

Appendix A

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

Product Name: TWS Wireless Speaker

Trade Mark: N/A

Test Model: HT-1315

Environmental Conditions

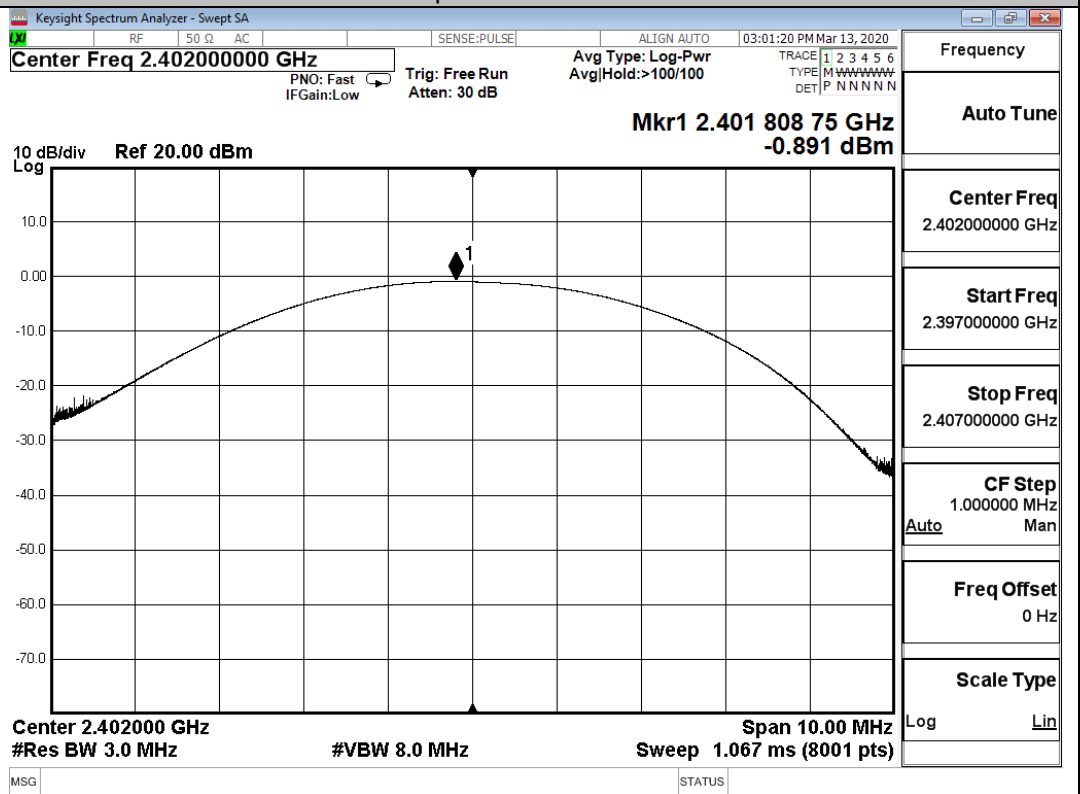
Temperature:	23.2 ° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa
Test Engineer:	CHUANG WANG
Supervised by:	JAYDEN ZHUO

A.1 Maximum Conducted Peak Output Power

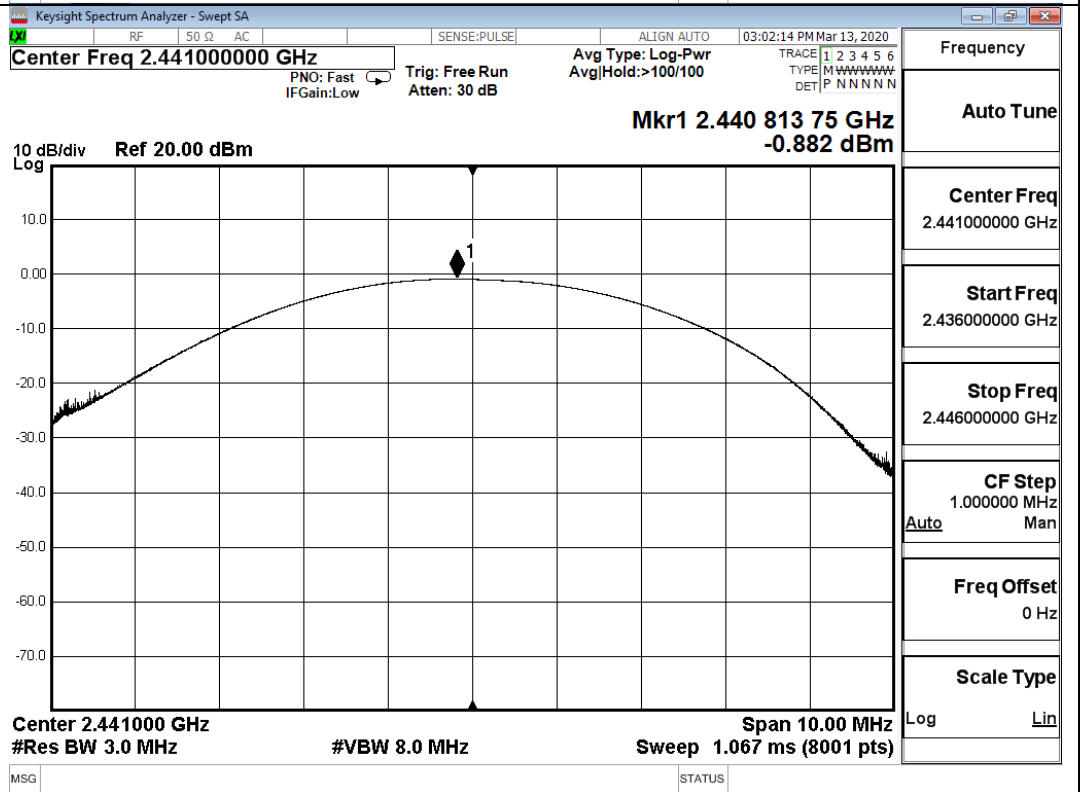
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.891	21	PASS
	MCH	-0.882	21	PASS
	HCH	-0.700	21	PASS
$\pi/4$ DQPSK	LCH	-0.205	21	PASS
	MCH	-0.196	21	PASS
	HCH	0.002	21	PASS

Test Graphs

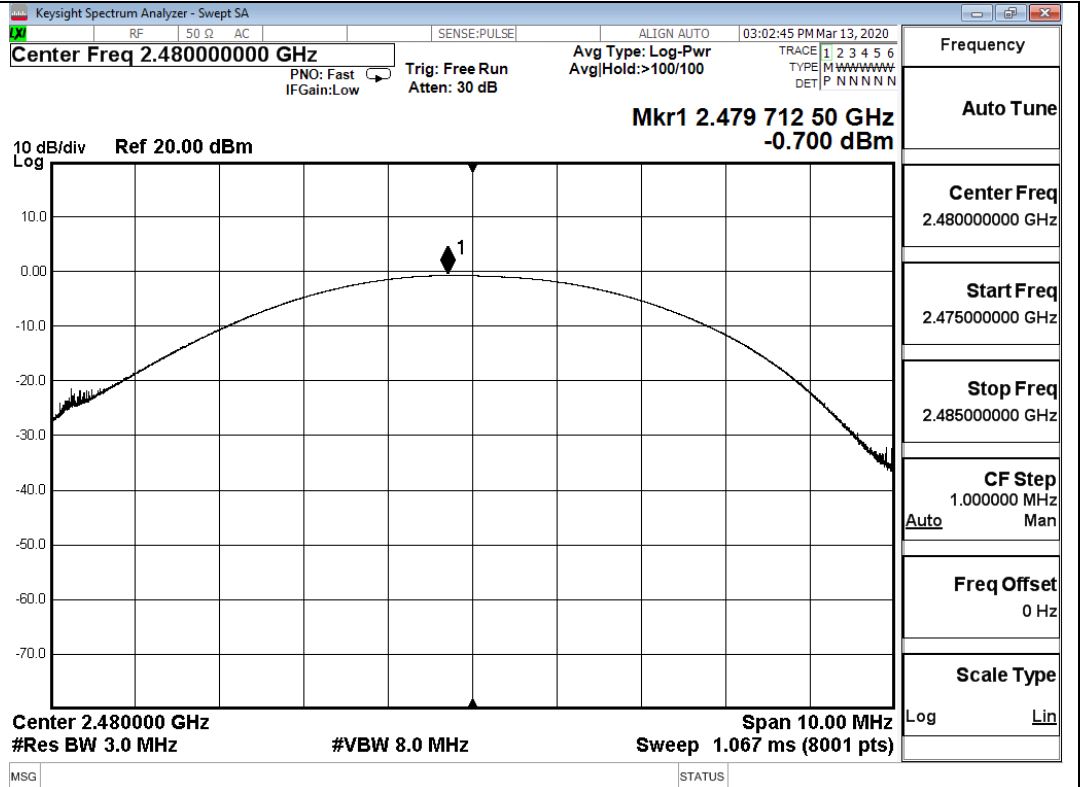
GFSK/LCH



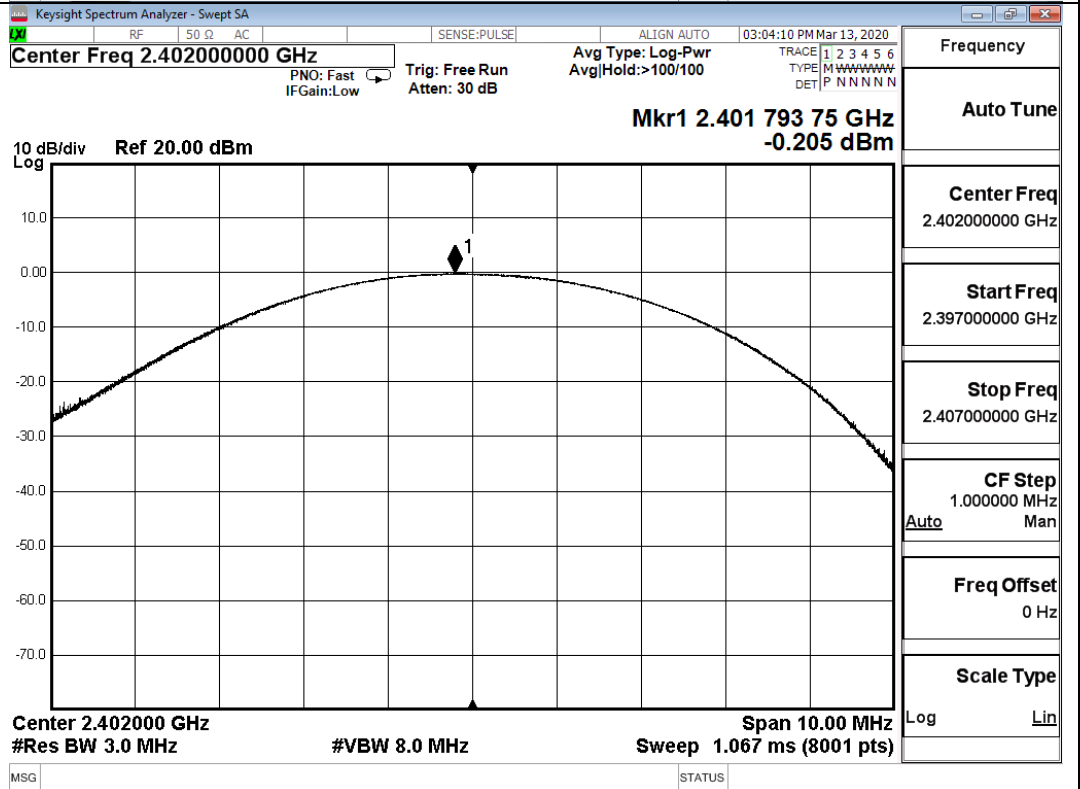
GFSK/MCH



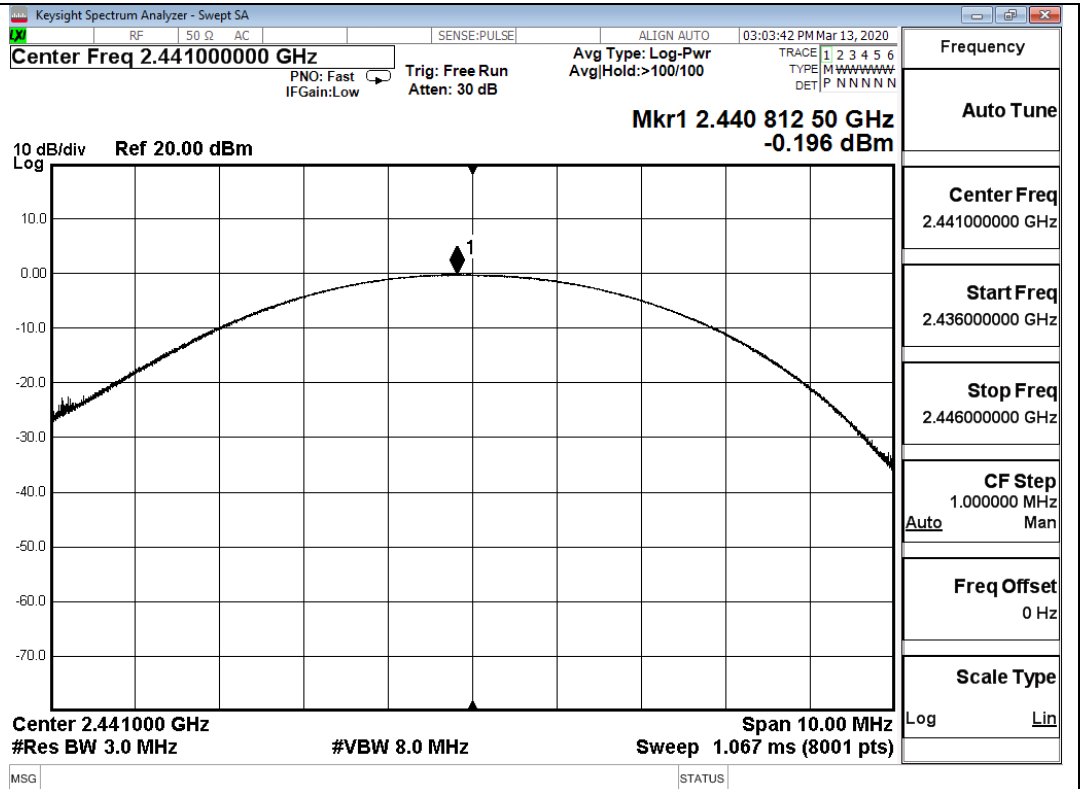
GFSK/HCH



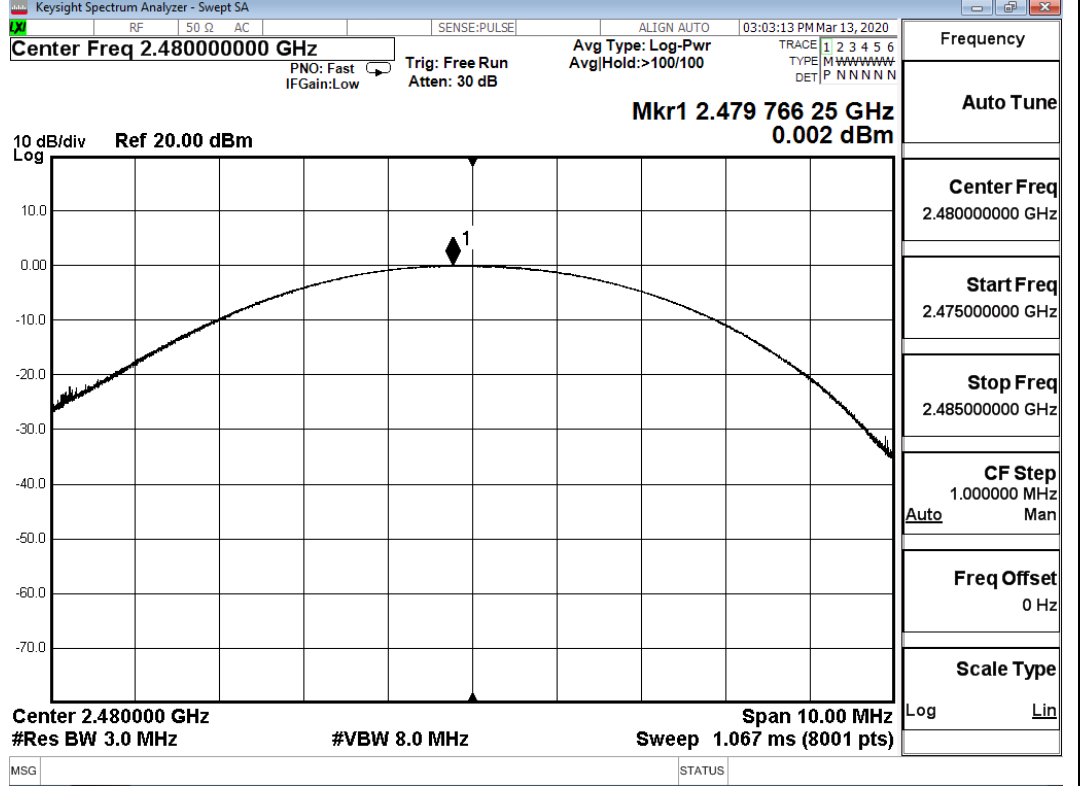
π /4DQPSK/LCH



$\pi/4$ DQPSK/MCH

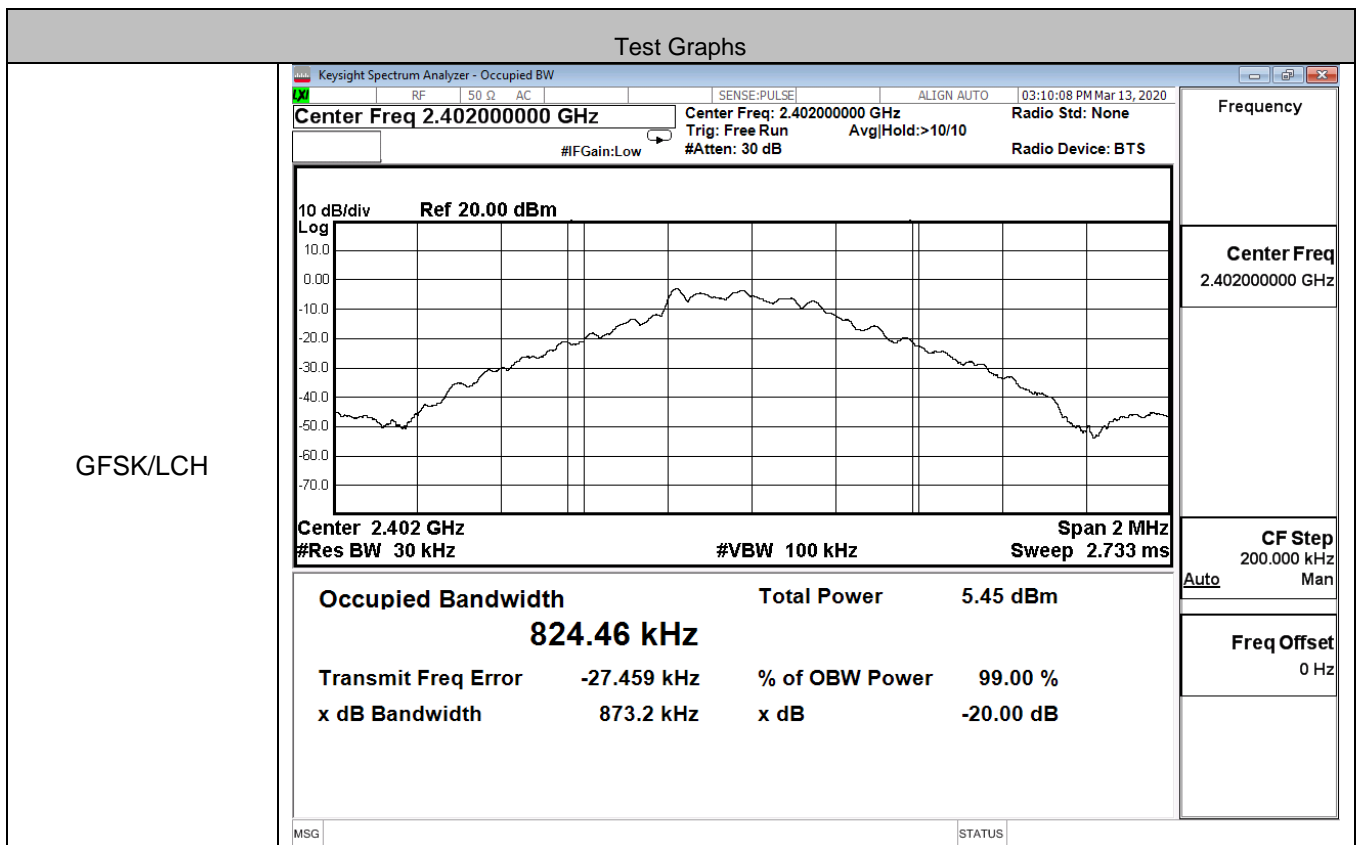


$\pi/4$ DQPSK/HCH

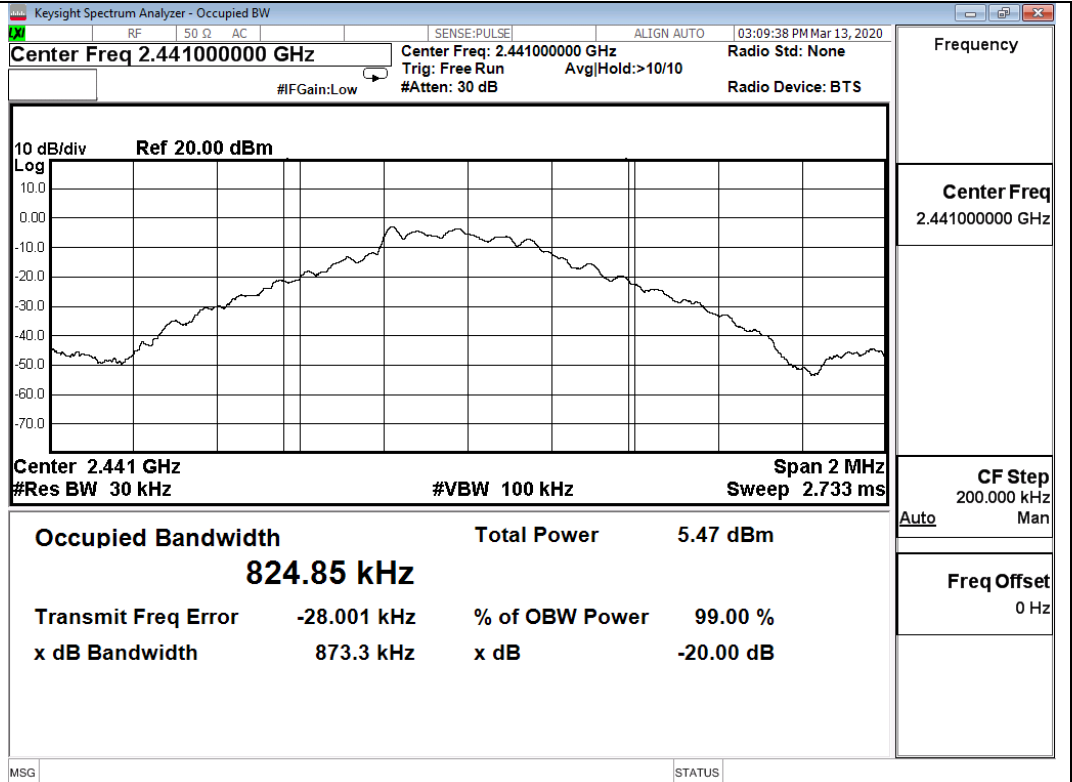


A.2 99% and 20dB Bandwidth

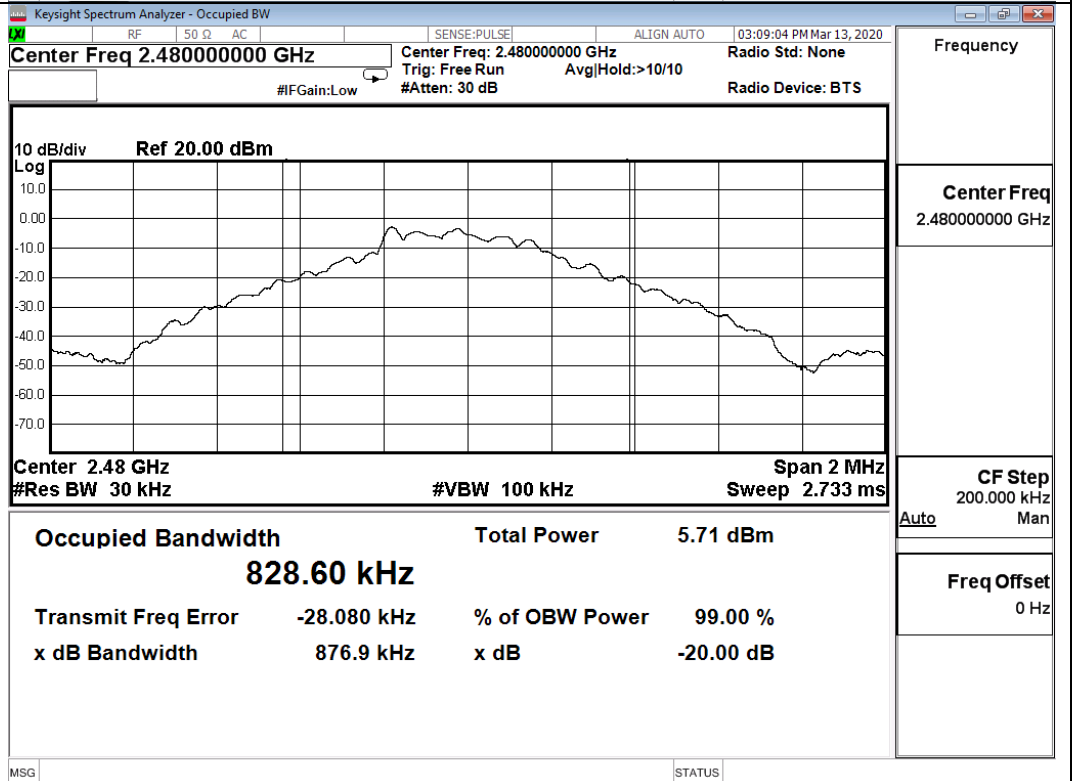
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.82446	0.8732	Not Specified	PASS
	MCH	0.82485	0.8733	Not Specified	PASS
	HCH	0.82860	0.8769	Not Specified	PASS
π/4DQPSK	LCH	1.1671	1.251	Not Specified	PASS
	MCH	1.1672	1.255	Not Specified	PASS
	HCH	1.1683	1.256	Not Specified	PASS



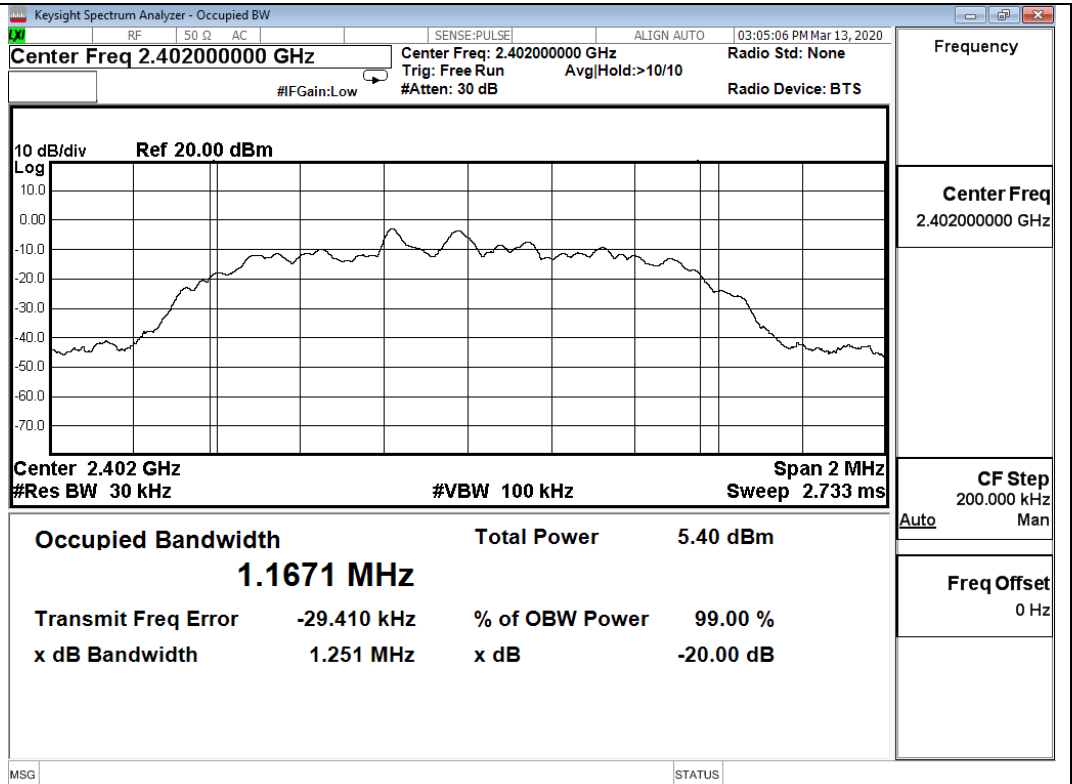
GFSK/MCH



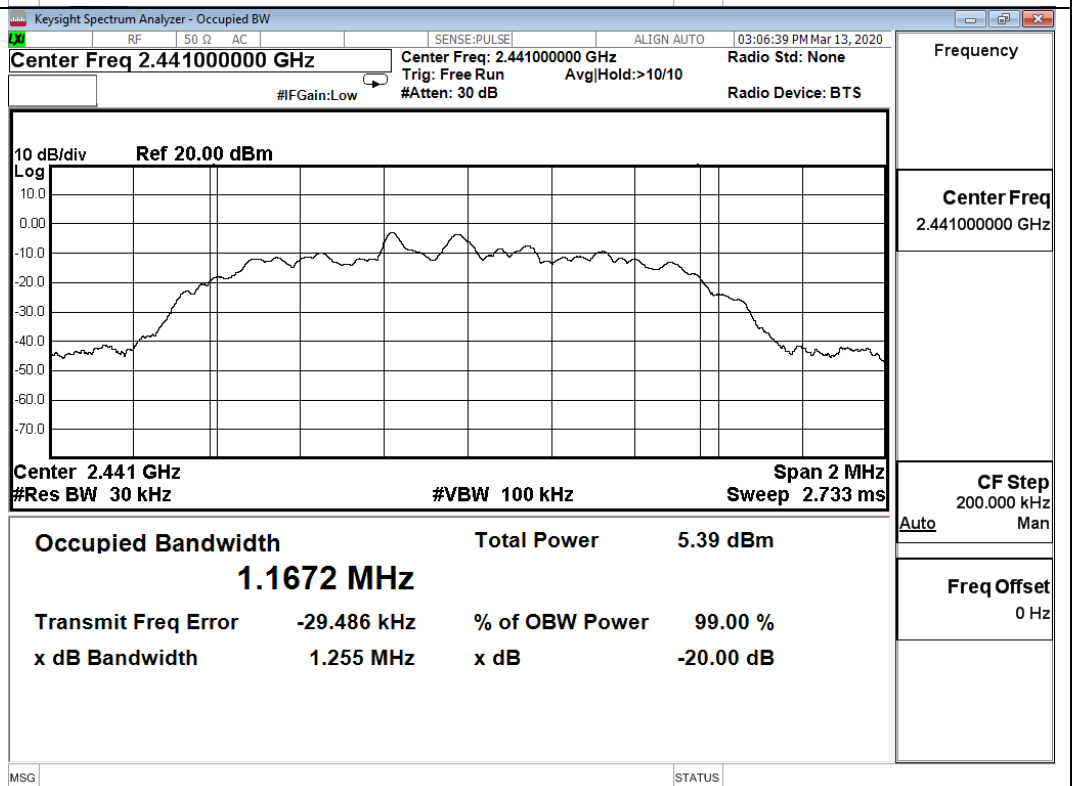
GFSK/HCH



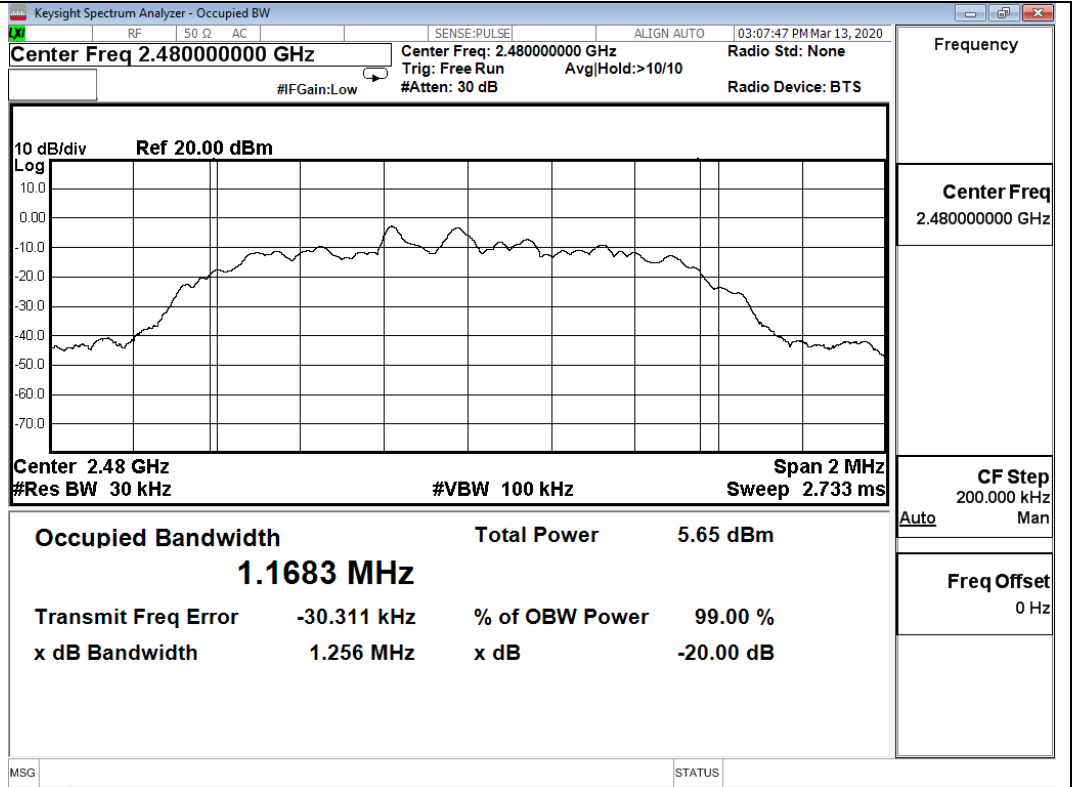
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

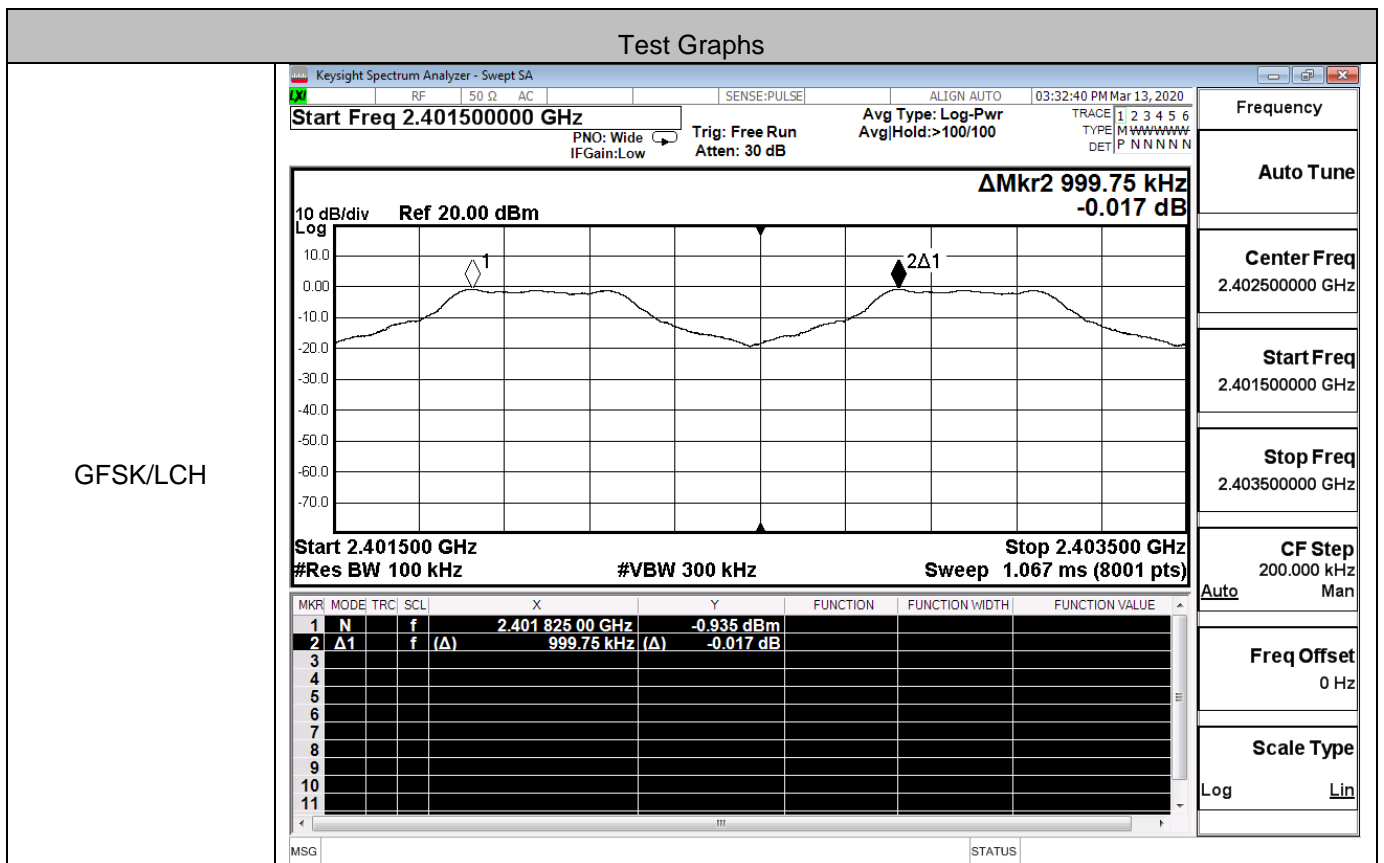


$\pi/4$ DQPSK/HCH

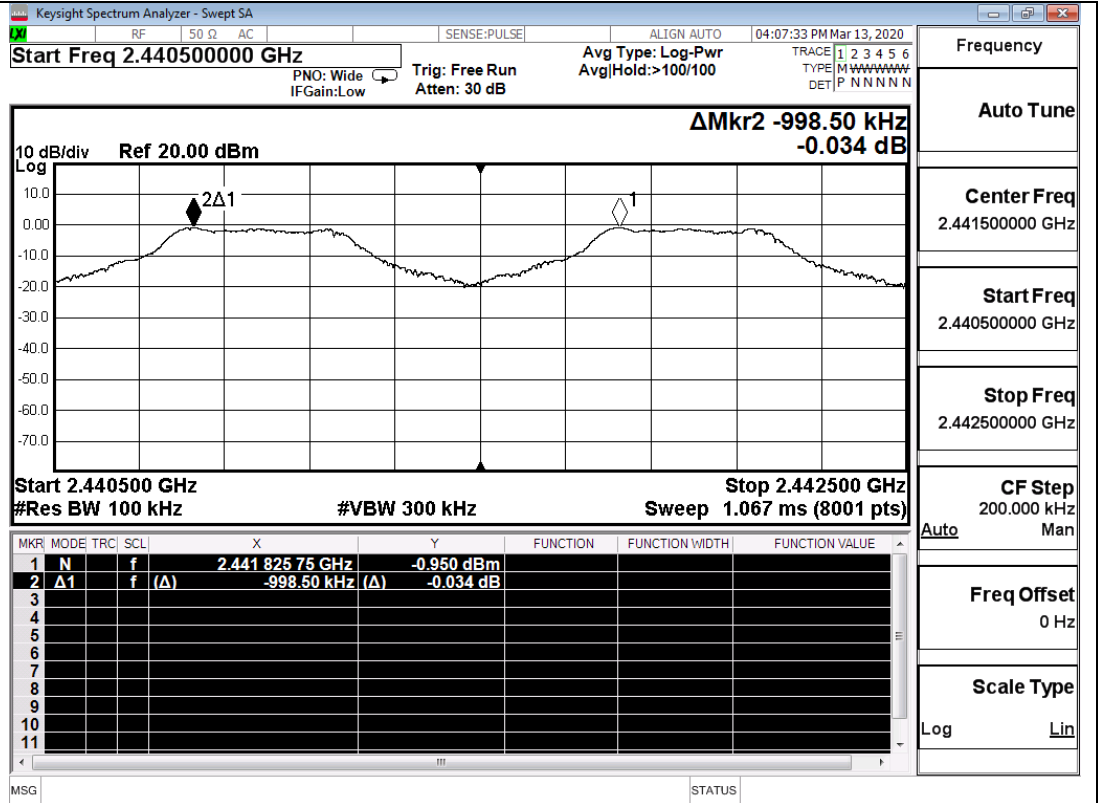


A.3 Carrier Frequency Separation

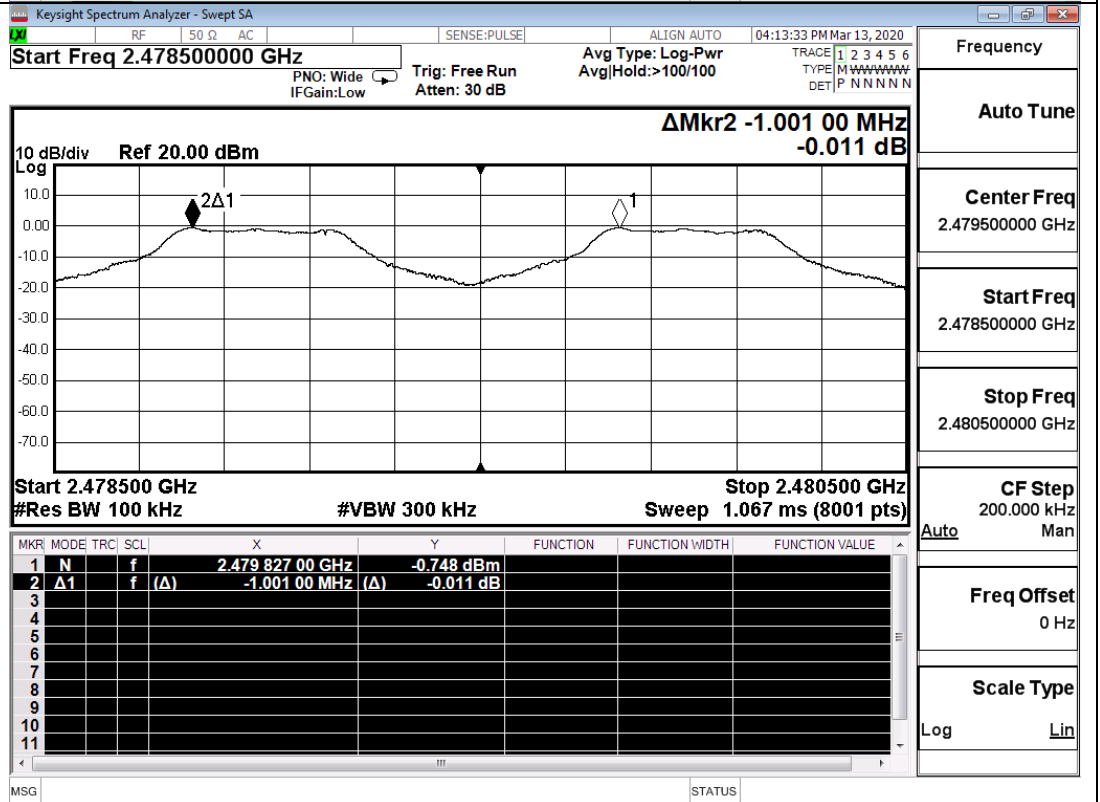
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz] 2/3*20dB Bandwidth	Verdict
GFSK	LCH	1.000	0.582	PASS
	MCH	0.999	0.582	PASS
	HCH	1.001	0.585	PASS
π/4DQPSK	LCH	0.998	0.834	PASS
	MCH	1.000	0.837	PASS
	HCH	0.999	0.837	PASS



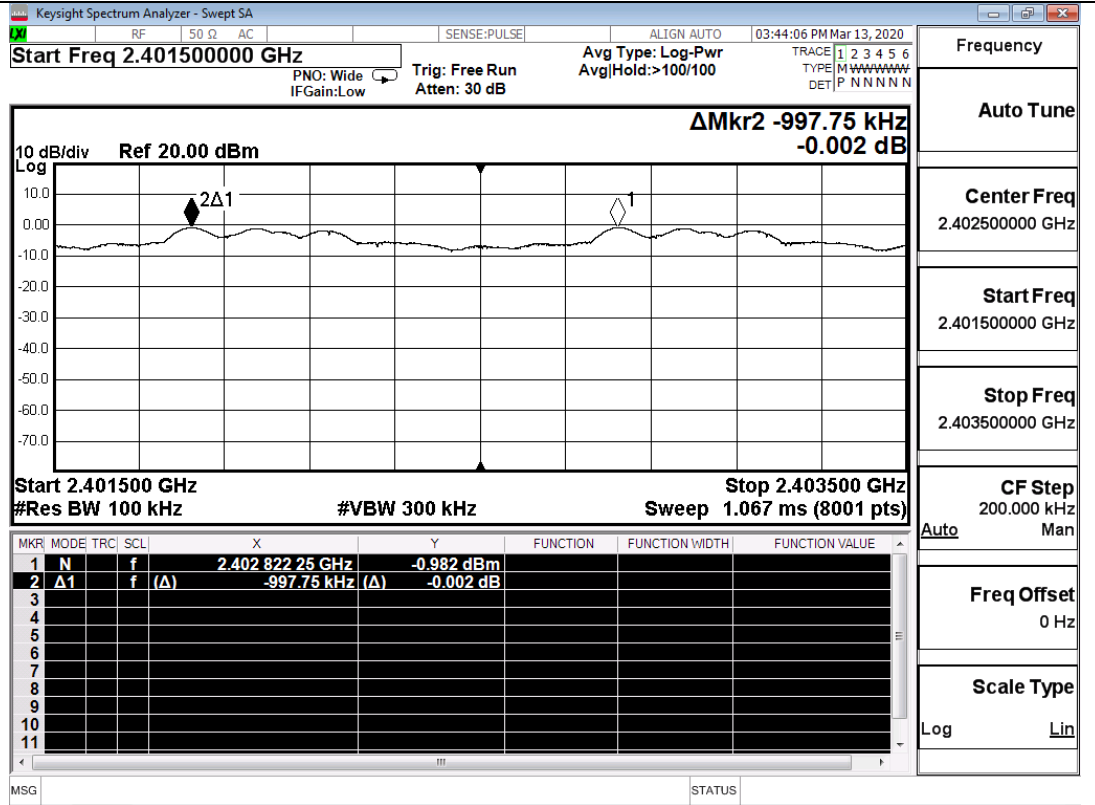
GFSK/MCH



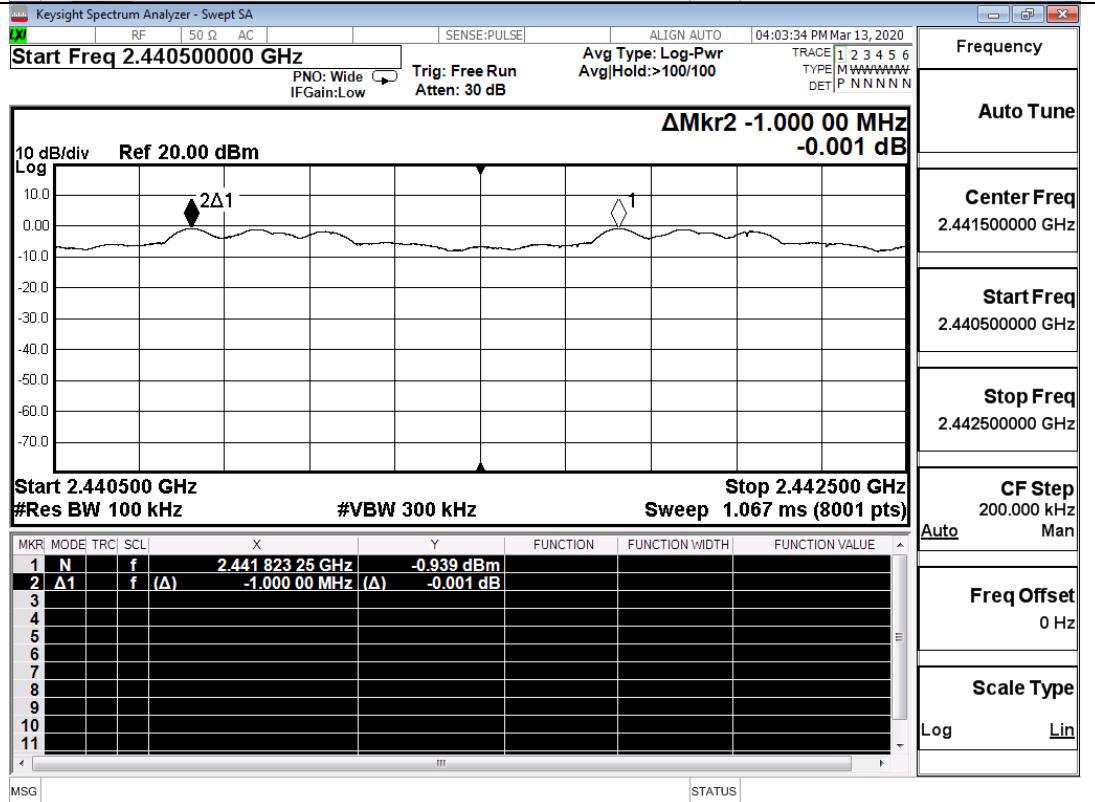
GFSK/HCH



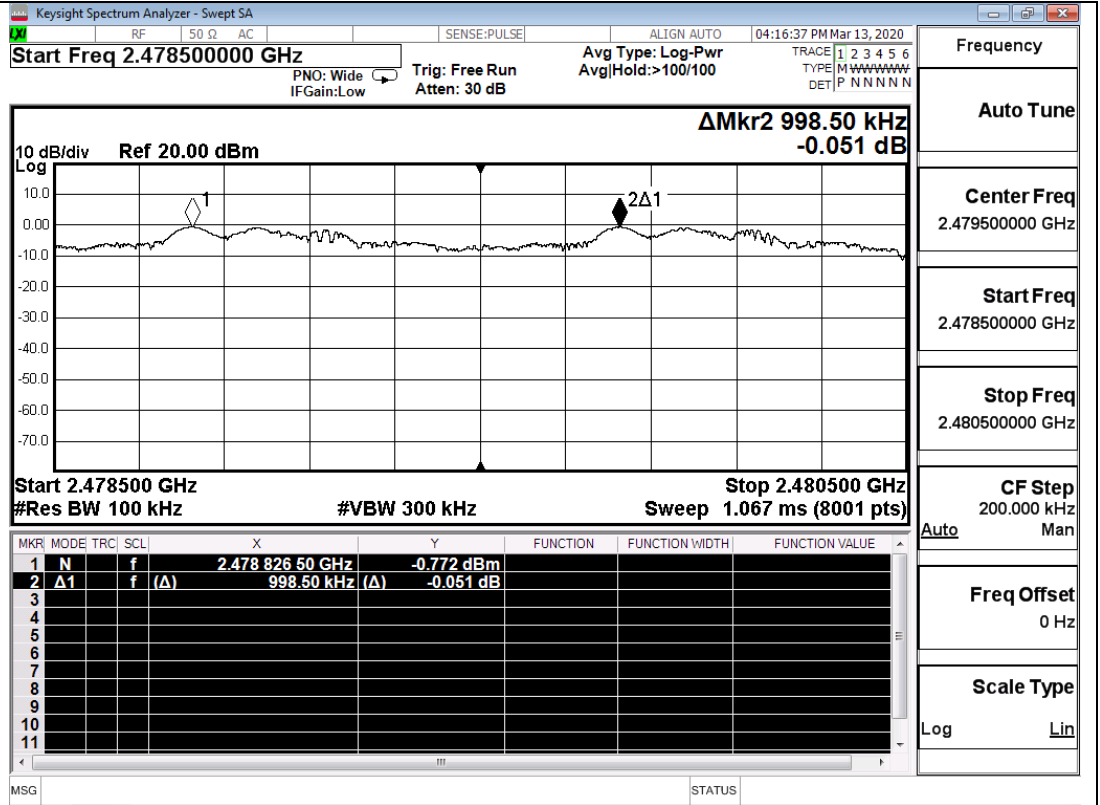
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

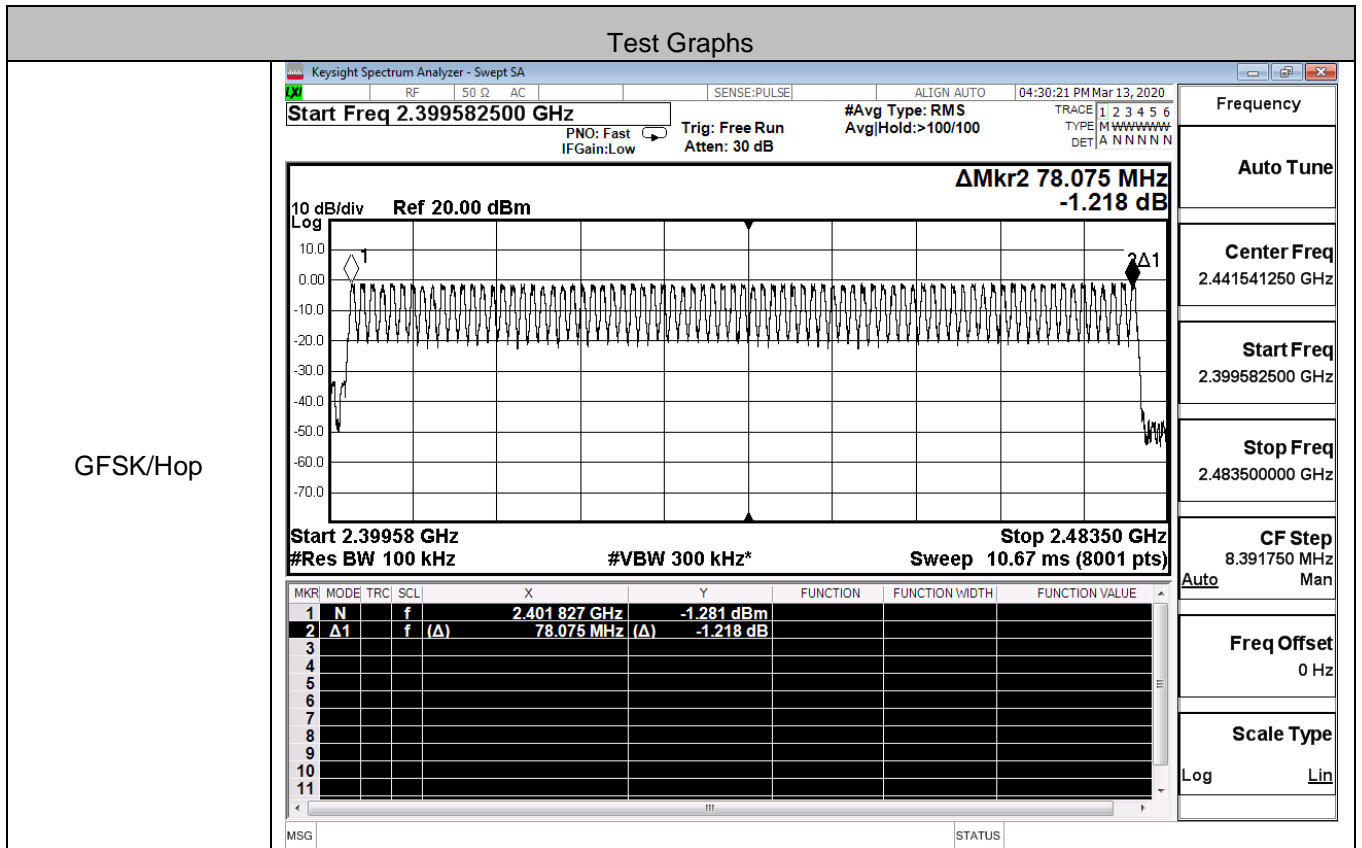


$\pi/4$ DQPSK/HCH

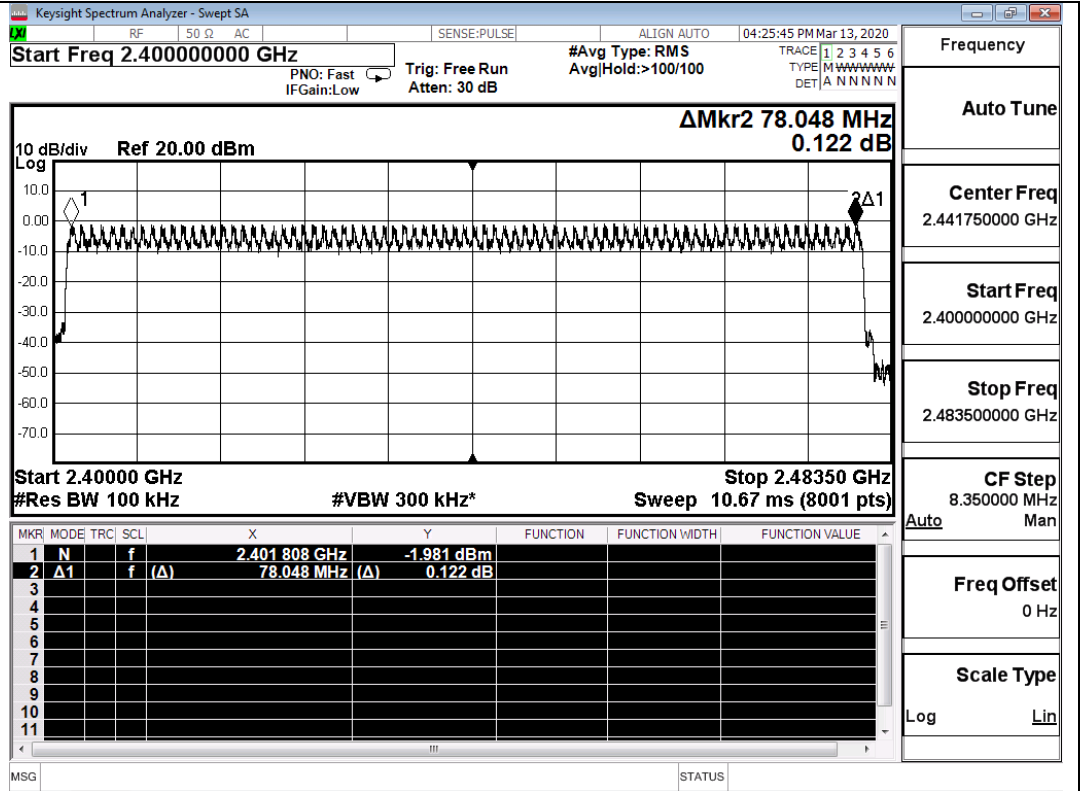


A.4 Hopping Channel Number

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

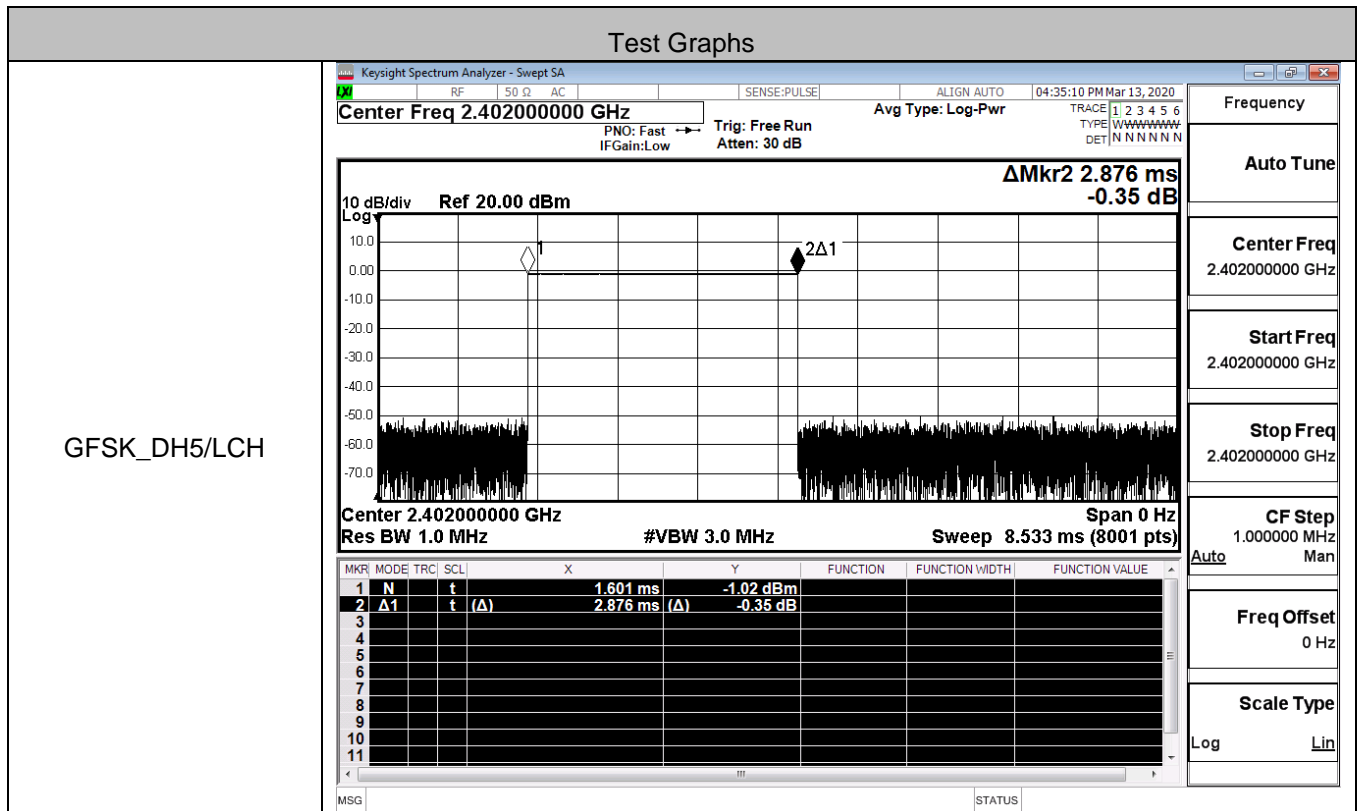


$\pi/4$ DQPSK/Hop

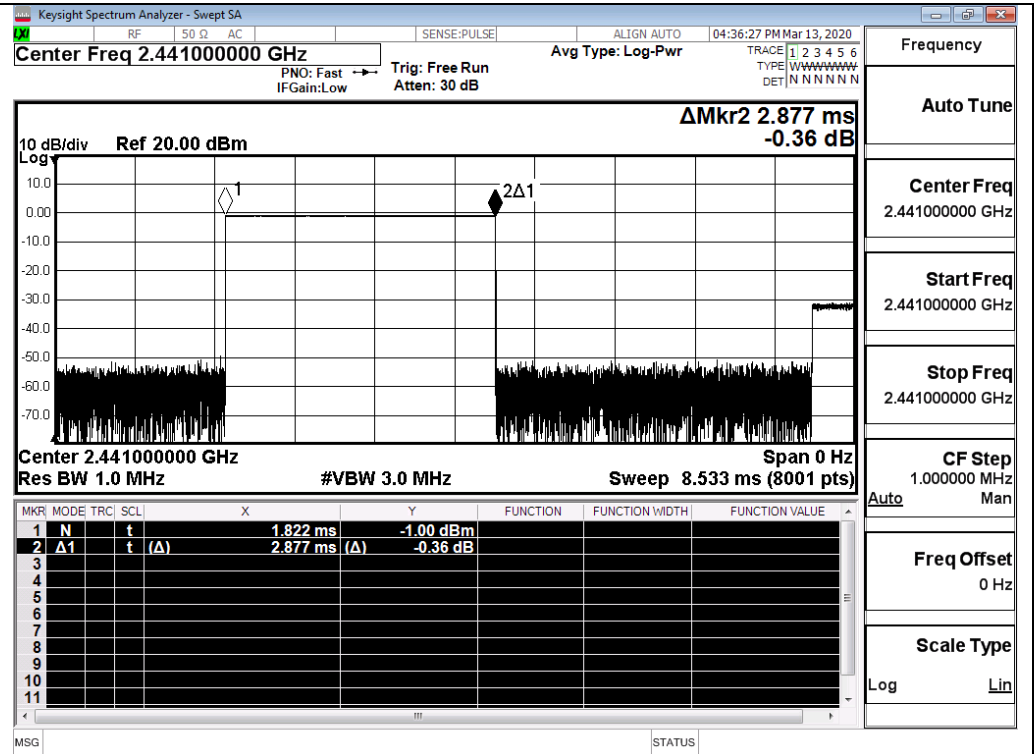


A.5 Dwell Time

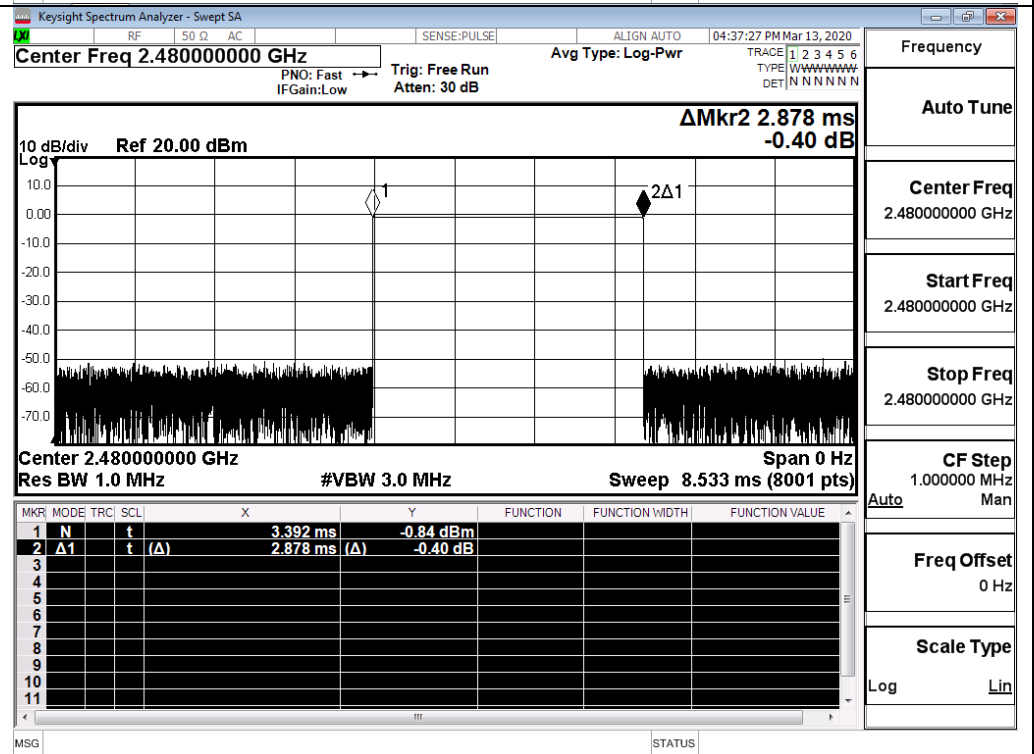
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7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



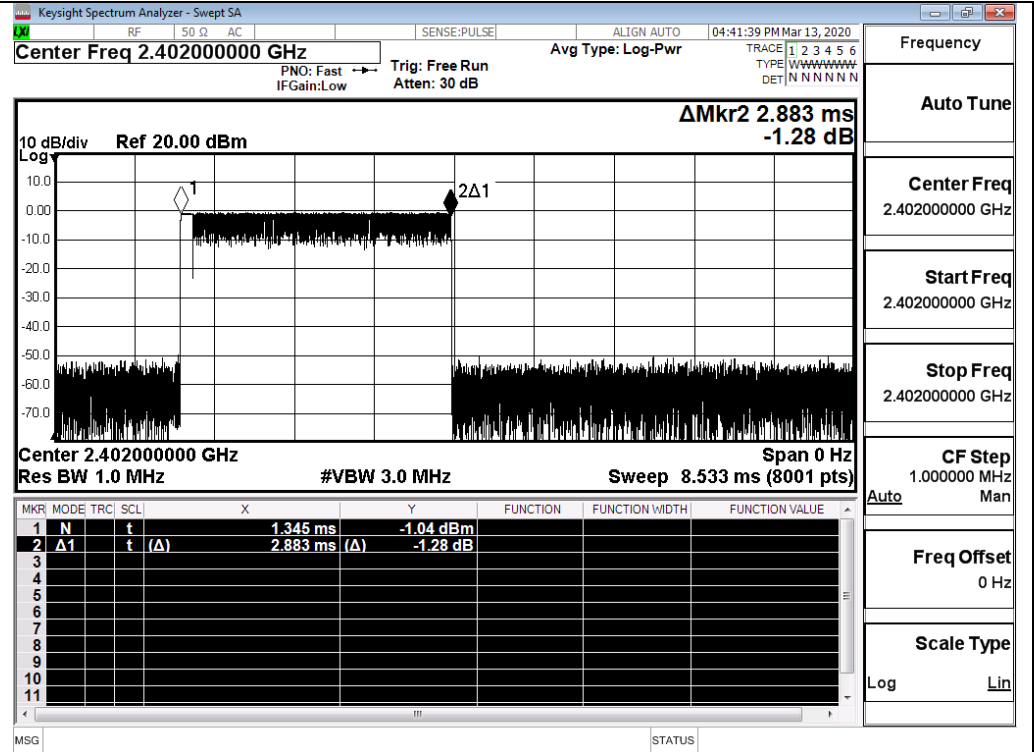
GFSK_DH5/MCH



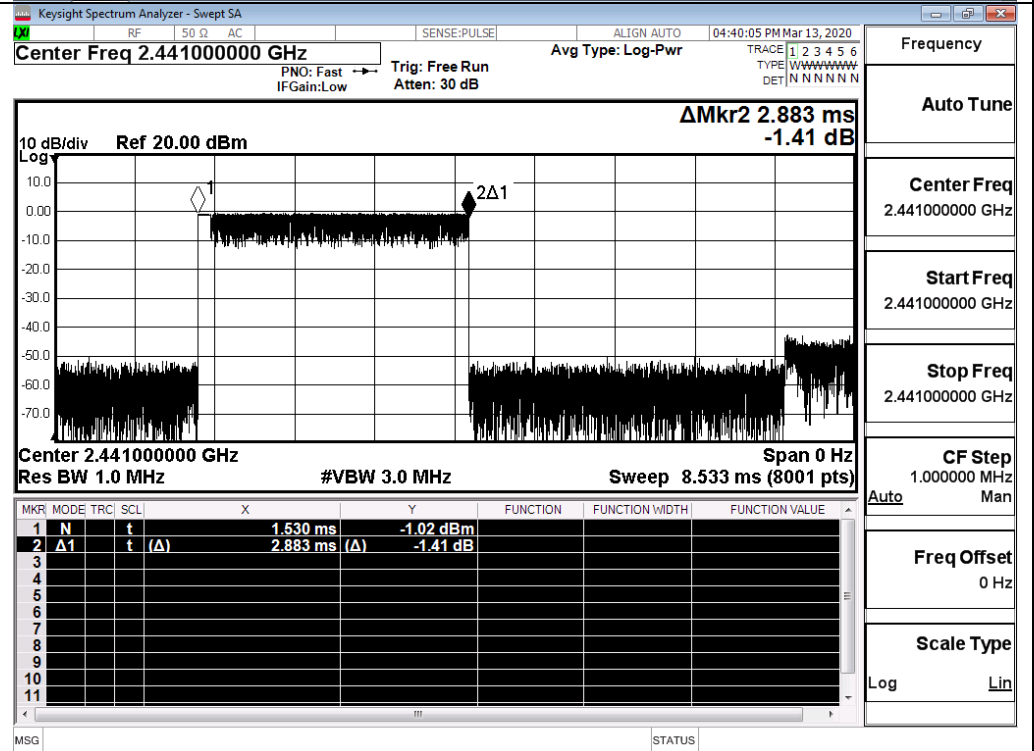
GFSK_DH5/HCH



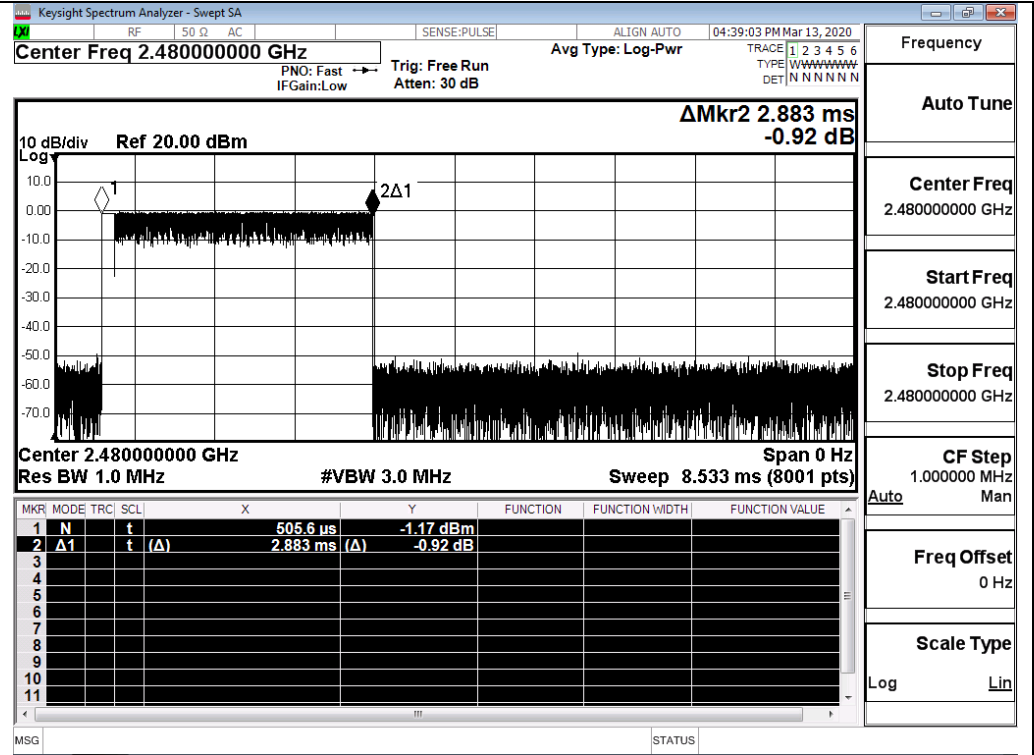
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



$\pi/4$ DQPSK
_2DH5/HCH

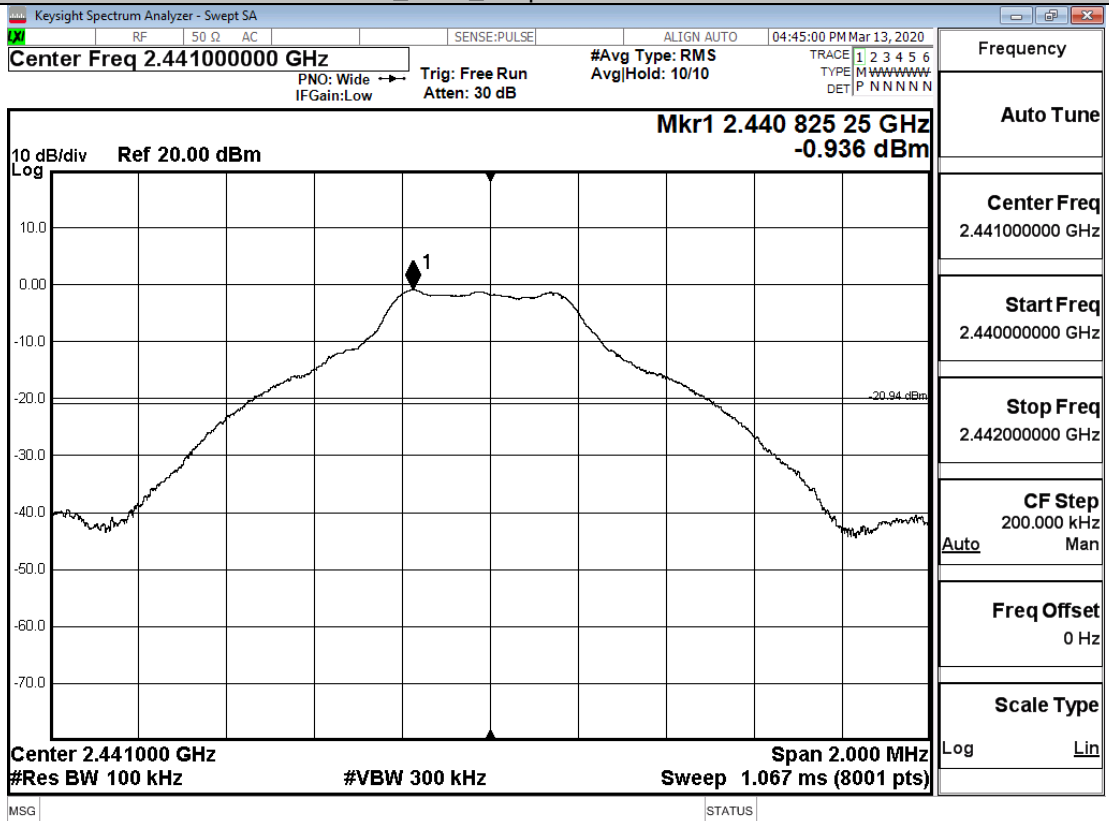


A.6 RF Conducted Spurious Emissions

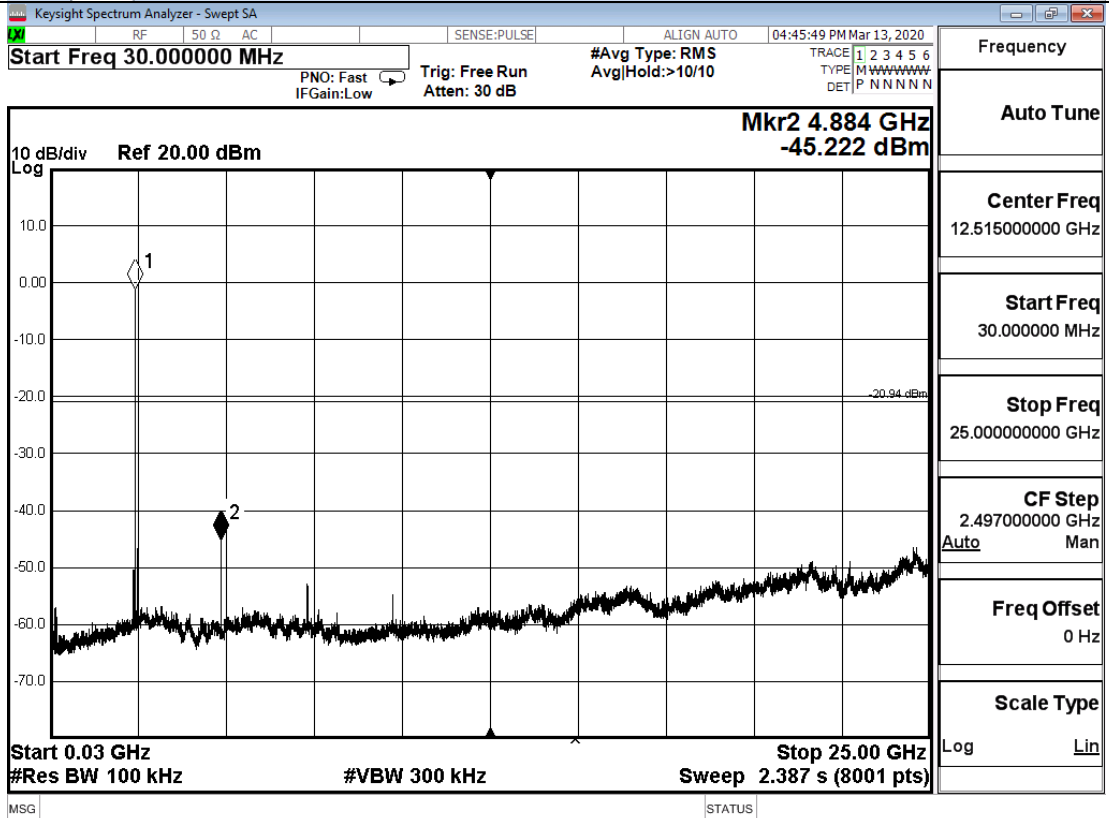
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.934	-44.289	-20.93	PASS
	MCH	-0.936	-45.222	-20.94	PASS
	HCH	-0.753	-42.783	-20.75	PASS
$\pi/4$ DQPSK	LCH	-0.962	-43.869	-20.96	PASS
	MCH	-0.948	-42.978	-20.95	PASS
	HCH	-0.754	-44.215	-20.75	PASS

GFSK_MCH_Graphs

Pref

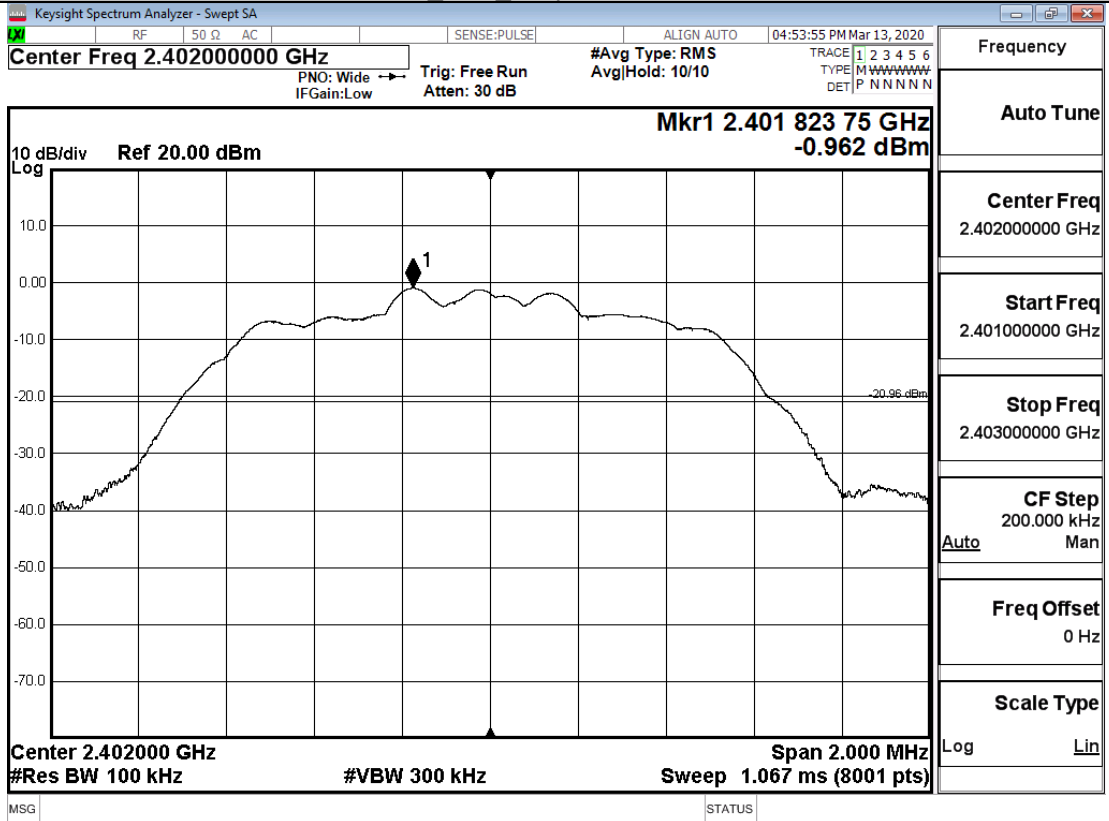


Puw

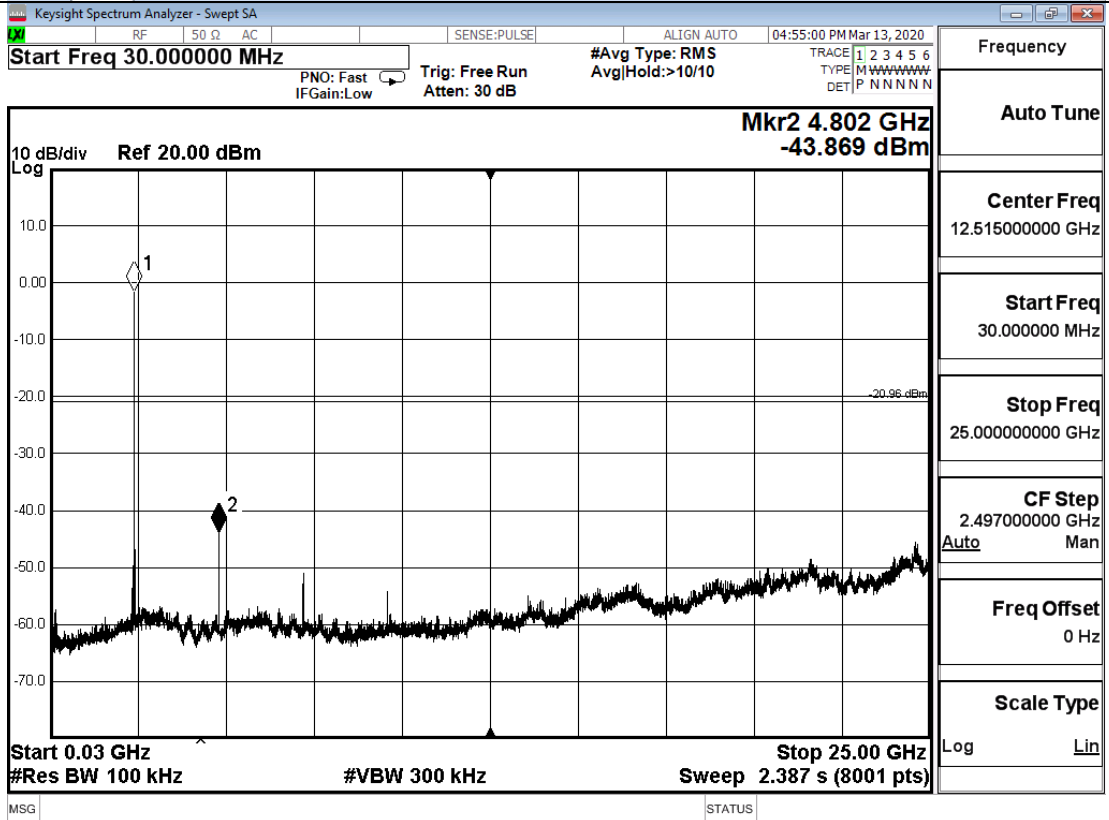


$\pi/4$ DQPSK_LCH_Graphs

Pref

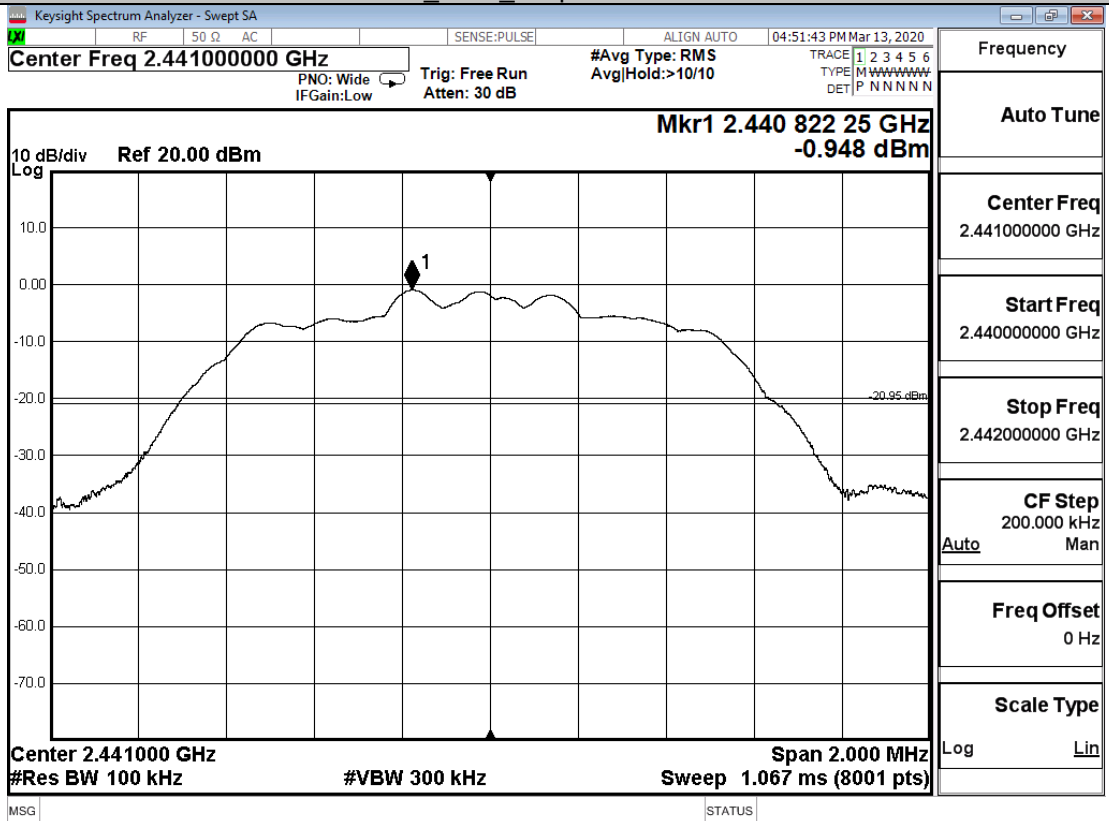


Puw

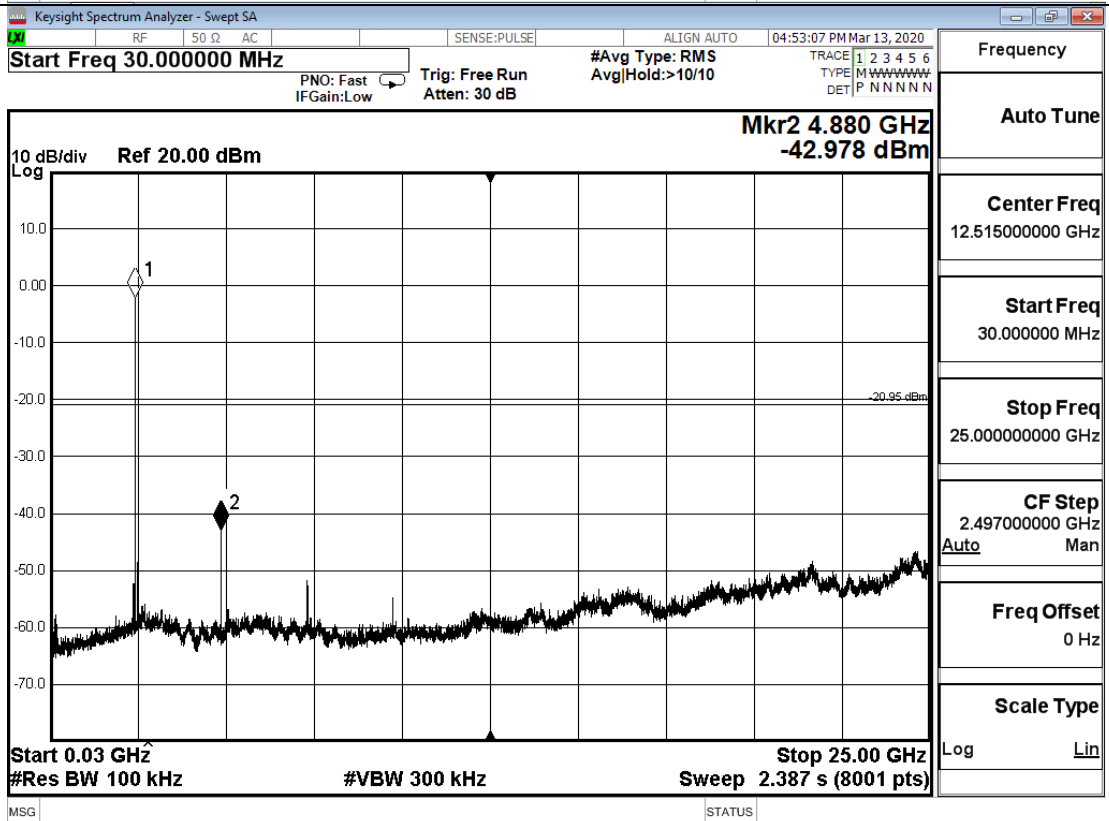


$\pi/4$ DQPSK_MCH_Graphs

Pref

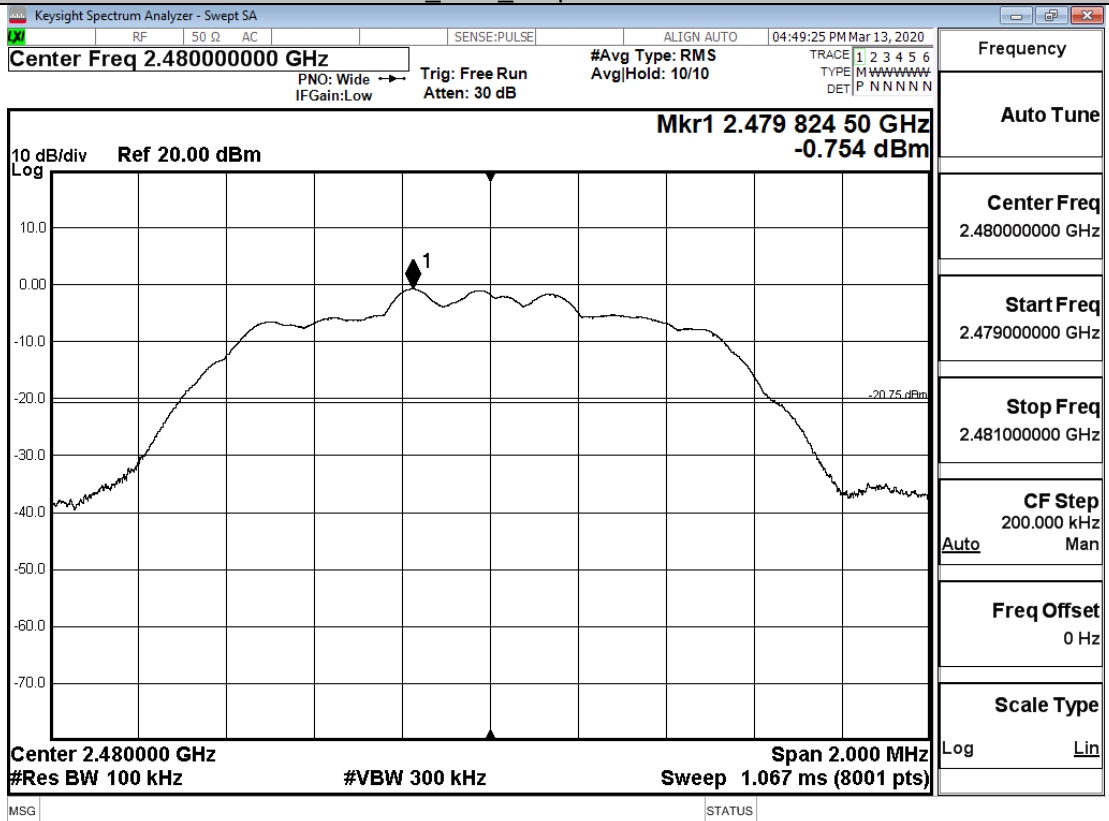


Puw

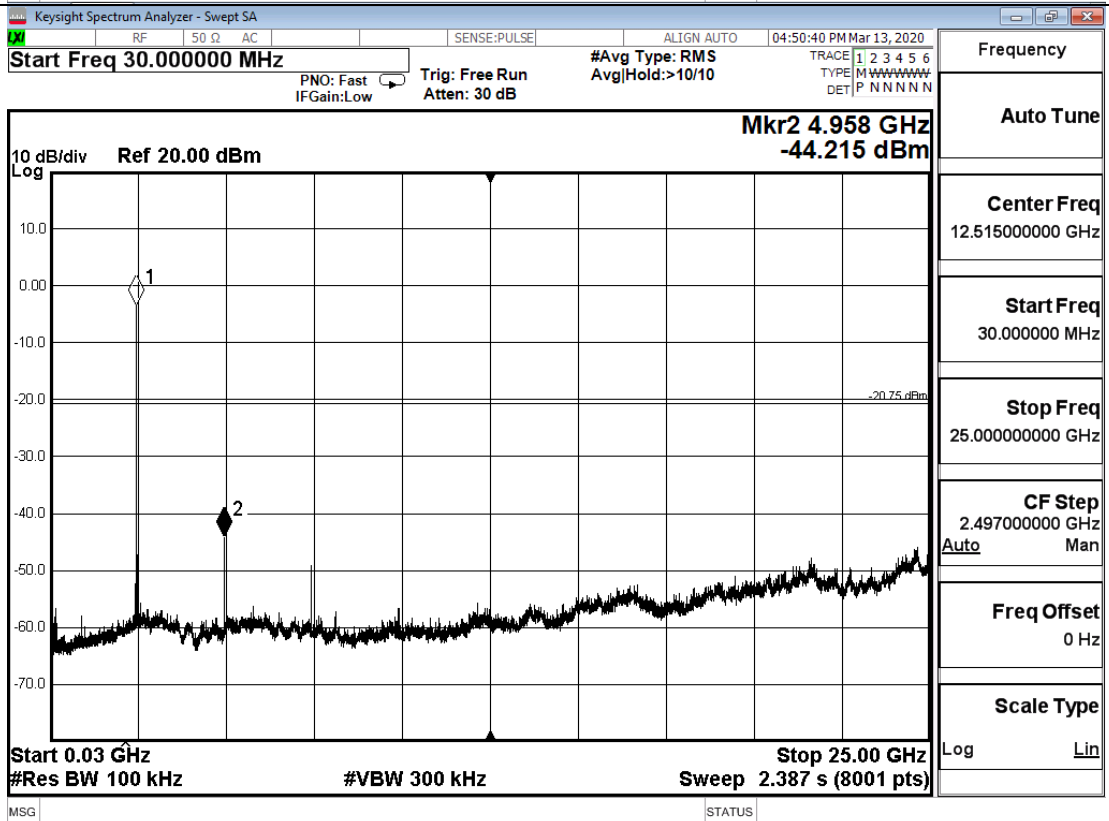


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

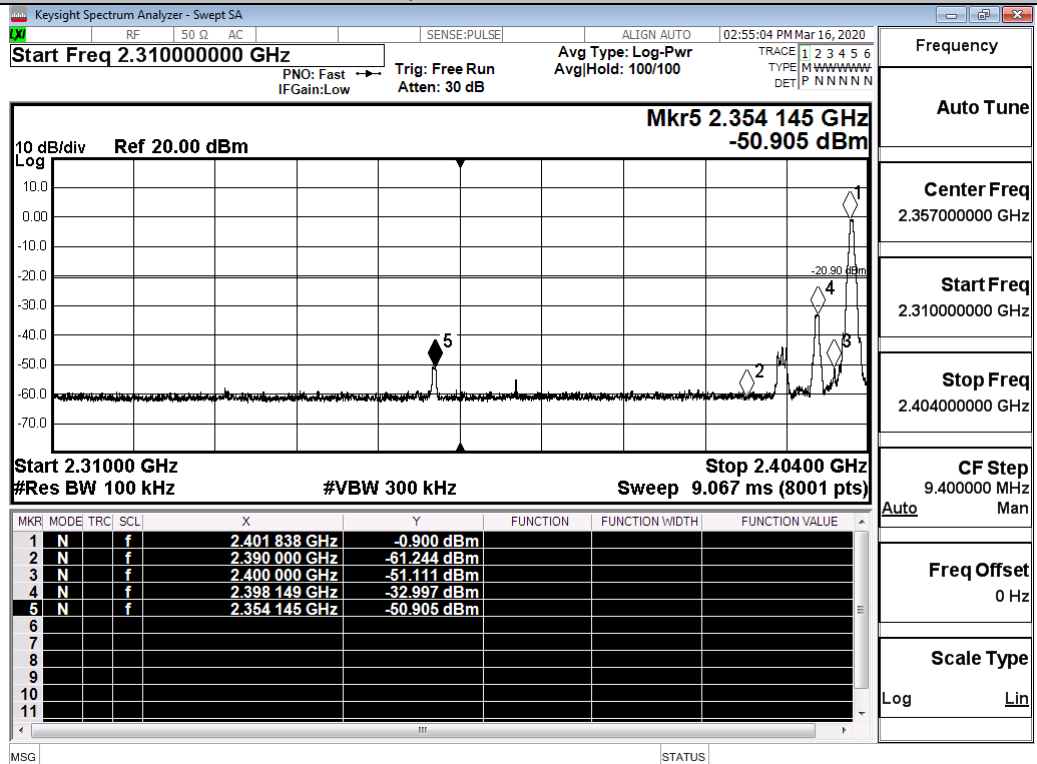


A.7 Band-edge for RF Conducted Emissions

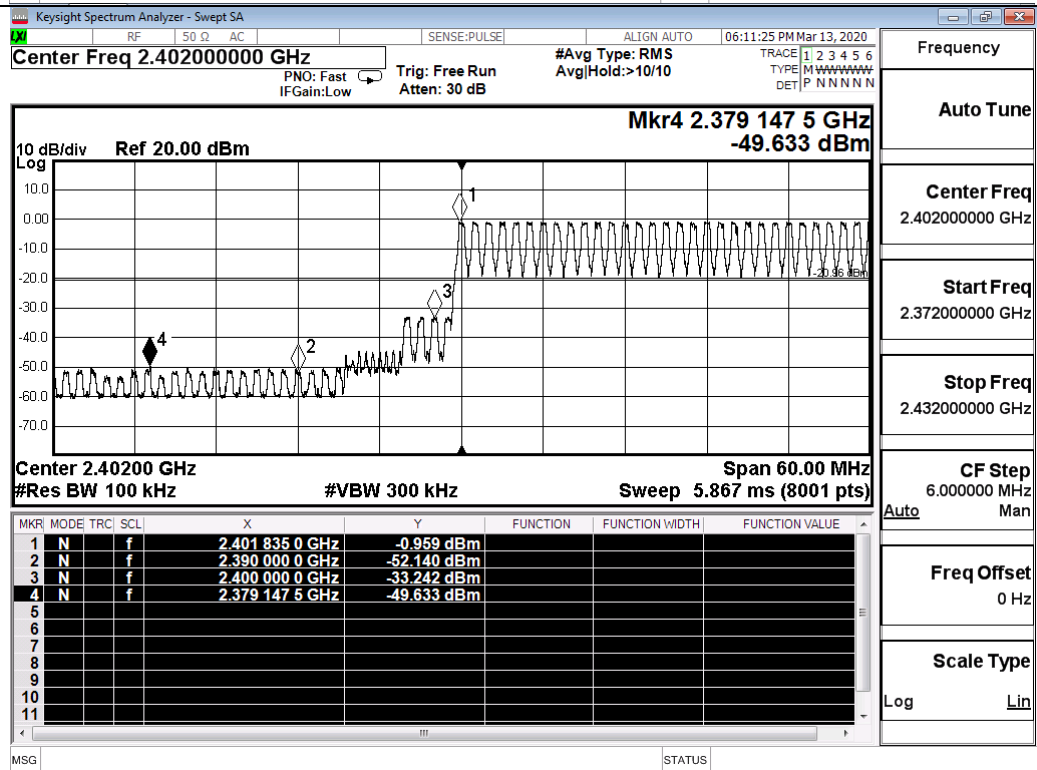
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.900	Off	-32.997	-20.90	PASS
			-0.959	On	-33.242	-20.96	PASS
	HCH	2480	-0.651	Off	-44.407	-20.65	PASS
			-0.981	On	-45.316	-20.98	PASS
$\pi/4$ DQPSK	LCH	2402	-0.953	Off	-33.171	-20.95	PASS
			-1.613	On	-33.299	-21.61	PASS
	HCH	2480	-0.664	Off	-44.598	-20.66	PASS
			-0.674	On	-45.008	-20.67	PASS

Test Graphs

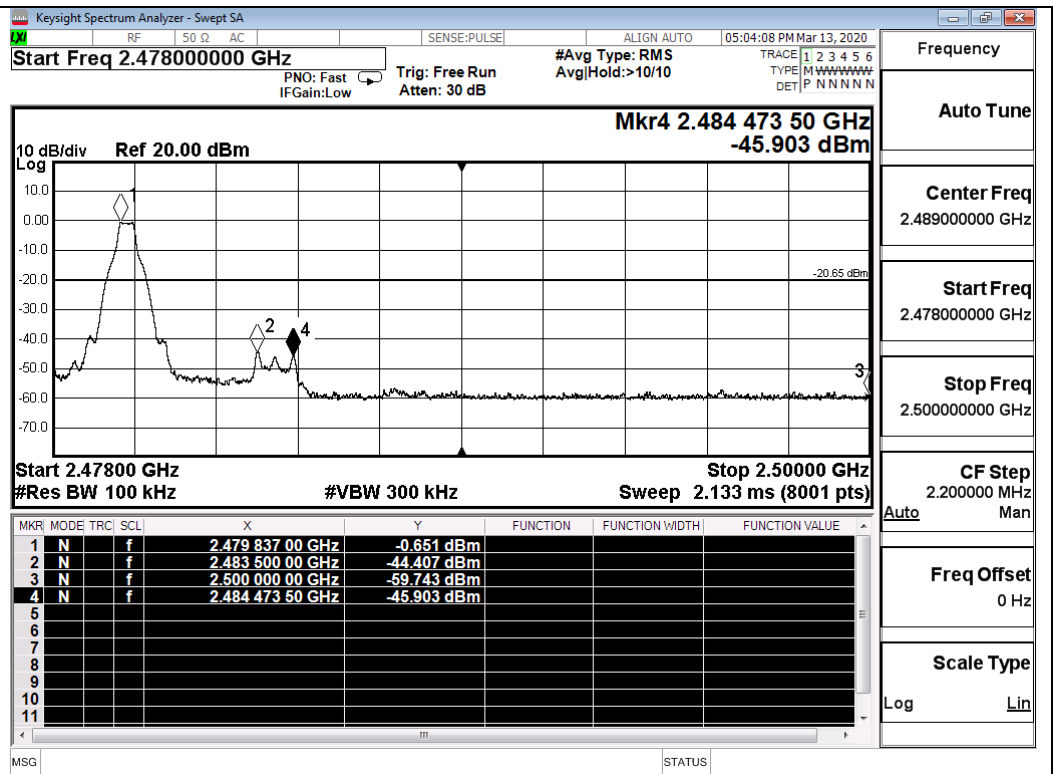
GFSK/LCH/No Hop



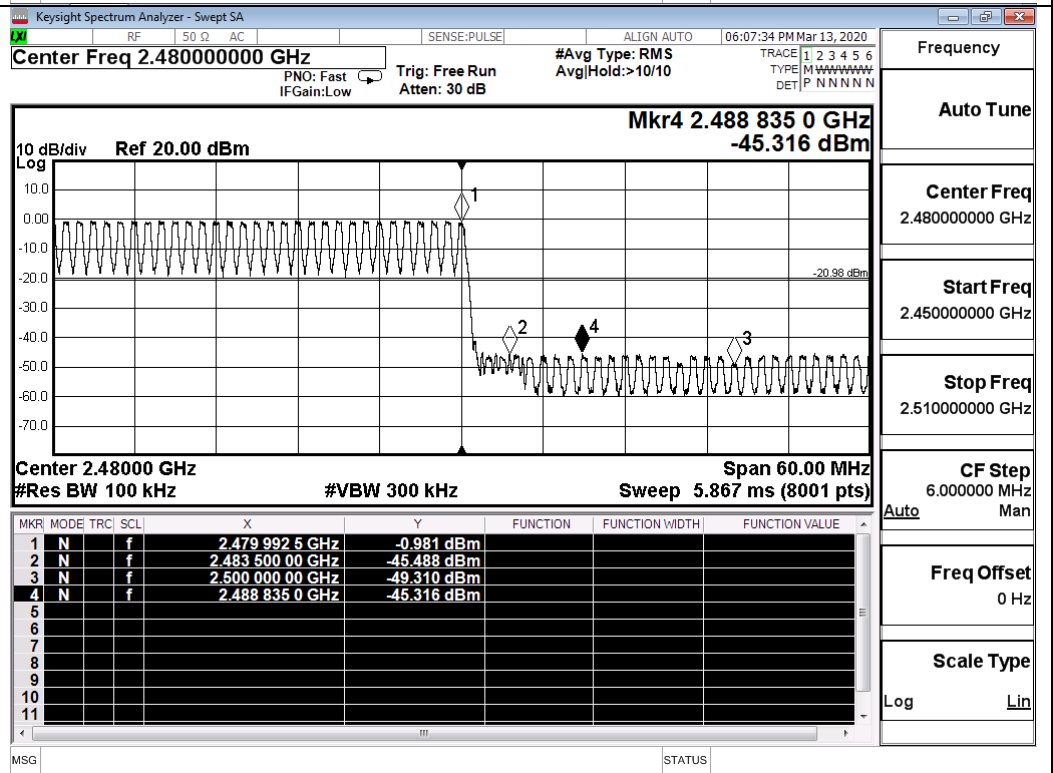
GFSK/LCH/Hop



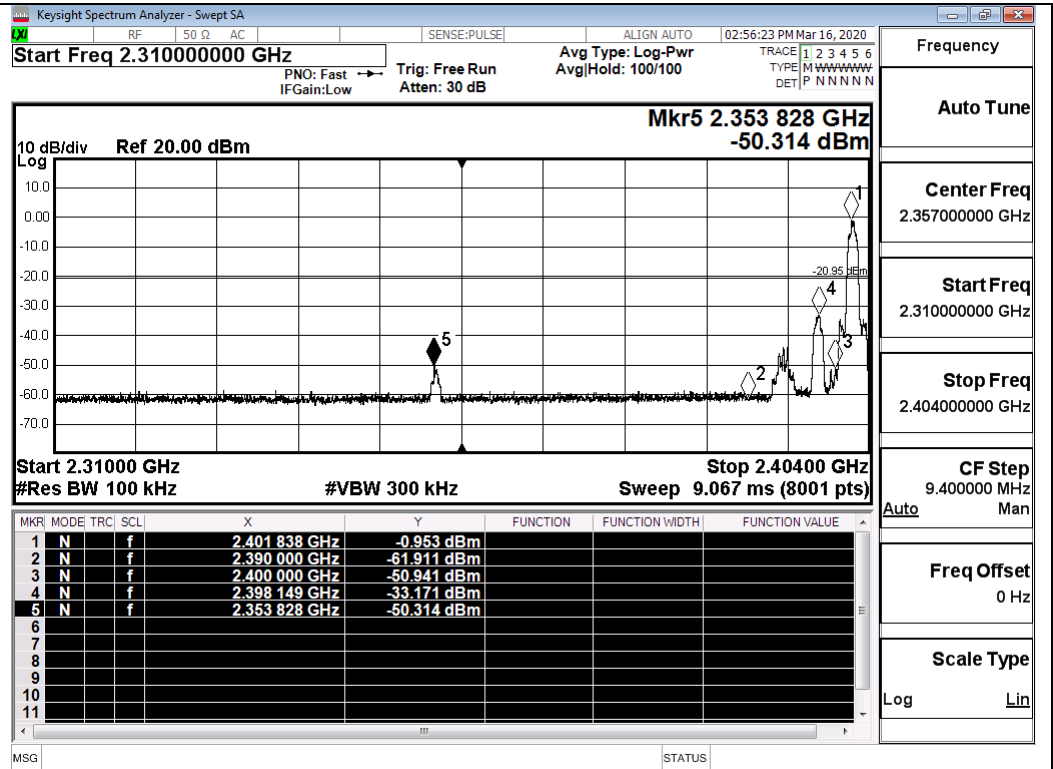
GFSK/HCH/No Hop



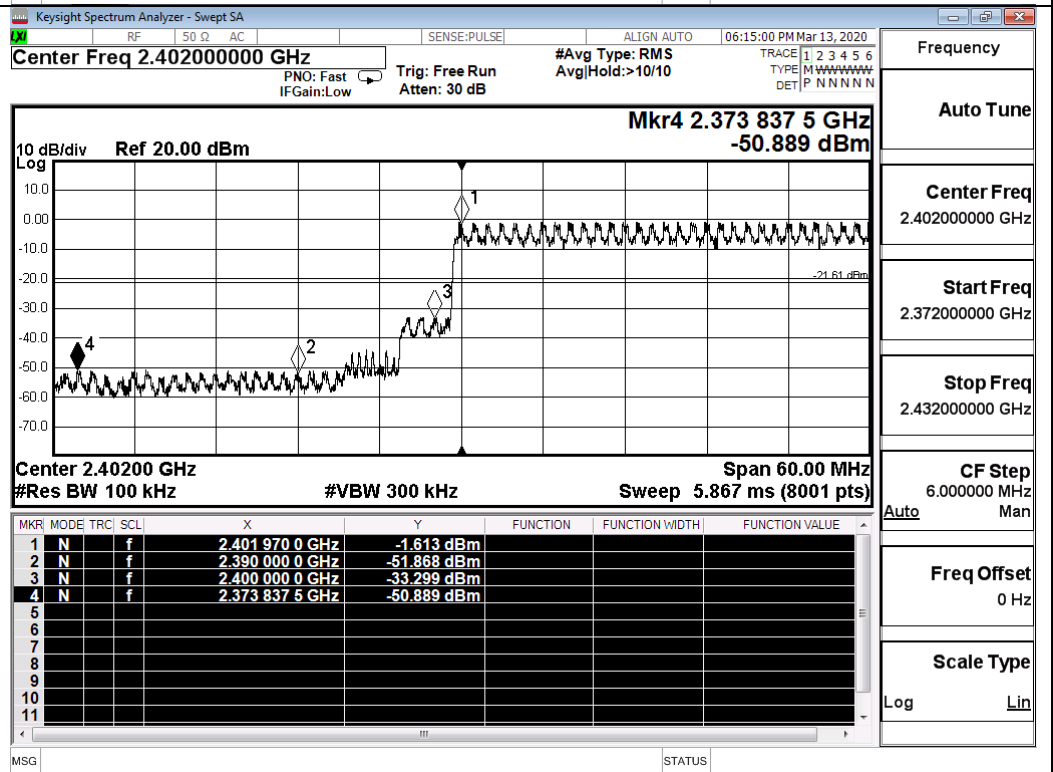
GFSK/HCH/Hop



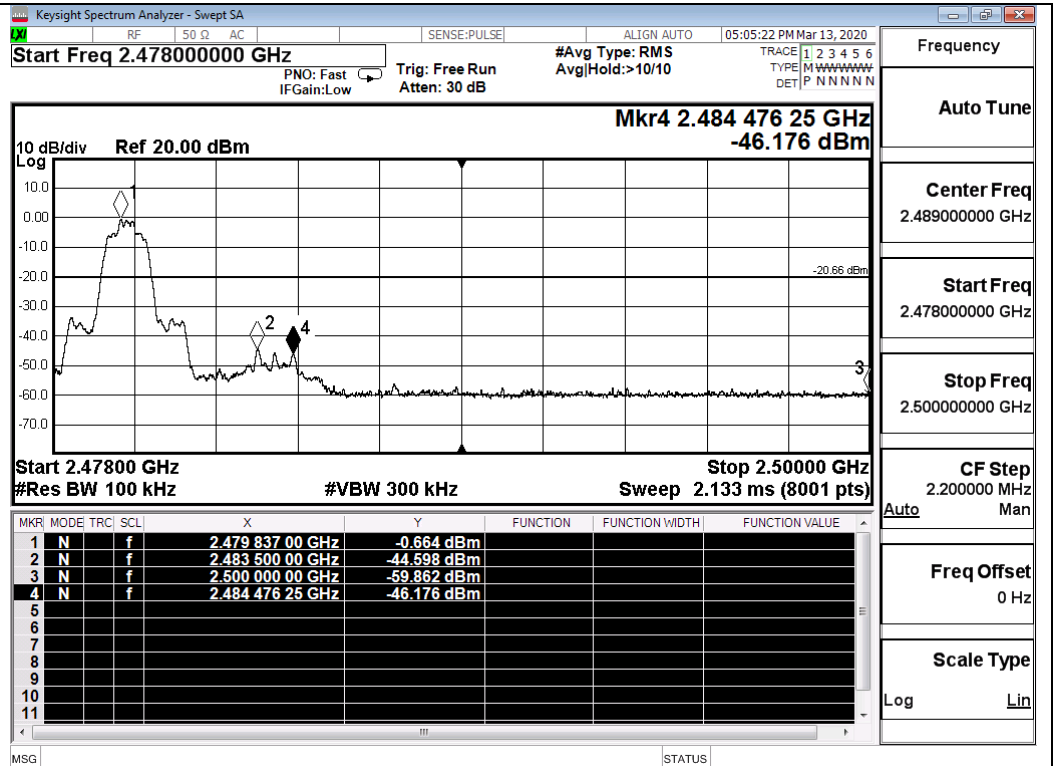
π /4DQPSK/LCH/No Hop



π /4DQPSK/LCH/Hop

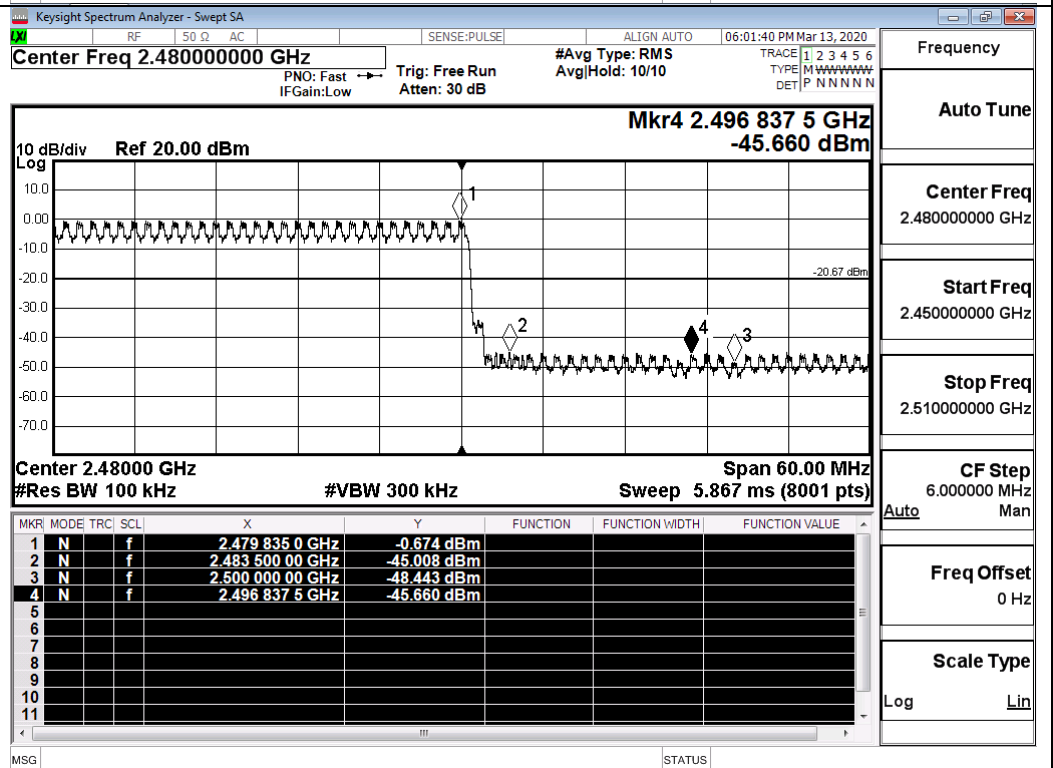


π /4DQPSK/HCH/No Hop



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

π /4DQPSK/HCH/Hop

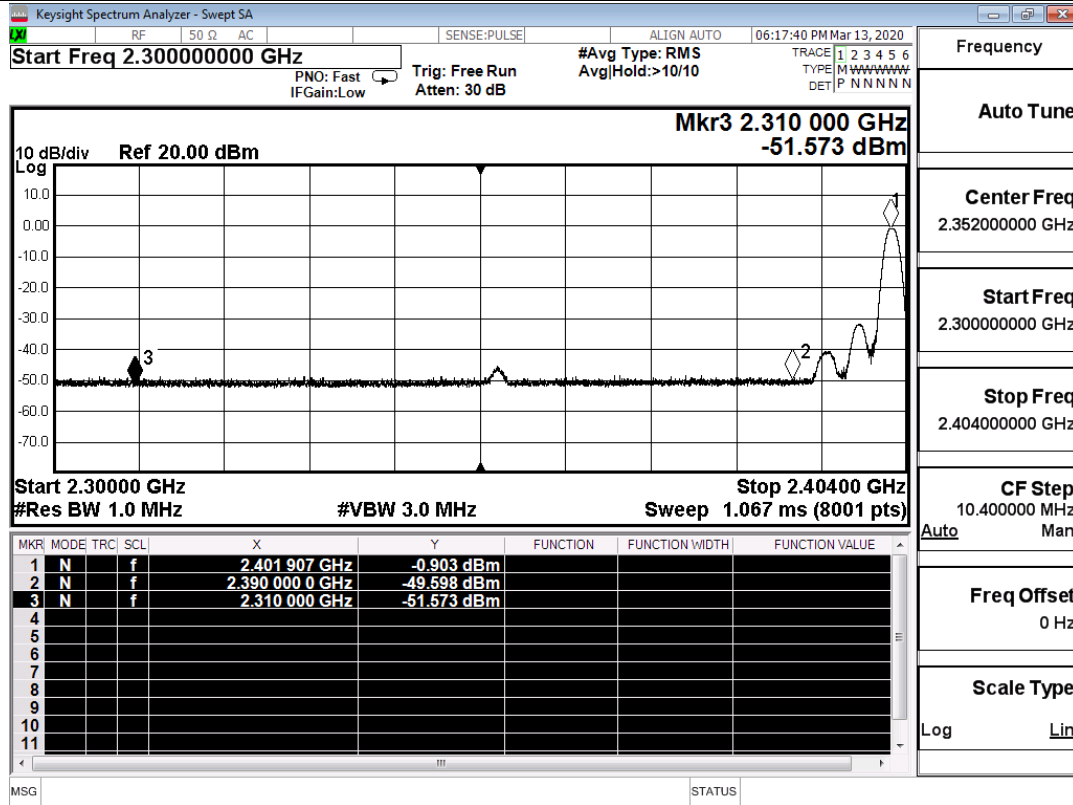


Frequency	Auto Tune
Center Freq	2.480000000 GHz
Start Freq	2.450000000 GHz
Stop Freq	2.510000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz
Scale Type	Log Lin

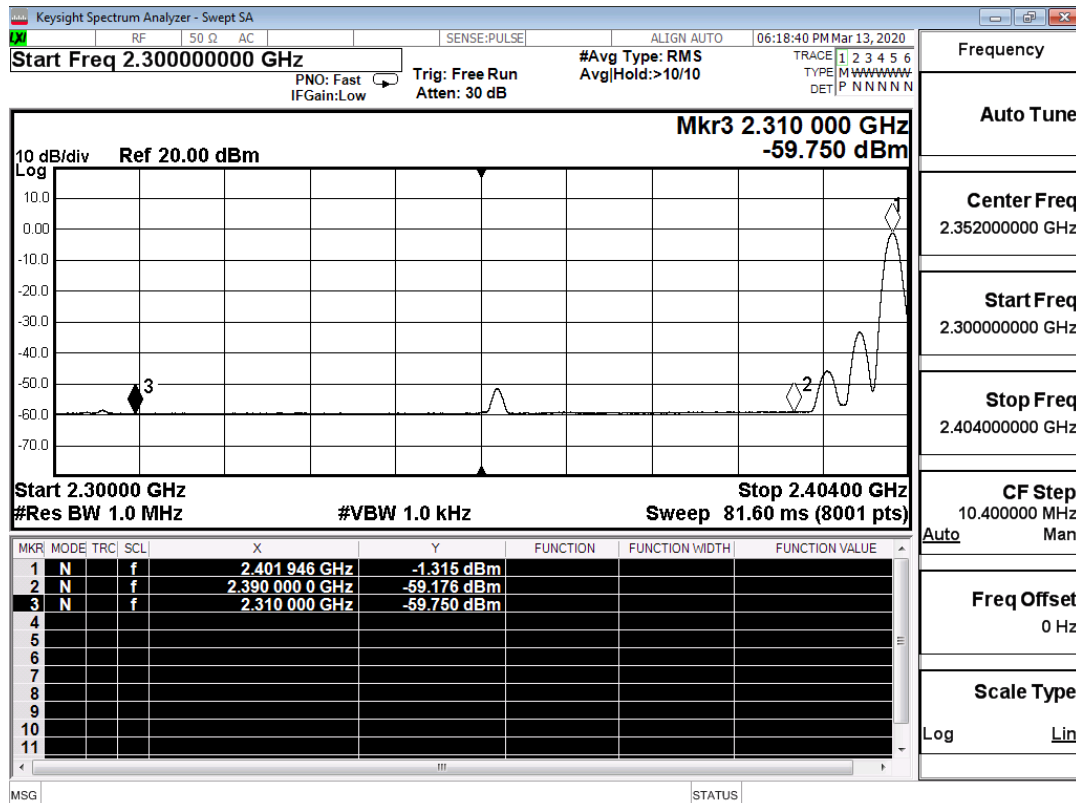
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-51.573	2.000	0	45.66	PEAK	74	PASS
	Off	2310.0	-59.750	2.000	0	37.48	AV	54	PASS
	Off	2390.0	-49.598	2.000	0	47.63	PEAK	74	PASS
	Off	2390.0	-59.176	2.000	0	38.05	AV	54	PASS
	Off	2483.5	-42.541	2.000	0	54.69	PEAK	74	PASS
	Off	2483.5	-47.352	2.000	0	49.88	AV	54	PASS
	Off	2500.0	-51.364	2.000	0	45.87	PEAK	74	PASS
	Off	2500.0	-58.774	2.000	0	38.46	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-50.399	2.000	0	46.83	PEAK	74	PASS
	Off	2310.0	-59.628	2.000	0	37.60	AV	54	PASS
	Off	2390.0	-51.215	2.000	0	46.02	PEAK	74	PASS
	Off	2390.0	-59.123	2.000	0	38.11	AV	54	PASS
	Off	2483.5	-42.105	2.000	0	55.13	PEAK	74	PASS
	Off	2483.5	-48.659	2.000	0	48.57	AV	54	PASS
	Off	2500.0	-51.130	2.000	0	46.10	PEAK	74	PASS
	Off	2500.0	-58.767	2.000	0	38.46	AV	54	PASS

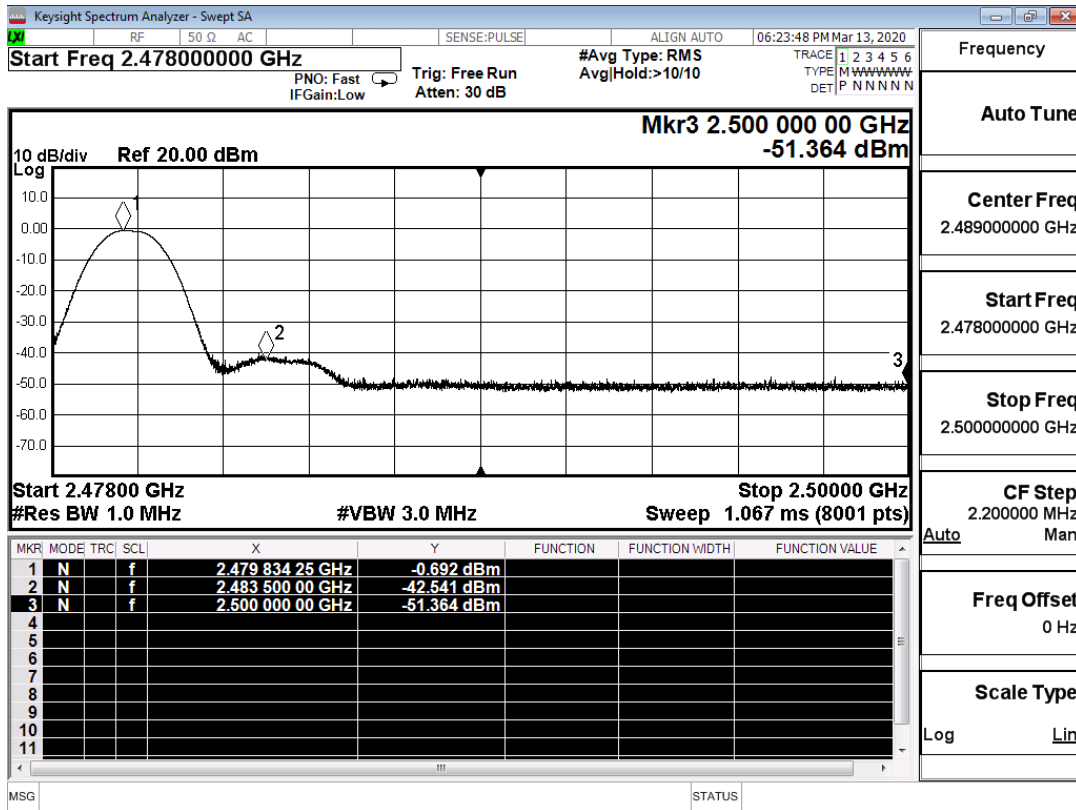
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



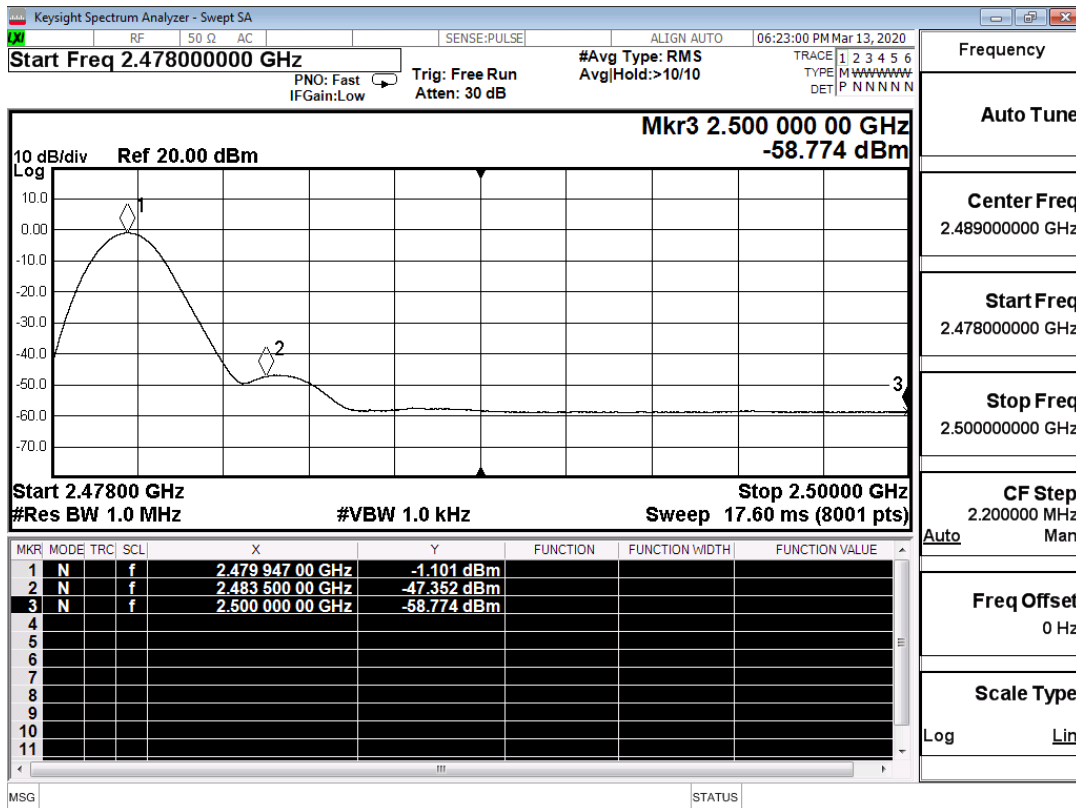
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



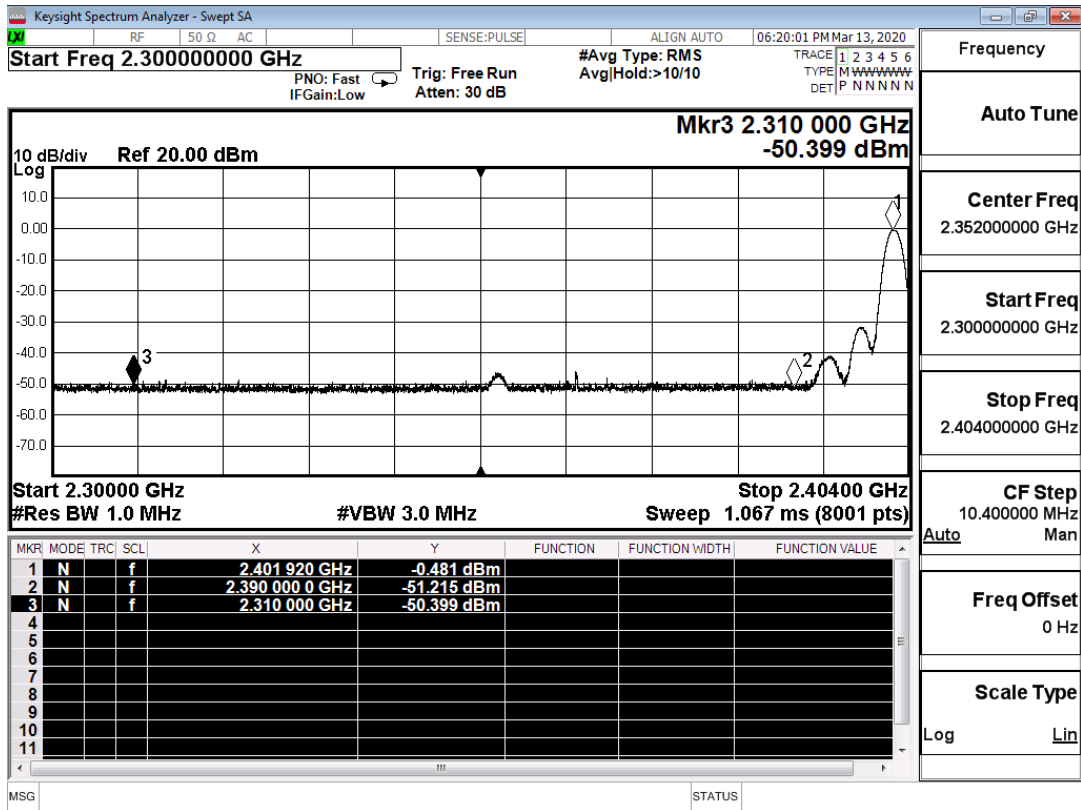
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



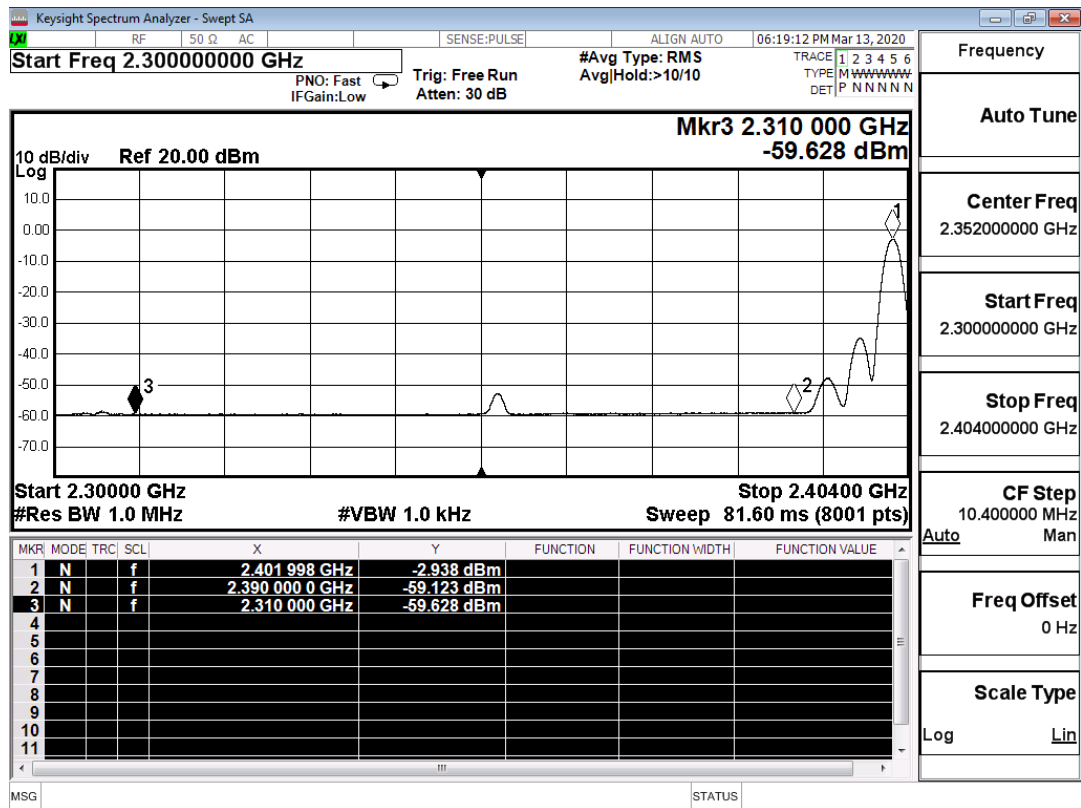
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



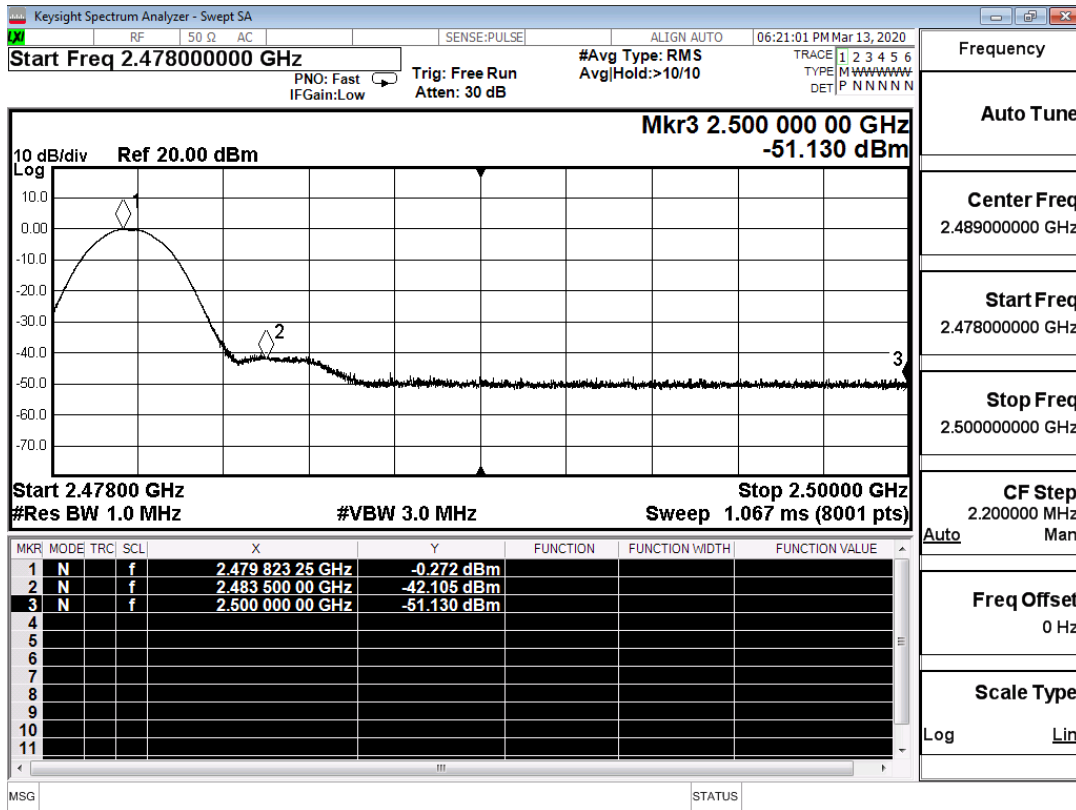
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



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)

