

Appendix A

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

Product Name: GNSS RECEIVER

Trade Mark: KOLIDA, SANDING, RUIDE, TIANYU, SOUTH

Test Model: G1Star

Environmental Conditions

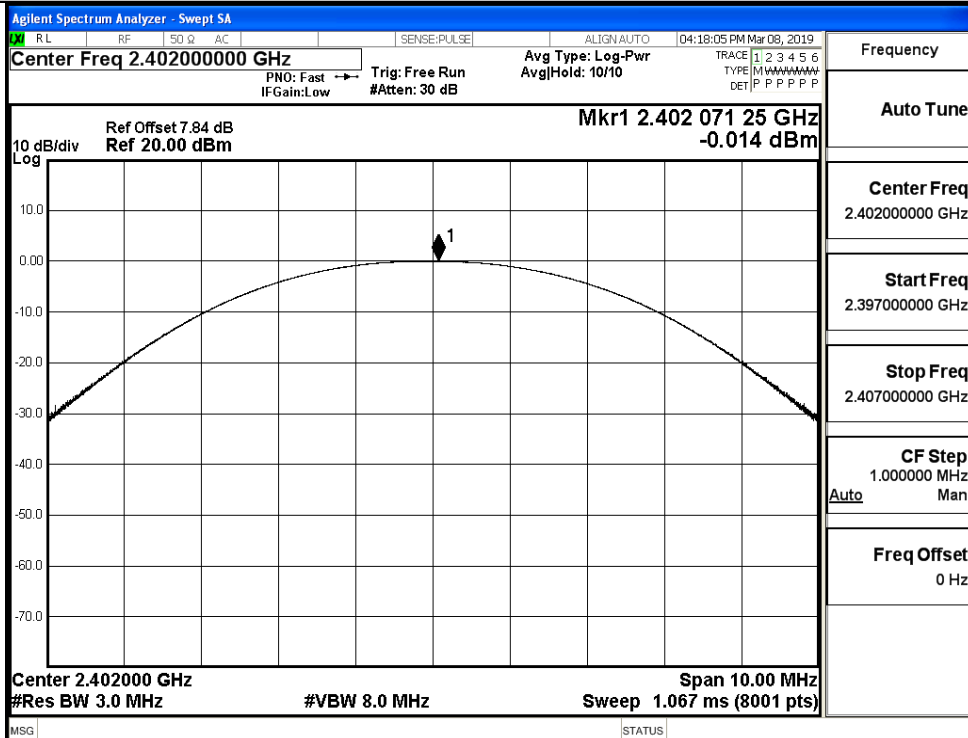
Temperature:	21.8° C
Relative Humidity:	53.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

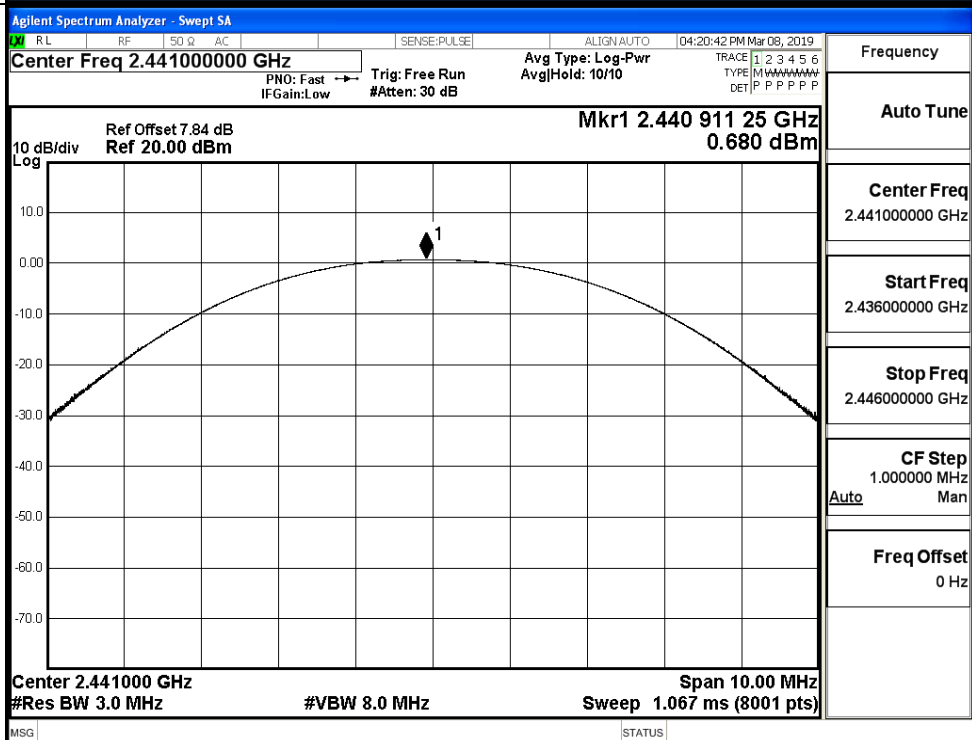
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.014	21	PASS
	MCH	0.680	21	PASS
	HCH	0.742	21	PASS
$\pi/4$ DQPSK	LCH	-0.525	21	PASS
	MCH	0.220	21	PASS
	HCH	0.380	21	PASS
8DPSK	LCH	-0.467	21	PASS
	MCH	0.505	21	PASS
	HCH	0.468	21	PASS

Test Graphs

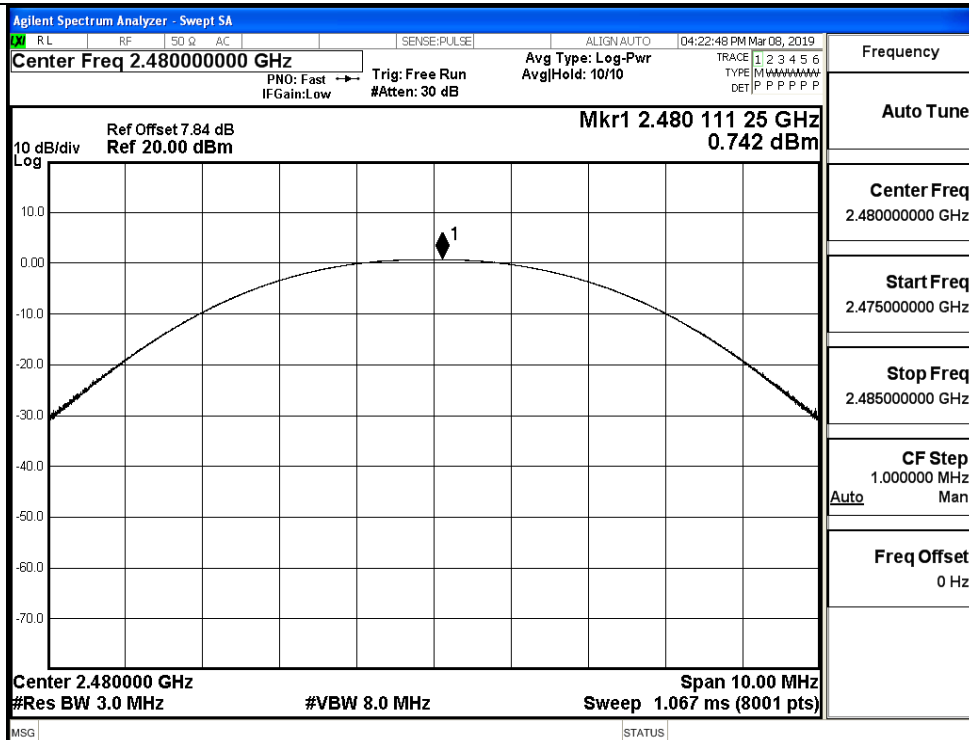
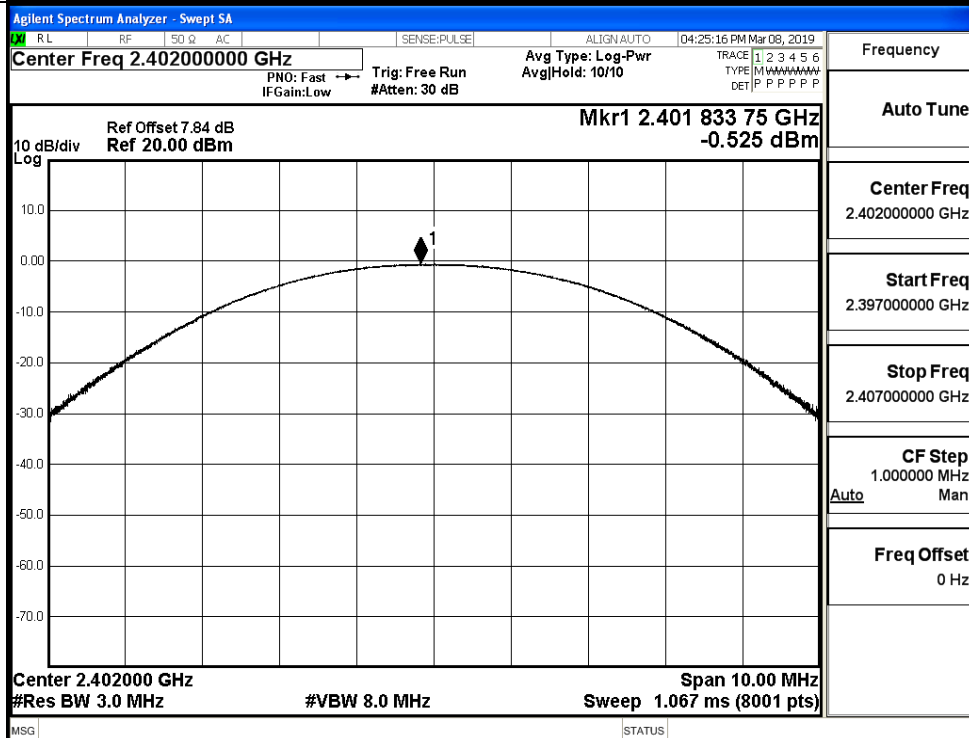
GFSK/LCH

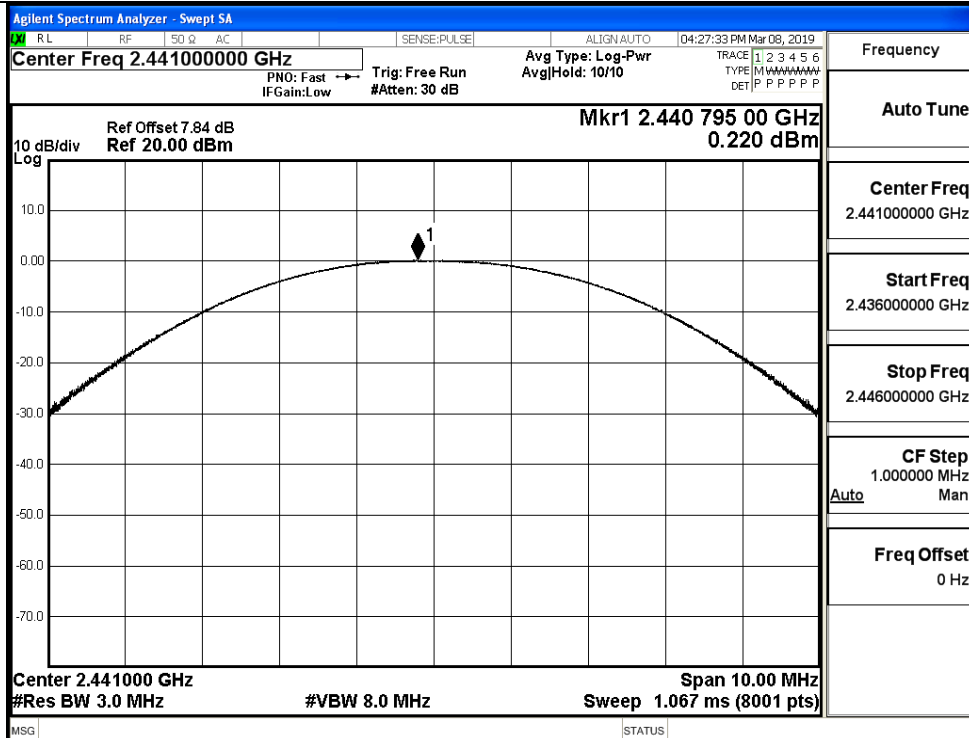
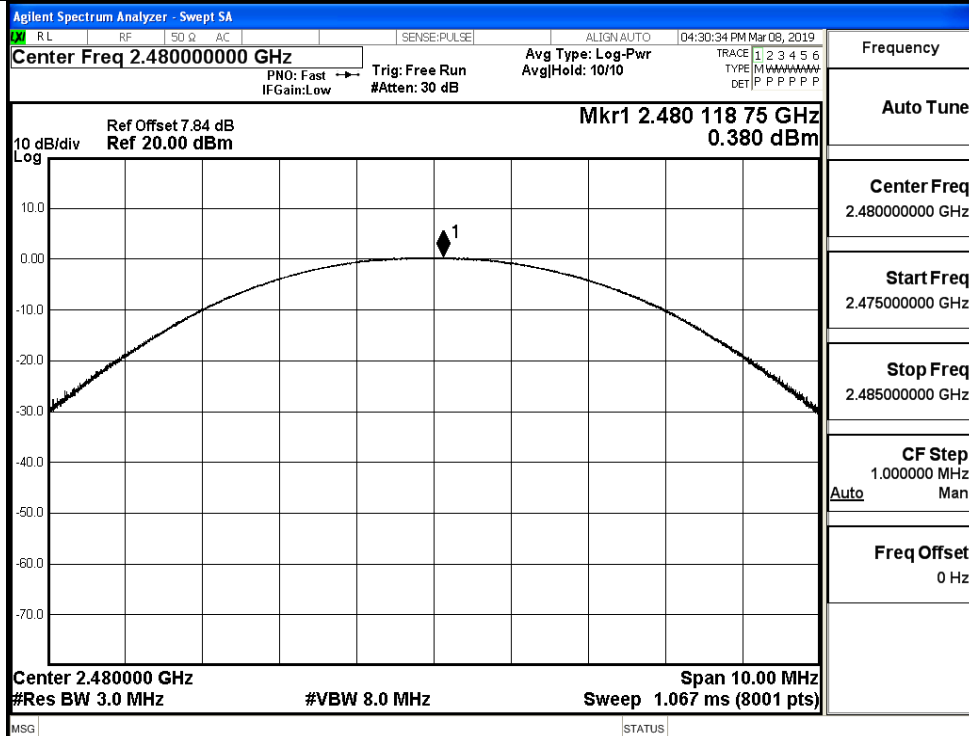


GFSK/MCH

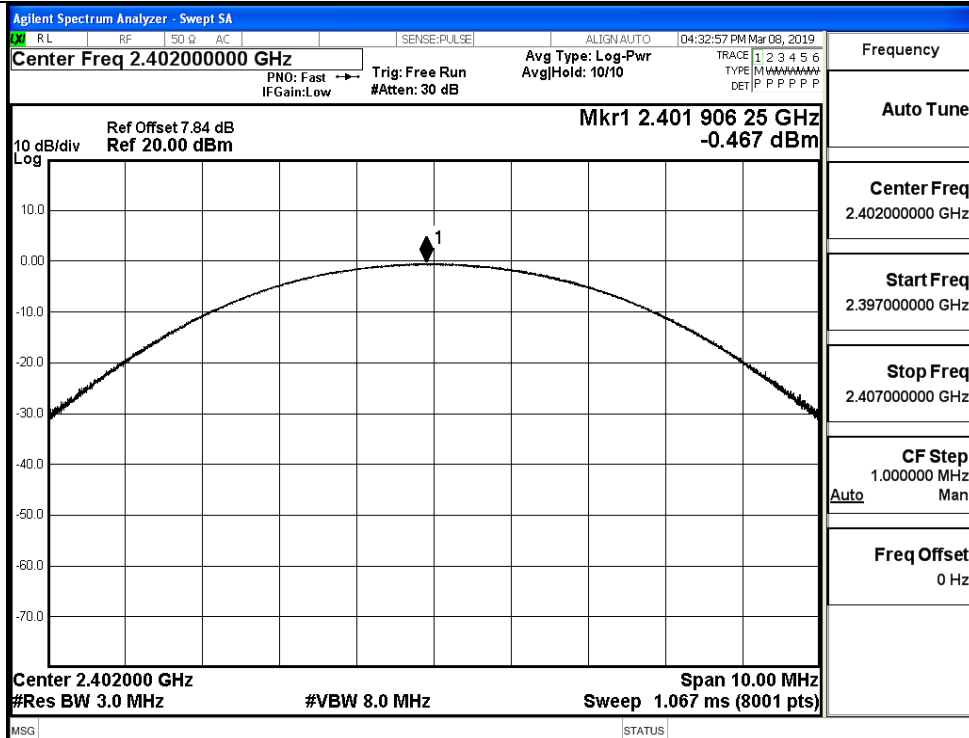


GFSK/HCH

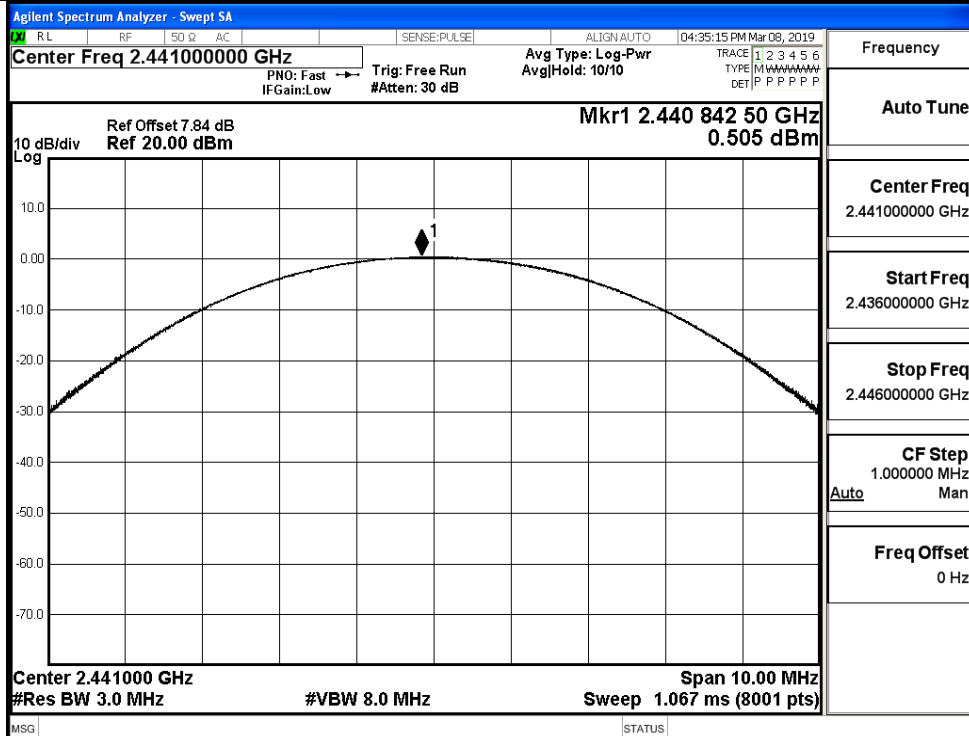
 $\pi/4$ DQPSK/LCH

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

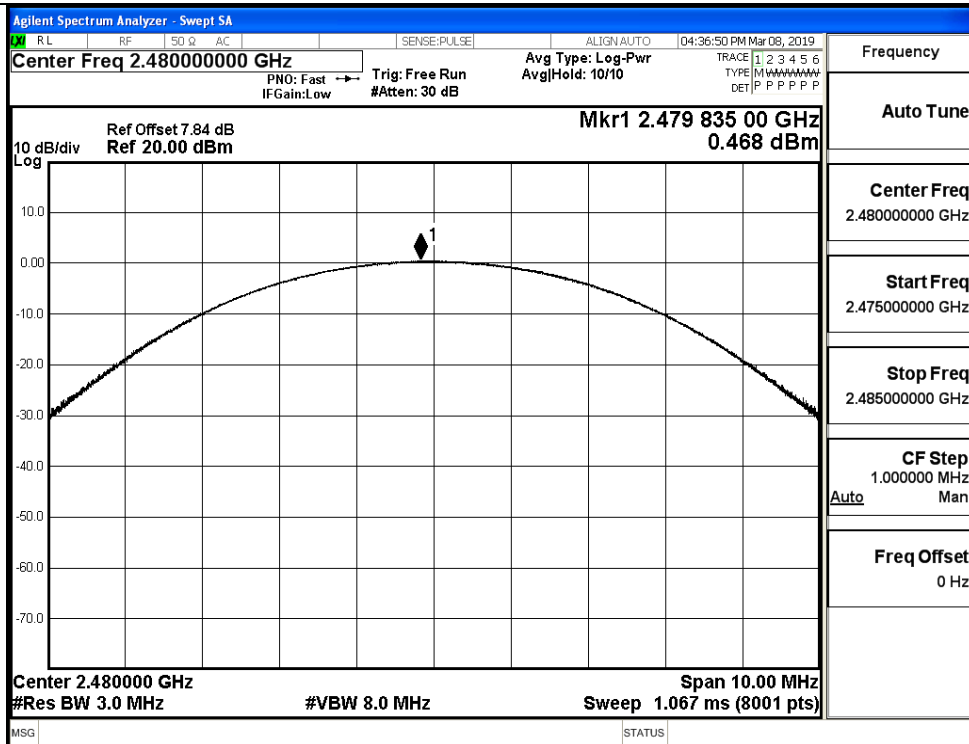
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

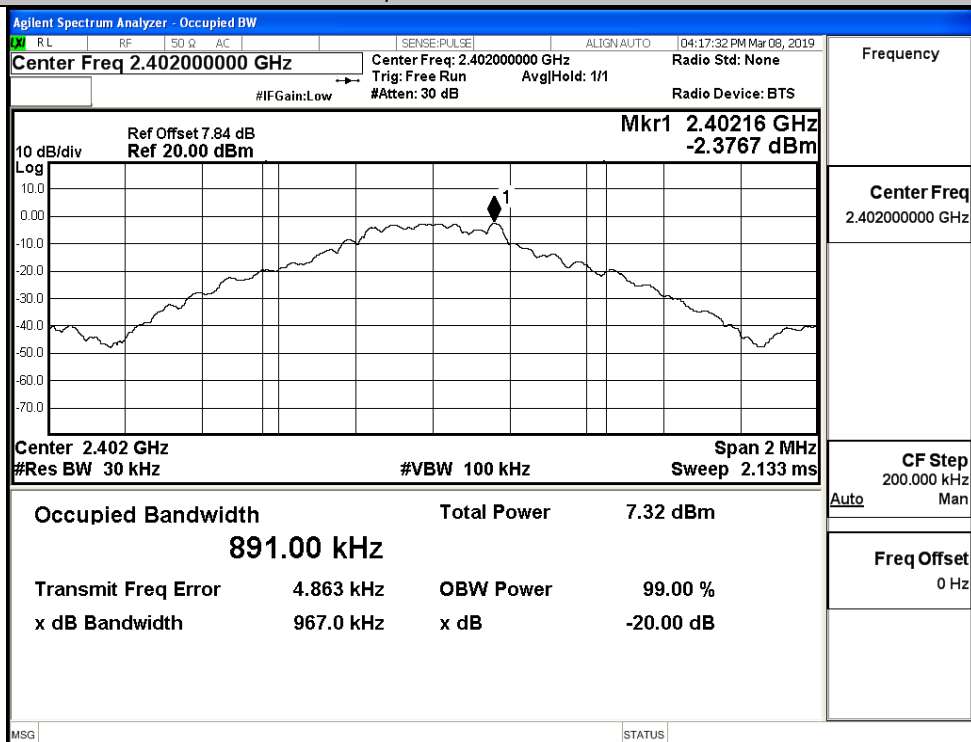


A.2 20dB Bandwidth

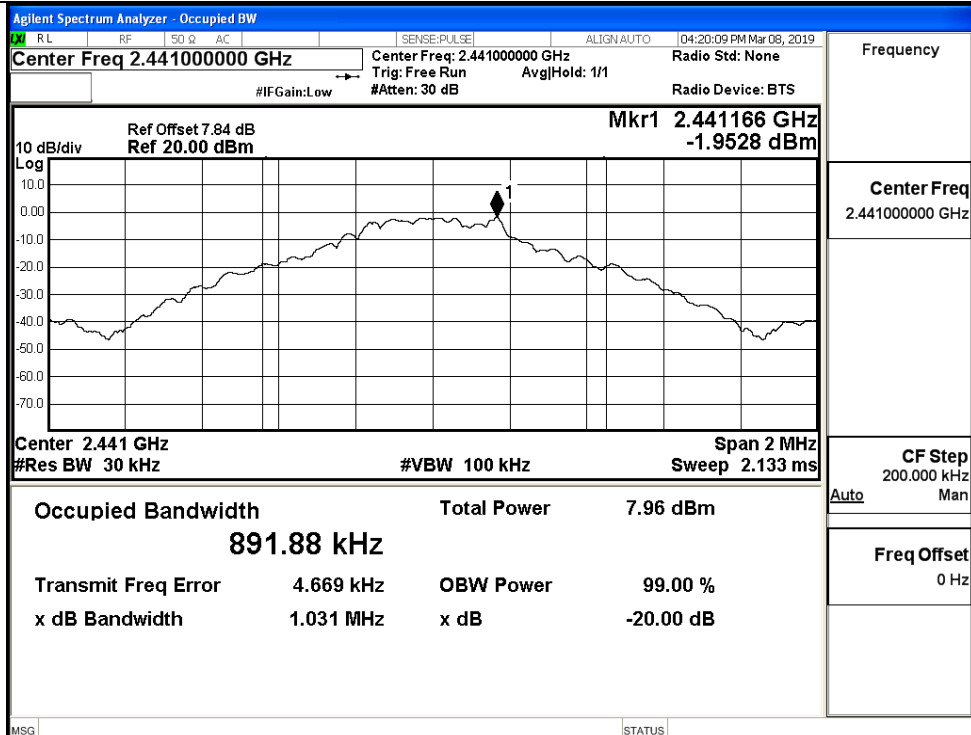
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9670	Not Specified	PASS
	MCH	1.031	Not Specified	PASS
	HCH	0.9732	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.292	Not Specified	PASS
	MCH	1.290	Not Specified	PASS
	HCH	1.269	Not Specified	PASS
8DPSK	LCH	1.297	Not Specified	PASS
	MCH	1.297	Not Specified	PASS
	HCH	1.297	Not Specified	PASS

Test Graphs

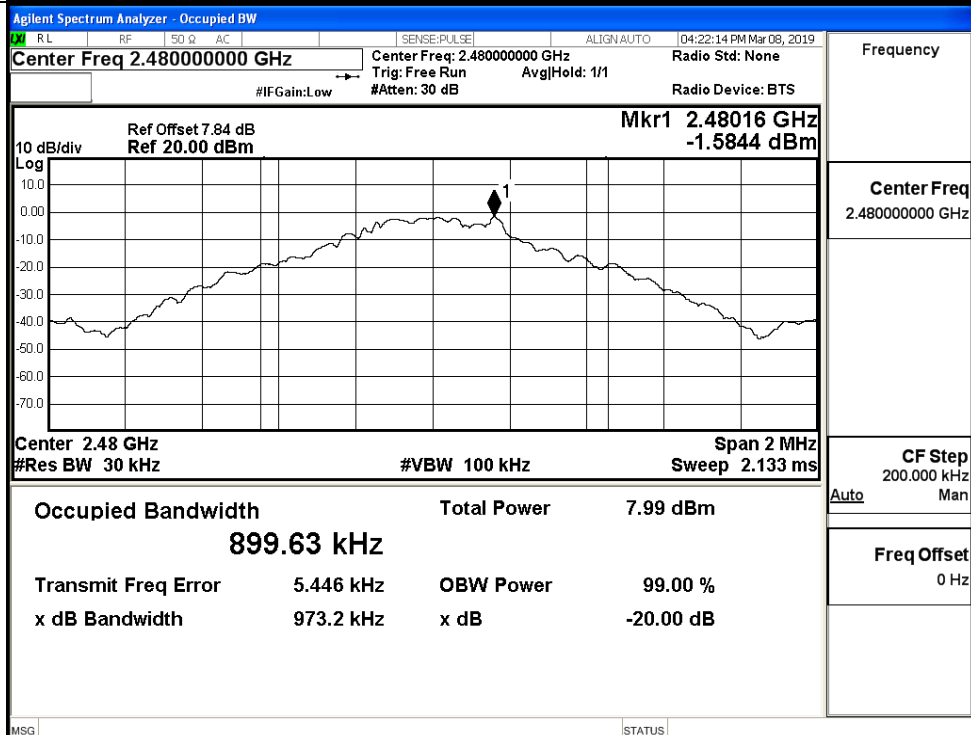
GFSK/LCH

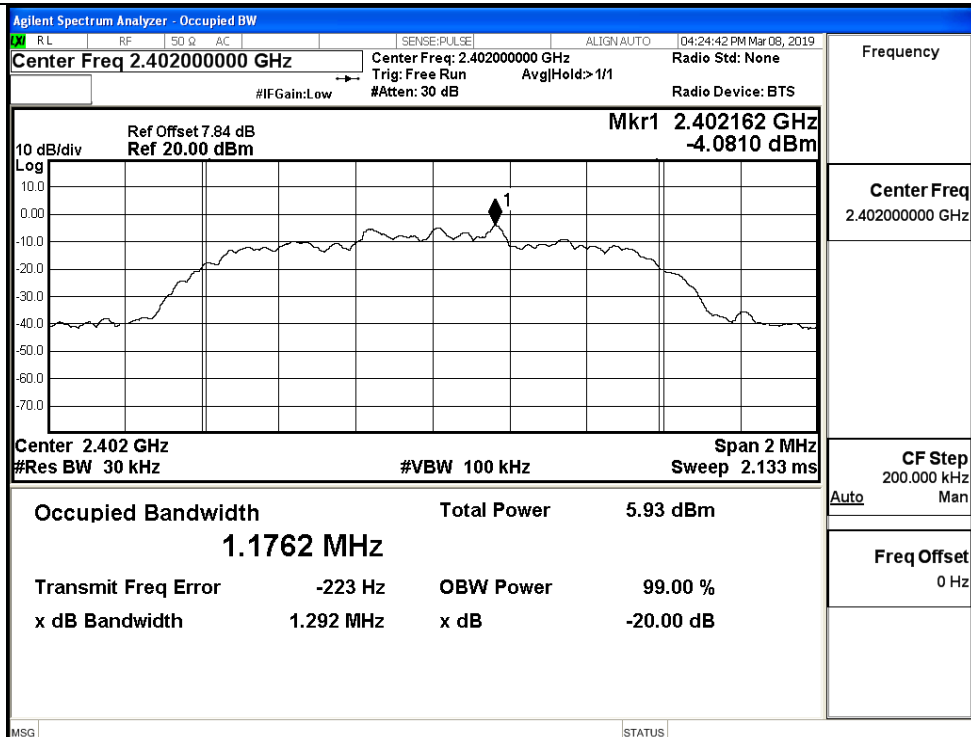
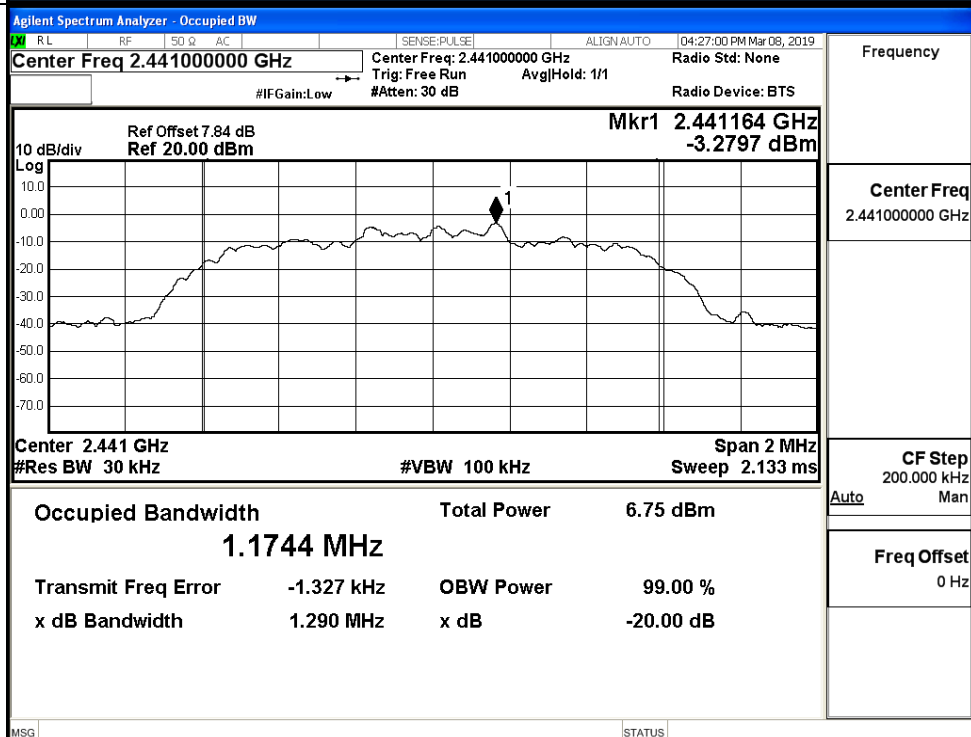


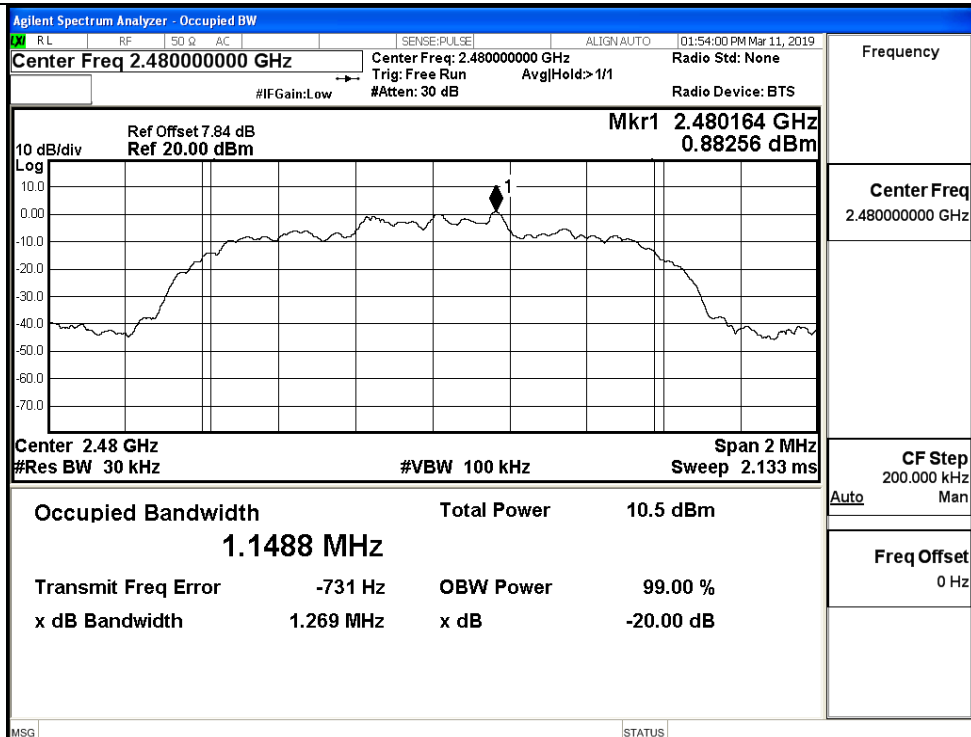
GFSK/MCH



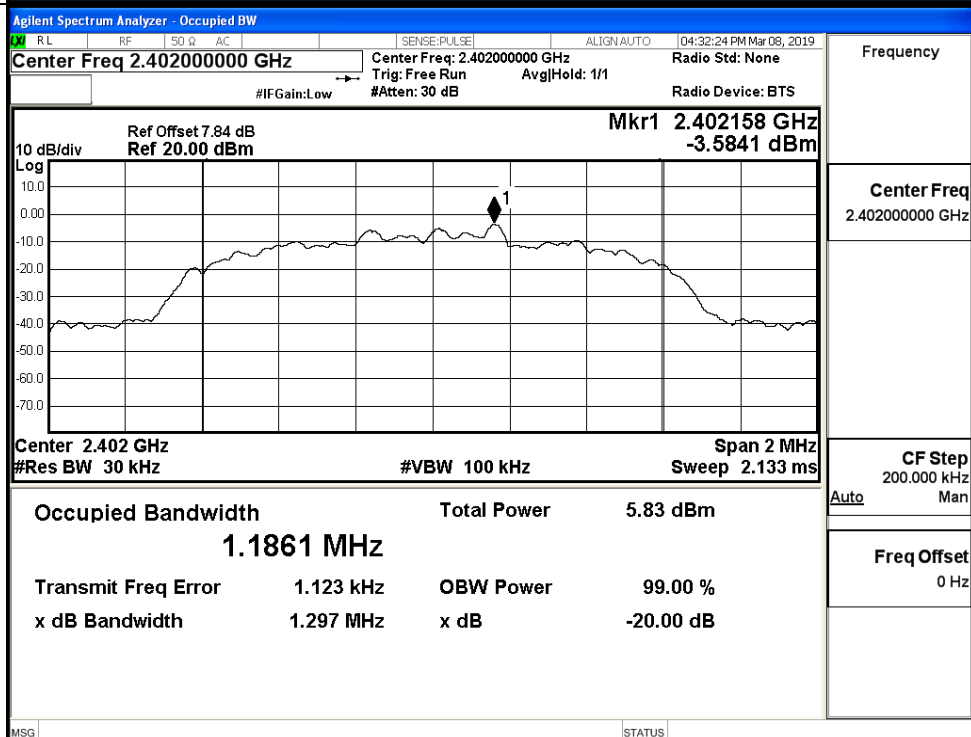
GFSK/HCH



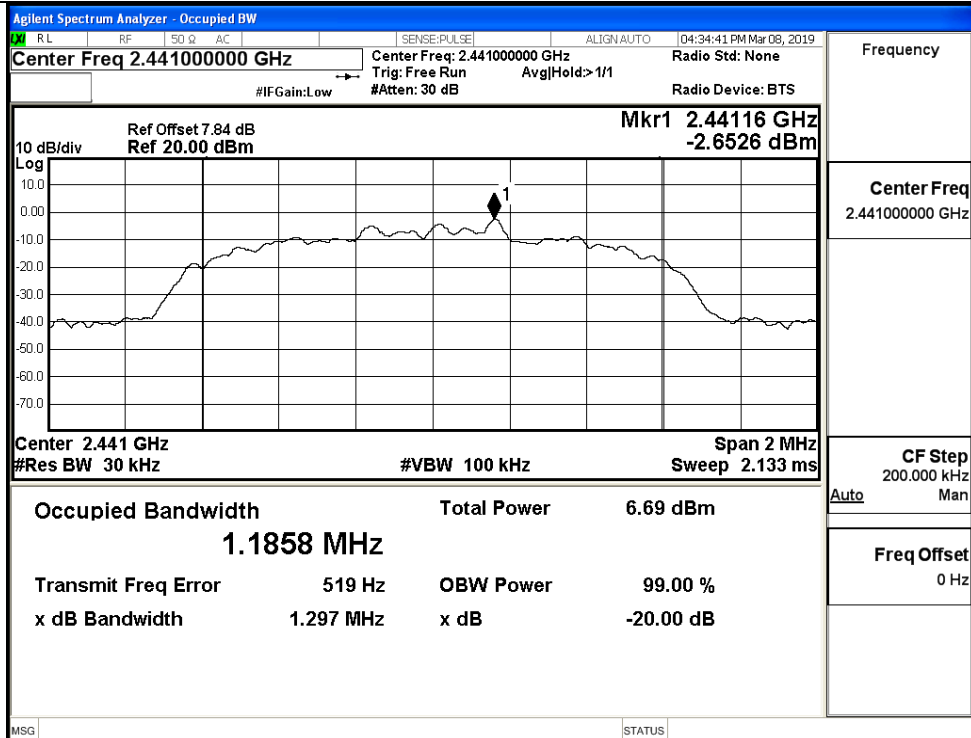
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

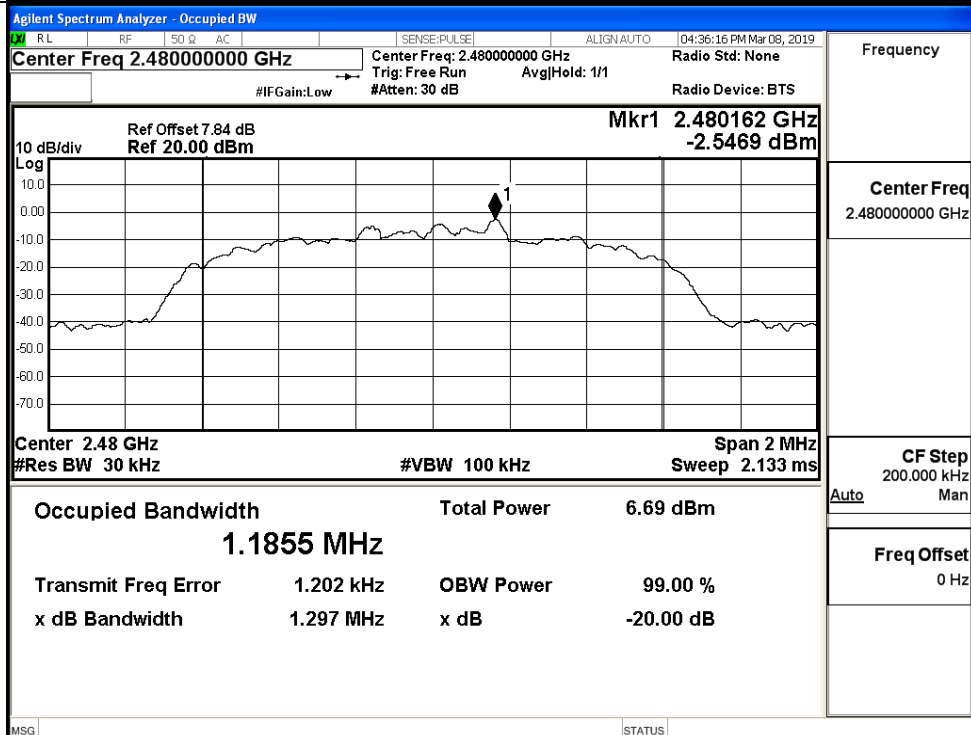
8DPSK/LCH



8DPSK/MCH



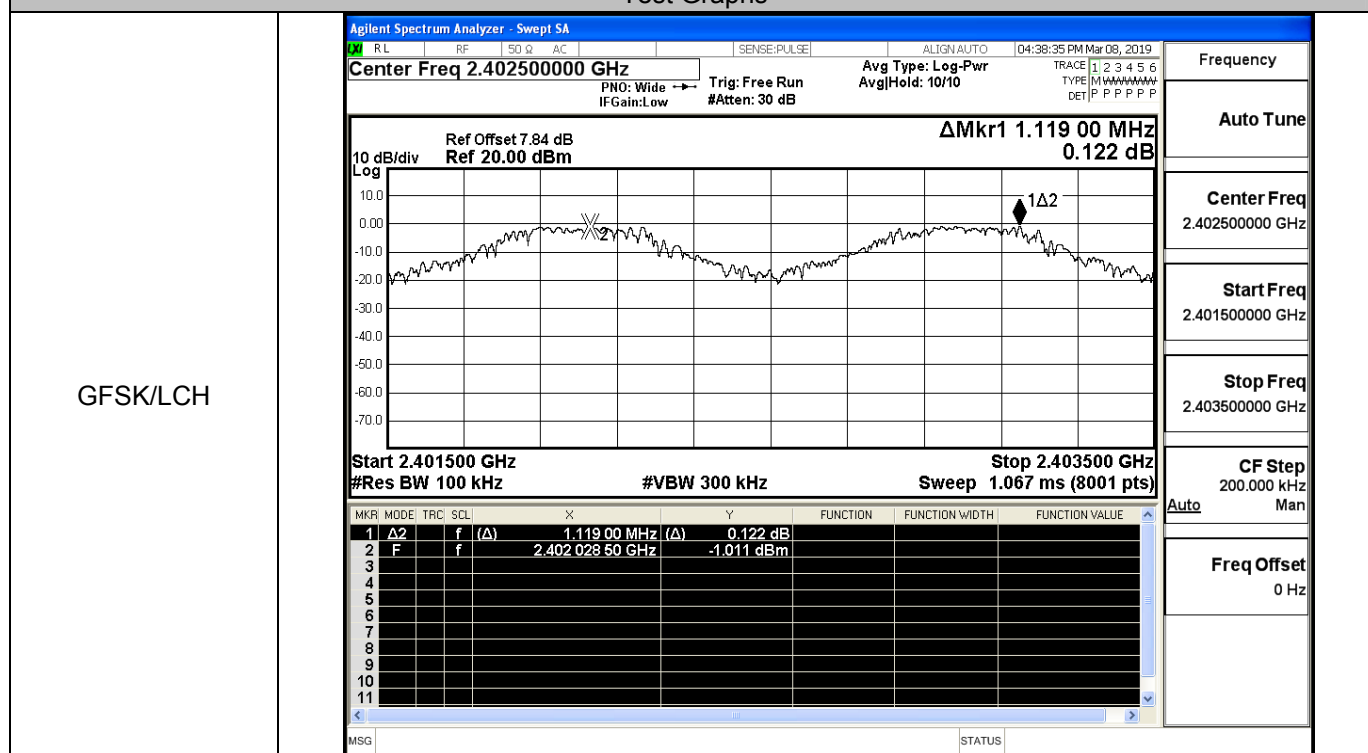
8DPSK/HCH



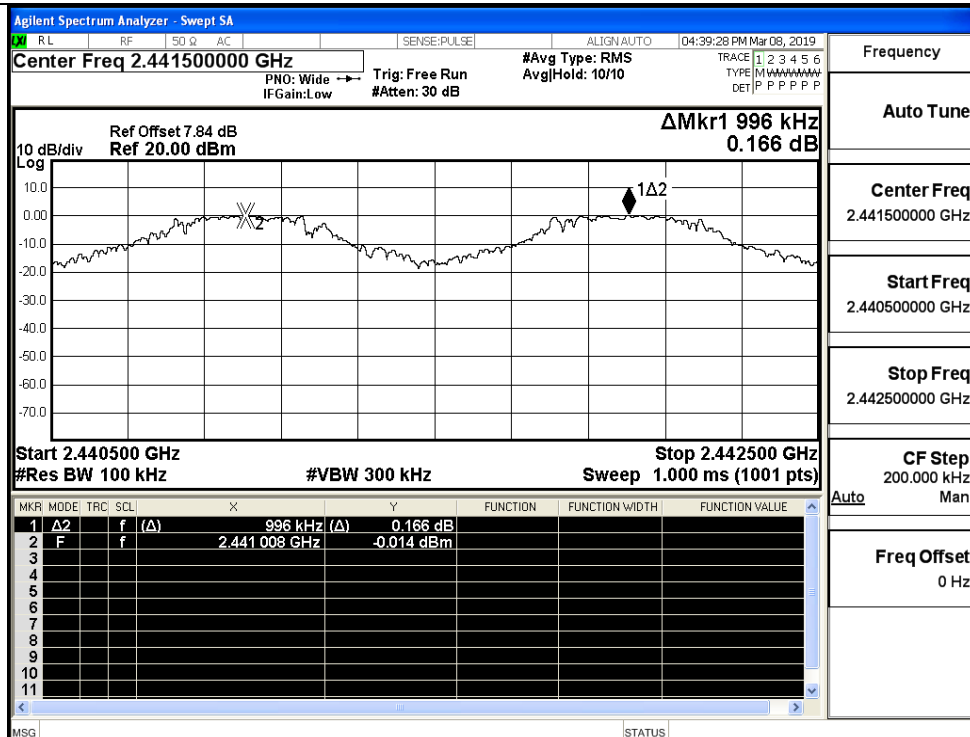
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.119	0.687	PASS
	MCH	0.996	0.687	PASS
	HCH	0.986	0.687	PASS
$\pi/4$ DQPSK	LCH	1.076	0.861	PASS
	MCH	1.052	0.861	PASS
	HCH	1.038	0.861	PASS
8DPSK	LCH	1.050	0.865	PASS
	MCH	0.940	0.865	PASS
	HCH	0.858	0.865	PASS

Test Graphs



GFSK/MCH

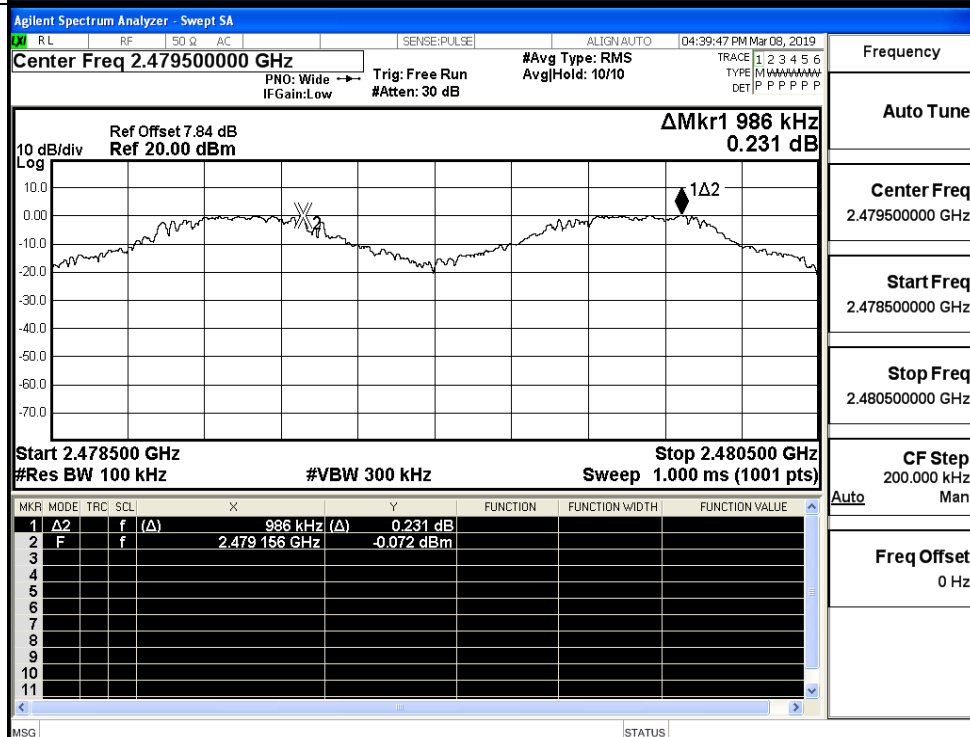


Frequency

Auto Tune

Center Freq
2.441500000 GHzStart Freq
2.440500000 GHzStop Freq
2.442500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

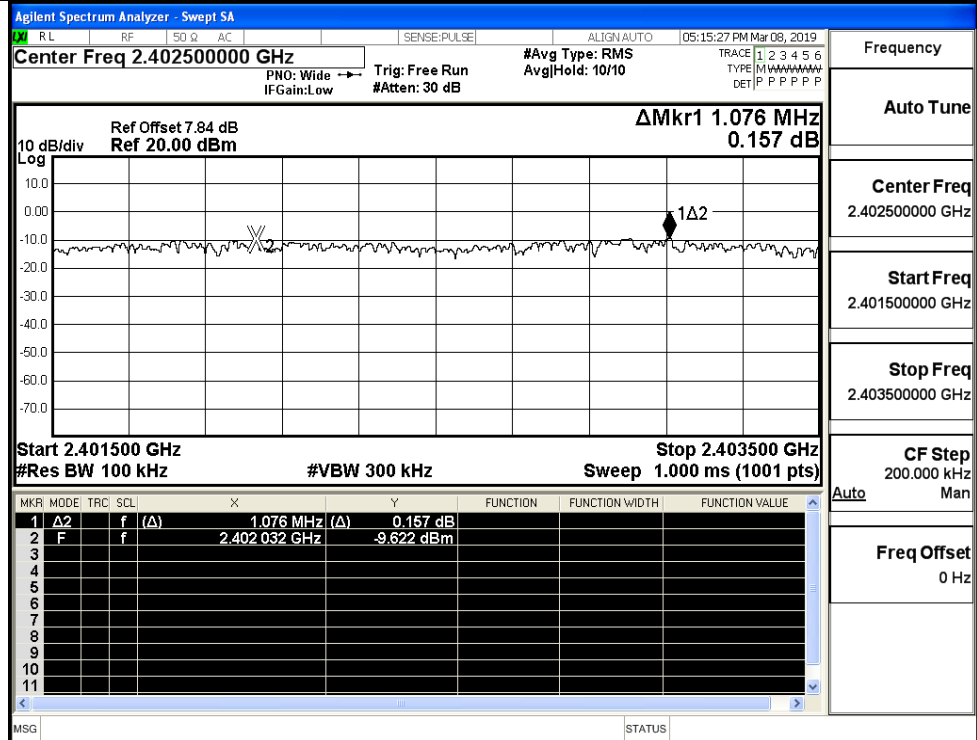
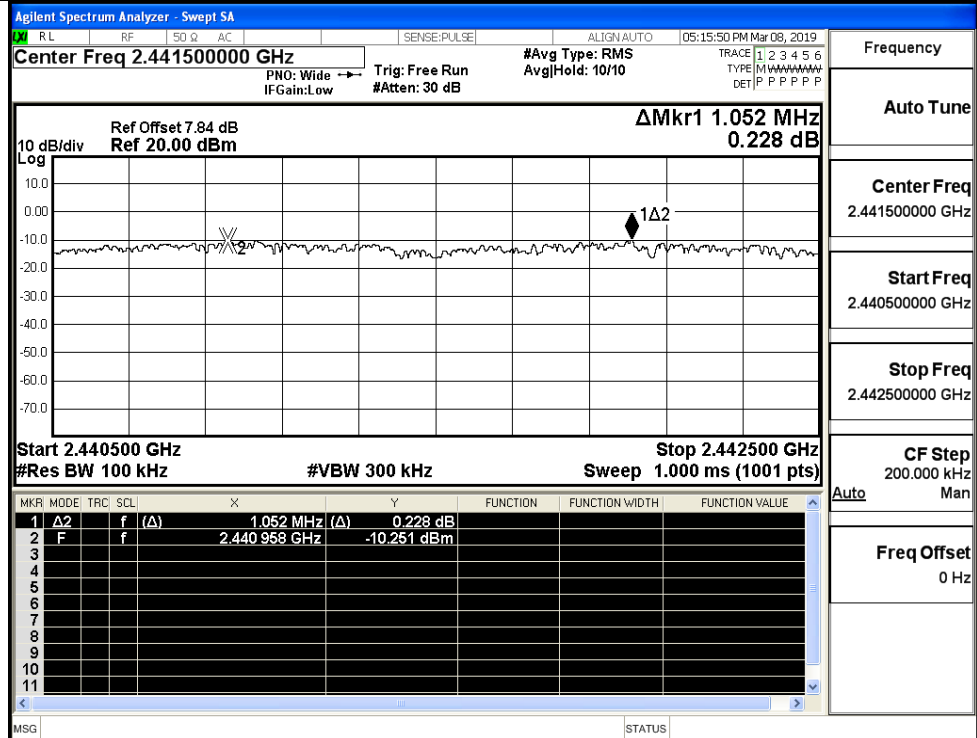
GFSK/HCH

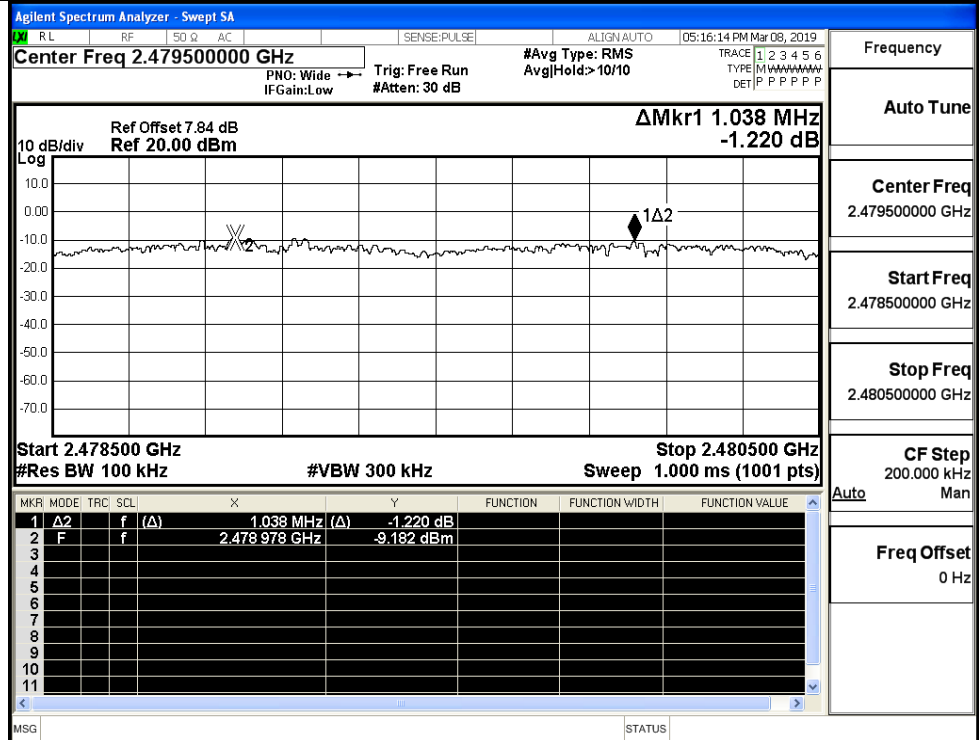


Frequency

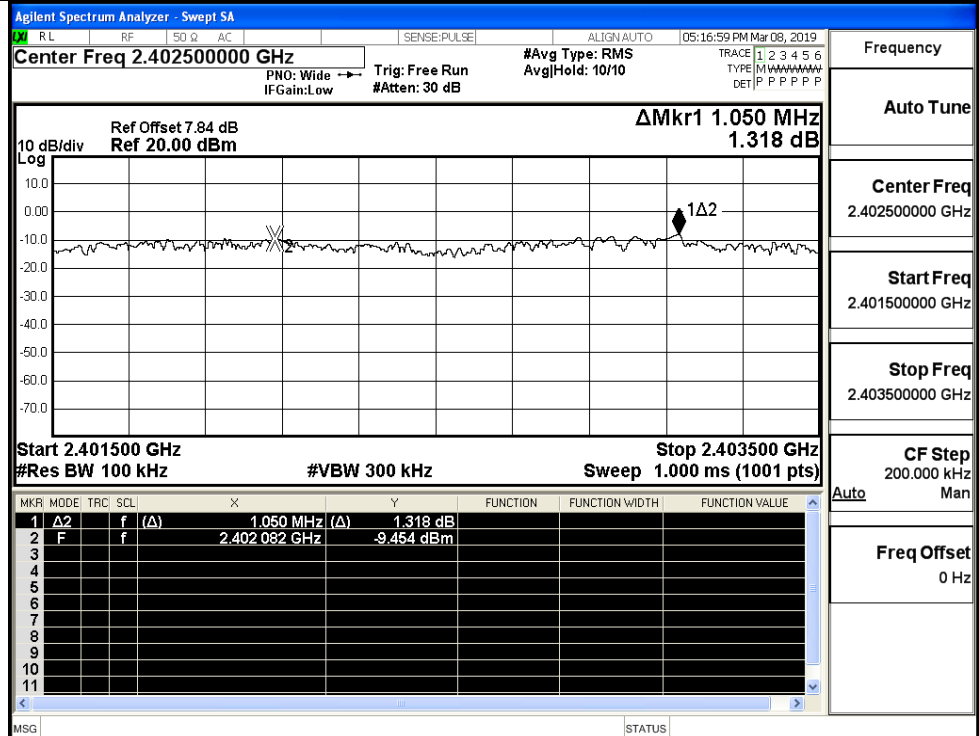
Auto Tune

Center Freq
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2.478500000 GHzStop Freq
2.480500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

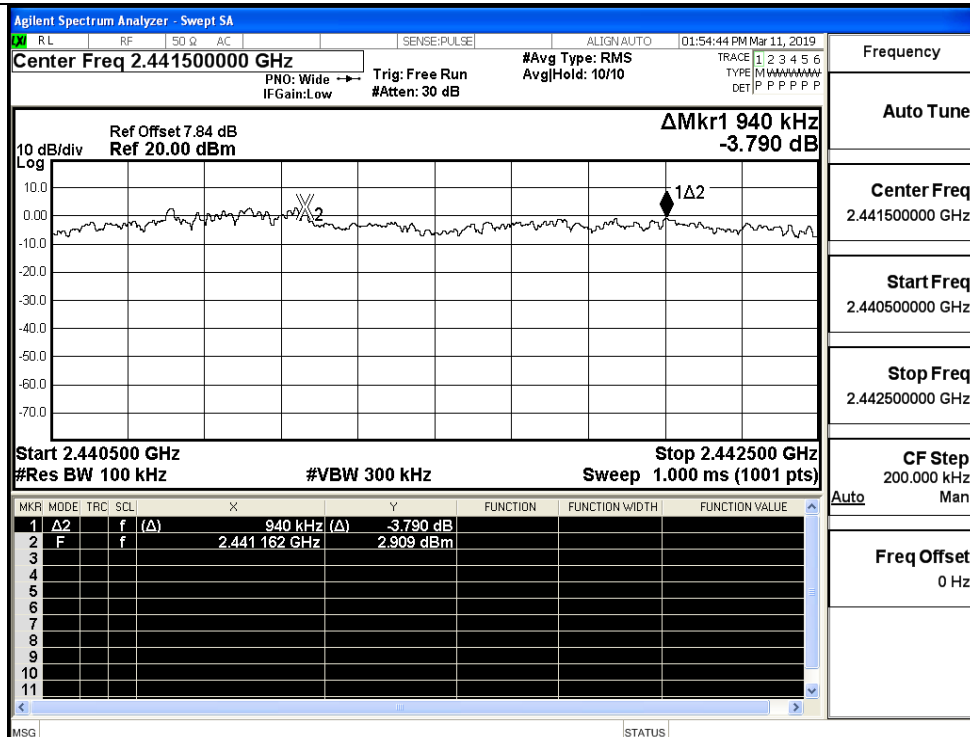
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

π /4DQPSK/HCH

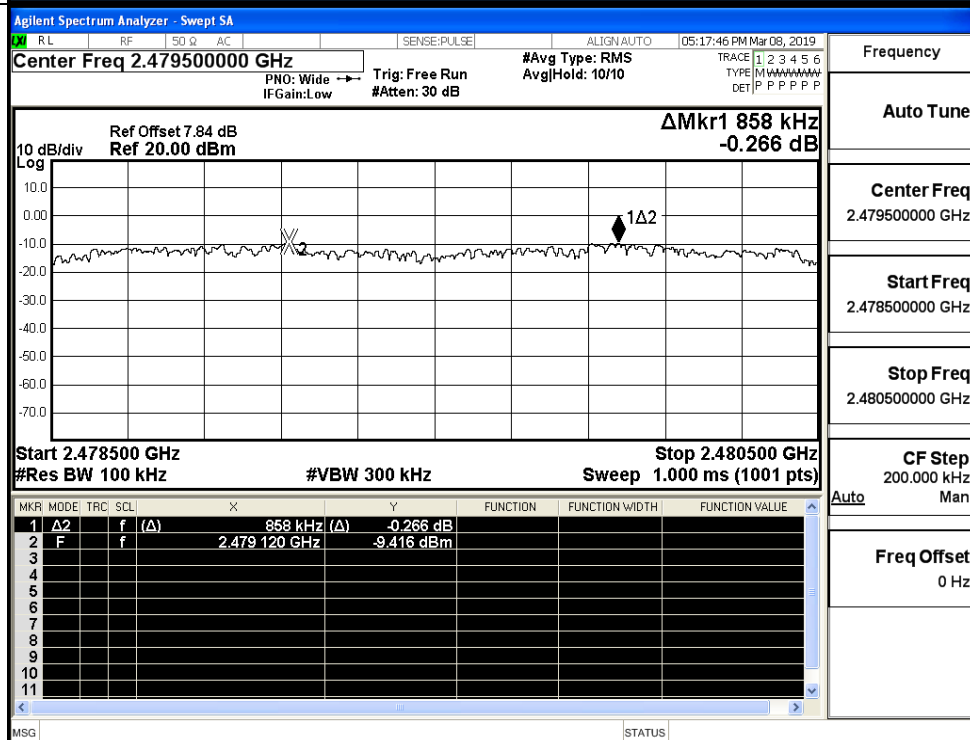
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

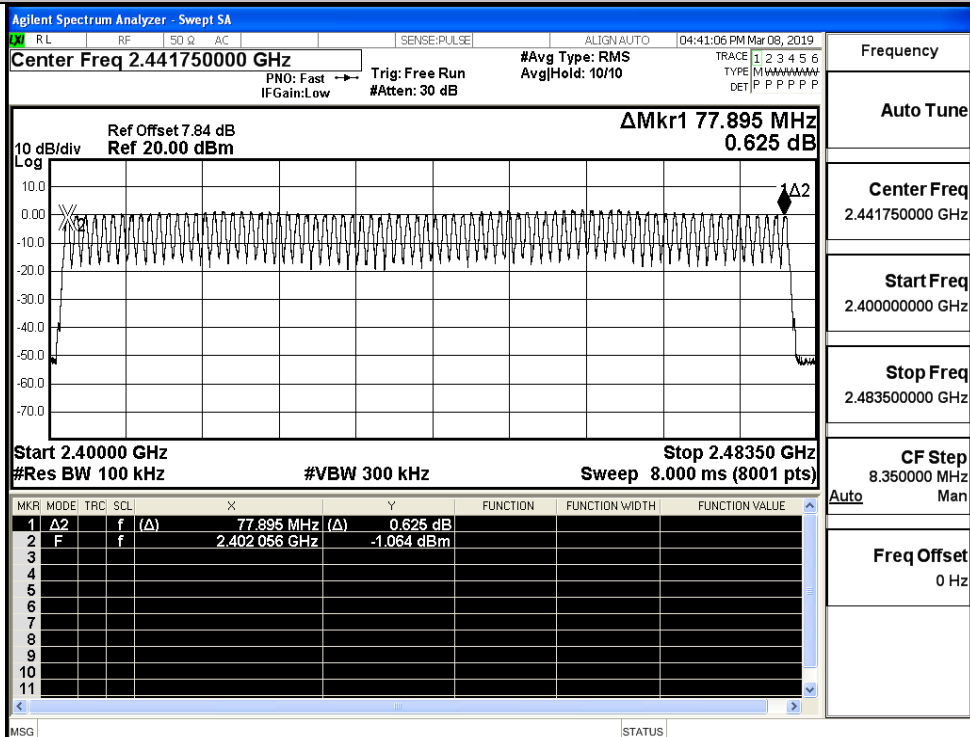


A.4 Hopping Channel Number

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

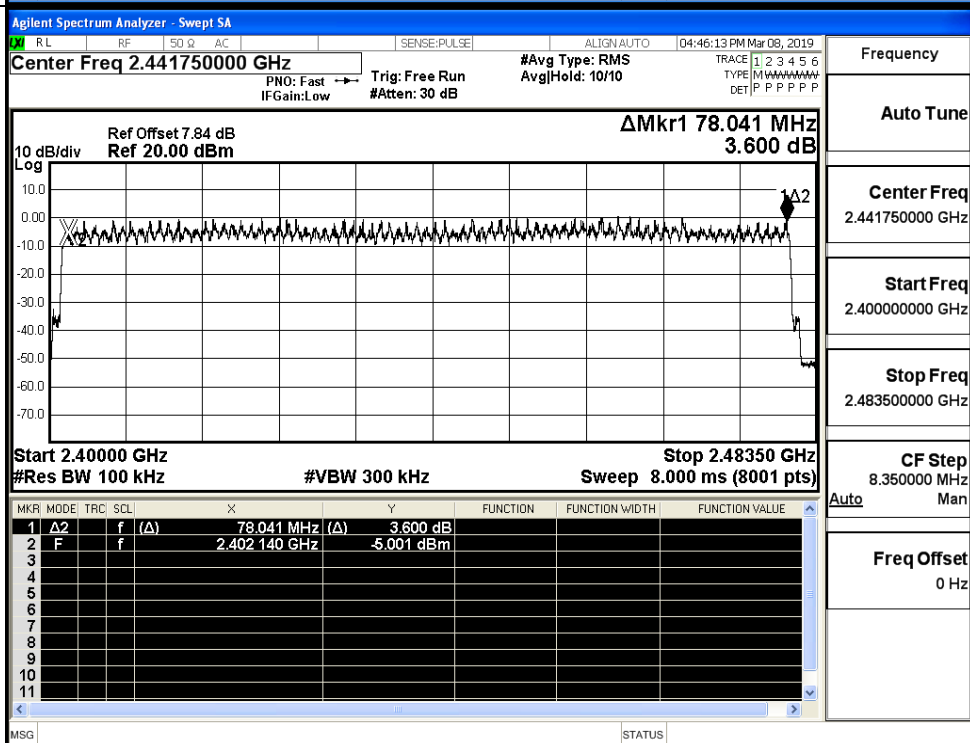
Test Graphs

GFSK/Hop



Frequency

Auto Tune

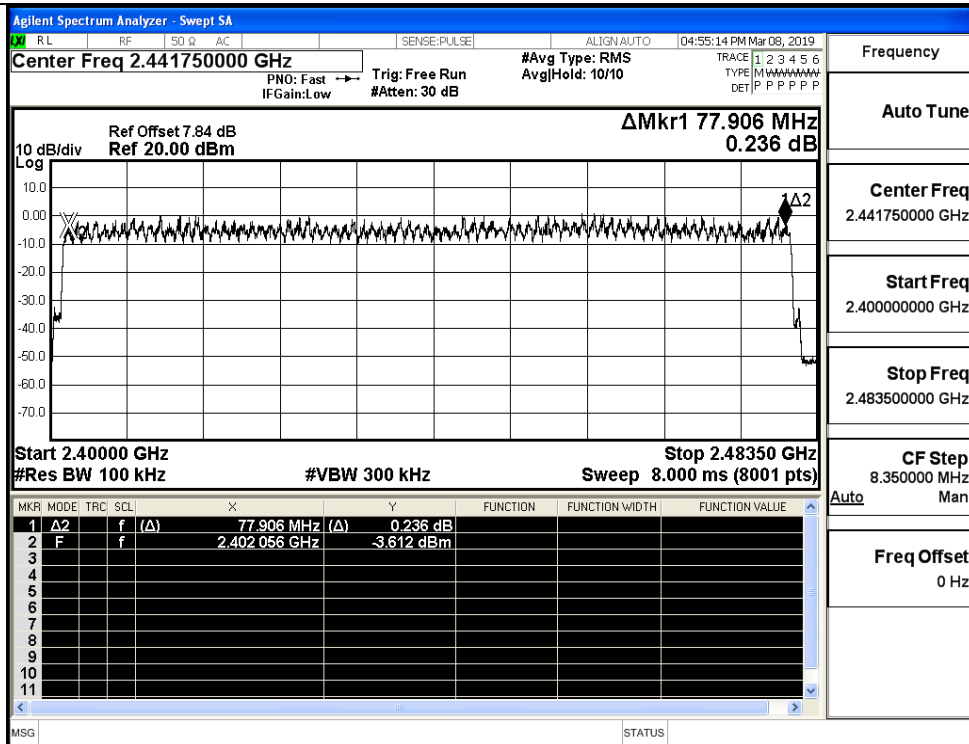
Center Freq
2.441750000 GHzStart Freq
2.400000000 GHzStop Freq
2.483500000 GHzCF Step
8.350000 MHz
Auto ManFreq Offset
0 Hz $\pi/4$ DQPSK/Hop

Frequency

Auto Tune

Center Freq
2.441750000 GHzStart Freq
2.400000000 GHzStop Freq
2.483500000 GHzCF Step
8.350000 MHz
Auto ManFreq Offset
0 Hz

8DPSK/Hop

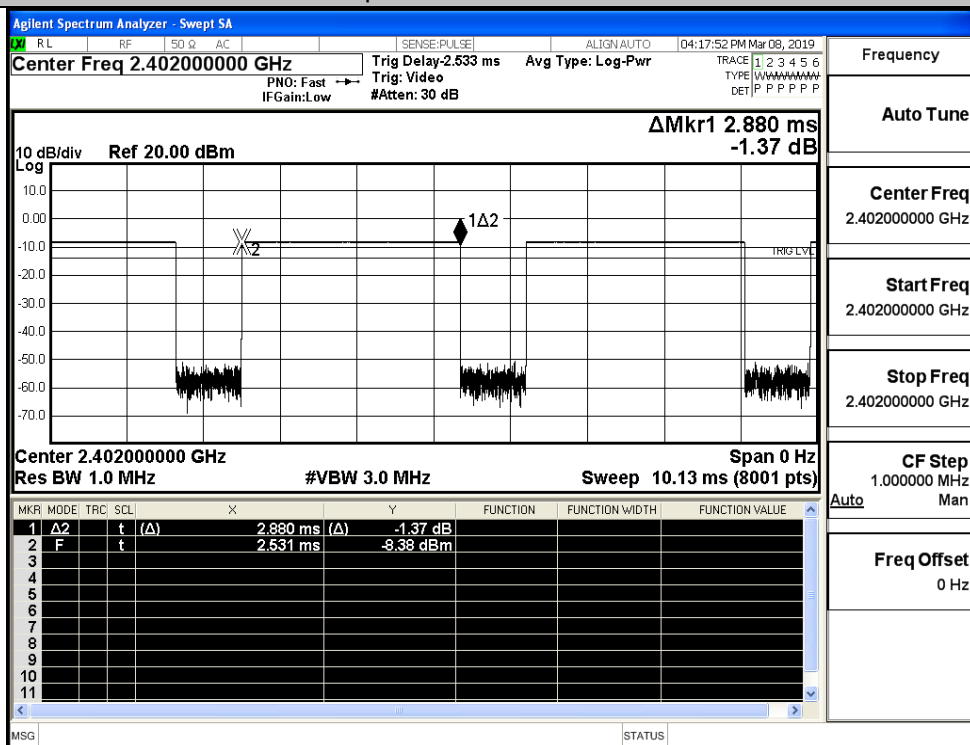


A.5 Dwell Time

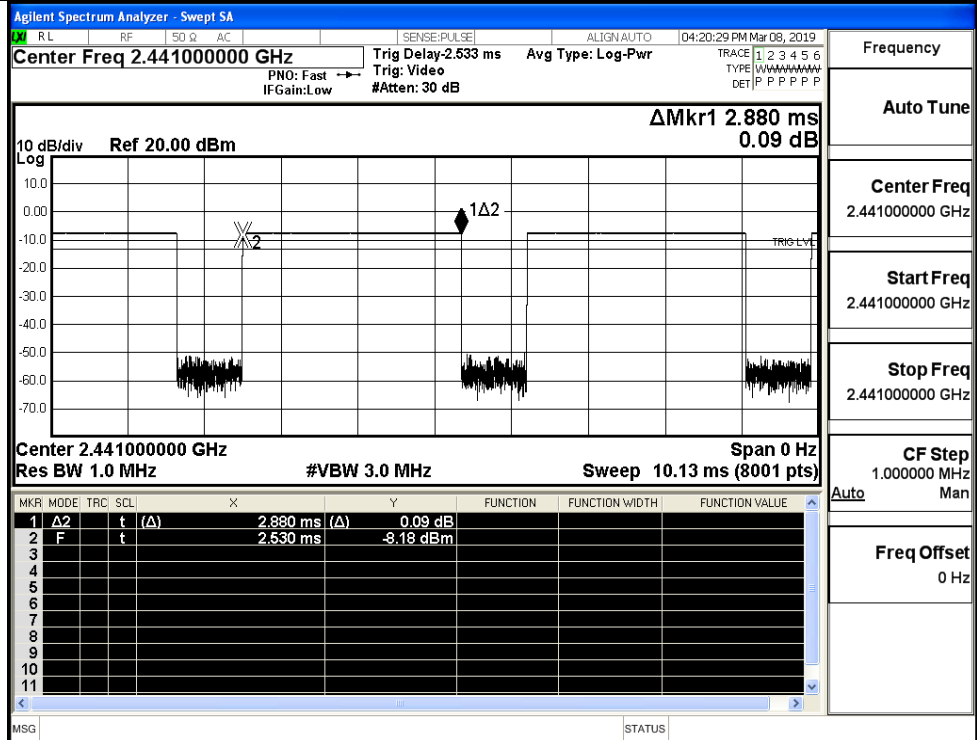
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.88	106.7	0.308	0.4	PASS
	3DH5	MCH	2.88	106.7	0.308	0.4	PASS
	3DH5	HCH	2.88	106.7	0.308	0.4	PASS

Test Graphs

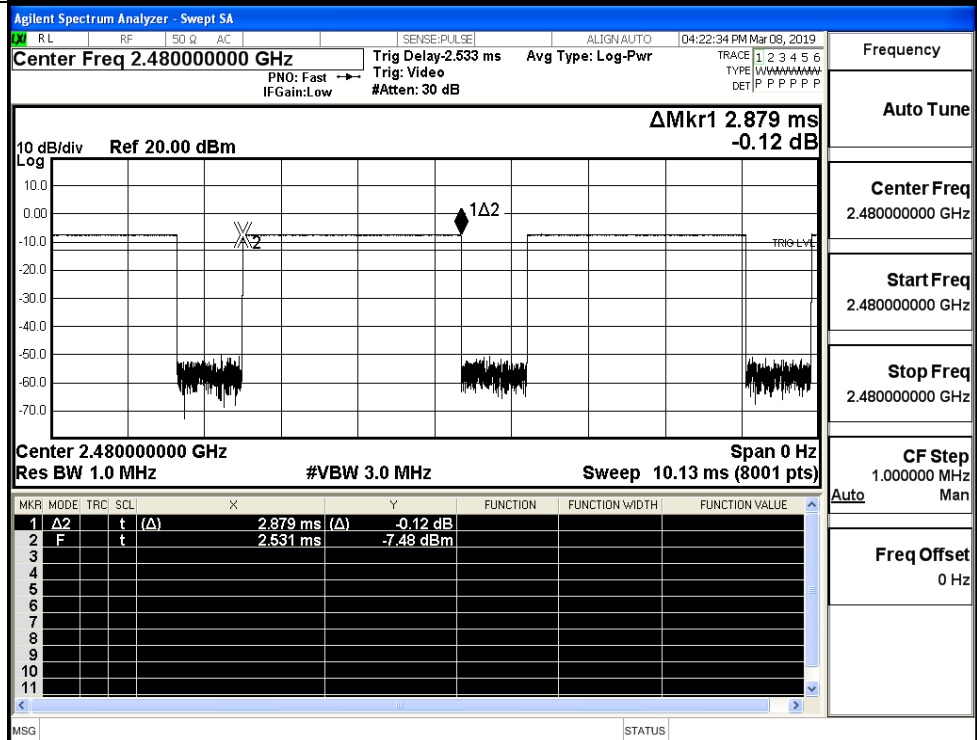
GFSK_DH5/LCH



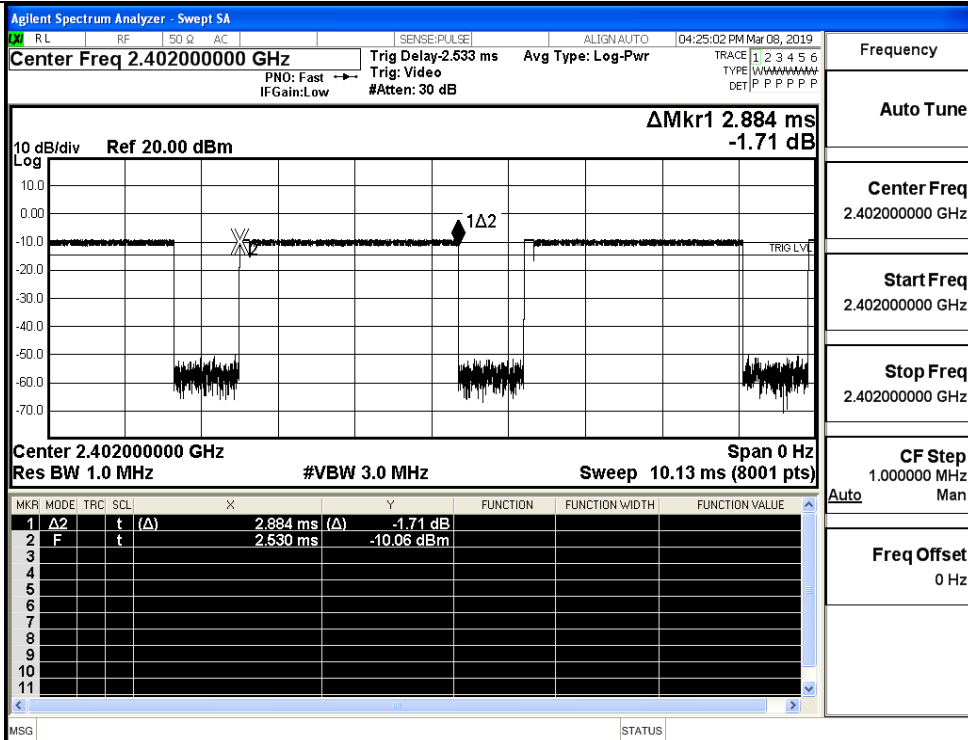
GFSK_DH5/MCH



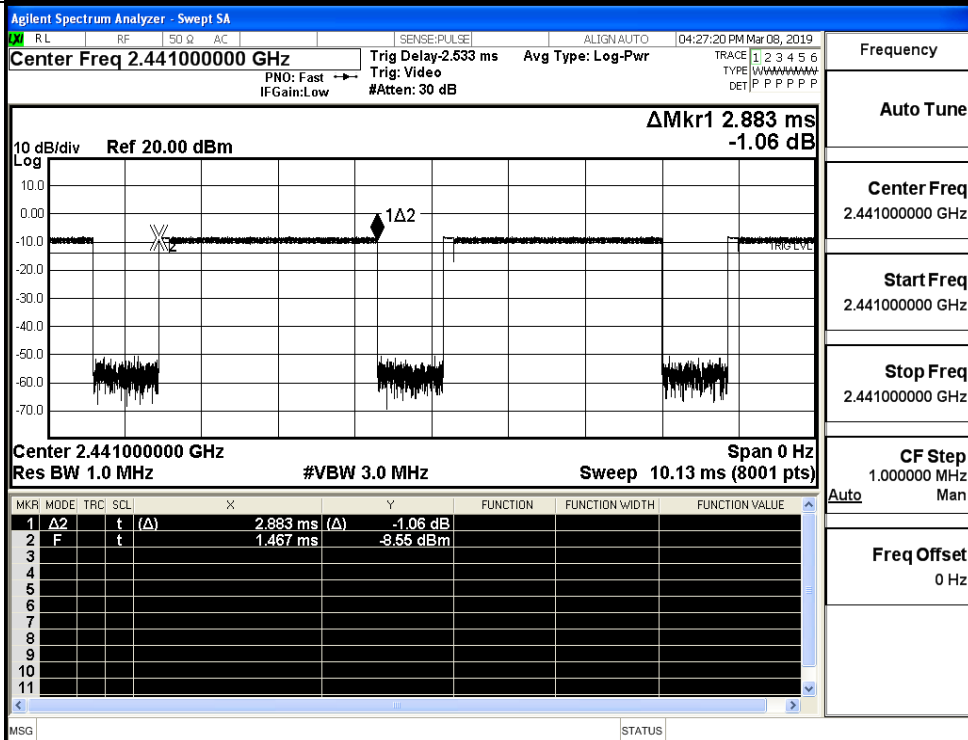
GFSK_DH5/HCH



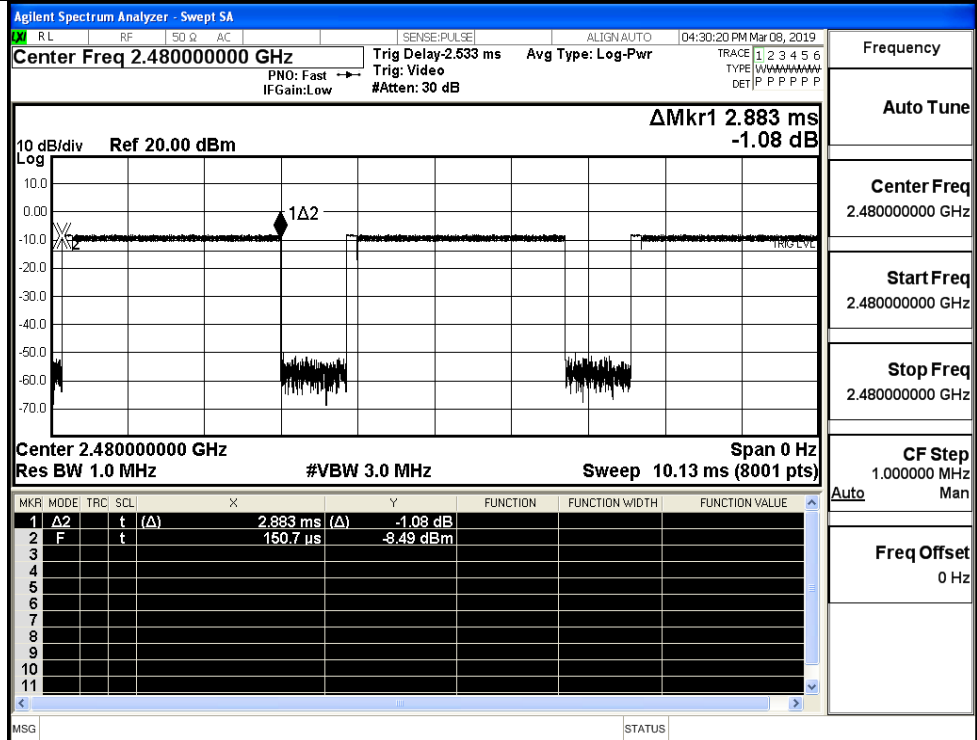
$\pi/4$ DQPSK
_2DH5/LCH



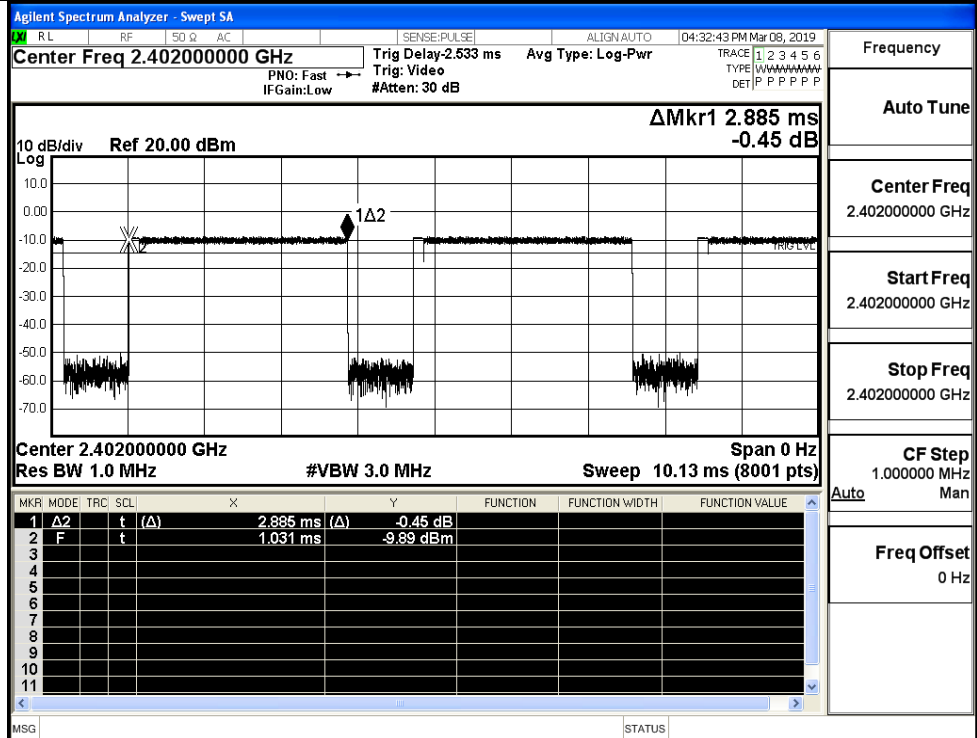
$\pi/4$ DQPSK
_2DH5/MCH



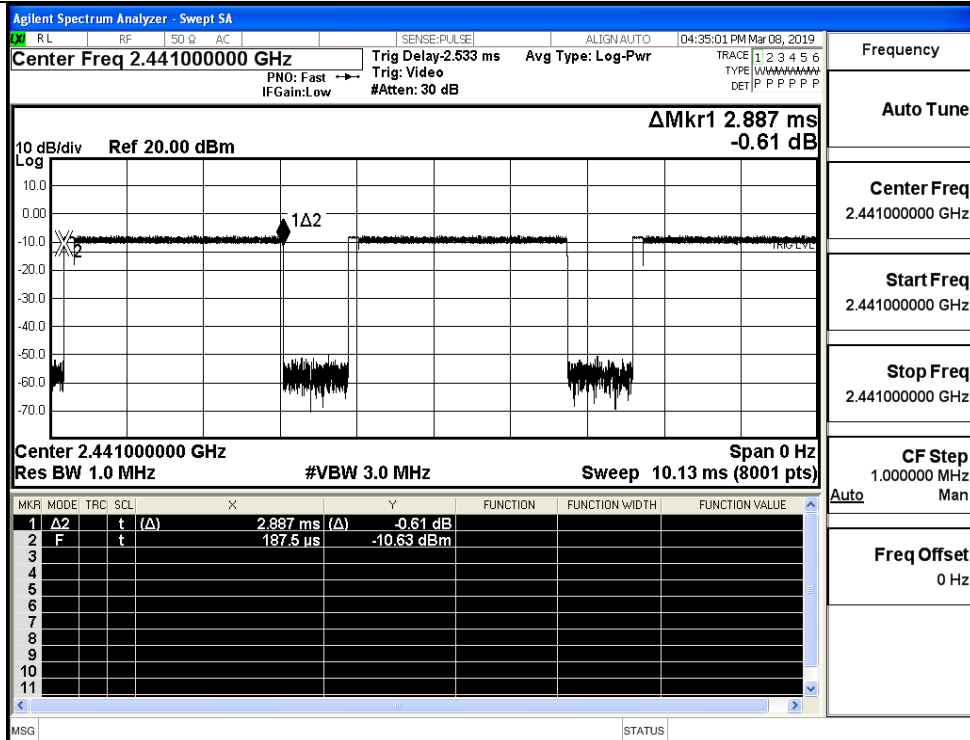
$\pi/4$ DQPSK
_2DH5/HCH



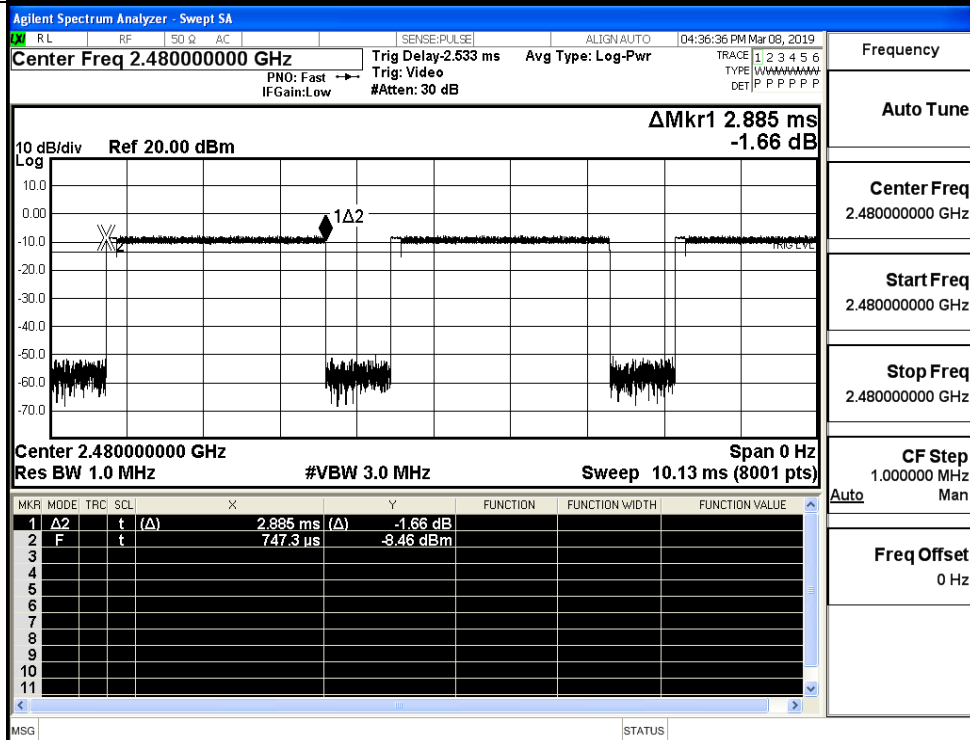
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



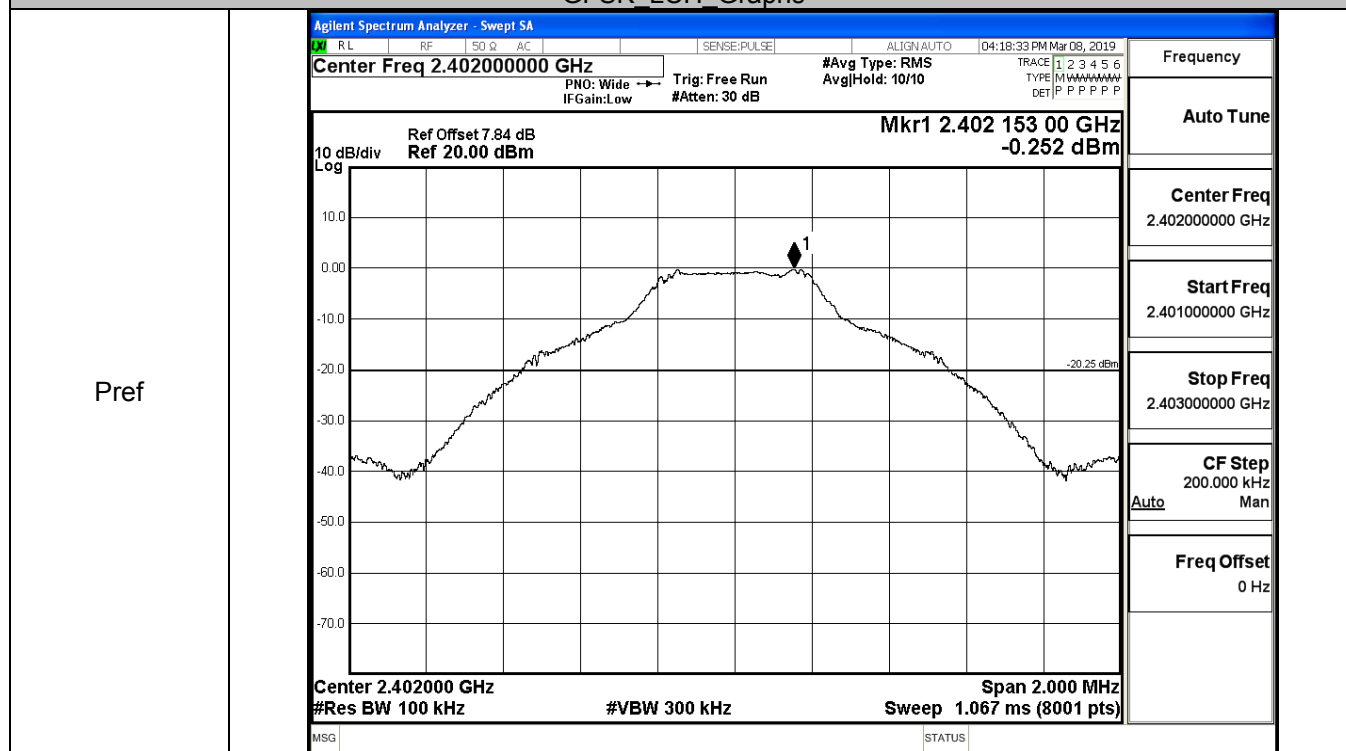
8DPSK_3DH5/HCH

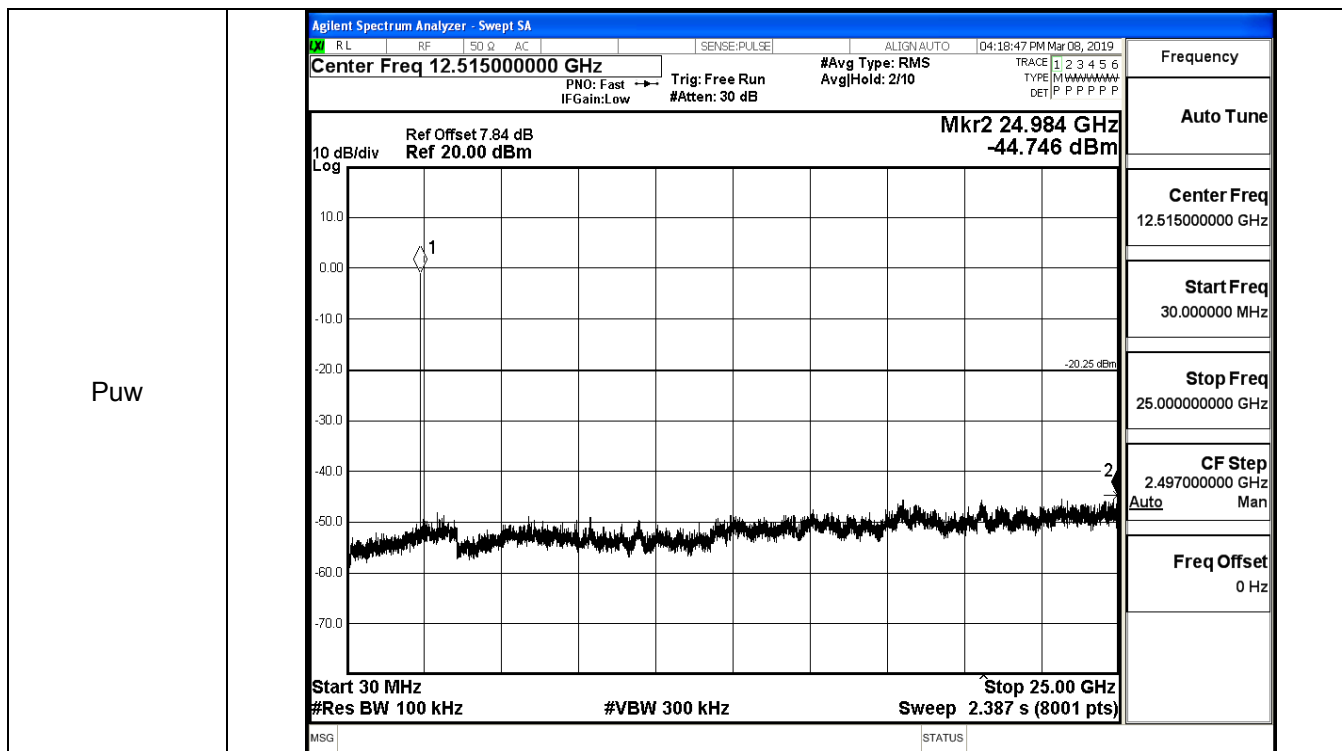


A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.252	-44.746	-20.252	PASS
	MCH	0.436	-44.890	-19.564	PASS
	HCH	0.524	-44.264	-19.476	PASS
$\pi/4$ DQPSK	LCH	-1.952	-45.019	-21.952	PASS
	MCH	-0.552	-45.469	-20.552	PASS
	HCH	-0.525	-45.042	-20.525	PASS
8DPSK	LCH	-1.487	-44.327	-21.487	PASS
	MCH	-0.371	-44.893	-20.371	PASS
	HCH	-0.501	-45.200	-20.501	PASS

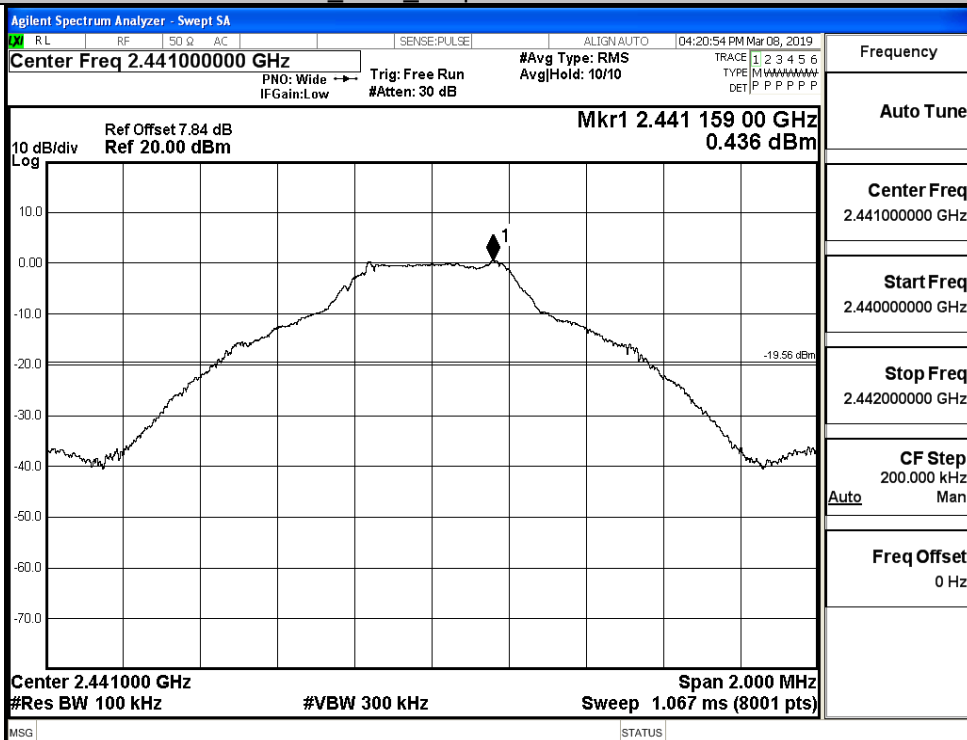
GFSK LCH Graphs



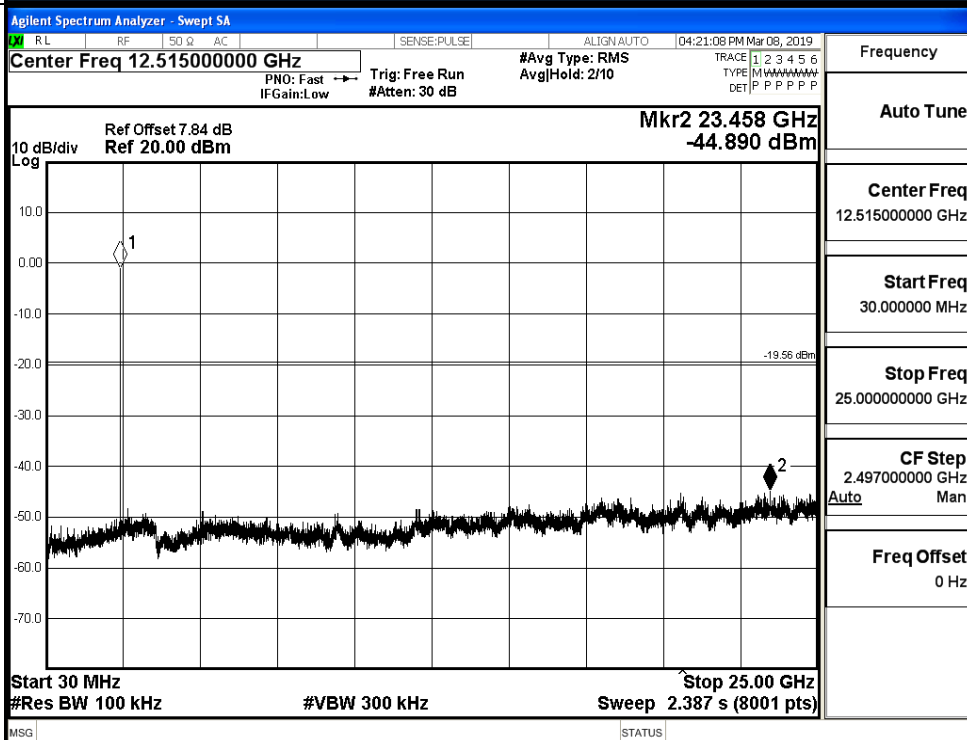


GFSK_MCH_Graphs

Pref

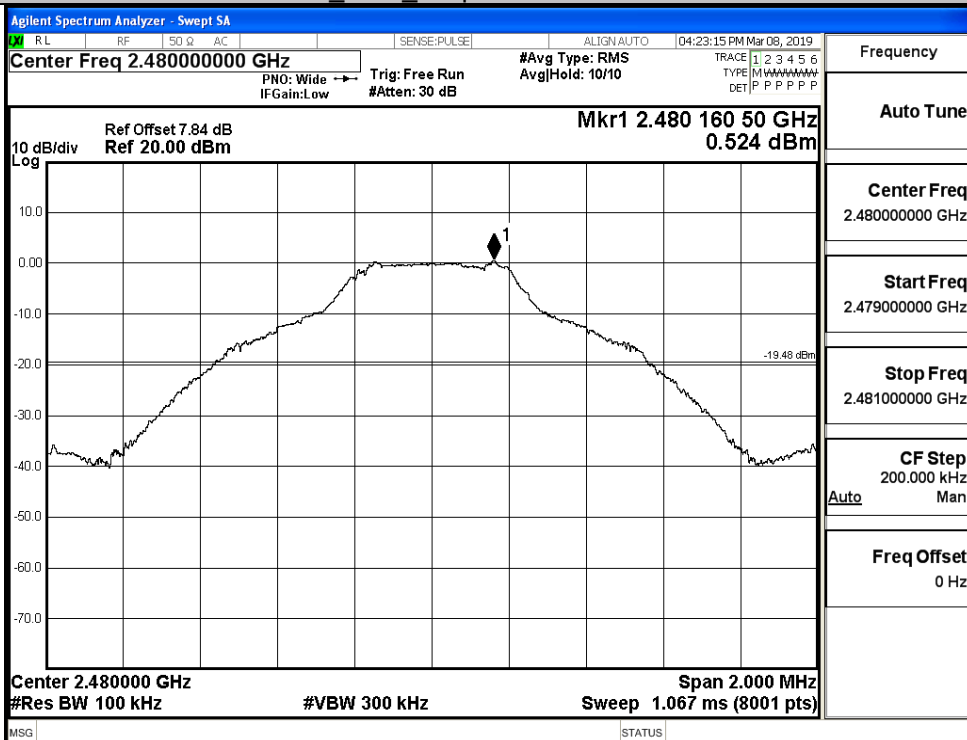


Puw

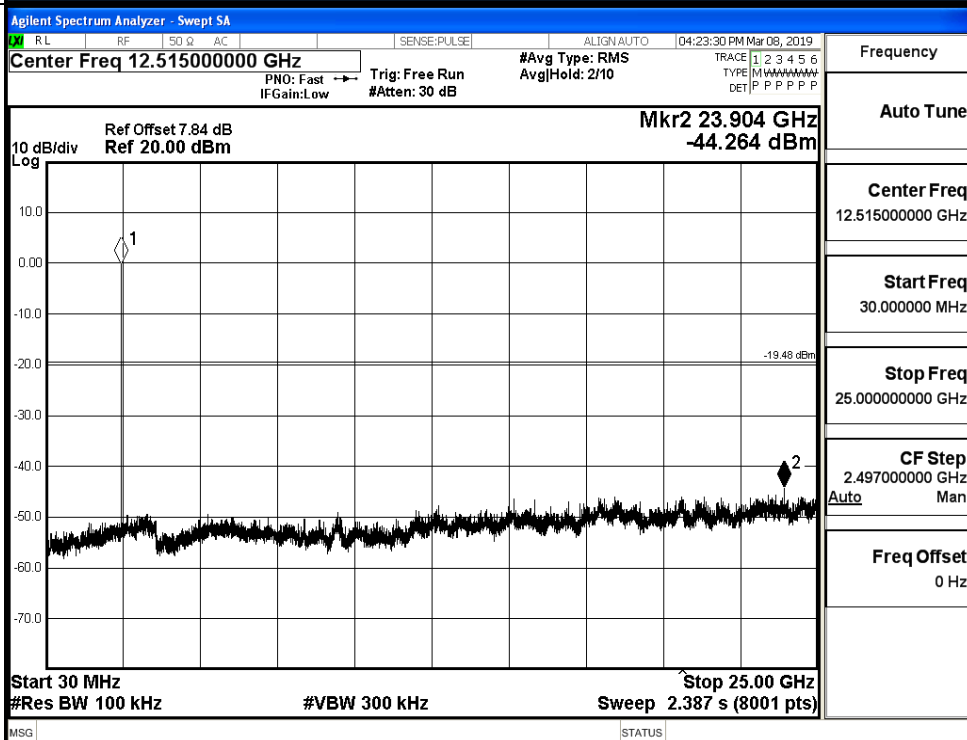


GFSK_HCH_Graphs

Pref

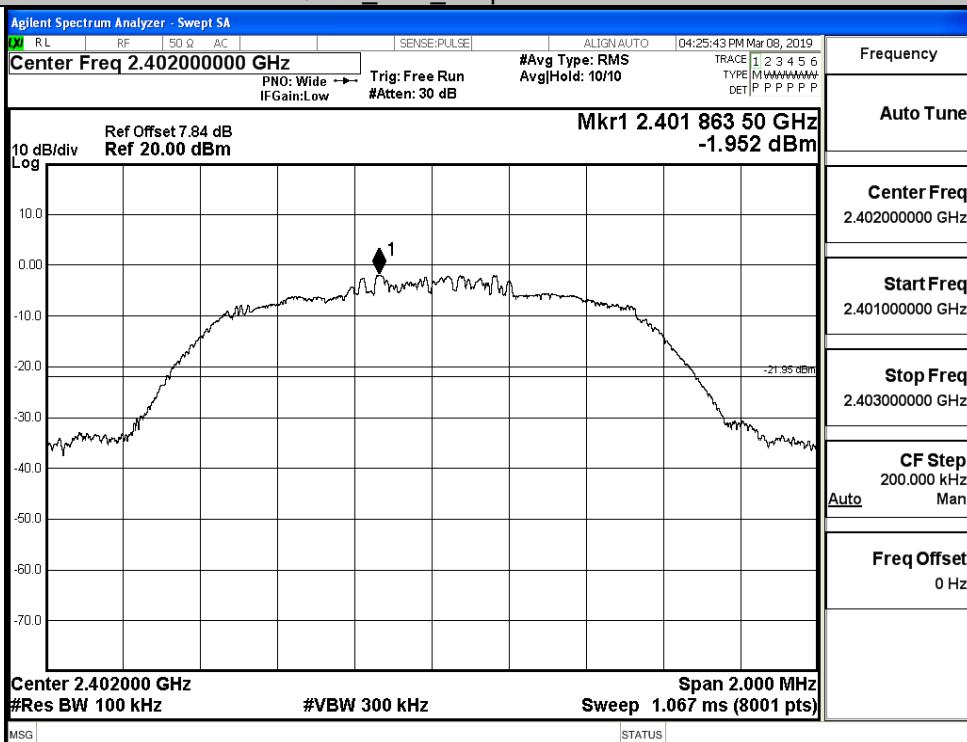


Puw

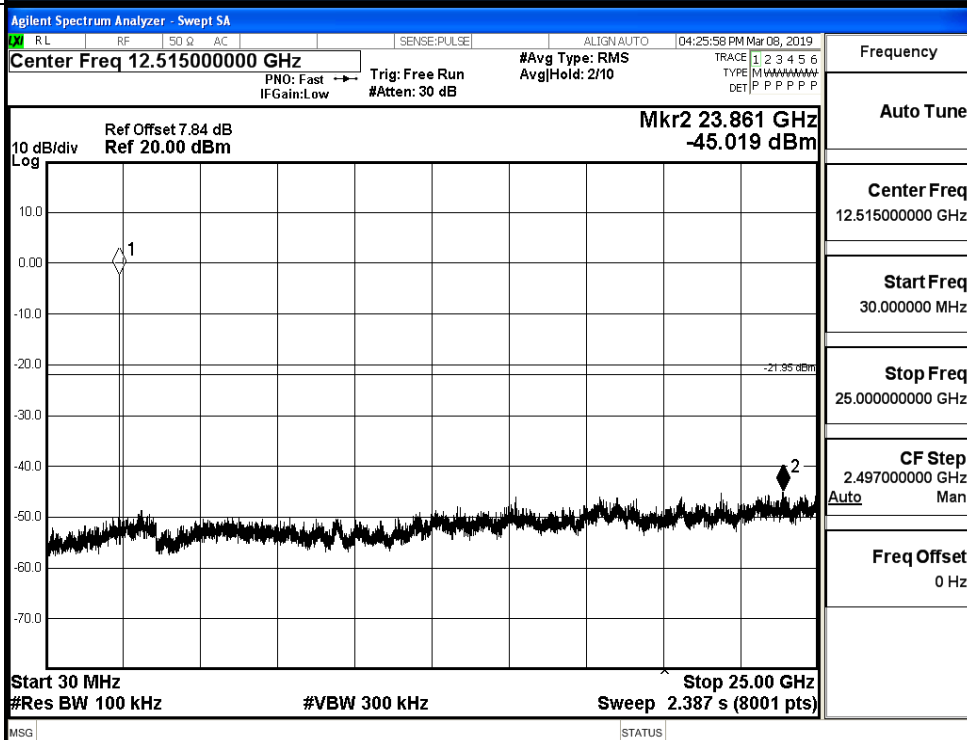


$\pi/4$ DQPSK_LCH_Graphs

Pref

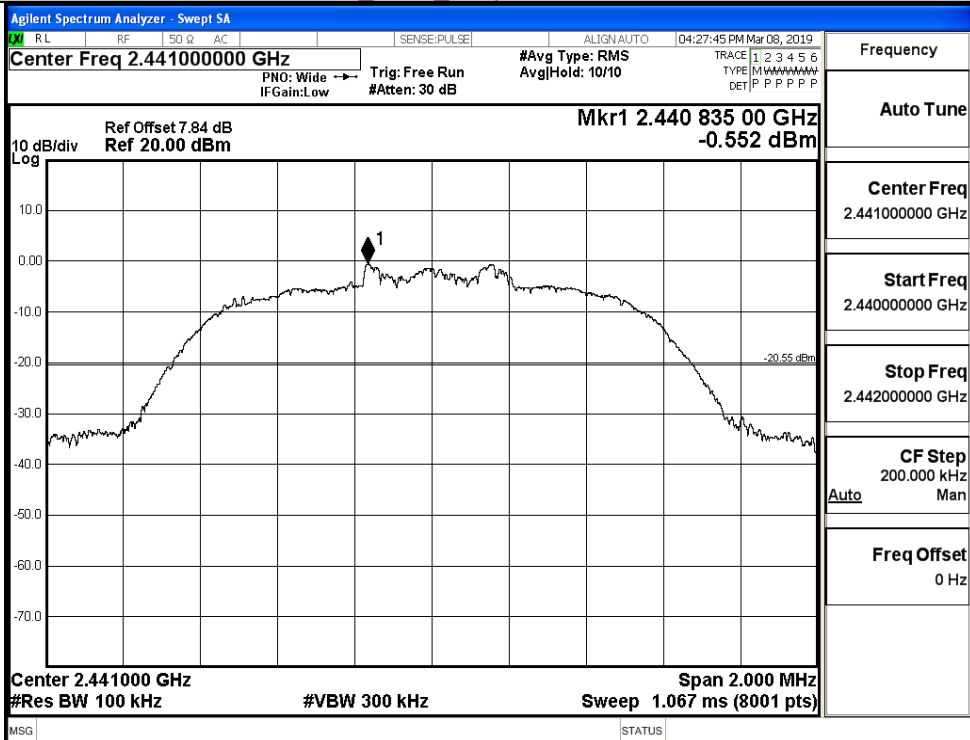


Puw

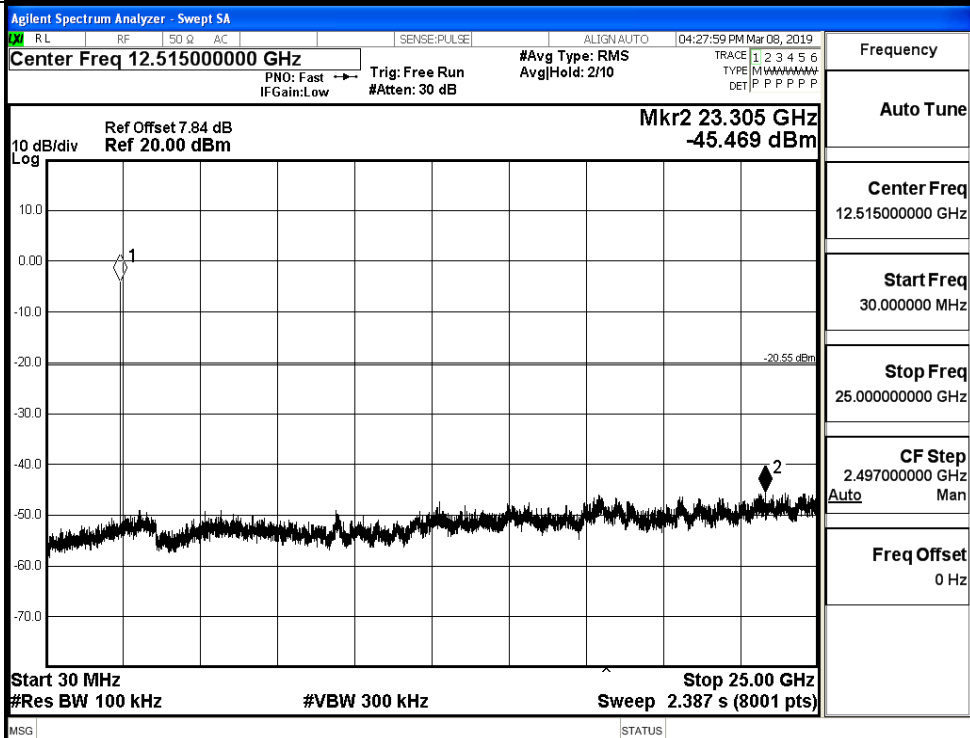


$\pi/4$ DQPSK_MCH_Graphs

Pref

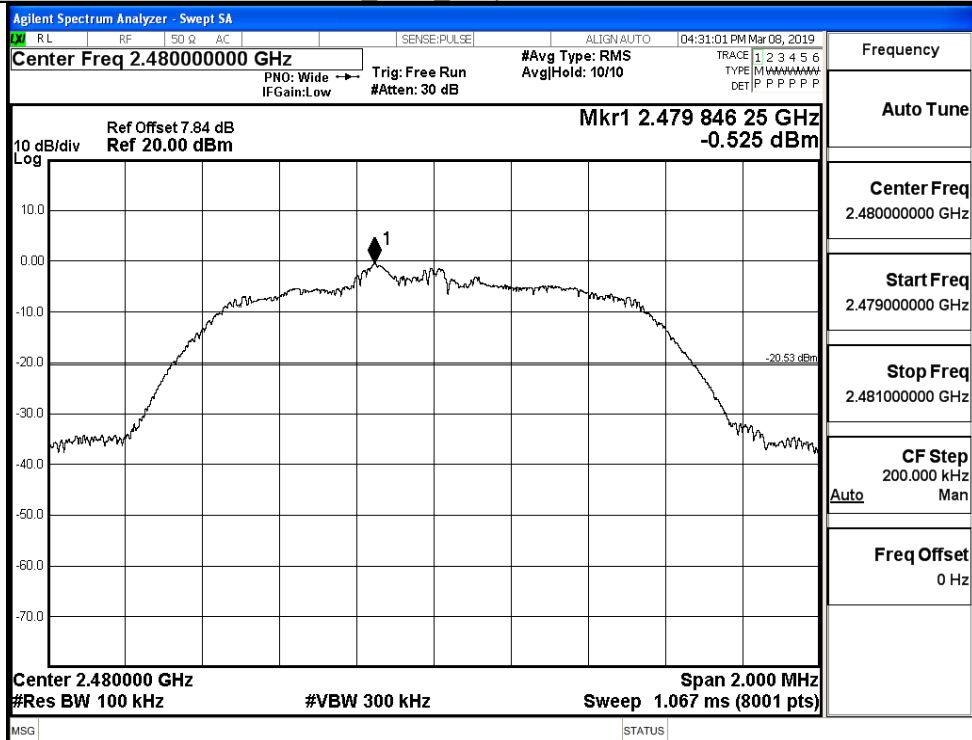


Puw

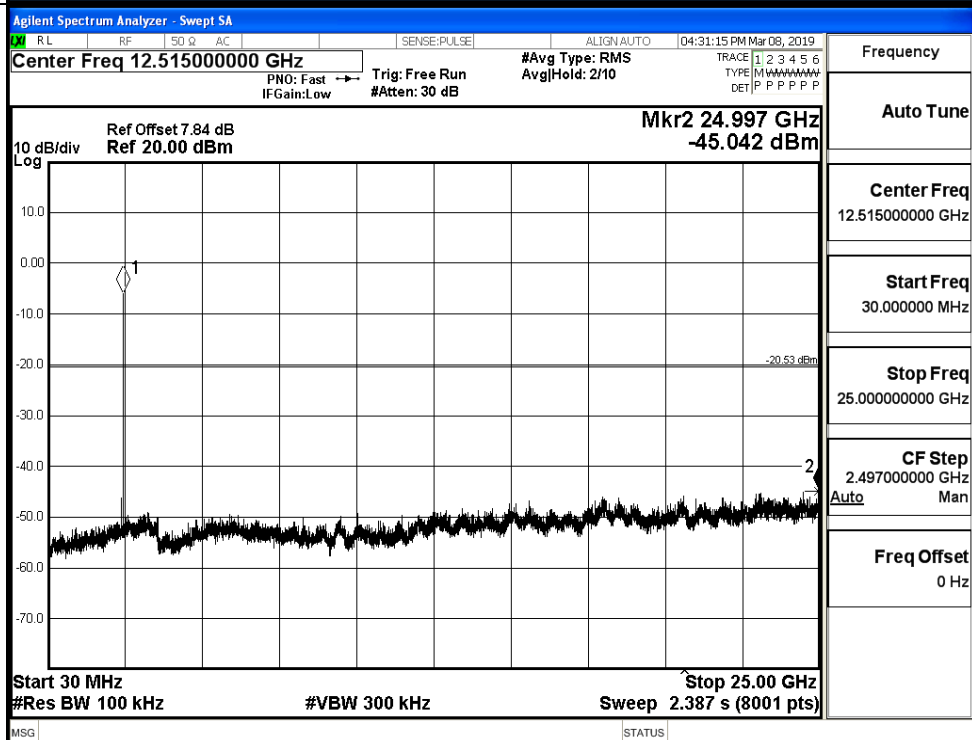


$\pi/4$ DQPSK_HCH_Graphs

Pref

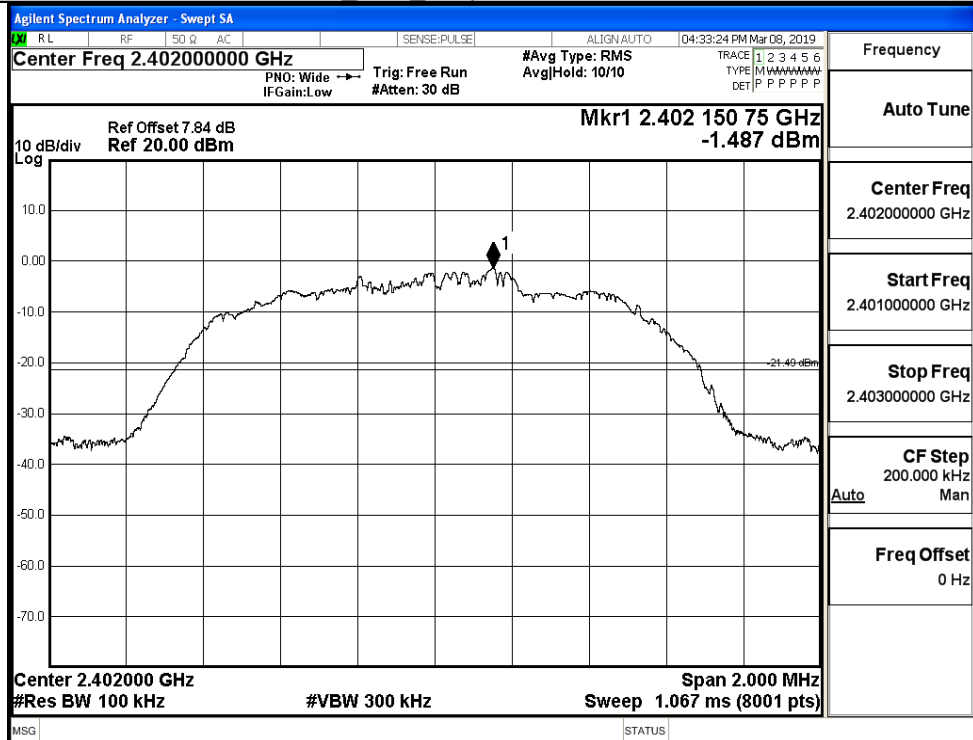


Puw

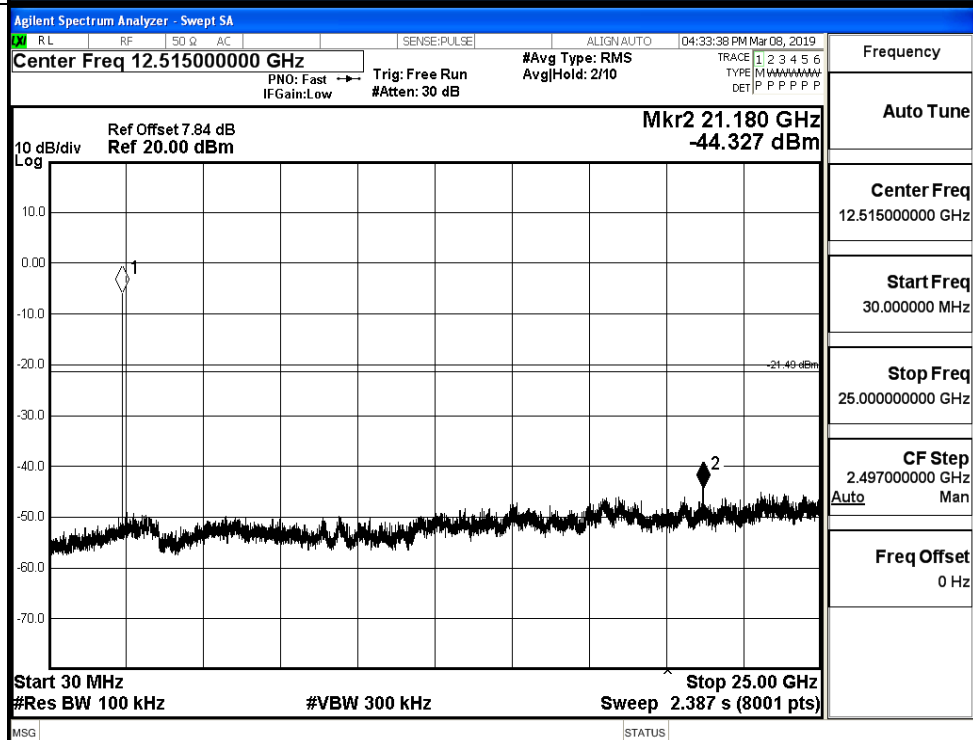


8DPSK_LCH_Graphs

Pref

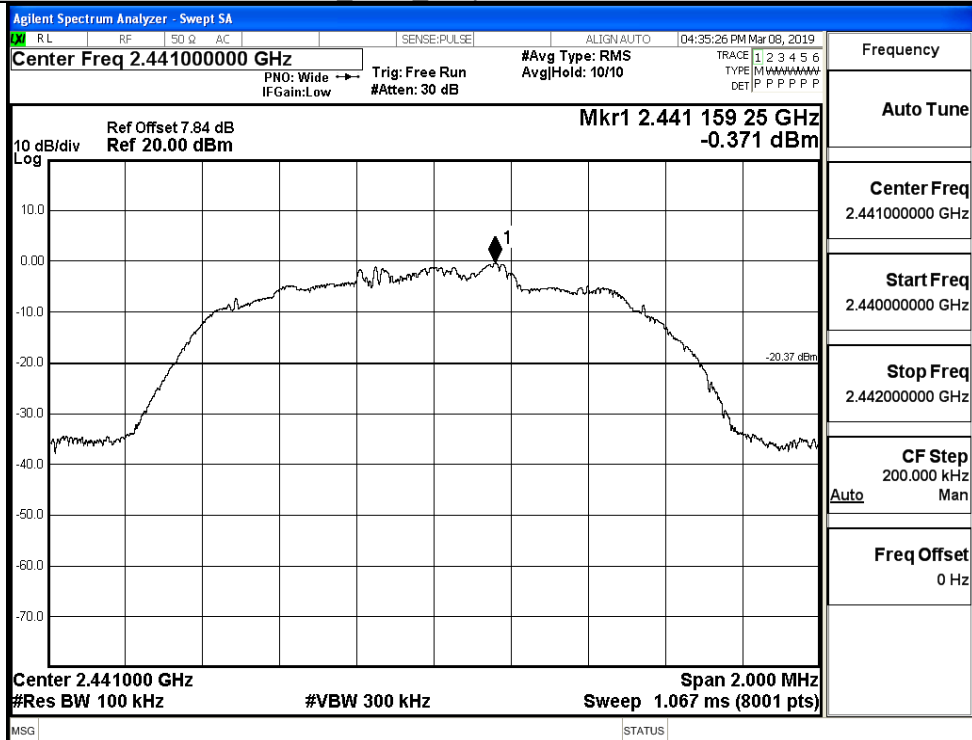


Puw

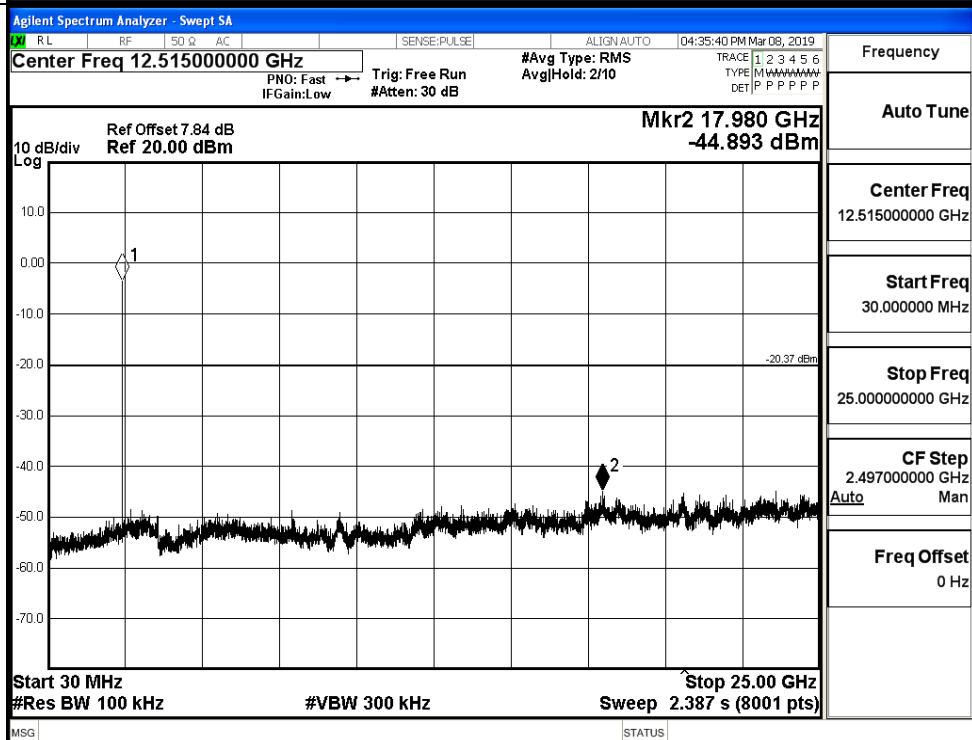


8DPSK_MCH_Graphs

Pref

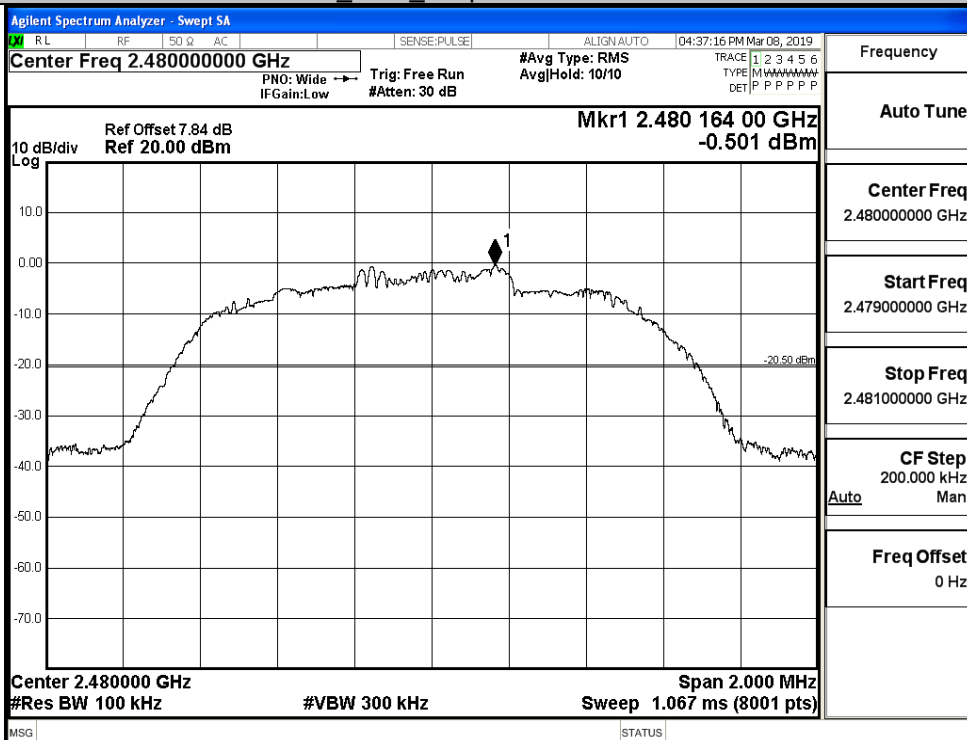


Puw

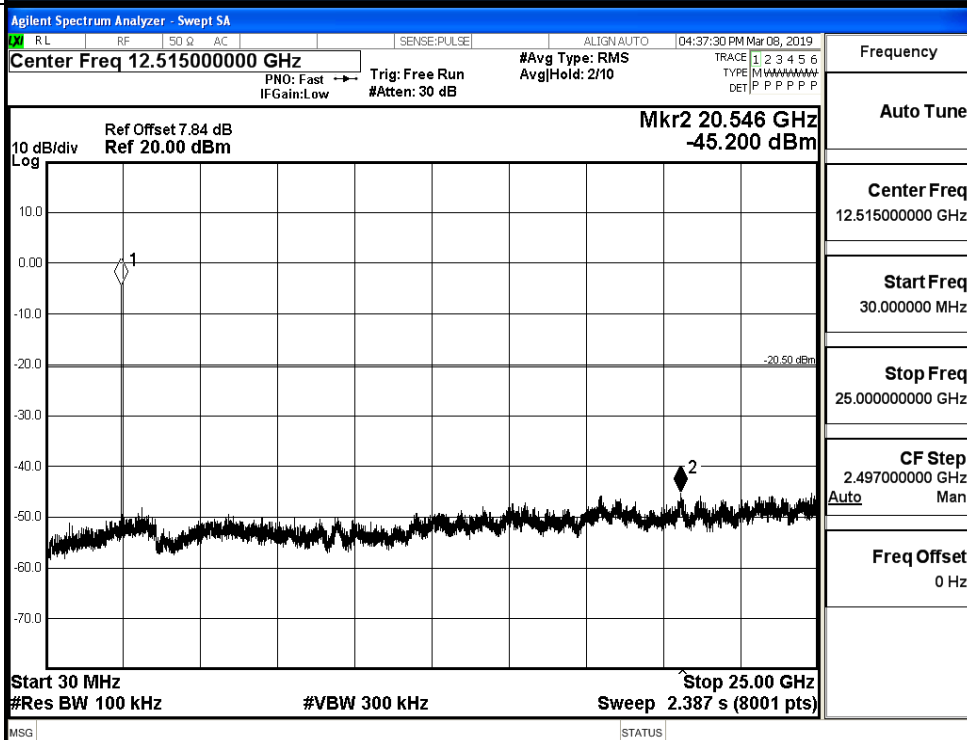


8DPSK_HCH_Graphs

Pref



Puw

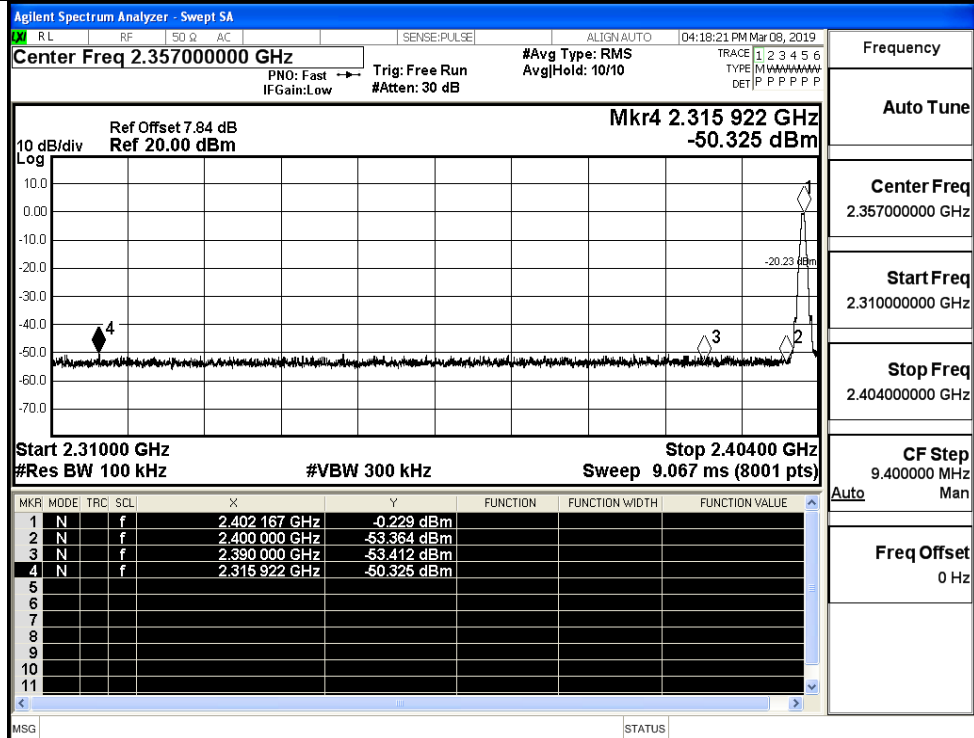


A.7 Band-edge for RF Conducted Emissions

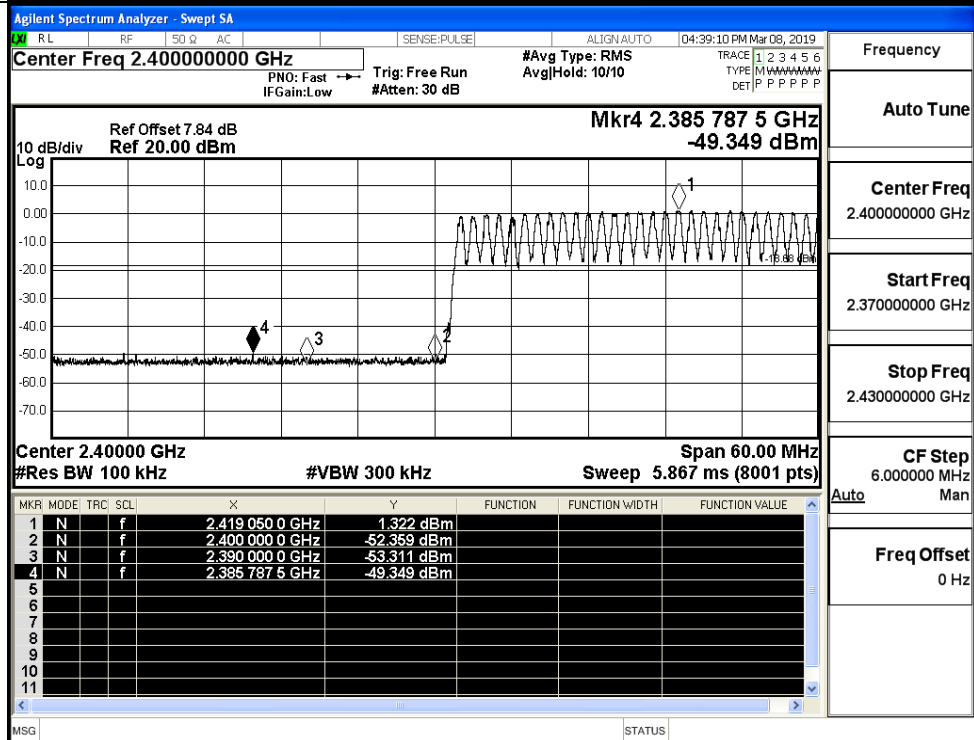
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.229	Off	-50.325	-20.23	PASS
			1.322	On	-49.349	-18.68	PASS
	HCH	2480	0.580	Off	-49.514	-19.42	PASS
			2.119	On	-50.076	-17.88	PASS
$\pi/4$ DQPSK	LCH	2402	-2.363	Off	-50.558	-22.36	PASS
			0.295	On	-49.575	-19.71	PASS
	HCH	2480	-0.372	Off	-49.803	-20.37	PASS
			0.770	On	-49.324	-19.23	PASS
8DPSK	LCH	2402	-2.928	Off	-50.156	-22.93	PASS
			-0.146	On	-49.903	-20.15	PASS
	HCH	2480	-0.447	Off	-50.190	-20.45	PASS
			0.580	On	-49.039	-19.42	PASS

Test Graphs

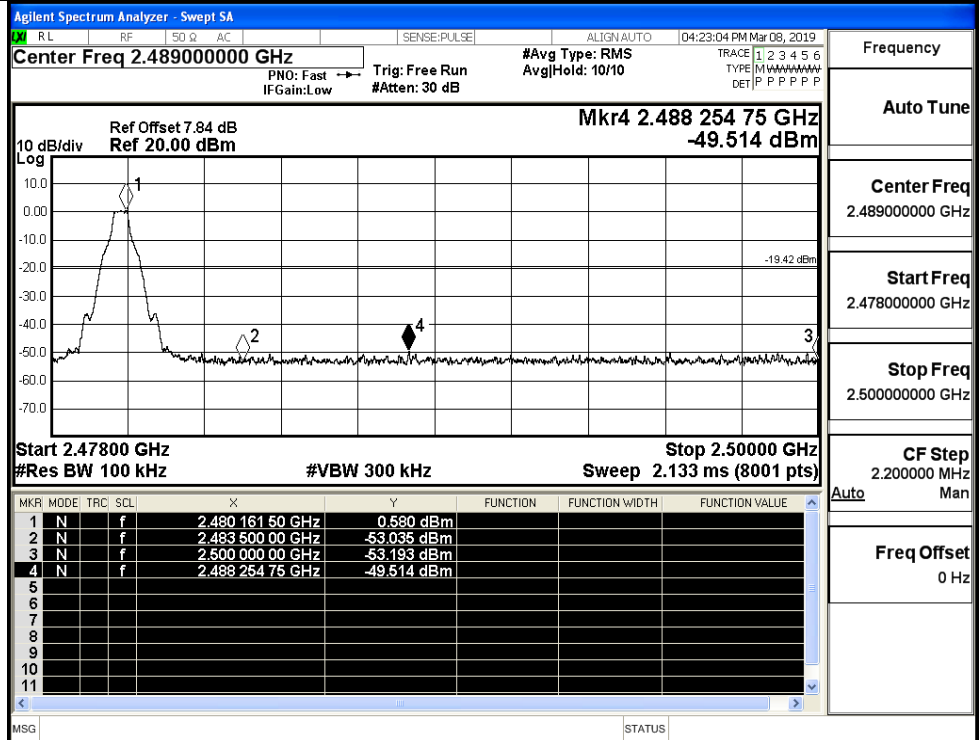
GFSK/LCH/No Hop



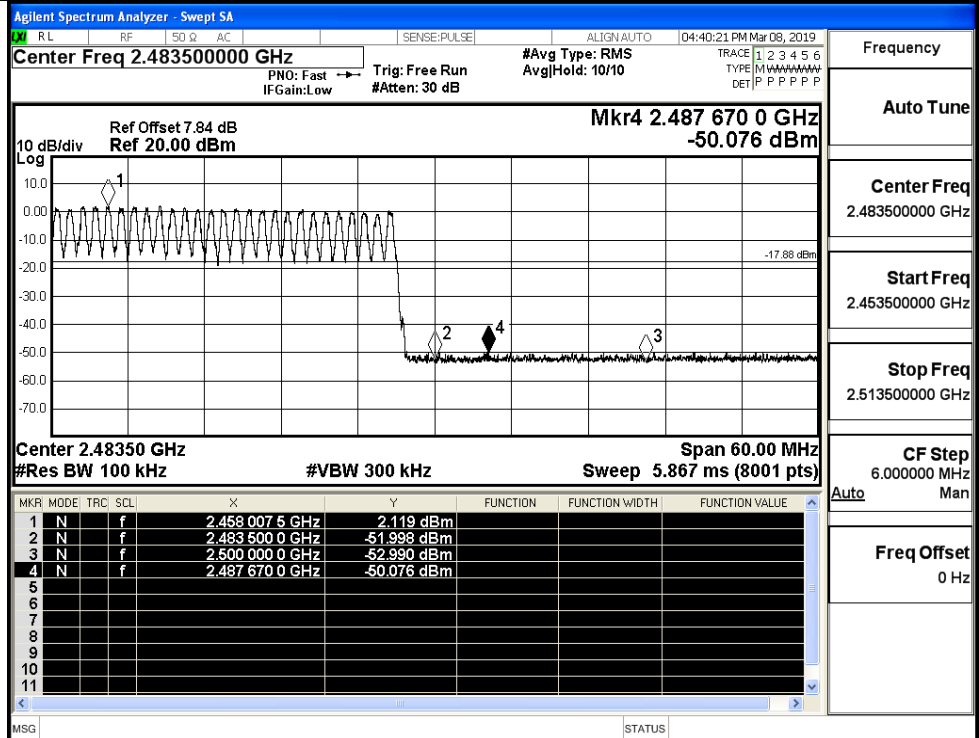
GFSK/LCH/Hop



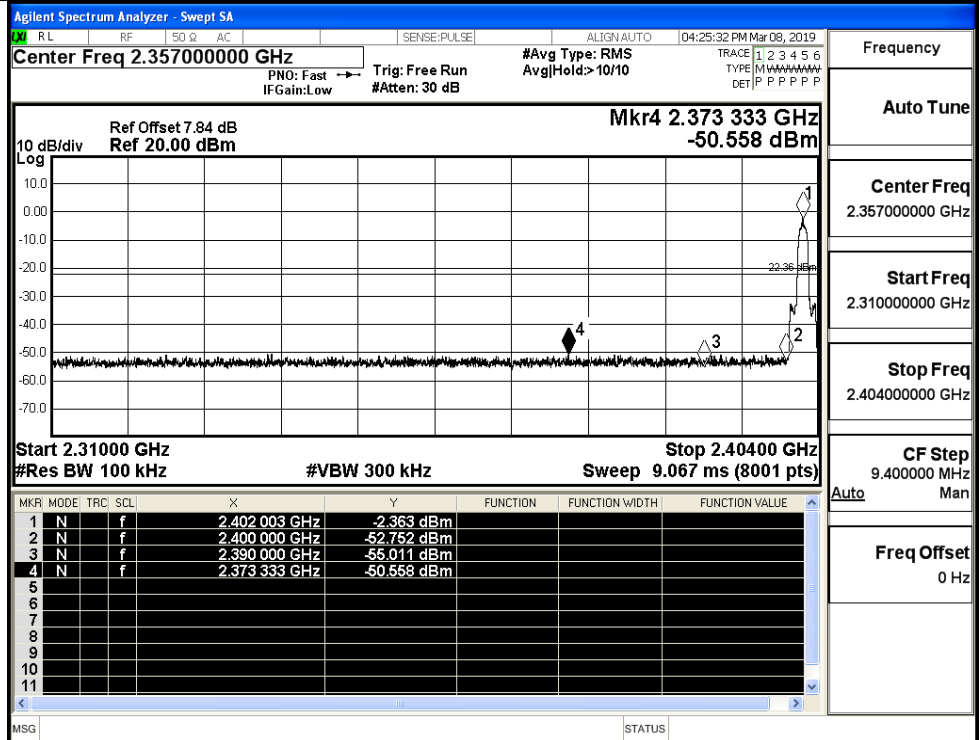
GFSK/HCH/No Hop



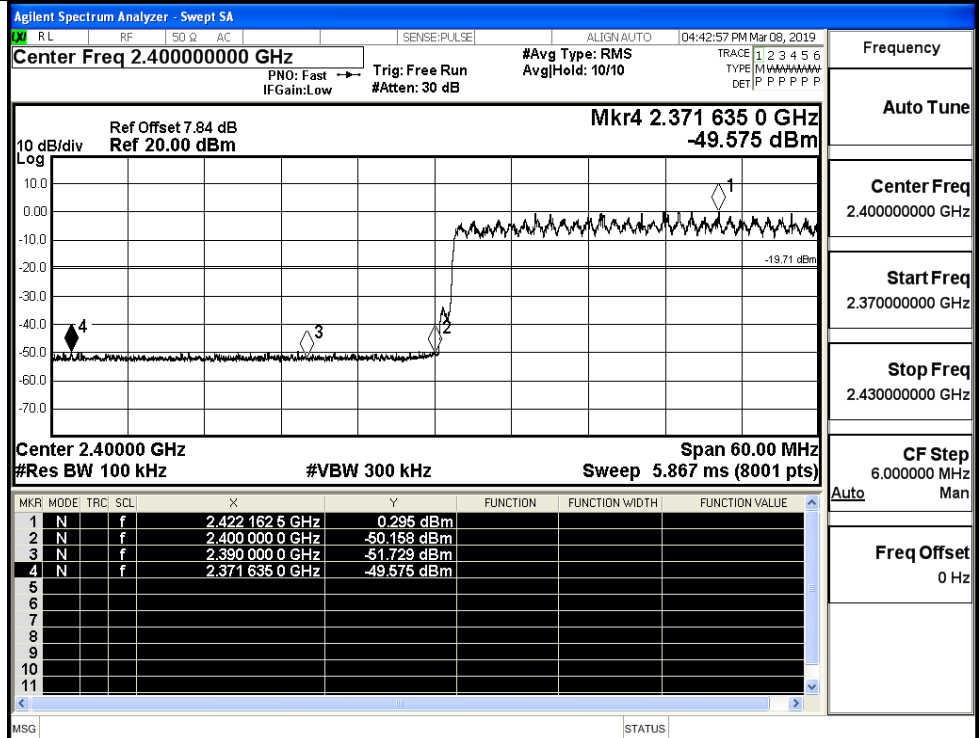
GFSK/HCH/Hop



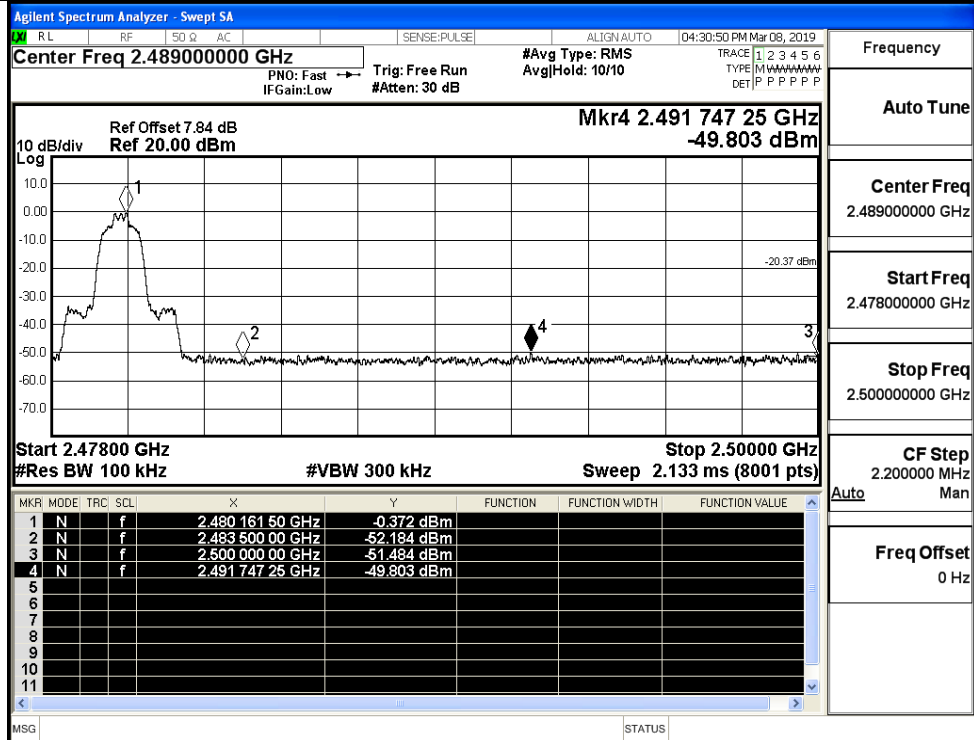
$\pi/4$ DQPSK/LCH/No
Hop



$\pi/4$ DQPSK/LCH/Hop



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

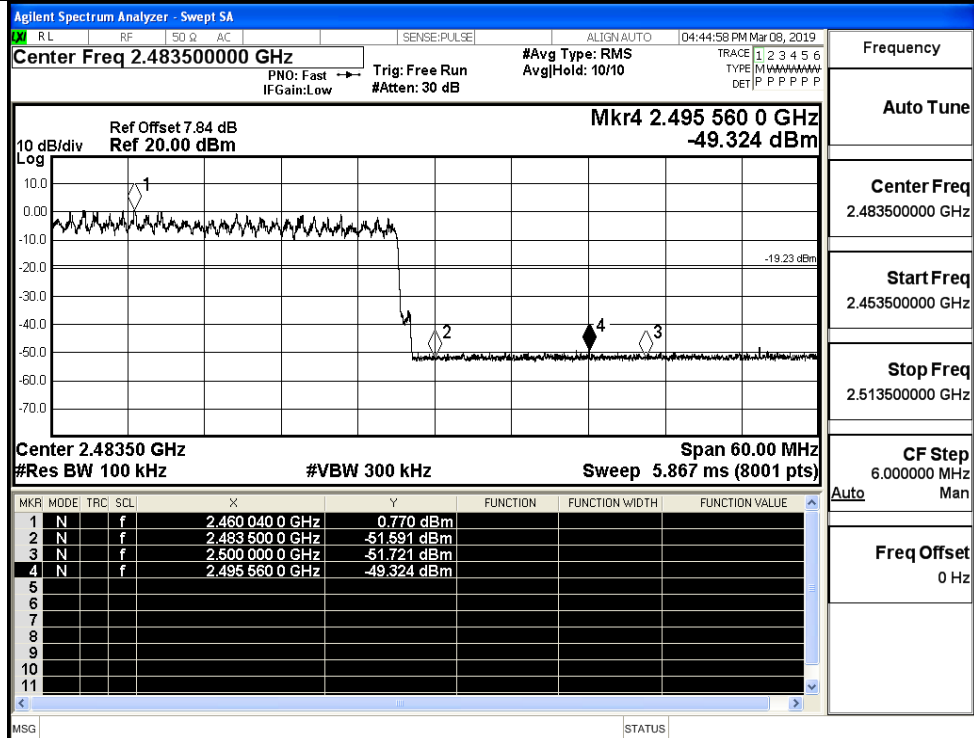


Frequency

Auto Tune

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

$\pi/4$ DQPSK/HCH/Hop

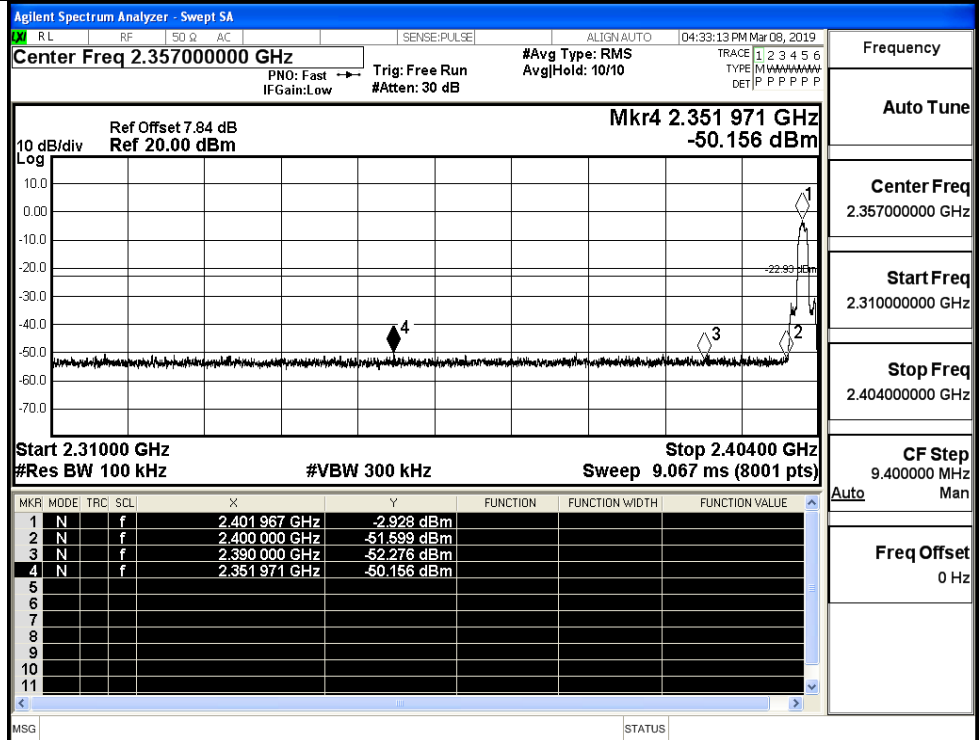


Frequency

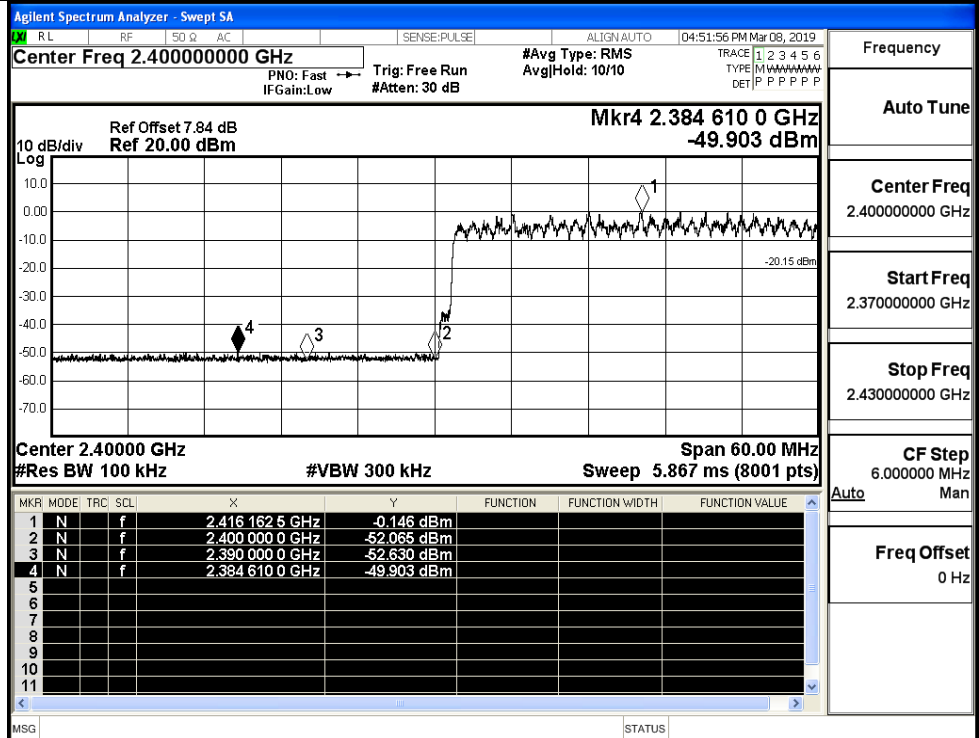
Auto Tune

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

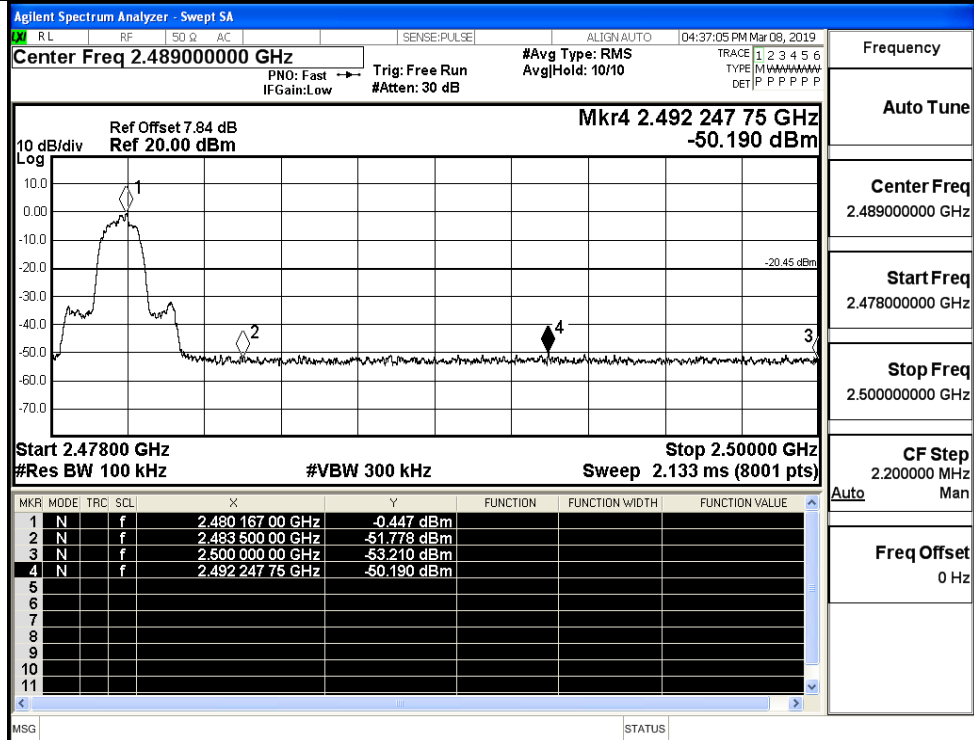
8DPSK/LCH/No Hop



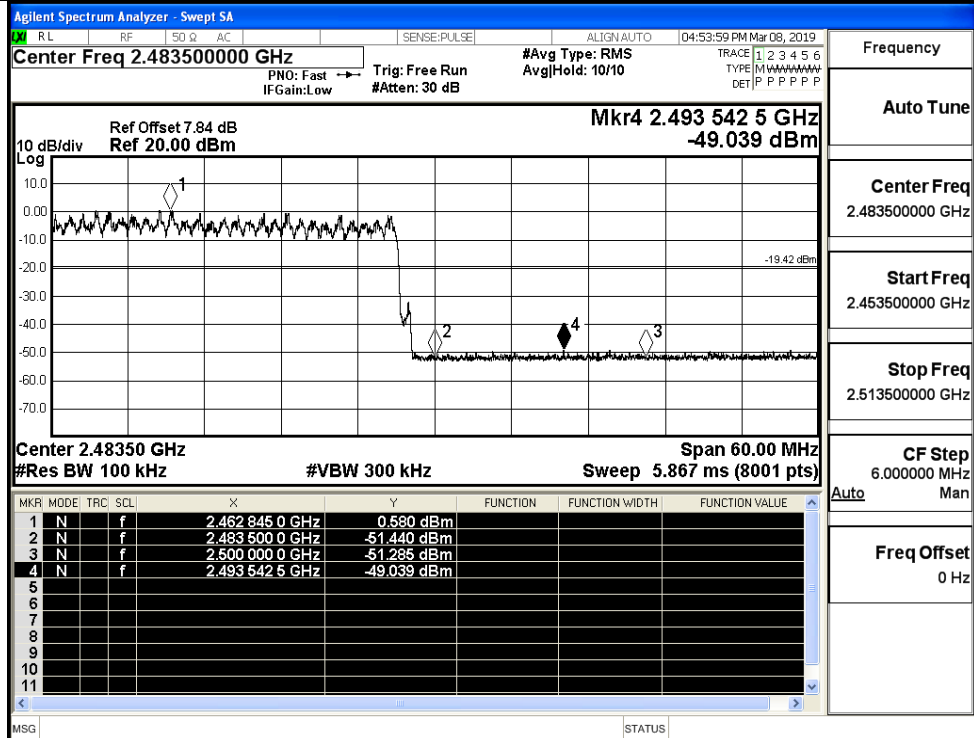
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



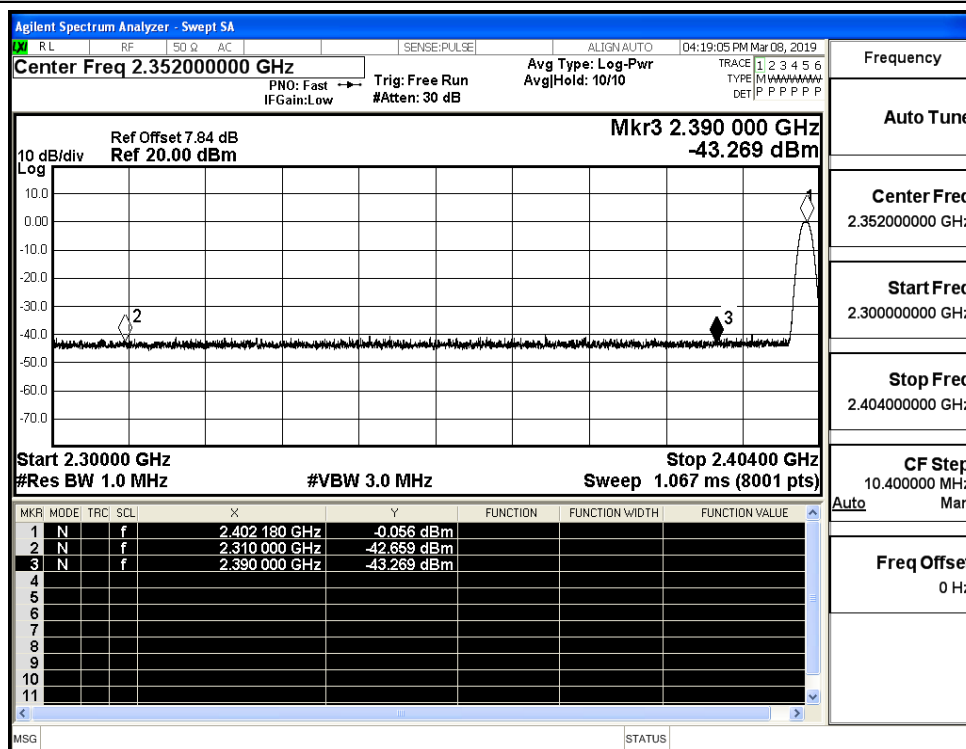
8DPSK/HCH/Hop



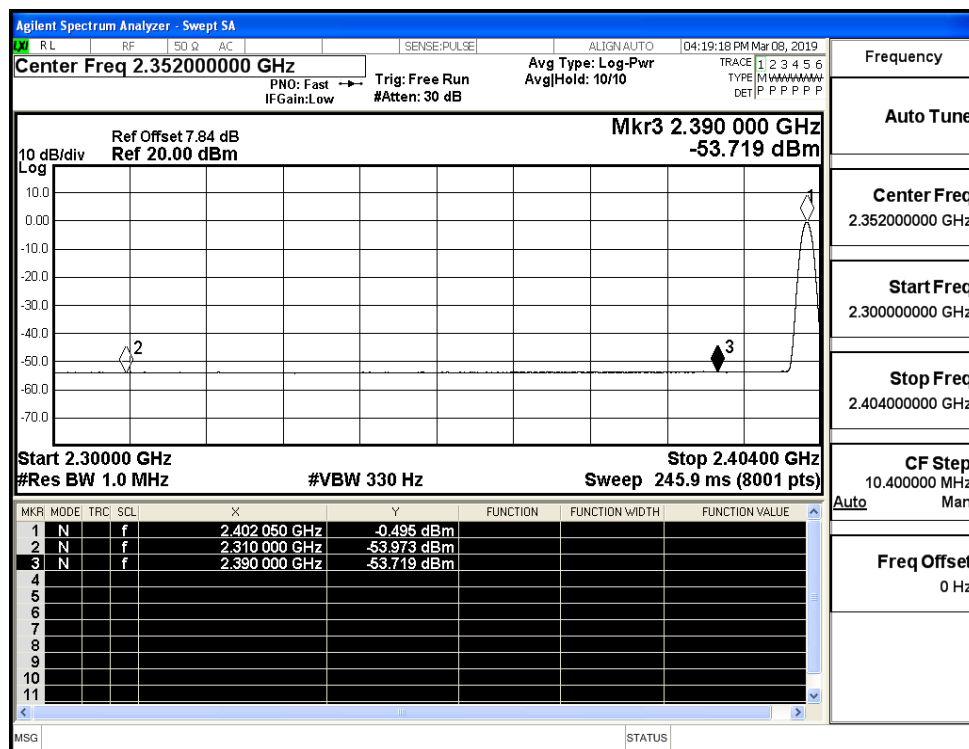
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.66	2.0	0	54.60	PEAK	74	PASS
	Off	2310.0	-53.97	2.0	0	43.28	AV	54	PASS
	Off	2390.0	-43.27	2.0	0	53.99	PEAK	74	PASS
	Off	2390.0	-53.72	2.0	0	43.54	AV	54	PASS
	Off	2483.5	-42.94	2.0	0	54.31	PEAK	74	PASS
	Off	2483.5	-53.42	2.0	0	43.84	AV	54	PASS
	Off	2500.0	-42.71	2.0	0	54.55	PEAK	74	PASS
	Off	2500.0	-53.29	2.0	0	43.97	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.36	2.0	0	53.90	PEAK	74	PASS
	Off	2310.0	-53.92	2.0	0	43.33	AV	54	PASS
	Off	2390.0	-42.75	2.0	0	54.50	PEAK	74	PASS
	Off	2390.0	-53.63	2.0	0	43.63	AV	54	PASS
	Off	2483.5	-42.96	2.0	0	54.30	PEAK	74	PASS
	Off	2483.5	-53.31	2.0	0	43.95	AV	54	PASS
	Off	2500.0	-43.81	2.0	0	53.45	PEAK	74	PASS
	Off	2500.0	-53.29	2.0	0	43.97	AV	54	PASS
8DPSK	Off	2310.0	-44.37	2.0	0	52.89	PEAK	74	PASS
	Off	2310.0	-53.94	2.0	0	43.32	AV	54	PASS
	Off	2390.0	-43.71	2.0	0	53.55	PEAK	74	PASS
	Off	2390.0	-53.70	2.0	0	43.56	AV	54	PASS
	Off	2483.5	-42.82	2.0	0	54.44	PEAK	74	PASS
	Off	2483.5	-53.32	2.0	0	43.94	AV	54	PASS
	Off	2500.0	-43.14	2.0	0	54.12	PEAK	74	PASS
	Off	2500.0	-53.30	2.0	0	43.96	AV	54	PASS

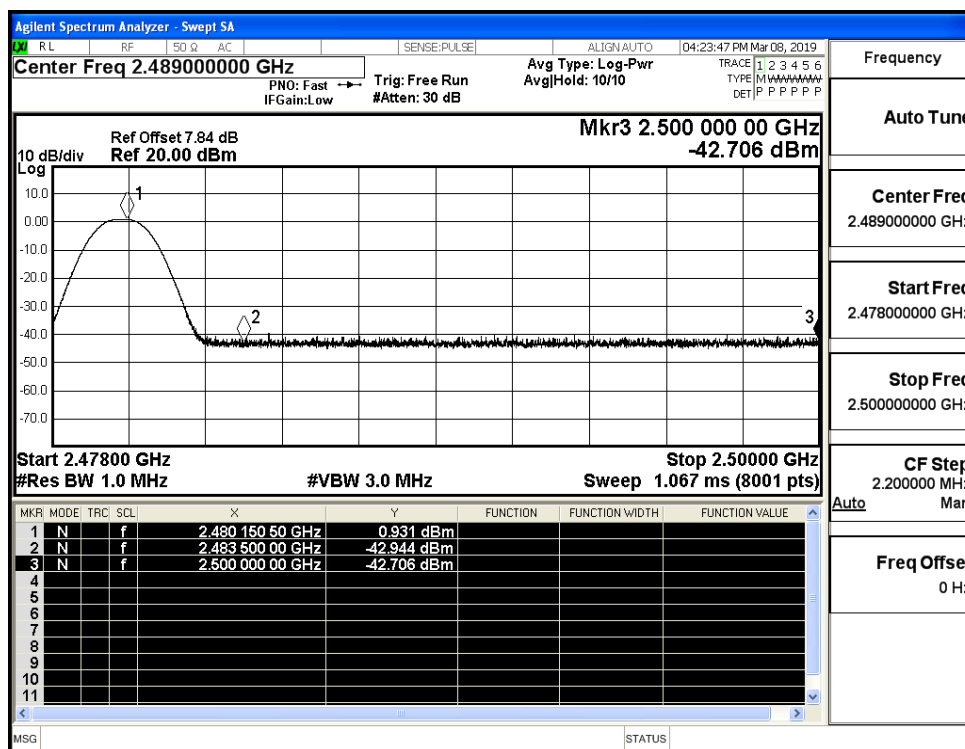
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



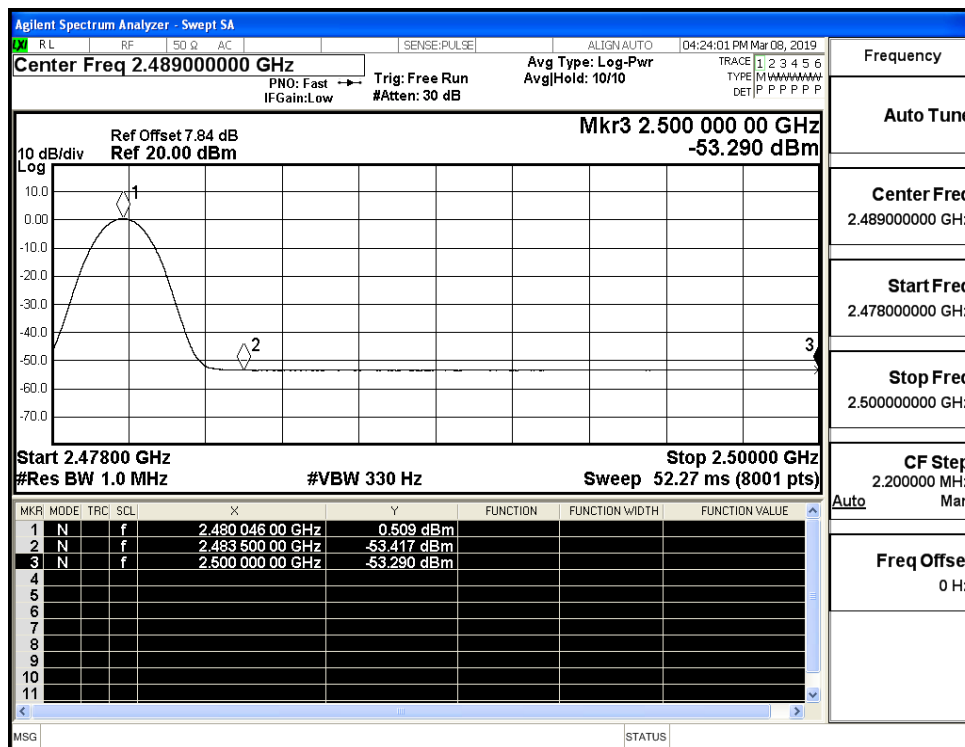
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

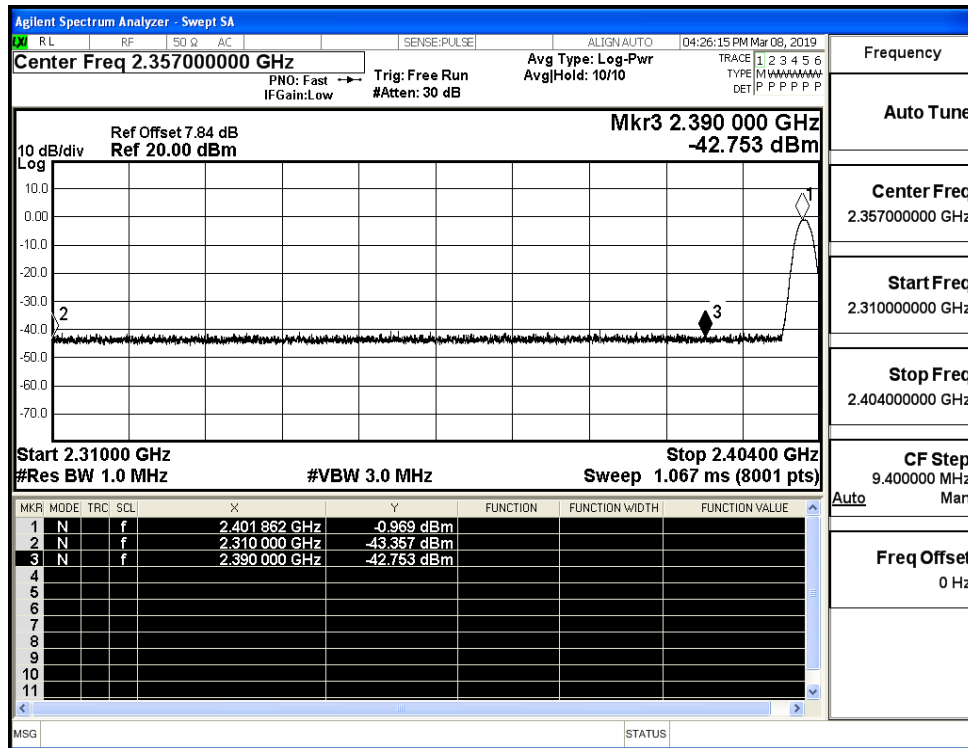
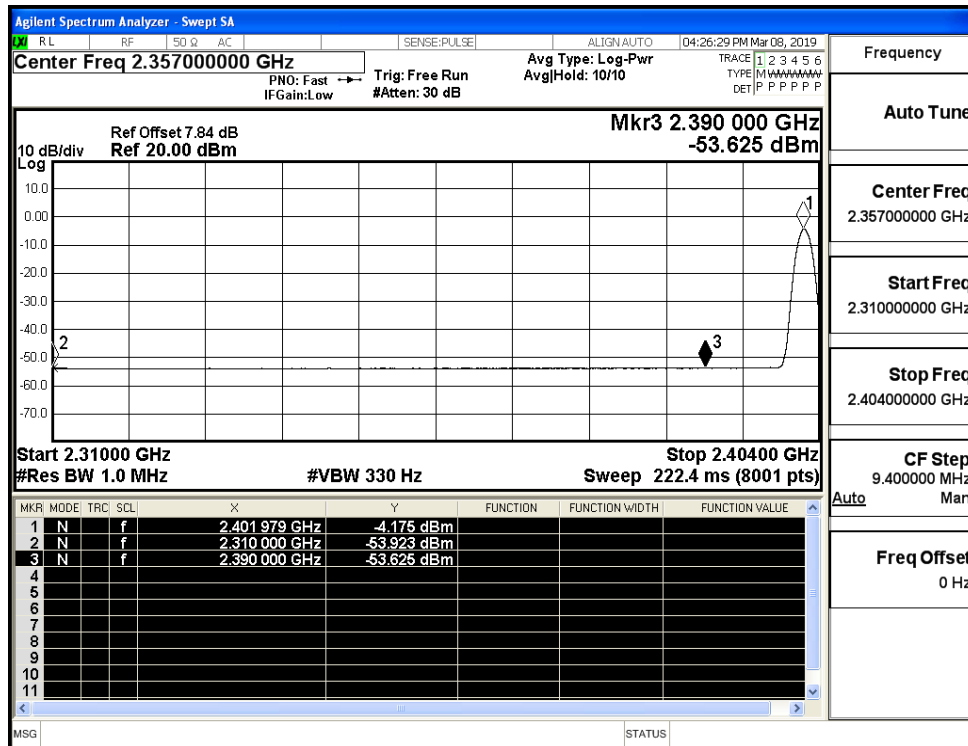


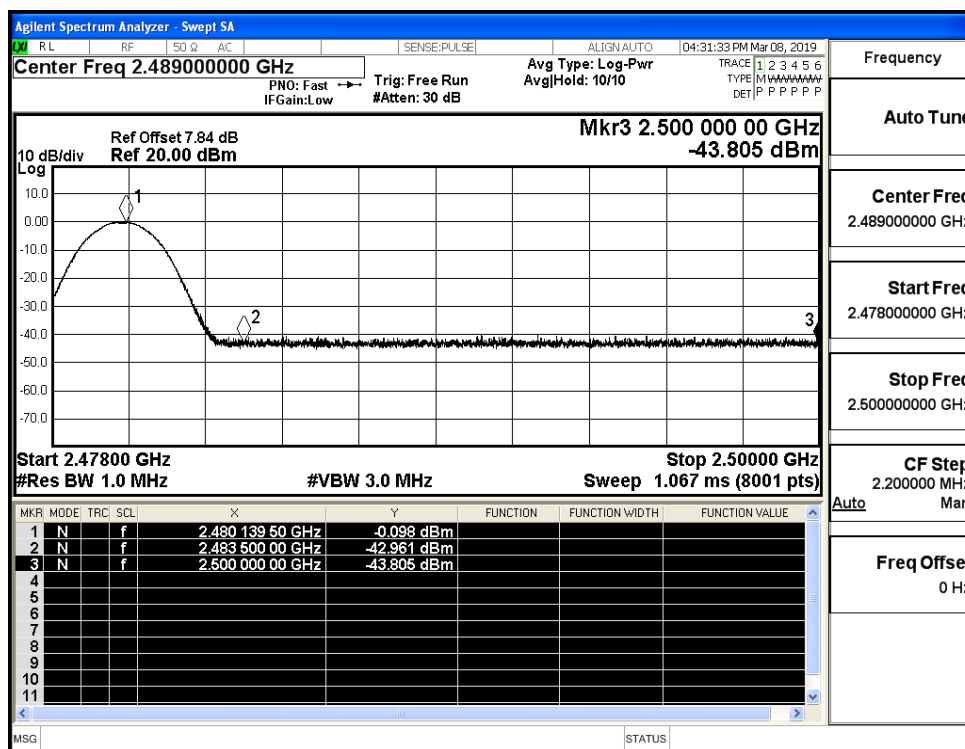
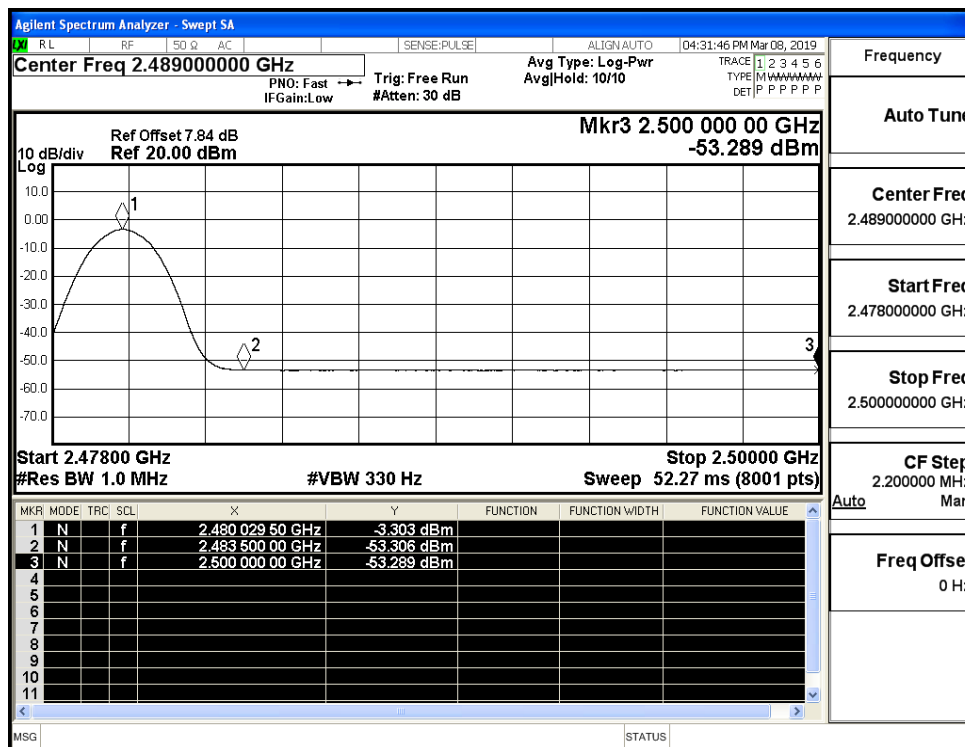
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



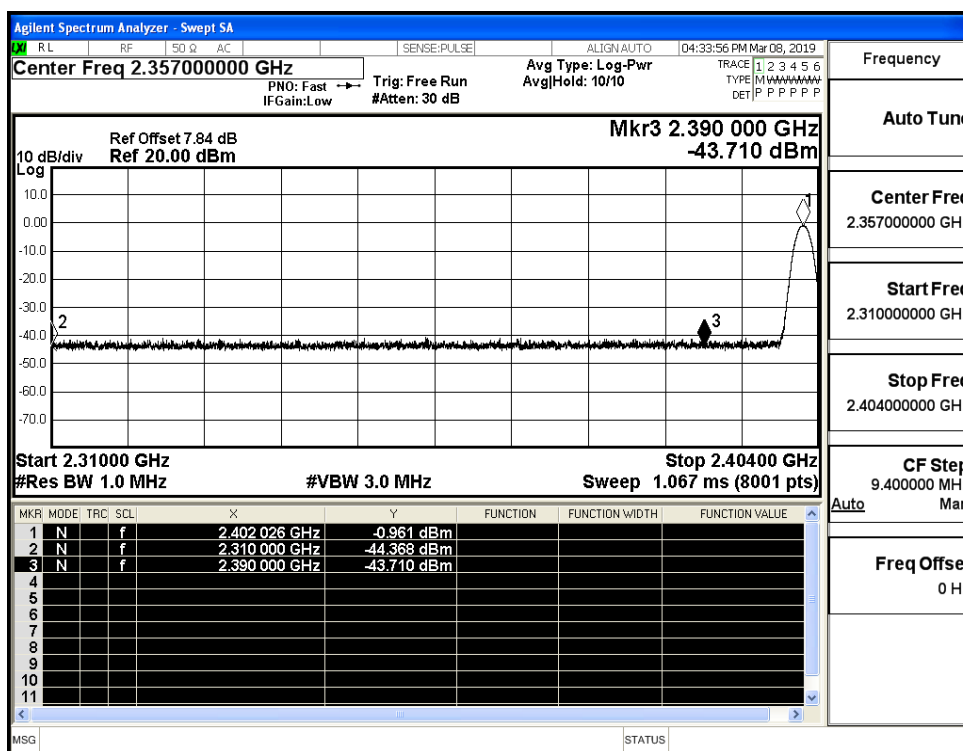
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



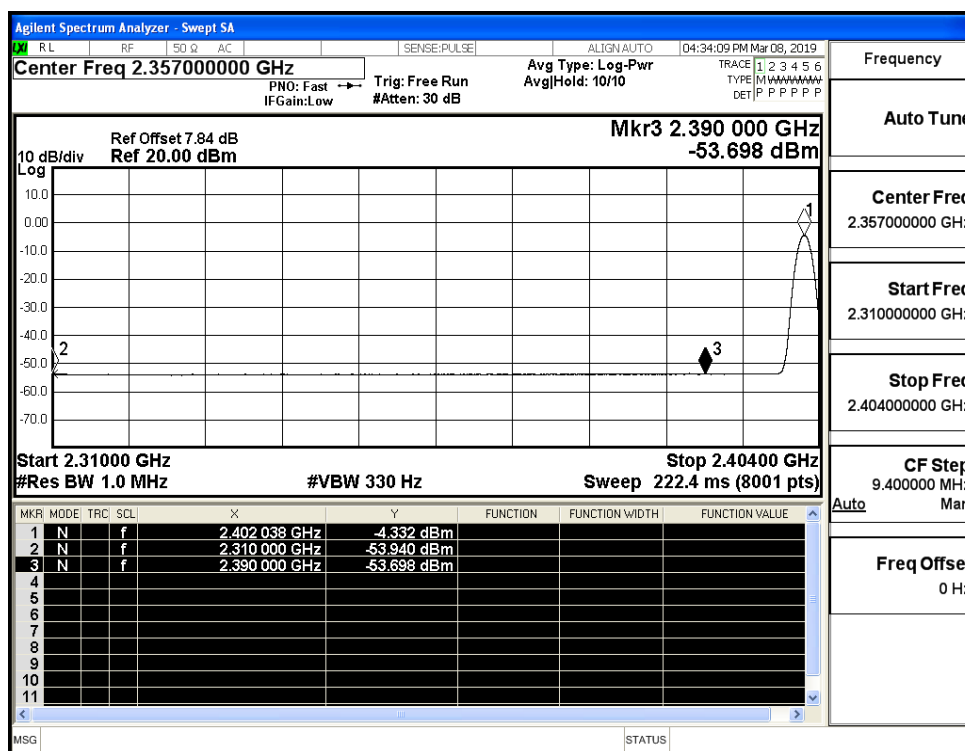
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

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)

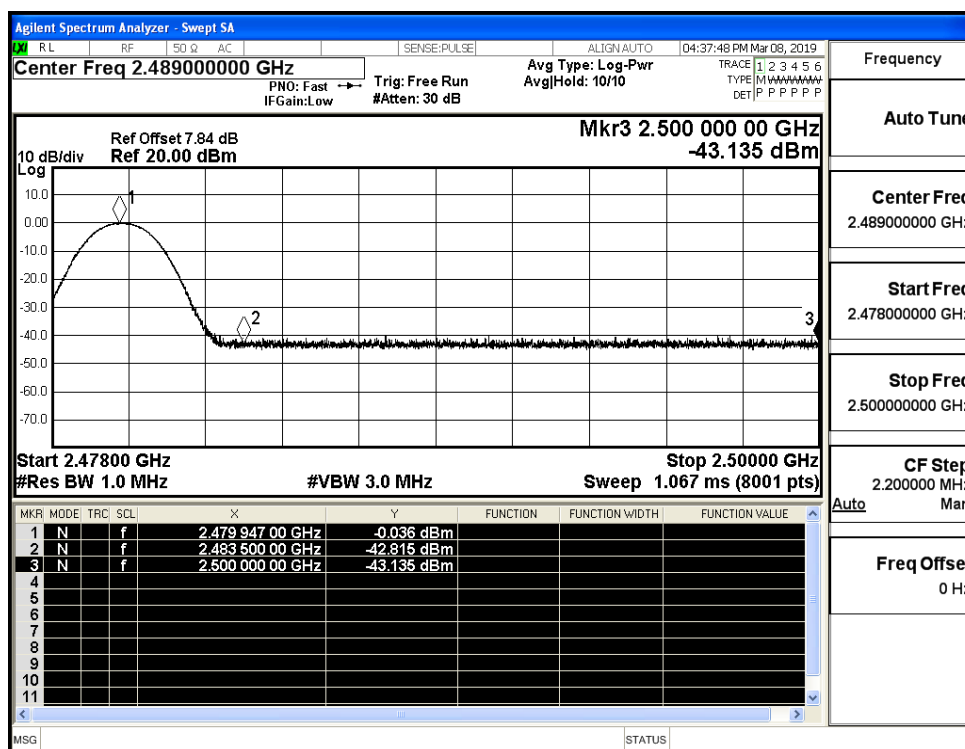
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

