

Appendix A

RF Test Data for BT V5.0 (BDR/EDR) (Conducted Measurement)

Product Name: Light Up Logo Bluetooth Headphones

Trade Mark: N/A

Test Model: XO-9728

Environmental Conditions

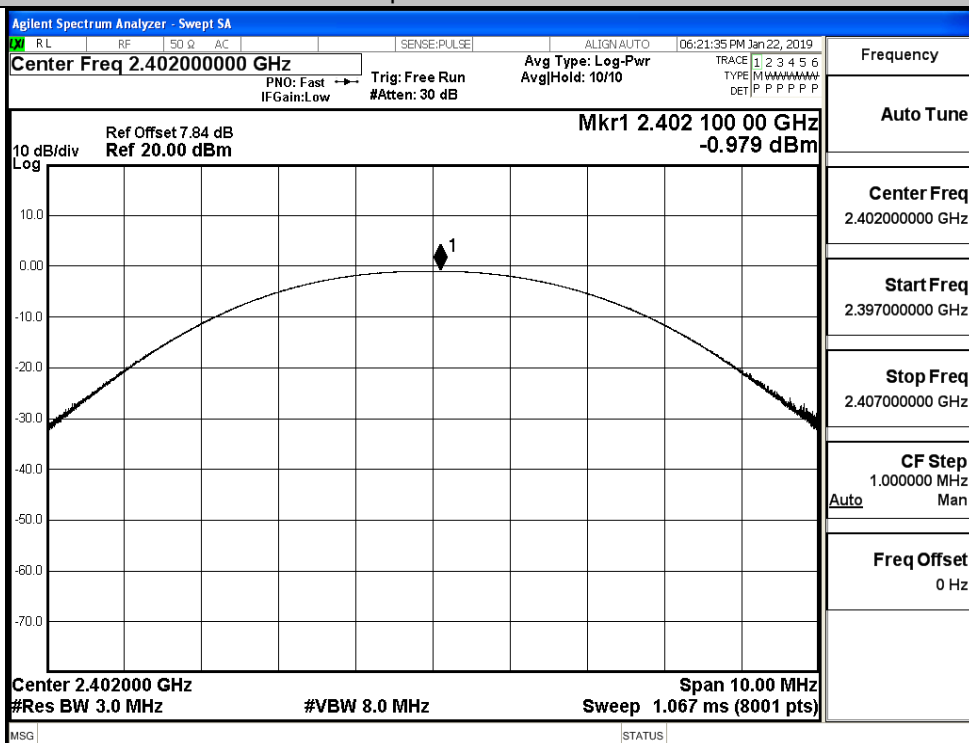
Temperature:	24.2 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Jerry.Zeng
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

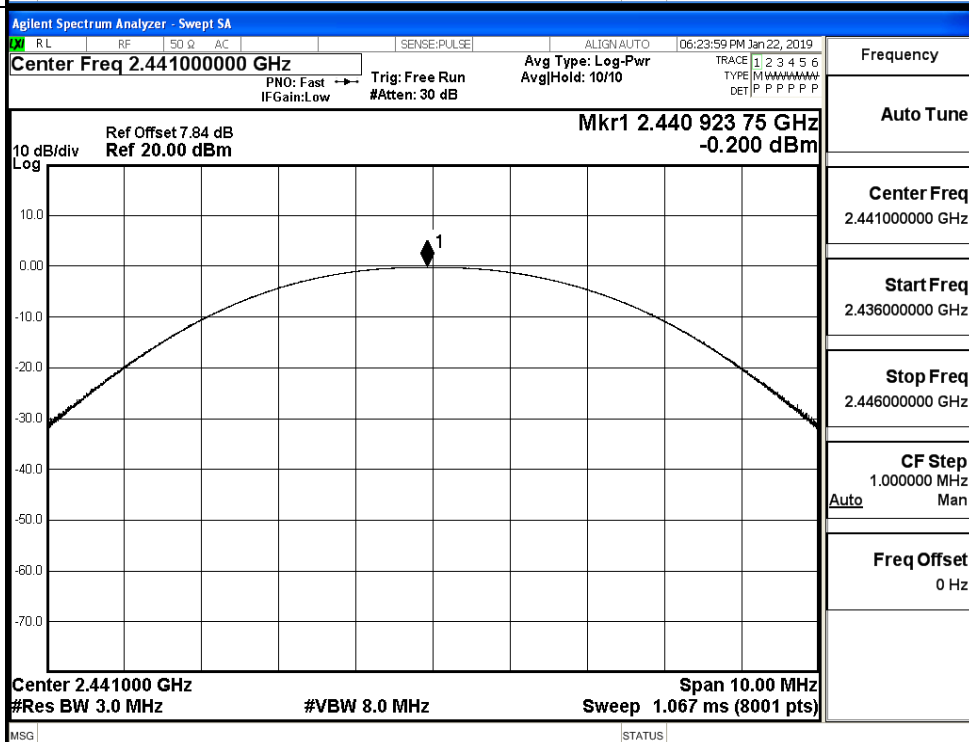
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.979	21	PASS
	MCH	-0.200	21	PASS
	HCH	-1.277	21	PASS
$\pi/4$ DQPSK	LCH	-1.506	21	PASS
	MCH	-0.753	21	PASS
	HCH	-1.940	21	PASS
8DPSK	LCH	-1.392	21	PASS
	MCH	-0.636	21	PASS
	HCH	-1.695	21	PASS

Test Graphs

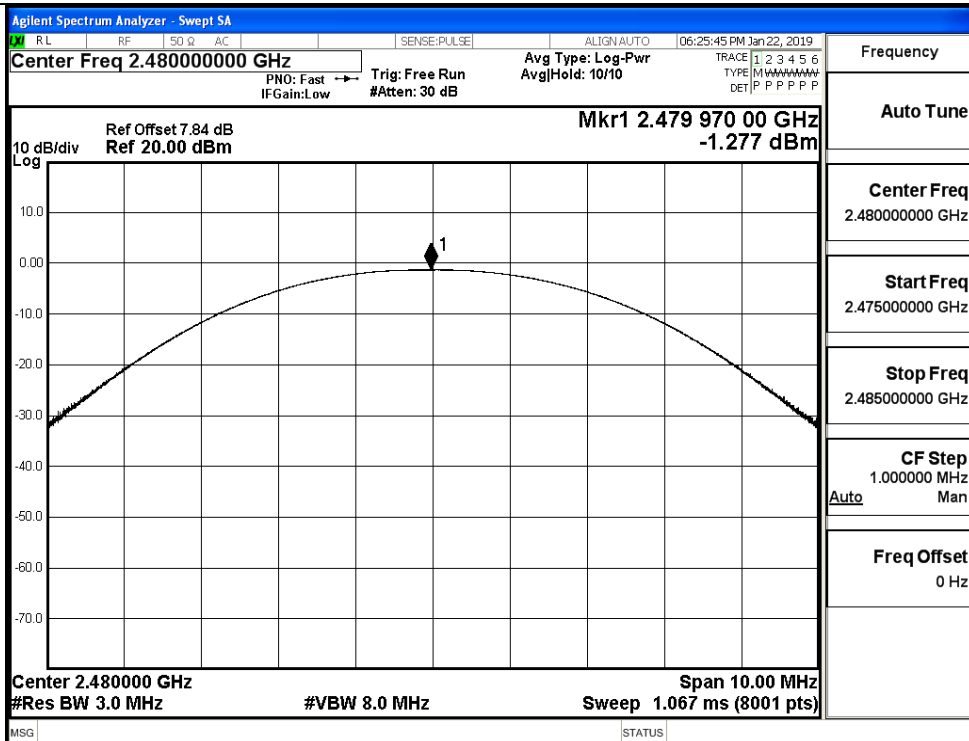
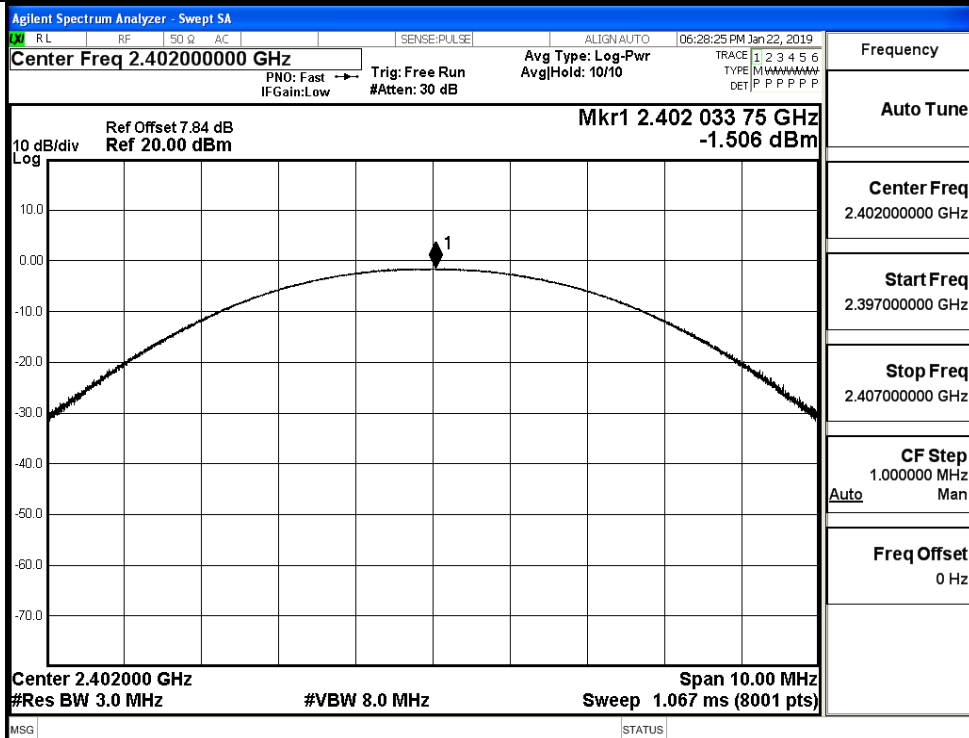
GFSK/LCH

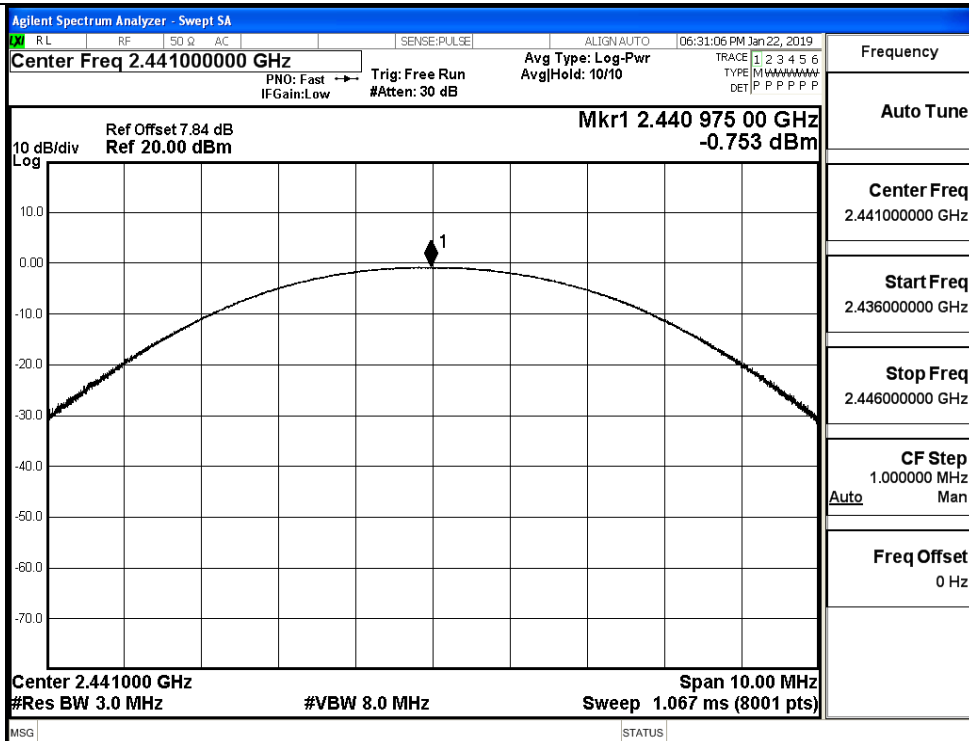
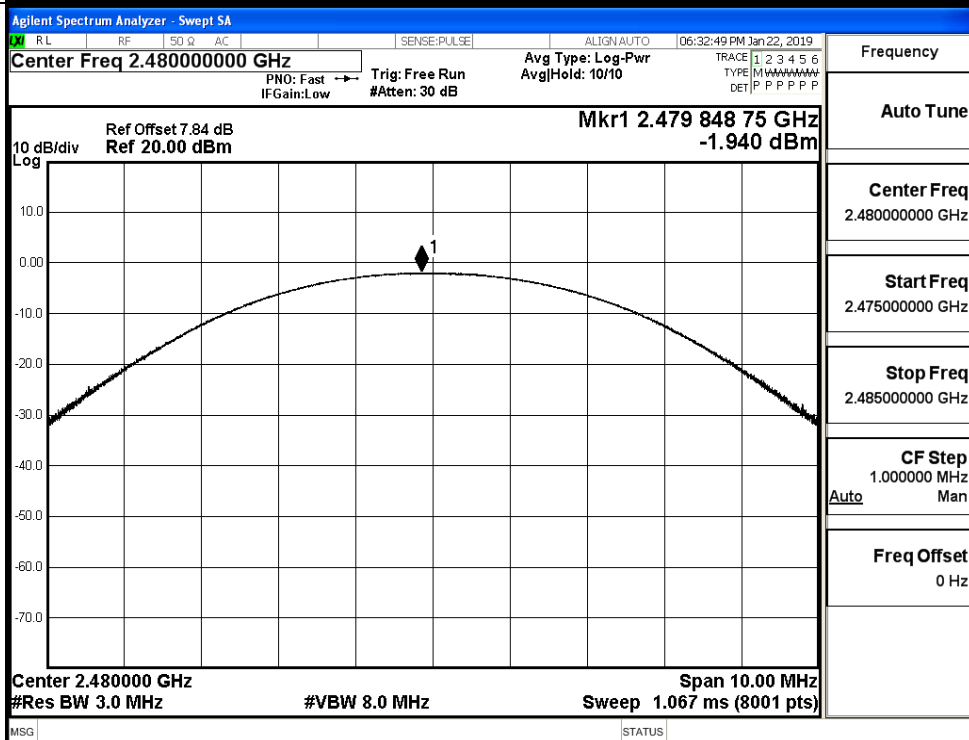


GFSK/MCH

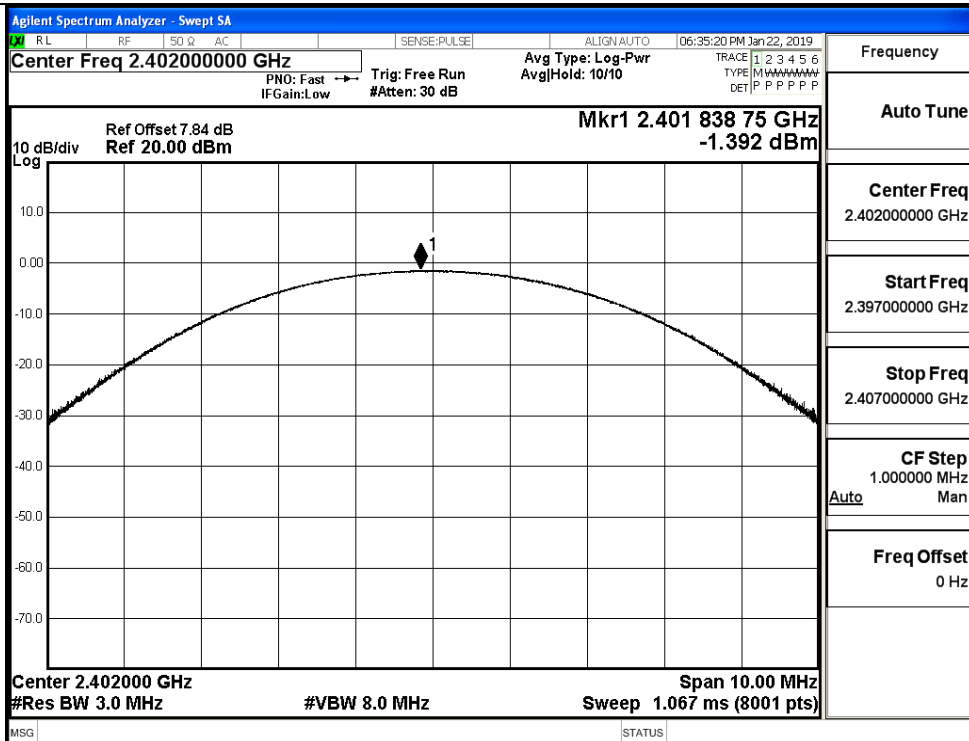


GFSK/HCH

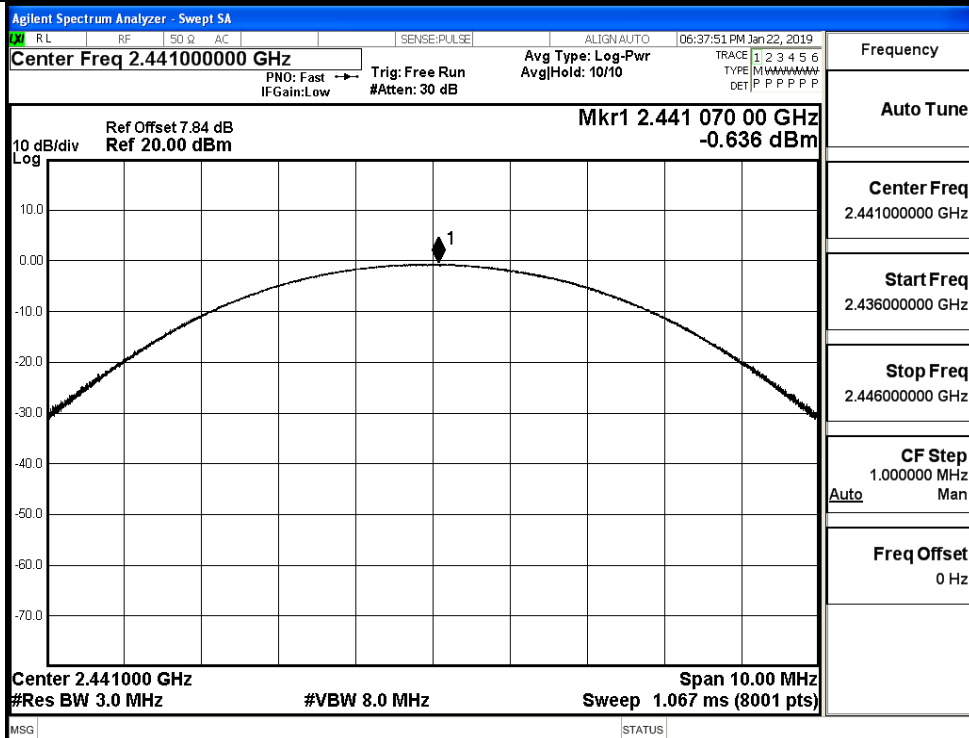
 π /4DQPSK/LCH

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

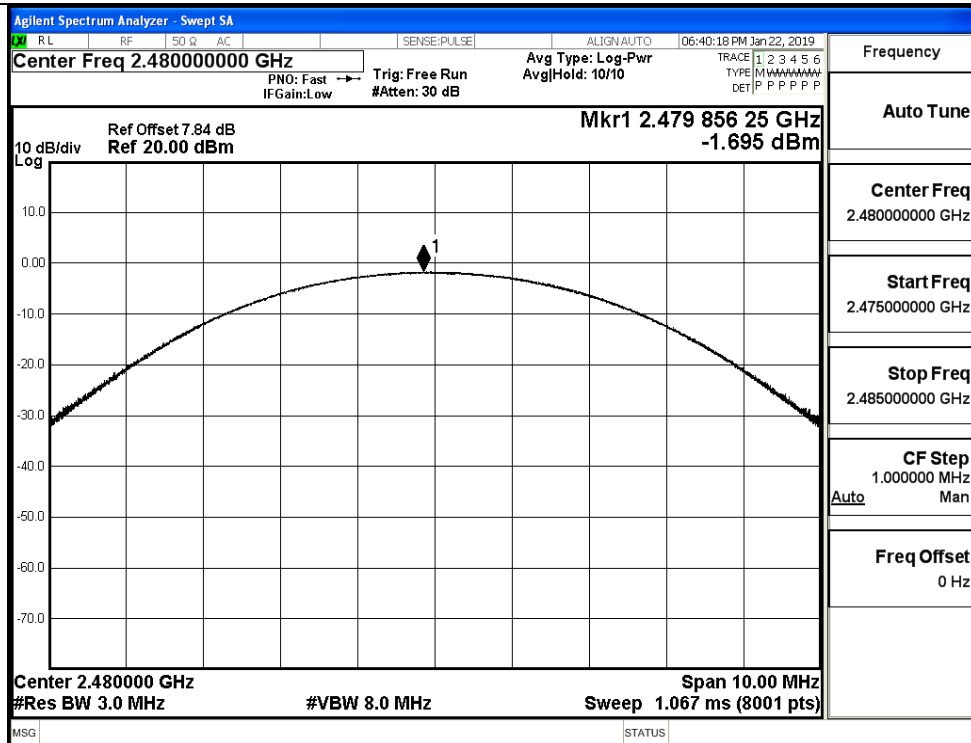
8DPSK/LCH



8DPSK/MCH



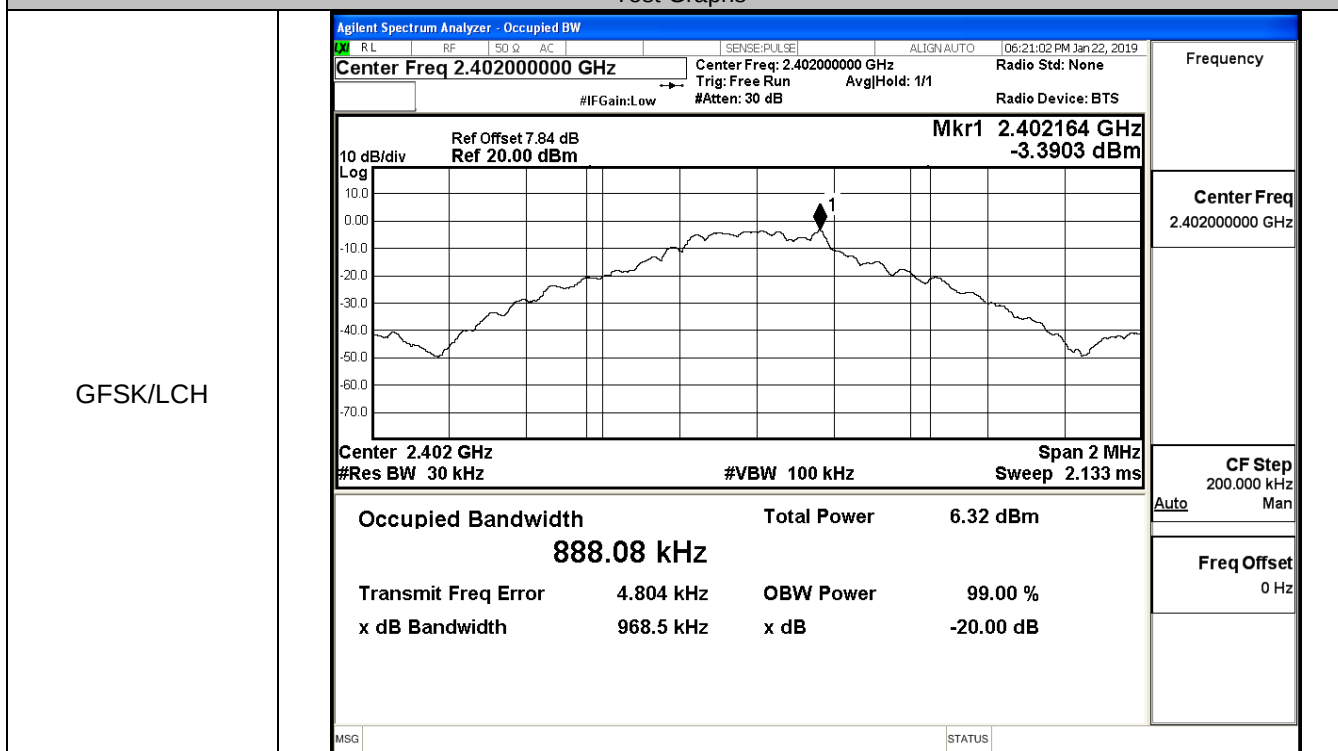
8DPSK/HCH



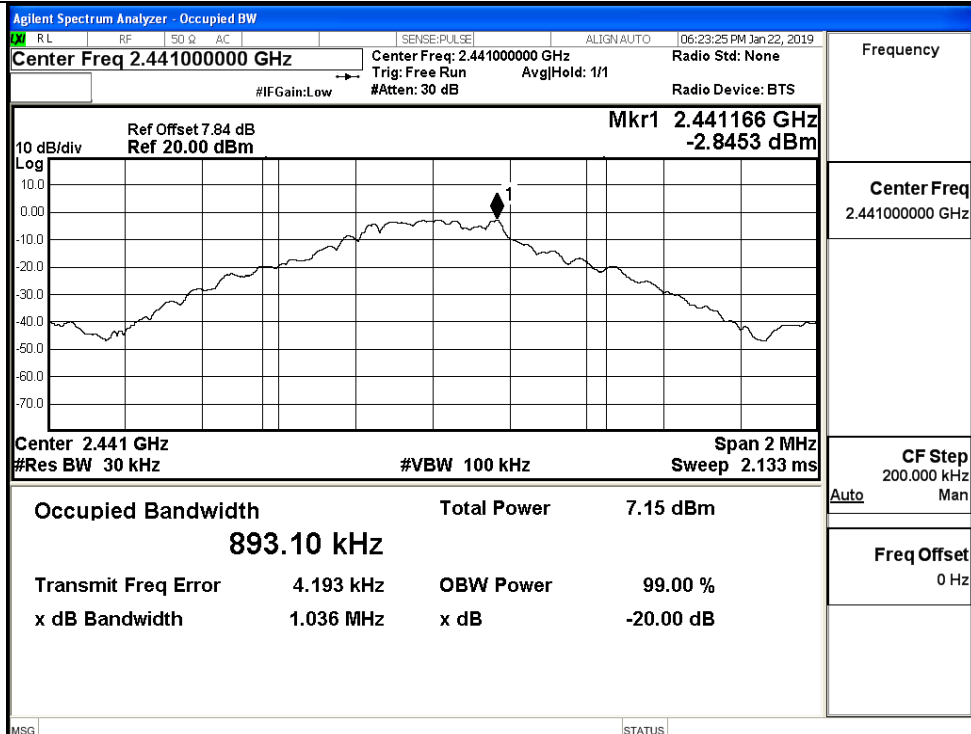
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.88808	0.9685	Not Specified	PASS
	MCH	0.89310	1.036	Not Specified	PASS
	HCH	0.89365	1.020	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.1789	1.293	Not Specified	PASS
	MCH	1.1764	1.309	Not Specified	PASS
	HCH	1.1749	1.310	Not Specified	PASS
8DPSK	LCH	1.1958	1.295	Not Specified	PASS
	MCH	1.1893	1.298	Not Specified	PASS
	HCH	1.1903	1.298	Not Specified	PASS

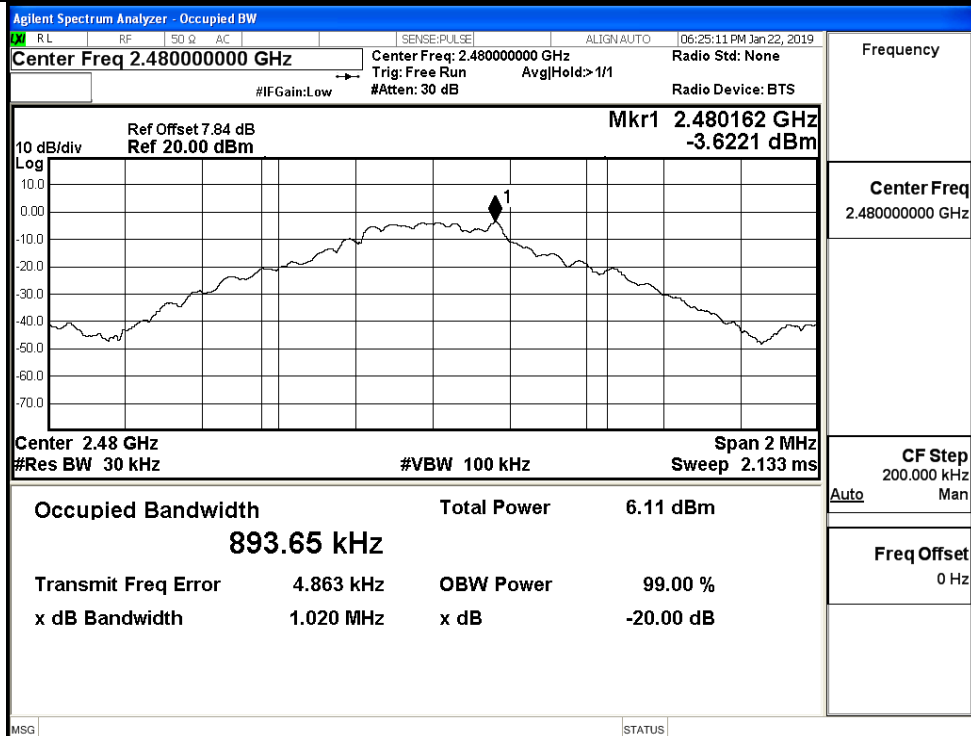
Test Graphs

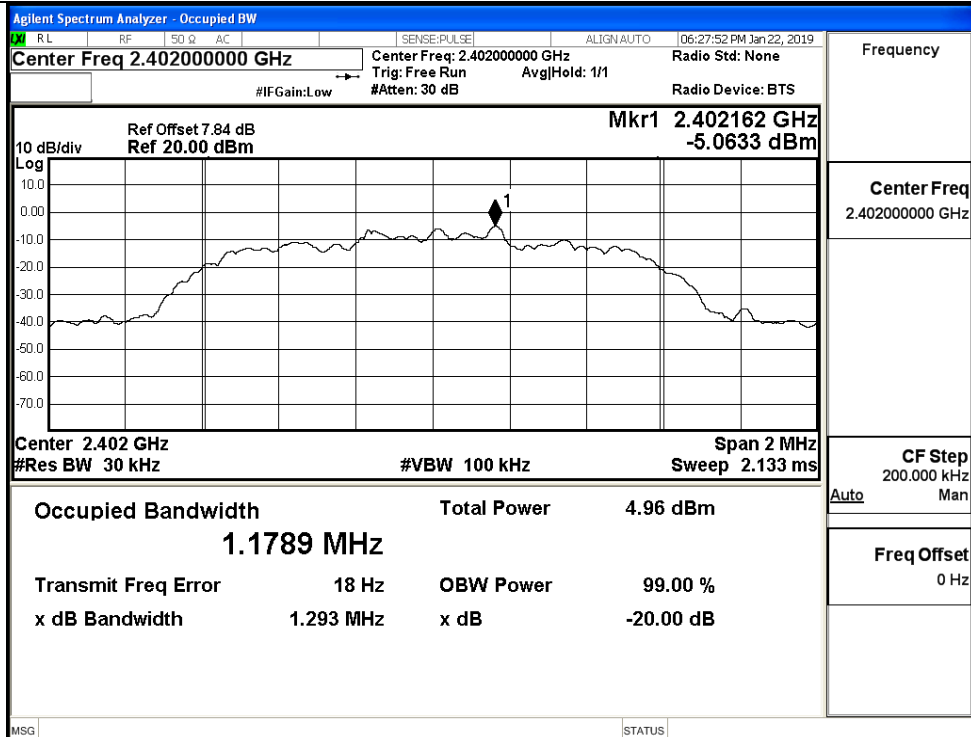
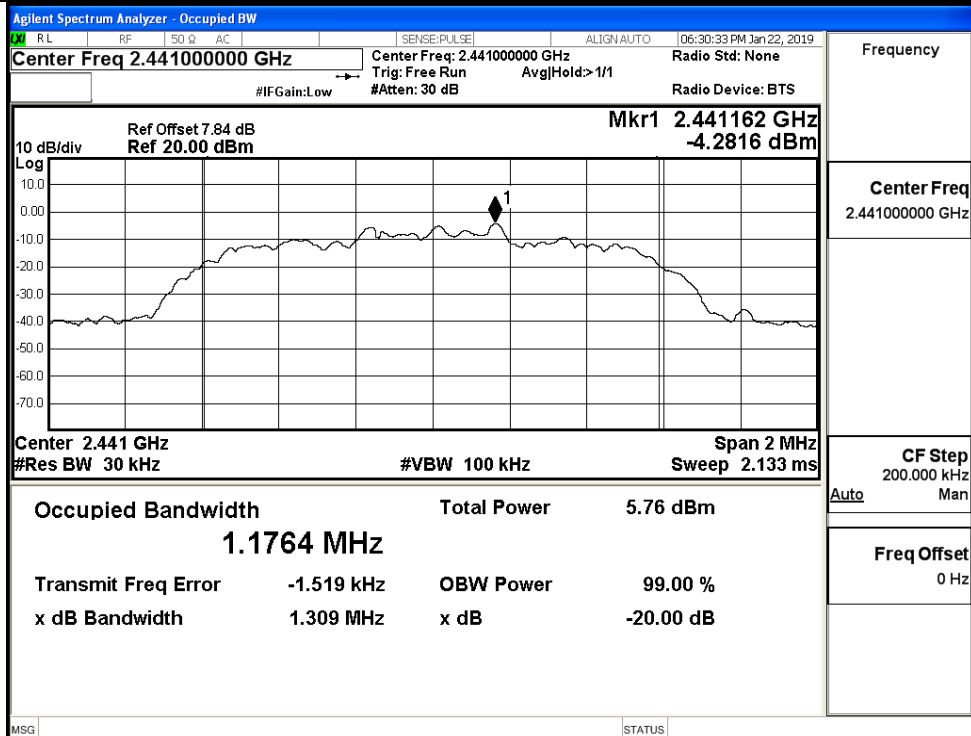


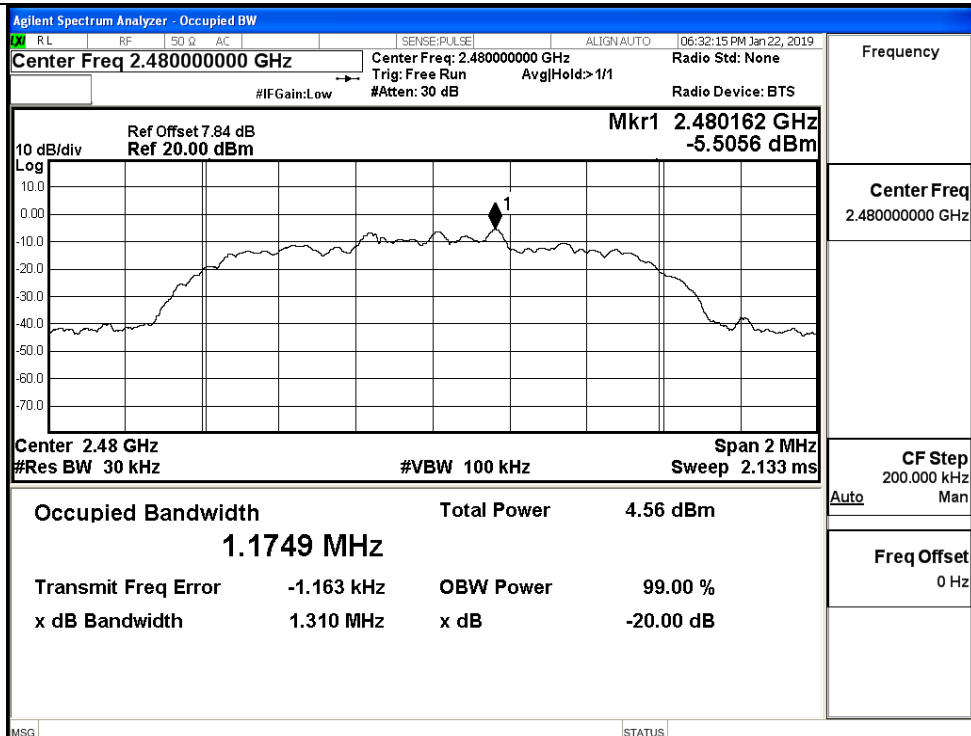
GFSK/MCH



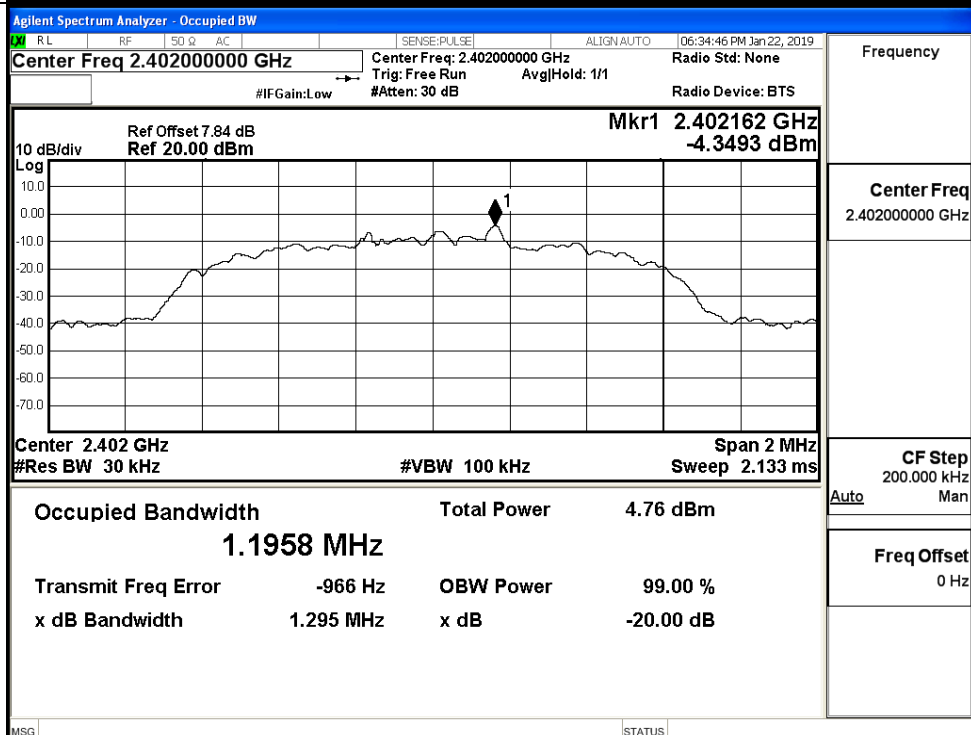
GFSK/HCH



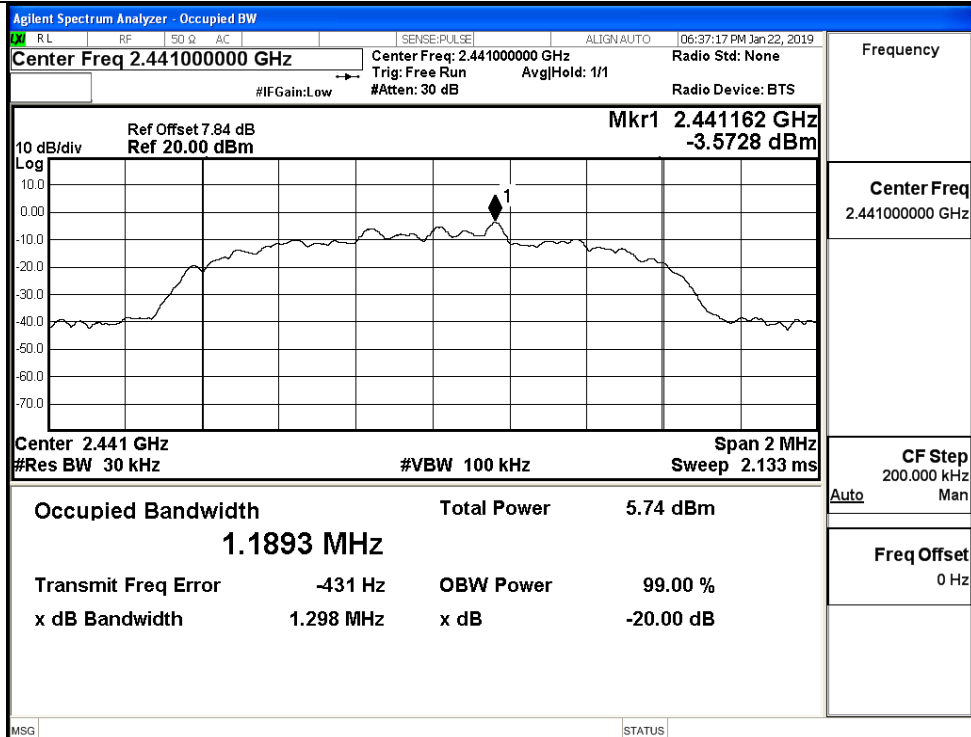
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

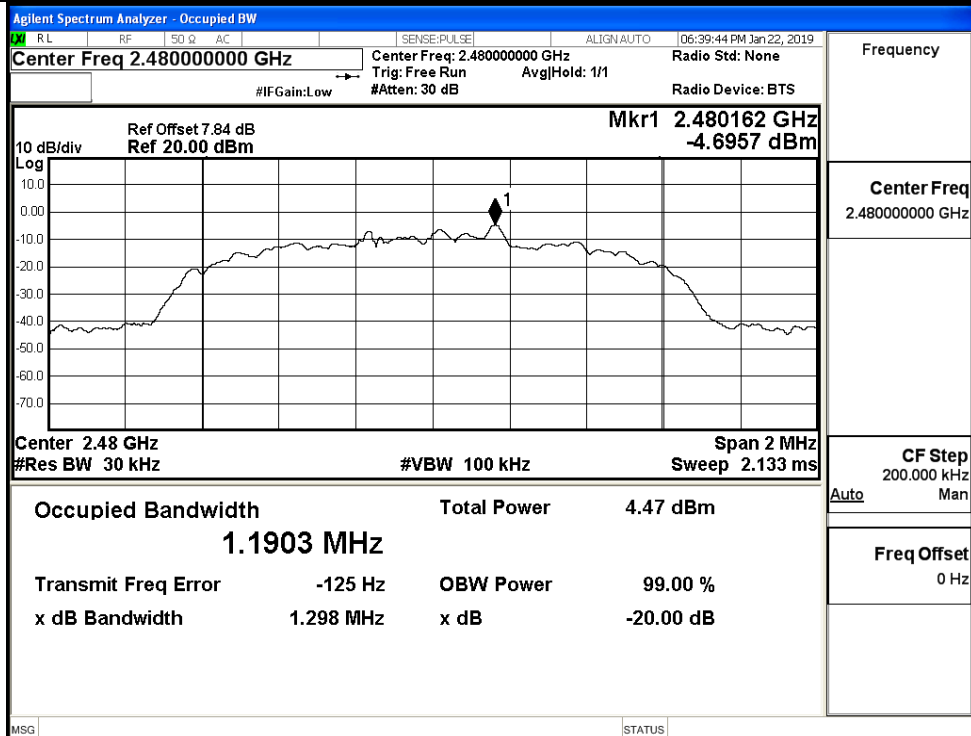
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

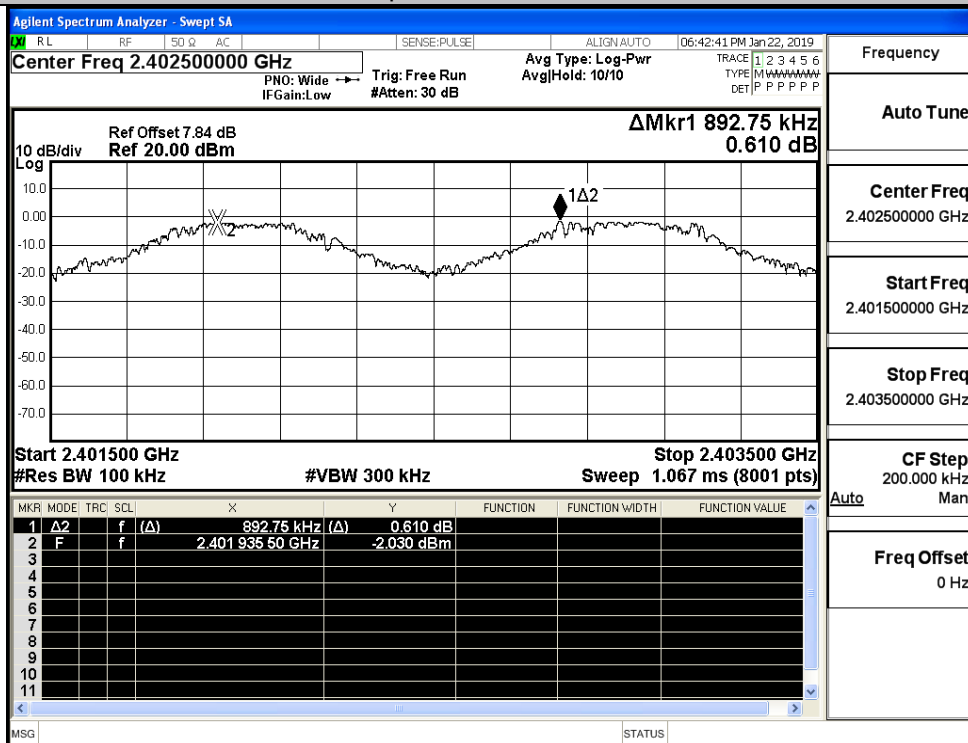


A.3 Carrier Frequency Separation

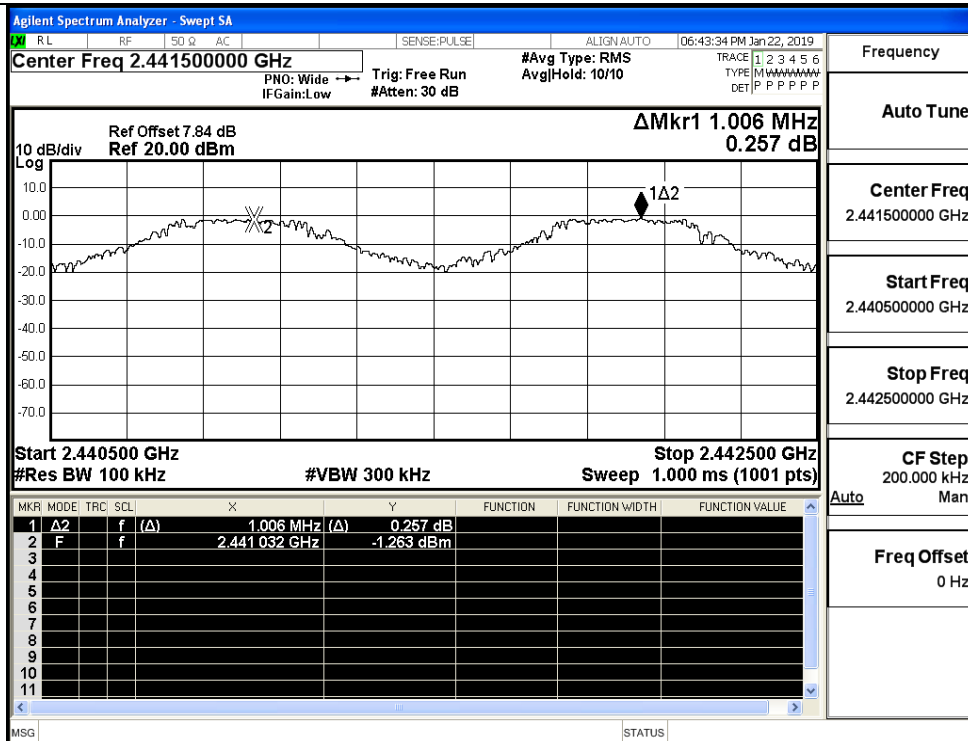
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.893	0.691	PASS
	MCH	1.006	0.691	PASS
	HCH	1.014	0.691	PASS
π /4DQPSK	LCH	0.890	0.873	PASS
	MCH	0.930	0.873	PASS
	HCH	0.954	0.873	PASS
8DPSK	LCH	1.016	0.865	PASS
	MCH	1.146	0.865	PASS
	HCH	0.964	0.865	PASS

Test Graphs

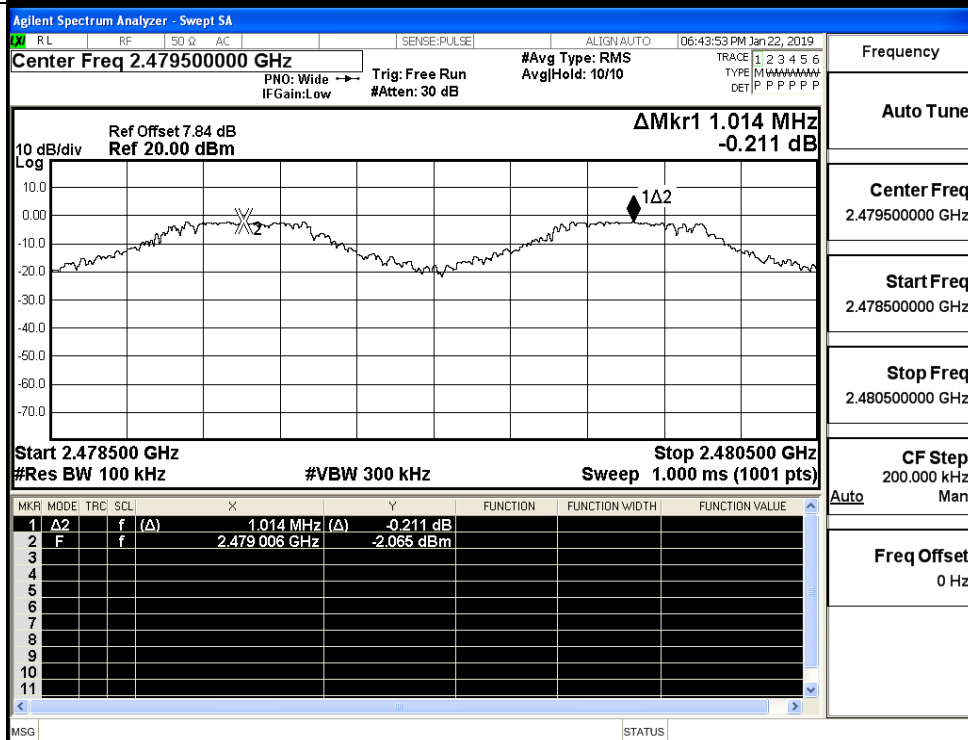
GFSK/LCH

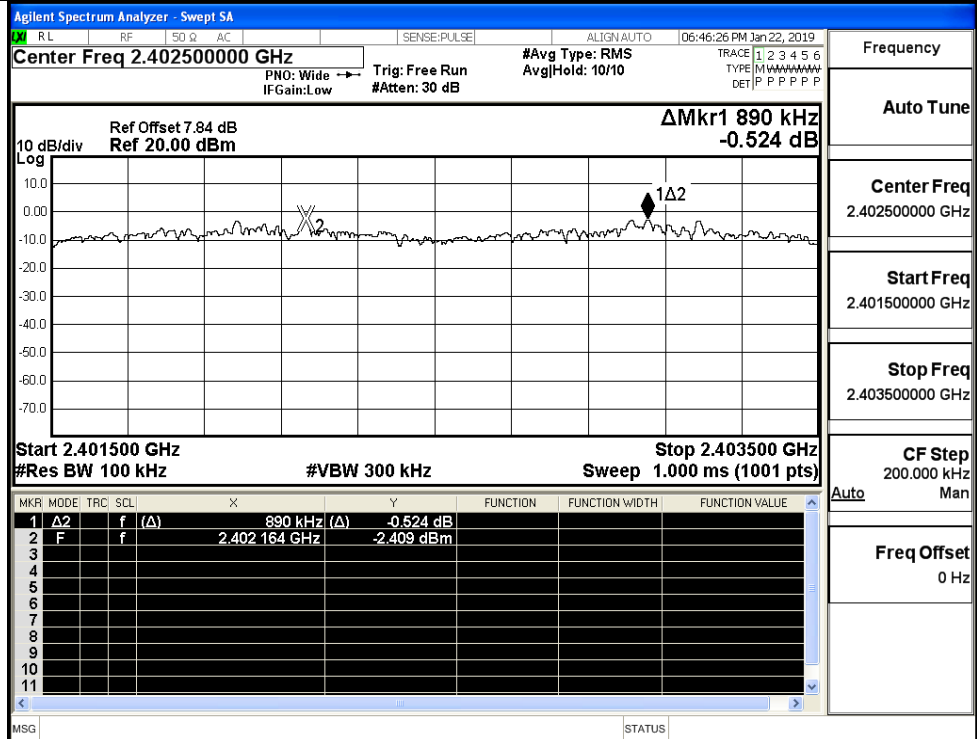
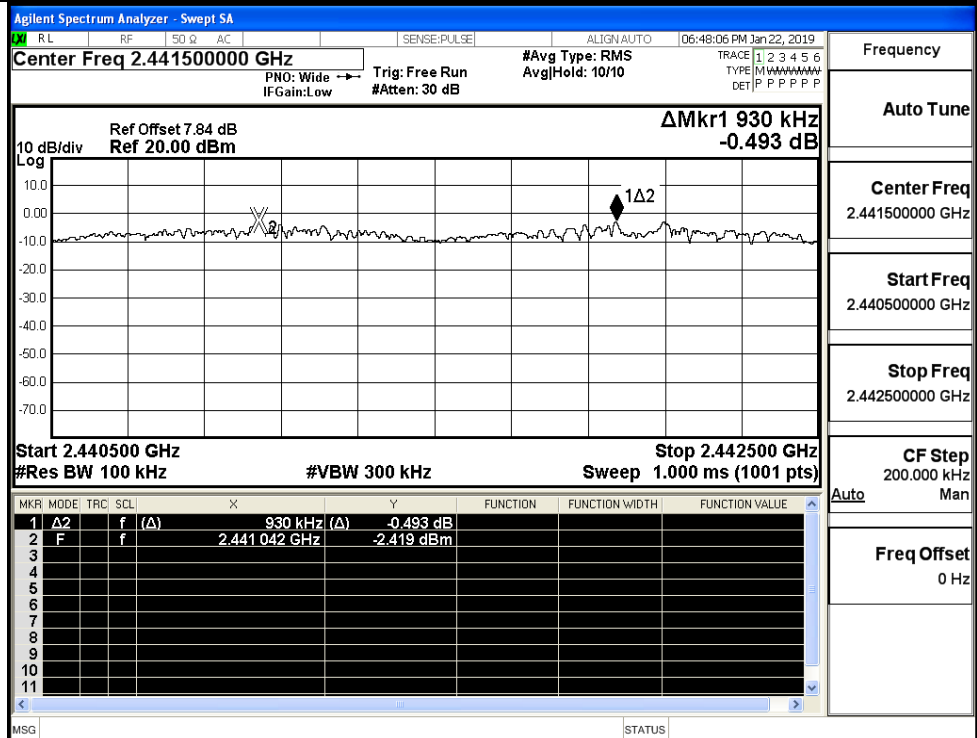


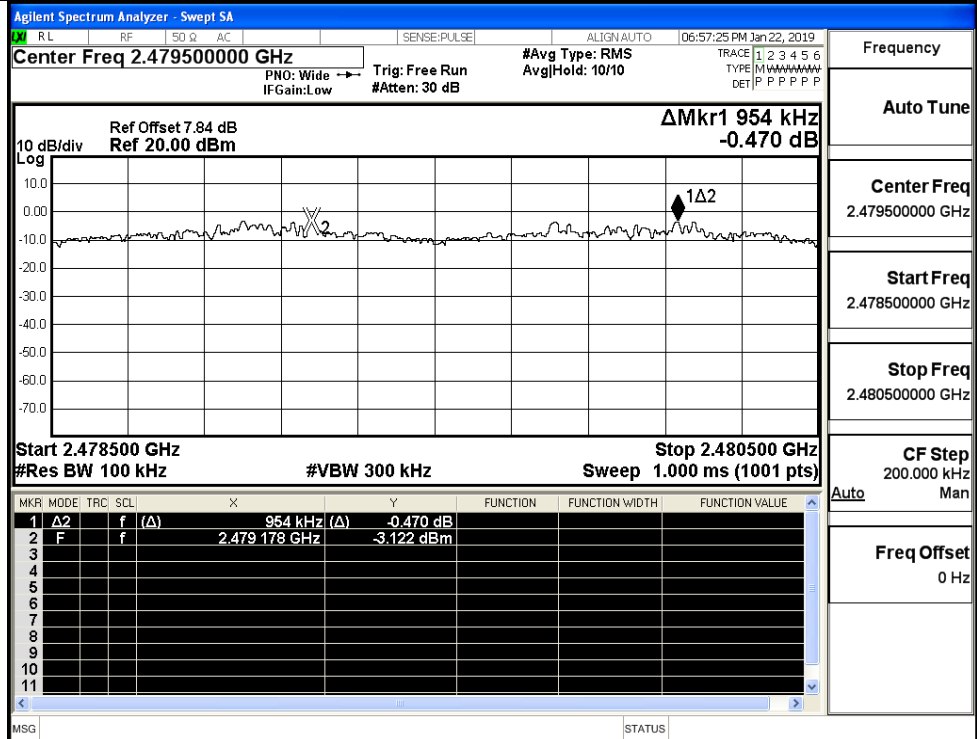
GFSK/MCH



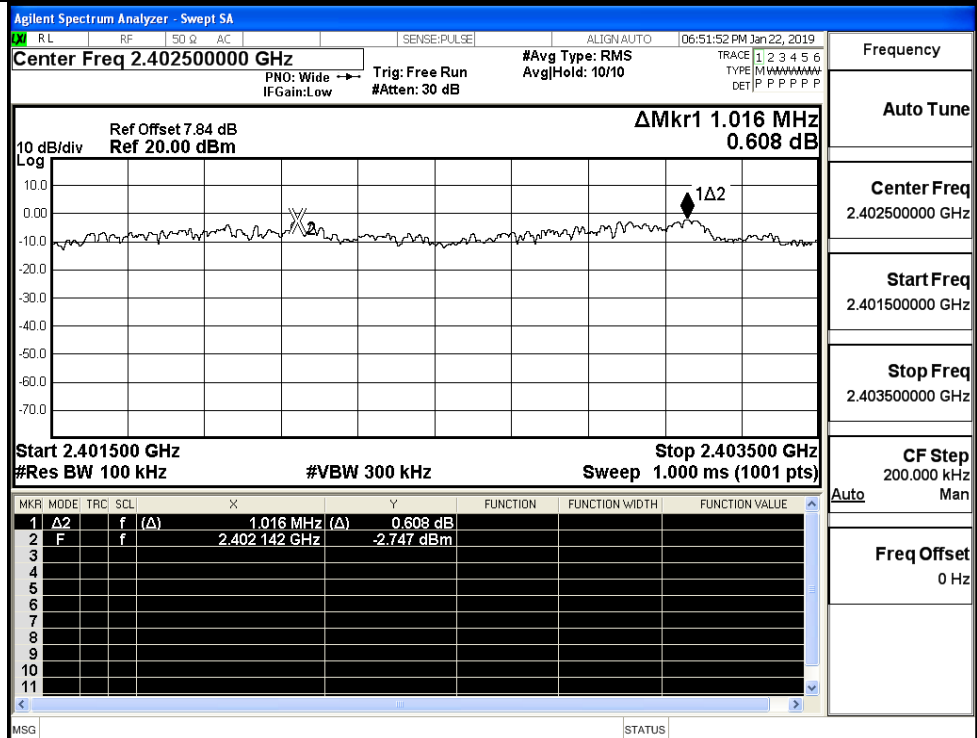
GFSK/HCH



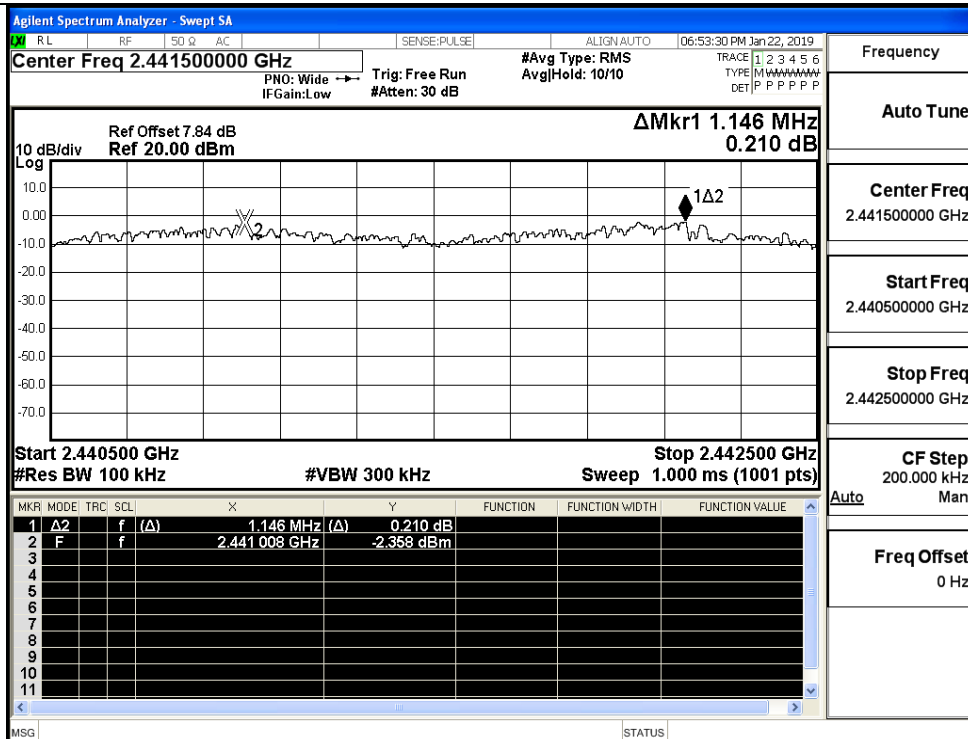
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

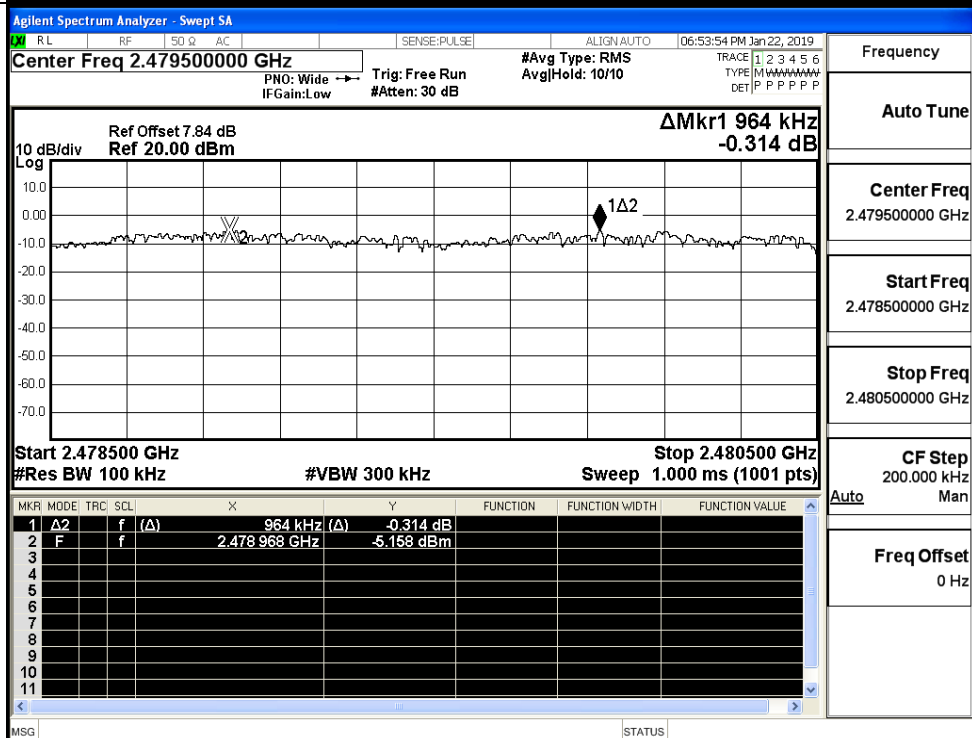
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

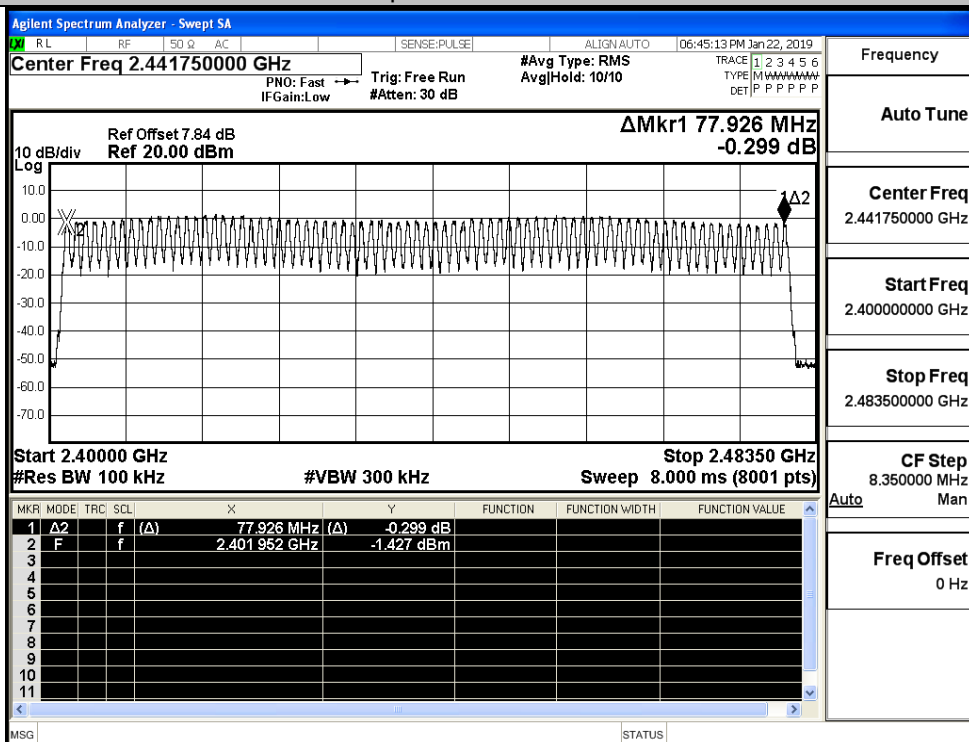
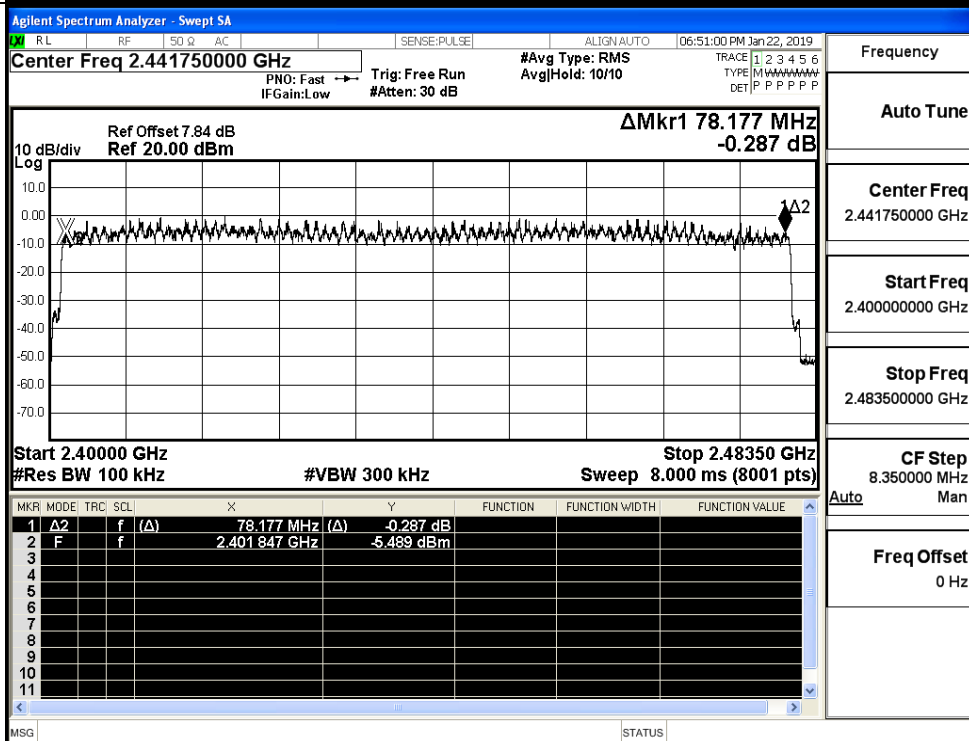


A.4 Hopping Channel Number

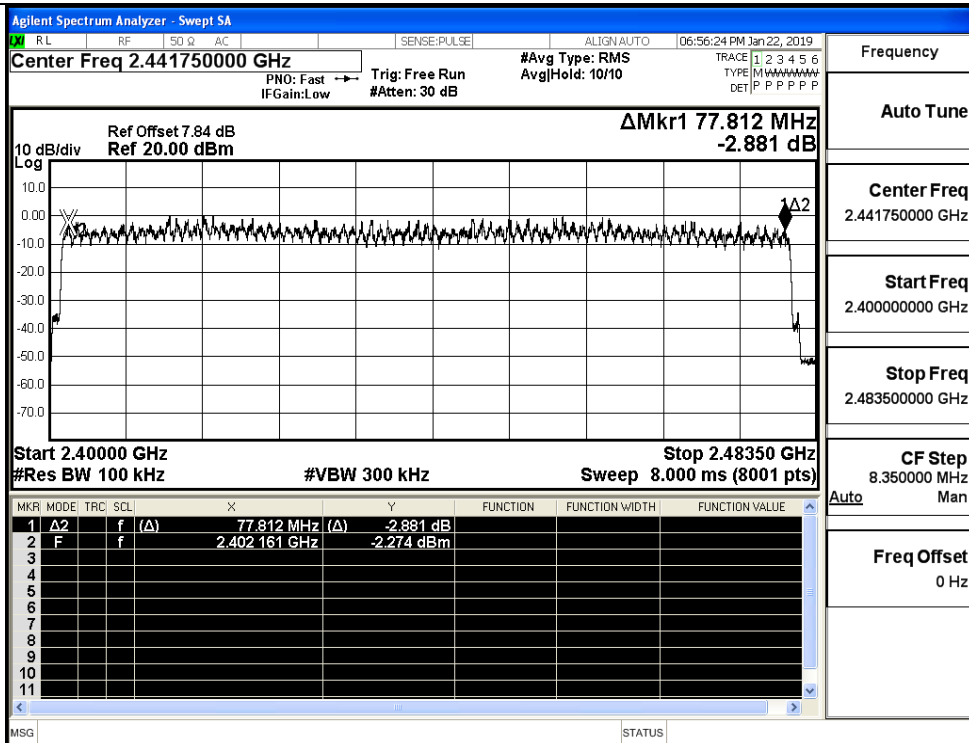
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

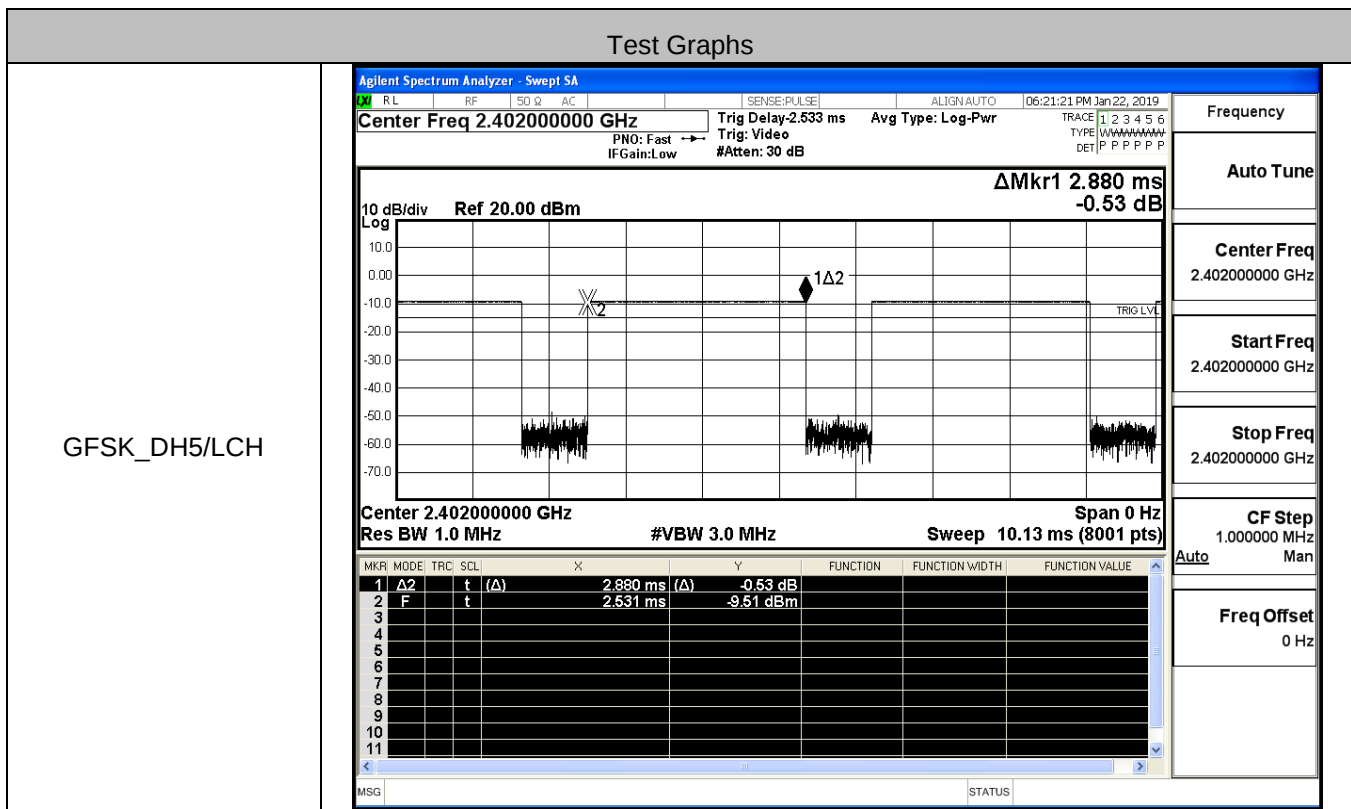
GFSK/Hop

 $\pi/4$ DQPSK/Hop

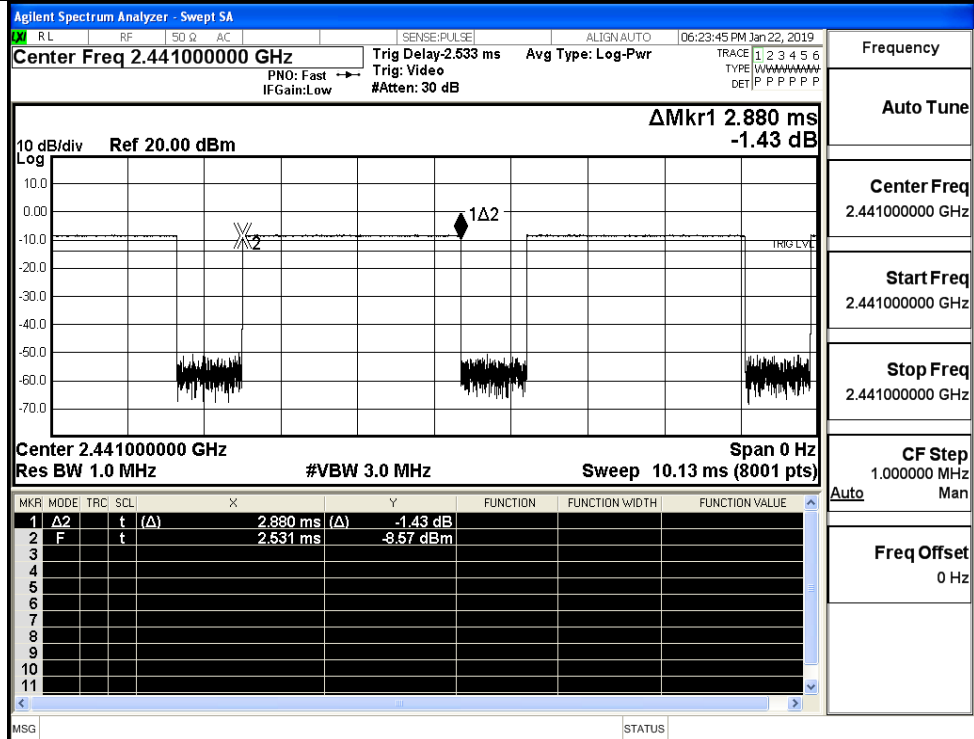
8DPSK/Hop



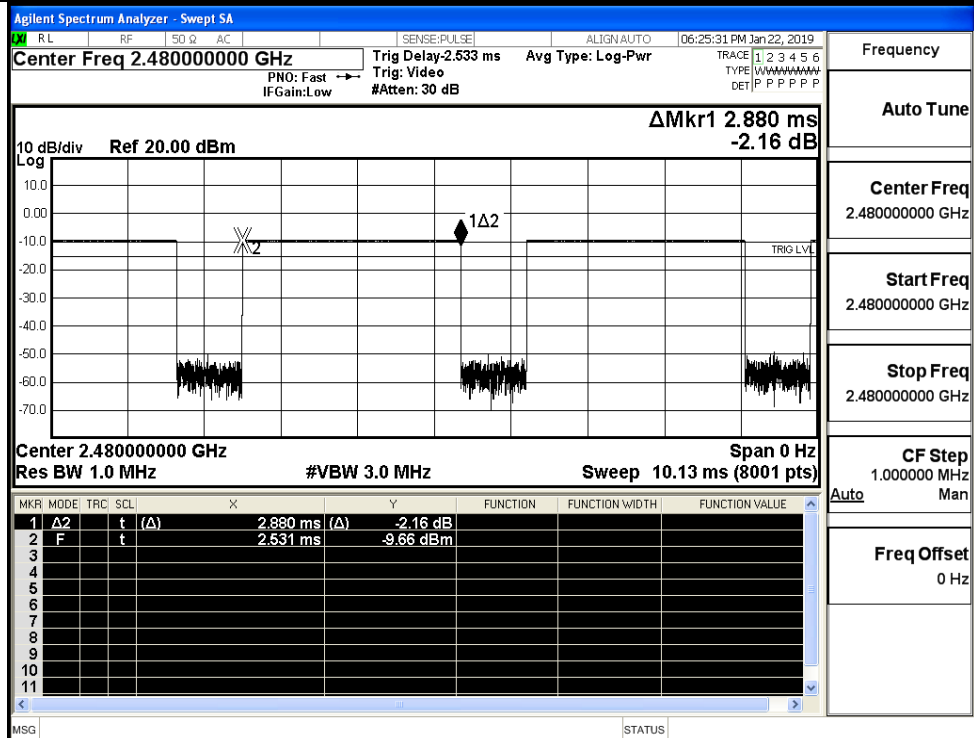
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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



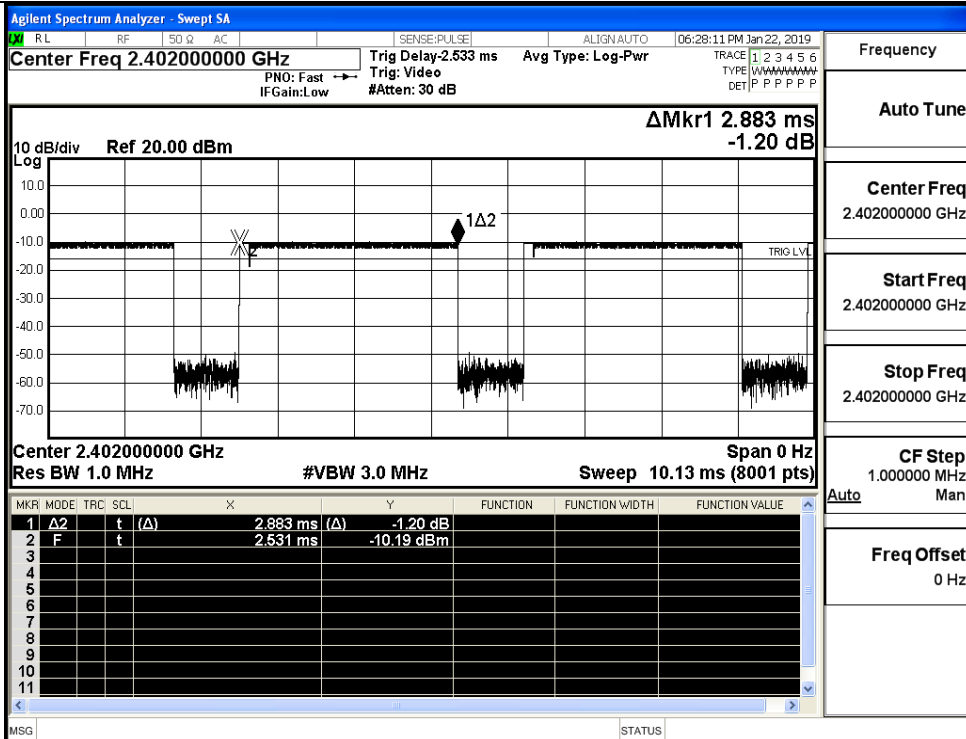
GFSK_DH5/MCH



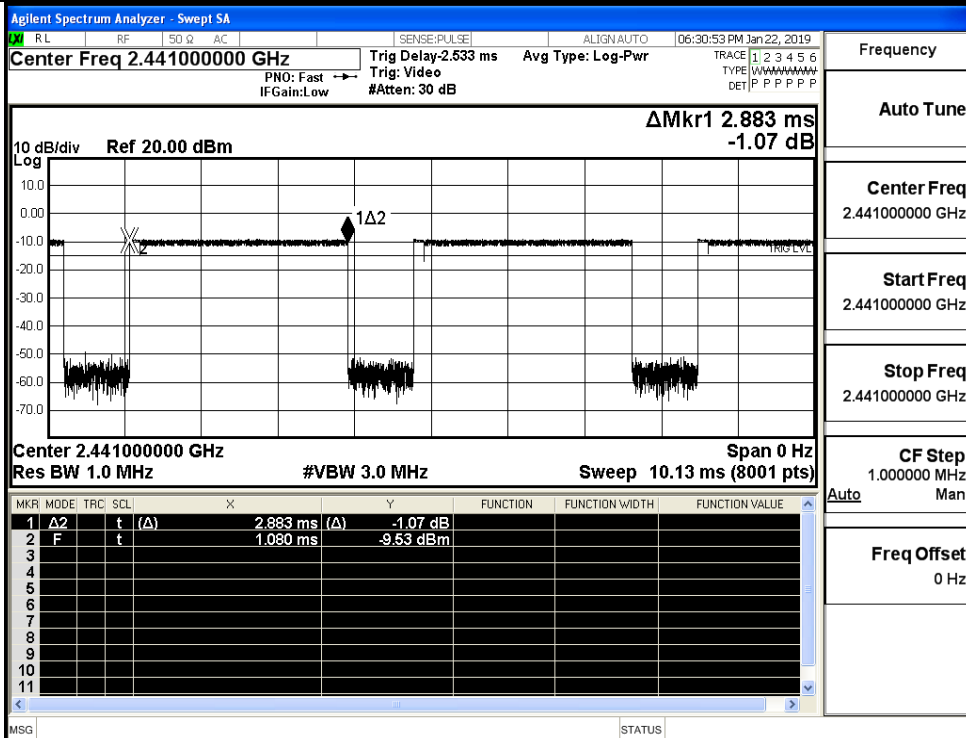
GFSK_DH5/HCH



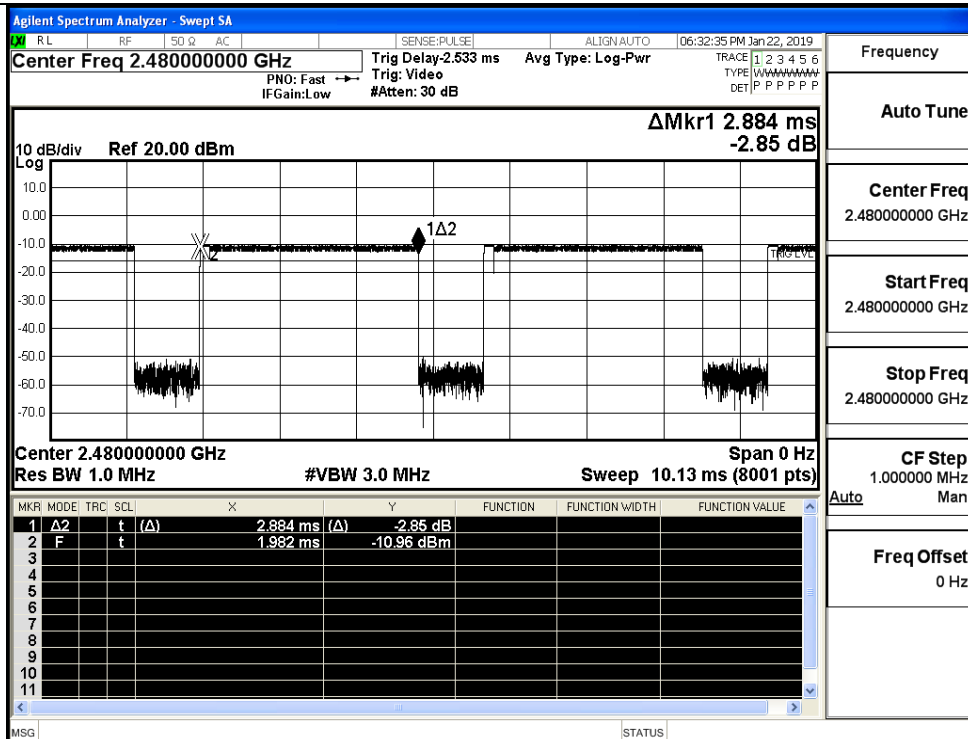
$\pi/4$ DQPSK
_2DH5/LCH



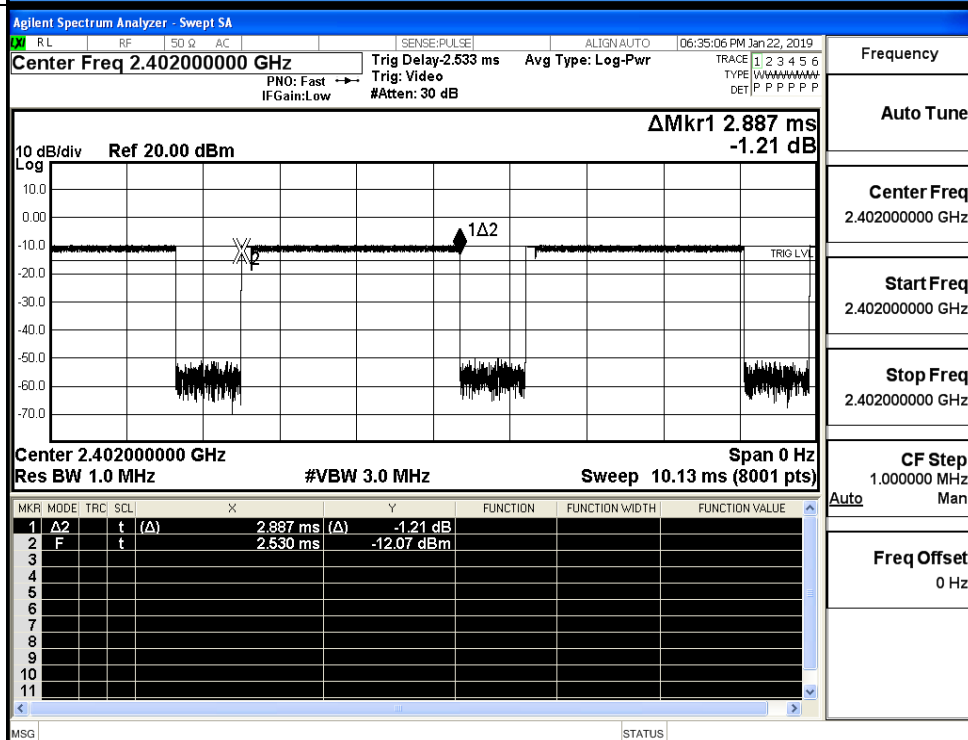
$\pi/4$ DQPSK
_2DH5/MCH



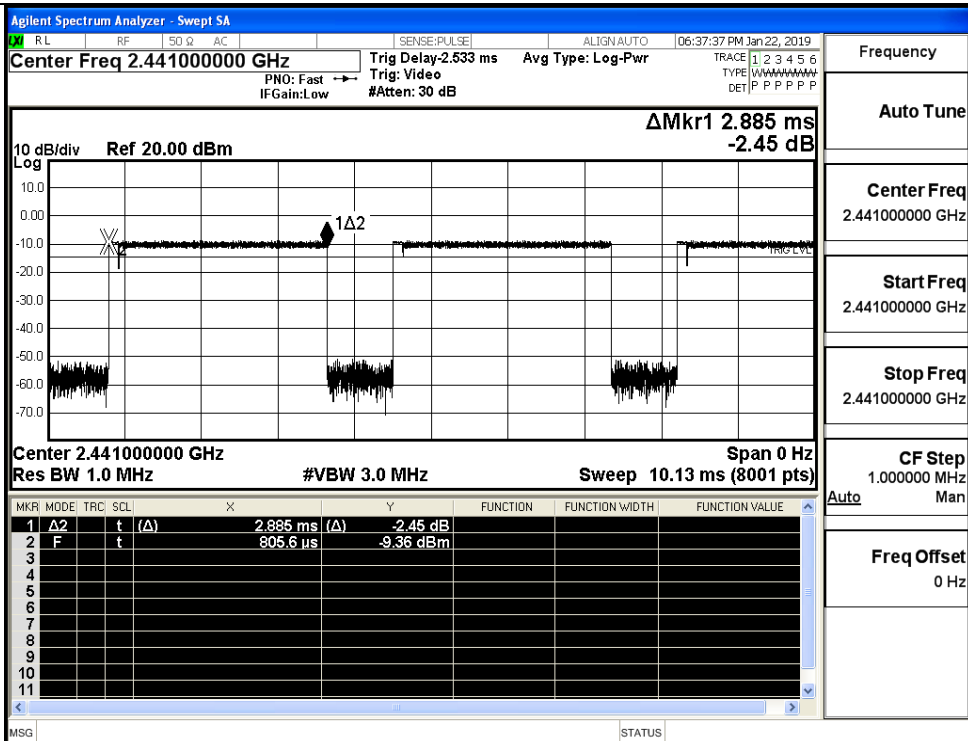
$\pi/4$ DQPSK
_2DH5/HCH



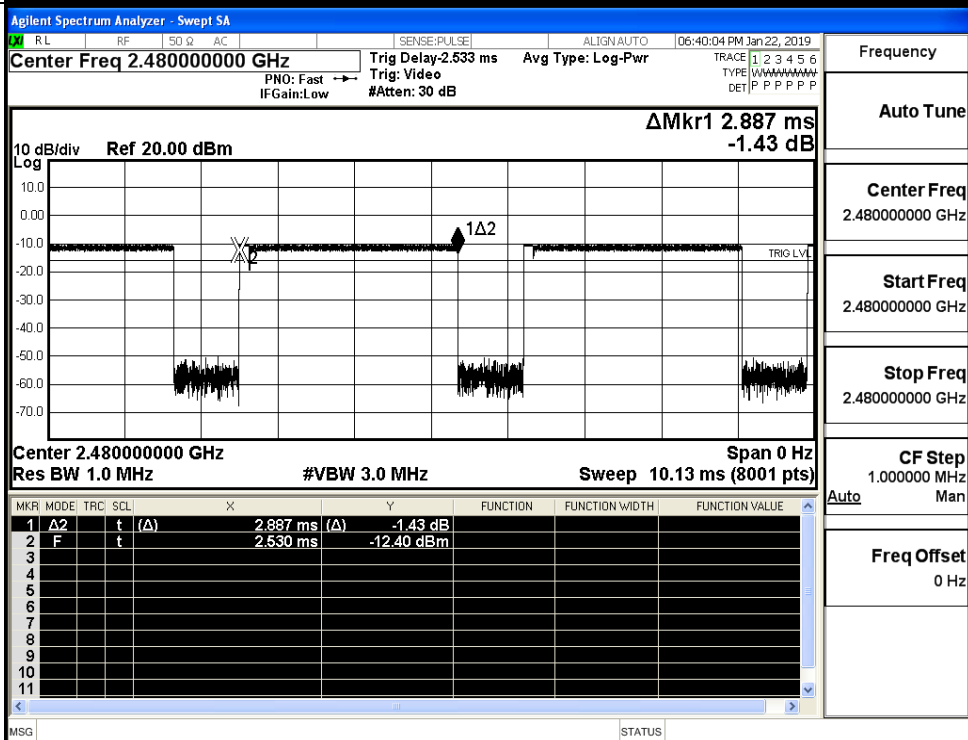
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

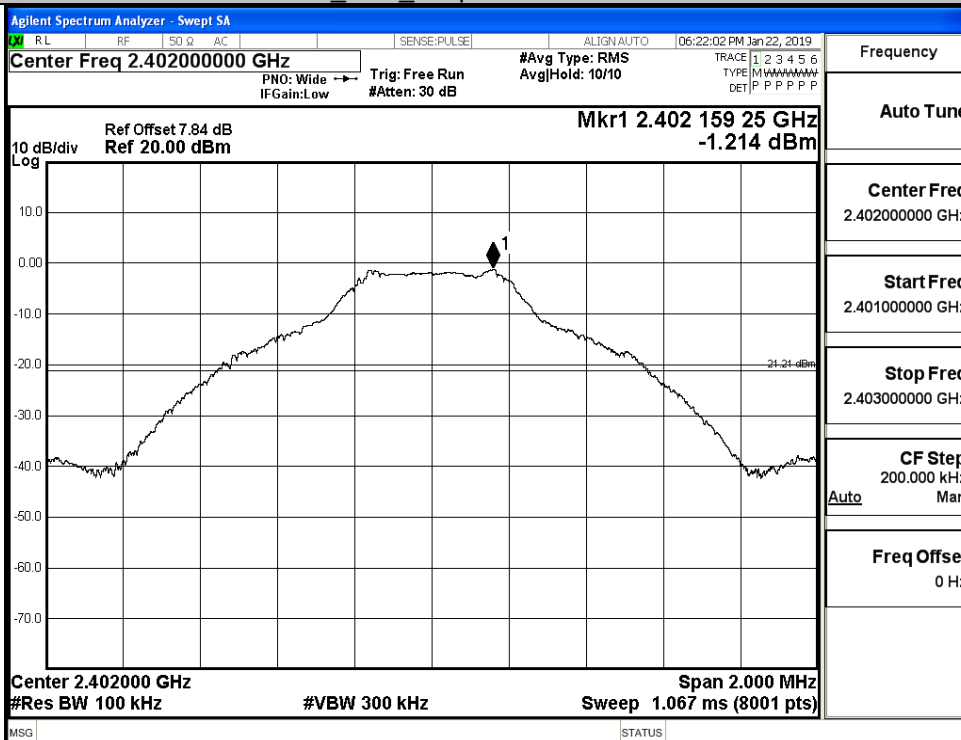


A.6 RF Conducted Spurious Emissions

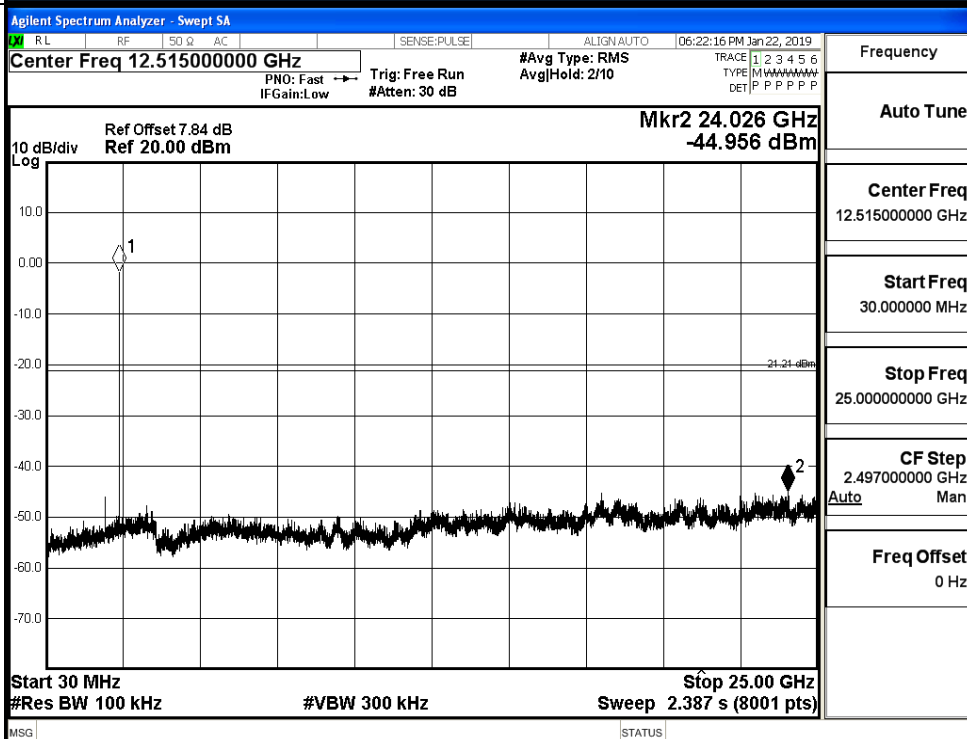
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.214	-44.956	-21.214	PASS
	MCH	-0.494	-45.415	-20.494	PASS
	HCH	-1.809	-45.098	-21.809	PASS
$\pi/4$ DQPSK	LCH	-2.367	-45.519	-22.367	PASS
	MCH	-1.913	-45.009	-21.913	PASS
	HCH	-2.776	-44.576	-22.776	PASS
8DPSK	LCH	-2.685	-45.372	-22.685	PASS
	MCH	-1.539	-44.814	-21.539	PASS
	HCH	-3.386	-45.743	-23.386	PASS

GFSK_LCH_Graphs

Pref

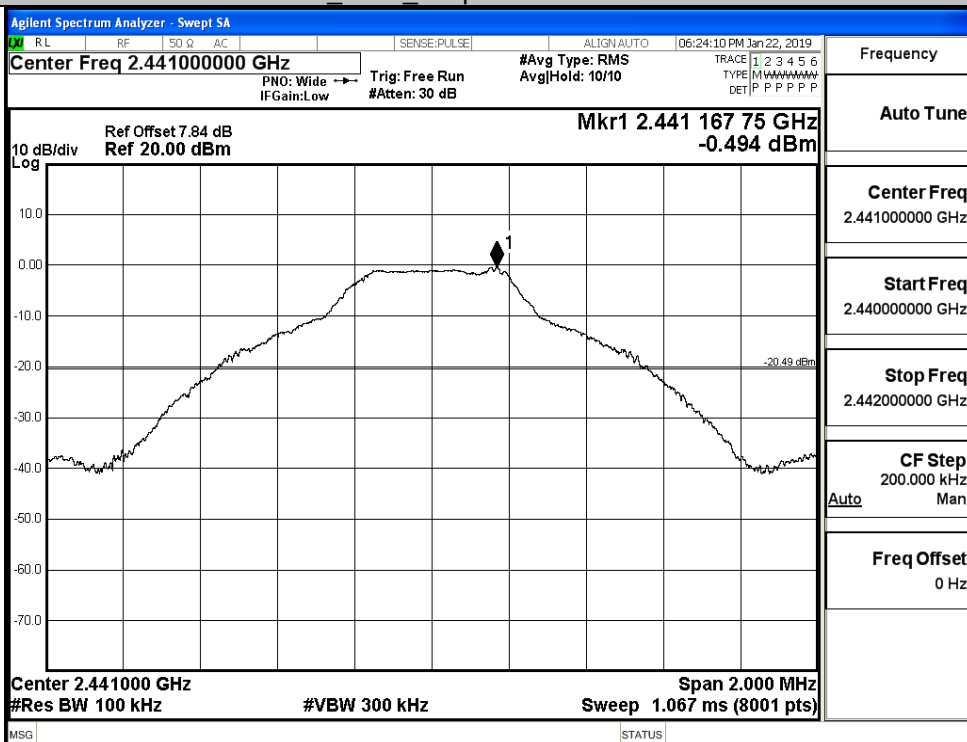


Puw

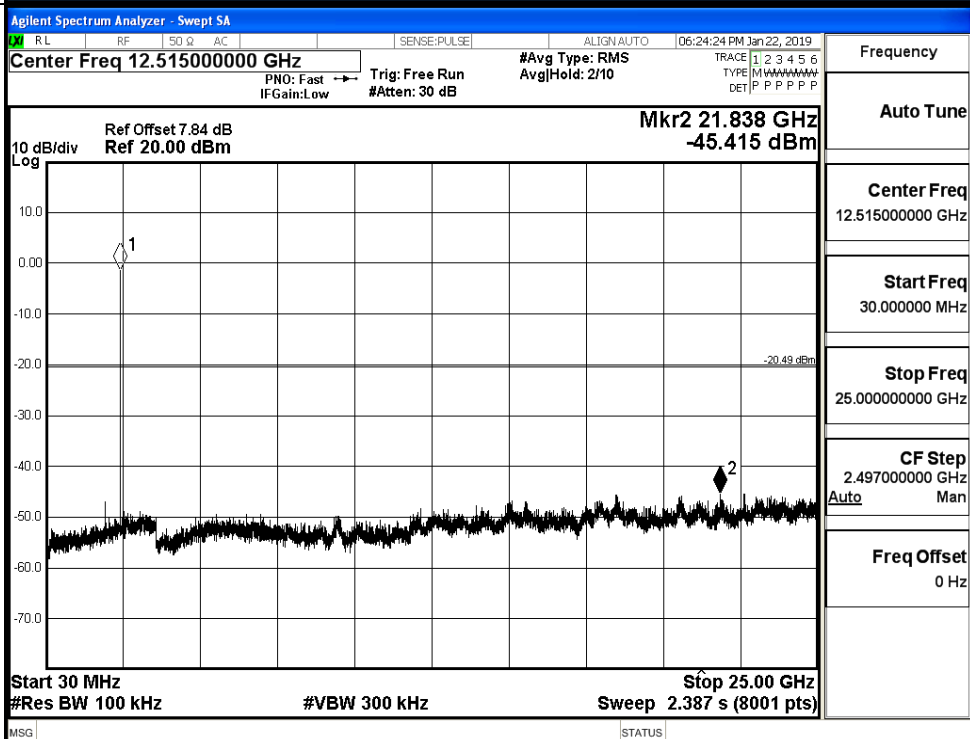


GFSK_MCH_Graphs

Pref

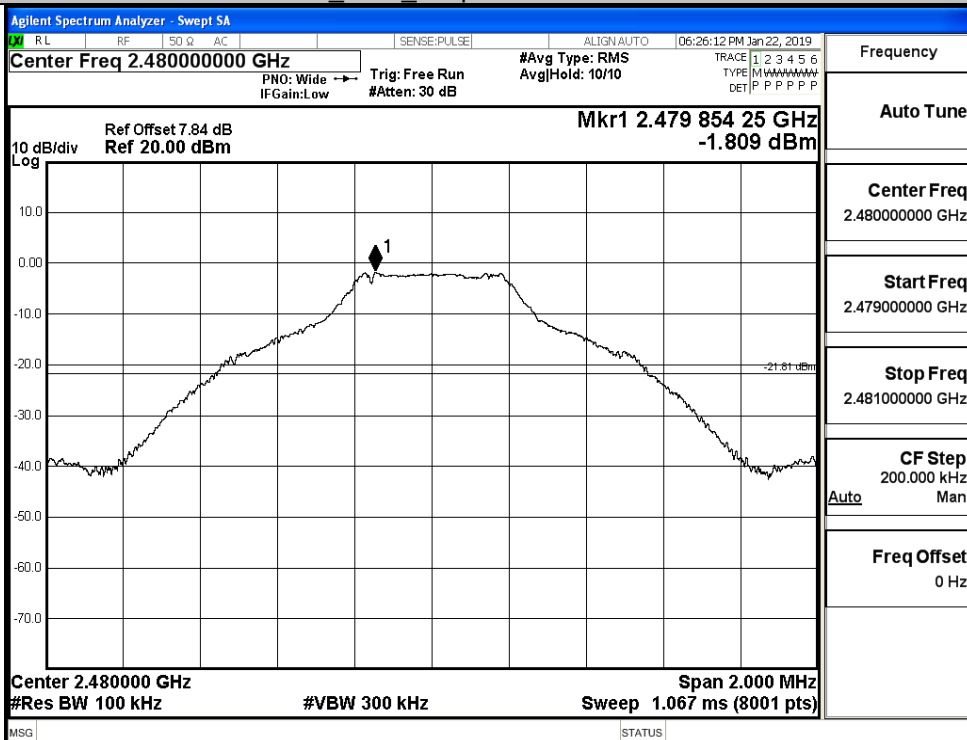


Puw

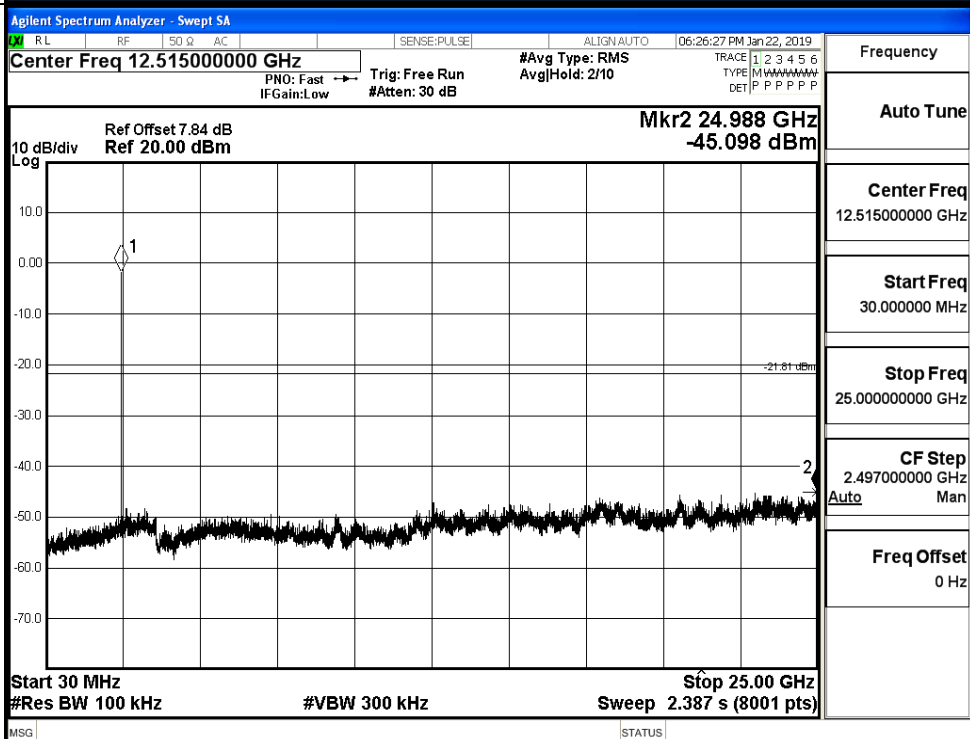


GFSK_HCH_Graphs

Pref

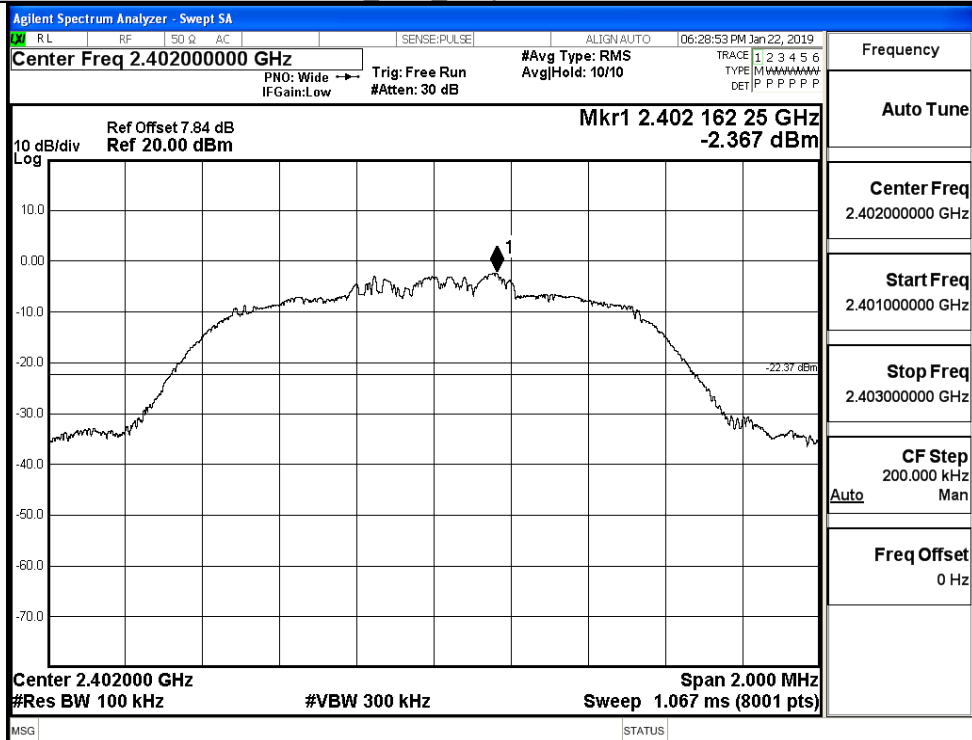


Puw

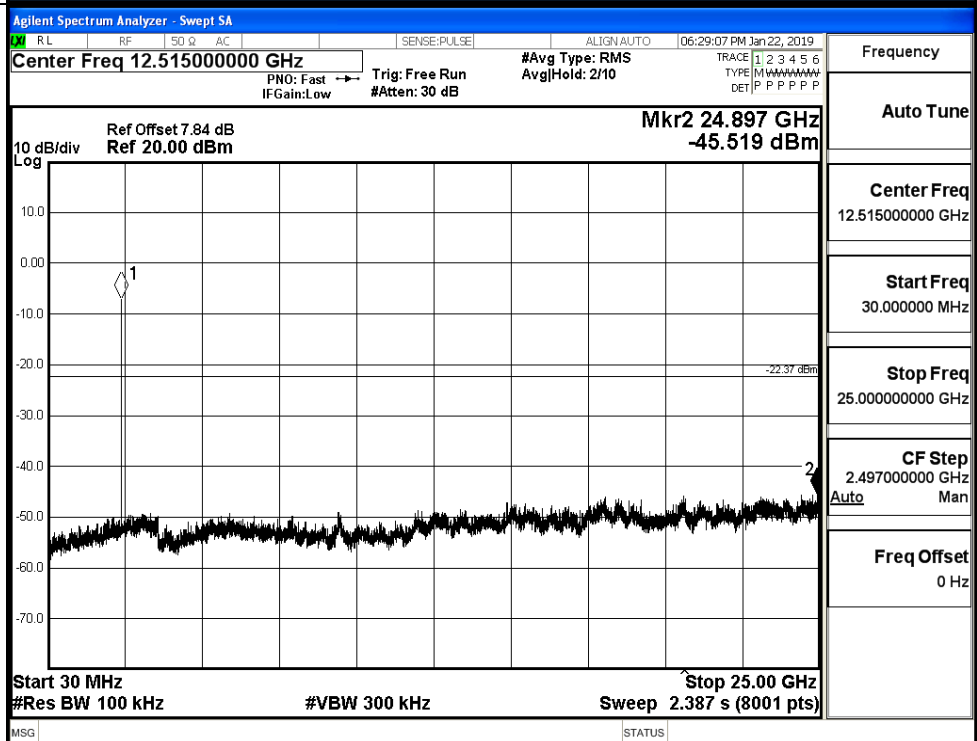


π /4DQPSK LCH_Graphs

Pref

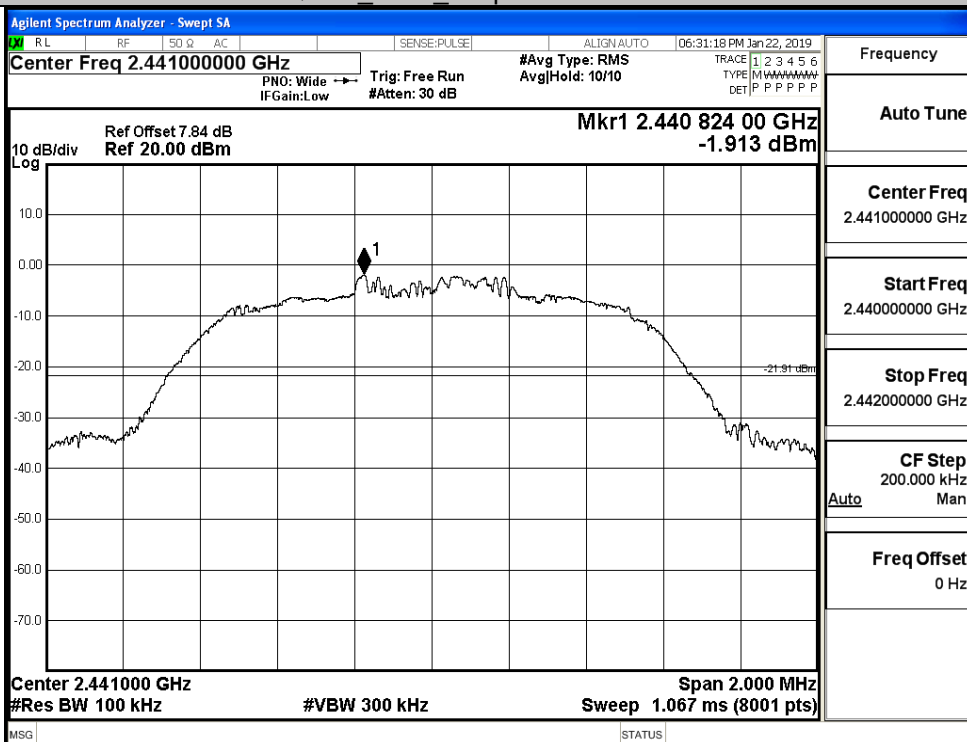


Puw

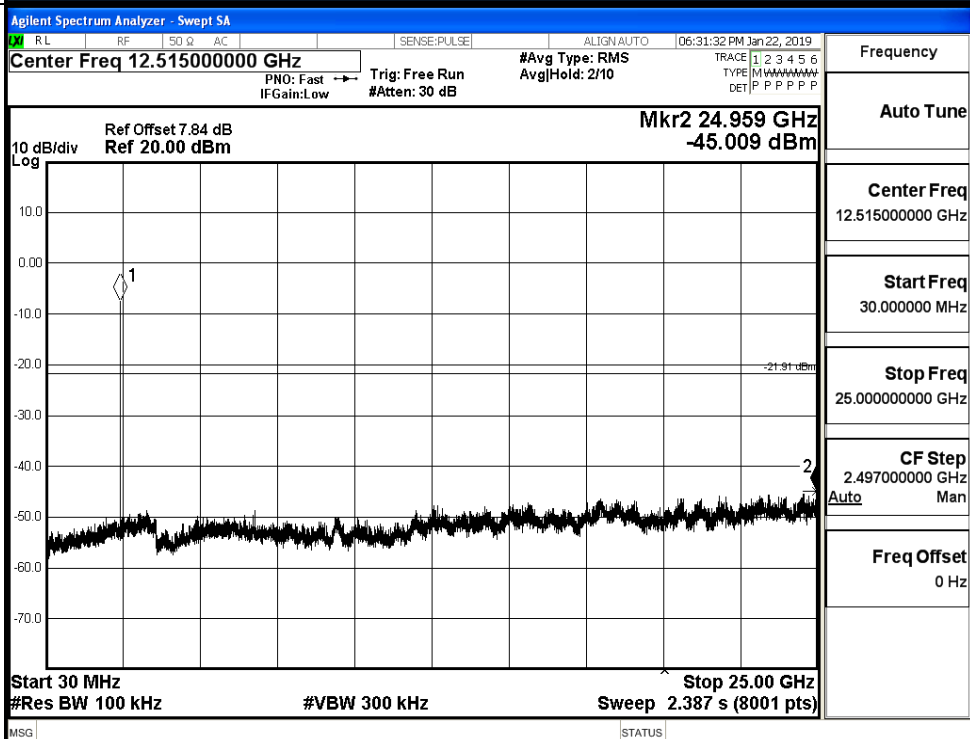


π /4DQPSK_MCH_Graphs

Pref

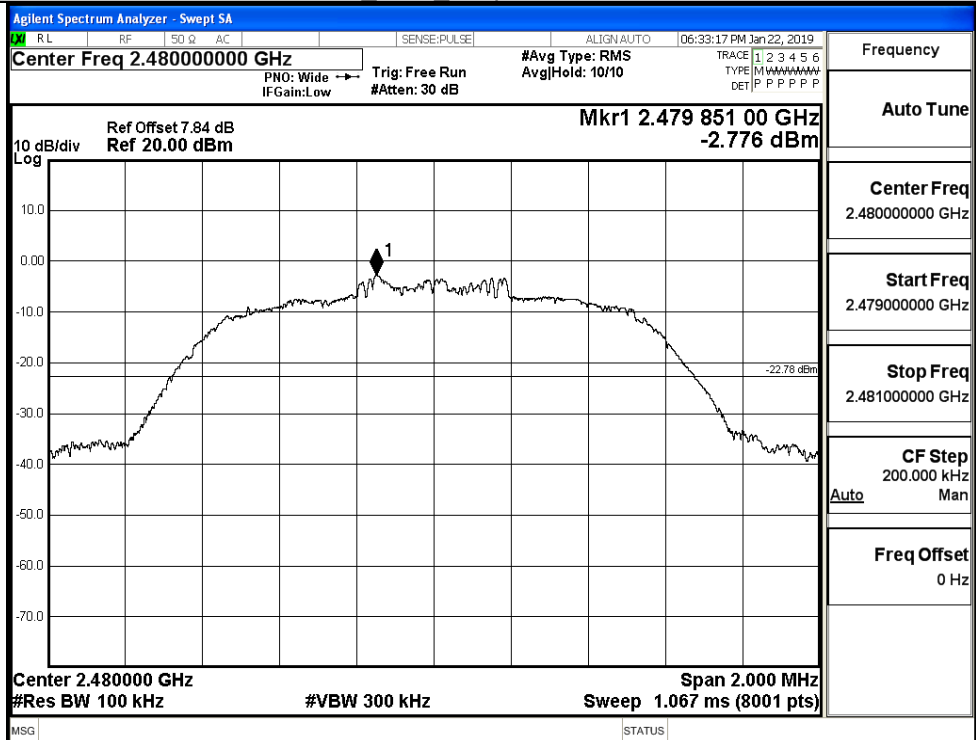


Puw

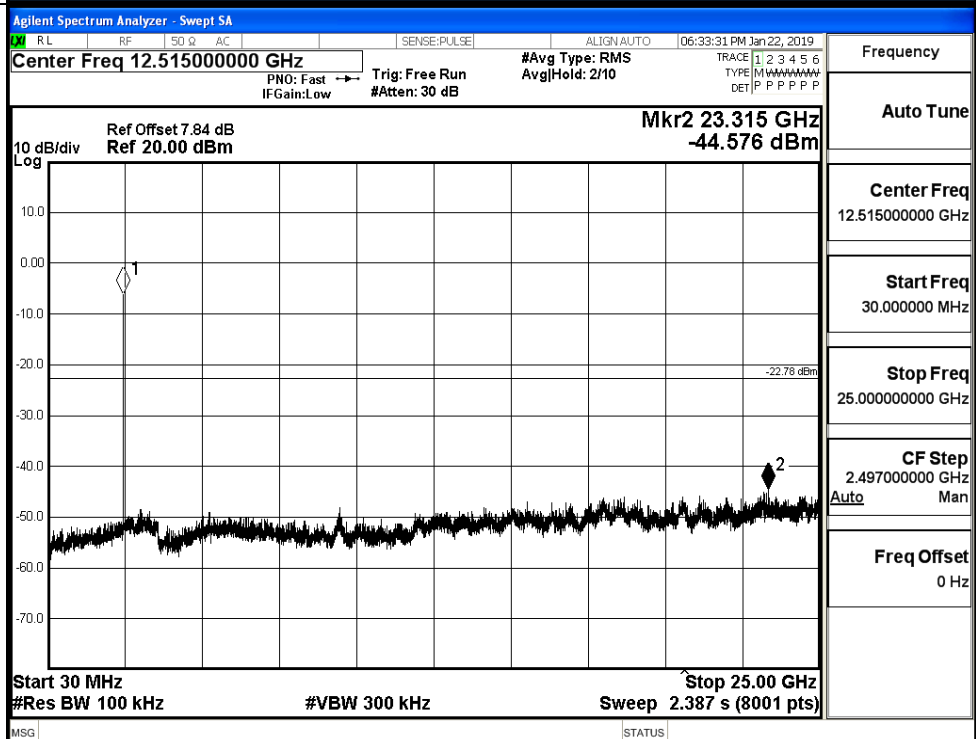


$\pi/4$ DQPSK_HCH_Graphs

Pref

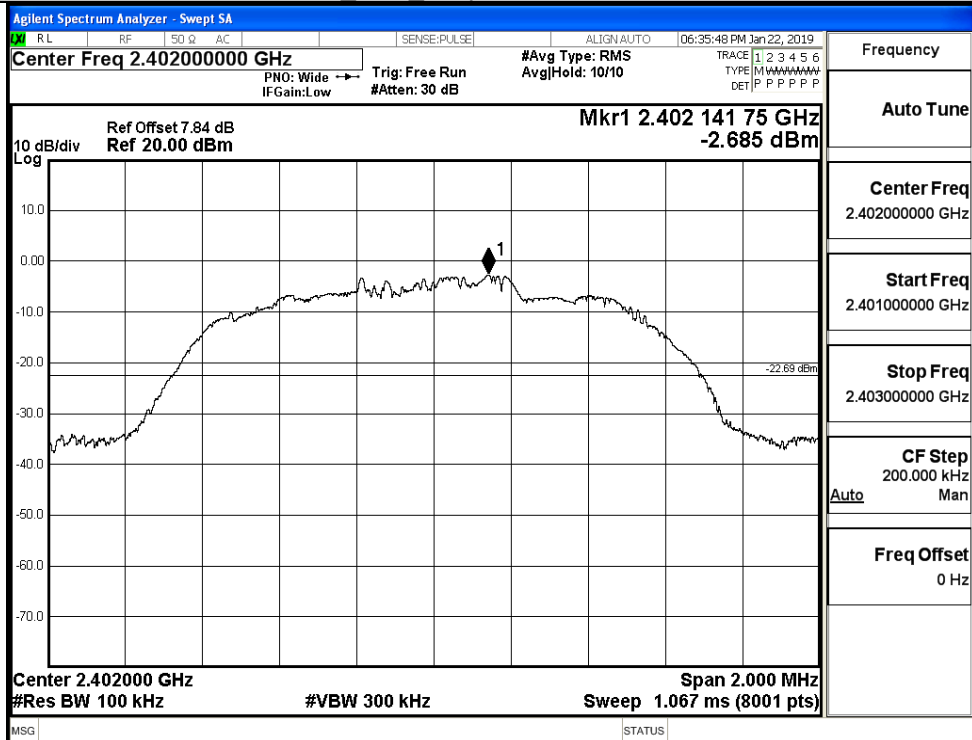


Puw

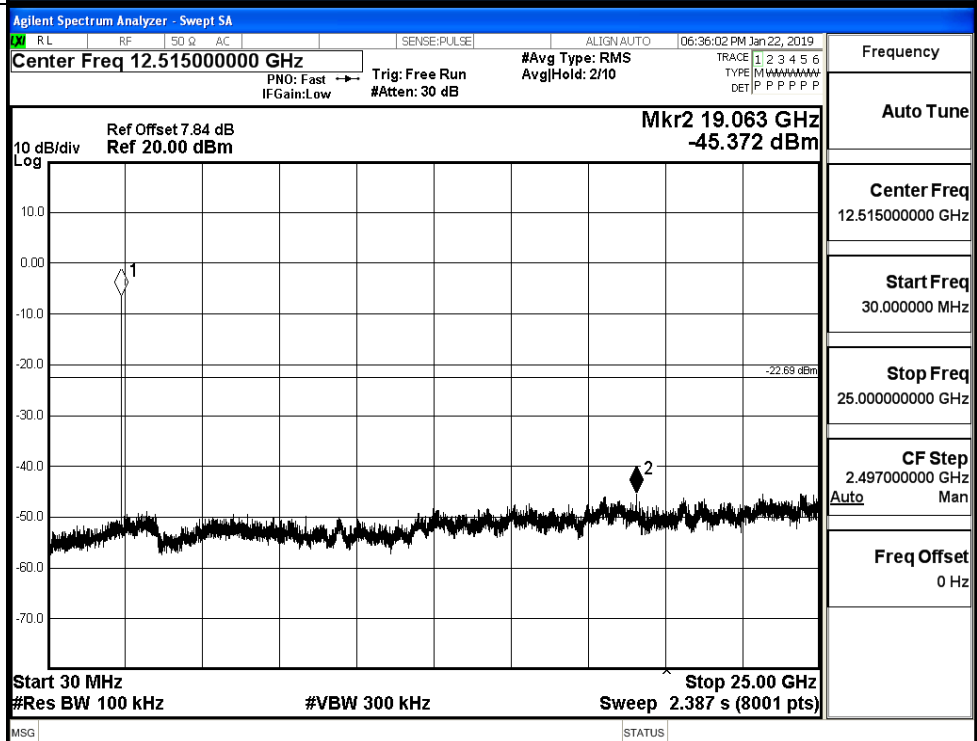


8DPSK_LCH_Graphs

Pref

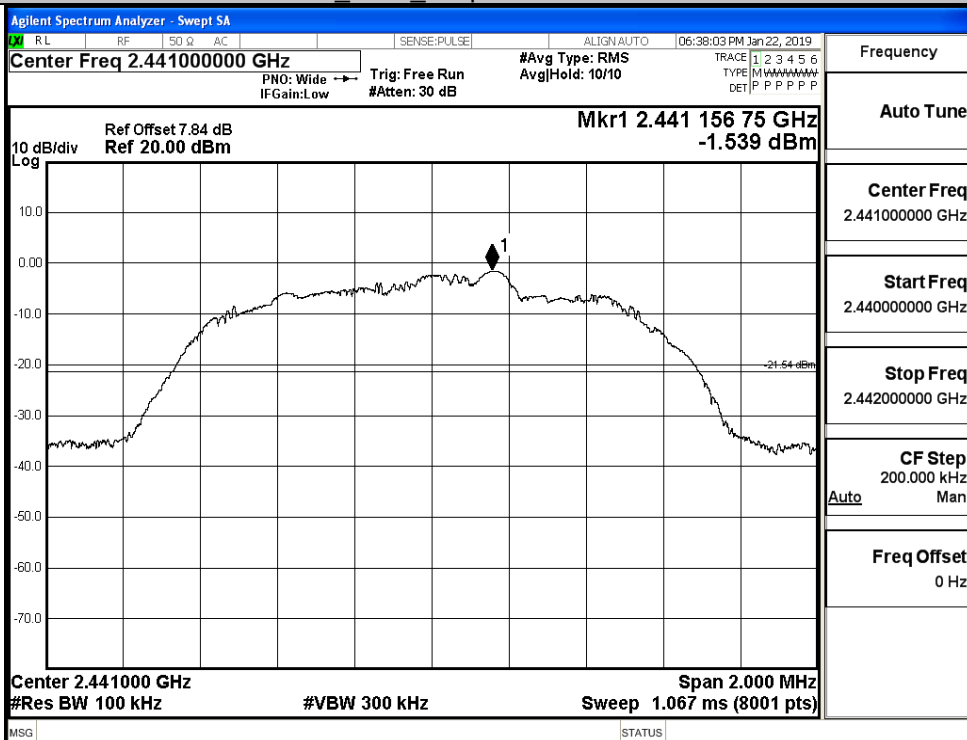


Puw

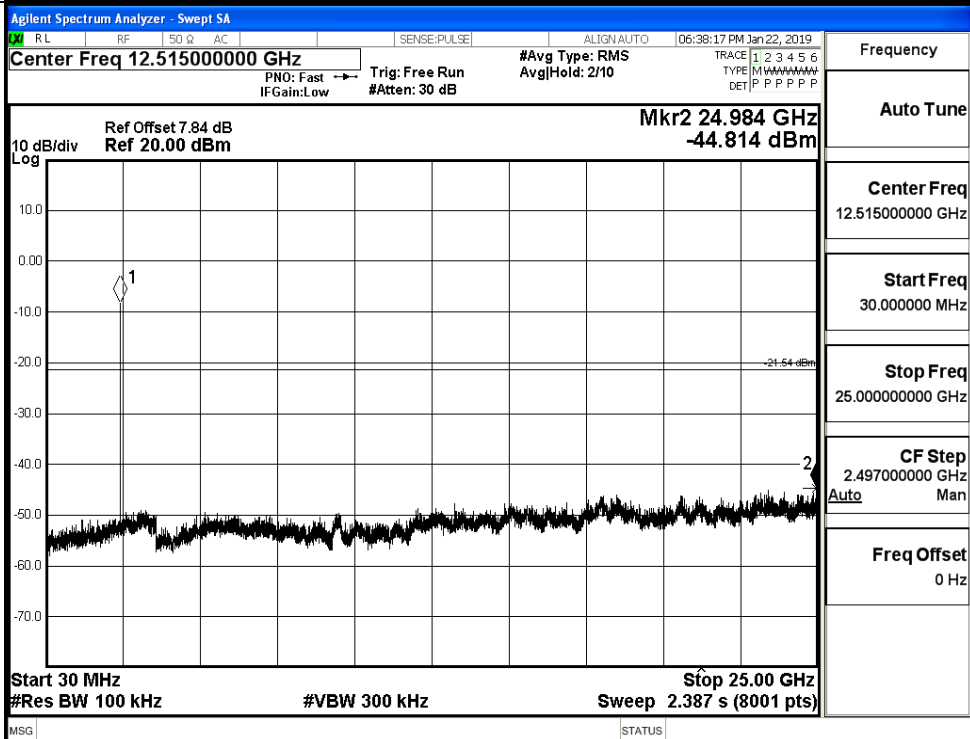


8DPSK_MCH_Graphs

Pref

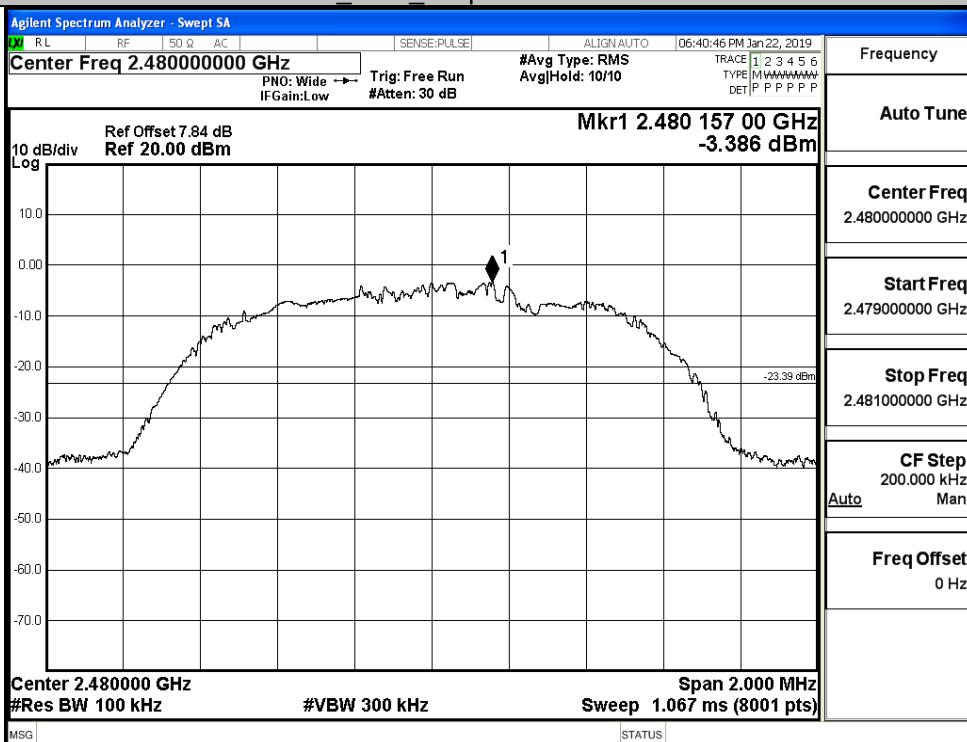


Puw

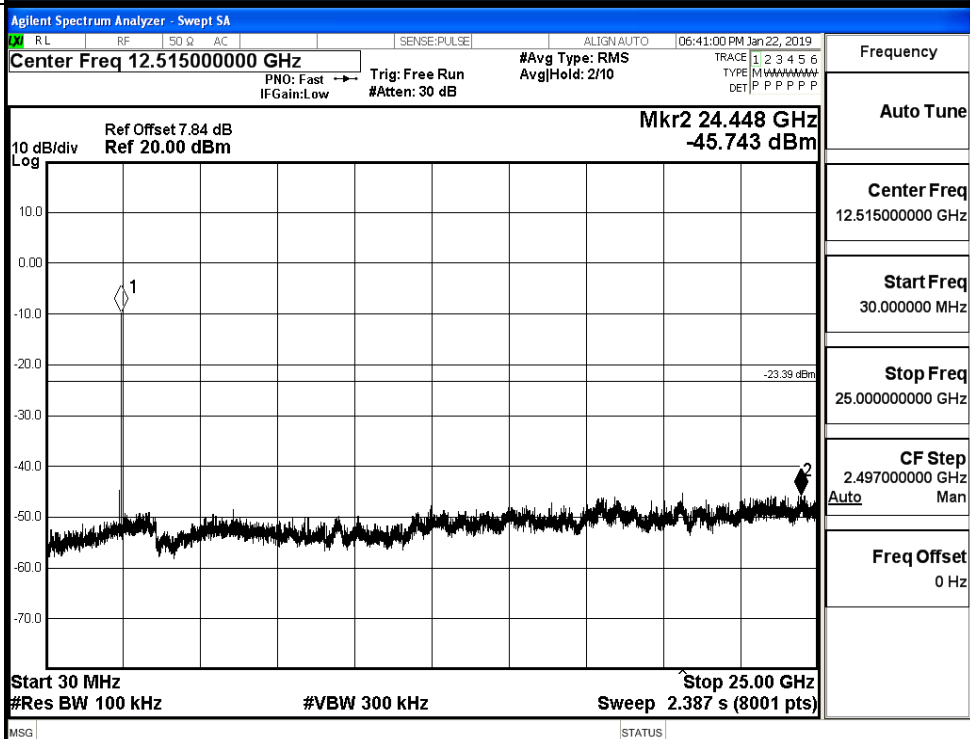


8DPSK_HCH_Graphs

Pref



Puw

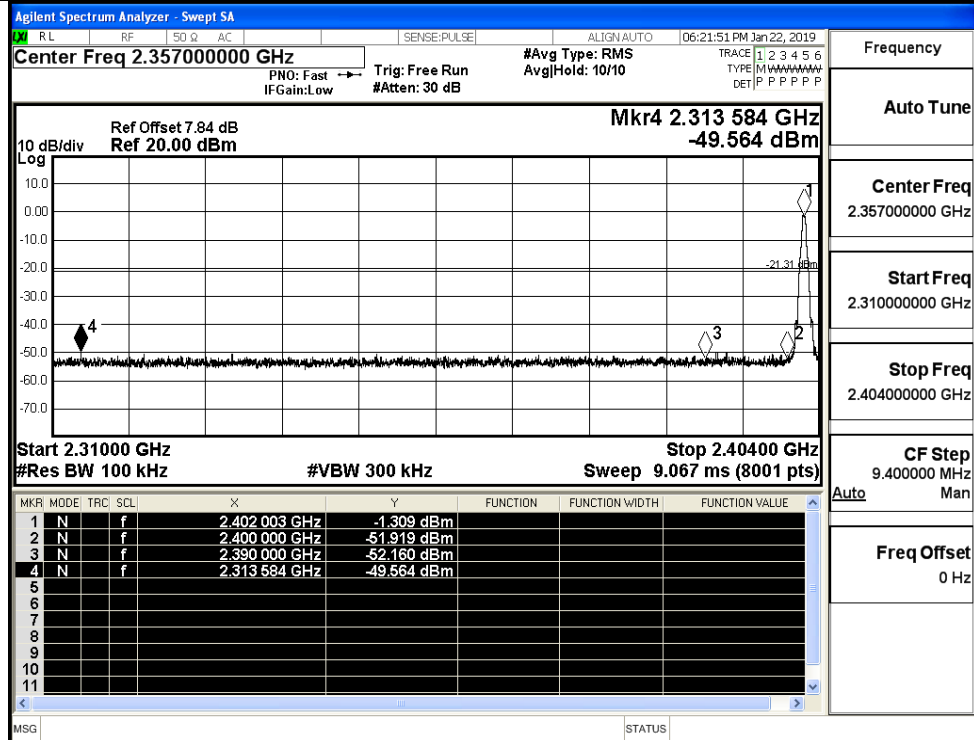


A.7 Band-edge for RF Conducted Emissions

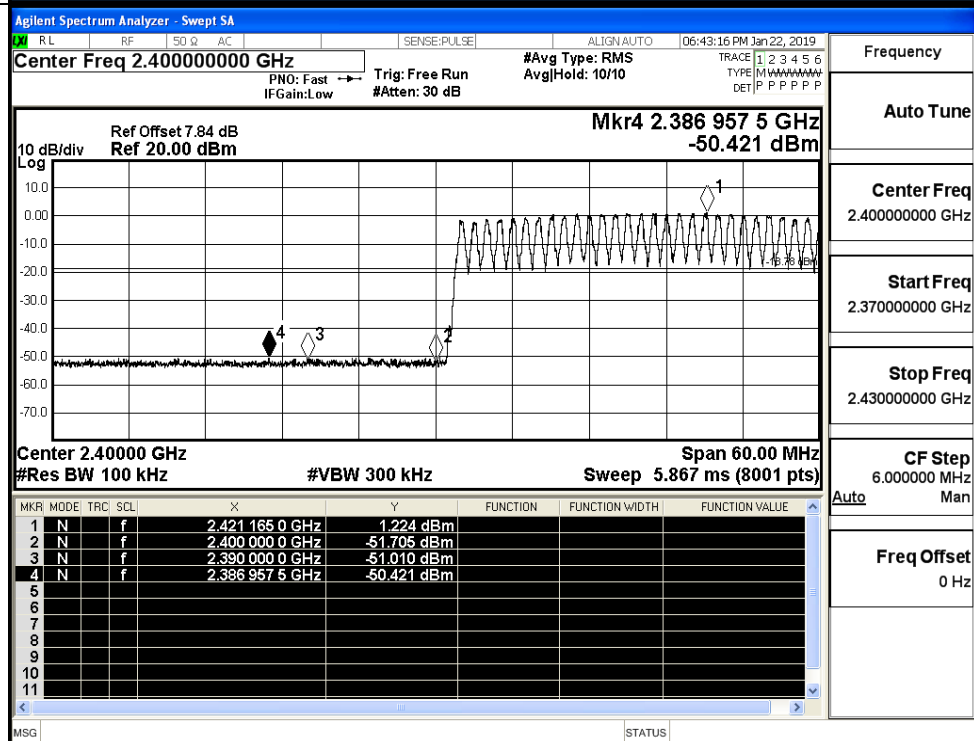
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-1.309	Off	-49.564	-21.31	PASS
			1.224	On	-50.421	-18.78	PASS
	HCH	2480	-1.759	Off	-49.281	-21.76	PASS
			1.248	On	-49.668	-18.75	PASS
$\pi/4$ DQPSK	LCH	2402	-2.496	Off	-49.215	-22.5	PASS
			-0.018	On	-48.563	-20.02	PASS
	HCH	2480	-2.651	Off	-49.386	-22.65	PASS
			-0.177	On	-49.499	-20.18	PASS
8DPSK	LCH	2402	-2.291	Off	-49.599	-22.29	PASS
			-0.217	On	-49.338	-20.22	PASS
	HCH	2480	-2.631	Off	-50.020	-22.63	PASS
			-0.575	On	-48.721	-20.58	PASS

Test Graphs

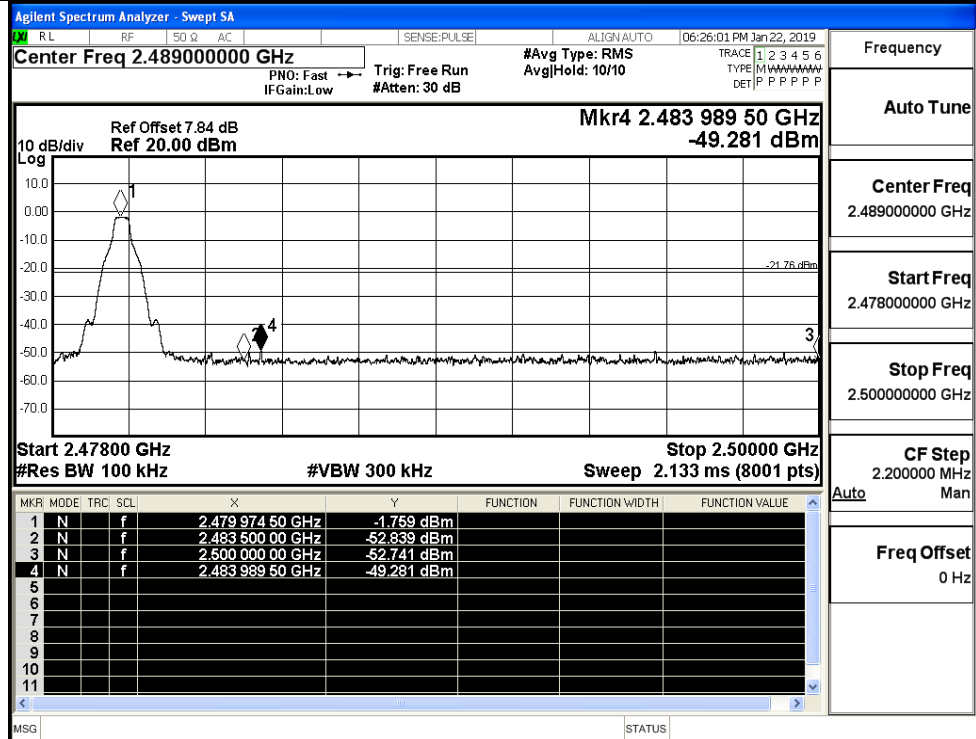
GFSK/LCH/No Hop



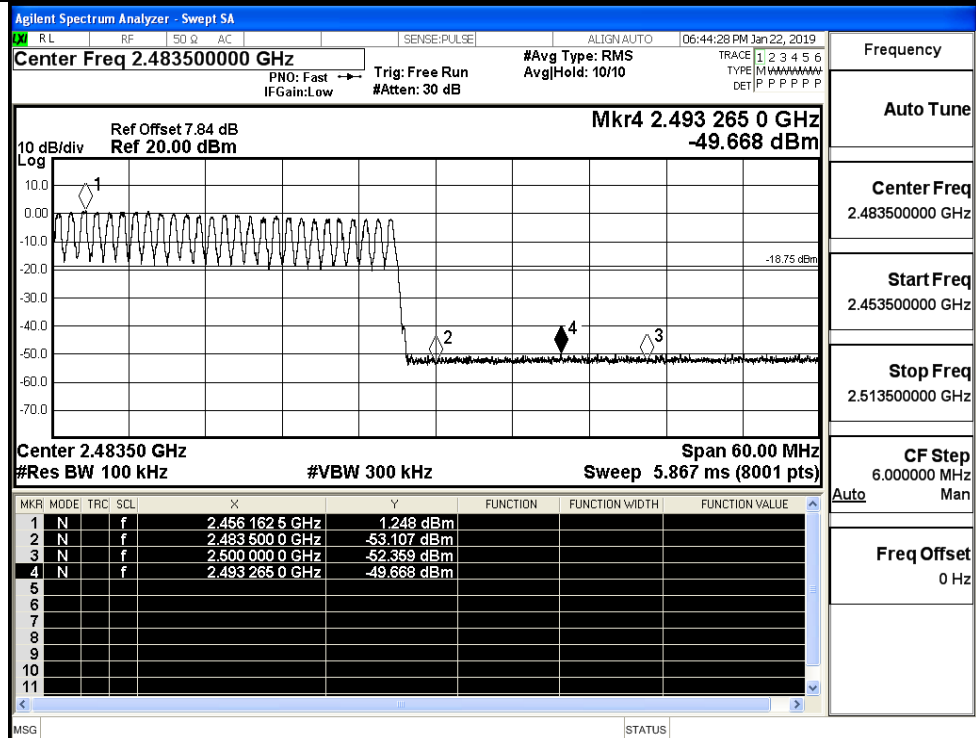
GFSK/LCH/Hop



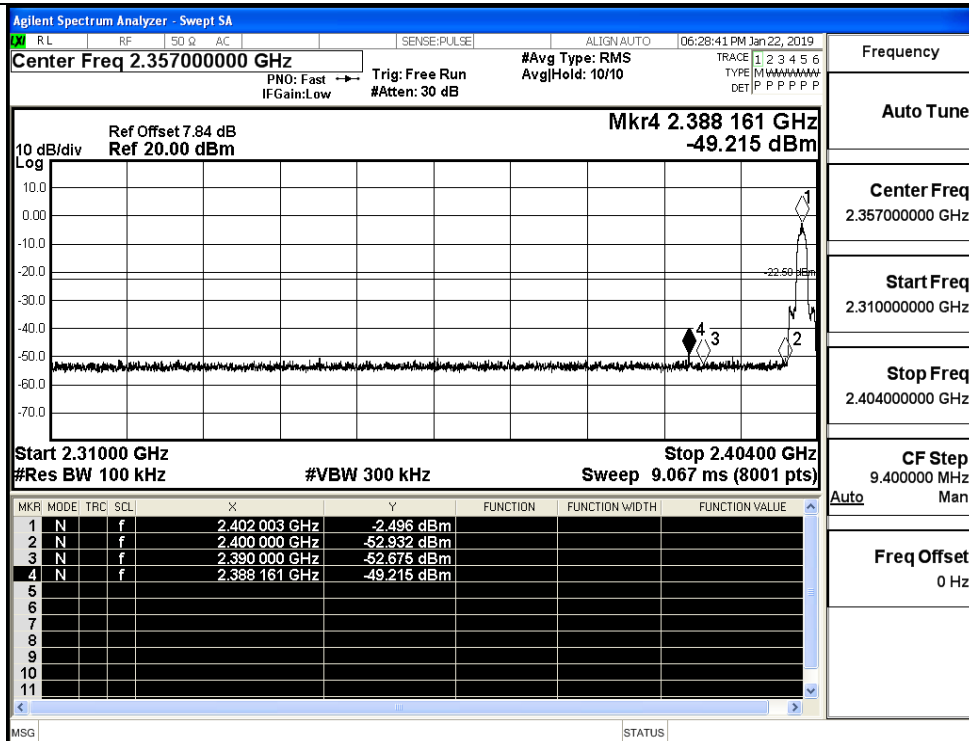
GFSK/HCH/No Hop



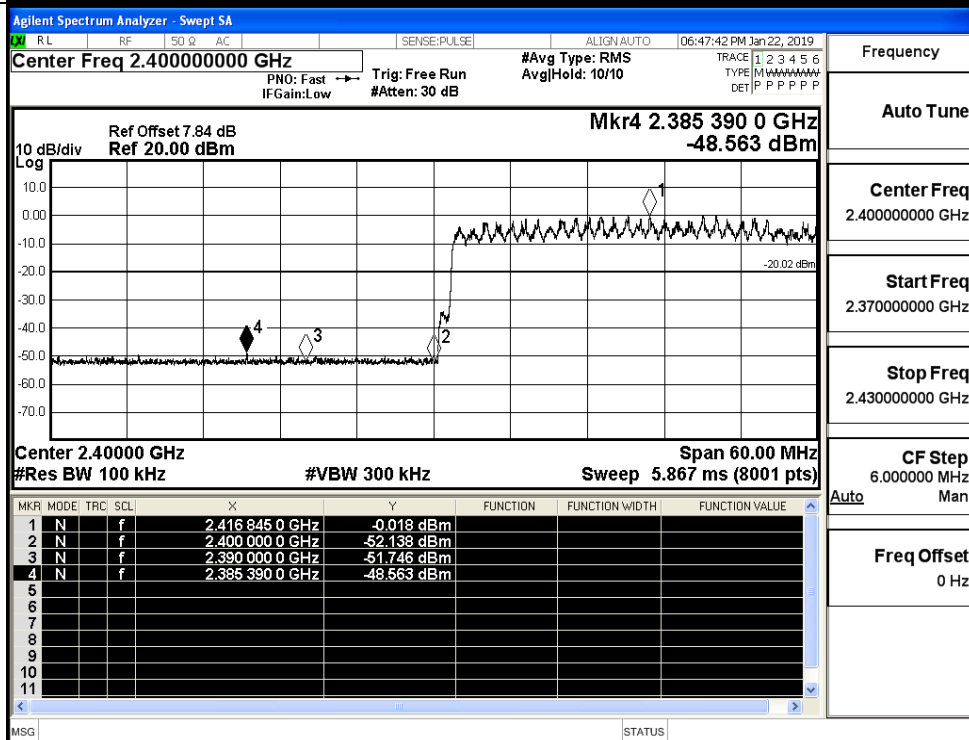
GFSK/HCH/Hop



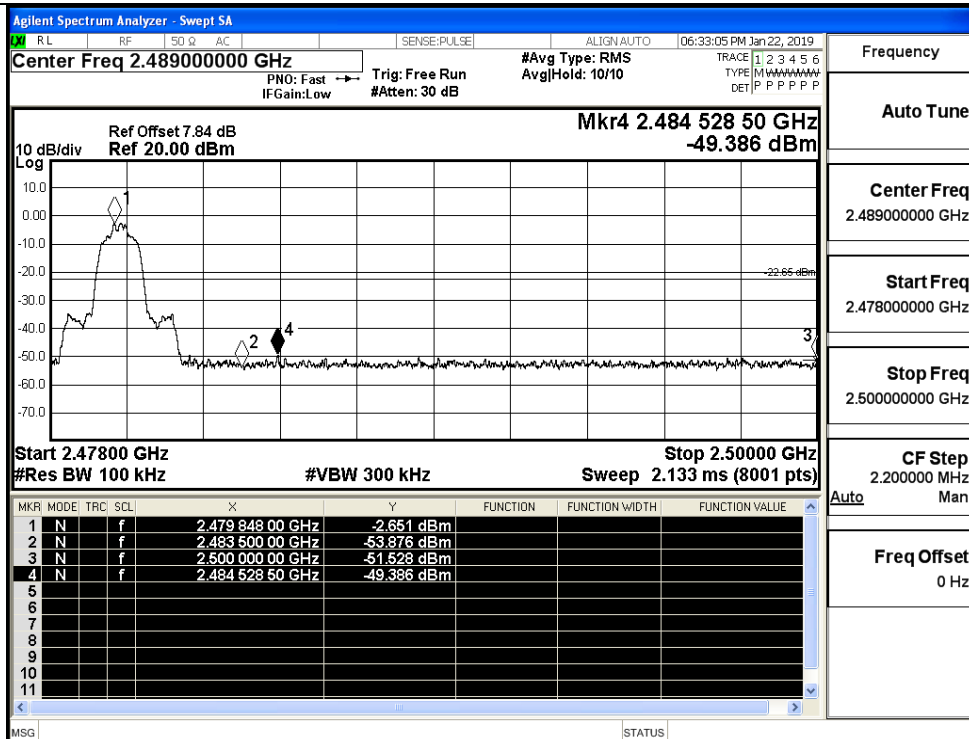
$\pi/4$ DQPSK/LCH/No
Hop



$\pi/4$ DQPSK/LCH/Hop



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

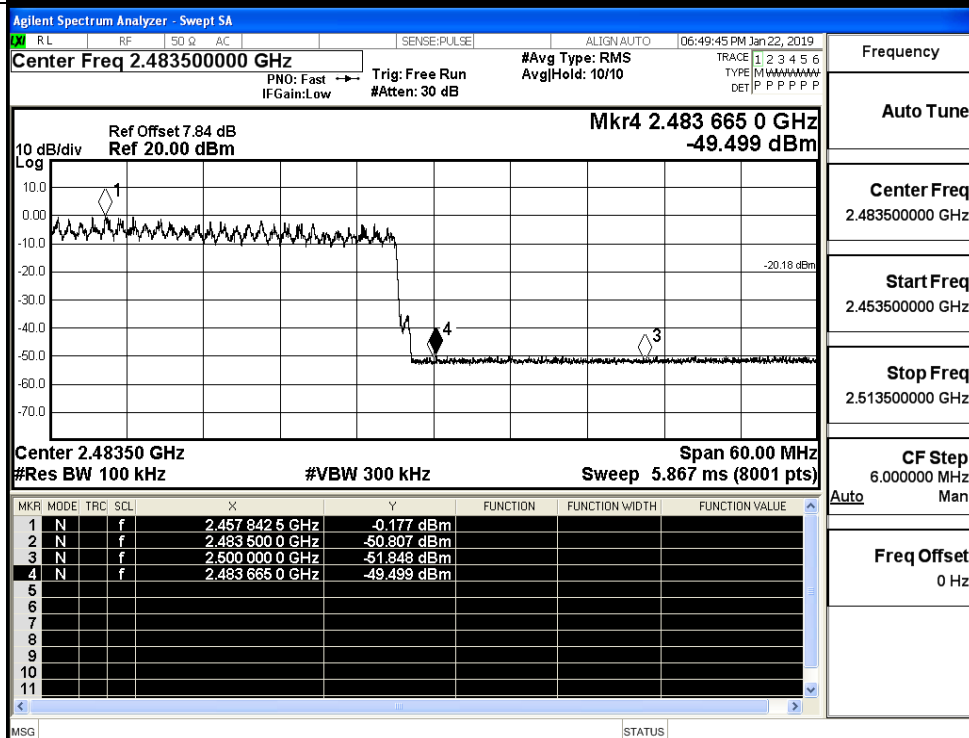


Frequency

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

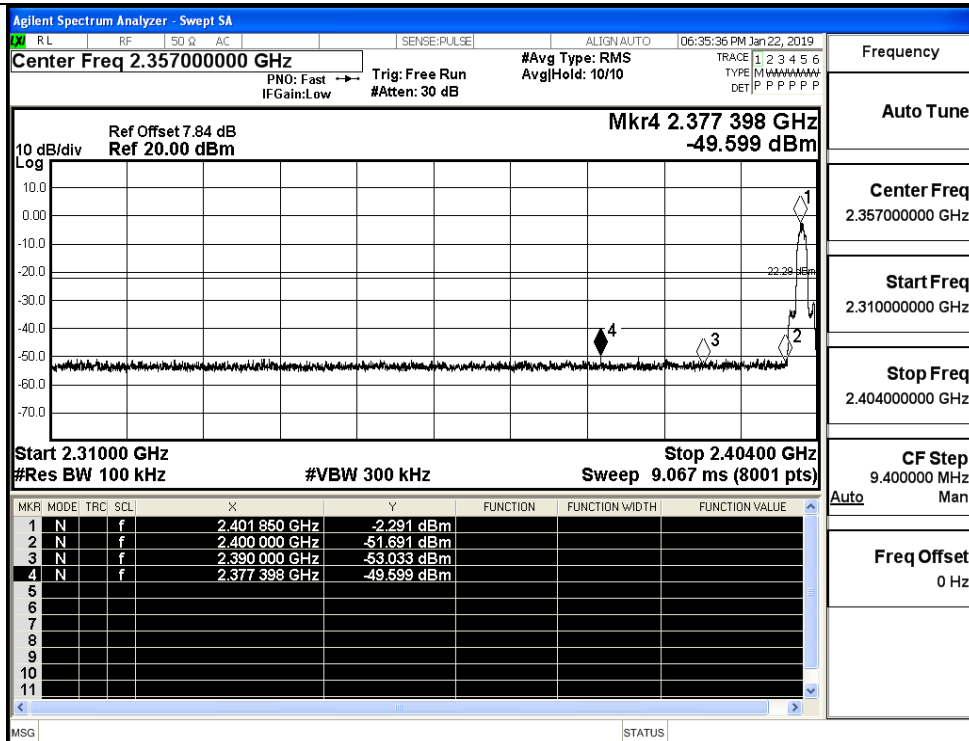


Frequency

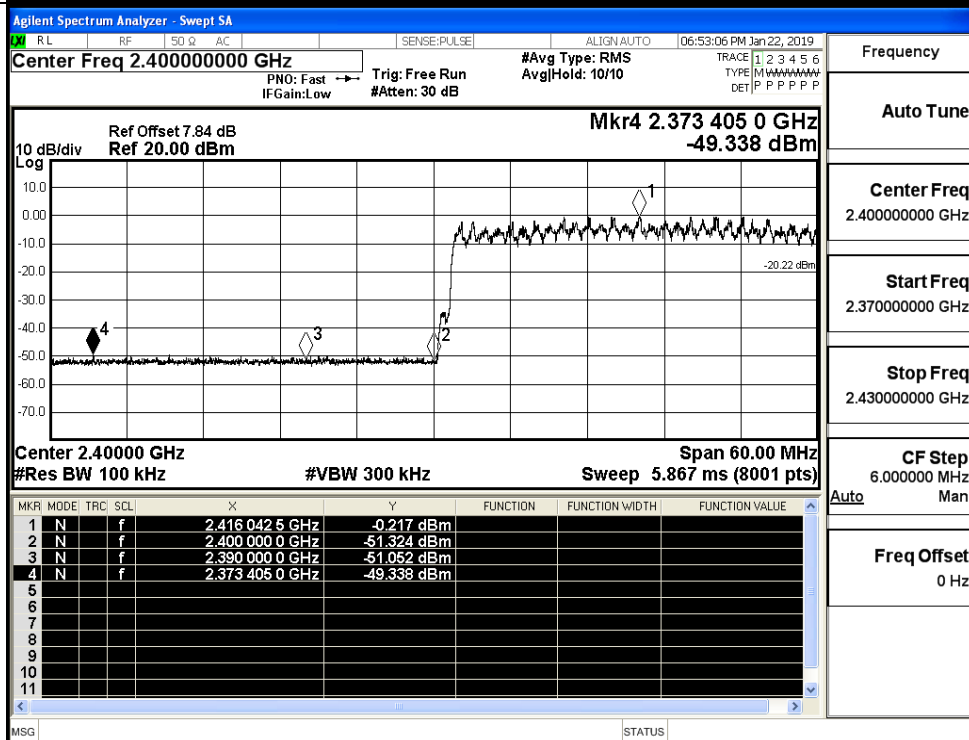
Auto Tune

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

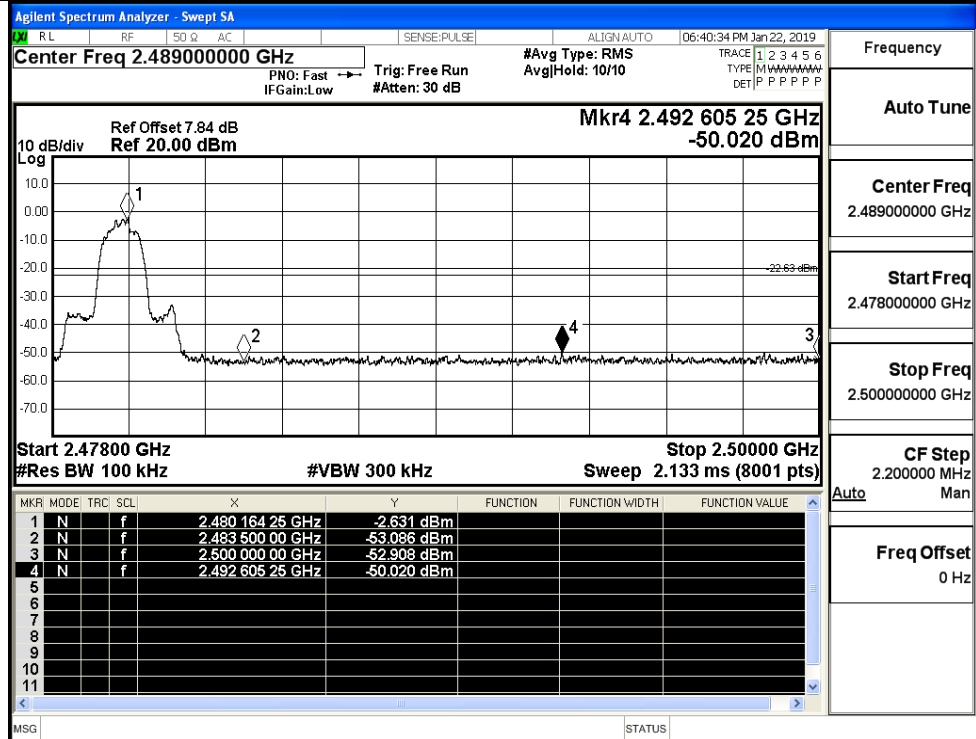
8DPSK/LCH/No Hop



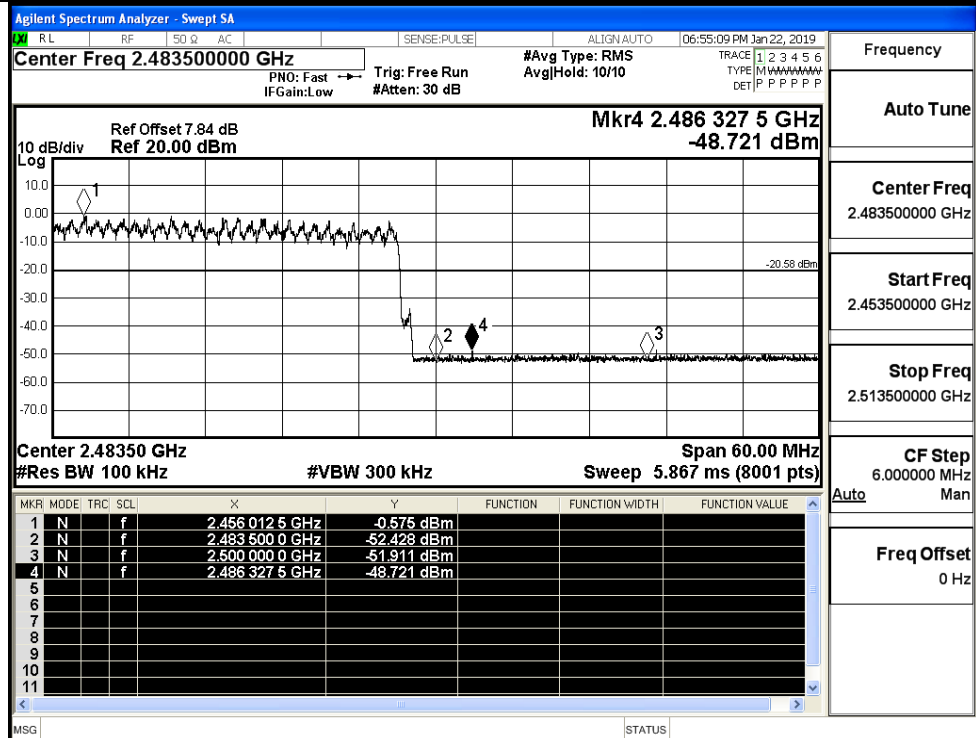
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



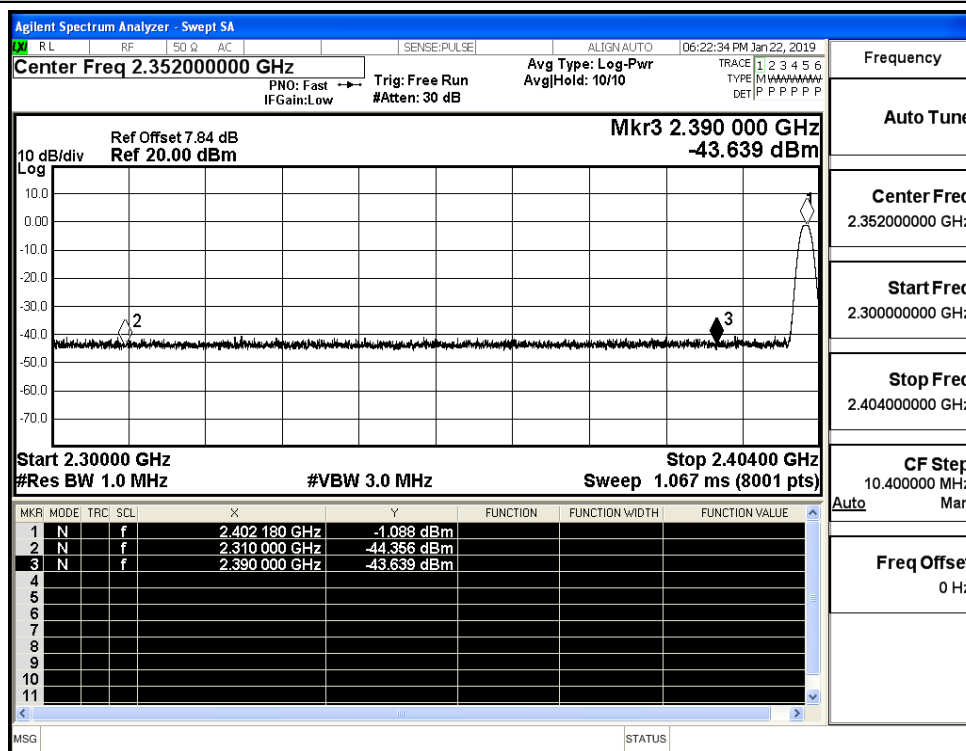
8DPSK/HCH/Hop



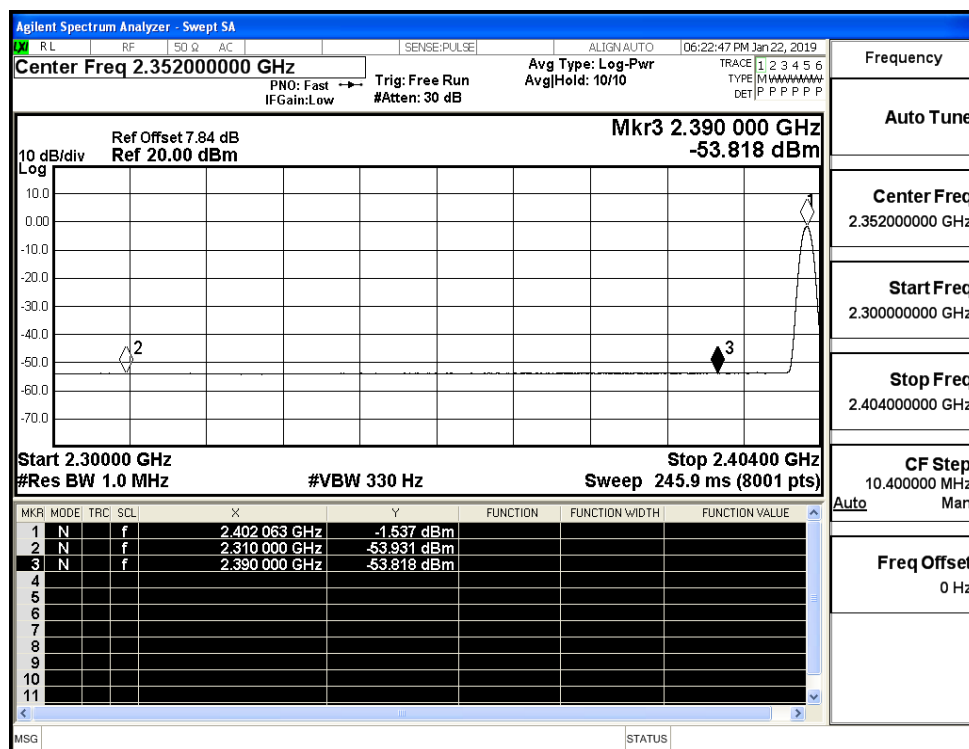
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.36	3.0	0	53.9	PEAK	74	PASS
	Off	2310.0	-53.93	3.0	0	44.33	AV	54	PASS
	Off	2390.0	-43.64	3.0	0	54.62	PEAK	74	PASS
	Off	2390.0	-53.82	3.0	0	44.44	AV	54	PASS
	Off	2483.5	-42.85	3.0	0	55.41	PEAK	74	PASS
	Off	2483.5	-53.54	3.0	0	44.72	AV	54	PASS
	Off	2500.0	-43.03	3.0	0	55.23	PEAK	74	PASS
	Off	2500.0	-53.30	3.0	0	44.96	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.30	3.0	0	54.96	PEAK	74	PASS
	Off	2310.0	-54.00	3.0	0	44.26	AV	54	PASS
	Off	2390.0	-44.43	3.0	0	53.83	PEAK	74	PASS
	Off	2390.0	-53.69	3.0	0	44.57	AV	54	PASS
	Off	2483.5	-42.76	3.0	0	55.5	PEAK	74	PASS
	Off	2483.5	-53.42	3.0	0	44.84	AV	54	PASS
	Off	2500.0	-43.50	3.0	0	54.76	PEAK	74	PASS
	Off	2500.0	-53.34	3.0	0	44.92	AV	54	PASS
8DPSK	Off	2310.0	-43.94	3.0	0	54.32	PEAK	74	PASS
	Off	2310.0	-54.02	3.0	0	44.24	AV	54	PASS
	Off	2390.0	-44.00	3.0	0	54.26	PEAK	74	PASS
	Off	2390.0	-53.61	3.0	0	44.65	AV	54	PASS
	Off	2483.5	-43.39	3.0	0	54.87	PEAK	74	PASS
	Off	2483.5	-53.36	3.0	0	44.9	AV	54	PASS
	Off	2500.0	-43.78	3.0	0	54.48	PEAK	74	PASS
	Off	2500.0	-53.32	3.0	0	44.94	AV	54	PASS

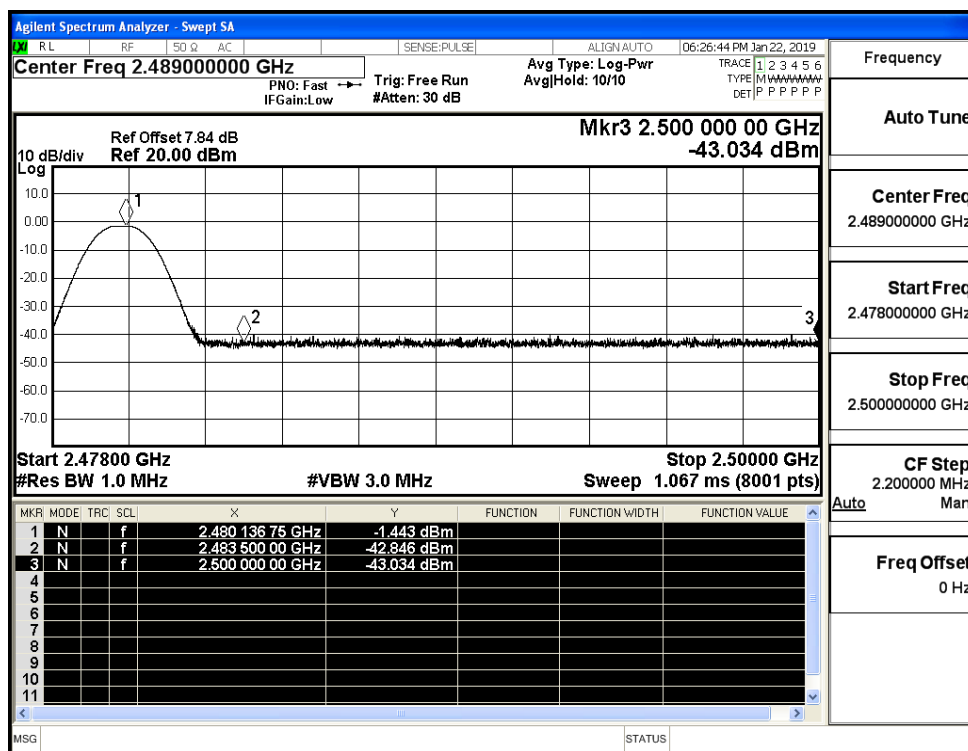
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



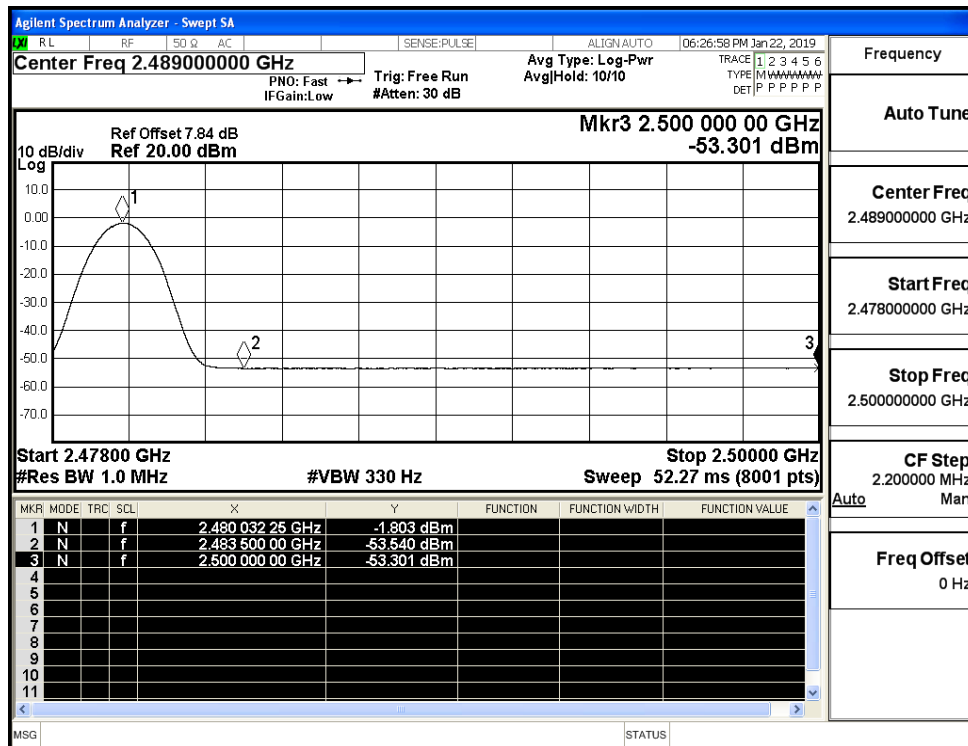
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

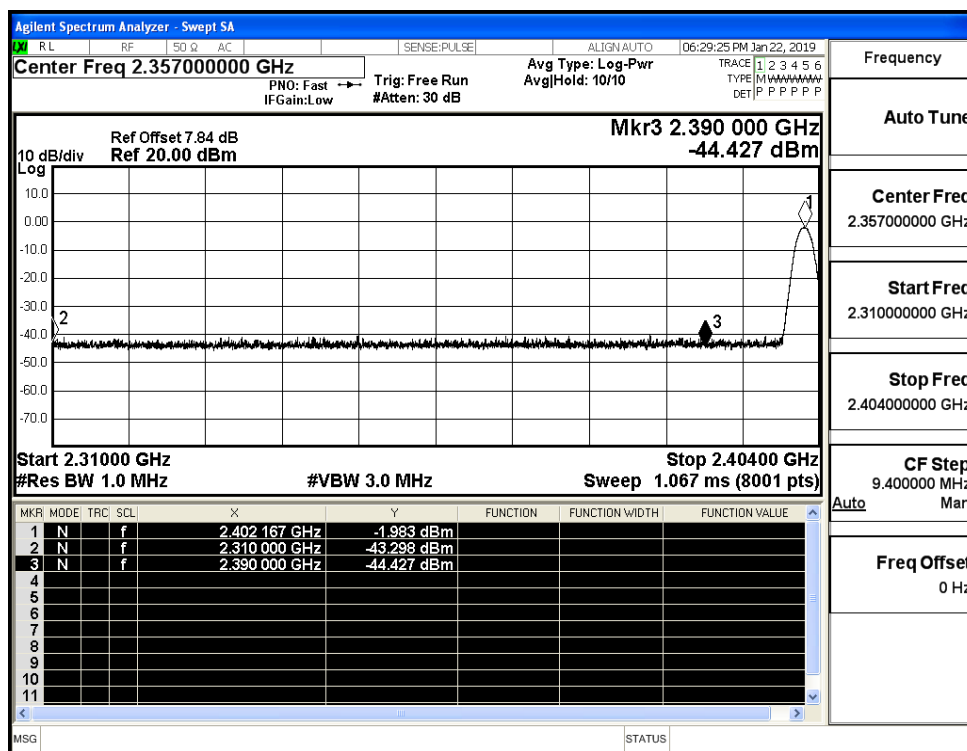
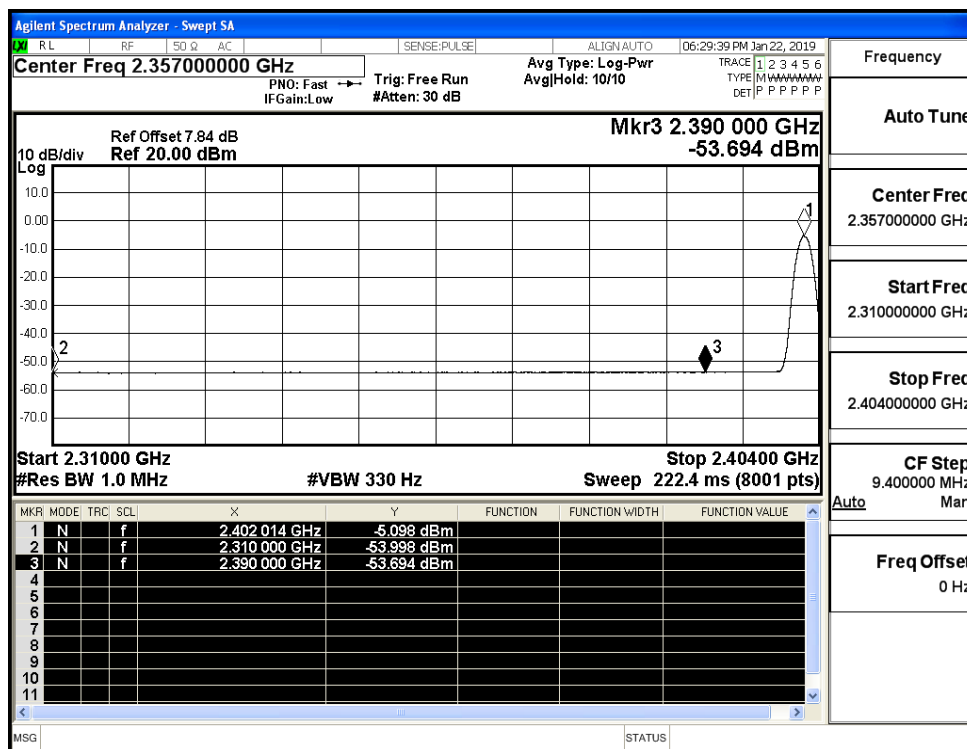


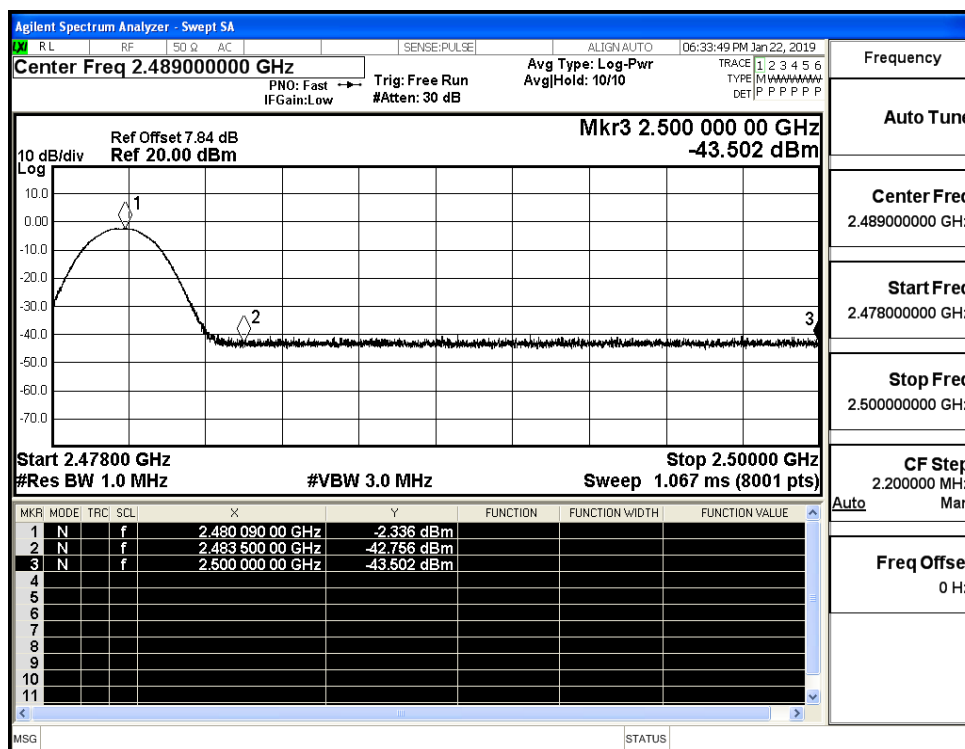
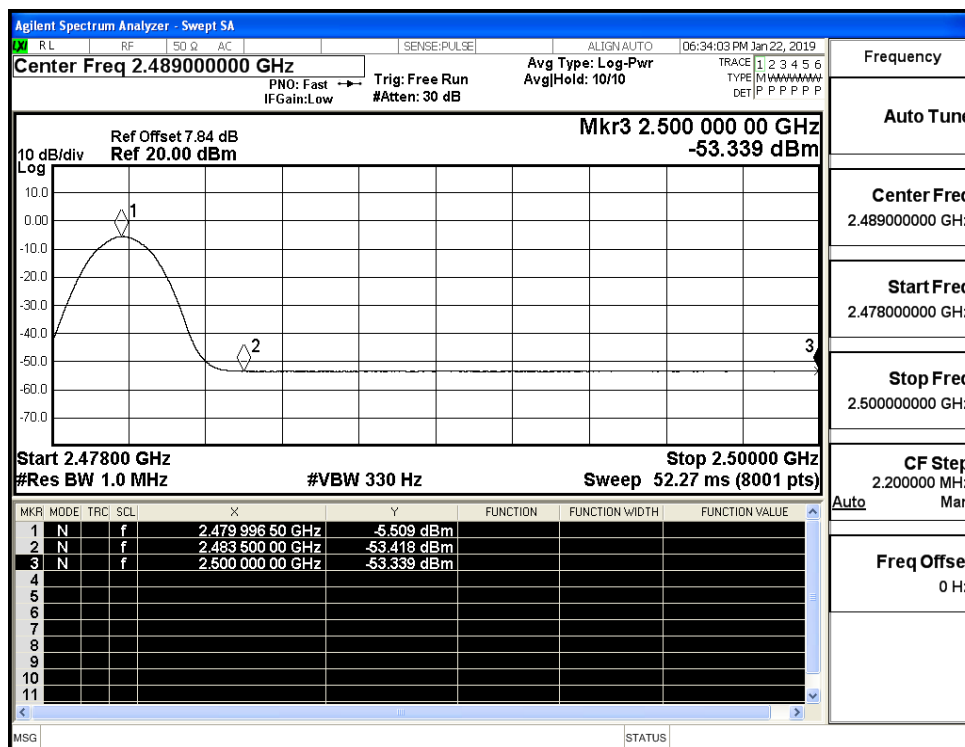
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



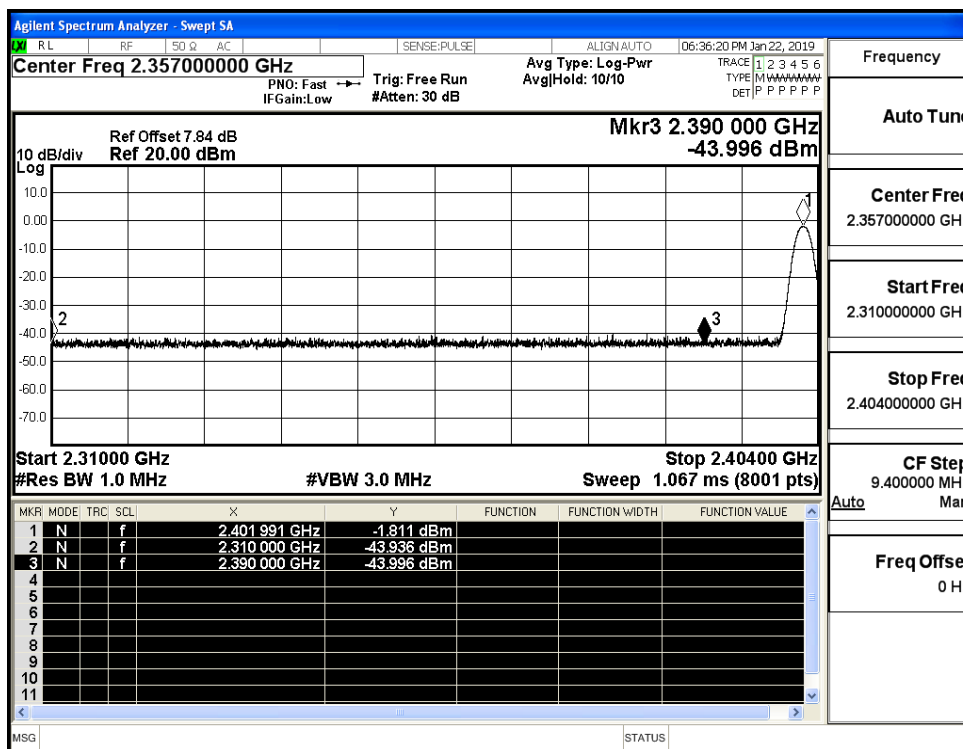
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



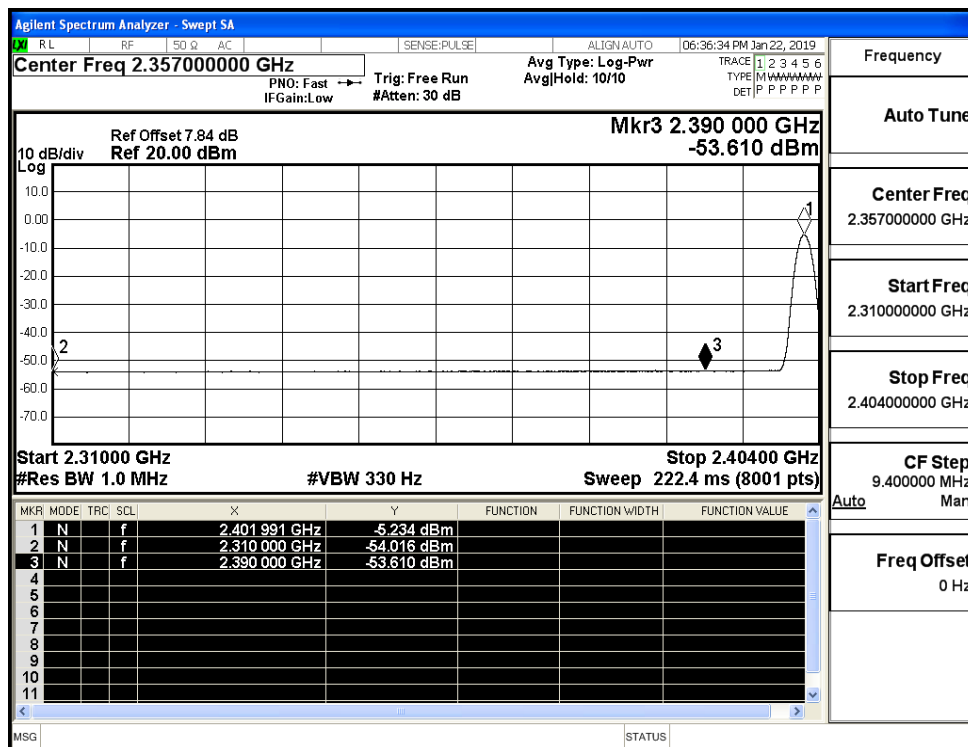
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

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)

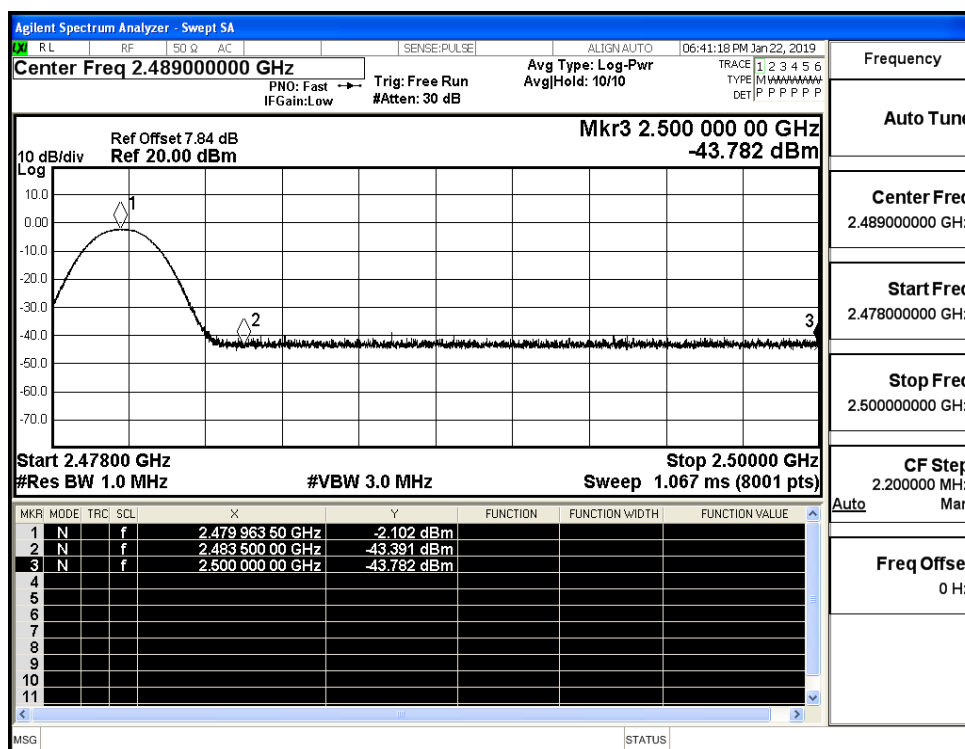
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

