

Appendix A

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

Product Name: TOUGH ROCK WIRELESS CONNECTION SPEAKER

Trade Mark: N/A

Test Model: BT2405

Environmental Conditions

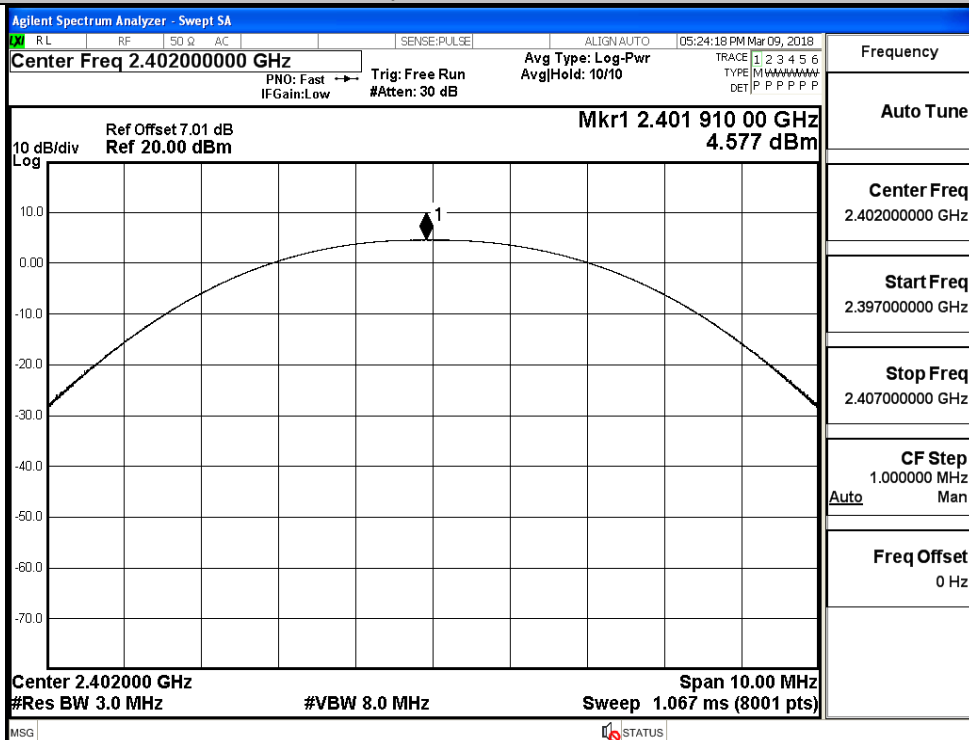
Temperature:	21.5 ° C
Relative Humidity:	51.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.xu
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

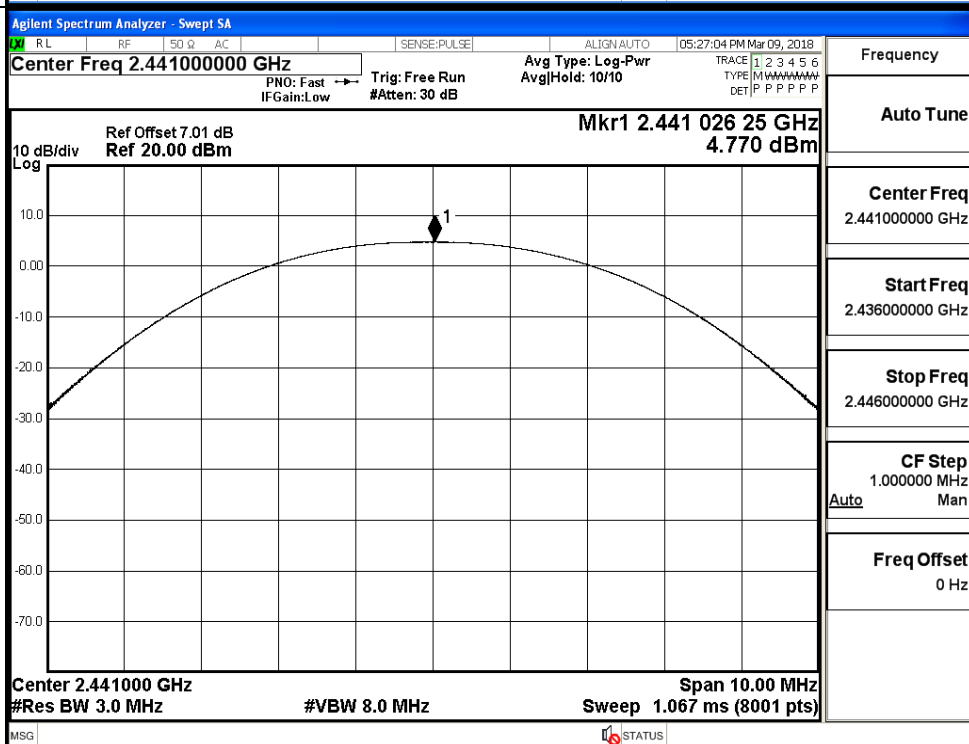
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.577	30	PASS
	MCH	4.770	30	PASS
	HCH	4.787	30	PASS
$\pi/4$ DQPSK	LCH	4.491	21	PASS
	MCH	4.664	21	PASS
	HCH	4.672	21	PASS
8DPSK	LCH	4.656	21	PASS
	MCH	4.831	21	PASS
	HCH	4.839	21	PASS

Test Graphs

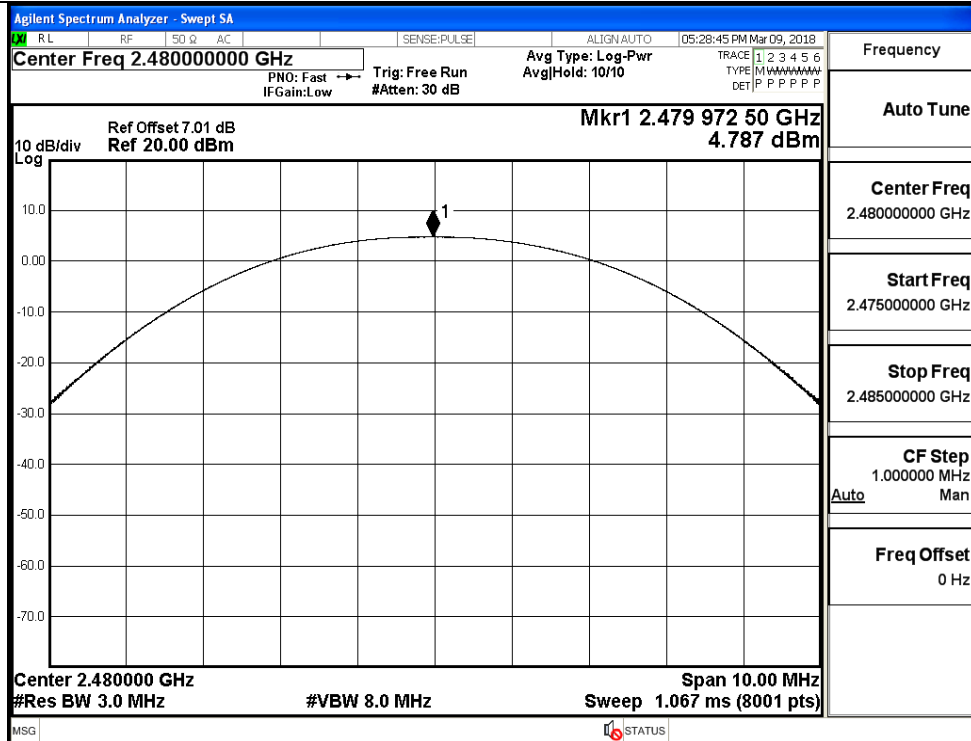
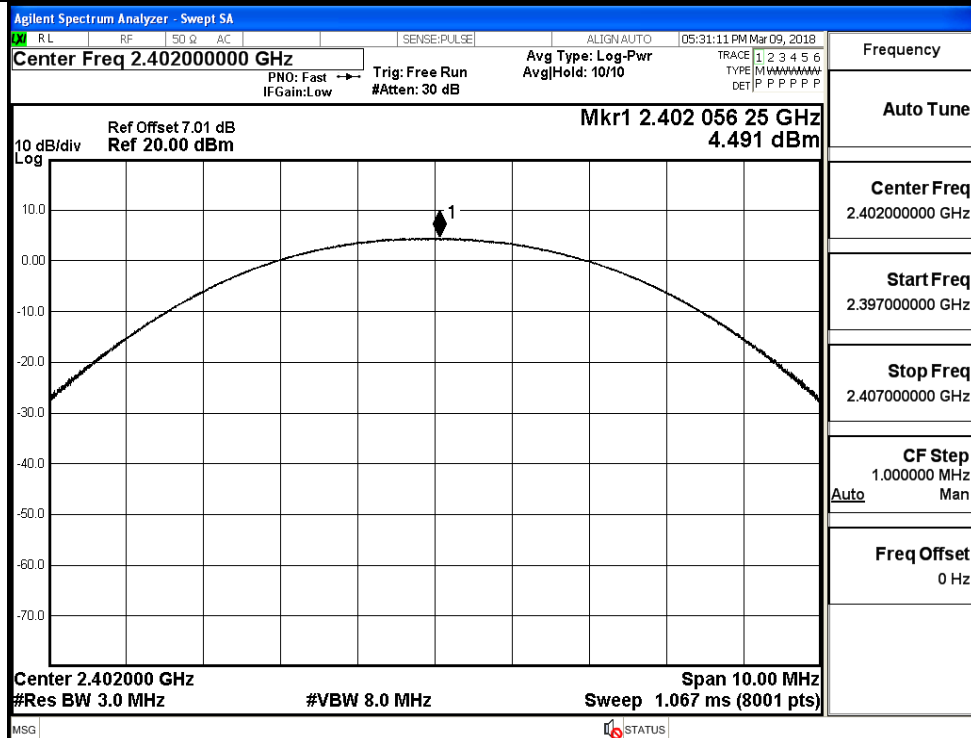
GFSK/LCH

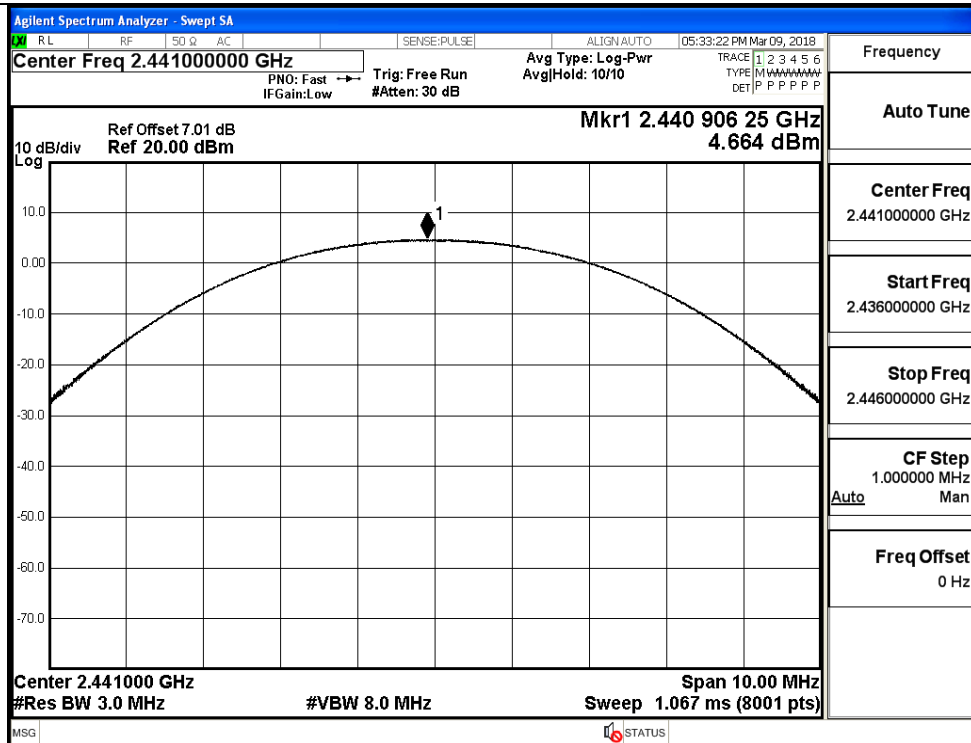
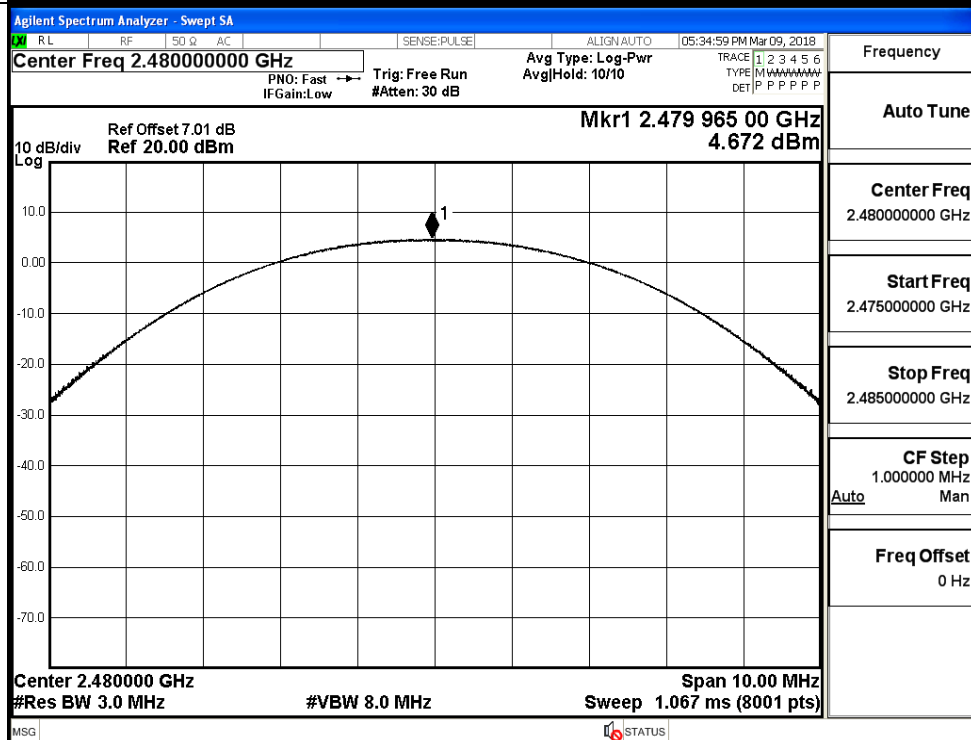


GFSK/MCH

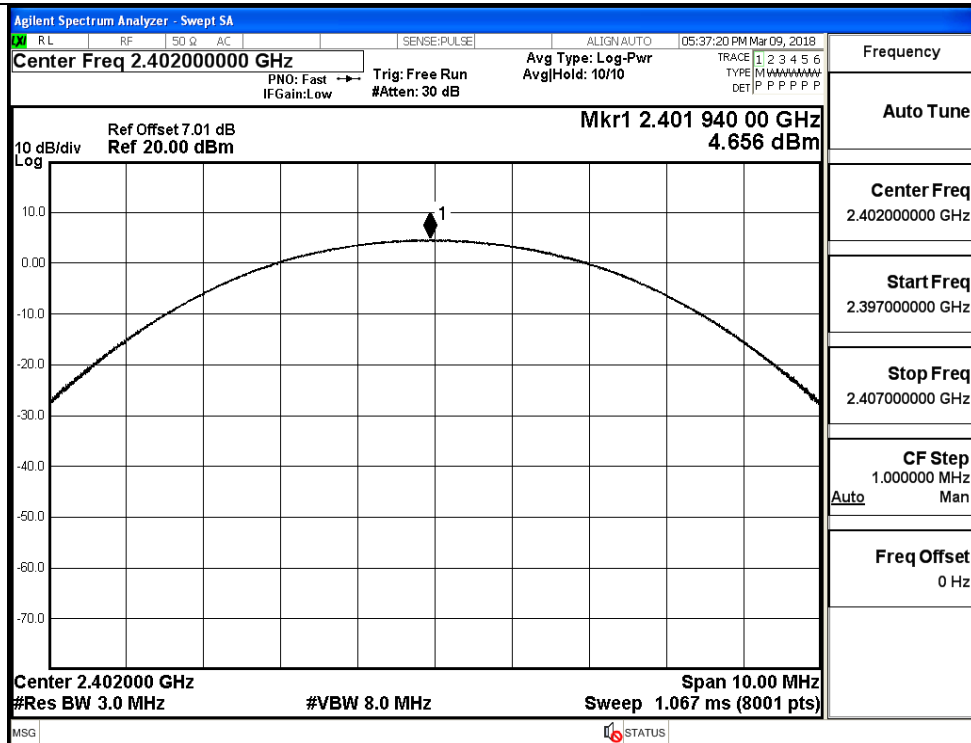


GFSK/HCH

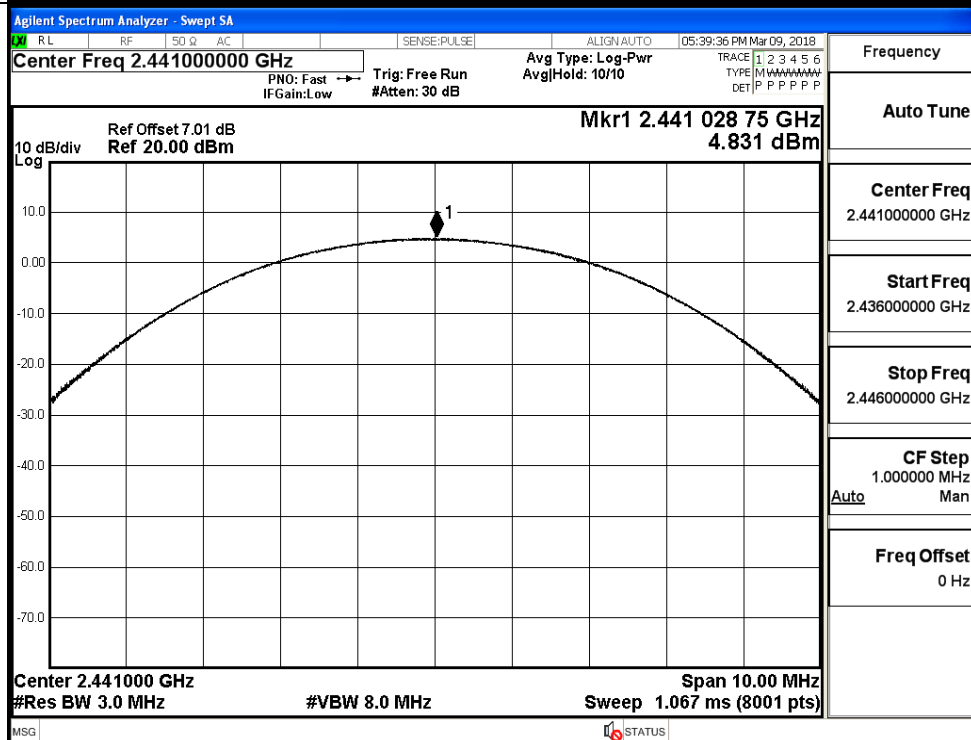
 $\pi/4$ DQPSK/LCH

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

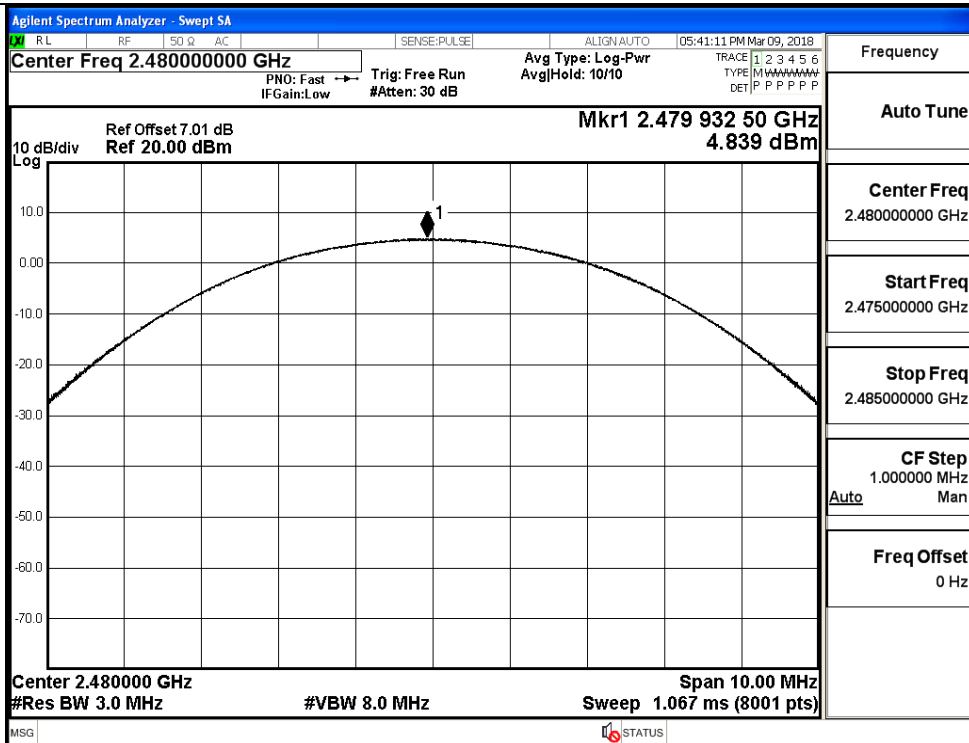
8DPSK/LCH



8DPSK/MCH



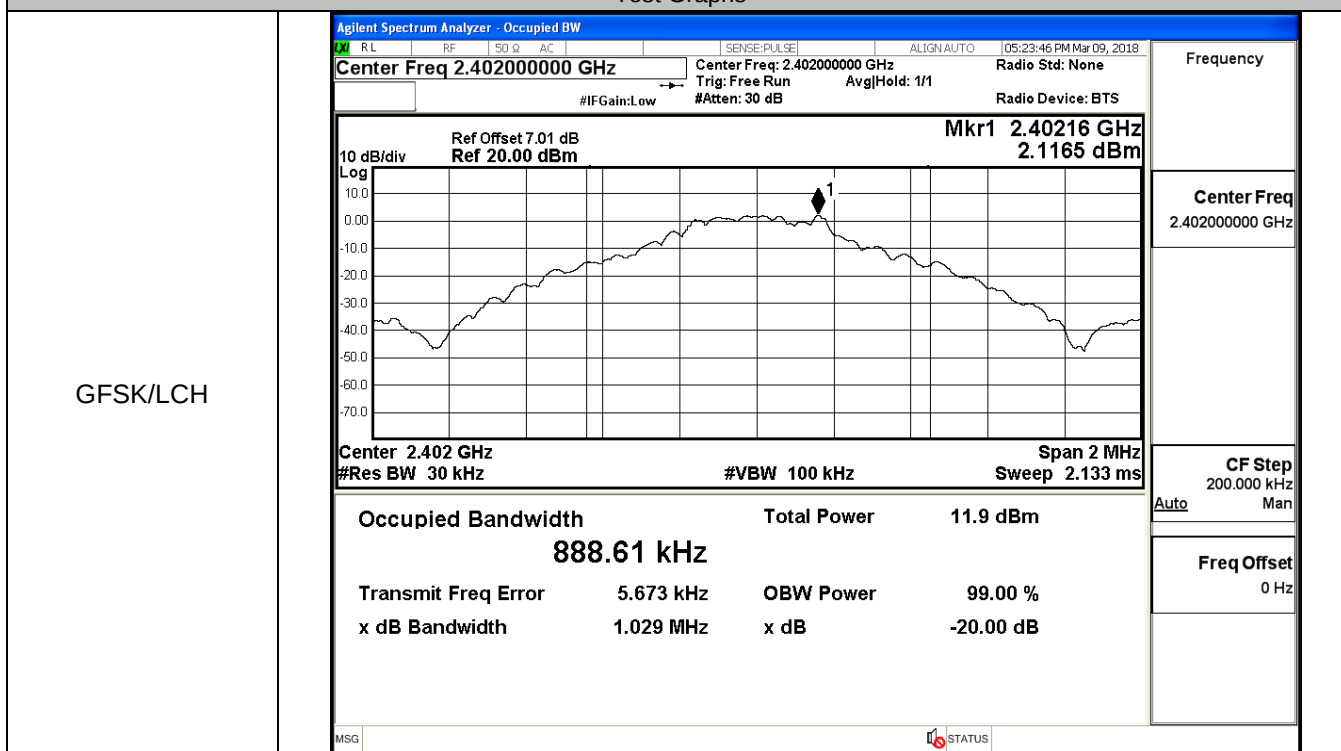
8DPSK/HCH



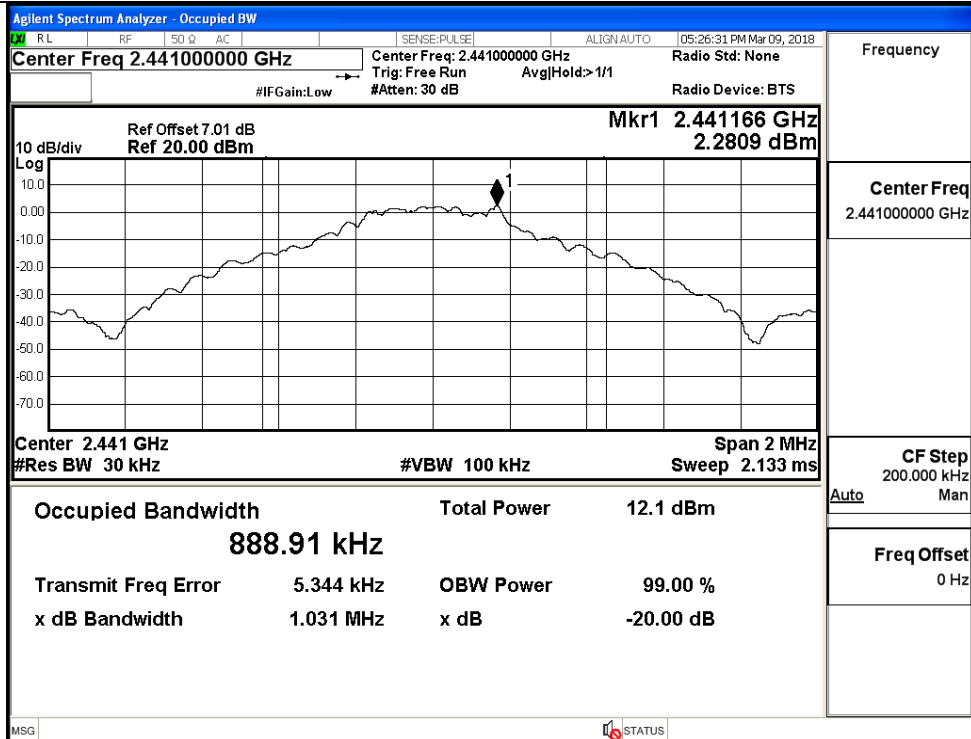
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.029	Not Specified	PASS
	MCH	1.031	Not Specified	PASS
	HCH	1.032	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	1.295	Not Specified	PASS
	HCH	1.288	Not Specified	PASS

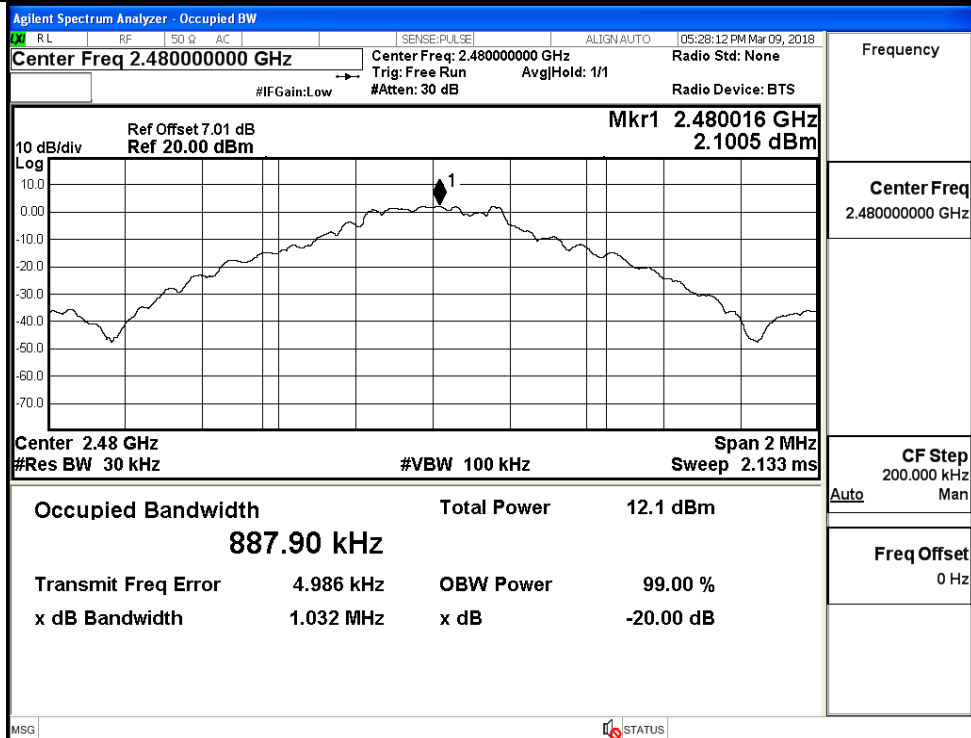
Test Graphs

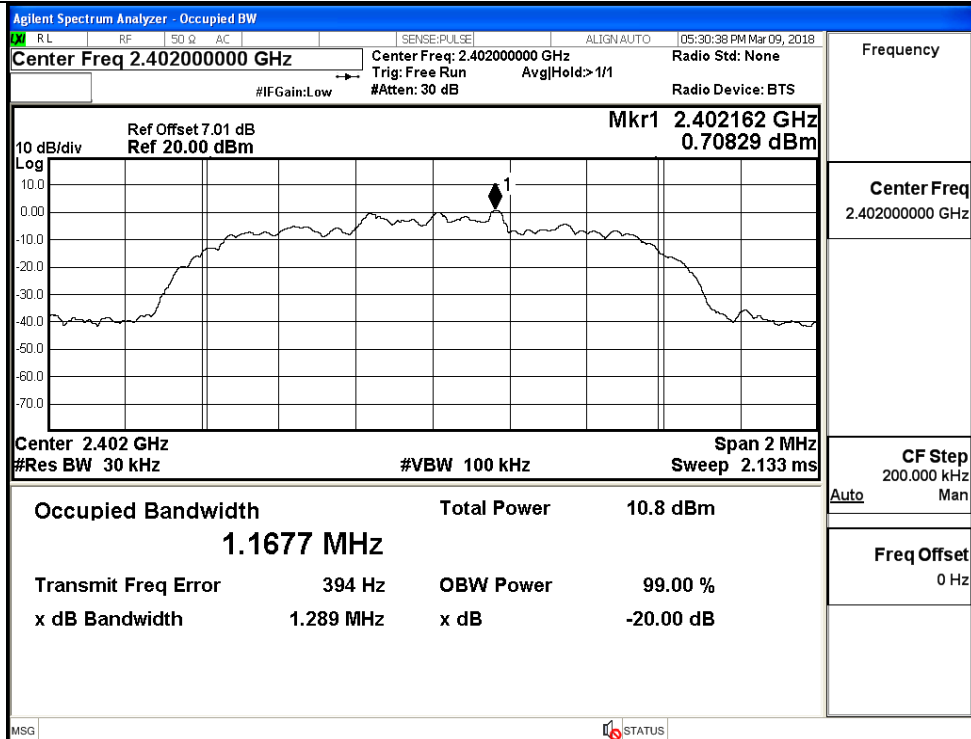
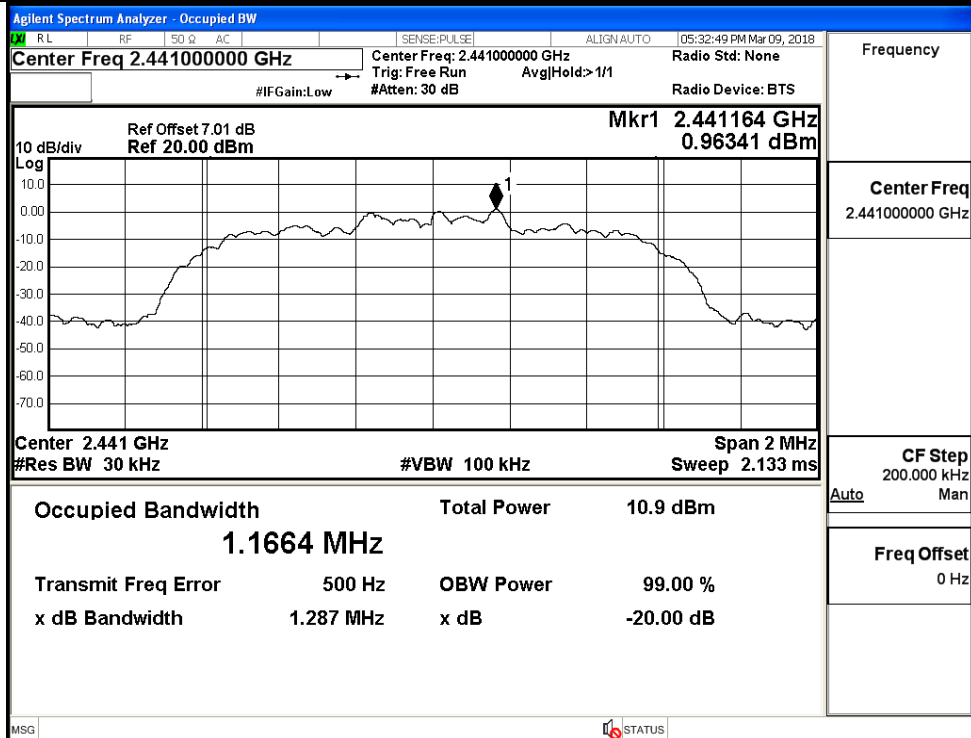


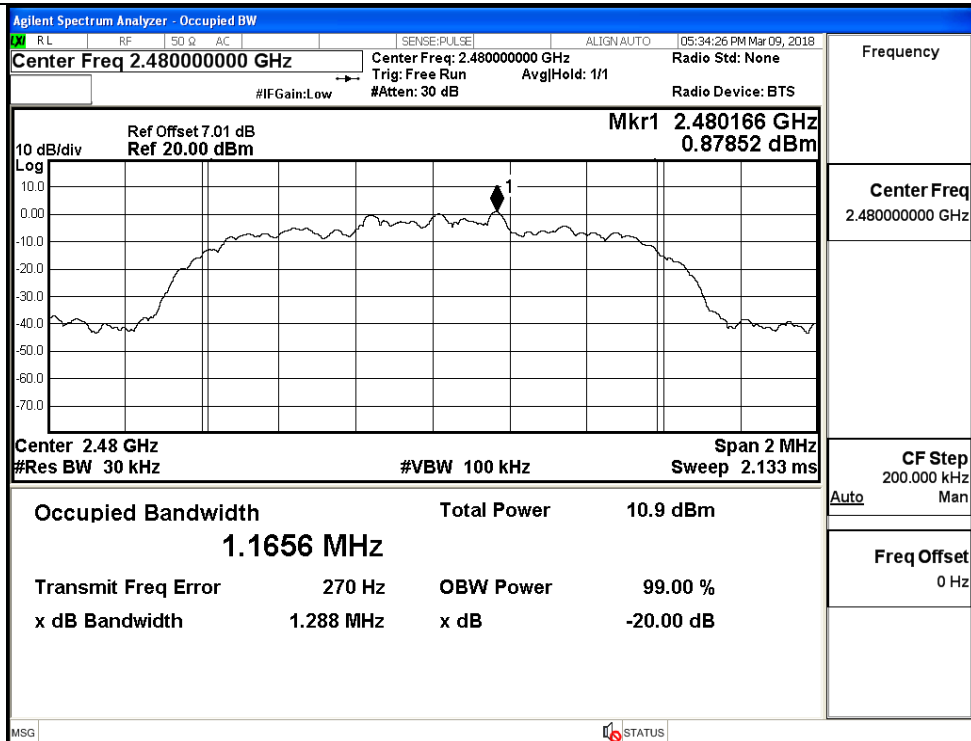
GFSK/MCH



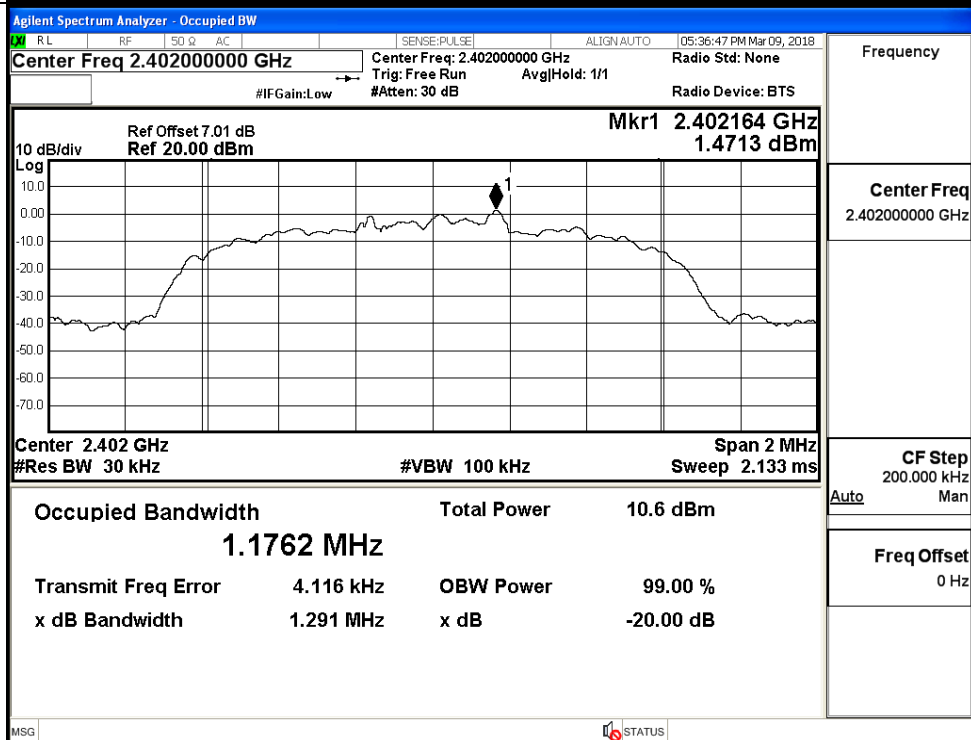
GFSK/HCH



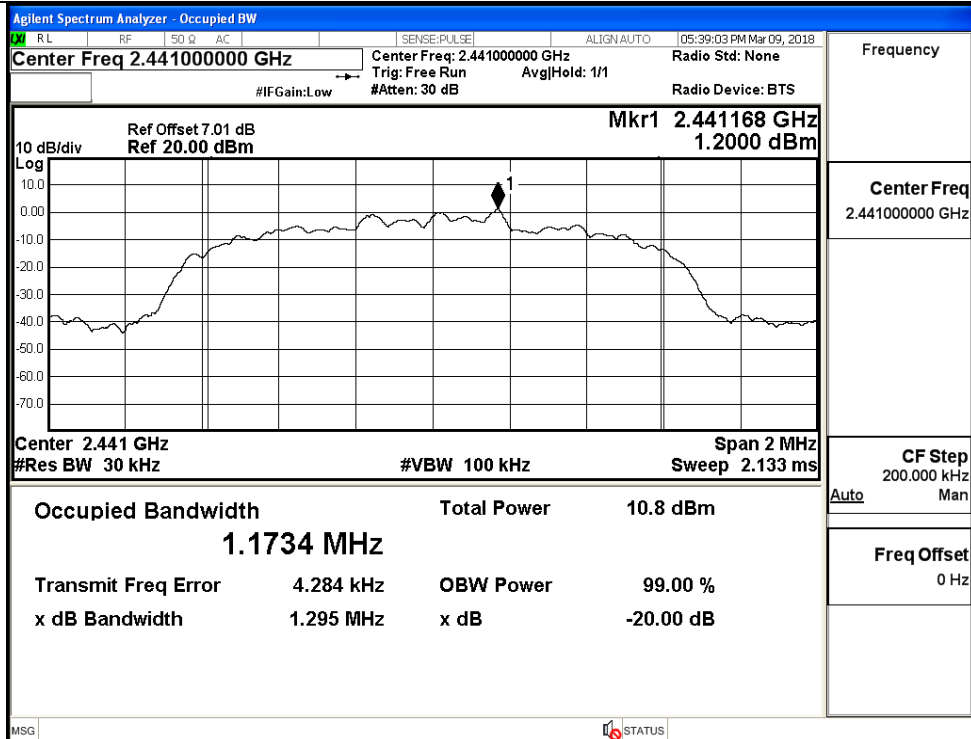
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

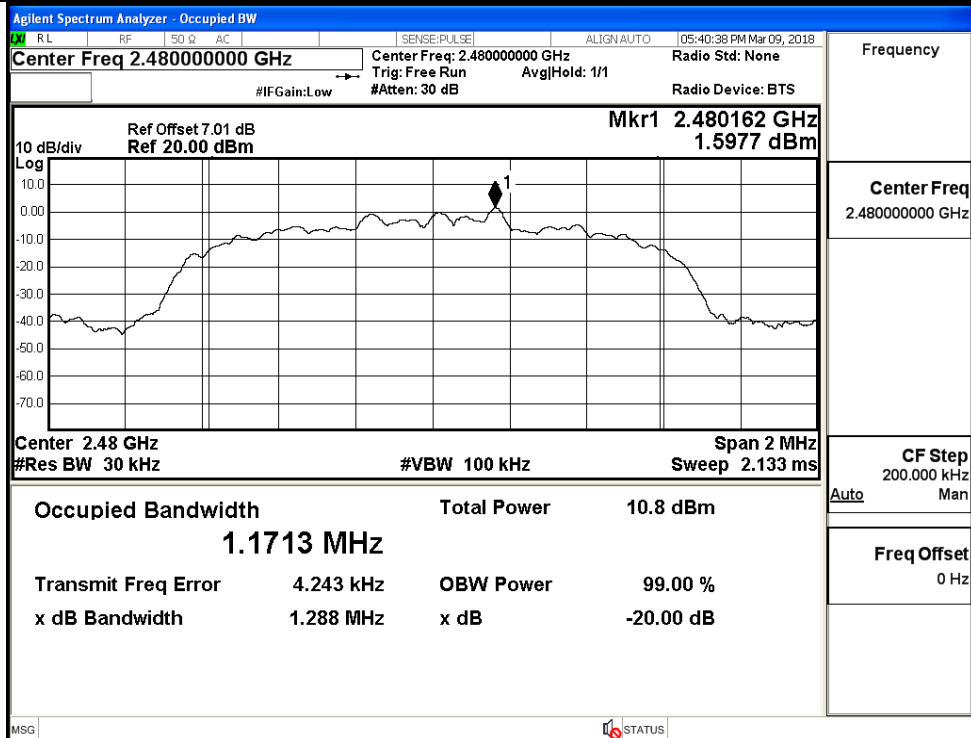
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

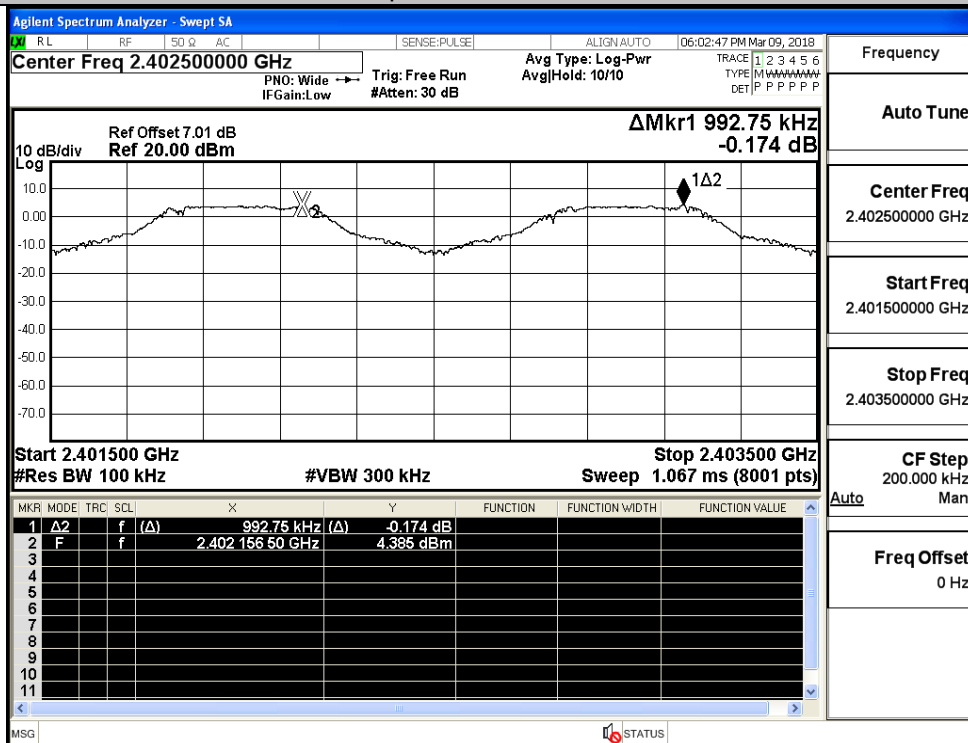


A.3 Carrier Frequency Separation

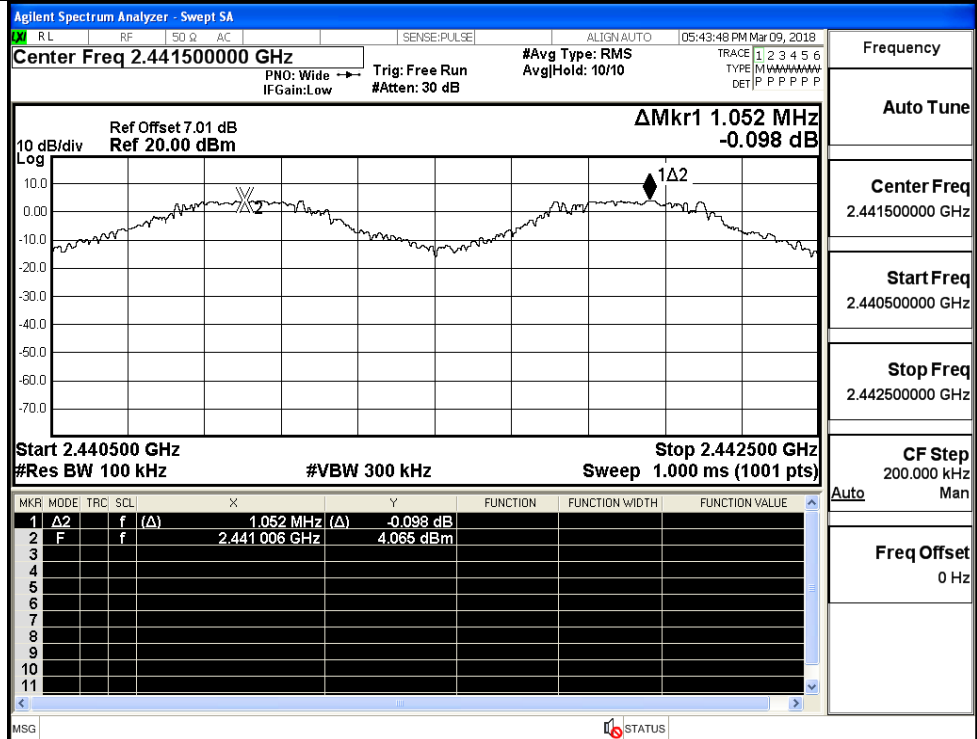
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.993	0.688	PASS
	MCH	1.052	0.688	PASS
	HCH	0.946	0.688	PASS
$\pi/4$ DQPSK	LCH	0.978	0.859	PASS
	MCH	0.922	0.859	PASS
	HCH	1.008	0.859	PASS
8DPSK	LCH	0.866	0.863	PASS
	MCH	1.170	0.863	PASS
	HCH	1.056	0.863	PASS

Test Graphs

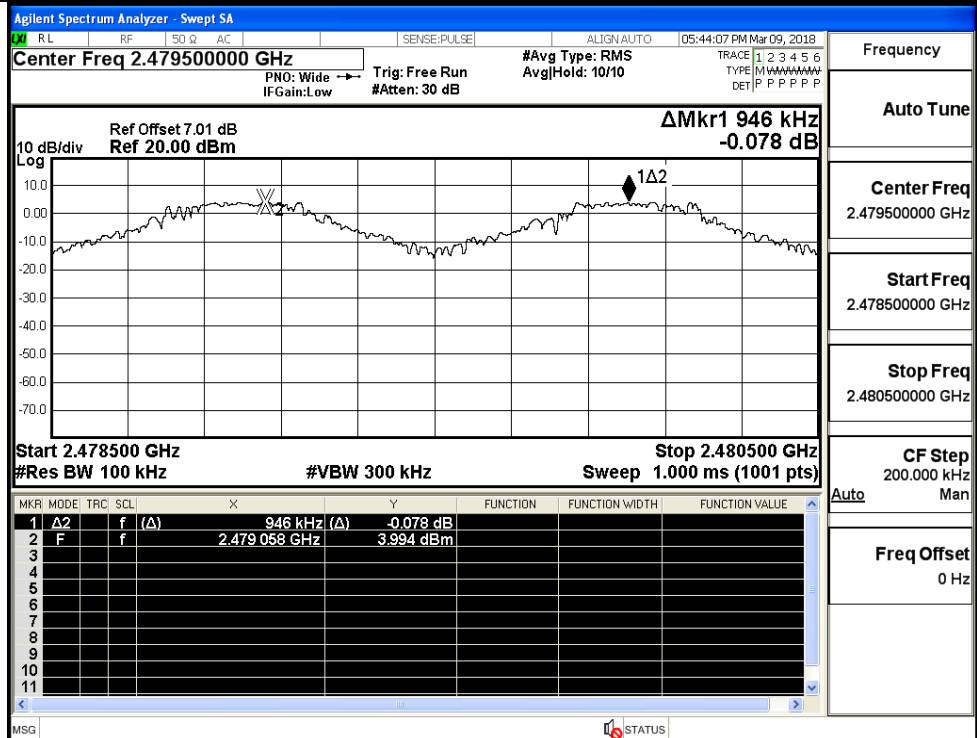
GFSK/LCH

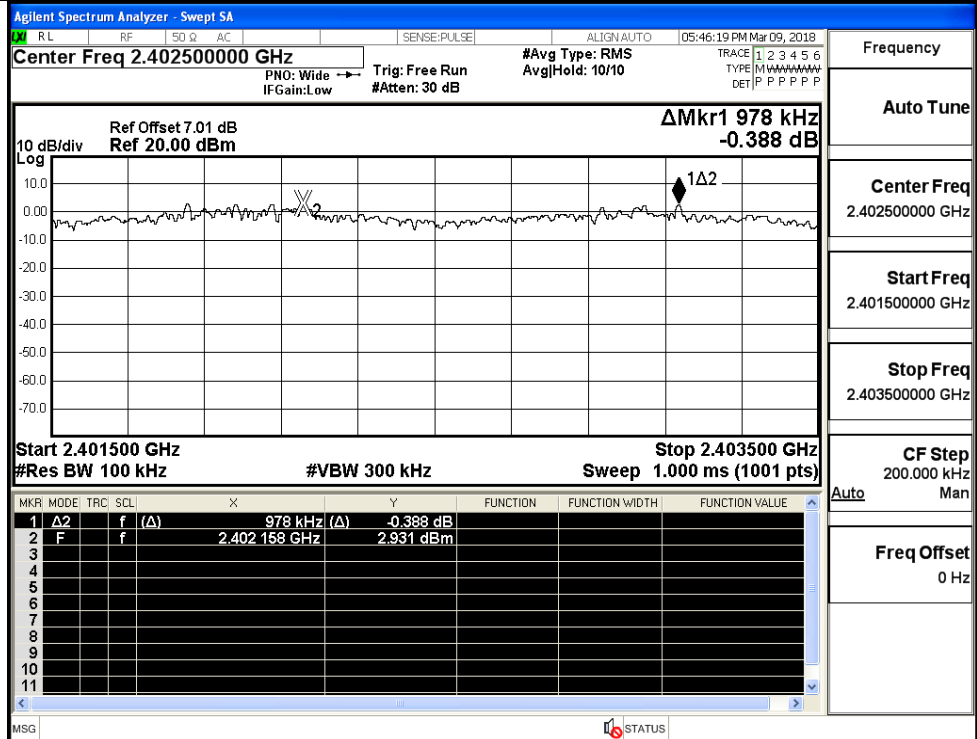
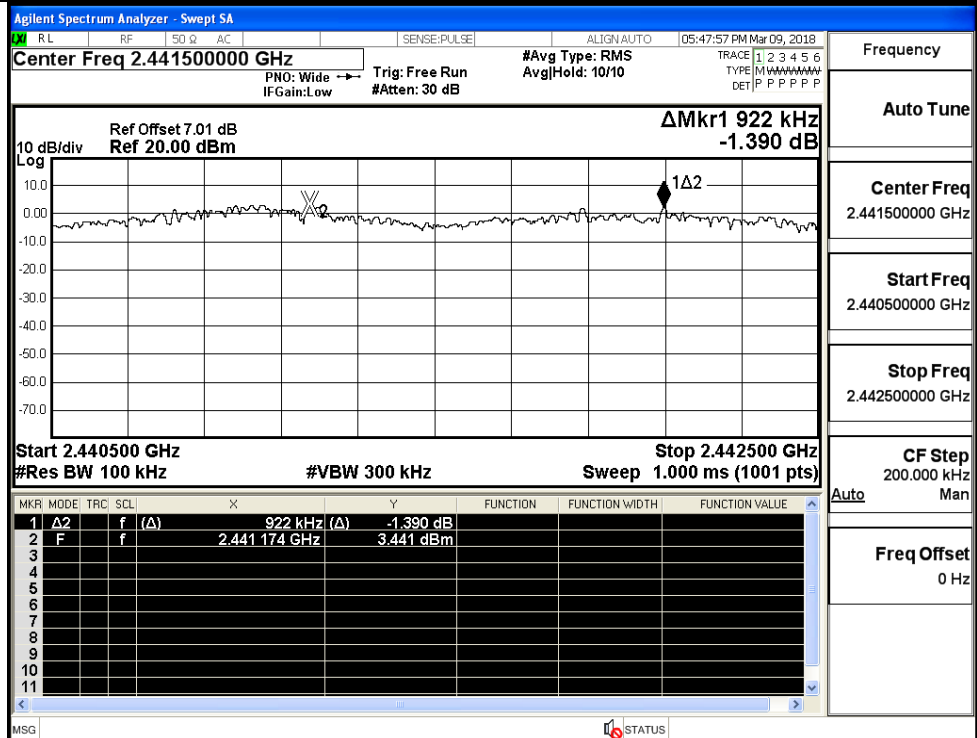


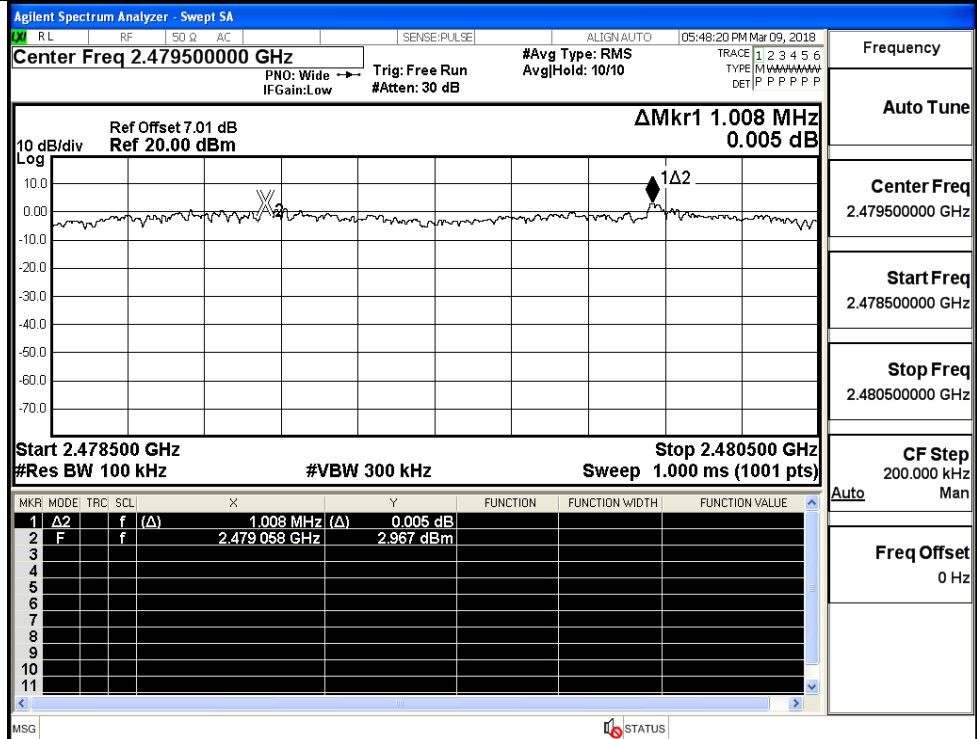
GFSK/MCH



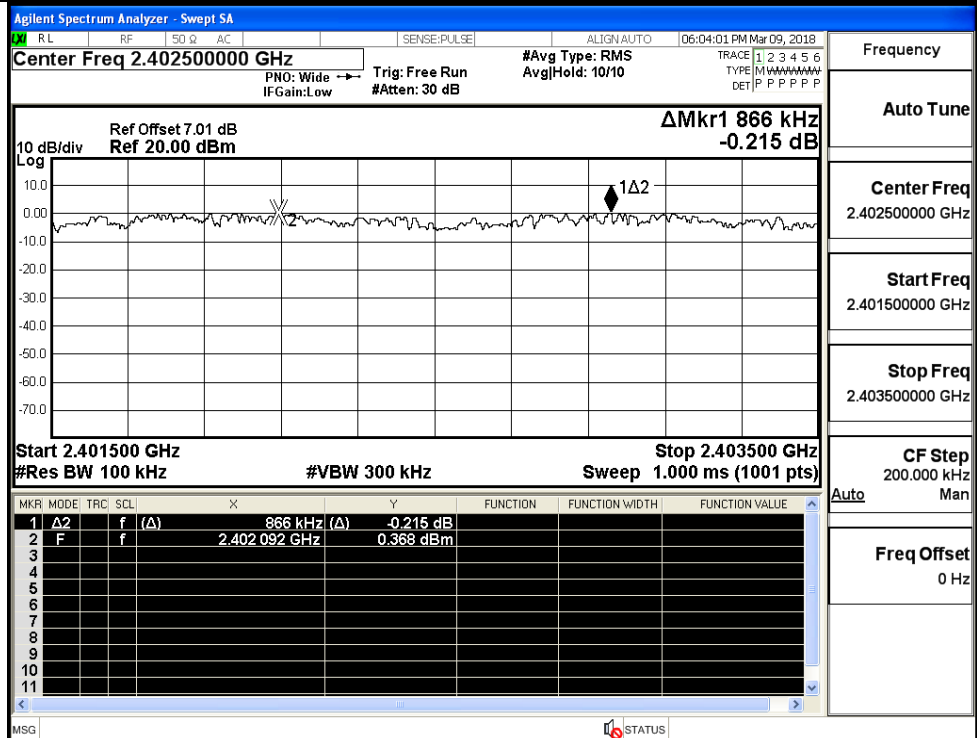
GFSK/HCH



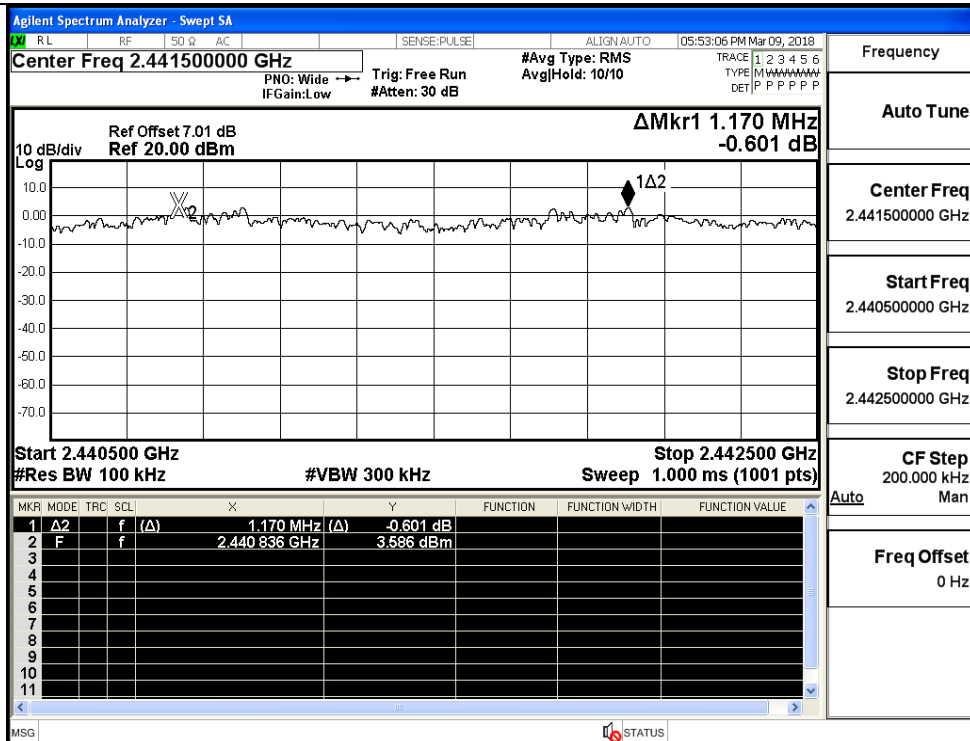
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

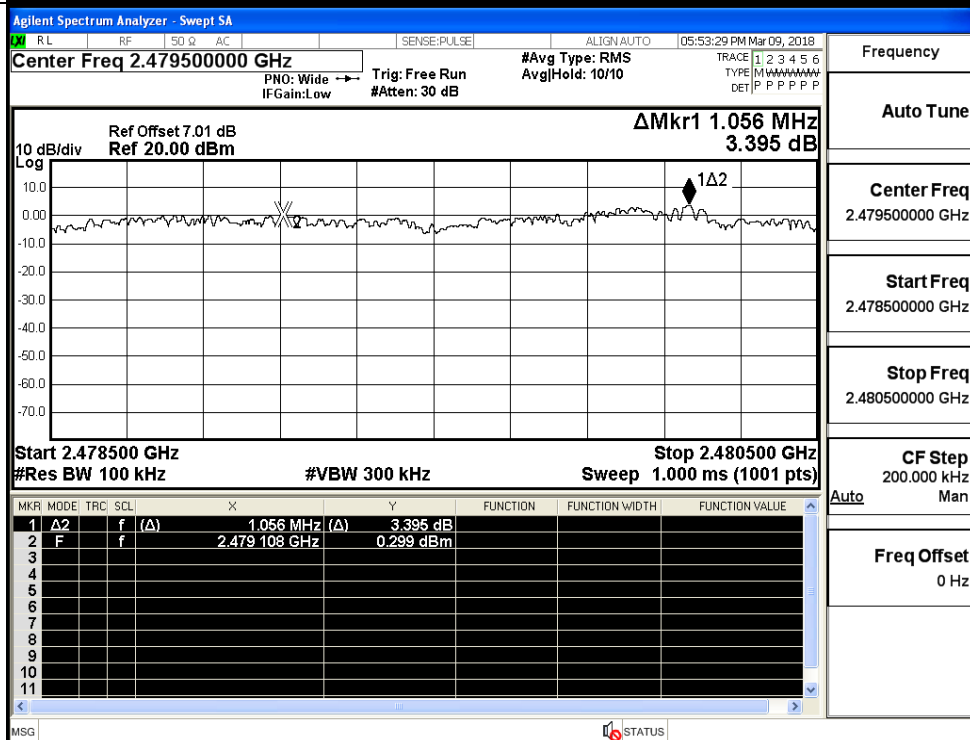
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

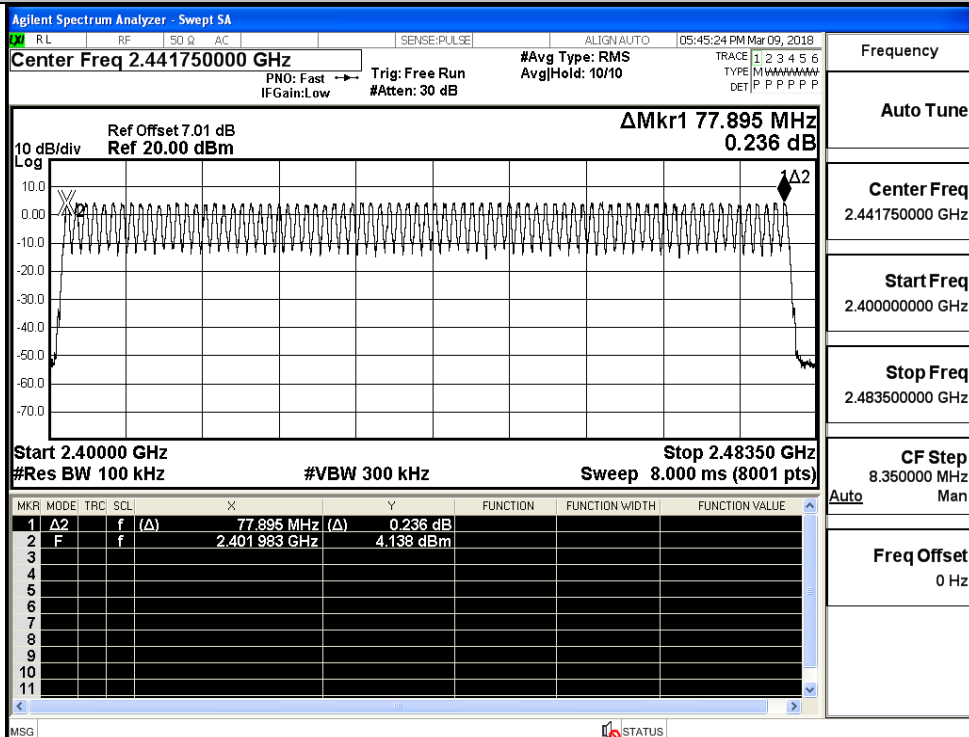
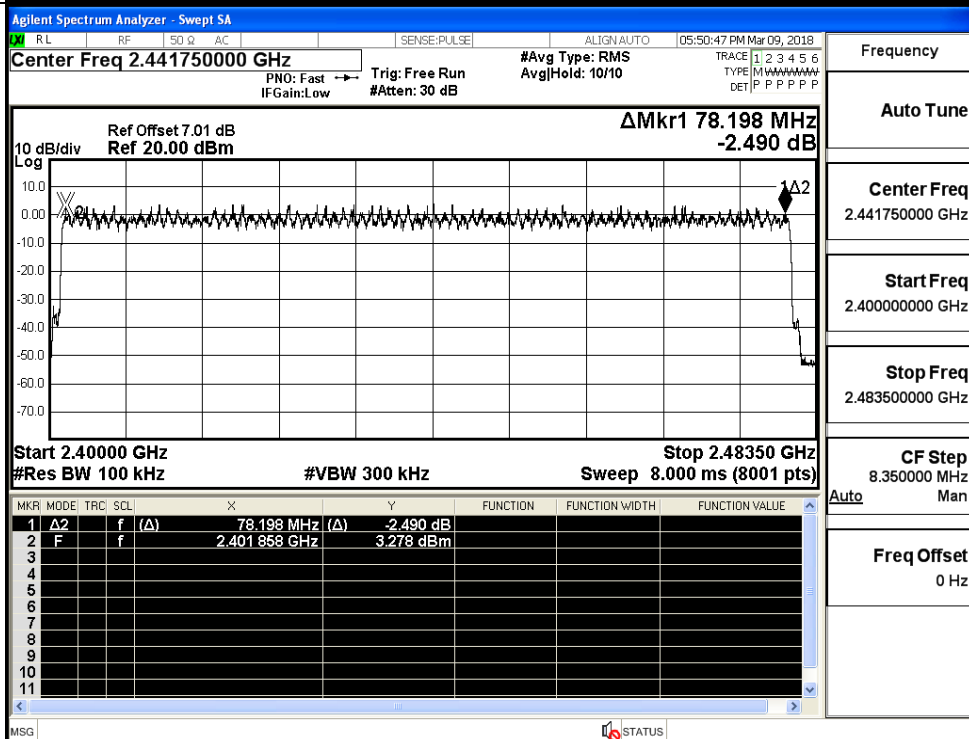


A.4 Hopping Channel Number

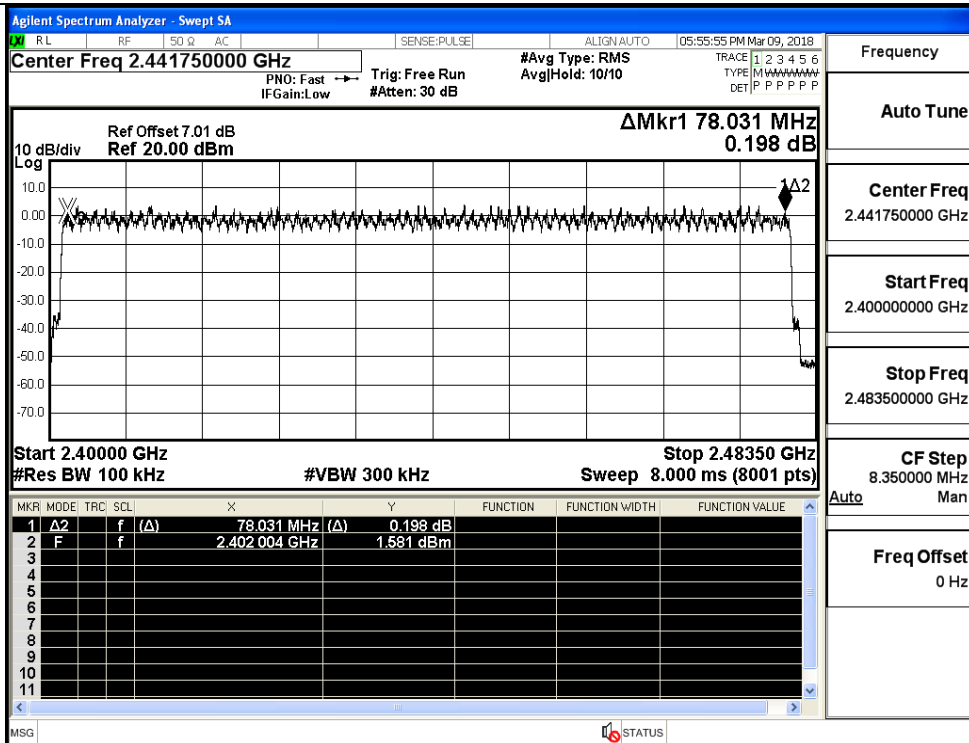
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

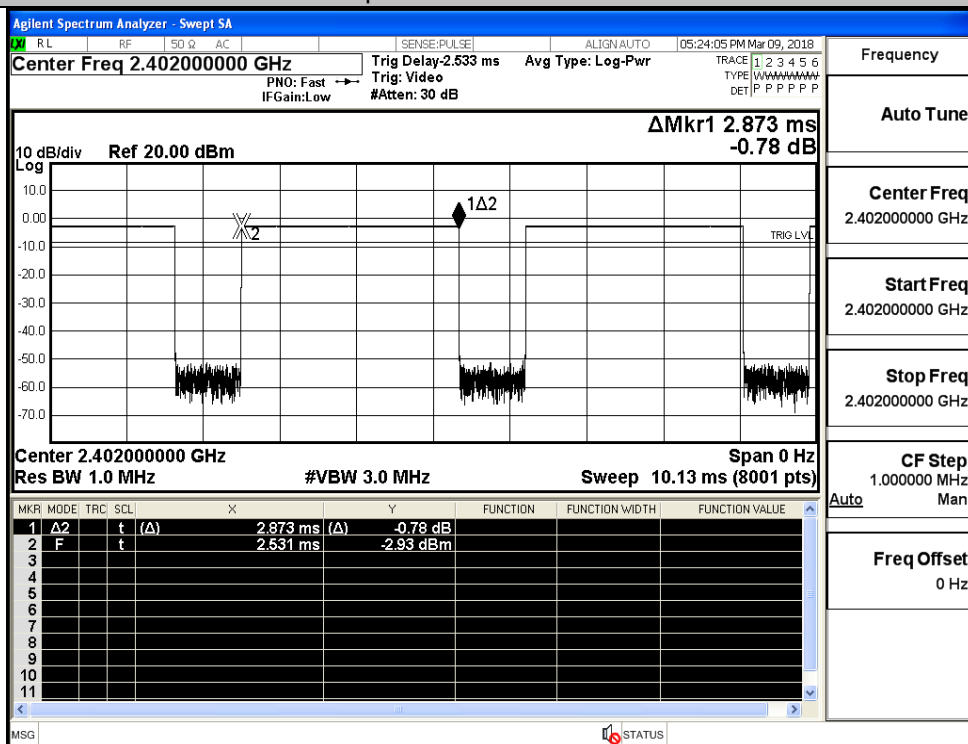


A.5 Dwell Time

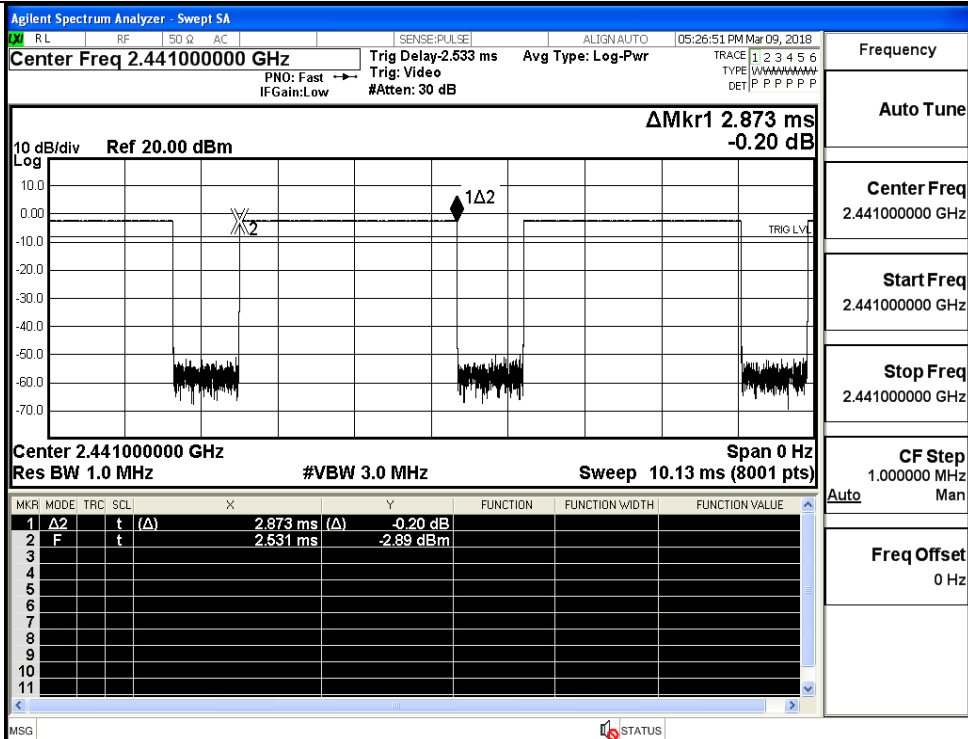
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.87	106.7	0.307	0.4	PASS
	2DH5	MCH	2.87	106.7	0.307	0.4	PASS
	2DH5	HCH	2.87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

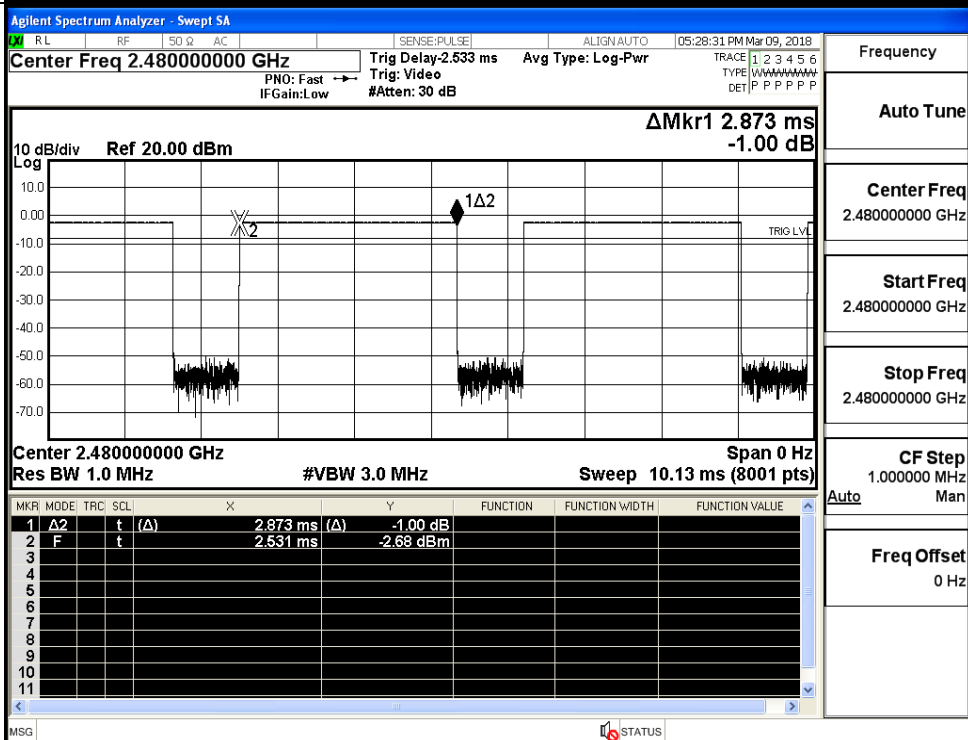
GFSK_DH5/LCH



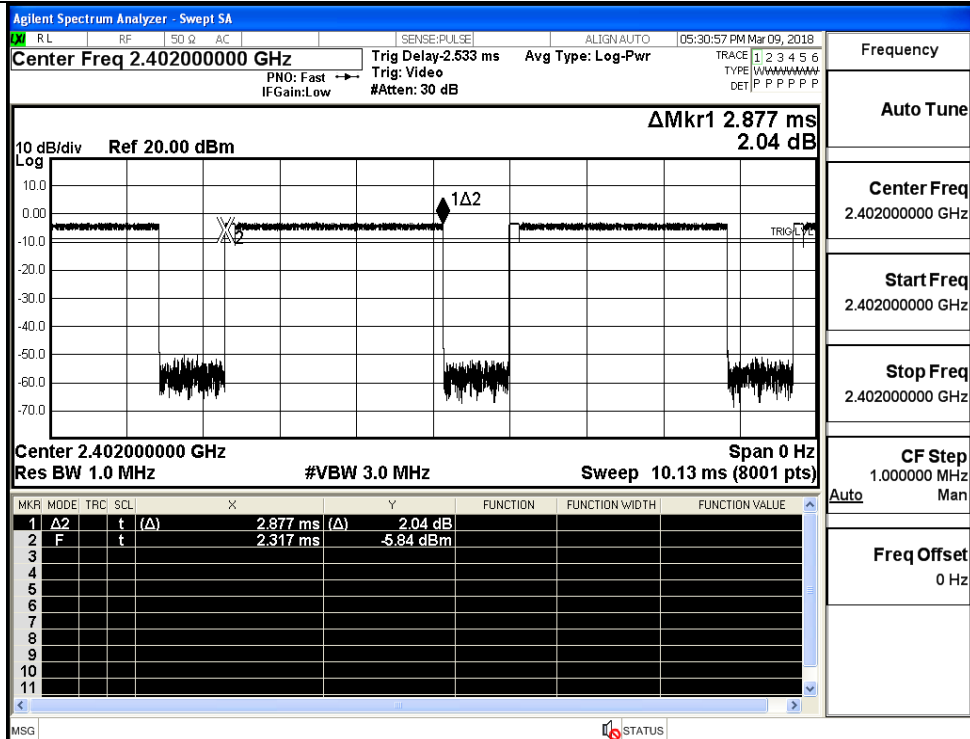
GFSK_DH5/MCH



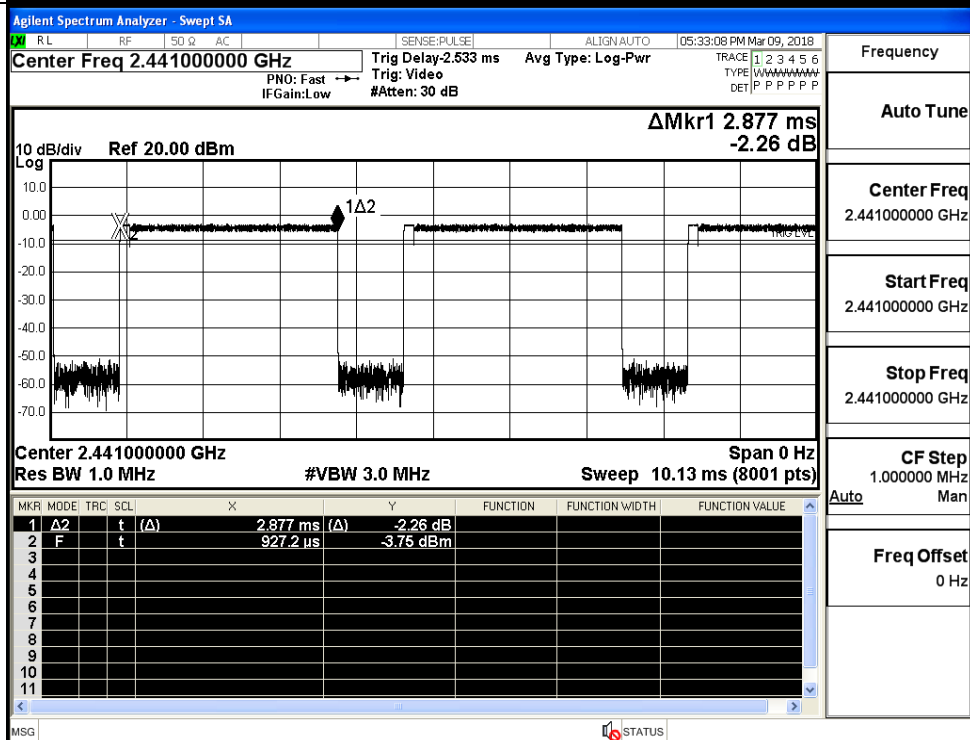
GFSK_DH5/HCH



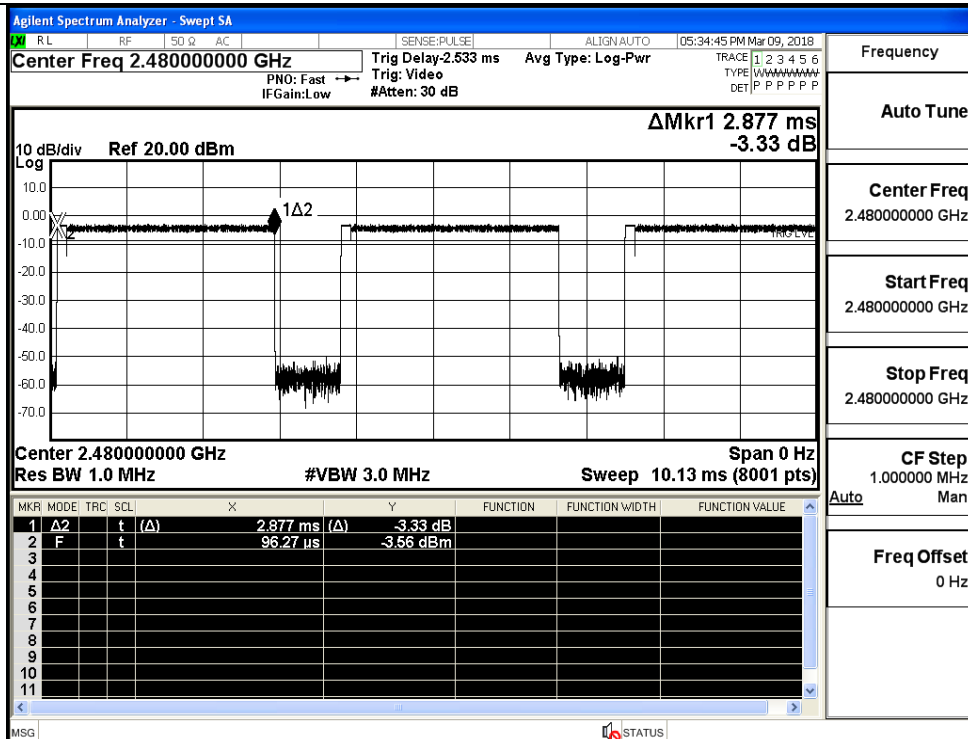
$\pi/4$ DQPSK
_2DH5/LCH



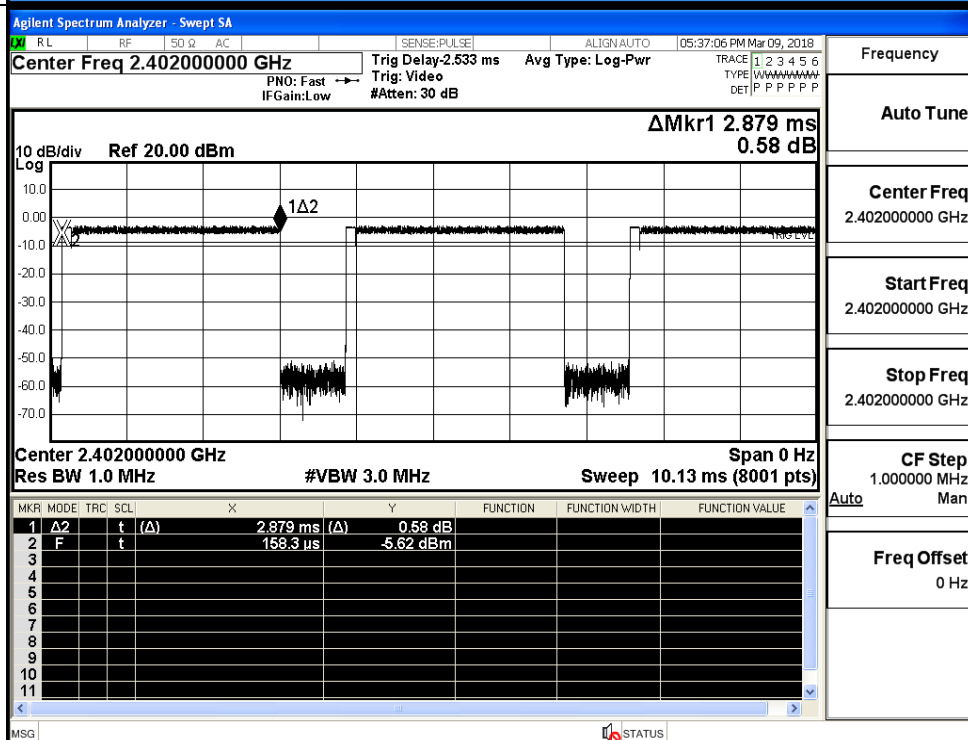
$\pi/4$ DQPSK
_2DH5/MCH



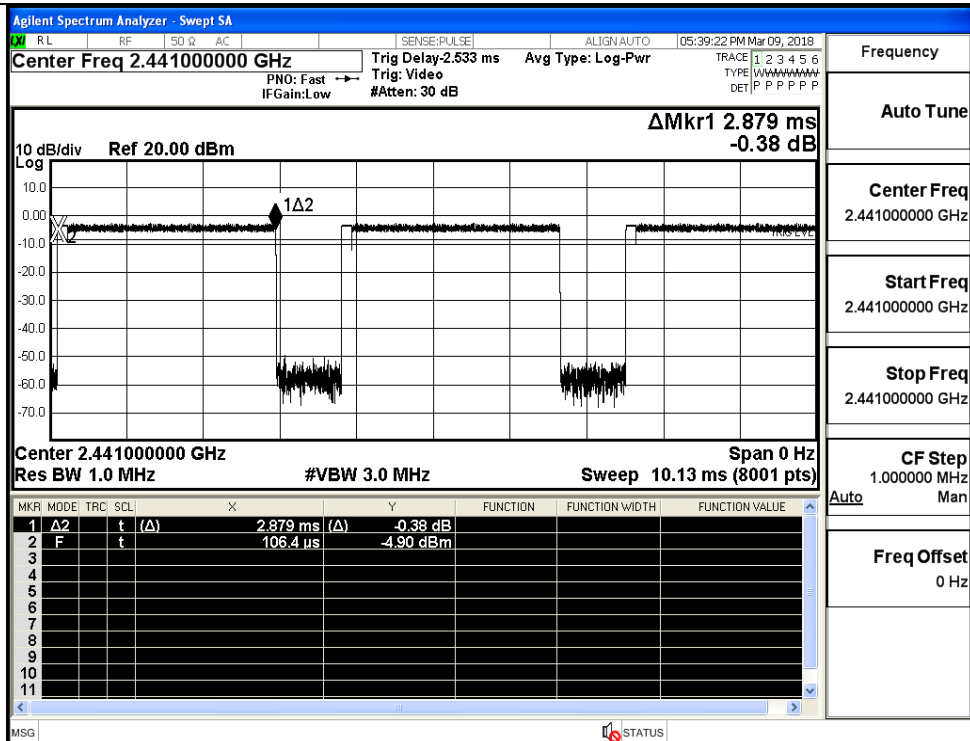
$\pi/4$ DQPSK
_2DH5/HCH



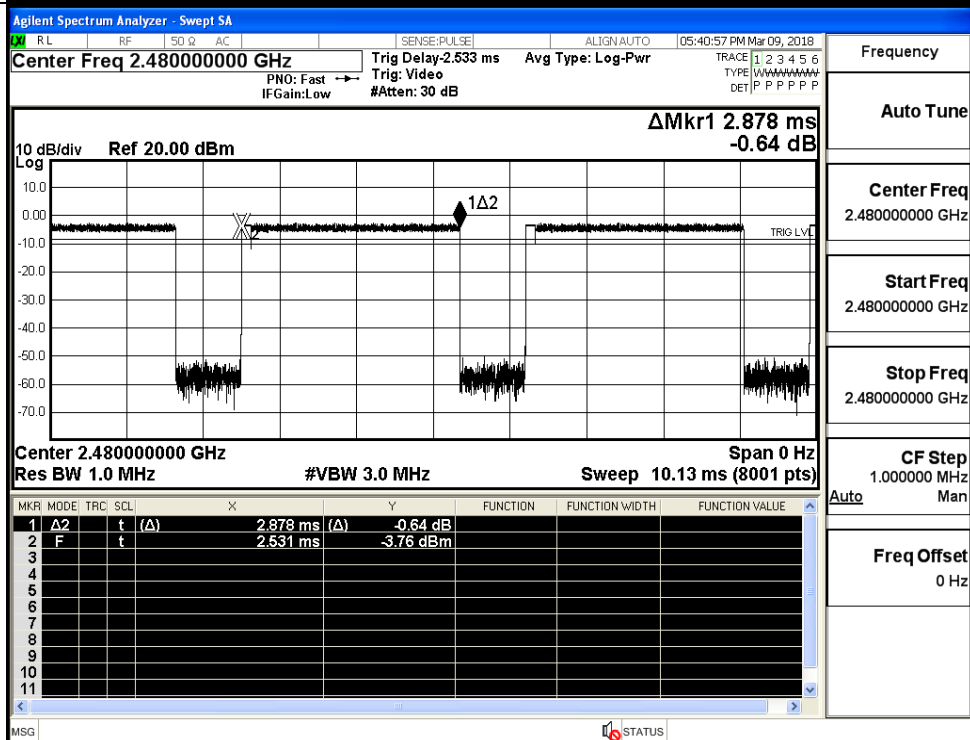
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



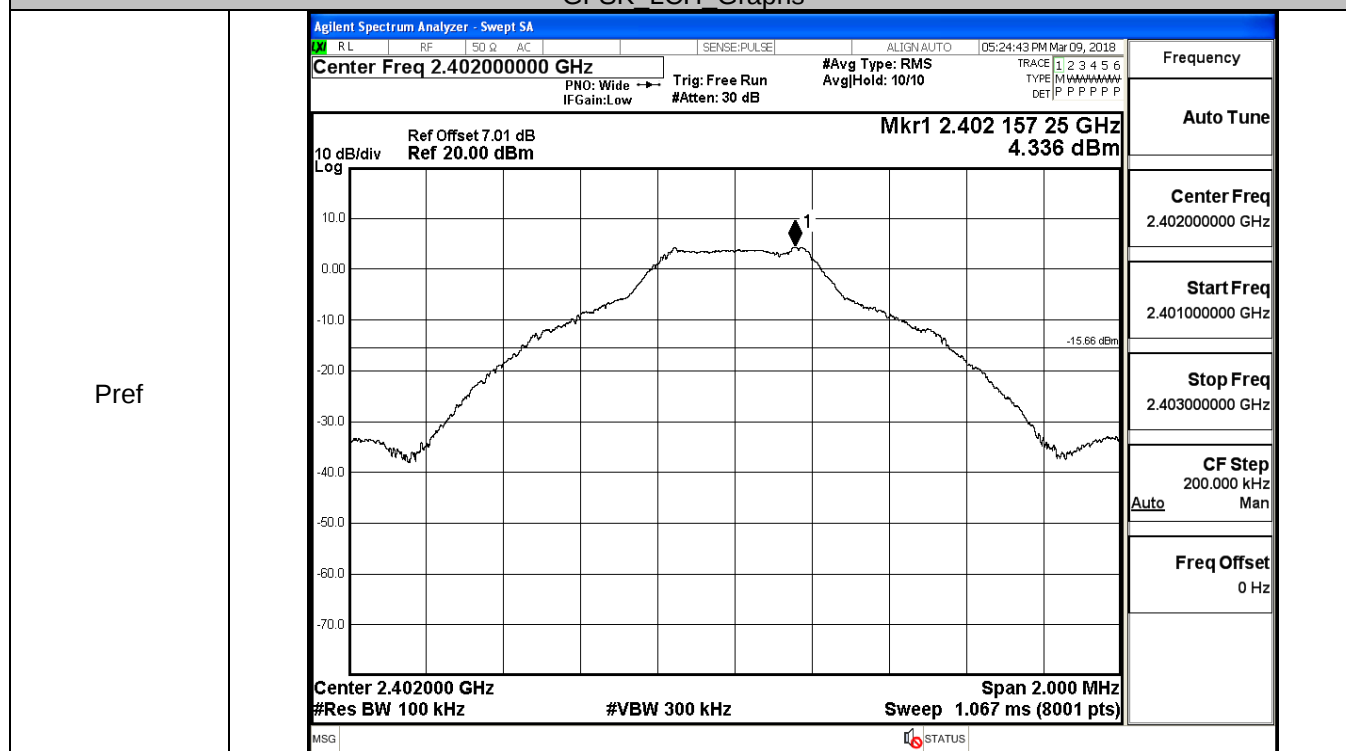
8DPSK_3DH5/HCH



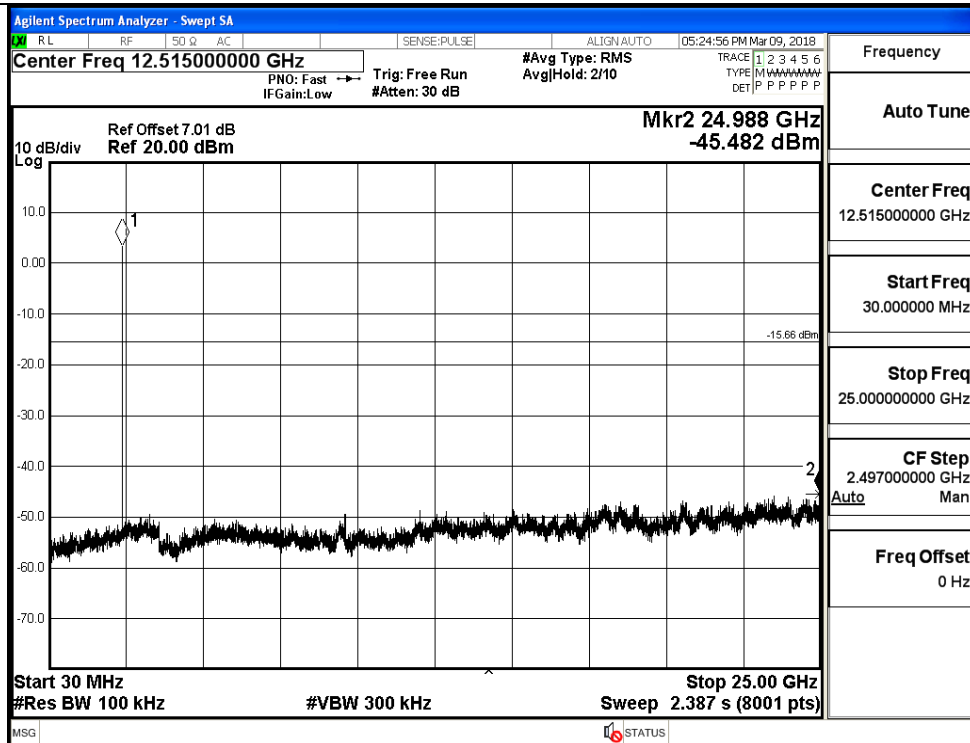
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.336	-45.482	-15.664	PASS
	MCH	4.041	-45.785	-15.959	PASS
	HCH	4.534	-46.205	-15.466	PASS
$\pi/4$ DQPSK	LCH	3.484	-45.248	-16.516	PASS
	MCH	3.718	-45.274	-16.282	PASS
	HCH	3.014	-43.292	-16.986	PASS
8DPSK	LCH	3.582	-45.429	-16.418	PASS
	MCH	3.23	-44.654	-16.770	PASS
	HCH	3.685	-44.943	-16.315	PASS

GFSK LCH Graphs

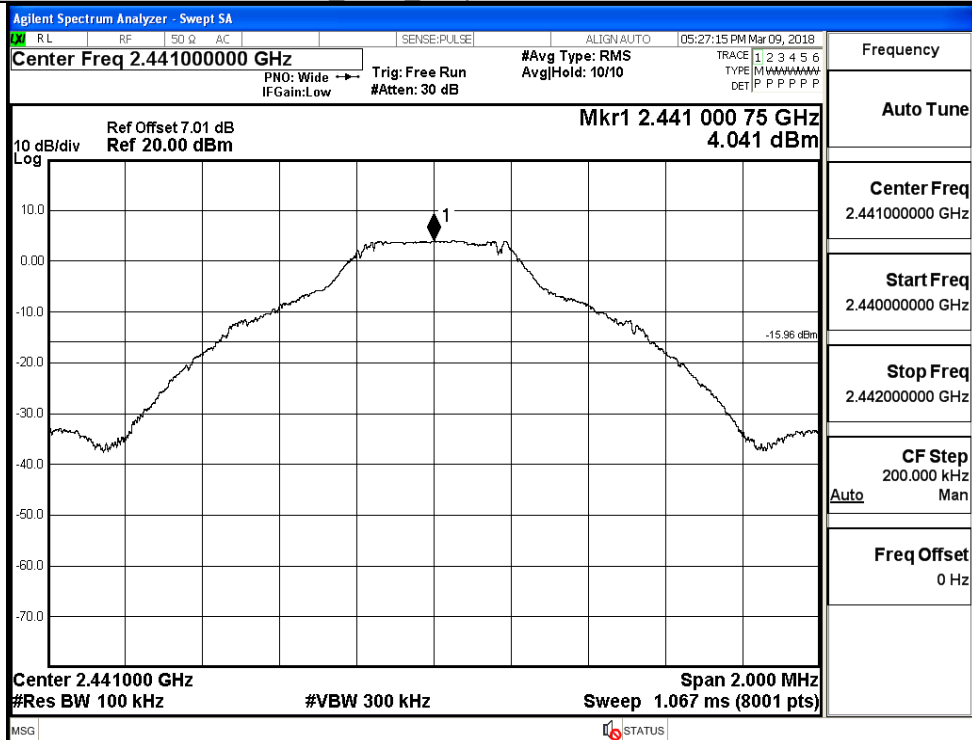


Puw

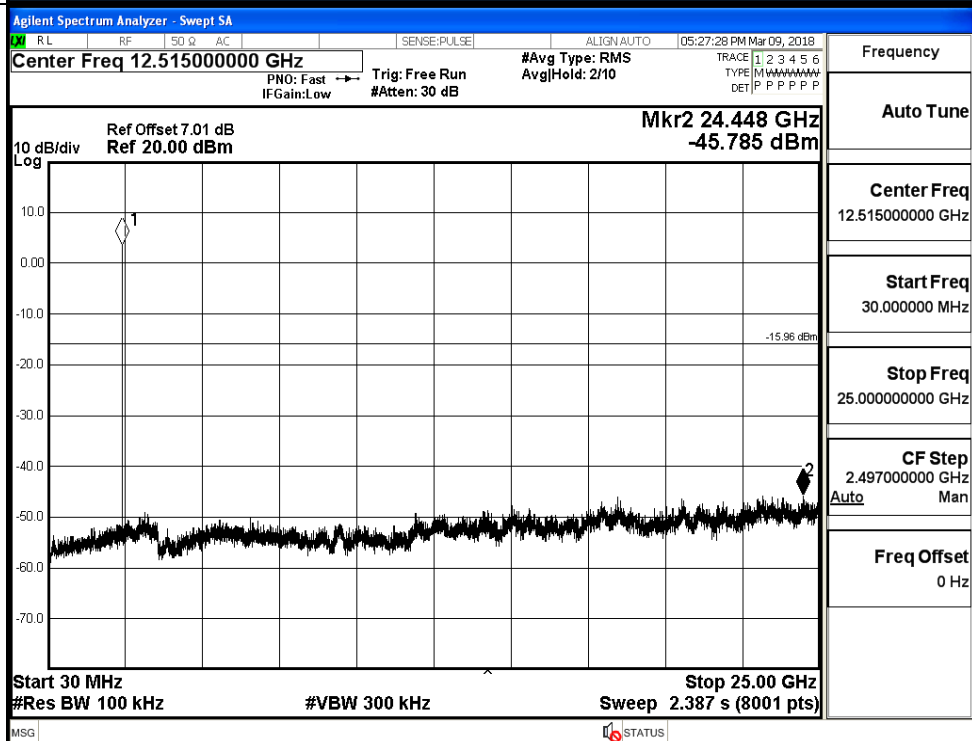


GFSK_MCH_Graphs

Pref

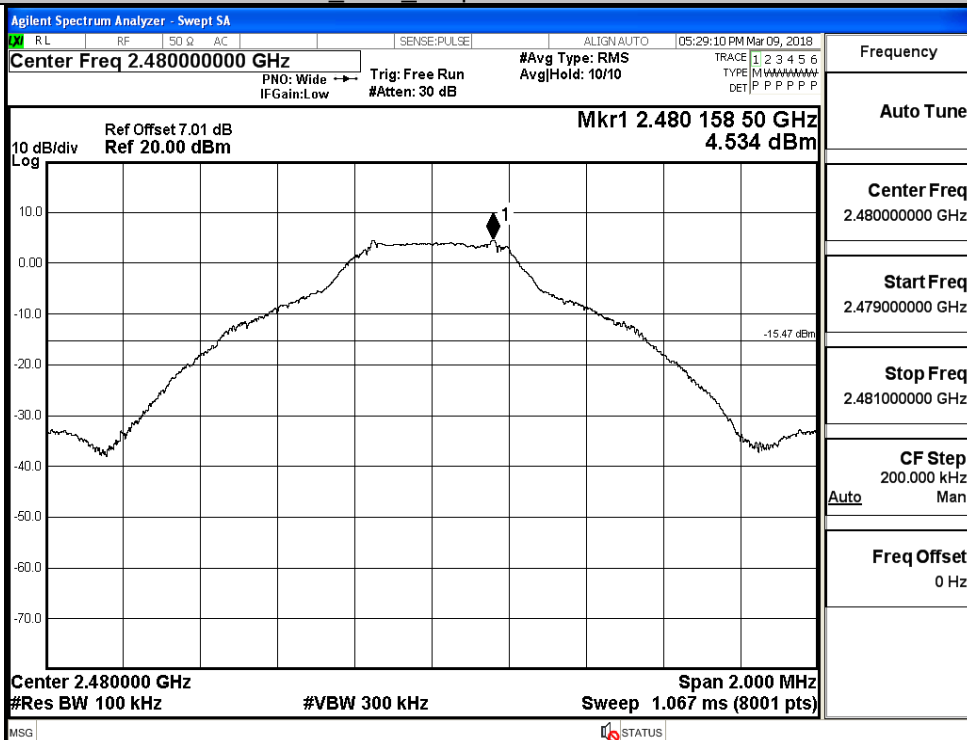


Puw

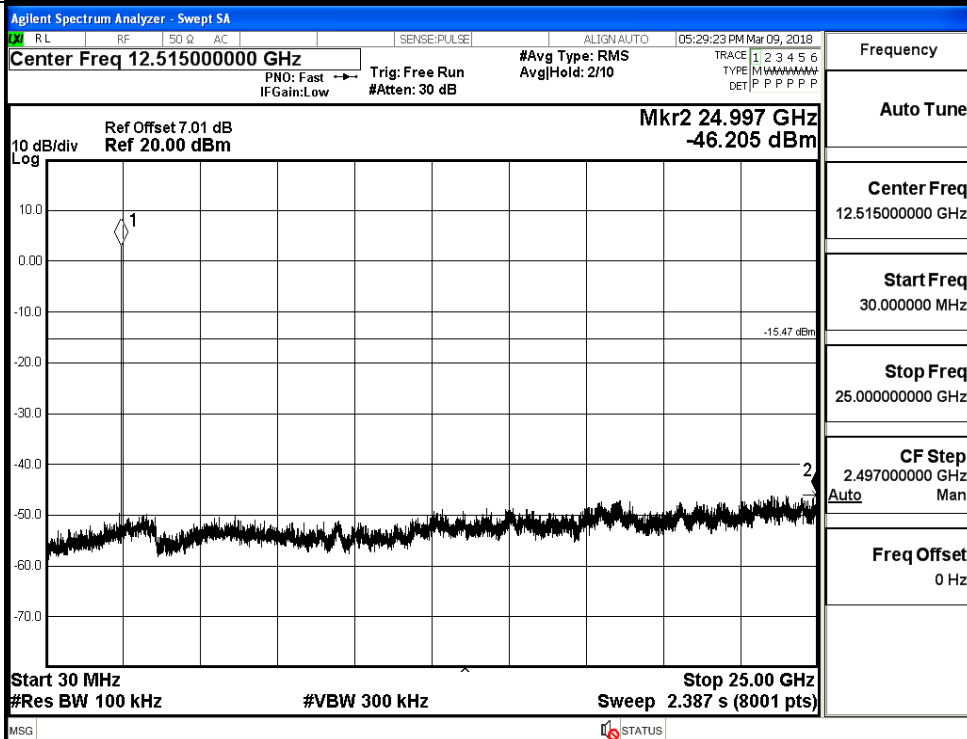


GFSK_HCH_Graphs

Pref

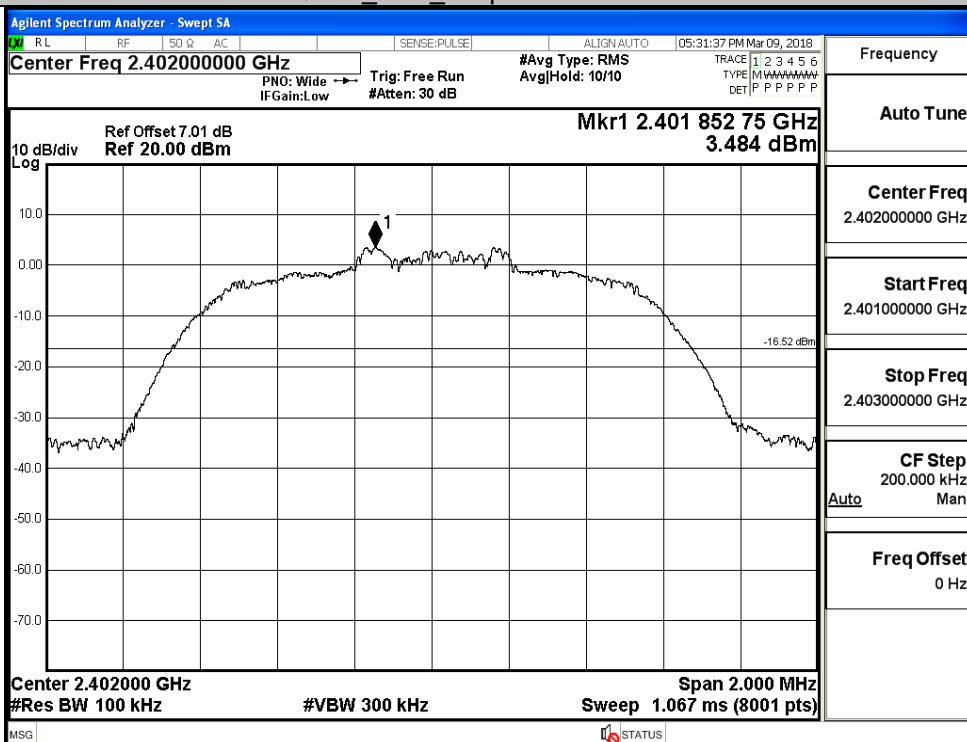


Puw

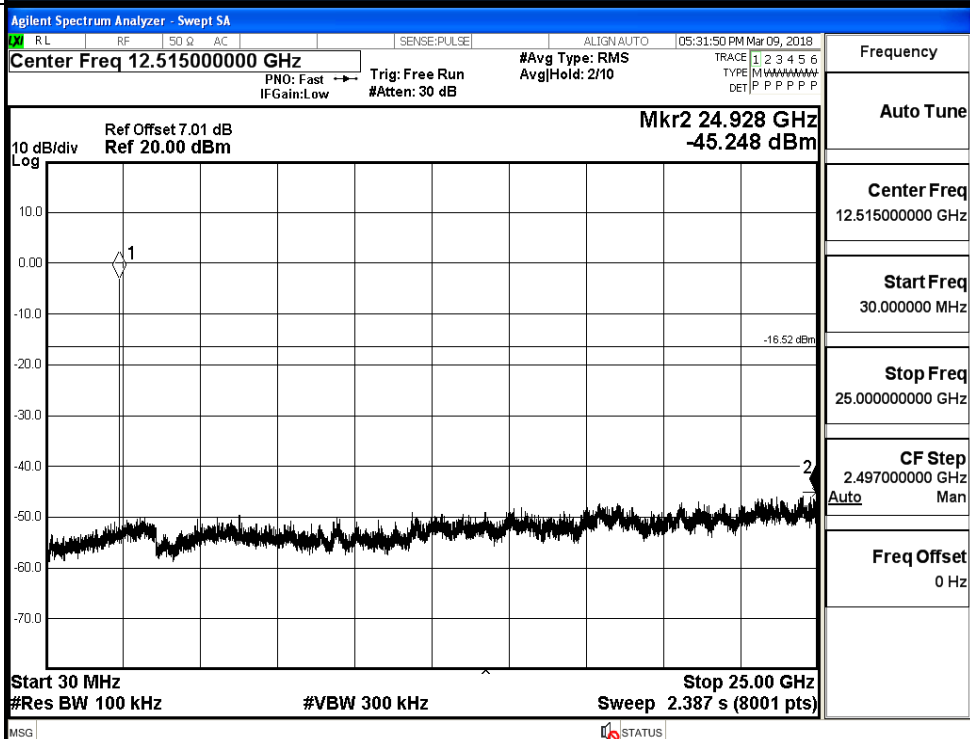


$\pi/4$ DQPSK_LCH_Graphs

Pref

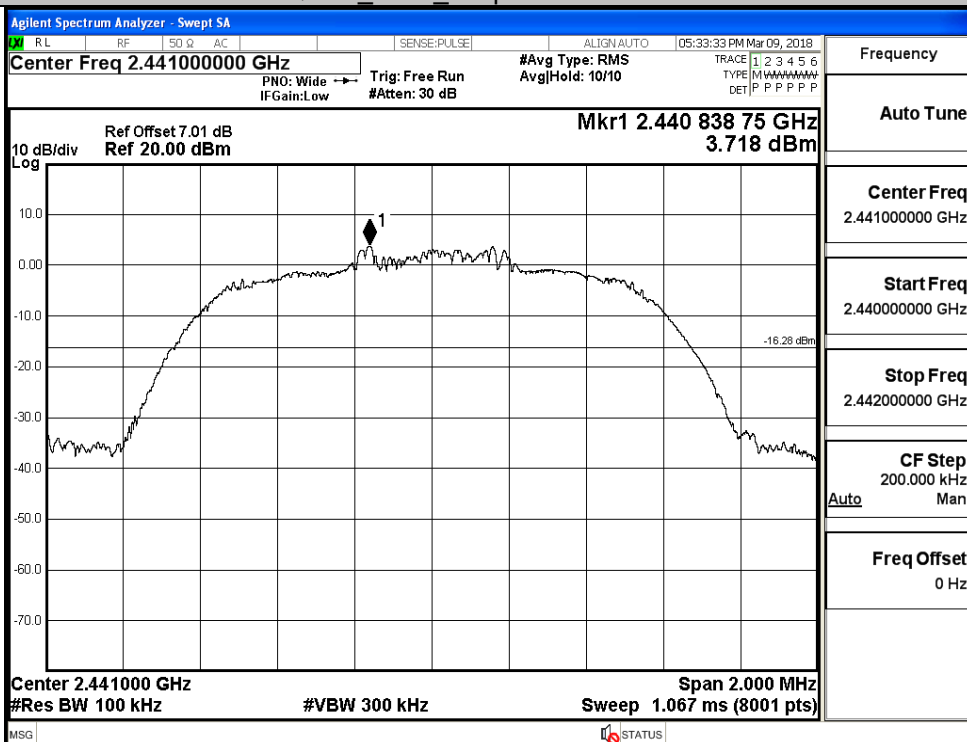


Puw

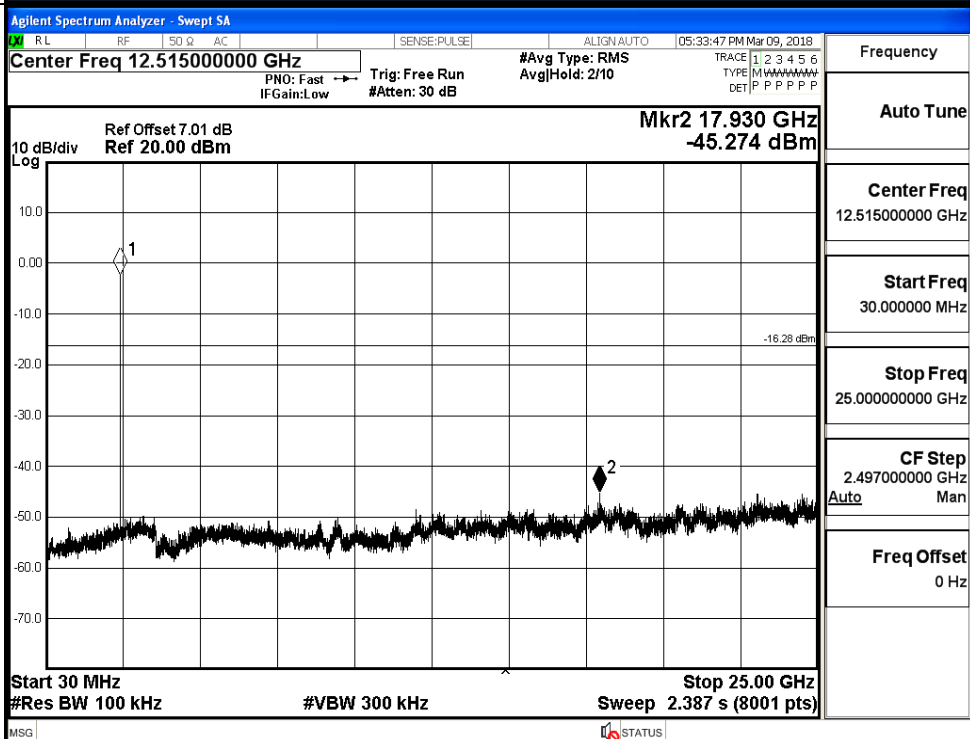


$\pi/4$ DQPSK_MCH_Graphs

Pref

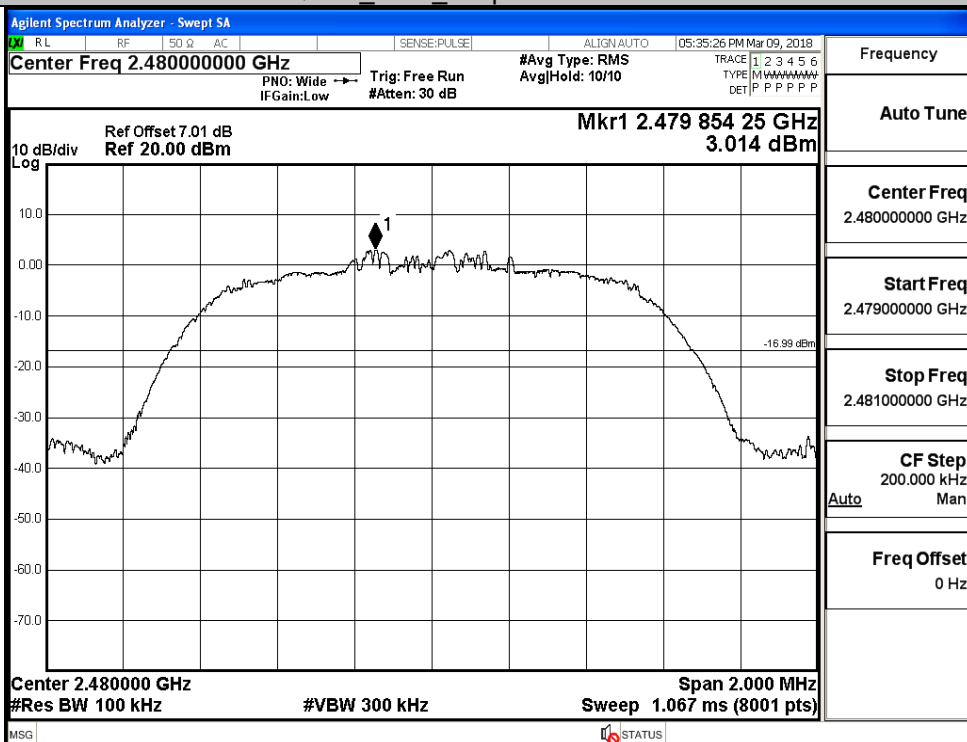


Puw

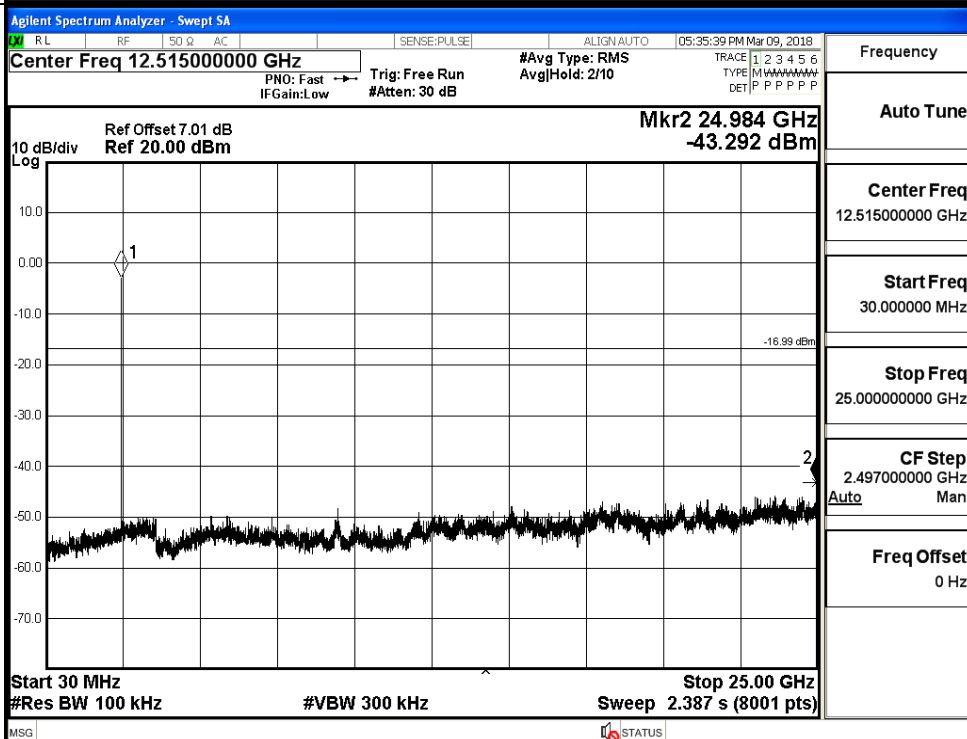


$\pi/4$ DQPSK_HCH_Graphs

Pref

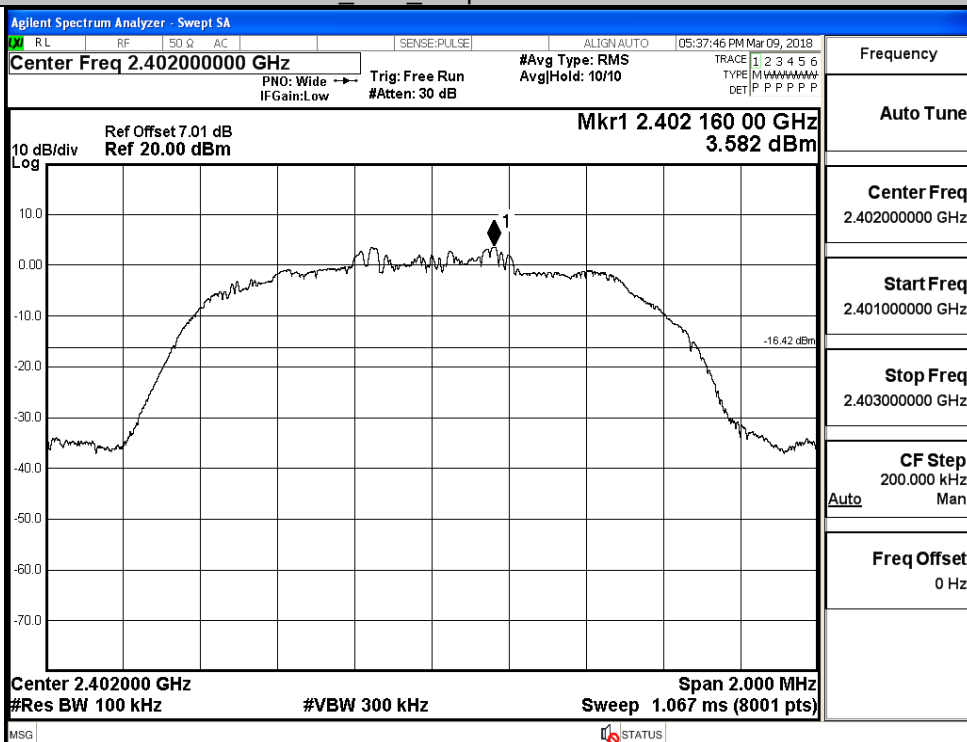


Puw

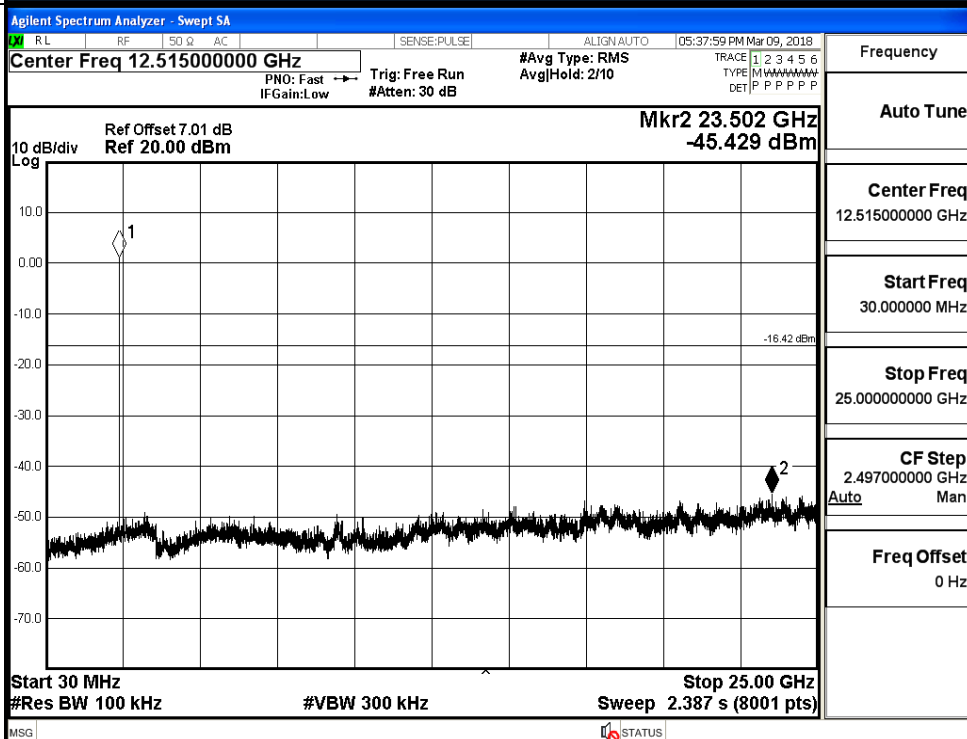


8DPSK_LCH_Graphs

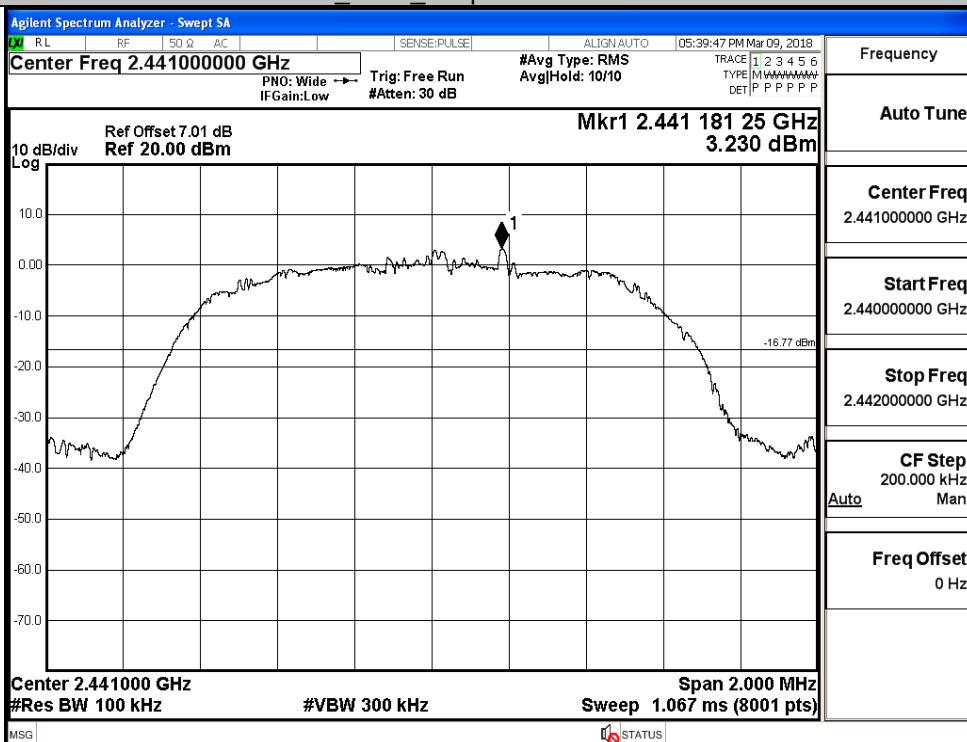
Pref



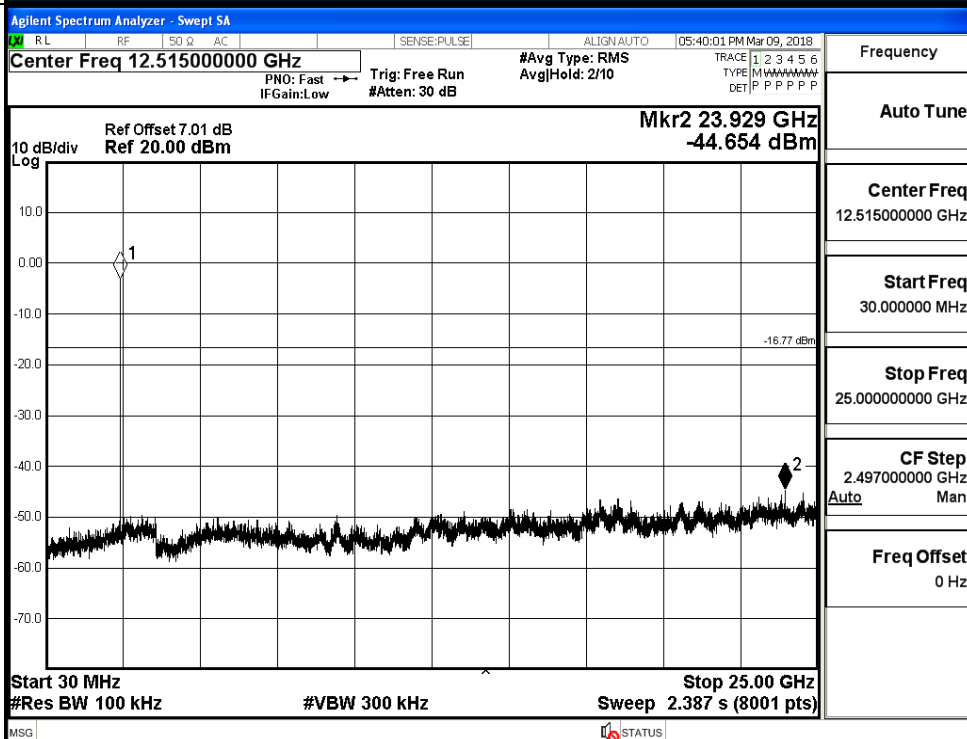
Puw



Pref

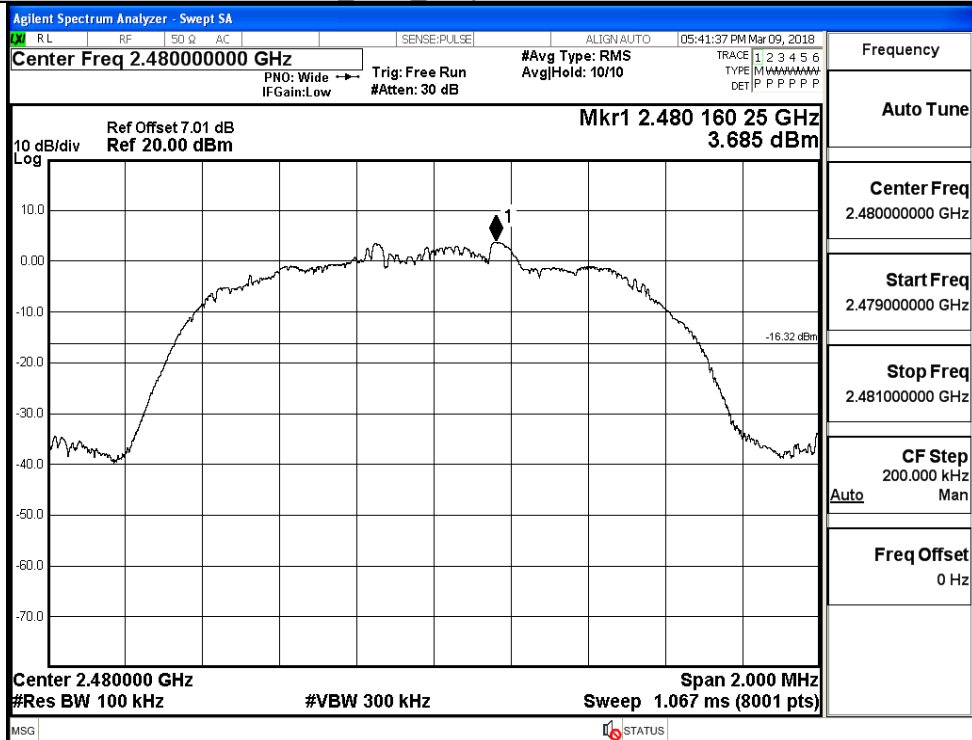


Puw

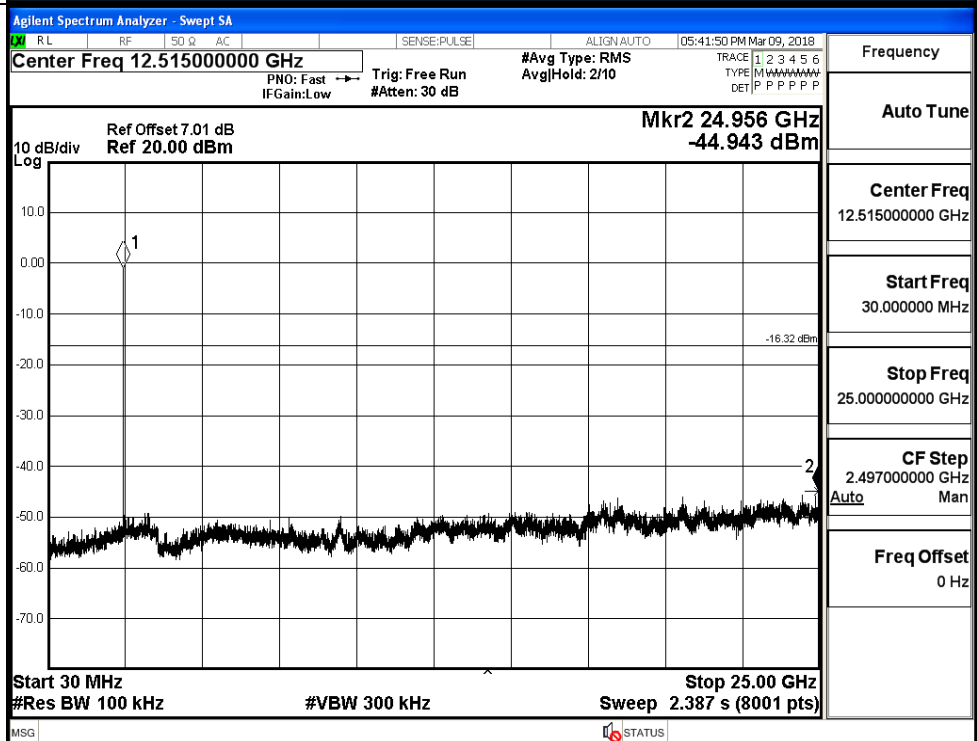


8DPSK_HCH_Graphs

Pref



Puw

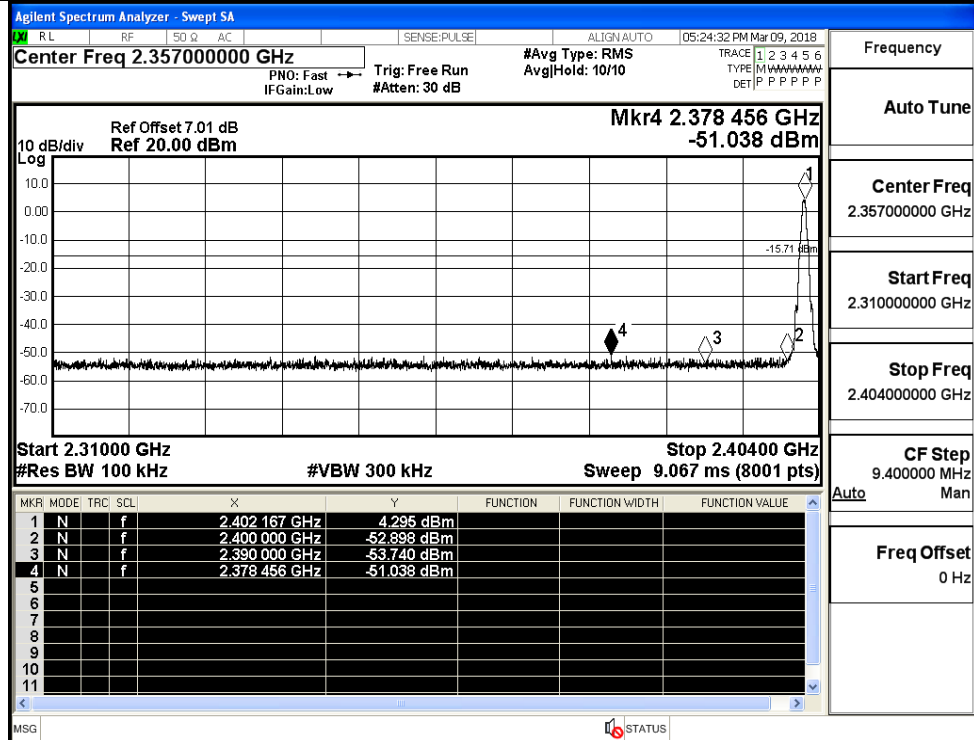


A.7 Band-edge for RF Conducted Emissions

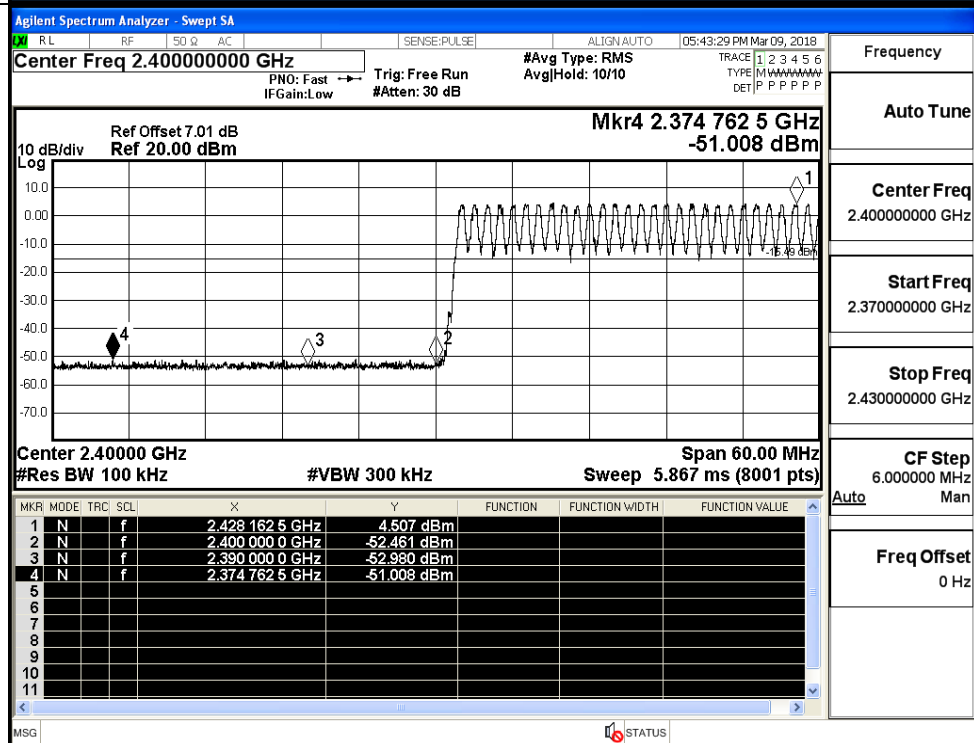
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	4.295	Off	-51.038	-15.71	PASS
			4.507	On	-51.008	-15.49	PASS
	HCH	2480	4.536	Off	-51.126	-15.46	PASS
			4.570	On	-49.676	-15.43	PASS
$\pi/4$ DQPSK	LCH	2402	3.630	Off	-50.850	-16.37	PASS
			3.631	On	-50.378	-16.37	PASS
	HCH	2480	3.596	Off	-50.900	-16.4	PASS
			3.750	On	-50.380	-16.25	PASS
8DPSK	LCH	2402	3.568	Off	-50.984	-16.43	PASS
			3.577	On	-50.720	-16.42	PASS
	HCH	2480	3.733	Off	-51.006	-16.27	PASS
			3.637	On	-50.134	-16.36	PASS

Test Graphs

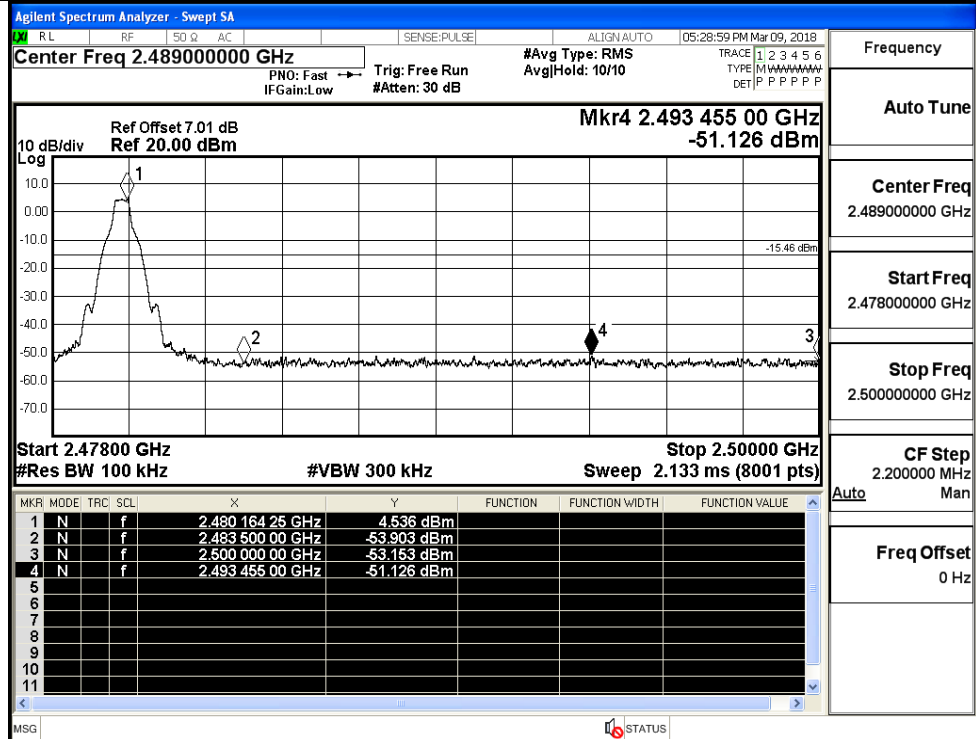
GFSK/LCH/No Hop



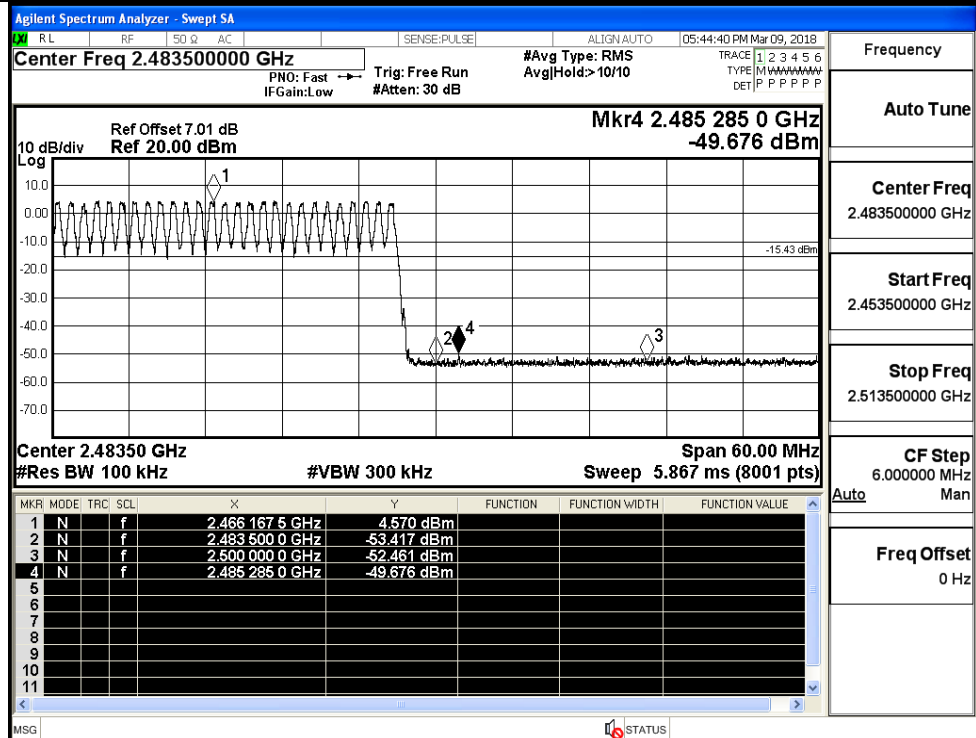
GFSK/LCH/Hop



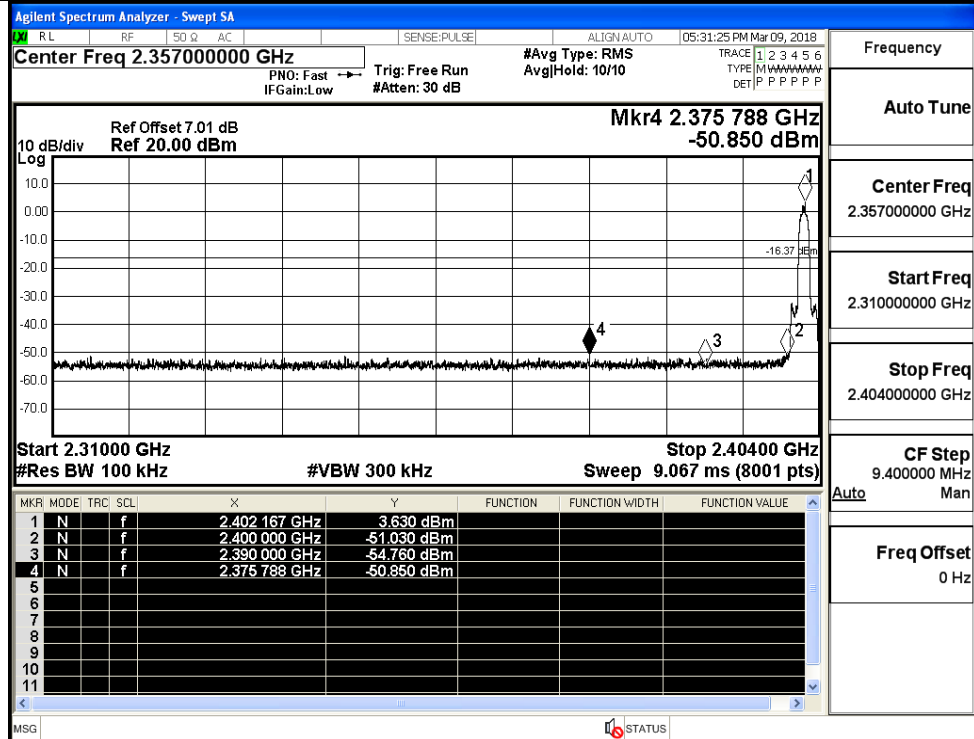
GFSK/HCH/No Hop



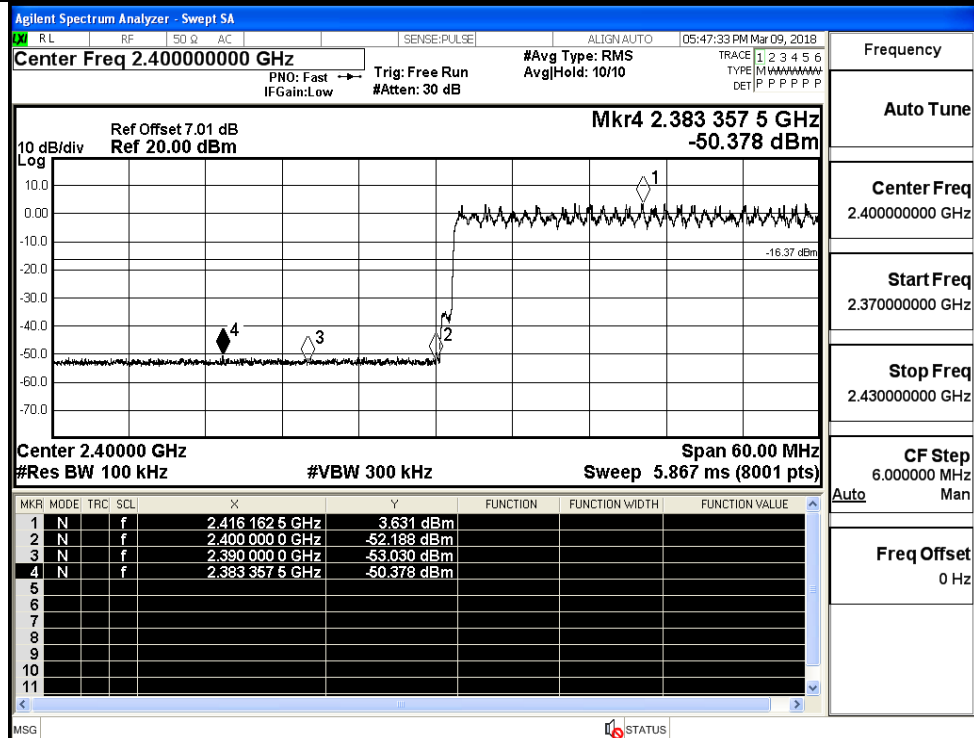
GFSK/HCH/Hop



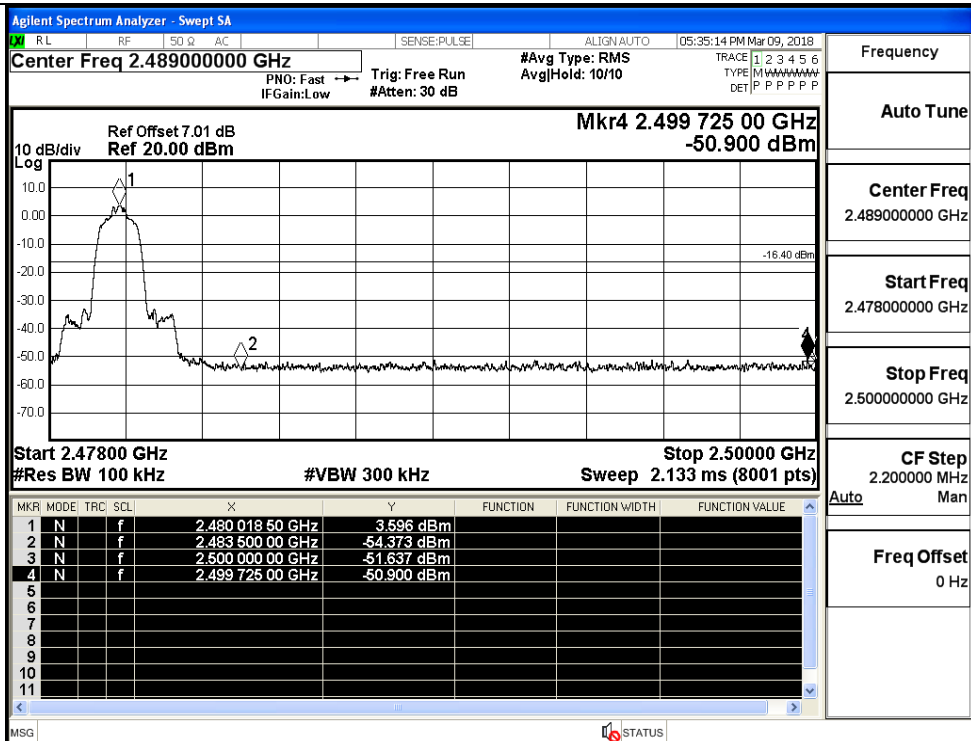
$\pi/4$ DQPSK/LCH/No
Hop



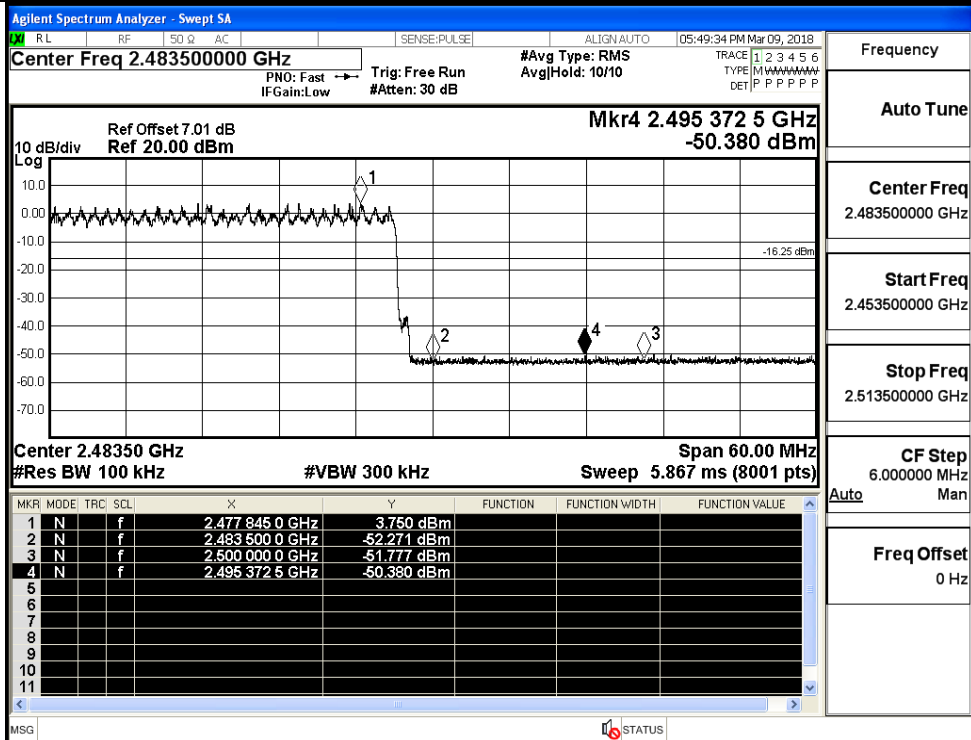
$\pi/4$ DQPSK/LCH/Hop



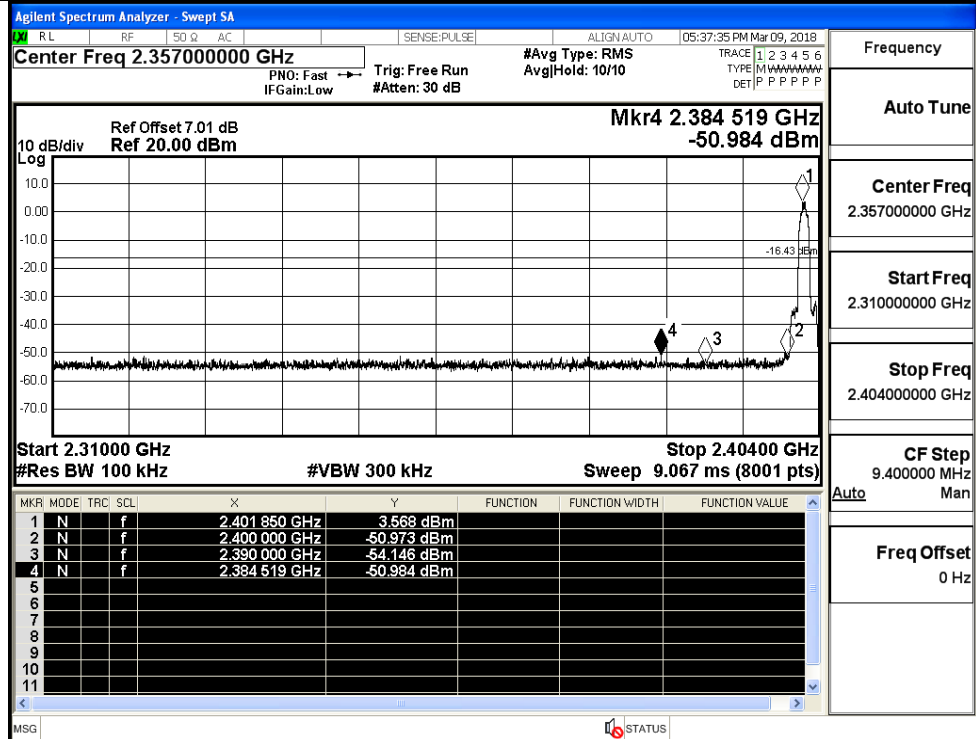
$\pi/4$ DQPSK/HCH/No
Hop



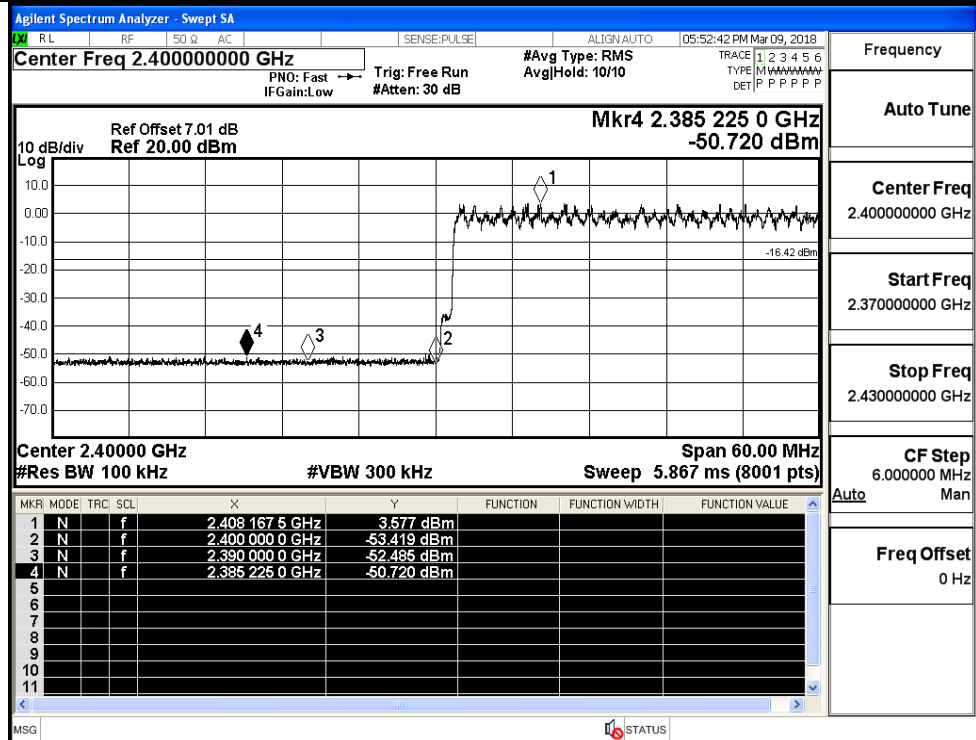
$\pi/4$ DQPSK/HCH/Hop



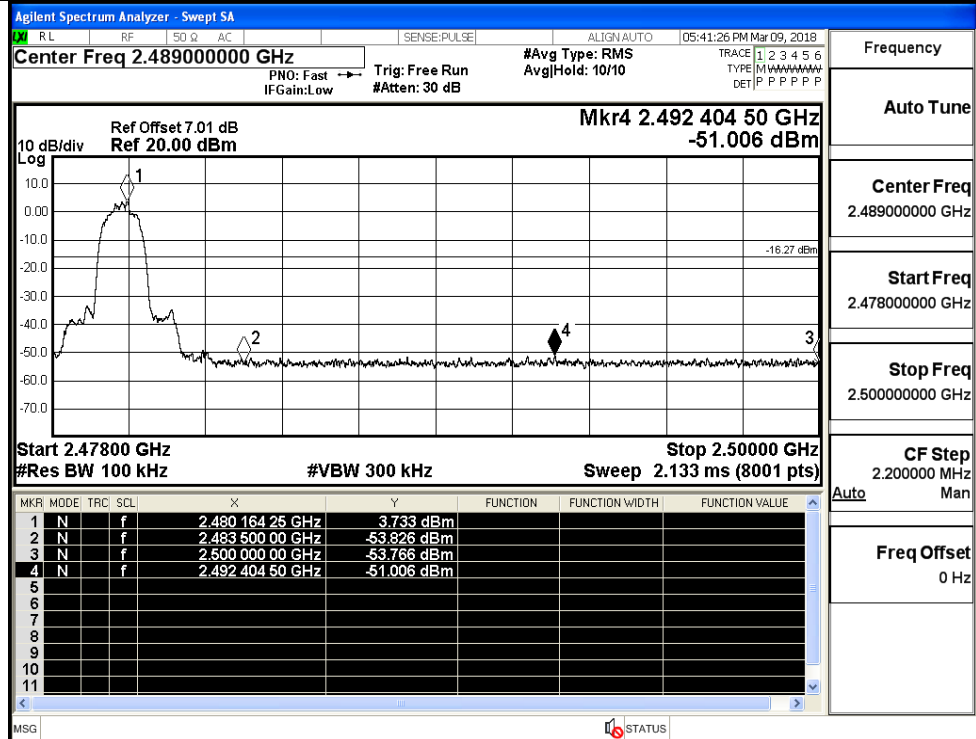
8DPSK/LCH/No Hop



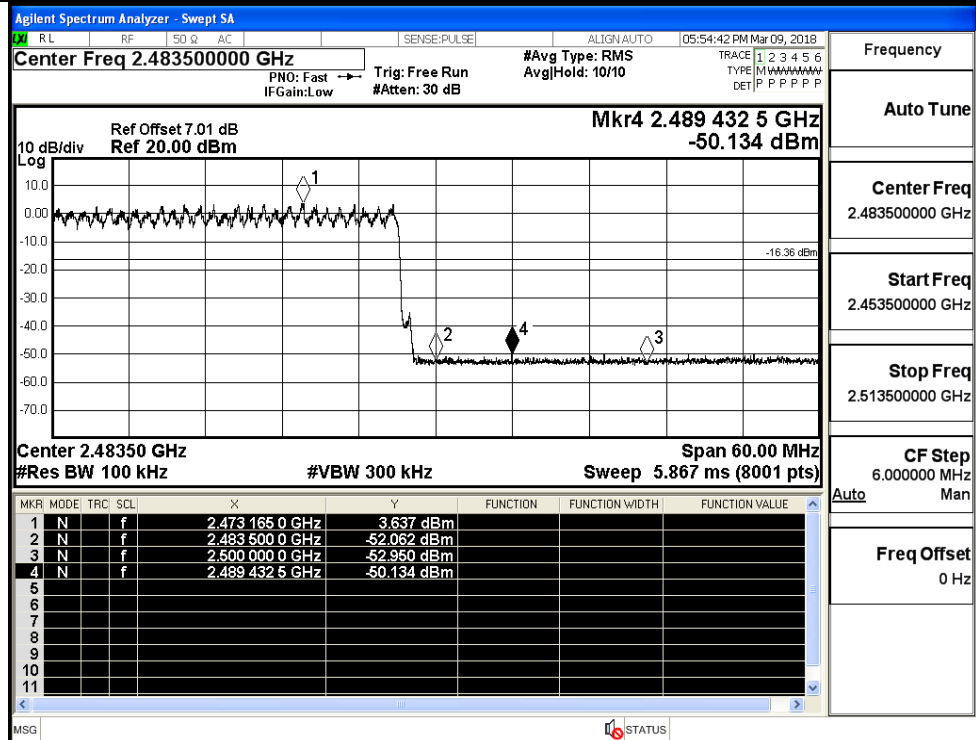
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



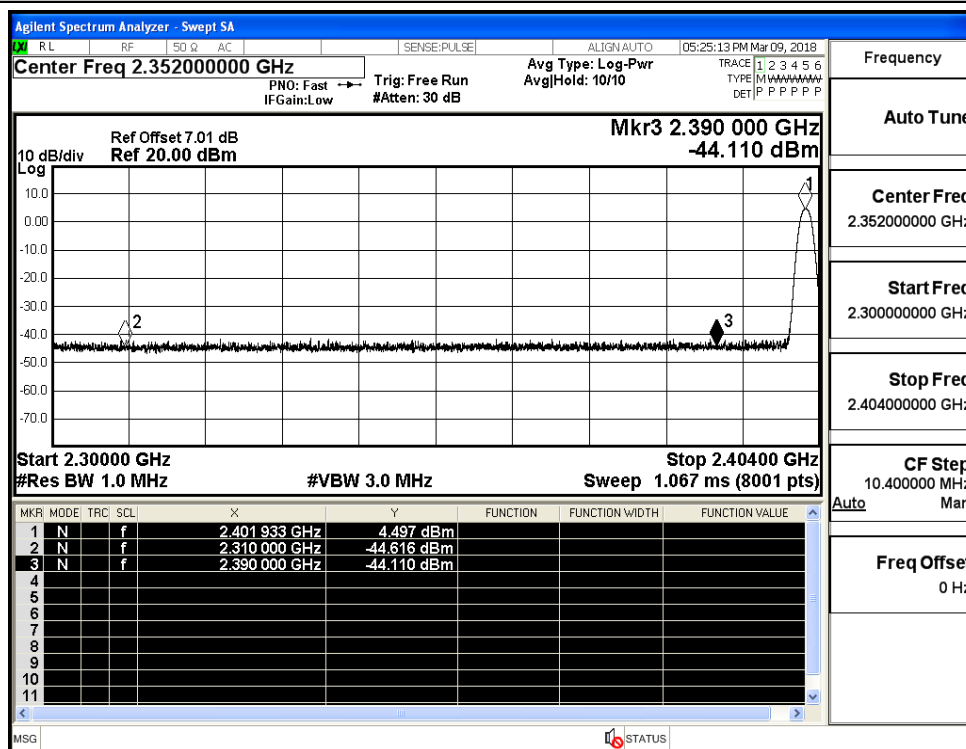
8DPSK/HCH/Hop



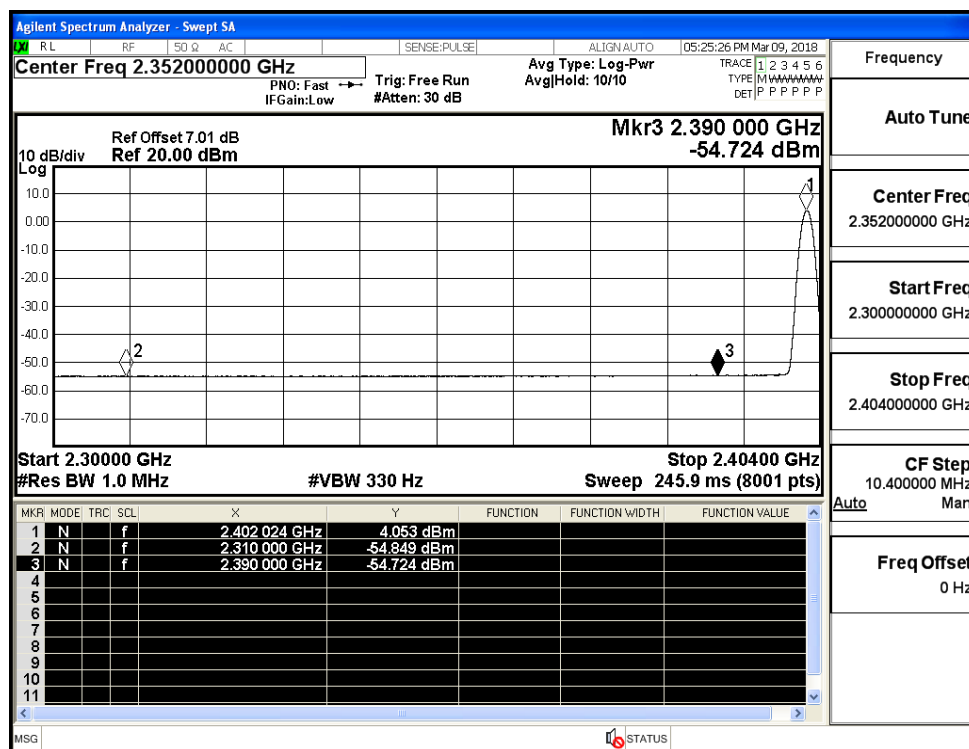
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.62	2.0	0	50.64	PEAK	74	PASS
	Off	2310.0	-54.85	2.0	0	40.41	AV	54	PASS
	Off	2390.0	-44.11	2.0	0	51.15	PEAK	74	PASS
	Off	2390.0	-54.72	2.0	0	40.53	AV	54	PASS
	Off	2483.5	-43.98	2.0	0	51.27	PEAK	74	PASS
	Off	2483.5	-54.19	2.0	0	41.07	AV	54	PASS
	Off	2500.0	-42.92	2.0	0	52.33	PEAK	74	PASS
	Off	2500.0	-54.20	2.0	0	41.06	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.22	2.0	0	53.04	PEAK	74	PASS
	Off	2310.0	-54.97	2.0	0	40.29	AV	54	PASS
	Off	2390.0	-45.25	2.0	0	50.01	PEAK	74	PASS
	Off	2390.0	-54.60	2.0	0	40.66	AV	54	PASS
	Off	2483.5	-44.83	2.0	0	50.43	PEAK	74	PASS
	Off	2483.5	-54.13	2.0	0	41.13	AV	54	PASS
	Off	2500.0	-44.07	2.0	0	51.18	PEAK	74	PASS
	Off	2500.0	-54.31	2.0	0	40.95	AV	54	PASS
8DPSK	Off	2310.0	-44.45	2.0	0	50.81	PEAK	74	PASS
	Off	2310.0	-54.99	2.0	0	40.26	AV	54	PASS
	Off	2390.0	-44.11	2.0	0	51.15	PEAK	74	PASS
	Off	2390.0	-54.53	2.0	0	40.73	AV	54	PASS
	Off	2483.5	-44.73	2.0	0	50.53	PEAK	74	PASS
	Off	2483.5	-54.05	2.0	0	41.21	AV	54	PASS
	Off	2500.0	-43.81	2.0	0	51.44	PEAK	74	PASS
	Off	2500.0	-54.11	2.0	0	41.15	AV	54	PASS

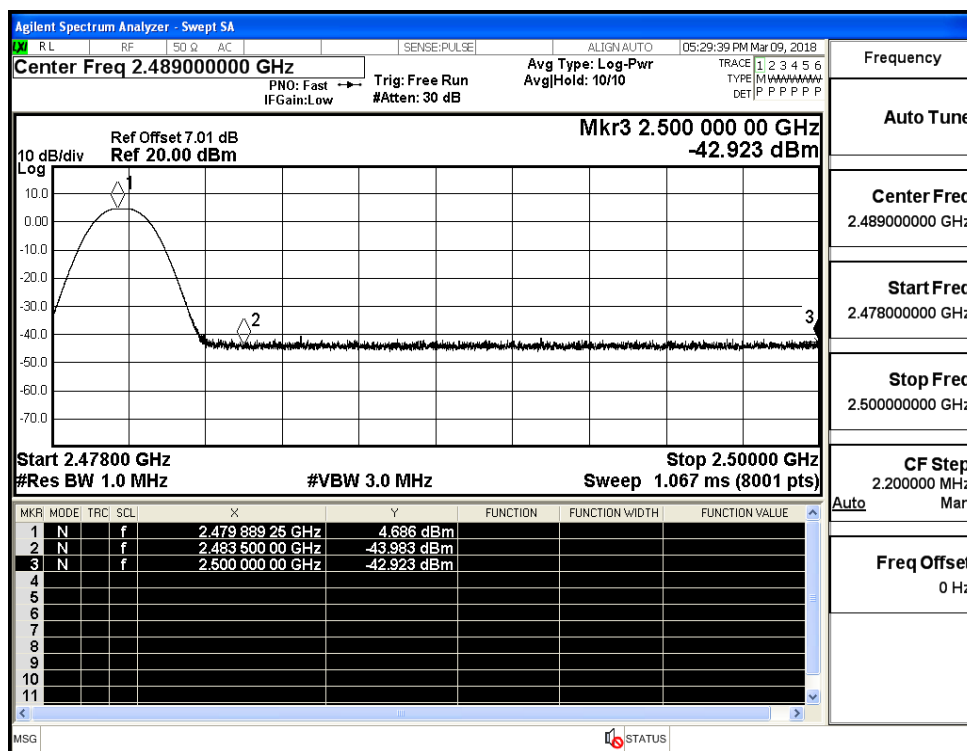
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



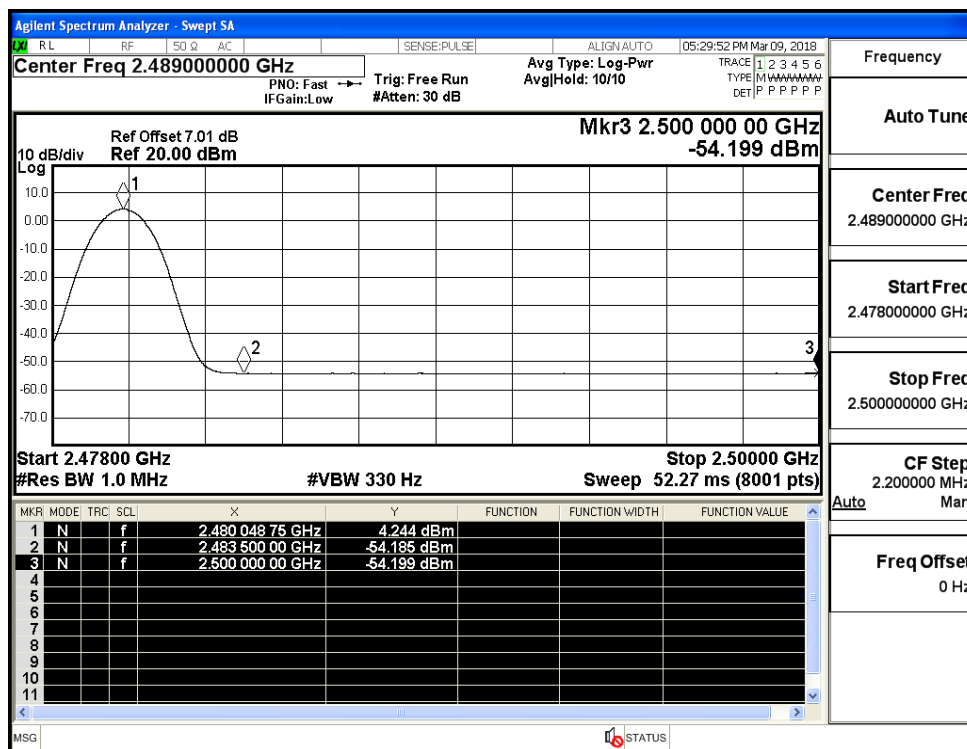
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

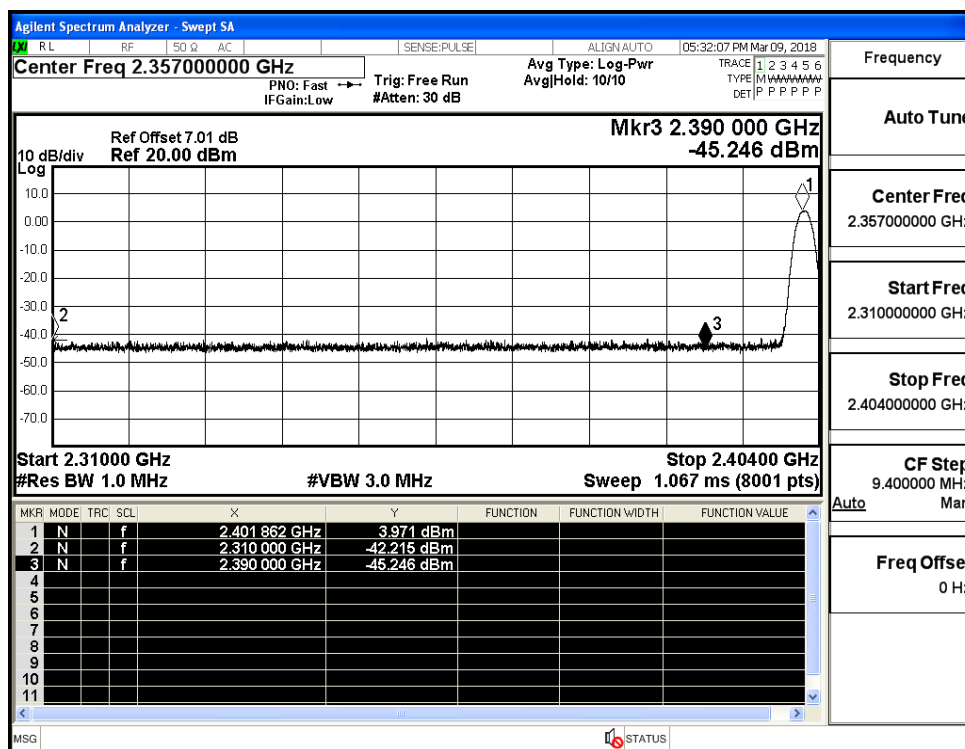
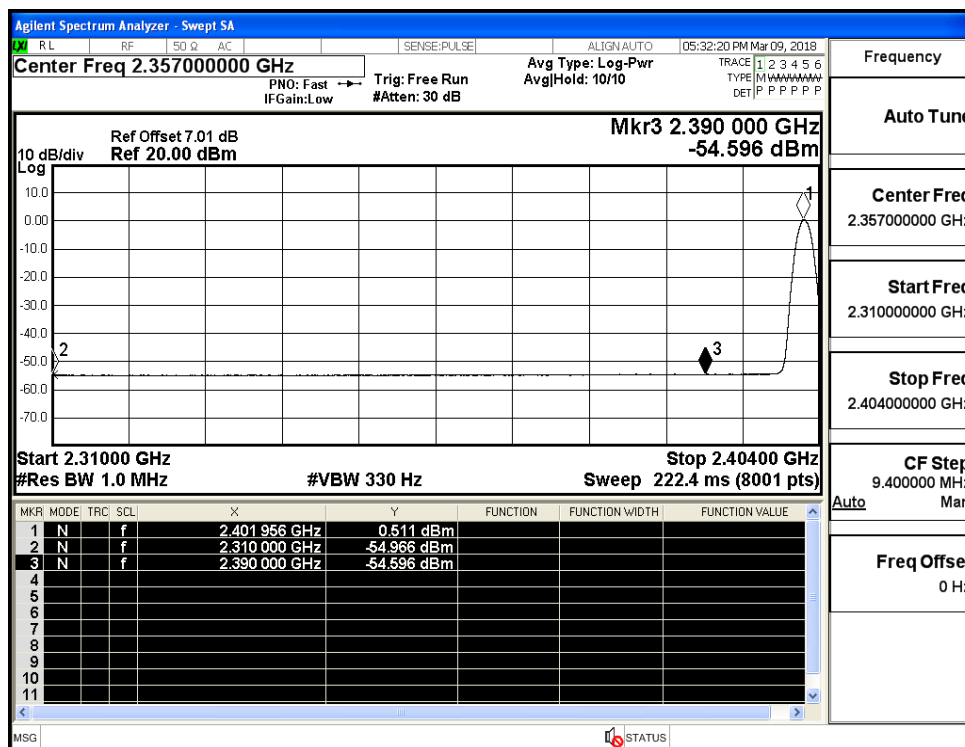


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

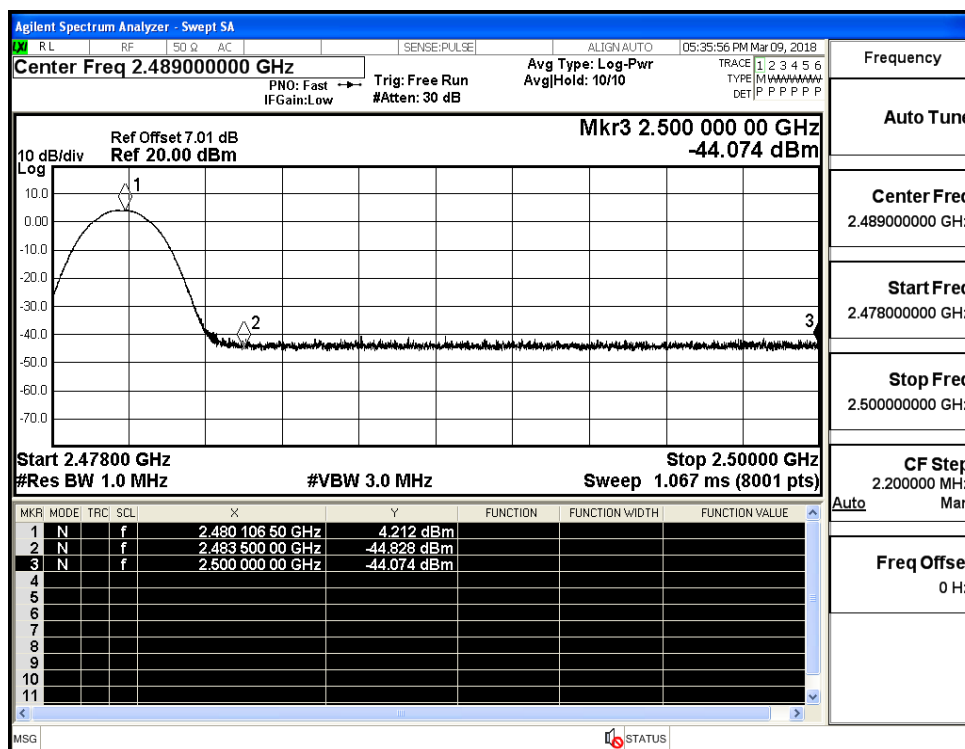


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

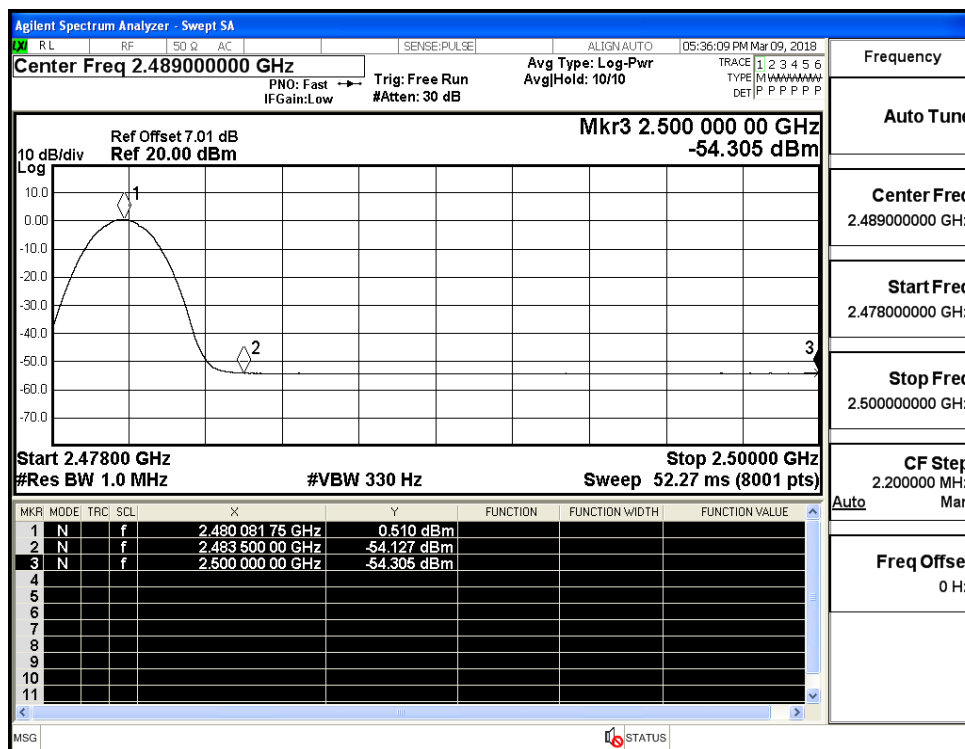


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

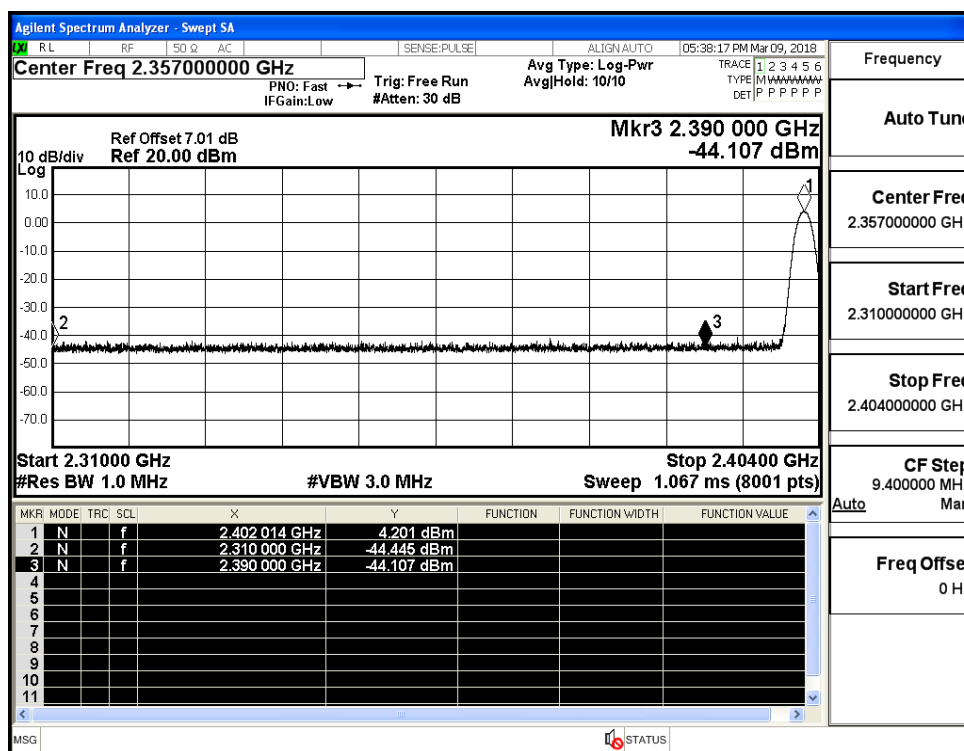
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



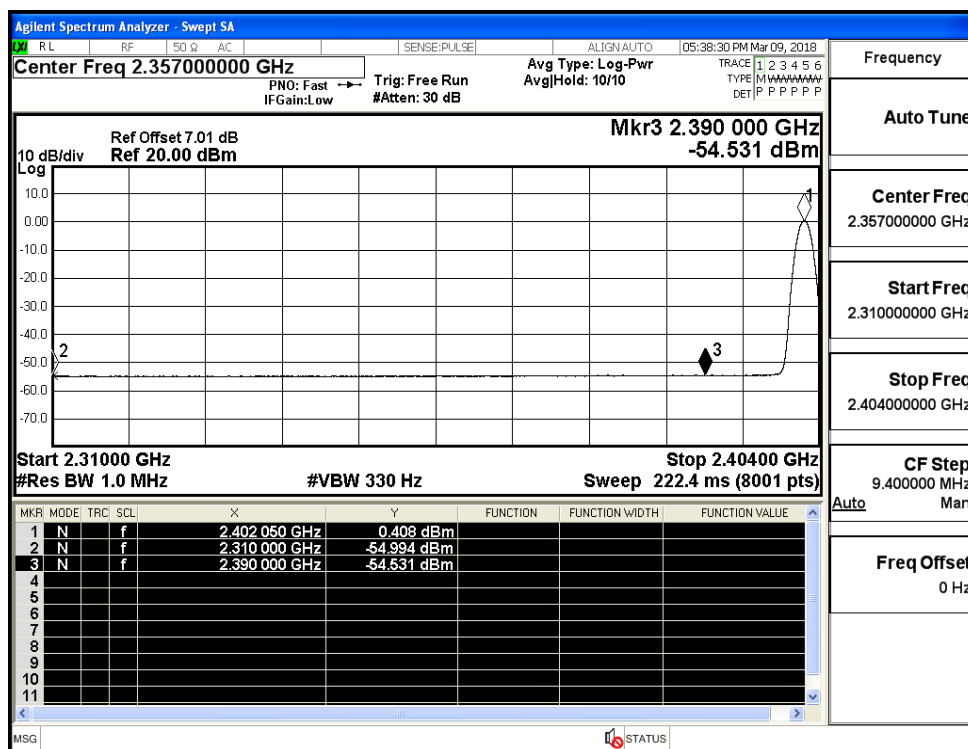
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



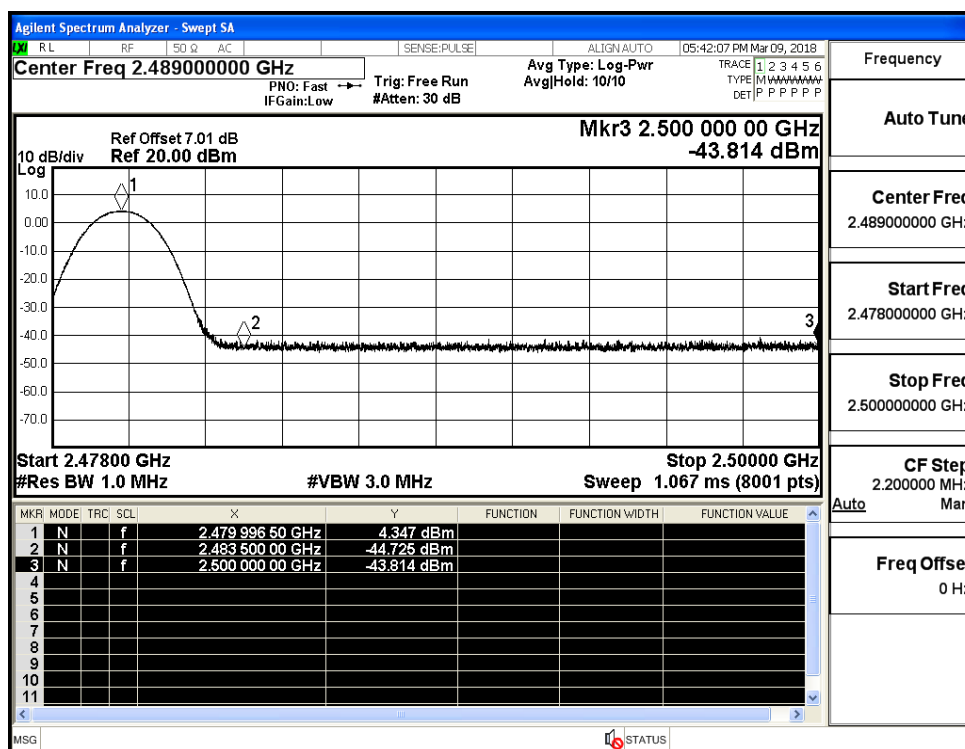
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

