

Appendix A

RF Test Data for BT V4.1 (BDR/EDR) (Conducted Measurement)

Product Name: W97L
Trade Mark: ZAPO
Test Model: W97L-5DB

Environmental Conditions

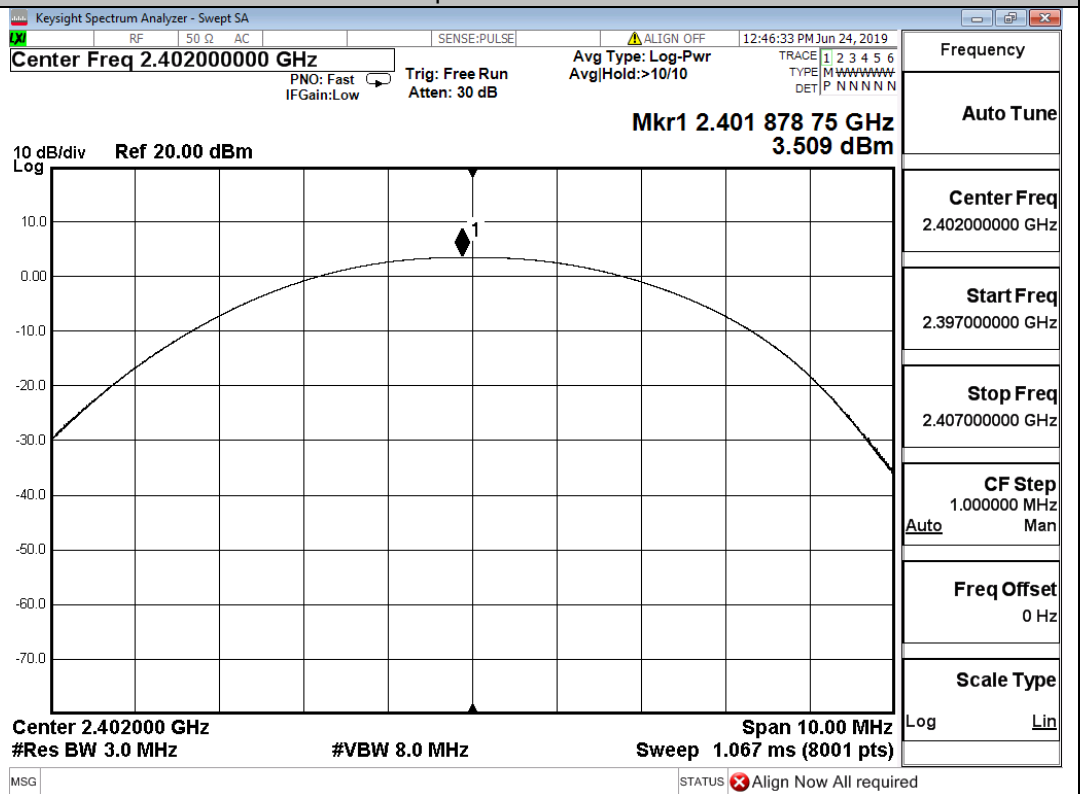
Temperature:	23.4 ° C
Relative Humidity:	60%
ATM Pressure:	100.0 kPa
Test Engineer:	CHUANG WANG
Supervised by:	JAYDEN ZHUO

A.1 Maximum Conducted Peak Output Power

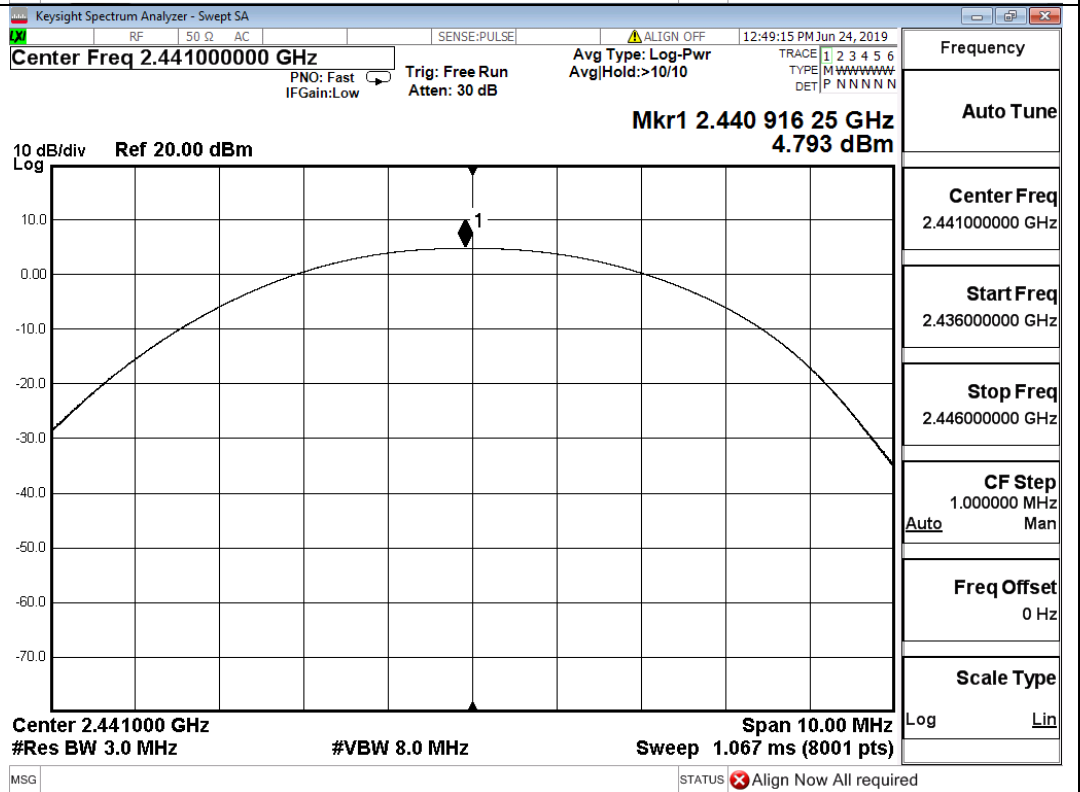
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.509	21	PASS
	MCH	4.793	21	PASS
	HCH	5.823	21	PASS
π/4DQPSK	LCH	4.637	21	PASS
	MCH	5.866	21	PASS
	HCH	6.812	21	PASS
8DPSK	LCH	4.863	21	PASS
	MCH	6.048	21	PASS
	HCH	6.900	21	PASS

Test Graphs

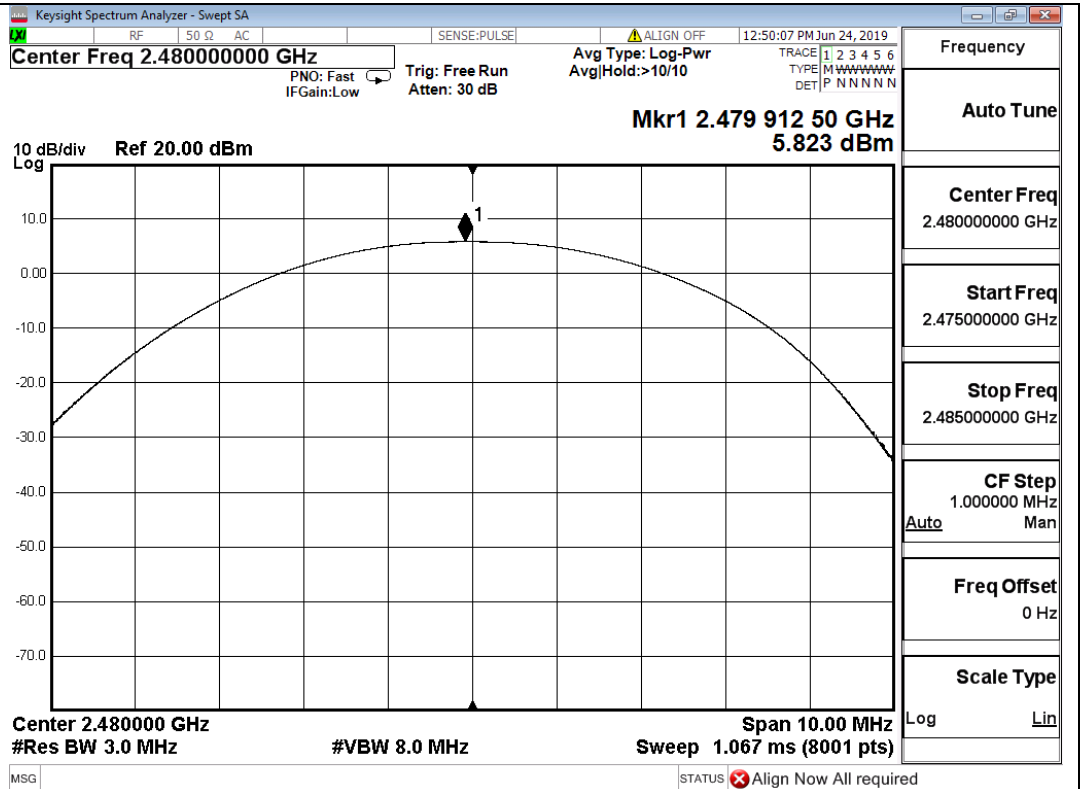
GFSK/LCH



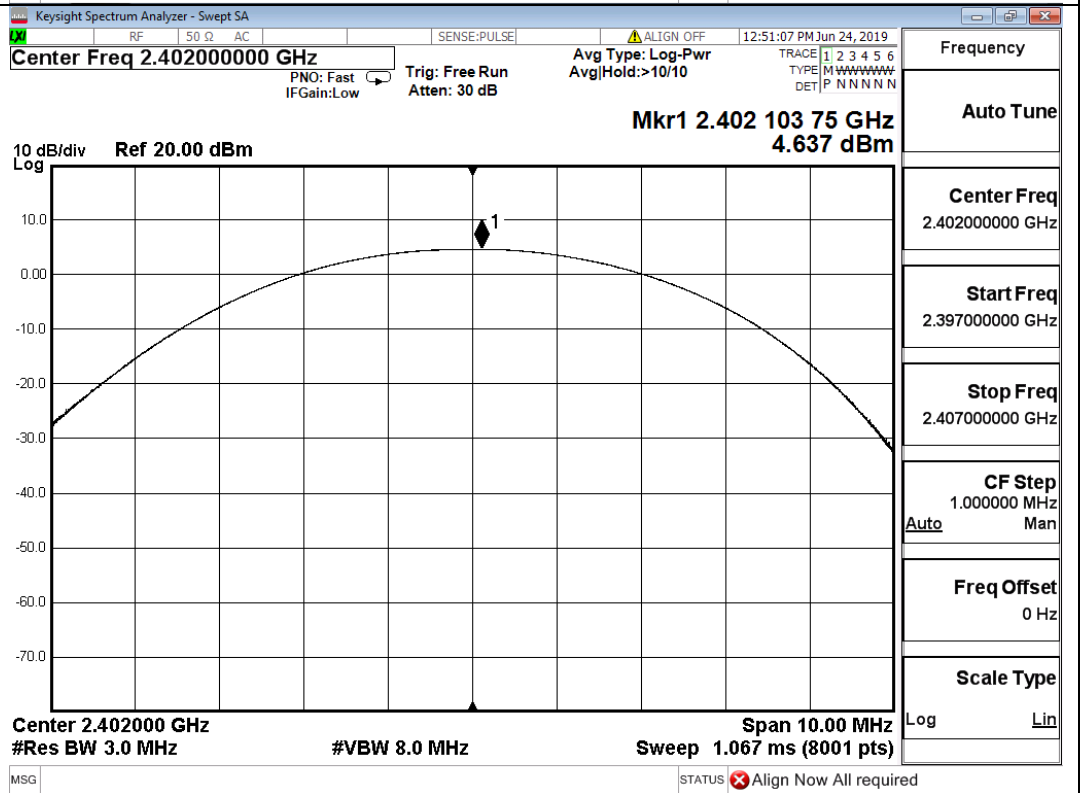
GFSK/MCH

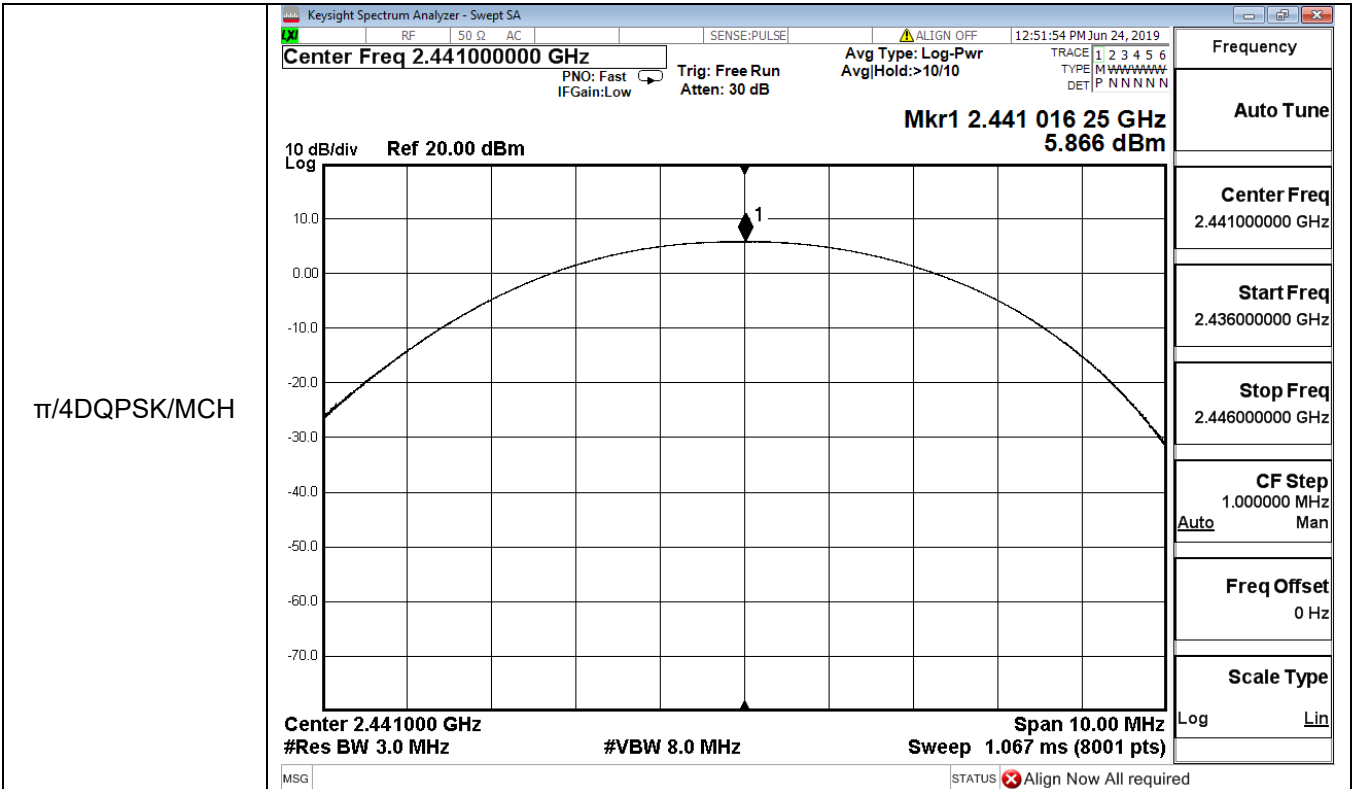


GFSK/HCH

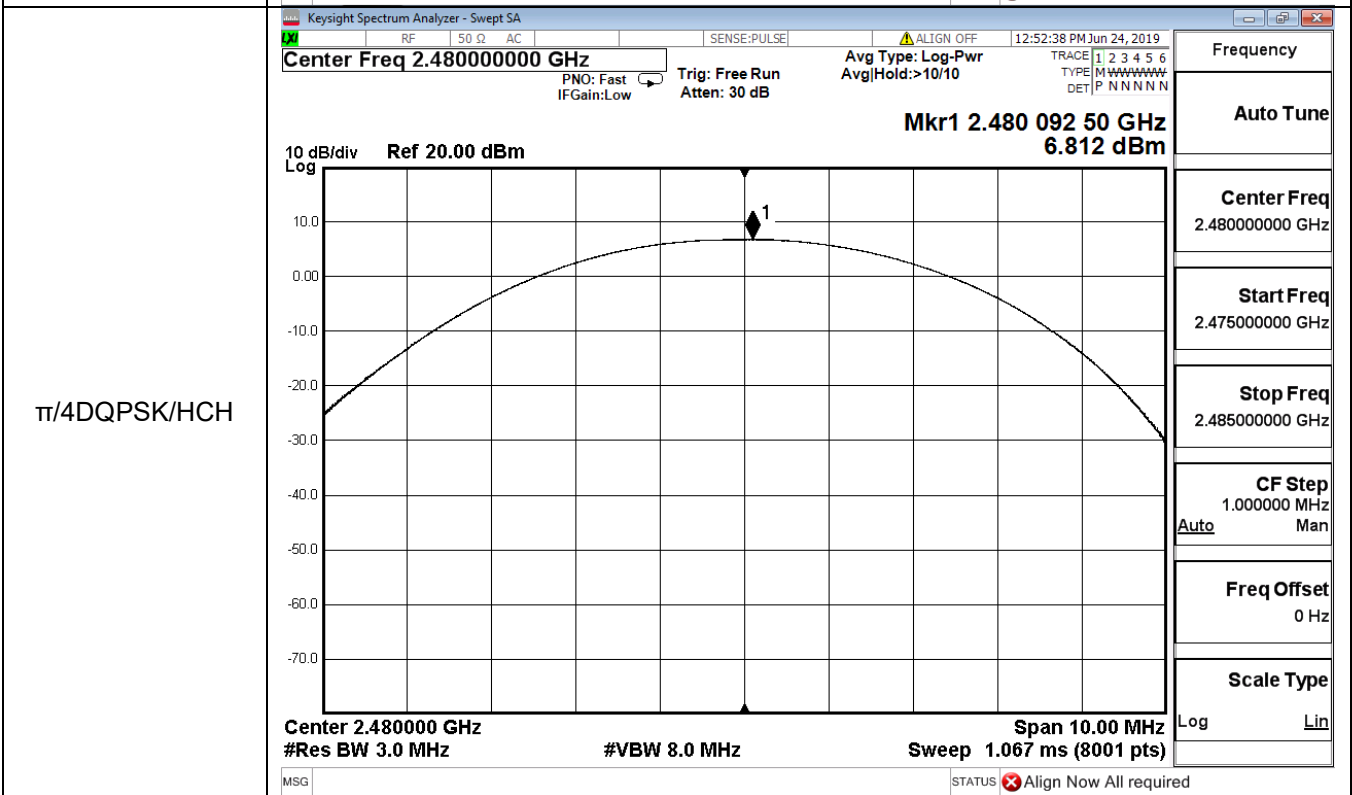


π /4DQPSK/LCH



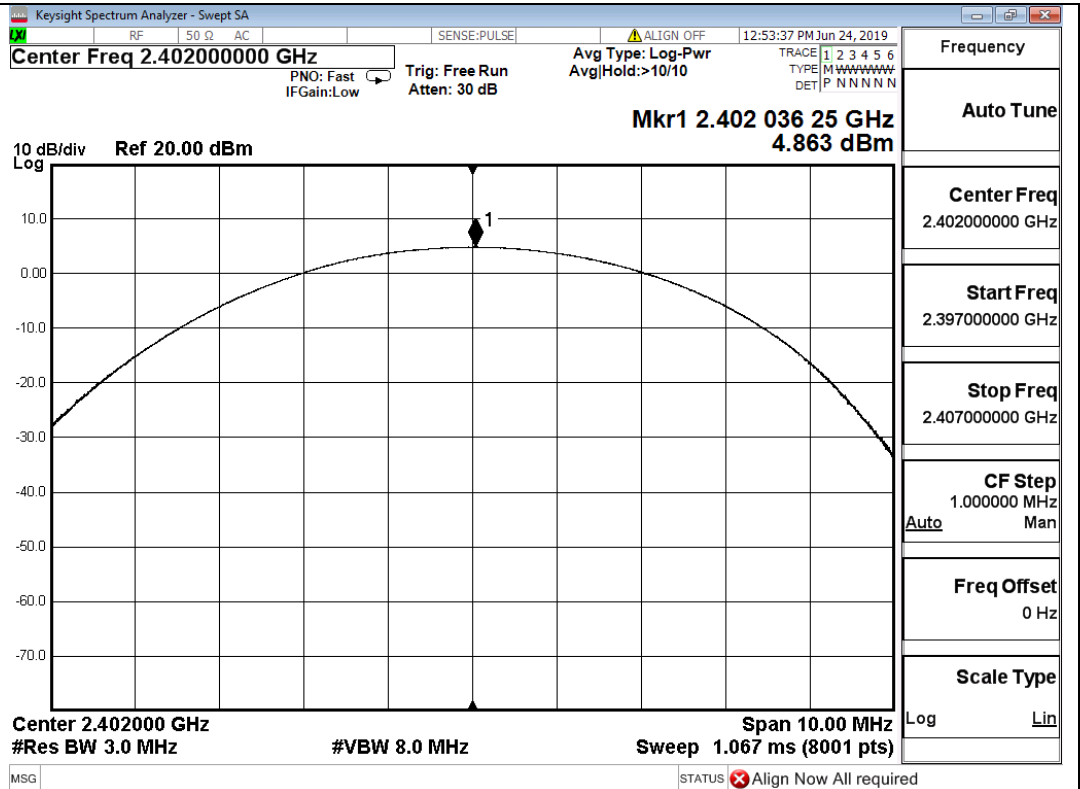


π/4DQPSK/MCH

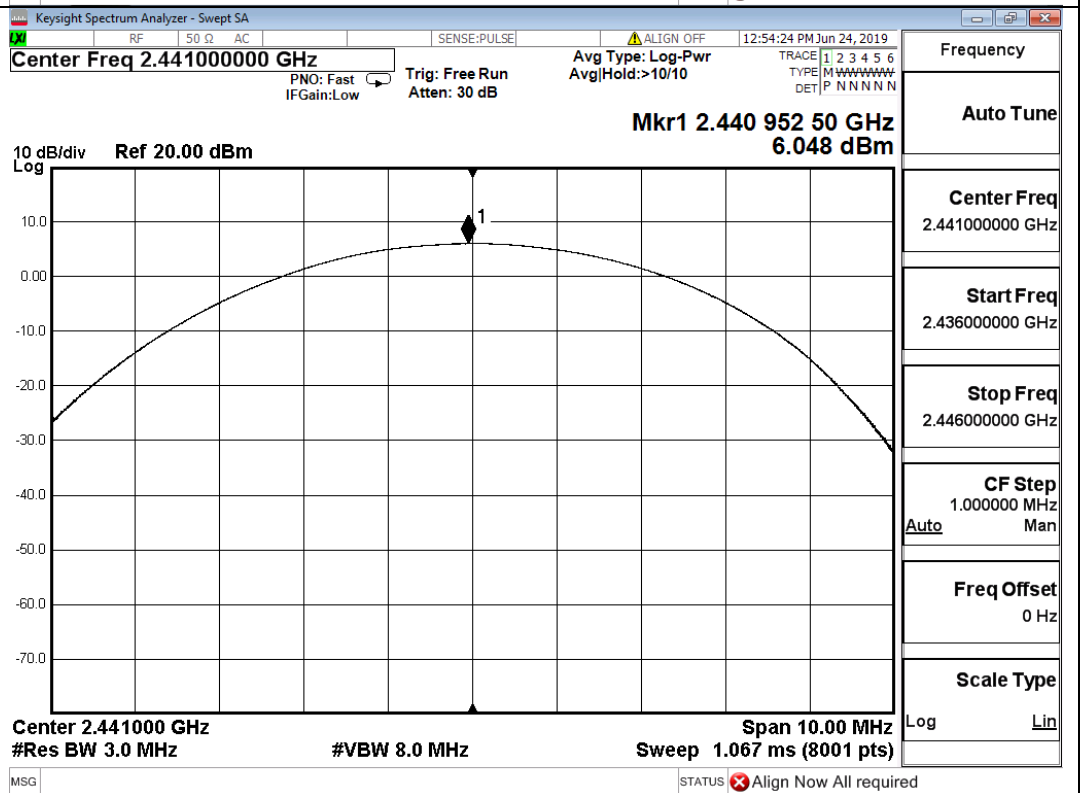


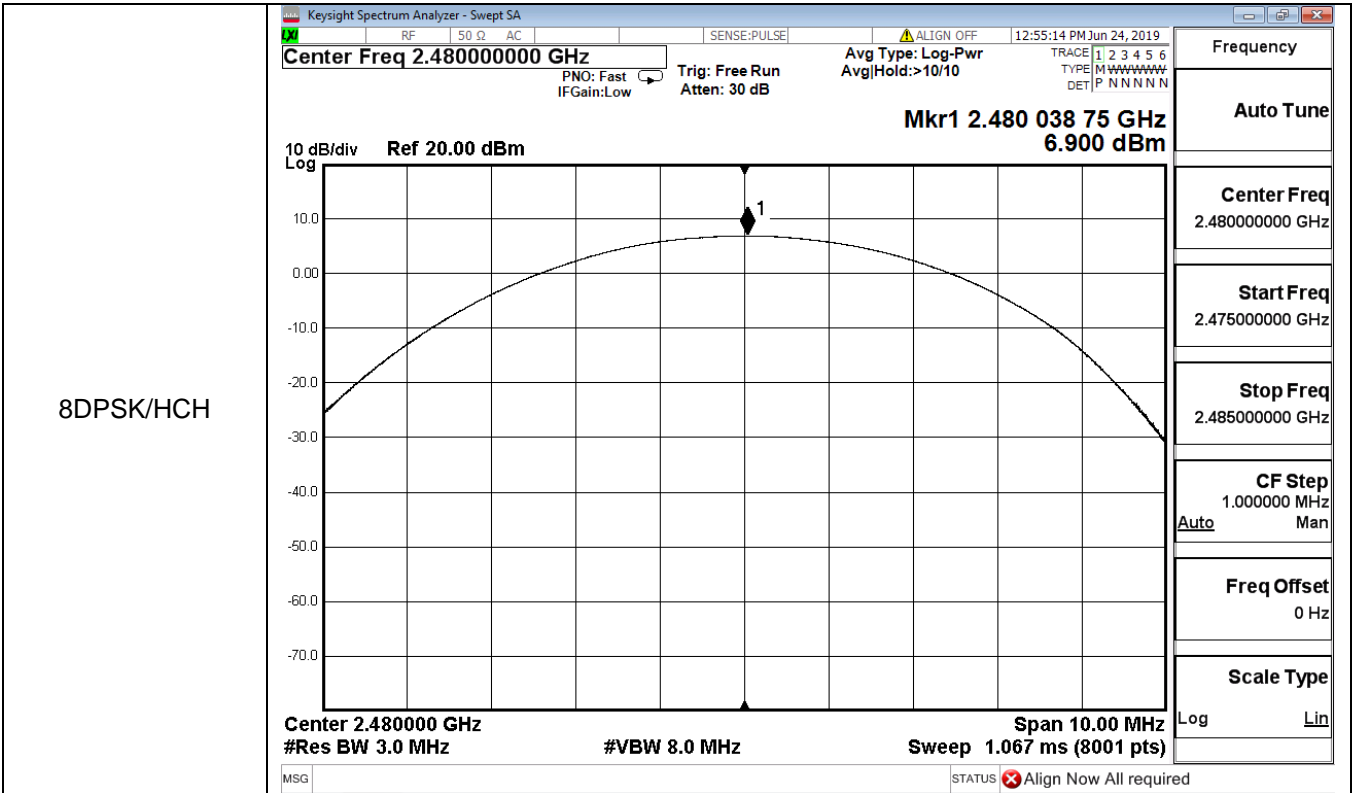
π/4DQPSK/HCH

8DPSK/LCH



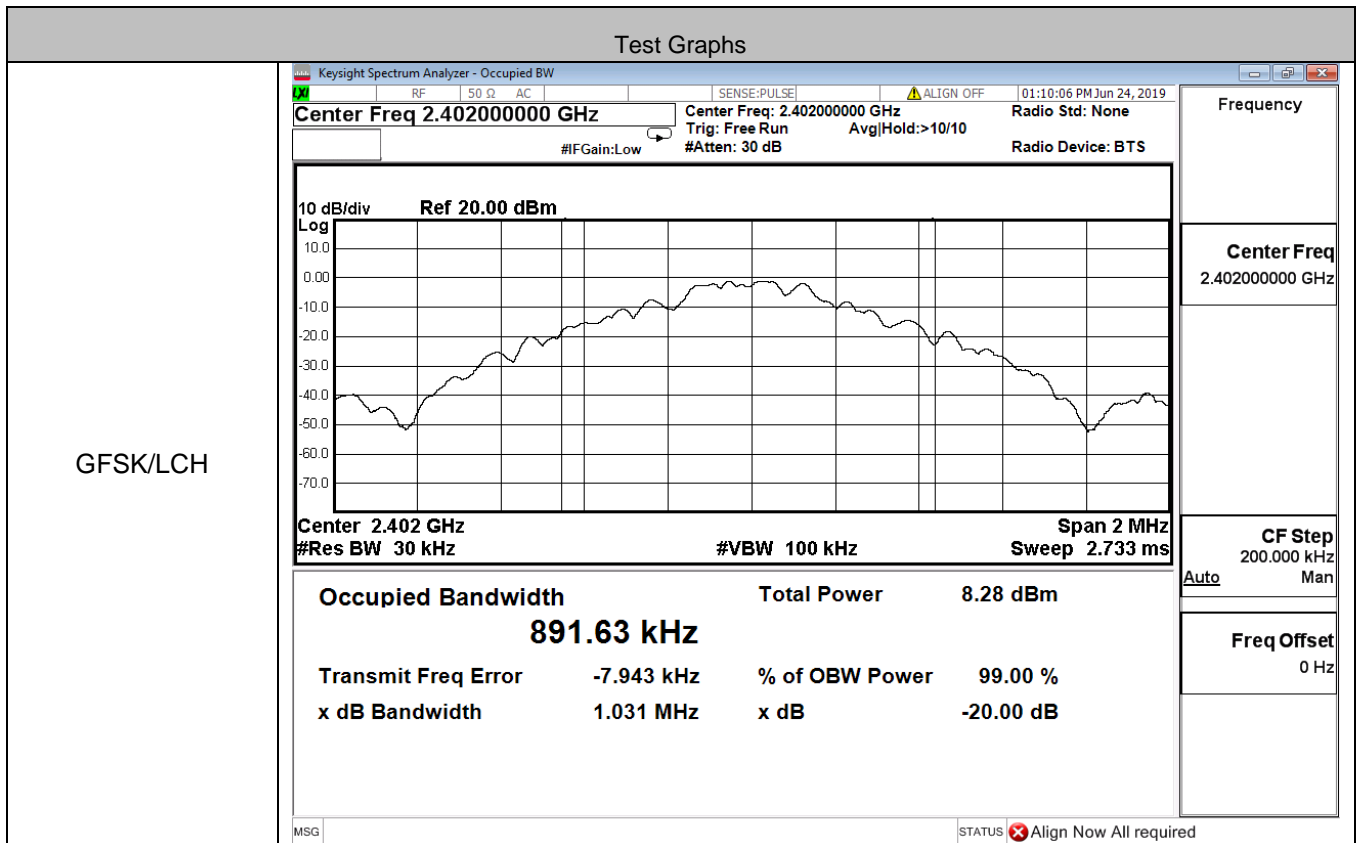
8DPSK/MCH



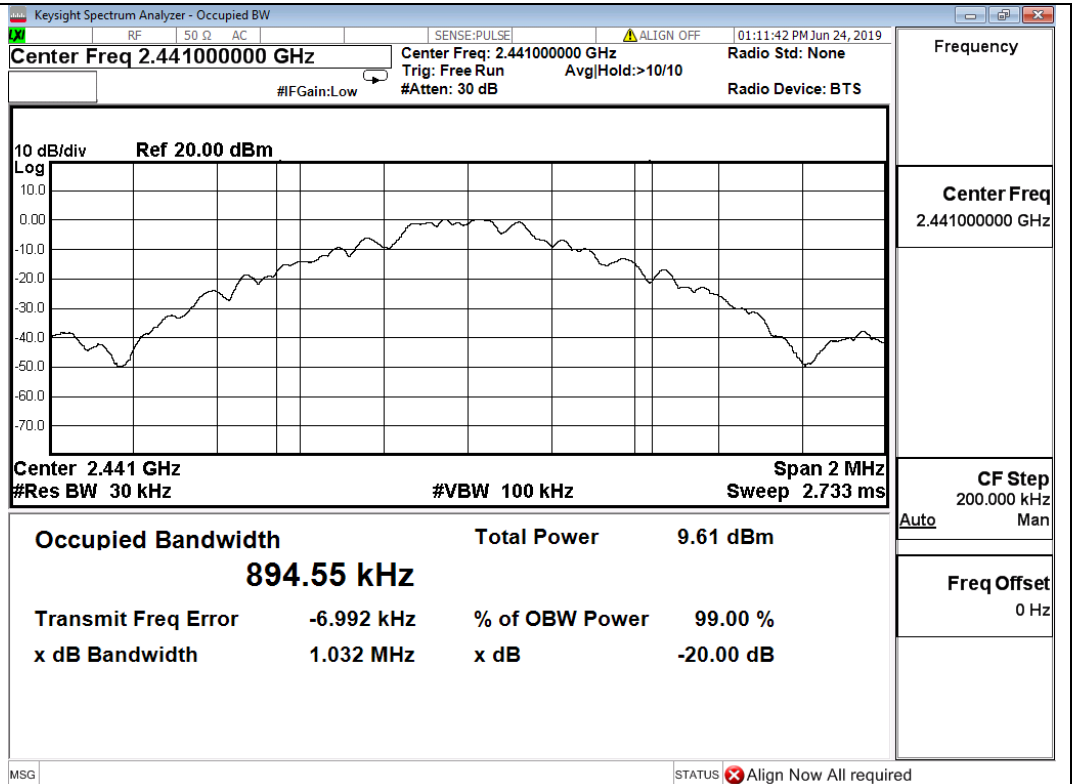


A.2 99% and 20dB Bandwidth

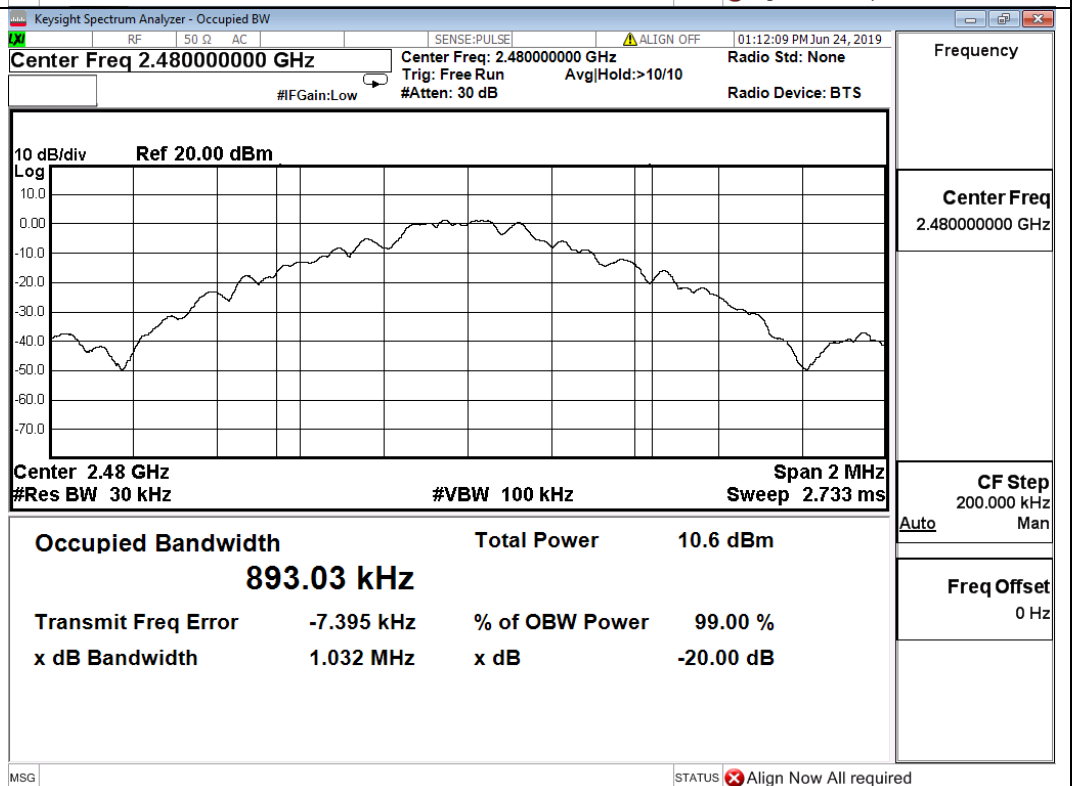
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89163	1.031	Not Specified	PASS
	MCH	0.89455	1.032	Not Specified	PASS
	HCH	0.89303	1.032	Not Specified	PASS
π/4DQPSK	LCH	1.1852	1.337	Not Specified	PASS
	MCH	1.1861	1.339	Not Specified	PASS
	HCH	1.1869	1.341	Not Specified	PASS
8DPSK	LCH	1.2305	1.367	Not Specified	PASS
	MCH	1.2315	1.369	Not Specified	PASS
	HCH	1.2327	1.369	Not Specified	PASS

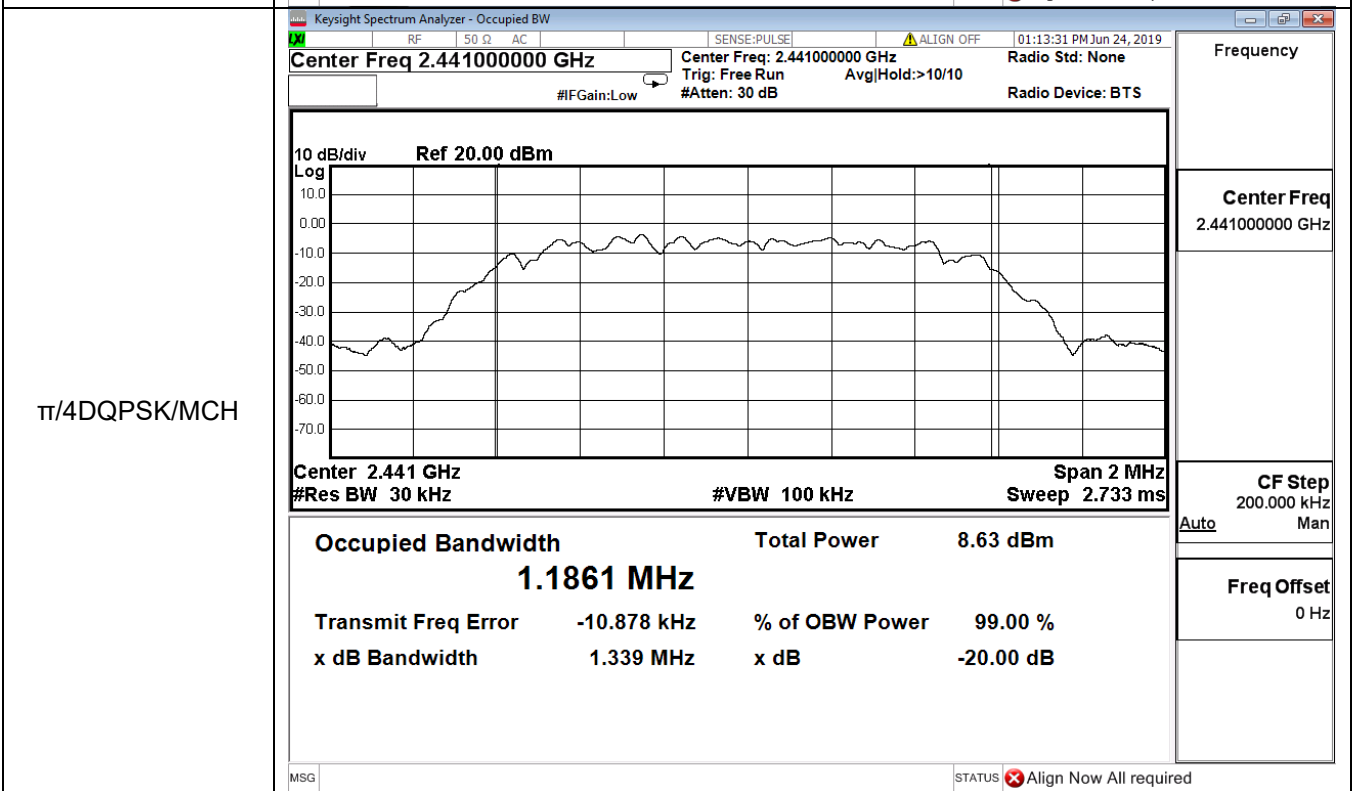
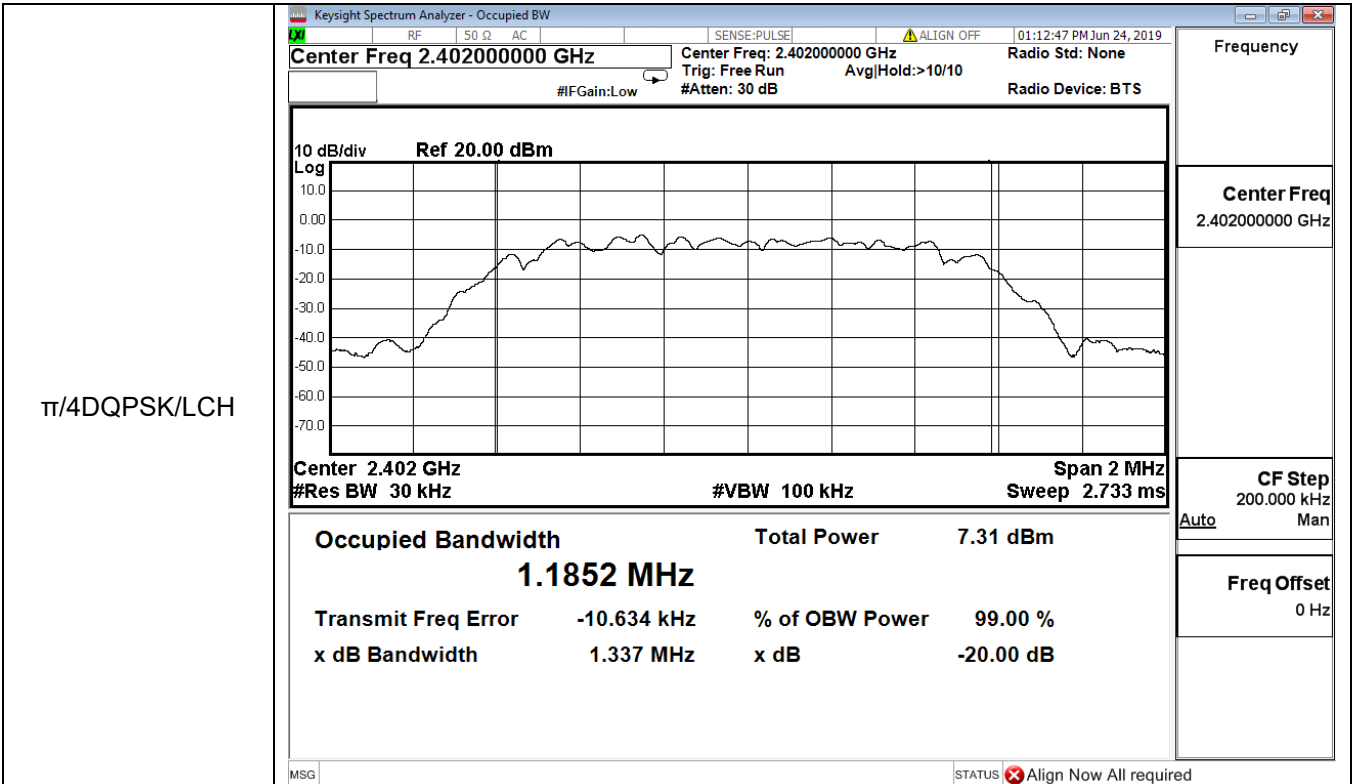


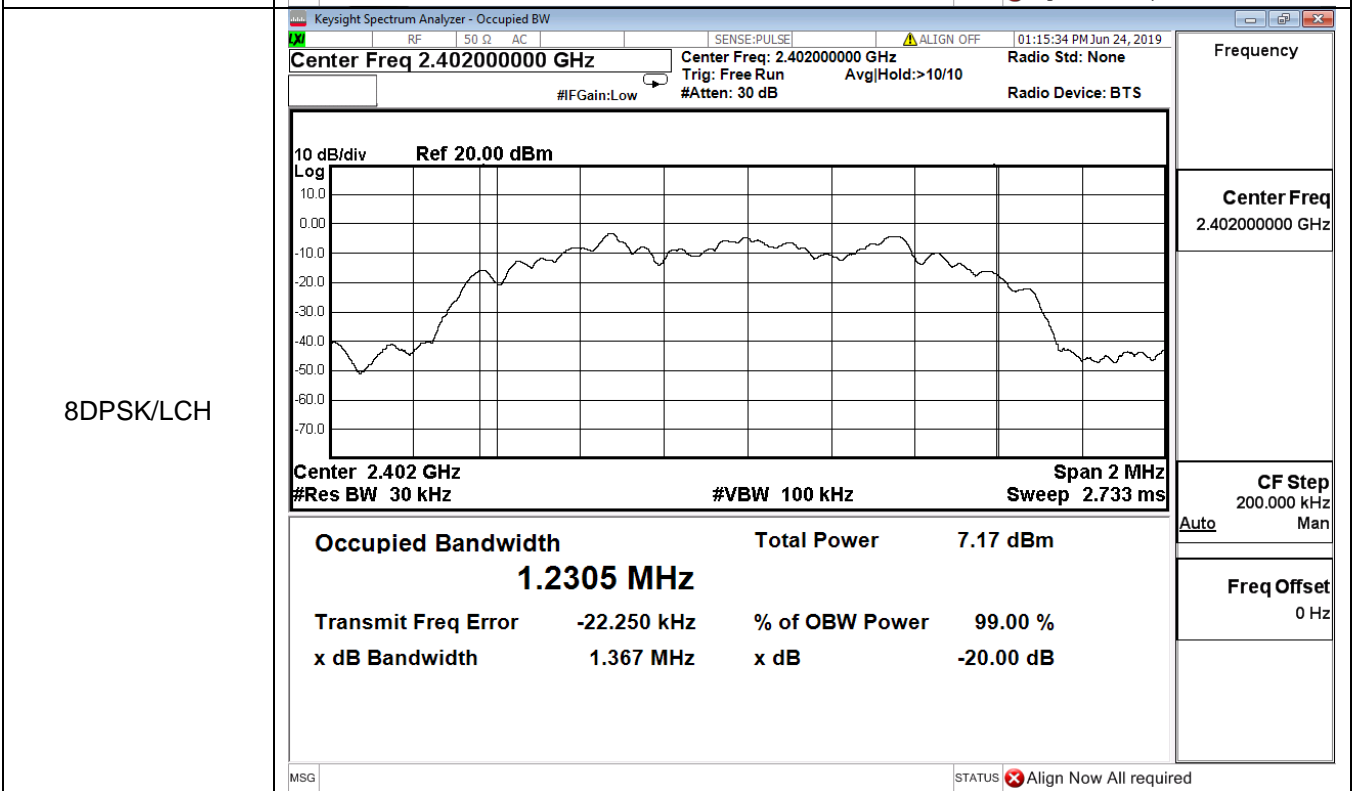
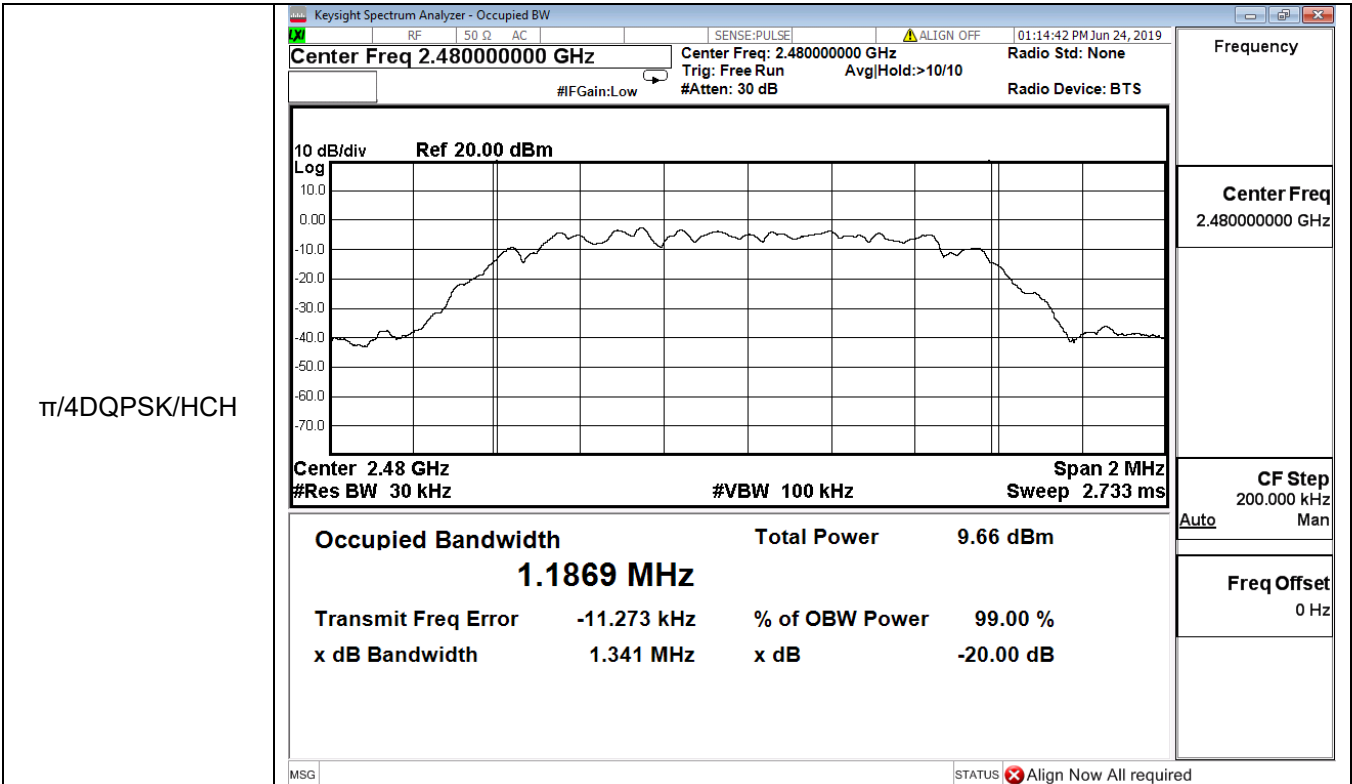
GFSK/MCH

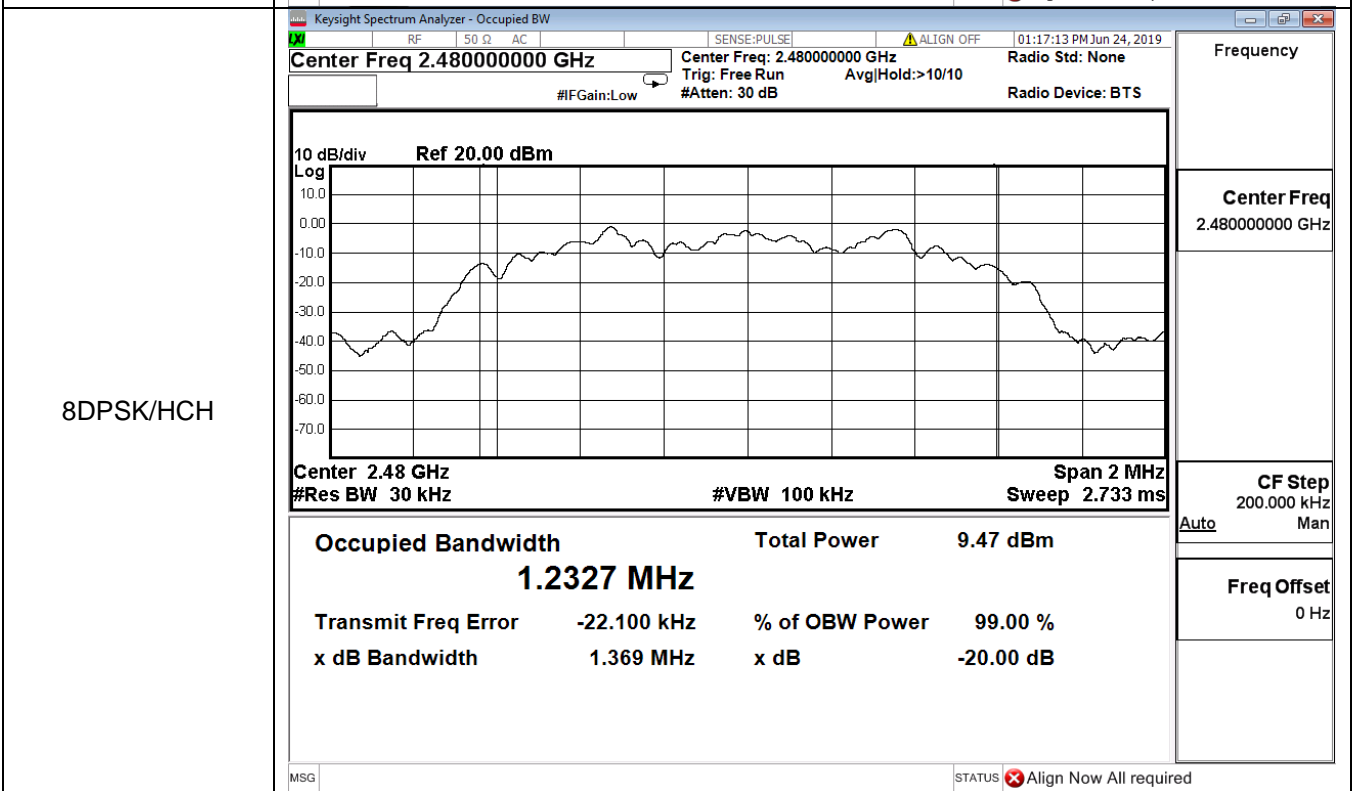
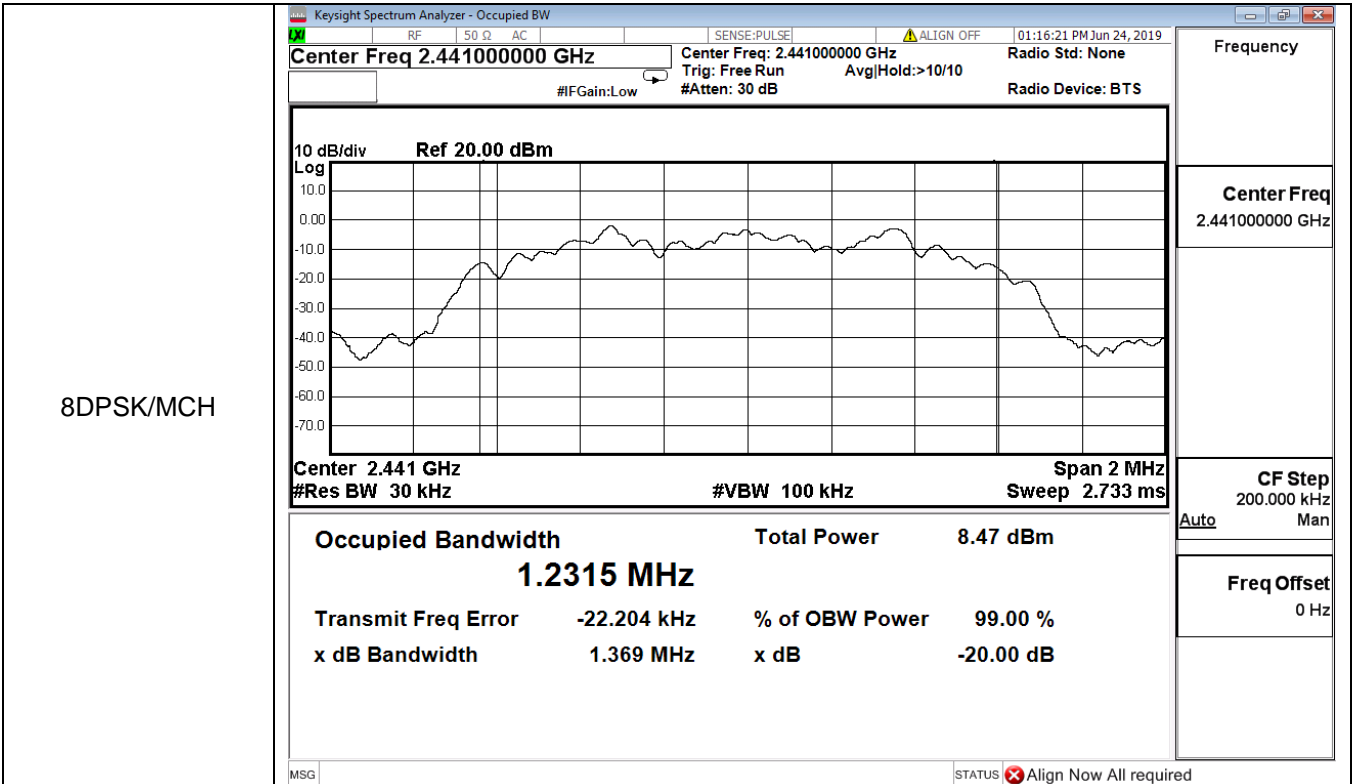


GFSK/HCH



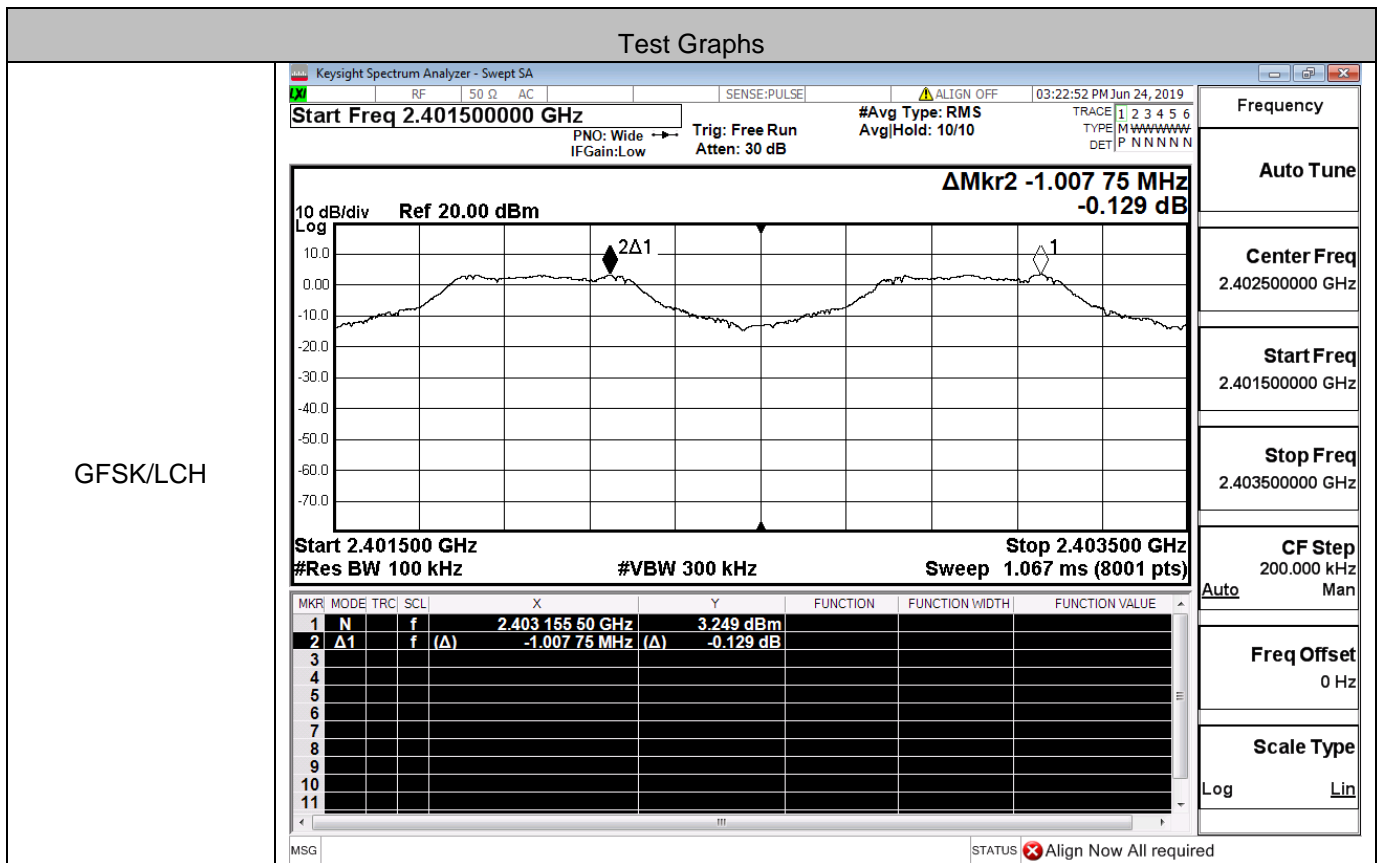




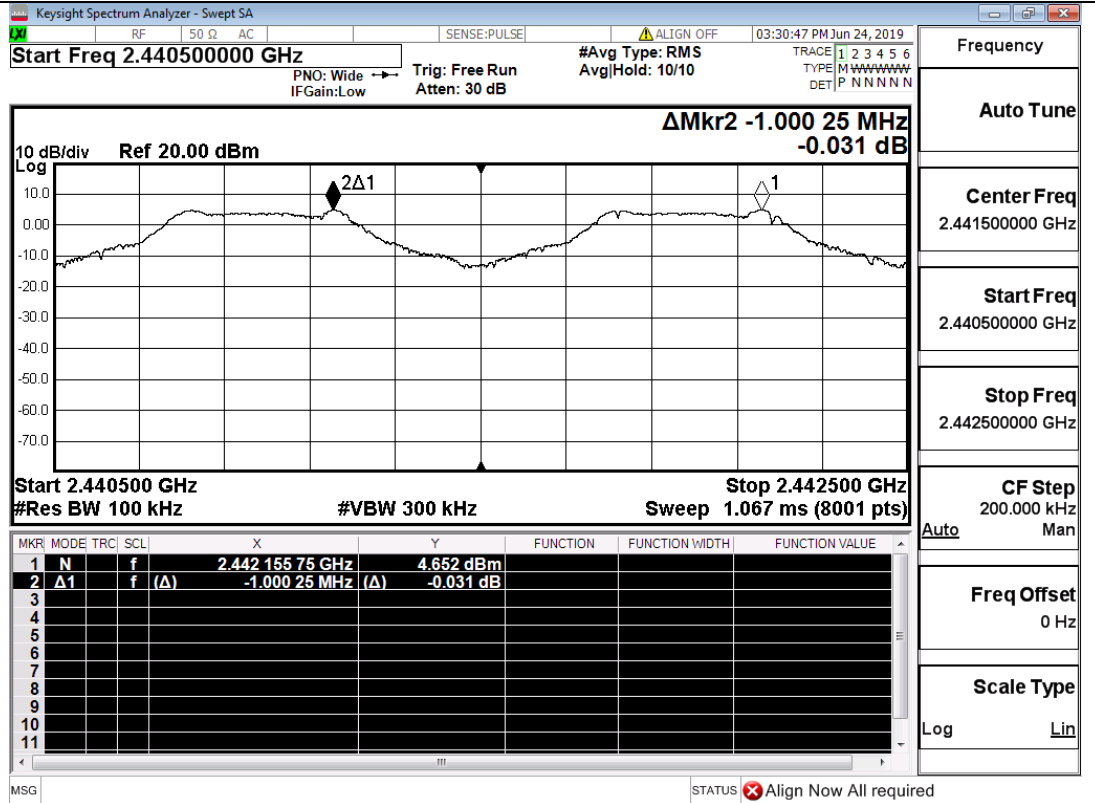


A.3 Carrier Frequency Separation

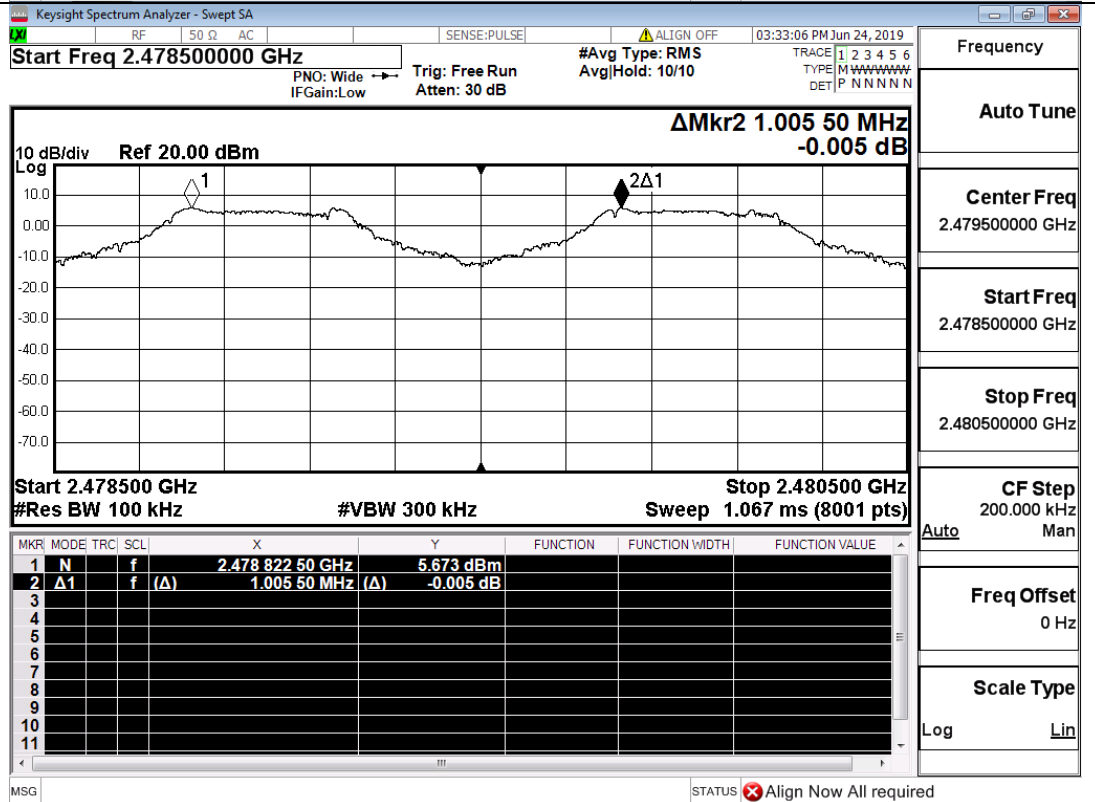
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz] 2/3*20dB Bandwidth	Verdict
GFSK	LCH	1.008	0.687	PASS
	MCH	1.000	0.688	PASS
	HCH	1.006	0.688	PASS
π/4DQPSK	LCH	0.997	0.891	PASS
	MCH	1.011	0.893	PASS
	HCH	0.997	0.894	PASS
8DPSK	LCH	0.998	0.911	PASS
	MCH	1.002	0.913	PASS
	HCH	0.985	0.913	PASS



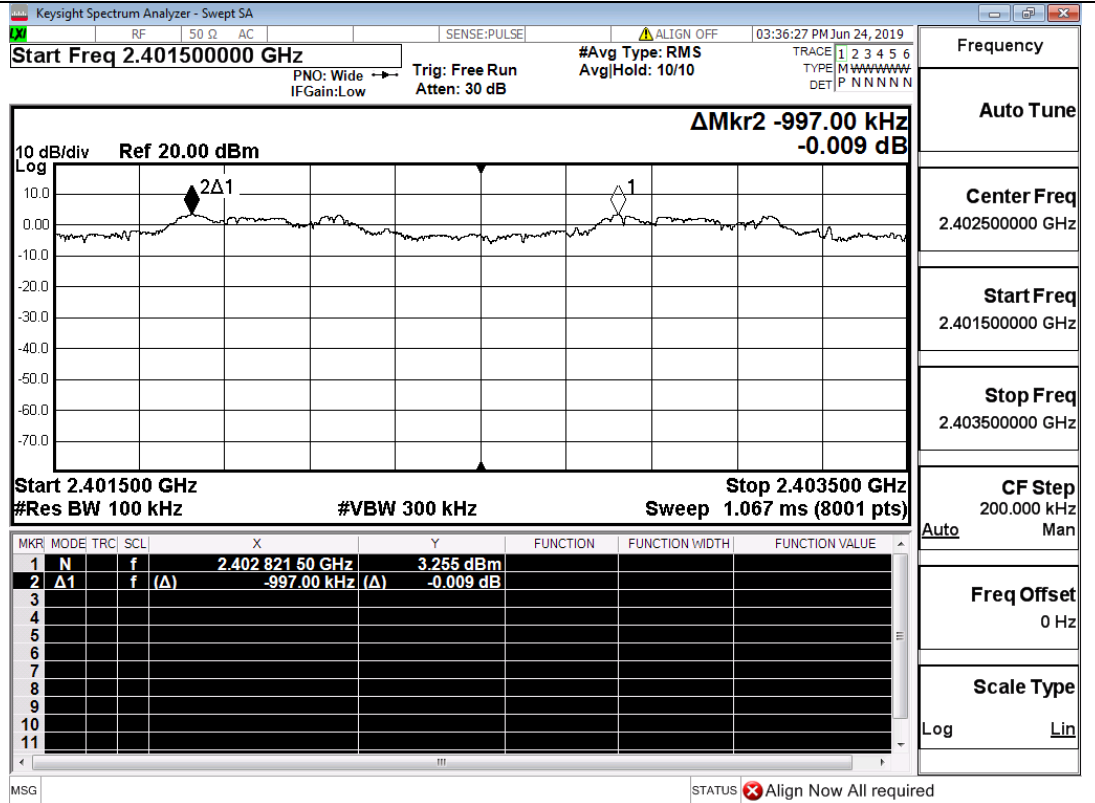
GFSK/MCH



GFSK/HCH

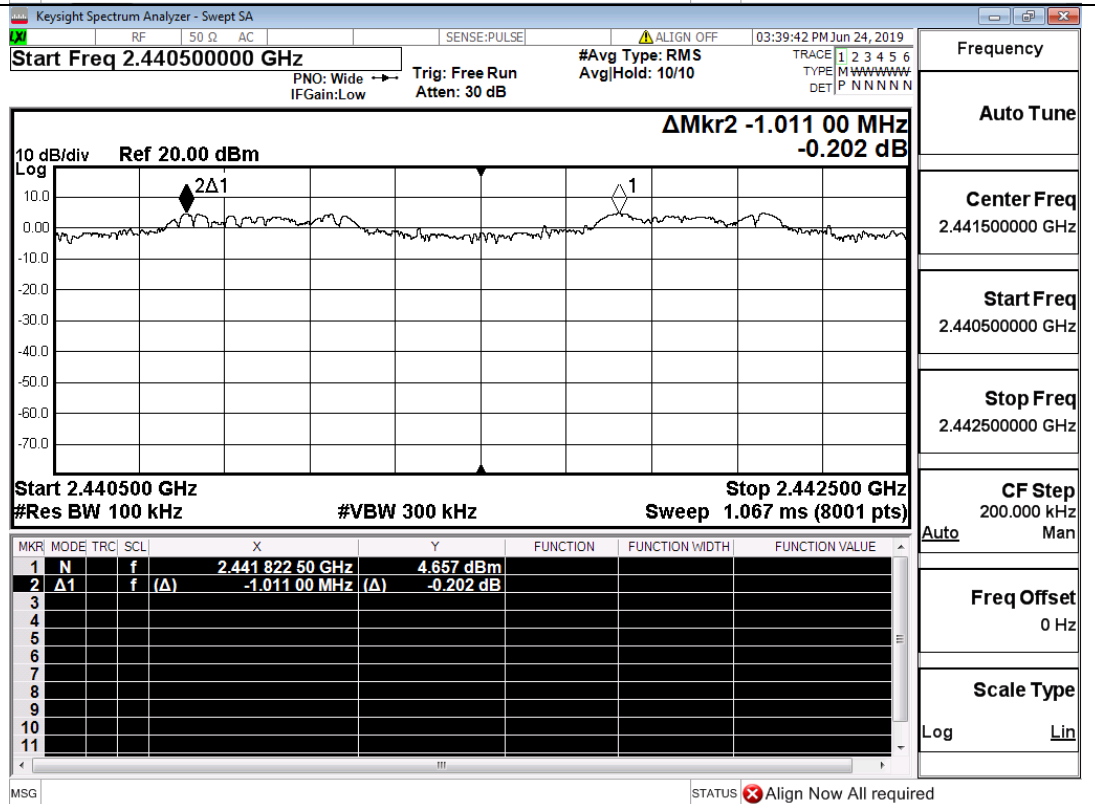


$\pi/4$ DQPSK/LCH



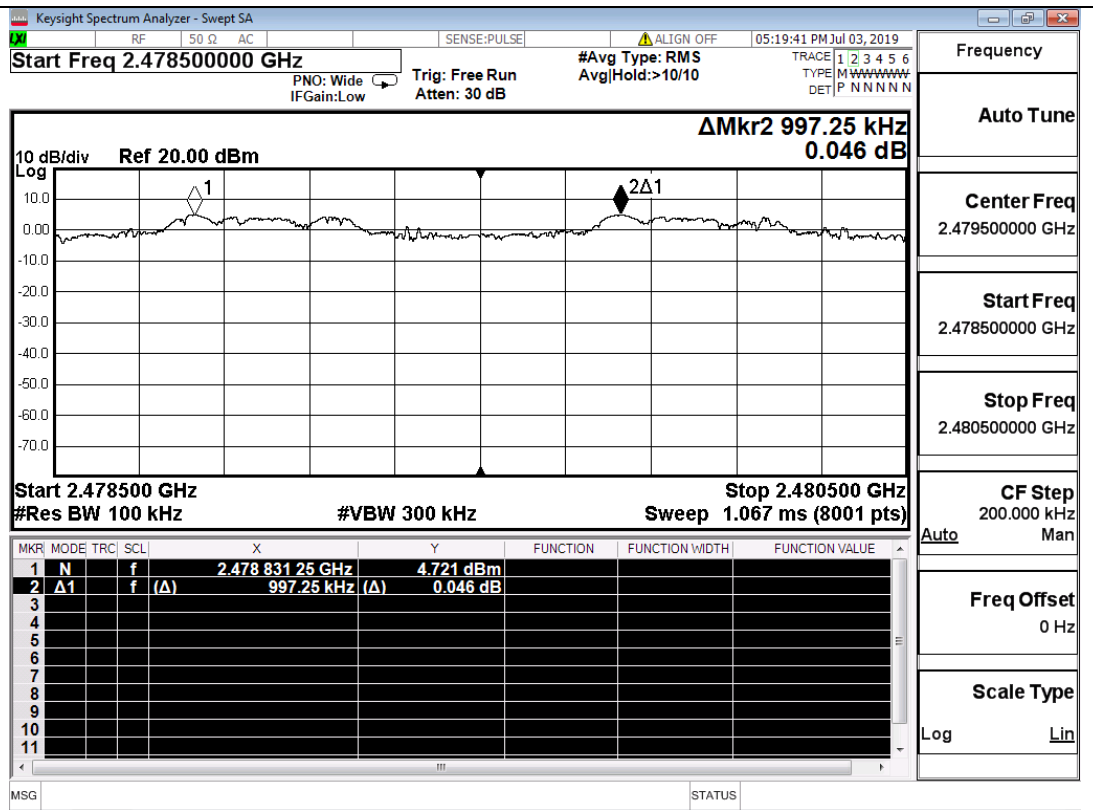
Frequency
Auto Tune
Center Freq 2.402500000 GHz
Start Freq 2.401500000 GHz
Stop Freq 2.403500000 GHz
CF Step 200.000 kHz
Auto Man
Freq Offset 0 Hz
Scale Type Log Lin

$\pi/4$ DQPSK/MCH

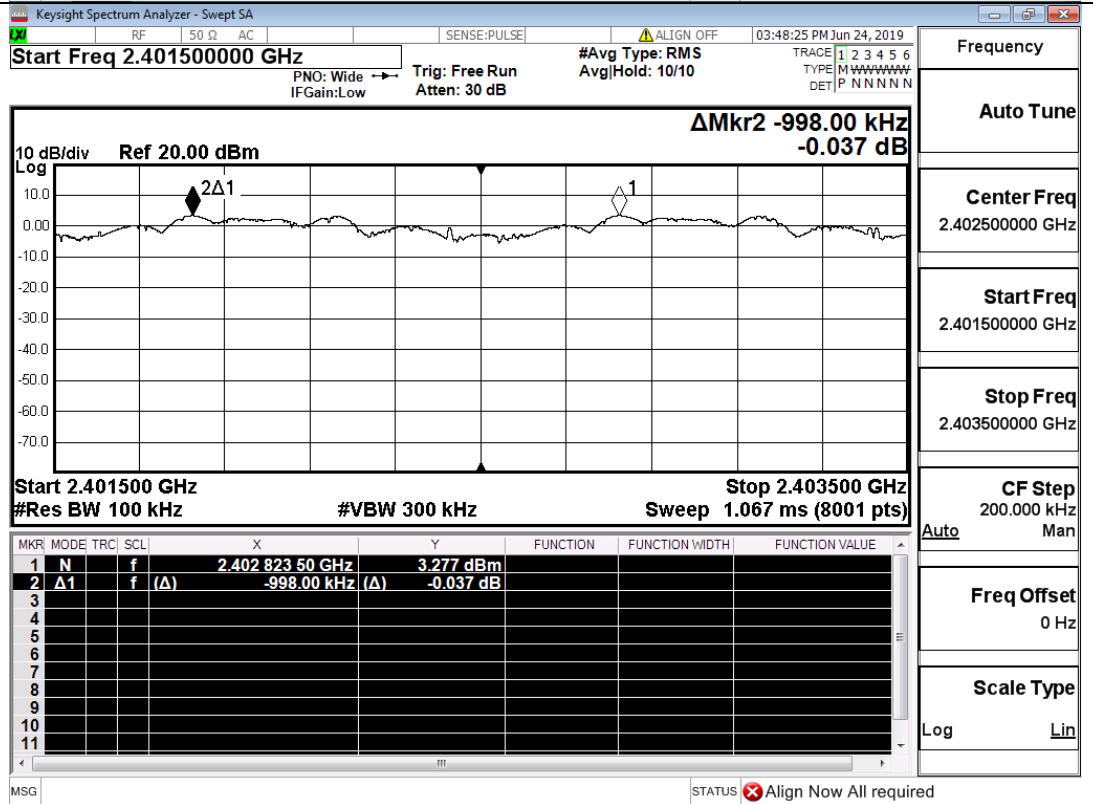


Frequency
Auto Tune
Center Freq 2.441500000 GHz
Start Freq 2.440500000 GHz
Stop Freq 2.442500000 GHz
CF Step 200.000 kHz
Auto Man
Freq Offset 0 Hz
Scale Type Log Lin

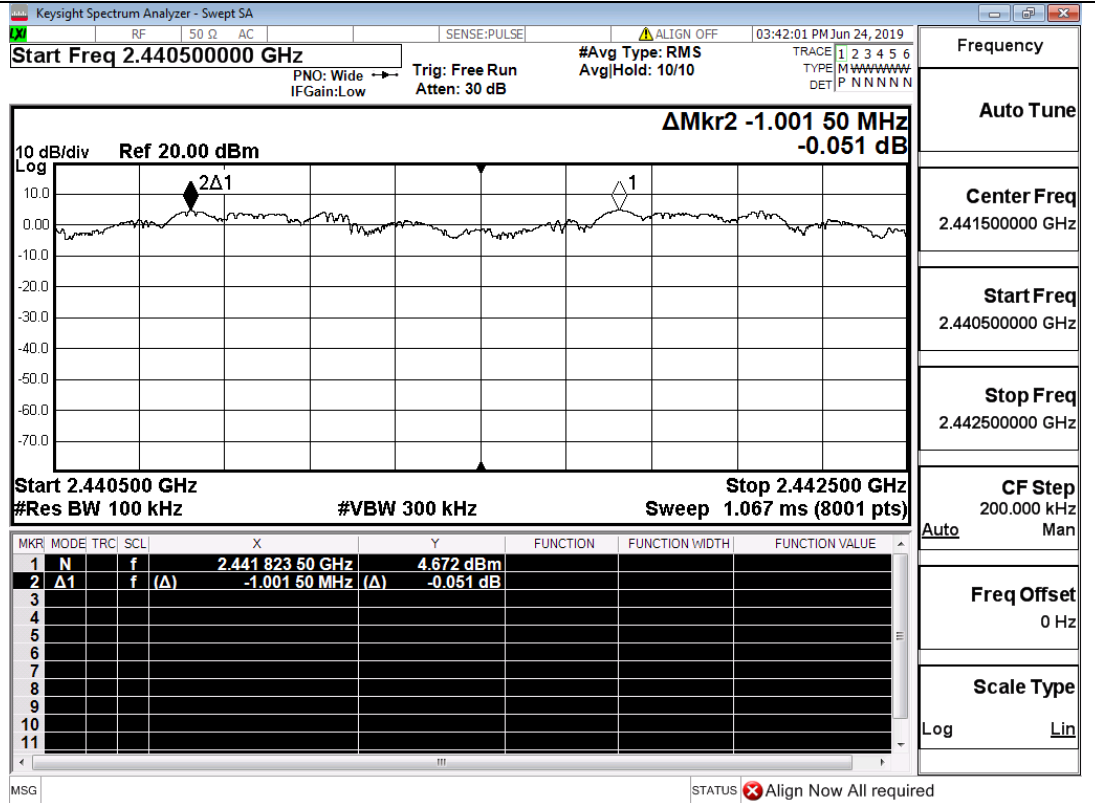
$\pi/4$ DQPSK/HCH



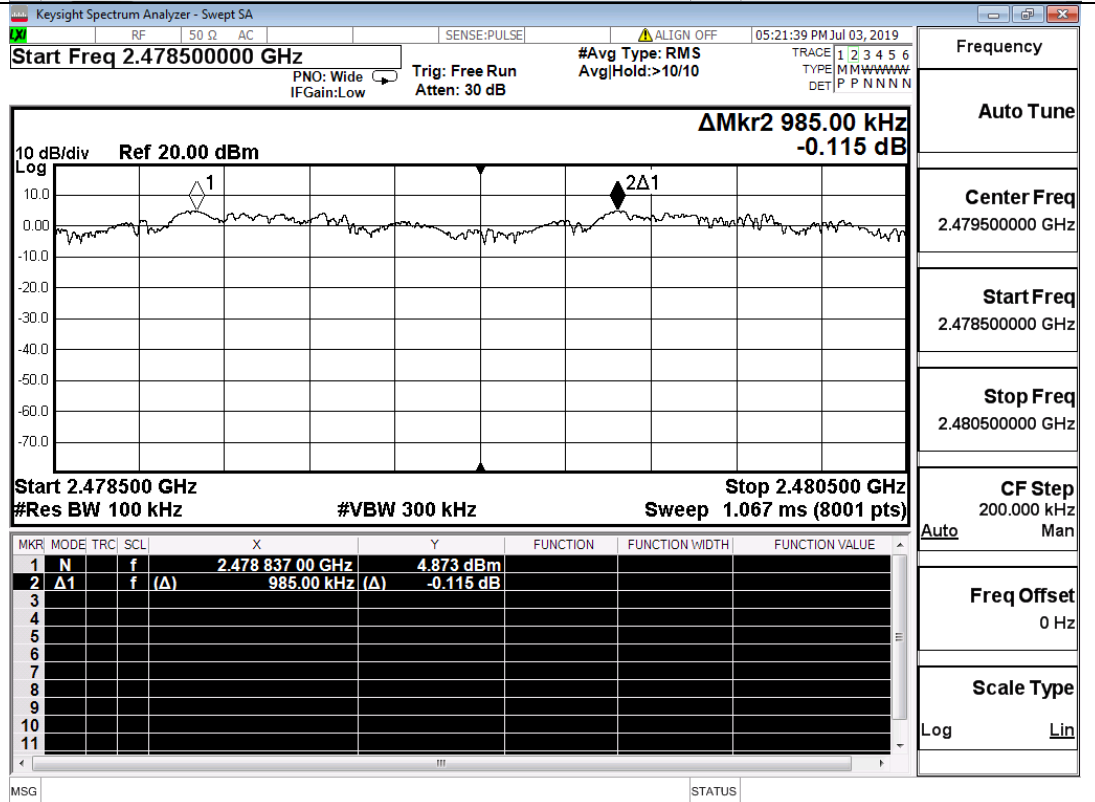
8DPSK/LCH



8DPSK/MCH

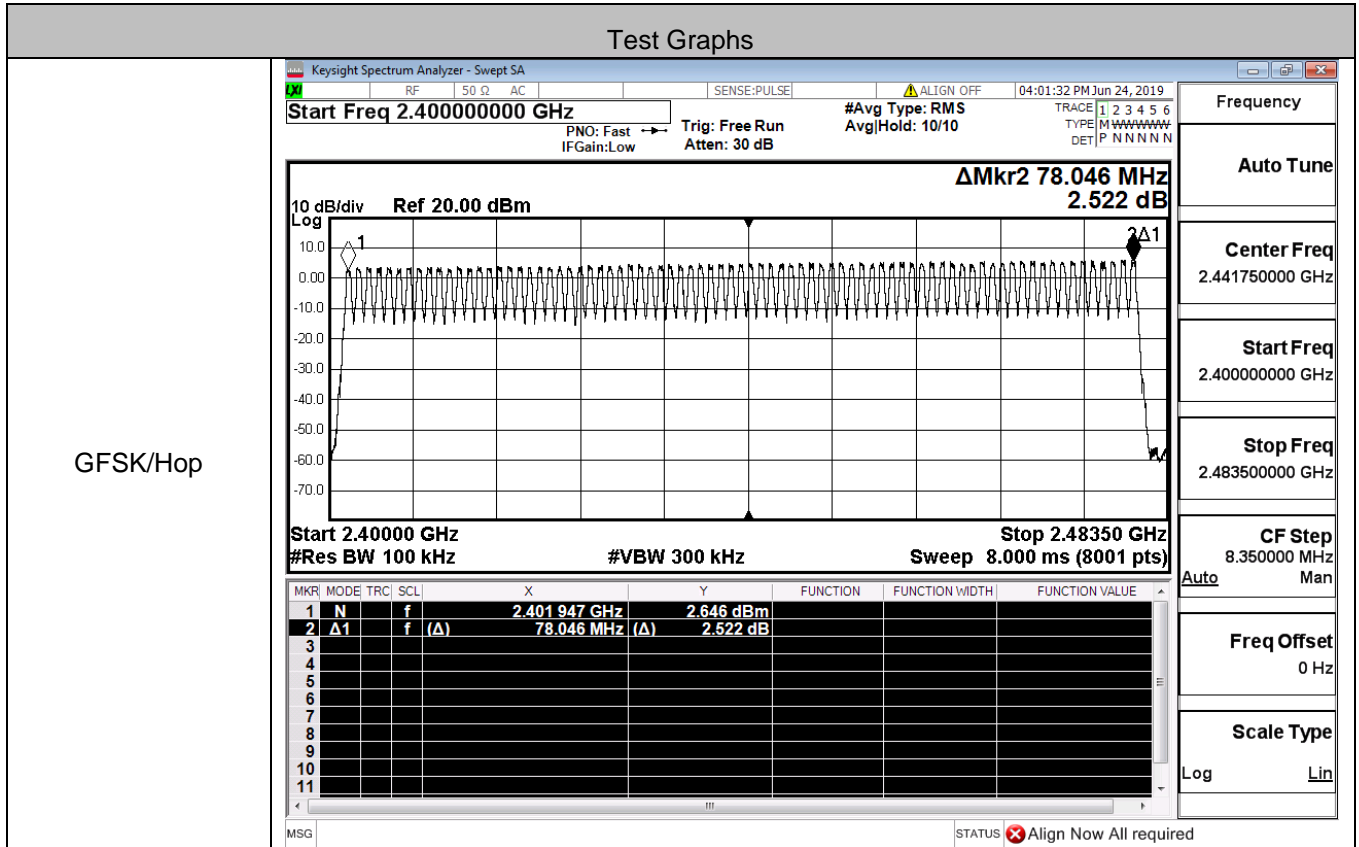


8DPSK/HCH

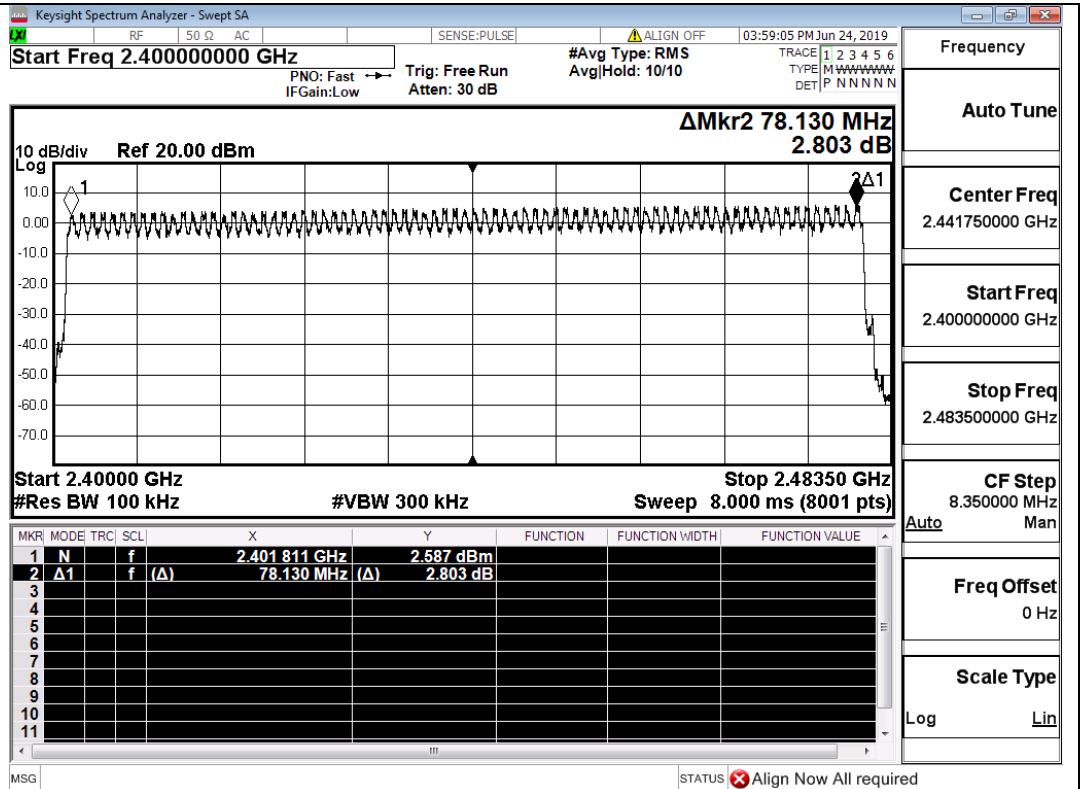


A.4 Hopping Channel Number

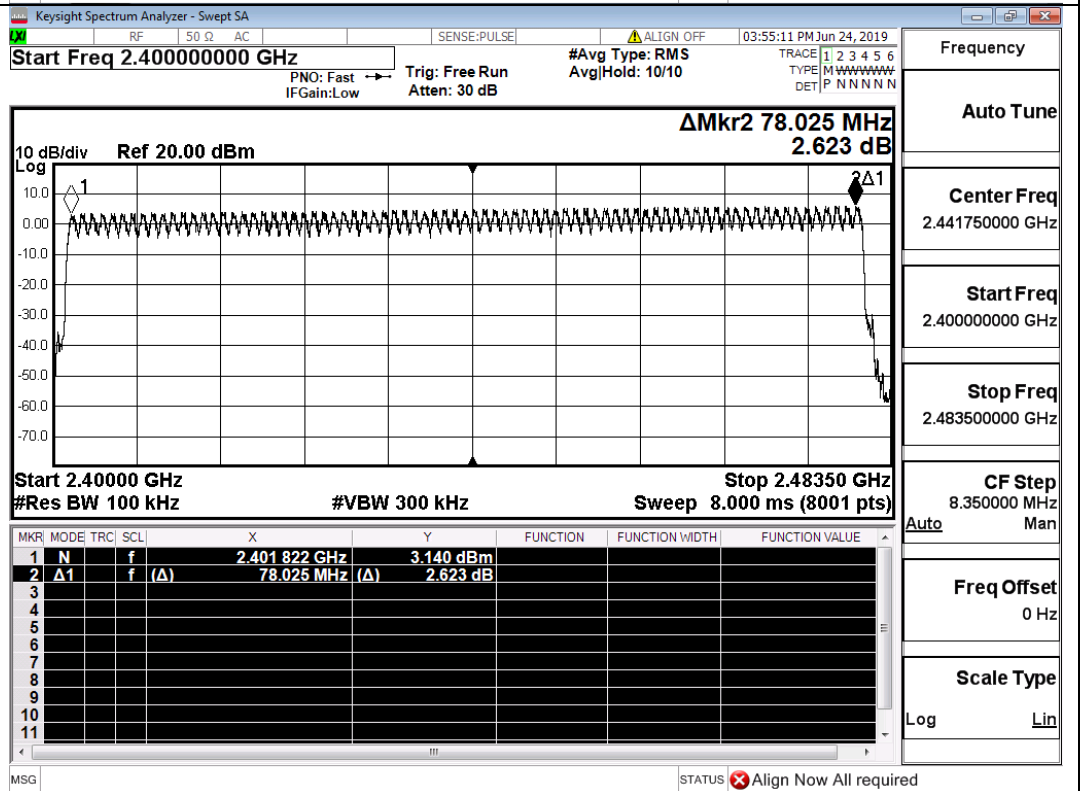
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS



$\pi/4$ DQPSK/Hop

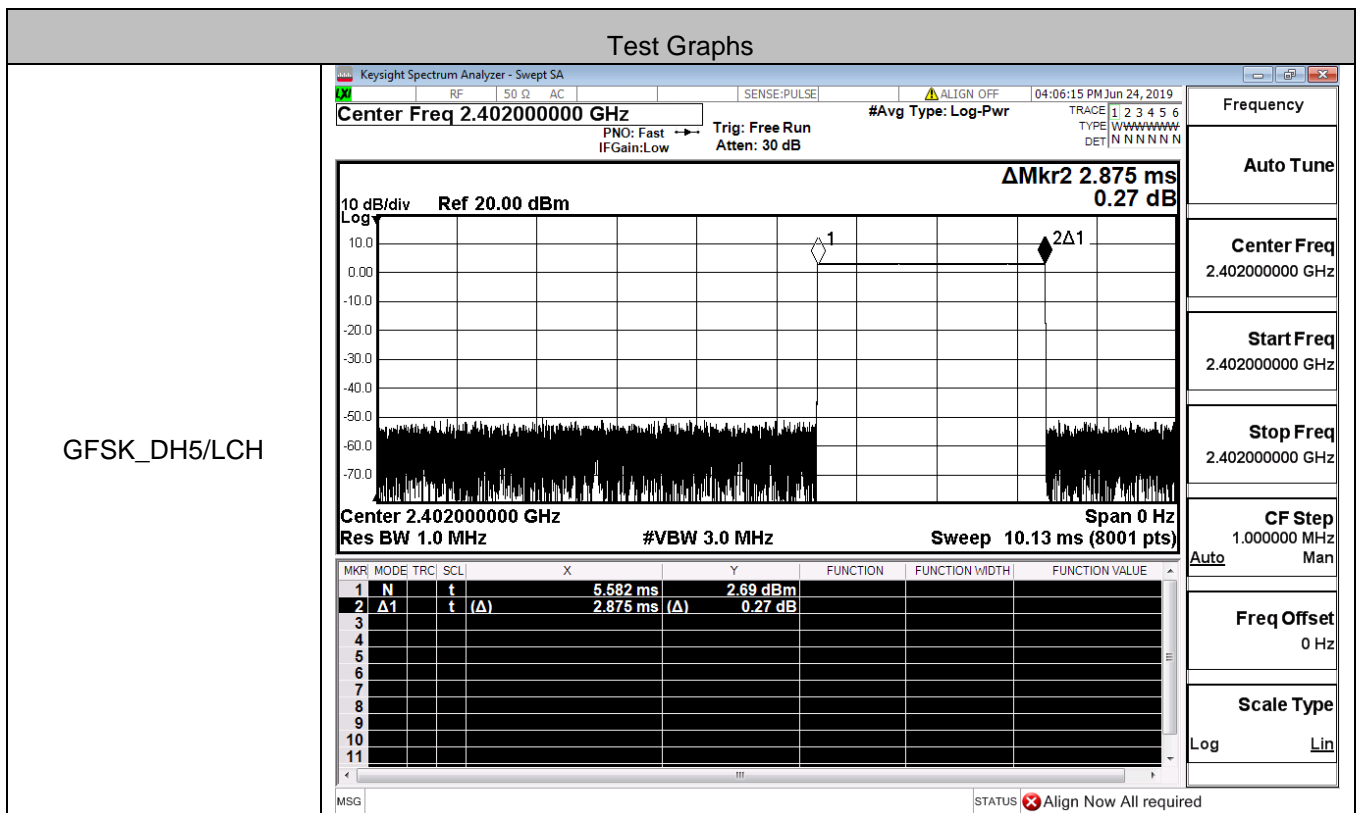


8DPSK/Hop

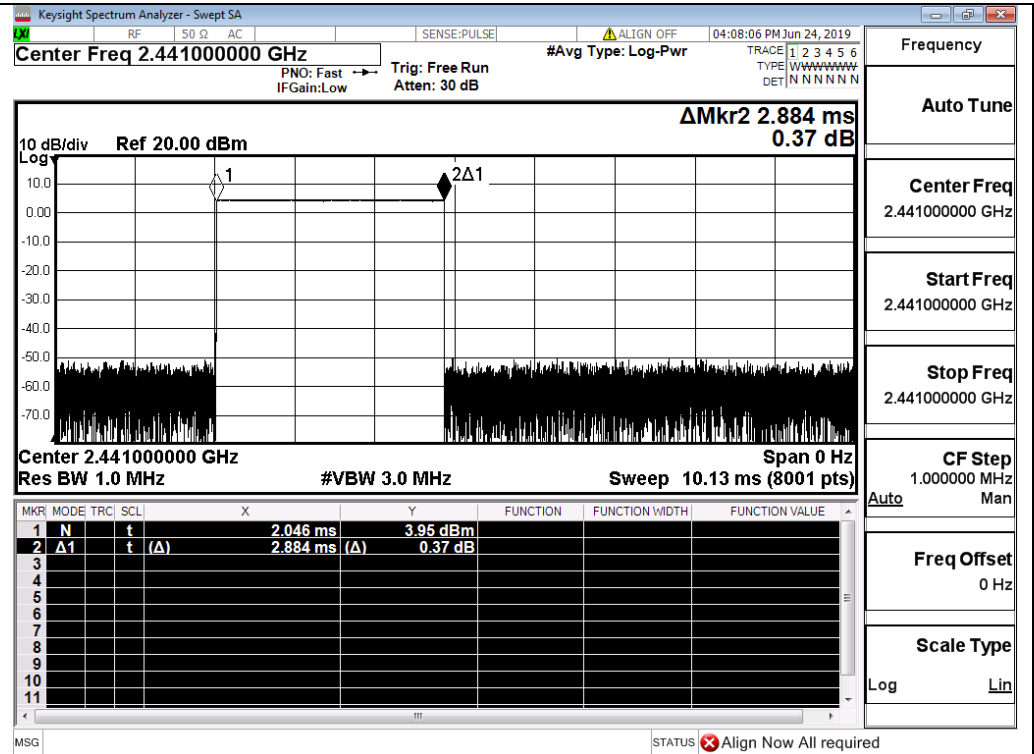


A.5 Dwell Time

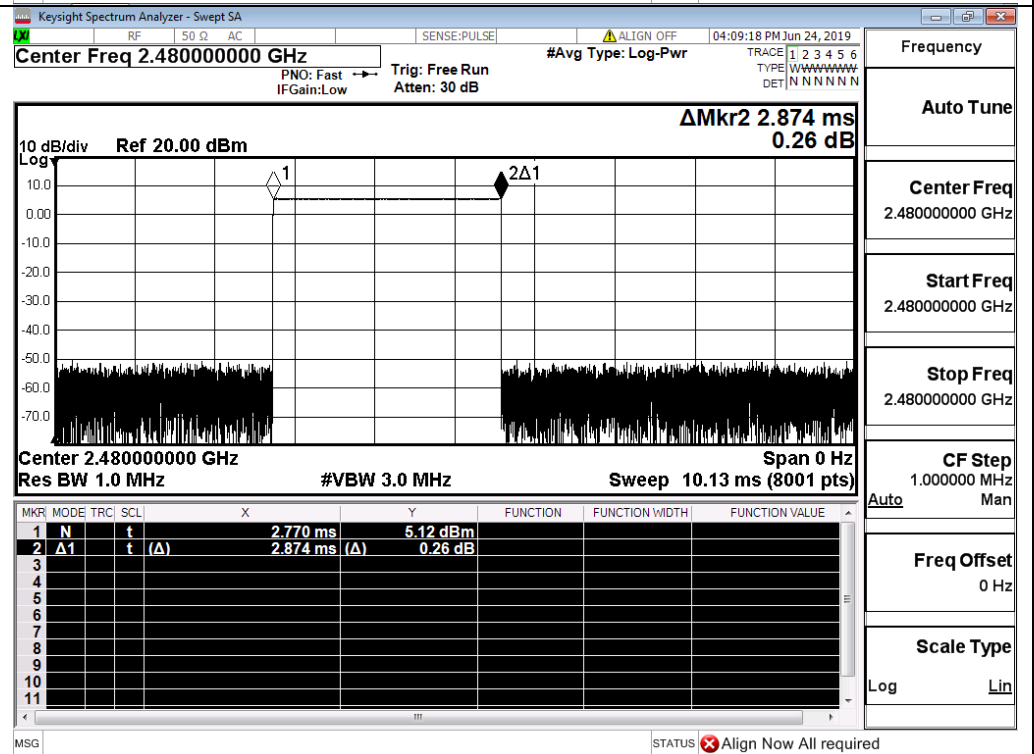
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.89	106.7	0.308	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.88	106.7	0.307	0.4	PASS
	3DH5	MCH	2.87	106.7	0.306	0.4	PASS
	3DH5	HCH	2.88	106.7	0.307	0.4	PASS



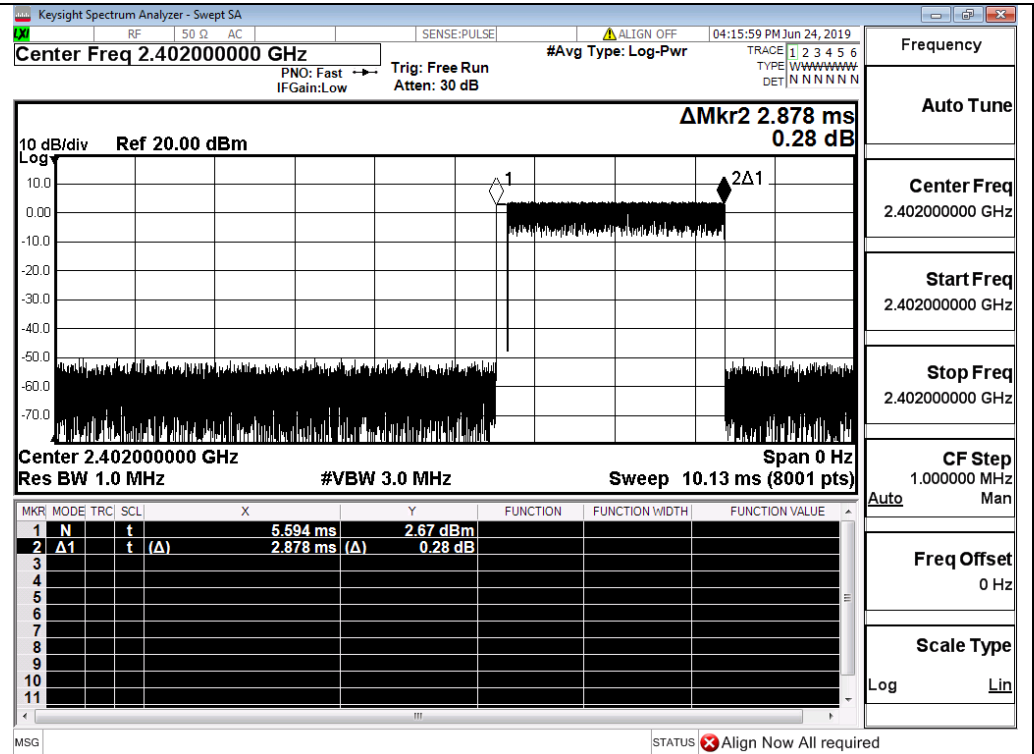
GFSK_DH5/MCH



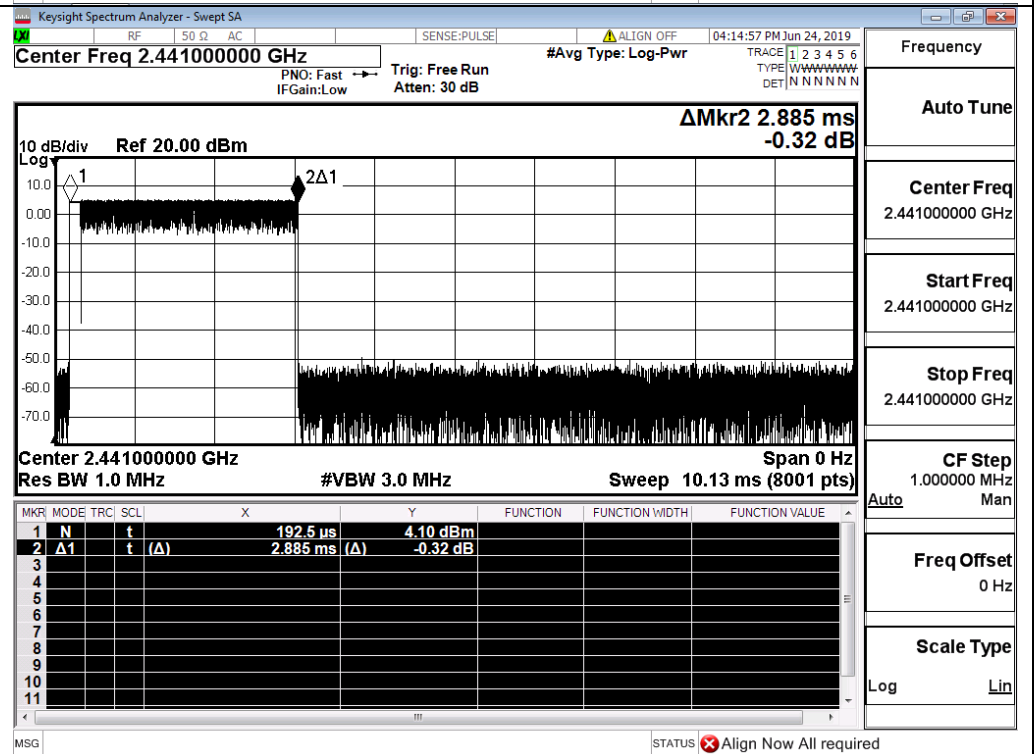
GFSK_DH5/HCH



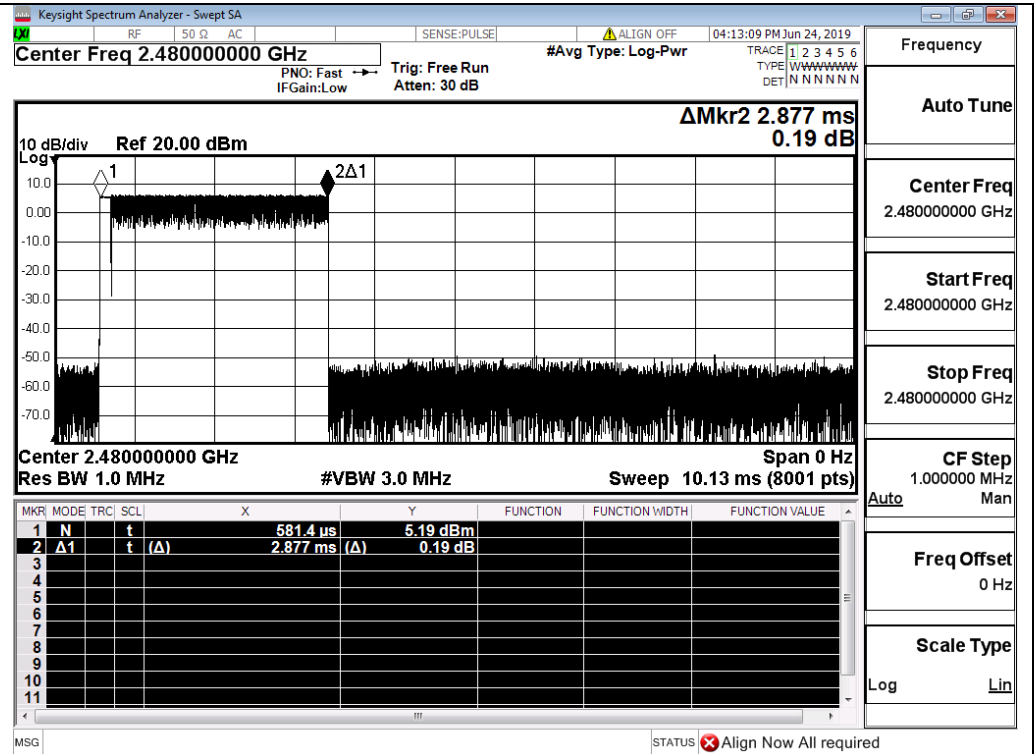
$\pi/4$ DQPSK
_2DH5/LCH



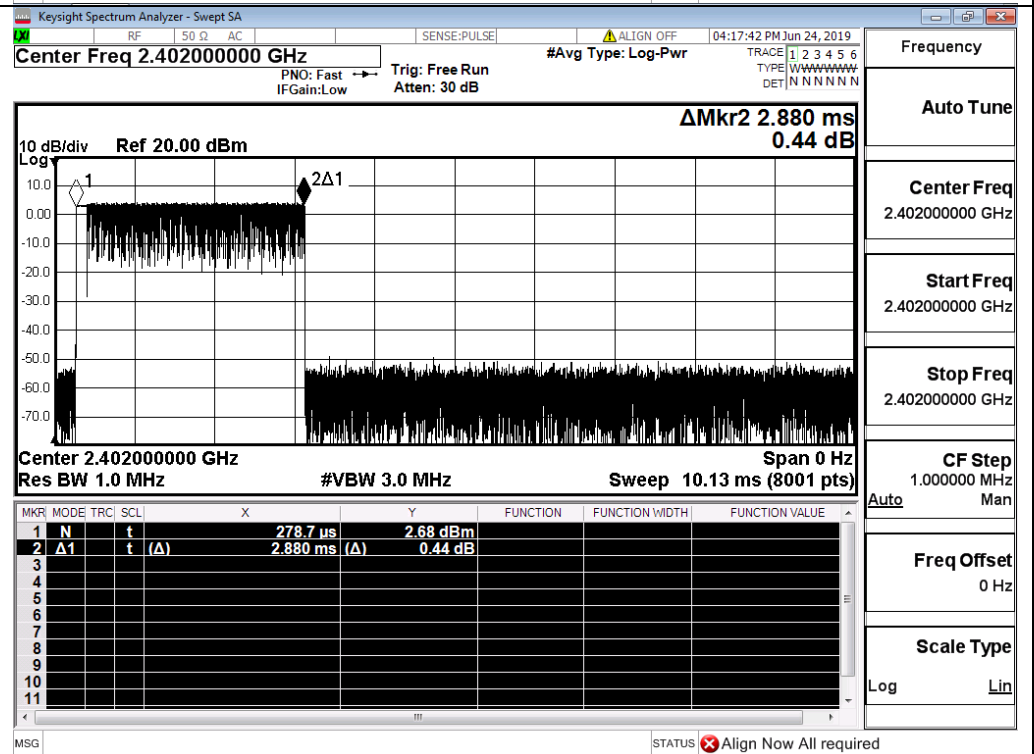
$\pi/4$ DQPSK
_2DH5/MCH



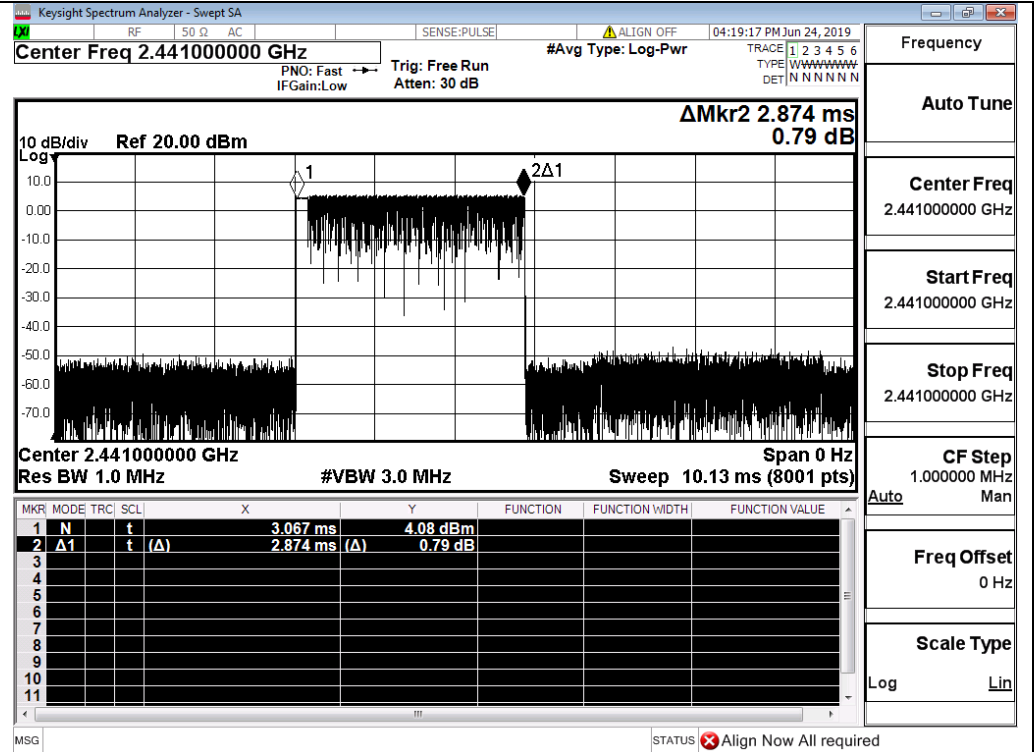
$\pi/4$ DQPSK
_2DH5/HCH



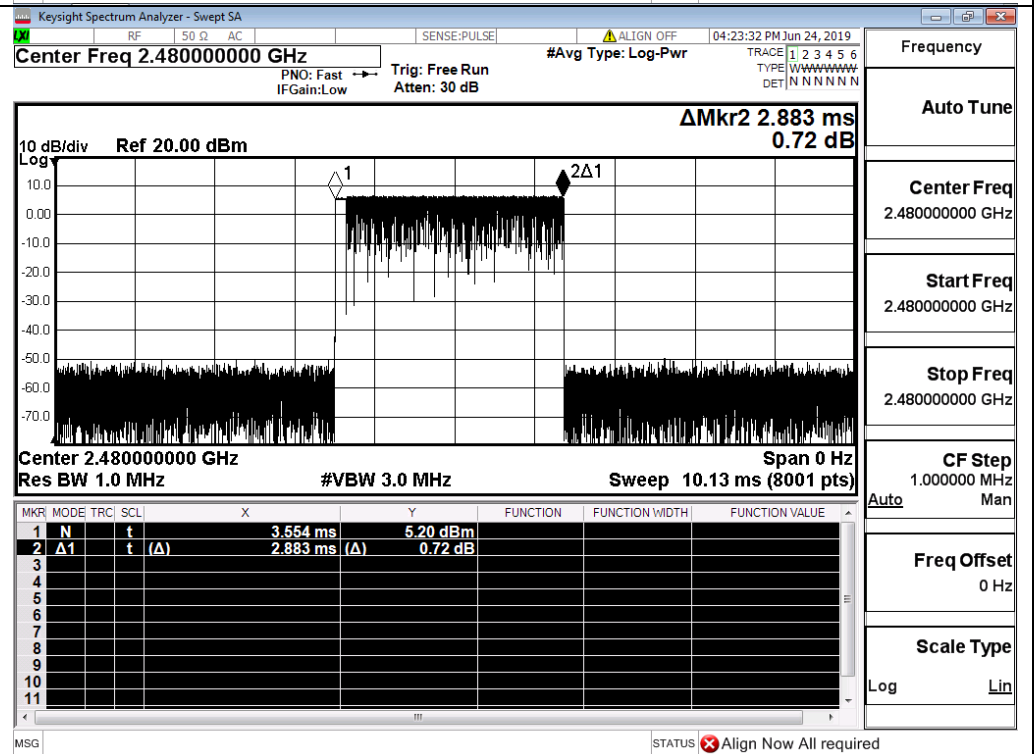
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

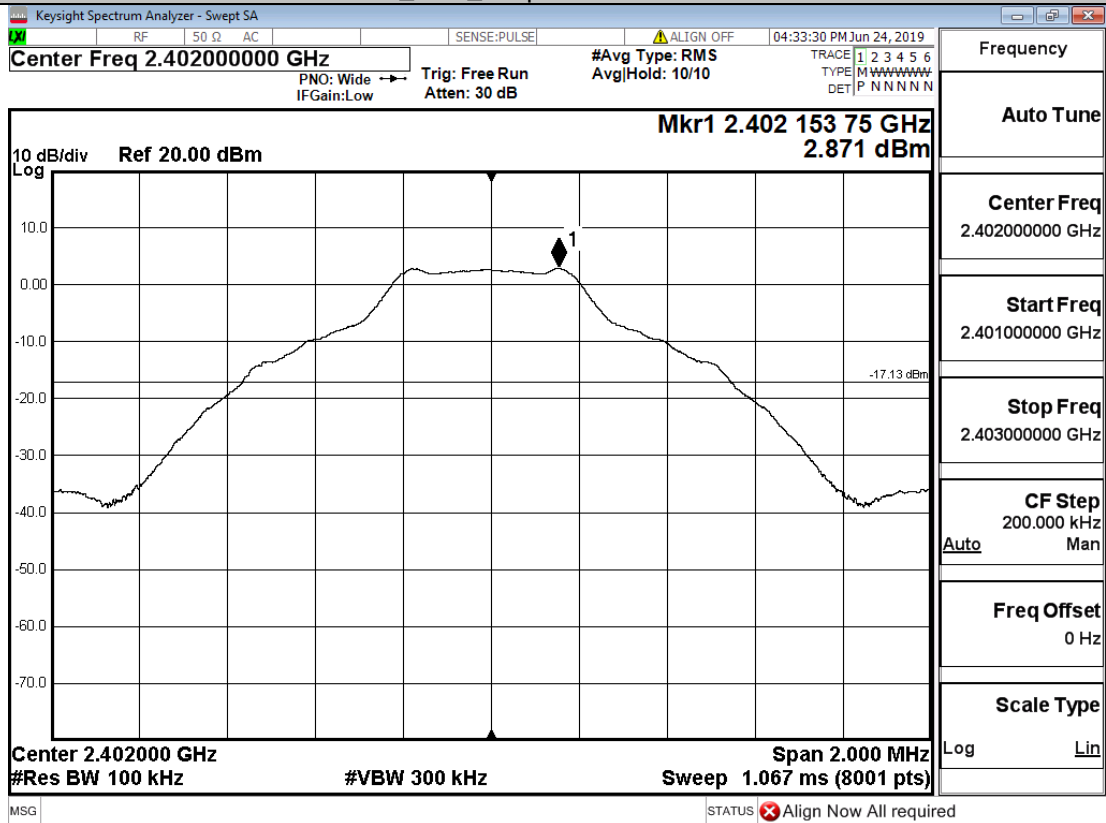


A.6 RF Conducted Spurious Emissions

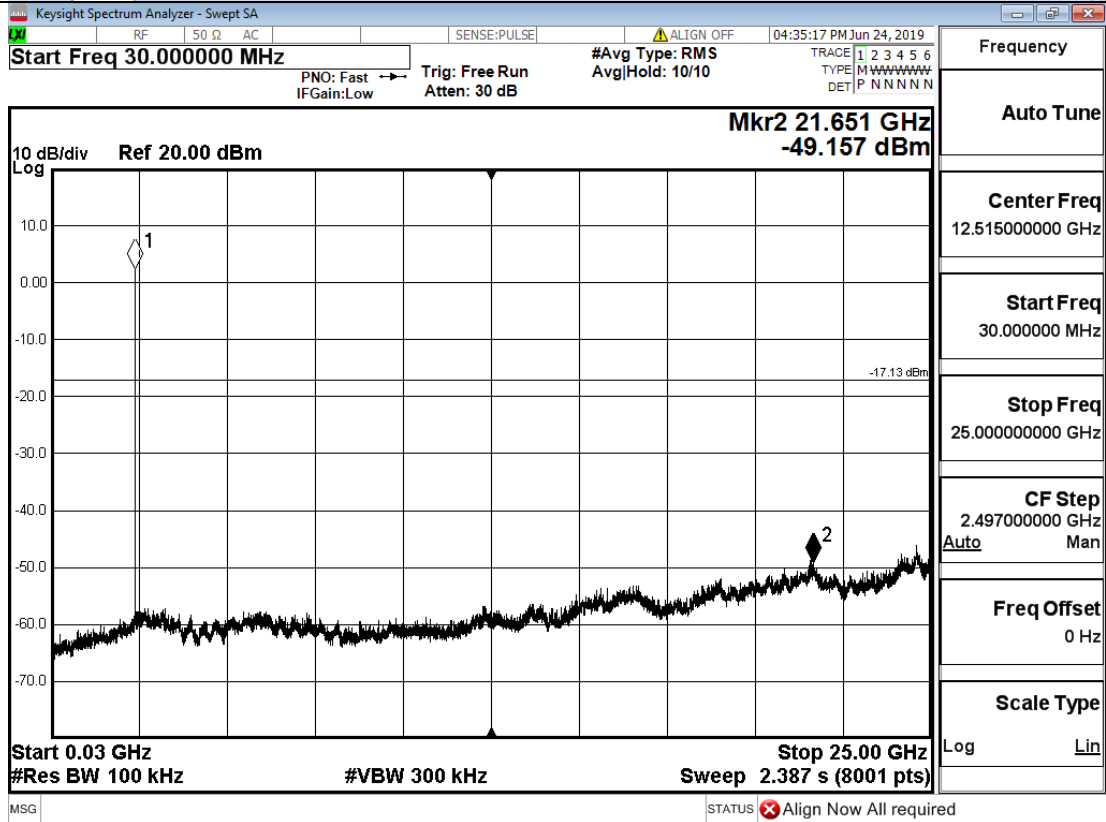
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.871	-49.157	-17.13	PASS
	MCH	4.271	-49.501	-15.73	PASS
	HCH	5.323	-48.950	-14.68	PASS
$\pi/4$ DQPSK	LCH	1.272	-45.093	-18.73	PASS
	MCH	2.698	-46.271	-17.30	PASS
	HCH	3.825	-49.065	-16.18	PASS
8DPSK	LCH	1.139	-47.951	-18.86	PASS
	MCH	2.708	-48.270	-17.29	PASS
	HCH	3.812	-48.403	-16.19	PASS

GFSK_LCH_Graphs

Pref

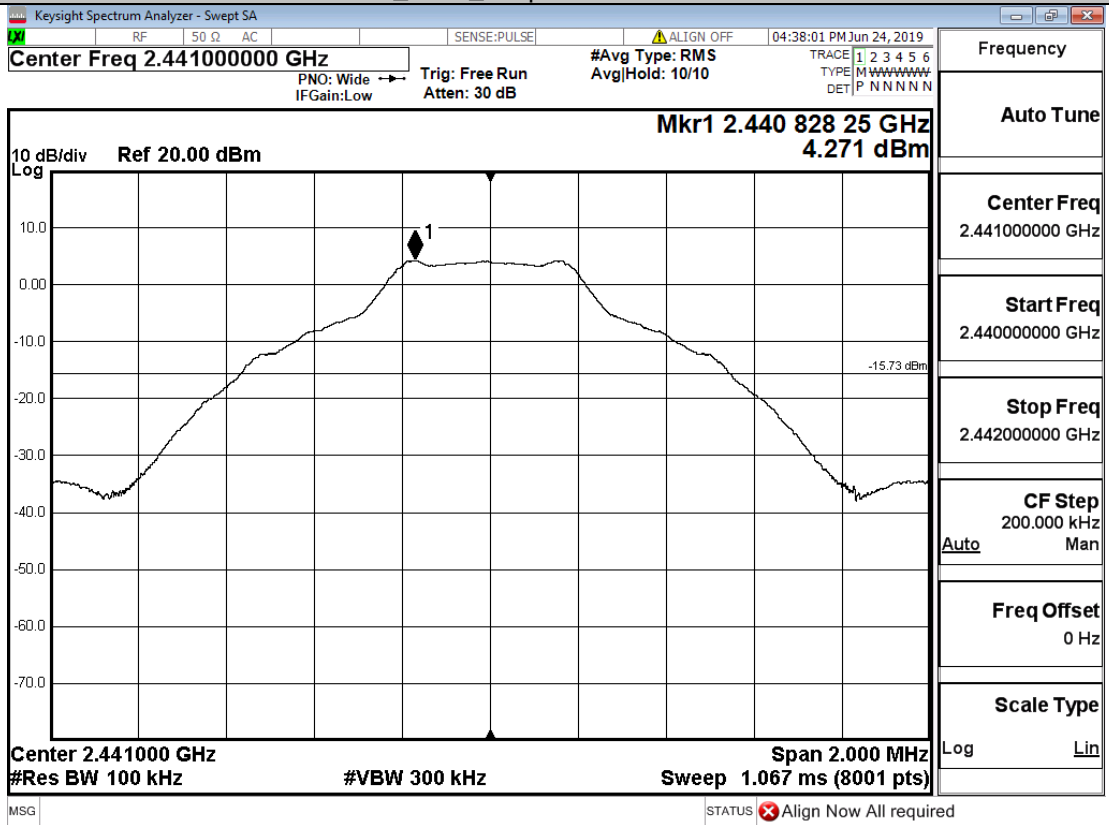


Puw

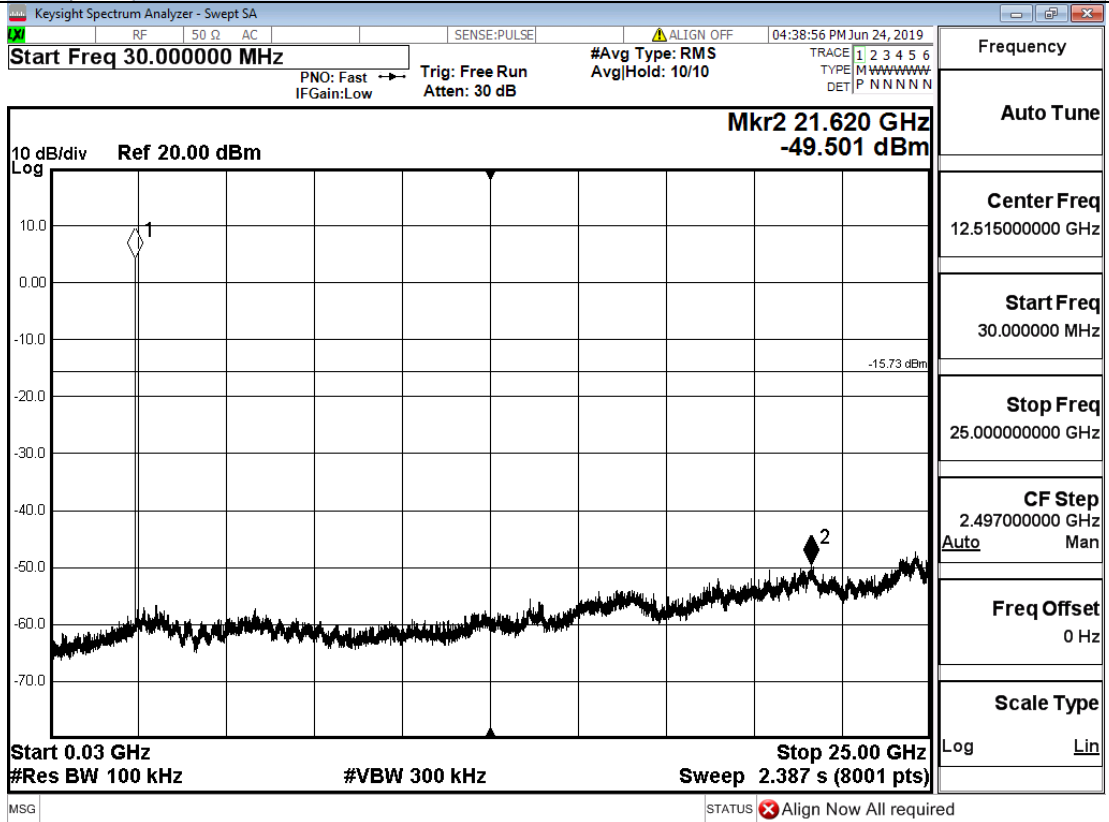


GFSK_MCH_Graphs

Pref

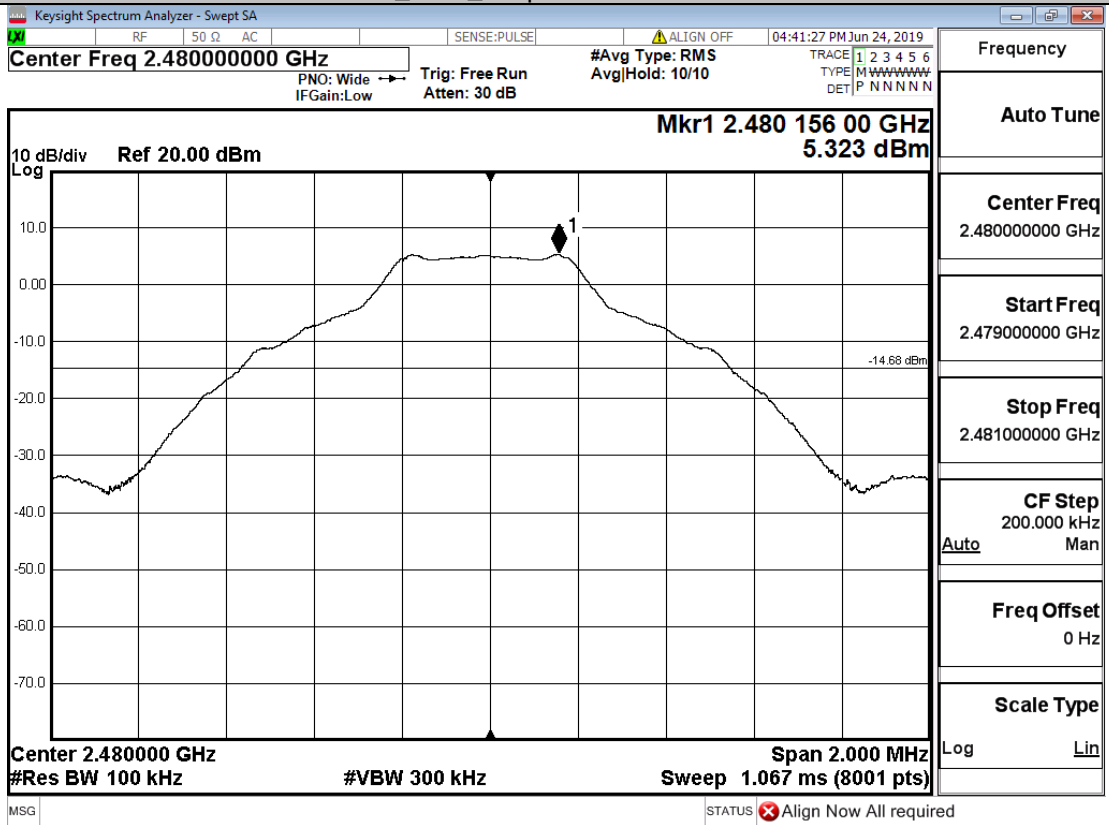


Puw

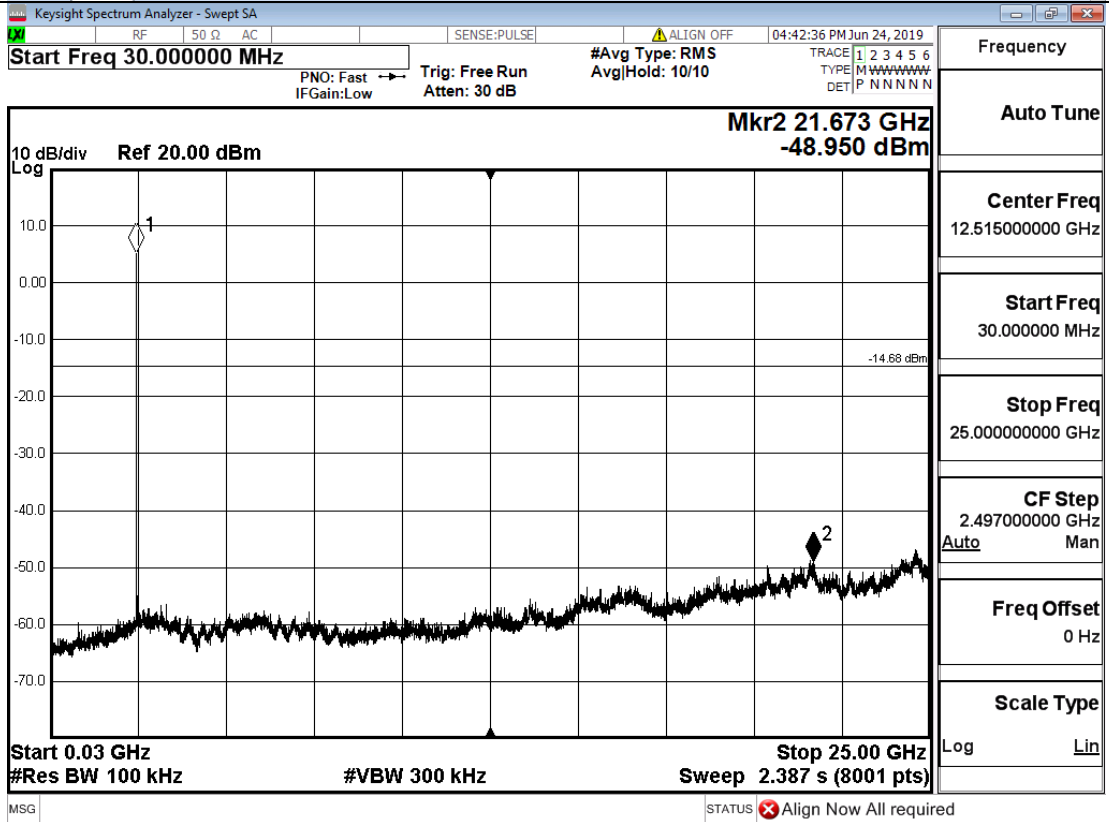


GFSK_HCH_Graphs

Pref

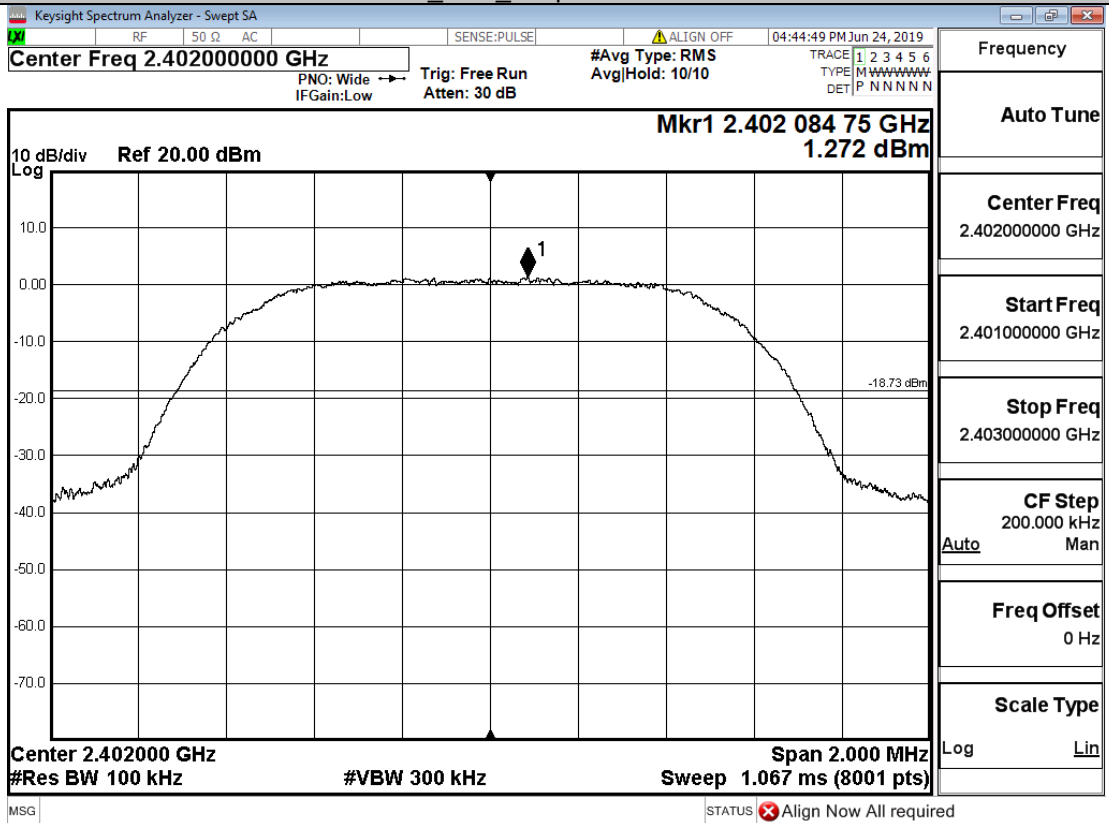


Puw

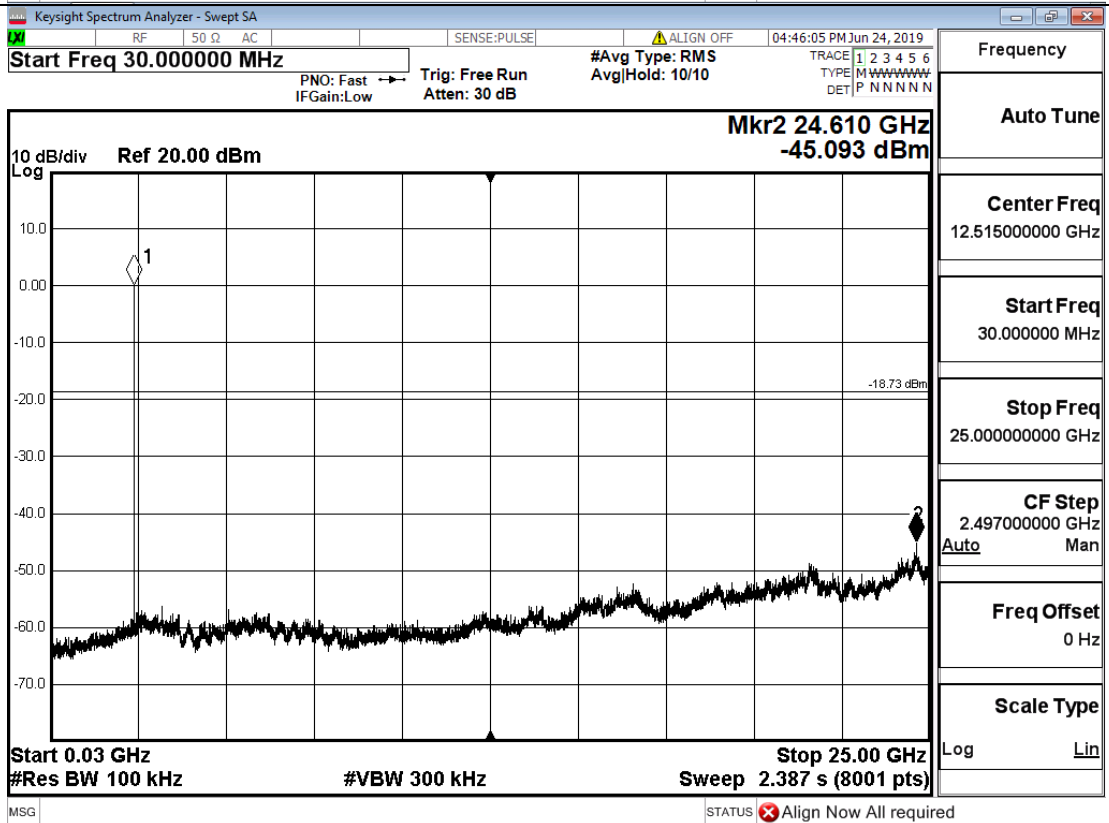


$\pi/4$ DQPSK_LCH_Graphs

Pref

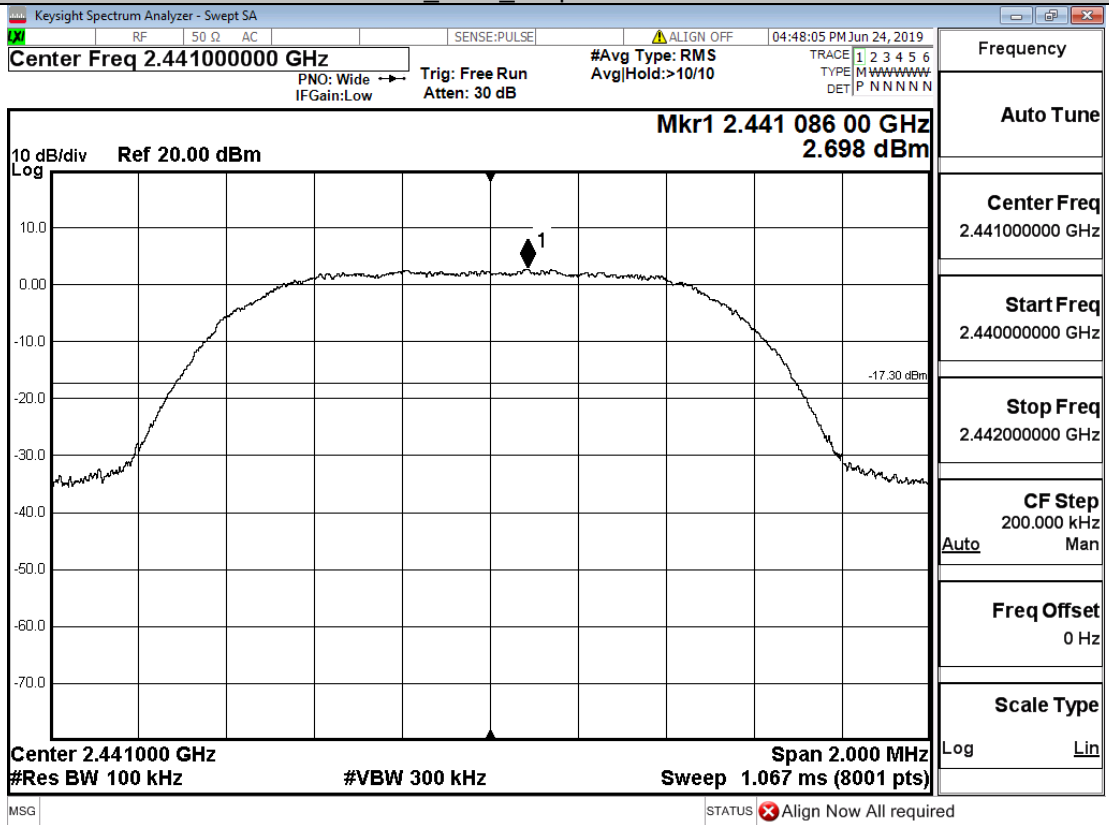


Puw

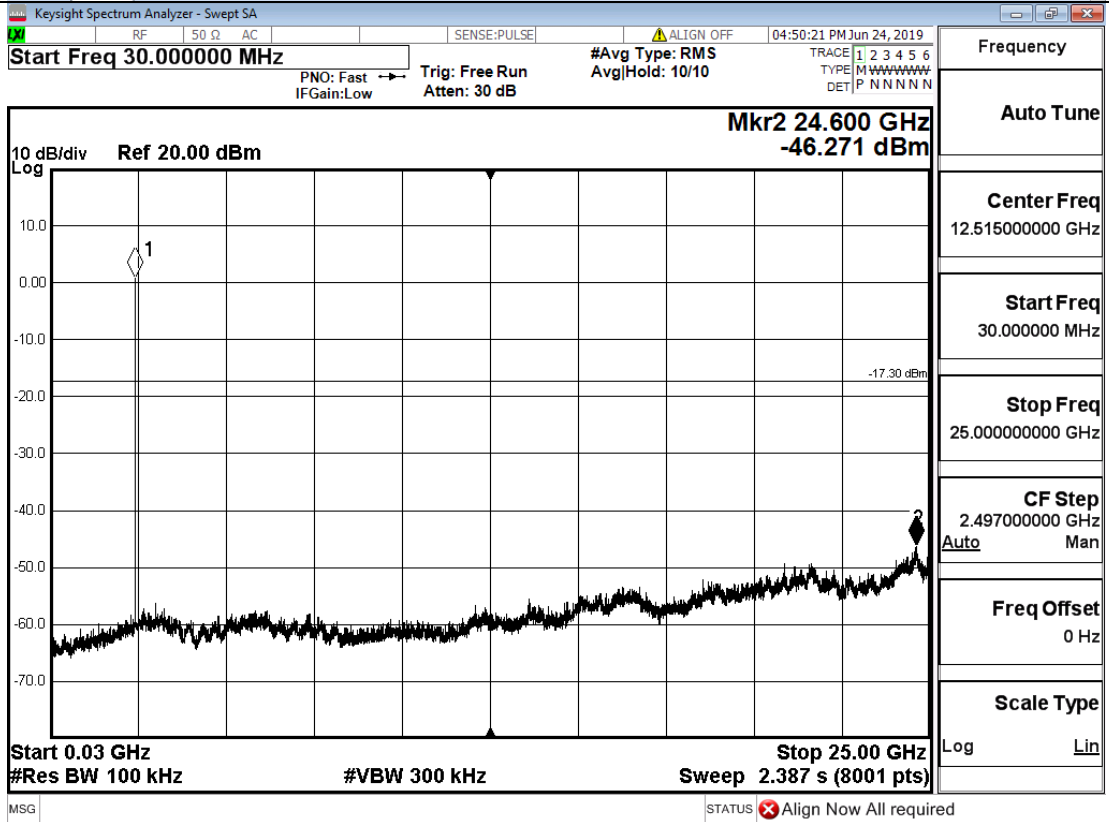


$\pi/4$ DQPSK_MCH_Graphs

Pref

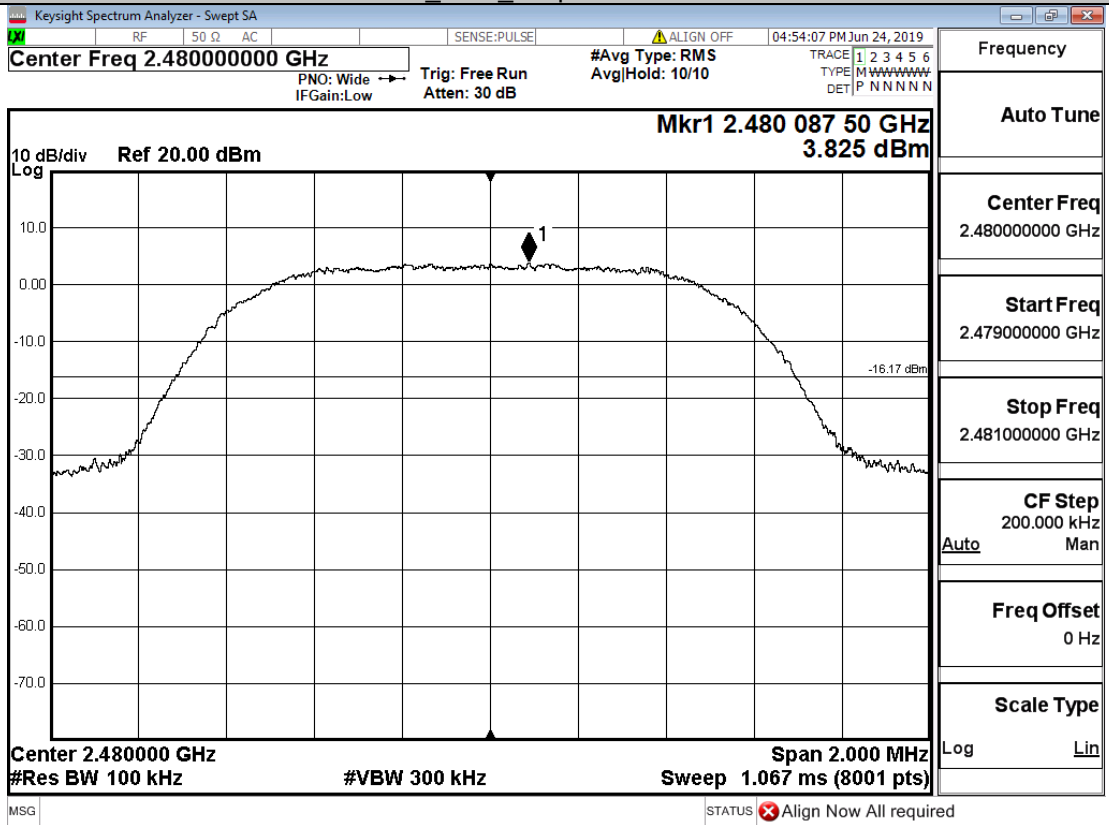


Puw

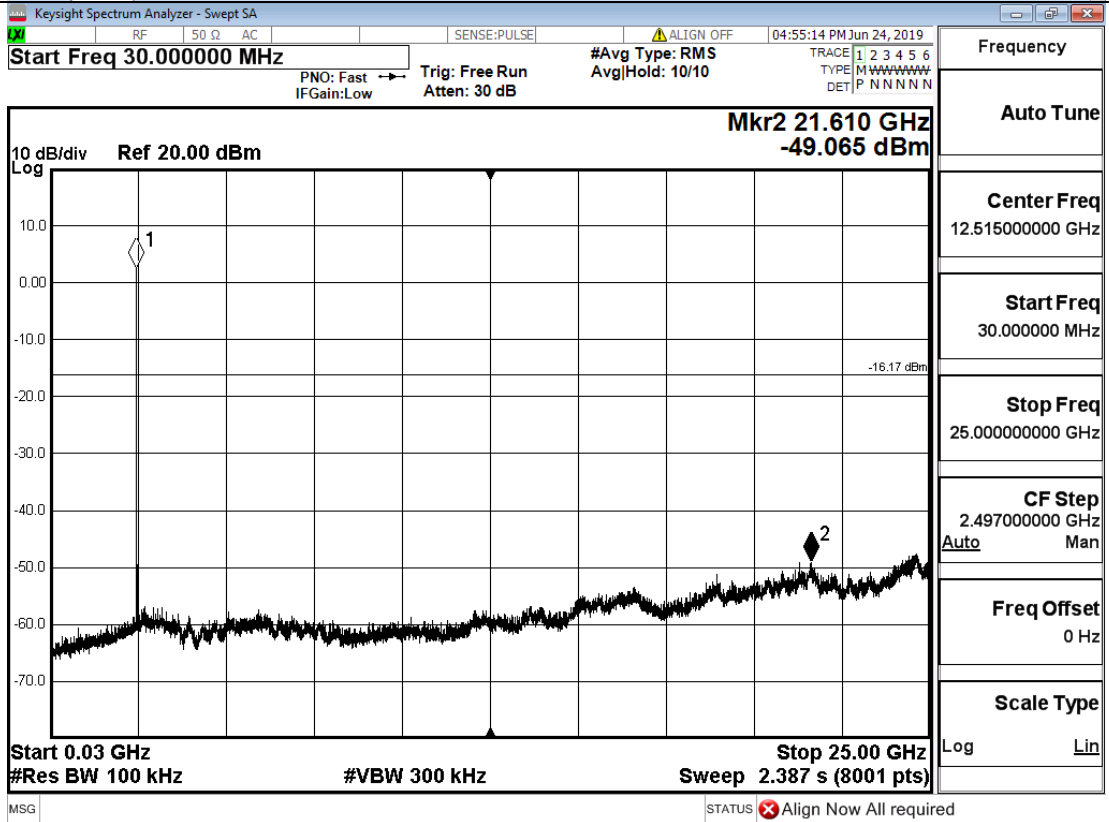


$\pi/4$ DQPSK_HCH_Graphs

Pref

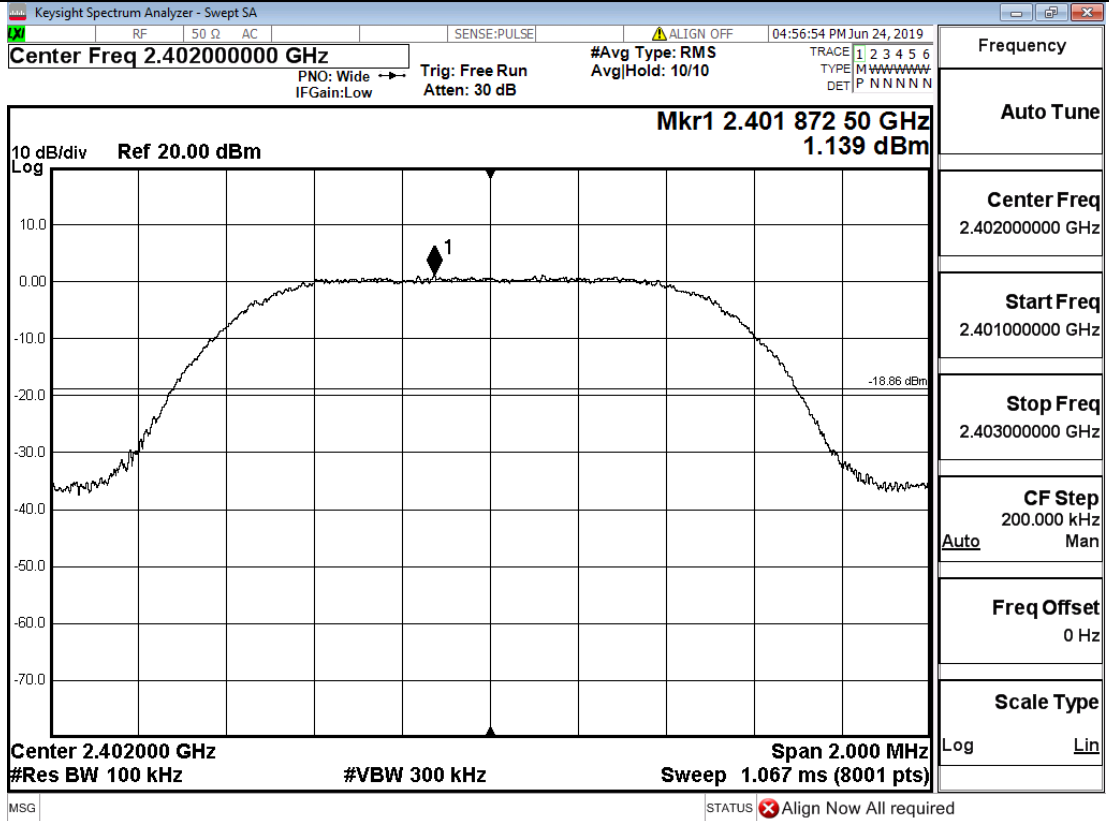


Puw

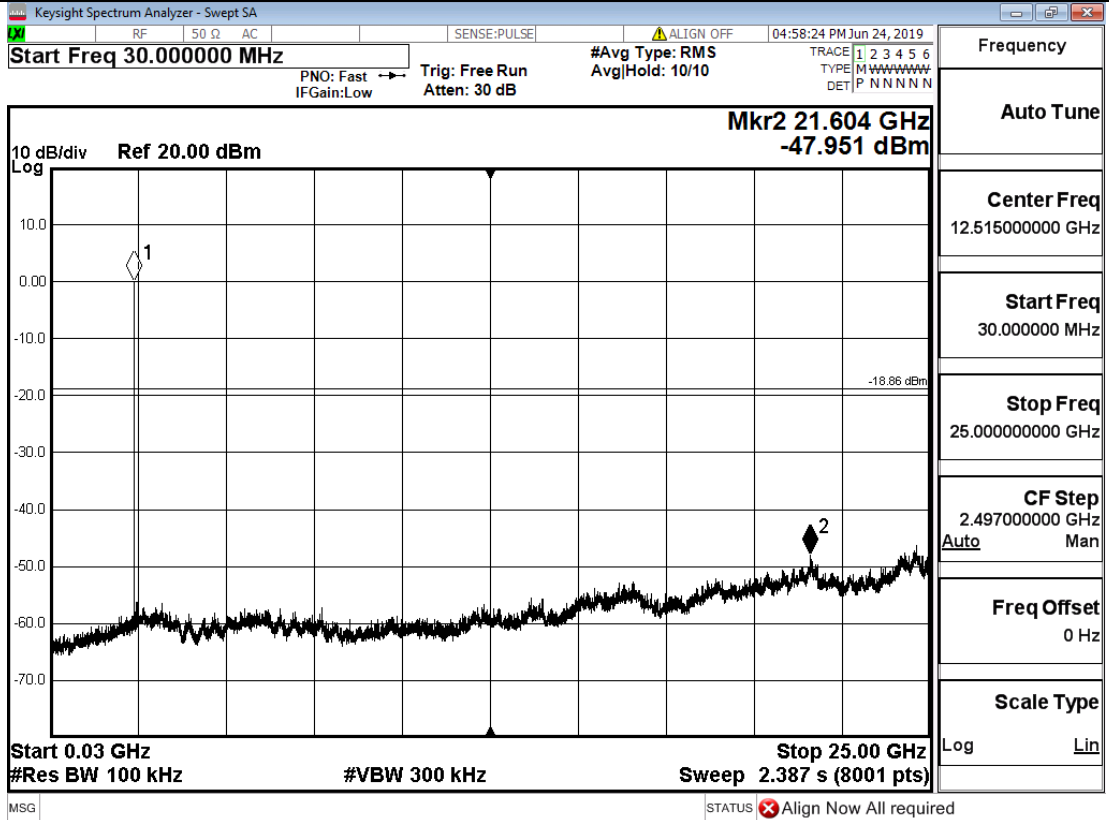


8DPSK_LCH_Graphs

Pref

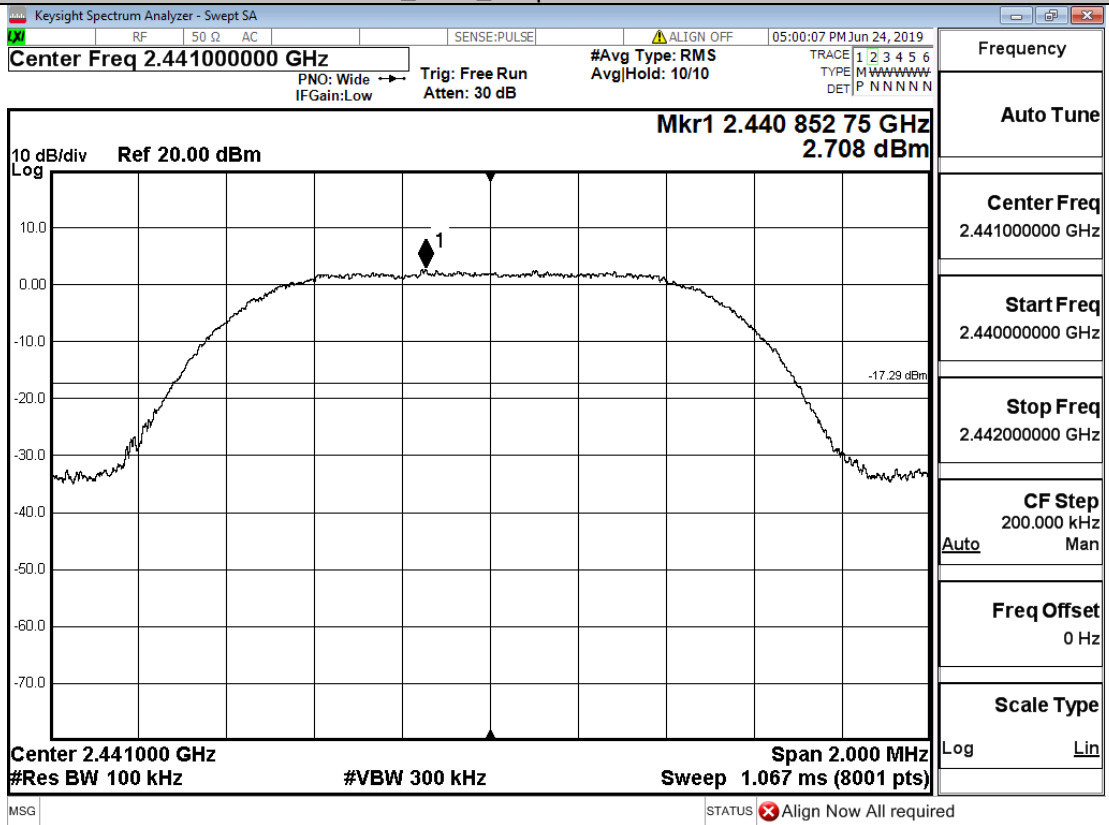


Puw

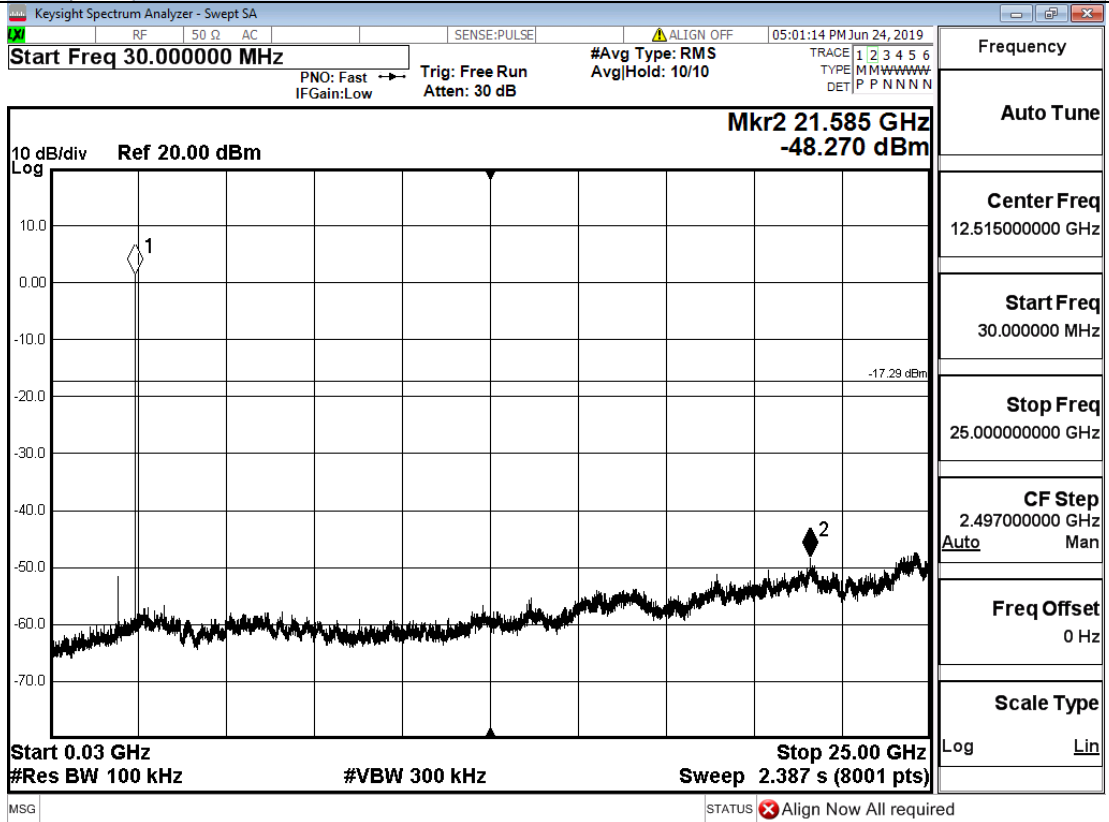


8DPSK_MCH_Graphs

Pref

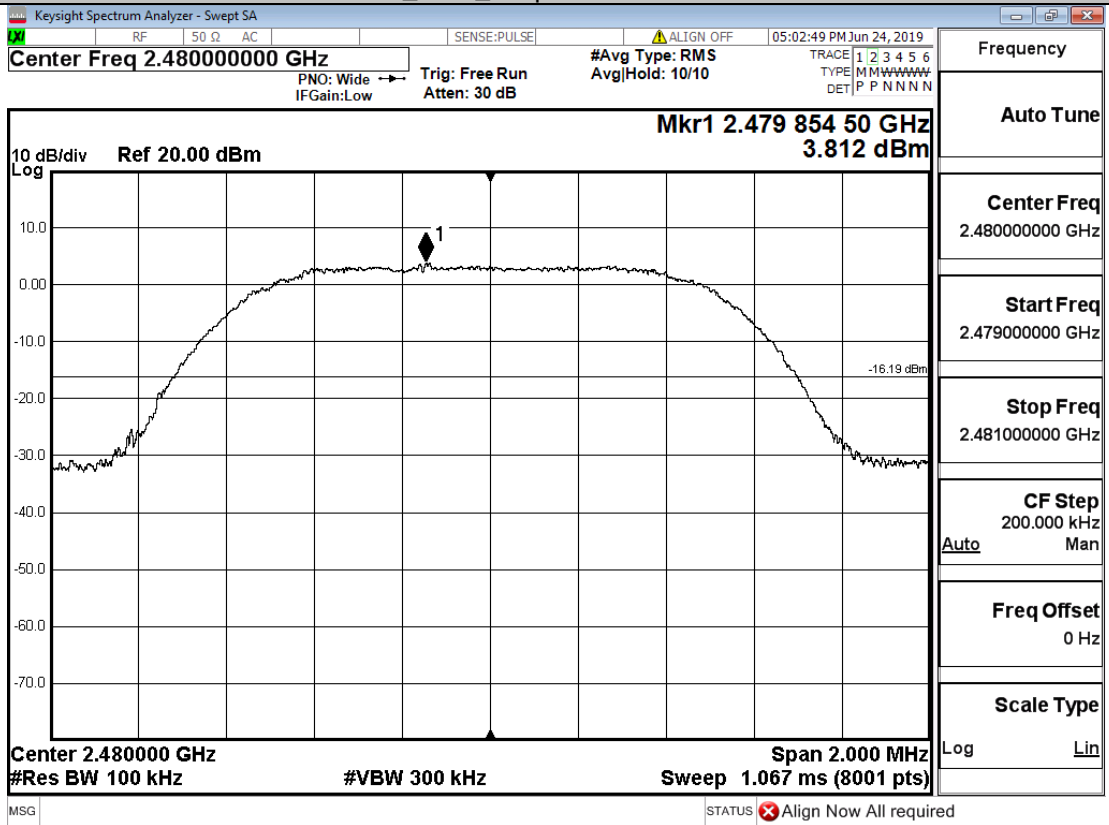


Puw

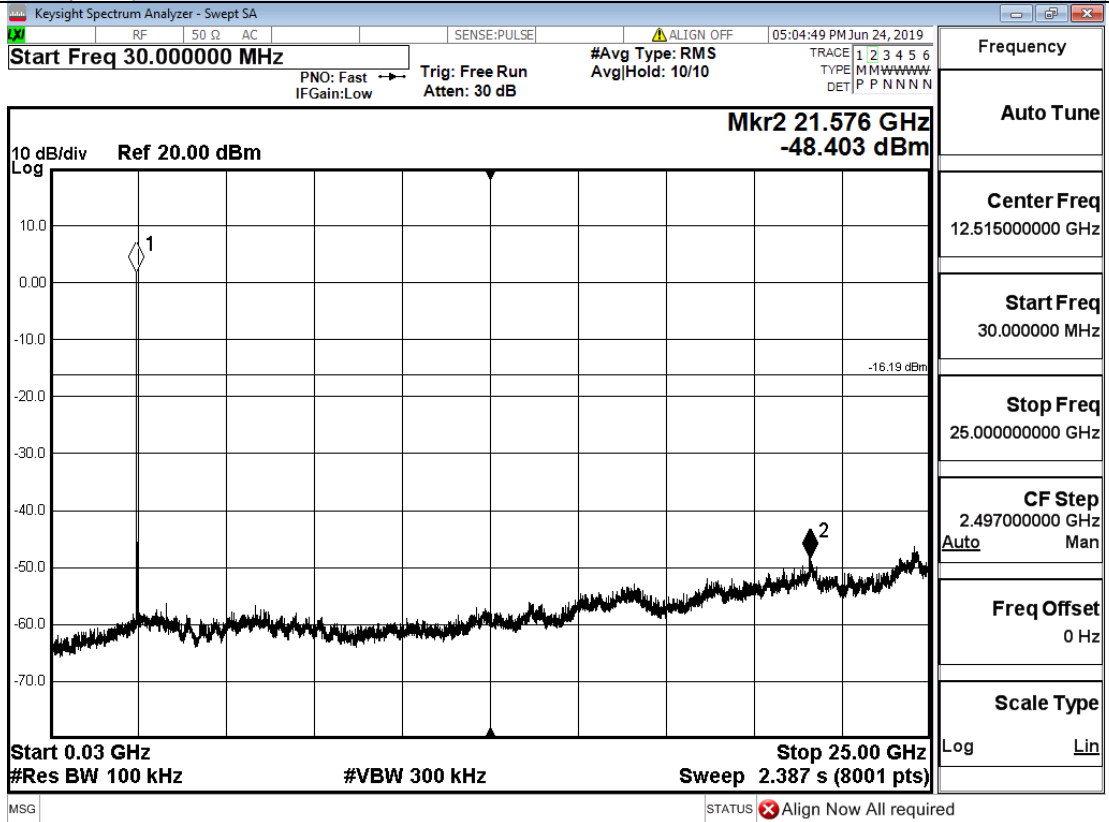


8DPSK_HCH_Graphs

Pref



Puw

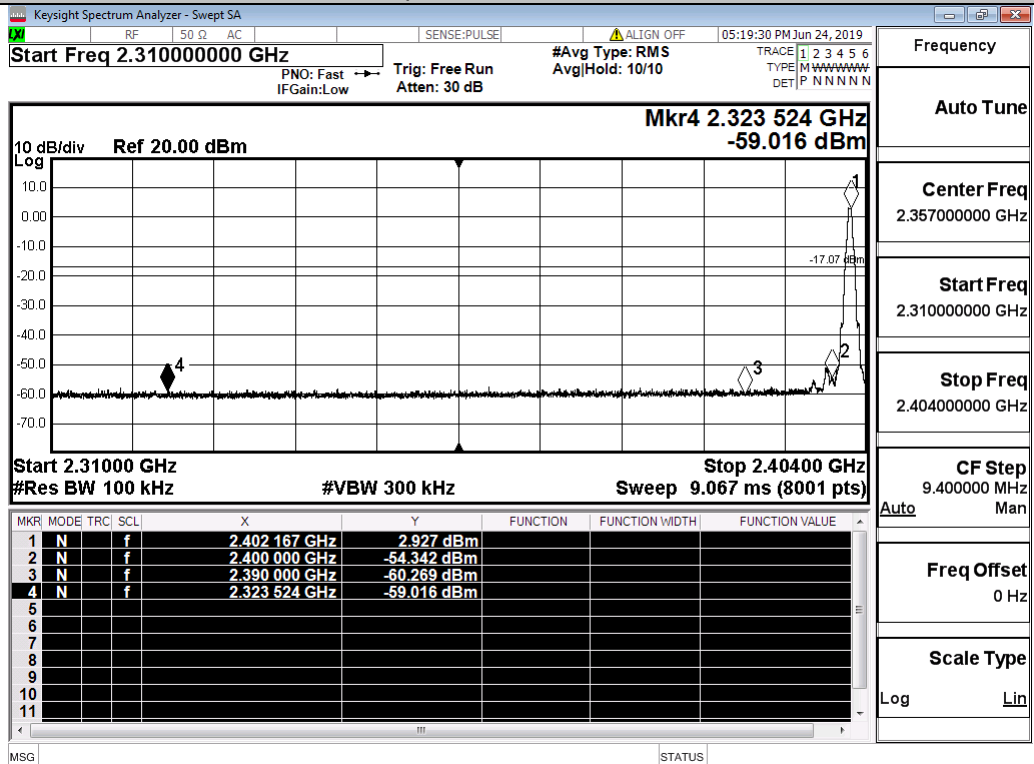


A.7 Band-edge for RF Conducted Emissions

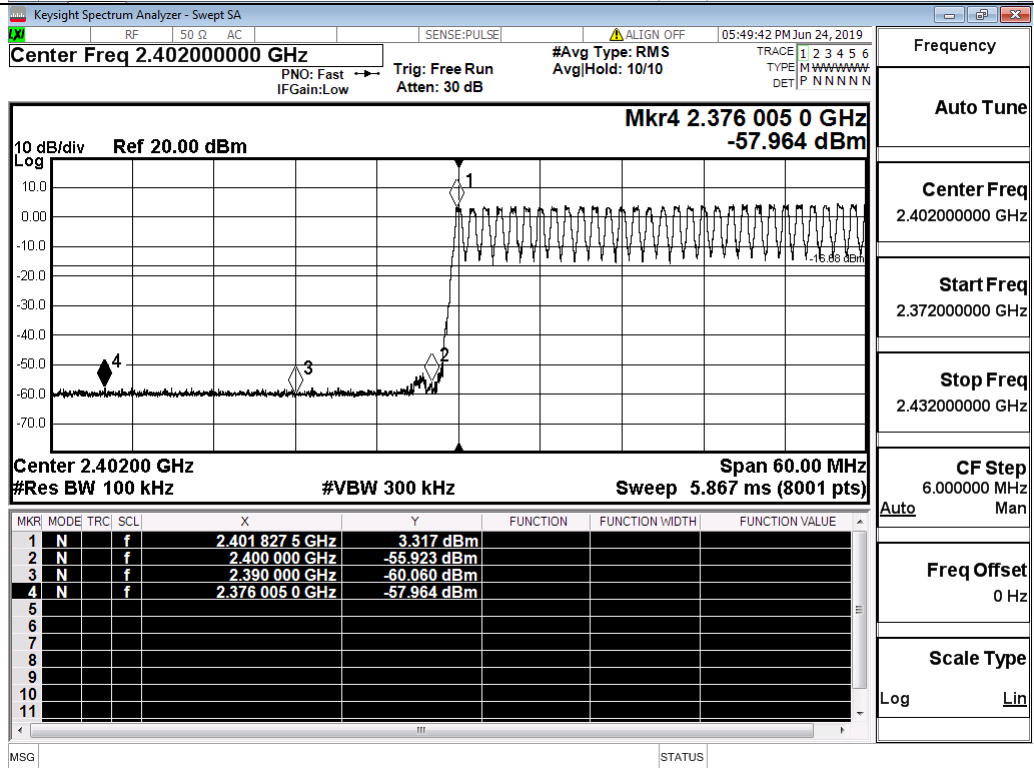
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	2.927	Off	-54.342	-17.07	PASS
			3.317	On	-55.923	-16.68	PASS
	HCH	2480	5.462	Off	-53.622	-14.54	PASS
			5.771	On	-56.197	-14.23	PASS
π/4DQPSK	LCH	2402	1.602	Off	-47.804	-18.40	PASS
			2.923	On	-57.613	-17.08	PASS
	HCH	2480	3.916	Off	-57.486	-16.08	PASS
			5.066	On	-58.562	-14.93	PASS
8DPSK	LCH	2402	0.935	Off	-50.745	-19.07	PASS
			2.280	On	-50.145	-17.72	PASS
	HCH	2480	3.793	Off	-57.048	-16.21	PASS
			4.989	On	-55.955	-15.01	PASS

Test Graphs

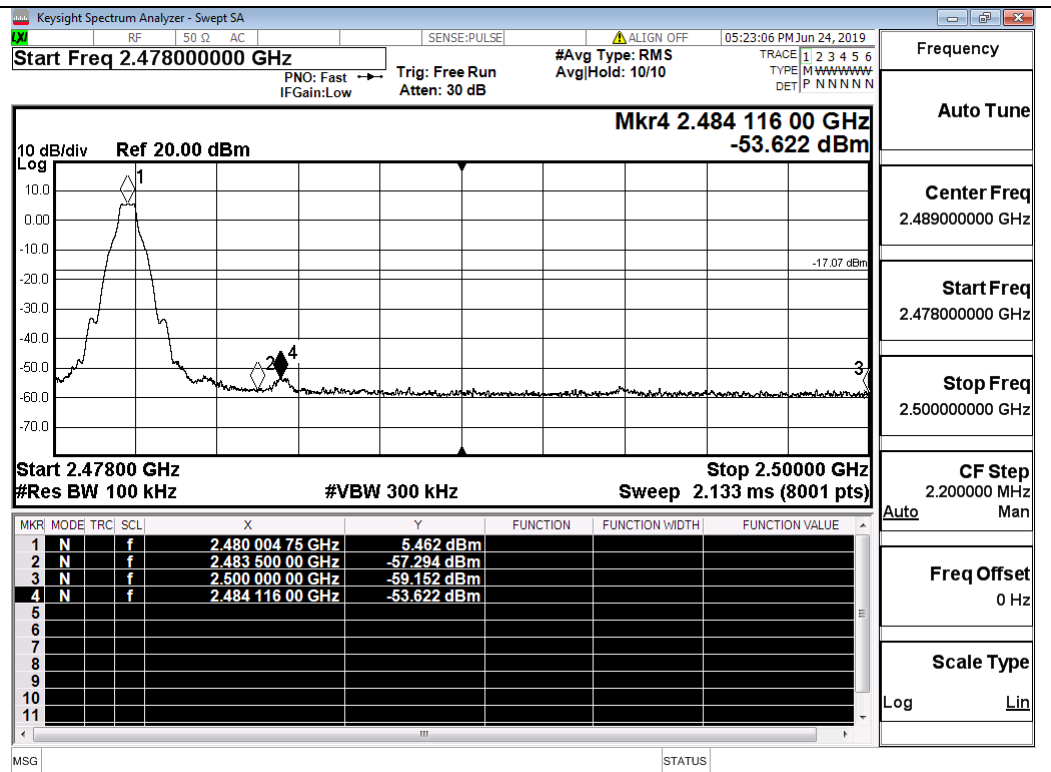
GFSK/LCH/No Hop



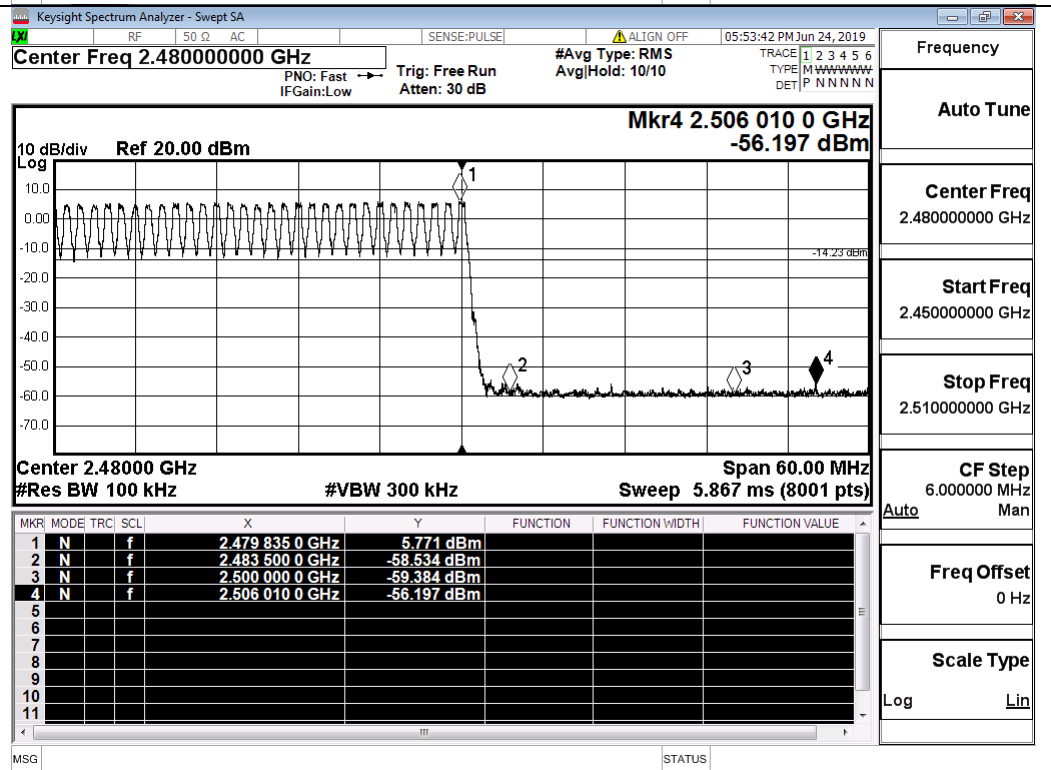
GFSK/LCH/Hop



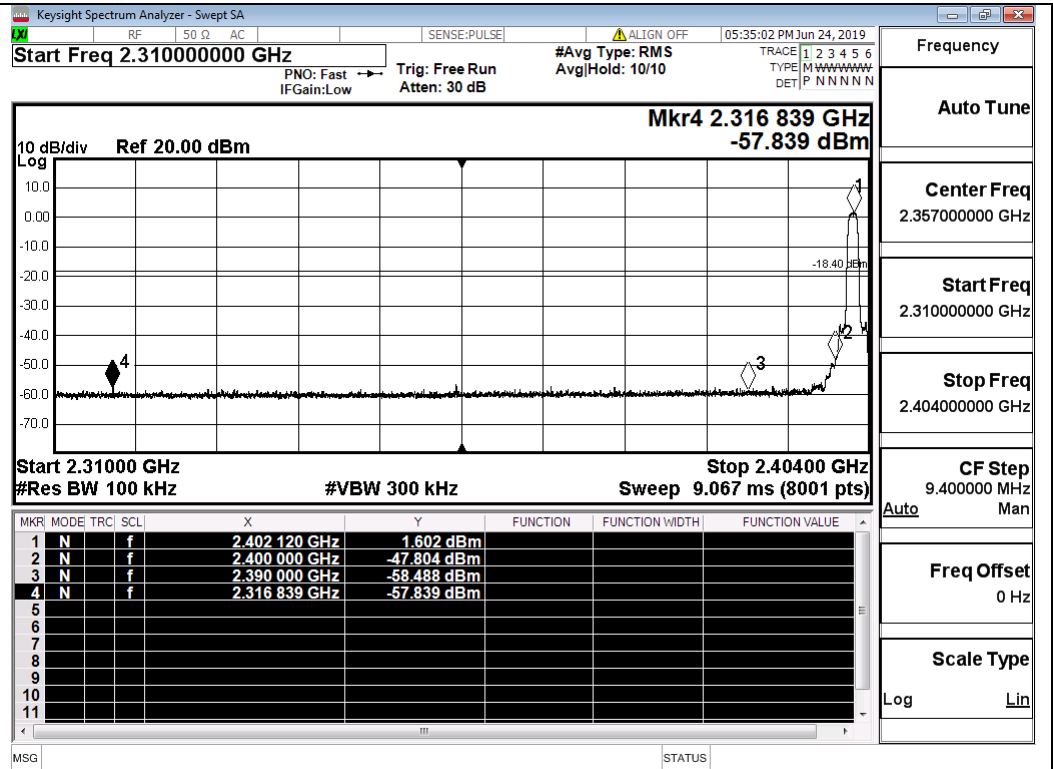
GFSK/HCH/No Hop



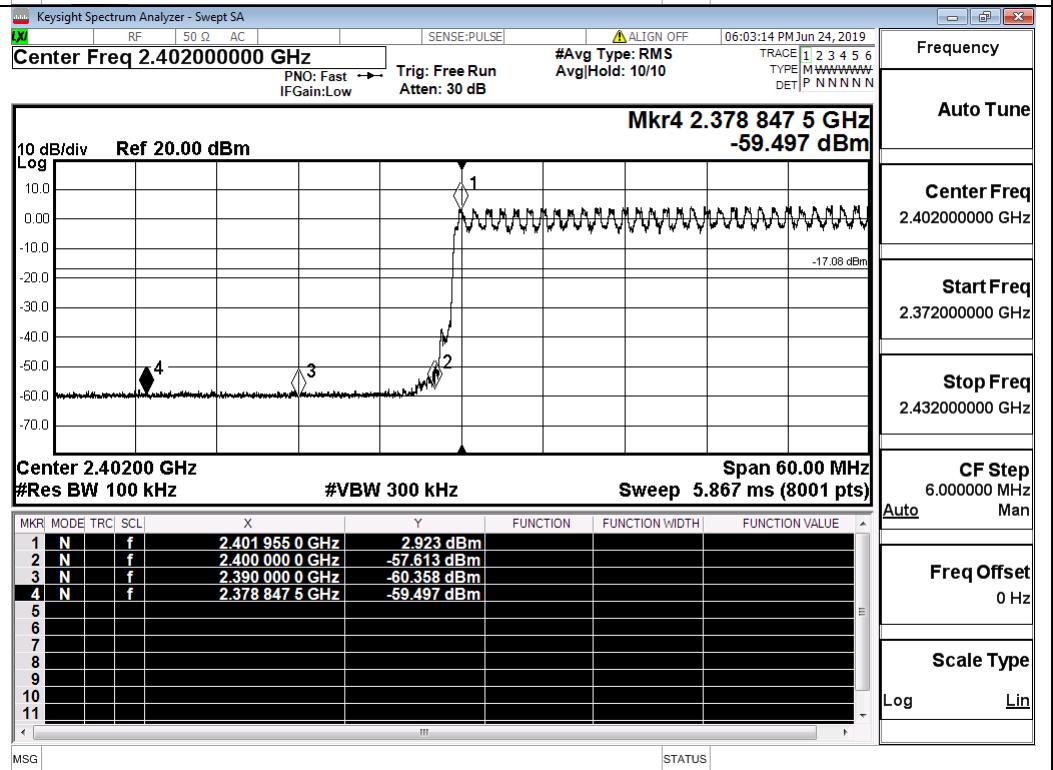
GFSK/HCH/Hop



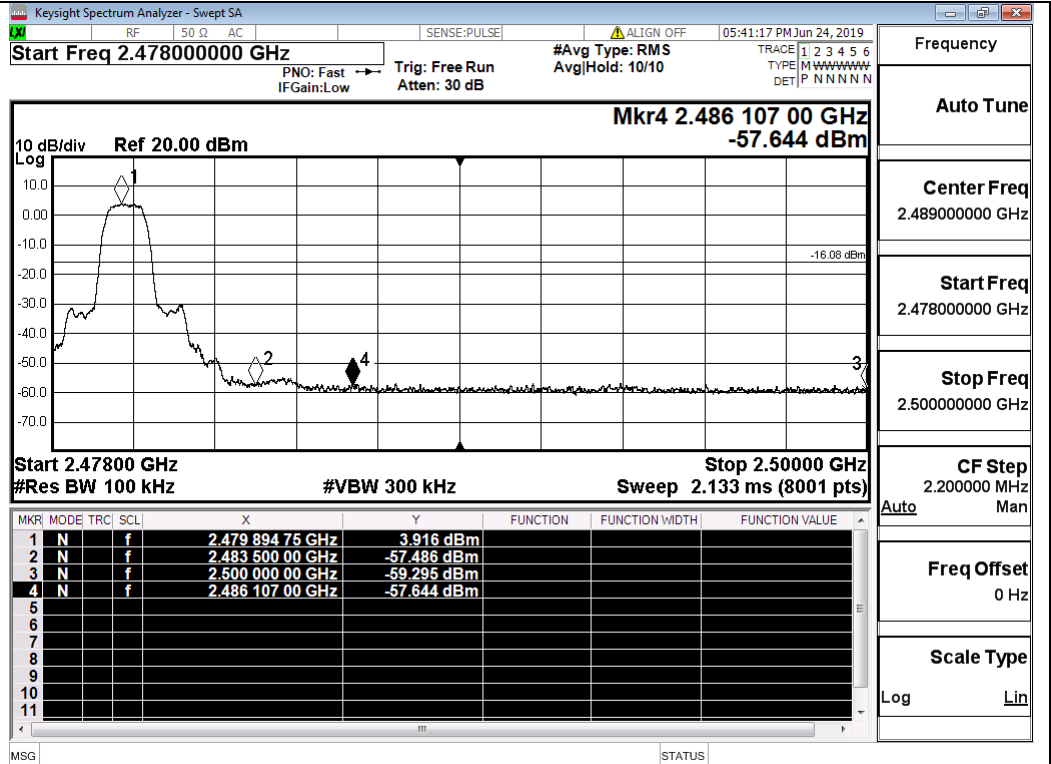
$\pi/4$ DQPSK/LCH/No Hop



$\pi/4$ DQPSK/LCH/Hop

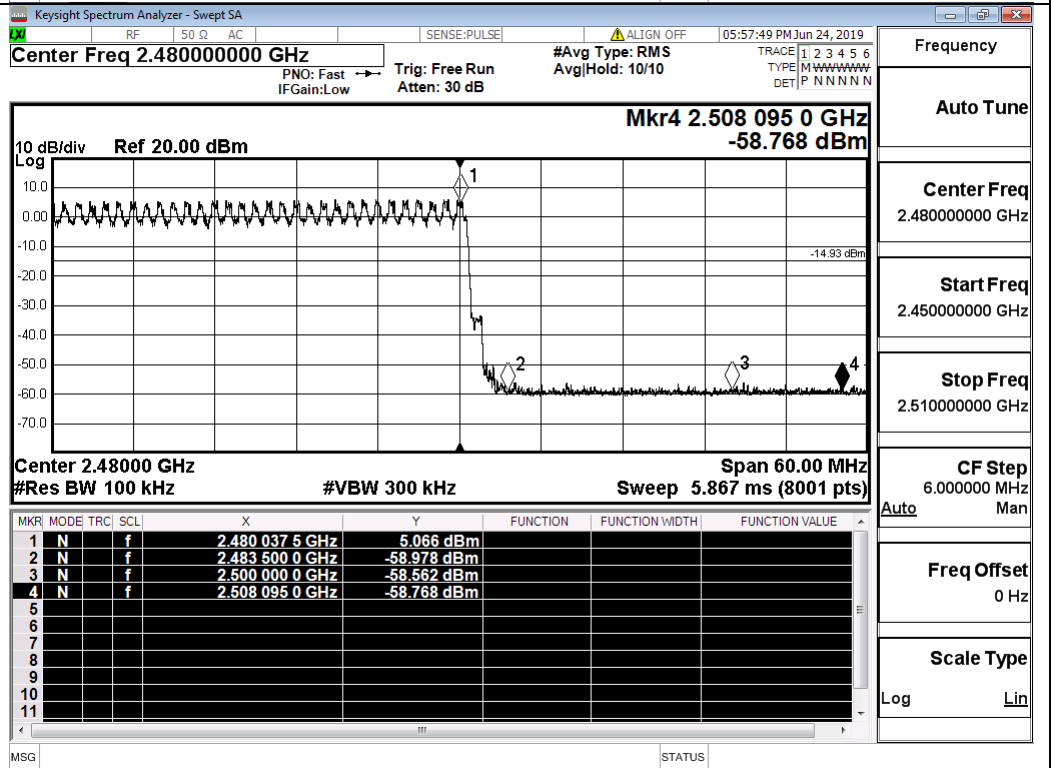


$\pi/4$ DQPSK/HCH/No Hop



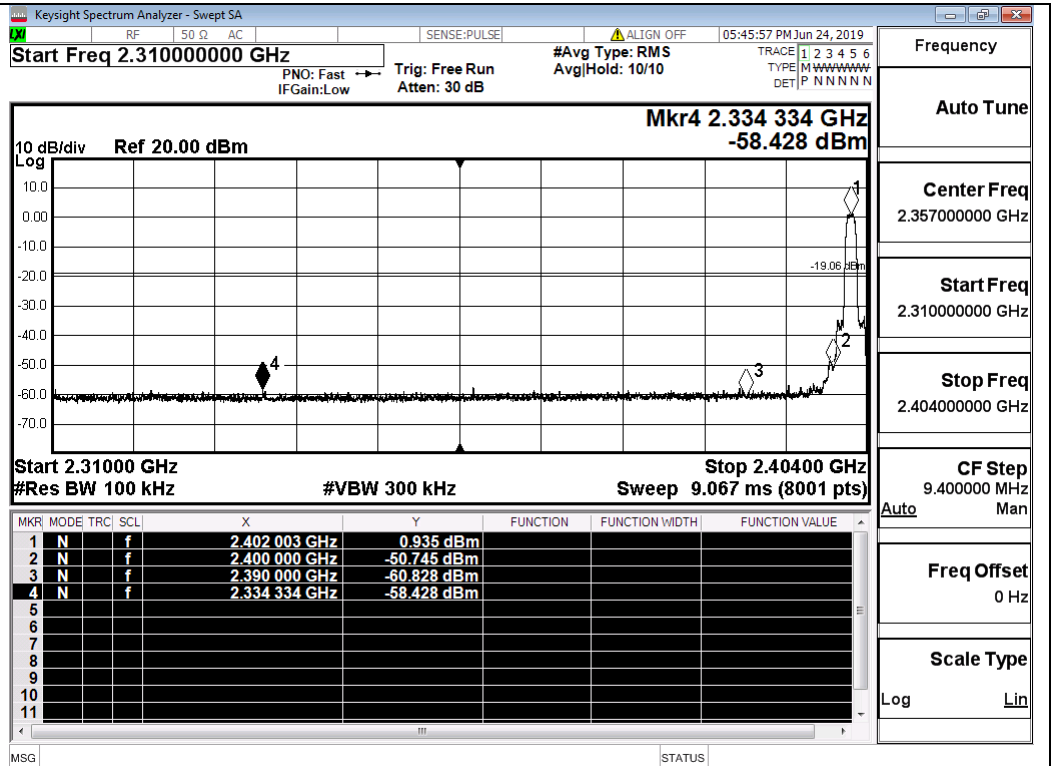
Frequency	Auto Tune
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Freq Offset	0 Hz
Scale Type	Log Lin

$\pi/4$ DQPSK/HCH/Hop

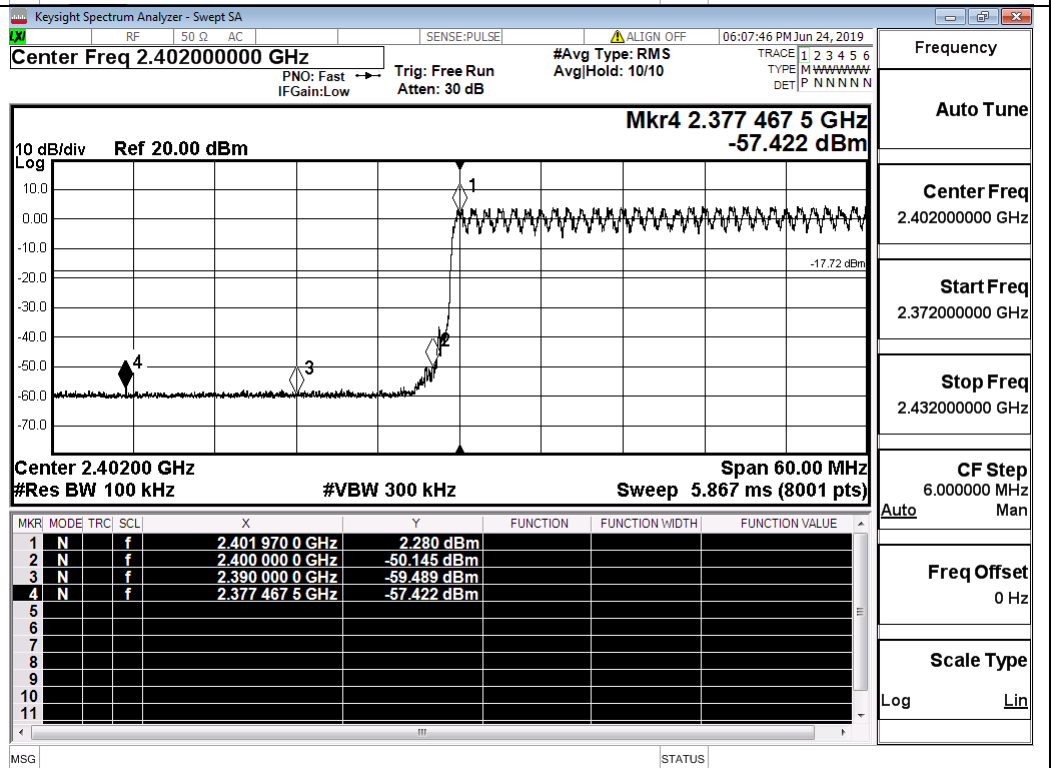


Frequency	Auto Tune
Center Freq	2.480000000 GHz
Start Freq	2.450000000 GHz
Stop Freq	2.510000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz
Scale Type	Log Lin

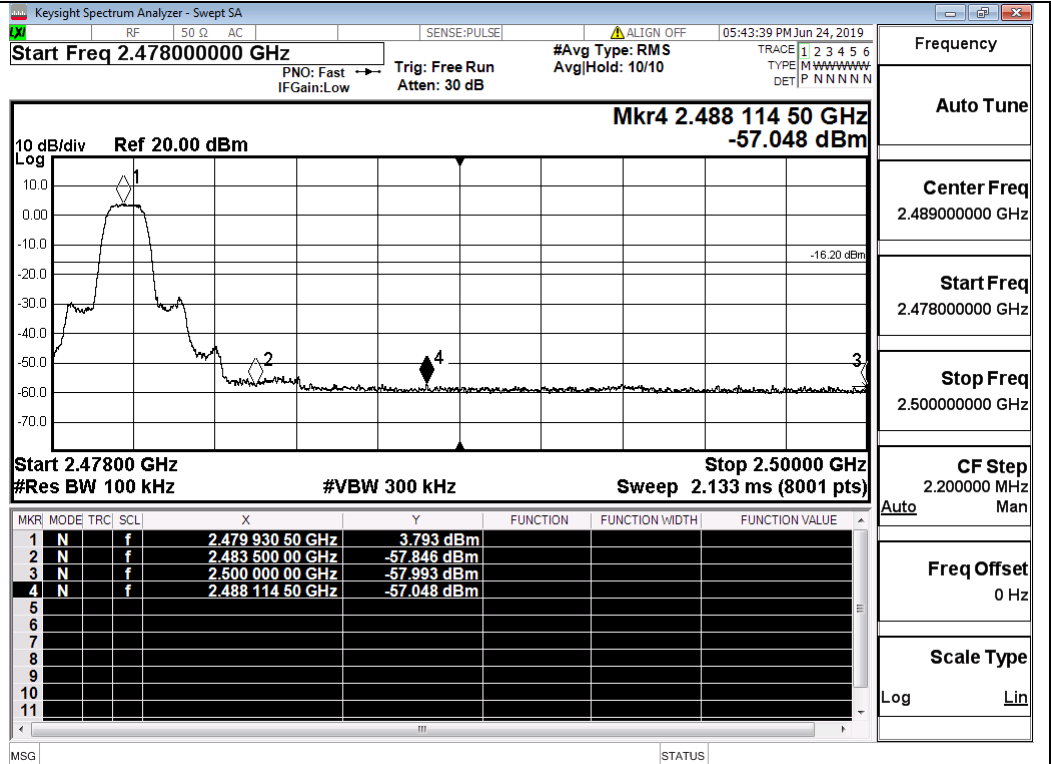
8DPSK/LCH/No Hop



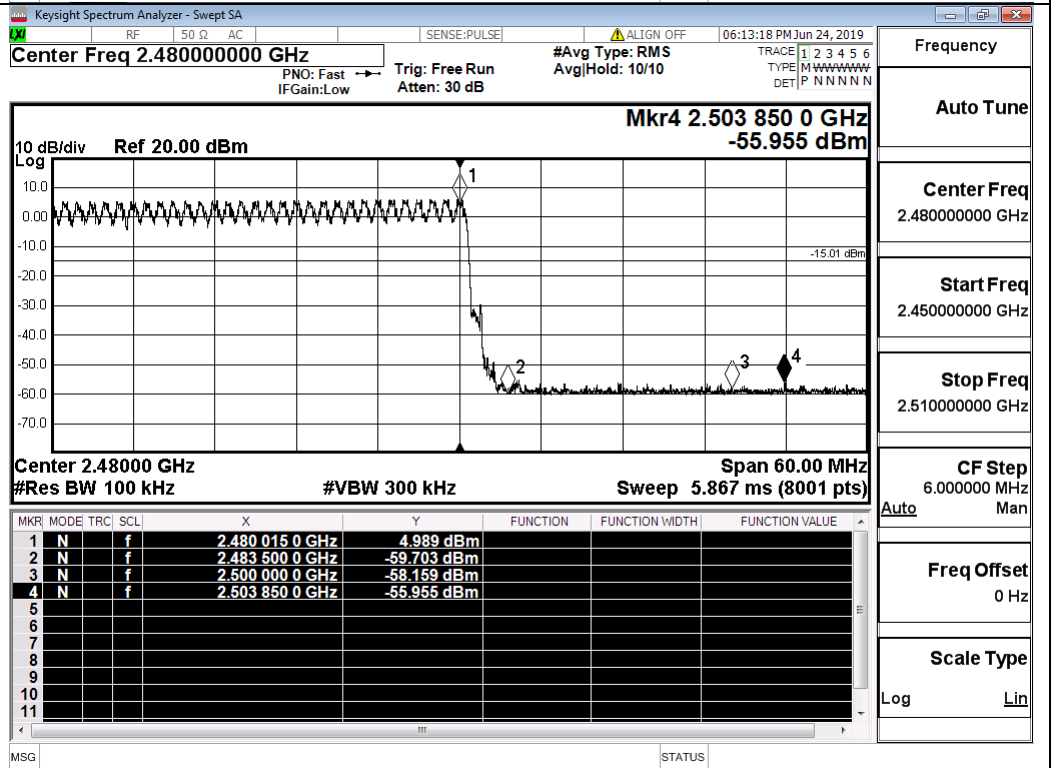
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



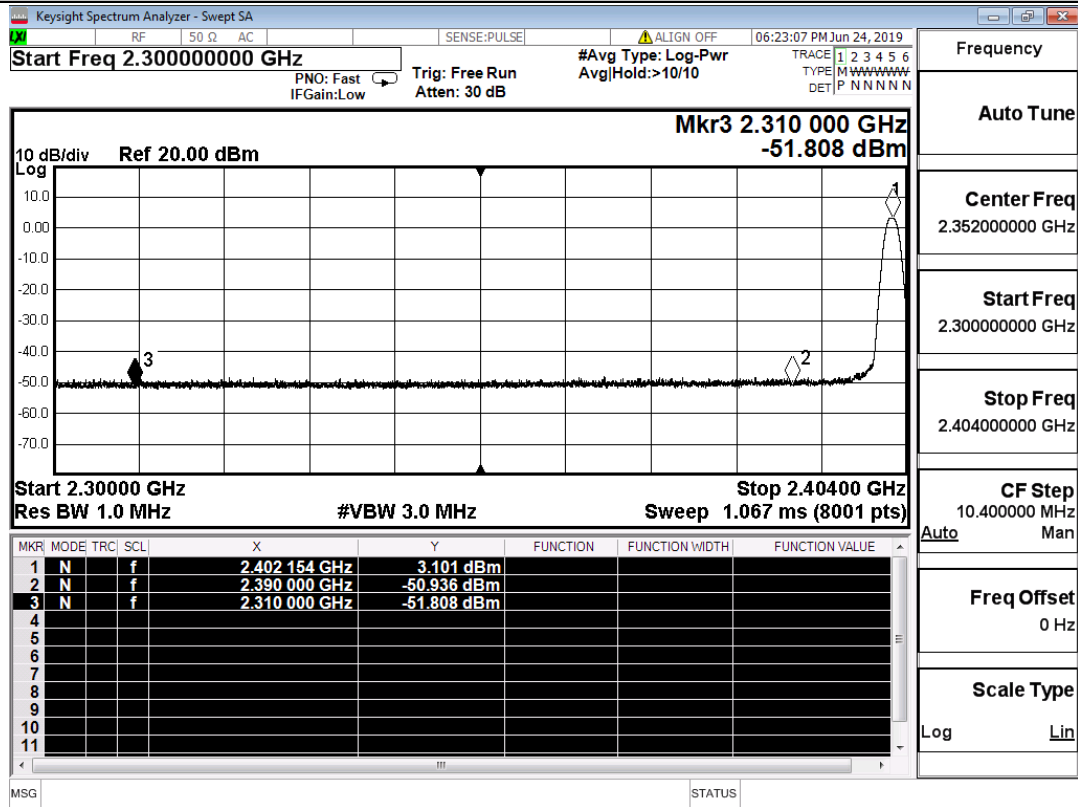
8DPSK/HCH/Hop



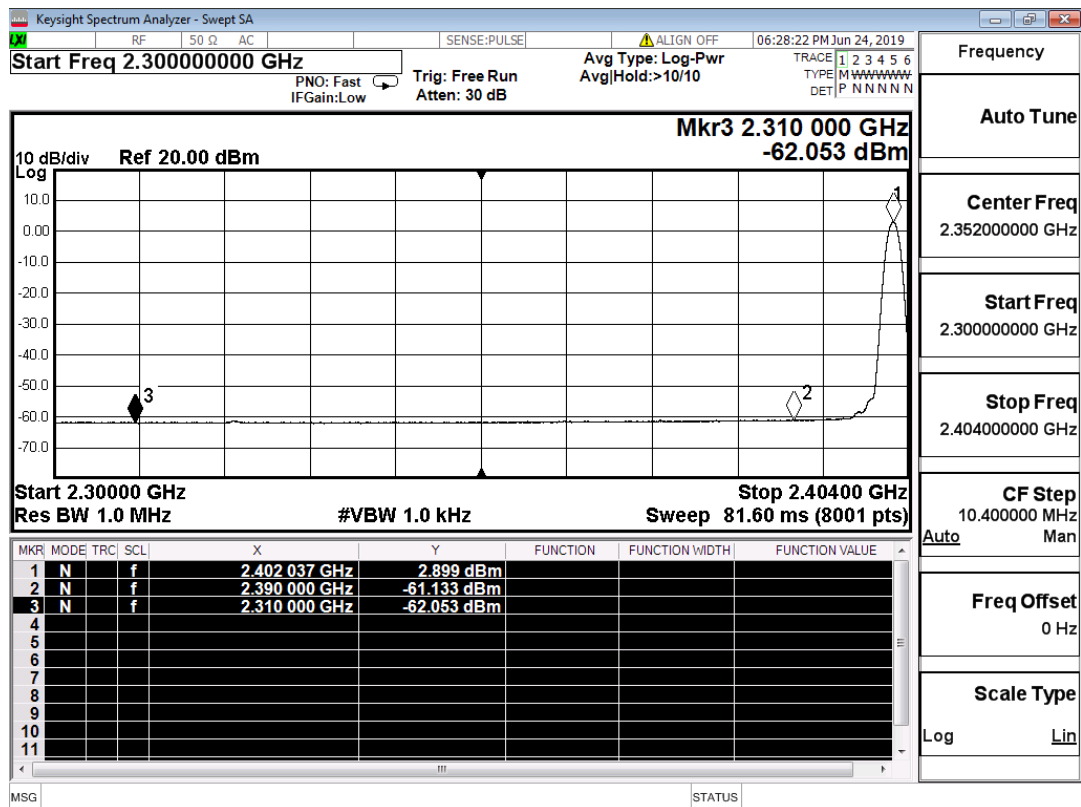
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-51.808	2.000	0	45.42	PEAK	74	PASS
	Off	2310.0	-62.053	2.000	0	35.18	AV	54	PASS
	Off	2390.0	-50.936	2.000	0	46.29	PEAK	74	PASS
	Off	2390.0	-61.133	2.000	0	36.10	AV	54	PASS
	Off	2483.5	-48.400	2.000	0	48.83	PEAK	74	PASS
	Off	2483.5	-57.912	2.000	0	39.32	AV	54	PASS
	Off	2500.0	-49.998	2.000	0	47.23	PEAK	74	PASS
	Off	2500.0	-60.697	2.000	0	36.53	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-50.806	2.000	0	46.42	PEAK	74	PASS
	Off	2310.0	-61.834	2.000	0	35.40	AV	54	PASS
	Off	2390.0	-49.640	2.000	0	47.59	PEAK	74	PASS
	Off	2390.0	-61.267	2.000	0	35.96	AV	54	PASS
	Off	2483.5	-47.335	2.000	0	49.90	PEAK	74	PASS
	Off	2483.5	-57.743	2.000	0	39.49	AV	54	PASS
	Off	2500.0	-50.527	2.000	0	46.70	PEAK	74	PASS
	Off	2500.0	-60.630	2.000	0	36.60	AV	54	PASS
8DPSK	Off	2310.0	-51.554	2.000	0	45.68	PEAK	74	PASS
	Off	2310.0	-61.861	2.000	0	35.37	AV	54	PASS
	Off	2390.0	-50.676	2.000	0	46.55	PEAK	74	PASS
	Off	2390.0	-61.139	2.000	0	36.09	AV	54	PASS
	Off	2483.5	-45.674	2.000	0	51.56	PEAK	74	PASS
	Off	2483.5	-58.019	2.000	0	39.21	AV	54	PASS
	Off	2500.0	-50.740	2.000	0	46.49	PEAK	74	PASS
	Off	2500.0	-60.902	2.000	0	36.33	AV	54	PASS

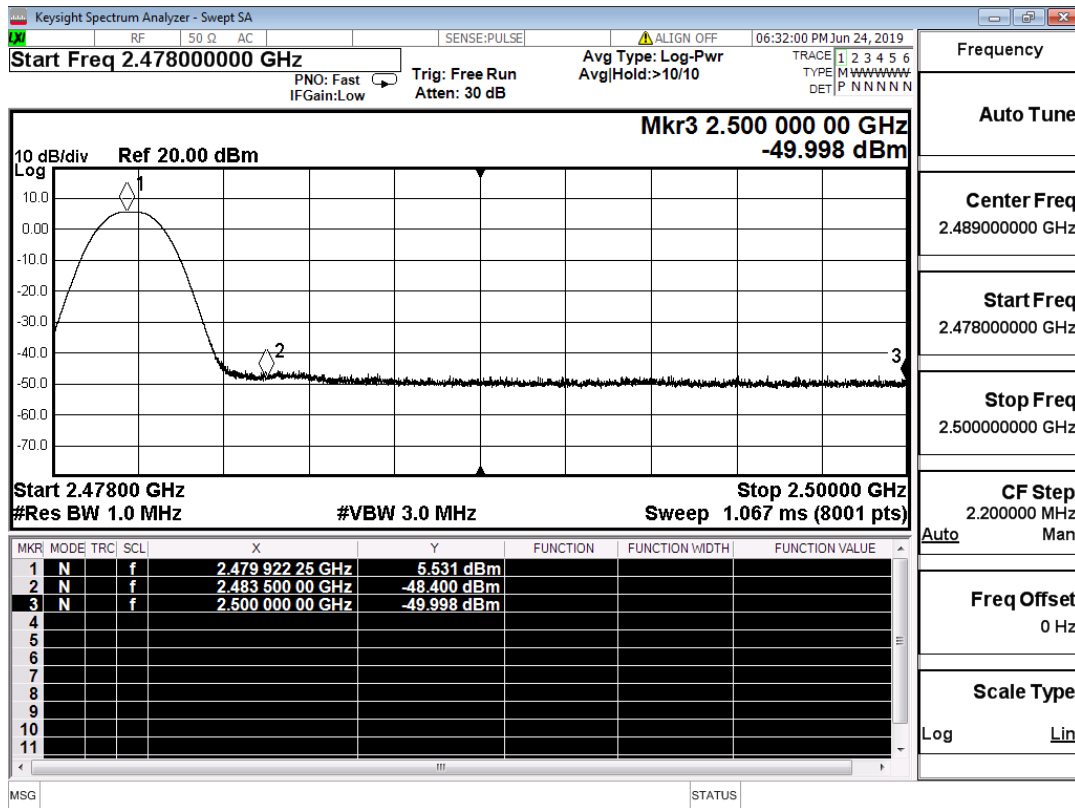
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



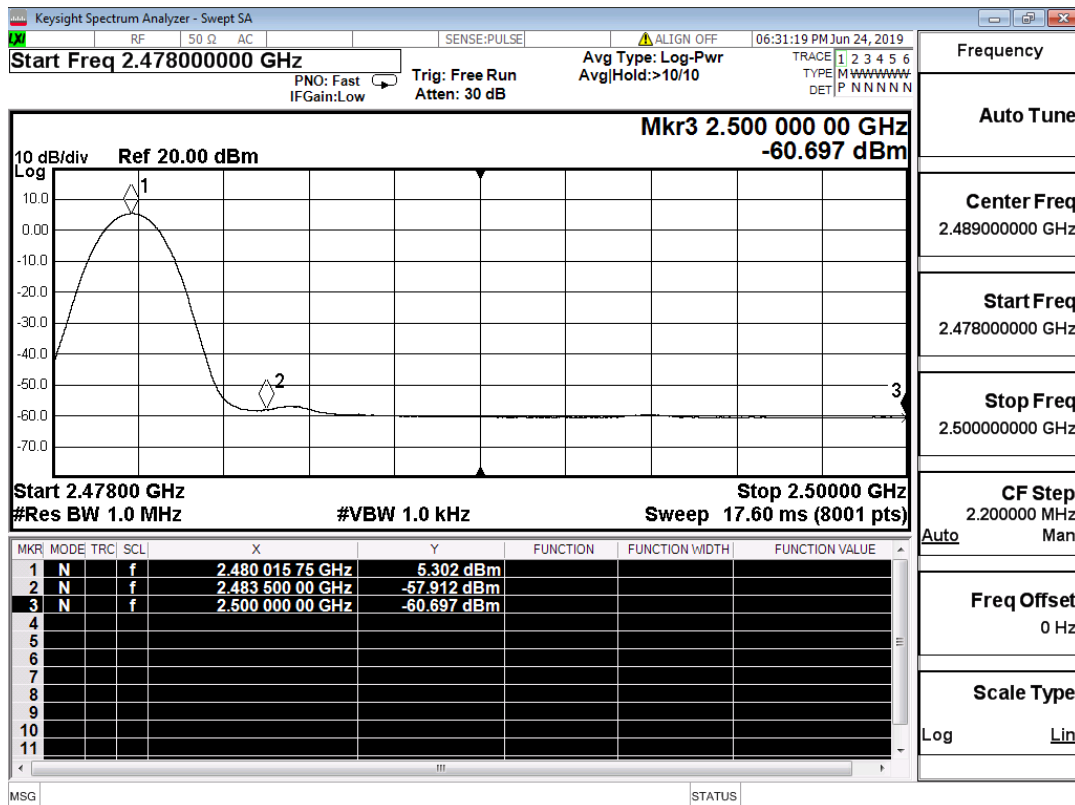
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



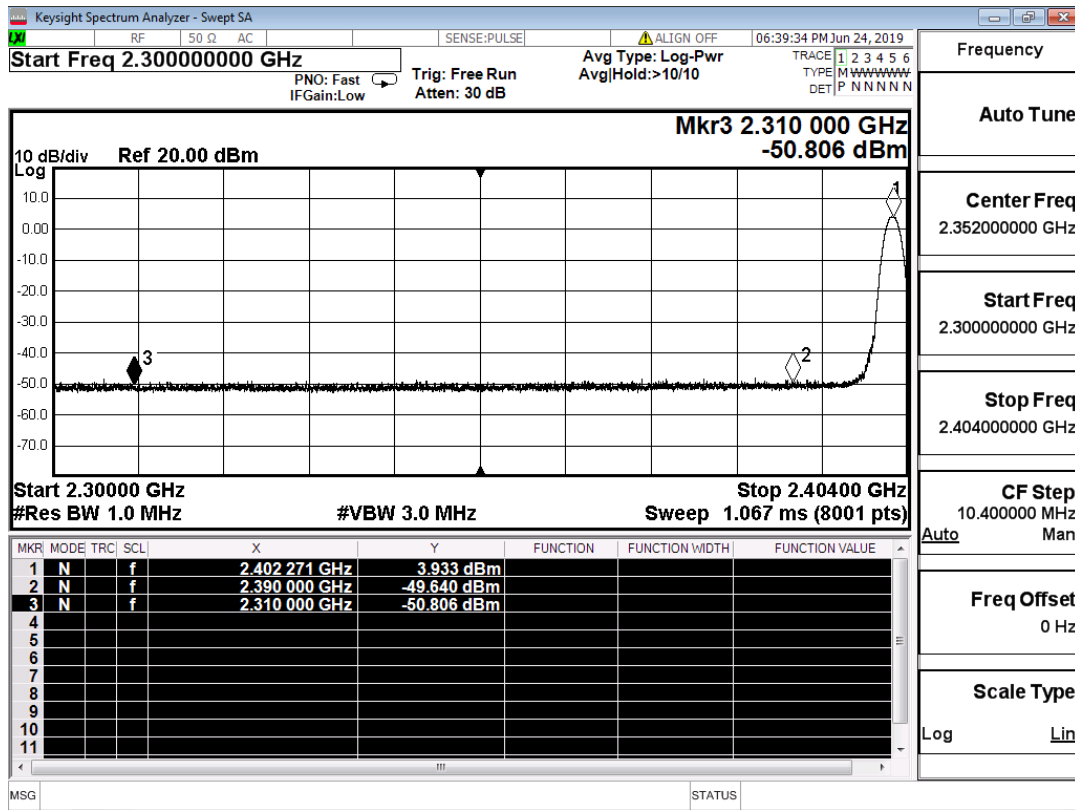
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



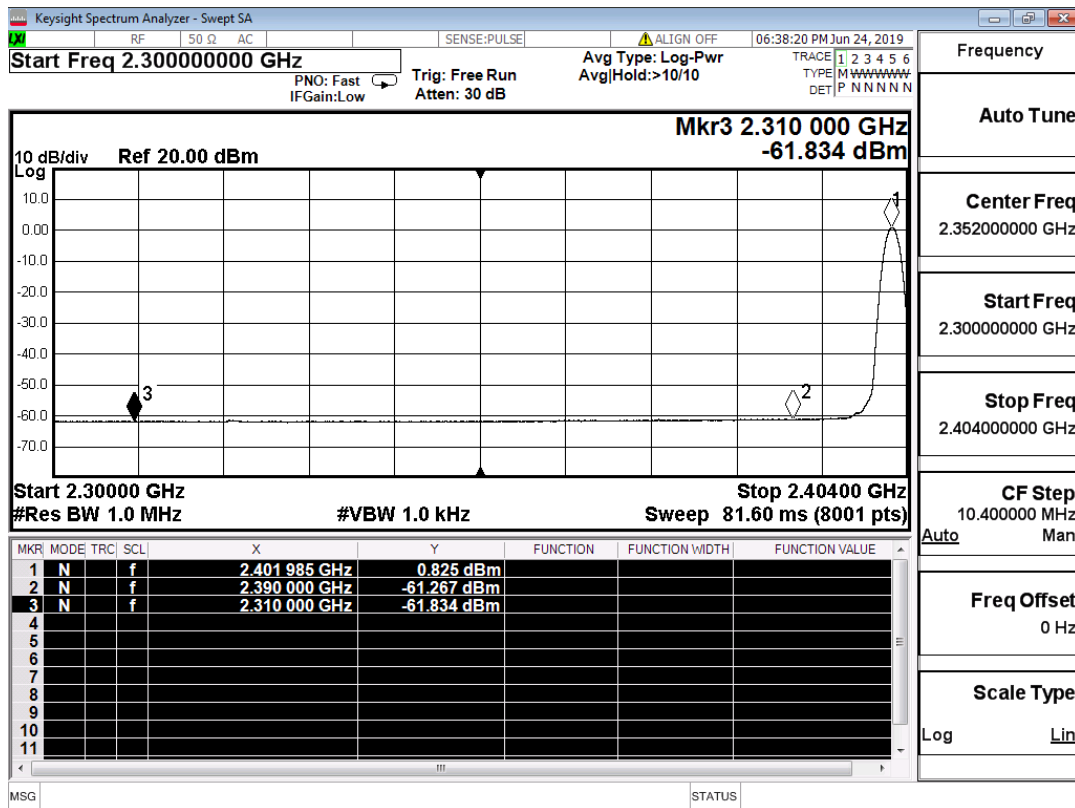
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



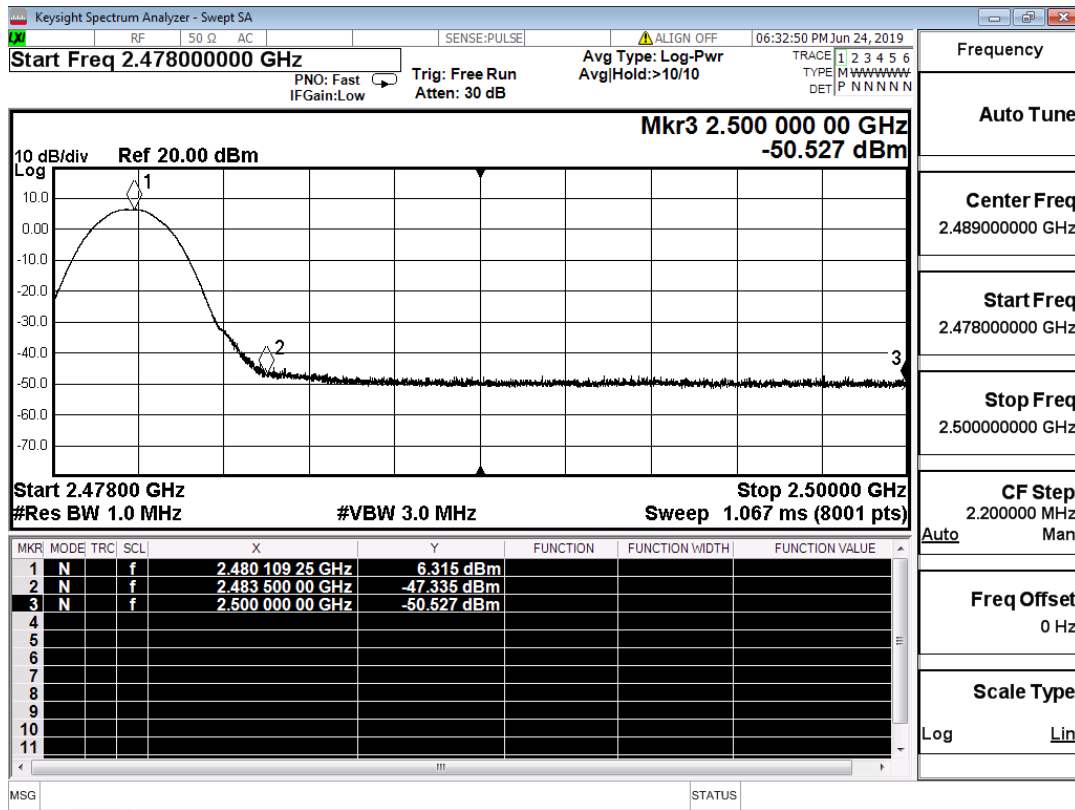
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



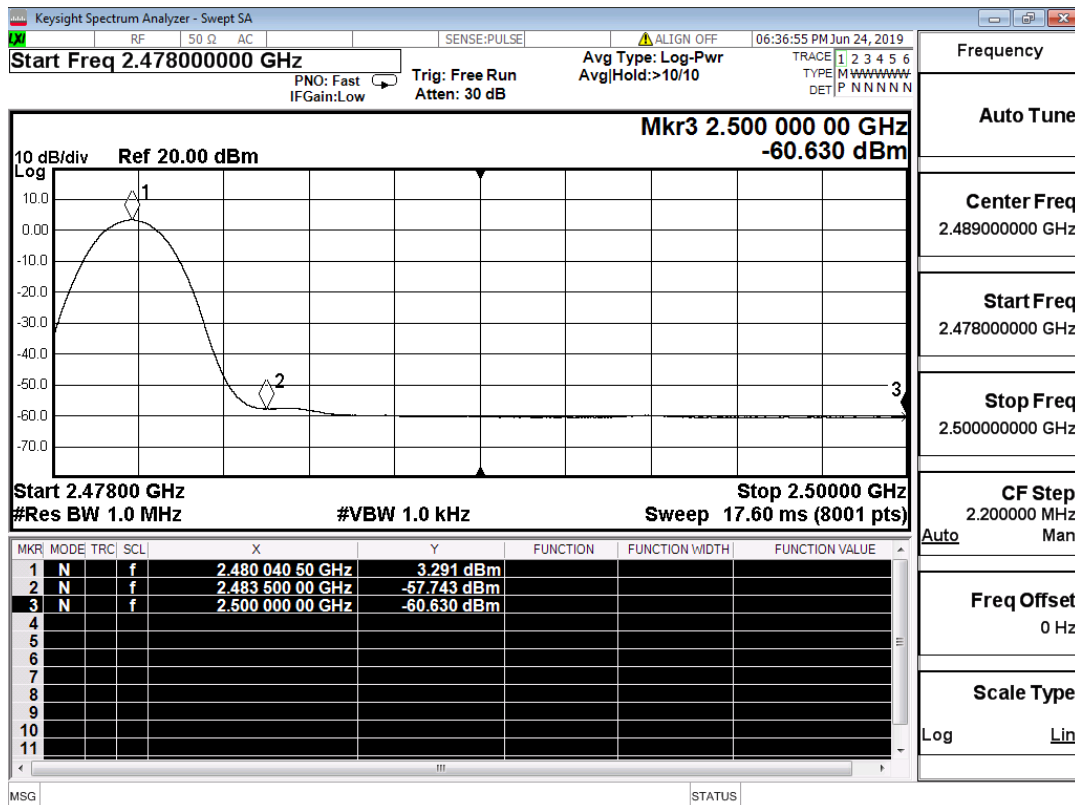
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



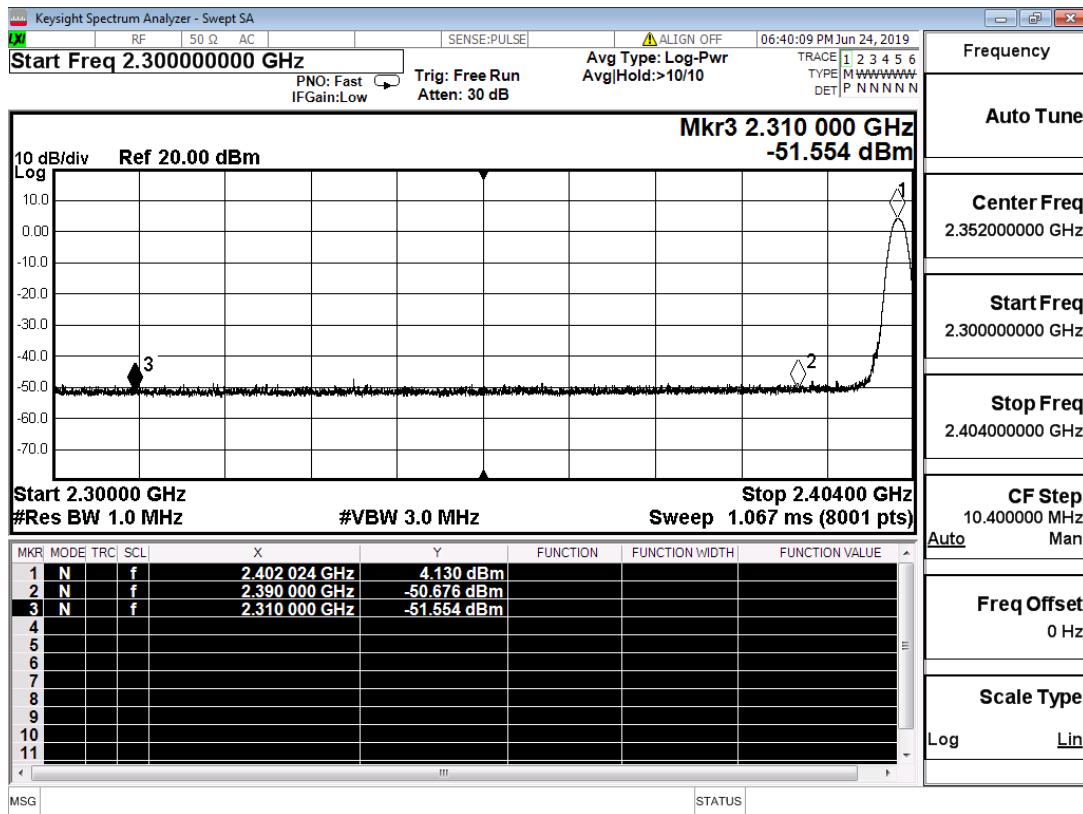
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



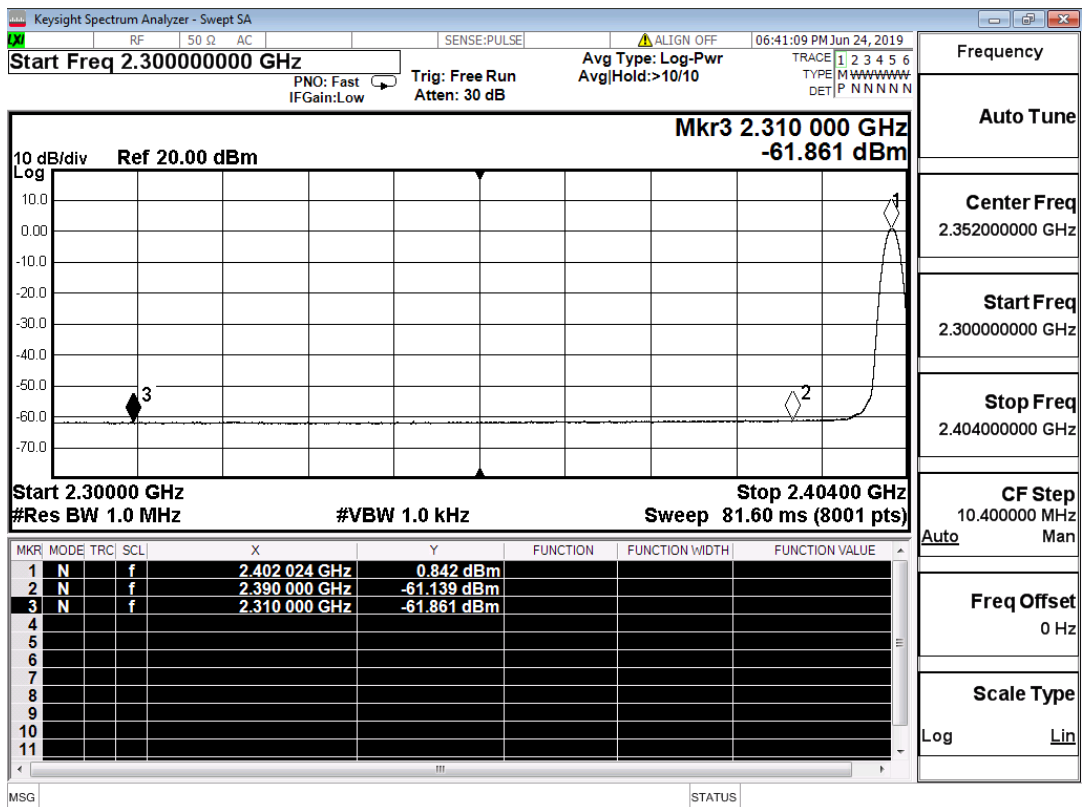
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



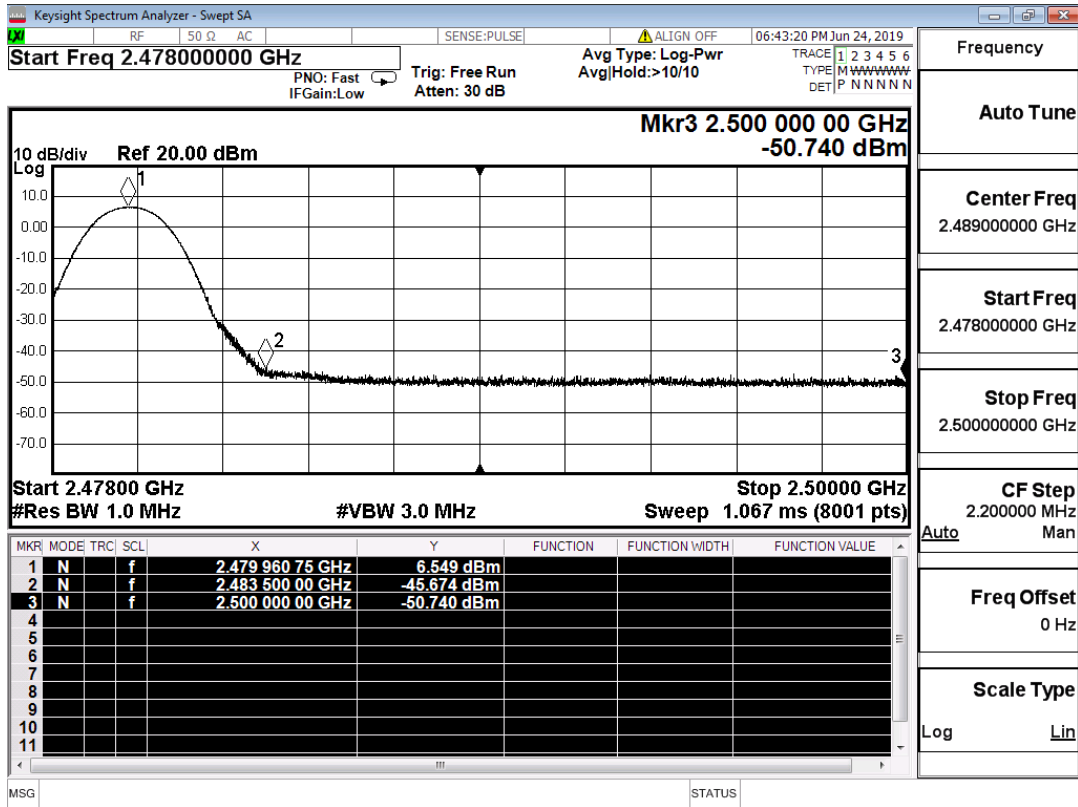
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

