

Appendix A

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

Product Name: WIRELESS EARBUDS W/MIC

Trade Mark: N/A

Test Model: K20-BT

Environmental Conditions

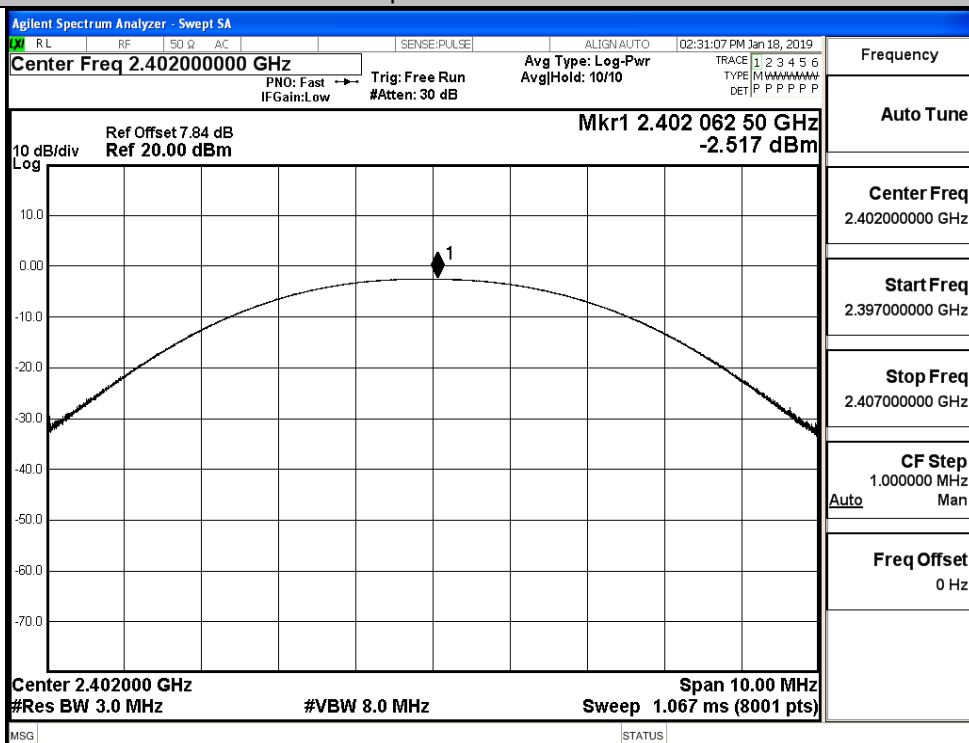
Temperature:	24.1 ° C
Relative Humidity:	54.6%
ATM Pressure:	100.0 kPa
Test Engineer:	David.Luo
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

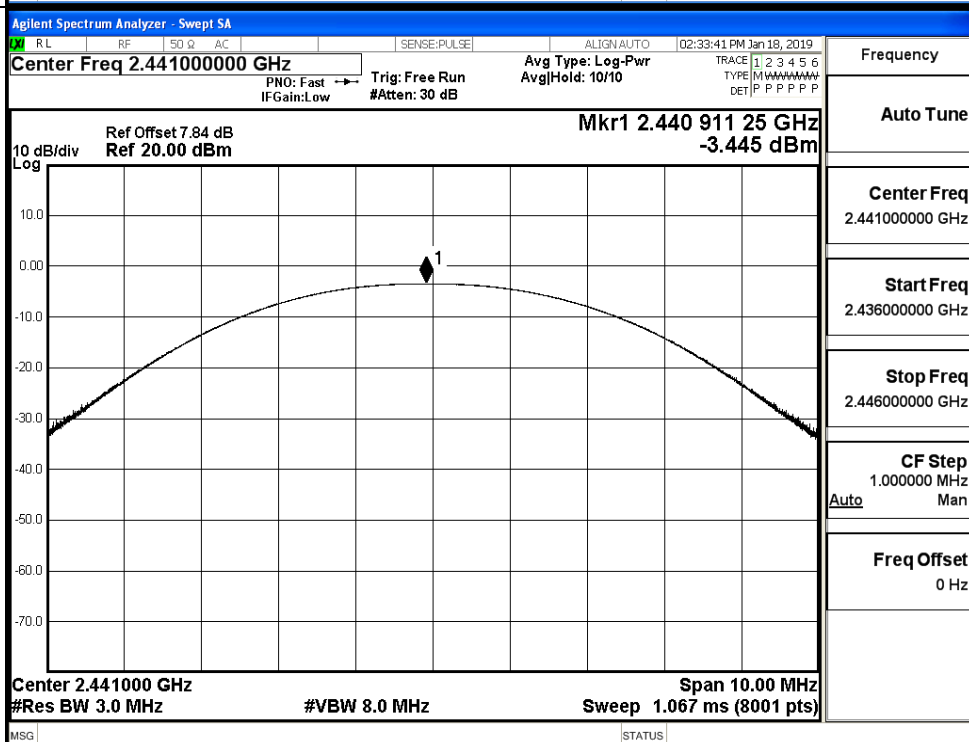
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.517	21	PASS
	MCH	-3.445	21	PASS
	HCH	-4.663	21	PASS
$\pi/4$ DQPSK	LCH	-0.317	21	PASS
	MCH	-1.267	21	PASS
	HCH	-2.585	21	PASS
8DPSK	LCH	0.268	21	PASS
	MCH	-0.673	21	PASS
	HCH	-2.005	21	PASS

Test Graphs

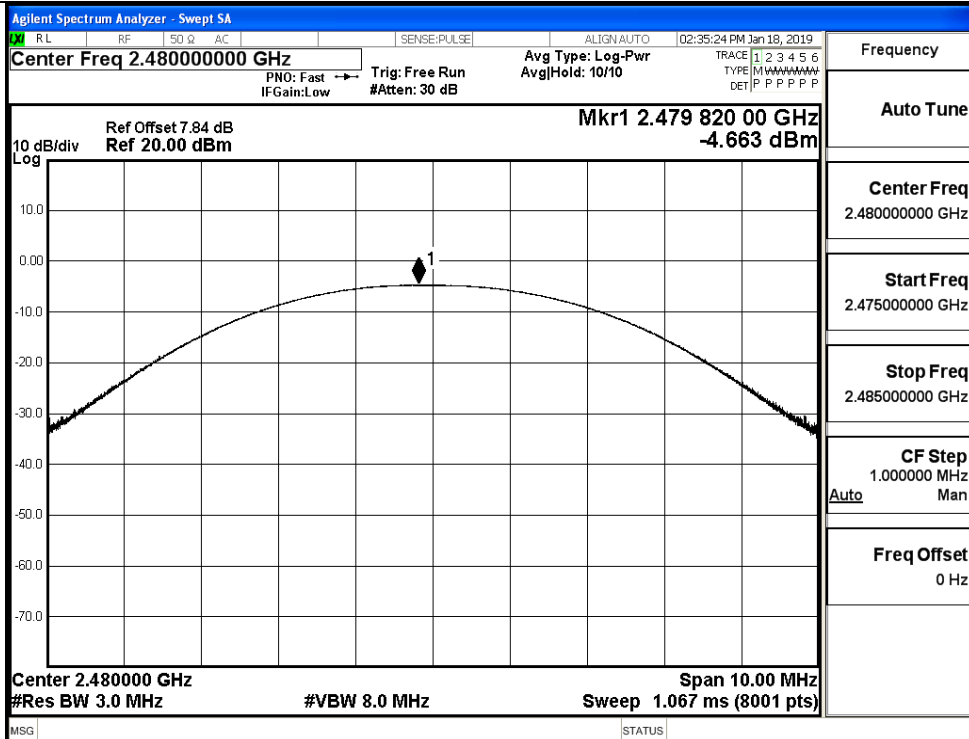
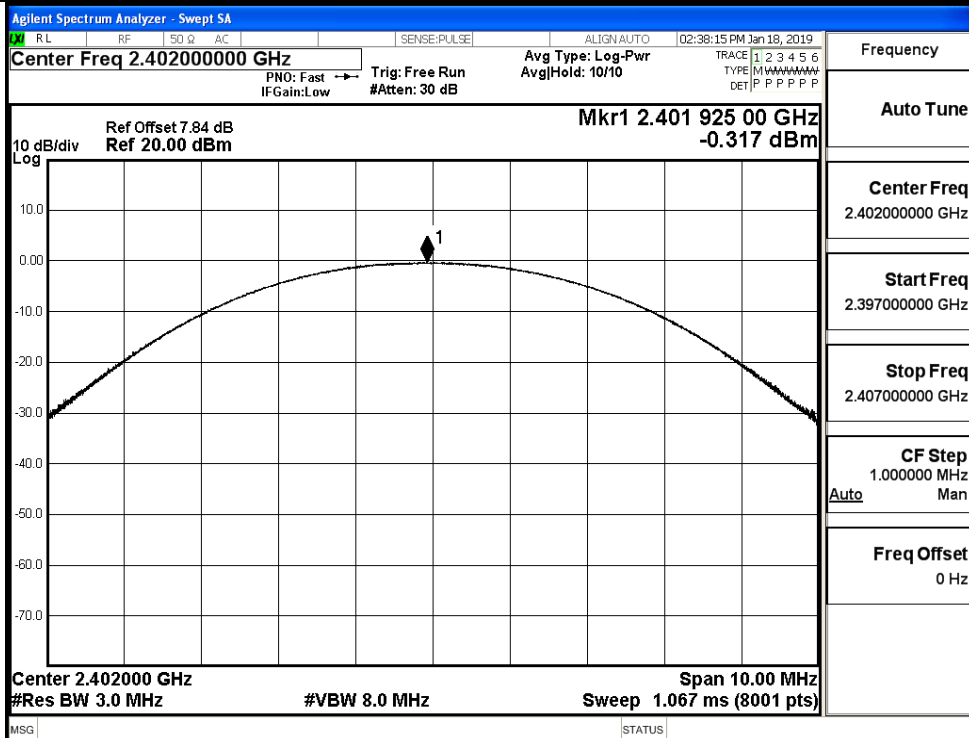
GFSK/LCH

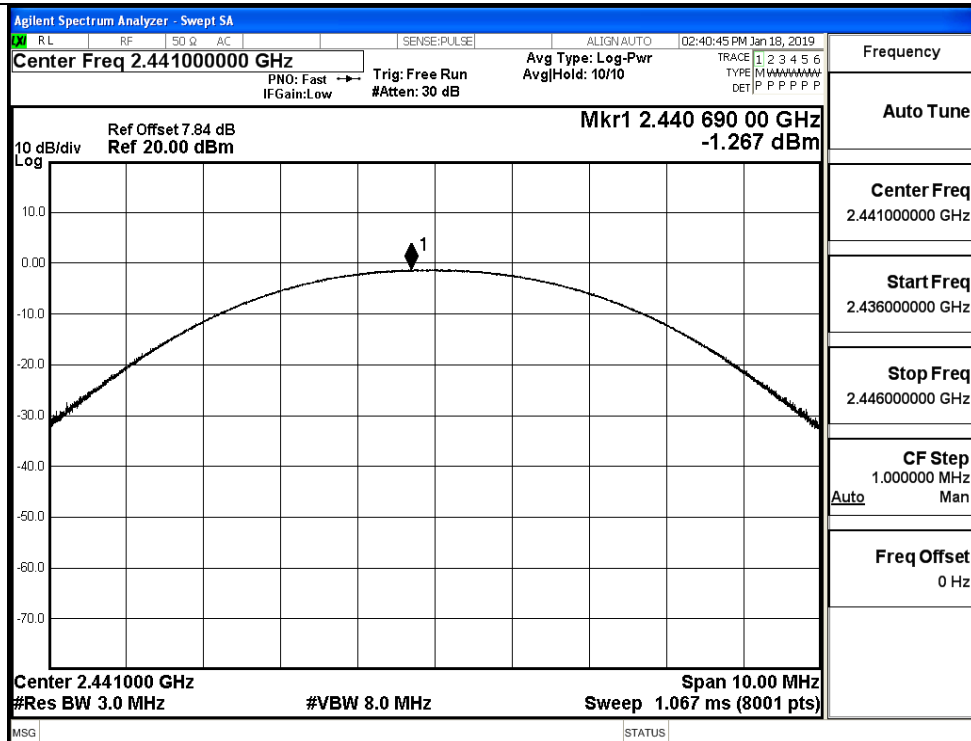
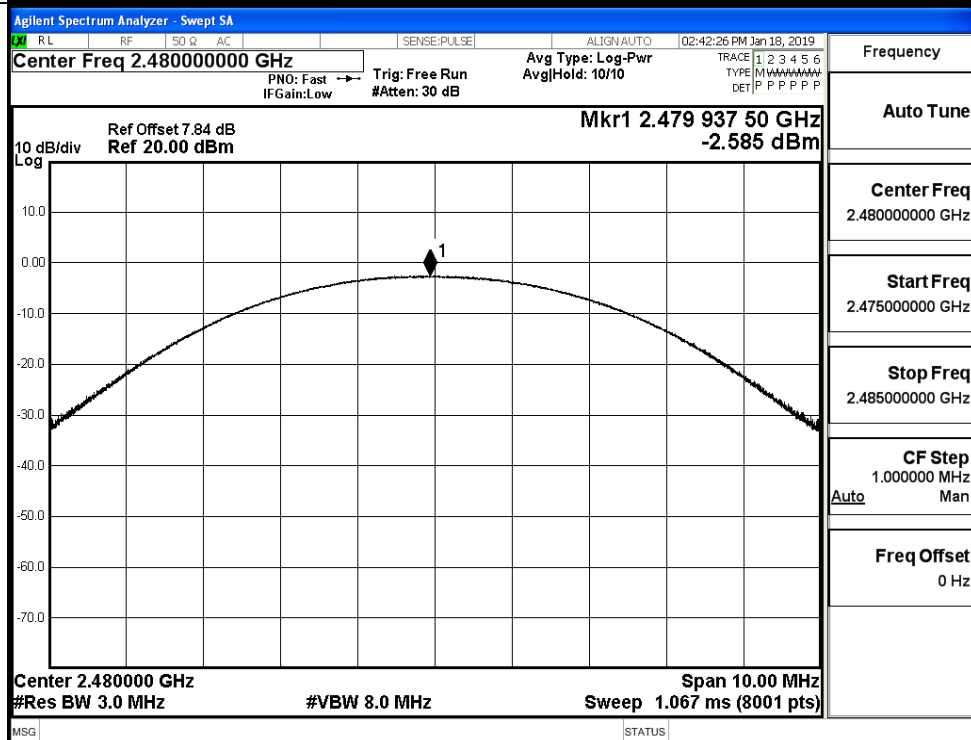


GFSK/MCH

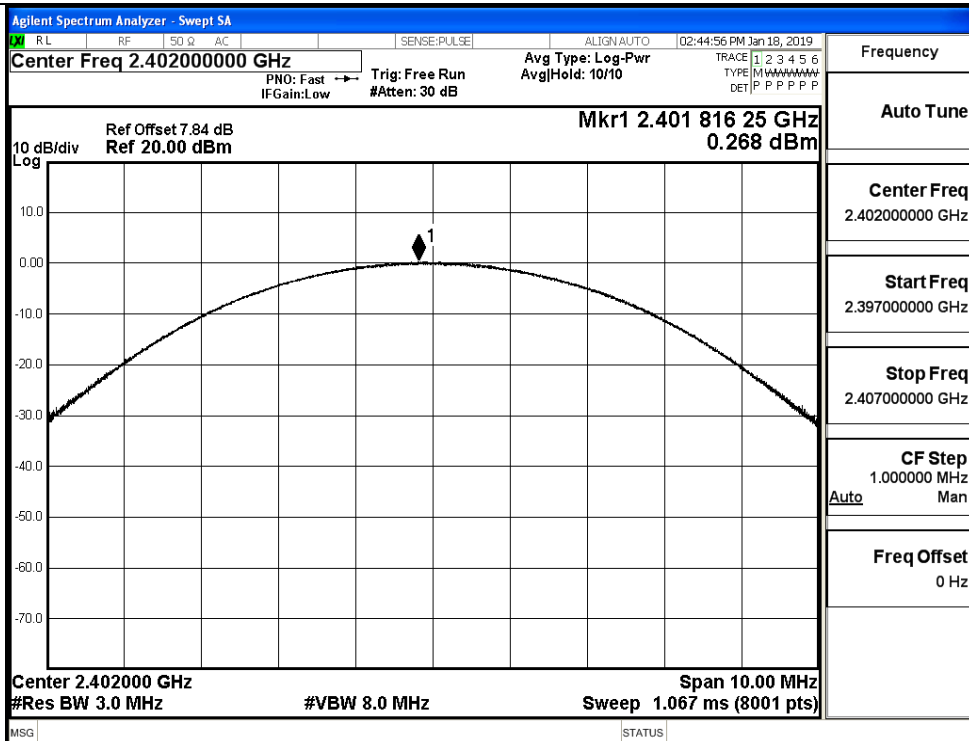


GFSK/HCH

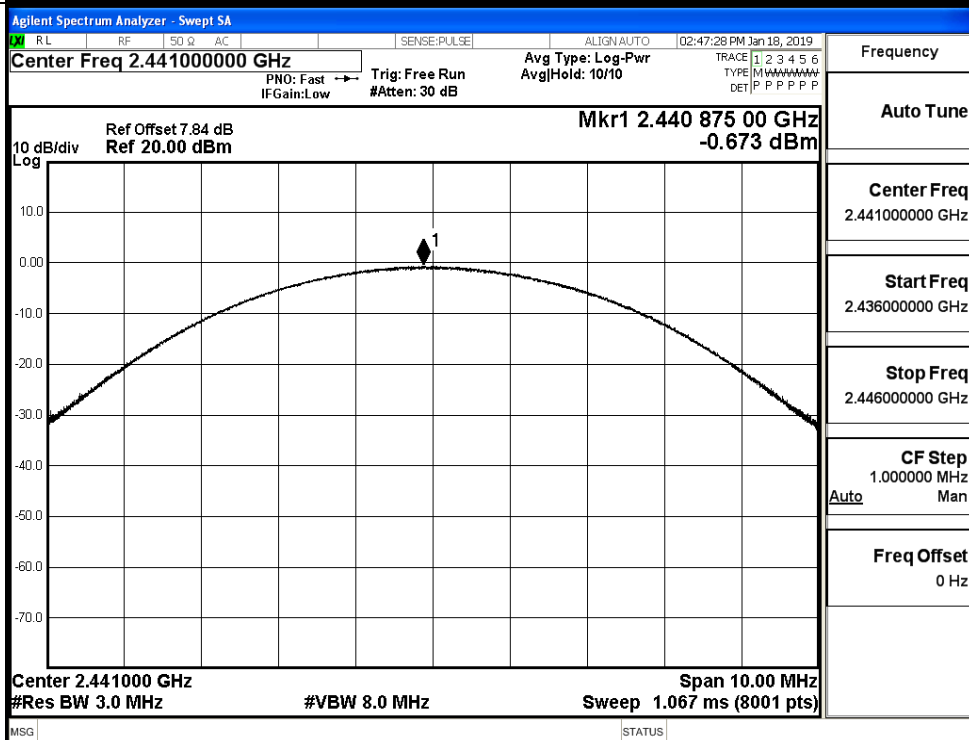
 π /4DQPSK/LCH

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

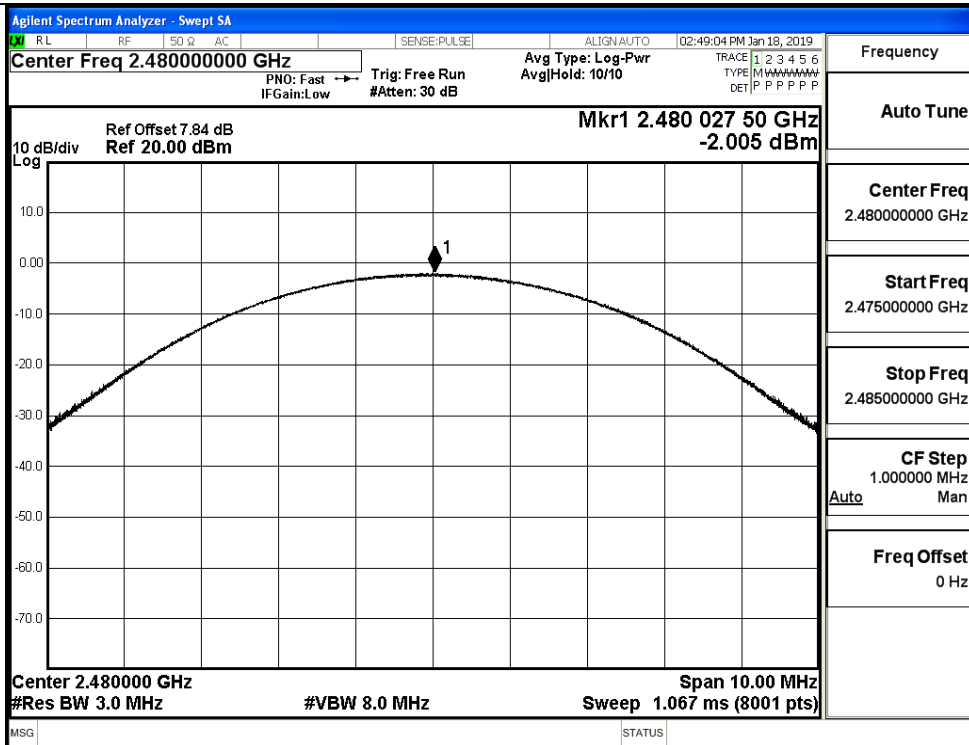
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

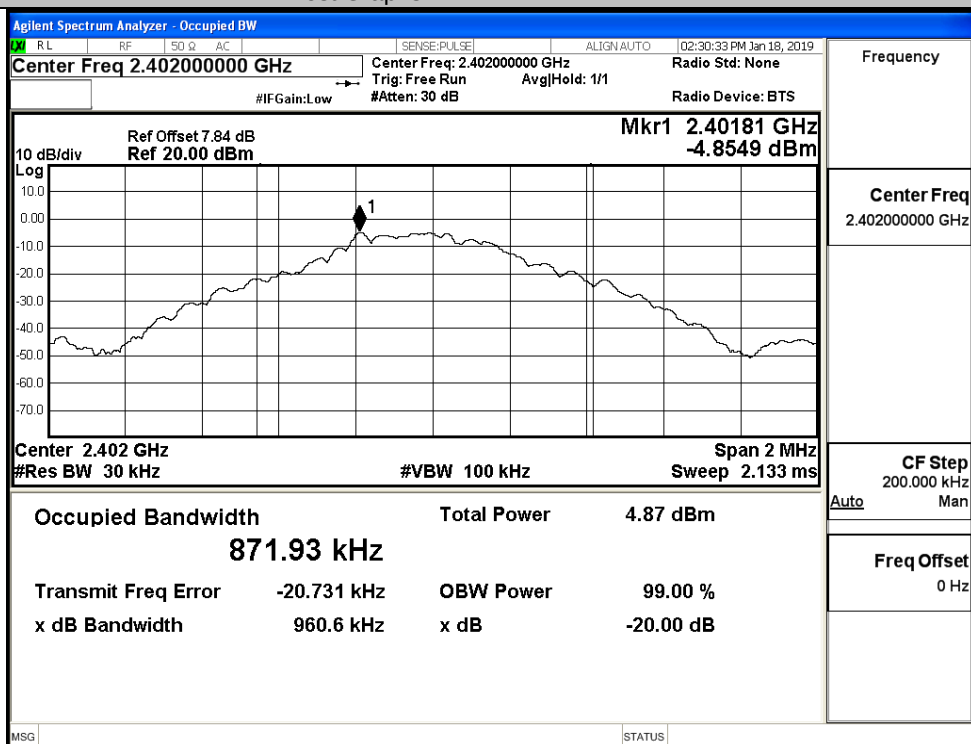


A.2 20dB Bandwidth

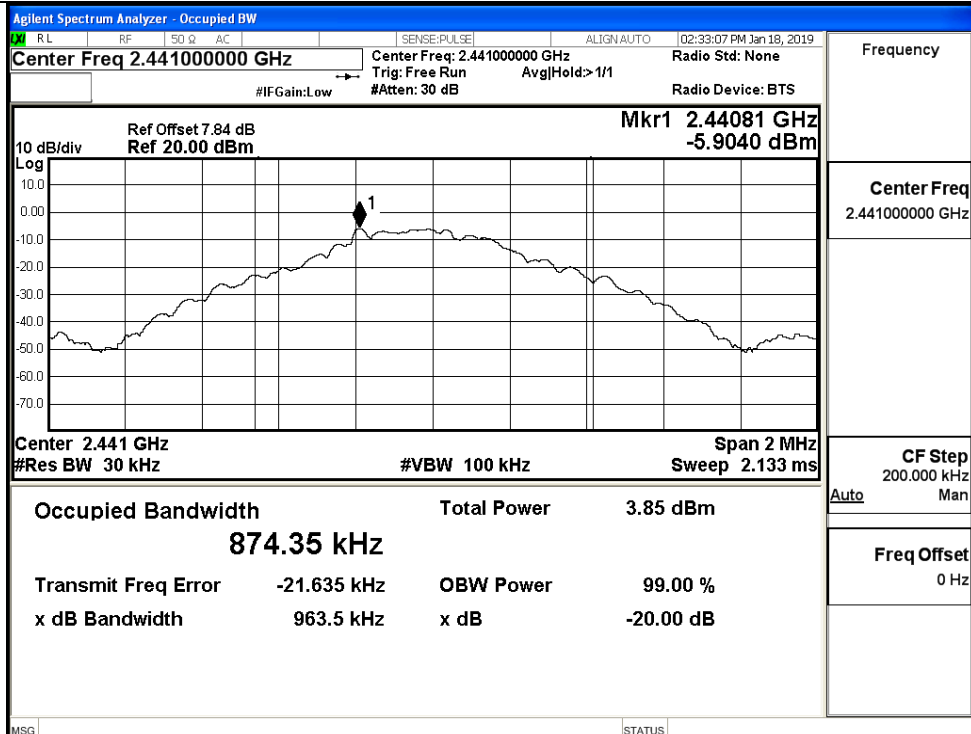
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.87193	0.9606	Not Specified	PASS
	MCH	0.87435	0.9635	Not Specified	PASS
	HCH	0.87452	0.9635	Not Specified	PASS
π /4DQPSK	LCH	1.1612	1.279	Not Specified	PASS
	MCH	1.1615	1.281	Not Specified	PASS
	HCH	1.1610	1.282	Not Specified	PASS
8DPSK	LCH	1.1684	1.302	Not Specified	PASS
	MCH	1.1686	1.302	Not Specified	PASS
	HCH	1.1688	1.301	Not Specified	PASS

Test Graphs

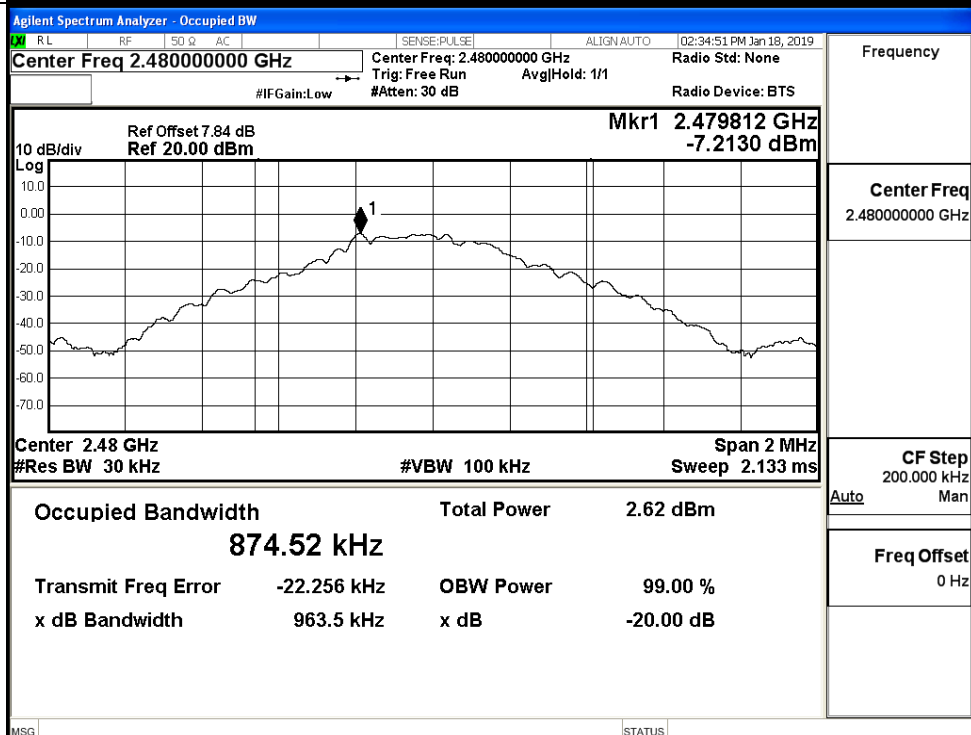
GFSK/LCH

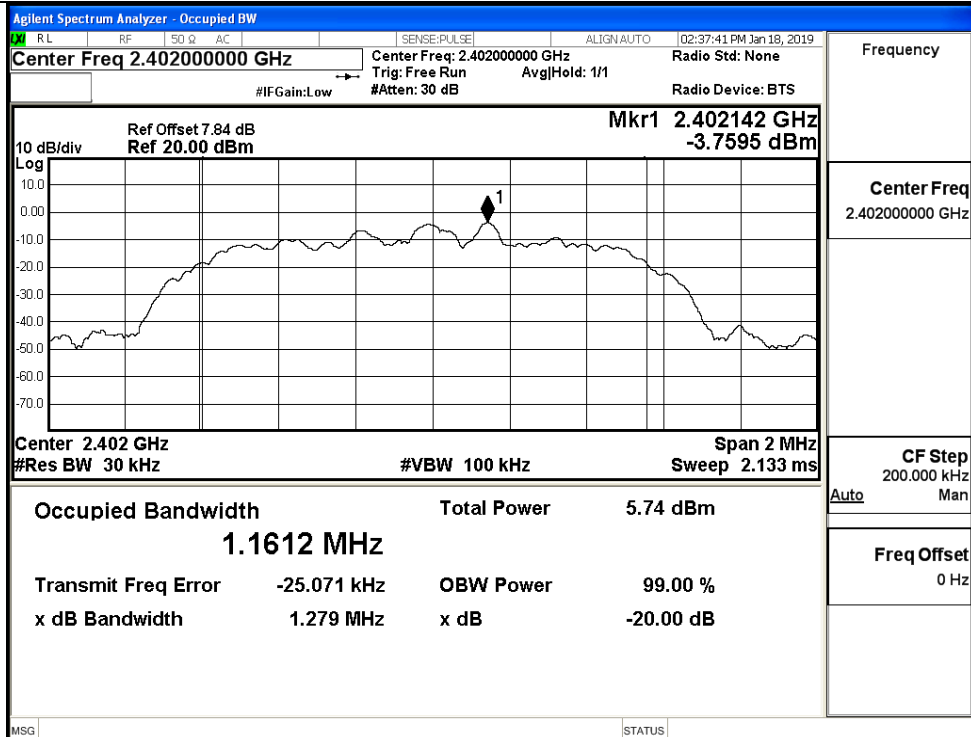
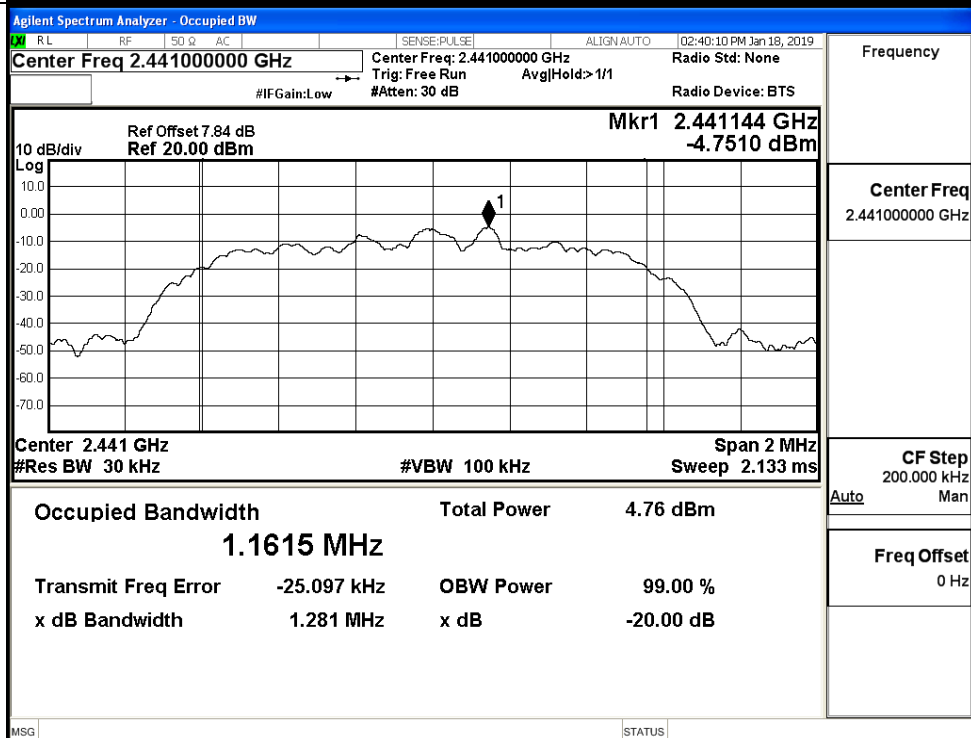


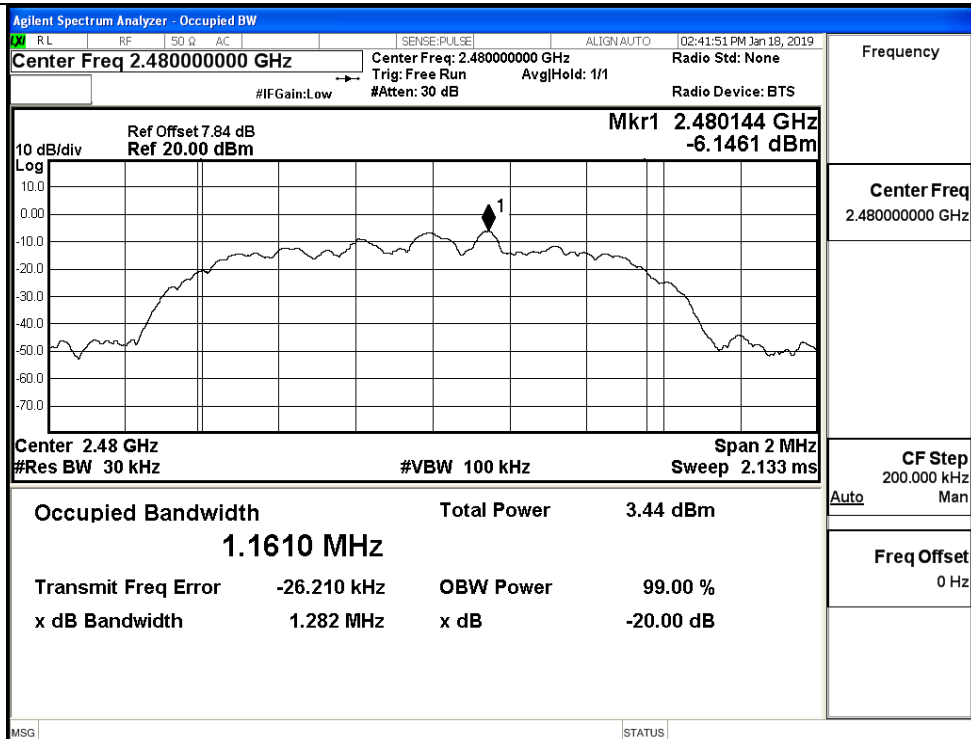
GFSK/MCH



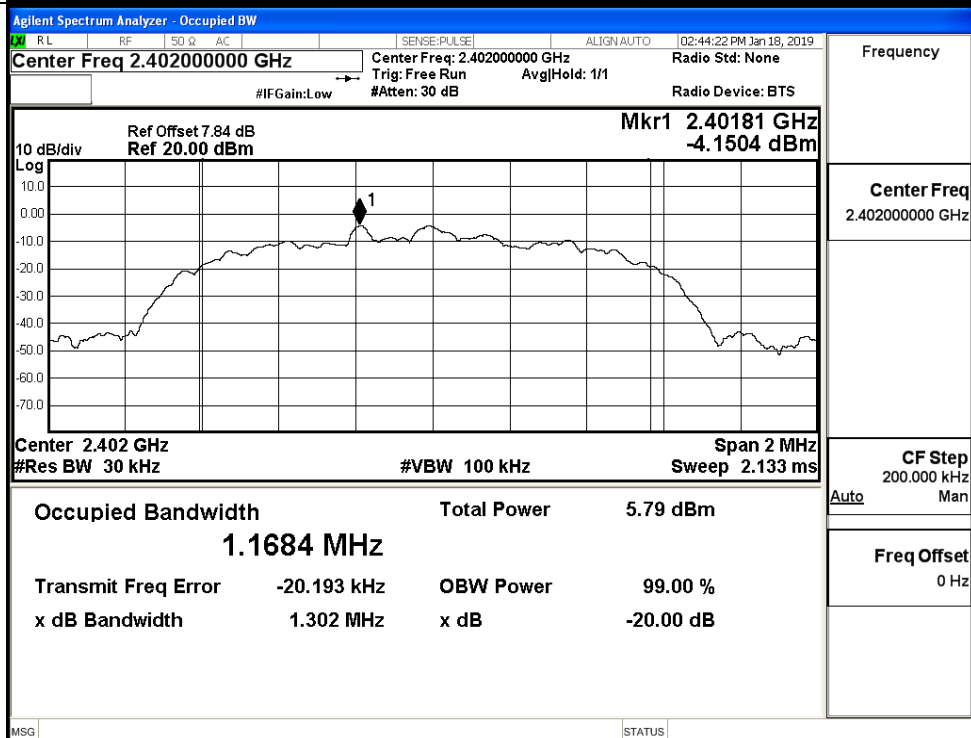
GFSK/HCH



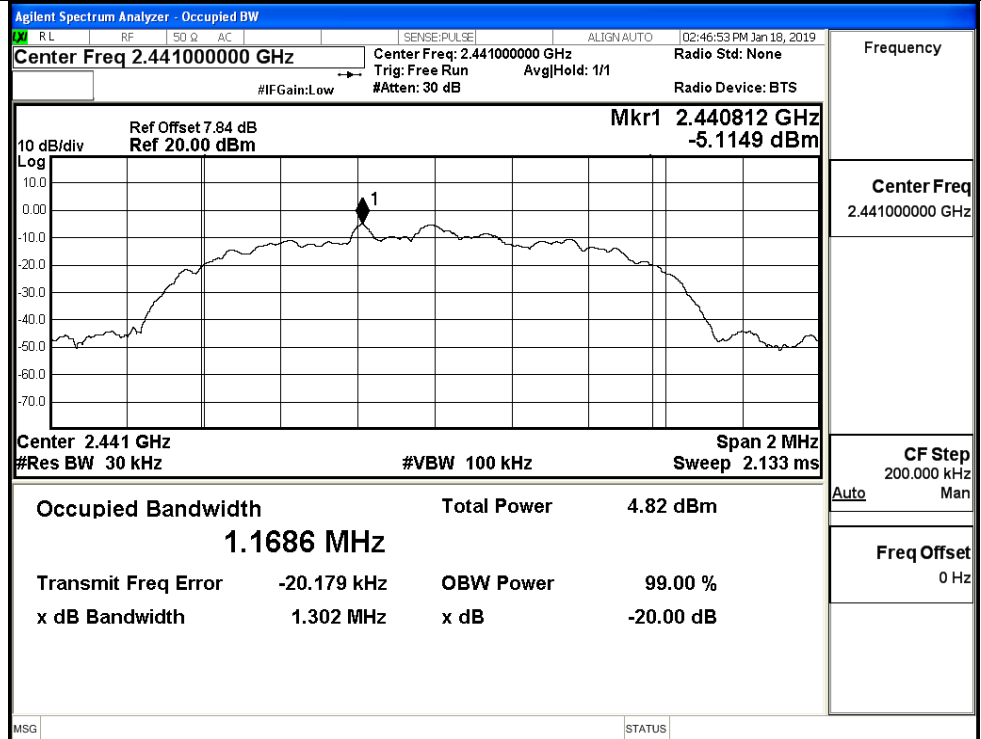
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

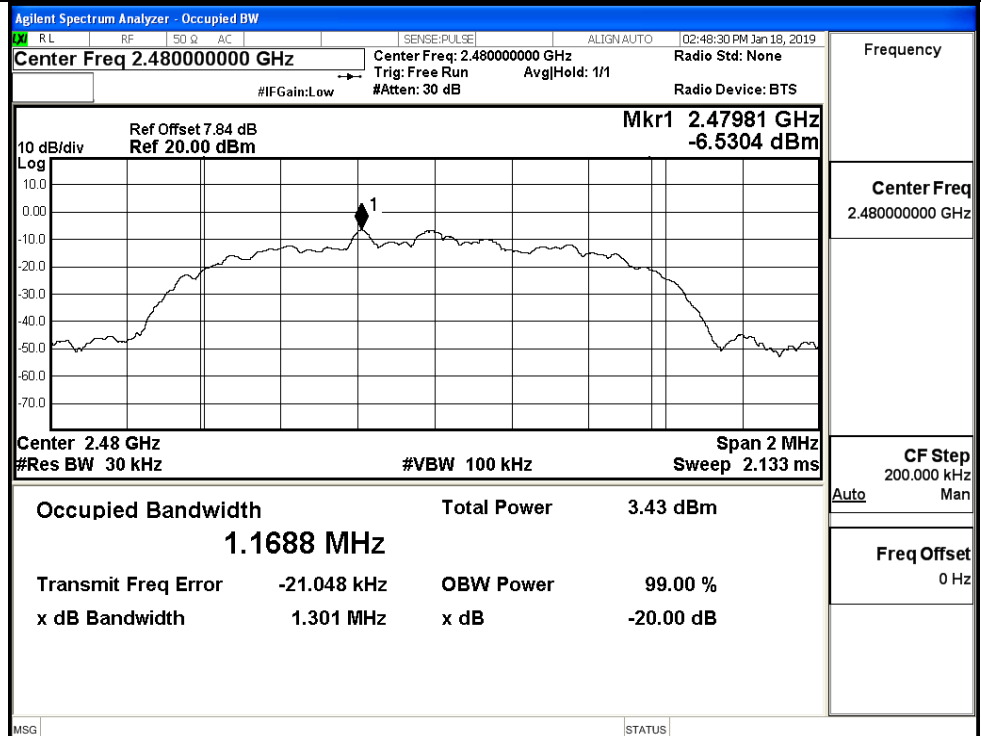
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

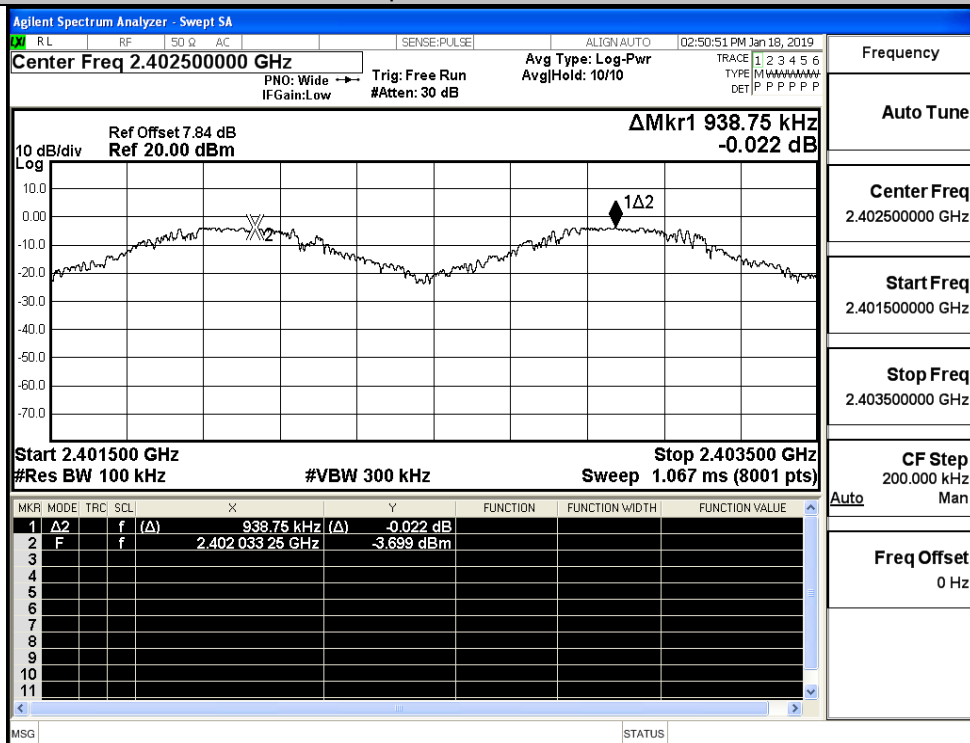


A.3 Carrier Frequency Separation

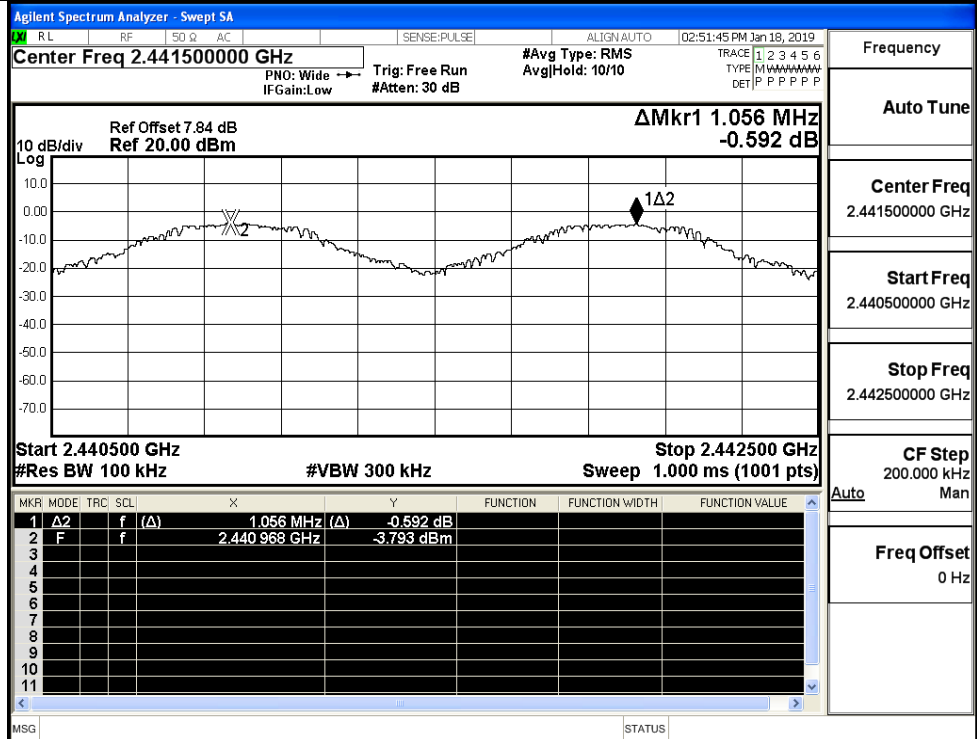
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.939	0.642	PASS
	MCH	1.056	0.642	PASS
	HCH	1.158	0.642	PASS
π /4DQPSK	LCH	0.988	0.855	PASS
	MCH	1.062	0.855	PASS
	HCH	1.002	0.855	PASS
8DPSK	LCH	0.992	0.868	PASS
	MCH	1.016	0.868	PASS
	HCH	1.074	0.868	PASS

Test Graphs

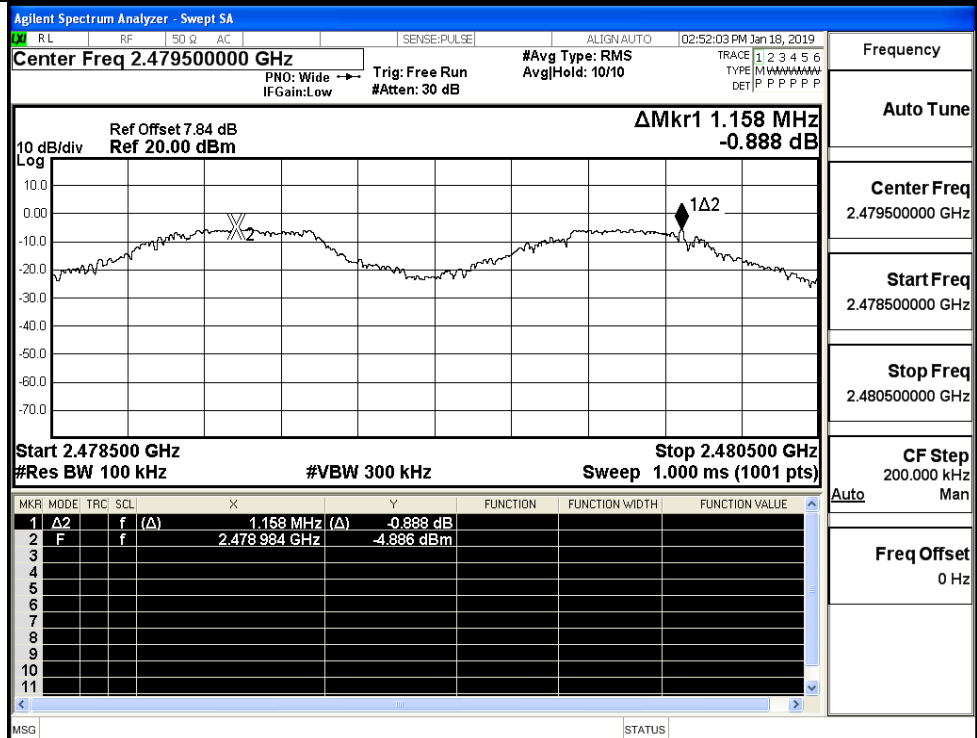
GFSK/LCH

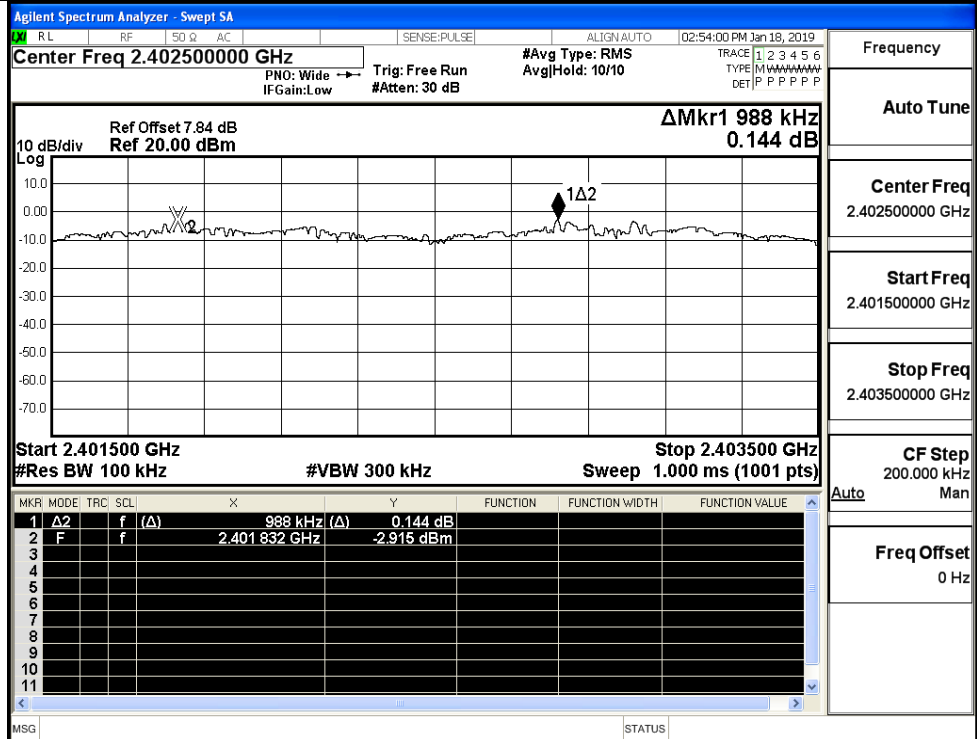
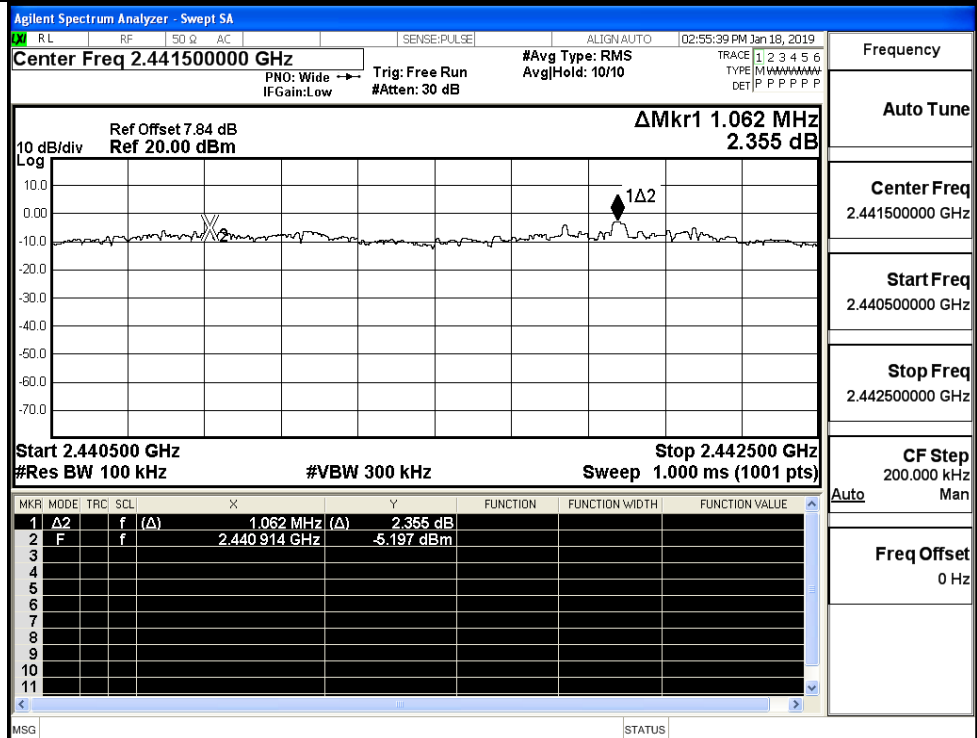


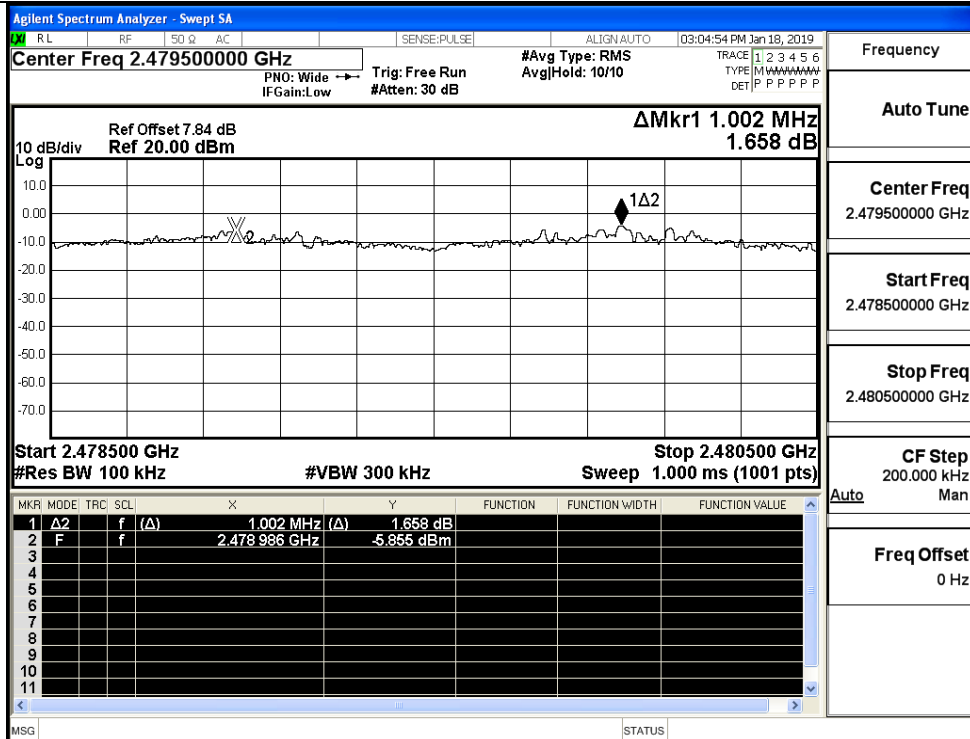
GFSK/MCH



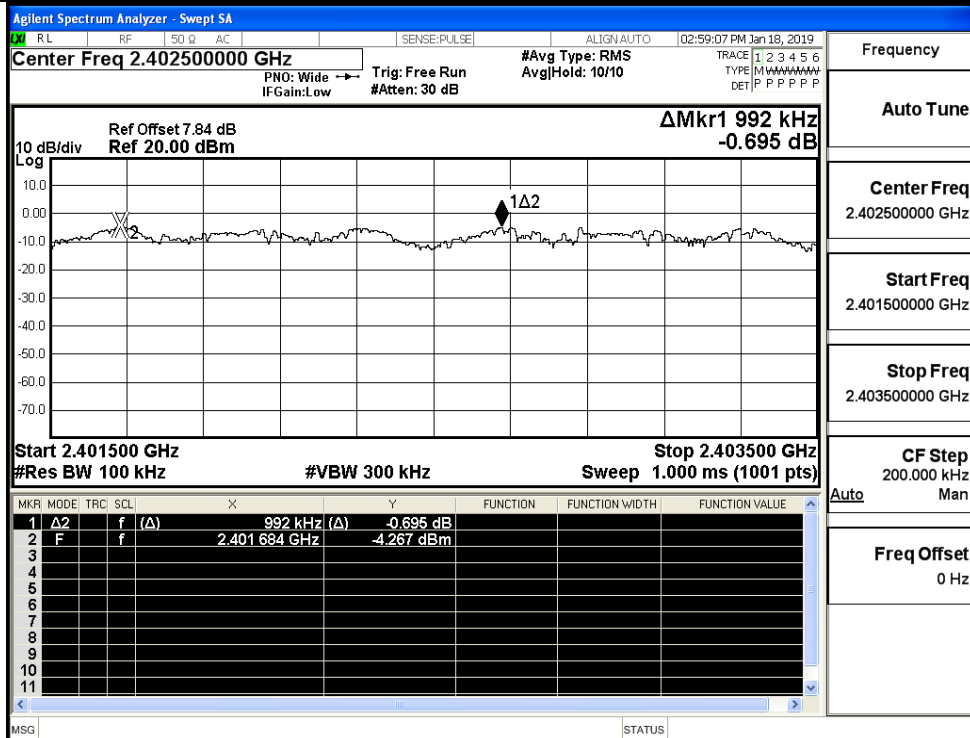
GFSK/HCH



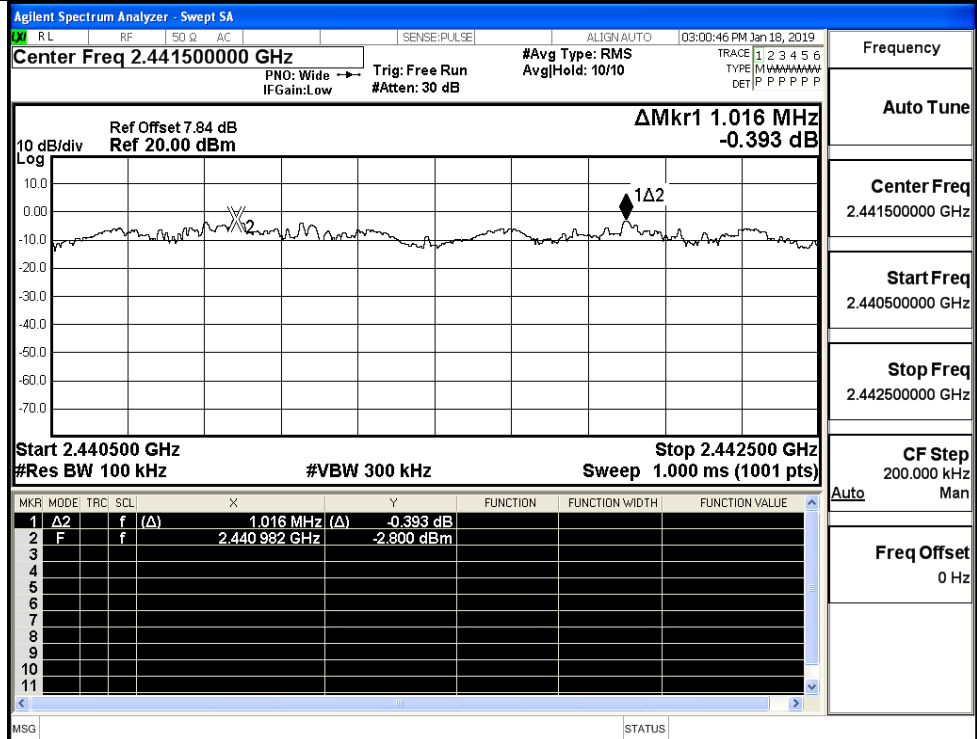
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

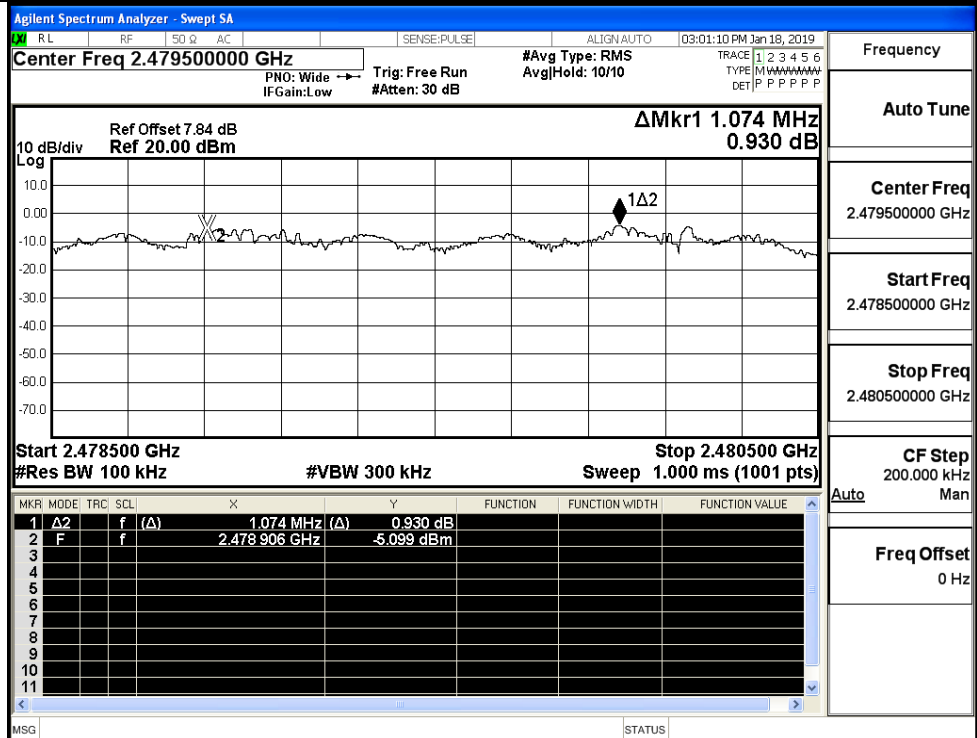
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

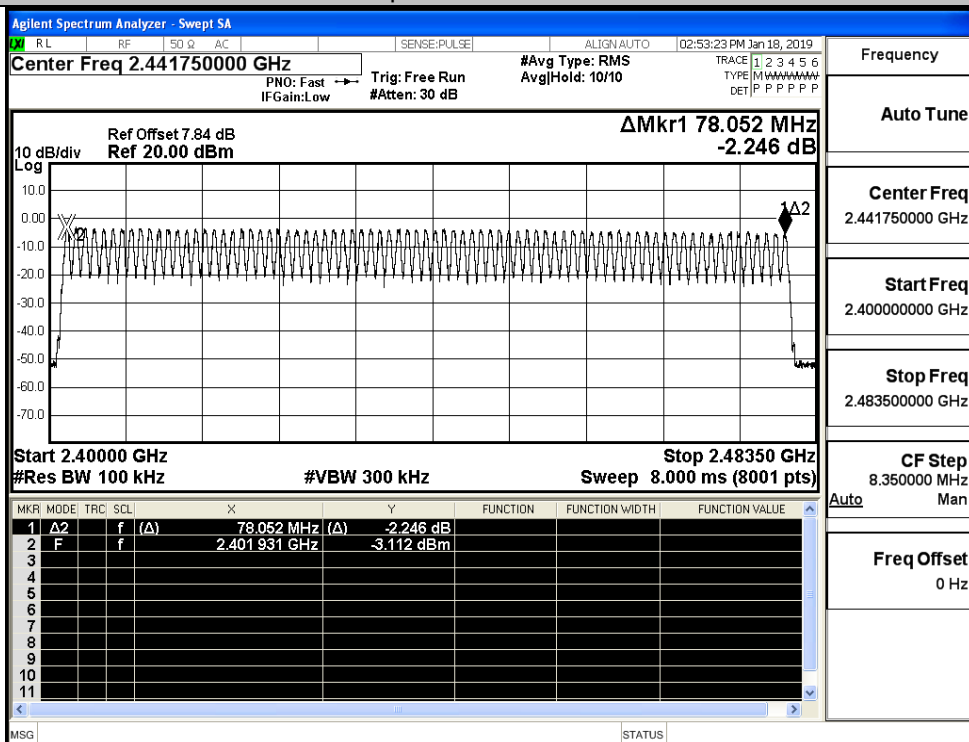
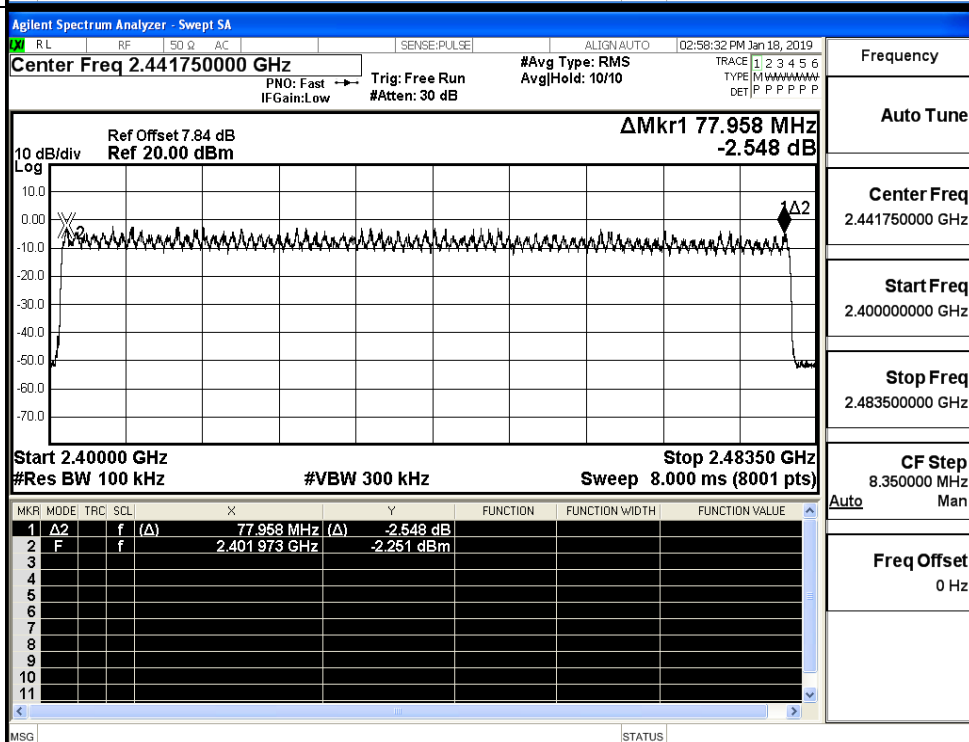


A.4 Hopping Channel Number

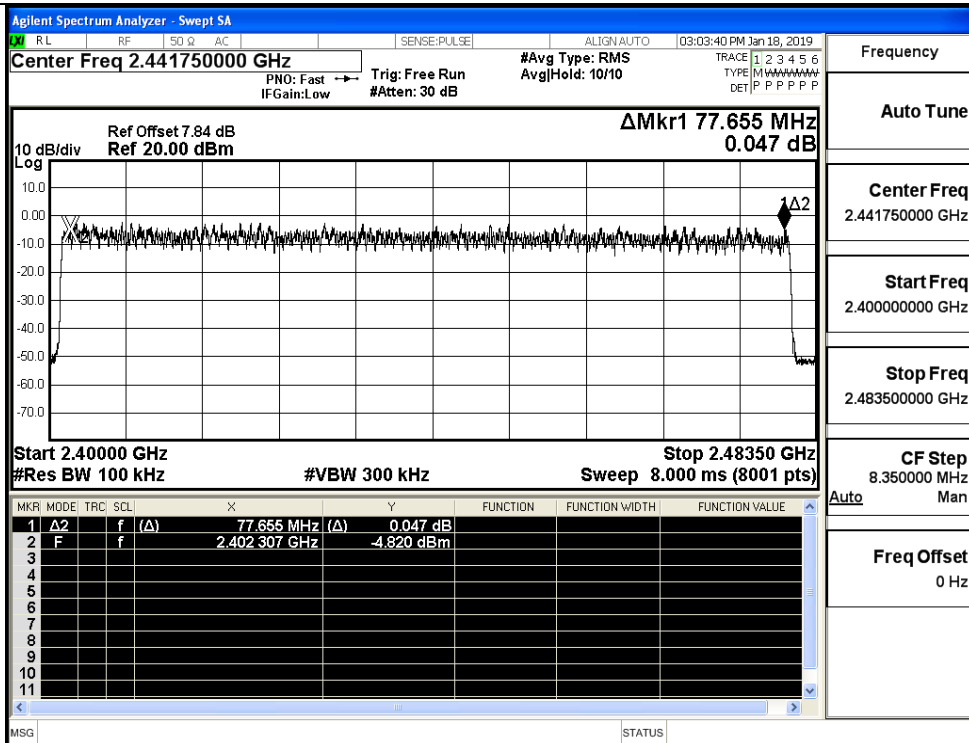
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

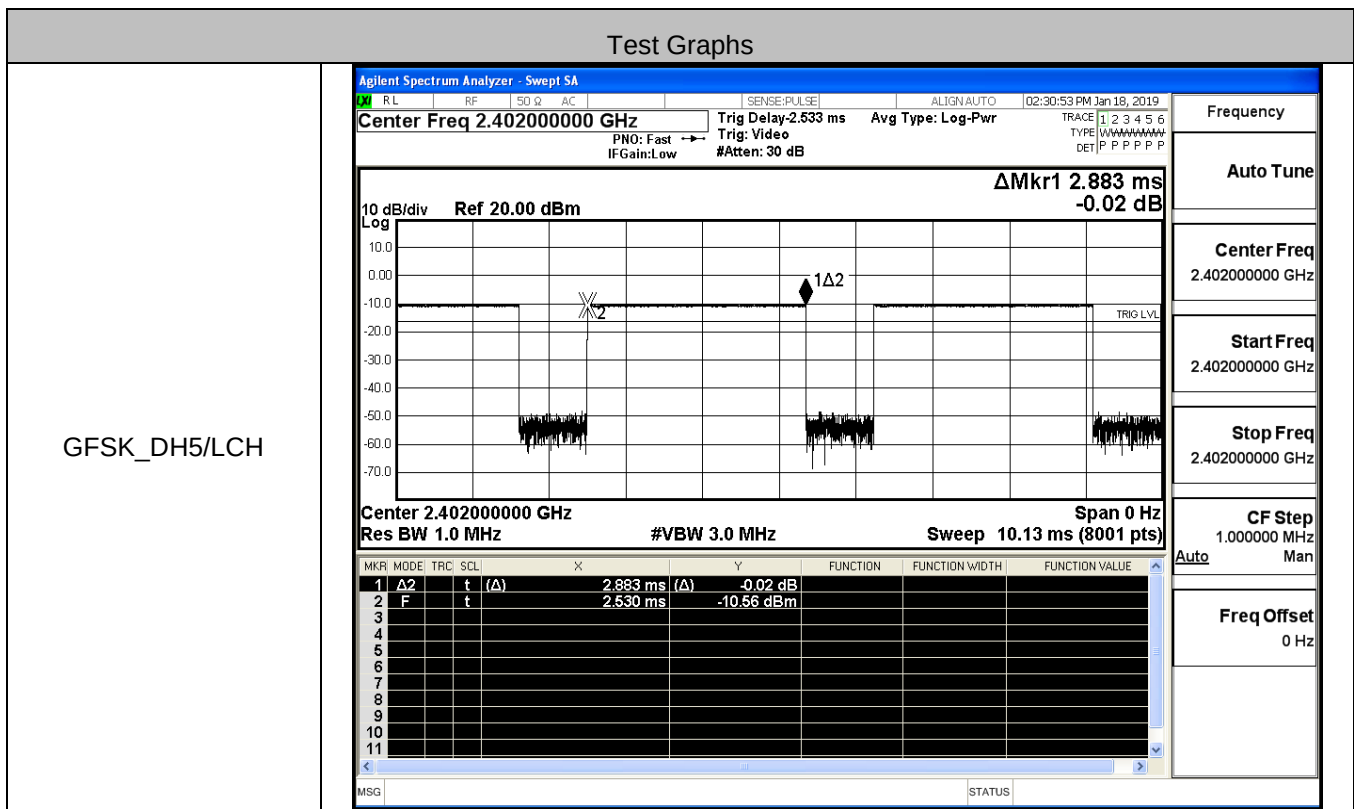
GFSK/Hop

 $\pi/4$ DQPSK/Hop

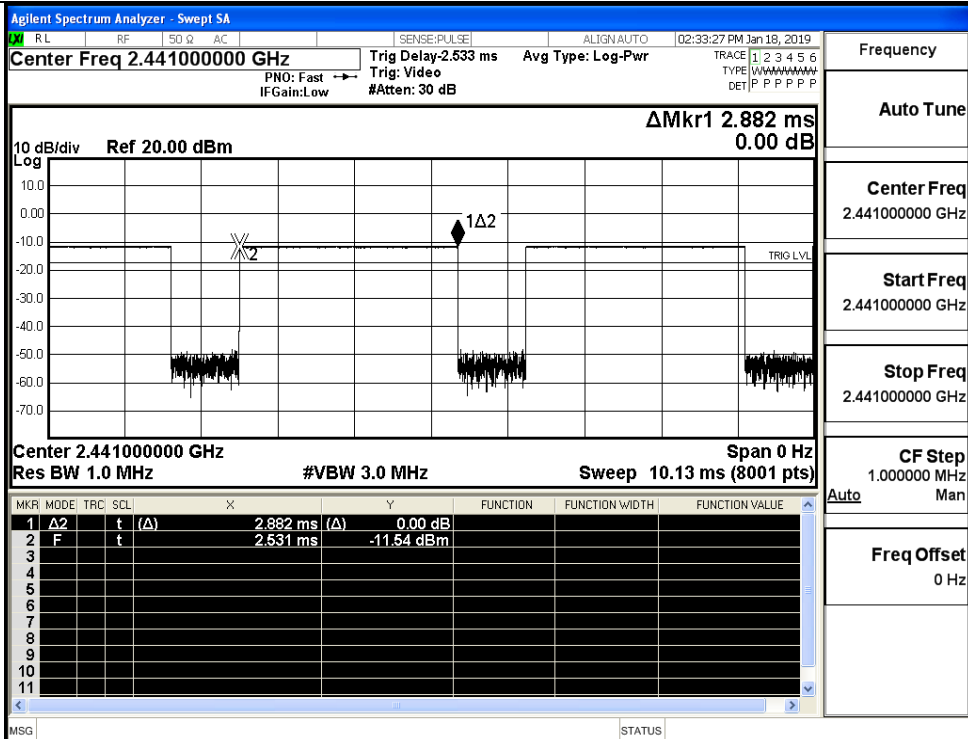
8DPSK/Hop



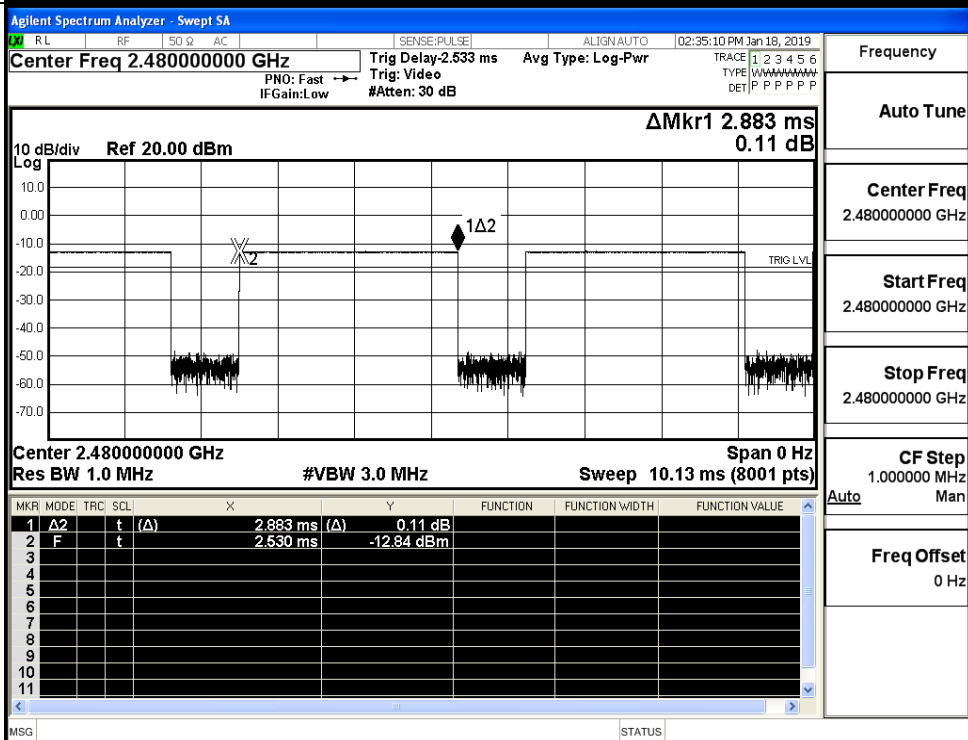
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.89	106.7	0.308	0.4	PASS
	2DH5	MCH	2.89	106.7	0.308	0.4	PASS
	2DH5	HCH	2.89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



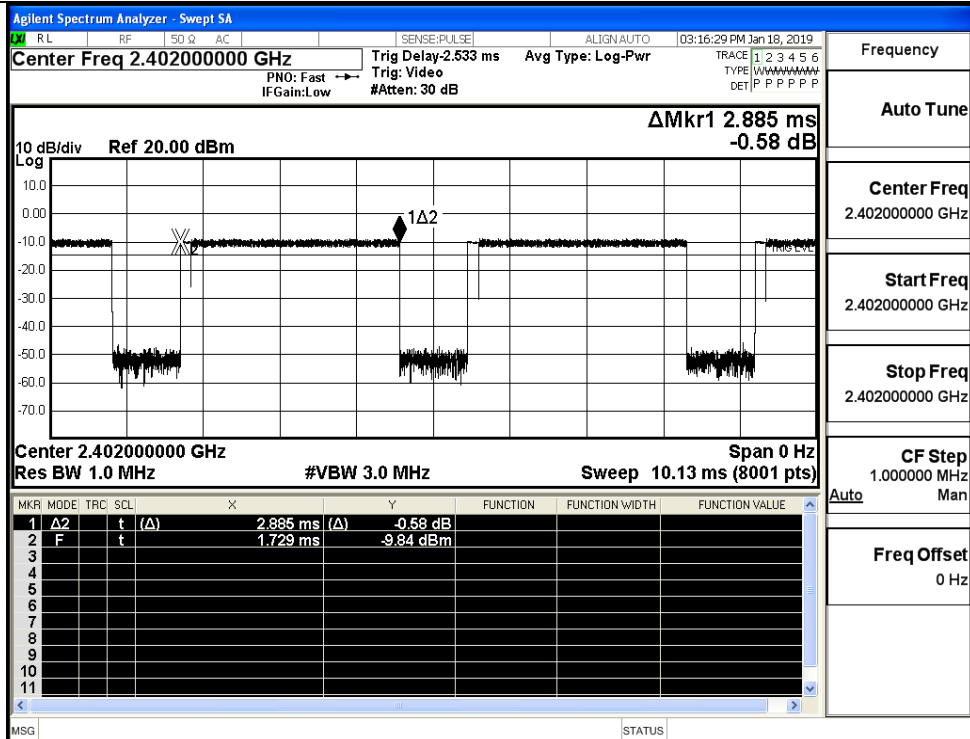
GFSK_DH5/MCH



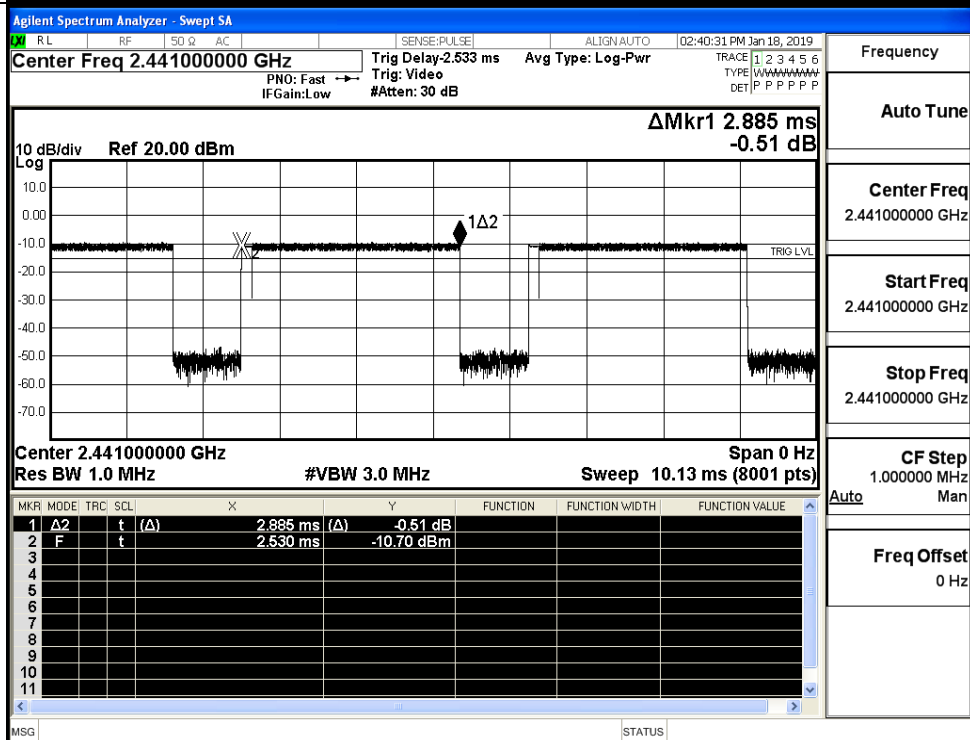
GFSK_DH5/HCH



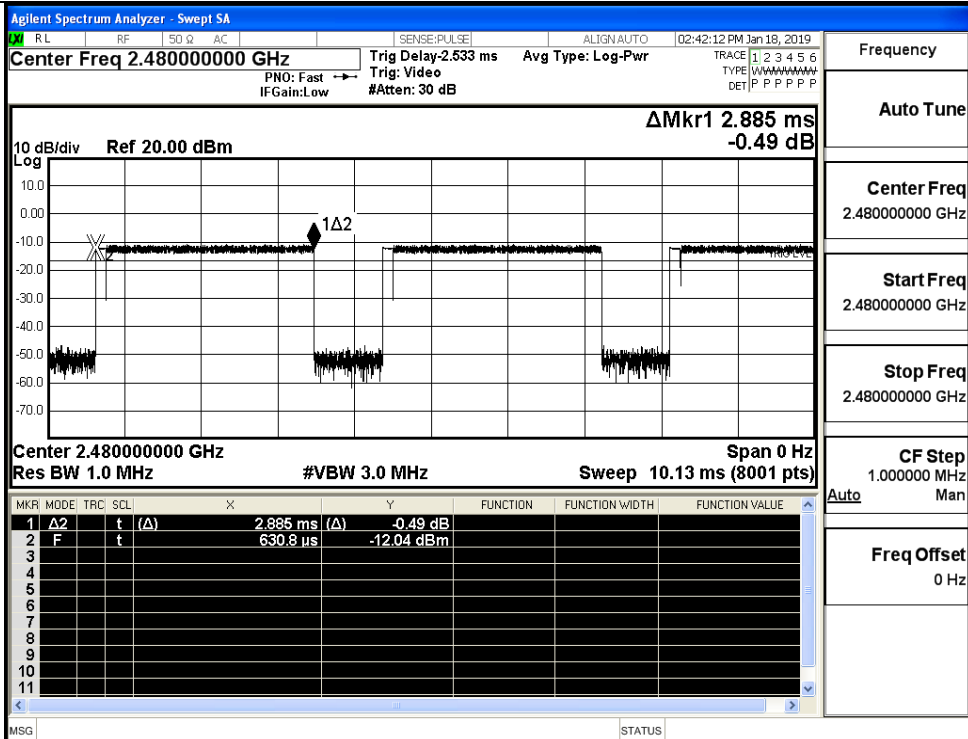
$\pi/4$ DQPSK
_2DH5/LCH



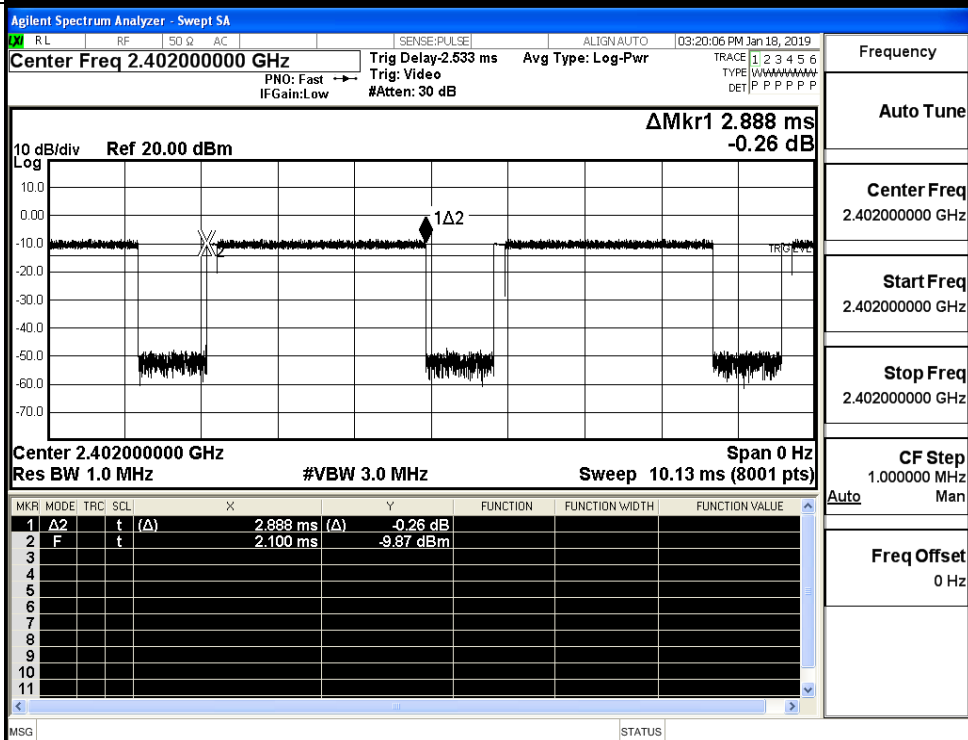
$\pi/4$ DQPSK
_2DH5/MCH



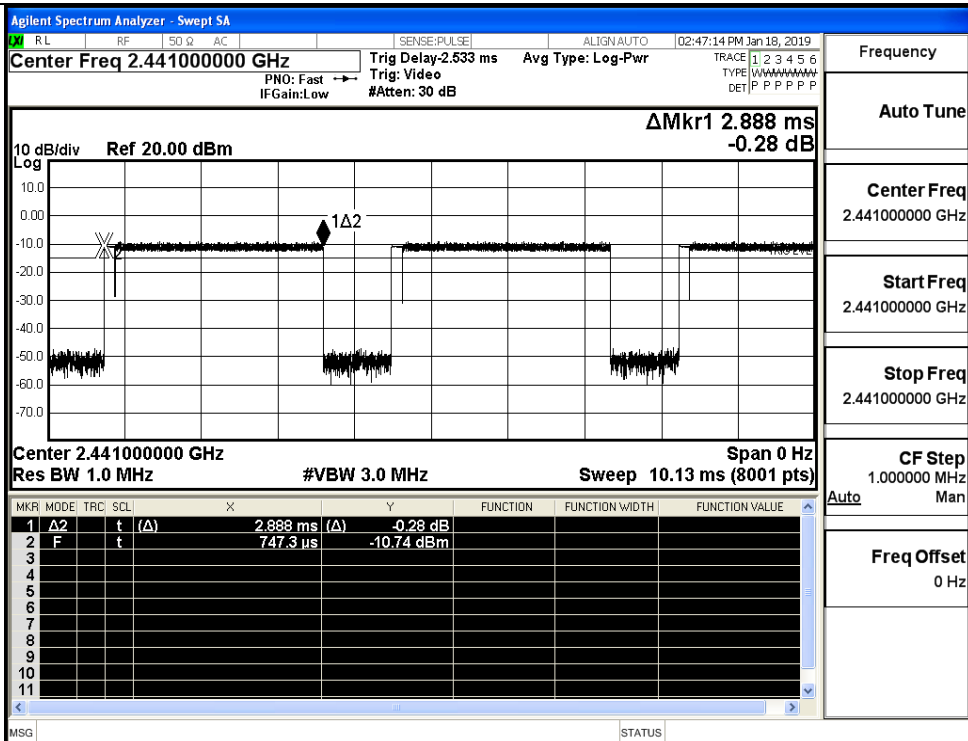
$\pi/4$ DQPSK
_2DH5/HCH



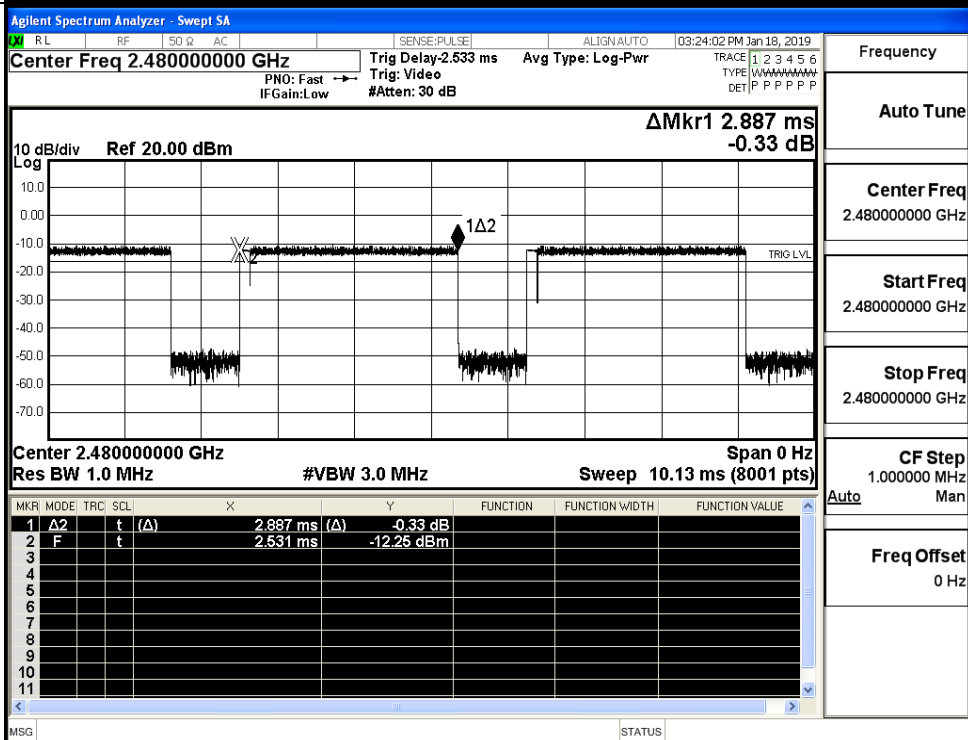
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

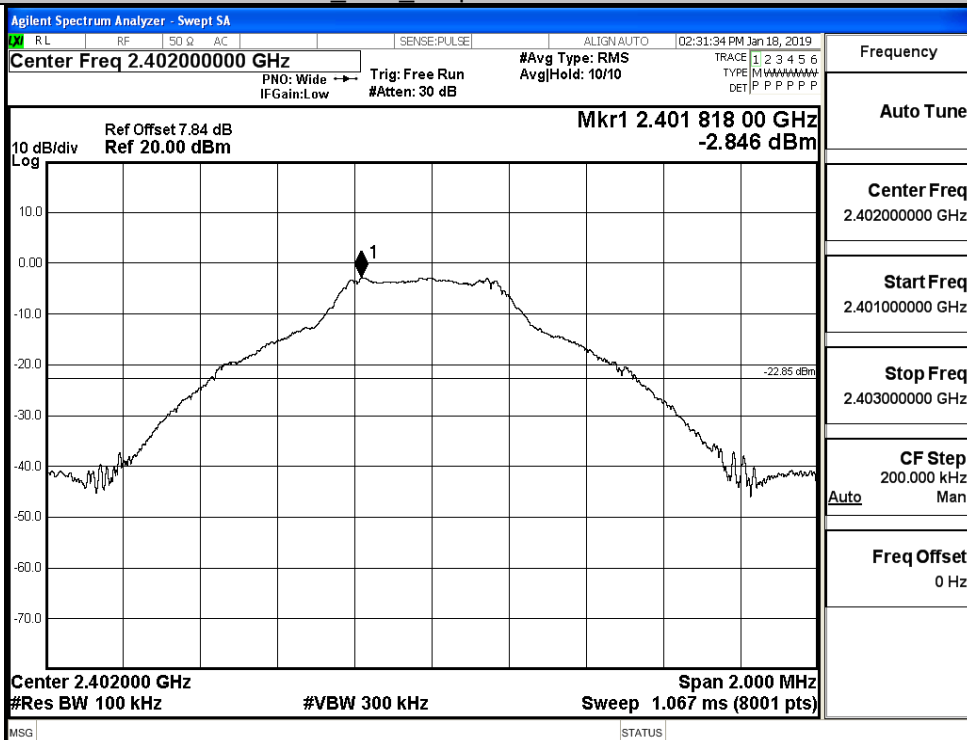


A.6 RF Conducted Spurious Emissions

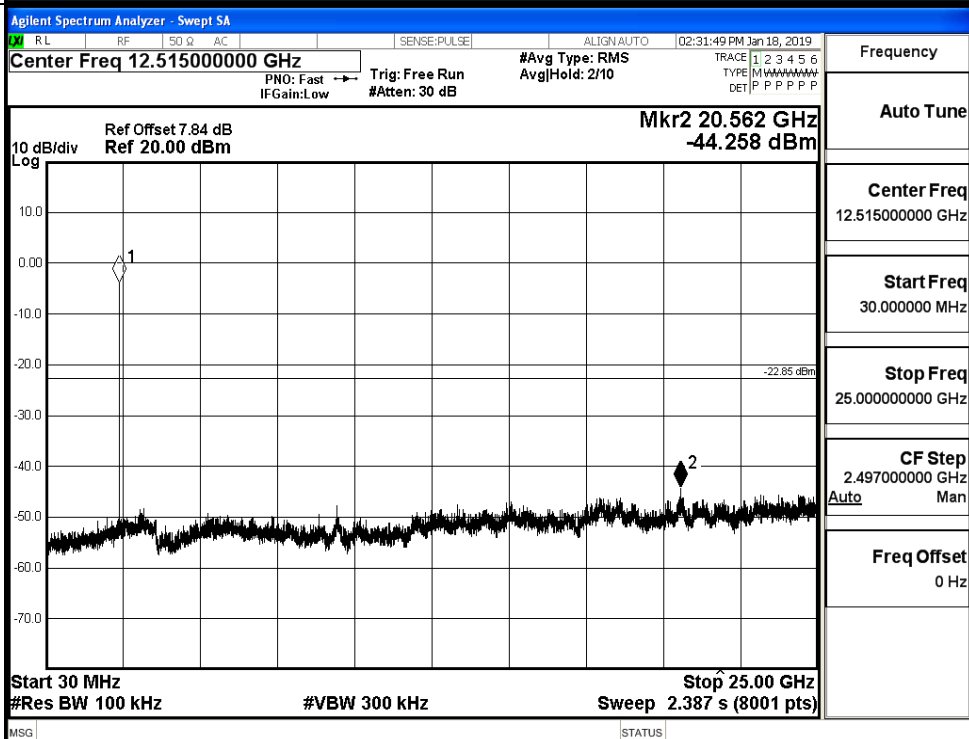
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.846	-44.258	-22.846	PASS
	MCH	-3.926	-44.994	-23.926	PASS
	HCH	-4.982	-45.183	-24.982	PASS
$\pi/4$ DQPSK	LCH	-1.948	-44.915	-21.948	PASS
	MCH	-2.9	-45.426	-22.900	PASS
	HCH	-4.274	-45.302	-24.274	PASS
8DPSK	LCH	-1.997	-43.645	-21.997	PASS
	MCH	-3.059	-45.115	-23.059	PASS
	HCH	-4.272	-44.981	-24.272	PASS

GFSK LCH Graphs

Pref

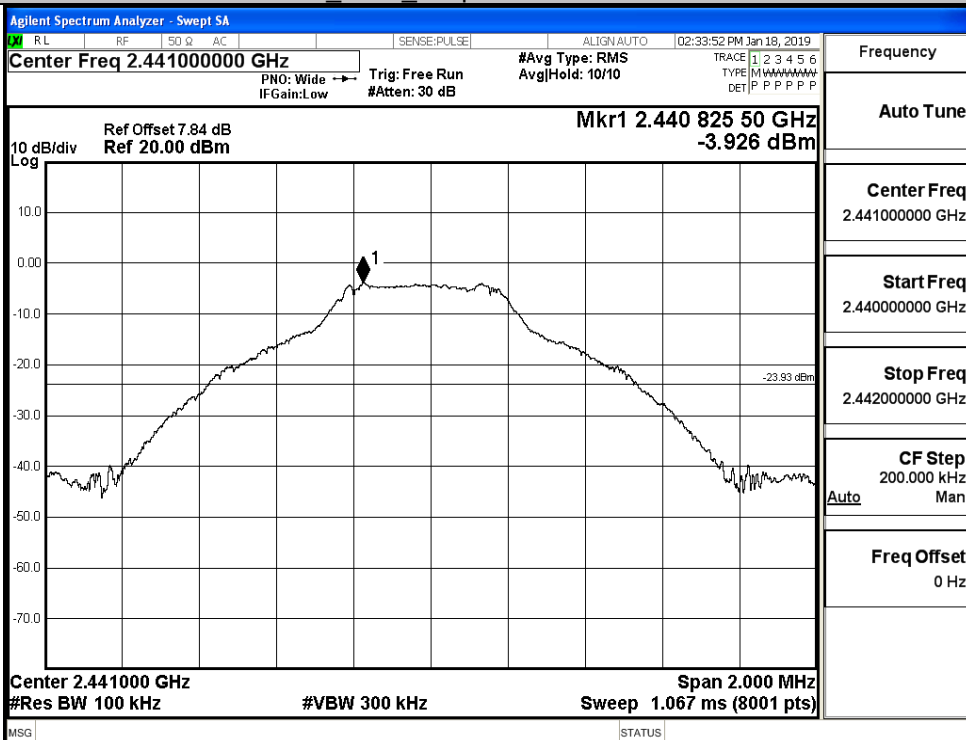


Puw

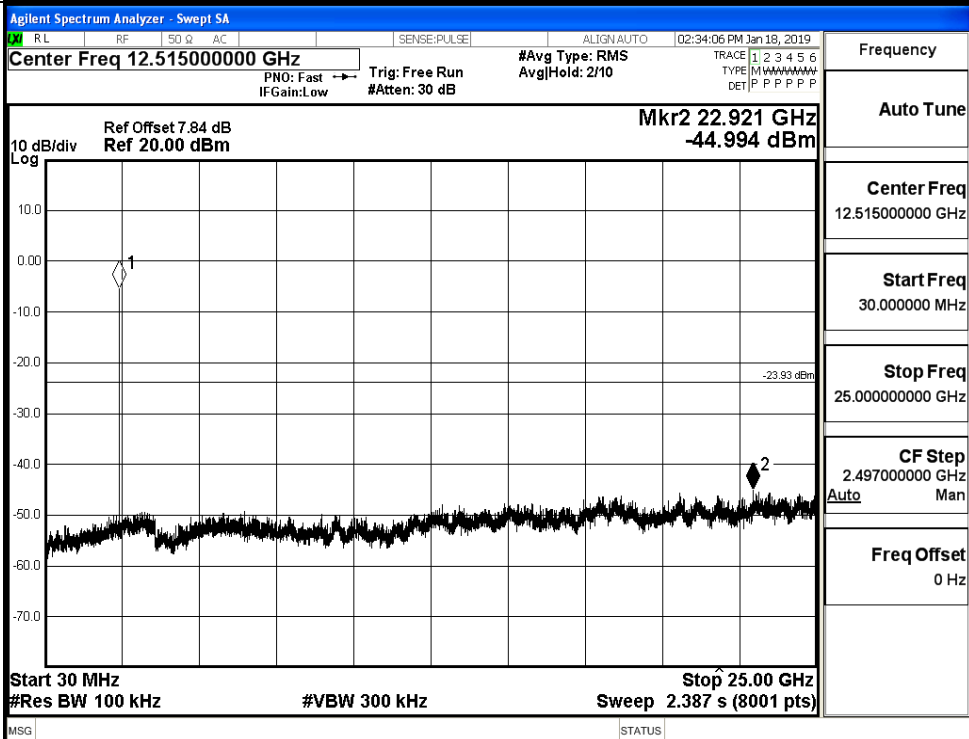


GFSK_MCH_Graphs

Pref

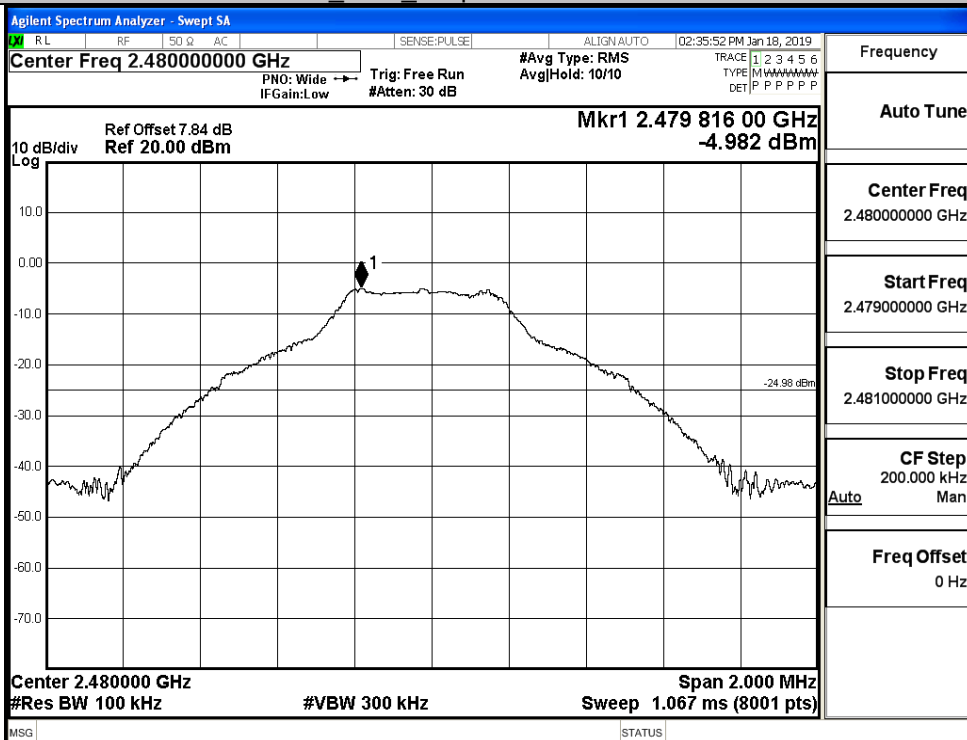


Puw

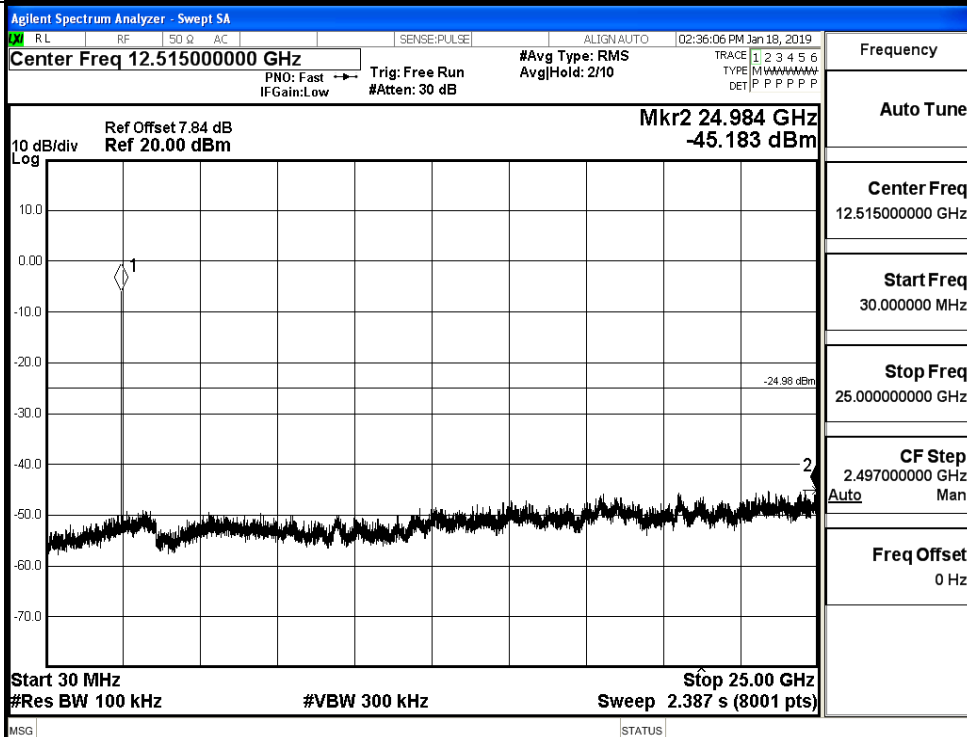


GFSK_HCH_Graphs

Pref

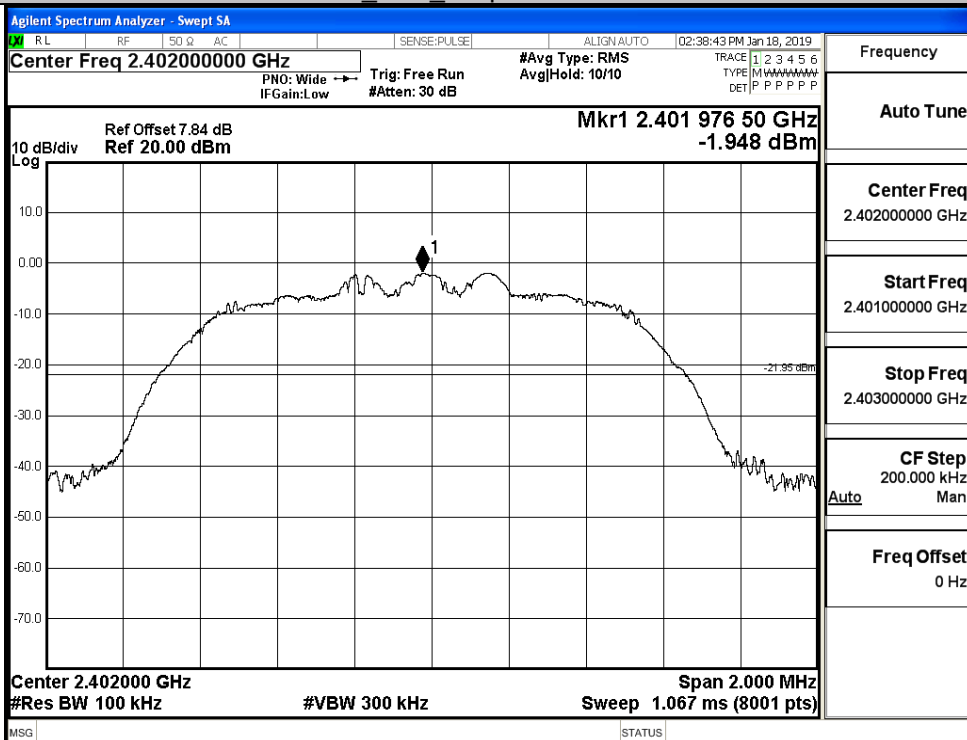


Puw

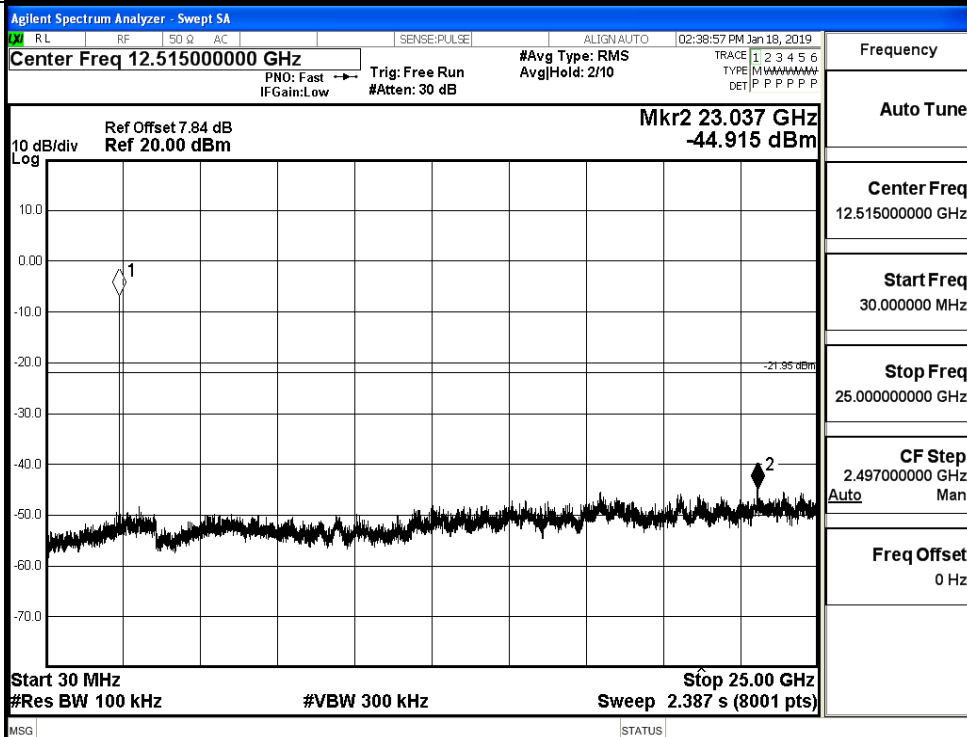


π /4DQPSK LCH_Graphs

Pref

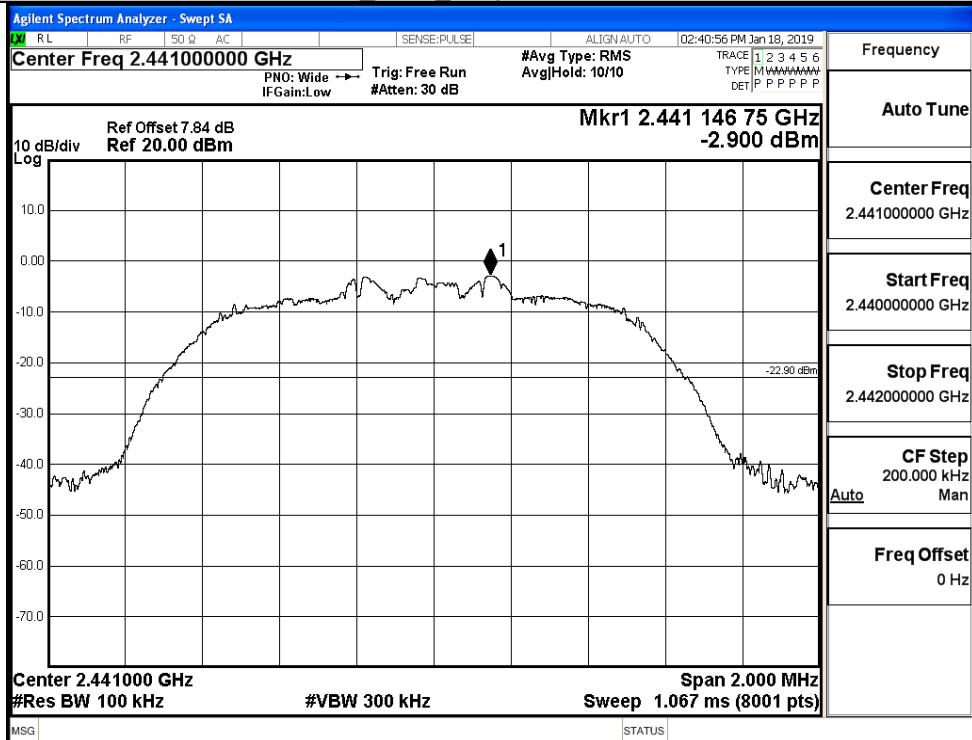


Puw

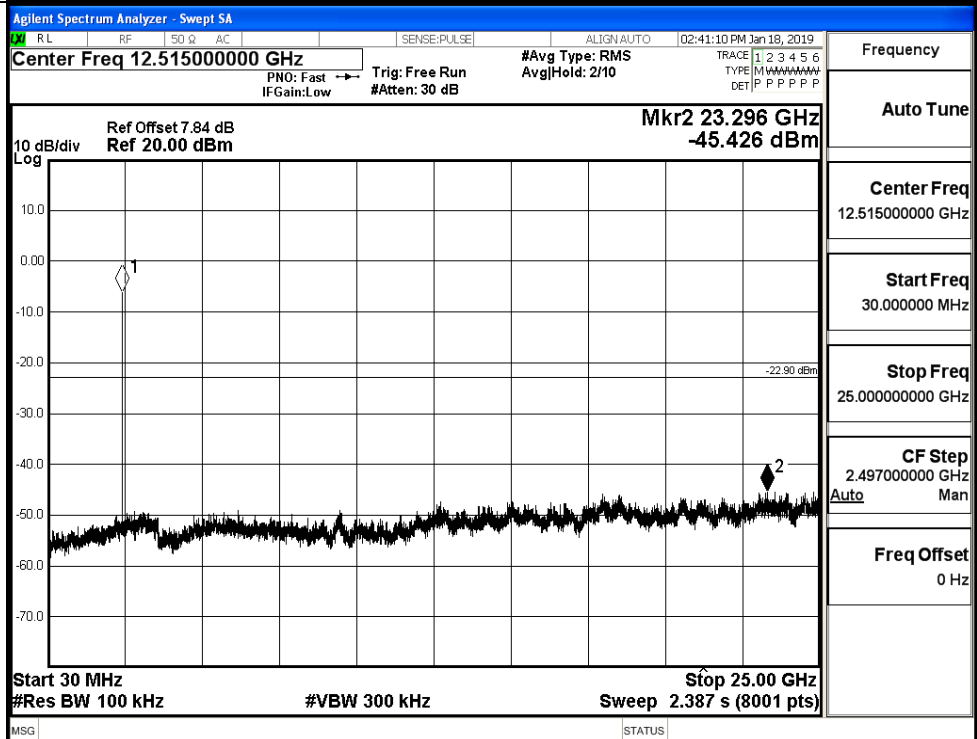


π /4DQPSK_MCH_Graphs

Pref

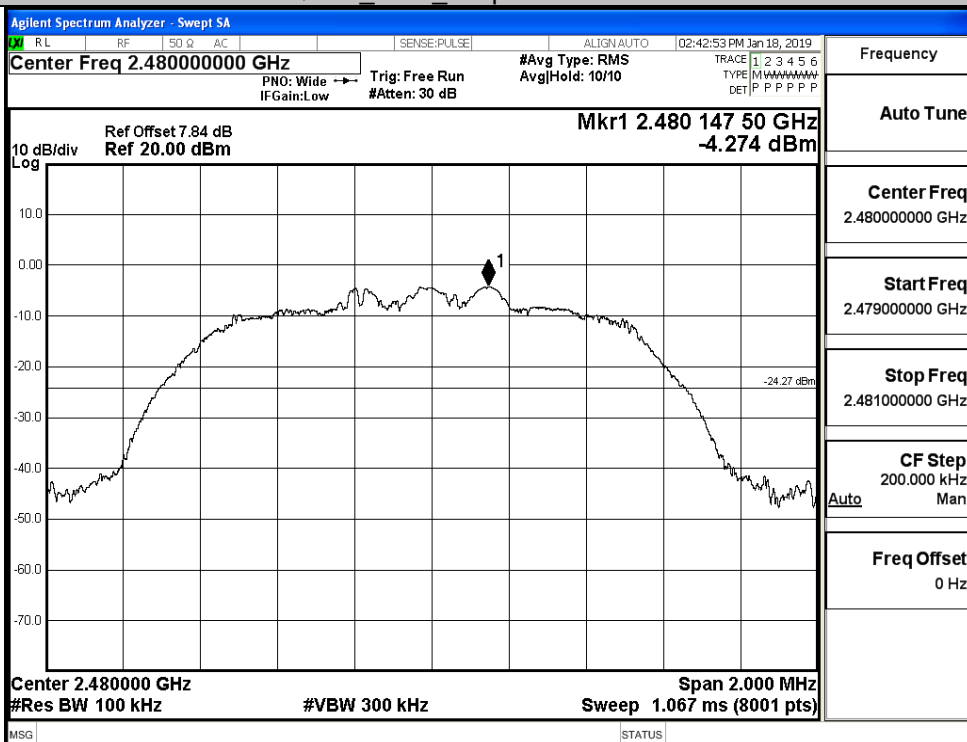


Puw

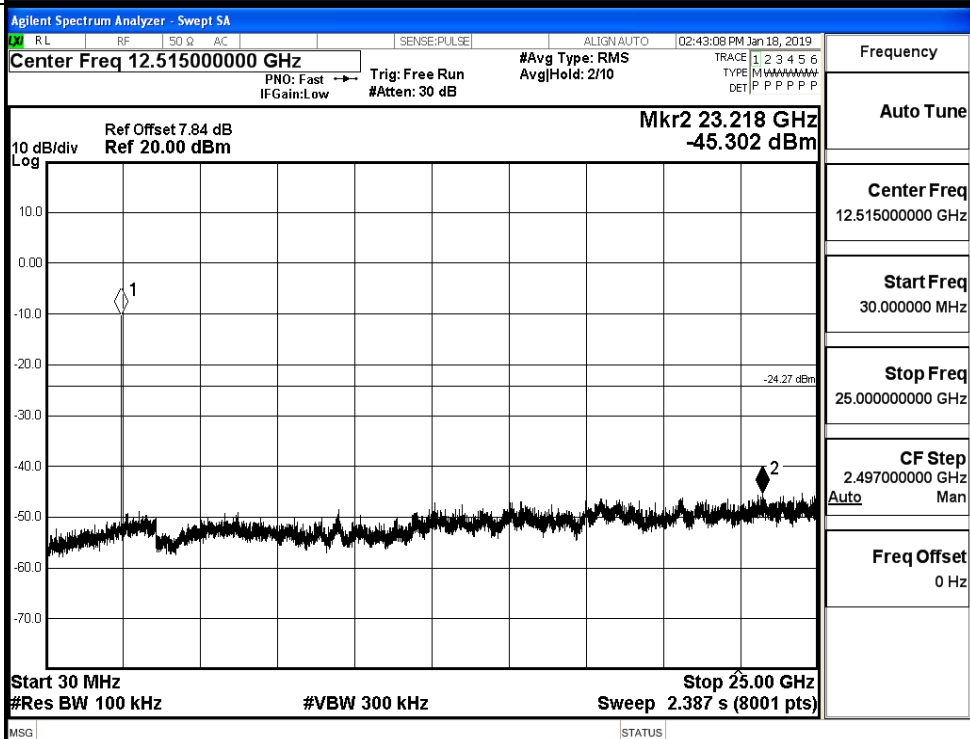


$\pi/4$ DQPSK_HCH_Graphs

Pref

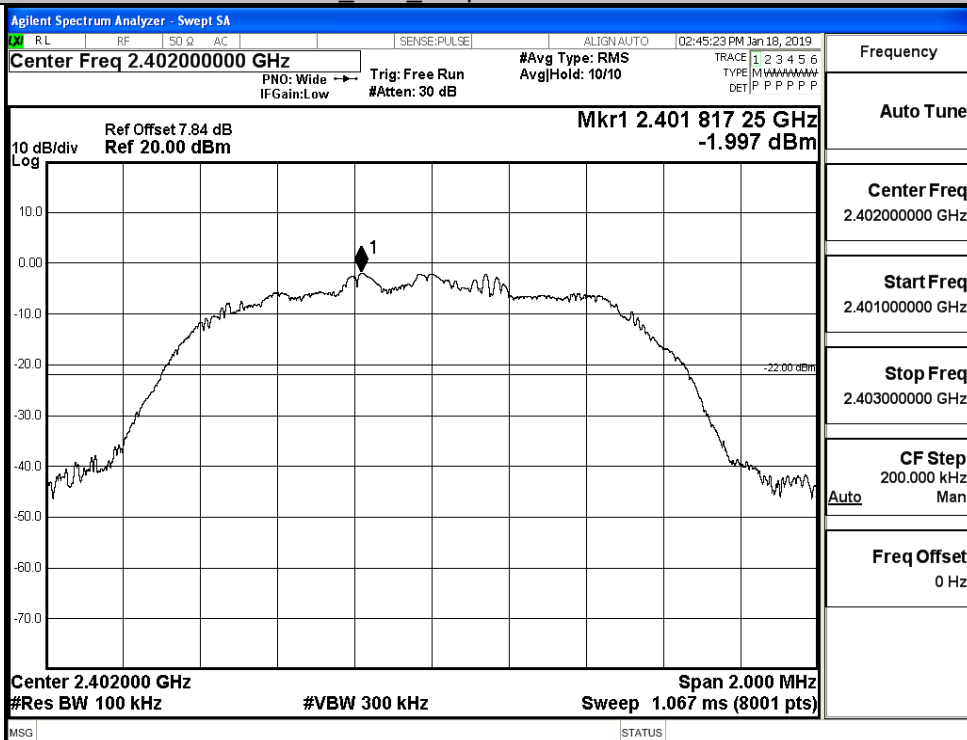


Puw

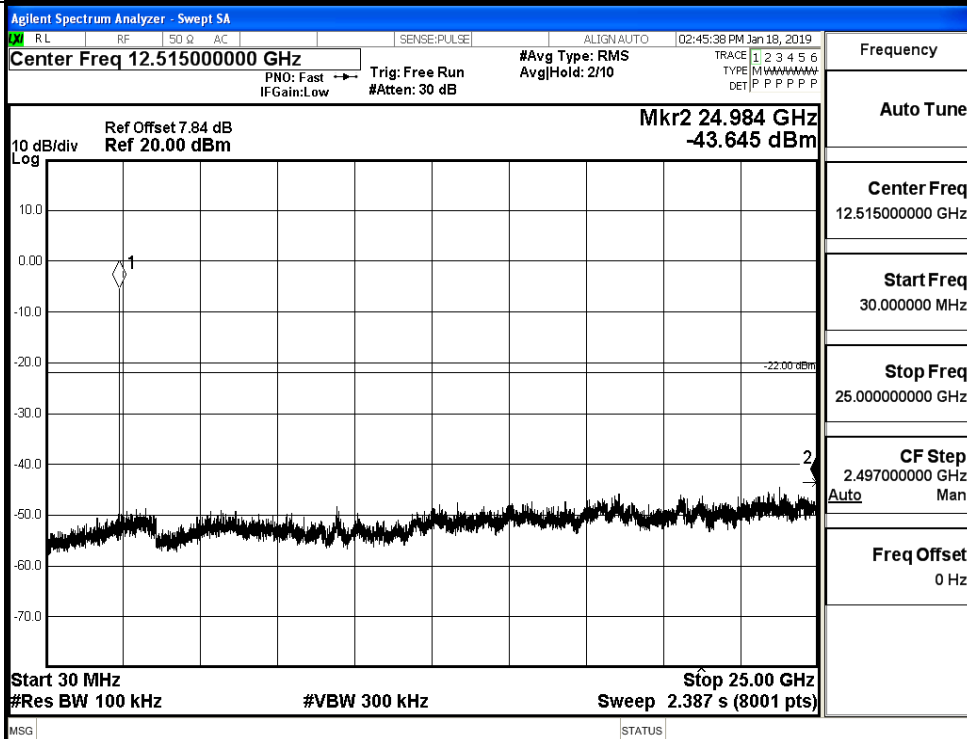


8DPSK_LCH_Graphs

Pref

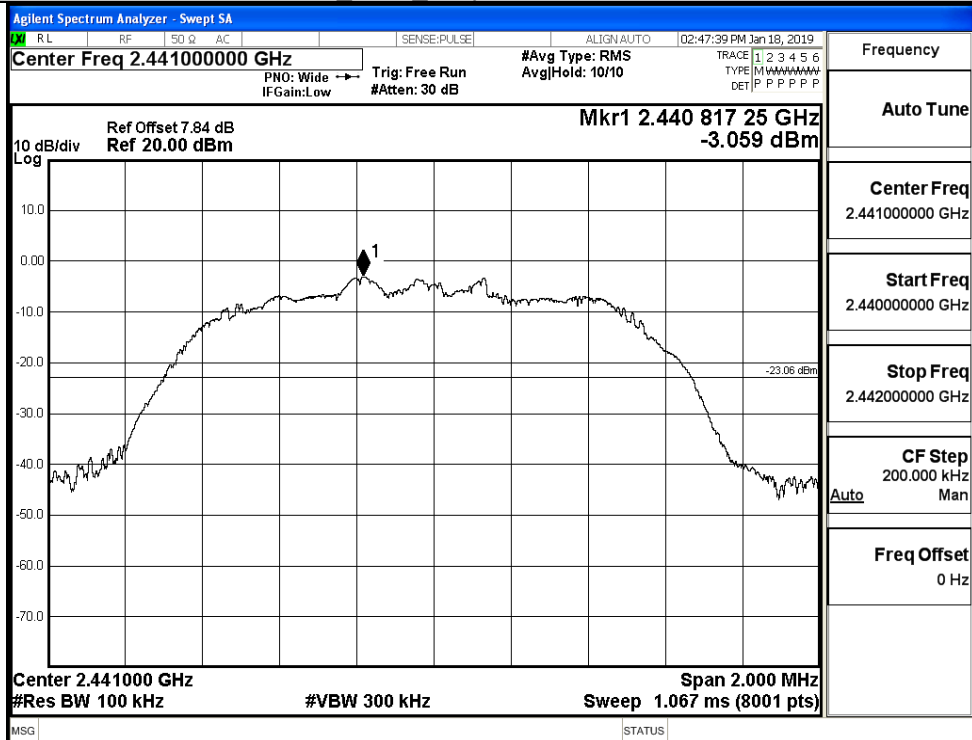


Puw

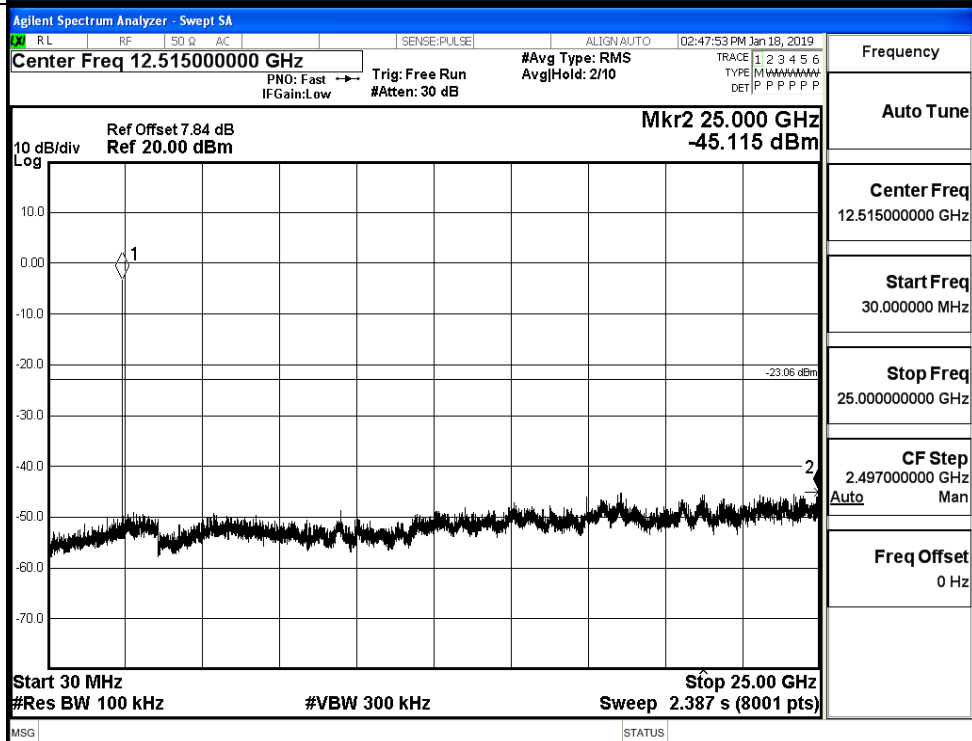


8DPSK_MCH_Graphs

Pref

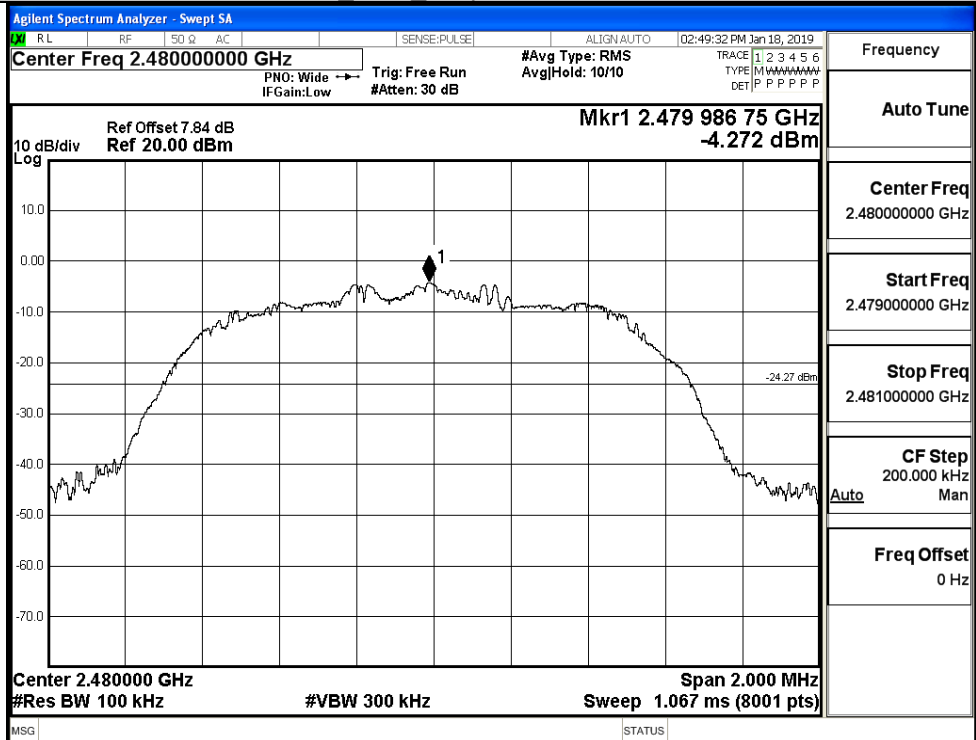


Puw

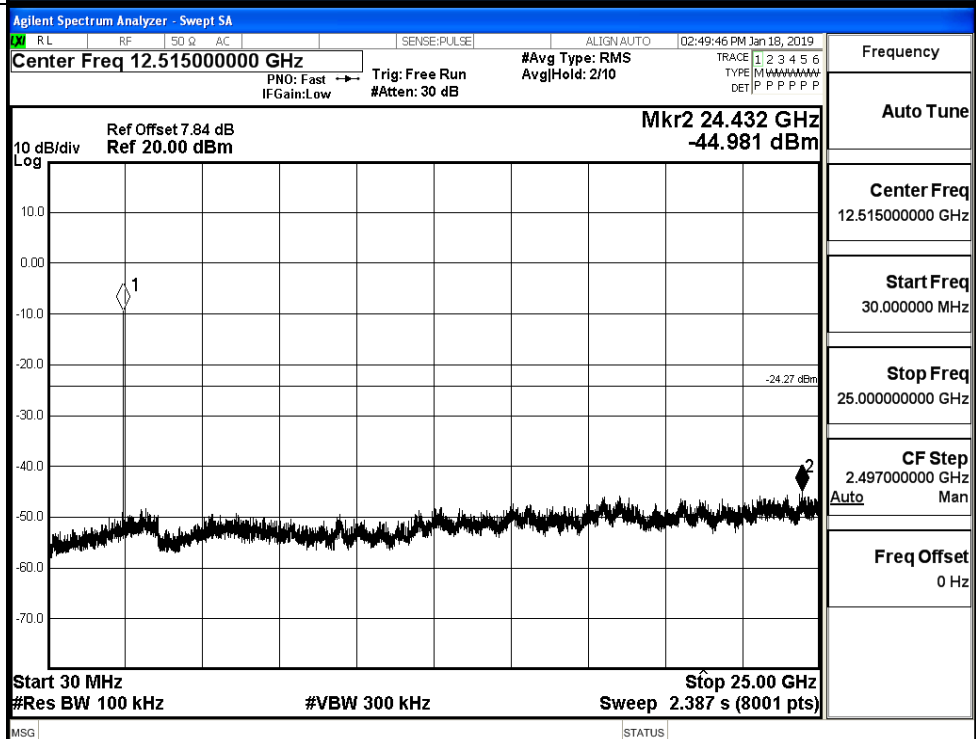


8DPSK_HCH_Graphs

Pref



Puw

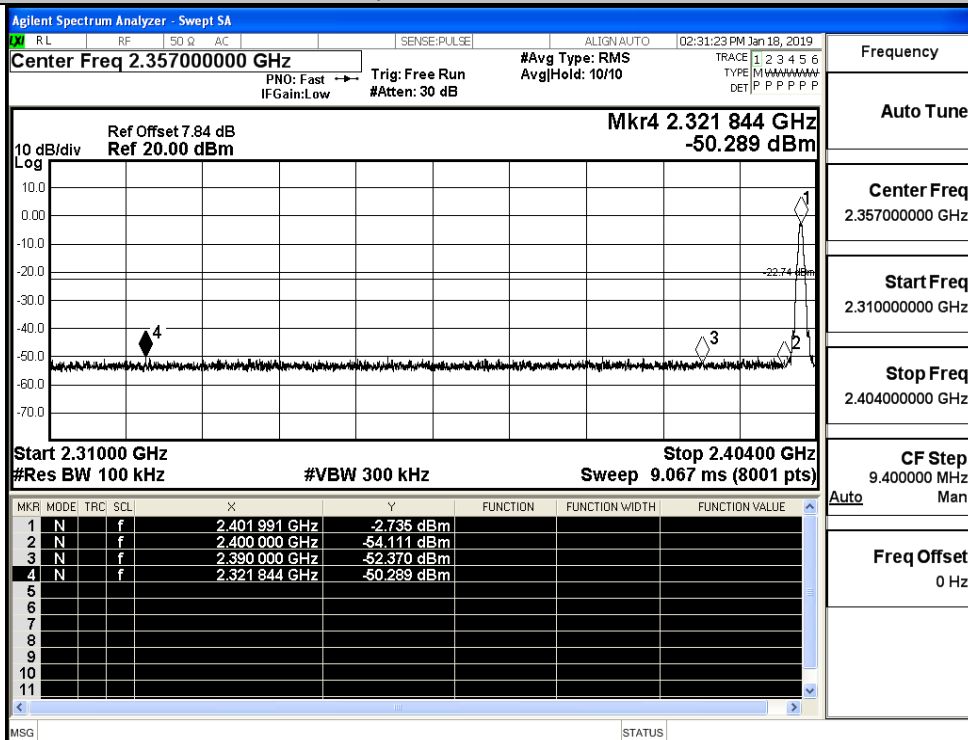


A.7 Band-edge for RF Conducted Emissions

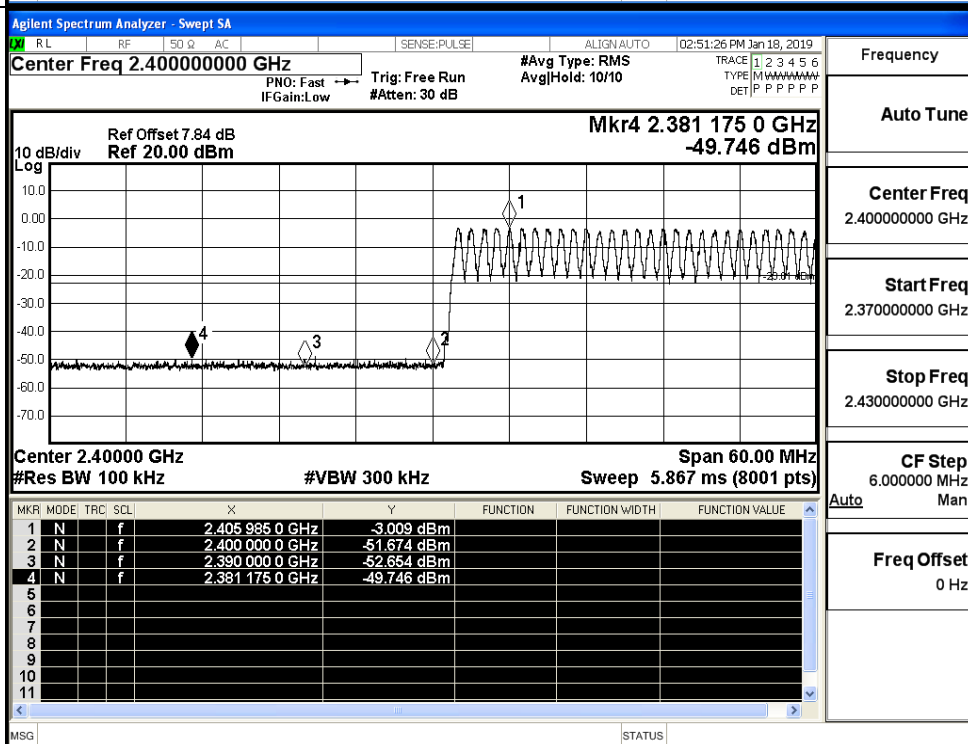
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-2.735	Off	-50.289	-22.74	PASS
			-3.009	On	-49.746	-23.01	PASS
	HCH	2480	-5.005	Off	-49.535	-25.01	PASS
			-3.944	On	-49.961	-23.94	PASS
$\pi/4$ DQPSK	LCH	2402	-1.972	Off	-50.141	-21.97	PASS
			-1.965	On	-49.308	-21.97	PASS
	HCH	2480	-4.233	Off	-50.174	-24.23	PASS
			-3.024	On	-49.313	-23.02	PASS
8DPSK	LCH	2402	-1.775	Off	-50.052	-21.78	PASS
			-2.509	On	-49.165	-22.51	PASS
	HCH	2480	-4.126	Off	-50.012	-24.13	PASS
			-3.174	On	-49.570	-23.17	PASS

Test Graphs

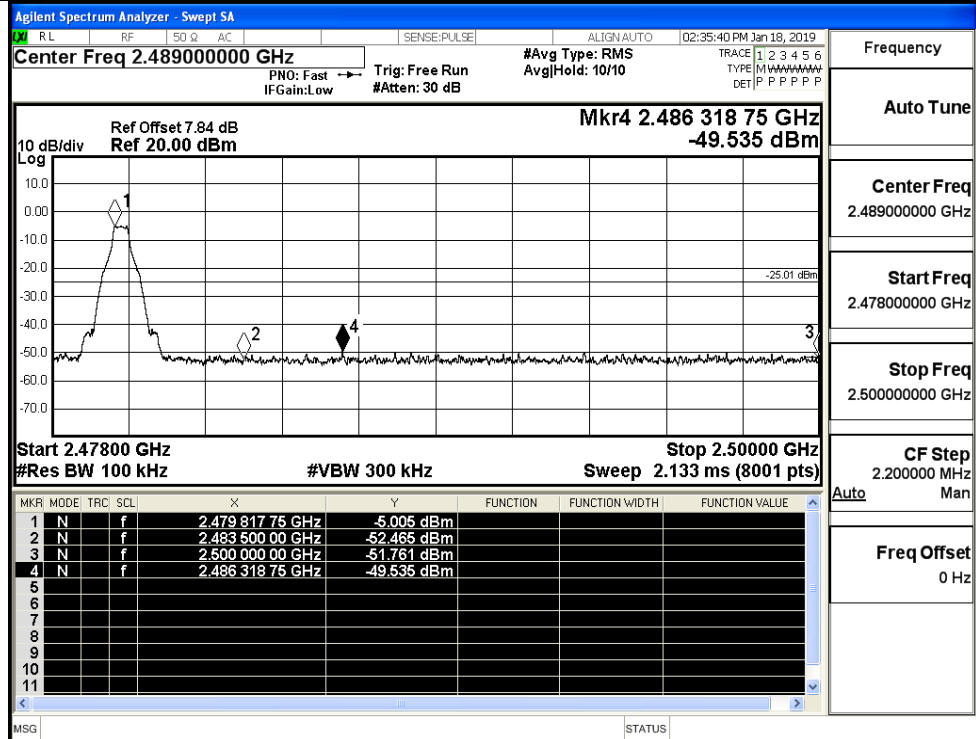
GFSK/LCH/No Hop



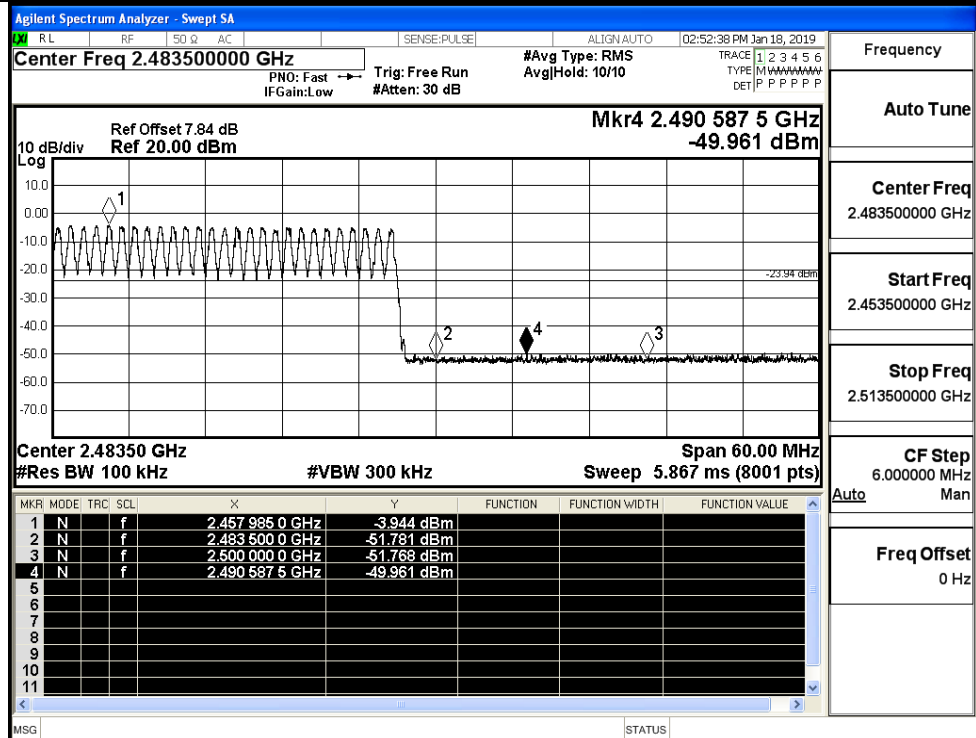
GFSK/LCH/Hop



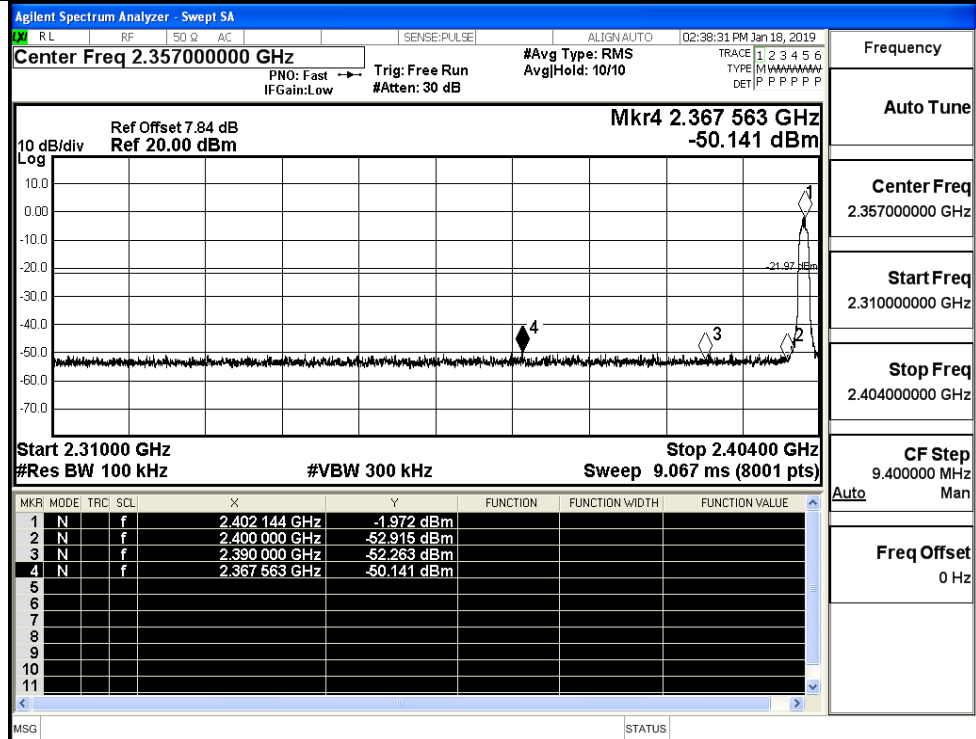
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

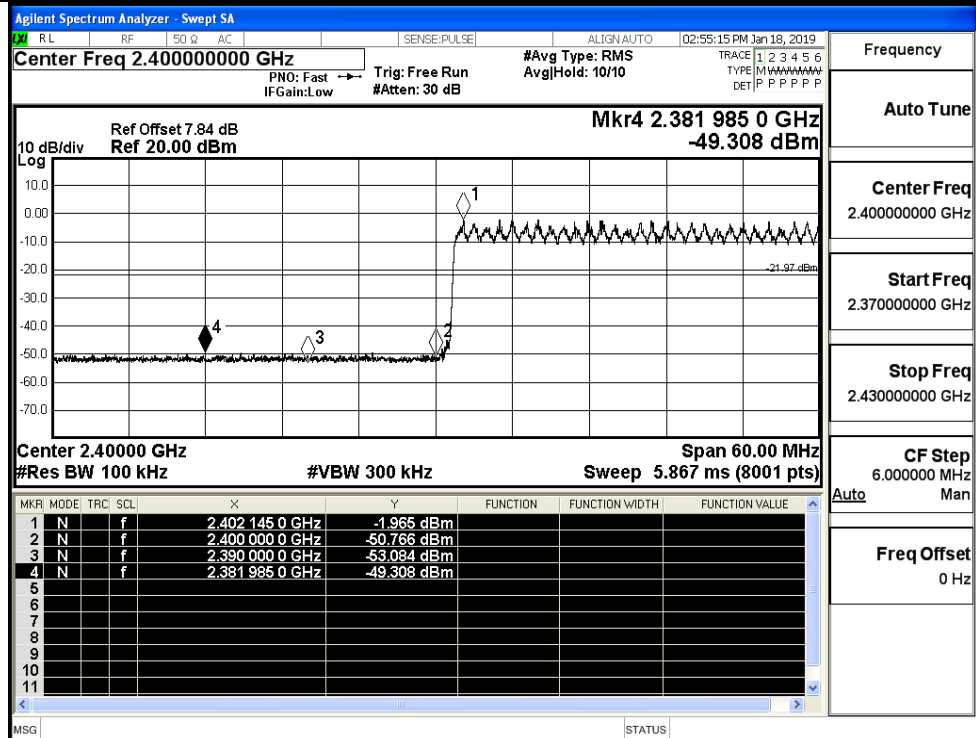
Start Freq
2.310000000 GHz

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

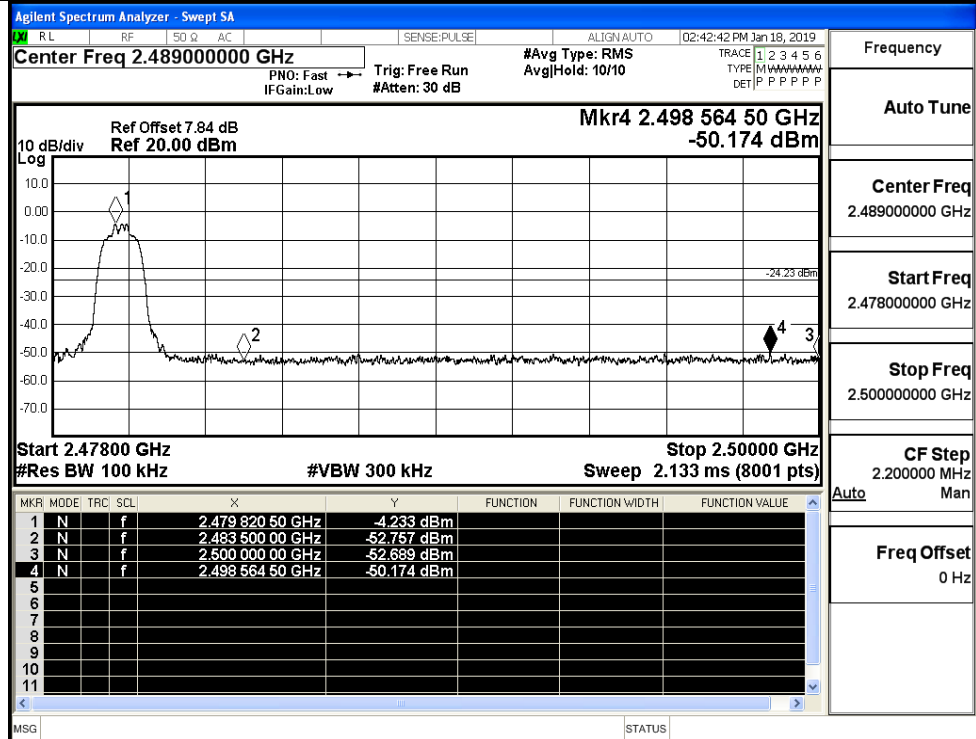
Start Freq
2.370000000 GHz

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 GHz

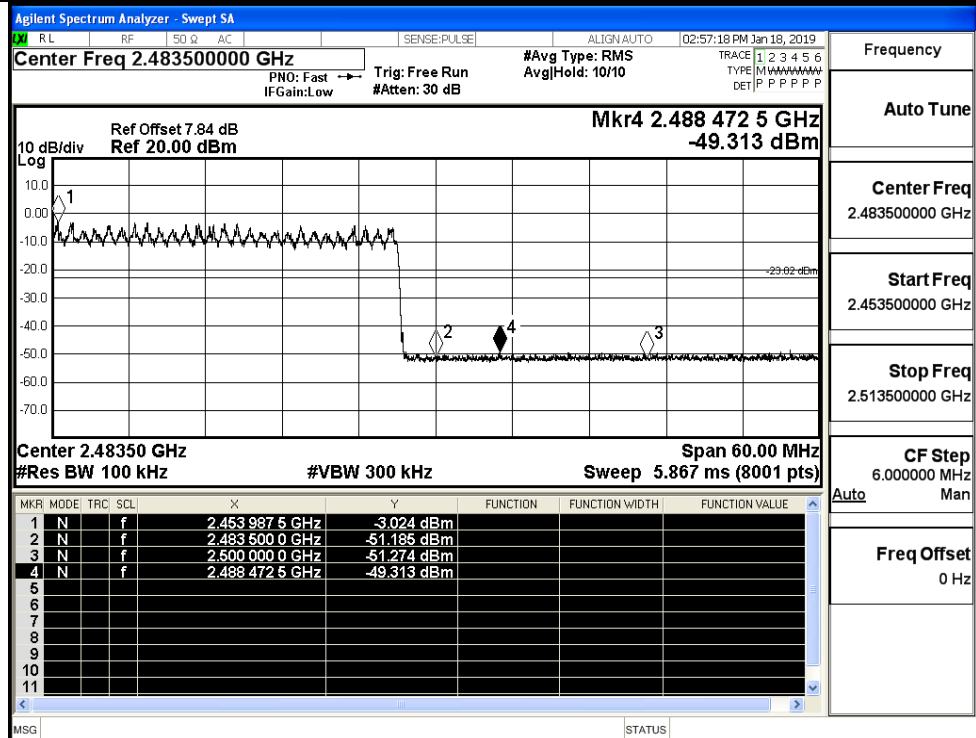
Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz
Auto Man

Freq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq
2.483500000 GHz

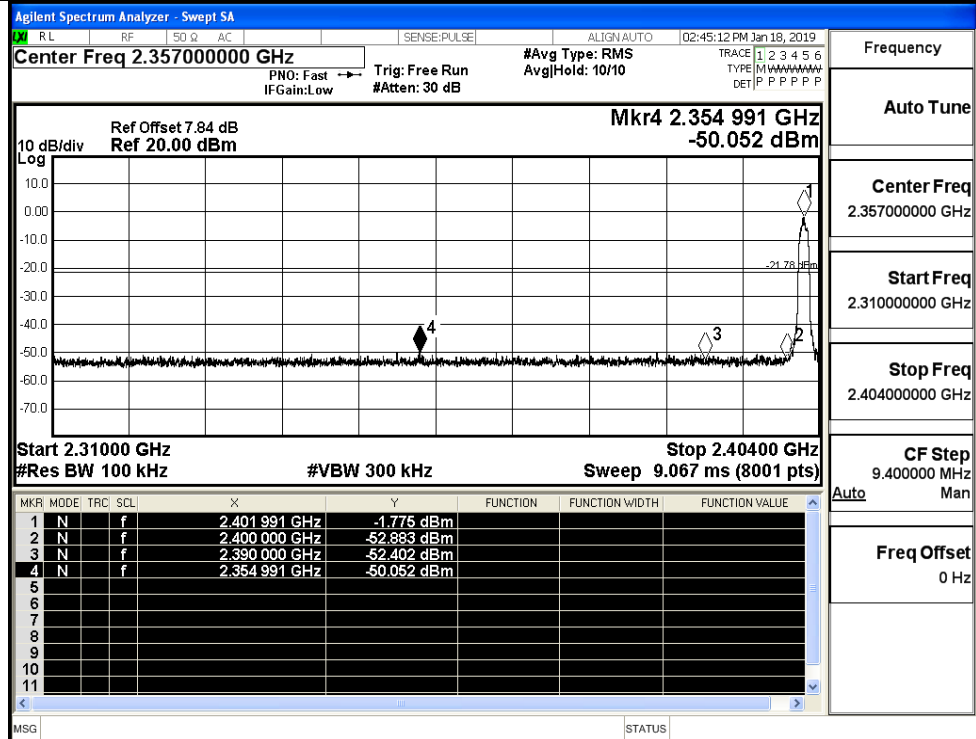
Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

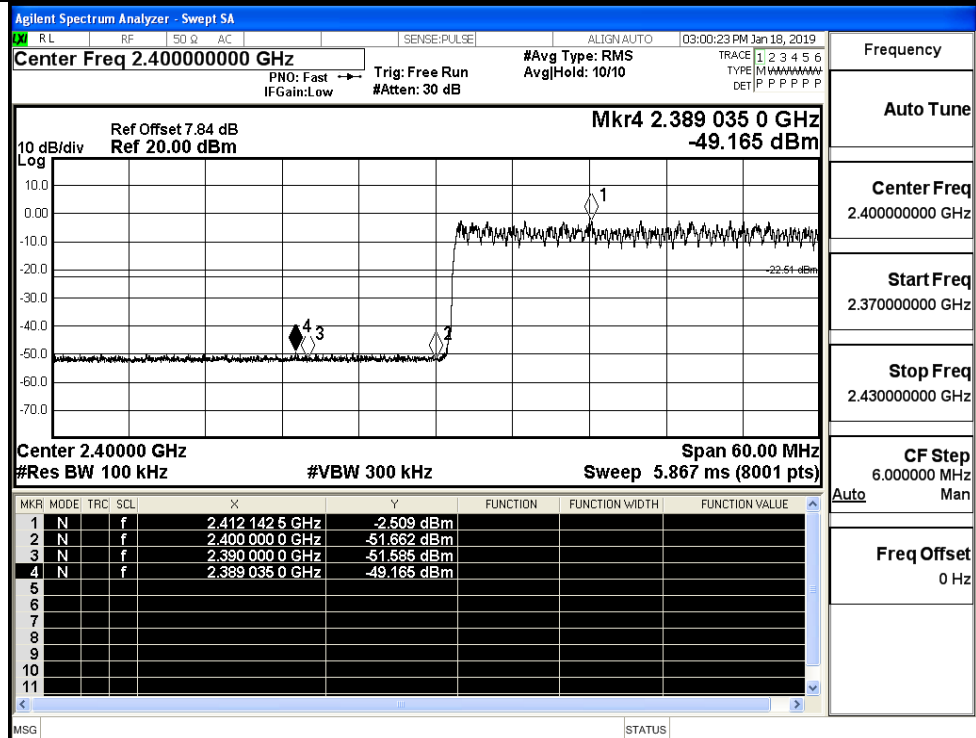
CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

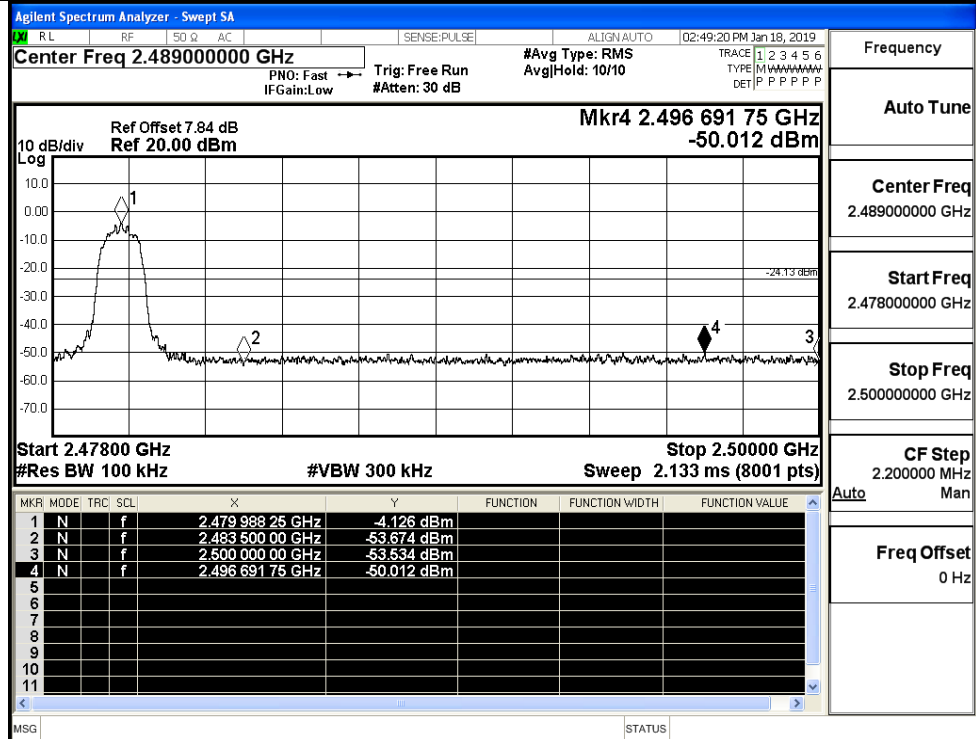
8DPSK/LCH/No Hop



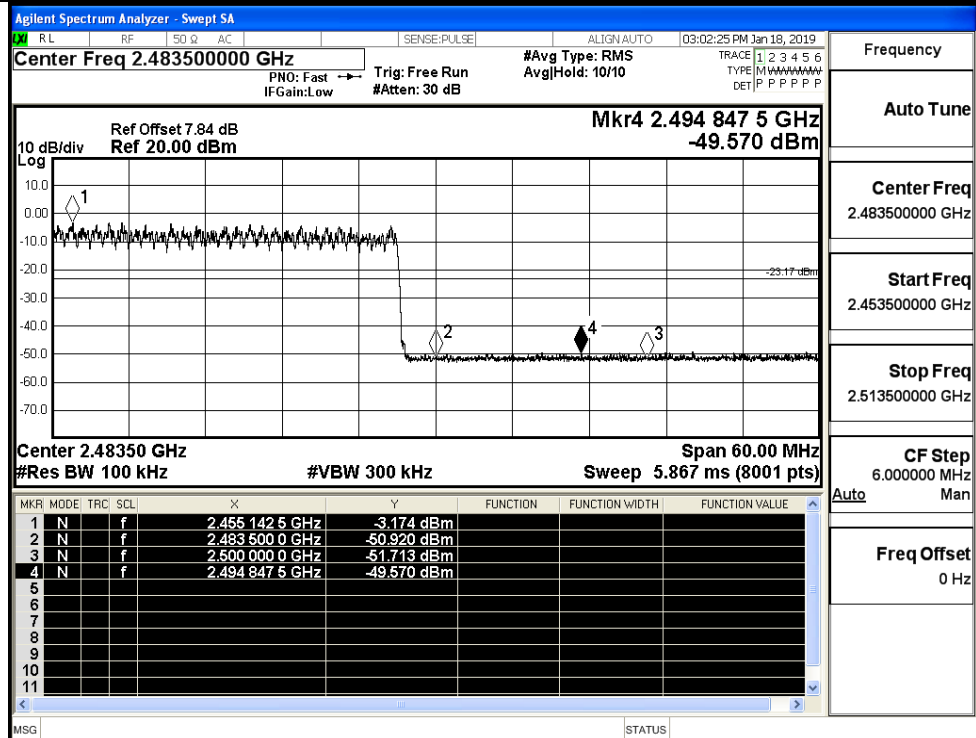
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



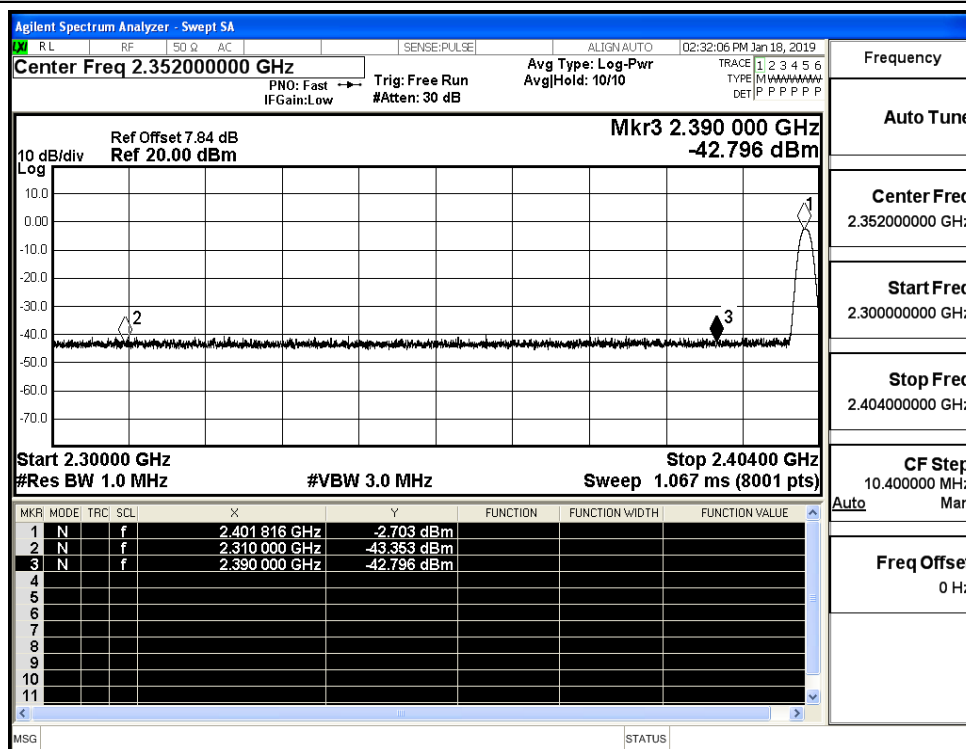
8DPSK/HCH/Hop



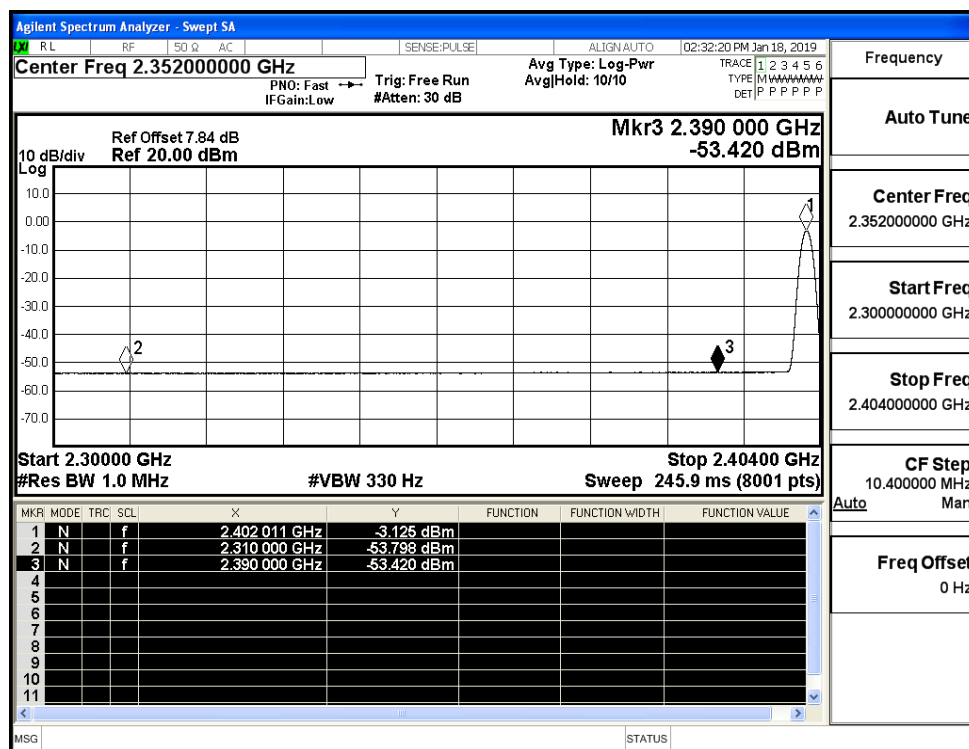
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.35	2.0	0	54.90	PEAK	74	PASS
	Off	2310.0	-53.80	2.0	0	44.46	AV	54	PASS
	Off	2390.0	-42.80	2.0	0	55.46	PEAK	74	PASS
	Off	2390.0	-53.42	2.0	0	44.84	AV	54	PASS
	Off	2483.5	-43.00	2.0	0	55.26	PEAK	74	PASS
	Off	2483.5	-53.27	2.0	0	44.99	AV	54	PASS
	Off	2500.0	-43.37	2.0	0	54.89	PEAK	74	PASS
	Off	2500.0	-53.07	2.0	0	45.19	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.01	2.0	0	54.24	PEAK	74	PASS
	Off	2310.0	-53.86	2.0	0	44.40	AV	54	PASS
	Off	2390.0	-42.54	2.0	0	55.71	PEAK	74	PASS
	Off	2390.0	-53.51	2.0	0	44.74	AV	54	PASS
	Off	2483.5	-41.02	2.0	0	57.23	PEAK	74	PASS
	Off	2483.5	-53.17	2.0	0	45.08	AV	54	PASS
	Off	2500.0	-43.72	2.0	0	54.53	PEAK	74	PASS
	Off	2500.0	-53.12	2.0	0	45.13	AV	54	PASS
8DPSK	Off	2310.0	-44.26	2.0	0	54.00	PEAK	74	PASS
	Off	2310.0	-53.76	2.0	0	44.50	AV	54	PASS
	Off	2390.0	-44.03	2.0	0	54.23	PEAK	74	PASS
	Off	2390.0	-53.58	2.0	0	44.68	AV	54	PASS
	Off	2483.5	-43.78	2.0	0	54.48	PEAK	74	PASS
	Off	2483.5	-53.29	2.0	0	44.97	AV	54	PASS
	Off	2500.0	-42.94	2.0	0	55.32	PEAK	74	PASS
	Off	2500.0	-53.17	2.0	0	45.09	AV	54	PASS

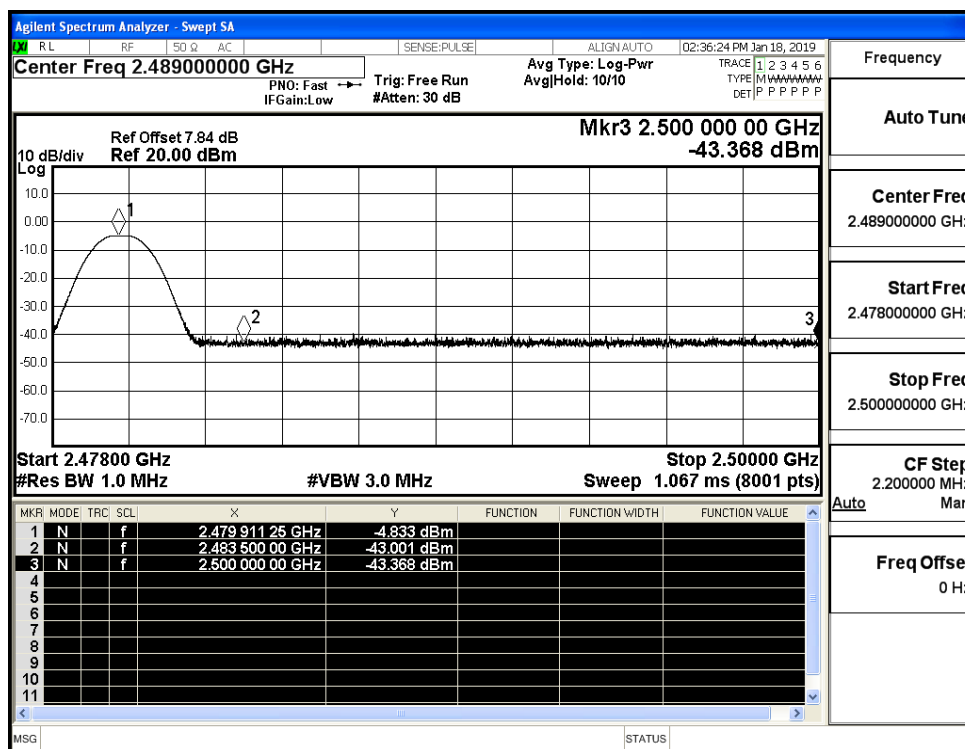
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



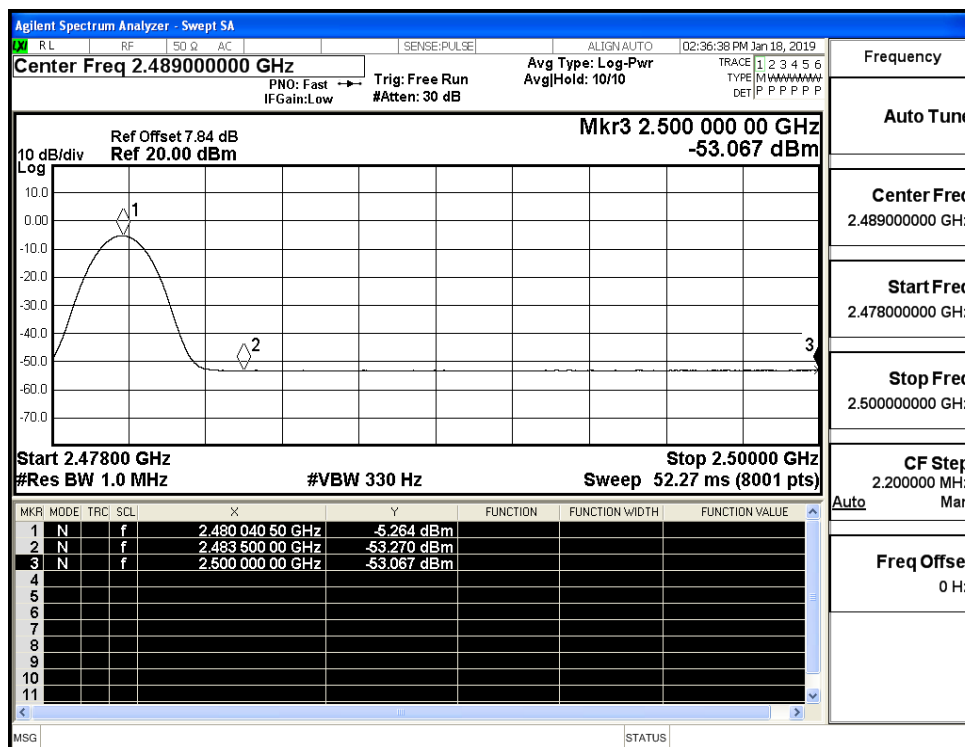
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

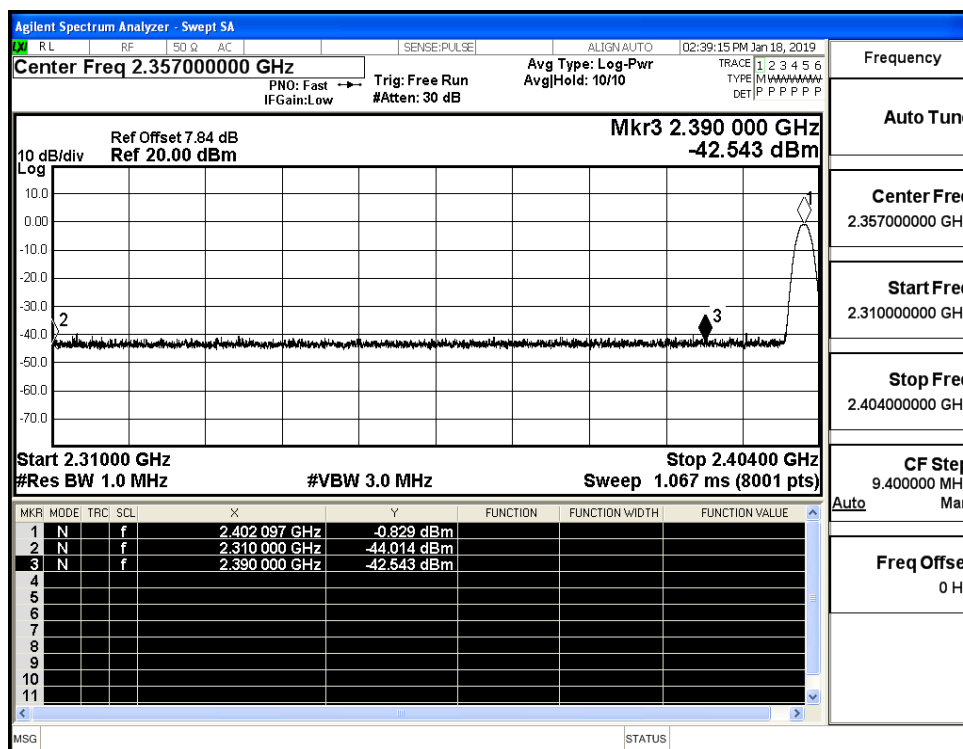
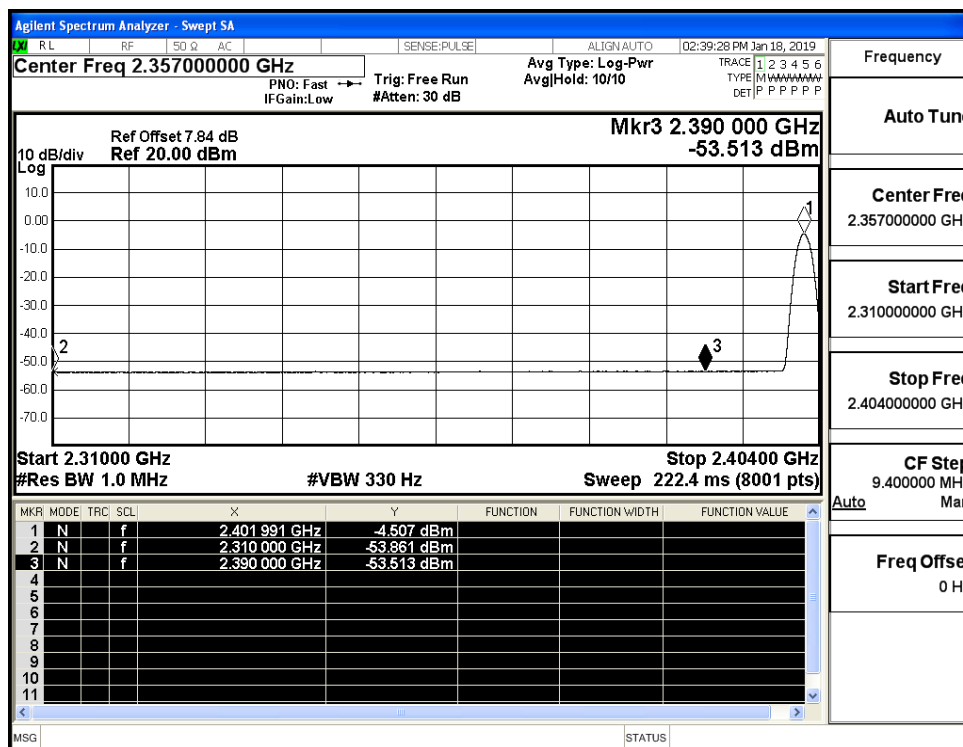


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

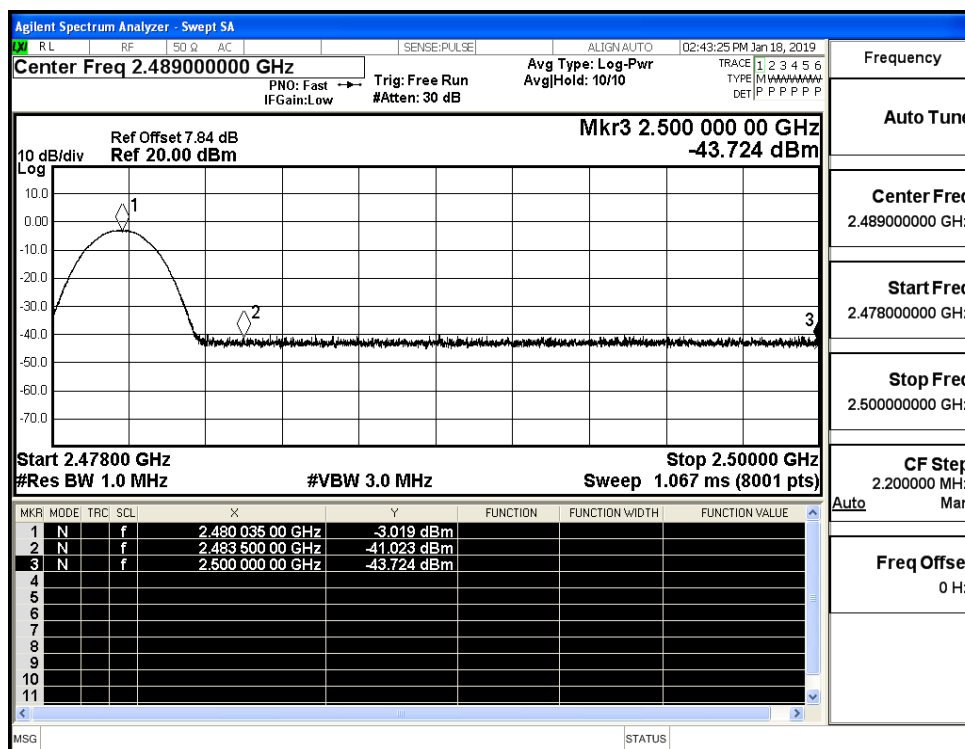


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

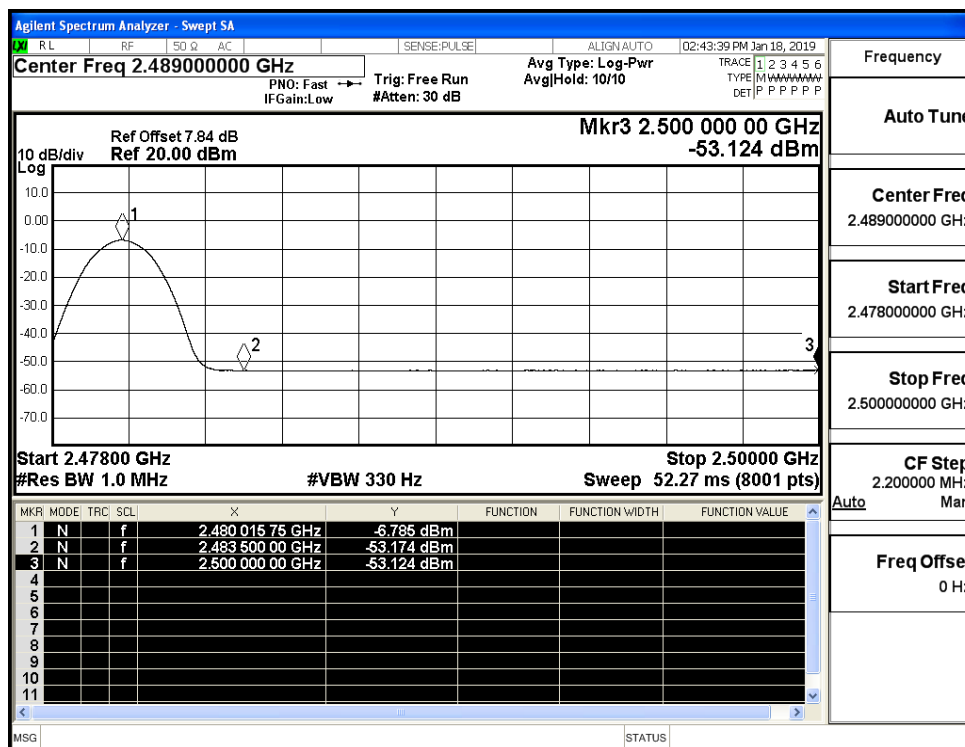


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

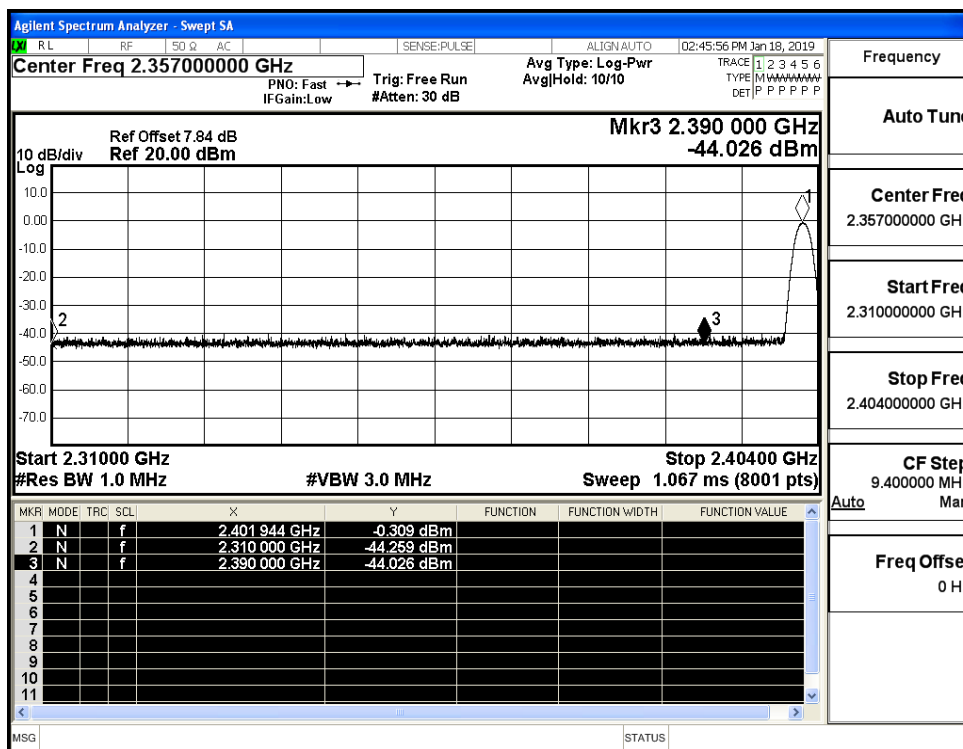
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



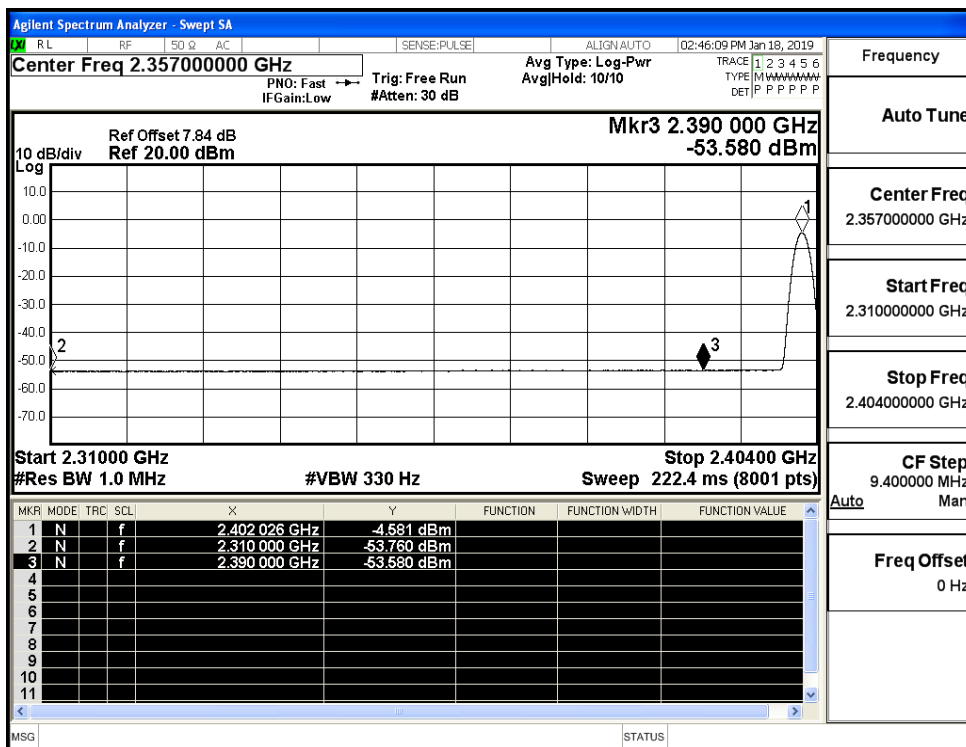
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



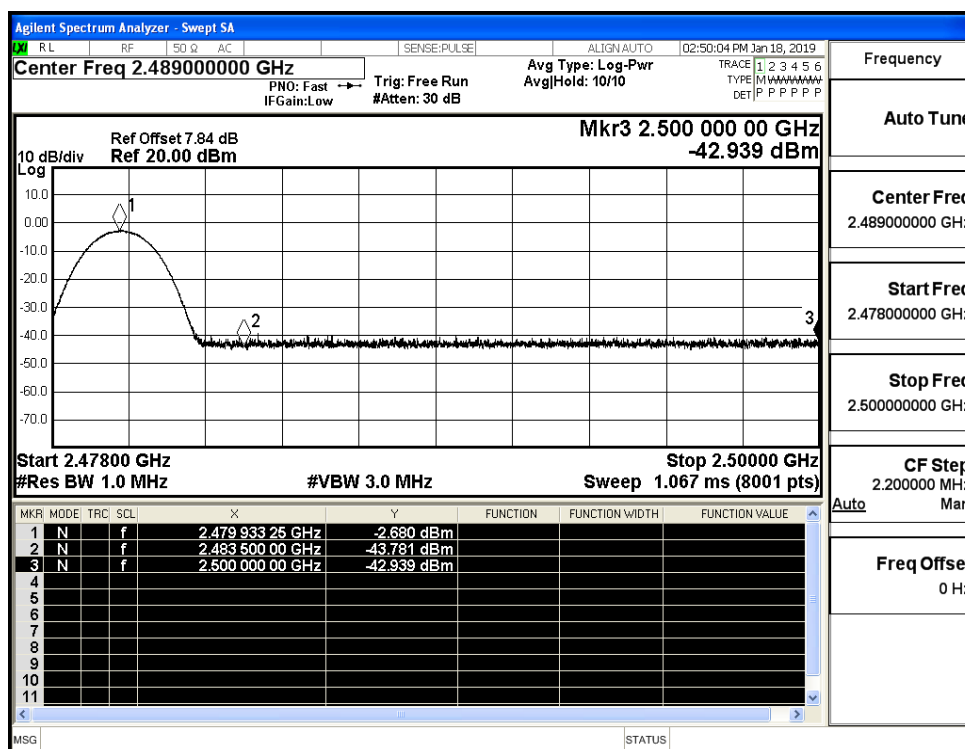
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

