

Appendix A

RF Test Data for BT V4.1 (BDR/EDR) (Conducted Measurement)

Product Name: WIRELESS HEADPHONE

Trade Mark: PAHP1002-ASST

Test Model: PrimeAudio

Environmental Conditions

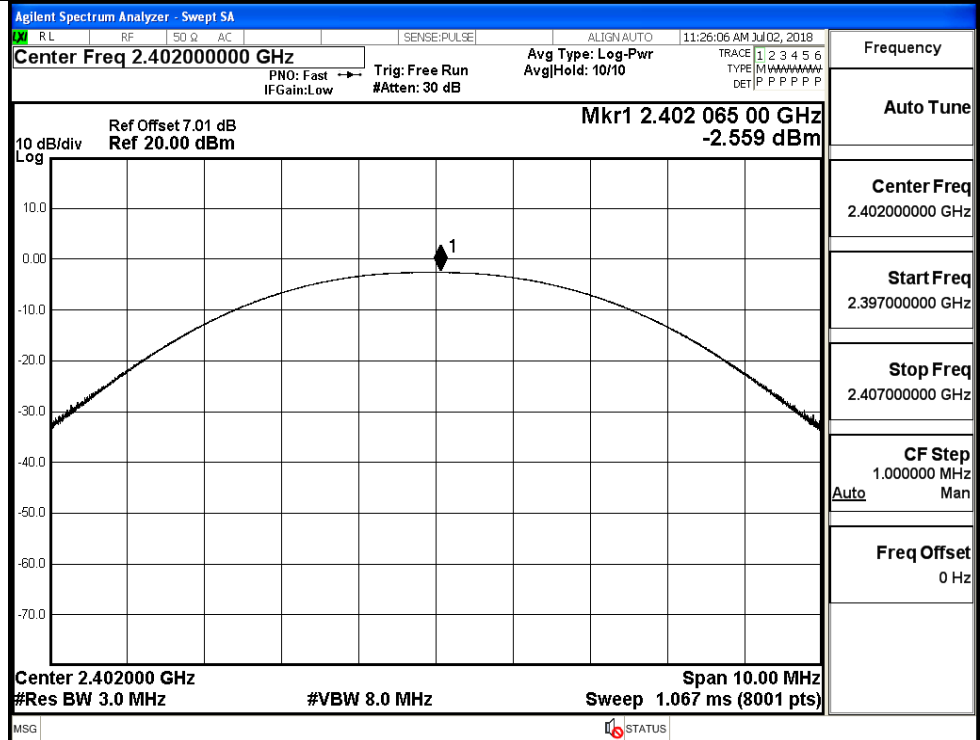
Temperature:	23.2 ° C
Relative Humidity:	53.5%
ATM Pressure:	100.0 kPa
Test Engineer:	Ryan.Hu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

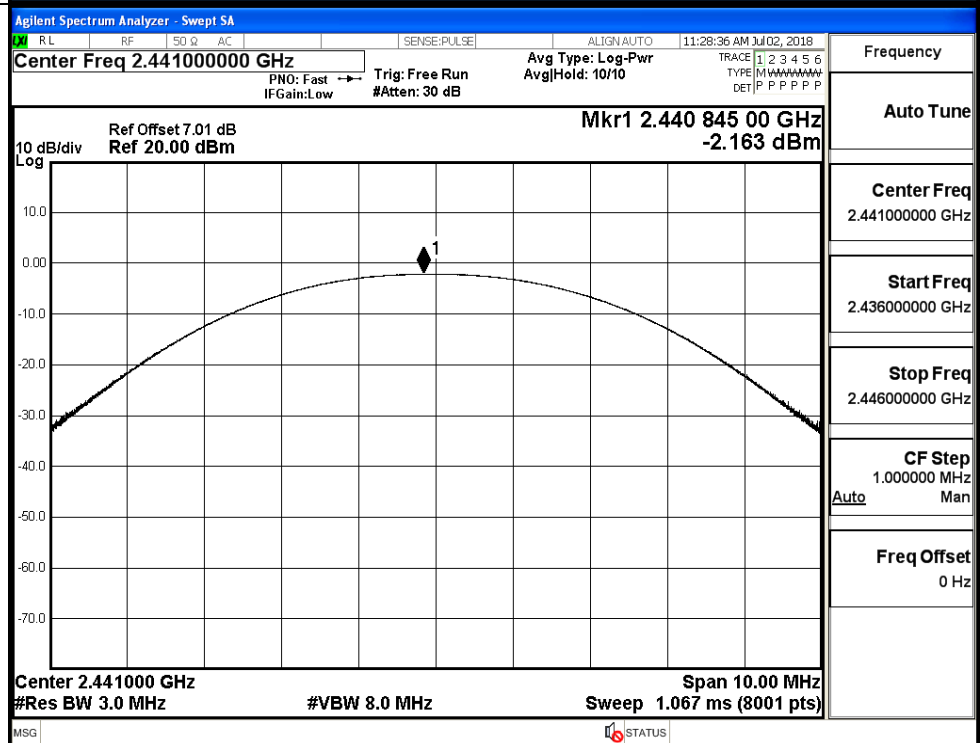
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.559	30	PASS
	MCH	-2.163	30	PASS
	HCH	-1.651	30	PASS
$\pi/4$ DQPSK	LCH	-1.762	21	PASS
	MCH	-2.222	21	PASS
	HCH	-2.764	21	PASS
8DPSK	LCH	-1.583	21	PASS
	MCH	-1.895	21	PASS
	HCH	-1.188	21	PASS

Test Graphs

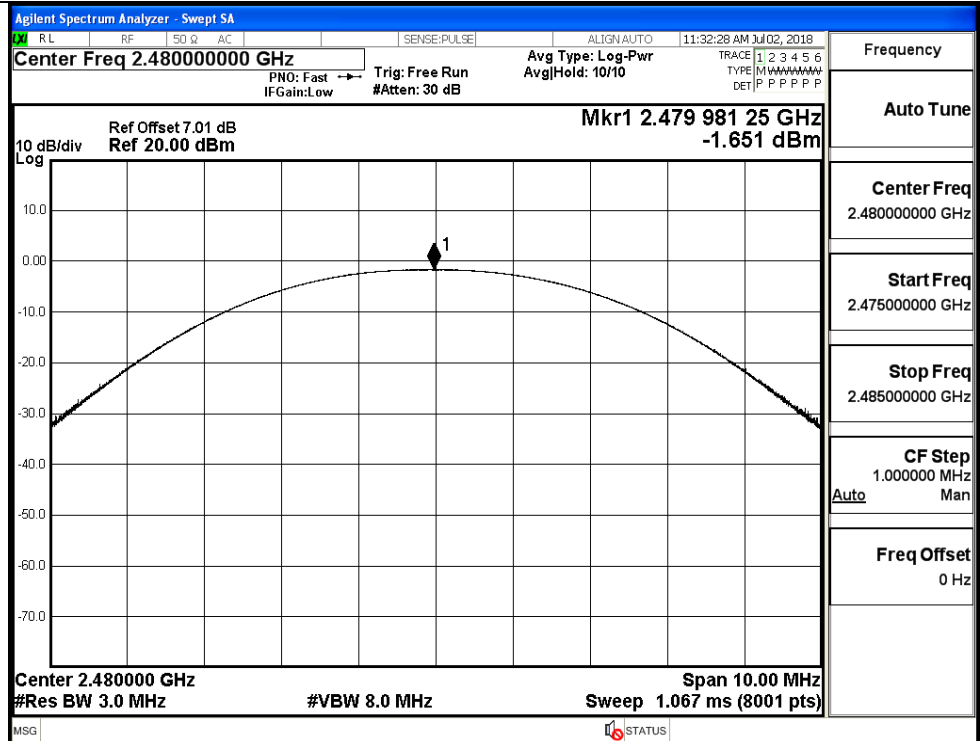
GFSK/LCH



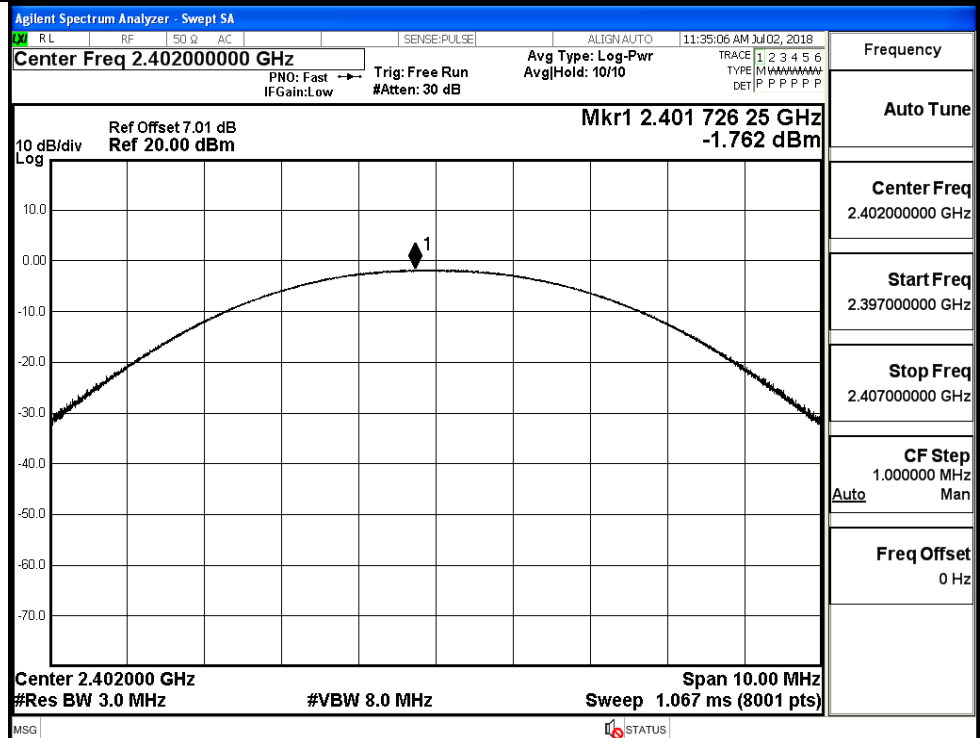
GFSK/MCH

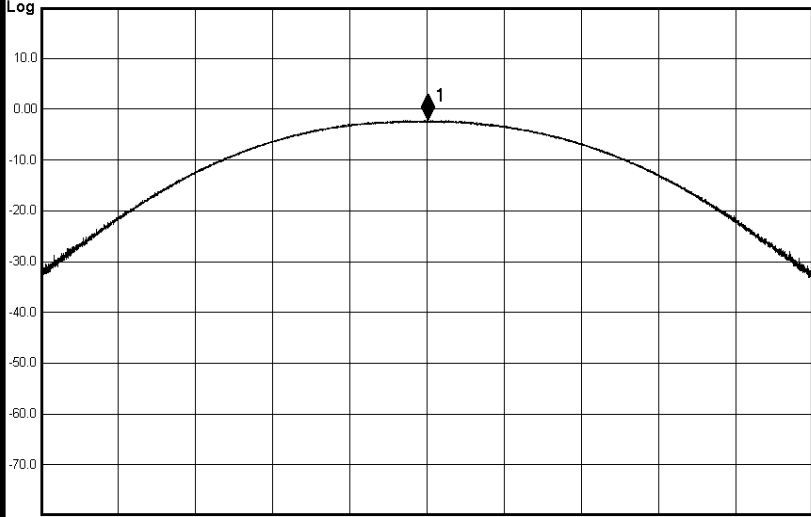
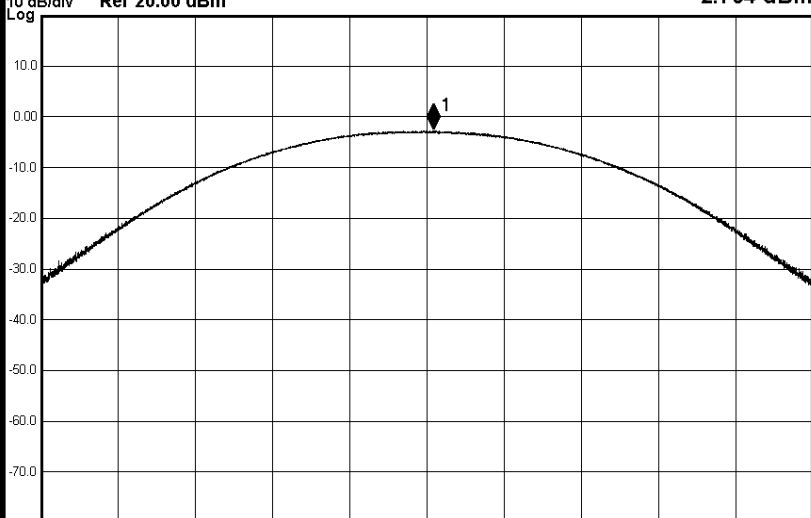


GFSK/HCH

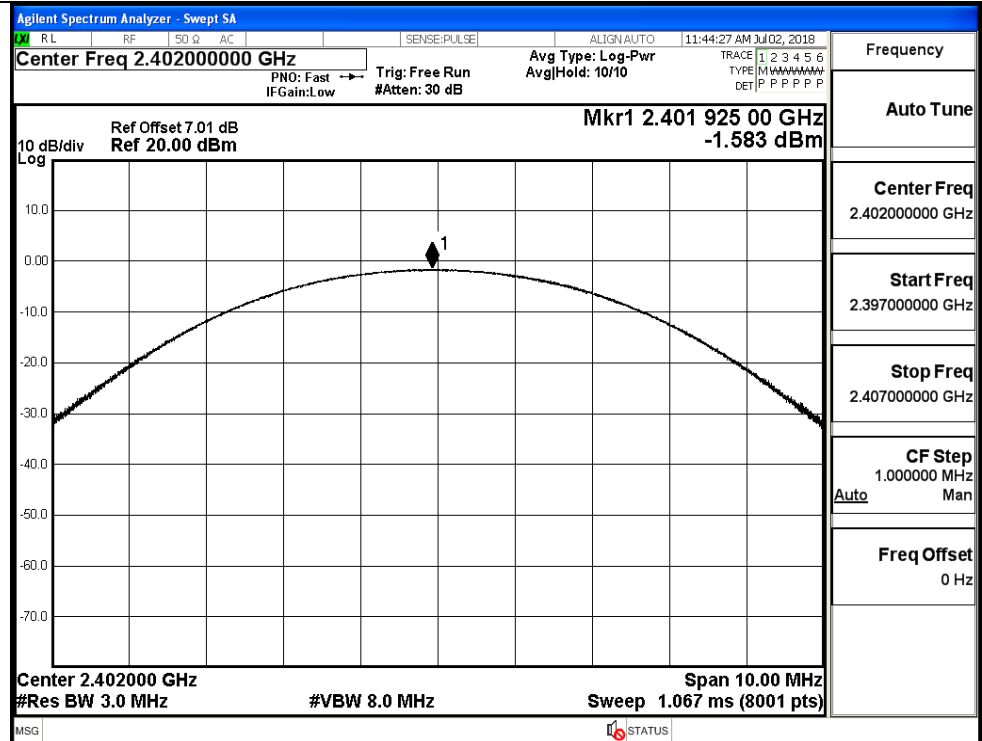


π /4DQPSK/LCH

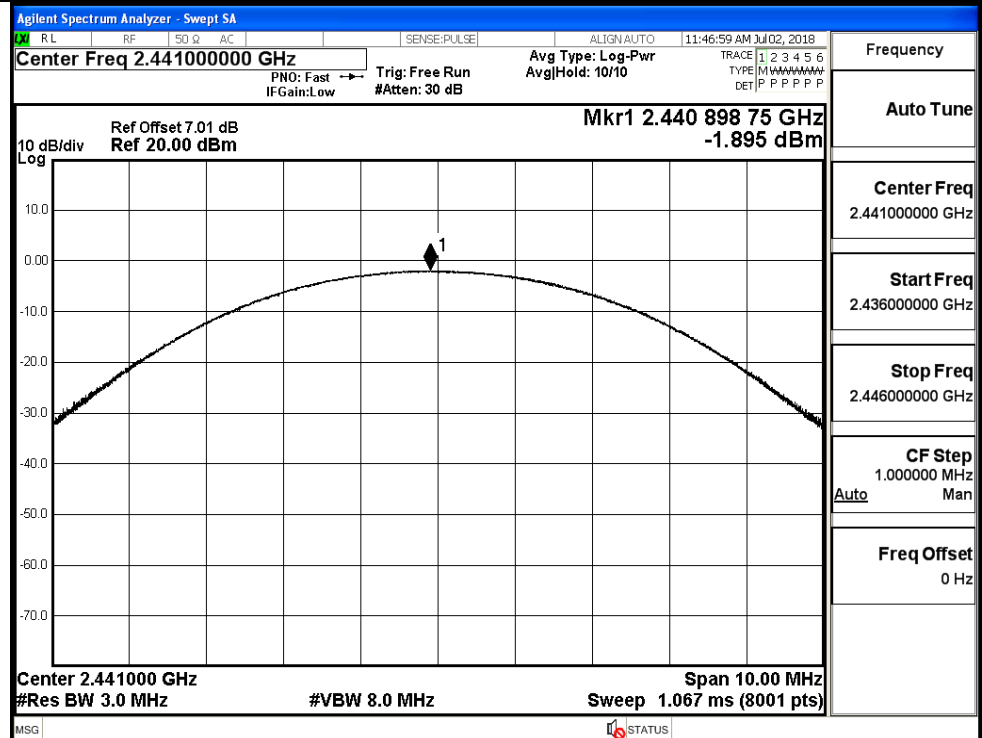


$\pi/4$DQPSK/MCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 11:37:36 AM Jul 02, 2018 Center Freq 2.441000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P P 10 dB/div Log Ref Offset 7.01 dB Ref 20.00 dBm Mkr1 2.441 011 25 GHz -2.222 dBm  Center 2.441000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Span 10.00 MHz Sweep 1.067 ms (8001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.436000000 GHz Stop Freq 2.446000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz
$\pi/4$DQPSK/HCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 11:39:32 AM Jul 02, 2018 Center Freq 2.480000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P P 10 dB/div Log Ref Offset 7.01 dB Ref 20.00 dBm Mkr1 2.480 081 25 GHz -2.764 dBm  Center 2.480000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Span 10.00 MHz Sweep 1.067 ms (8001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.480000000 GHz Start Freq 2.475000000 GHz Stop Freq 2.485000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz

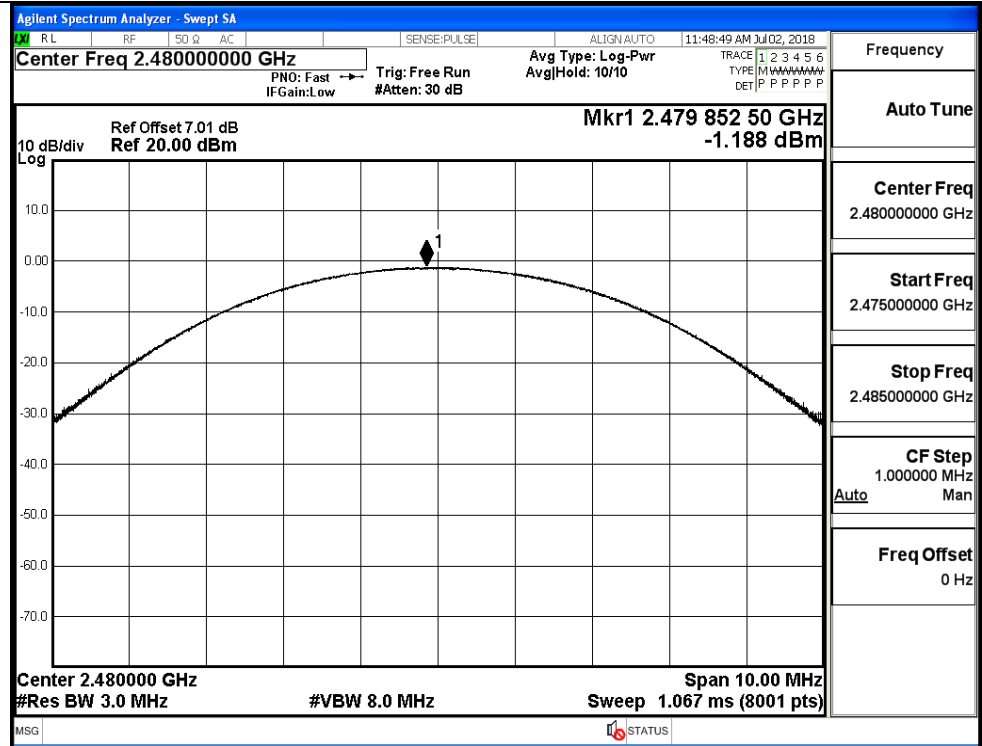
8DPSK/LCH



8DPSK/MCH



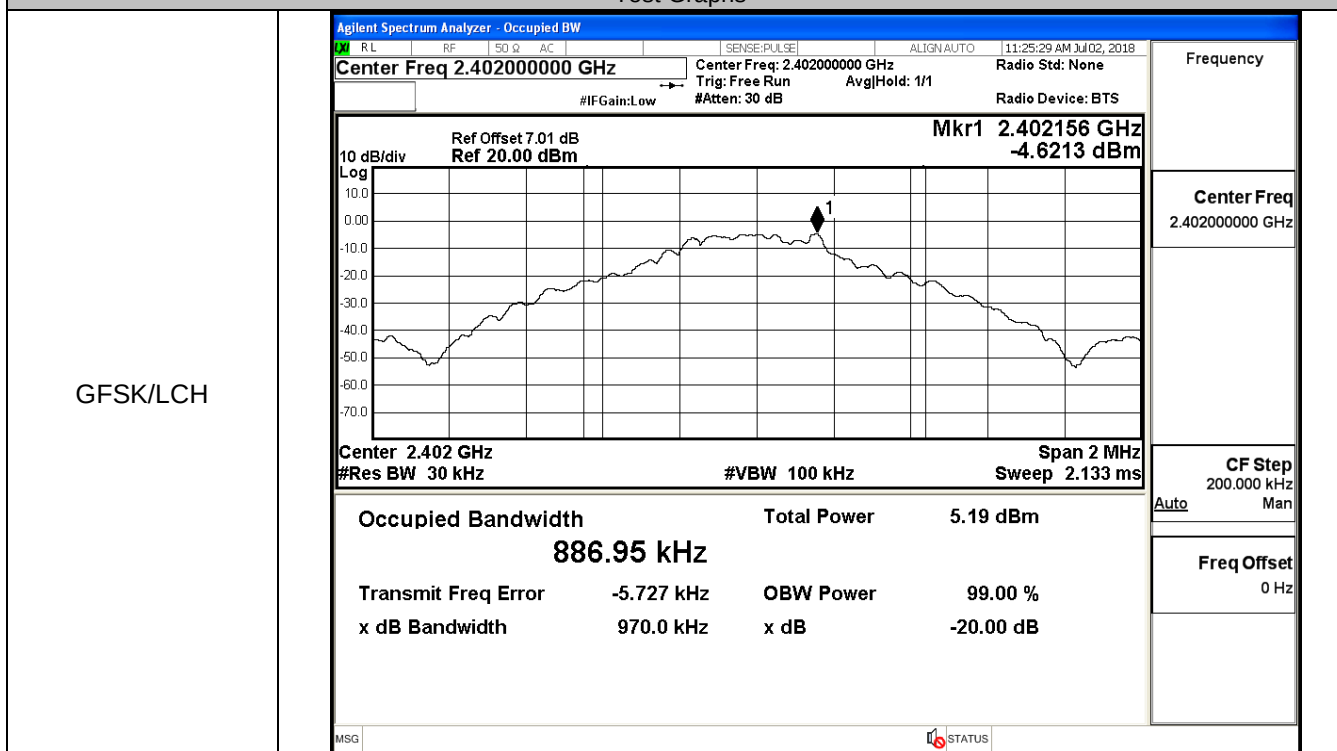
8DPSK/HCH



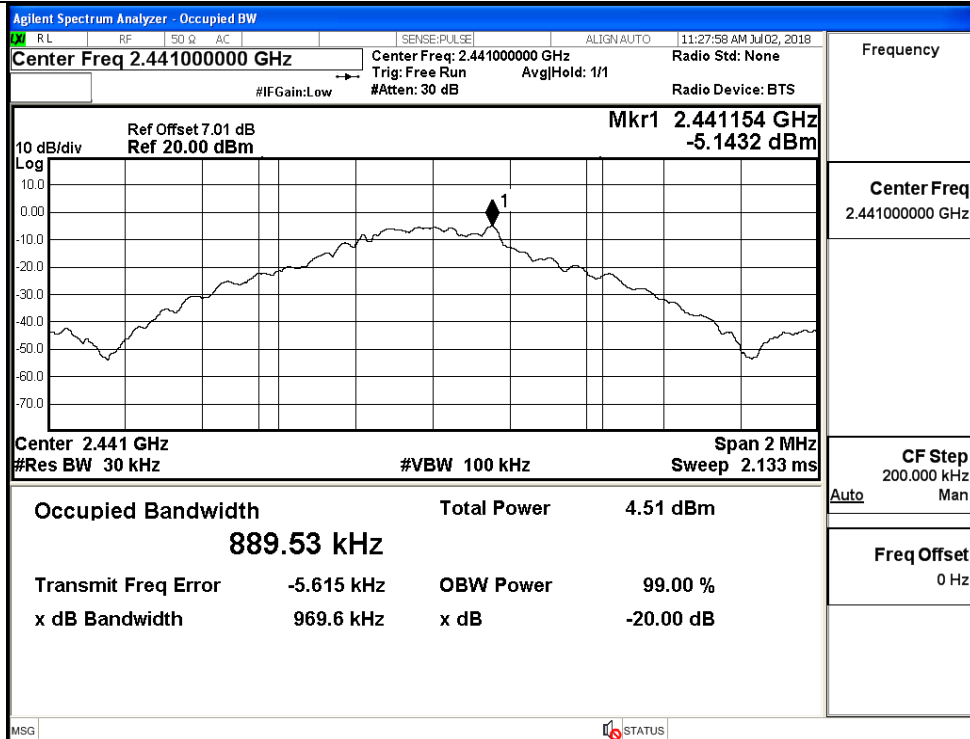
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9700	Not Specified	PASS
	MCH	0.9696	Not Specified	PASS
	HCH	0.9677	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.291	Not Specified	PASS
	MCH	1.317	Not Specified	PASS
	HCH	1.287	Not Specified	PASS
8DPSK	LCH	1.292	Not Specified	PASS
	MCH	1.292	Not Specified	PASS
	HCH	1.291	Not Specified	PASS

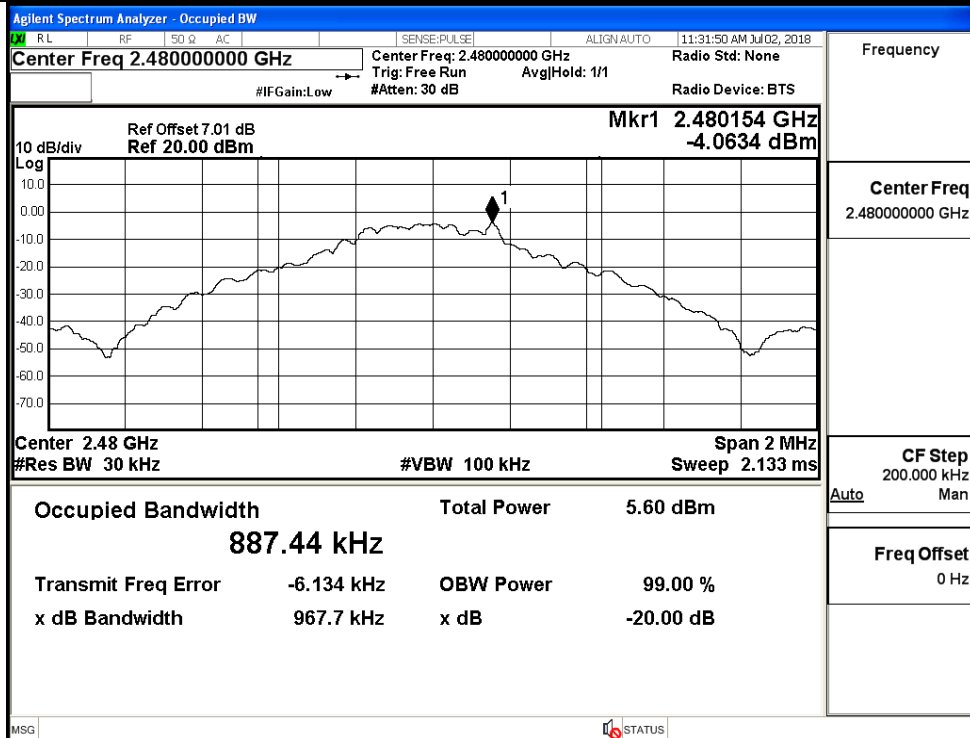
Test Graphs



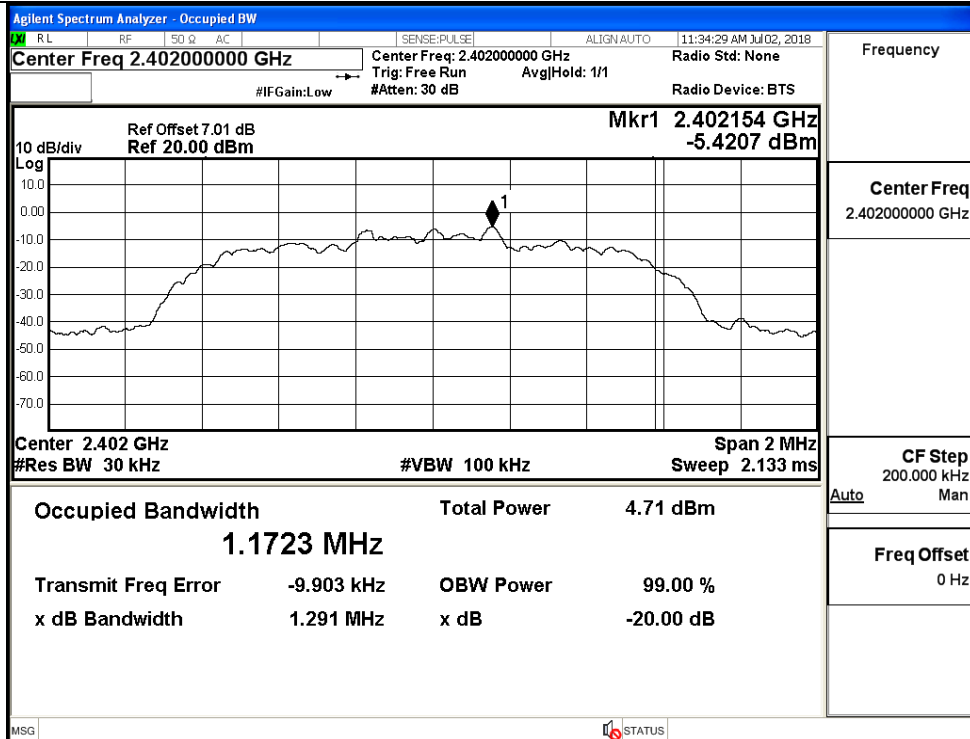
GFSK/MCH



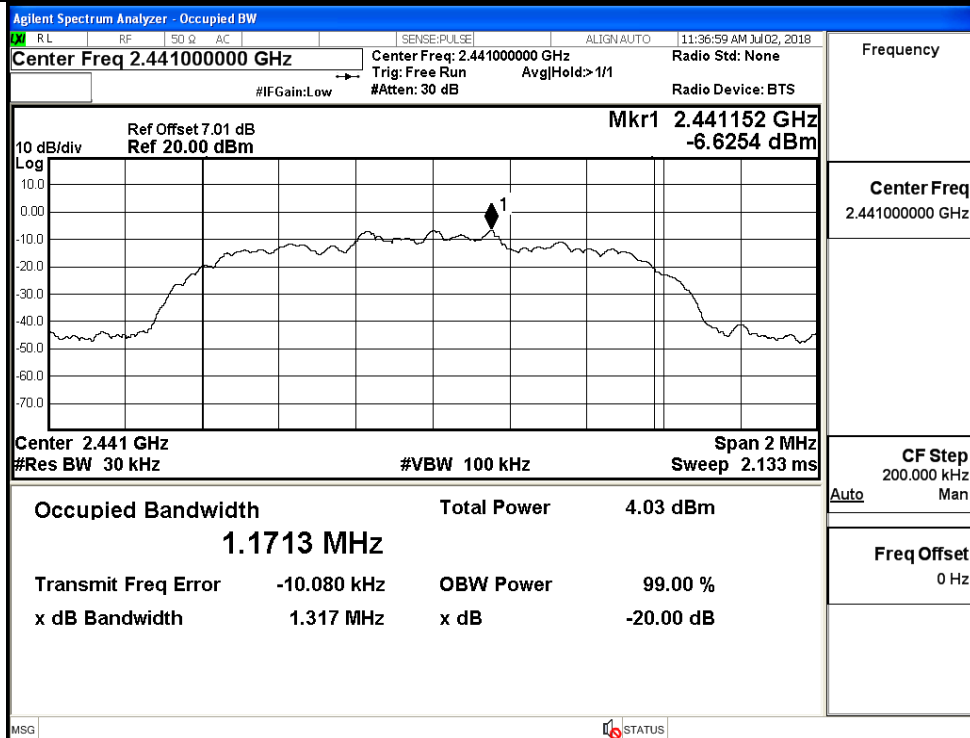
GFSK/HCH



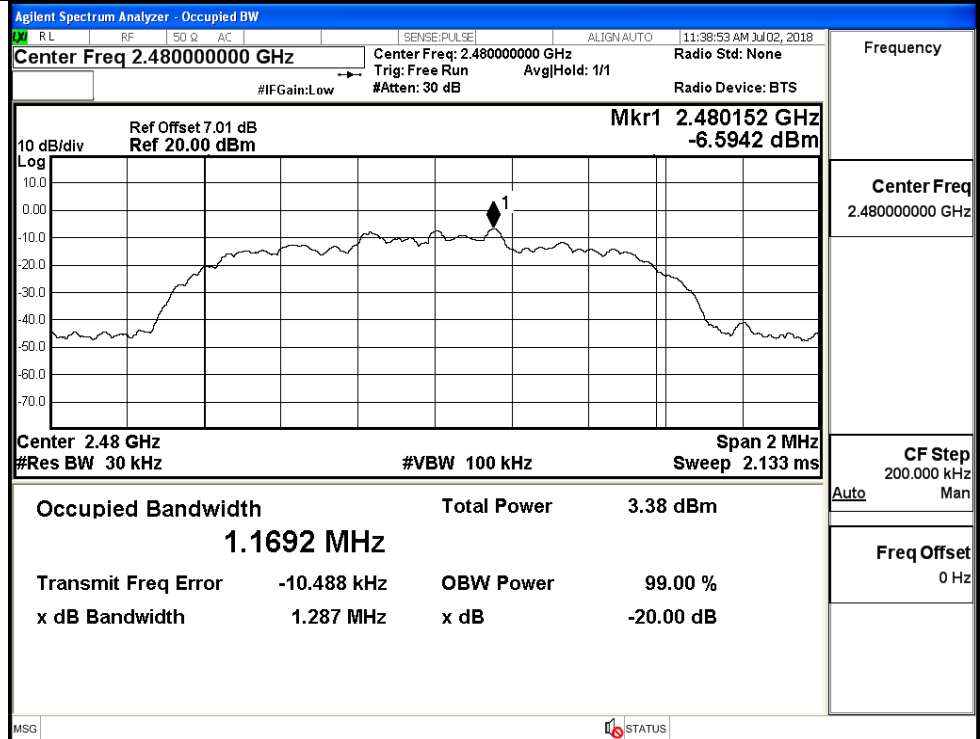
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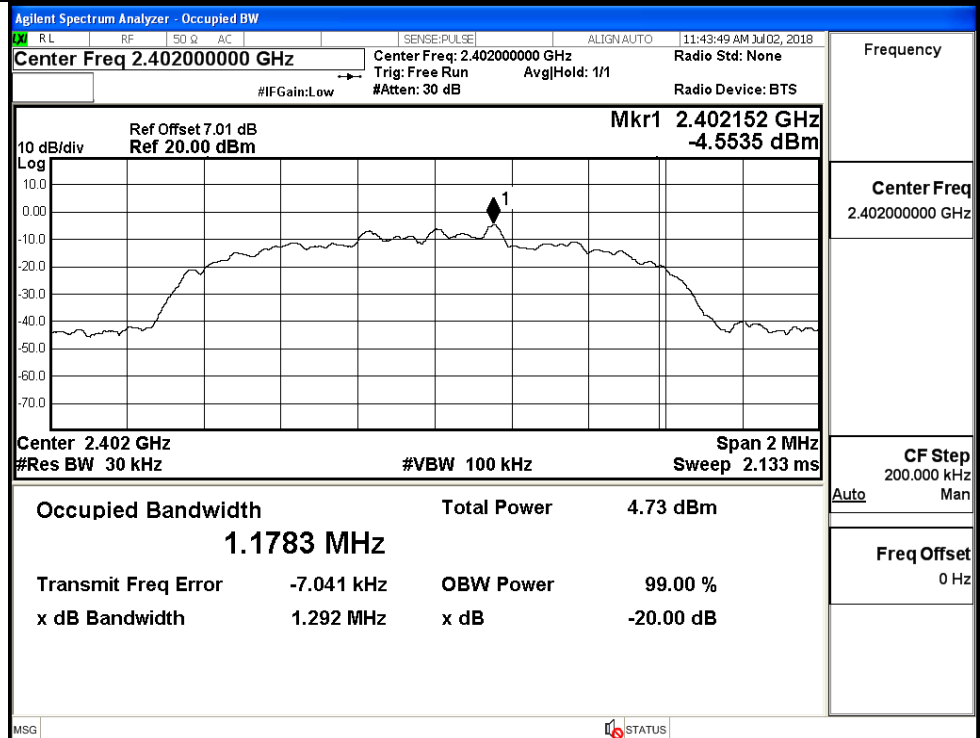
$\pi/4$ DQPSK/MCH



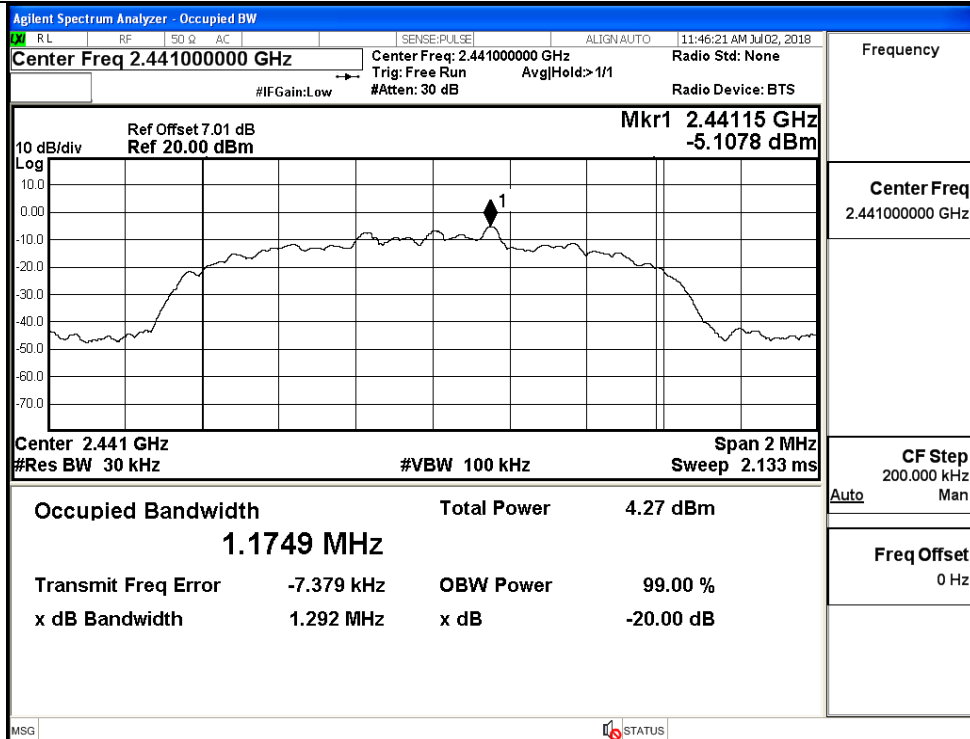
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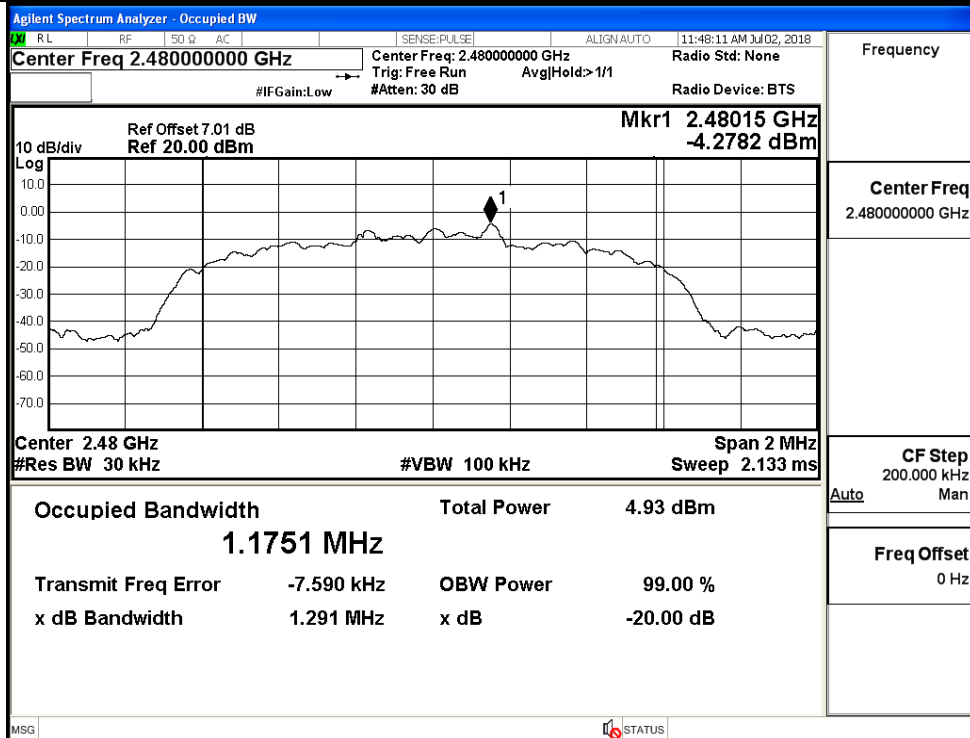
8DPSK/LCH



8DPSK/MCH



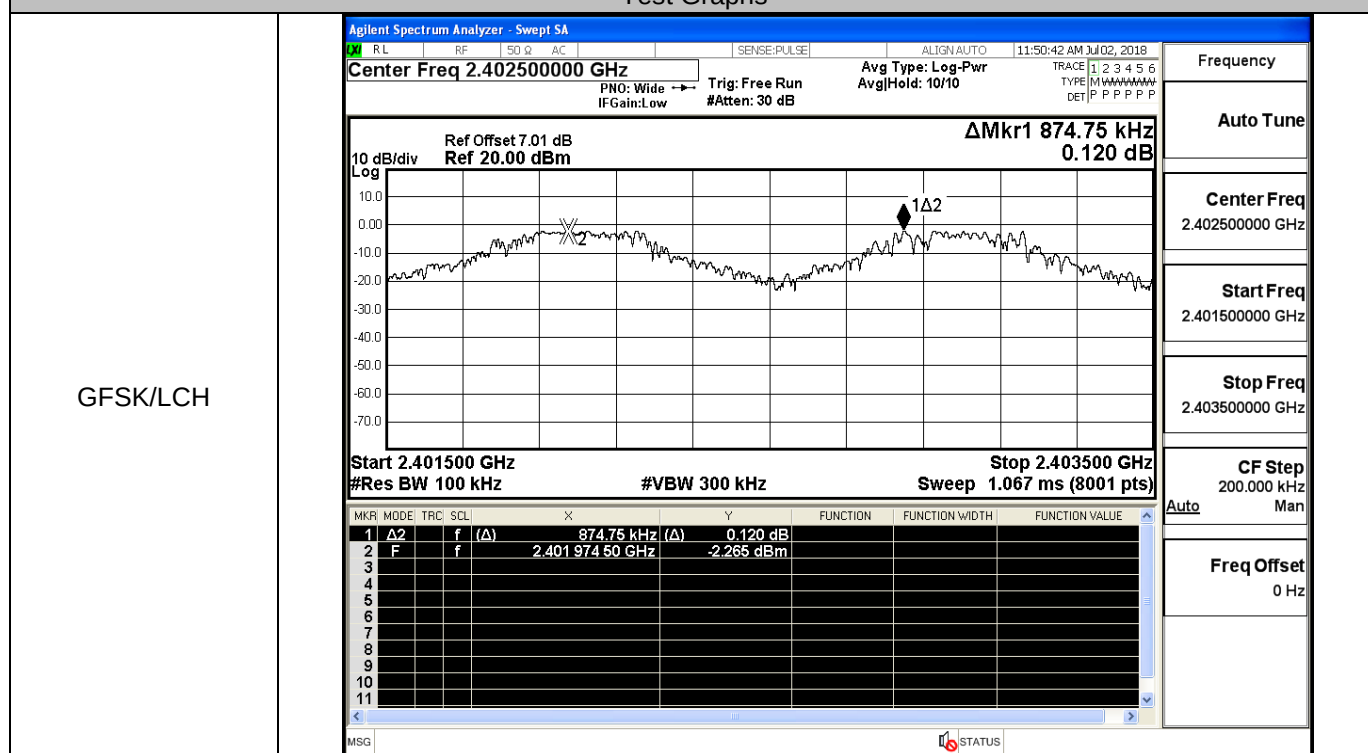
8DPSK/HCH



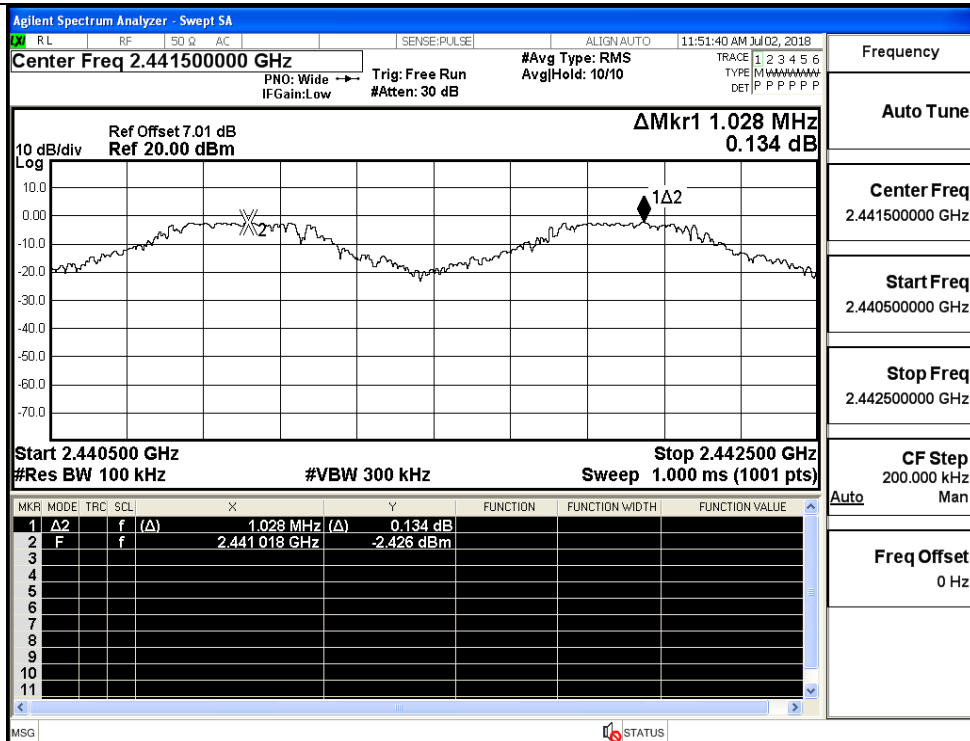
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.875	0.647	PASS
	MCH	1.028	0.647	PASS
	HCH	0.978	0.647	PASS
π /4DQPSK	LCH	0.954	0.878	PASS
	MCH	1.212	0.878	PASS
	HCH	1.178	0.878	PASS
8DPSK	LCH	1.178	0.861	PASS
	MCH	1.088	0.861	PASS
	HCH	0.990	0.861	PASS

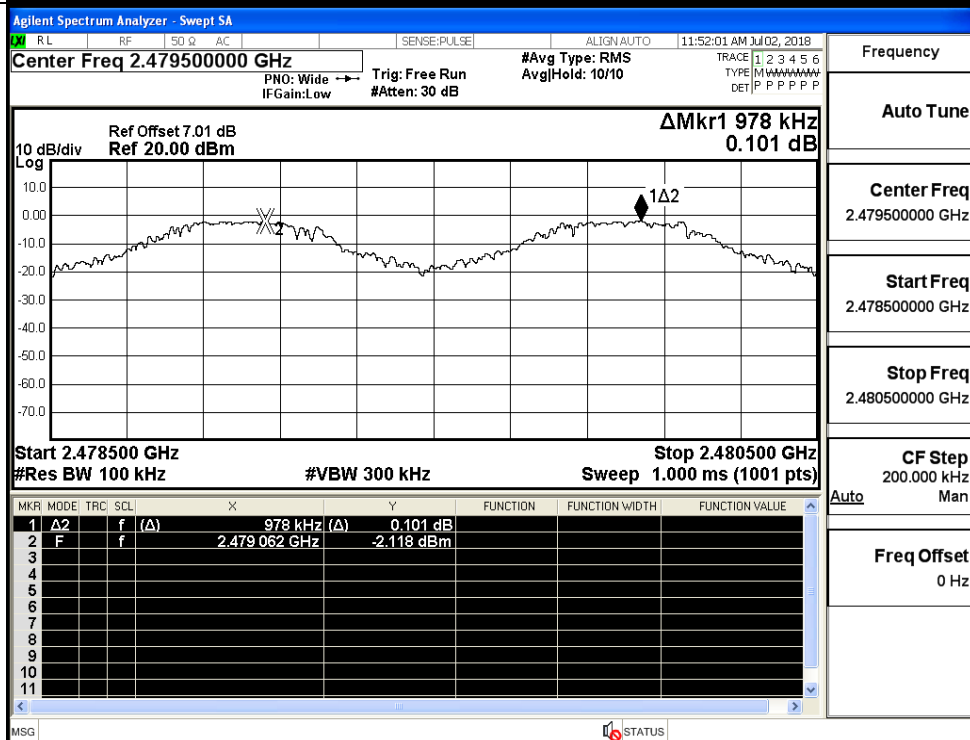
Test Graphs



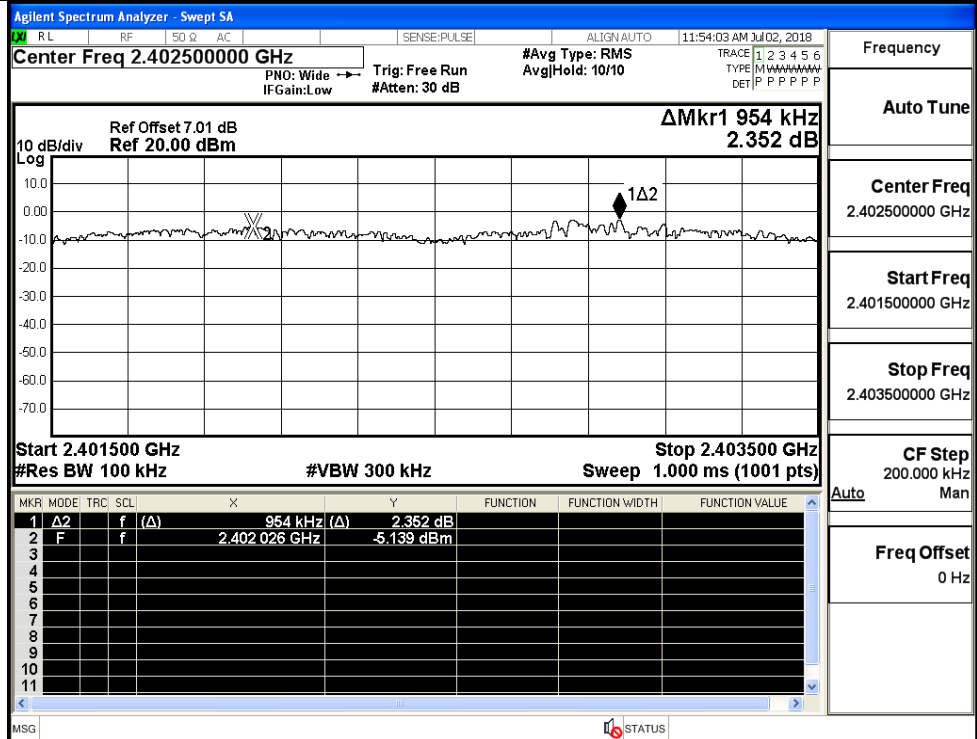
GFSK/MCH



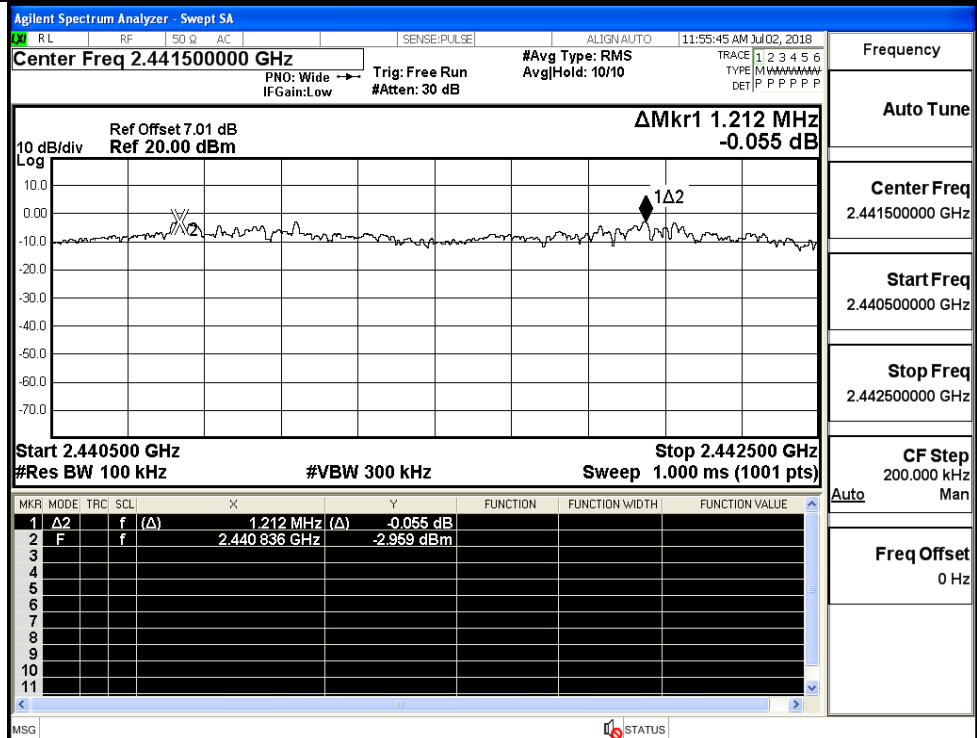
GFSK/HCH

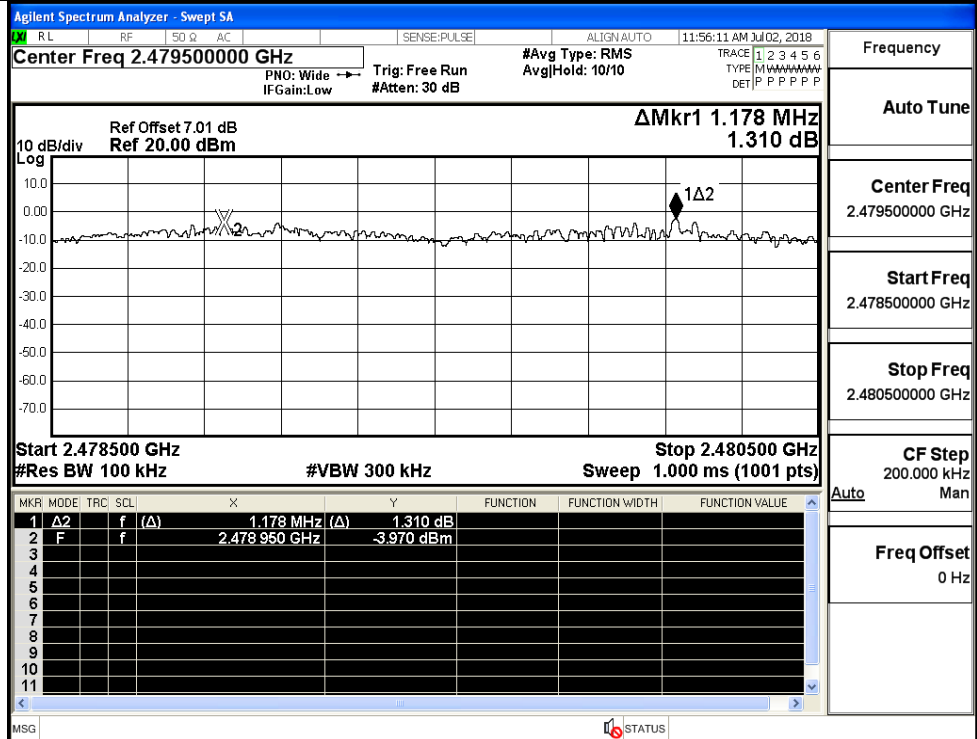


$\pi/4$ DQPSK/LCH

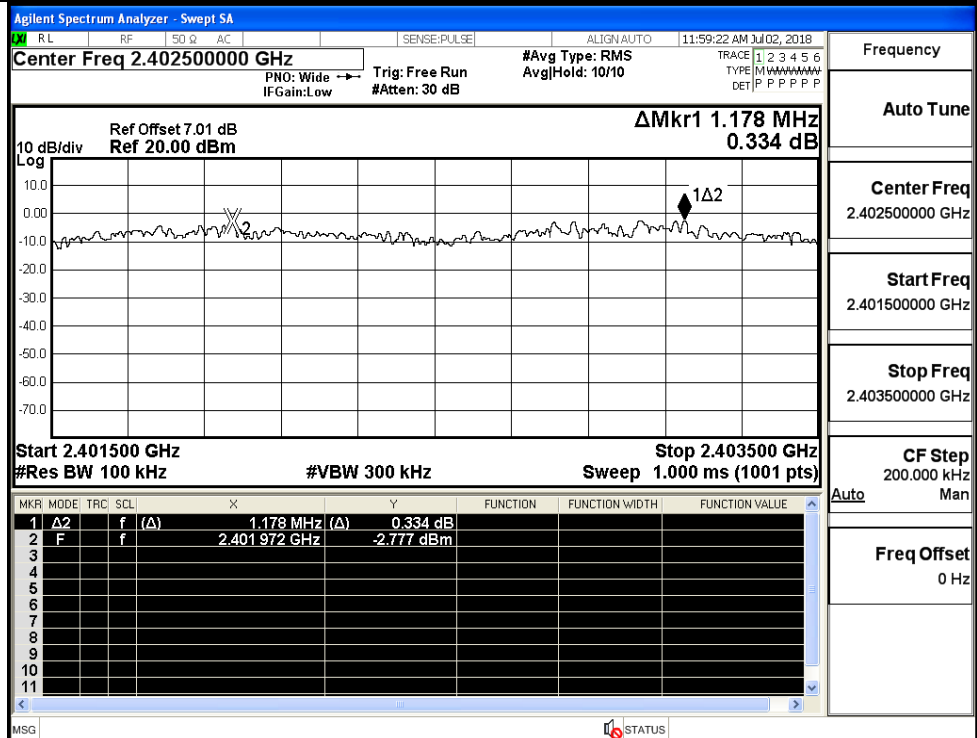


$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

8DPSK/LCH



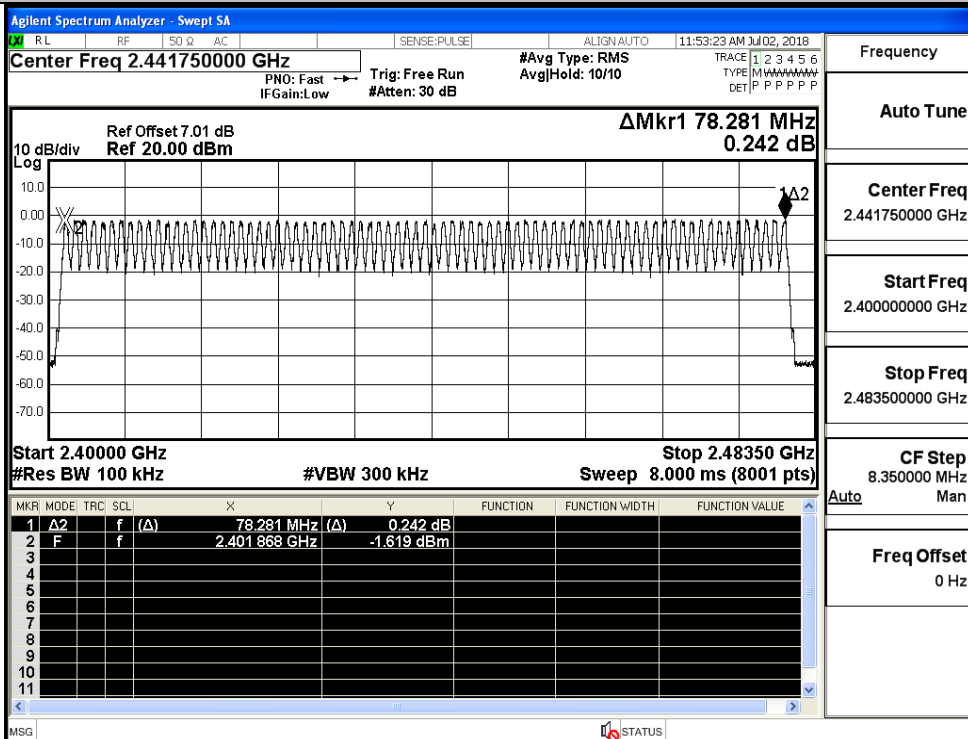
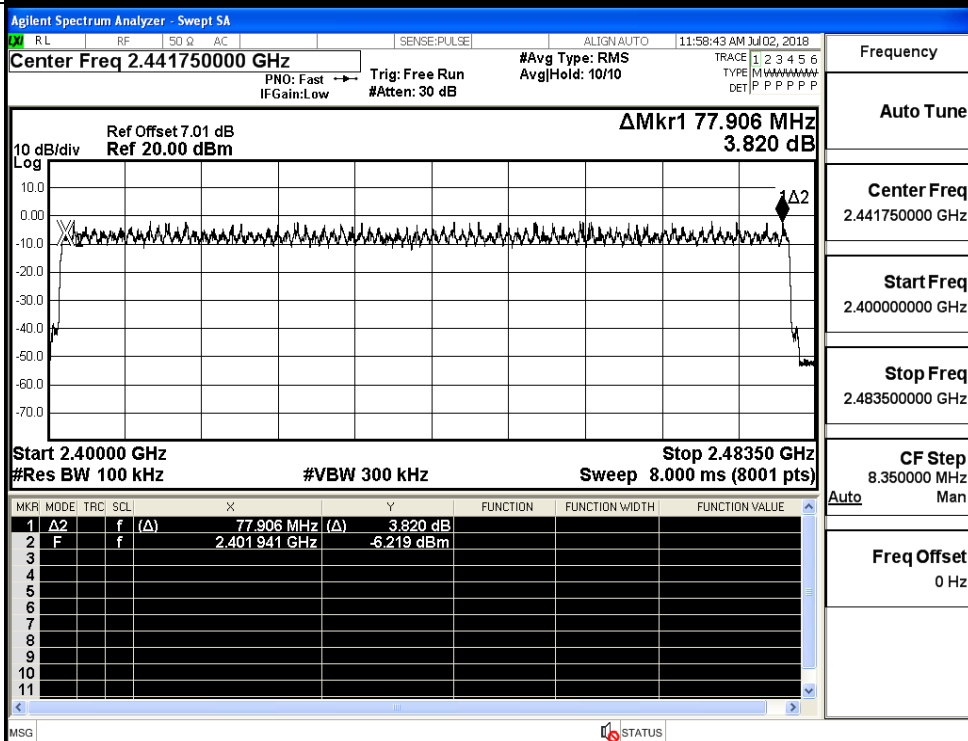
8DPSK/MCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Q AC SENSE:PULSE ALIGN: AUTO 12:01:03 PM Jul 02, 2018 Center Freq 2.441500000 GHz PN0: Wide → IF Gain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS AvgHold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W DET P P P P P P P Ref Offset 7.01 dB Ref 20.00 dBm ΔMkr1 1.088 MHz 0.206 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>1.088 MHz (Δ)</td><td>0.206 dB</td><td></td><td></td><td></td></tr><tr><td>2</td><td>F</td><td>f</td><td></td><td>2.441 066 GHz</td><td>-2.958 dBm</td><td></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 Freq Offset 0 Hz	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	1.088 MHz (Δ)	0.206 dB				2	F	f		2.441 066 GHz	-2.958 dBm				3									4									5									6									7									8									9									10									11								
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8DPSK/HCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Q AC SENSE:PULSE ALIGN: AUTO 01:34:20 PM Jul 02, 2018 Center Freq 2.479500000 GHz PN0: Wide → IF Gain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS AvgHold: >10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W DET P P P P P P P Ref Offset 7.01 dB Ref 20.00 dBm ΔMkr1 990 kHz 0.101 dB 10 dB/div Log Start 2.478500 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.480500 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>990 kHz (Δ)</td><td>0.101 dB</td><td></td><td></td><td></td></tr><tr><td>2</td><td>F</td><td>f</td><td></td><td>2.478 852 GHz</td><td>-5.429 dBm</td><td></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 2.479500000 GHz Start Freq 2.478500000 GHz Stop Freq 2.480500000 GHz CF Step 200.000 kHz Man Freq Offset 0 Hz	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	990 kHz (Δ)	0.101 dB				2	F	f		2.478 852 GHz	-5.429 dBm				3									4									5									6									7									8									9									10									11								
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A.4 Hopping Channel Number

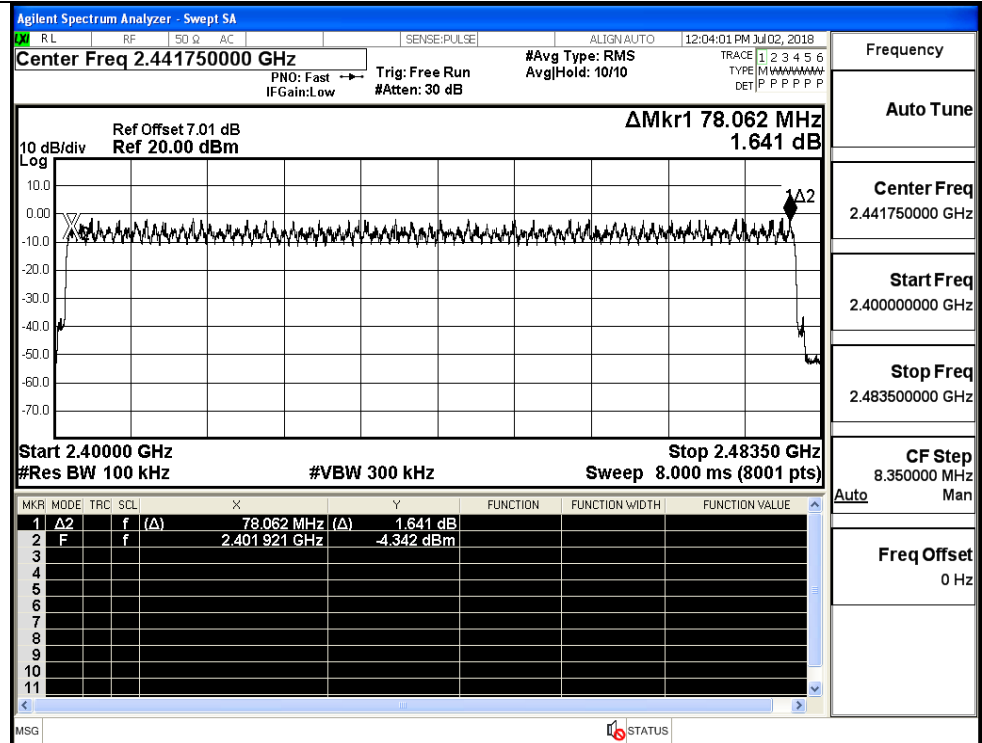
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

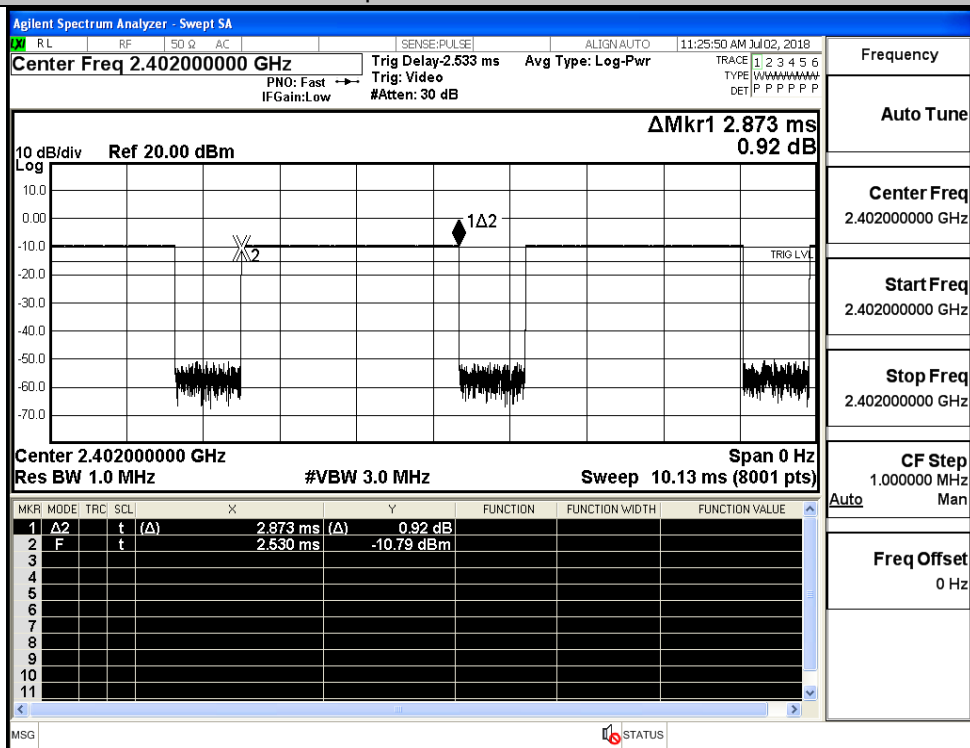


A.5 Dwell Time

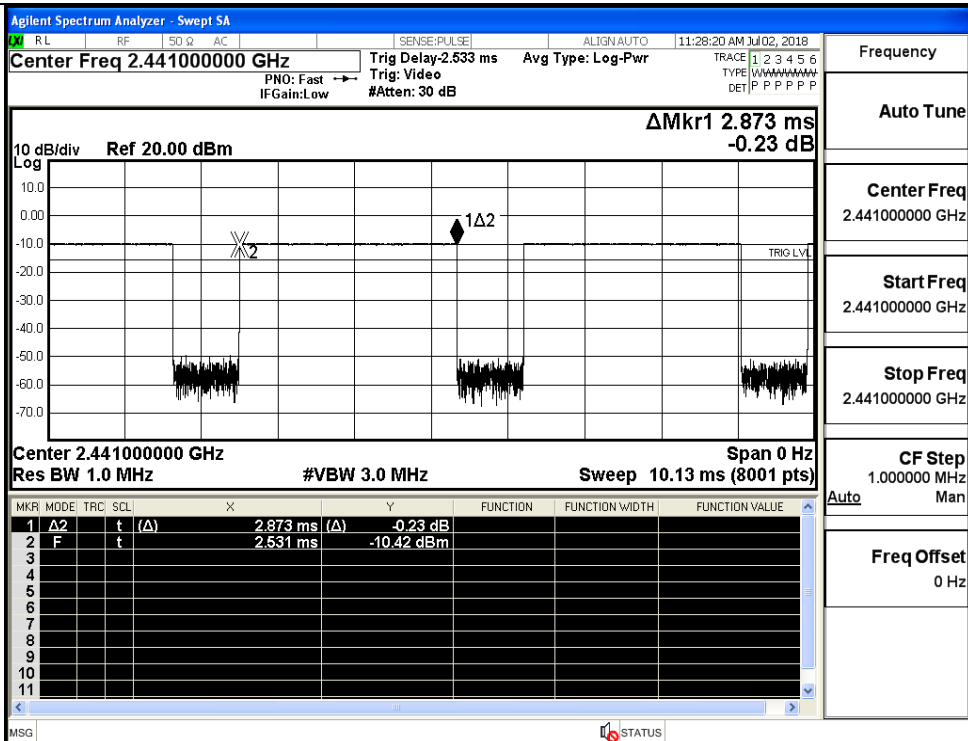
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.87	106.7	0.307	0.4	PASS
	2DH5	MCH	2.87	106.7	0.307	0.4	PASS
	2DH5	HCH	2.87	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.87	106.7	0.307	0.4	PASS
	3DH5	MCH	2.87	106.7	0.307	0.4	PASS
	3DH5	HCH	2.87	106.7	0.307	0.4	PASS

Test Graphs

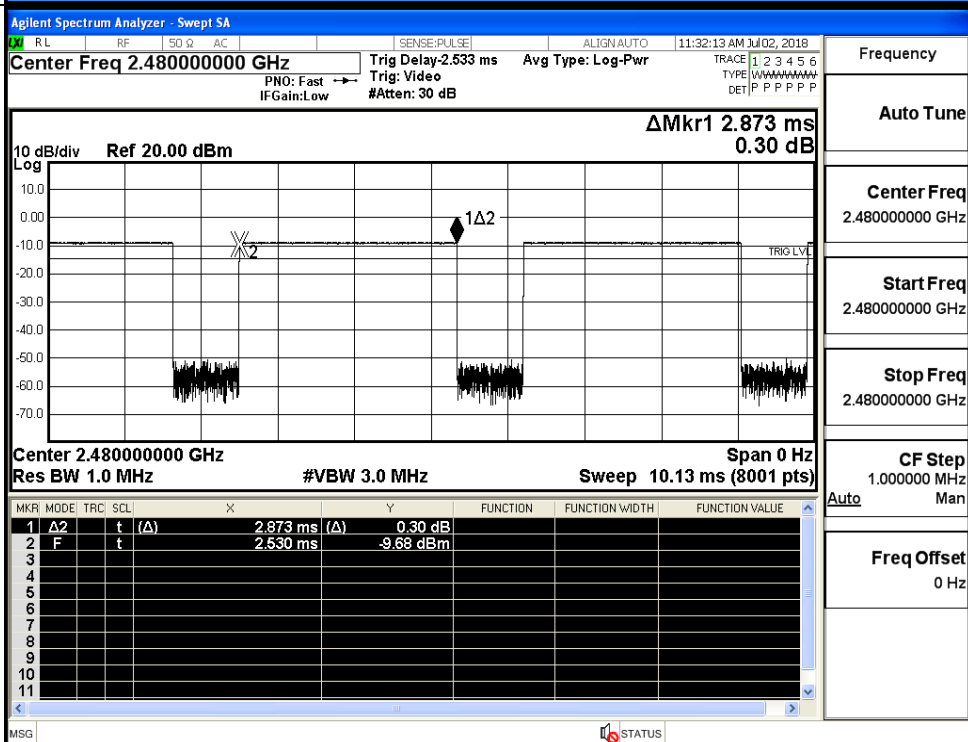
GFSK_DH5/LCH



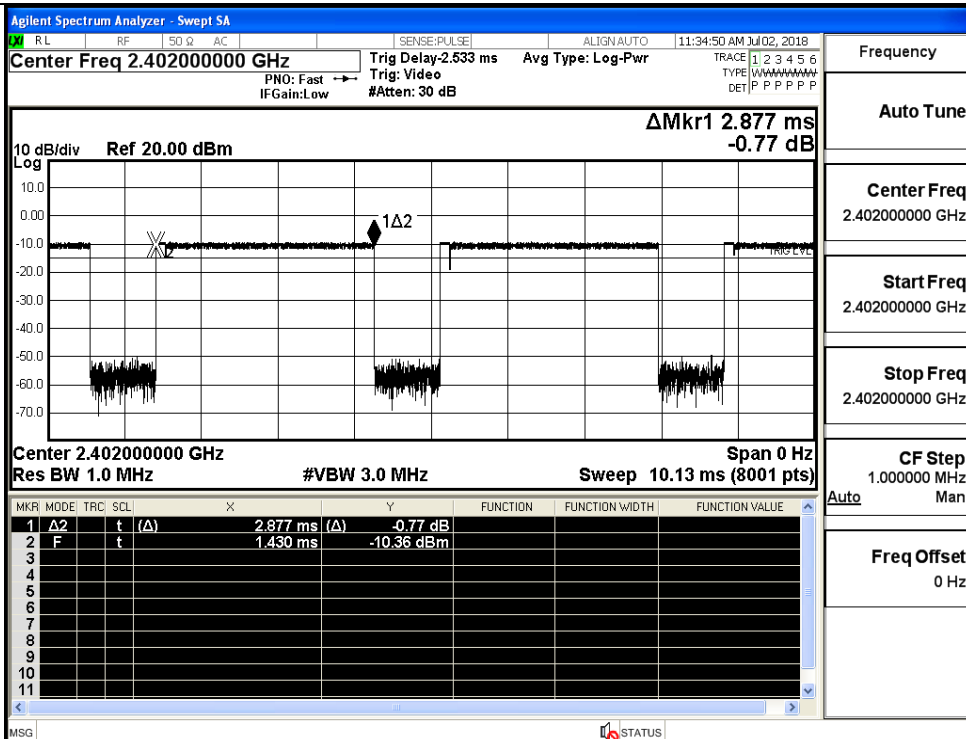
GFSK_DH5/MCH



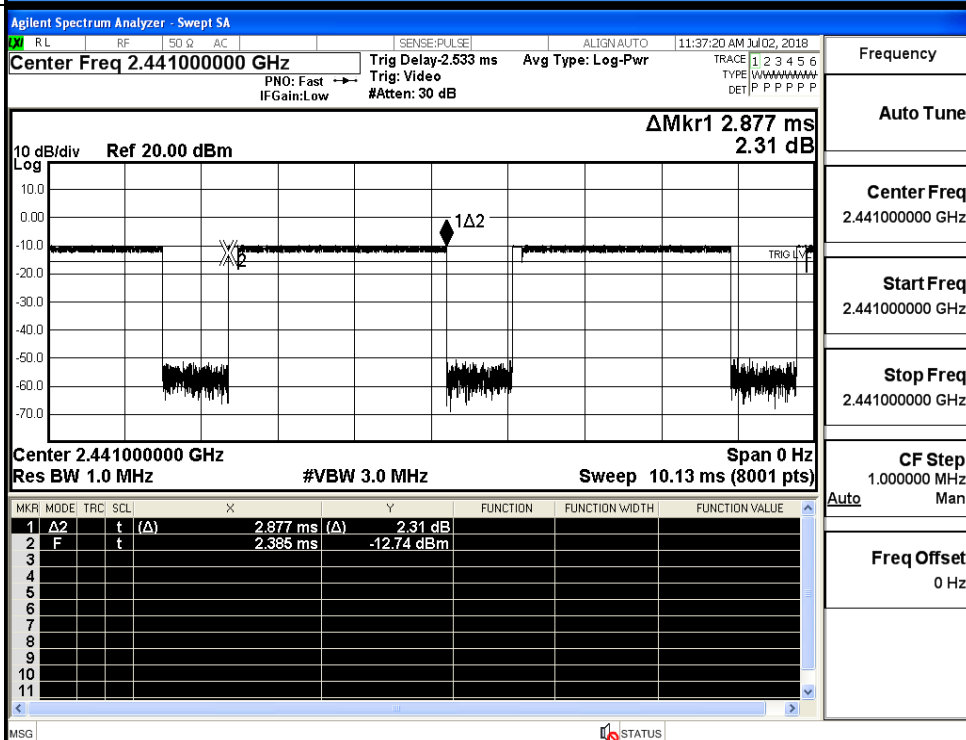
GFSK_DH5/HCH



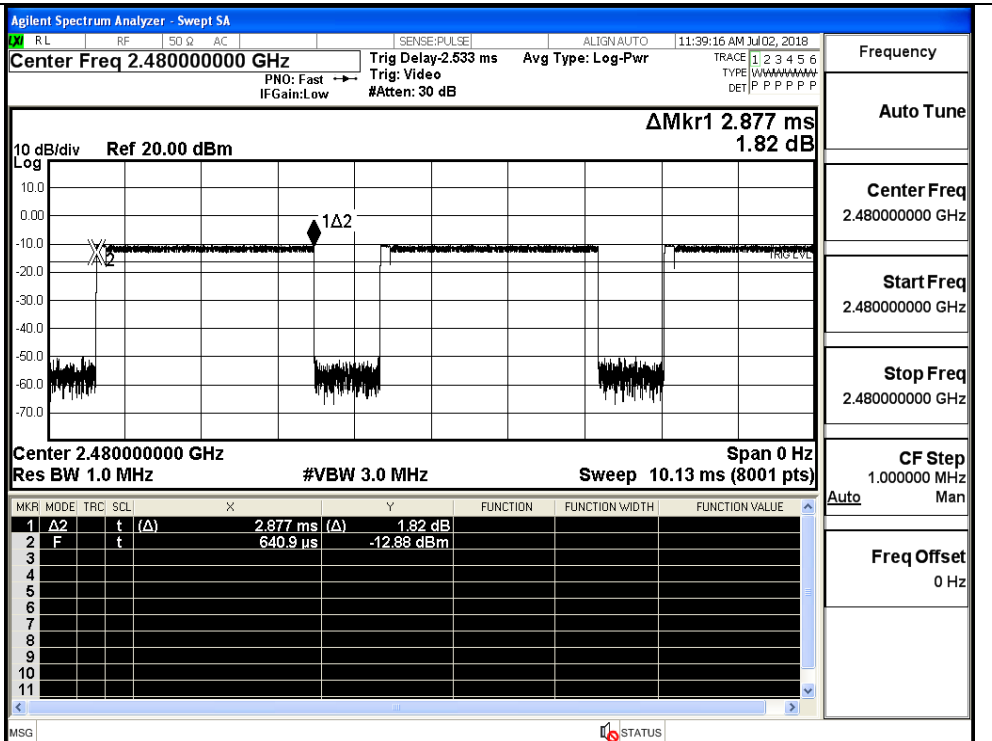
$\pi/4$ DQPSK
_2DH5/LCH



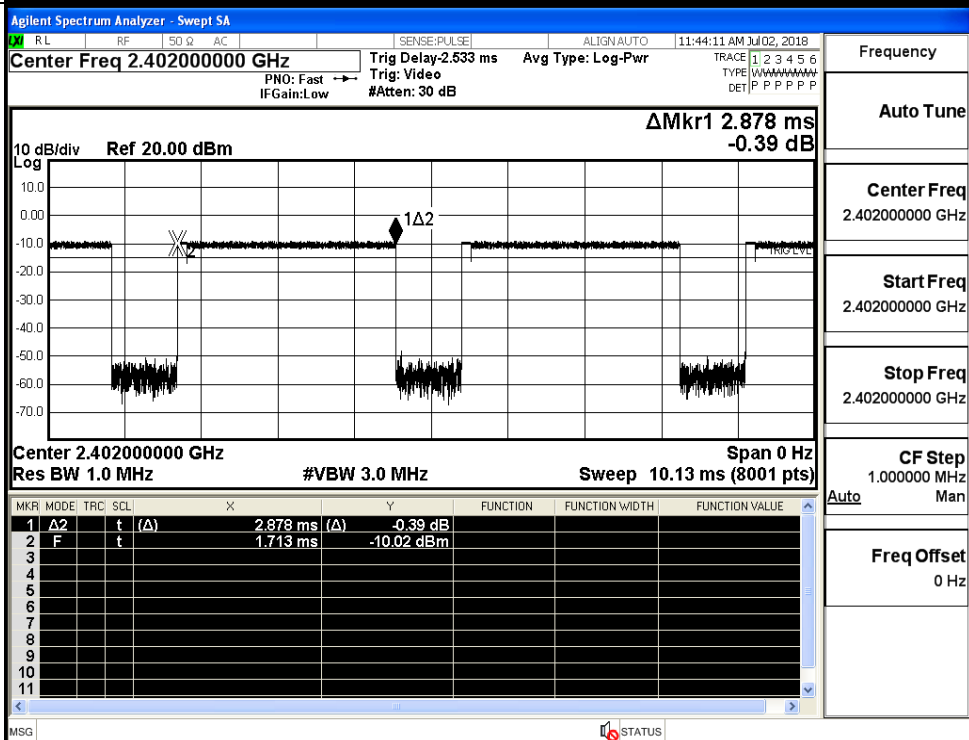
$\pi/4$ DQPSK
_2DH5/MCH



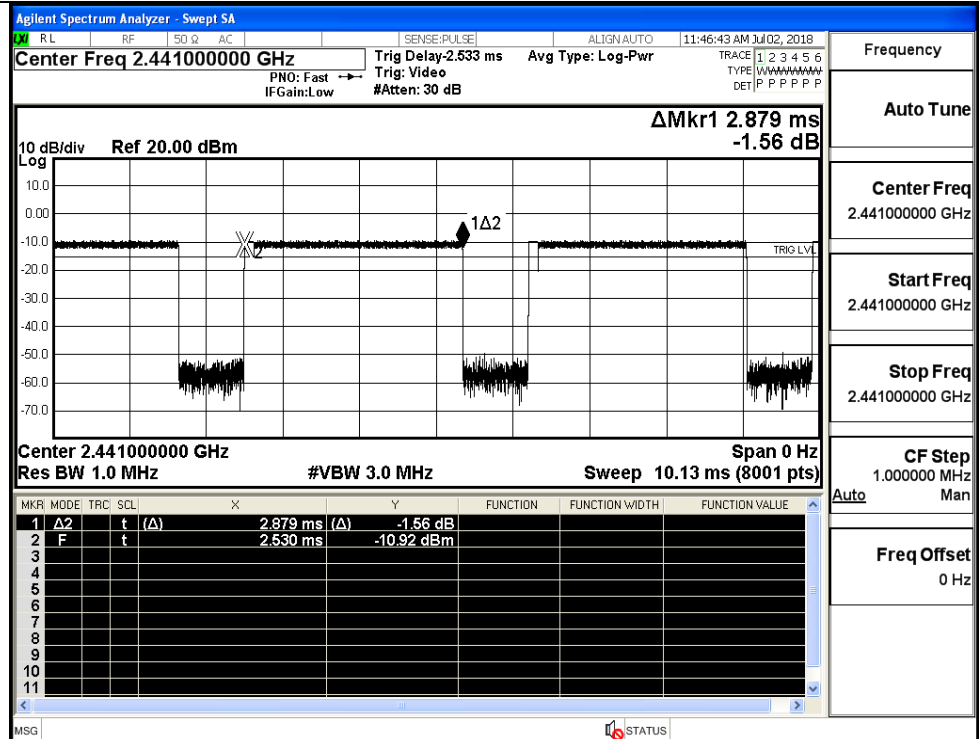
$\pi/4$ DQPSK
_2DH5/HCH



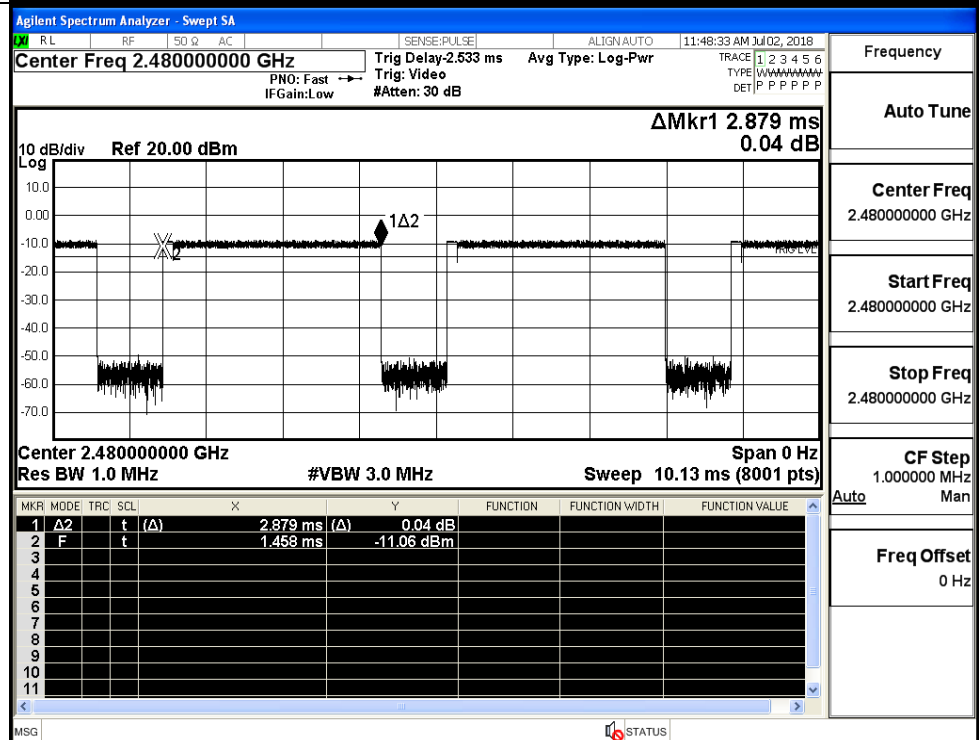
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



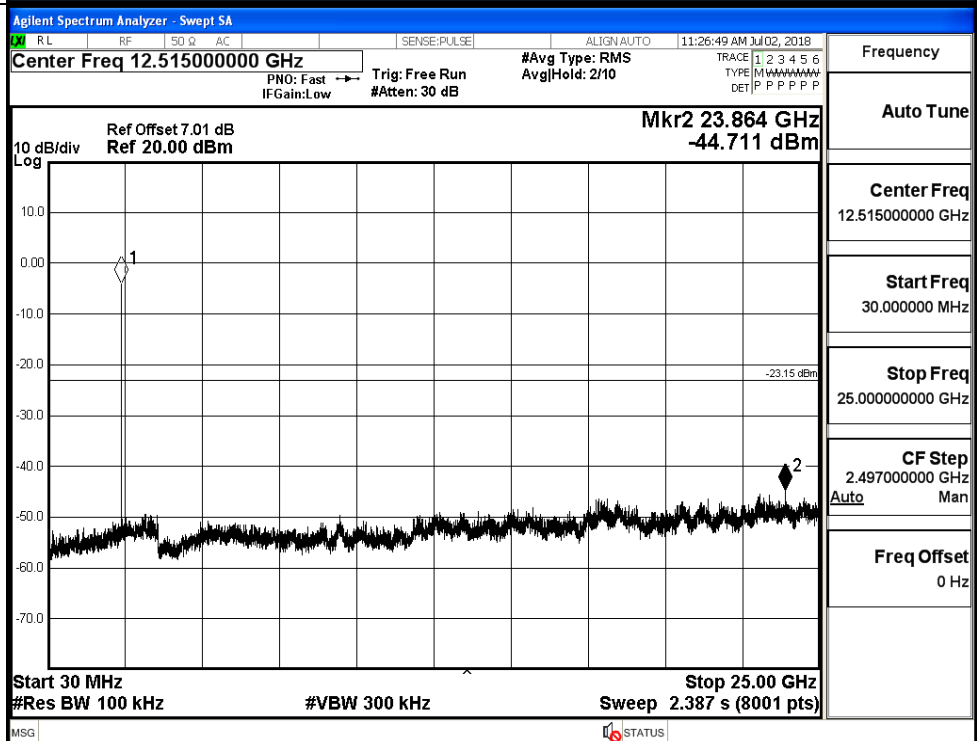
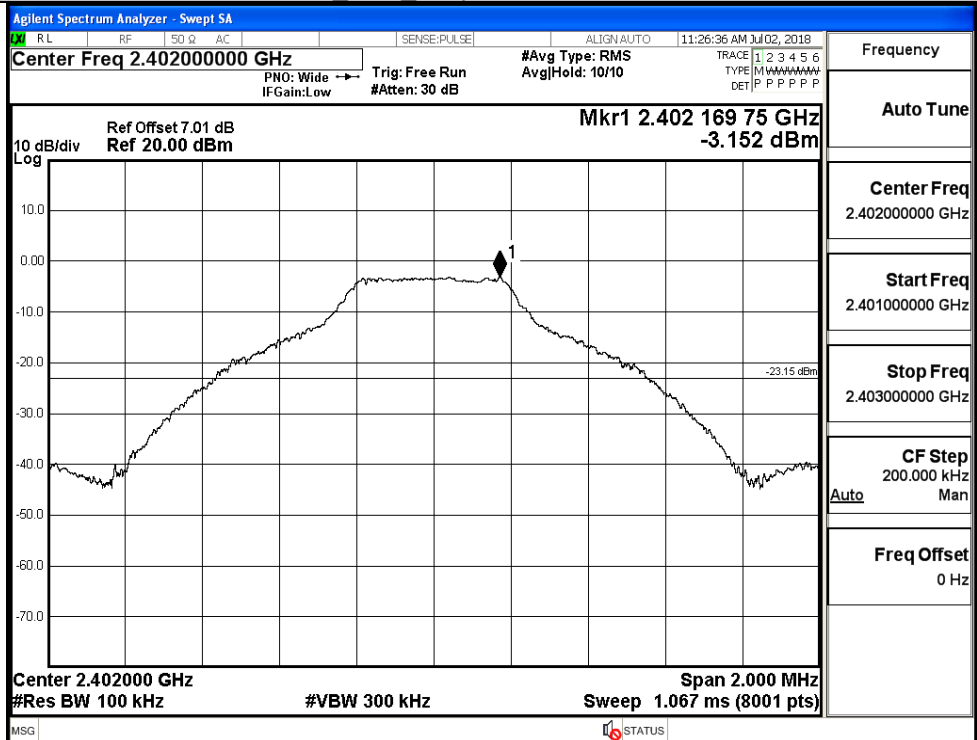
8DPSK_3DH5/HCH



A.6 RF Conducted Spurious Emissions

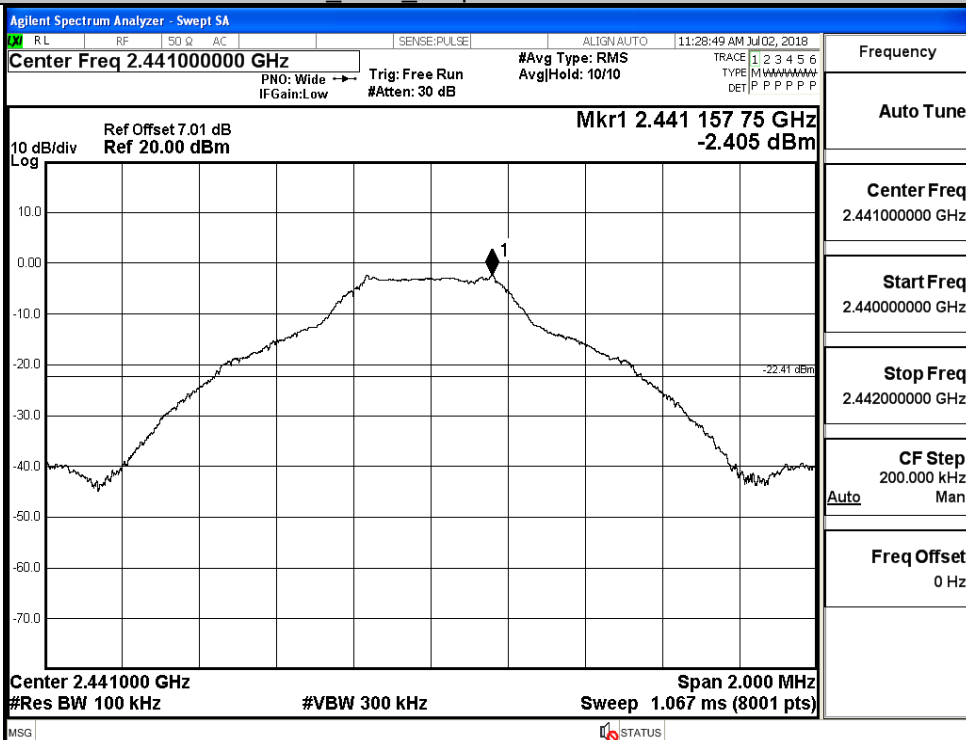
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.152	-44.711	-23.152	PASS
	MCH	-2.405	-45.533	-22.405	PASS
	HCH	-2.012	-45.090	-22.012	PASS
$\pi/4$ DQPSK	LCH	-2.525	-42.897	-22.525	PASS
	MCH	-3.076	-46.371	-23.076	PASS
	HCH	-3.553	-44.780	-23.553	PASS
8DPSK	LCH	-2.509	-42.182	-22.509	PASS
	MCH	-2.881	-44.925	-22.881	PASS
	HCH	-2.221	-46.061	-22.221	PASS

GFSK_LCH_Graphs

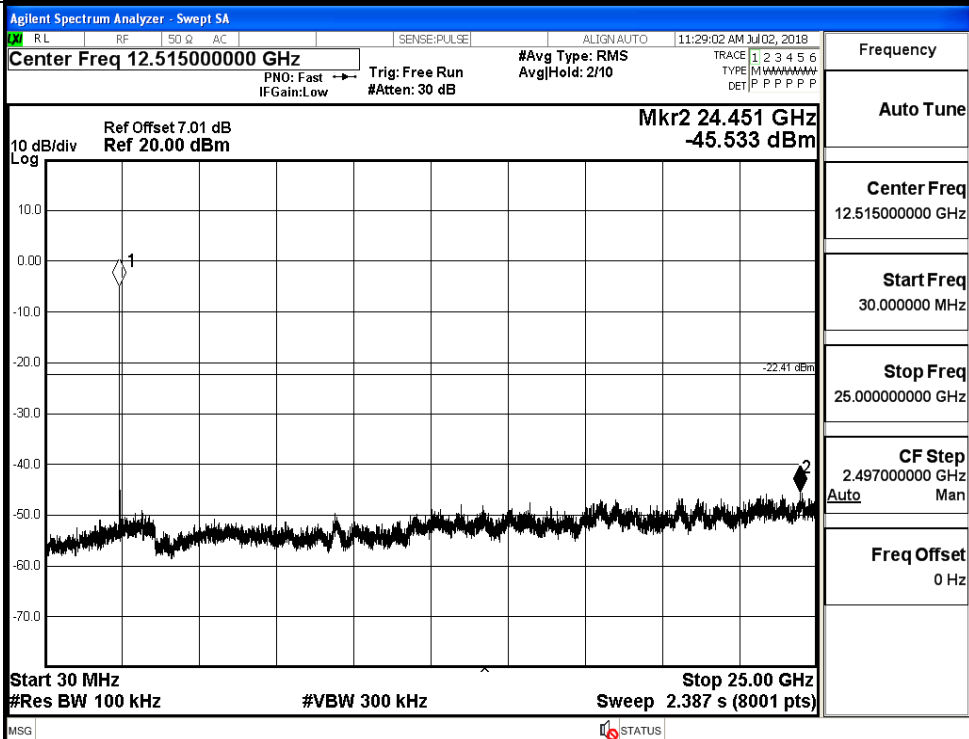


GFSK_MCH_Graphs

Pref

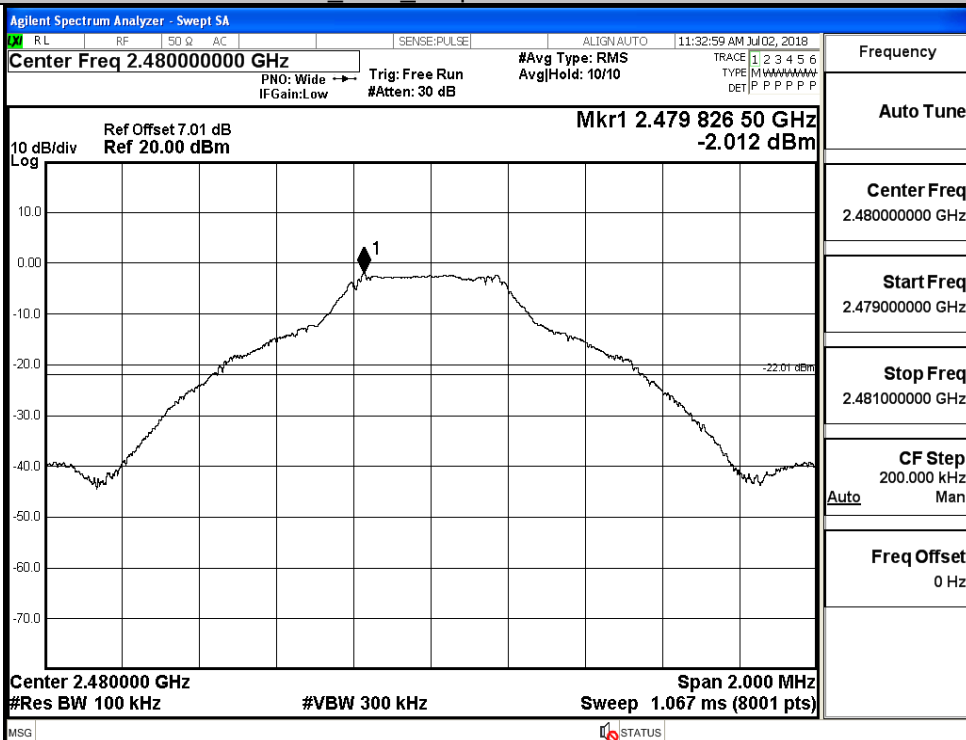


Puw

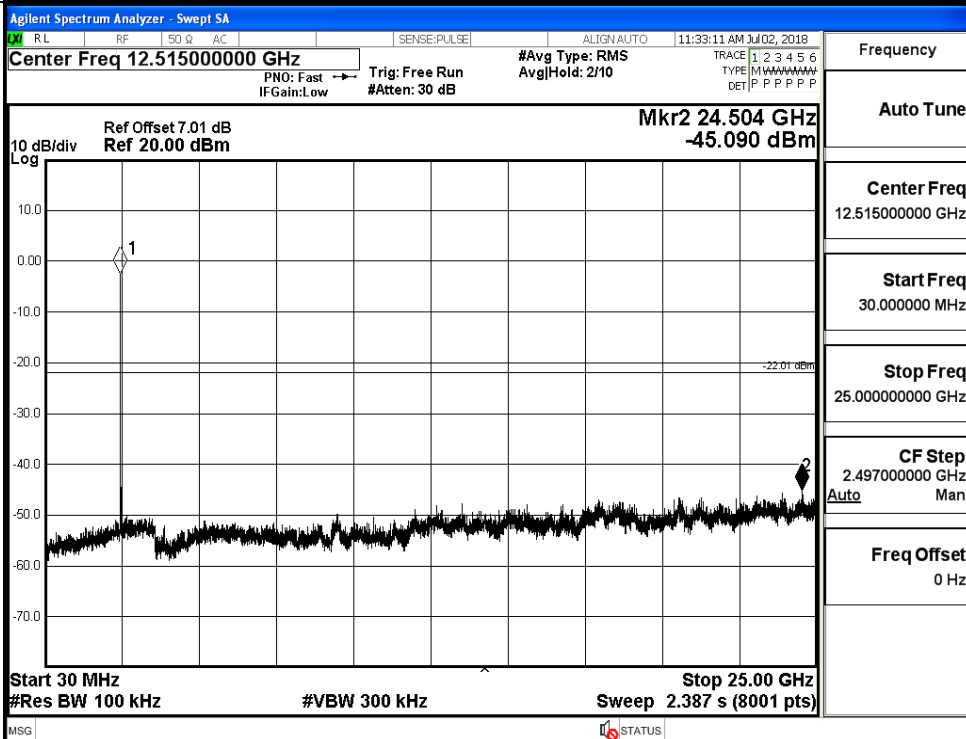


GFSK HCH_Graphs

Pref

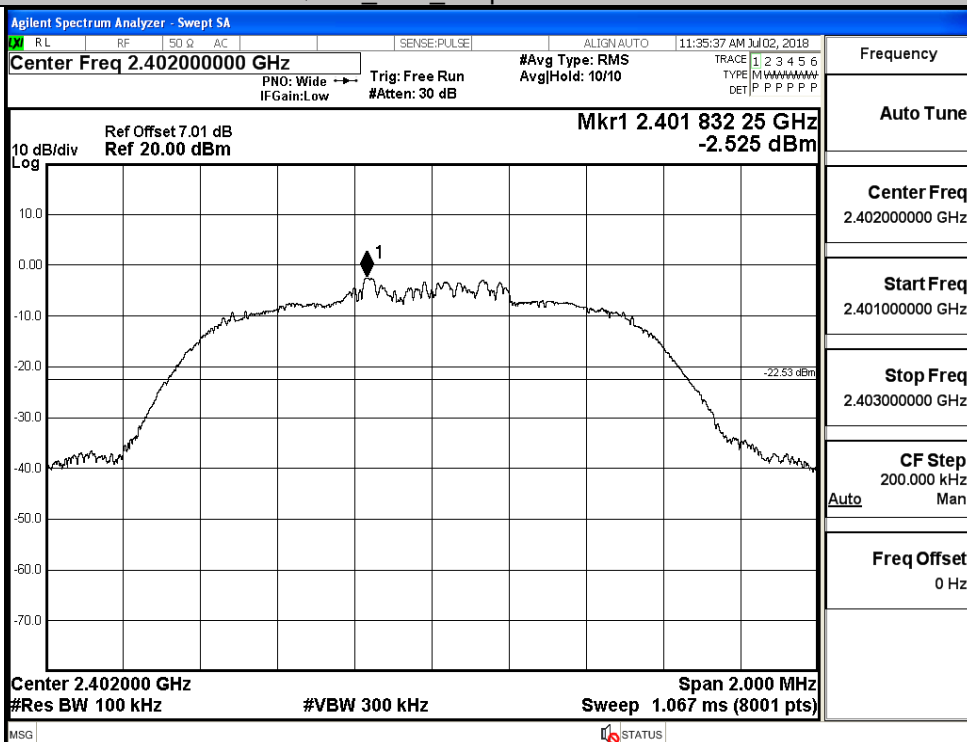


Puw

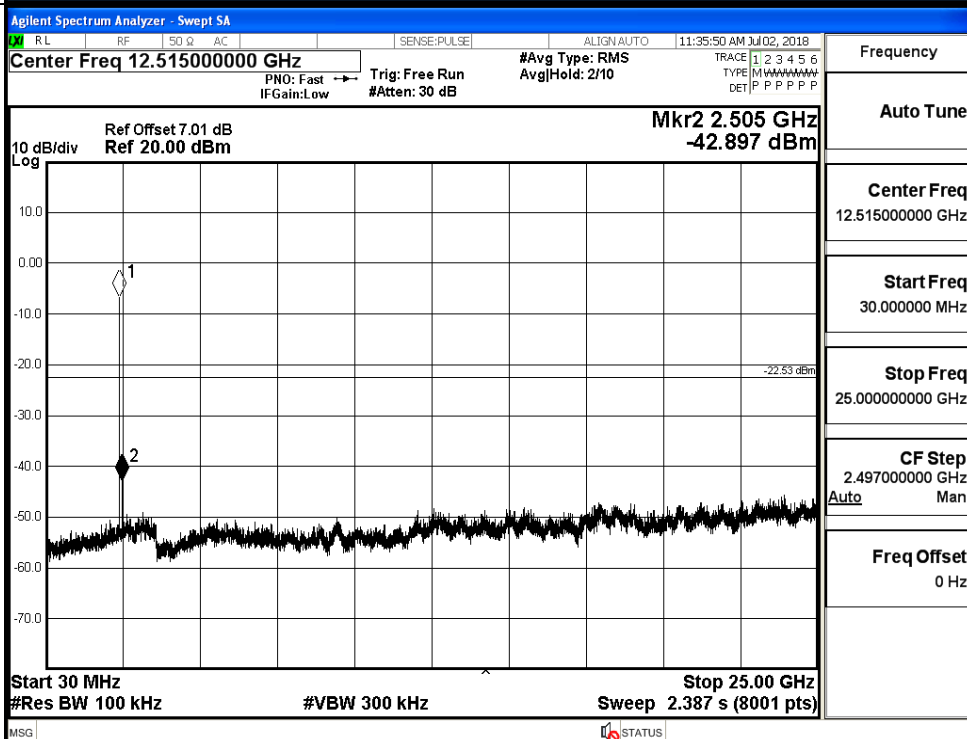


$\pi/4$ DQPSK LCH_Graphs

Pref

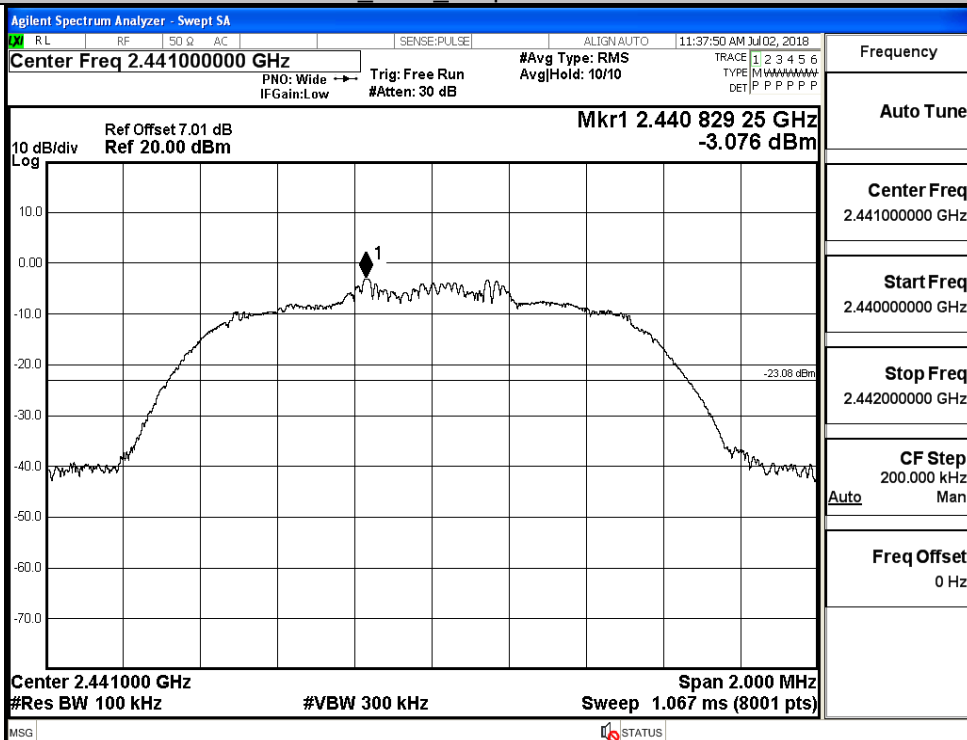


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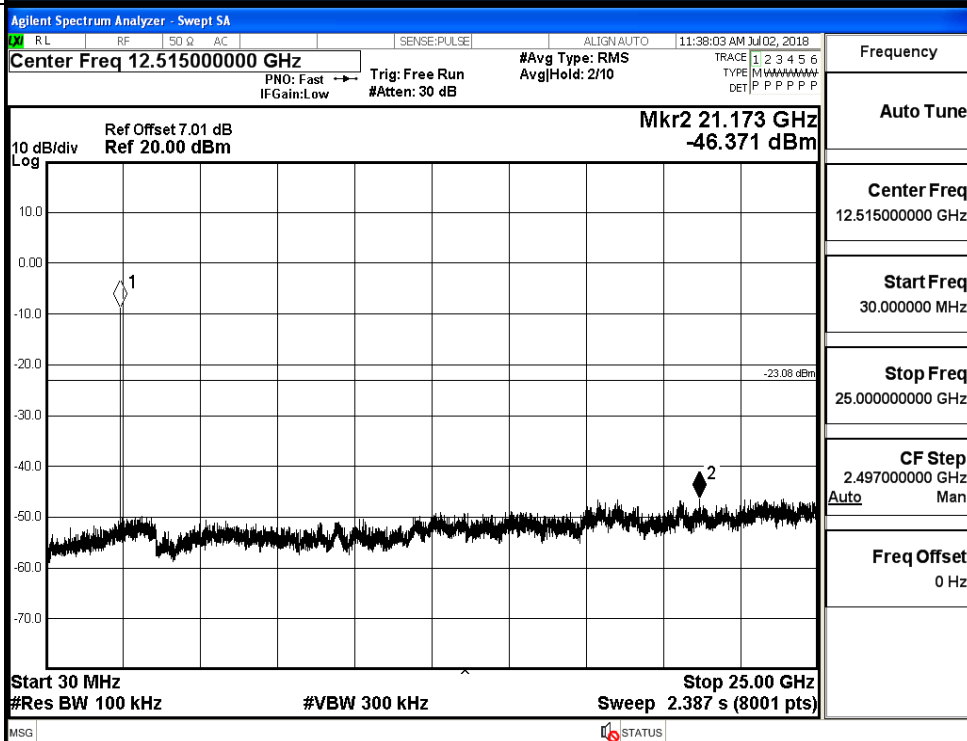


π /4DQPSK_MCH_Graphs

Pref

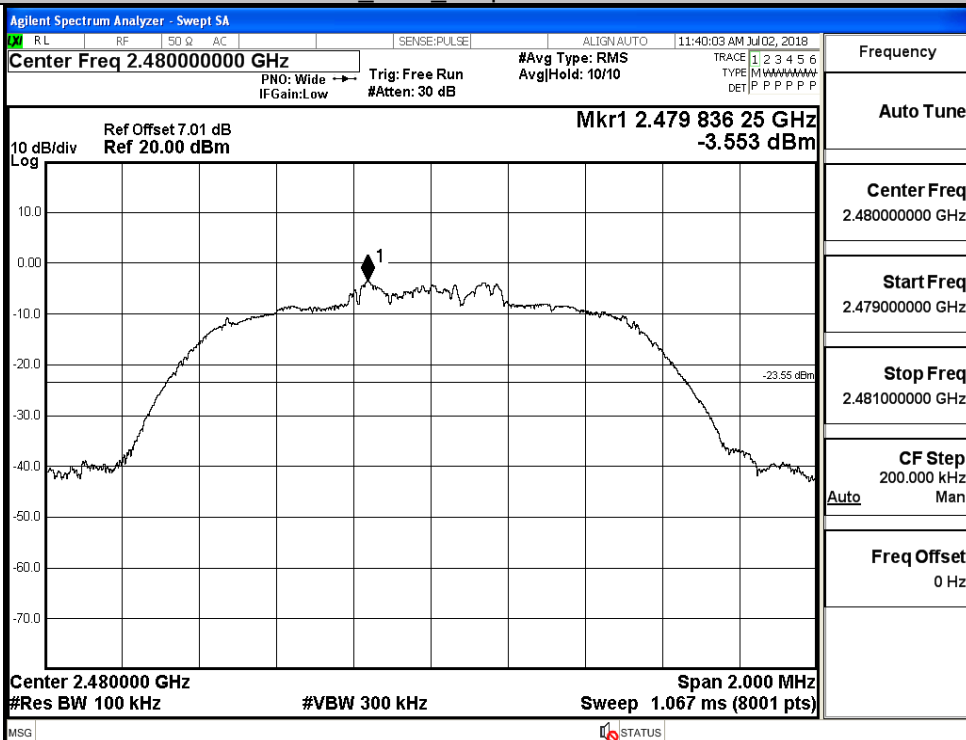


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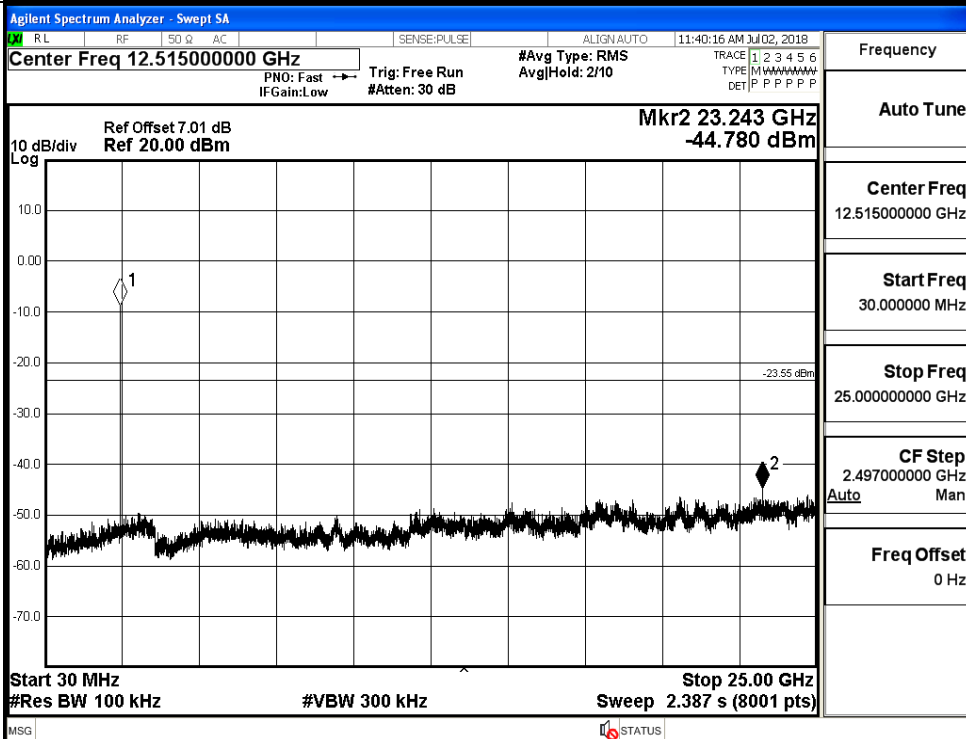


$\pi/4$ DQPSK_HCH_Graphs

Pref

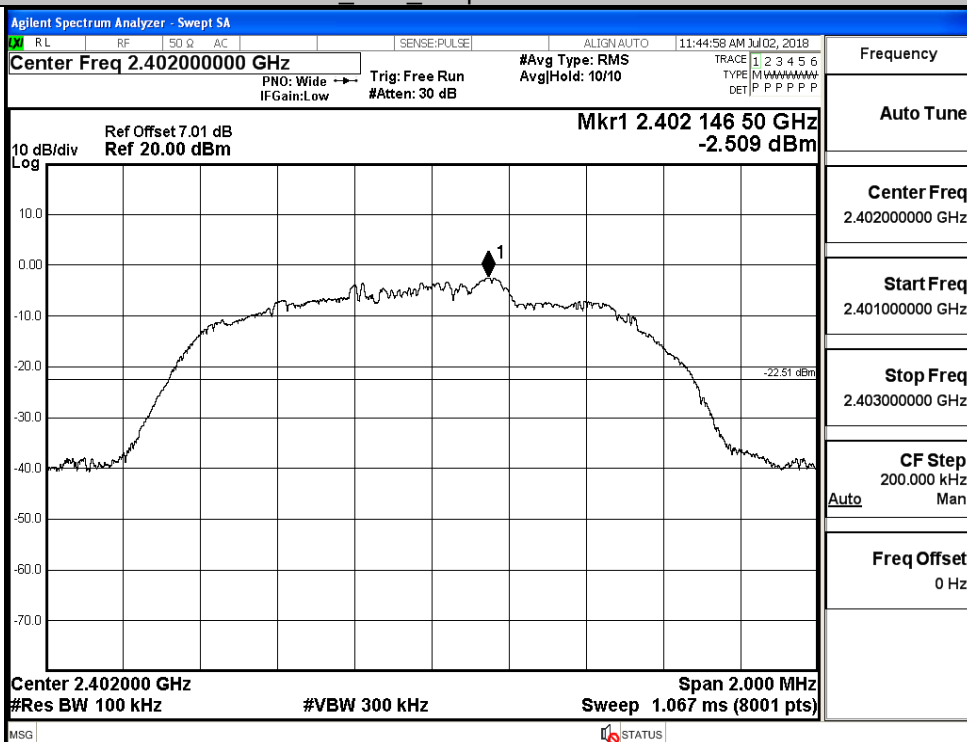


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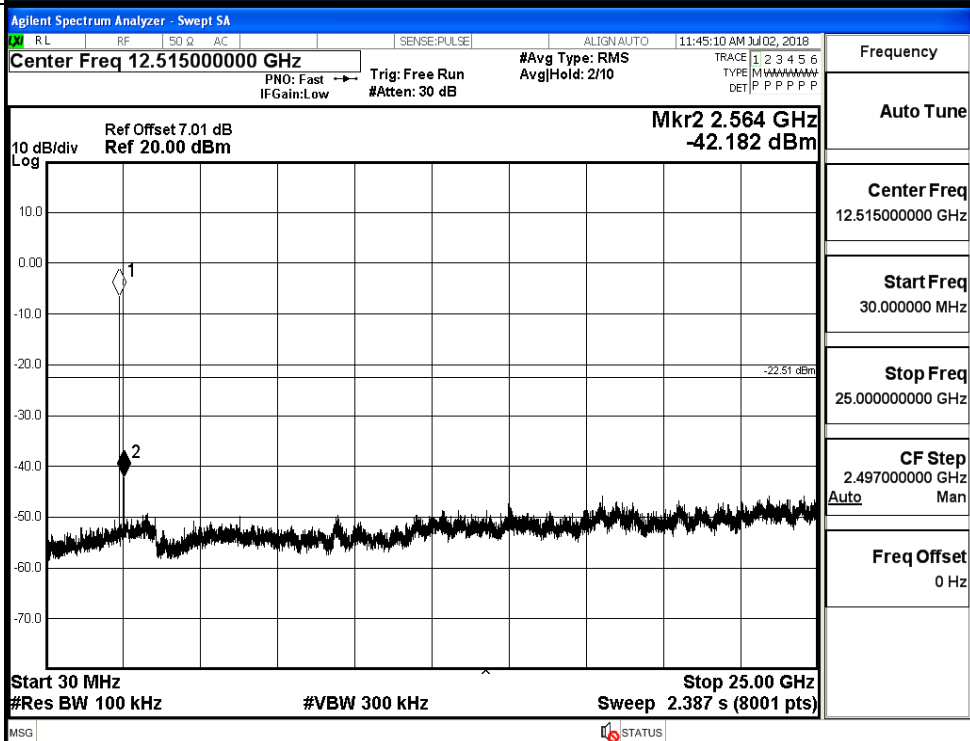


8DPSK_LCH_Graphs

Pref

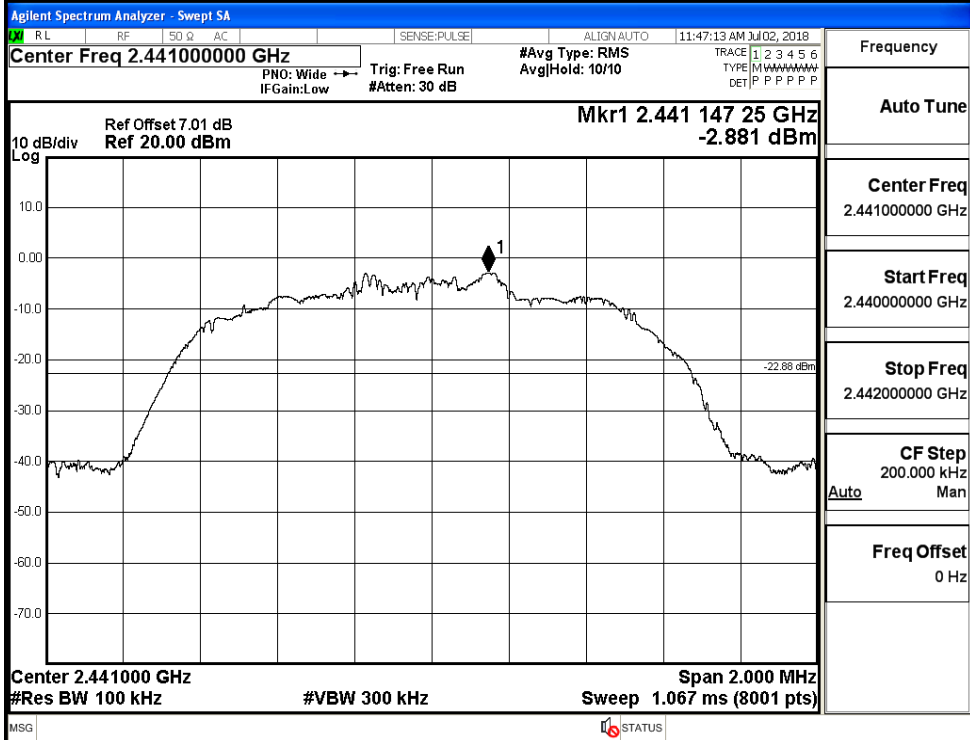


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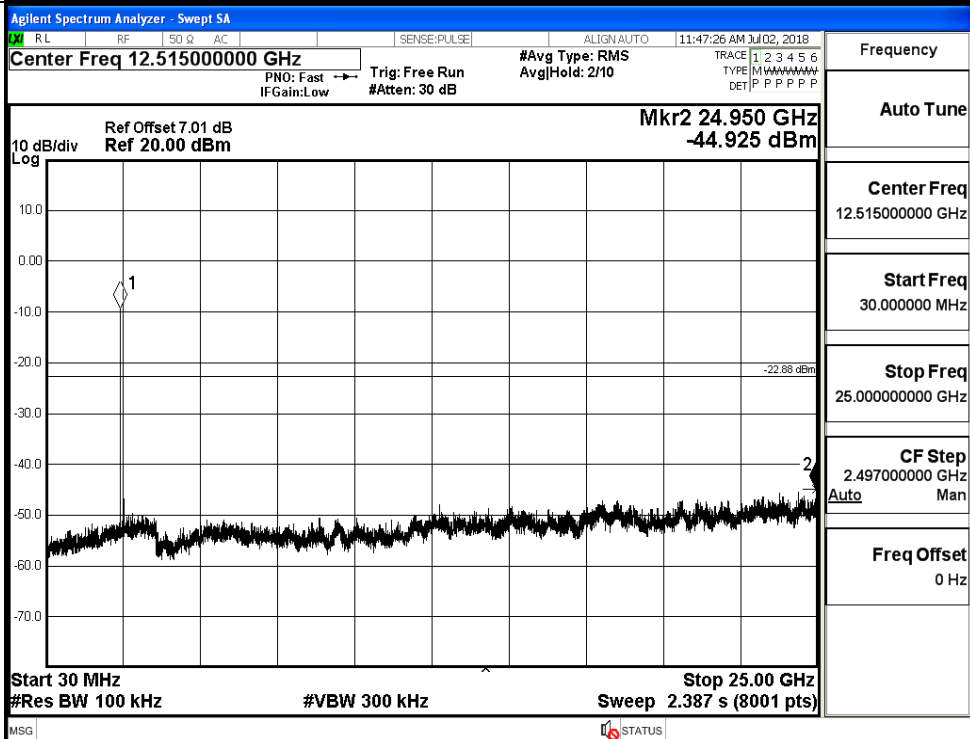


8DPSK_MCH_Graphs

Pref

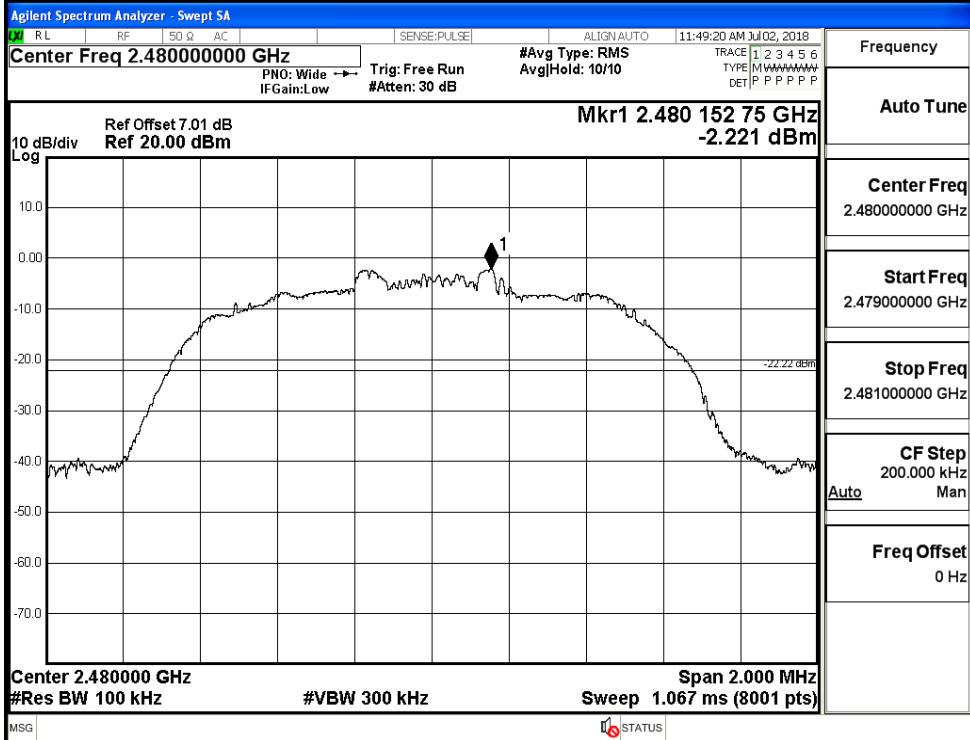


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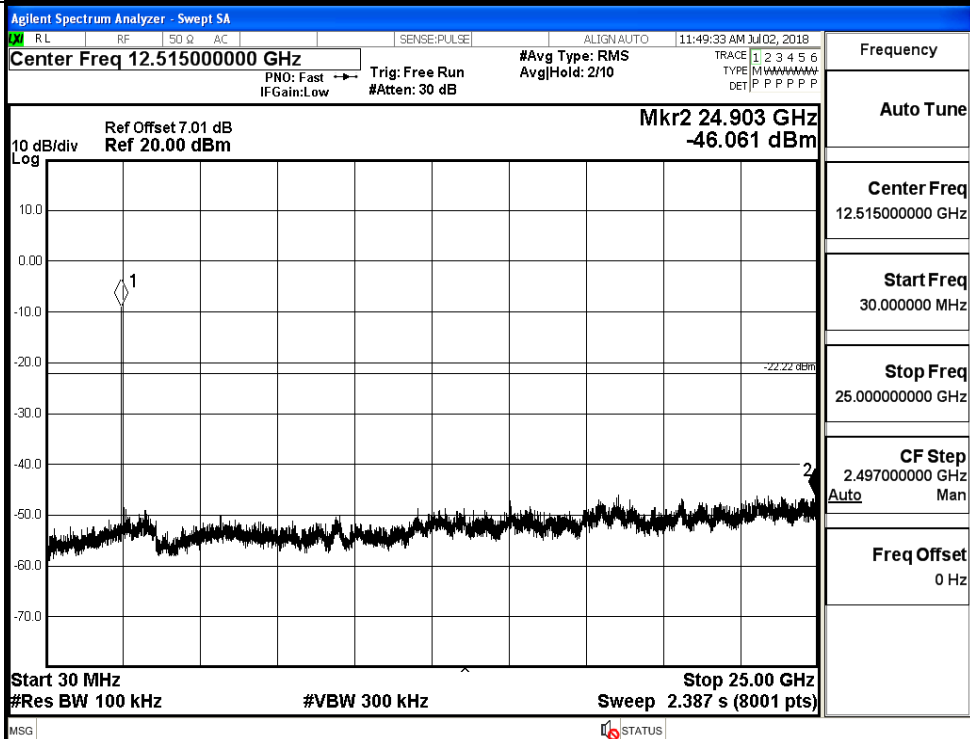


8DPSK_HCH_Graphs

Pref



Puw

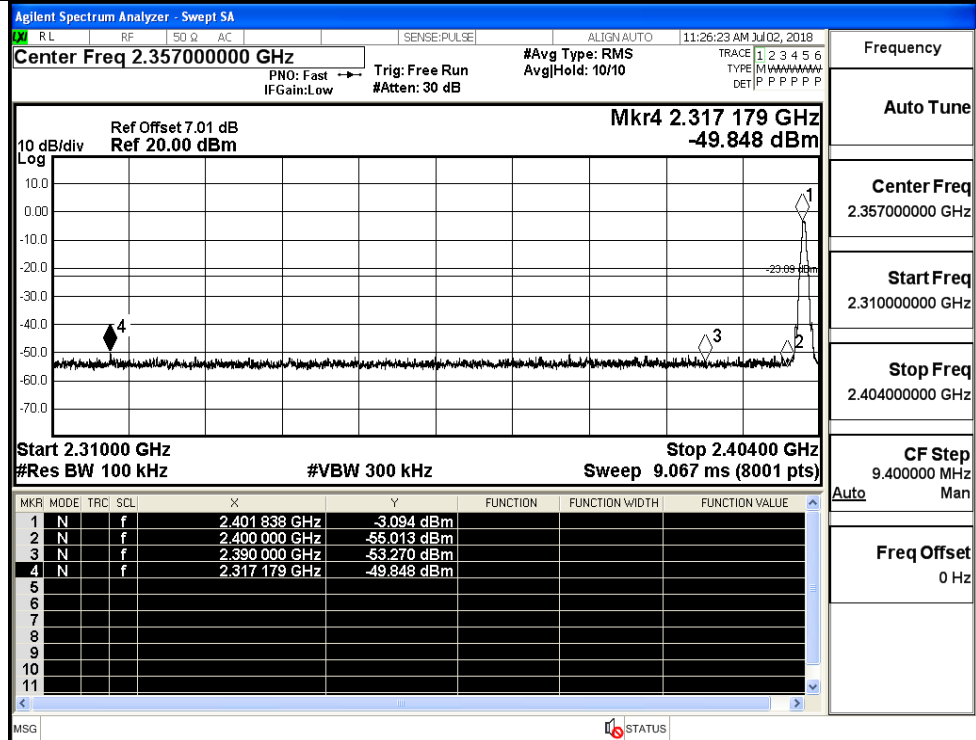


A.7 Band-edge for RF Conducted Emissions

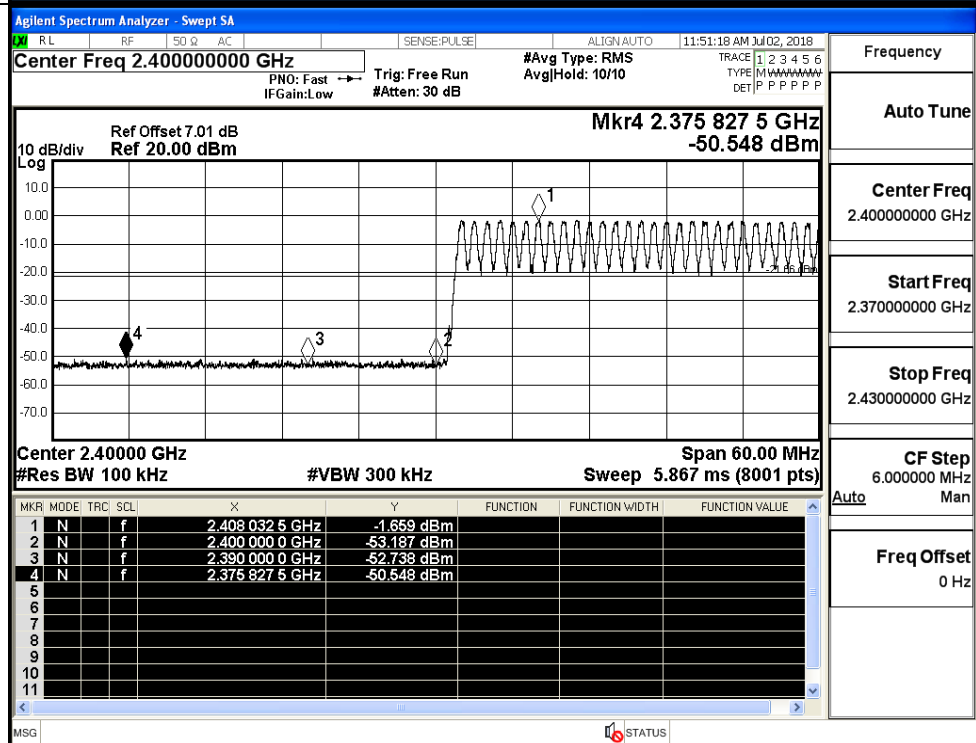
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-3.094	Off	-49.848	-23.09	PASS
			-1.659	On	-50.548	-21.66	PASS
	HCH	2480	-1.811	Off	-50.467	-21.81	PASS
			-1.579	On	-50.509	-21.58	PASS
$\pi/4$ DQPSK	LCH	2402	-2.652	Off	-51.002	-22.65	PASS
			-1.872	On	-50.353	-21.87	PASS
	HCH	2480	-3.541	Off	-50.211	-23.54	PASS
			-2.017	On	-48.816	-22.02	PASS
8DPSK	LCH	2402	-2.632	Off	-51.169	-22.63	PASS
			-1.777	On	-50.009	-21.78	PASS
	HCH	2480	-2.228	Off	-50.544	-22.23	PASS
			-1.717	On	-50.116	-21.72	PASS

Test Graphs

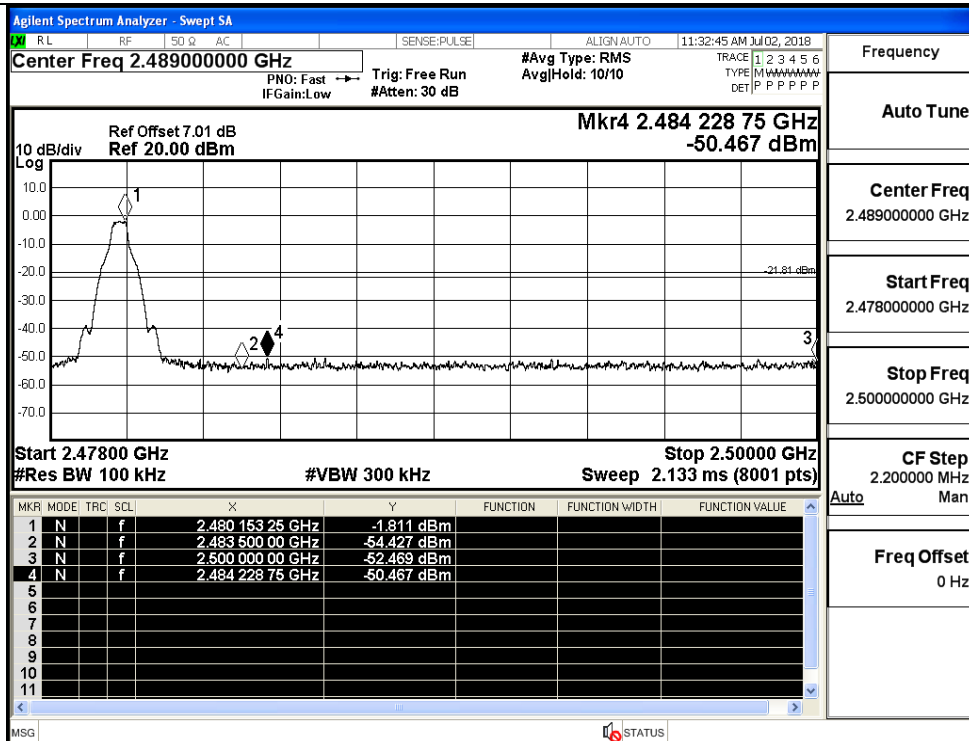
GFSK/LCH/No Hop



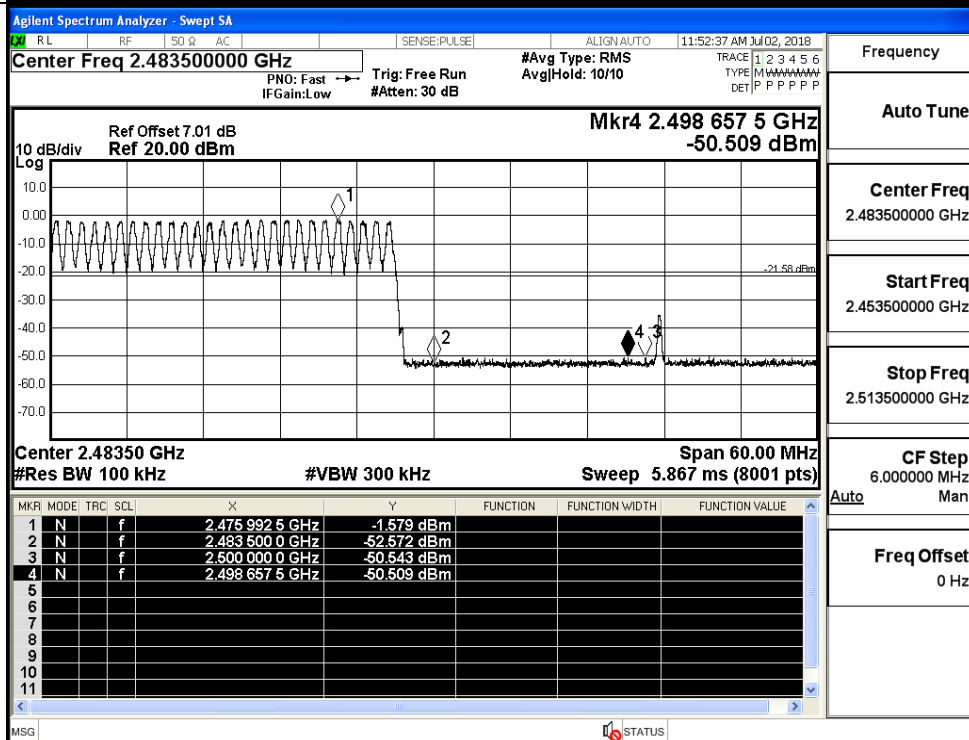
GFSK/LCH/Hop



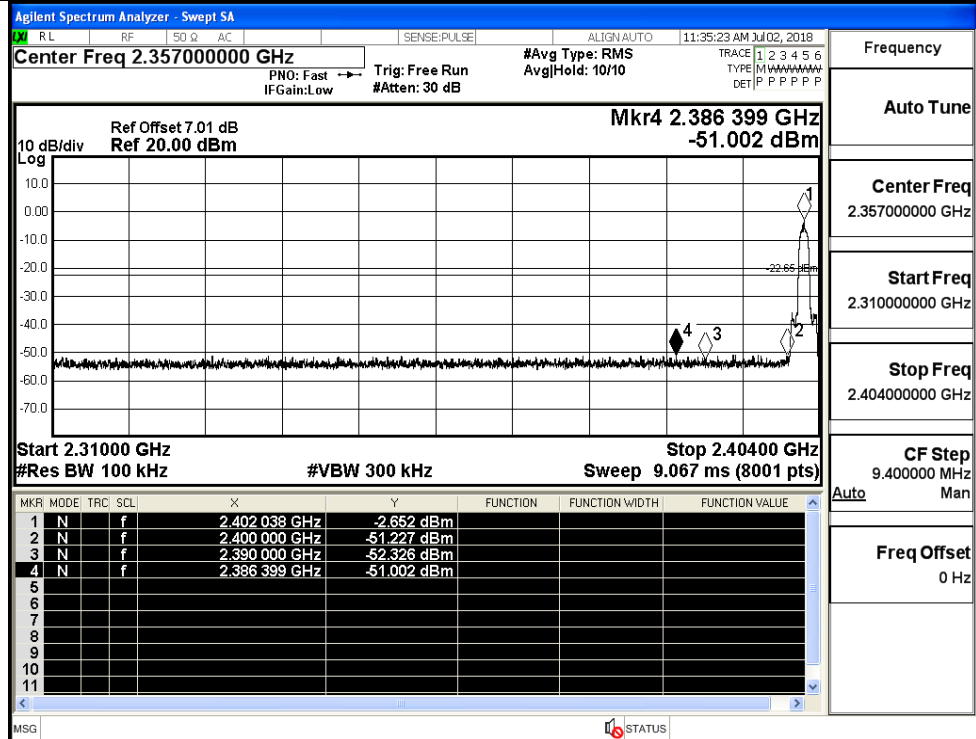
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

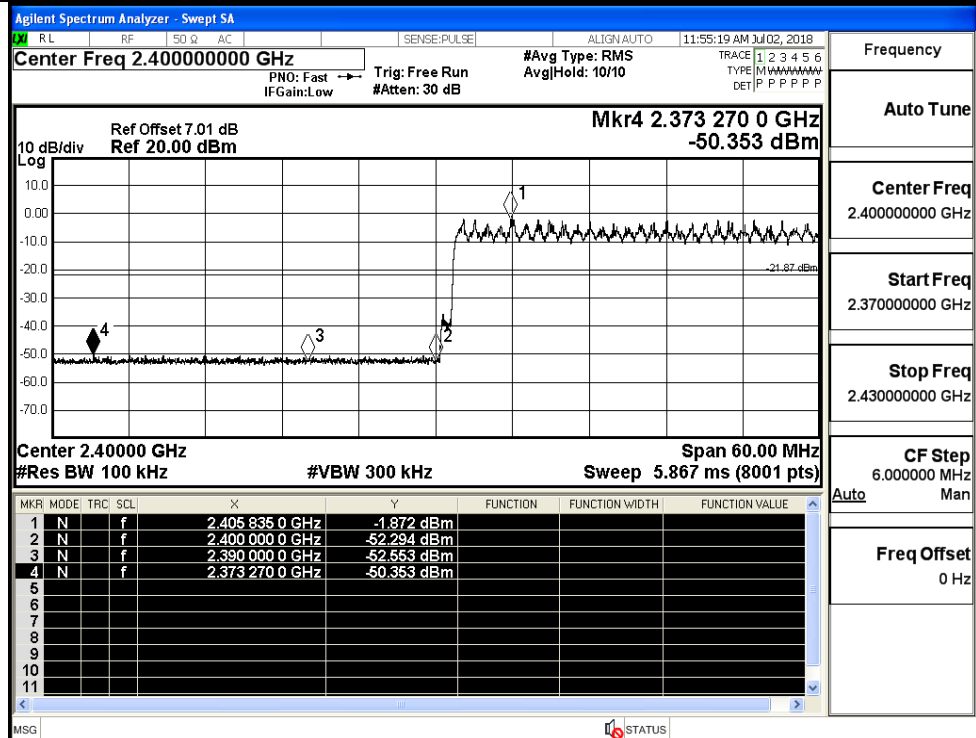
Start Freq
2.310000000 GHz

Stop Freq
2.404000000 GHz

CF Step
9.400000 MHz
Auto Man

Freq Offset
0 Hz

$\pi/4$ DQPSK/LCH/Hop



Frequency

Auto Tune

Center Freq
2.400000000 GHz

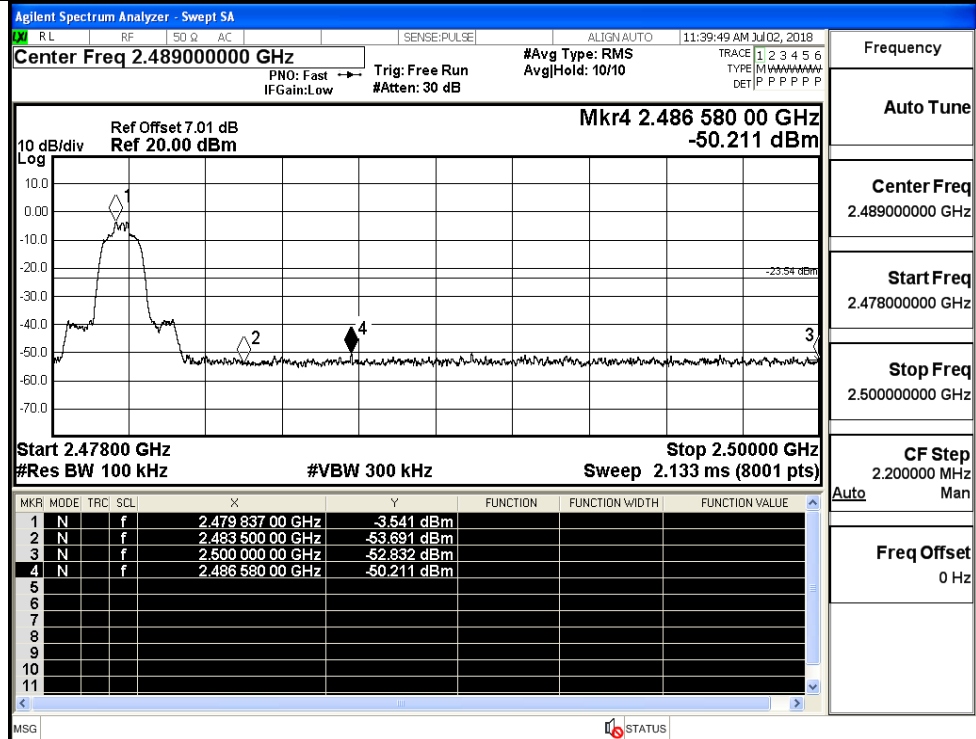
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

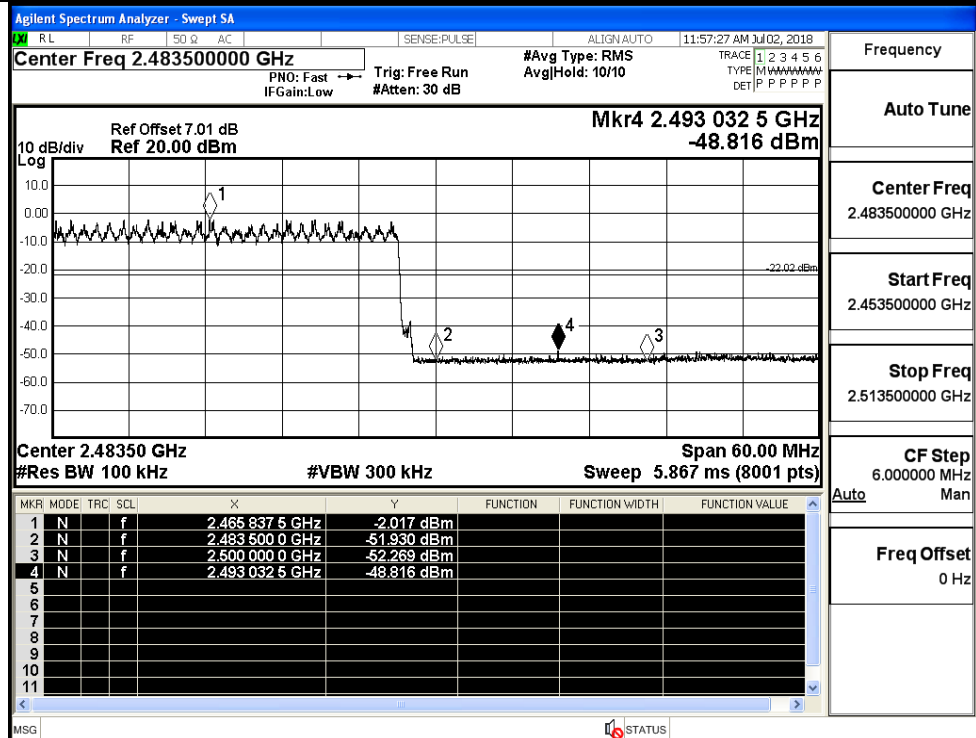
CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

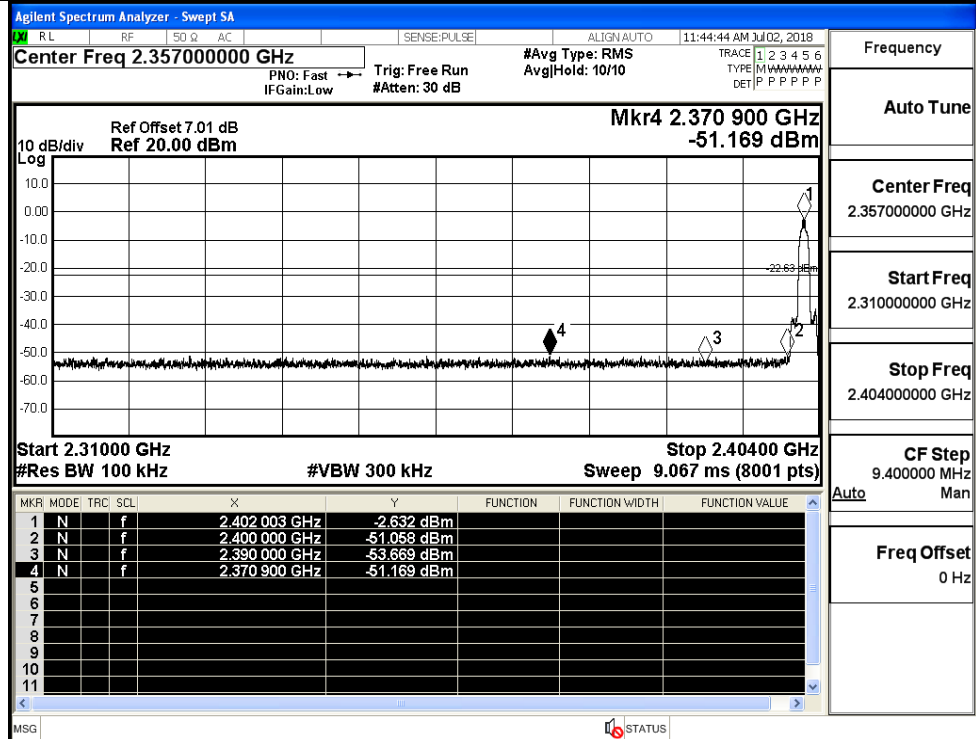
$\pi/4$ DQPSK/HCH/No
Hop



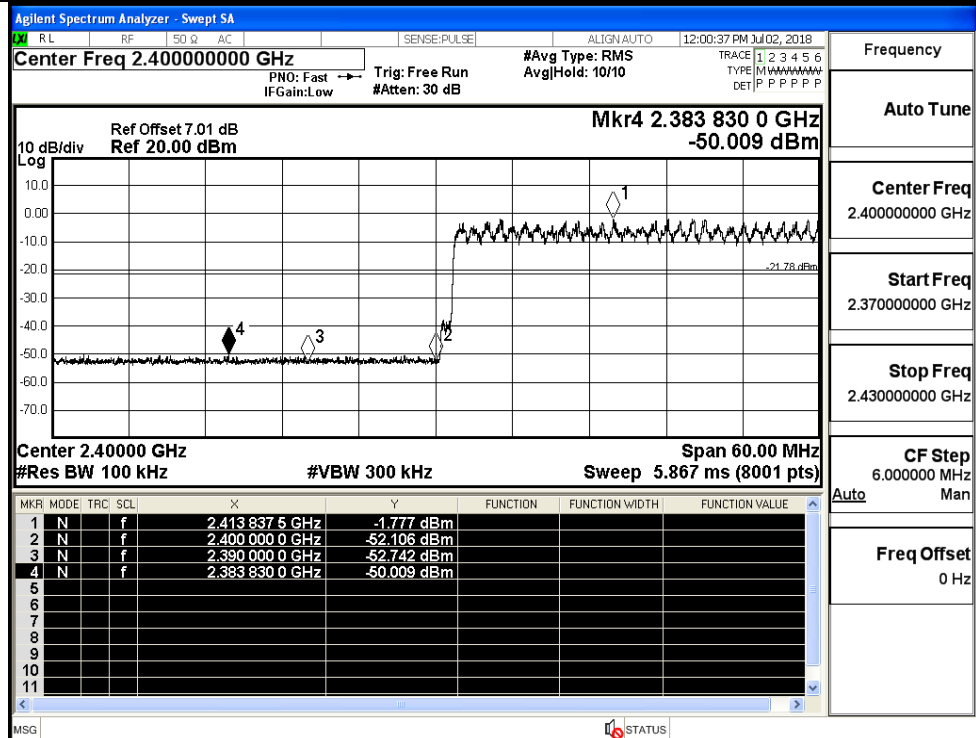
$\pi/4$ DQPSK/HCH/Hop



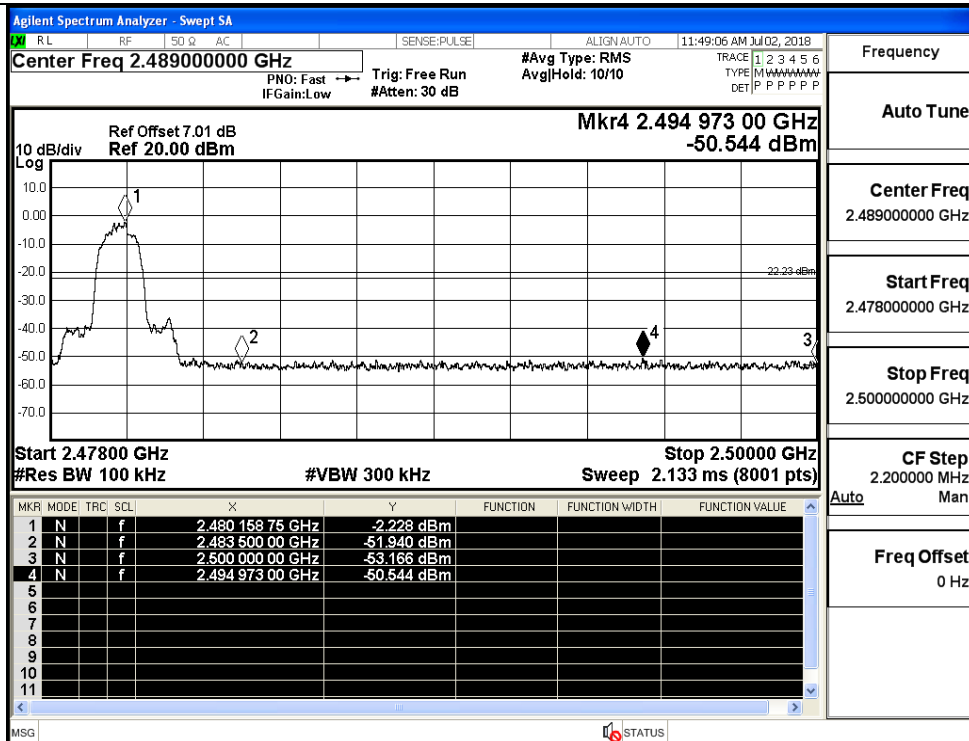
8DPSK/LCH/No Hop



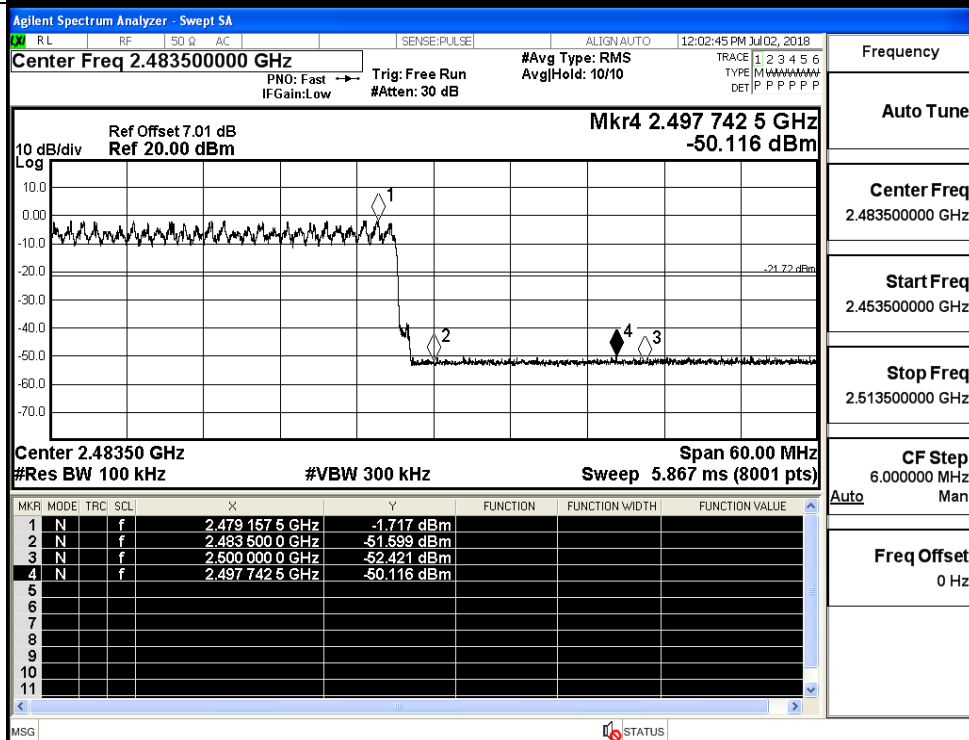
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



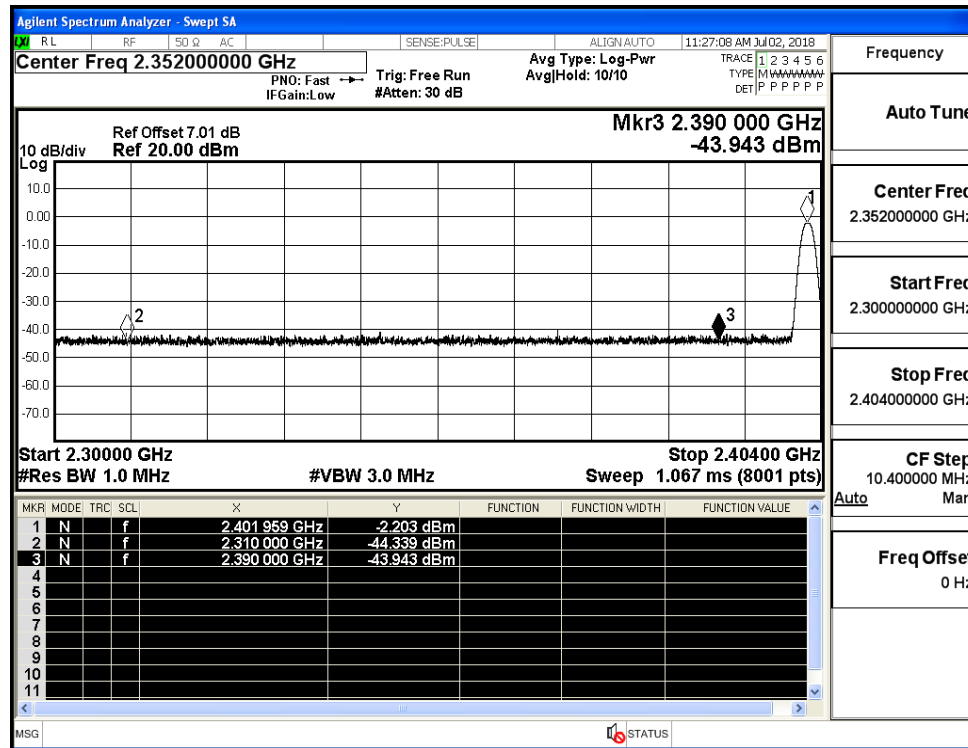
8DPSK/HCH/Hop



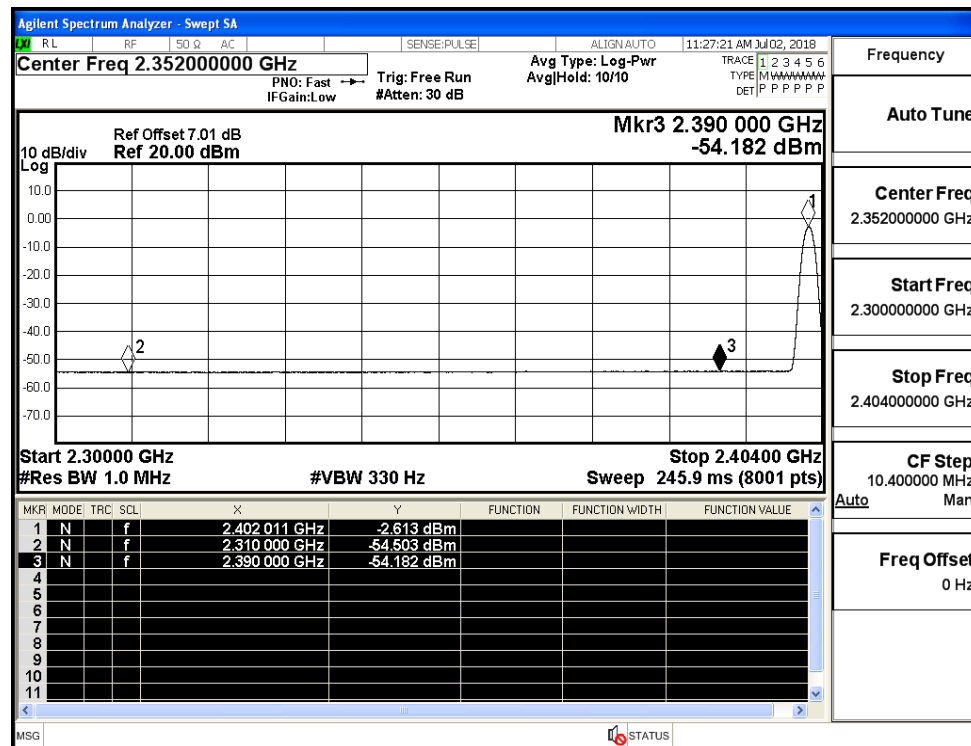
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.34	2.0	0	52.92	PEAK	74	PASS
	Off	2310.0	-54.50	2.0	0	42.75	AV	54	PASS
	Off	2390.0	-43.94	2.0	0	53.31	PEAK	74	PASS
	Off	2390.0	-54.18	2.0	0	43.08	AV	54	PASS
	Off	2483.5	-44.03	2.0	0	53.23	PEAK	74	PASS
	Off	2483.5	-53.96	2.0	0	43.30	AV	54	PASS
	Off	2500.0	-40.65	2.0	0	56.61	PEAK	74	PASS
	Off	2500.0	-47.23	2.0	0	50.03	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.95	2.0	0	53.31	PEAK	74	PASS
	Off	2310.0	-54.45	2.0	0	42.80	AV	54	PASS
	Off	2390.0	-43.73	2.0	0	53.53	PEAK	74	PASS
	Off	2390.0	-54.13	2.0	0	43.13	AV	54	PASS
	Off	2483.5	-43.84	2.0	0	53.42	PEAK	74	PASS
	Off	2483.5	-53.97	2.0	0	43.29	AV	54	PASS
	Off	2500.0	-44.44	2.0	0	52.82	PEAK	74	PASS
	Off	2500.0	-53.85	2.0	0	43.41	AV	54	PASS
8DPSK	Off	2310.0	-43.48	2.0	0	53.78	PEAK	74	PASS
	Off	2310.0	-54.48	2.0	0	42.78	AV	54	PASS
	Off	2390.0	-42.22	2.0	0	55.04	PEAK	74	PASS
	Off	2390.0	-54.14	2.0	0	43.12	AV	54	PASS
	Off	2483.5	-43.98	2.0	0	53.28	PEAK	74	PASS
	Off	2483.5	-53.92	2.0	0	43.34	AV	54	PASS
	Off	2500.0	-44.84	2.0	0	52.42	PEAK	74	PASS
	Off	2500.0	-53.86	2.0	0	43.39	AV	54	PASS

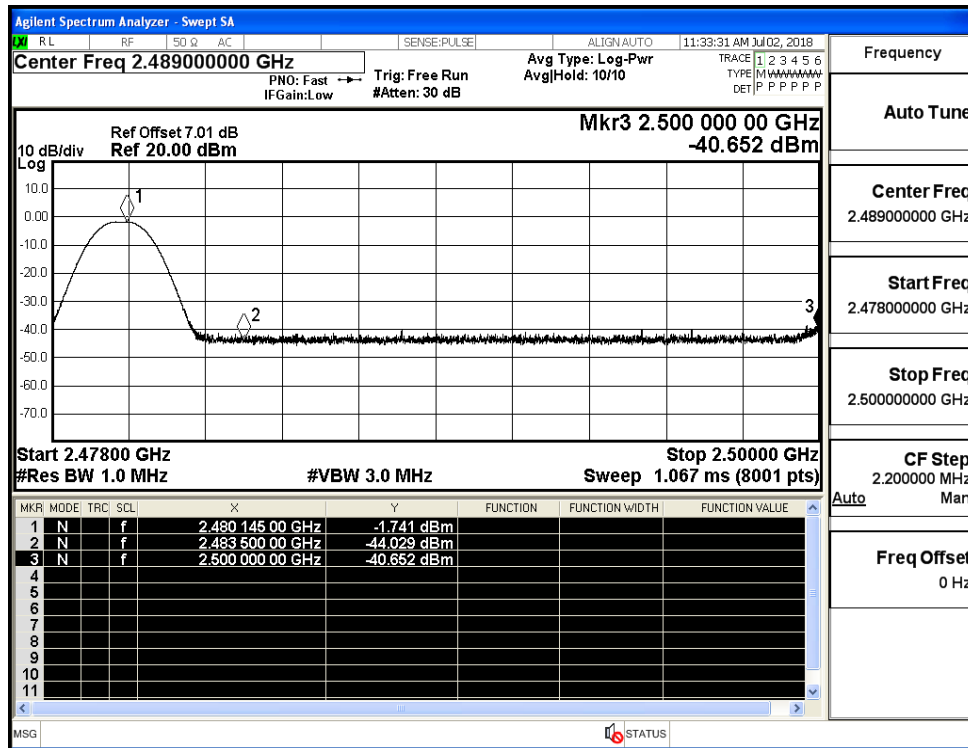
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



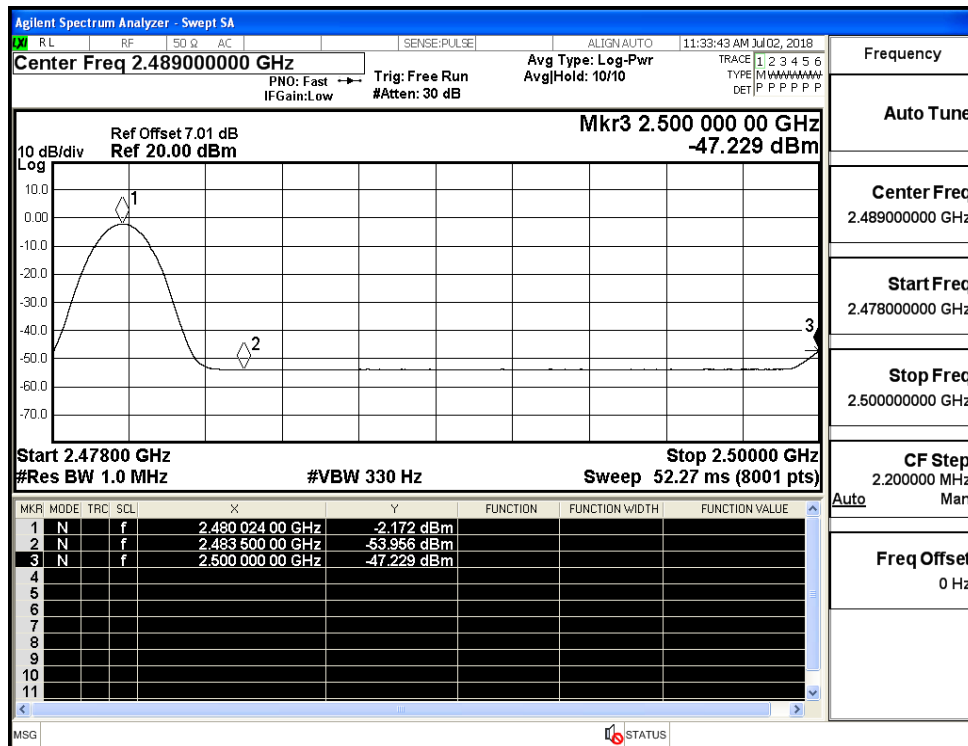
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

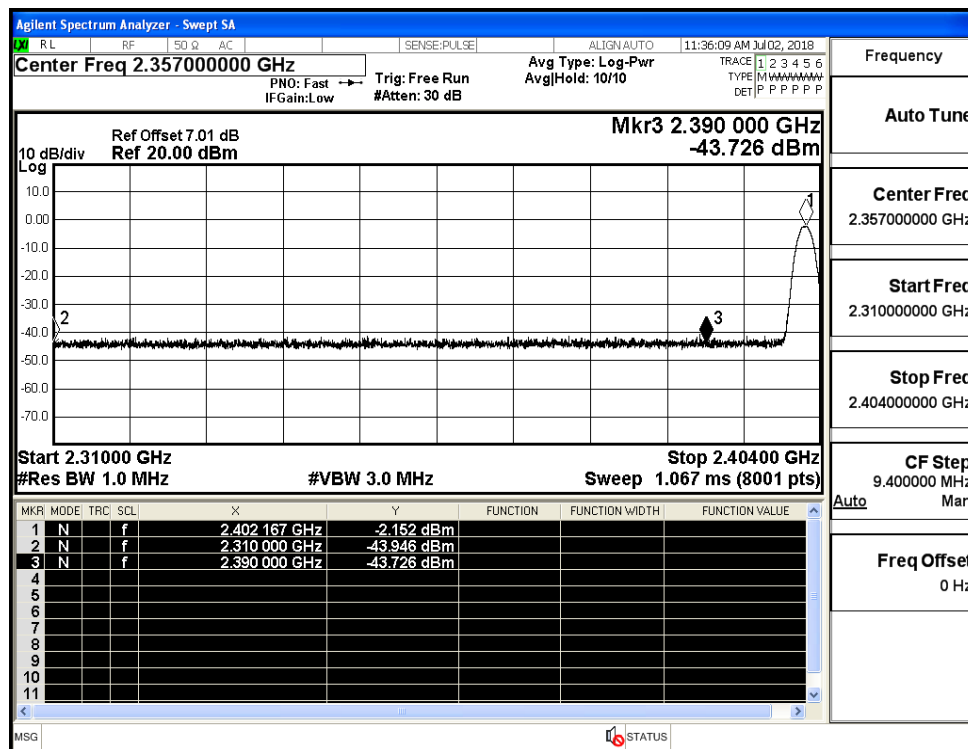
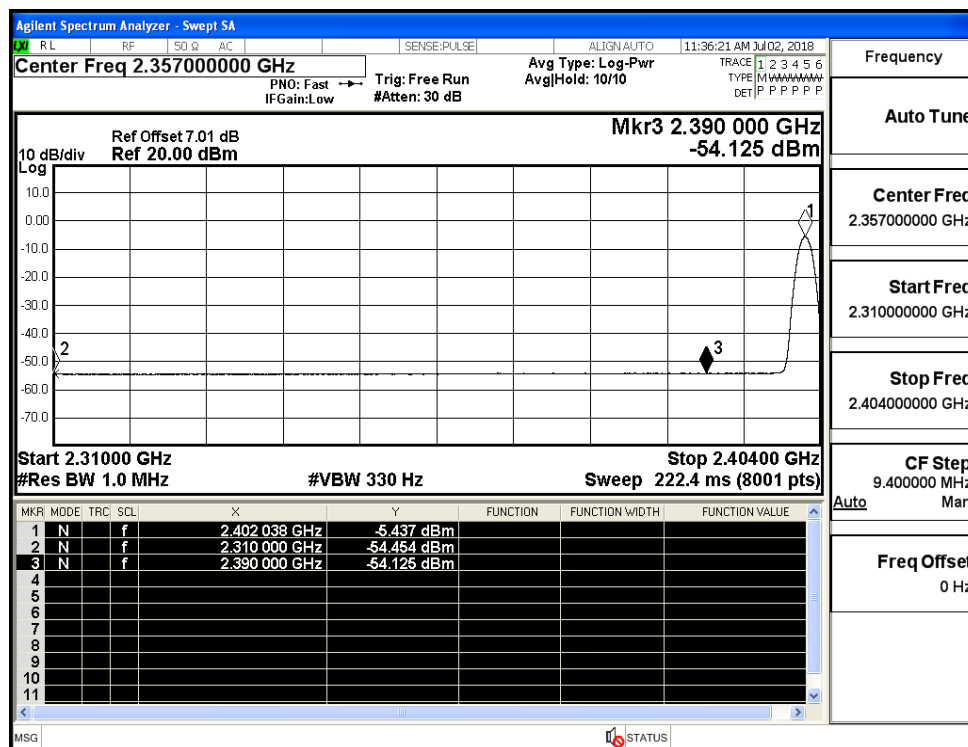


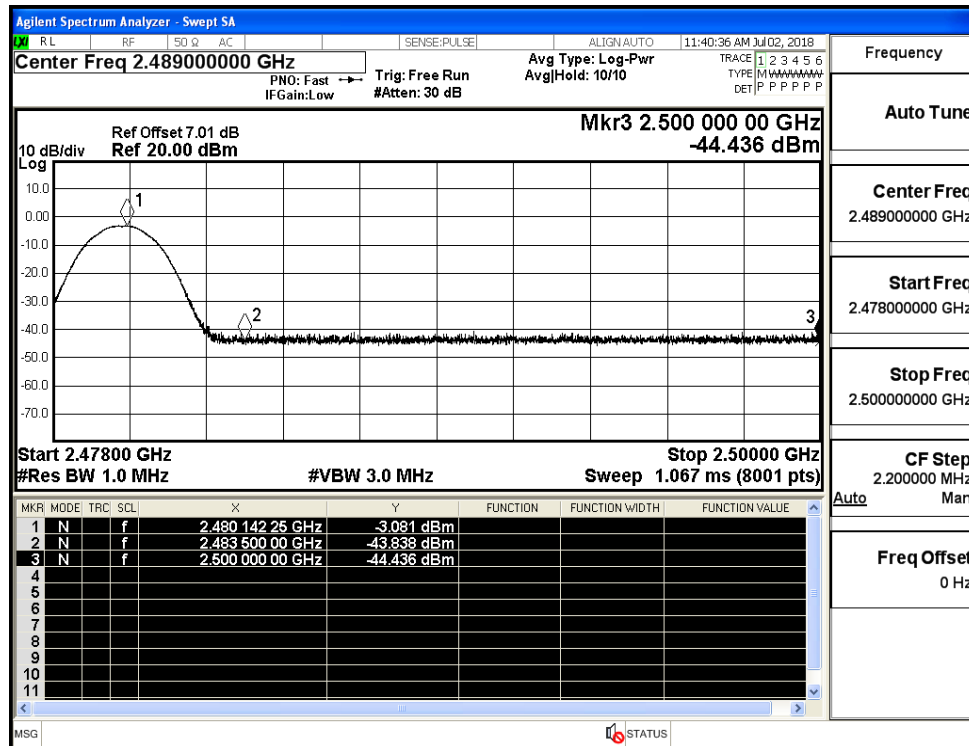
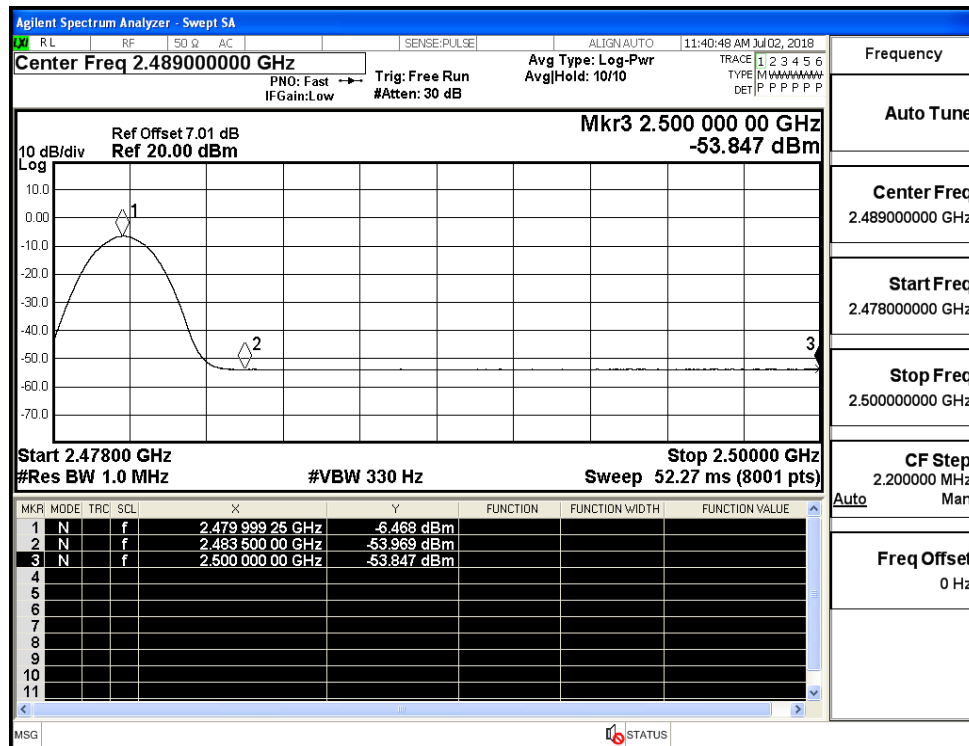
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



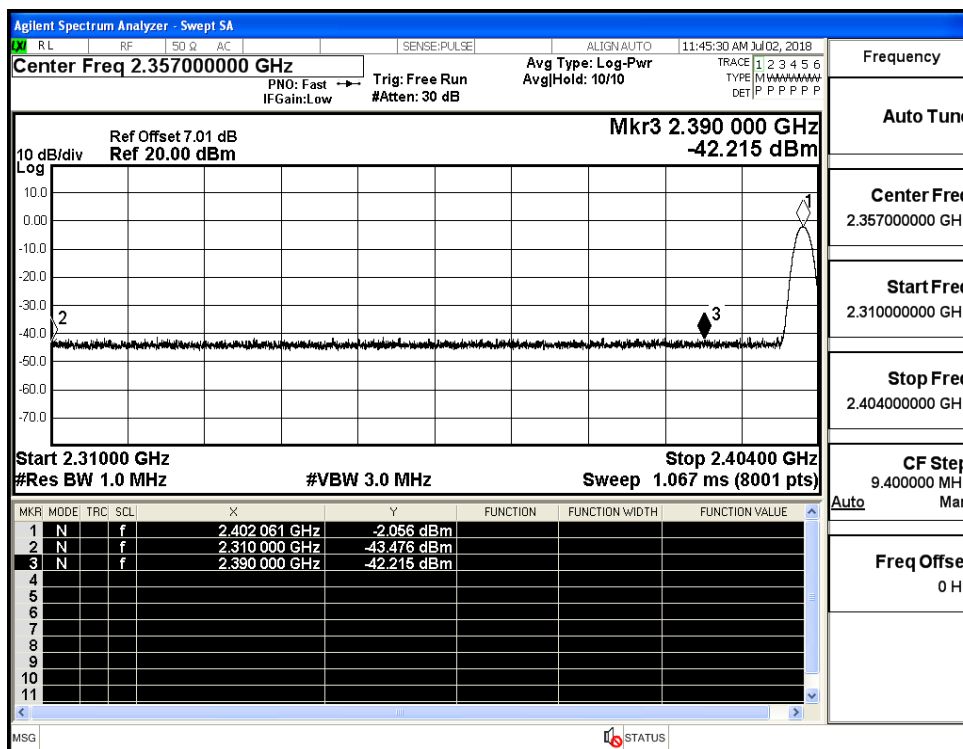
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



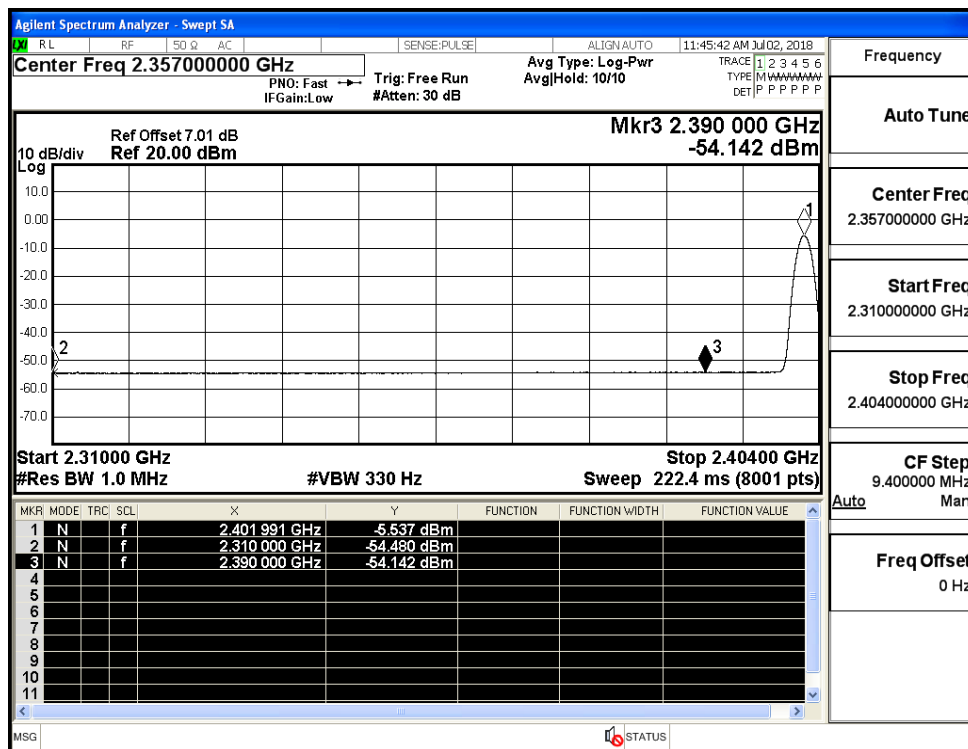
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

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)

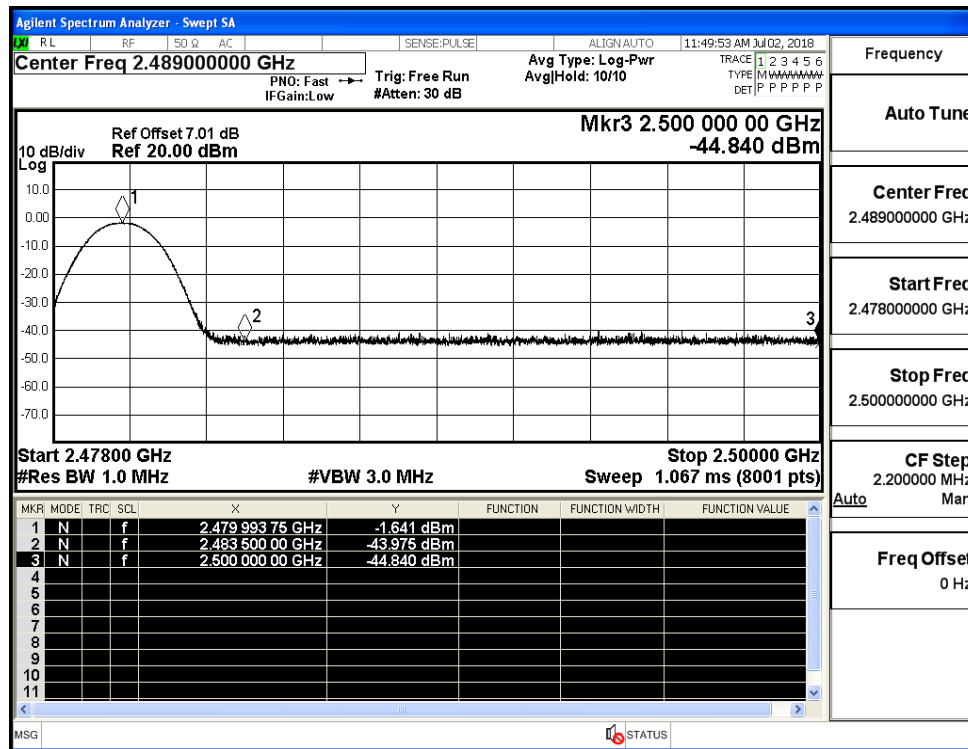
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

