

Appendix A

RF Test Data for BT V4.0 (BDR/EDR) (Conducted Measurement)

Product Name: iConnect Rectangle

Trade Mark: iConnect By Timex

Test Model: M03Y

Environmental Conditions

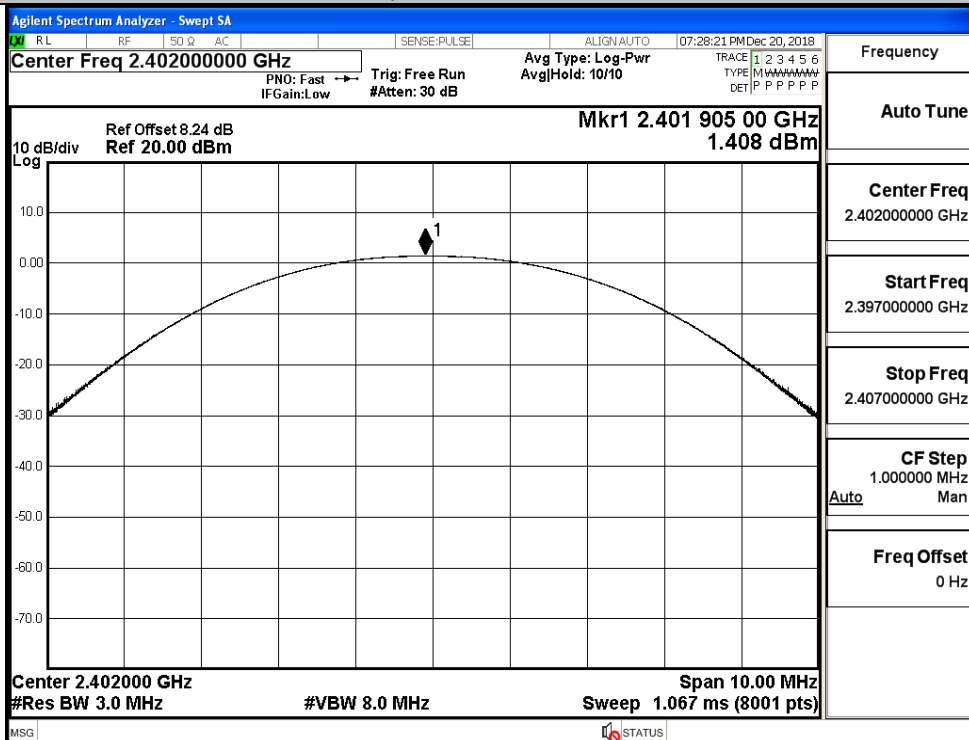
Temperature:	23.5 ° C
Relative Humidity:	53.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

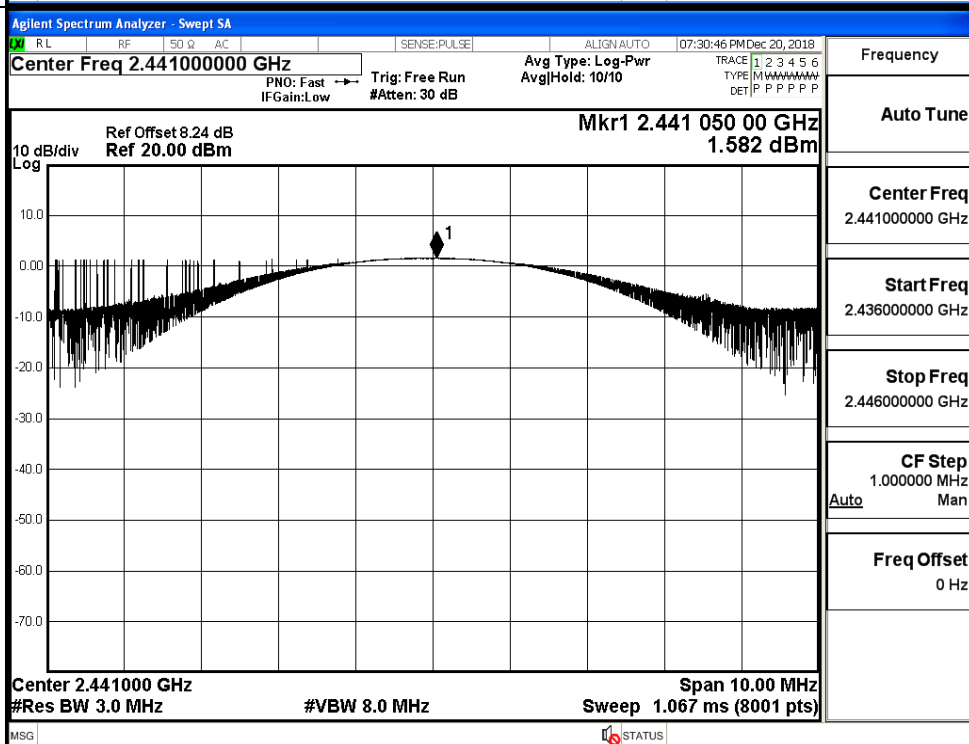
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.408	21	PASS
	MCH	1.582	21	PASS
	HCH	1.568	21	PASS
$\pi/4$ DQPSK	LCH	0.590	21	PASS
	MCH	1.050	21	PASS
	HCH	0.656	21	PASS
8DPSK	LCH	0.817	21	PASS
	MCH	0.945	21	PASS
	HCH	1.056	21	PASS

Test Graphs

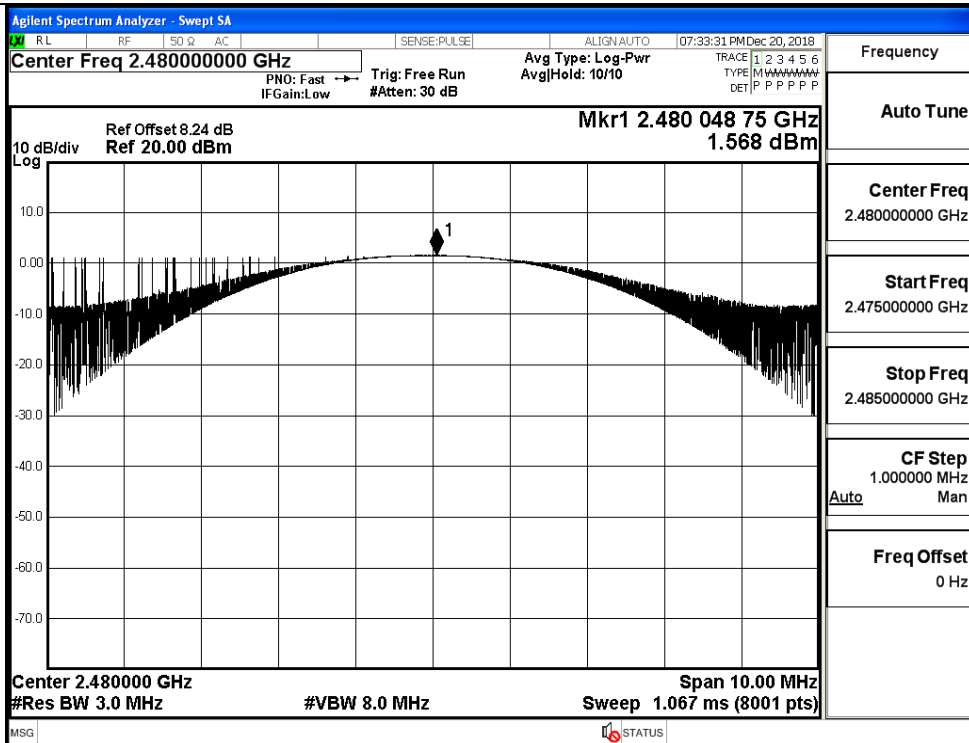
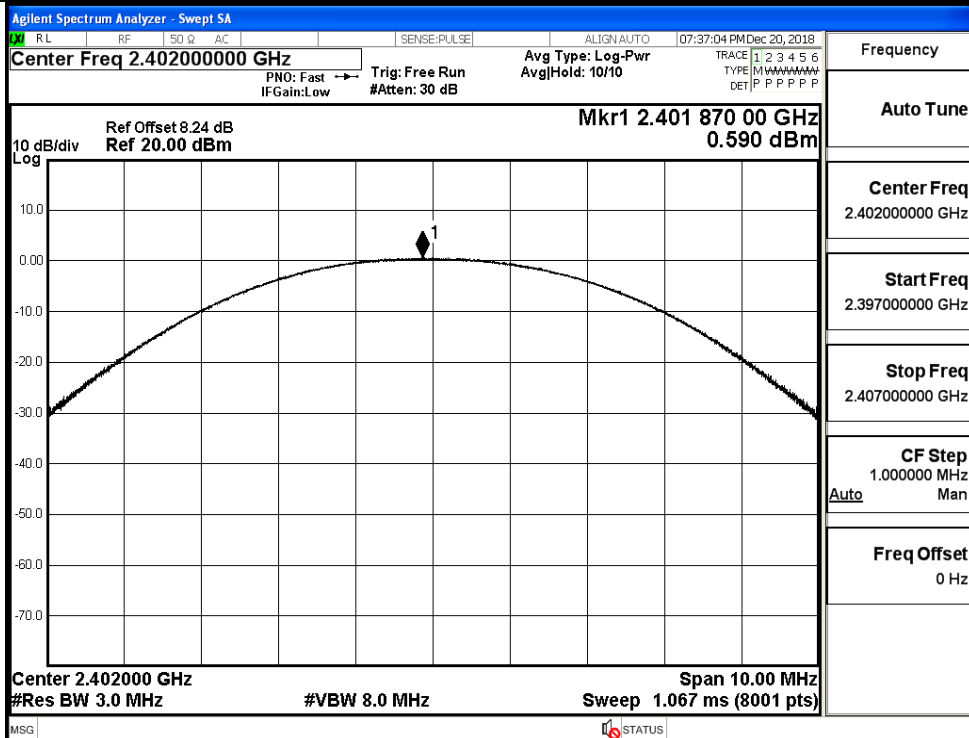
GFSK/LCH

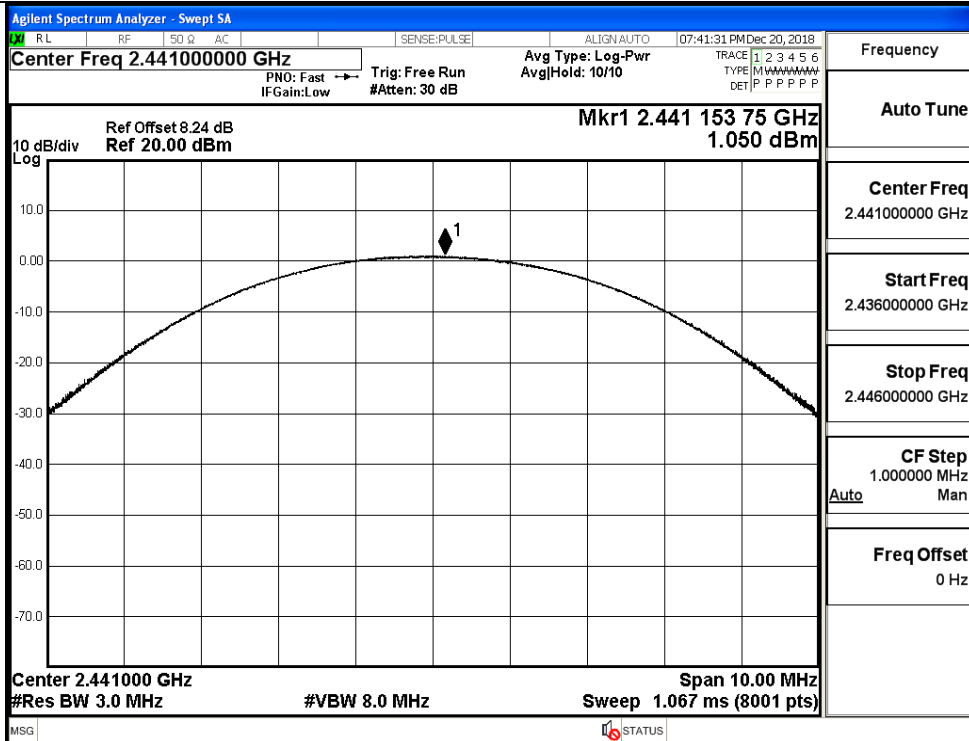
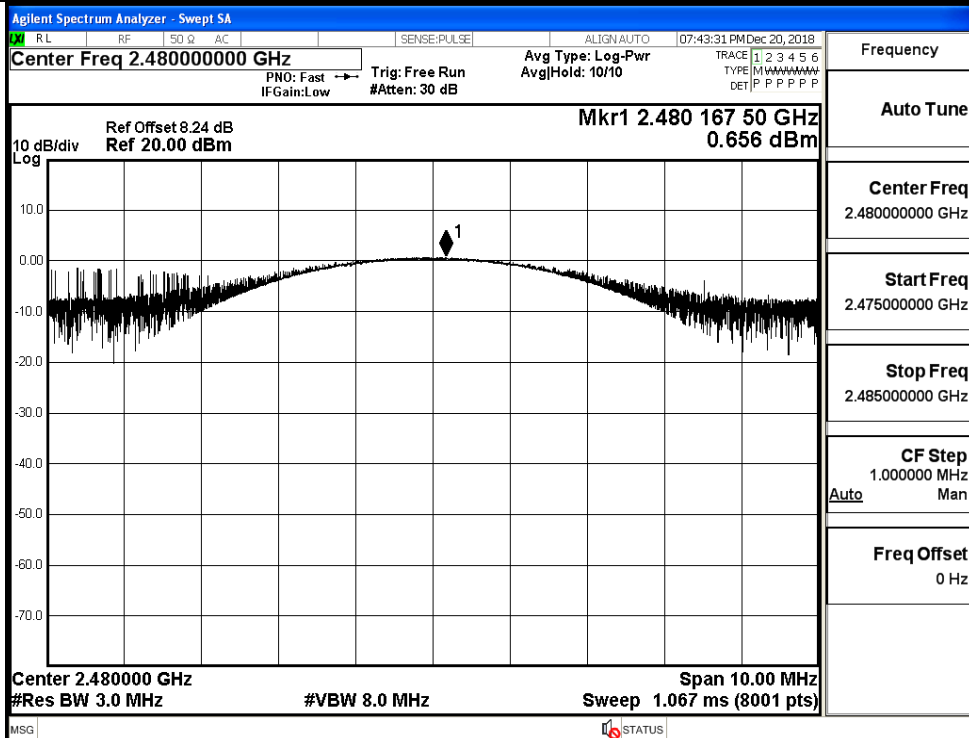


GFSK/MCH

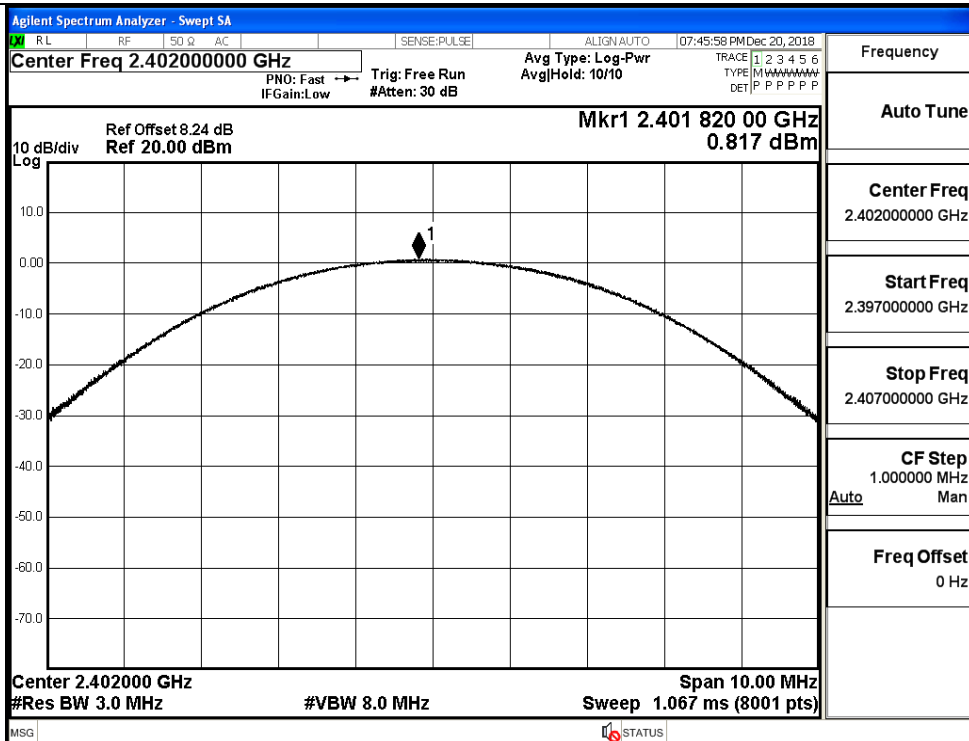


GFSK/HCH

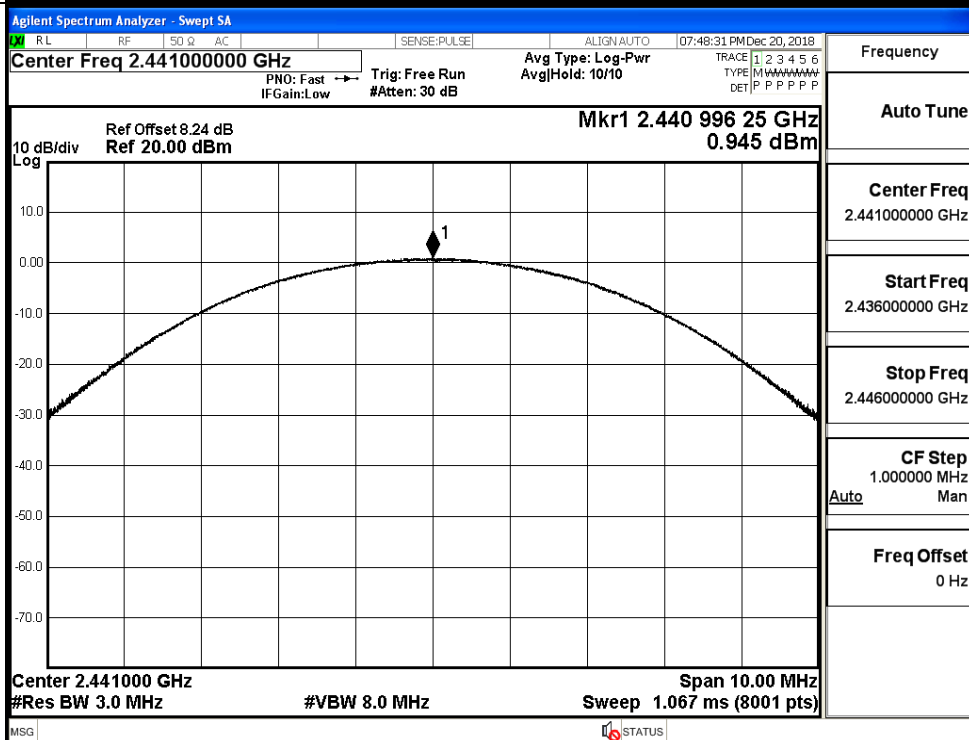
 π /4DQPSK/LCH

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

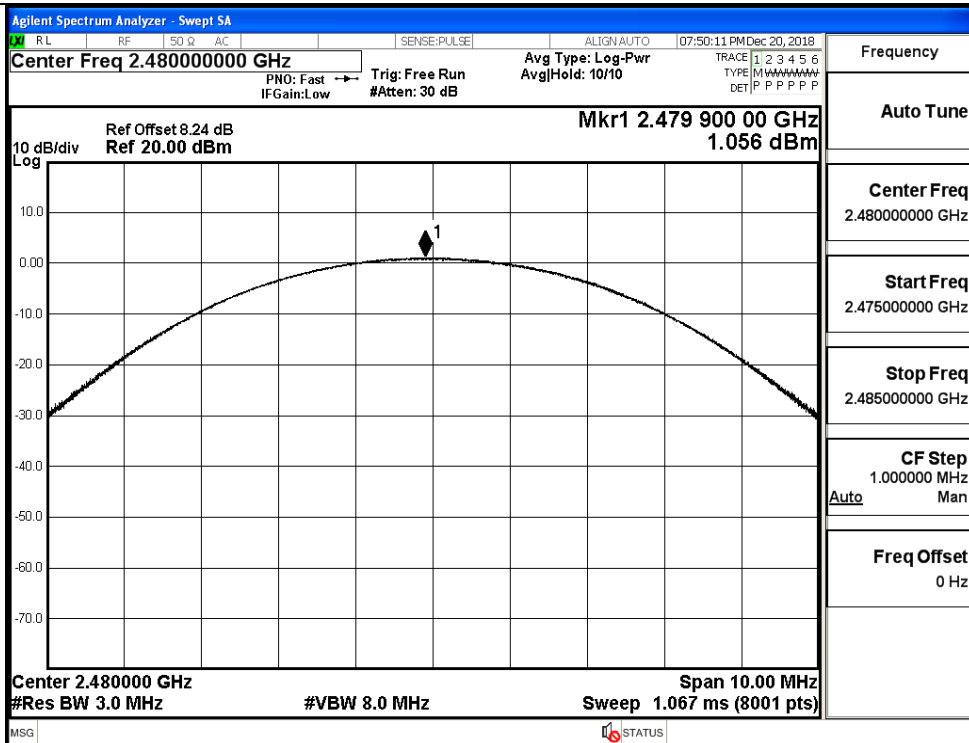
8DPSK/LCH



8DPSK/MCH



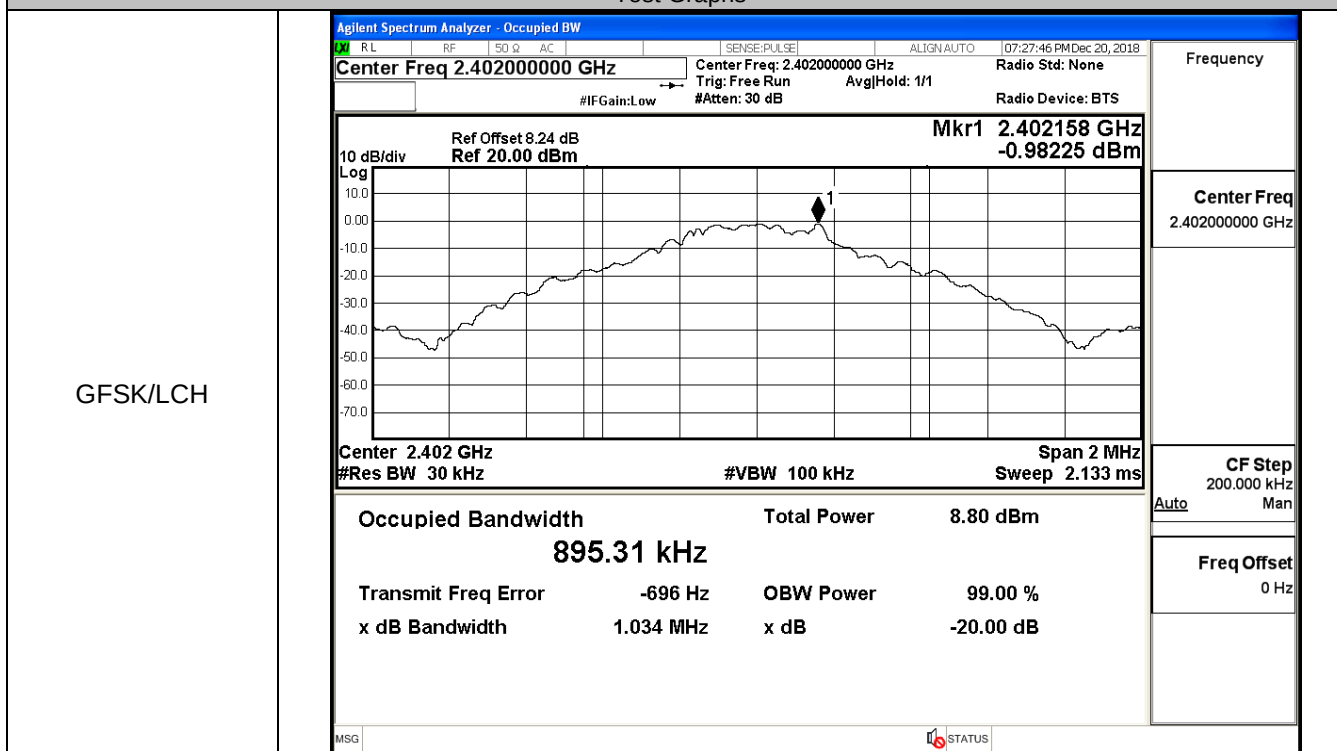
8DPSK/HCH



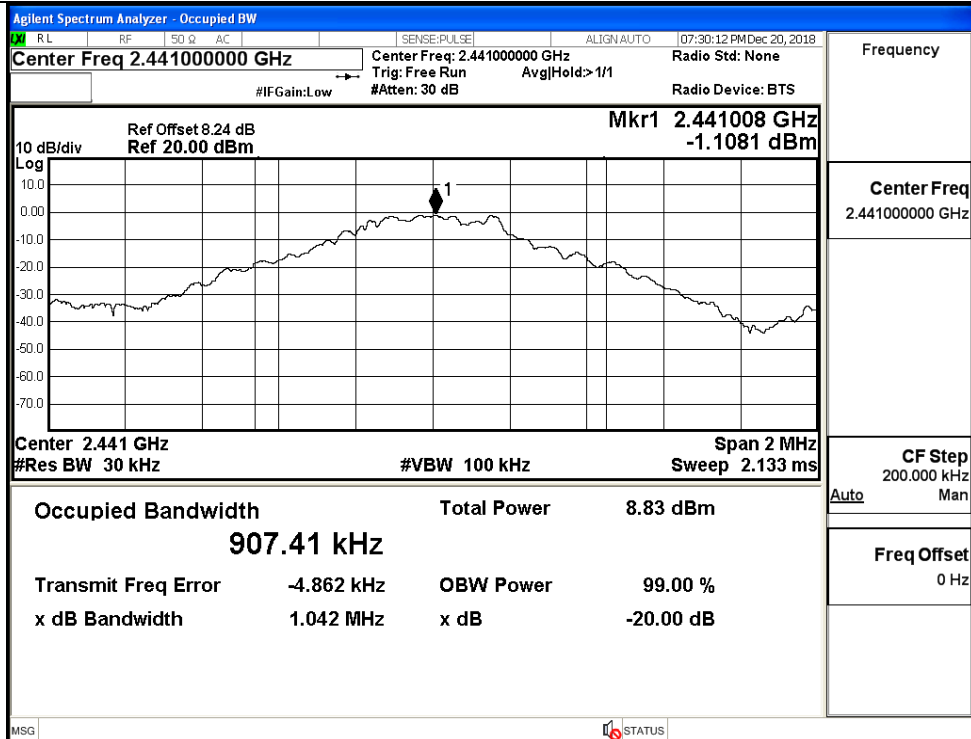
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89531	1.034	Not Specified	PASS
	MCH	0.90741	1.042	Not Specified	PASS
	HCH	0.90647	1.037	Not Specified	PASS
π /4DQPSK	LCH	1.1691	1.291	Not Specified	PASS
	MCH	1.1721	1.290	Not Specified	PASS
	HCH	1.1817	1.287	Not Specified	PASS
8DPSK	LCH	1.1807	1.285	Not Specified	PASS
	MCH	1.1770	1.294	Not Specified	PASS
	HCH	1.1789	1.300	Not Specified	PASS

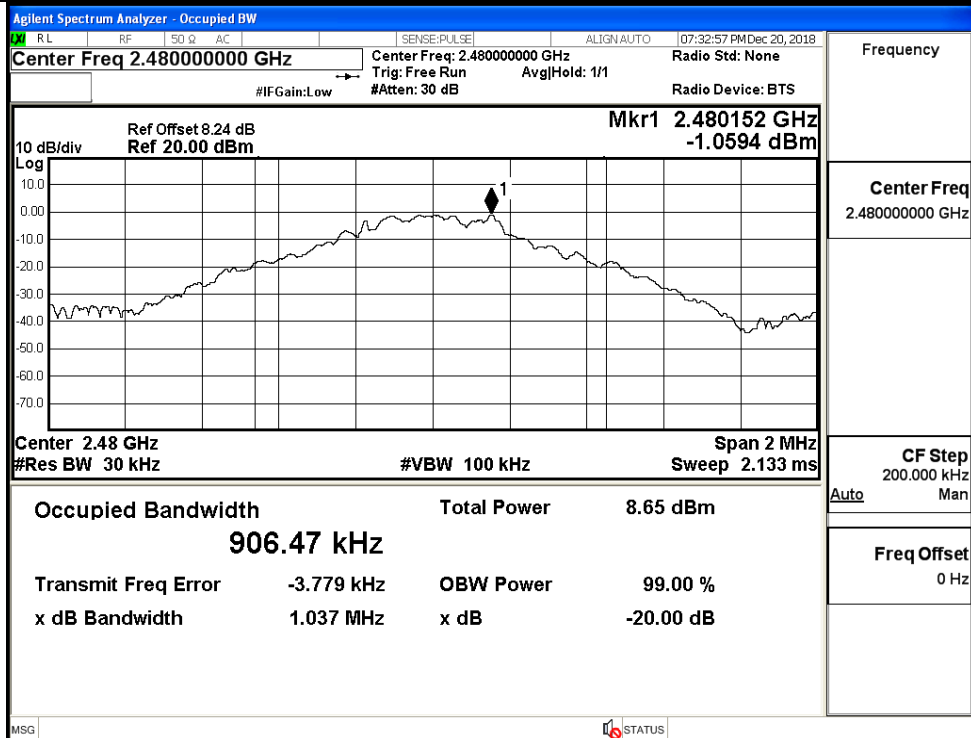
Test Graphs

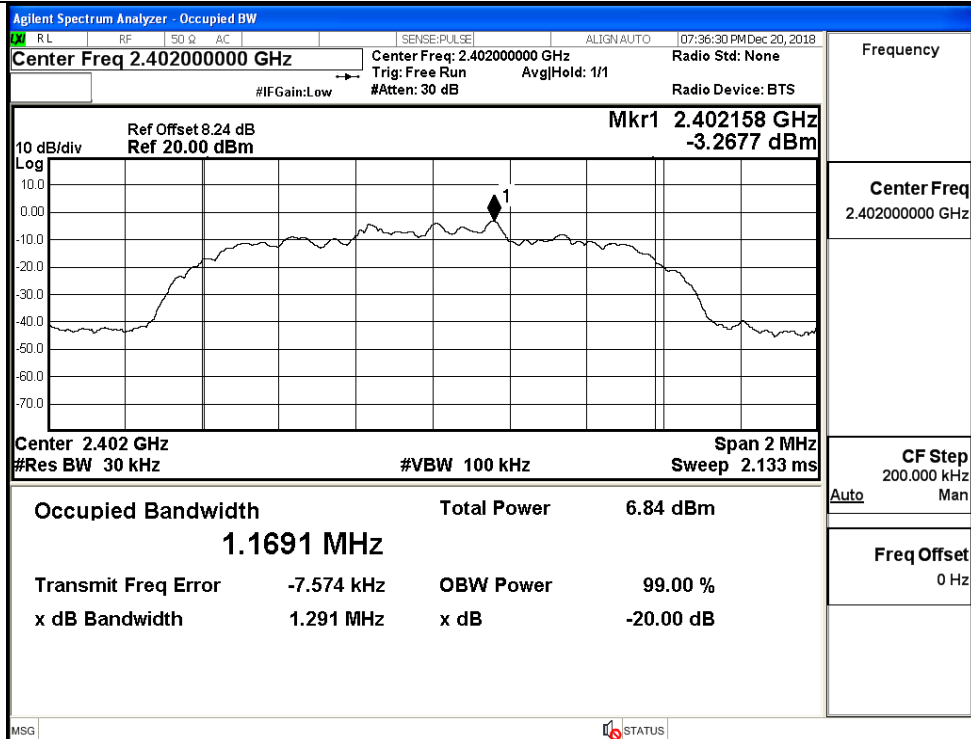
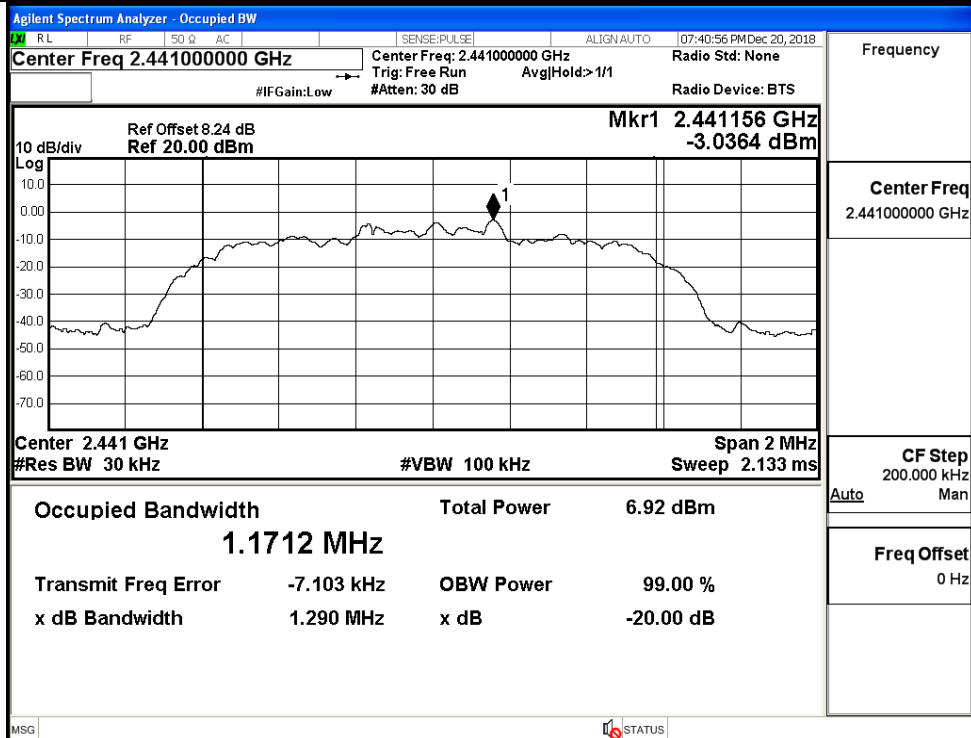


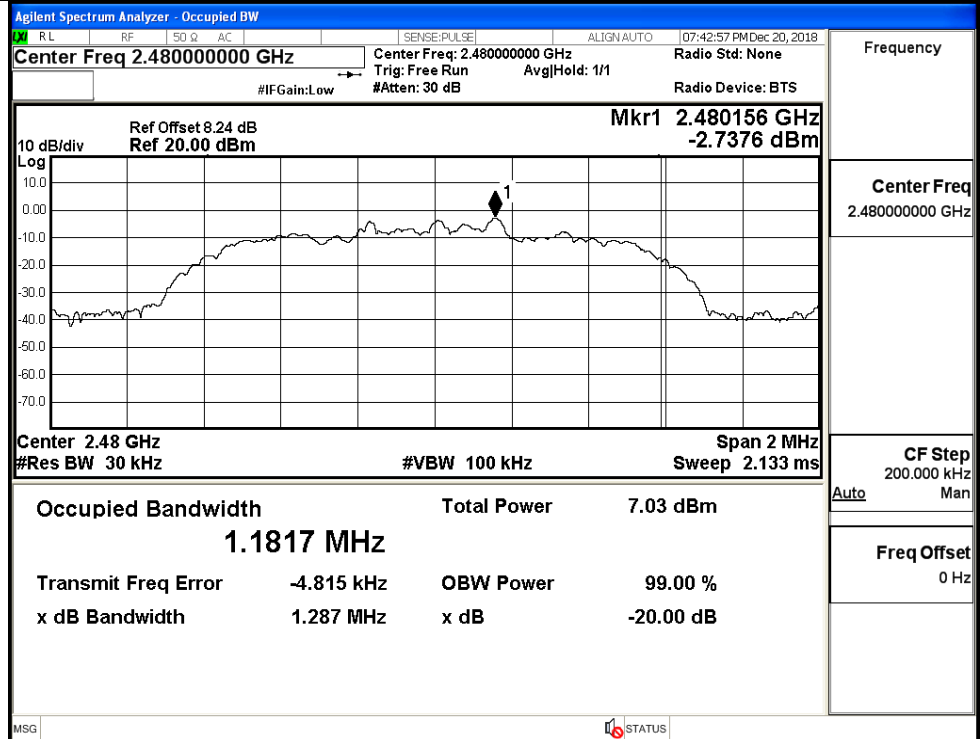
GFSK/MCH



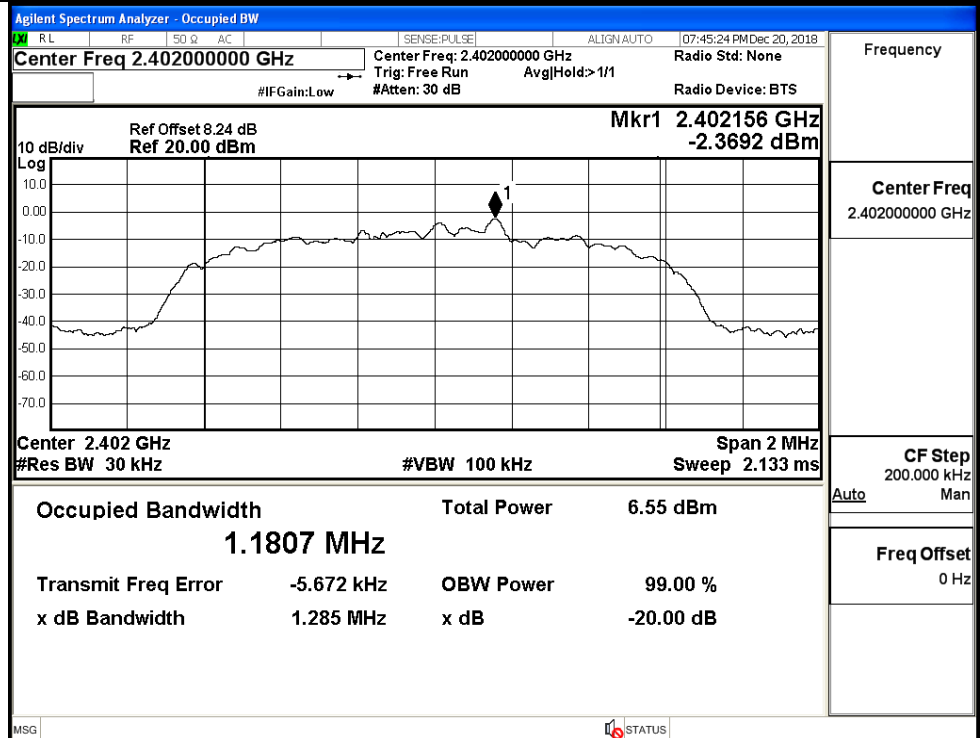
GFSK/HCH



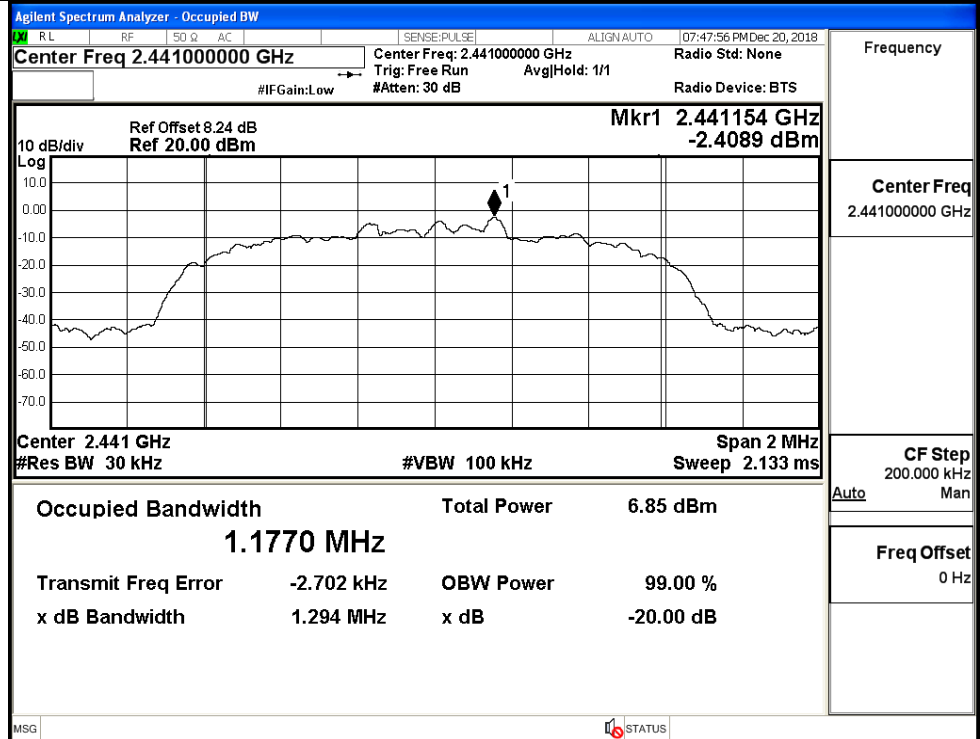
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

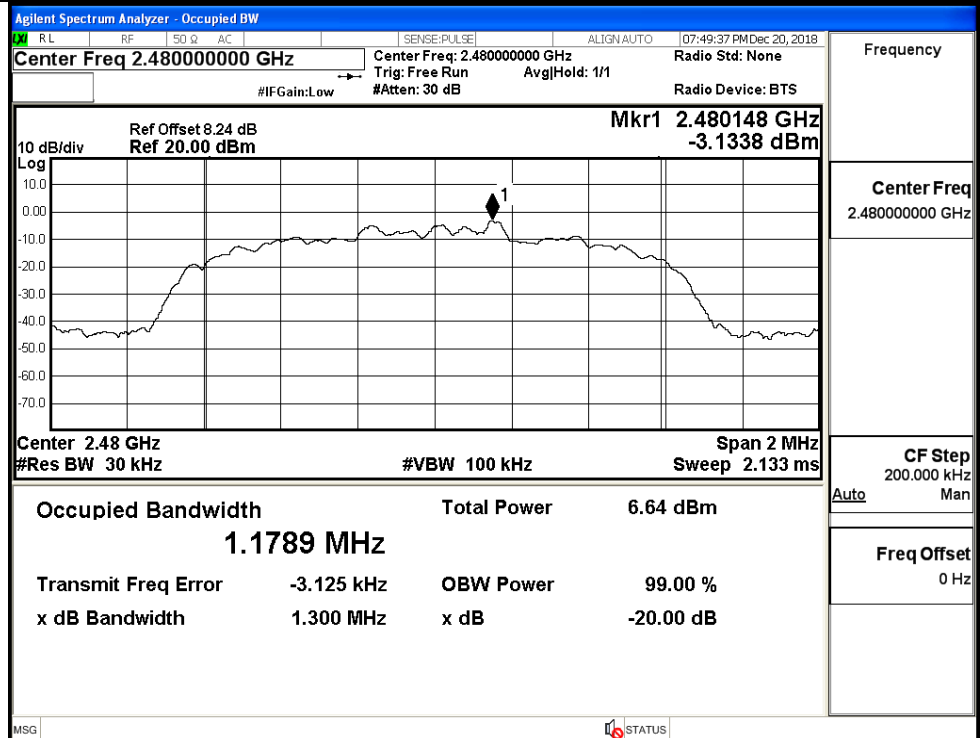
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

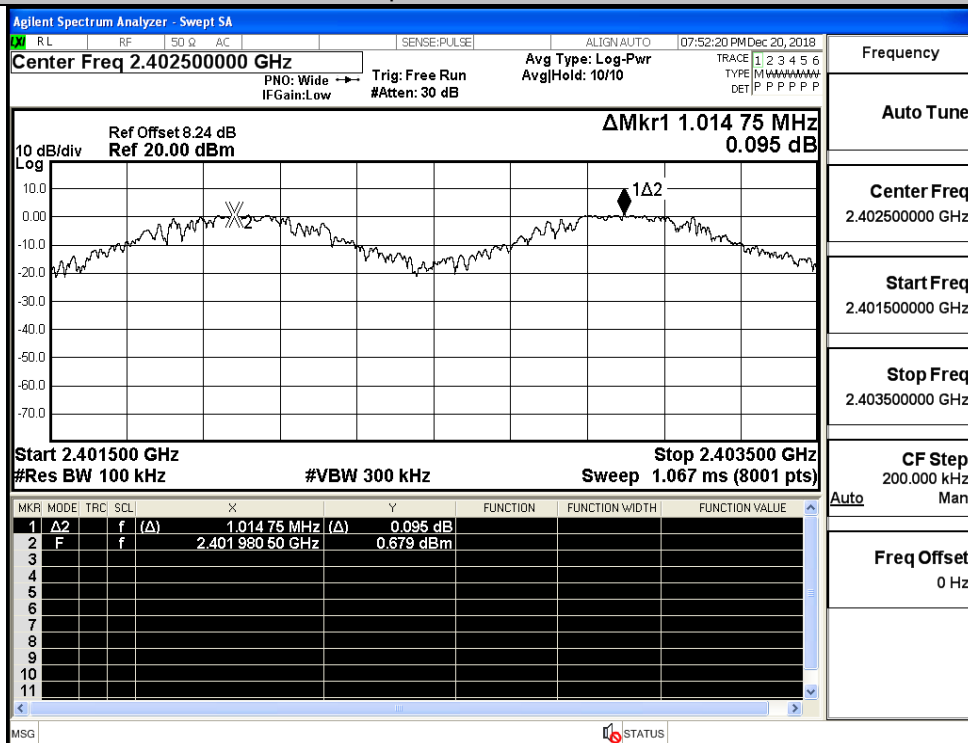


A.3 Carrier Frequency Separation

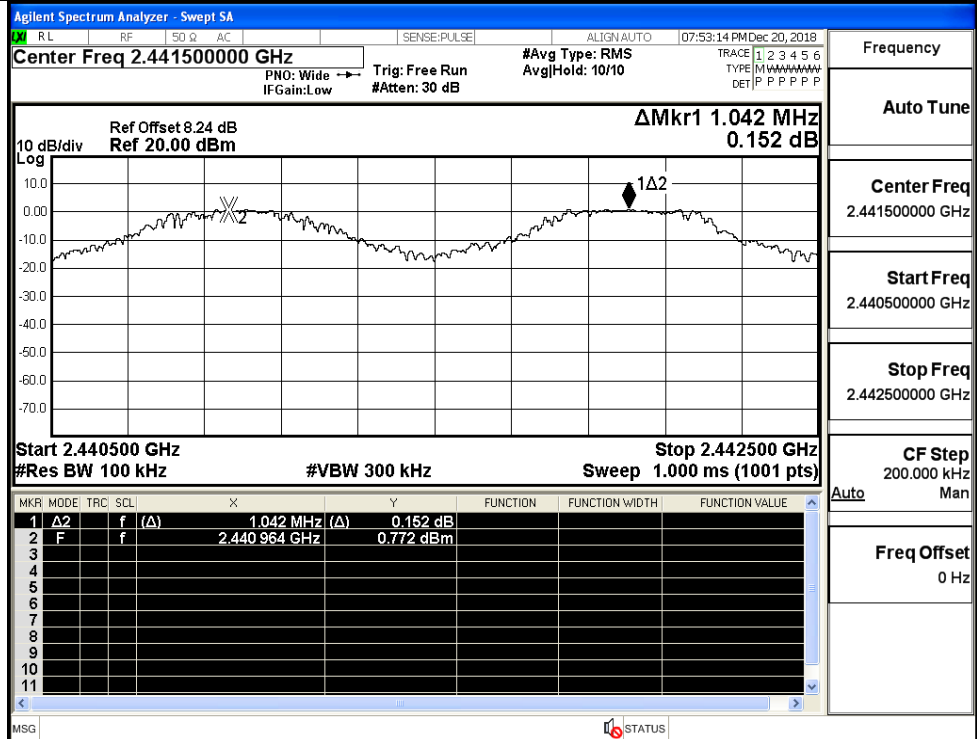
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.015	0.695	PASS
	MCH	1.042	0.695	PASS
	HCH	1.016	0.695	PASS
π /4DQPSK	LCH	0.876	0.861	PASS
	MCH	1.168	0.861	PASS
	HCH	1.082	0.861	PASS
8DPSK	LCH	1.122	0.867	PASS
	MCH	1.082	0.867	PASS
	HCH	0.986	0.867	PASS

Test Graphs

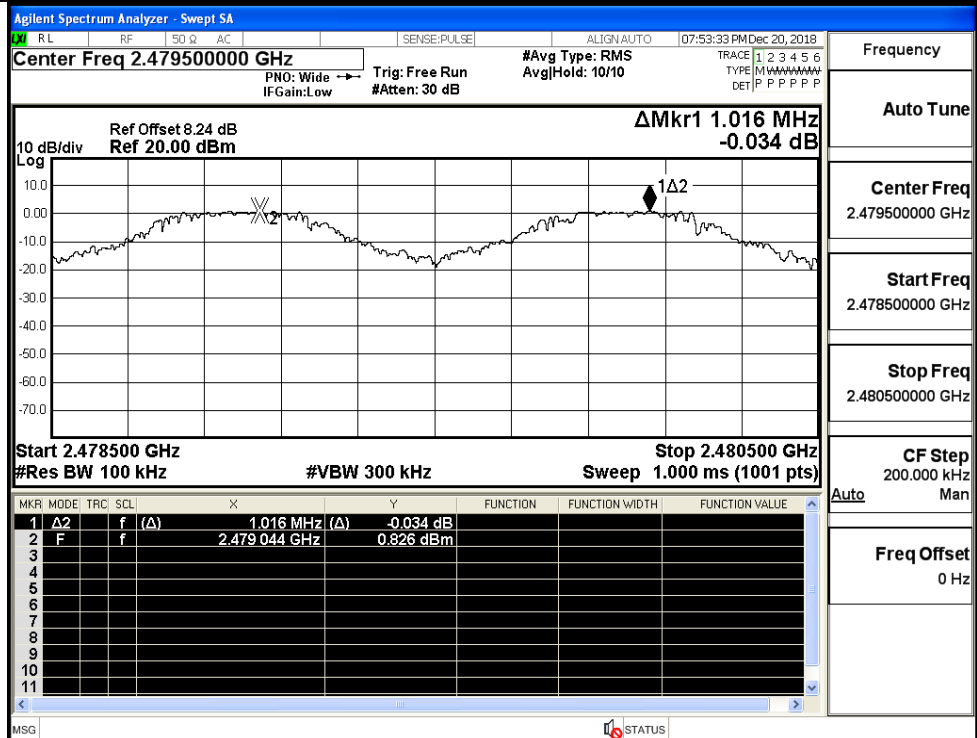
GFSK/LCH

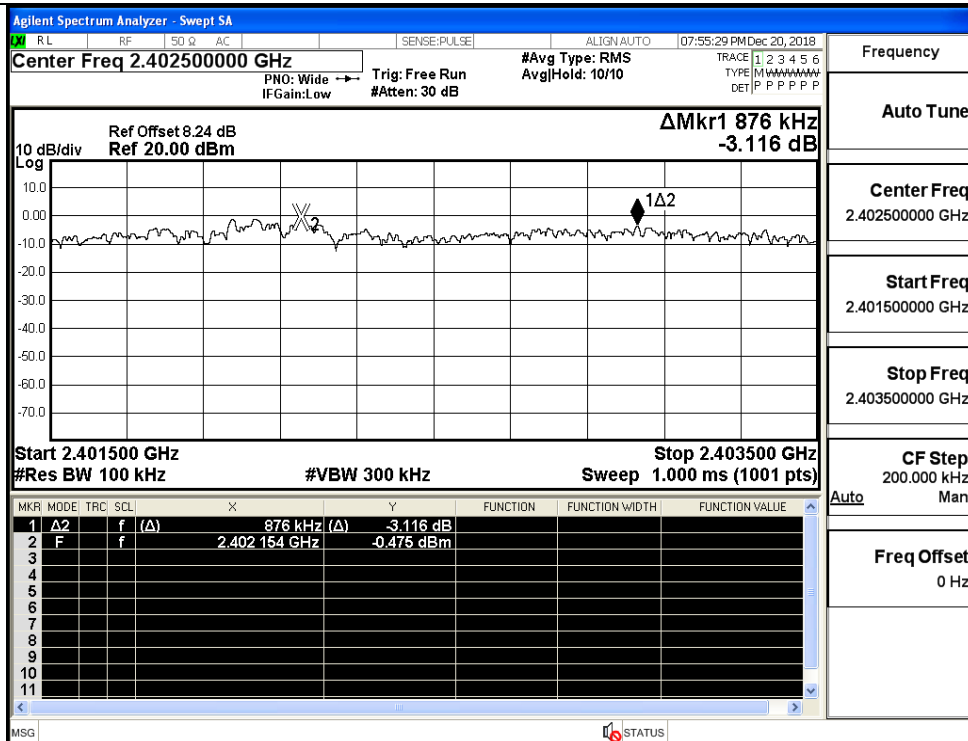
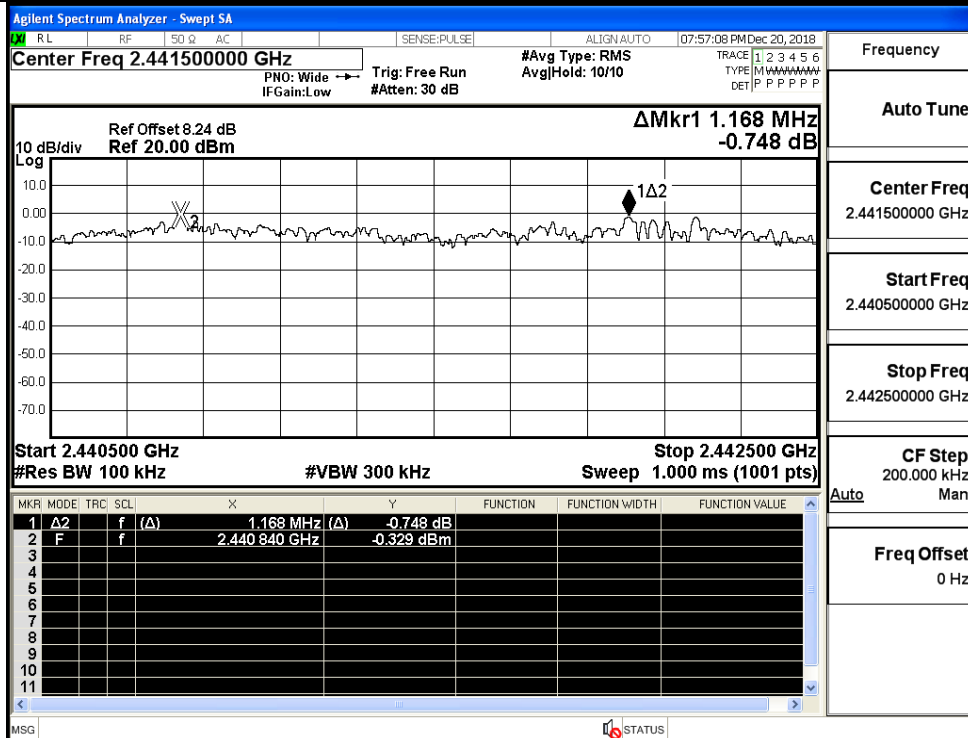


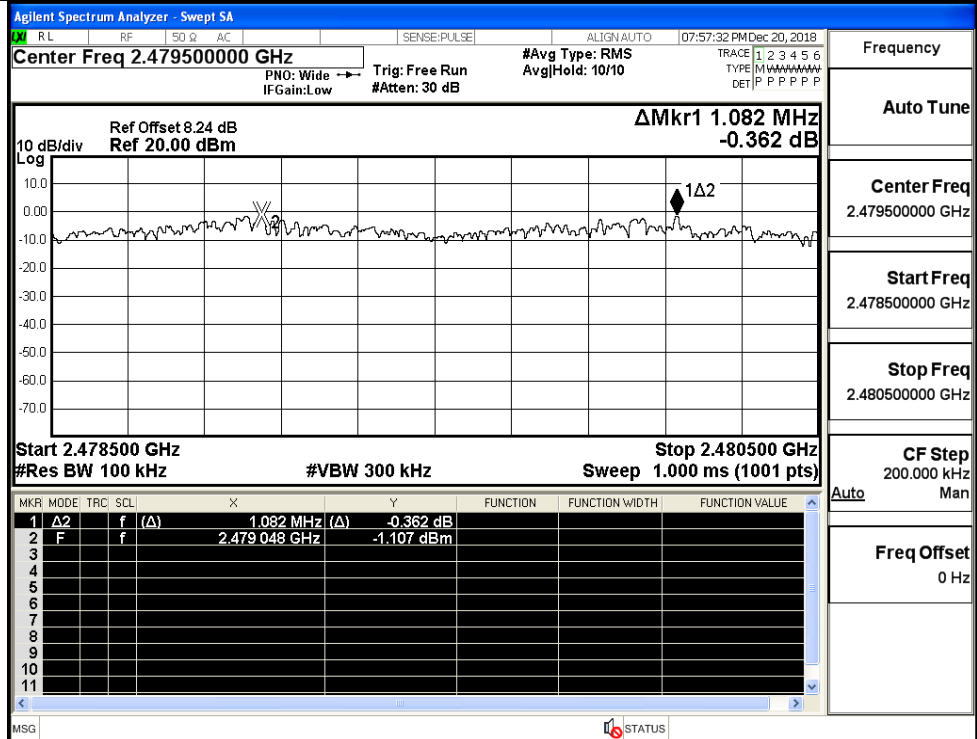
GFSK/MCH



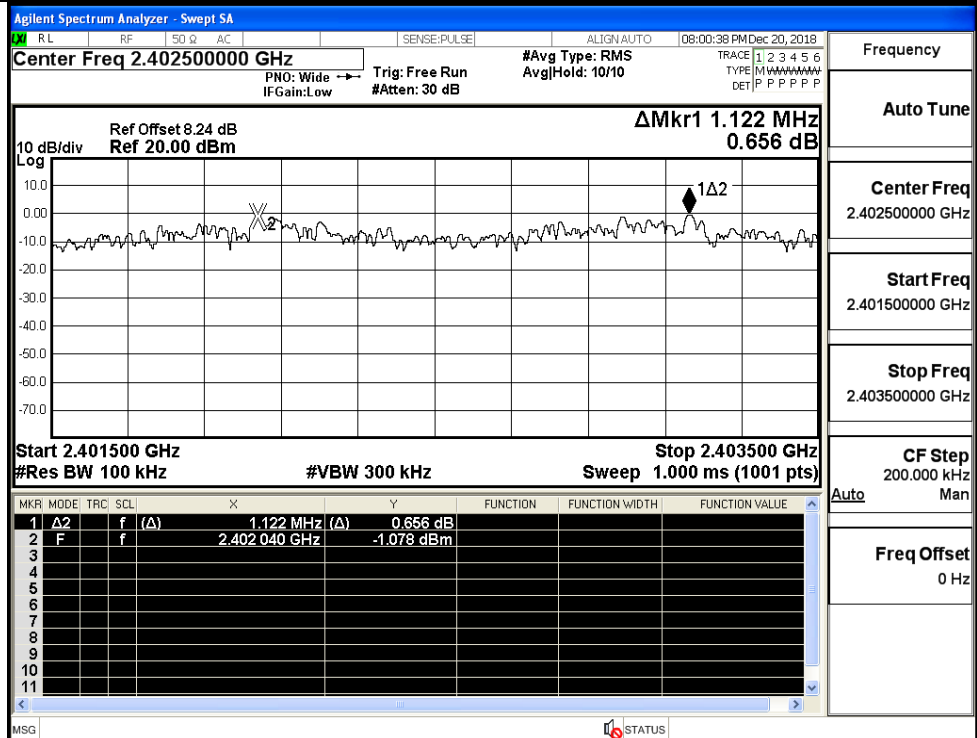
GFSK/HCH



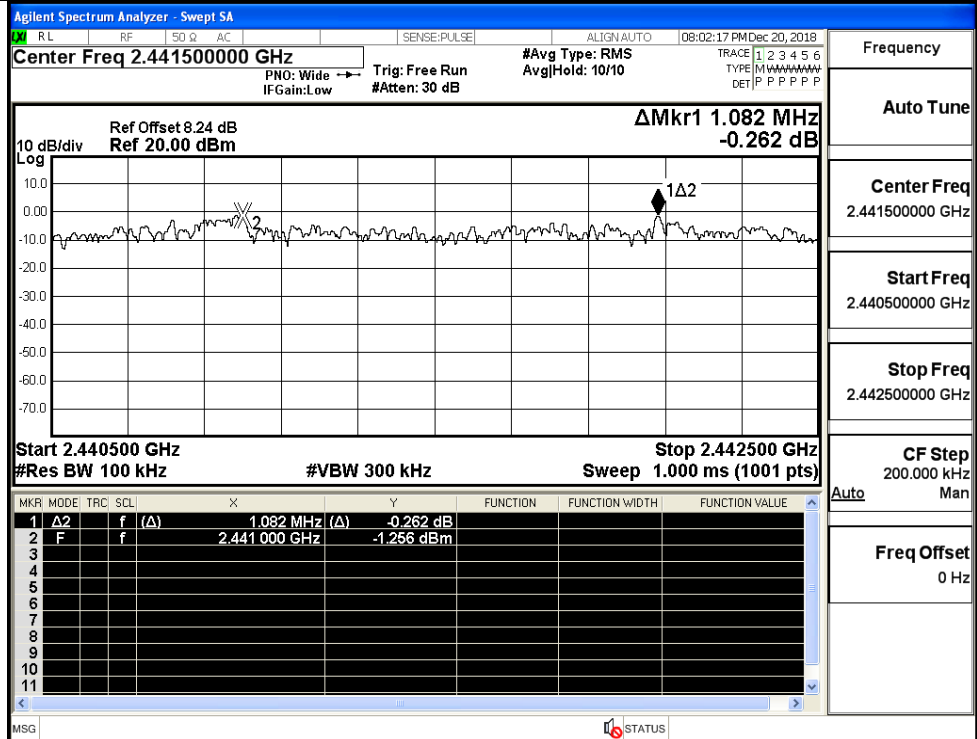
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

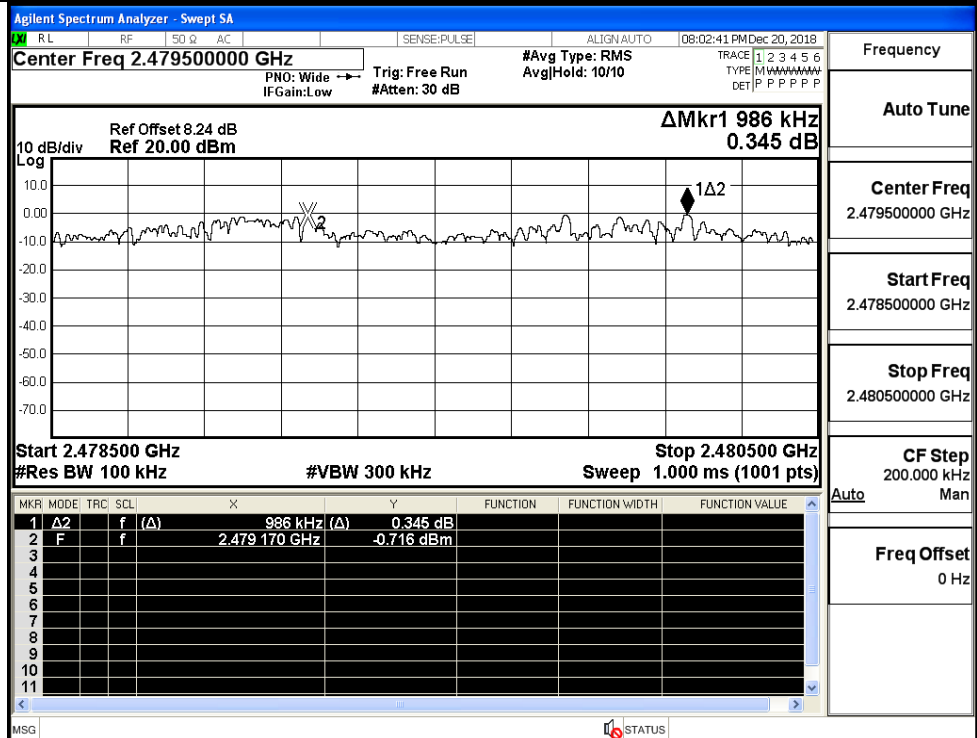
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

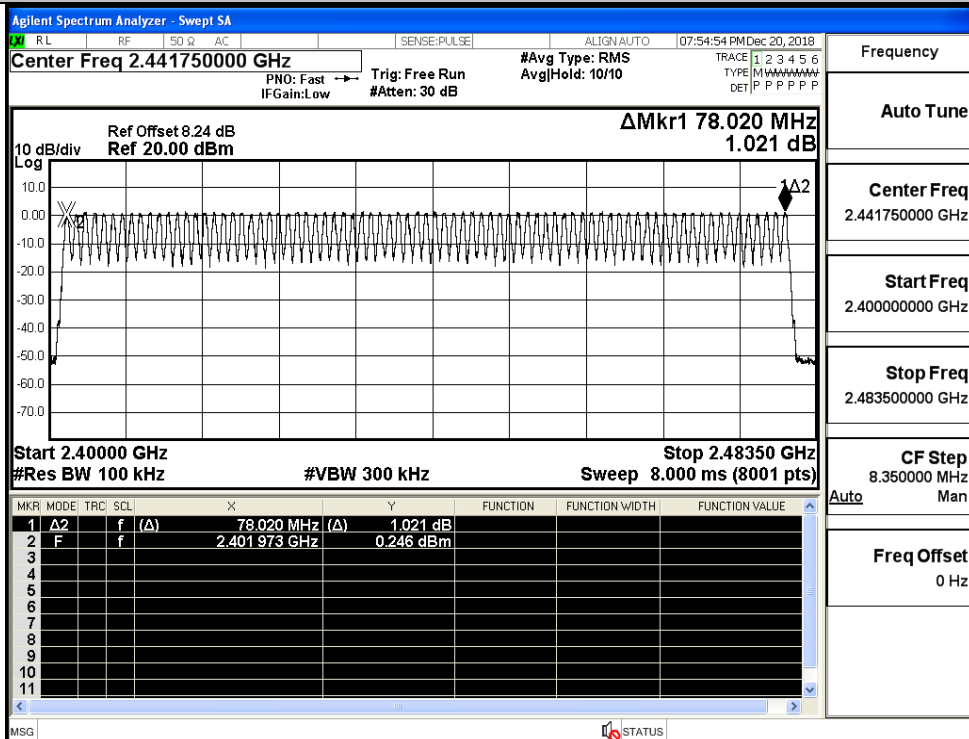
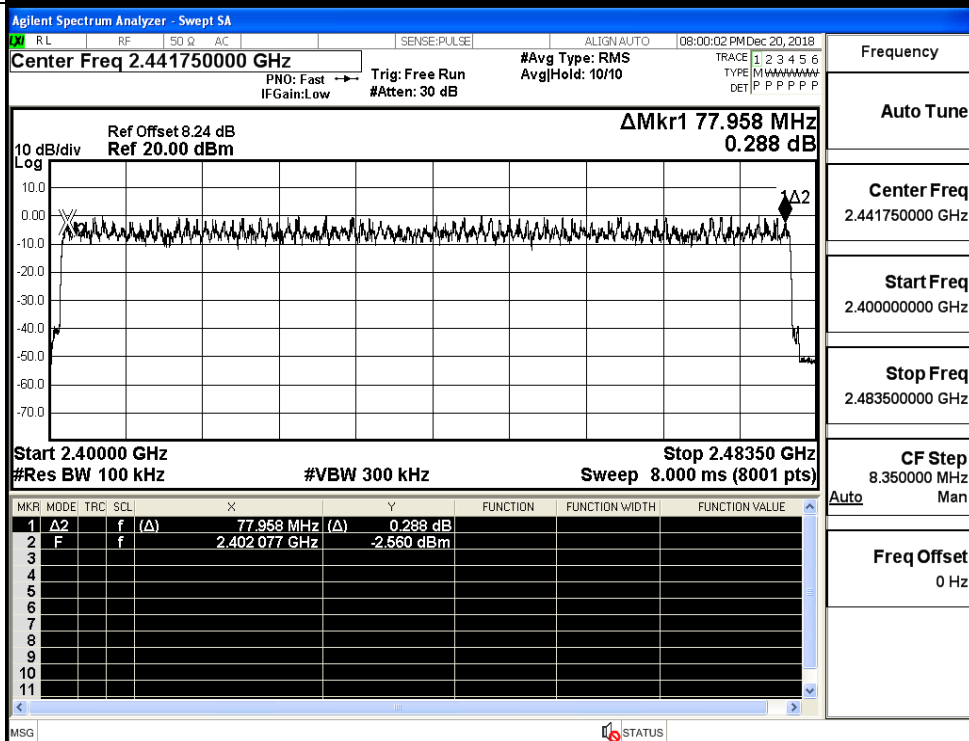


A.4 Hopping Channel Number

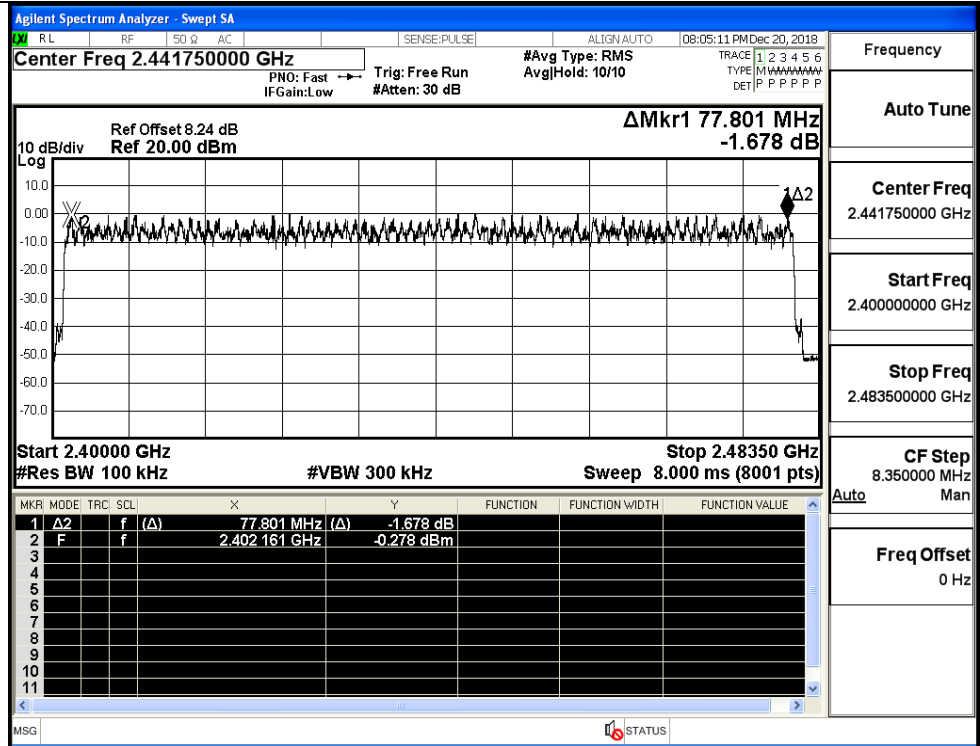
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

GFSK/Hop

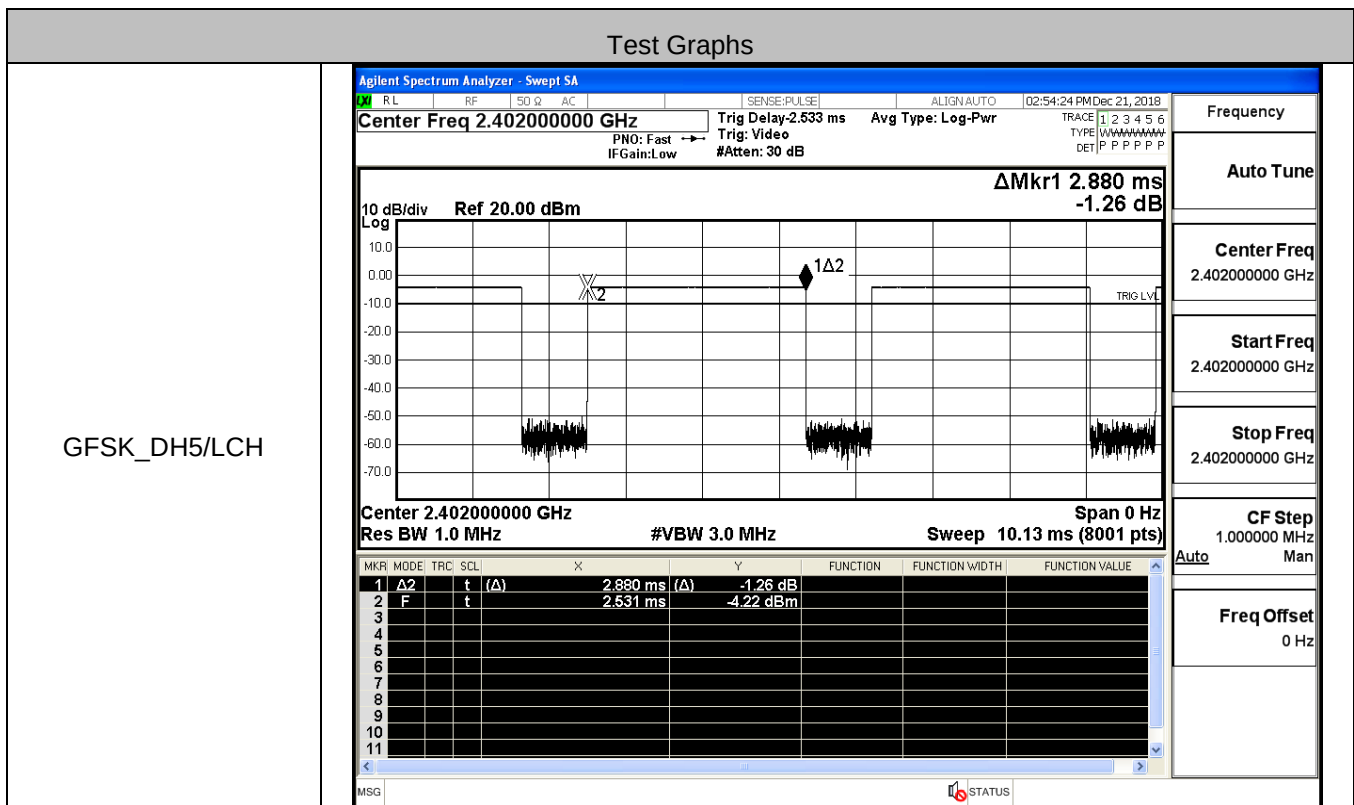
 $\pi/4$ DQPSK/Hop

8DPSK/Hop

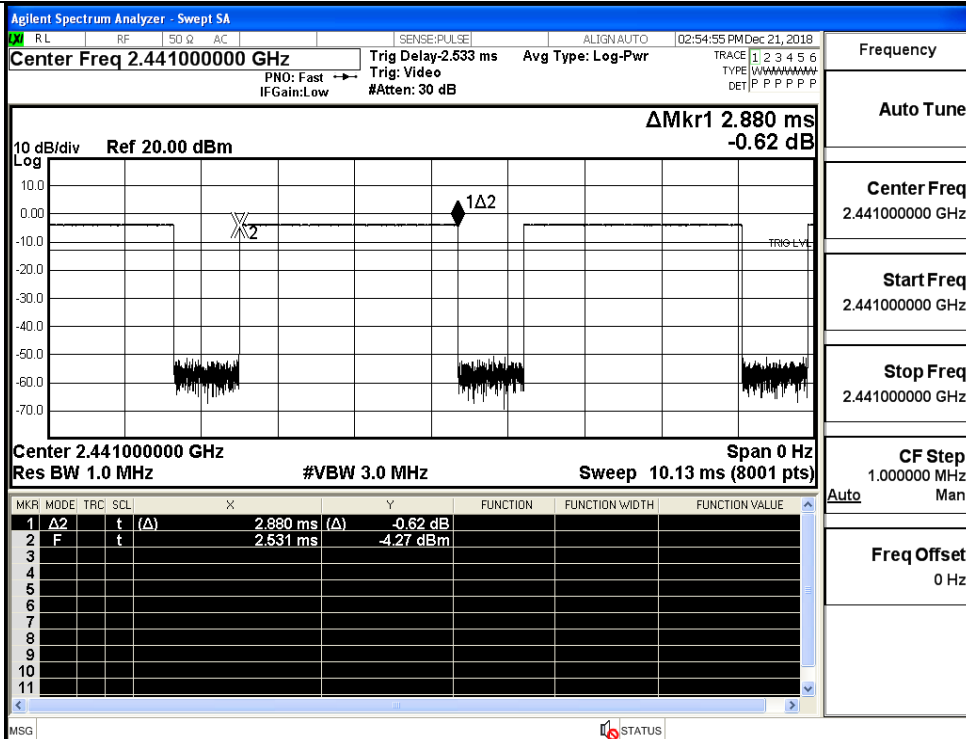


A.5 Dwell Time

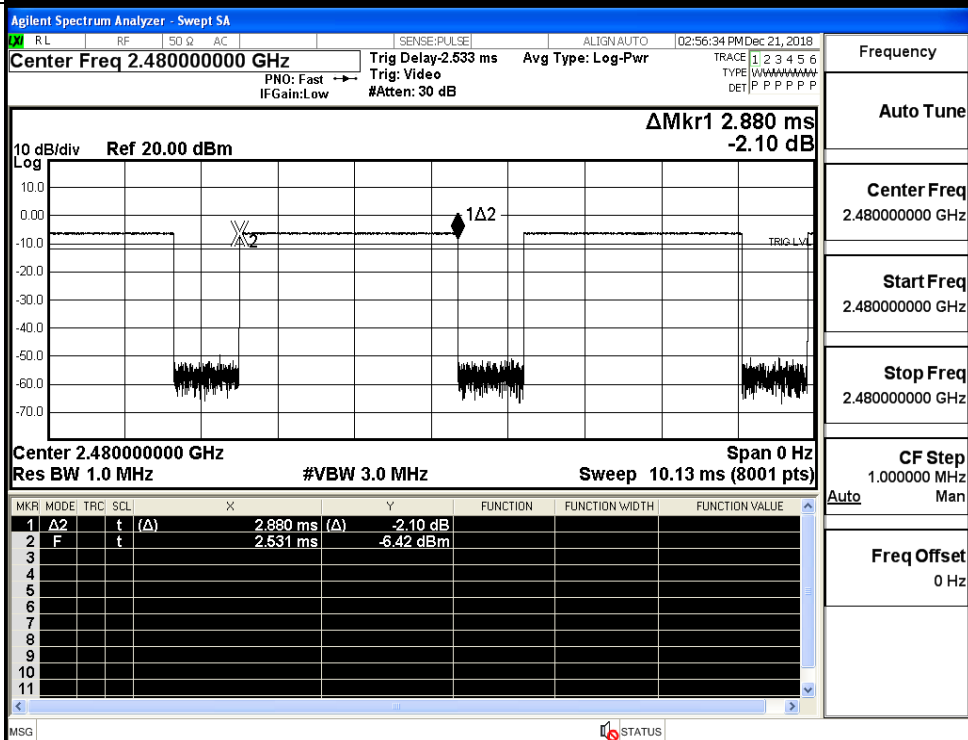
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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



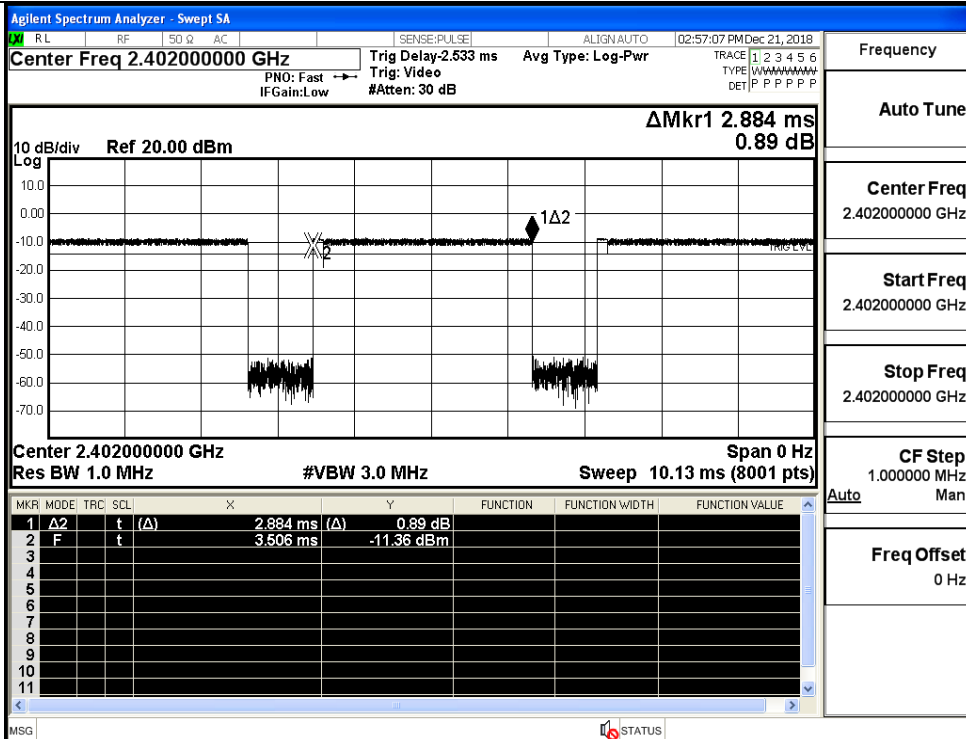
GFSK_DH5/MCH



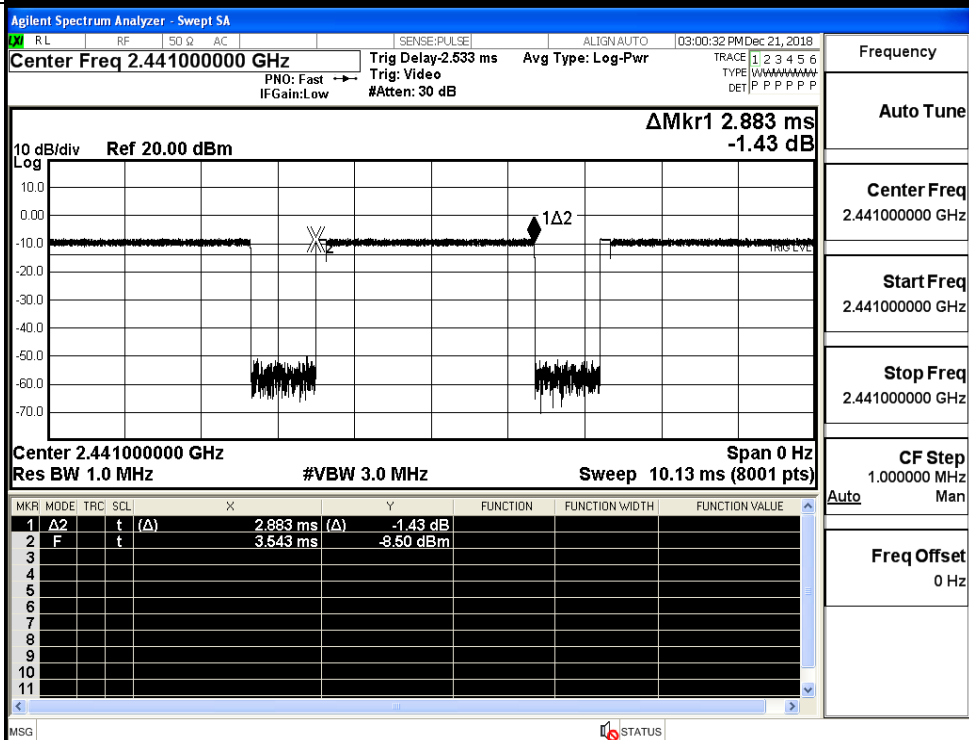
GFSK_DH5/HCH



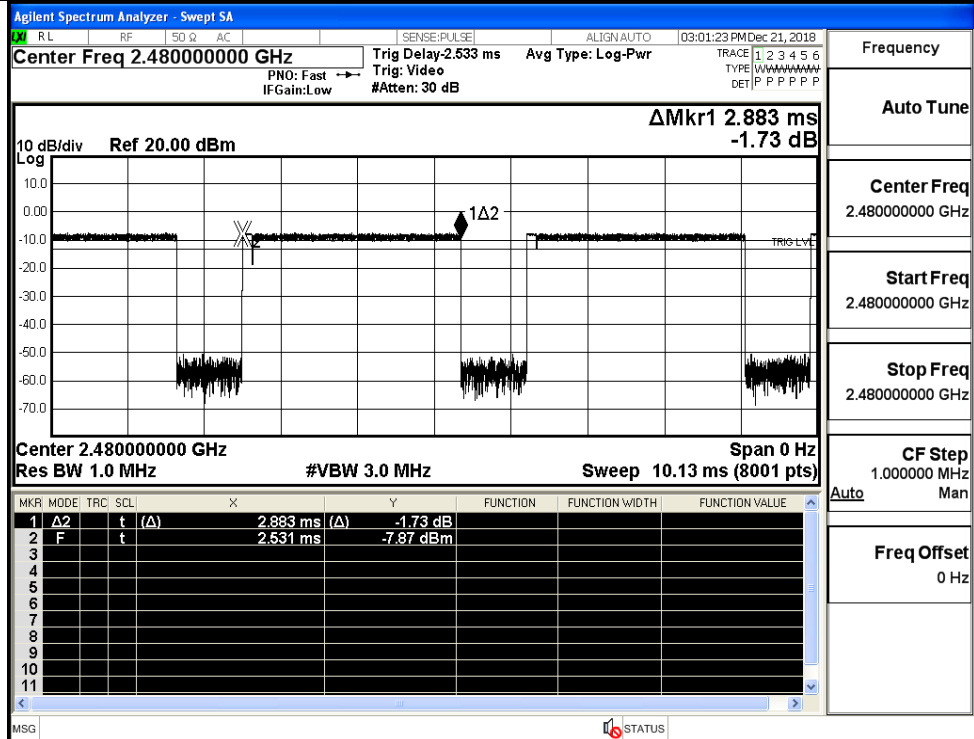
$\pi/4$ DQPSK
_2DH5/LCH



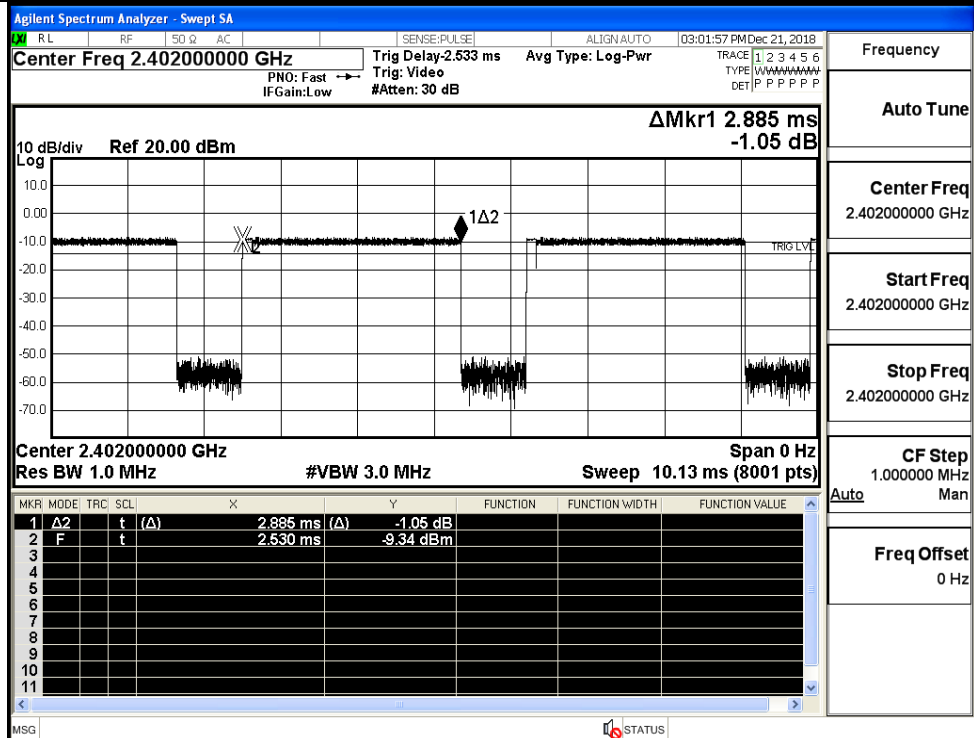
$\pi/4$ DQPSK
_2DH5/MCH



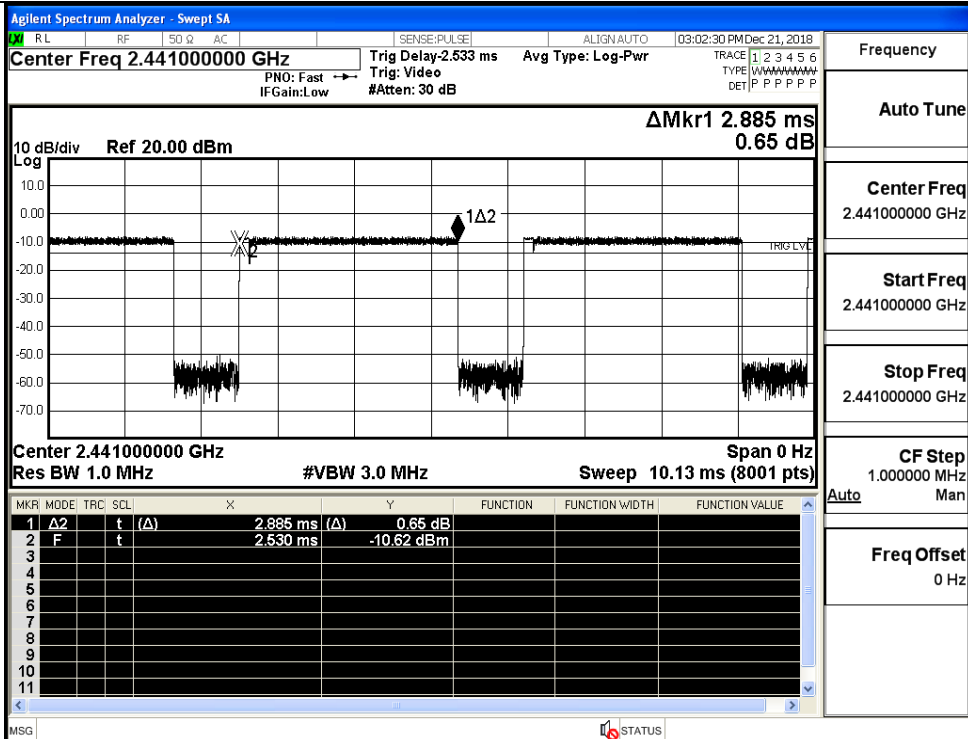
$\pi/4$ DQPSK
_2DH5/HCH



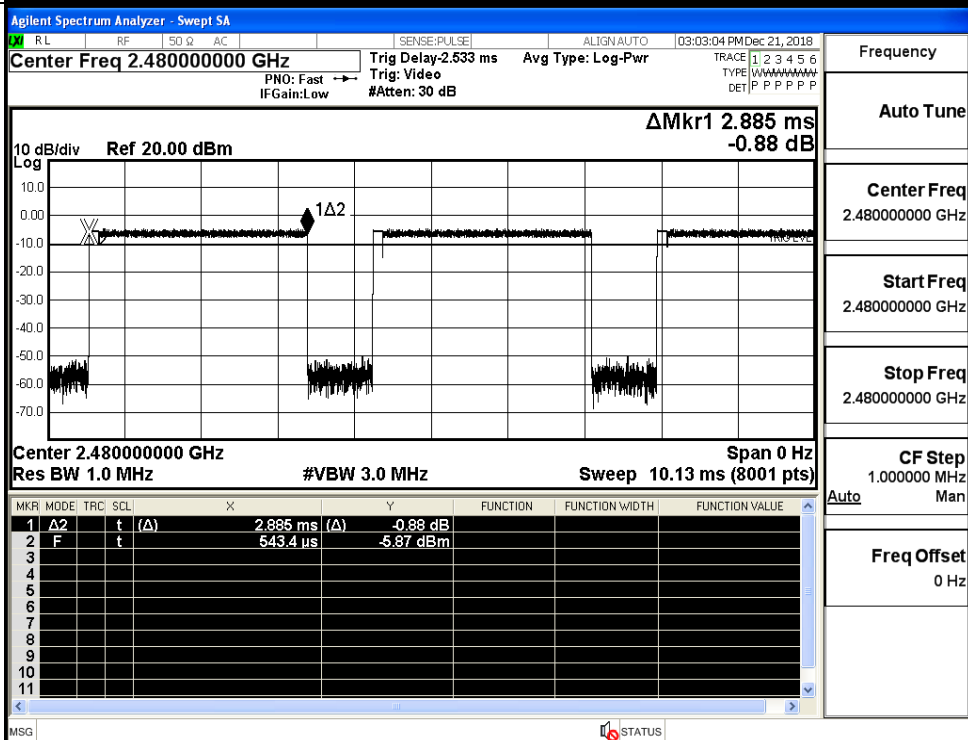
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

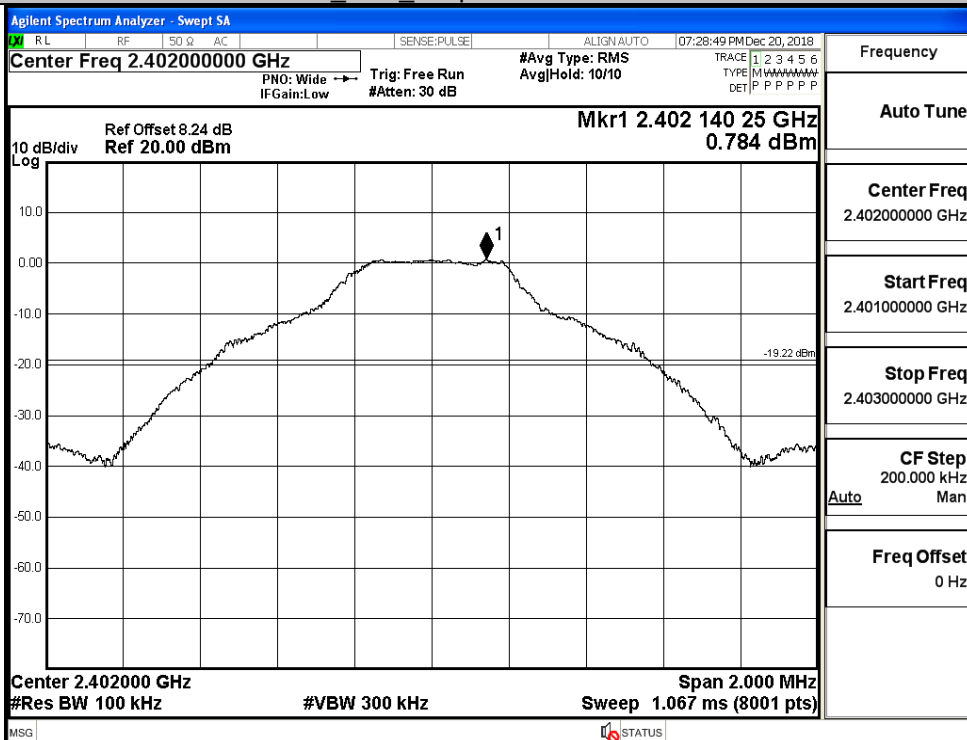


A.6 RF Conducted Spurious Emissions

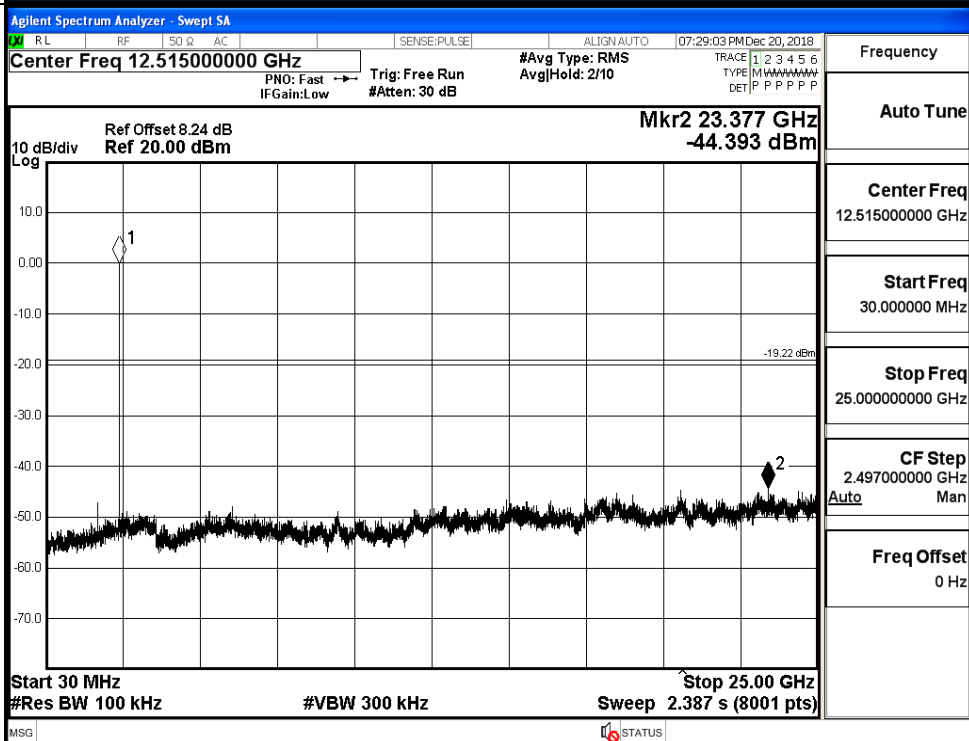
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.784	-44.393	-19.216	PASS
	MCH	1.249	-44.030	-18.751	PASS
	HCH	0.721	-44.197	-19.279	PASS
$\pi/4$ DQPSK	LCH	-0.503	-44.706	-20.503	PASS
	MCH	-0.125	-44.109	-20.125	PASS
	HCH	-1.058	-42.665	-21.058	PASS
8DPSK	LCH	-0.298	-44.394	-20.298	PASS
	MCH	-0.451	-44.419	-20.451	PASS
	HCH	-0.141	-44.369	-20.141	PASS

GFSK LCH Graphs

Pref

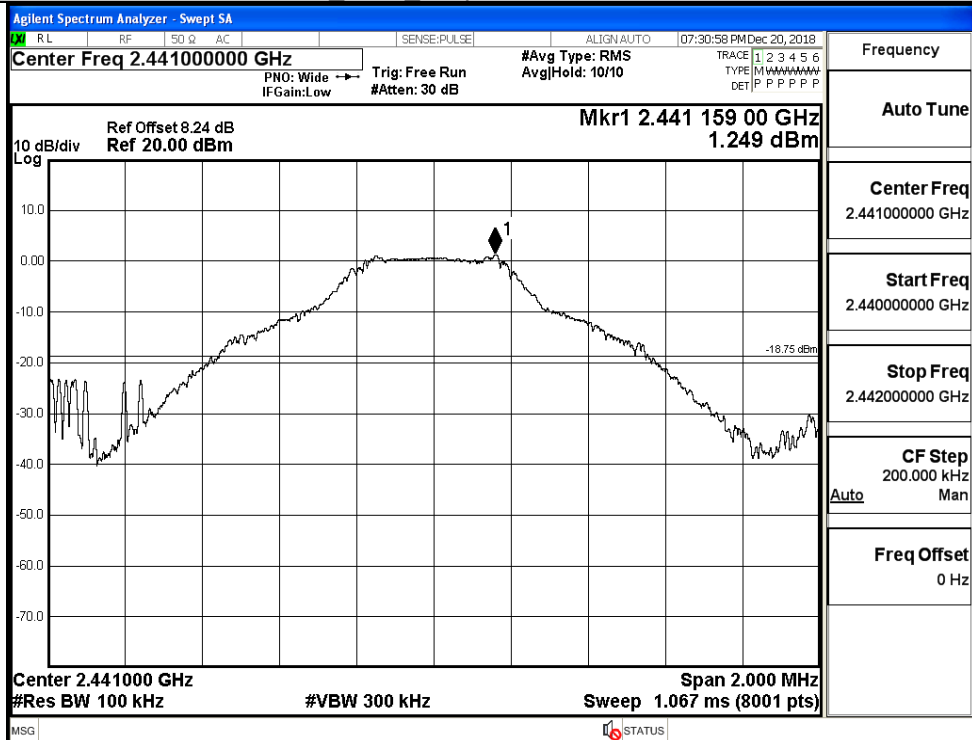


Puw

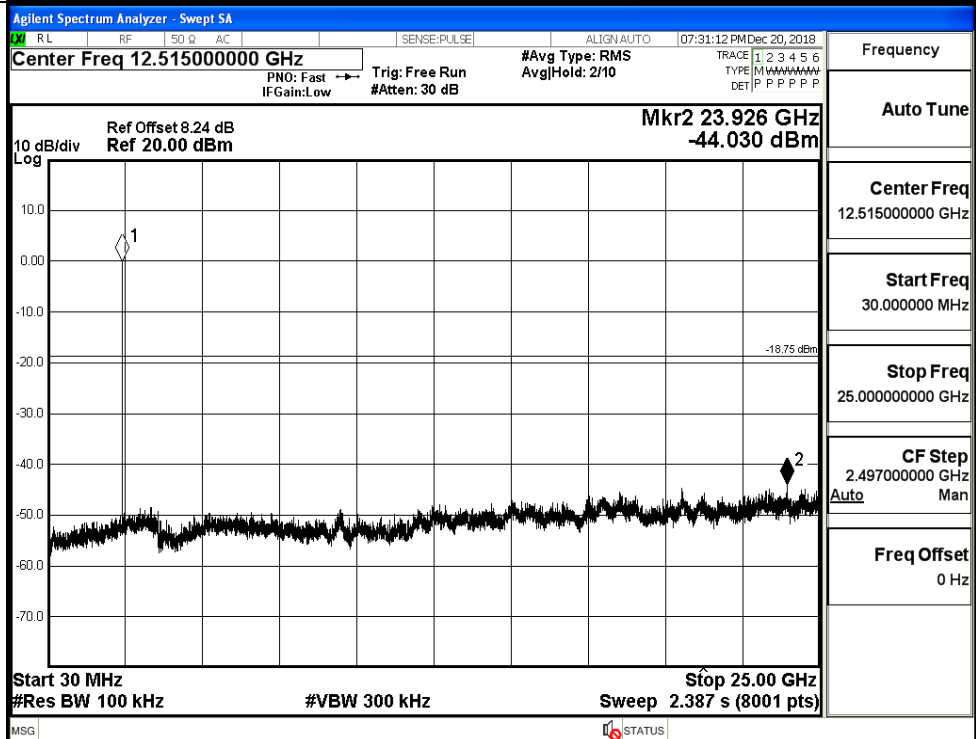


GFSK_MCH_Graphs

Pref

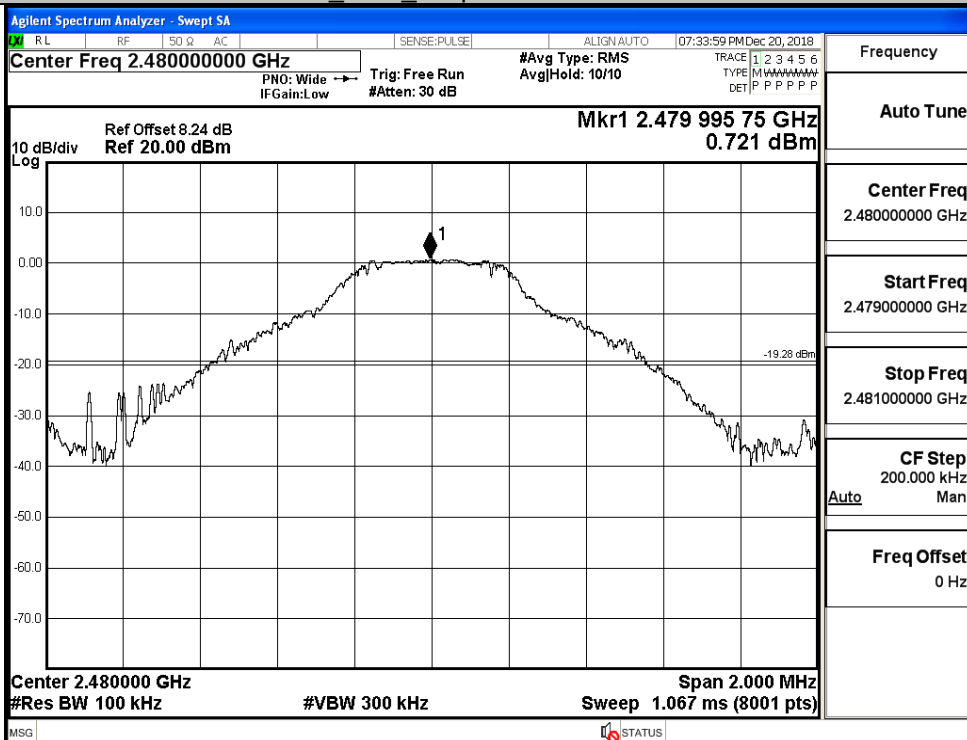


Puw

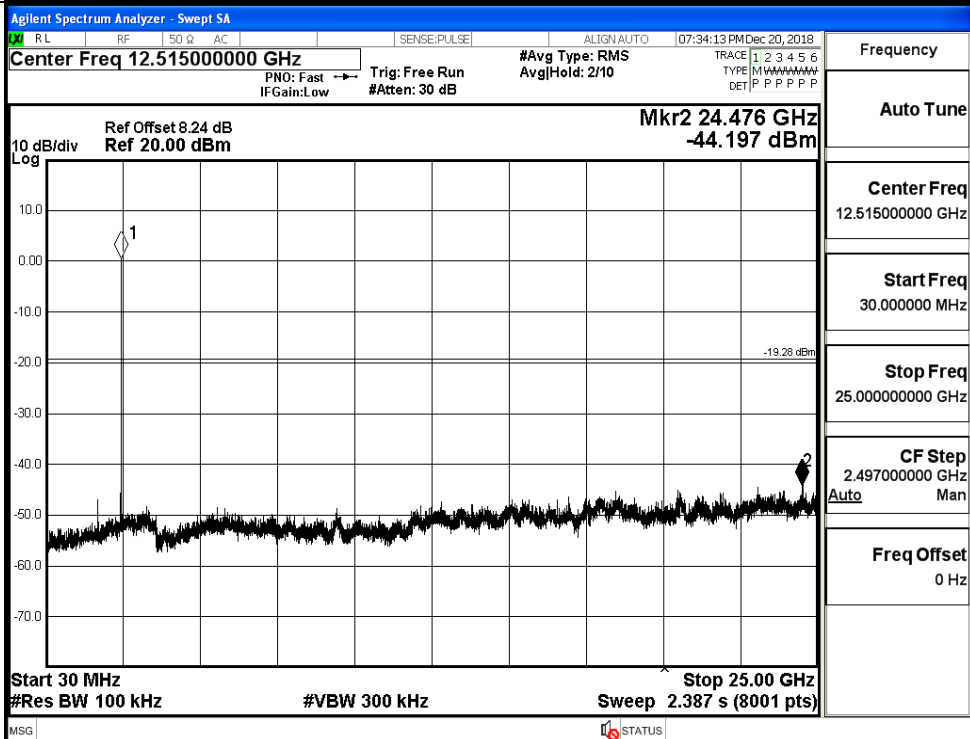


GFSK_HCH_Graphs

Pref

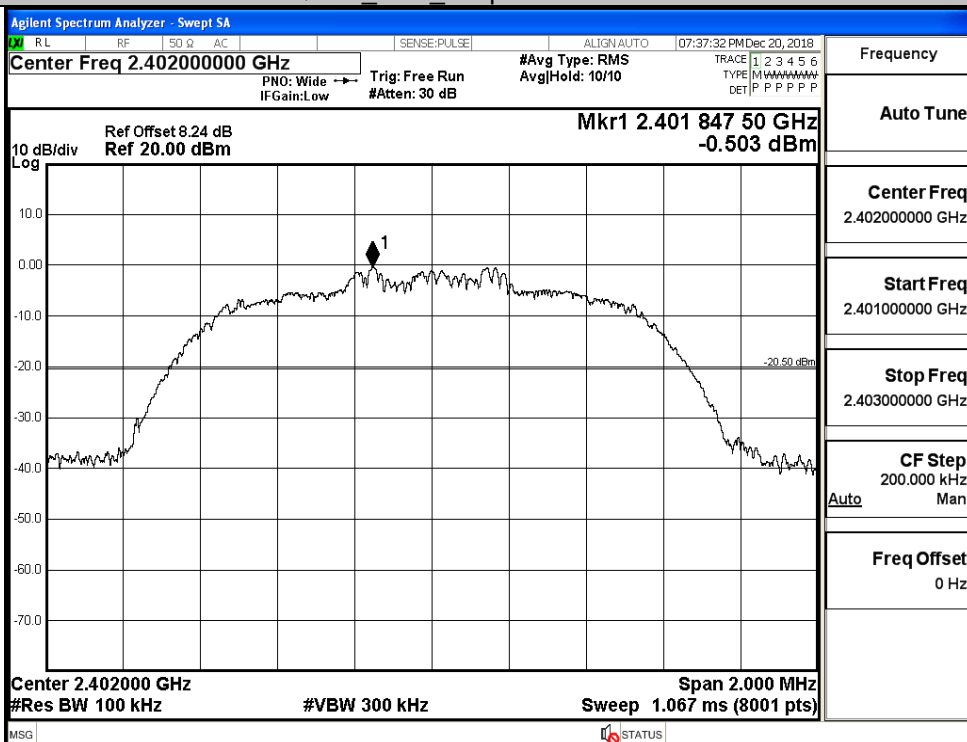


Puw

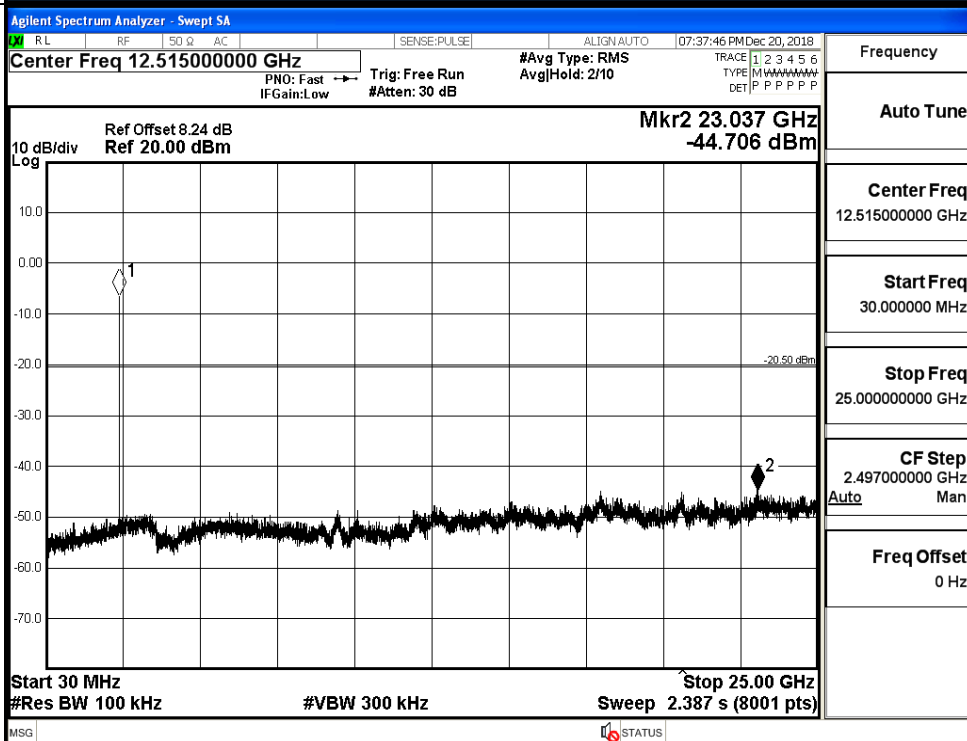


$\pi/4$ DQPSK LCH_Graphs

Pref

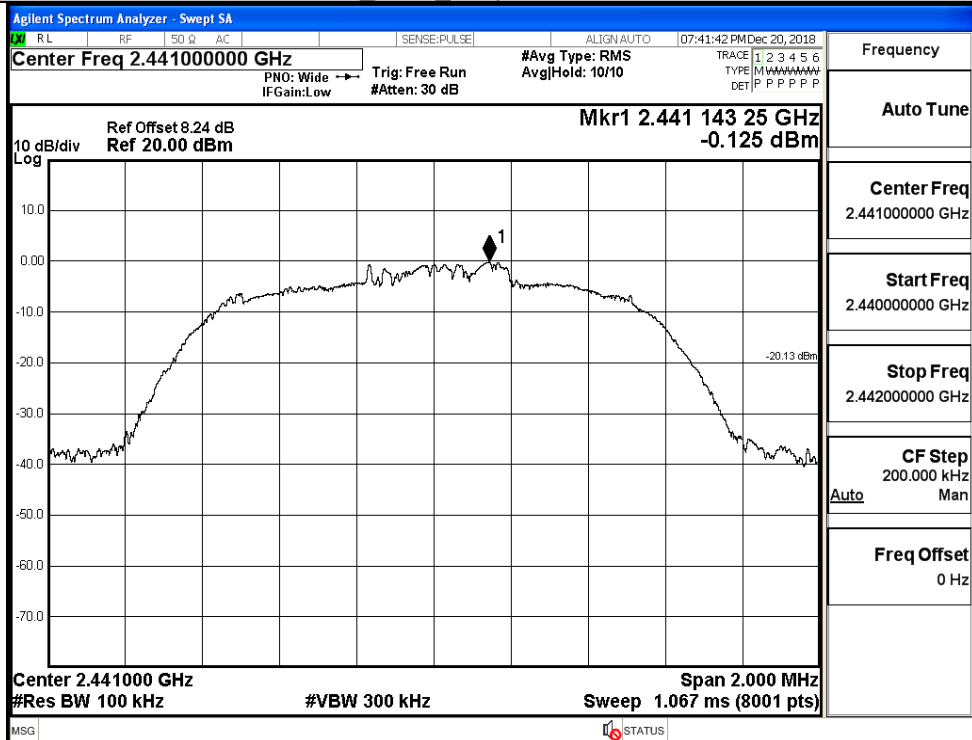


Puw

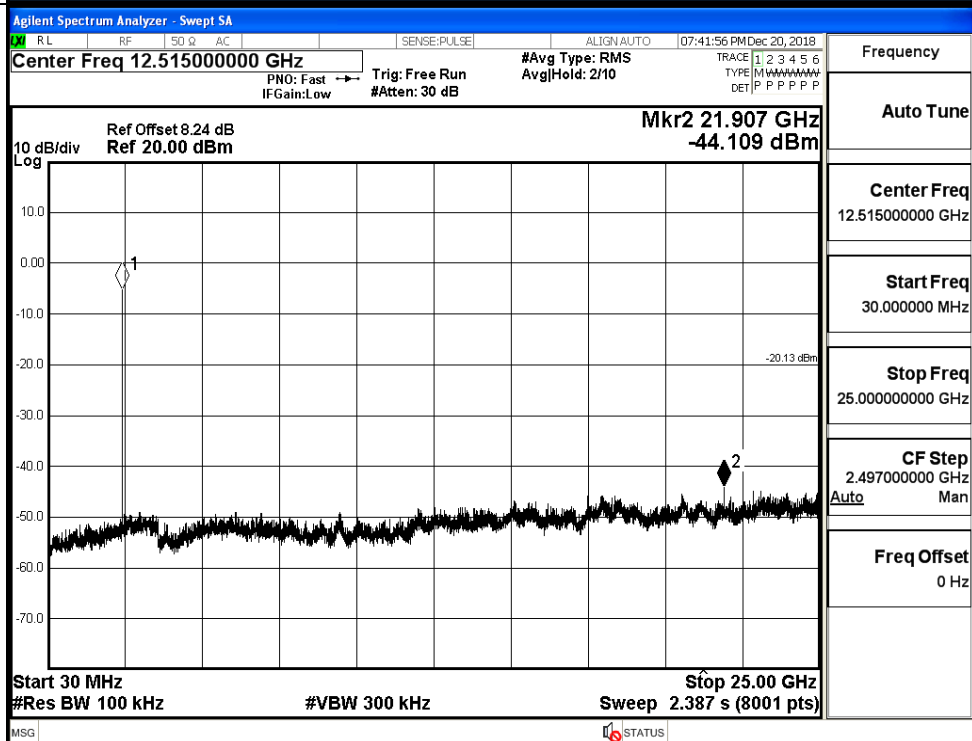


$\pi/4$ DQPSK_MCH_Graphs

Pref

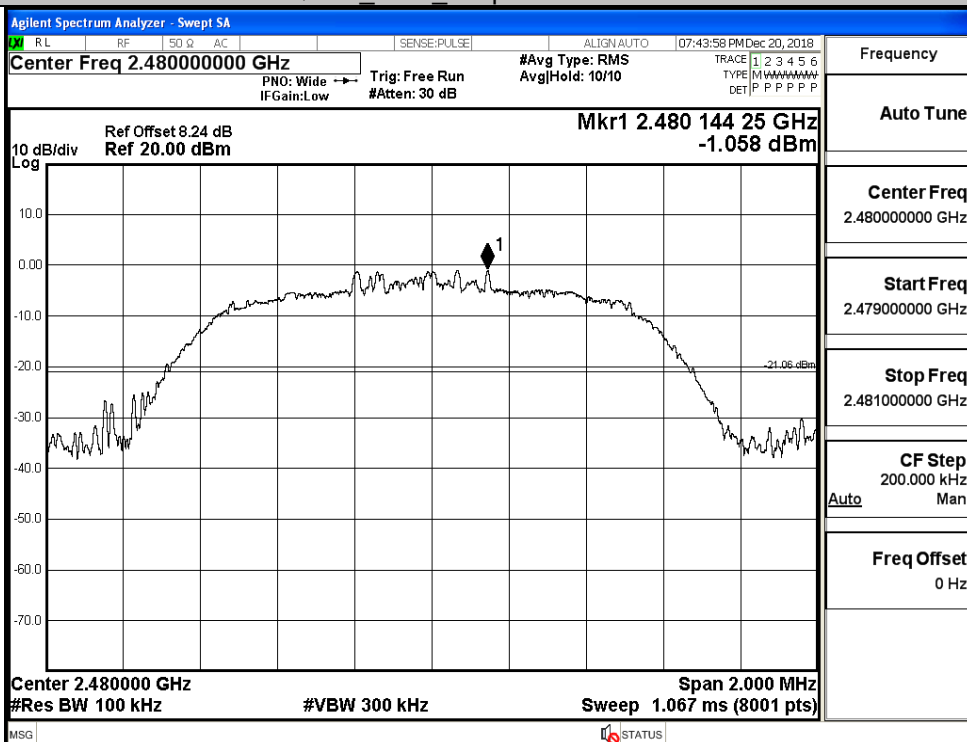


Puw

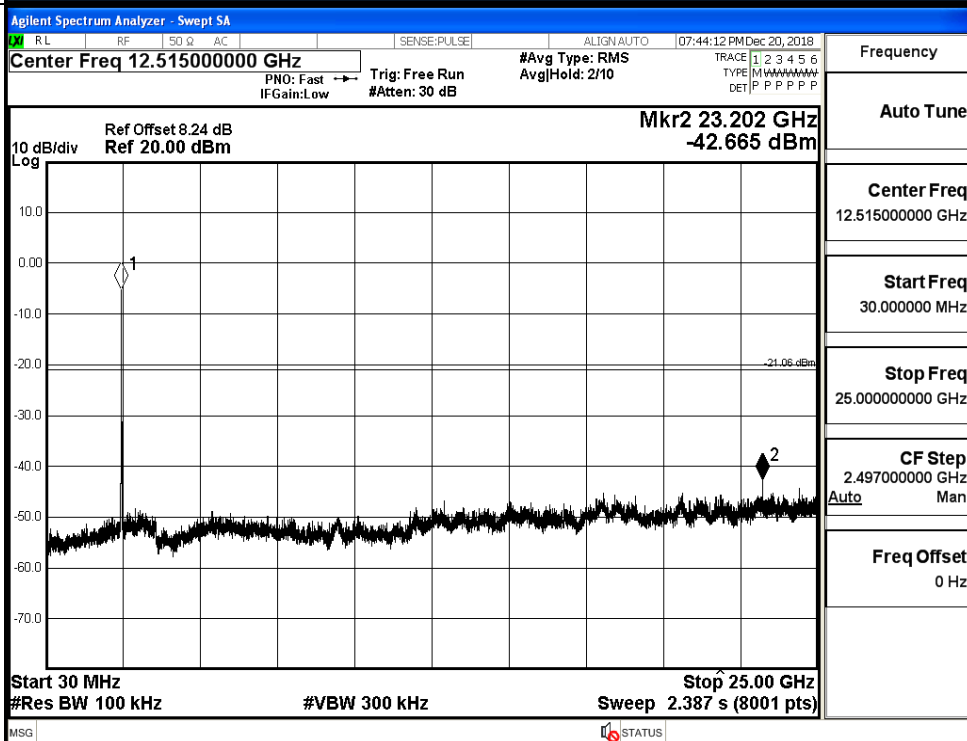


π /4DQPSK_HCH_Graphs

Pref

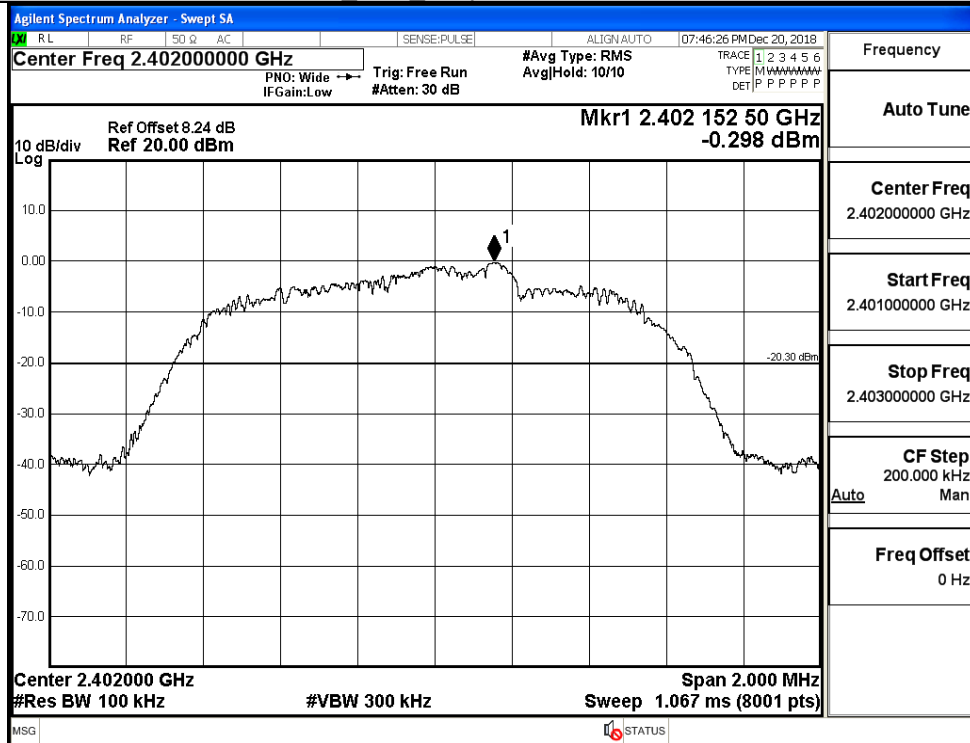


Puw

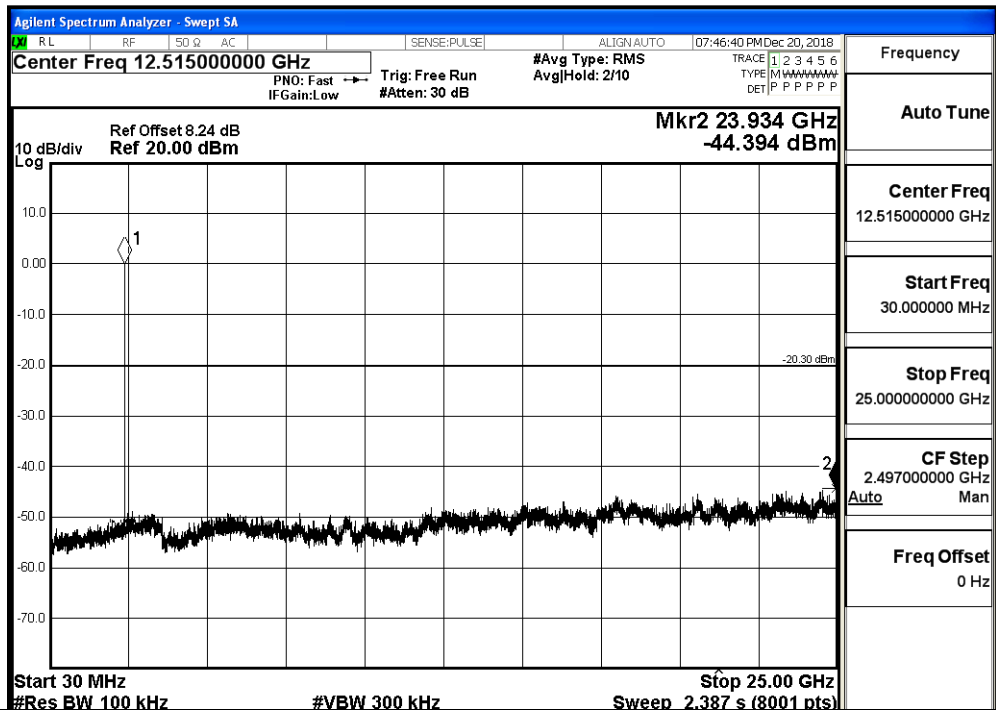


8DPSK_LCH_Graphs

Pref

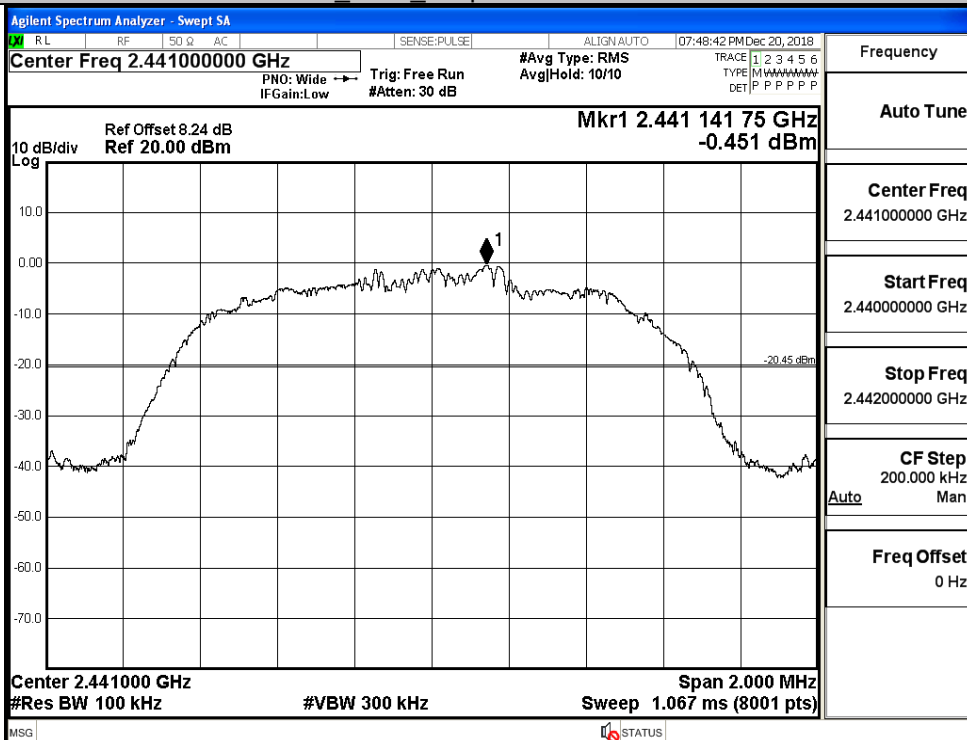


Puw

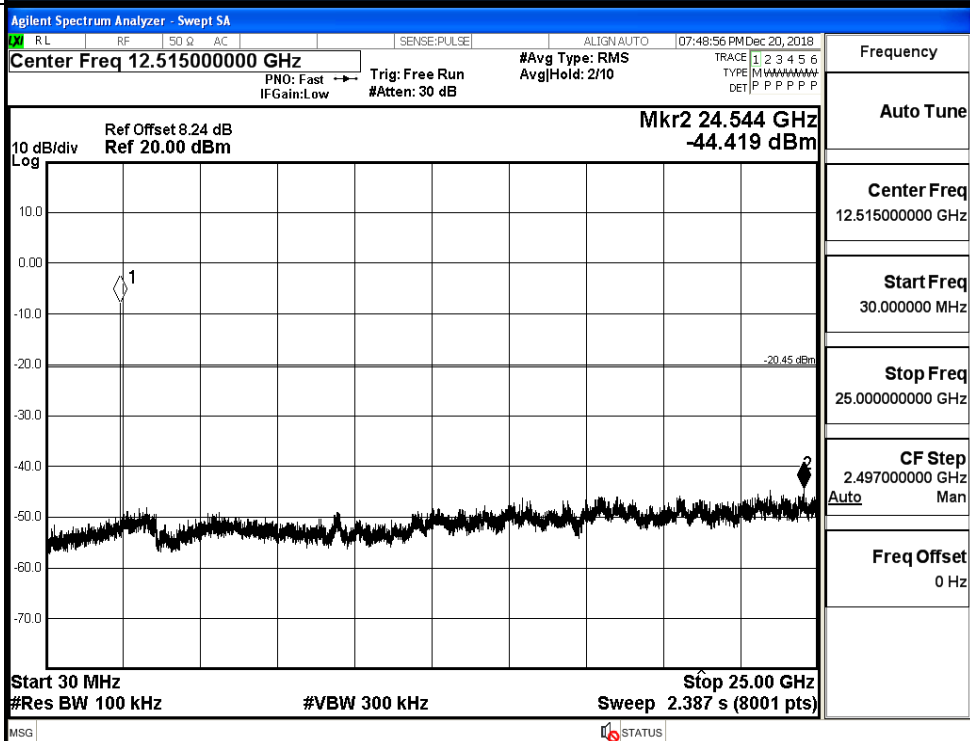


8DPSK_MCH_Graphs

Pref

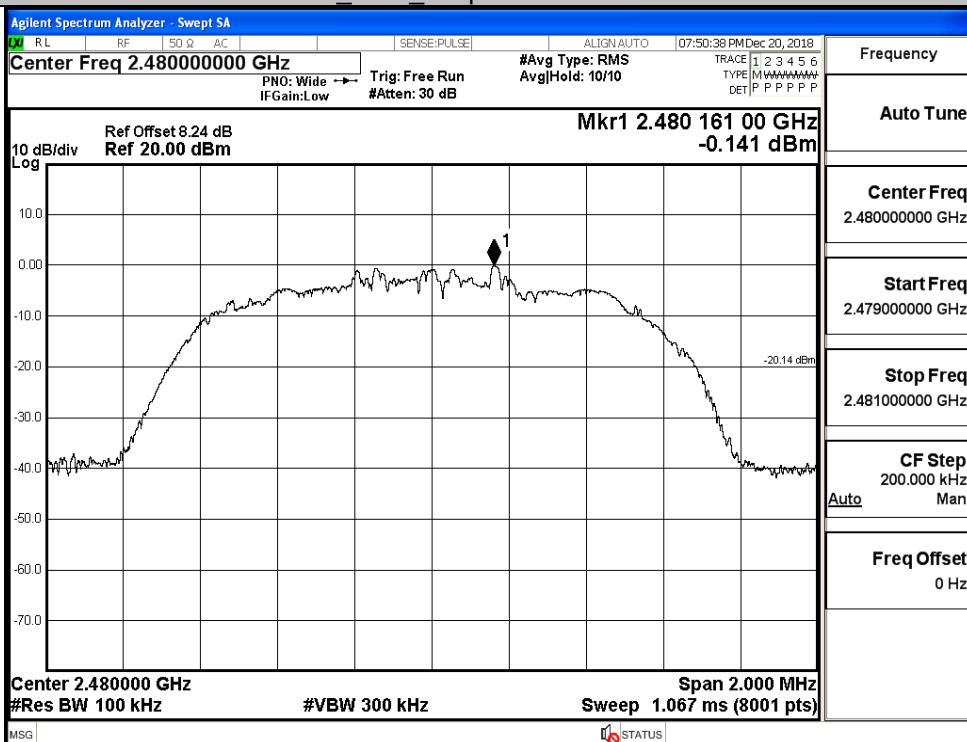


Puw

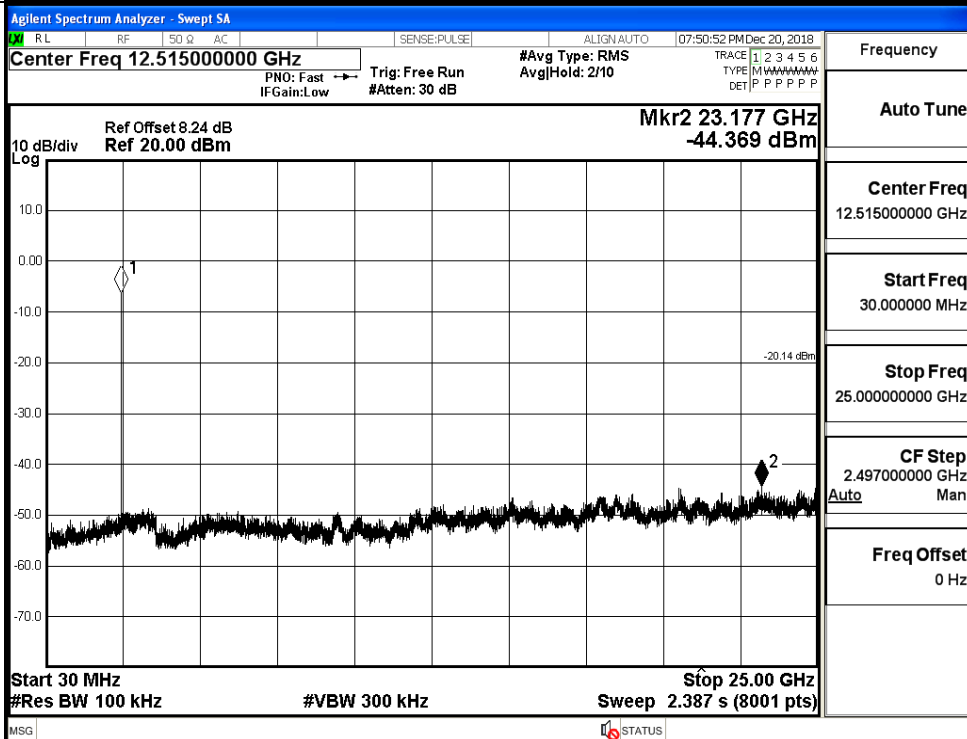


8DPSK_HCH_Graphs

Pref



Puw

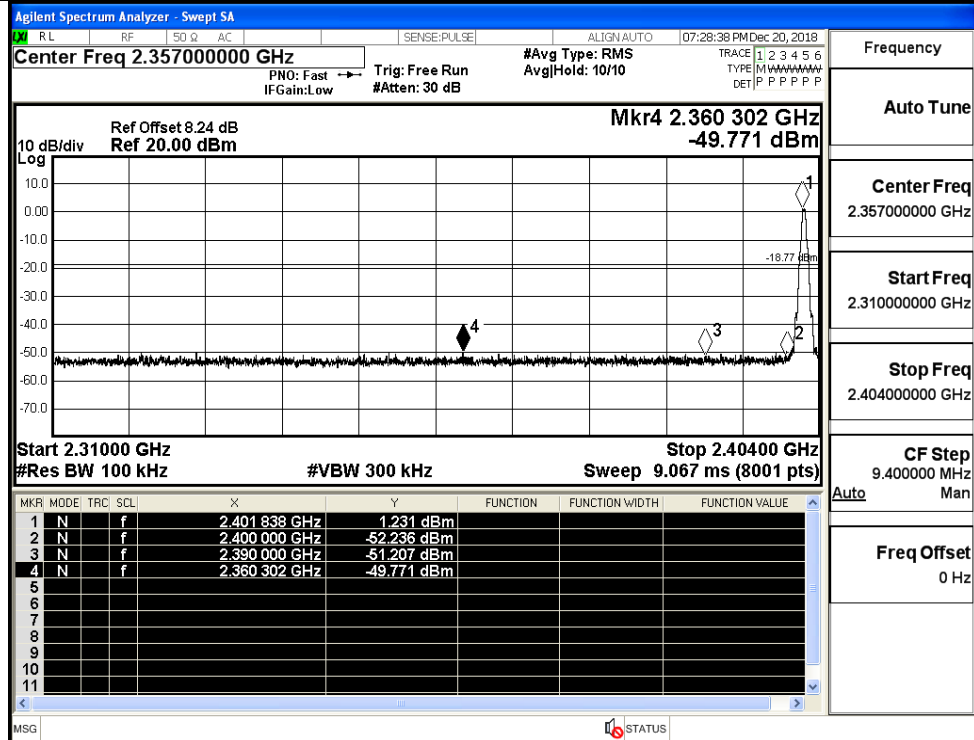


A.7 Band-edge for RF Conducted Emissions

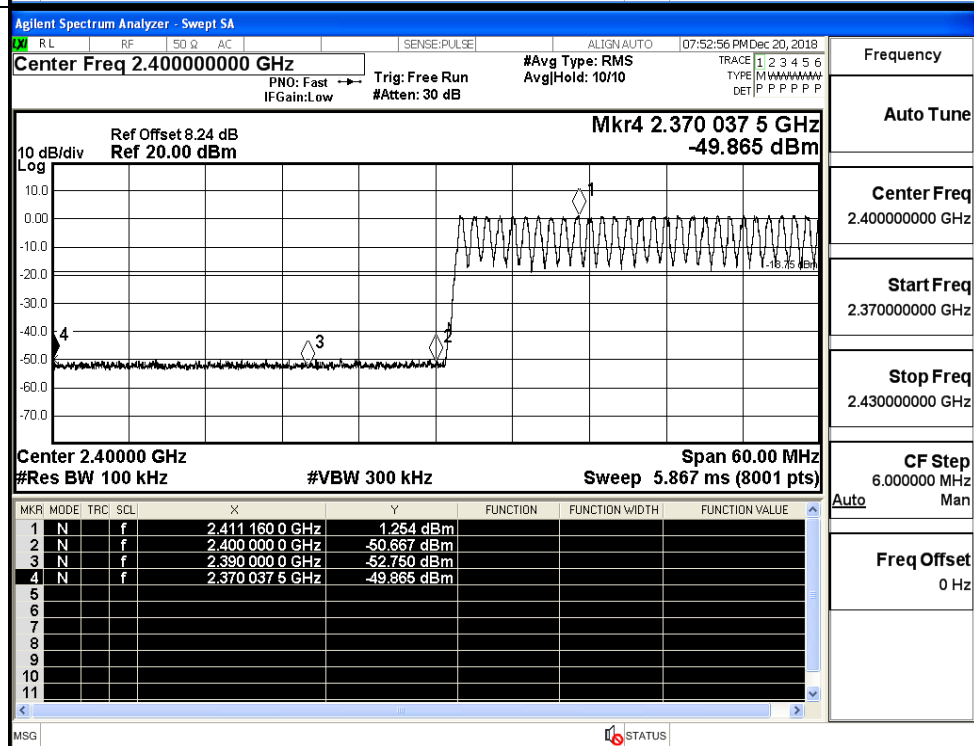
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.231	Off	-49.771	-18.77	PASS
			1.254	On	-49.865	-18.75	PASS
	HCH	2480	1.047	Off	-29.168	-18.95	PASS
			1.382	On	-49.377	-18.62	PASS
$\pi/4$ DQPSK	LCH	2402	-0.586	Off	-50.043	-20.59	PASS
			-0.304	On	-49.409	-20.3	PASS
	HCH	2480	-0.649	Off	-26.010	-20.65	PASS
			-0.304	On	-48.055	-20.3	PASS
8DPSK	LCH	2402	-2.758	Off	-49.974	-22.76	PASS
			-0.393	On	-49.280	-20.39	PASS
	HCH	2480	-0.062	Off	-49.530	-20.06	PASS
			-0.327	On	-49.000	-20.33	PASS

Test Graphs

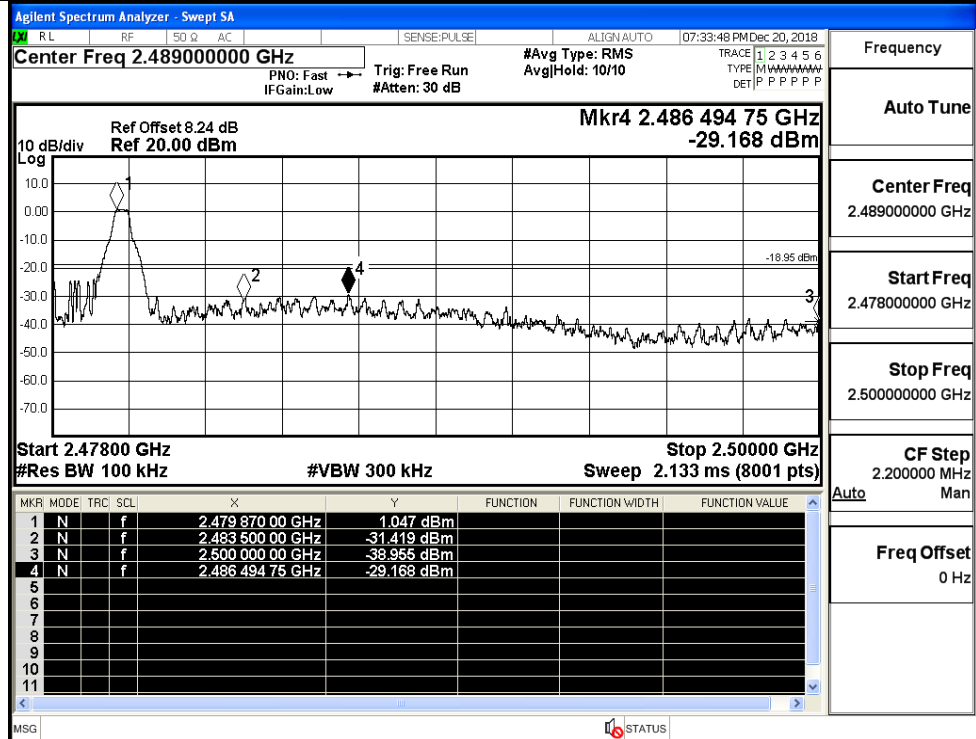
GFSK/LCH/No Hop



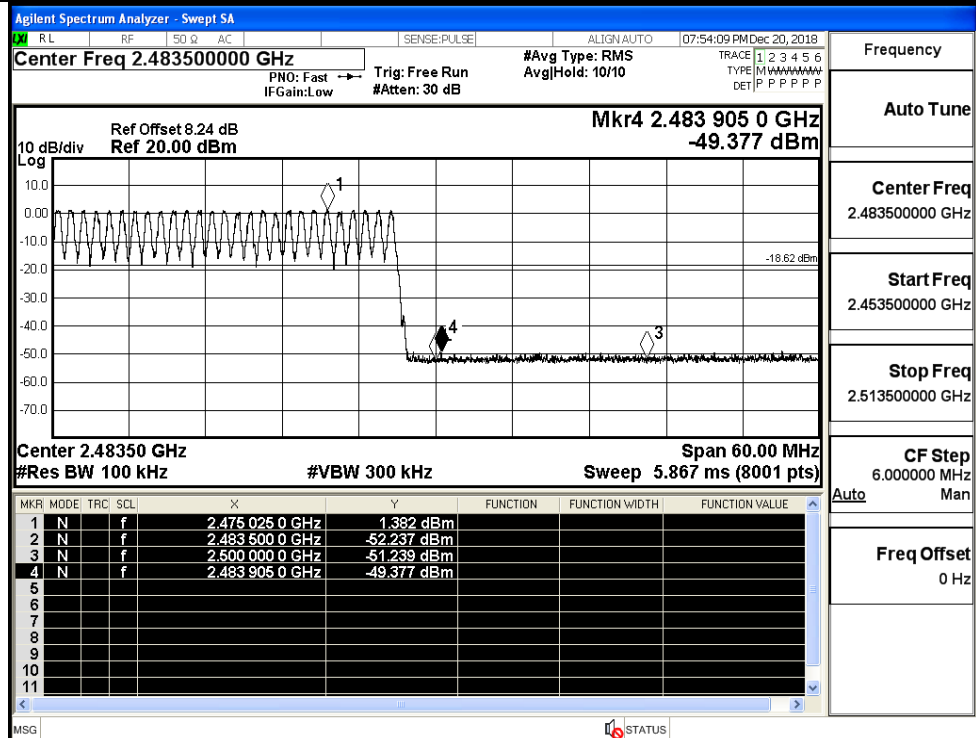
GFSK/LCH/Hop



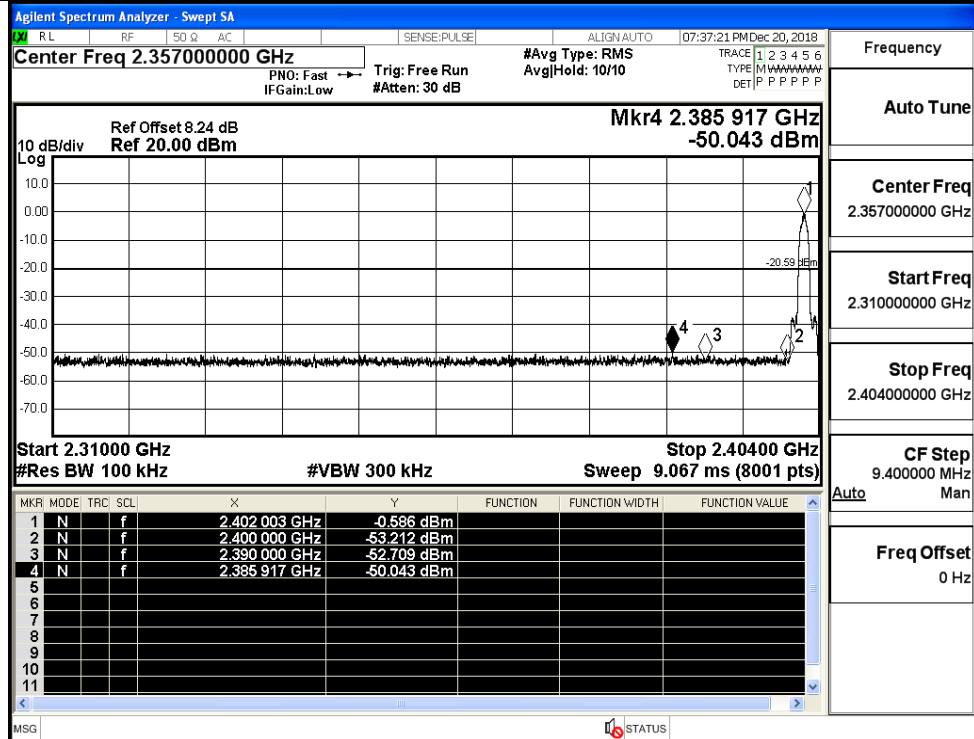
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

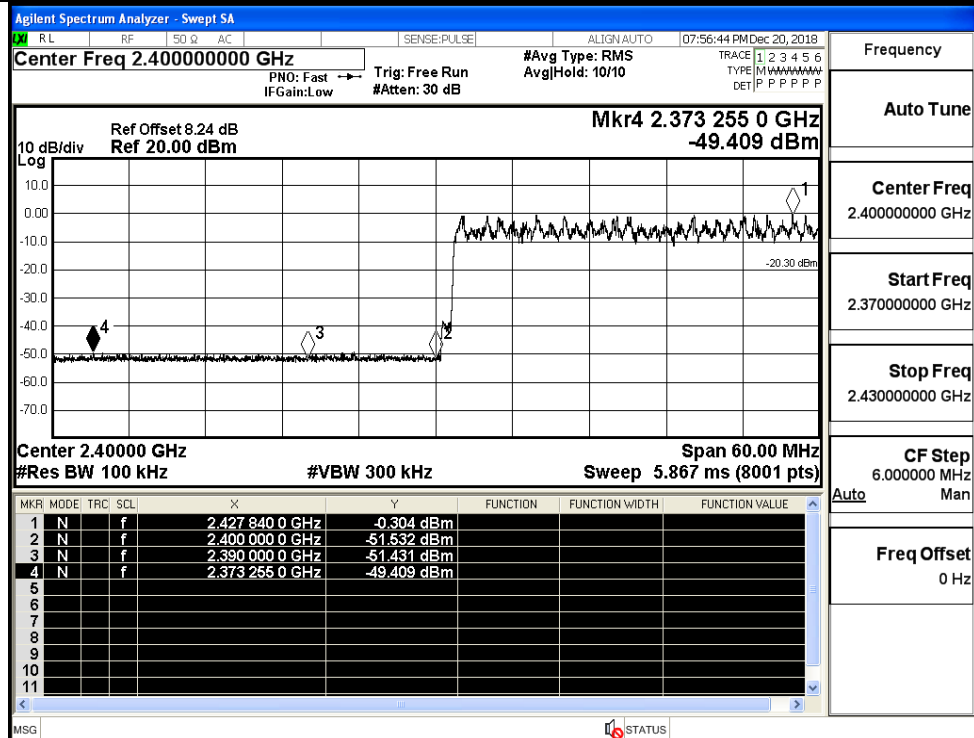
Start Freq
2.310000000 GHz

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

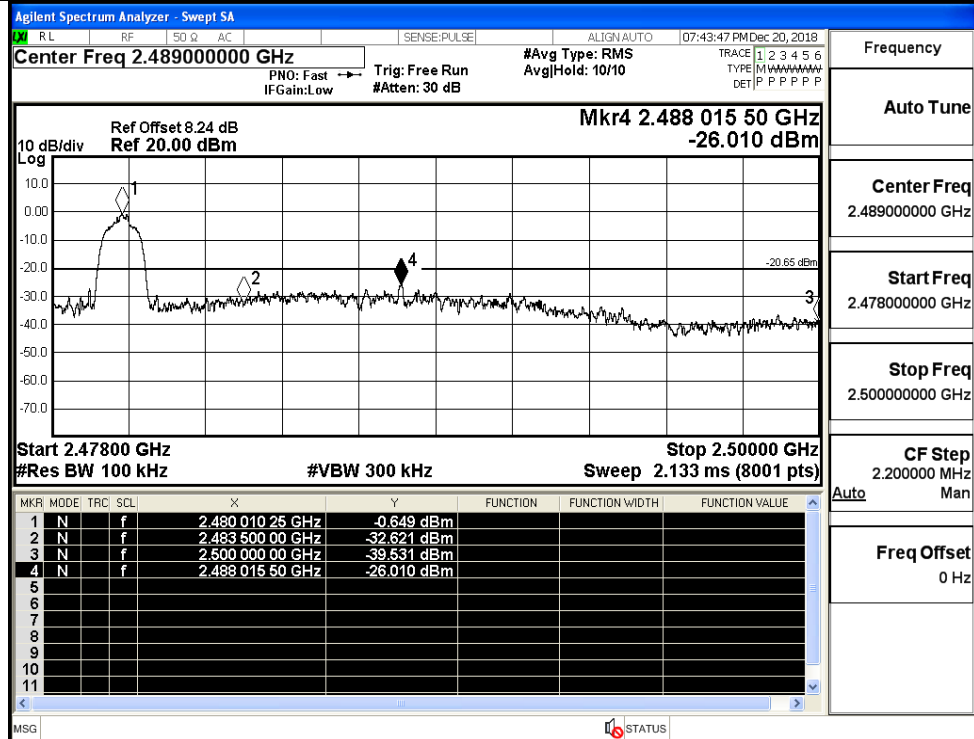
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

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

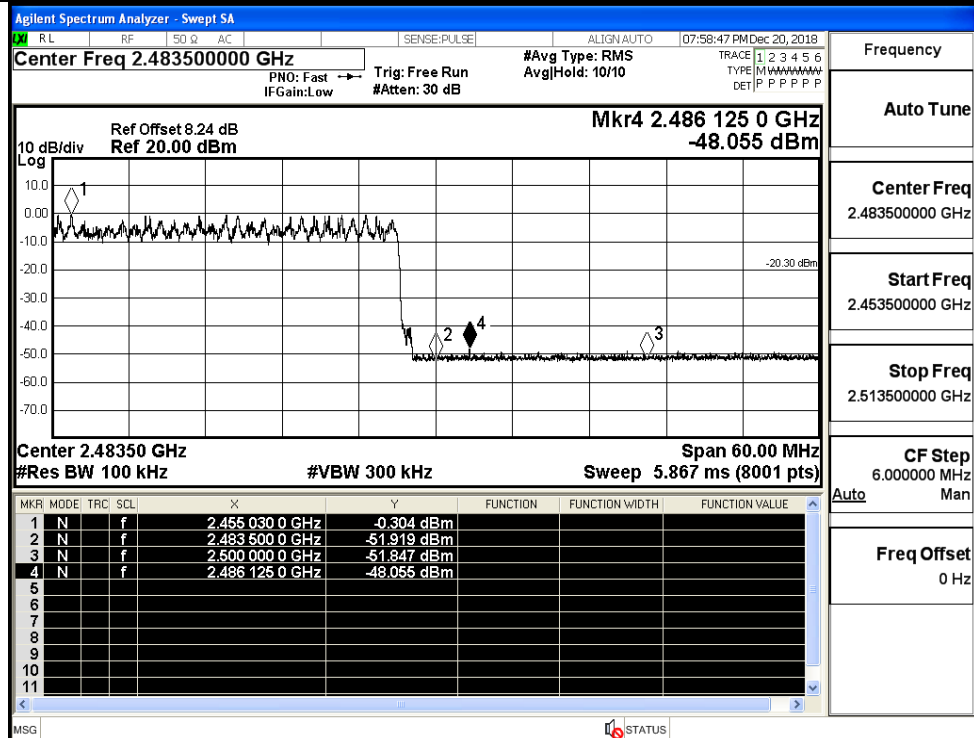


Frequency

Auto Tune

Center Freq
2.489000000 GHzStart Freq
2.478000000 GHzStop Freq
2.500000000 GHzCF Step
2.200000 MHz
Auto ManFreq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop

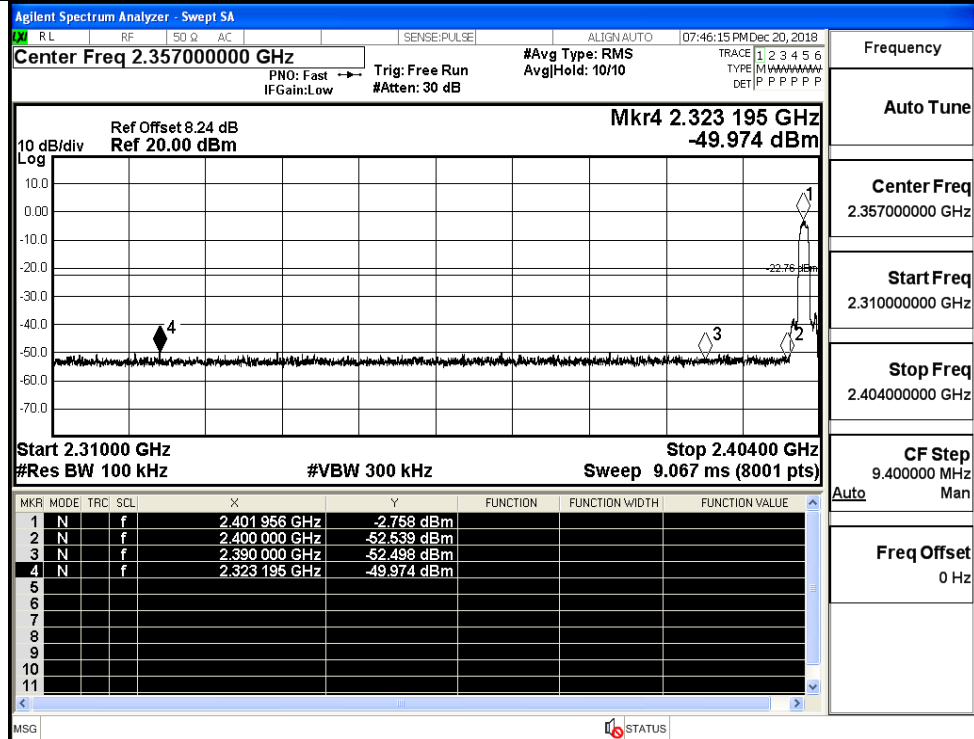


Frequency

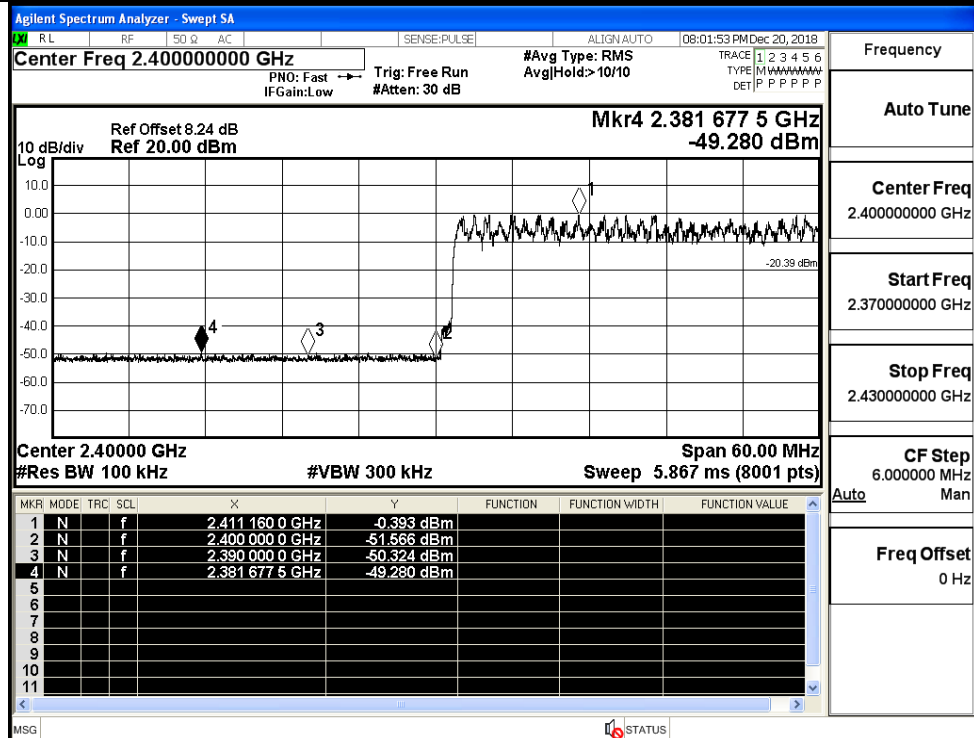
Auto Tune

Center Freq
2.483500000 GHzStart Freq
2.453500000 GHzStop Freq
2.513500000 GHzCF Step
6.000000 MHz
Auto ManFreq Offset
0 Hz

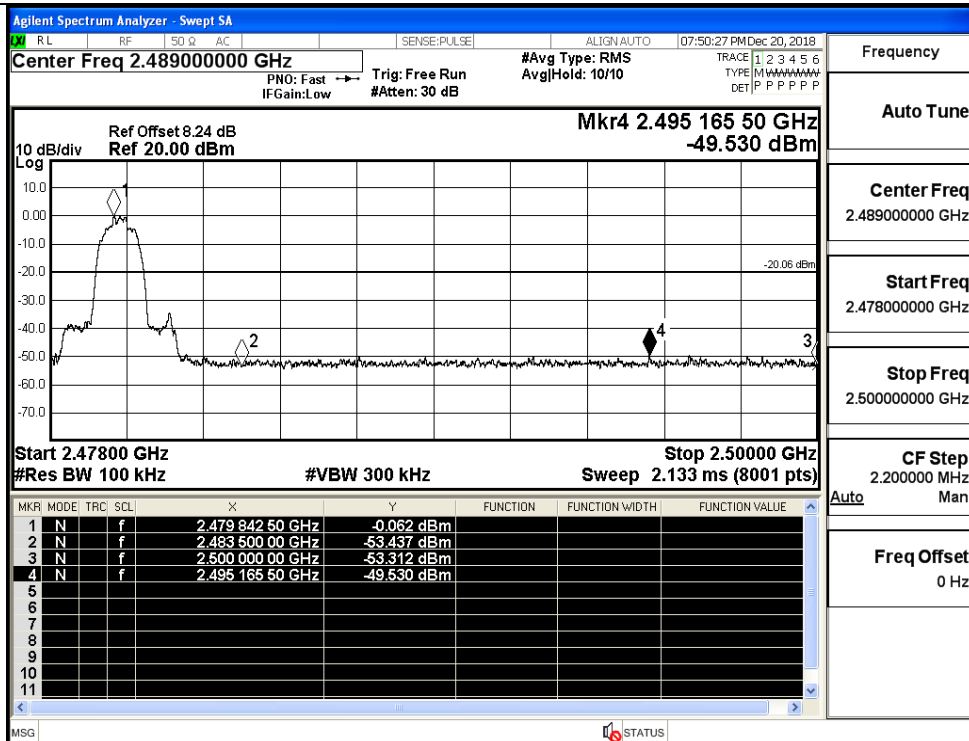
8DPSK/LCH/No Hop



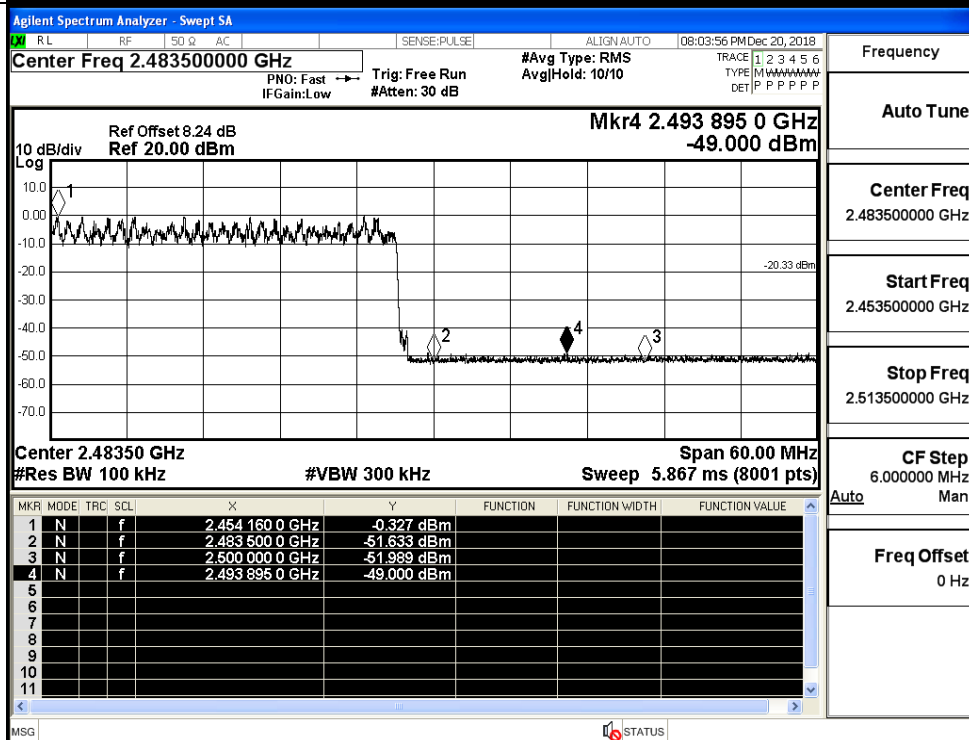
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



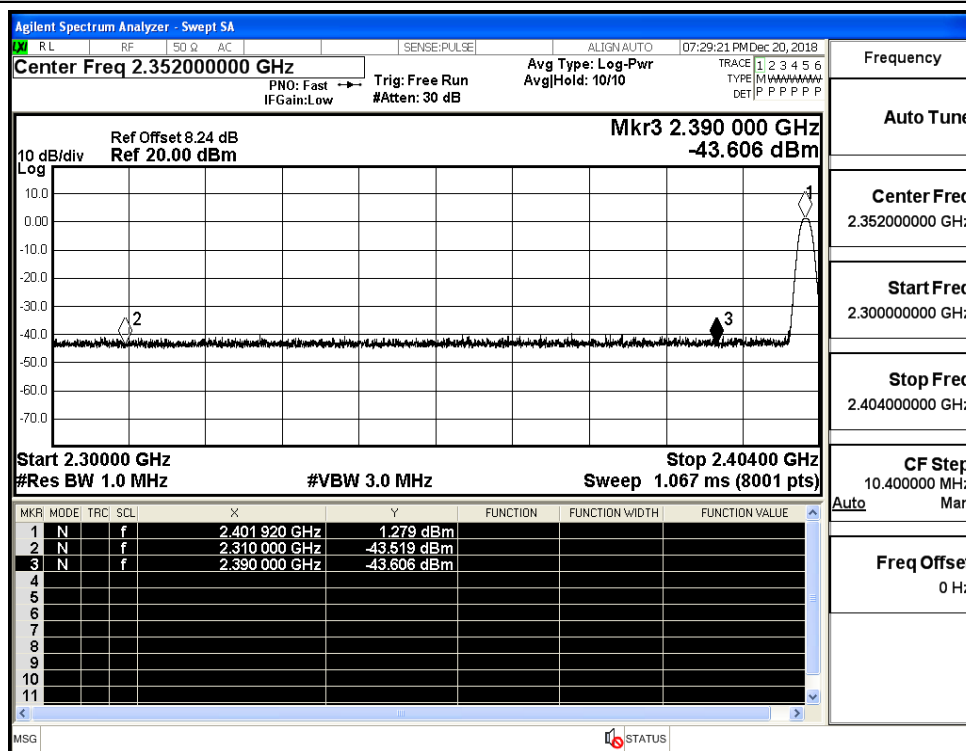
8DPSK/HCH/Hop



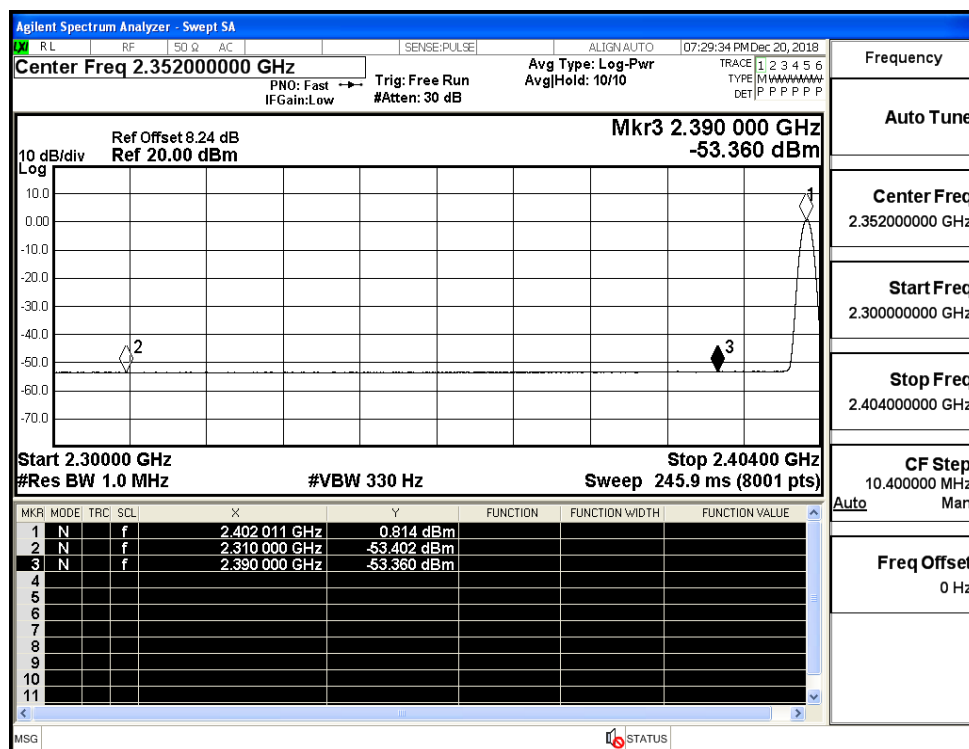
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.52	2.0	0	53.74	PEAK	74	PASS
	Off	2310.0	-53.40	2.0	0	43.86	AV	54	PASS
	Off	2390.0	-43.61	2.0	0	53.65	PEAK	74	PASS
	Off	2390.0	-53.36	2.0	0	43.9	AV	54	PASS
	Off	2483.5	-43.26	2.0	0	54.0	PEAK	74	PASS
	Off	2483.5	-53.03	2.0	0	44.23	AV	54	PASS
	Off	2500.0	-43.51	2.0	0	53.75	PEAK	74	PASS
	Off	2500.0	-52.89	2.0	0	44.37	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-41.90	2.0	0	55.36	PEAK	74	PASS
	Off	2310.0	-53.61	2.0	0	43.65	AV	54	PASS
	Off	2390.0	-42.42	2.0	0	54.84	PEAK	74	PASS
	Off	2390.0	-53.32	2.0	0	43.94	AV	54	PASS
	Off	2483.5	-41.81	2.0	0	55.45	PEAK	74	PASS
	Off	2483.5	-52.94	2.0	0	44.32	AV	54	PASS
	Off	2500.0	-42.18	2.0	0	55.08	PEAK	74	PASS
	Off	2500.0	-52.91	2.0	0	44.35	AV	54	PASS
8DPSK	Off	2310.0	-43.30	2.0	0	53.96	PEAK	74	PASS
	Off	2310.0	-53.57	2.0	0	43.69	AV	54	PASS
	Off	2390.0	-42.64	2.0	0	54.62	PEAK	74	PASS
	Off	2390.0	-53.23	2.0	0	44.03	AV	54	PASS
	Off	2483.5	-42.72	2.0	0	54.54	PEAK	74	PASS
	Off	2483.5	-52.91	2.0	0	44.35	AV	54	PASS
	Off	2500.0	-42.42	2.0	0	54.84	PEAK	74	PASS
	Off	2500.0	-52.90	2.0	0	44.36	AV	54	PASS

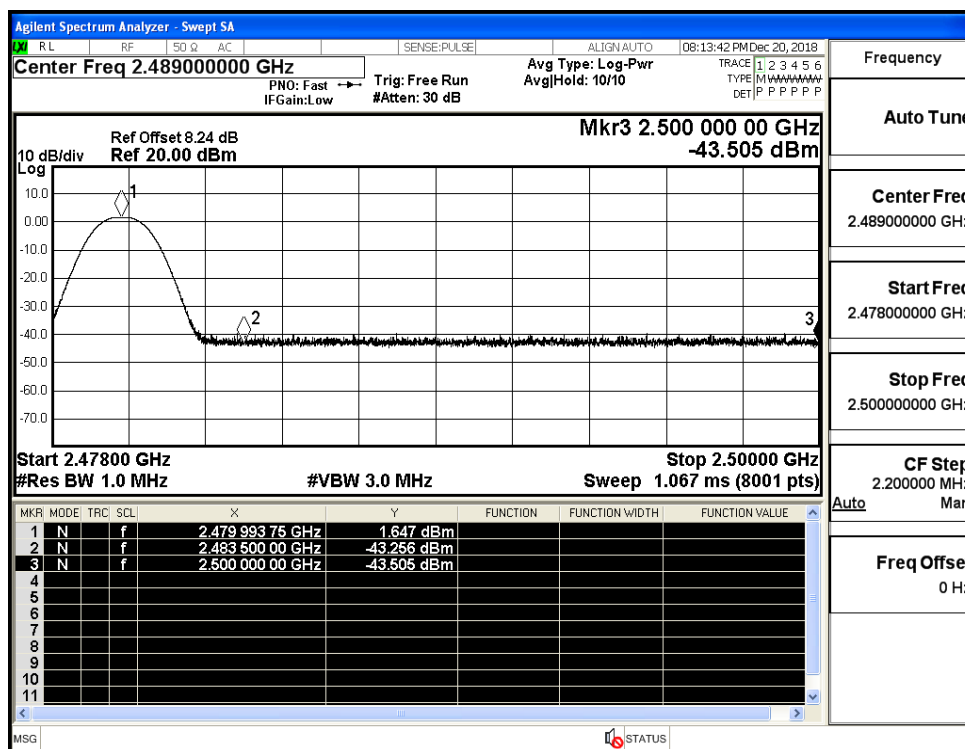
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



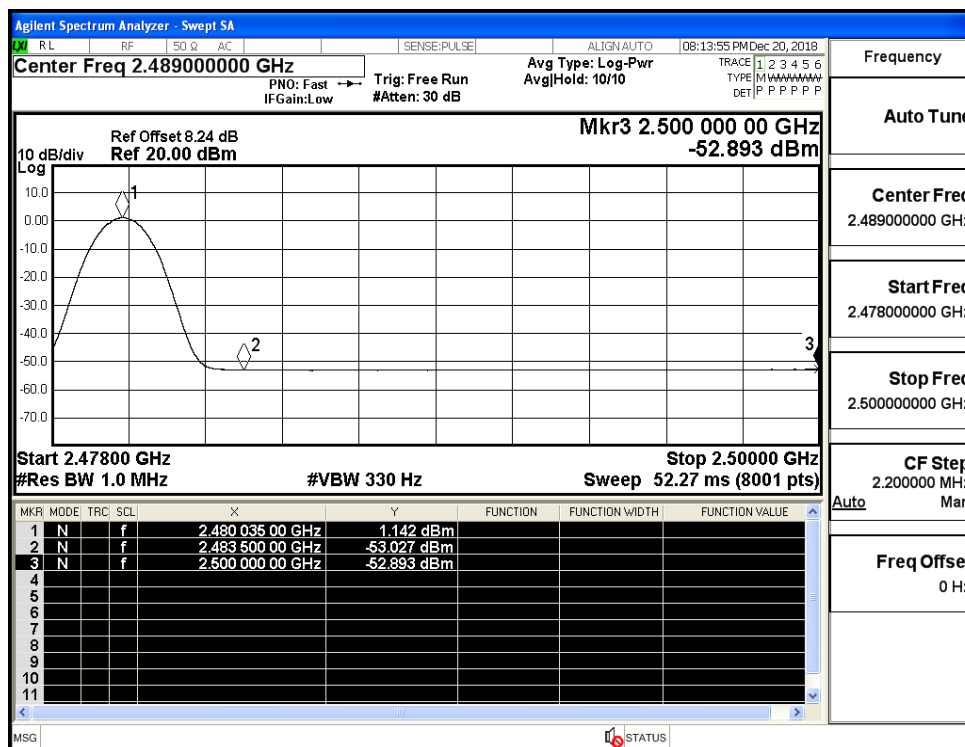
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

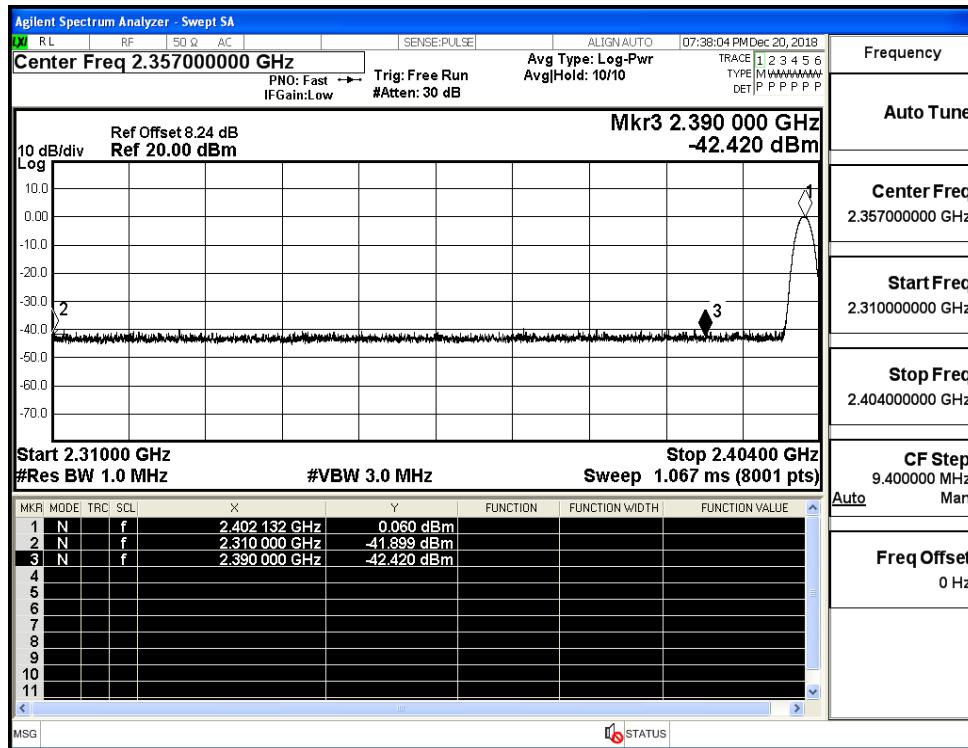
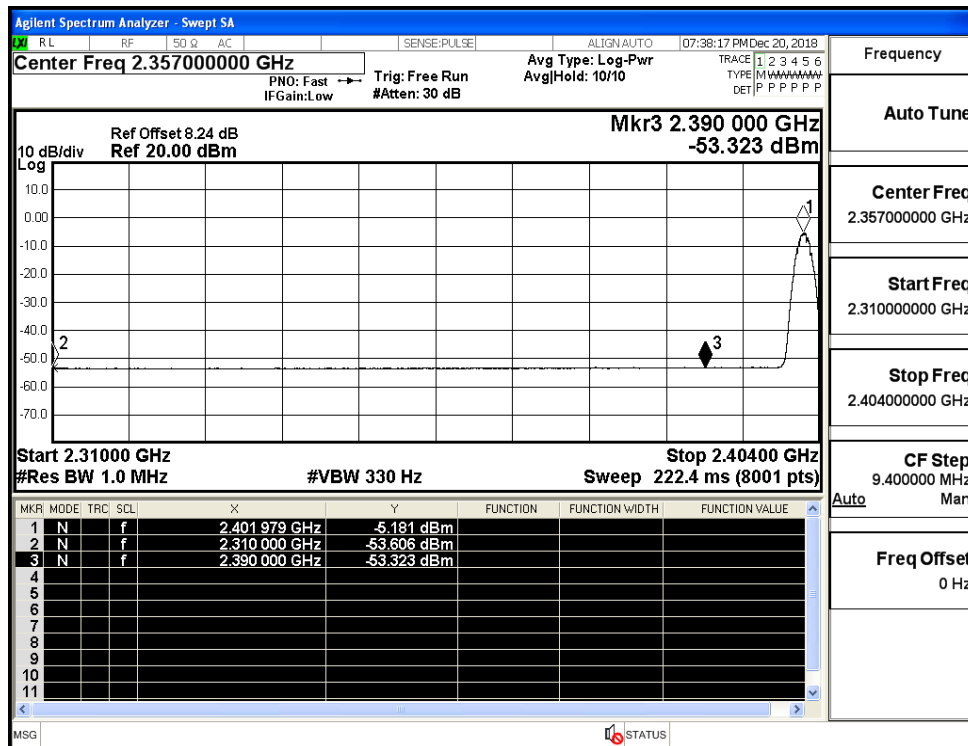


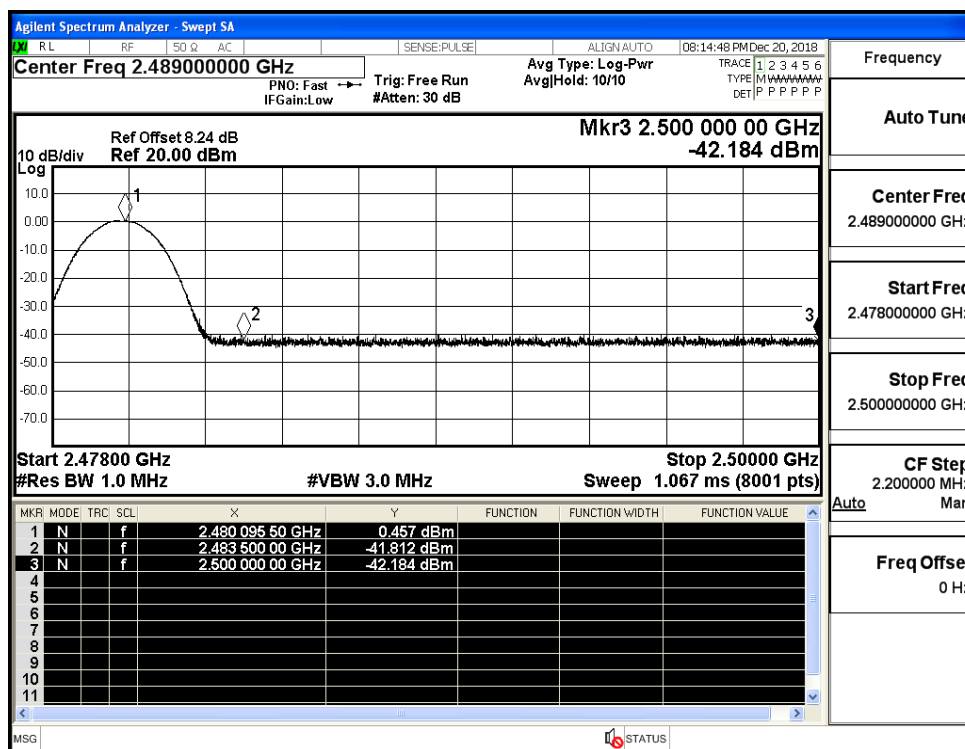
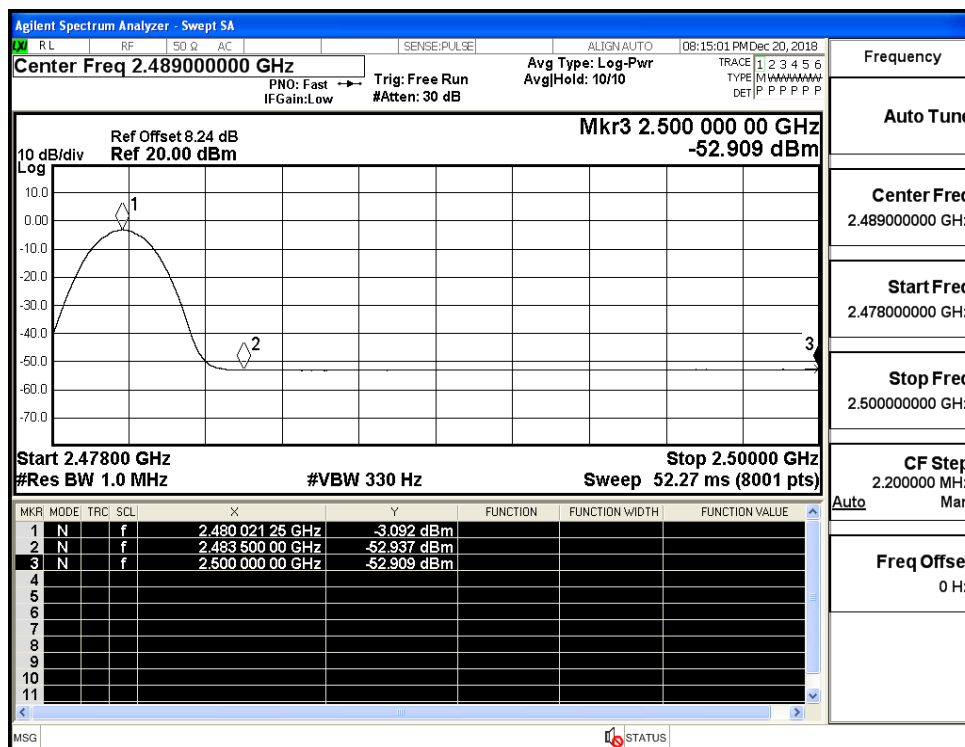
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



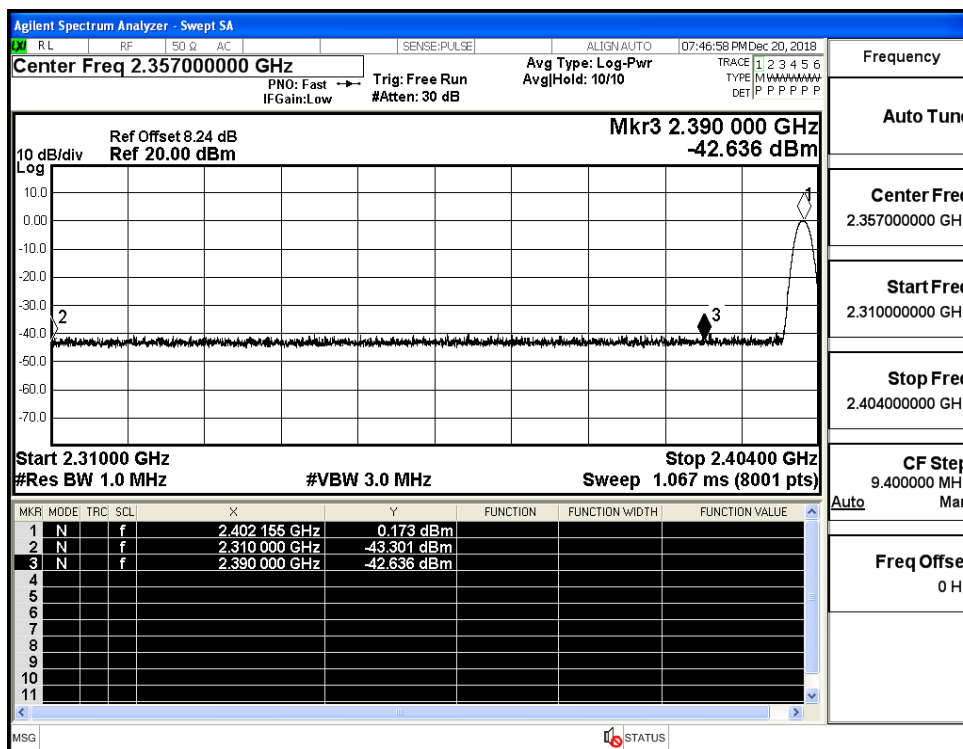
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



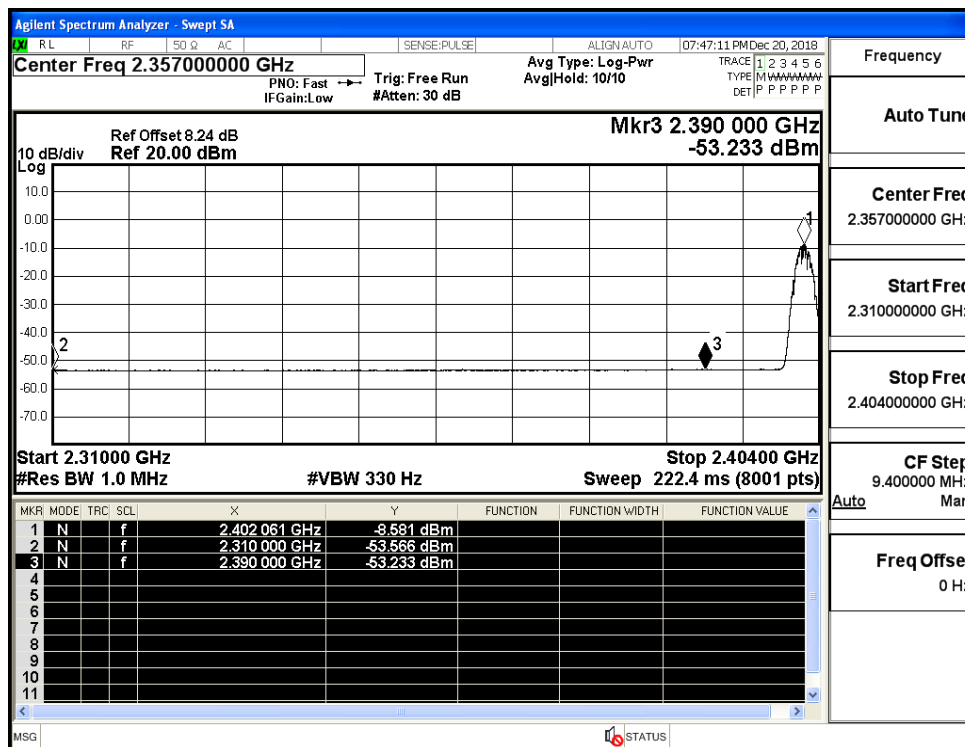
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

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)

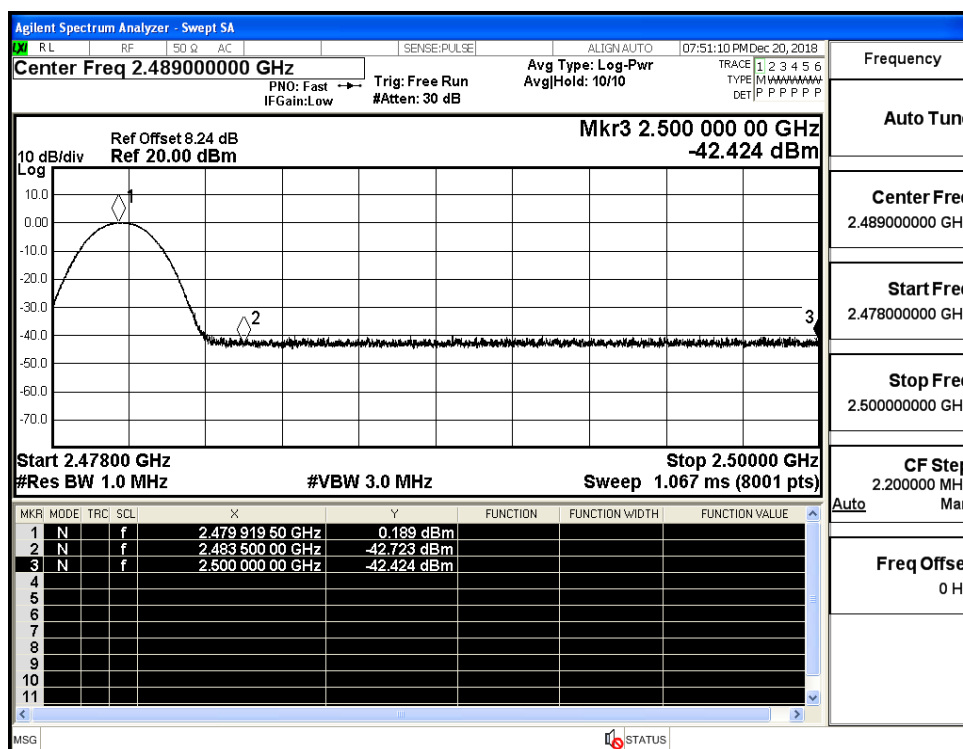
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

