

Appendix A

RF Test Data for BT V5.1(BDR/EDR) (Conducted Measurement)

Product Name: Wireless Earbuds

Trade Mark: N/A

Test Model: T82

Environmental Conditions

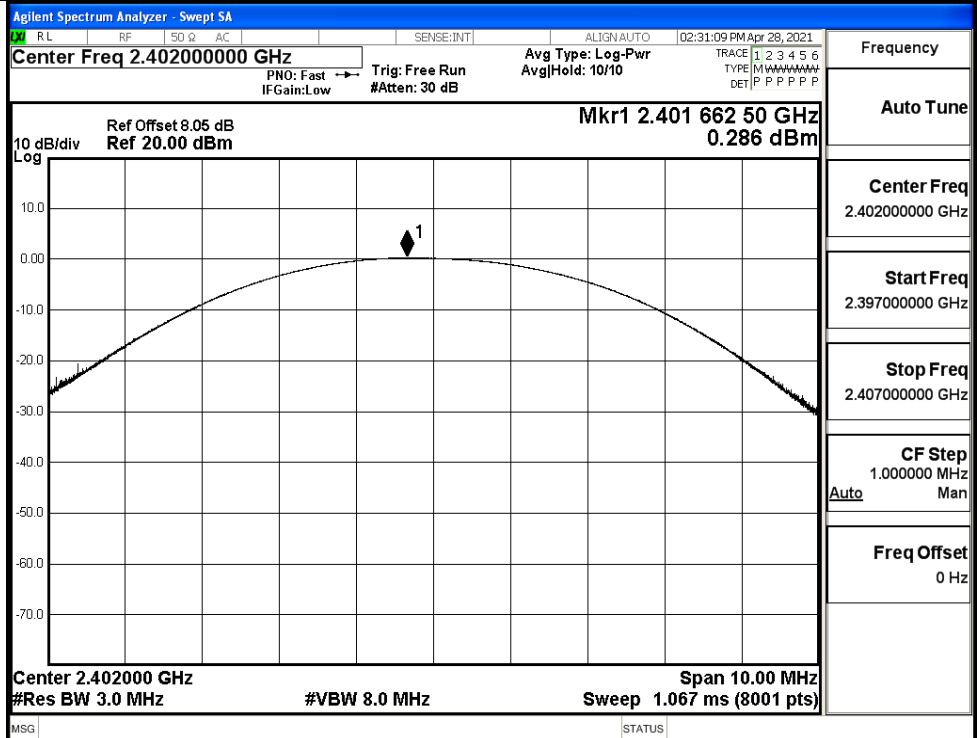
Temperature:	25 .1° C
Relative Humidity:	54.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Li
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

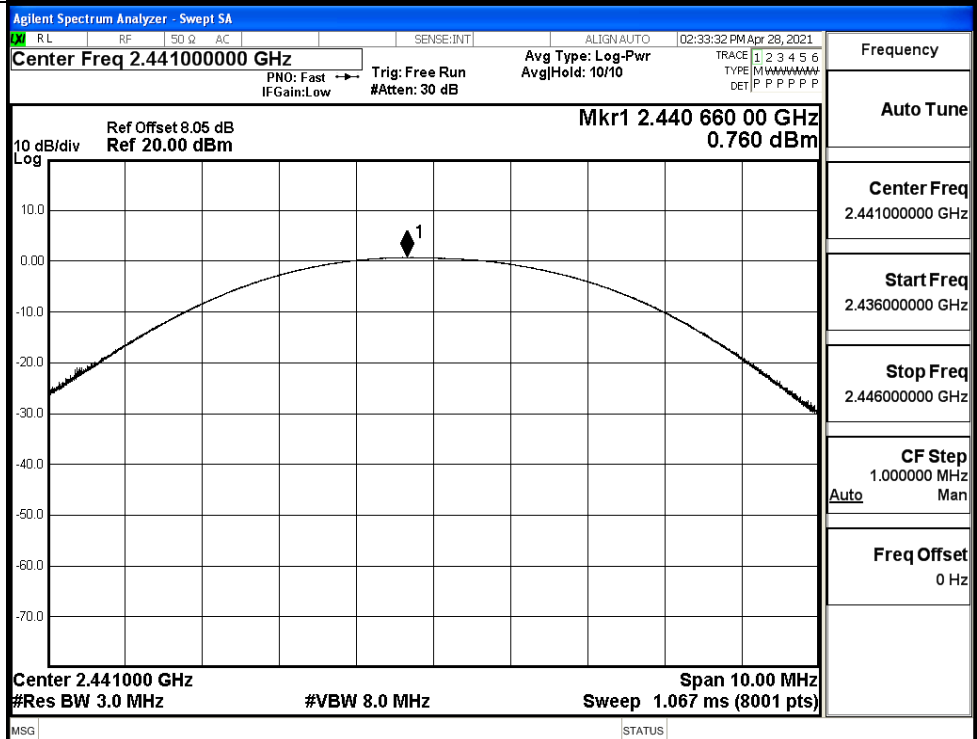
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.286	21	PASS
	MCH	0.760	21	PASS
	HCH	0.500	21	PASS
$\pi/4$ DQPSK	LCH	0.913	21	PASS
	MCH	1.342	21	PASS
	HCH	1.124	21	PASS
8DPSK	LCH	0.906	21	PASS
	MCH	1.387	21	PASS
	HCH	1.167	21	PASS

Test Graphs

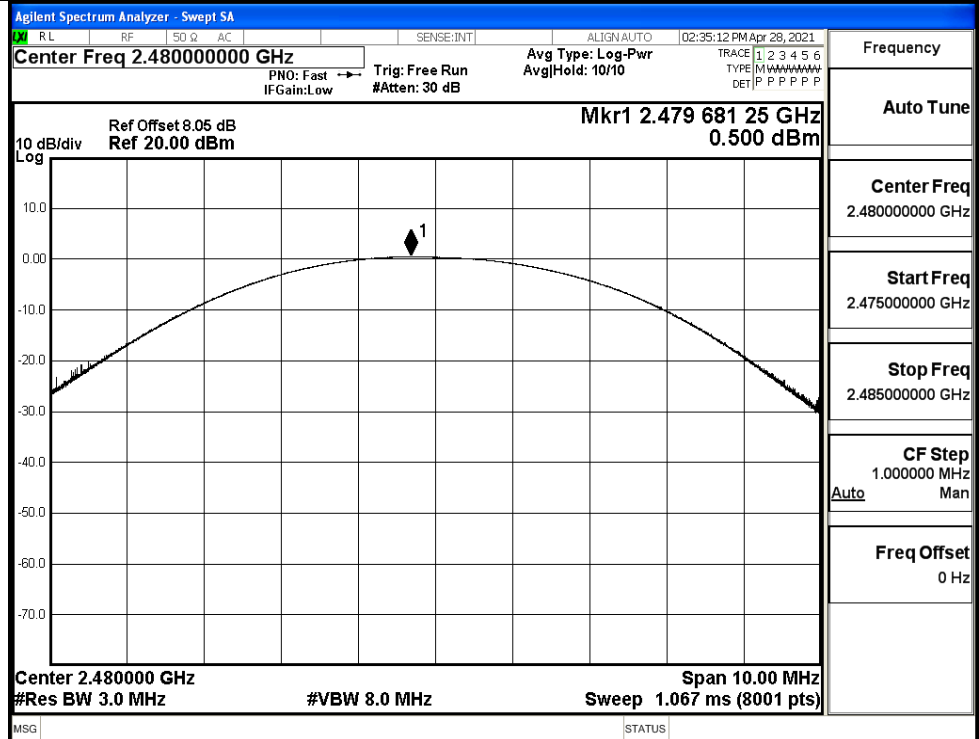
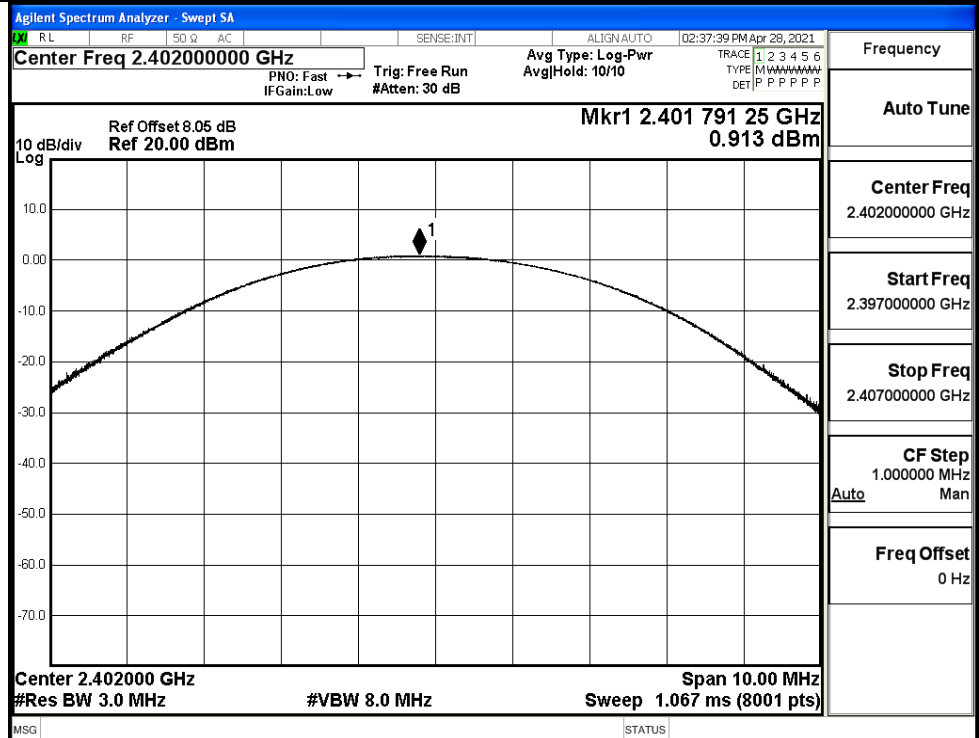
GFSK/LCH

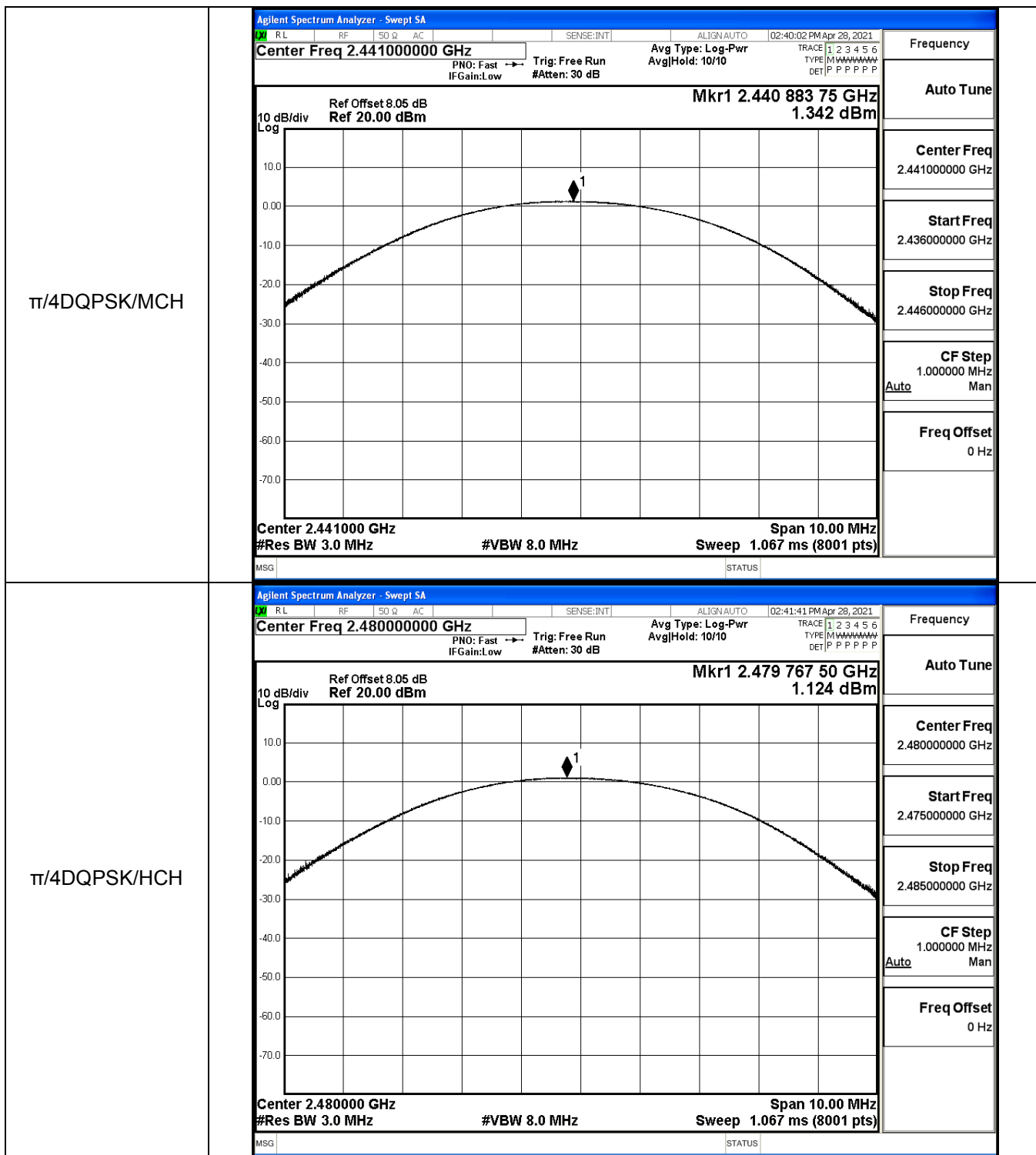


GFSK/MCH

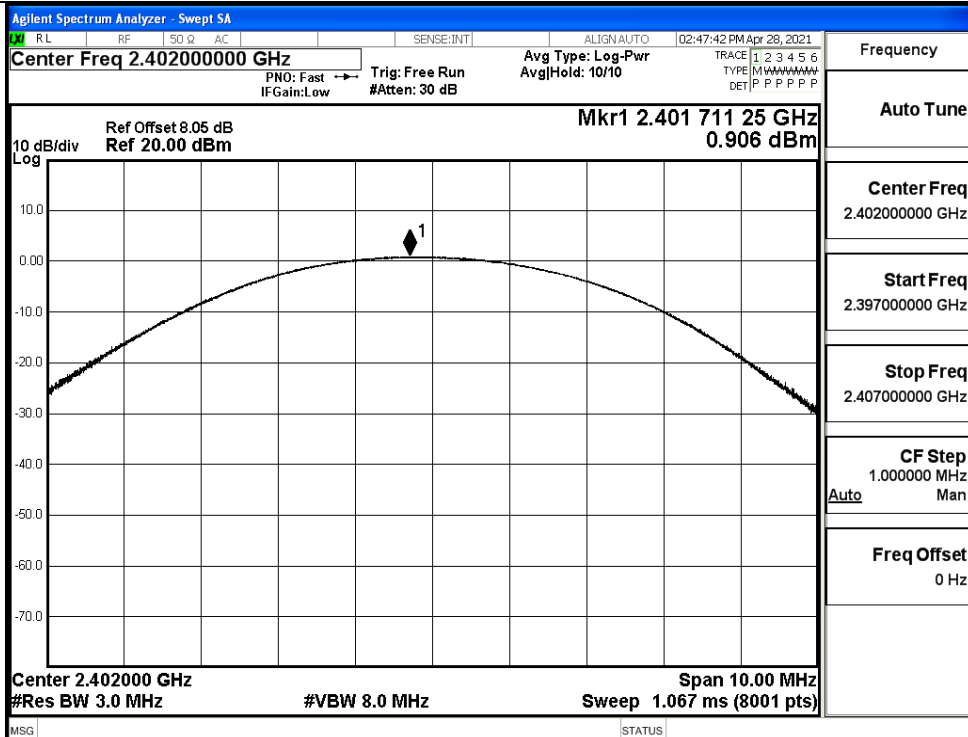


GFSK/HCH

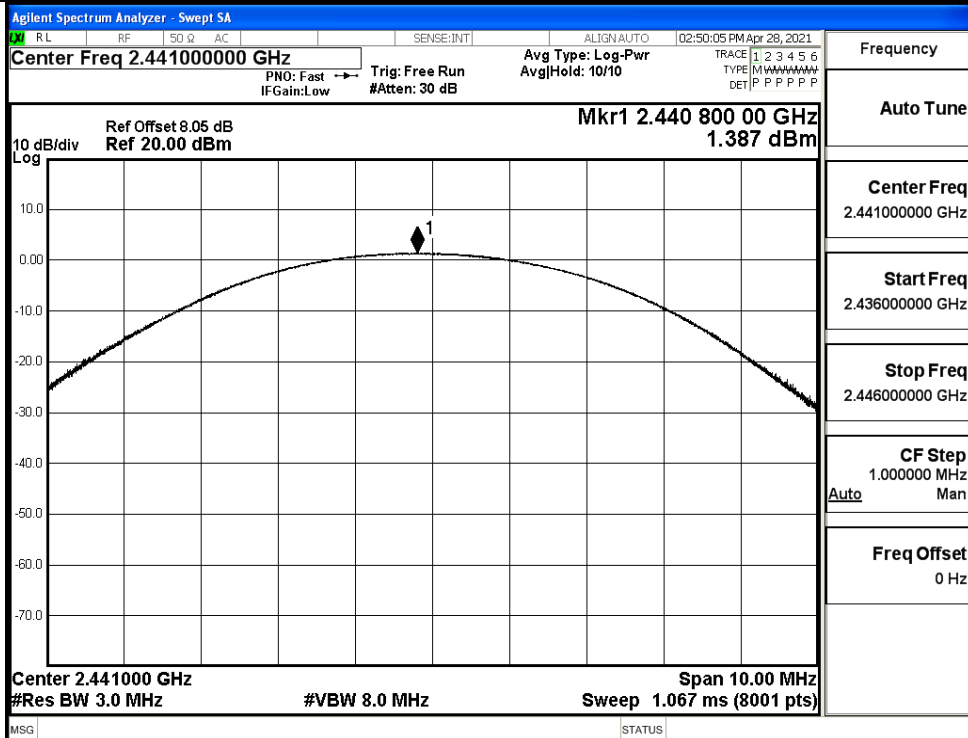
 π /4DQPSK/LCH



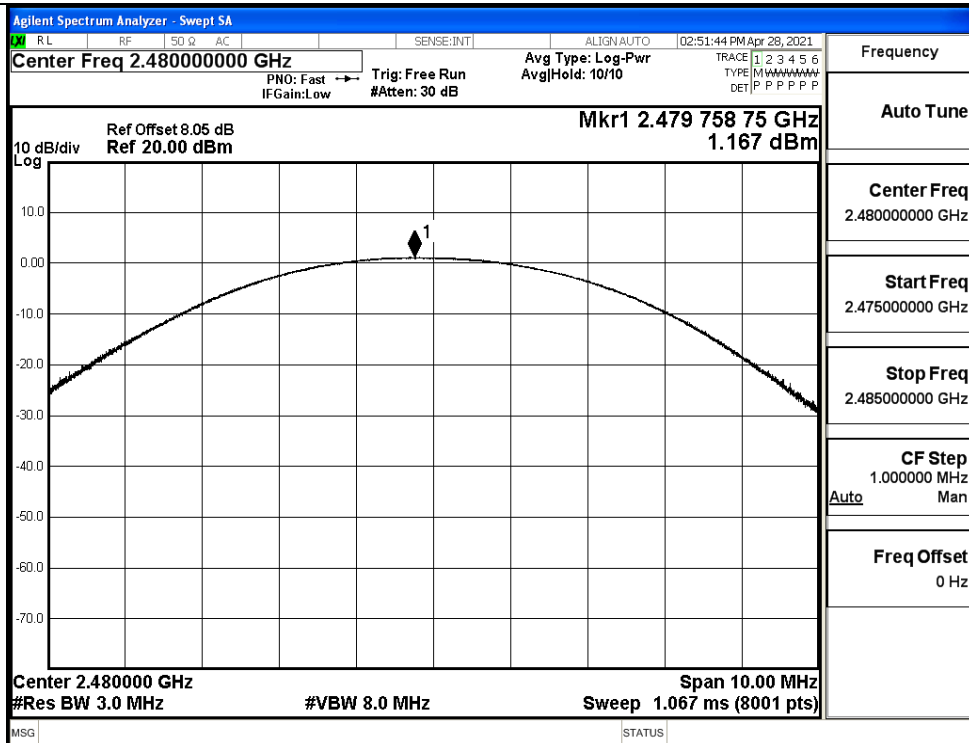
8DPSK/LCH



8DPSK/MCH



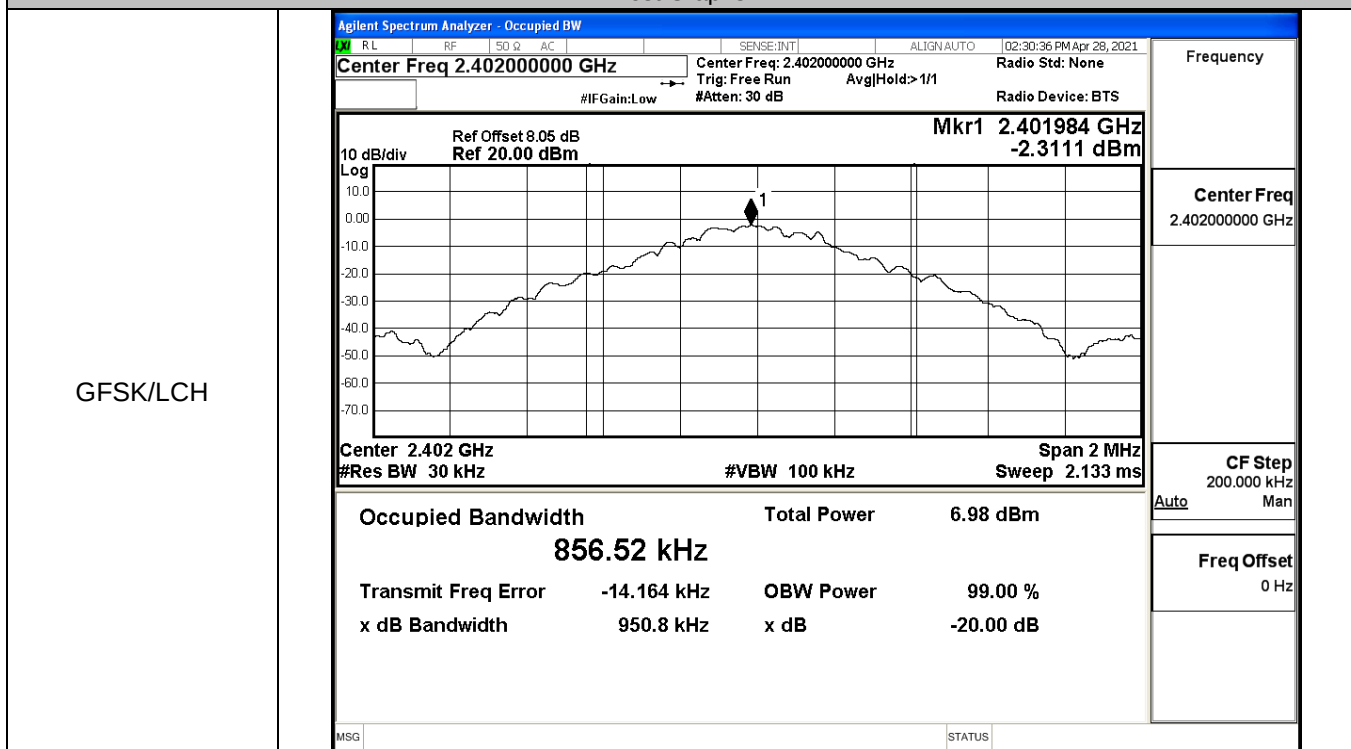
8DPSK/HCH



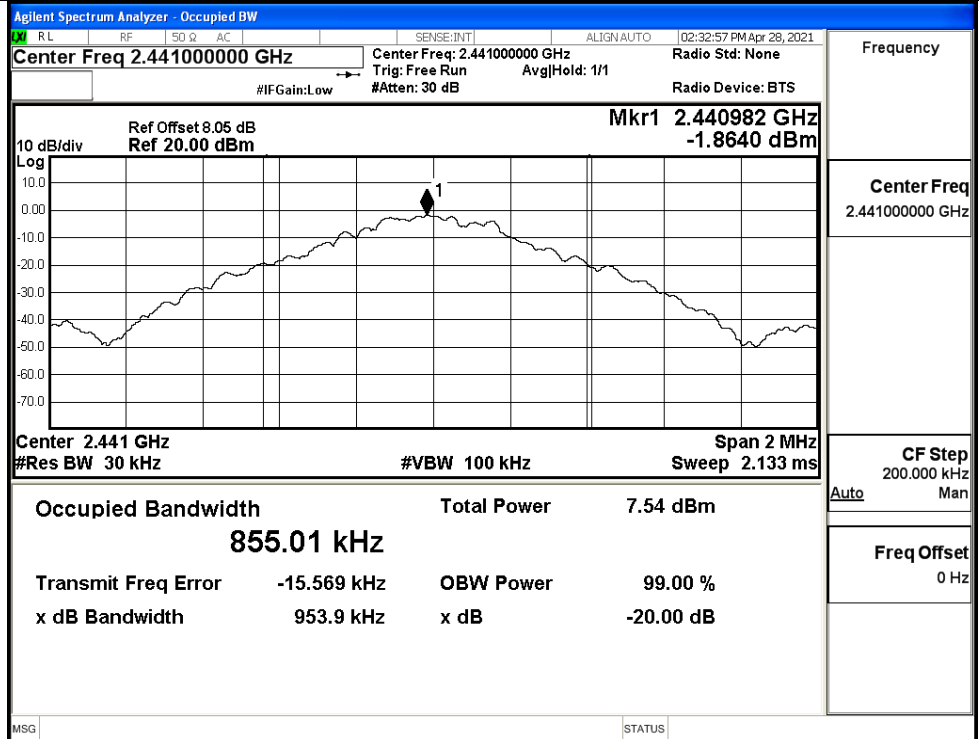
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9508	Not Specified	PASS
	MCH	0.9539	Not Specified	PASS
	HCH	0.9560	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.311	Not Specified	PASS
	MCH	1.314	Not Specified	PASS
	HCH	1.316	Not Specified	PASS
8DPSK	LCH	1.312	Not Specified	PASS
	MCH	1.314	Not Specified	PASS
	HCH	1.313	Not Specified	PASS

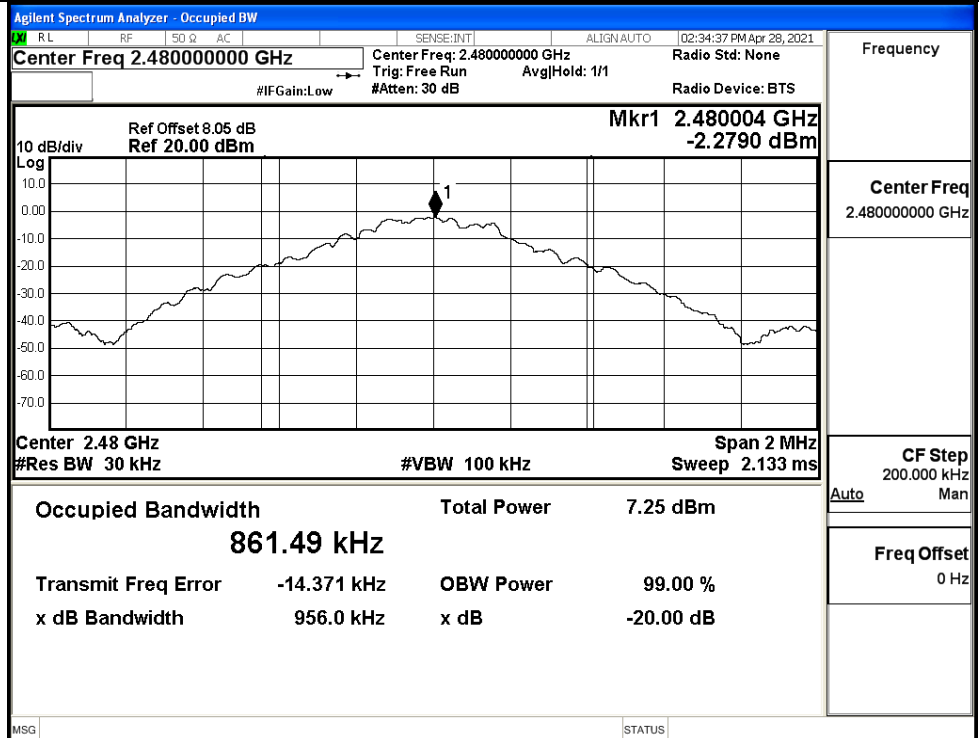
Test Graphs

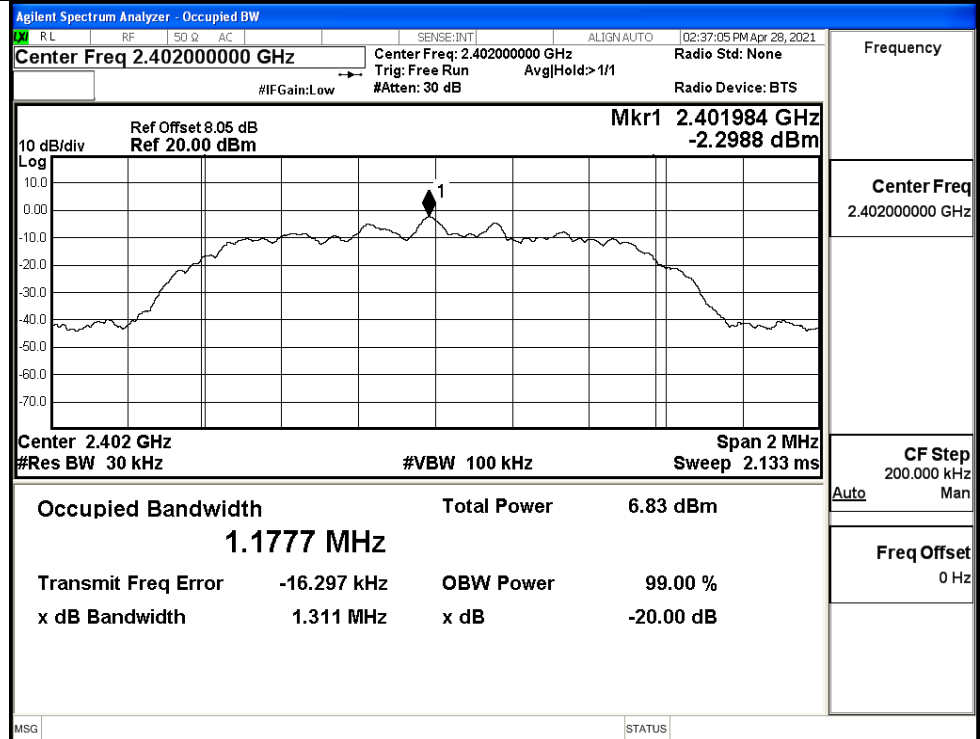
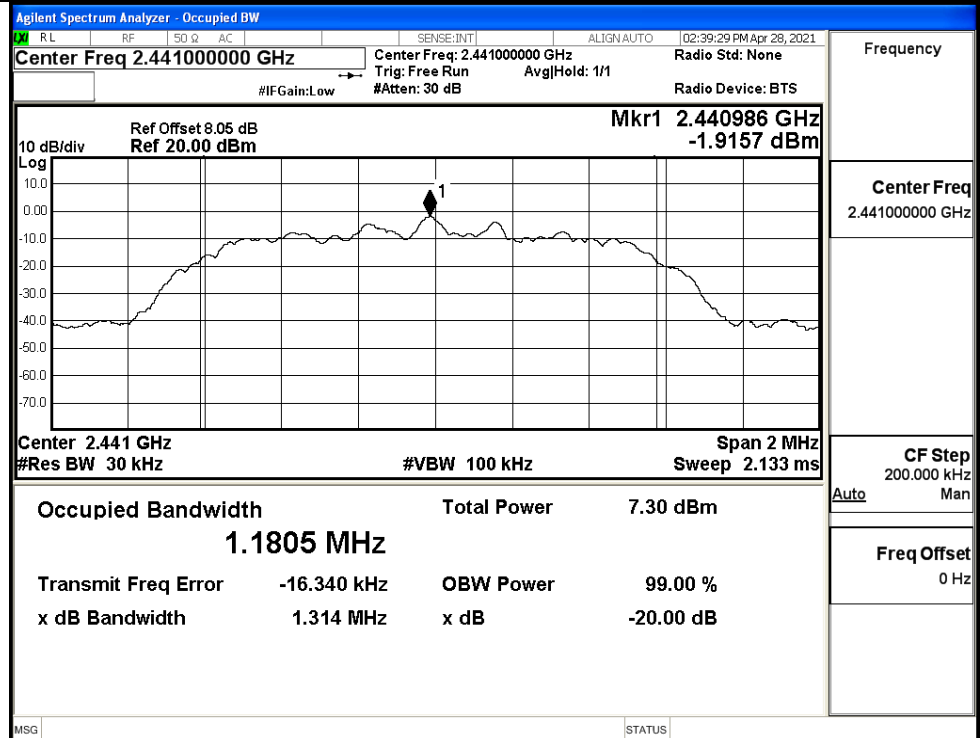


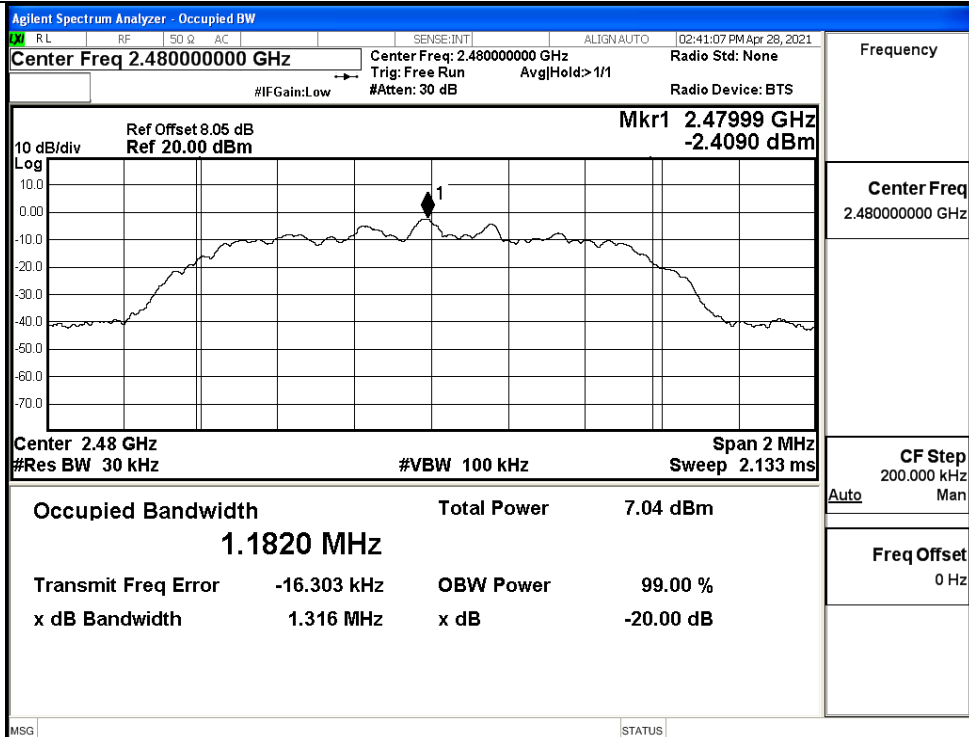
GFSK/MCH



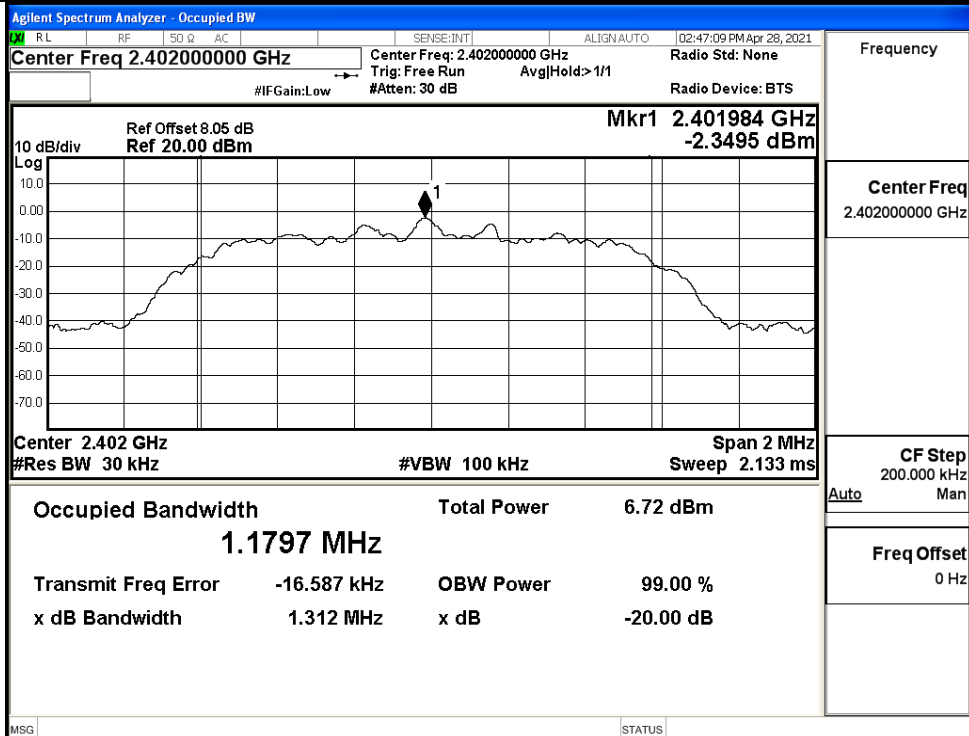
GFSK/HCH



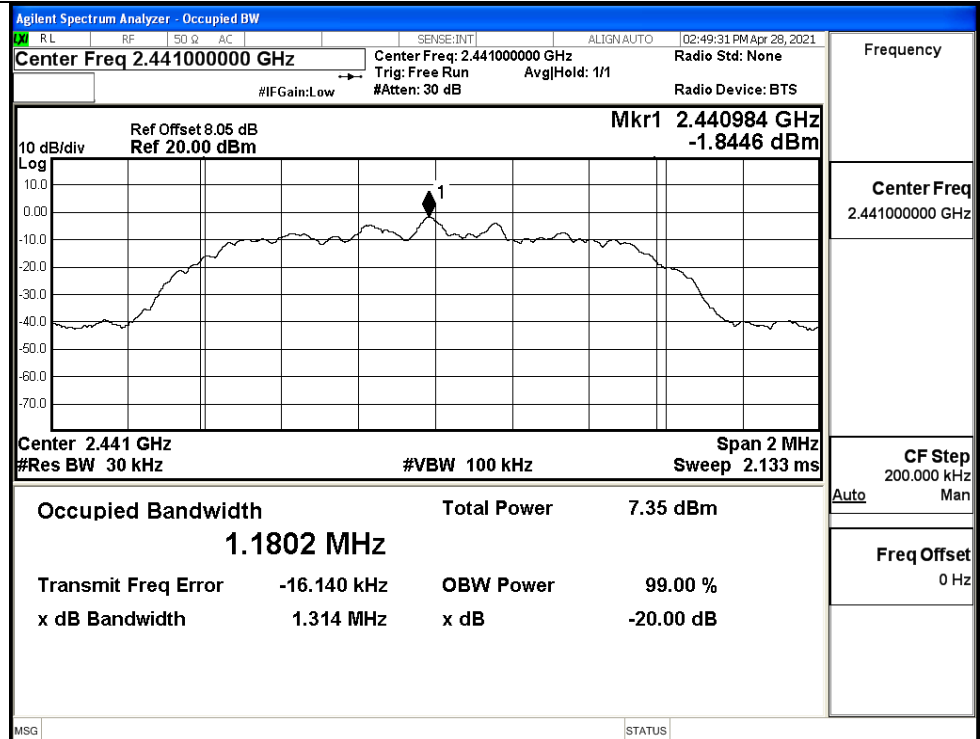
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

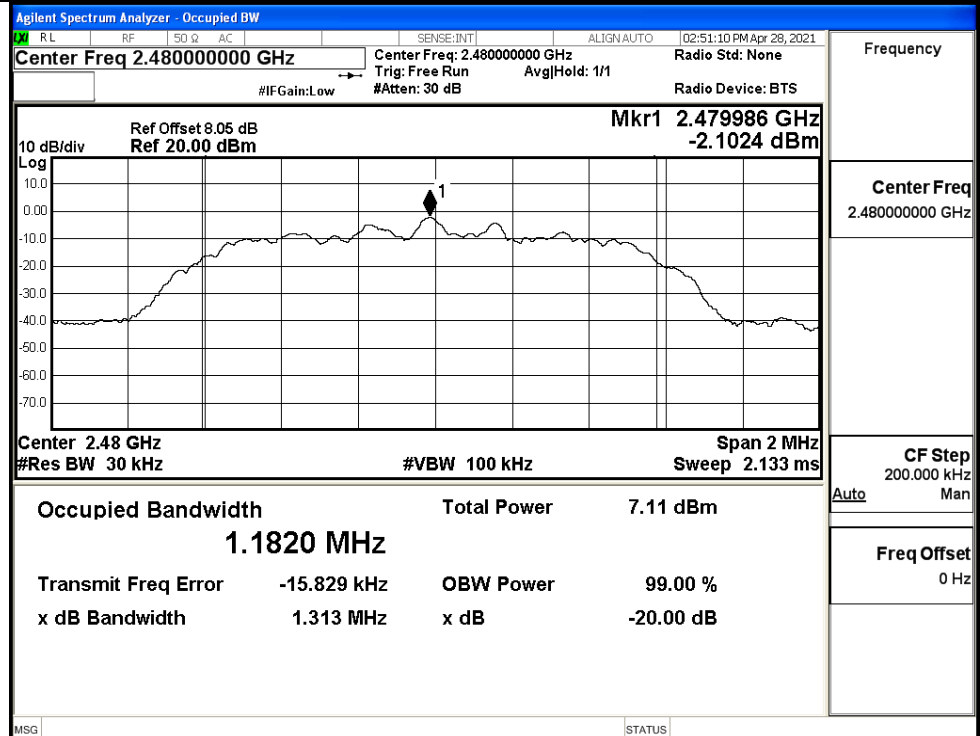
8DPSK/LCH



8DPSK/MCH



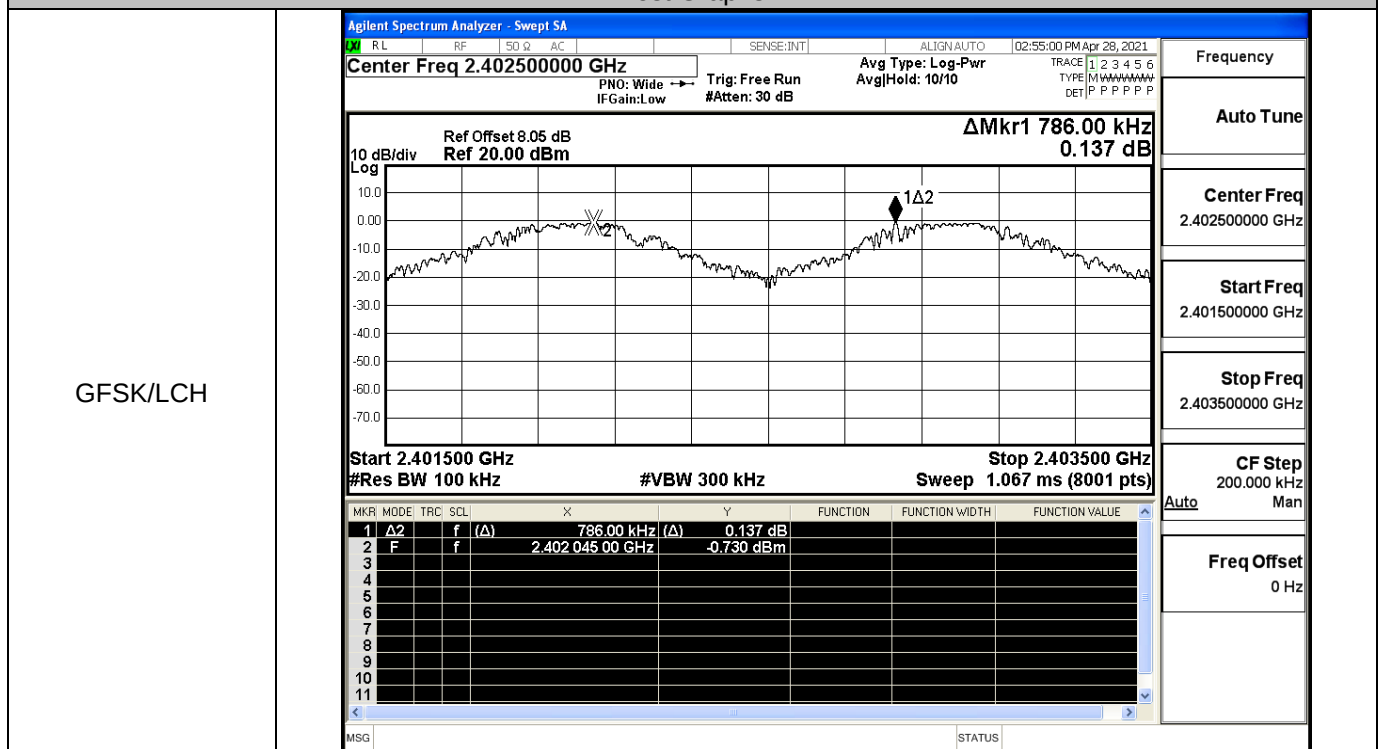
8DPSK/HCH



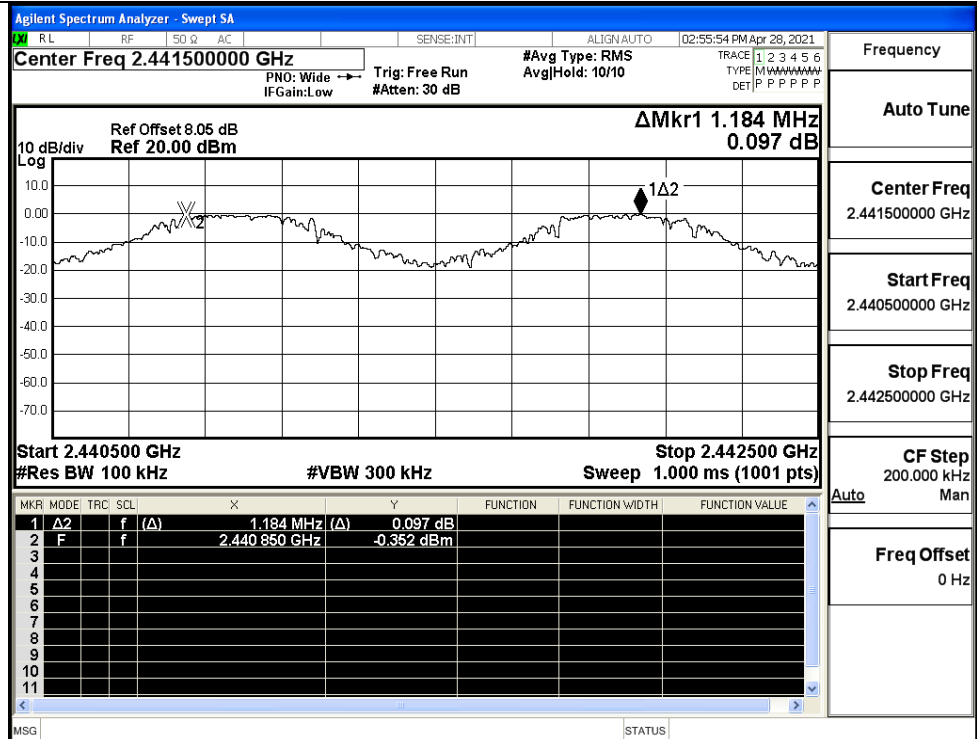
A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.786	0.637	PASS
	MCH	1.184	0.637	PASS
	HCH	0.962	0.637	PASS
$\pi/4$ DQPSK	LCH	1.184	0.877	PASS
	MCH	1.030	0.877	PASS
	HCH	1.002	0.877	PASS
8DPSK	LCH	1.038	0.876	PASS
	MCH	1.106	0.876	PASS
	HCH	1.188	0.876	PASS

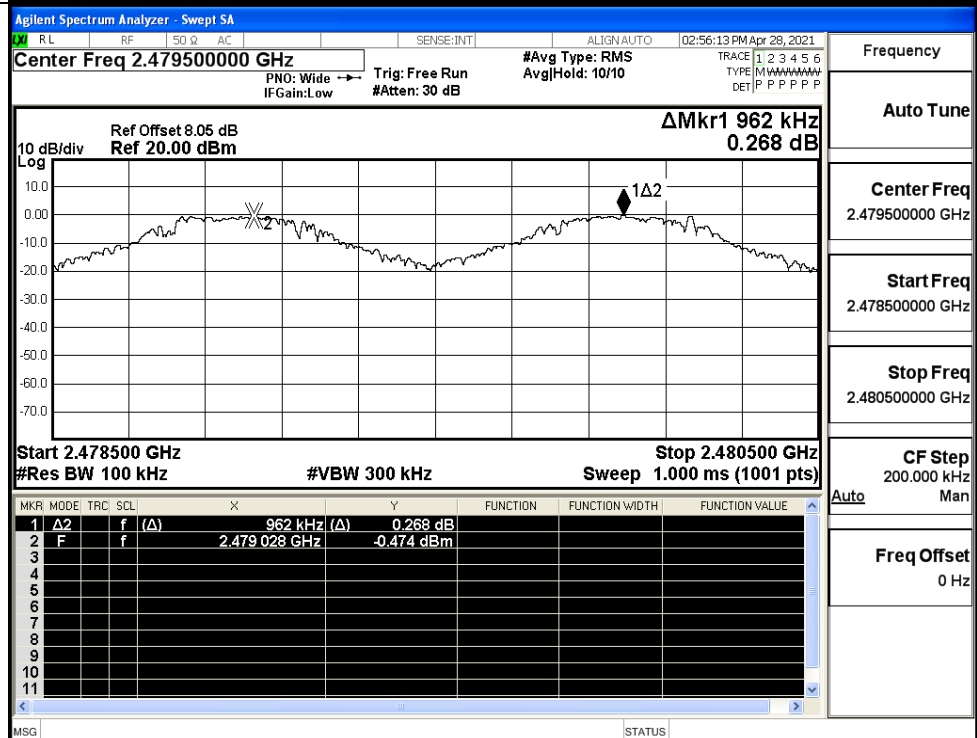
Test Graphs

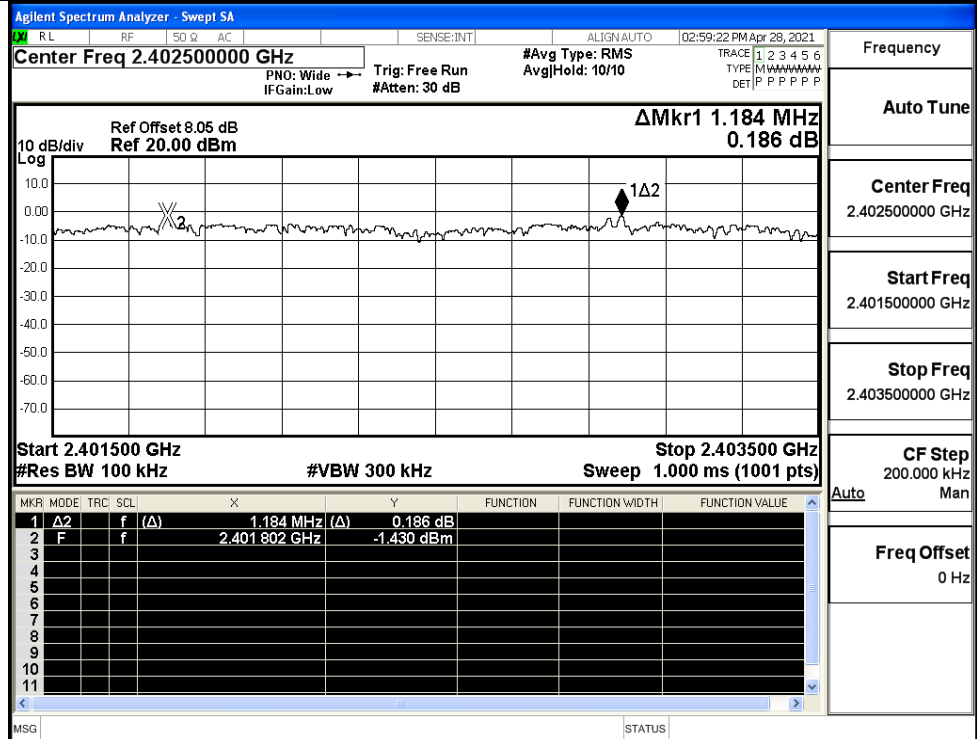
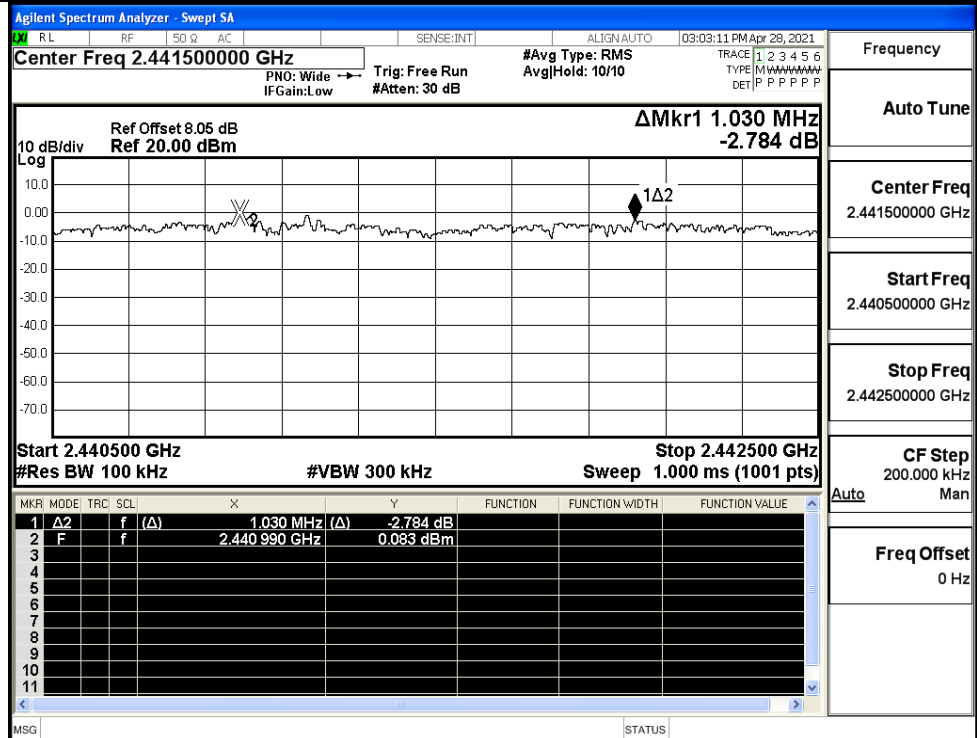


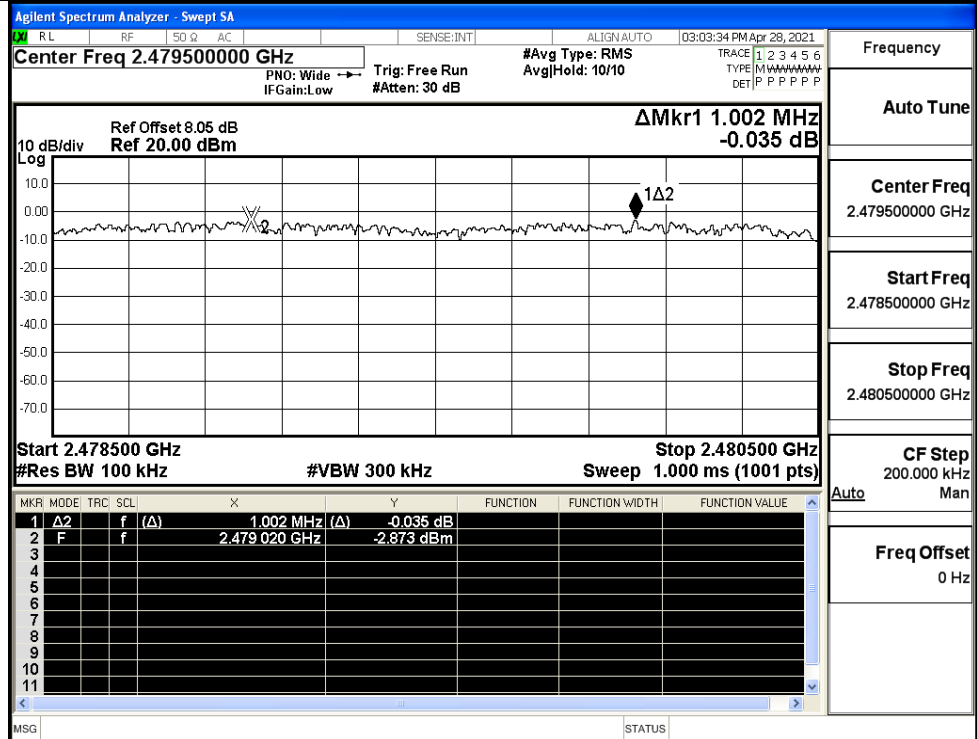
GFSK/MCH



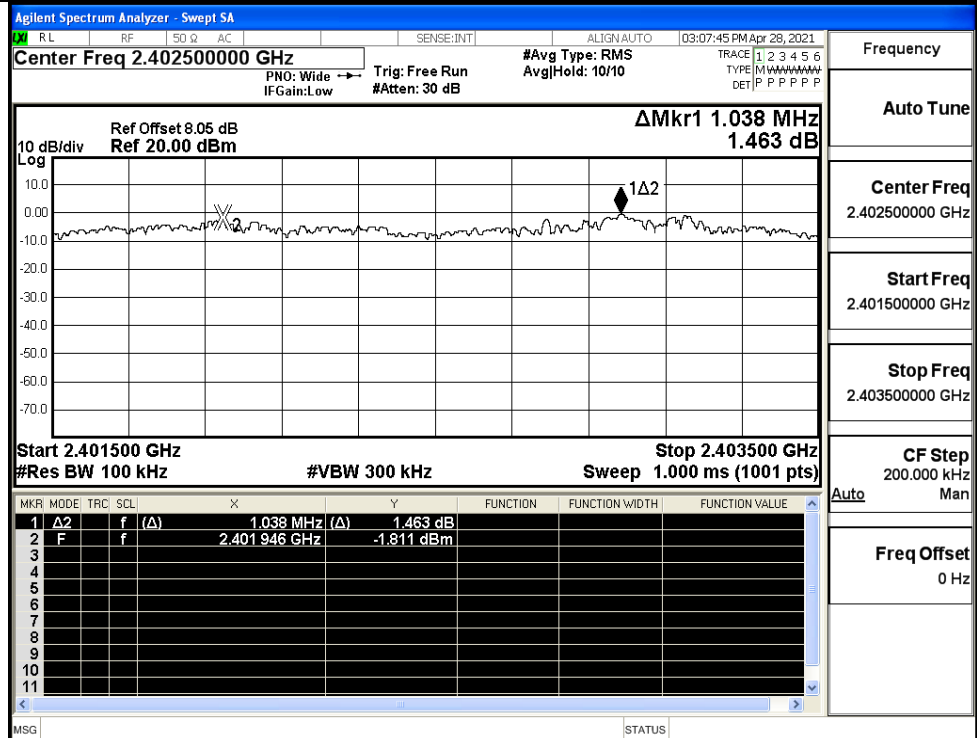
GFSK/HCH



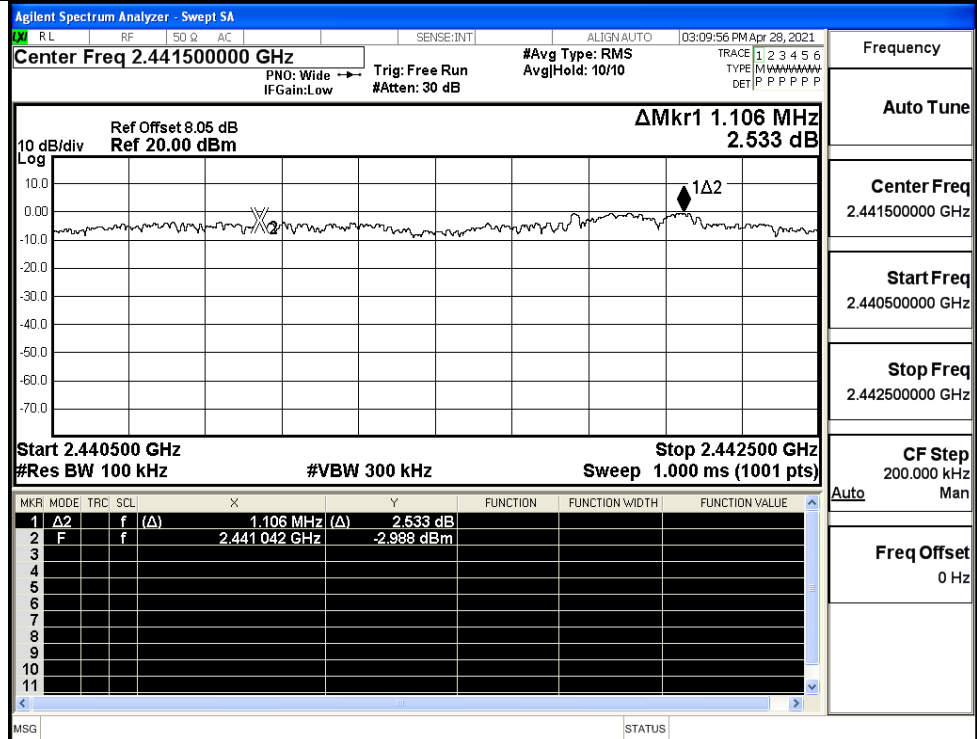
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

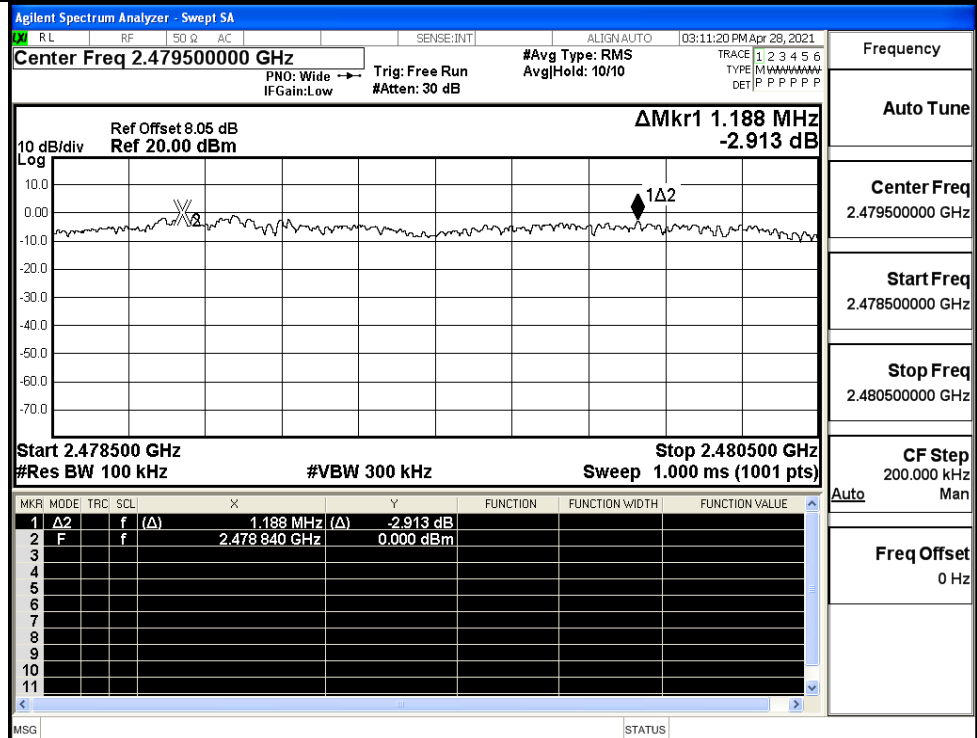
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

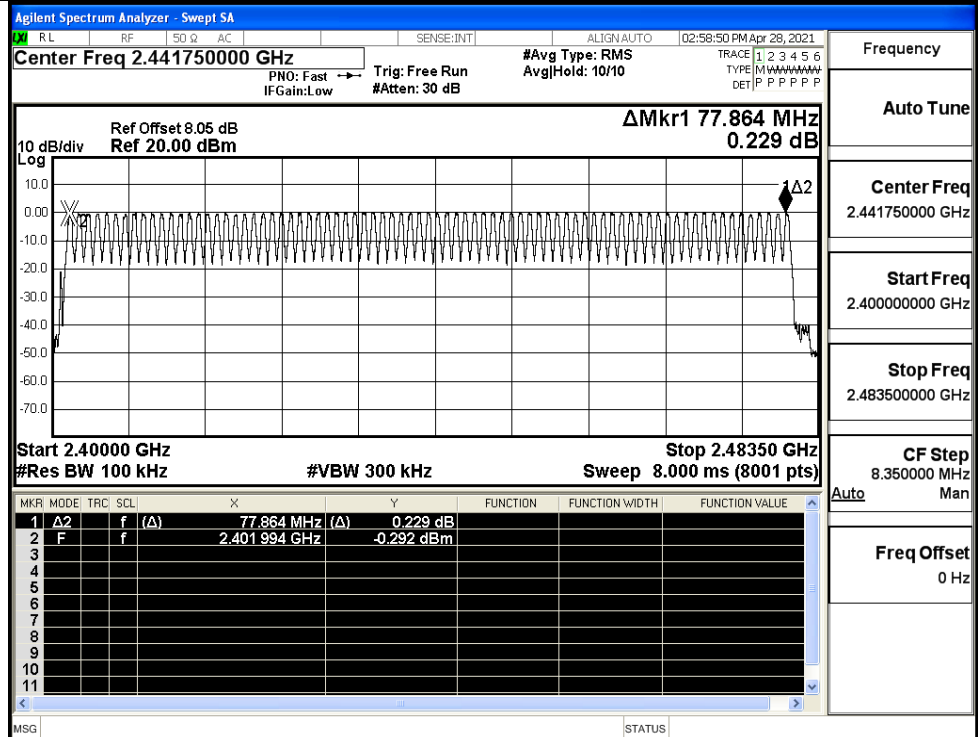


A.4 Hopping Channel Number

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 GHz

Start Freq

2.400000000 GHz

Stop Freq

2.483500000 GHz

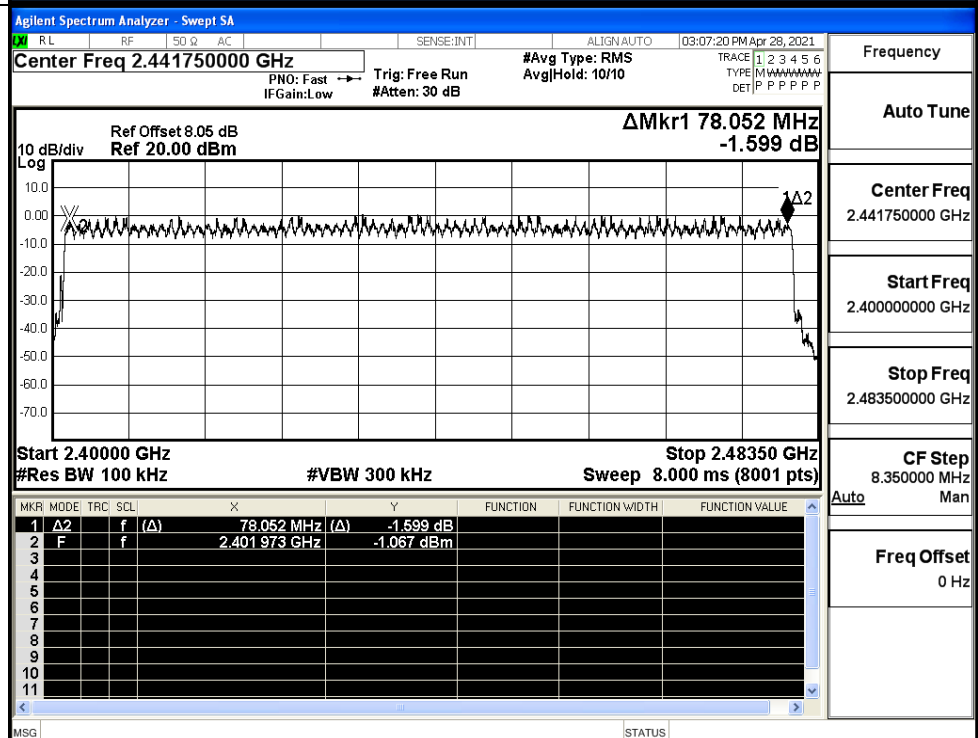
CF Step

8.350000 MHz

Auto Man

Freq Offset

0 Hz

 $\pi/4$ DQPSK/Hop

Frequency

Auto Tune

Center Freq

2.441750000 GHz

Start Freq

2.400000000 GHz

Stop Freq

2.483500000 GHz

CF Step

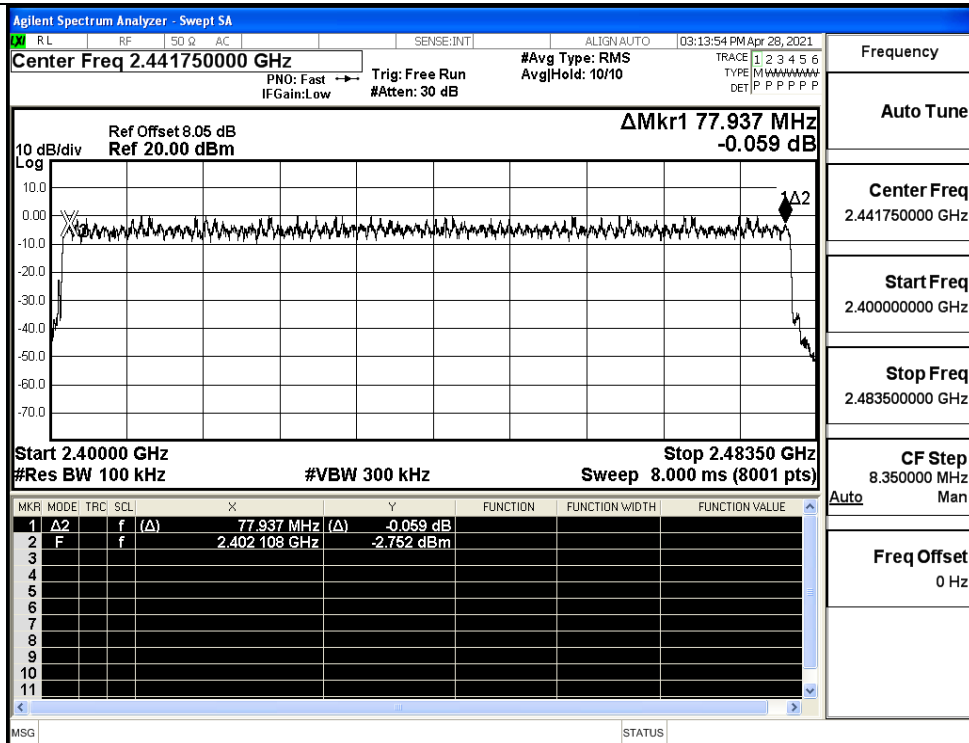
8.350000 MHz

Auto Man

Freq Offset

0 Hz

8DPSK/Hop

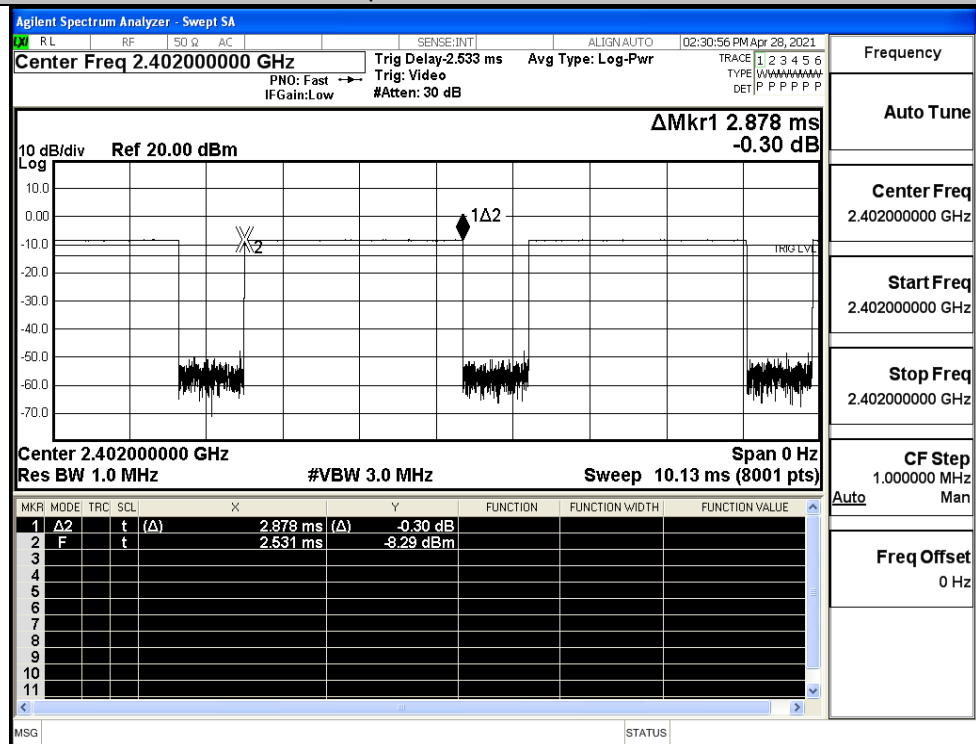


A.5 Dwell Time

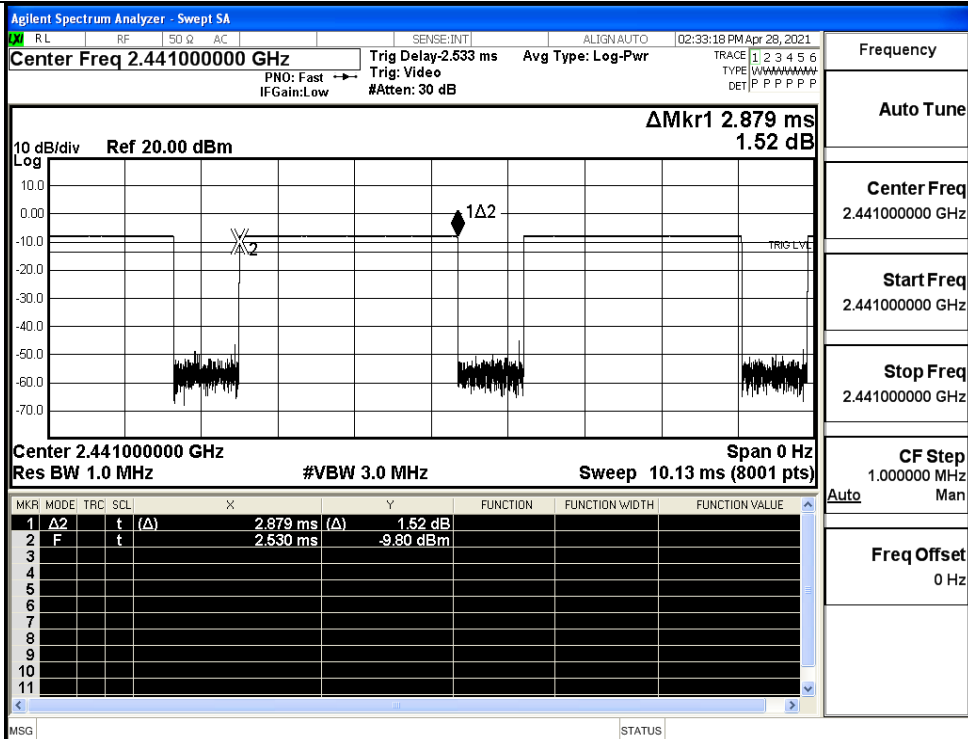
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.308	0.4	PASS
	2DH5	HCH	2.88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

Test Graphs

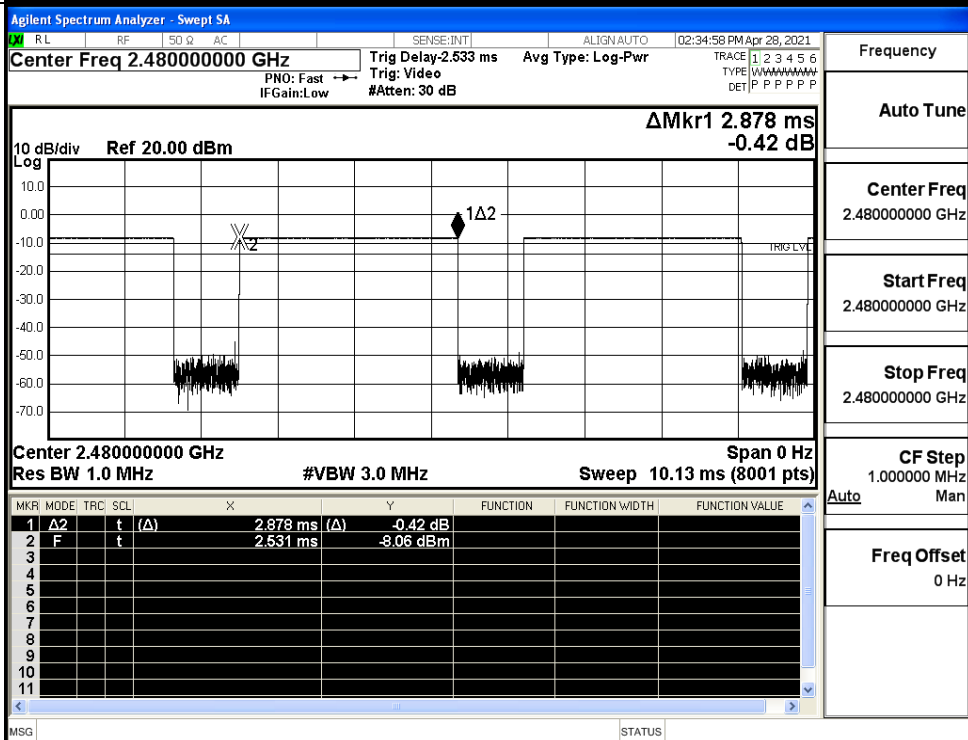
GFSK_DH5/LCH



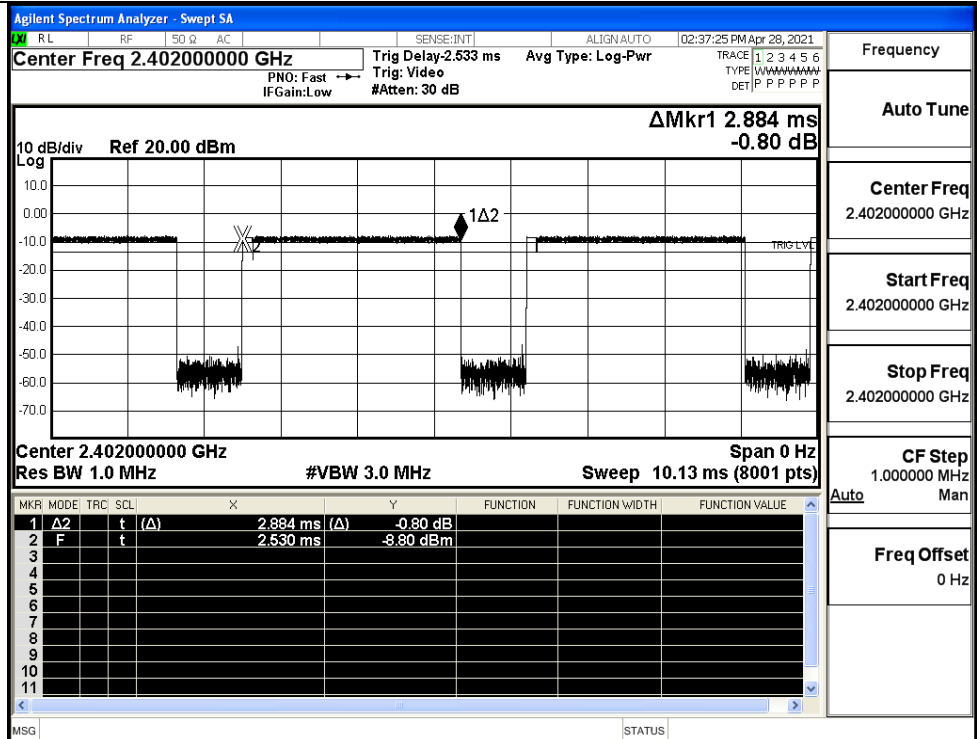
GFSK_DH5/MCH



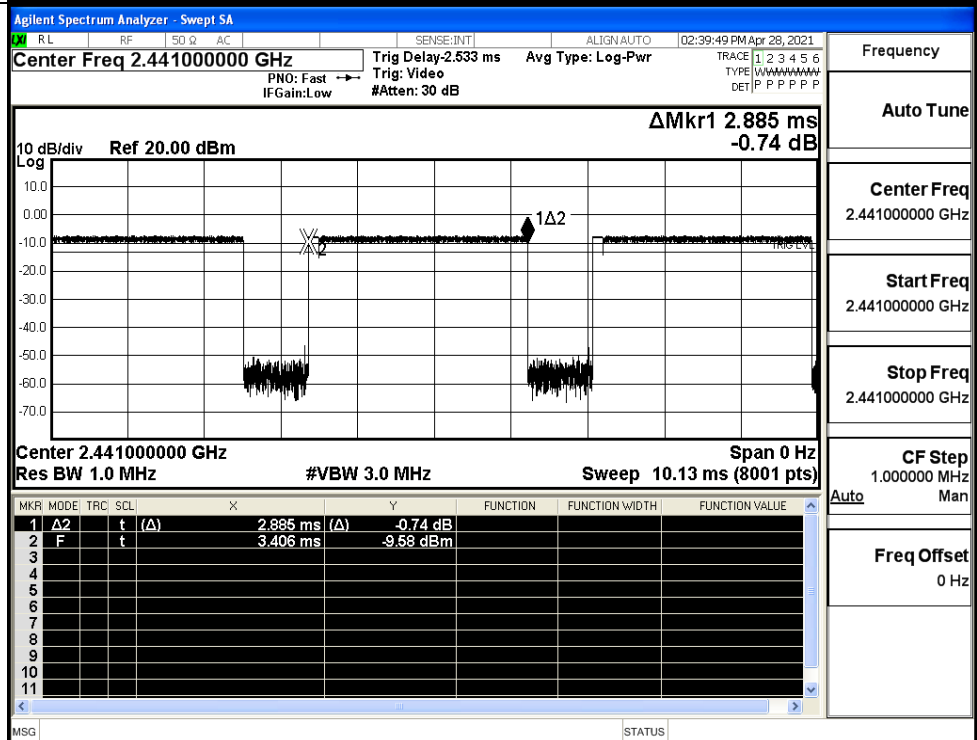
GFSK_DH5/HCH



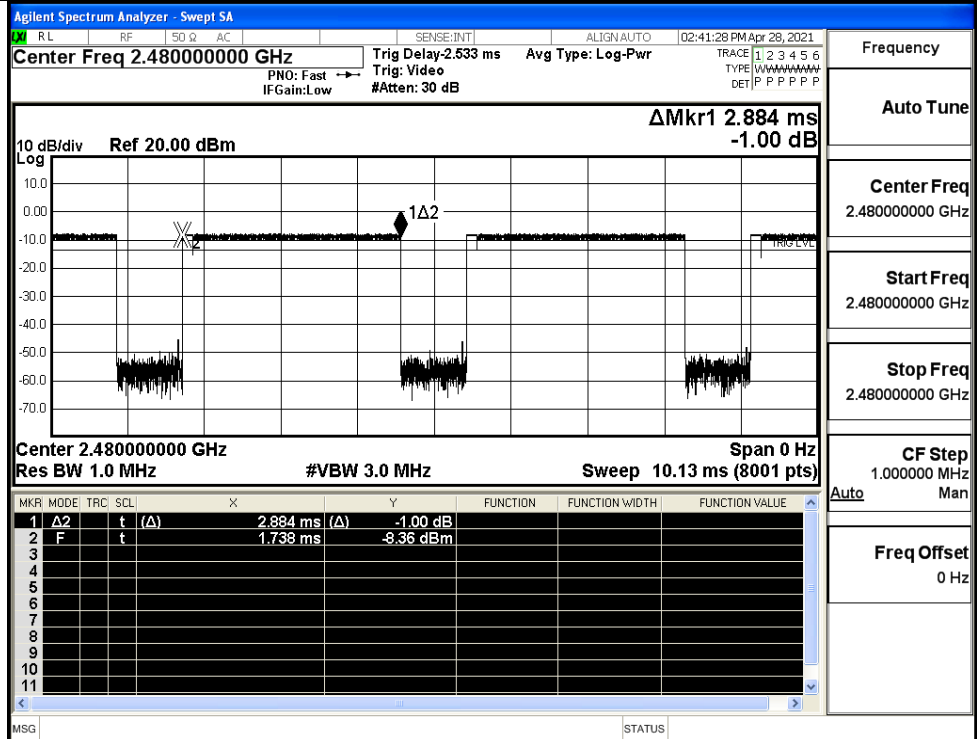
$\pi/4$ DQPSK
_2DH5/LCH



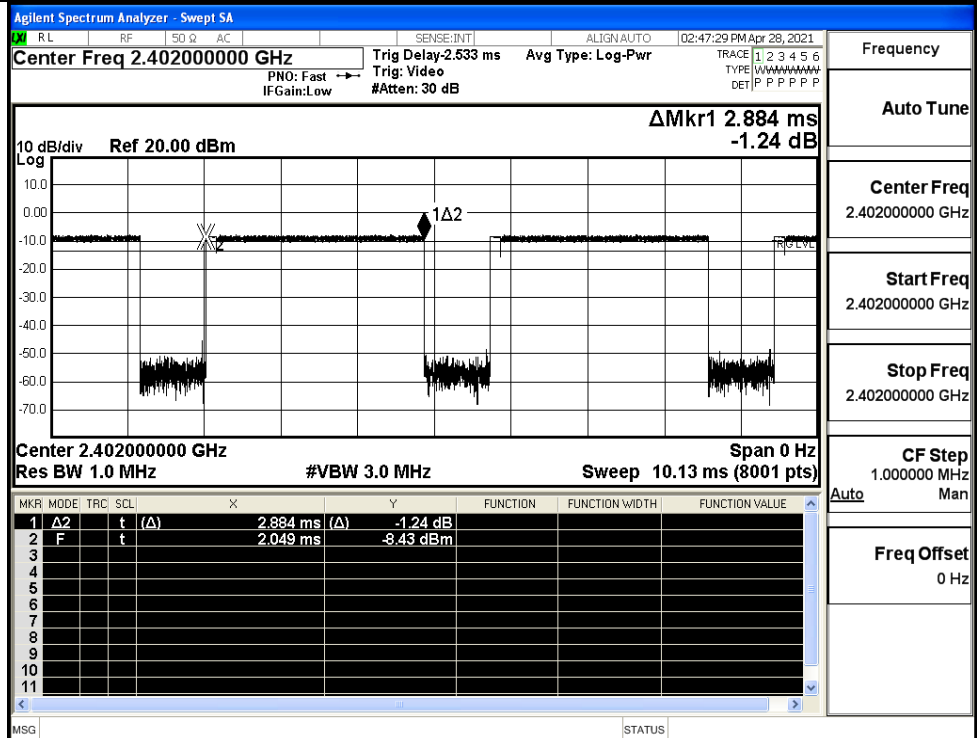
$\pi/4$ DQPSK
_2DH5/MCH



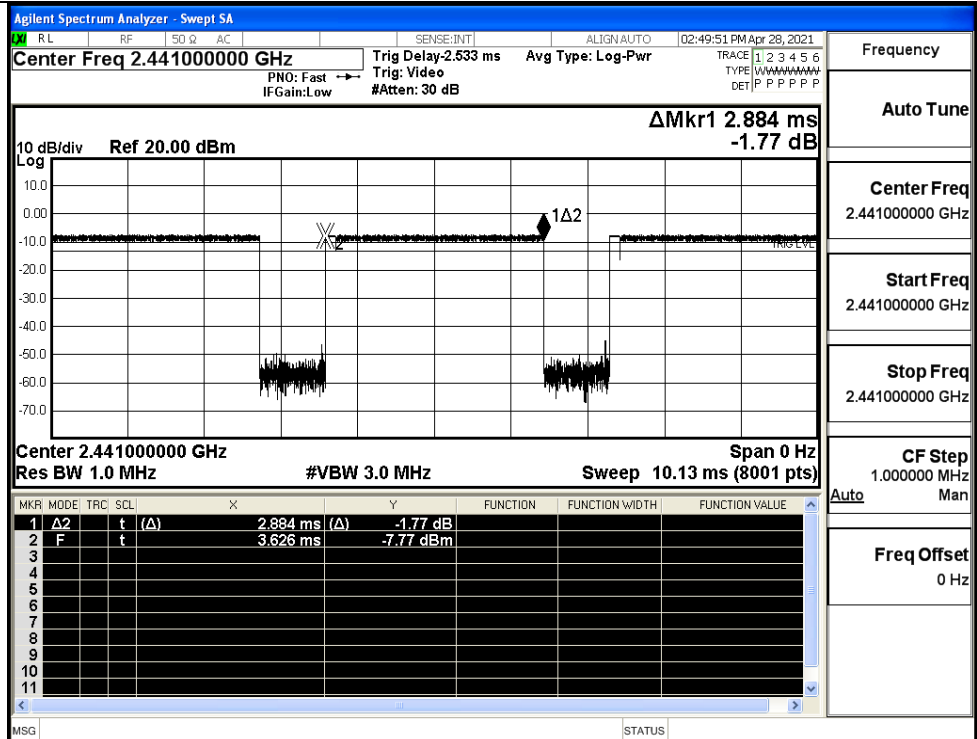
$\pi/4$ DQPSK
_2DH5/HCH



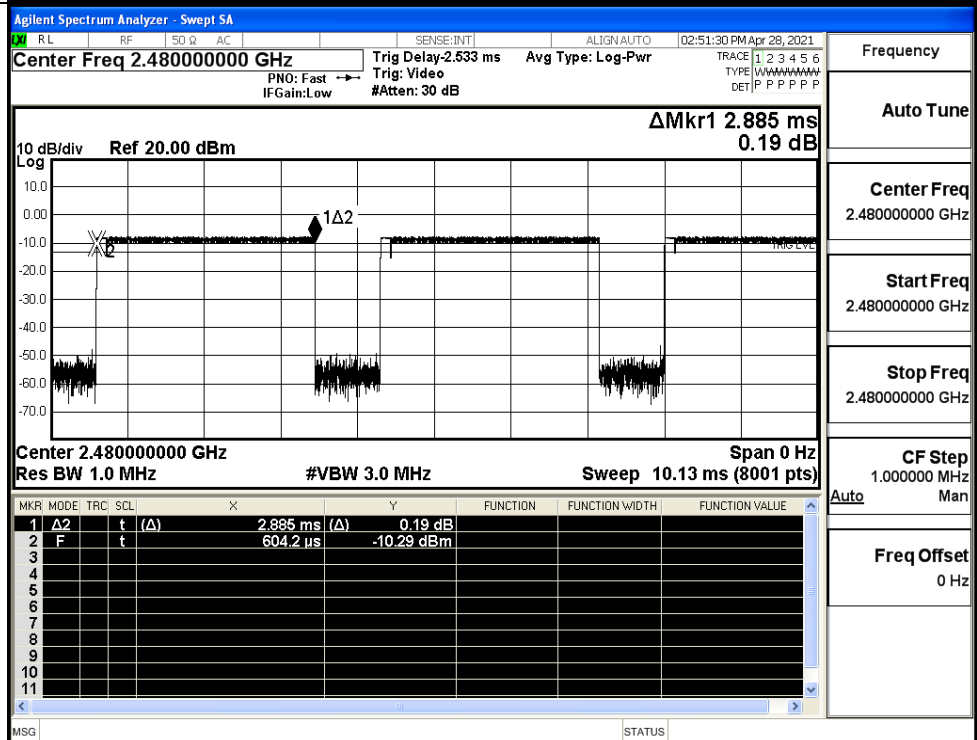
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



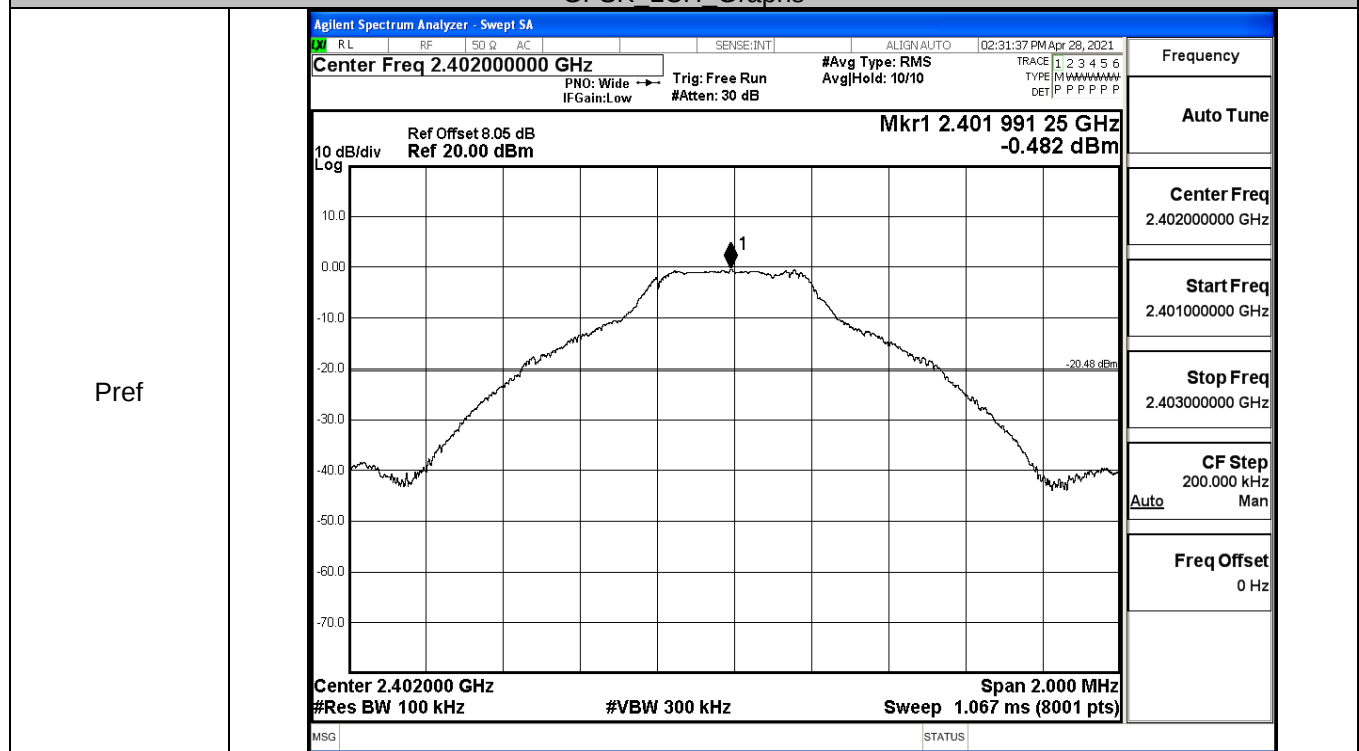
8DPSK_3DH5/HCH



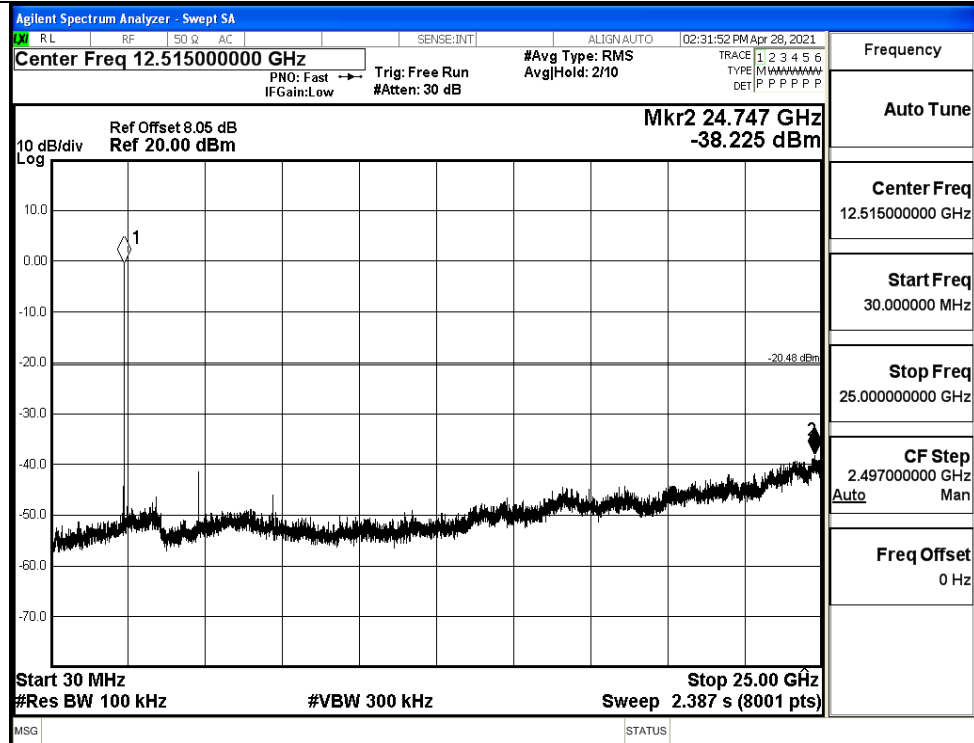
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.482	-38.225	-20.482	PASS
	MCH	-0.247	-36.940	-20.247	PASS
	HCH	-0.291	-37.984	-20.291	PASS
$\pi/4$ DQPSK	LCH	-0.42	-36.890	-20.420	PASS
	MCH	0.238	-37.198	-19.762	PASS
	HCH	-0.2	-36.906	-20.200	PASS
8DPSK	LCH	-0.322	-36.640	-20.322	PASS
	MCH	0.27	-38.071	-19.730	PASS
	HCH	-0.036	-38.122	-20.036	PASS

GFSK LCH Graphs

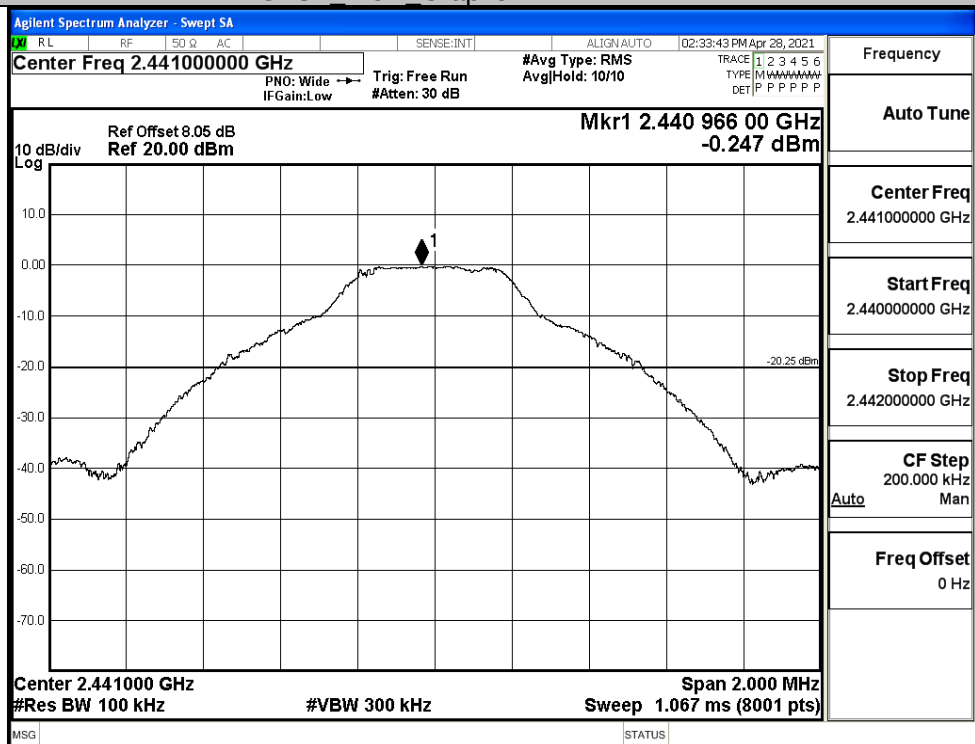


Puw

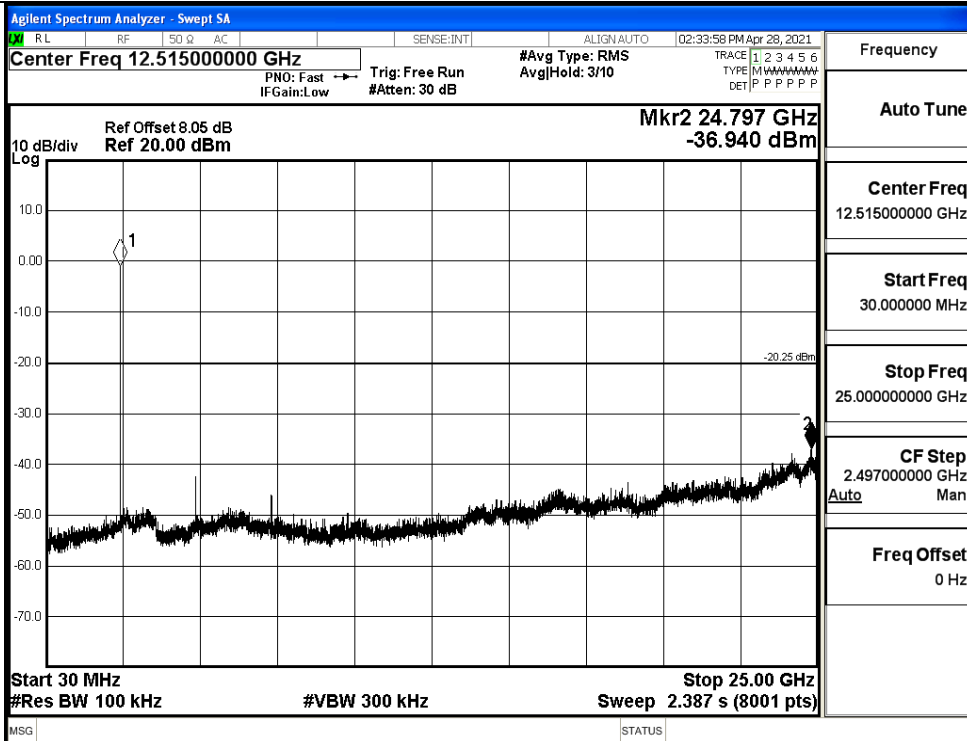


GFSK MCH Graphs

Pref

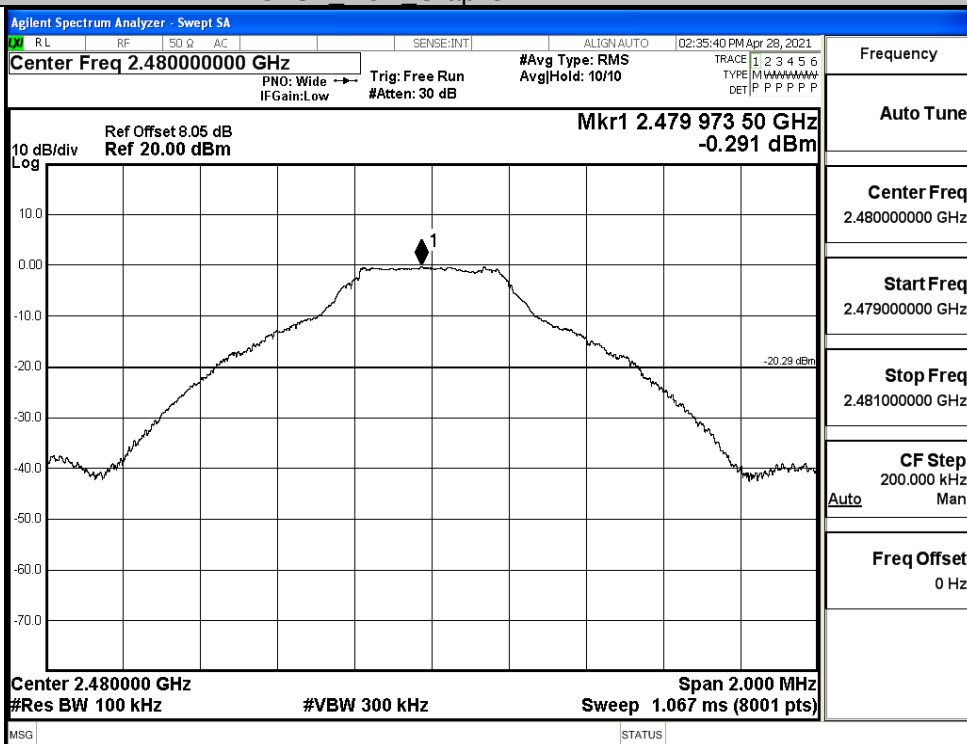


Puw

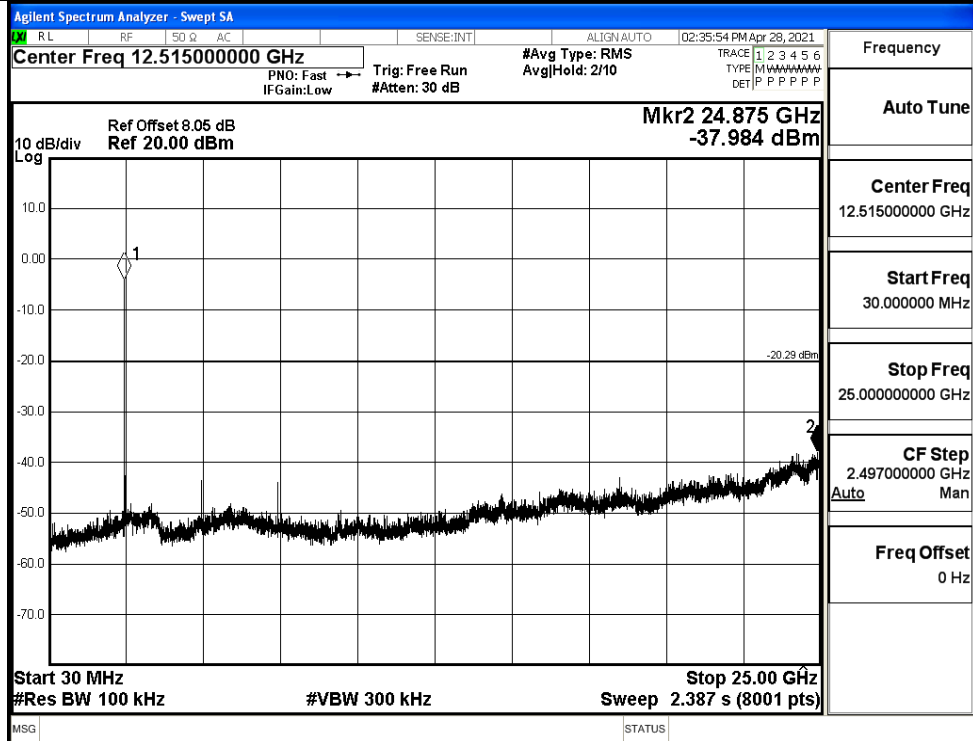


GFSK HCH Graphs

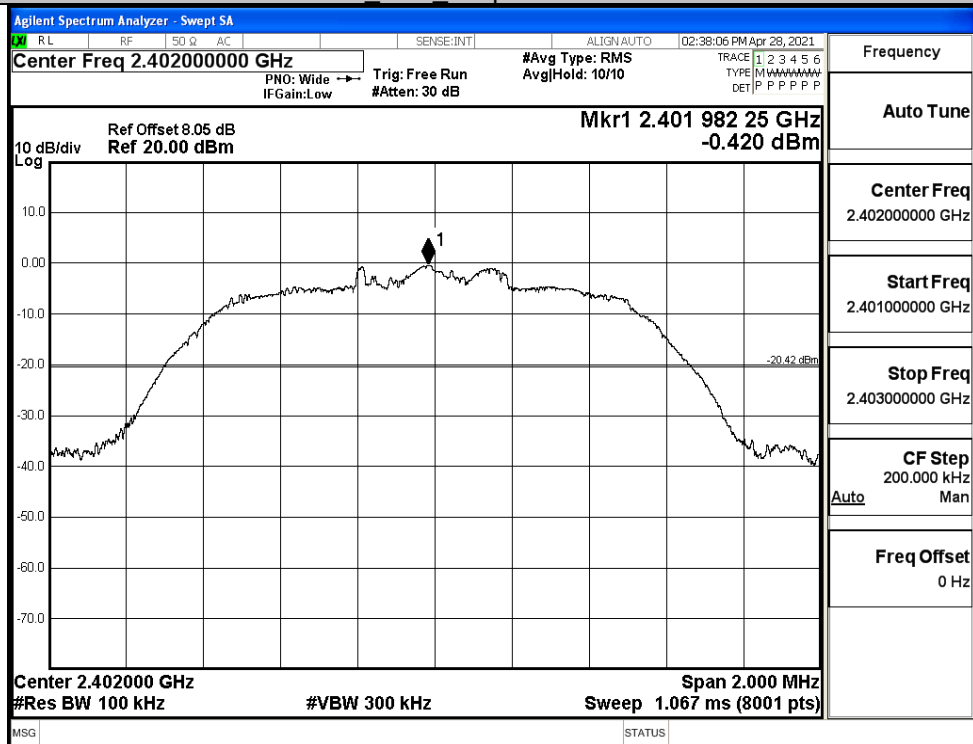
Pref



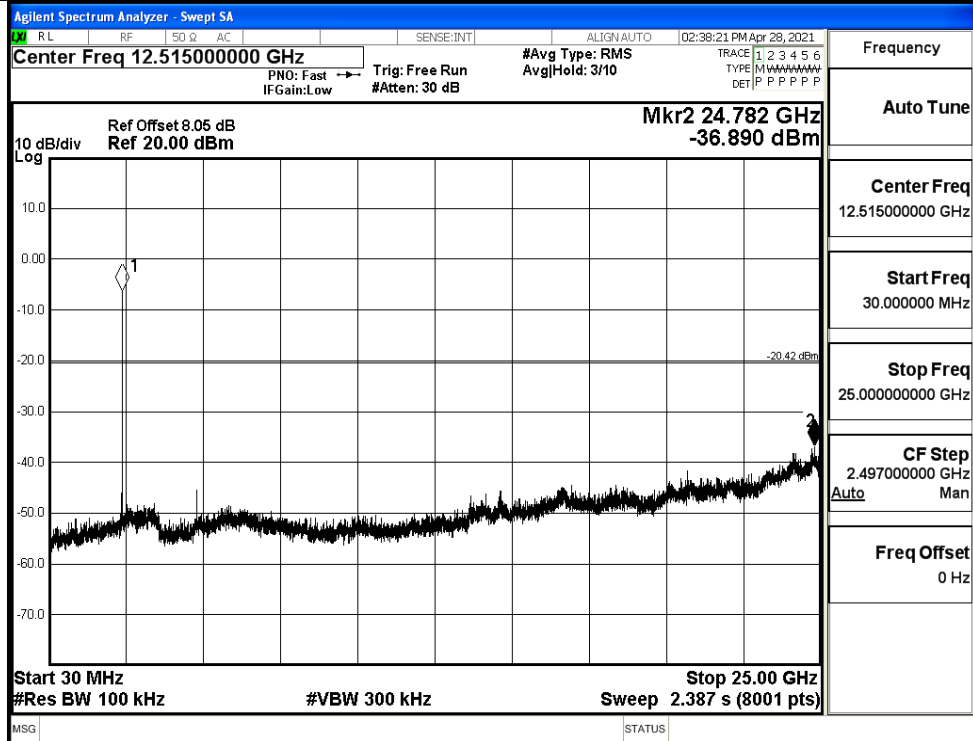
Puw

 $\pi/4$ DQPSK LCH Graphs

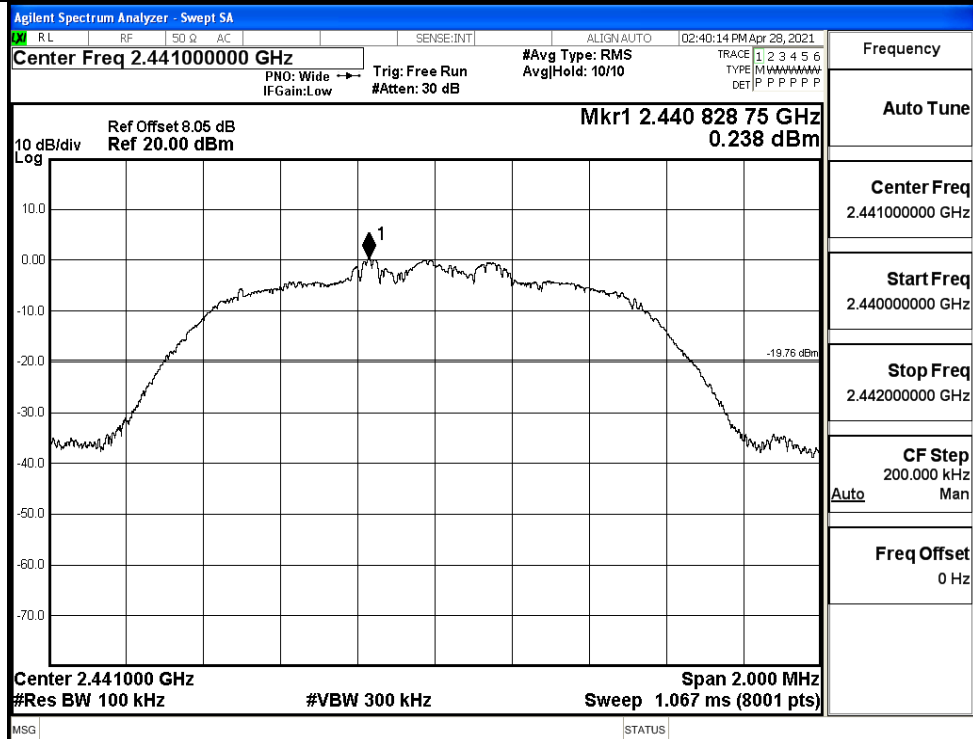
Pref



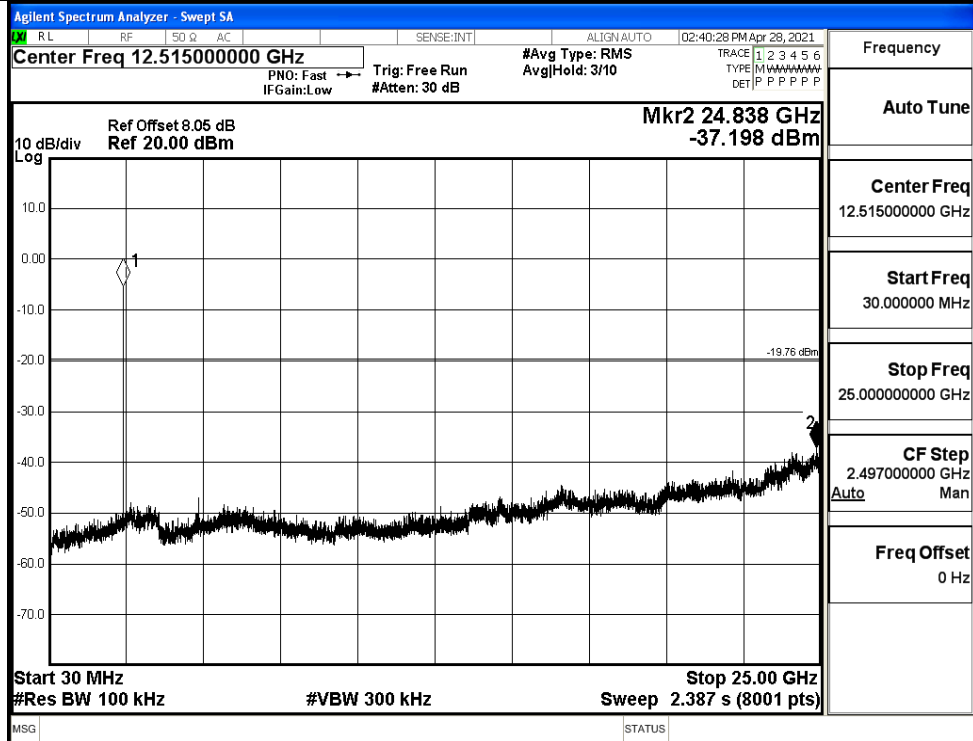
Puw



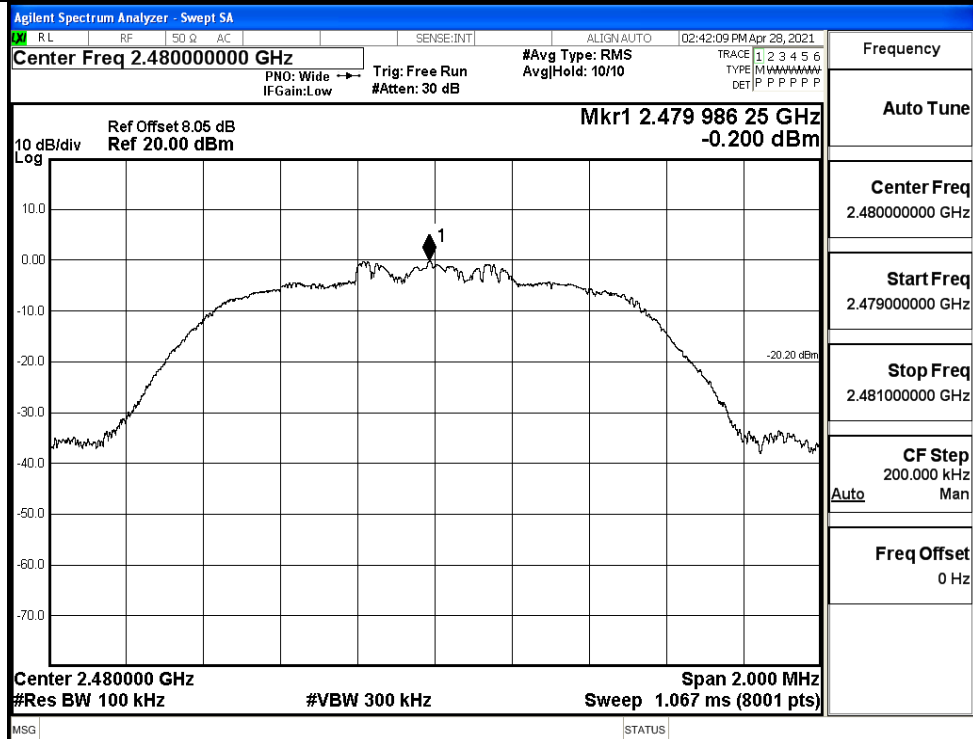
Pref

 $\pi/4$ DQPSK MCH Graphs

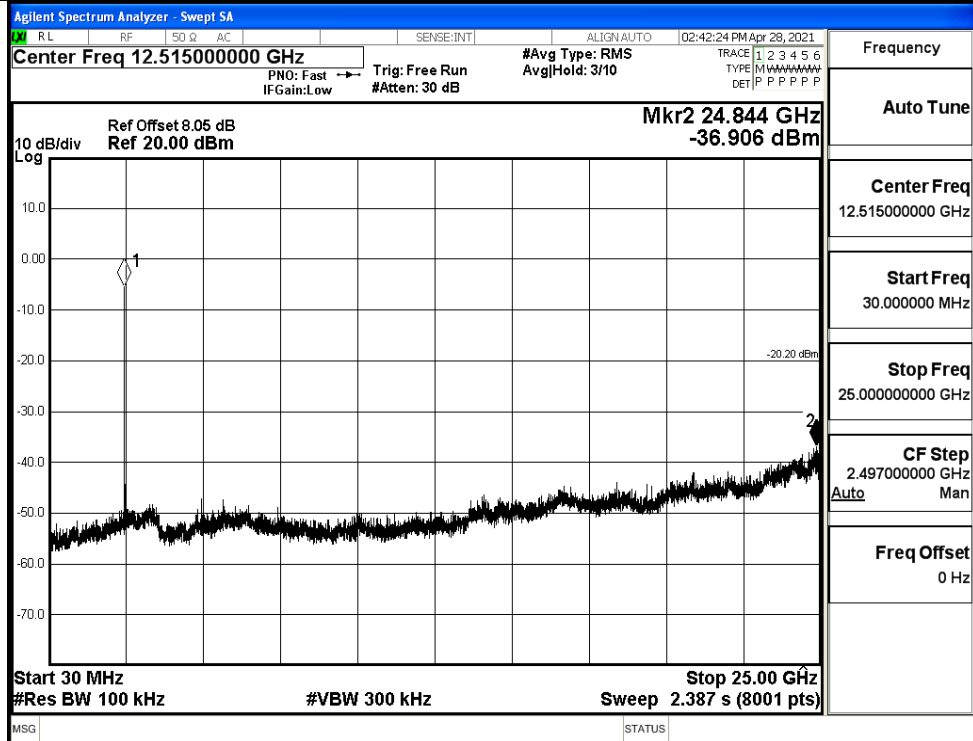
Puw

 $\pi/4$ DQPSK HCH Graphs

Pref

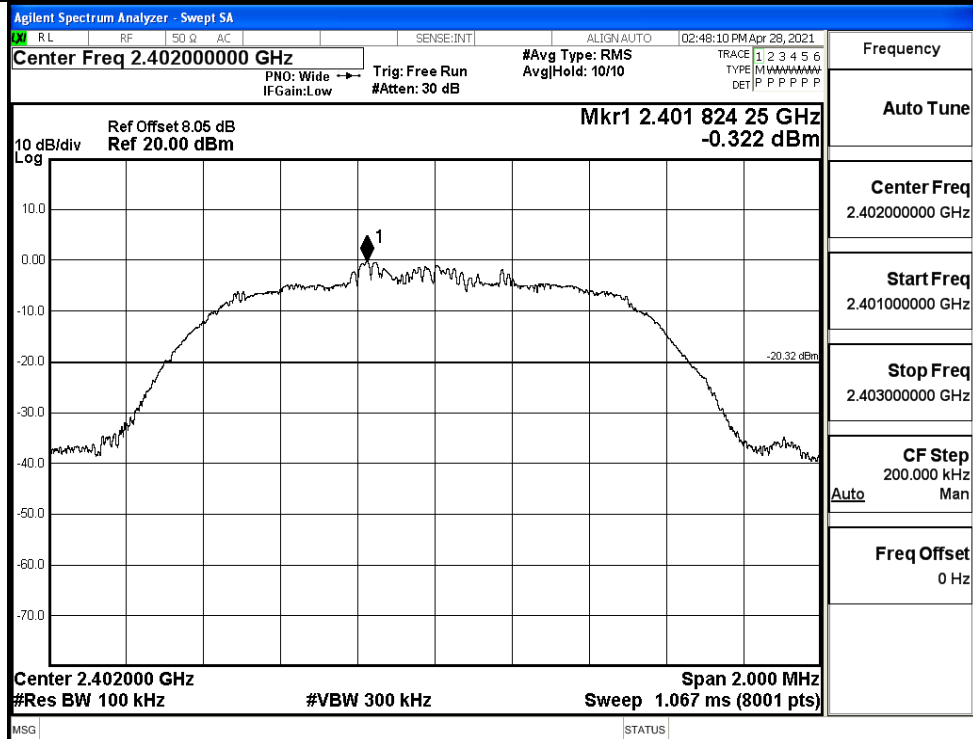


Puw

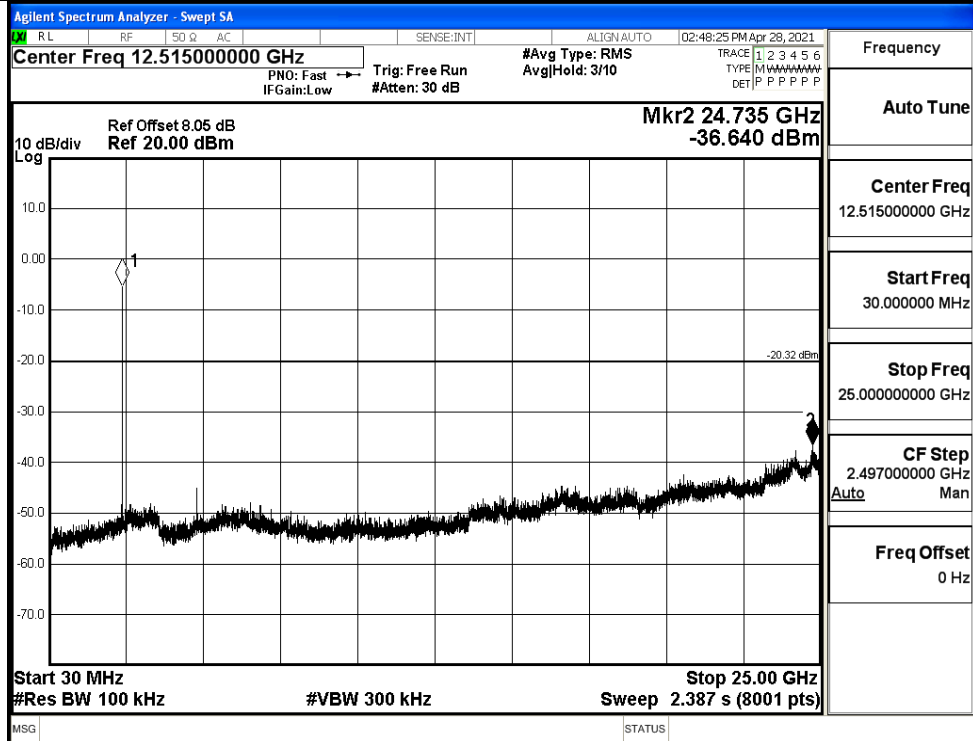


8DPSK LCH Graphs

Pref

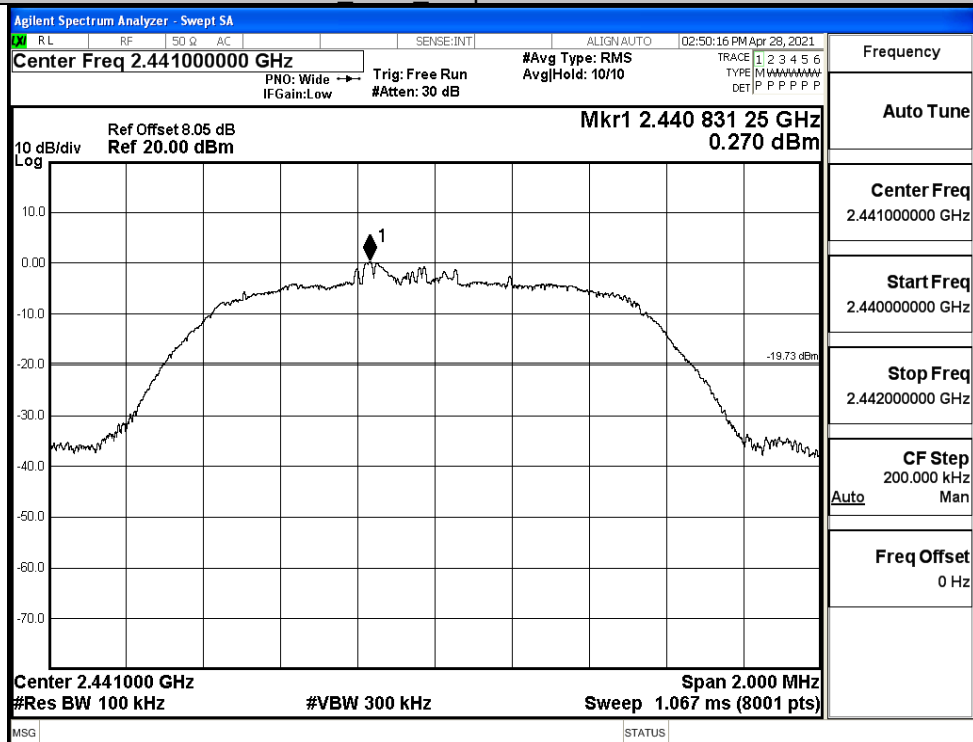


Puw

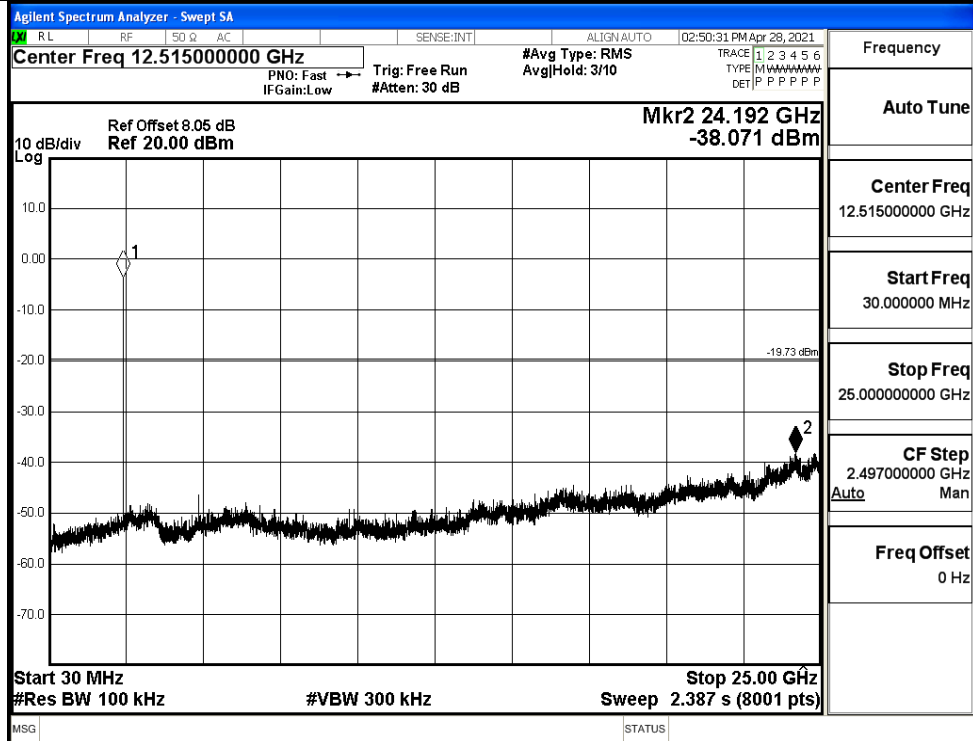


8DPSK MCH Graphs

Pref

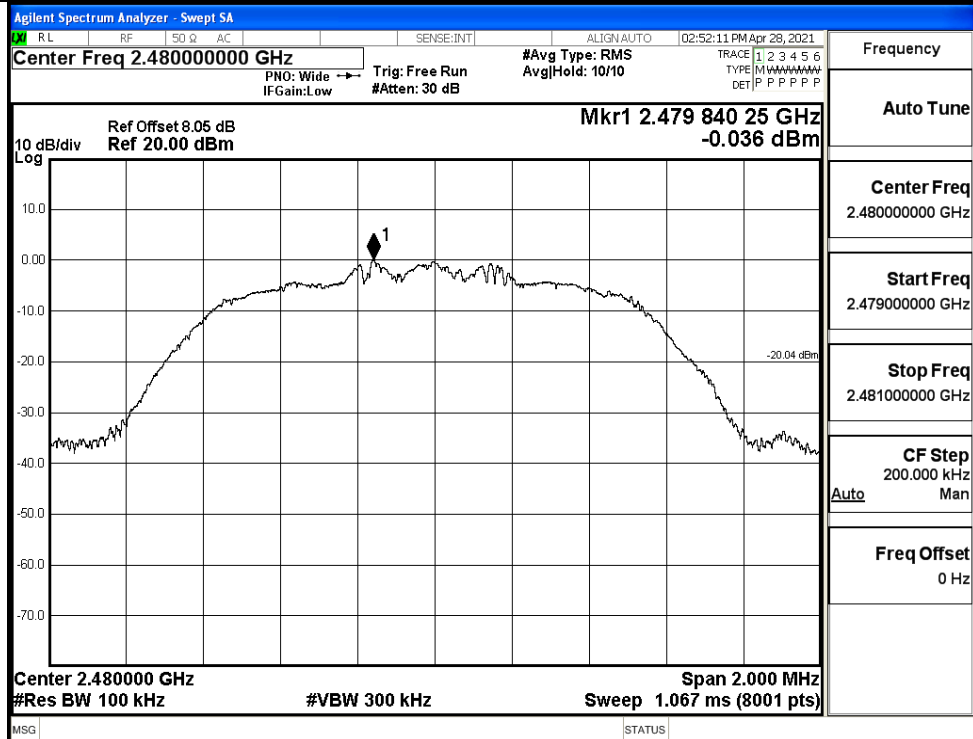


Puw

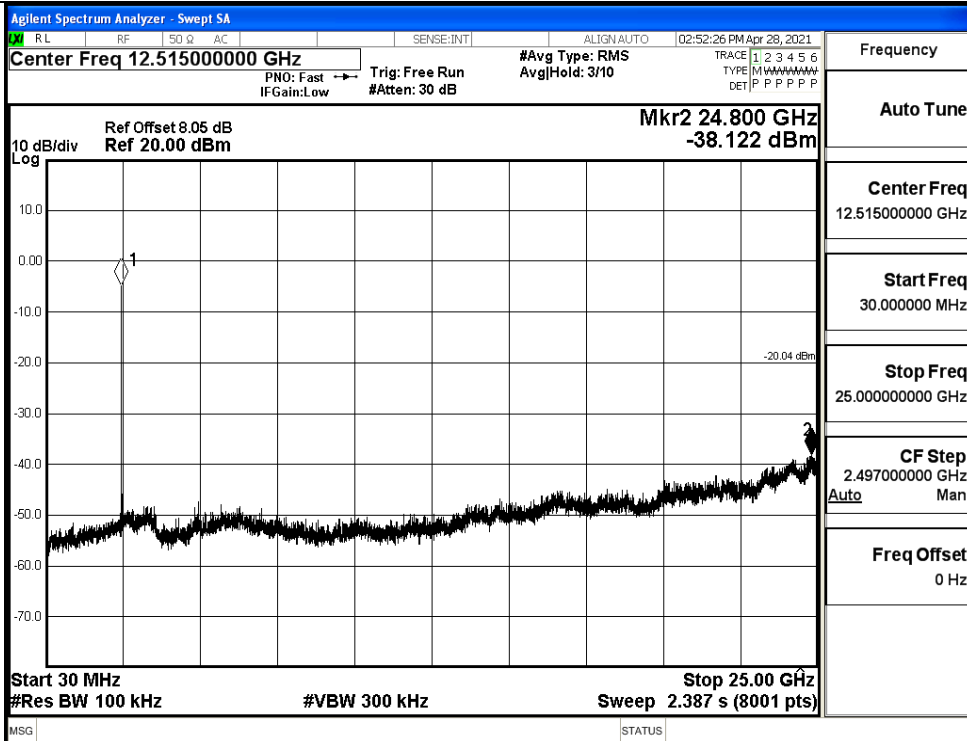


8DPSK HCH Graphs

Pref



Puw

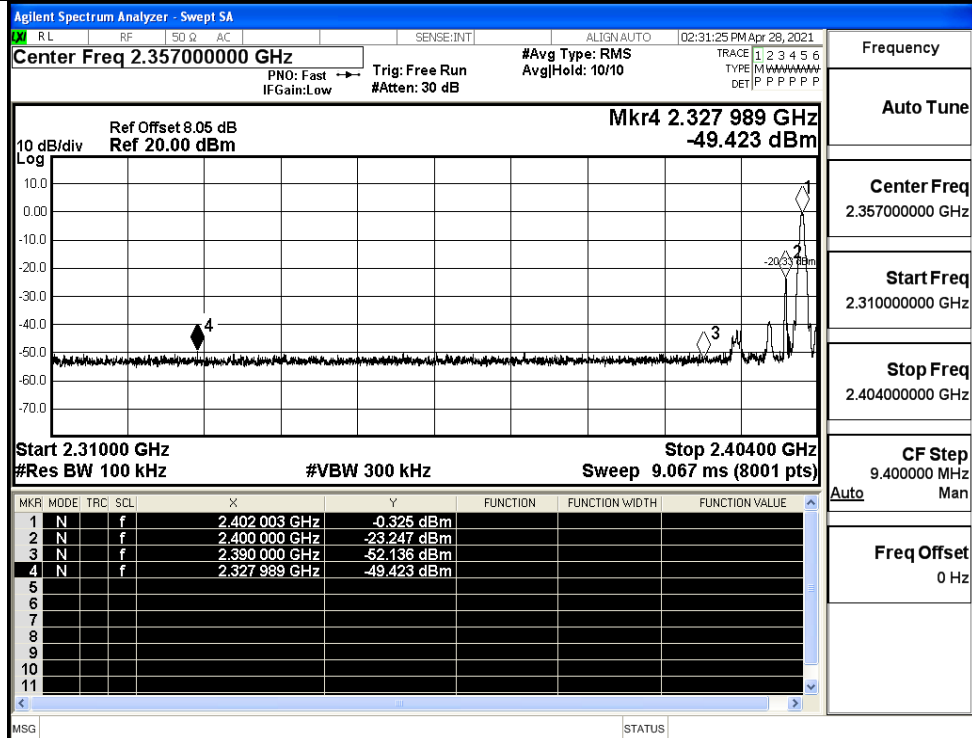


A.7 Band-edge for RF Conducted Emissions

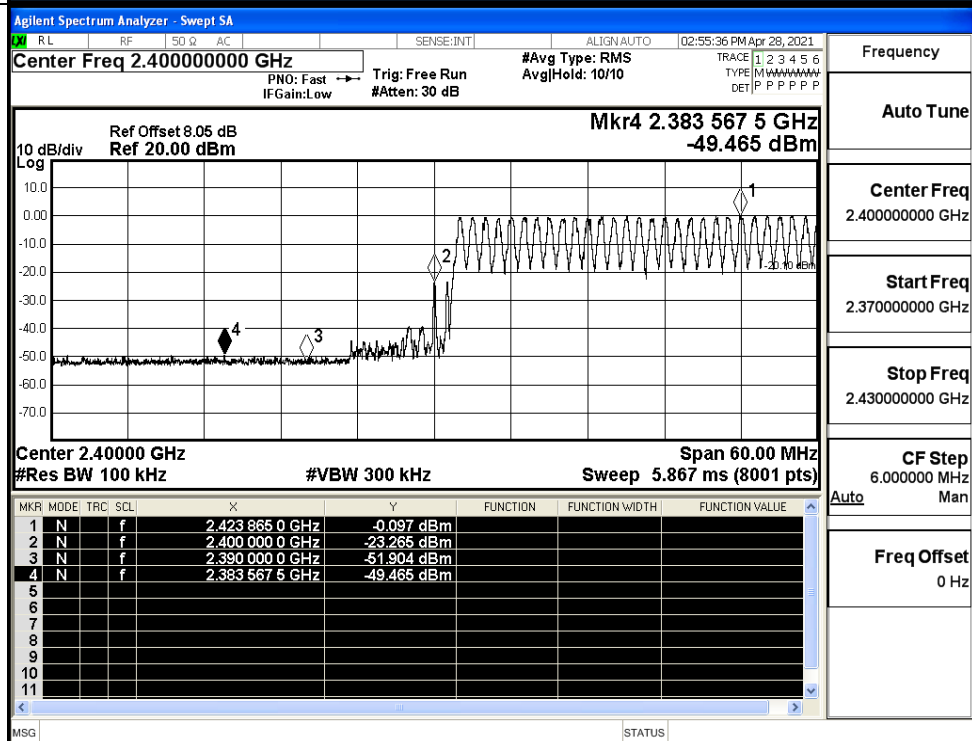
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.325	Off	-49.423	-20.33	PASS
			-0.097	On	-49.465	-20.1	PASS
	HCH	2480	-0.148	Off	-48.374	-20.15	PASS
			-0.109	On	-48.327	-20.11	PASS
$\pi/4$ DQPSK	LCH	2402	-0.142	Off	-49.557	-20.14	PASS
			0.282	On	-48.884	-19.72	PASS
	HCH	2480	-0.462	Off	-48.201	-20.46	PASS
			0.087	On	-48.416	-19.91	PASS
8DPSK	LCH	2402	-3.072	Off	-50.025	-23.07	PASS
			-0.060	On	-48.839	-20.06	PASS
	HCH	2480	0.176	Off	-48.496	-19.82	PASS
			0.120	On	-48.247	-19.88	PASS

Test Graphs

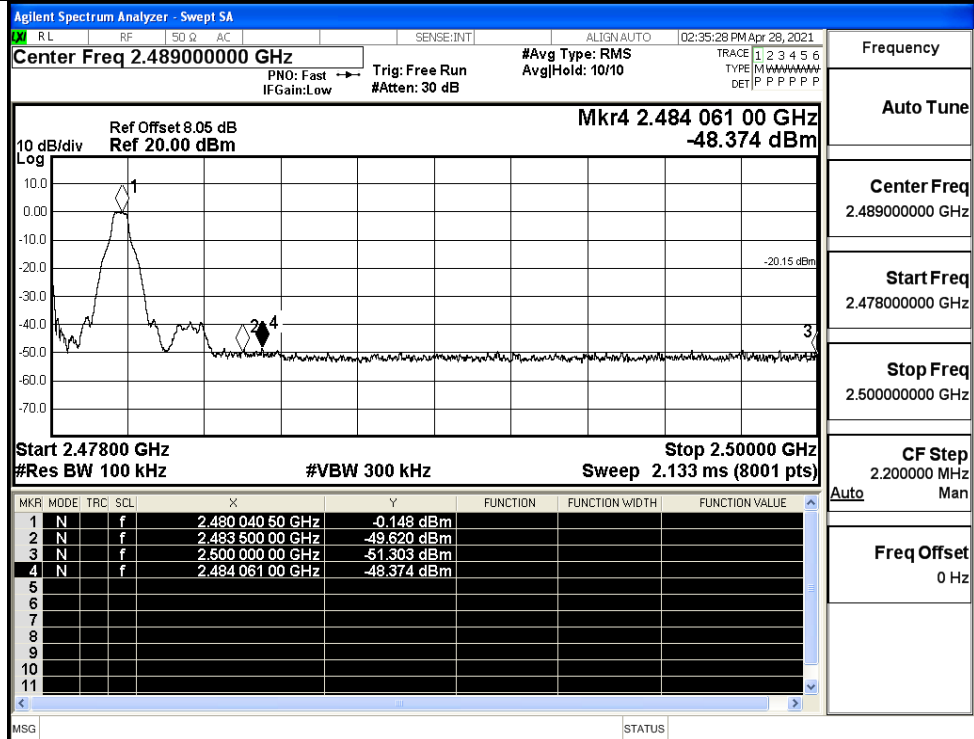
GFSK/LCH/No Hop



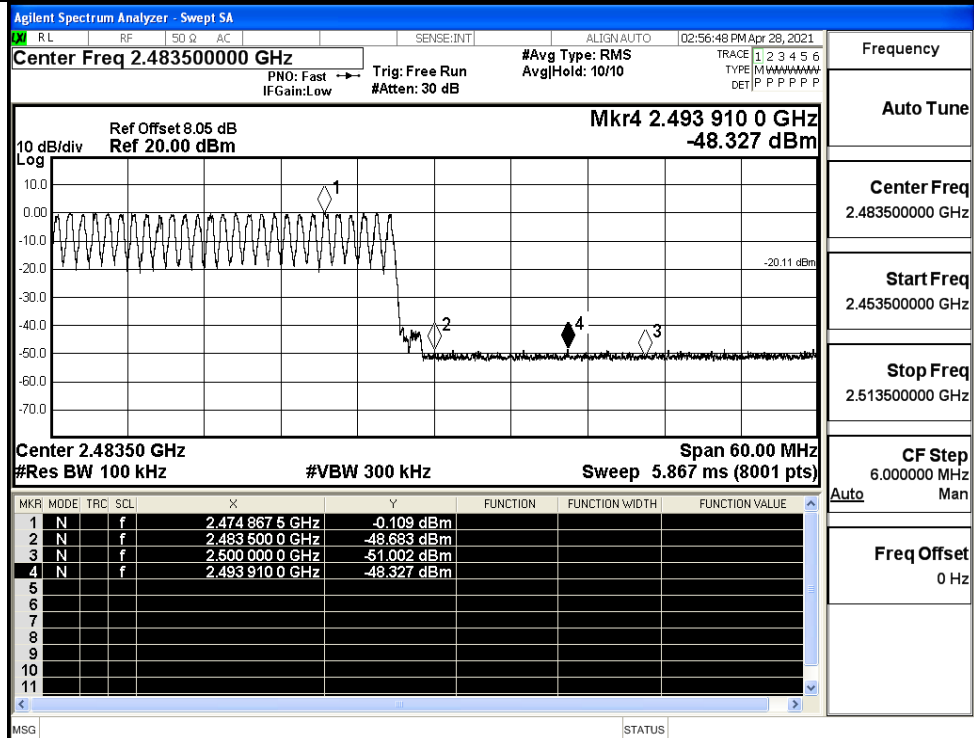
GFSK/LCH/Hop



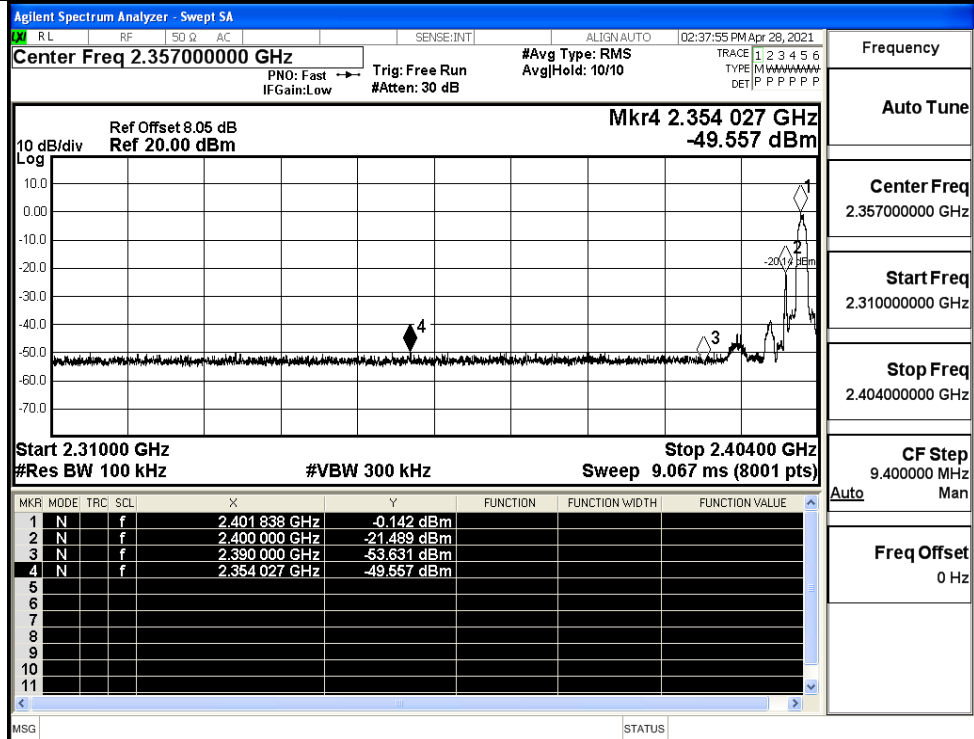
GFSK/HCH/No Hop



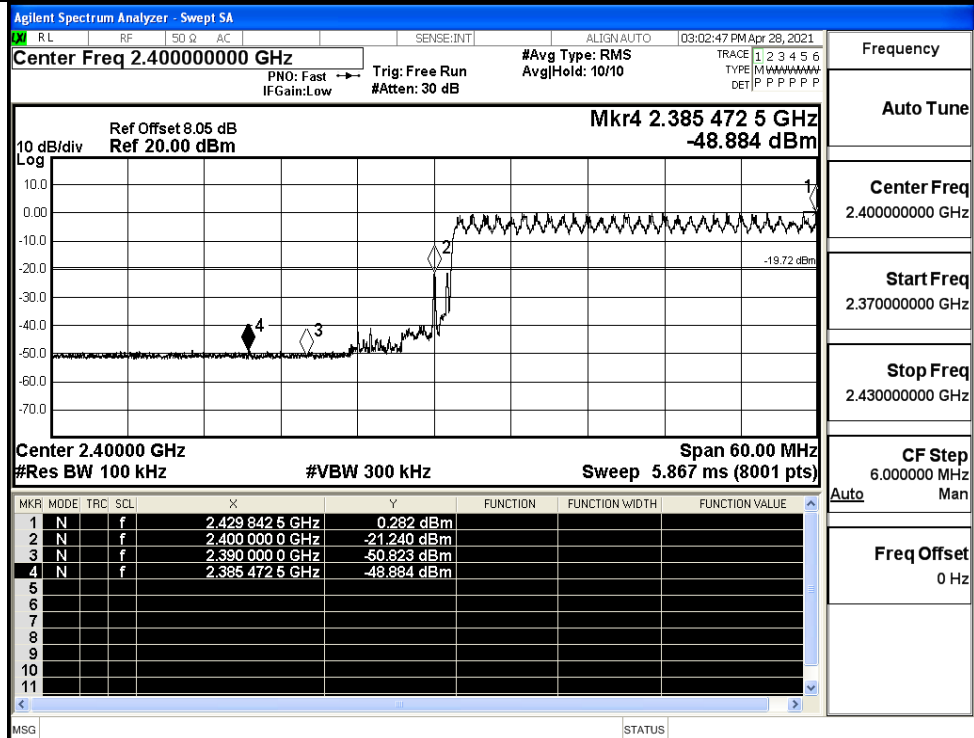
GFSK/HCH/Hop



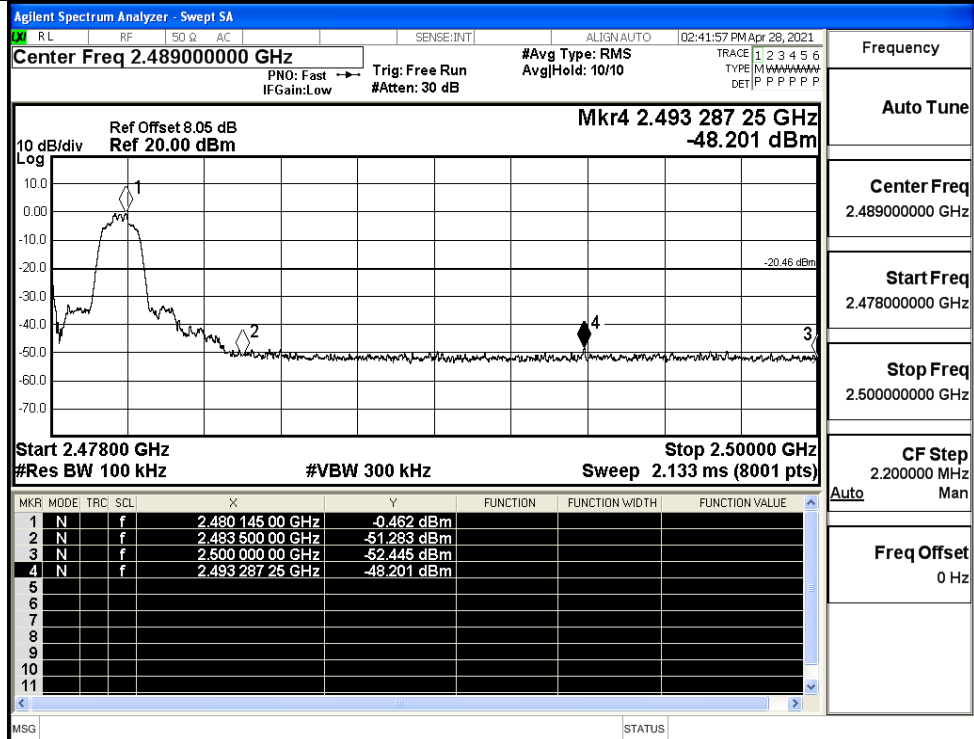
$\pi/4$ DQPSK/LCH/No
Hop



$\pi/4$ DQPSK/LCH/Hop



π /4DQPSK/HCH/No
Hop



Frequency

Auto Tune

Center Freq
2.489000000 GHz

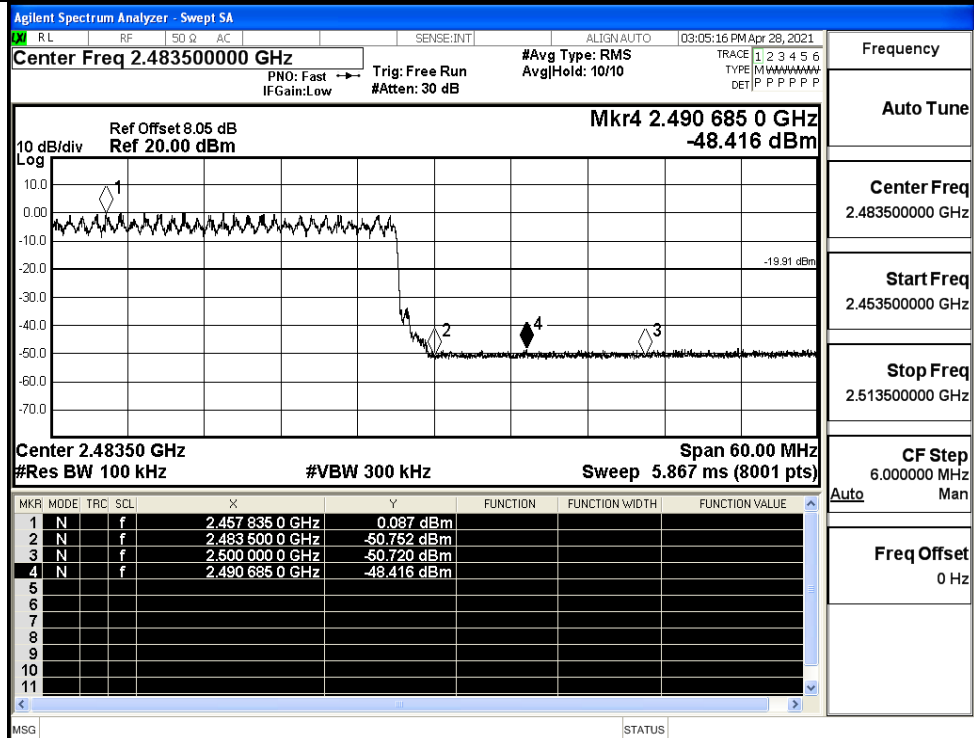
Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz
Auto Man

Freq Offset
0 Hz

π /4DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq
2.483500000 GHz

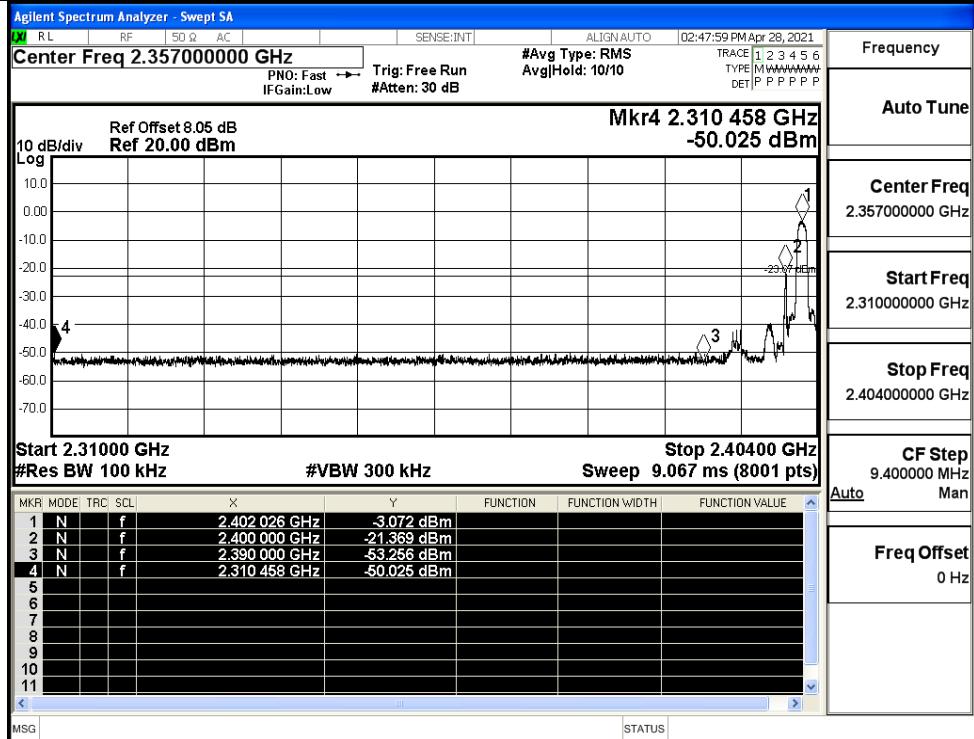
Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

8DPSK/LCH/No Hop



Frequency

Auto Tune

Center Freq
2.357000000 GHz

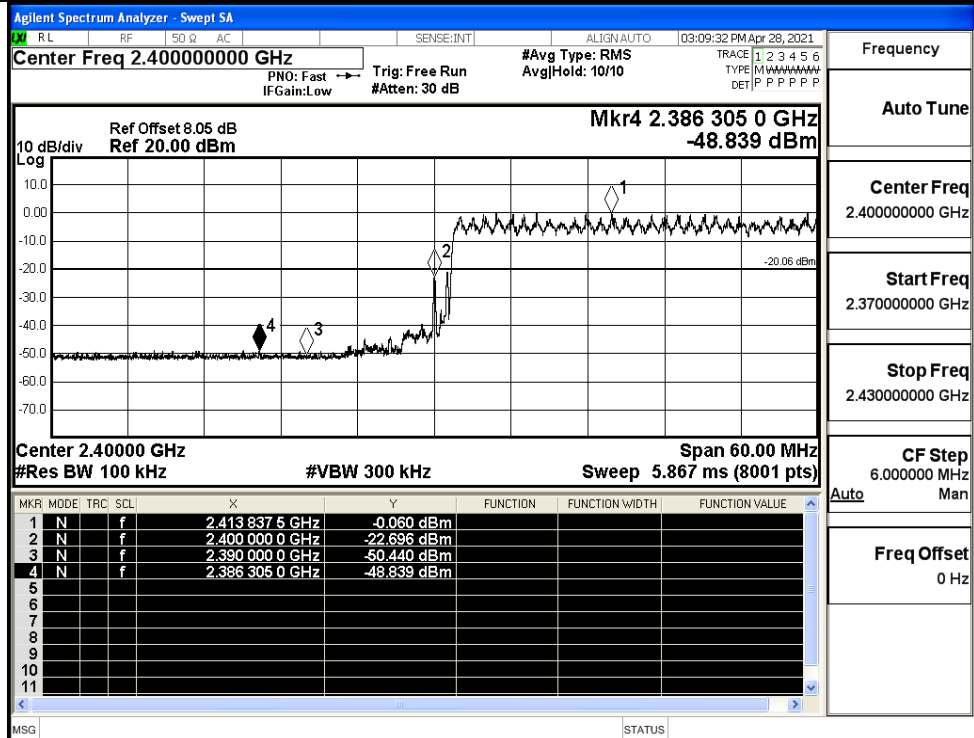
Start Freq
2.310000000 GHz

Stop Freq
2.404000000 GHz

CF Step
9.400000 MHz
Auto Man

Freq Offset
0 Hz

8DPSK/LCH/Hop



Frequency

Auto Tune

Center Freq
2.400000000 GHz

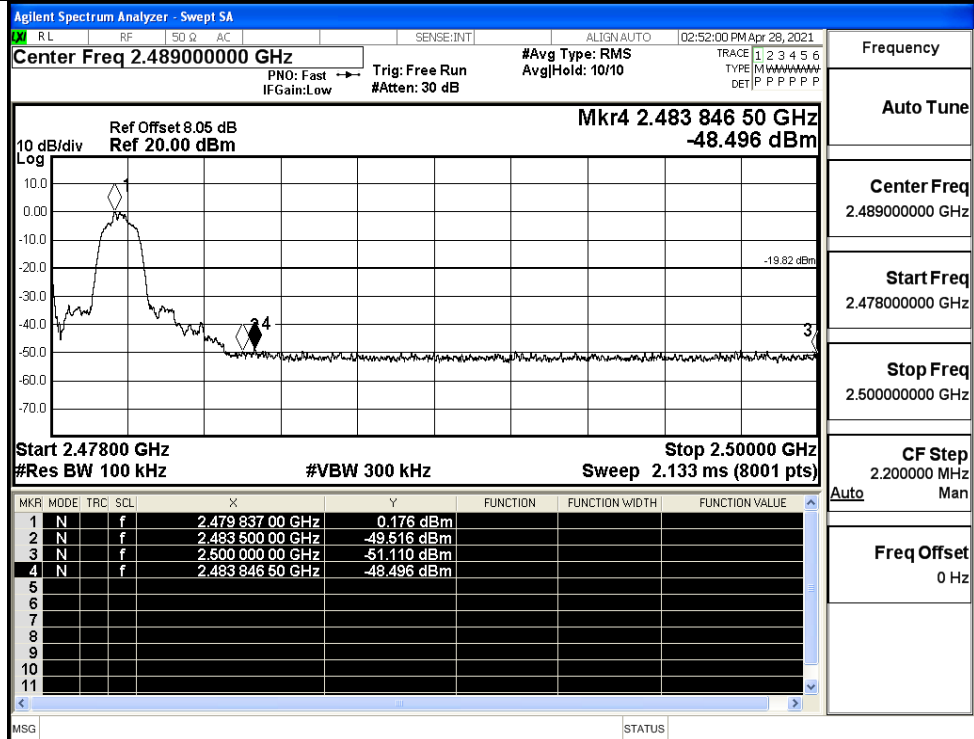
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

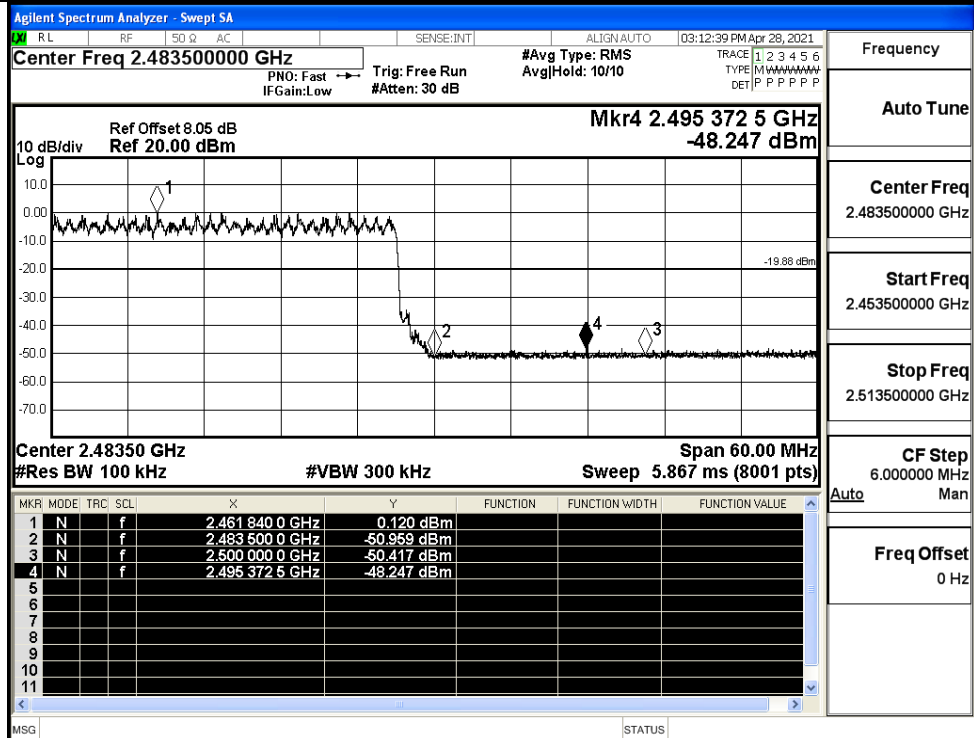
CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

8DPSK/HCH/No Hop



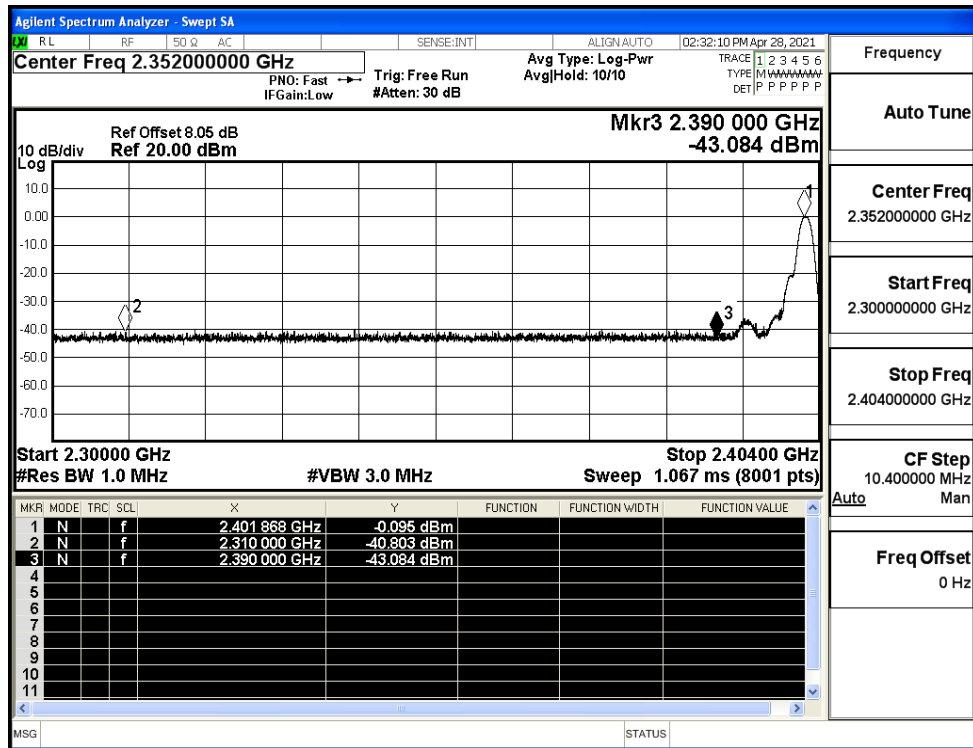
8DPSK/HCH/Hop



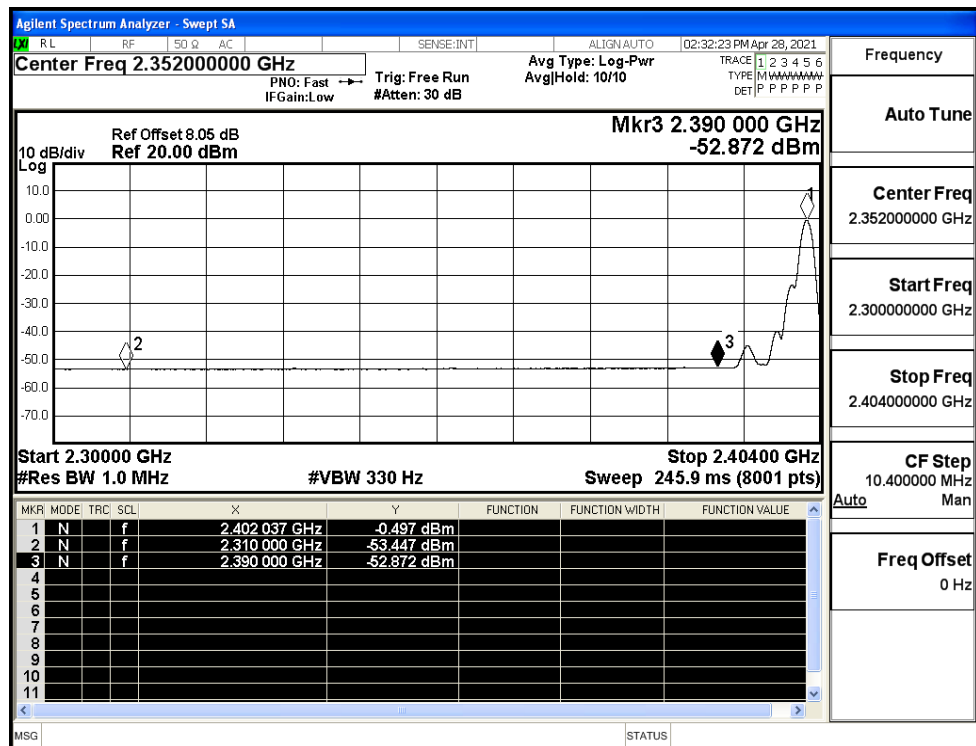
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-40.80	3.0	0	57.46	PEAK	74	PASS
	Off	2310.0	-53.45	3.0	0	44.81	AV	54	PASS
	Off	2390.0	-43.08	3.0	0	55.18	PEAK	74	PASS
	Off	2390.0	-52.87	3.0	0	45.39	AV	54	PASS
	Off	2483.5	-42.12	3.0	0	56.14	PEAK	74	PASS
	Off	2483.5	-50.19	3.0	0	48.07	AV	54	PASS
	Off	2500.0	-42.54	3.0	0	55.72	PEAK	74	PASS
	Off	2500.0	-52.30	3.0	0	45.96	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.47	3.0	0	55.79	PEAK	74	PASS
	Off	2310.0	-53.43	3.0	0	44.83	AV	54	PASS
	Off	2390.0	-43.16	3.0	0	55.1	PEAK	74	PASS
	Off	2390.0	-52.96	3.0	0	45.3	AV	54	PASS
	Off	2483.5	-38.70	3.0	0	59.56	PEAK	74	PASS
	Off	2483.5	-50.23	3.0	0	48.03	AV	54	PASS
	Off	2500.0	-42.87	3.0	0	55.39	PEAK	74	PASS
	Off	2500.0	-52.33	3.0	0	45.93	AV	54	PASS
8DPSK	Off	2310.0	-42.75	3.0	0	55.51	PEAK	74	PASS
	Off	2310.0	-53.33	3.0	0	44.93	AV	54	PASS
	Off	2390.0	-42.48	3.0	0	55.78	PEAK	74	PASS
	Off	2390.0	-52.93	3.0	0	45.33	AV	54	PASS
	Off	2483.5	-41.40	3.0	0	56.86	PEAK	74	PASS
	Off	2483.5	-50.16	3.0	0	48.1	AV	54	PASS
	Off	2500.0	-40.49	3.0	0	57.77	PEAK	74	PASS
	Off	2500.0	-52.32	3.0	0	45.94	AV	54	PASS

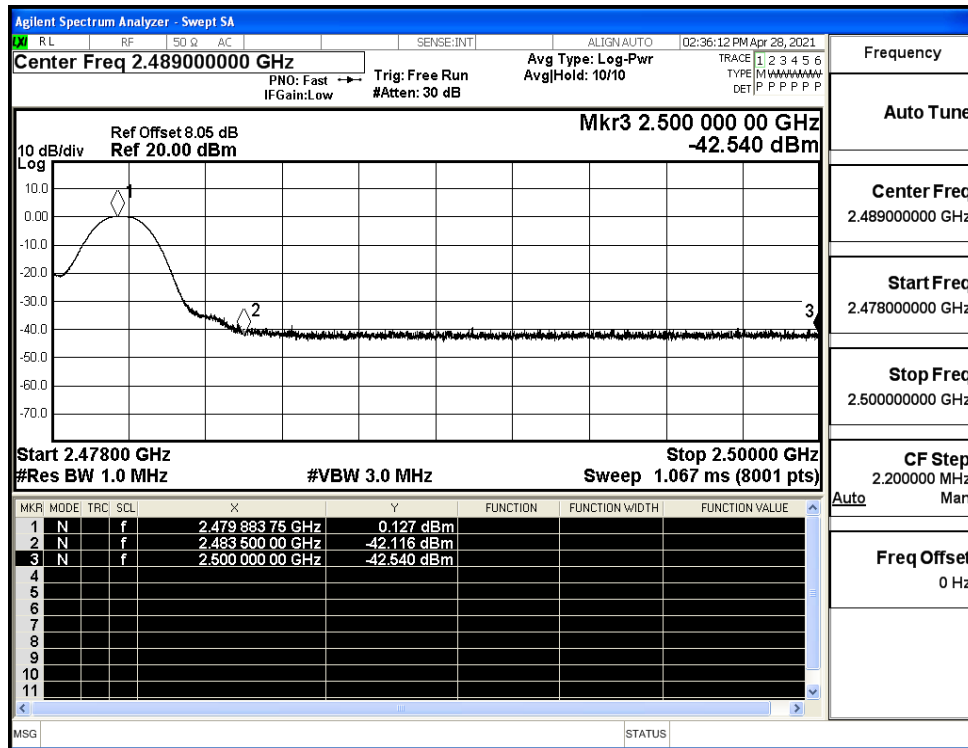
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



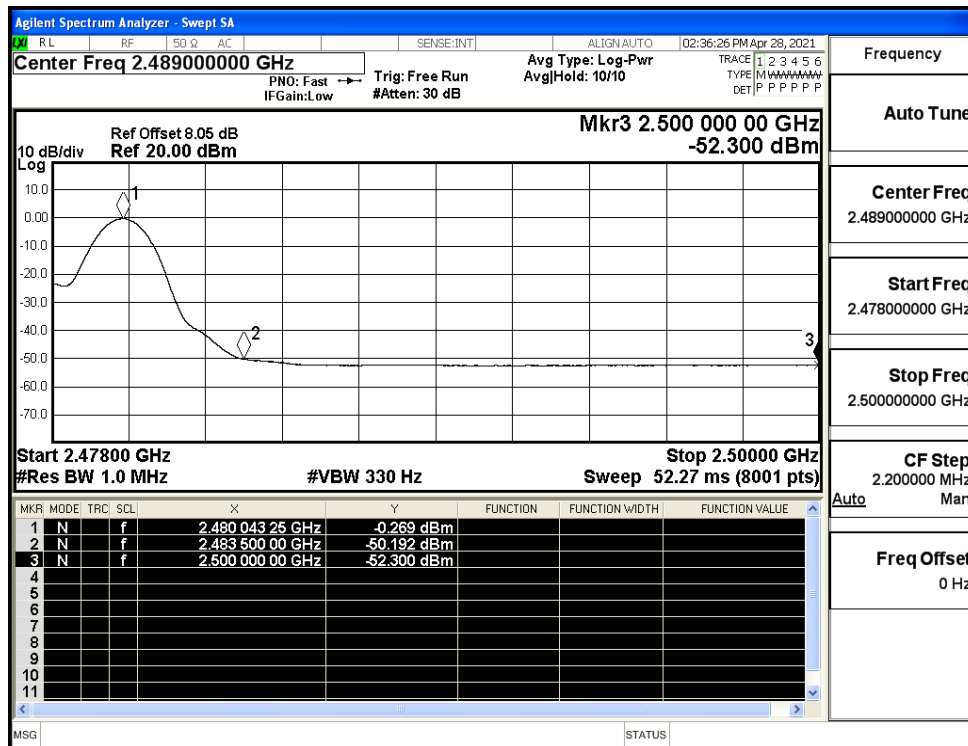
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

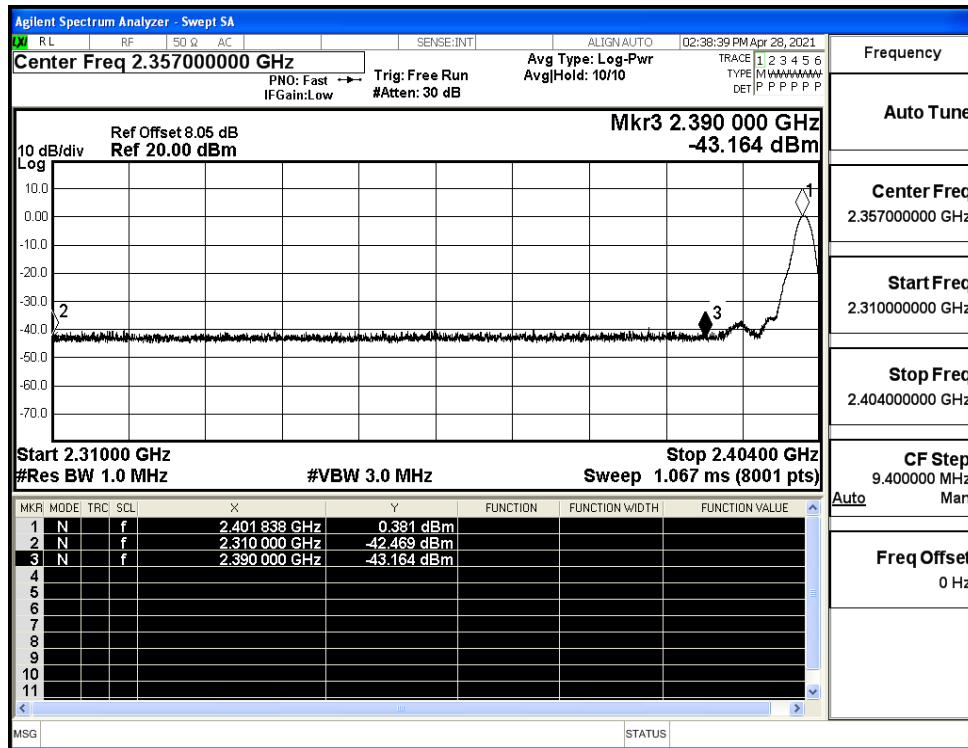
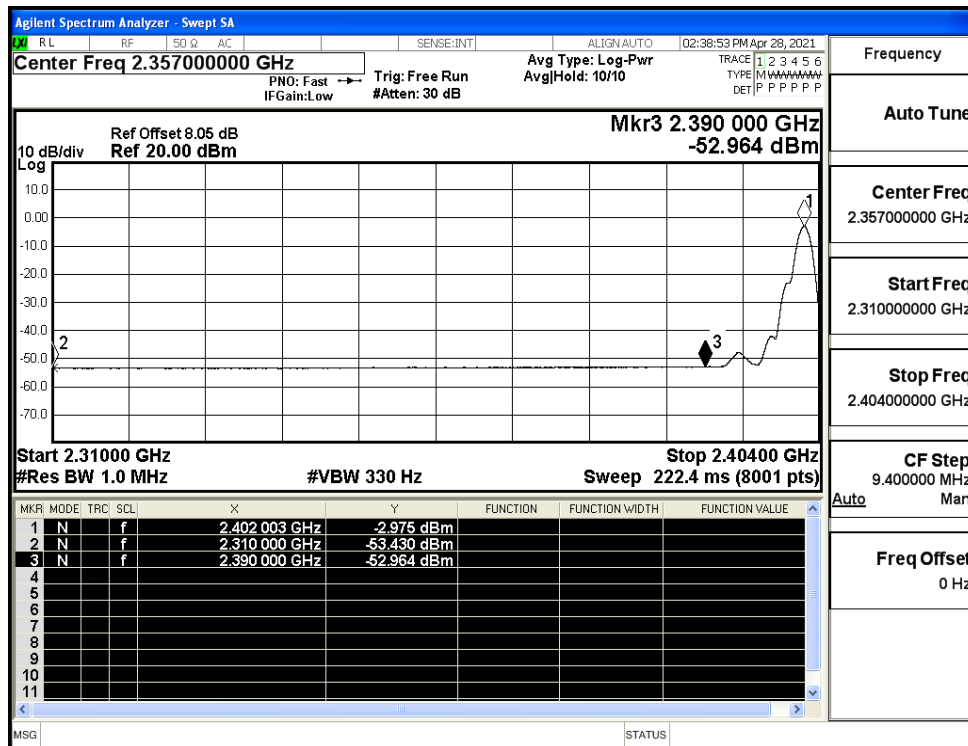


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

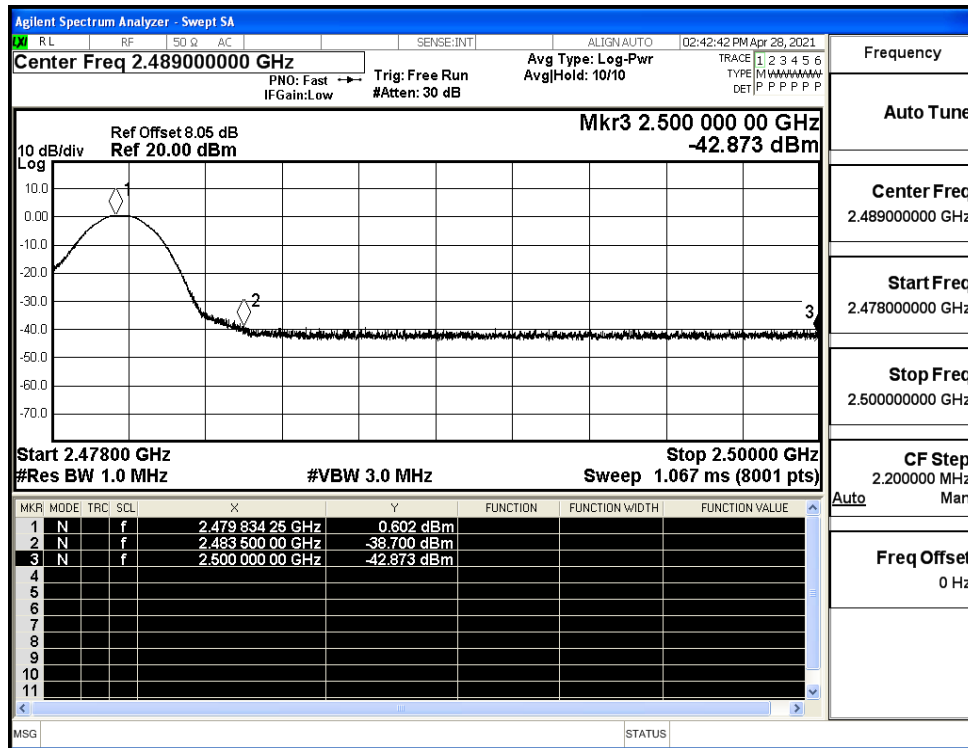


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

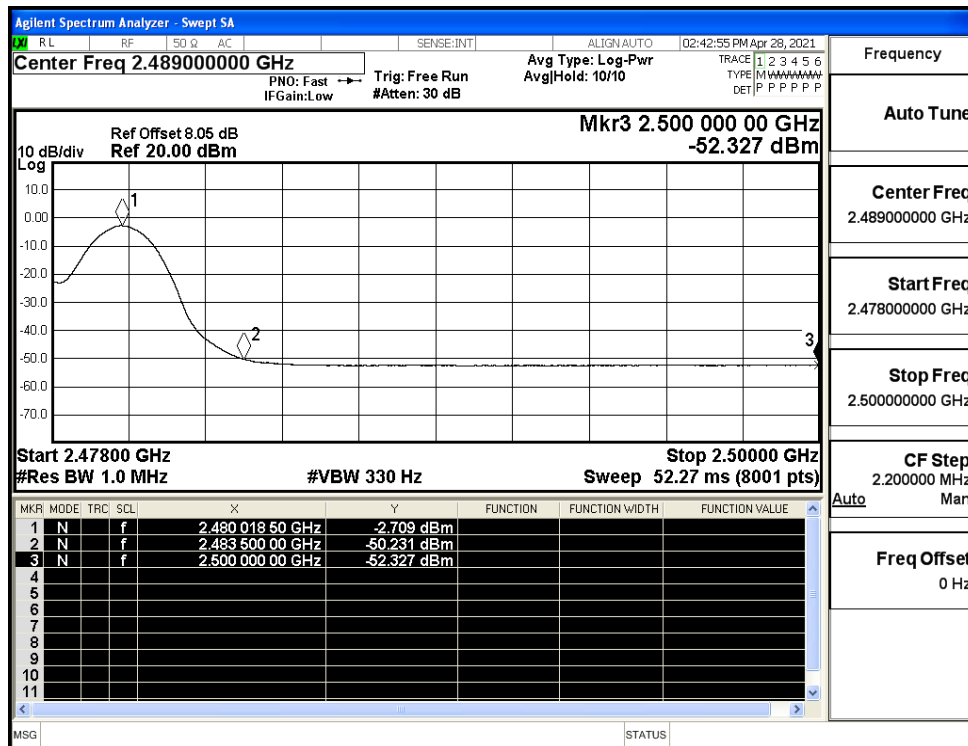


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

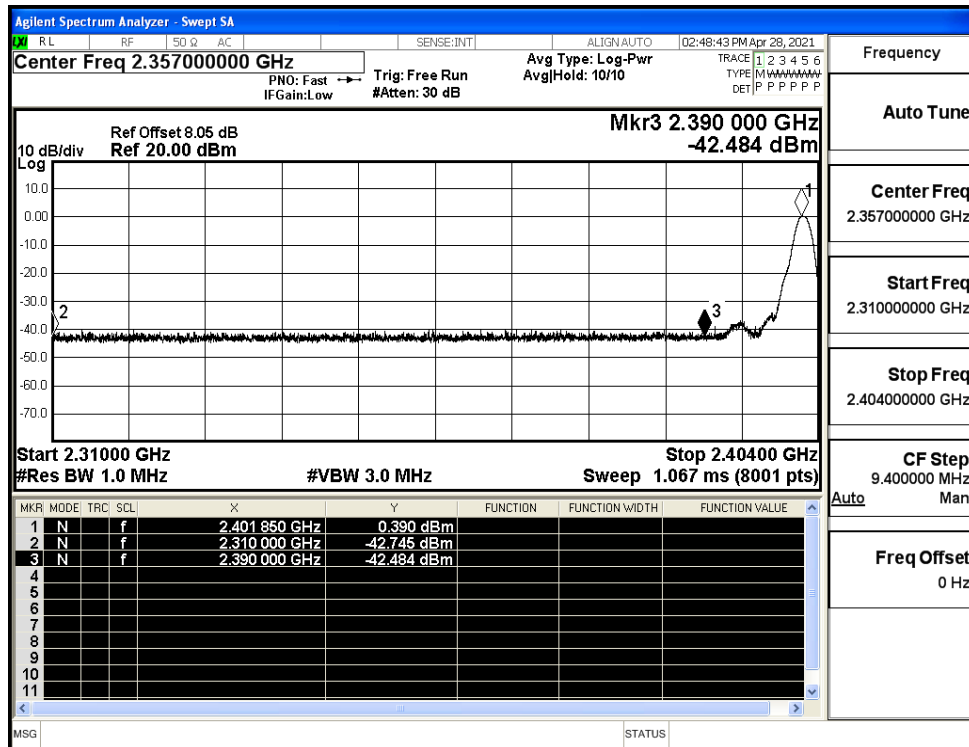
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



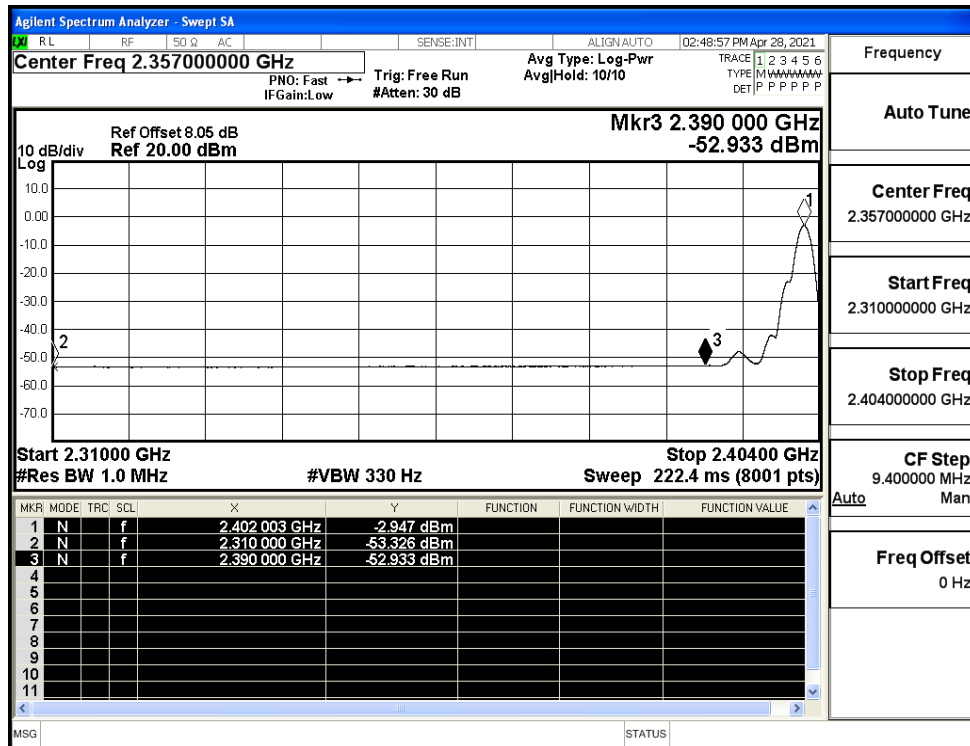
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



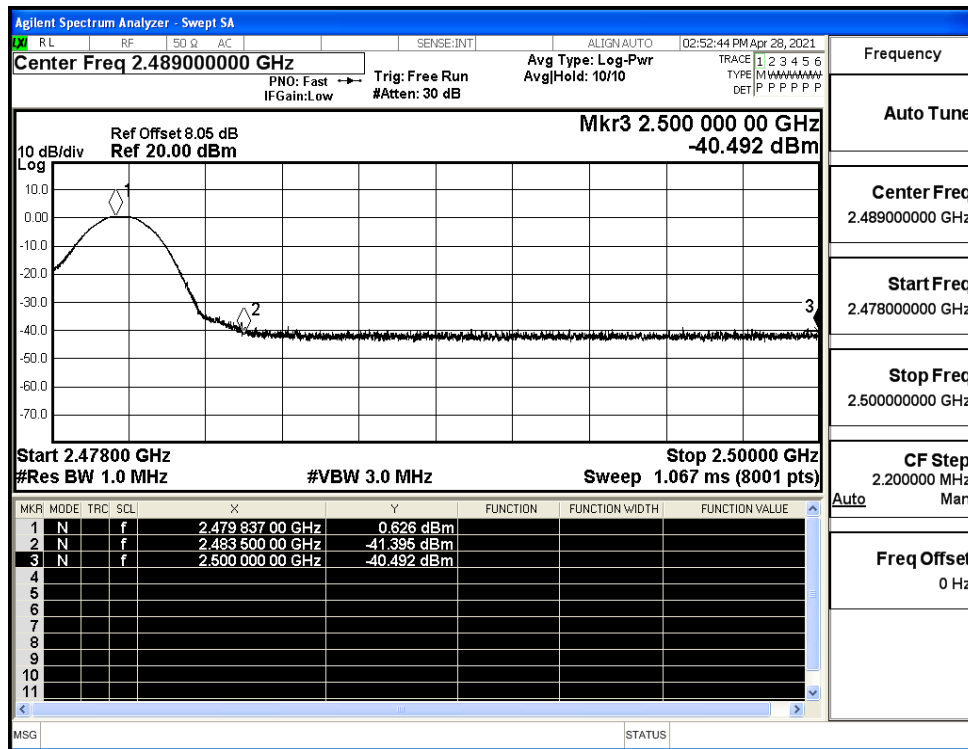
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

