

Appendix A

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

Product Name: Bluetooth Speaker

Trade Mark: Origaudio

Test Model: Wristler

Environmental Conditions

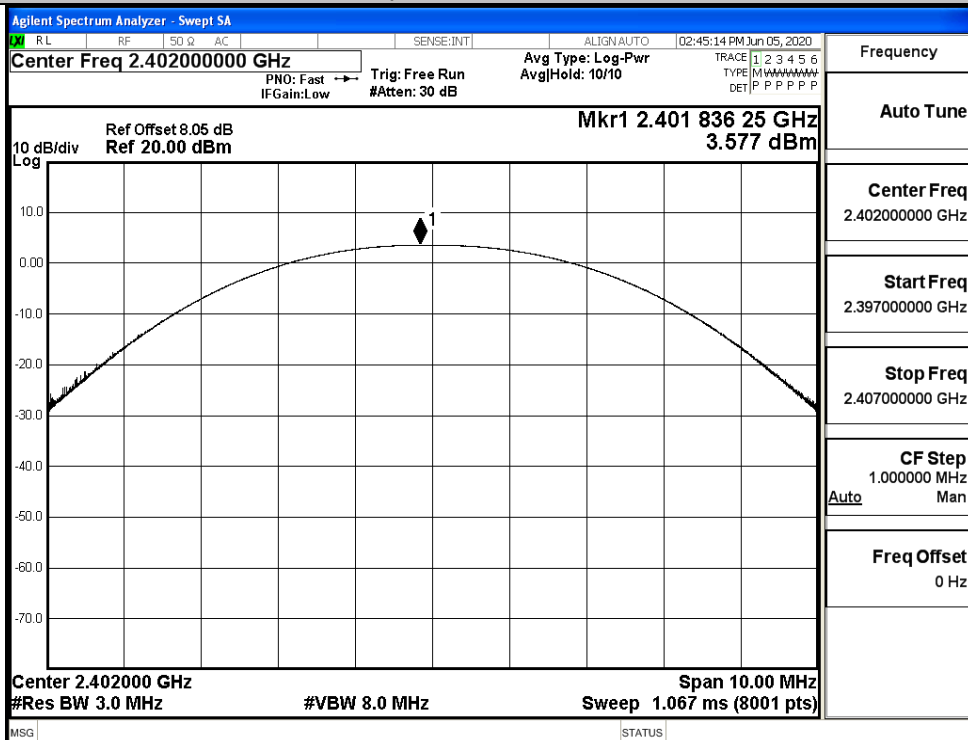
Temperature:	23.5 ° C
Relative Humidity:	53.5%
ATM Pressure:	100.0 kPa
Test Engineer:	Scout Wu
Supervised by:	Li Huan

A.1 Maximum Conducted Peak Output Power

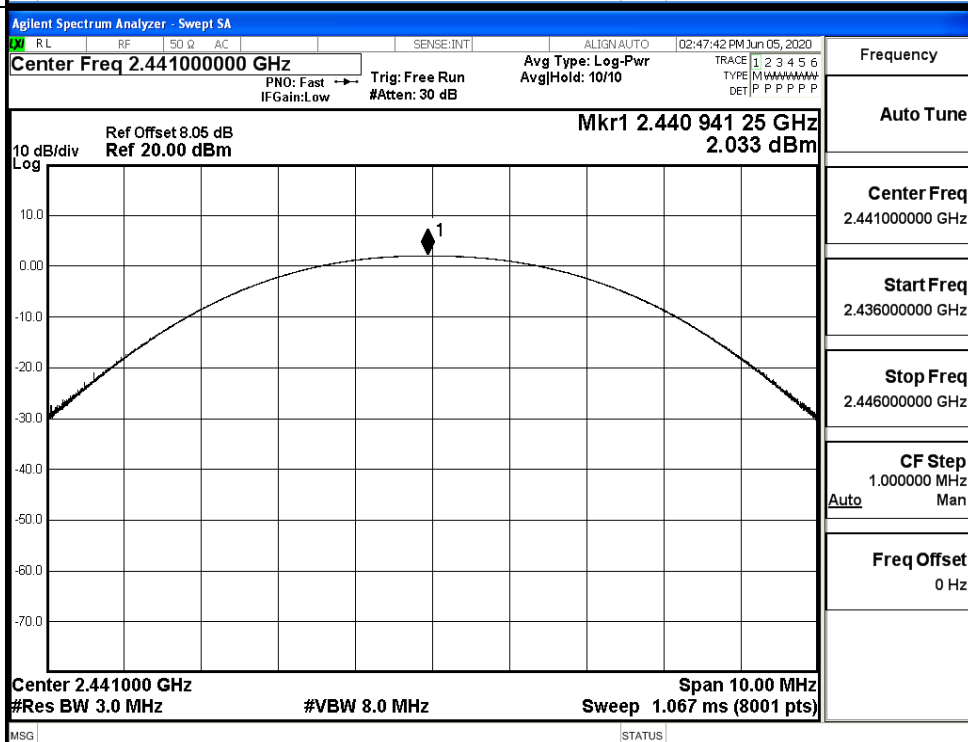
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.577	30	PASS
	MCH	2.033	30	PASS
	HCH	0.420	30	PASS
$\pi/4$ DQPSK	LCH	3.066	30	PASS
	MCH	1.445	30	PASS
	HCH	-0.222	30	PASS
8DPSK	LCH	3.665	30	PASS
	MCH	2.096	30	PASS
	HCH	0.412	30	PASS

Test Graphs

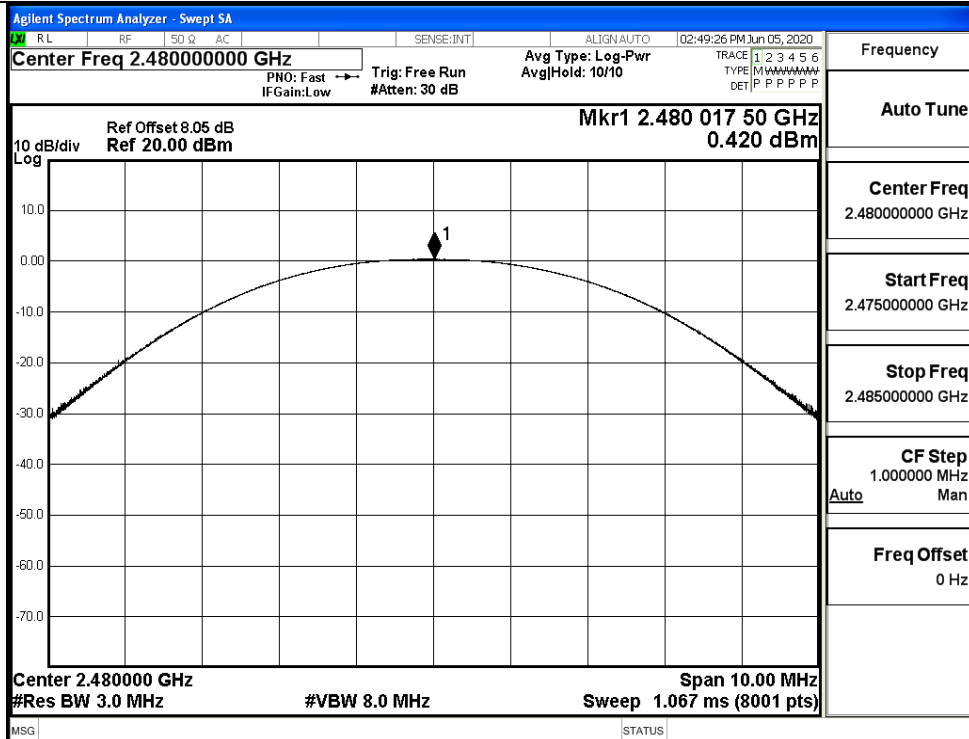
GFSK/LCH



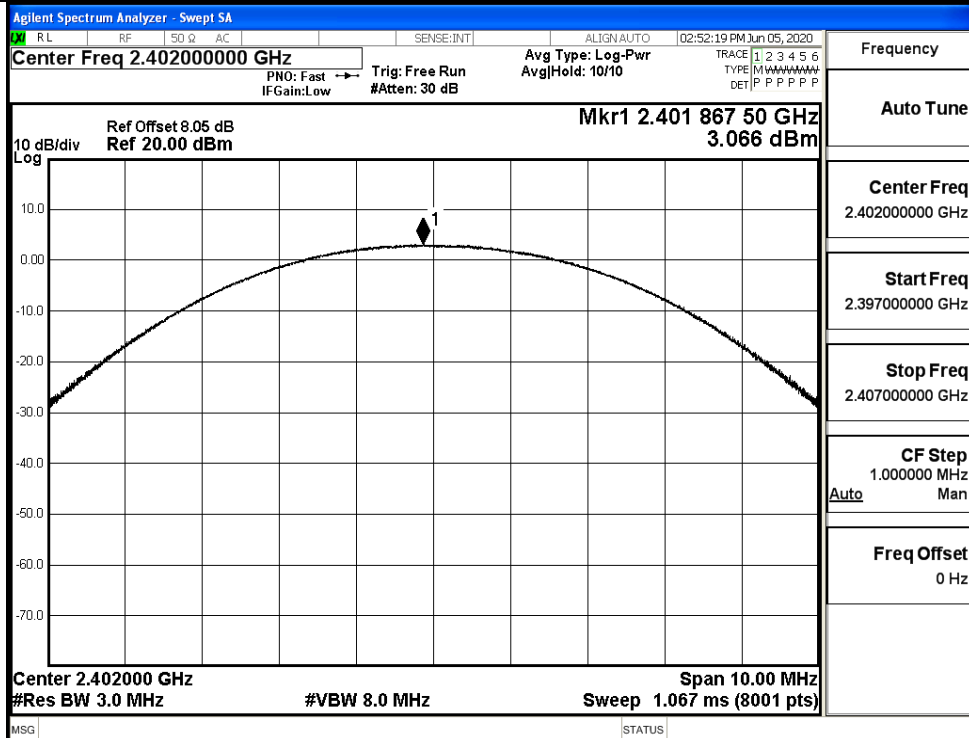
GFSK/MCH

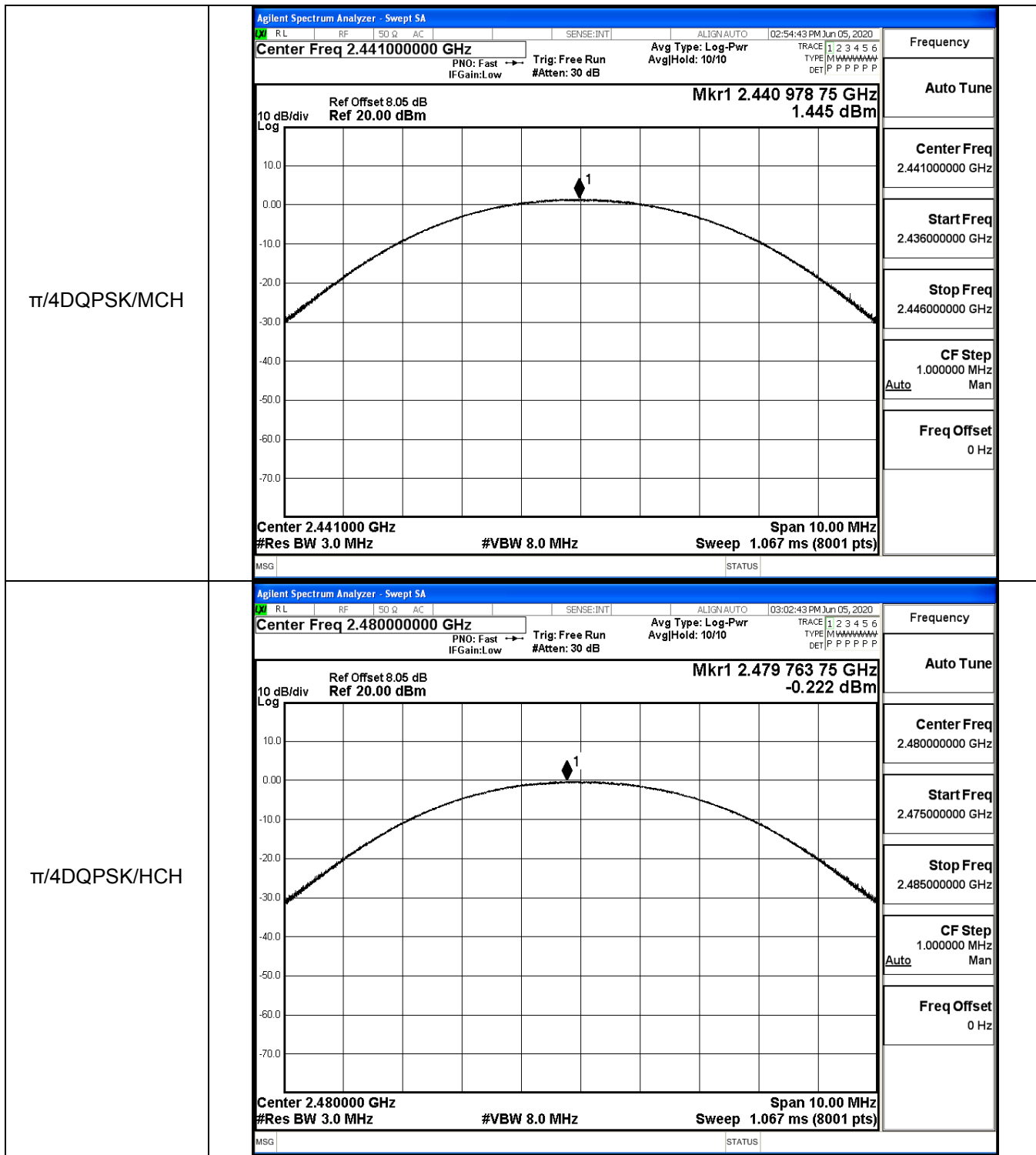


GFSK/HCH

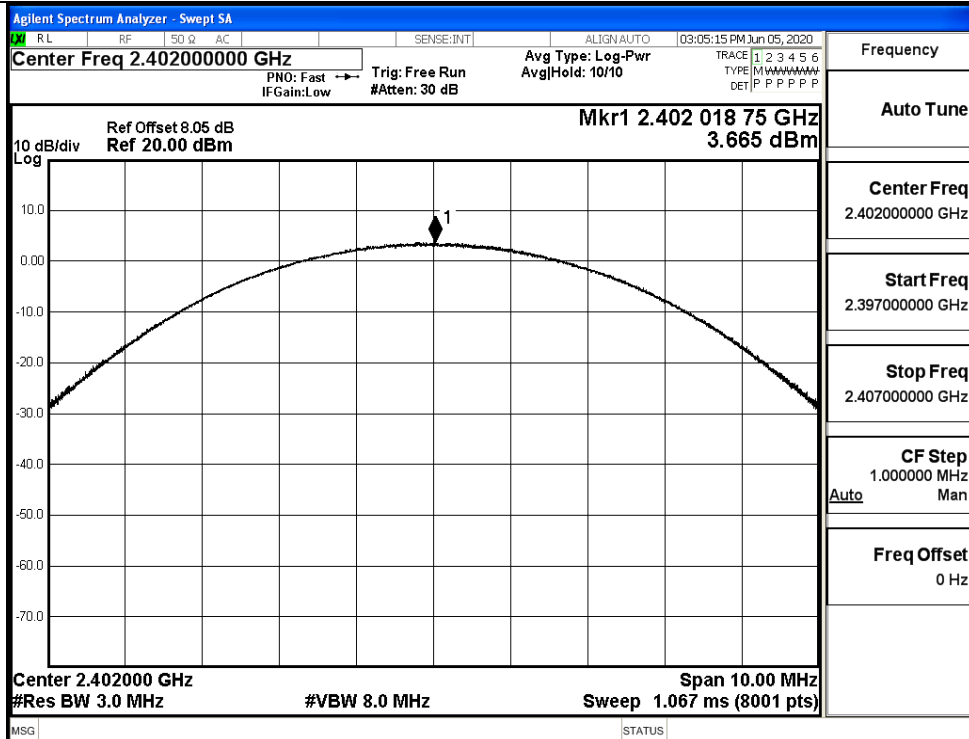


$\pi/4$ DQPSK/LCH

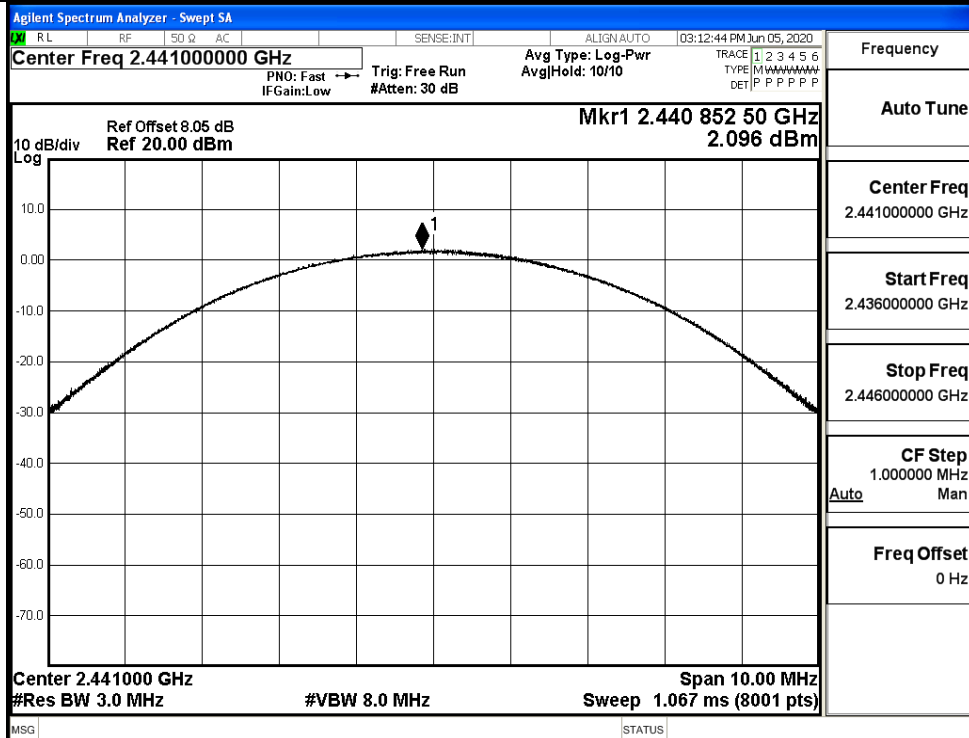




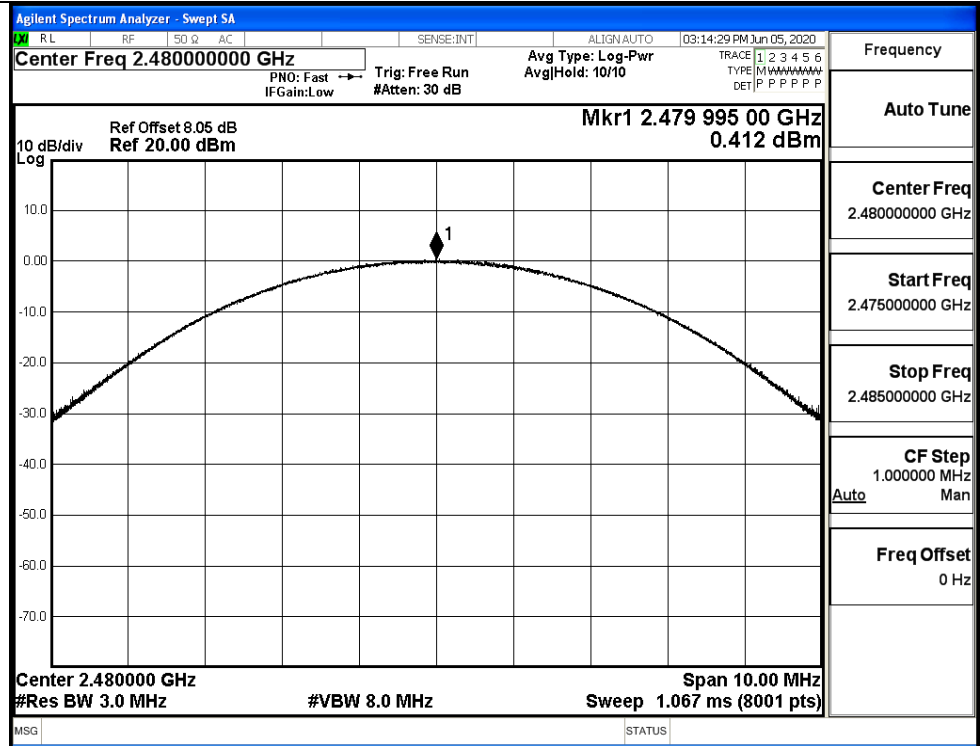
8DPSK/LCH



8DPSK/MCH



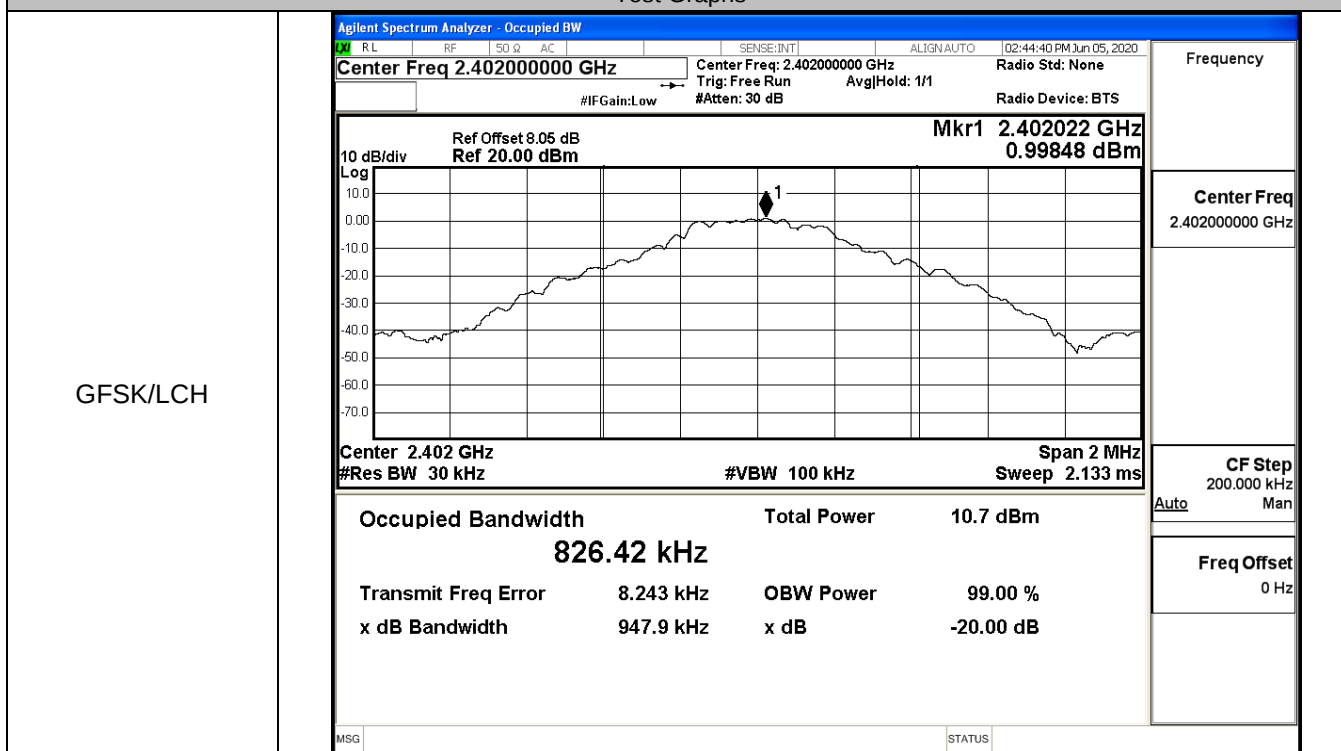
8DPSK/HCH



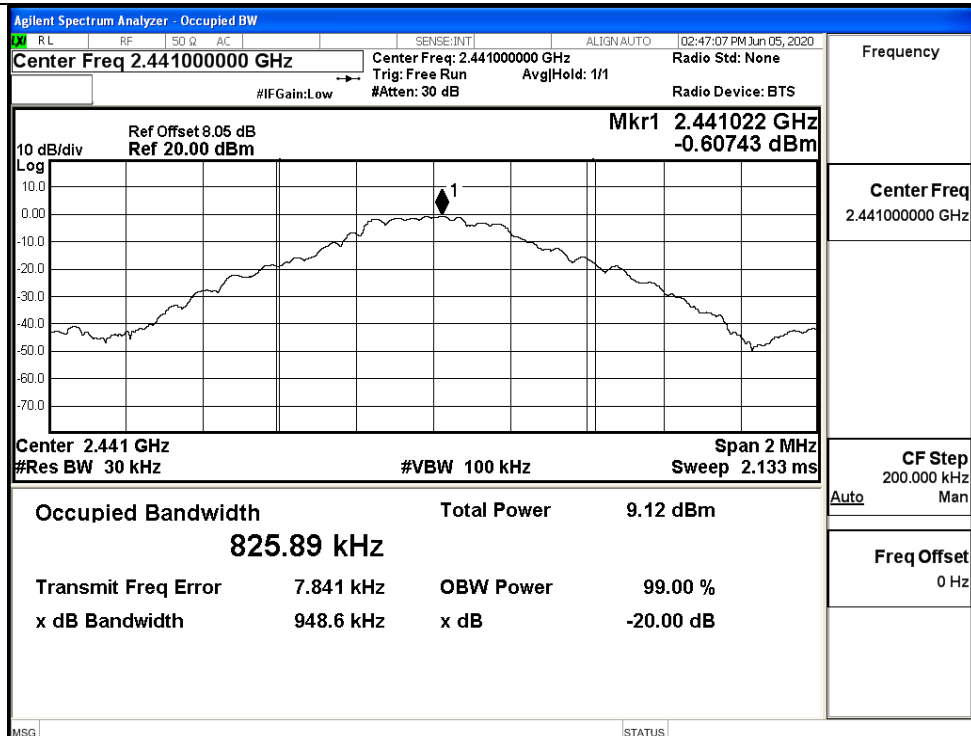
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9479	Not Specified	PASS
	MCH	0.9486	Not Specified	PASS
	HCH	0.9489	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.323	Not Specified	PASS
	MCH	1.323	Not Specified	PASS
	HCH	1.323	Not Specified	PASS
8DPSK	LCH	1.298	Not Specified	PASS
	MCH	1.299	Not Specified	PASS
	HCH	1.304	Not Specified	PASS

Test Graphs



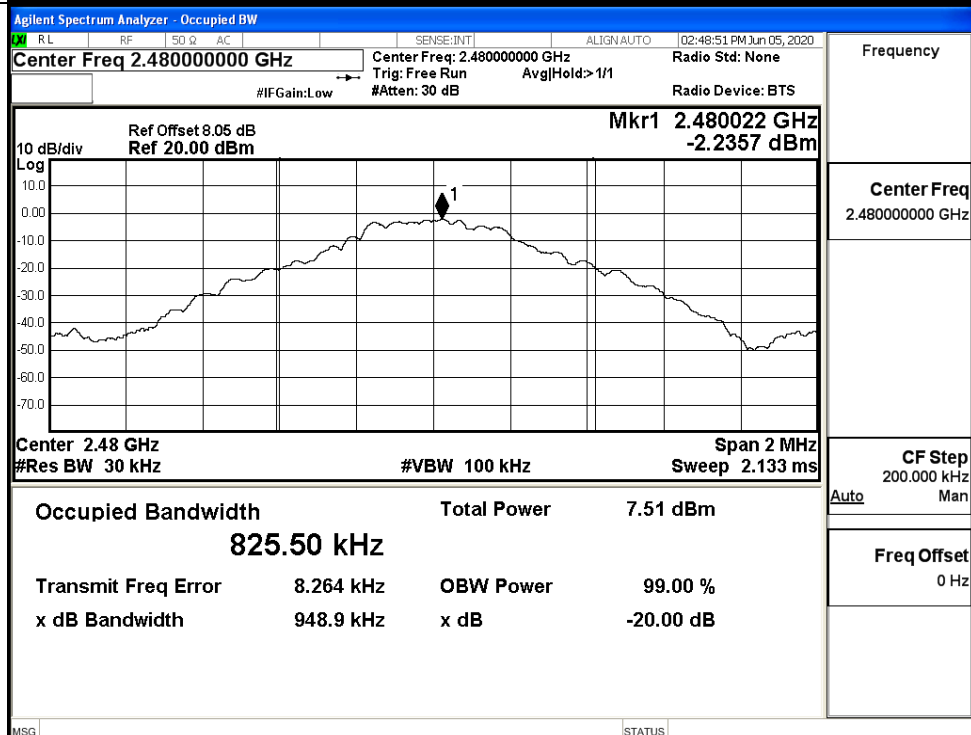
GFSK/MCH



Frequency

Center Freq
2.441000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

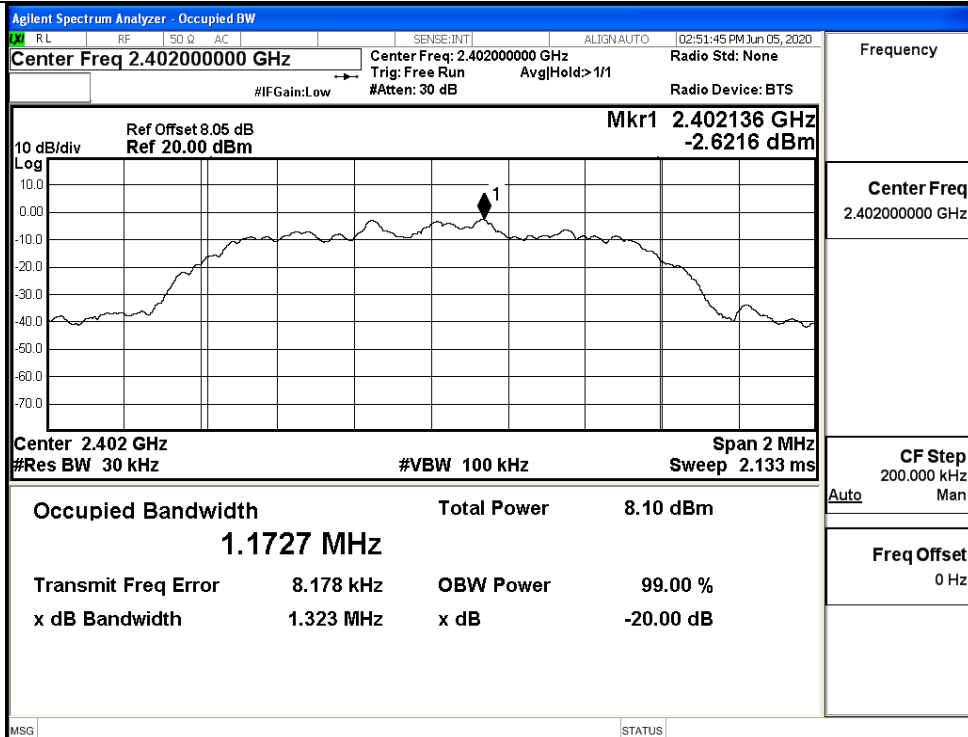
GFSK/HCH



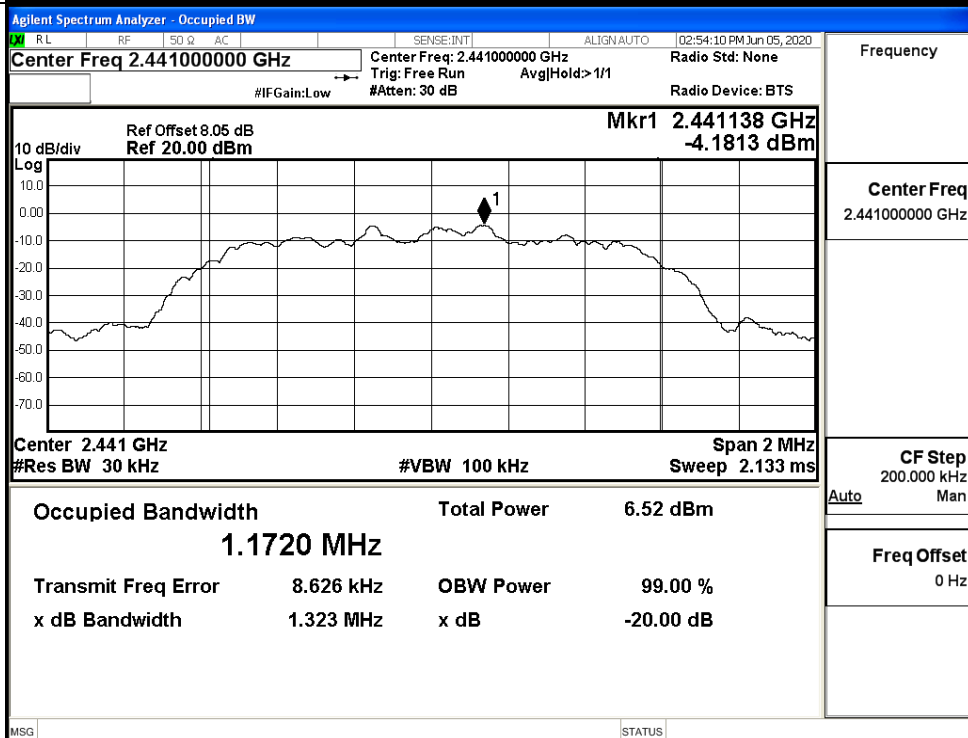
Frequency

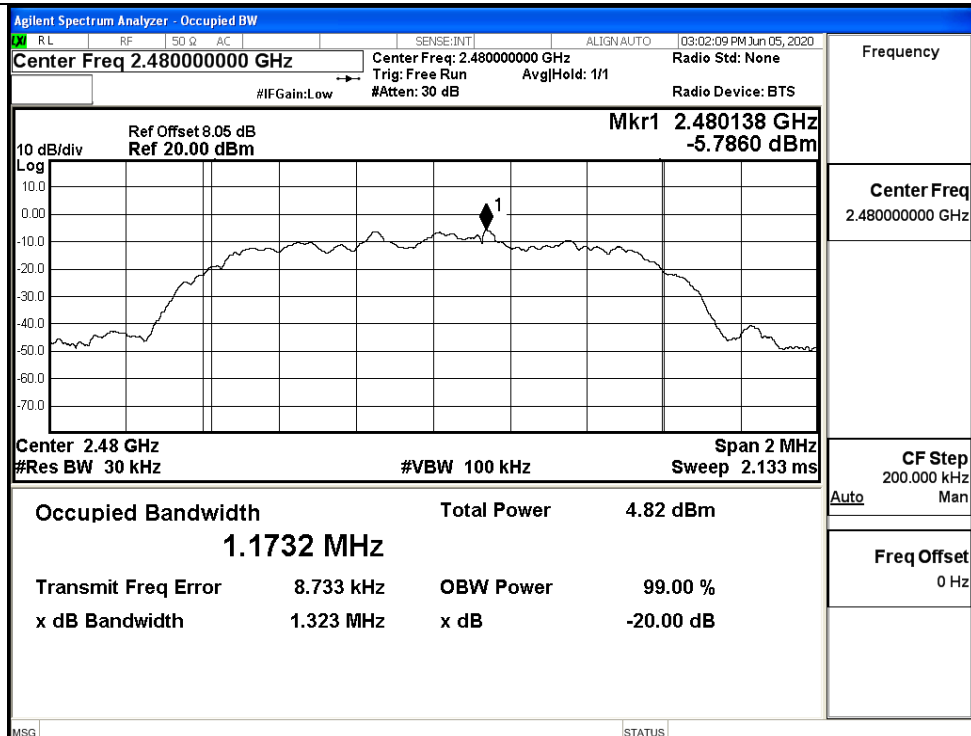
Center Freq
2.480000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

$\pi/4$ DQPSK/LCH

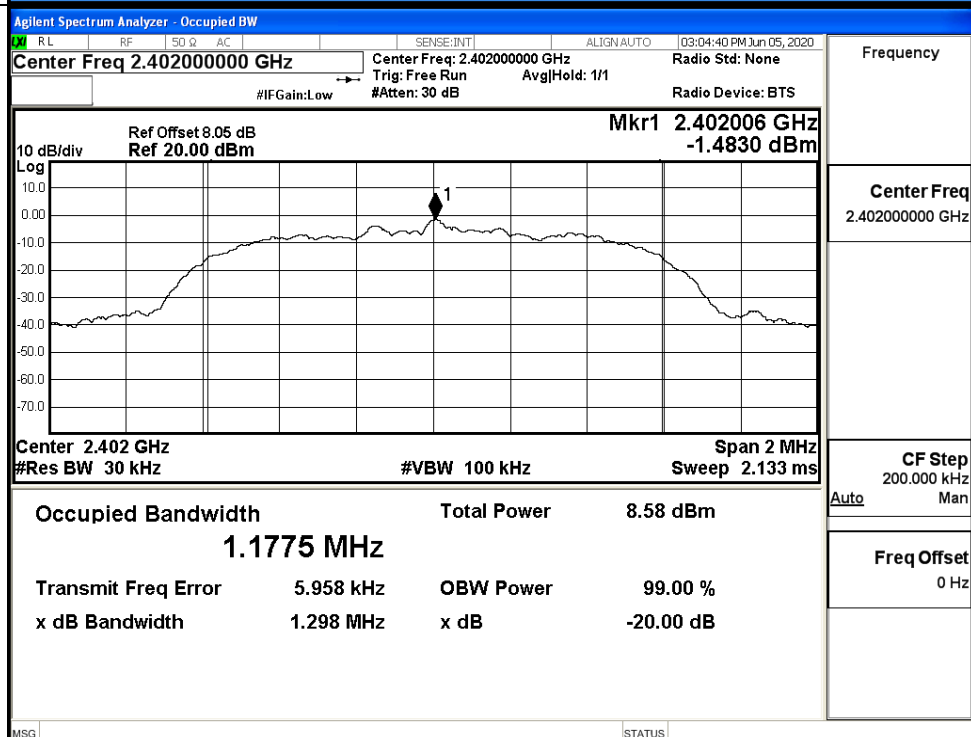


$\pi/4$ DQPSK/MCH

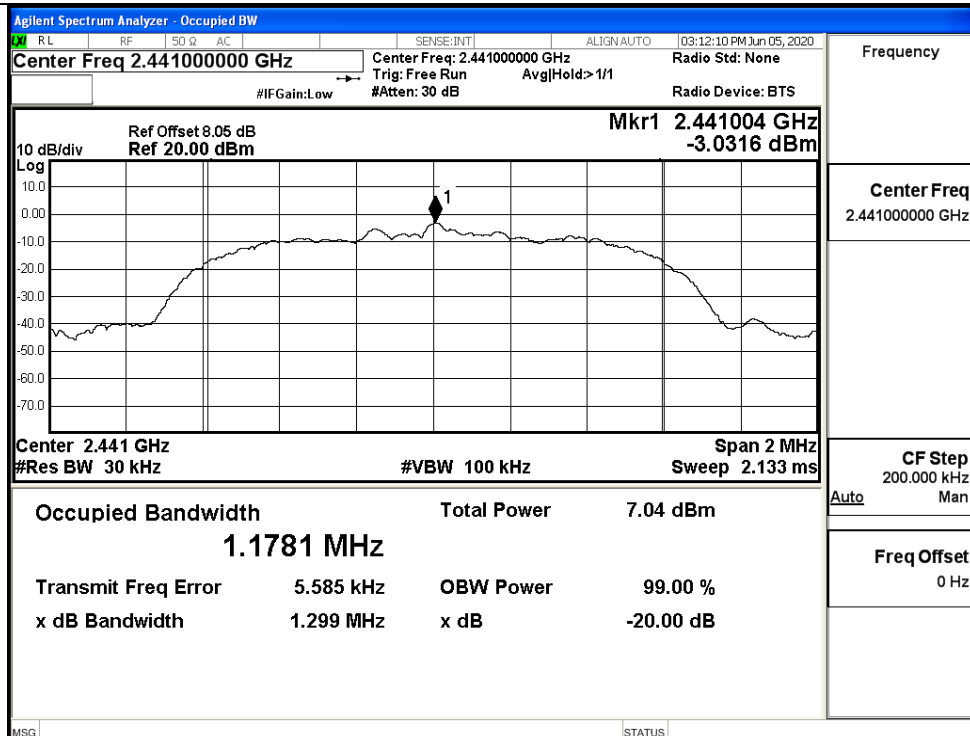


$\pi/4$ DQPSK/HCH

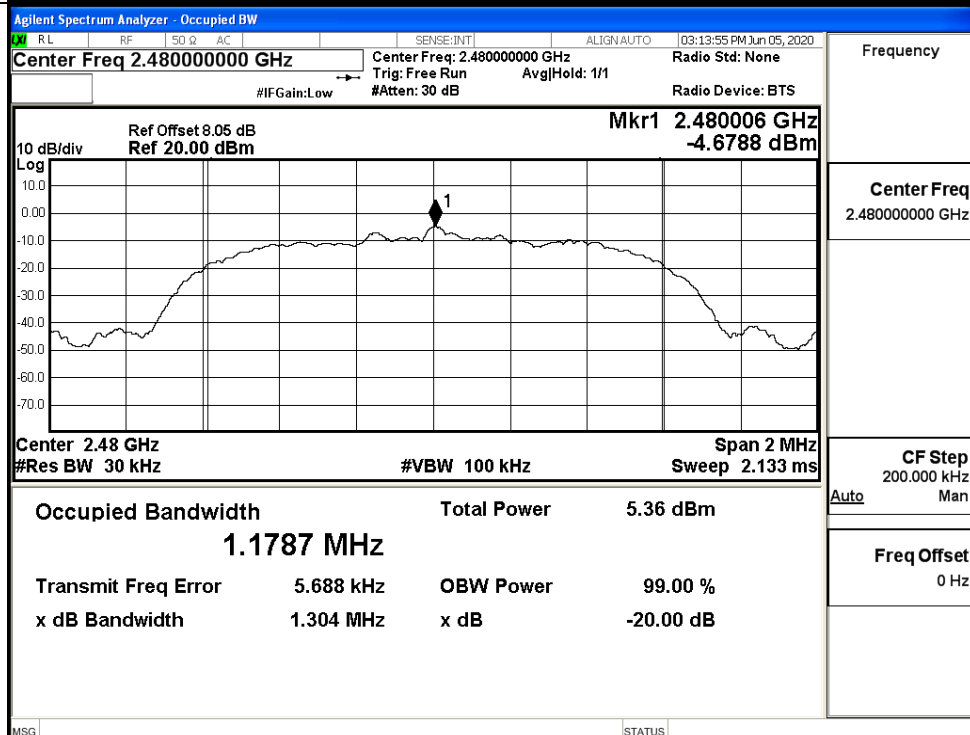
8DPSK/LCH



8DPSK/MCH



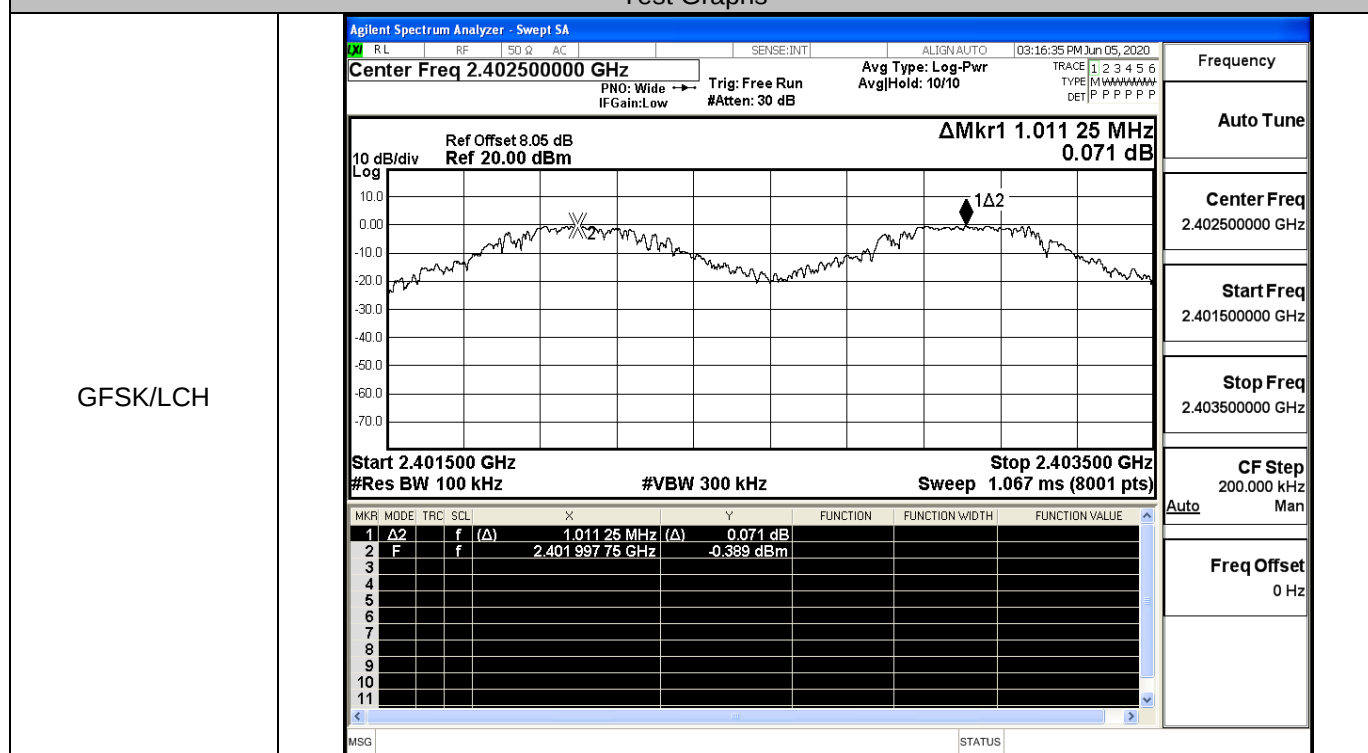
8DPSK/HCH



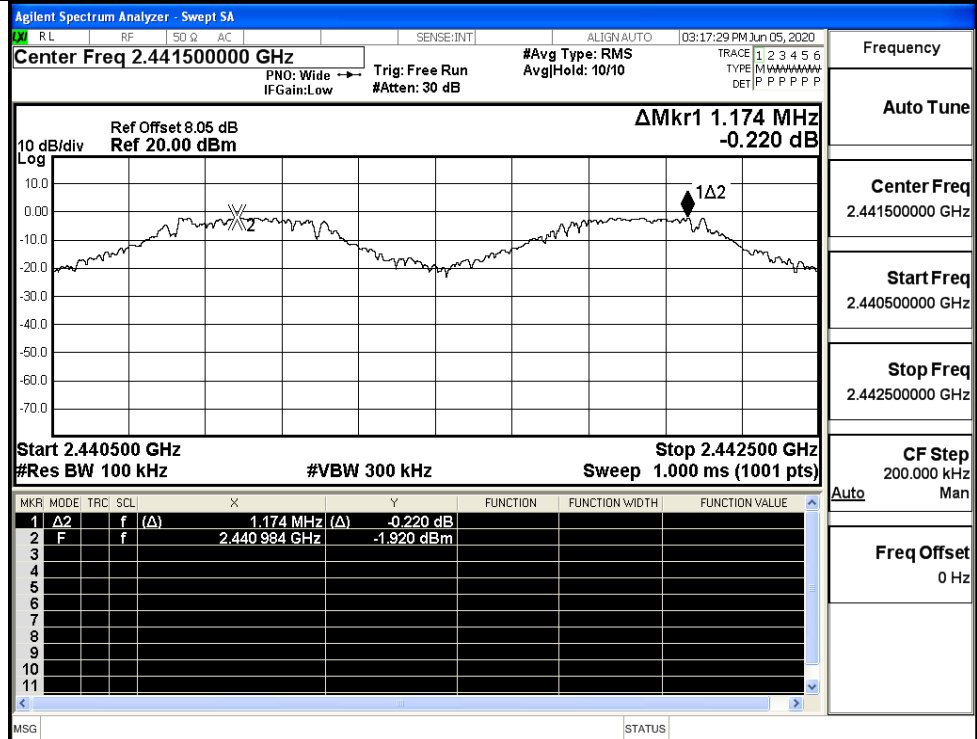
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.011	0.633	PASS
	MCH	1.174	0.633	PASS
	HCH	1.006	0.633	PASS
$\pi/4$ DQPSK	LCH	1.034	0.882	PASS
	MCH	1.092	0.882	PASS
	HCH	0.906	0.882	PASS
8DPSK	LCH	1.290	0.869	PASS
	MCH	0.986	0.869	PASS
	HCH	1.160	0.869	PASS

Test Graphs



GFSK/MCH



Frequency

Auto Tune

Center Freq
2.441500000 GHz

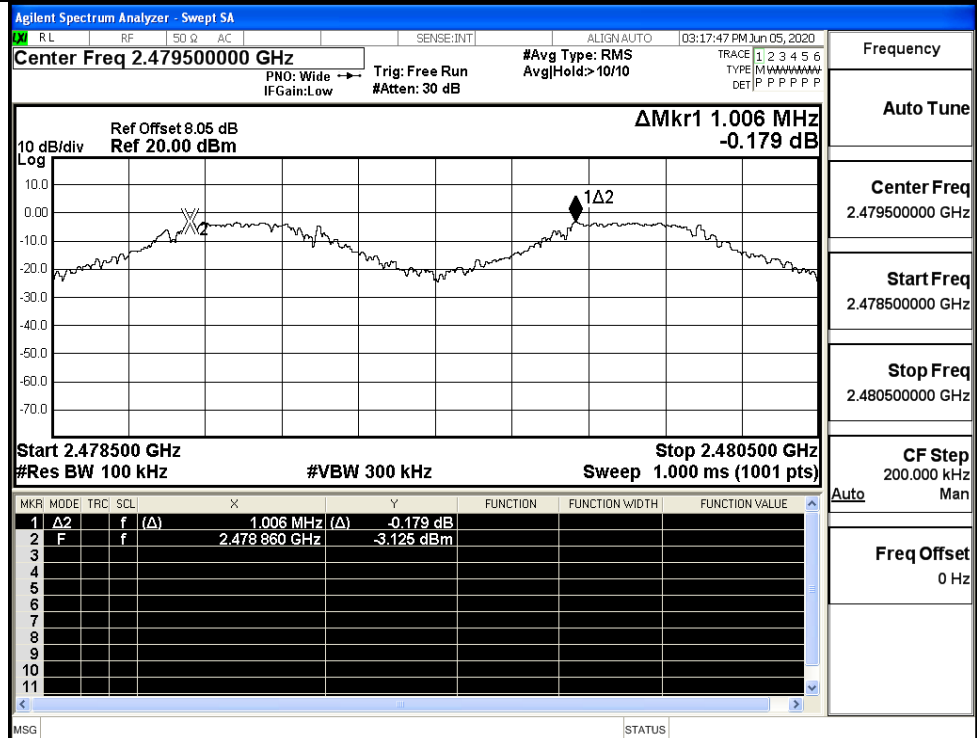
Start Freq
2.440500000 GHz

Stop Freq
2.442500000 GHz

CF Step
200.000 kHz
Man

Freq Offset
0 Hz

GFSK/HCH



Frequency

Auto Tune

Center Freq
2.479500000 GHz

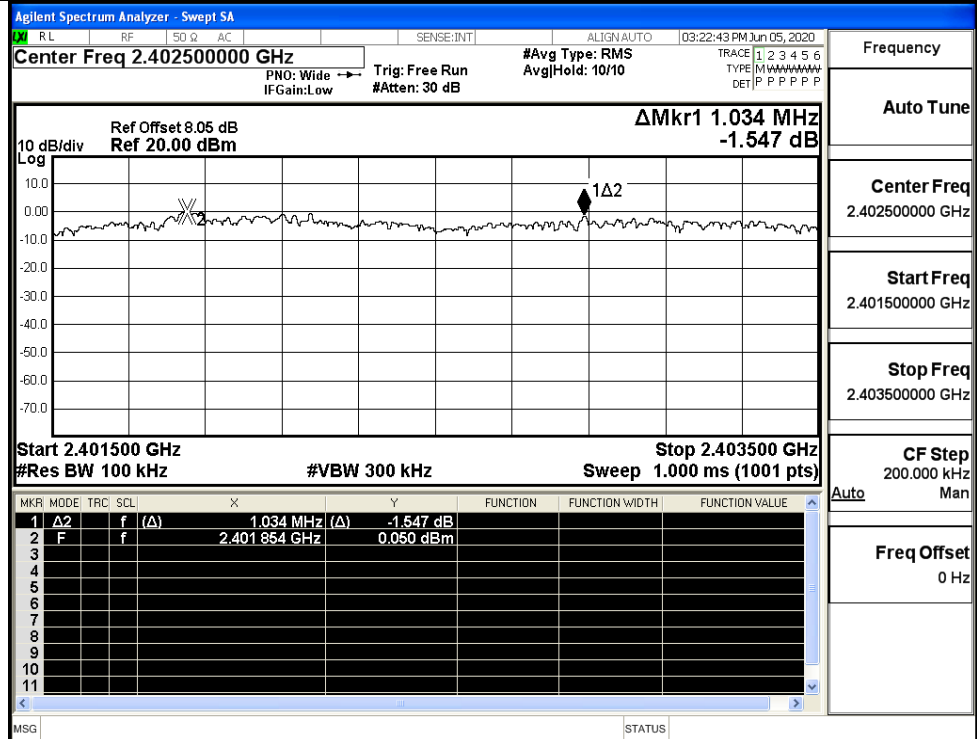
Start Freq
2.478500000 GHz

Stop Freq
2.480500000 GHz

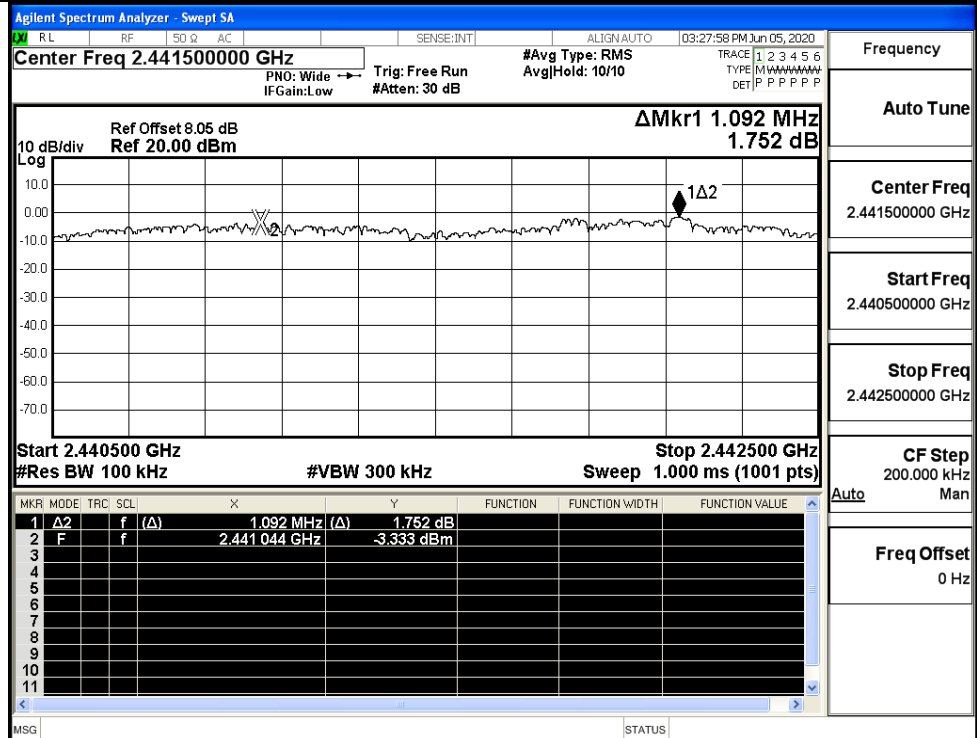
CF Step
200.000 kHz
Man

Freq Offset
0 Hz

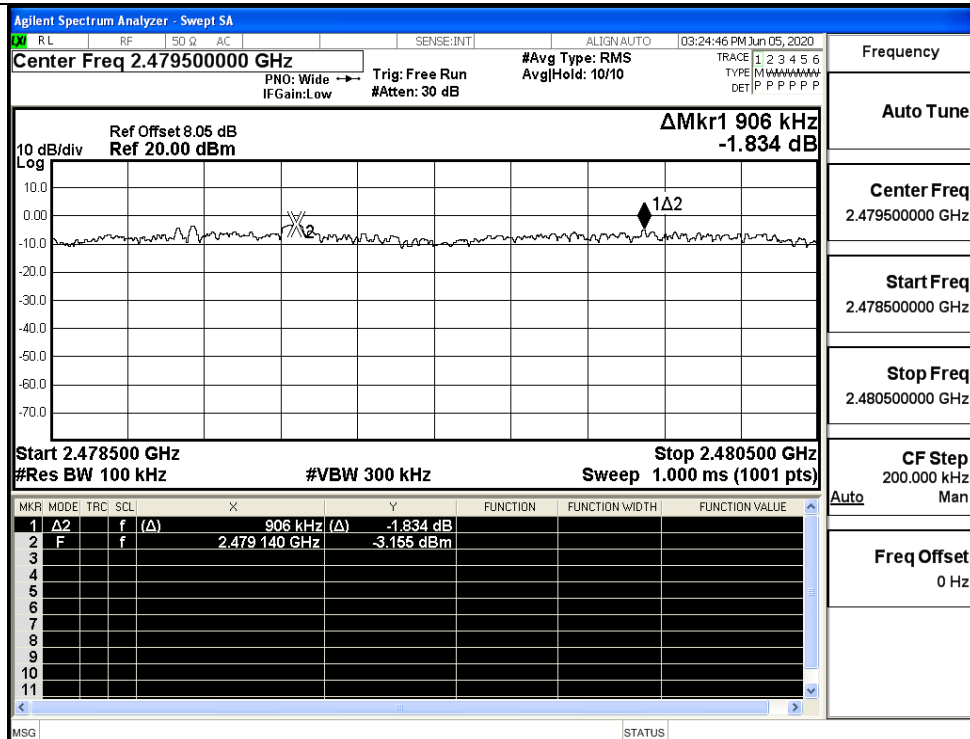
$\pi/4$ DQPSK/LCH



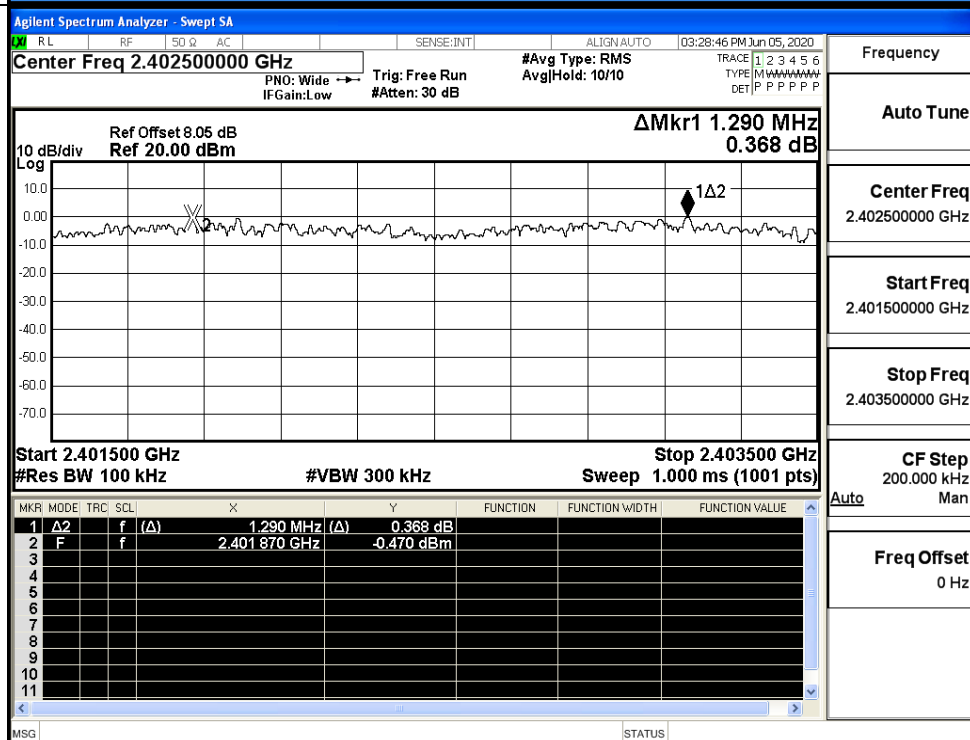
$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH



8DPSK/LCH



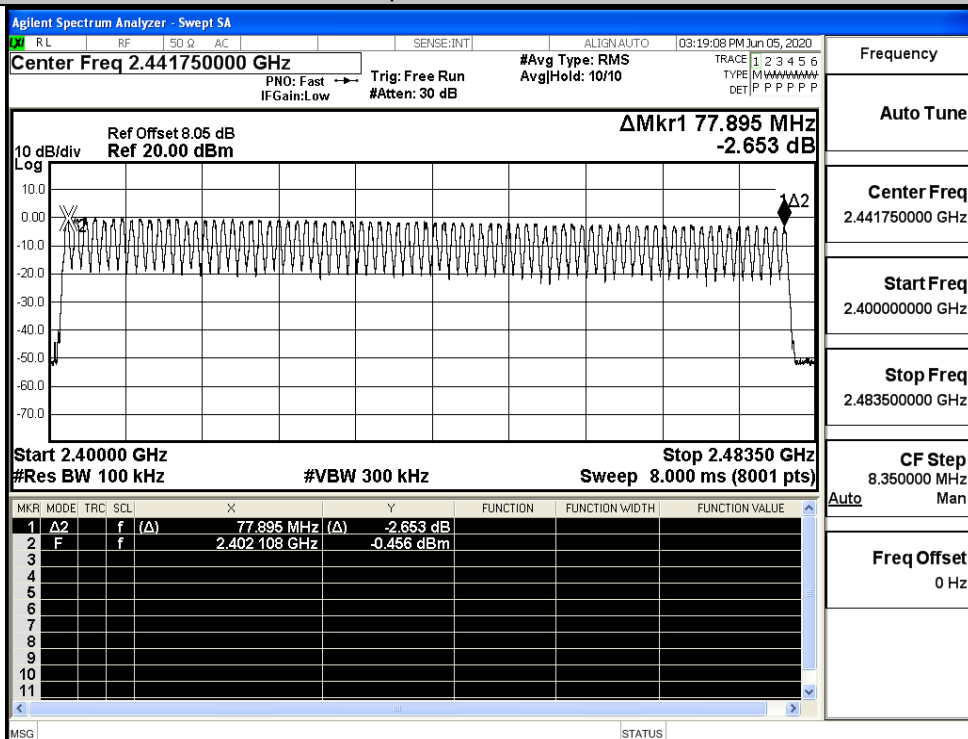
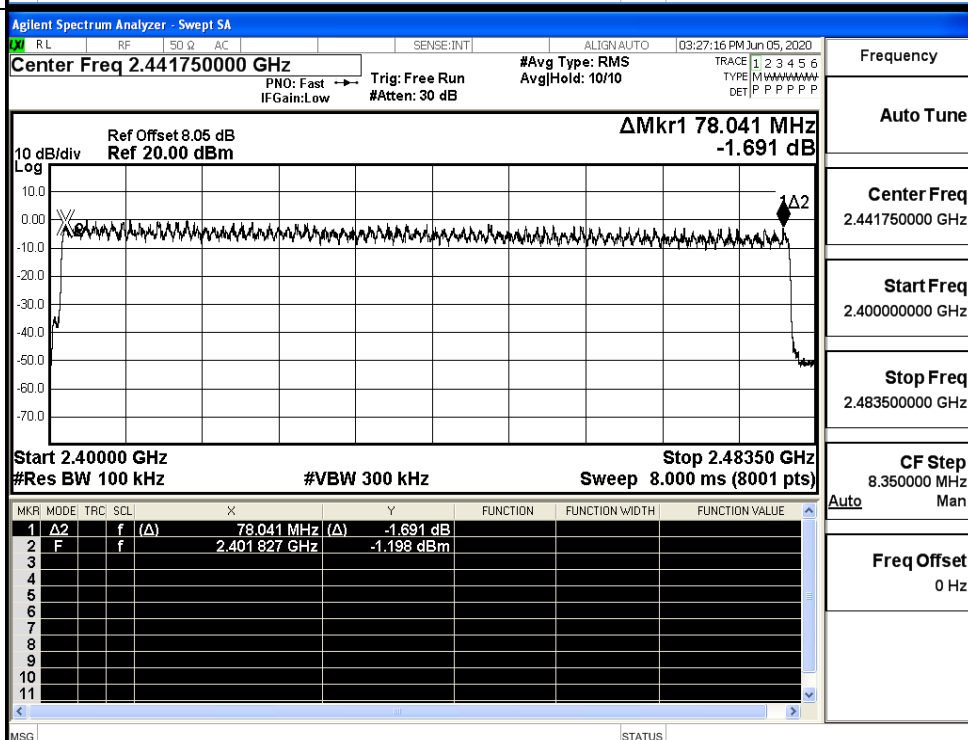
8DPSK/MCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Q AC SENSE:INT ALIGN AUTO 03:30:25 PM Jun 05, 2020 Center Freq 2.441500000 GHz PNO: Wide IFGain:Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS AvgHold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P P Frequency Auto Tune Center Freq 2.441500000 GHz Start Freq 2.440500000 GHz Stop Freq 2.442500000 GHz CF Step 200.000 kHz Man Freq Offset 0 Hz Ref Offset 8.05 dB Ref 20.00 dBm 10 dB/div Log ΔMkr1 986 kHz -2.203 dB 1Δ2 Start 2.440500 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.442500 GHz Sweep 1.000 ms (1001 pts) MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE 1 Δ2 f (Δ) 986 kHz (Δ) -2.203 dB 2 F f 2.441 004 GHz -1.327 dBm 3 4 5 6 7 8 9 10 11 MSG STATUS
------------------	---

A.4 Hopping Channel Number

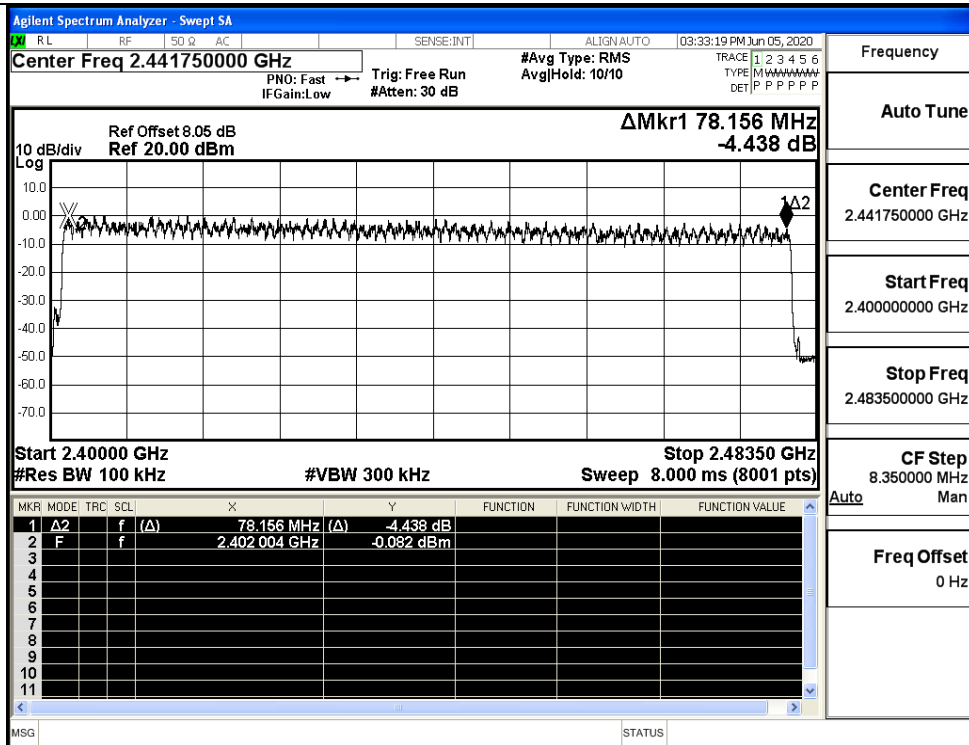
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

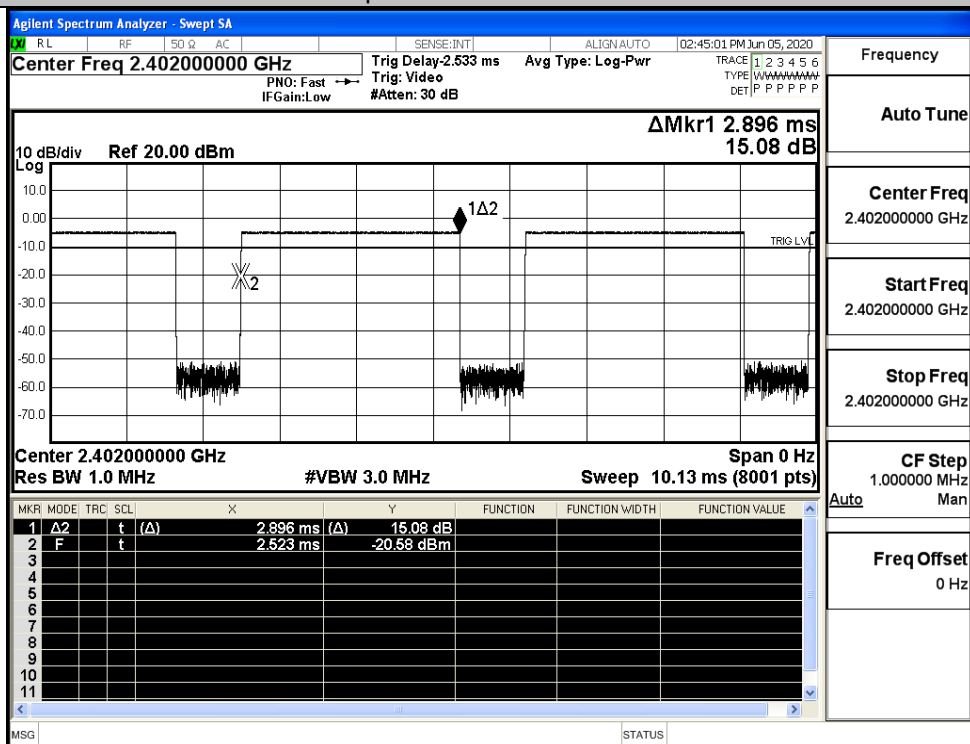


A.5 Dwell Time

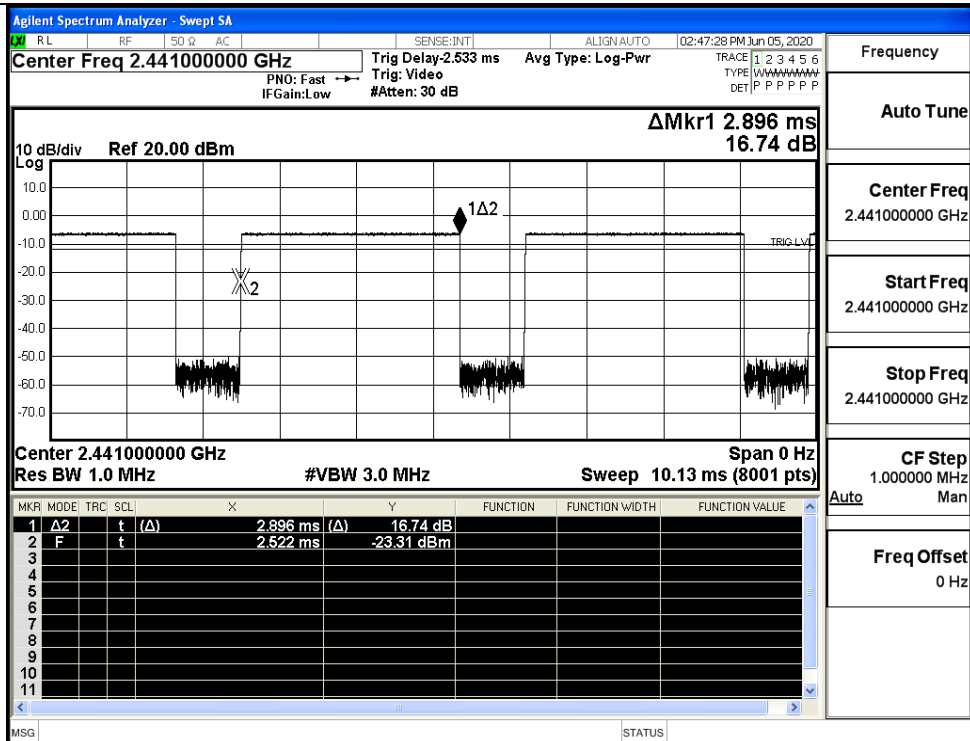
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7	0.309	0.4	PASS
8DPSK	3DH5	LCH	2.9	106.7	0.309	0.4	PASS
	3DH5	MCH	2.9	106.7	0.309	0.4	PASS
	3DH5	HCH	2.9	106.7	0.309	0.4	PASS

Test Graphs

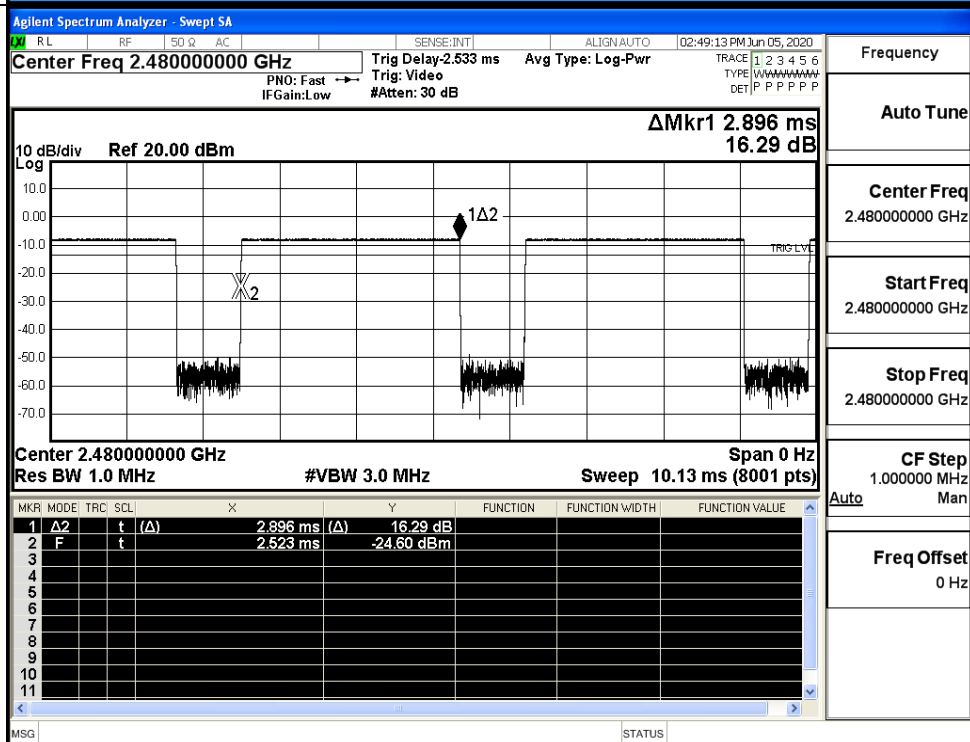
GFSK_DH5/LCH



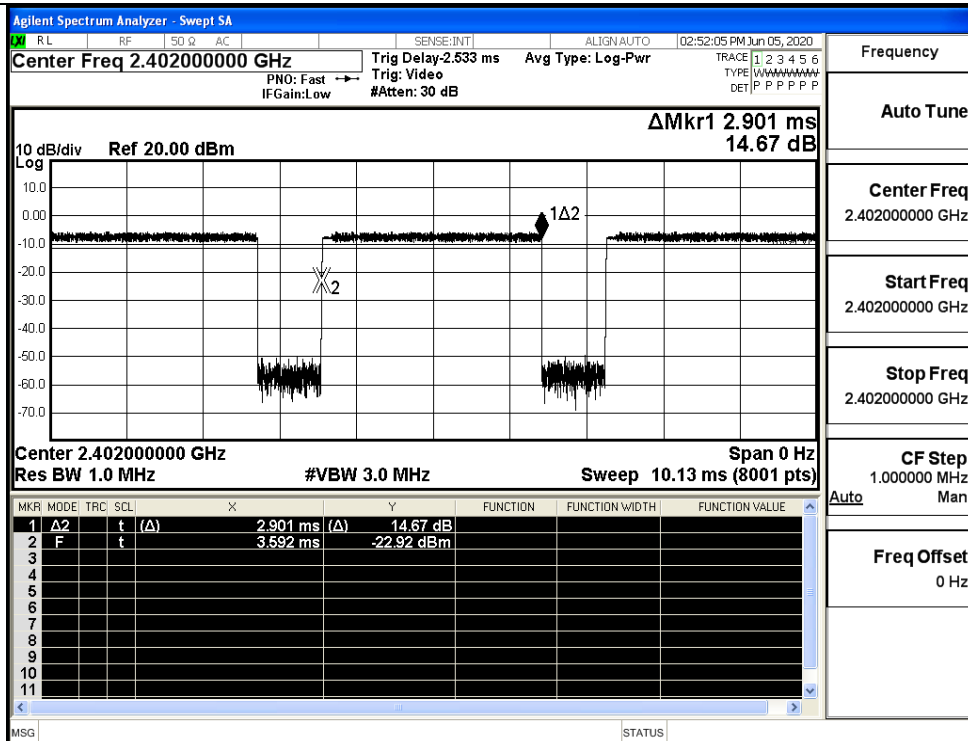
GFSK_DH5/MCH



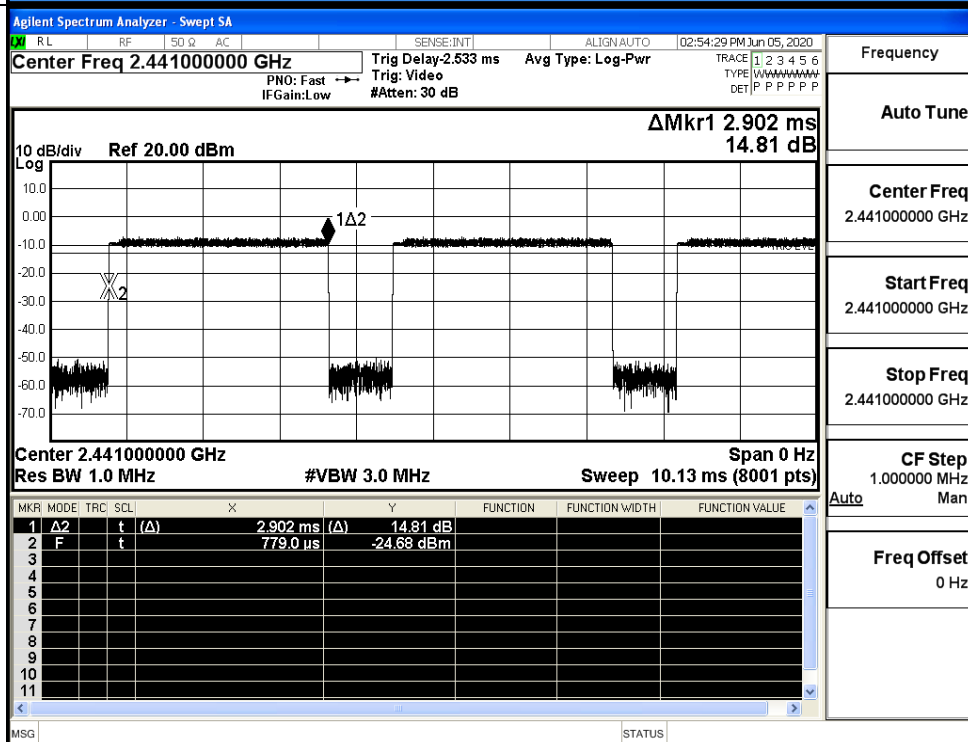
GFSK_DH5/HCH



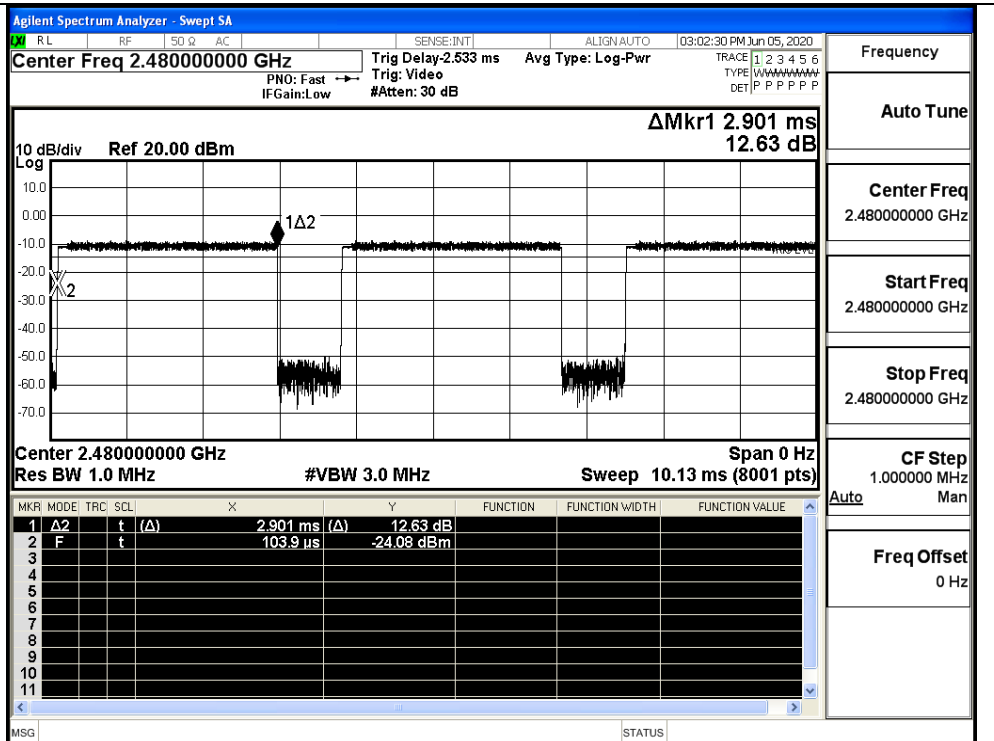
$\pi/4$ DQPSK
_2DH5/LCH



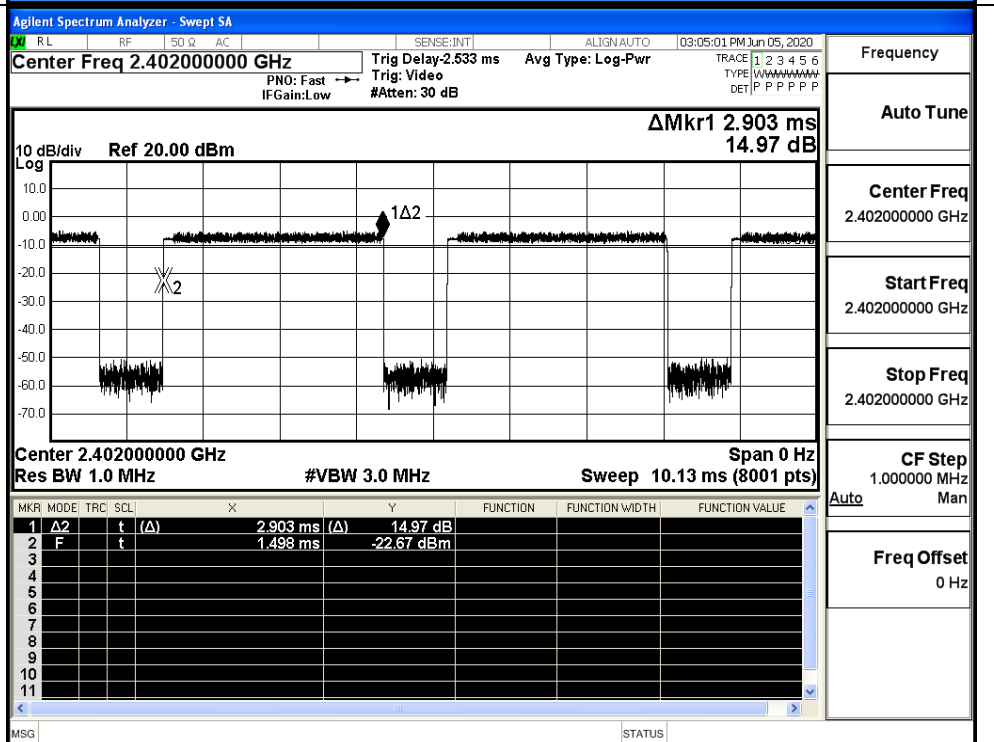
$\pi/4$ DQPSK
_2DH5/MCH



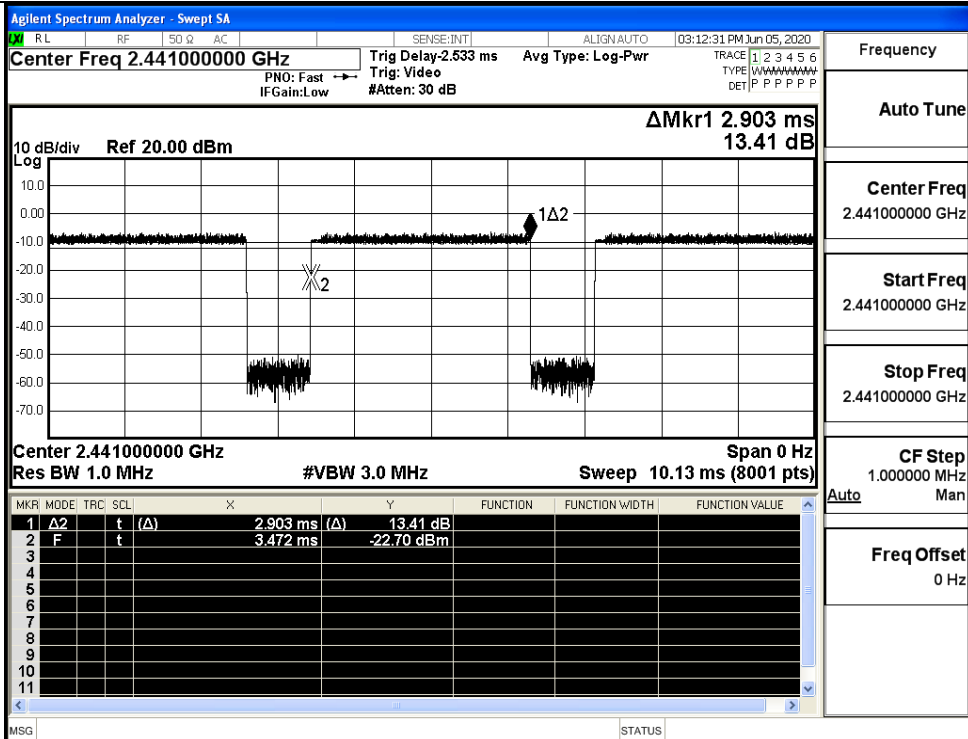
$\pi/4$ DQPSK
_2DH5/HCH



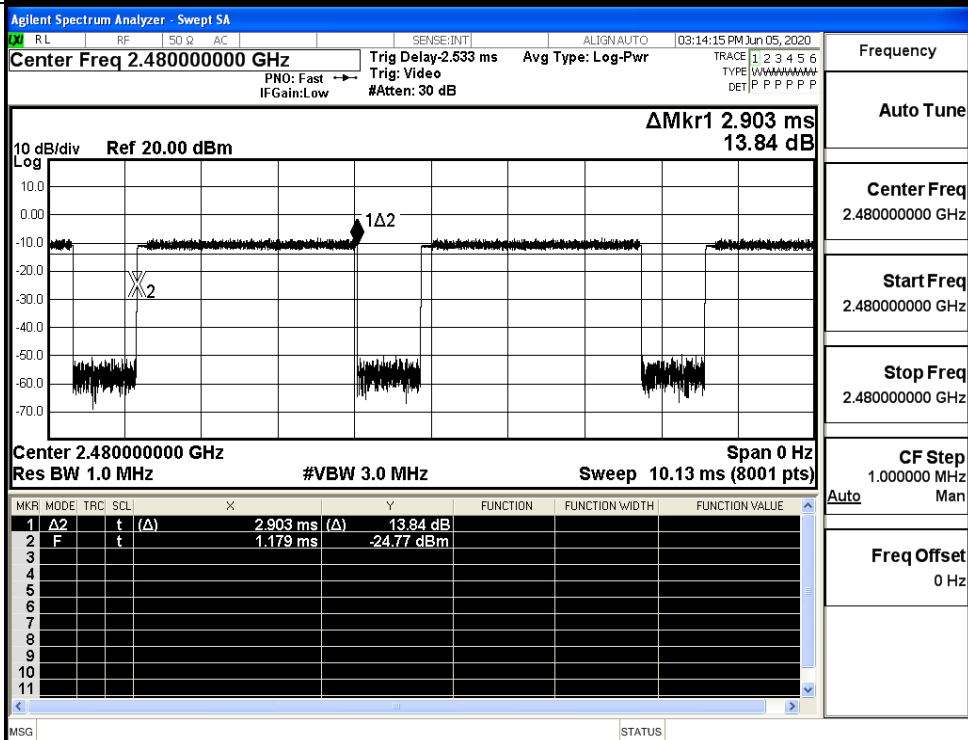
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



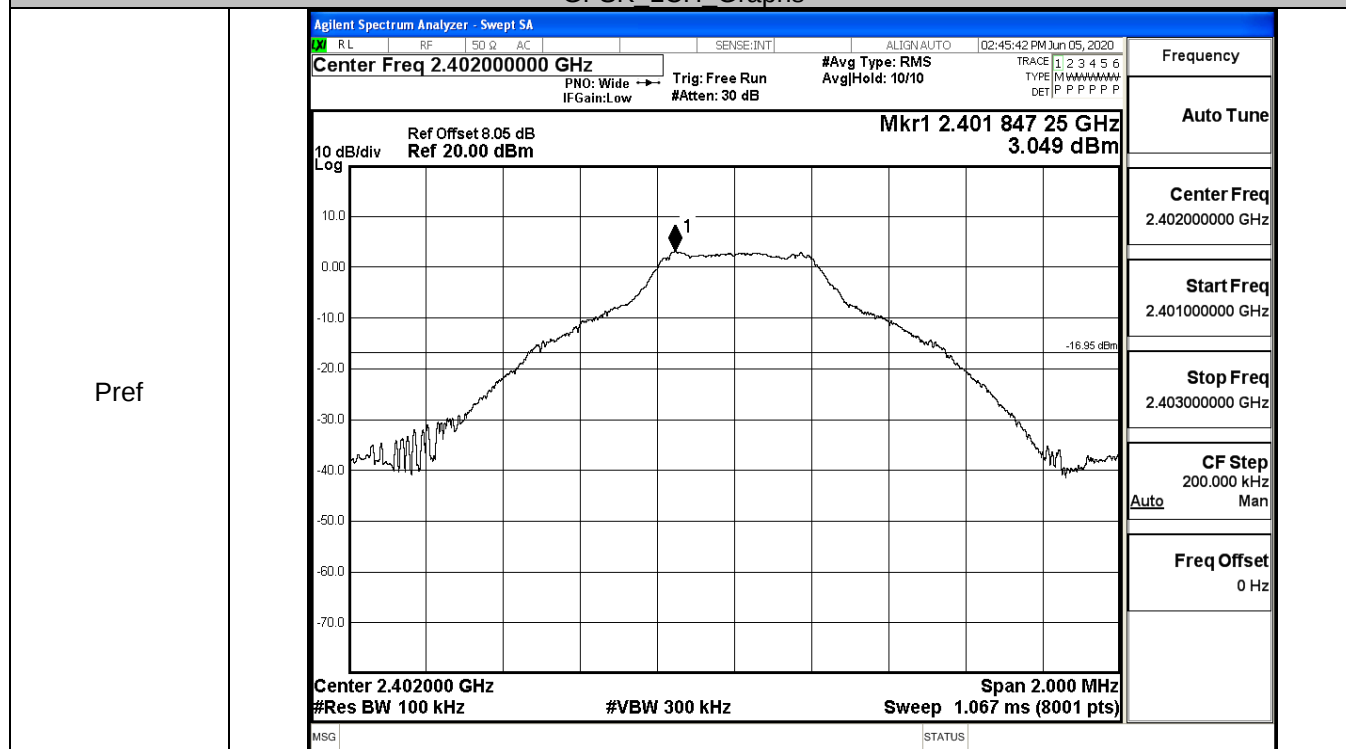
8DPSK_3DH5/HCH



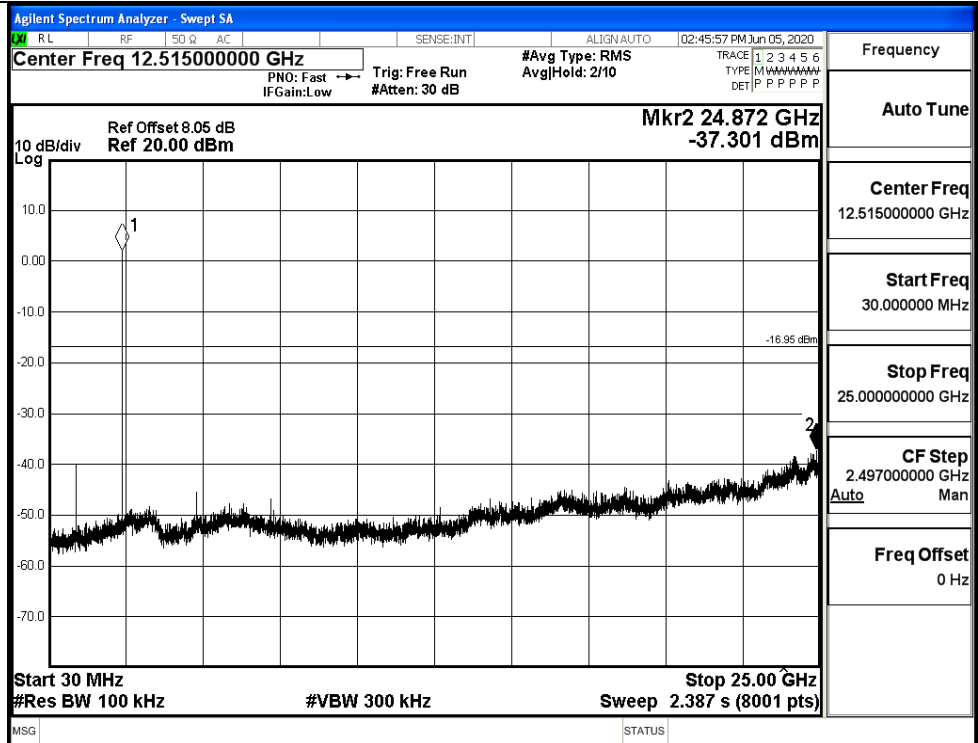
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.049	-37.301	-16.951	PASS
	MCH	1.513	-37.944	-18.487	PASS
	HCH	-0.108	-38.010	-20.108	PASS
$\pi/4$ DQPSK	LCH	0.014	-37.492	-19.986	PASS
	MCH	-1.53	-37.109	-21.530	PASS
	HCH	-3.154	-38.196	-23.154	PASS
8DPSK	LCH	0.175	-37.570	-19.825	PASS
	MCH	-1.322	-37.293	-21.322	PASS
	HCH	-2.924	-37.937	-22.924	PASS

GFSK LCH Graphs

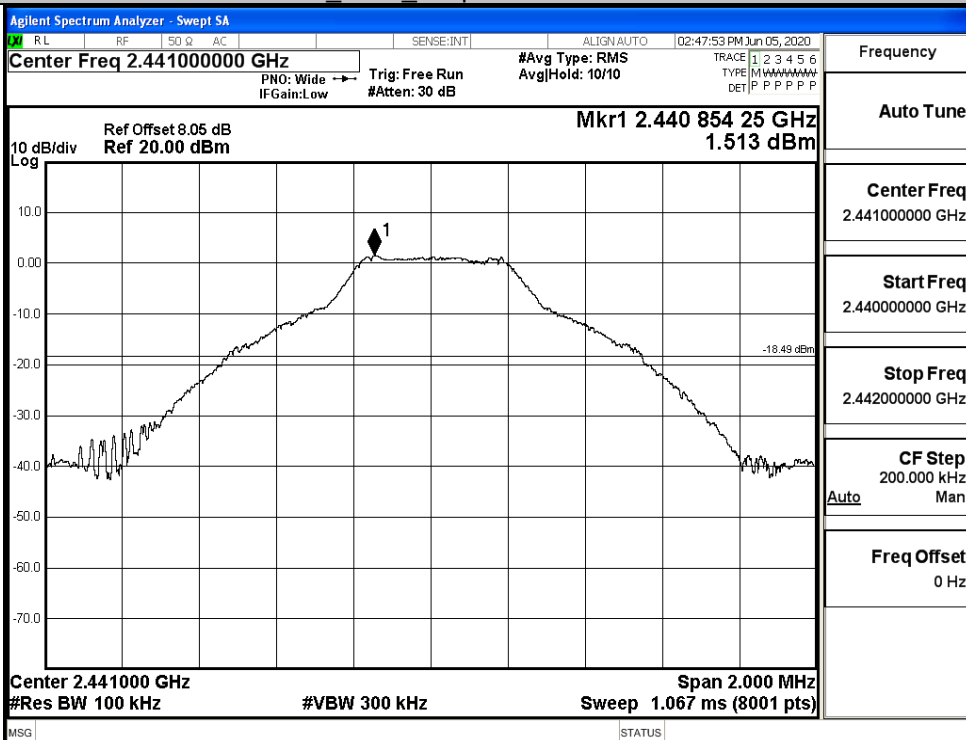


Puw

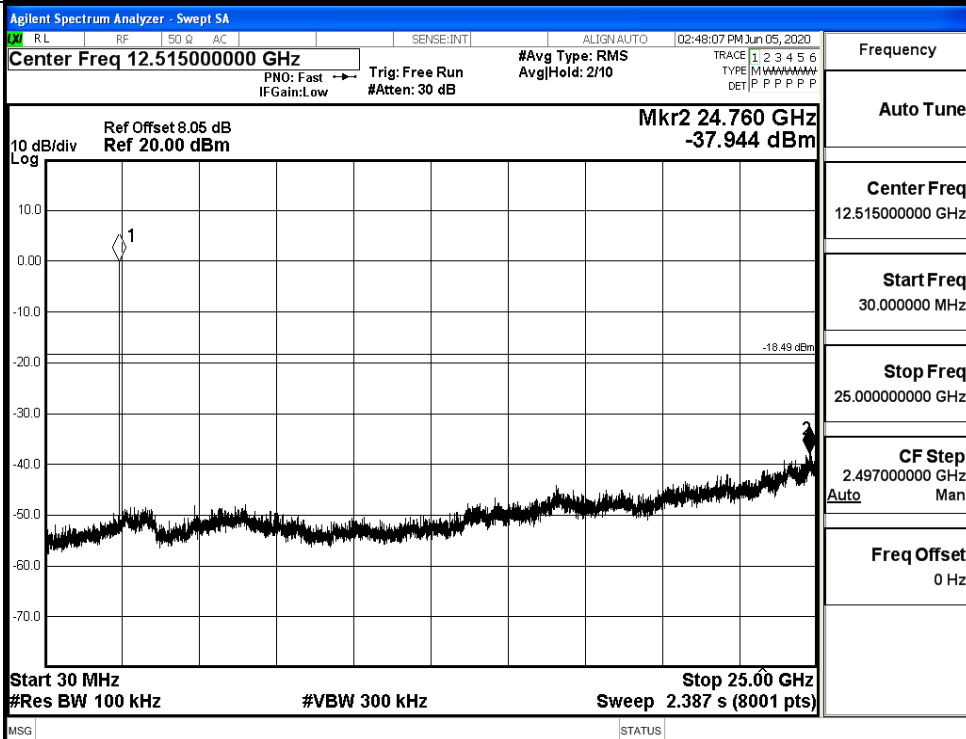


GFSK_MCH_Graphs

Pref

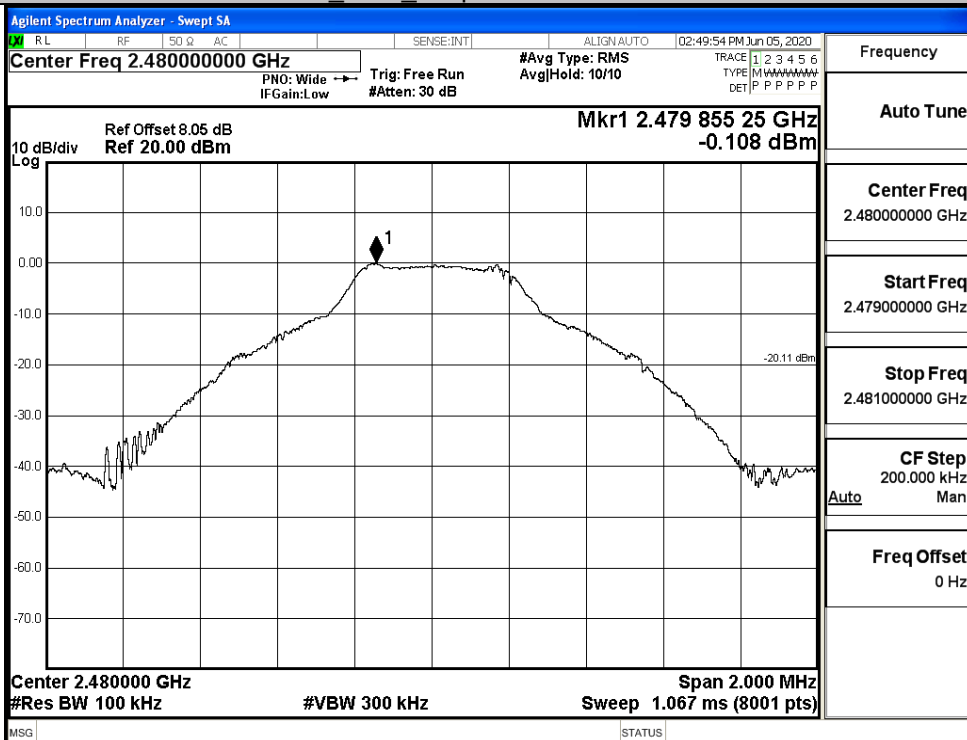


Puw

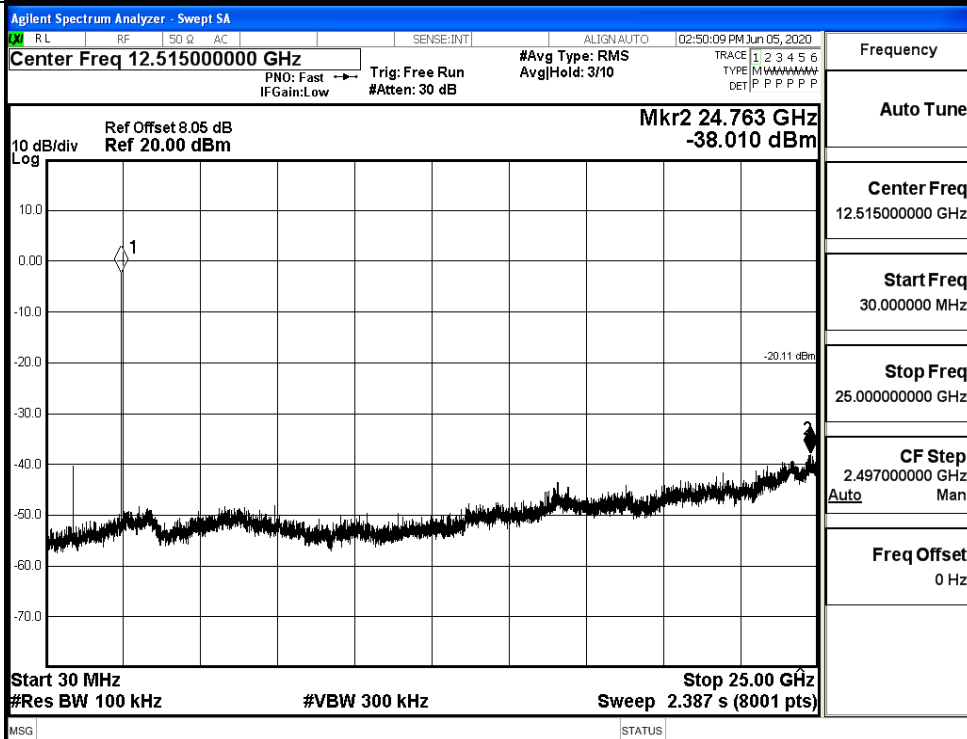


GFSK HCH_Graphs

Pref

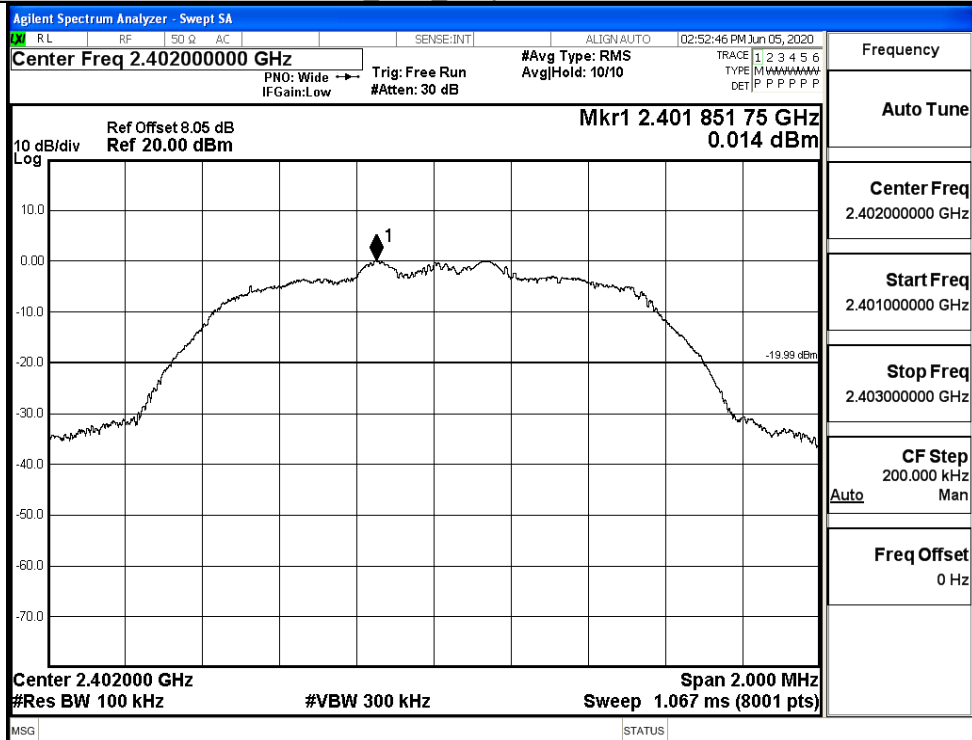


Puw

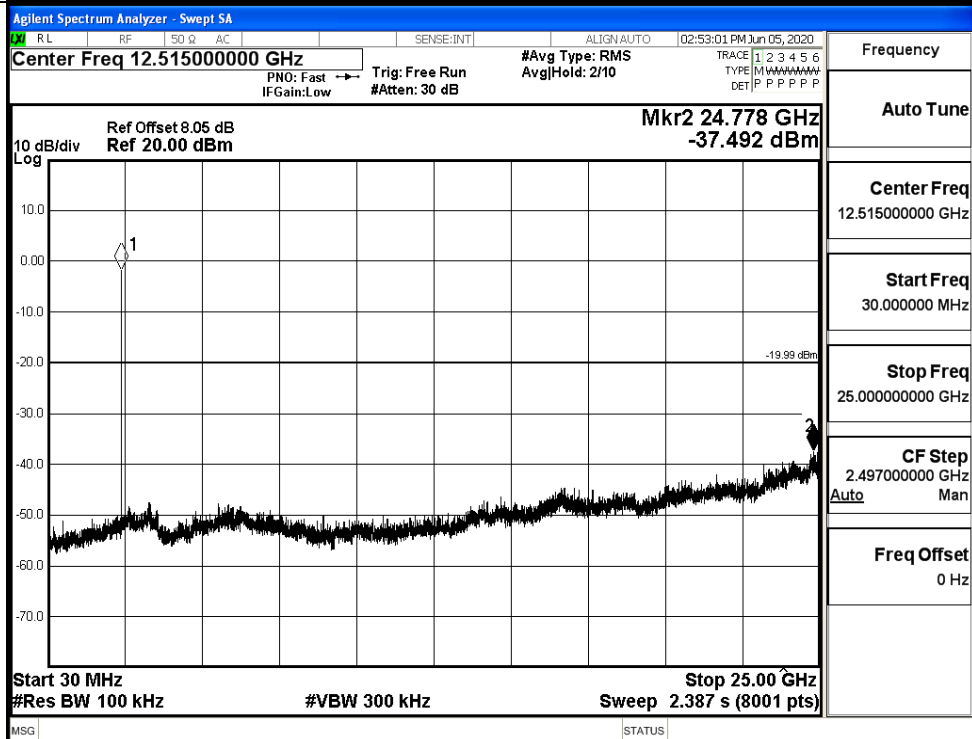


$\pi/4$ DQPSK_LCH_Graphs

Pref

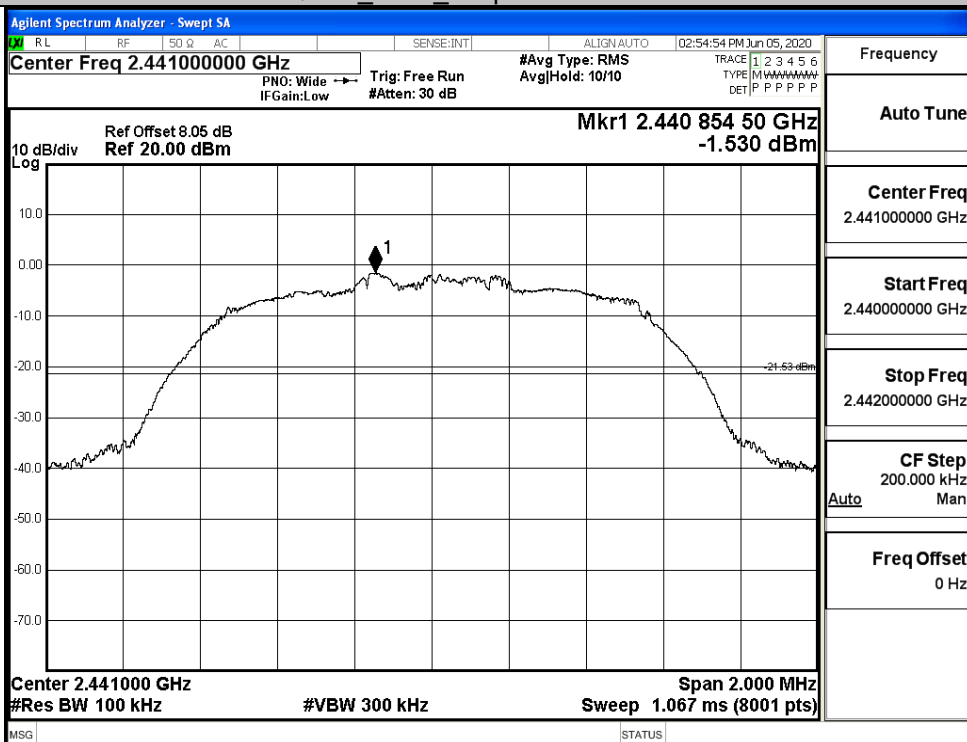


Puw

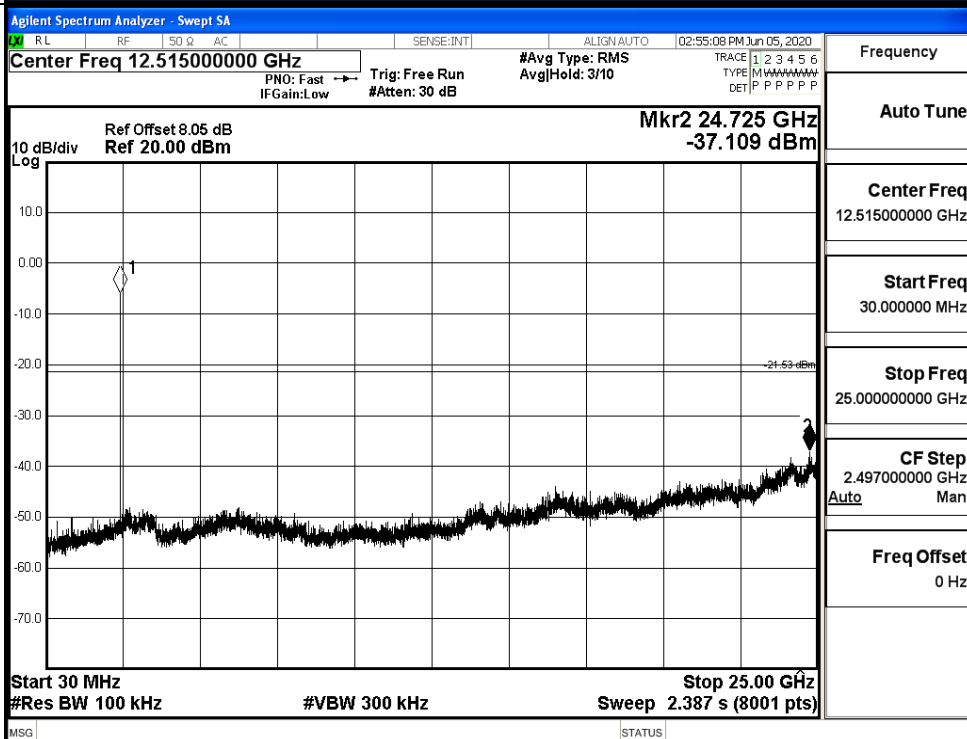


$\pi/4$ DQPSK_MCH_Graphs

Pref

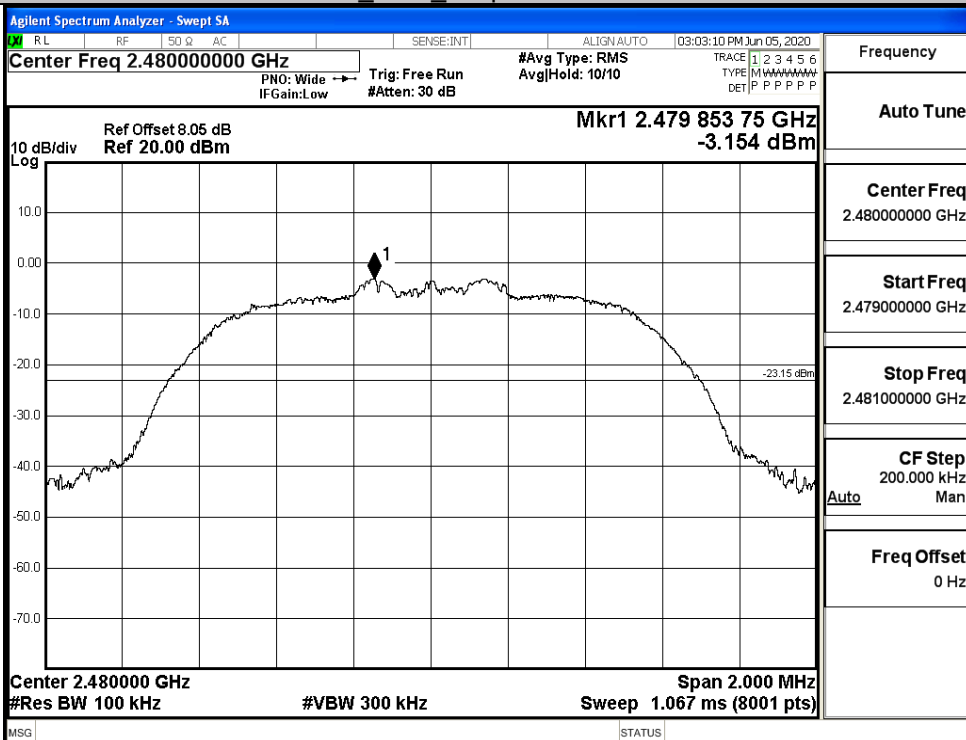


Puw

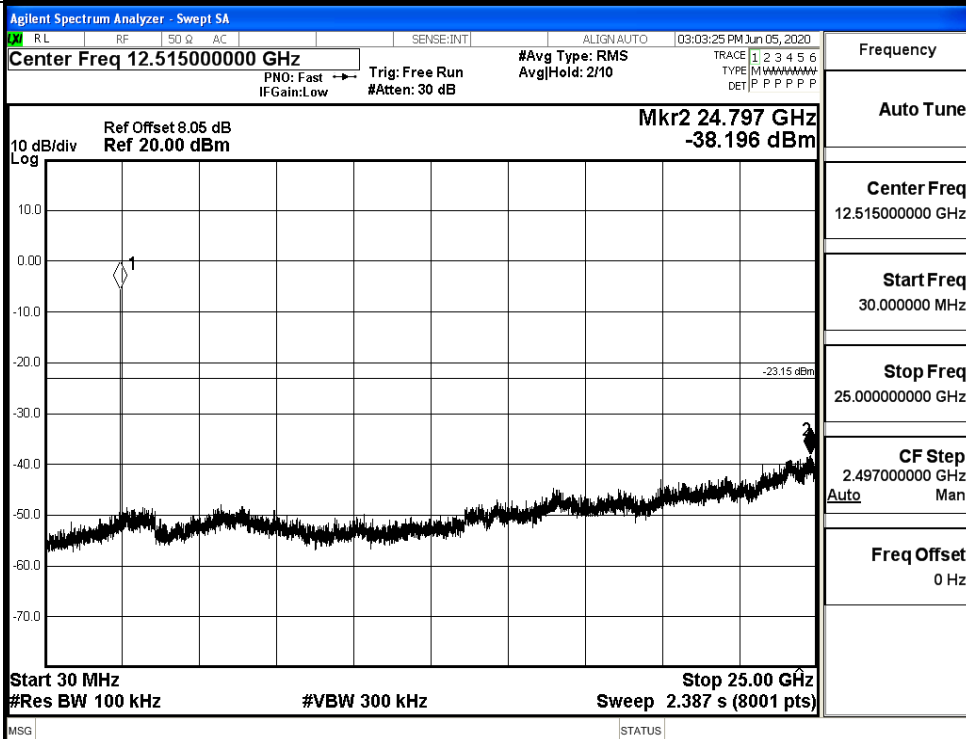


$\pi/4$ DQPSK_HCH_Graphs

Pref

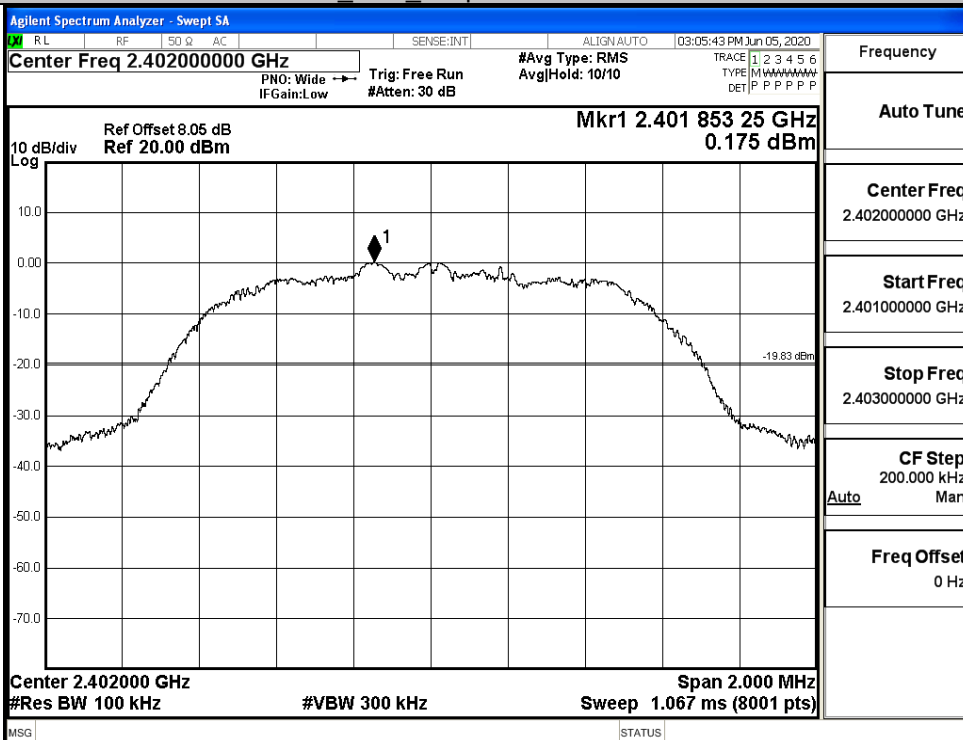


Puw



8DPSK_LCH_Graphs

Pref

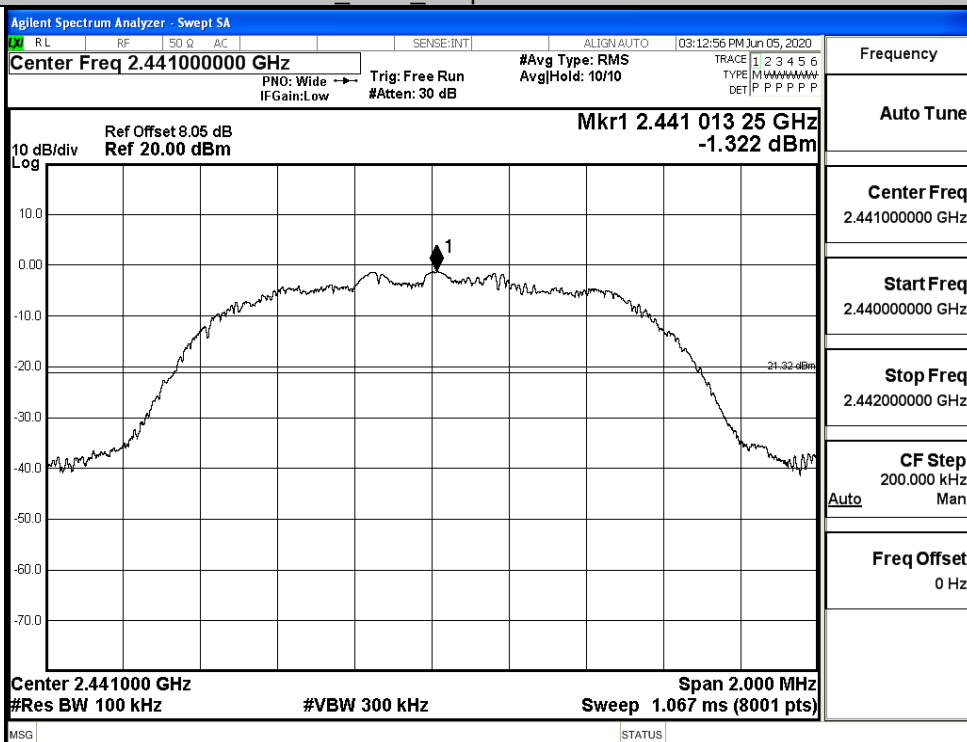


Puw

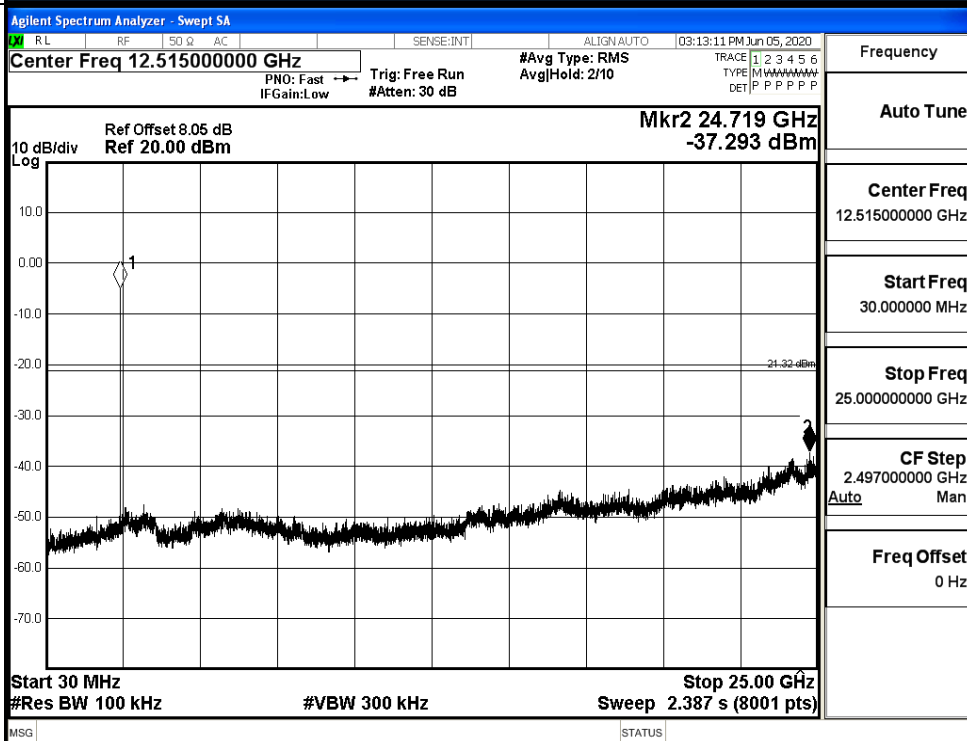


8DPSK_MCH_Graphs

Pref

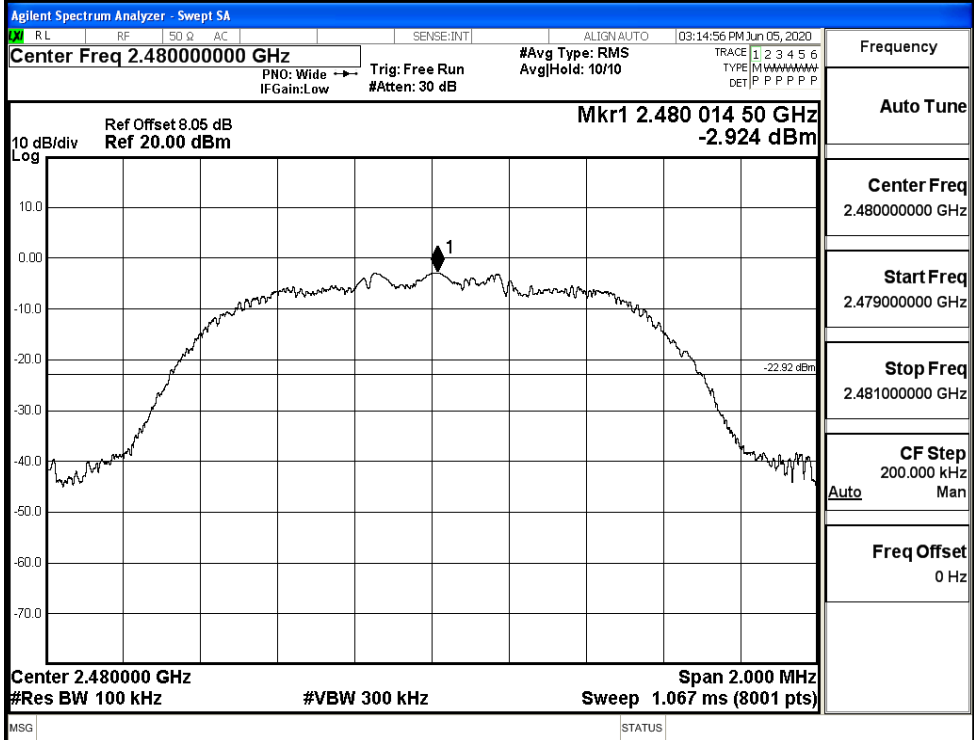


Puw

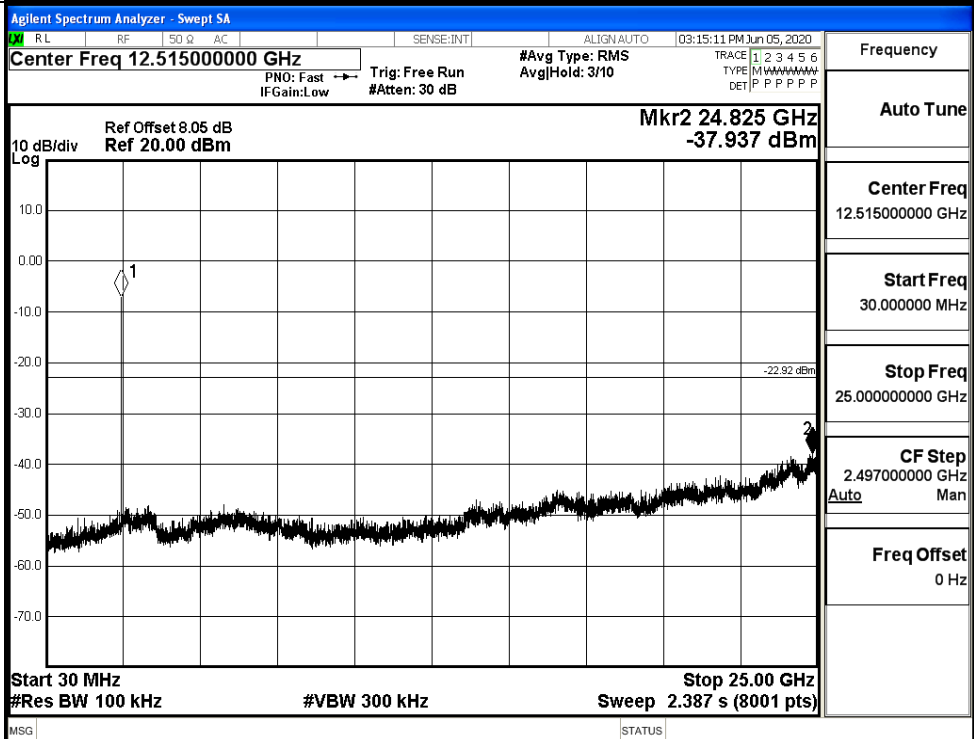


8DPSK_HCH_Graphs

Pref



Puw

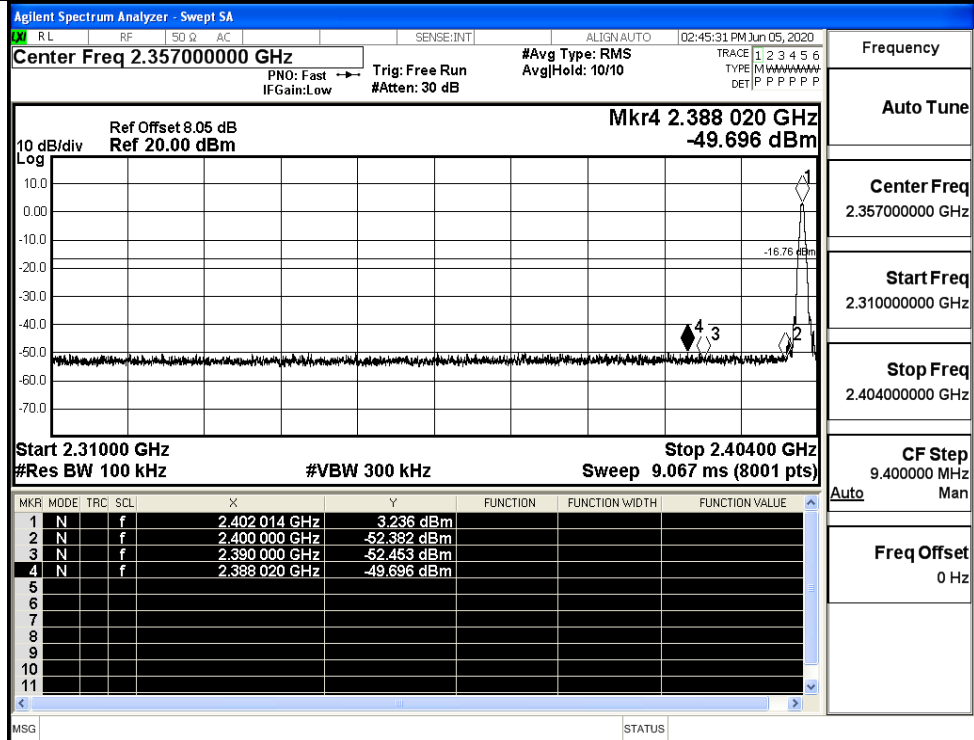


A.7 Band-edge for RF Conducted Emissions

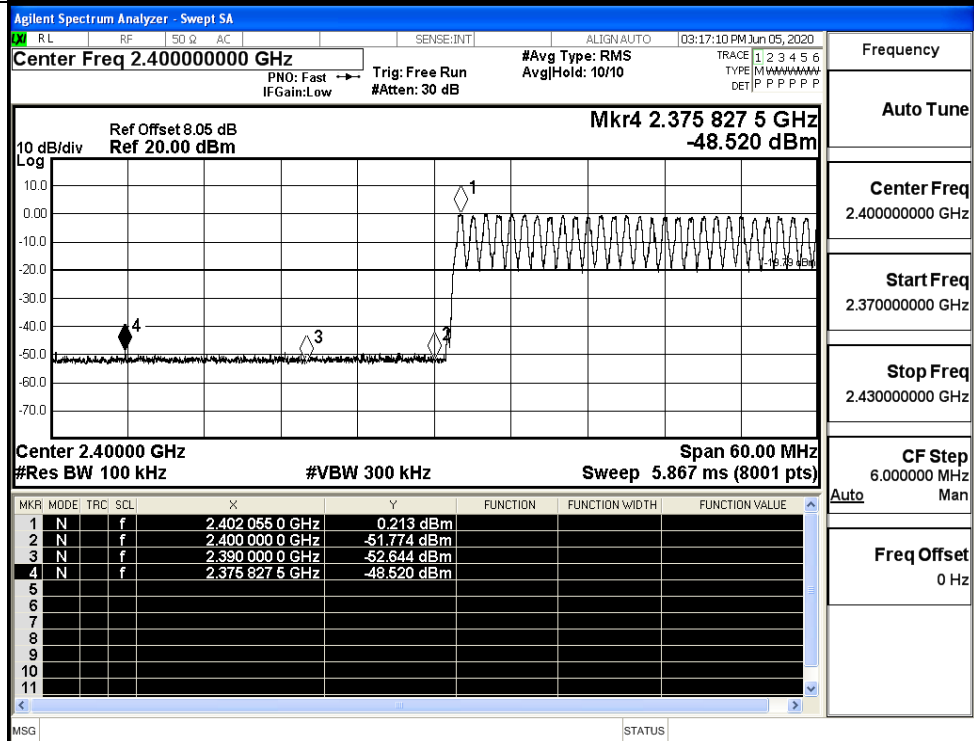
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.236	Off	-49.696	-16.76	PASS
			0.213	On	-48.520	-19.79	PASS
	HCH	2480	-0.025	Off	-48.563	-20.03	PASS
			-2.101	On	-48.841	-22.1	PASS
$\pi/4$ DQPSK	LCH	2402	0.191	Off	-49.249	-19.81	PASS
			-0.006	On	-49.107	-20.01	PASS
	HCH	2480	-3.207	Off	-48.771	-23.21	PASS
			-2.216	On	-48.516	-22.22	PASS
8DPSK	LCH	2402	-0.091	Off	-49.688	-20.09	PASS
			0.226	On	-49.674	-19.77	PASS
	HCH	2480	-2.776	Off	-49.355	-22.78	PASS
			-1.900	On	-48.605	-21.9	PASS

Test Graphs

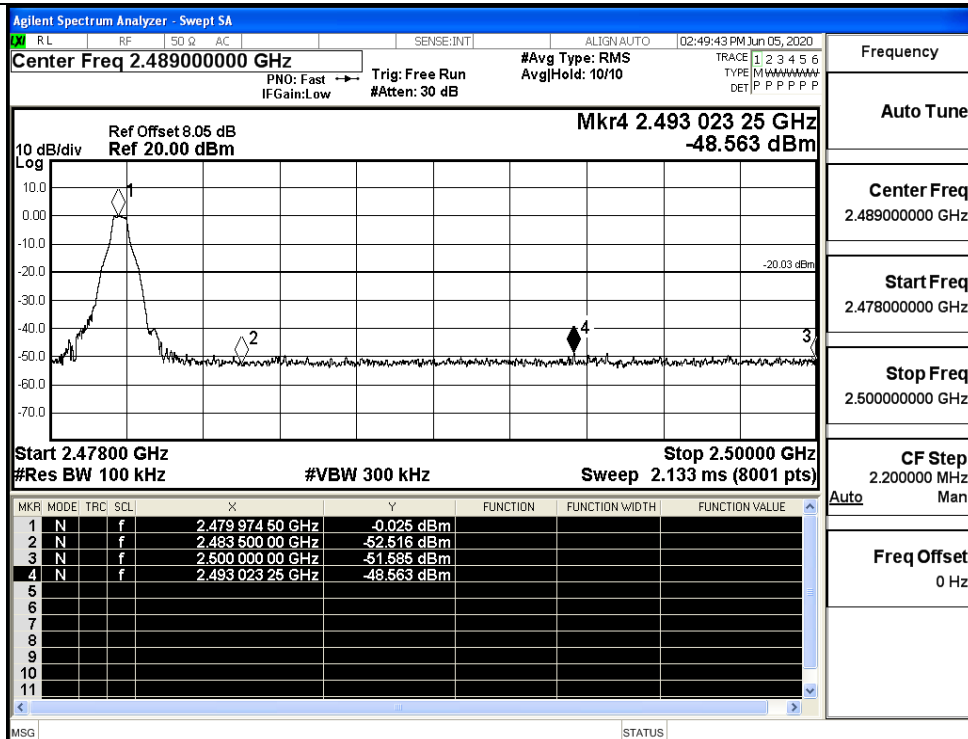
GFSK/LCH/No Hop



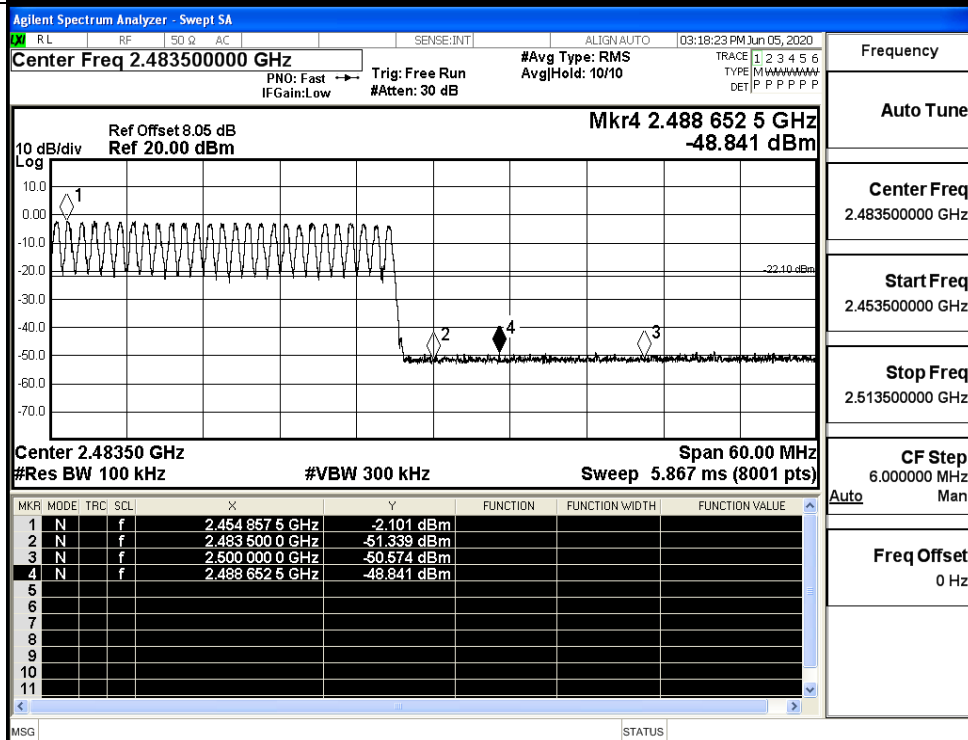
GFSK/LCH/Hop



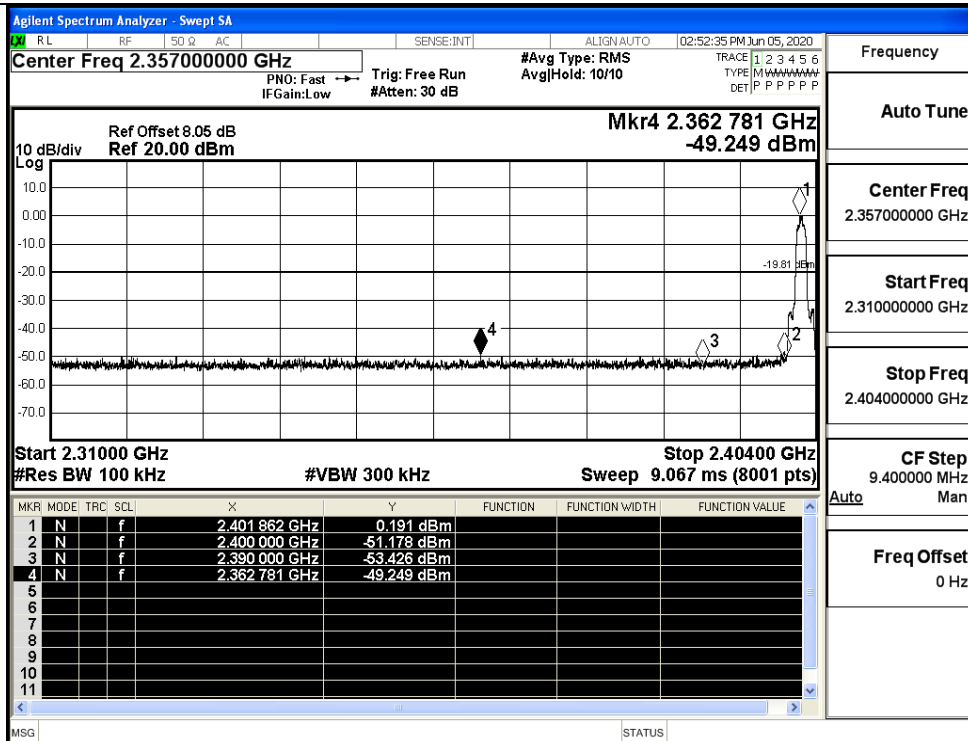
GFSK/HCH/No Hop



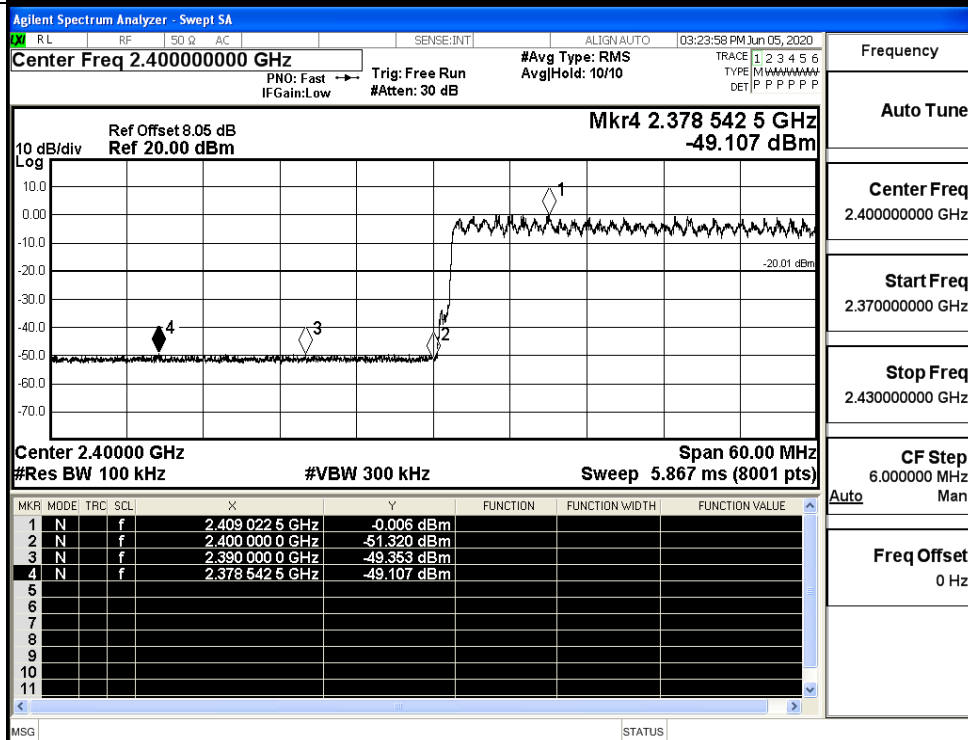
GFSK/HCH/Hop



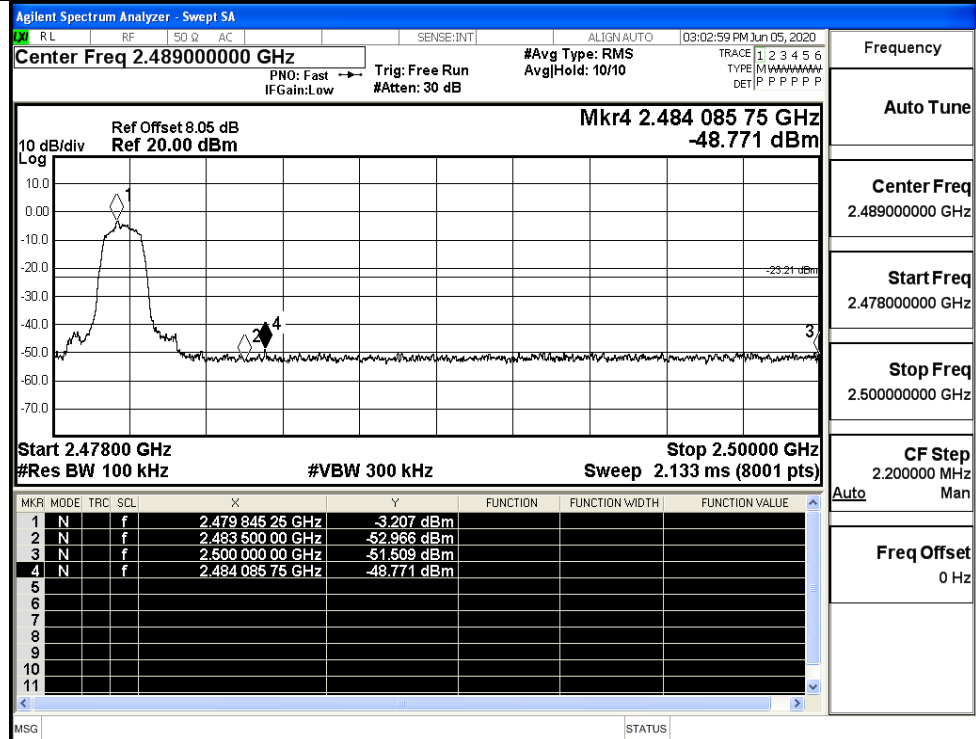
$\pi/4$ DQPSK/LCH/No
Hop



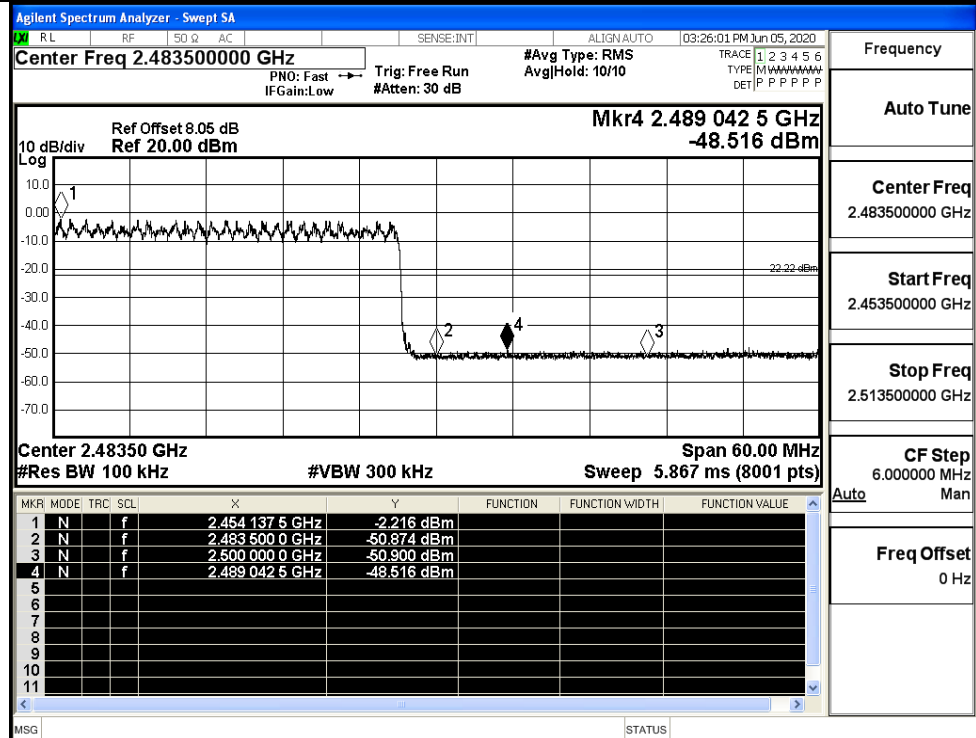
$\pi/4$ DQPSK/LCH/Hop



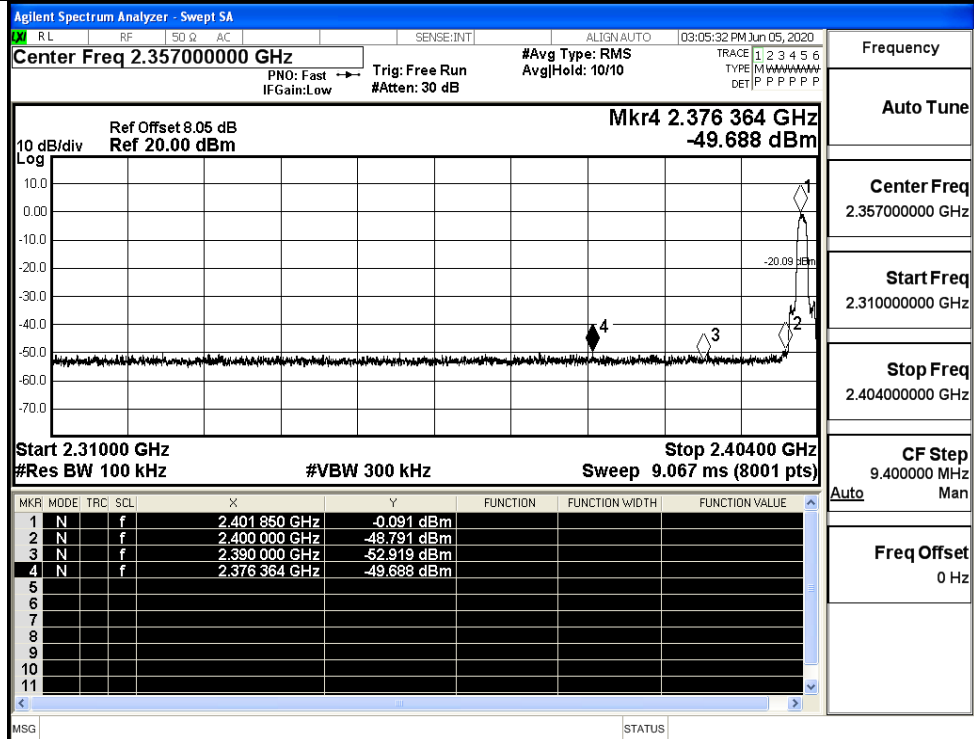
$\pi/4$ DQPSK/HCH/No
Hop



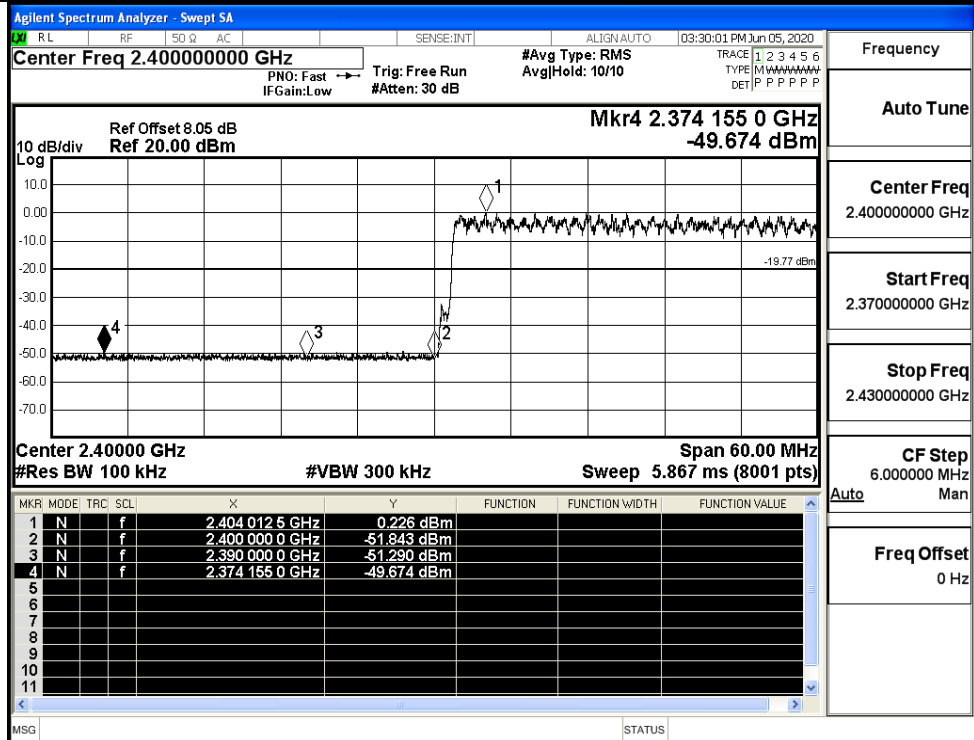
$\pi/4$ DQPSK/HCH/Hop



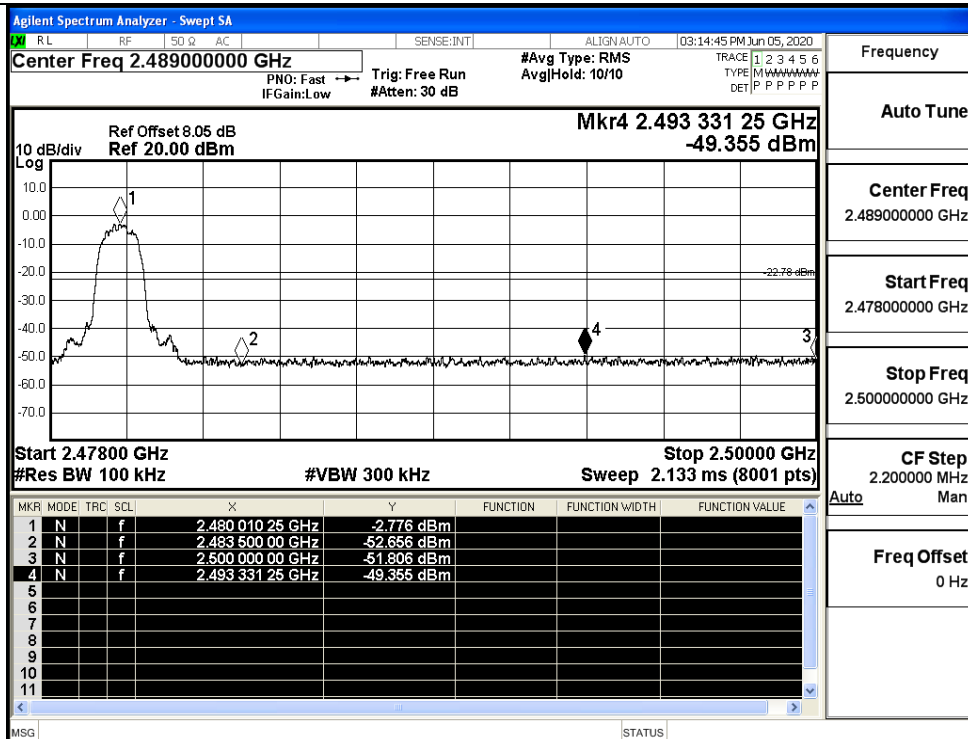
8DPSK/LCH/No Hop



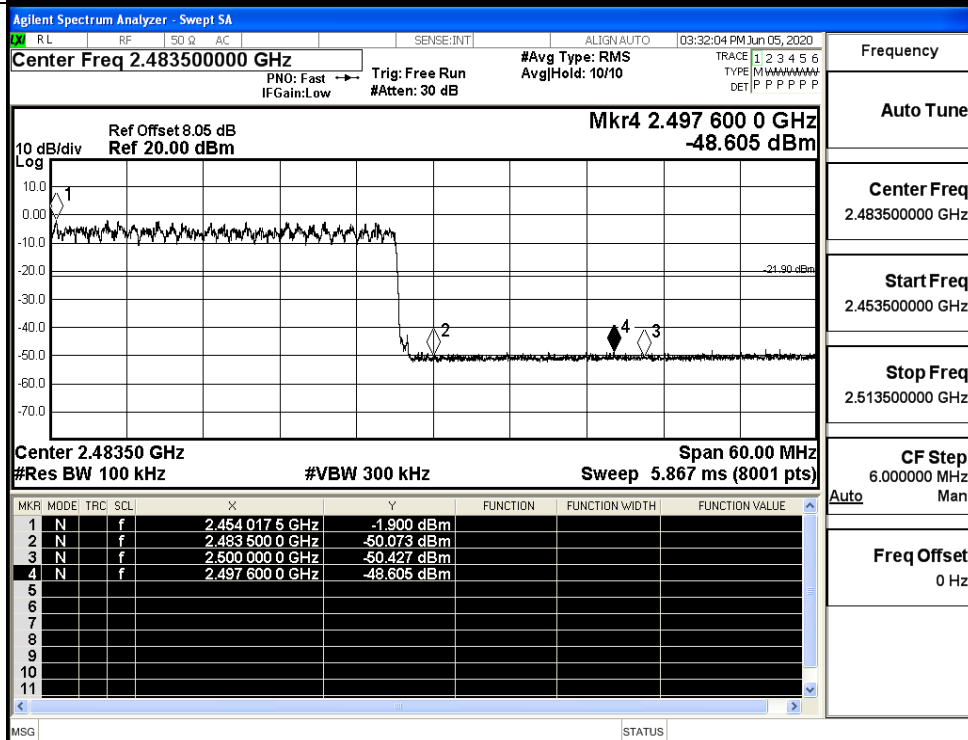
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



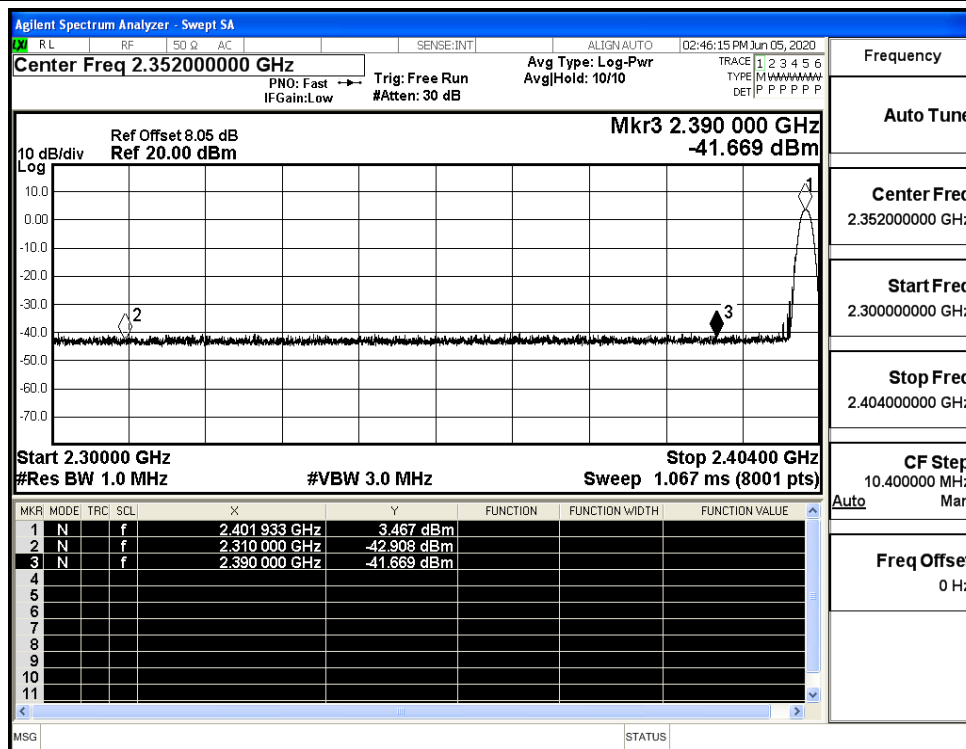
8DPSK/HCH/Hop



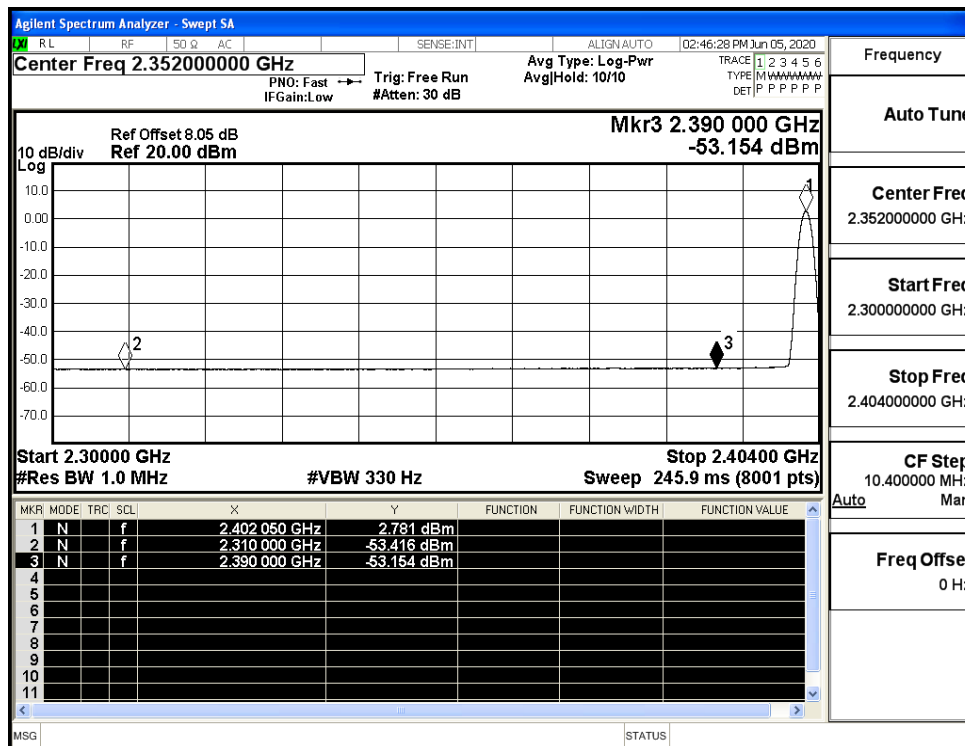
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.91	2.0	0	54.35	PEAK	74	PASS
	Off	2310.0	-53.42	2.0	0	43.84	AV	54	PASS
	Off	2390.0	-41.67	2.0	0	55.59	PEAK	74	PASS
	Off	2390.0	-53.15	2.0	0	44.11	AV	54	PASS
	Off	2483.5	-42.58	2.0	0	54.68	PEAK	74	PASS
	Off	2483.5	-52.35	2.0	0	44.91	AV	54	PASS
	Off	2500.0	-41.67	2.0	0	55.59	PEAK	74	PASS
	Off	2500.0	-52.42	2.0	0	44.84	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.44	2.0	0	54.82	PEAK	74	PASS
	Off	2310.0	-53.50	2.0	0	43.76	AV	54	PASS
	Off	2390.0	-43.39	2.0	0	53.87	PEAK	74	PASS
	Off	2390.0	-53.06	2.0	0	44.2	AV	54	PASS
	Off	2483.5	-42.31	2.0	0	54.95	PEAK	74	PASS
	Off	2483.5	-52.58	2.0	0	44.68	AV	54	PASS
	Off	2500.0	-42.52	2.0	0	54.74	PEAK	74	PASS
	Off	2500.0	-52.47	2.0	0	44.79	AV	54	PASS
8DPSK	Off	2310.0	-43.19	2.0	0	54.07	PEAK	74	PASS
	Off	2310.0	-53.50	2.0	0	43.76	AV	54	PASS
	Off	2390.0	-43.37	2.0	0	53.89	PEAK	74	PASS
	Off	2390.0	-53.16	2.0	0	44.1	AV	54	PASS
	Off	2483.5	-41.96	2.0	0	55.3	PEAK	74	PASS
	Off	2483.5	-52.55	2.0	0	44.71	AV	54	PASS
	Off	2500.0	-42.83	2.0	0	54.43	PEAK	74	PASS
	Off	2500.0	-52.42	2.0	0	44.84	AV	54	PASS

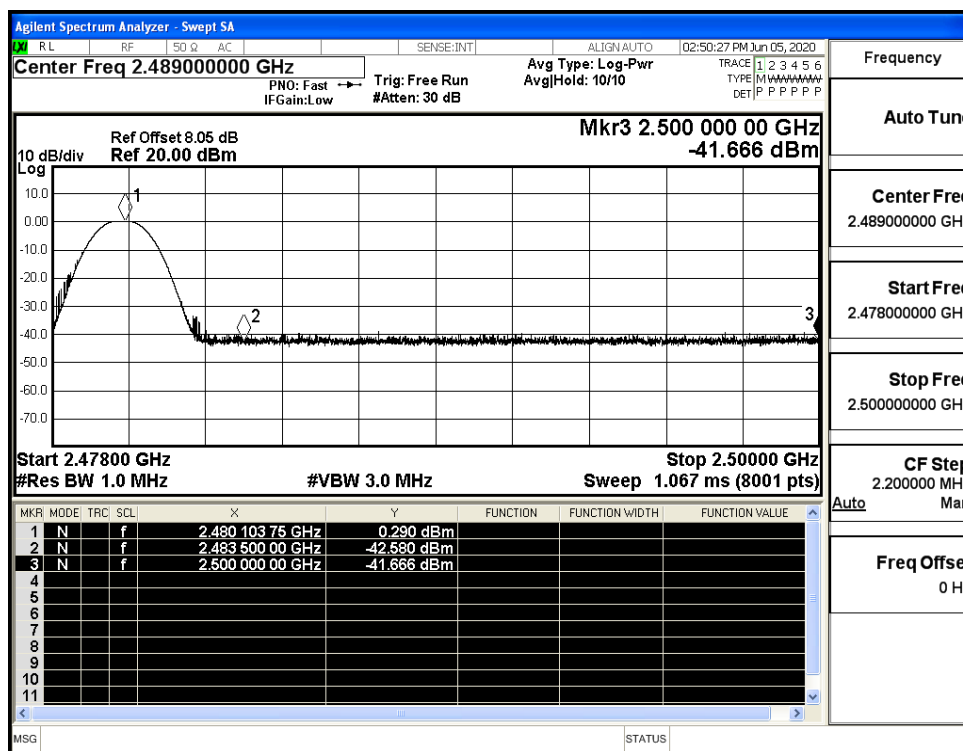
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



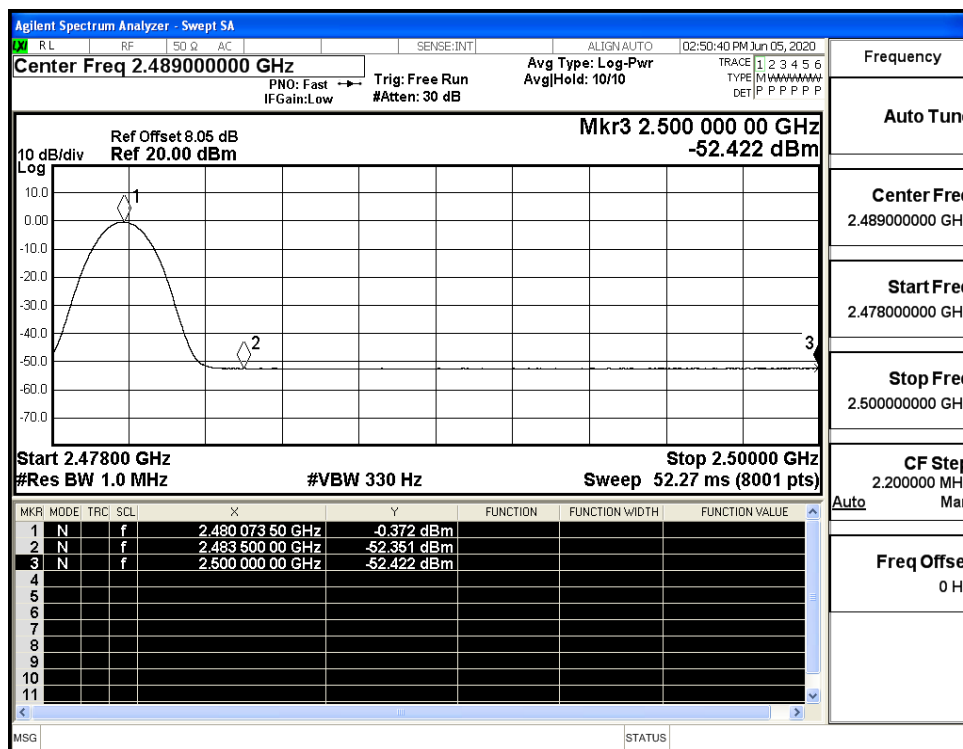
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



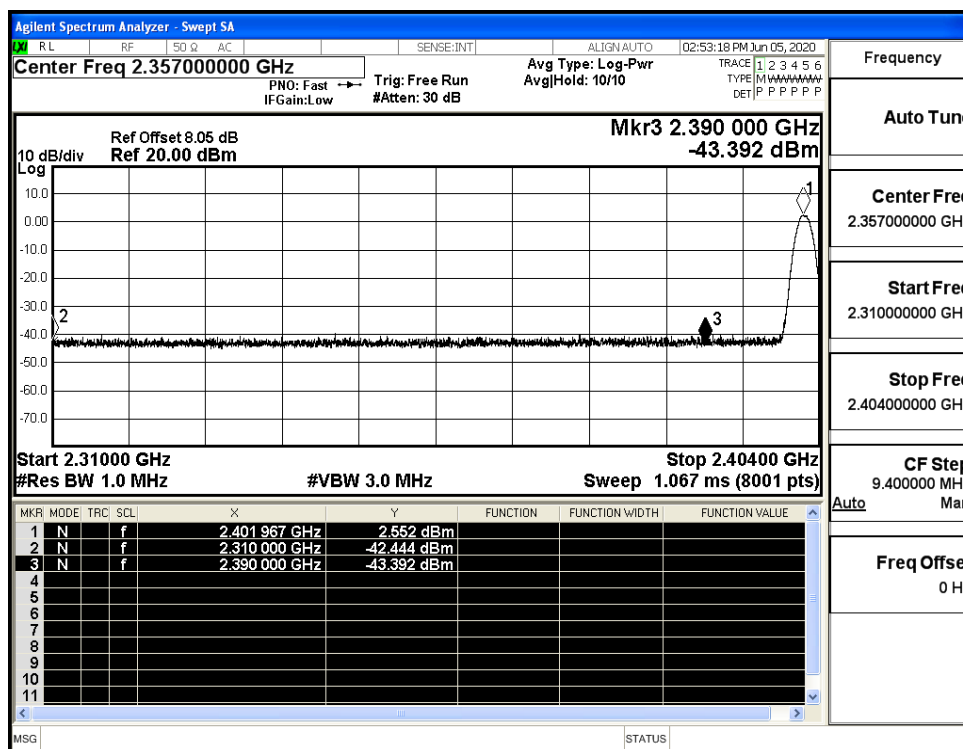
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



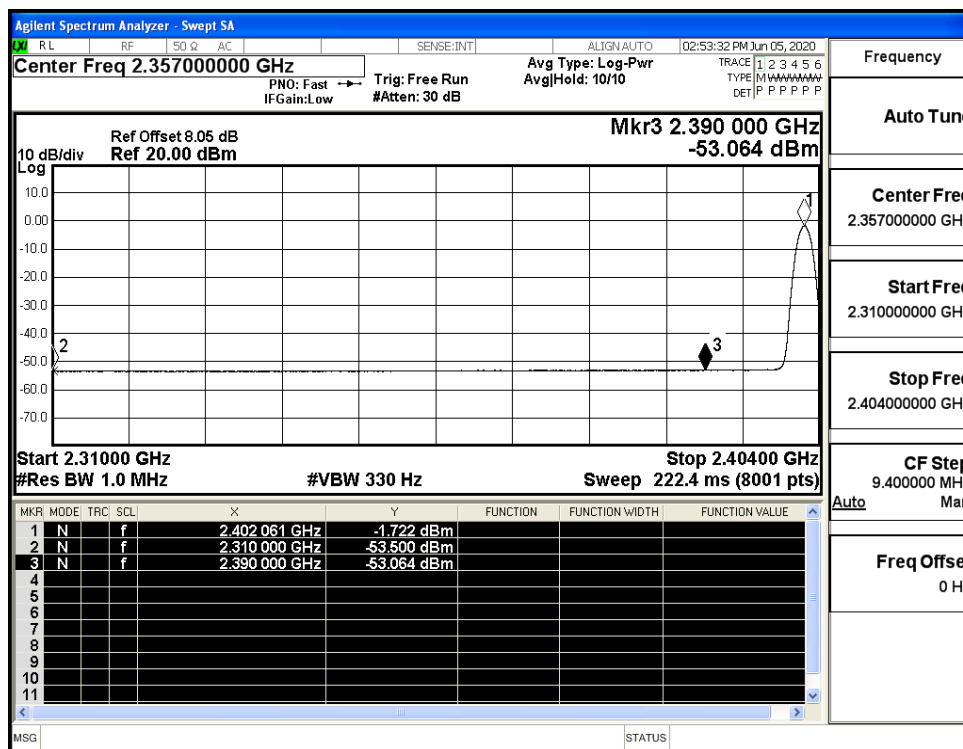
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

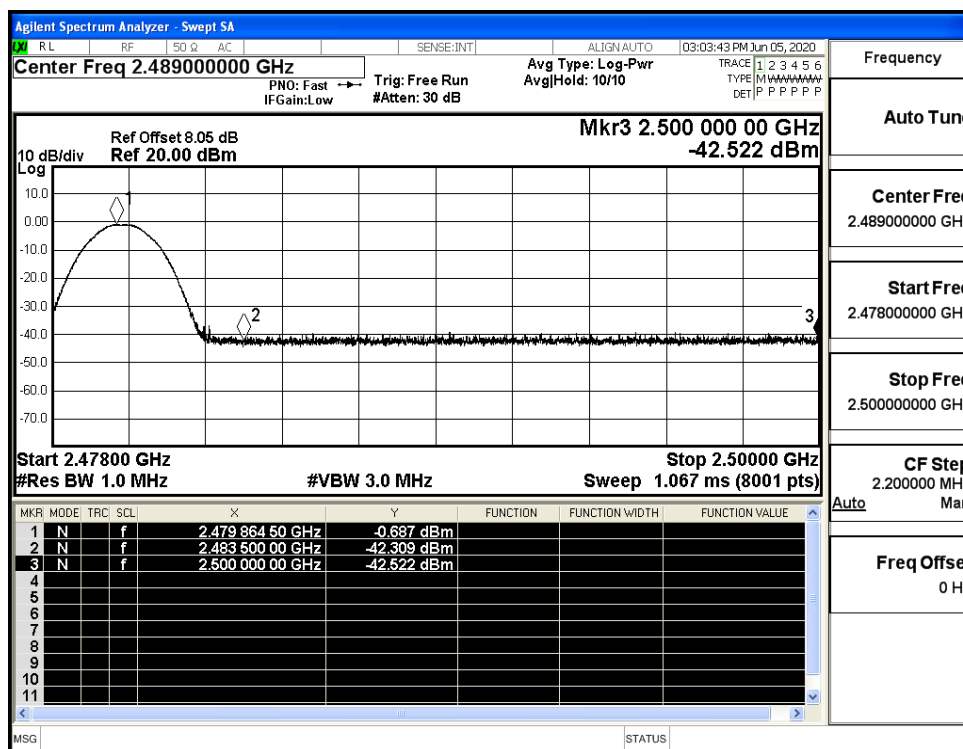
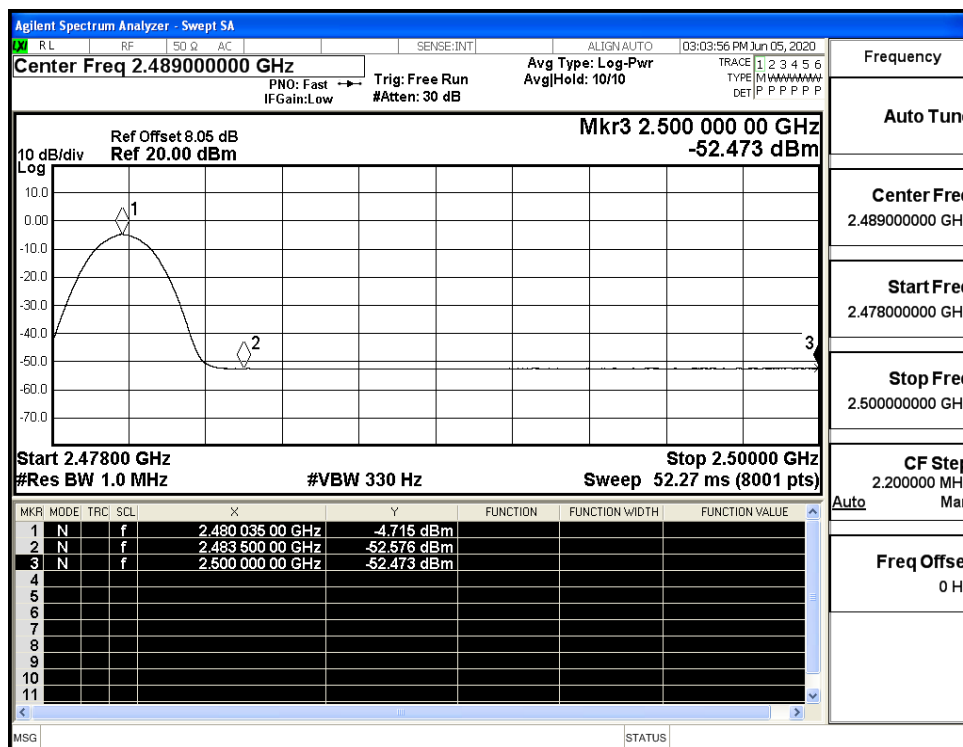


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)

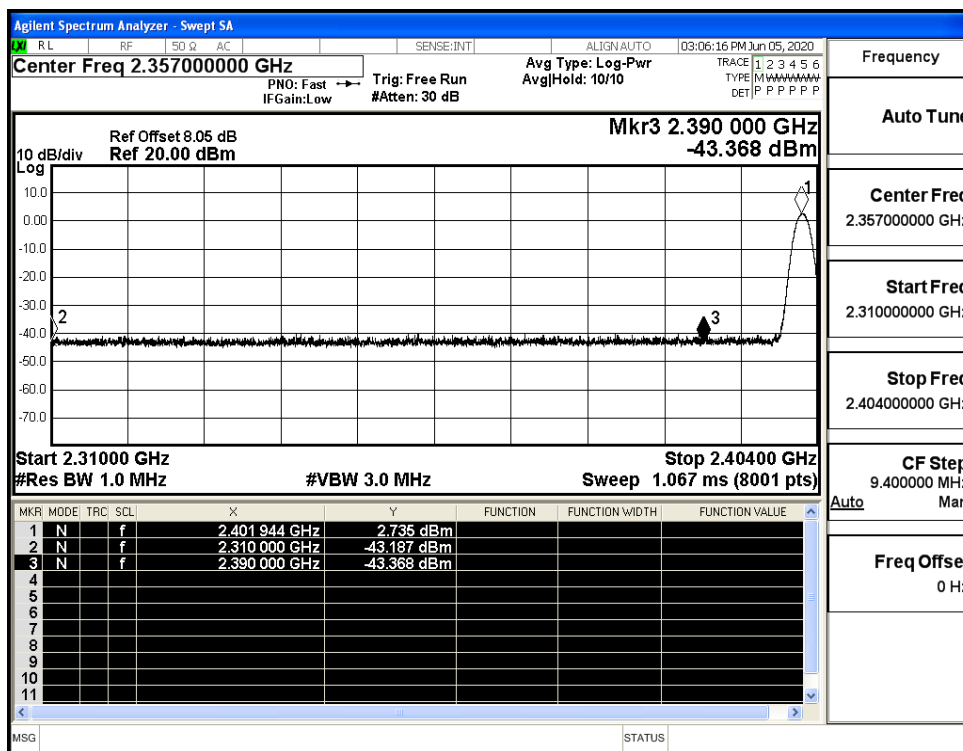


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

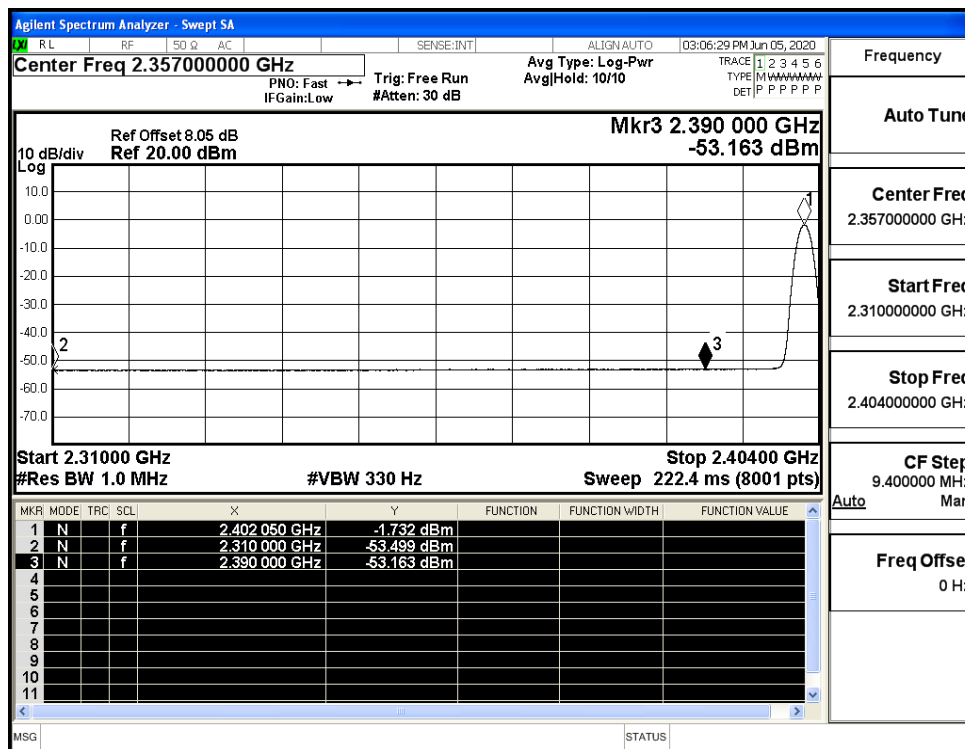


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)

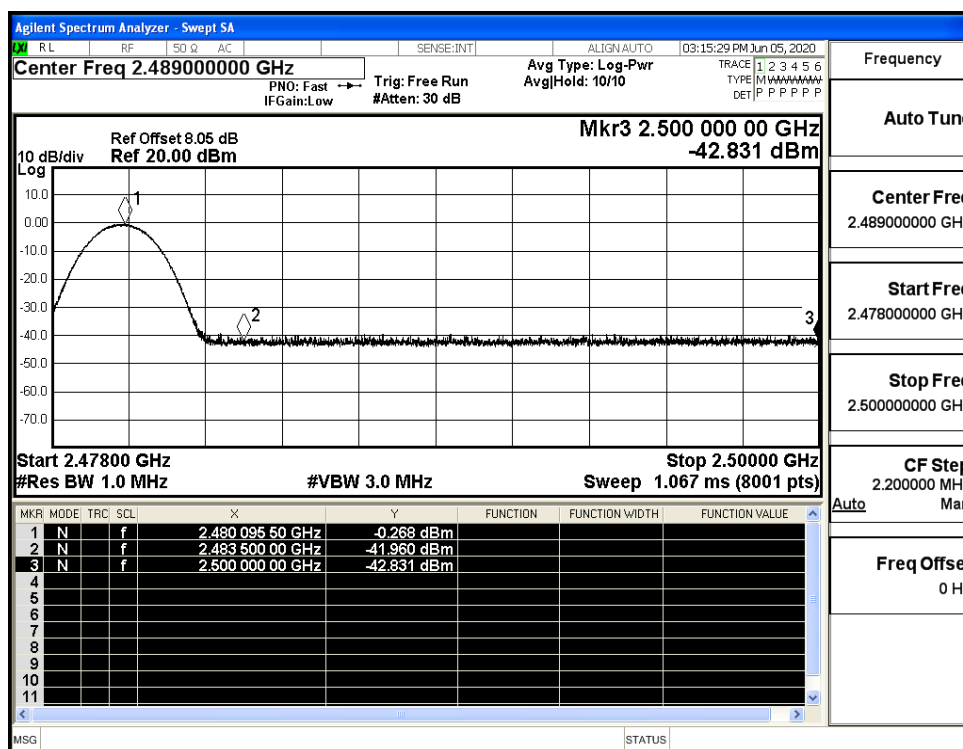
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

