

Appendix A

RF Test Data for BT V4.2 (BDR/EDR) (Conducted Measurement)

Product Name: Portable Speaker

Trade Mark: zēnith

Test Model: ZT-2018

Environmental Conditions

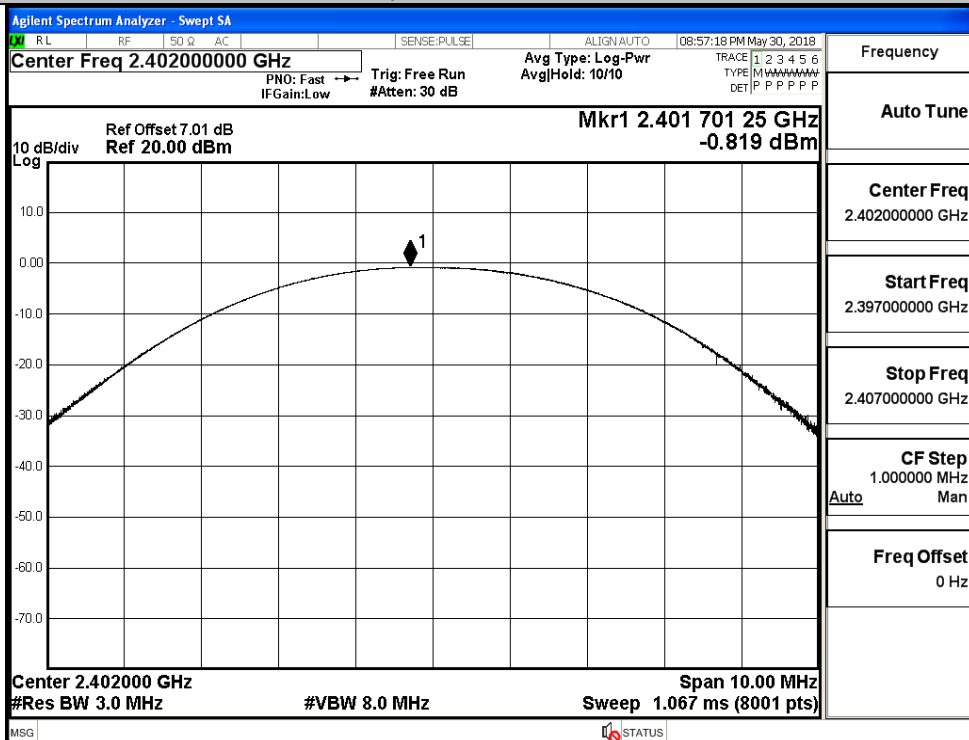
Temperature:	23.5 ° C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	WANGCHUANG
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

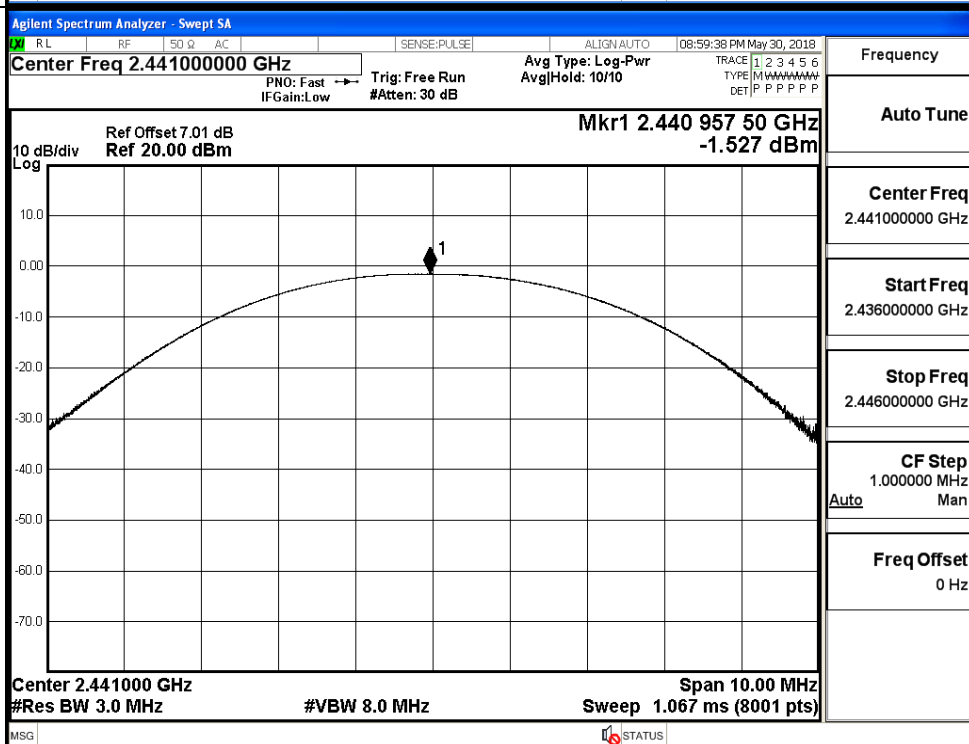
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.819	30	PASS
	MCH	-1.527	30	PASS
	HCH	-1.571	30	PASS
$\pi/4$ DQPSK	LCH	-1.630	21	PASS
	MCH	-2.309	21	PASS
	HCH	-2.466	21	PASS
8DPSK	LCH	-1.561	21	PASS
	MCH	-2.254	21	PASS
	HCH	-2.467	21	PASS

Test Graphs

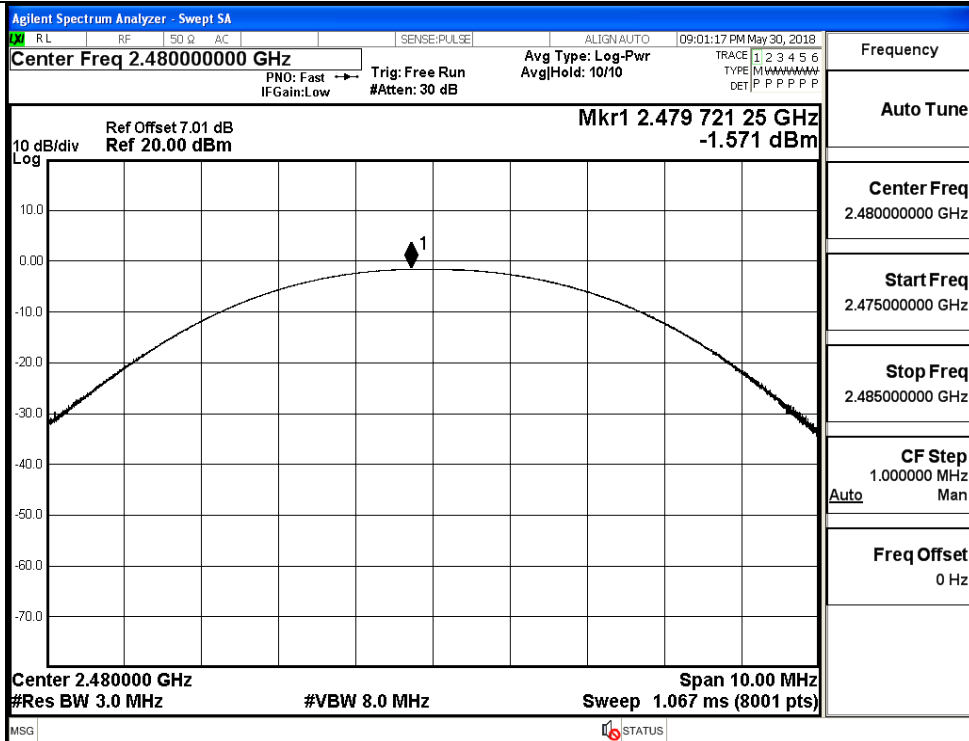
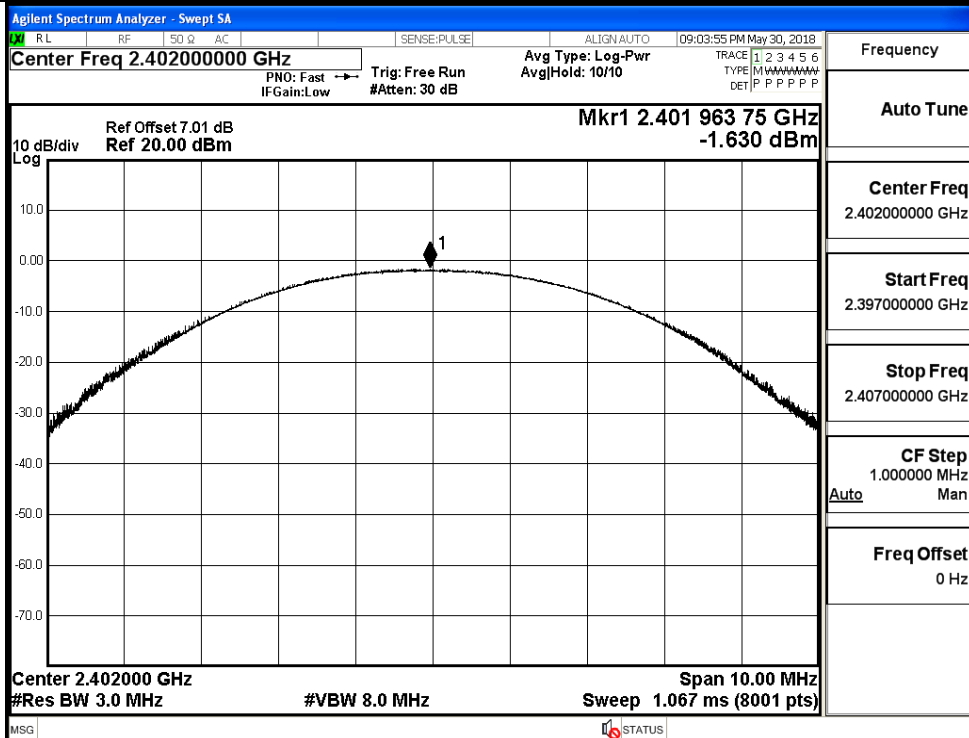
GFSK/LCH

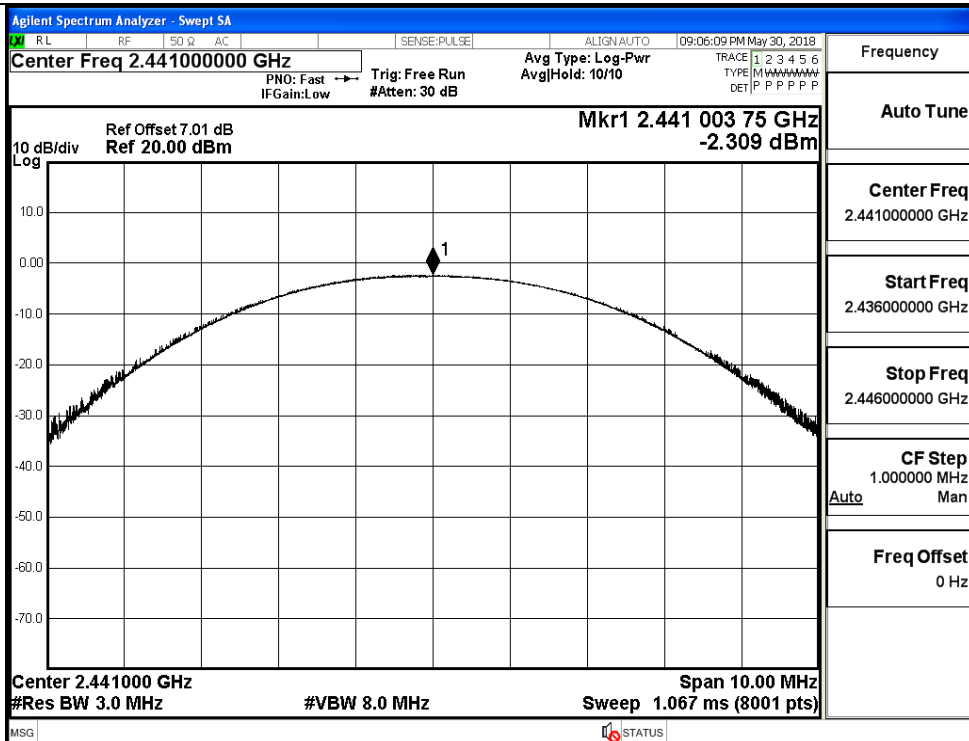
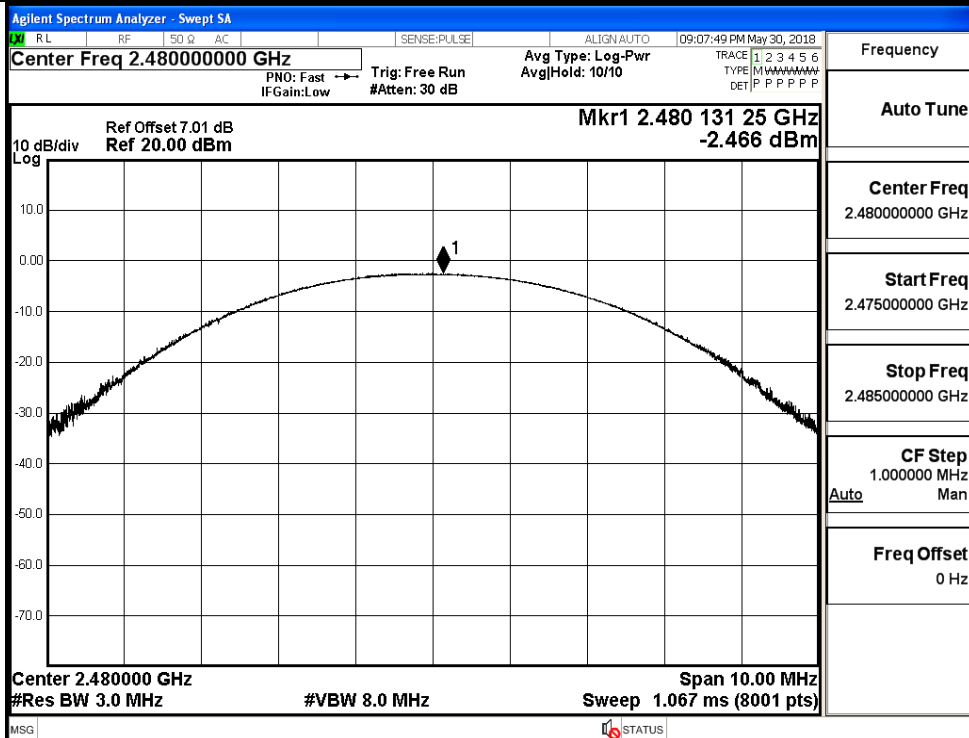


GFSK/MCH

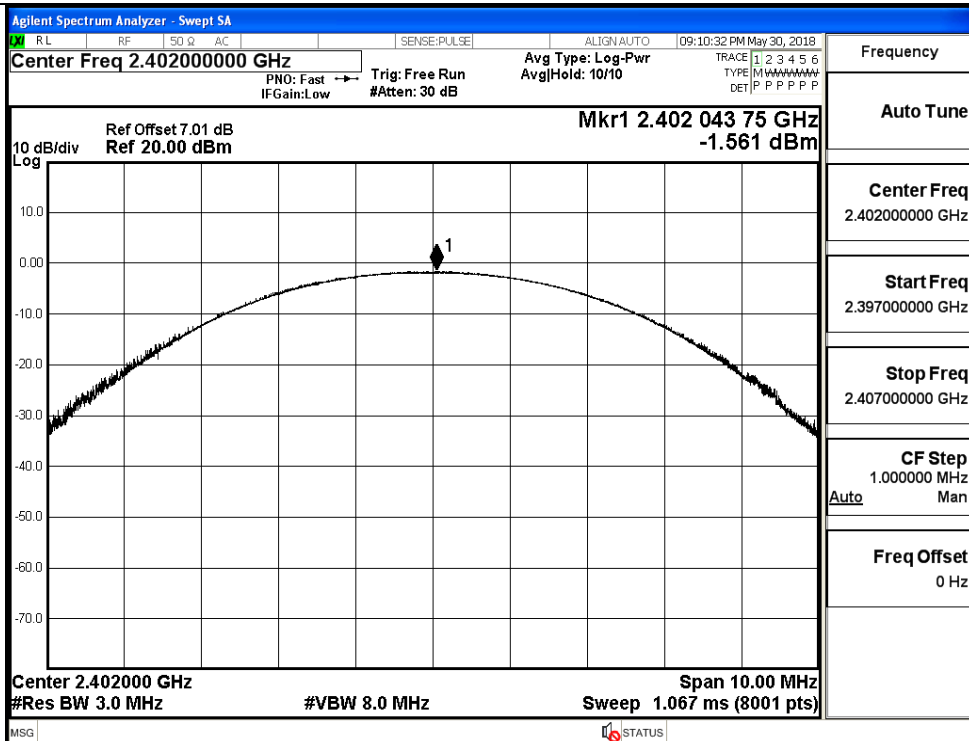


GFSK/HCH

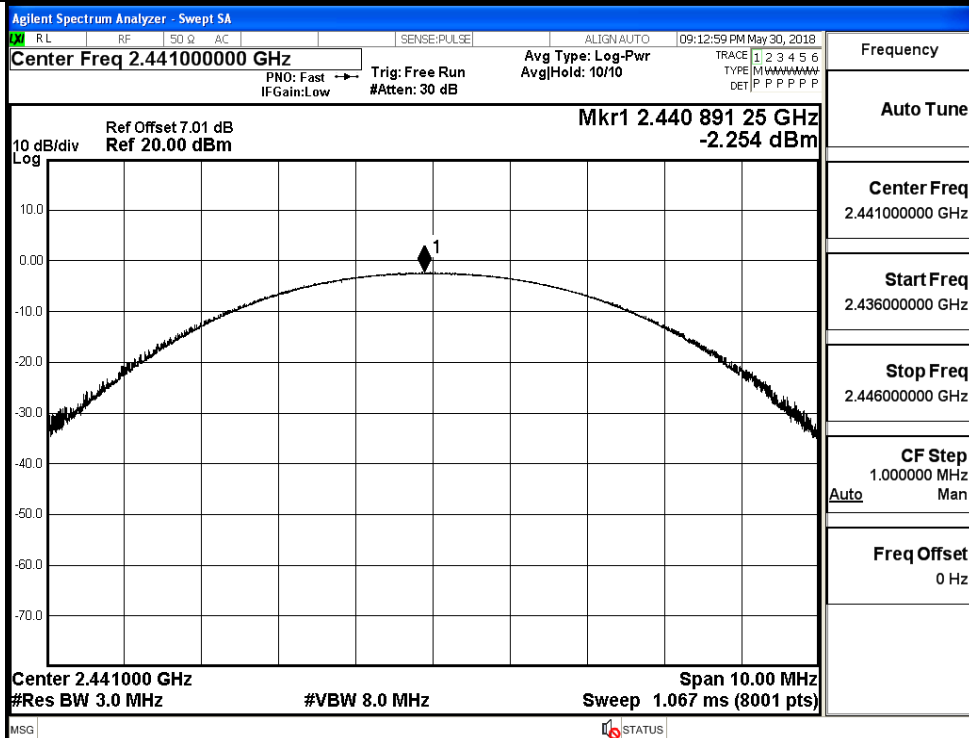
 π /4DQPSK/LCH

$\pi/4$ DQPSK/MCH $\pi/4$ DQPSK/HCH

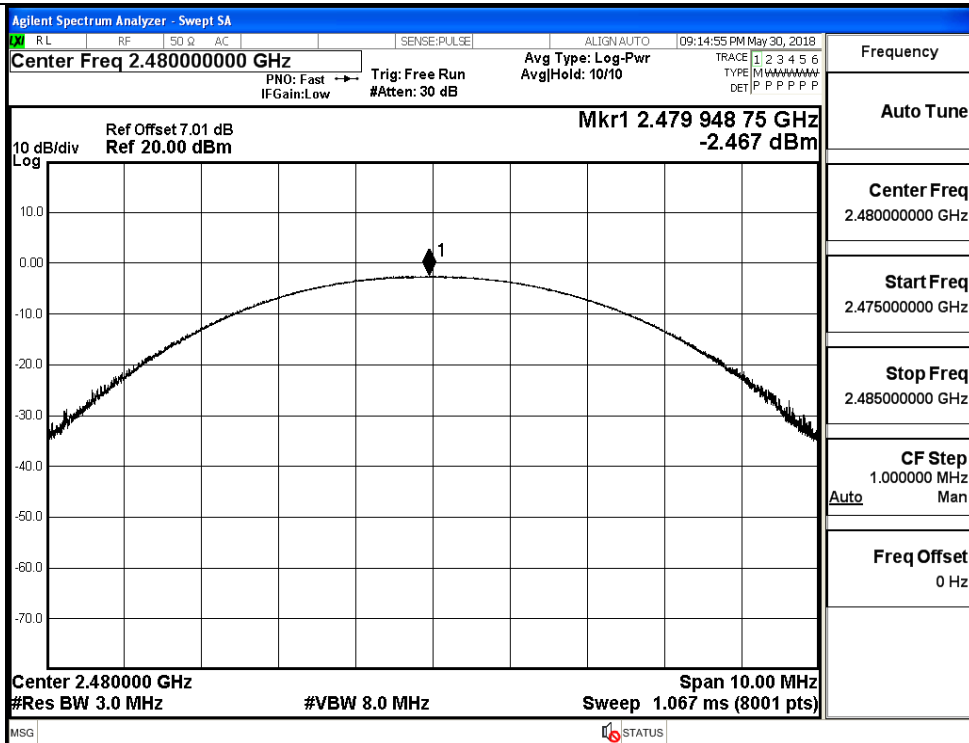
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

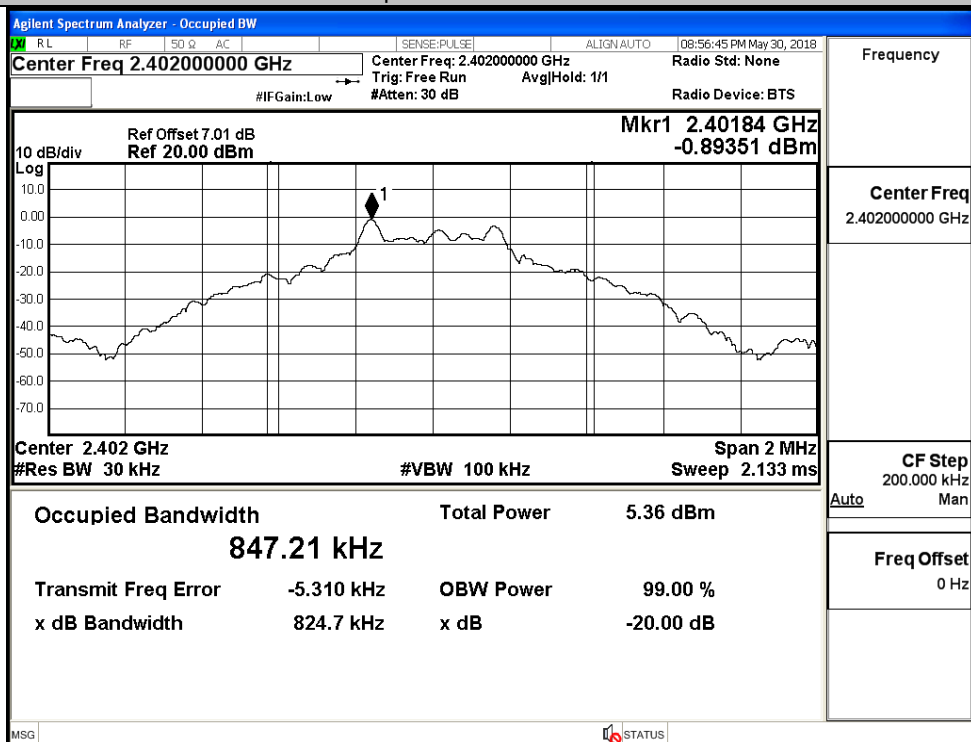


A.2 20dB Bandwidth

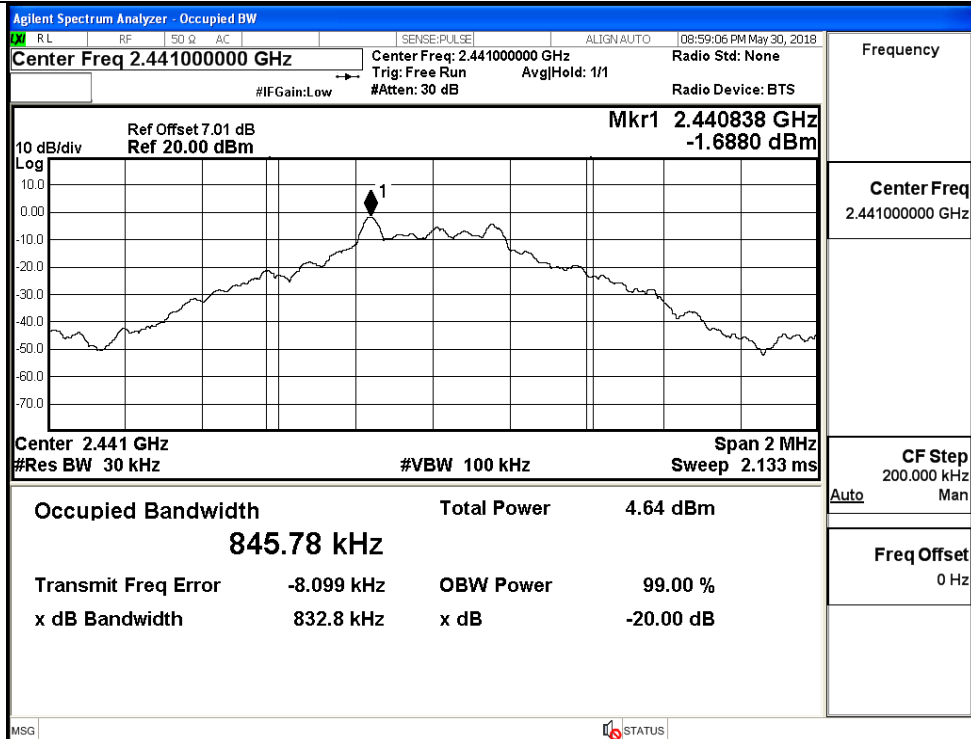
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.8247	Not Specified	PASS
	MCH	0.8328	Not Specified	PASS
	HCH	0.8410	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.119	Not Specified	PASS
	MCH	1.116	Not Specified	PASS
	HCH	1.112	Not Specified	PASS
8DPSK	LCH	1.123	Not Specified	PASS
	MCH	1.120	Not Specified	PASS
	HCH	1.113	Not Specified	PASS

Test Graphs

GFSK/LCH



GFSK/MCH



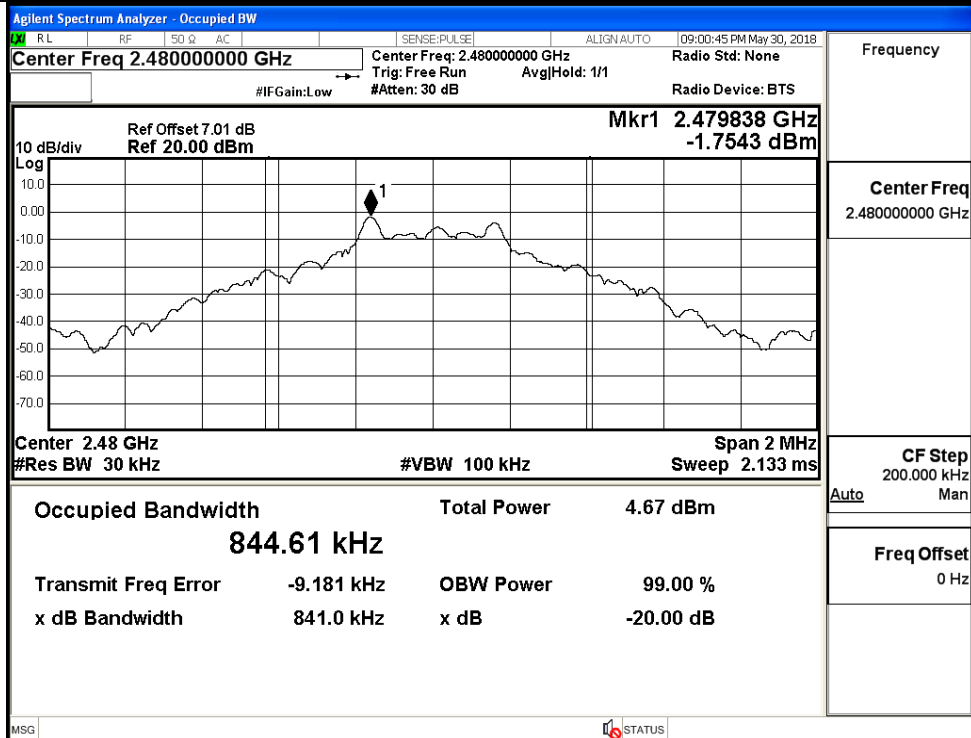
Frequency

Center Freq
2.441000000 GHzCF Step
200.000 kHz
Man

Auto

Freq Offset
0 Hz

GFSK/HCH

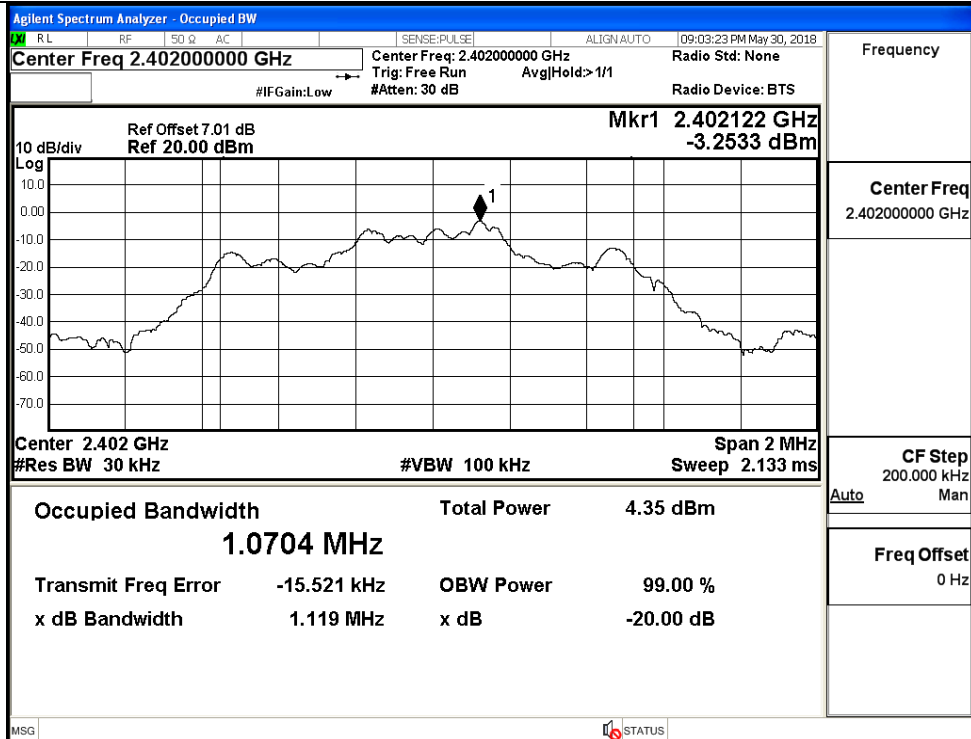
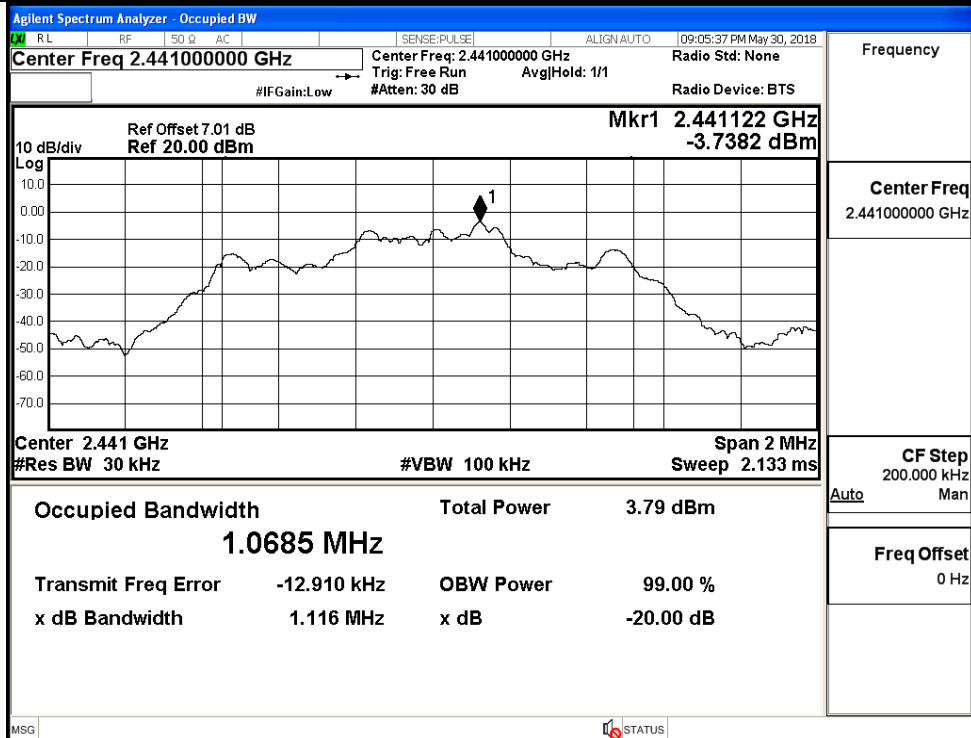


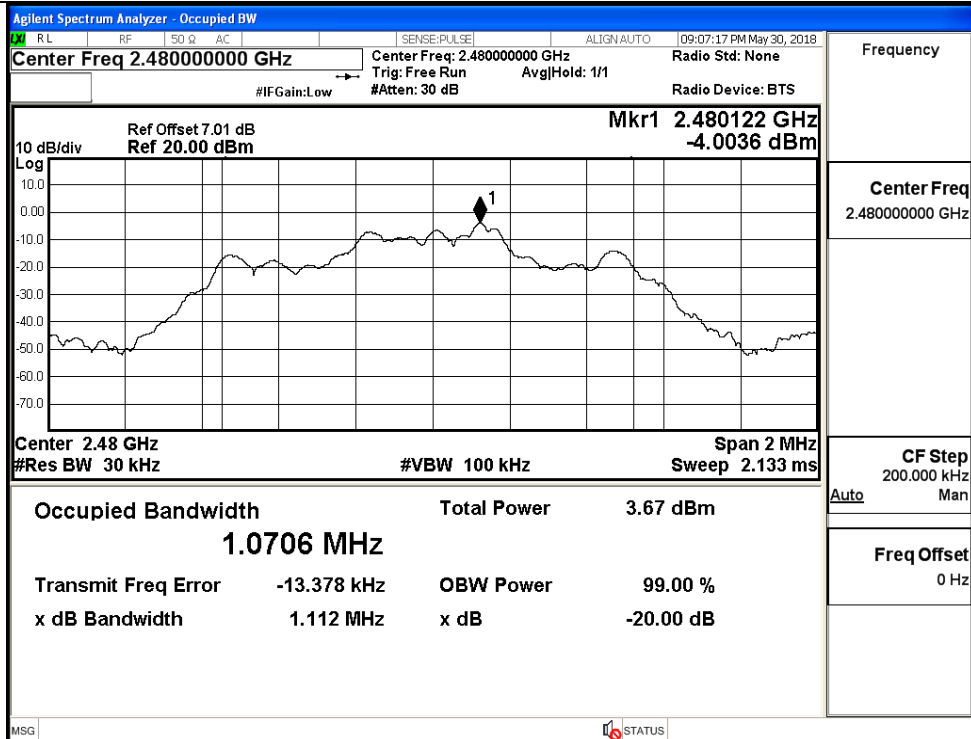
Frequency

Center Freq
2.480000000 GHzCF Step
200.000 kHz
Man

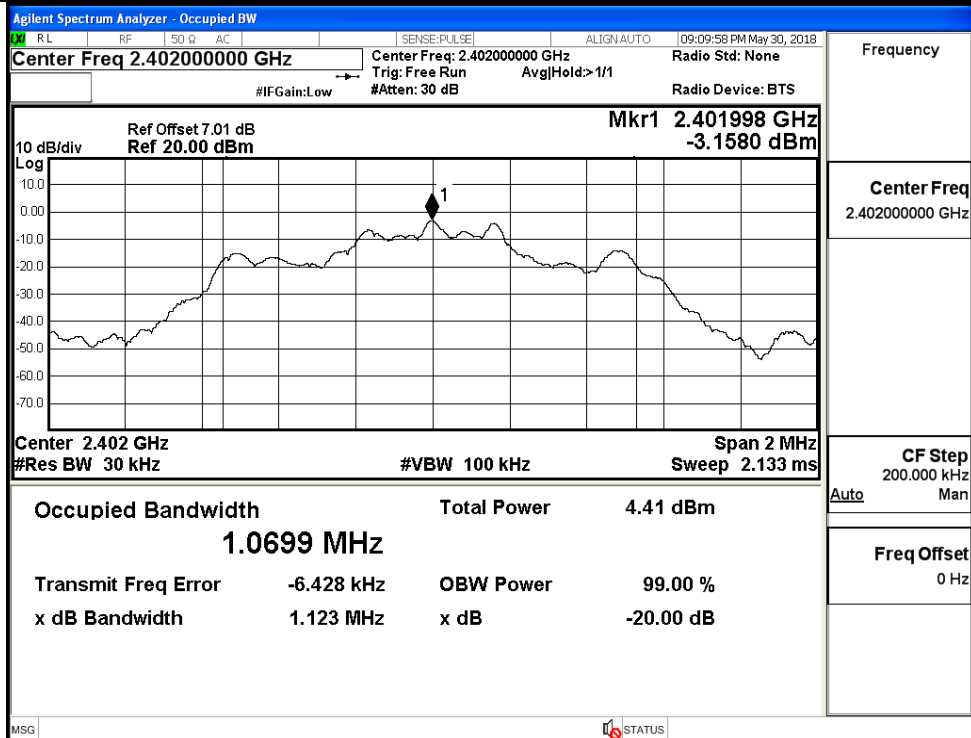
Auto

Freq Offset
0 Hz

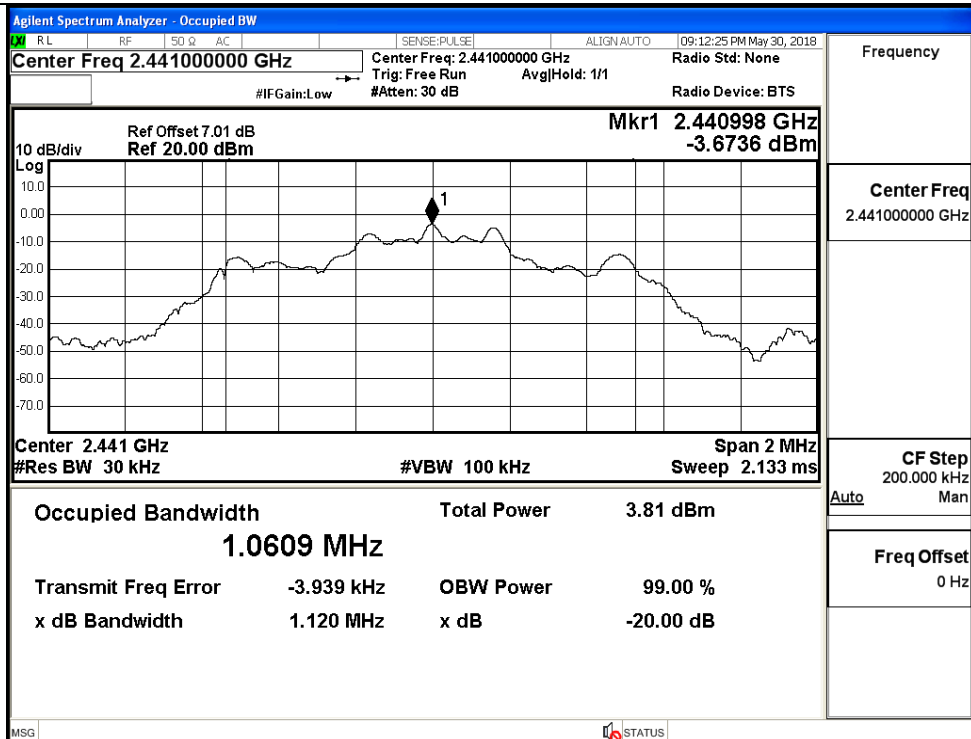
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

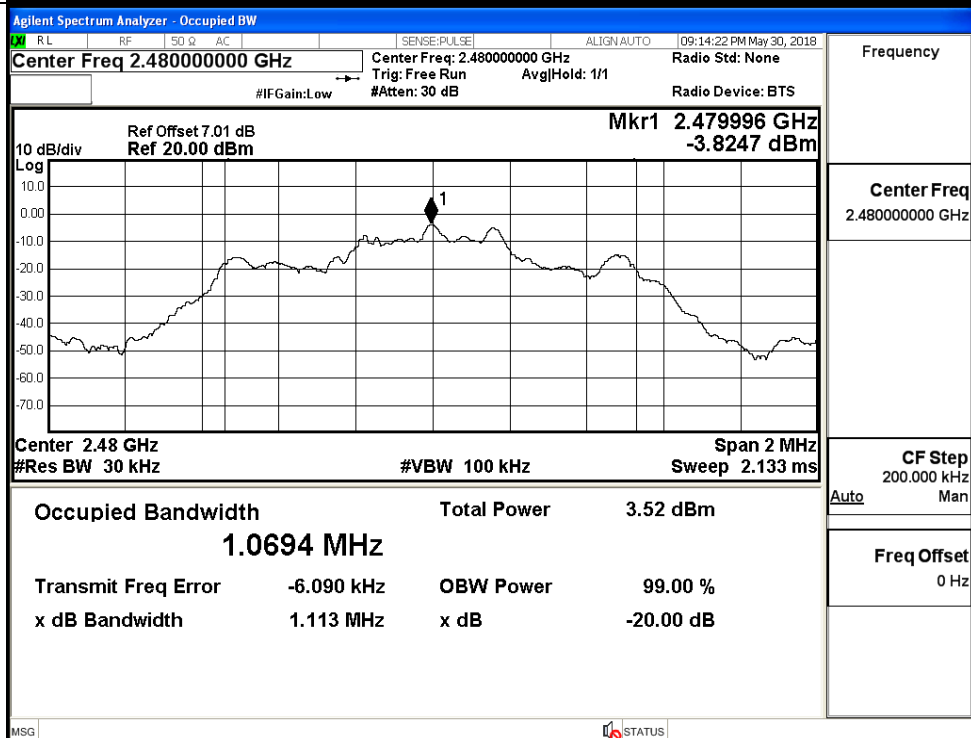
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

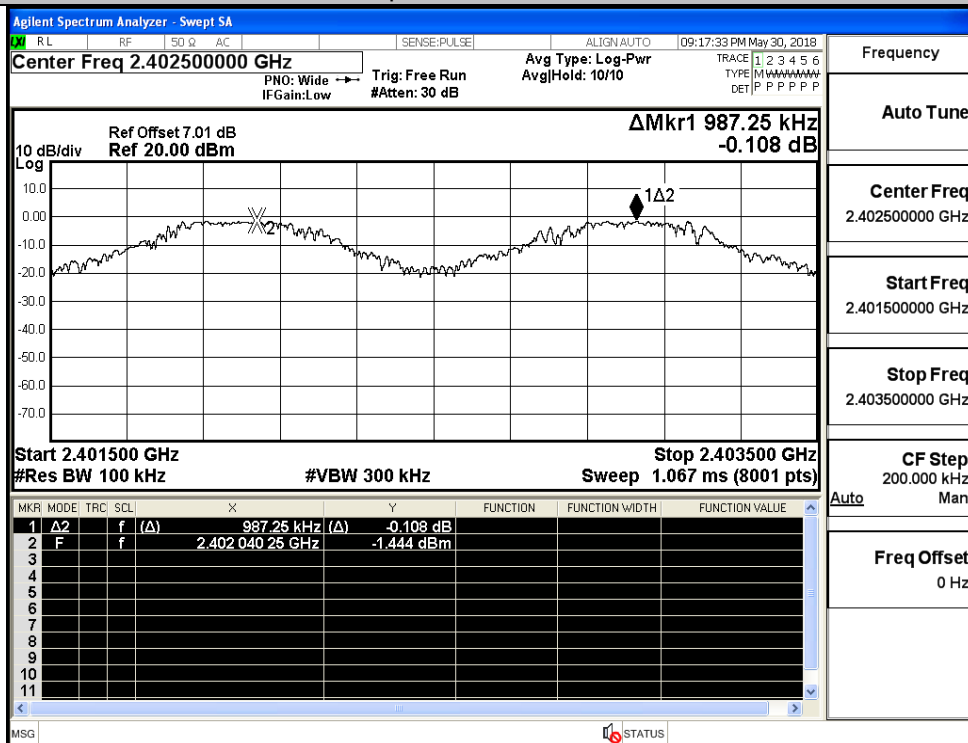


A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.987	0.8247	PASS
	MCH	1.034	0.8328	PASS
	HCH	1.160	0.8410	PASS
π /4DQPSK	LCH	1.284	1.119	PASS
	MCH	0.980	1.116	PASS
	HCH	1.180	1.112	PASS
8DPSK	LCH	1.146	1.123	PASS
	MCH	0.982	1.120	PASS
	HCH	1.134	1.113	PASS

Test Graphs

GFSK/LCH



Frequency

Auto Tune

Center Freq

2.402500000 GHz

Start Freq

2.401500000 GHz

Stop Freq

2.403500000 GHz

CF Step

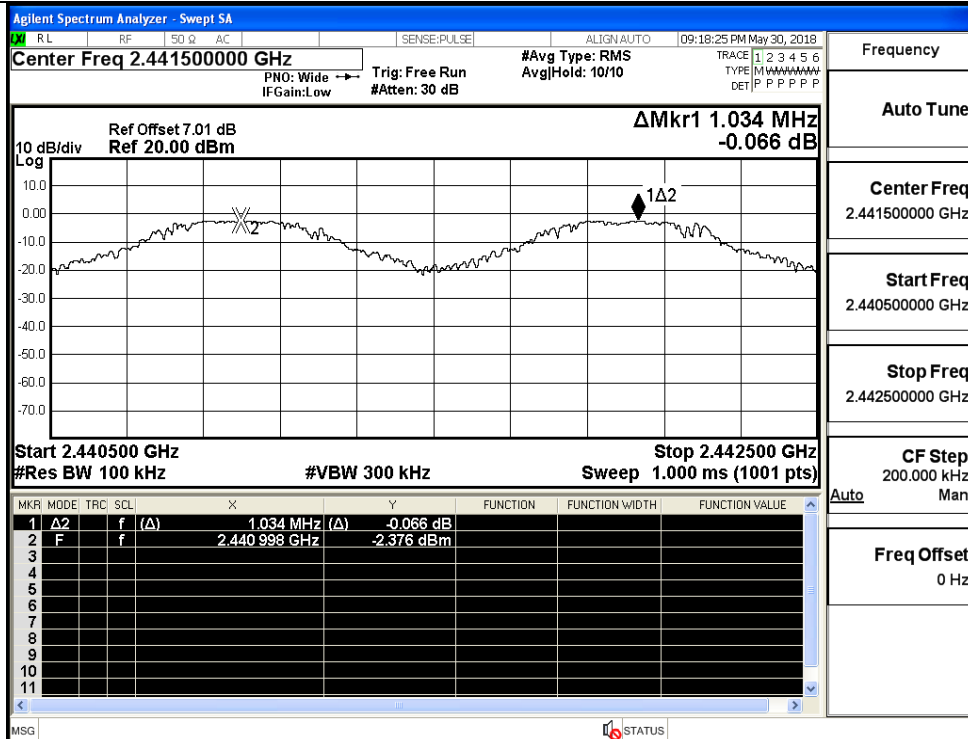
200.000 kHz

Man

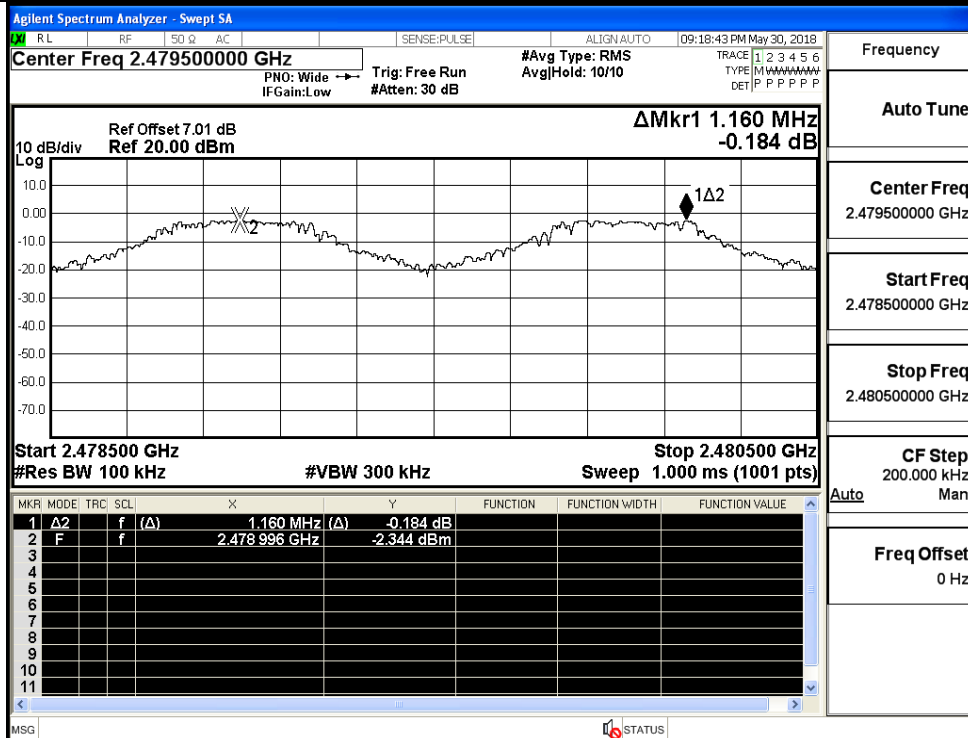
Freq Offset

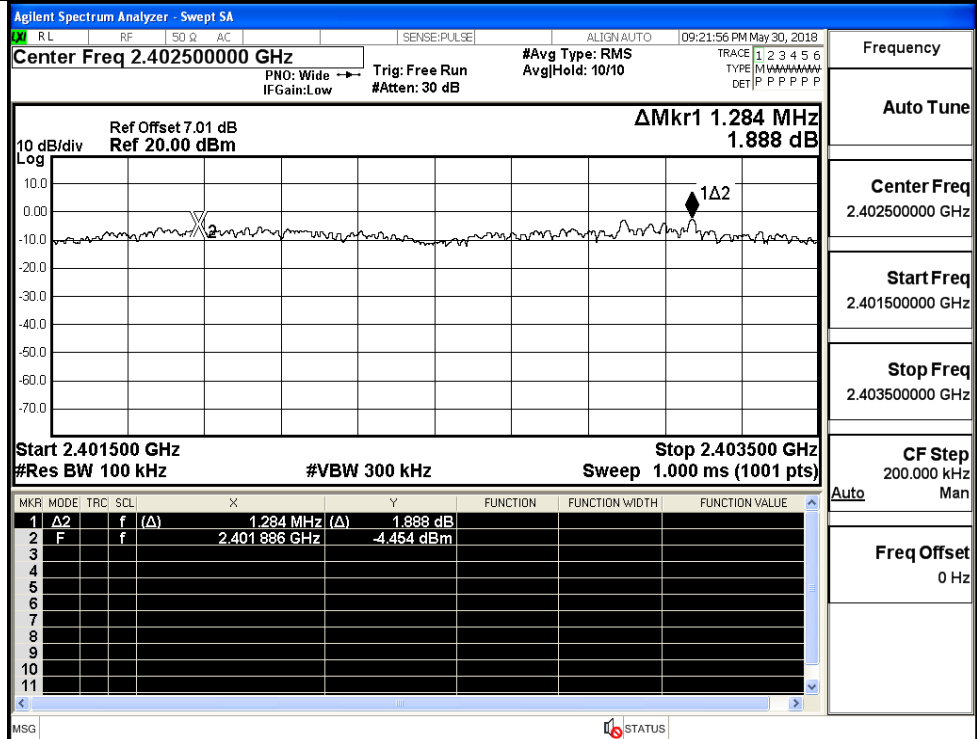
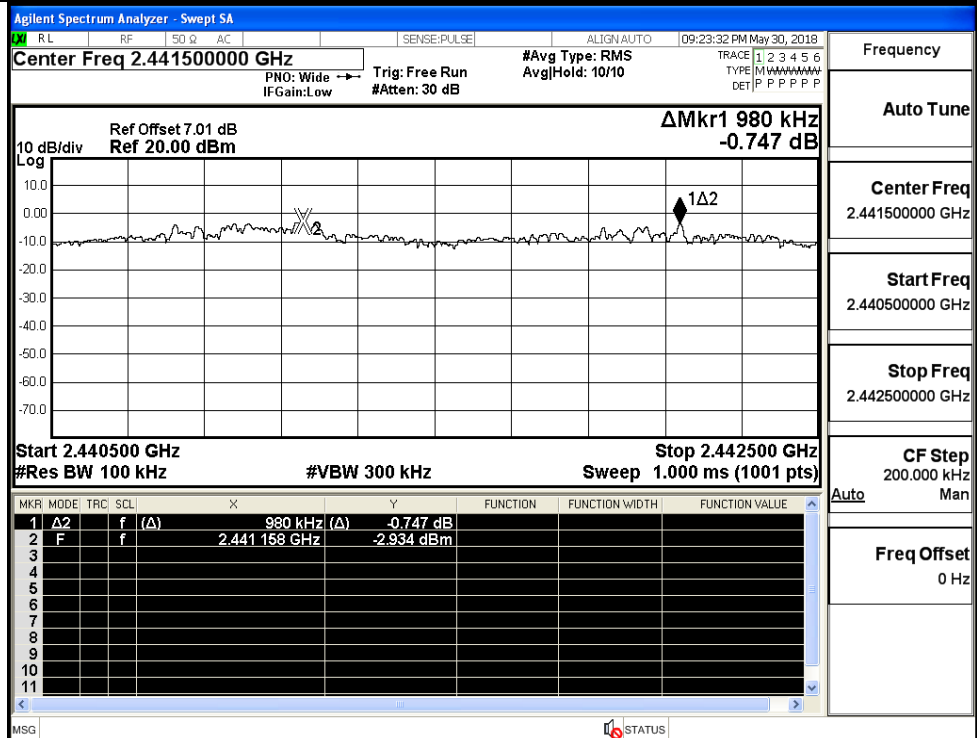
0 Hz

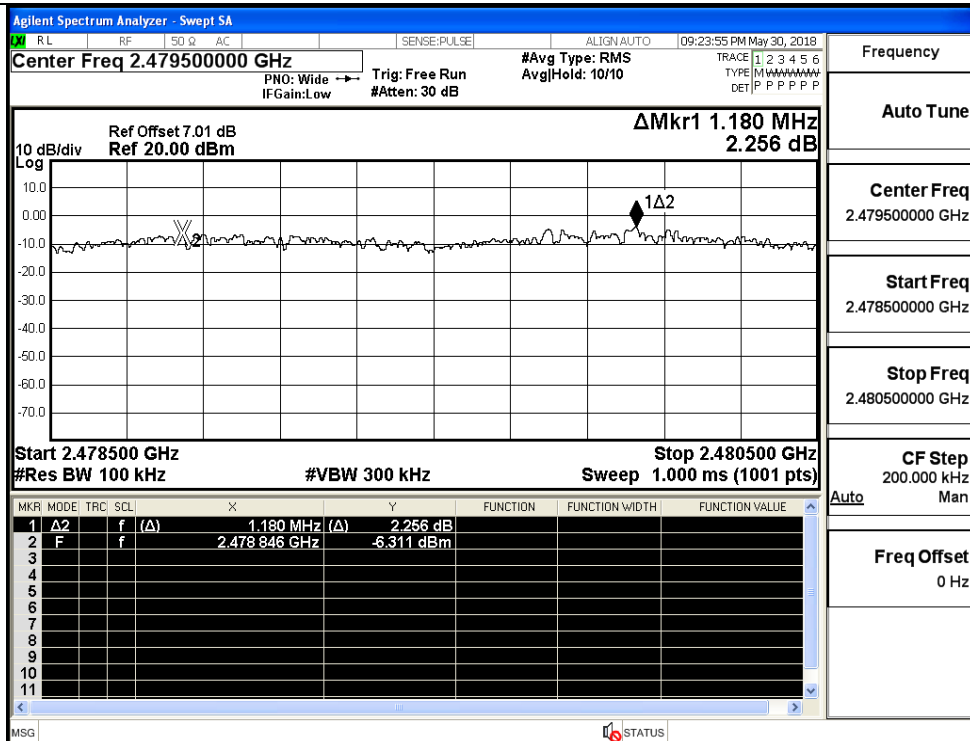
GFSK/MCH



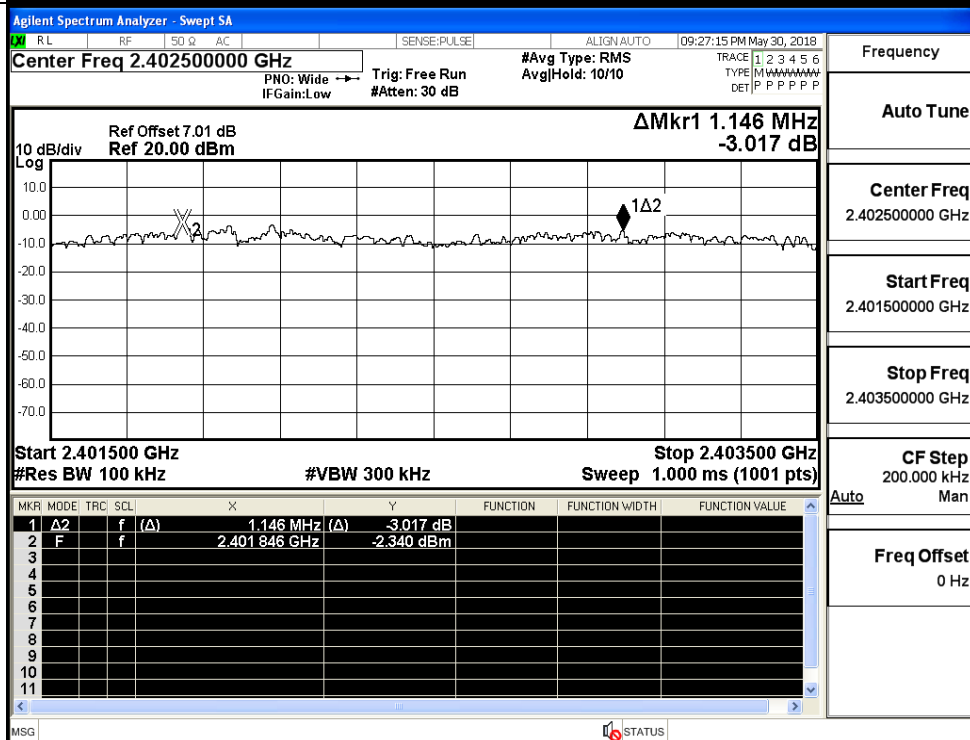
GFSK/HCH



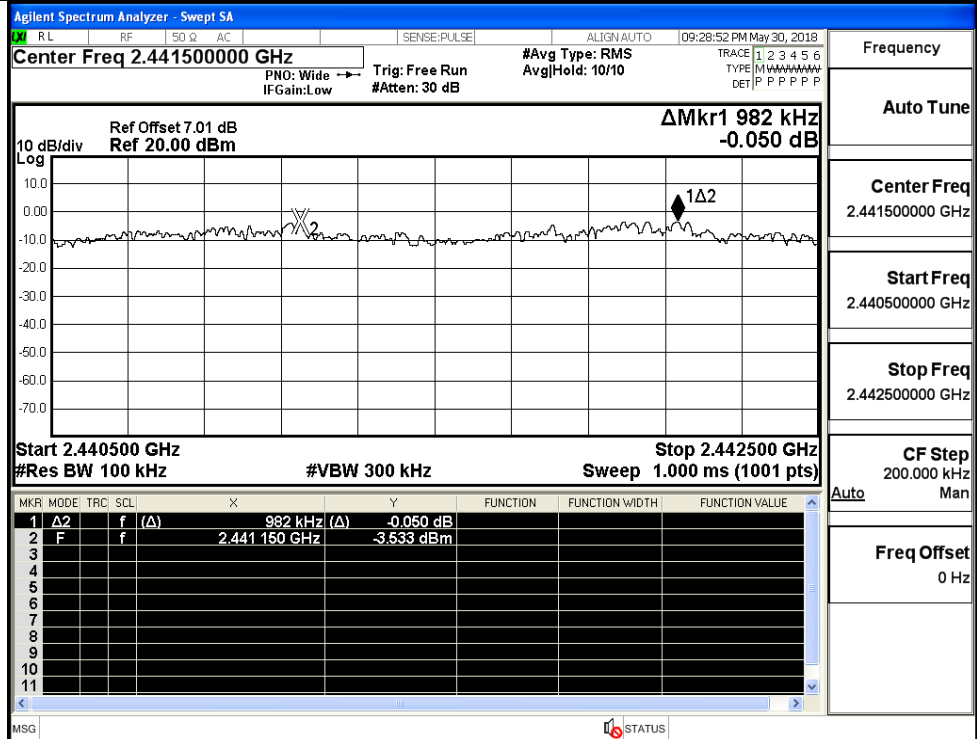
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

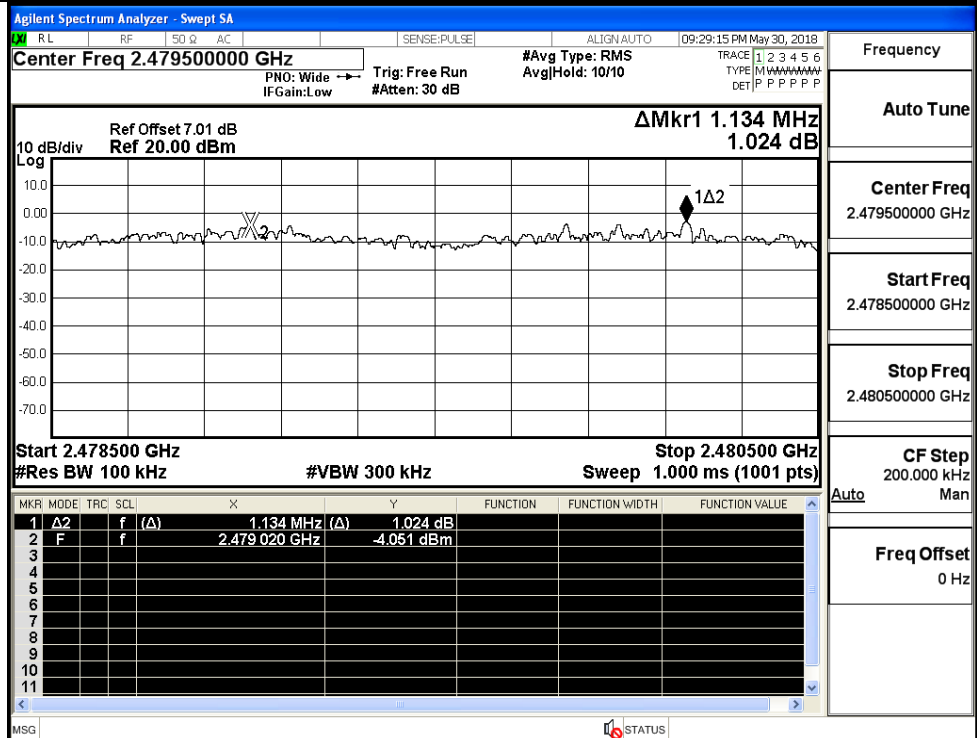
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

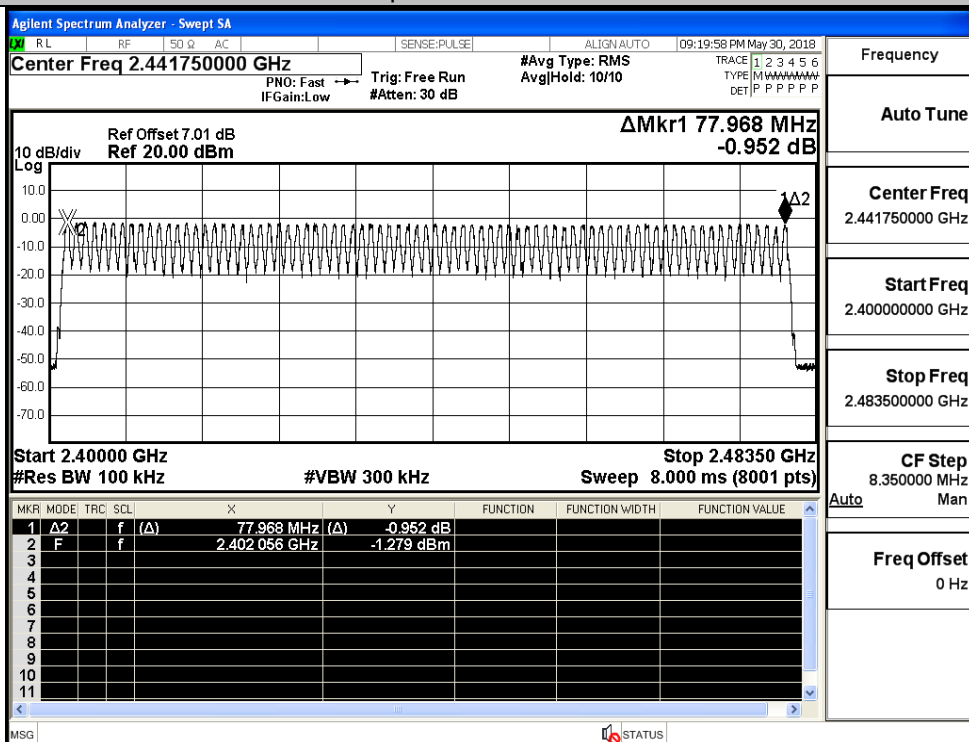
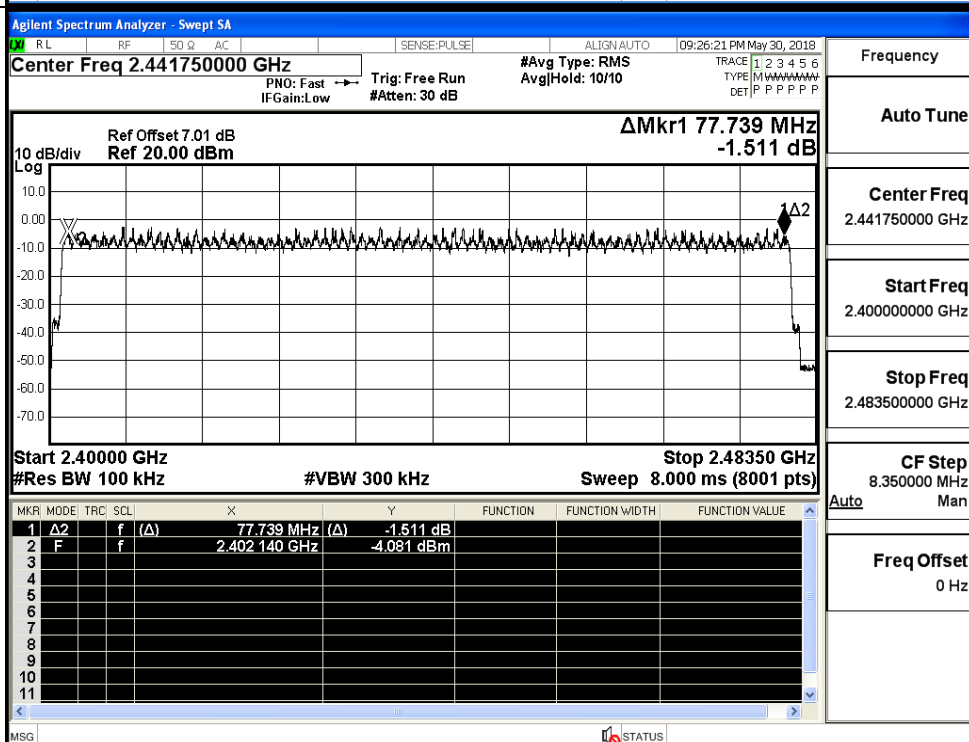


A.4 Hopping Channel Number

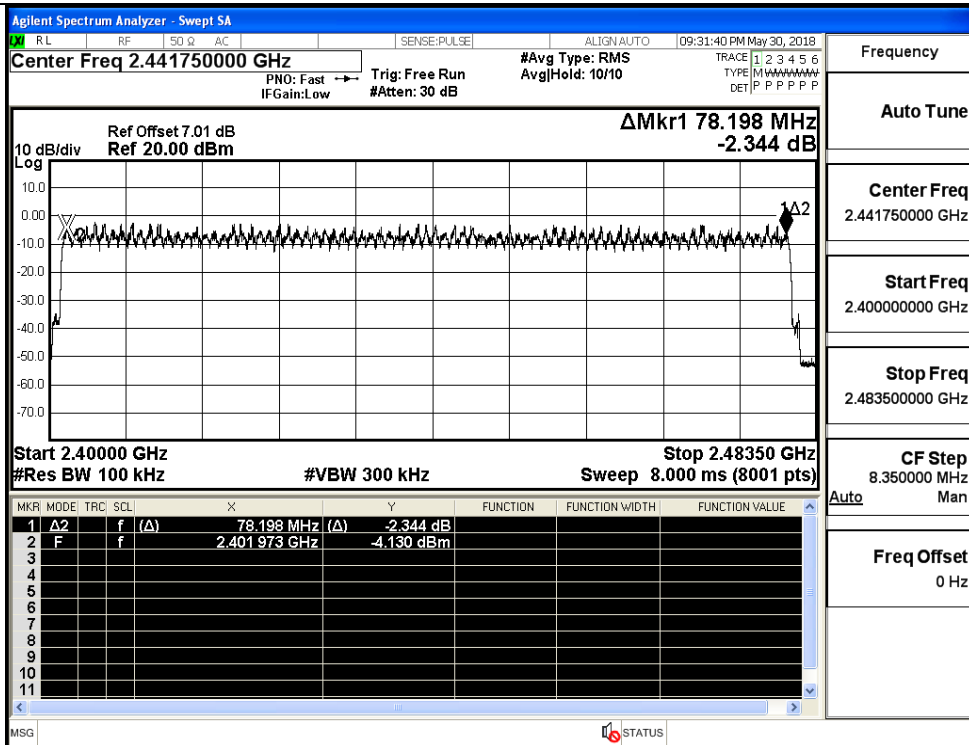
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

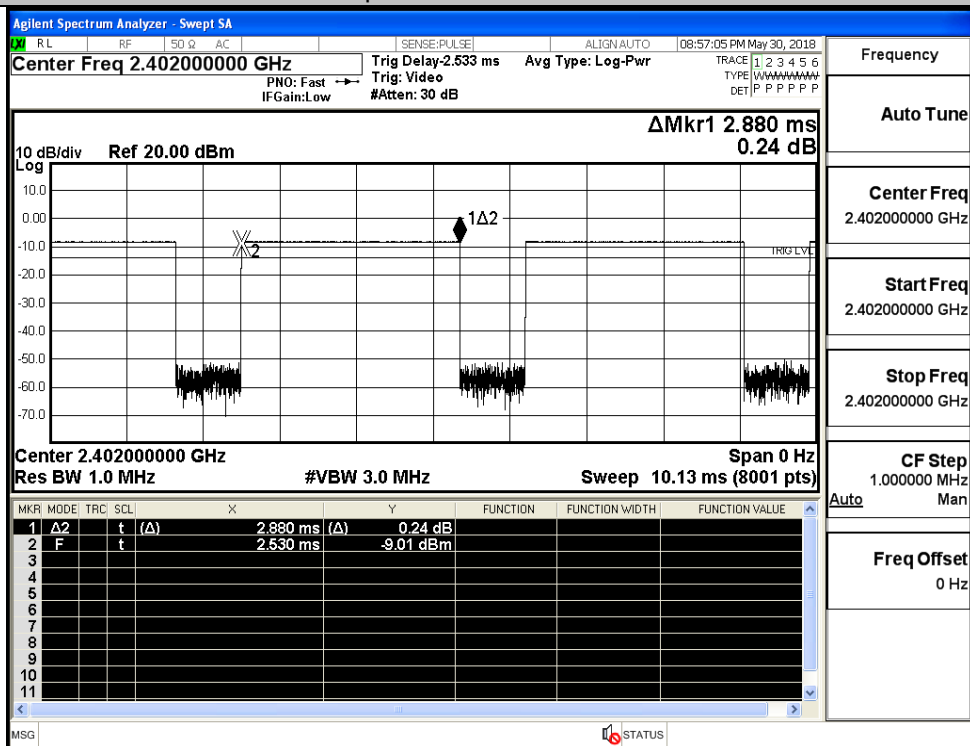


A.5 Dwell Time

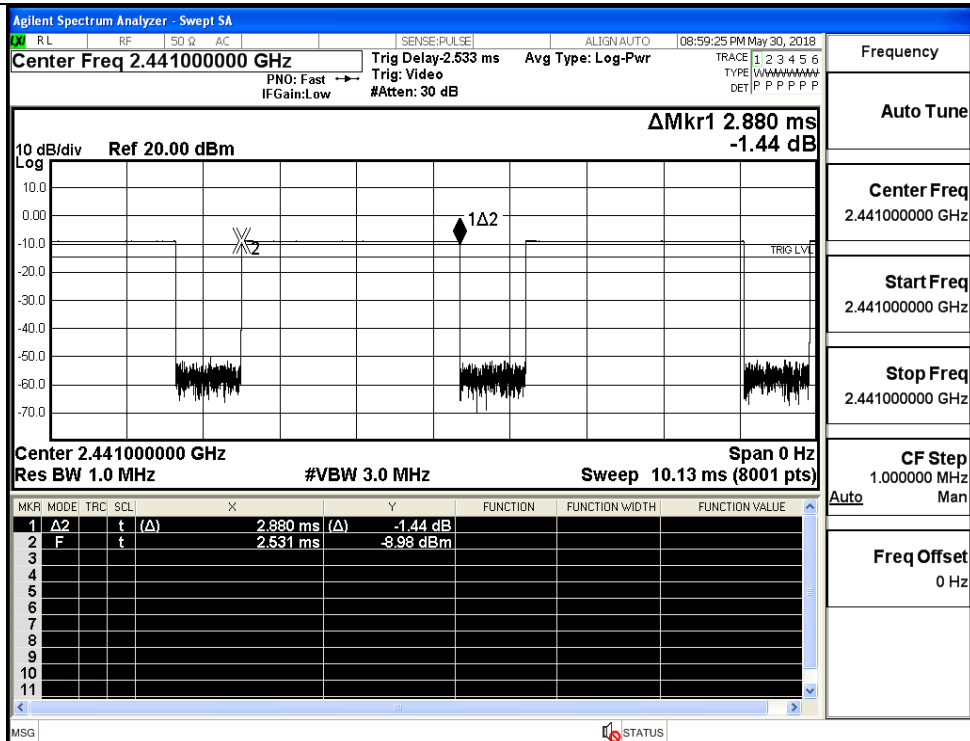
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	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

Test Graphs

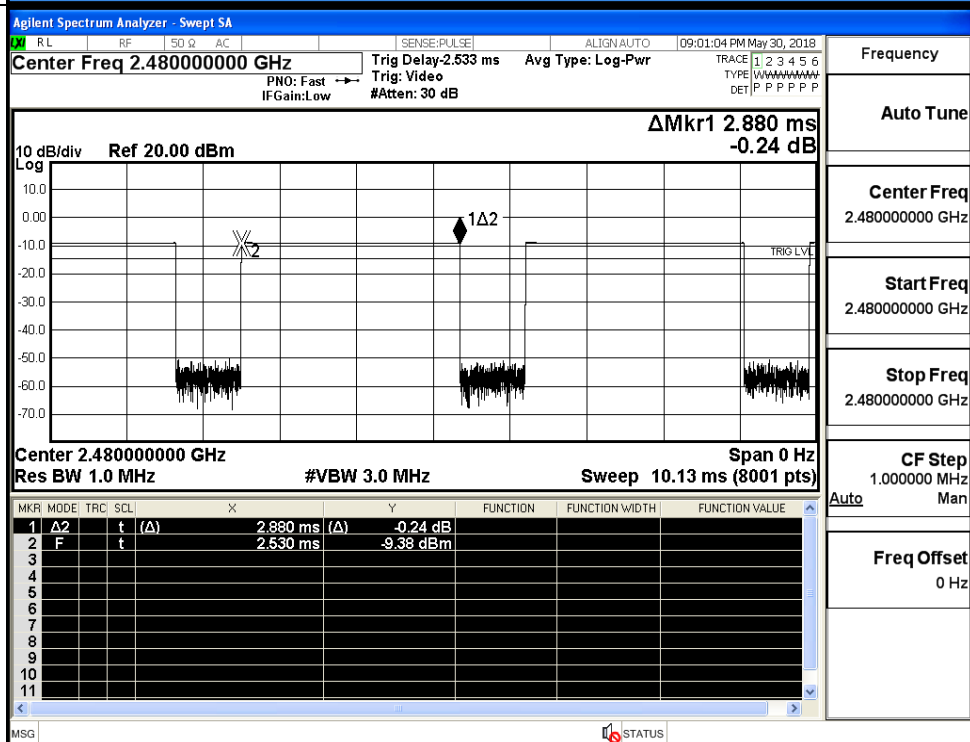
GFSK_DH5/LCH



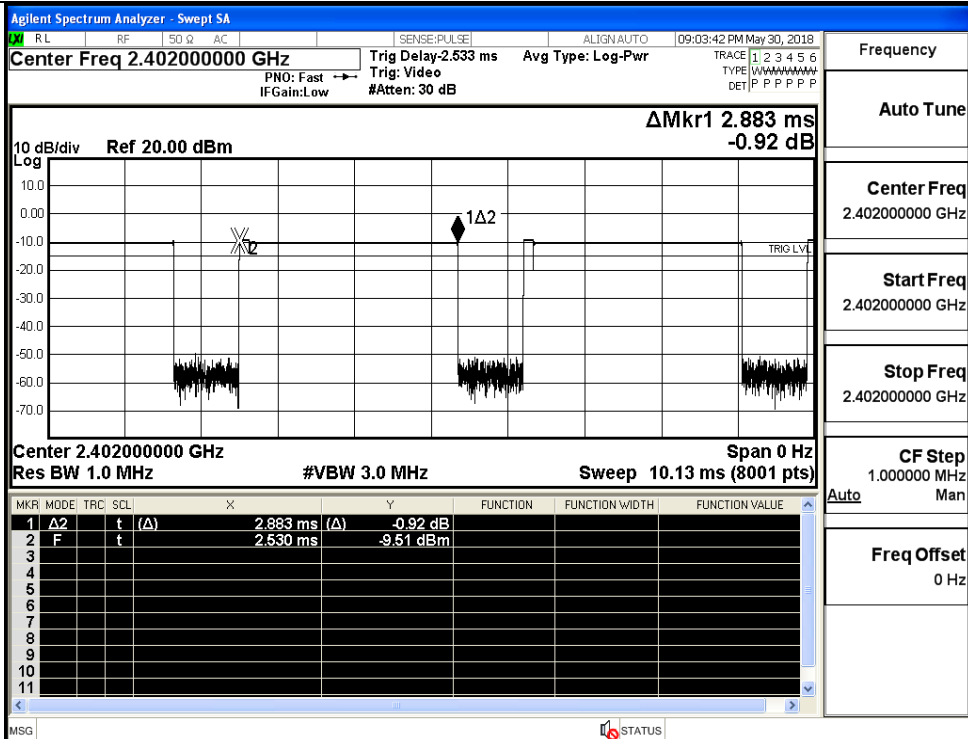
GFSK_DH5/MCH



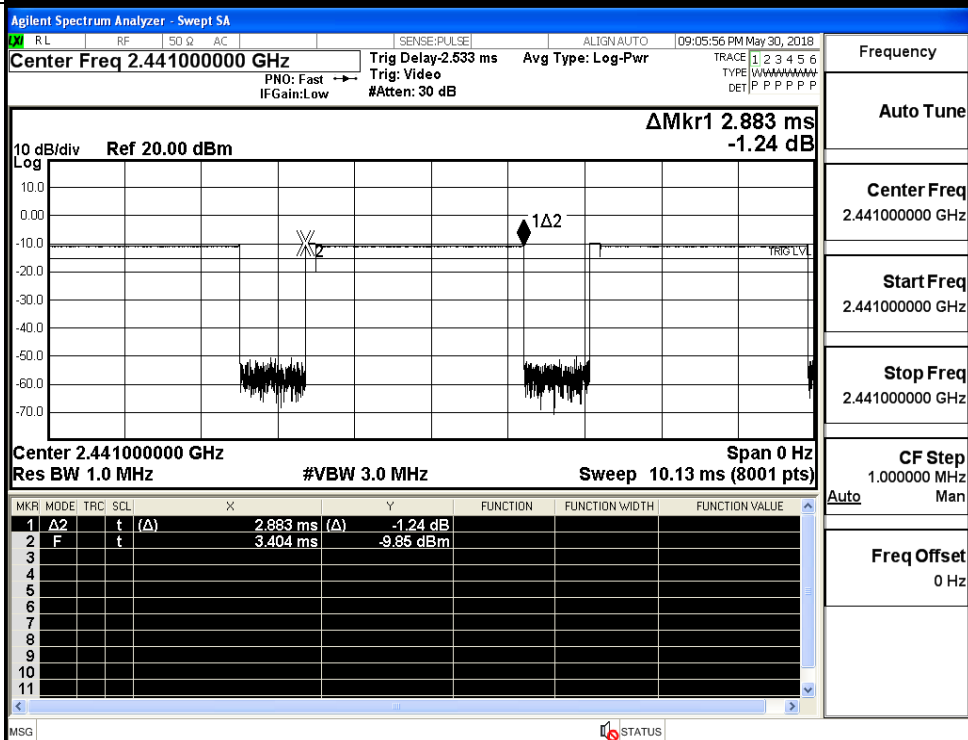
GFSK_DH5/HCH



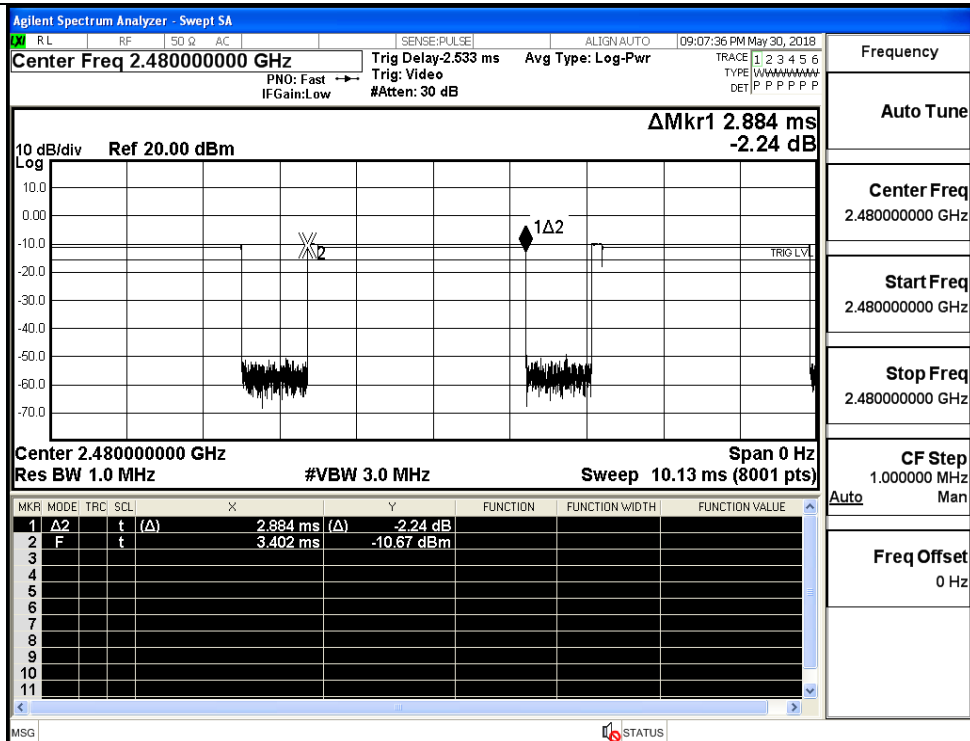
$\pi/4$ DQPSK
_2DH5/LCH



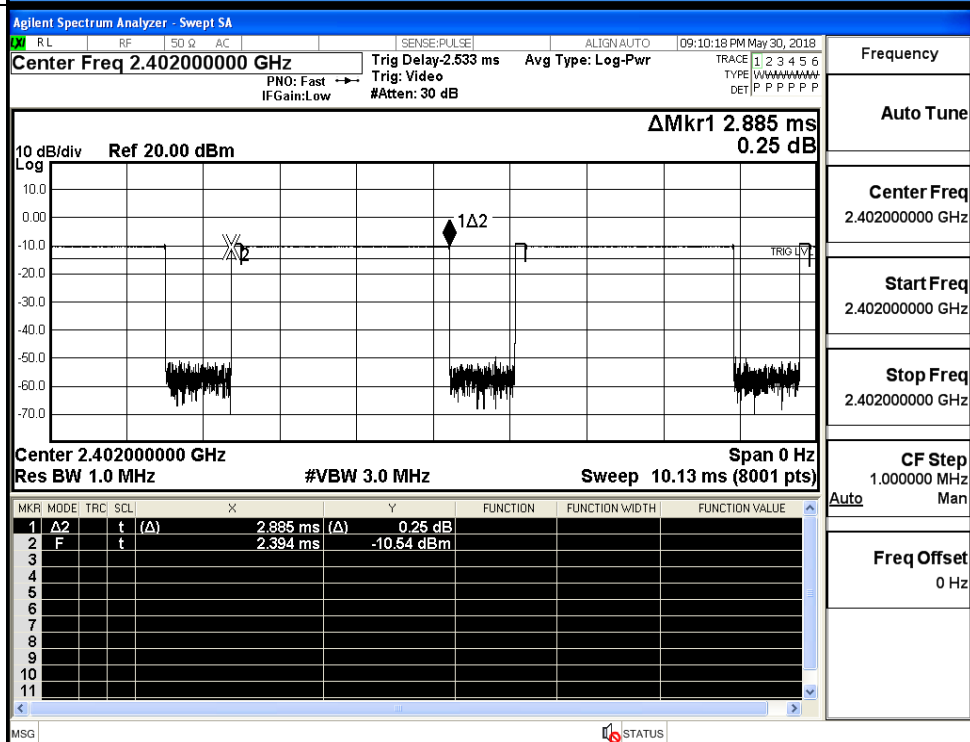
$\pi/4$ DQPSK
_2DH5/MCH



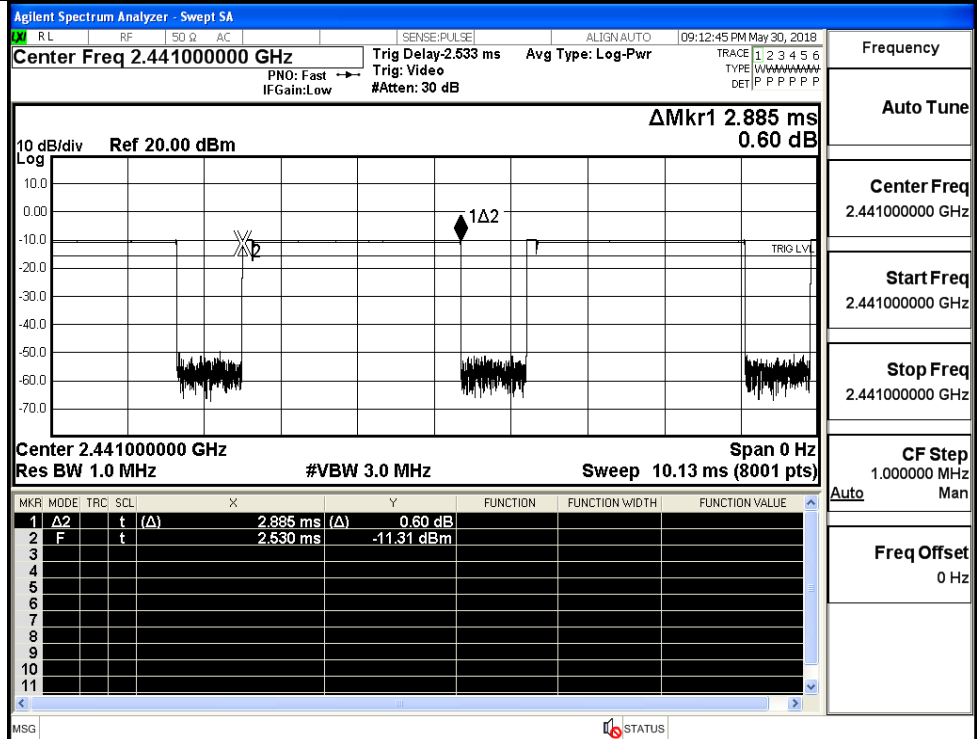
$\pi/4$ DQPSK
_2DH5/HCH



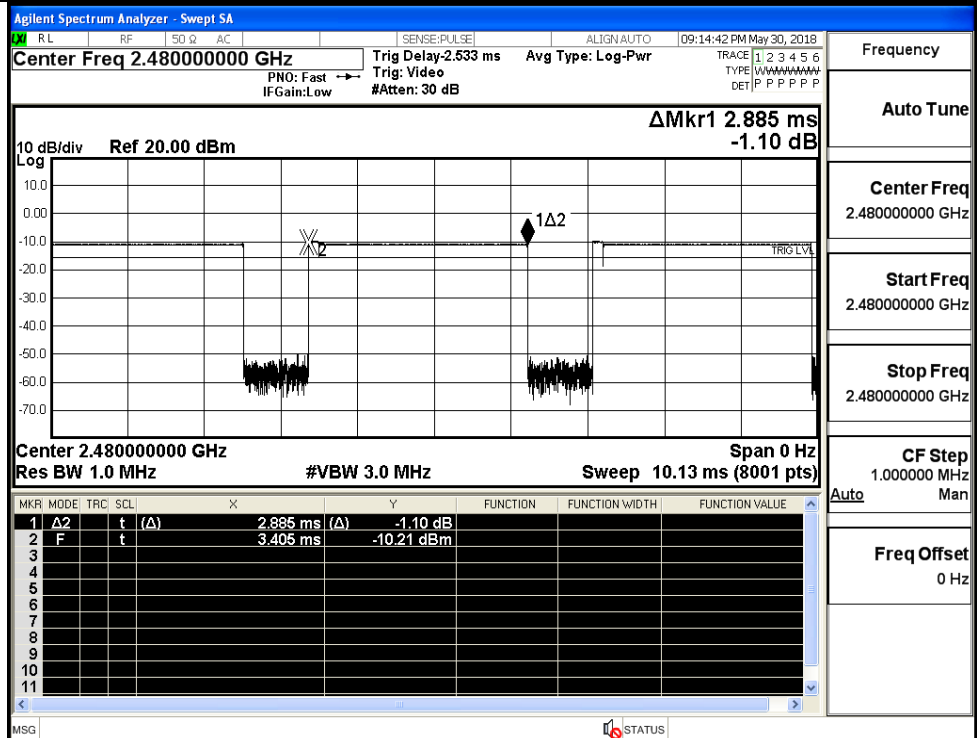
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



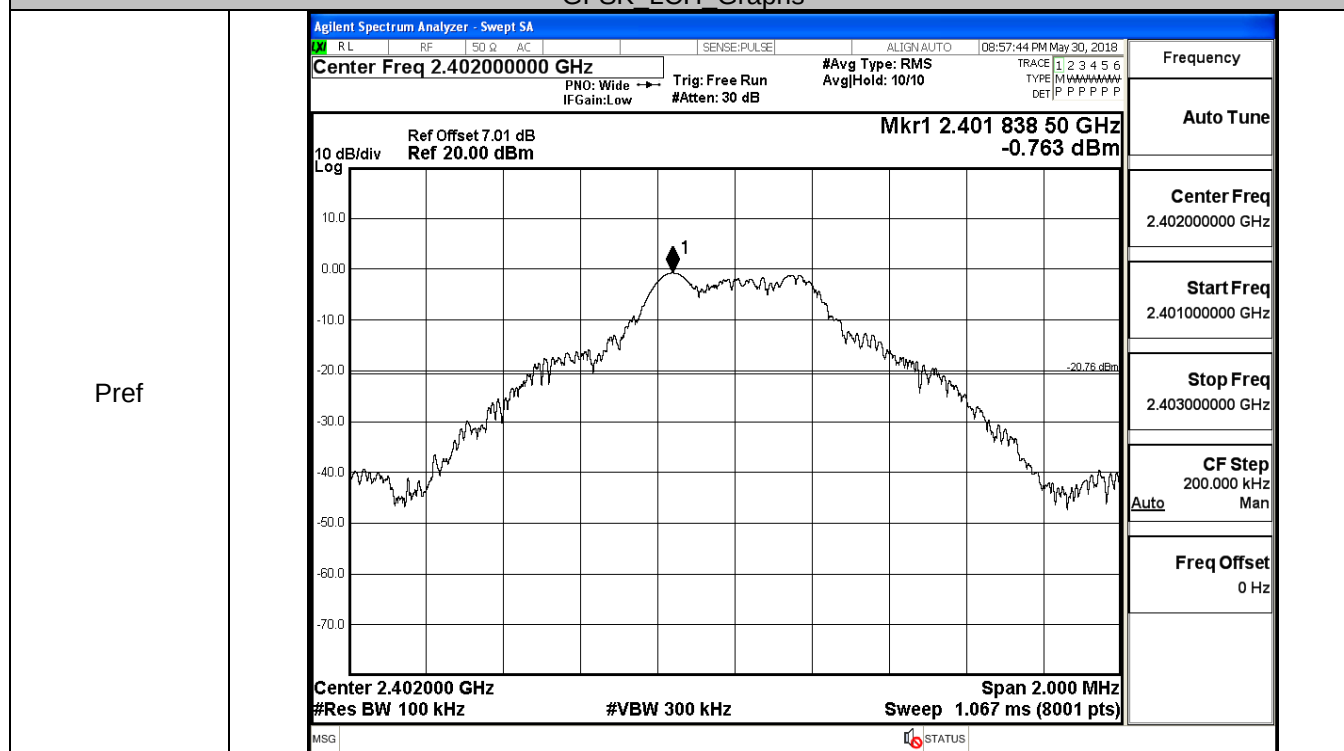
8DPSK_3DH5/HCH



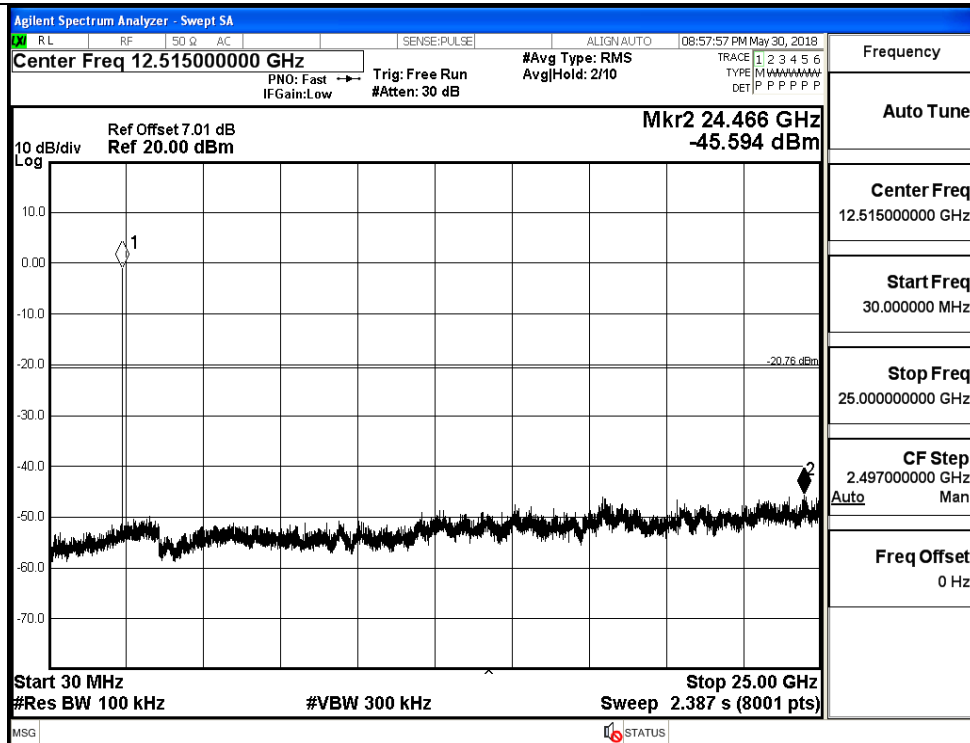
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.763	-45.594	-20.763	PASS
	MCH	-1.678	-45.015	-21.678	PASS
	HCH	-1.774	-44.845	-21.774	PASS
$\pi/4$ DQPSK	LCH	-2.234	-45.209	-22.234	PASS
	MCH	-2.795	-46.073	-22.795	PASS
	HCH	-2.899	-46.057	-22.899	PASS
8DPSK	LCH	-2.124	-45.455	-22.124	PASS
	MCH	-2.855	-44.473	-22.855	PASS
	HCH	-3.173	-45.843	-23.173	PASS

GFSK LCH Graphs

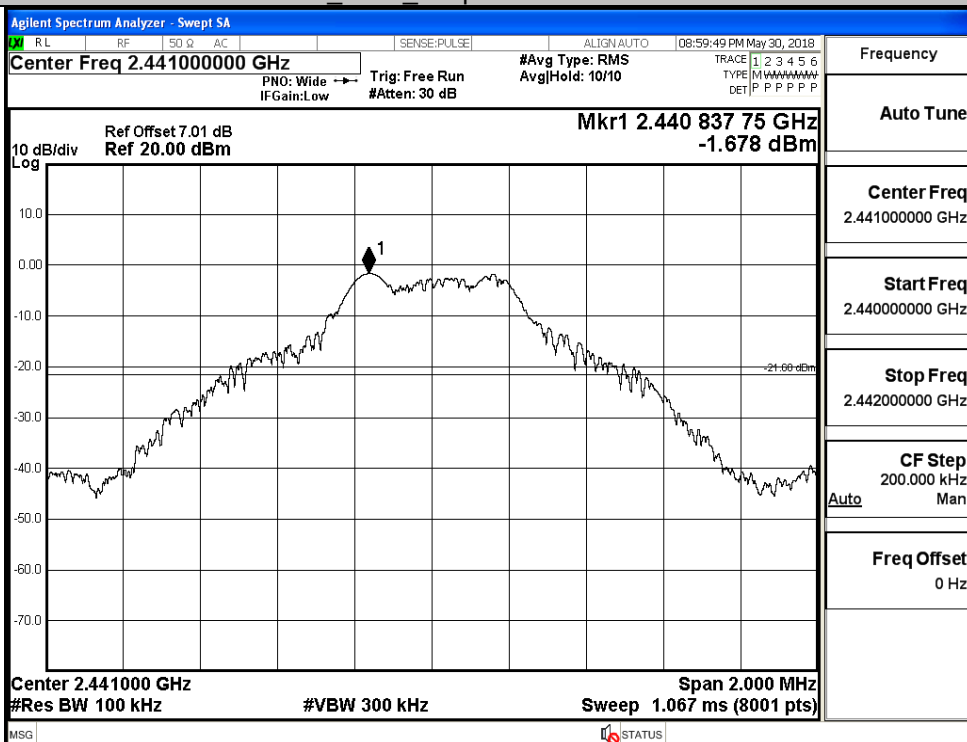


Puw

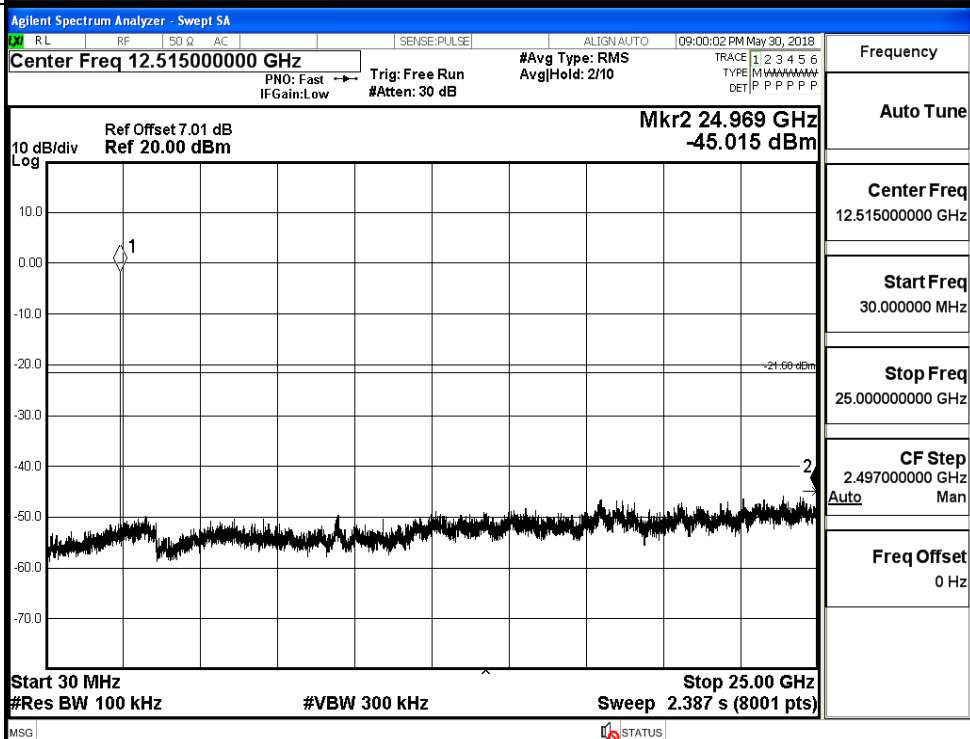


GFSK_MCH_Graphs

Pref

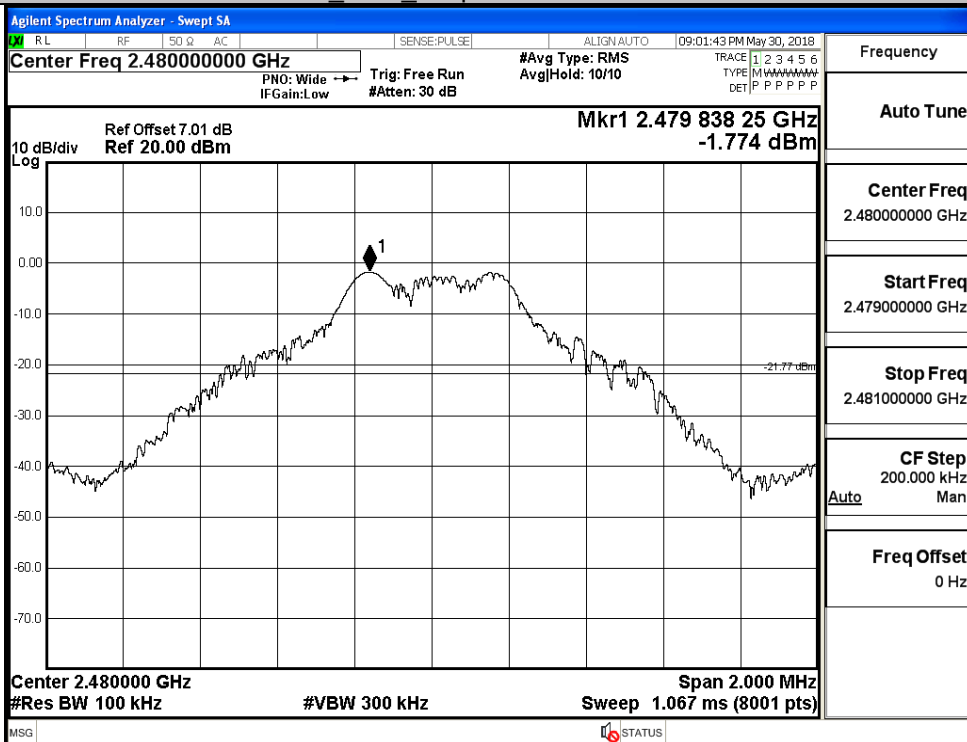


Puw

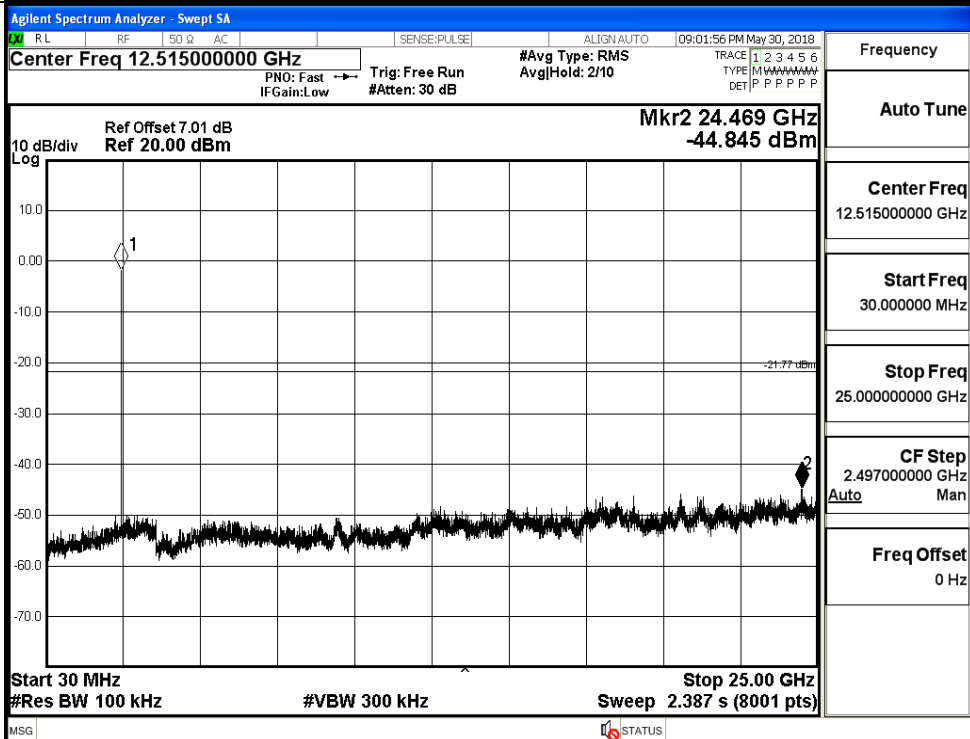


GFSK HCH Graphs

Pref

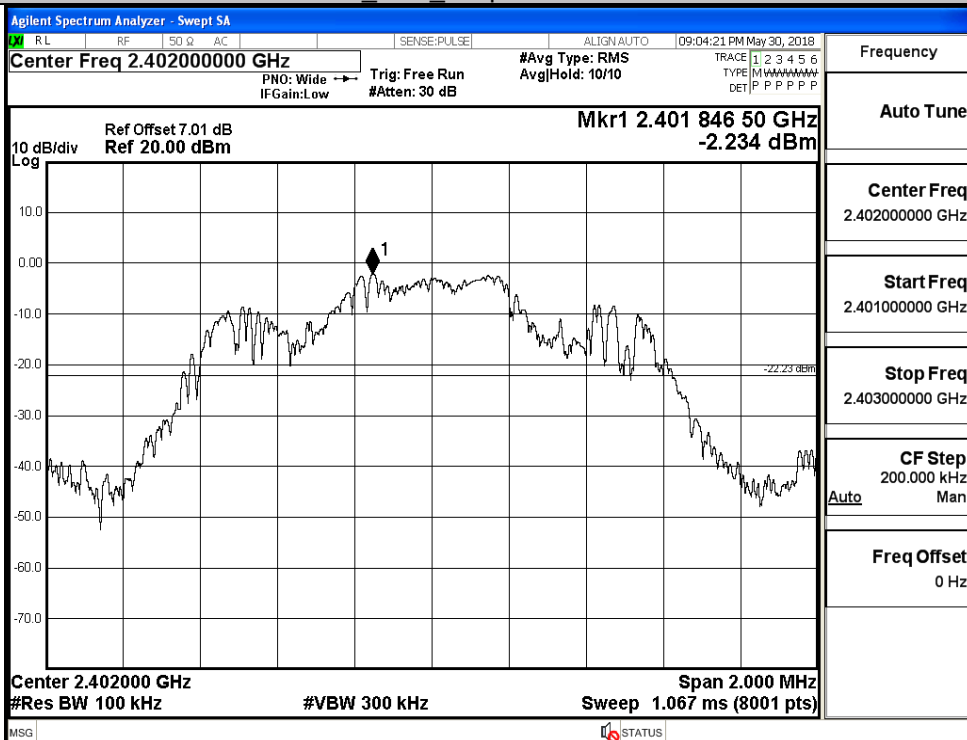


Puw

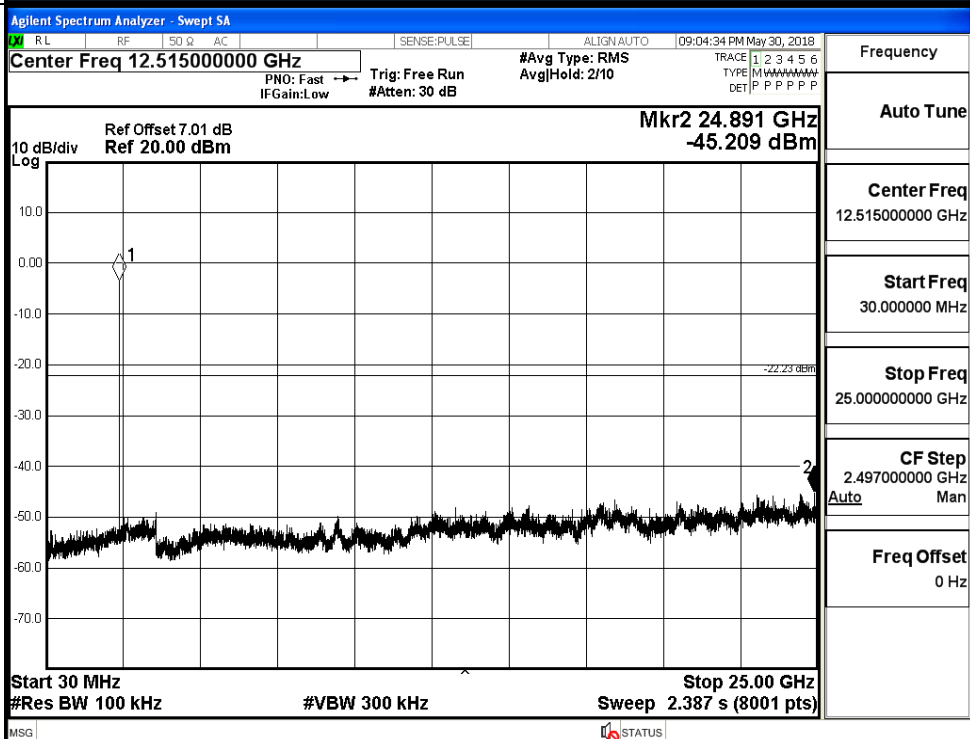


$\pi/4$ DQPSK LCH_Graphs

Pref

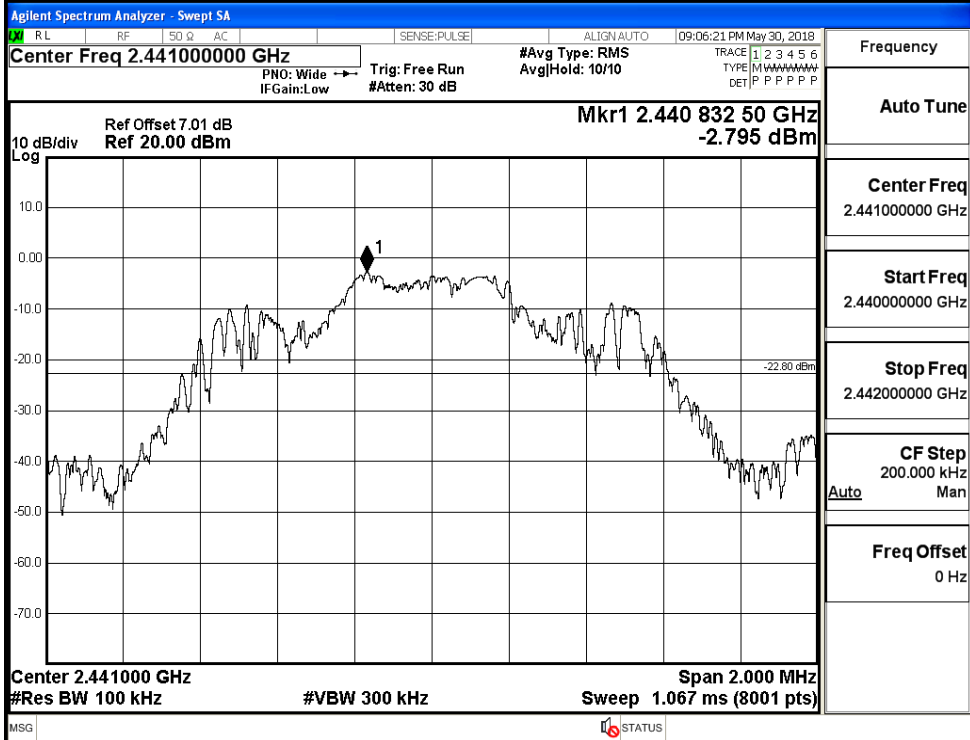


Puw

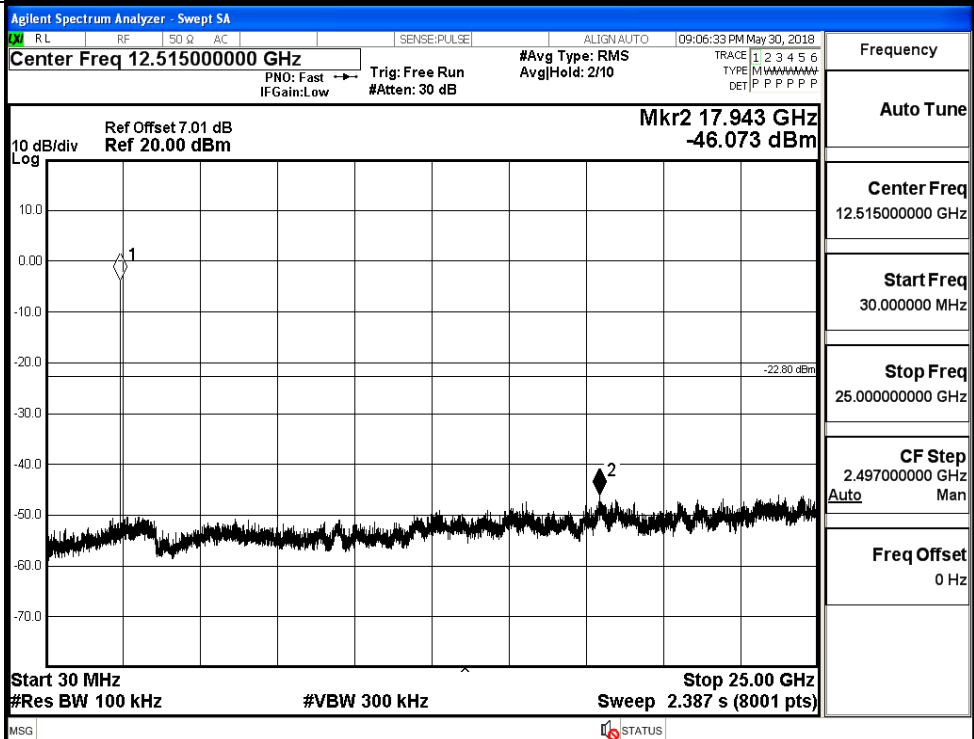


π /4DQPSK_MCH_Graphs

Pref

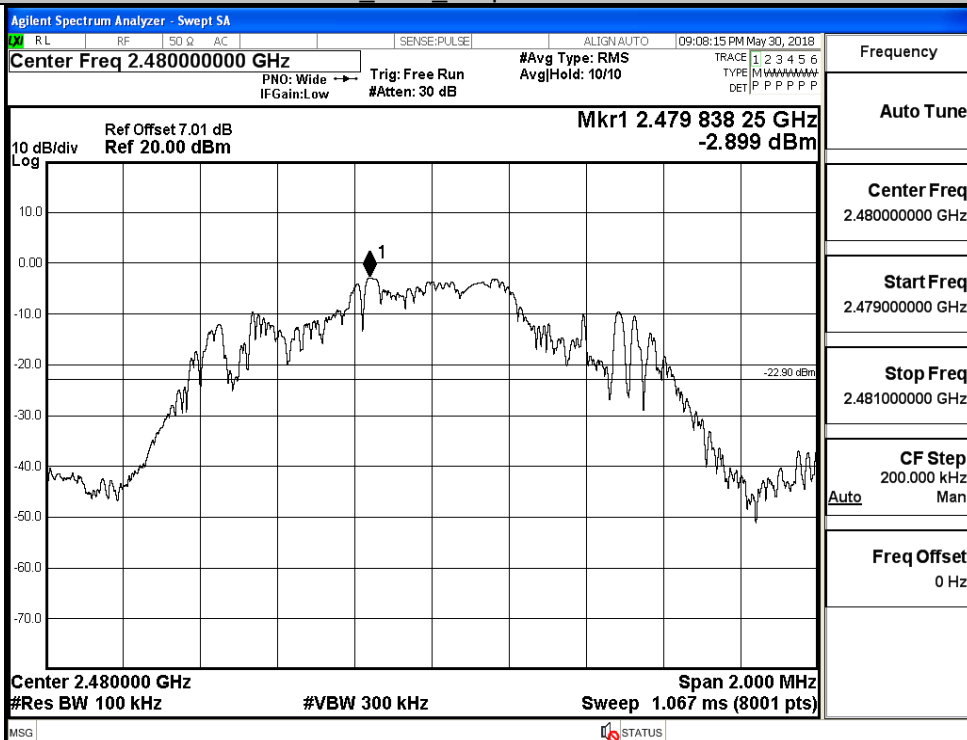


Puw

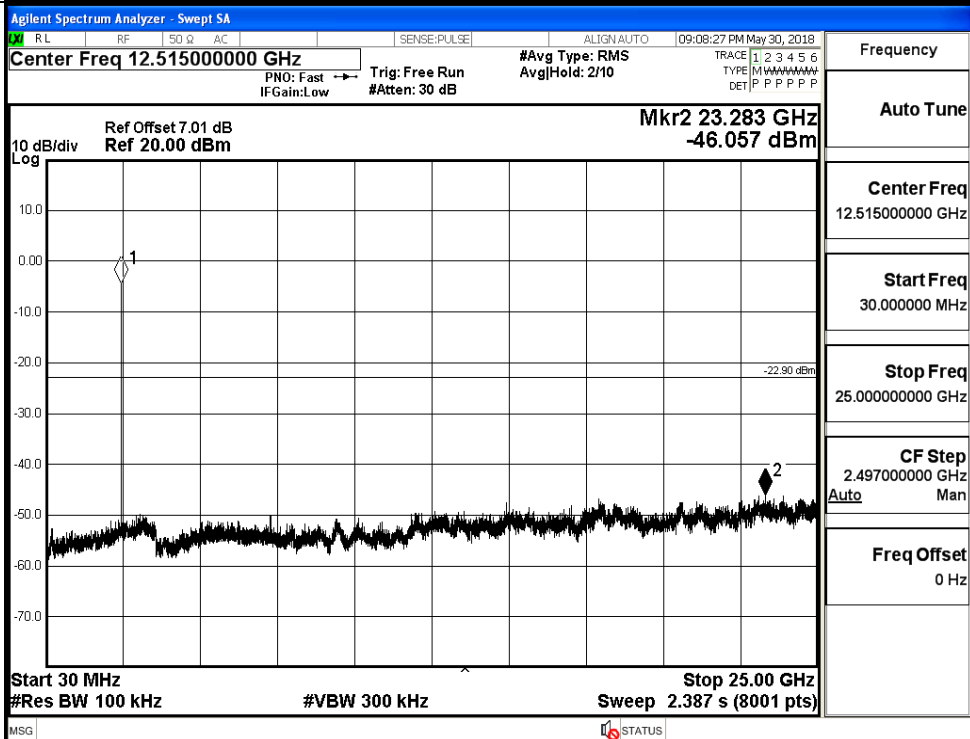


$\pi/4$ DQPSK_HCH_Graphs

Pref

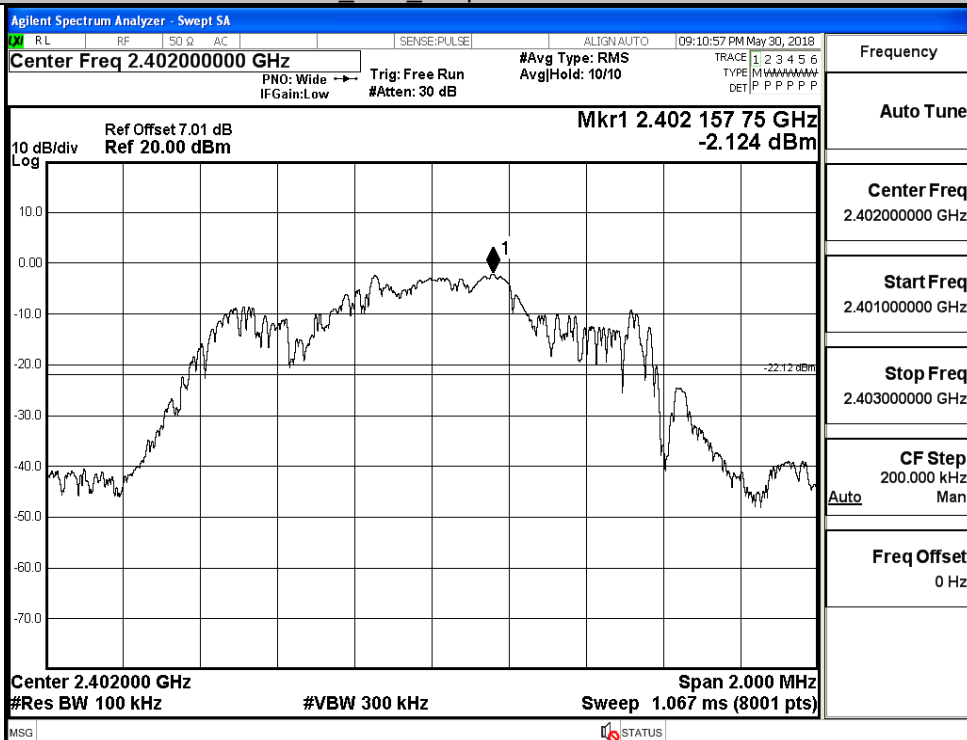


Puw

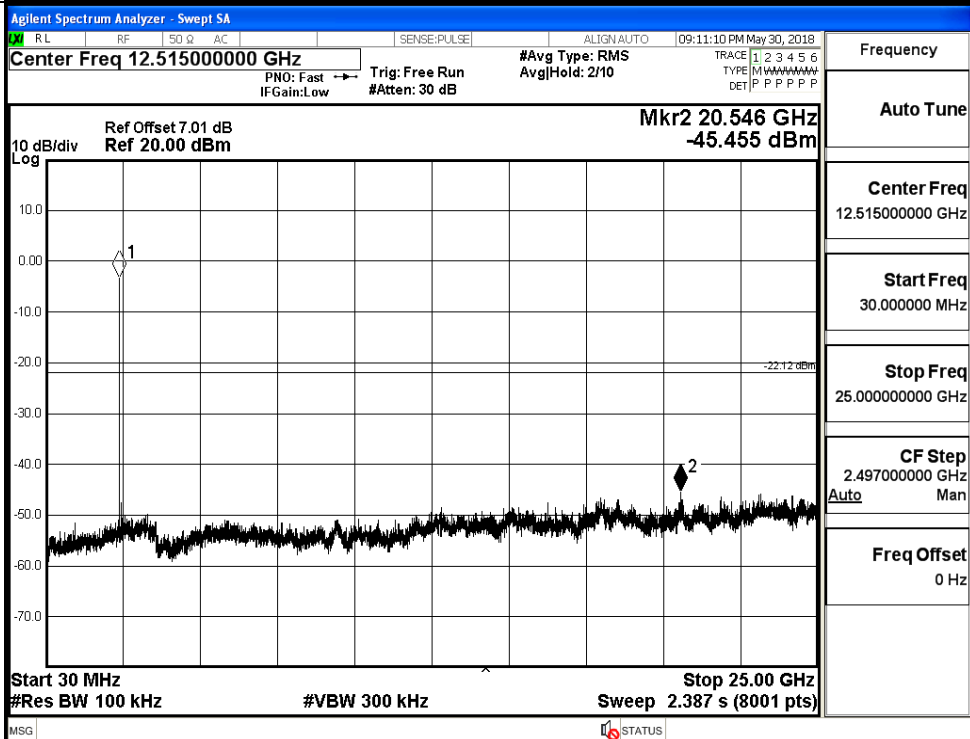


8DPSK_LCH_Graphs

Pref

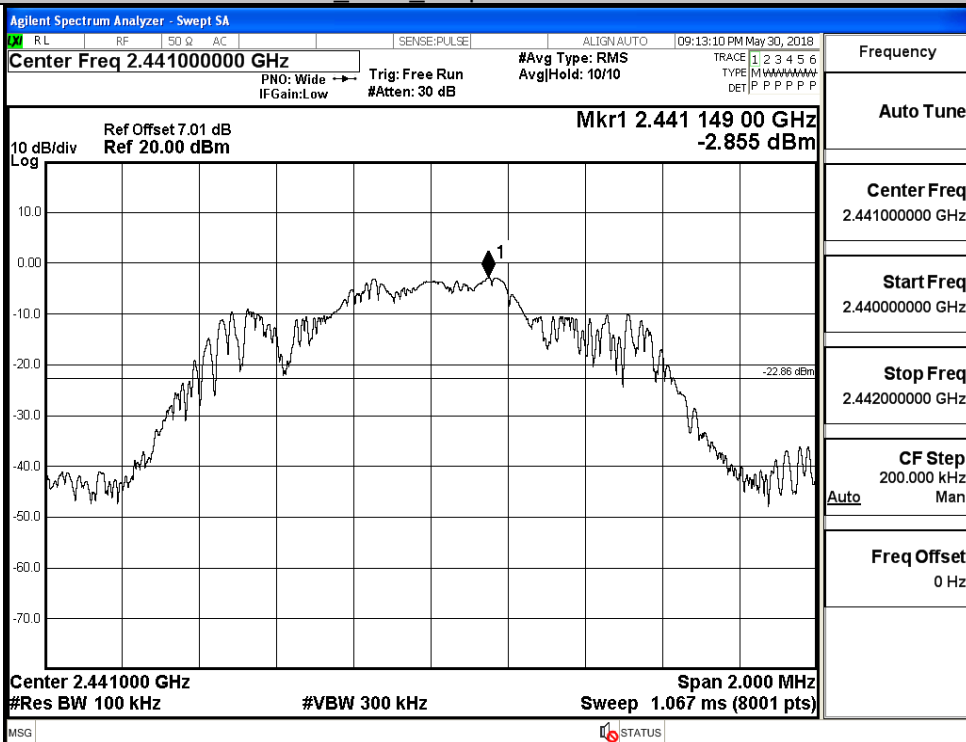


Puw

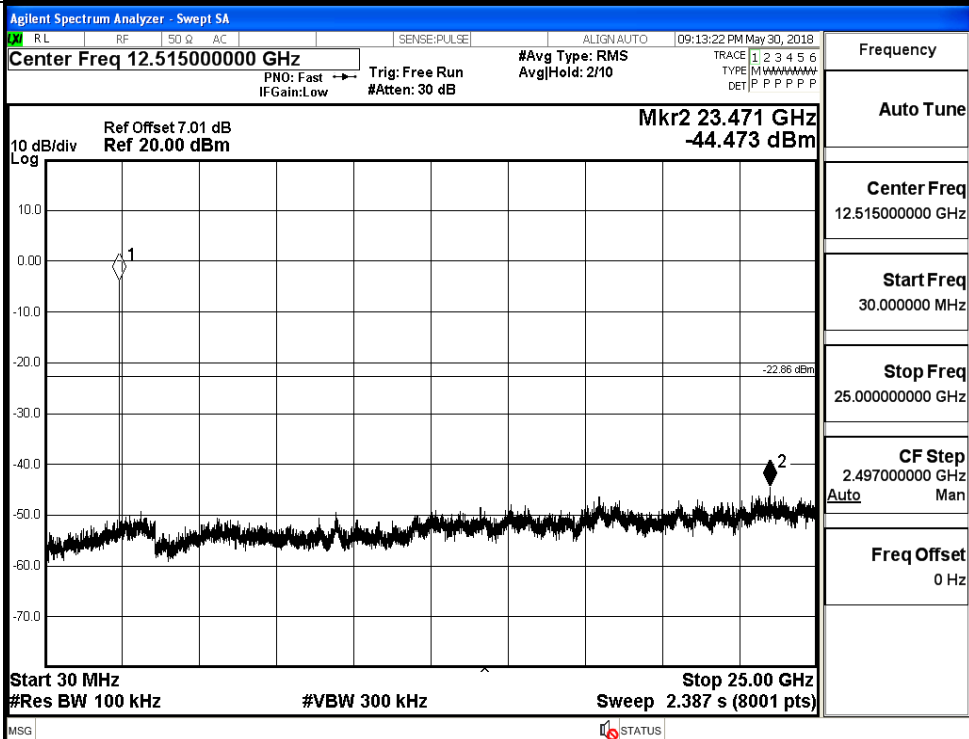


8DPSK_MCH_Graphs

Pref

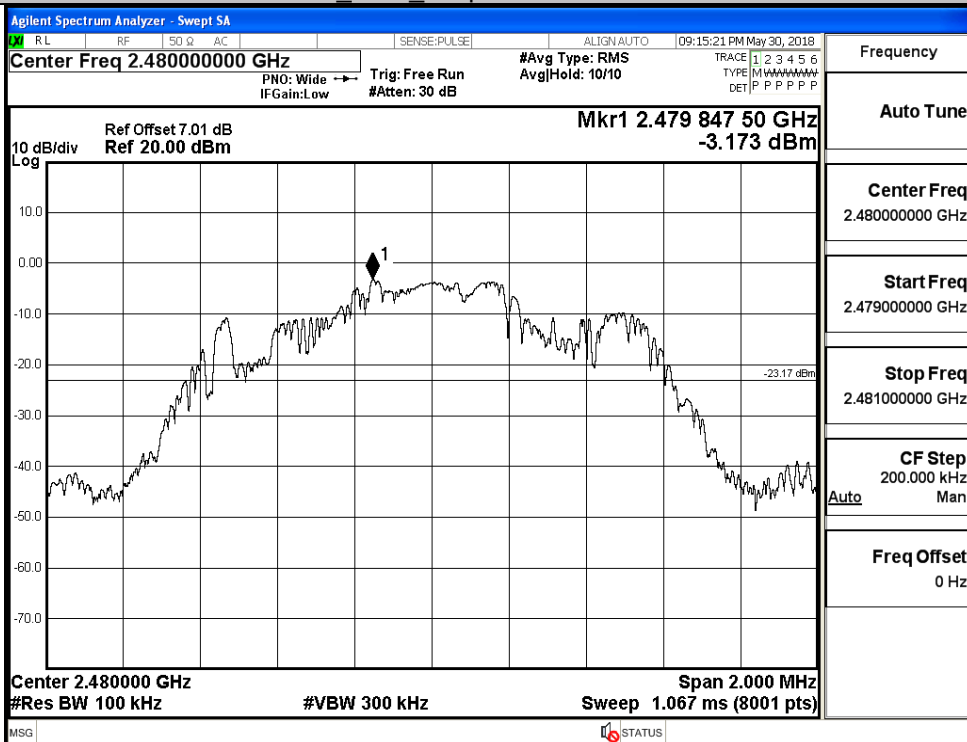


Puw

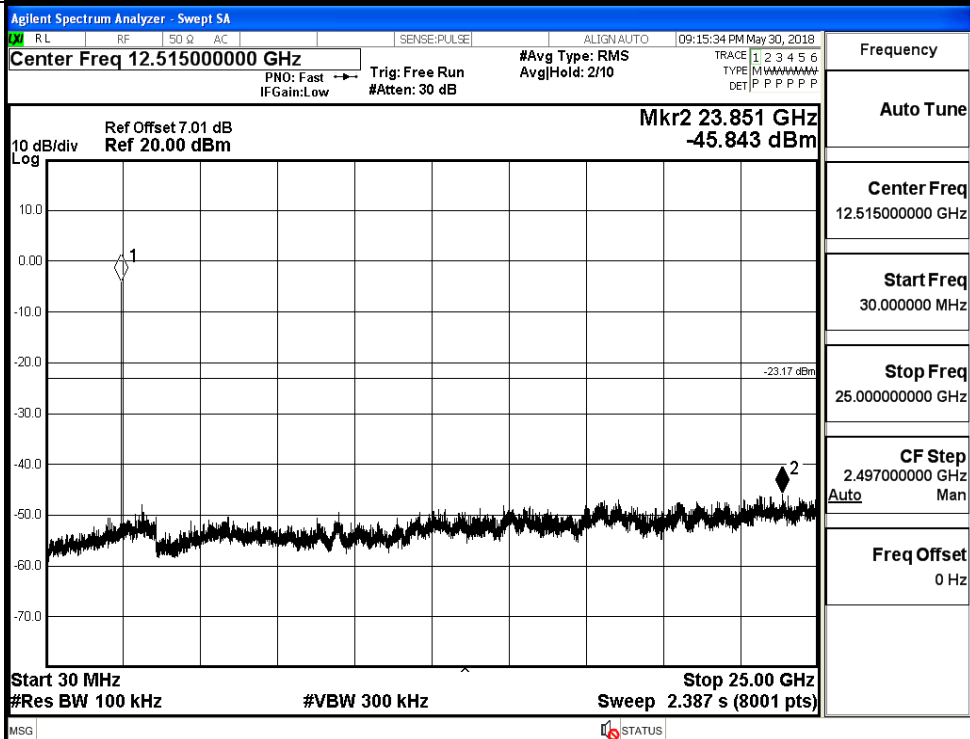


8DPSK_HCH_Graphs

Pref



Puw

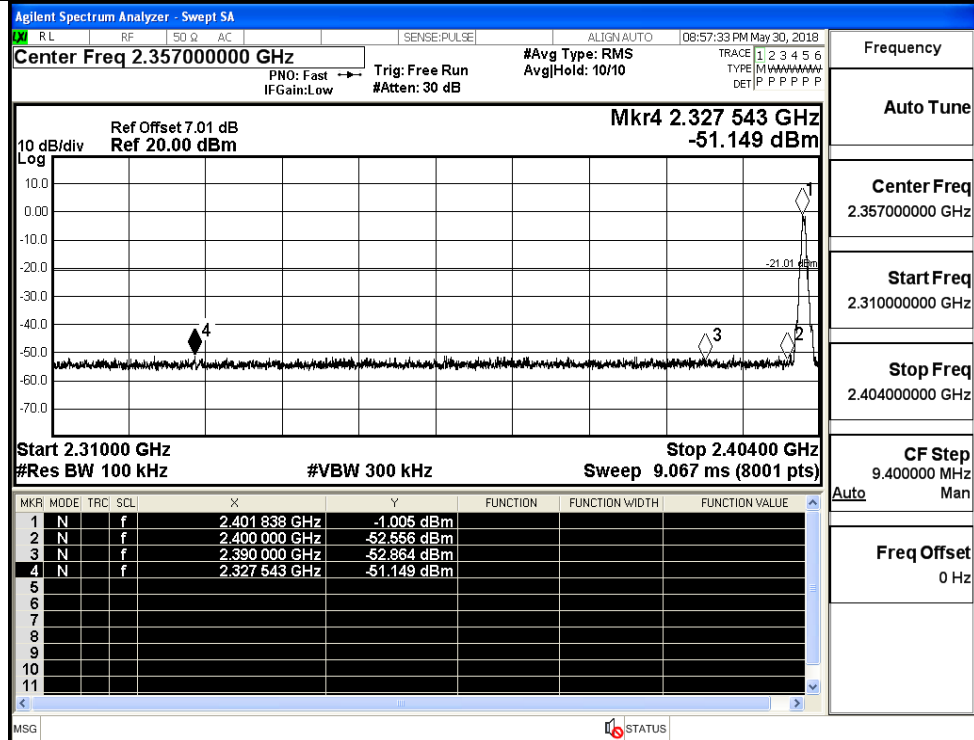


A.7 Band-edge for RF Conducted Emissions

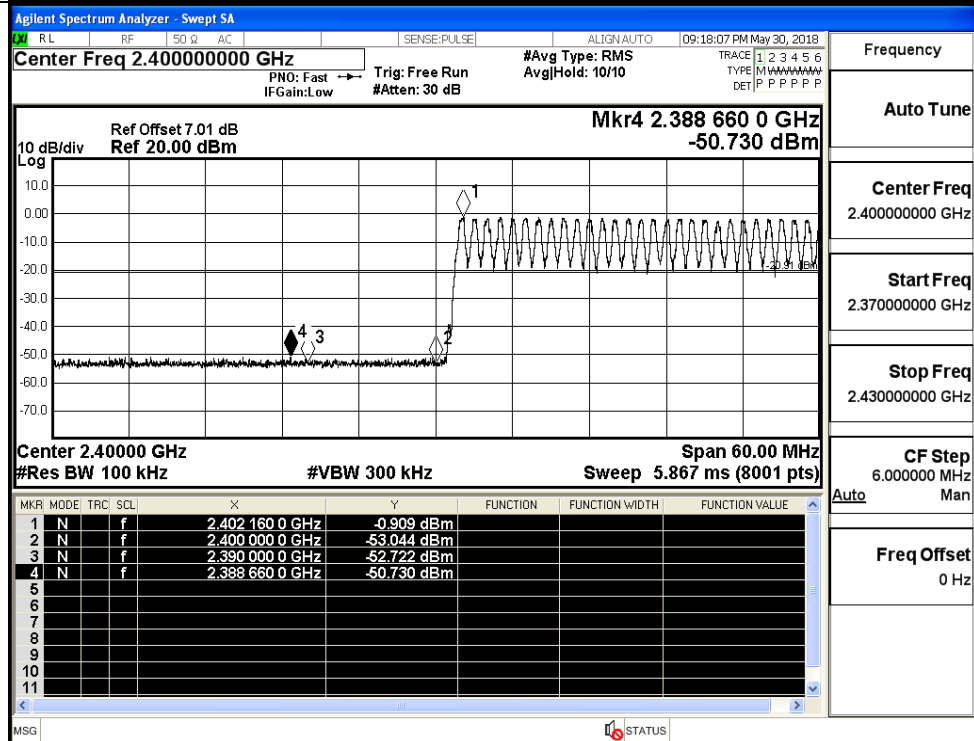
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-1.005	Off	-51.149	-21.01	PASS
			-0.909	On	-50.730	-20.91	PASS
	HCH	2480	-1.716	Off	-51.136	-21.72	PASS
			-2.009	On	-50.402	-22.01	PASS
$\pi/4$ DQPSK	LCH	2402	-2.168	Off	-50.424	-22.17	PASS
			-2.144	On	-50.969	-22.14	PASS
	HCH	2480	-2.923	Off	-50.170	-22.92	PASS
			-2.941	On	-50.052	-22.94	PASS
8DPSK	LCH	2402	-2.605	Off	-50.811	-22.61	PASS
			-2.446	On	-50.314	-22.45	PASS
	HCH	2480	-2.954	Off	-50.773	-22.95	PASS
			-3.043	On	-50.129	-23.04	PASS

Test Graphs

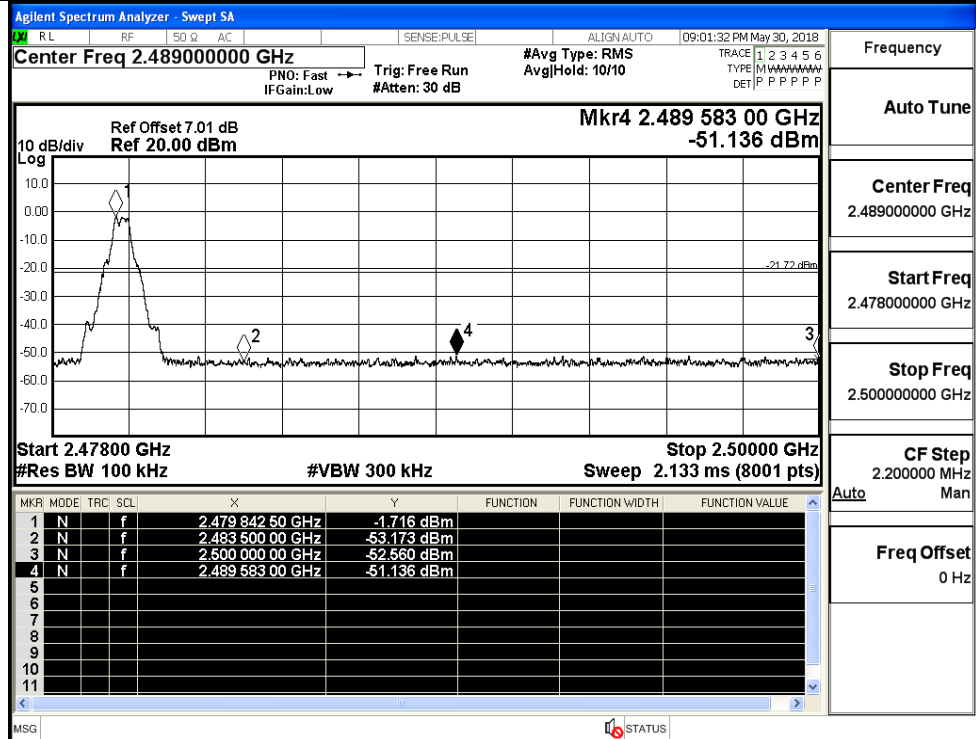
GFSK/LCH/No Hop



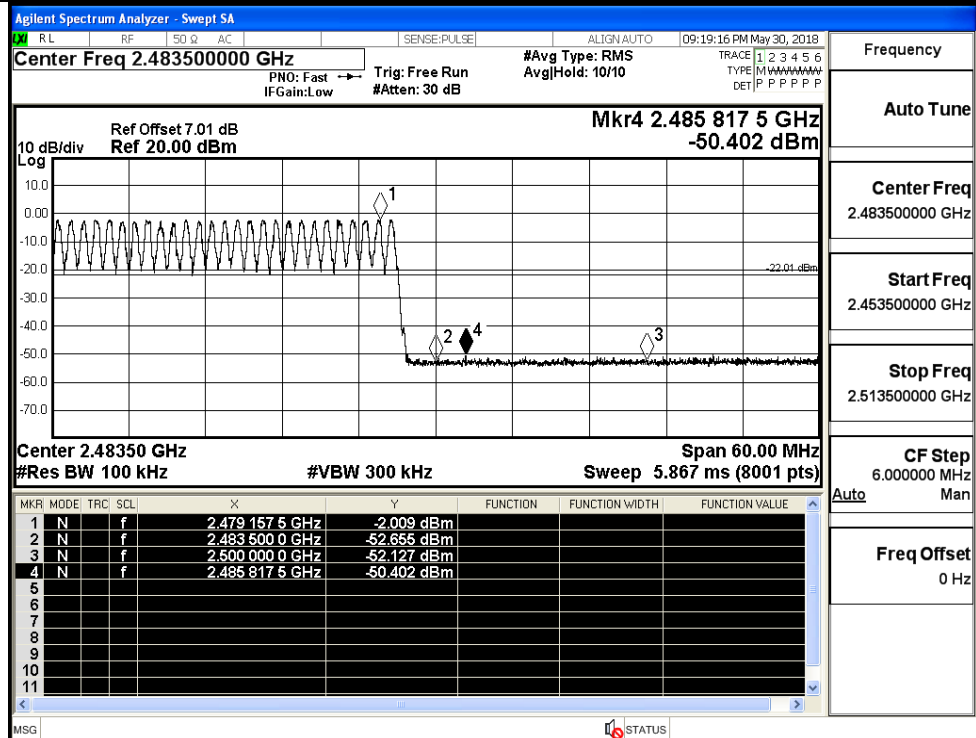
GFSK/LCH/Hop



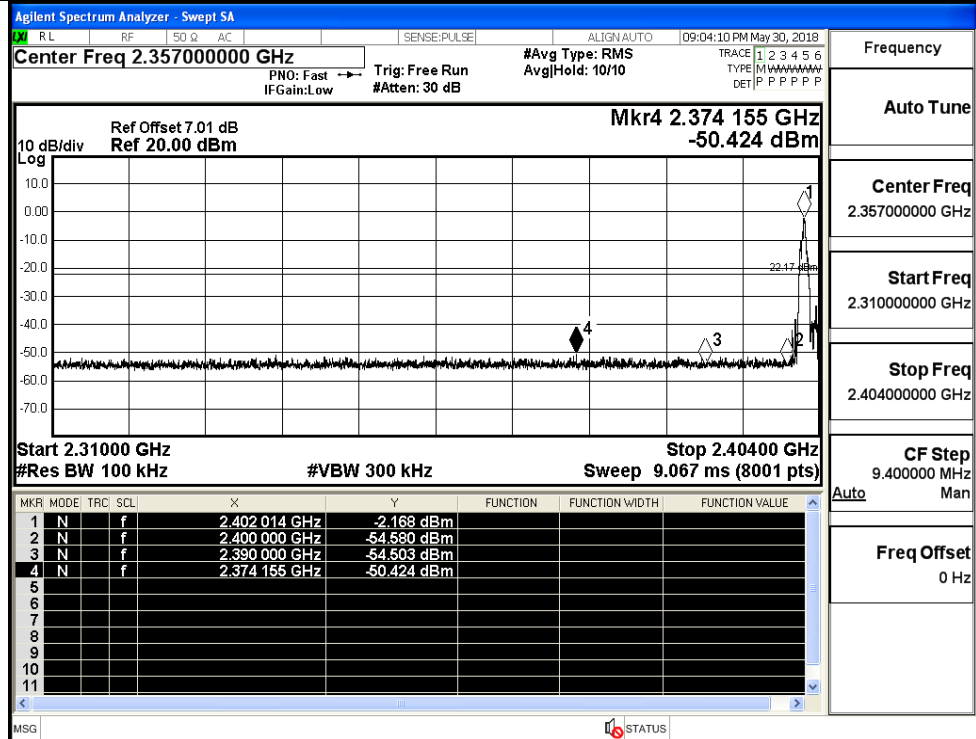
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

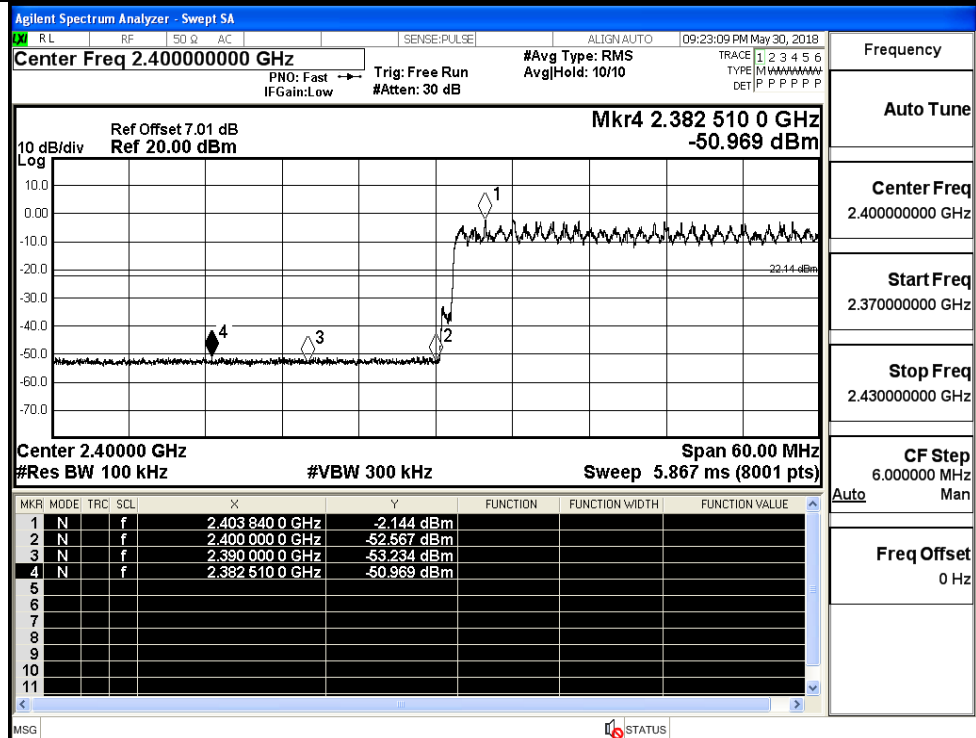
Start Freq
2.310000000 GHz

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

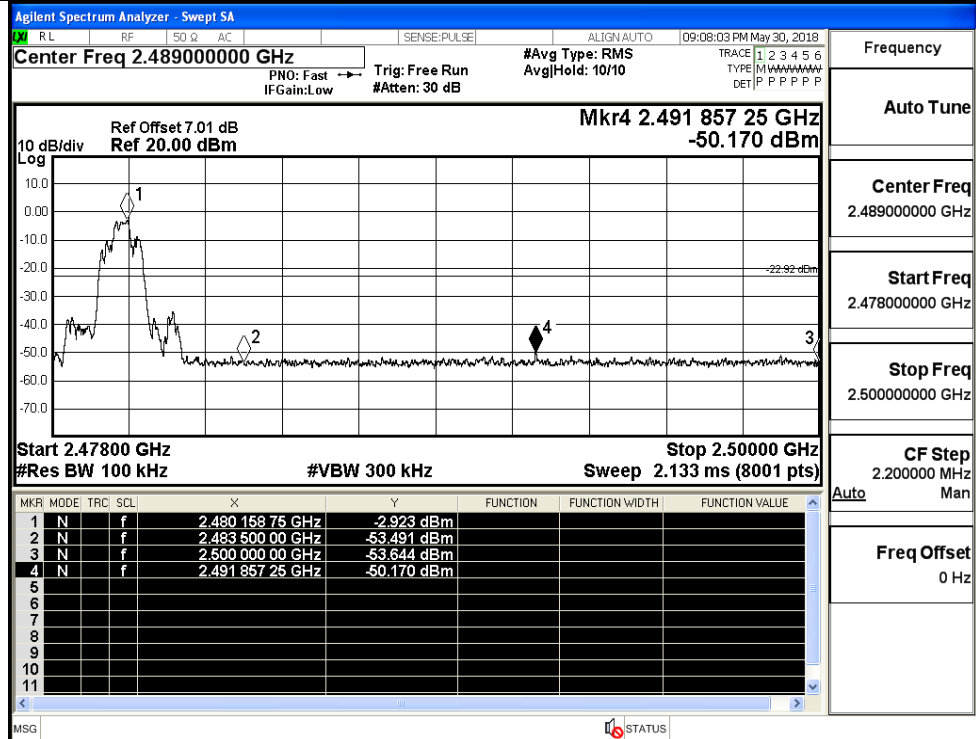
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

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



Frequency

Auto Tune

Center Freq
2.489000000 GHz

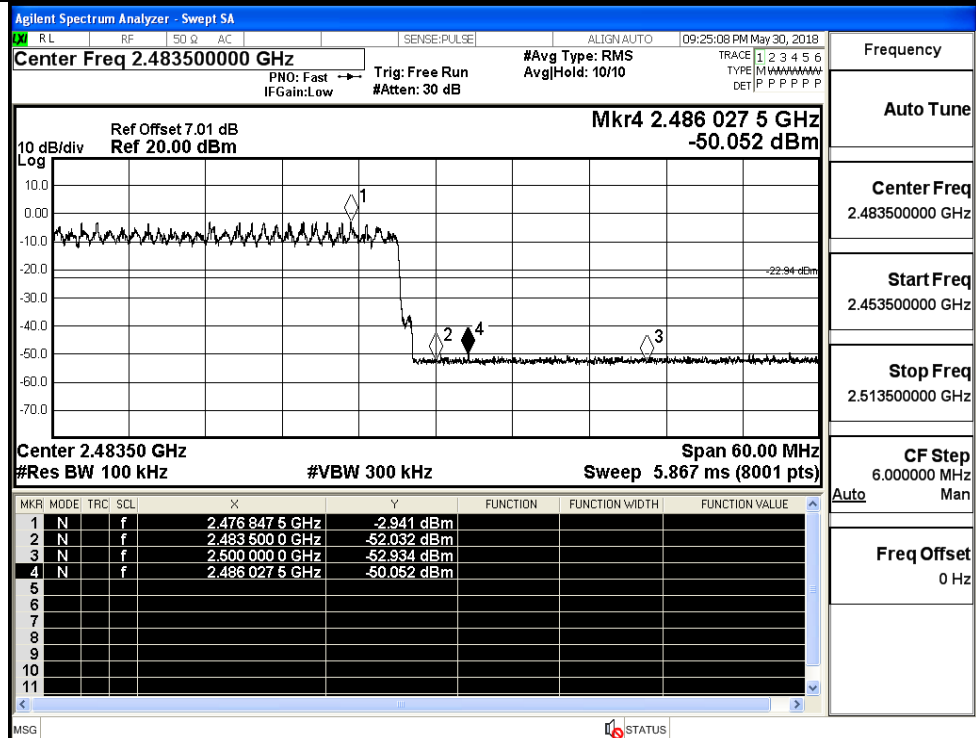
Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz

Freq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq
2.483500000 GHz

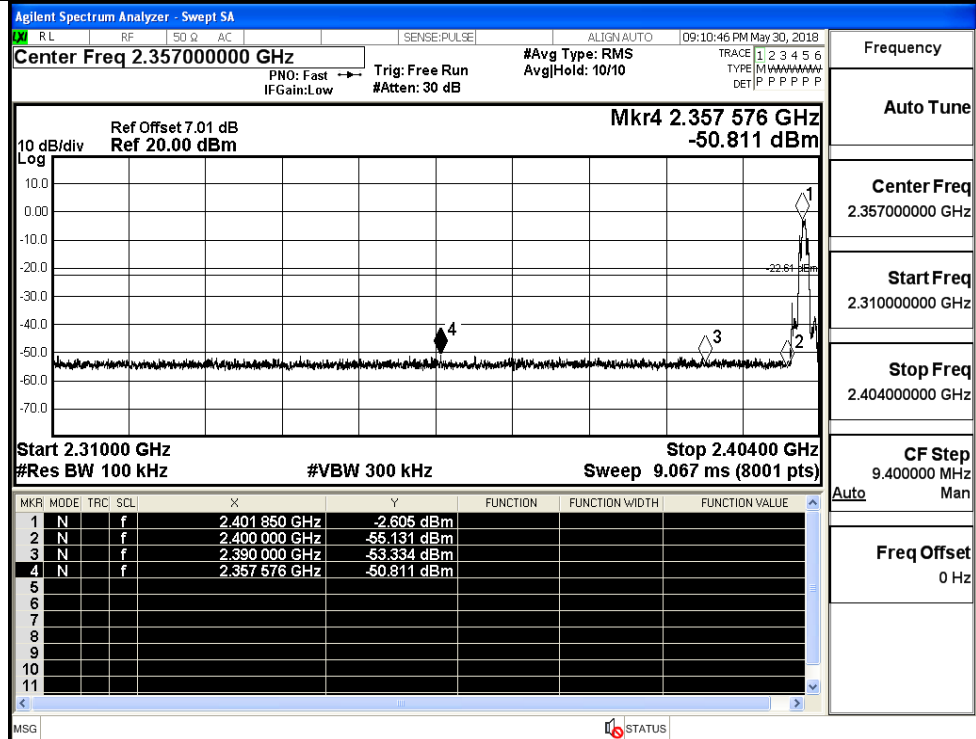
Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

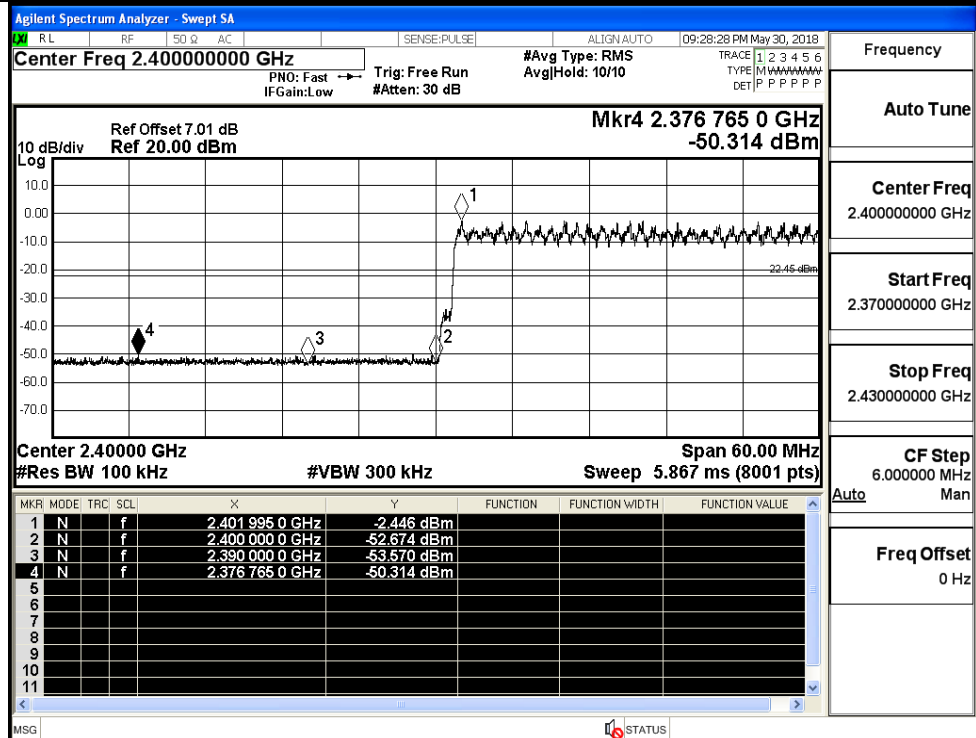
CF Step
6.000000 MHz

Freq Offset
0 Hz

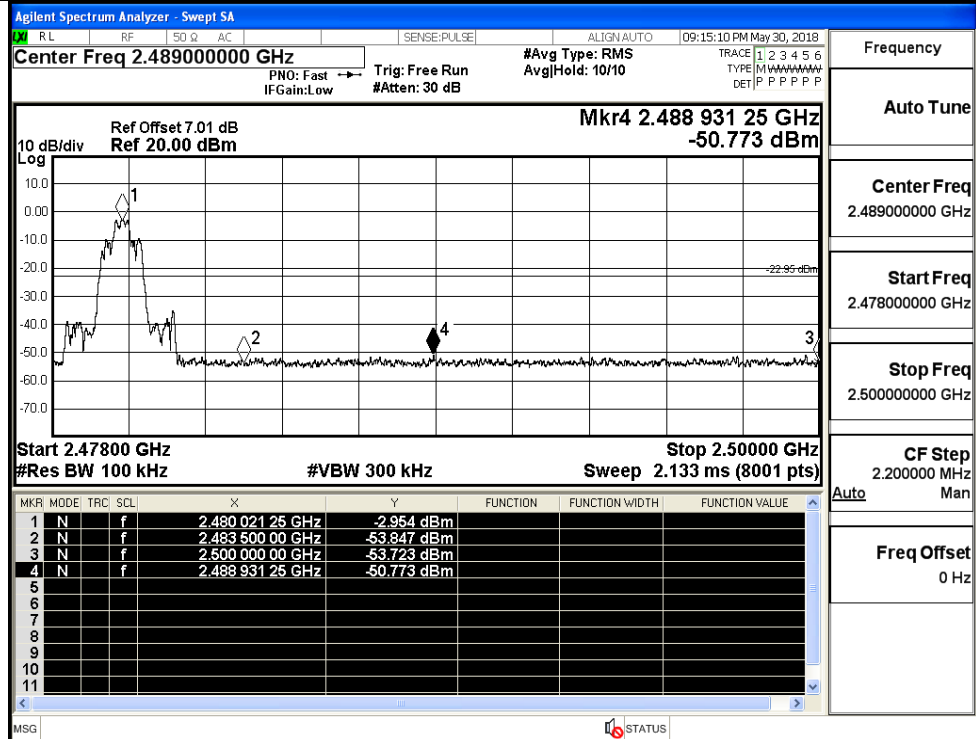
8DPSK/LCH/No Hop



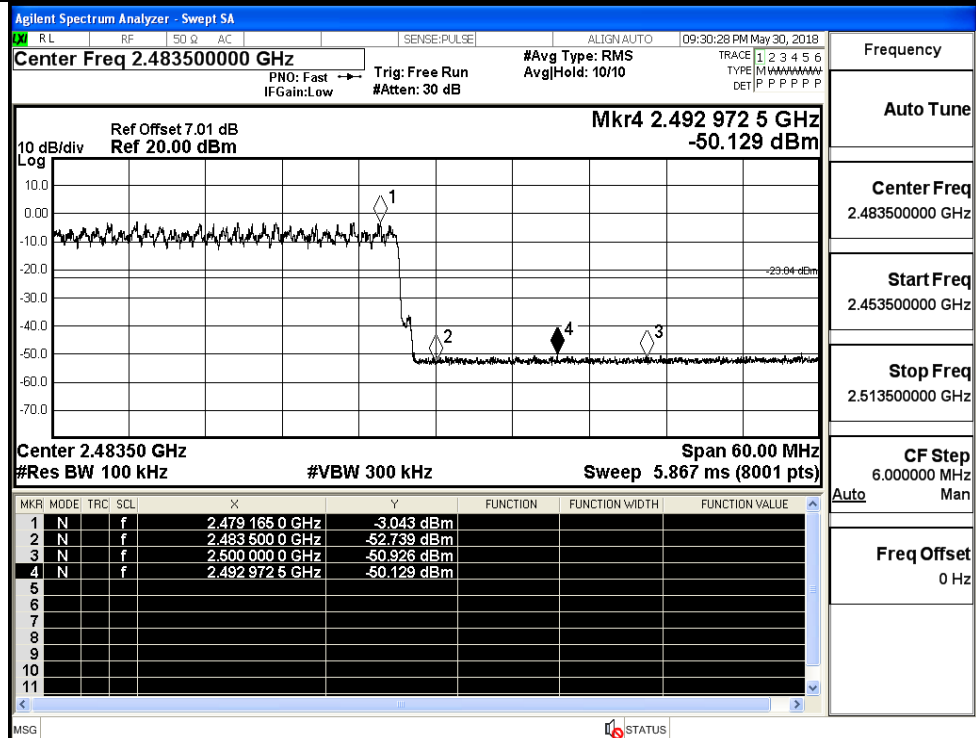
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



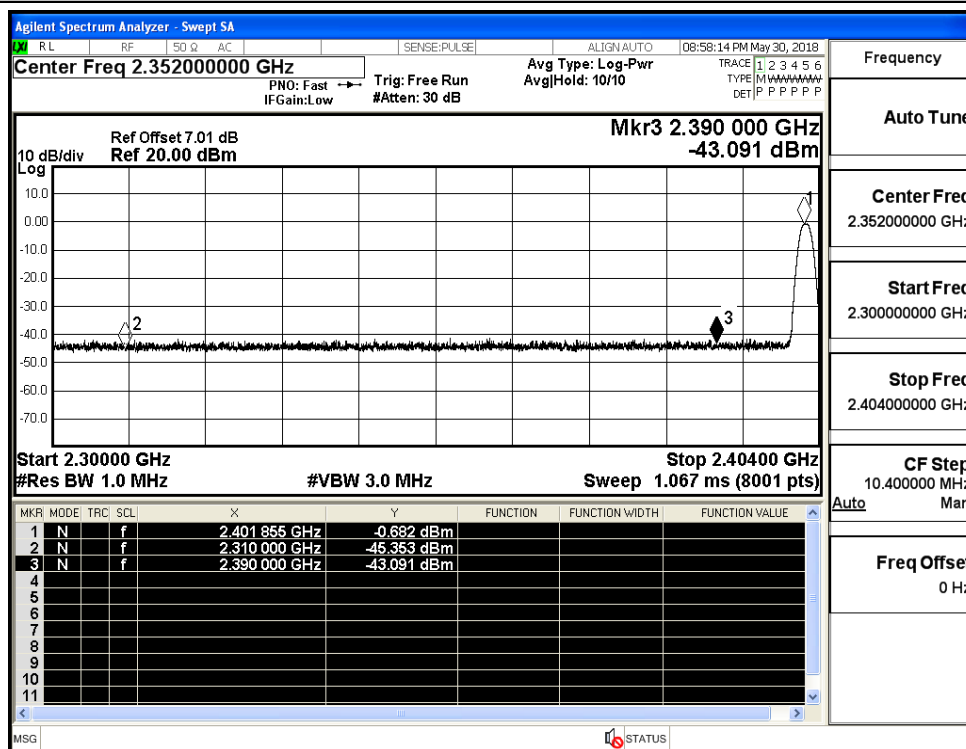
8DPSK/HCH/Hop



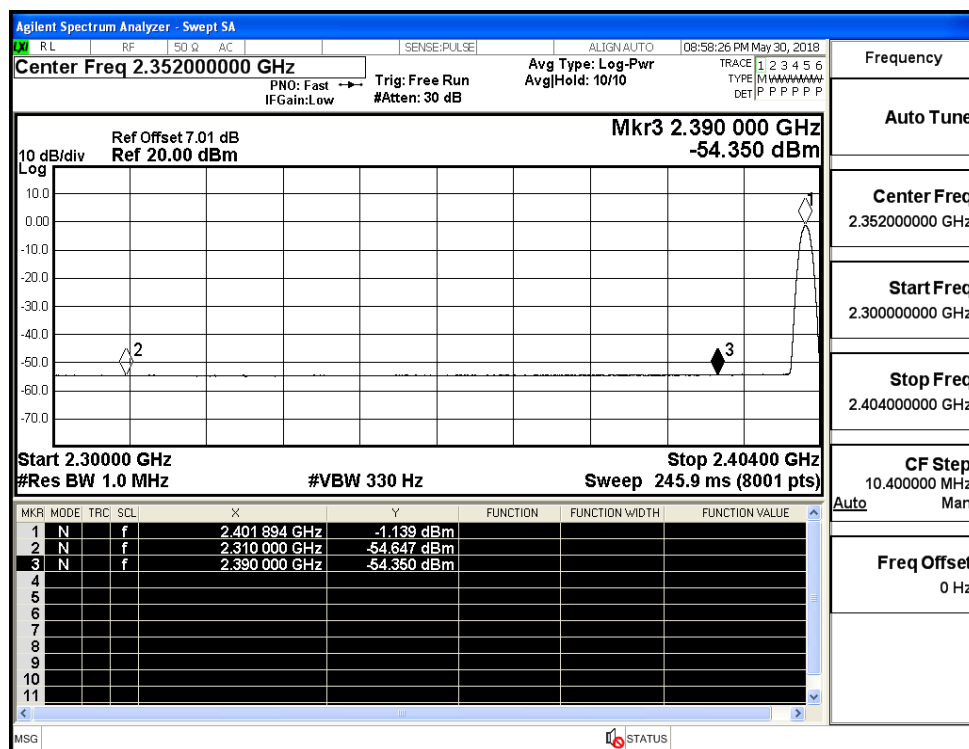
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-45.35	2.0	0	51.90	PEAK	74	PASS
	Off	2310.0	-54.65	2.0	0	42.61	AV	54	PASS
	Off	2390.0	-43.09	2.0	0	54.17	PEAK	74	PASS
	Off	2390.0	-54.35	2.0	0	42.91	AV	54	PASS
	Off	2483.5	-43.84	2.0	0	53.42	PEAK	74	PASS
	Off	2483.5	-54.06	2.0	0	43.20	AV	54	PASS
	Off	2500.0	-43.61	2.0	0	53.65	PEAK	74	PASS
	Off	2500.0	-54.07	2.0	0	43.19	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-45.46	2.0	0	51.80	PEAK	74	PASS
	Off	2310.0	-54.60	2.0	0	42.66	AV	54	PASS
	Off	2390.0	-44.98	2.0	0	52.27	PEAK	74	PASS
	Off	2390.0	-54.36	2.0	0	42.90	AV	54	PASS
	Off	2483.5	-43.75	2.0	0	53.51	PEAK	74	PASS
	Off	2483.5	-53.98	2.0	0	43.28	AV	54	PASS
	Off	2500.0	-44.67	2.0	0	52.59	PEAK	74	PASS
	Off	2500.0	-54.06	2.0	0	43.20	AV	54	PASS
8DPSK	Off	2310.0	-44.57	2.0	0	52.69	PEAK	74	PASS
	Off	2310.0	-54.68	2.0	0	42.57	AV	54	PASS
	Off	2390.0	-44.98	2.0	0	52.28	PEAK	74	PASS
	Off	2390.0	-54.37	2.0	0	42.89	AV	54	PASS
	Off	2483.5	-43.33	2.0	0	53.93	PEAK	74	PASS
	Off	2483.5	-54.10	2.0	0	43.16	AV	54	PASS
	Off	2500.0	-43.56	2.0	0	53.70	PEAK	74	PASS
	Off	2500.0	-54.05	2.0	0	43.20	AV	54	PASS

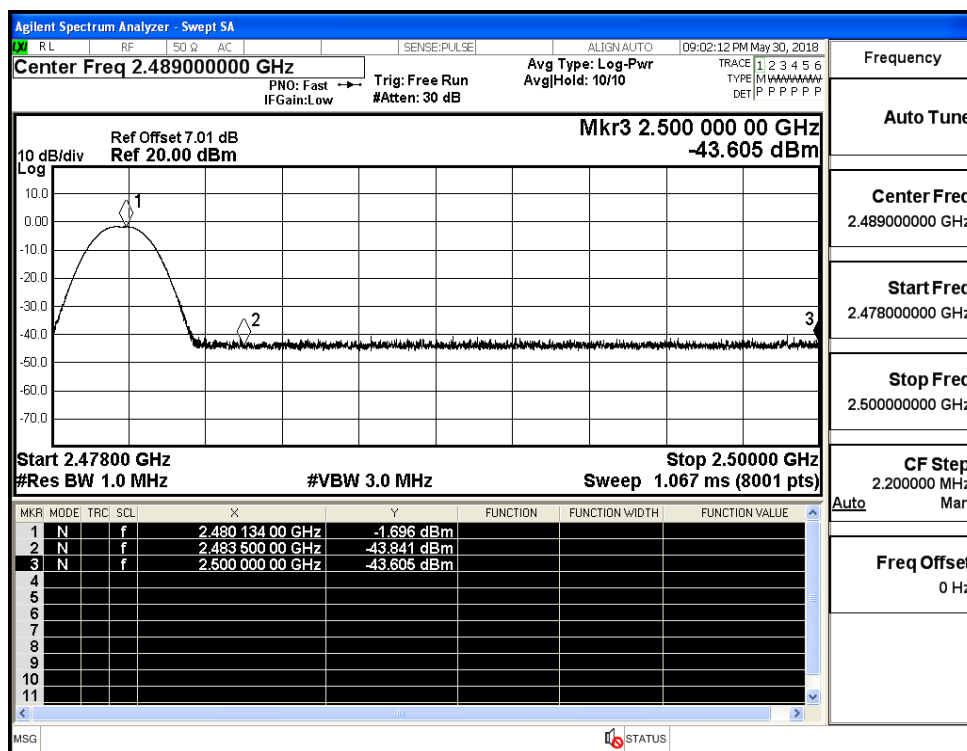
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



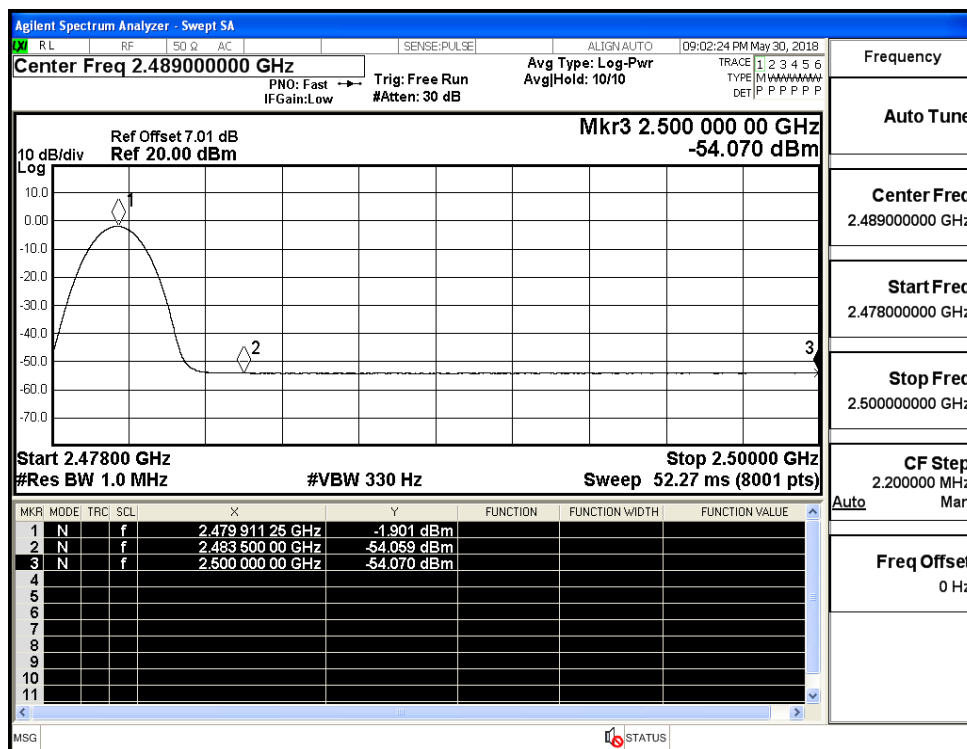
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

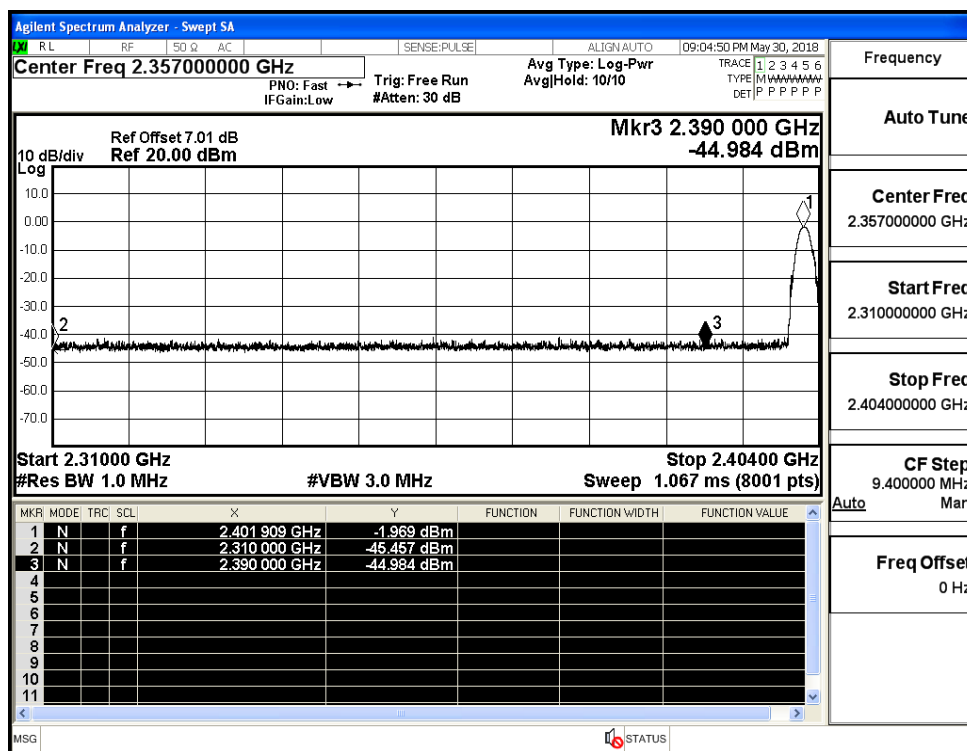
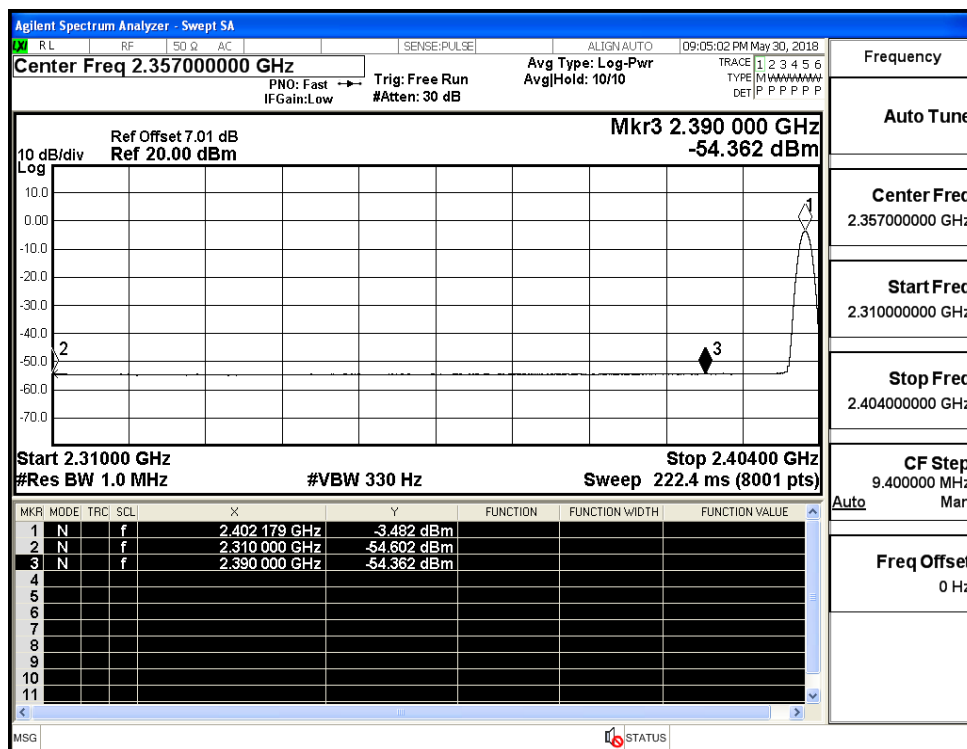


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

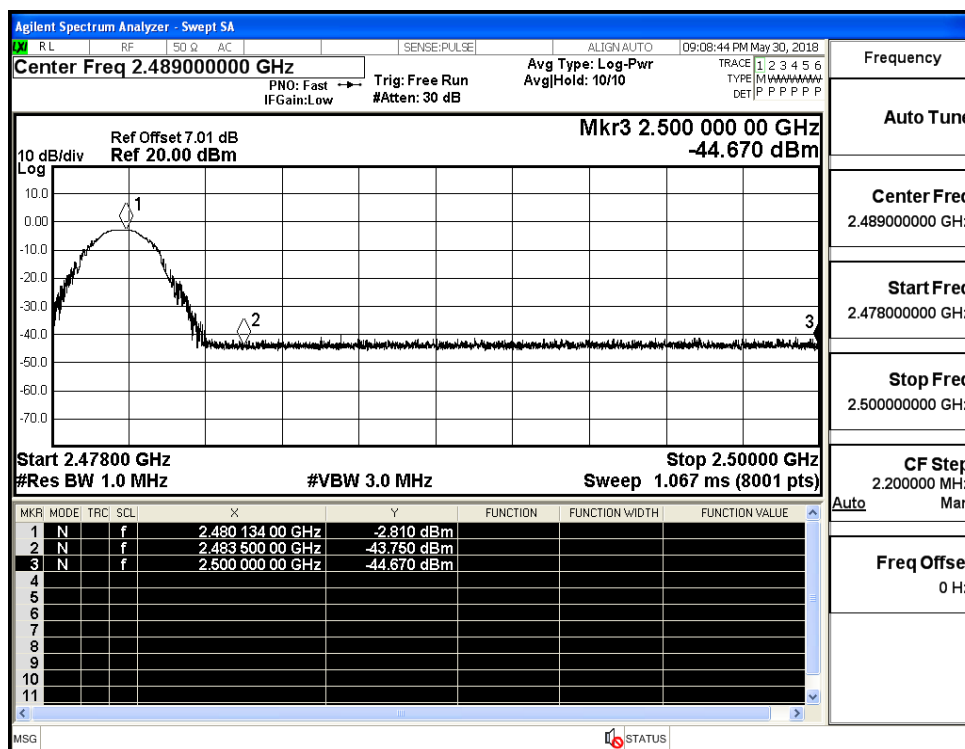


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

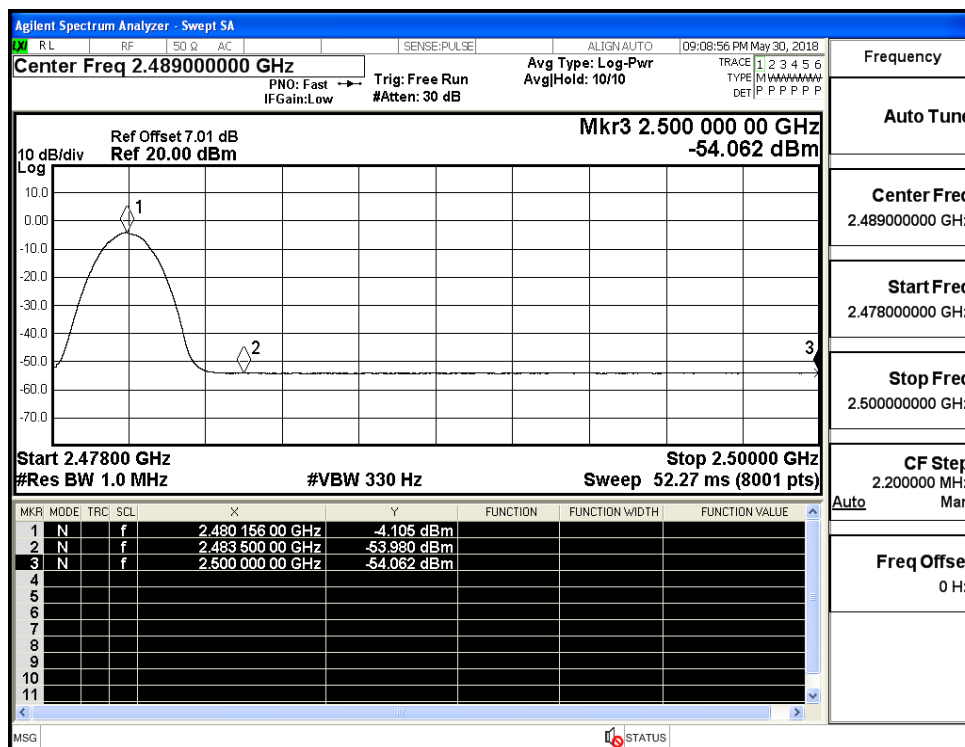


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

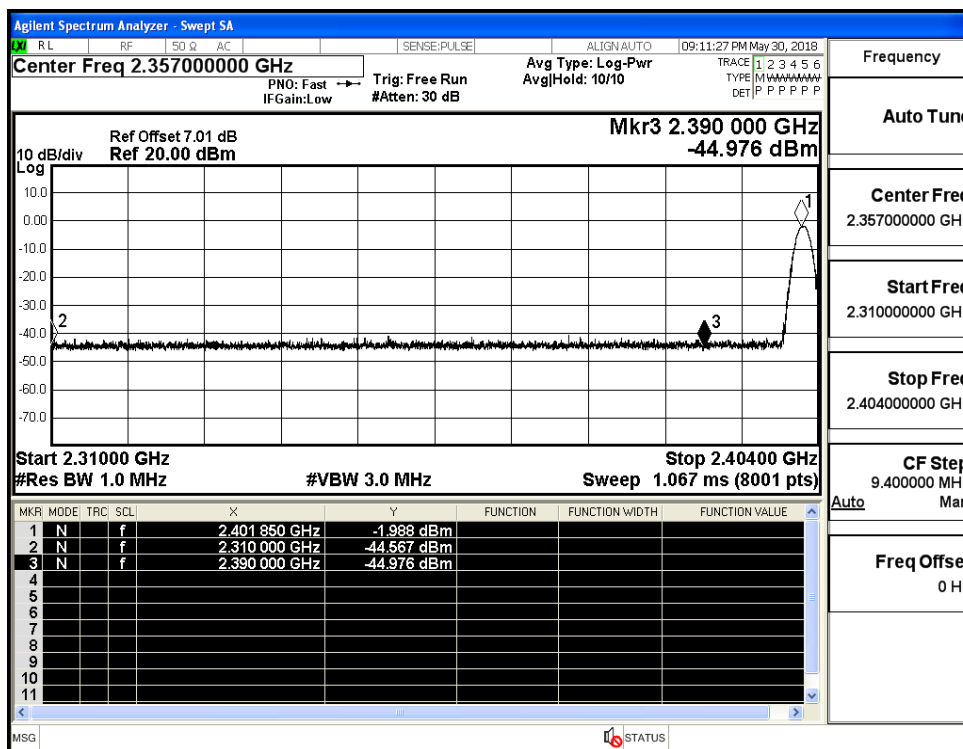
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



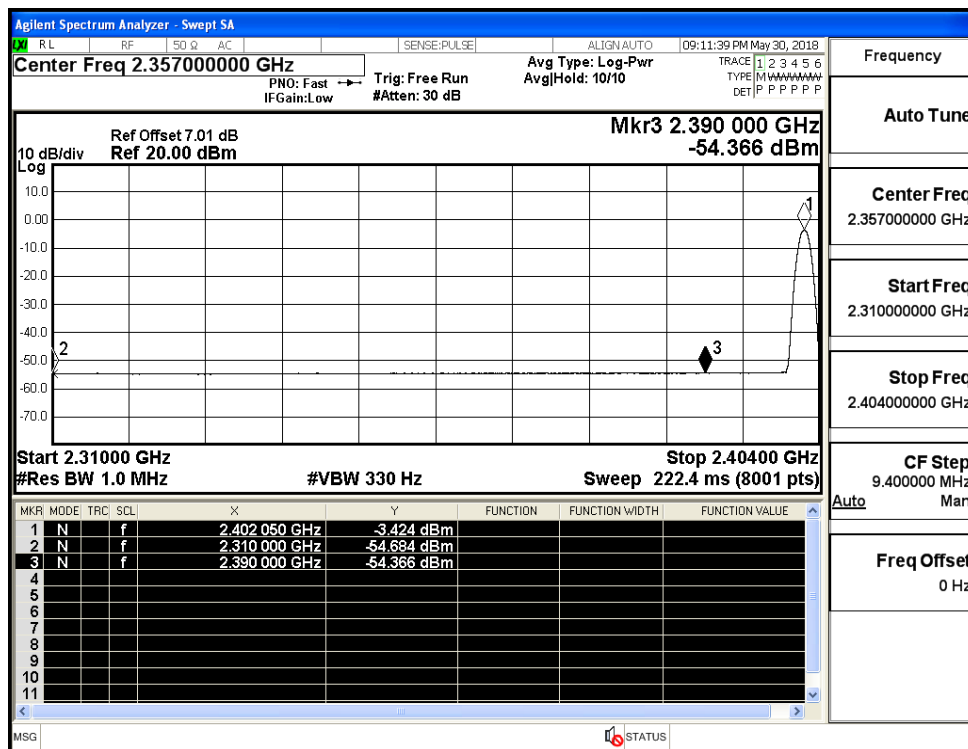
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



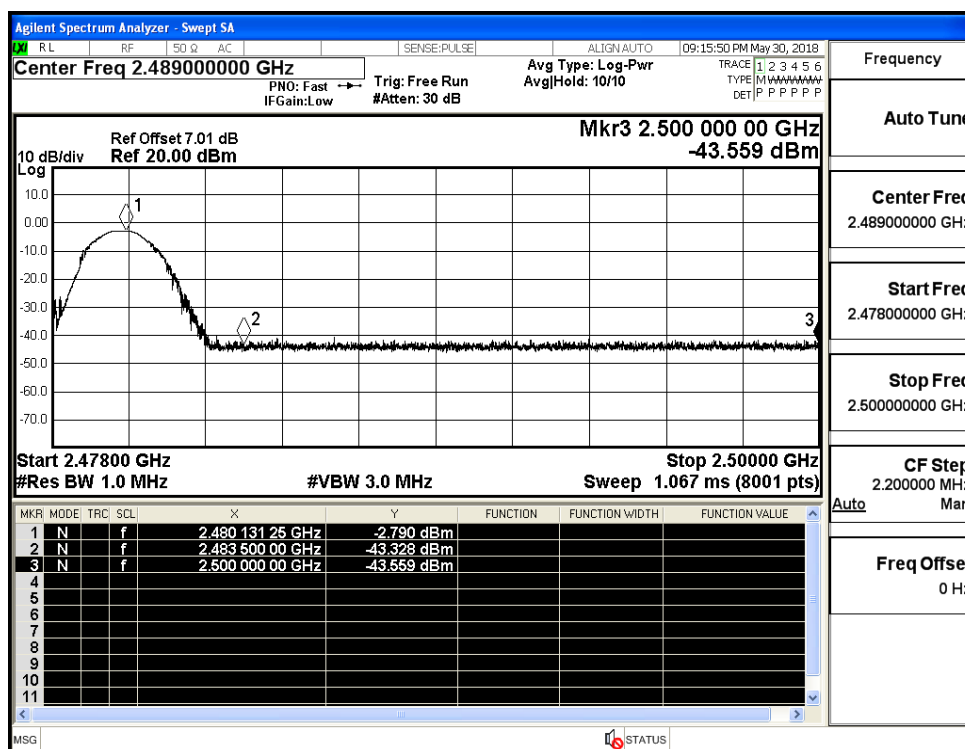
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

