



Appendix A

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

Product Name: Dual Alarm Clock with Wireless Charging

Trade Mark: KIMIUP

Test Model: KIMIUP 101

Environmental Conditions

Temperature:	21.6 ° C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Ken He
Supervised by:	Li Huan

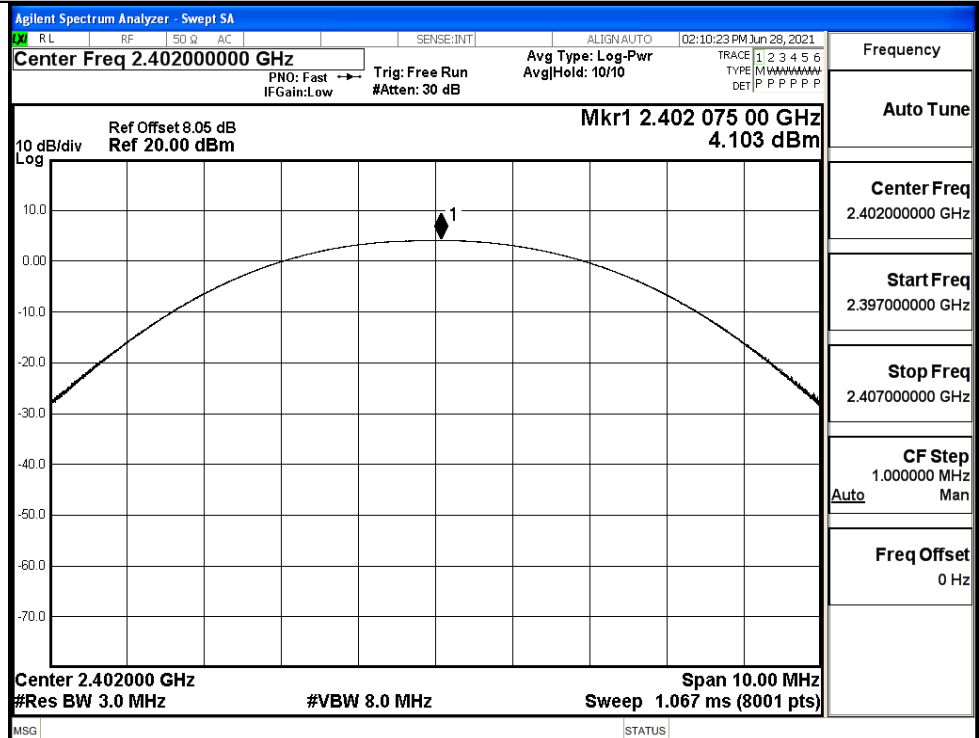
A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.103	21	PASS
	MCH	5.431	21	PASS
	HCH	3.836	21	PASS
$\pi/4$ DQPSK	LCH	3.320	21	PASS
	MCH	4.634	21	PASS
	HCH	3.082	21	PASS
8DPSK	LCH	3.439	21	PASS
	MCH	4.816	21	PASS
	HCH	3.290	21	PASS

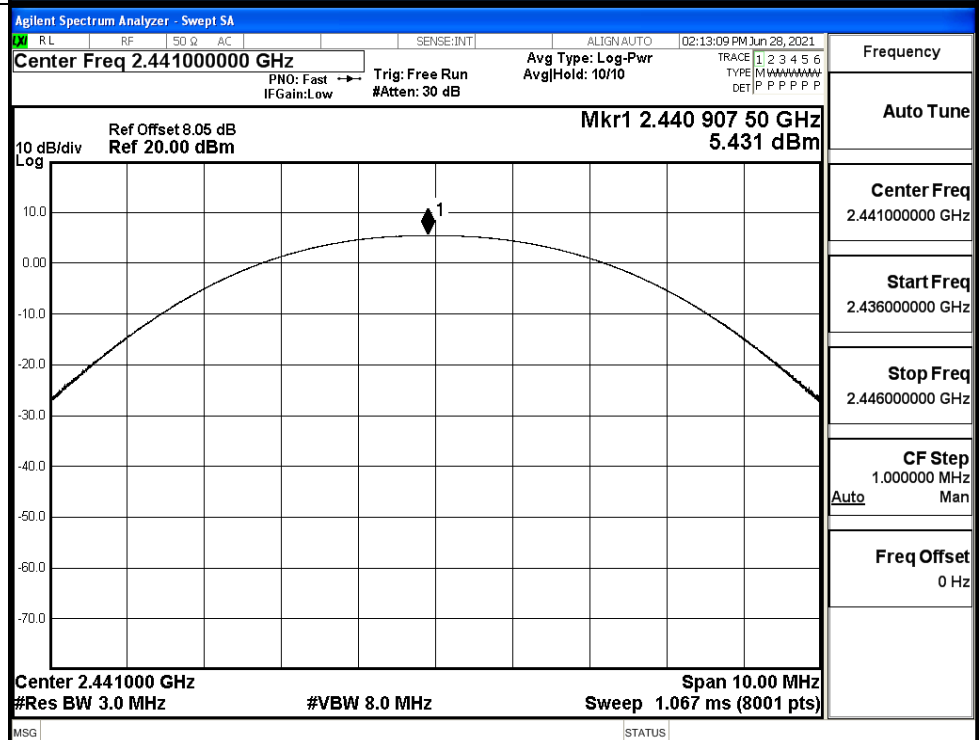


Test Graphs

GFSK/LCH

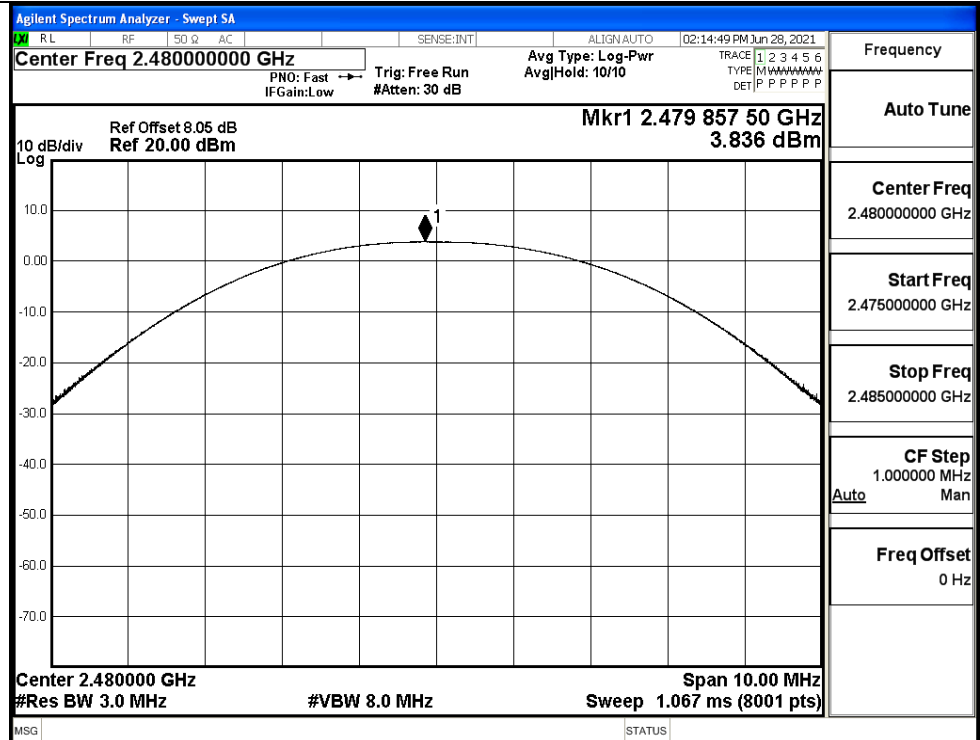
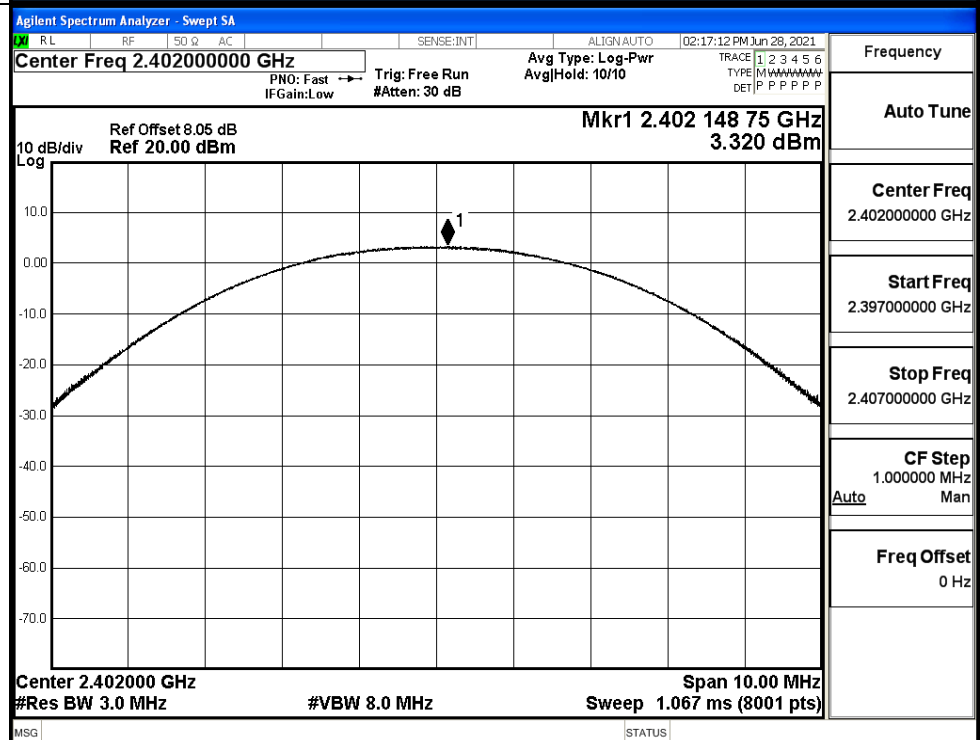


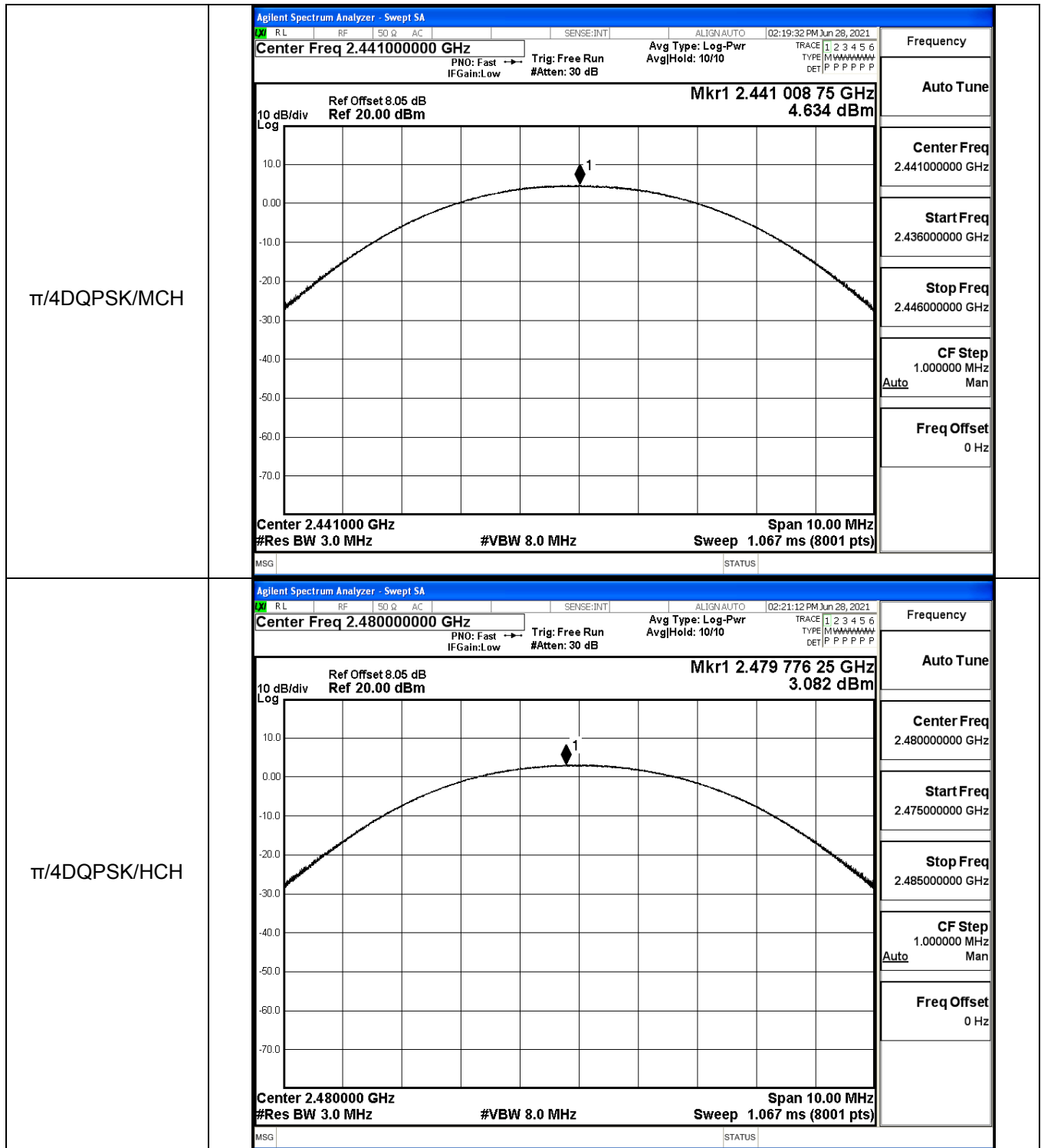
GFSK/MCH





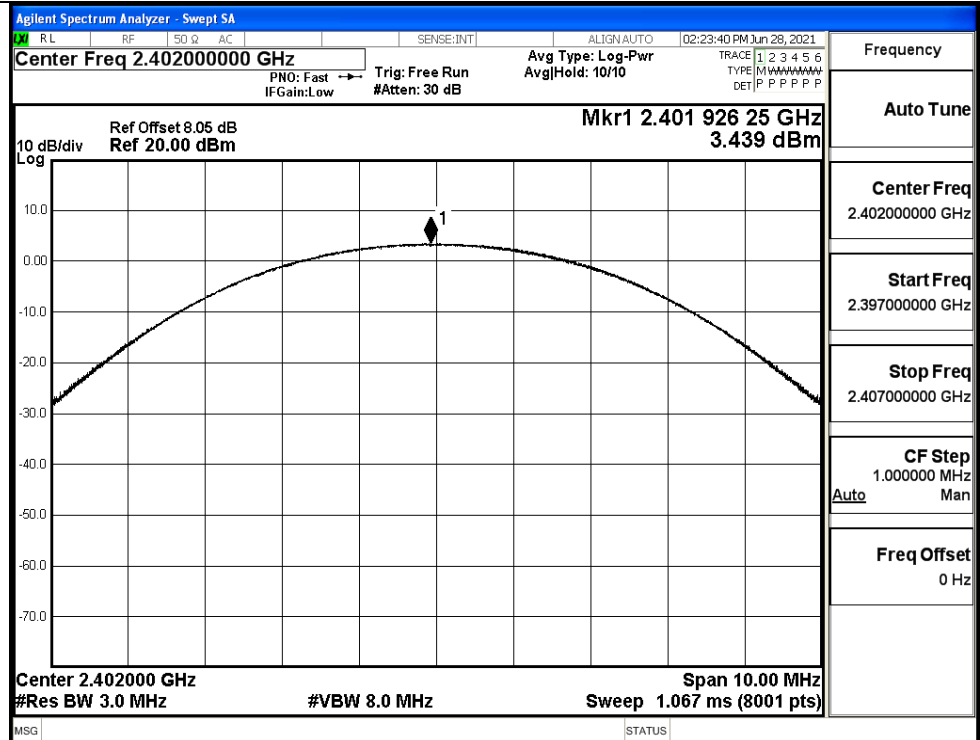
GFSK/HCH

 π /4DQPSK/LCH

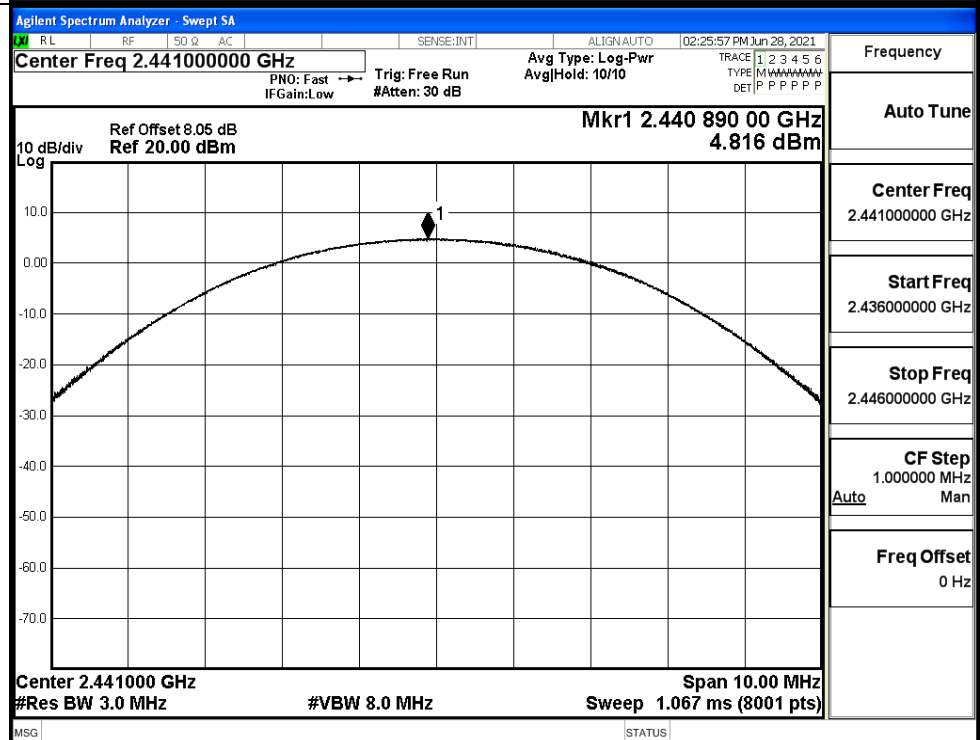




8DPSK/LCH

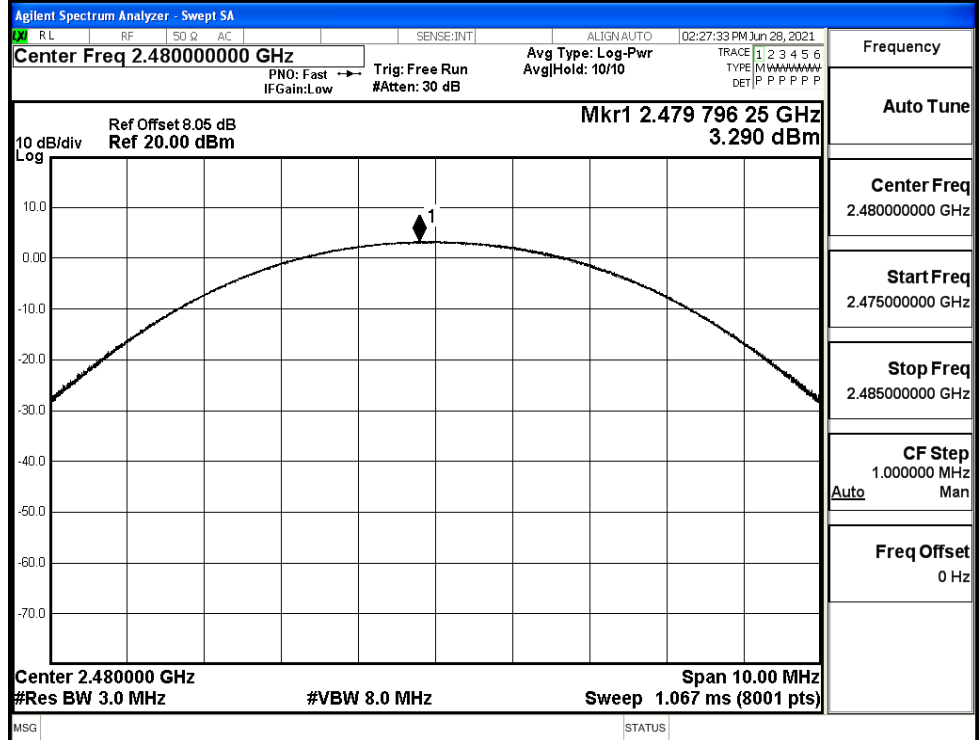


8DPSK/MCH





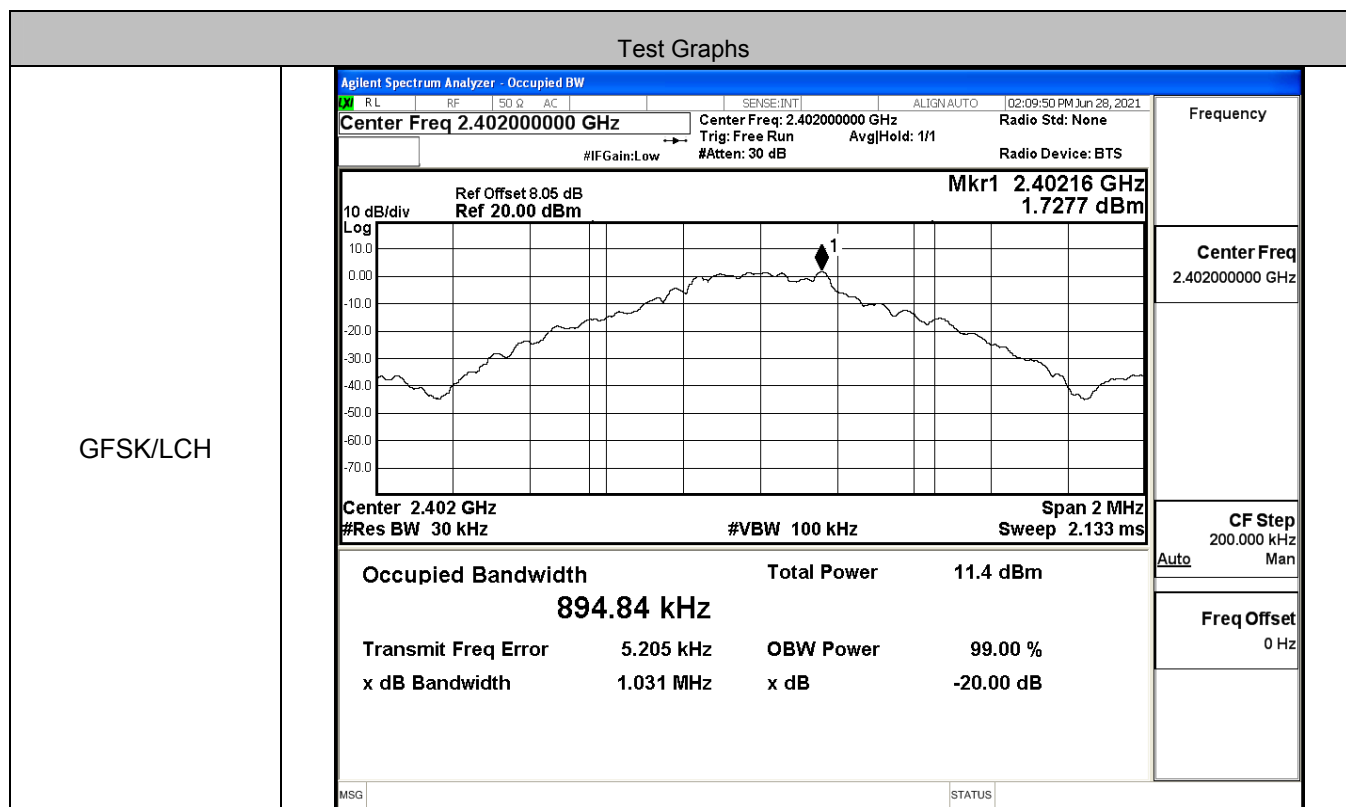
8DPSK/HCH





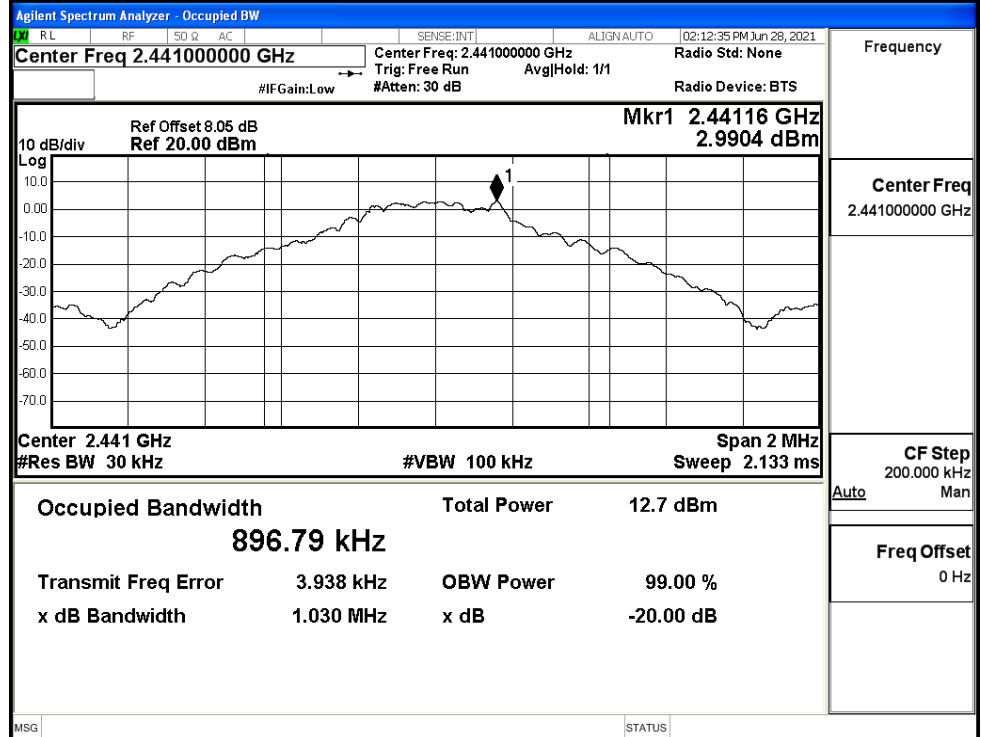
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.031	Not Specified	PASS
	MCH	1.030	Not Specified	PASS
	HCH	1.034	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.289	Not Specified	PASS
	MCH	1.287	Not Specified	PASS
	HCH	1.288	Not Specified	PASS
8DPSK	LCH	1.291	Not Specified	PASS
	MCH	1.300	Not Specified	PASS
	HCH	1.293	Not Specified	PASS





GFSK/MCH



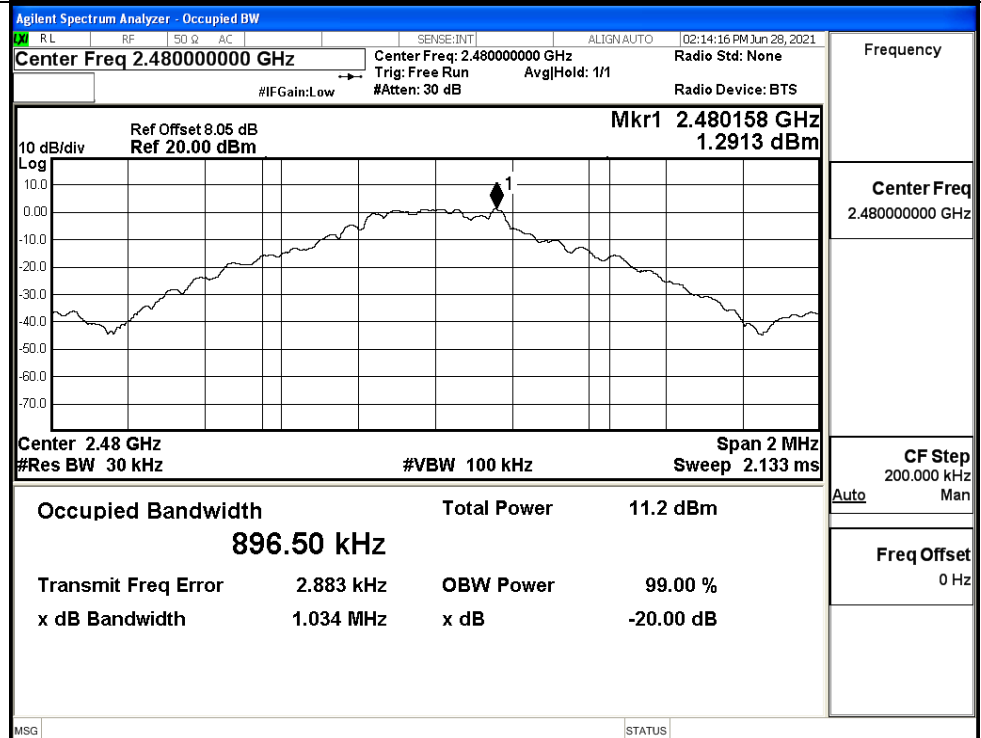
Frequency

Center Freq
2.441000000 GHzCF Step
200.000 kHz
Man

Auto

Freq Offset
0 Hz

GFSK/HCH

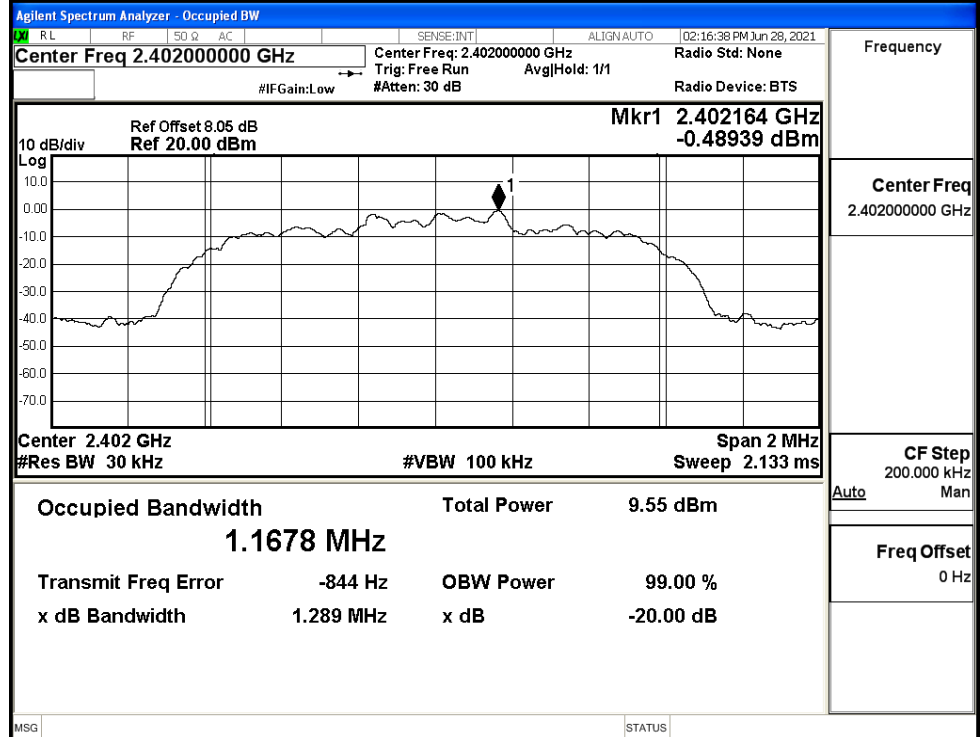
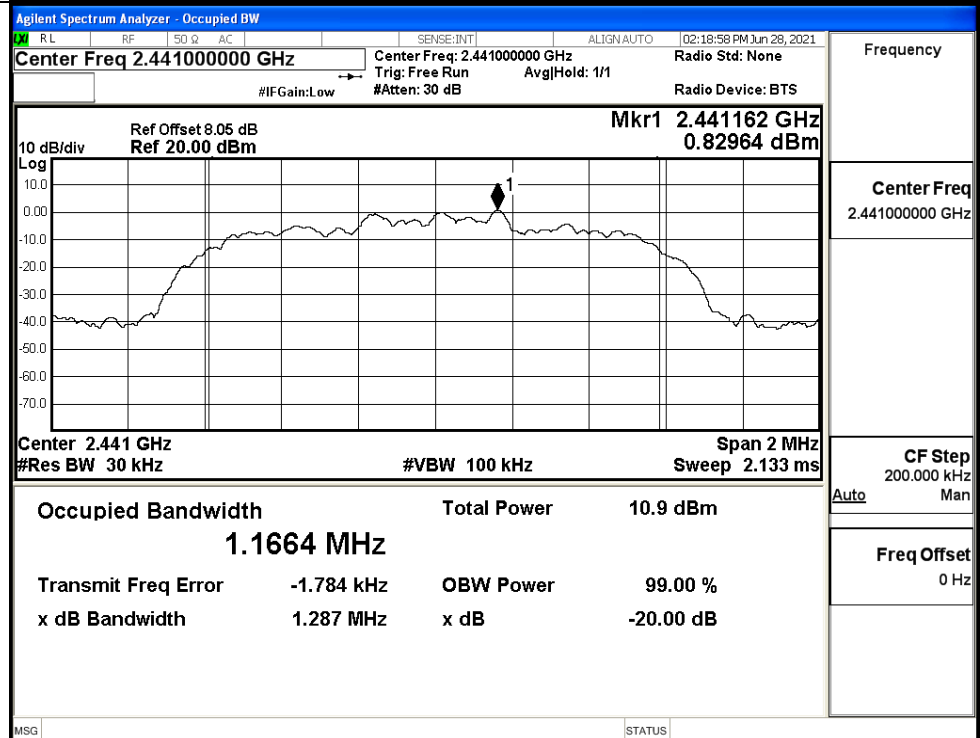


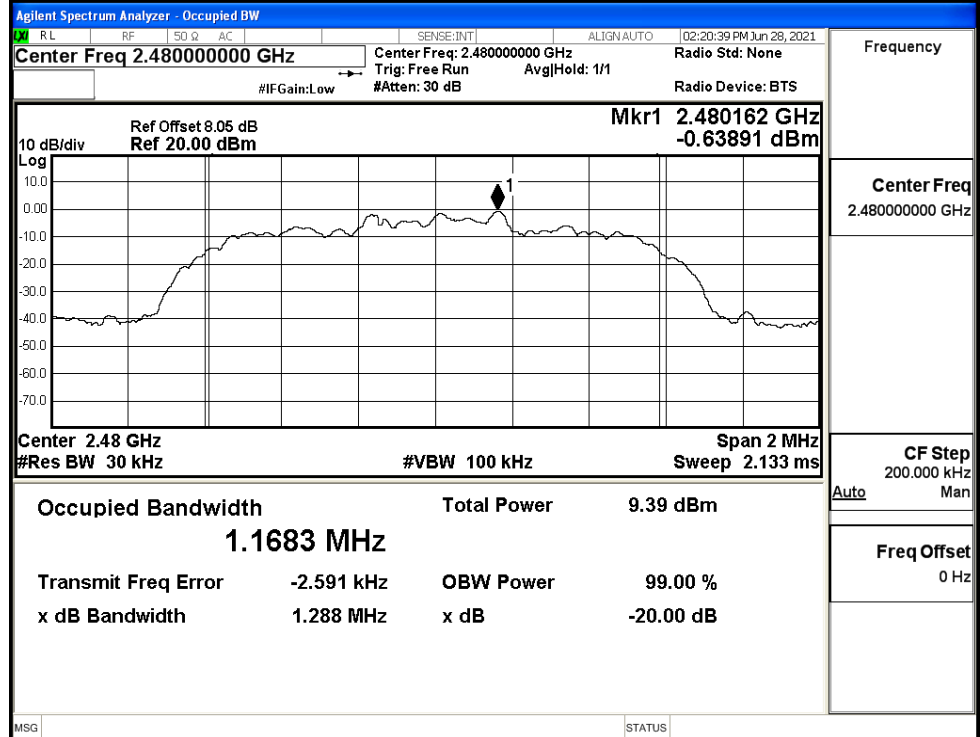
Frequency

Center Freq
2.480000000 GHzCF Step
200.000 kHz
Man

Auto

Freq Offset
0 Hz

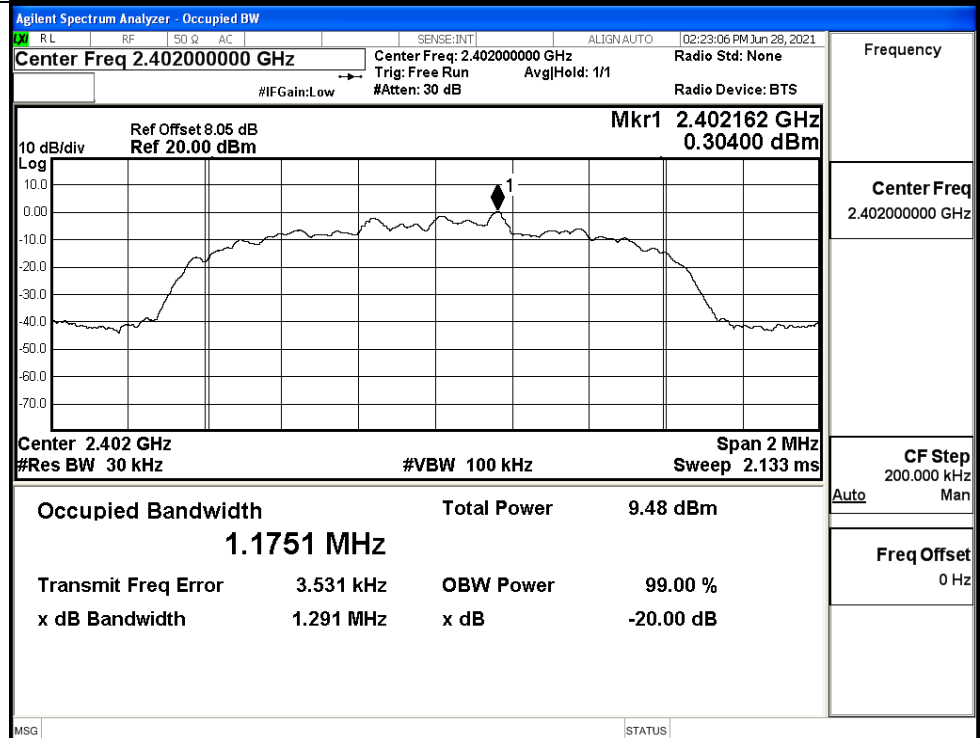
 $\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH

Frequency

Center Freq
2.480000000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

8DPSK/LCH

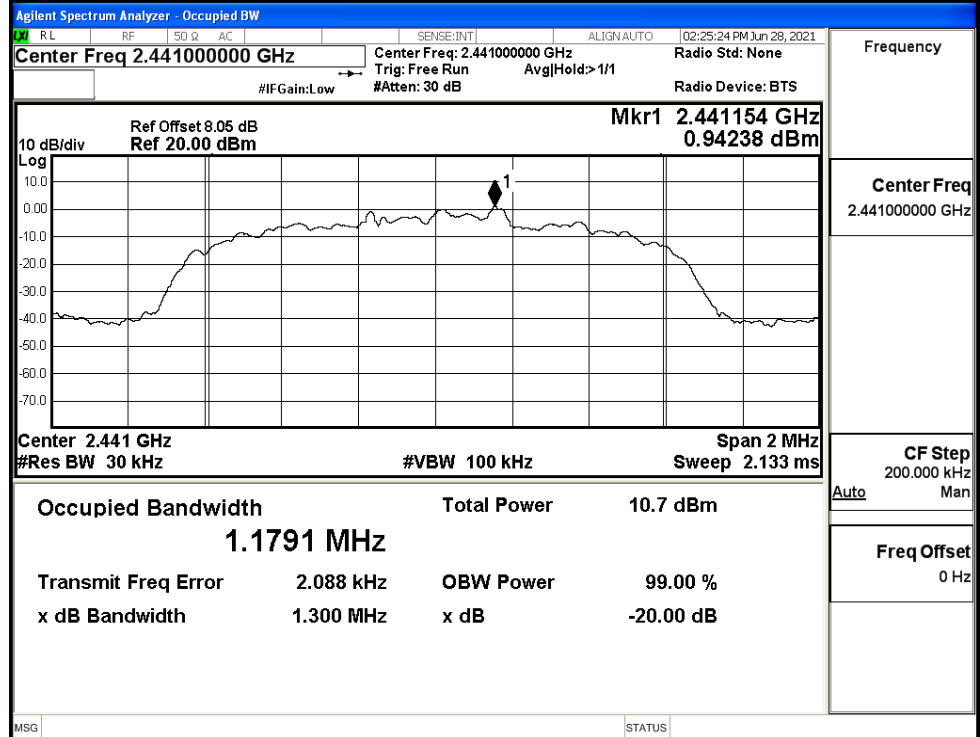


Frequency

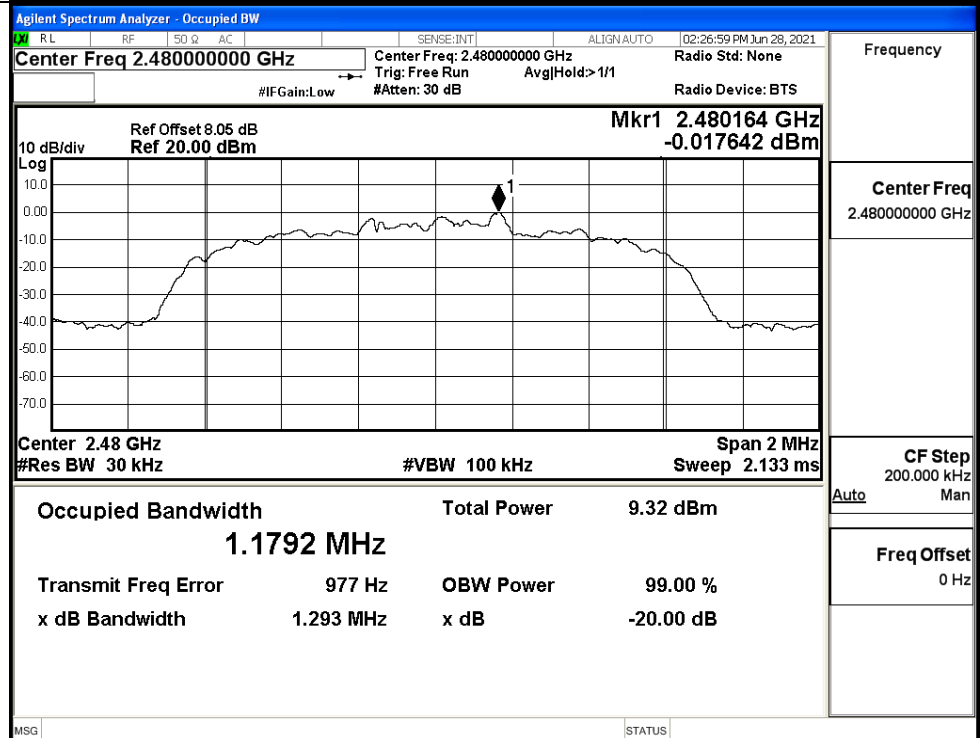
Center Freq
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200.000 kHz
ManFreq Offset
0 Hz



8DPSK/MCH



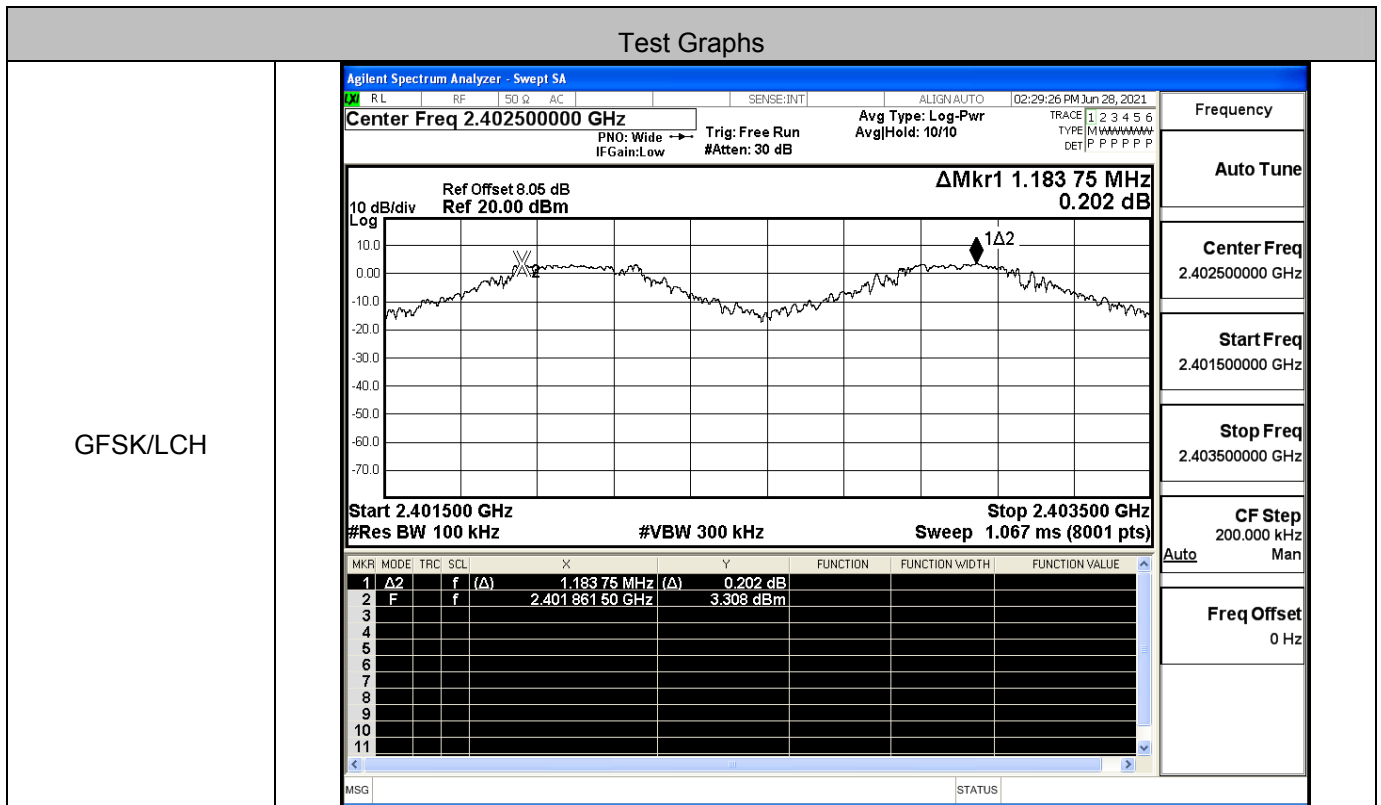
8DPSK/HCH





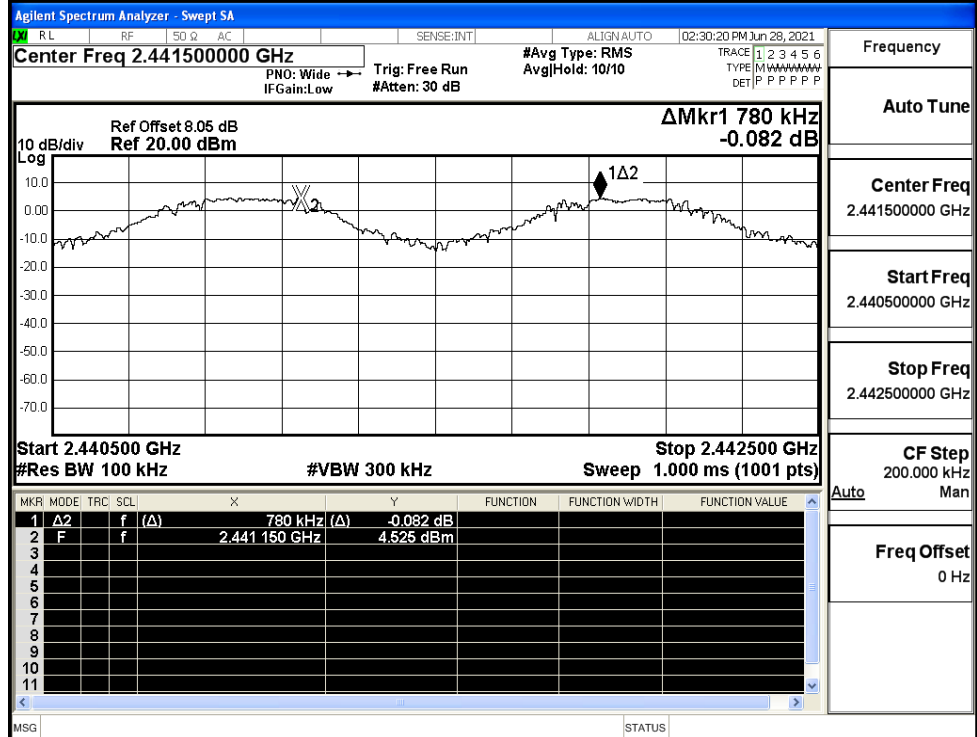
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.184	0.689	PASS
	MCH	0.780	0.689	PASS
	HCH	1.108	0.689	PASS
$\pi/4$ DQPSK	LCH	1.026	0.859	PASS
	MCH	1.130	0.859	PASS
	HCH	0.906	0.859	PASS
8DPSK	LCH	1.178	0.867	PASS
	MCH	1.290	0.867	PASS
	HCH	1.328	0.867	PASS

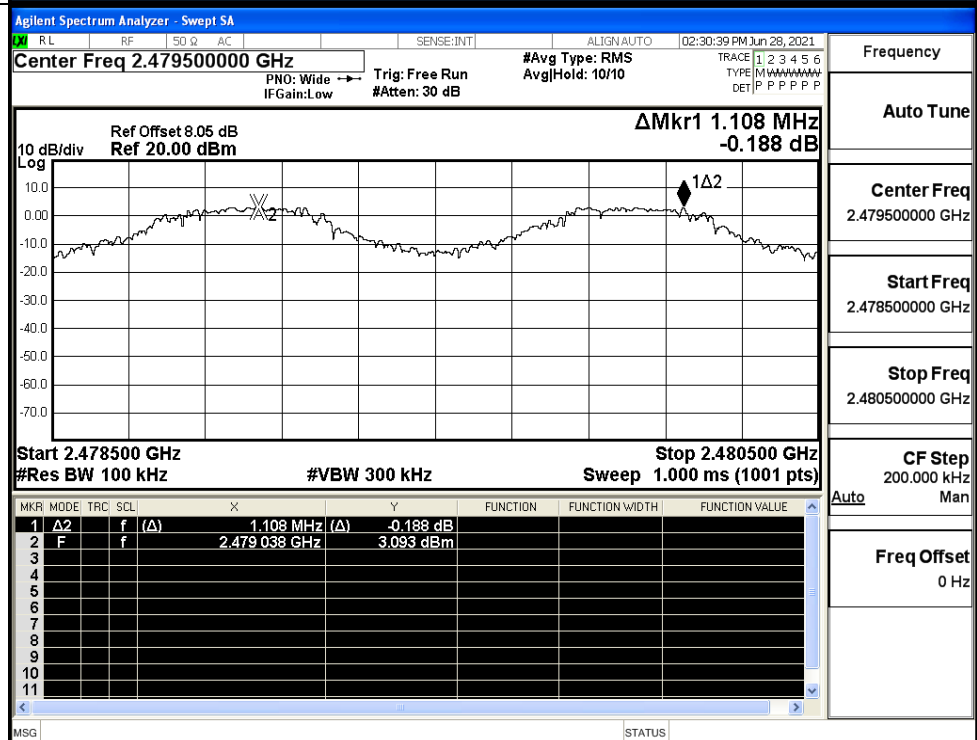




GFSK/MCH

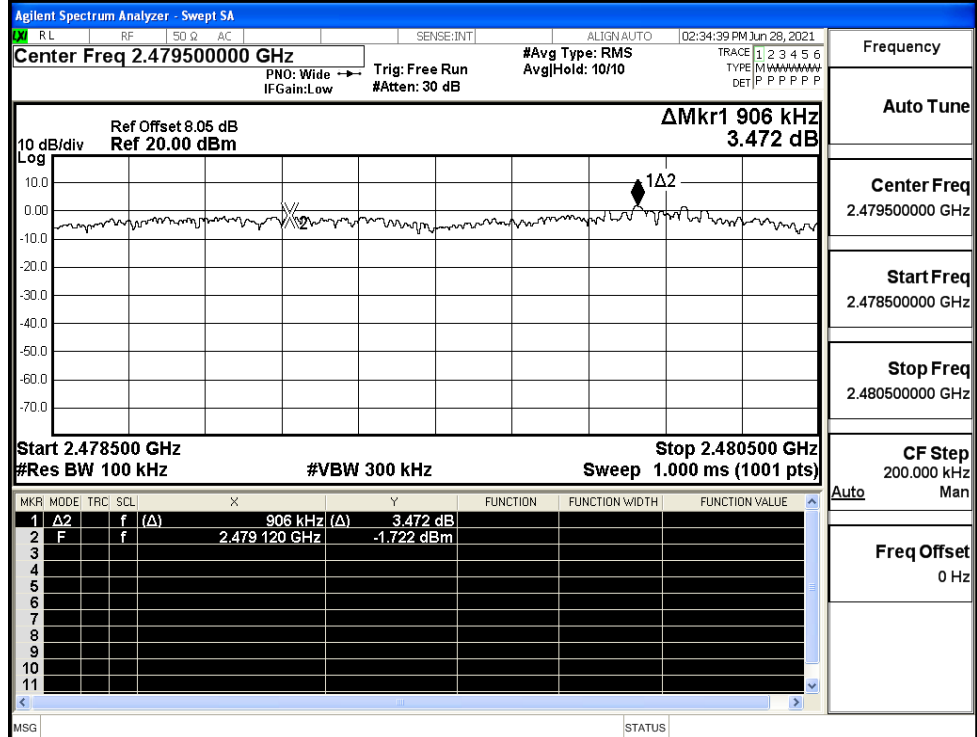


GFSK/HCH

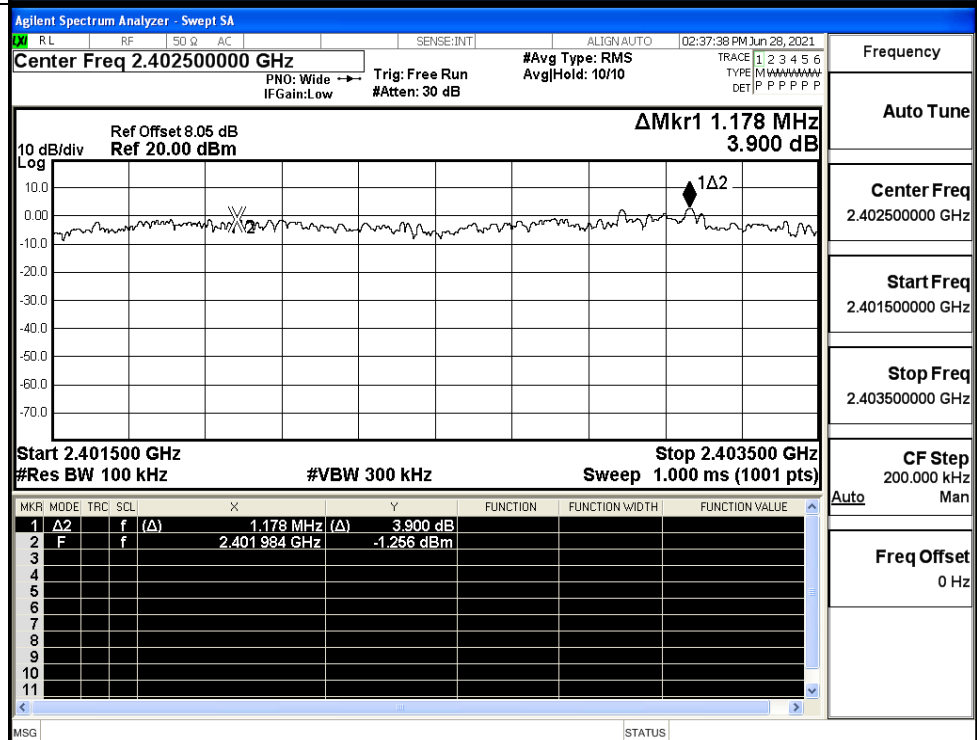


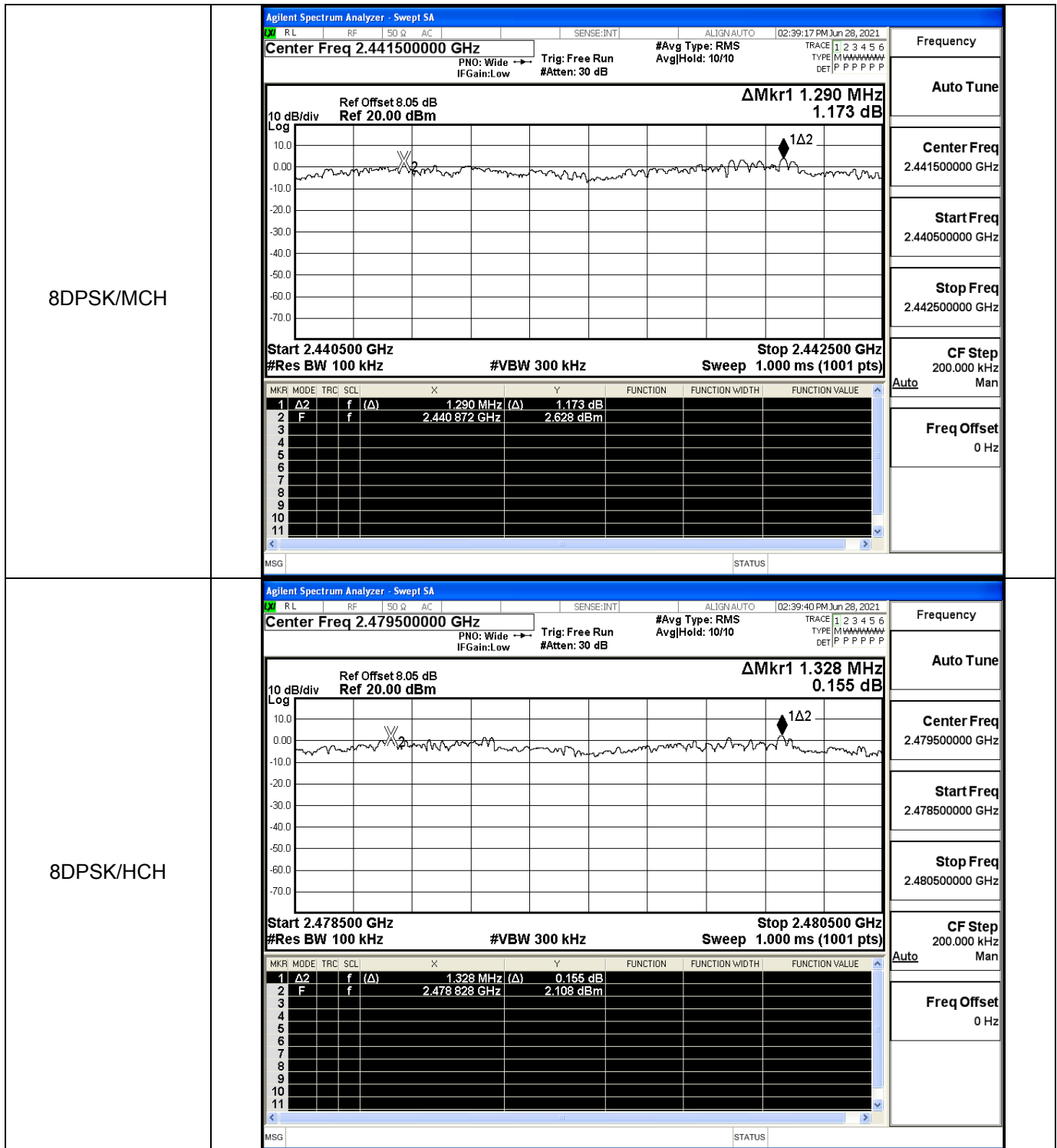


$\pi/4$ DQPSK/LCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 02:32:37 PM Jun 28, 2021 Center Freq 2.402500000 GHz PNO: Wide IFGain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS Avg/Hold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W W DET P P P P P P P Ref Offset 8.05 dB Ref 20.00 dBm ΔMkr1 1.026 MHz 0.120 dB 10 dB/div Log Start 2.401500 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.403500 GHz Sweep 1.000 ms (1001 pts) <table><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><tr><td>1</td><td>Δ2</td><td>f</td><td>(Δ)</td><td>1.026 MHz</td><td>(Δ)</td><td>0.120 dB</td><td></td><td></td></tr><tr><td>2</td><td>F</td><td>f</td><td></td><td>2.402 038 GHz</td><td></td><td>1.672 dBm</td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> MSG STATUS Frequency Auto Tune Center Freq 2.402500000 GHz Start Freq 2.401500000 GHz Stop Freq 2.403500000 GHz CF Step 200.000 kHz Man Auto Freq Offset 0 Hz	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	1.026 MHz	(Δ)	0.120 dB			2	F	f		2.402 038 GHz		1.672 dBm			3									4									5									6									7									8									9									10									11								
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$\pi/4$ DQPSK/MCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 02:34:16 PM Jun 28, 2021 Center Freq 2.441500000 GHz PNO: Wide IFGain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS Avg/Hold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W W DET P P P P P P P Ref Offset 8.05 dB Ref 20.00 dBm ΔMkr1 1.130 MHz 0.196 dB 10 dB/div Log Start 2.440500 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.442500 GHz Sweep 1.000 ms (1001 pts) <table><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><tr><td>1</td><td>Δ2</td><td>f</td><td>(Δ)</td><td>1.130 MHz</td><td>(Δ)</td><td>0.196 dB</td><td></td><td></td></tr><tr><td>2</td><td>F</td><td>f</td><td></td><td>2.441 016 GHz</td><td></td><td>2.746 dBm</td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> MSG STATUS Frequency Auto Tune Center Freq 2.441500000 GHz Start Freq 2.440500000 GHz Stop Freq 2.442500000 GHz CF Step 200.000 kHz Man Auto Freq Offset 0 Hz	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	1.130 MHz	(Δ)	0.196 dB			2	F	f		2.441 016 GHz		2.746 dBm			3									4									5									6									7									8									9									10									11								
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 $\pi/4$ DQPSK/HCH

8DPSK/LCH

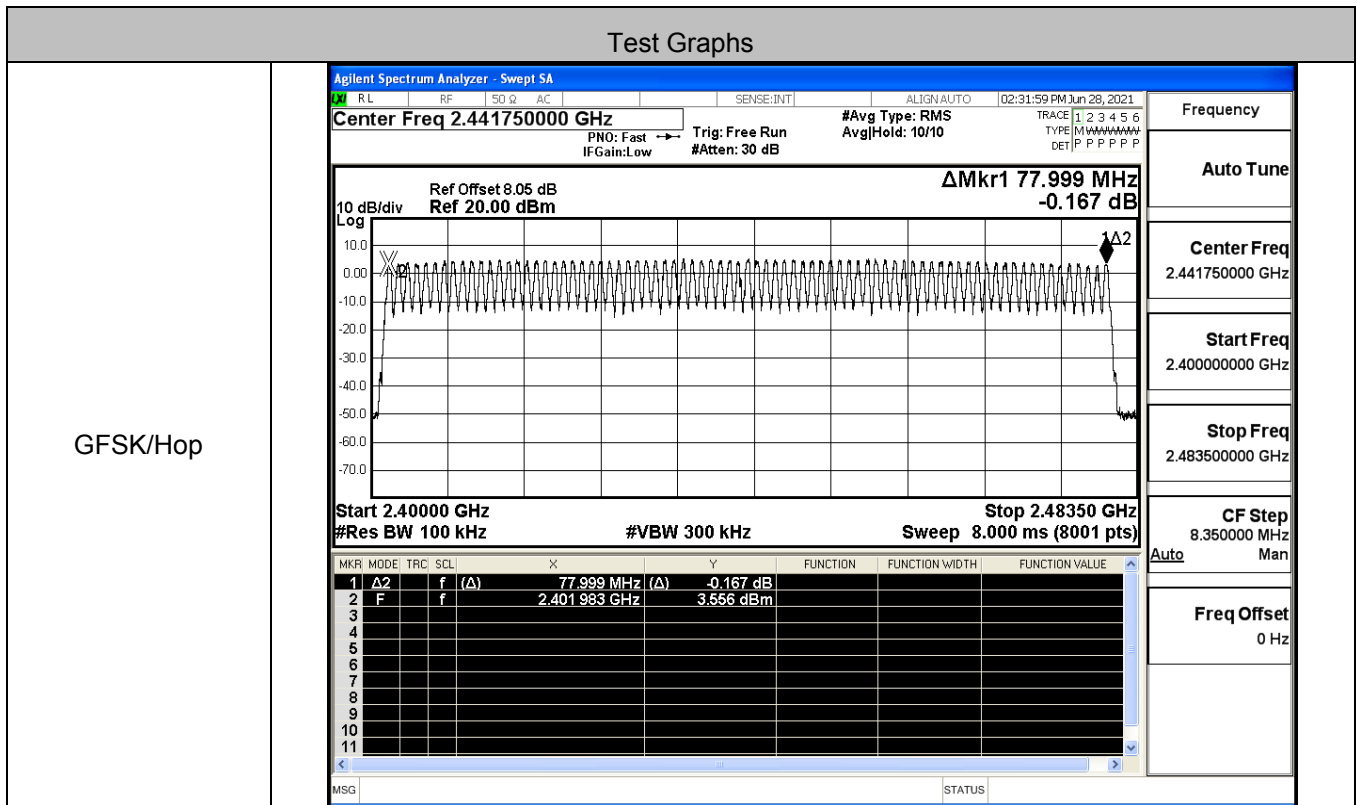


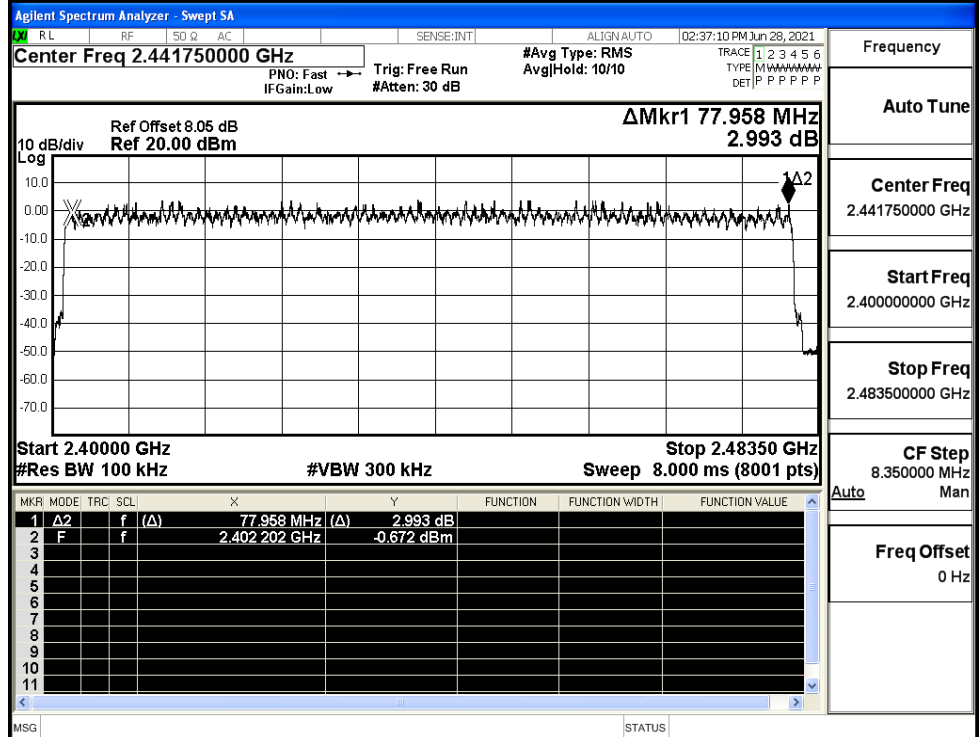




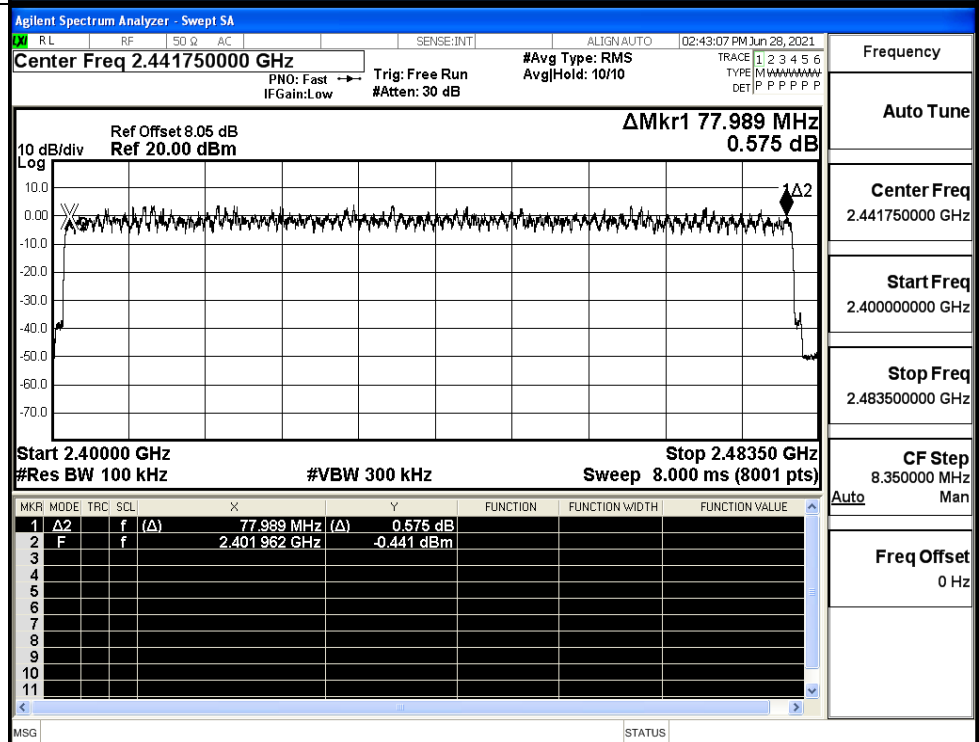
A.4 Hopping Channel Number

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



 $\pi/4$ DQPSK/Hop

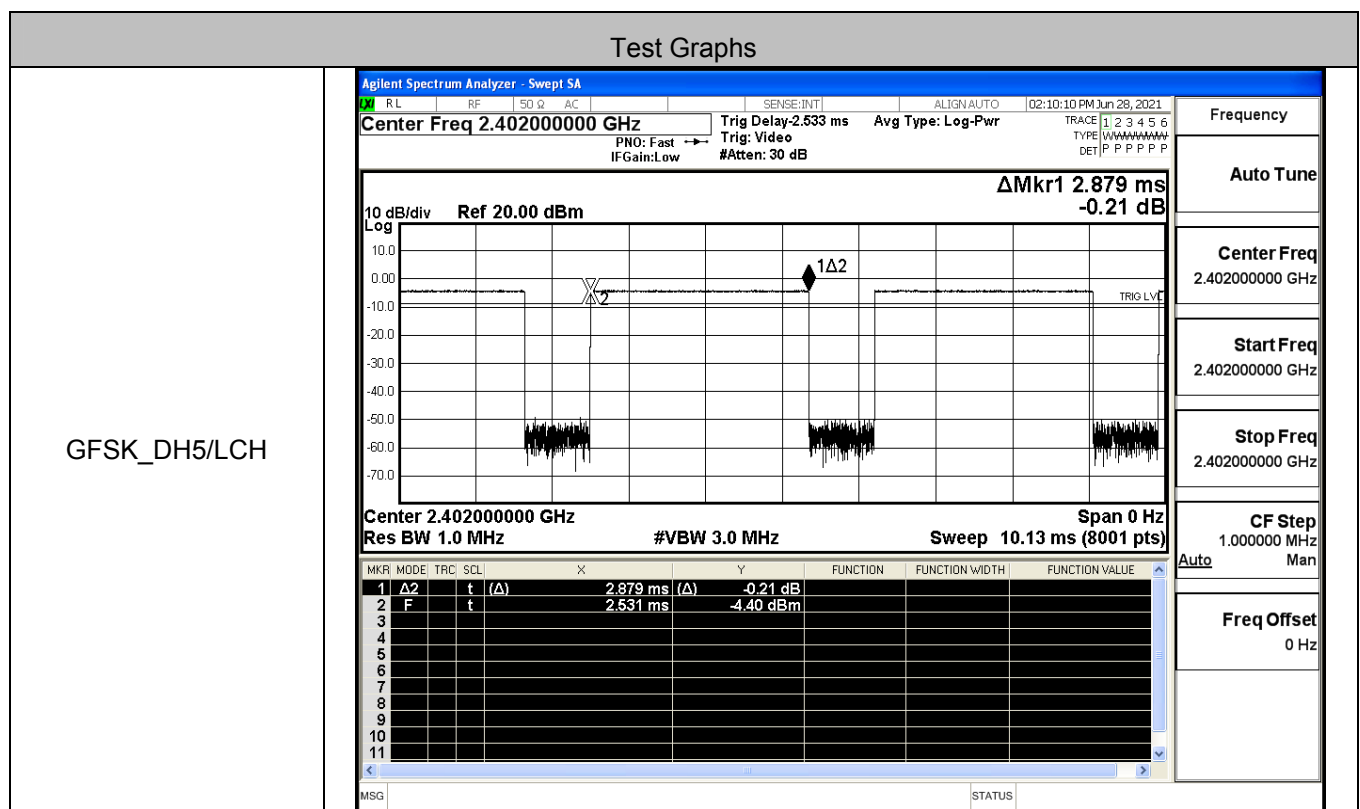
8DPSK/Hop





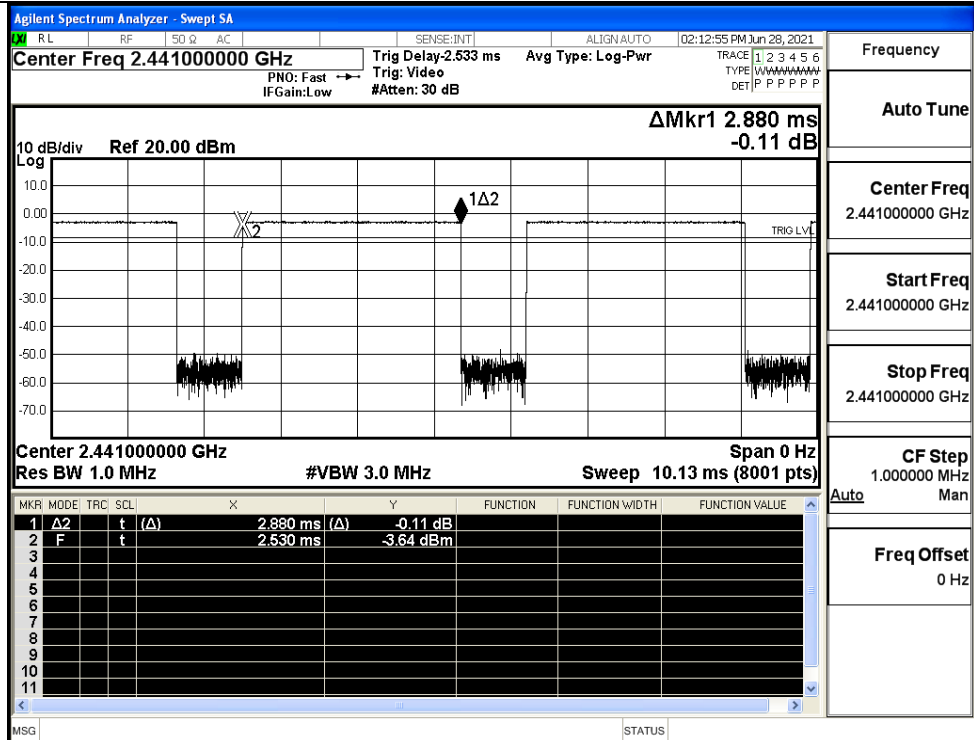
A.5 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	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	0.308	0.4	PASS
	3DH5	MCH	2.88	106.7	0.308	0.4	PASS
	3DH5	HCH	2.88	106.7	0.308	0.4	PASS

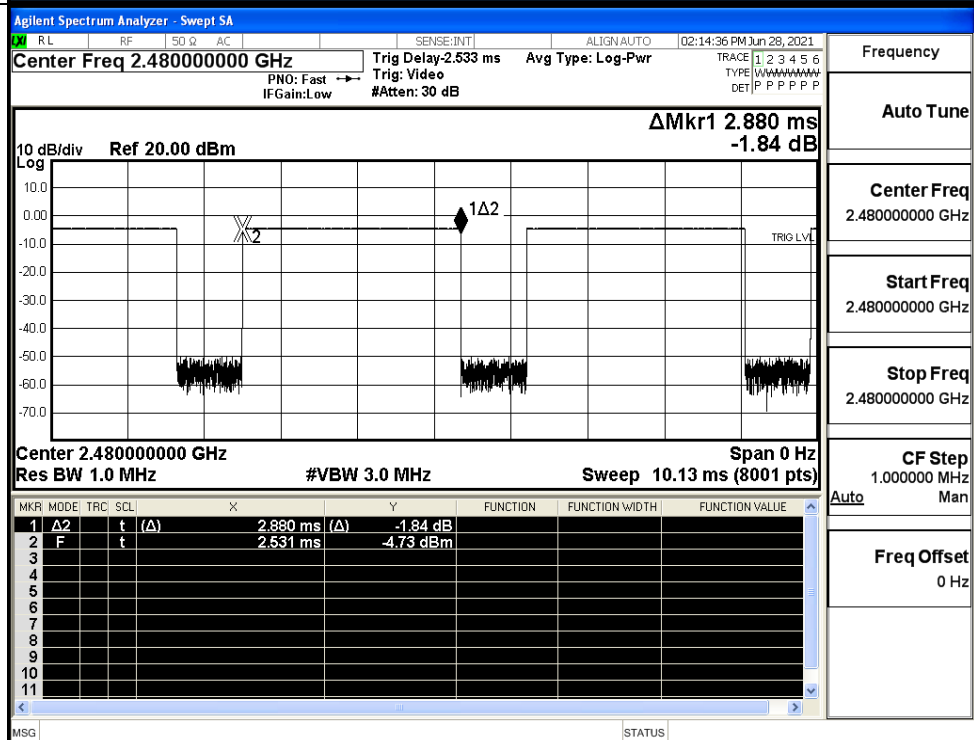




GFSK_DH5/MCH

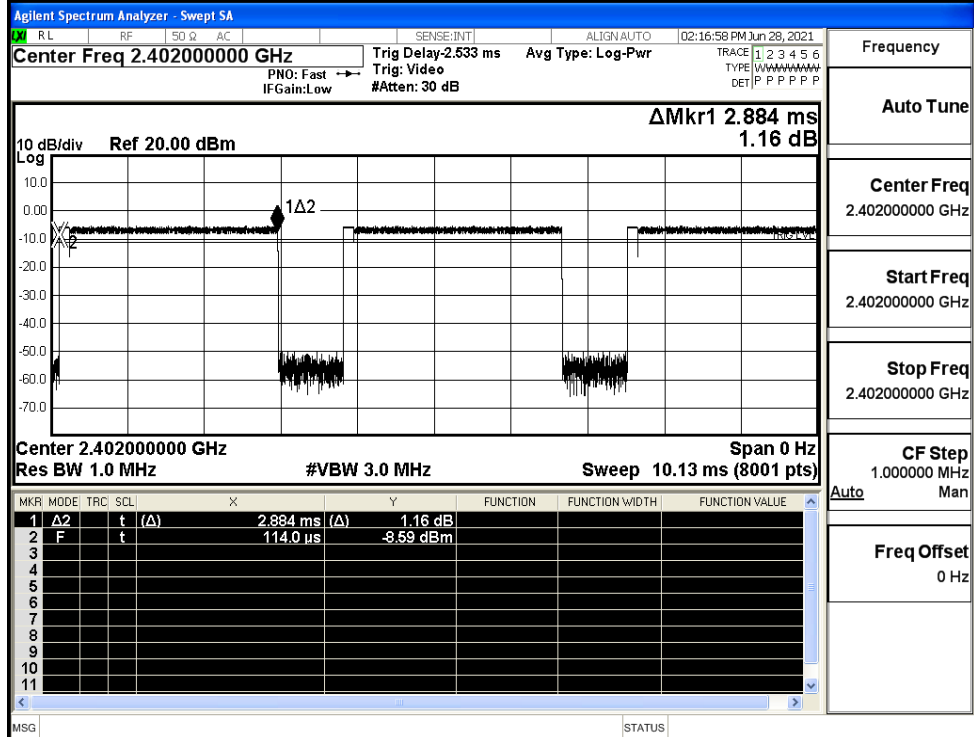


GFSK_DH5/HCH

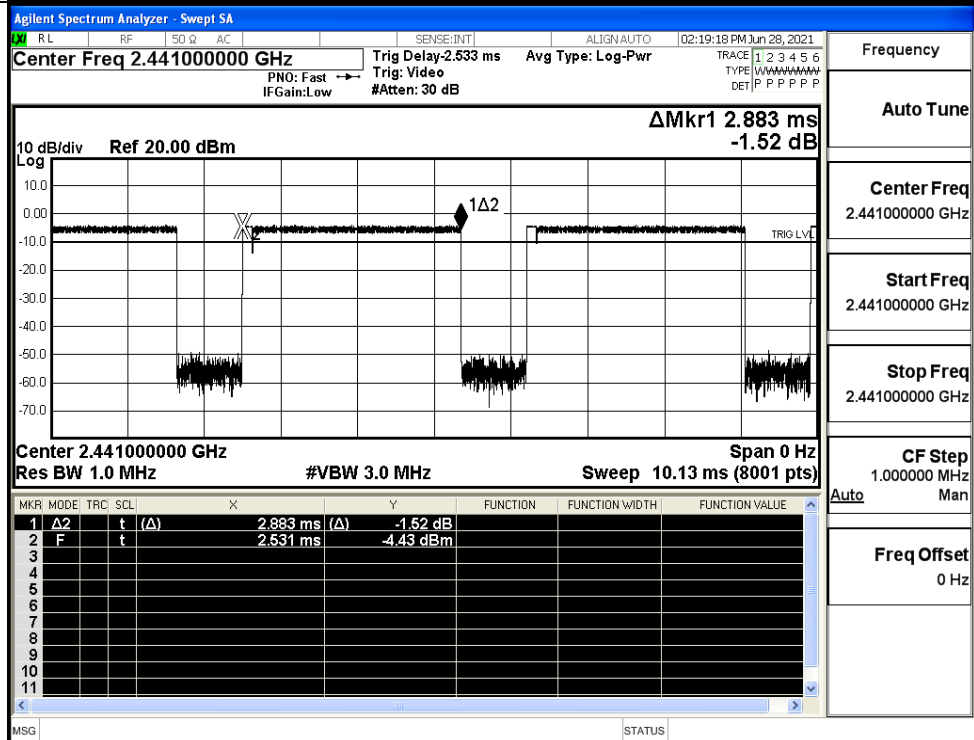




$\pi/4$ DQPSK
_2DH5/LCH

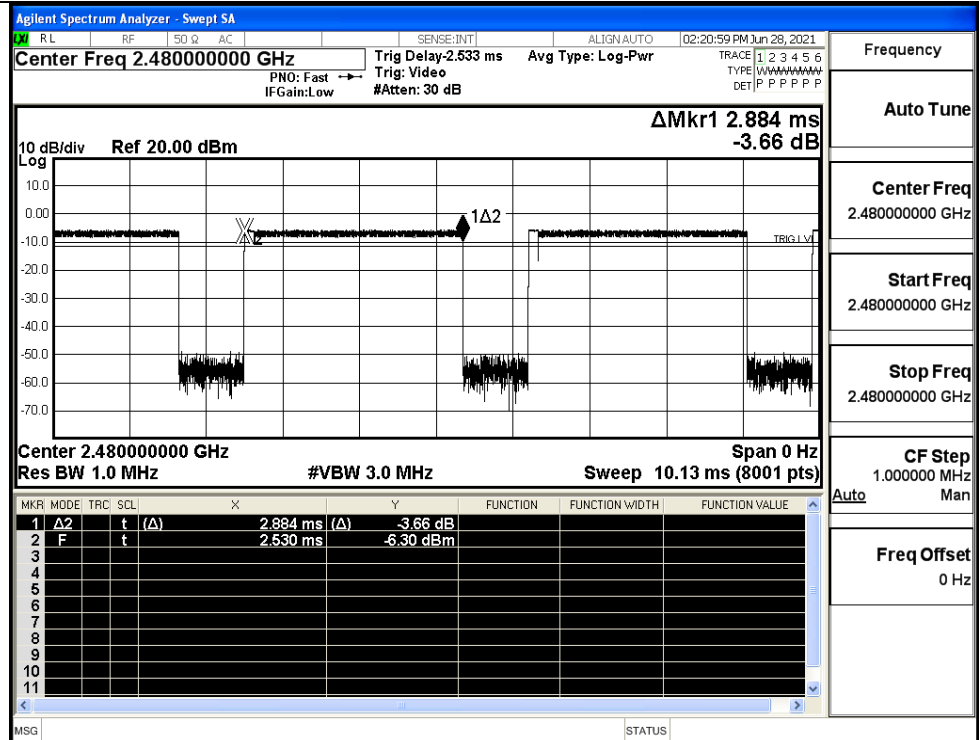


$\pi/4$ DQPSK
_2DH5/MCH

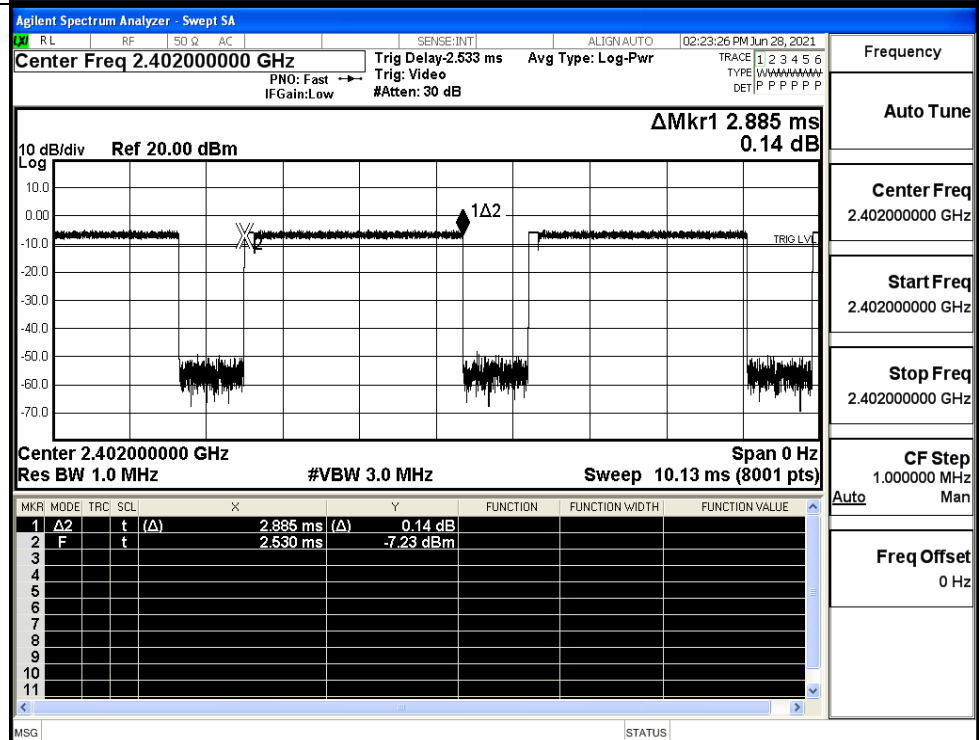




$\pi/4$ DQPSK
_2DH5/HCH

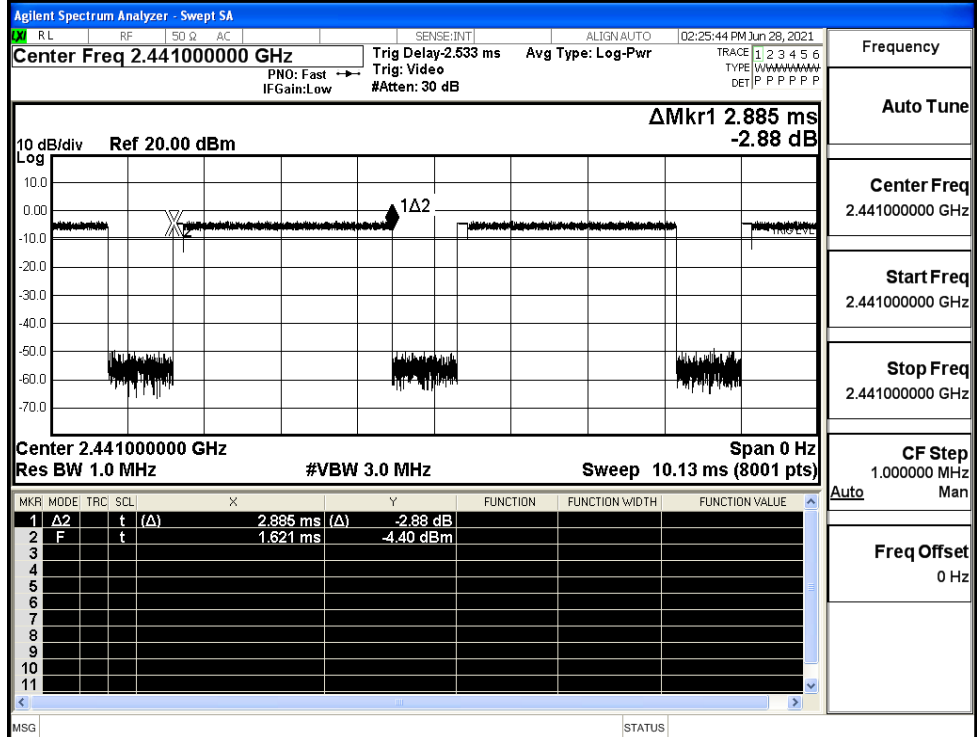


8DPSK _3DH5/LCH

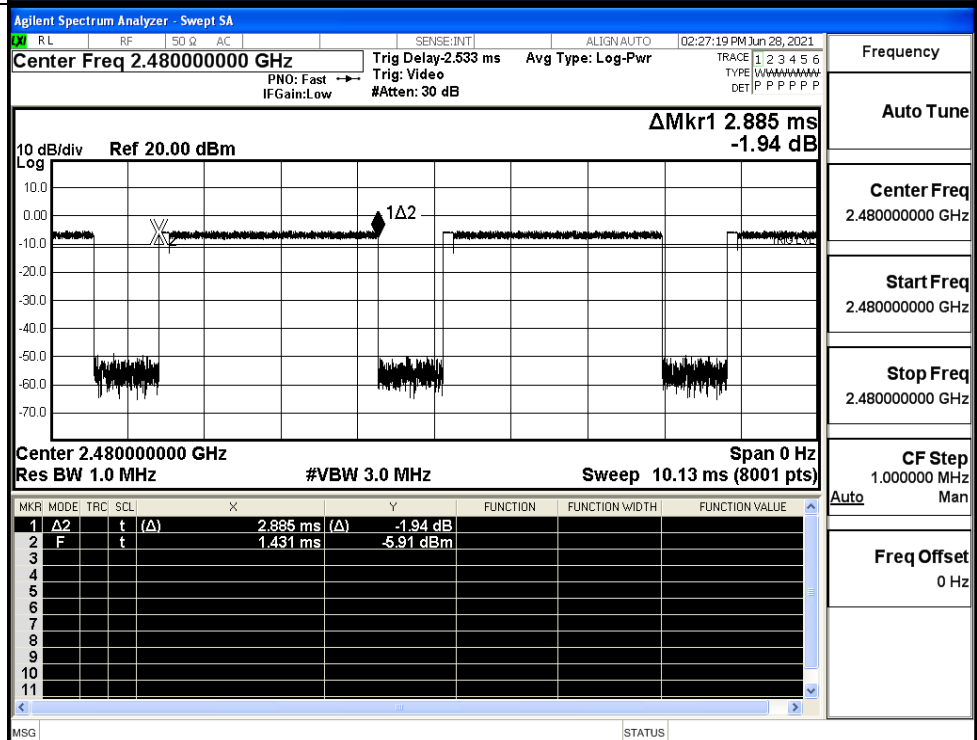




8DPSK_3DH5/MCH



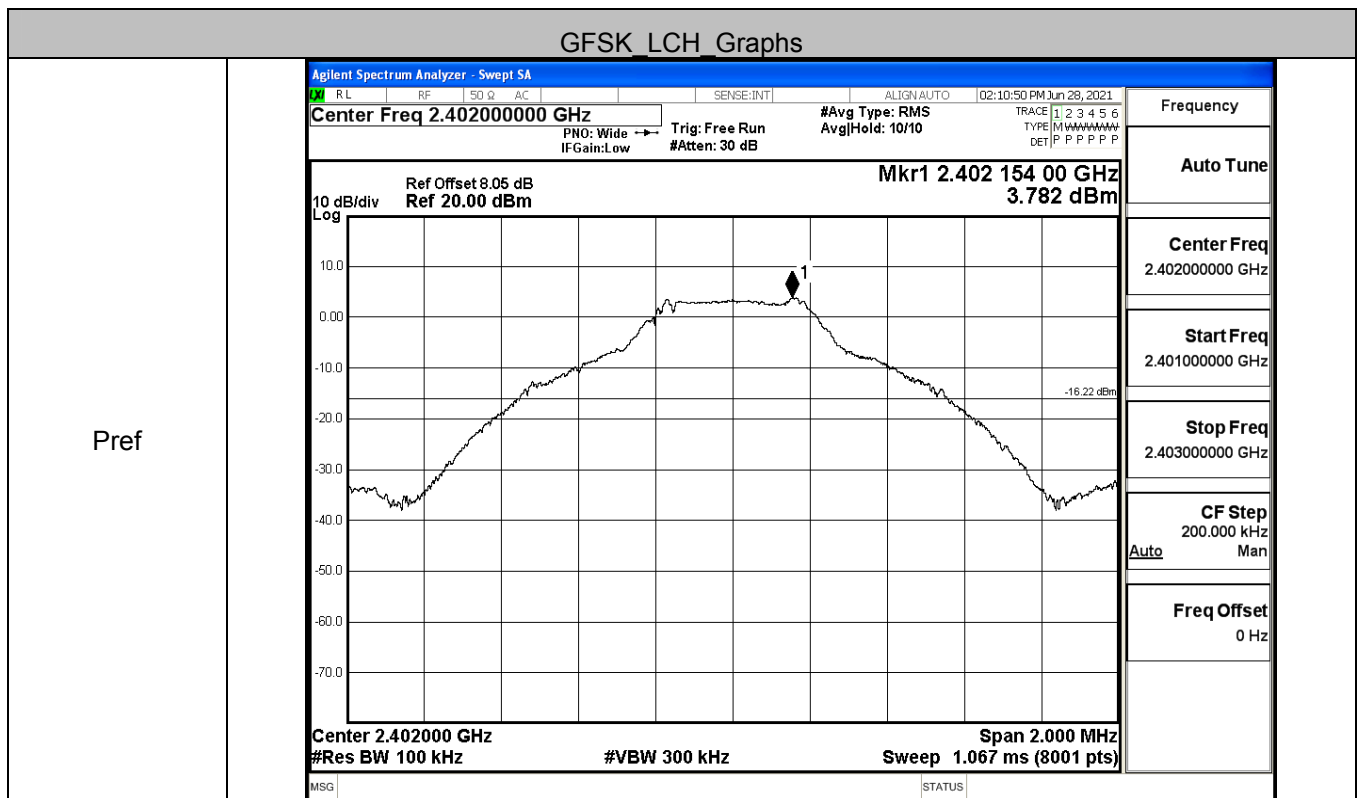
8DPSK_3DH5/HCH

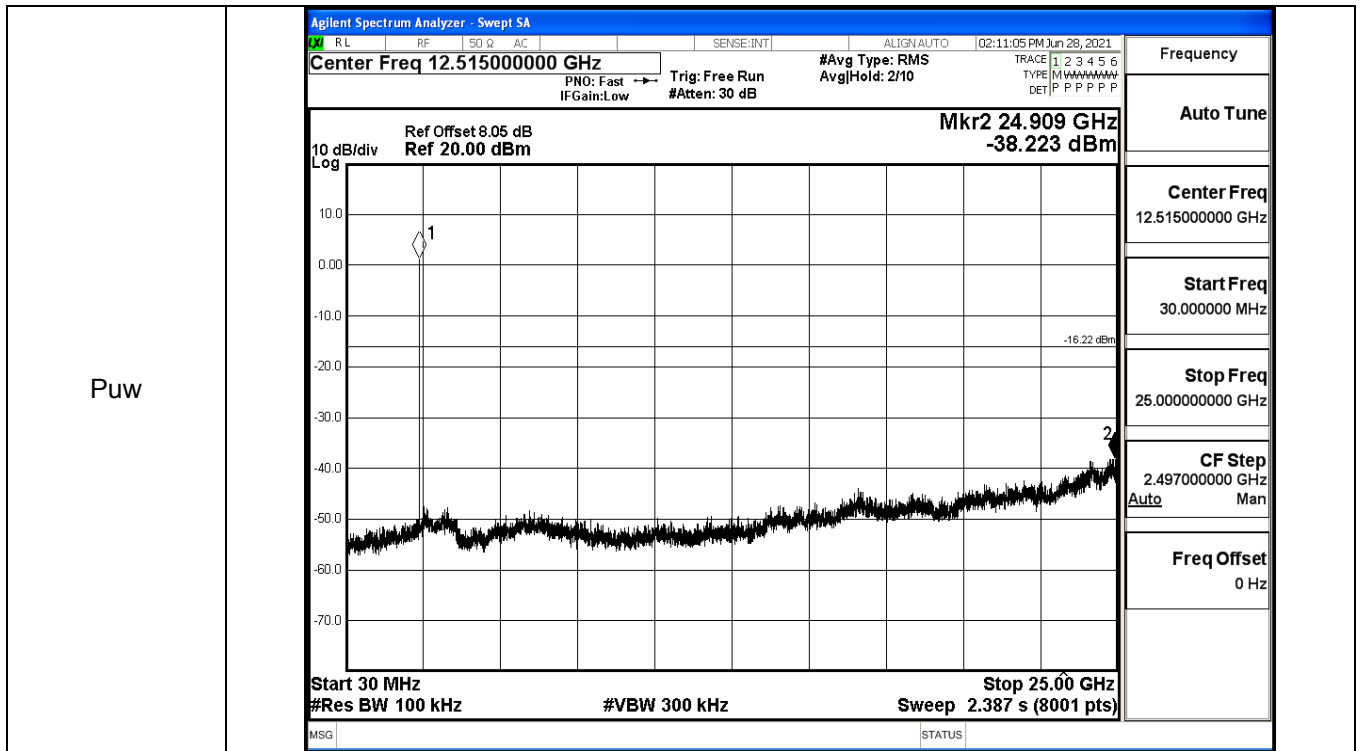




A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.782	-38.223	-16.218	PASS
	MCH	5.018	-38.203	-14.982	PASS
	HCH	3.509	-38.630	-16.491	PASS
$\pi/4$ DQPSK	LCH	2.161	-38.035	-17.839	PASS
	MCH	3.516	-38.341	-16.484	PASS
	HCH	2.182	-37.949	-17.818	PASS
8DPSK	LCH	2.341	-37.297	-17.659	PASS
	MCH	3.694	-37.366	-16.306	PASS
	HCH	2.156	-38.122	-17.844	PASS

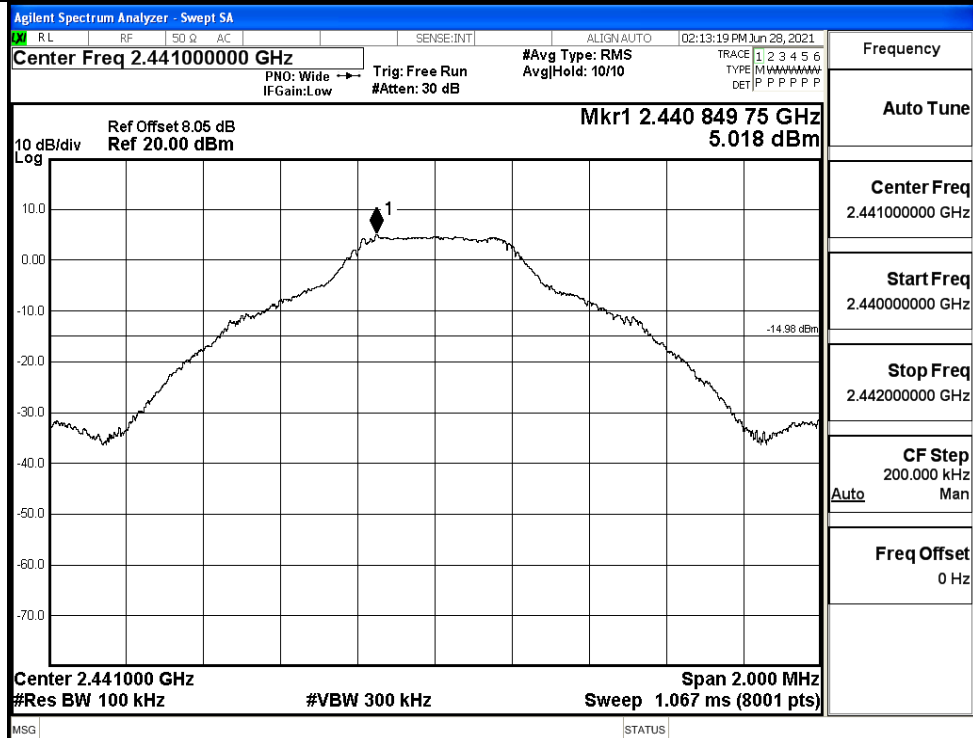




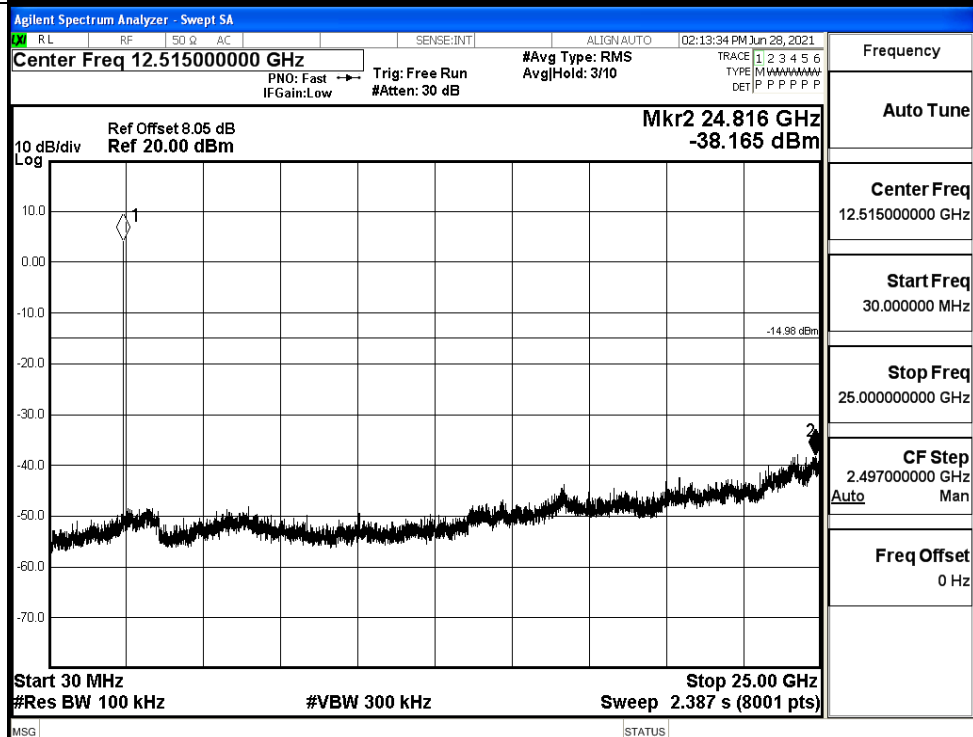


GFSK_MCH_Graphs

Pref



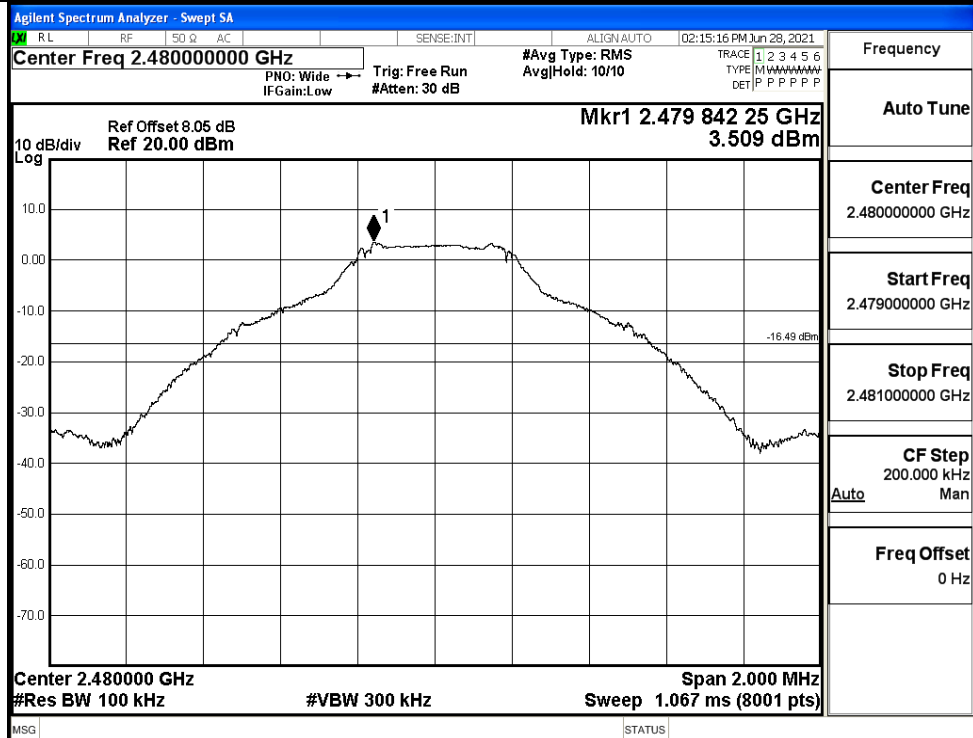
Puw



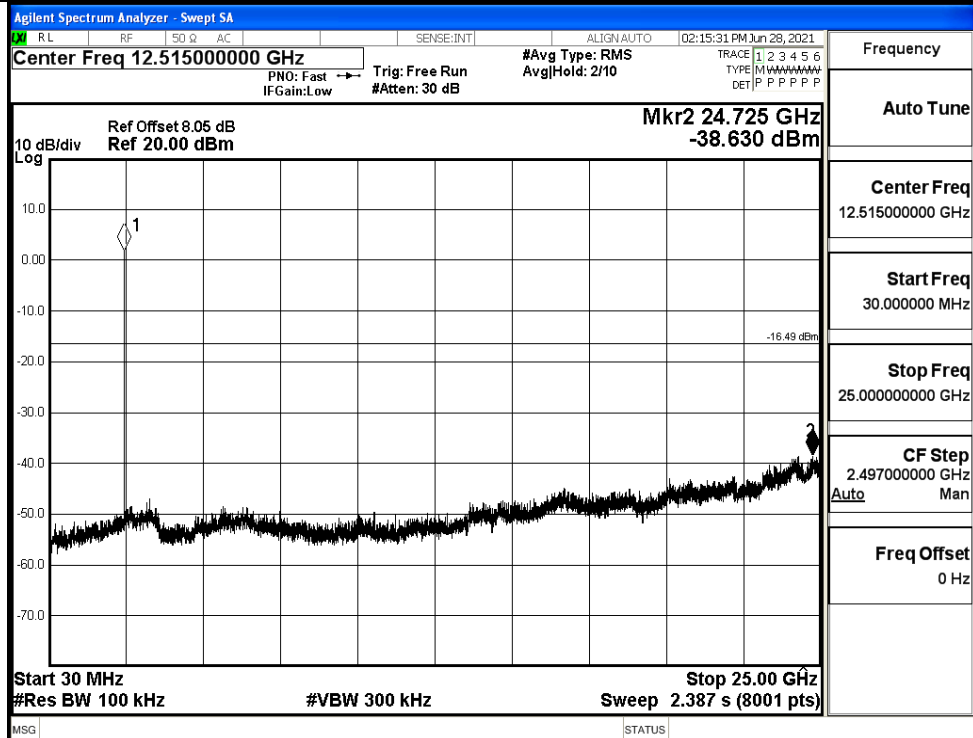


GFSK HCH_Graphs

Pref

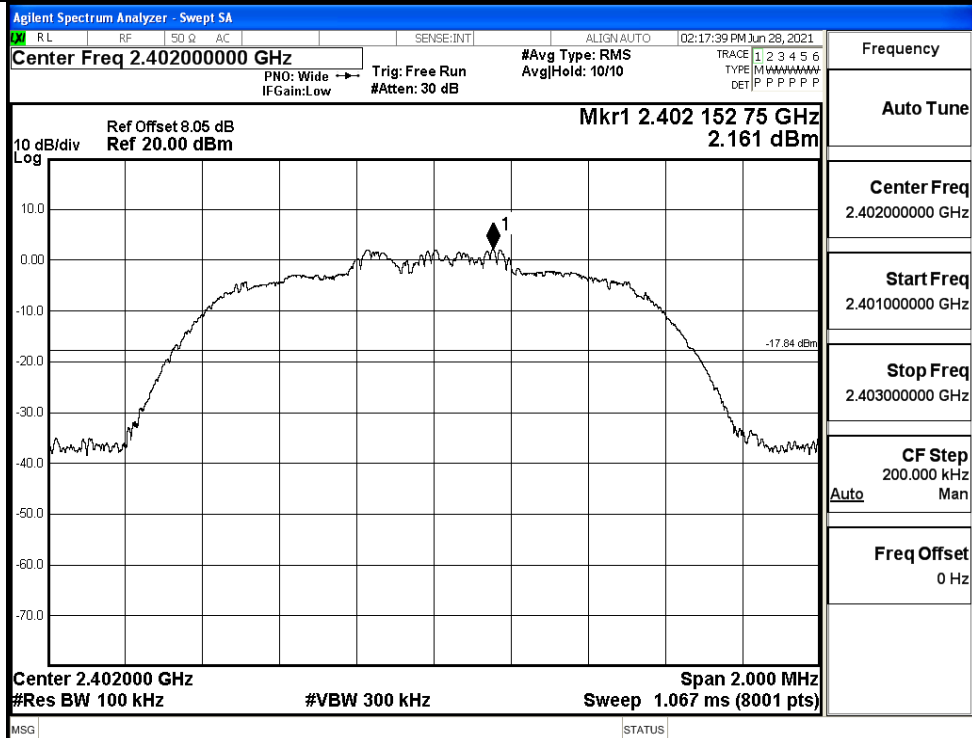


Puw

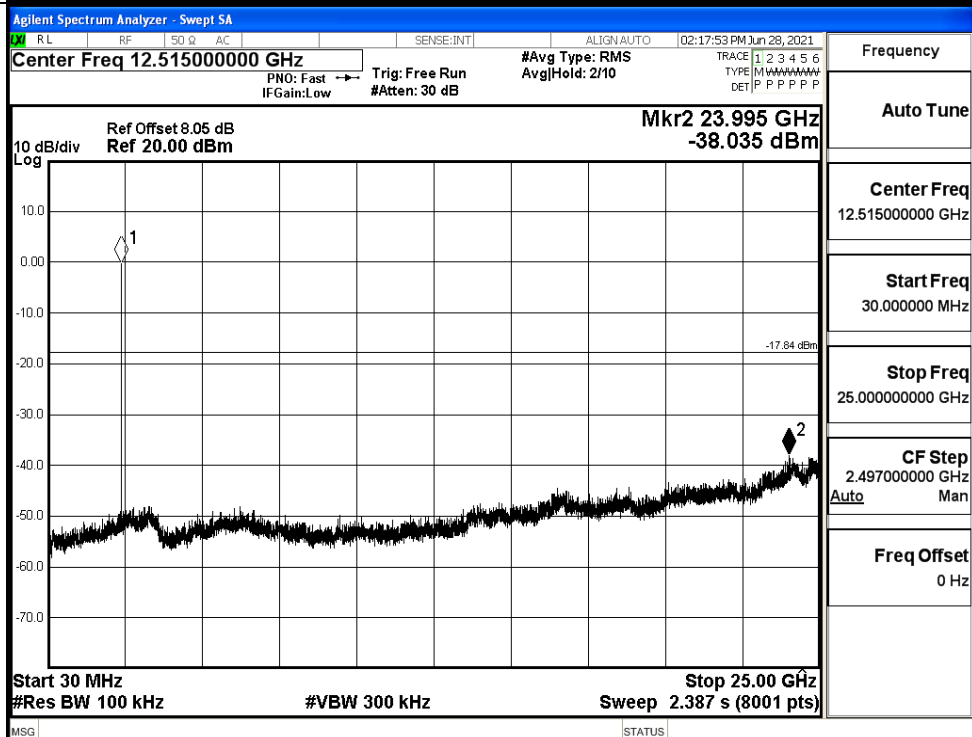


 $\pi/4$ DQPSK LCH_Graphs

Pref

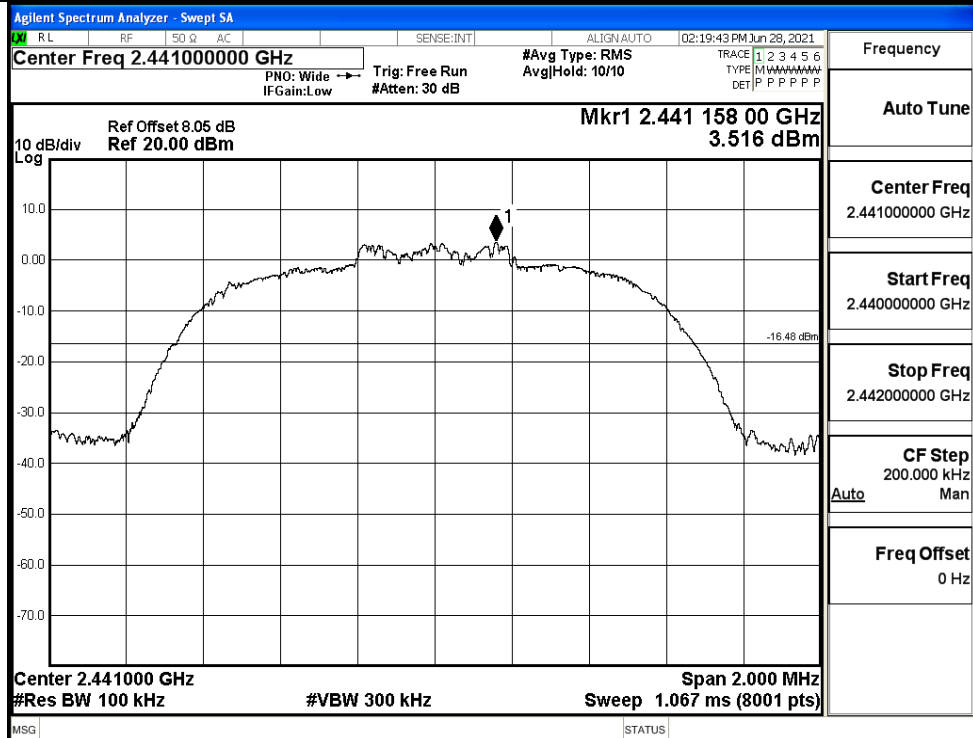


Puw

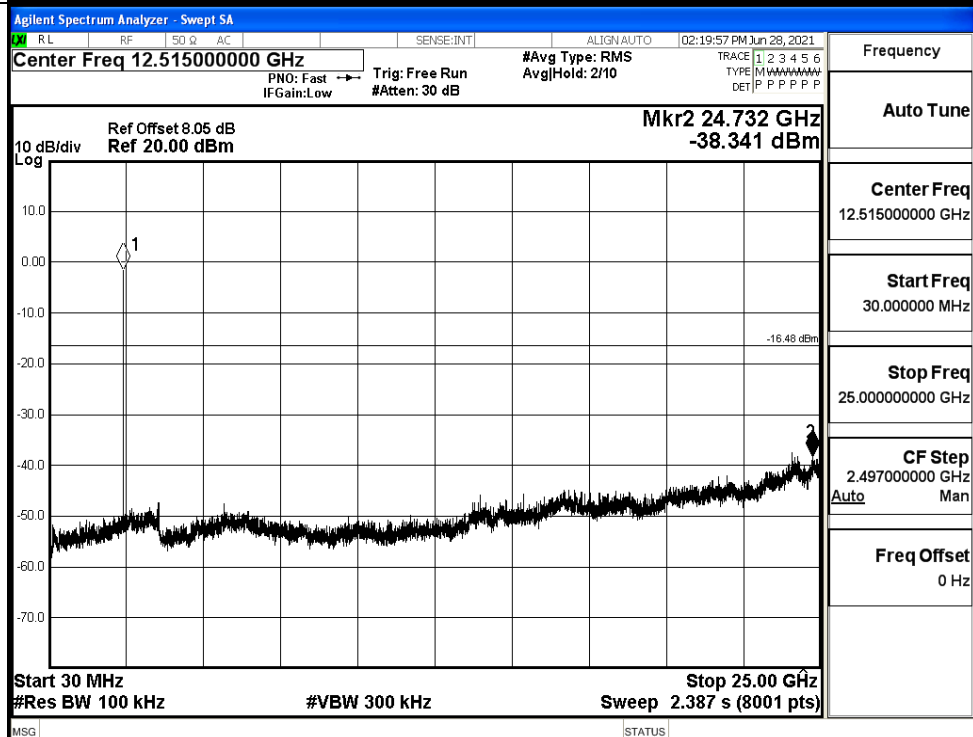


 $\pi/4$ DQPSK_MCH_Graphs

Pref

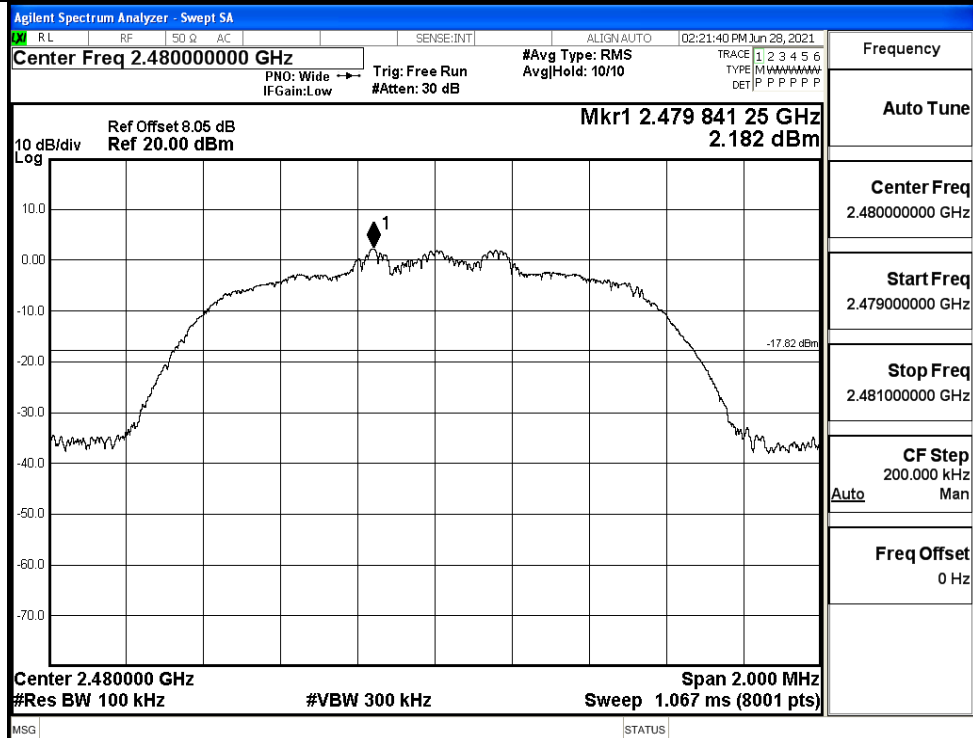


Puw

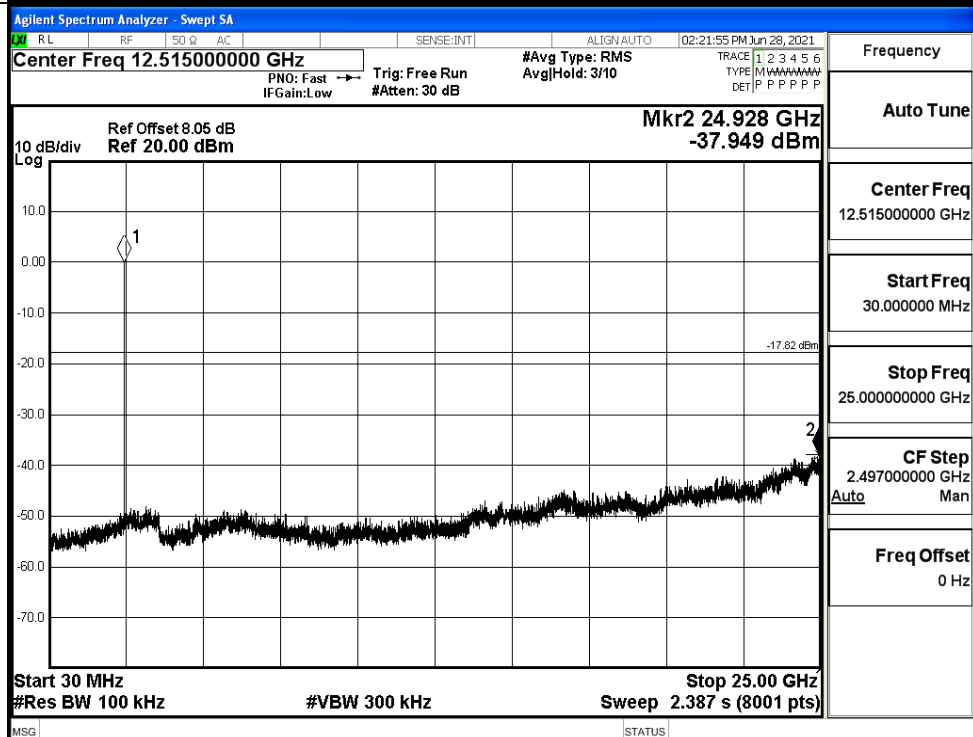


 $\pi/4$ DQPSK HCH_Graphs

Pref



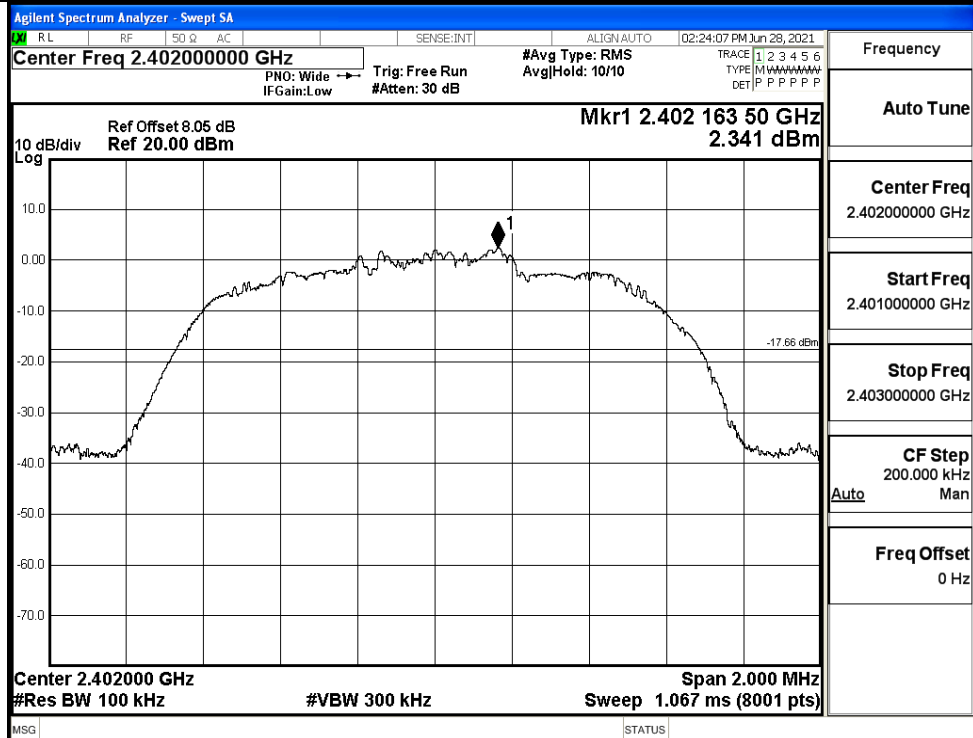
Puw



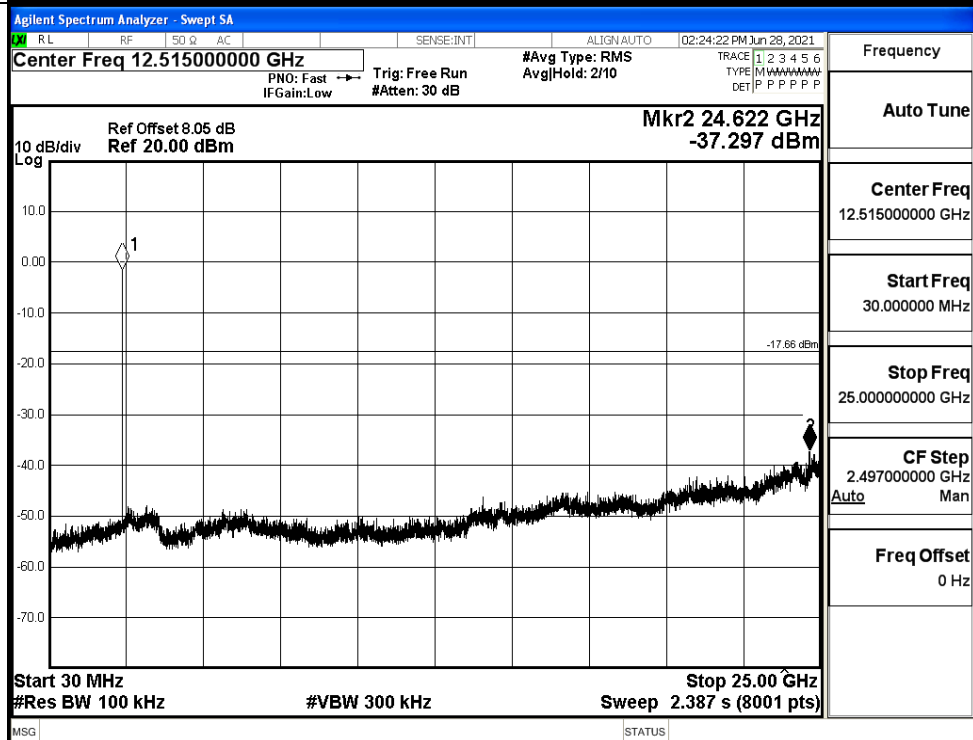


8DPSK_LCH_Graphs

Pref



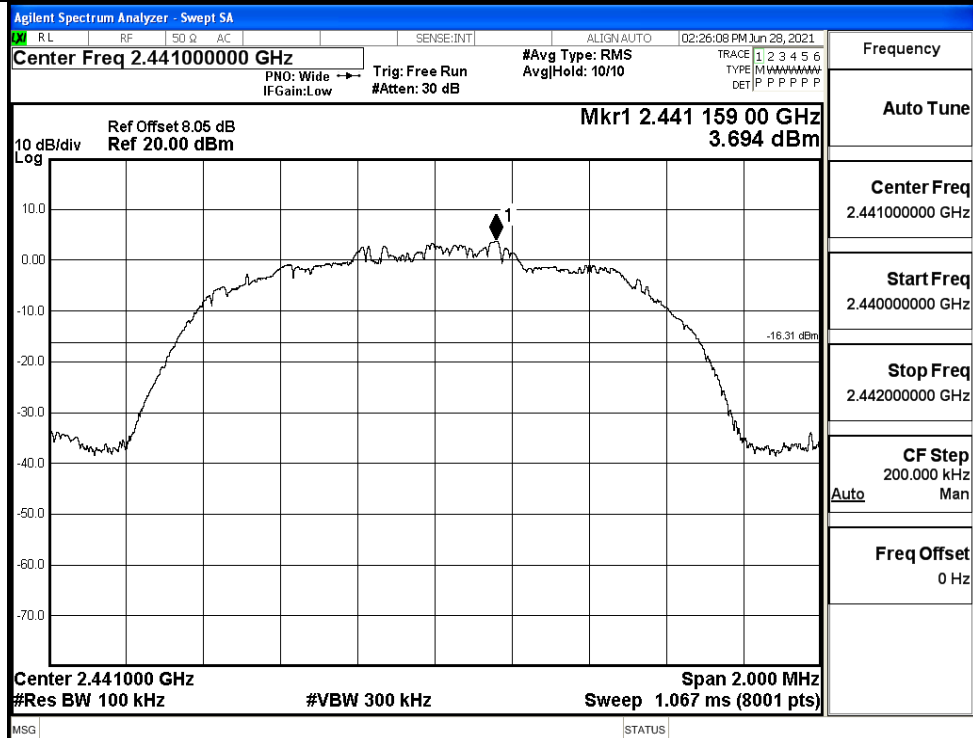
Puw



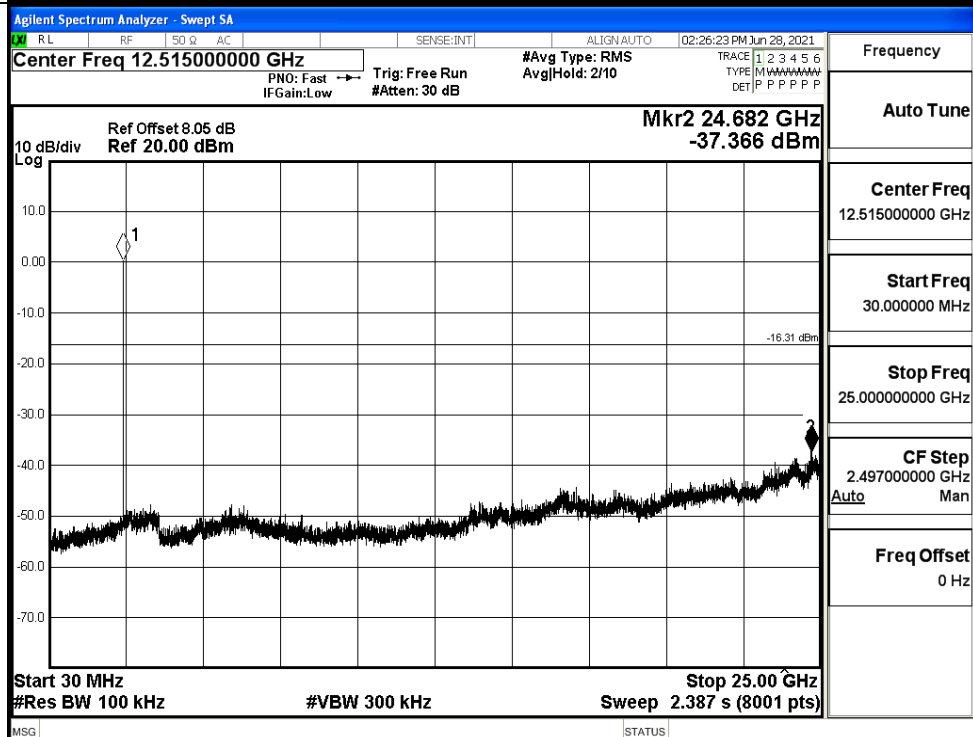


8DPSK MCH_Graphs

Pref



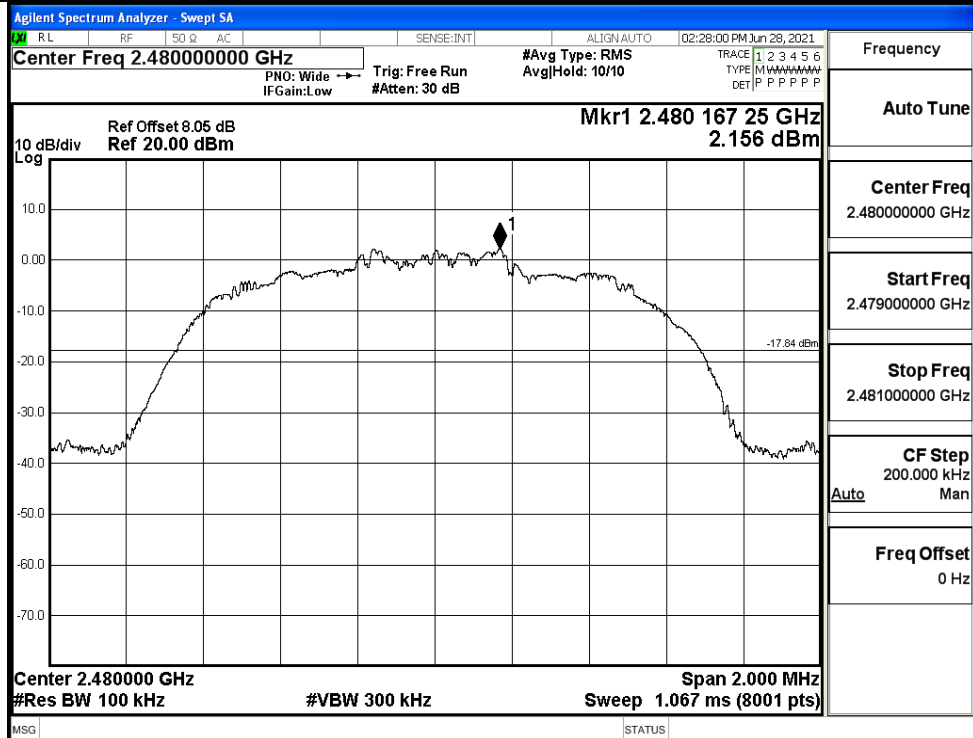
Puw



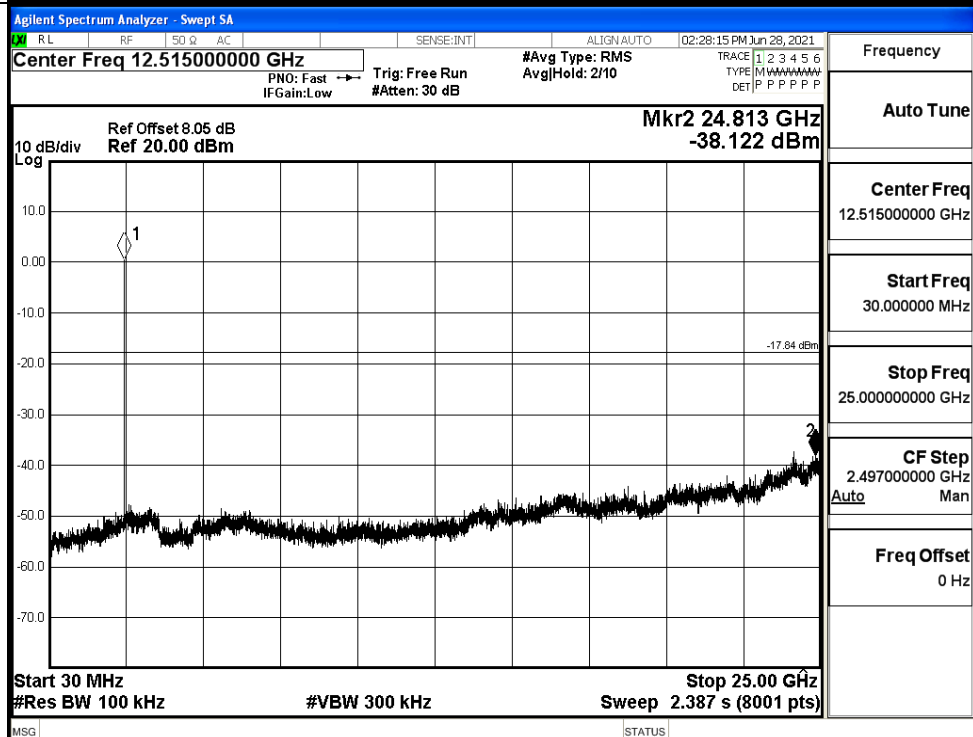


8DPSK_HCH_Graphs

Pref



Puw





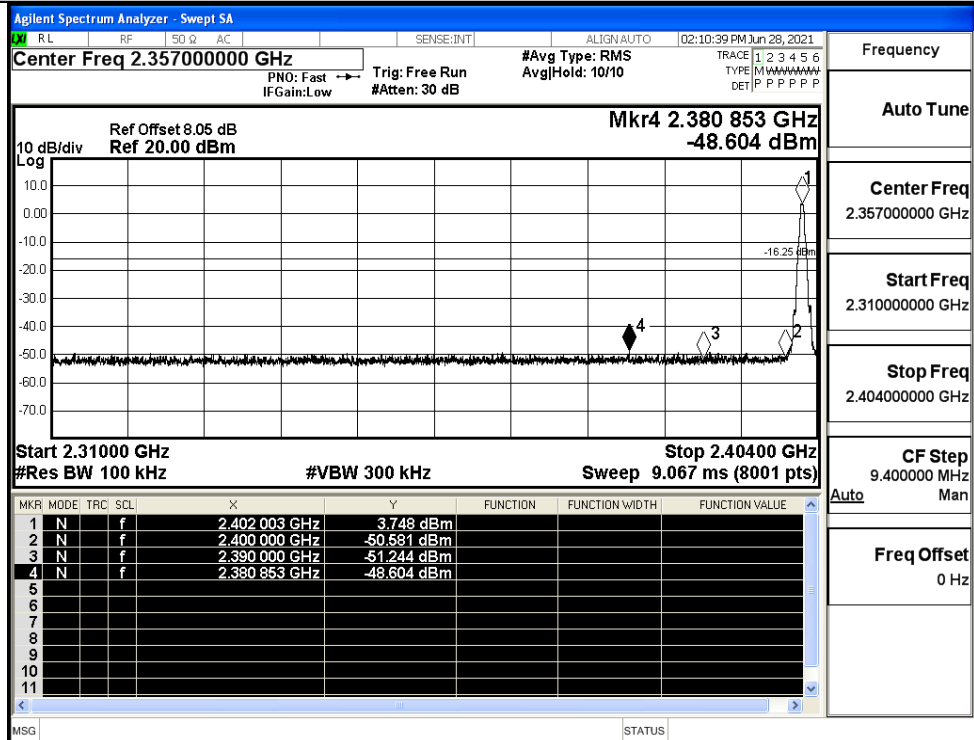
A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.748	Off	-48.604	-16.25	PASS
			4.929	On	-48.888	-15.07	PASS
	HCH	2480	3.583	Off	-48.323	-16.42	PASS
			5.010	On	-48.462	-14.99	PASS
π /4DQPSK	LCH	2402	2.086	Off	-48.817	-17.91	PASS
			3.612	On	-48.410	-16.39	PASS
	HCH	2480	2.317	Off	-48.628	-17.68	PASS
			3.542	On	-47.905	-16.46	PASS
8DPSK	LCH	2402	2.453	Off	-48.041	-17.55	PASS
			3.543	On	-48.443	-16.46	PASS
	HCH	2480	2.229	Off	-47.872	-17.77	PASS
			3.342	On	-47.359	-16.66	PASS

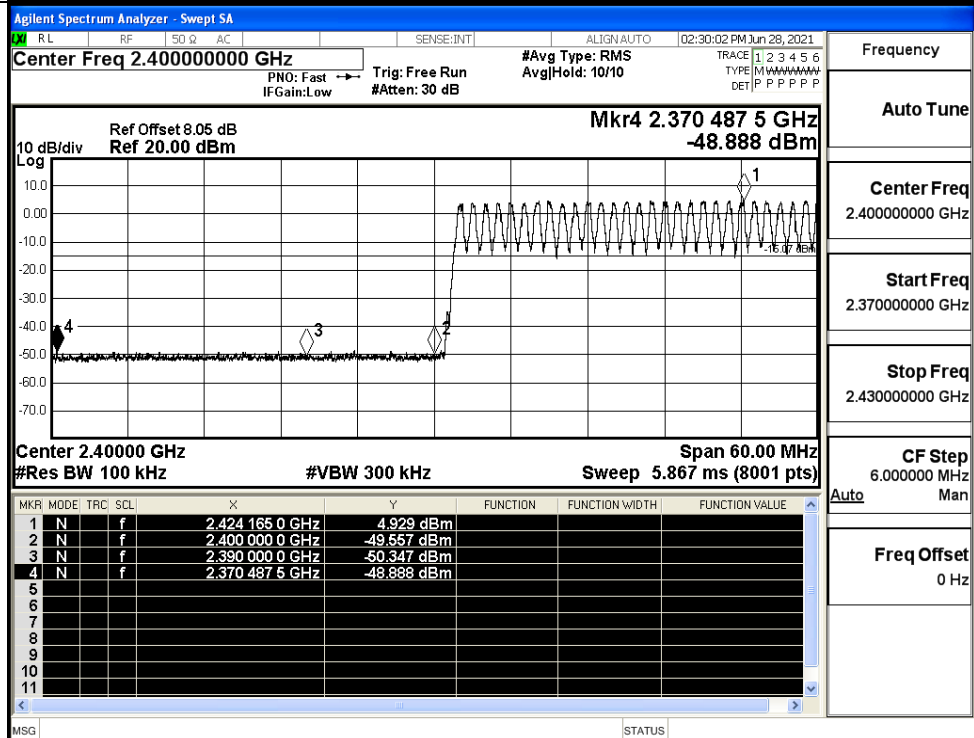


Test Graphs

GFSK/LCH/No Hop

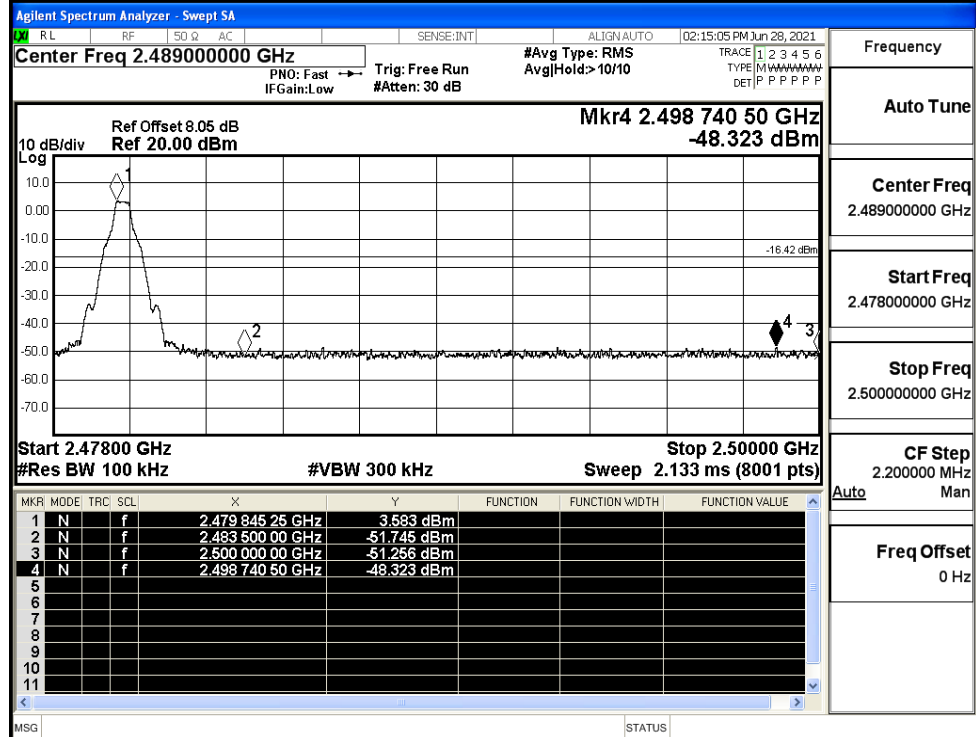


GFSK/LCH/Hop

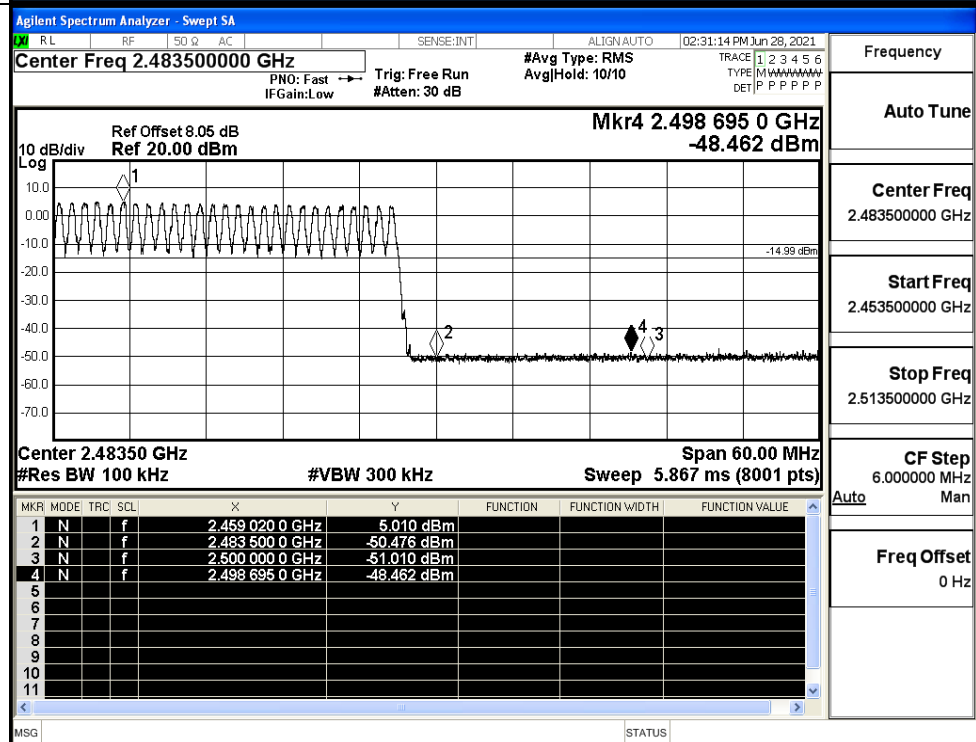




GFSK/HCH/No Hop

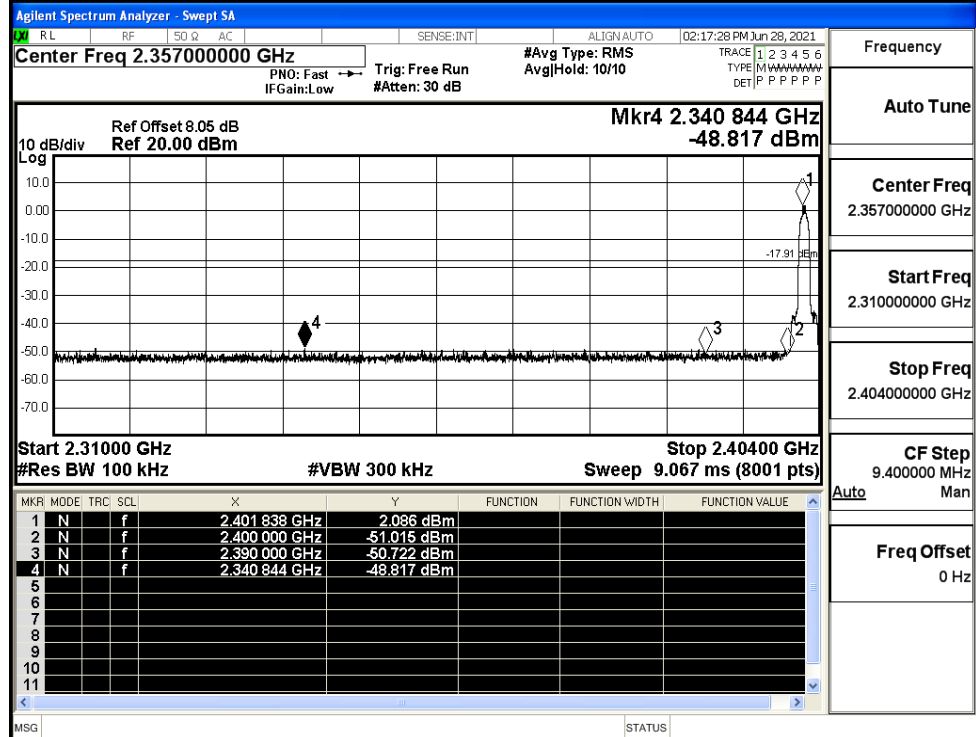


GFSK/HCH/Hop





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



Frequency

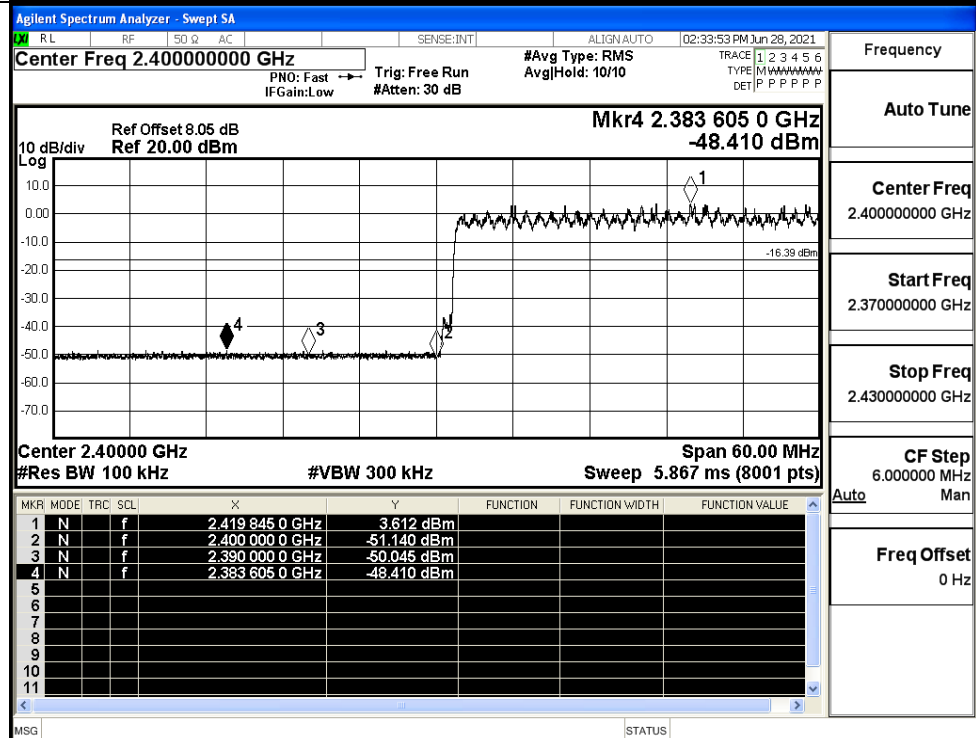
Auto Tune

Center Freq
2.357000000 GHzStart Freq
2.310000000 GHzStop Freq
2.404000000 GHzCF Step
9.400000 MHz

Auto

Freq Offset
0 Hz

$\pi/4$ DQPSK/LCH/Hop



Frequency

Auto Tune

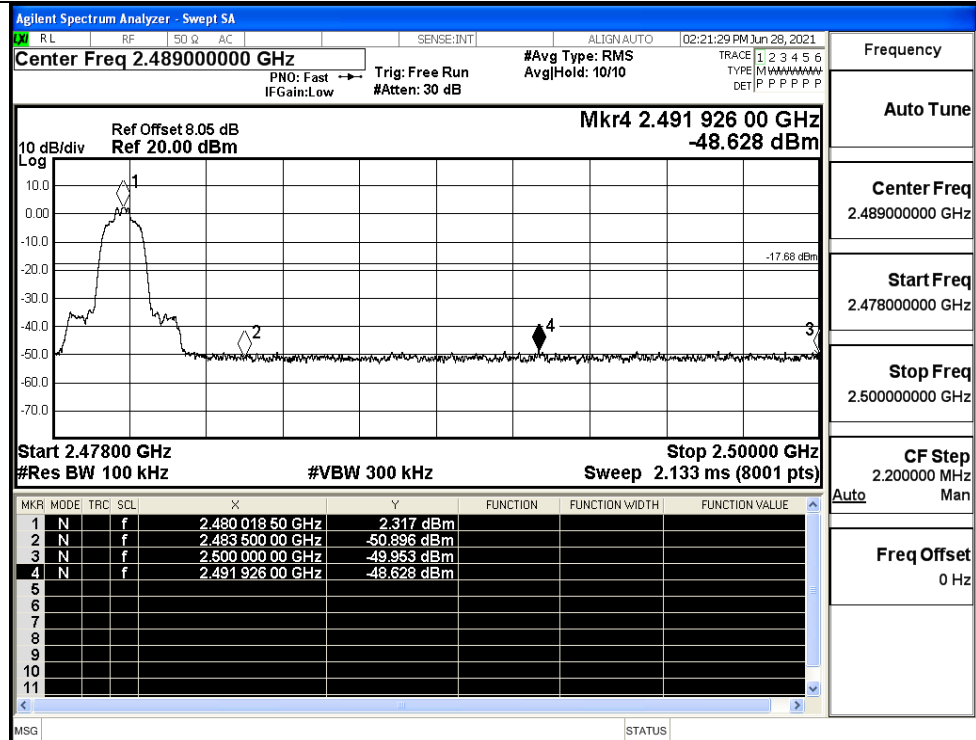
Center Freq
2.400000000 GHzStart Freq
2.370000000 GHzStop Freq
2.430000000 GHzCF Step
6.000000 MHz

Auto

Freq Offset
0 Hz



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

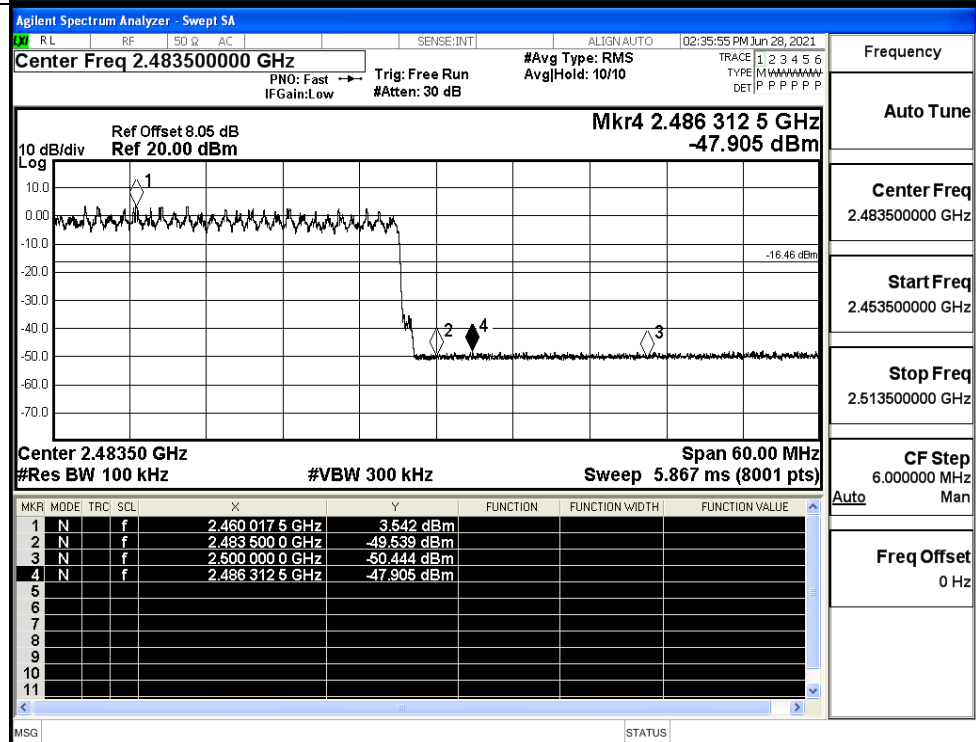


Frequency

Auto Tune

Center Freq
2.489000000 GHzStart Freq
2.478000000 GHzStop Freq
2.500000000 GHzCF Step
2.200000 MHz
Auto ManFreq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop



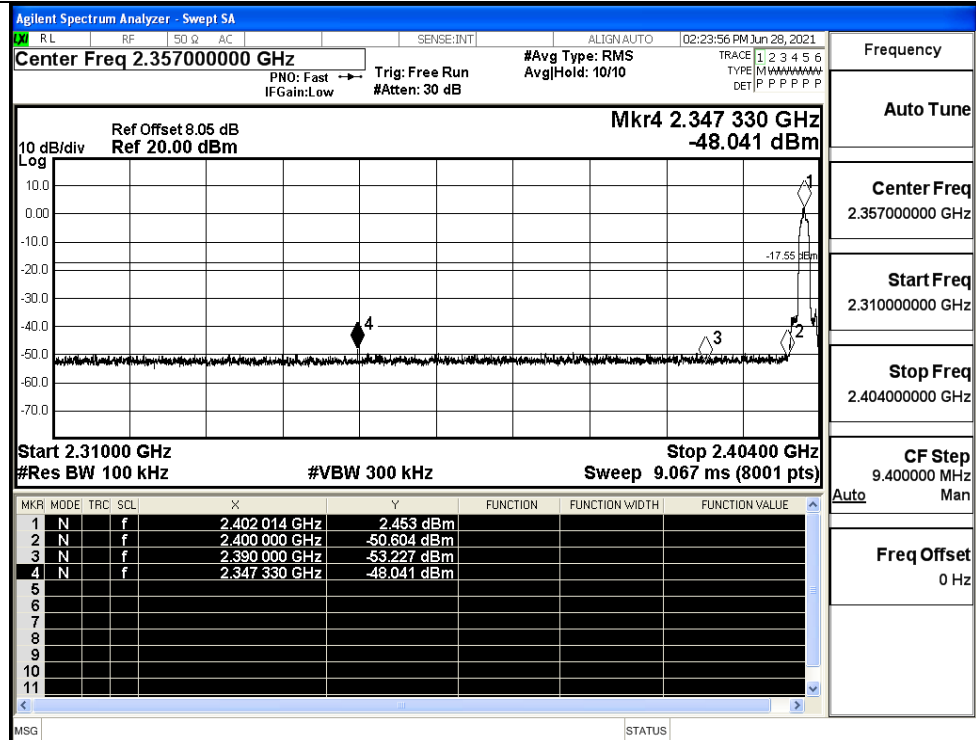
Frequency

Auto Tune

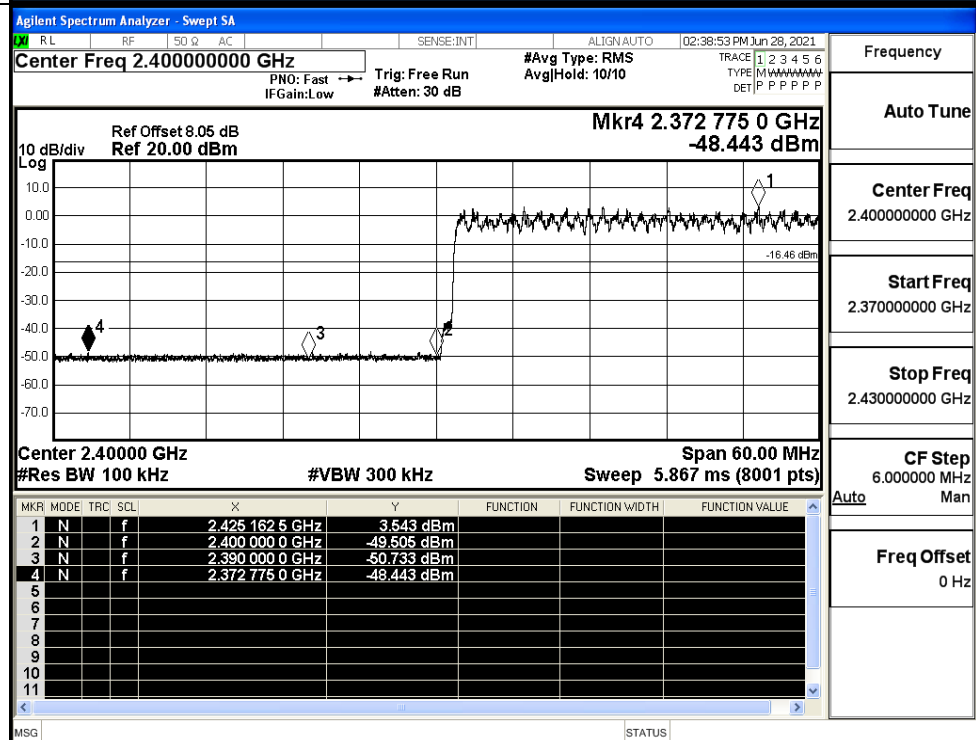
Center Freq
2.483500000 GHzStart Freq
2.453500000 GHzStop Freq
2.513500000 GHzCF Step
6.000000 MHz
Auto ManFreq Offset
0 Hz



8DPSK/LCH/No Hop

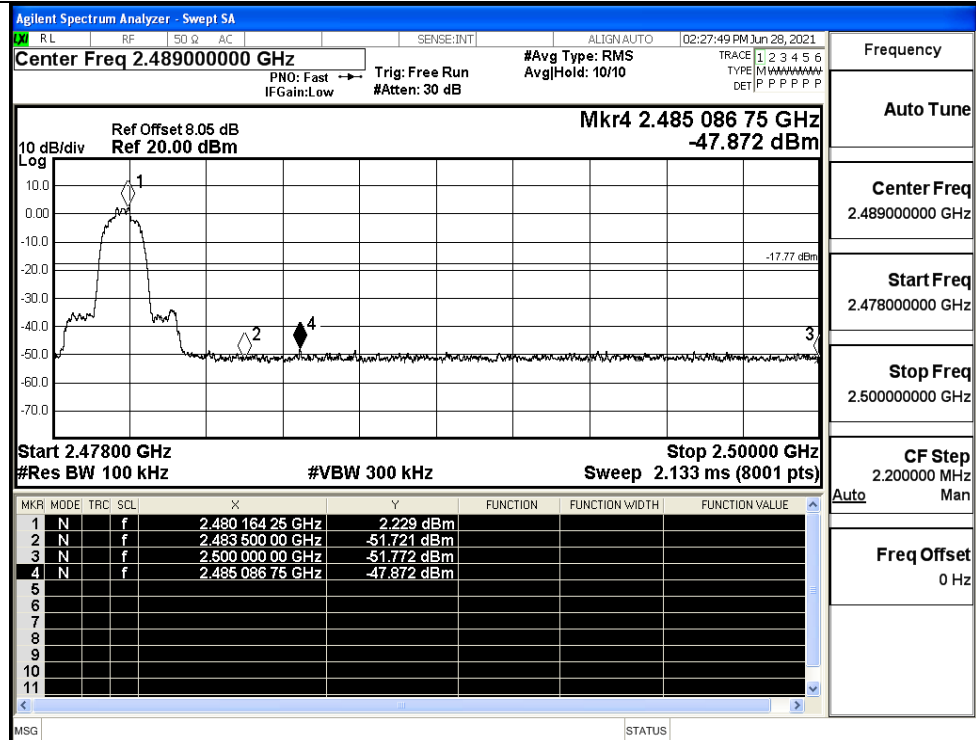


8DPSK/LCH/Hop

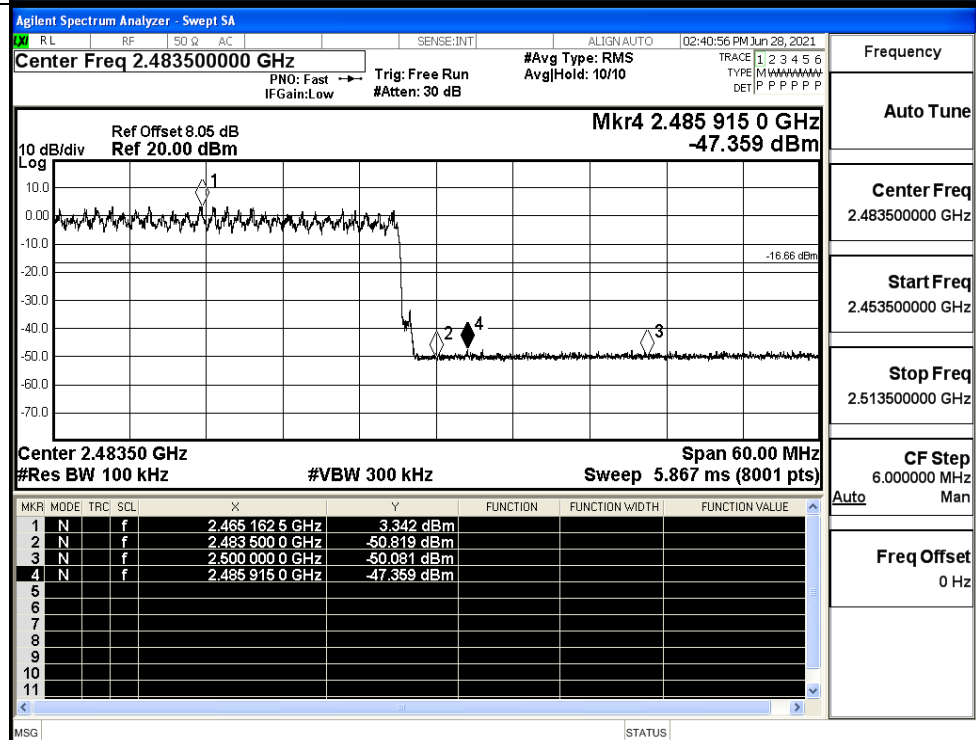




8DPSK/HCH/No Hop



8DPSK/HCH/Hop



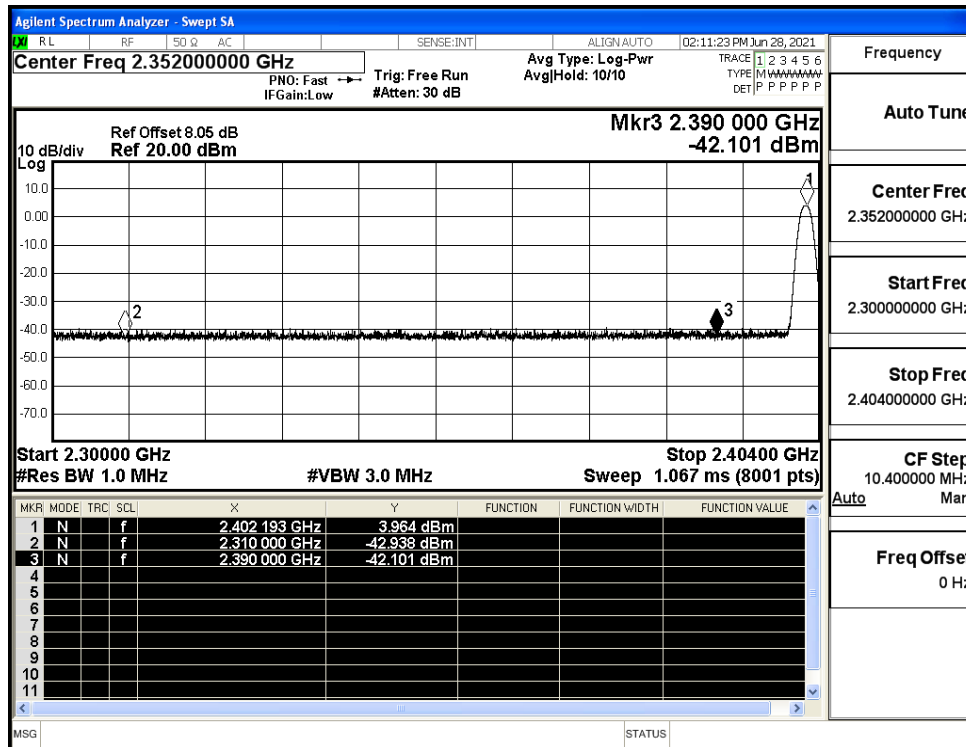


A.8 Restrict-band band-edge measurements

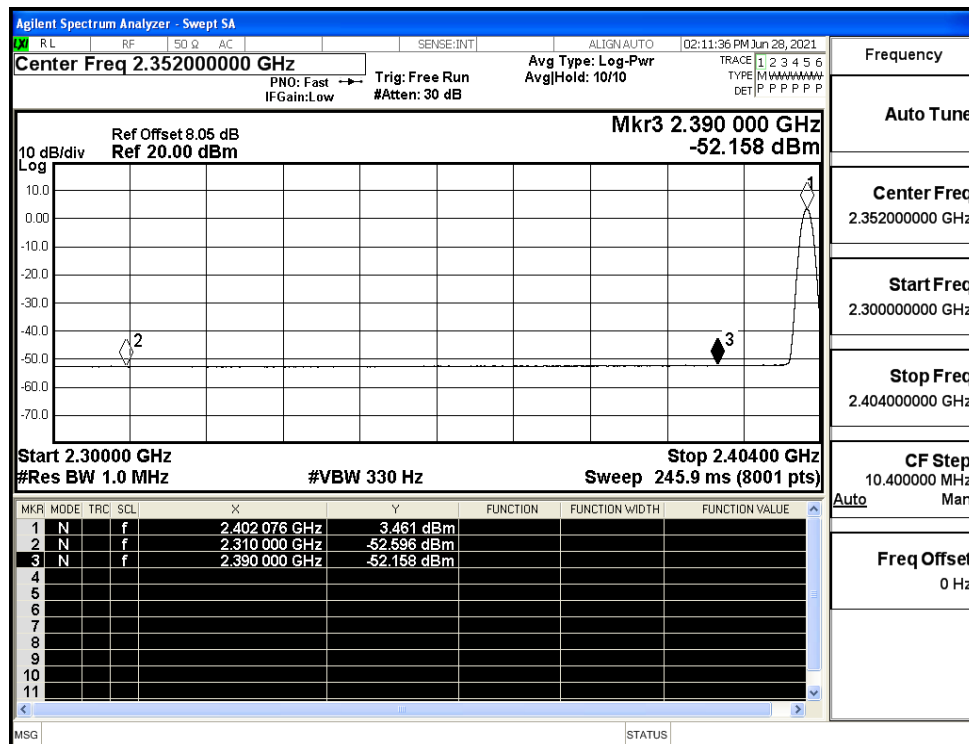
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.94	2.0	0	52.32	PEAK	74	PASS
	Off	2310.0	-52.60	2.0	0	42.66	AV	54	PASS
	Off	2390.0	-42.10	2.0	0	53.16	PEAK	74	PASS
	Off	2390.0	-52.16	2.0	0	43.10	AV	54	PASS
	Off	2483.5	-41.60	2.0	0	53.66	PEAK	74	PASS
	Off	2483.5	-51.71	2.0	0	43.55	AV	54	PASS
	Off	2500.0	-41.43	2.0	0	53.83	PEAK	74	PASS
	Off	2500.0	-51.62	2.0	0	43.64	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-41.20	2.0	0	54.06	PEAK	74	PASS
	Off	2310.0	-52.63	2.0	0	42.62	AV	54	PASS
	Off	2390.0	-41.40	2.0	0	53.86	PEAK	74	PASS
	Off	2390.0	-52.29	2.0	0	42.97	AV	54	PASS
	Off	2483.5	-41.83	2.0	0	53.43	PEAK	74	PASS
	Off	2483.5	-51.75	2.0	0	43.51	AV	54	PASS
	Off	2500.0	-41.63	2.0	0	53.63	PEAK	74	PASS
	Off	2500.0	-51.64	2.0	0	43.61	AV	54	PASS
8DPSK	Off	2310.0	-42.72	2.0	0	52.54	PEAK	74	PASS
	Off	2310.0	-52.67	2.0	0	42.59	AV	54	PASS
	Off	2390.0	-41.82	2.0	0	53.44	PEAK	74	PASS
	Off	2390.0	-52.31	2.0	0	42.95	AV	54	PASS
	Off	2483.5	-41.62	2.0	0	53.64	PEAK	74	PASS
	Off	2483.5	-51.69	2.0	0	43.57	AV	54	PASS
	Off	2500.0	-42.27	2.0	0	52.99	PEAK	74	PASS
	Off	2500.0	-51.67	2.0	0	43.58	AV	54	PASS



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

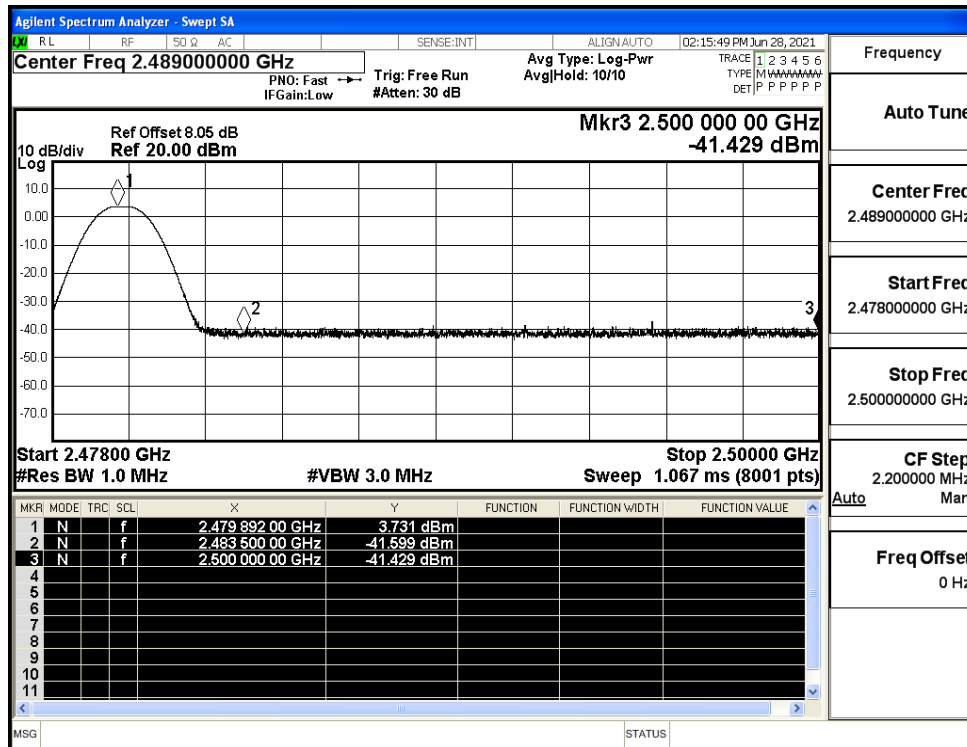


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

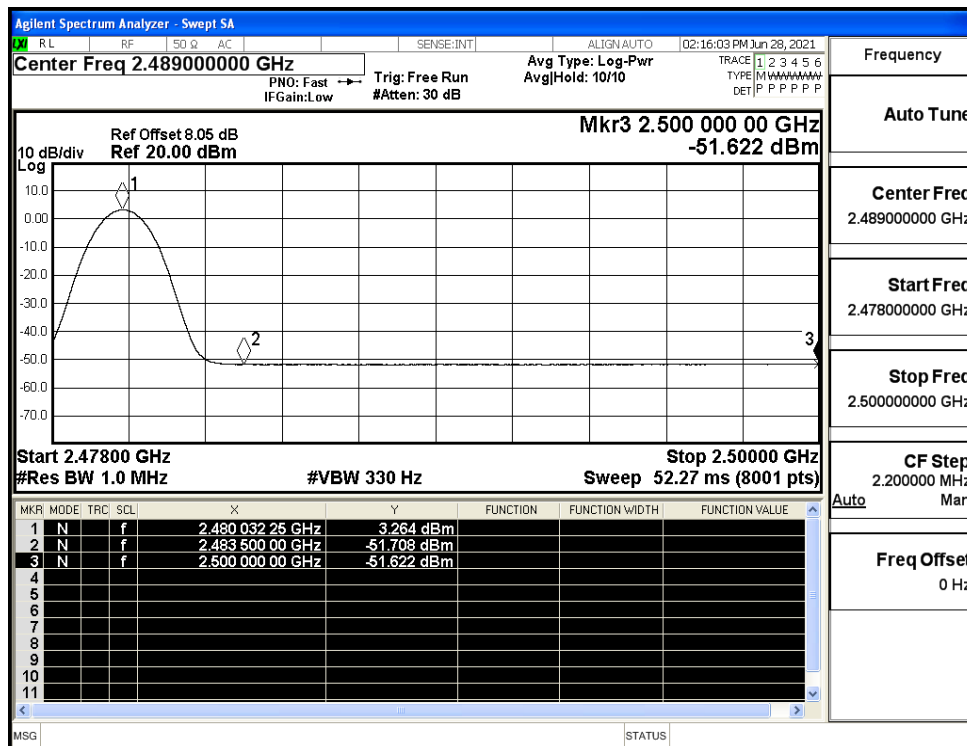


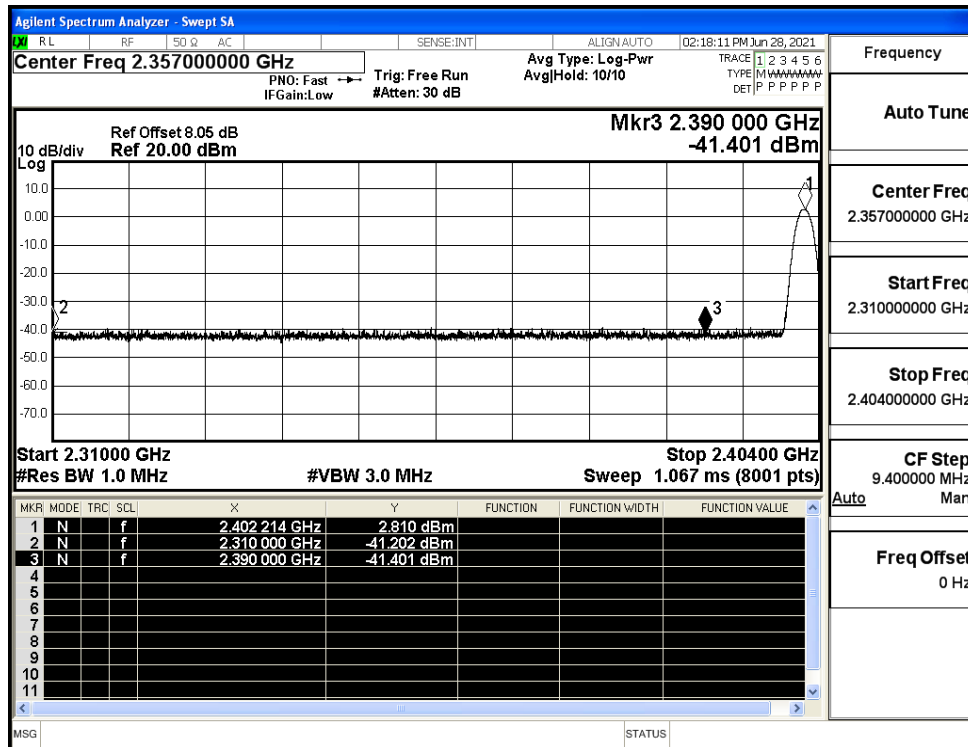
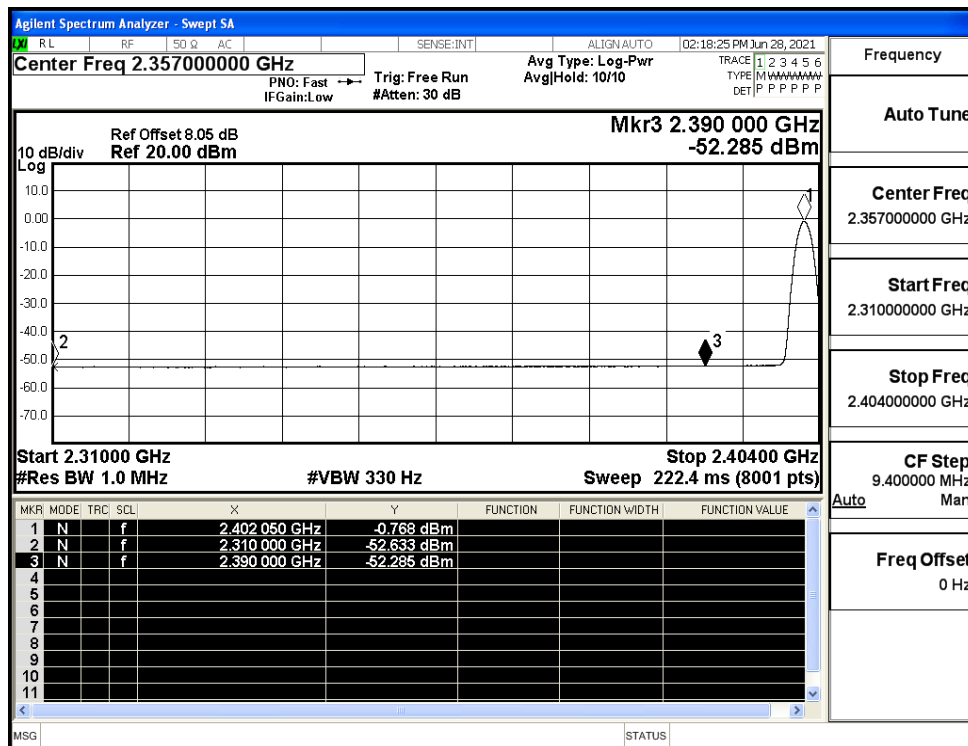


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



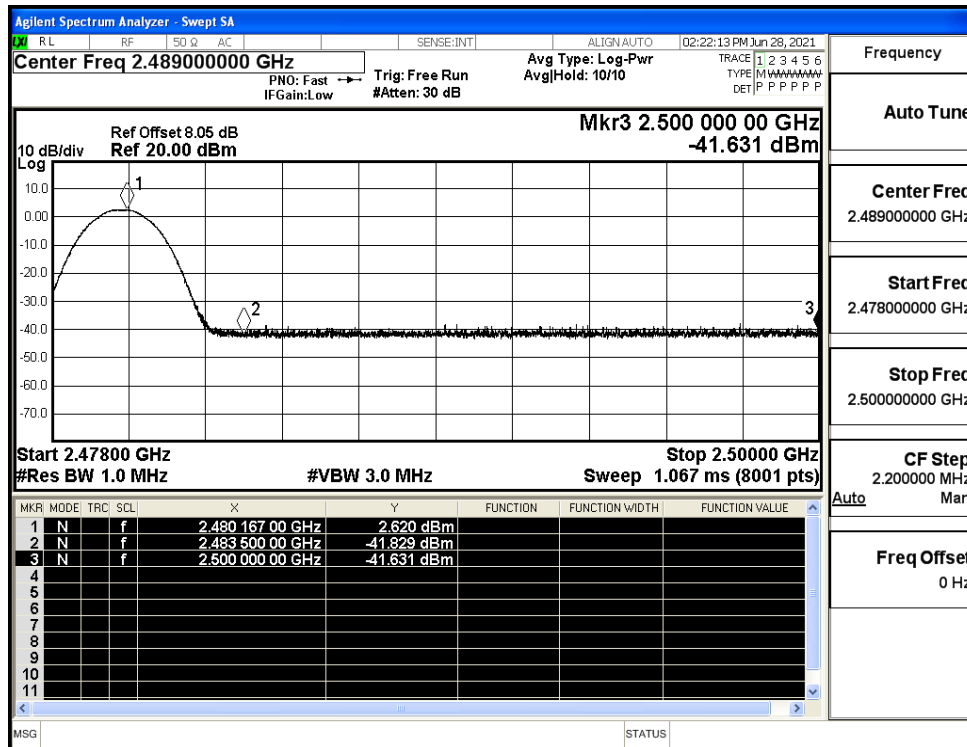
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



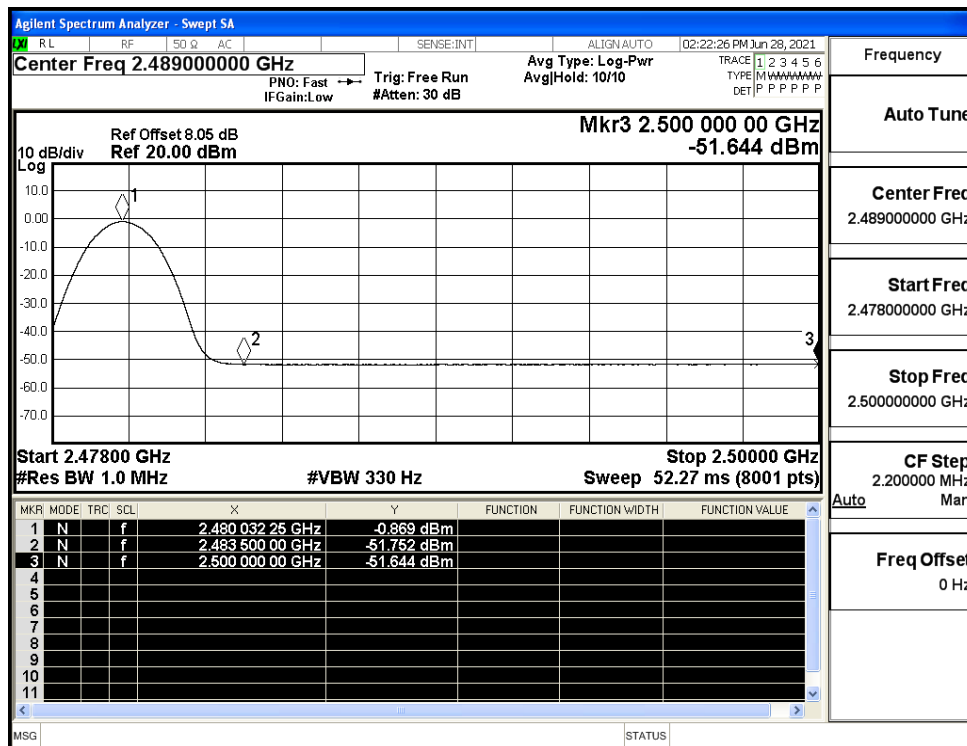
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



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

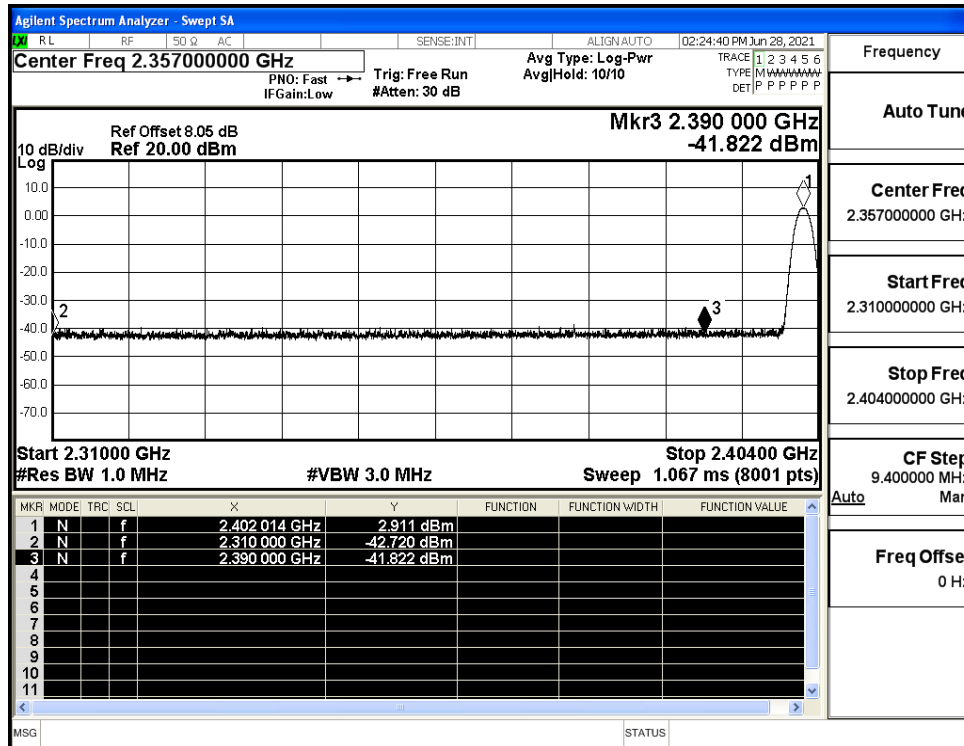


Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)

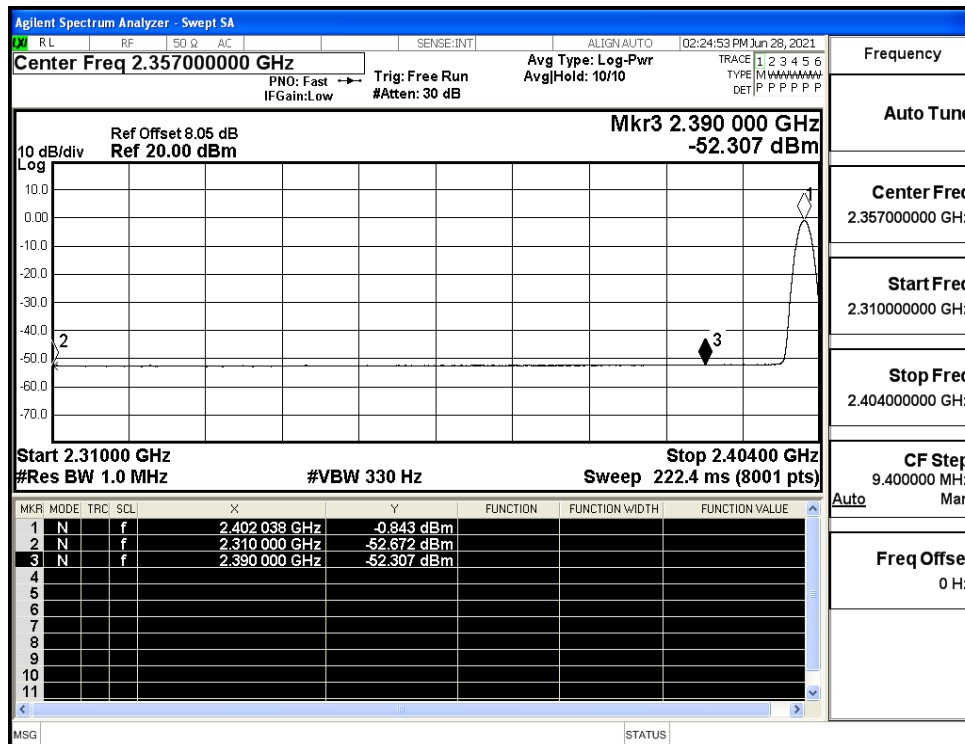




Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)

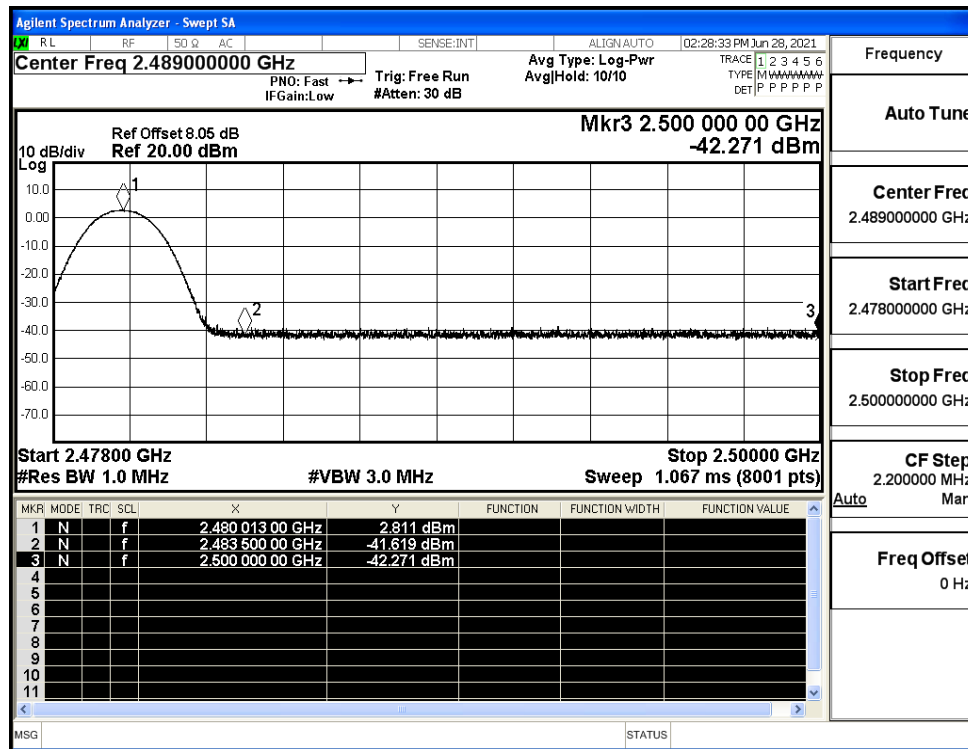


Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)





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



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)

