

Appendix A

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

Product Name: Bluetooth Speaker

Trade Mark: N/A

Test Model: S5

Environmental Conditions

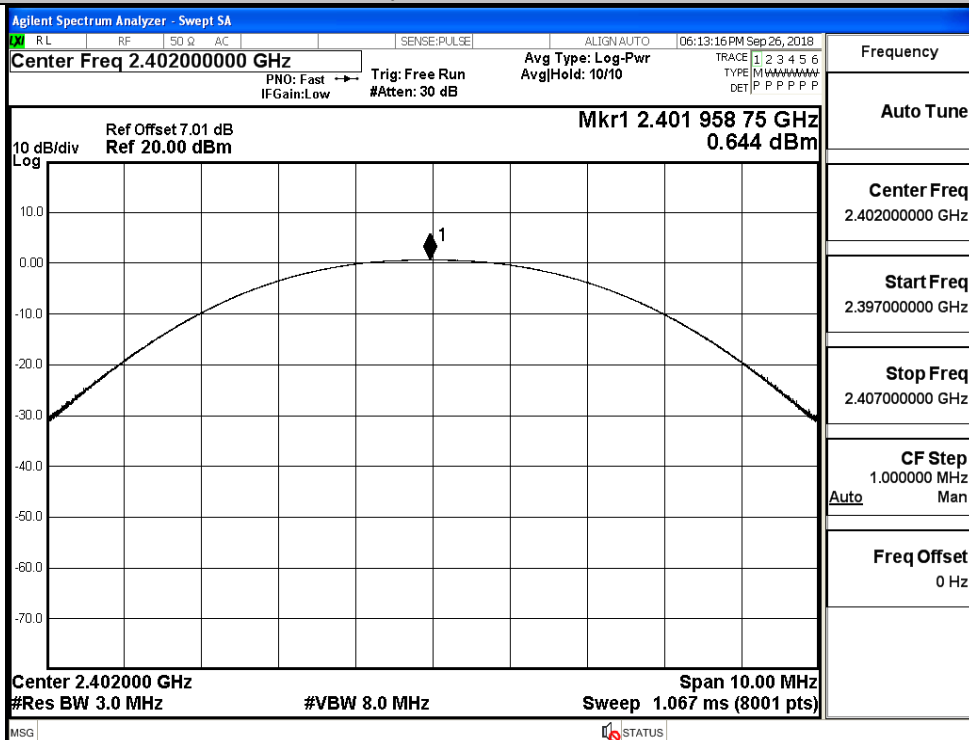
Temperature:	24.3 ° C
Relative Humidity:	53.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

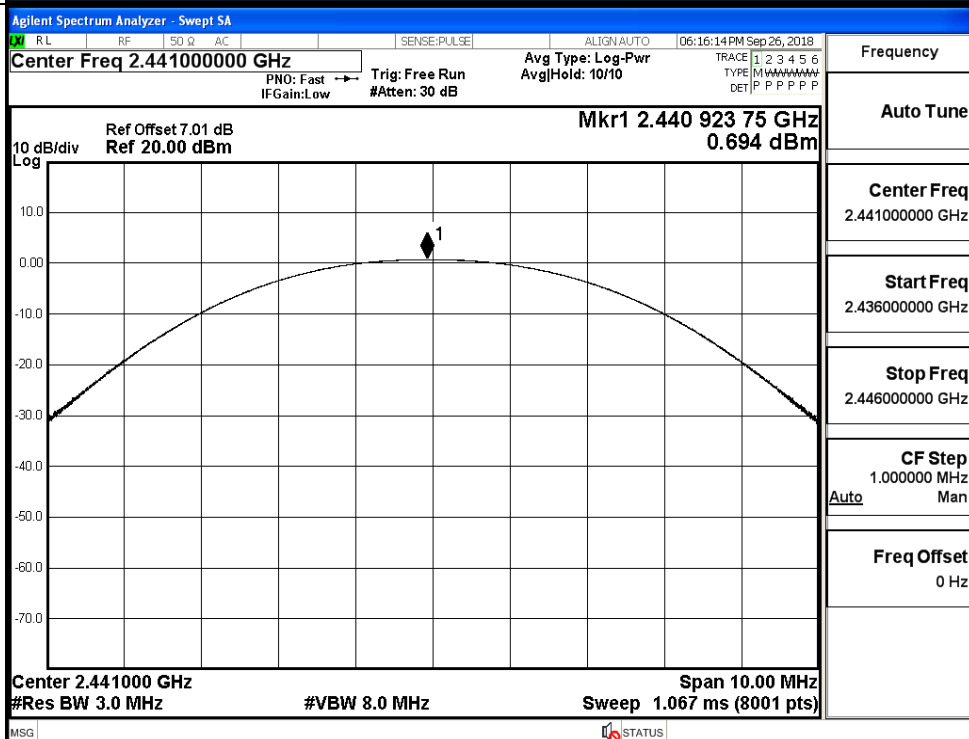
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.644	21	PASS
	MCH	0.694	21	PASS
	HCH	0.244	21	PASS
$\pi/4$ DQPSK	LCH	0.359	21	PASS
	MCH	0.710	21	PASS
	HCH	0.290	21	PASS
8DPSK	LCH	0.810	21	PASS
	MCH	0.892	21	PASS
	HCH	0.477	21	PASS

Test Graphs

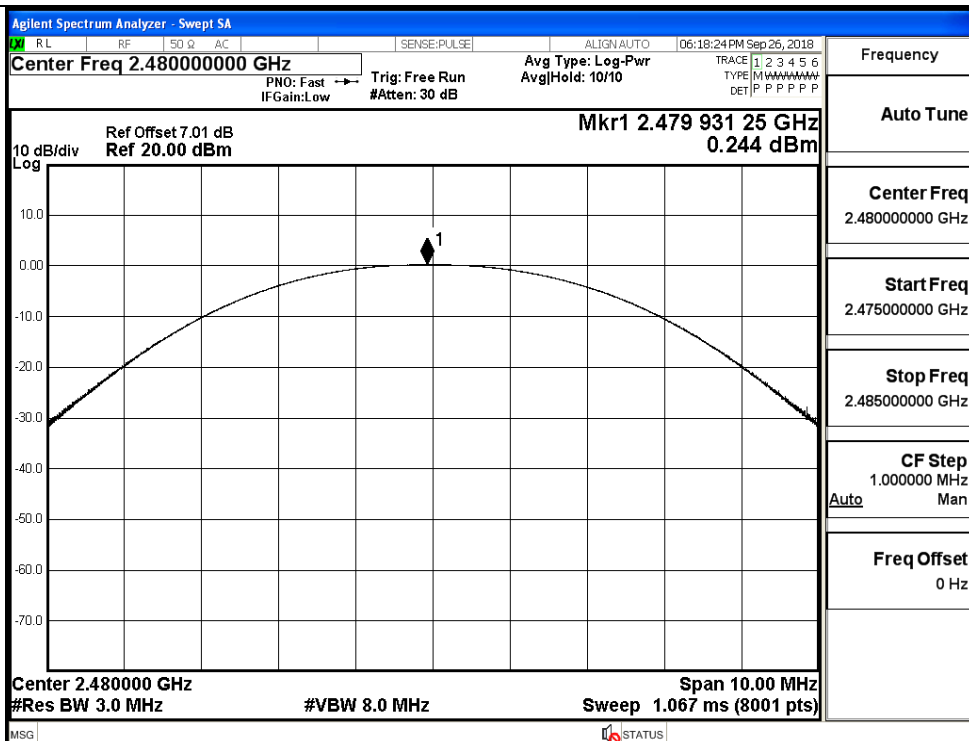
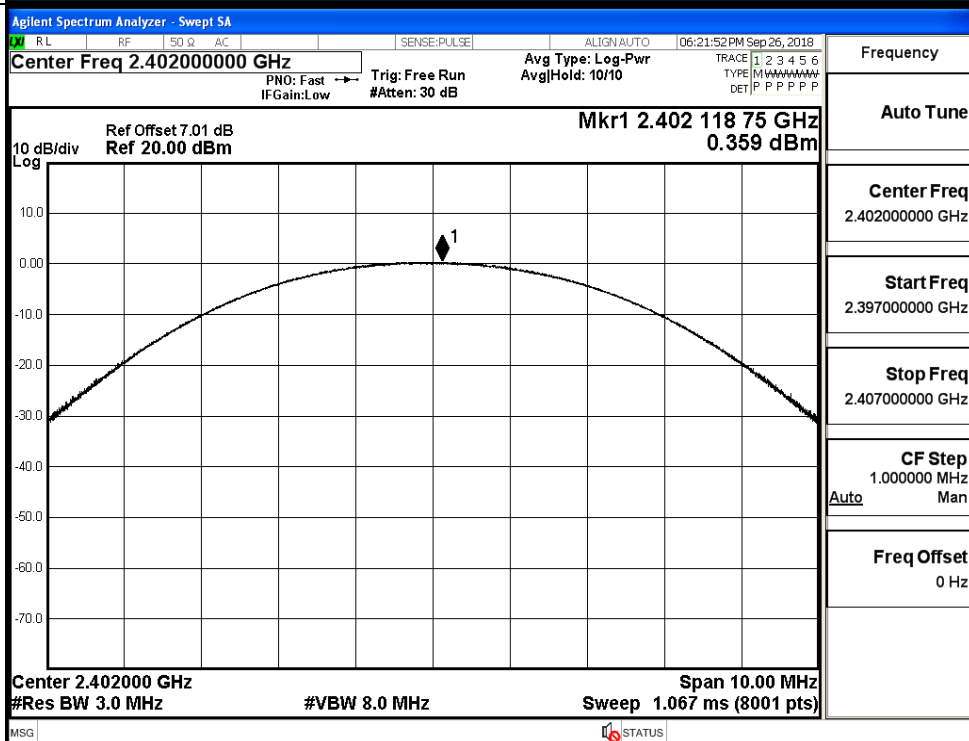
GFSK/LCH

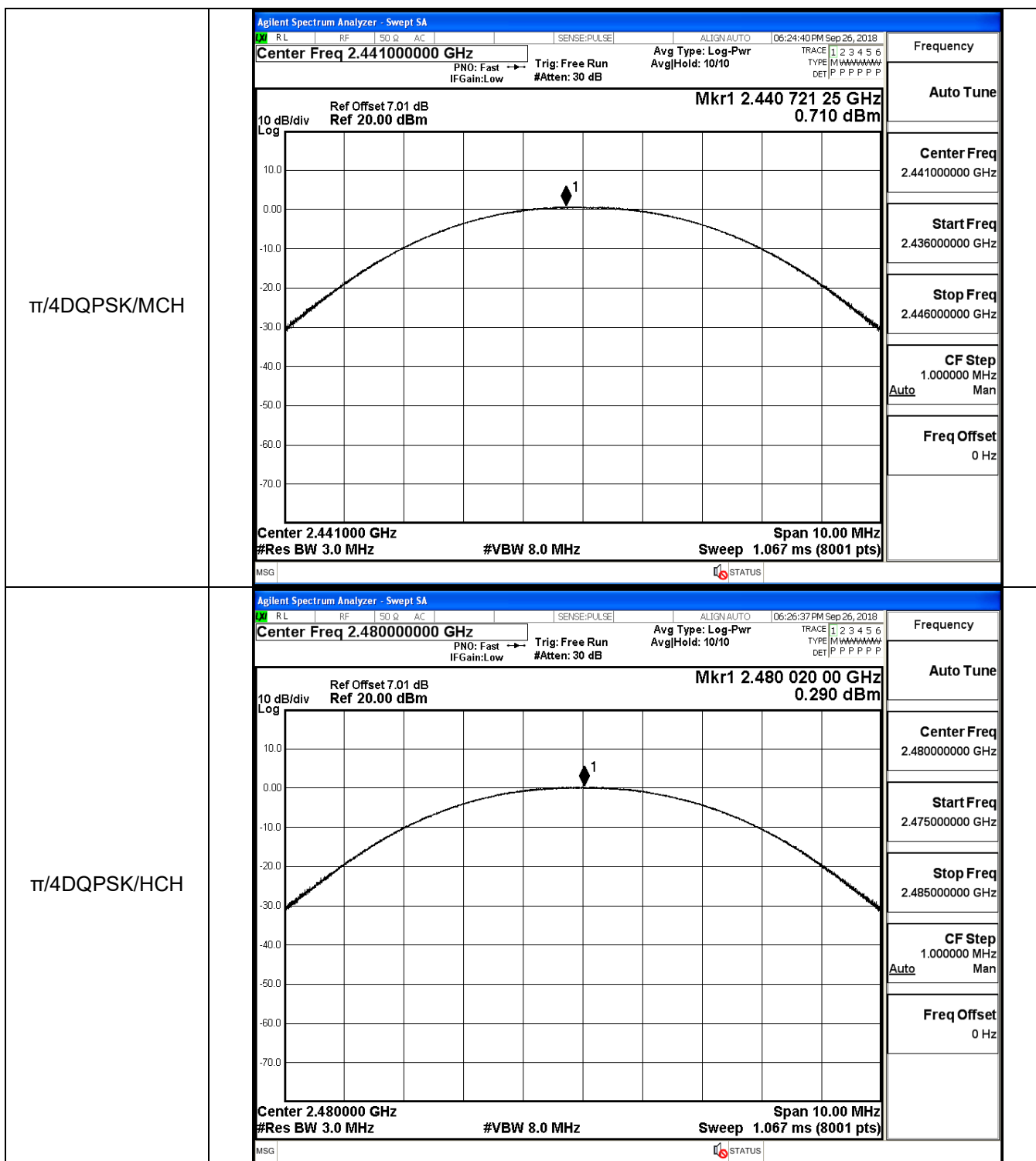


GFSK/MCH

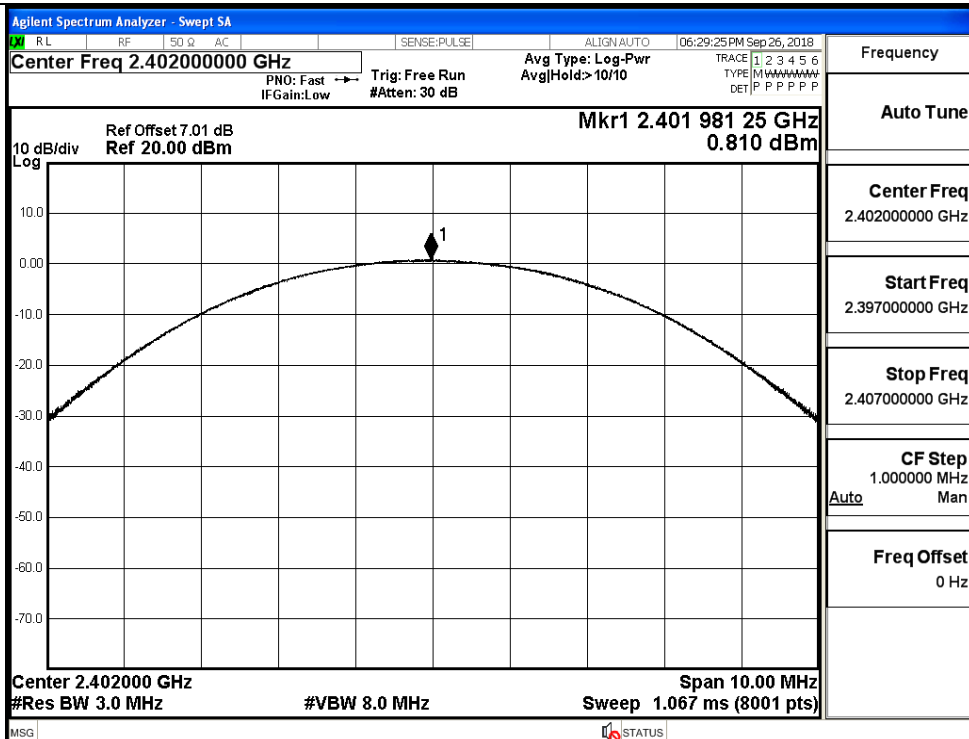


GFSK/HCH

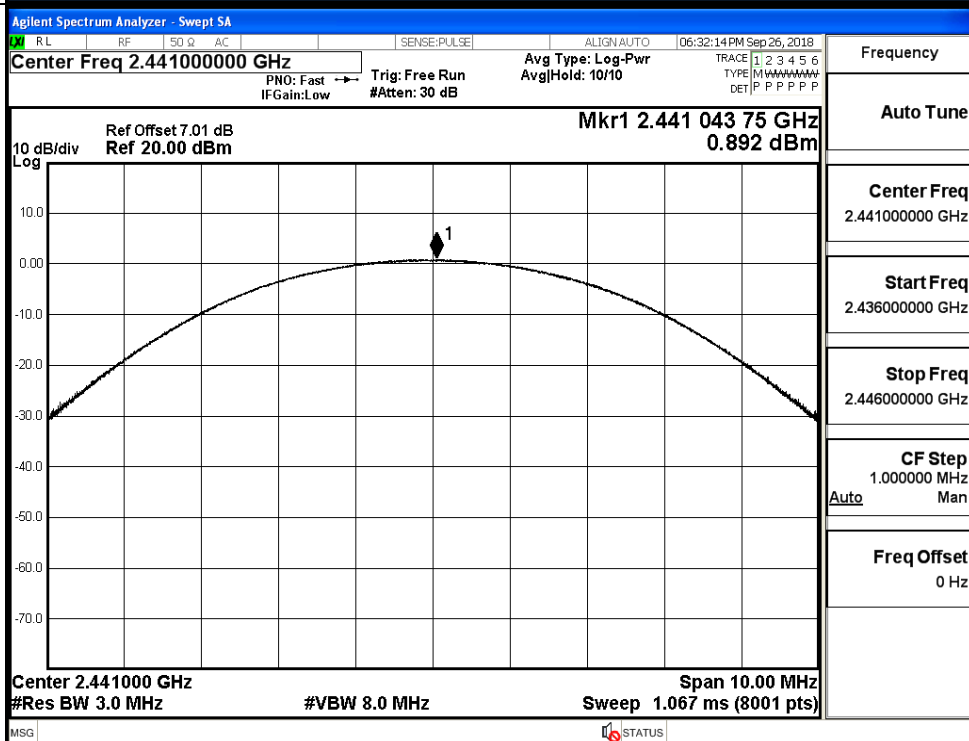
 π /4DQPSK/LCH



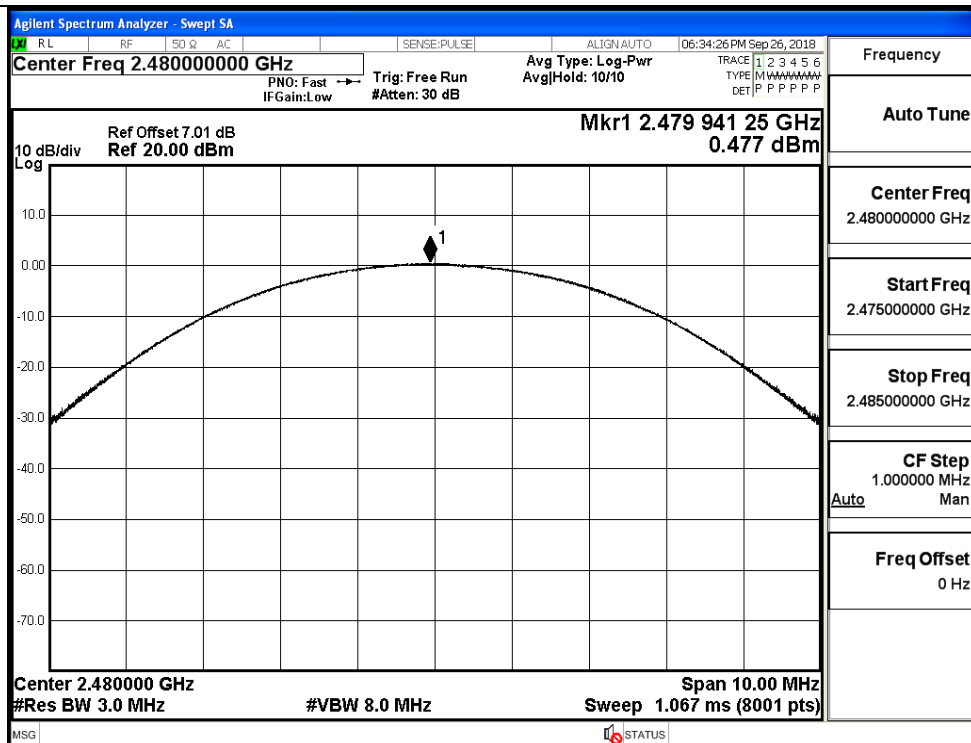
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

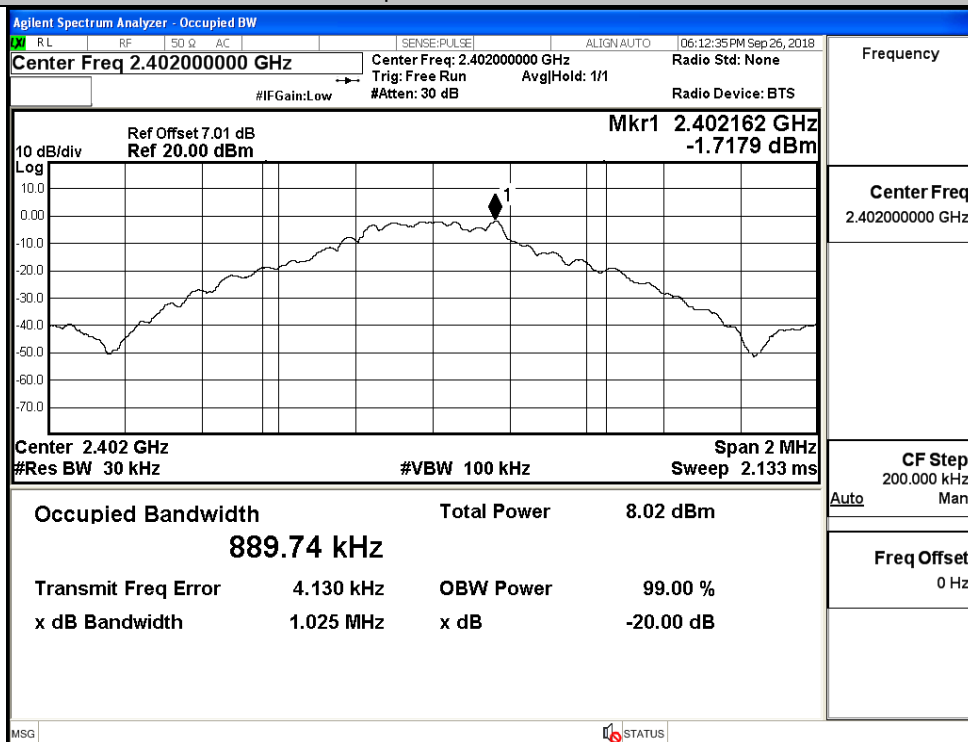


A.2 99% and 20dB Bandwidth

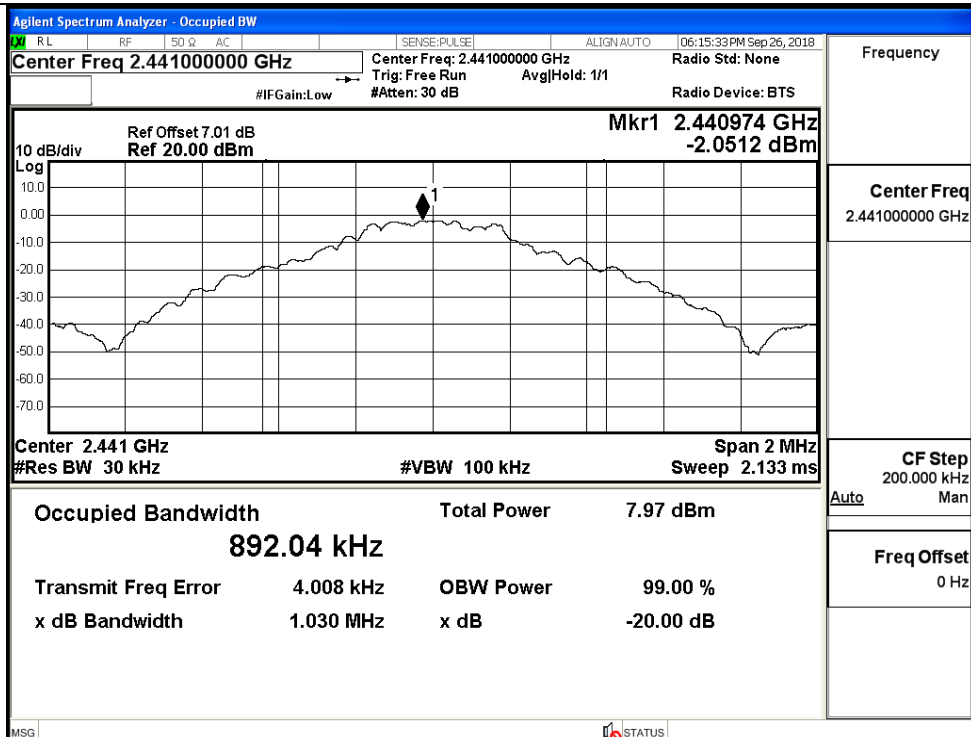
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.88974	1.025	Not Specified	PASS
	MCH	0.89204	1.030	Not Specified	PASS
	HCH	0.89071	1.034	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.1676	1.290	Not Specified	PASS
	MCH	1.1680	1.288	Not Specified	PASS
	HCH	1.1669	1.287	Not Specified	PASS
8DPSK	LCH	1.1727	1.287	Not Specified	PASS
	MCH	1.1717	1.289	Not Specified	PASS
	HCH	1.1732	1.286	Not Specified	PASS

Test Graphs

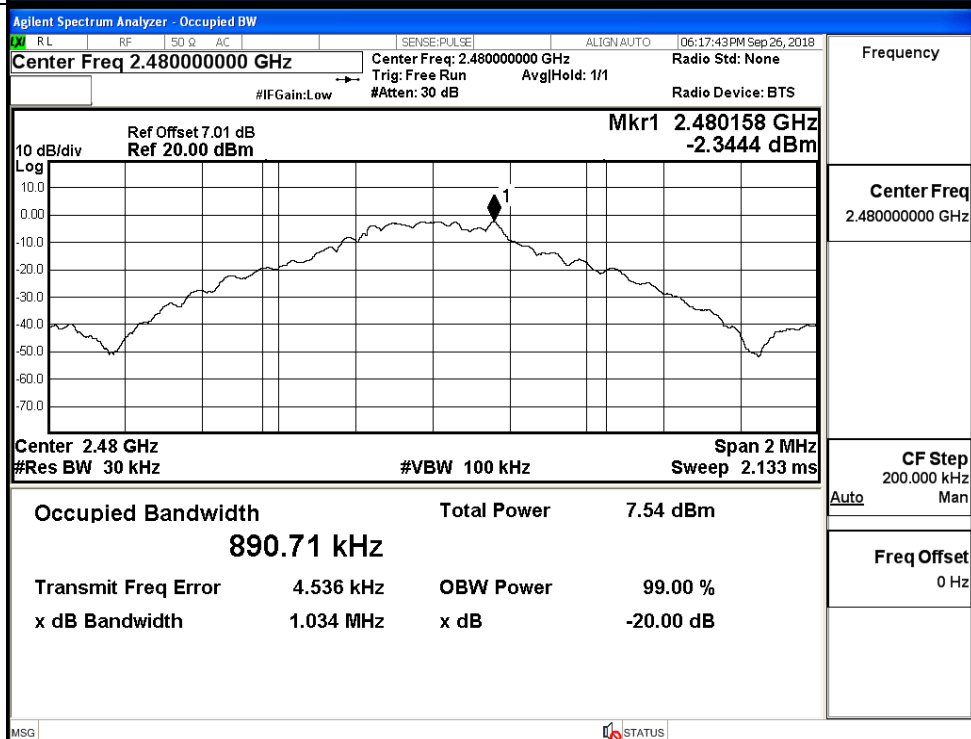
GFSK/LCH

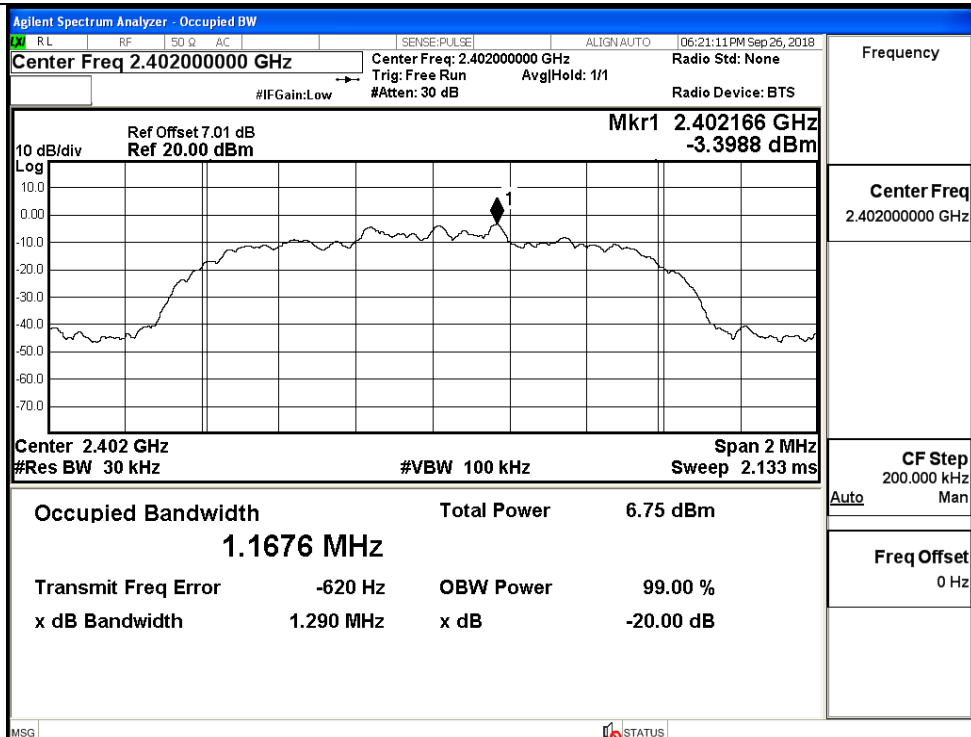


GFSK/MCH



GFSK/HCH

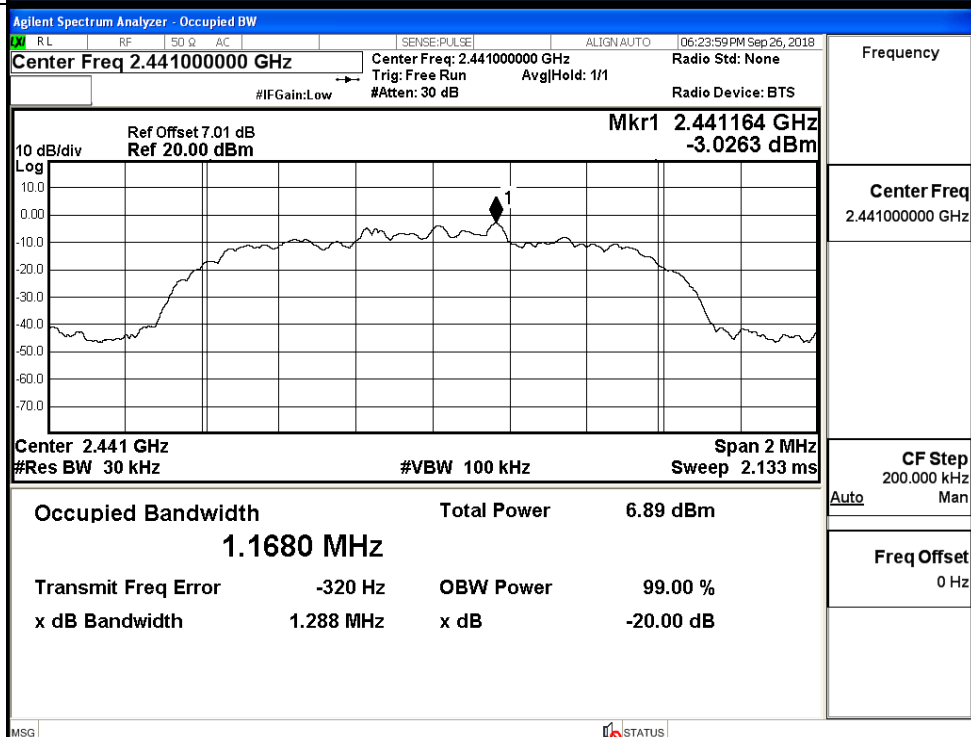


$\pi/4$ DQPSK/LCH

Frequency

Center Freq
2.402000000 GHzCF Step
200.000 kHz
Man

Auto

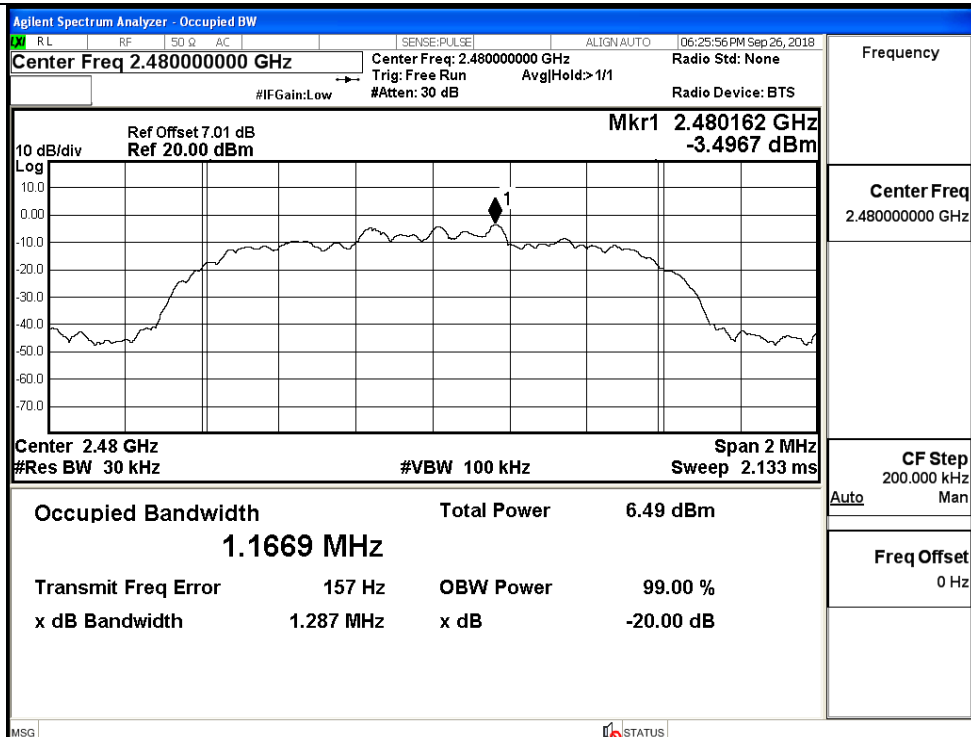
Freq Offset
0 Hz $\pi/4$ DQPSK/MCH

Frequency

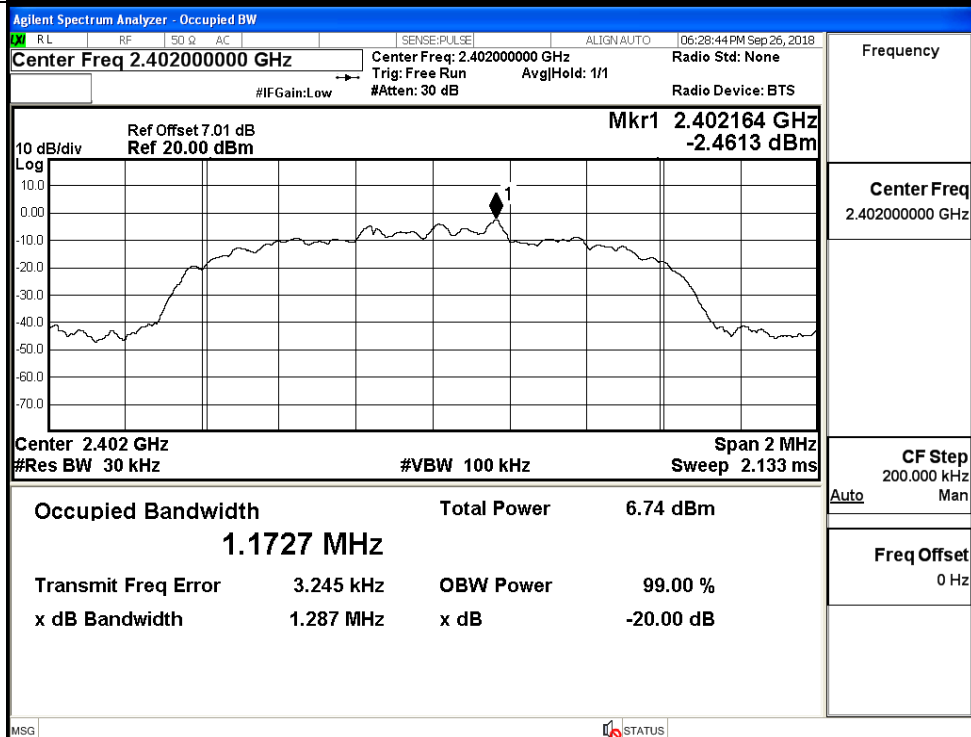
Center Freq
2.441000000 GHzCF Step
200.000 kHz
Man

Auto

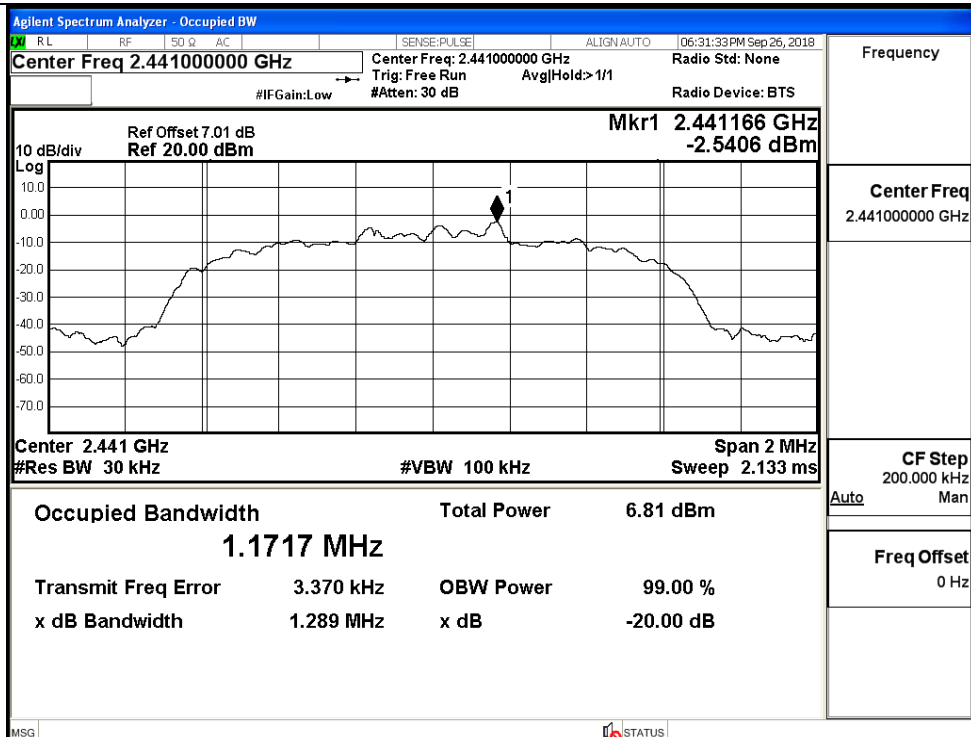
Freq Offset
0 Hz

$\pi/4$ DQPSK/HCH

8DPSK/LCH



8DPSK/MCH



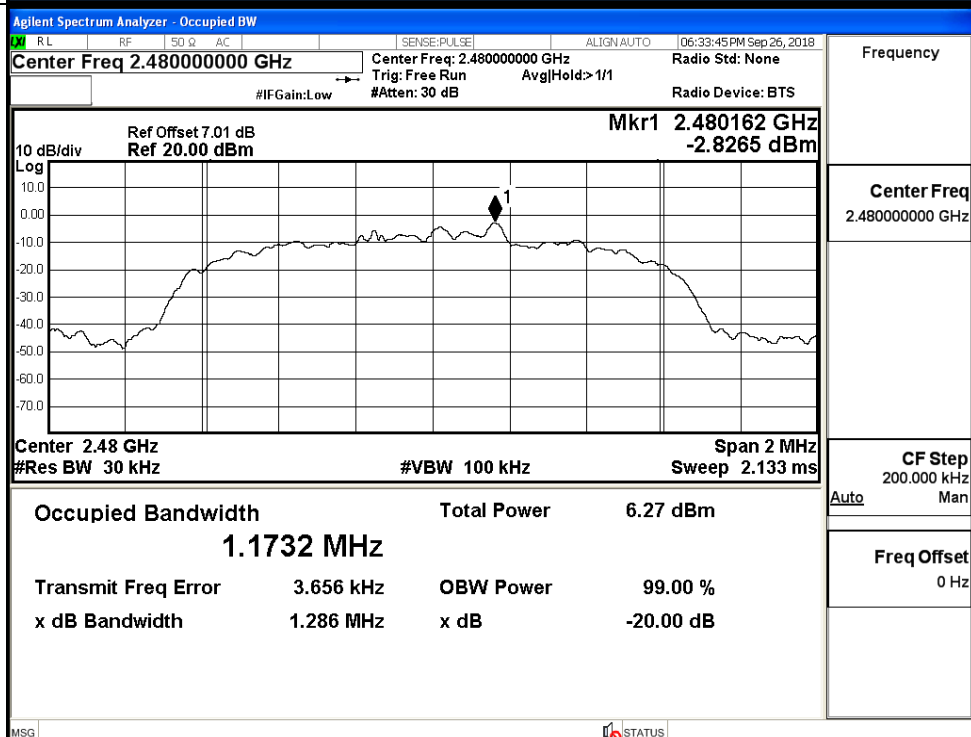
Frequency

Center Freq
2.441000000 GHzCF Step
200.000 kHz
Man

Auto

Freq Offset
0 Hz

8DPSK/HCH



Frequency

Center Freq
2.480000000 GHzCF Step
200.000 kHz
Man

Auto

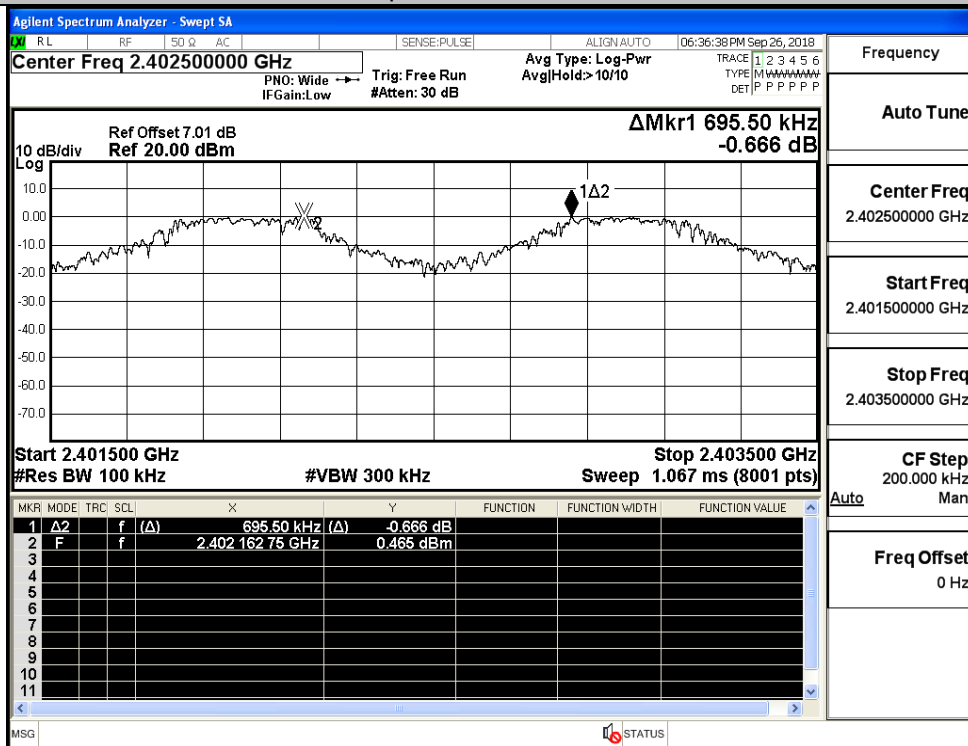
Freq Offset
0 Hz

A.3 Carrier Frequency Separation

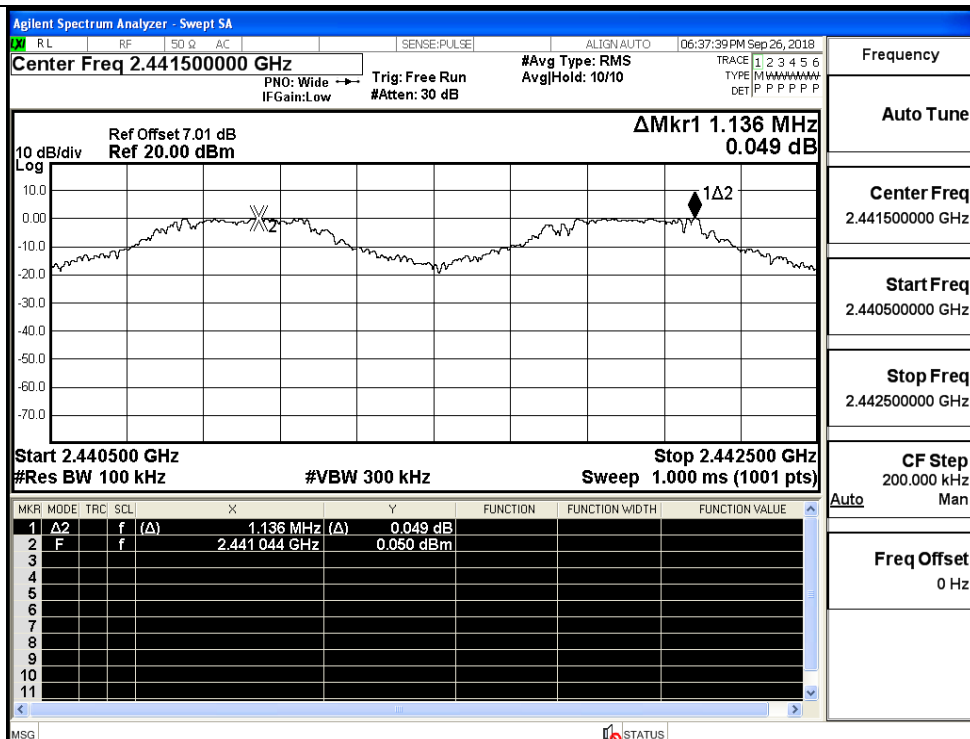
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.696	0.689	PASS
	MCH	1.136	0.689	PASS
	HCH	1.124	0.689	PASS
$\pi/4$ DQPSK	LCH	0.874	0.860	PASS
	MCH	1.280	0.860	PASS
	HCH	1.026	0.860	PASS
8DPSK	LCH	1.114	0.859	PASS
	MCH	0.988	0.859	PASS
	HCH	1.048	0.859	PASS

Test Graphs

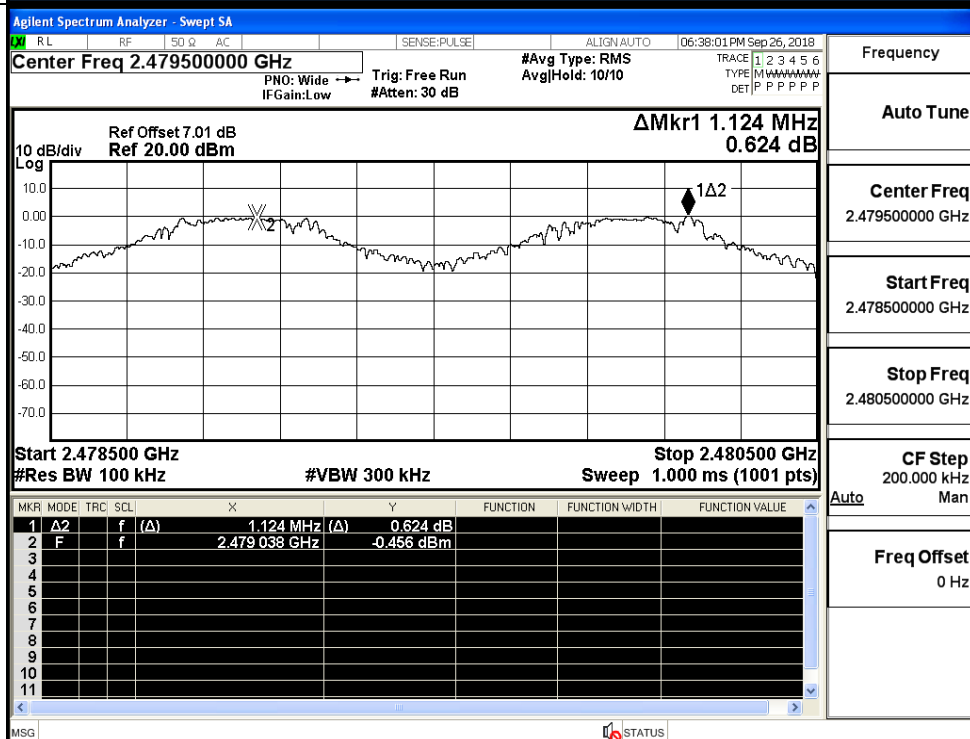
GFSK/LCH

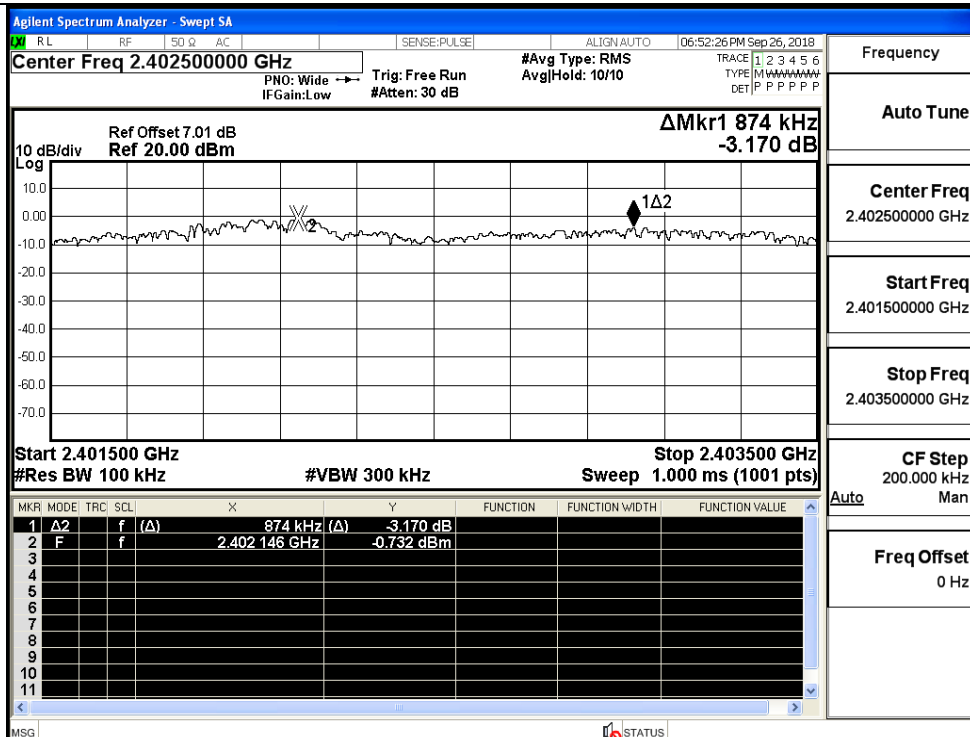
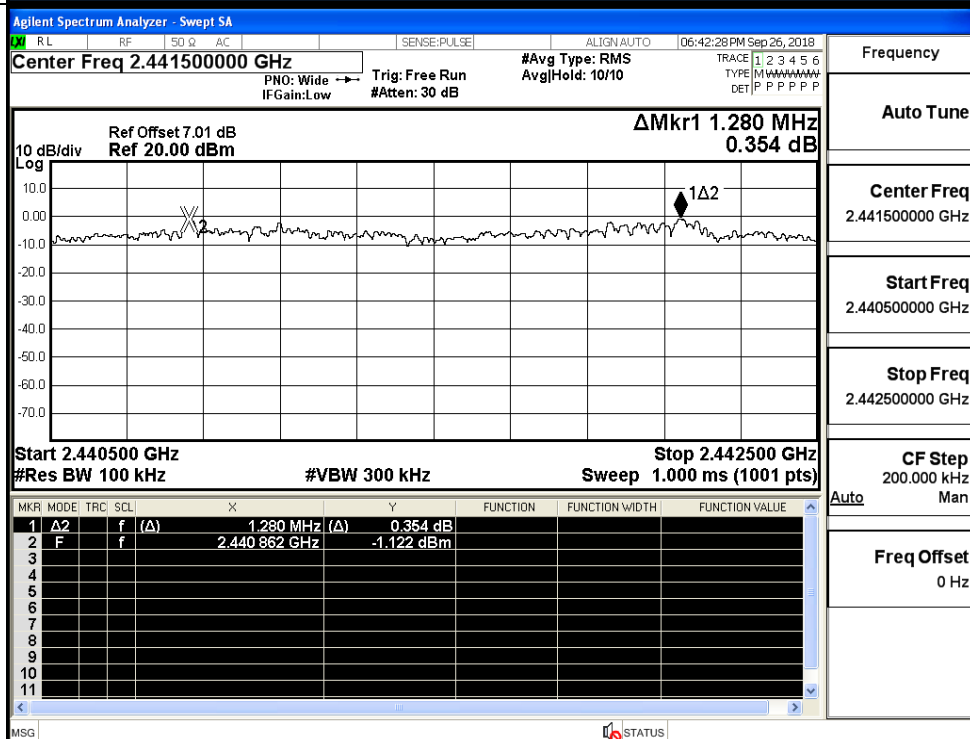


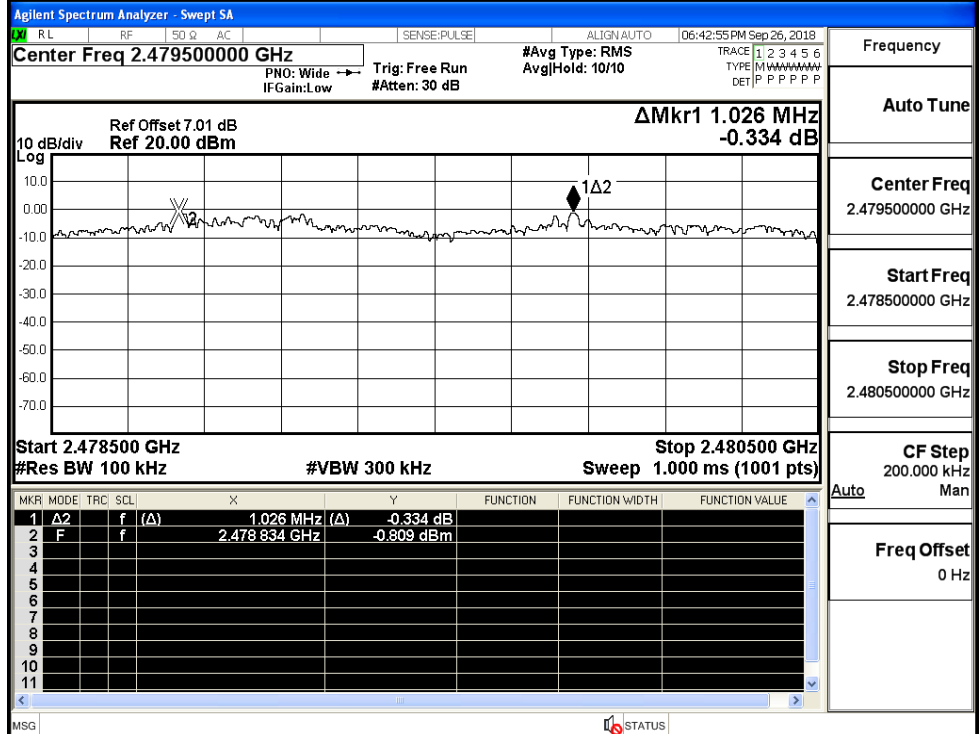
GFSK/MCH



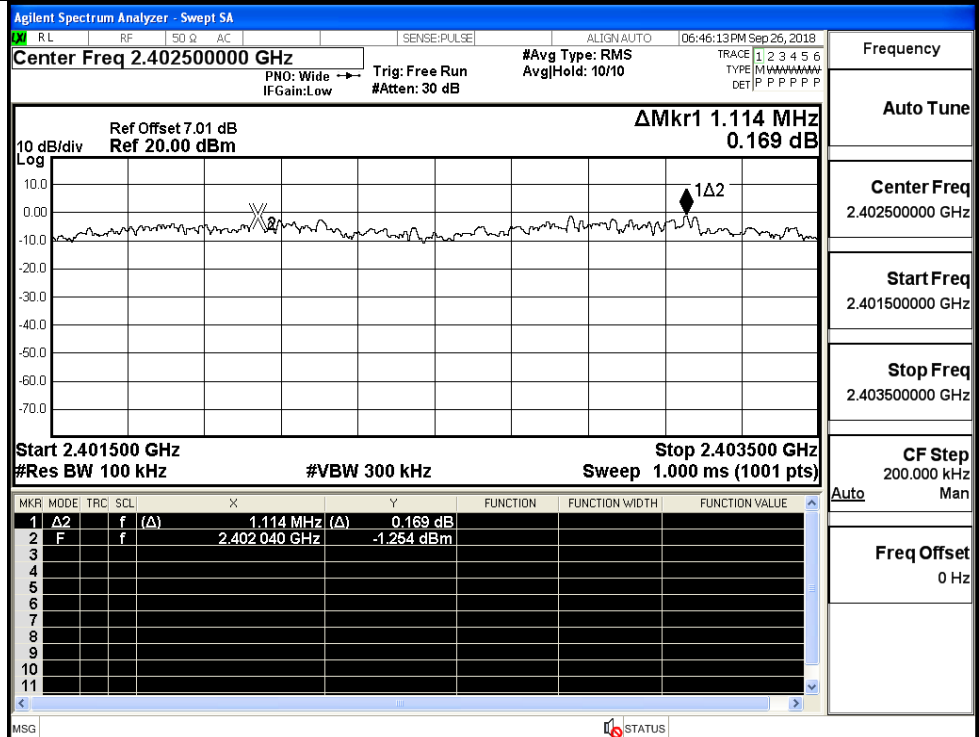
GFSK/HCH



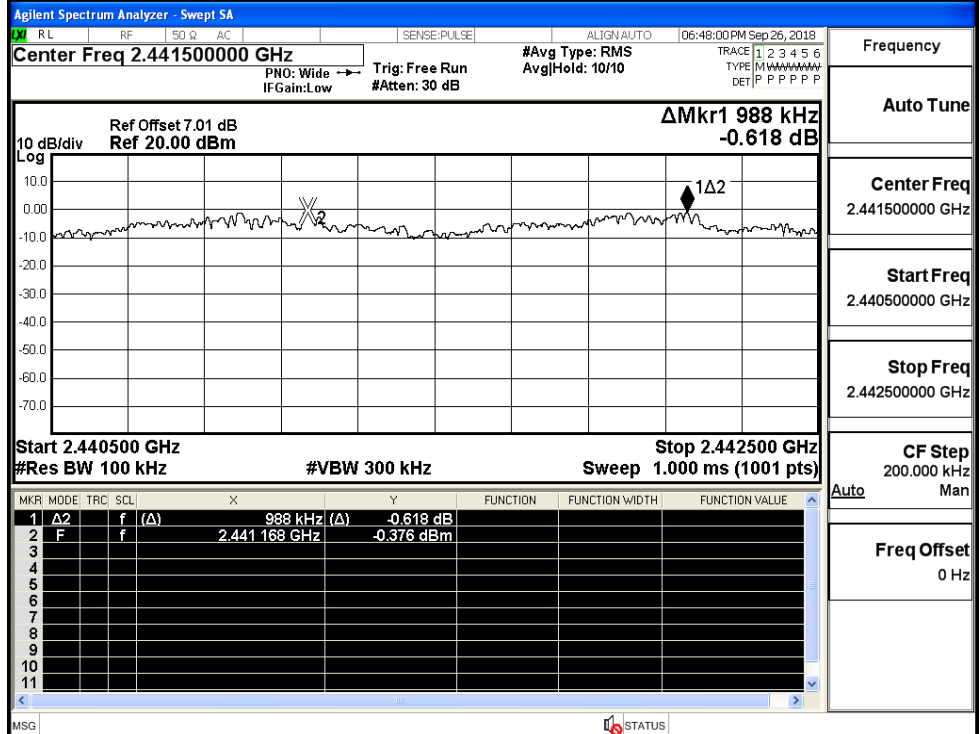
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

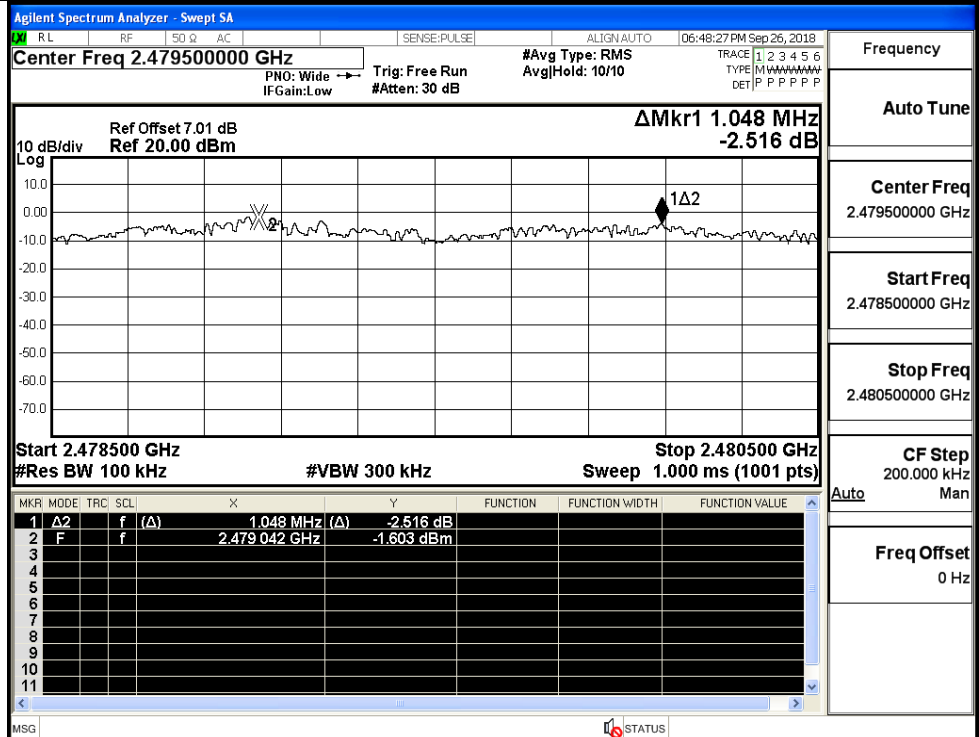
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

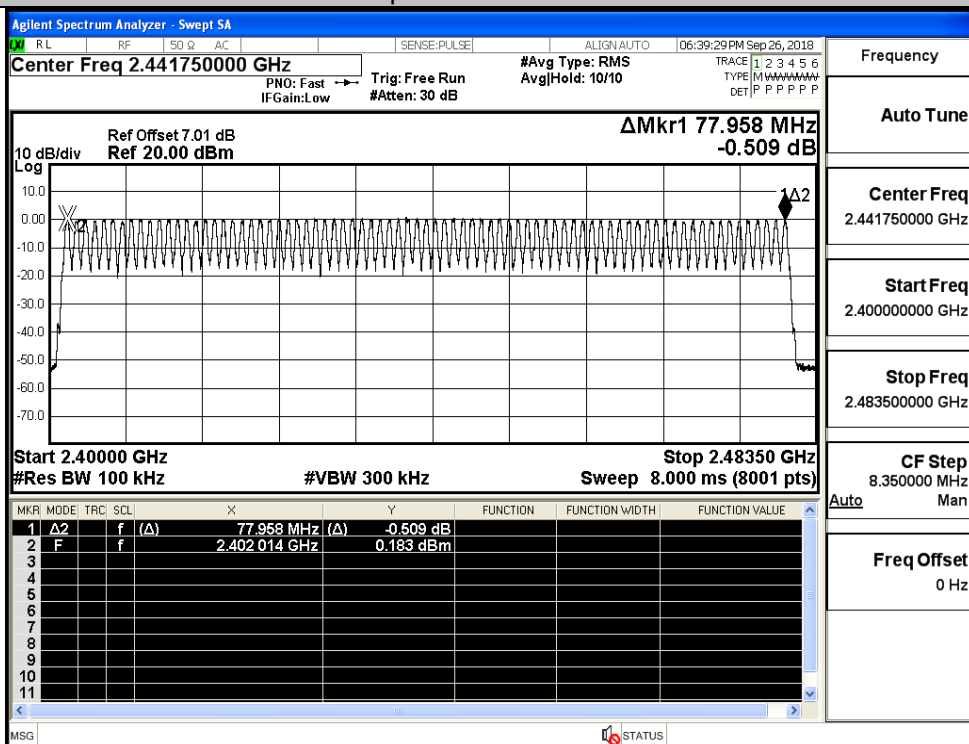


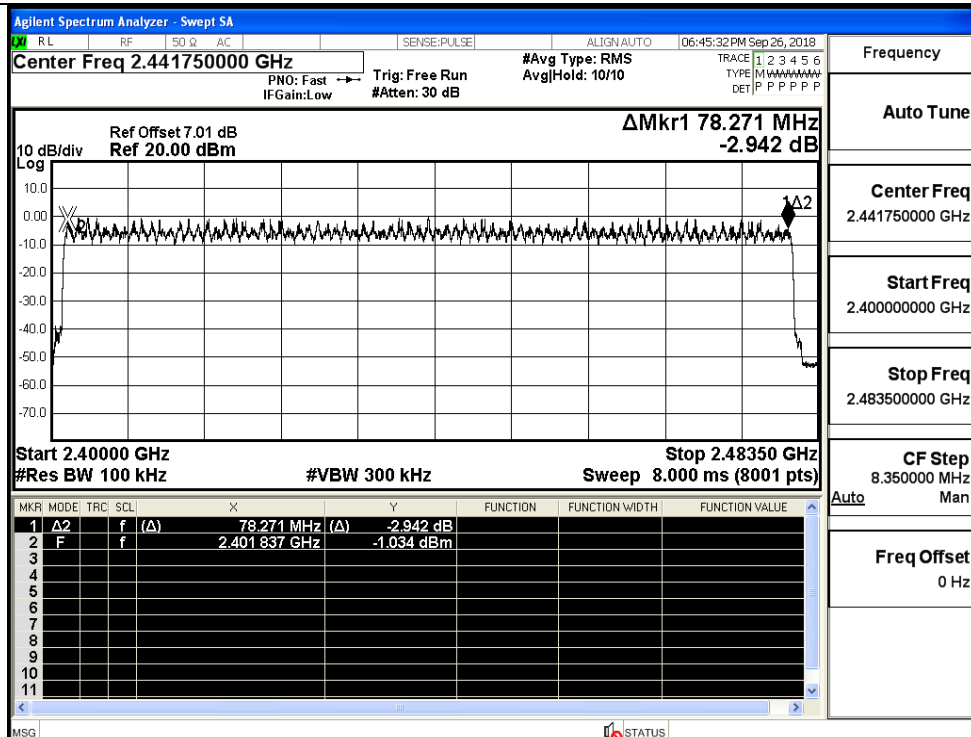
A.4 Hopping Channel Number

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

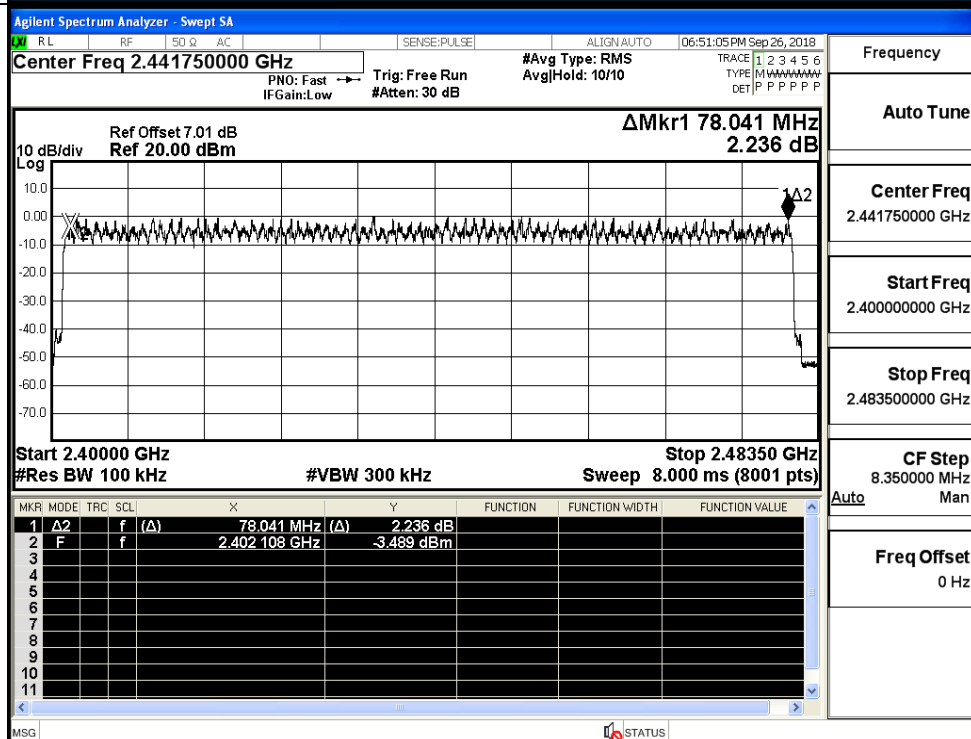
Test Graphs

GFSK/Hop



$\pi/4$ DQPSK/Hop

8DPSK/Hop

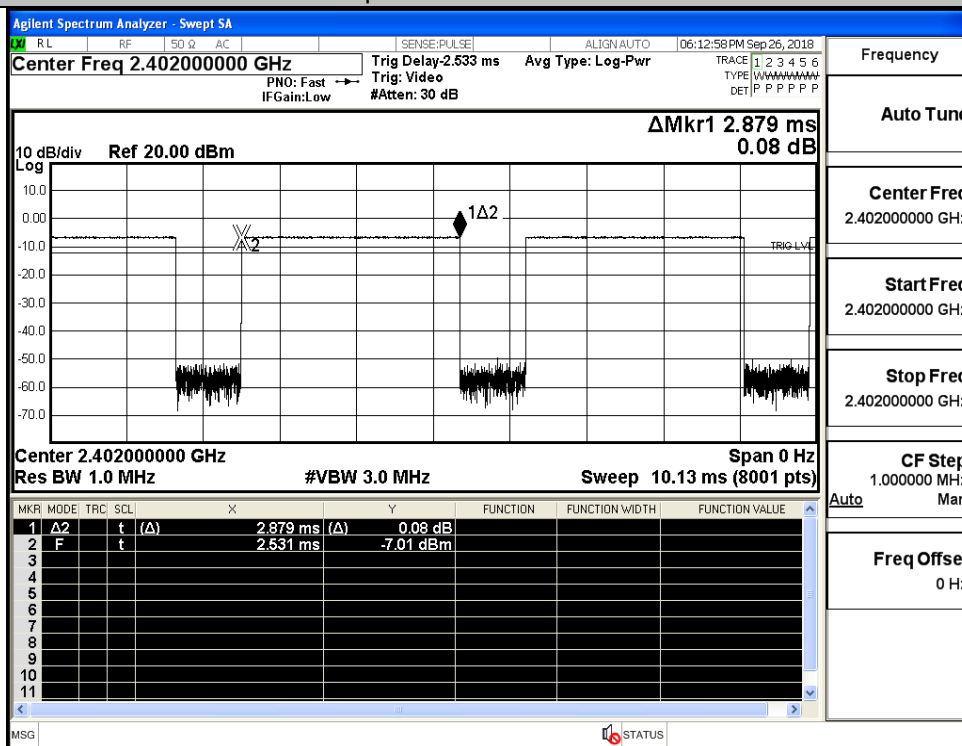


A.5 Dwell Time

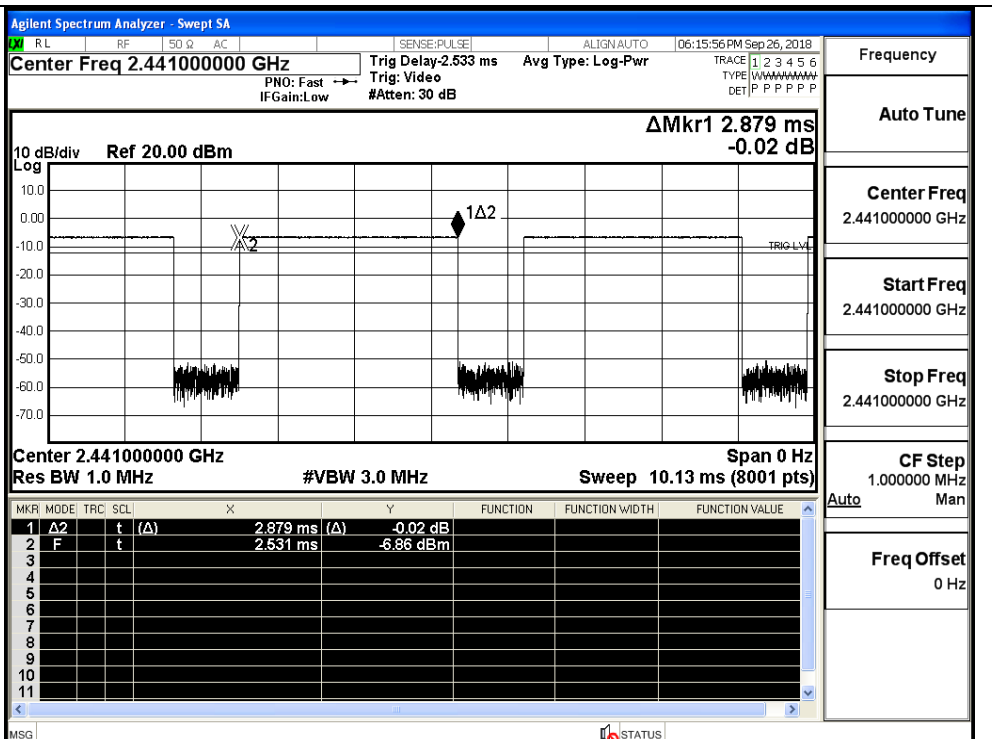
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.89	106.7	0.308	0.4	PASS
	3DH5	MCH	2.89	106.7	0.308	0.4	PASS
	3DH5	HCH	2.89	106.7	0.308	0.4	PASS

Test Graphs

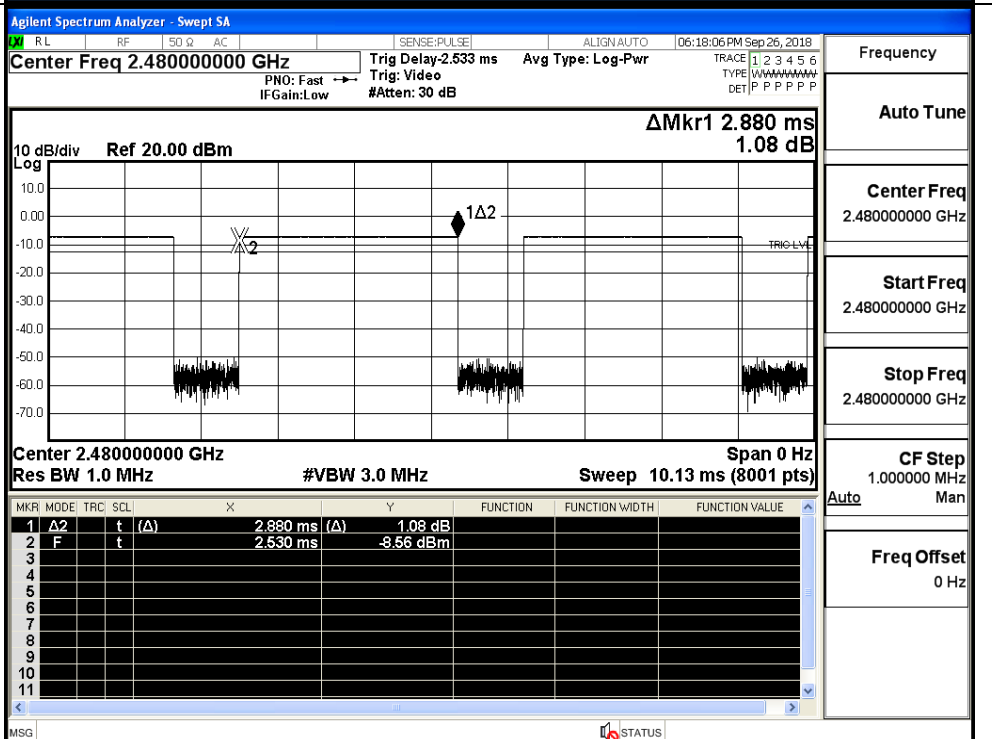
GFSK_DH5/LCH



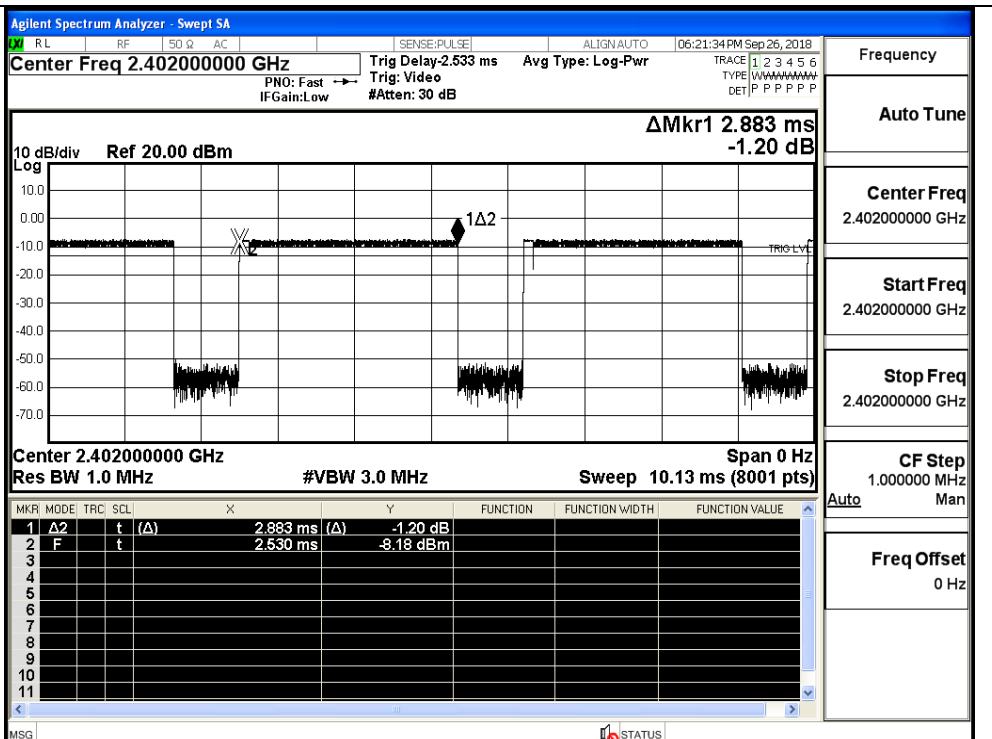
GFSK_DH5/MCH



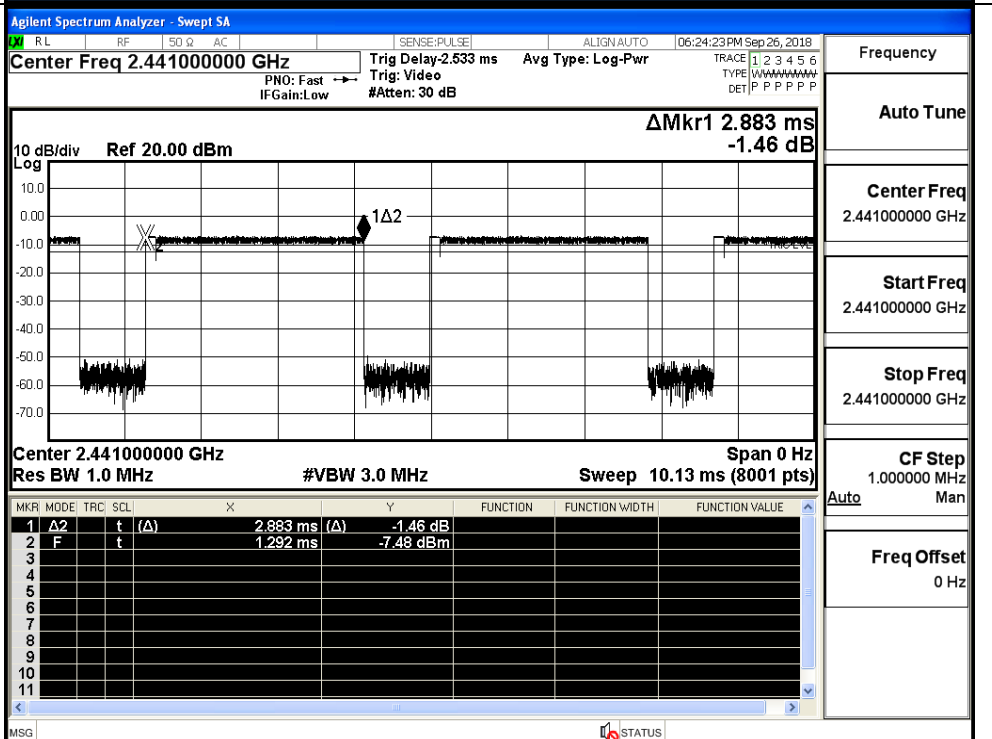
GFSK_DH5/HCH



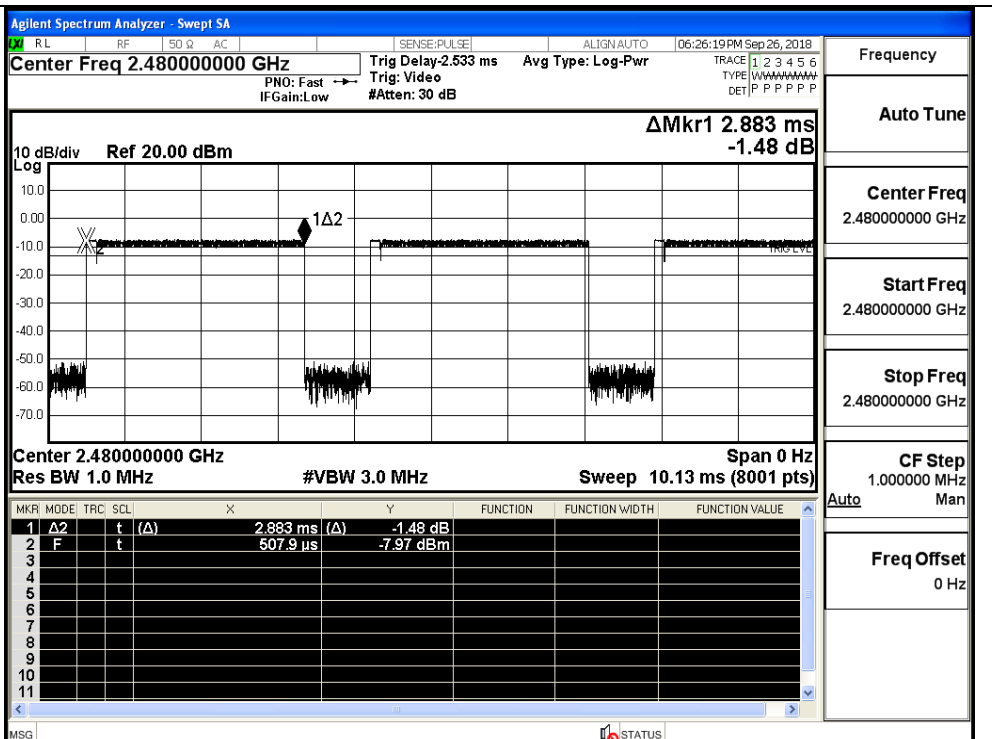
$\pi/4$ DQPSK
_2DH5/LCH



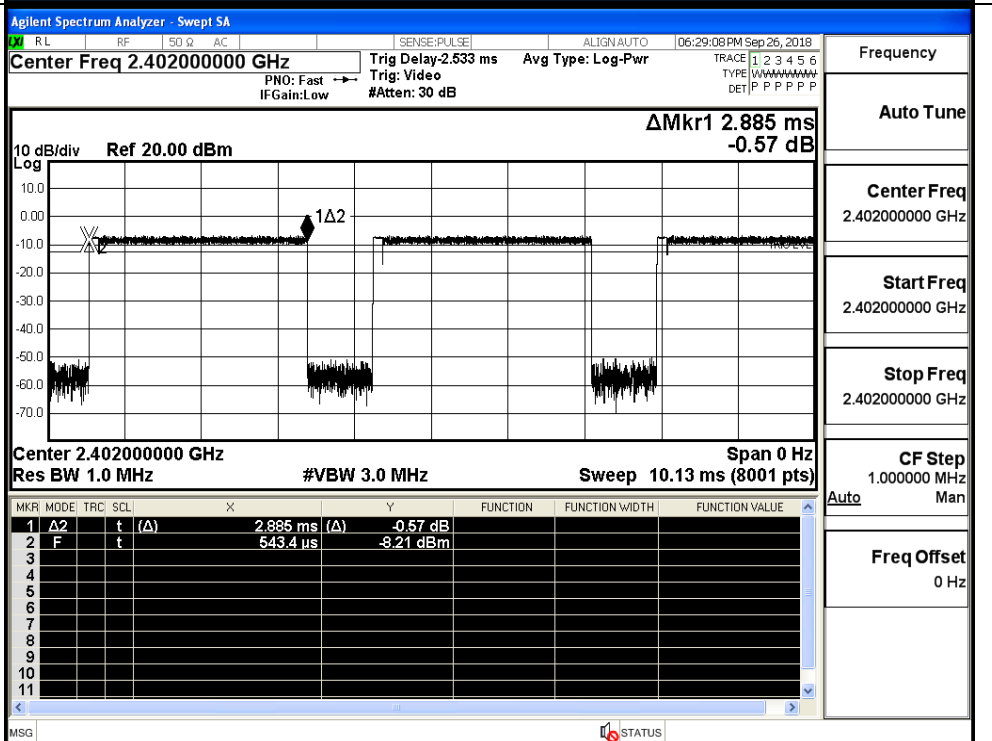
$\pi/4$ DQPSK
_2DH5/MCH



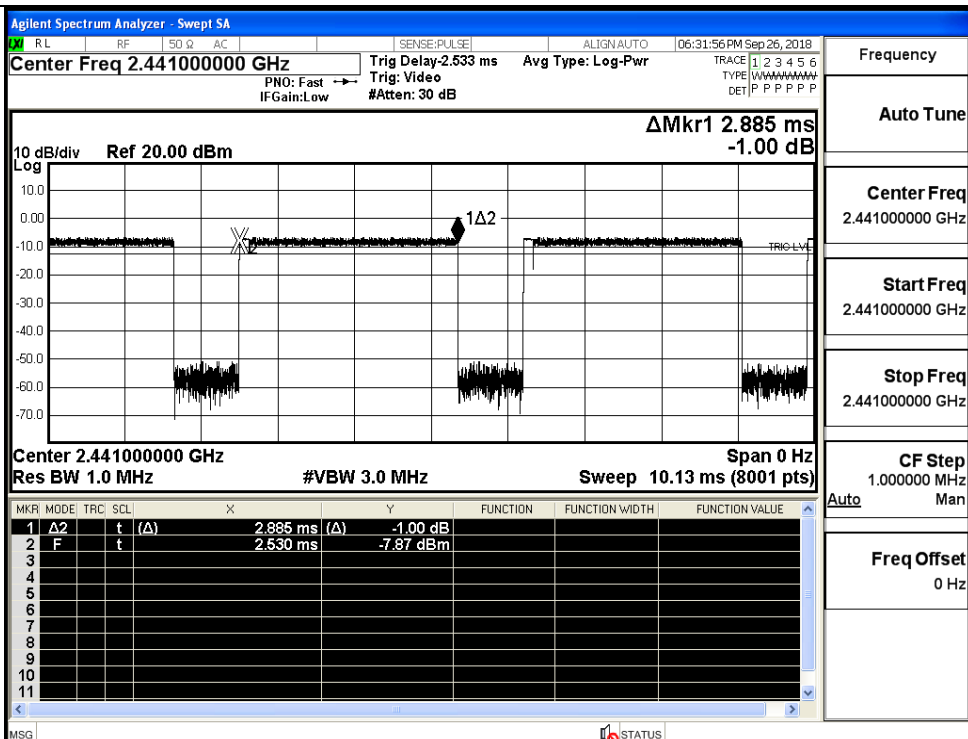
$\pi/4$ DQPSK
_2DH5/HCH



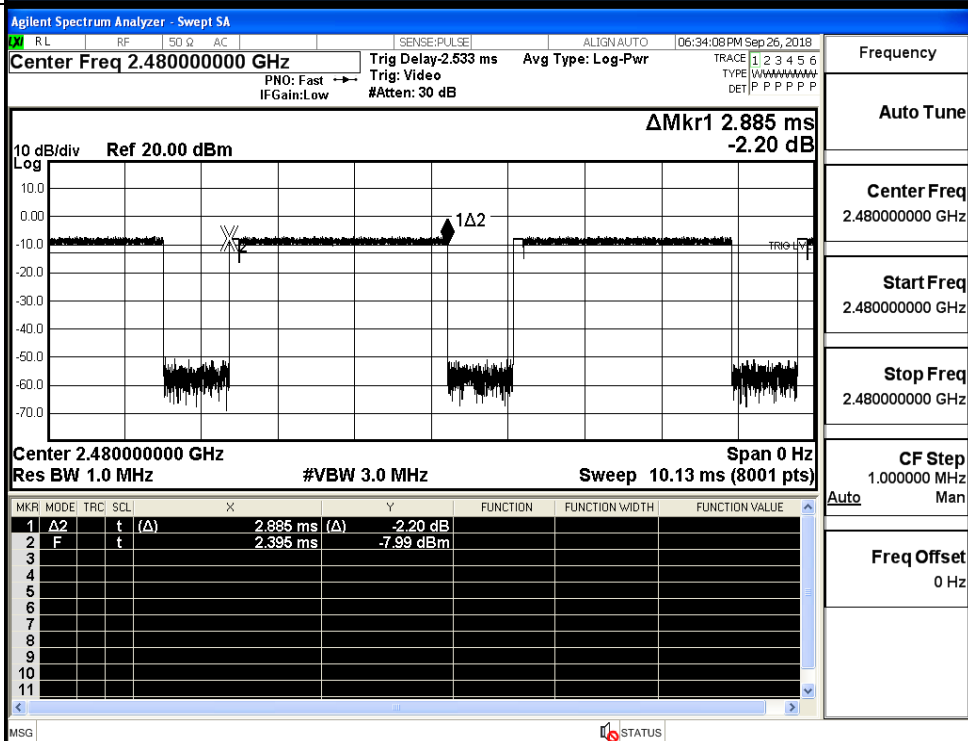
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

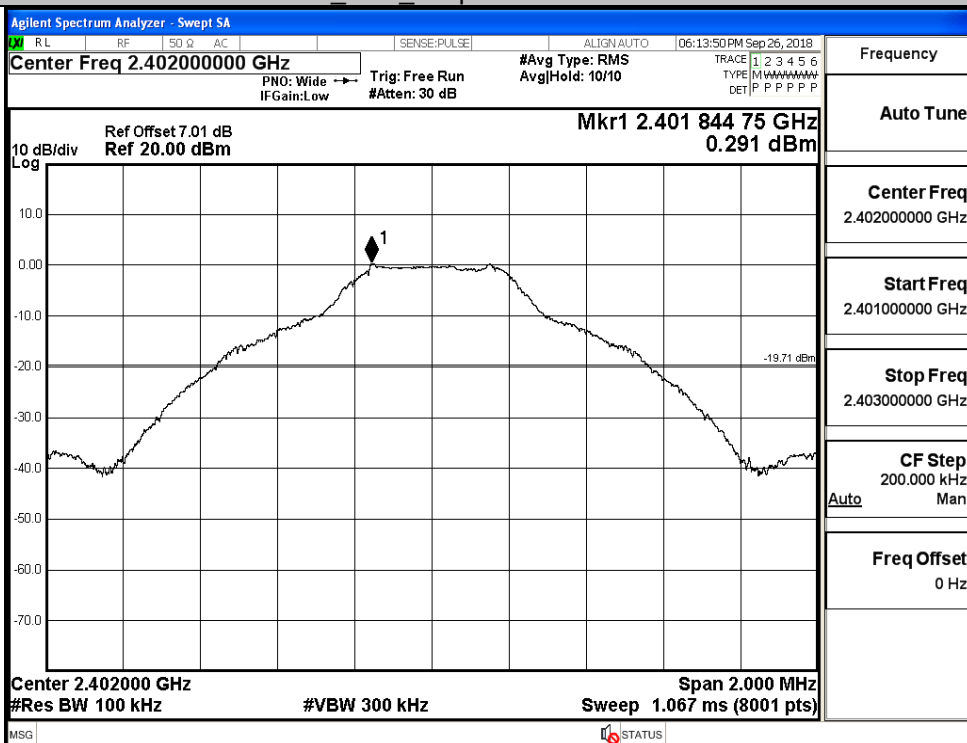


A.6 RF Conducted Spurious Emissions

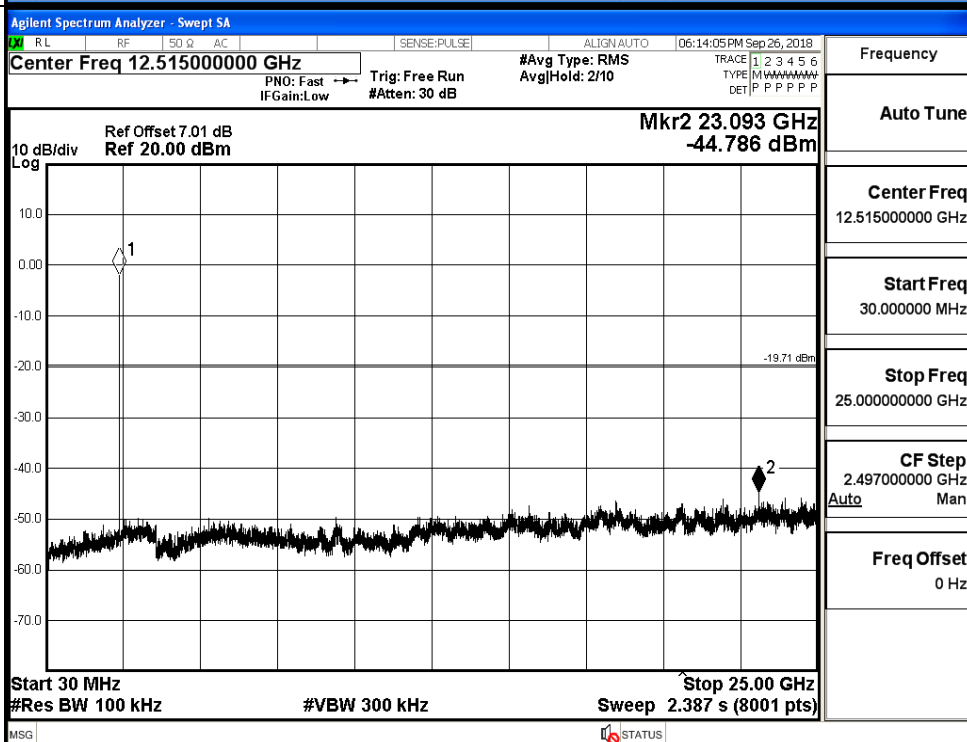
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.291	-44.786	-19.709	PASS
	MCH	0.404	-46.201	-19.596	PASS
	HCH	-0.103	-45.680	-20.103	PASS
$\pi/4$ DQPSK	LCH	-0.828	-45.101	-20.828	PASS
	MCH	-0.398	-45.757	-20.398	PASS
	HCH	-0.708	-45.352	-20.708	PASS
8DPSK	LCH	-0.36	-45.399	-20.360	PASS
	MCH	-0.334	-45.706	-20.334	PASS
	HCH	-0.761	-46.134	-20.761	PASS

GFSK LCH Graphs

Pref

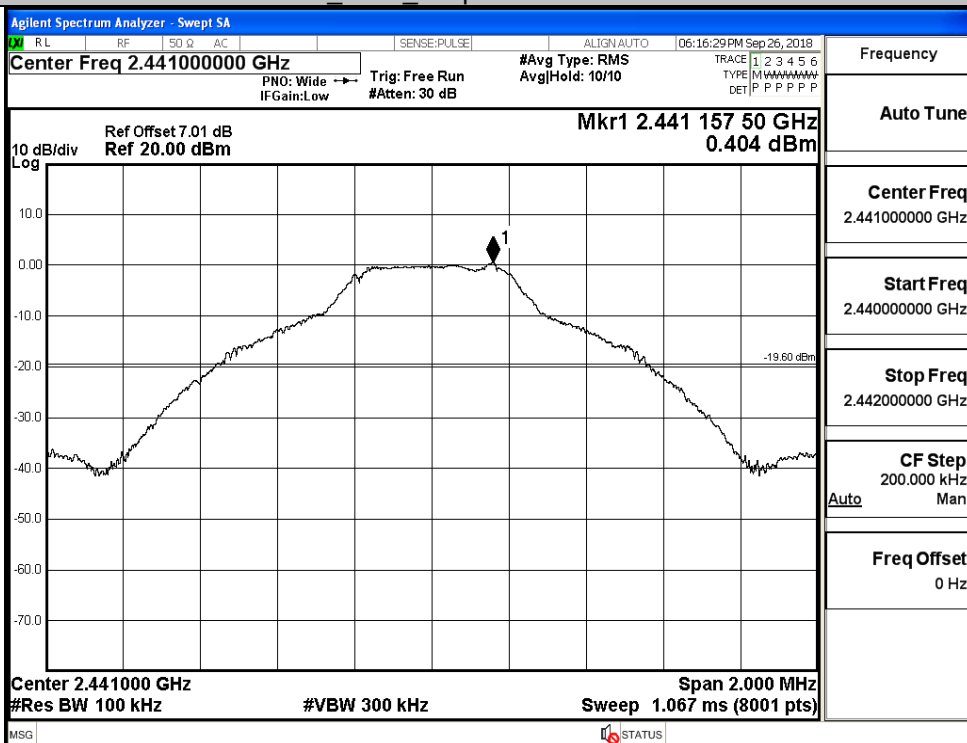


Puw

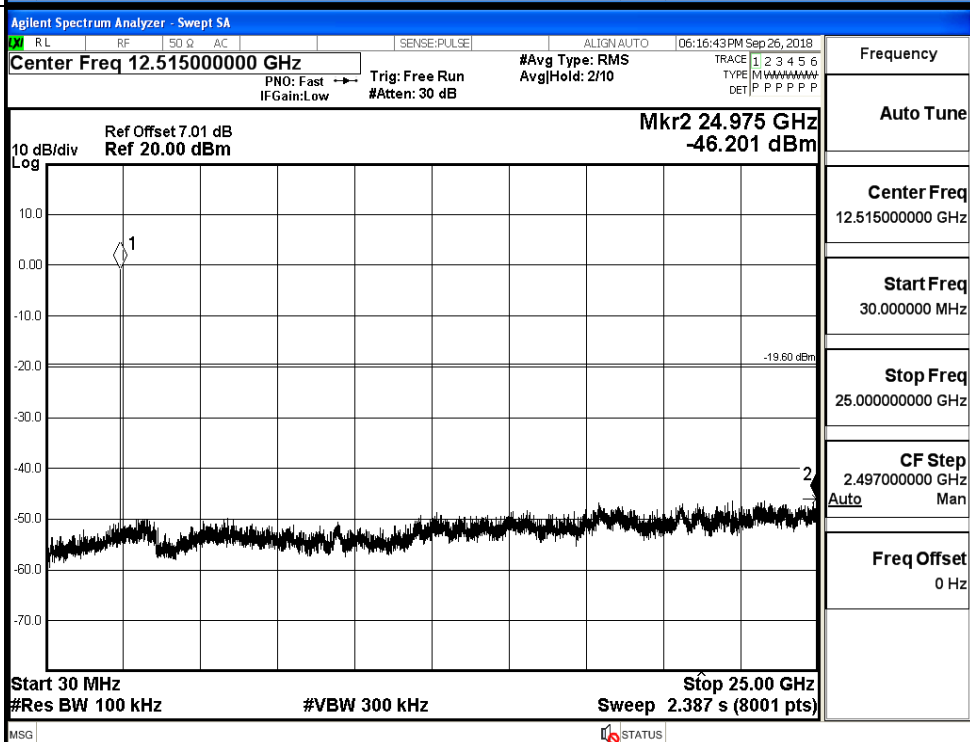


GFSK MCH_Graphs

Pref

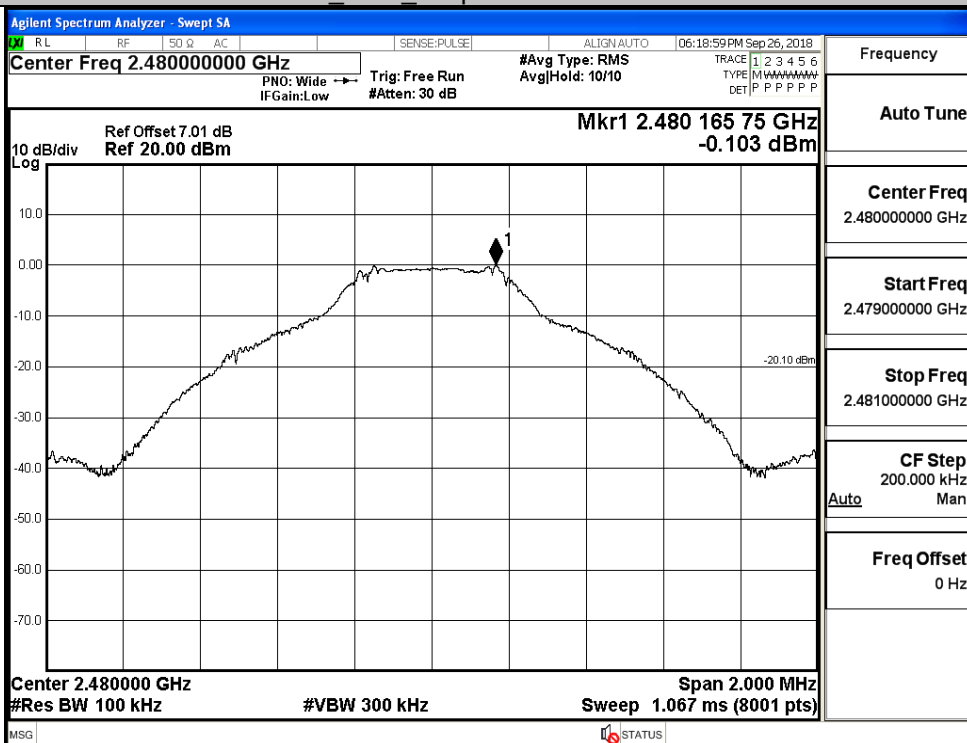


Puw

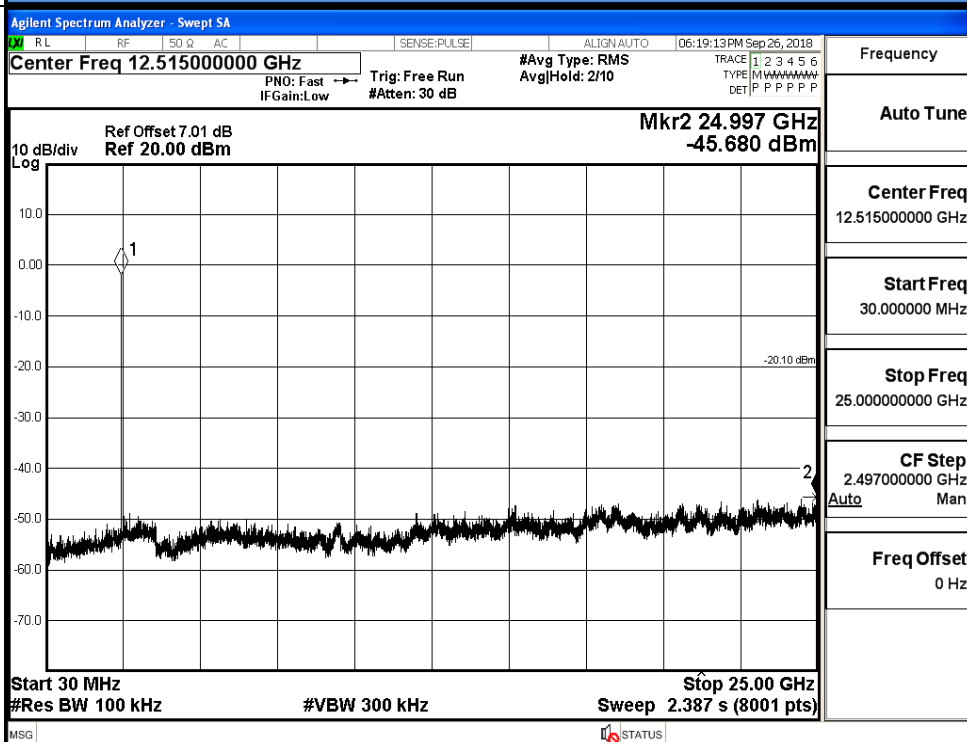


GFSK HCH Graphs

Pref

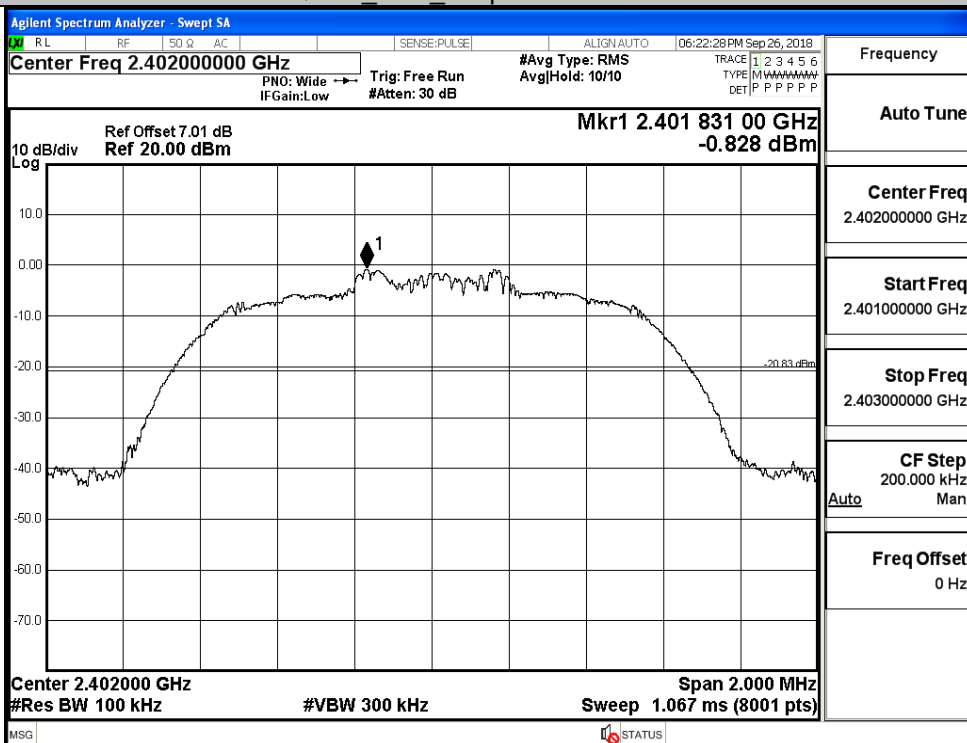


Puw

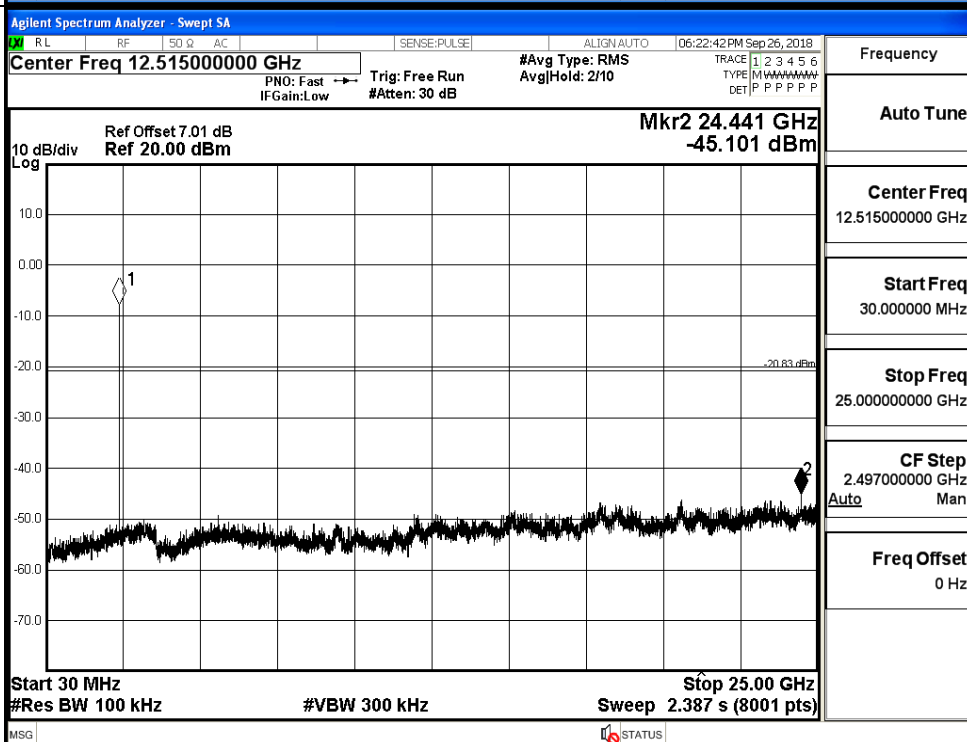


$\pi/4$ DQPSK LCH_Graphs

Pref

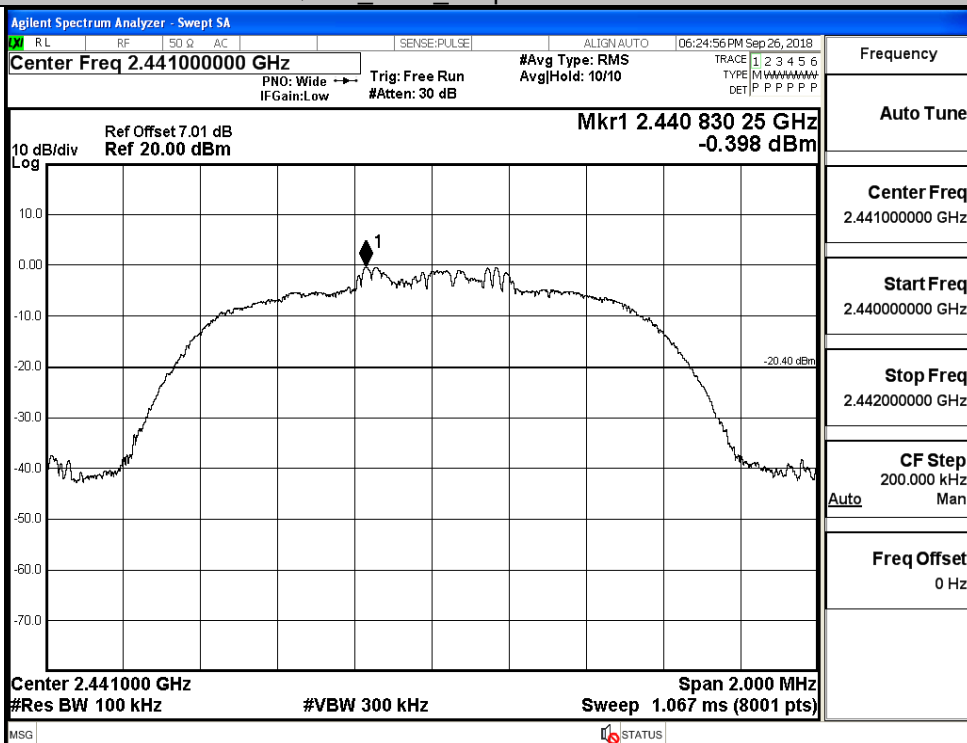


Puw

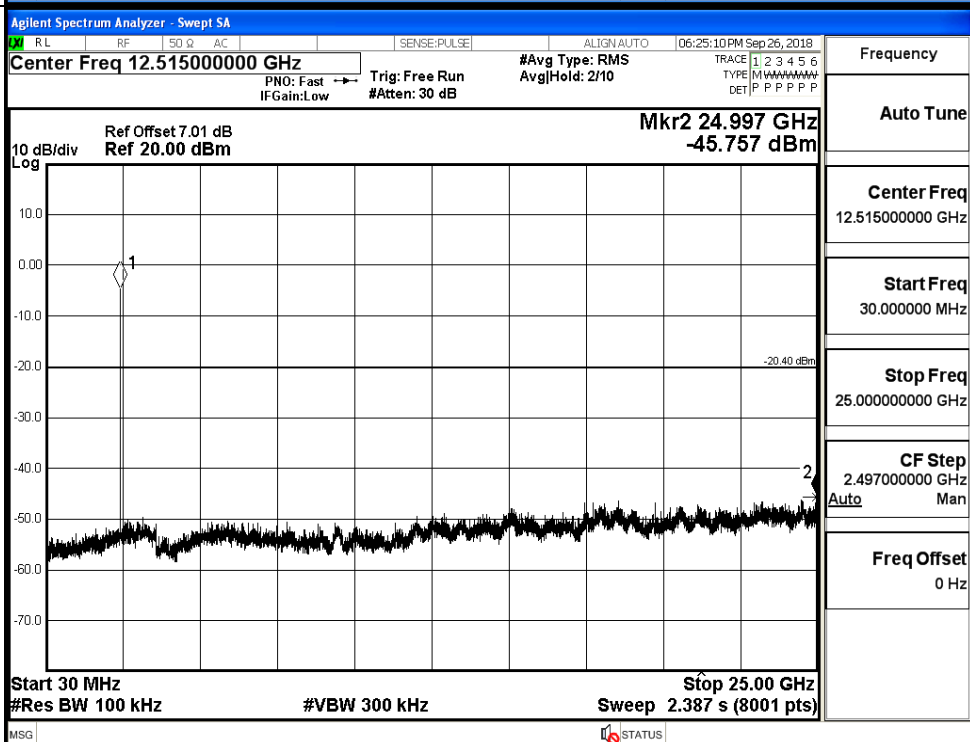


π /4DQPSK MCH Graphs

Pref

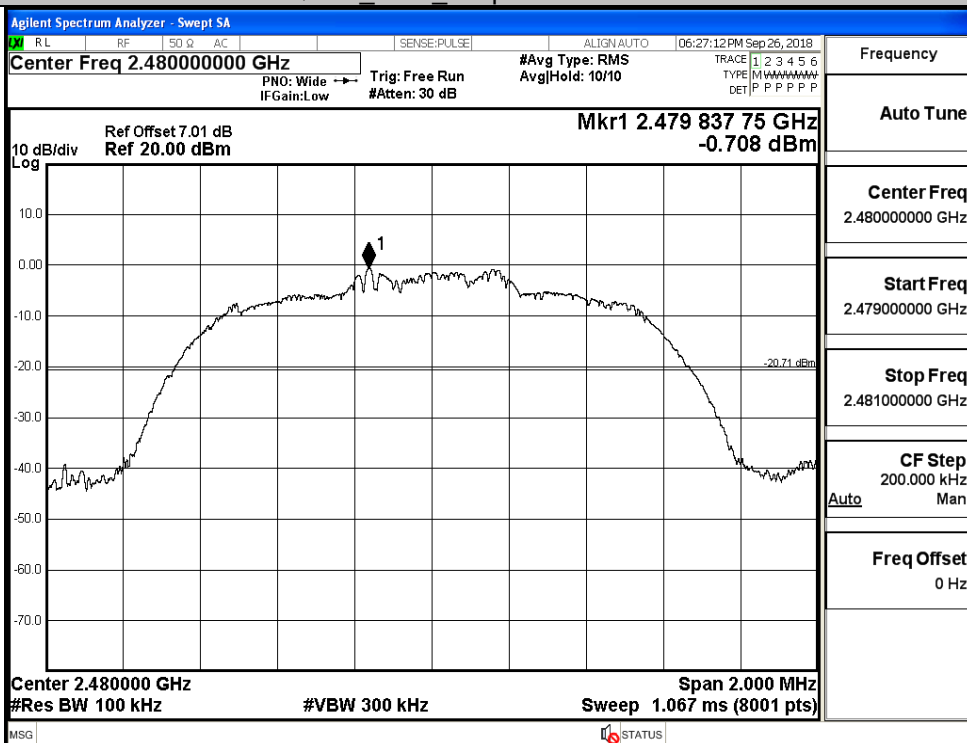


Puw

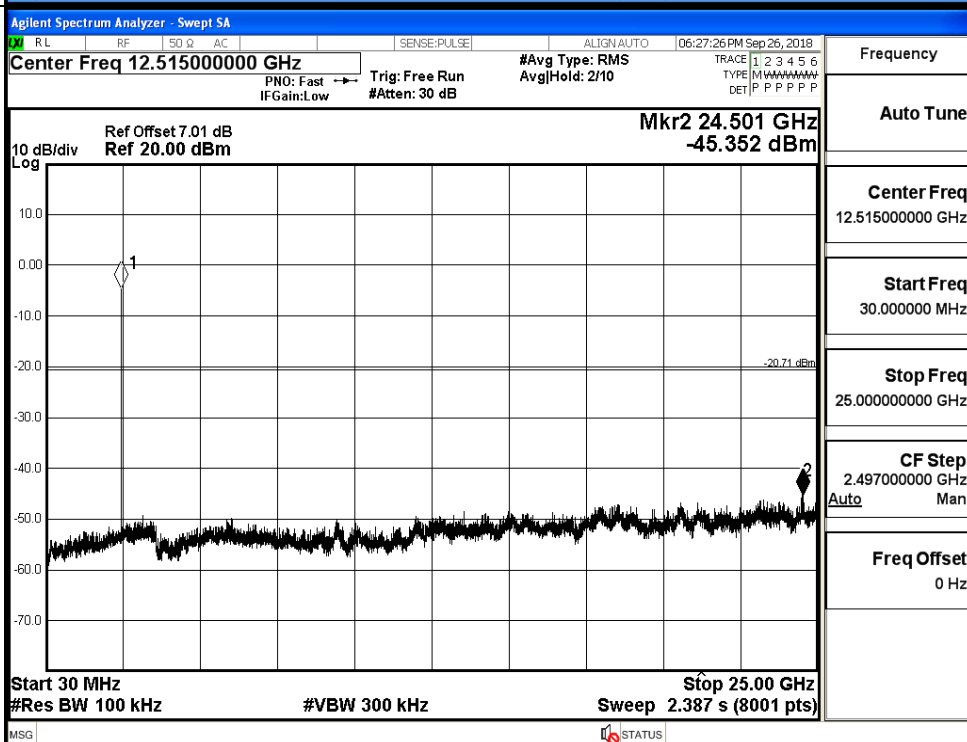


$\pi/4$ DQPSK HCH Graphs

Pref

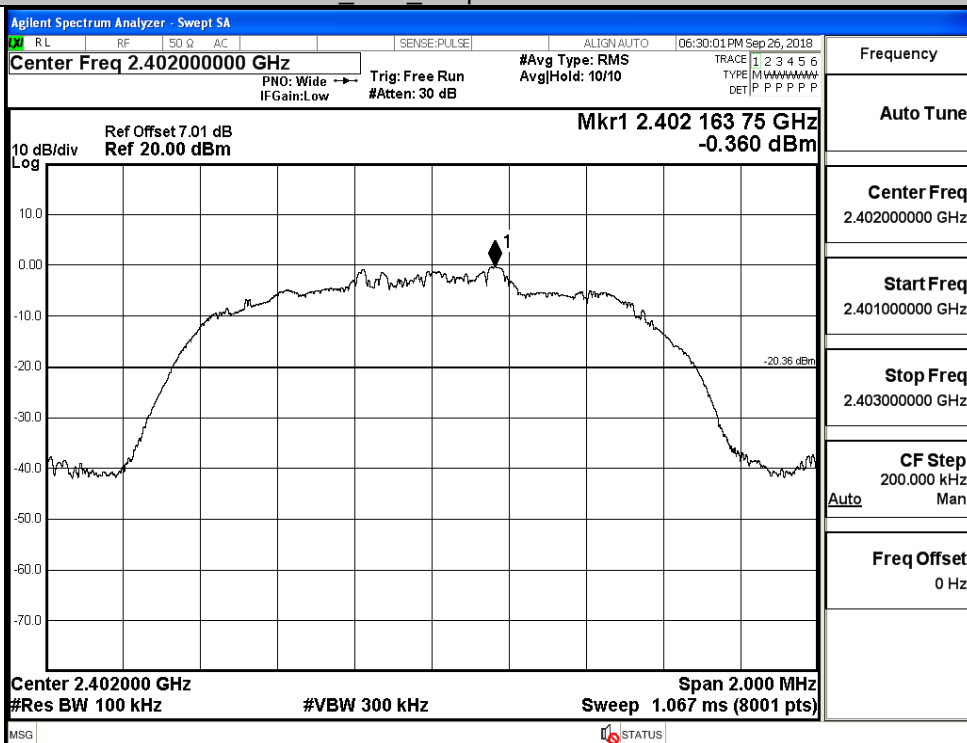


Puw

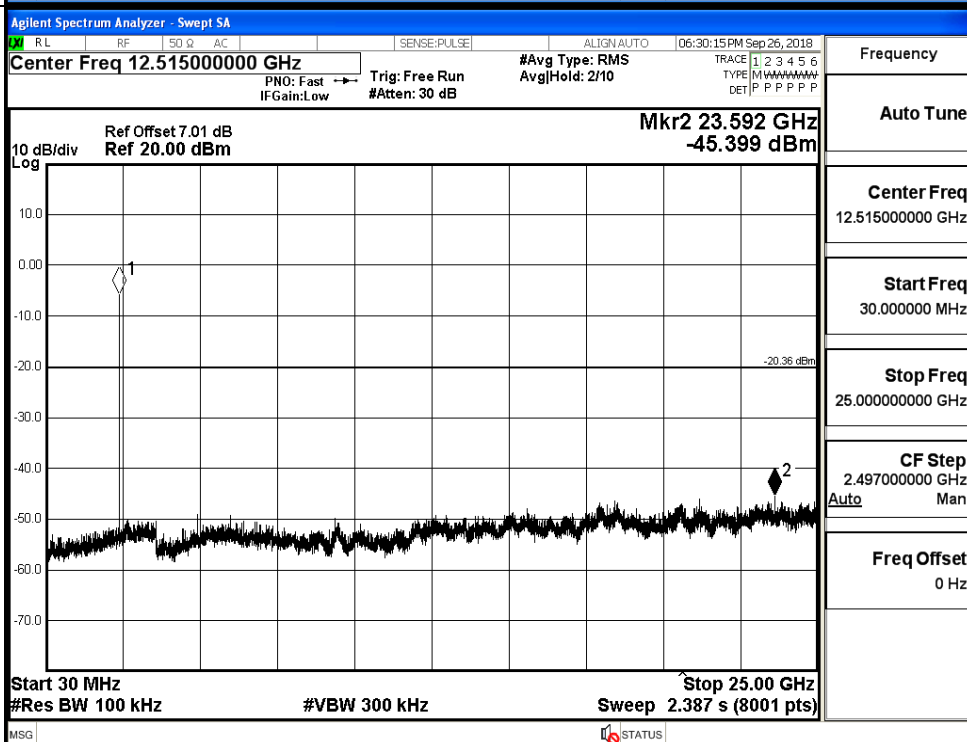


8DPSK_LCH_Graphs

Pref

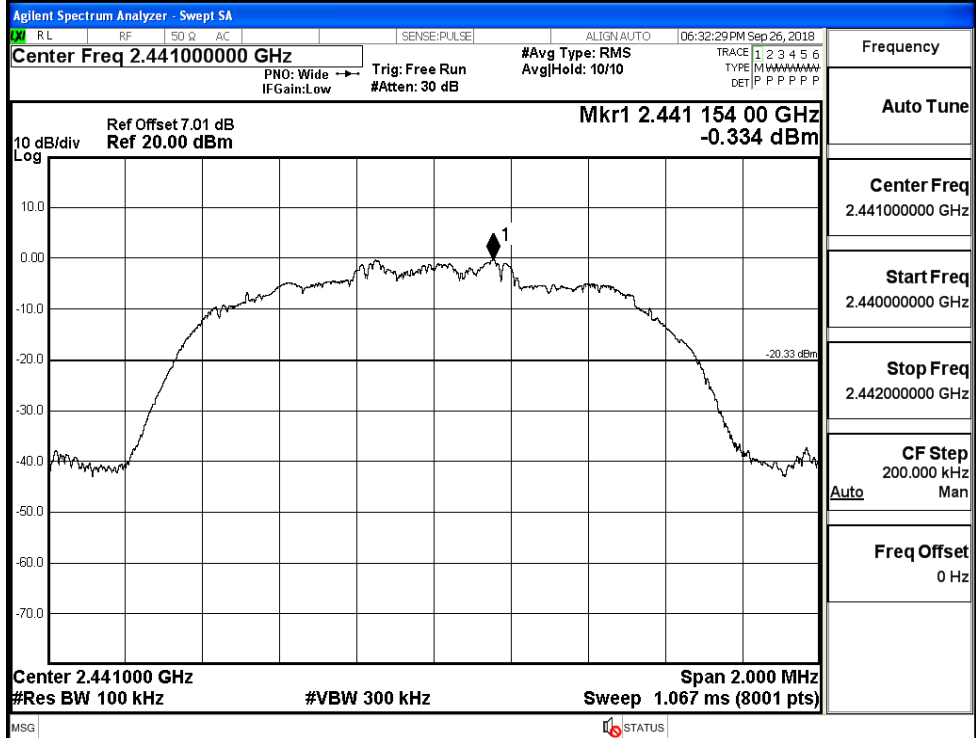


Puw

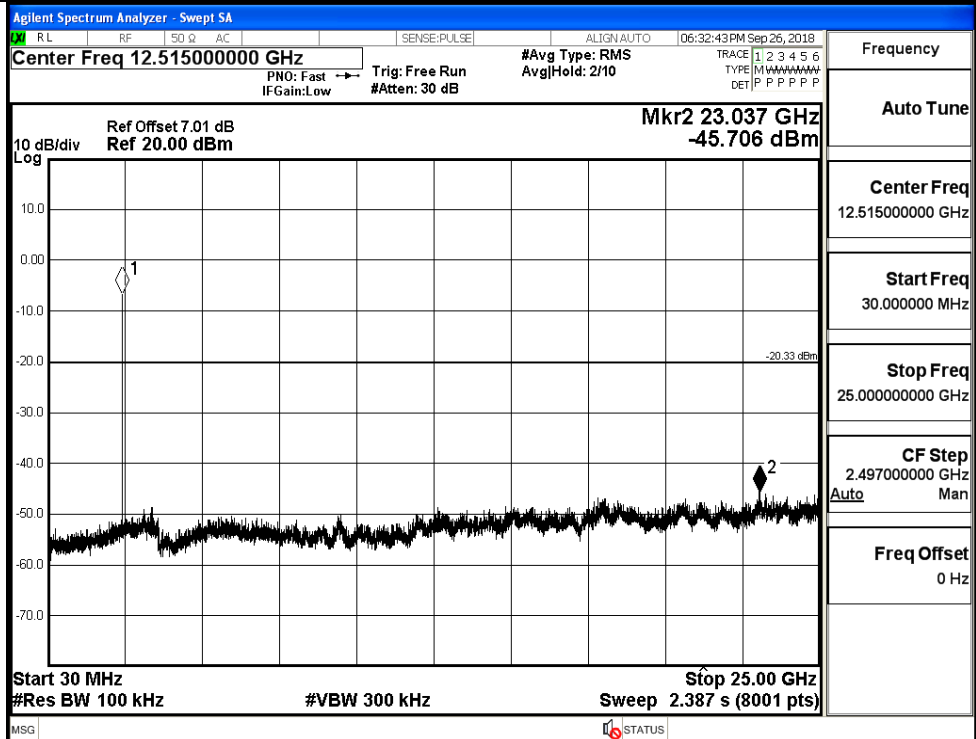


8DPSK MCH_Graphs

Pref

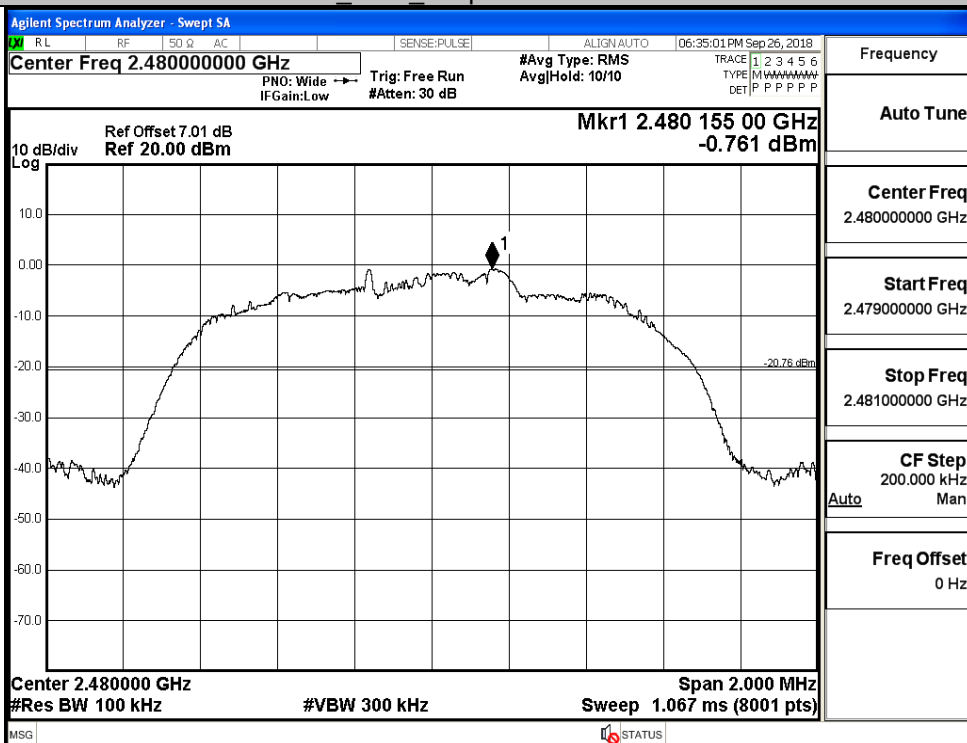


Puw

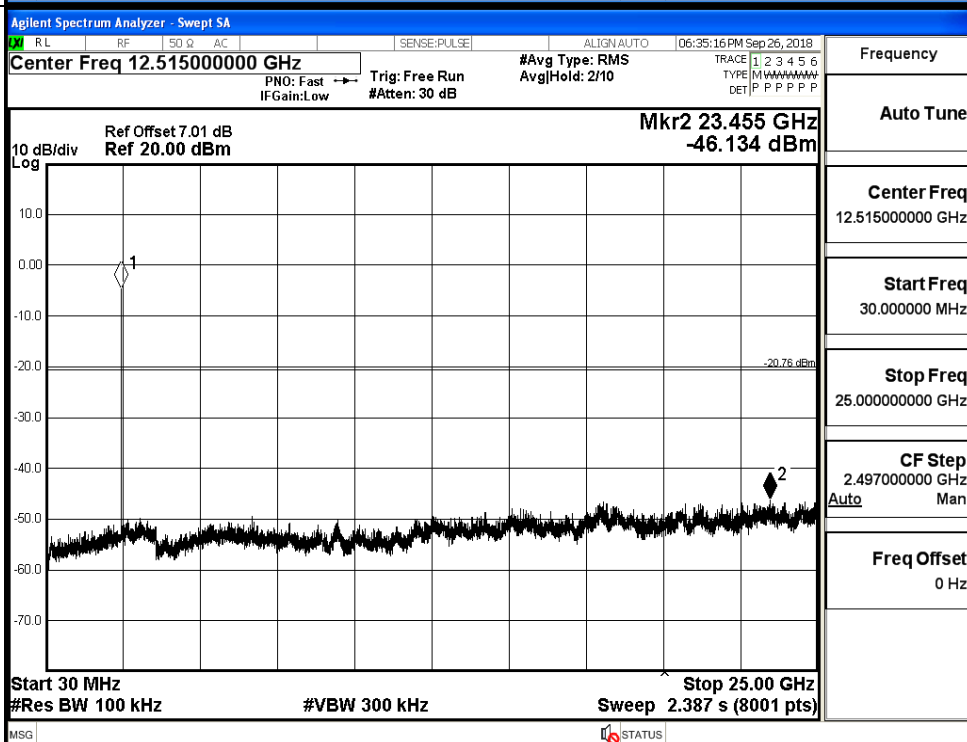


8DPSK_HCH_Graphs

Pref



Puw

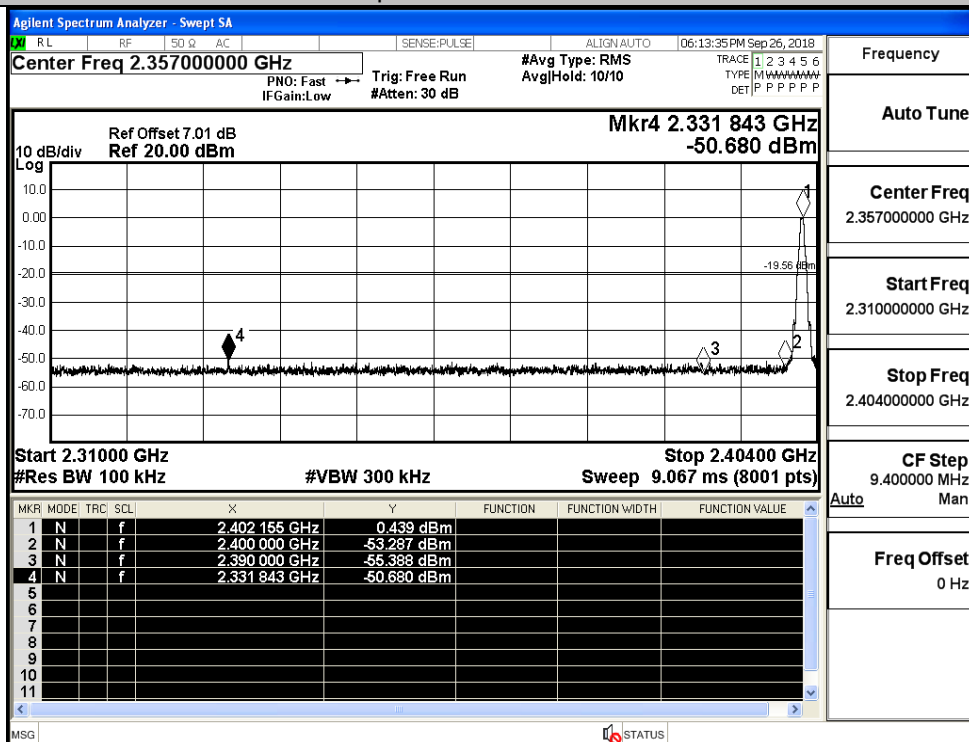


A.7 Band-edge for RF Conducted Emissions

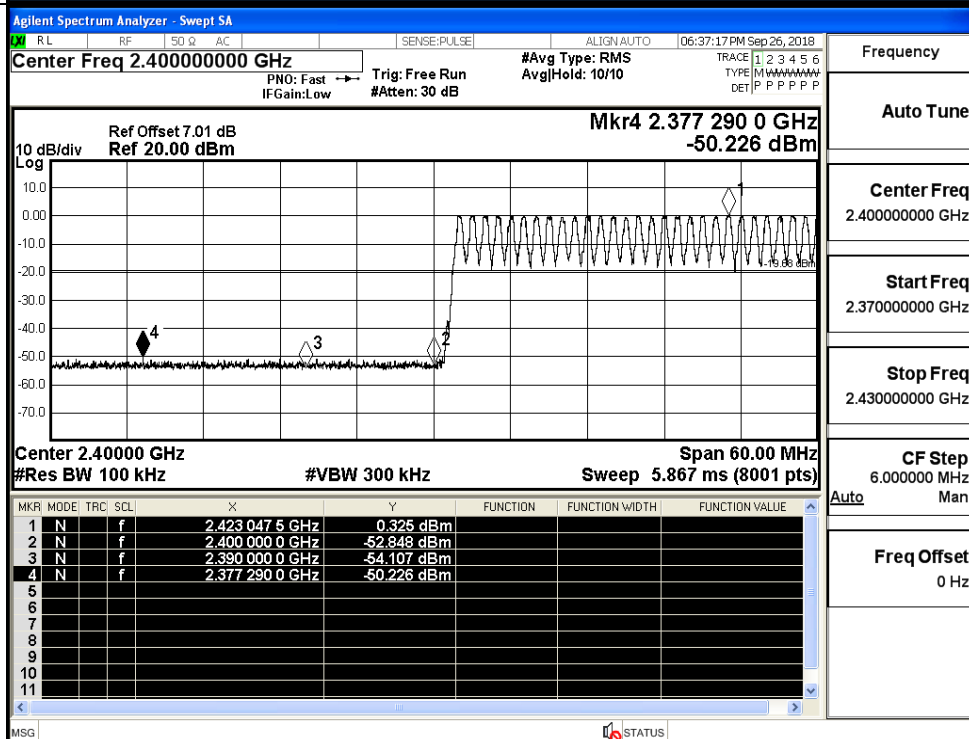
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.439	Off	-50.680	-19.56	PASS
			0.325	On	-50.226	-19.68	PASS
	HCH	2480	-0.031	Off	-51.082	-20.03	PASS
			0.414	On	-50.259	-19.59	PASS
π /4DQPSK	LCH	2402	-0.913	Off	-50.509	-20.91	PASS
			-0.394	On	-49.731	-20.39	PASS
	HCH	2480	-0.757	Off	-50.512	-20.76	PASS
			-0.562	On	-50.692	-20.56	PASS
8DPSK	LCH	2402	-0.704	Off	-51.213	-20.7	PASS
			-0.409	On	-49.891	-20.41	PASS
	HCH	2480	-0.610	Off	-50.281	-20.61	PASS
			-0.587	On	-49.866	-20.59	PASS

Test Graphs

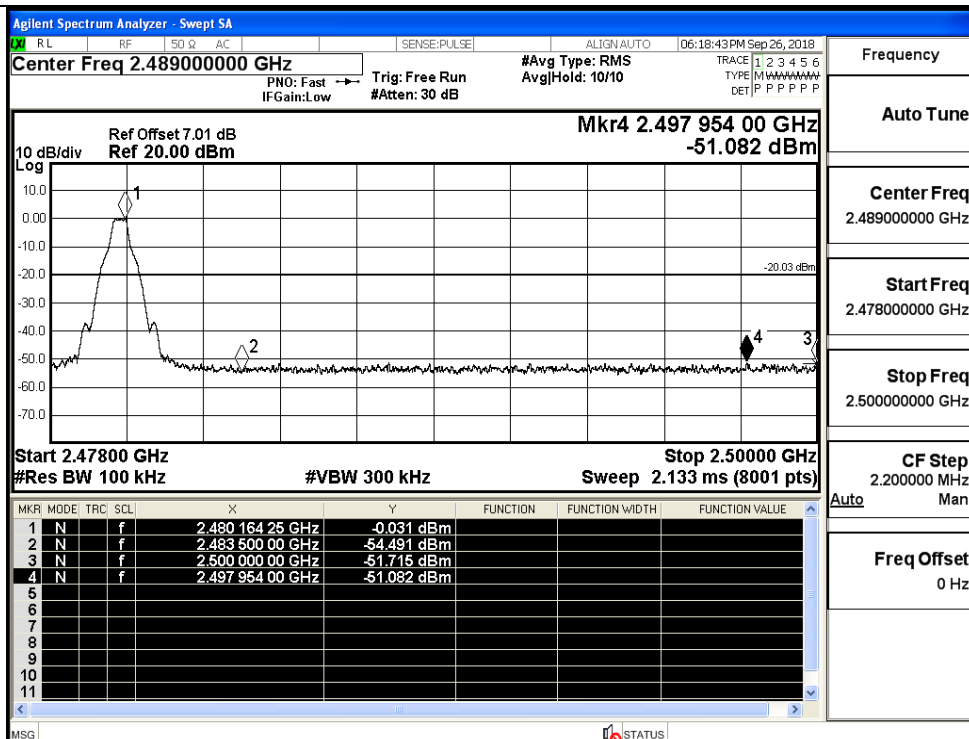
GFSK/LCH/No Hop



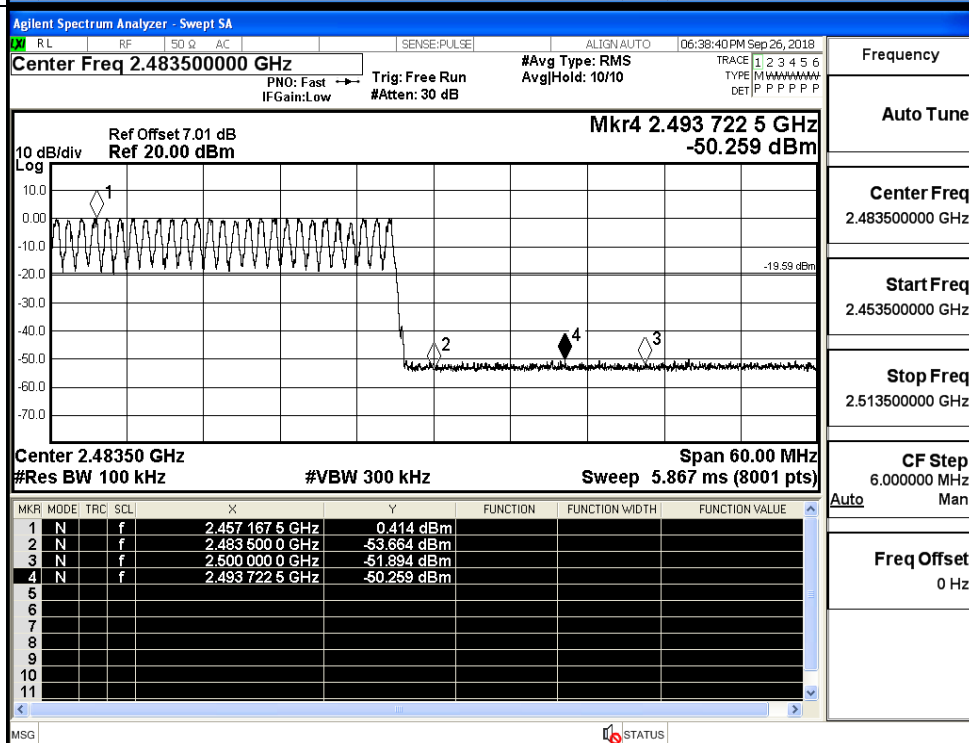
GFSK/LCH/Hop



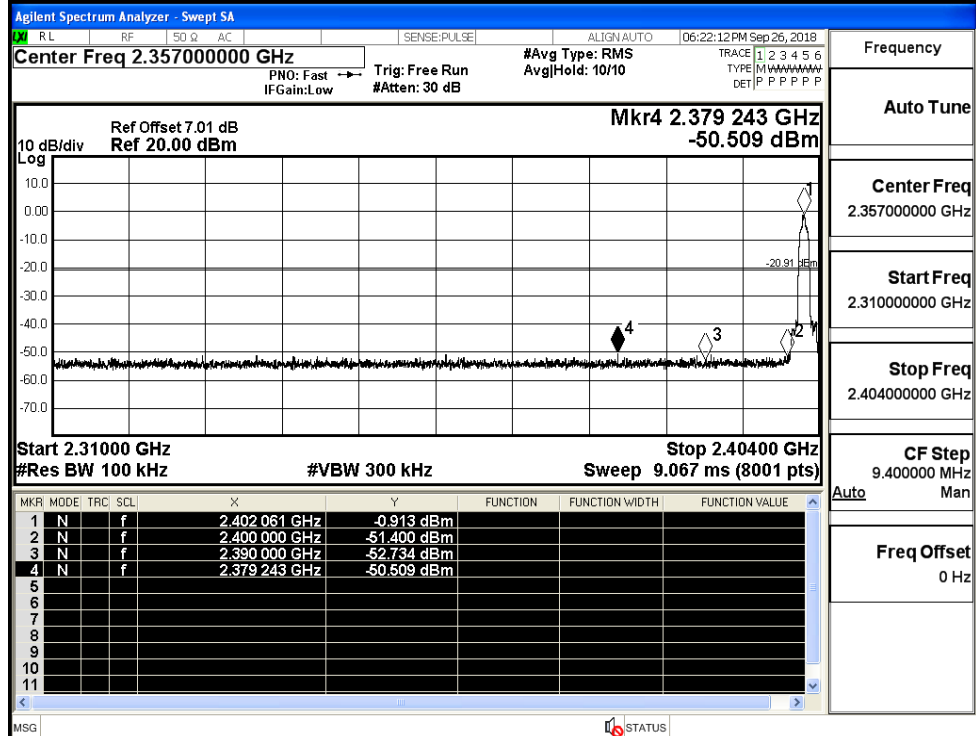
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

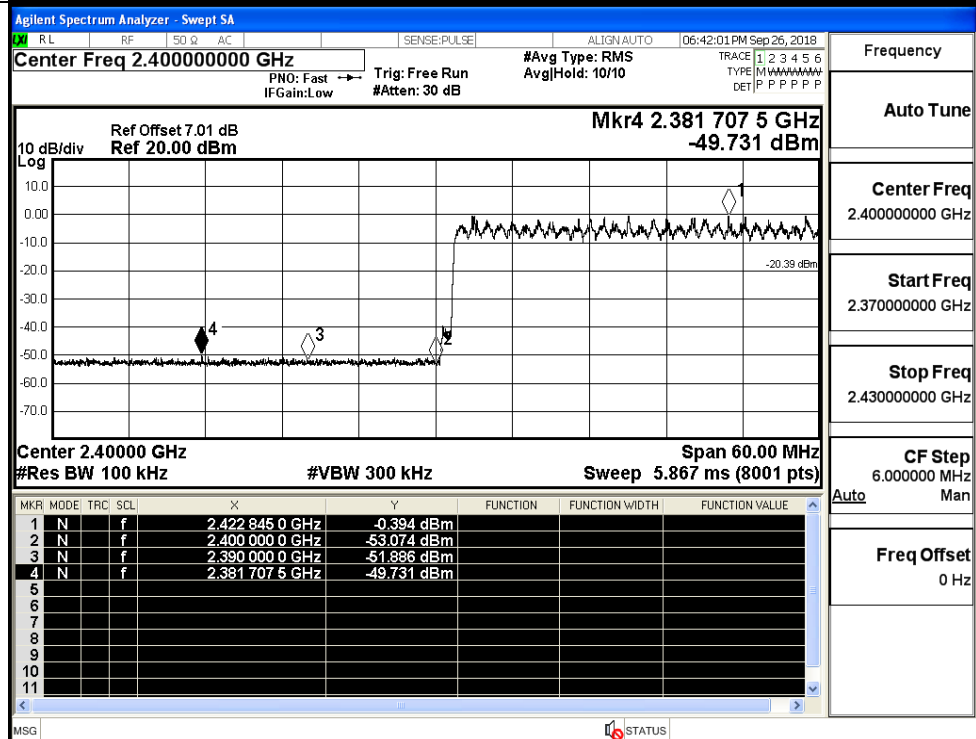
Auto Tune

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

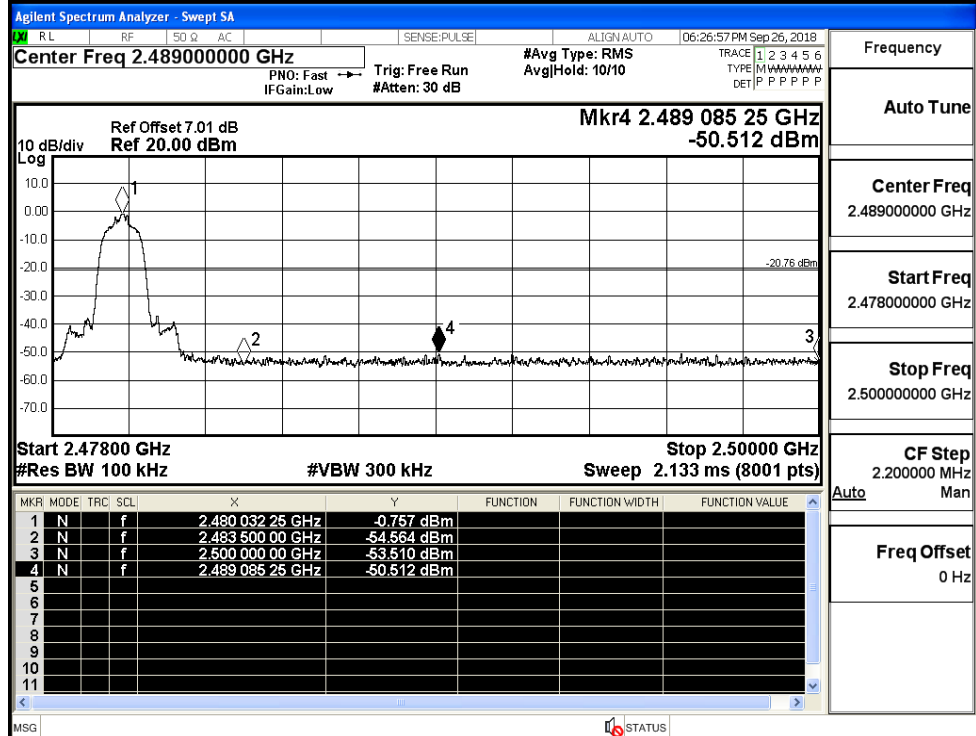
Auto Tune

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

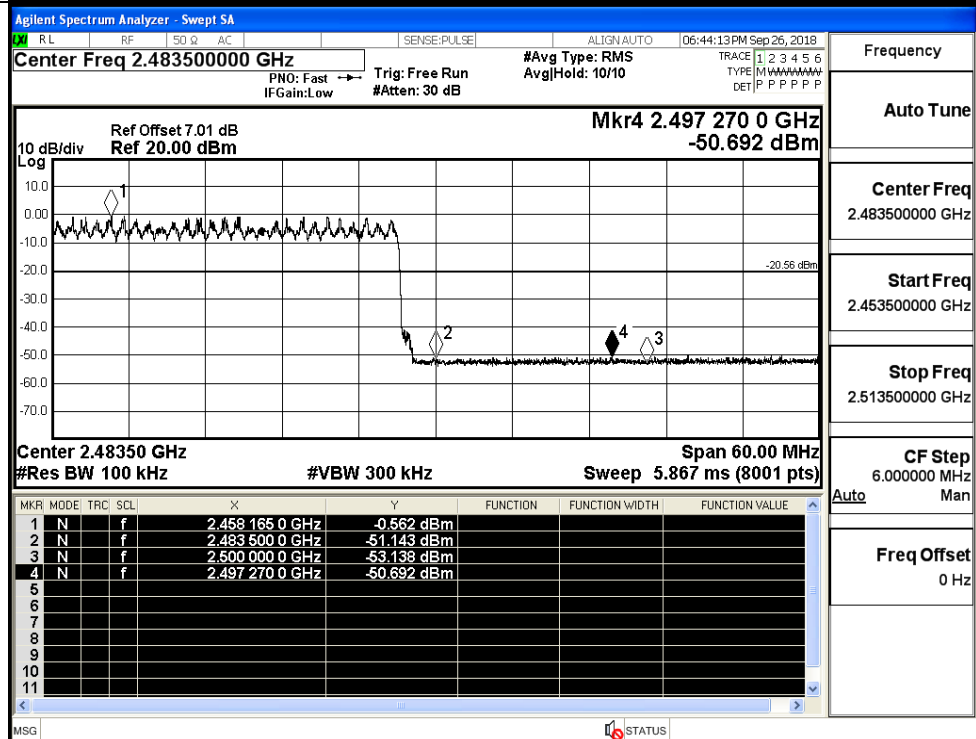
Auto

Freq Offset
0 Hz

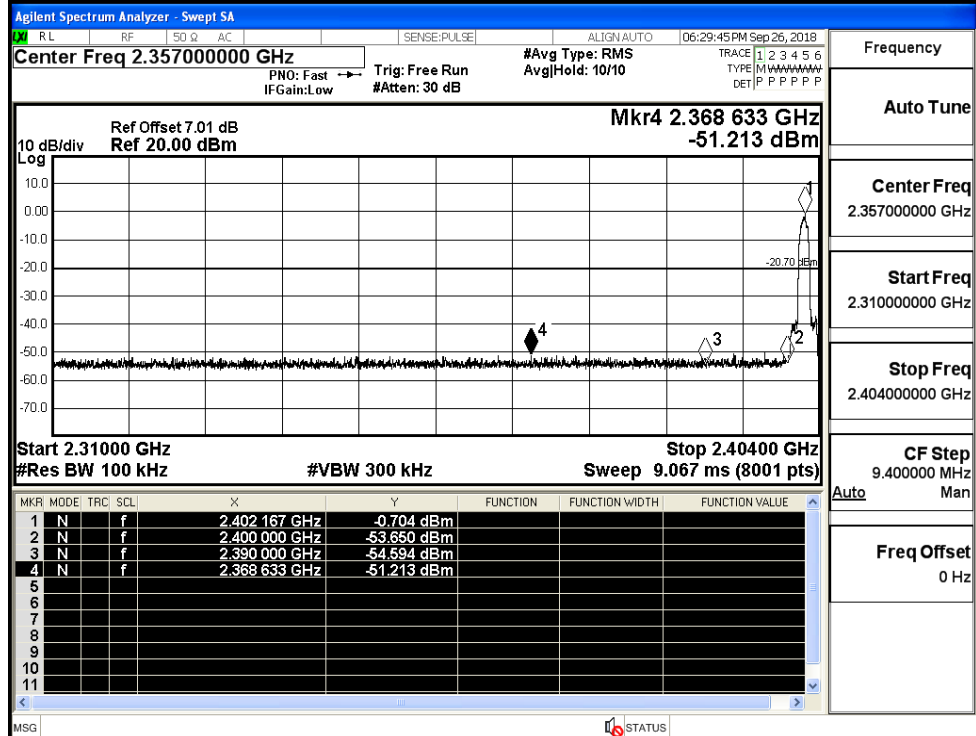
$\pi/4$ DQPSK/HCH/No
Hop



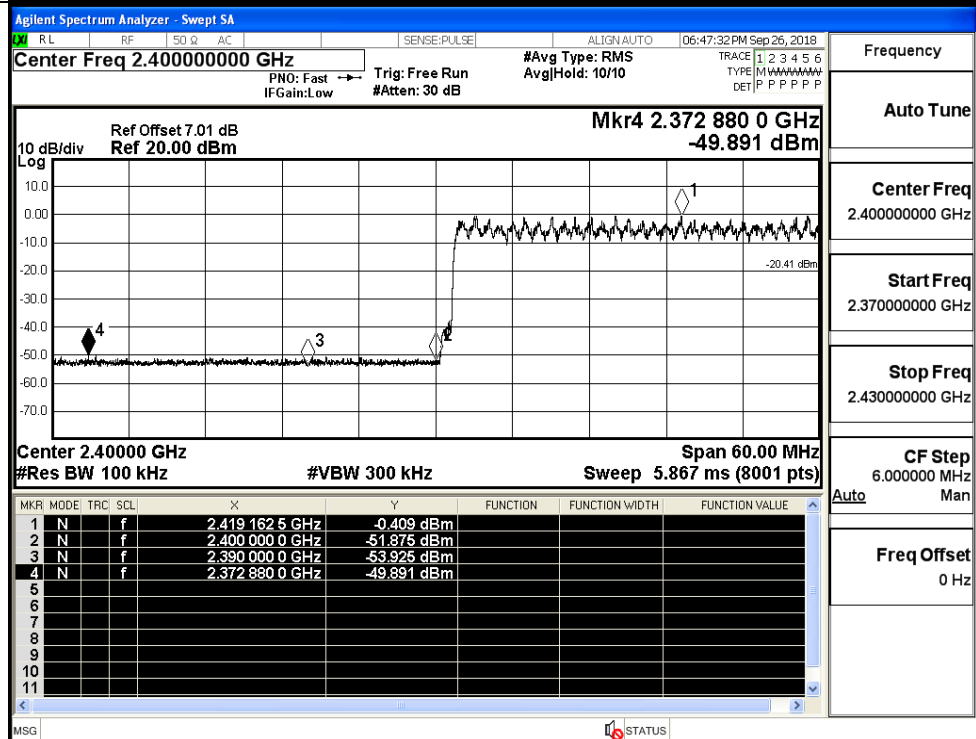
$\pi/4$ DQPSK/HCH/Hop



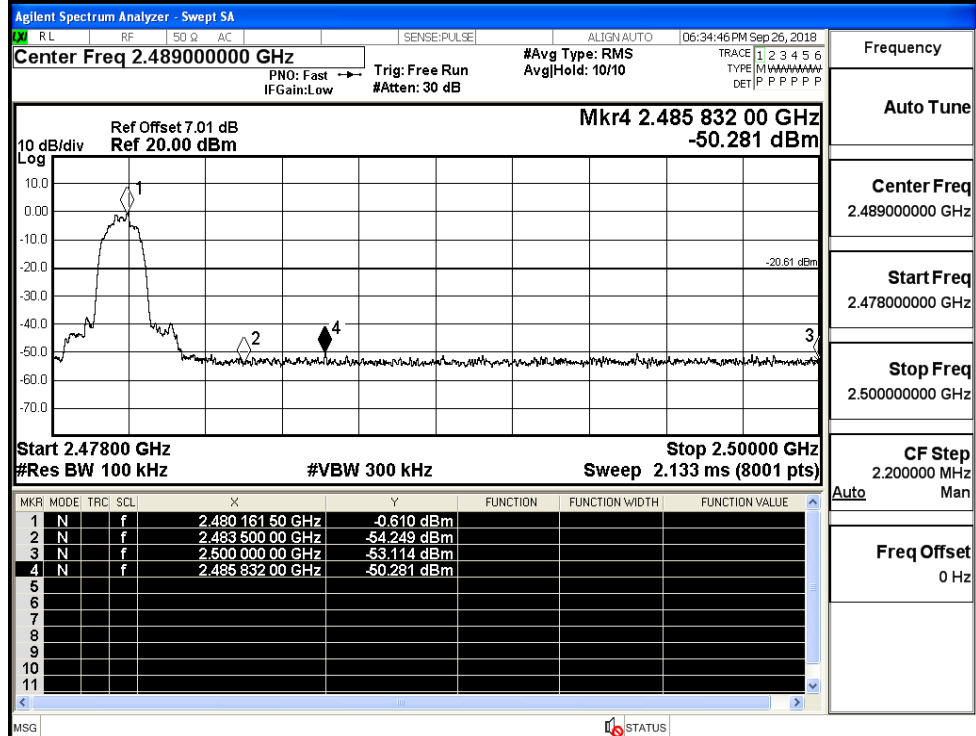
8DPSK/LCH/No Hop



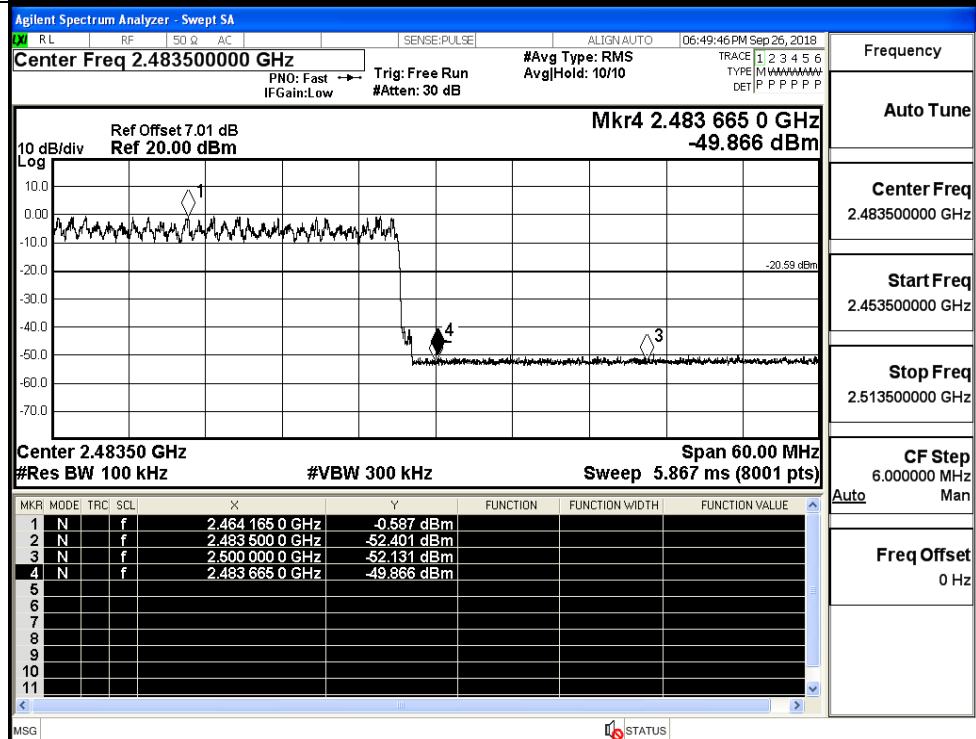
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



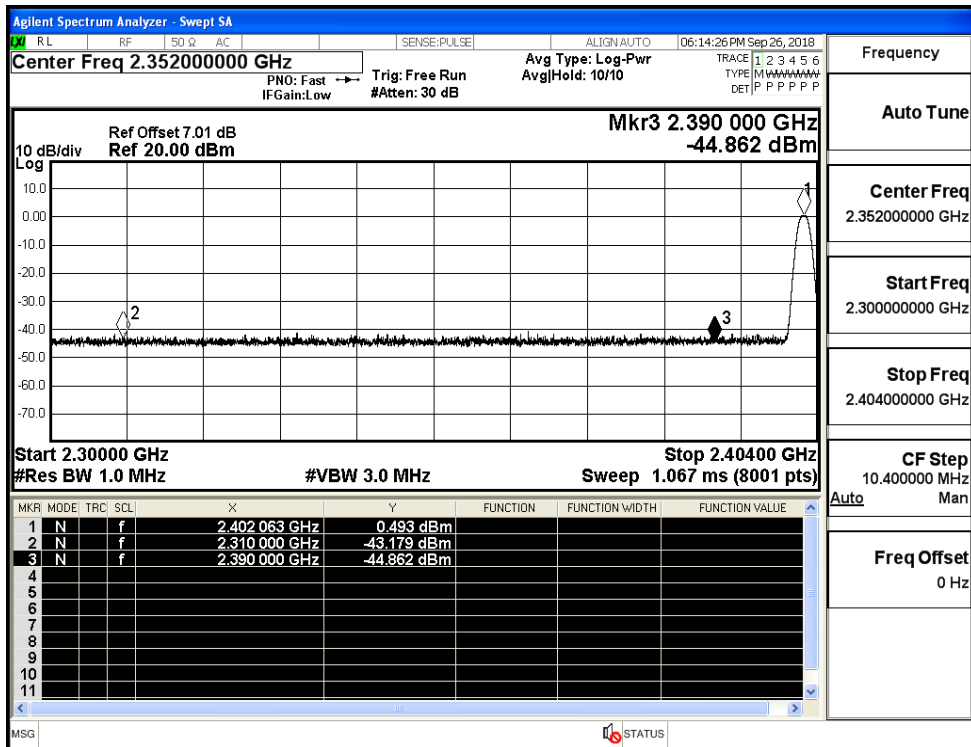
8DPSK/HCH/Hop



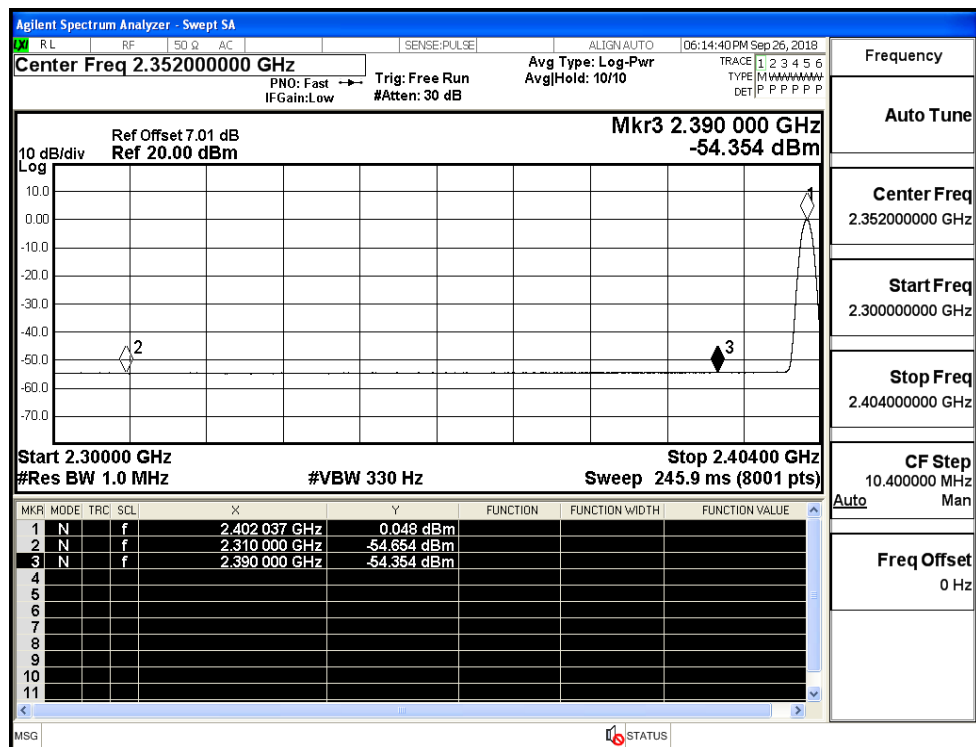
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.18	2.0	0	54.08	PEAK	74	PASS
	Off	2310.0	-54.65	2.0	0	42.60	AV	54	PASS
	Off	2390.0	-44.86	2.0	0	52.40	PEAK	74	PASS
	Off	2390.0	-54.35	2.0	0	42.90	AV	54	PASS
	Off	2483.5	-44.67	2.0	0	52.59	PEAK	74	PASS
	Off	2483.5	-54.05	2.0	0	43.21	AV	54	PASS
	Off	2500.0	-43.54	2.0	0	53.72	PEAK	74	PASS
	Off	2500.0	-53.98	2.0	0	43.28	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.11	2.0	0	54.15	PEAK	74	PASS
	Off	2310.0	-54.76	2.0	0	42.50	AV	54	PASS
	Off	2390.0	-44.28	2.0	0	52.97	PEAK	74	PASS
	Off	2390.0	-54.48	2.0	0	42.78	AV	54	PASS
	Off	2483.5	-44.07	2.0	0	53.18	PEAK	74	PASS
	Off	2483.5	-54.08	2.0	0	43.18	AV	54	PASS
	Off	2500.0	-43.75	2.0	0	53.51	PEAK	74	PASS
	Off	2500.0	-54.00	2.0	0	43.25	AV	54	PASS
8DPSK	Off	2310.0	-43.22	2.0	0	54.04	PEAK	74	PASS
	Off	2310.0	-54.75	2.0	0	42.50	AV	54	PASS
	Off	2390.0	-43.03	2.0	0	54.23	PEAK	74	PASS
	Off	2390.0	-54.45	2.0	0	42.81	AV	54	PASS
	Off	2483.5	-44.14	2.0	0	53.12	PEAK	74	PASS
	Off	2483.5	-54.17	2.0	0	43.09	AV	54	PASS
	Off	2500.0	-44.37	2.0	0	52.88	PEAK	74	PASS
	Off	2500.0	-53.95	2.0	0	43.30	AV	54	PASS

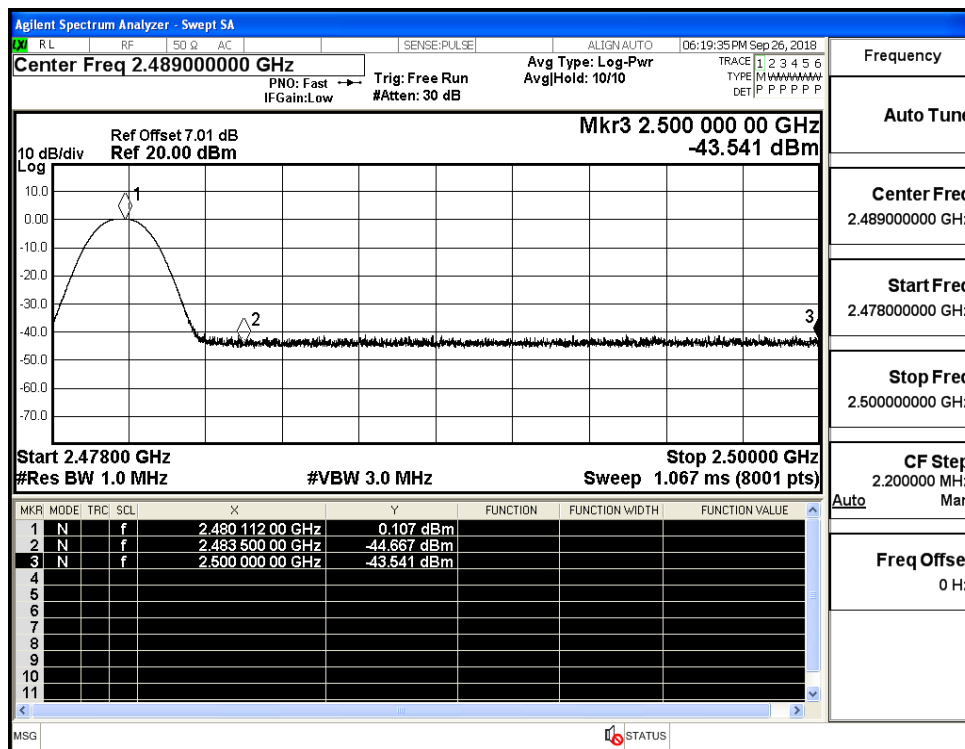
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



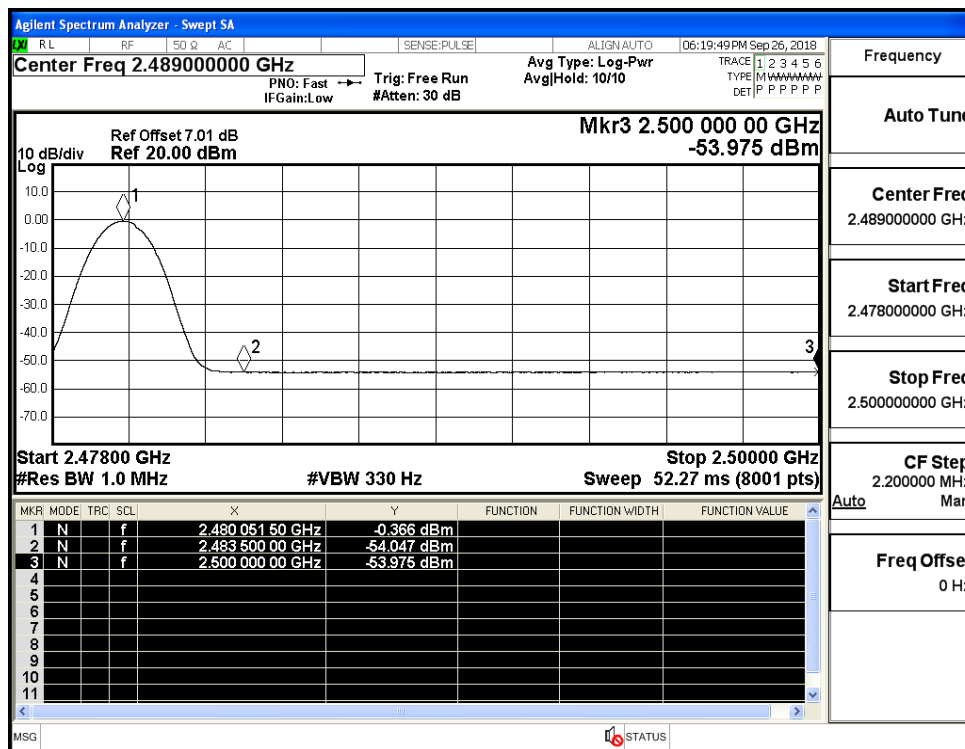
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

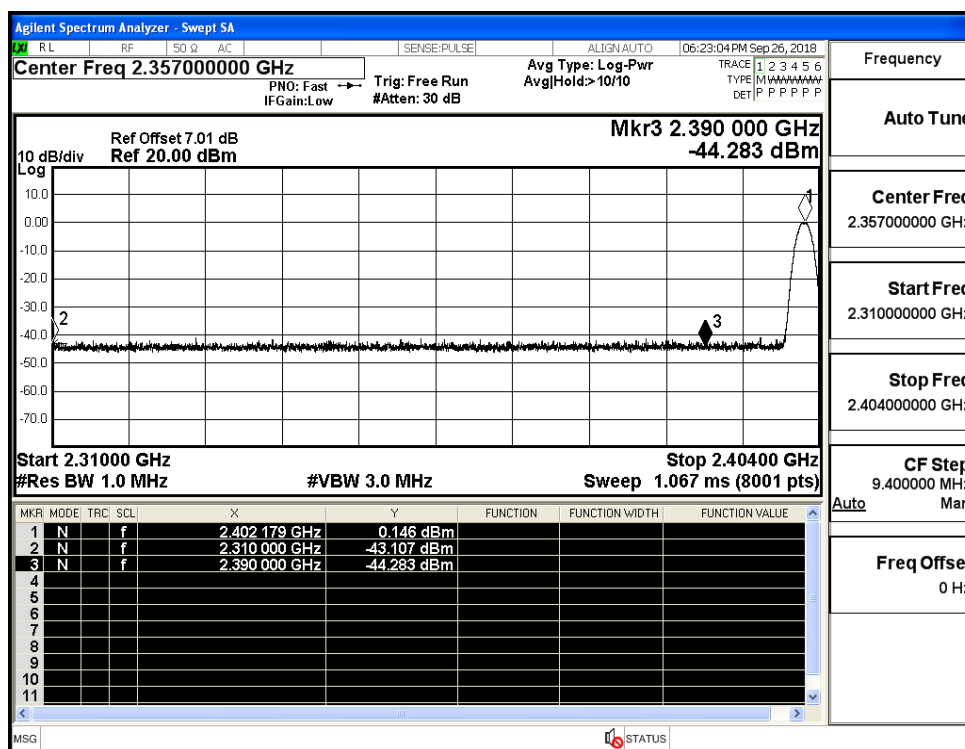
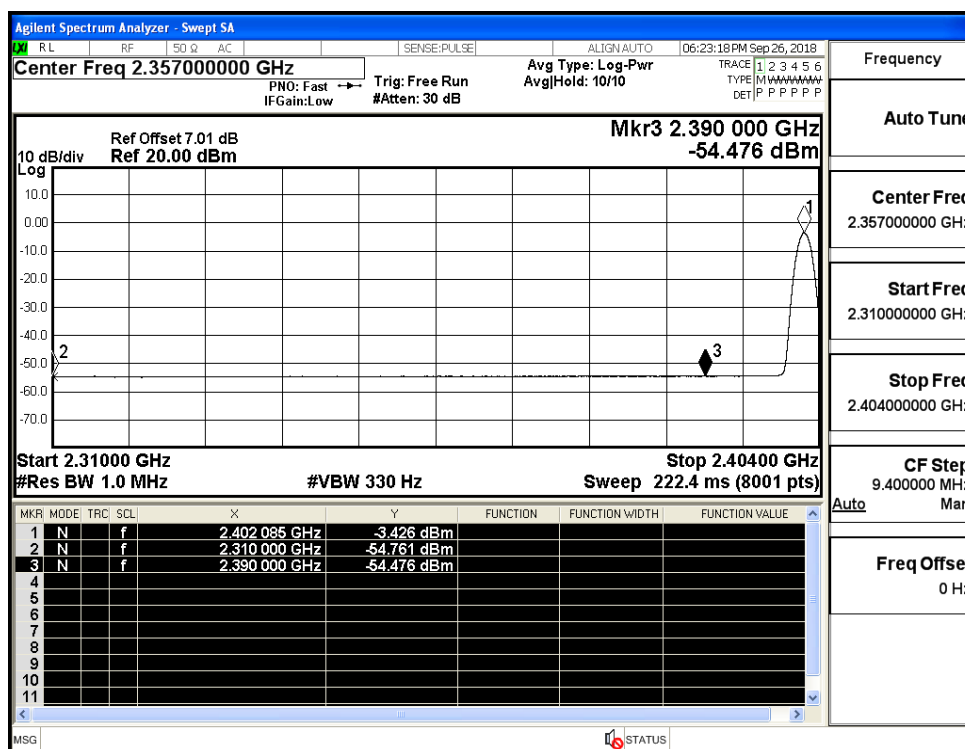


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

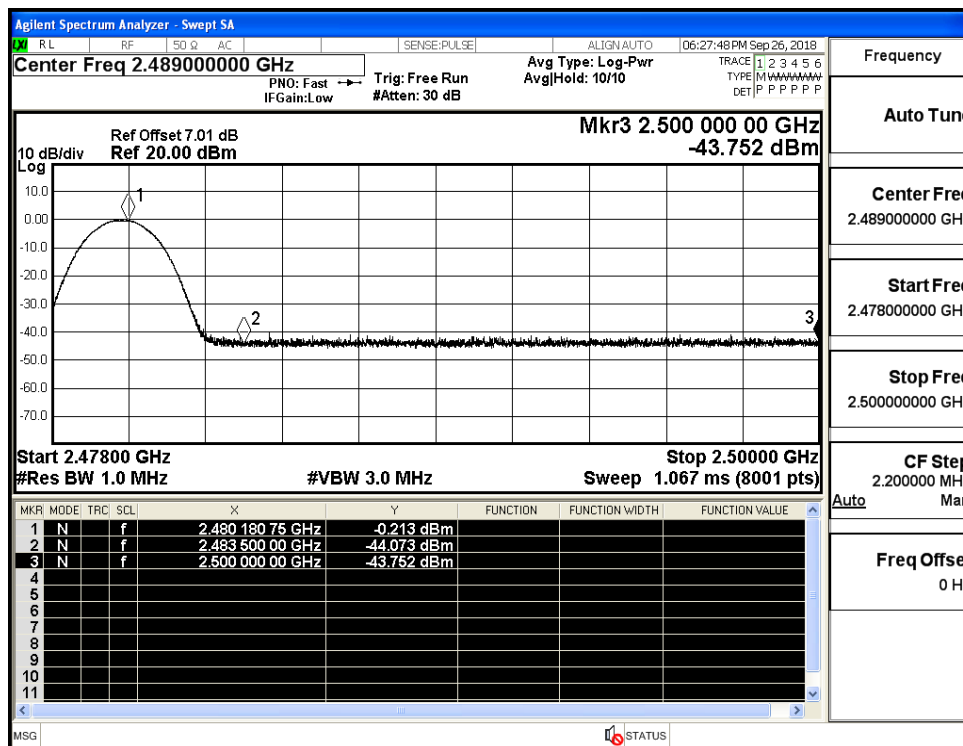


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

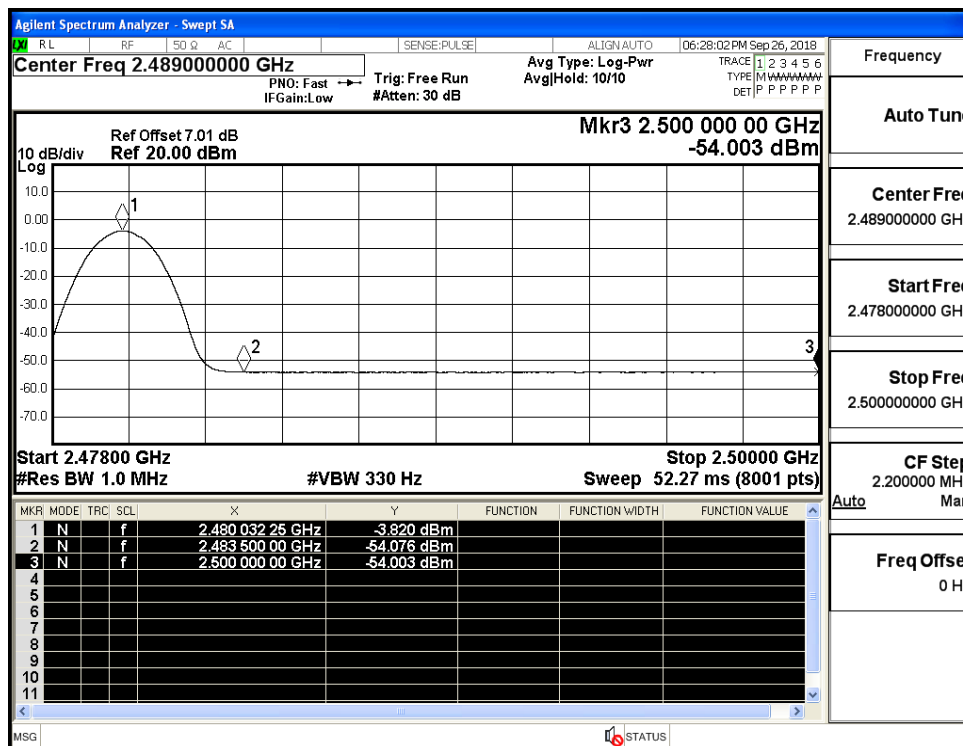


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

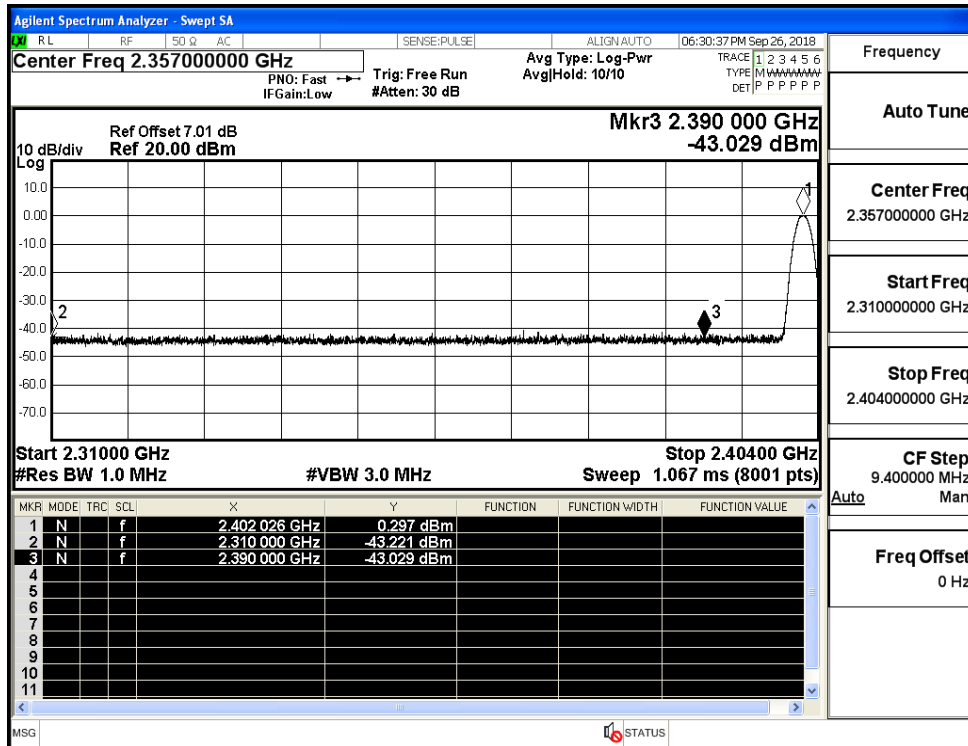
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



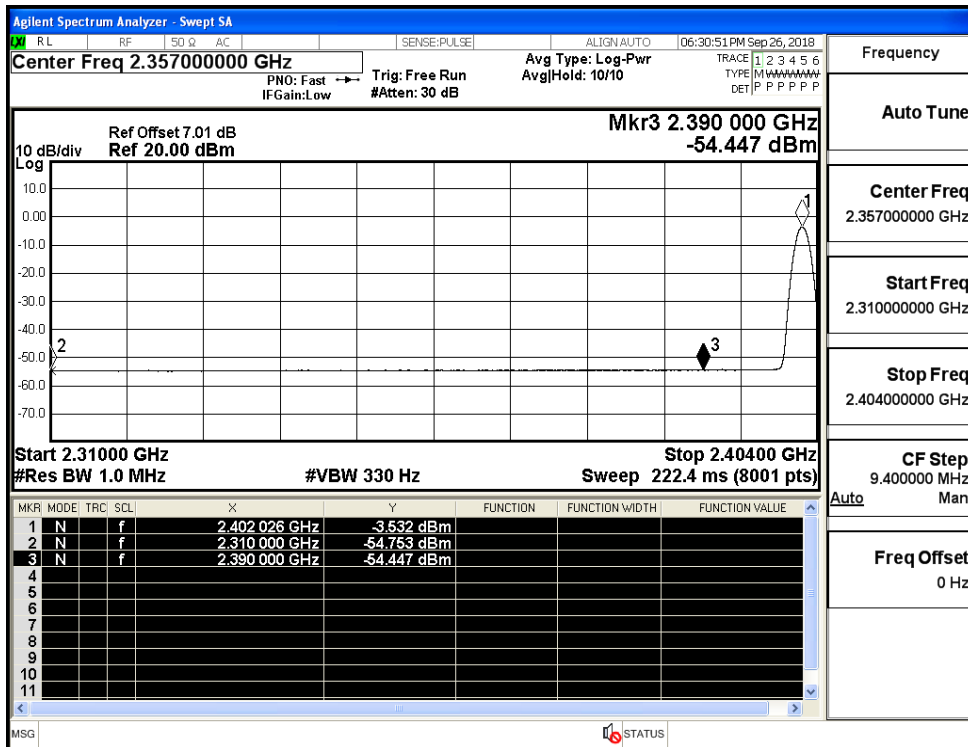
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



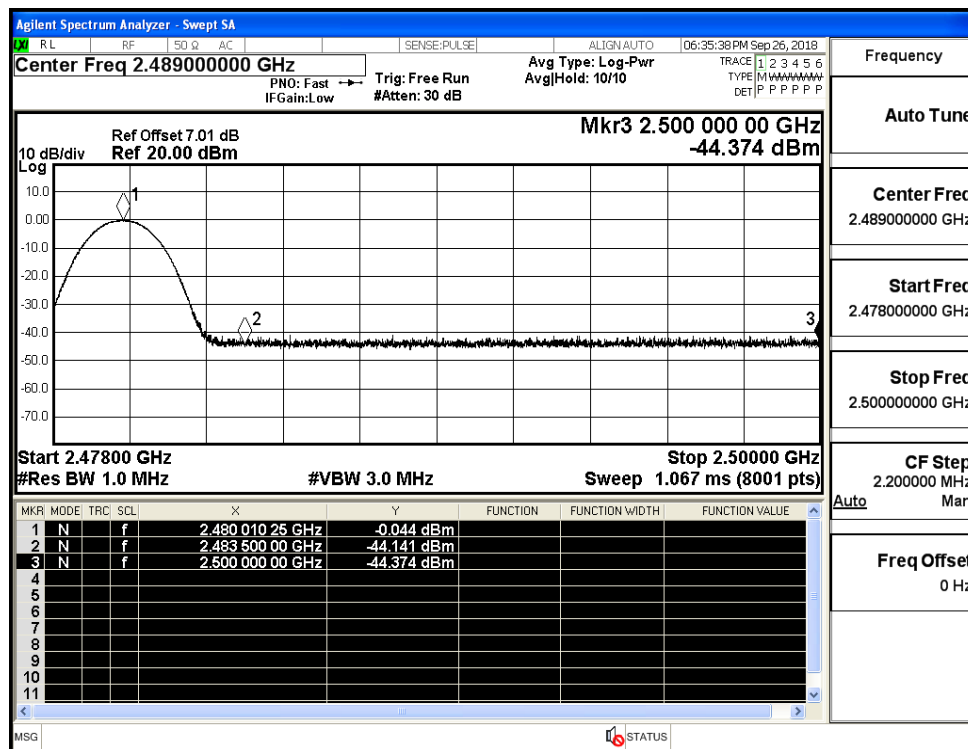
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

