

Appendix A

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

Product Name: **Bluetooth Backpack Speaker**

Trade Mark: **WizPak**

Test Model: **WizPak**

Environmental Conditions

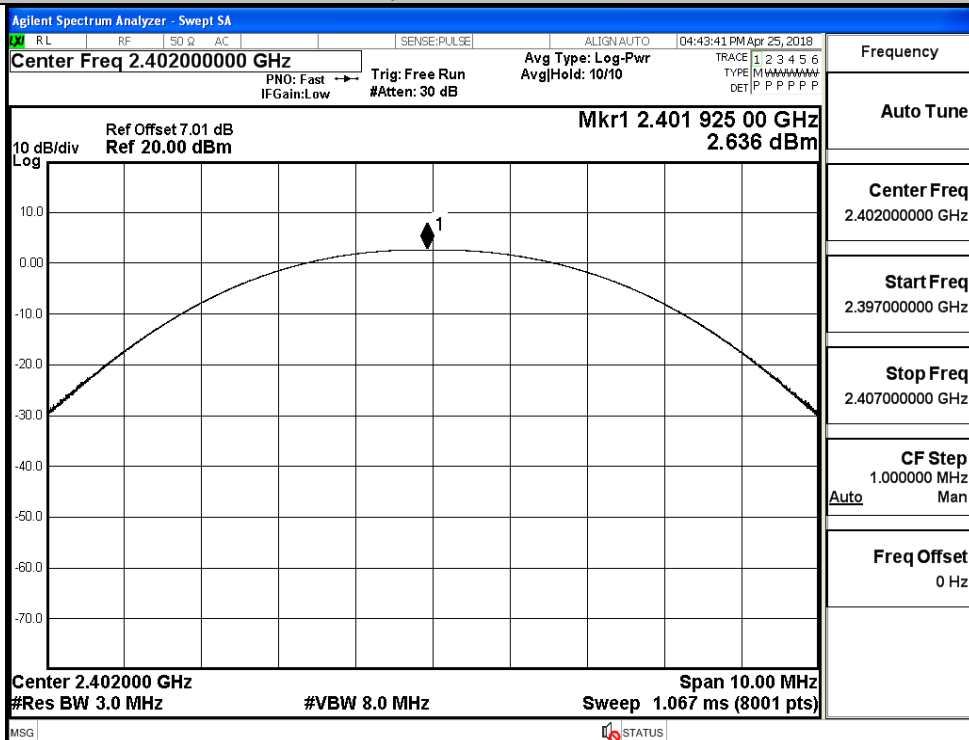
Temperature:	21.3 ° C
Relative Humidity:	52.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Wilson.Hong
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

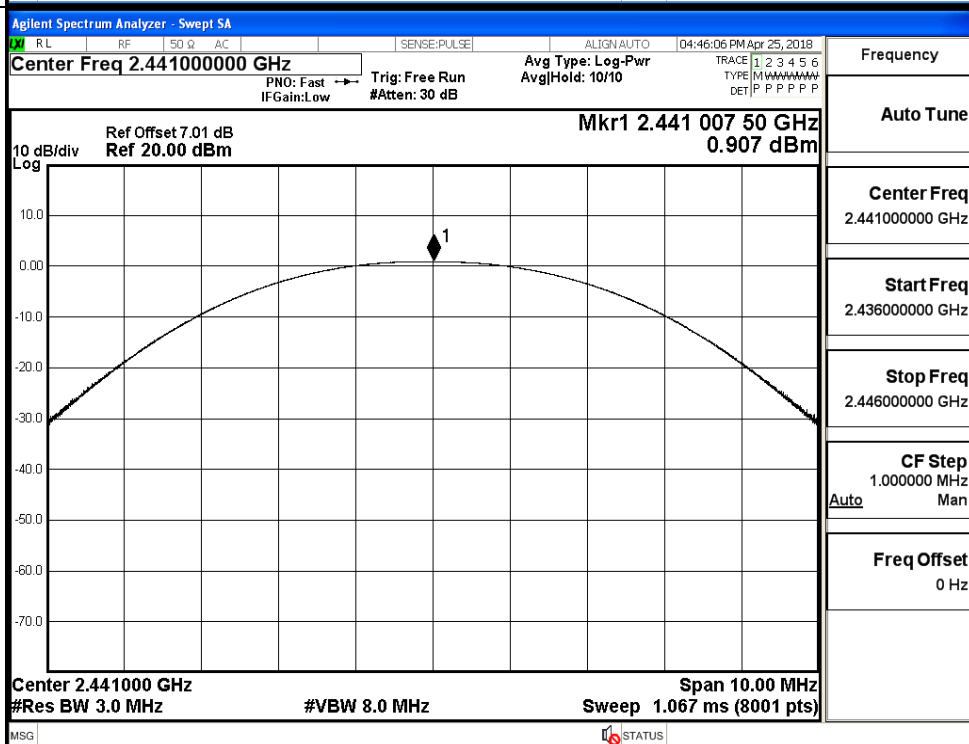
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.636	21	PASS
	MCH	0.907	21	PASS
	HCH	1.196	21	PASS
$\pi/4$ DQPSK	LCH	1.810	21	PASS
	MCH	0.258	21	PASS
	HCH	0.348	21	PASS
8DPSK	LCH	1.900	21	PASS
	MCH	0.383	21	PASS
	HCH	0.393	21	PASS

Test Graphs

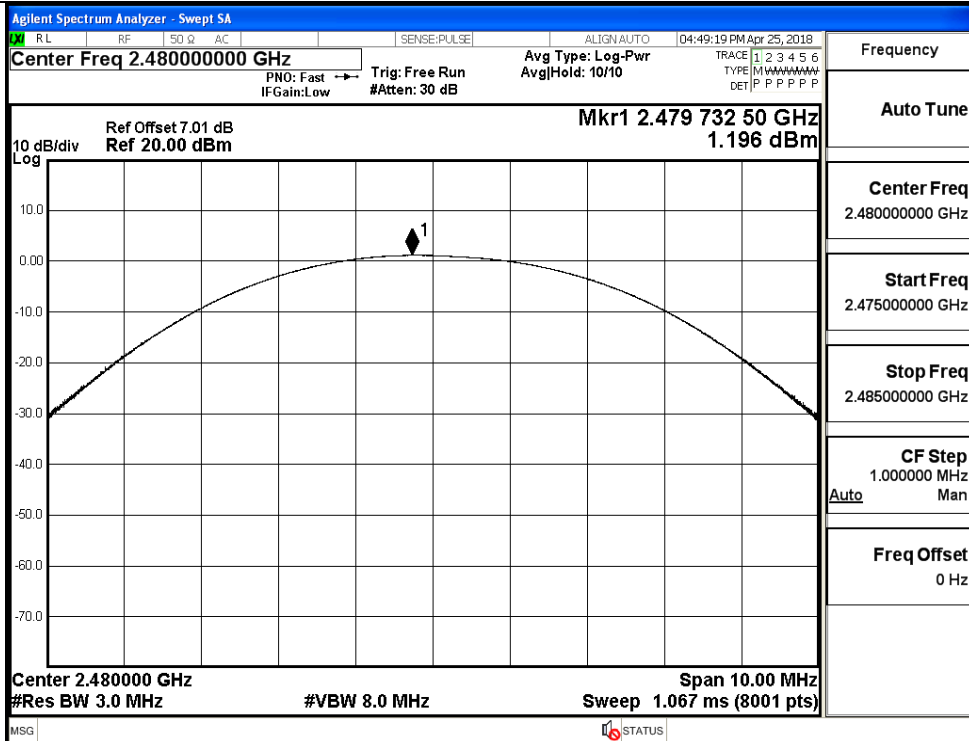
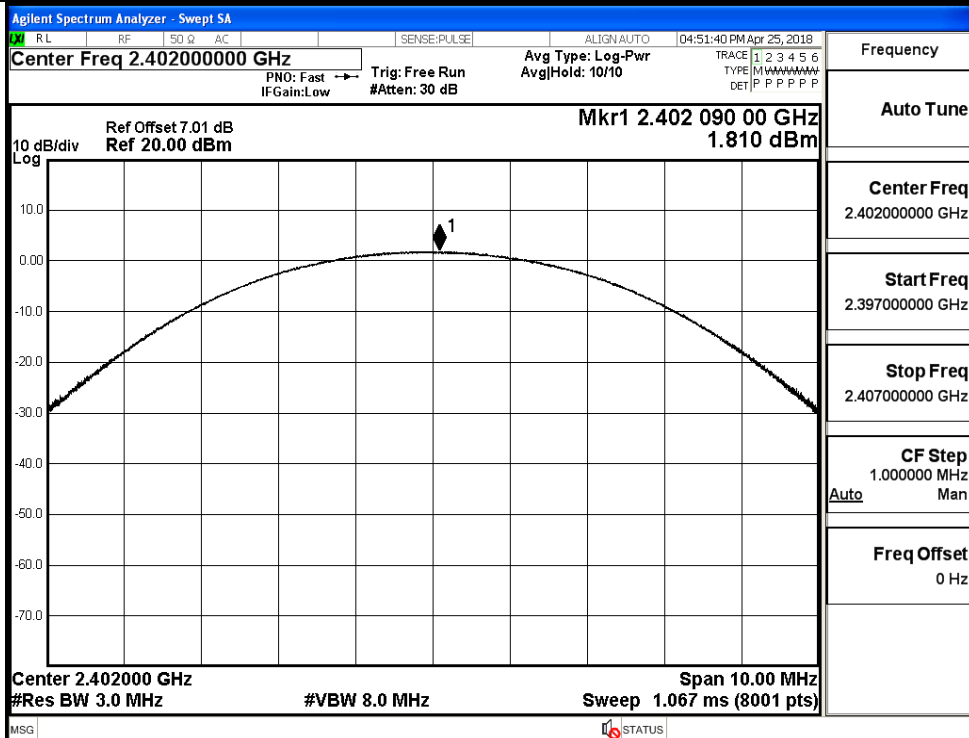
GFSK/LCH

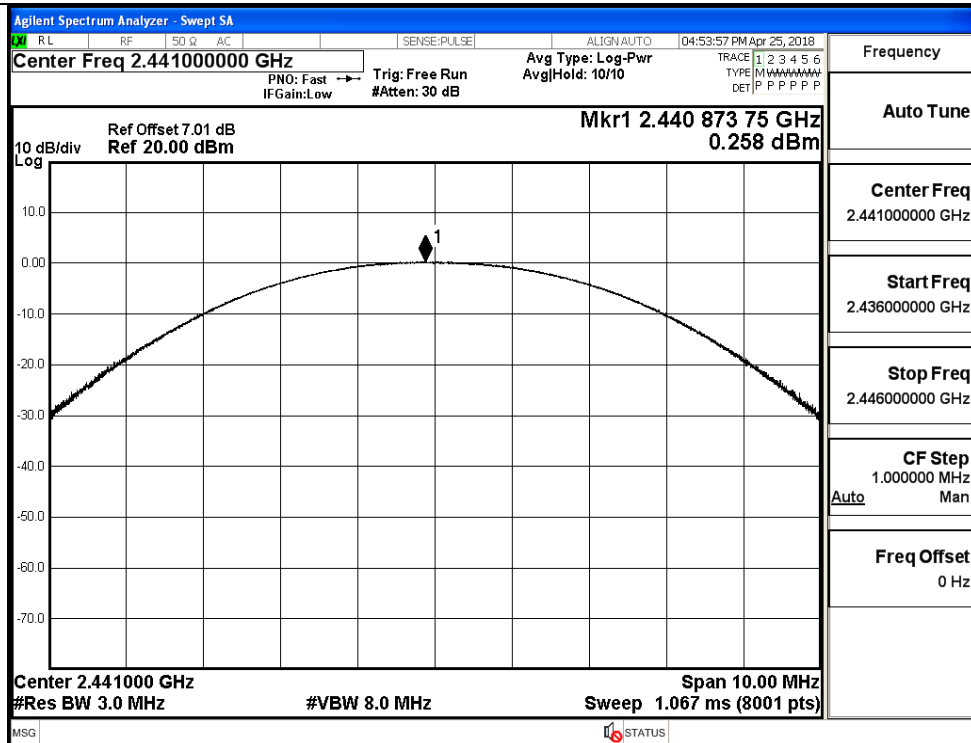
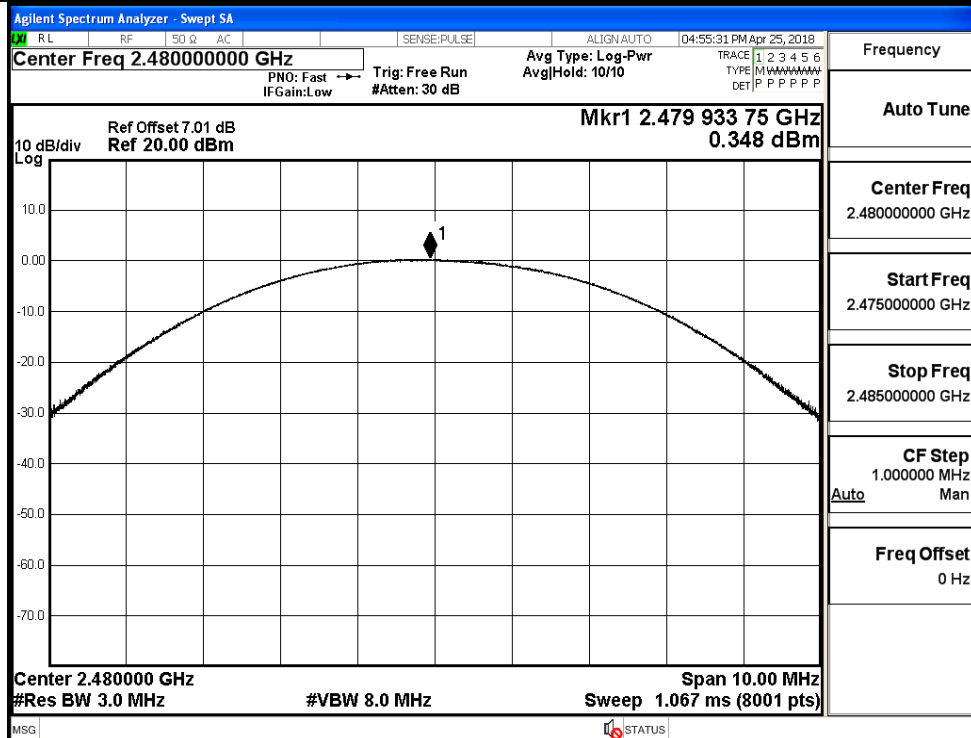


GFSK/MCH

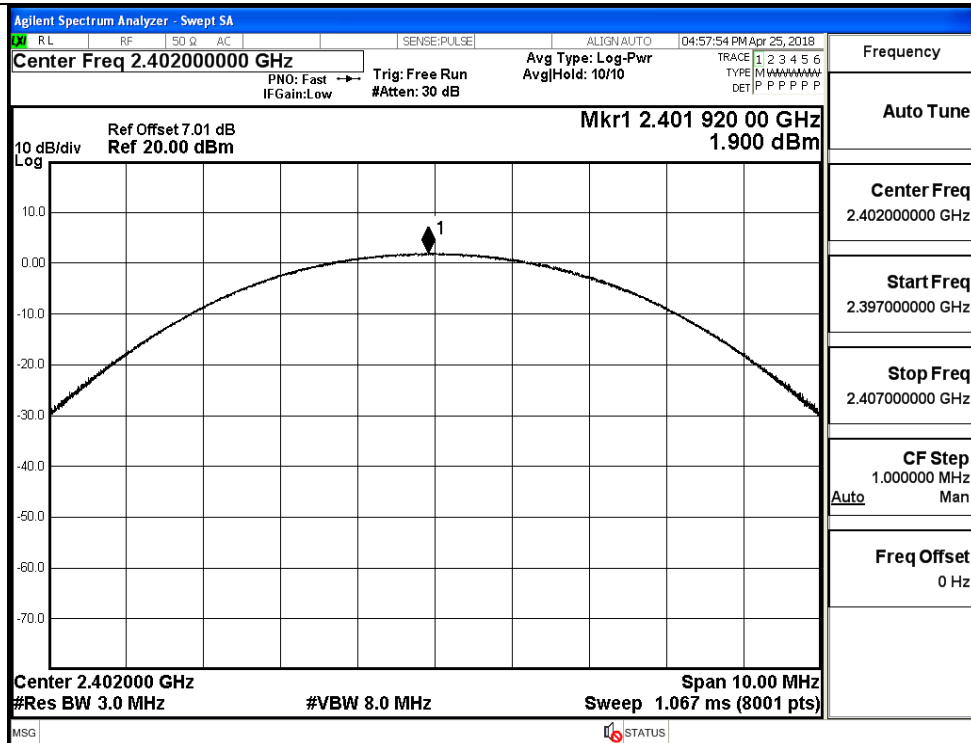


GFSK/HCH

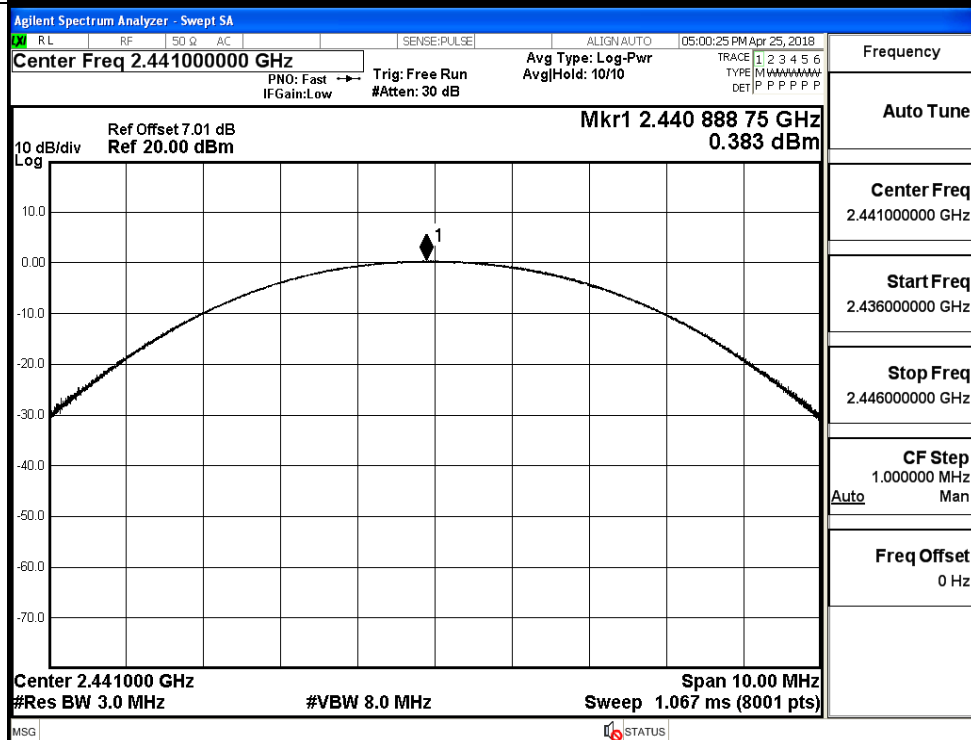
 π /4DQPSK/LCH

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

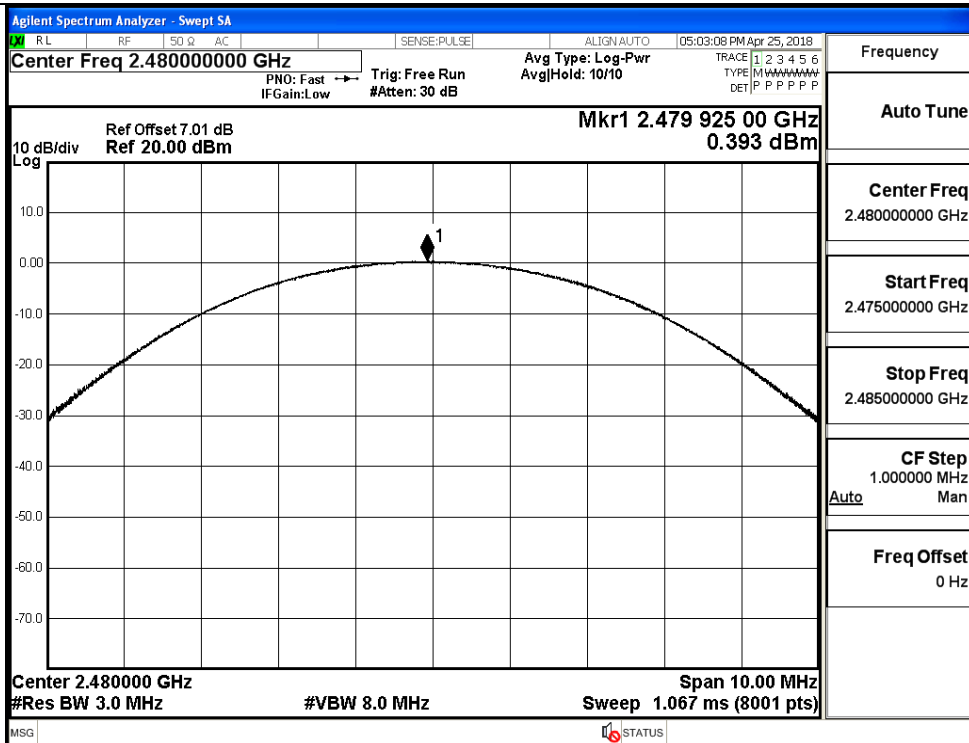
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

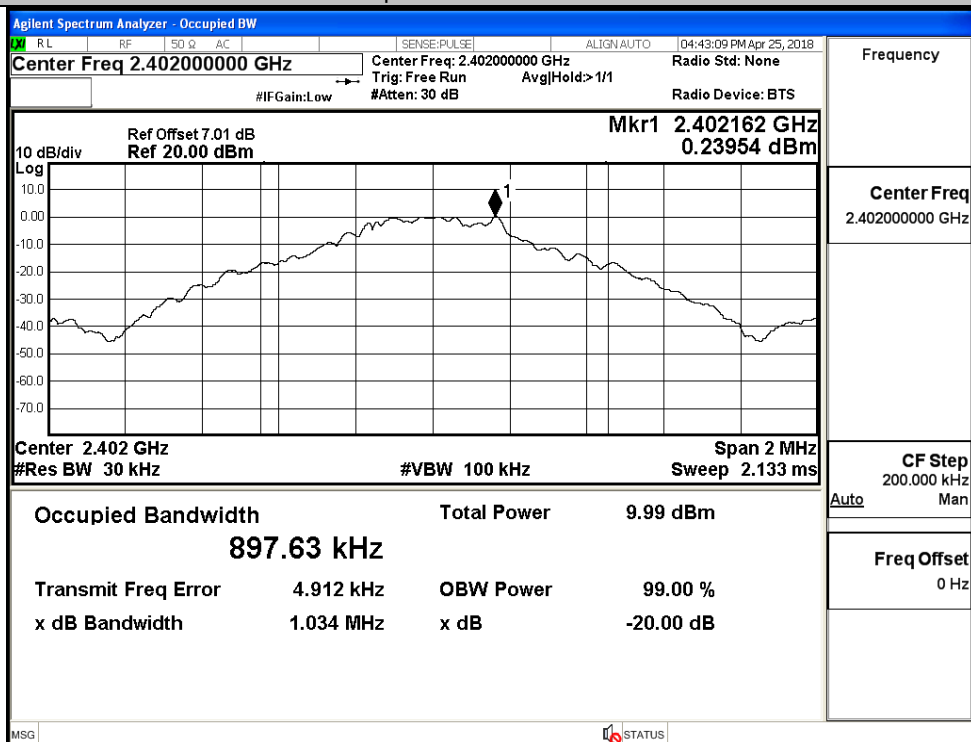


A.2 20dB Bandwidth

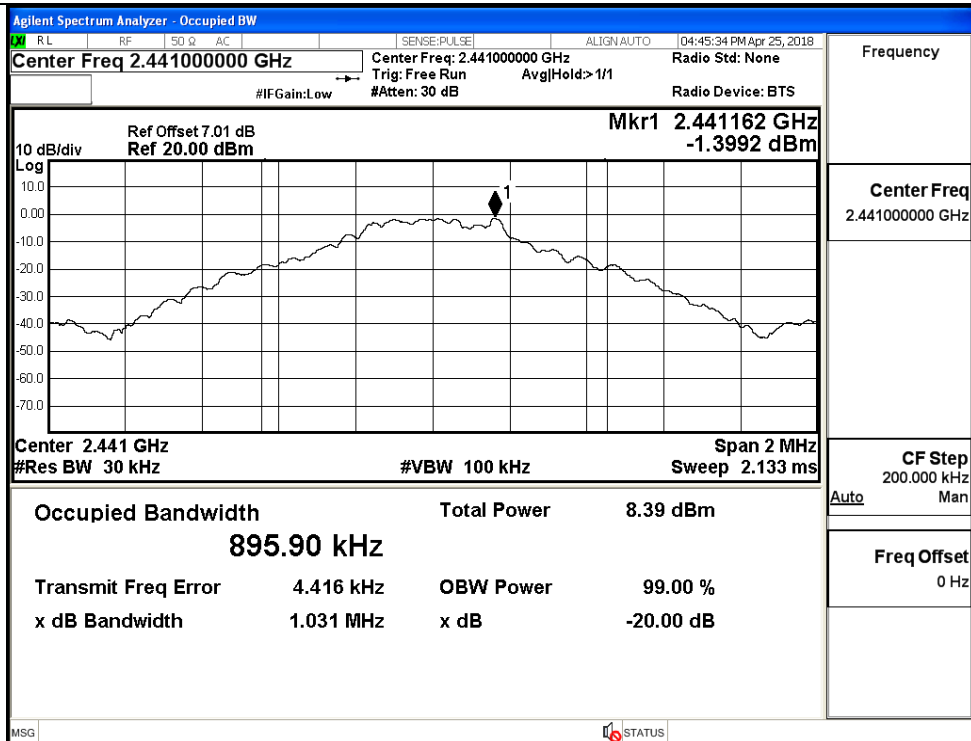
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.034	Not Specified	PASS
	MCH	1.031	Not Specified	PASS
	HCH	1.036	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.291	Not Specified	PASS
	MCH	1.310	Not Specified	PASS
	HCH	1.309	Not Specified	PASS
8DPSK	LCH	1.293	Not Specified	PASS
	MCH	1.298	Not Specified	PASS
	HCH	1.295	Not Specified	PASS

Test Graphs

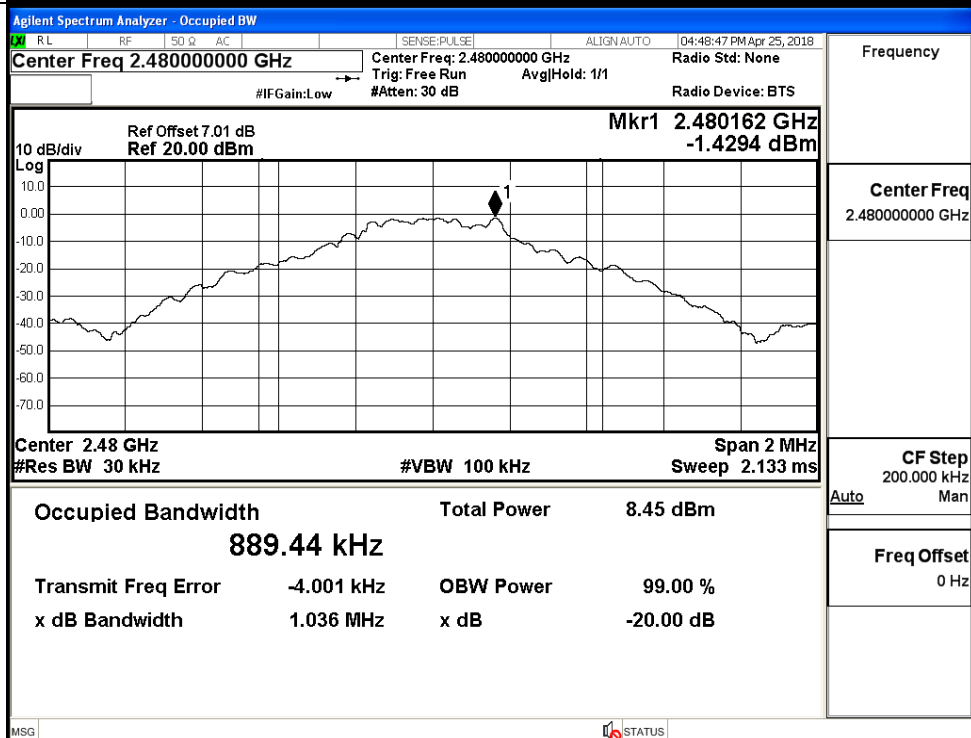
GFSK/LCH

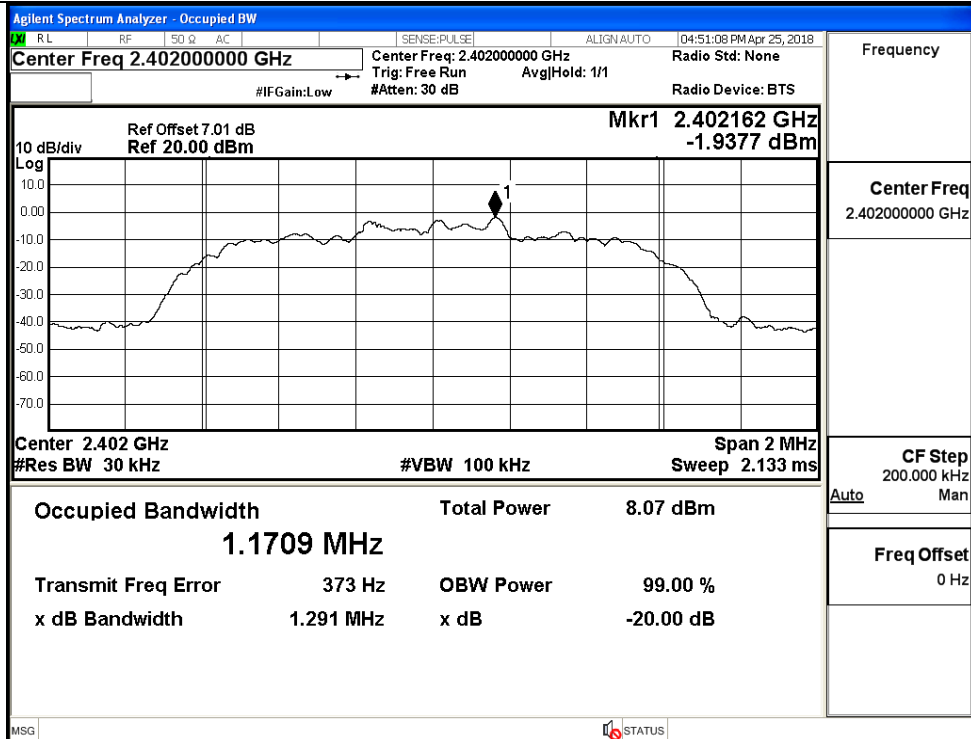
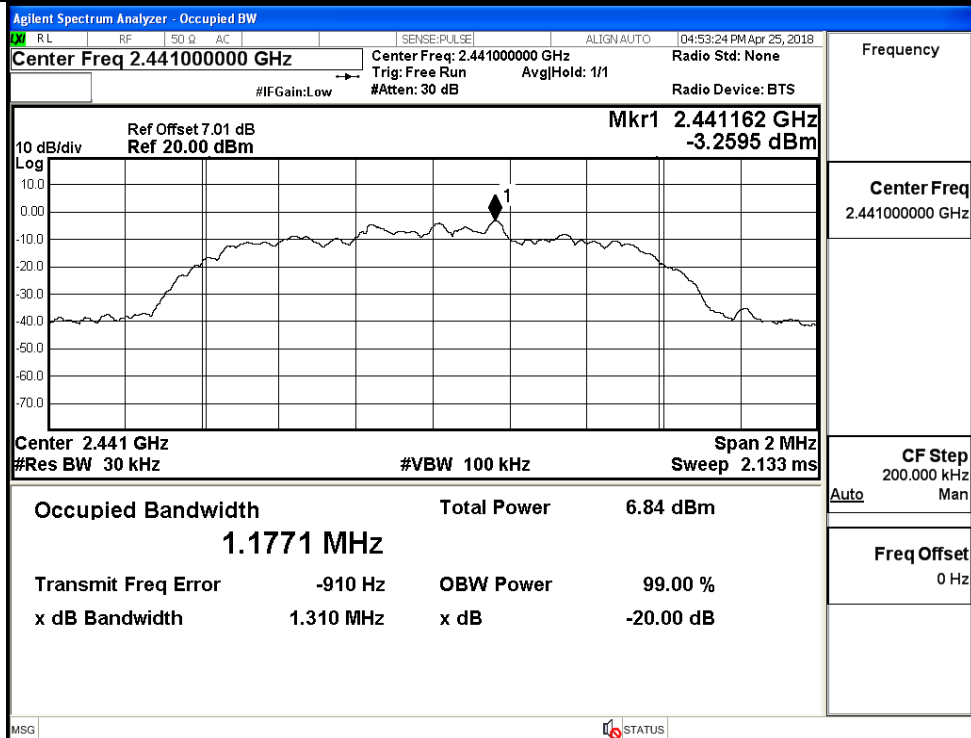


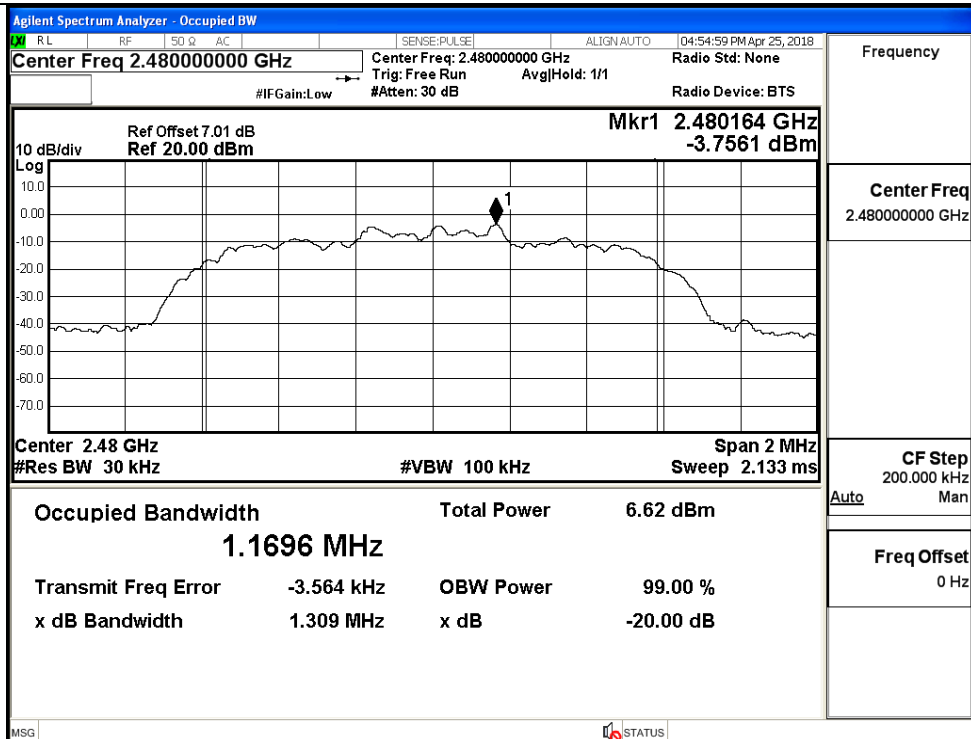
GFSK/MCH



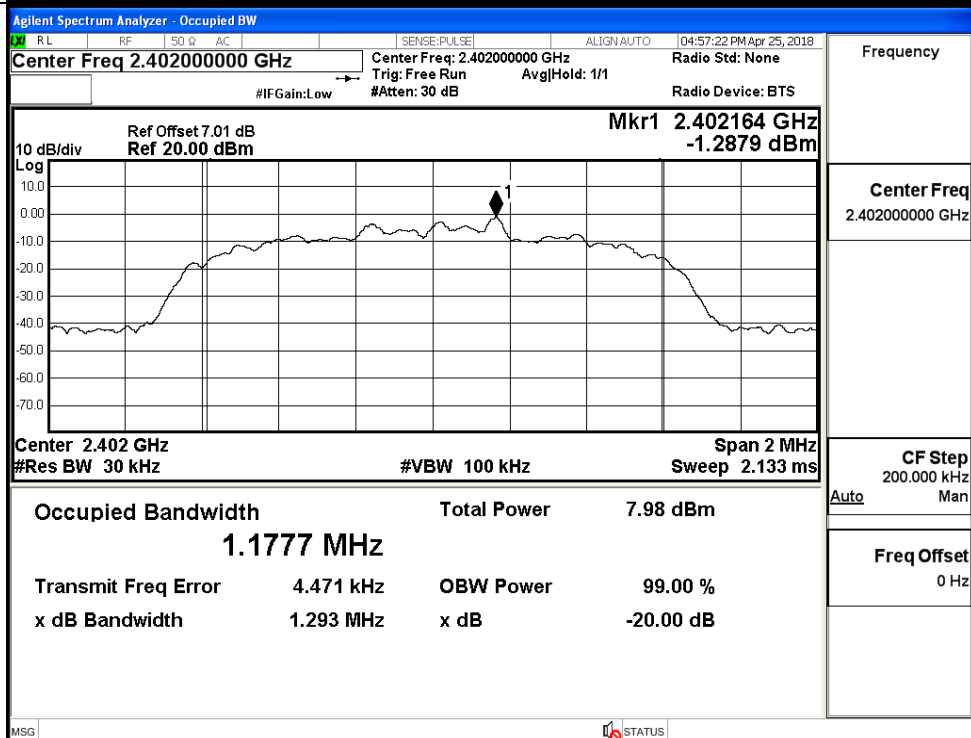
GFSK/HCH



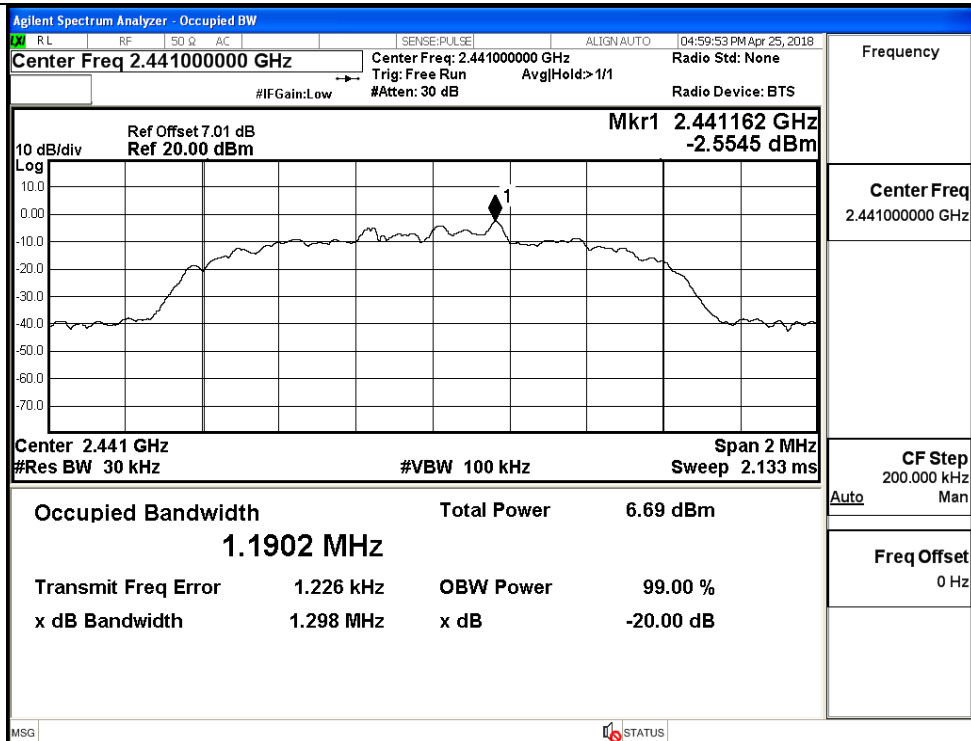
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

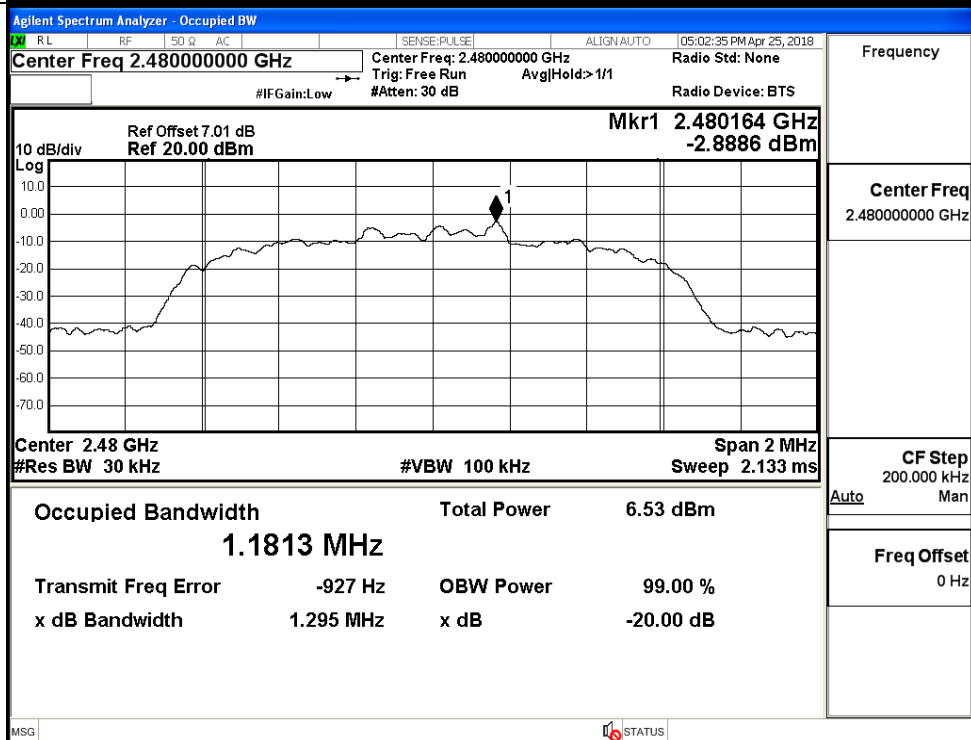
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

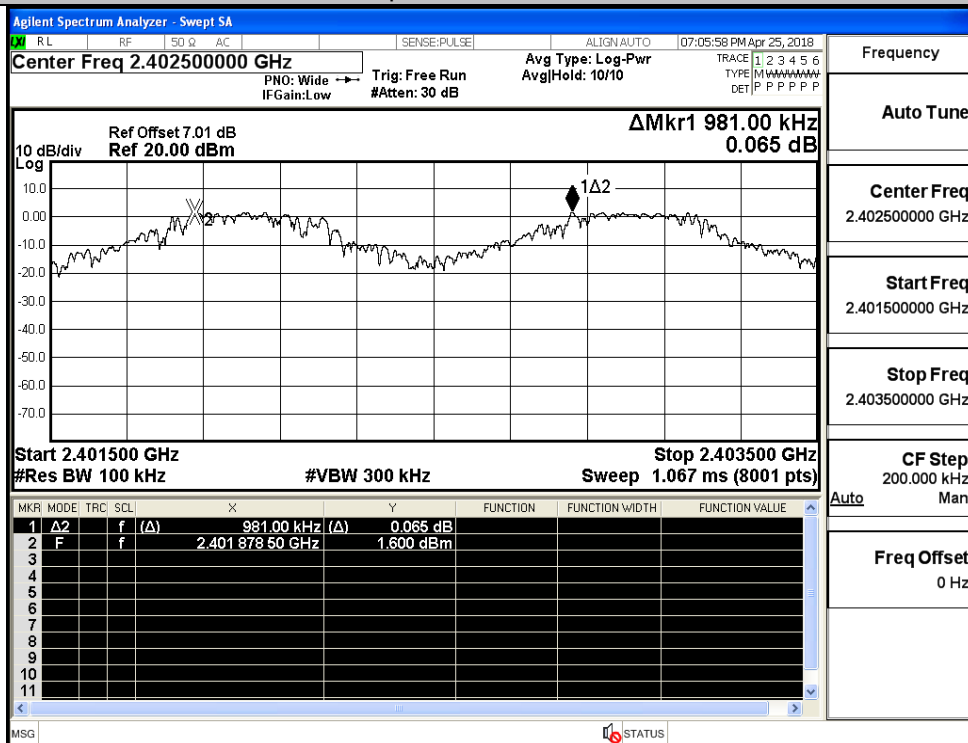


A.3 Carrier Frequency Separation

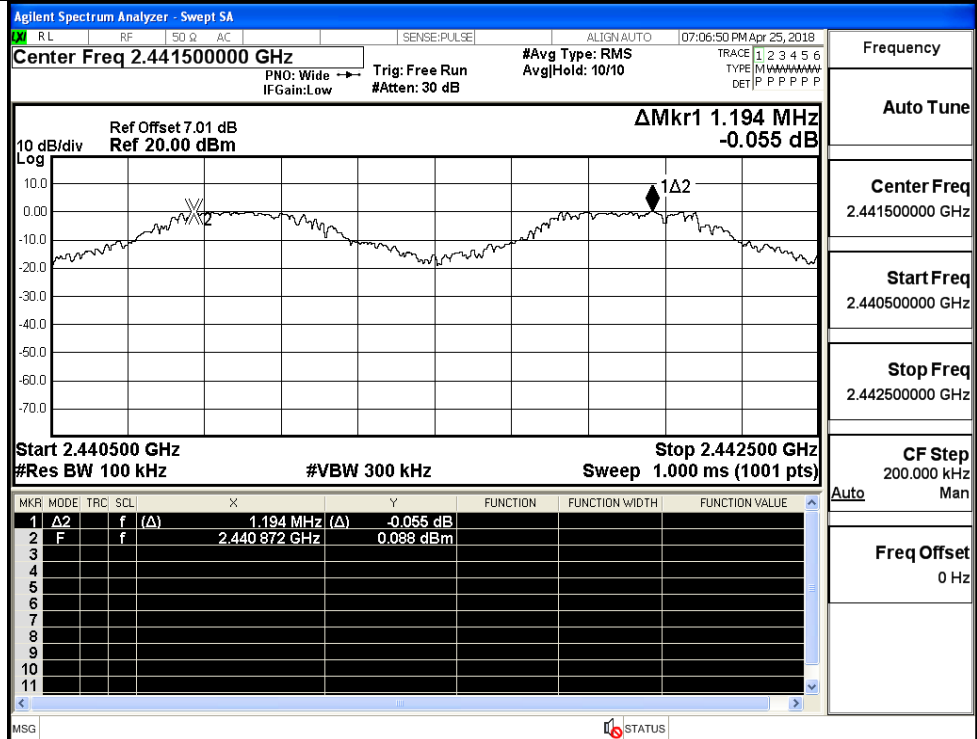
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.981	0.691	PASS
	MCH	1.194	0.691	PASS
	HCH	0.990	0.691	PASS
π /4DQPSK	LCH	0.994	0.873	PASS
	MCH	1.010	0.873	PASS
	HCH	1.204	0.873	PASS
8DPSK	LCH	1.150	0.865	PASS
	MCH	0.988	0.865	PASS
	HCH	1.292	0.865	PASS

Test Graphs

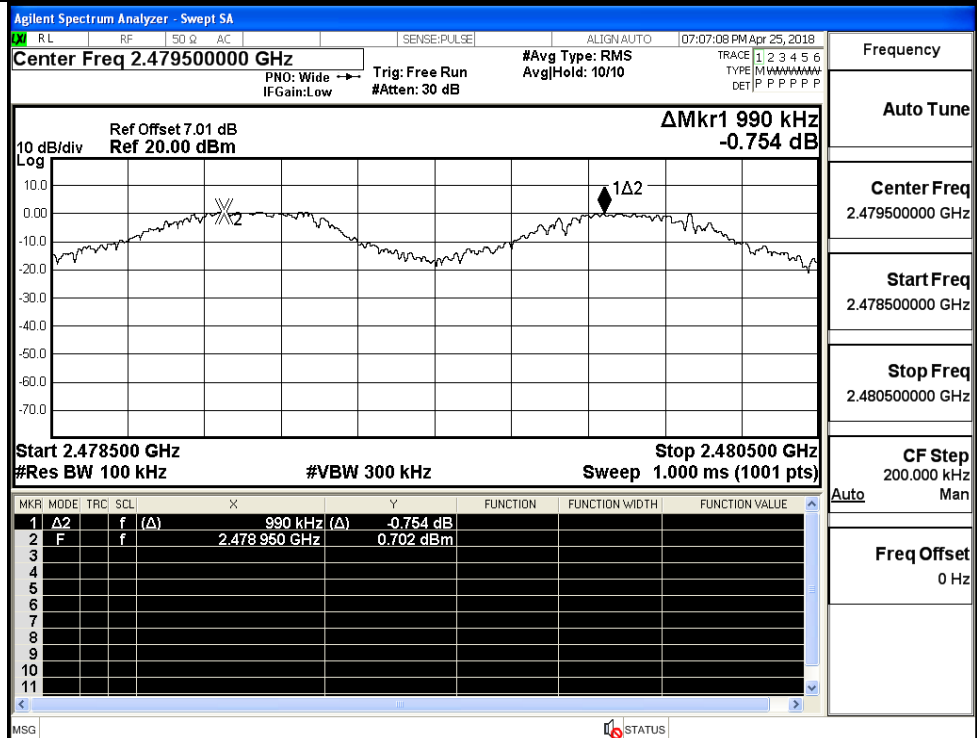
GFSK/LCH

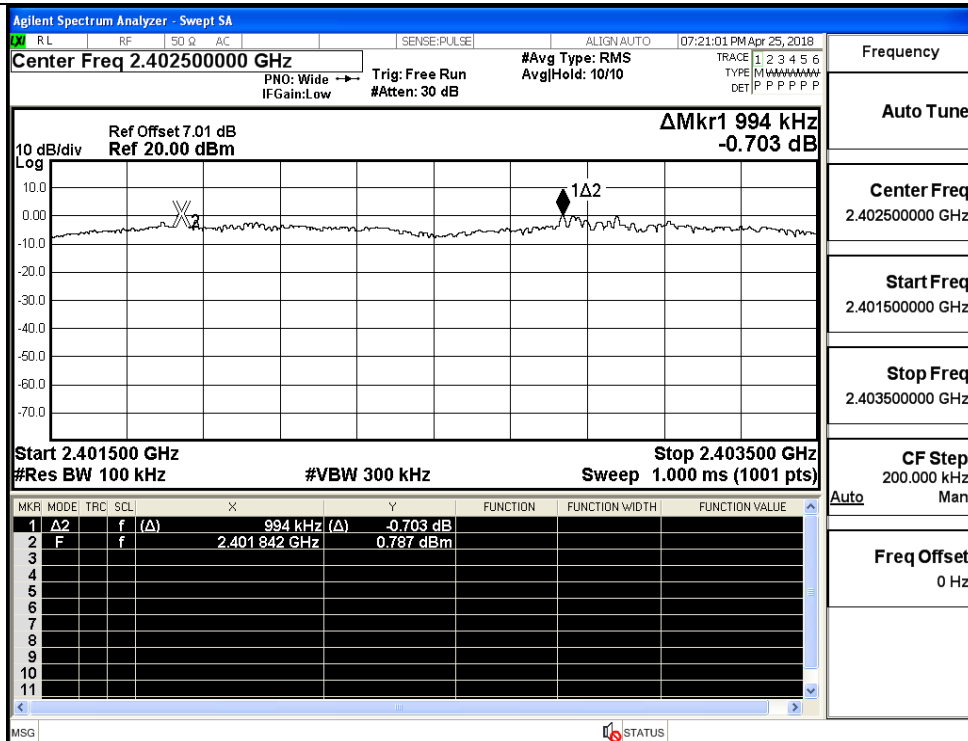
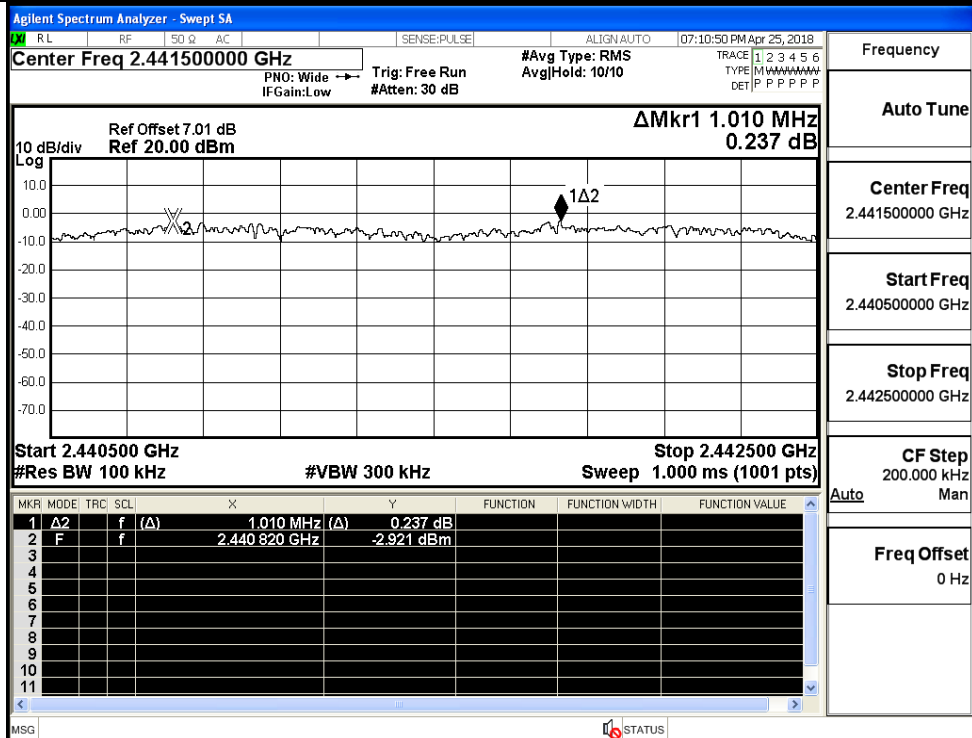


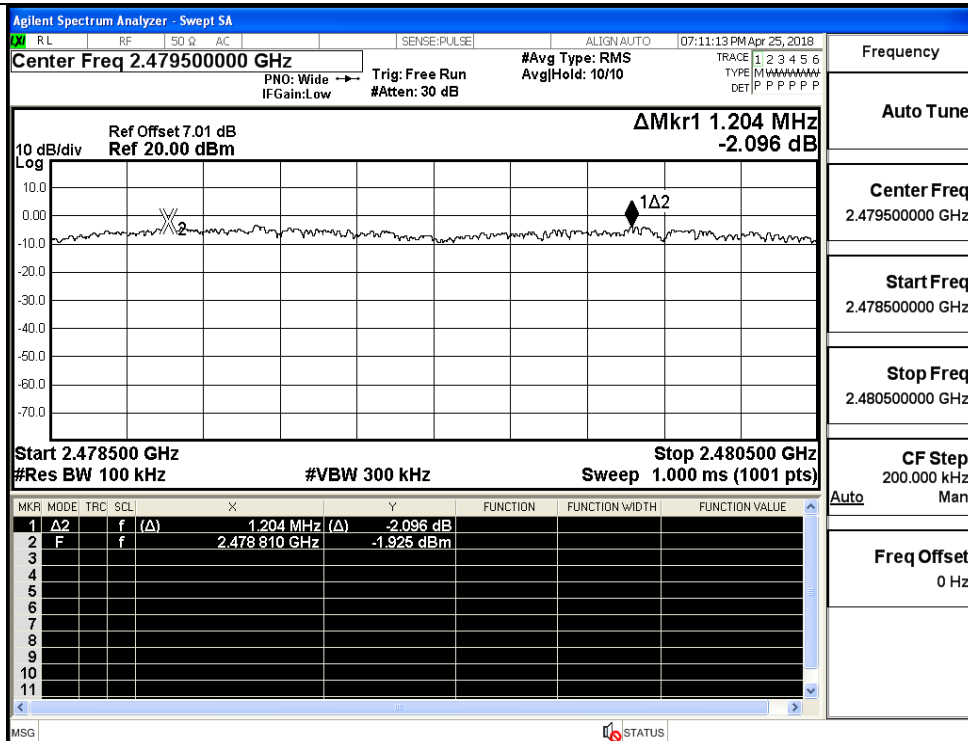
GFSK/MCH



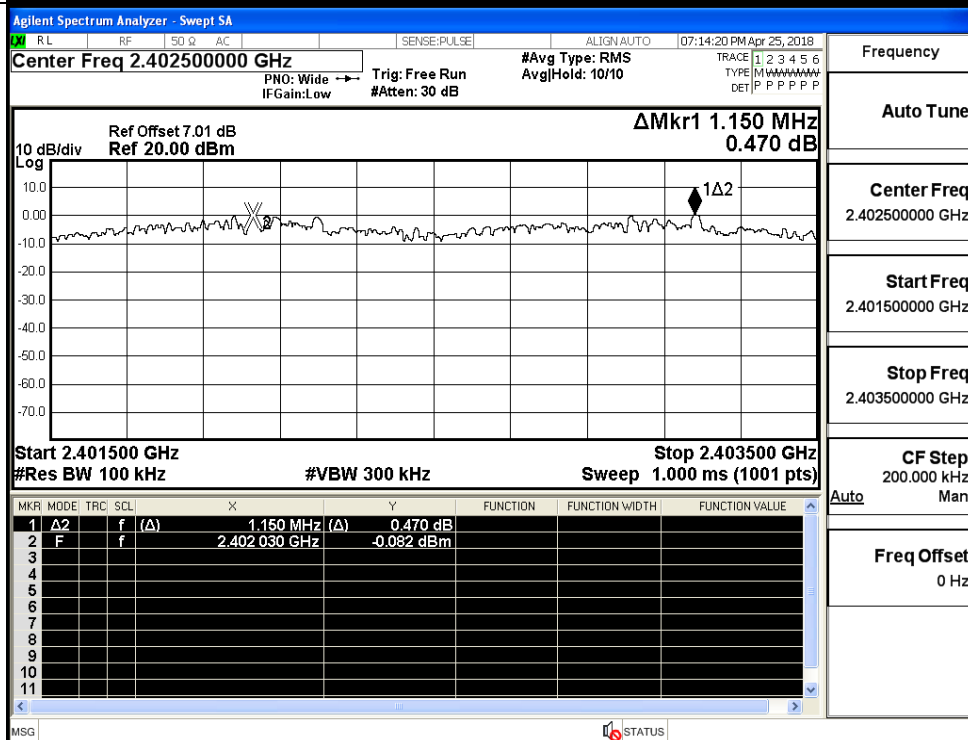
GFSK/HCH



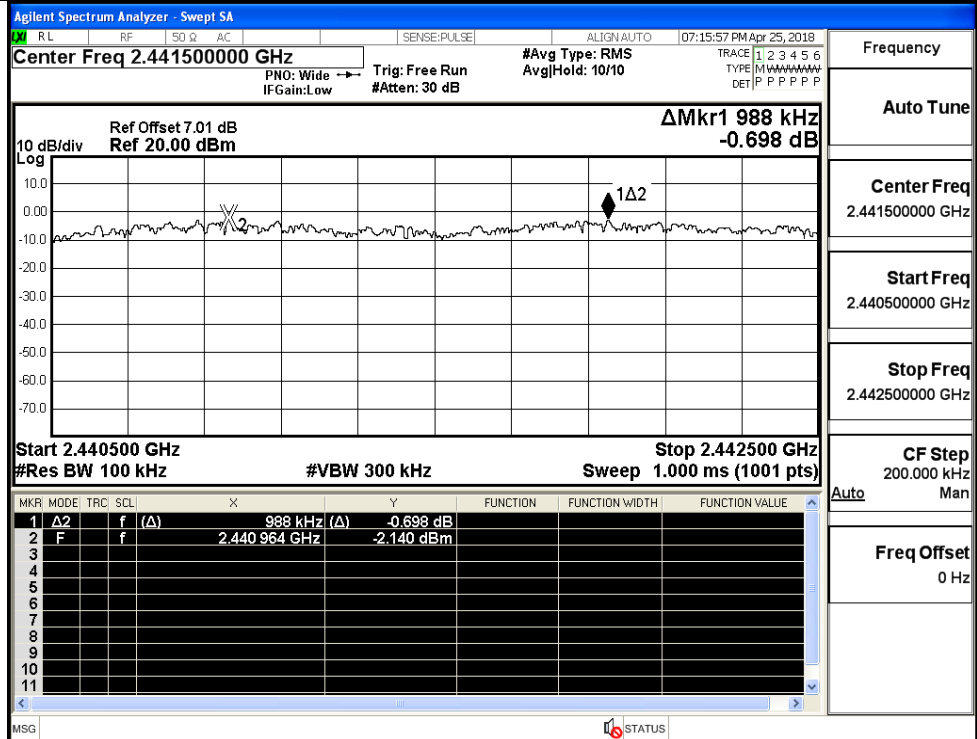
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

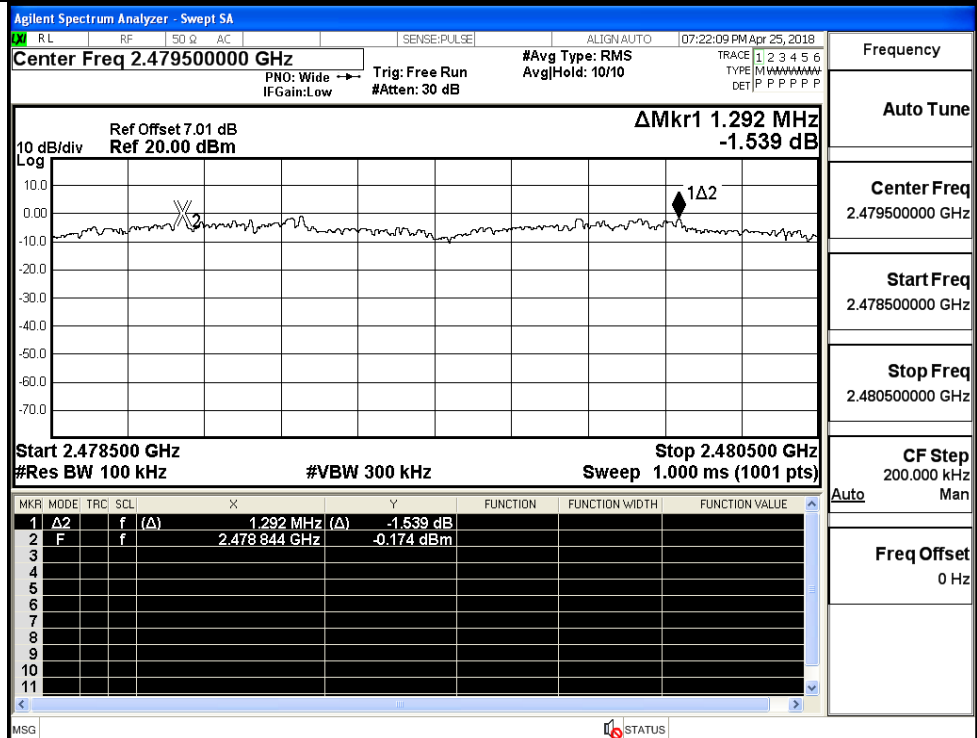
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

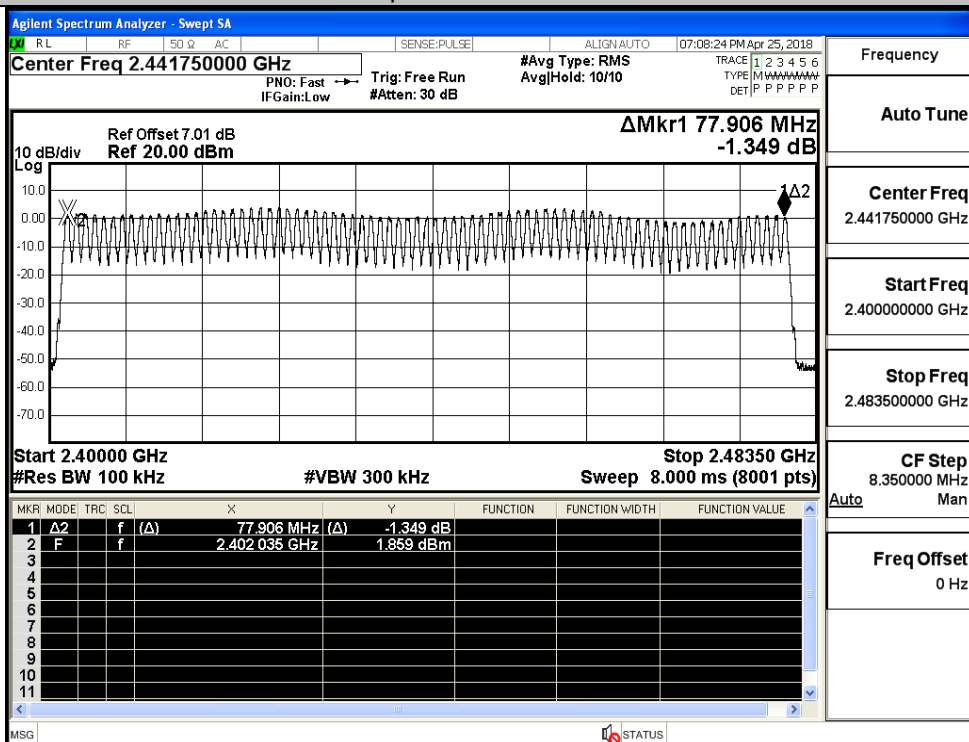
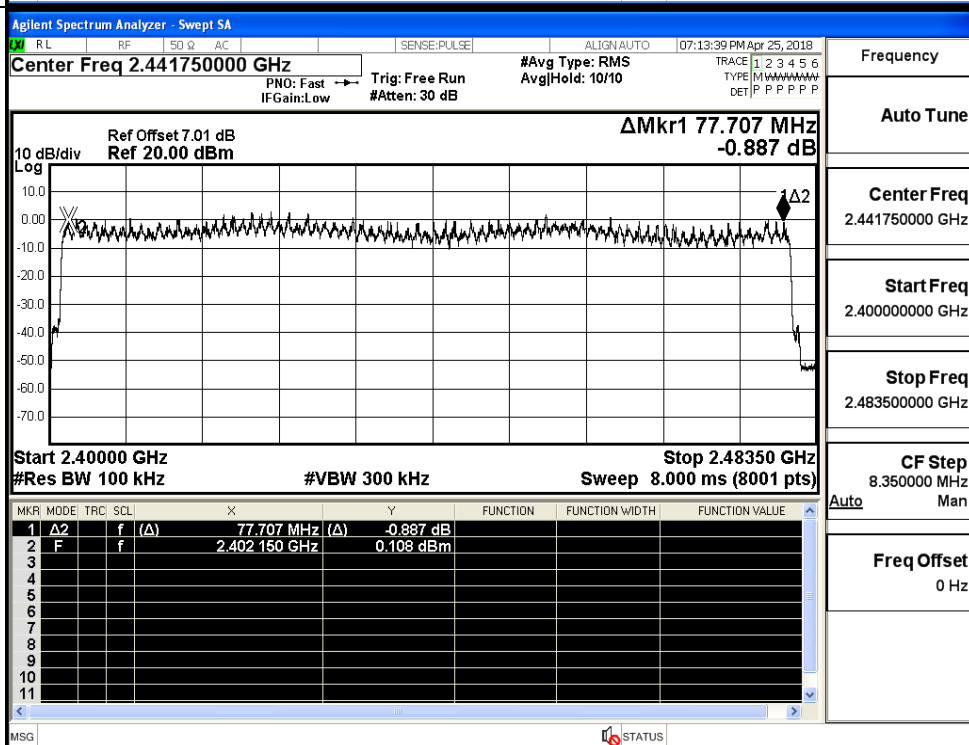


A.4 Hopping Channel Number

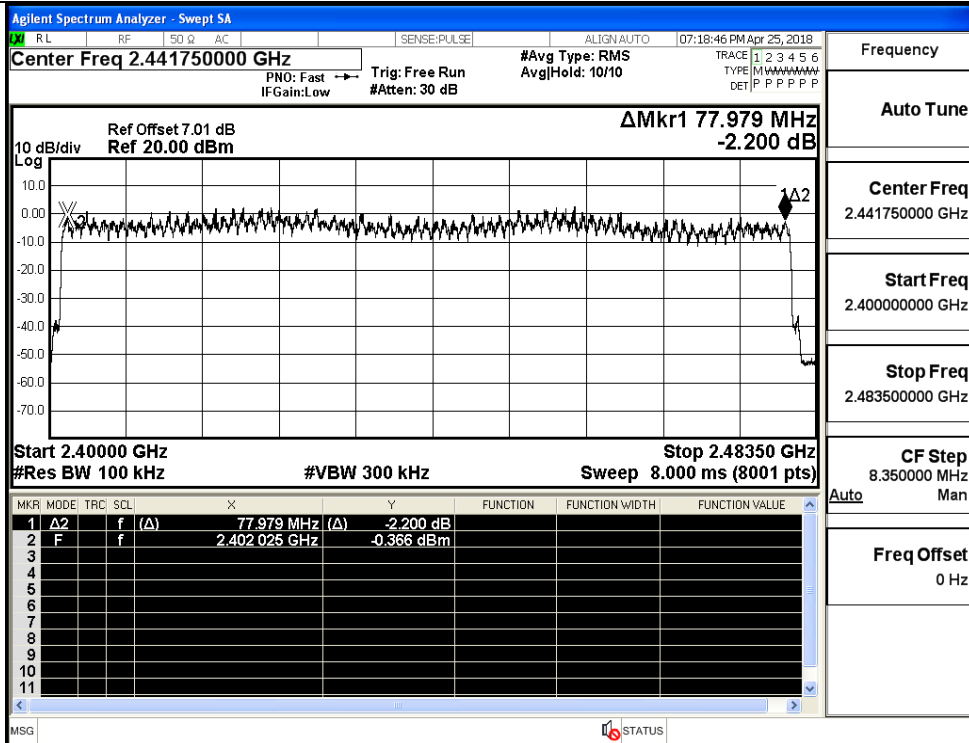
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

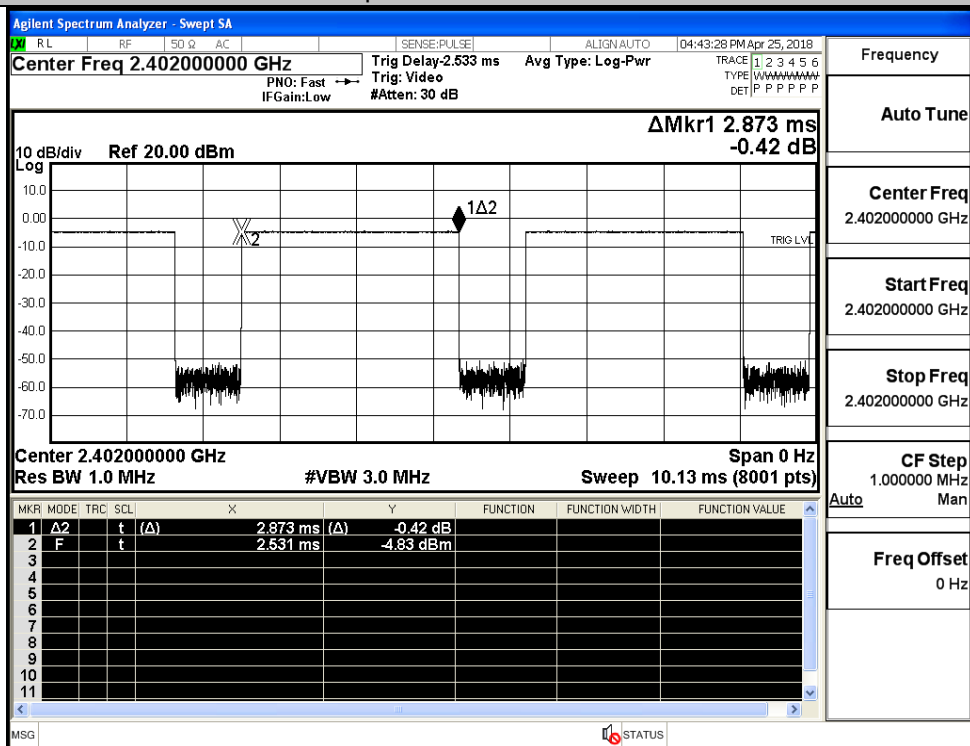


A.5 Dwell Time

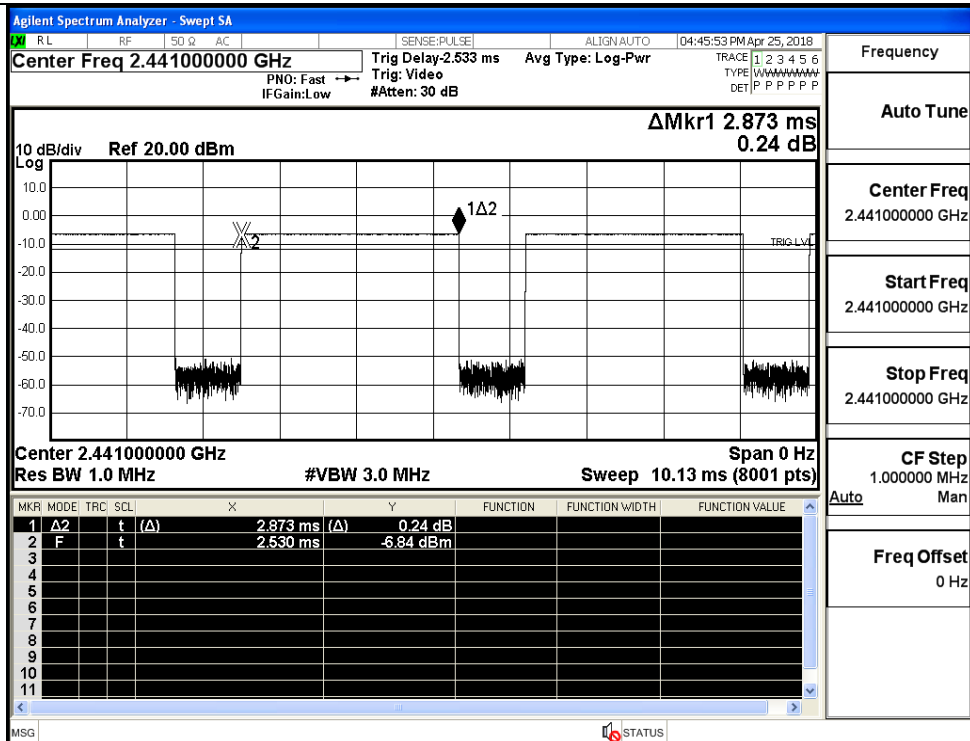
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.87	106.7	0.307	0.4	PASS
	2DH5	MCH	2.87	106.7	0.307	0.4	PASS
	2DH5	HCH	2.87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

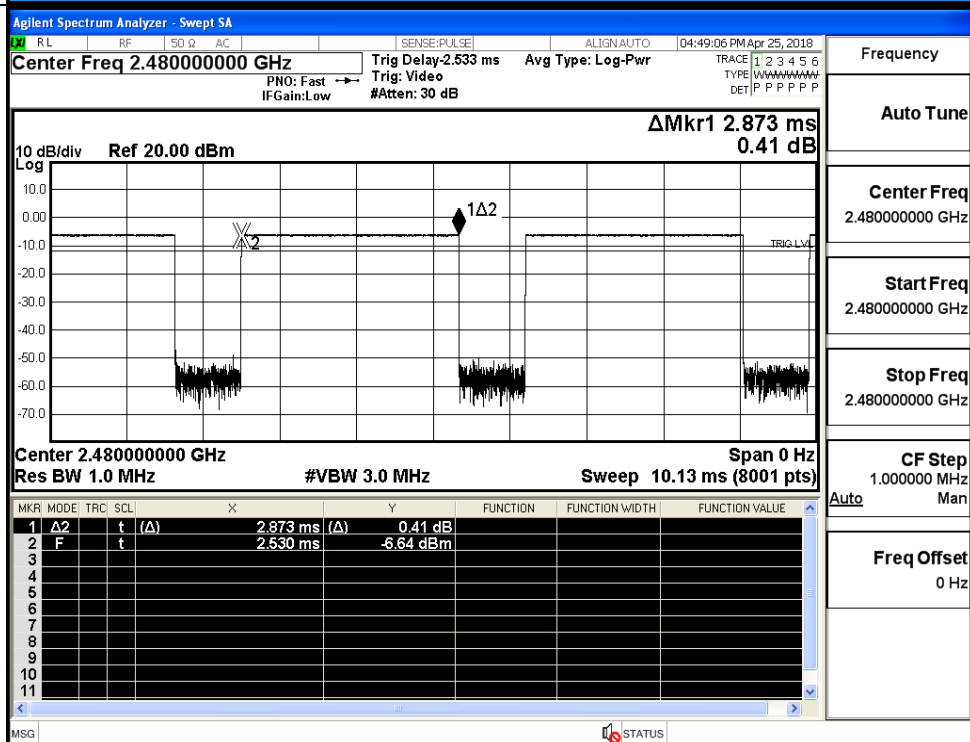
GFSK_DH5/LCH



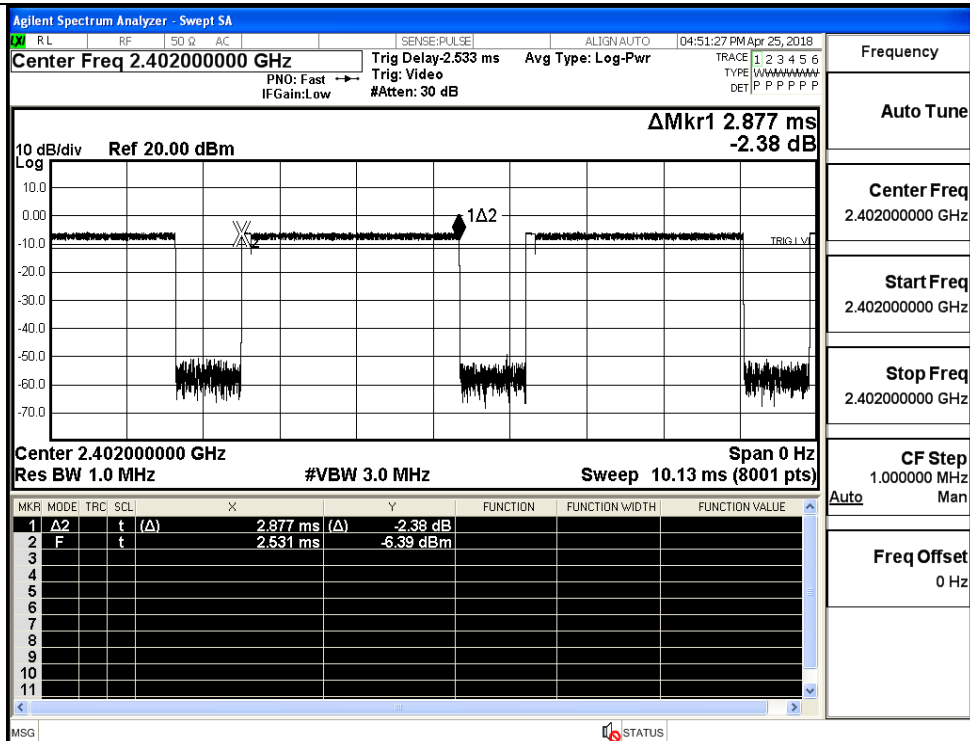
GFSK_DH5/MCH



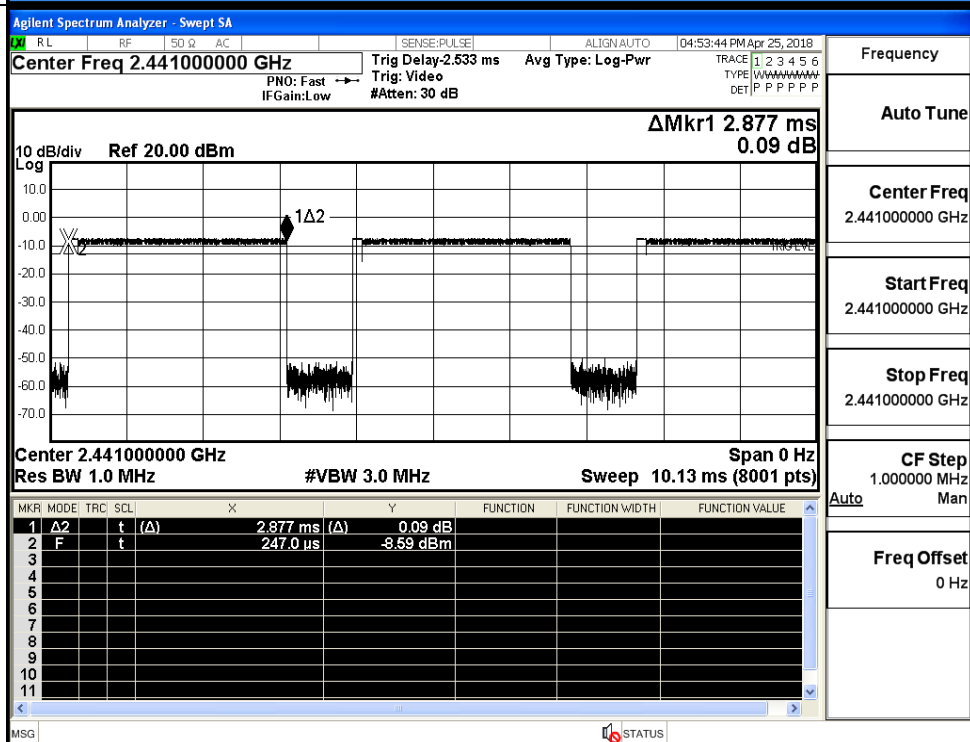
GFSK_DH5/HCH



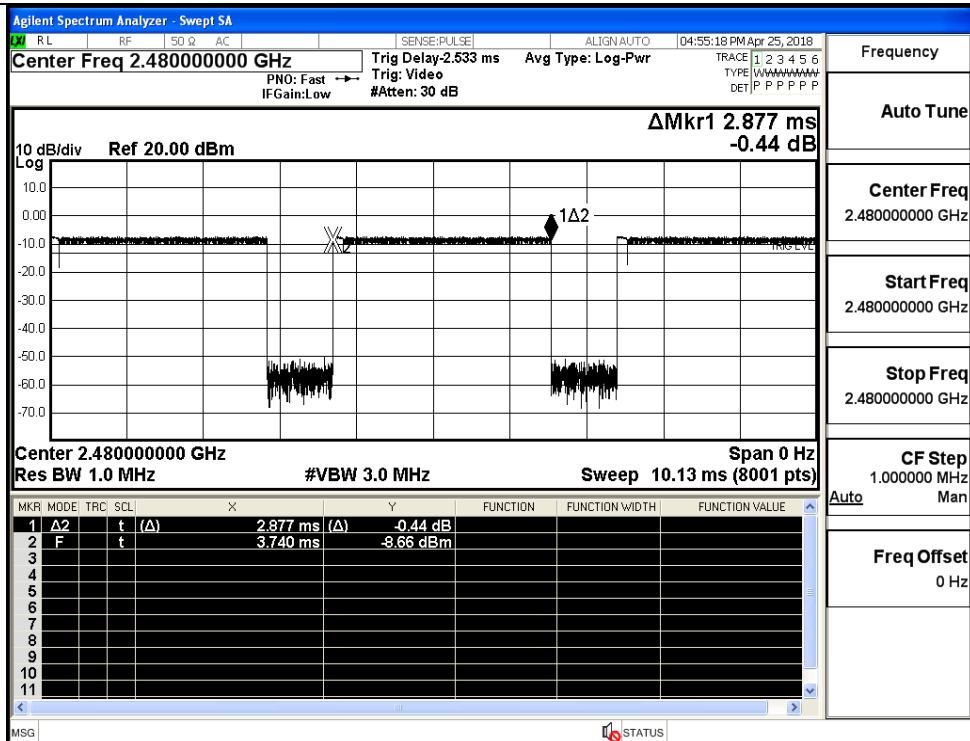
$\pi/4$ DQPSK
_2DH5/LCH



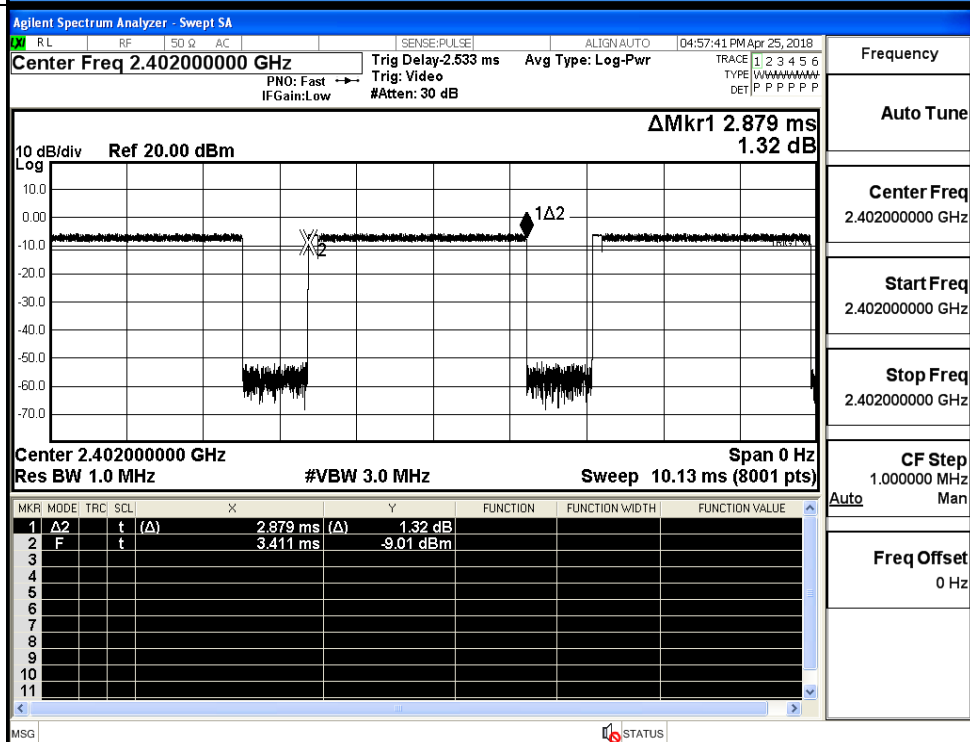
$\pi/4$ DQPSK
_2DH5/MCH



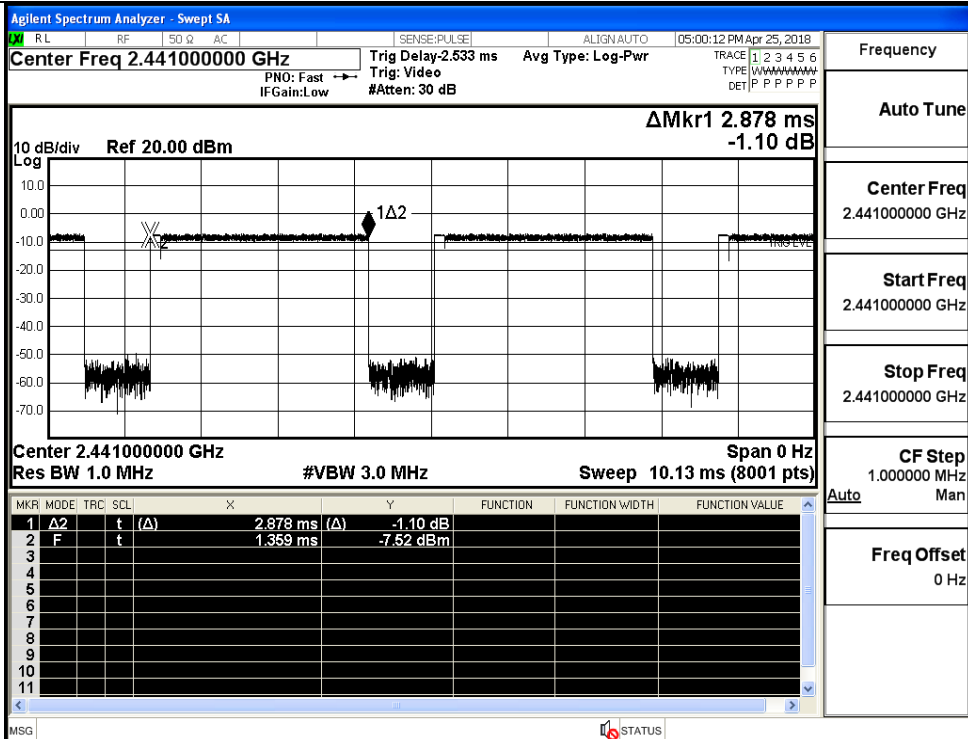
$\pi/4$ DQPSK
_2DH5/HCH



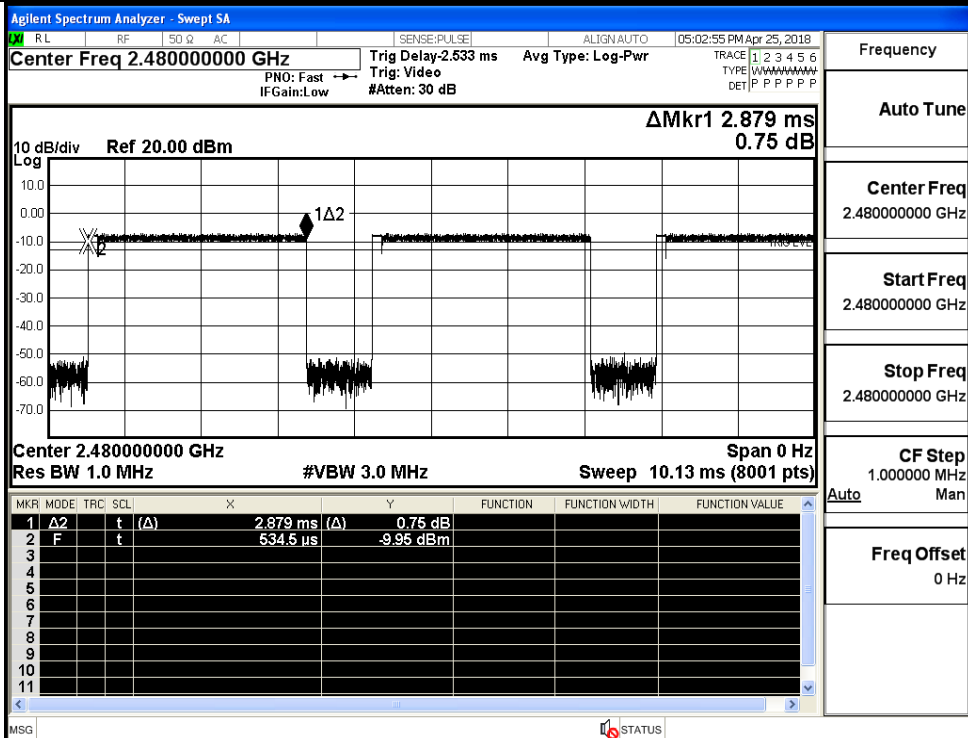
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



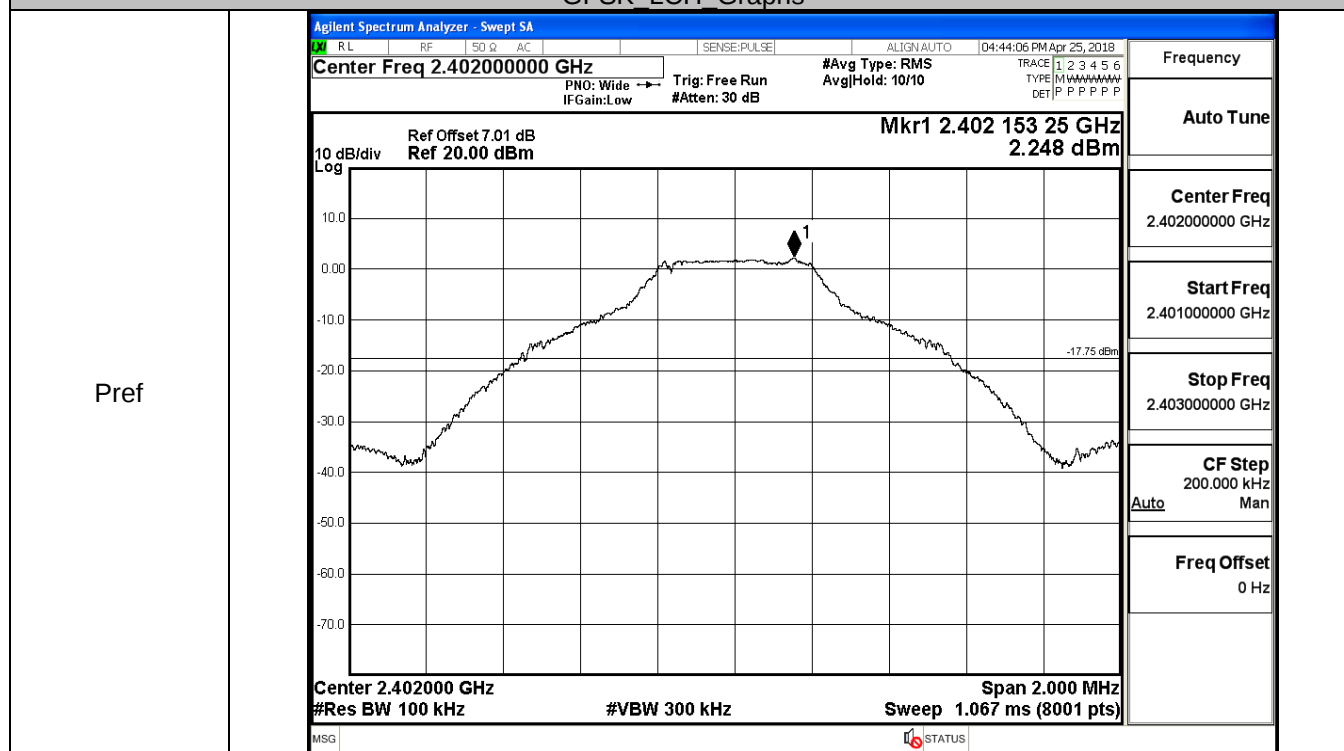
8DPSK_3DH5/HCH



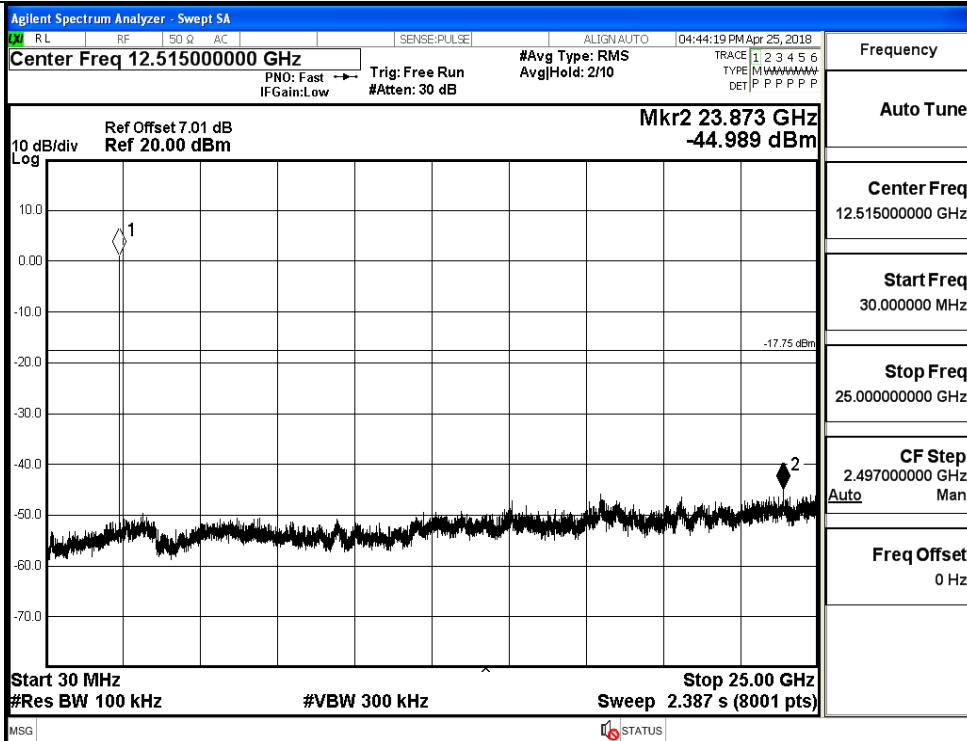
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.248	-44.989	-17.752	PASS
	MCH	0.654	-45.728	-19.346	PASS
	HCH	0.801	-45.403	-19.199	PASS
$\pi/4$ DQPSK	LCH	0.57	-45.956	-19.430	PASS
	MCH	-0.451	-44.730	-20.451	PASS
	HCH	-0.577	-45.422	-20.577	PASS
8DPSK	LCH	0.828	-45.713	-19.172	PASS
	MCH	-0.67	-45.675	-20.670	PASS
	HCH	-0.733	-45.833	-20.733	PASS

GFSK LCH Graphs

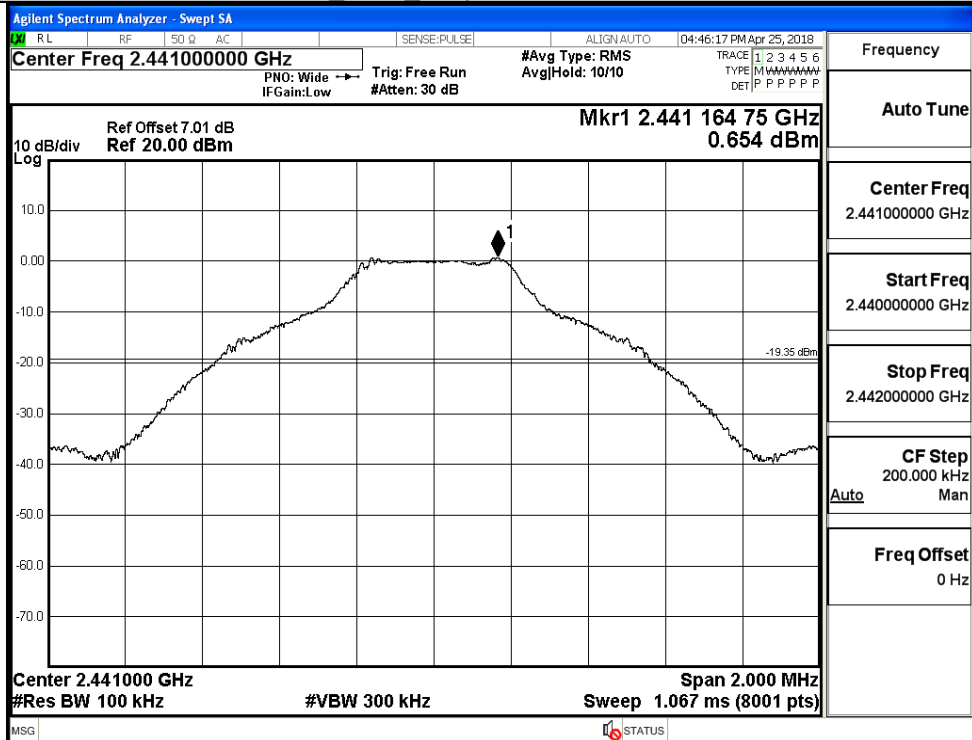


Puw

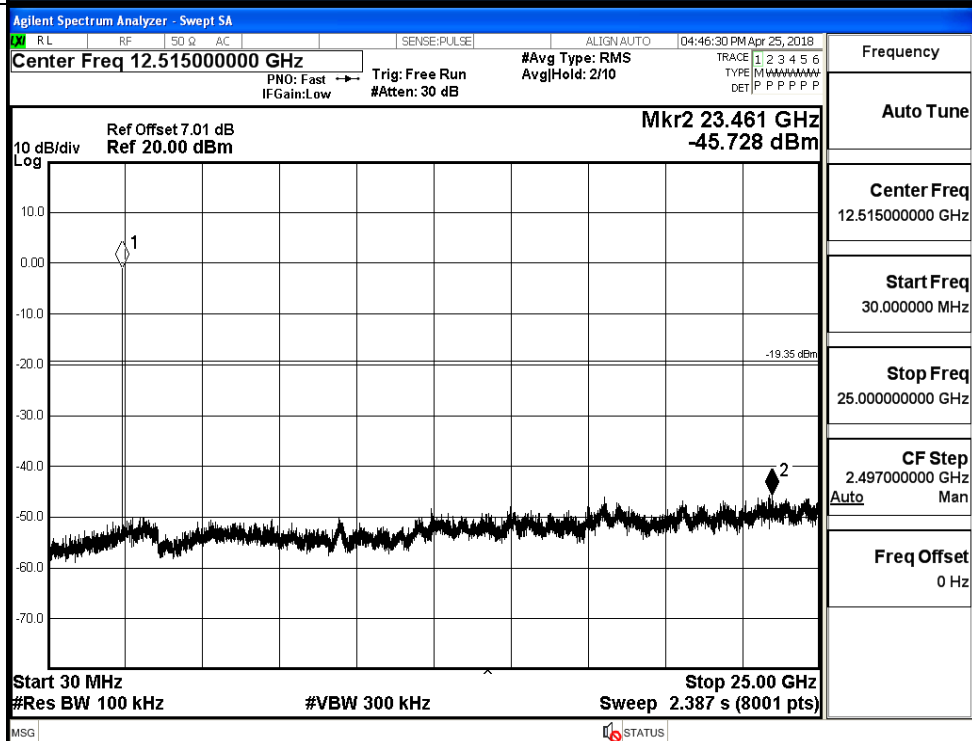


GFSK_MCH_Graphs

Pref

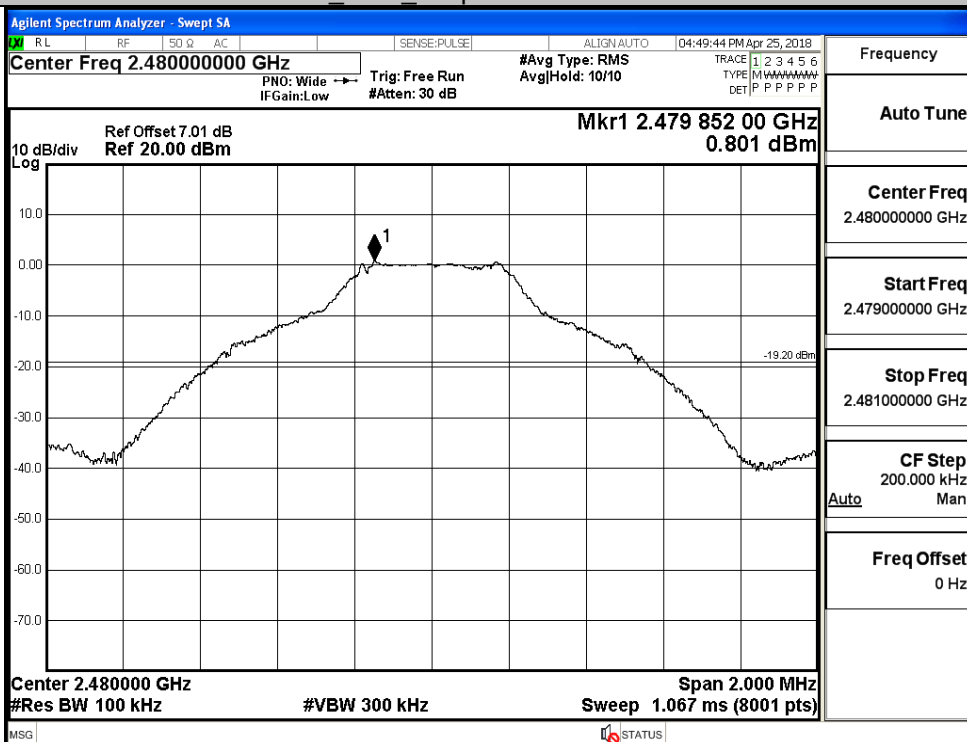


Puw

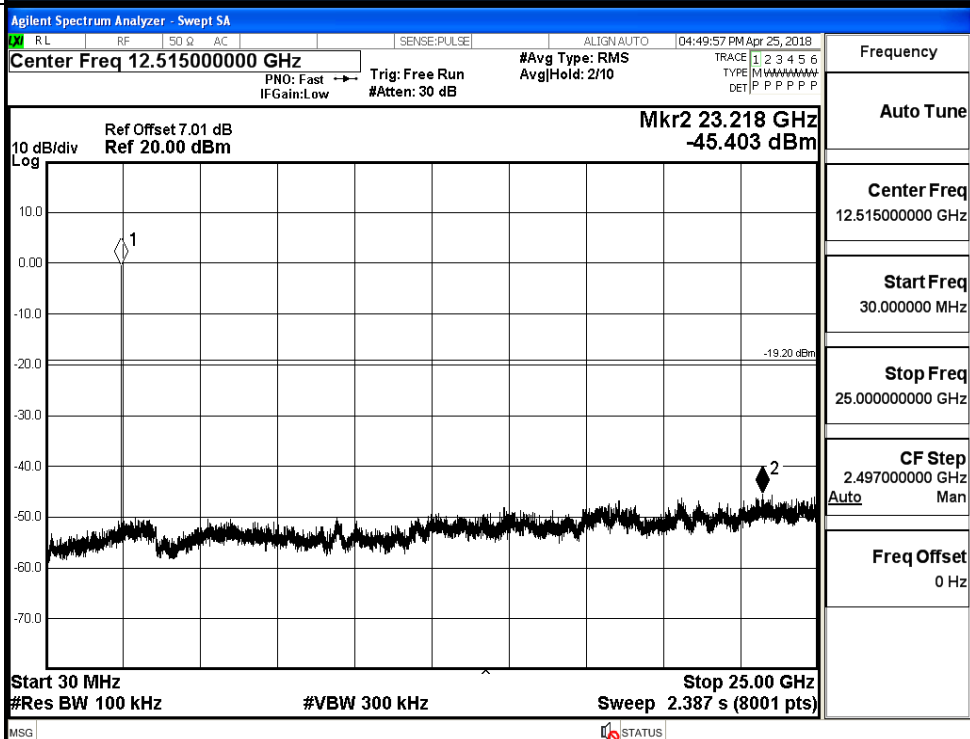


GFSK_HCH_Graphs

Pref

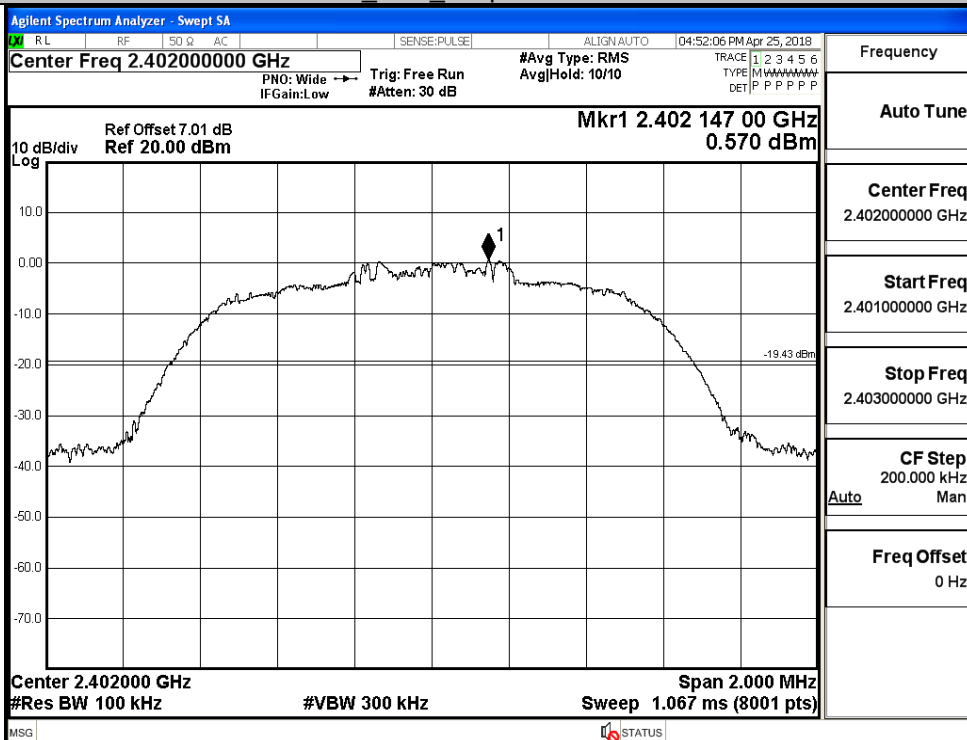


Puw

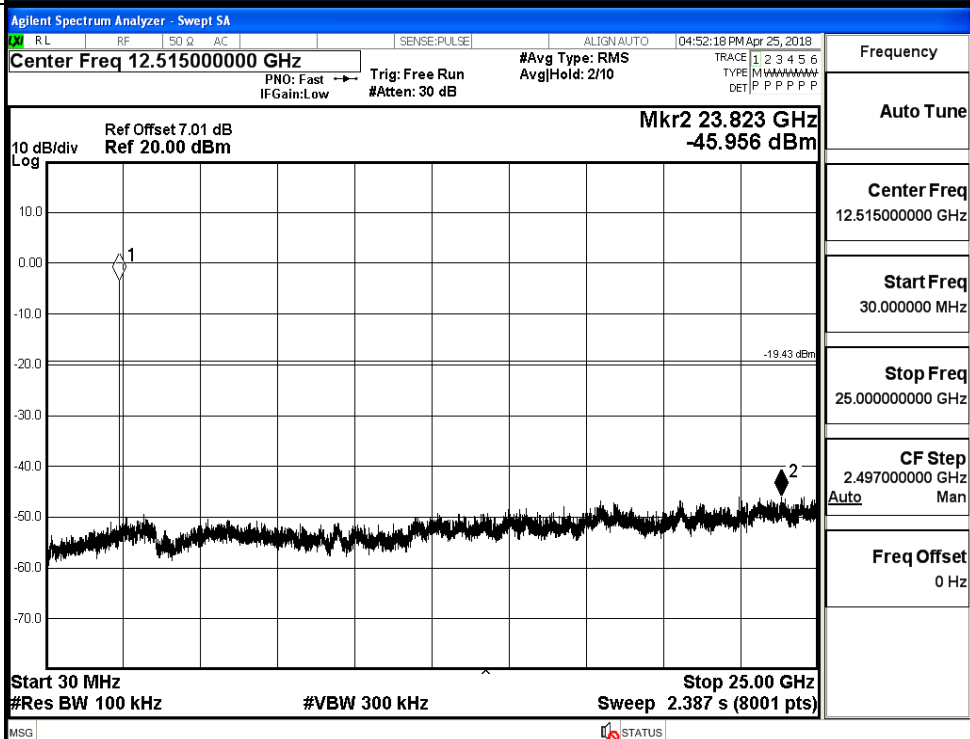


$\pi/4$ DQPSK LCH_Graphs

Pref

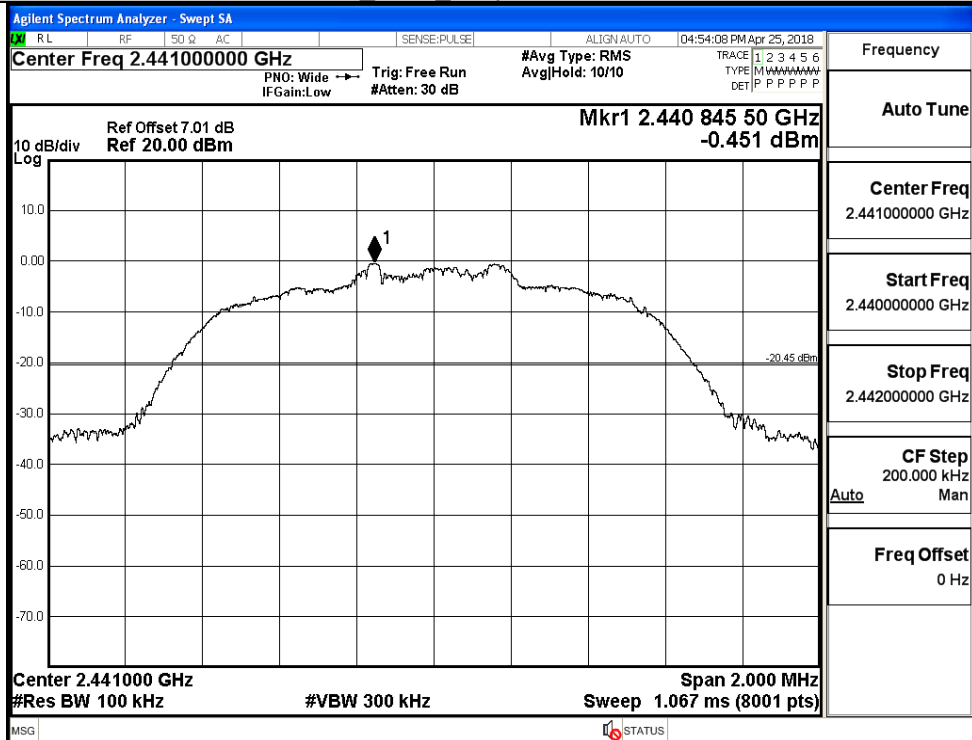


Puw

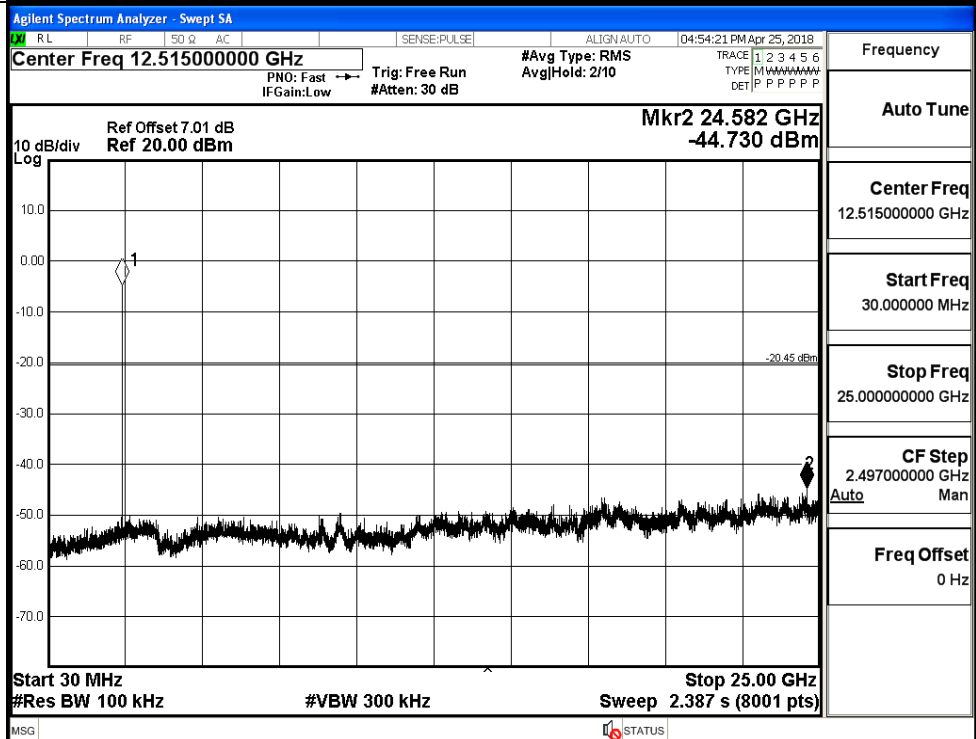


π /4DQPSK_MCH_Graphs

Pref

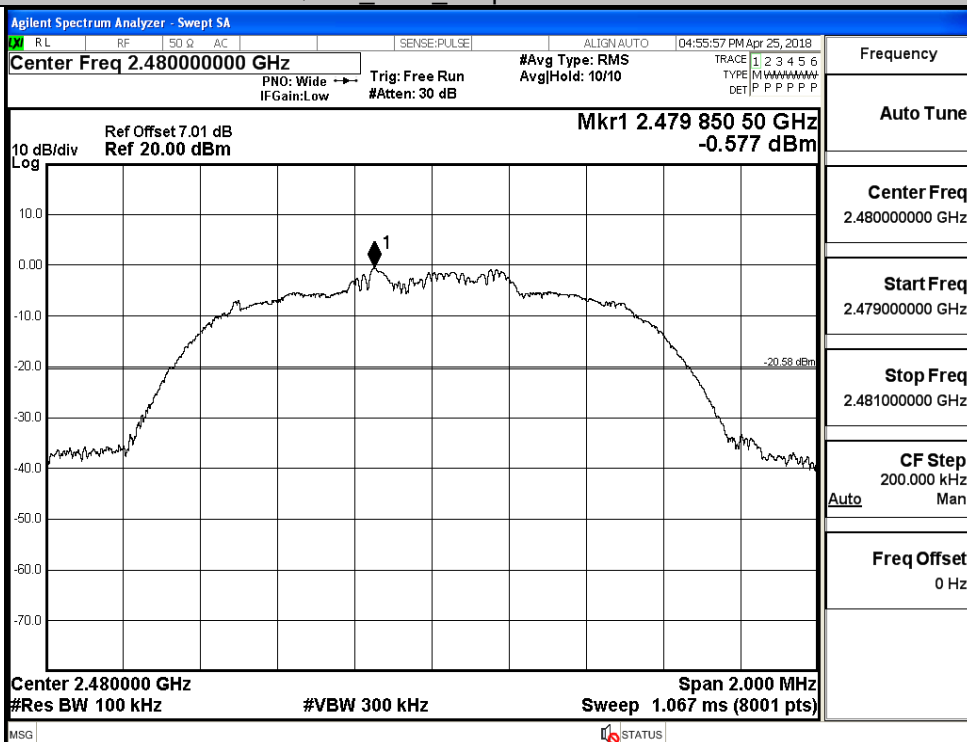


Puw

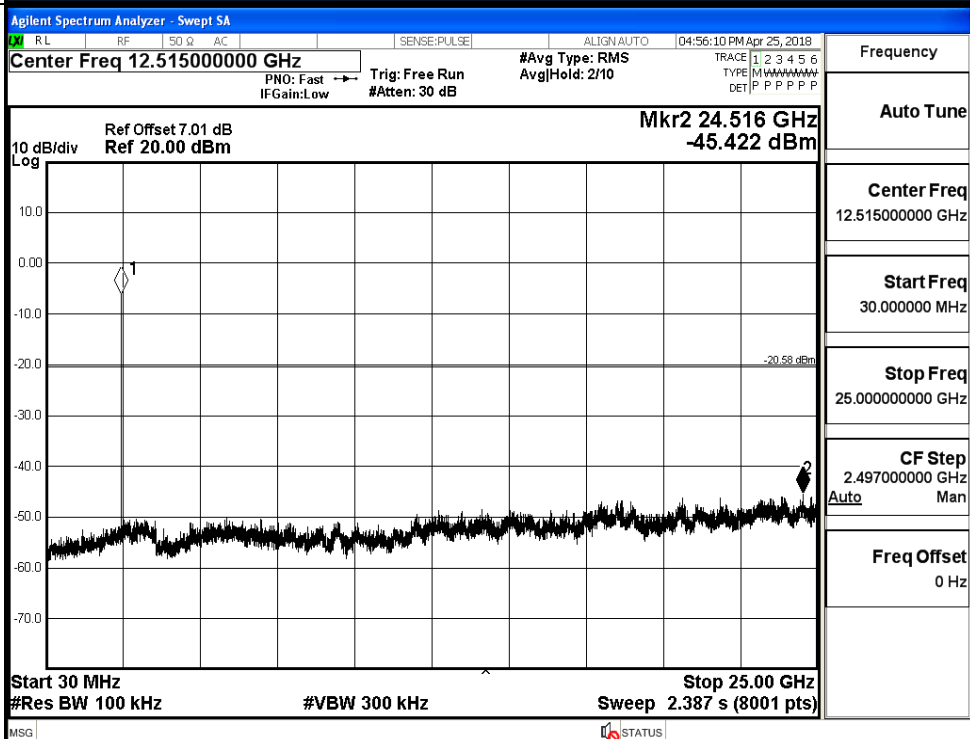


$\pi/4$ DQPSK_HCH_Graphs

Pref

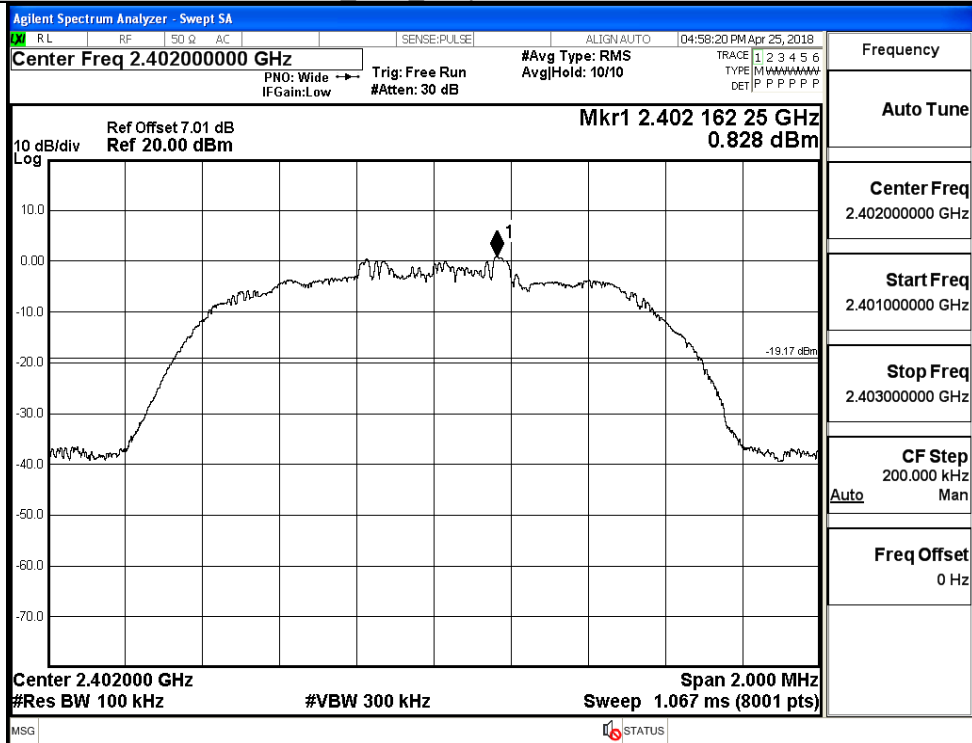


Puw

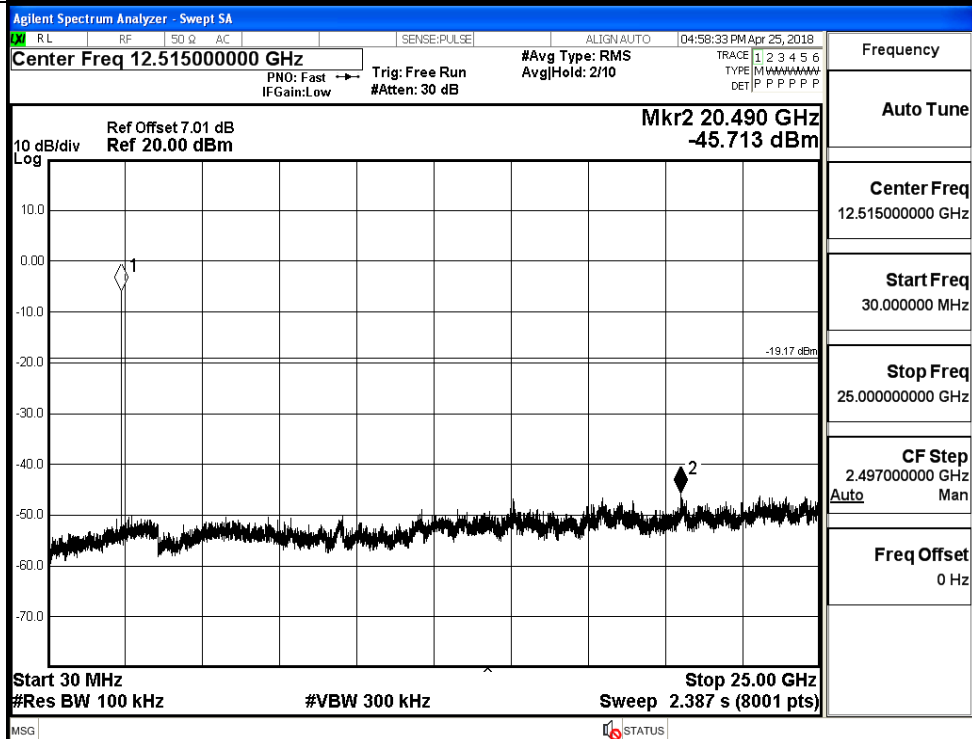


8DPSK_LCH_Graphs

Pref

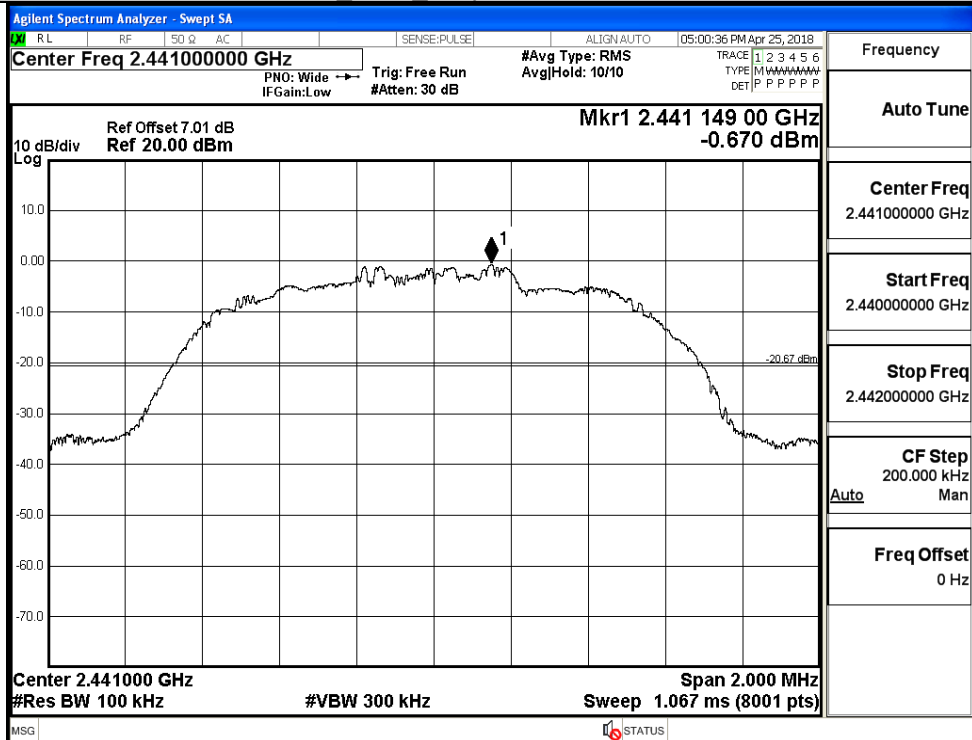


Puw

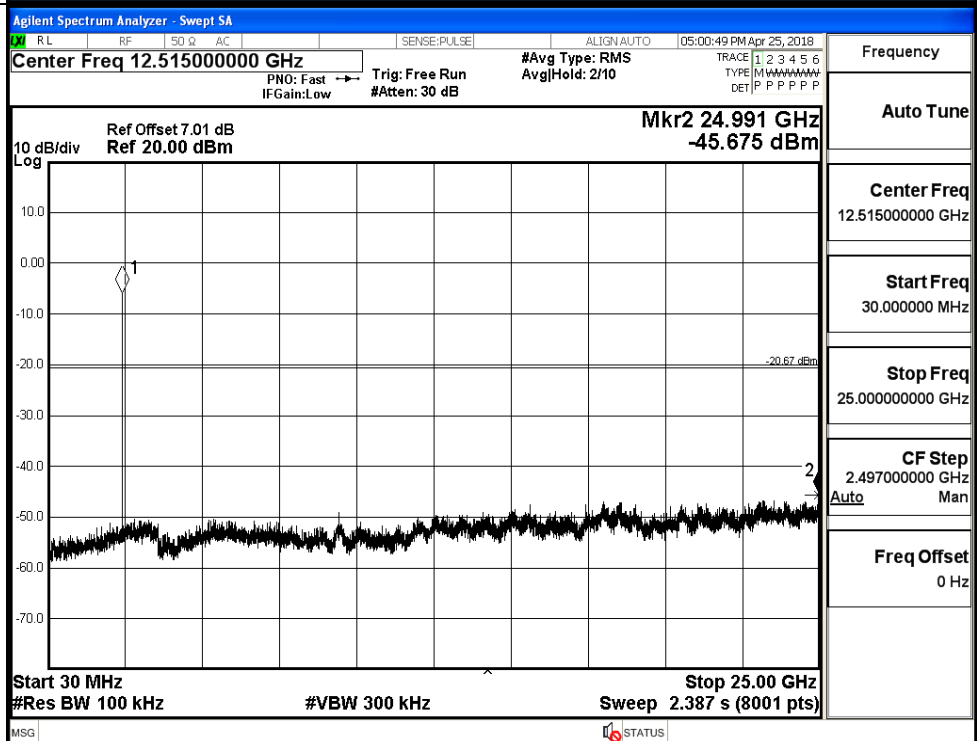


8DPSK_MCH_Graphs

Pref

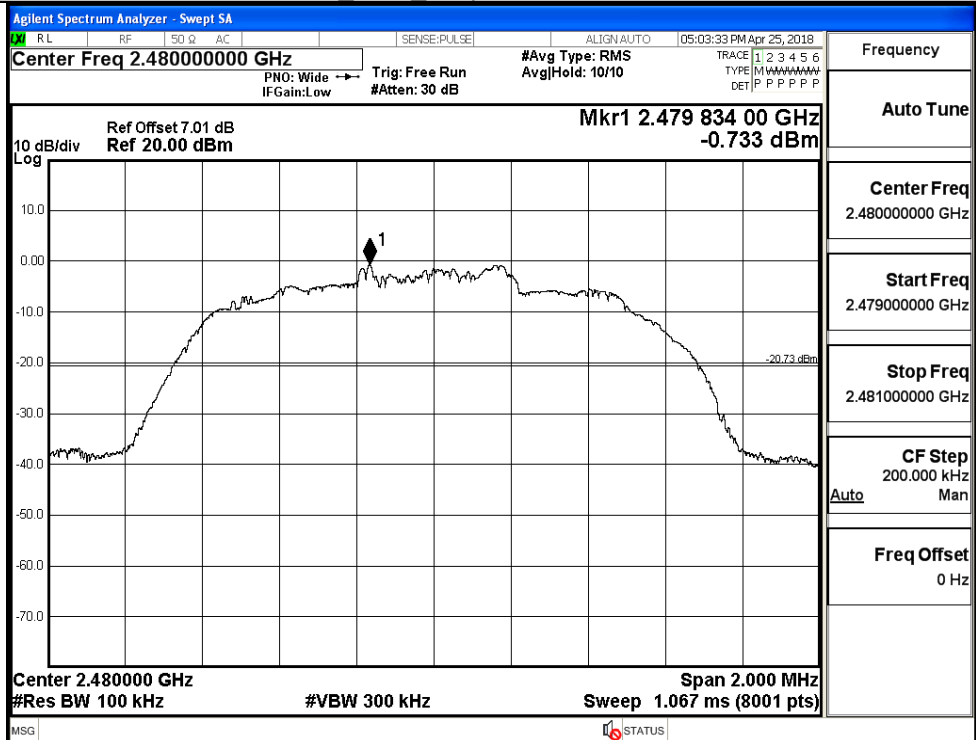


Puw

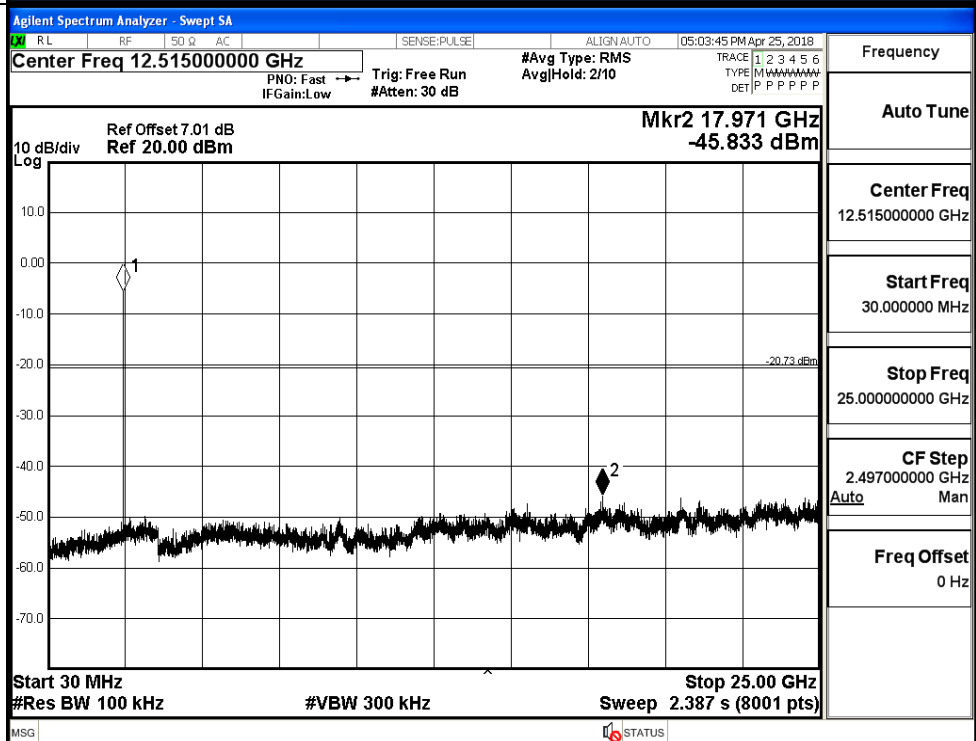


8DPSK_HCH_Graphs

Pref



Puw

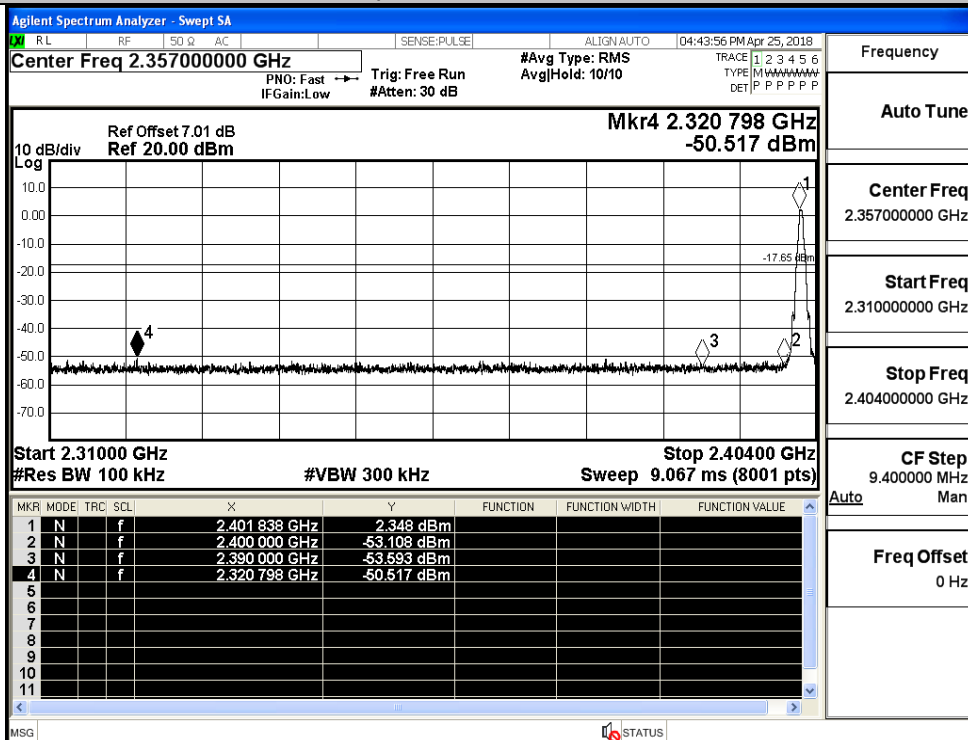


A.7 Band-edge for RF Conducted Emissions

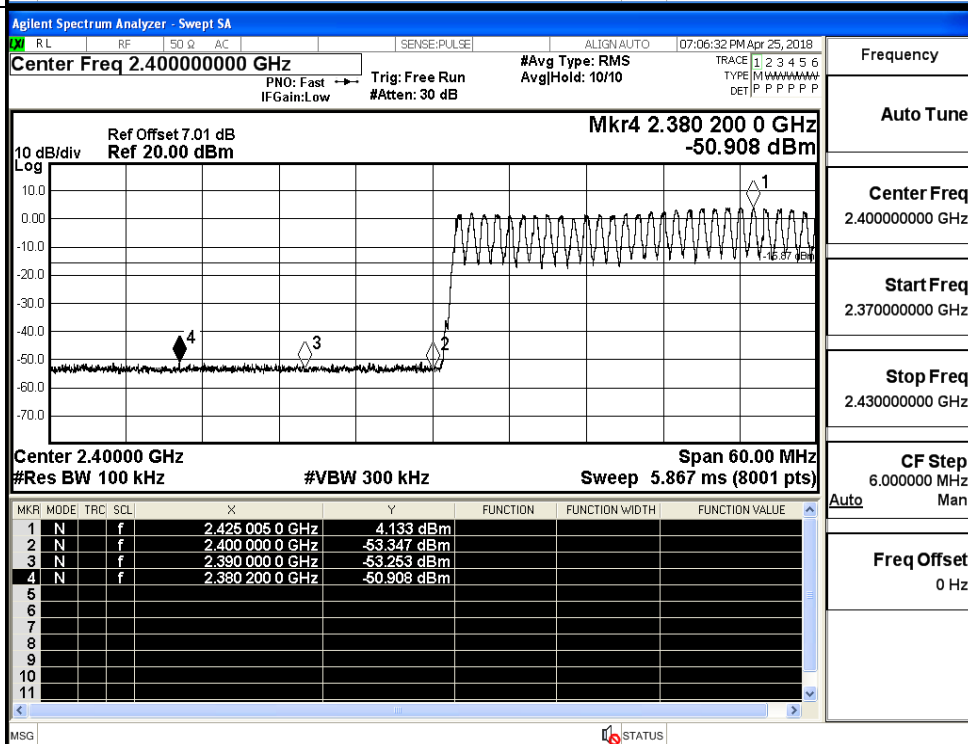
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	2.348	Off	-50.517	-17.65	PASS
			4.133	On	-50.908	-15.87	PASS
	HCH	2480	1.023	Off	-51.062	-18.98	PASS
			4.040	On	-49.740	-15.96	PASS
$\pi/4$ DQPSK	LCH	2402	0.697	Off	-51.257	-19.3	PASS
			2.361	On	-50.427	-17.64	PASS
	HCH	2480	-0.754	Off	-50.752	-20.75	PASS
			1.974	On	-50.344	-18.03	PASS
8DPSK	LCH	2402	0.118	Off	-50.975	-19.88	PASS
			2.664	On	-51.035	-17.34	PASS
	HCH	2480	-0.524	Off	-50.491	-20.52	PASS
			1.861	On	-50.575	-18.14	PASS

Test Graphs

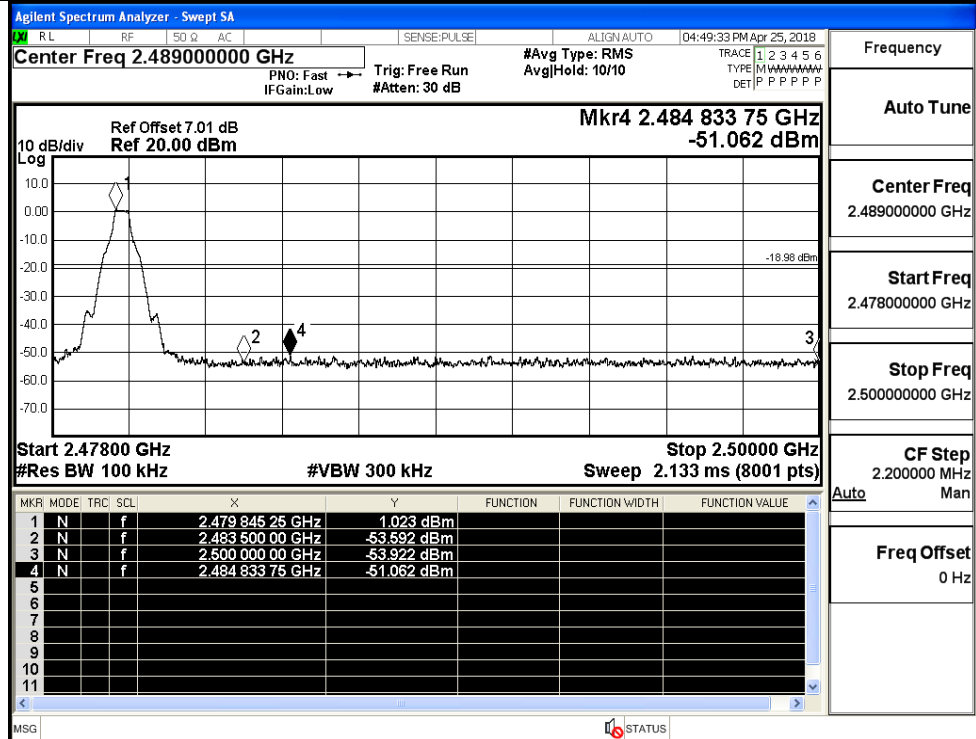
GFSK/LCH/No Hop



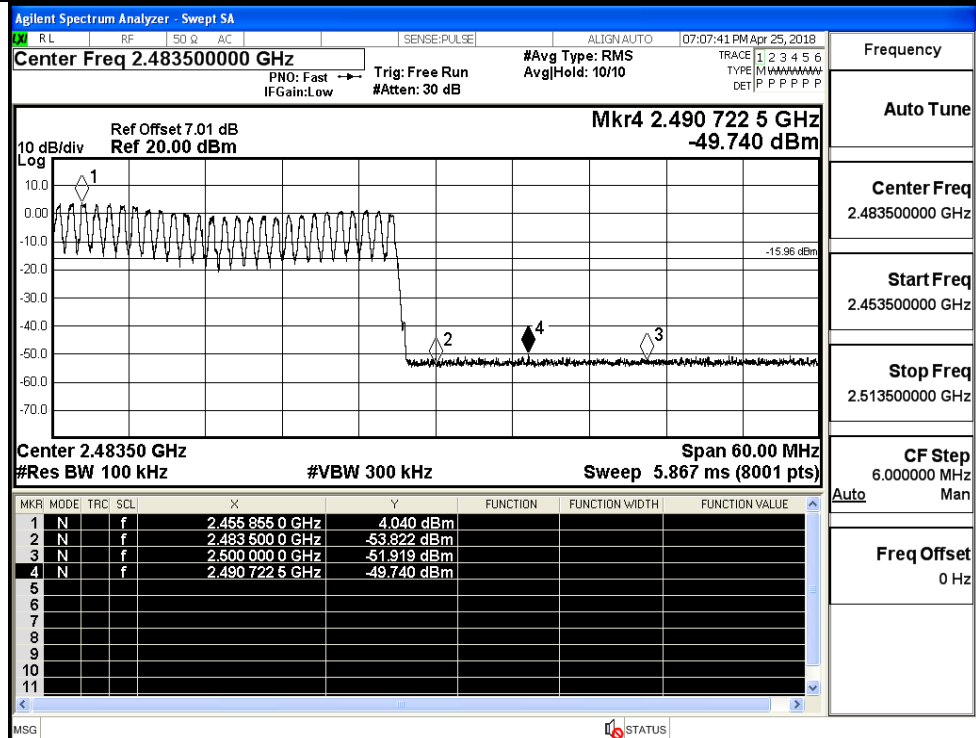
GFSK/LCH/Hop



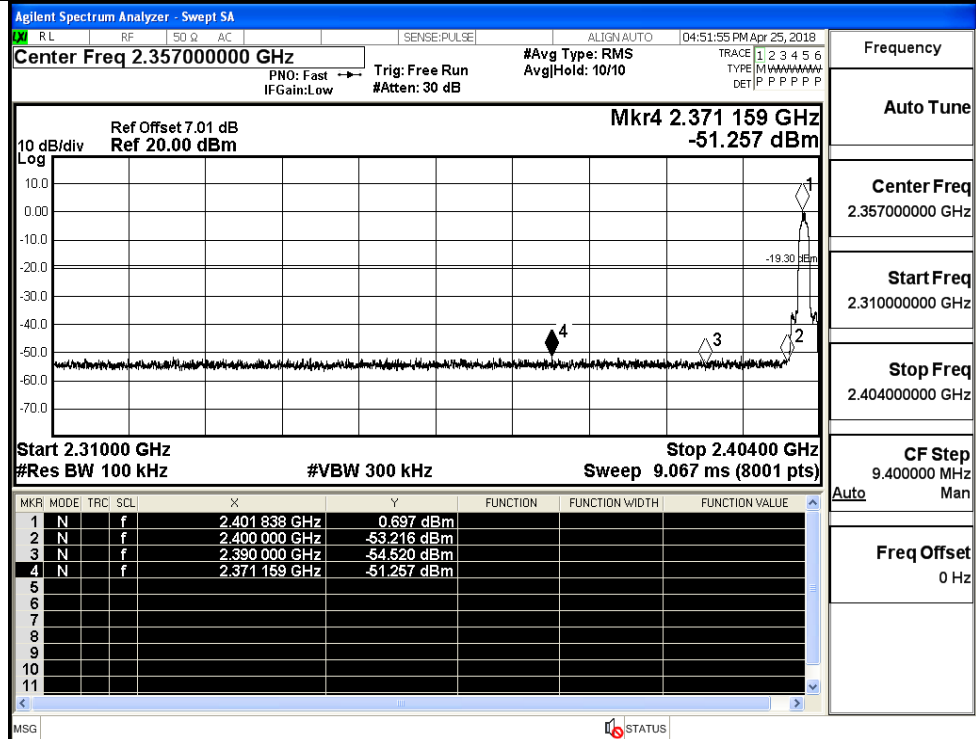
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

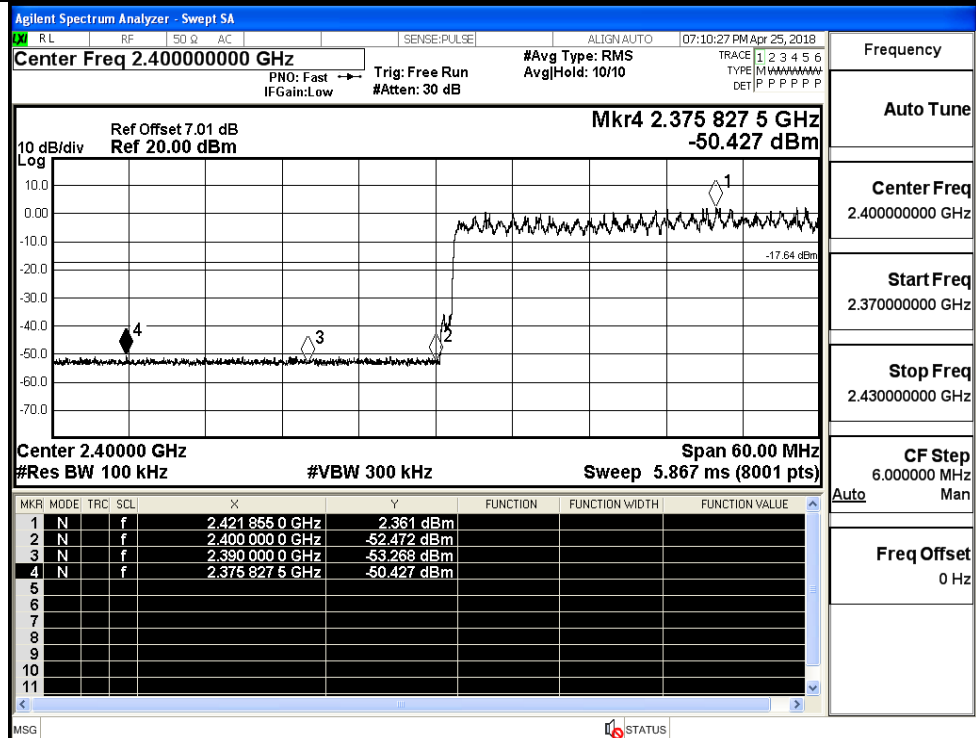
Start Freq
2.310000000 GHz

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

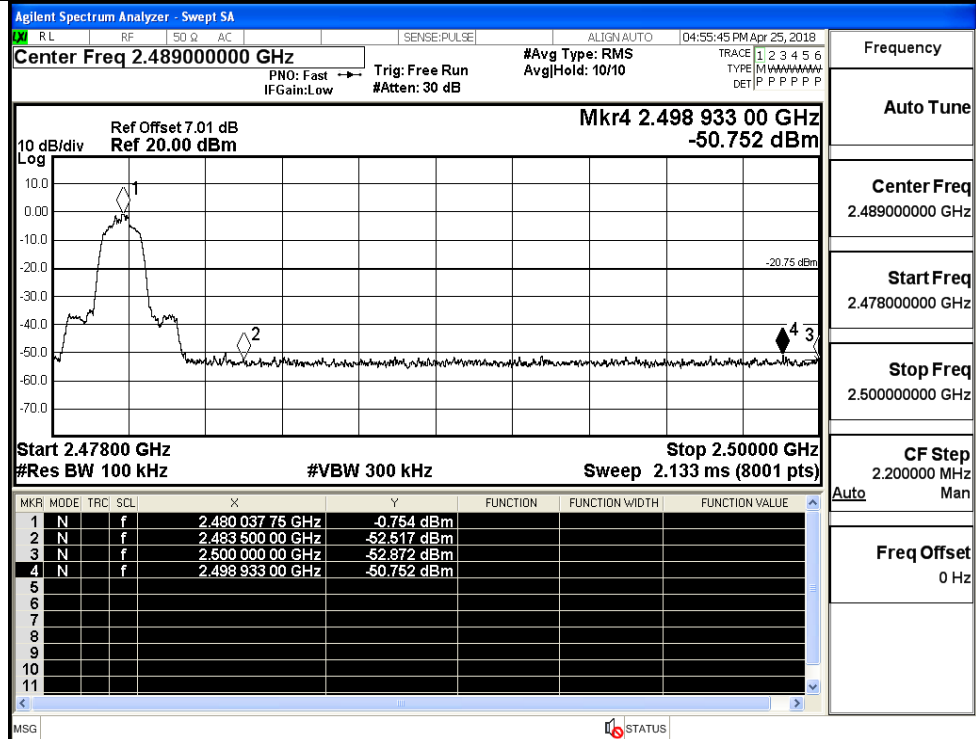
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

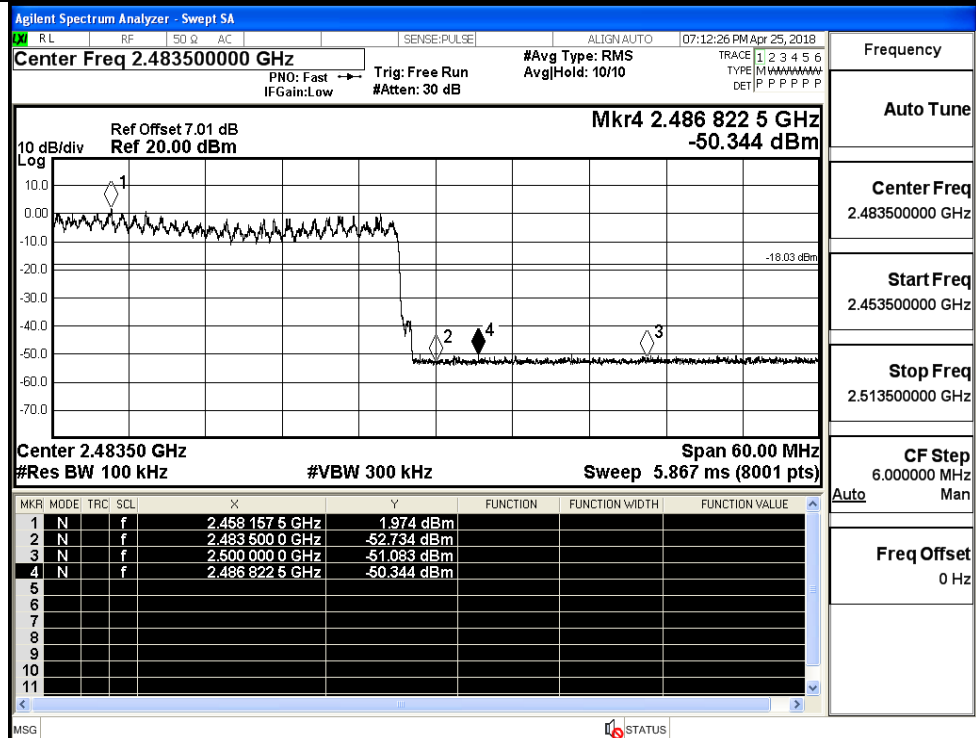
CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

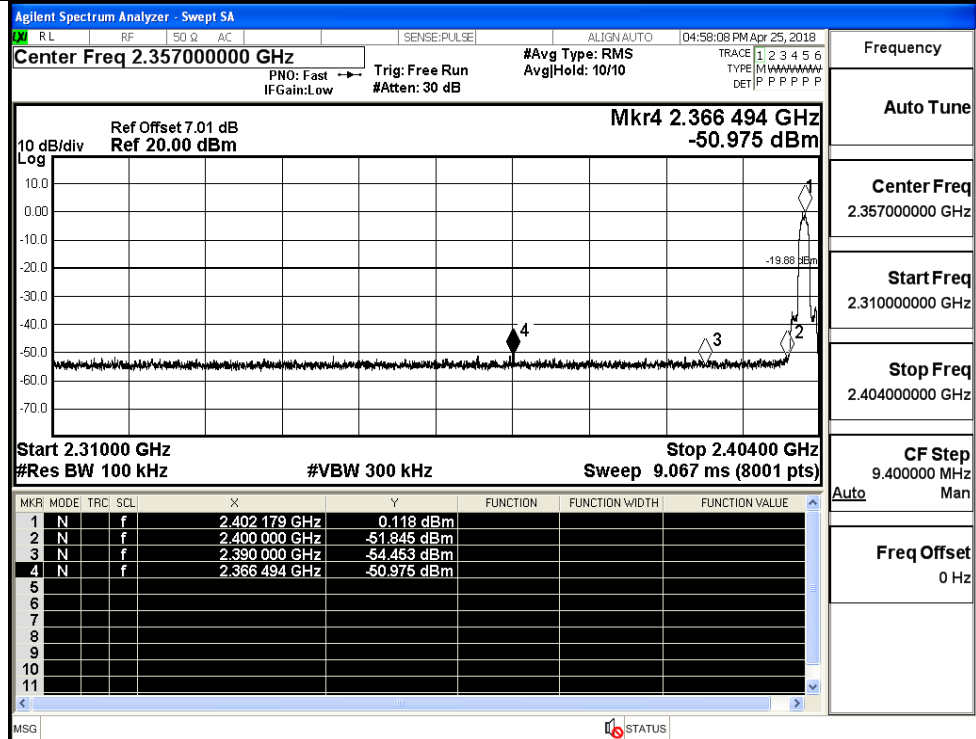
$\pi/4$ DQPSK/HCH/No
Hop



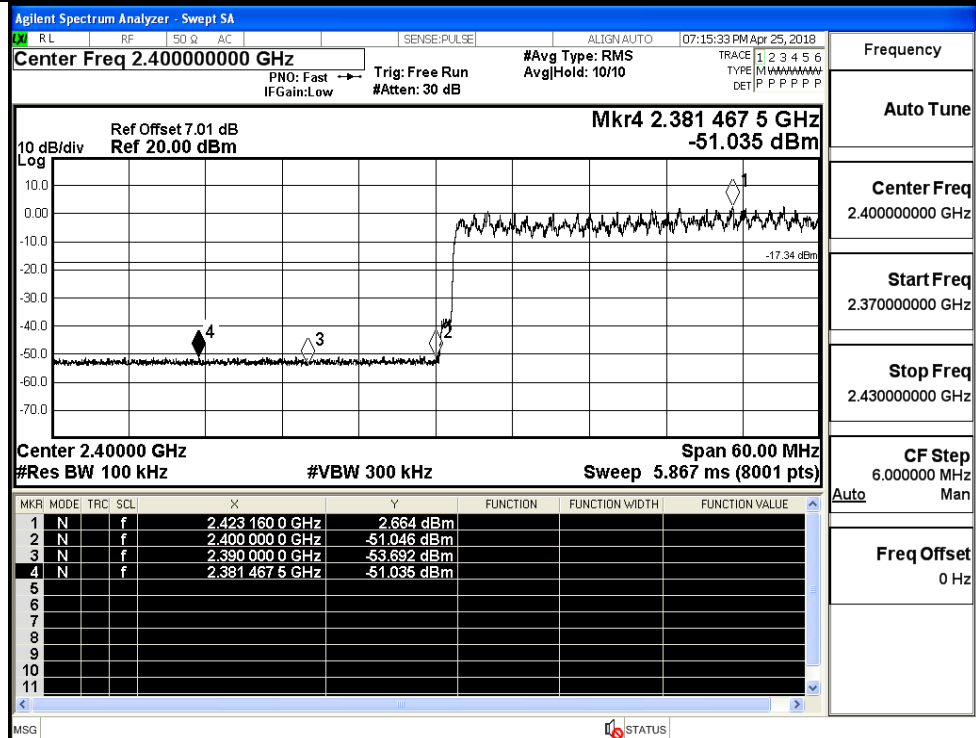
$\pi/4$ DQPSK/HCH/Hop



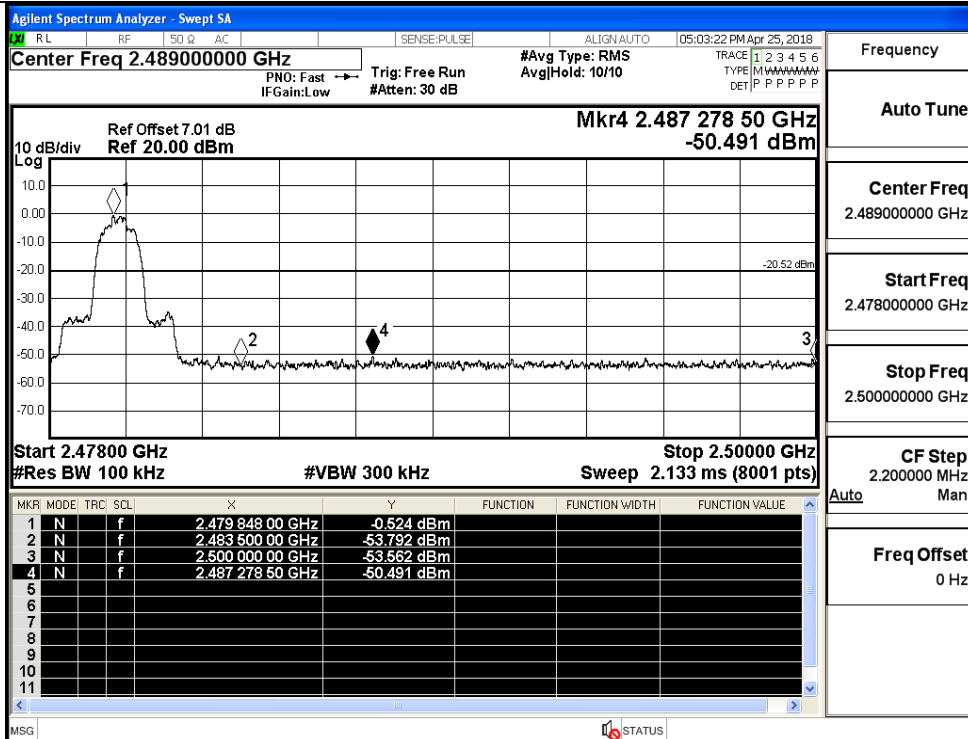
8DPSK/LCH/No Hop



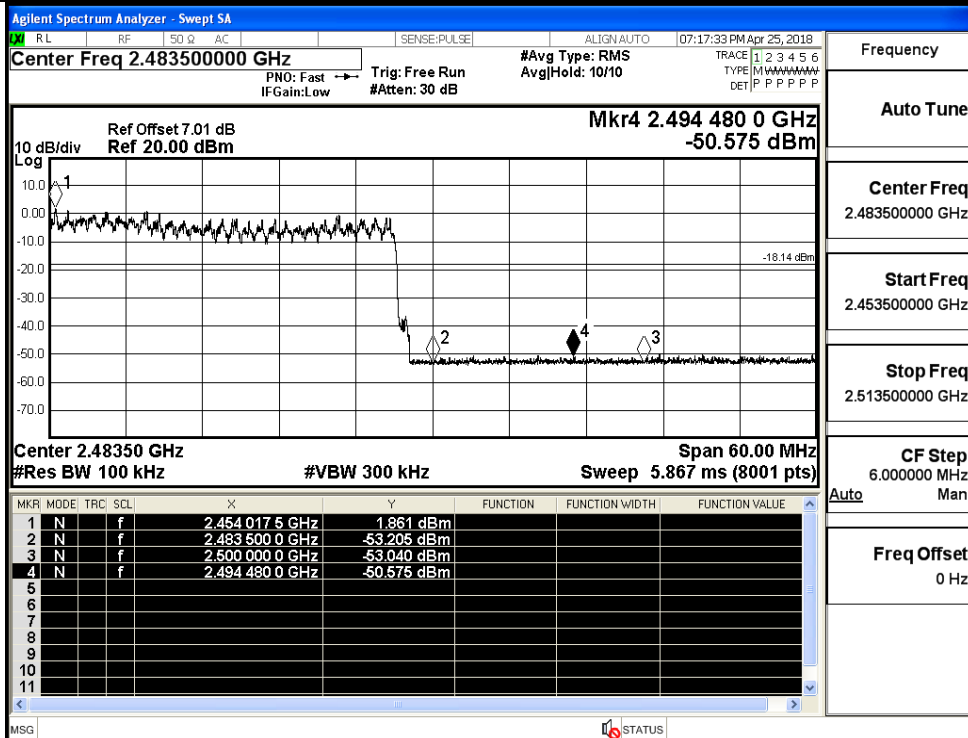
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



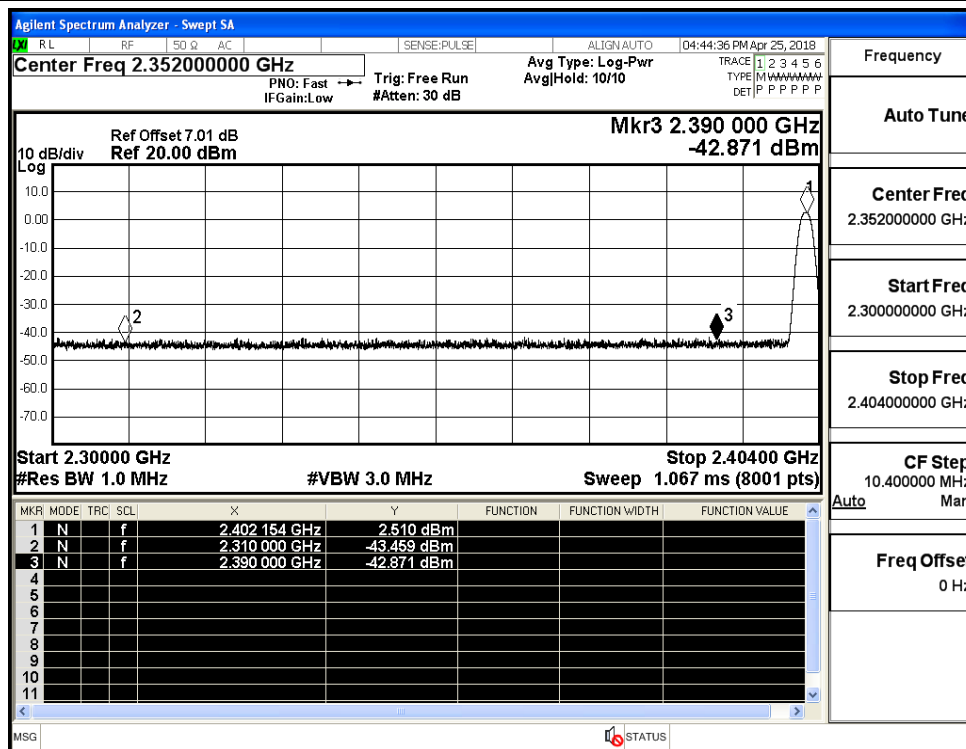
8DPSK/HCH/Hop



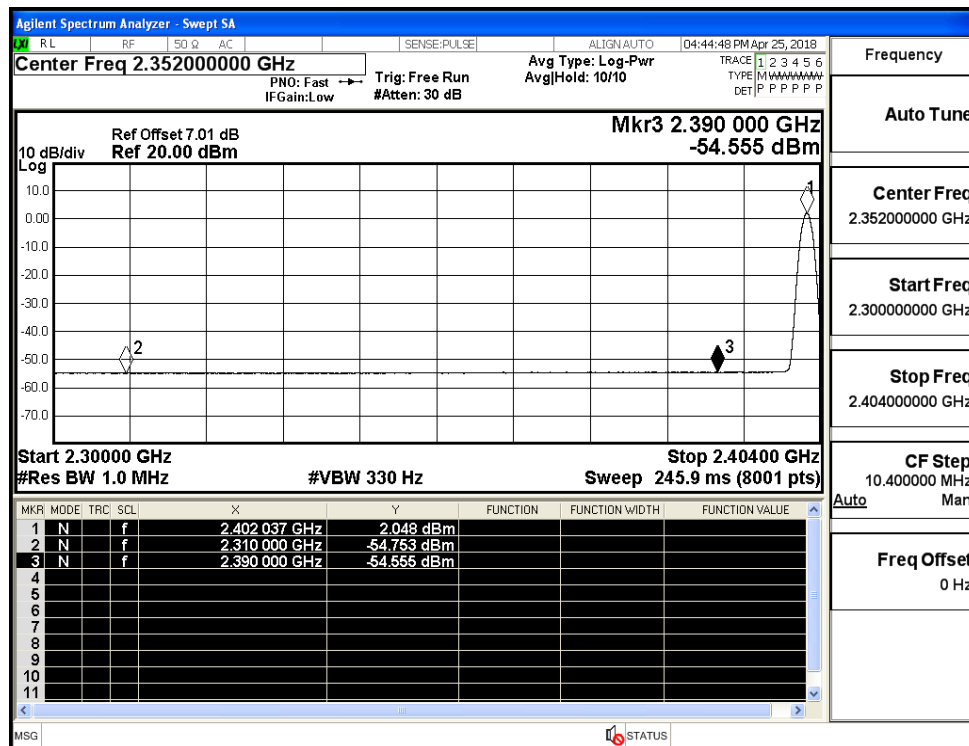
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.46	2.0	0	53.8	PEAK	74	PASS
	Off	2310.0	-54.75	2.0	0	42.5	AV	54	PASS
	Off	2390.0	-42.87	2.0	0	54.39	PEAK	74	PASS
	Off	2390.0	-54.56	2.0	0	42.7	AV	54	PASS
	Off	2483.5	-43.22	2.0	0	54.03	PEAK	74	PASS
	Off	2483.5	-54.29	2.0	0	42.96	AV	54	PASS
	Off	2500.0	-43.78	2.0	0	53.48	PEAK	74	PASS
	Off	2500.0	-53.98	2.0	0	43.28	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.63	2.0	0	52.63	PEAK	74	PASS
	Off	2310.0	-54.80	2.0	0	42.46	AV	54	PASS
	Off	2390.0	-44.14	2.0	0	53.12	PEAK	74	PASS
	Off	2390.0	-54.34	2.0	0	42.91	AV	54	PASS
	Off	2483.5	-44.63	2.0	0	52.63	PEAK	74	PASS
	Off	2483.5	-54.03	2.0	0	43.23	AV	54	PASS
	Off	2500.0	-43.35	2.0	0	53.91	PEAK	74	PASS
	Off	2500.0	-54.20	2.0	0	43.05	AV	54	PASS
8DPSK	Off	2310.0	-44.73	2.0	0	52.53	PEAK	74	PASS
	Off	2310.0	-54.83	2.0	0	42.43	AV	54	PASS
	Off	2390.0	-44.69	2.0	0	52.57	PEAK	74	PASS
	Off	2390.0	-54.48	2.0	0	42.78	AV	54	PASS
	Off	2483.5	-43.80	2.0	0	53.45	PEAK	74	PASS
	Off	2483.5	-54.17	2.0	0	43.09	AV	54	PASS
	Off	2500.0	-42.78	2.0	0	54.47	PEAK	74	PASS
	Off	2500.0	-54.09	2.0	0	43.16	AV	54	PASS

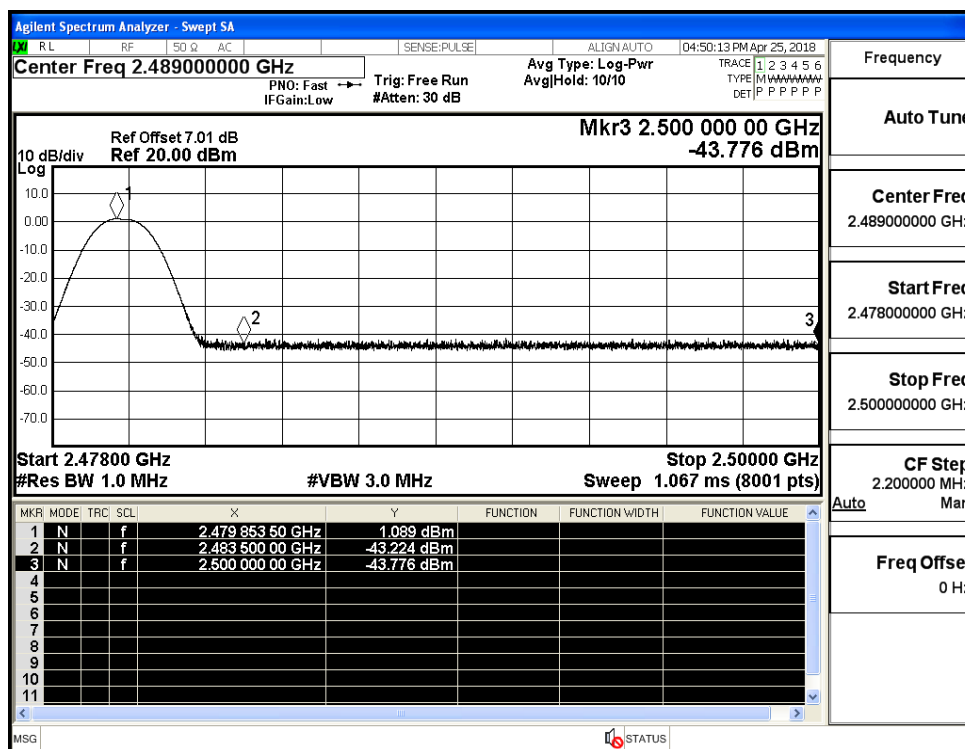
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



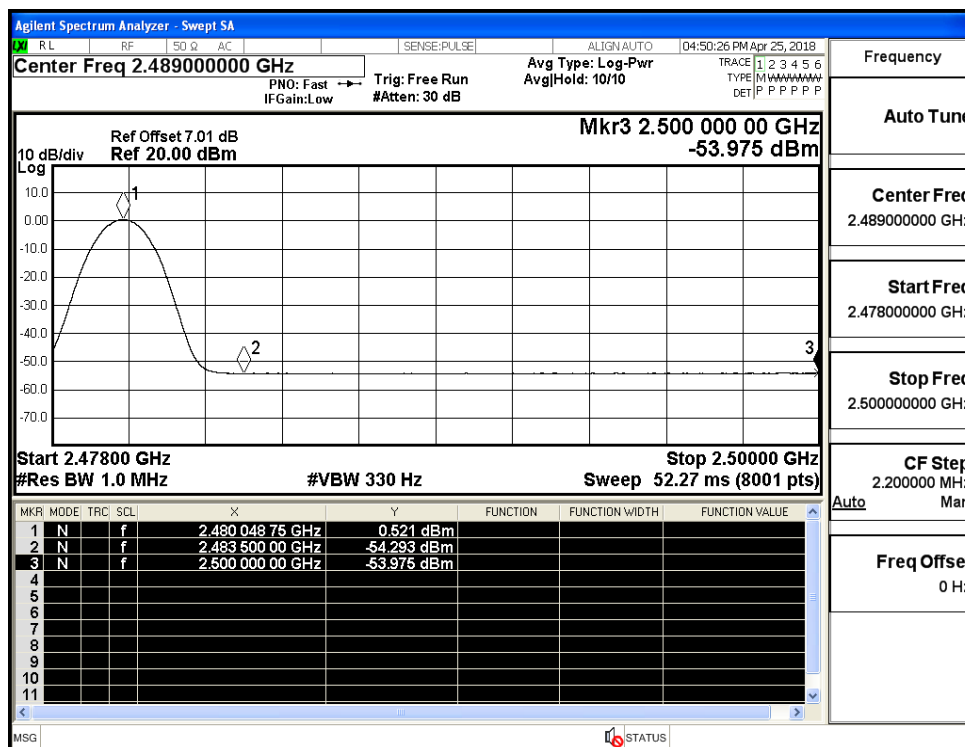
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

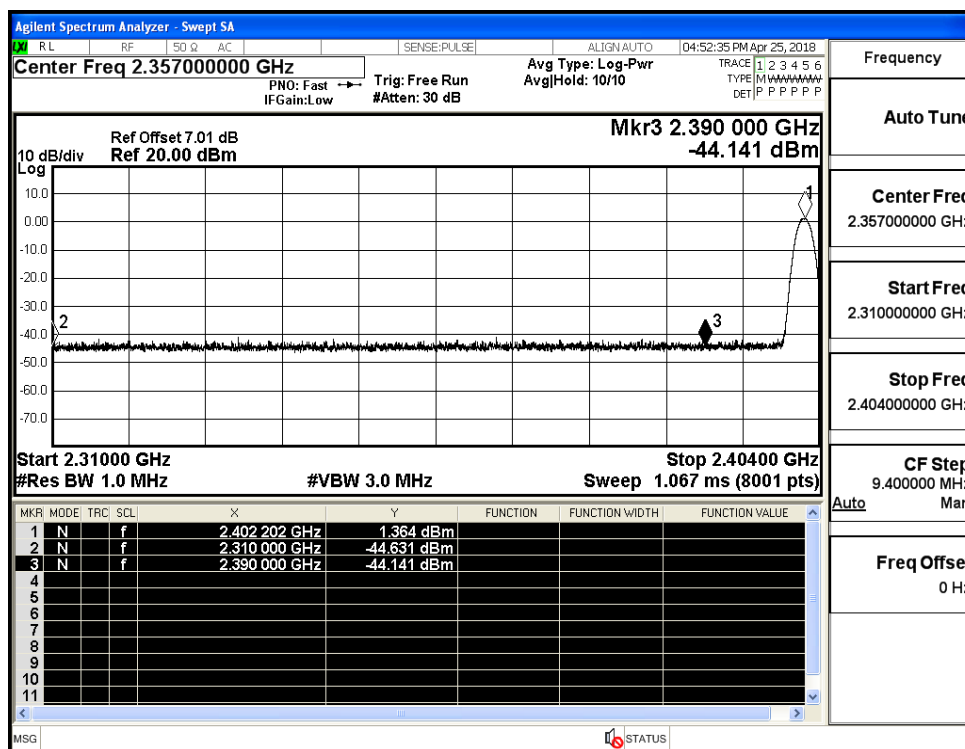
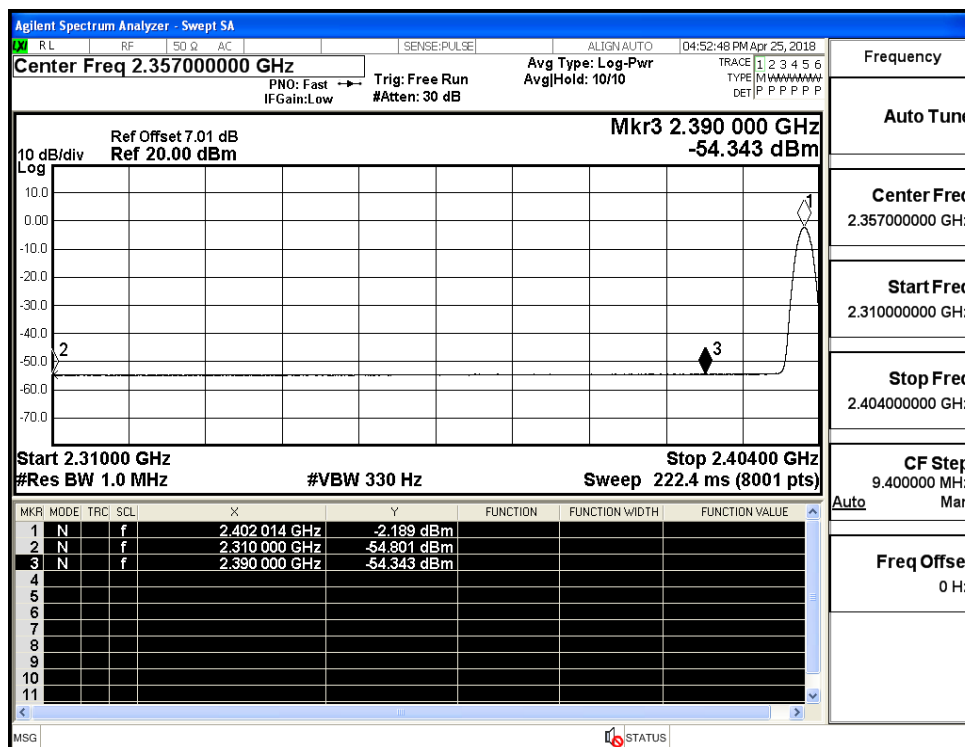


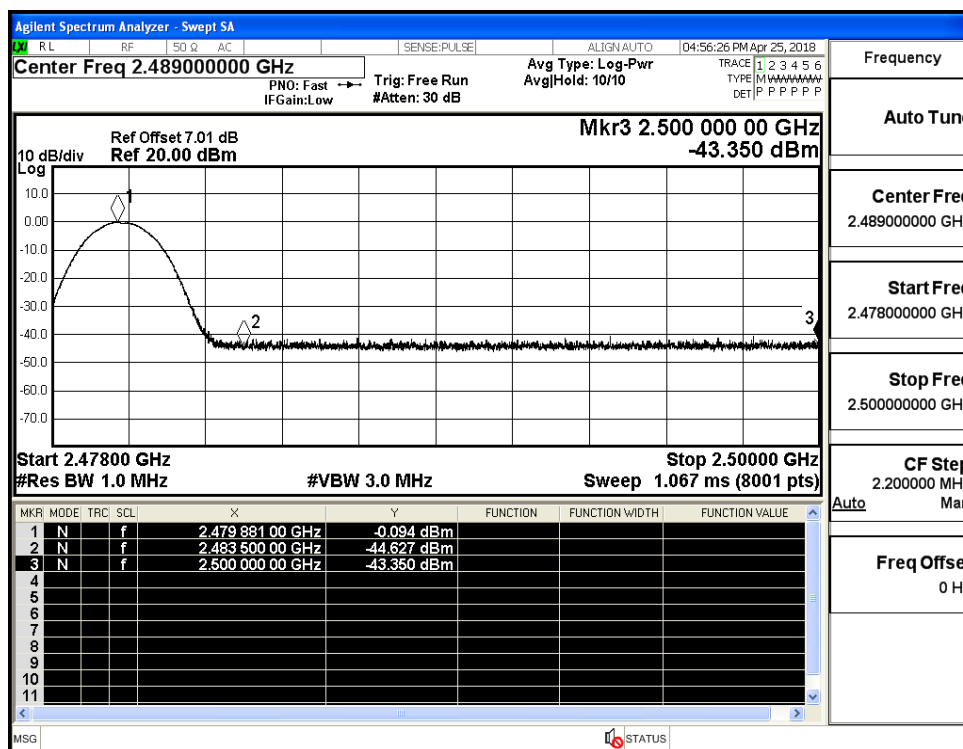
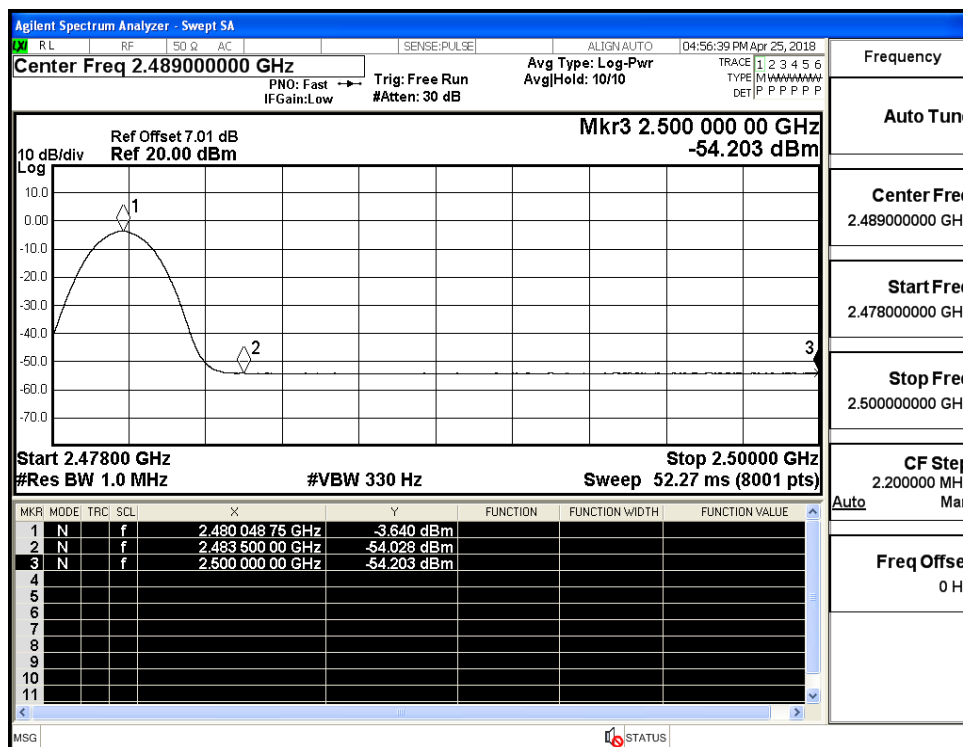
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



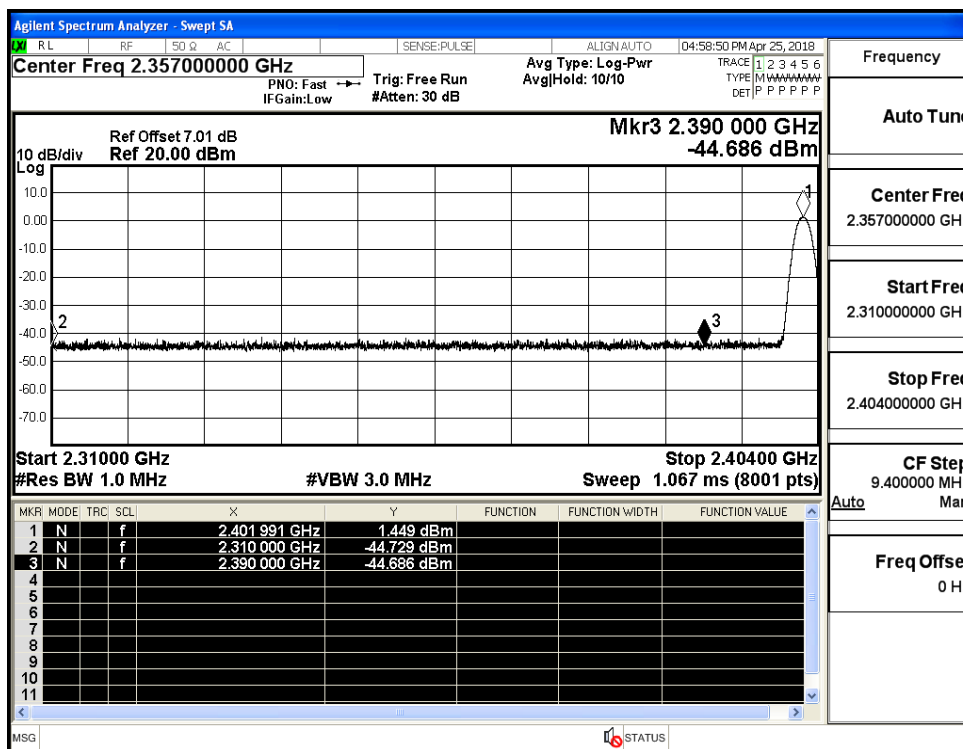
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



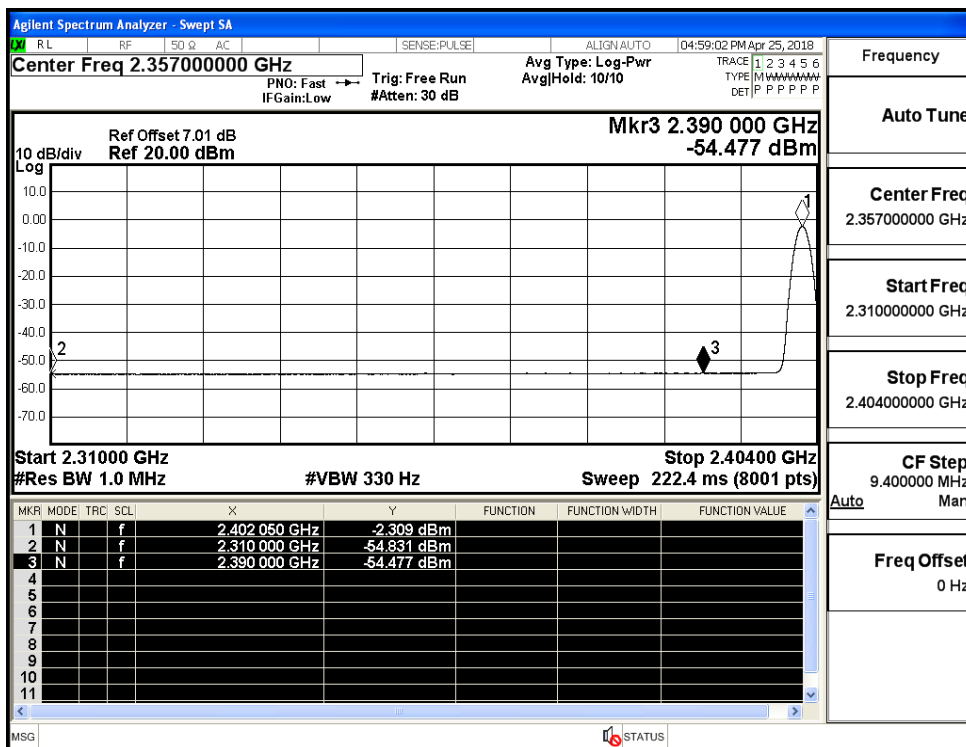
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

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)

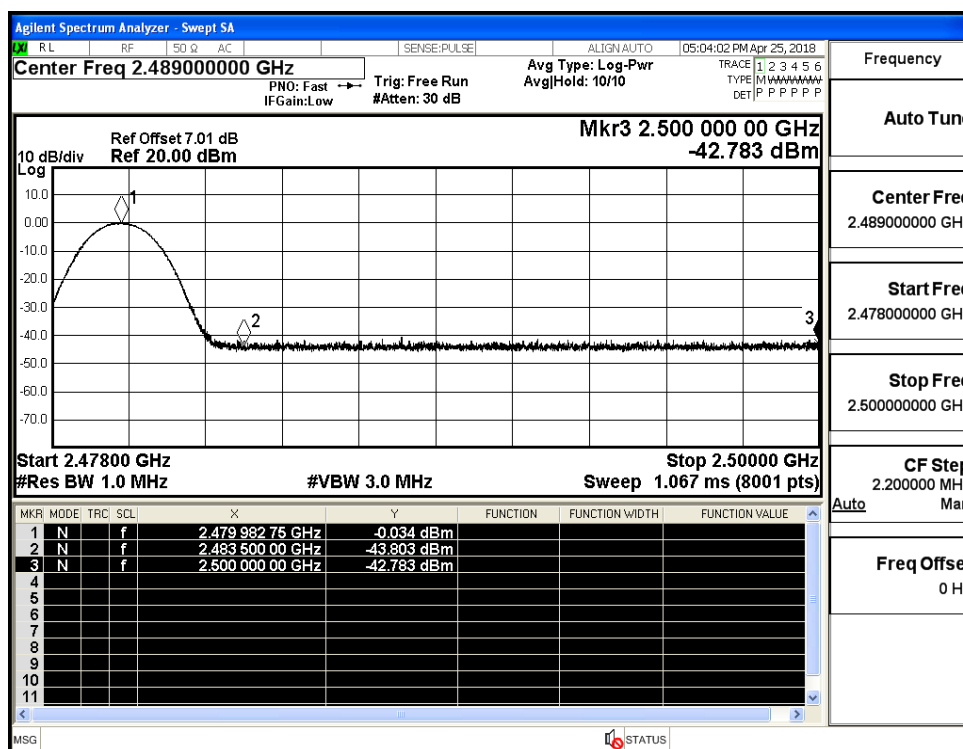
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

