

Appendix A

RF Test Data for BT V3.0+EDR (Conducted Measurement)

Product Name: WIRELESS EARPHONES

Trade Mark: Humixx

Test Model: HEHZ34

Environmental Conditions

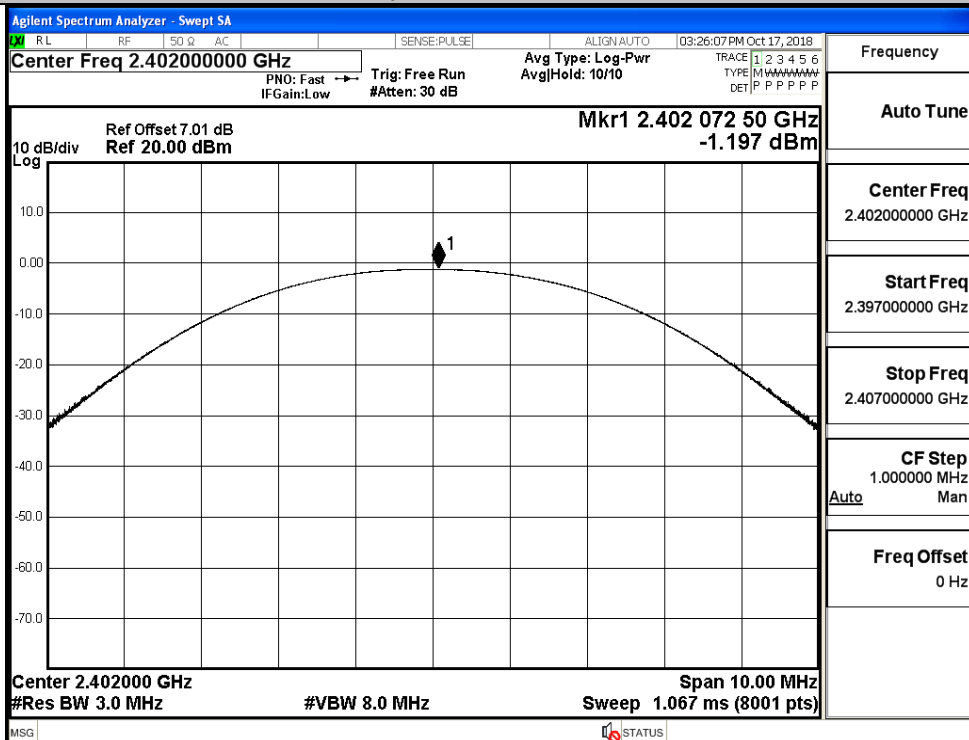
Temperature:	23.5 ° C
Relative Humidity:	53.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Diamond.Lu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

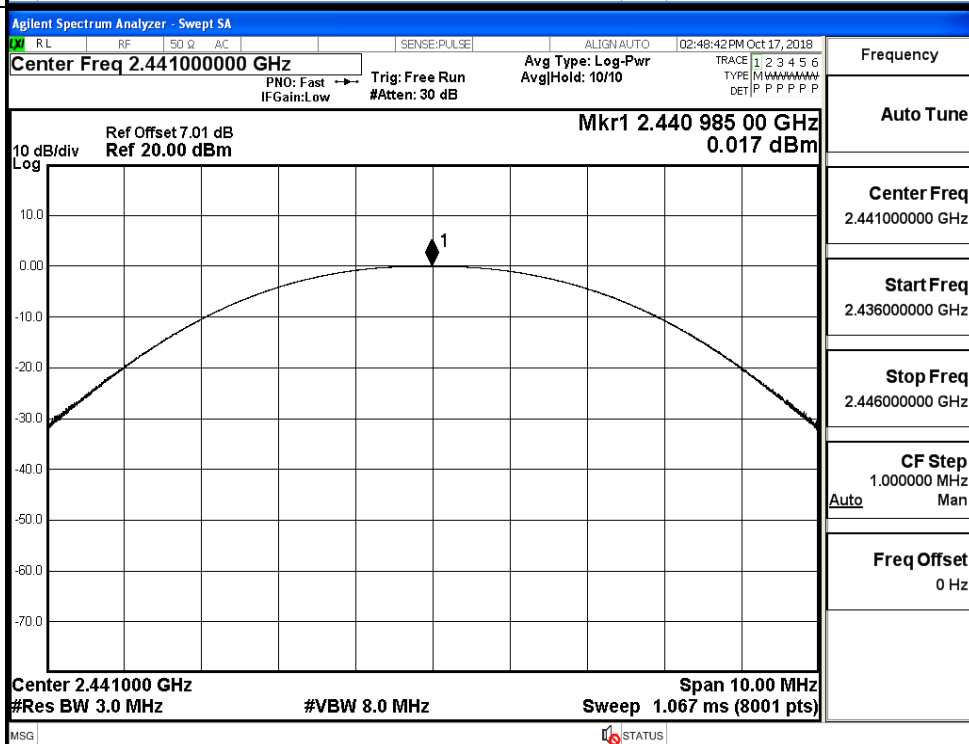
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.197	21	PASS
	MCH	0.017	21	PASS
	HCH	0.347	21	PASS
$\pi/4$ DQPSK	LCH	-1.356	21	PASS
	MCH	-0.154	21	PASS
	HCH	-0.165	21	PASS
8DPSK	LCH	-1.306	21	PASS
	MCH	-0.055	21	PASS
	HCH	0.223	21	PASS

Test Graphs

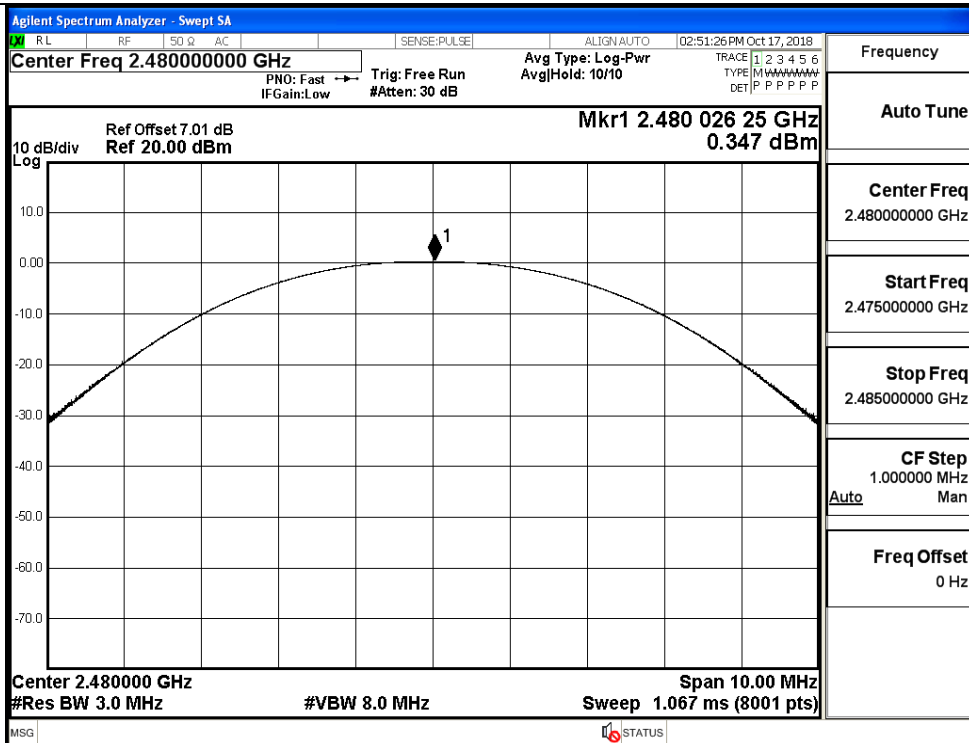
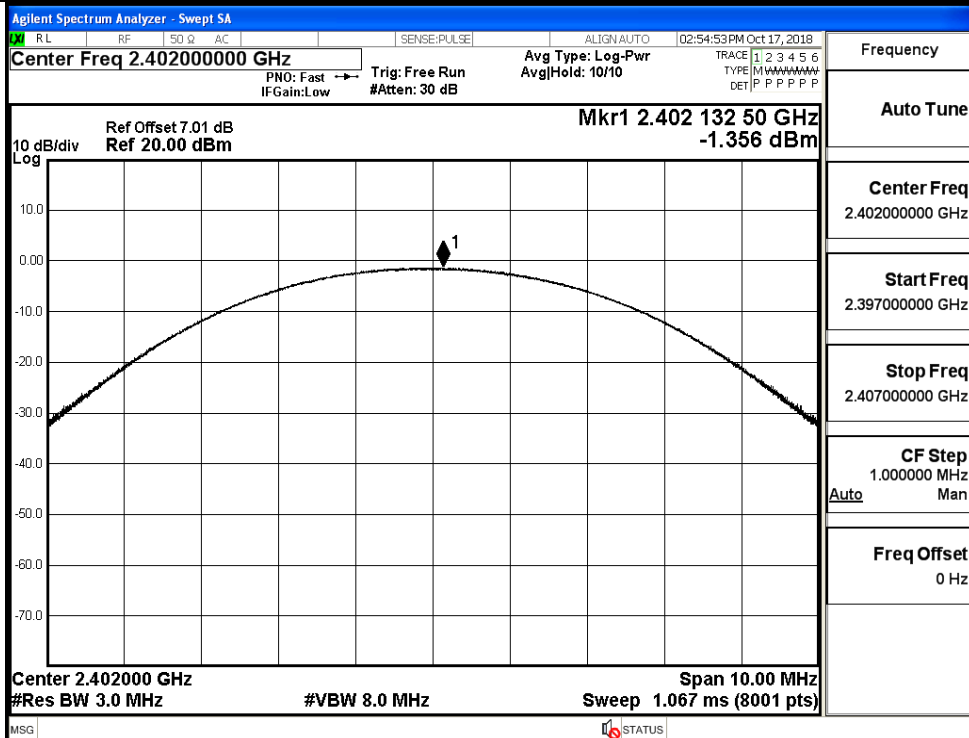
GFSK/LCH

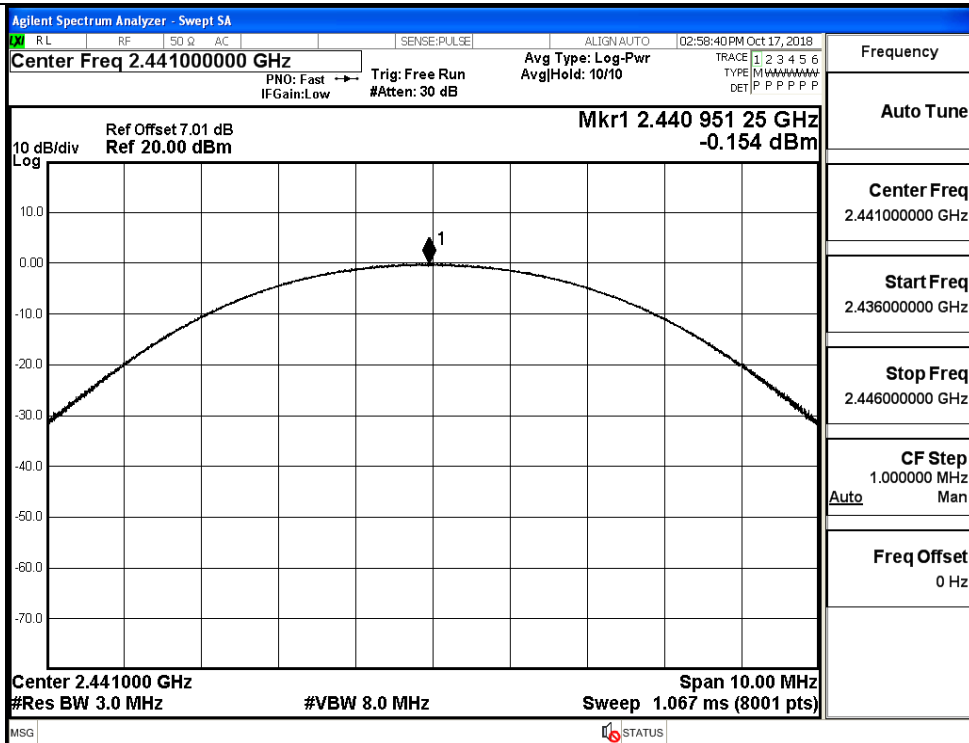
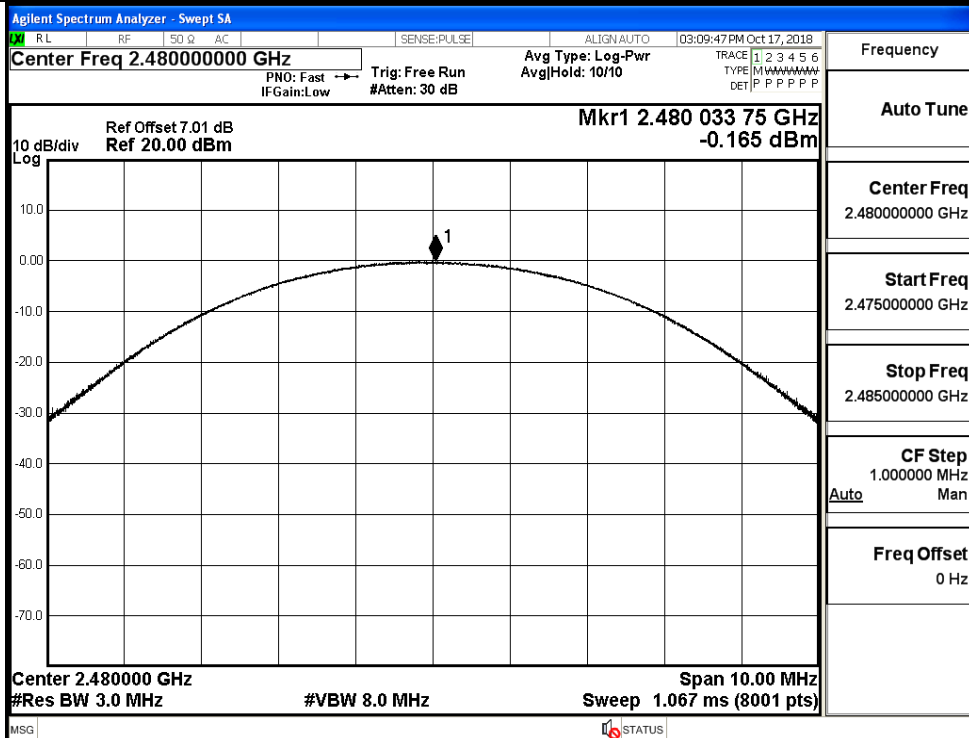


GFSK/MCH

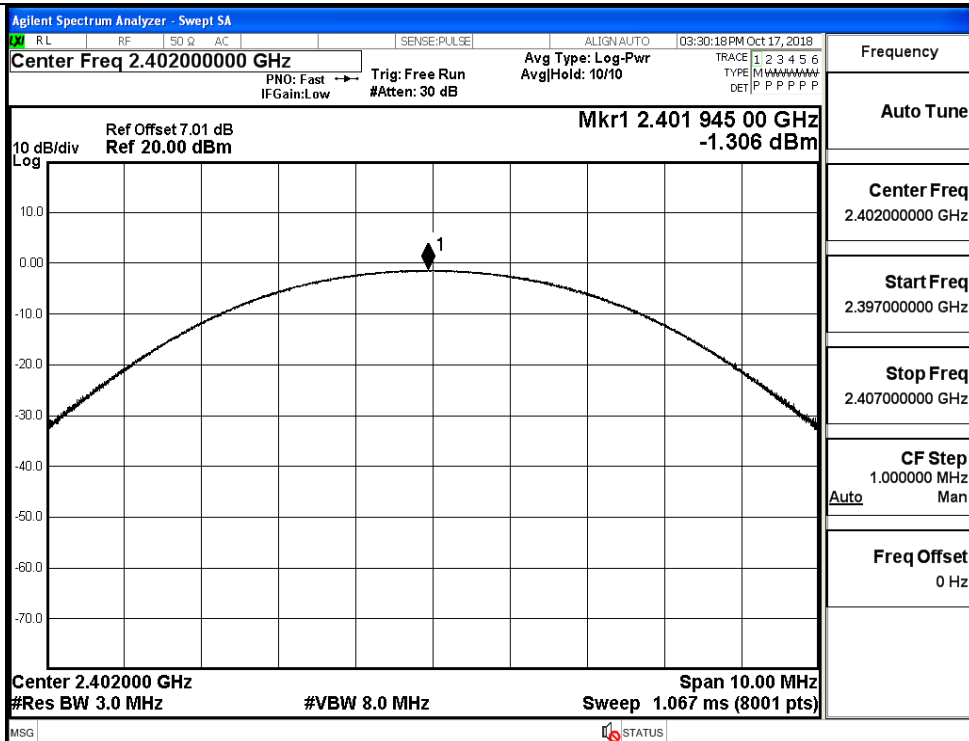


GFSK/HCH

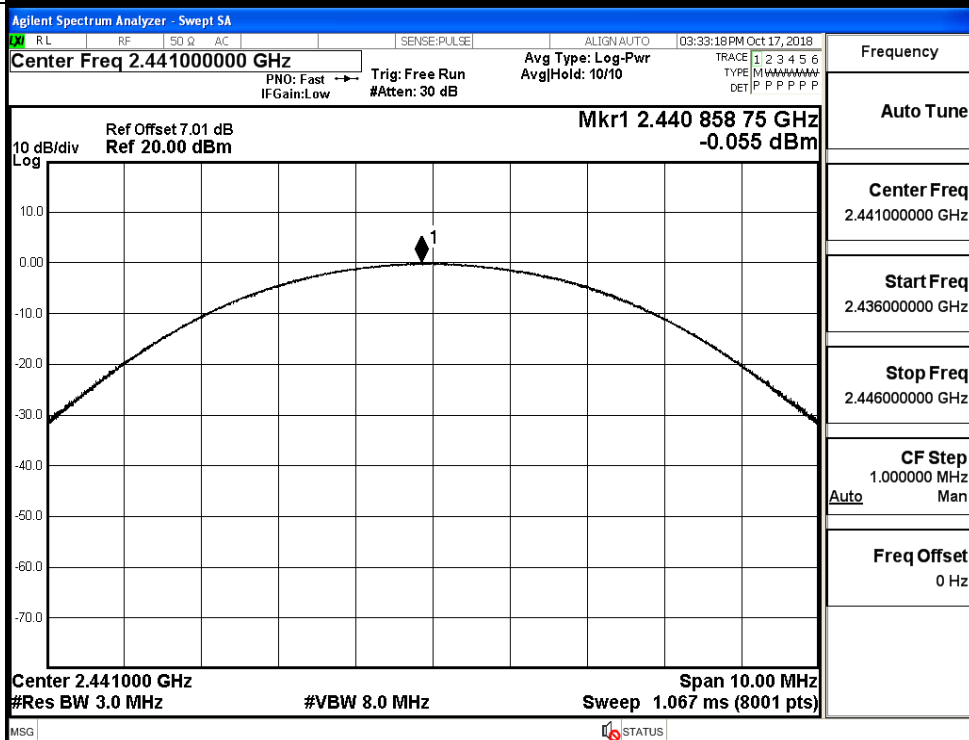
 π /4DQPSK/LCH

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

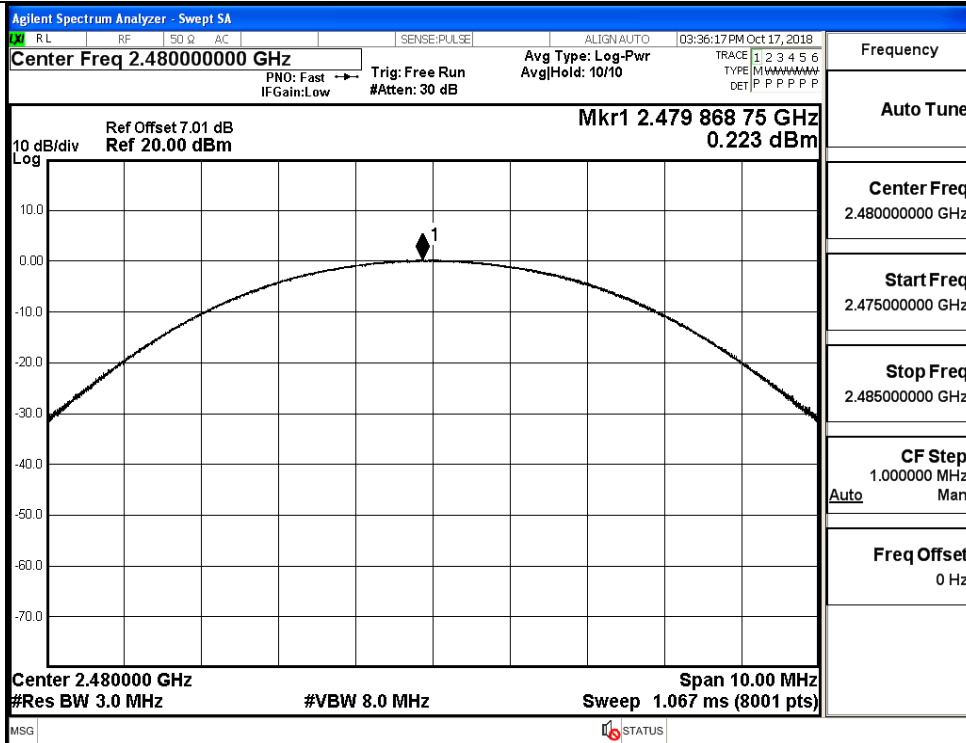
8DPSK/LCH



8DPSK/MCH



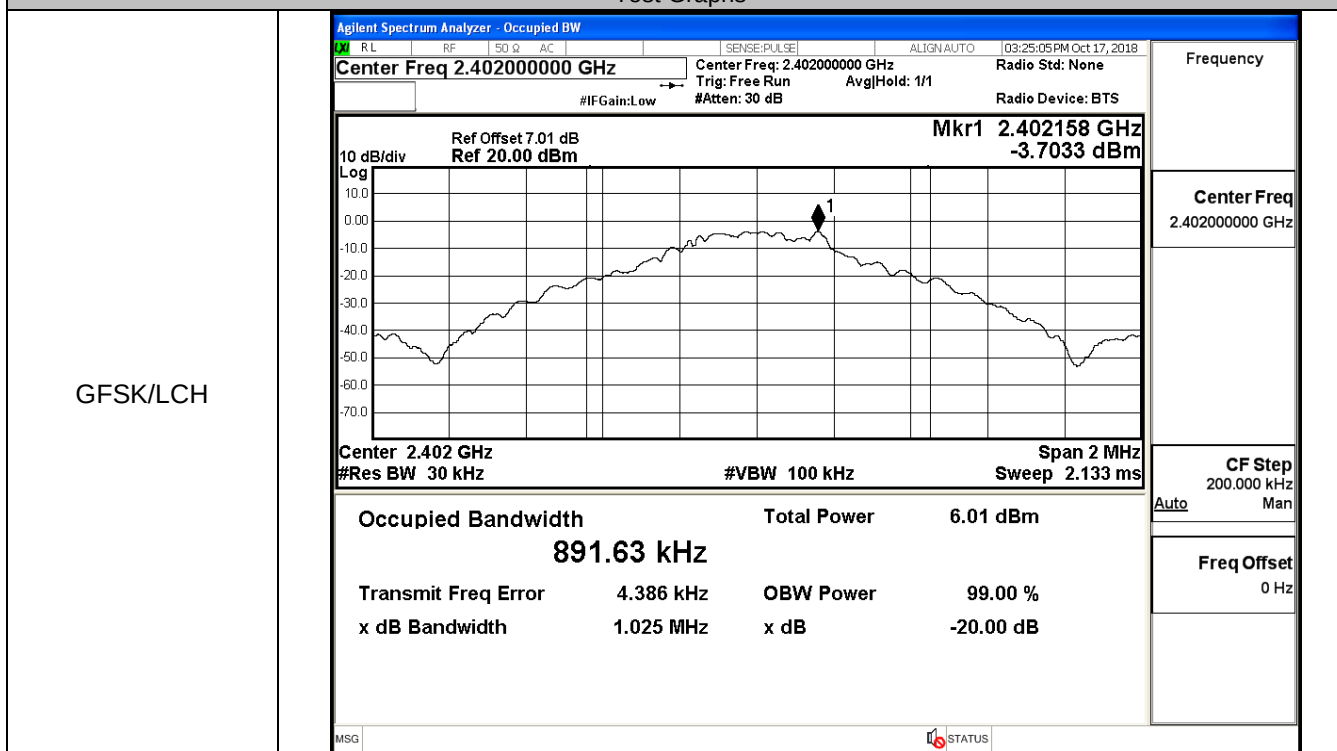
8DPSK/HCH



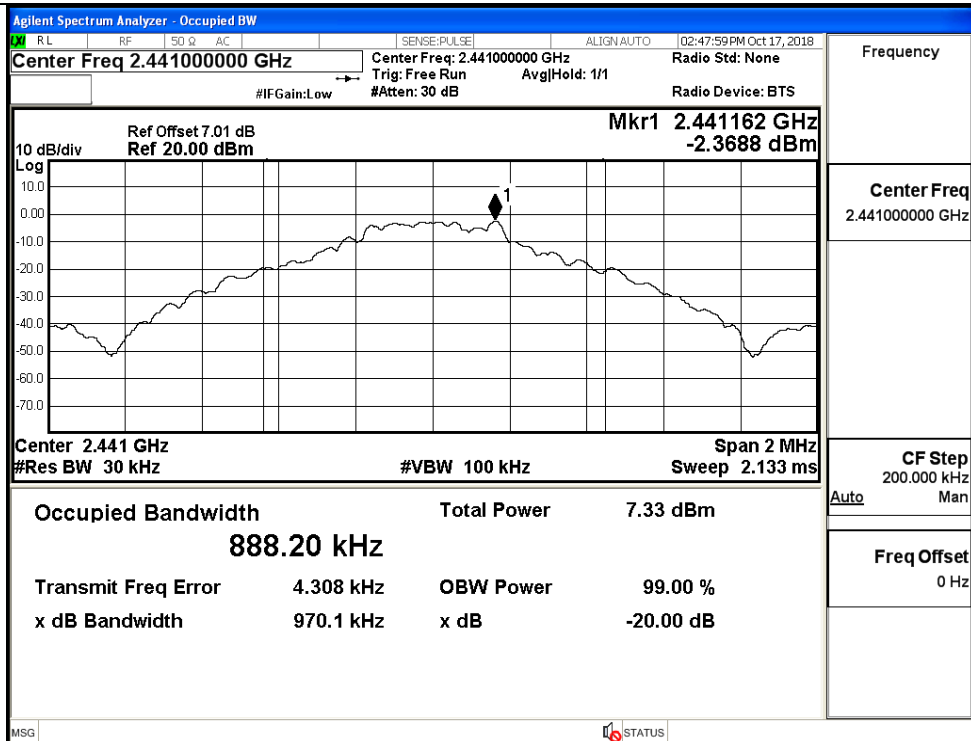
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89163	1.025	Not Specified	PASS
	MCH	0.88820	0.9701	Not Specified	PASS
	HCH	0.88690	0.9688	Not Specified	PASS
π /4DQPSK	LCH	1.1655	1.286	Not Specified	PASS
	MCH	1.1678	1.287	Not Specified	PASS
	HCH	1.1650	1.287	Not Specified	PASS
8DPSK	LCH	1.1724	1.288	Not Specified	PASS
	MCH	1.1716	1.288	Not Specified	PASS
	HCH	1.1703	1.287	Not Specified	PASS

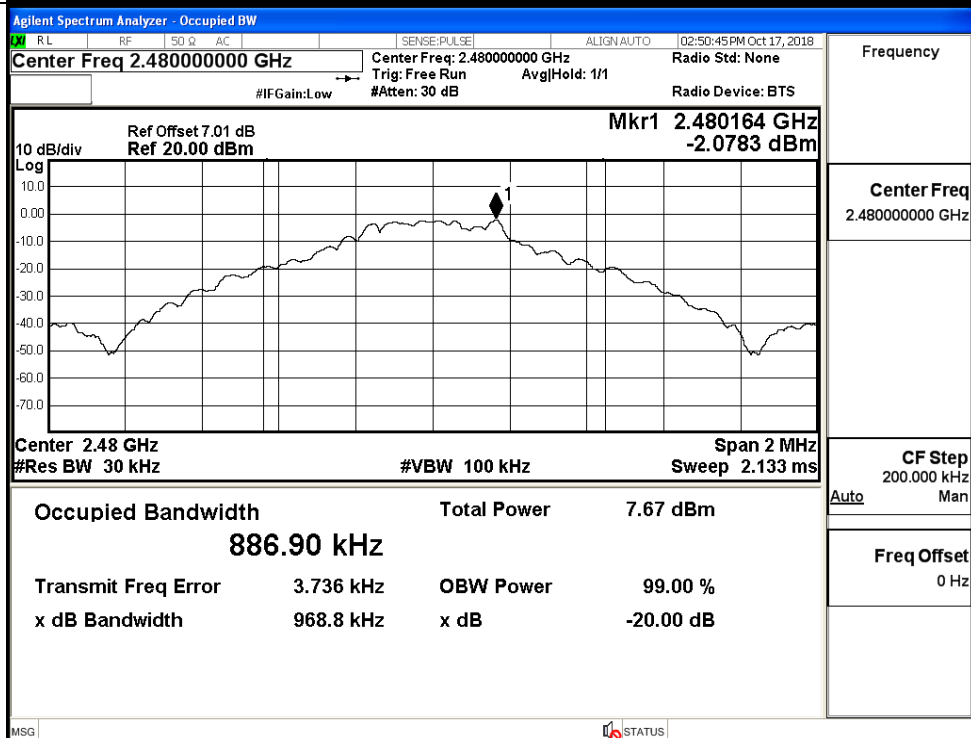
Test Graphs

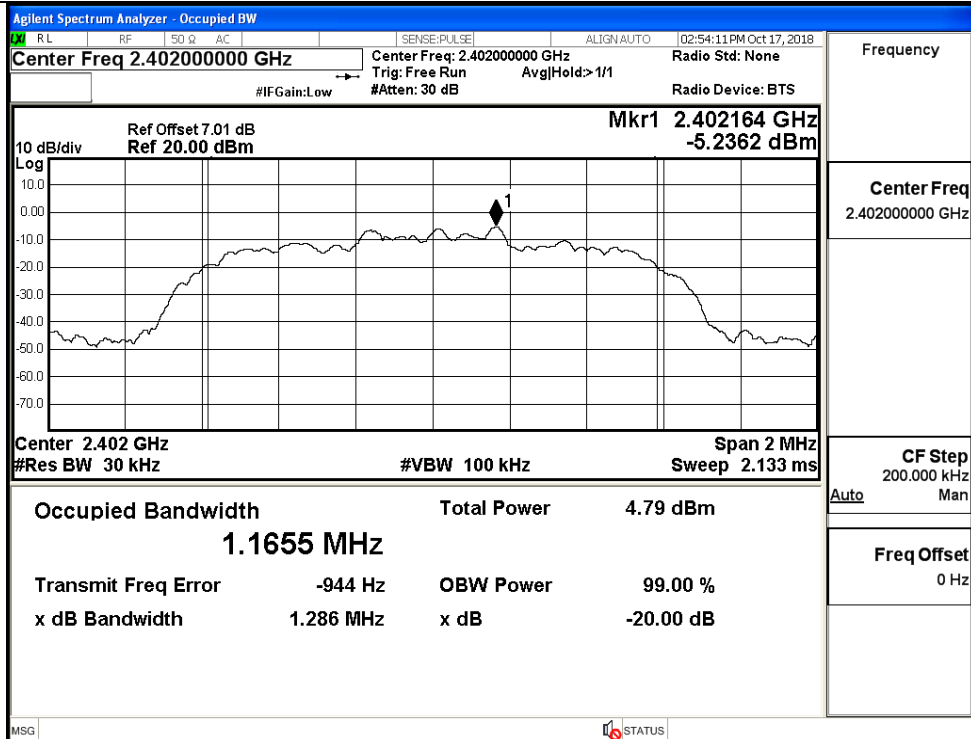
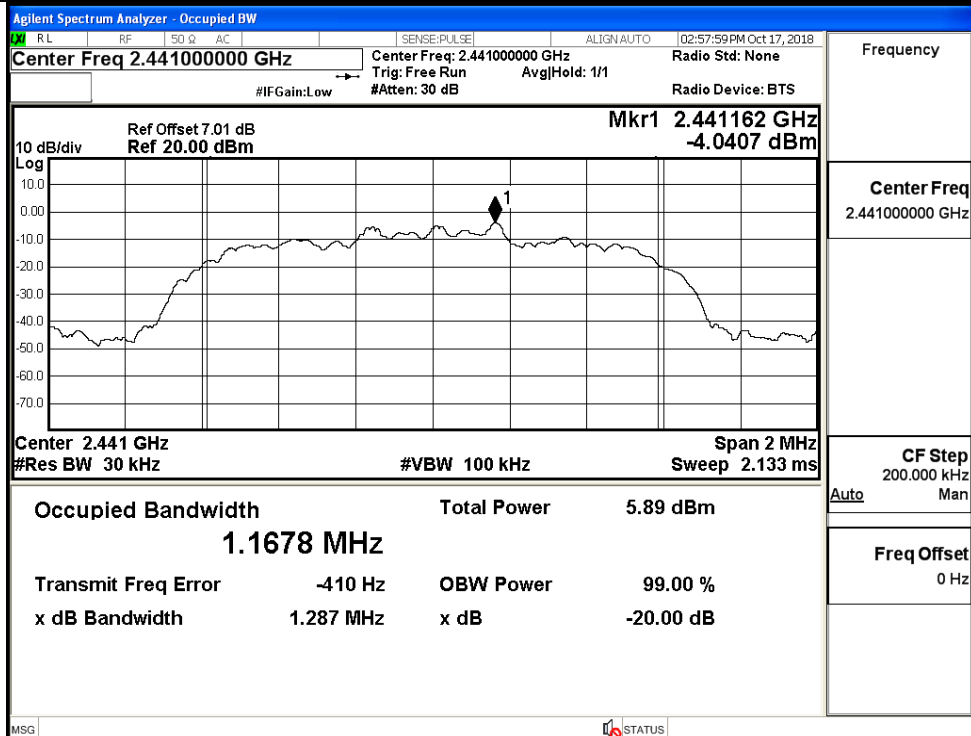


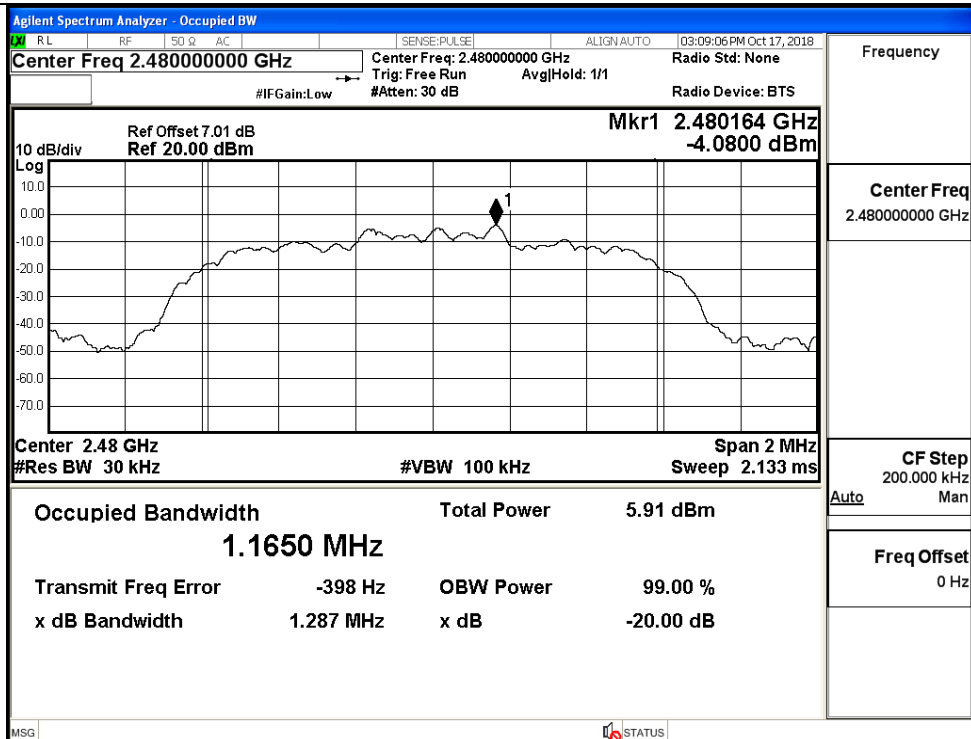
GFSK/MCH



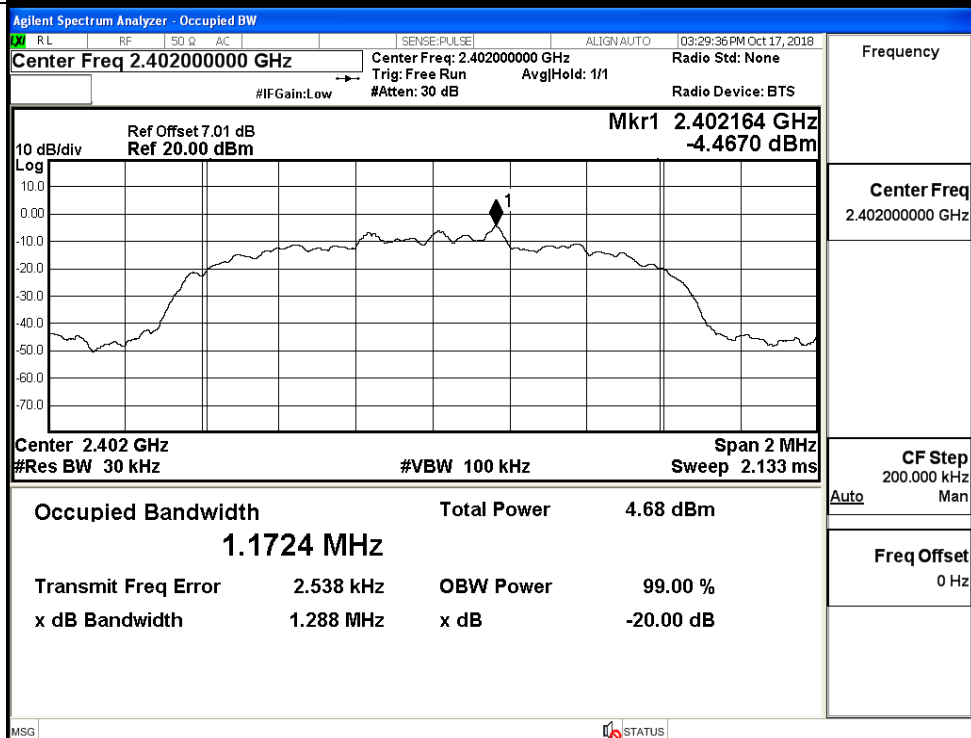
GFSK/HCH



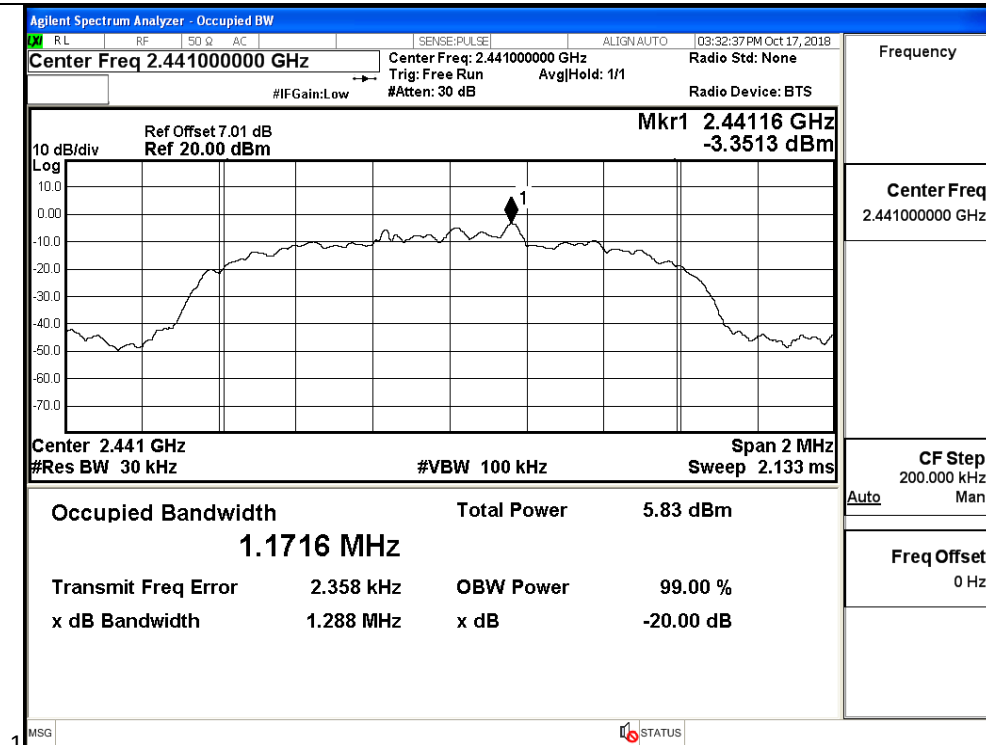
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

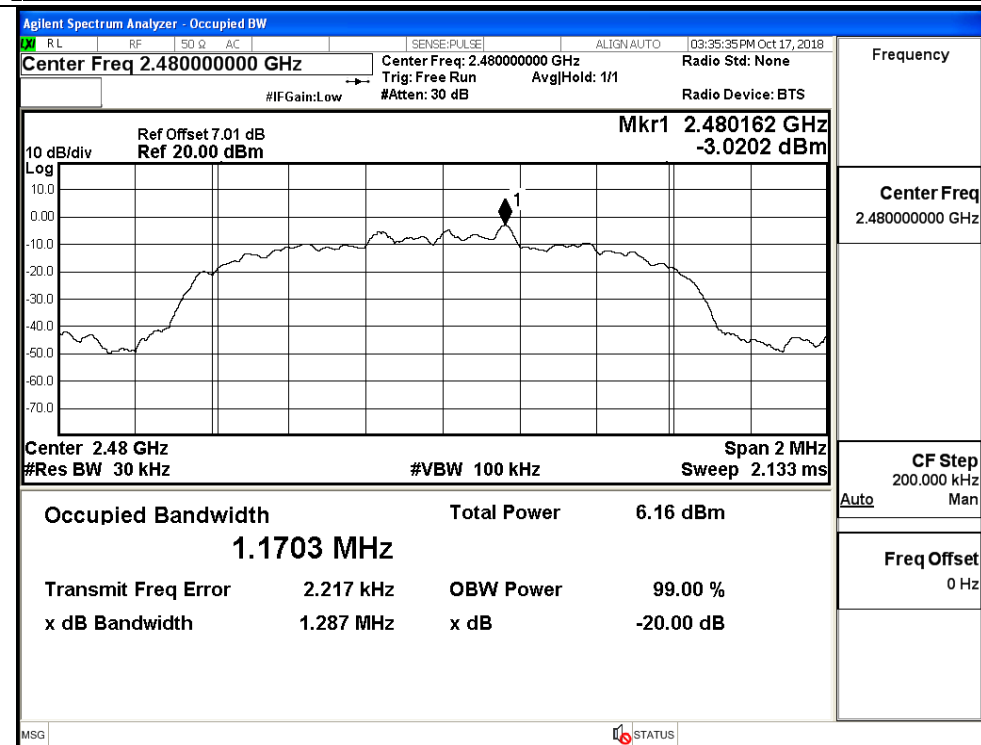
8DPSK/LCH



8DPSK/MCH



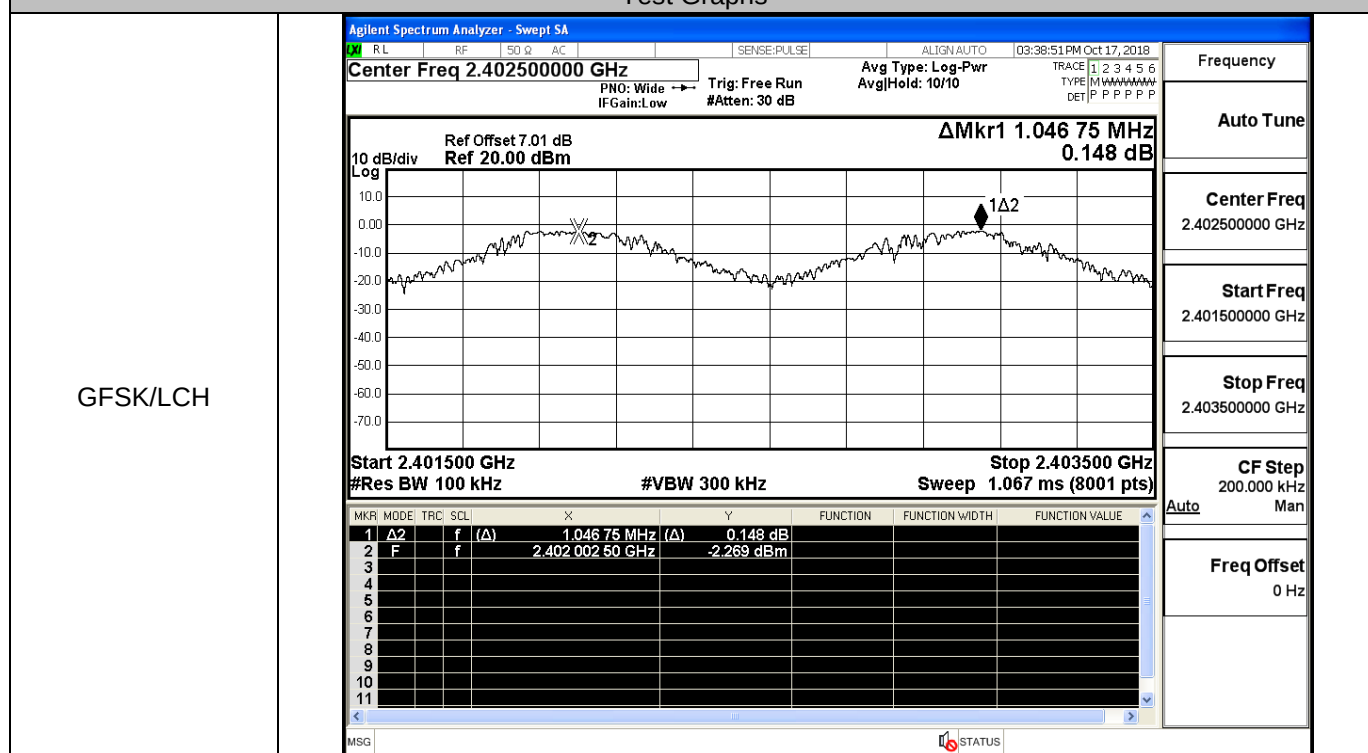
8DPSK/HCH



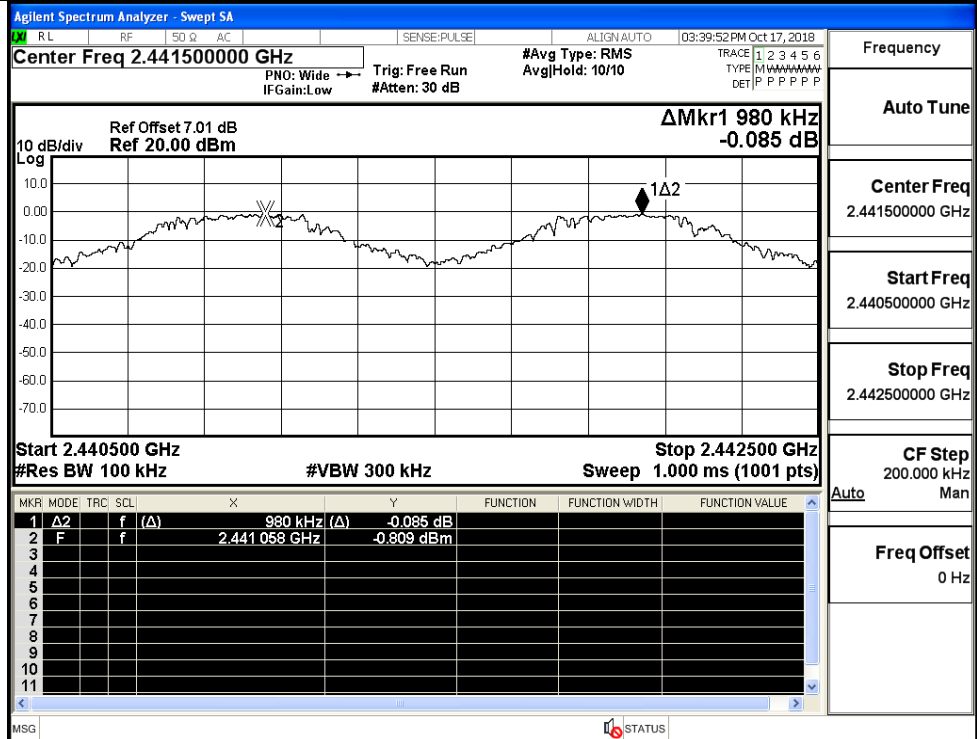
A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.047	0.683	PASS
	MCH	0.980	0.683	PASS
	HCH	1.086	0.683	PASS
$\pi/4$ DQPSK	LCH	1.306	0.858	PASS
	MCH	0.992	0.858	PASS
	HCH	1.144	0.858	PASS
8DPSK	LCH	0.734	0.859	PASS
	MCH	1.188	0.859	PASS
	HCH	0.862	0.859	PASS

Test Graphs



GFSK/MCH

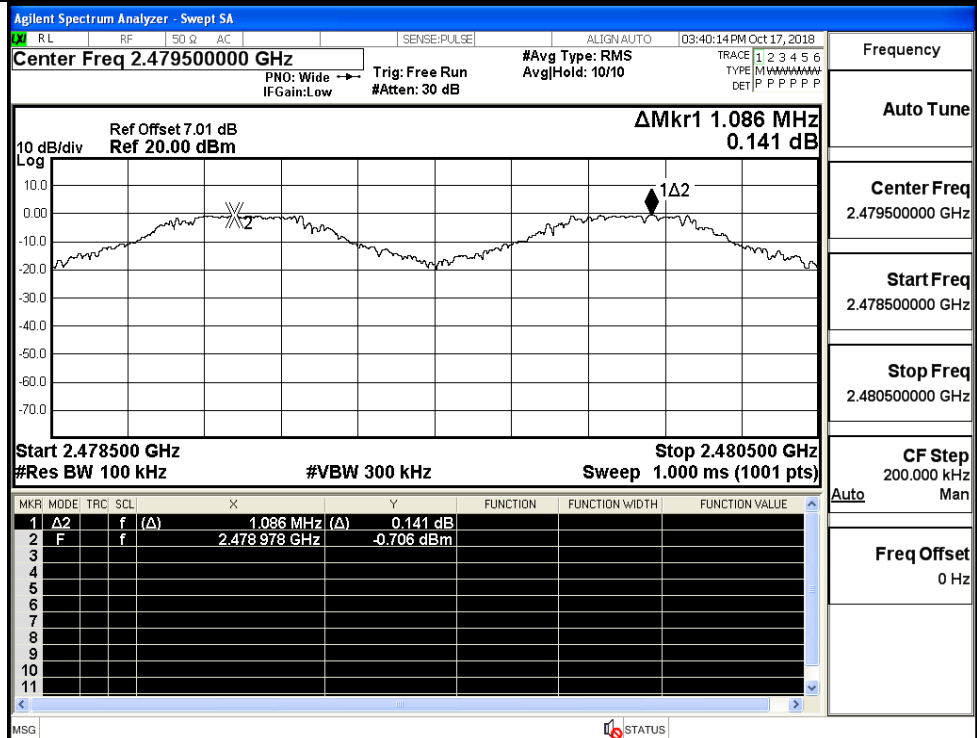


Frequency

Auto Tune

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

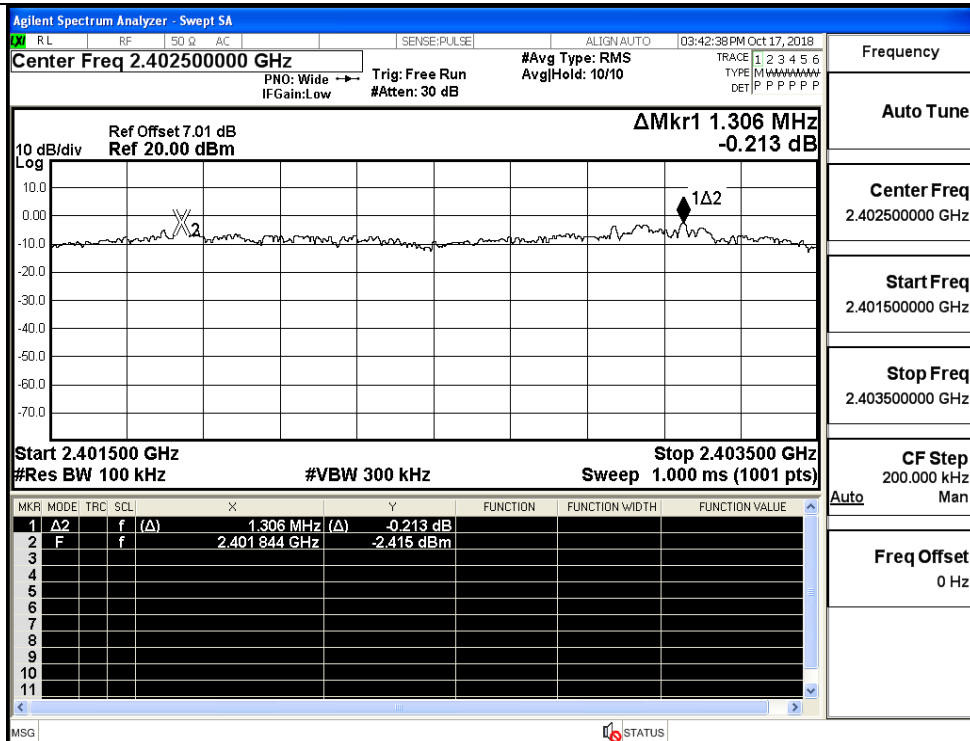
GFSK/HCH



Frequency

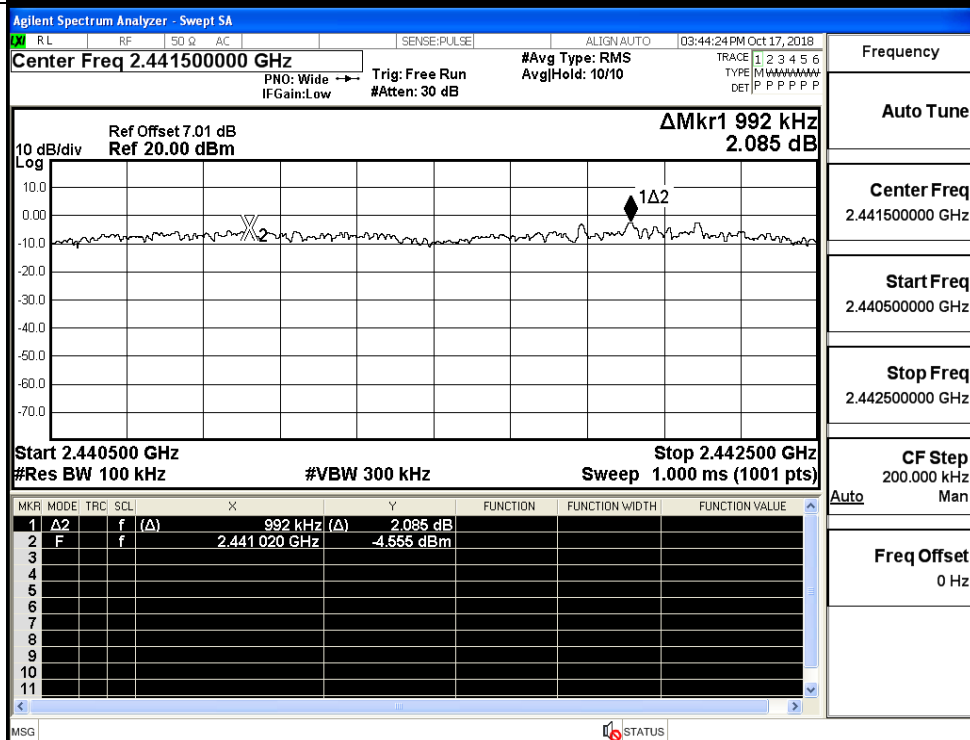
Auto Tune

Center Freq
2.479500000 GHzStart Freq
2.478500000 GHzStop Freq
2.480500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

$\pi/4$ DQPSK/LCH

Frequency

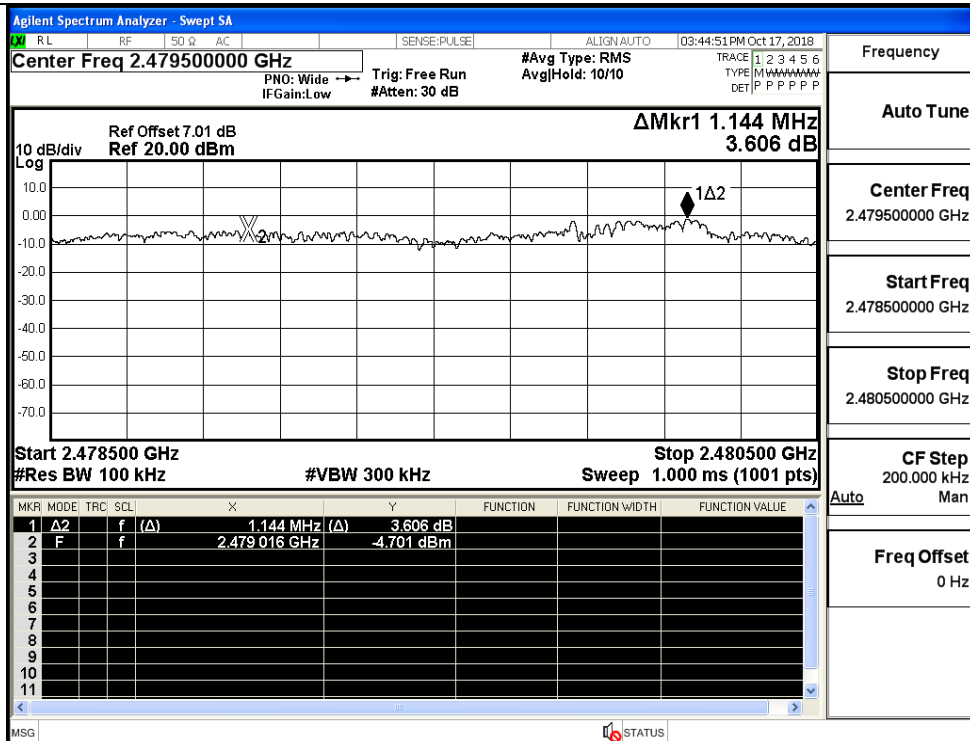
Auto Tune

Center Freq
2.402500000 GHzStart Freq
2.401500000 GHzStop Freq
2.403500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz $\pi/4$ DQPSK/MCH

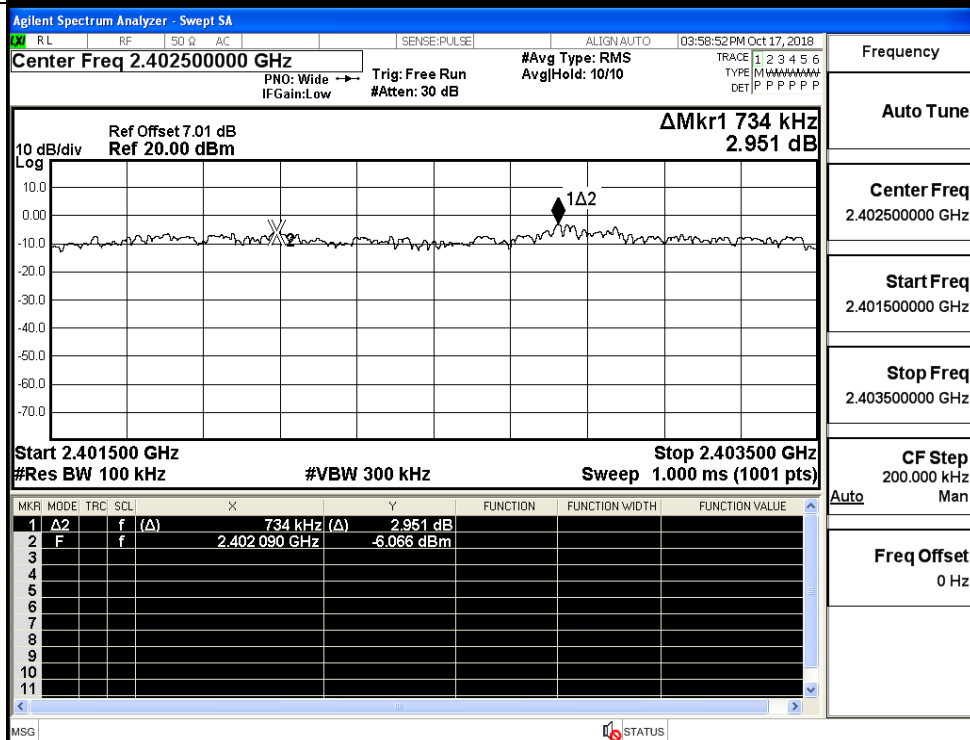
Frequency

Auto Tune

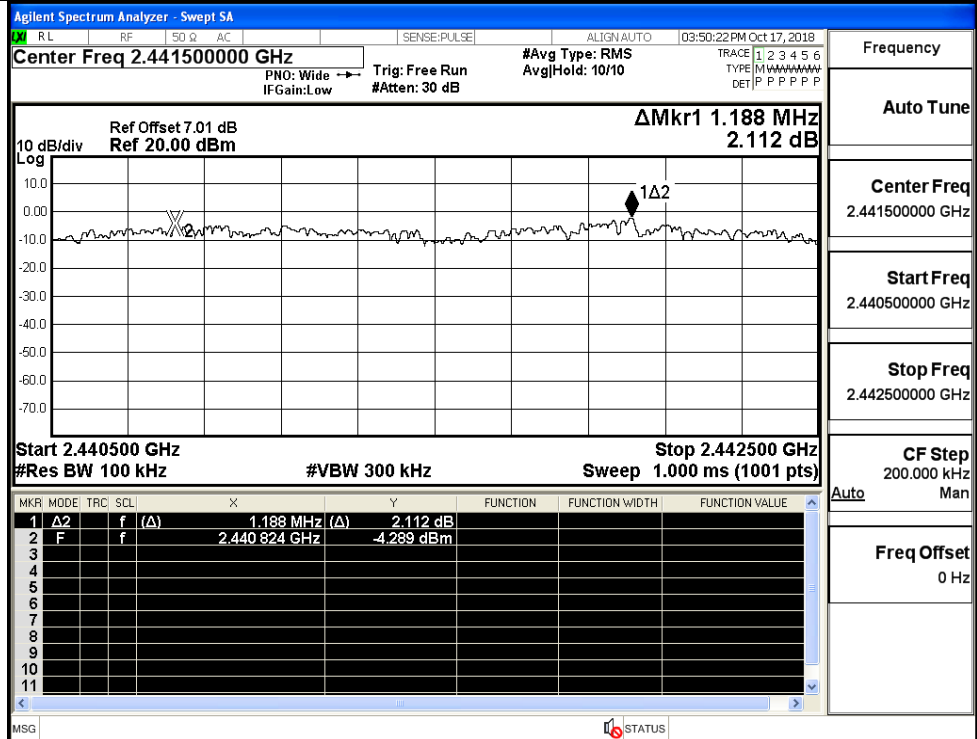
Center Freq
2.441500000 GHzStart Freq
2.440500000 GHzStop Freq
2.442500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

$\pi/4$ DQPSK/HCH

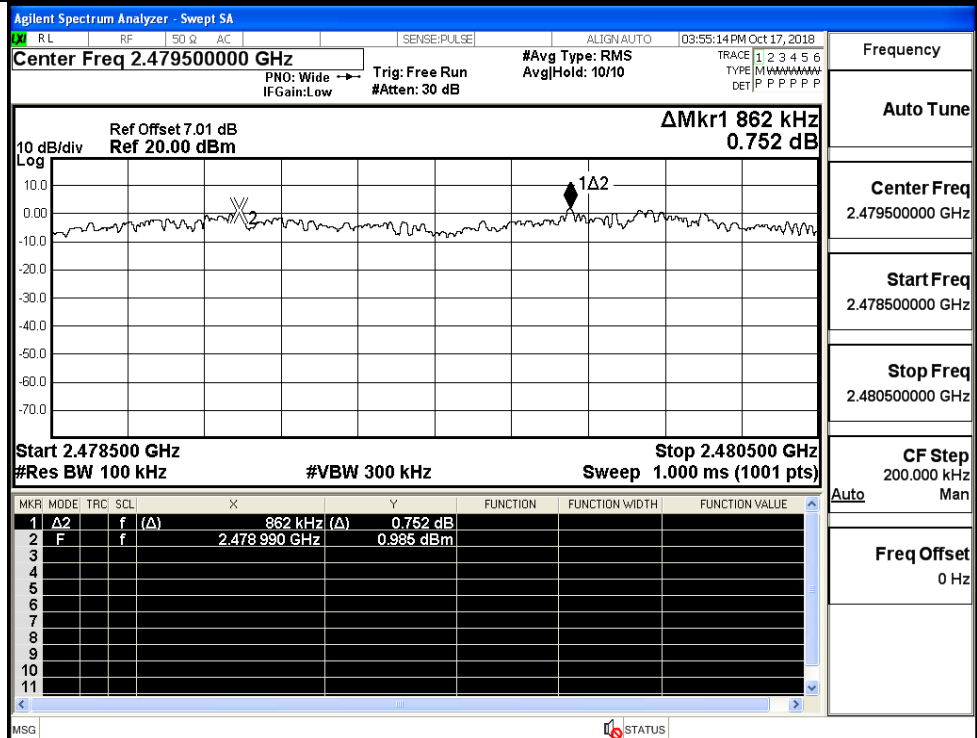
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

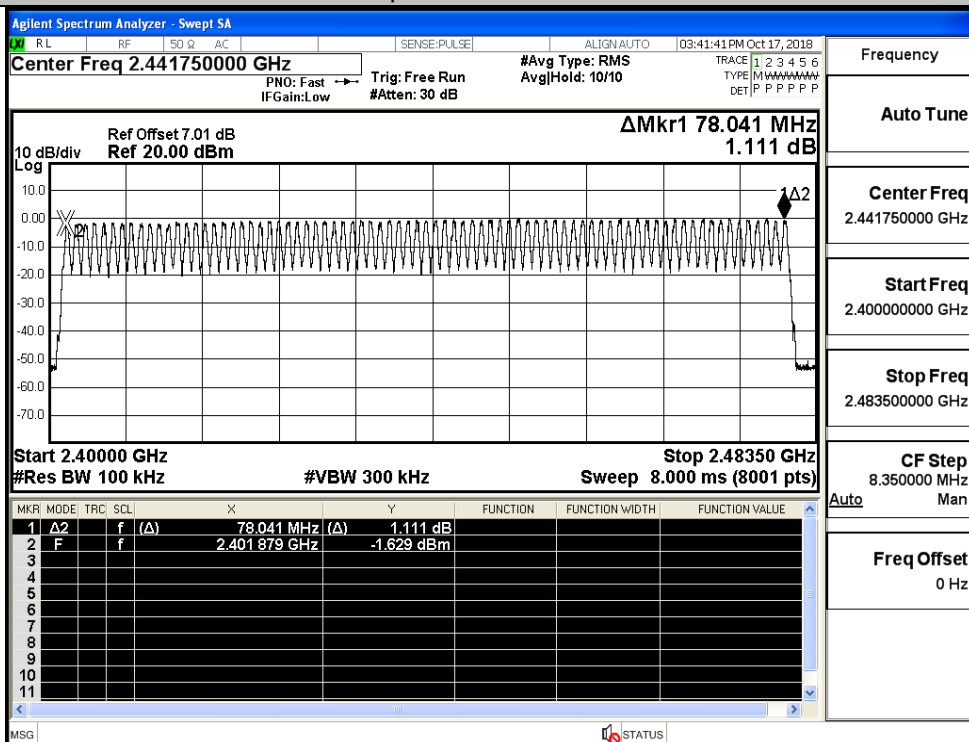
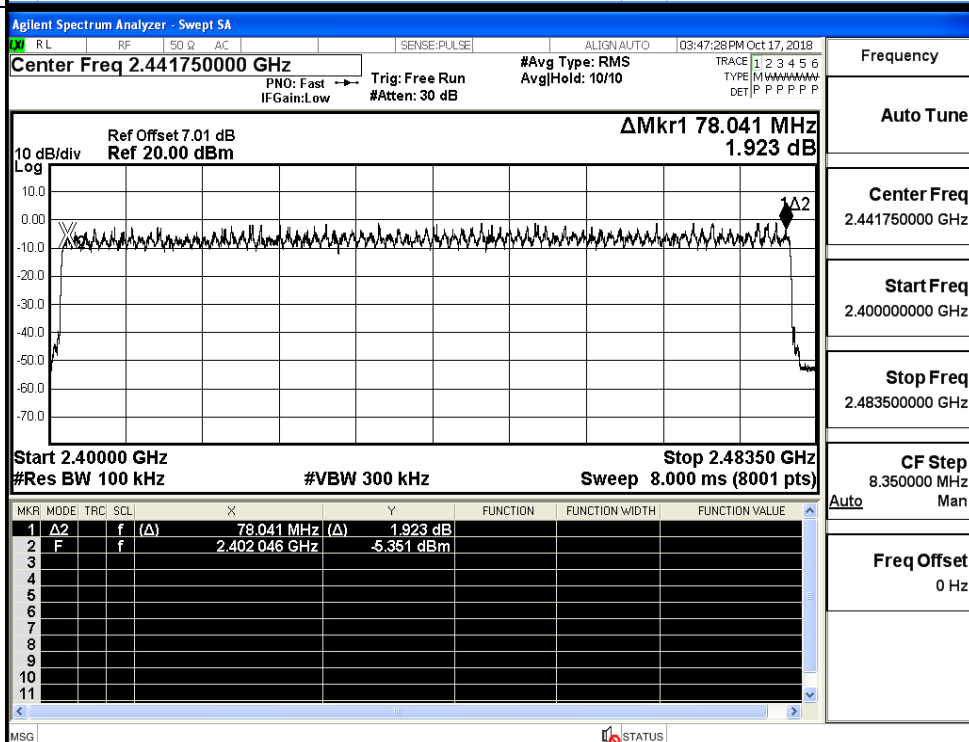


A.4 Hopping Channel Number

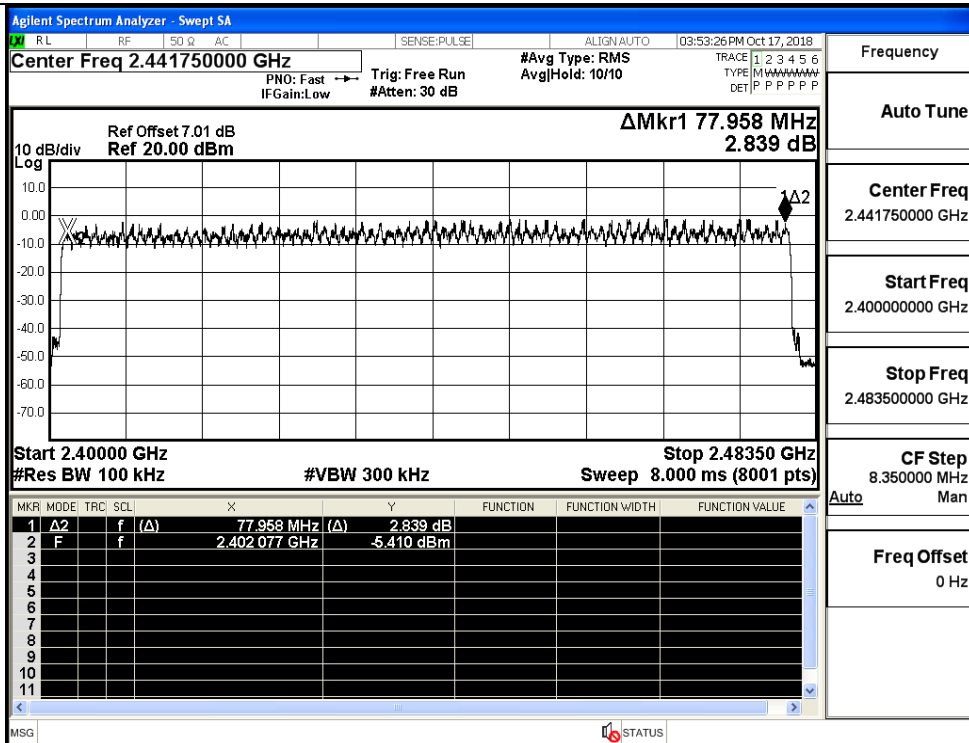
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

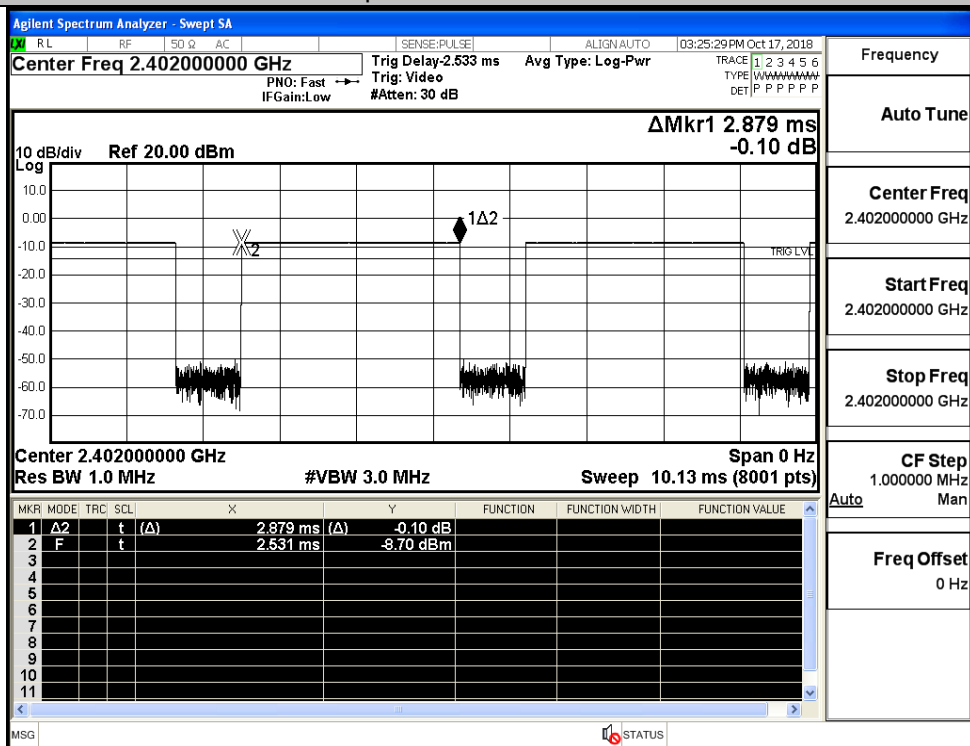


A.5 Dwell Time

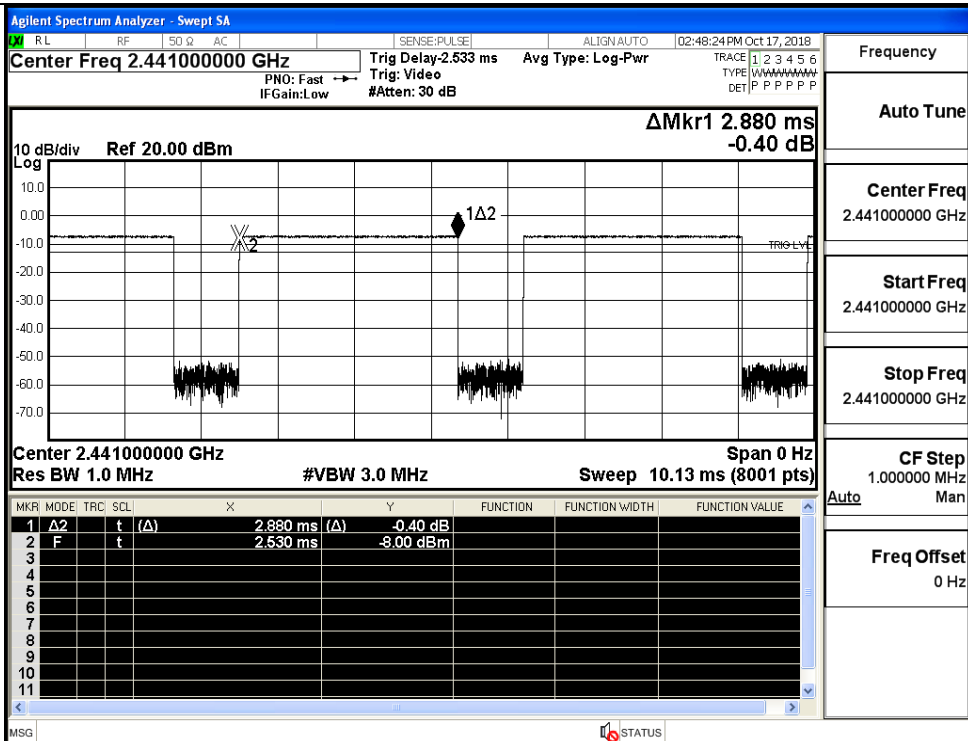
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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

Test Graphs

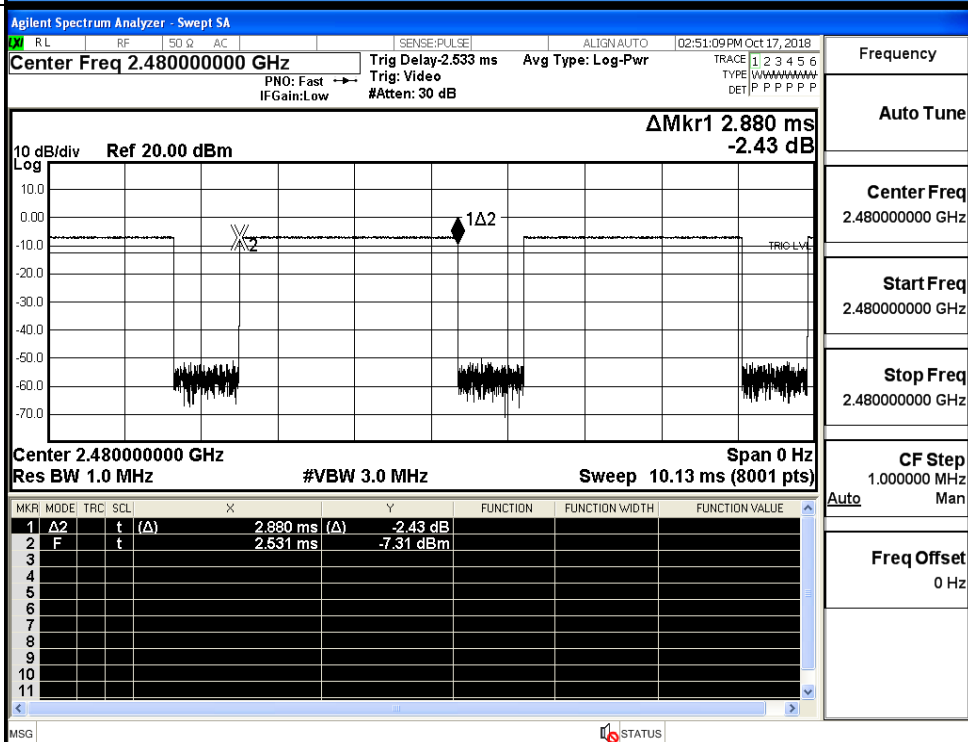
GFSK_DH5/LCH



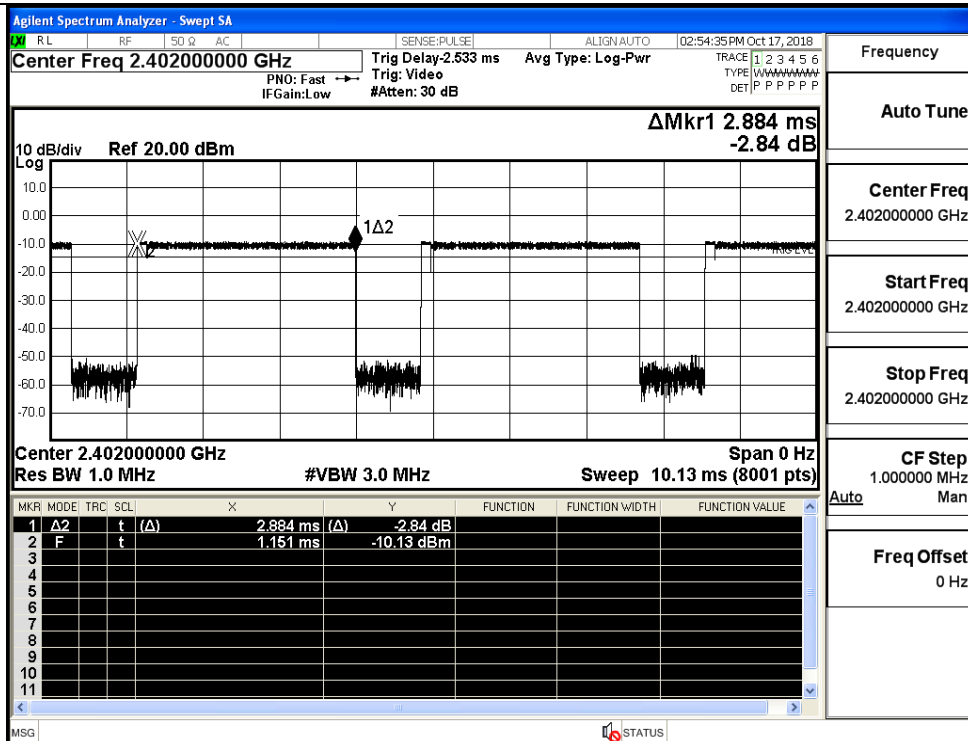
GFSK_DH5/MCH



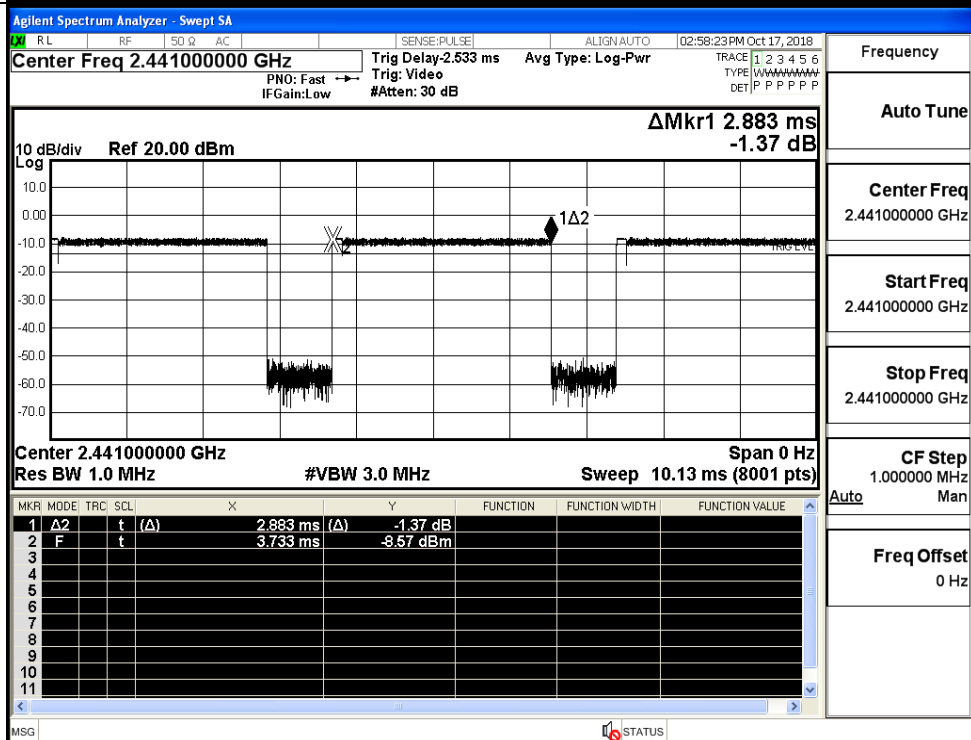
GFSK_DH5/HCH



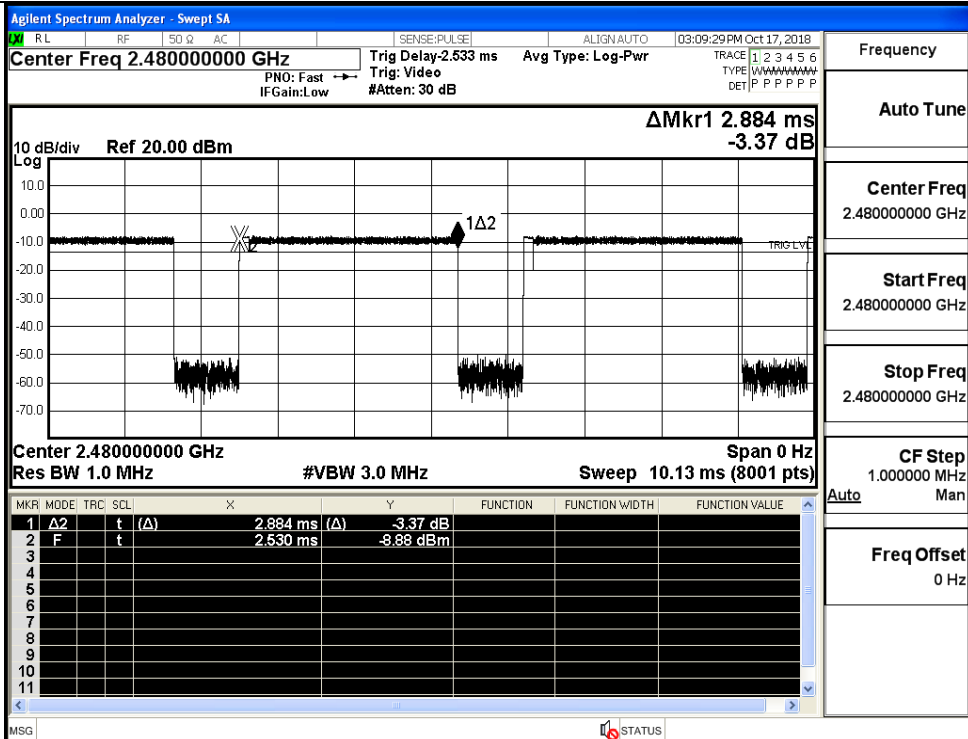
$\pi/4$ DQPSK
_2DH5/LCH



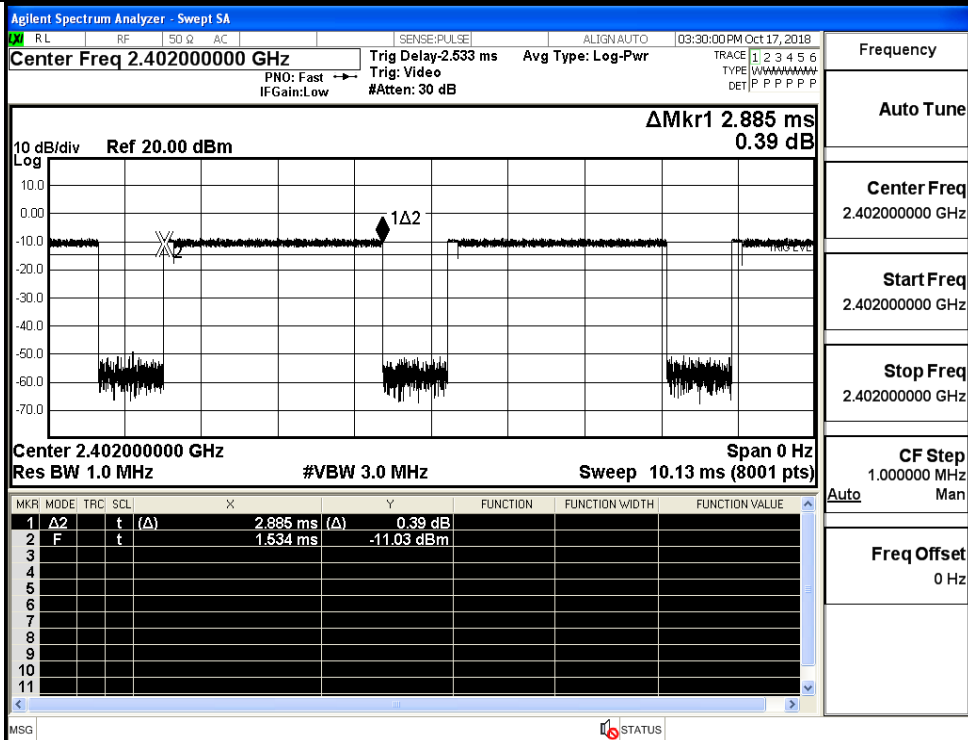
$\pi/4$ DQPSK
_2DH5/MCH



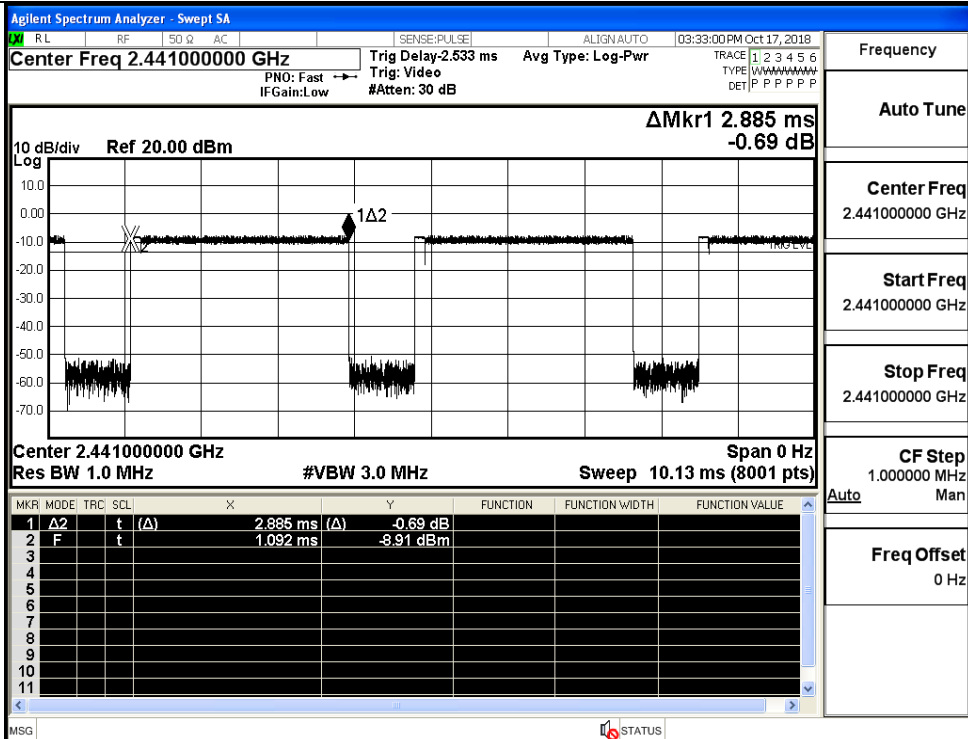
$\pi/4$ DQPSK
_2DH5/HCH



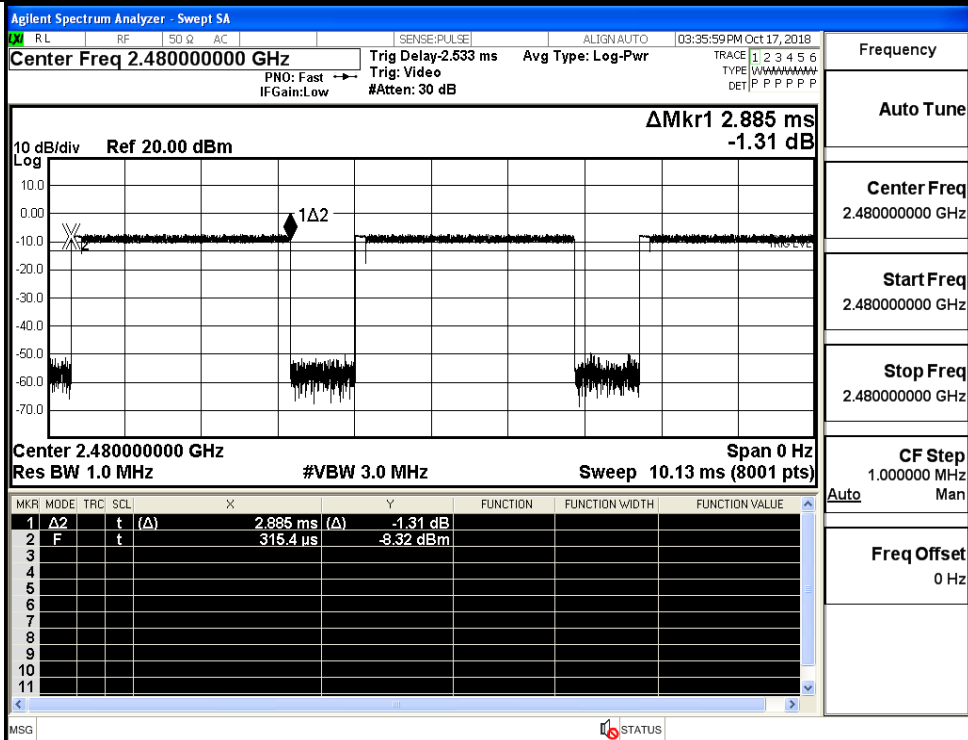
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

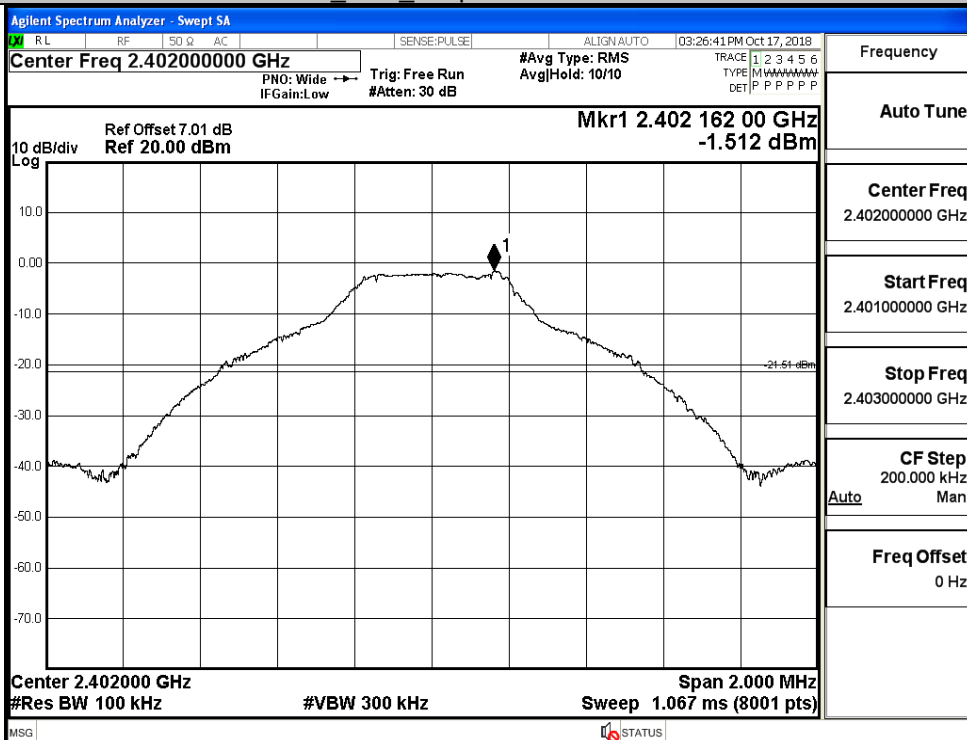


A.6 RF Conducted Spurious Emissions

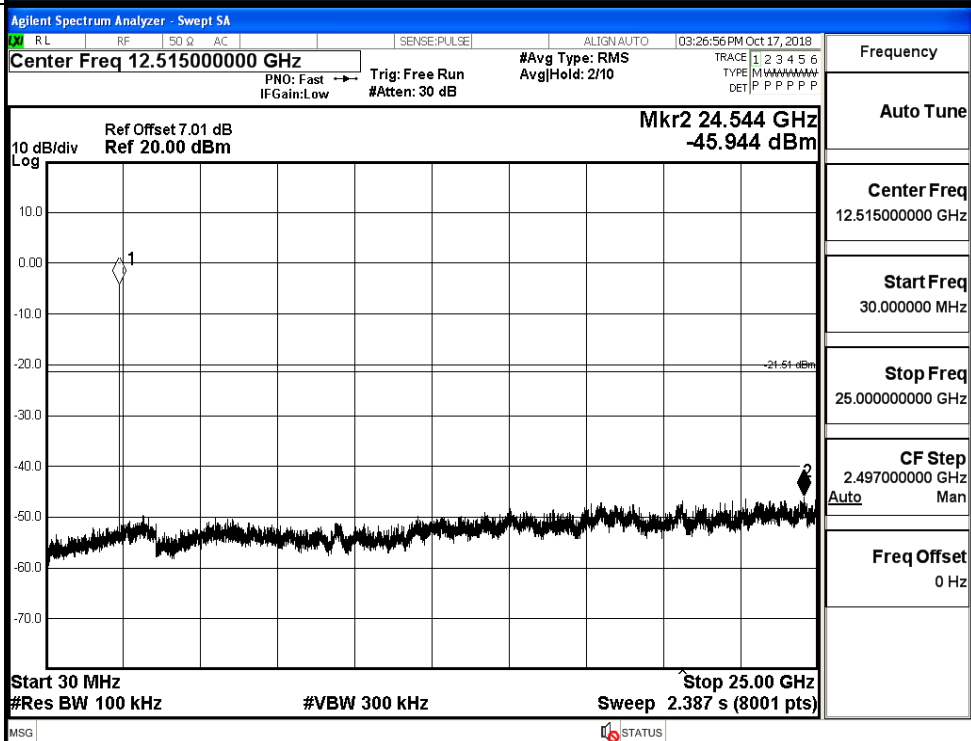
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.512	-45.944	-21.512	PASS
	MCH	-0.279	-45.775	-20.279	PASS
	HCH	-0.076	-45.840	-20.076	PASS
$\pi/4$ DQPSK	LCH	-2.385	-45.582	-22.385	PASS
	MCH	-1.203	-46.094	-21.203	PASS
	HCH	-1.334	-46.210	-21.334	PASS
8DPSK	LCH	-2.74	-46.231	-22.740	PASS
	MCH	-1.2	-46.162	-21.200	PASS
	HCH	-1.134	-45.887	-21.134	PASS

GFSK_LCH_Graphs

Pref

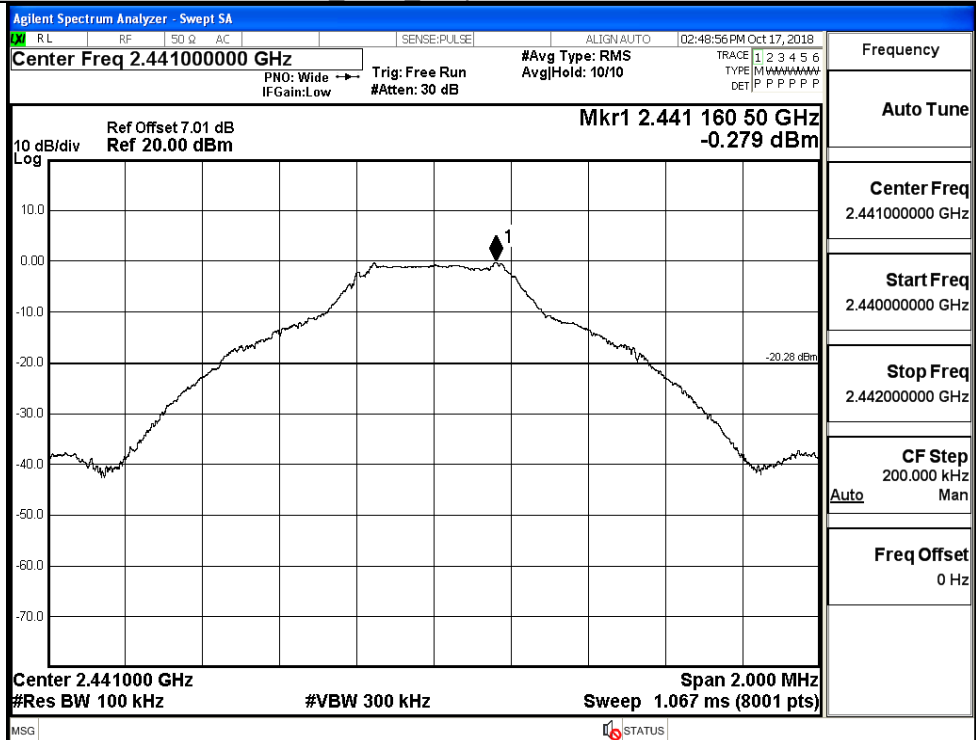


Puw

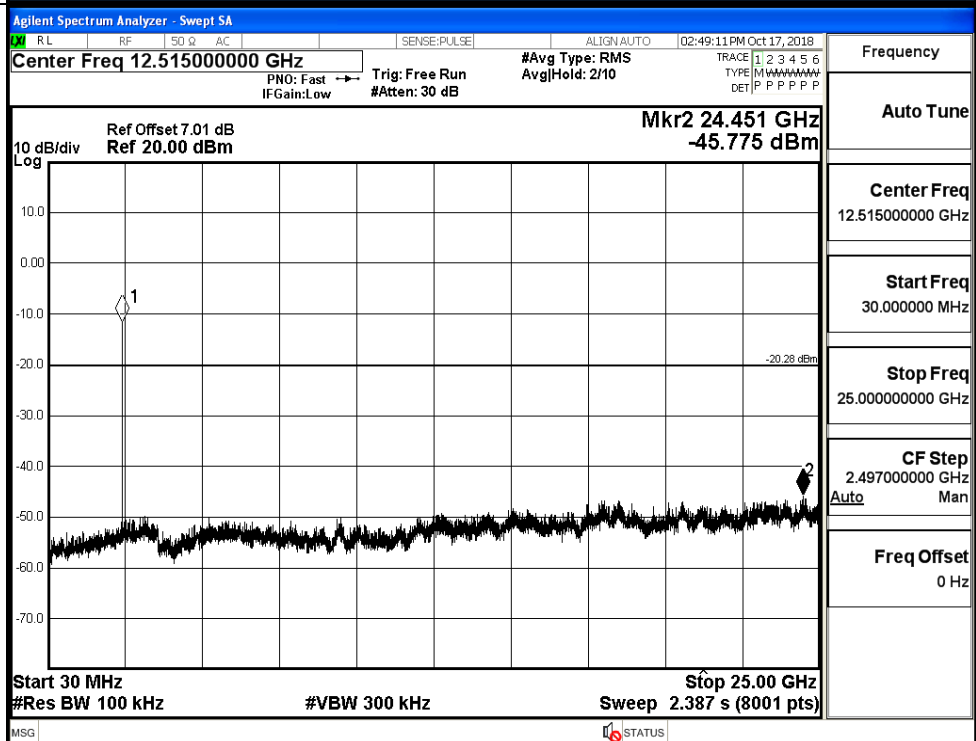


GFSK_MCH_Graphs

Pref

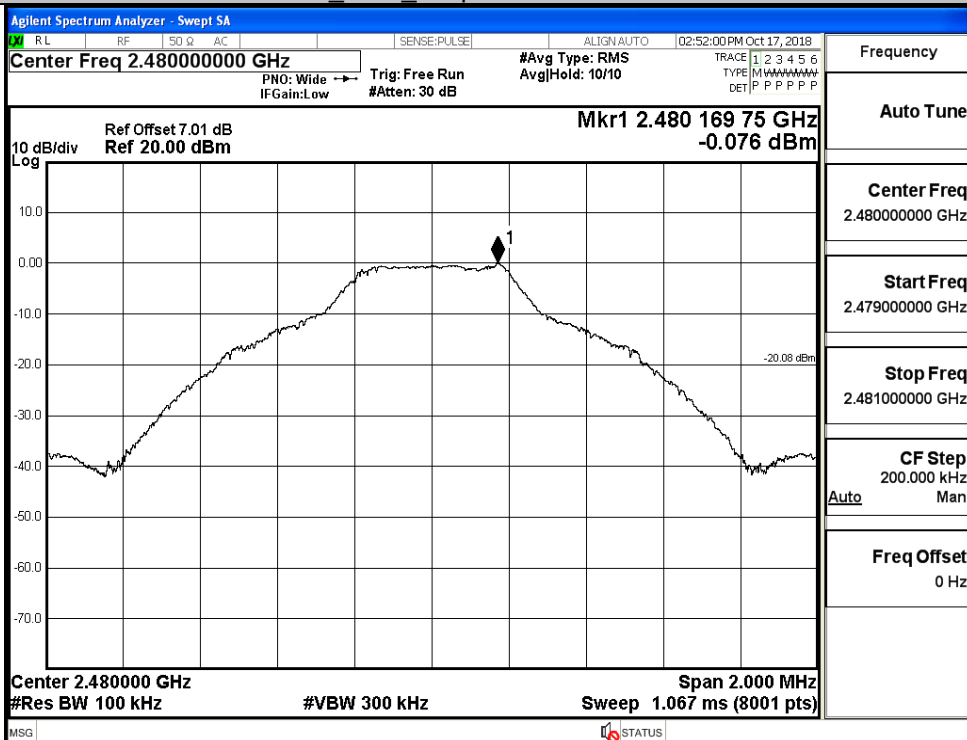


Puw

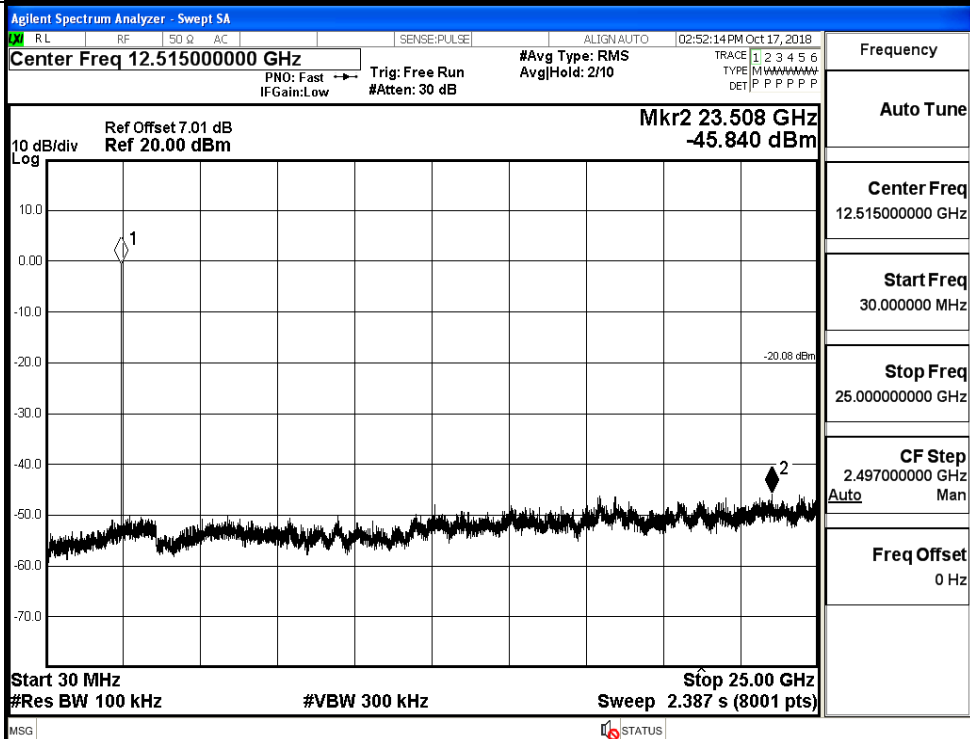


GFSK_HCH_Graphs

Pref

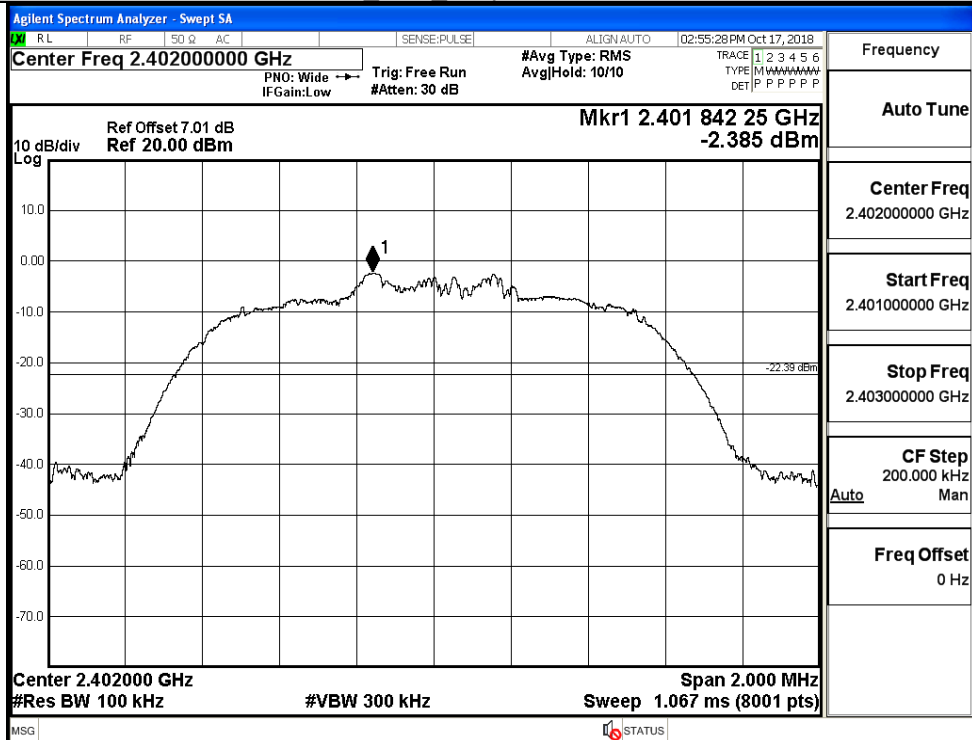


Puw

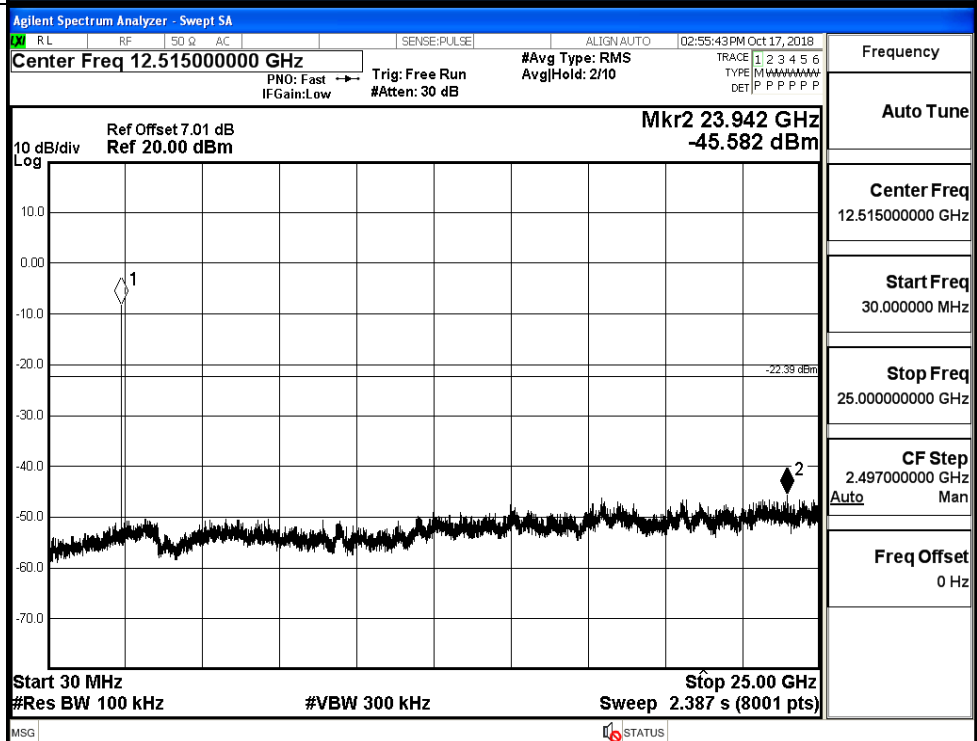


$\pi/4$ DQPSK LCH_Graphs

Pref

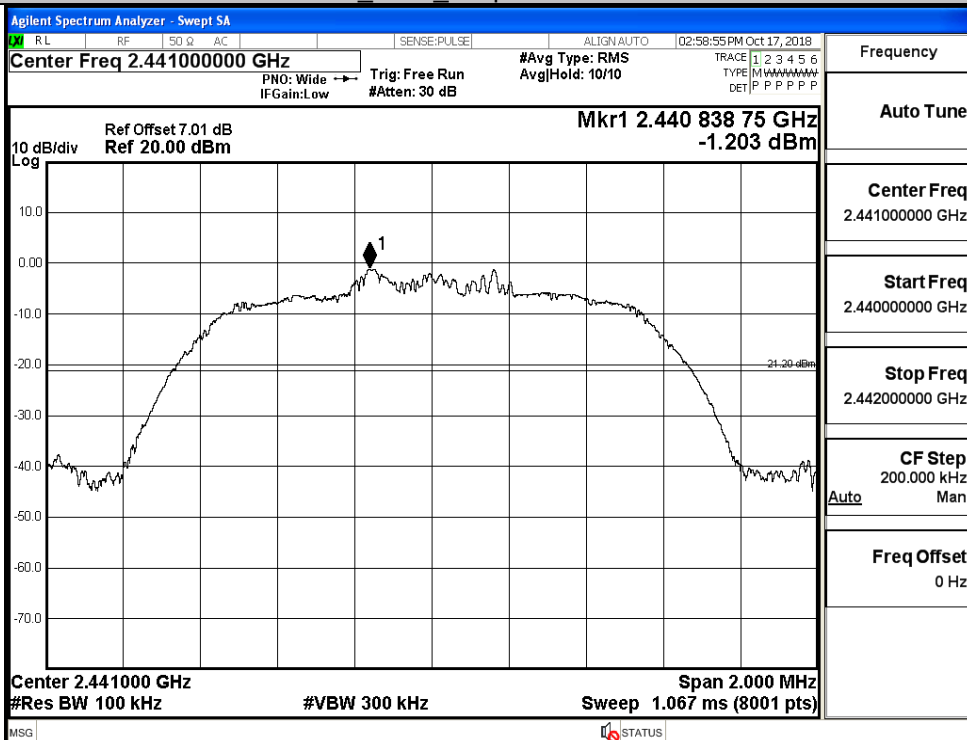


Puw

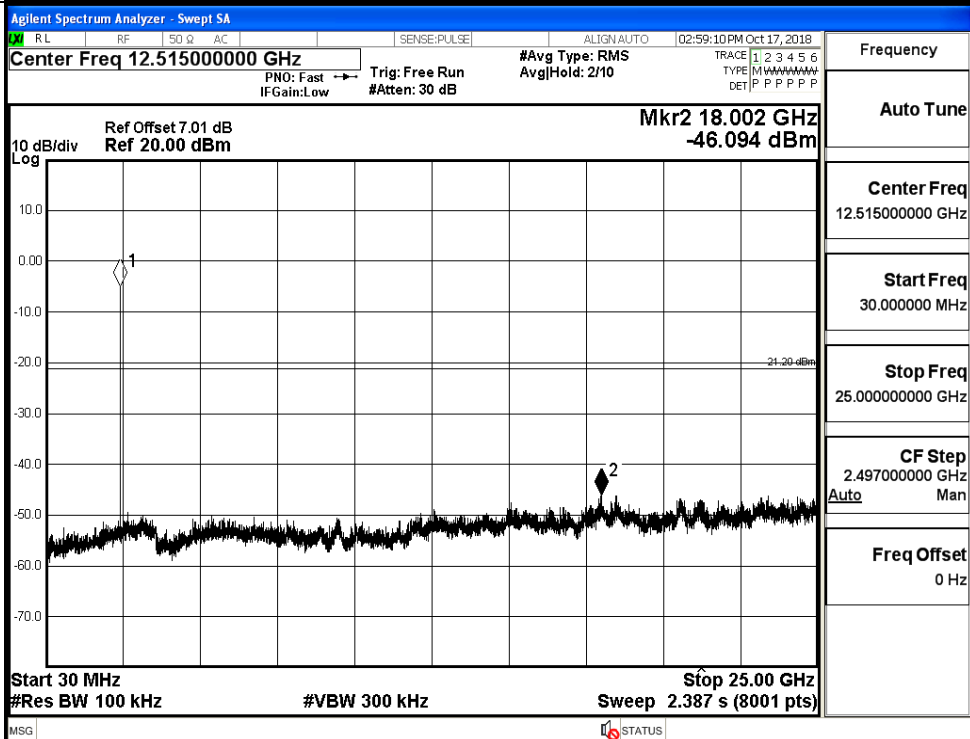


π /4DQPSK_MCH_Graphs

Pref

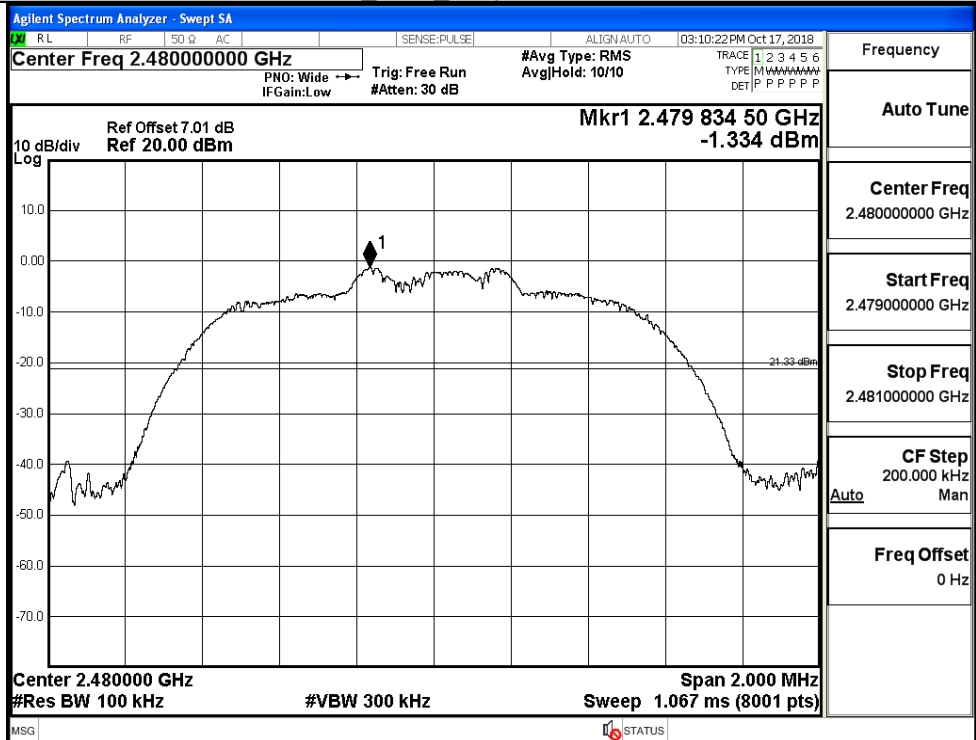


Puw

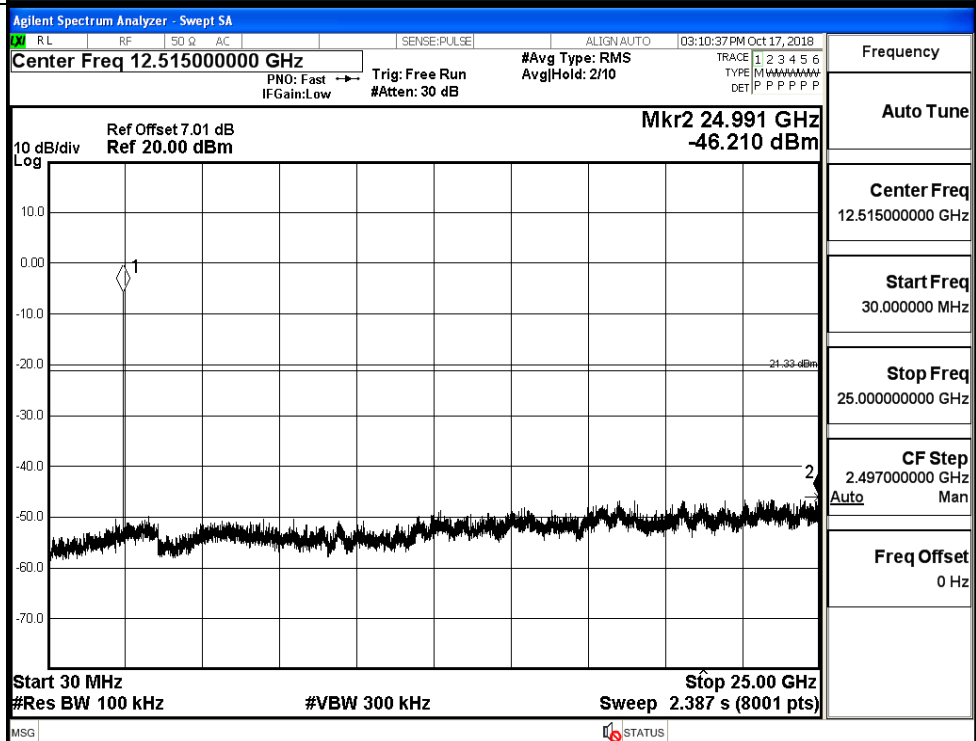


$\pi/4$ DQPSK_HCH_Graphs

Pref

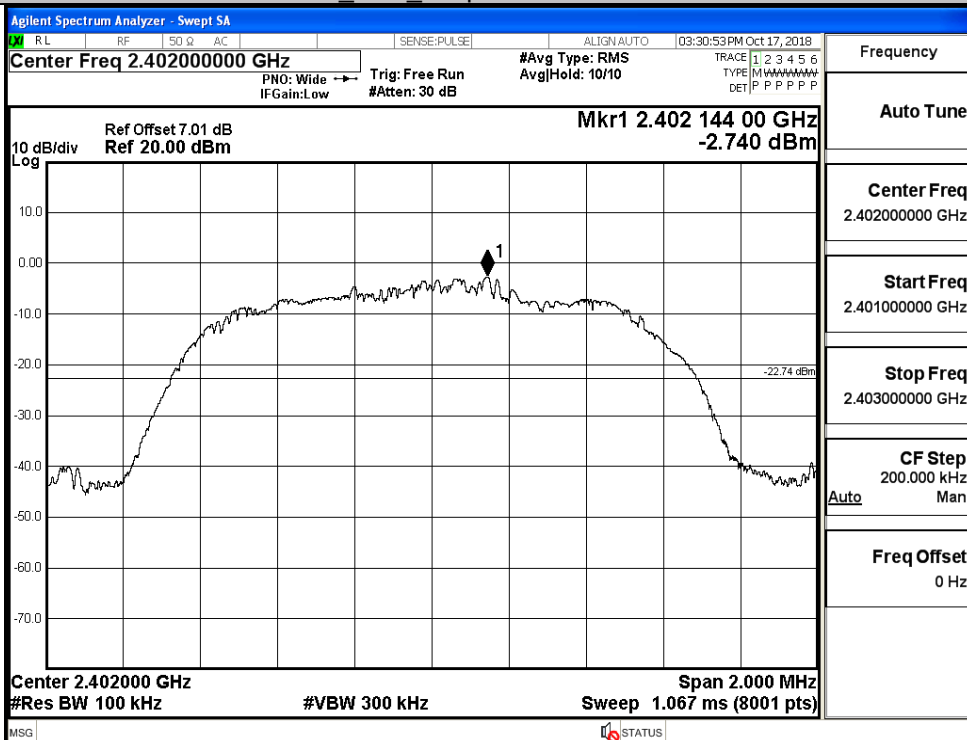


Puw

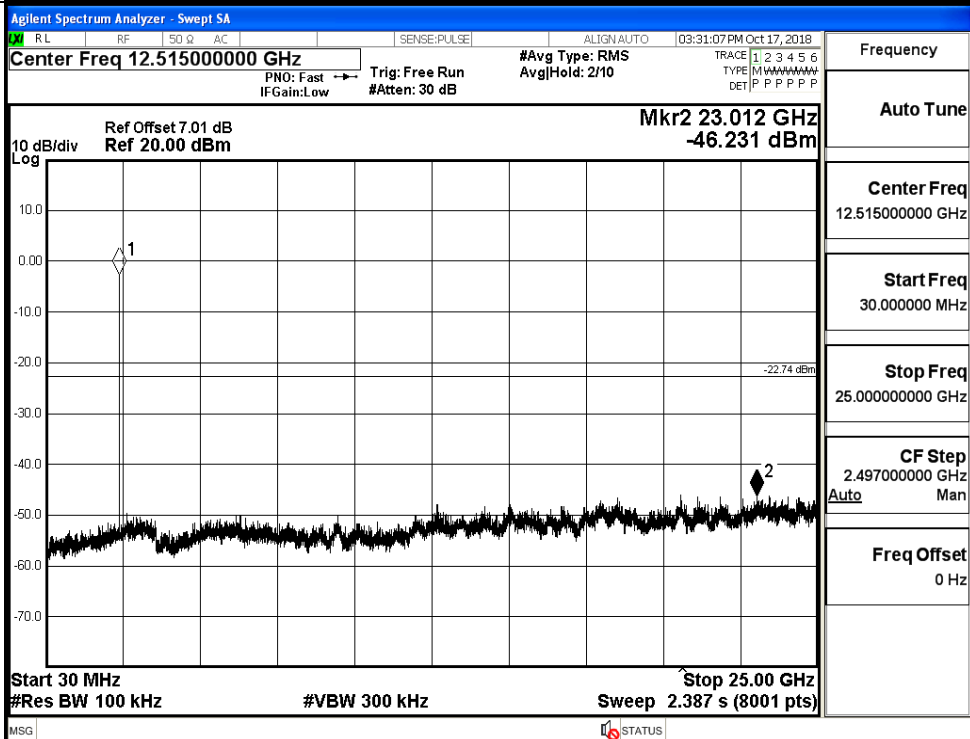


8DPSK_LCH_Graphs

Pref

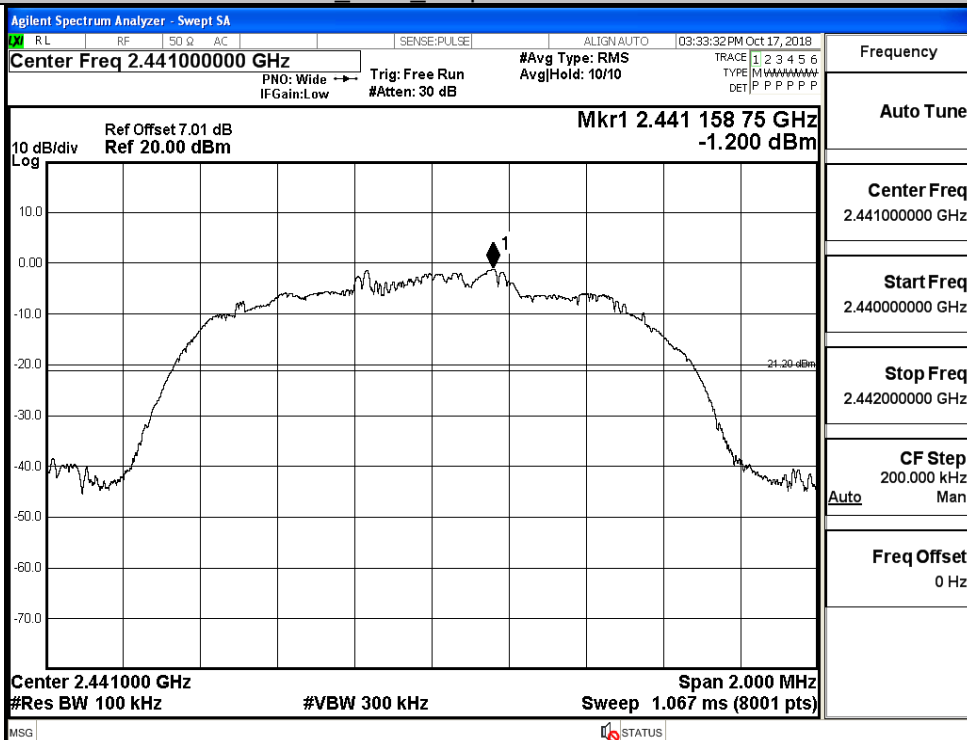


Puw

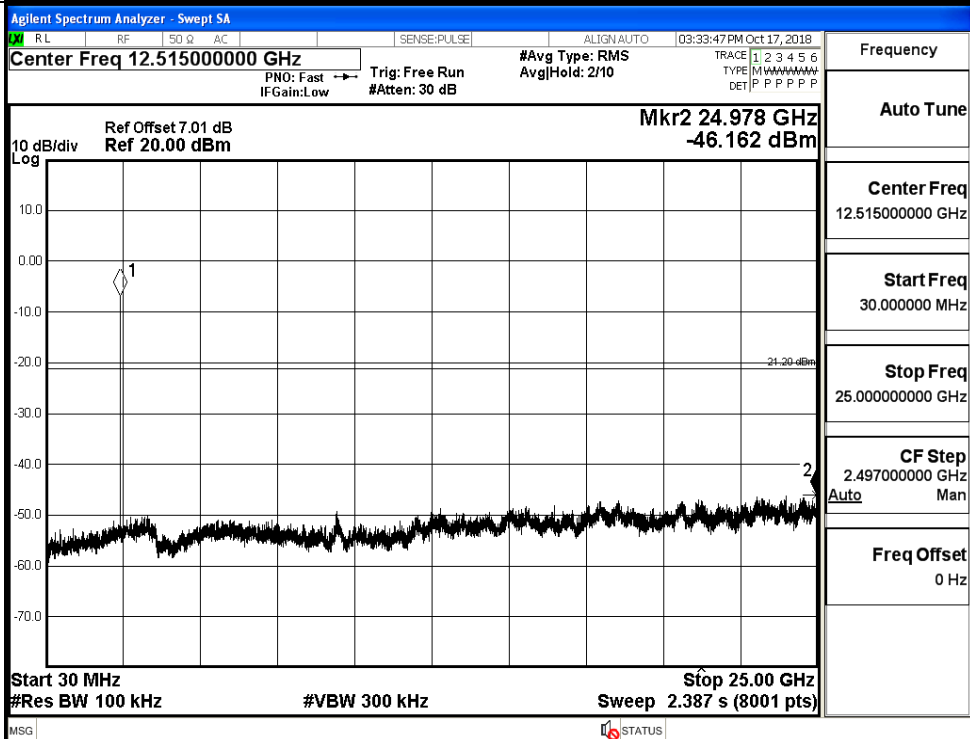


8DPSK_MCH_Graphs

Pref

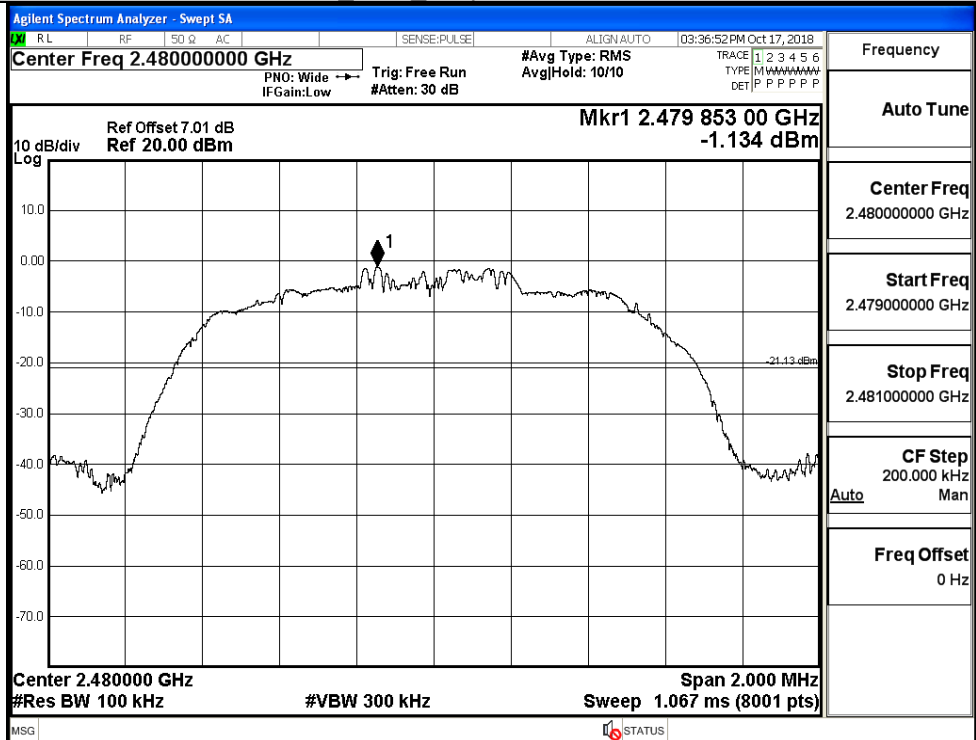


Puw

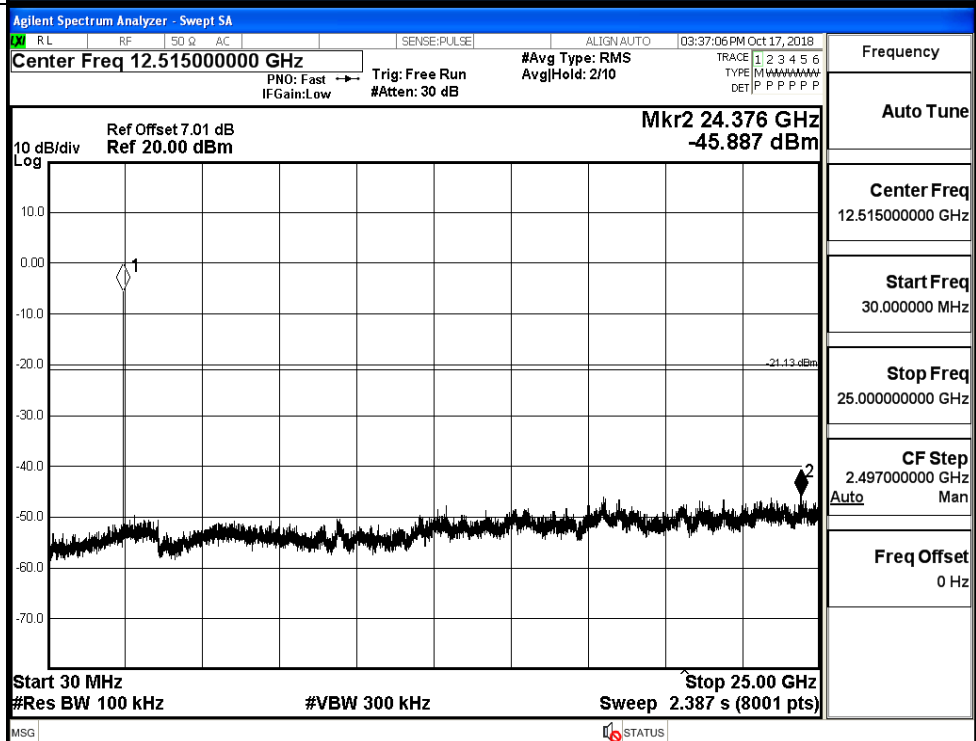


8DPSK_HCH_Graphs

Pref



Puw

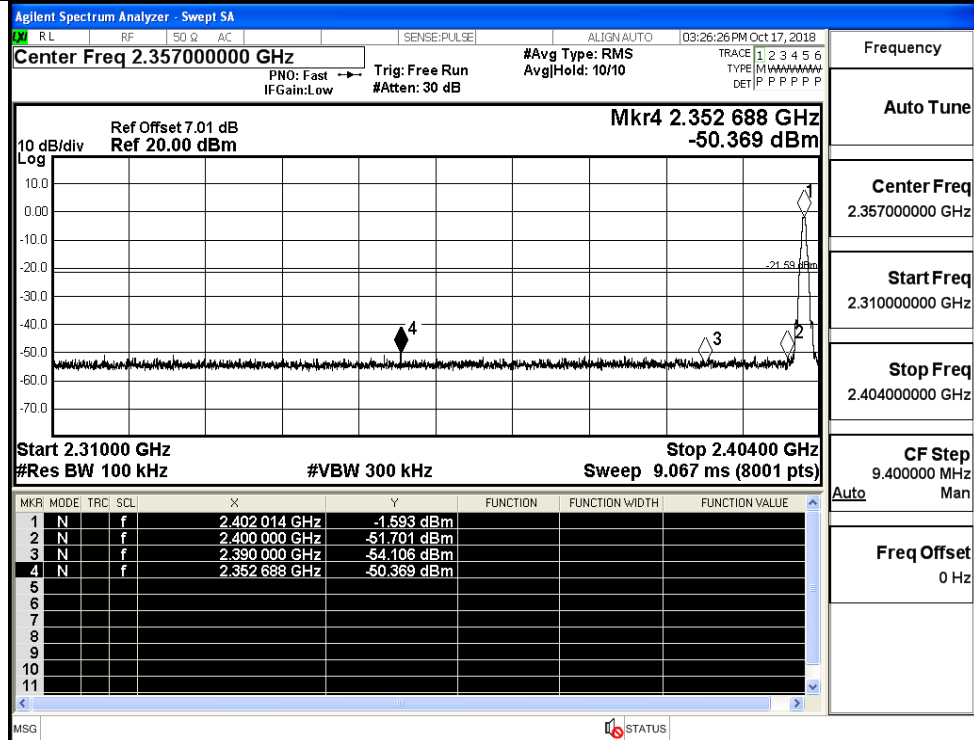


A.7 Band-edge for RF Conducted Emissions

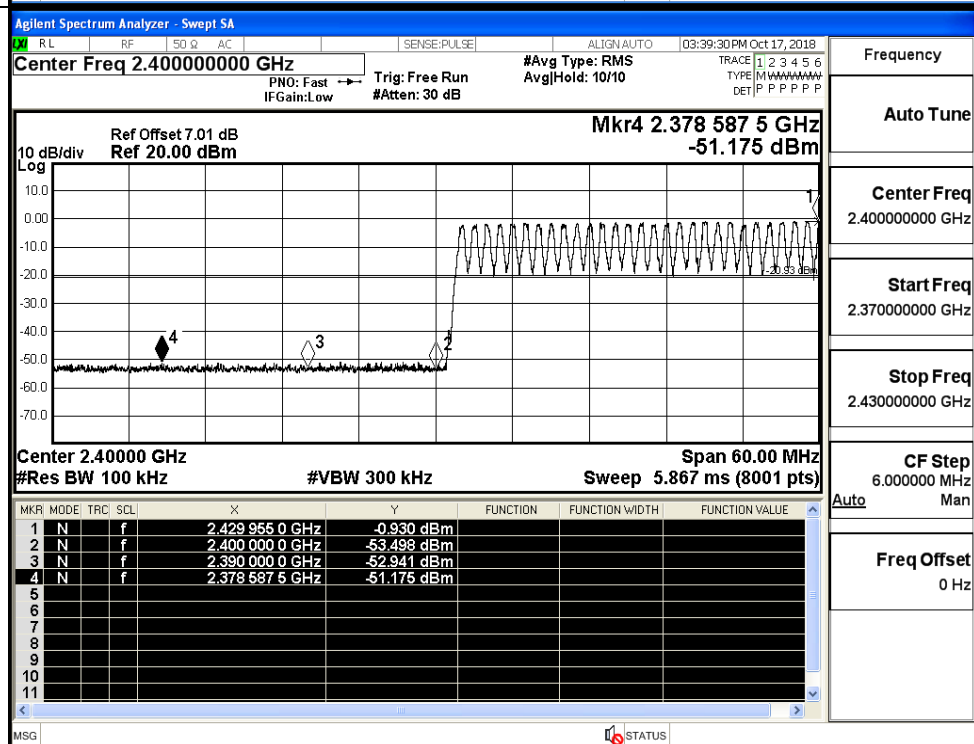
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-1.593	Off	-50.369	-21.59	PASS
			-0.930	On	-51.175	-20.93	PASS
	HCH	2480	0.118	Off	-51.008	-19.88	PASS
			-0.180	On	-49.864	-20.18	PASS
$\pi/4$ DQPSK	LCH	2402	-2.465	Off	-51.269	-22.47	PASS
			-1.826	On	-50.663	-21.83	PASS
	HCH	2480	-1.253	Off	-50.979	-21.25	PASS
			-1.026	On	-50.048	-21.03	PASS
8DPSK	LCH	2402	-2.488	Off	-51.077	-22.49	PASS
			-1.790	On	-50.155	-21.79	PASS
	HCH	2480	-0.918	Off	-51.182	-20.92	PASS
			-1.016	On	-50.079	-21.02	PASS

Test Graphs

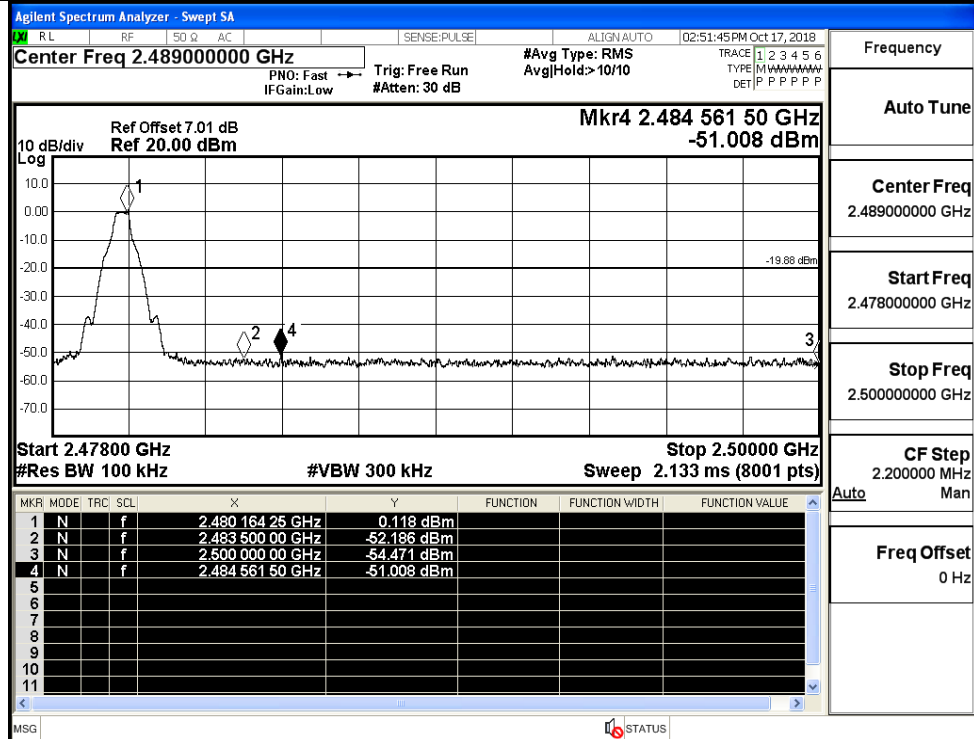
GFSK/LCH/No Hop



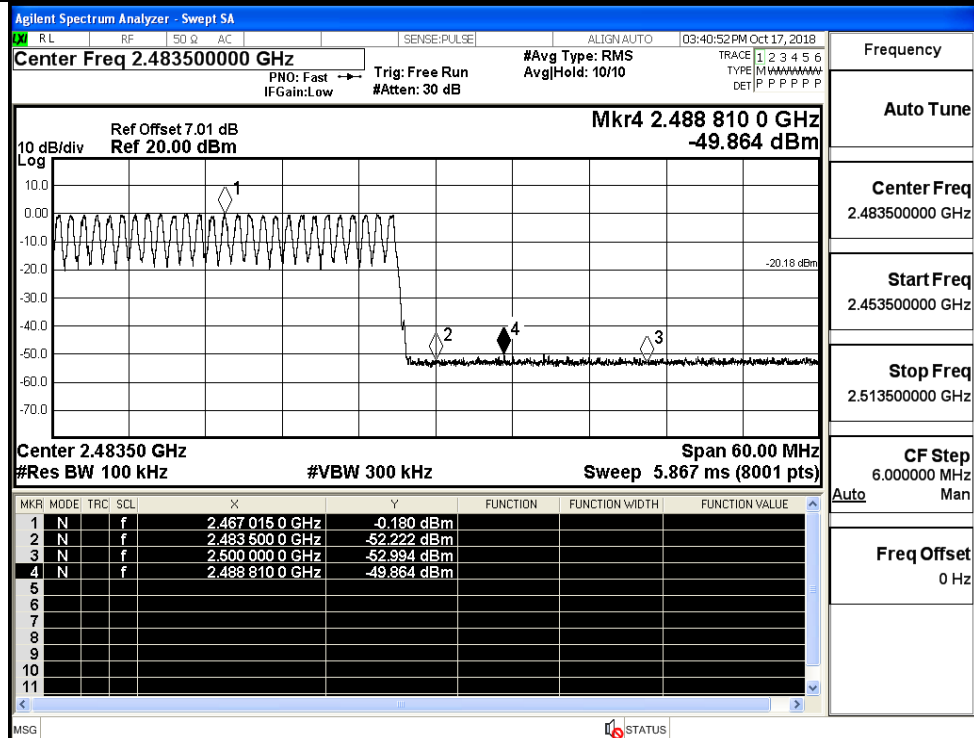
GFSK/LCH/Hop



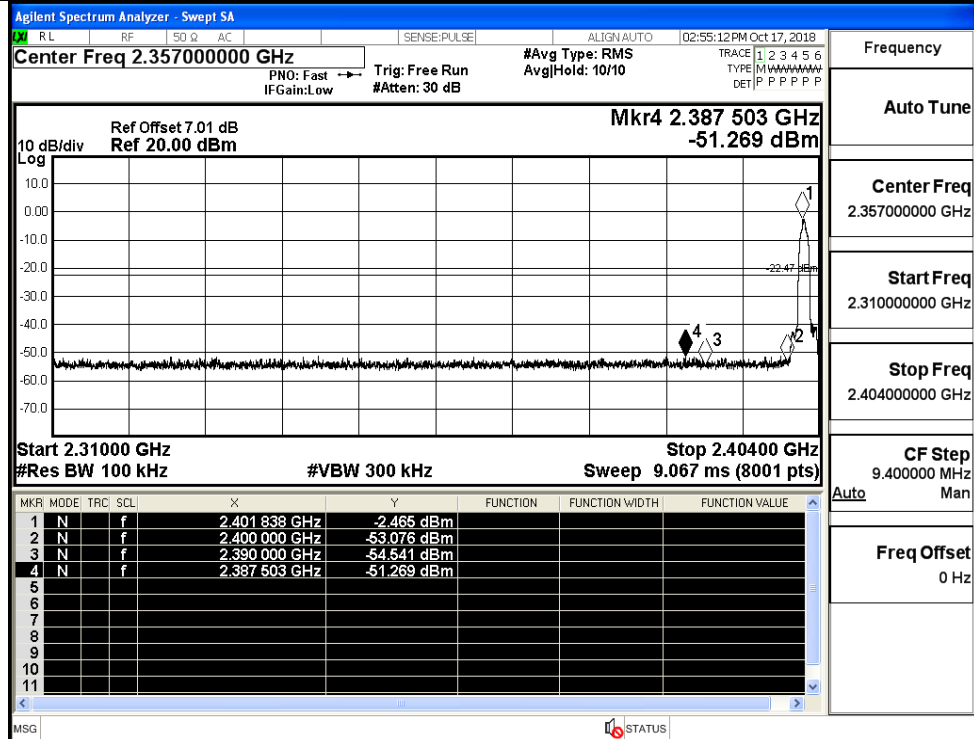
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

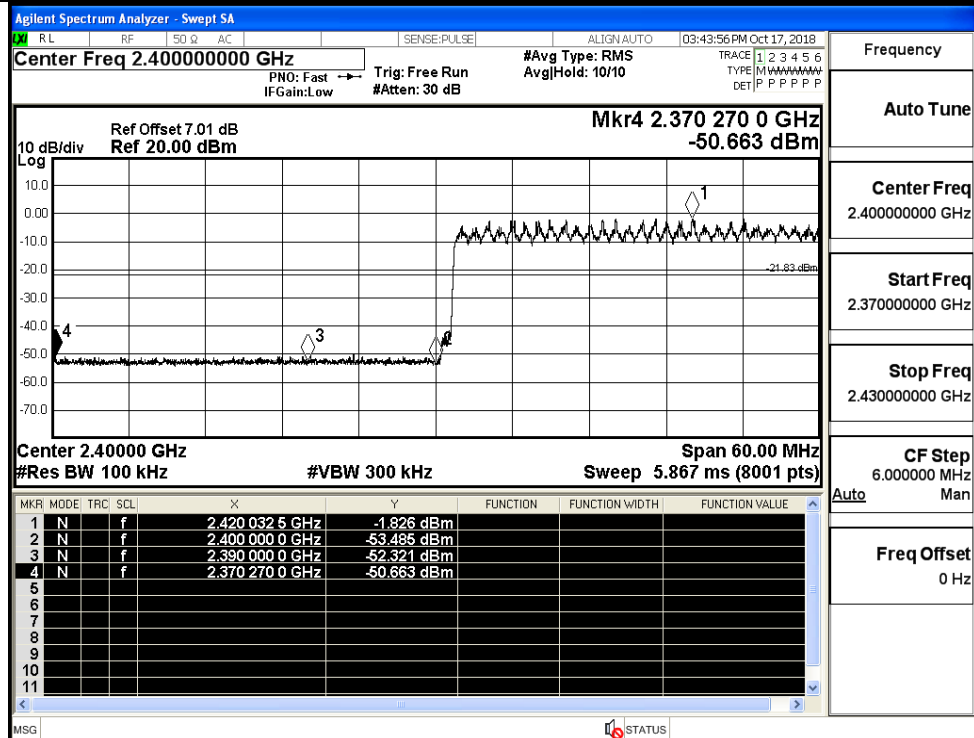
Start Freq
2.310000000 GHz

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

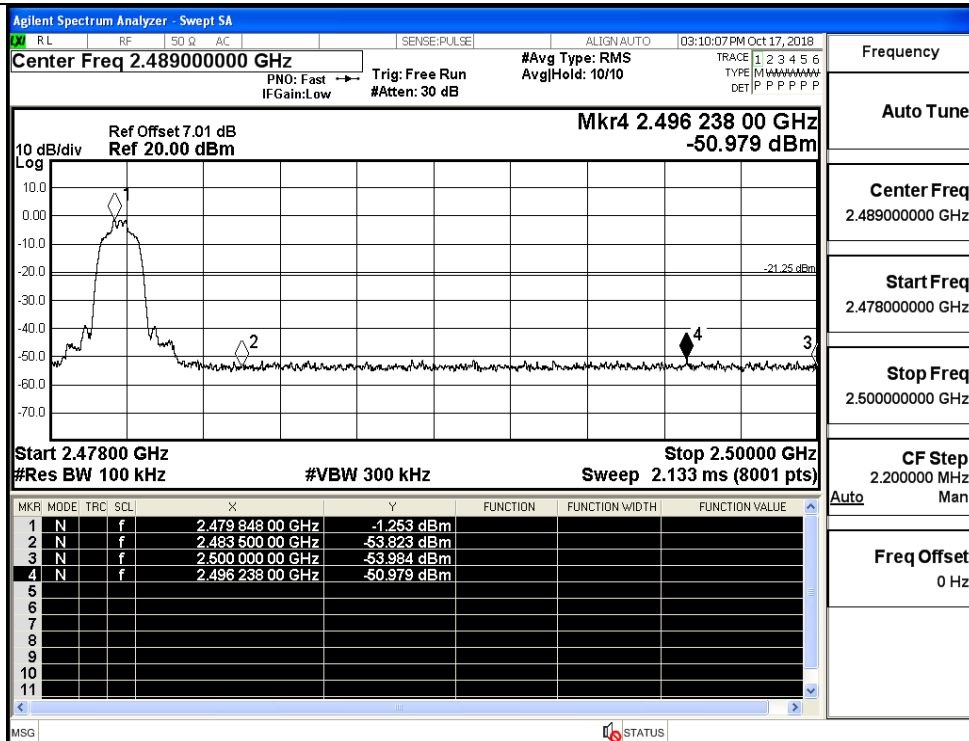
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

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

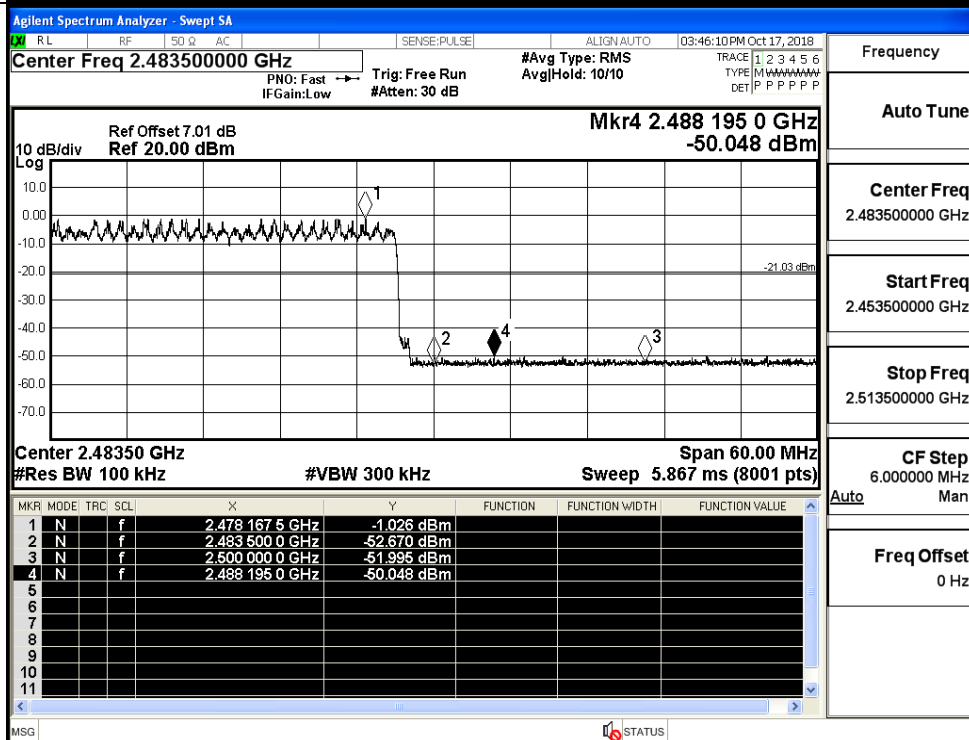


Frequency

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

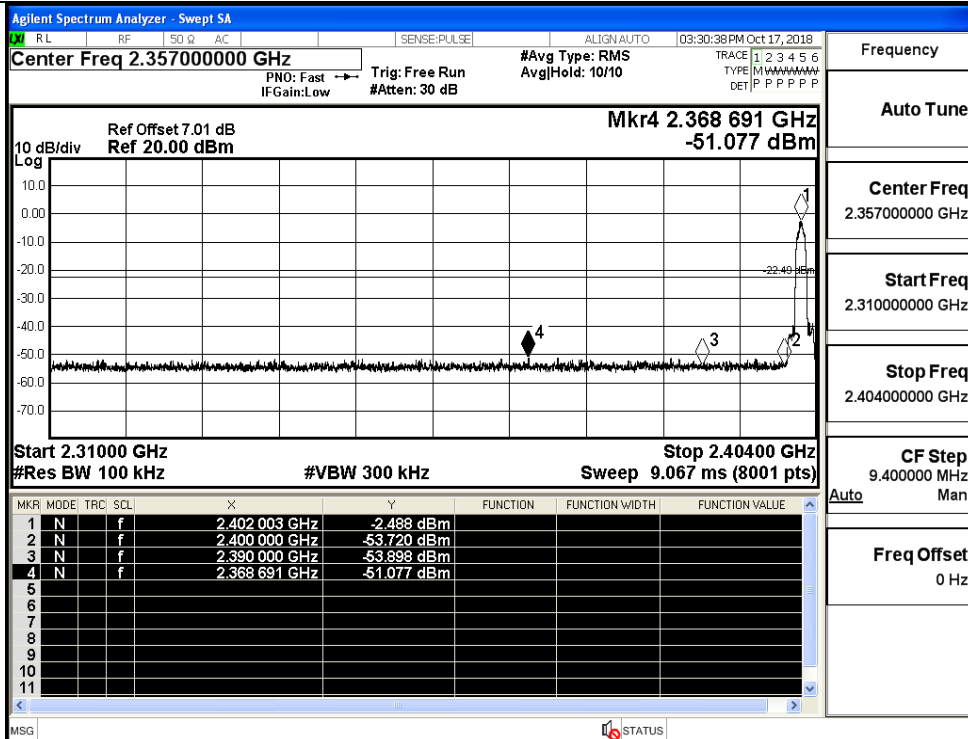


Frequency

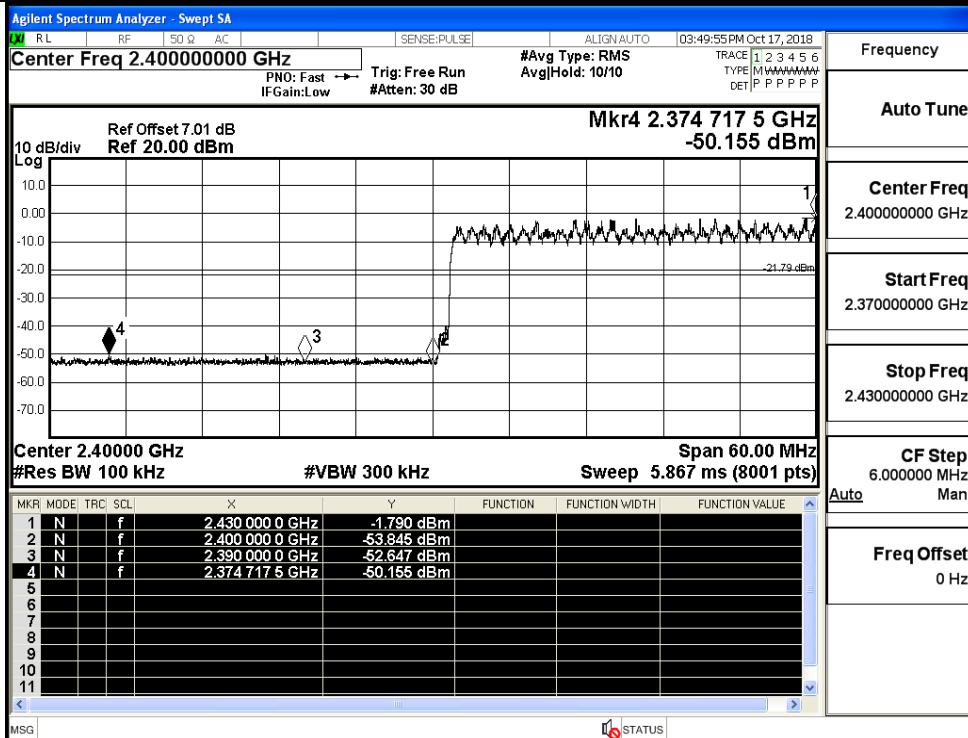
Auto Tune

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

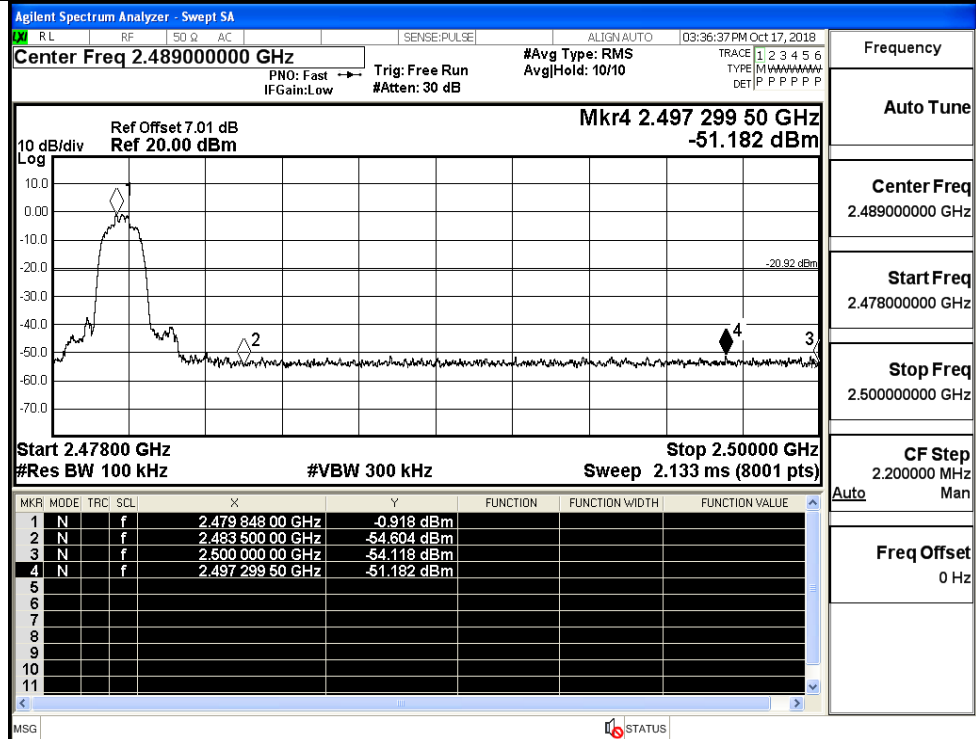
8DPSK/LCH/No Hop



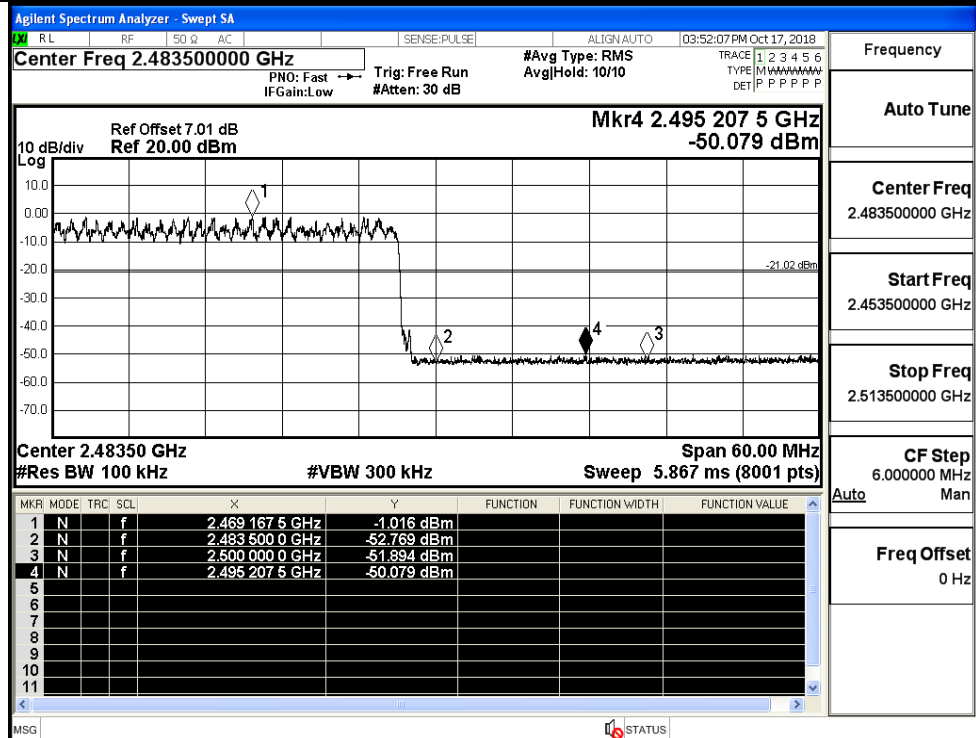
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



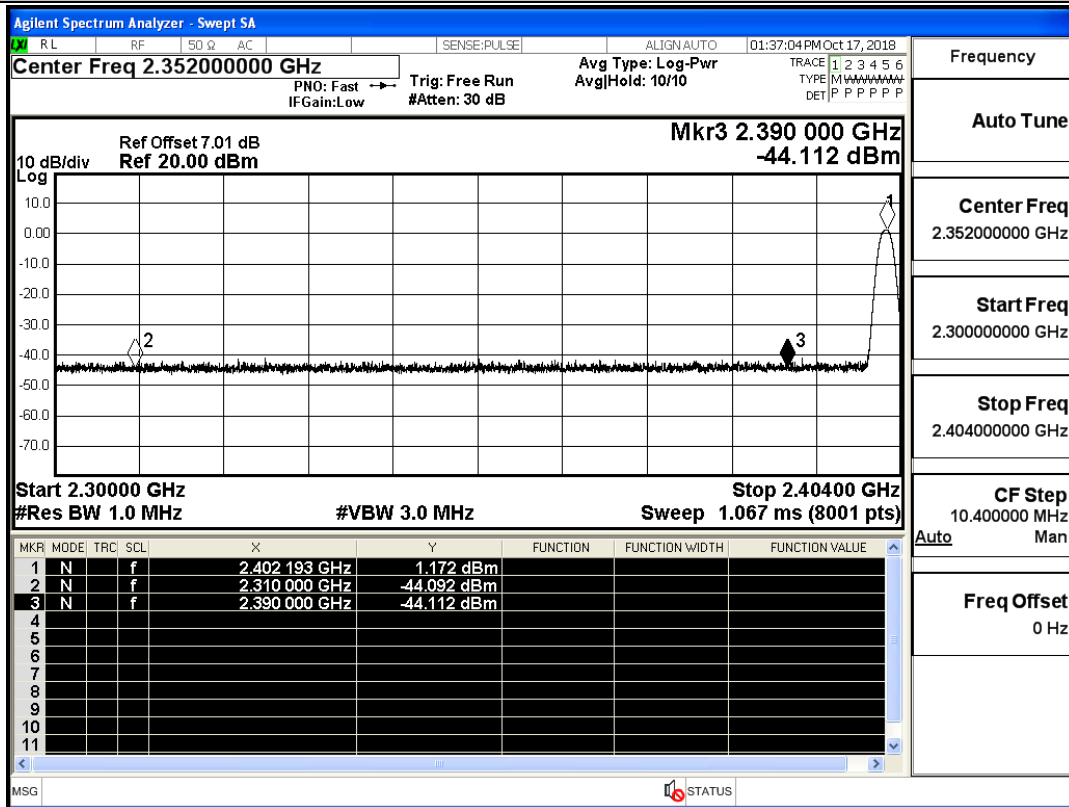
8DPSK/HCH/Hop



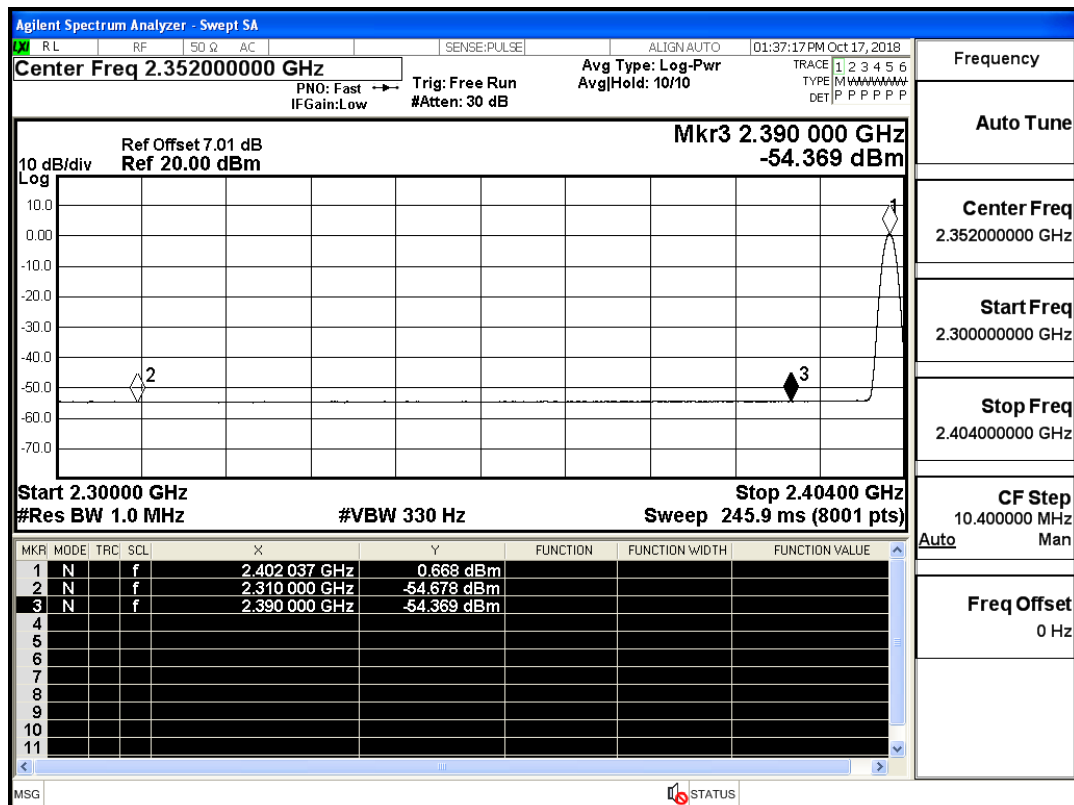
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.09	2.0	0	53.17	PEAK	74	PASS
	Off	2310.0	-54.68	2.0	0	42.58	AV	54	PASS
	Off	2390.0	-44.11	2.0	0	53.15	PEAK	74	PASS
	Off	2390.0	-54.37	2.0	0	42.89	AV	54	PASS
	Off	2483.5	-44.63	2.0	0	50.62	PEAK	74	PASS
	Off	2483.5	-54.27	2.0	0	40.99	AV	54	PASS
	Off	2500.0	-43.83	2.0	0	51.43	PEAK	74	PASS
	Off	2500.0	-54.08	2.0	0	41.18	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.69	2.0	0	52.57	PEAK	74	PASS
	Off	2310.0	-54.60	2.0	0	40.66	AV	54	PASS
	Off	2390.0	-44.29	2.0	0	50.97	PEAK	74	PASS
	Off	2390.0	-54.28	2.0	0	40.98	AV	54	PASS
	Off	2483.5	-44.58	2.0	0	50.68	PEAK	74	PASS
	Off	2483.5	-54.16	2.0	0	41.10	AV	54	PASS
	Off	2500.0	-43.91	2.0	0	51.34	PEAK	74	PASS
	Off	2500.0	-54.13	2.0	0	41.13	AV	54	PASS
8DPSK	Off	2310.0	-45.35	2.0	0	49.91	PEAK	74	PASS
	Off	2310.0	-54.74	2.0	0	40.52	AV	54	PASS
	Off	2390.0	-44.74	2.0	0	50.52	PEAK	74	PASS
	Off	2390.0	-54.52	2.0	0	40.74	AV	54	PASS
	Off	2483.5	-44.04	2.0	0	51.22	PEAK	74	PASS
	Off	2483.5	-54.14	2.0	0	41.11	AV	54	PASS
	Off	2500.0	-43.36	2.0	0	51.90	PEAK	74	PASS
	Off	2500.0	-54.10	2.0	0	41.16	AV	54	PASS

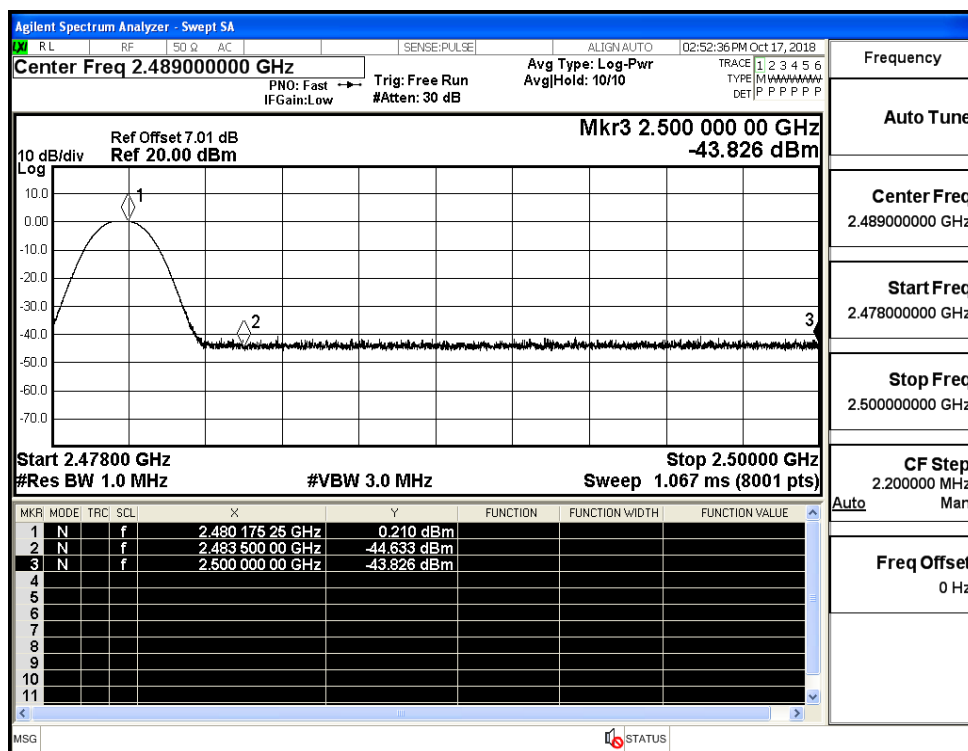
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



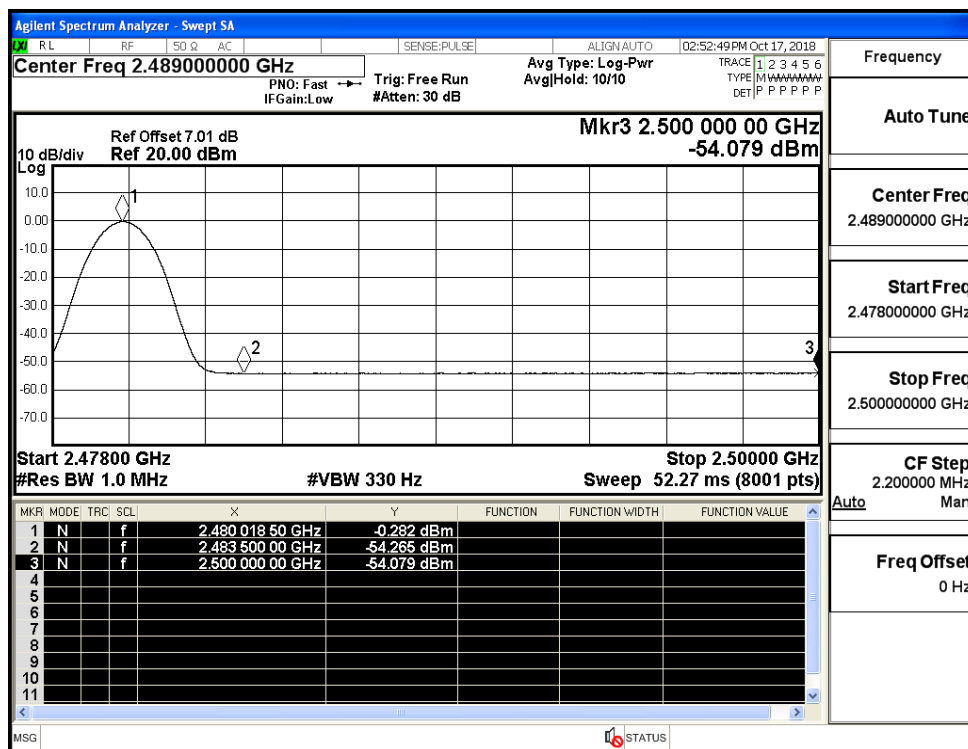
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

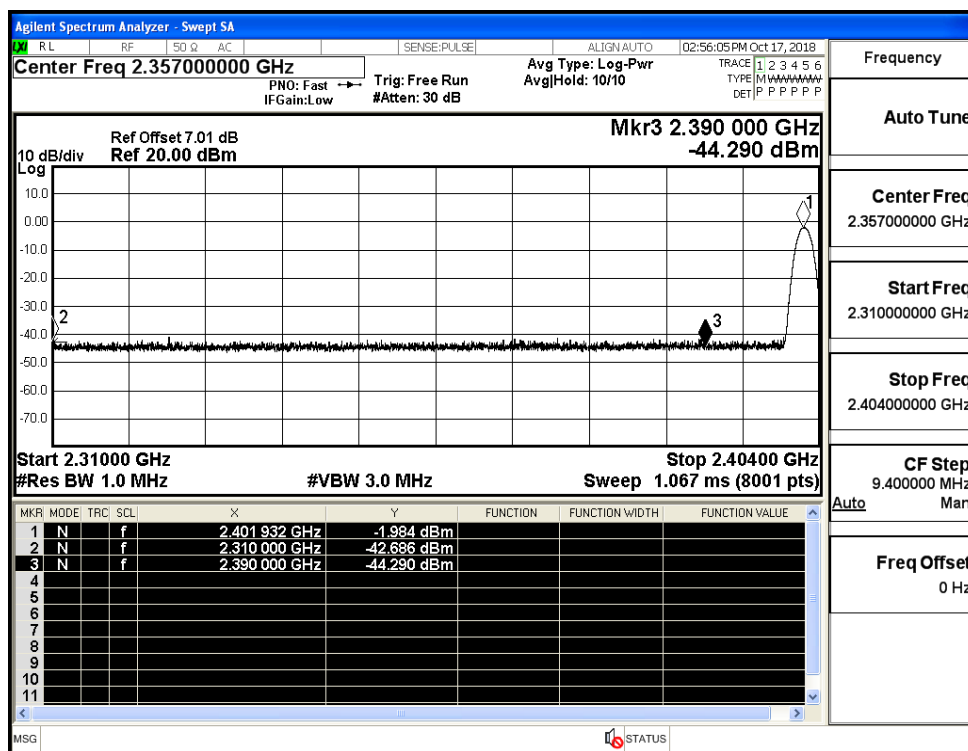
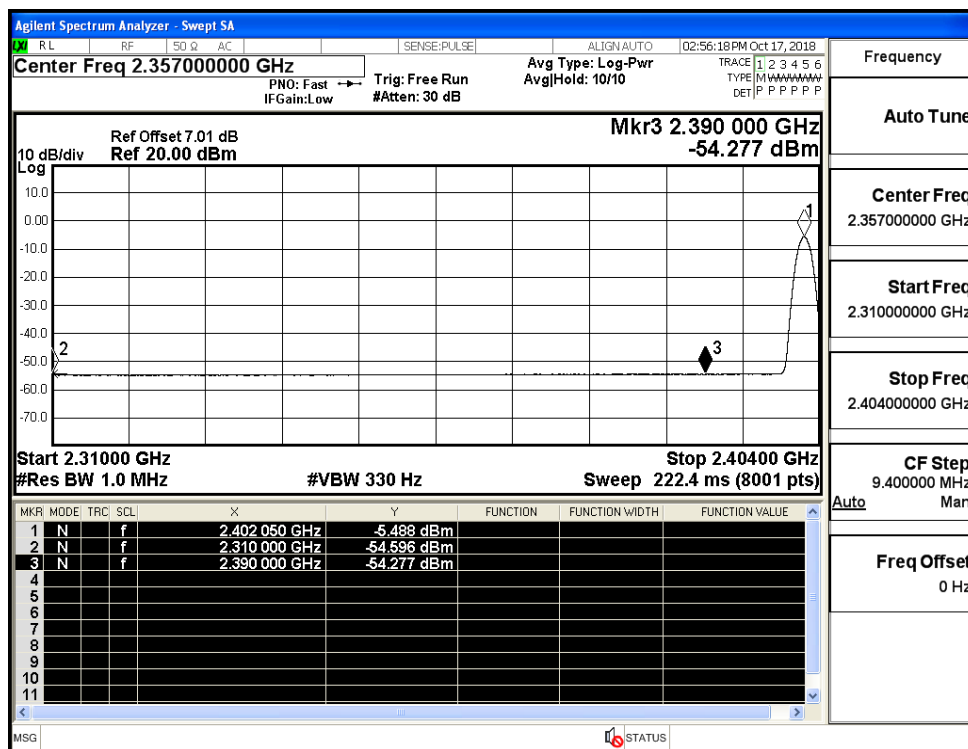


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

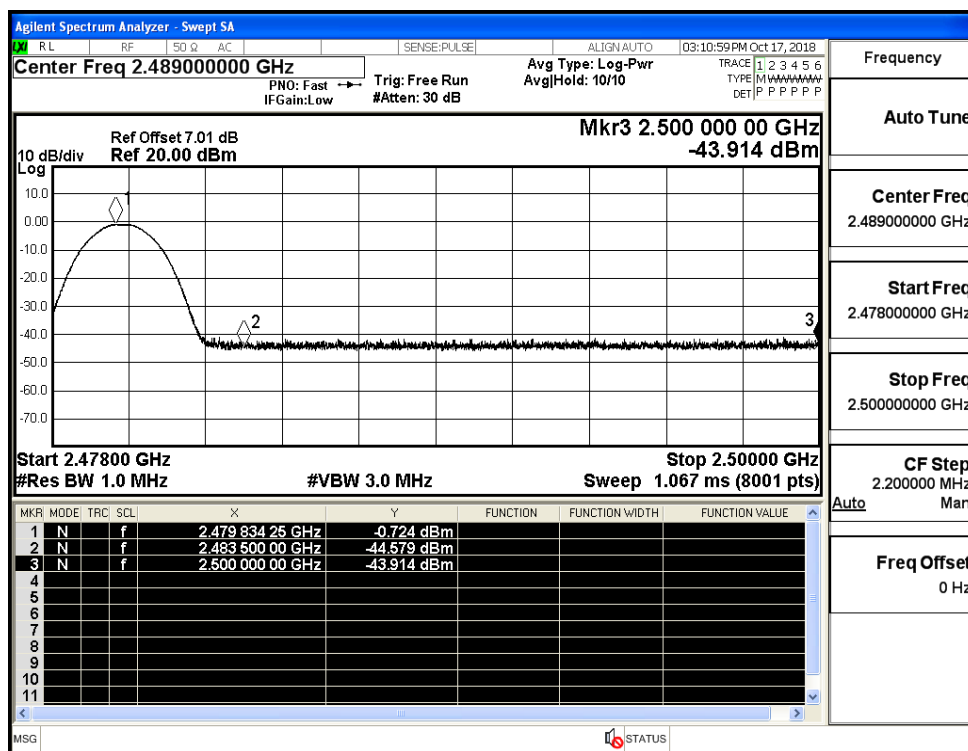


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

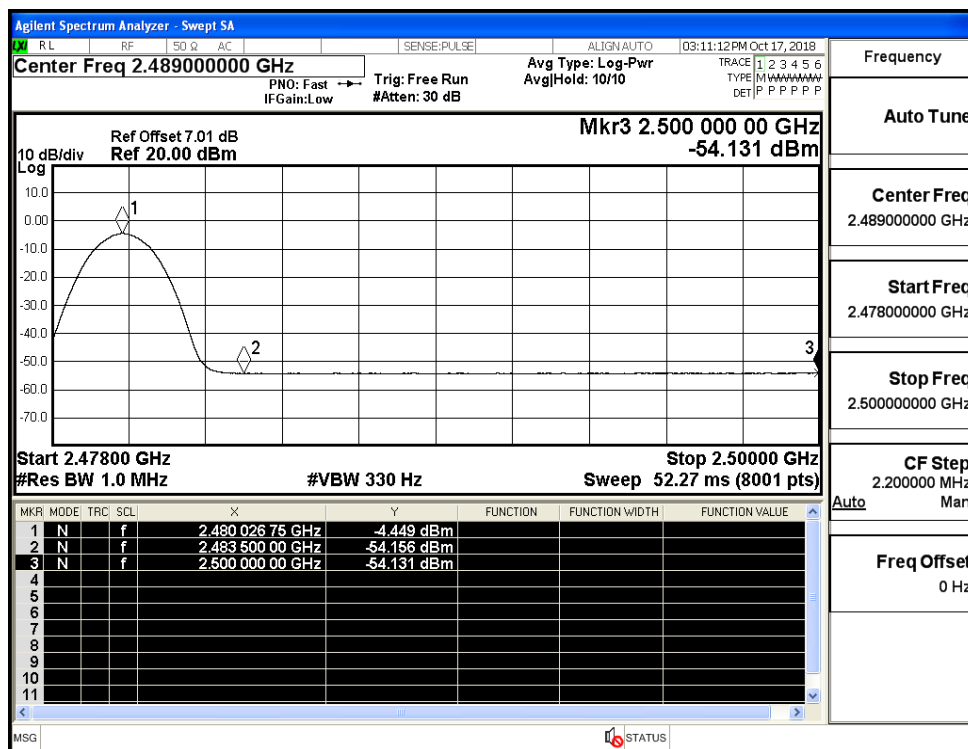


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

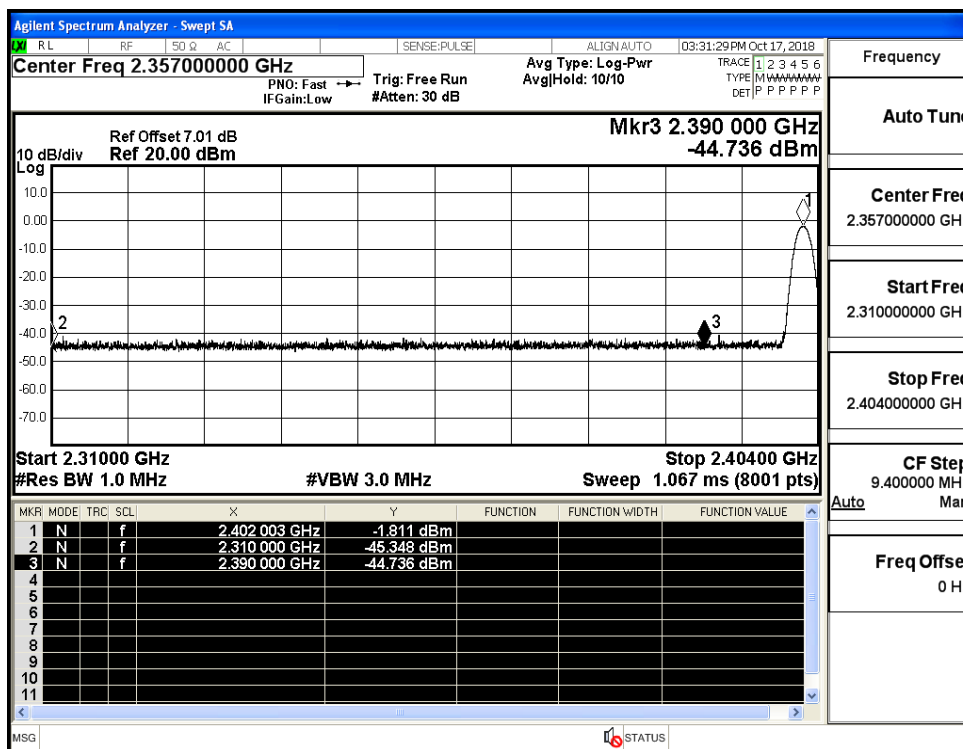
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



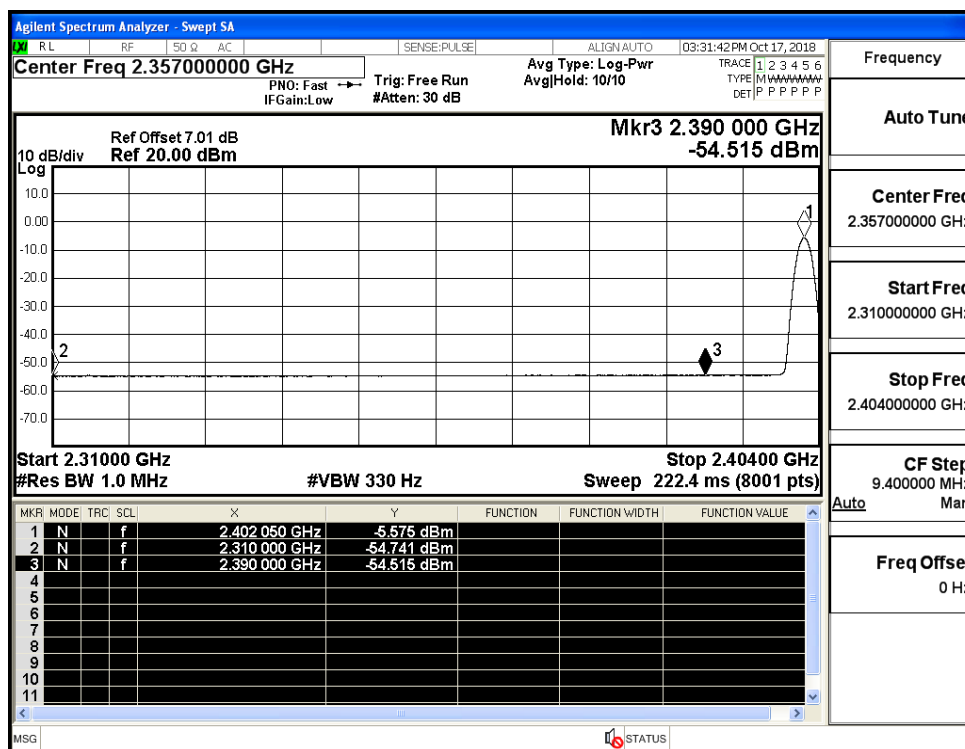
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



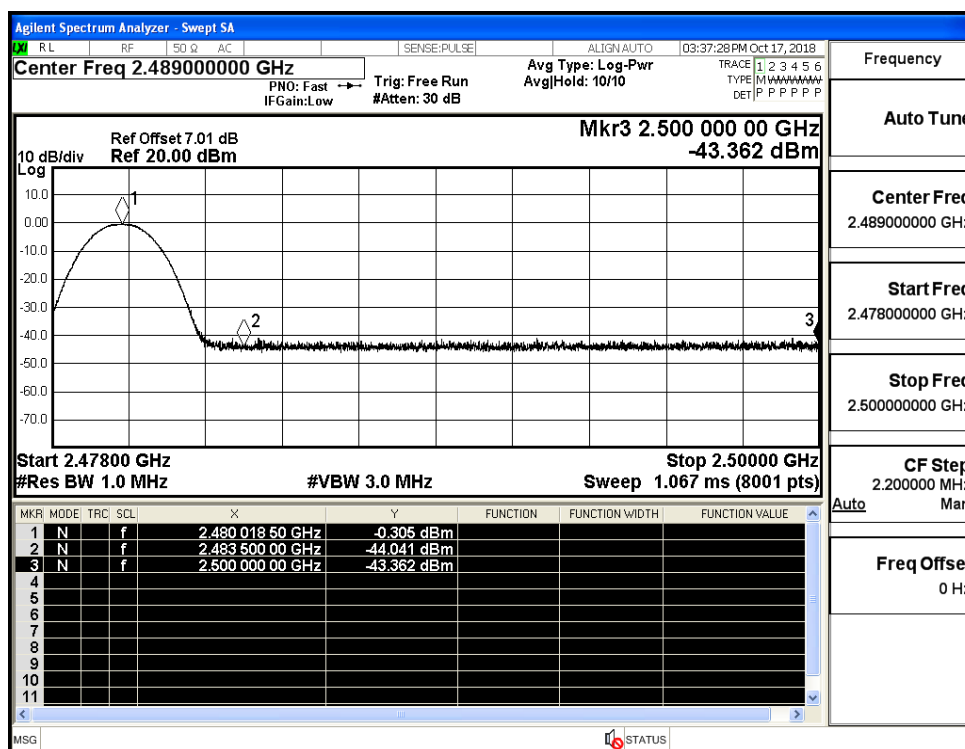
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

