

Appendix A

RF Test Data for BT V4.2 (BDR/EDR) (Conducted Measurement)

Product Name: Bluetooth earphone

Trade Mark: billboard

Test Model: MG508

Environmental Conditions

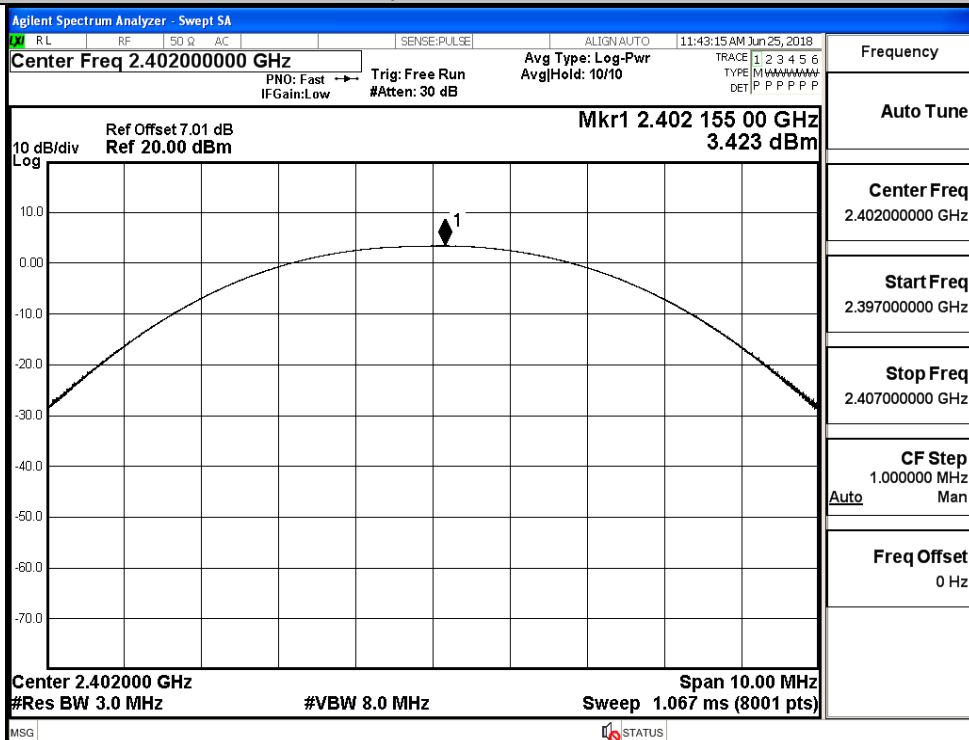
Temperature:	23.8 ° C
Relative Humidity:	53.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Wilson.Hong
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

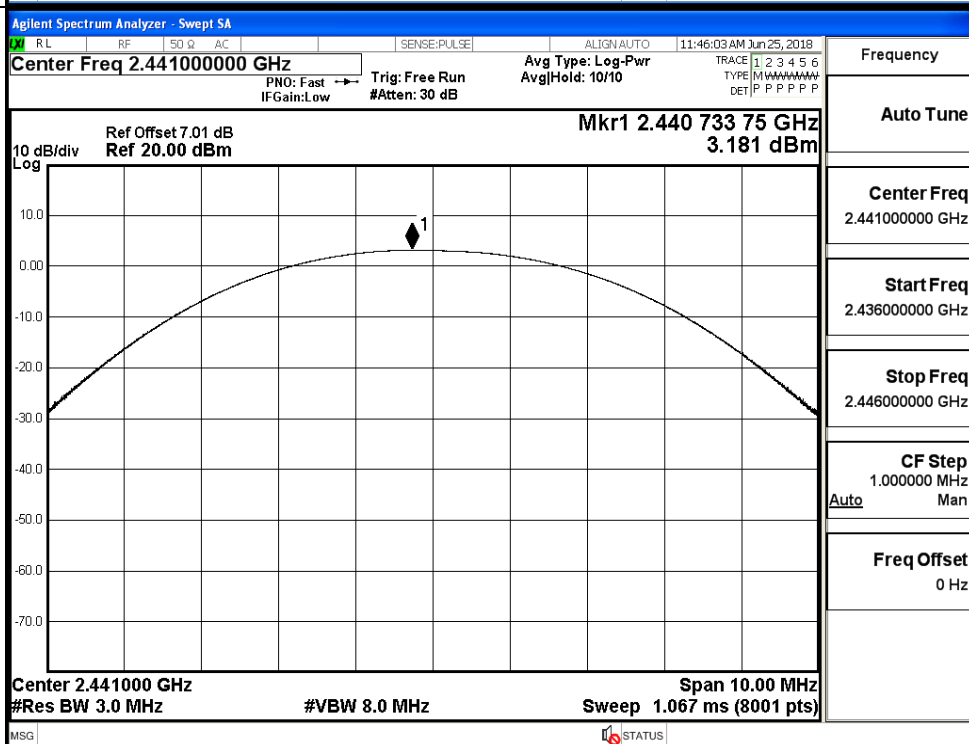
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.423	30	PASS
	MCH	3.181	30	PASS
	HCH	3.596	30	PASS
$\pi/4$ DQPSK	LCH	3.461	21	PASS
	MCH	3.329	21	PASS
	HCH	3.743	21	PASS

Test Graphs

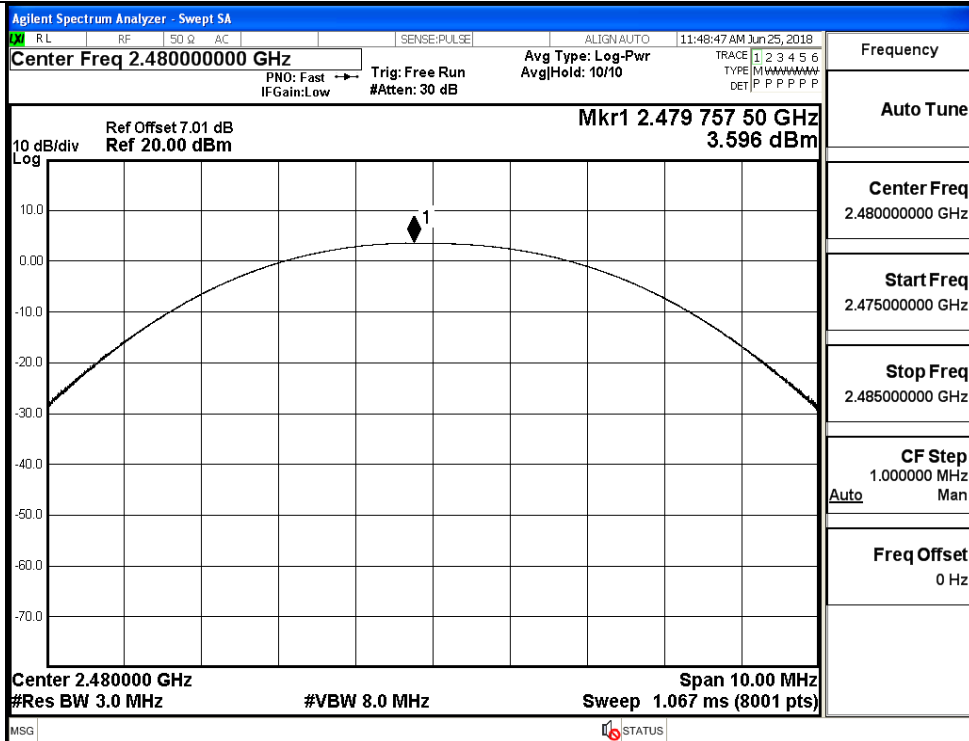
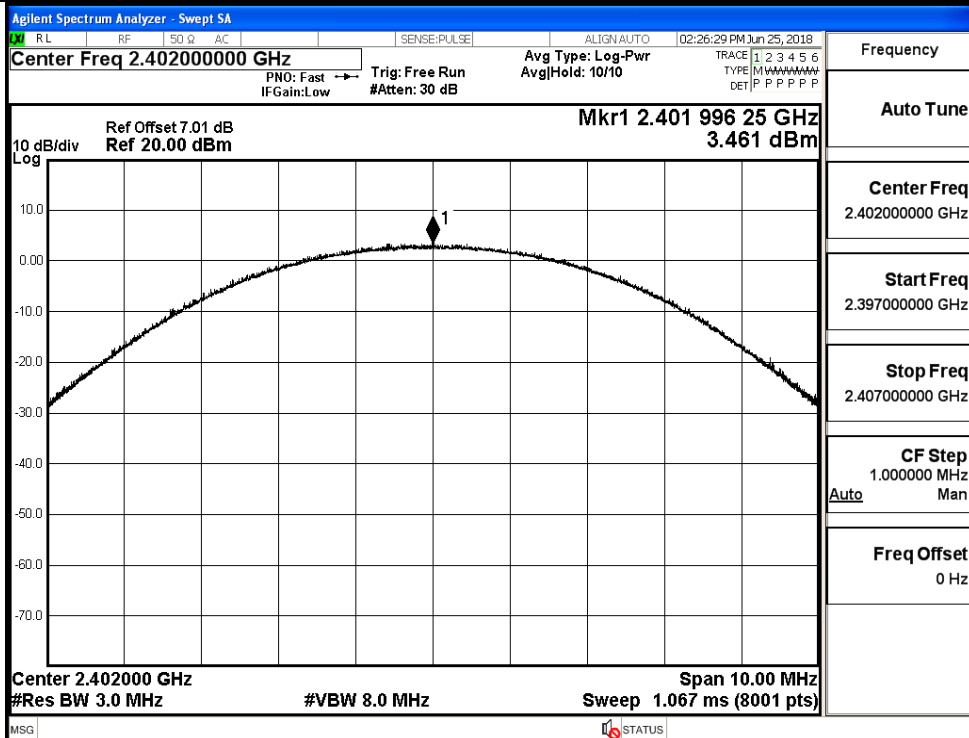
GFSK/LCH

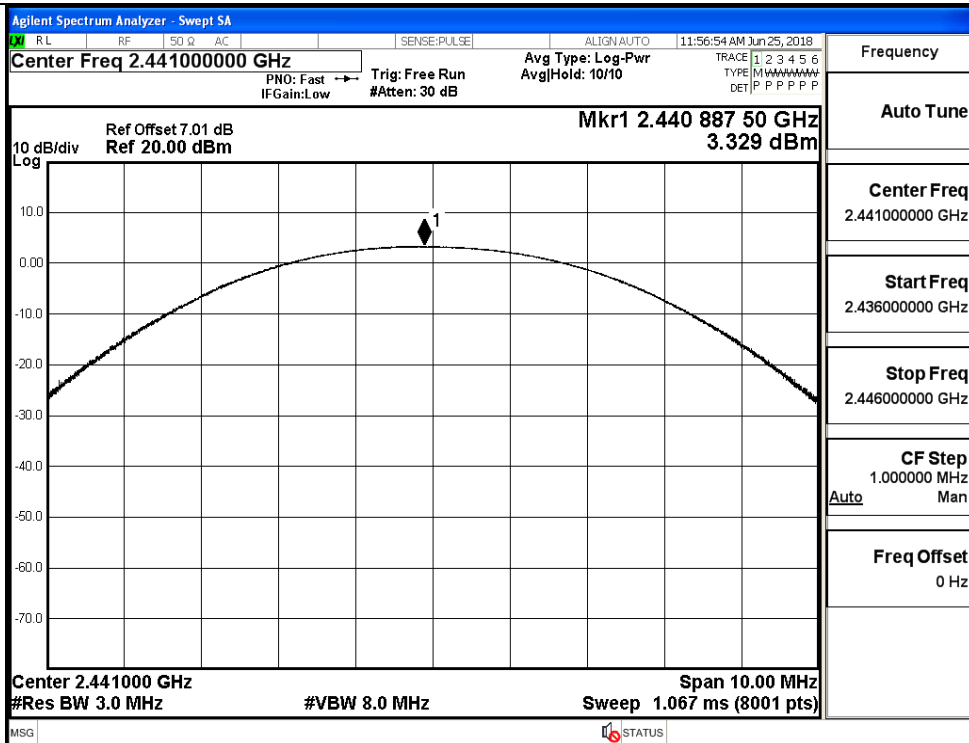
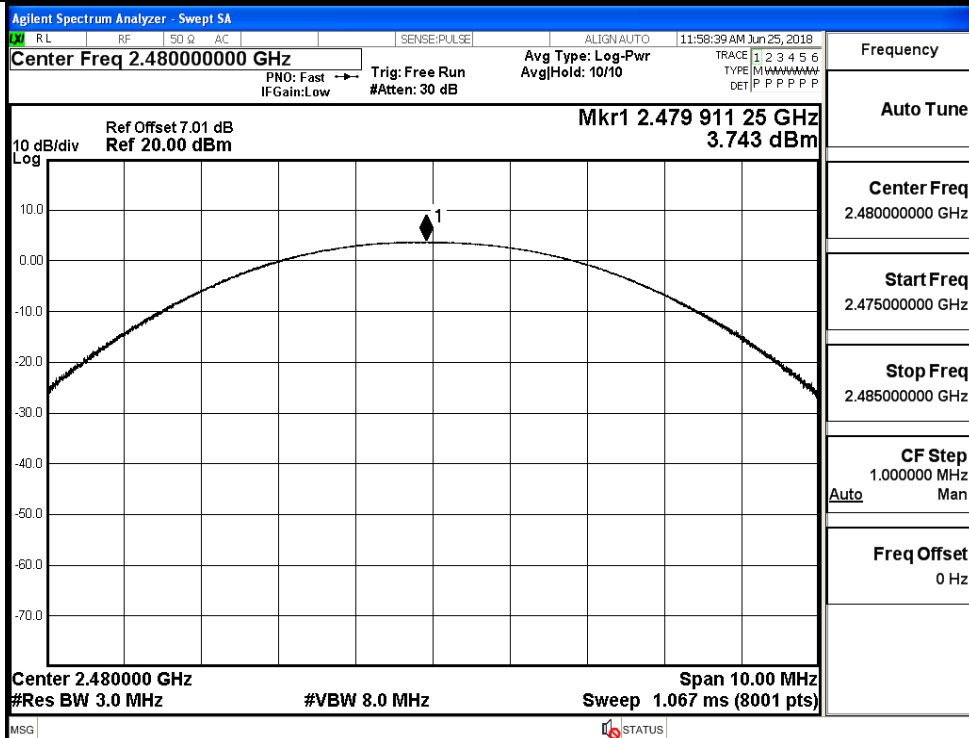


GFSK/MCH



GFSK/HCH

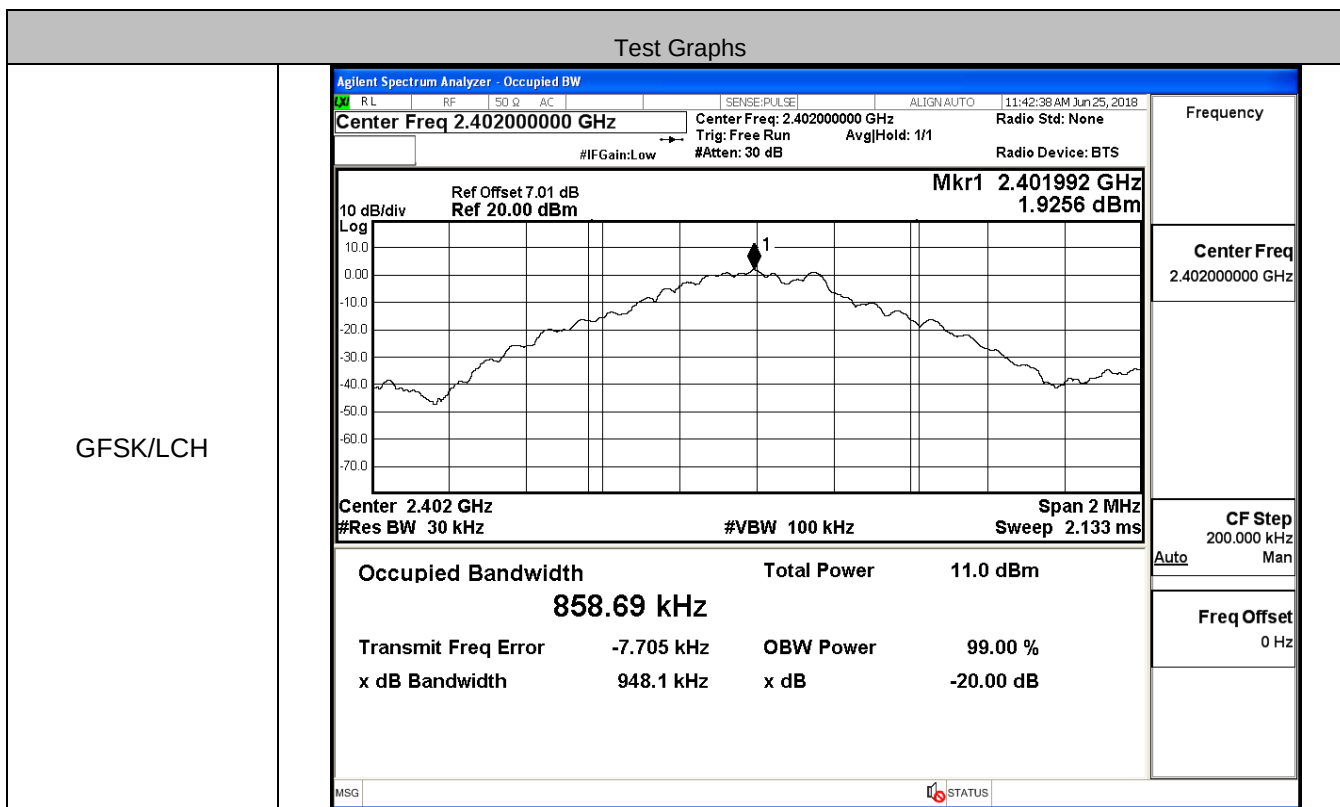
 π /4DQPSK/LCH

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

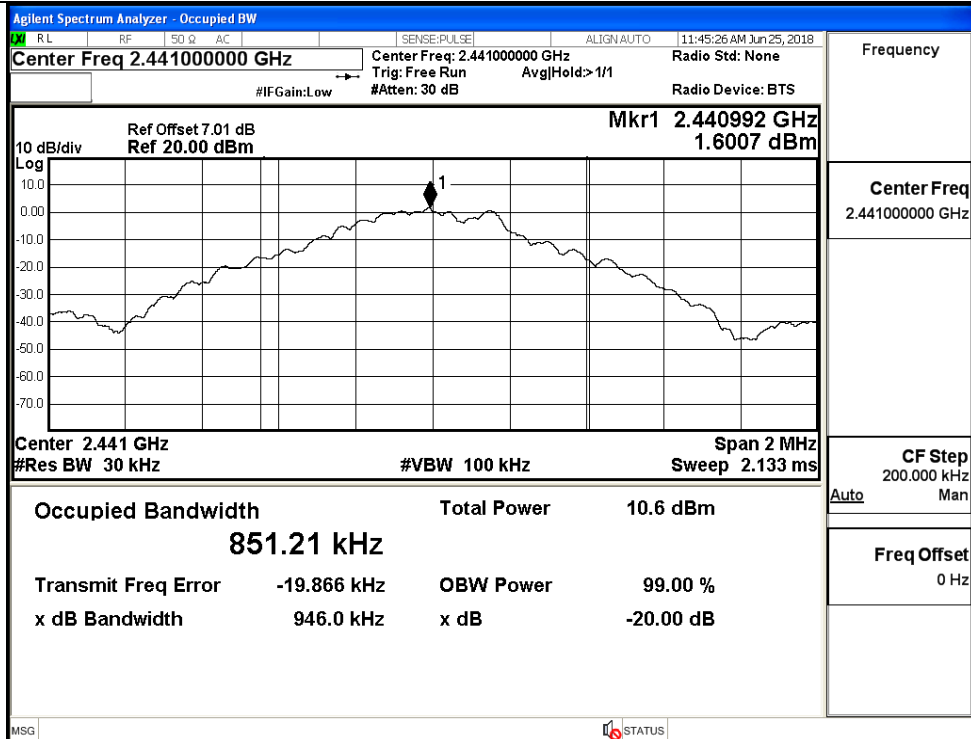
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9481	Not Specified	PASS
	MCH	0.9460	Not Specified	PASS
	HCH	0.9461	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.269	Not Specified	PASS
	MCH	1.266	Not Specified	PASS
	HCH	1.239	Not Specified	PASS

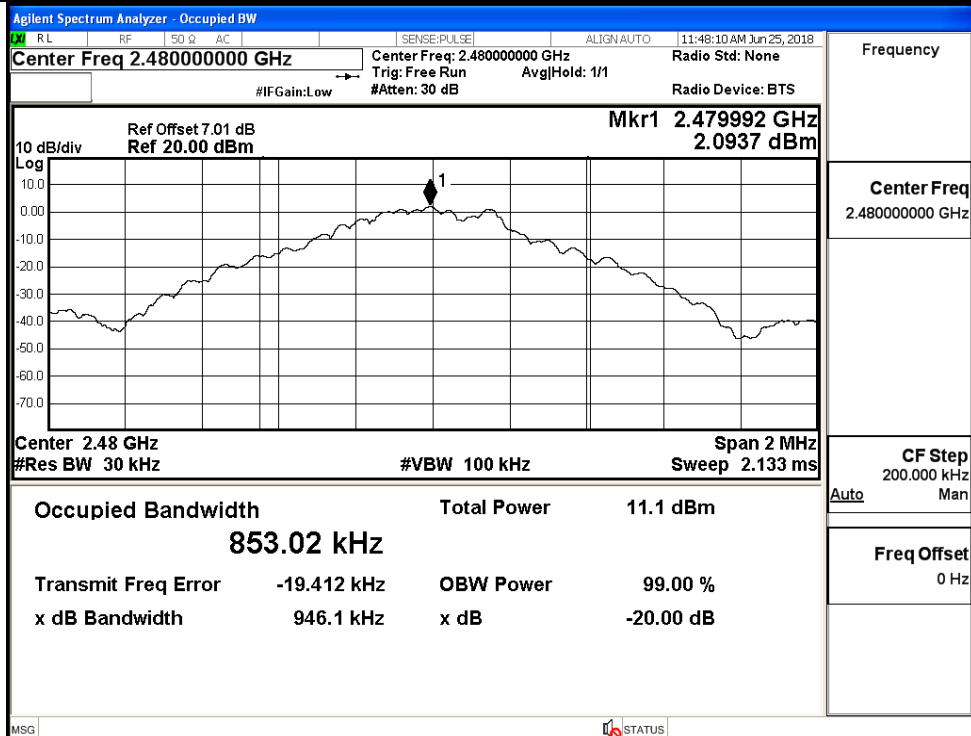
Test Graphs

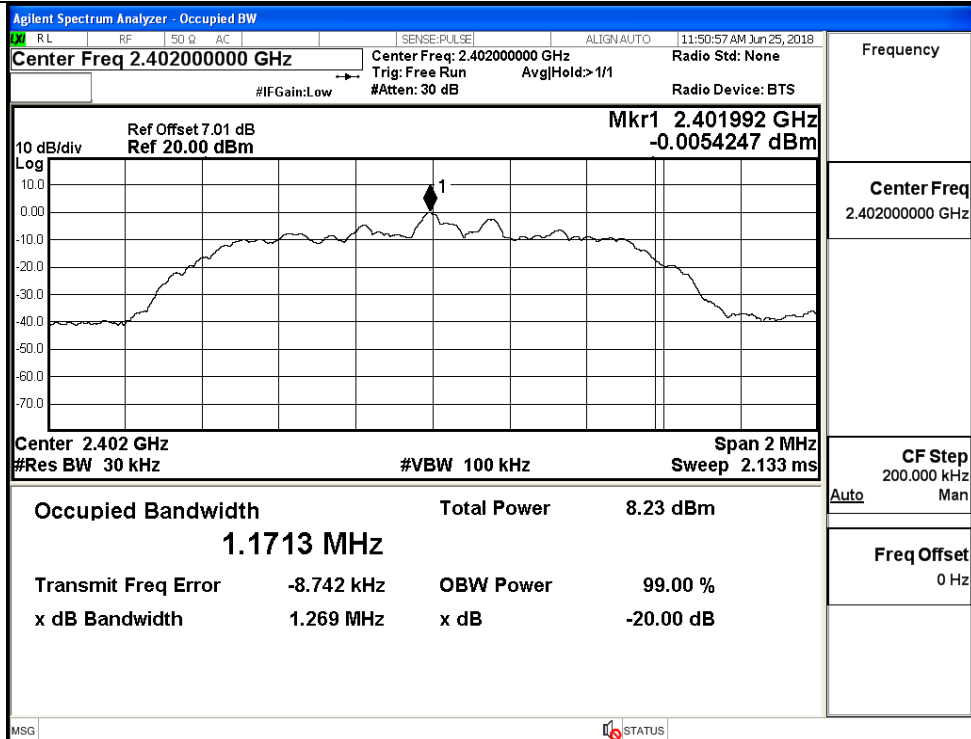
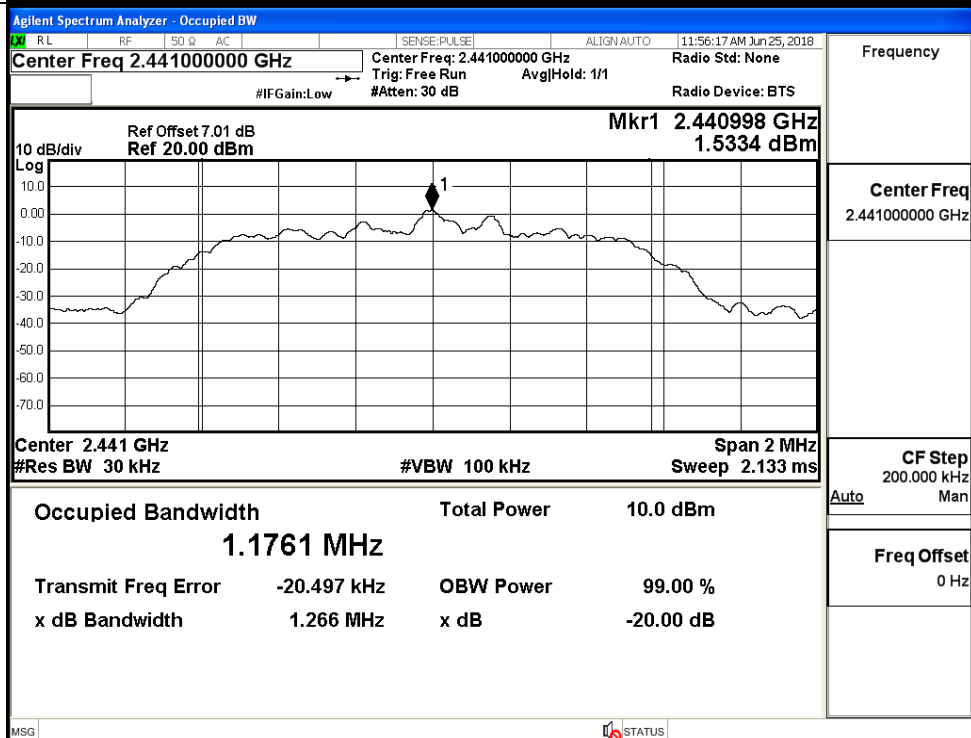


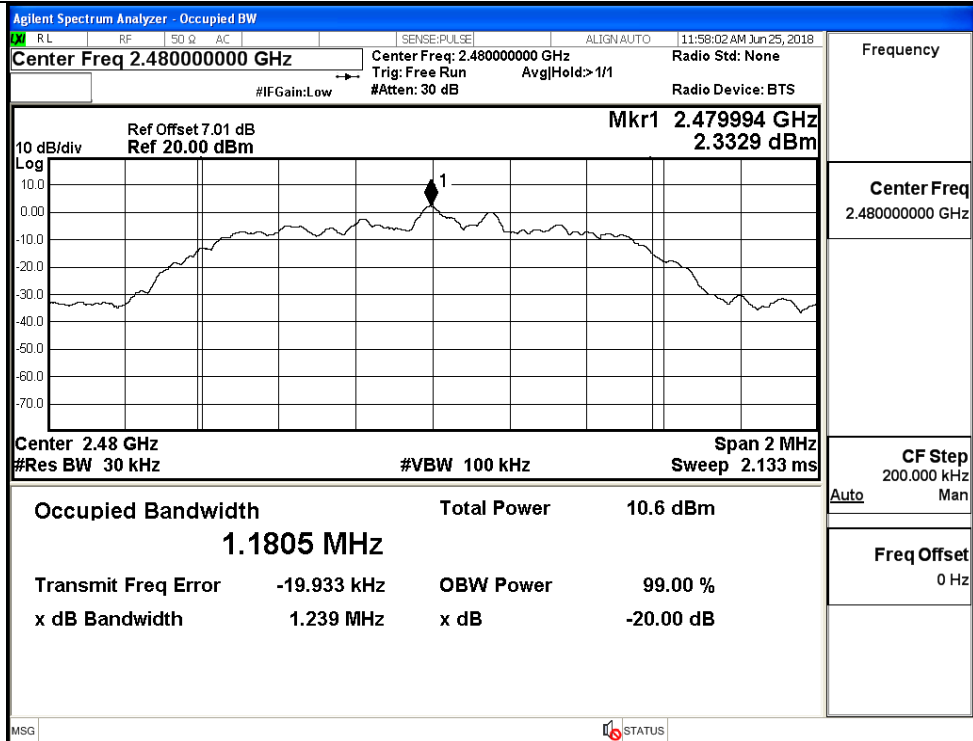
GFSK/MCH



GFSK/HCH



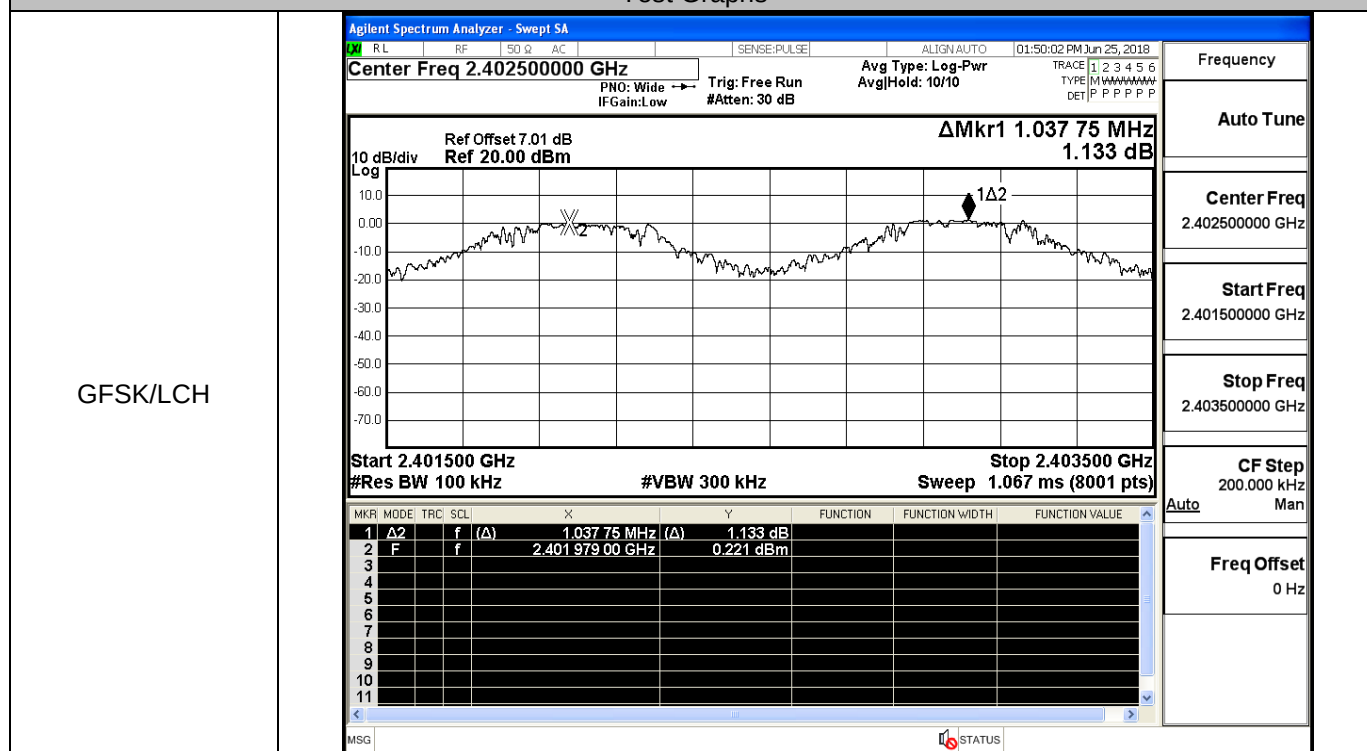
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

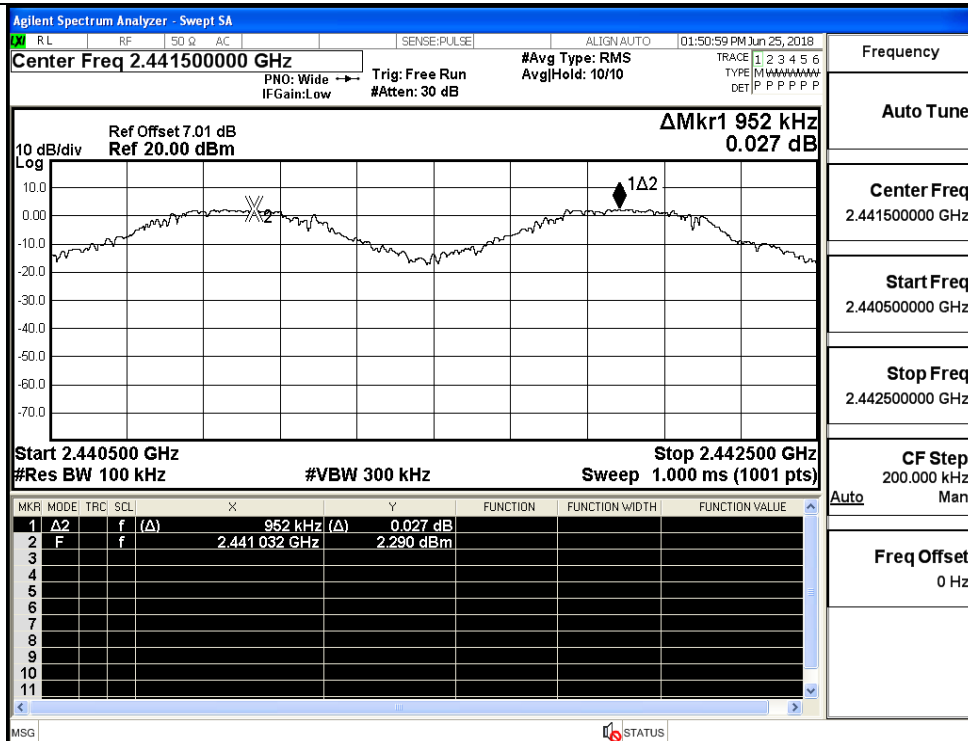
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.038	0.632	PASS
	MCH	0.952	0.632	PASS
	HCH	0.814	0.632	PASS
π /4DQPSK	LCH	0.988	0.846	PASS
	MCH	1.162	0.846	PASS
	HCH	0.974	0.846	PASS

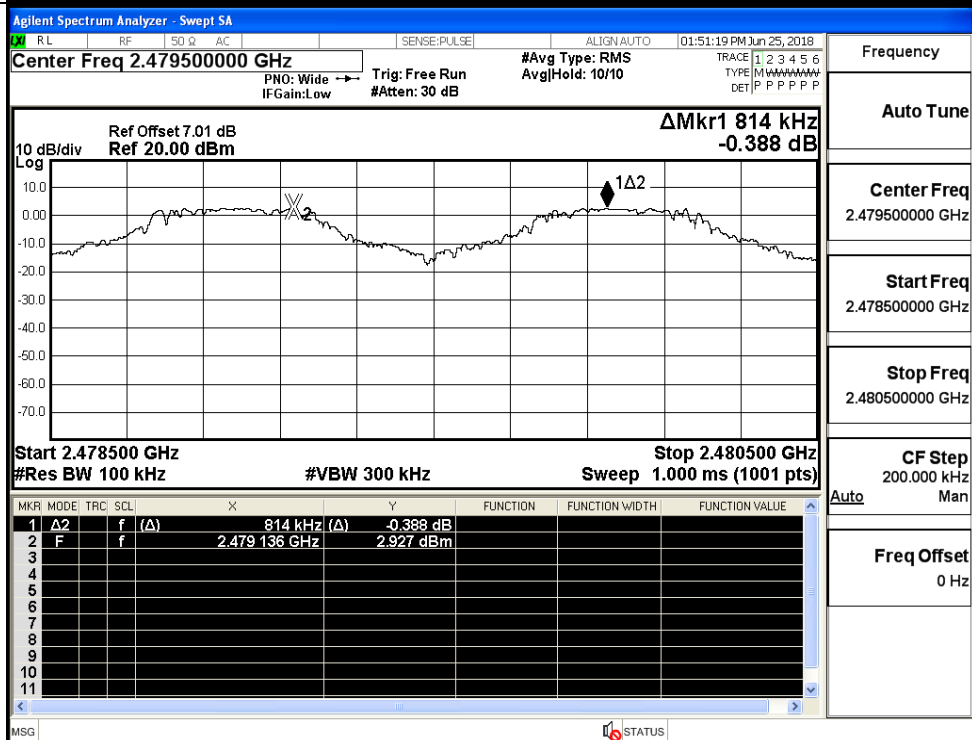
Test Graphs

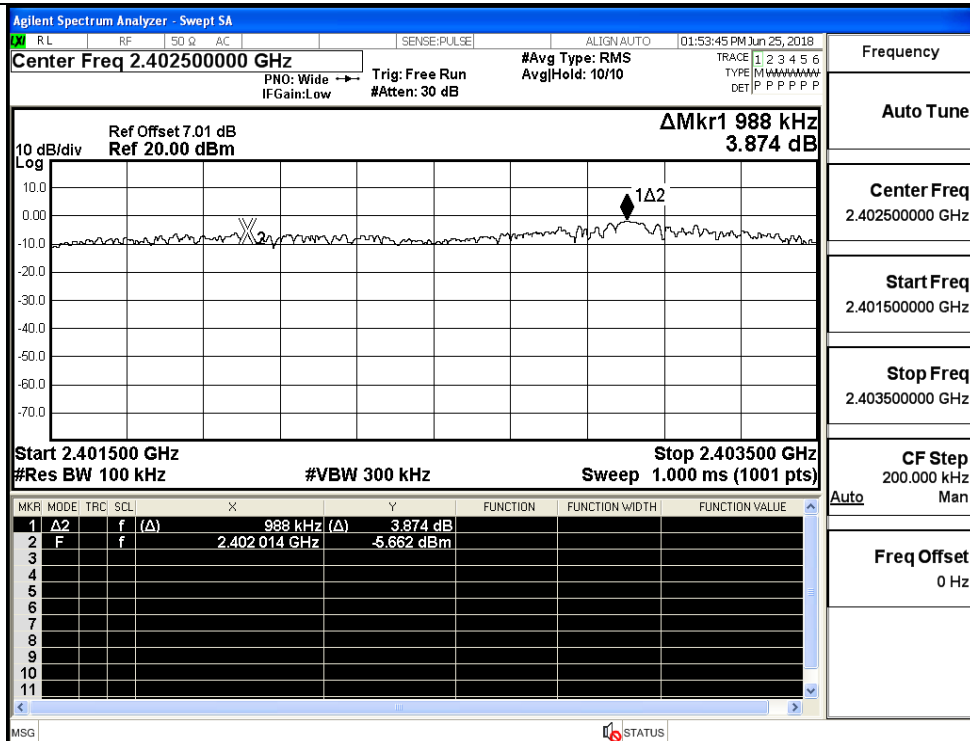
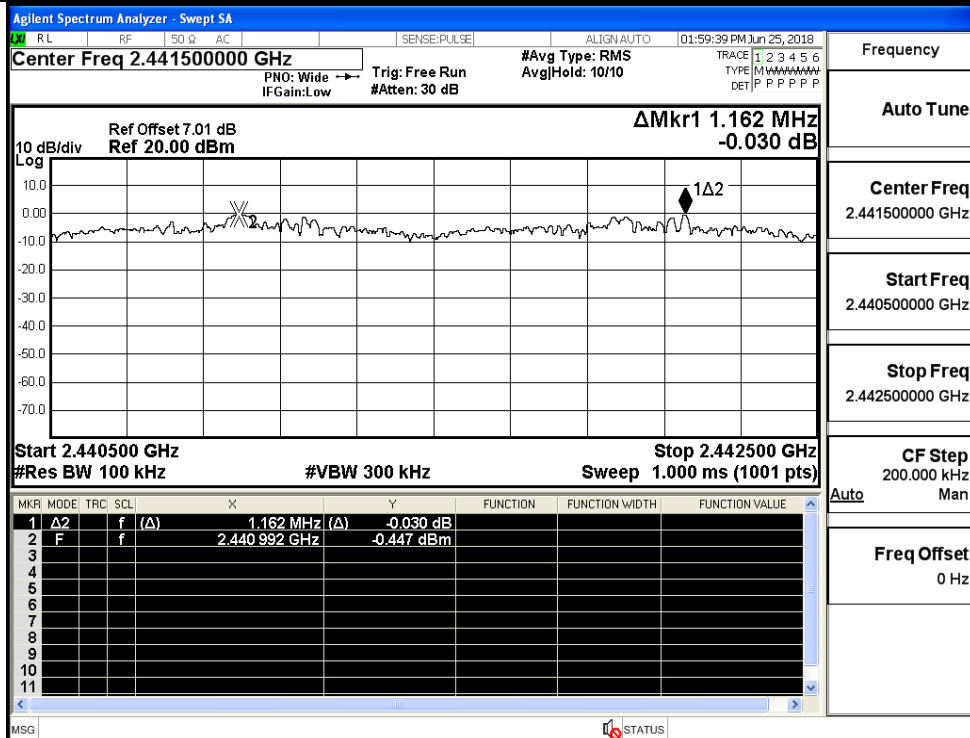


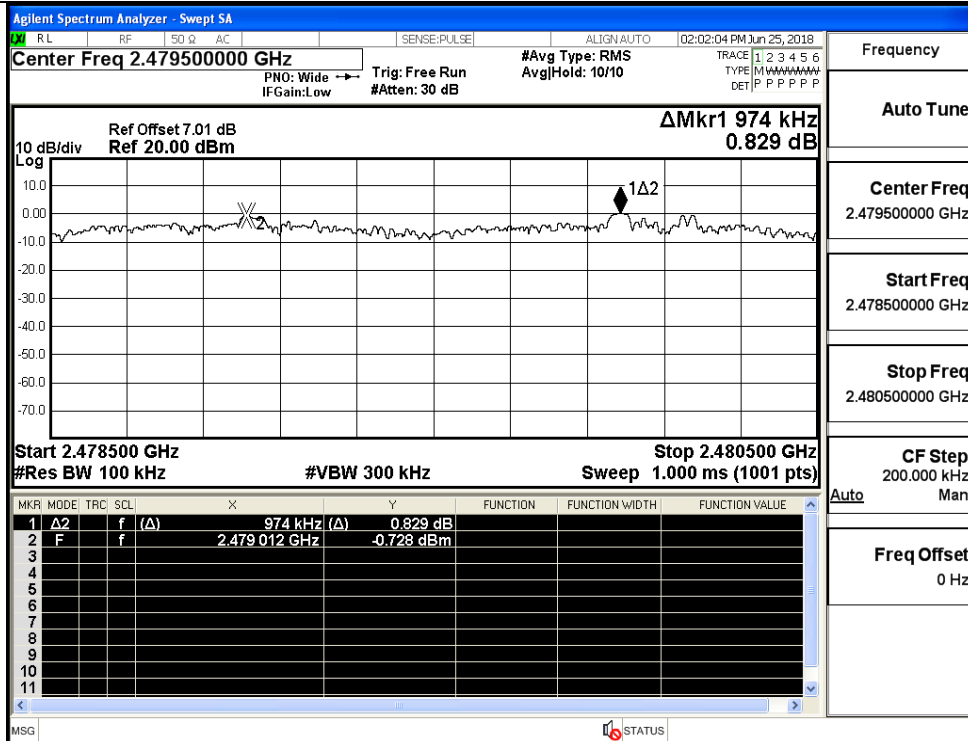
GFSK/MCH



GFSK/HCH



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

$\pi/4$ DQPSK/HCH

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

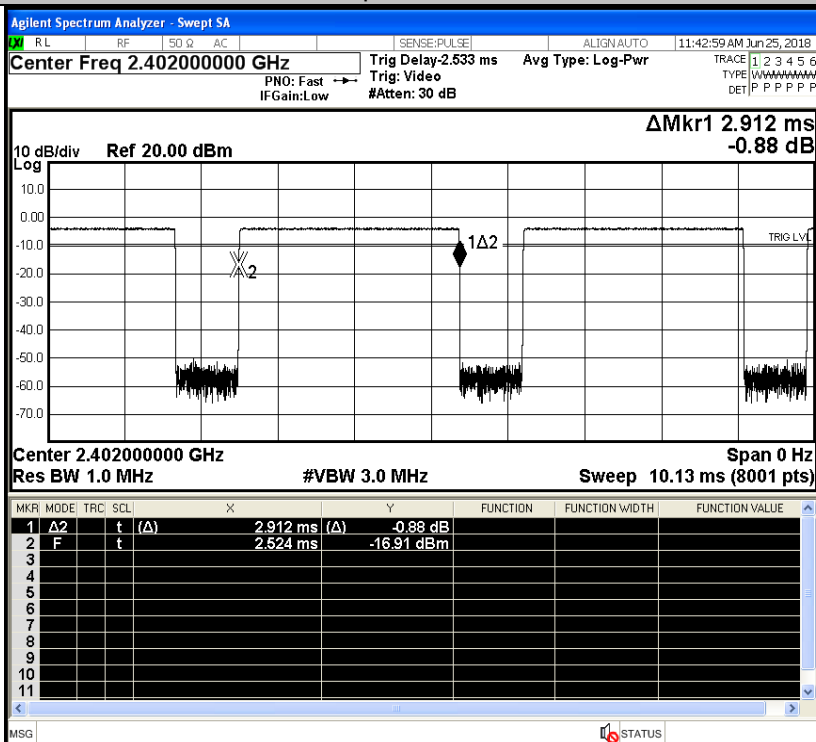


A.5 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.91	106.7	0.31	0.4	PASS
	DH5	MCH	2.91	106.7	0.31	0.4	PASS
	DH5	HCH	2.91	106.7	0.31	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.91	106.7	0.312	0.4	PASS
	2DH5	MCH	2.91	106.7	0.312	0.4	PASS
	2DH5	HCH	2.91	106.7	0.312	0.4	PASS

Test Graphs

GFSK_DH5/LCH



Frequency

Auto Tune

Center Freq

2.402000000 GHz

Start Freq

2.402000000 GHz

Stop Freq

2.402000000 GHz

CF Step

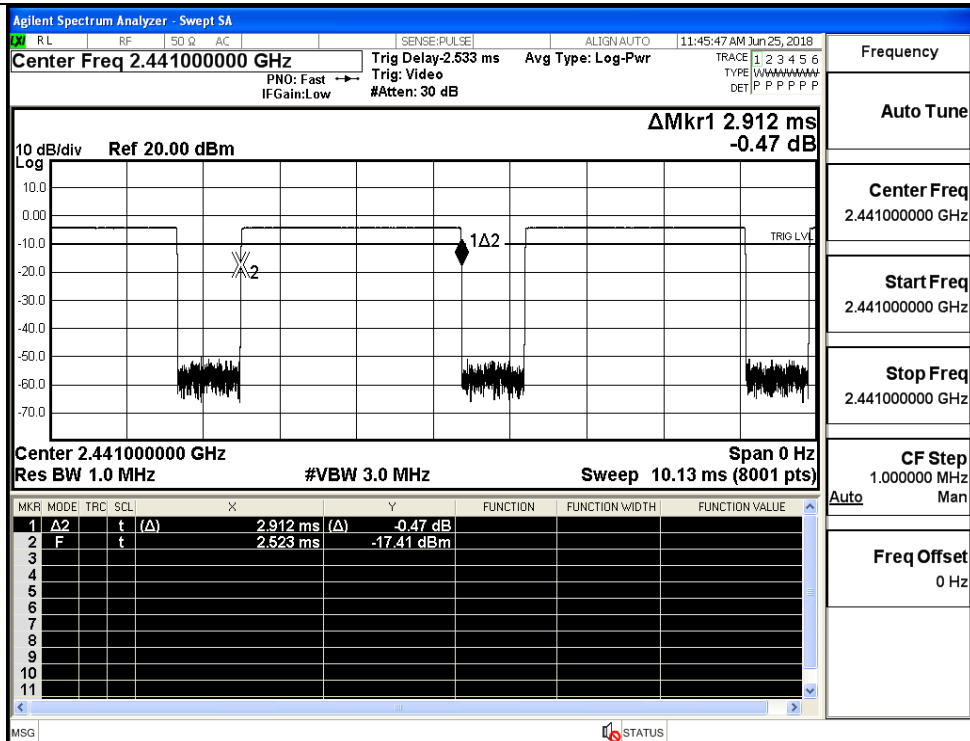
1.000000 MHz

Auto

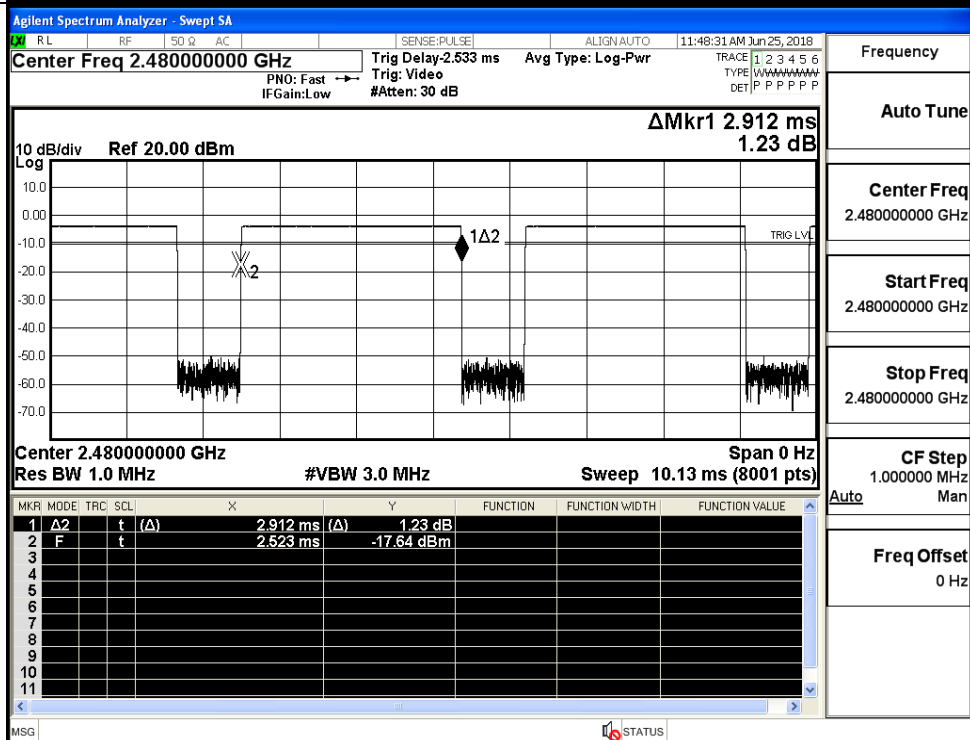
Freq Offset

0 Hz

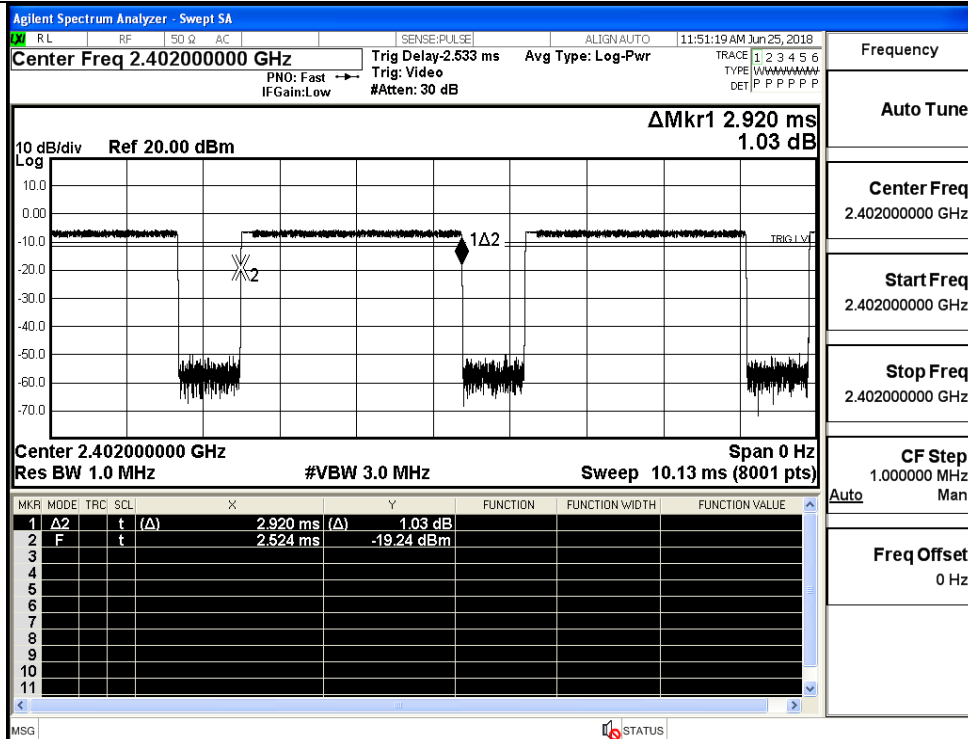
GFSK_DH5/MCH



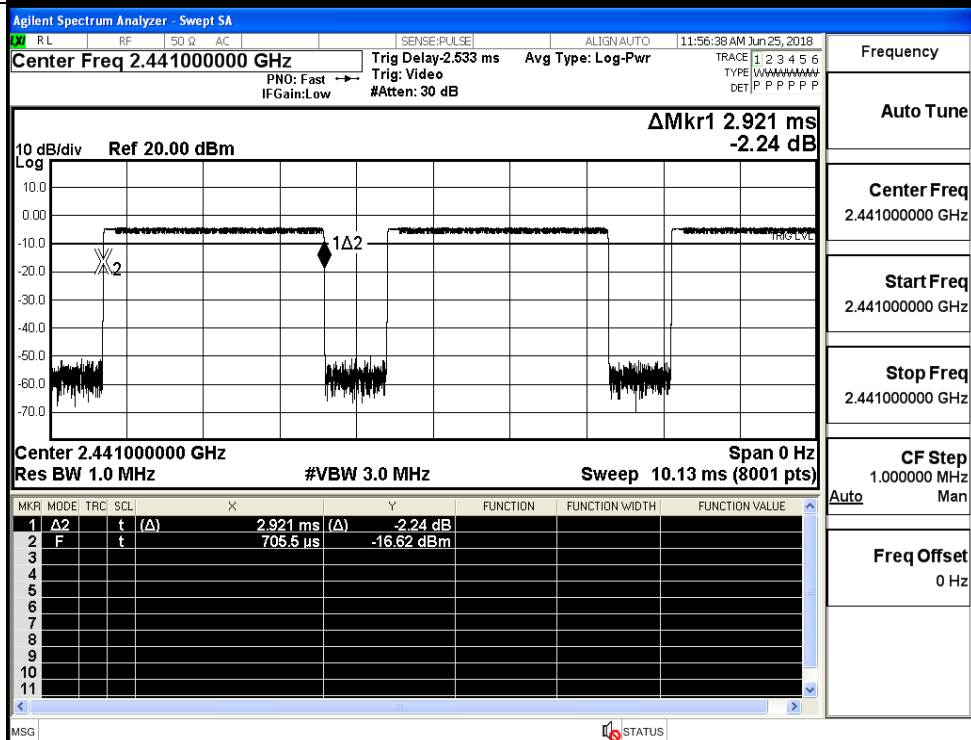
GFSK_DH5/HCH



$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH

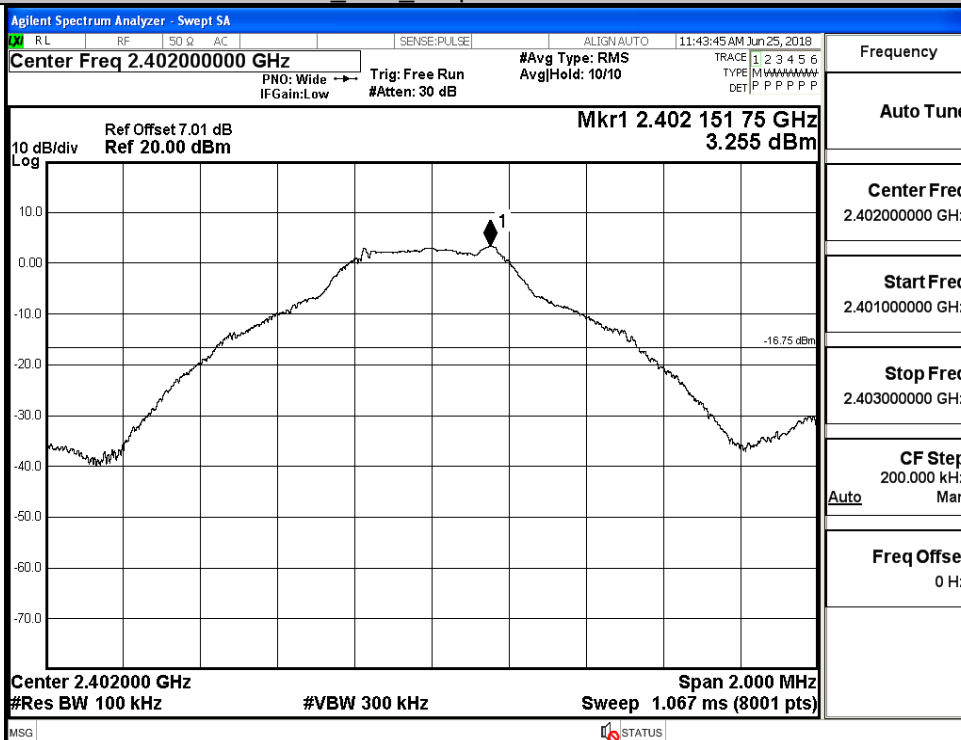


A.6 RF Conducted Spurious Emissions

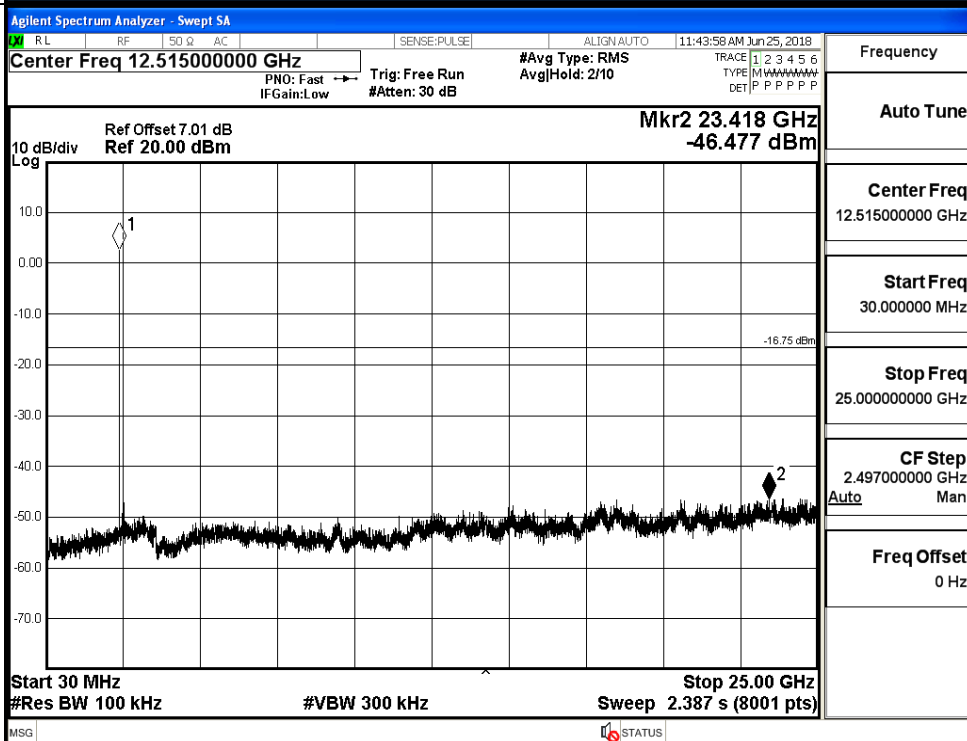
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.255	-46.477	-16.745	PASS
	MCH	2.844	-46.008	-17.156	PASS
	HCH	3.213	-46.139	-16.787	PASS
$\pi/4$ DQPSK	LCH	-0.219	-45.529	-20.219	PASS
	MCH	2.214	-45.703	-17.786	PASS
	HCH	2.771	-45.176	-17.229	PASS

GFSK LCH Graphs

Pref

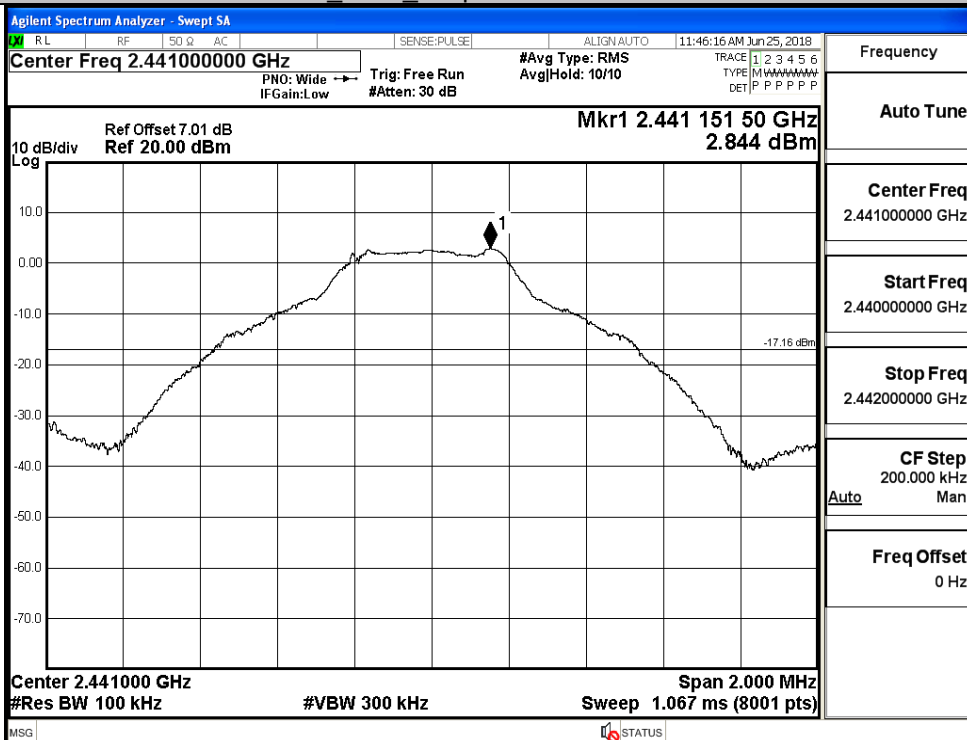


Puw

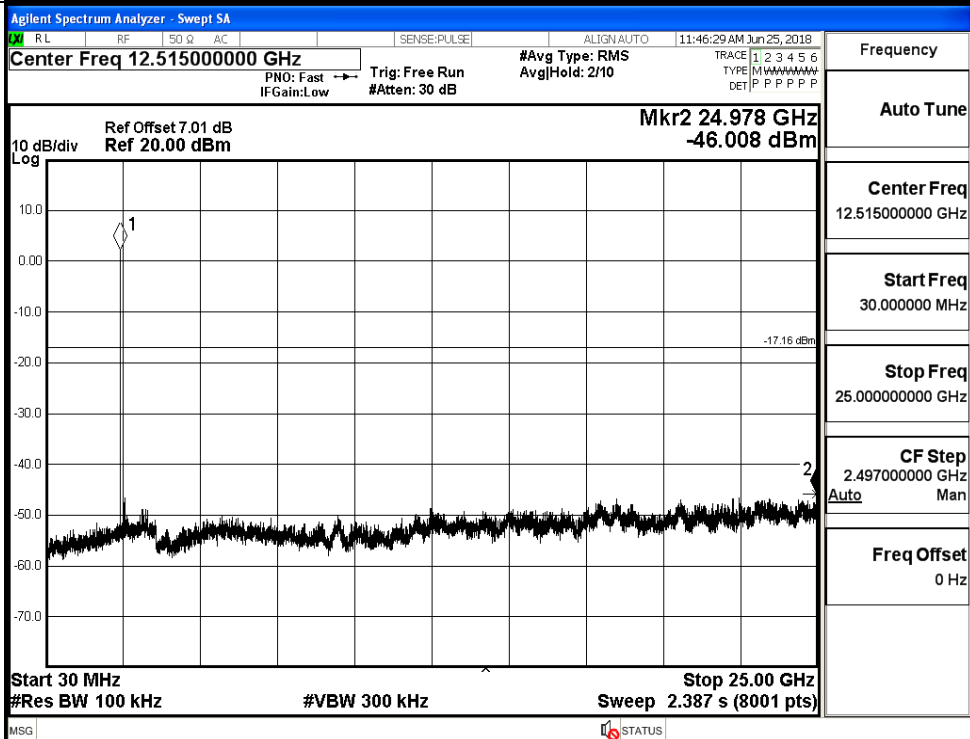


GFSK_MCH_Graphs

Pref

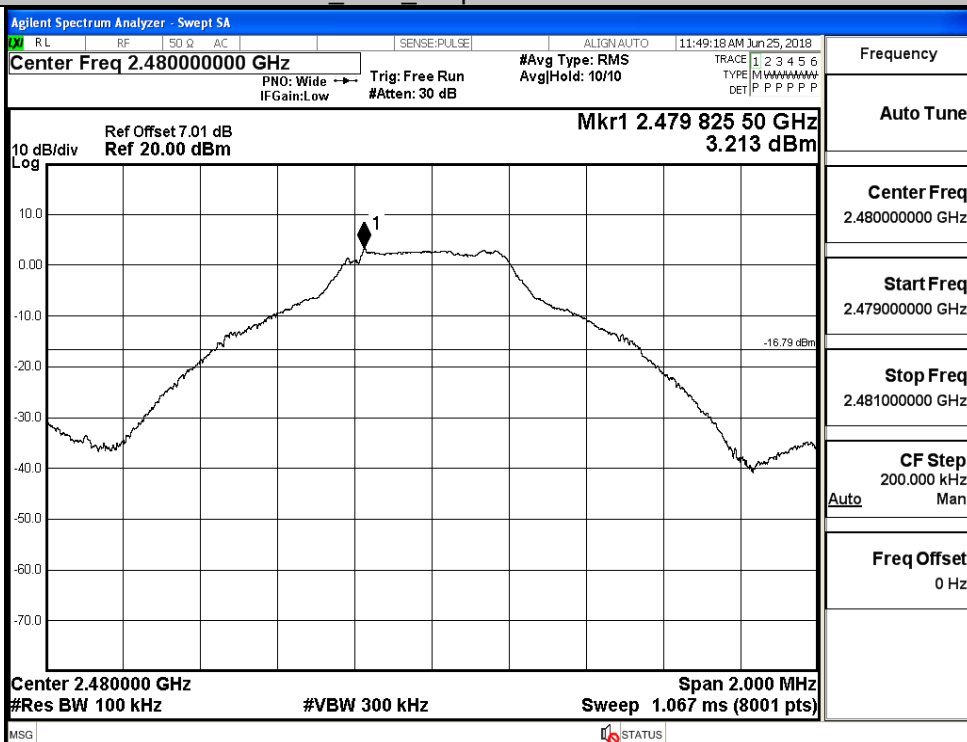


Puw

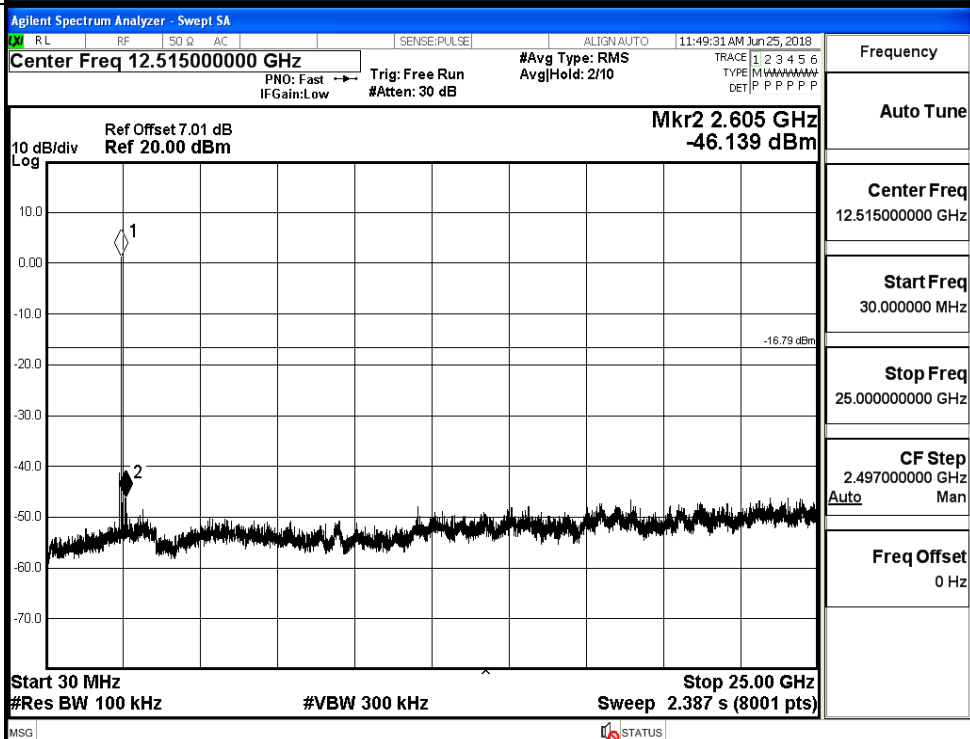


GFSK HCH_Graphs

Pref

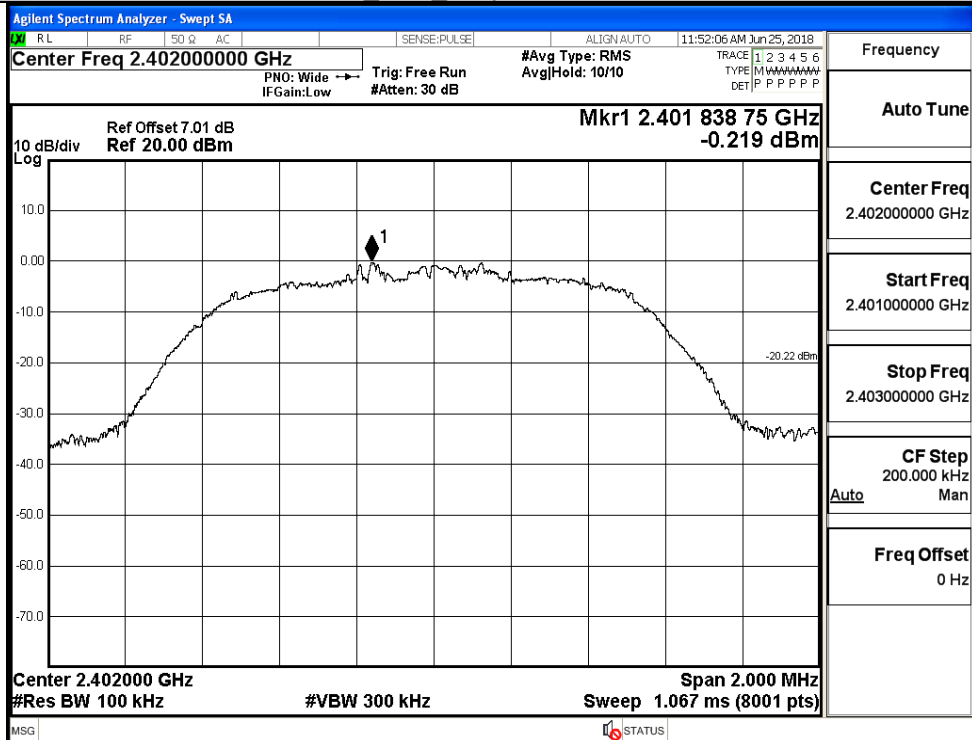


Puw

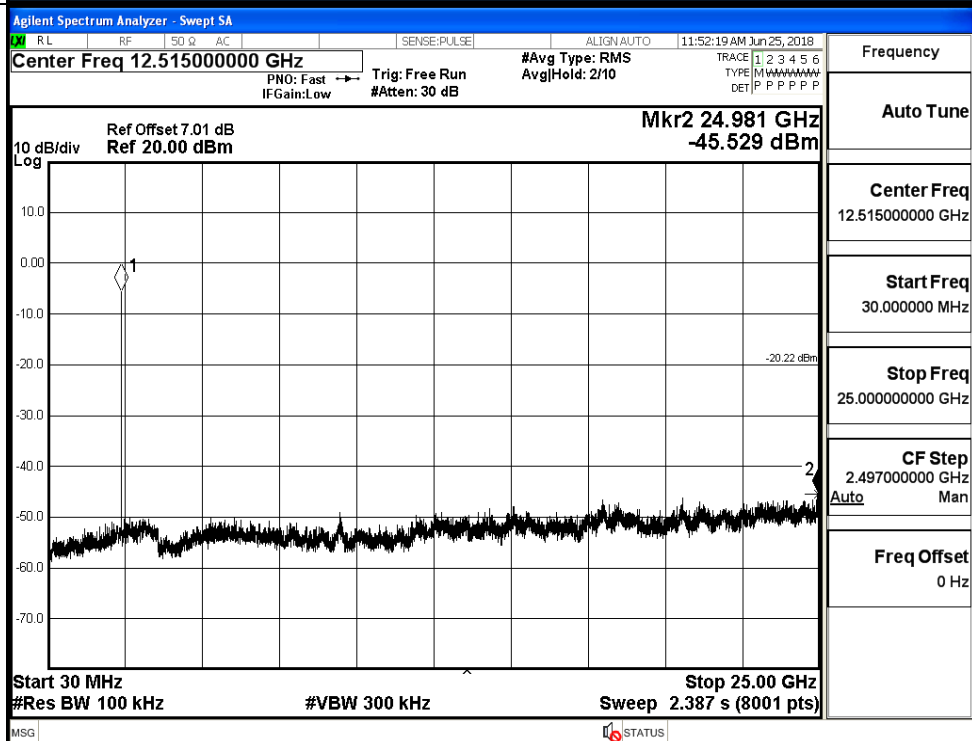


$\pi/4$ DQPSK LCH_Graphs

Pref

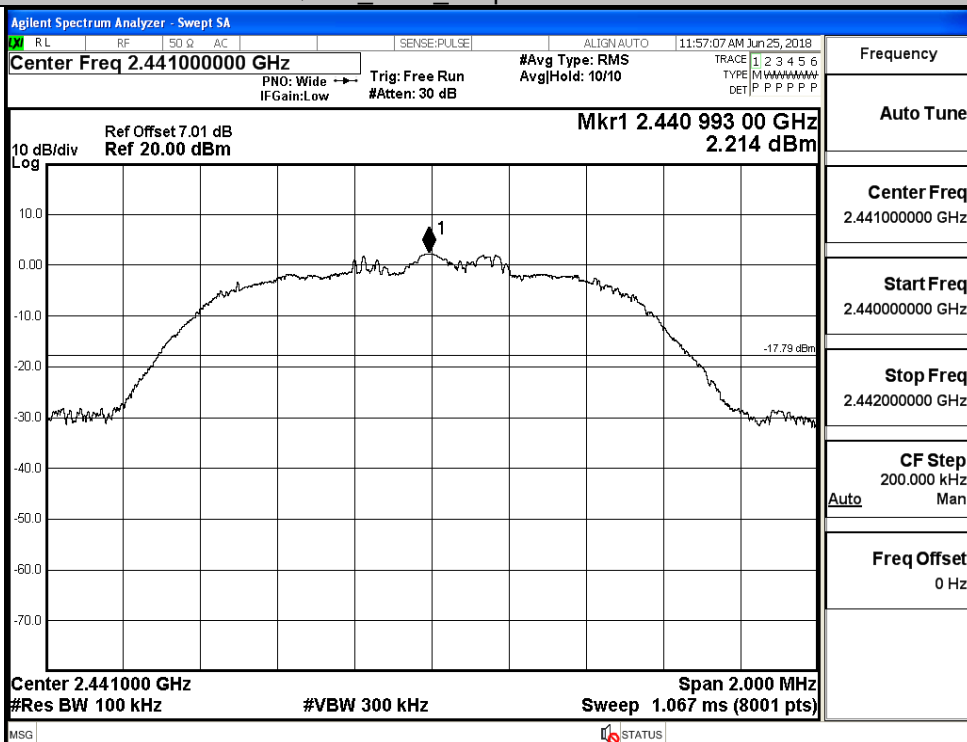


Puw

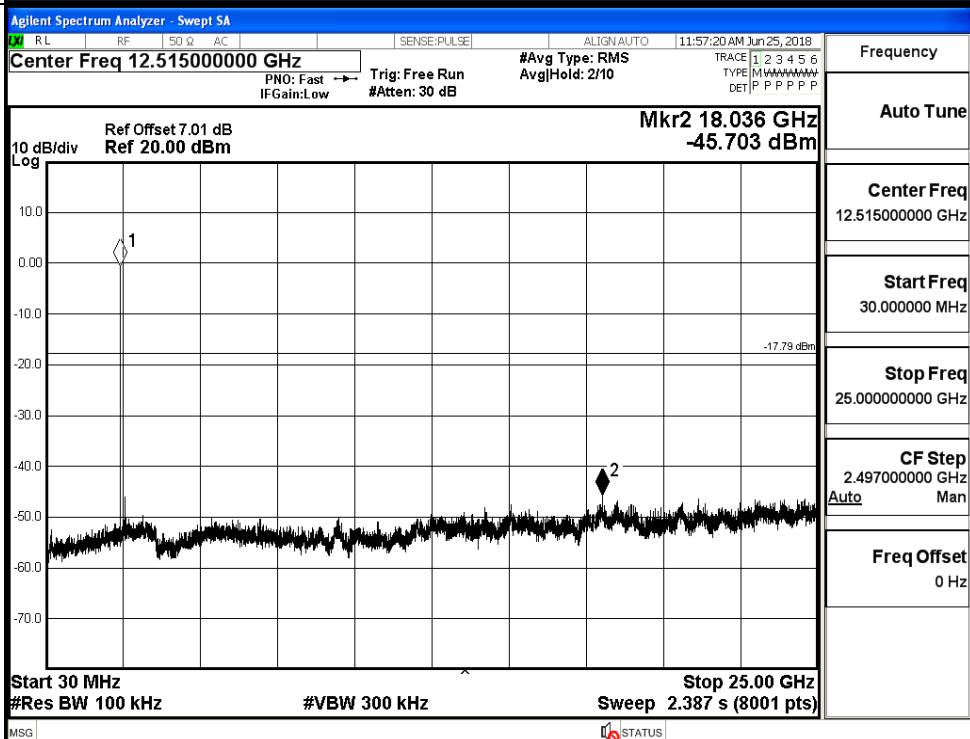


π /4DQPSK_MCH_Graphs

Pref

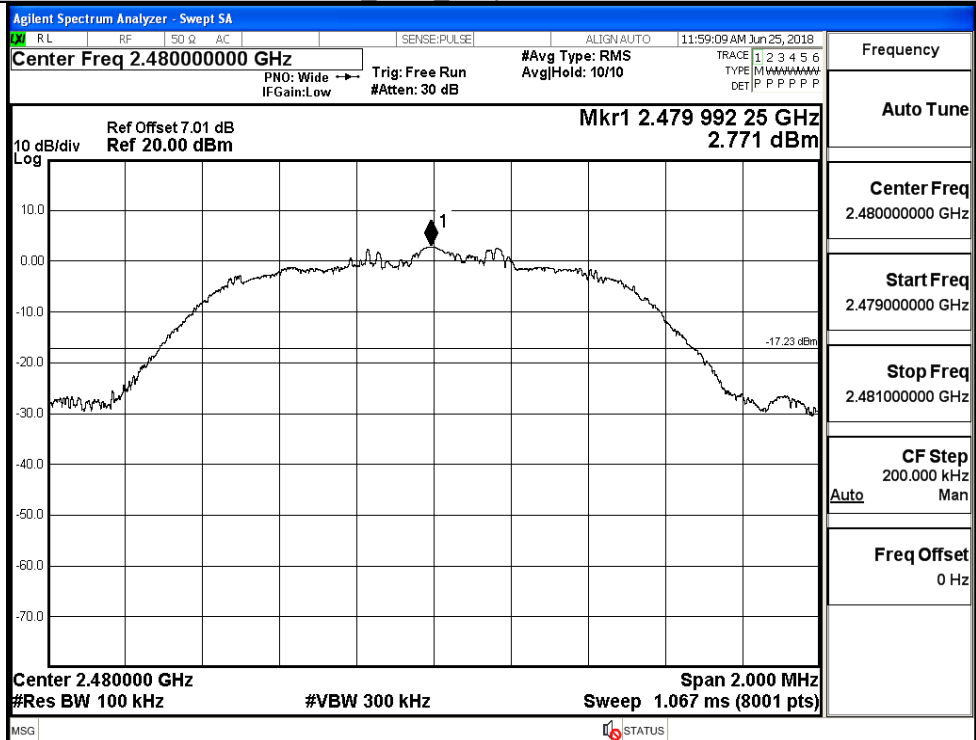


Puw

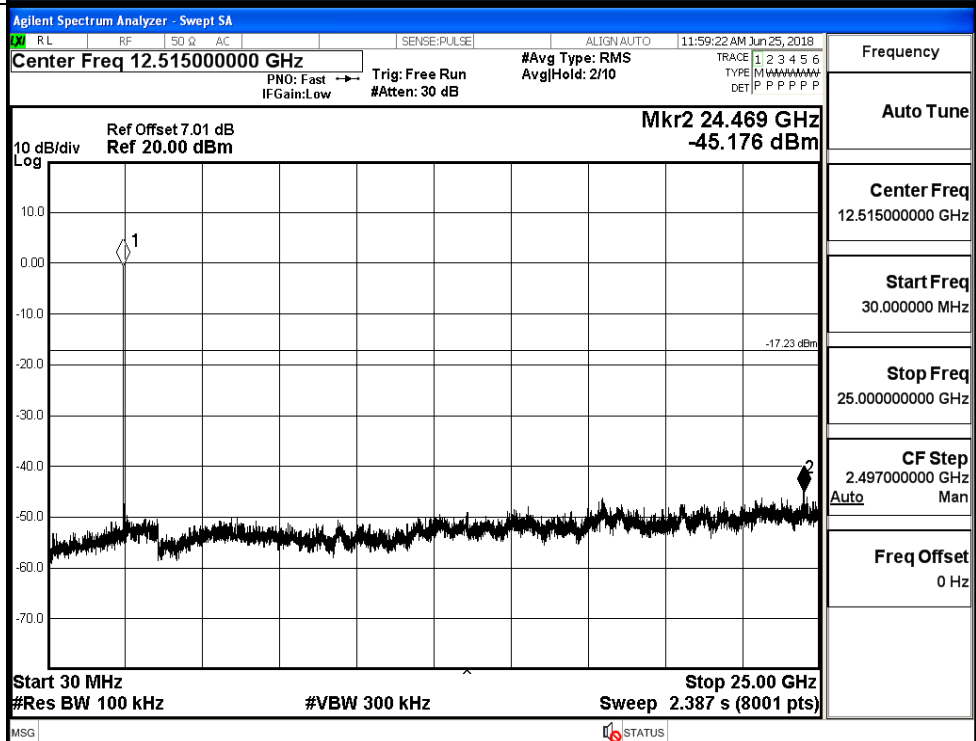


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

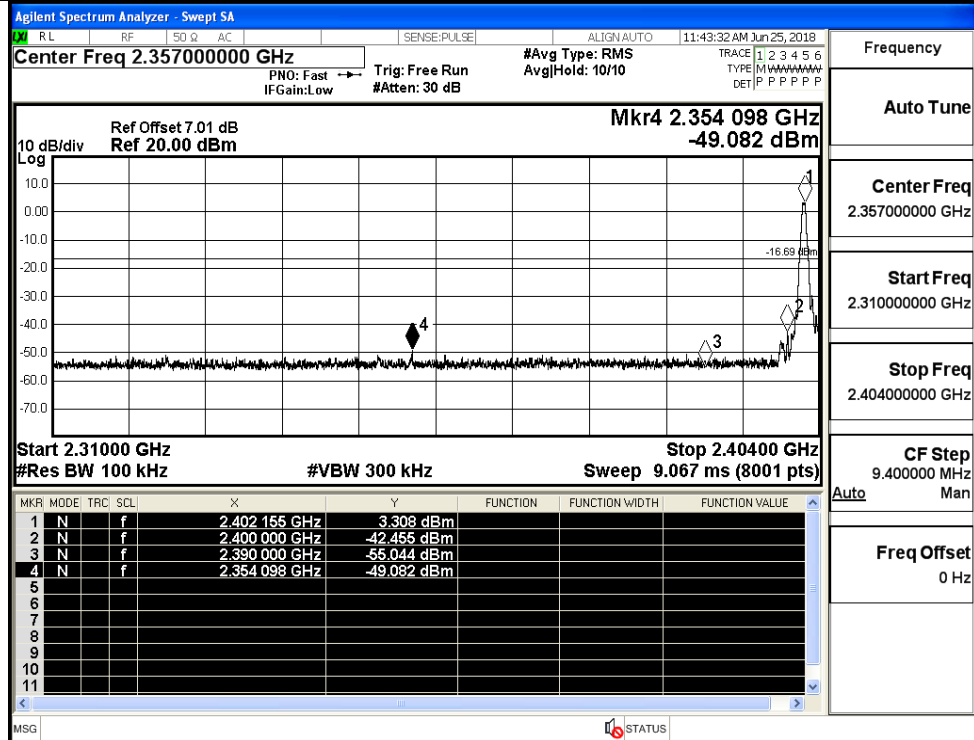


A.7 Band-edge for RF Conducted Emissions

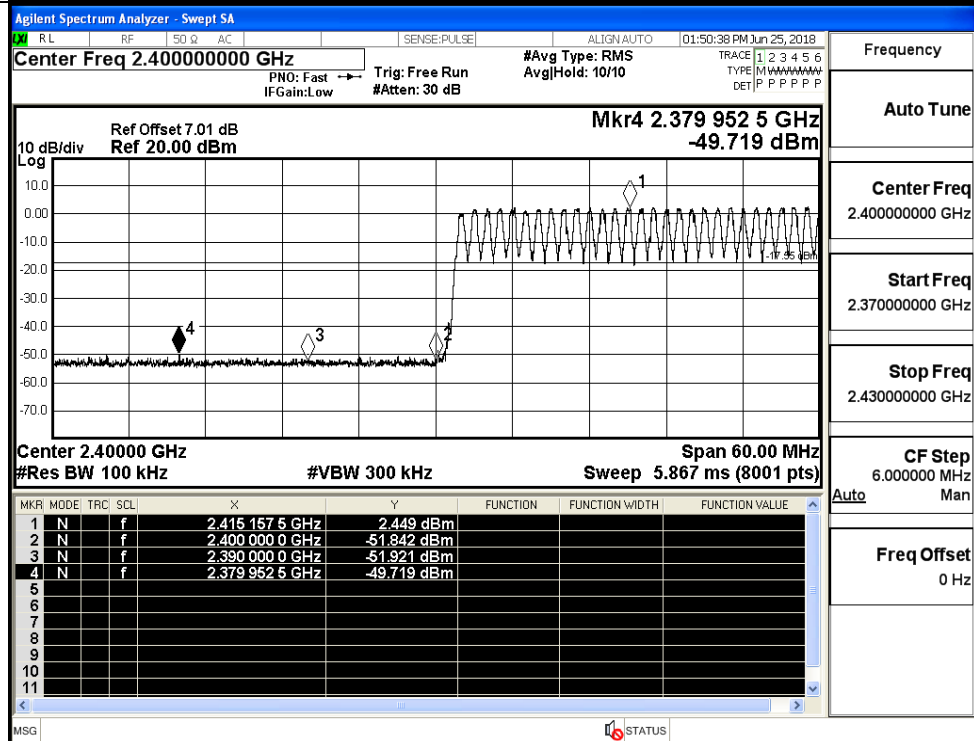
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.308	Off	-49.082	-16.69	PASS
			2.449	On	-49.719	-17.55	PASS
	HCH	2480	3.366	Off	-50.807	-16.63	PASS
			3.293	On	-49.100	-16.71	PASS
$\pi/4$ DQPSK	LCH	2402	0.541	Off	-50.288	-19.46	PASS
			-0.785	On	-50.141	-20.79	PASS
	HCH	2480	2.809	Off	-50.365	-17.19	PASS
			0.217	On	-49.481	-19.78	PASS

Test Graphs

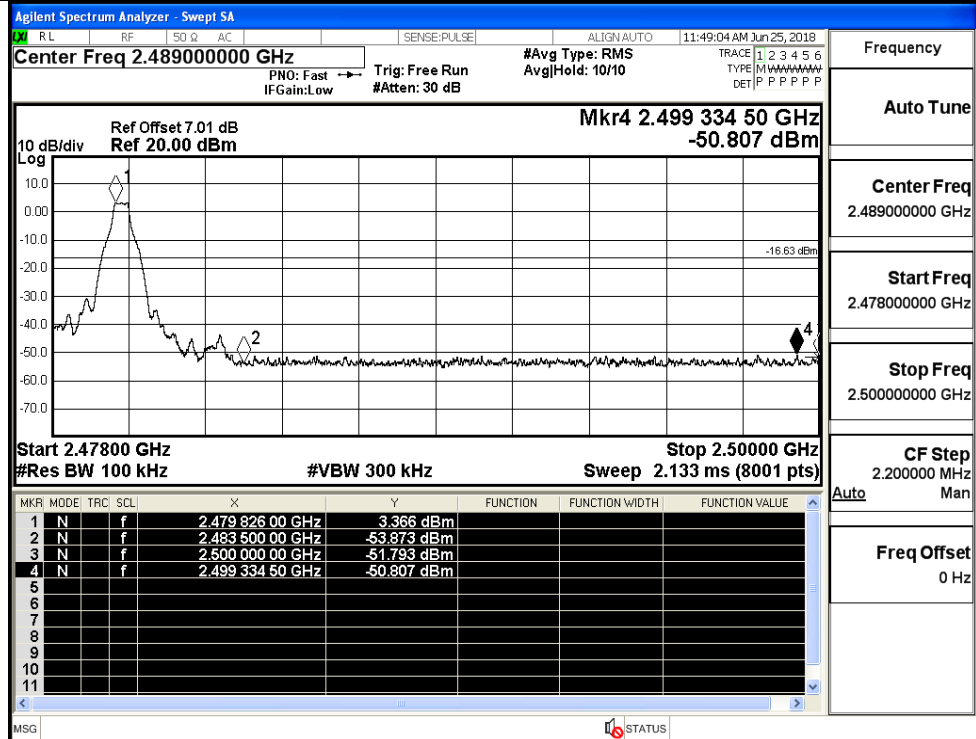
GFSK/LCH/No Hop



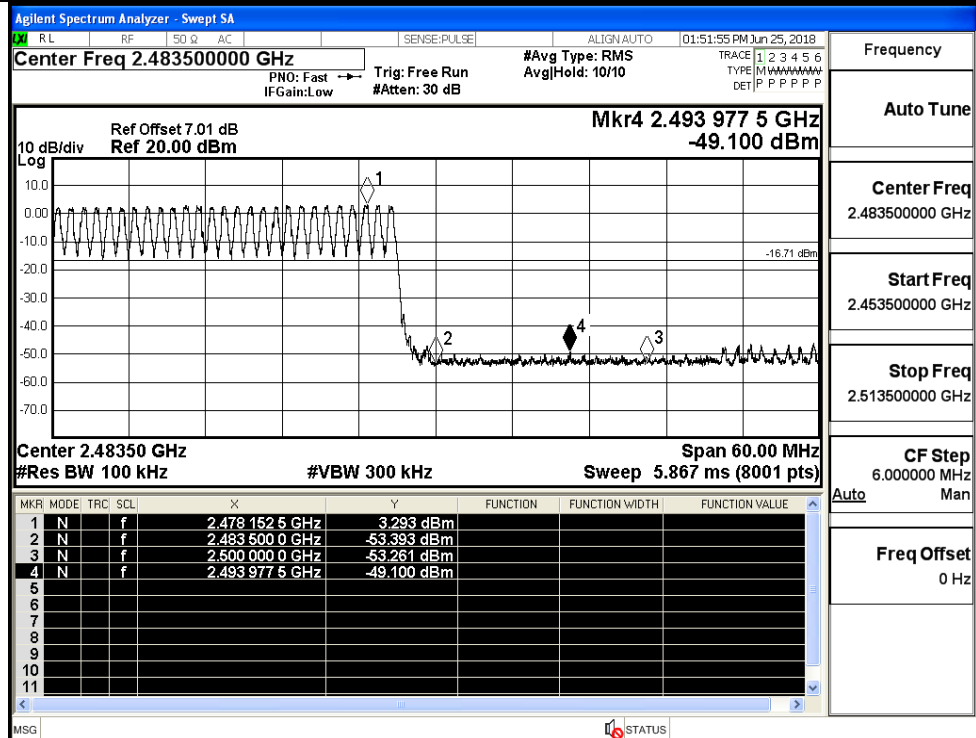
GFSK/LCH/Hop



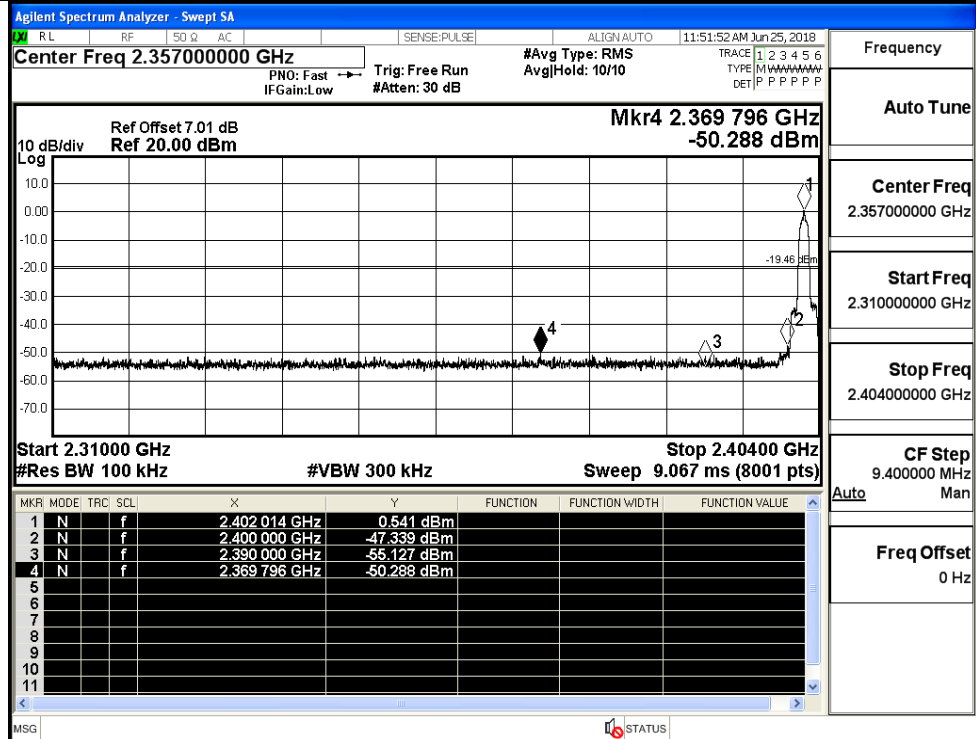
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

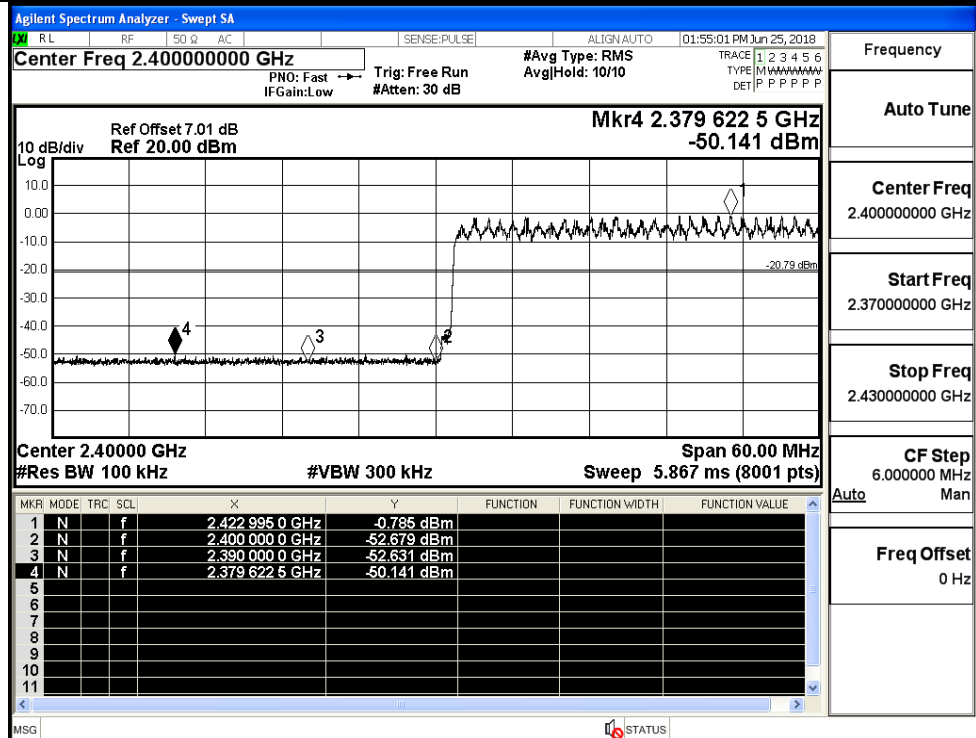
Start Freq
2.310000000 GHz

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

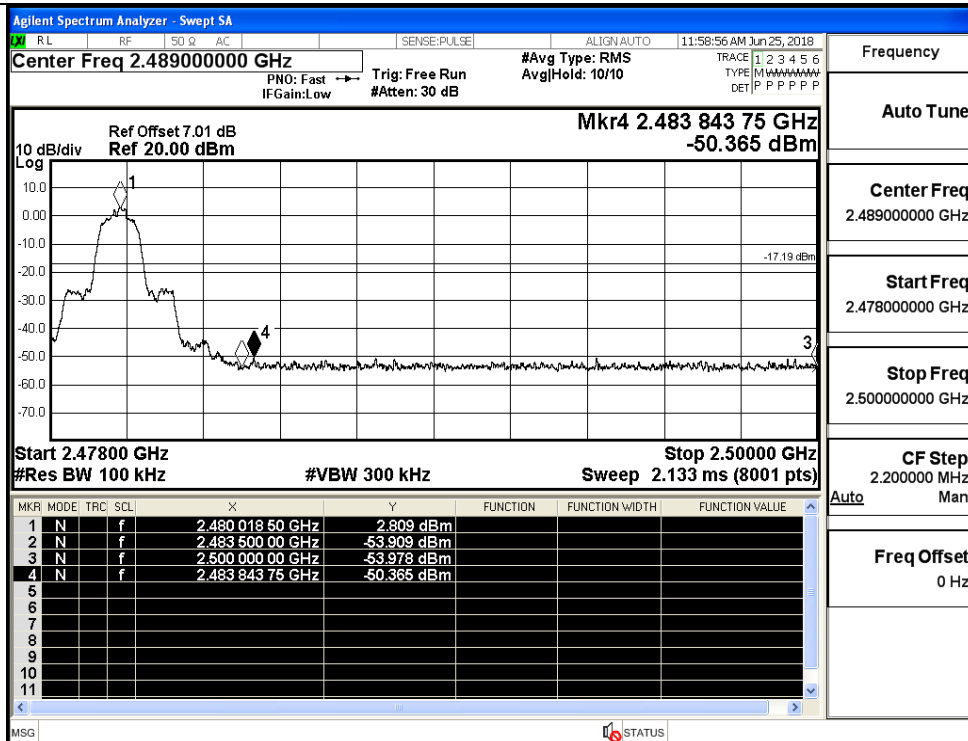
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

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

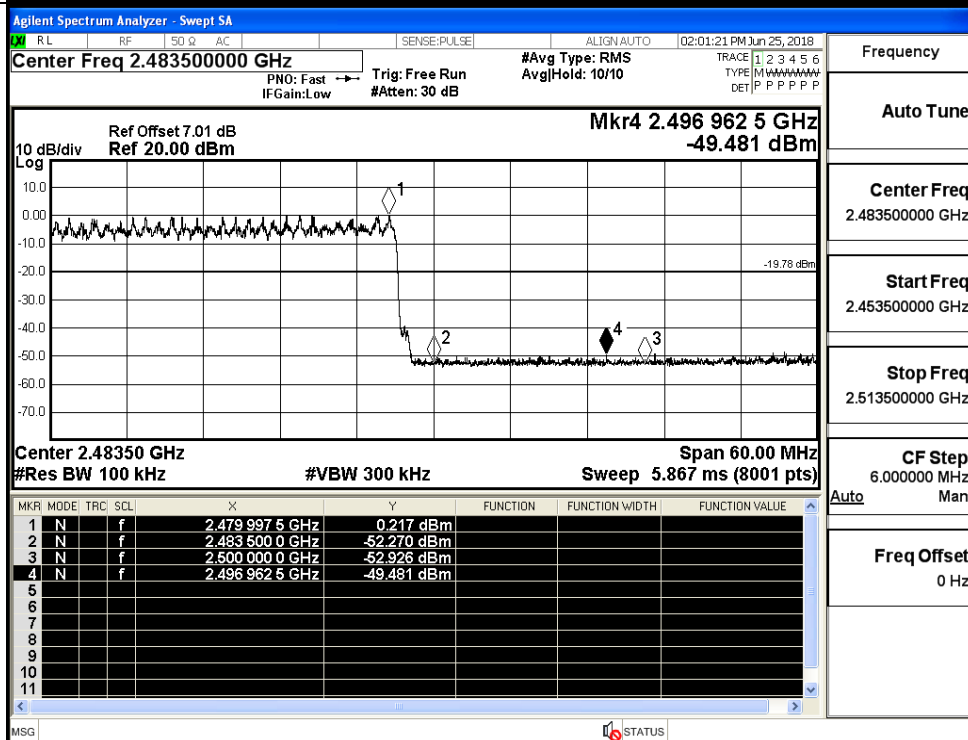


Frequency

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

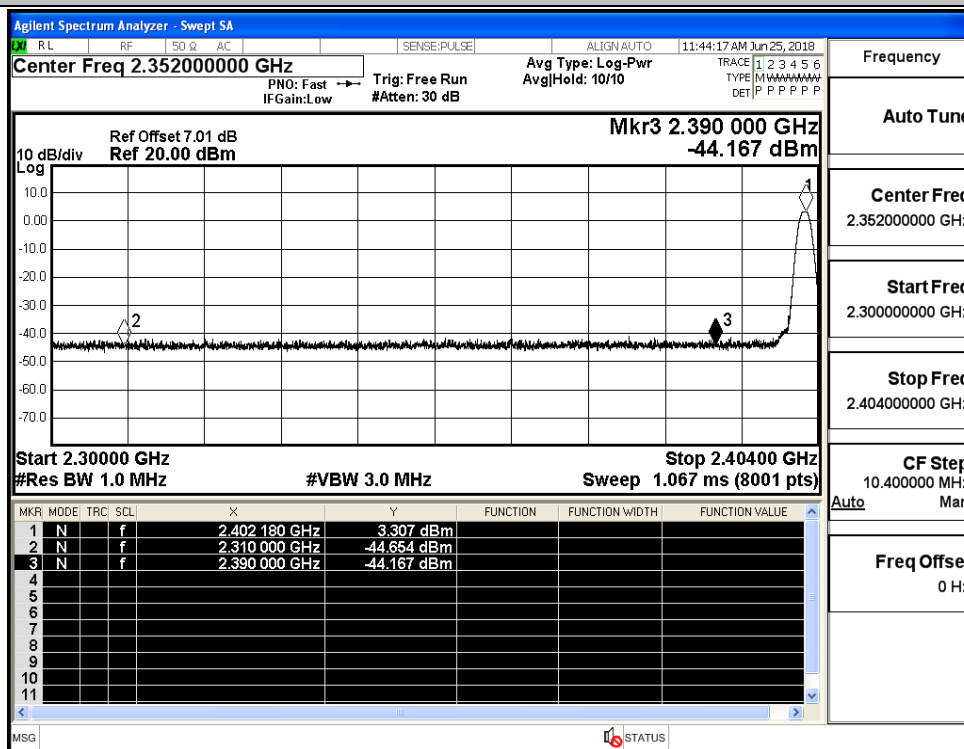
Auto Tune

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

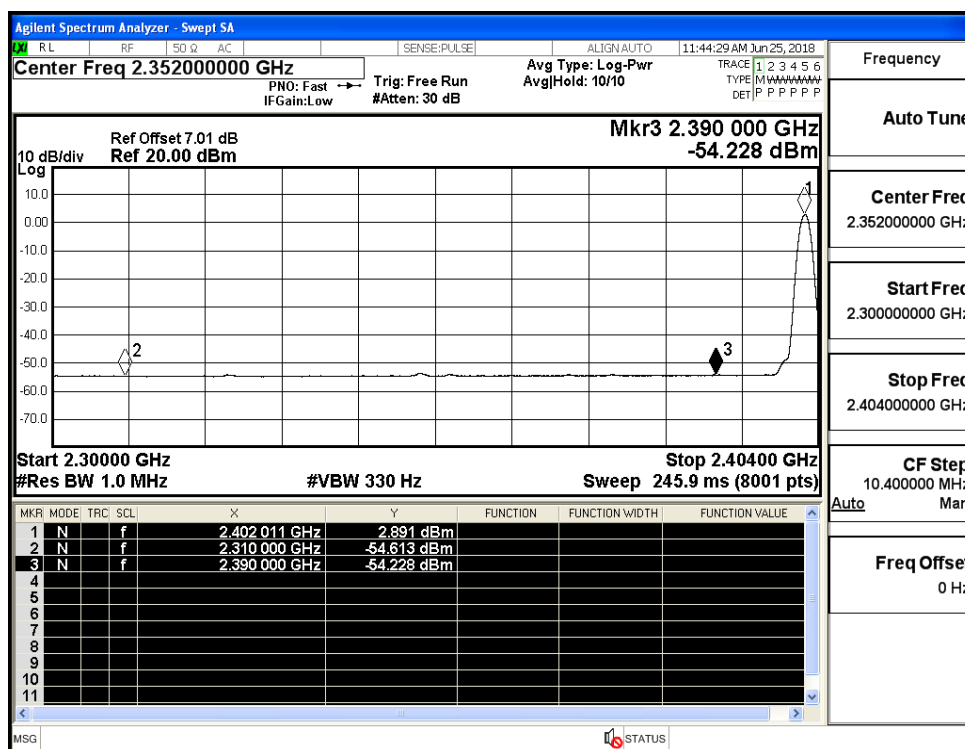
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.65	2.0	0	52.60	PEAK	74	PASS
	Off	2310.0	-54.61	2.0	0	42.64	AV	54	PASS
	Off	2390.0	-44.17	2.0	0	53.09	PEAK	74	PASS
	Off	2390.0	-54.23	2.0	0	43.03	AV	54	PASS
	Off	2483.5	-42.39	2.0	0	54.87	PEAK	74	PASS
	Off	2483.5	-52.47	2.0	0	44.79	AV	54	PASS
	Off	2500.0	-43.53	2.0	0	53.73	PEAK	74	PASS
	Off	2500.0	-53.93	2.0	0	43.33	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.58	2.0	0	53.68	PEAK	74	PASS
	Off	2310.0	-54.54	2.0	0	42.71	AV	54	PASS
	Off	2390.0	-43.66	2.0	0	53.60	PEAK	74	PASS
	Off	2390.0	-54.41	2.0	0	42.85	AV	54	PASS
	Off	2483.5	-42.52	2.0	0	54.74	PEAK	74	PASS
	Off	2483.5	-52.82	2.0	0	44.44	AV	54	PASS
	Off	2500.0	-43.81	2.0	0	53.45	PEAK	74	PASS
	Off	2500.0	-53.93	2.0	0	43.33	AV	54	PASS

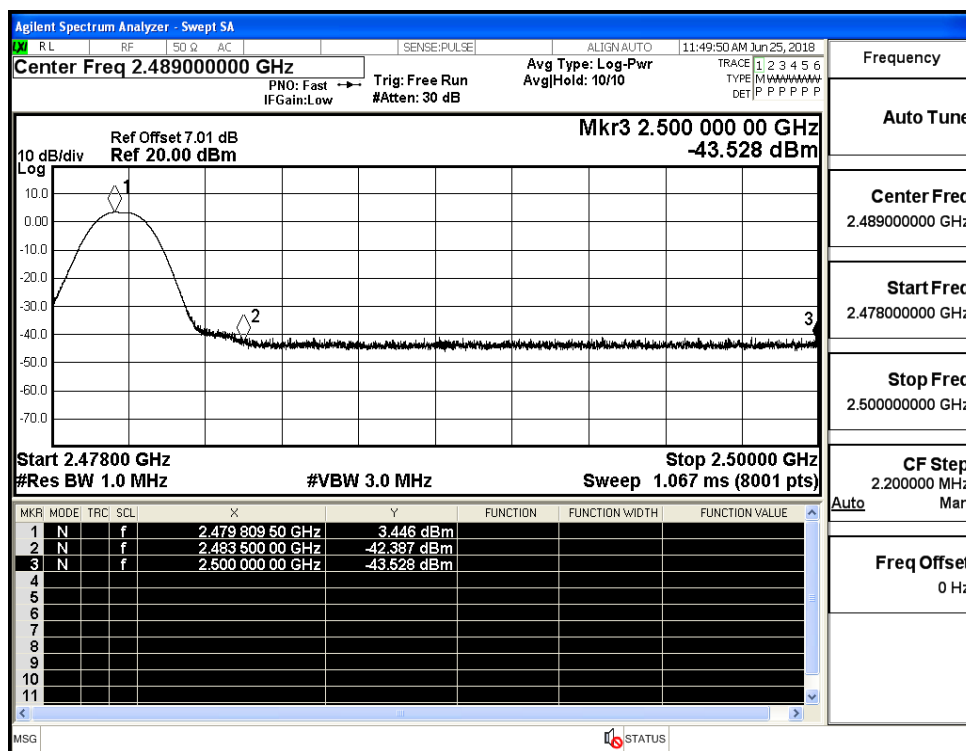
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



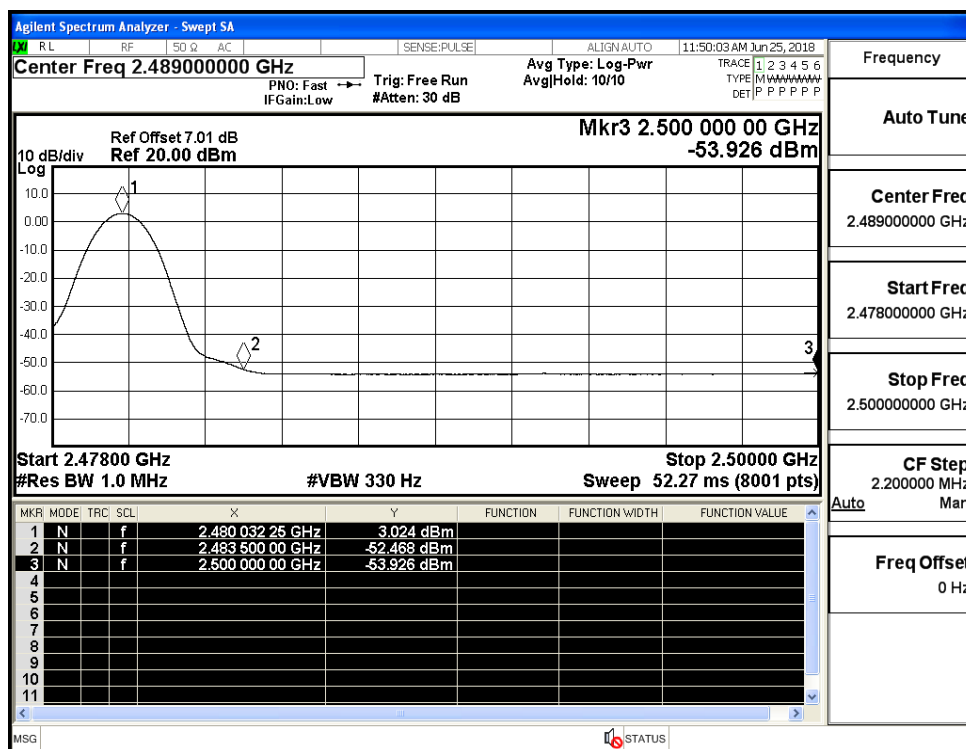
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



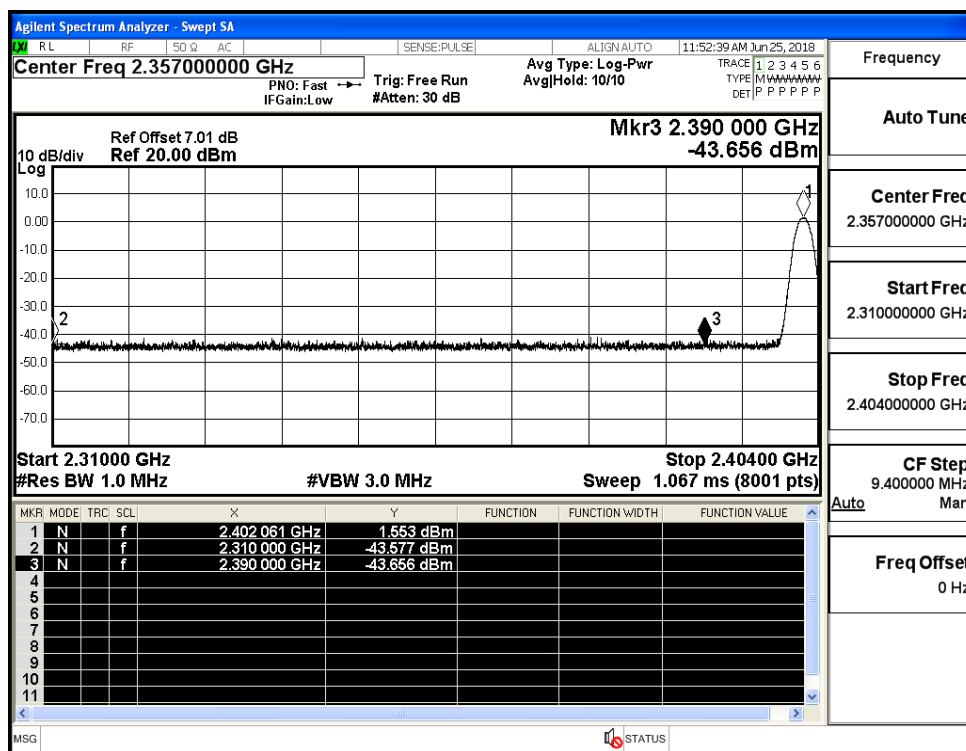
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



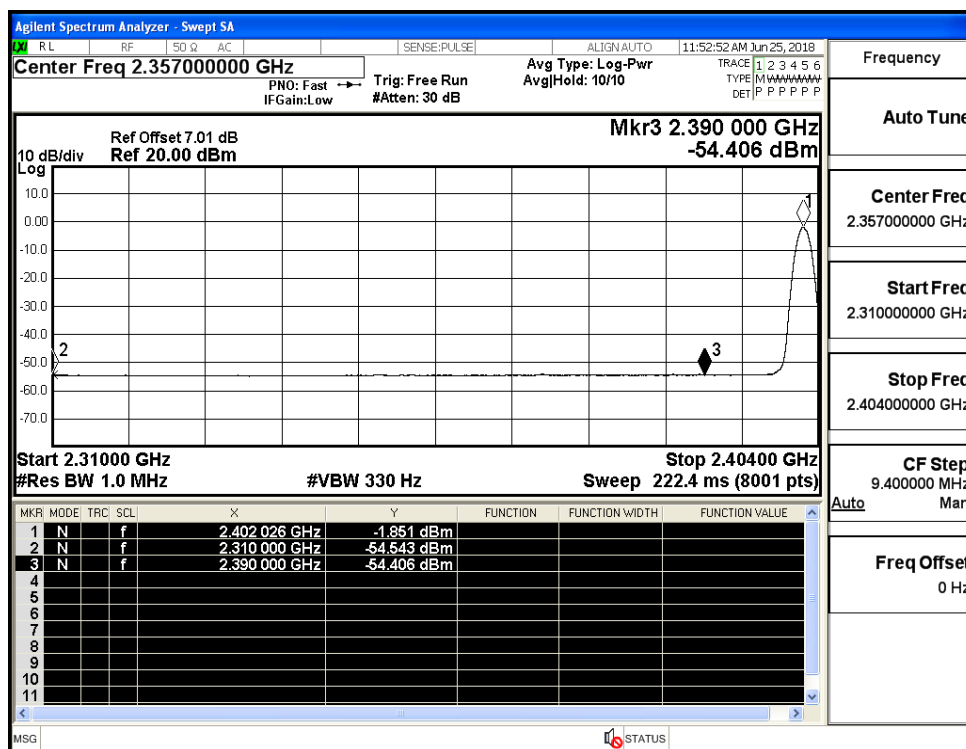
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



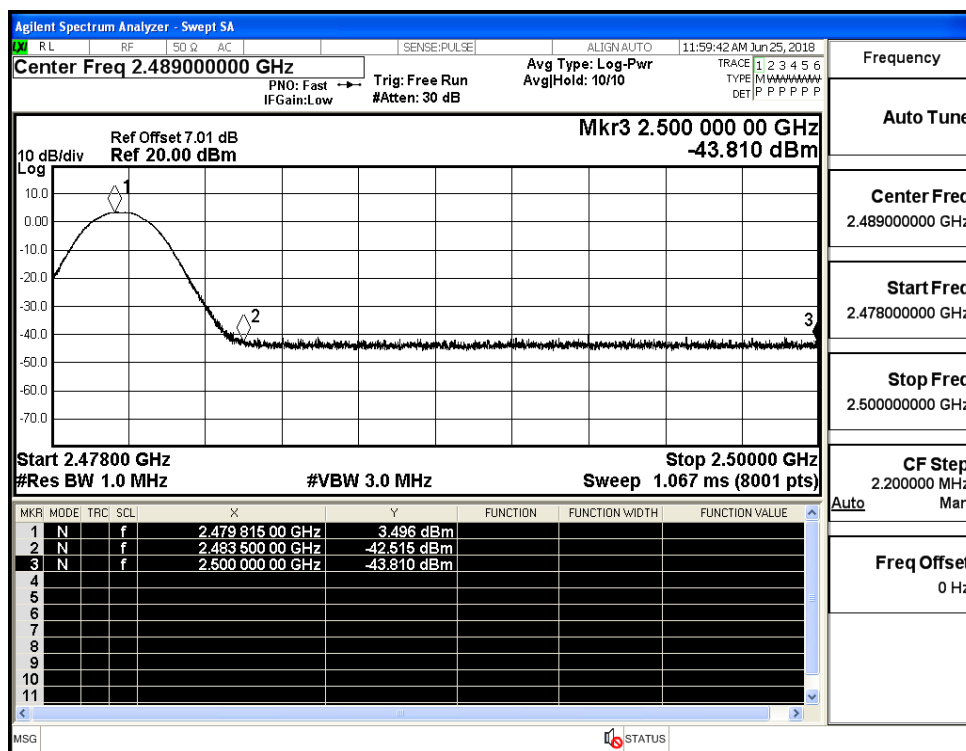
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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