

Appendix A
RF Test Data for BT V4.2(DSS) (Conducted Measurement)
Product Name: Bluetooth Speaker
Trade Mark: Origaudio
Test Model: THUMPAH

Environmental Conditions

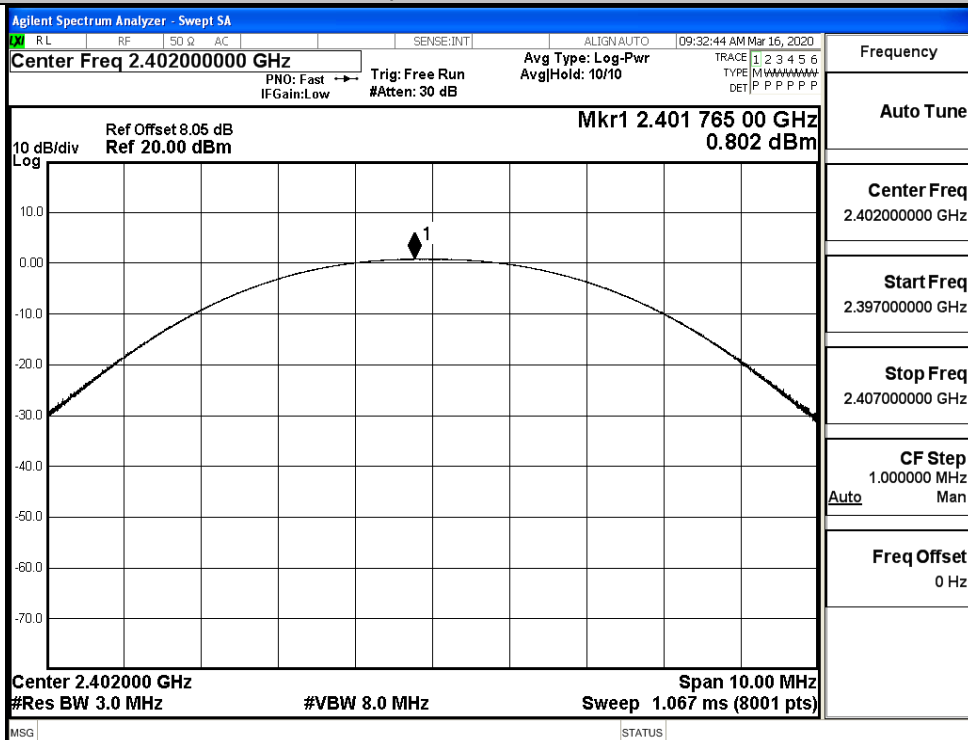
Temperature:	22.3 ° C
Relative Humidity:	53.0%
ATM Pressure:	100.0 kPa
Test Engineer:	Qu Xin
Supervised by:	Tom Liu

A.1 Maxmum Conducted Peak Output Power

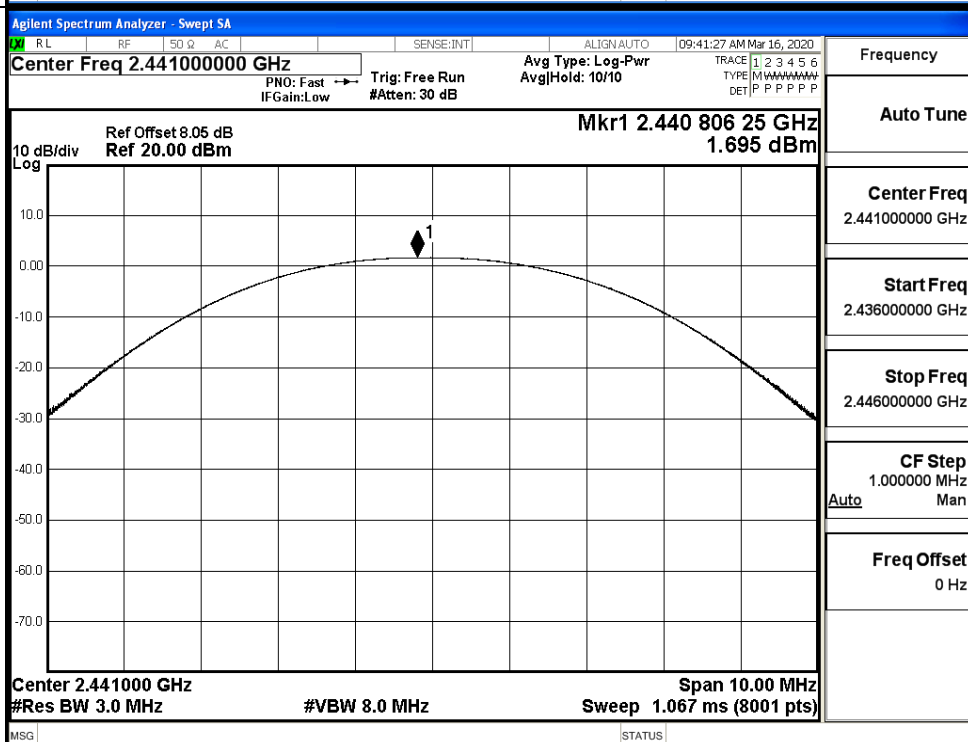
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.802	30	PASS
	MCH	1.695	30	PASS
	HCH	-0.048	30	PASS
$\pi/4$ DQPSK	LCH	0.759	21	PASS
	MCH	1.705	21	PASS
	HCH	-0.087	21	PASS
8DPSK	LCH	1.086	21	PASS
	MCH	0.628	21	PASS
	HCH	0.214	21	PASS

Test Graphs

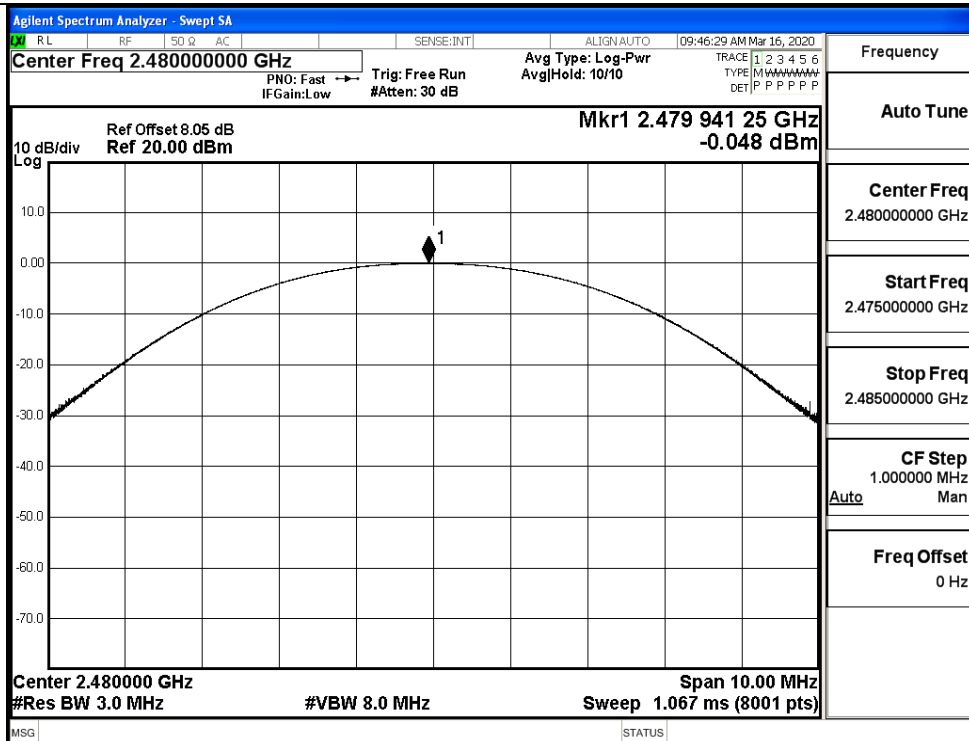
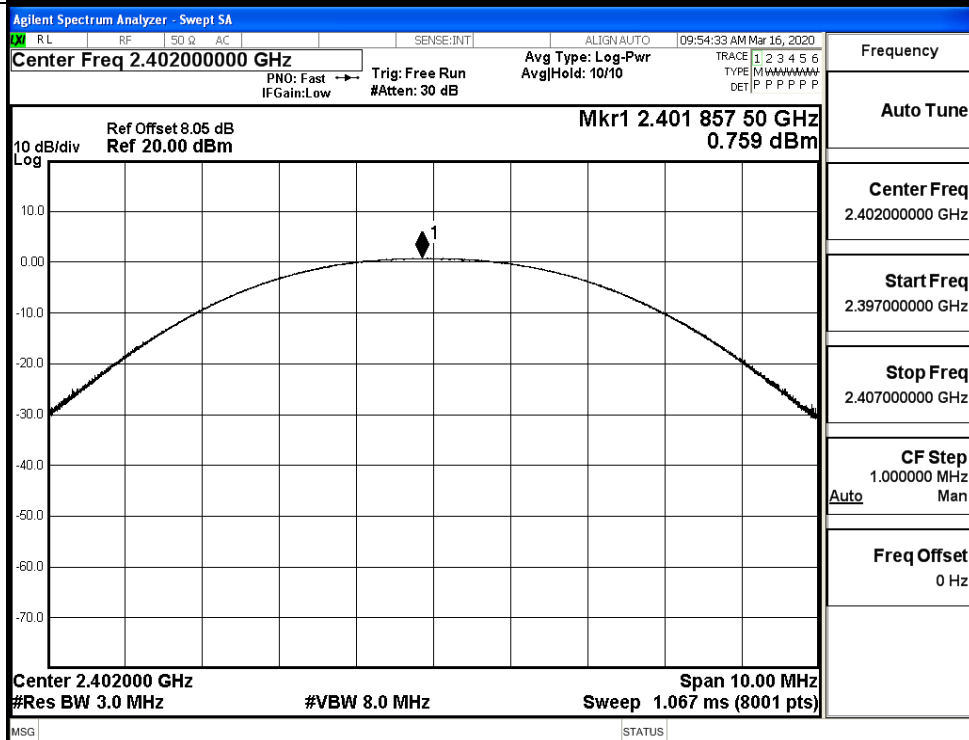
GFSK/LCH

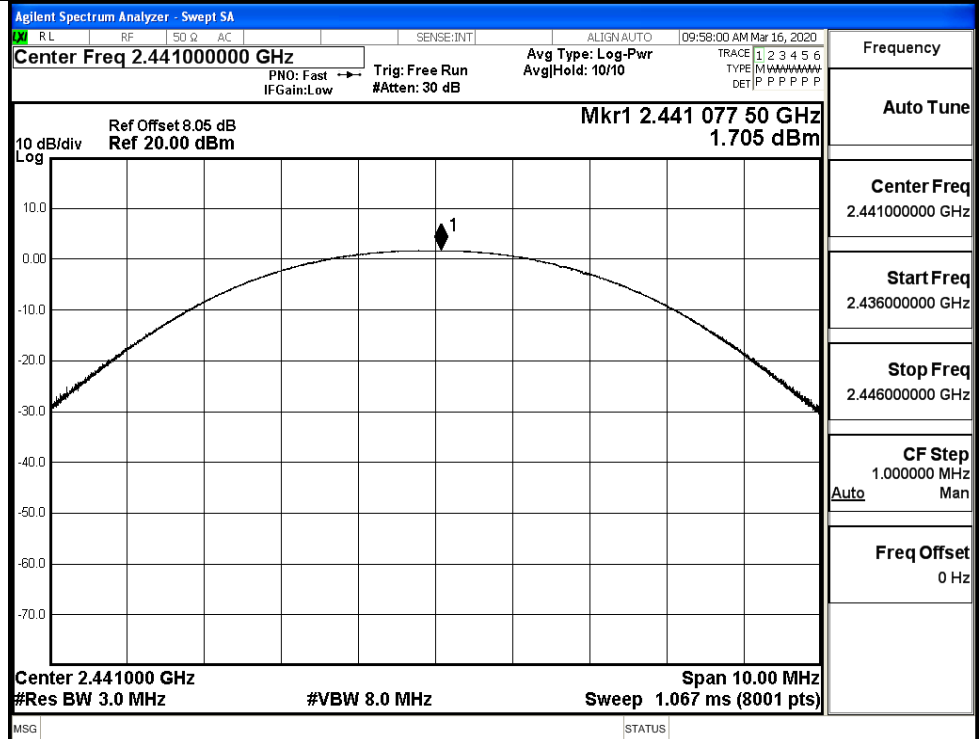
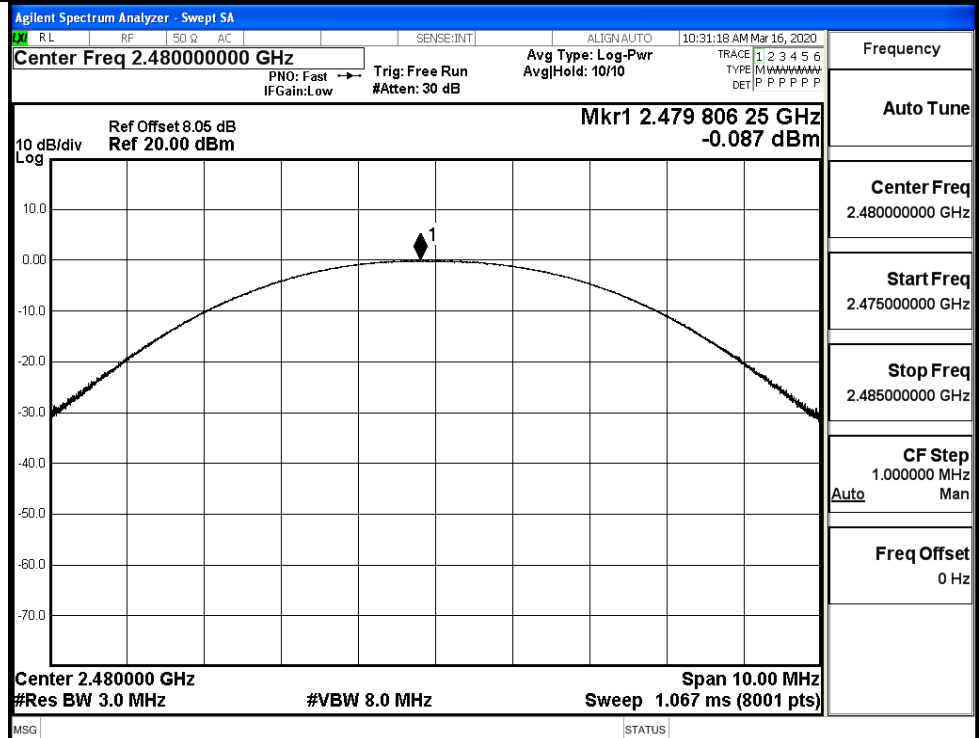


GFSK/MCH

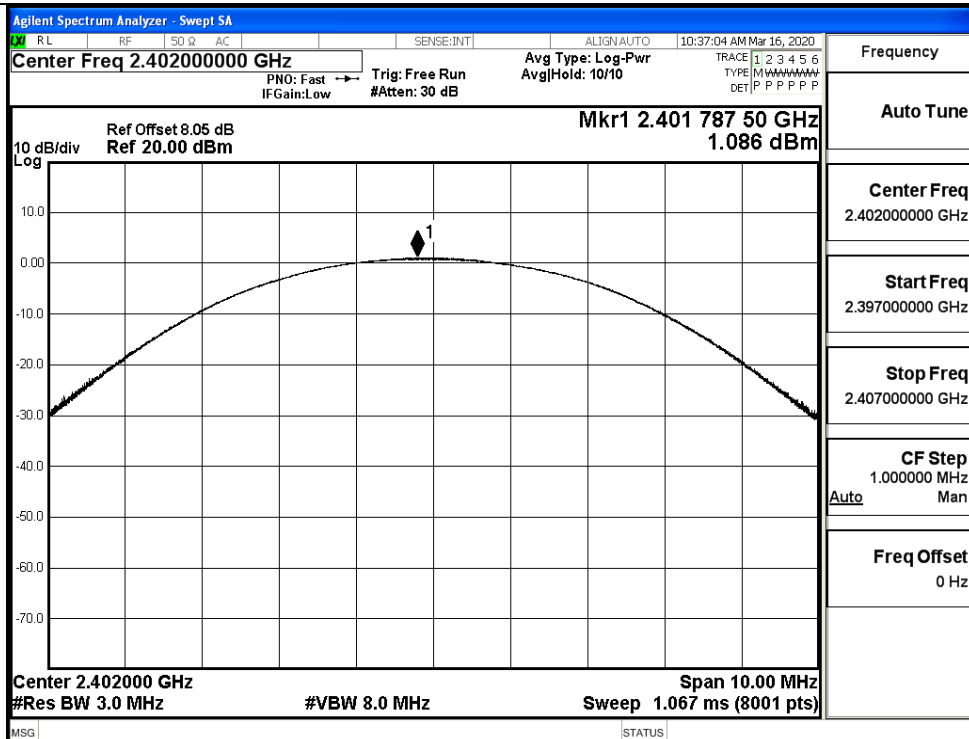


GFSK/HCH

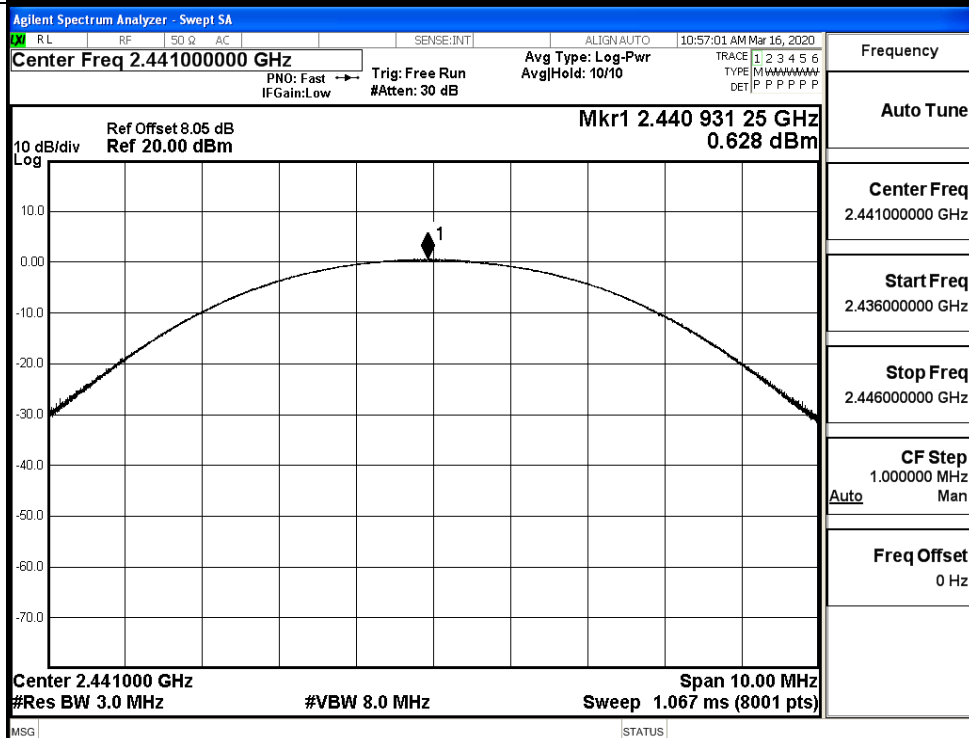
 $\pi/4$ DQPSK/LCH

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

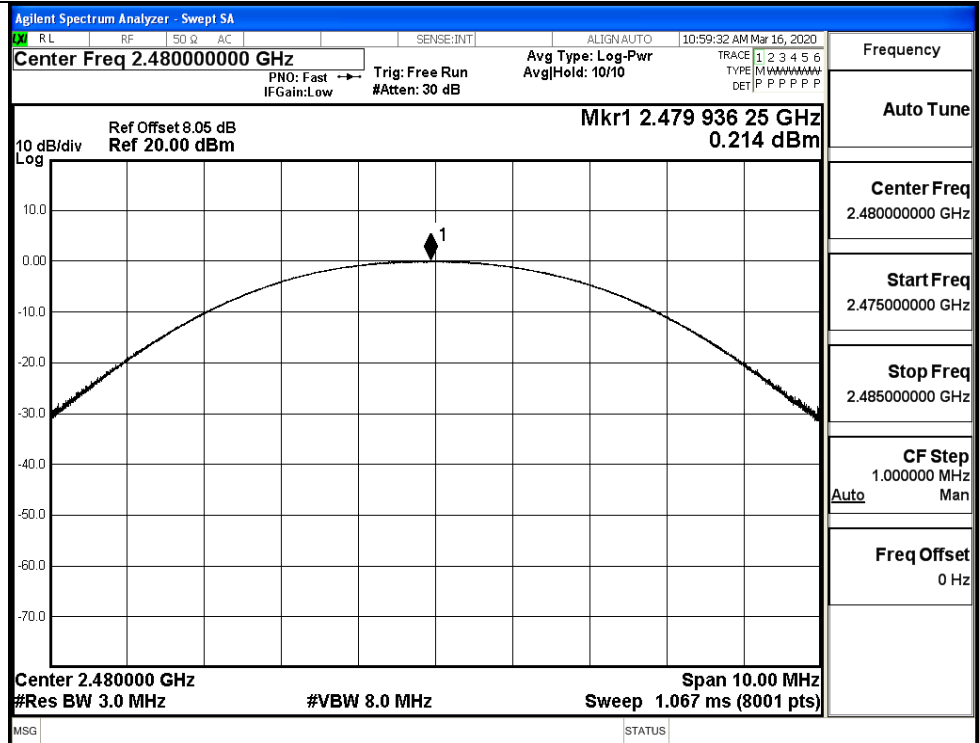
8DPSK/LCH



8DPSK/MCH



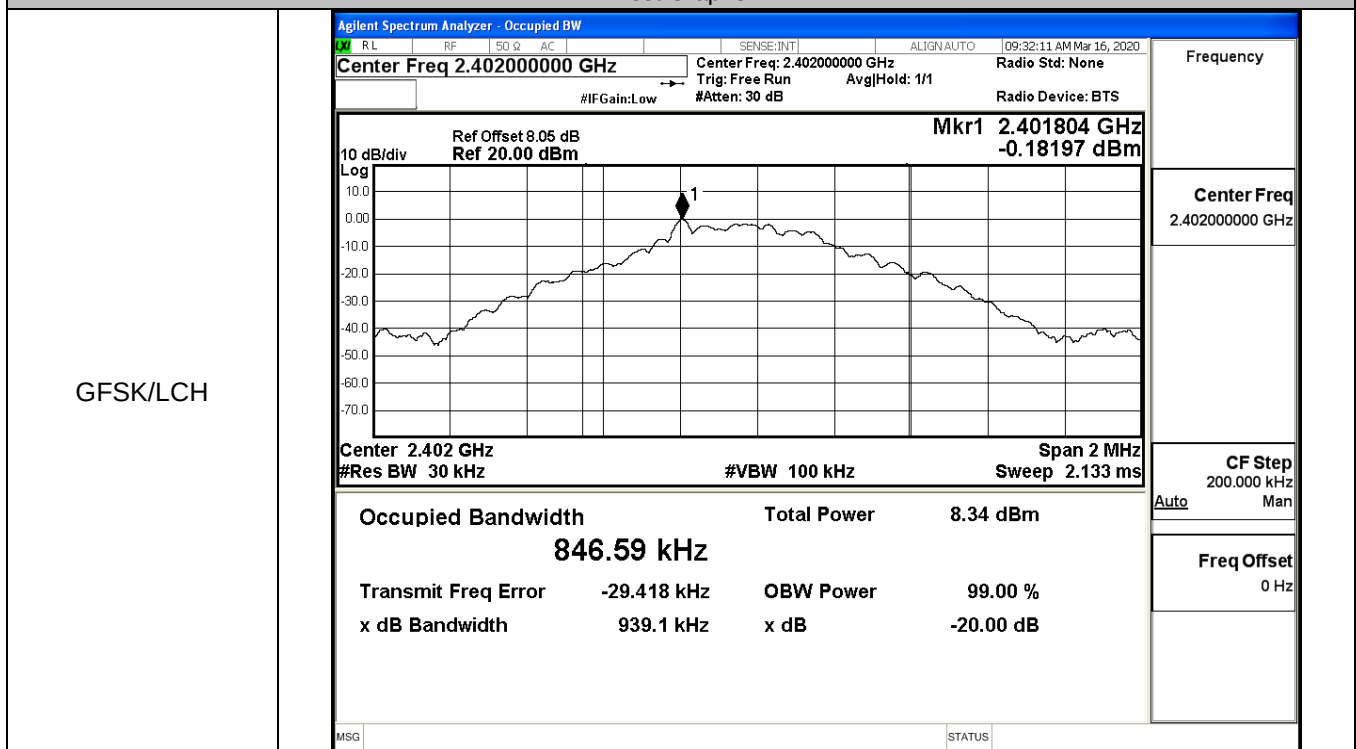
8DPSK/HCH



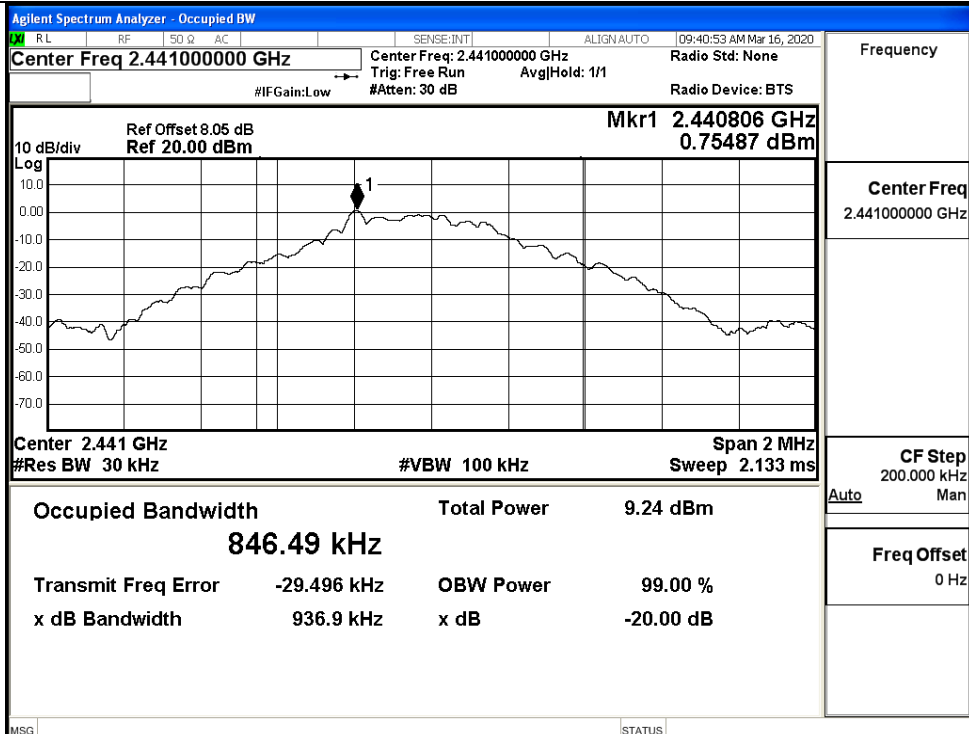
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9391	Not Specified	PASS
	MCH	0.9369	Not Specified	PASS
	HCH	0.9391	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.258	Not Specified	PASS
	MCH	1.263	Not Specified	PASS
	HCH	1.265	Not Specified	PASS
8DPSK	LCH	1.244	Not Specified	PASS
	MCH	1.242	Not Specified	PASS
	HCH	1.242	Not Specified	PASS

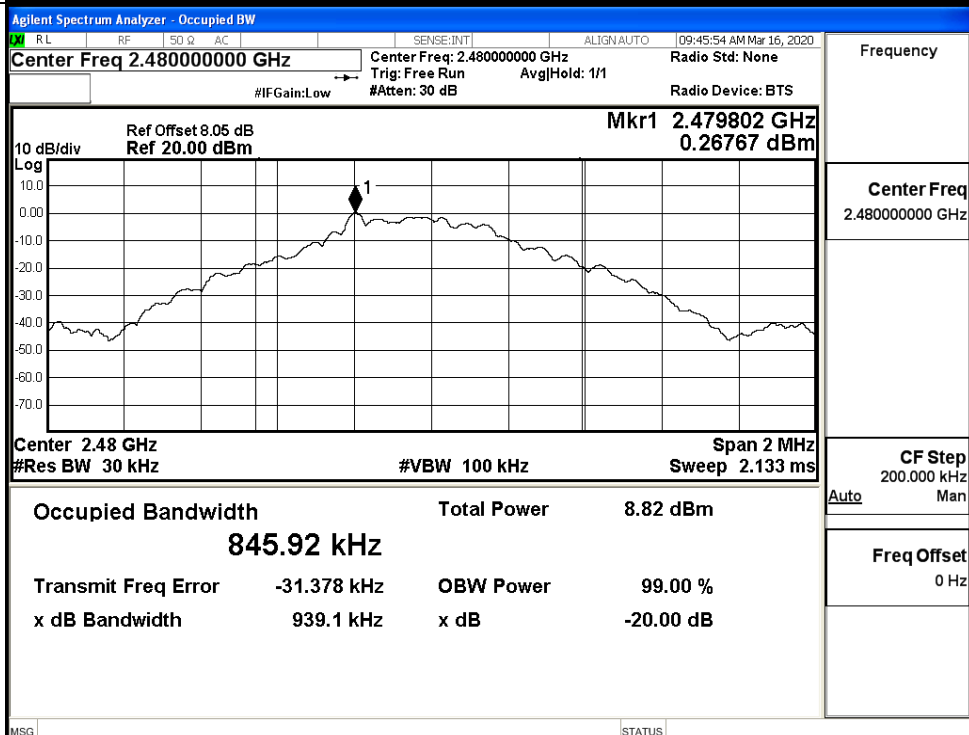
Test Graphs

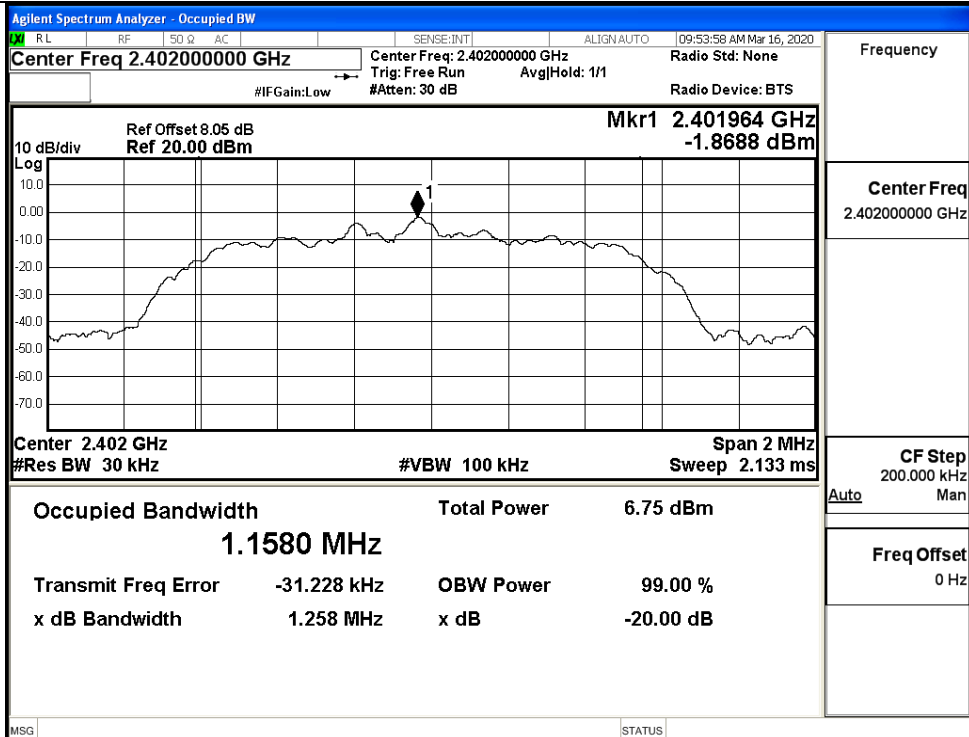


GFSK/MCH



GFSK/HCH

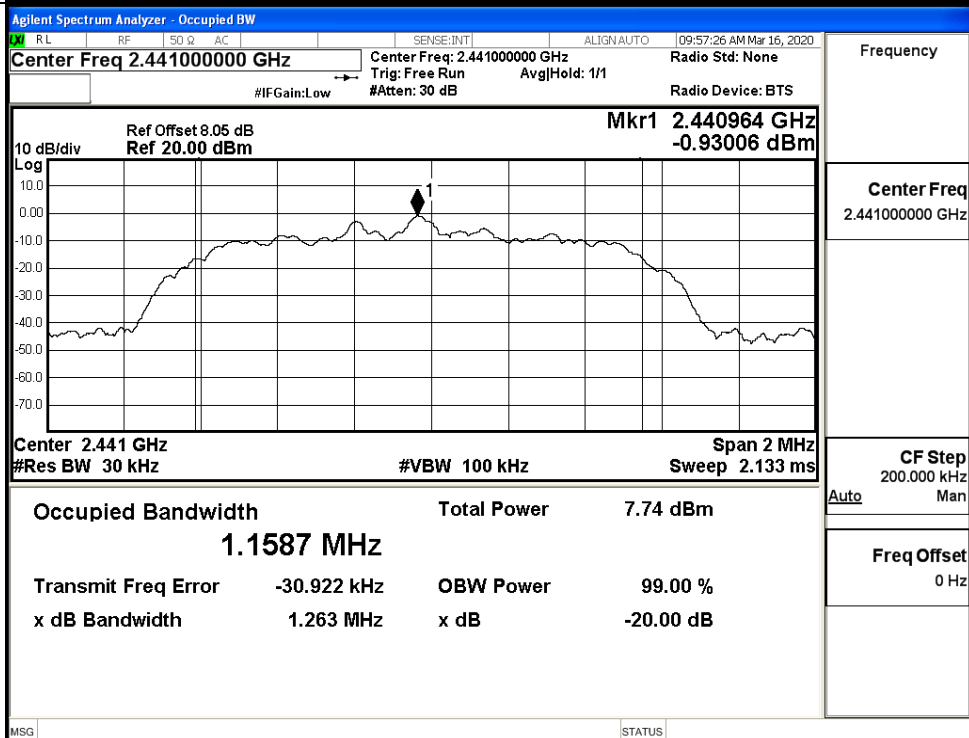


$\pi/4$ DQPSK/LCH

Frequency

Center Freq
2.40200000 GHzCF Step
200.000 kHz
Man

Auto

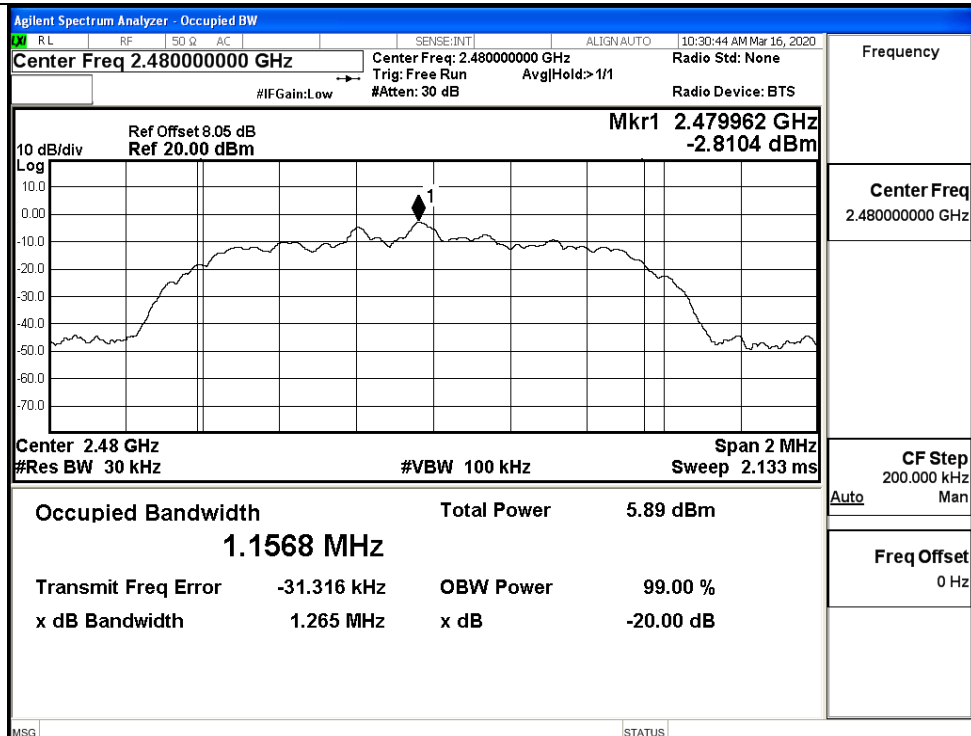
Freq Offset
0 Hz $\pi/4$ DQPSK/MCH

Frequency

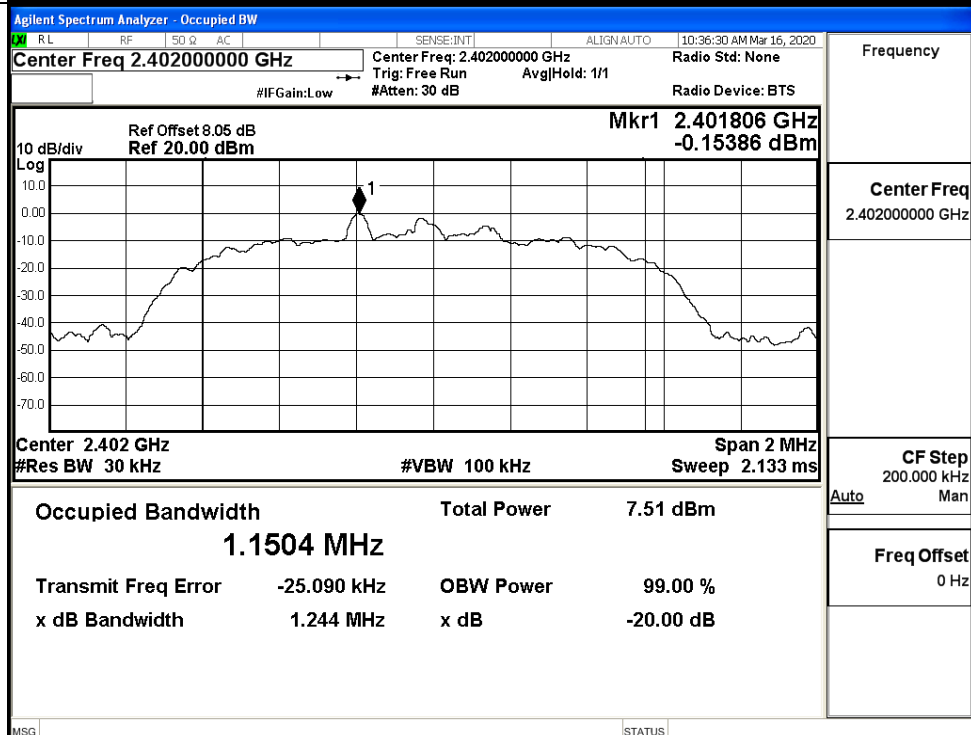
Center Freq
2.44100000 GHzCF Step
200.000 kHz
Man

Auto

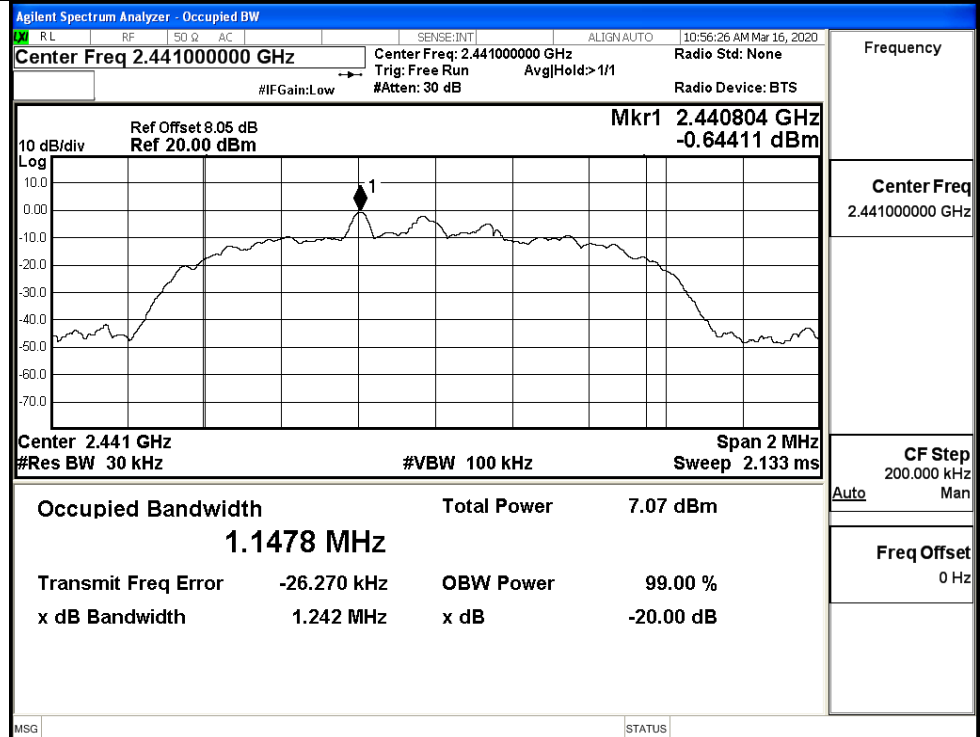
Freq Offset
0 Hz

$\pi/4$ DQPSK/HCH

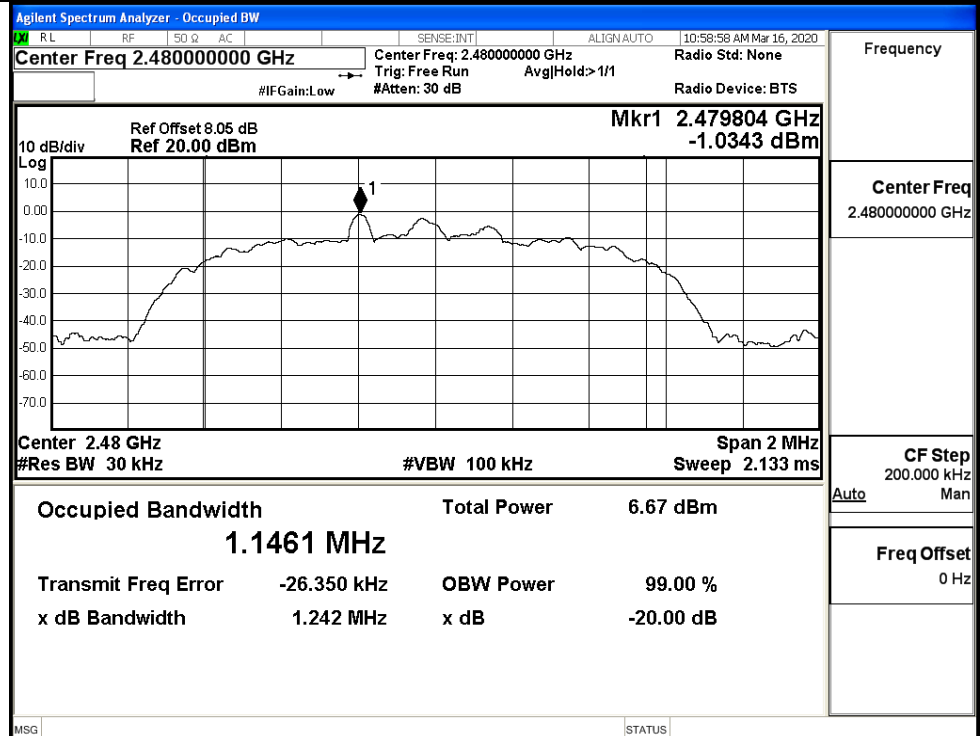
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

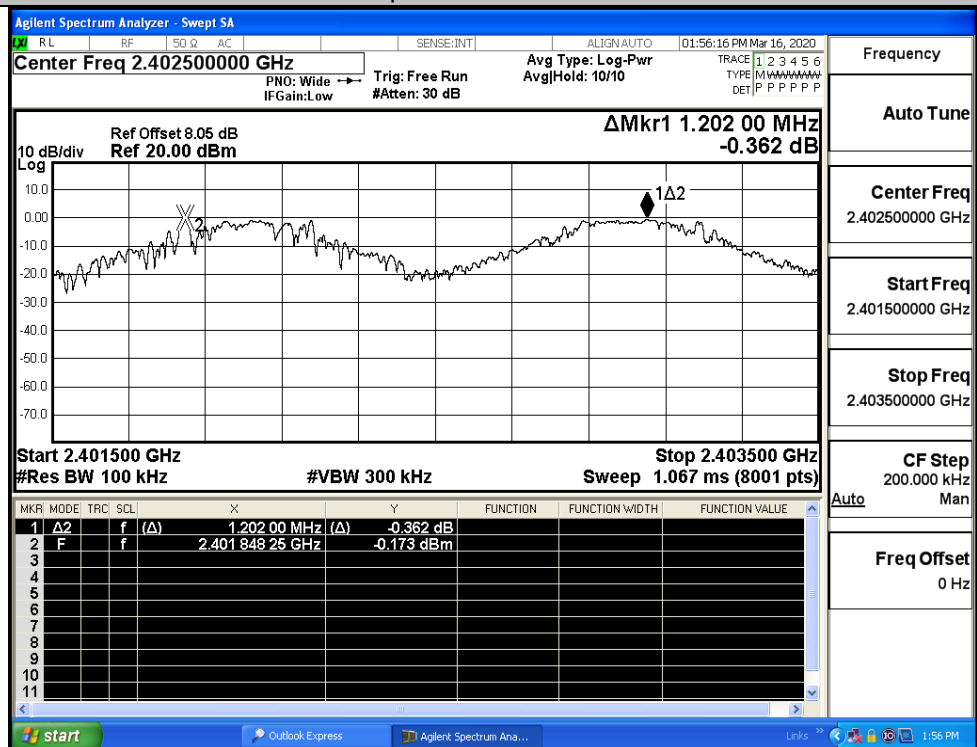


A.3 Carrier Frequency Separation

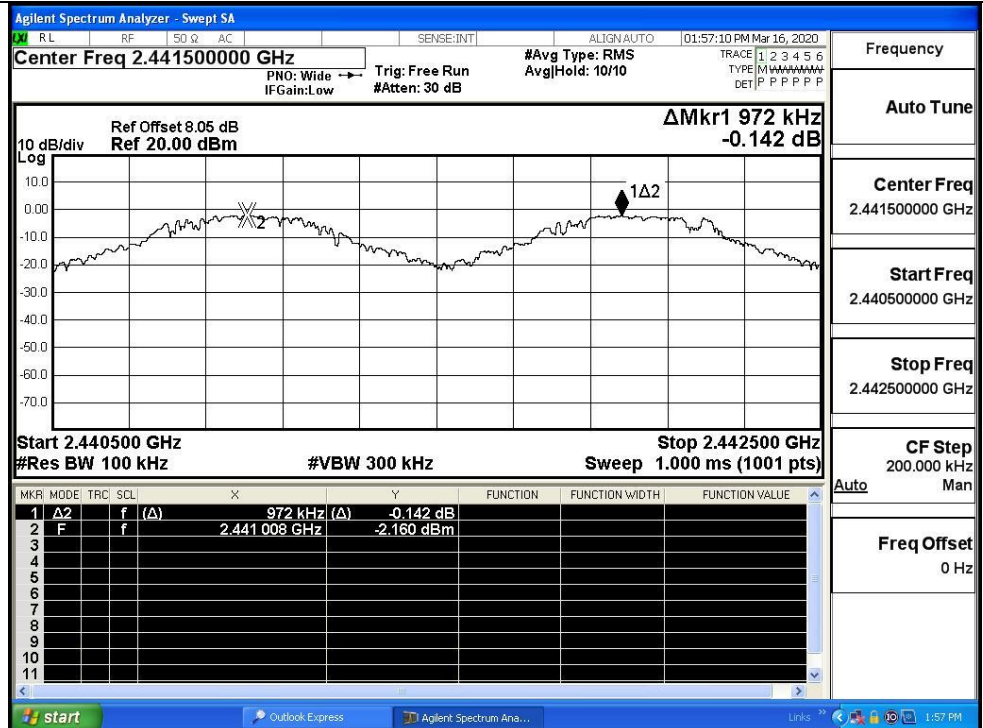
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.202	0.633	PASS
	MCH	0.972	0.633	PASS
	HCH	0.780	0.633	PASS
$\pi/4$ DQPSK	LCH	1.194	0.883	PASS
	MCH	0.974	0.883	PASS
	HCH	1.220	0.883	PASS
8DPSK	LCH	0.948	0.863	PASS
	MCH	0.992	0.863	PASS
	HCH	1.006	0.863	PASS

Test Graphs

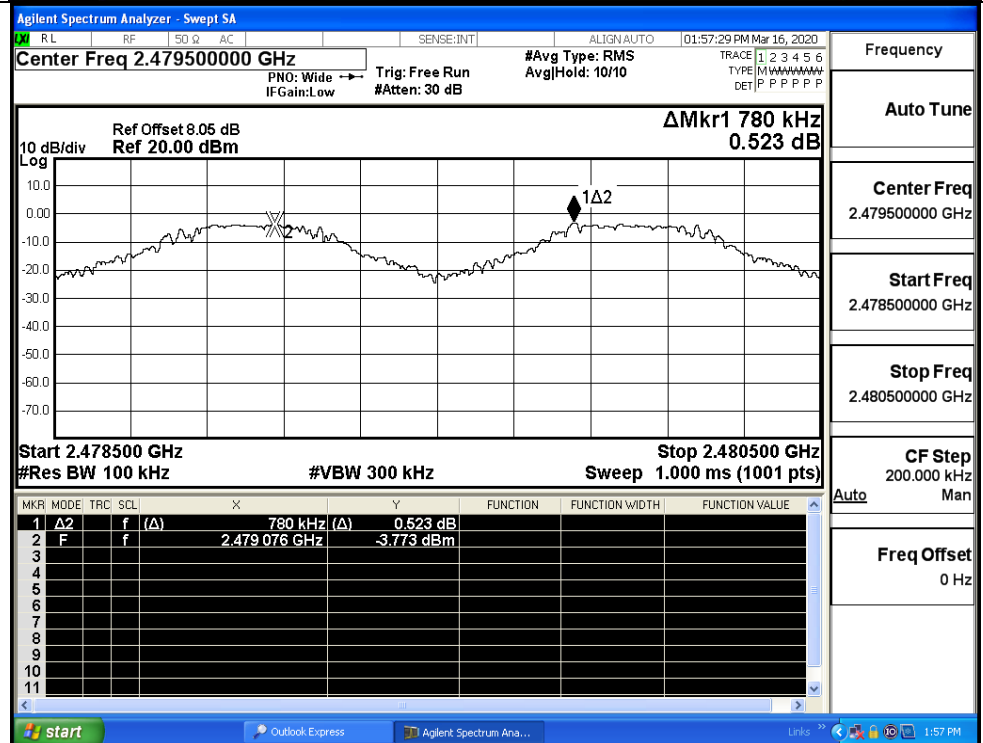
GFSK/LCH

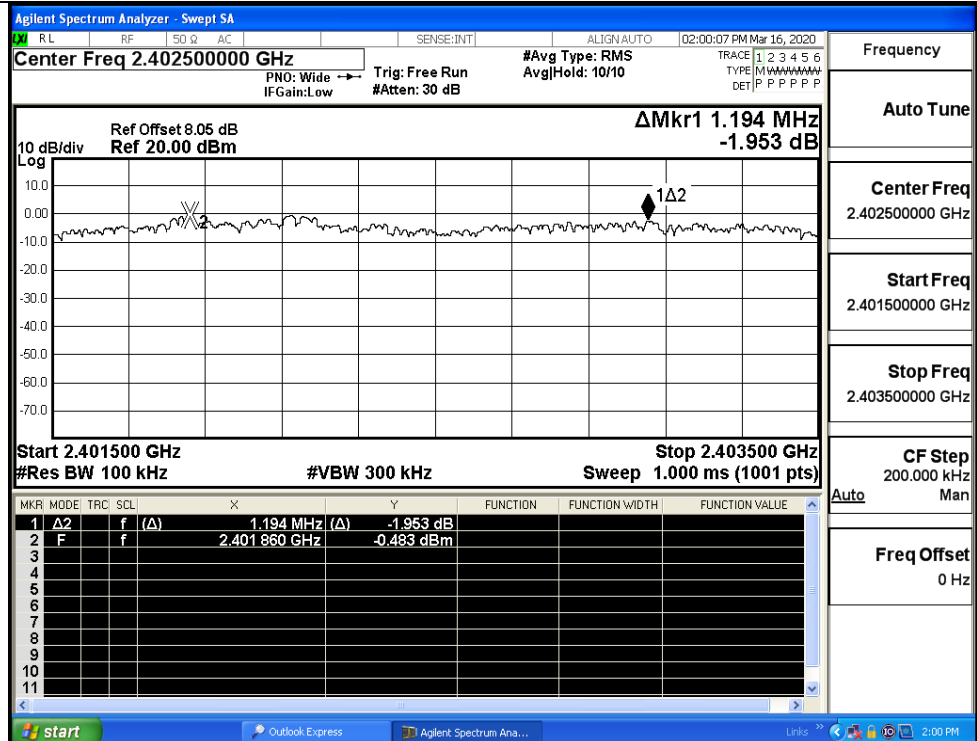
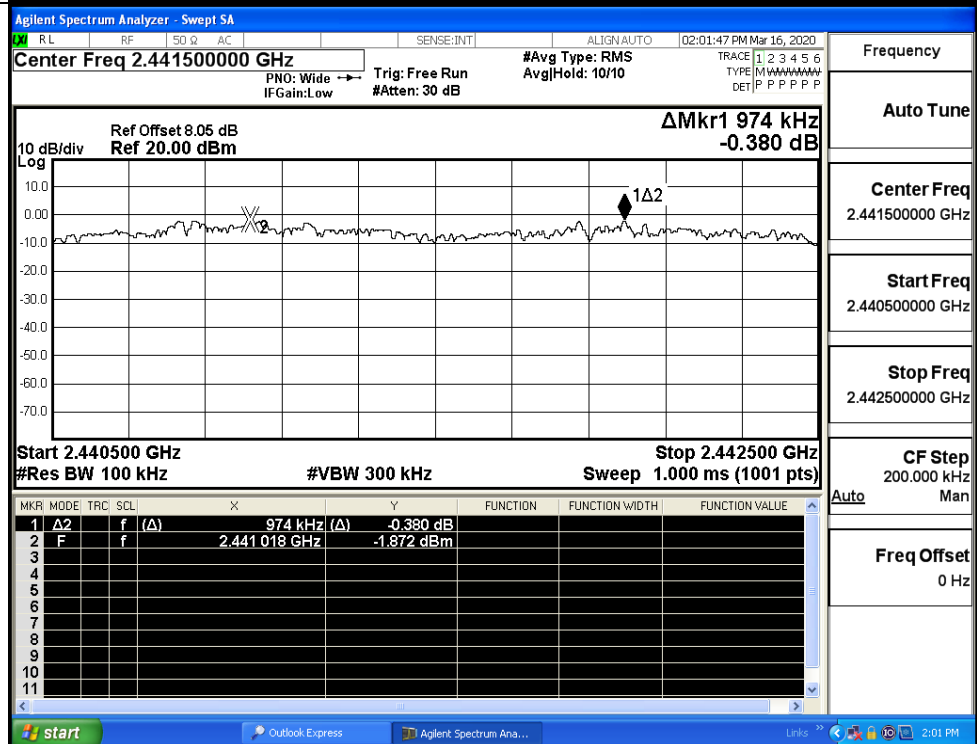


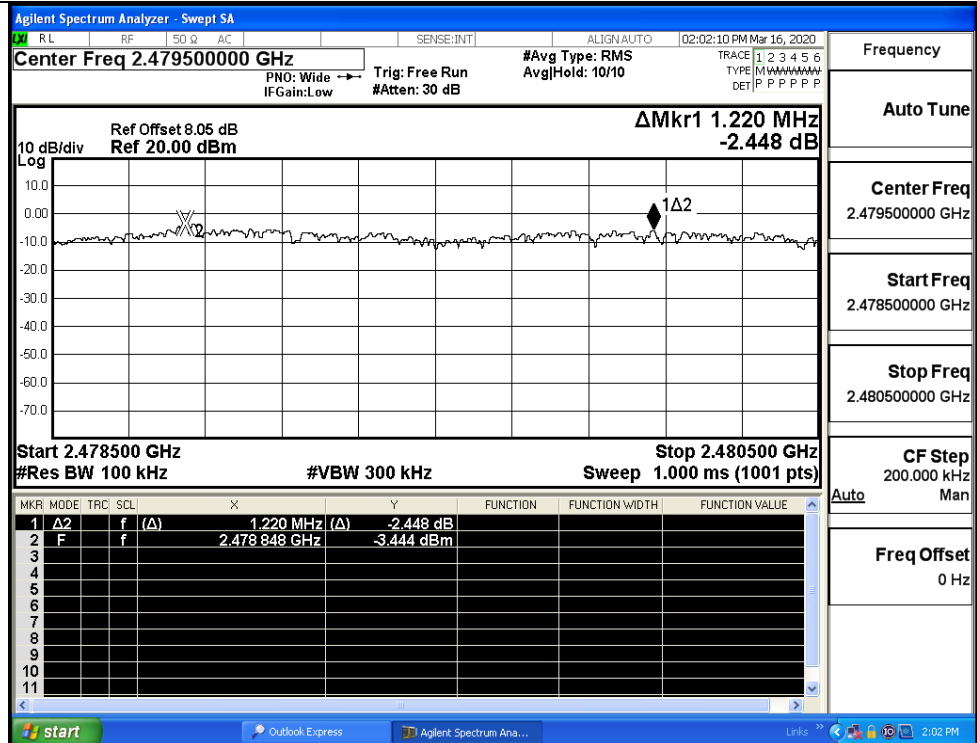
GFSK/MCH



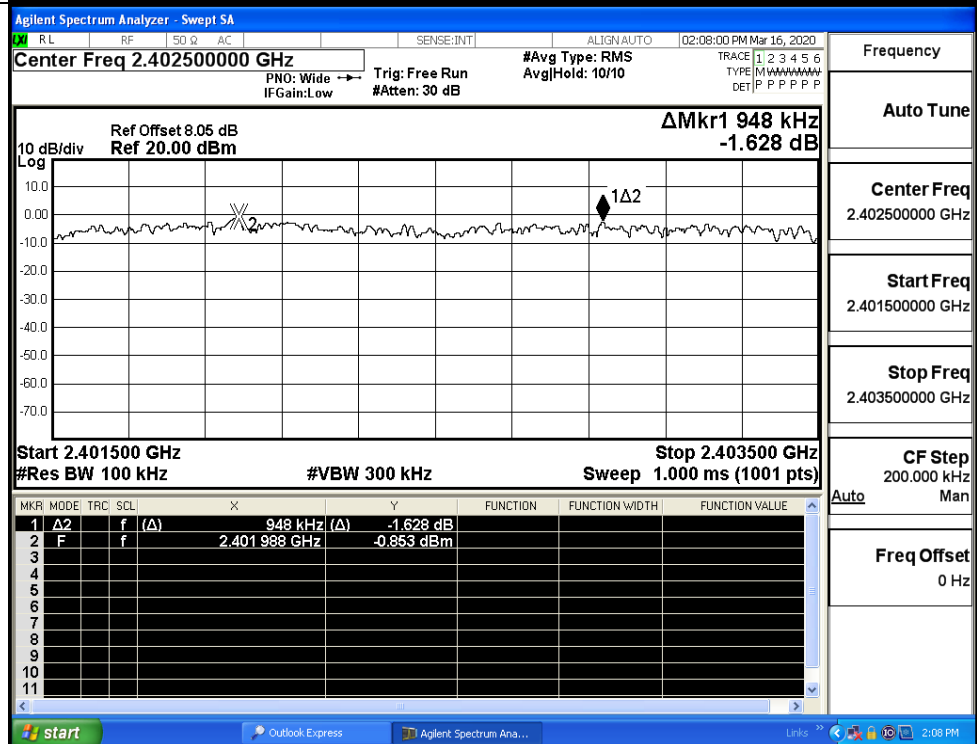
GFSK/HCH



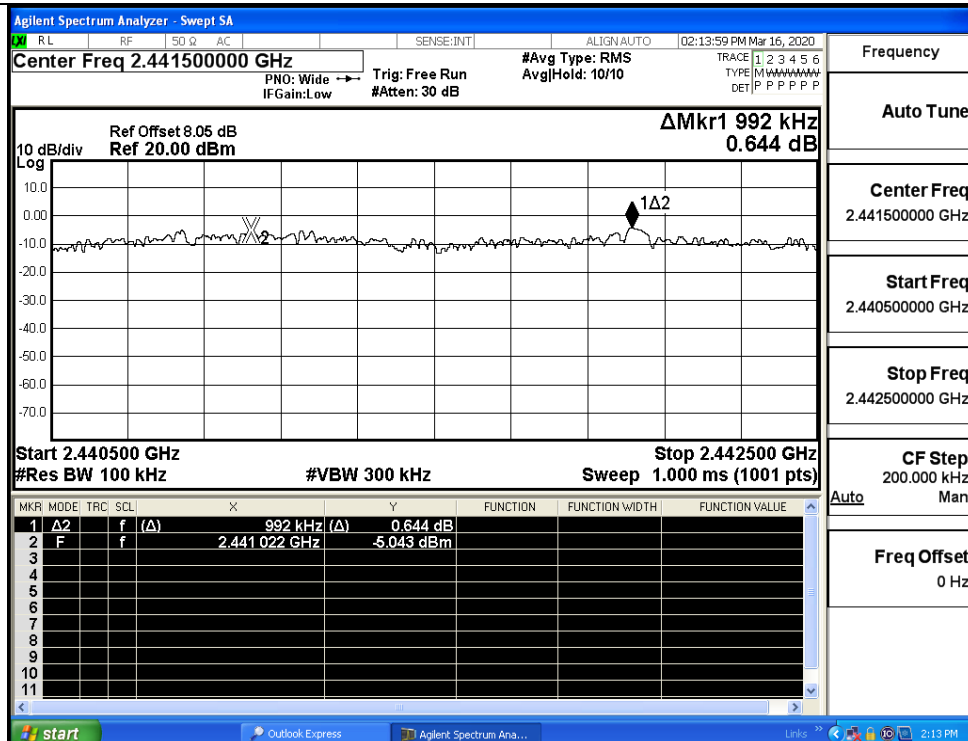
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

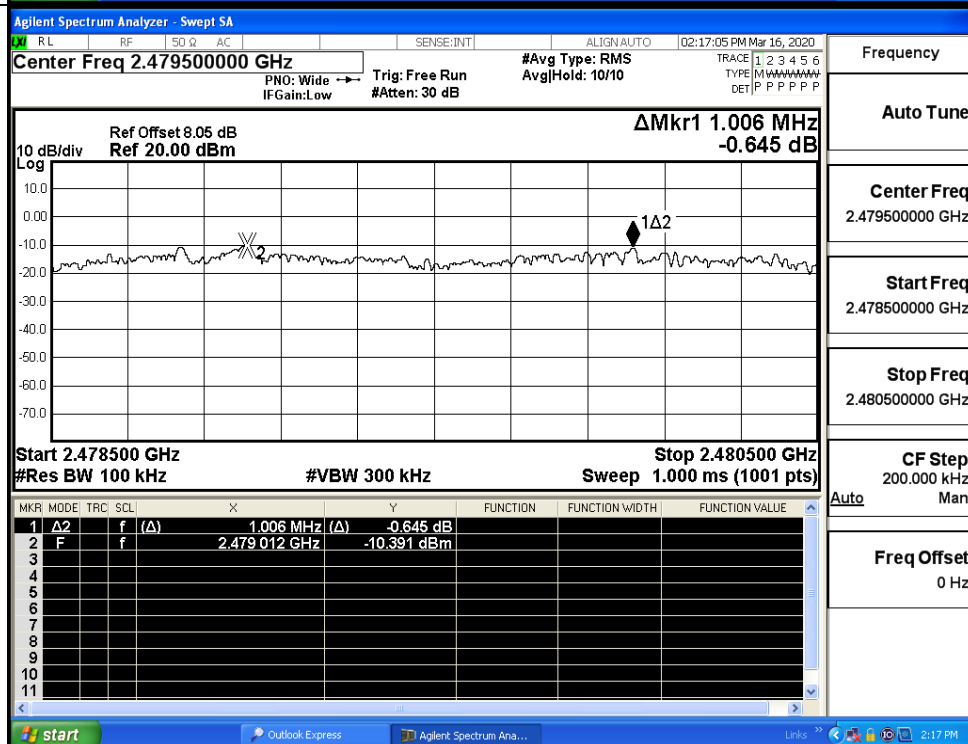
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

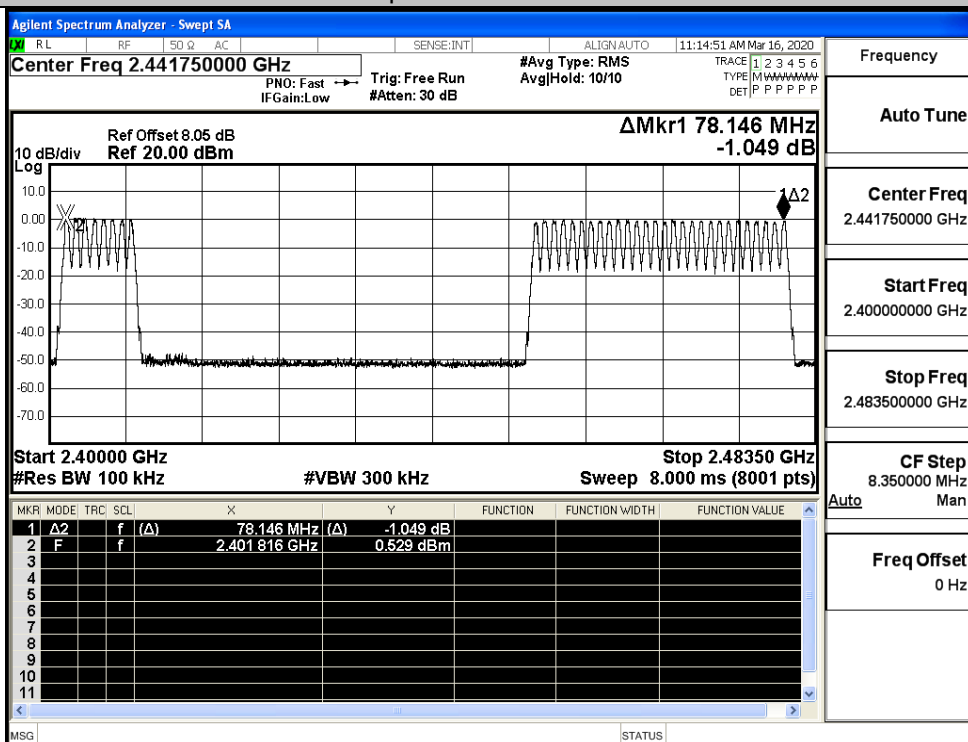
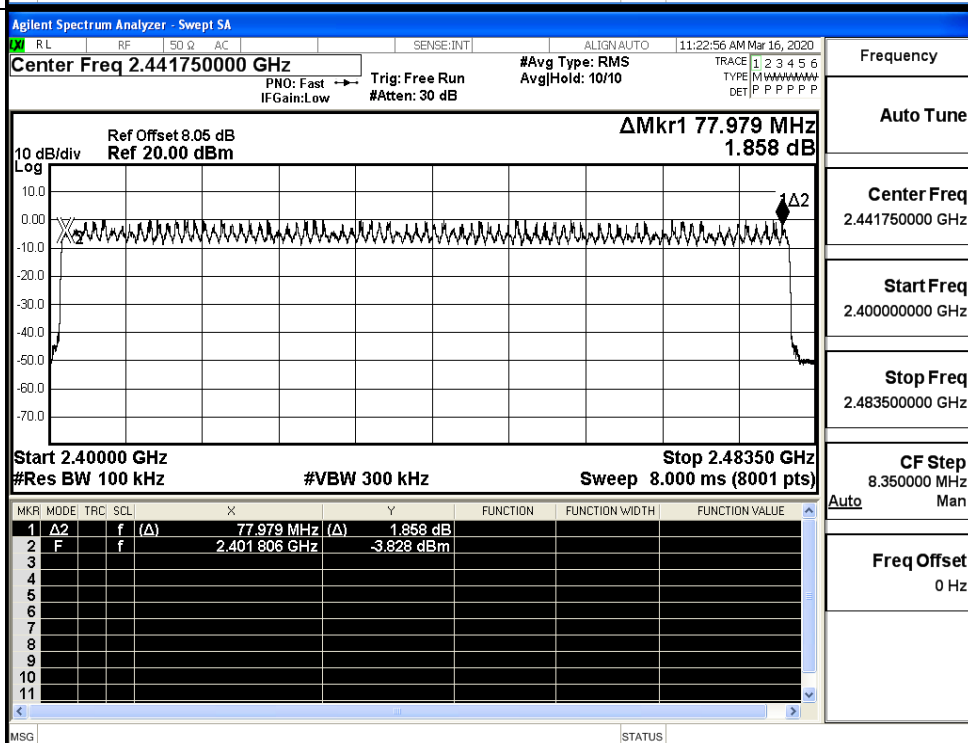


A.4 Hopping Channel Number

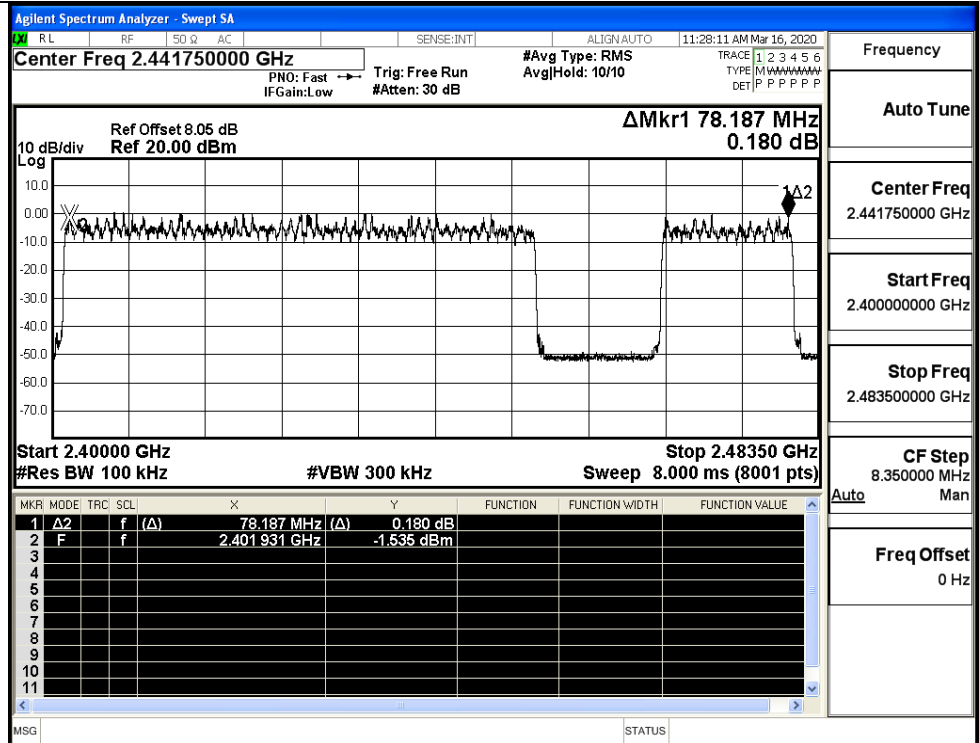
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

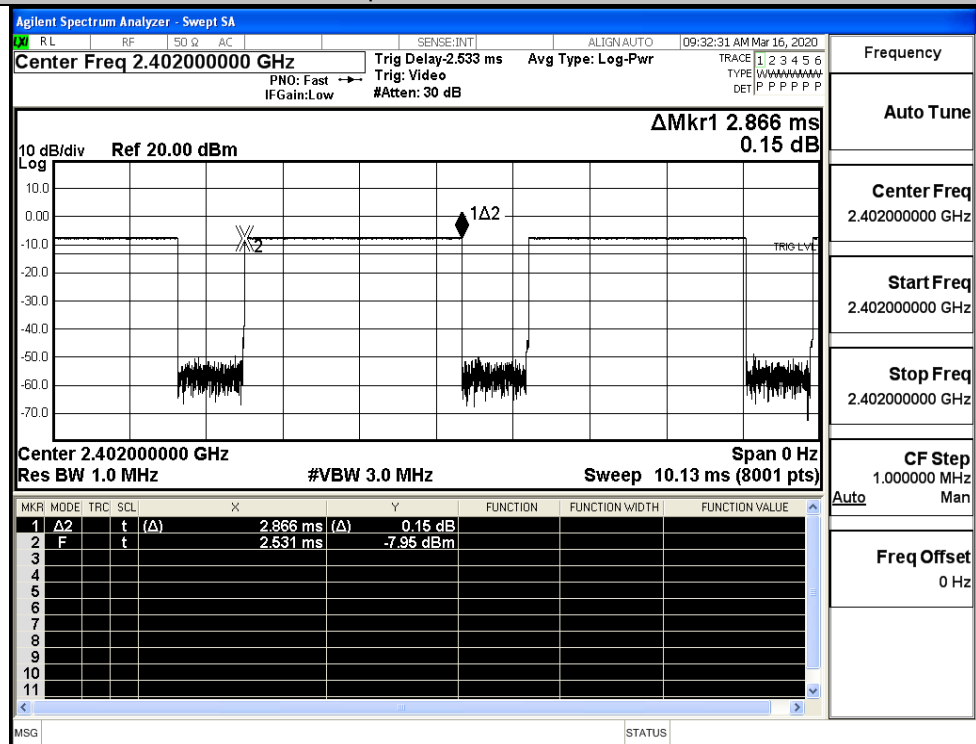


A.5 Dwell Time

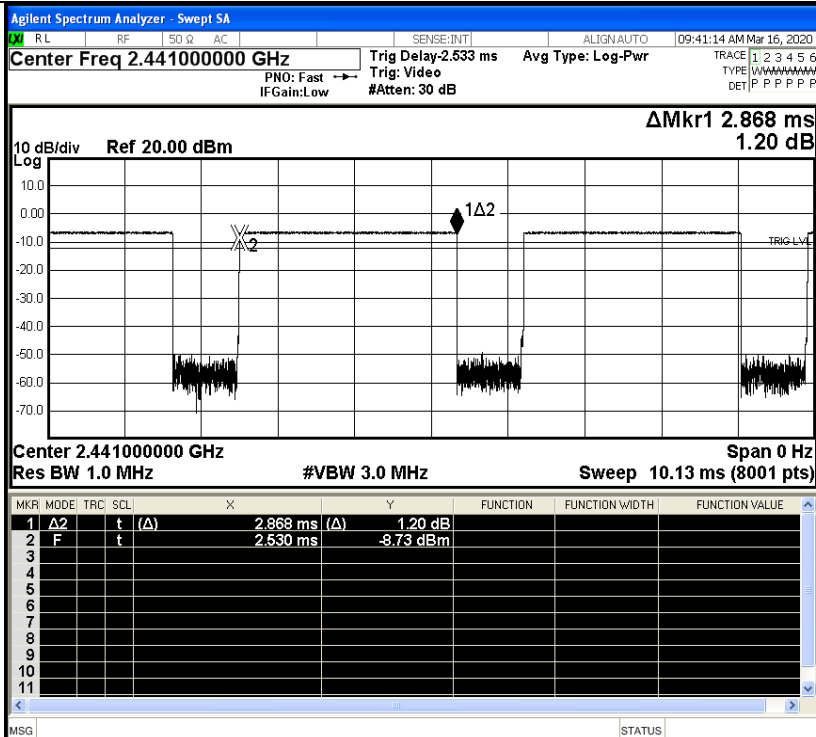
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.87	106.7	0.307	0.4	PASS
	2DH5	MCH	2.87	106.7	0.307	0.4	PASS
	2DH5	HCH	2.87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

Test Graphs

GFSK_DH5/LCH



GFSK_DH5/MCH

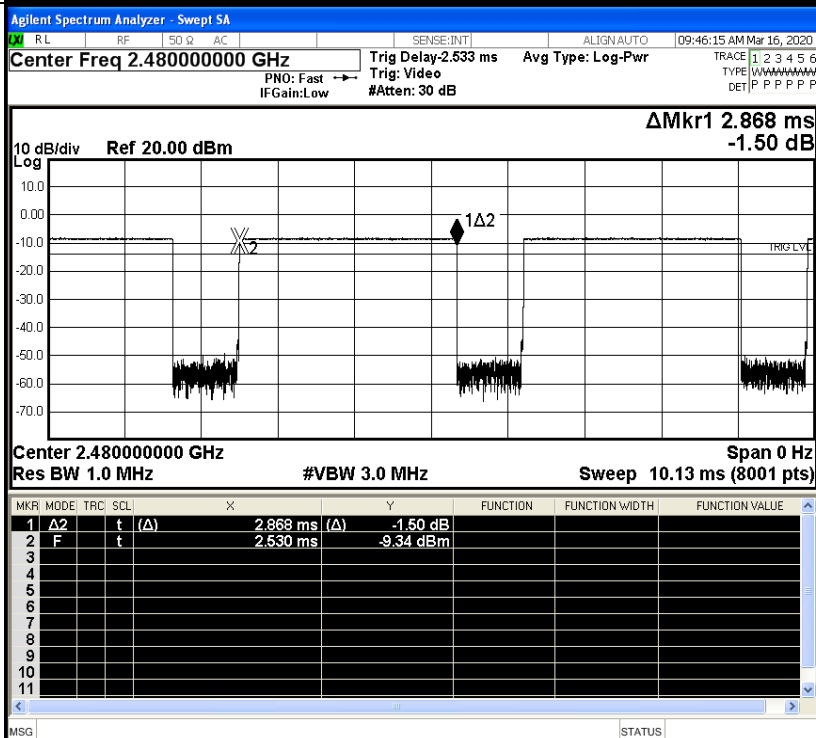


Frequency

Auto Tune

Center Freq
2.441000000 GHzStart Freq
2.441000000 GHzStop Freq
2.441000000 GHzCF Step
1.000000 MHz
Auto ManFreq Offset
0 Hz

GFSK_DH5/HCH

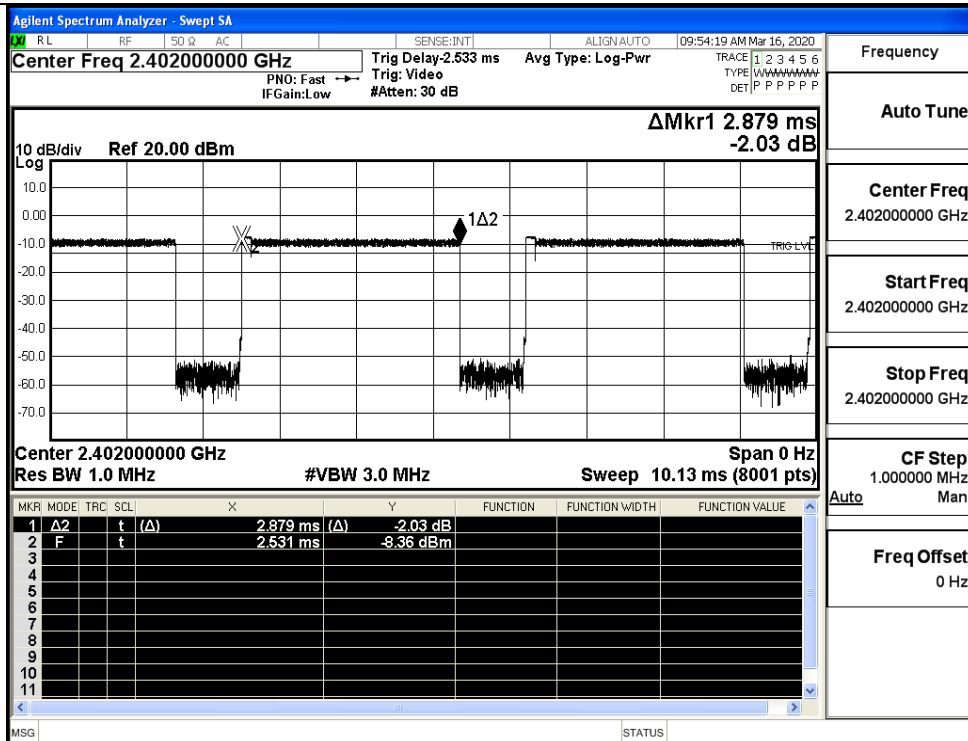


Frequency

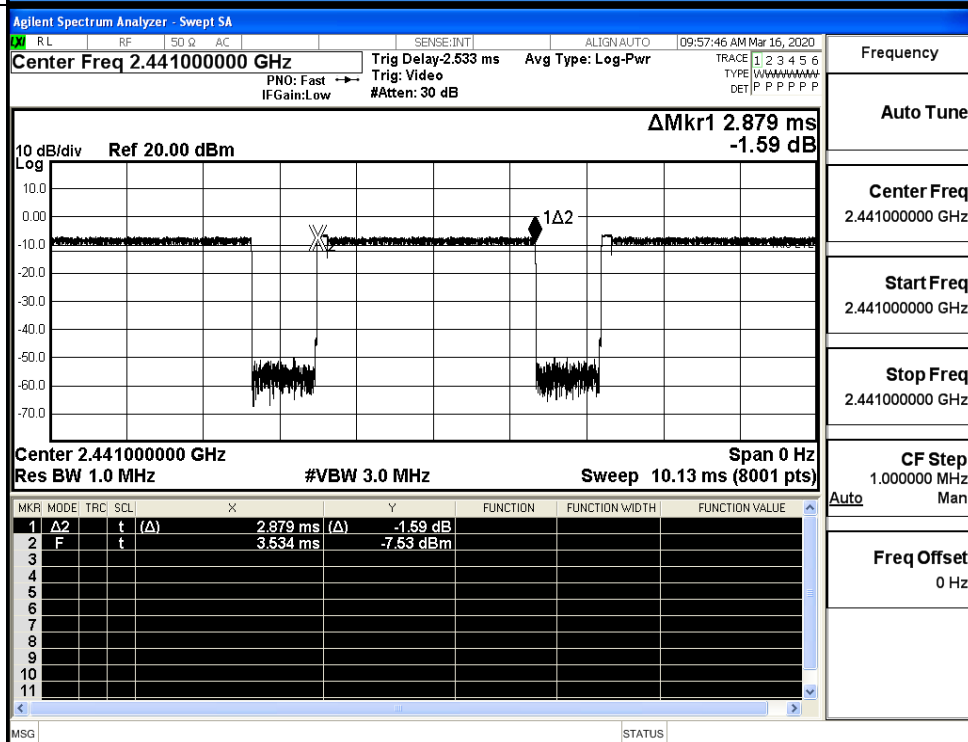
Auto Tune

Center Freq
2.480000000 GHzStart Freq
2.480000000 GHzStop Freq
2.480000000 GHzCF Step
1.000000 MHz
Auto ManFreq Offset
0 Hz

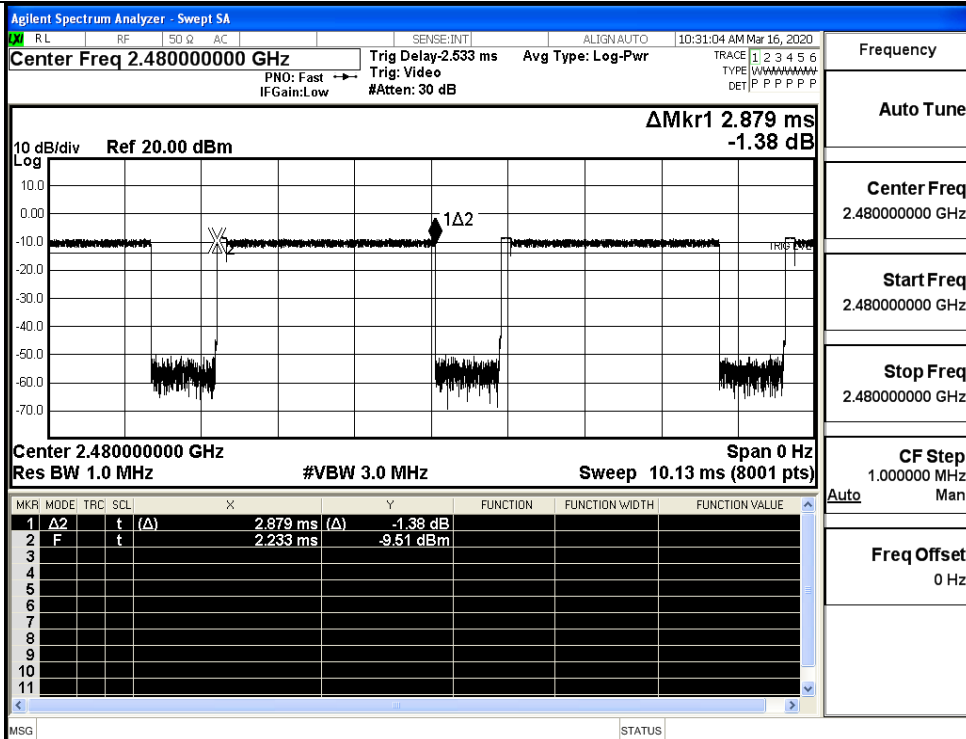
$\pi/4$ DQPSK
_2DH5/LCH



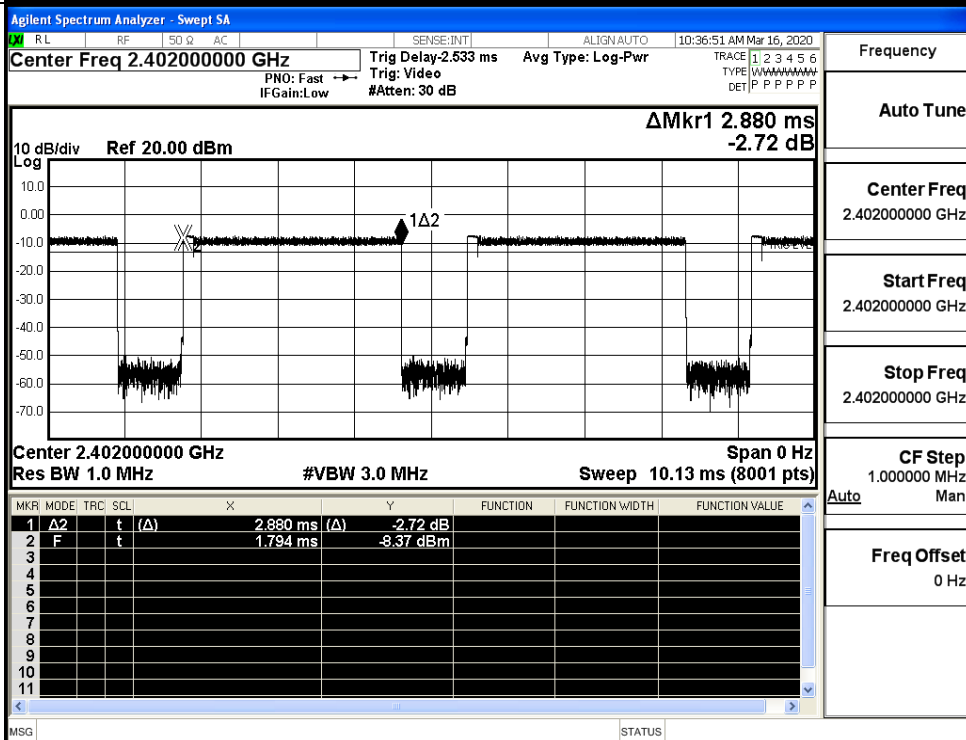
$\pi/4$ DQPSK
_2DH5/MCH



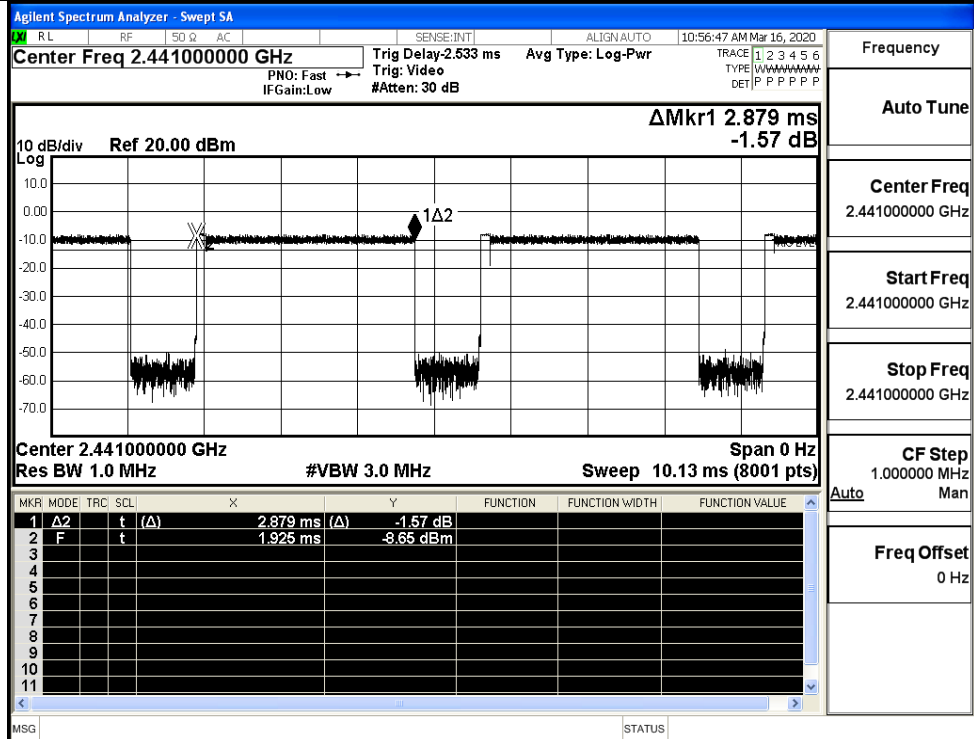
$\pi/4$ DQPSK
_2DH5/HCH



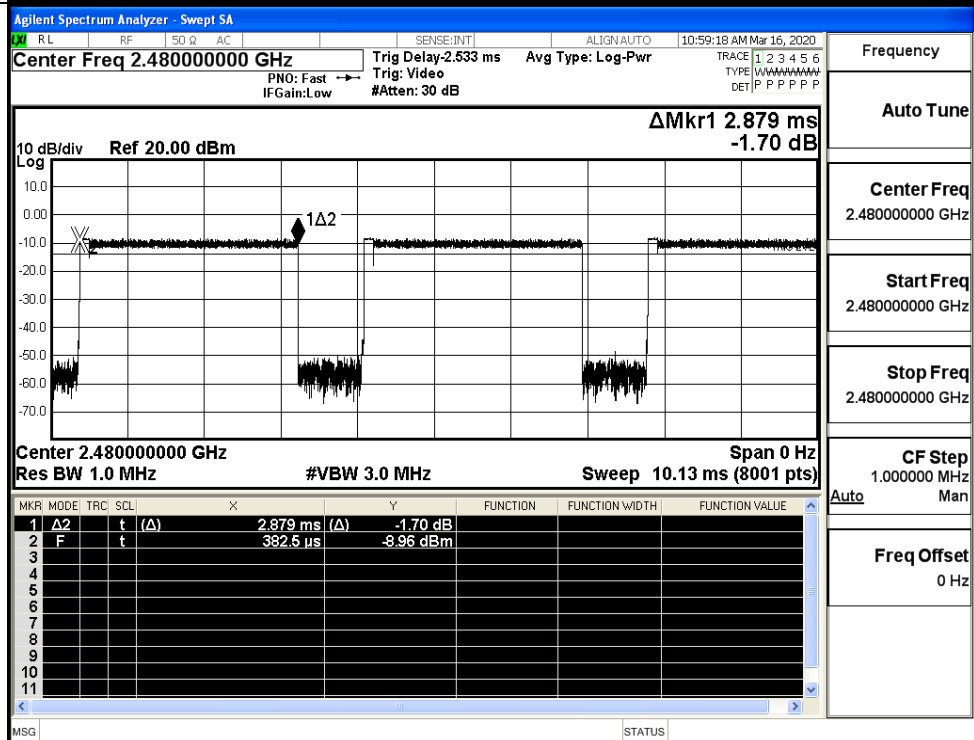
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



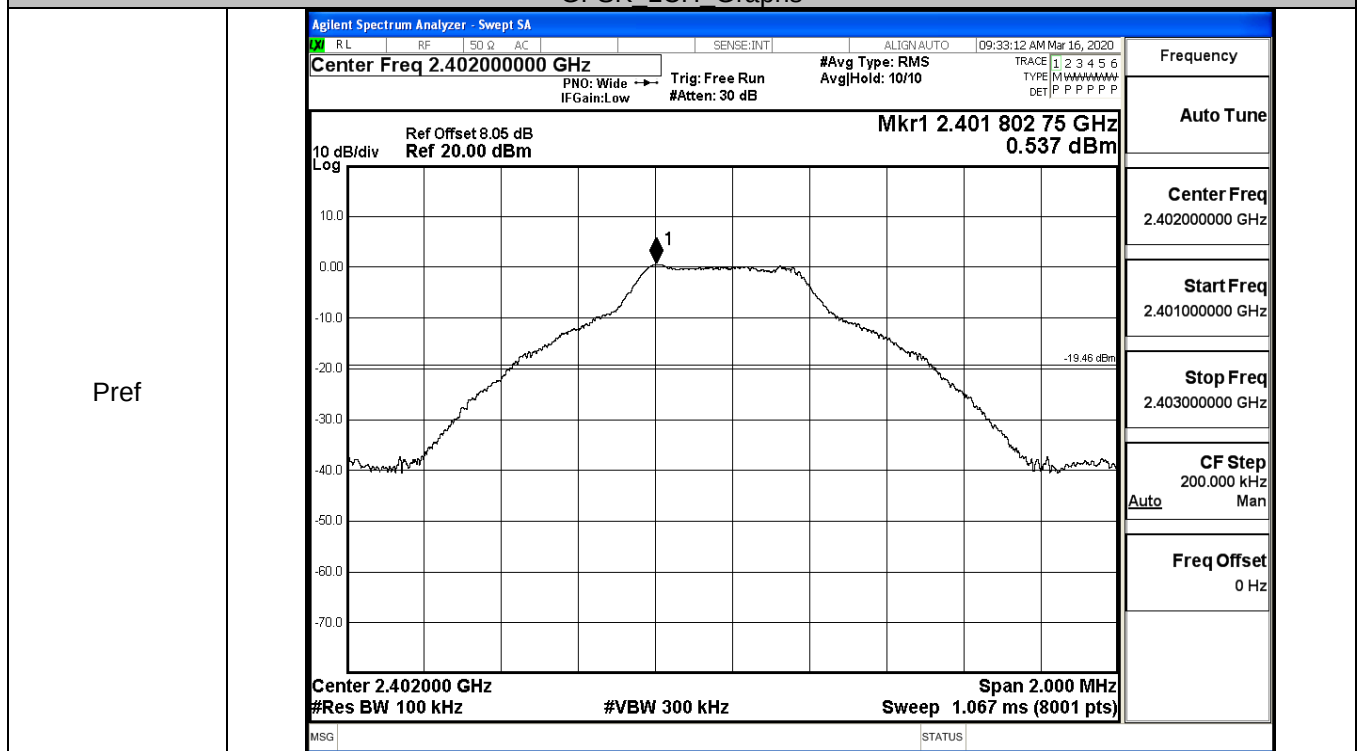
8DPSK_3DH5/HCH



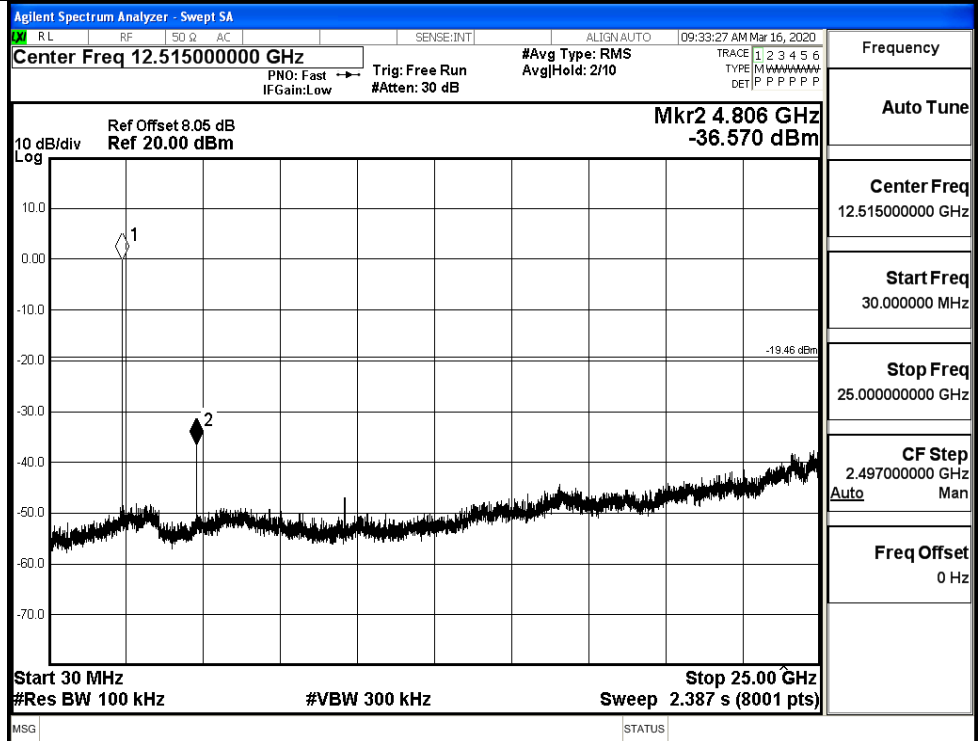
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.537	-36.570	-19.463	PASS
	MCH	1.304	-36.930	-18.696	PASS
	HCH	-0.808	-33.389	-20.808	PASS
$\pi/4$ DQPSK	LCH	-0.236	-38.069	-20.236	PASS
	MCH	0.727	-36.959	-19.273	PASS
	HCH	-0.45	-37.847	-20.450	PASS
8DPSK	LCH	0.182	-38.014	-19.818	PASS
	MCH	-0.062	-36.720	-20.062	PASS
	HCH	-0.503	-37.899	-20.503	PASS

GFSK LCH Graphs

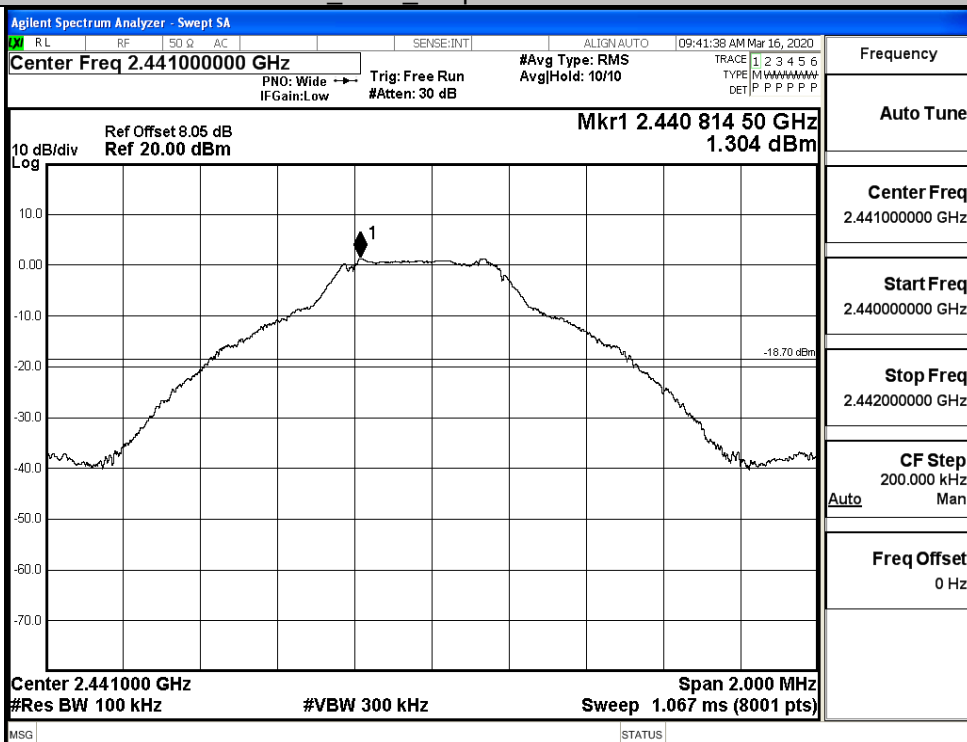


Puw

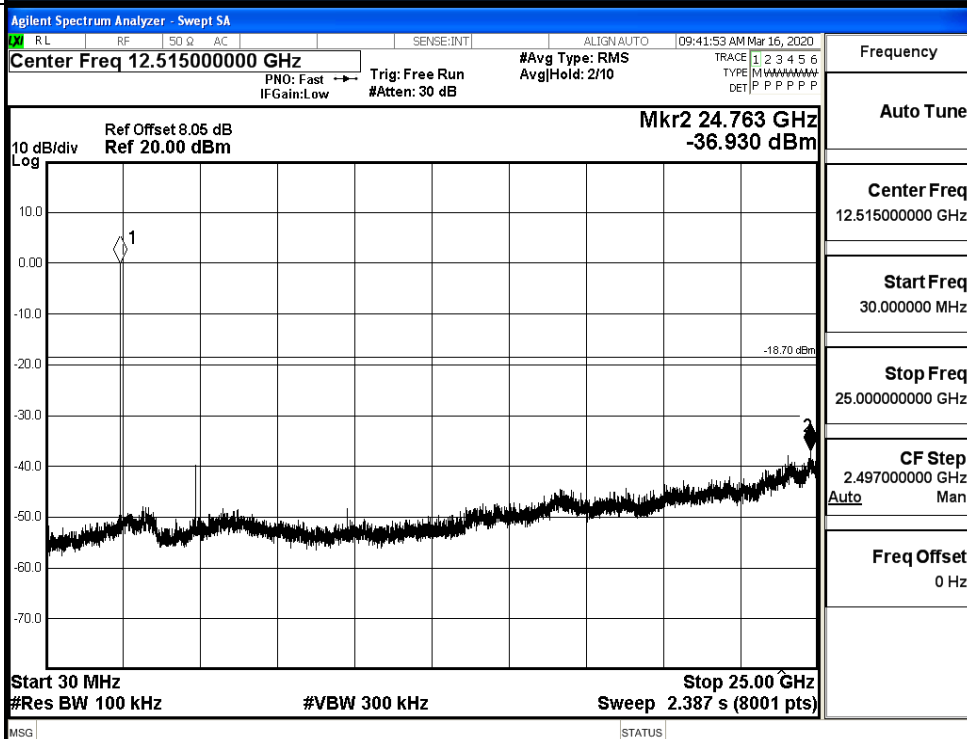


GFSK_MCH_Graphs

Pref

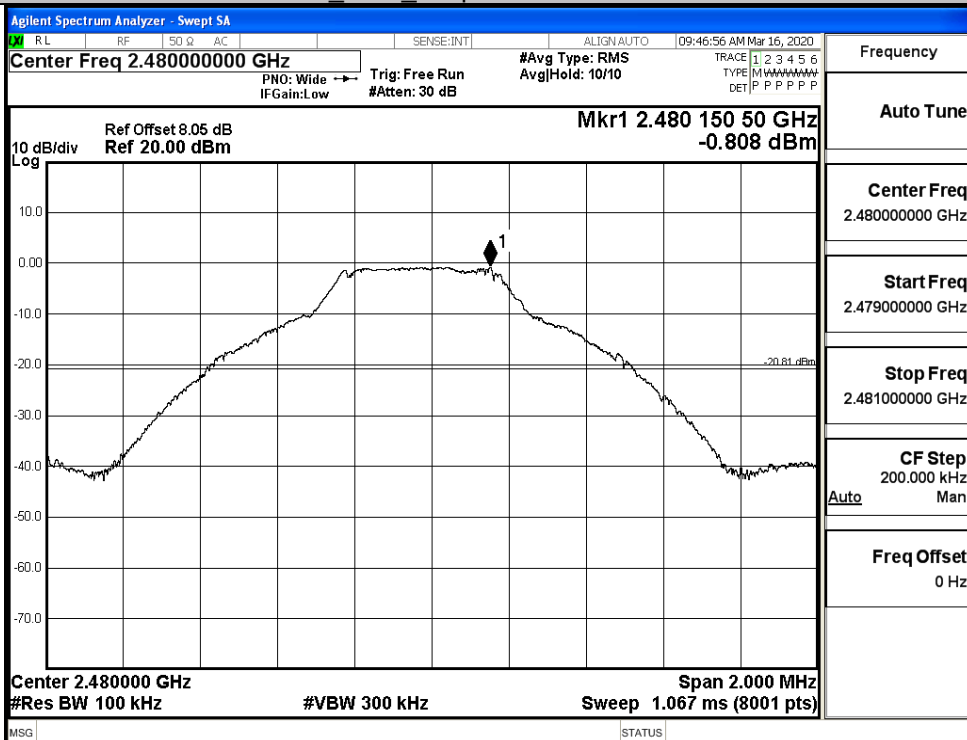


Puw

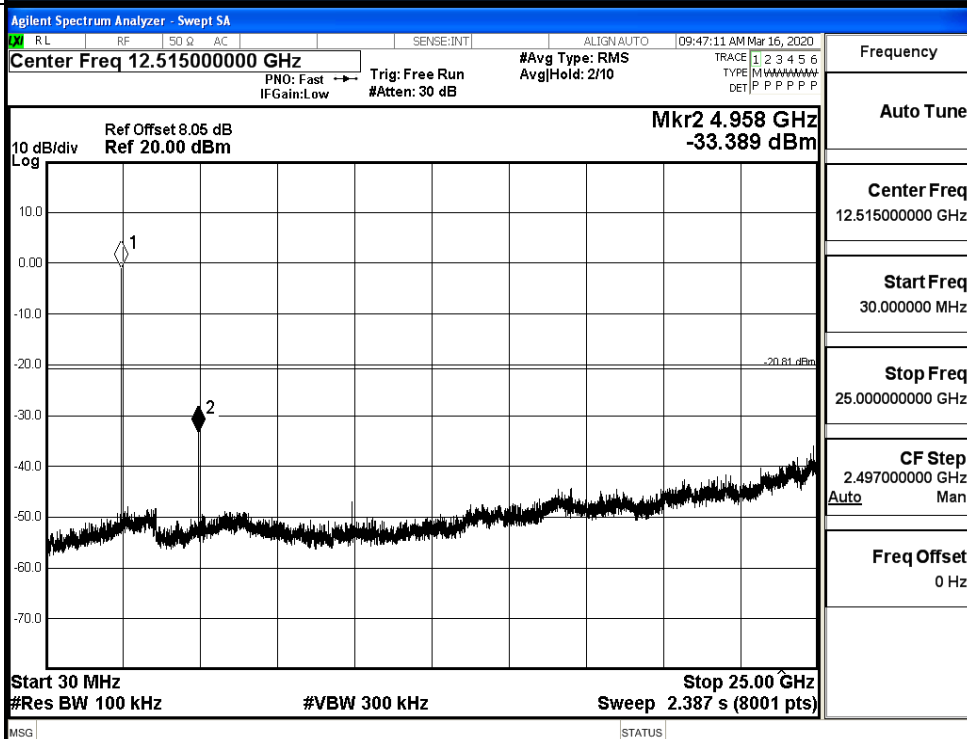


GFSK HCH Graphs

Pref

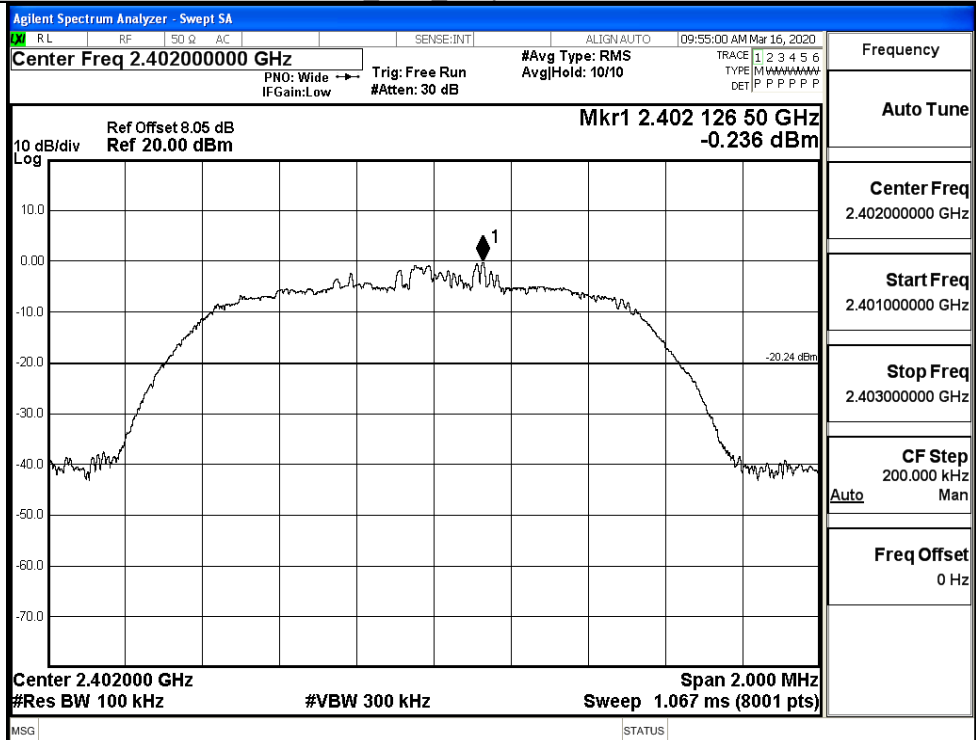


Puw

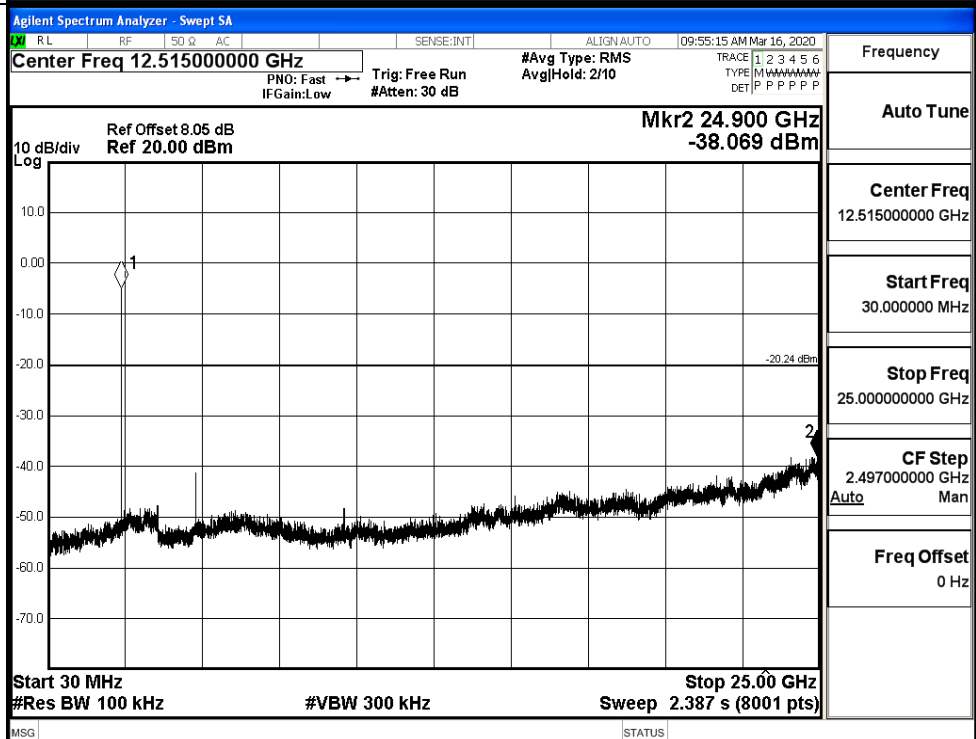


$\pi/4$ DQPSK_LCH_Graphs

Pref

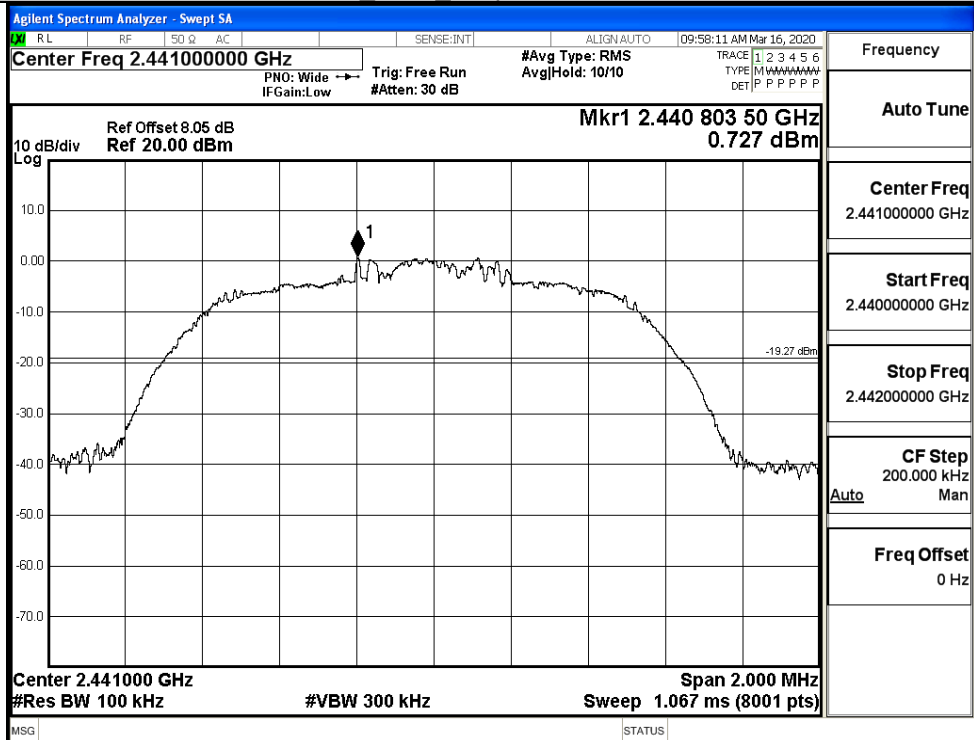


Puw

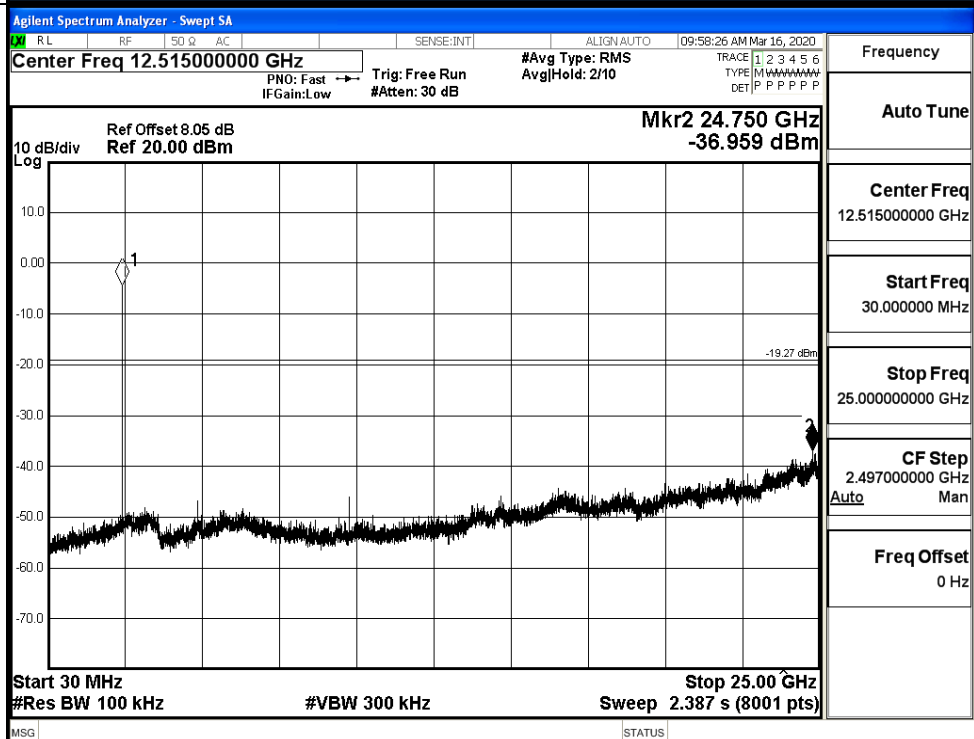


$\pi/4$ DQPSK_MCH_Graphs

Pref

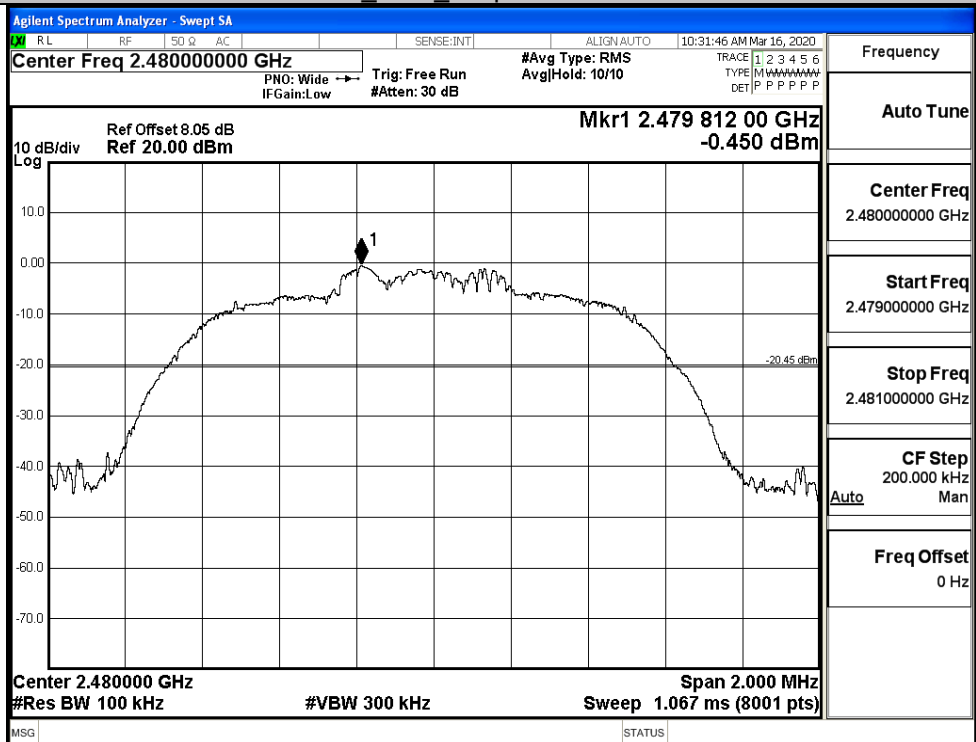


Puw

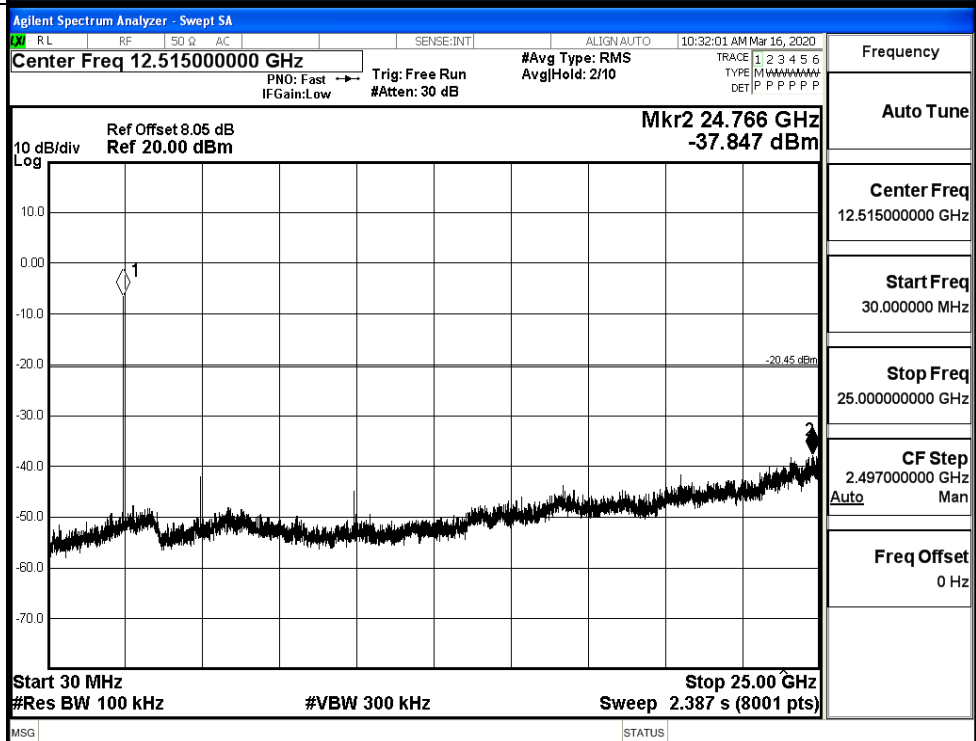


$\pi/4$ DQPSK_HCH_Graphs

Pref

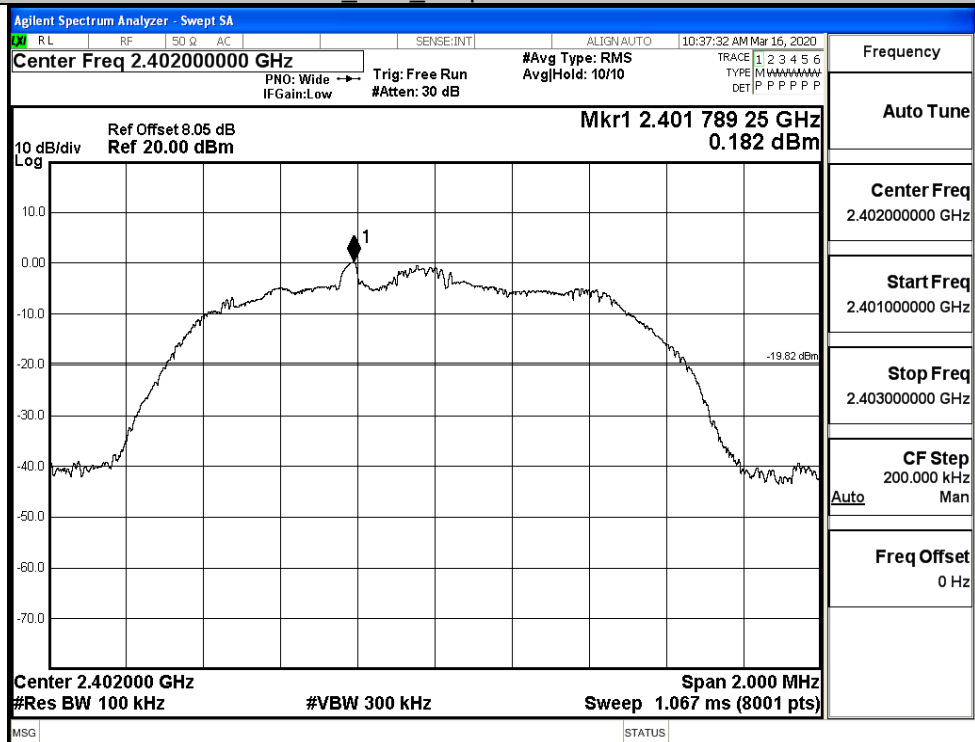


Puw

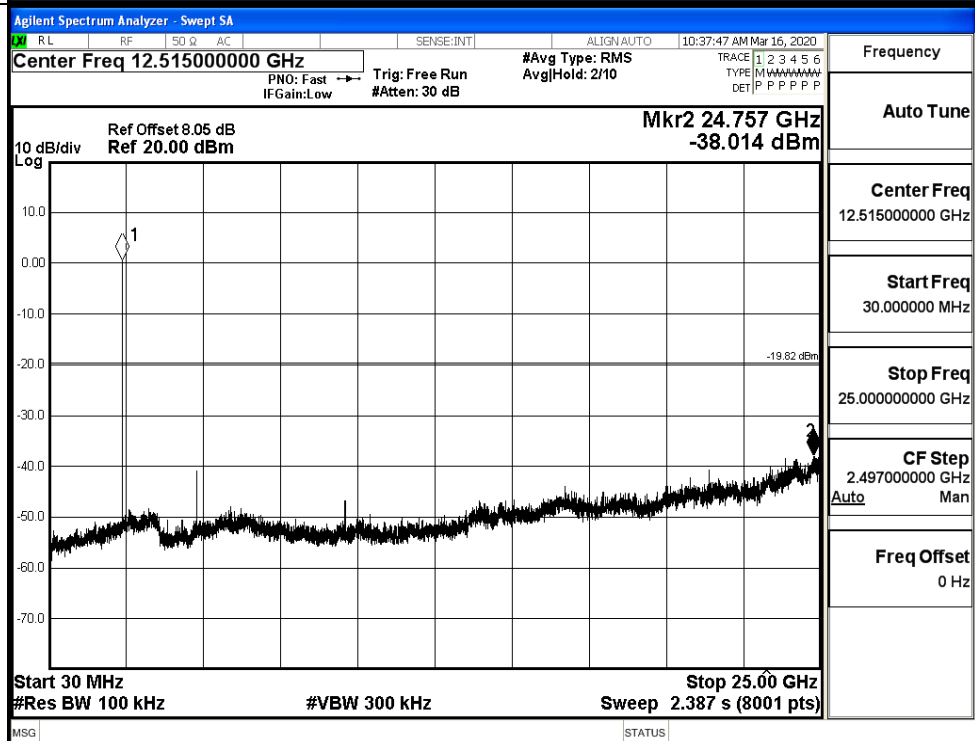


8DPSK_LCH_Graphs

Pref

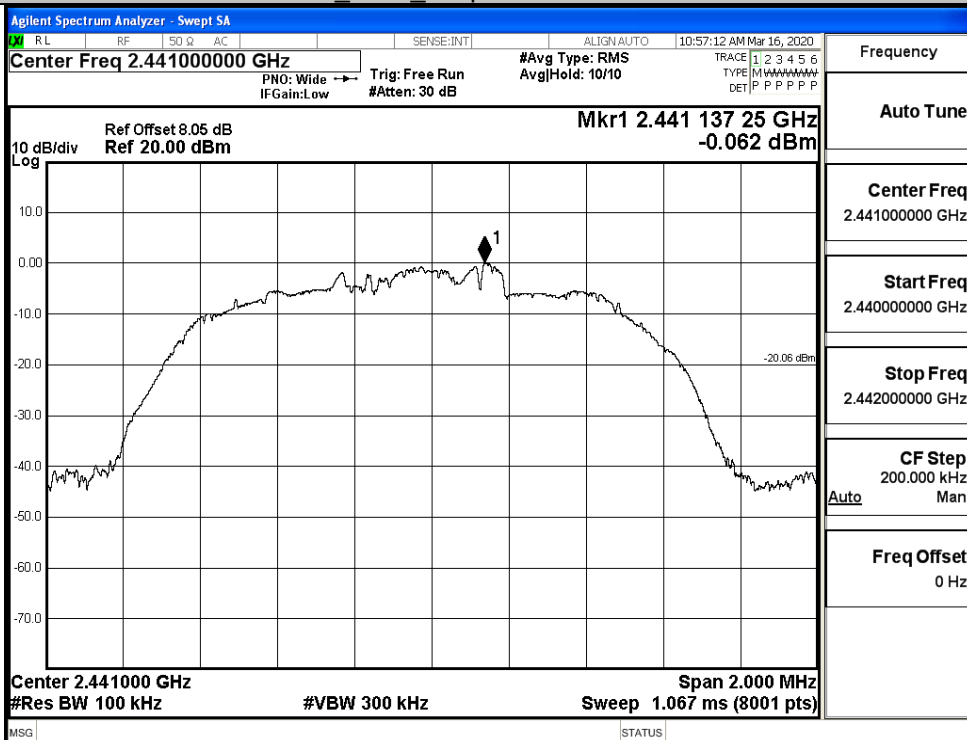


Puw

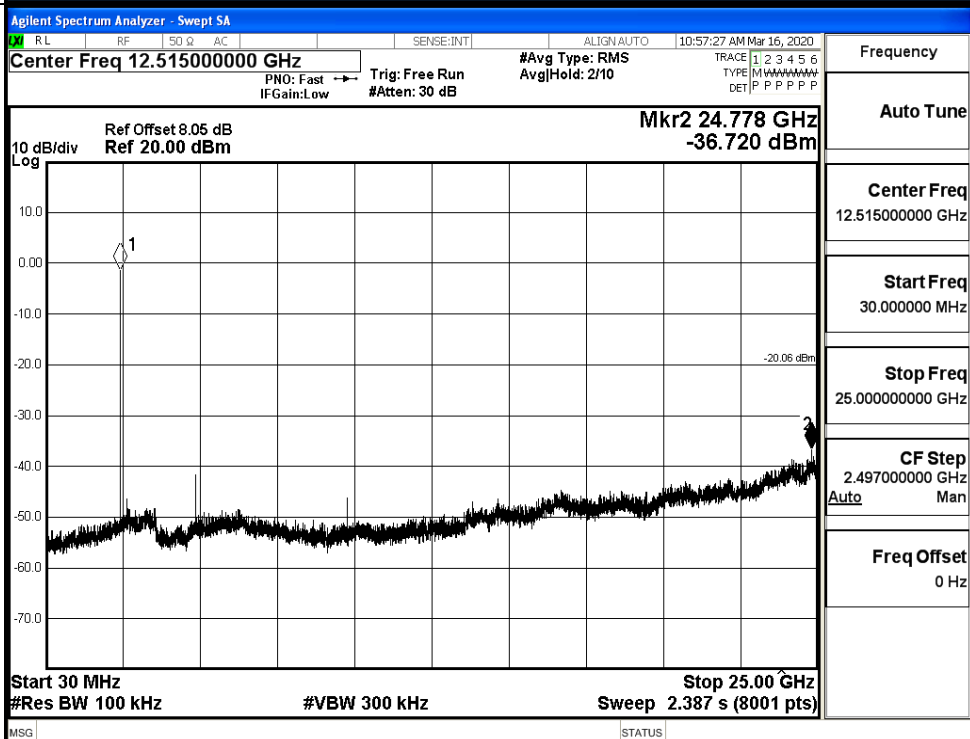


8DPSK_MCH_Graphs

Pref

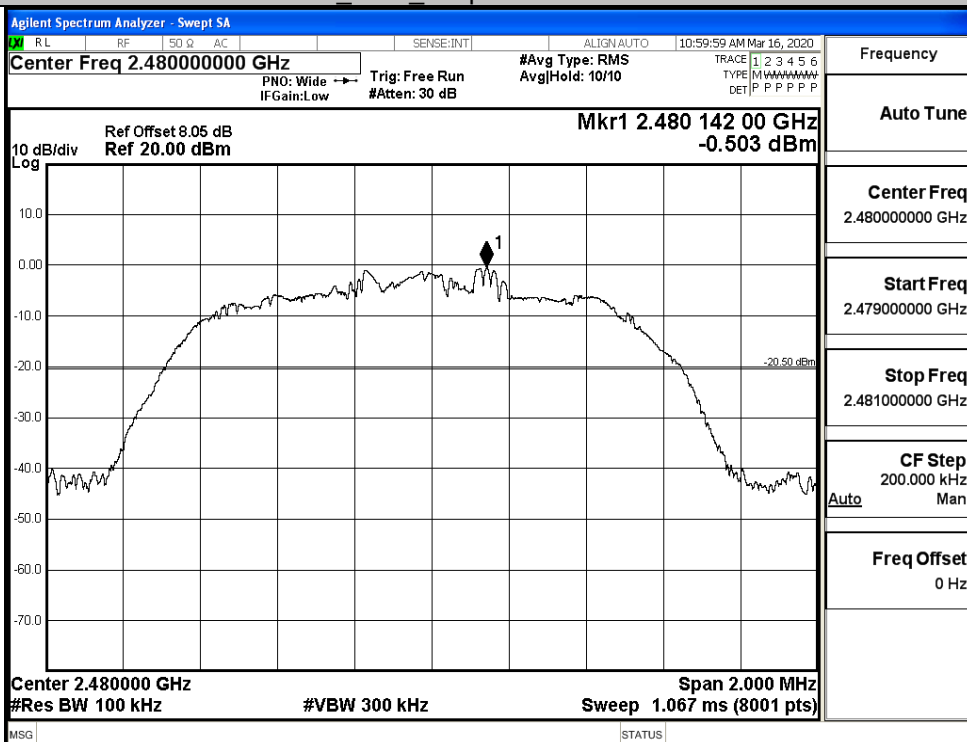


Puw

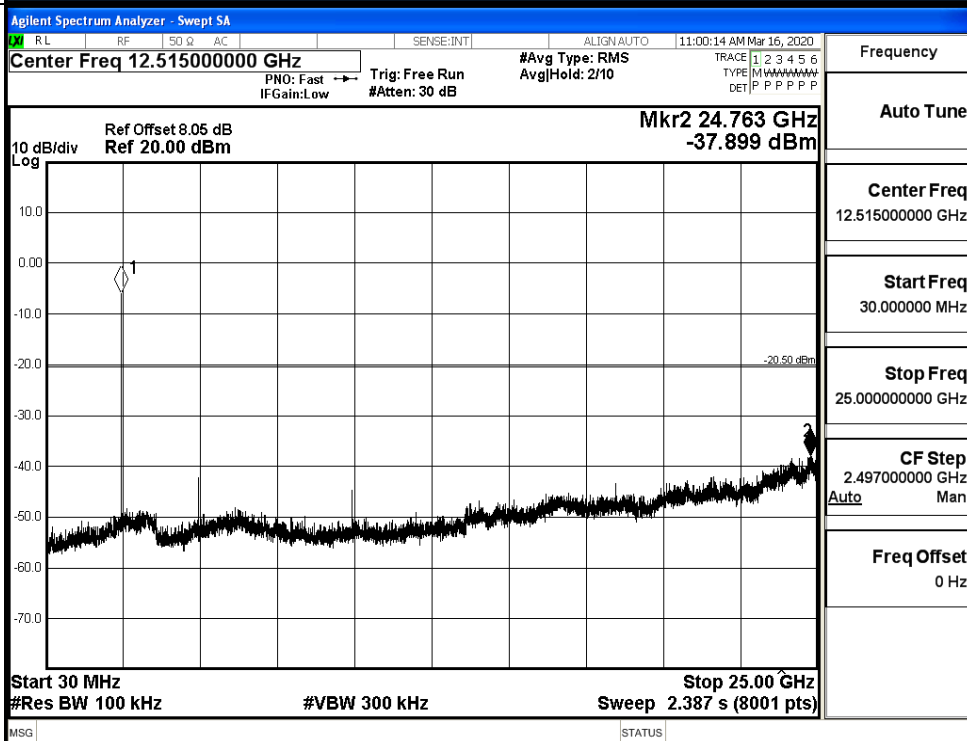


8DPSK_HCH_Graphs

Pref



Puw

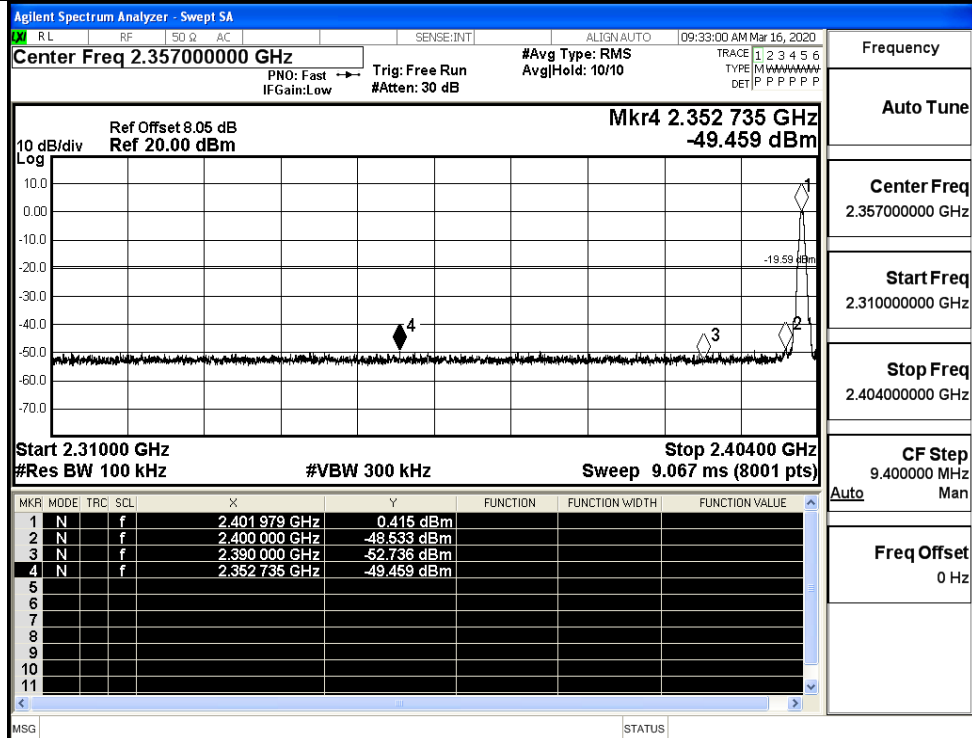


A.7 Band-edge for RF Conducted Emissions

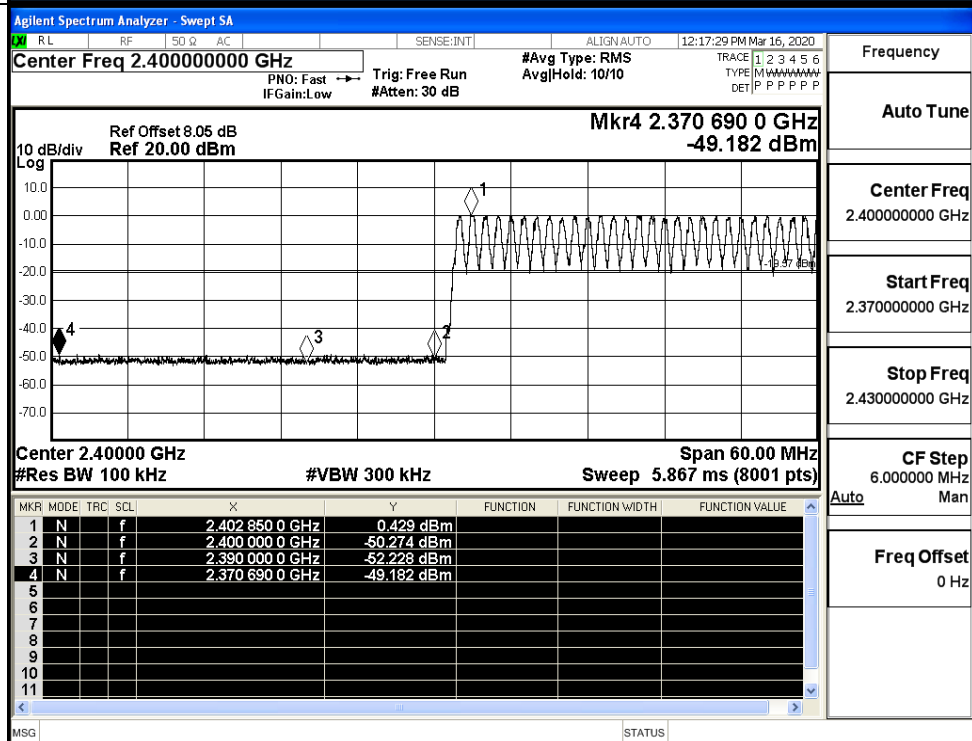
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.415	Off	-49.459	-19.59	PASS
			0.429	On	-49.182	-19.57	PASS
	HCH	2480	-0.286	Off	-49.083	-20.29	PASS
			-0.208	On	-48.408	-20.21	PASS
$\pi/4$ DQPSK	LCH	2402	0.240	Off	-49.081	-19.76	PASS
			0.290	On	-49.113	-19.71	PASS
	HCH	2480	-0.301	Off	-49.098	-20.3	PASS
			-0.082	On	-48.288	-20.08	PASS
8DPSK	LCH	2402	-0.537	Off	-49.324	-20.54	PASS
			0.573	On	-48.969	-19.43	PASS
	HCH	2480	-0.256	Off	-48.388	-20.26	PASS
			-0.088	On	-48.584	-20.09	PASS

Test Graphs

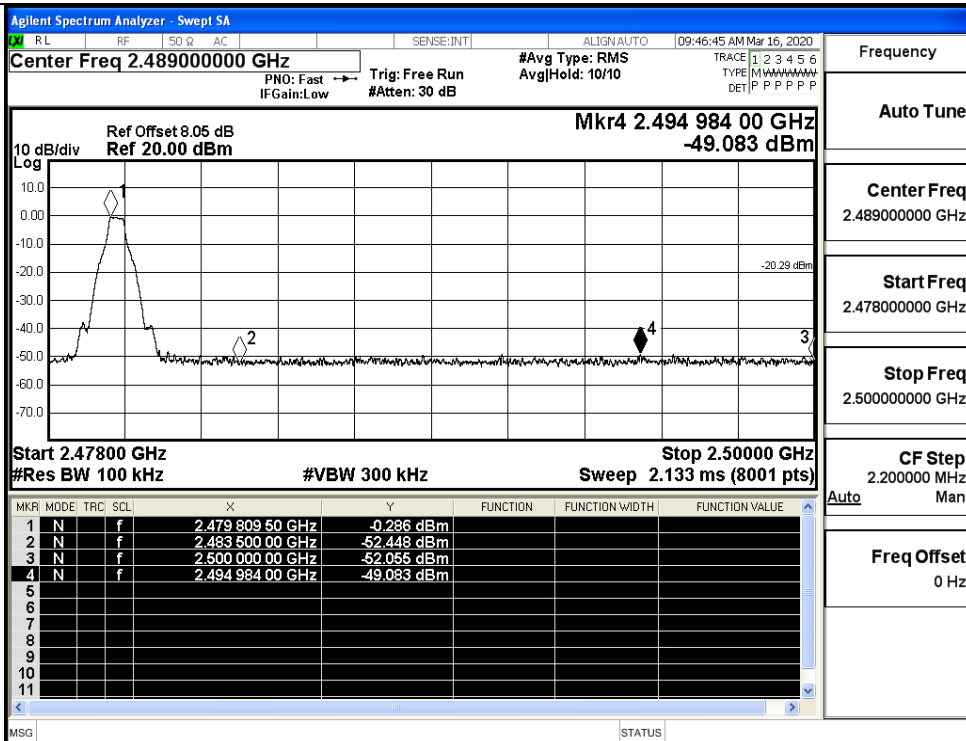
GFSK/LCH/No Hop



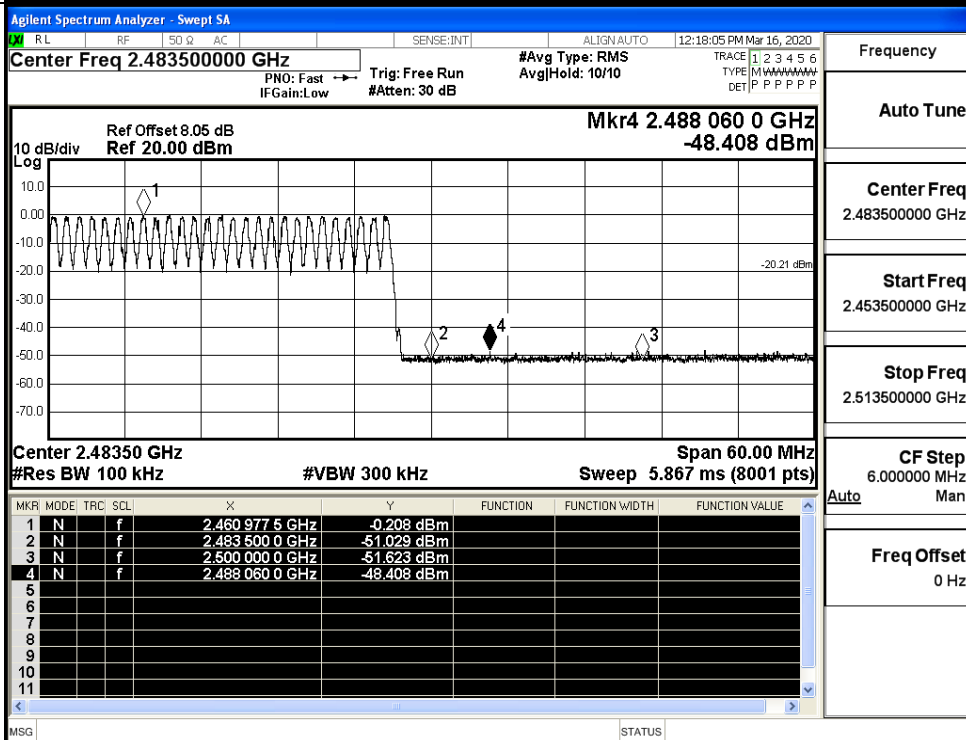
GFSK/LCH/Hop



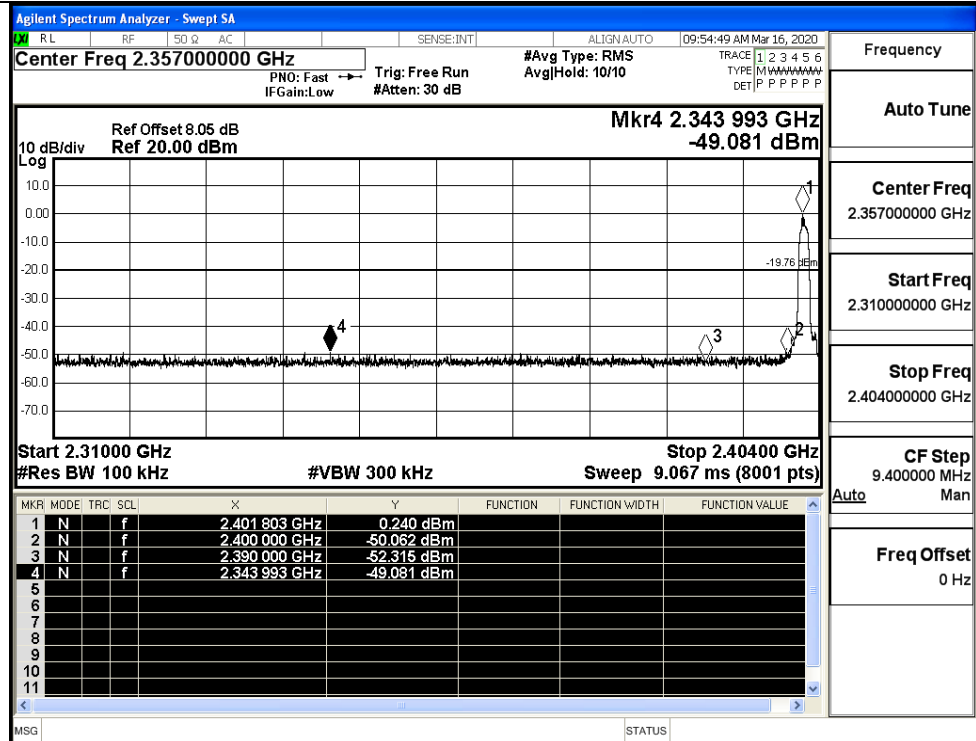
GFSK/HCH/No Hop



GFSK/HCH/Hop



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

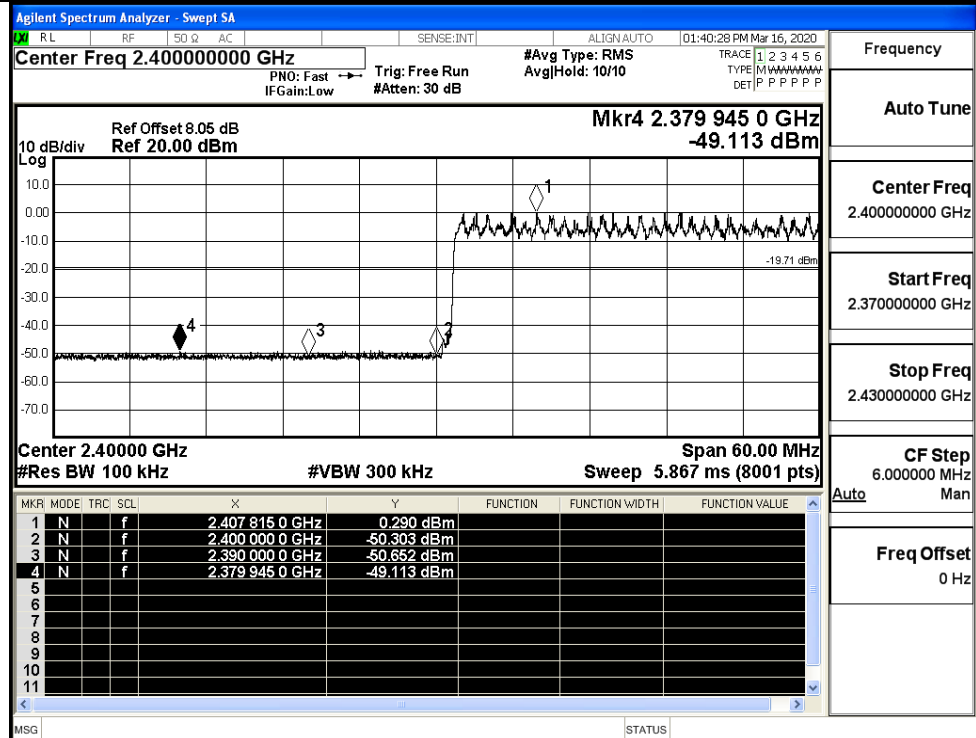


Frequency

Auto Tune

Center Freq
2.357000000 GHzStart Freq
2.310000000 GHzStop Freq
2.404000000 GHzCF Step
9.400000 MHz
Auto ManFreq Offset
0 Hz

$\pi/4$ DQPSK/LCH/Hop

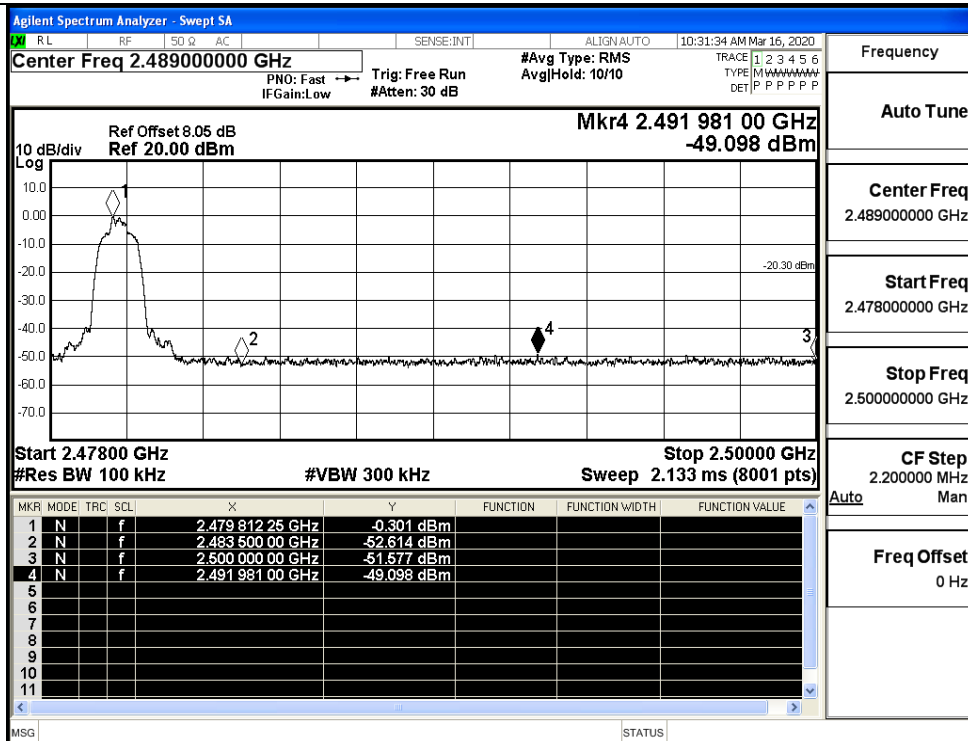


Frequency

Auto Tune

Center Freq
2.400000000 GHzStart Freq
2.370000000 GHzStop Freq
2.430000000 GHzCF Step
6.000000 MHz
Auto ManFreq Offset
0 Hz

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

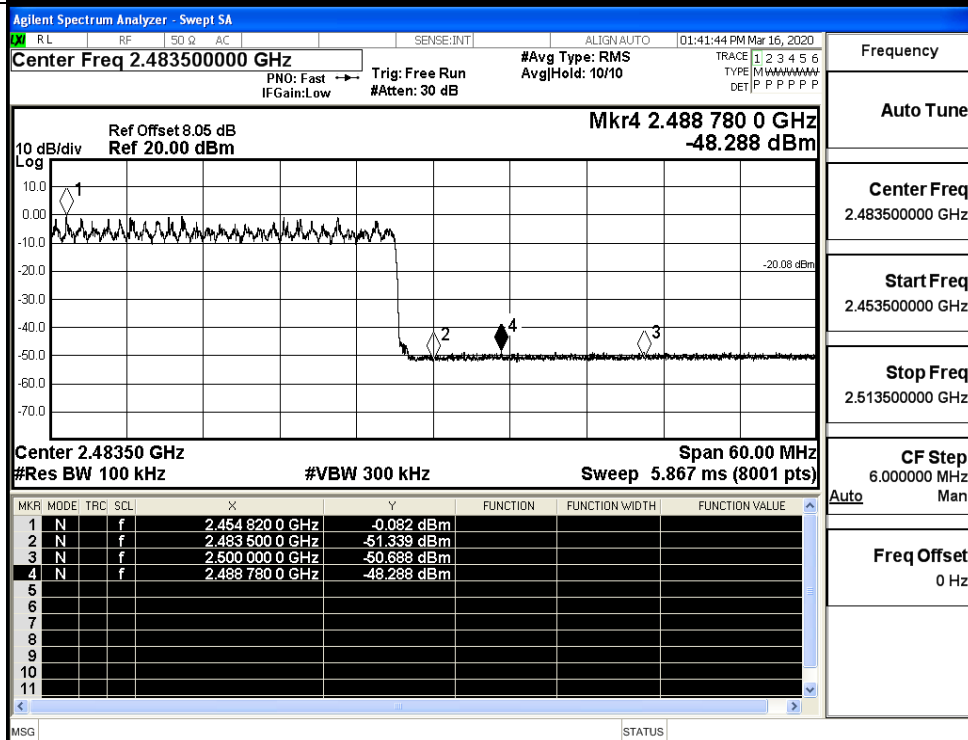


Frequency

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

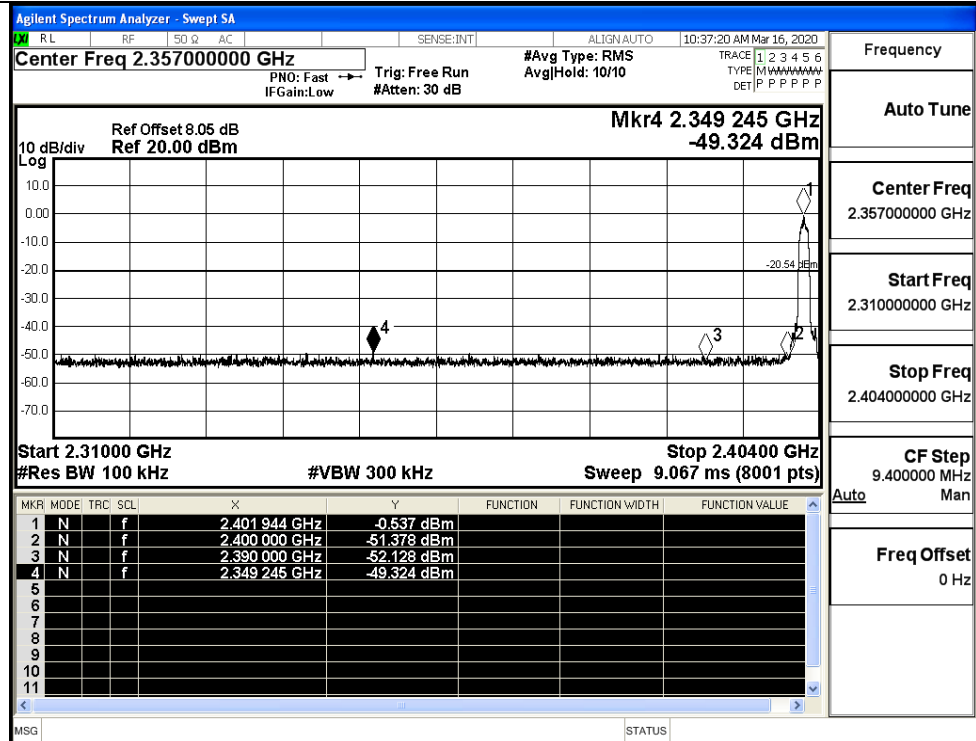


Frequency

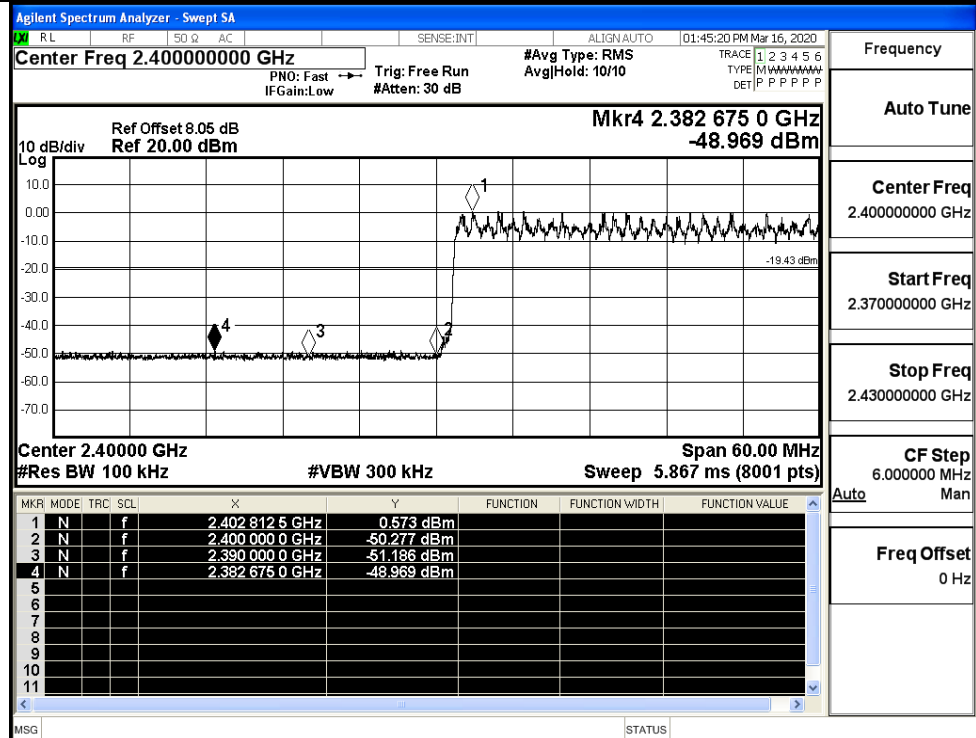
Auto Tune

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

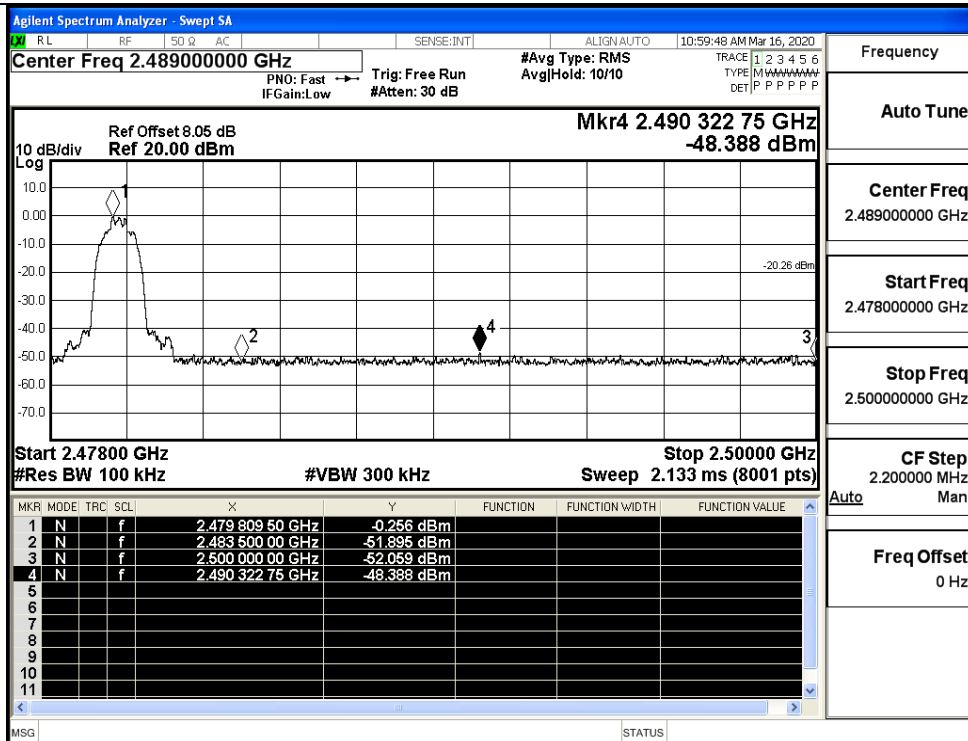
8DPSK/LCH/No Hop



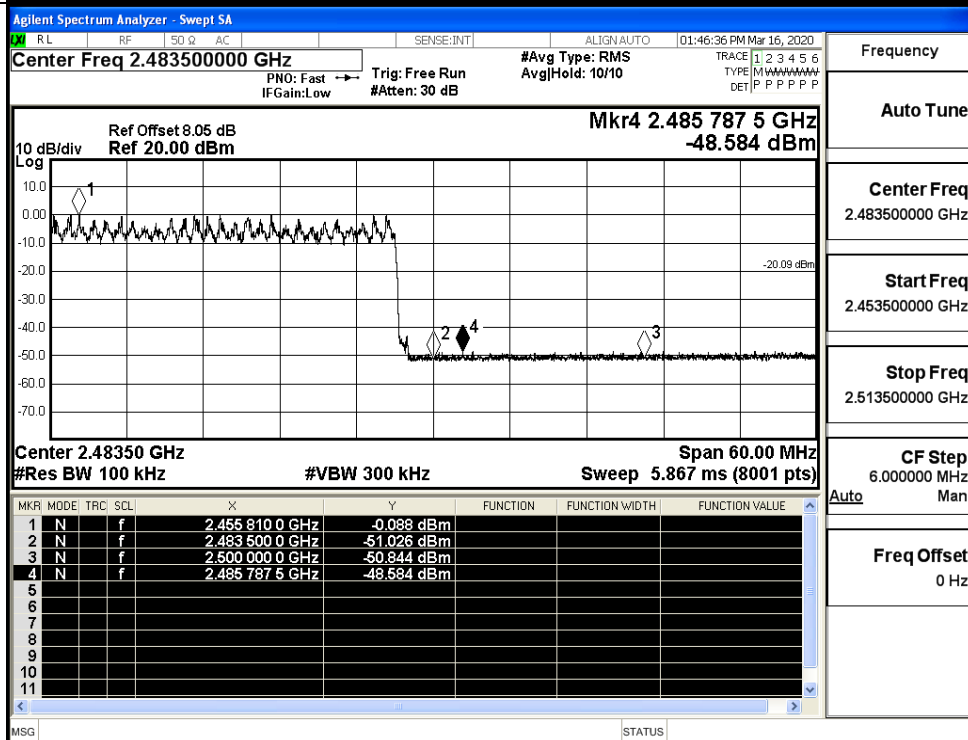
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



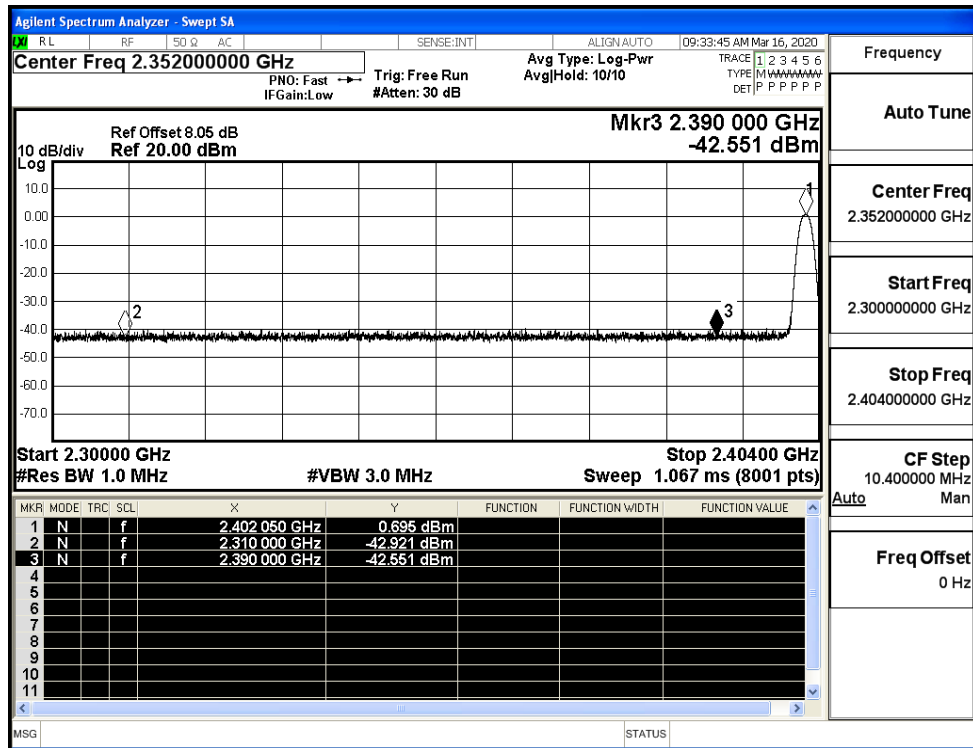
8DPSK/HCH/Hop



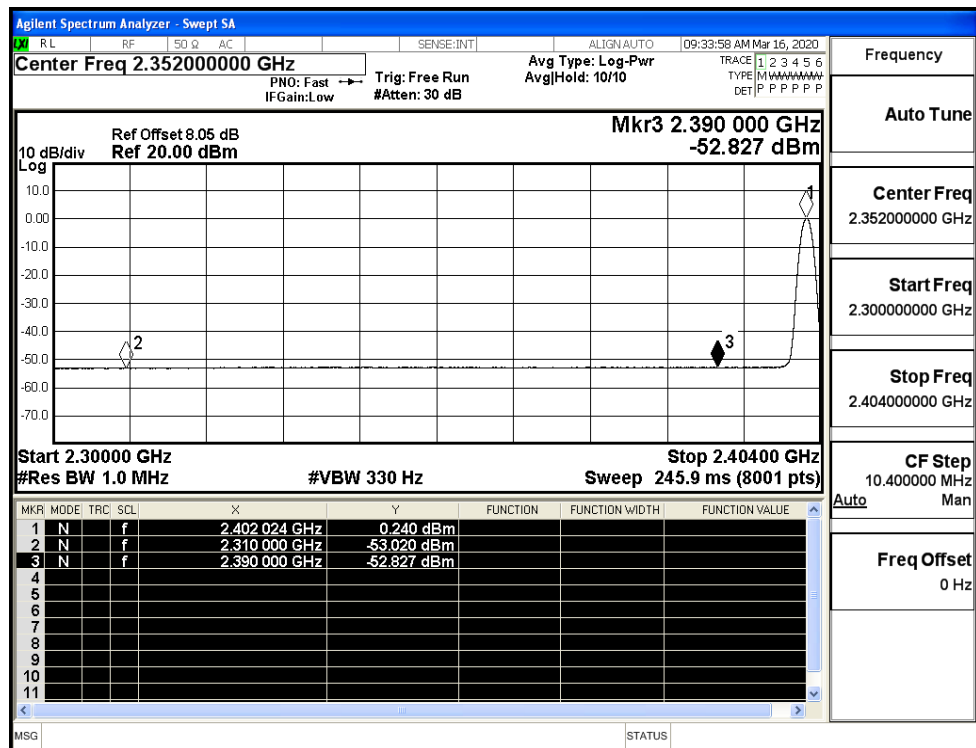
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.92	2.0	0	54.31	PEAK	74	PASS
	Off	2310.0	-53.02	2.0	0	44.21	AV	54	PASS
	Off	2390.0	-42.55	2.0	0	54.68	PEAK	74	PASS
	Off	2390.0	-52.83	2.0	0	44.4	AV	54	PASS
	Off	2483.5	-43.10	2.0	0	54.13	PEAK	74	PASS
	Off	2483.5	-52.36	2.0	0	44.87	AV	54	PASS
	Off	2500.0	-42.54	2.0	0	54.69	PEAK	74	PASS
	Off	2500.0	-52.25	2.0	0	44.98	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-40.62	2.0	0	56.61	PEAK	74	PASS
	Off	2310.0	-53.19	2.0	0	44.04	AV	54	PASS
	Off	2390.0	-40.81	2.0	0	56.42	PEAK	74	PASS
	Off	2390.0	-52.96	2.0	0	44.27	AV	54	PASS
	Off	2483.5	-42.12	2.0	0	55.11	PEAK	74	PASS
	Off	2483.5	-52.37	2.0	0	44.86	AV	54	PASS
	Off	2500.0	-42.72	2.0	0	54.51	PEAK	74	PASS
	Off	2500.0	-52.31	2.0	0	44.92	AV	54	PASS
8DPSK	Off	2310.0	-43.11	2.0	0	54.12	PEAK	74	PASS
	Off	2310.0	-53.10	2.0	0	44.13	AV	54	PASS
	Off	2390.0	-42.29	2.0	0	54.94	PEAK	74	PASS
	Off	2390.0	-52.92	2.0	0	44.31	AV	54	PASS
	Off	2483.5	-41.78	2.0	0	55.45	PEAK	74	PASS
	Off	2483.5	-52.25	2.0	0	44.98	AV	54	PASS
	Off	2500.0	-41.94	2.0	0	55.29	PEAK	74	PASS
	Off	2500.0	-52.28	2.0	0	44.95	AV	54	PASS

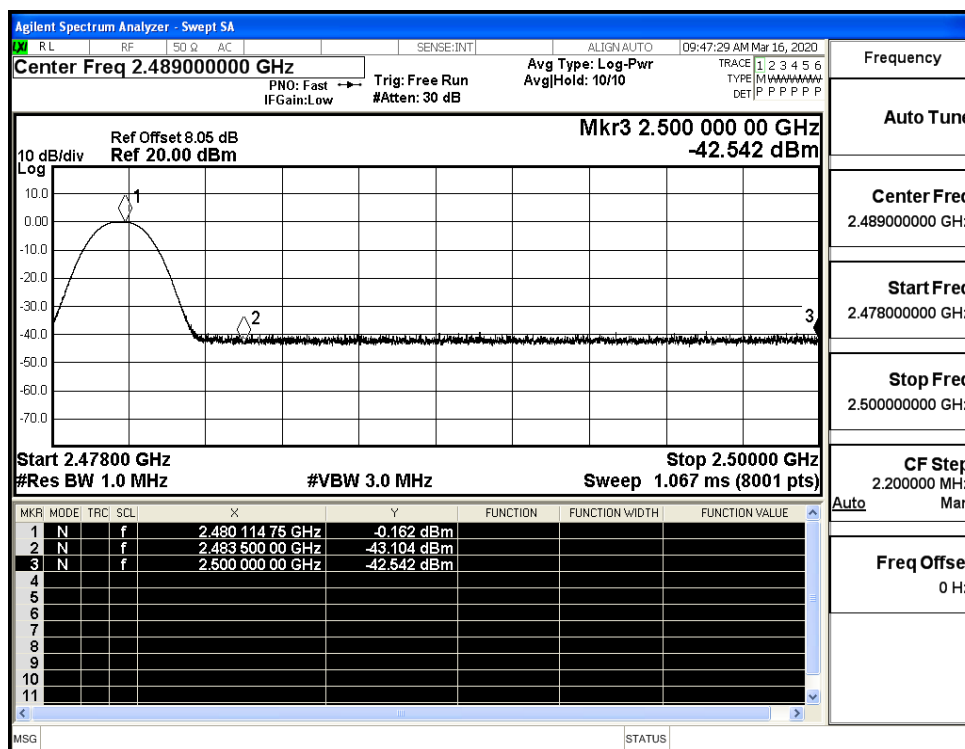
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



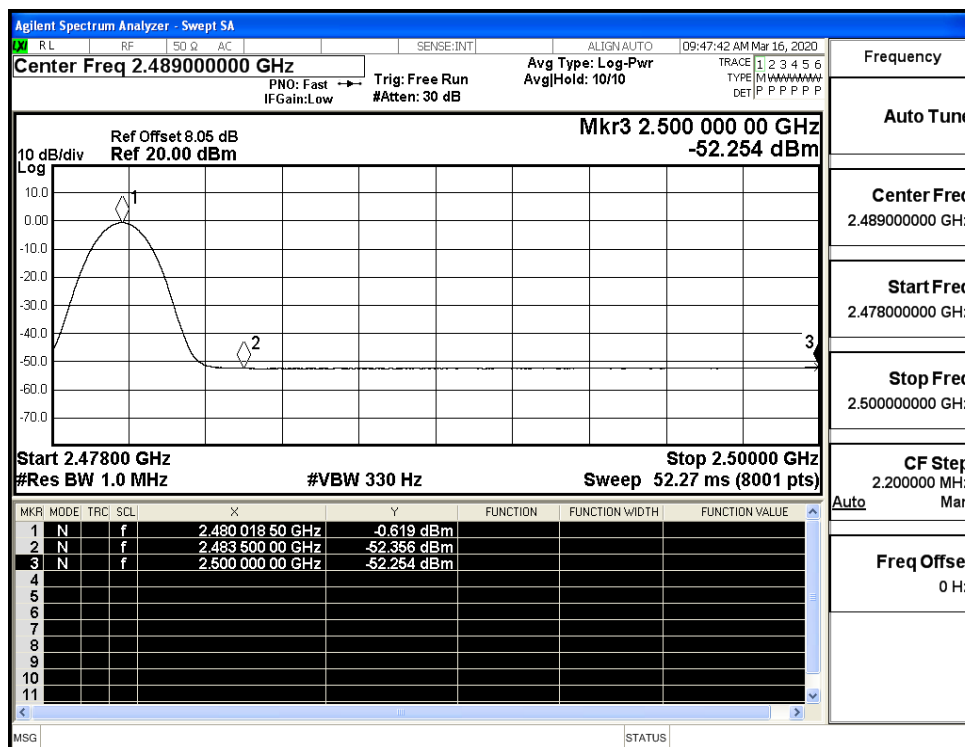
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

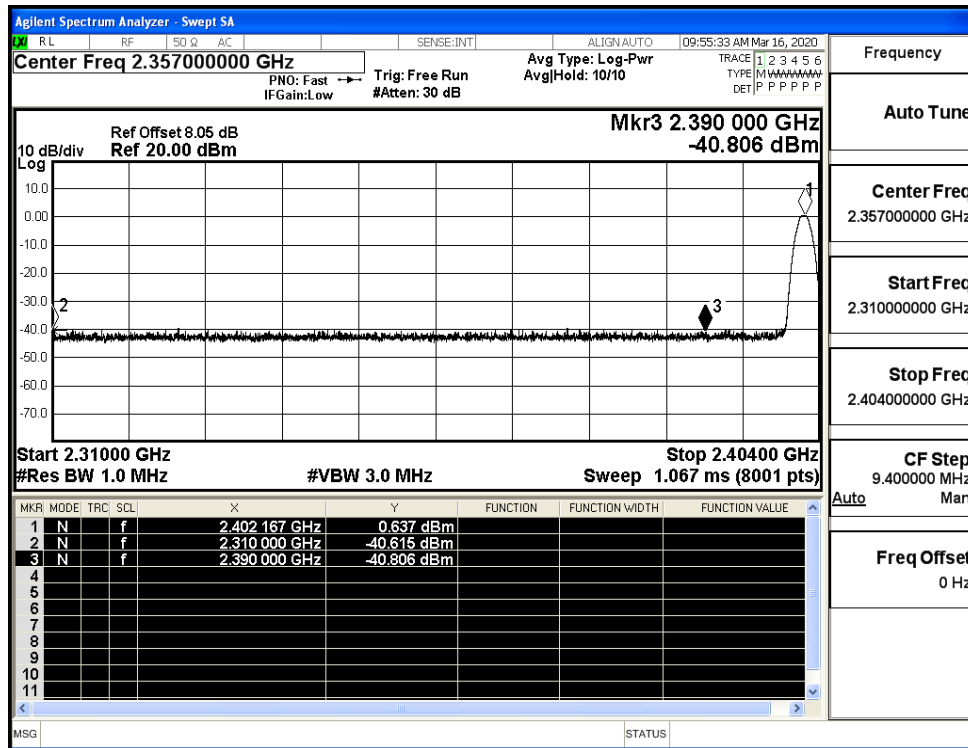
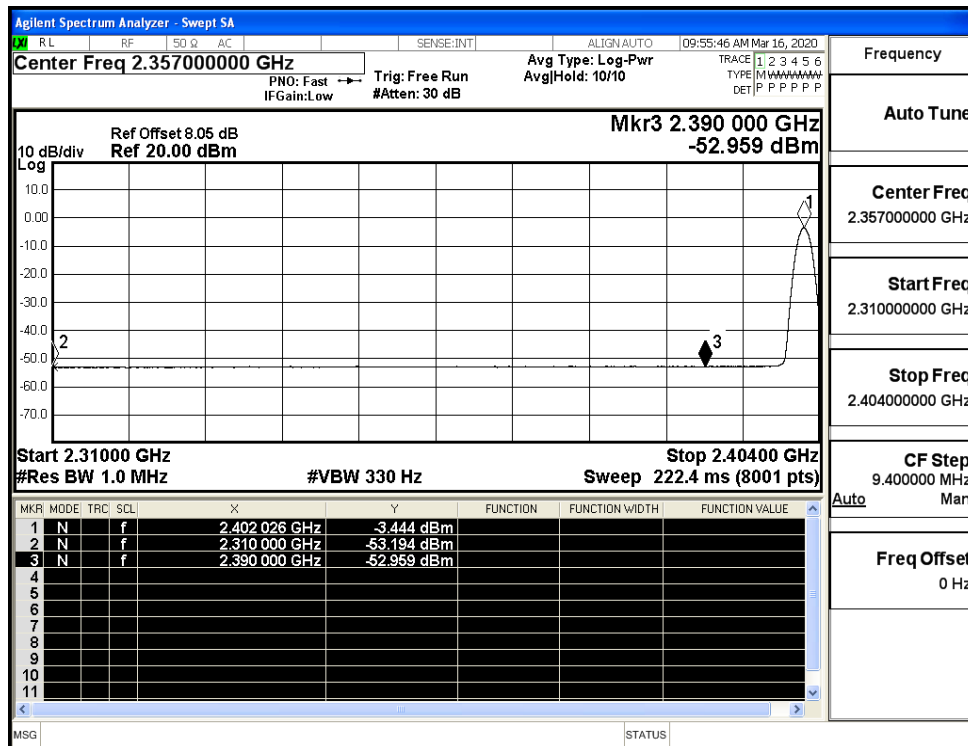


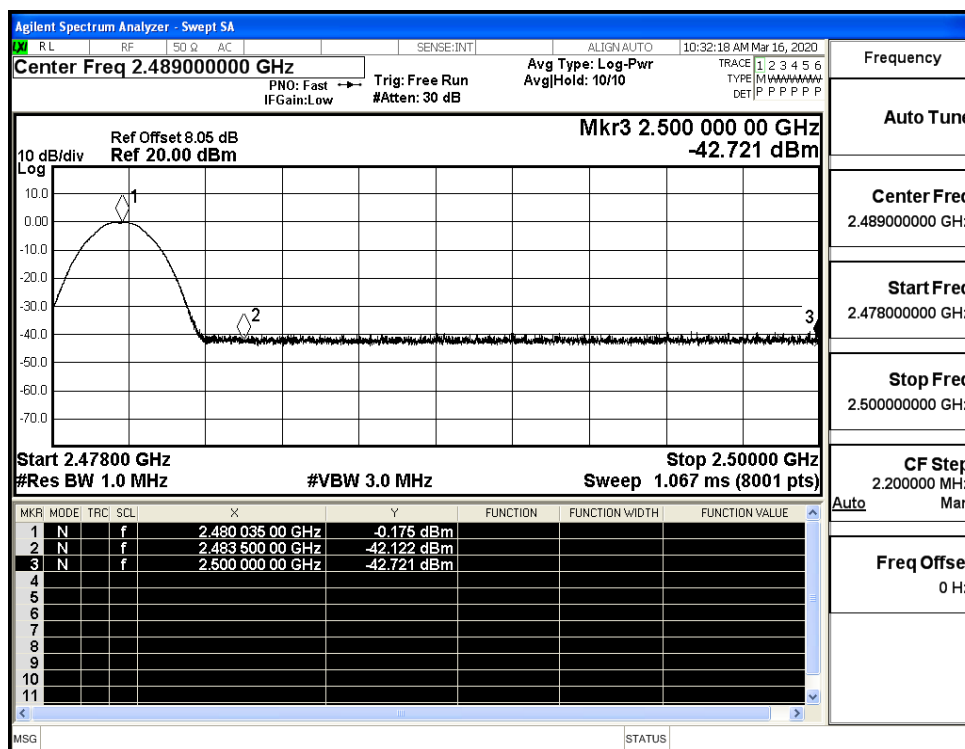
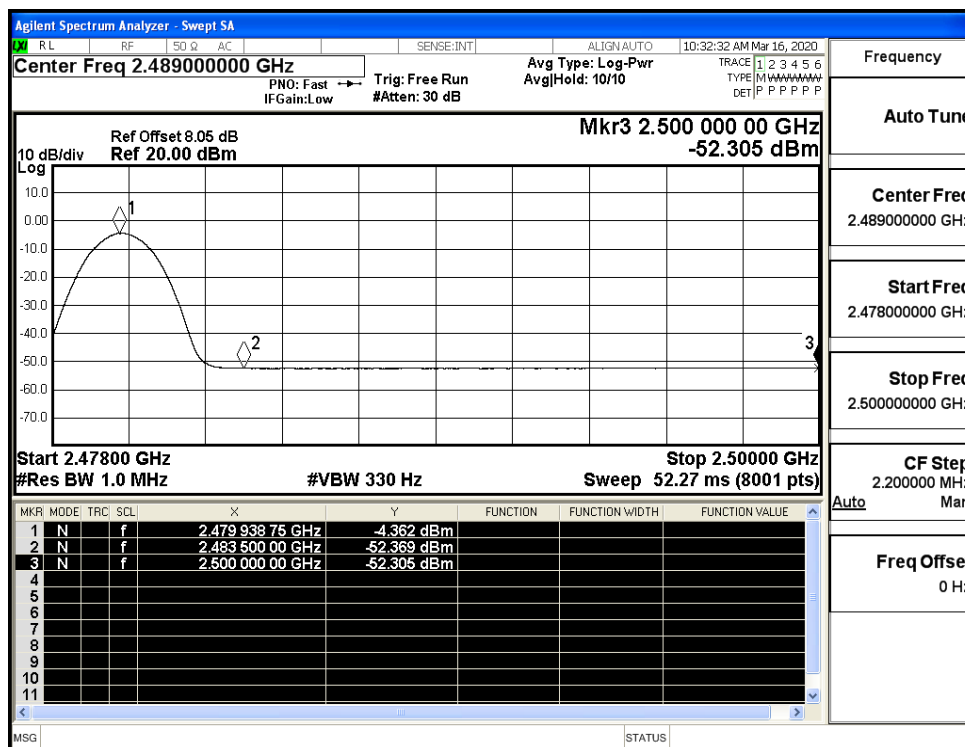
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



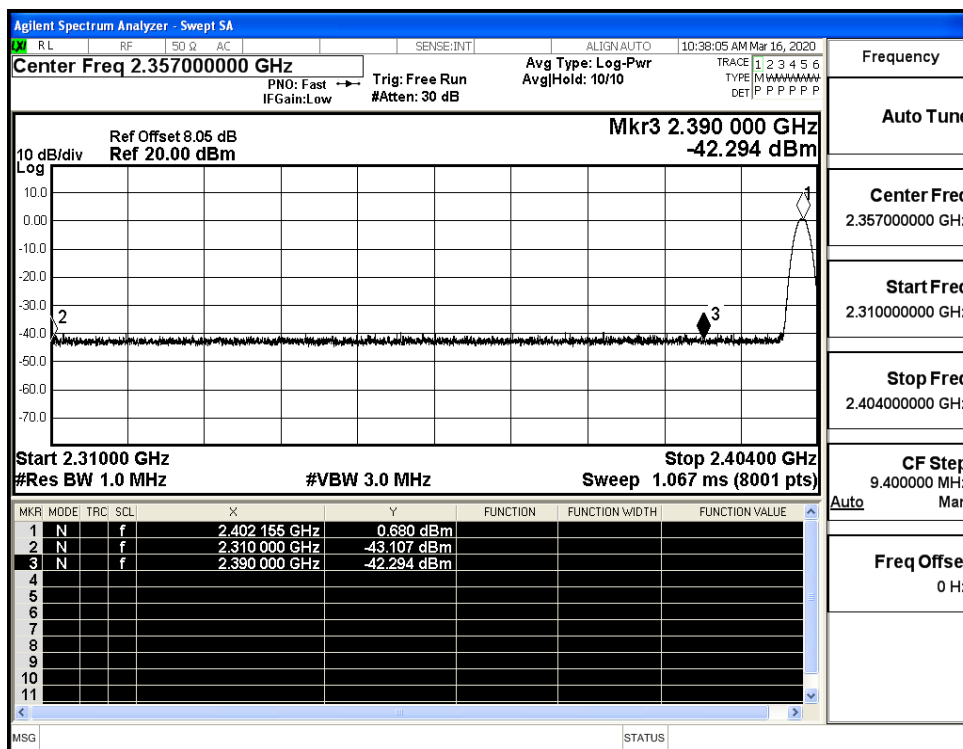
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



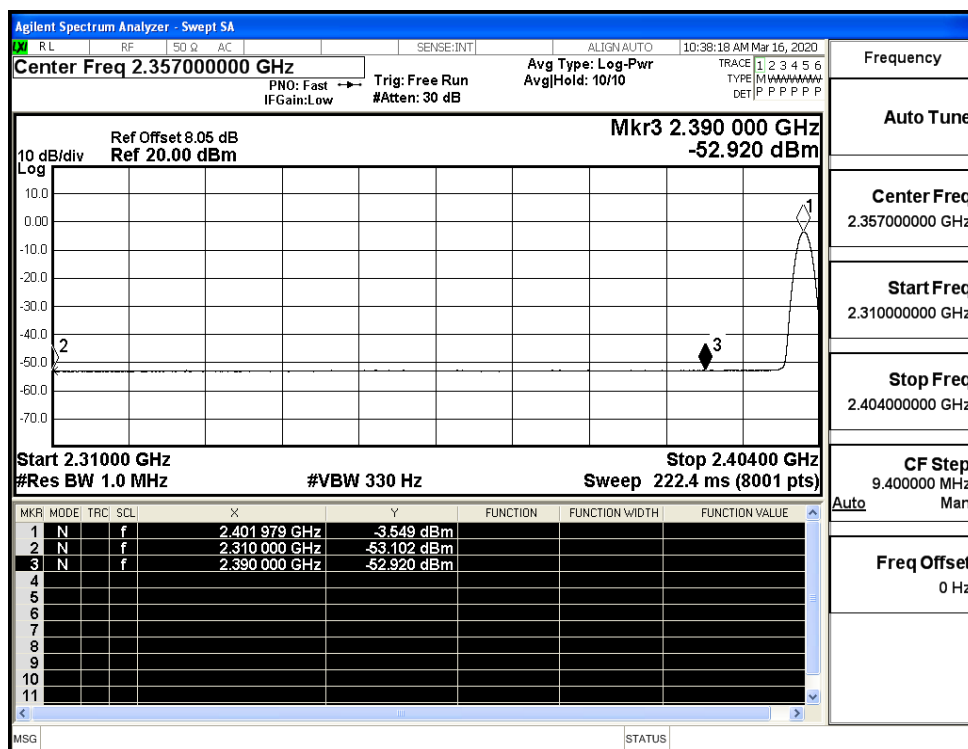
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

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

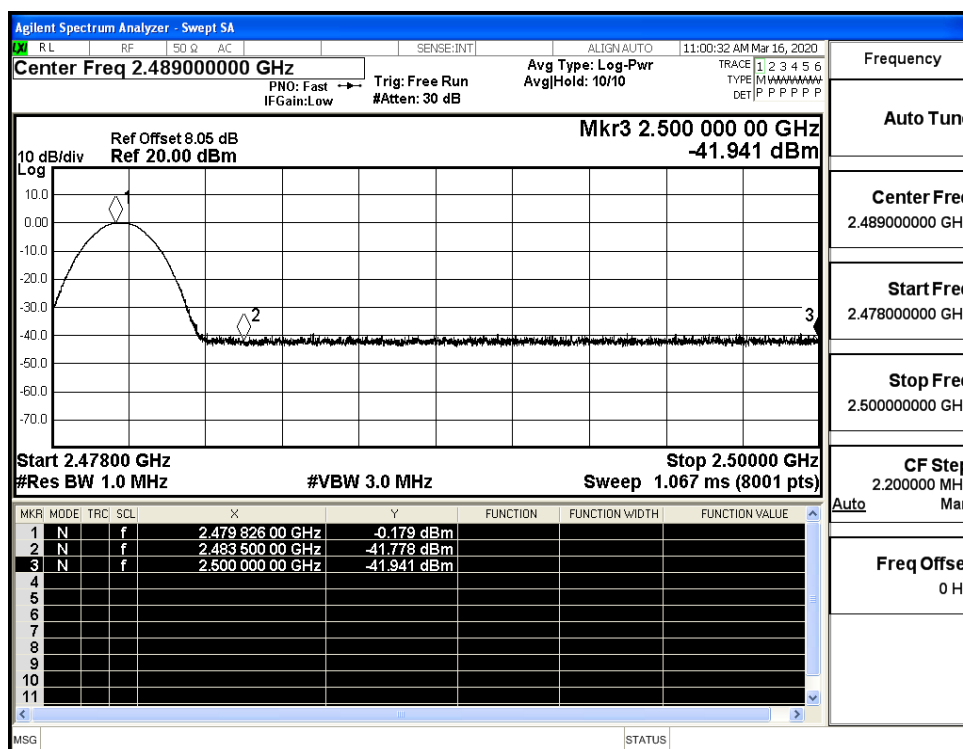
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

