

Appendix A

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

Product Name: sports bluetooth earphone

Trade Mark: TZY

Test Model: T22

Environmental Conditions

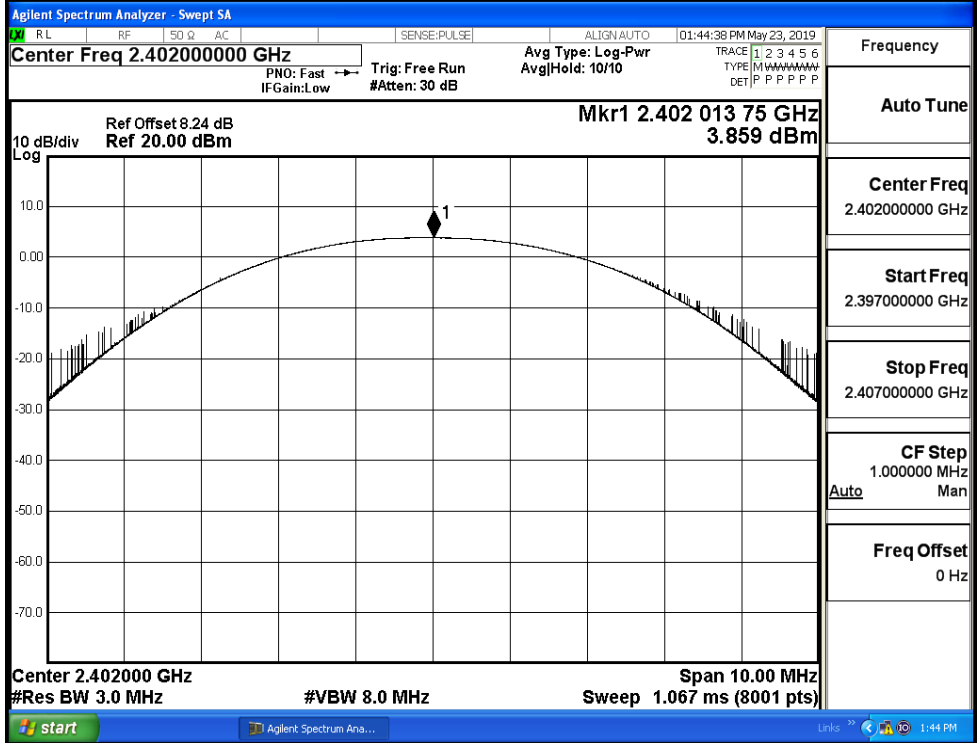
Temperature:	22.6 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	JERRY.ZENG
Supervised by:	Tom.Liu

A.1 Maxmum Conducted Peak Output Power

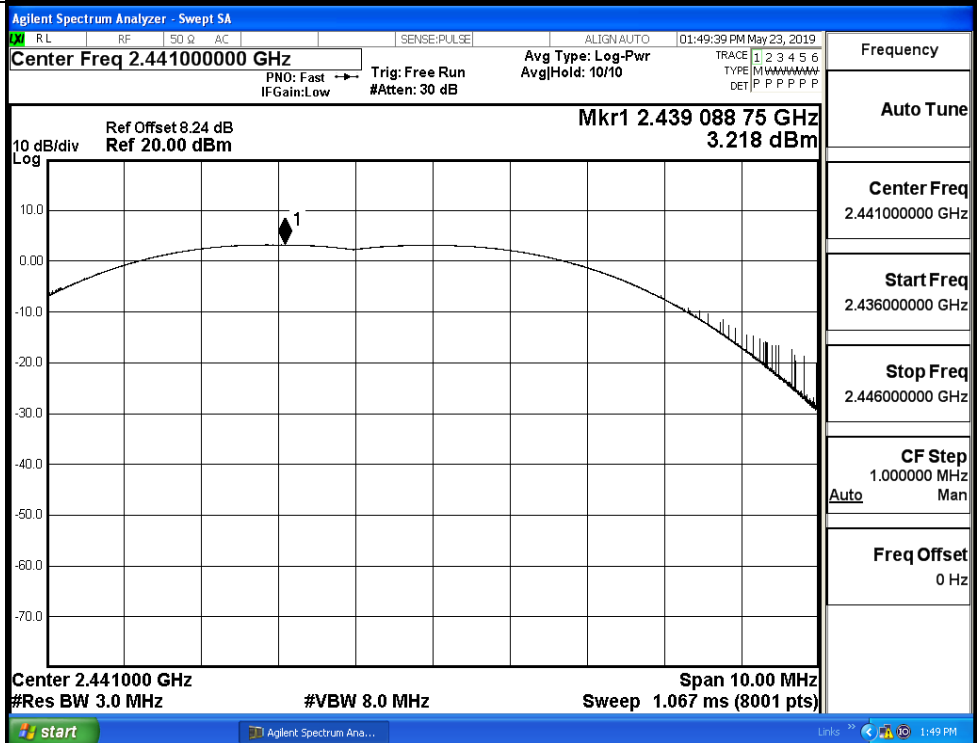
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.859	21	PASS
	MCH	3.218	21	PASS
	HCH	2.699	21	PASS
$\pi/4$ DQPSK	LCH	5.019	21	PASS
	MCH	4.845	21	PASS
	HCH	4.107	21	PASS
8DPSK	LCH	6.007	21	PASS
	MCH	5.304	21	PASS
	HCH	4.767	21	PASS

Test Graphs

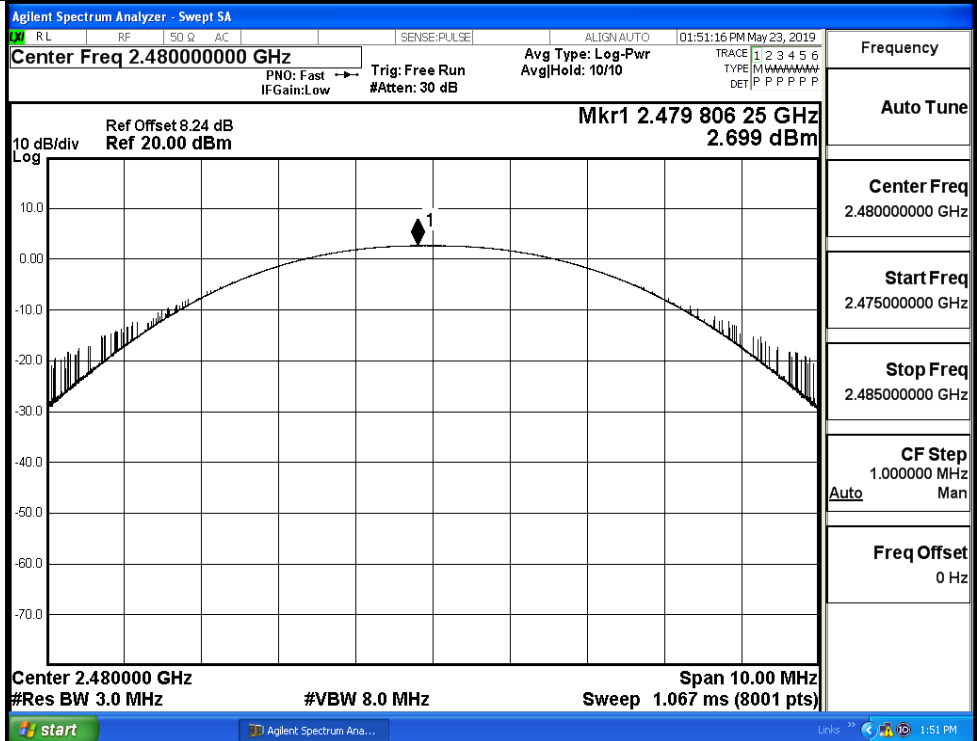
GFSK/LCH



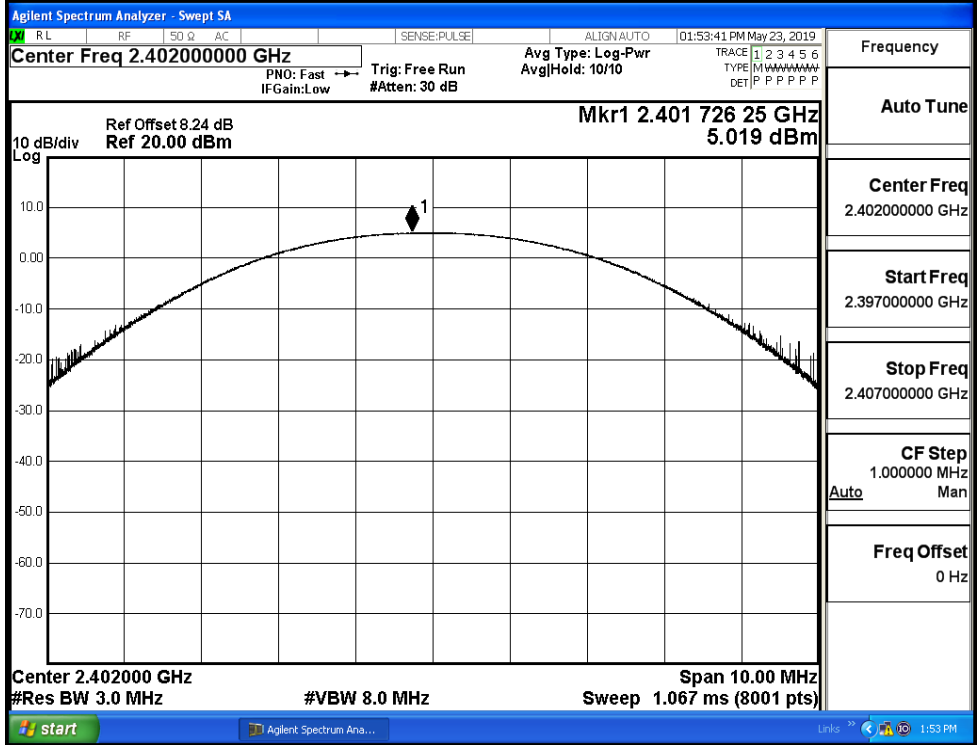
GFSK/MCH



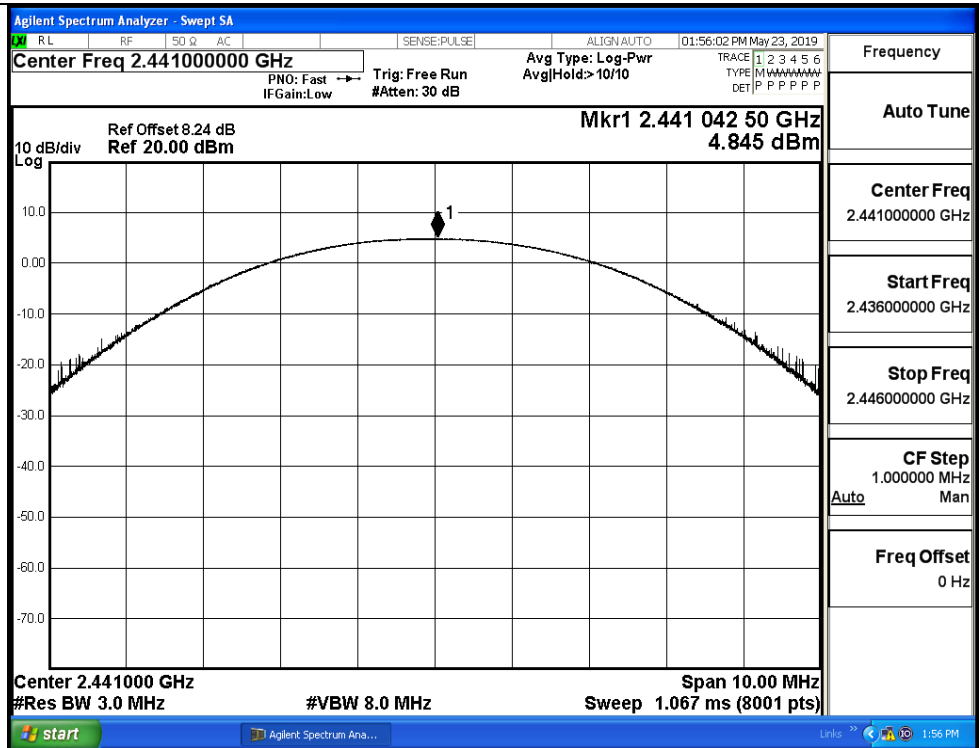
GFSK/HCH



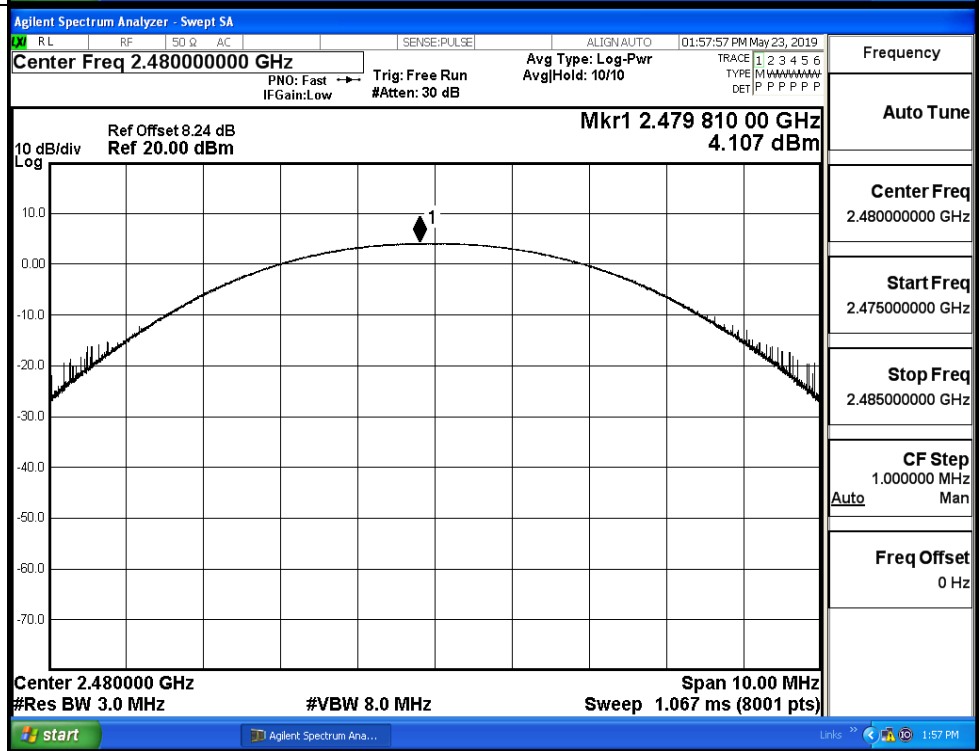
π /4DQPSK/LCH



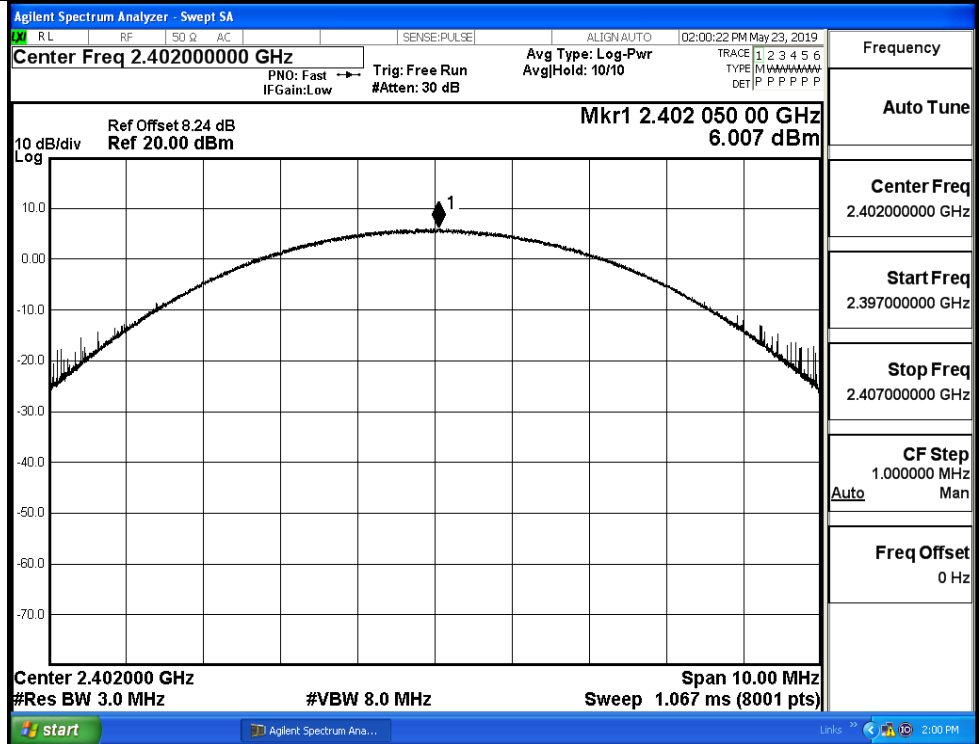
$\pi/4$ DQPSK/MCH



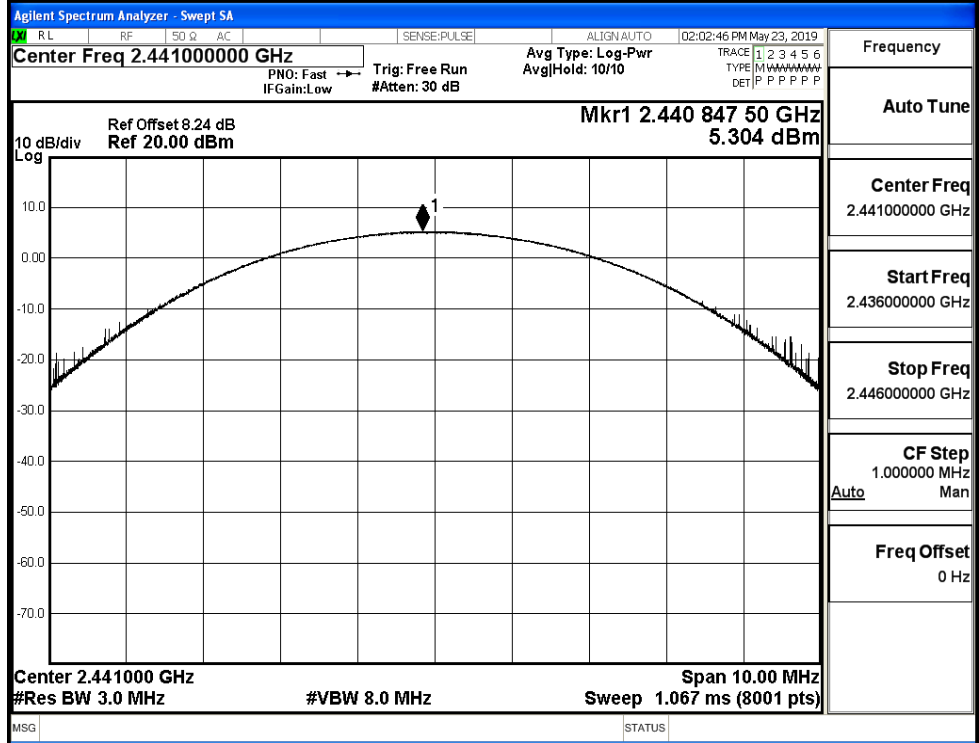
$\pi/4$ DQPSK/HCH



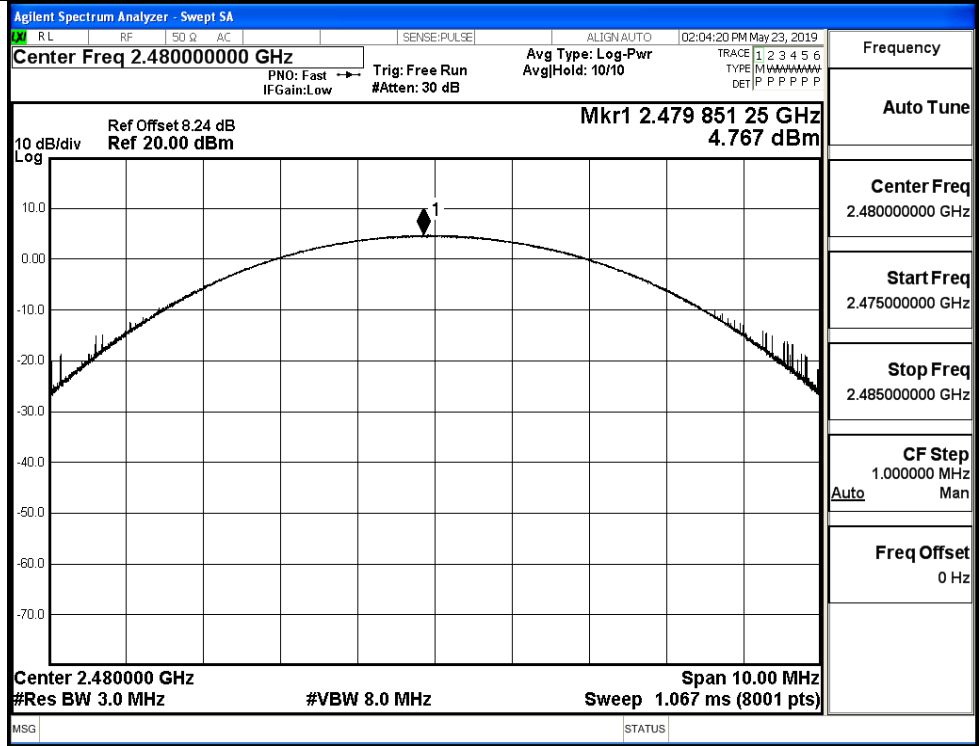
8DPSK/LCH



8DPSK/MCH

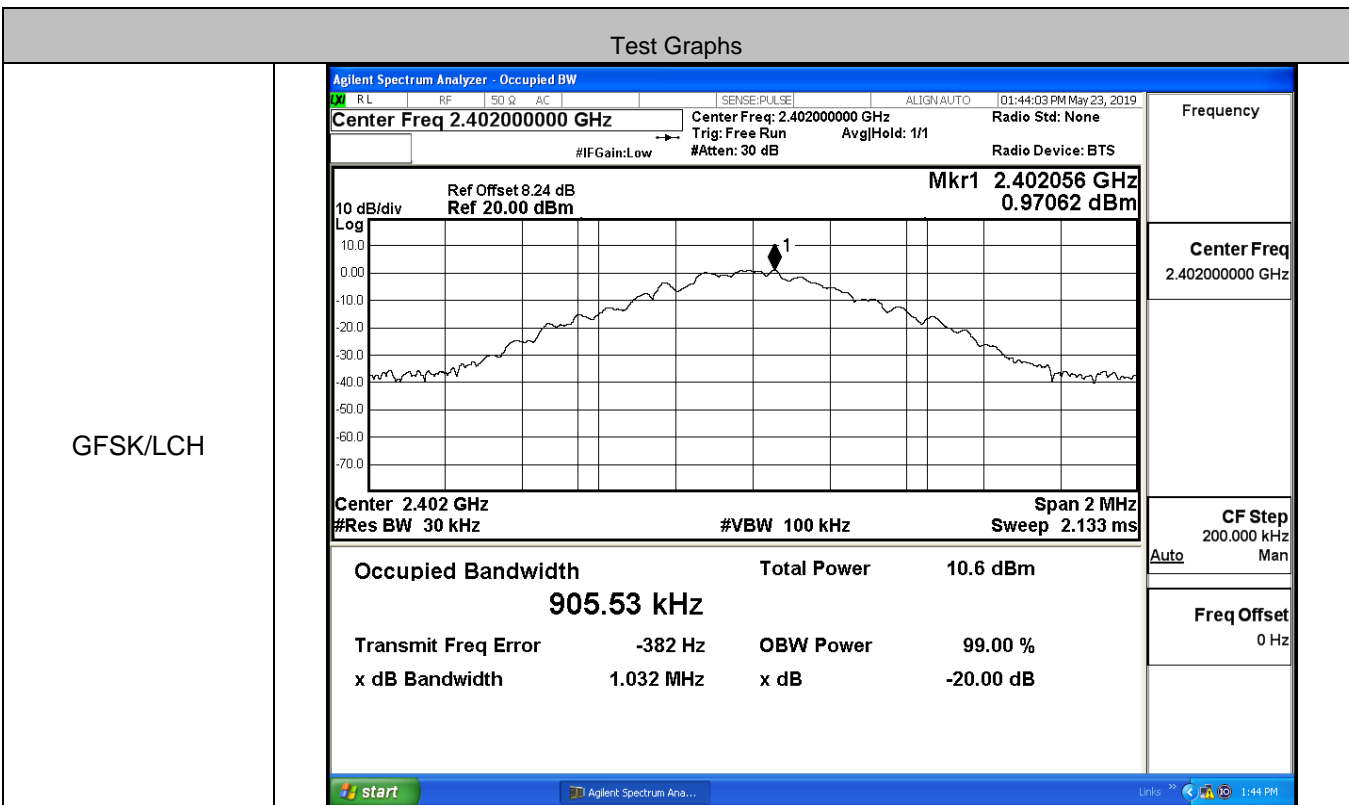


8DPSK/HCH

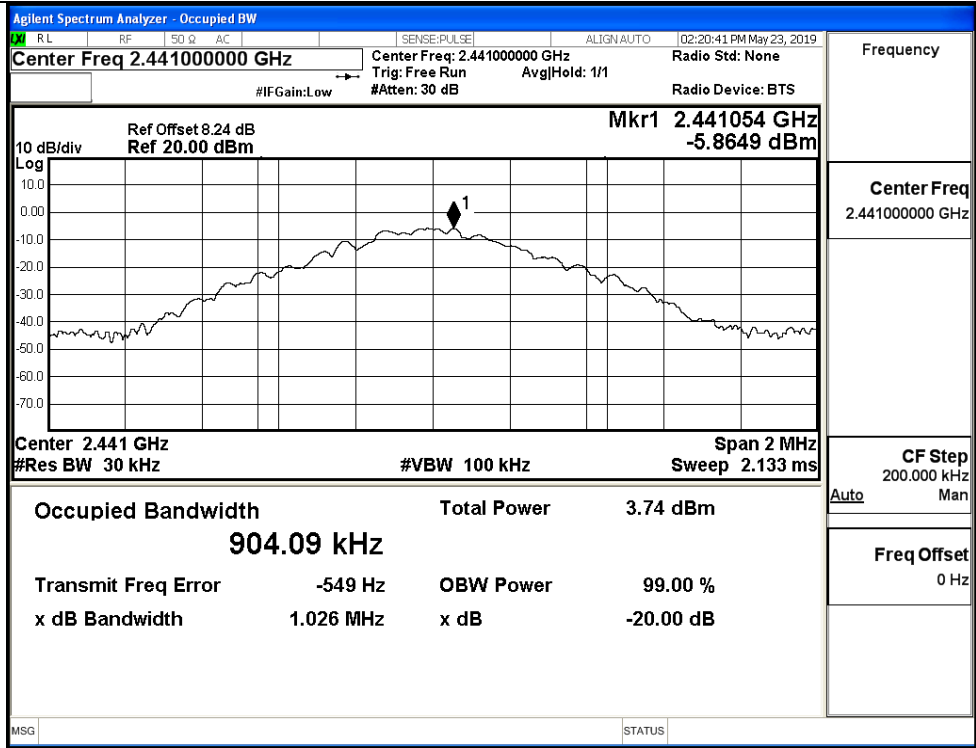


A.2 20dB Bandwidth

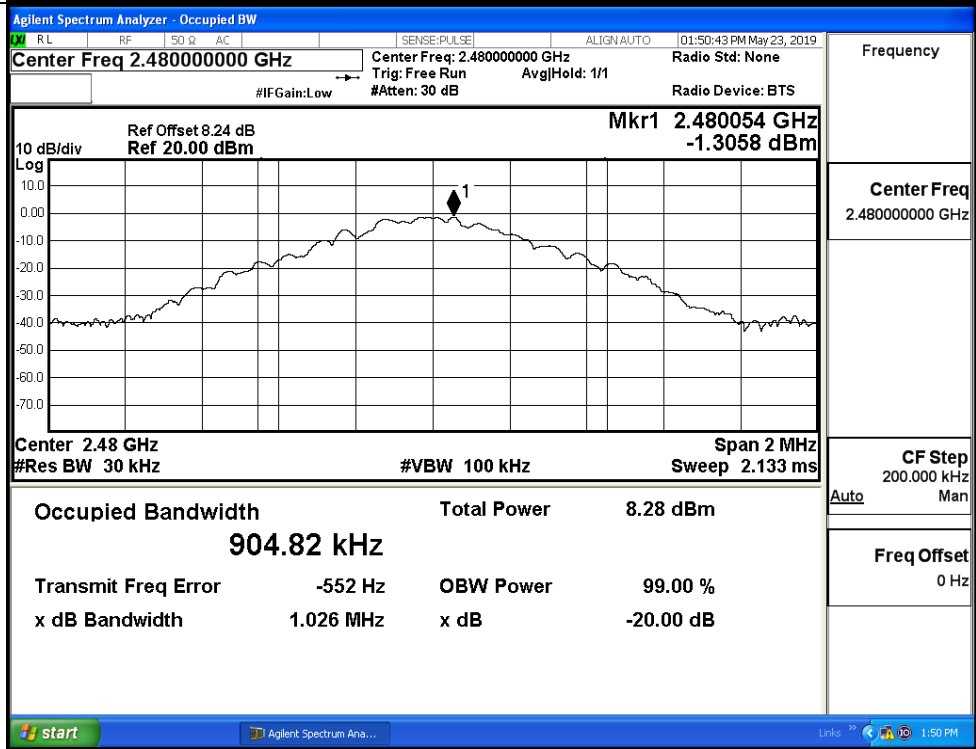
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.032	Not Specified	PASS
	MCH	1.026	Not Specified	PASS
	HCH	1.026	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.383	Not Specified	PASS
	MCH	1.381	Not Specified	PASS
	HCH	1.372	Not Specified	PASS
8DPSK	LCH	1.357	Not Specified	PASS
	MCH	1.360	Not Specified	PASS
	HCH	1.357	Not Specified	PASS



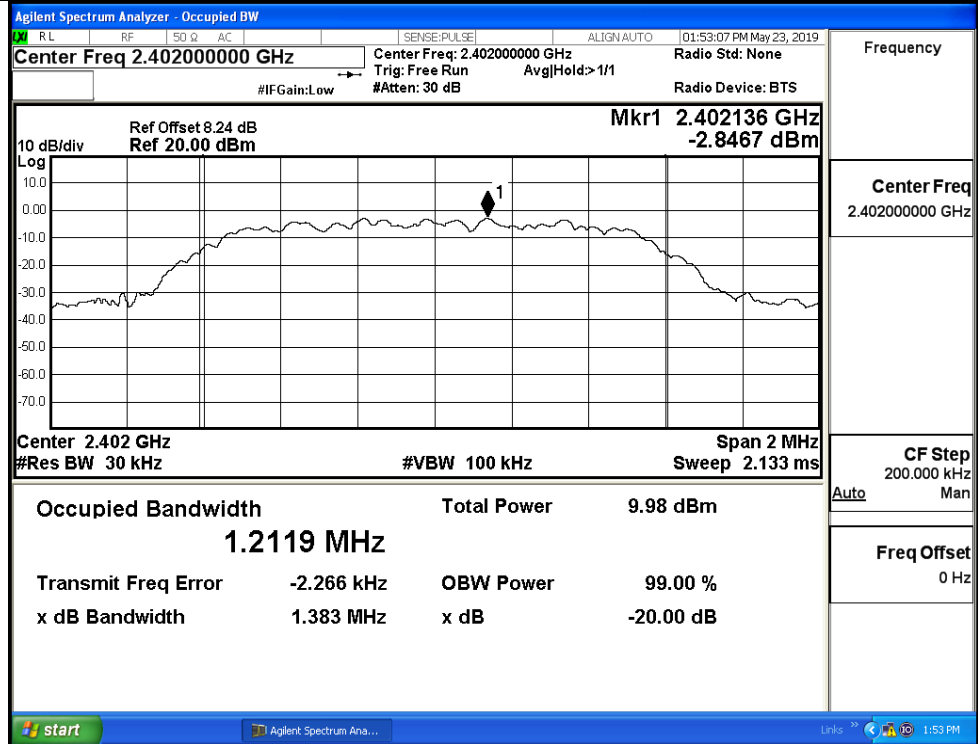
GFSK/MCH



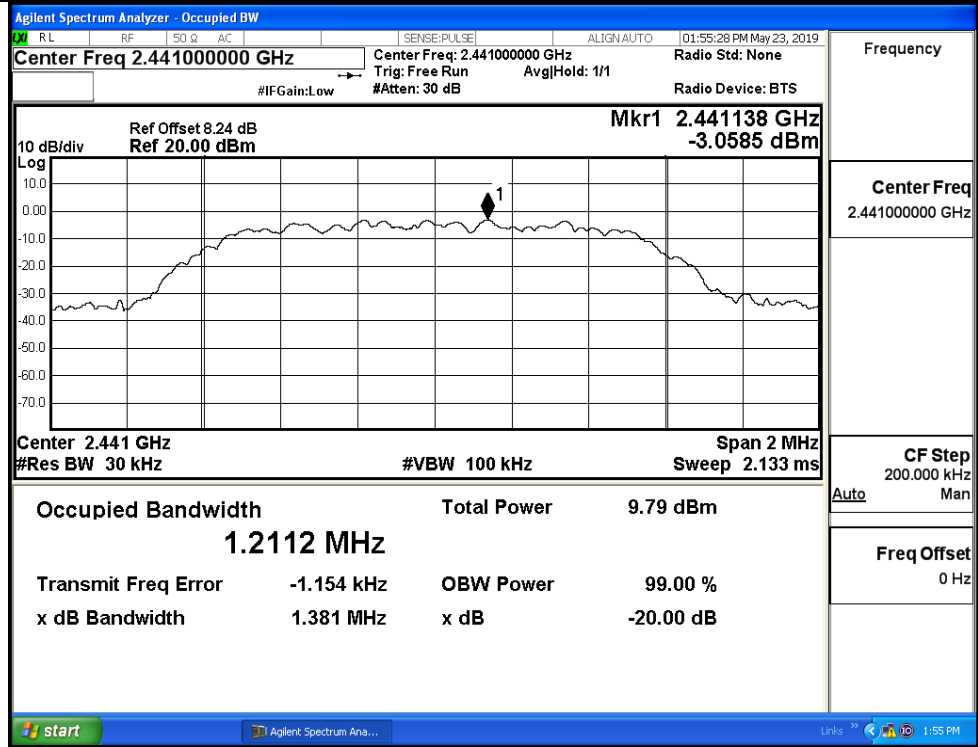
GFSK/HCH



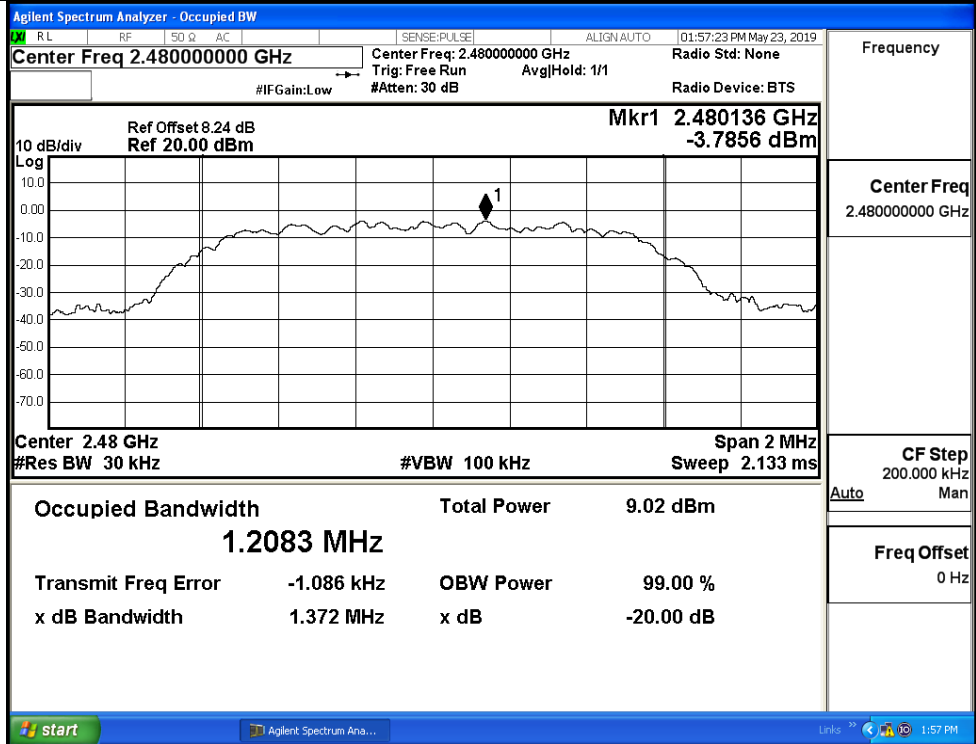
$\pi/4$ DQPSK/LCH



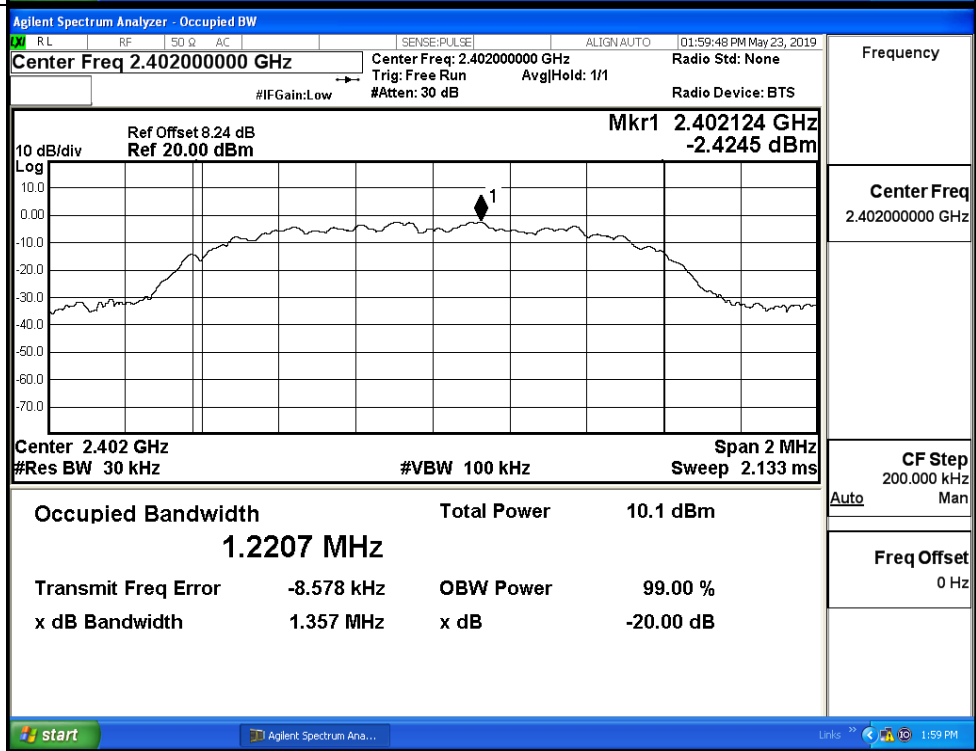
$\pi/4$ DQPSK/MCH



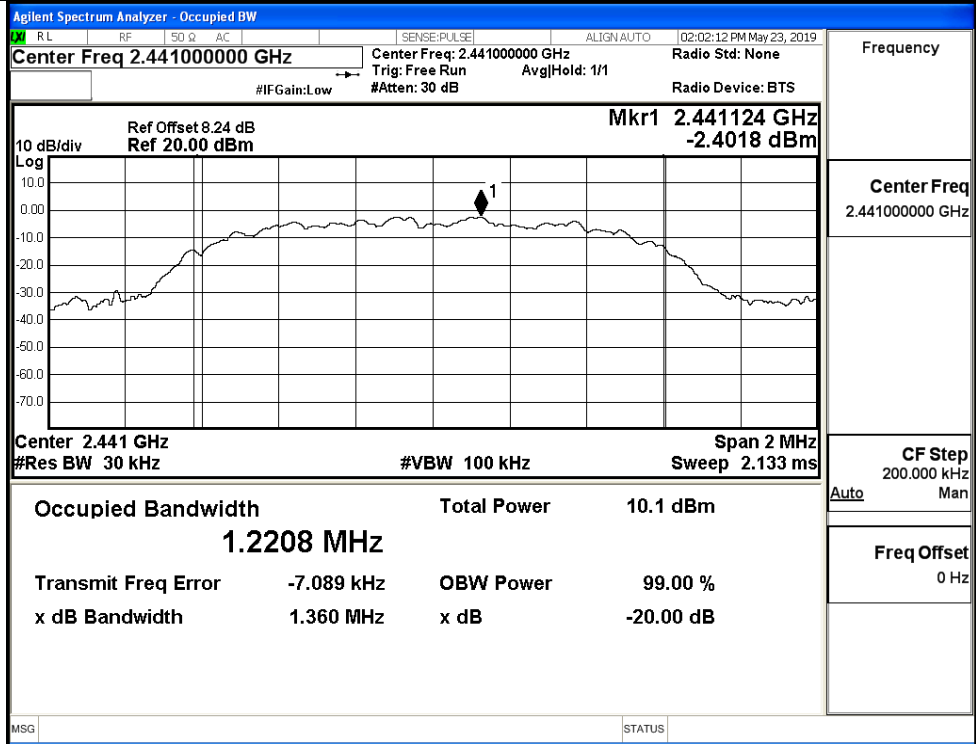
$\pi/4$ DQPSK/HCH



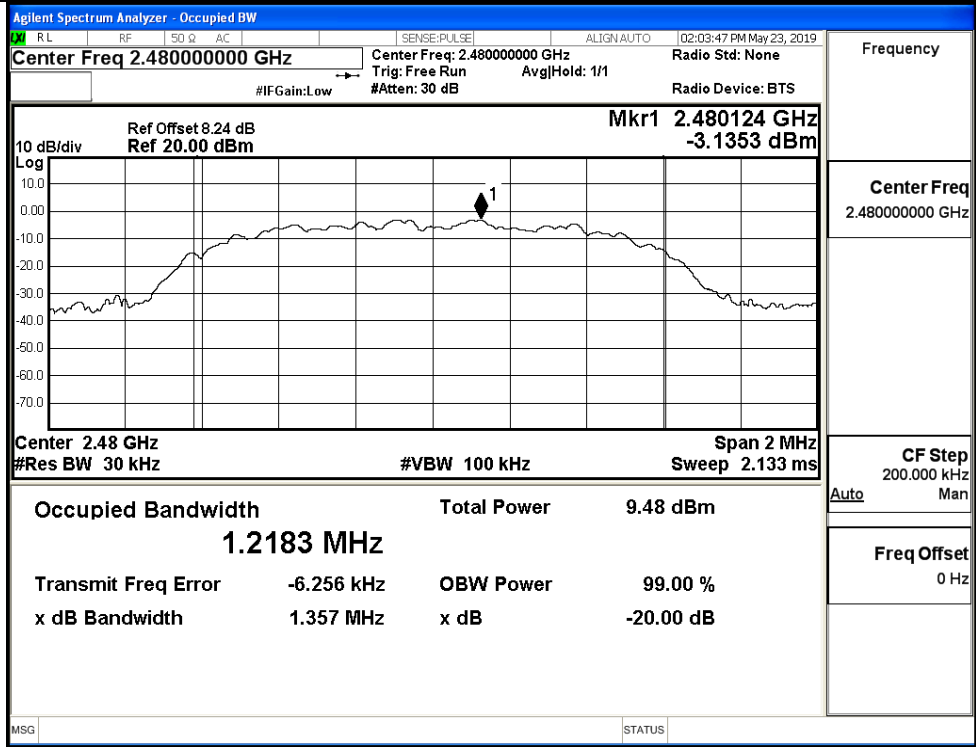
8DPSK/LCH



8DPSK/MCH

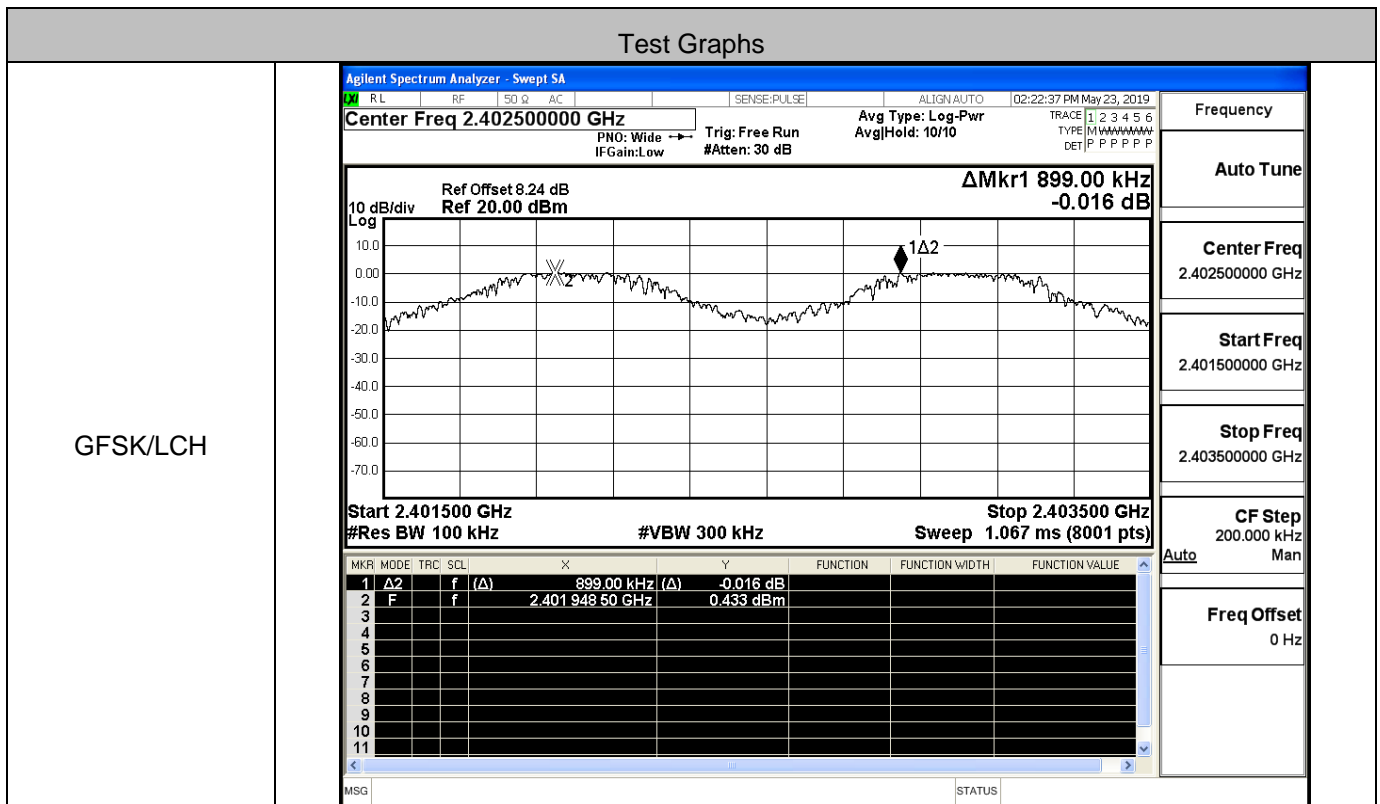


8DPSK/HCH

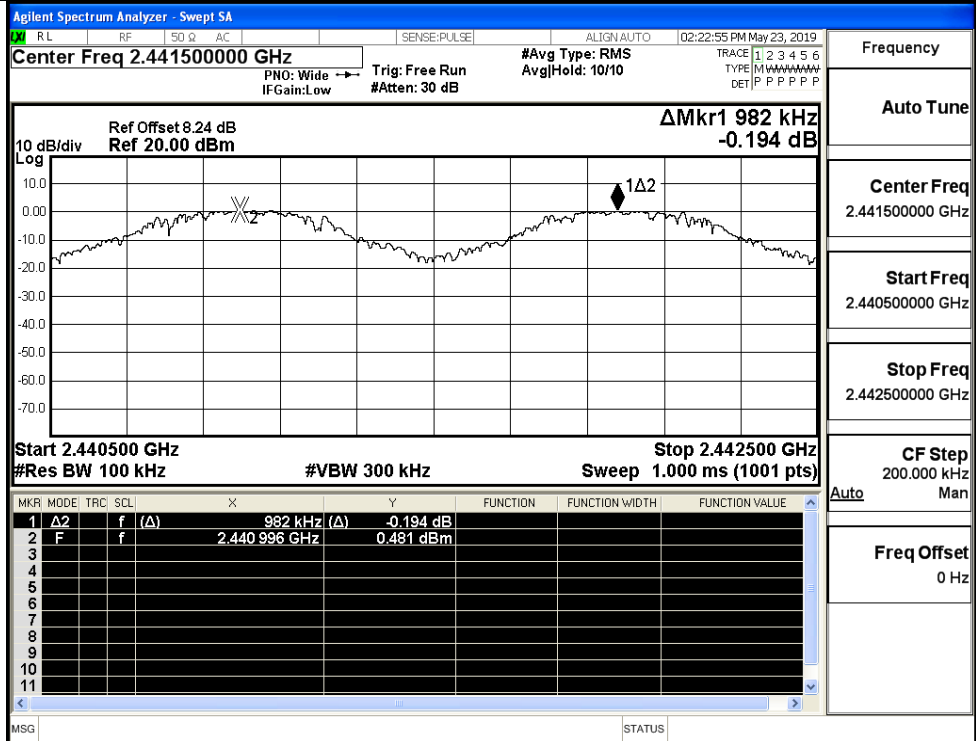


A.3 Carrier Frequency Separation

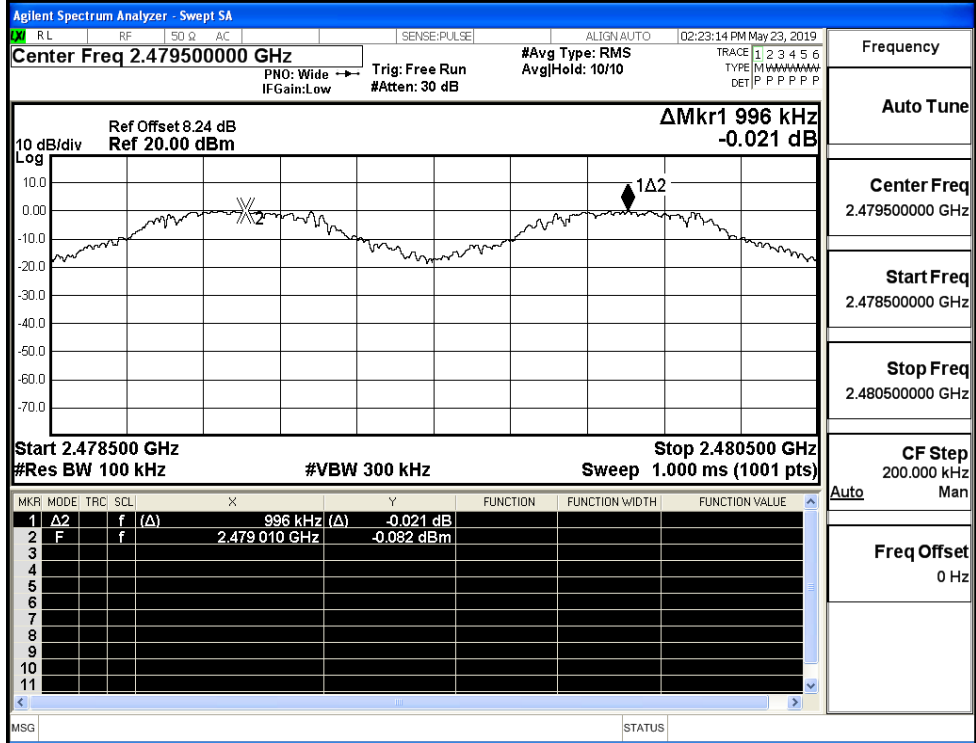
Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.899	0.688	PASS
	MCH	0.982	0.688	PASS
	HCH	0.996	0.688	PASS
π/4DQPSK	LCH	1.010	0.922	PASS
	MCH	1.010	0.922	PASS
	HCH	1.012	0.922	PASS
8DPSK	LCH	1.010	0.907	PASS
	MCH	0.998	0.907	PASS
	HCH	1.022	0.907	PASS



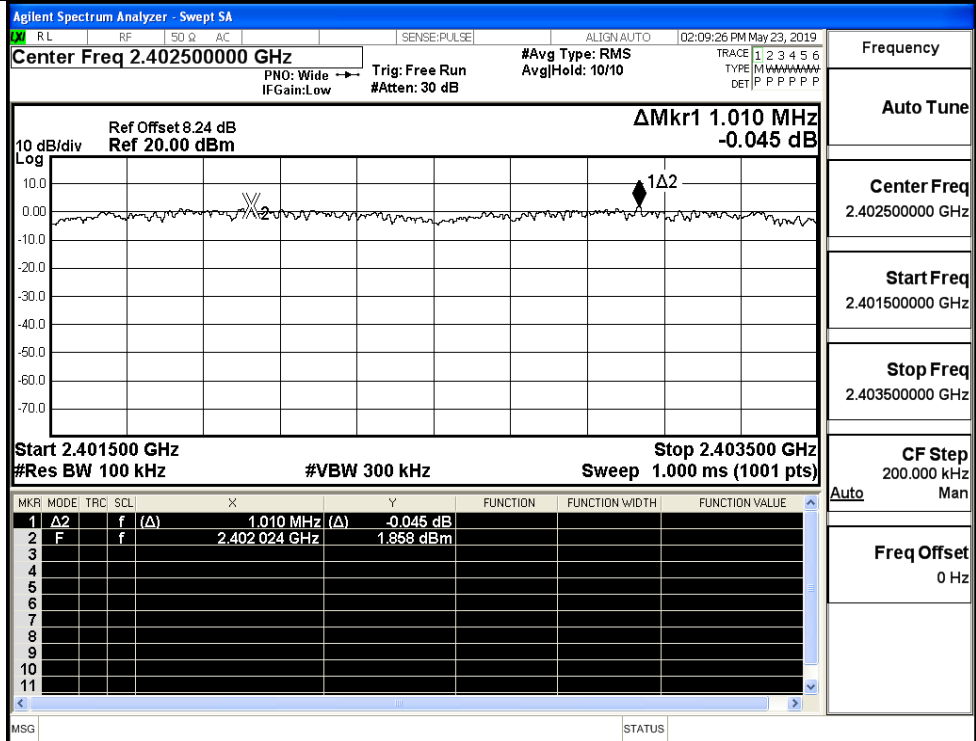
GFSK/MCH



GFSK/HCH

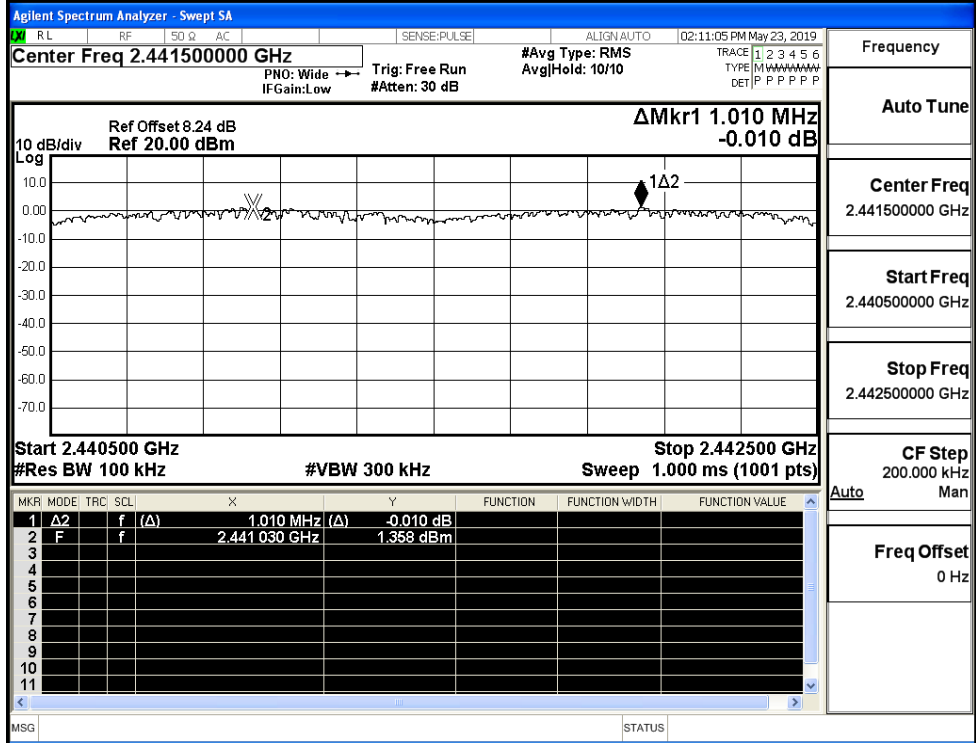


$\pi/4$ DQPSK/LCH



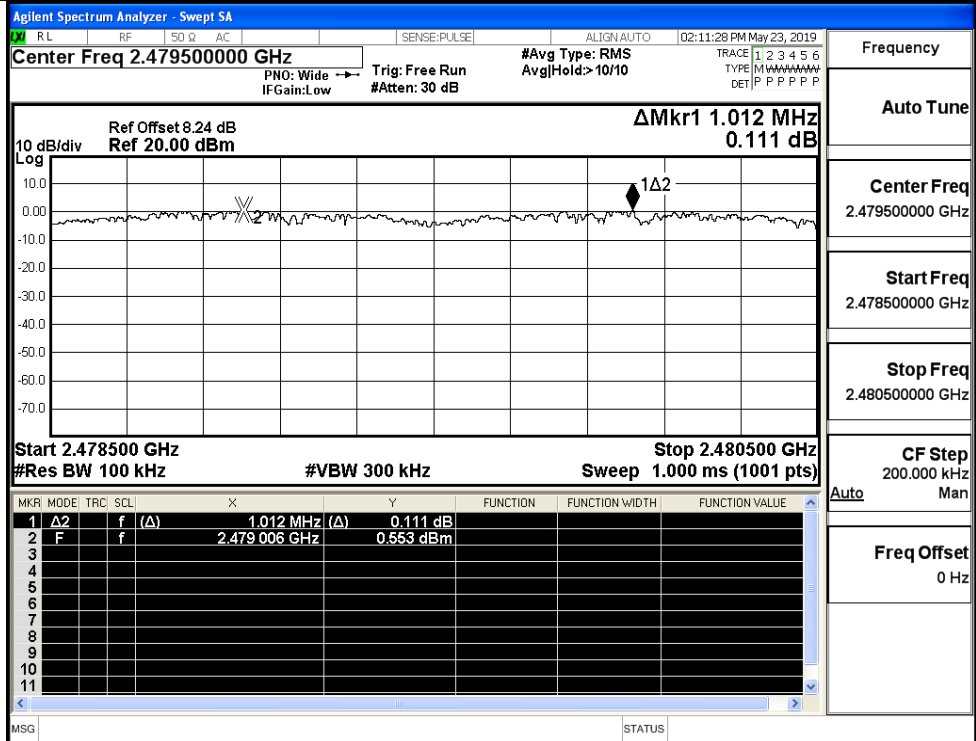
Frequency
Auto Tune
Center Freq
2.402500000 GHz
Start Freq
2.401500000 GHz
Stop Freq
2.403500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

$\pi/4$ DQPSK/MCH



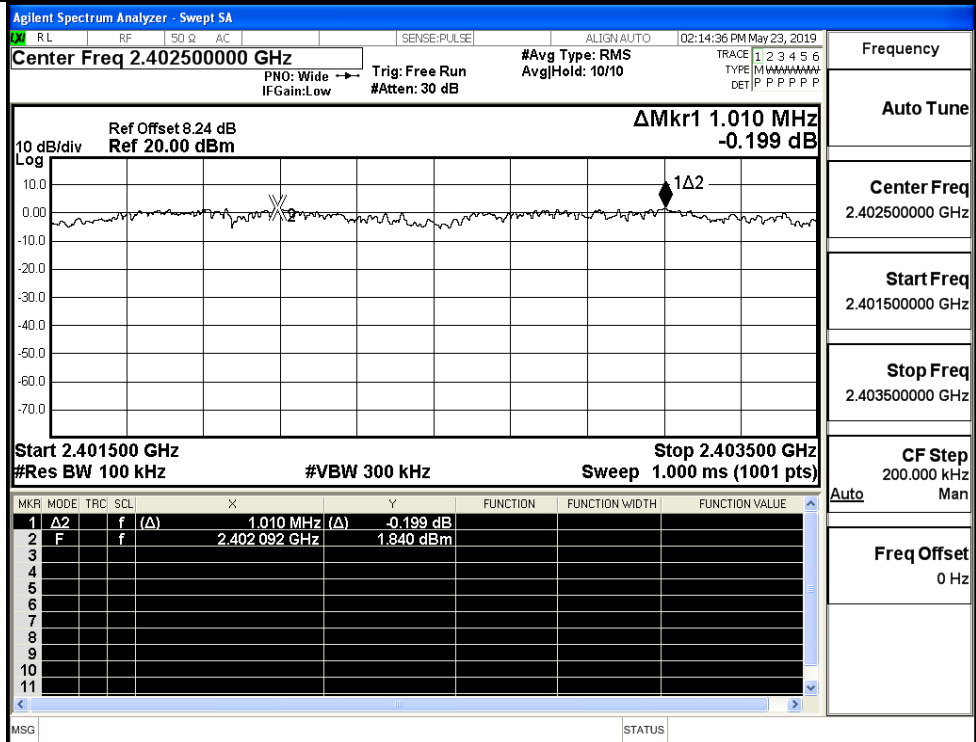
Frequency
Auto Tune
Center Freq
2.441500000 GHz
Start Freq
2.440500000 GHz
Stop Freq
2.442500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

π/4DQPSK/HCH



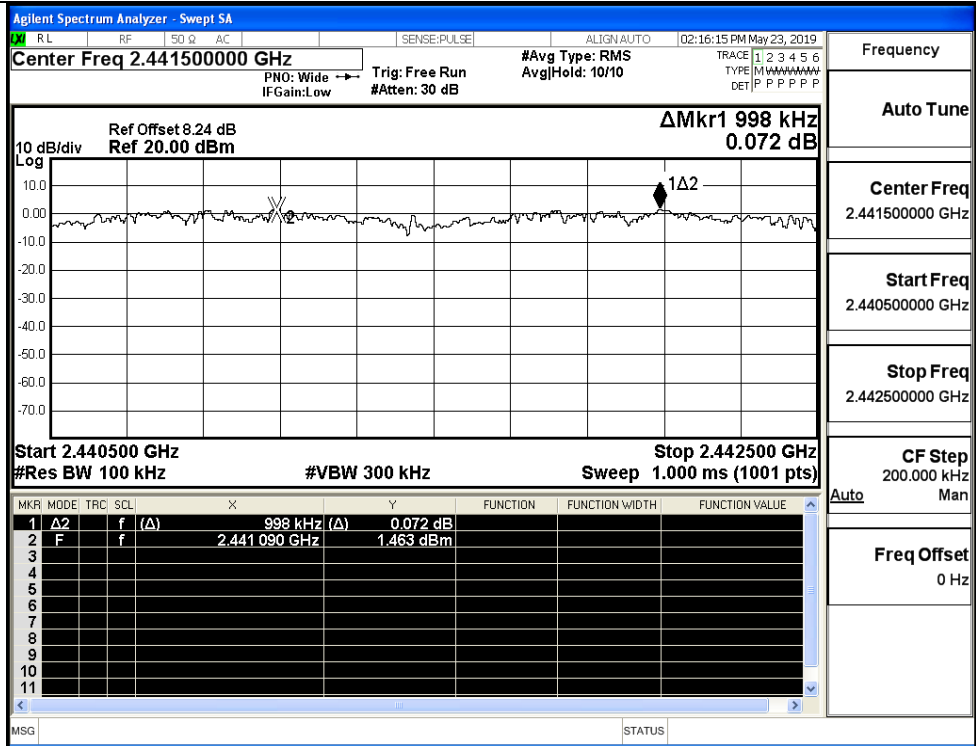
Frequency
Auto Tune
Center Freq
2.479500000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.480500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

8DPSK/LCH

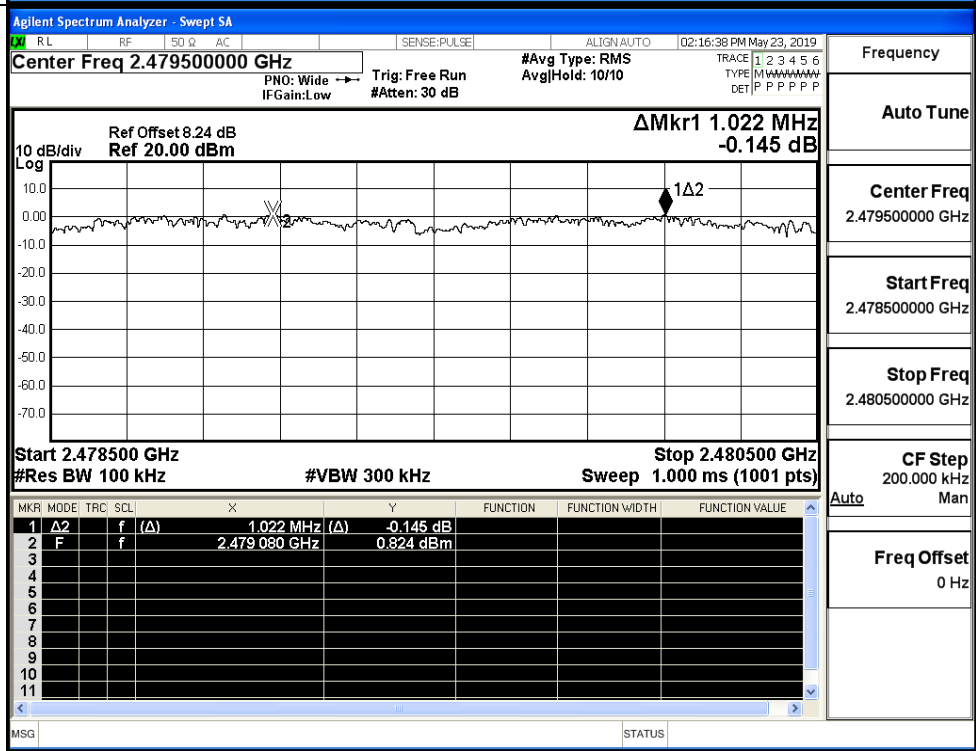


Frequency
Auto Tune
Center Freq
2.402500000 GHz
Start Freq
2.401500000 GHz
Stop Freq
2.403500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

8DPSK/MCH



8DPSK/HCH

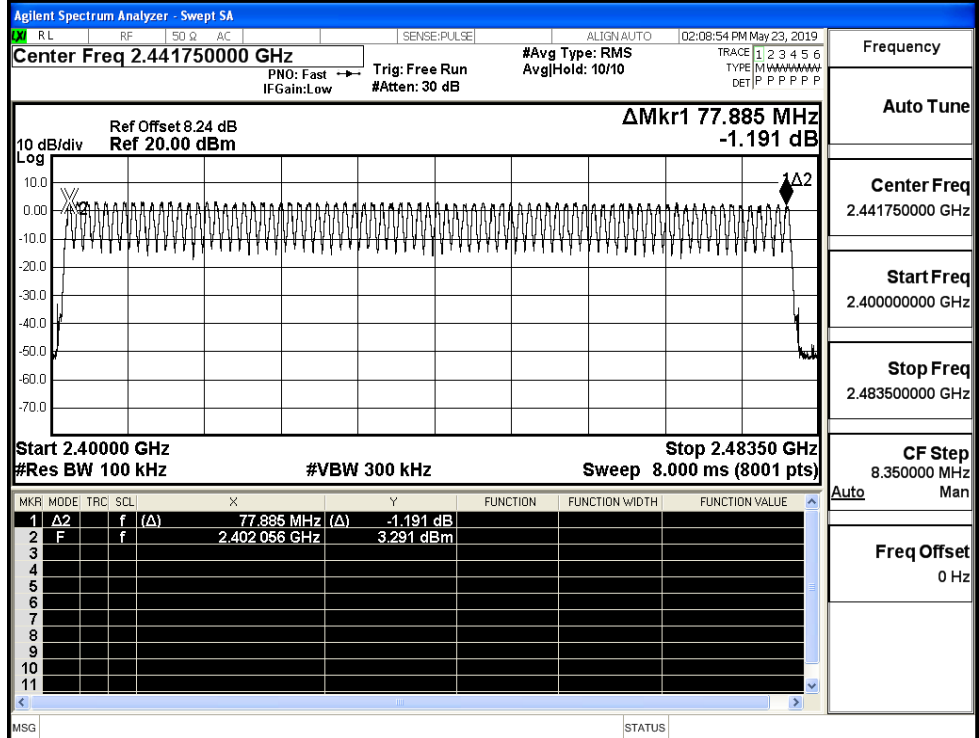


A.4 Hopping Channel Number

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

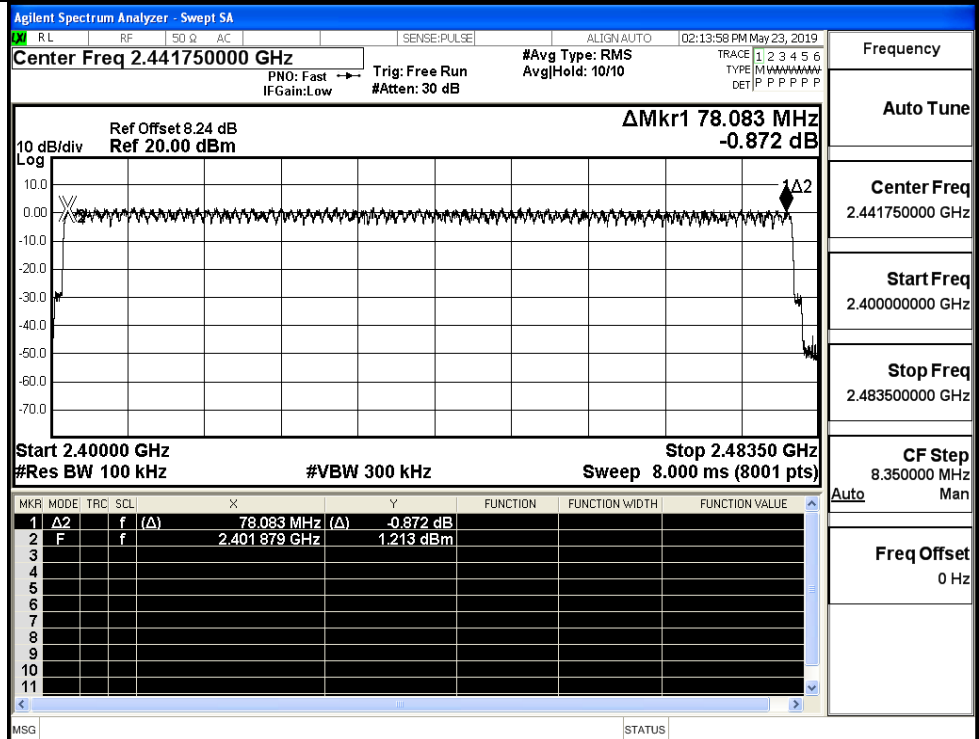
Test Graphs

GFSK/Hop



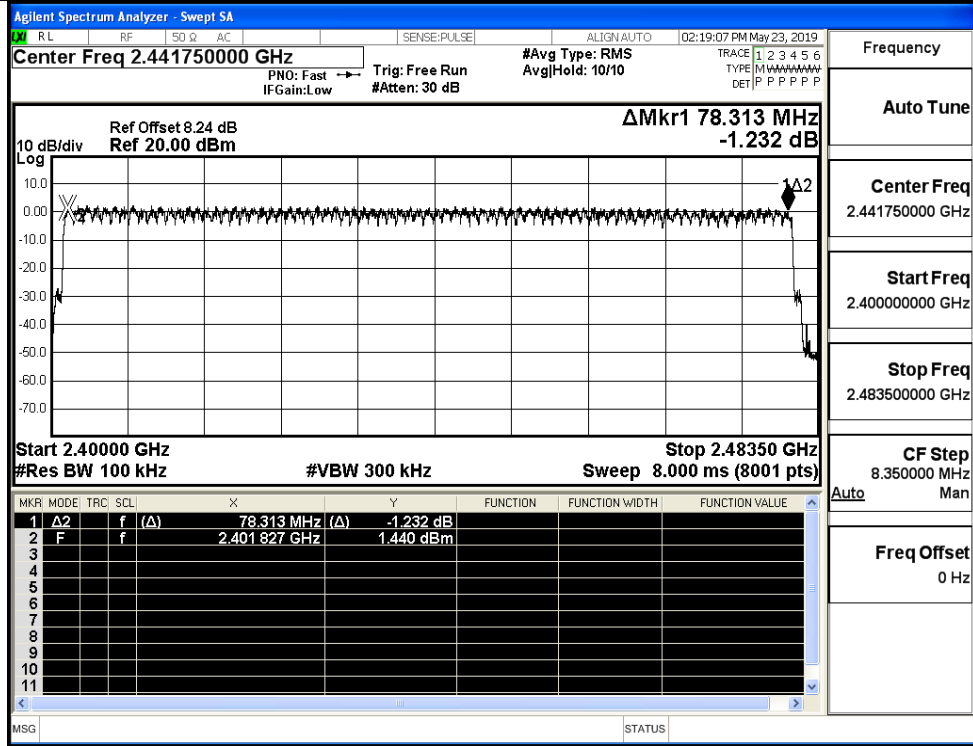
Frequency
Auto Tune
Center Freq 2.441750000 GHz
Start Freq 2.400000000 GHz
Stop Freq 2.483500000 GHz
CF Step 8.350000 MHz
Auto Man
Freq Offset 0 Hz

$\pi/4$ DQPSK/Hop



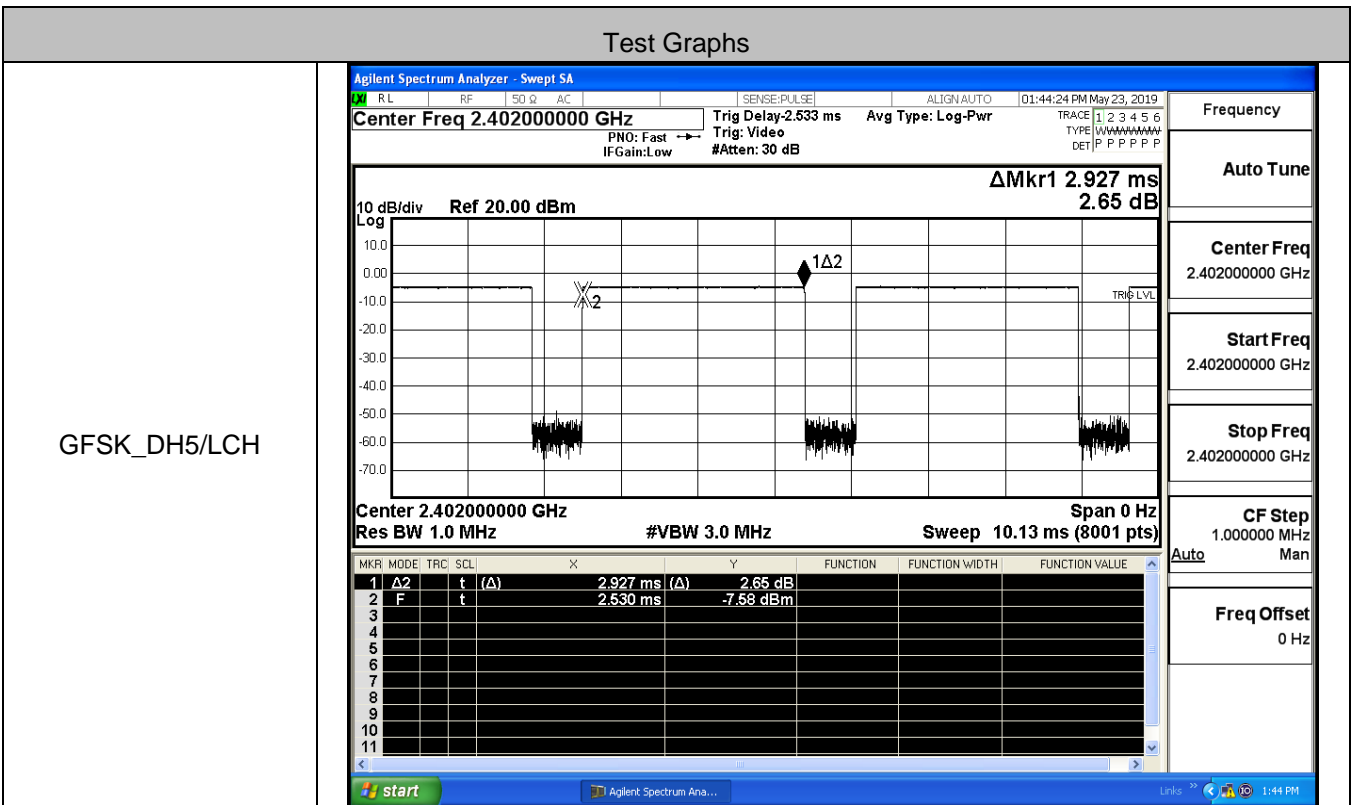
Frequency
Auto Tune
Center Freq 2.441750000 GHz
Start Freq 2.400000000 GHz
Stop Freq 2.483500000 GHz
CF Step 8.350000 MHz
Auto Man
Freq Offset 0 Hz

8DPSK/Hop

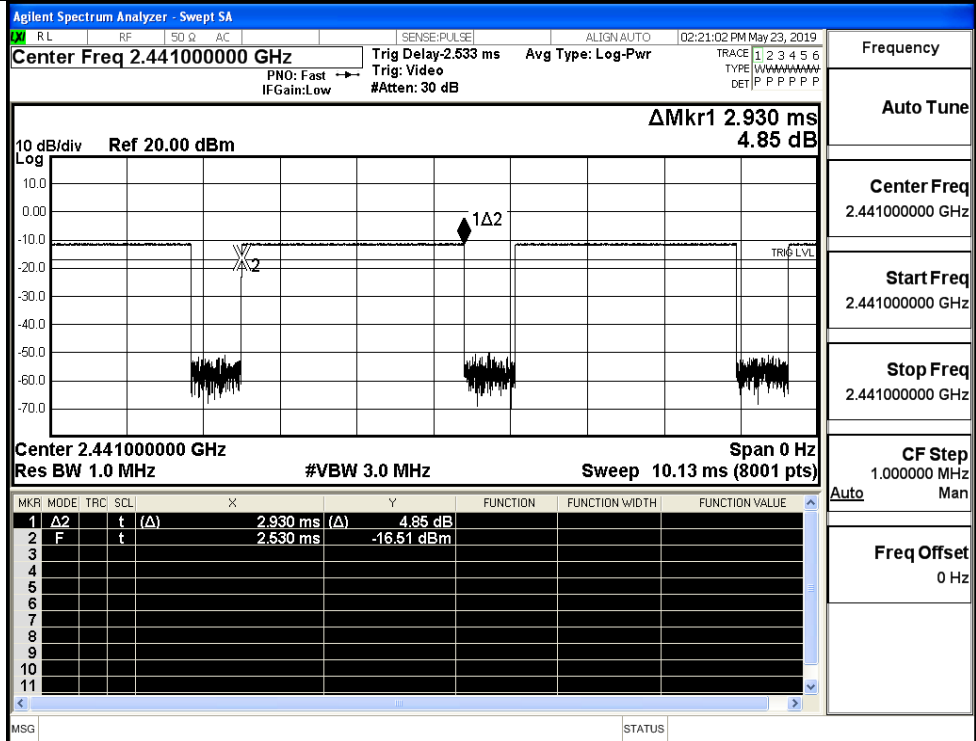


A.5 Dwell Time

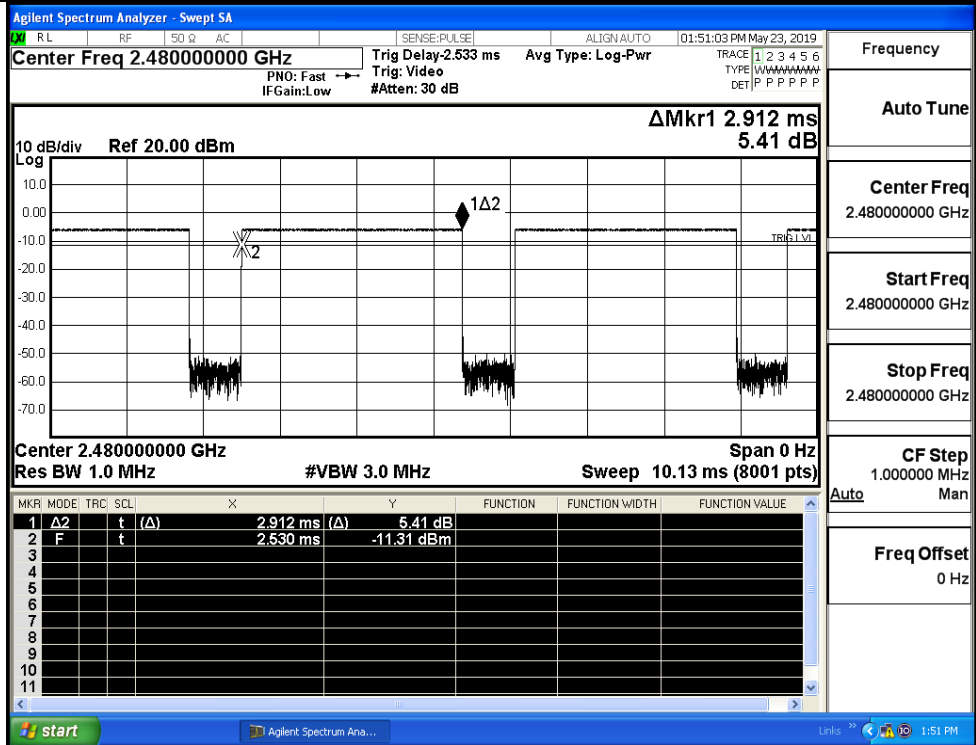
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.93	106.7	0.313	0.4	PASS
	DH5	MCH	2.93	106.7	0.313	0.4	PASS
	DH5	HCH	2.91	106.7	0.31	0.4	PASS
π/4DQPSK	2DH5	LCH	2.93	106.7	0.312	0.4	PASS
	2DH5	MCH	2.93	106.7	0.313	0.4	PASS
	2DH5	HCH	2.91	106.7	0.312	0.4	PASS
8DPSK	3DH5	LCH	2.93	106.7	0.312	0.4	PASS
	3DH5	MCH	2.93	106.7	0.312	0.4	PASS
	3DH5	HCH	2.91	106.7	0.313	0.4	PASS



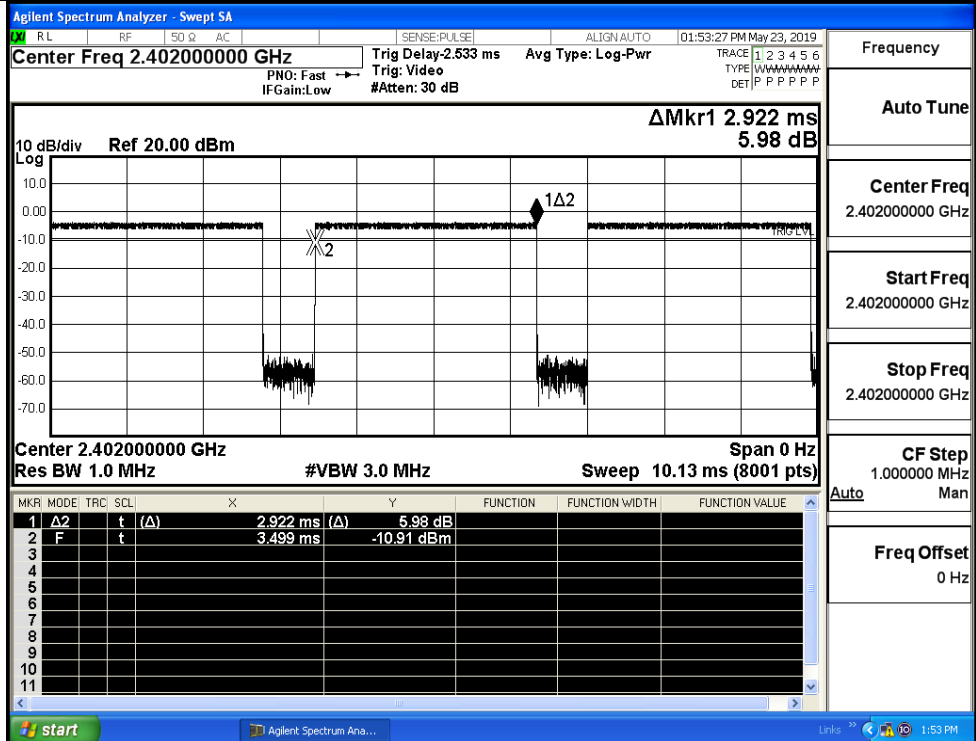
GFSK_DH5/MCH



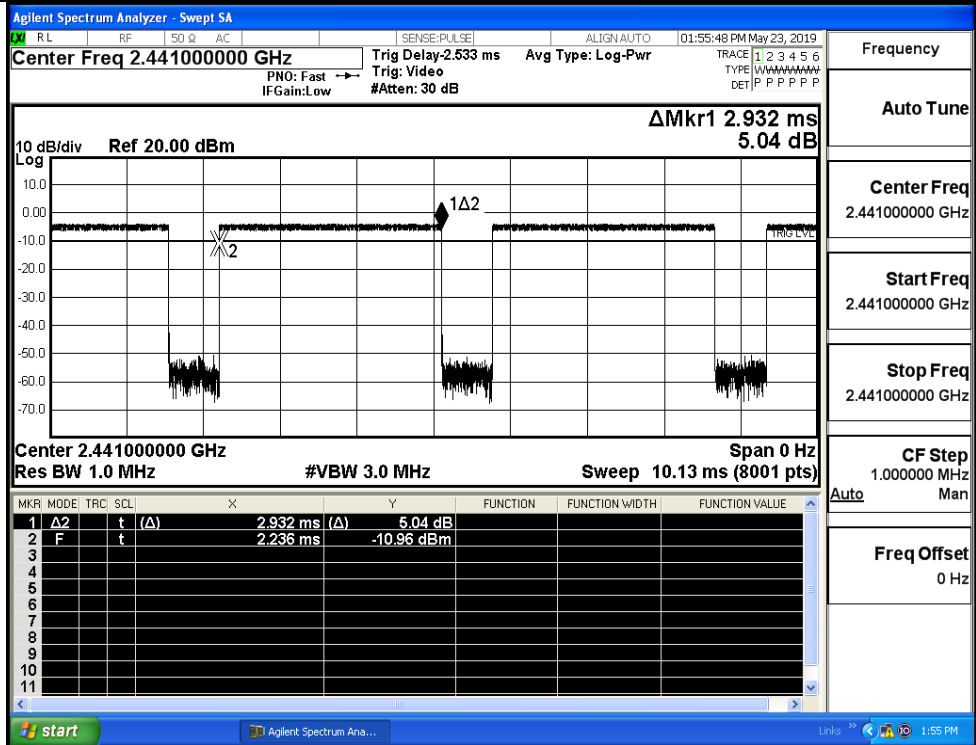
GFSK_DH5/HCH



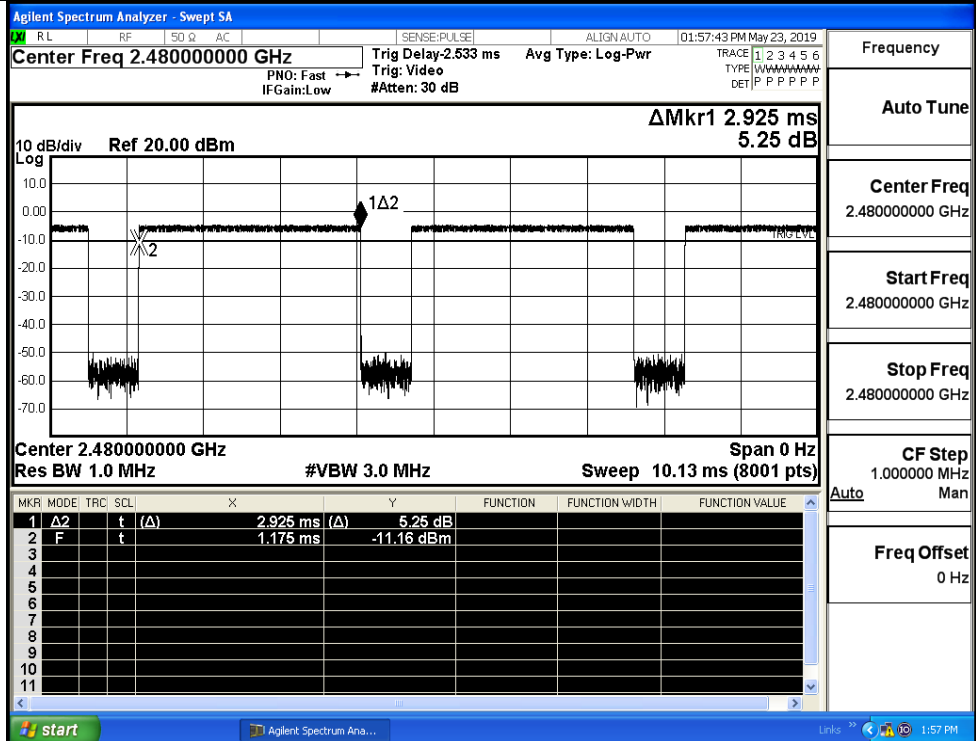
$\pi/4$ DQPSK
_2DH5/LCH



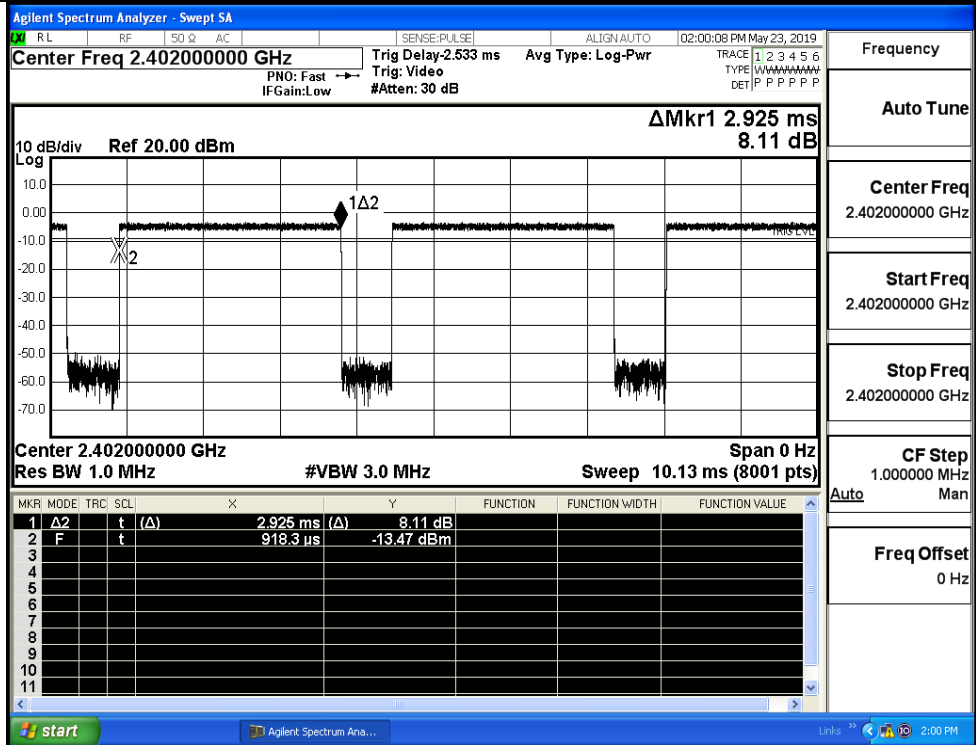
$\pi/4$ DQPSK
_2DH5/MCH



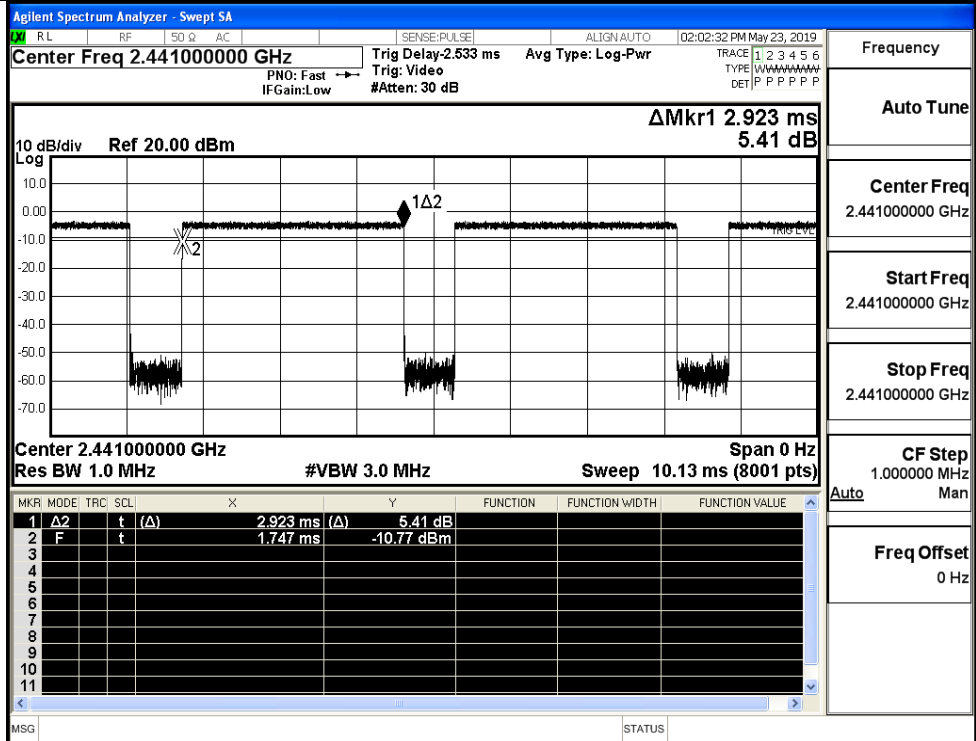
$\pi/4$ DQPSK
_2DH5/HCH



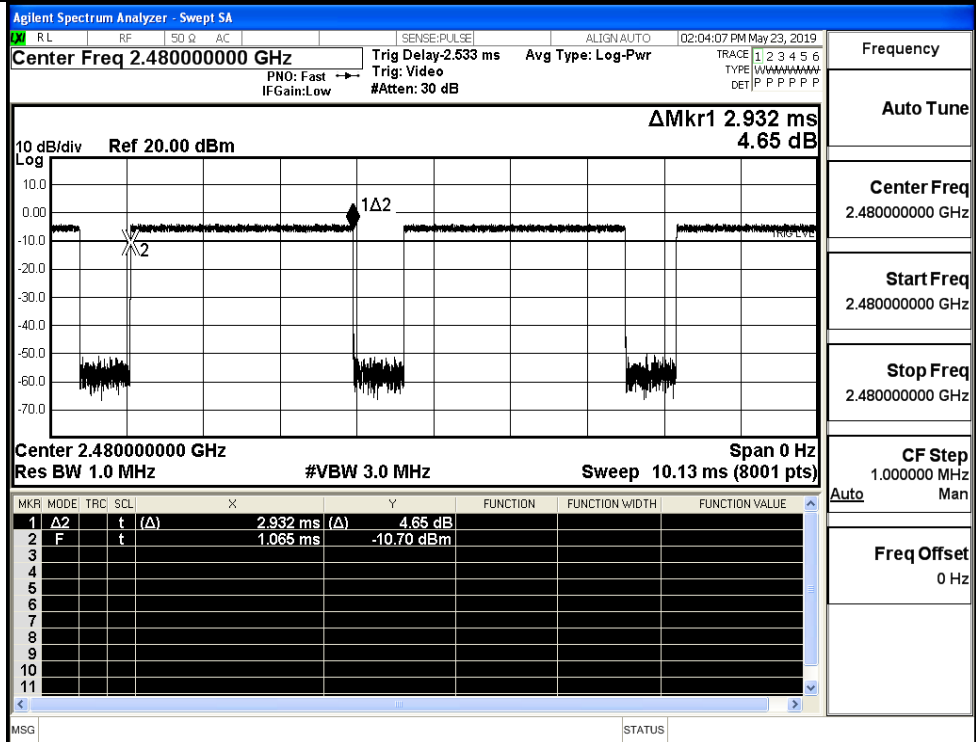
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



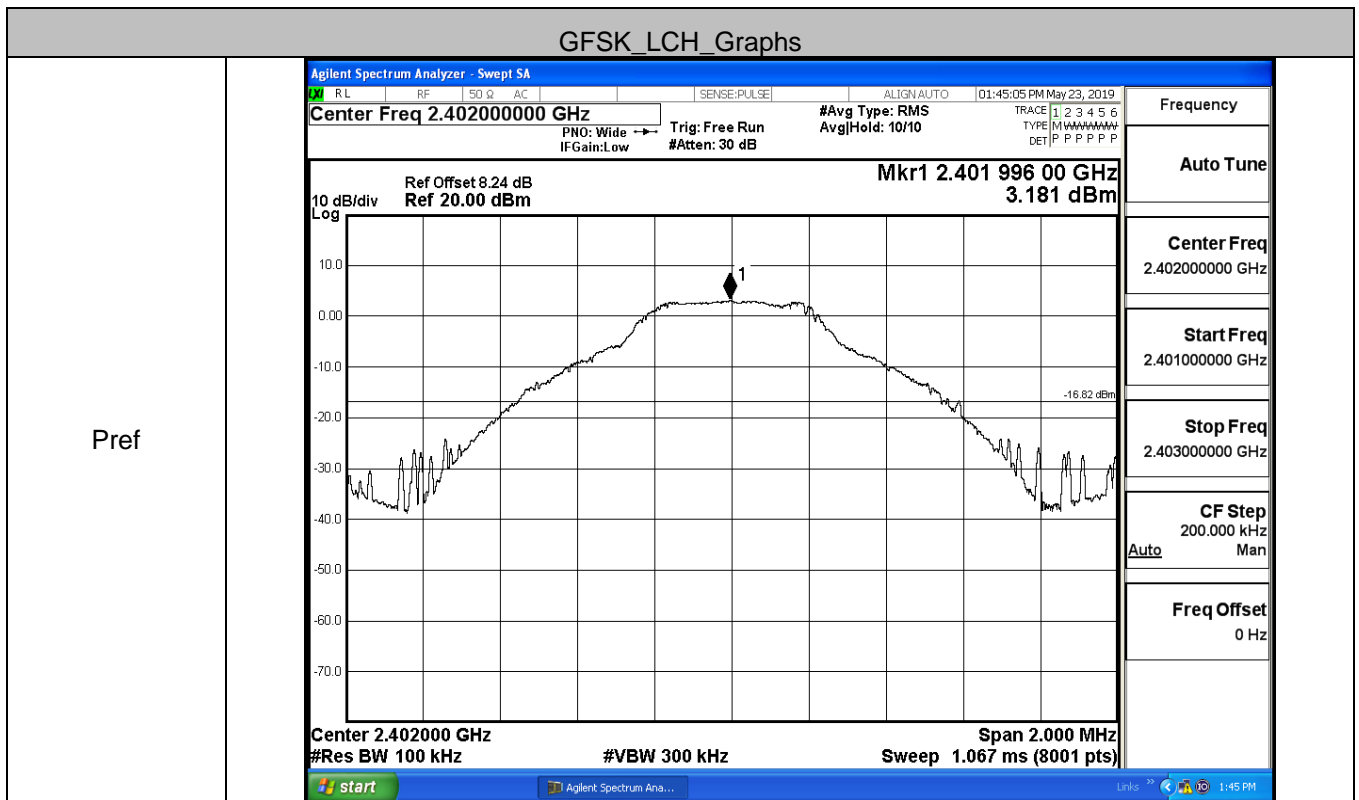
8DPSK_3DH5/HCH



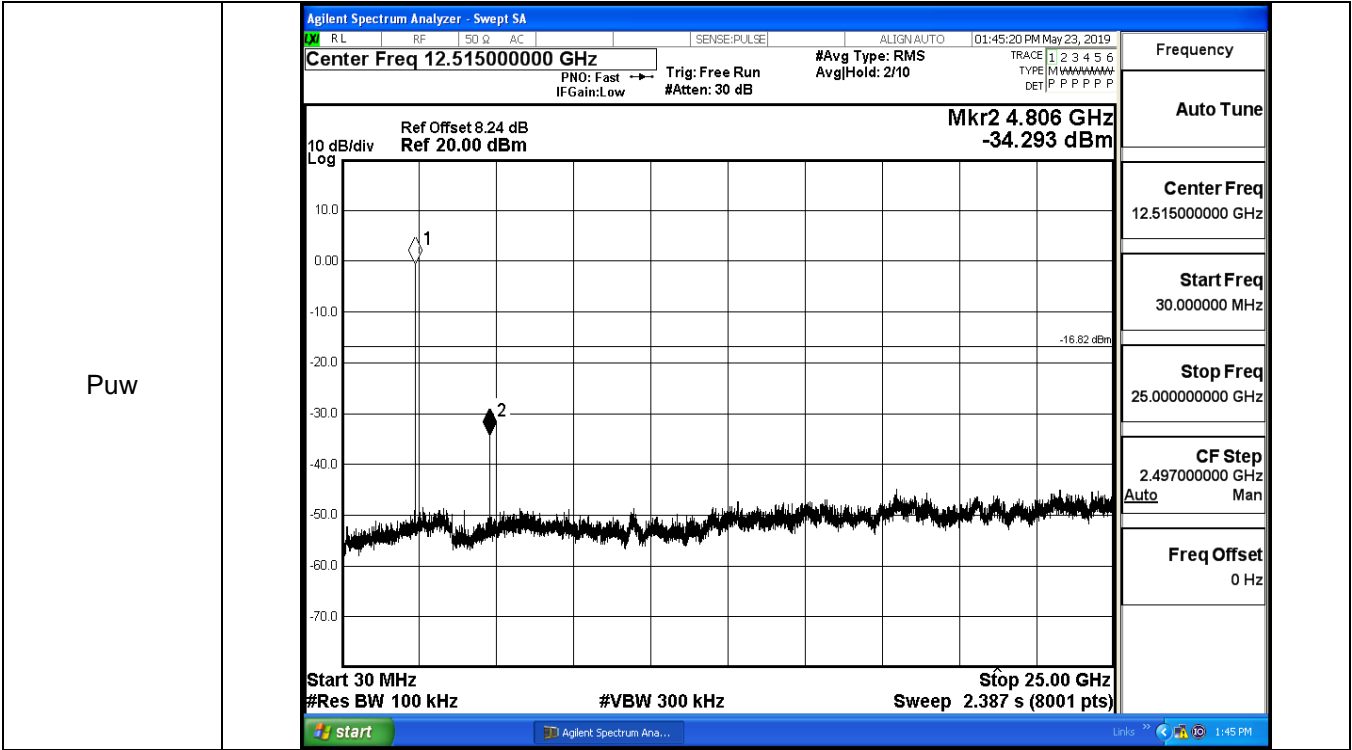
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.181	-34.293	-16.819	PASS
	MCH	1.635	-32.950	-18.365	PASS
	HCH	1.812	-36.655	-18.188	PASS
π /4DQPSK	LCH	1.724	-34.405	-18.276	PASS
	MCH	1.451	-34.964	-18.549	PASS
	HCH	0.608	-37.847	-19.392	PASS
8DPSK	LCH	1.688	-32.604	-18.312	PASS
	MCH	1.562	-35.192	-18.438	PASS
	HCH	0.842	-38.226	-19.158	PASS

GFSK_LCH_Graphs

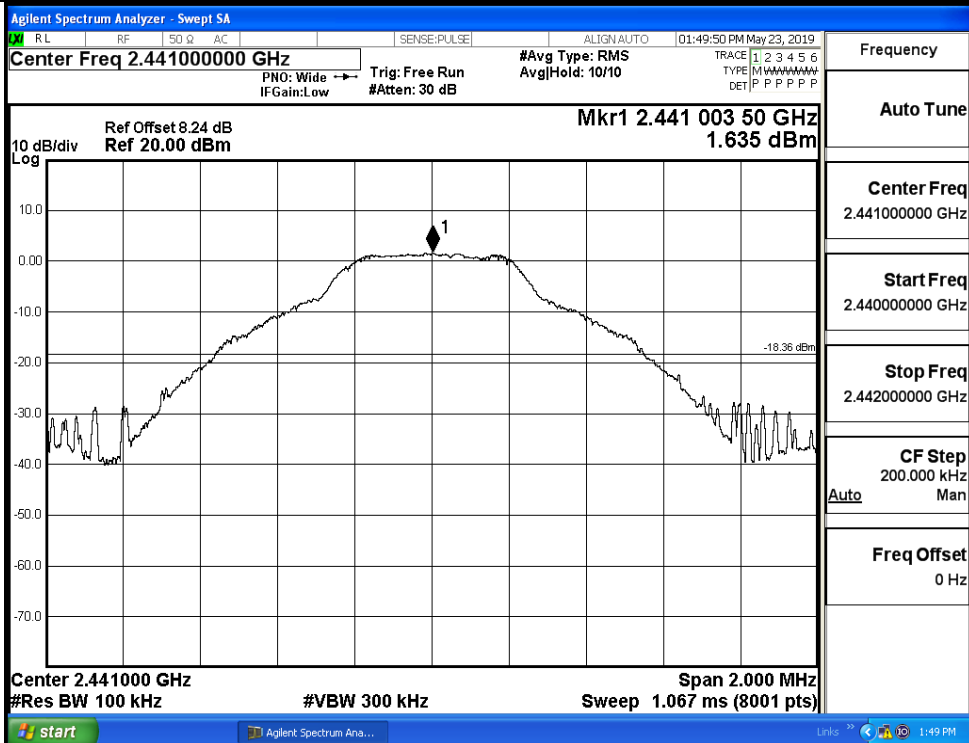


Pref

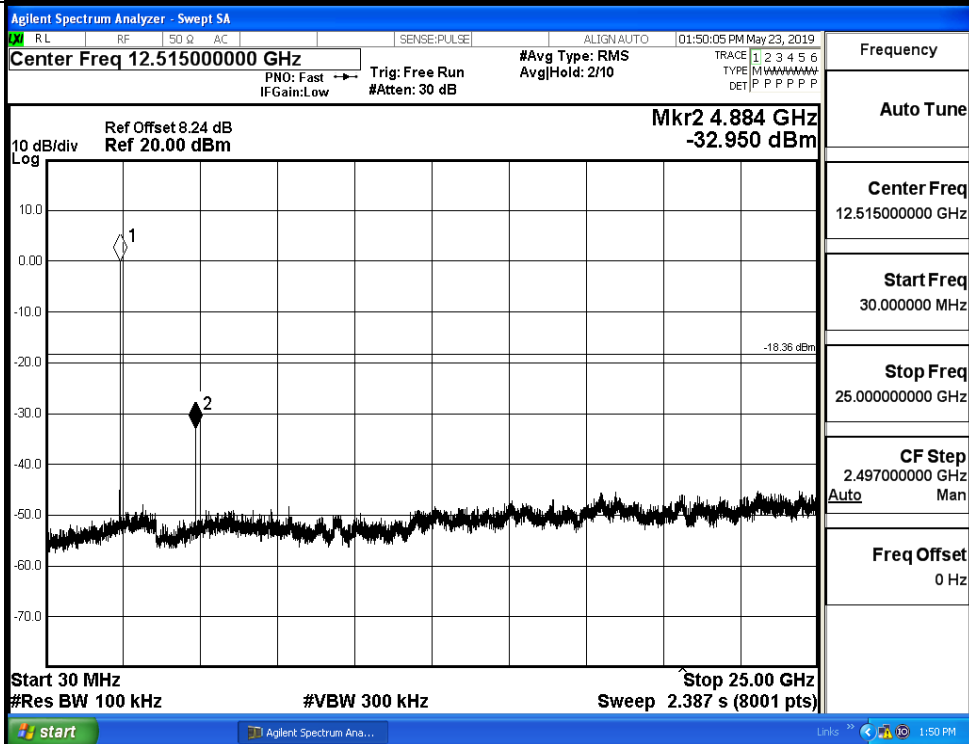


GFSK_MCH_Graphs

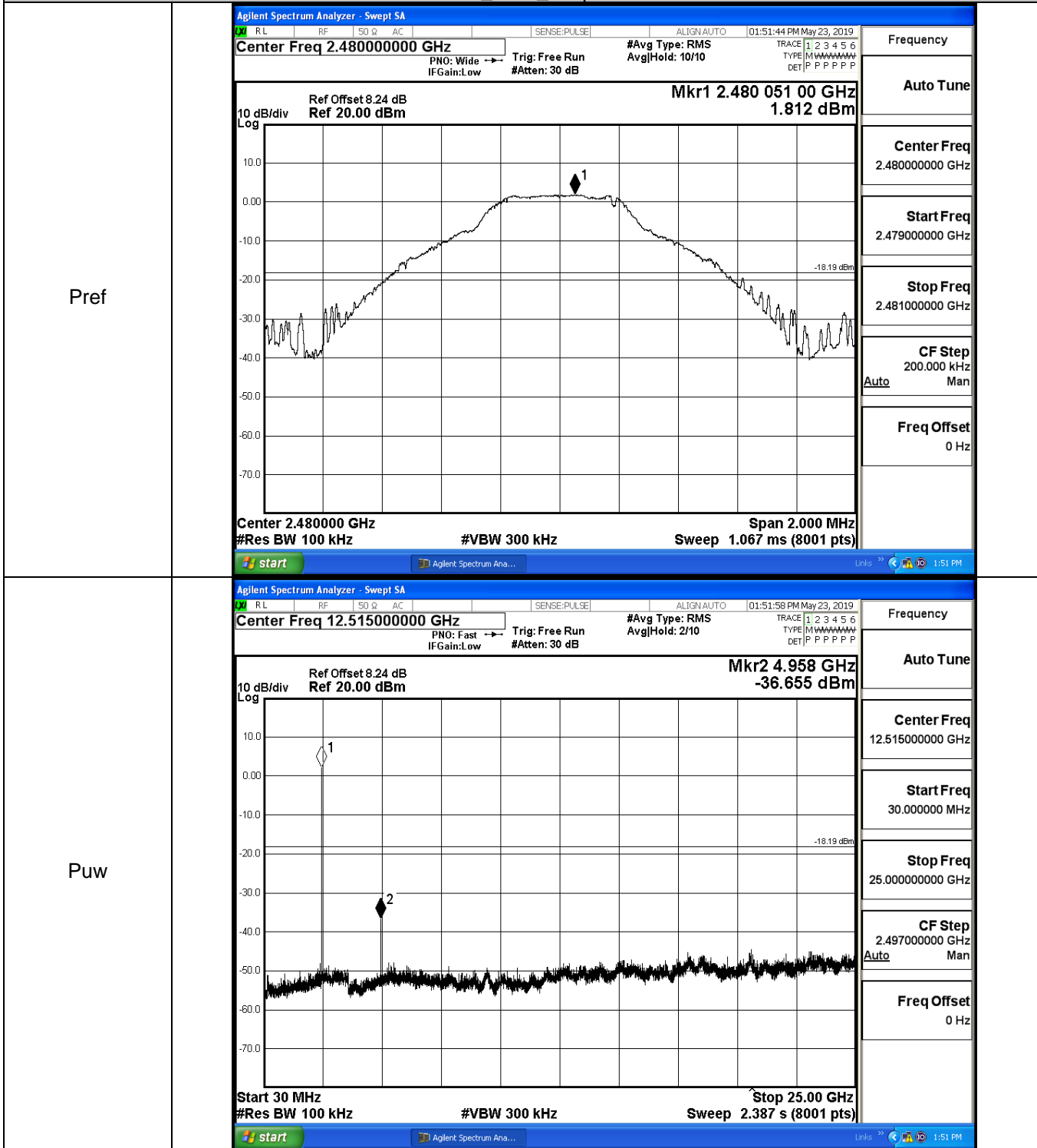
Pref



Puw

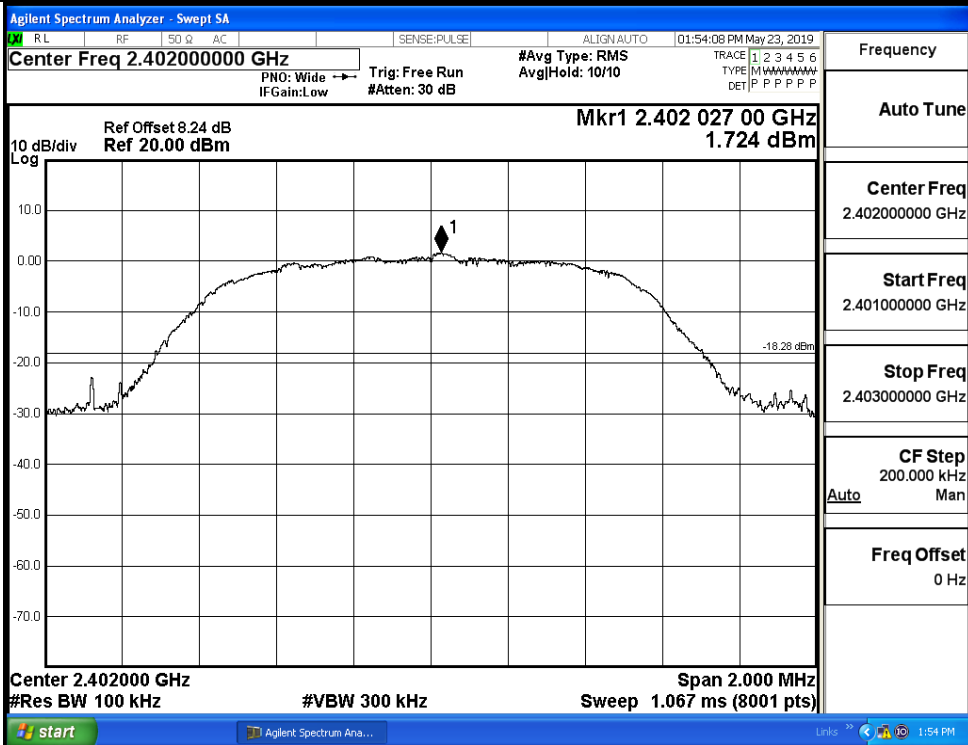


GFSK_HCH_Graphs

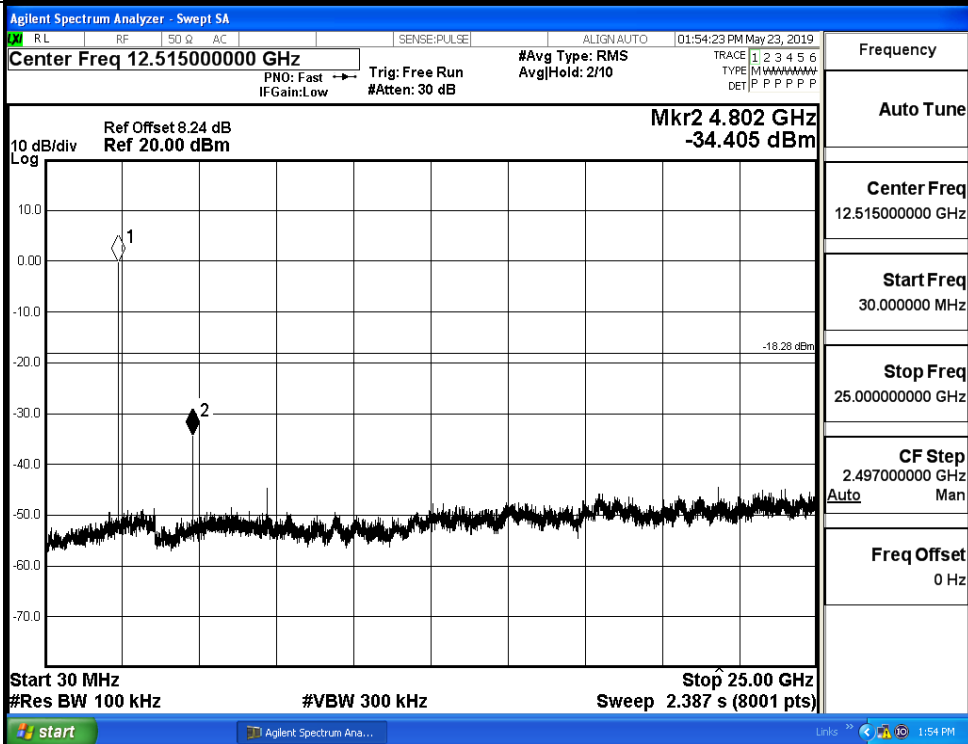


$\pi/4$ DQPSK LCH Graphs

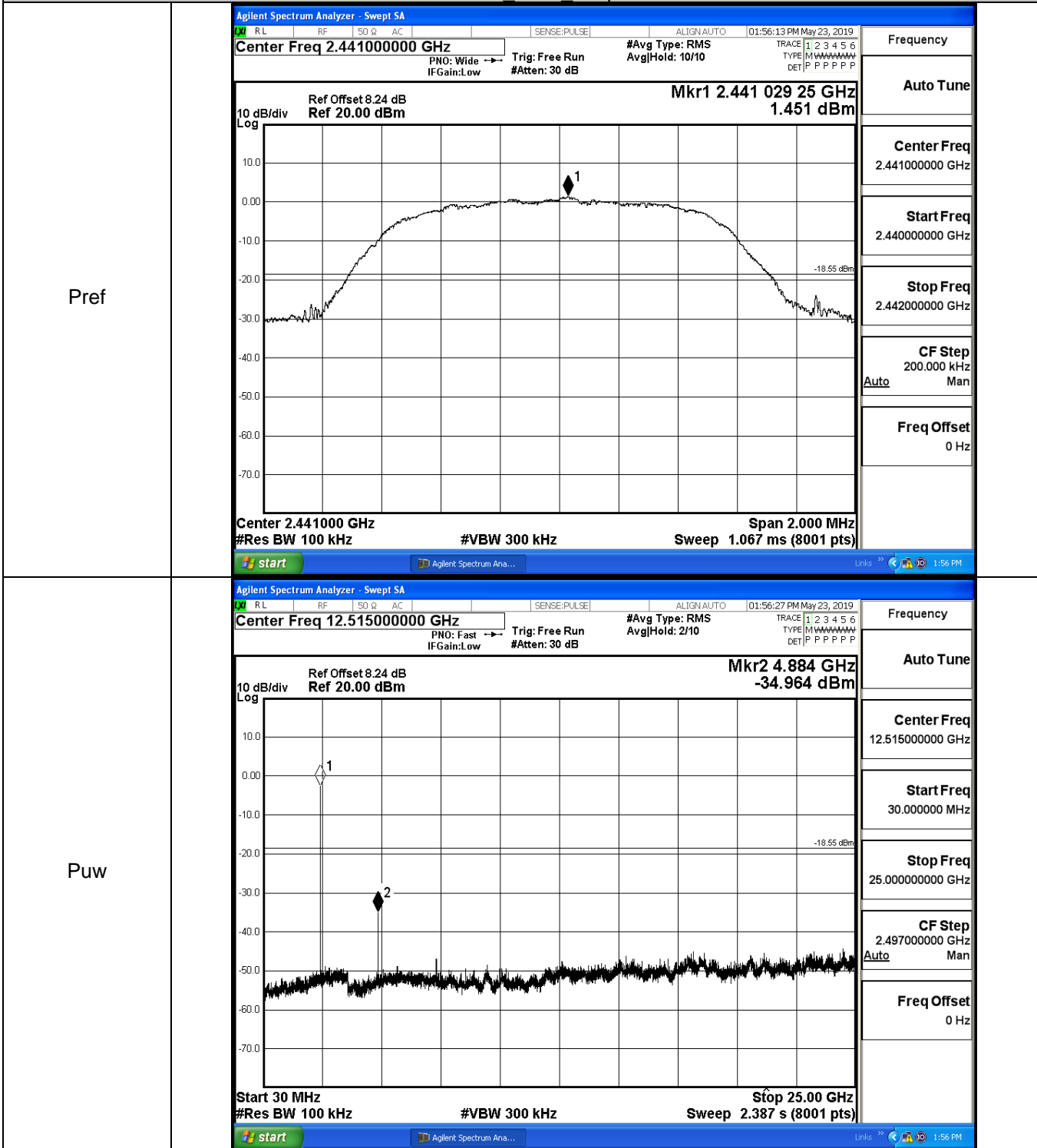
Pref



Puw

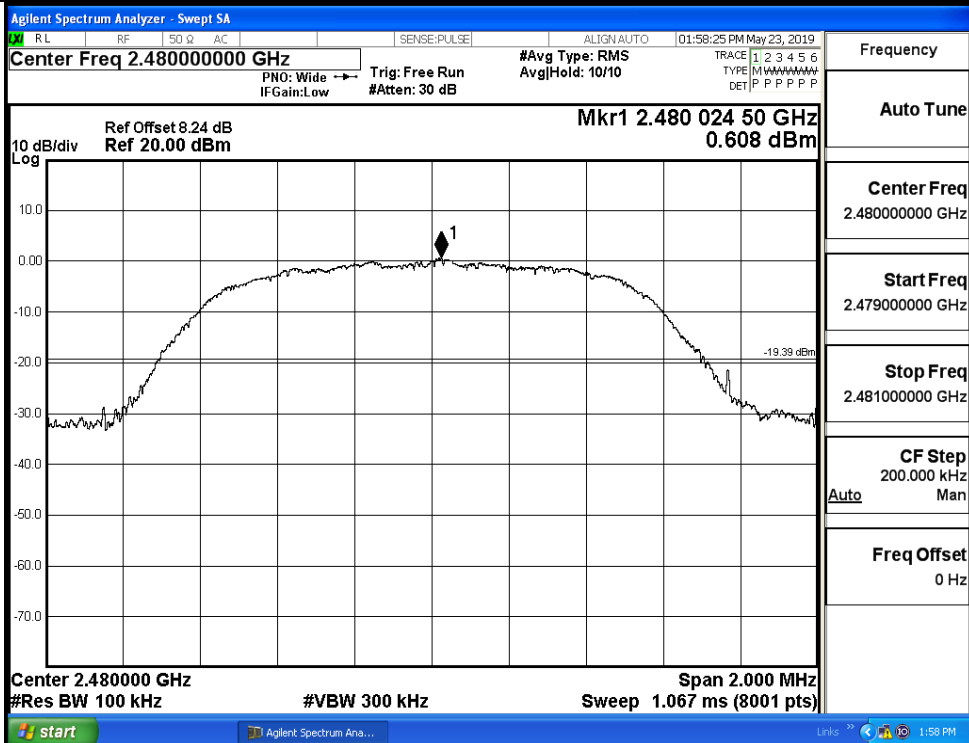


$\pi/4$ DQPSK MCH Graphs



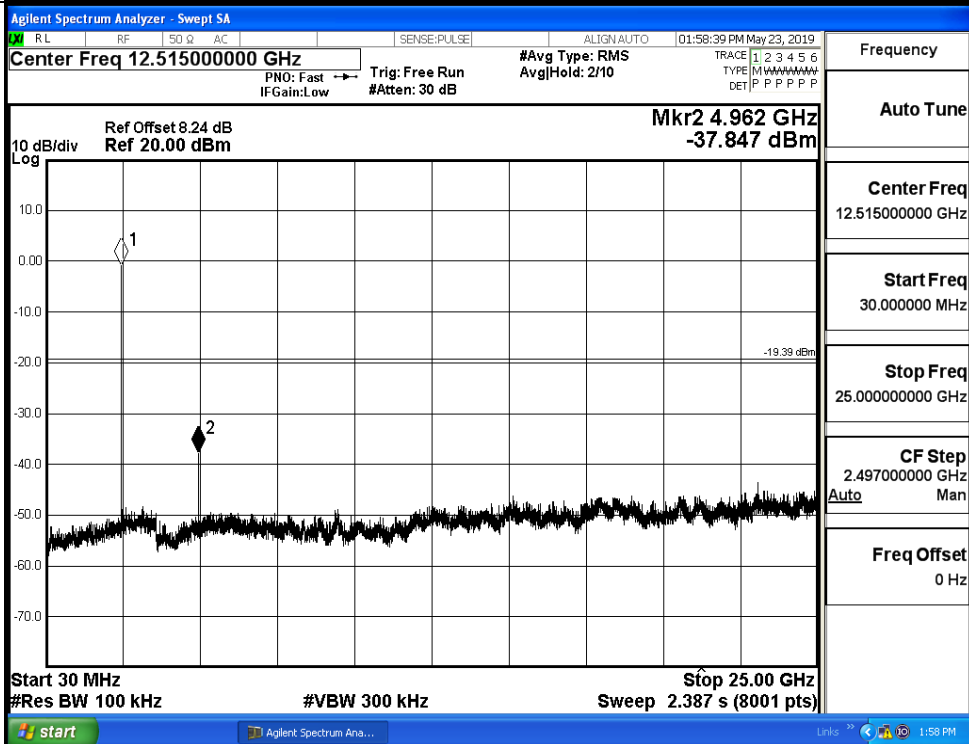
$\pi/4$ DQPSK HCH Graphs

Pref



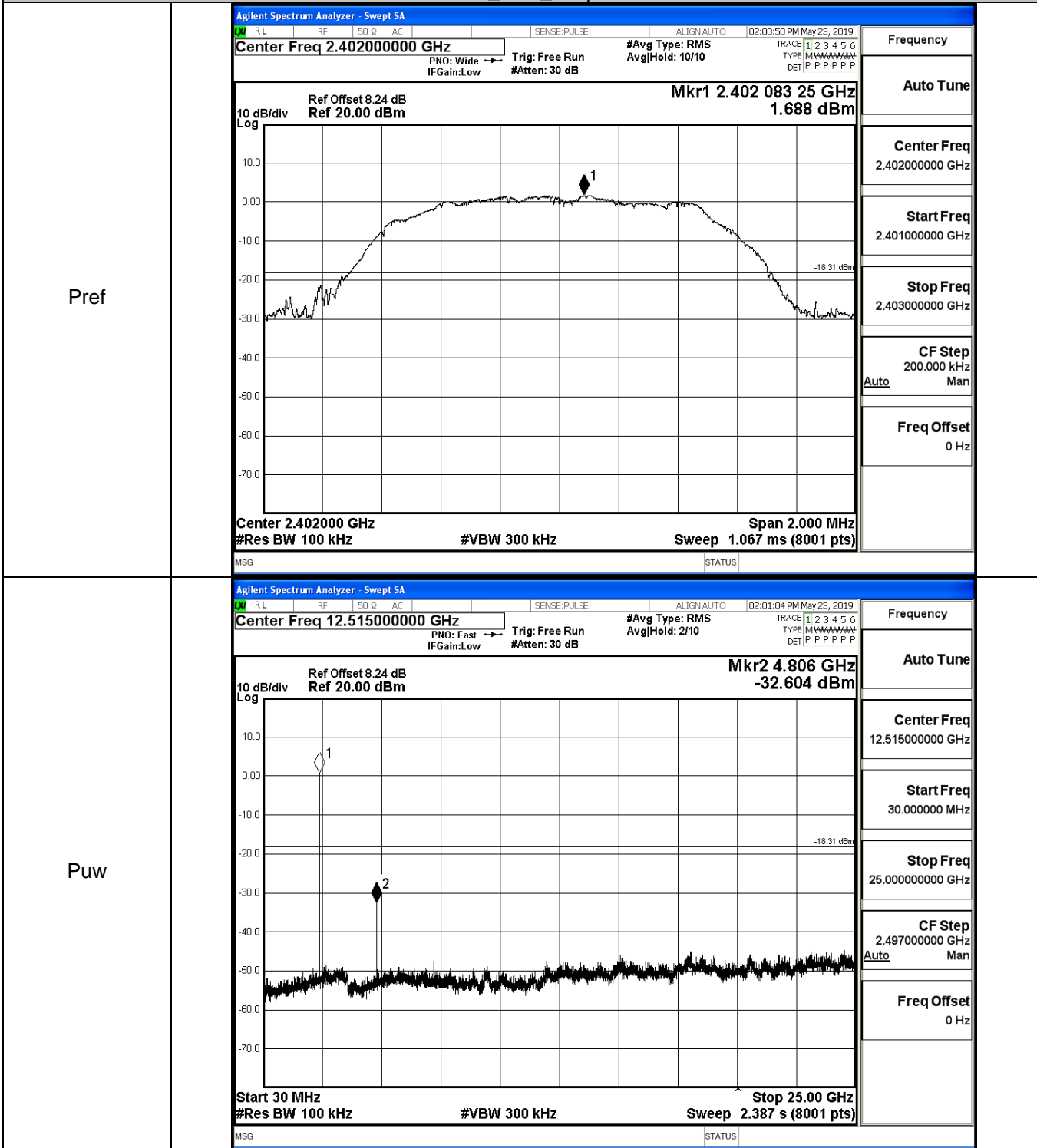
Frequency	
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.479000000 GHz
Stop Freq	2.481000000 GHz
CF Step	200.000 kHz Auto Man
Freq Offset	0 Hz

Puw



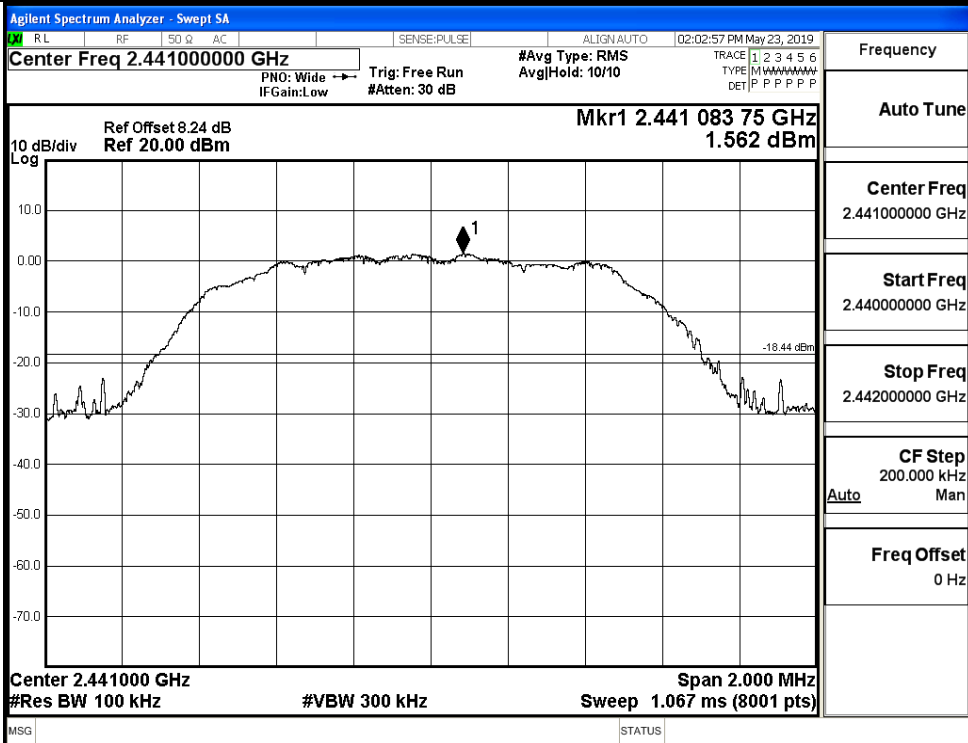
Frequency	
Auto Tune	
Center Freq	12.515000000 GHz
Start Freq	30.000000 MHz
Stop Freq	25.000000000 GHz
CF Step	2.497000000 GHz Auto Man
Freq Offset	0 Hz

8DPSK_LCH_Graphs

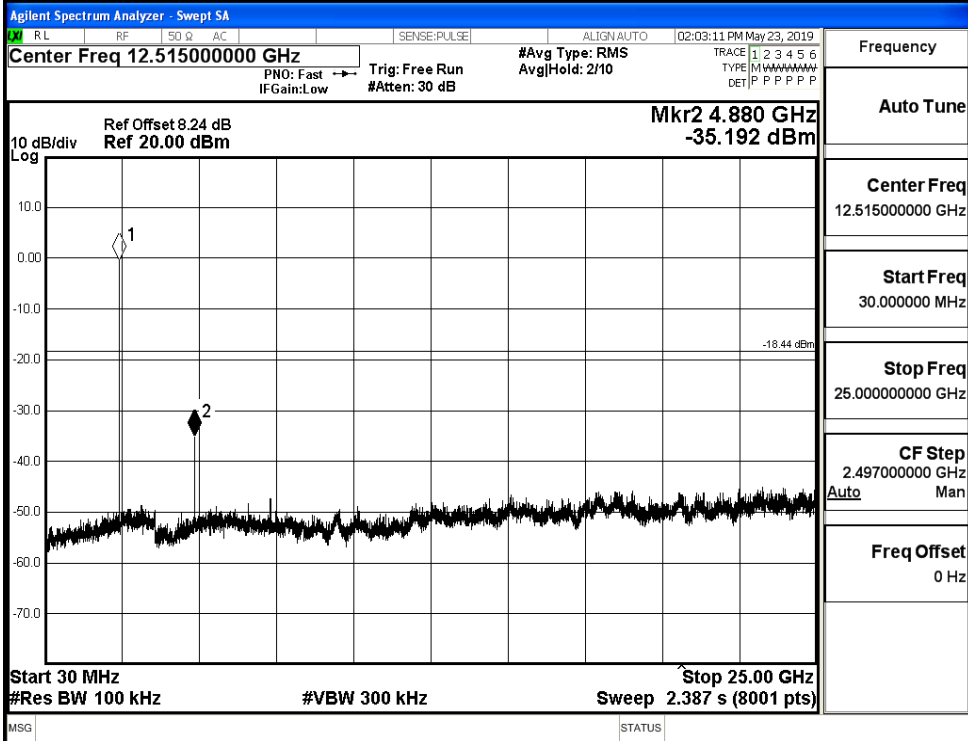


8DPSK_MCH_Graphs

Pref

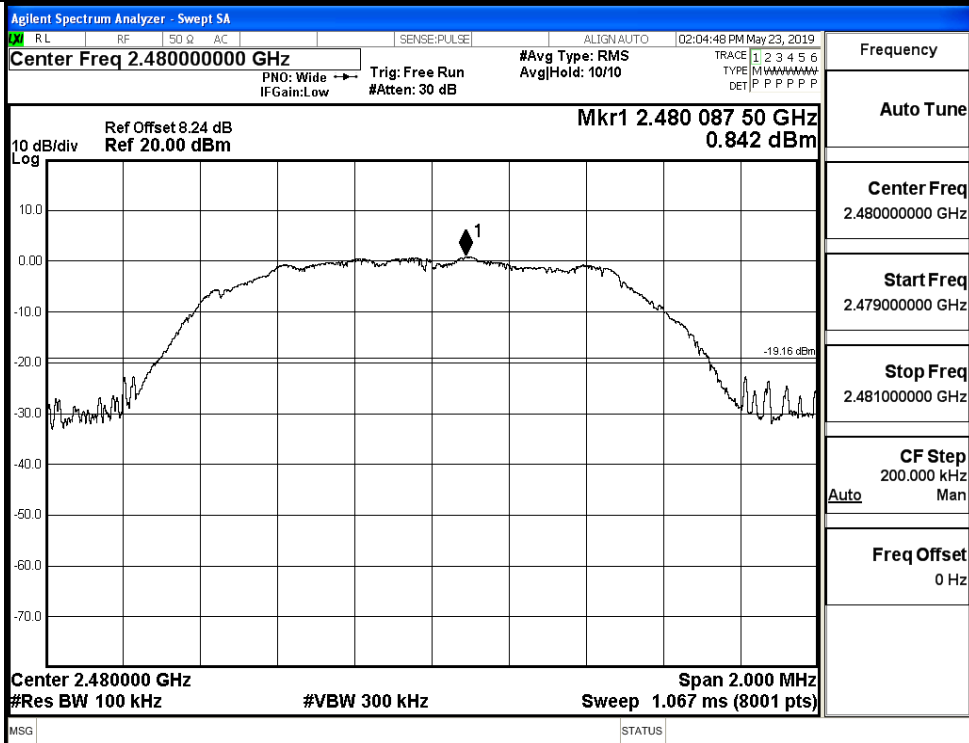


Puw

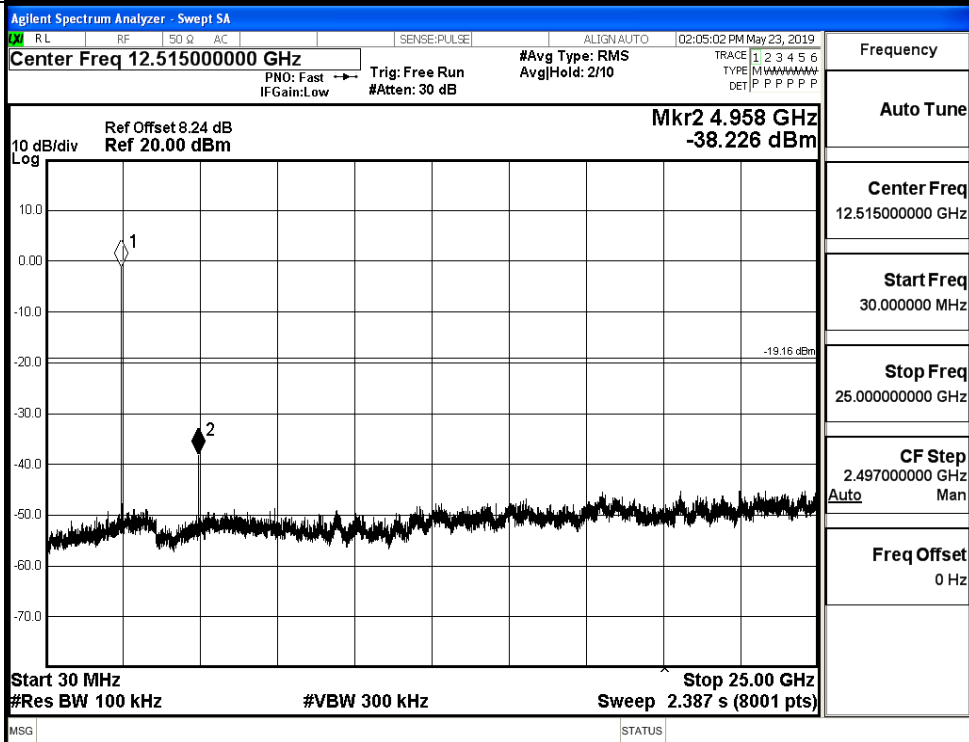


8DPSK_HCH_Graphs

Pref



Puw

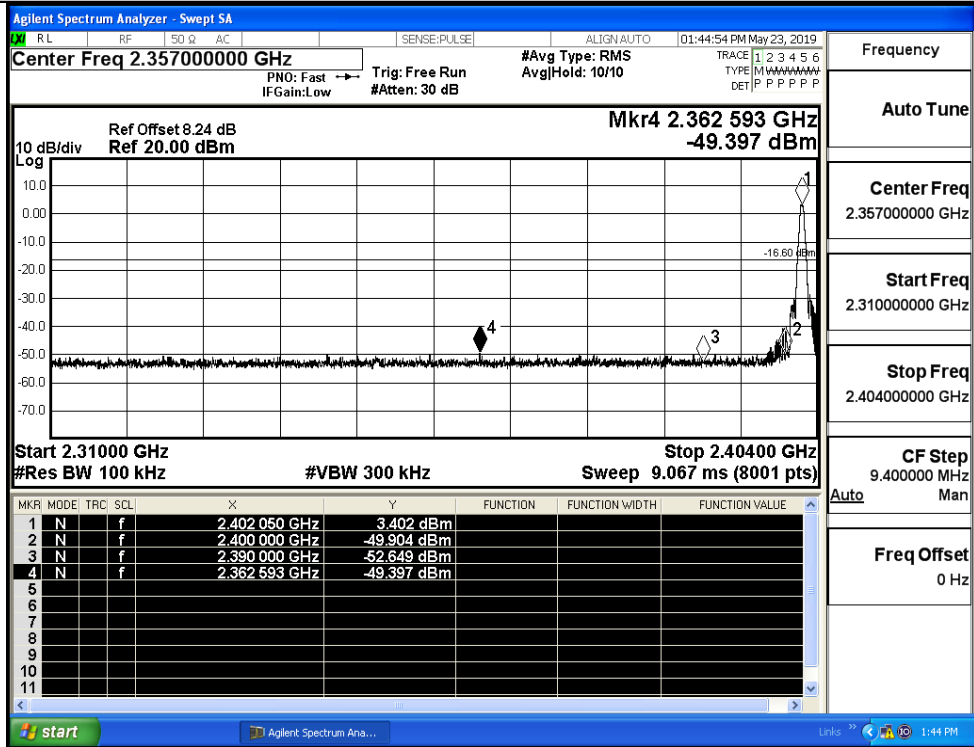


A.7 Band-edge for RF Conducted Emissions

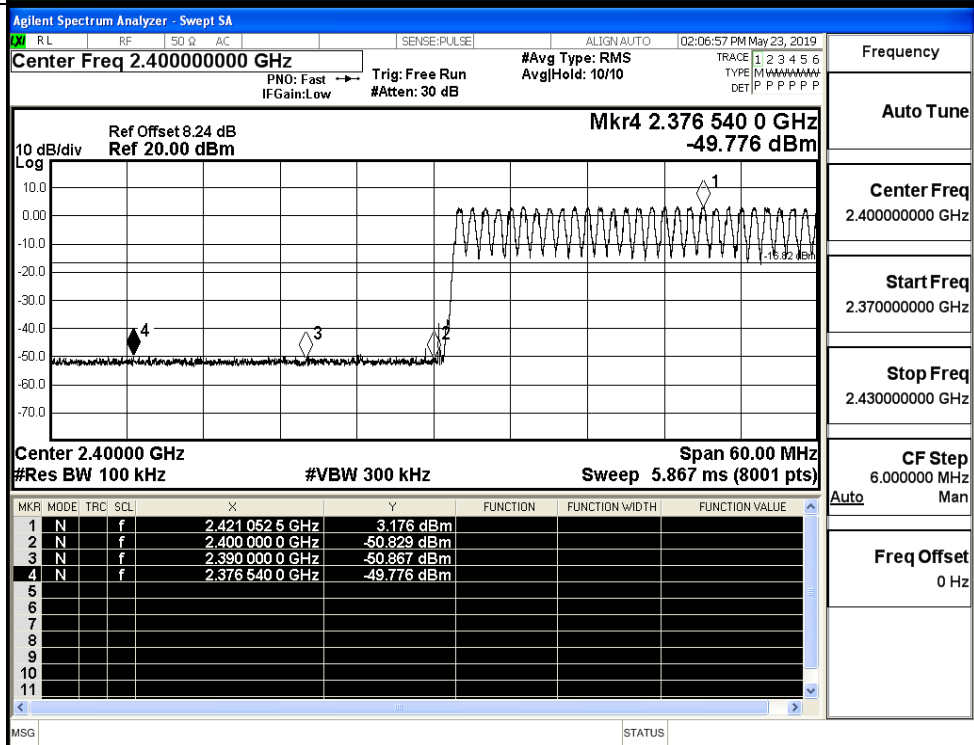
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.402	Off	-49.397	-16.6	PASS
			3.176	On	-49.776	-16.82	PASS
	HCH	2480	2.344	Off	-46.872	-17.66	PASS
			2.840	On	-49.222	-17.16	PASS
$\pi/4$ DQPSK	LCH	2402	1.853	Off	-49.034	-18.15	PASS
			1.926	On	-48.787	-18.07	PASS
	HCH	2480	0.731	Off	-47.051	-19.27	PASS
			1.712	On	-46.901	-18.29	PASS
8DPSK	LCH	2402	2.068	Off	-49.198	-17.93	PASS
			2.077	On	-48.983	-17.92	PASS
	HCH	2480	1.306	Off	-47.043	-18.69	PASS
			1.854	On	-48.669	-18.15	PASS

Test Graphs

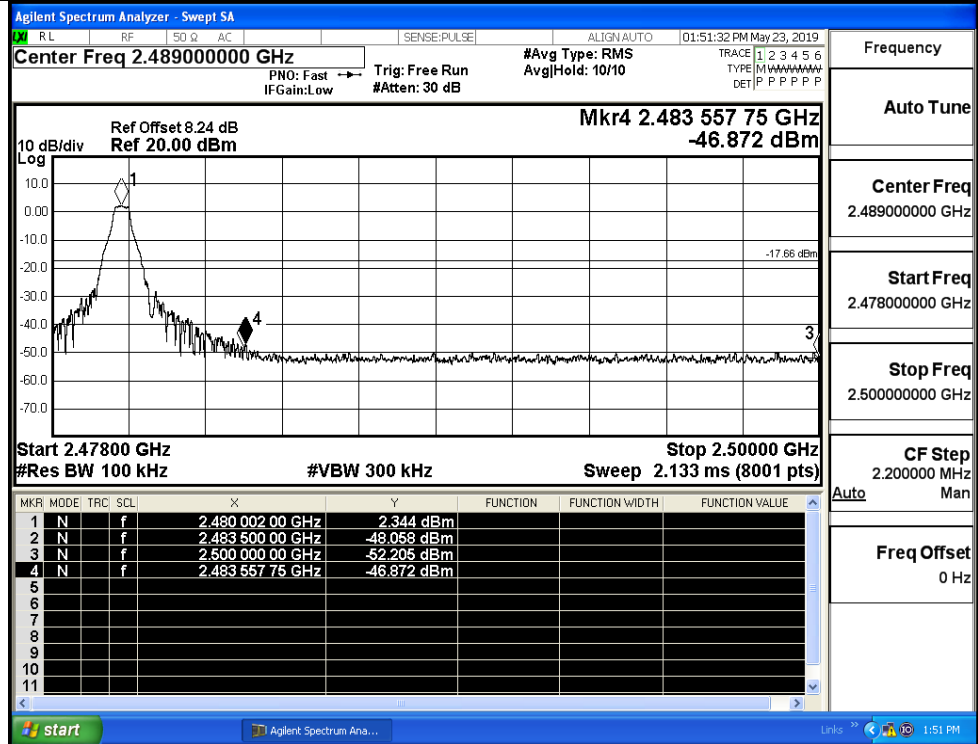
GFSK/LCH/No Hop



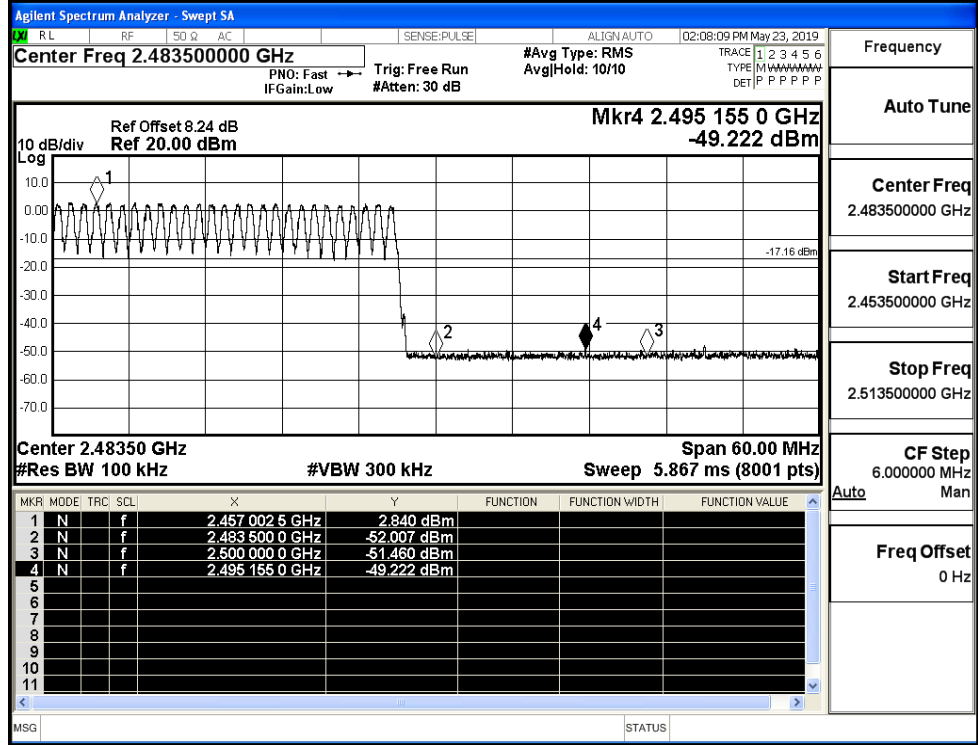
GFSK/LCH/Hop



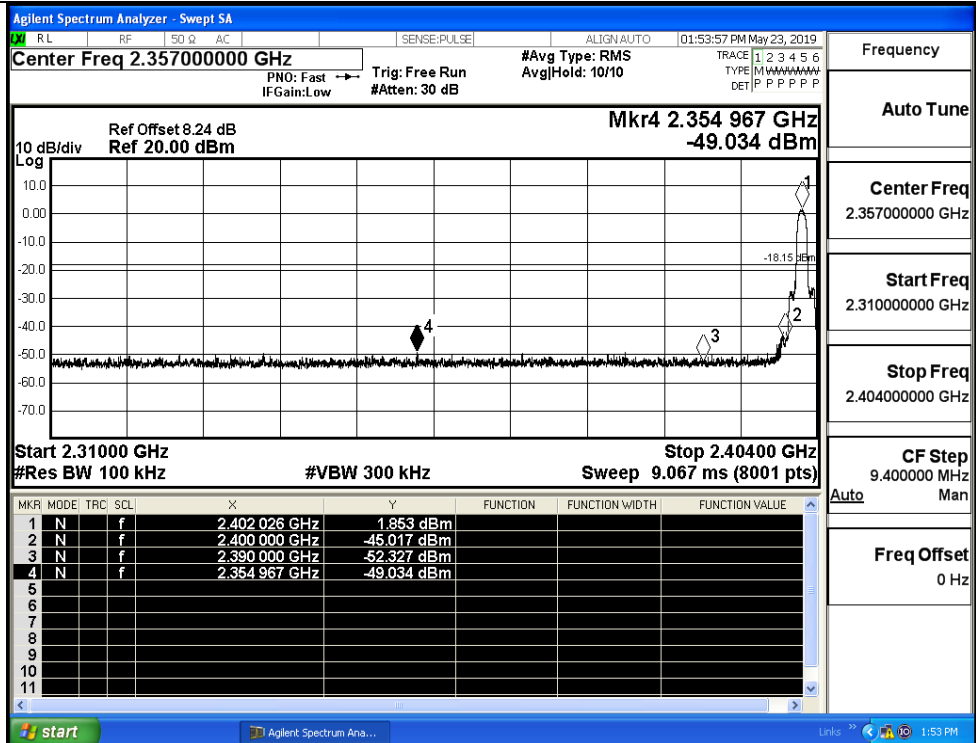
GFSK/HCH/No Hop



GFSK/HCH/Hop

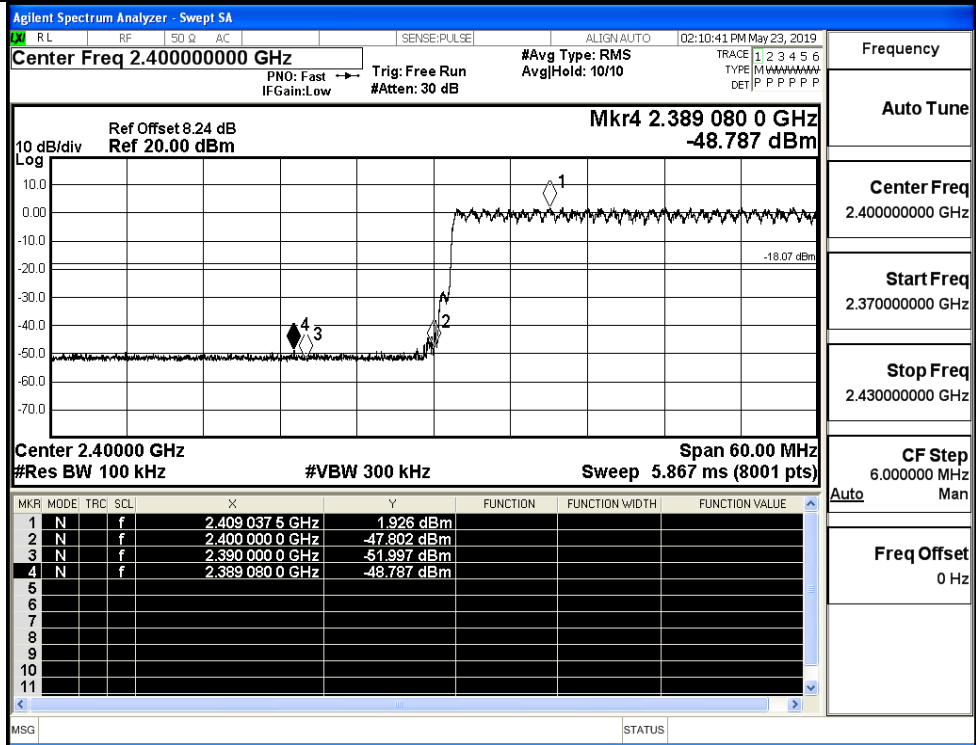


$\pi/4$ DQPSK/LCH/No
Hop



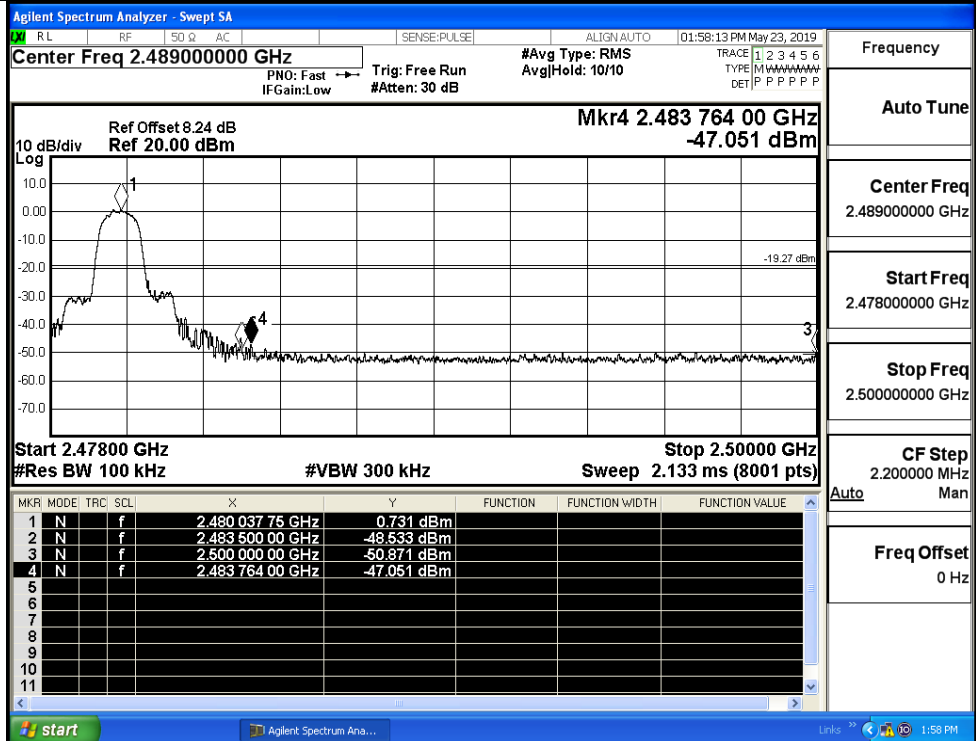
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

$\pi/4$ DQPSK/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

π /4DQPSK/HCH/No
Hop



Frequency

Auto Tune

Center Freq
2.489000000 GHz

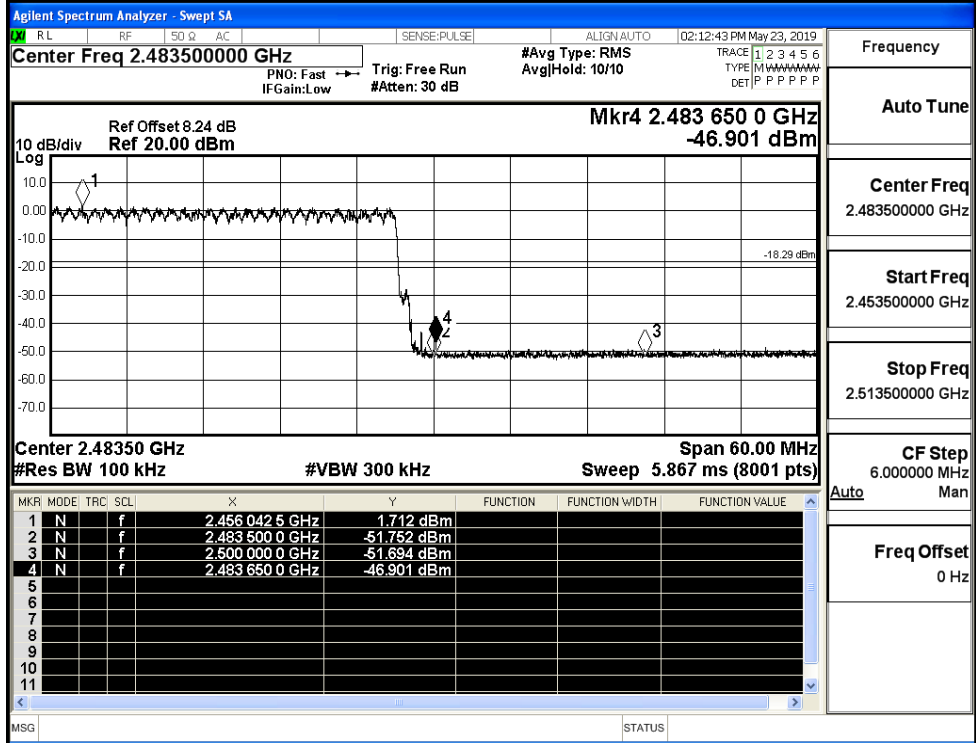
Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz

Freq Offset
0 Hz

π /4DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq
2.483500000 GHz

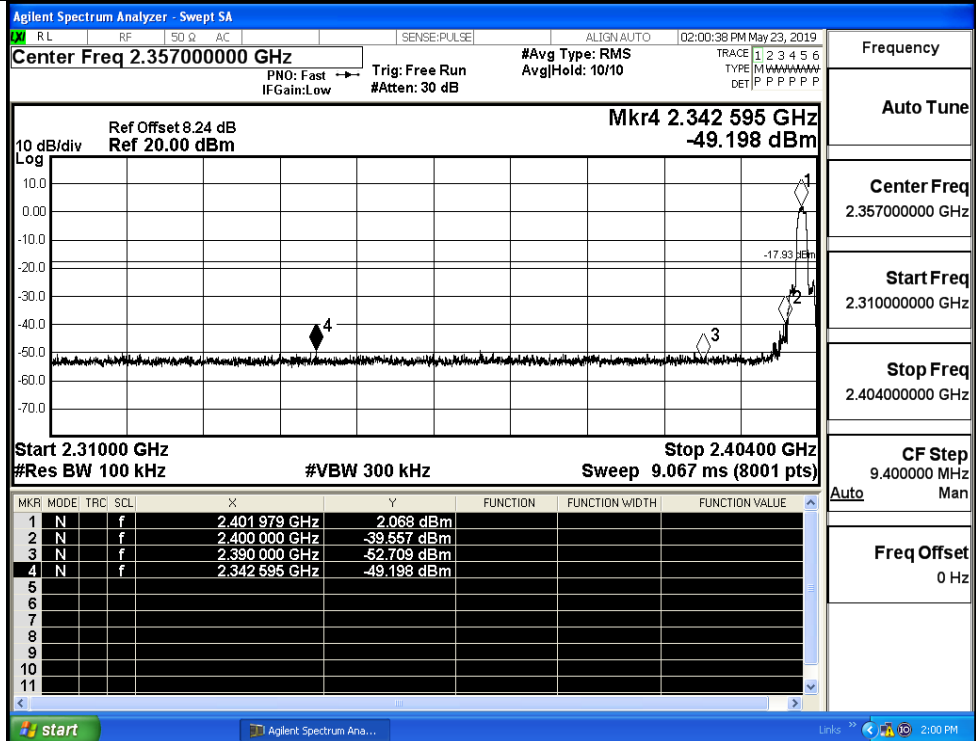
Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz

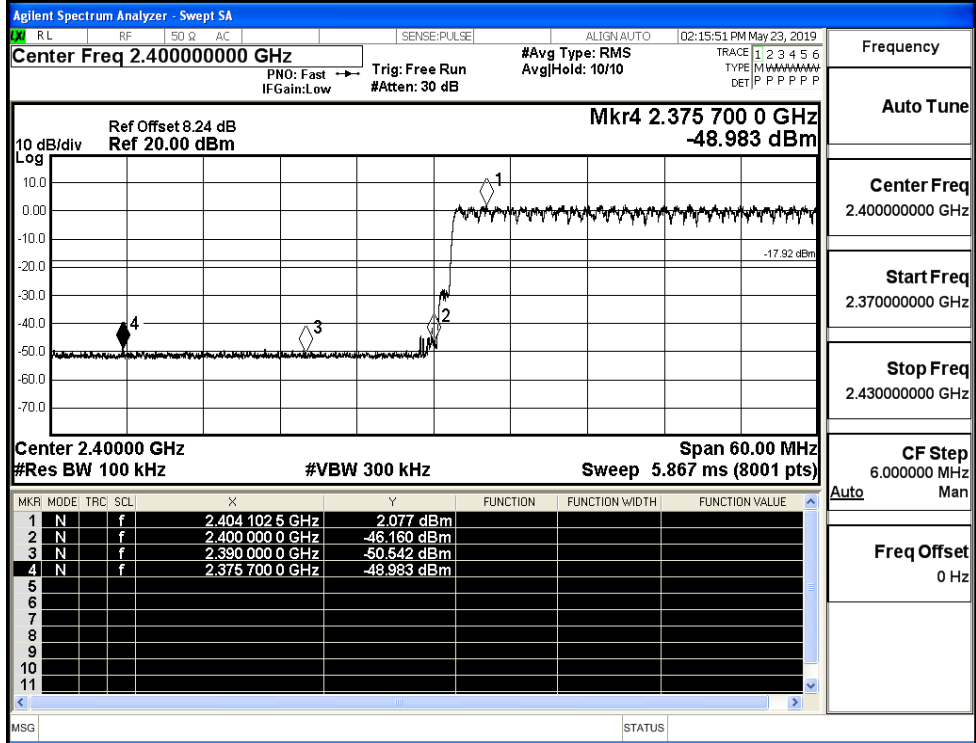
Freq Offset
0 Hz

8DPSK/LCH/No Hop



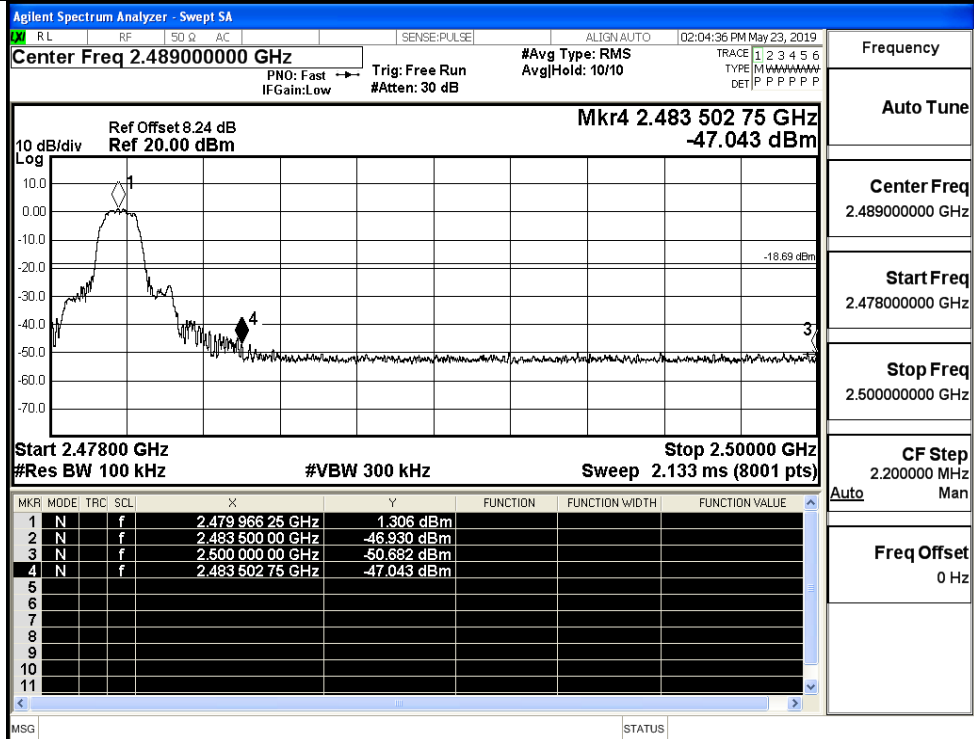
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/LCH/Hop



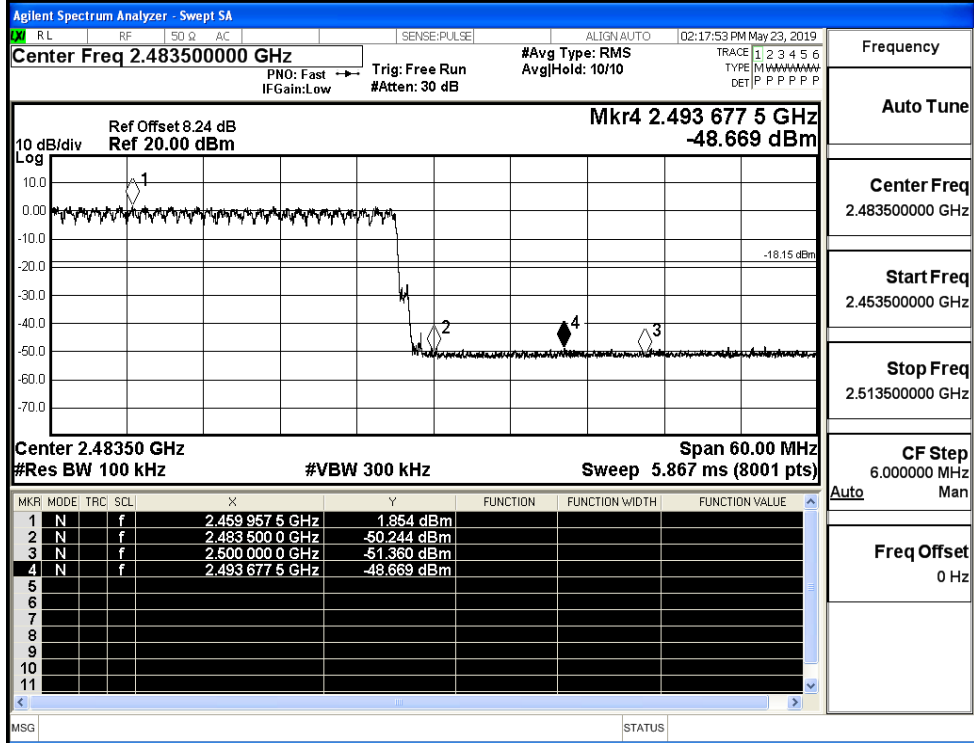
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.370000000 GHz
Stop Freq
2.430000000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/HCH/No Hop



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

8DPSK/HCH/Hop

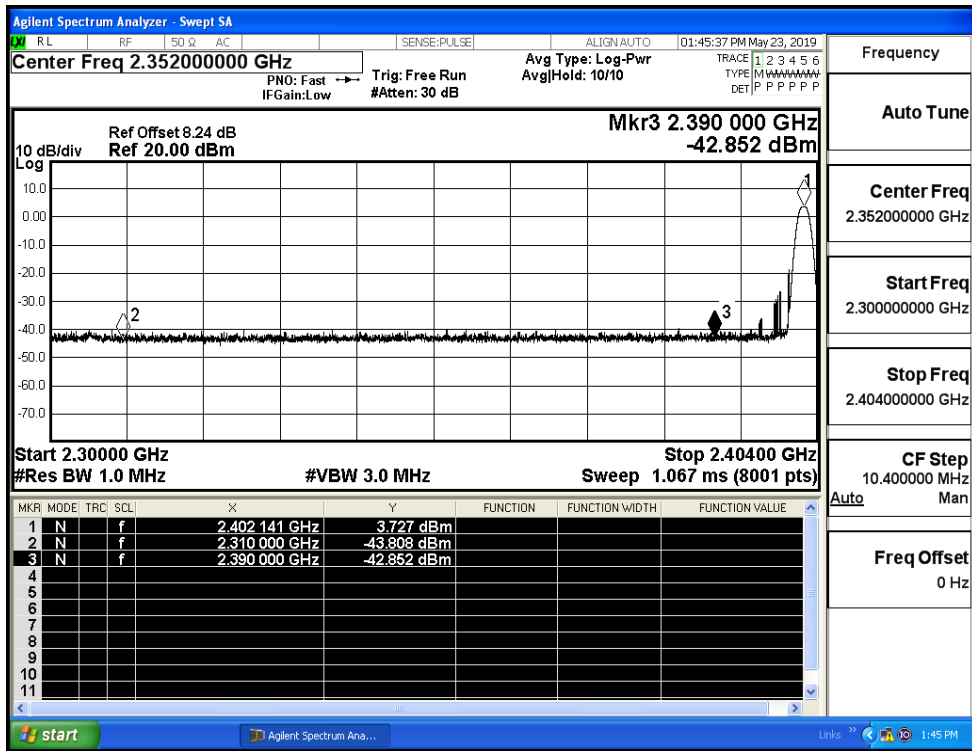


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

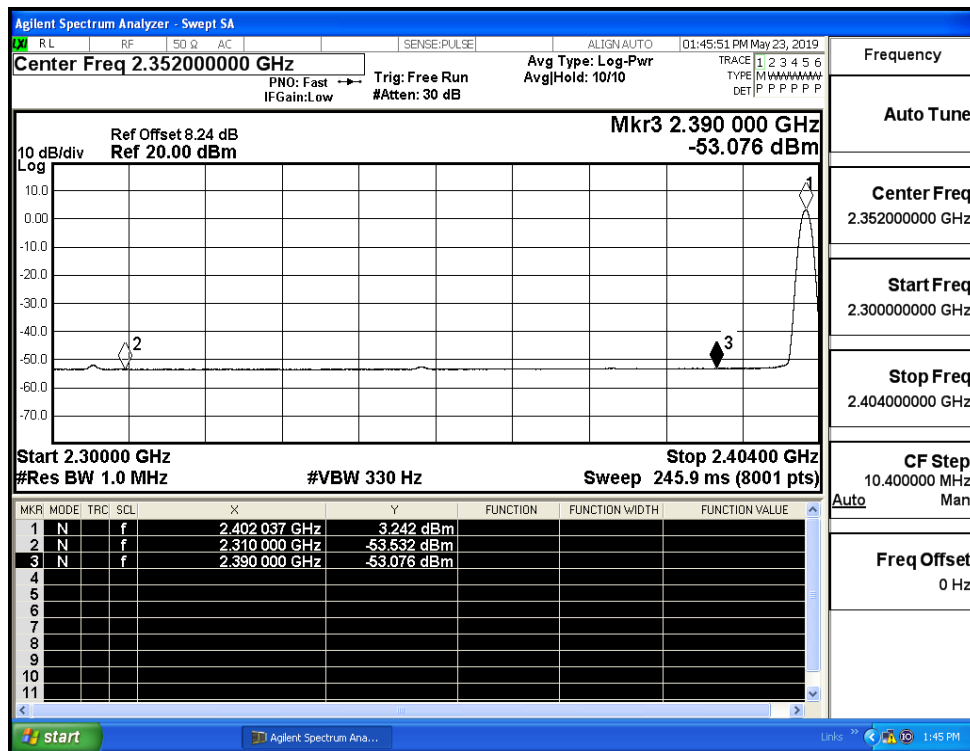
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.81	2.0	0	51.45	PEAK	74	PASS
	Off	2310.0	-53.53	2.0	0	41.73	AV	54	PASS
	Off	2390.0	-42.85	2.0	0	52.41	PEAK	74	PASS
	Off	2390.0	-53.08	2.0	0	42.18	AV	54	PASS
	Off	2483.5	-42.97	2.0	0	52.29	PEAK	74	PASS
	Off	2483.5	-52.39	2.0	0	42.87	AV	54	PASS
	Off	2500.0	-42.50	2.0	0	52.76	PEAK	74	PASS
	Off	2500.0	-52.82	2.0	0	42.44	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.32	2.0	0	51.94	PEAK	74	PASS
	Off	2310.0	-53.41	2.0	0	41.85	AV	54	PASS
	Off	2390.0	-42.29	2.0	0	52.96	PEAK	74	PASS
	Off	2390.0	-53.16	2.0	0	42.09	AV	54	PASS
	Off	2483.5	-43.62	2.0	0	51.64	PEAK	74	PASS
	Off	2483.5	-52.22	2.0	0	43.04	AV	54	PASS
	Off	2500.0	-42.28	2.0	0	52.97	PEAK	74	PASS
	Off	2500.0	-52.79	2.0	0	42.47	AV	54	PASS
8DPSK	Off	2310.0	-43.49	2.0	0	51.77	PEAK	74	PASS
	Off	2310.0	-53.40	2.0	0	41.86	AV	54	PASS
	Off	2390.0	-43.09	2.0	0	52.17	PEAK	74	PASS
	Off	2390.0	-53.18	2.0	0	42.07	AV	54	PASS
	Off	2483.5	-40.99	2.0	0	54.27	PEAK	74	PASS
	Off	2483.5	-52.00	2.0	0	43.26	AV	54	PASS
	Off	2500.0	-42.85	2.0	0	52.41	PEAK	74	PASS
	Off	2500.0	-52.80	2.0	0	42.46	AV	54	PASS

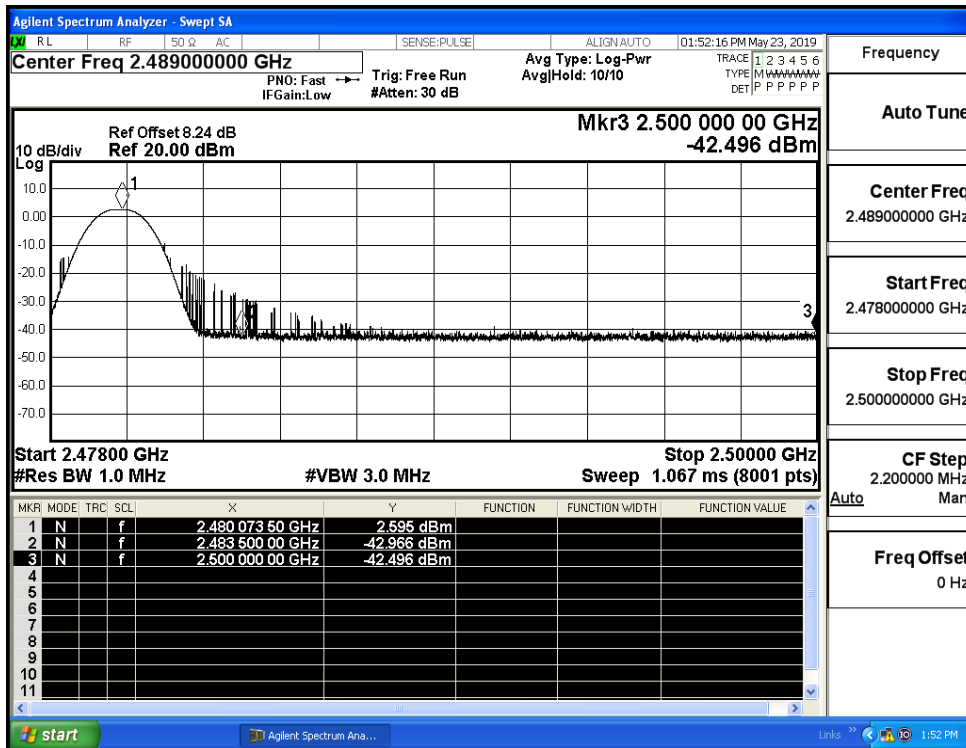
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



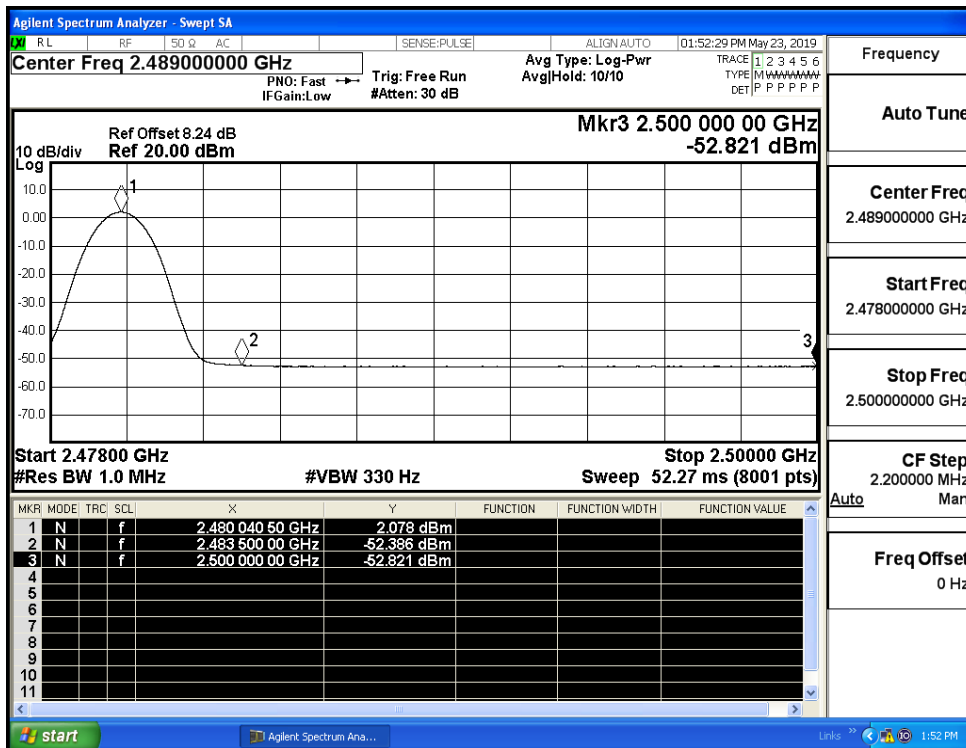
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



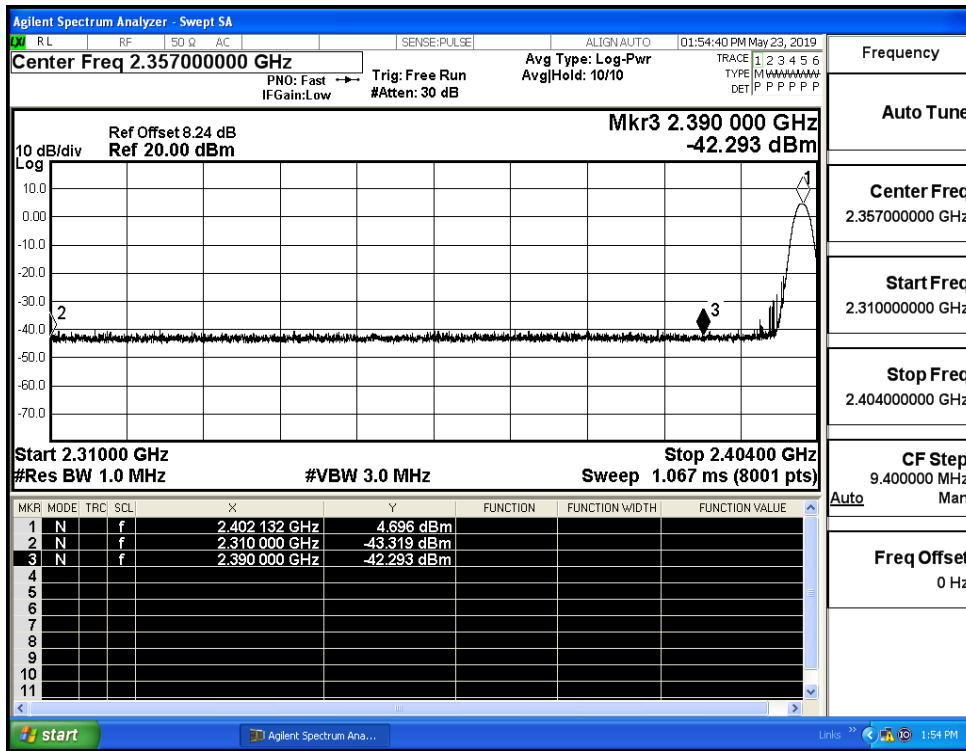
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



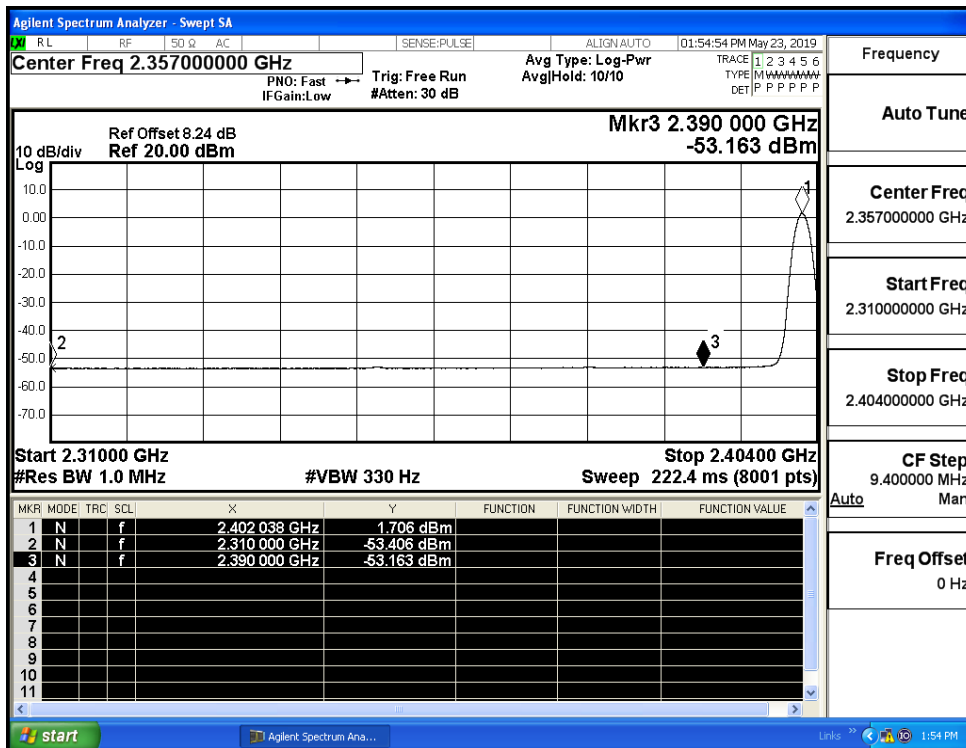
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



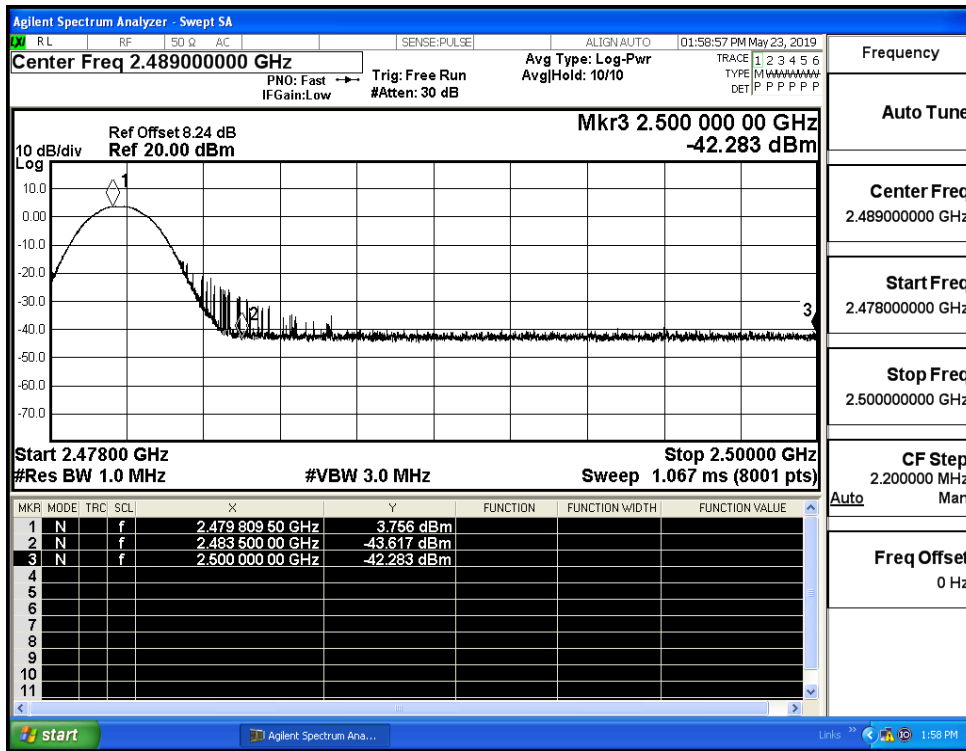
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



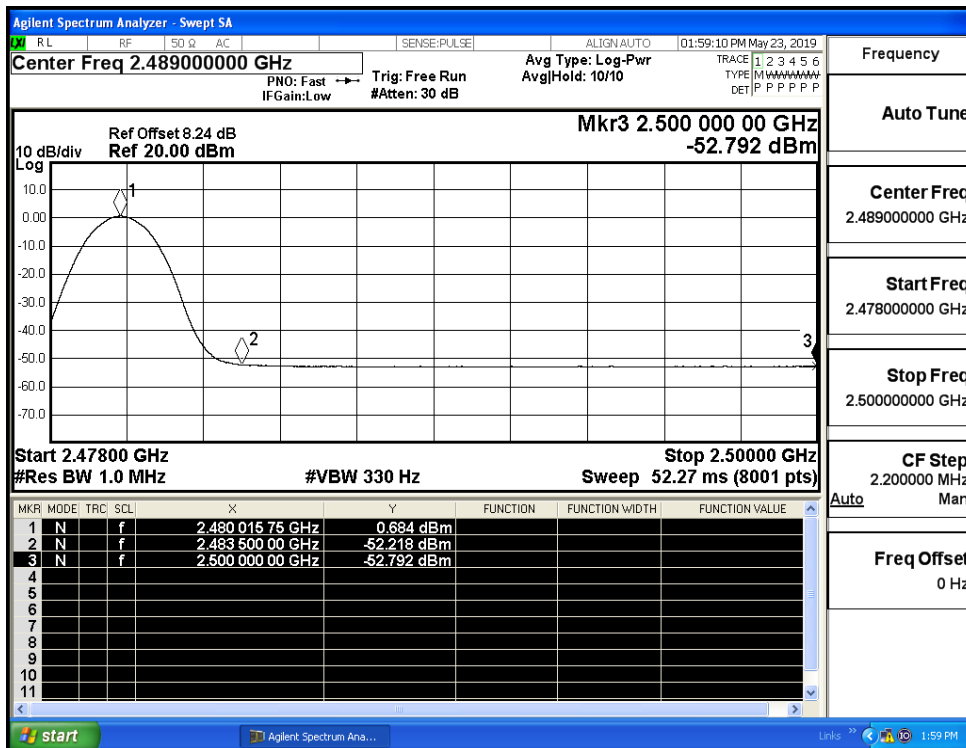
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



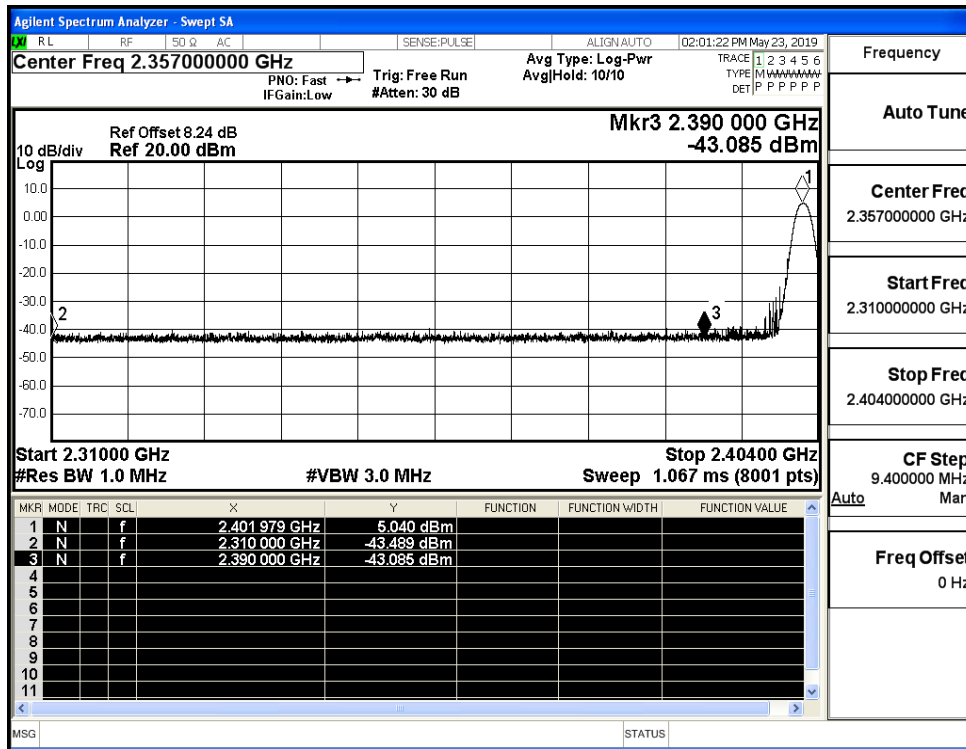
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)



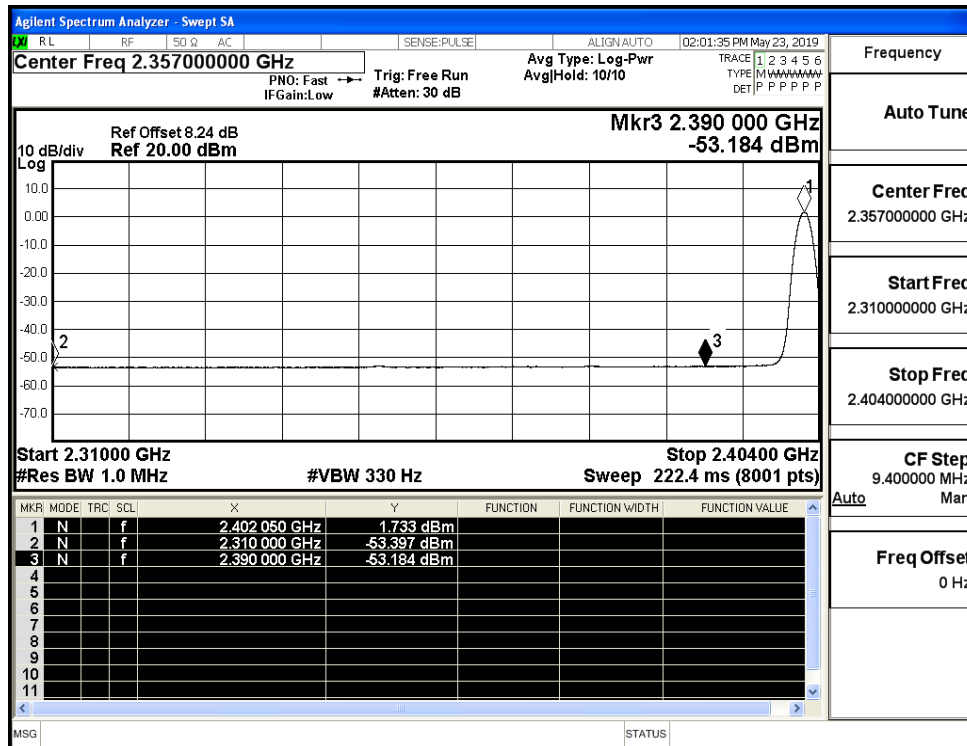
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)



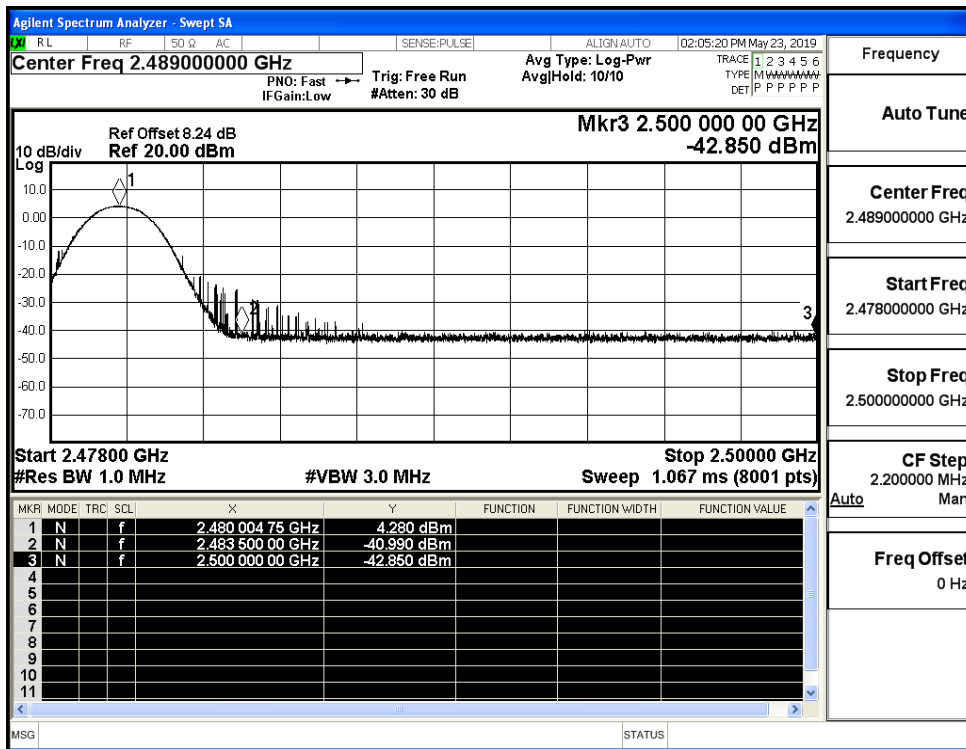
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

