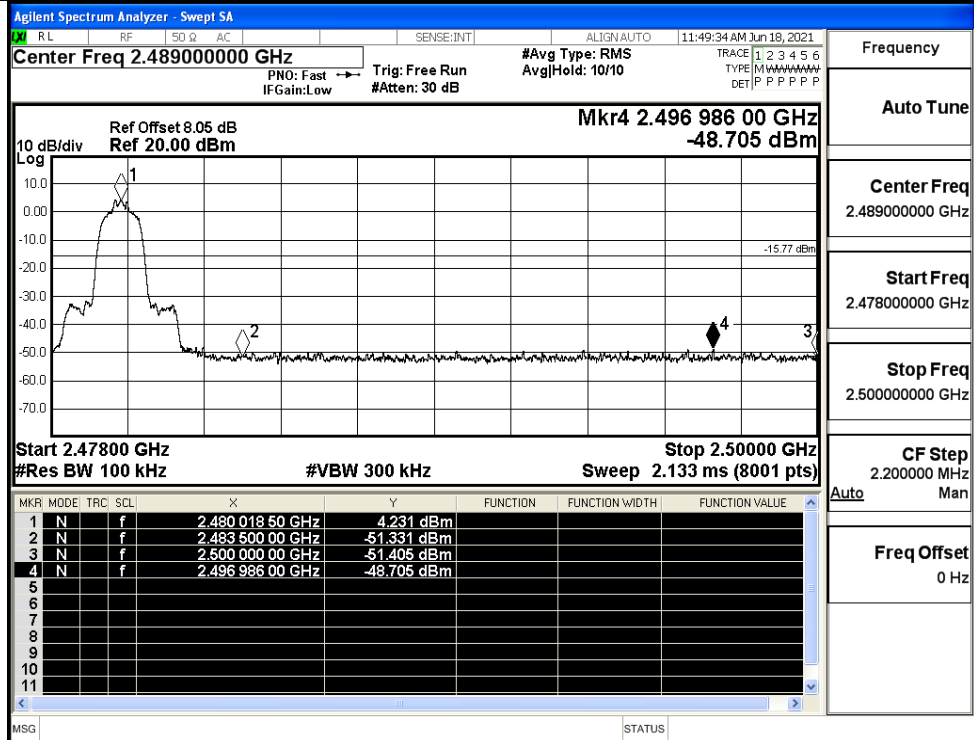
$\pi/4$ DQPSK/LCH/No Hop



$\pi/4$ DQPSK/LCH/Hop

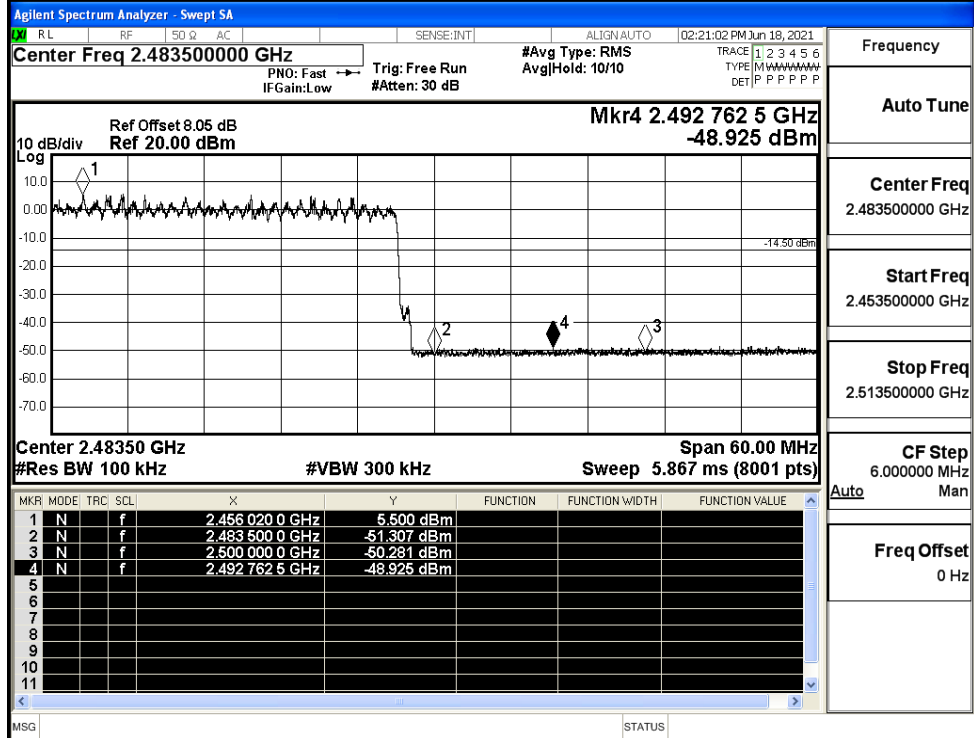


π /4DQPSK/HCH/No Hop



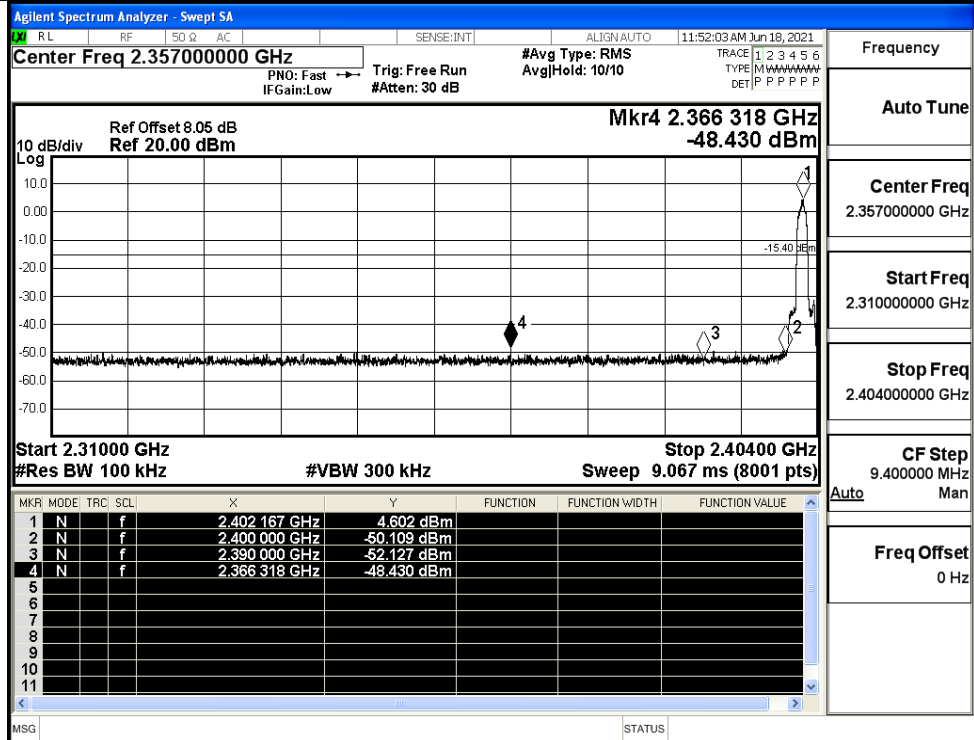
Frequency	
Auto Tune	
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Freq Offset	0 Hz

π /4DQPSK/HCH/Hop



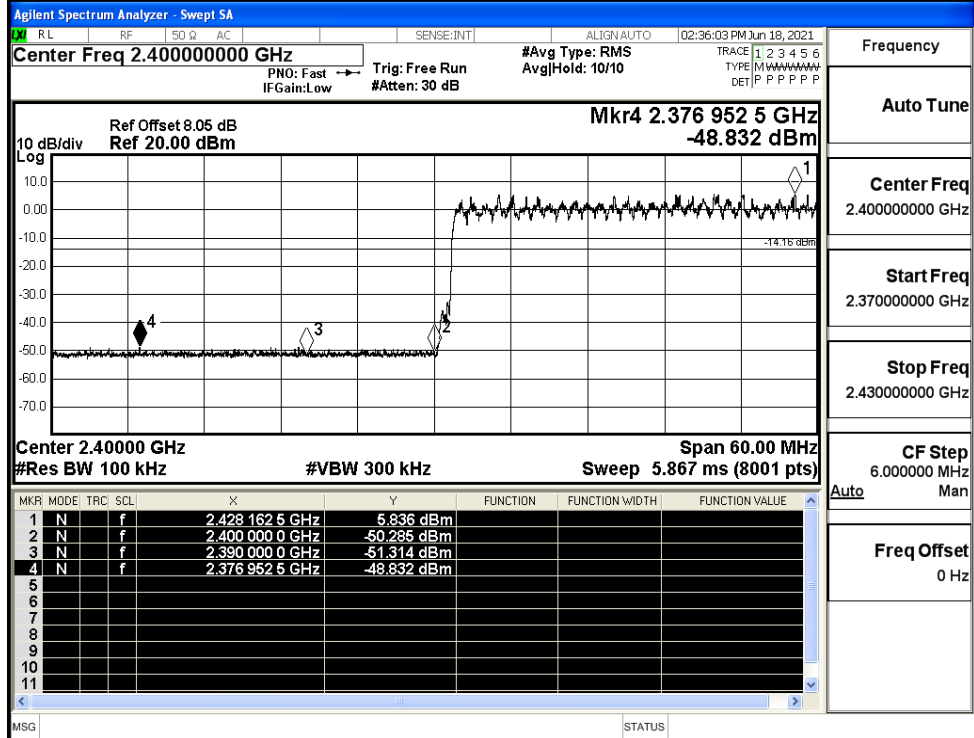
Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

8DPSK/LCH/No Hop



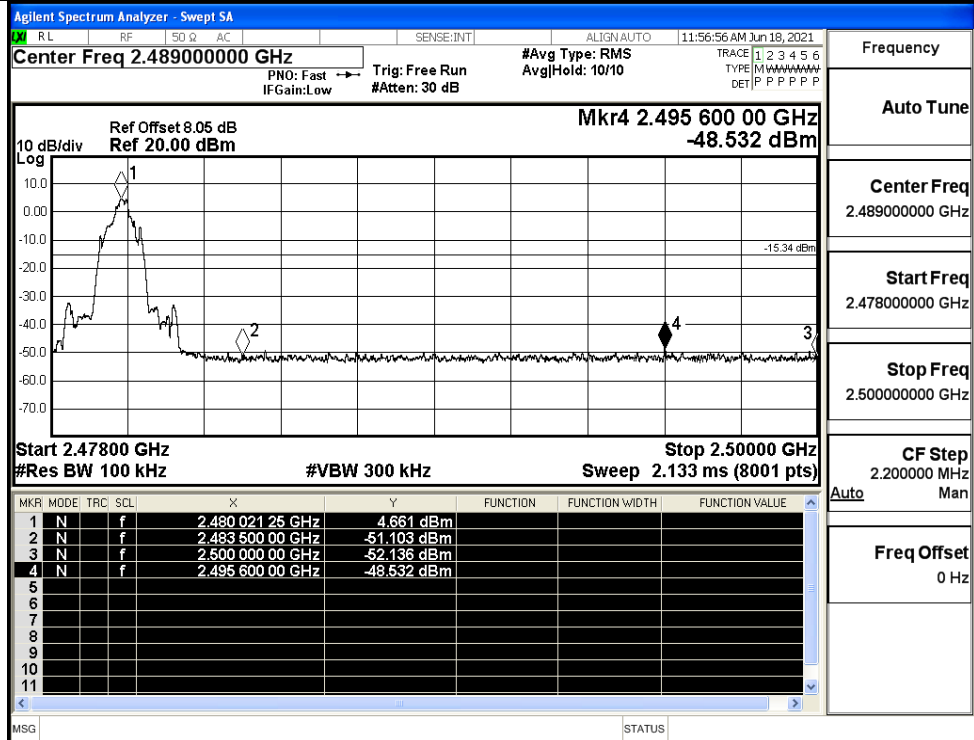
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/LCH/Hop



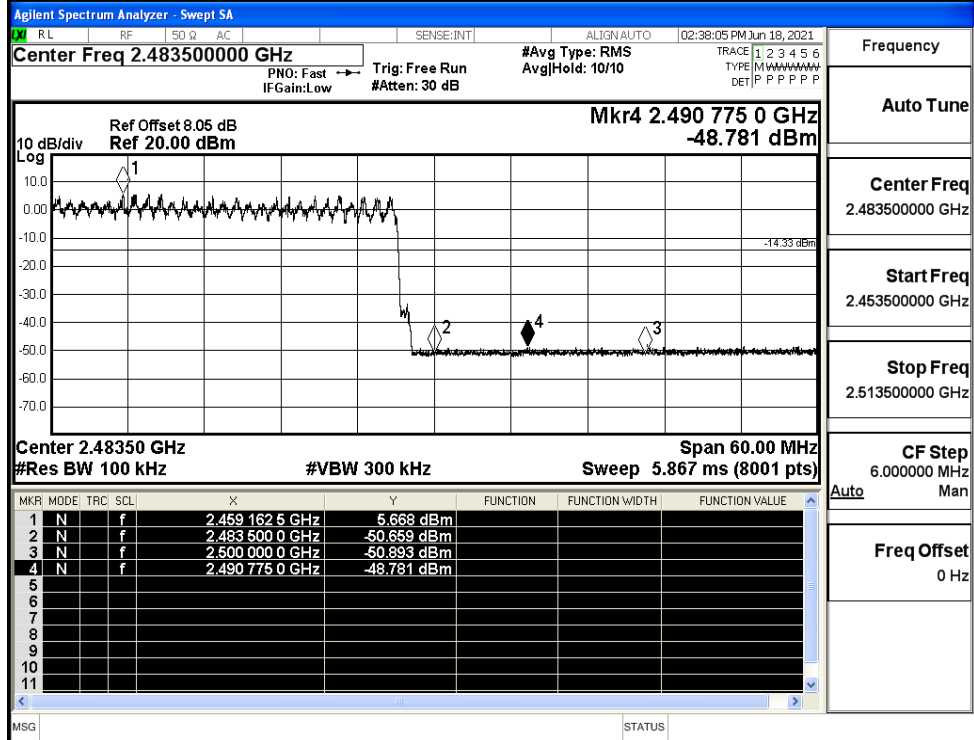
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.370000000 GHz
Stop Freq
2.430000000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

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
Auto Man
Freq Offset
0 Hz

8DPSK/HCH/Hop

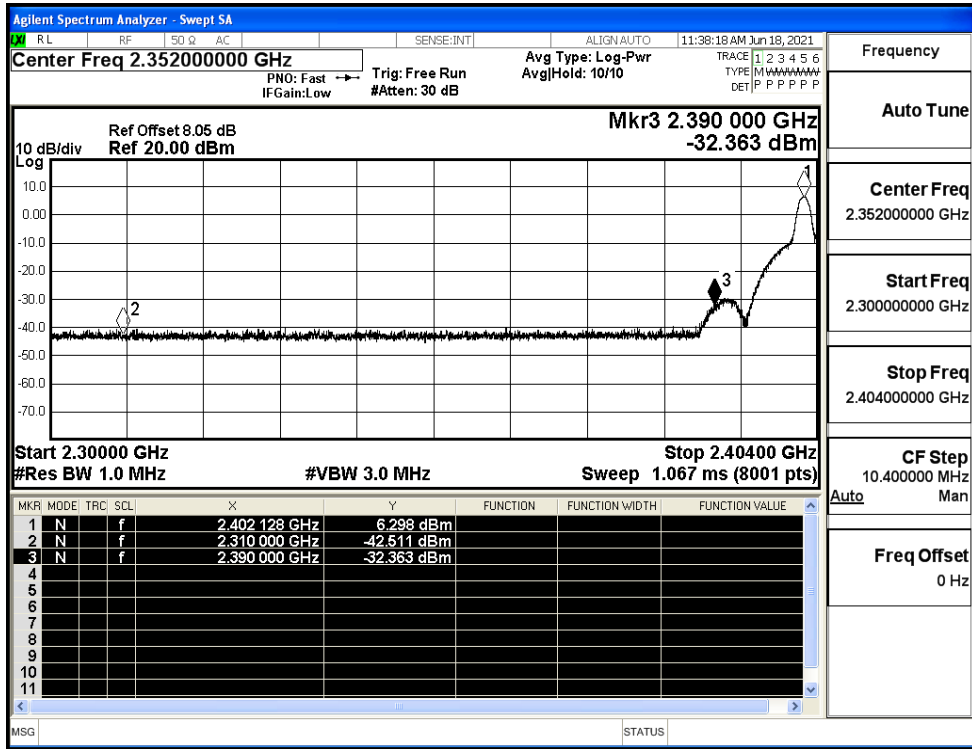


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

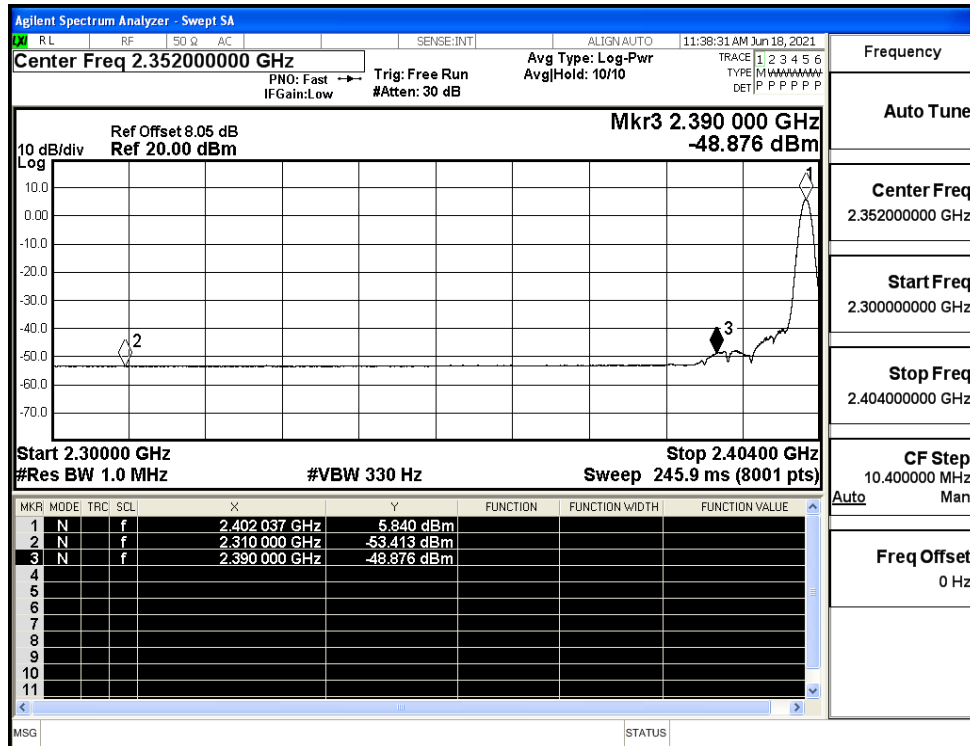
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.51	2.0	0	52.75	PEAK	74	PASS
	Off	2310.0	-53.41	2.0	0	41.84	AV	54	PASS
	Off	2390.0	-32.36	2.0	0	62.89	PEAK	74	PASS
	Off	2390.0	-48.88	2.0	0	46.38	AV	54	PASS
	Off	2483.5	-42.95	2.0	0	52.31	PEAK	74	PASS
	Off	2483.5	-52.26	2.0	0	42.99	AV	54	PASS
	Off	2500.0	-42.37	2.0	0	52.89	PEAK	74	PASS
	Off	2500.0	-52.38	2.0	0	42.88	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.26	2.0	0	51.99	PEAK	74	PASS
	Off	2310.0	-53.38	2.0	0	41.88	AV	54	PASS
	Off	2390.0	-42.97	2.0	0	52.28	PEAK	74	PASS
	Off	2390.0	-53.00	2.0	0	42.26	AV	54	PASS
	Off	2483.5	-42.42	2.0	0	52.84	PEAK	74	PASS
	Off	2483.5	-52.20	2.0	0	43.06	AV	54	PASS
	Off	2500.0	-43.05	2.0	0	52.20	PEAK	74	PASS
	Off	2500.0	-52.44	2.0	0	42.82	AV	54	PASS
8DPSK	Off	2310.0	-42.91	2.0	0	52.35	PEAK	74	PASS
	Off	2310.0	-53.40	2.0	0	41.86	AV	54	PASS
	Off	2390.0	-43.09	2.0	0	52.17	PEAK	74	PASS
	Off	2390.0	-53.05	2.0	0	42.21	AV	54	PASS
	Off	2483.5	-41.76	2.0	0	53.49	PEAK	74	PASS
	Off	2483.5	-52.37	2.0	0	42.89	AV	54	PASS
	Off	2500.0	-42.92	2.0	0	52.33	PEAK	74	PASS
	Off	2500.0	-52.38	2.0	0	42.87	AV	54	PASS

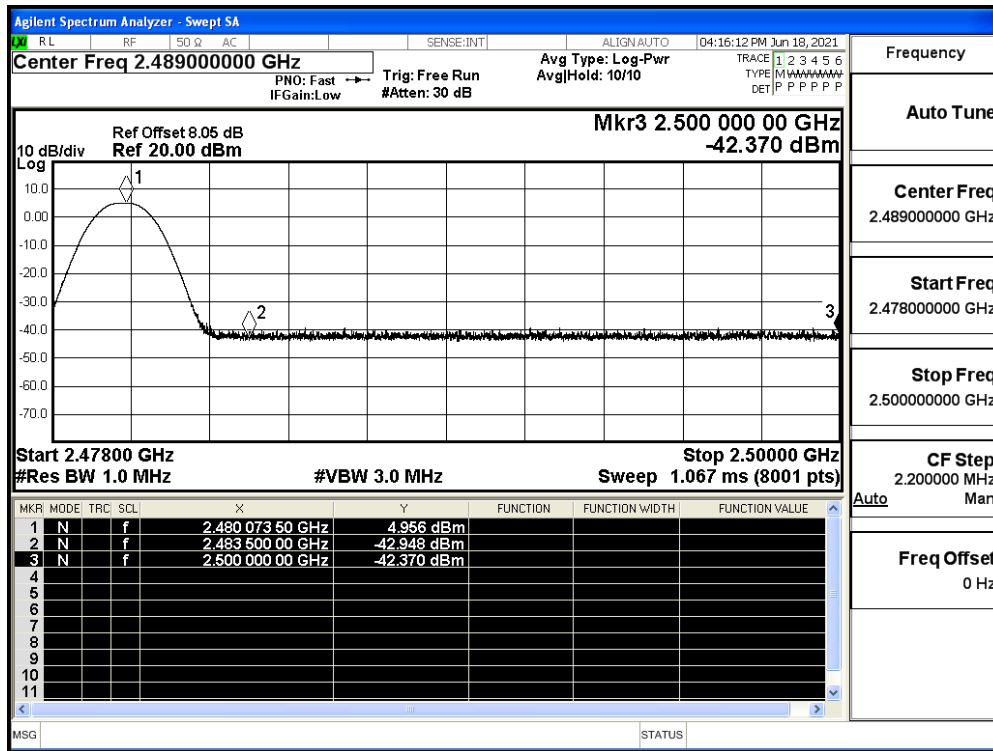
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



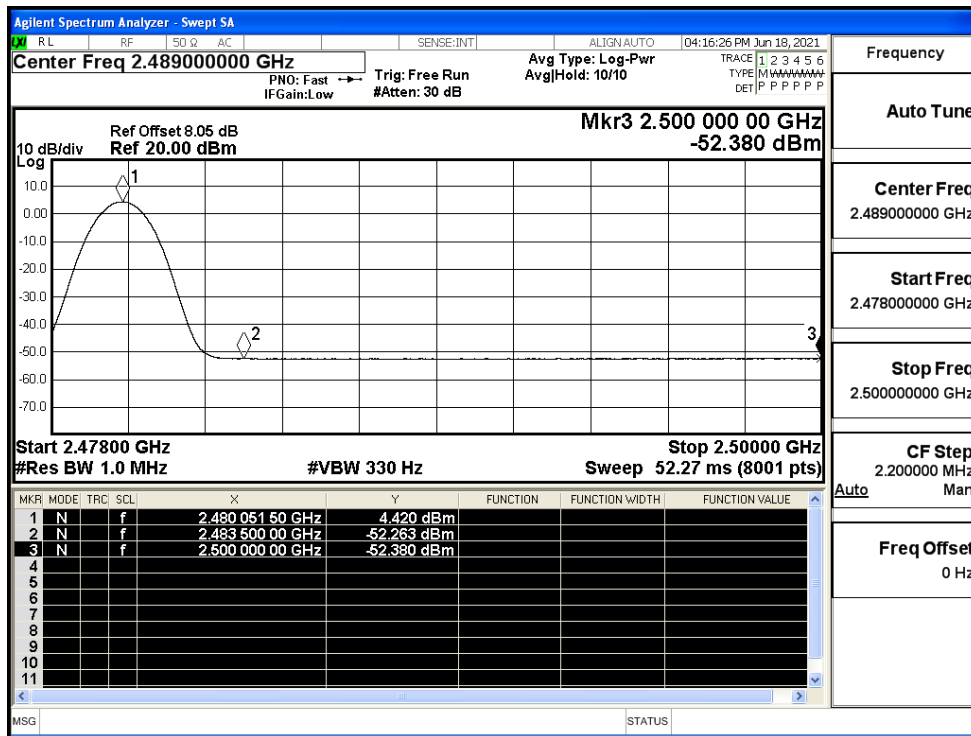
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



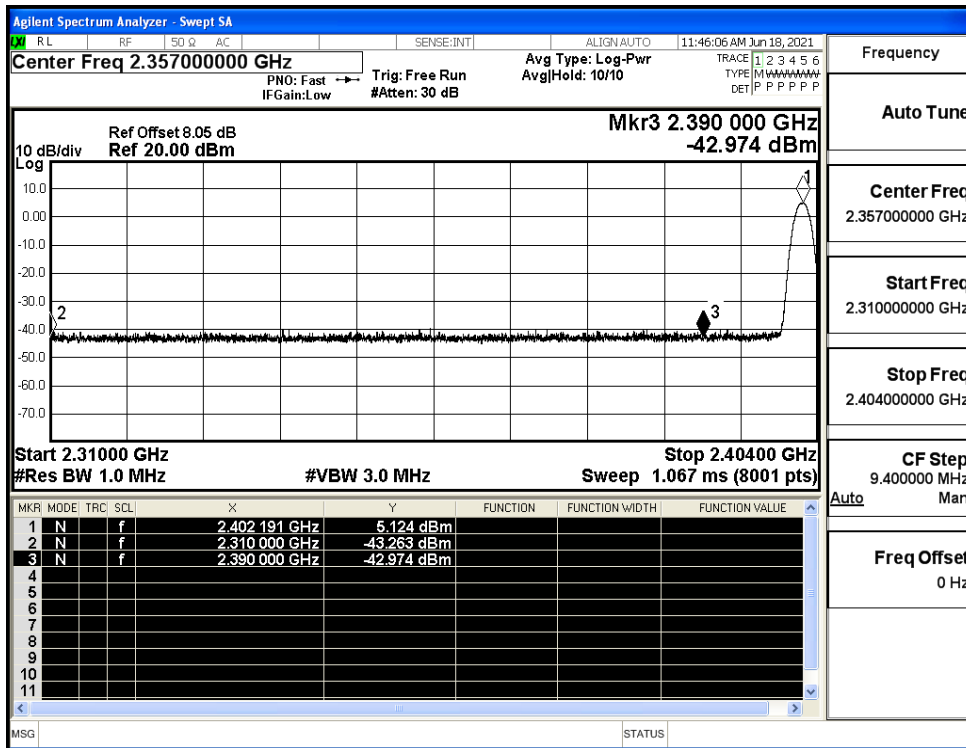
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



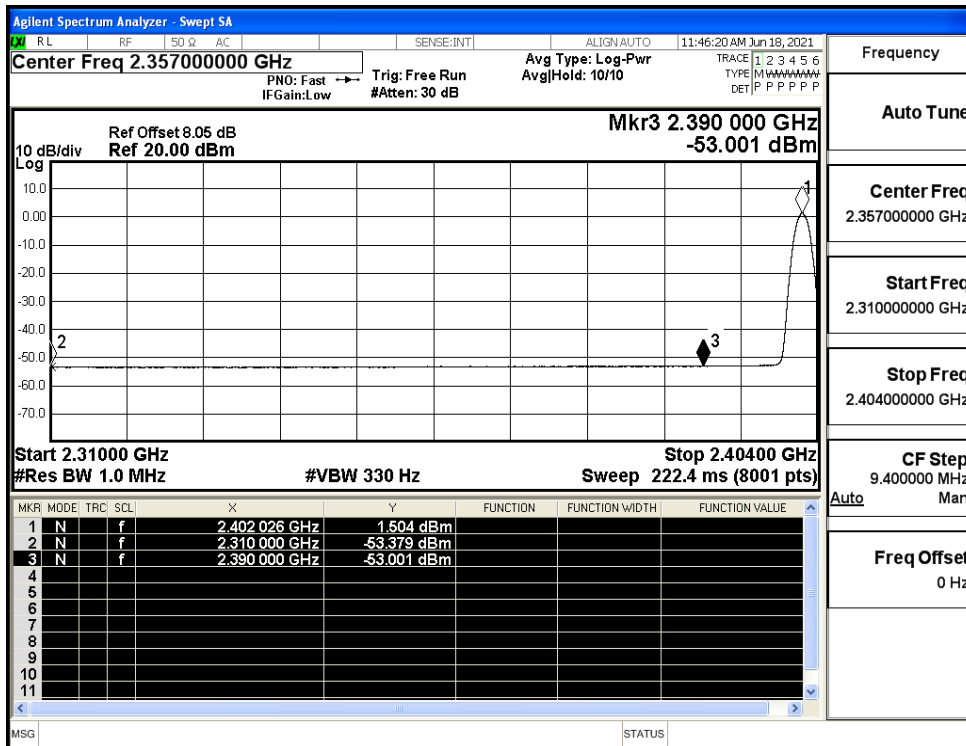
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



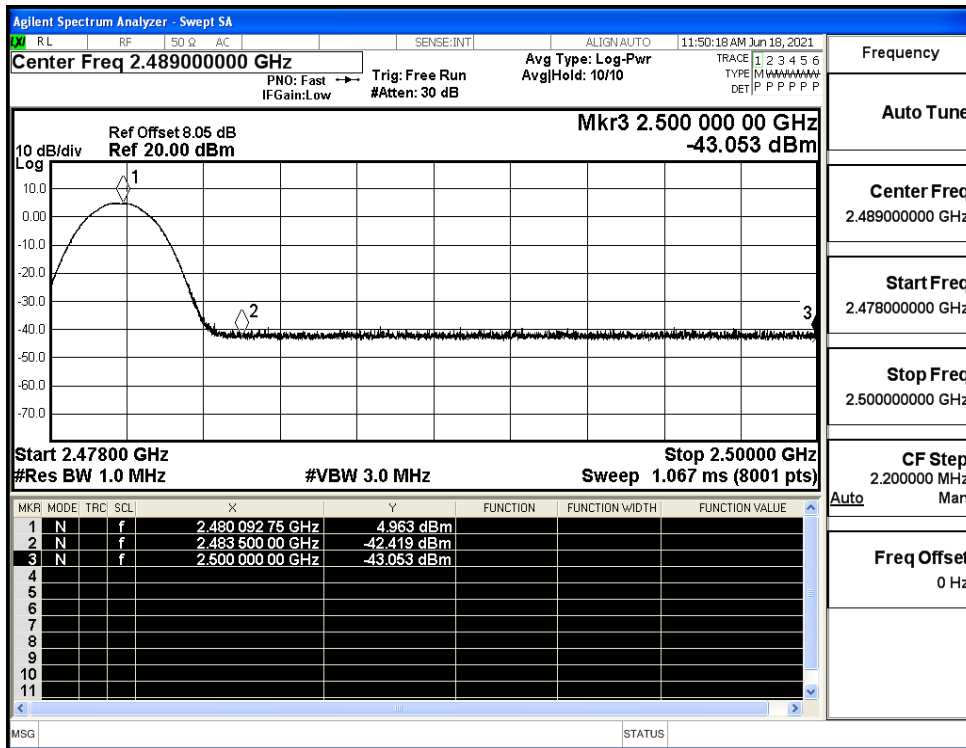
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



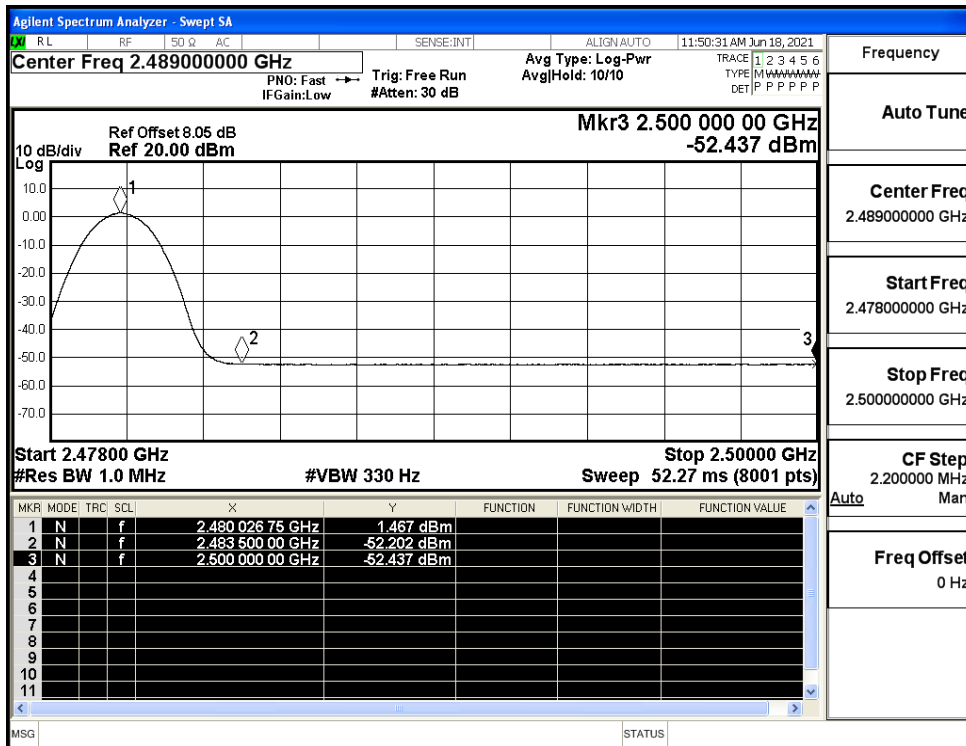
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



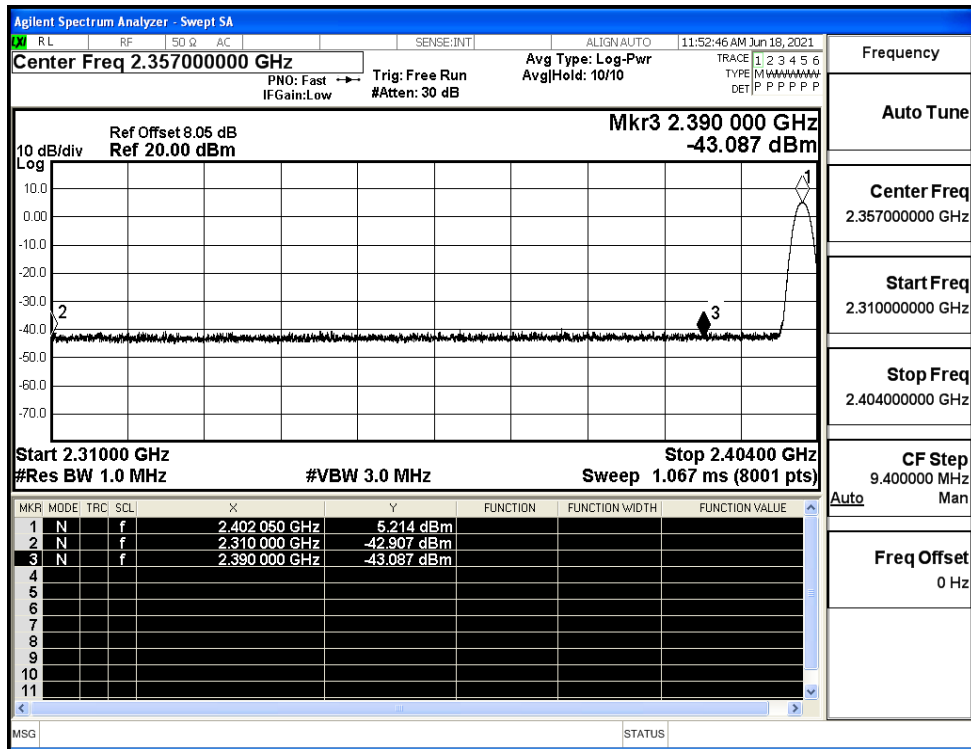
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



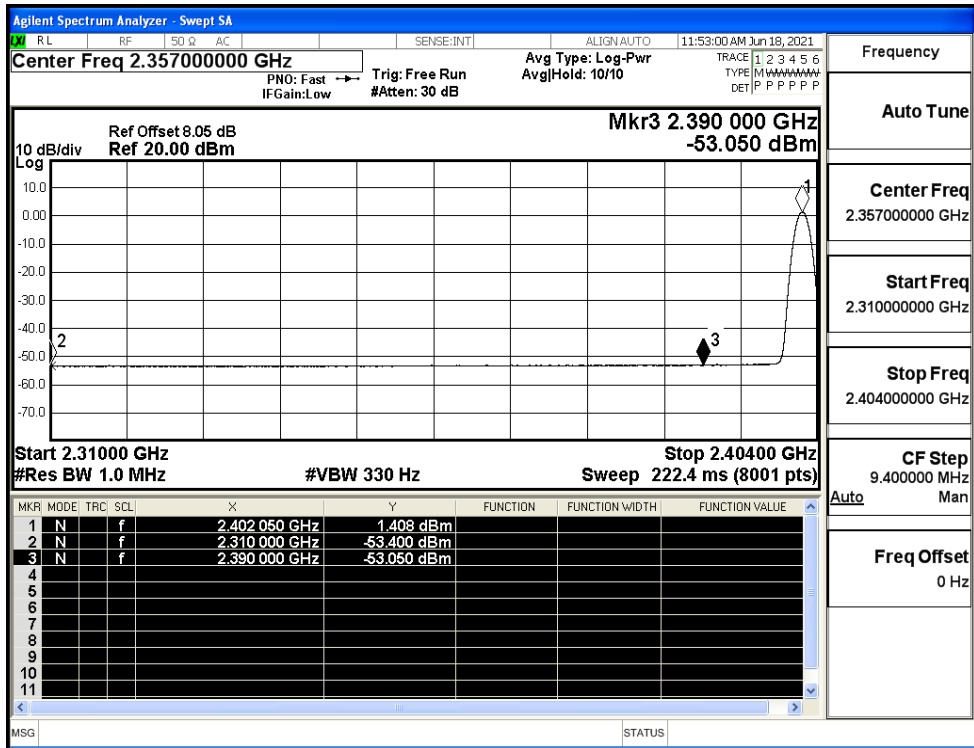
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



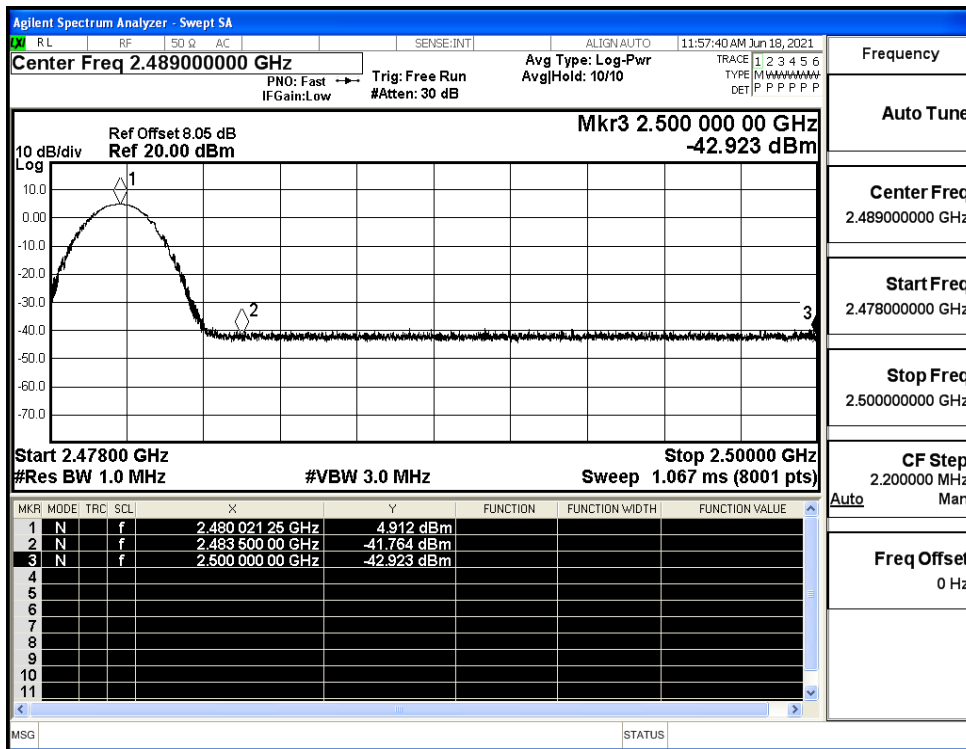
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

