

Appendix A

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

Product Name: Nreal Computing Unit

Trade Mark:  nreal

Test Model: NR-9100UGL

Environmental Conditions

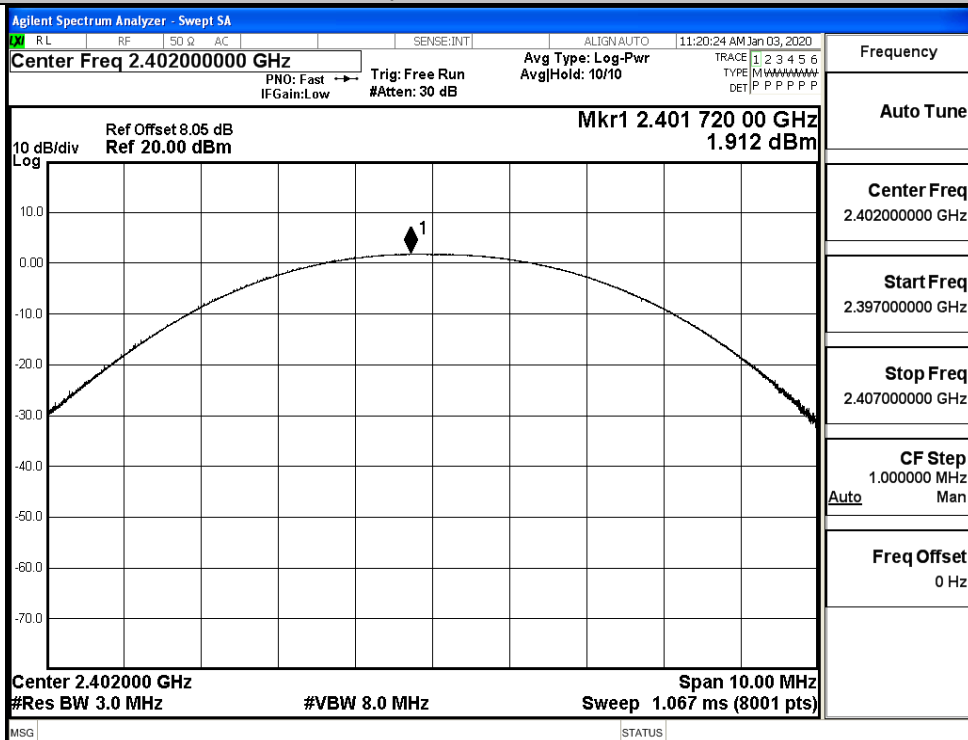
Temperature:	23.5 ° C
Relative Humidity:	53.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Wang Chuang
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

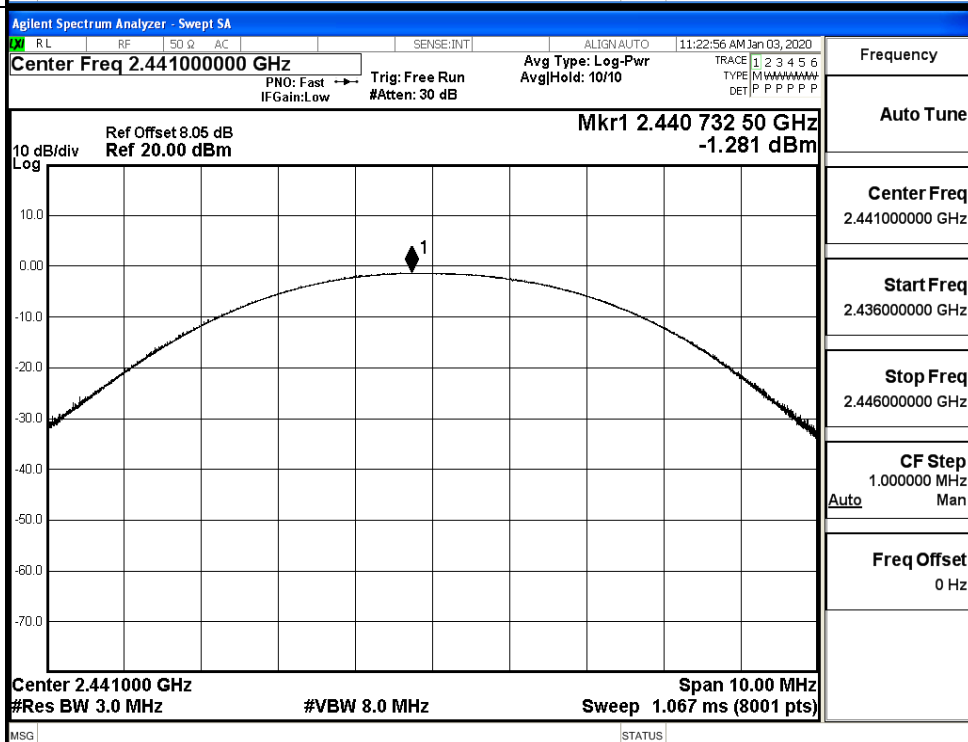
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.912	30	PASS
	MCH	-1.281	30	PASS
	HCH	-2.278	30	PASS
$\pi/4$ DQPSK	LCH	1.491	21	PASS
	MCH	-0.750	21	PASS
	HCH	-0.560	21	PASS
8DPSK	LCH	1.796	21	PASS
	MCH	-0.680	21	PASS
	HCH	-0.511	21	PASS

Test Graphs

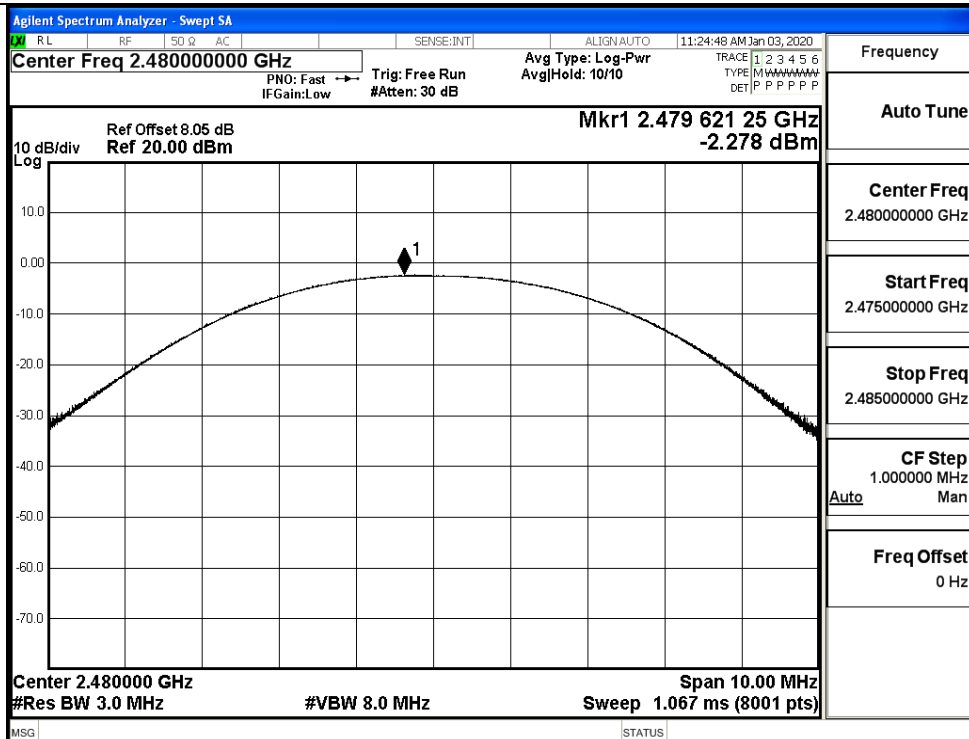
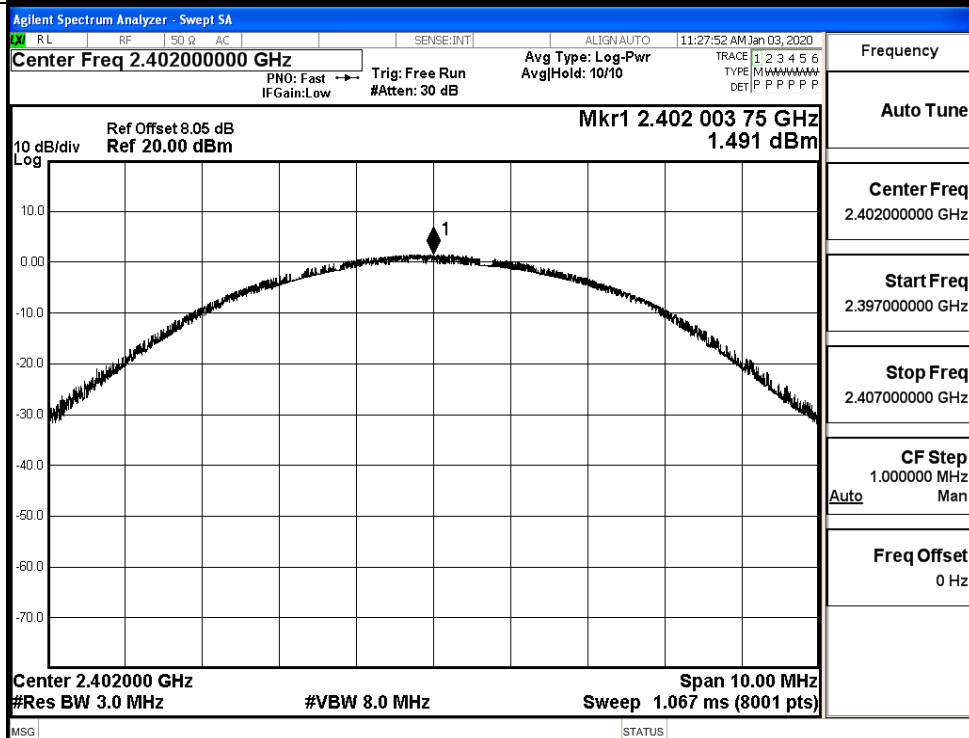
GFSK/LCH

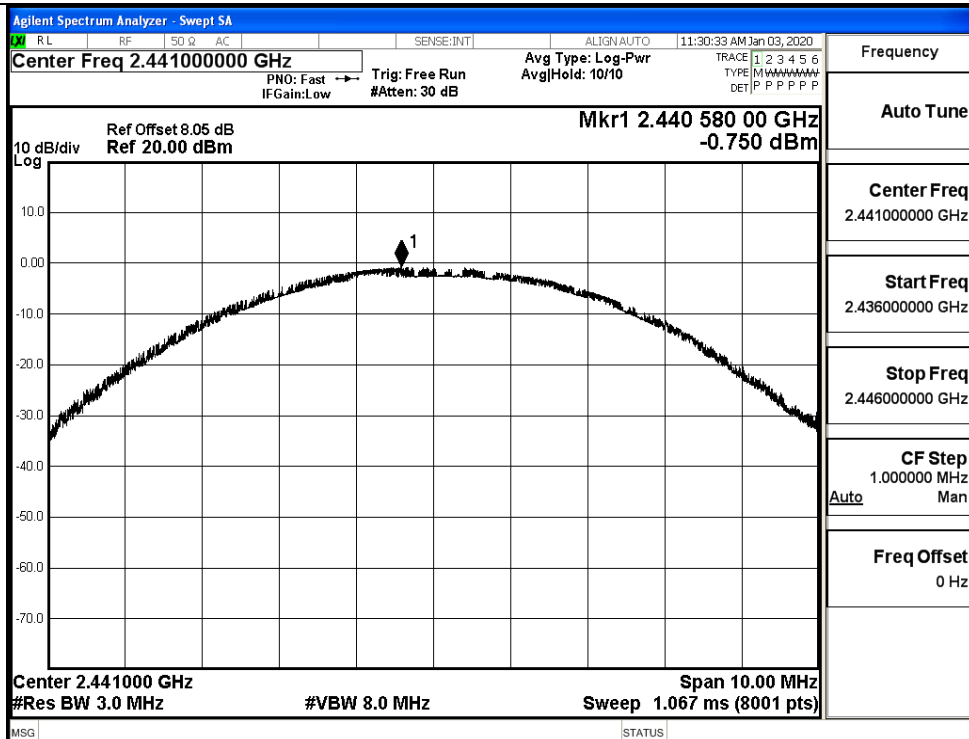
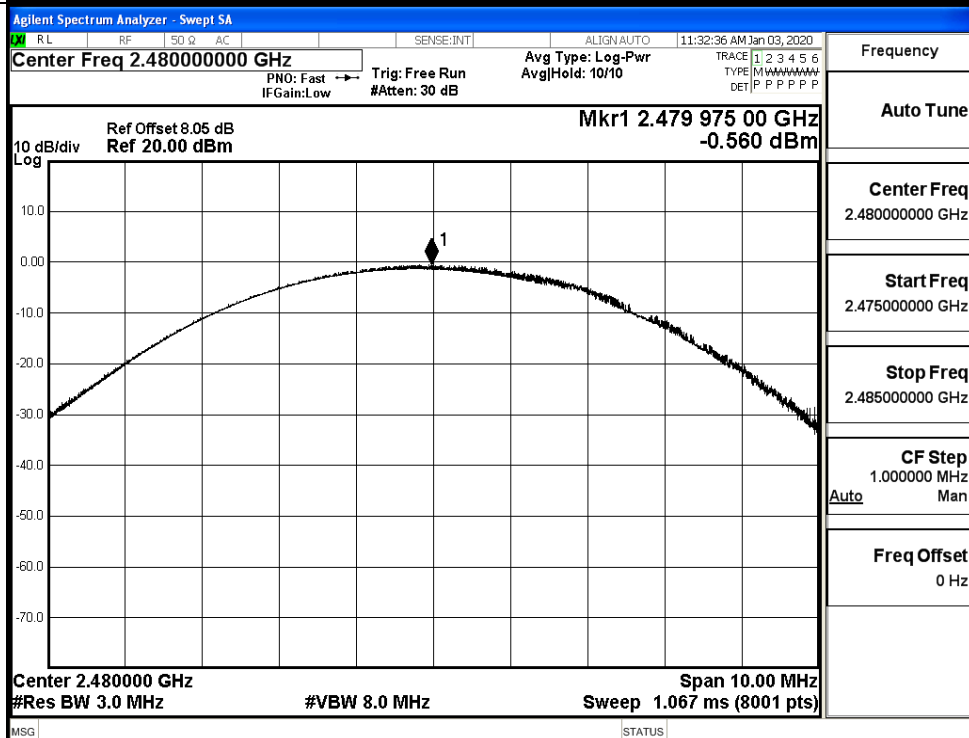


GFSK/MCH

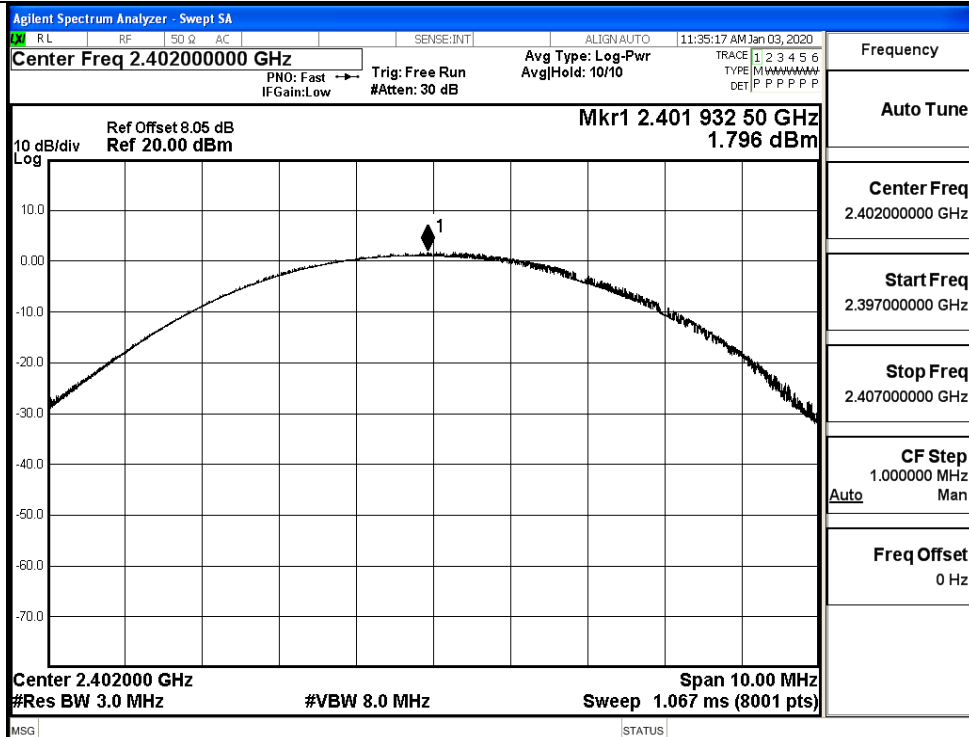


GFSK/HCH

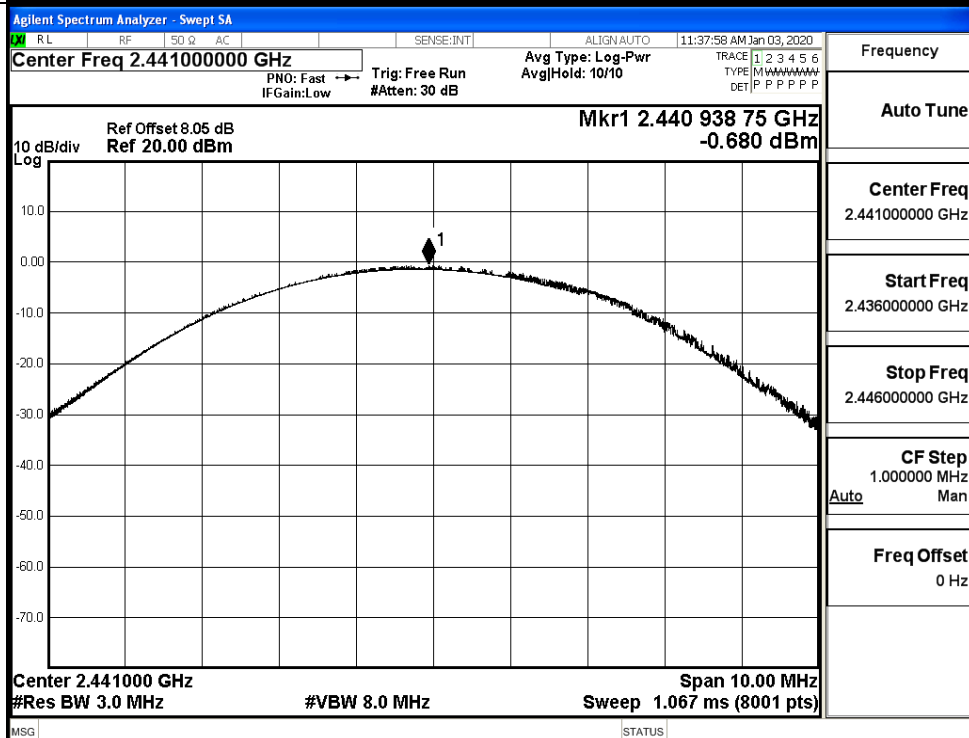
 $\pi/4$ DQPSK/LCH

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

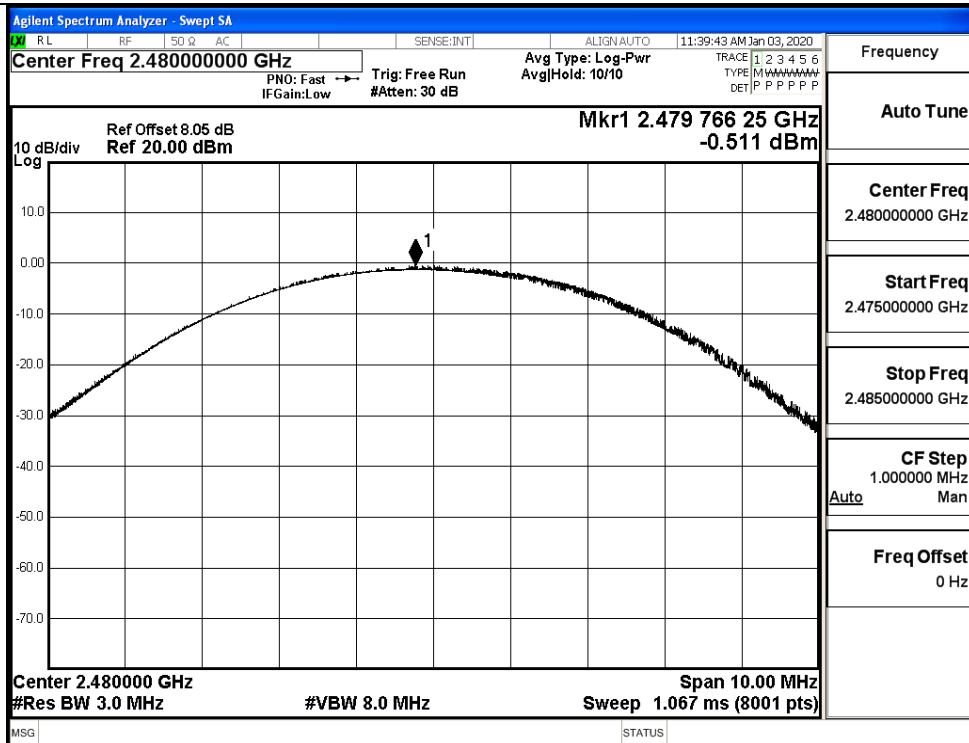
8DPSK/LCH



8DPSK/MCH



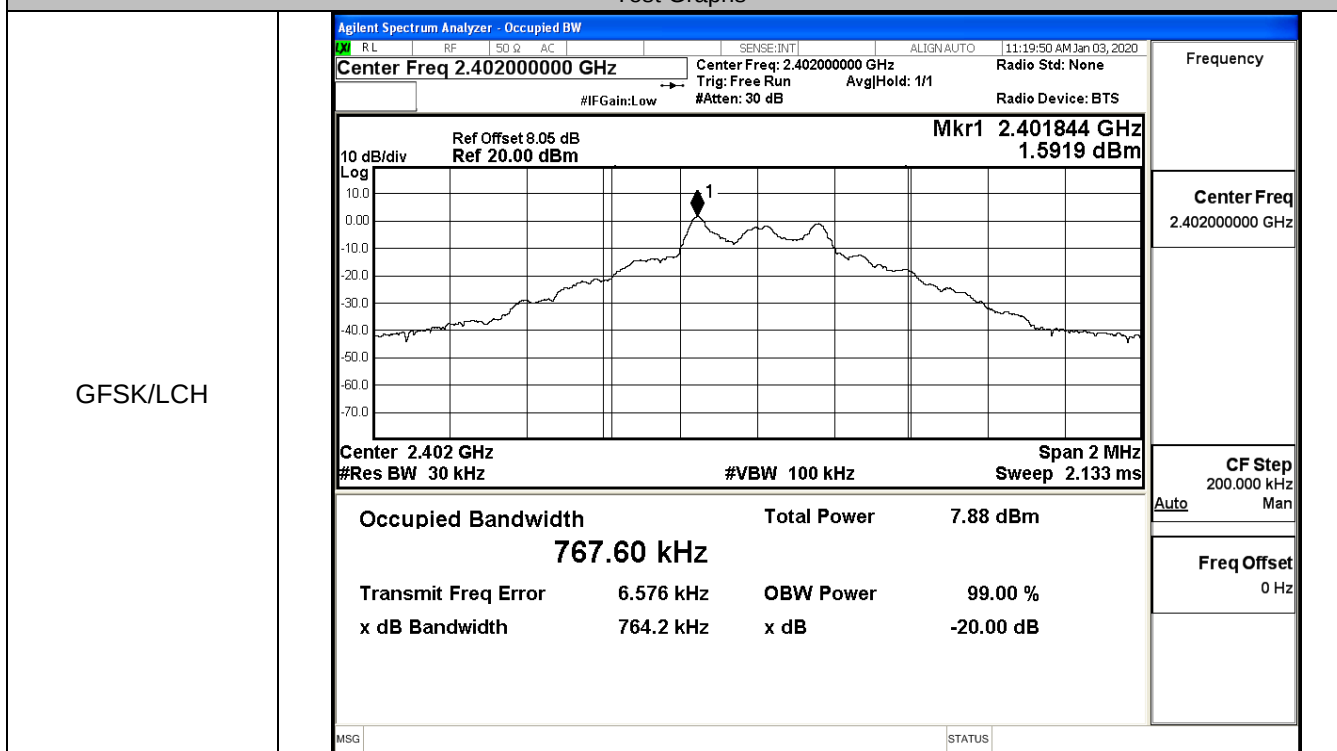
8DPSK/HCH



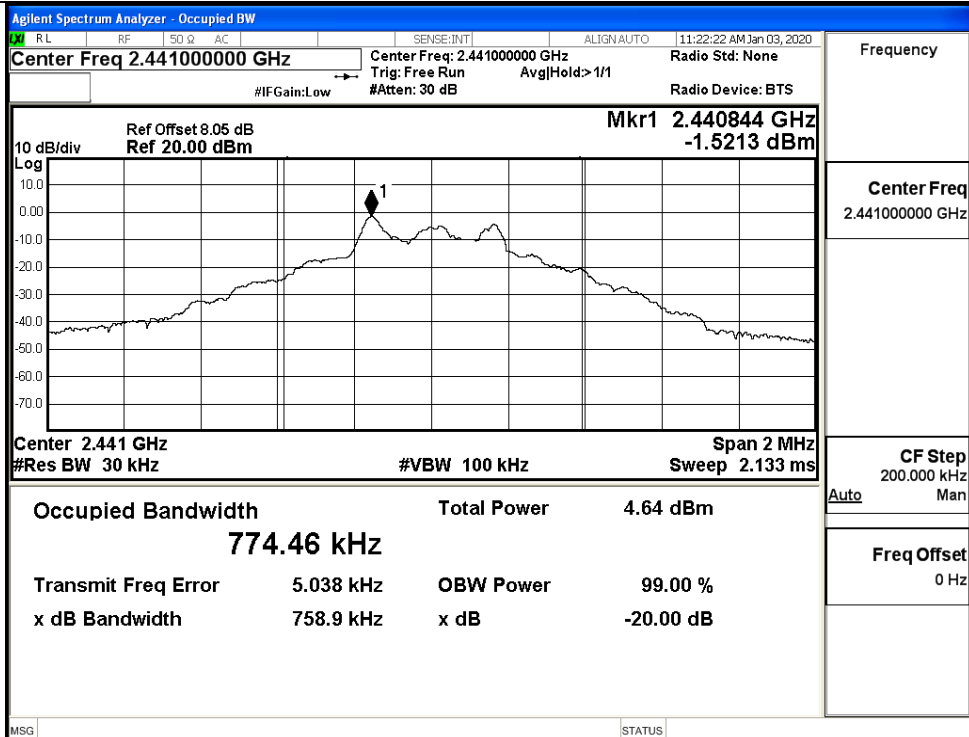
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.7642	Not Specified	PASS
	MCH	0.7589	Not Specified	PASS
	HCH	0.7621	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.152	Not Specified	PASS
	MCH	1.155	Not Specified	PASS
	HCH	1.233	Not Specified	PASS
8DPSK	LCH	1.241	Not Specified	PASS
	MCH	1.241	Not Specified	PASS
	HCH	1.234	Not Specified	PASS

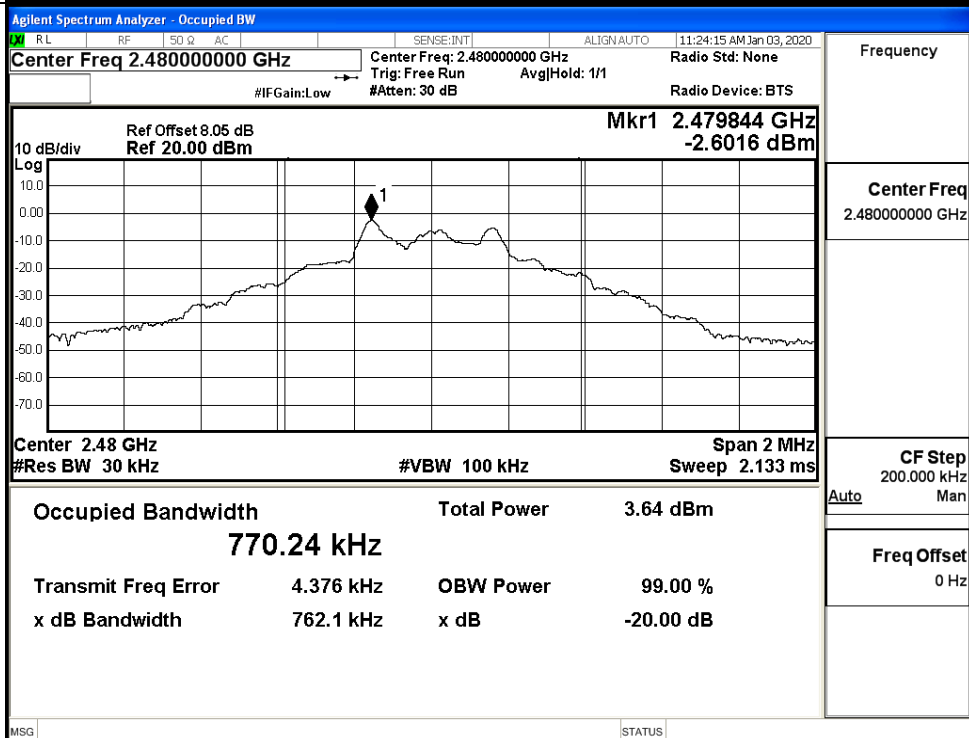
Test Graphs

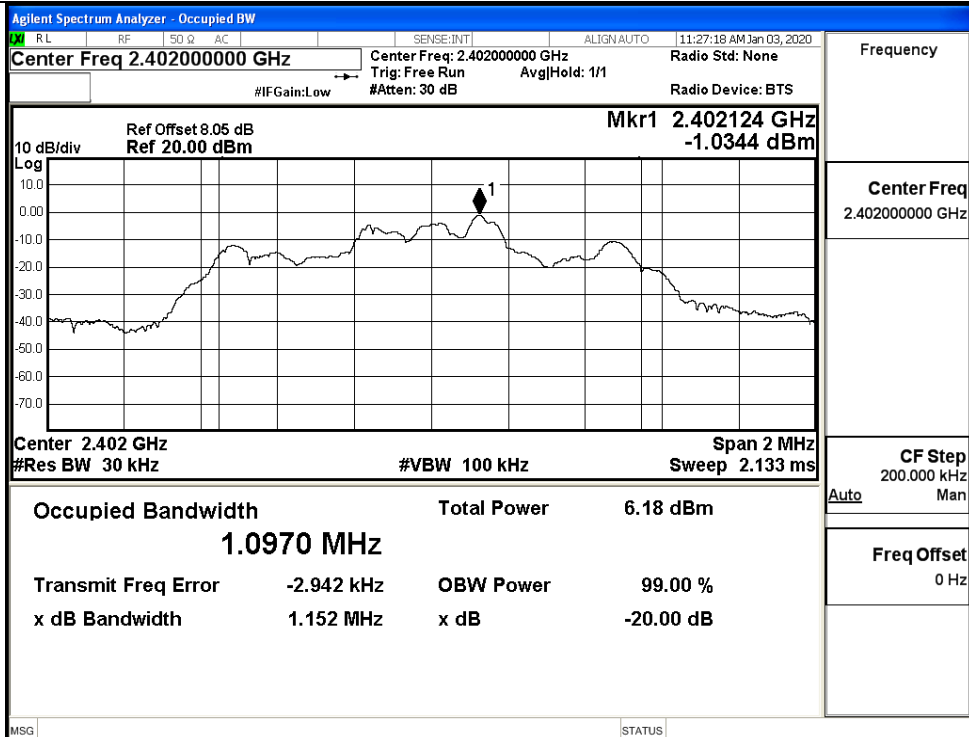
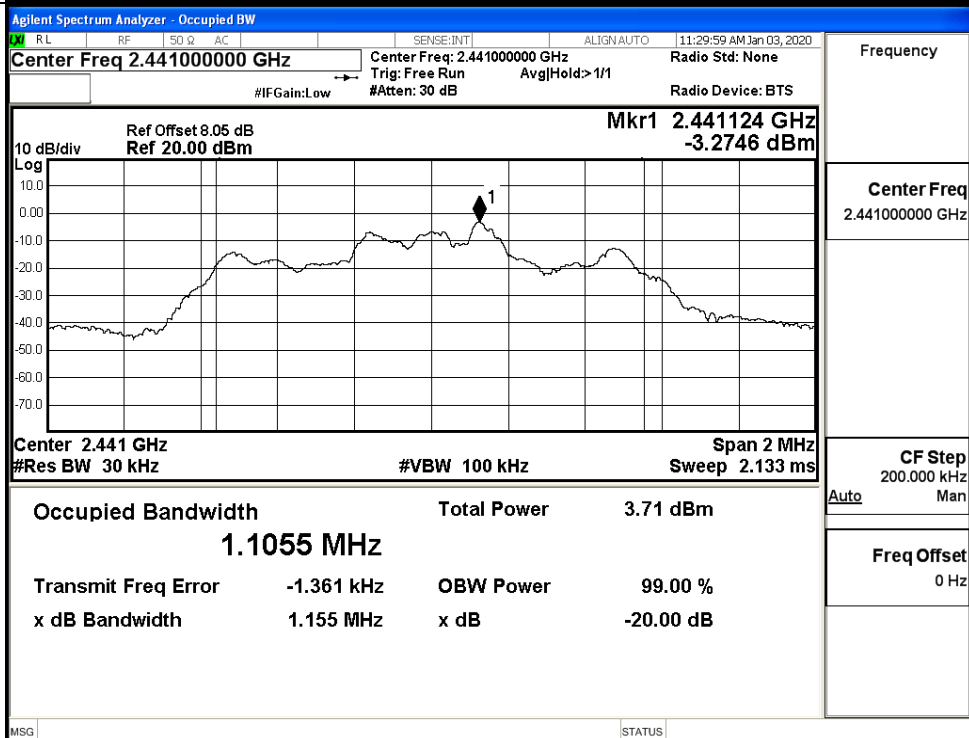


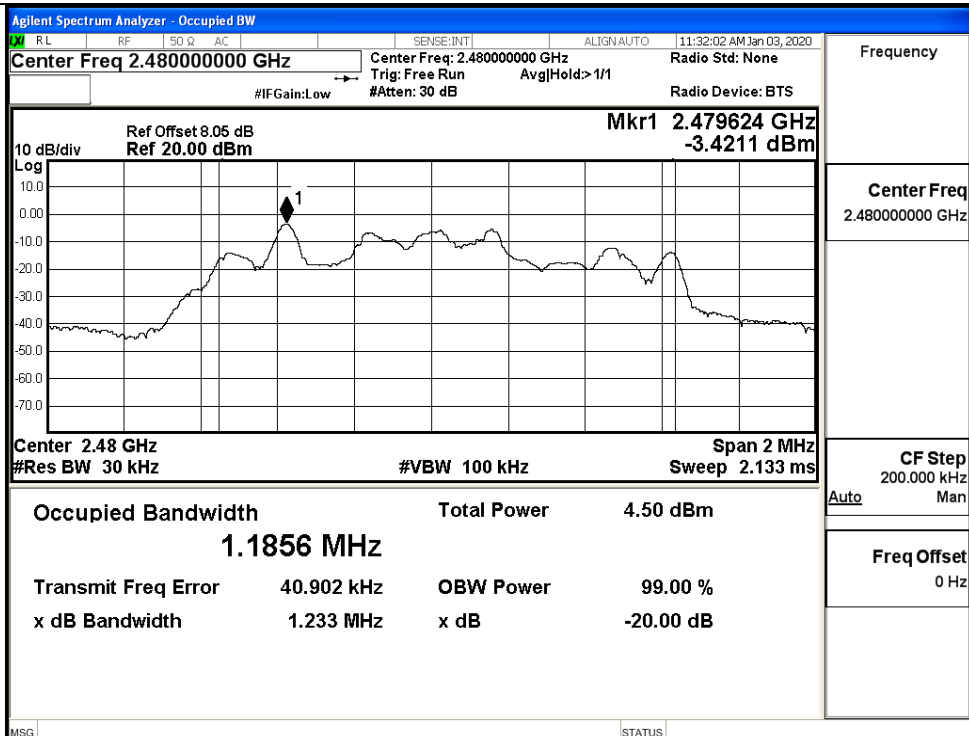
GFSK/MCH



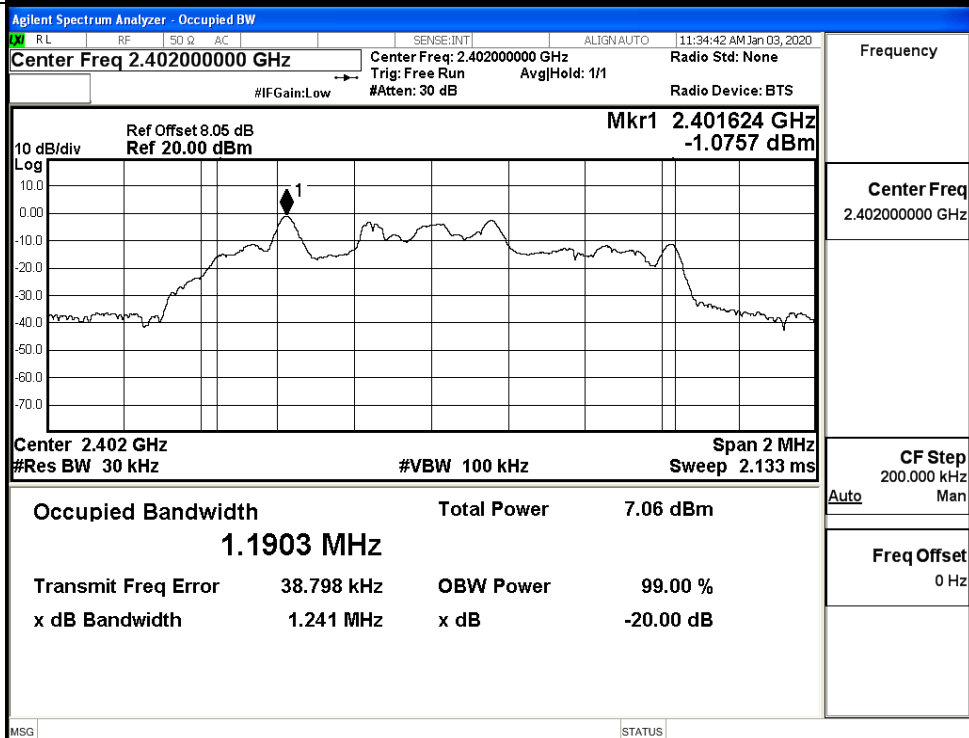
GFSK/HCH



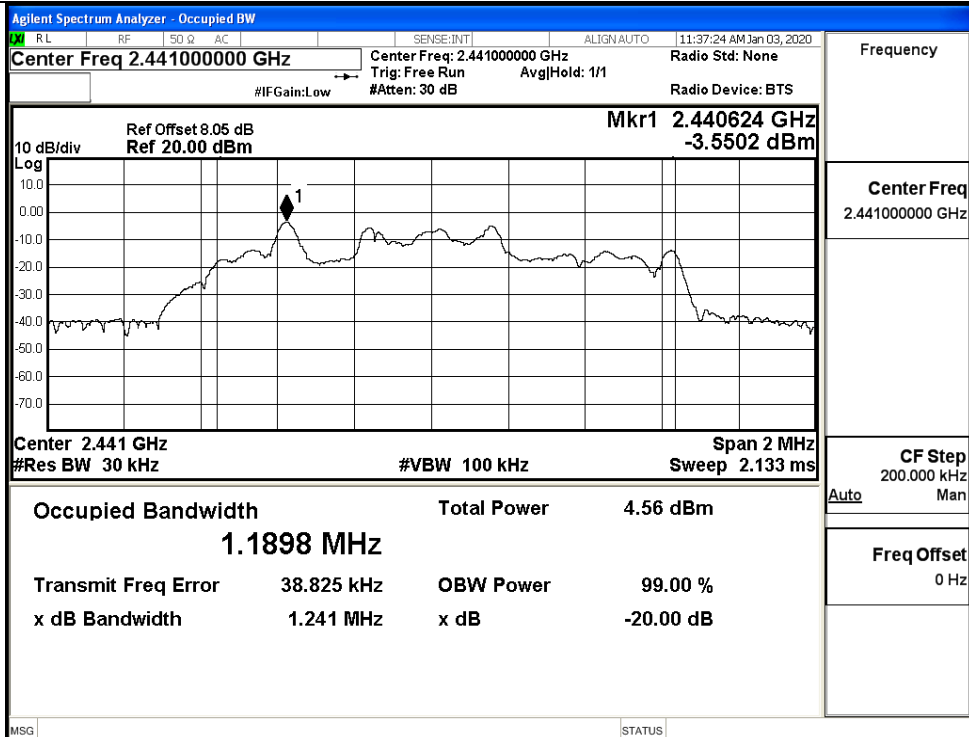
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

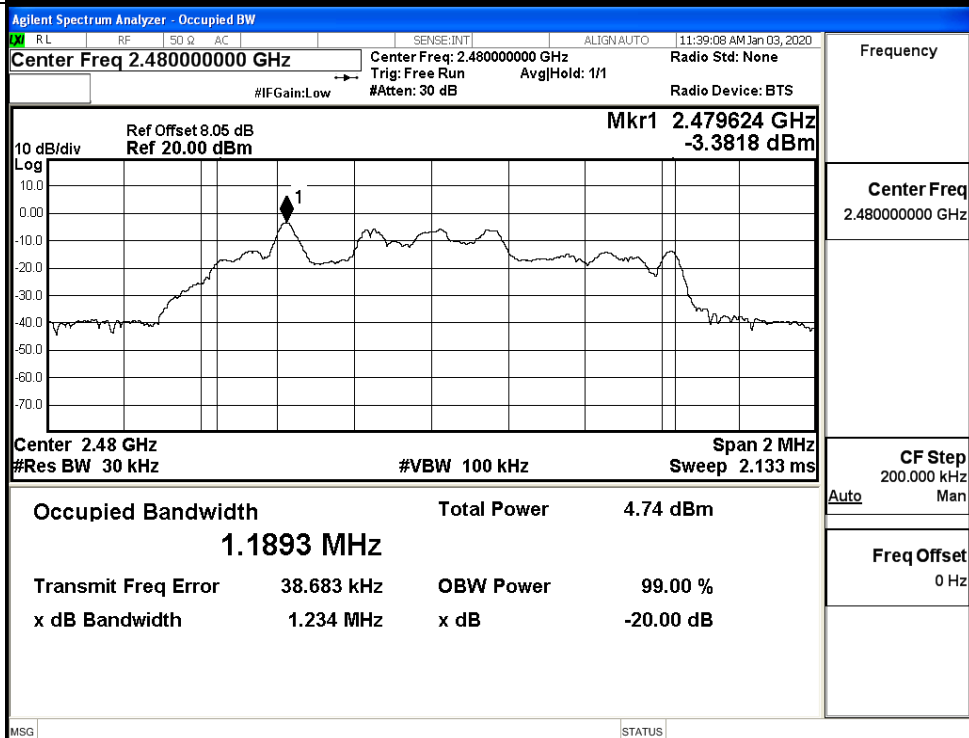
8DPSK/LCH



8DPSK/MCH



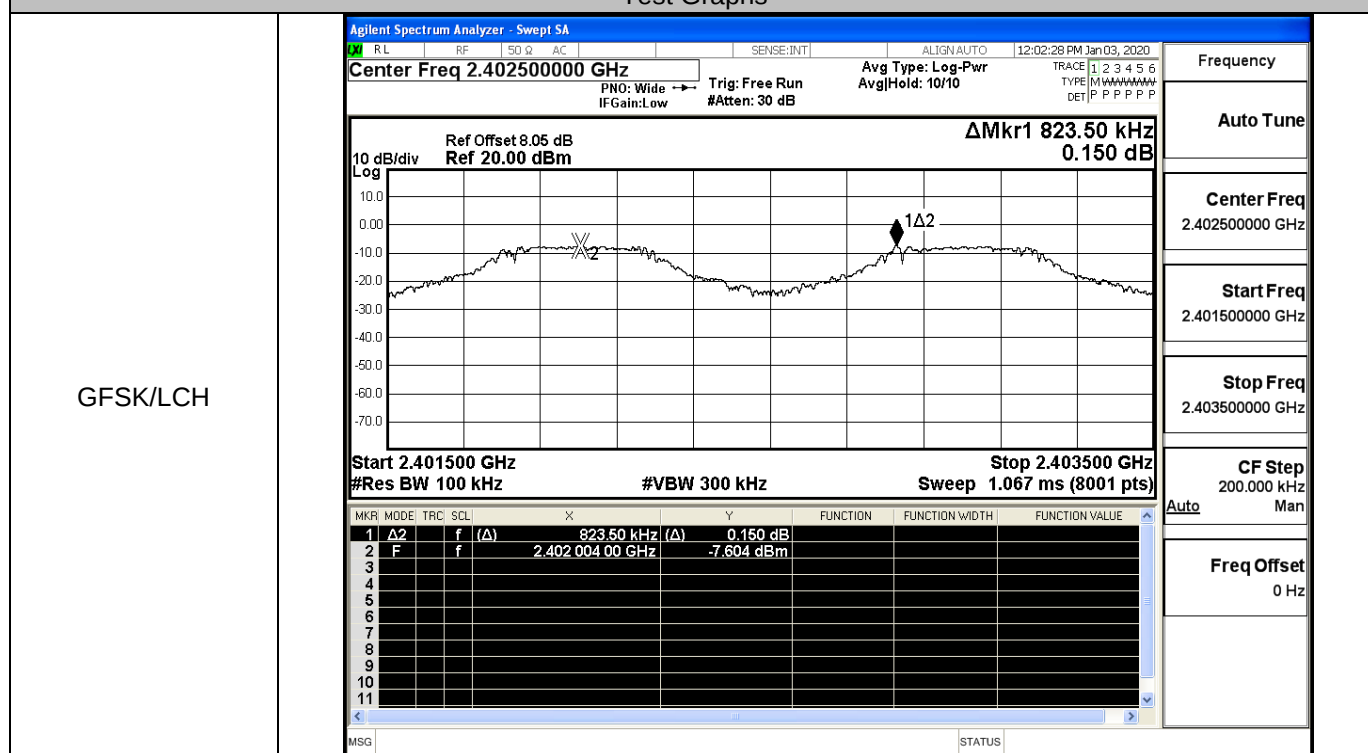
8DPSK/HCH



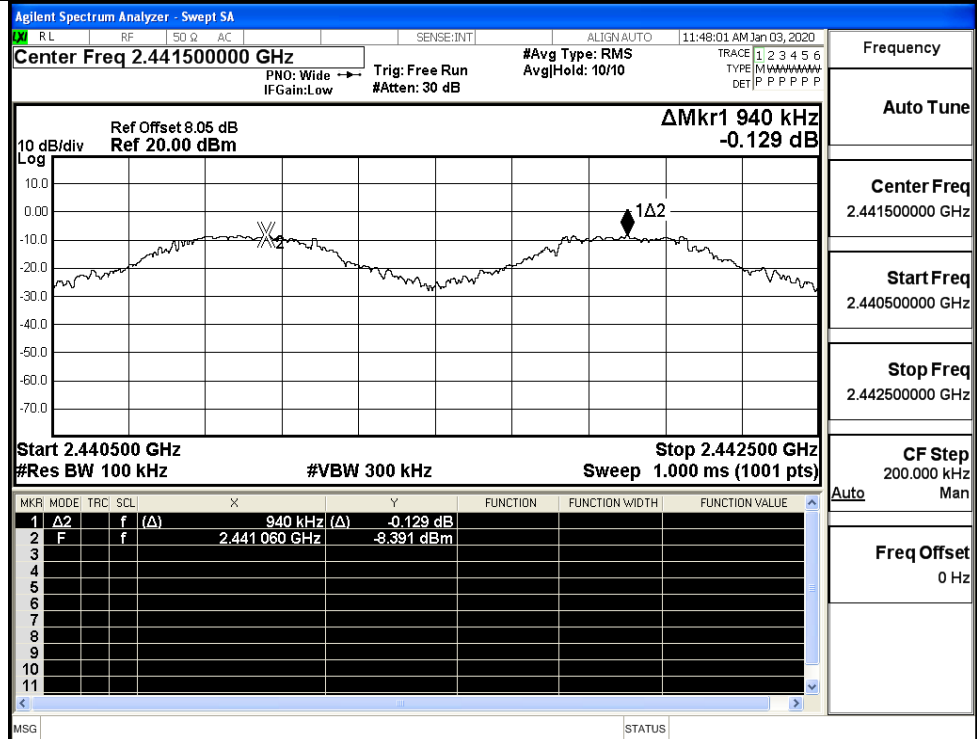
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.823	0.509	PASS
	MCH	0.940	0.509	PASS
	HCH	0.940	0.509	PASS
$\pi/4$ DQPSK	LCH	1.204	0.822	PASS
	MCH	0.866	0.822	PASS
	HCH	0.836	0.822	PASS
8DPSK	LCH	1.144	0.827	PASS
	MCH	1.016	0.827	PASS
	HCH	1.220	0.827	PASS

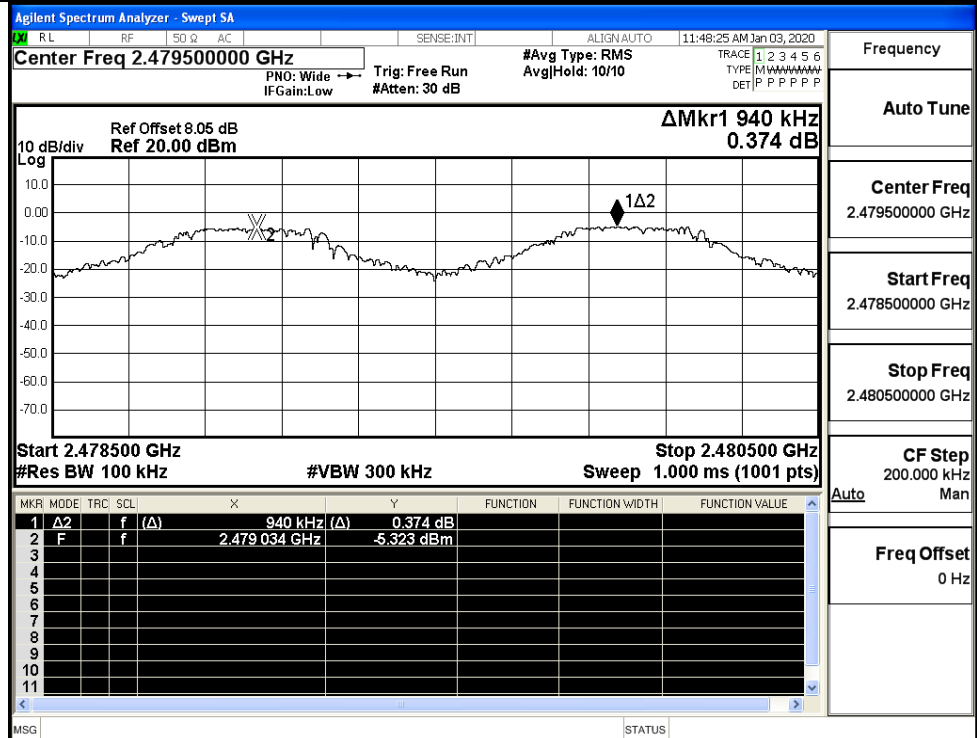
Test Graphs

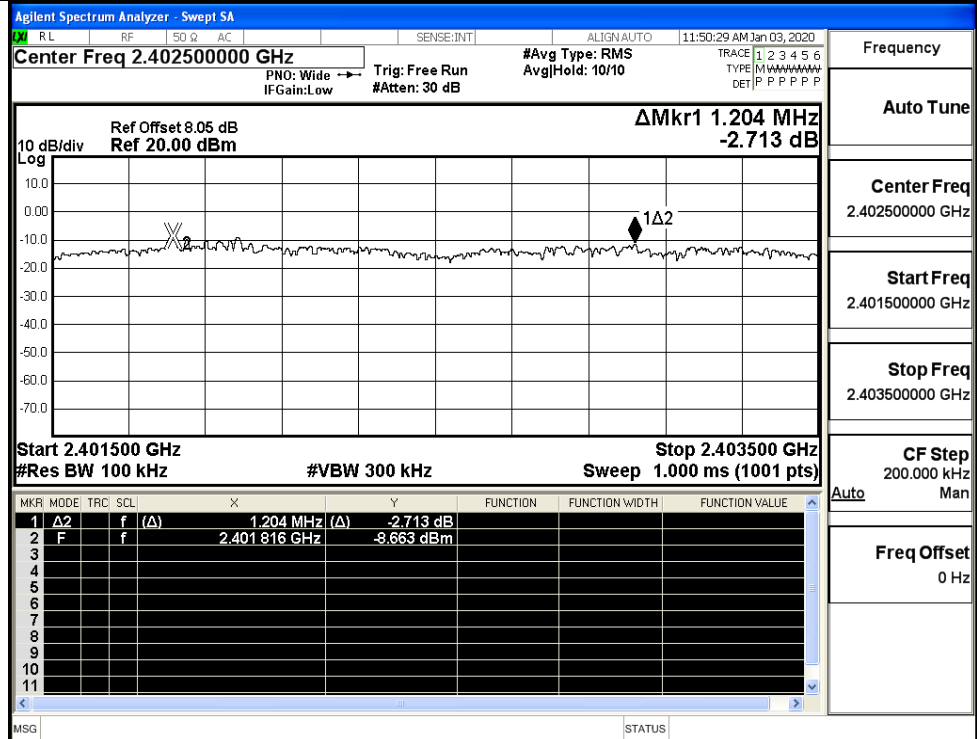
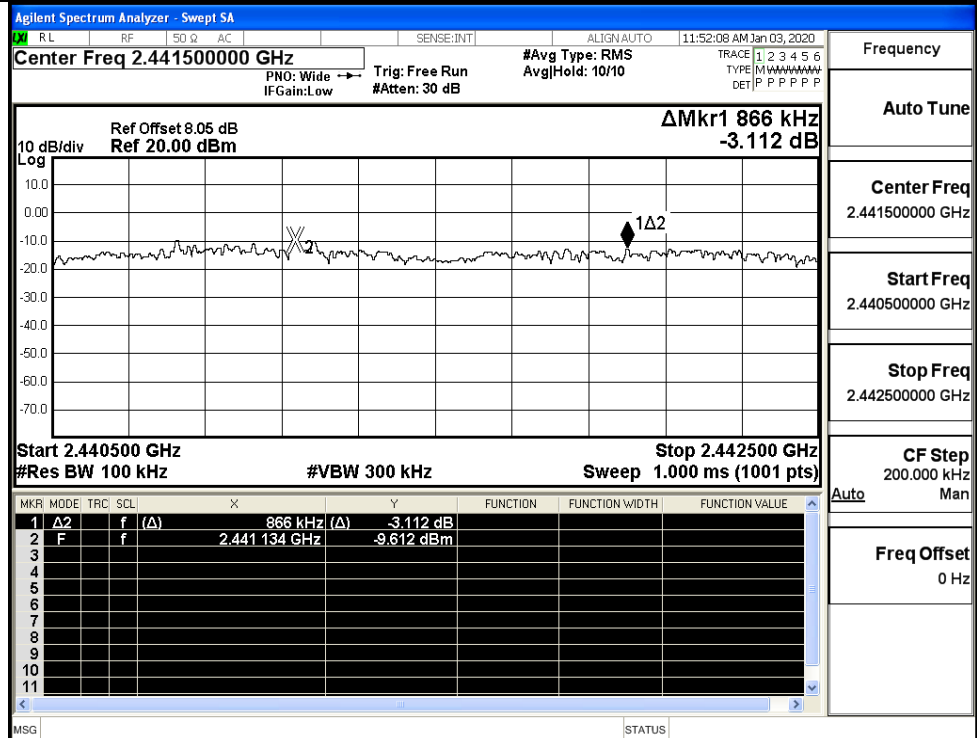


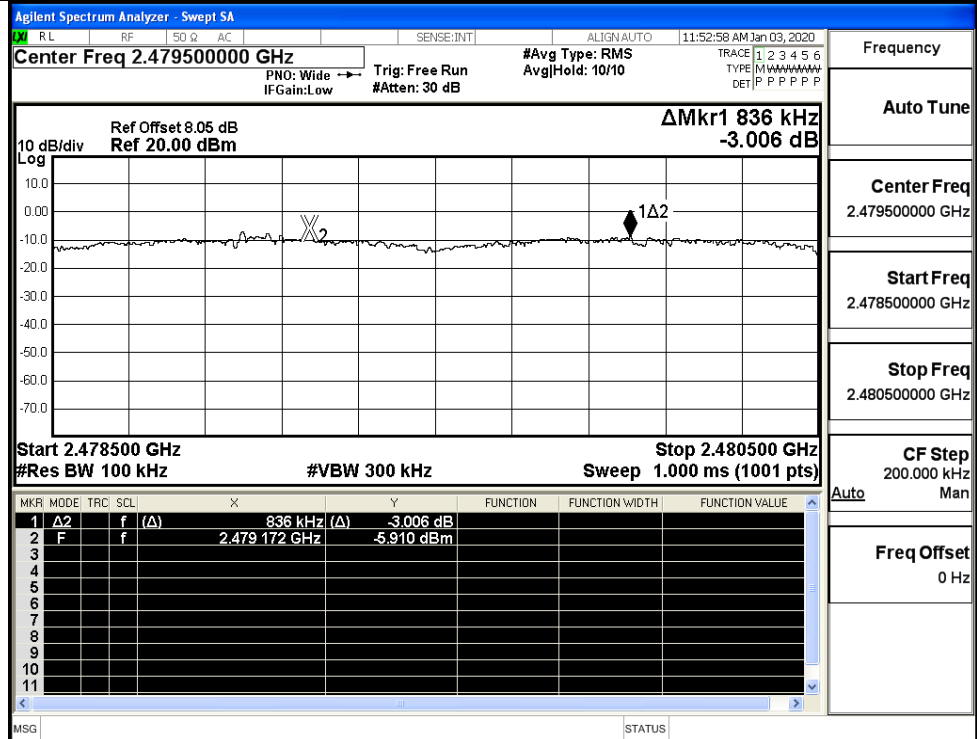
GFSK/MCH



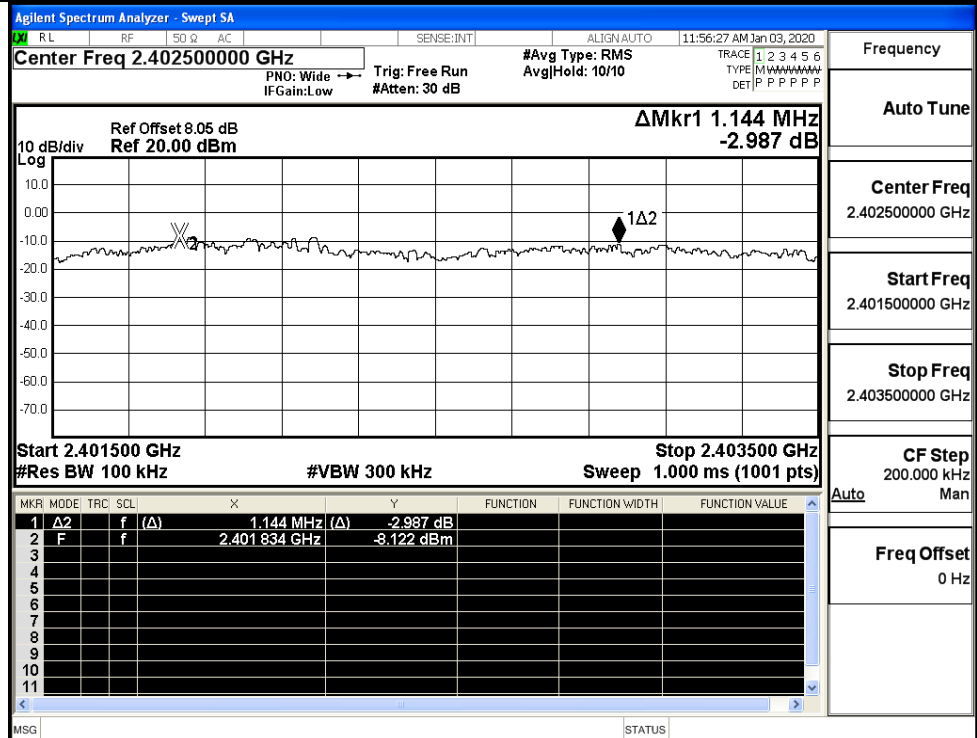
GFSK/HCH

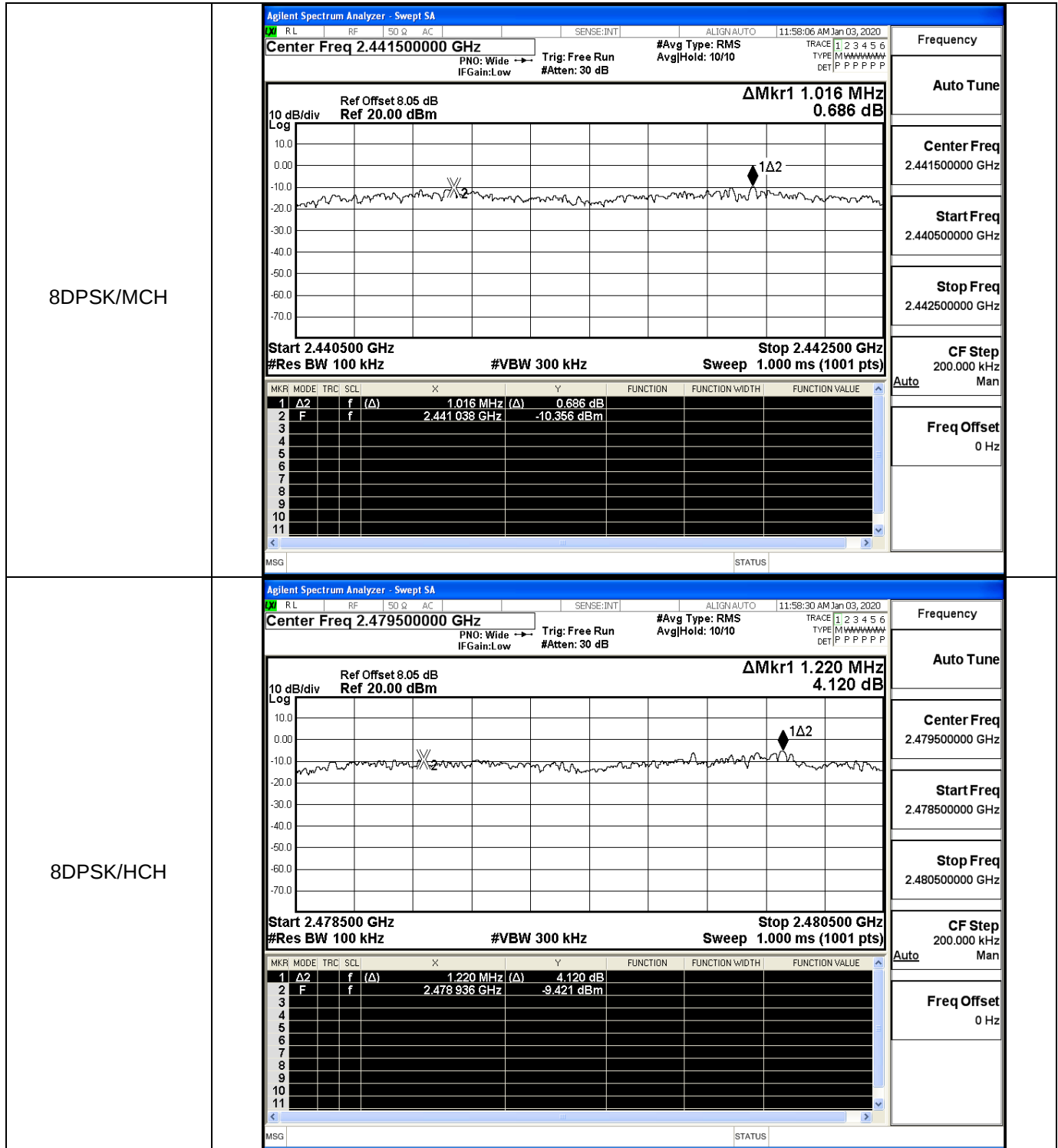


$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

8DPSK/LCH



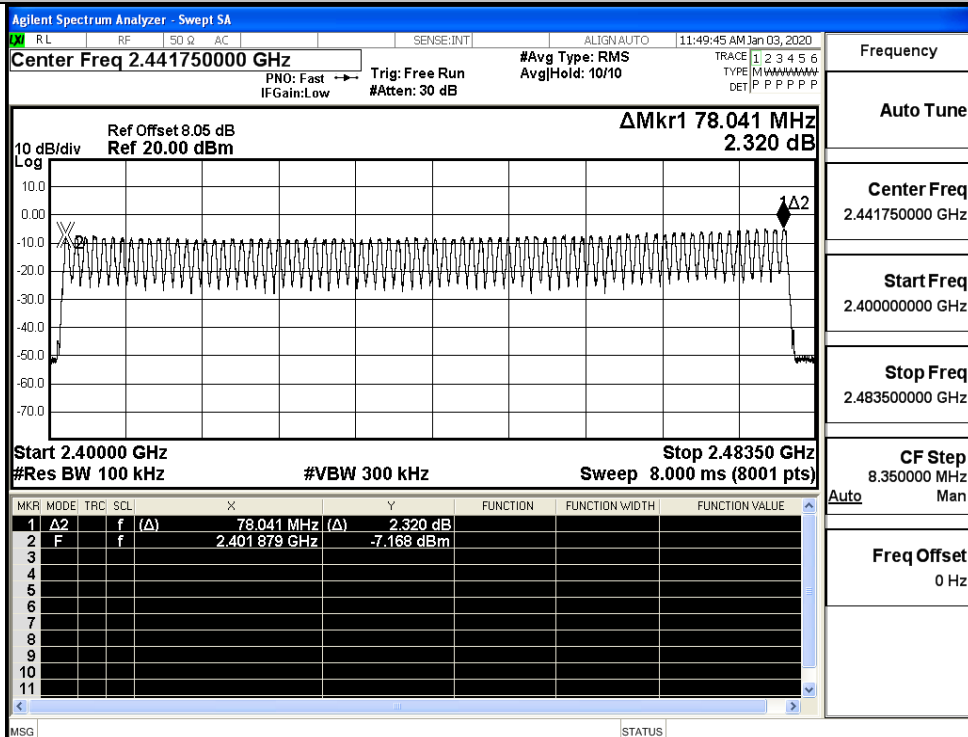
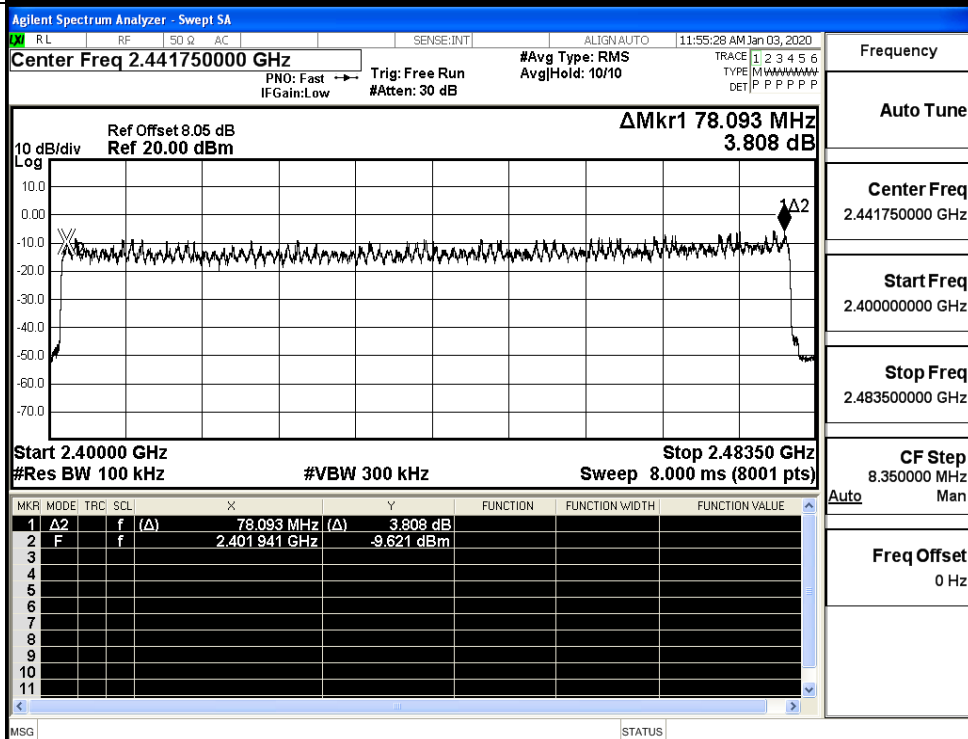


A.4 Hopping Channel Number

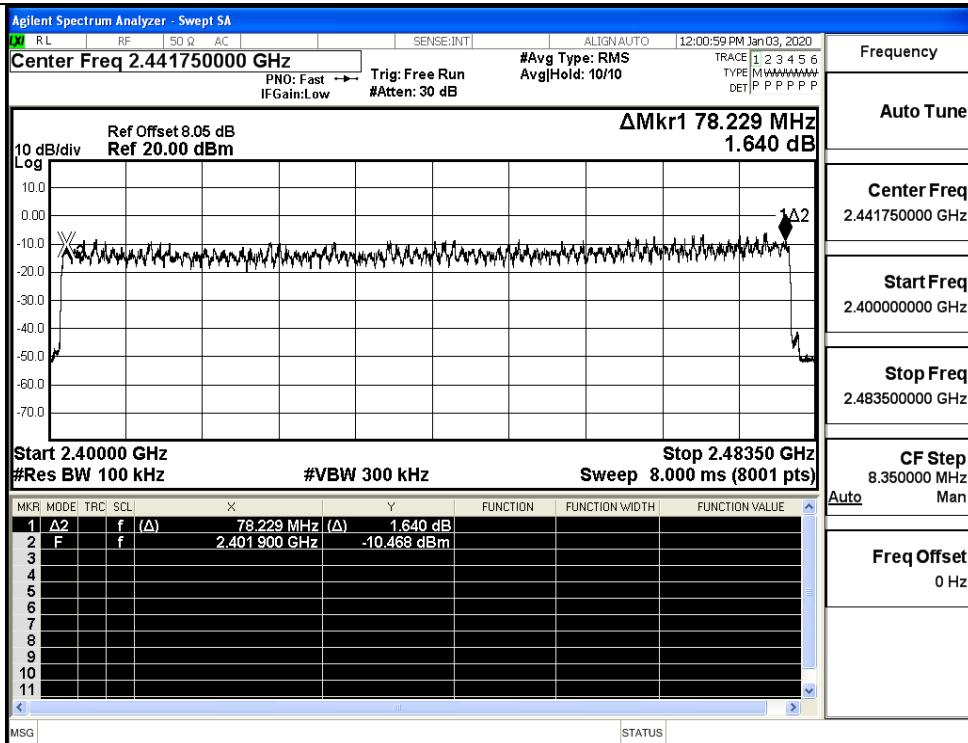
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

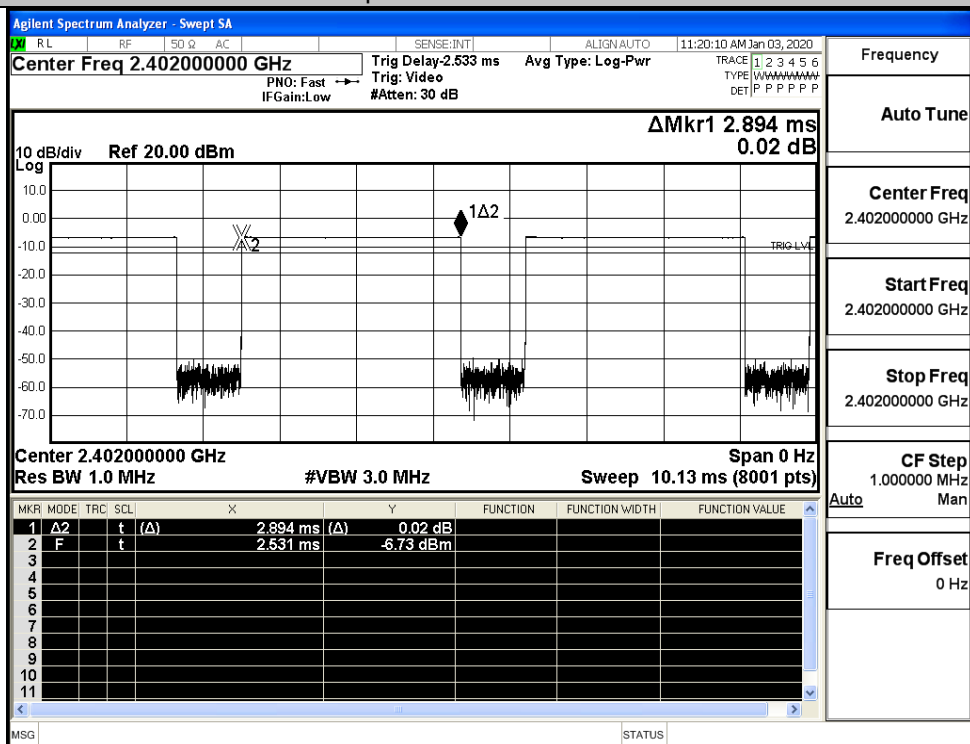


A.5 Dwell Time

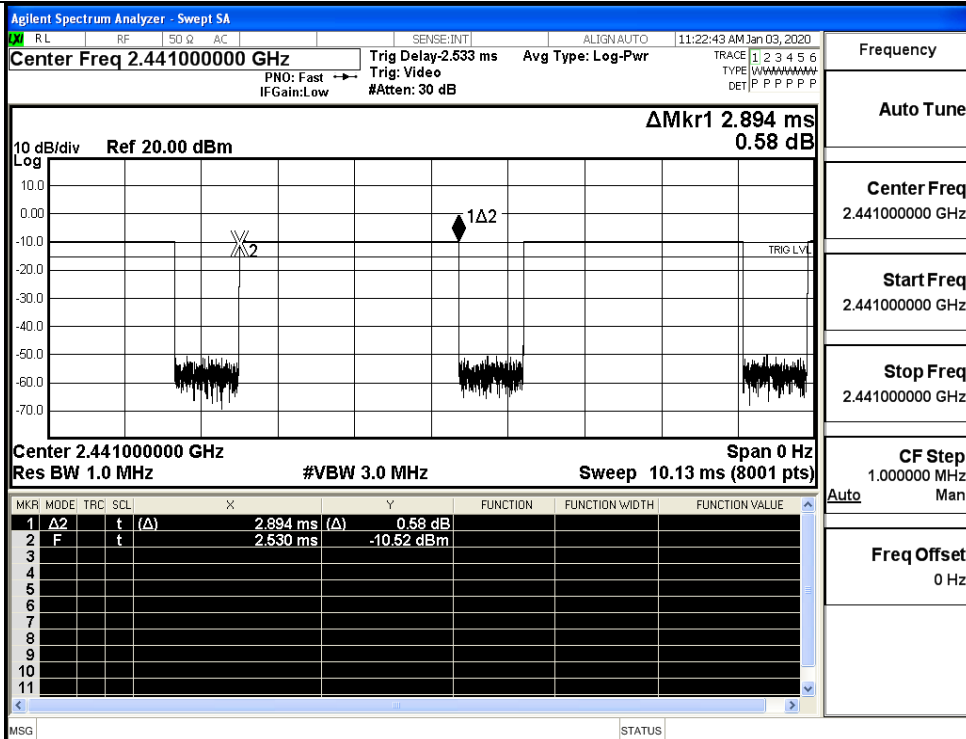
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.89	106.7	0.308	0.4	PASS
	DH5	MCH	2.89	106.7	0.308	0.4	PASS
	DH5	HCH	2.89	106.7	0.308	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.89	106.7	0.307	0.4	PASS
	2DH5	MCH	2.89	106.7	0.307	0.4	PASS
	2DH5	HCH	2.89	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.89	106.7	0.21	0.4	PASS
	3DH5	MCH	2.89	106.7	0.21	0.4	PASS
	3DH5	HCH	2.89	106.7	0.21	0.4	PASS

Test Graphs

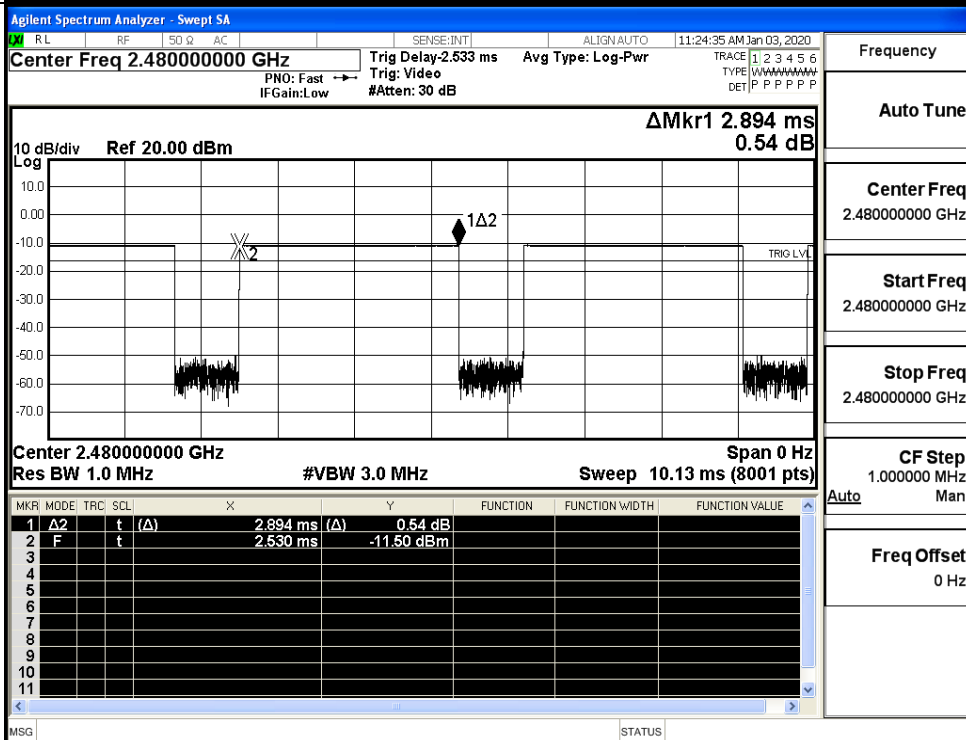
GFSK_DH5/LCH



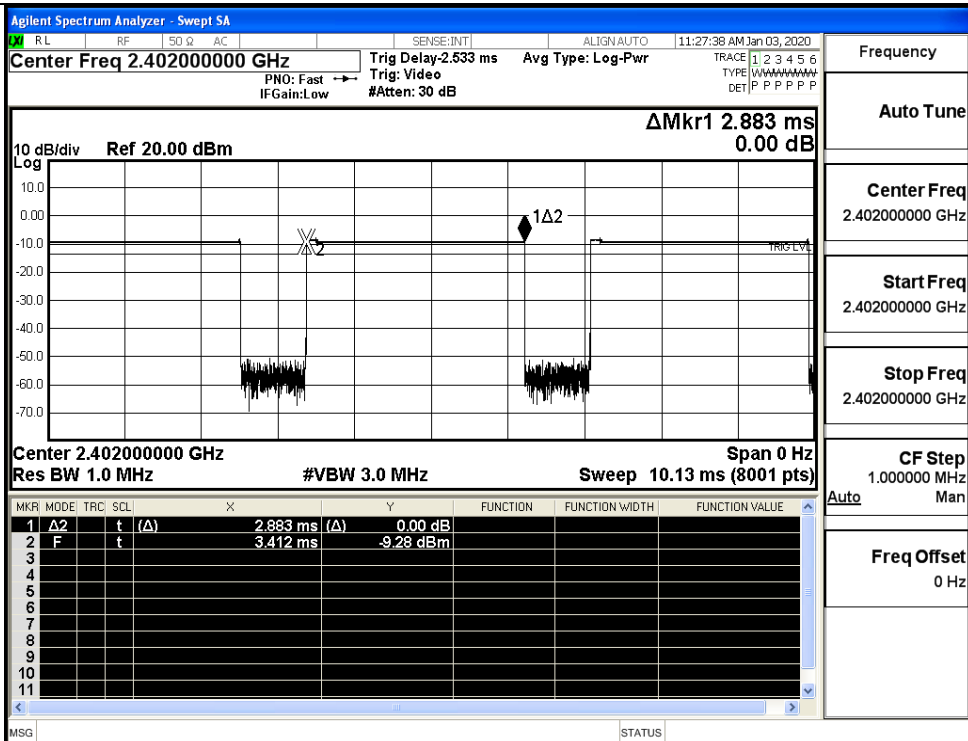
GFSK_DH5/MCH



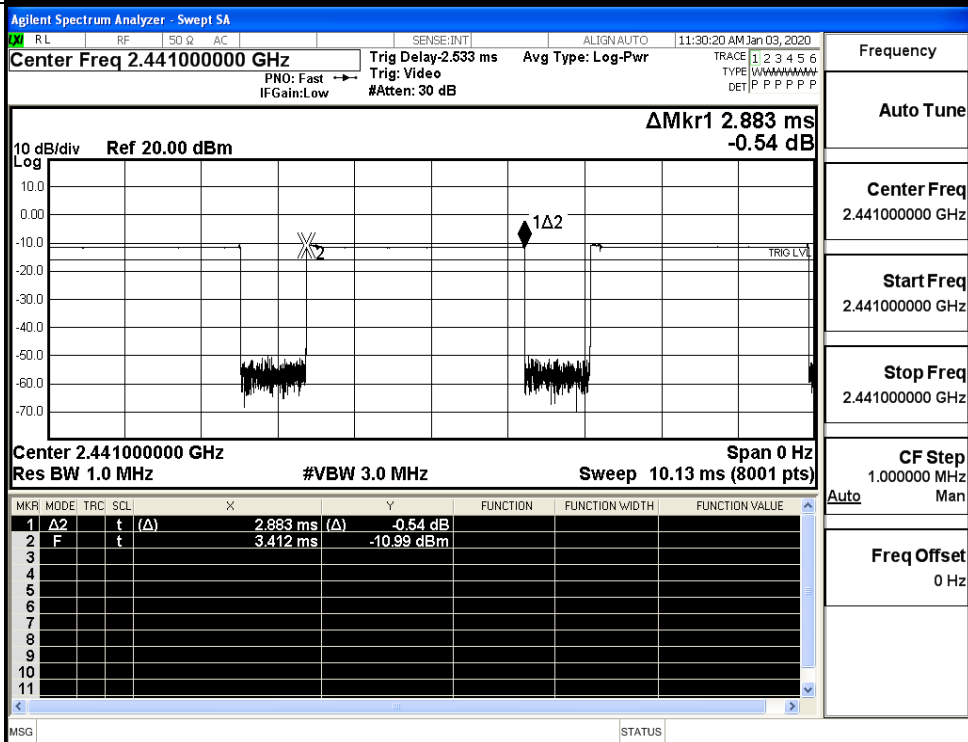
GFSK_DH5/HCH



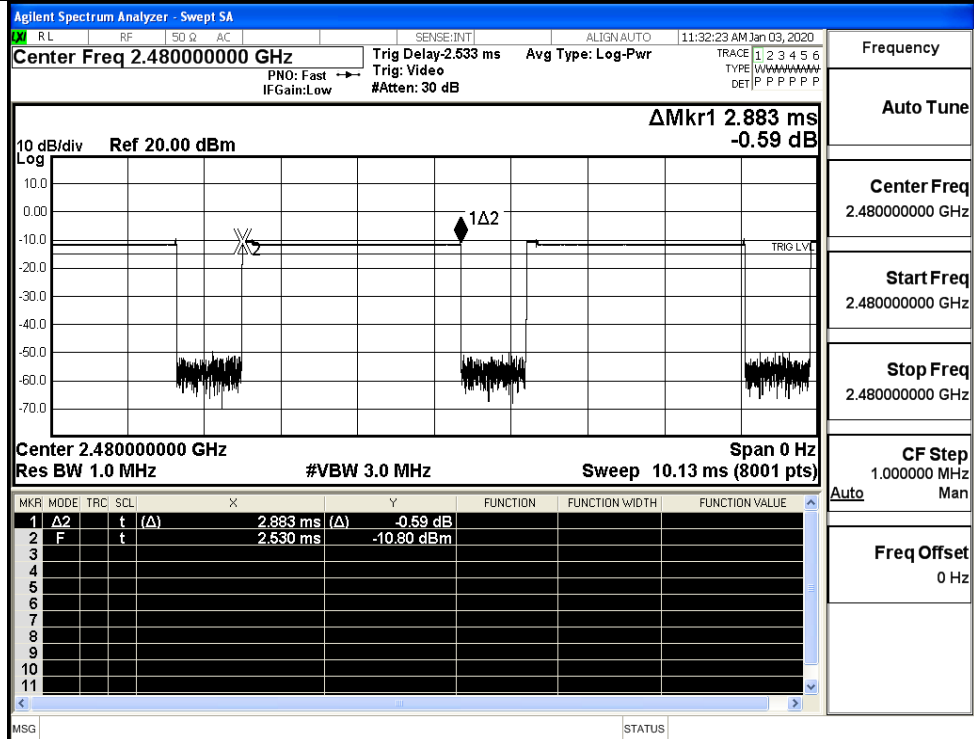
$\pi/4$ DQPSK
_2DH5/LCH



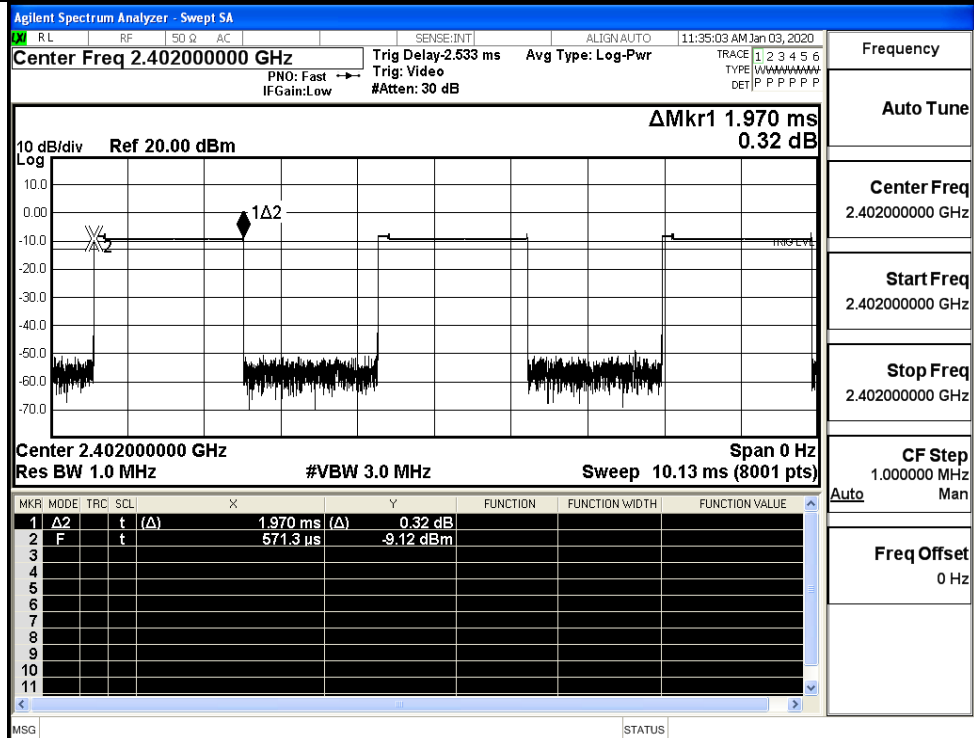
$\pi/4$ DQPSK
_2DH5/MCH



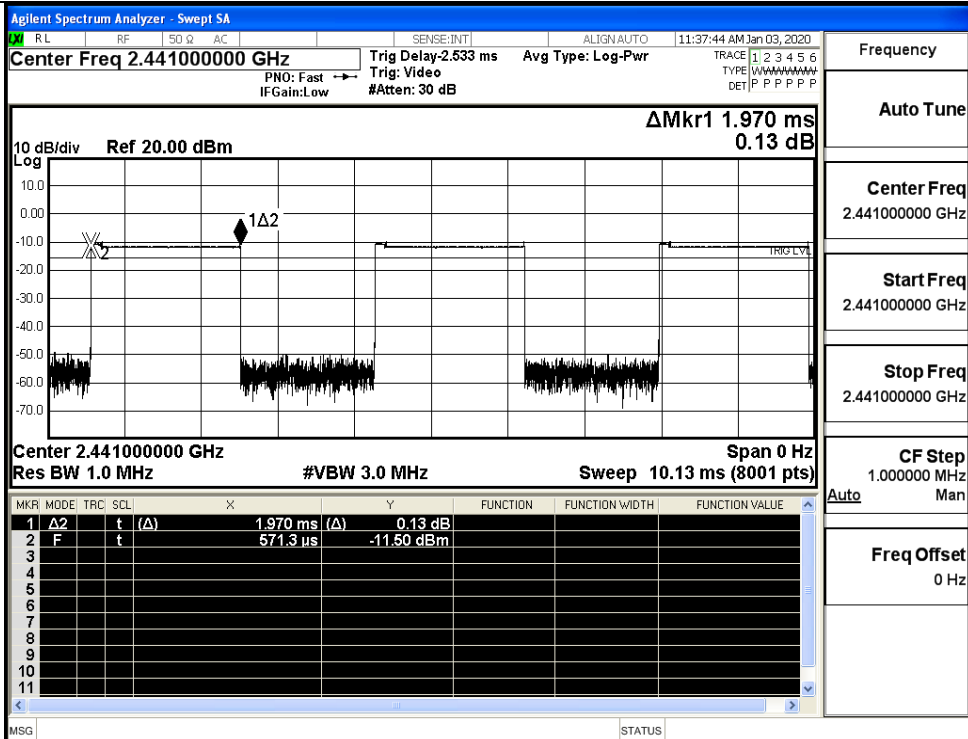
$\pi/4$ DQPSK
_2DH5/HCH



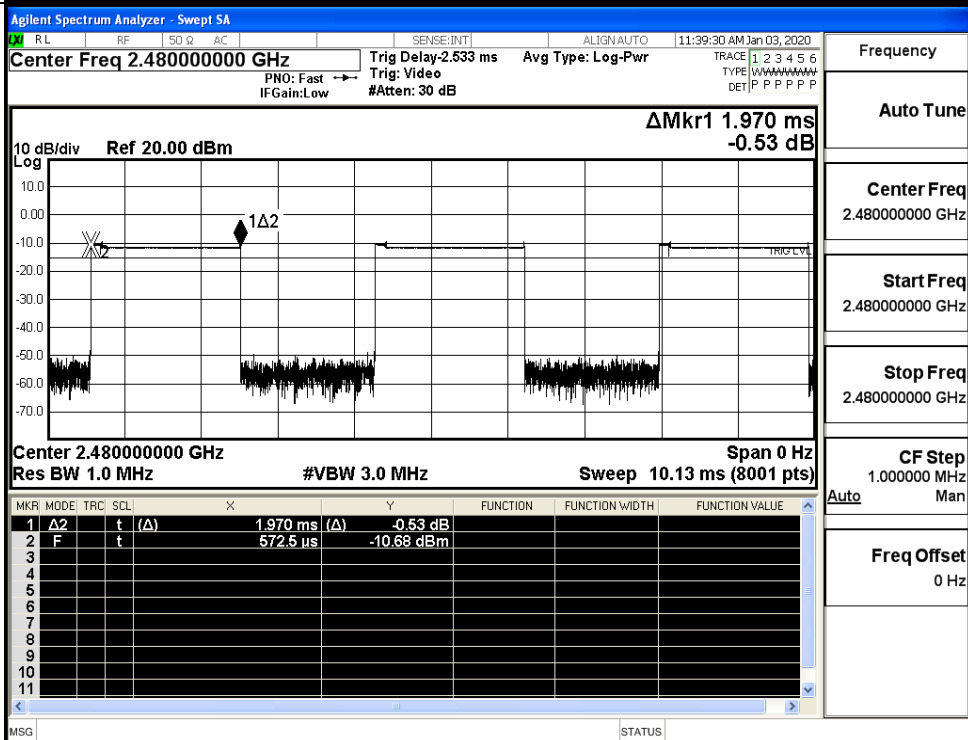
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



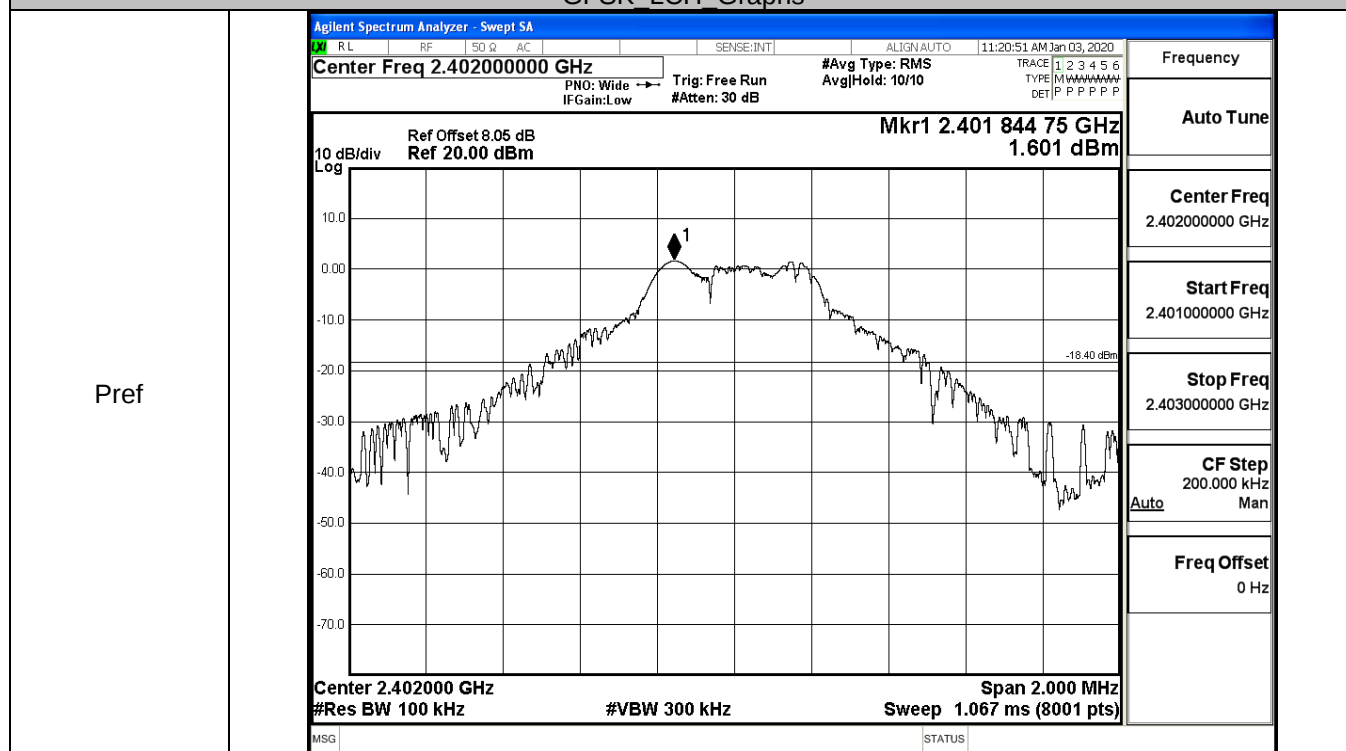
8DPSK_3DH5/HCH



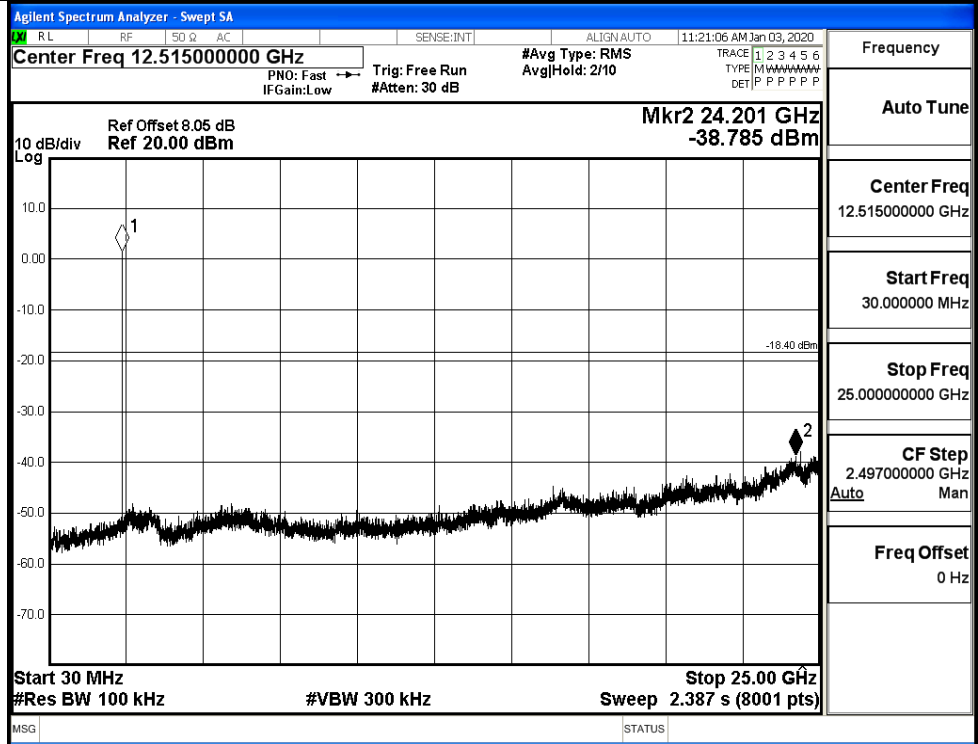
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.601	-38.785	-18.399	PASS
	MCH	-1.601	-38.293	-21.601	PASS
	HCH	-2.625	-38.405	-22.625	PASS
$\pi/4$ DQPSK	LCH	-0.421	-38.421	-20.421	PASS
	MCH	-2.897	-37.425	-22.897	PASS
	HCH	-2.615	-38.284	-22.615	PASS
8DPSK	LCH	-0.048	-37.488	-20.048	PASS
	MCH	-2.599	-37.813	-22.599	PASS
	HCH	-2.473	-36.791	-22.473	PASS

GFSK LCH Graphs

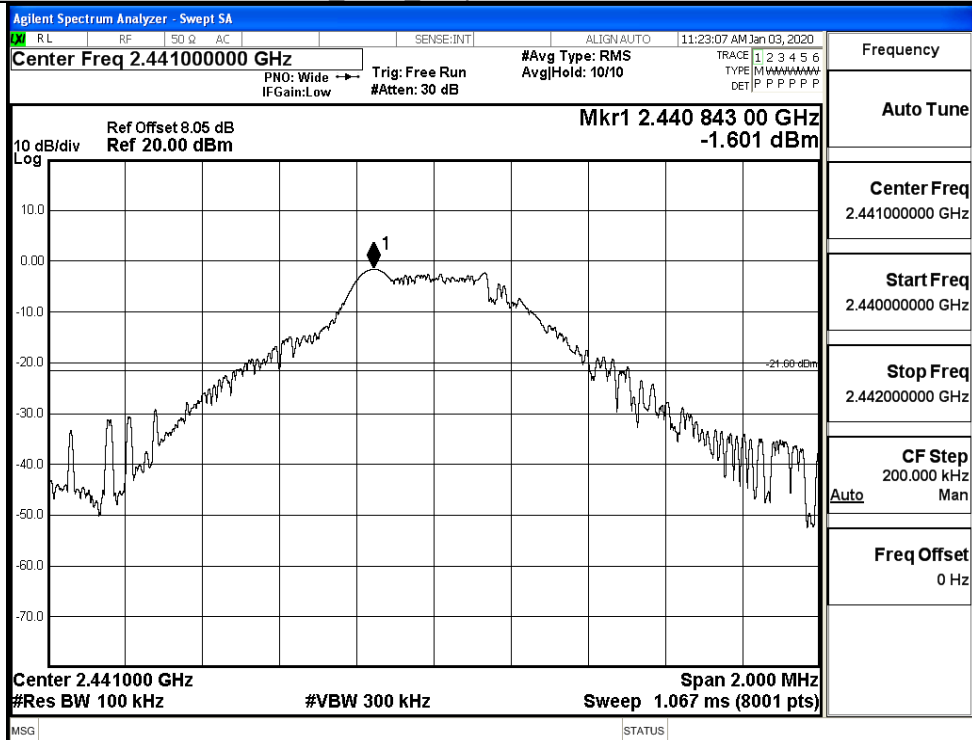


Puw

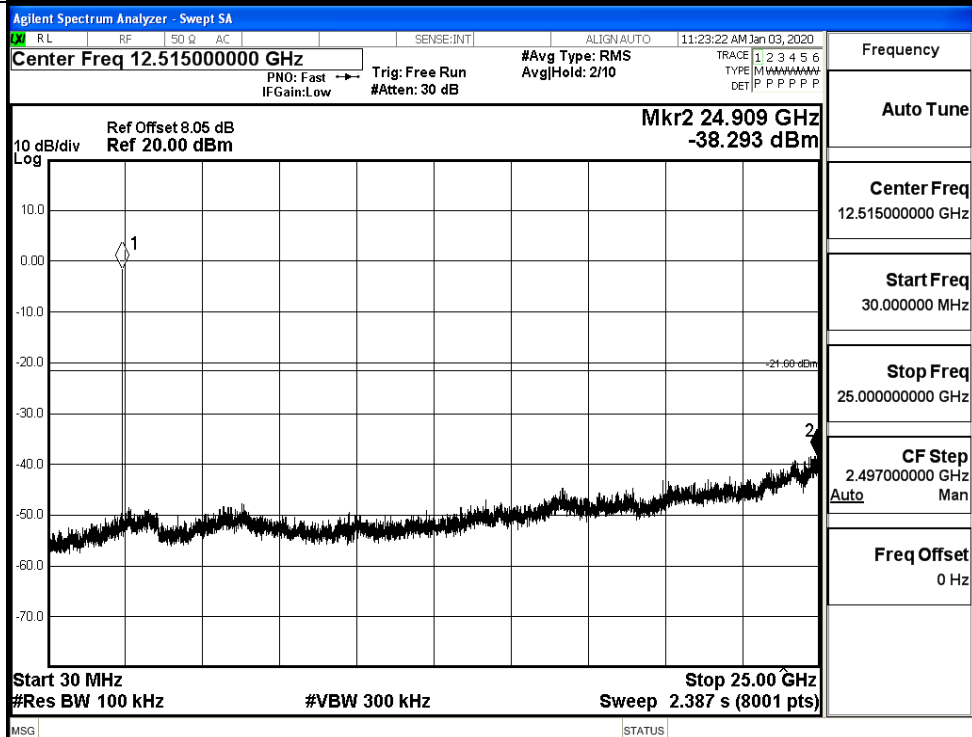


GFSK_MCH_Graphs

Pref

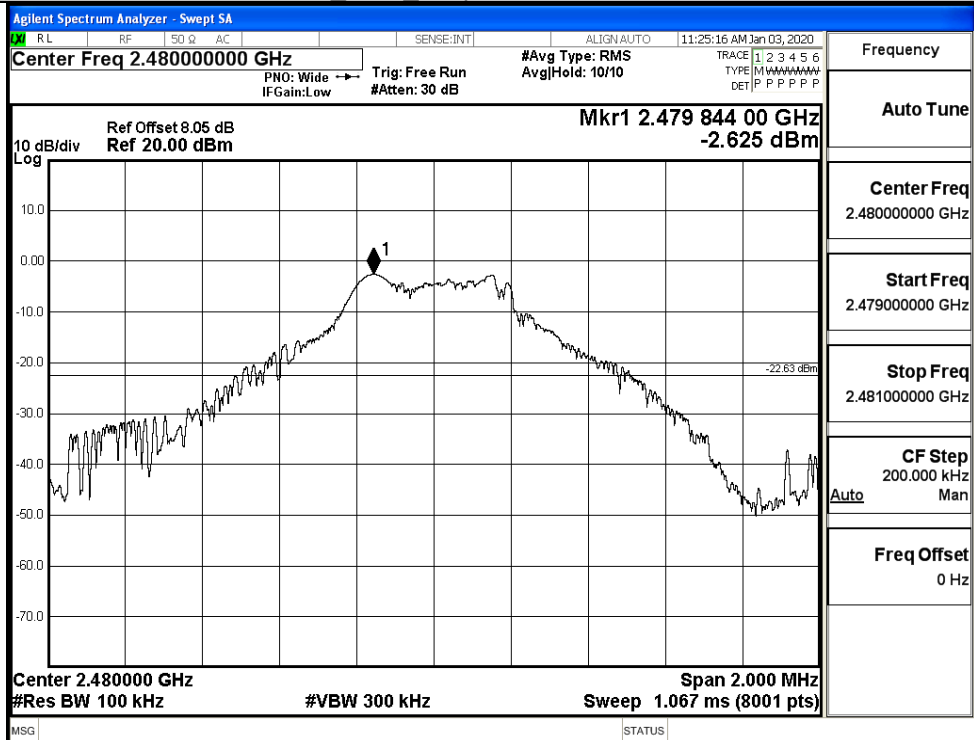


Puw

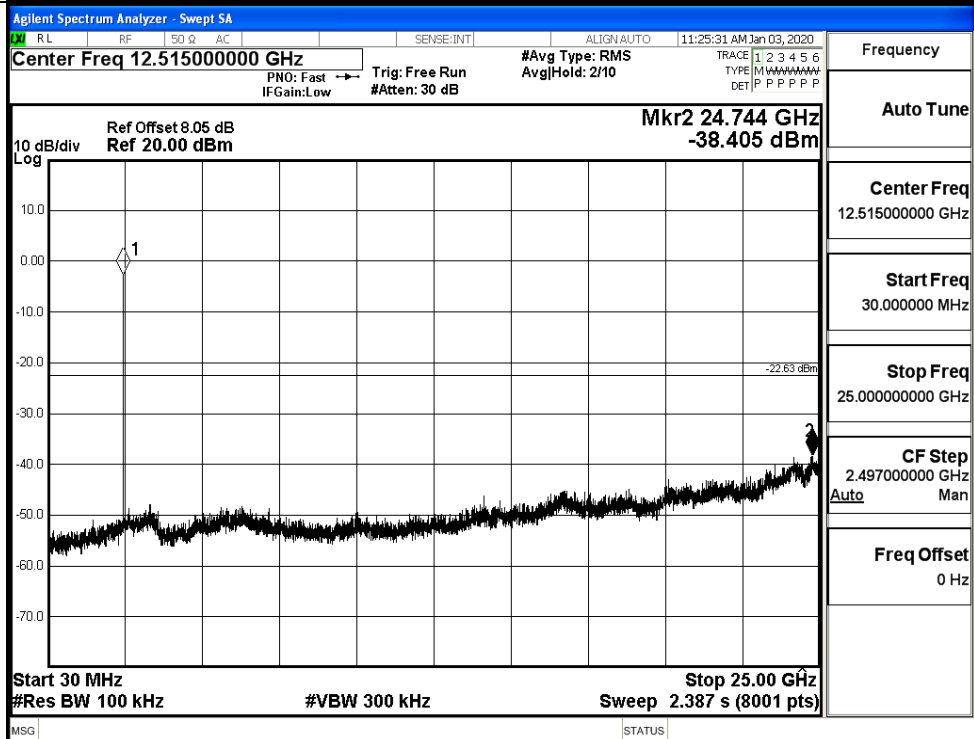


GFSK HCH_Graphs

Pref

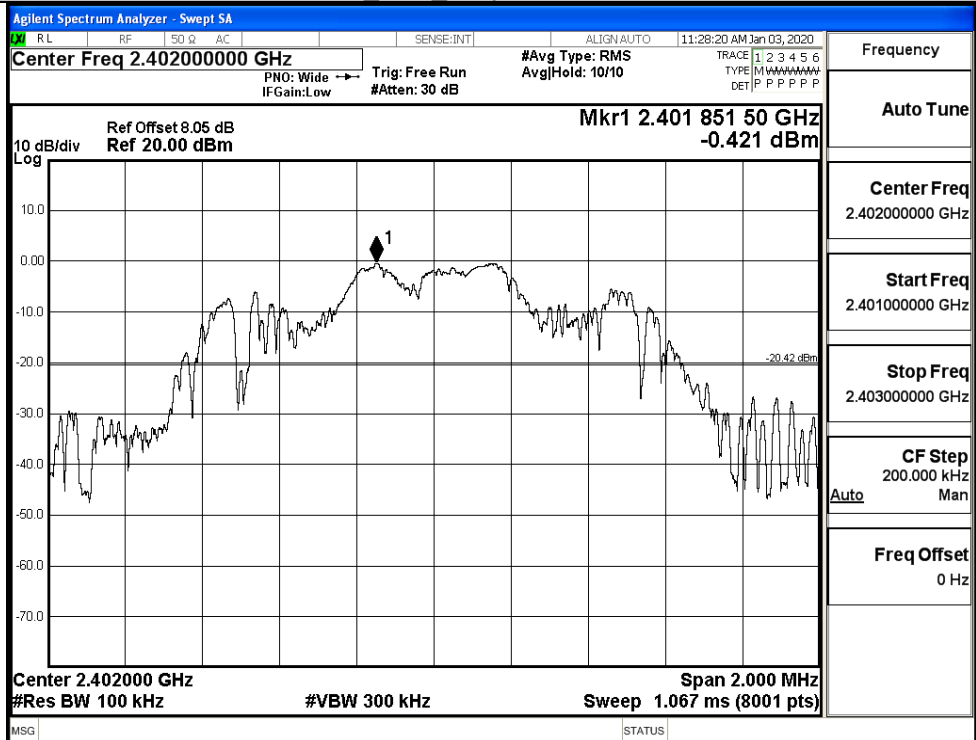


Puw

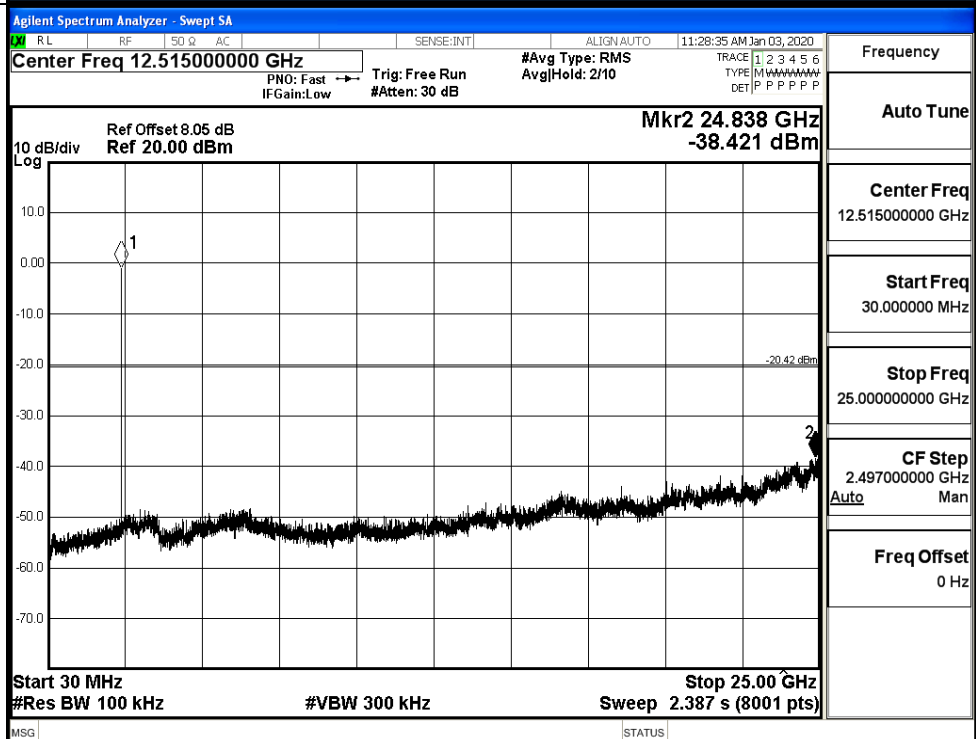


$\pi/4$ DQPSK_LCH_Graphs

Pref

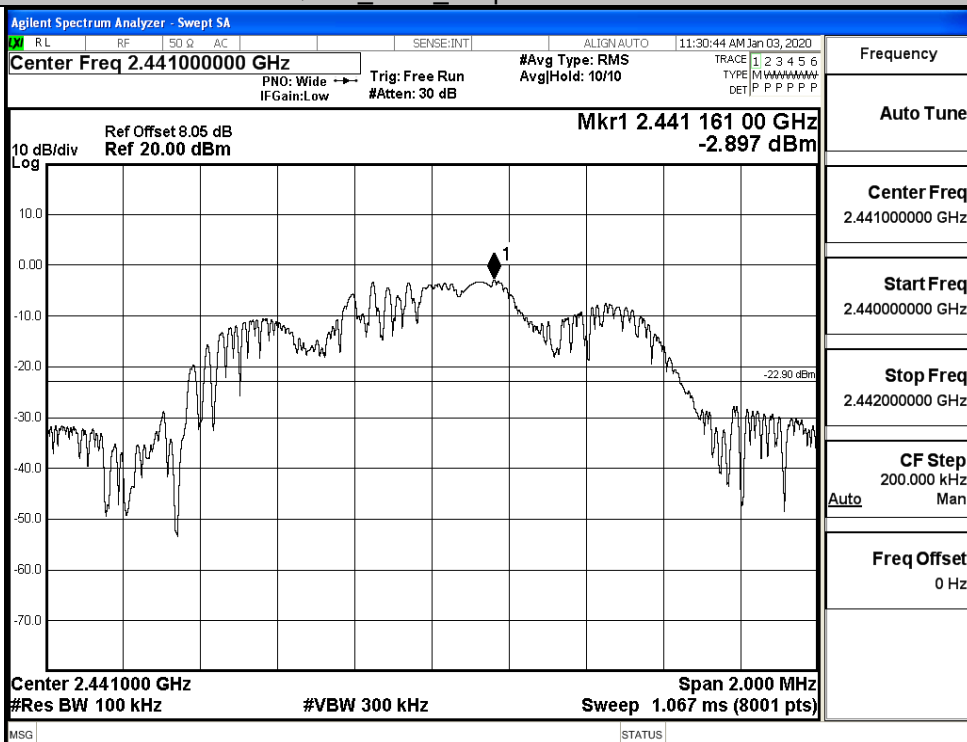


Puw

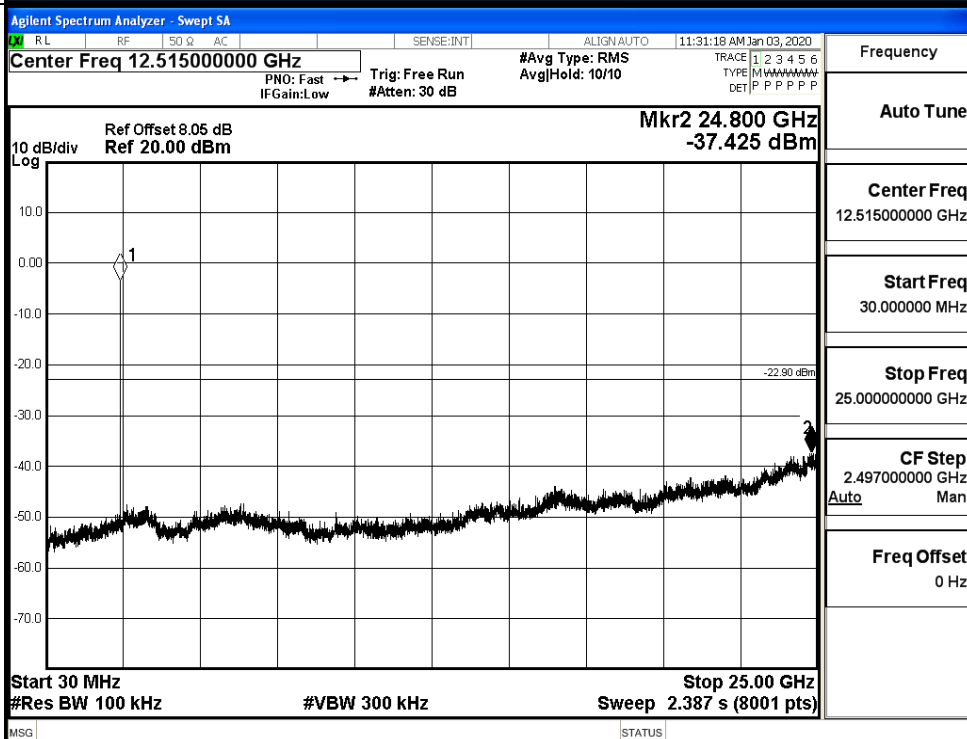


$\pi/4$ DQPSK_MCH_Graphs

Pref

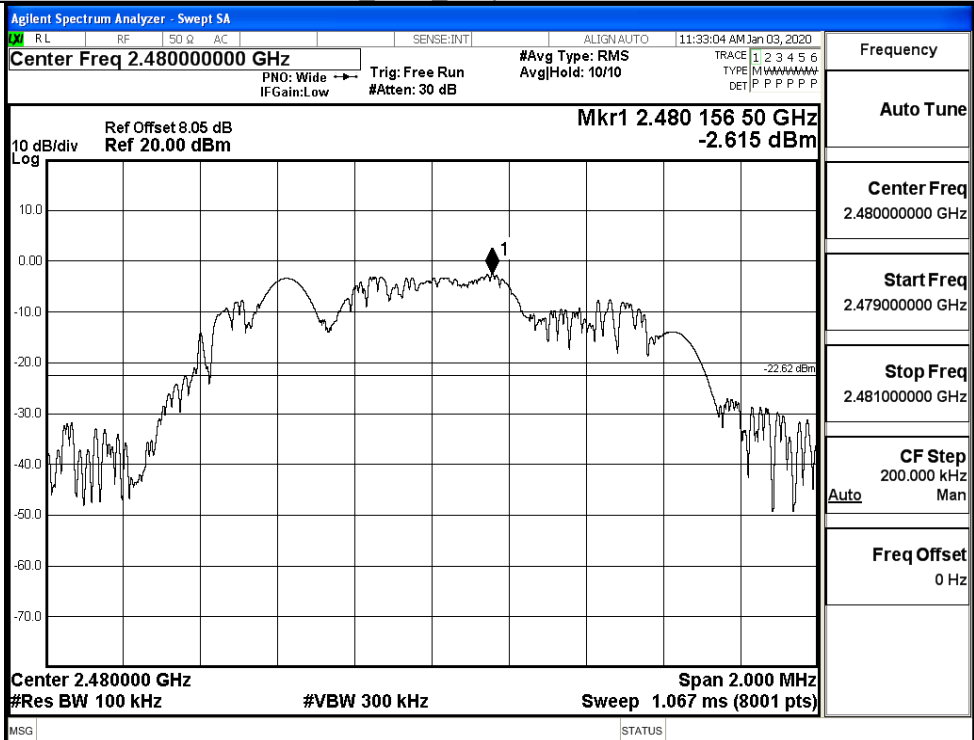


Puw

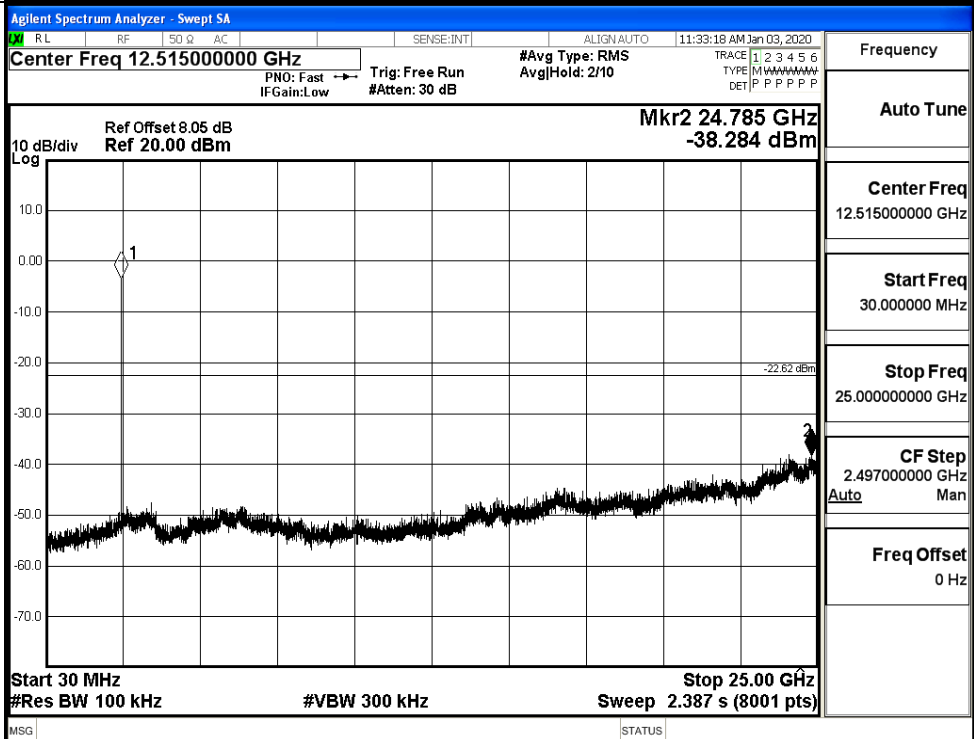


$\pi/4$ DQPSK_HCH_Graphs

Pref

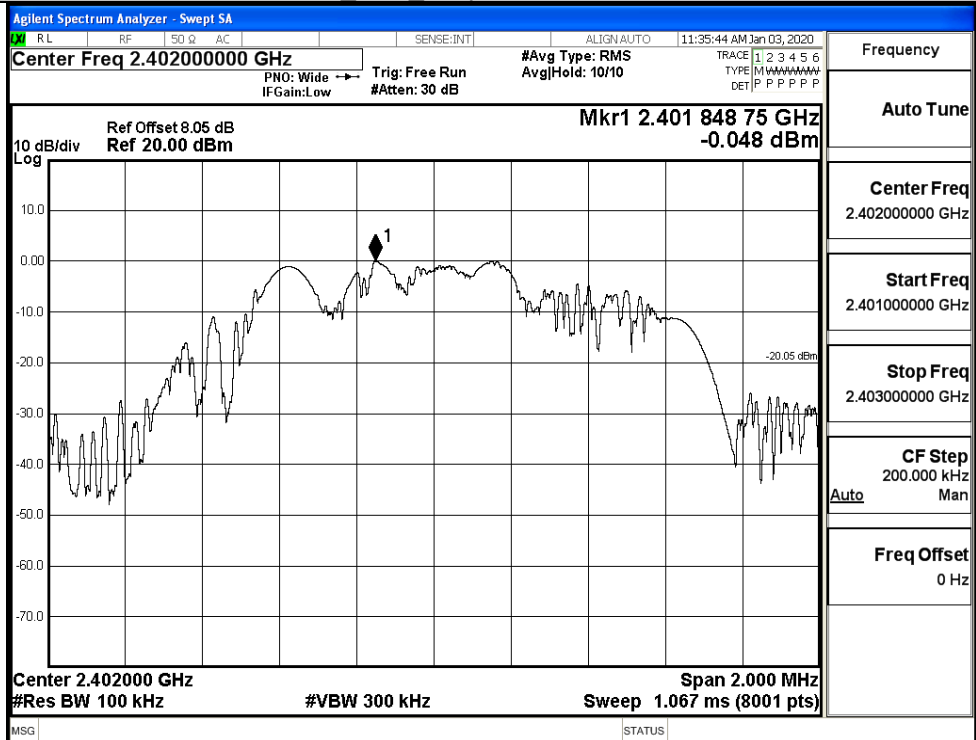


Puw



8DPSK_LCH_Graphs

Pref

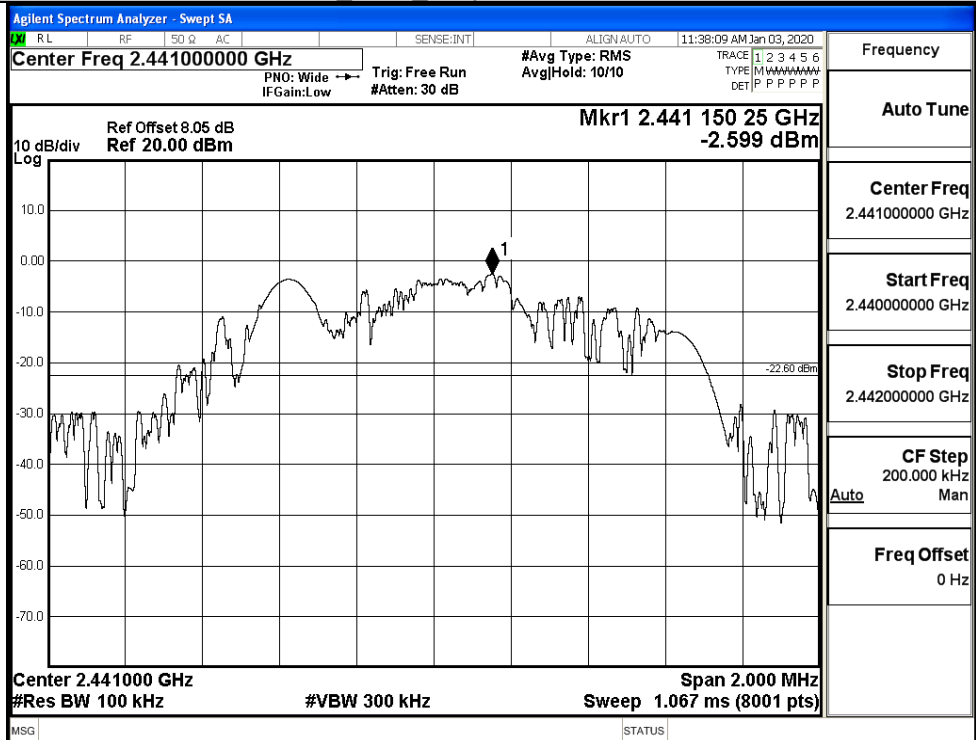


Puw

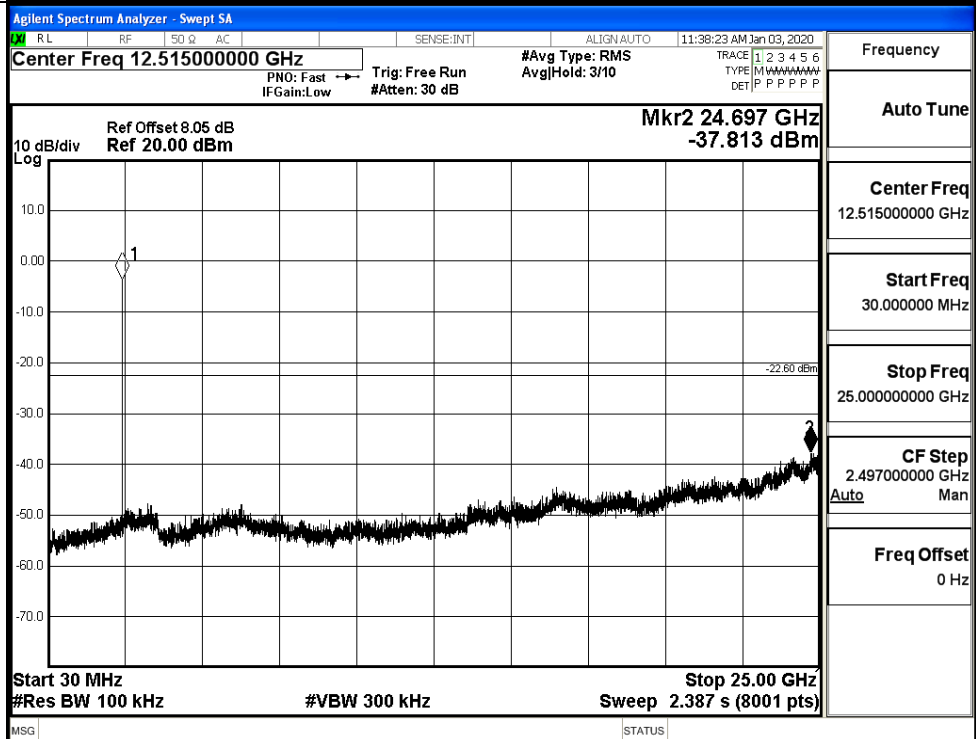


8DPSK_MCH_Graphs

Pref

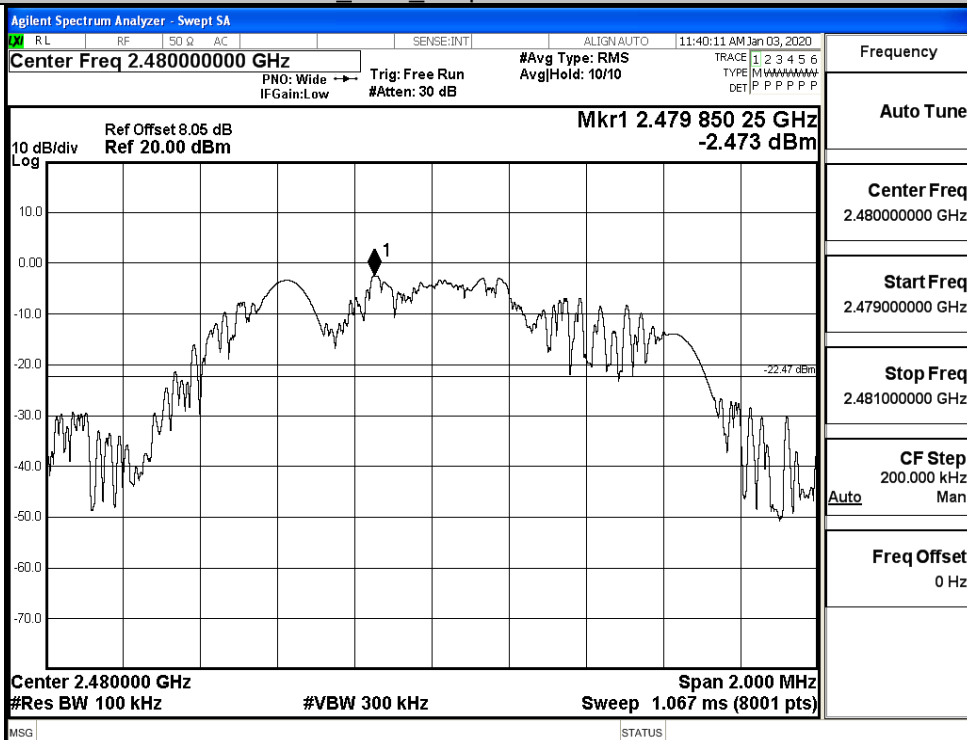


Puw

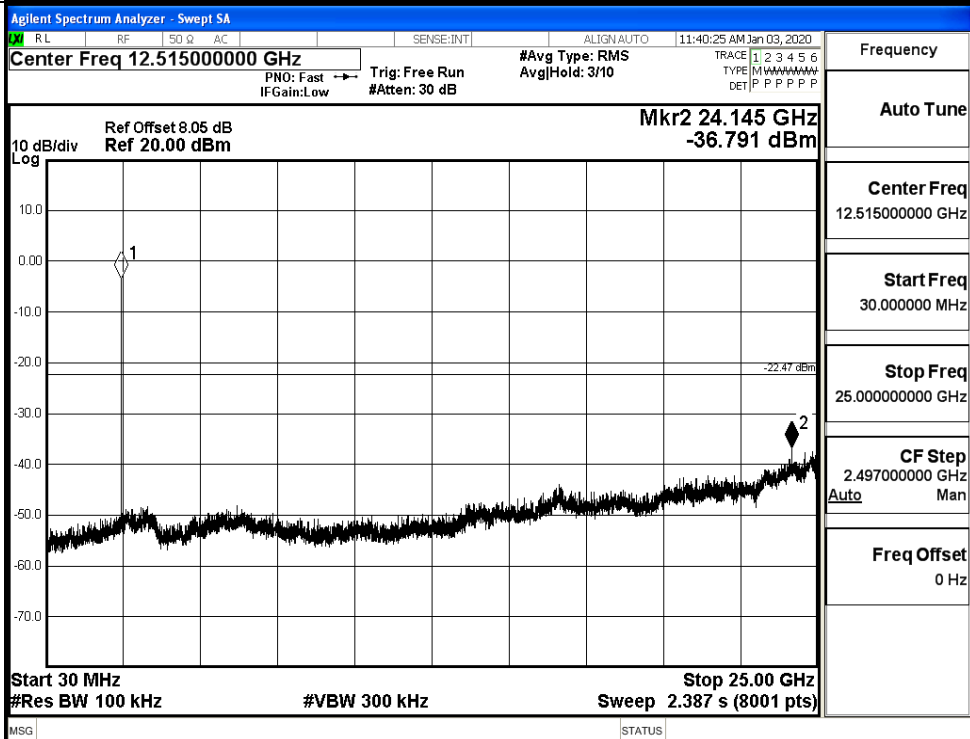


8DPSK_HCH_Graphs

Pref



Puw

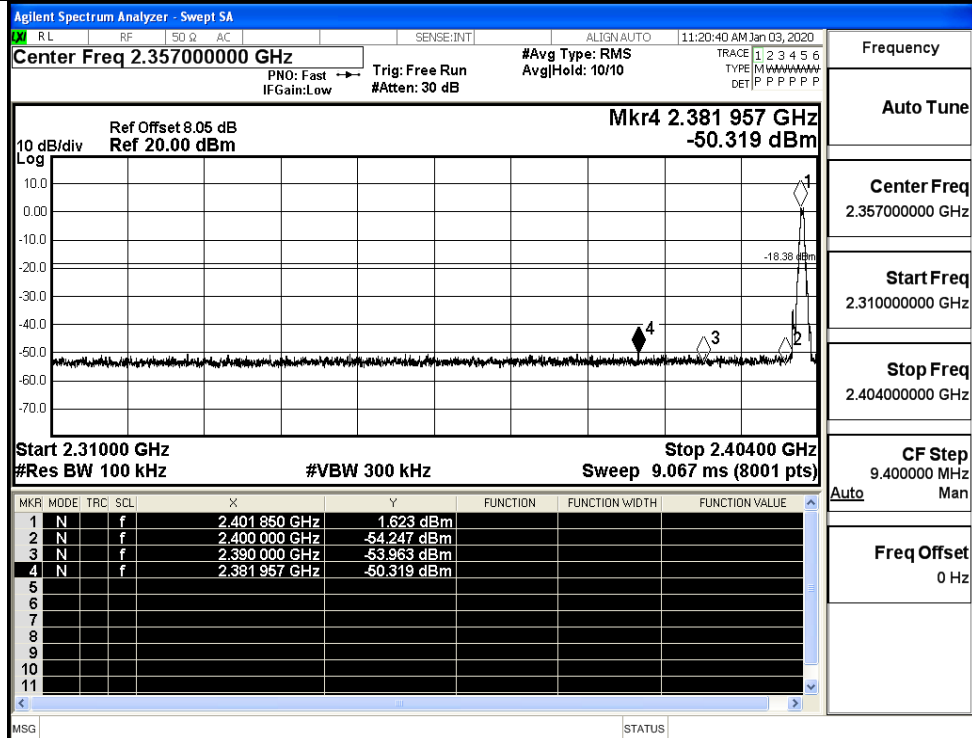


A.7 Band-edge for RF Conducted Emissions

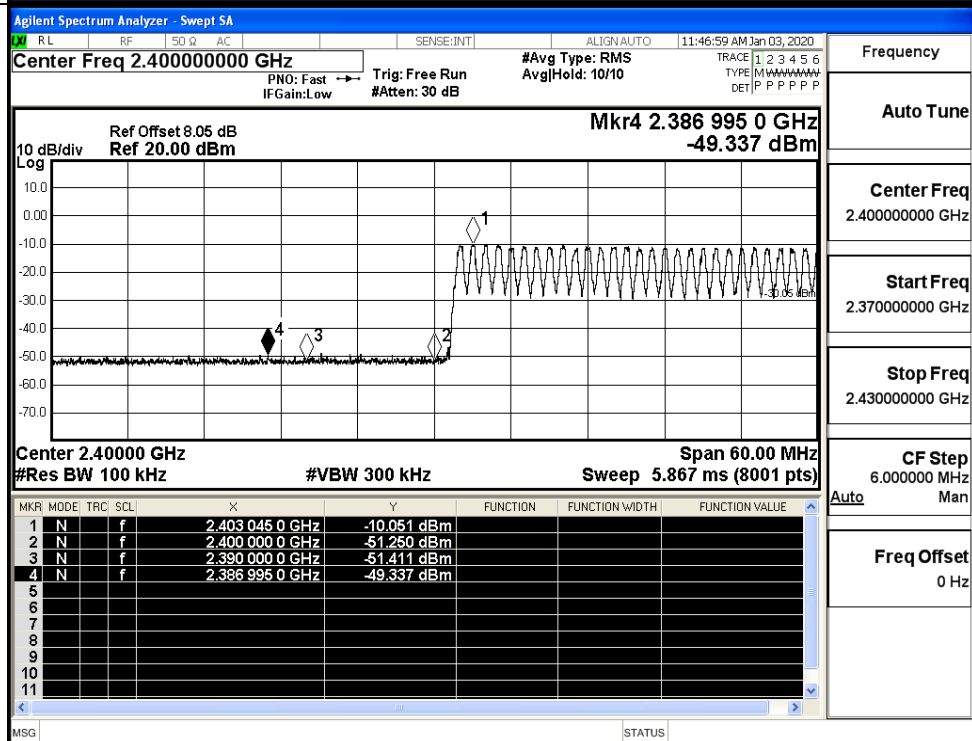
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.623	Off	-50.319	-18.38	PASS
			-10.051	On	-49.337	-30.05	PASS
	HCH	2480	-2.599	Off	-49.000	-22.6	PASS
			-4.638	On	-48.359	-24.64	PASS
$\pi/4$ DQPSK	LCH	2402	-0.534	Off	-50.249	-20.53	PASS
			-8.119	On	-48.714	-28.12	PASS
	HCH	2480	-2.687	Off	-49.664	-22.69	PASS
			-6.273	On	-48.267	-26.27	PASS
8DPSK	LCH	2402	0.011	Off	-49.474	-19.99	PASS
			-8.775	On	-48.348	-28.78	PASS
	HCH	2480	-2.444	Off	-49.207	-22.44	PASS
			-5.583	On	-48.644	-25.58	PASS

Test Graphs

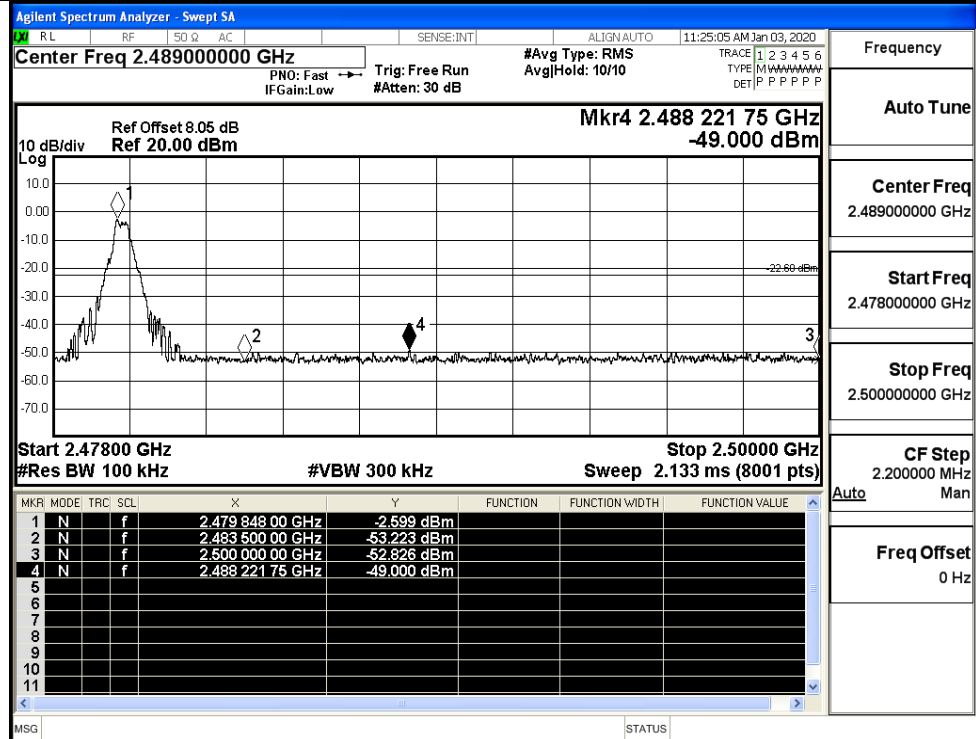
GFSK/LCH/No Hop



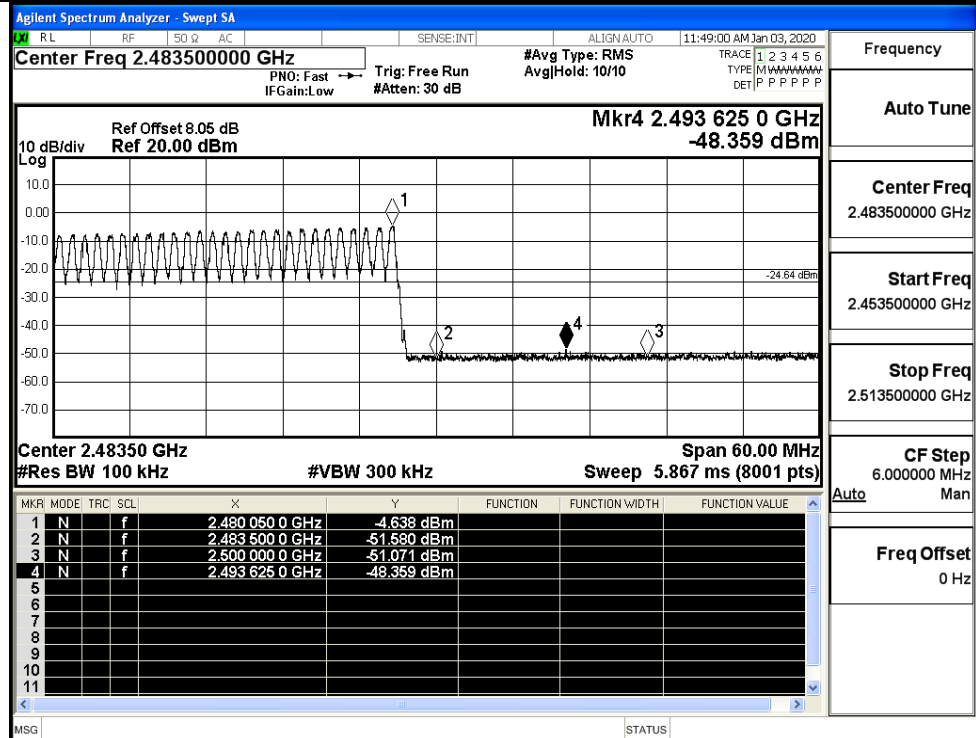
GFSK/LCH/Hop



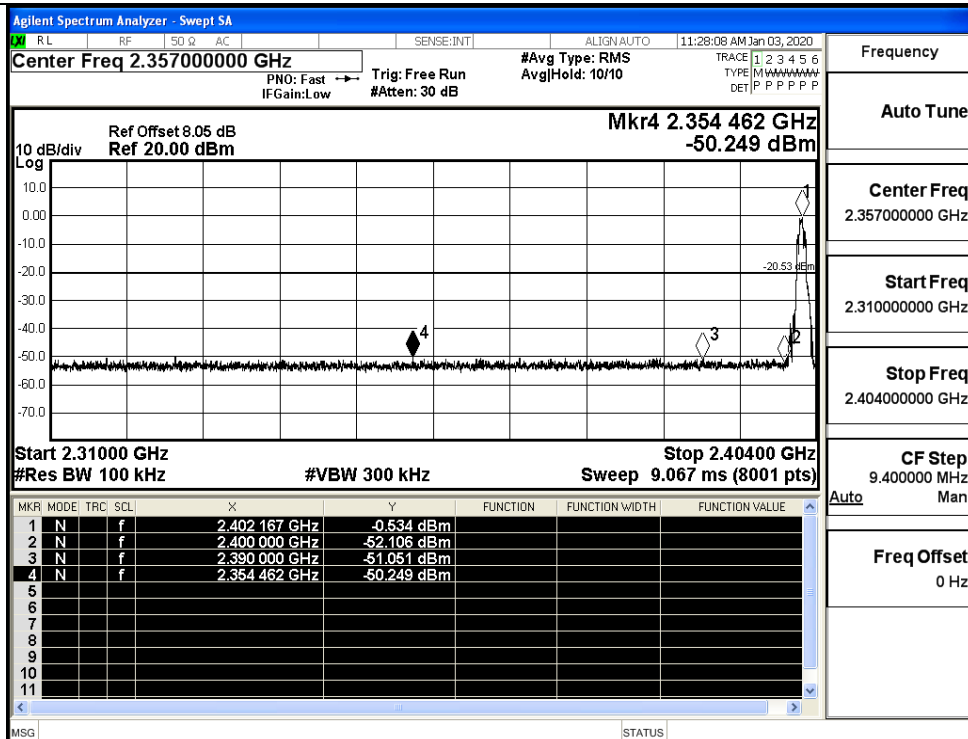
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

Start Freq
2.310000000 GHz

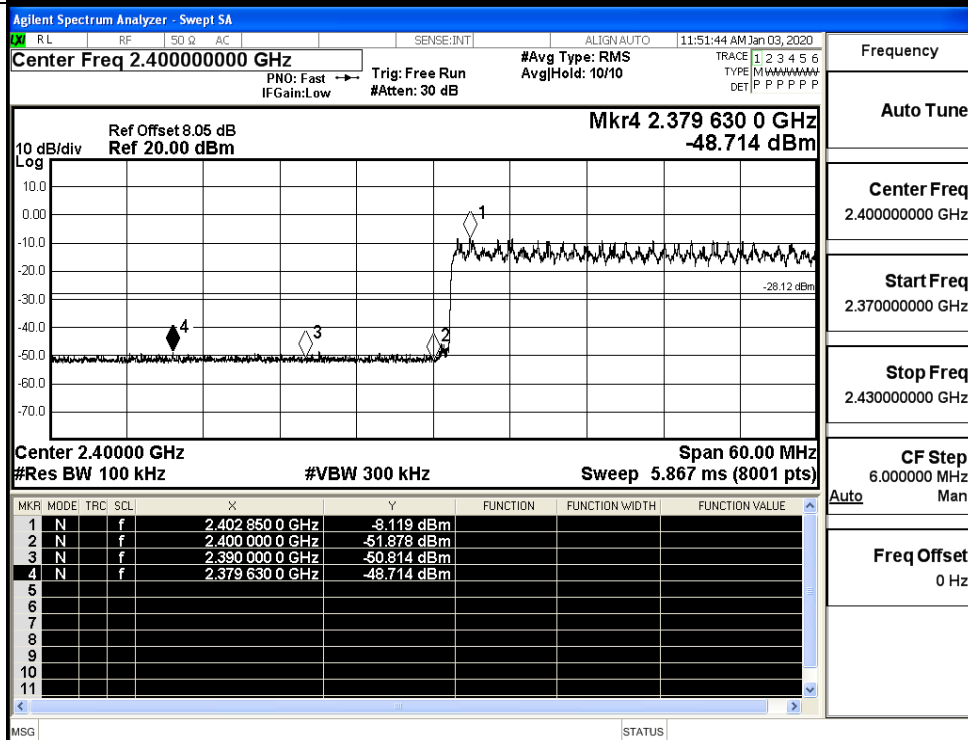
Stop Freq
2.404000000 GHz

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

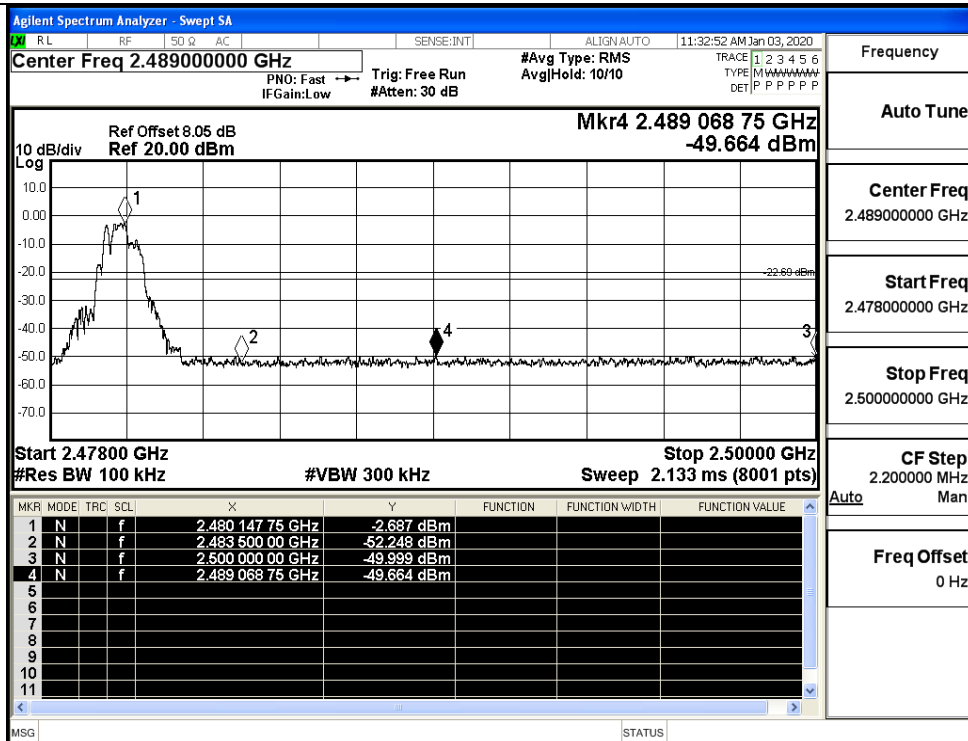
Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz

Auto Man

Freq Offset
0 Hz

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



Frequency

Auto Tune

Center Freq
2.489000000 GHz

Start Freq
2.478000000 GHz

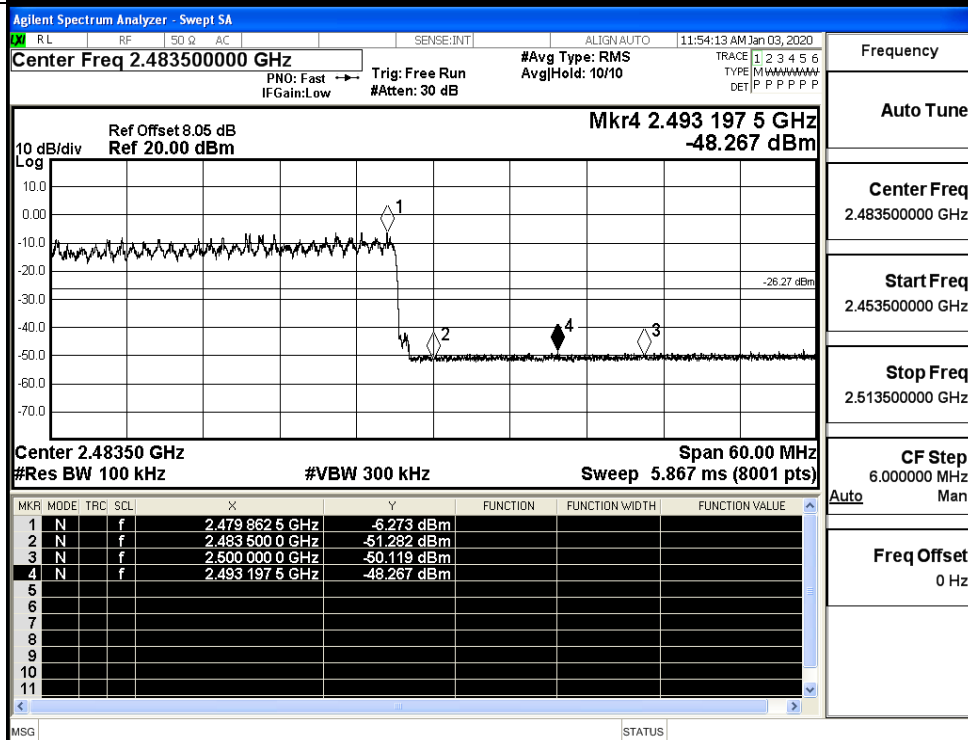
Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz

Auto Man

Freq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq
2.483500000 GHz

Start Freq
2.453500000 GHz

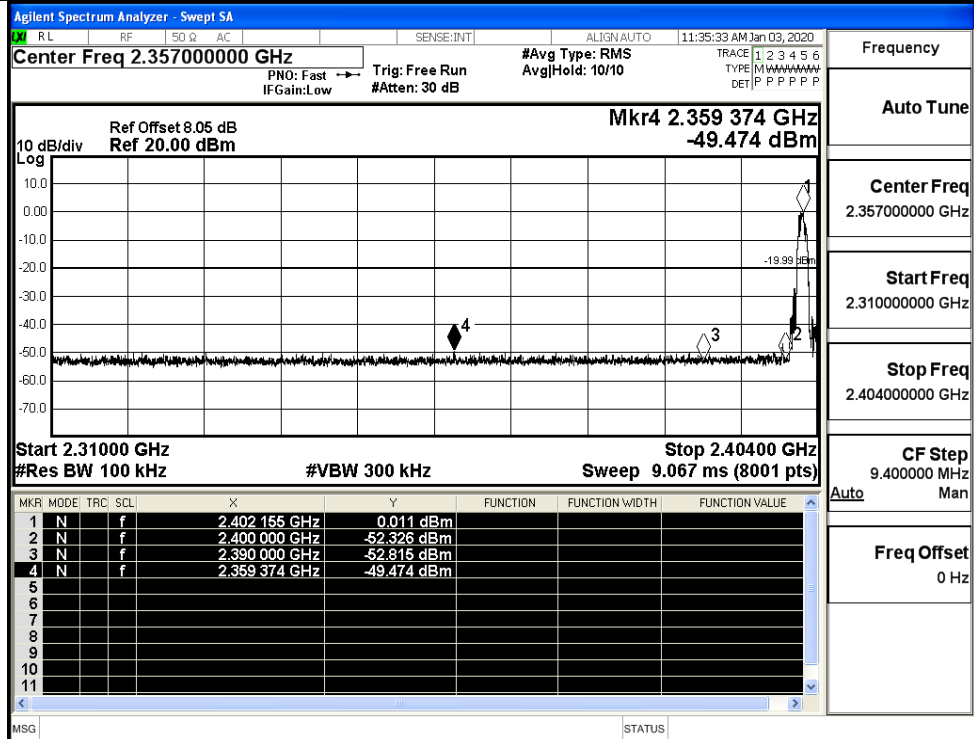
Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz

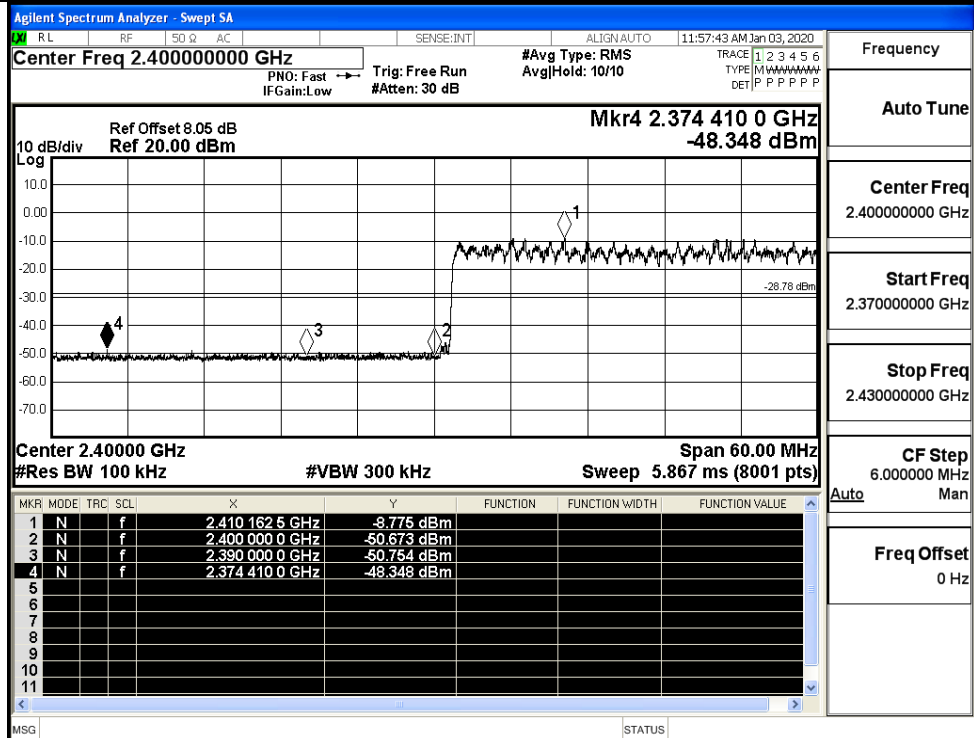
Auto Man

Freq Offset
0 Hz

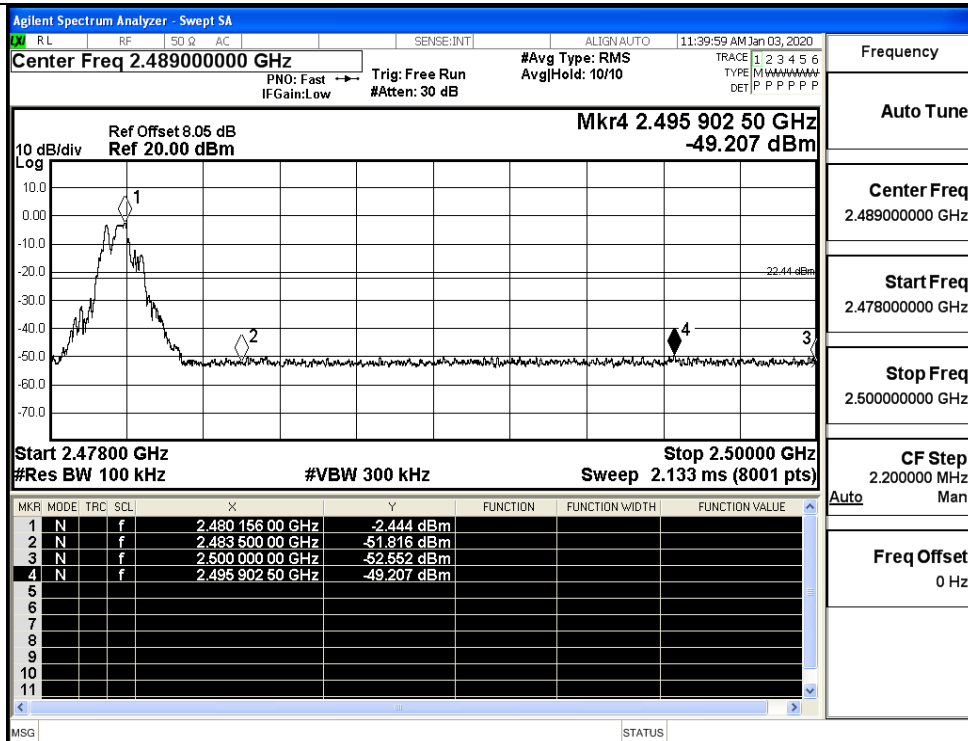
8DPSK/LCH/No Hop



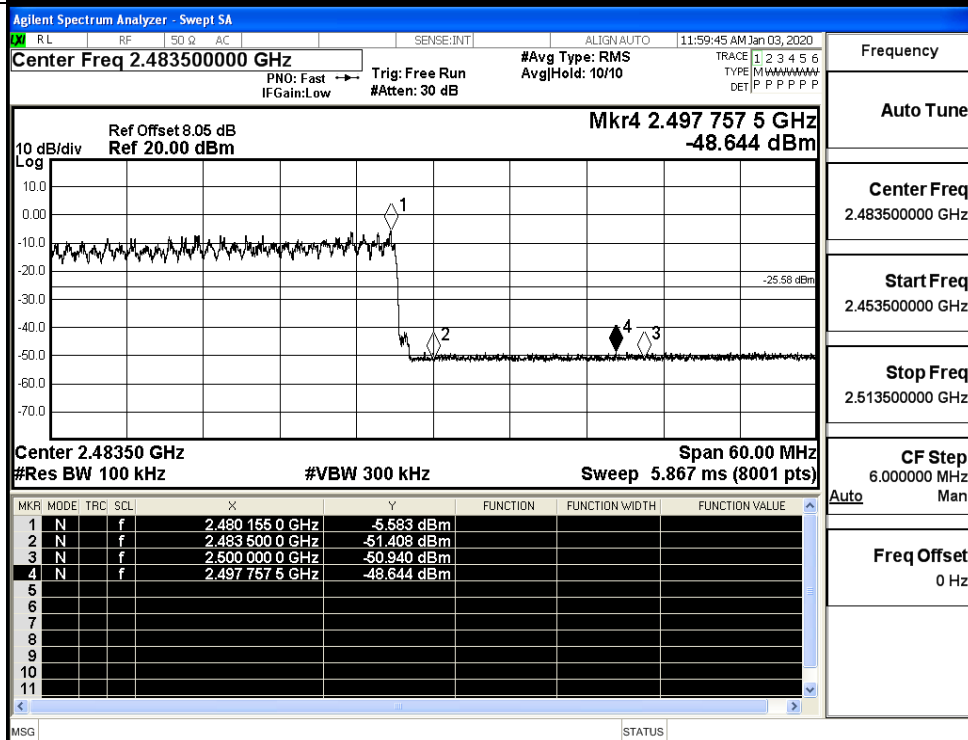
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



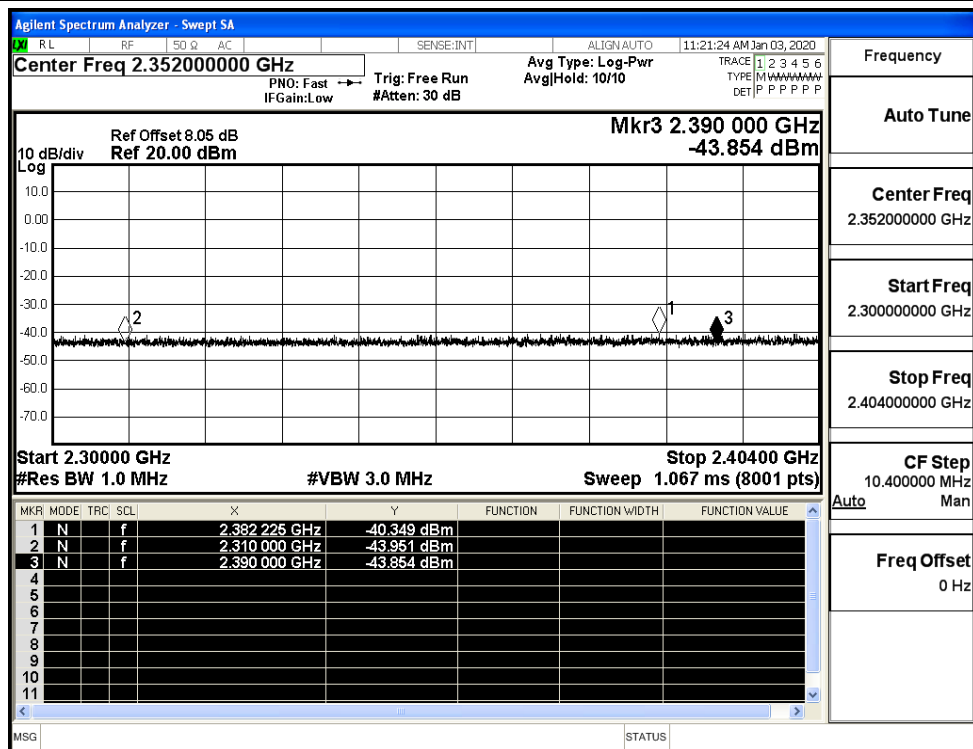
8DPSK/HCH/Hop



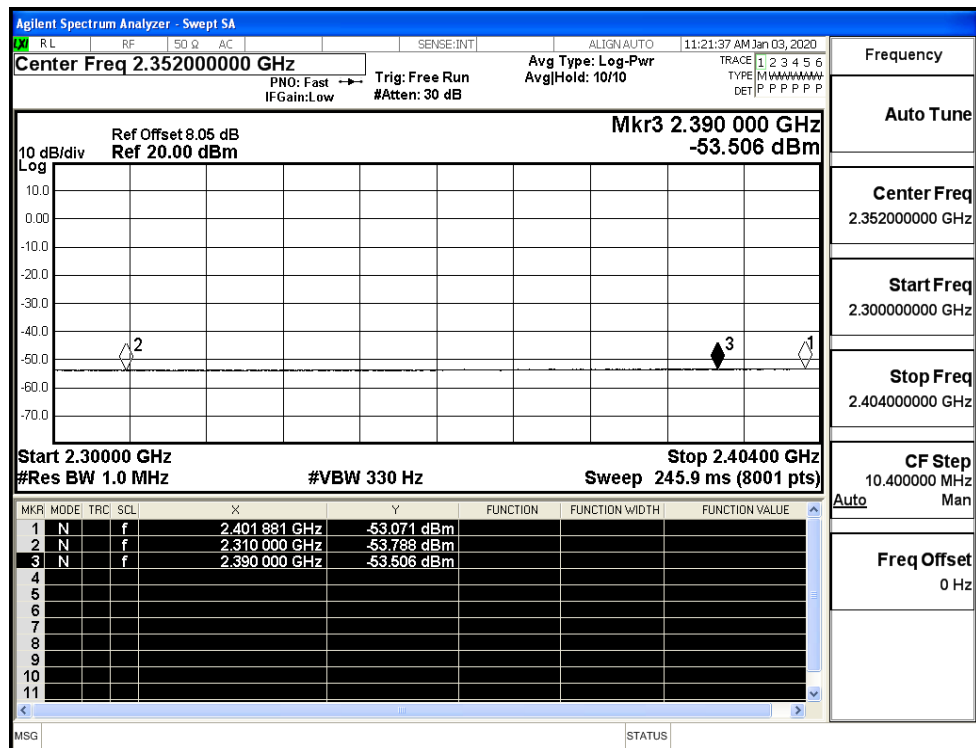
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.95	2.0	0	51.31	PEAK	74	PASS
	Off	2310.0	-53.79	2.0	0	41.47	AV	54	PASS
	Off	2390.0	-43.85	2.0	0	51.40	PEAK	74	PASS
	Off	2390.0	-53.51	2.0	0	41.75	AV	54	PASS
	Off	2483.5	-42.55	2.0	0	52.71	PEAK	74	PASS
	Off	2483.5	-52.58	2.0	0	42.67	AV	54	PASS
	Off	2500.0	-42.41	2.0	0	52.85	PEAK	74	PASS
	Off	2500.0	-52.31	2.0	0	42.95	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.26	2.0	0	52.00	PEAK	74	PASS
	Off	2310.0	-53.76	2.0	0	41.50	AV	54	PASS
	Off	2390.0	-43.43	2.0	0	51.82	PEAK	74	PASS
	Off	2390.0	-53.32	2.0	0	41.93	AV	54	PASS
	Off	2483.5	-41.98	2.0	0	53.27	PEAK	74	PASS
	Off	2483.5	-52.63	2.0	0	42.63	AV	54	PASS
	Off	2500.0	-42.23	2.0	0	53.03	PEAK	74	PASS
	Off	2500.0	-52.44	2.0	0	42.82	AV	54	PASS
8DPSK	Off	2310.0	-43.83	2.0	0	51.43	PEAK	74	PASS
	Off	2310.0	-53.44	2.0	0	41.82	AV	54	PASS
	Off	2390.0	-41.97	2.0	0	53.28	PEAK	74	PASS
	Off	2390.0	-52.98	2.0	0	42.28	AV	54	PASS
	Off	2483.5	-41.90	2.0	0	53.36	PEAK	74	PASS
	Off	2483.5	-52.62	2.0	0	42.63	AV	54	PASS
	Off	2500.0	-41.99	2.0	0	53.27	PEAK	74	PASS
	Off	2500.0	-52.48	2.0	0	42.78	AV	54	PASS

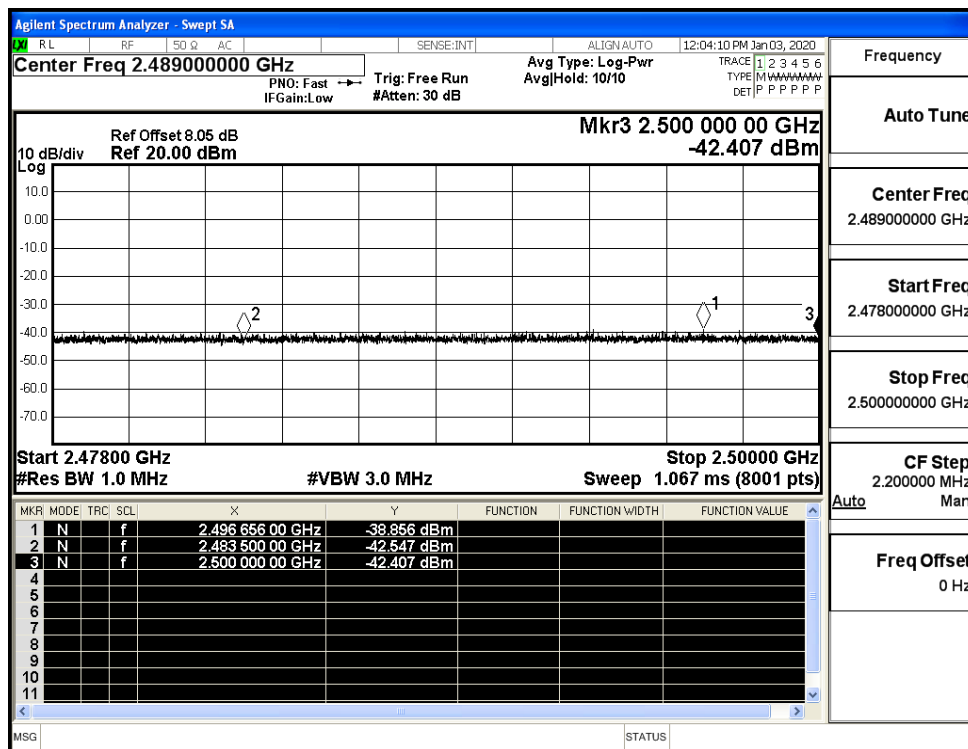
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



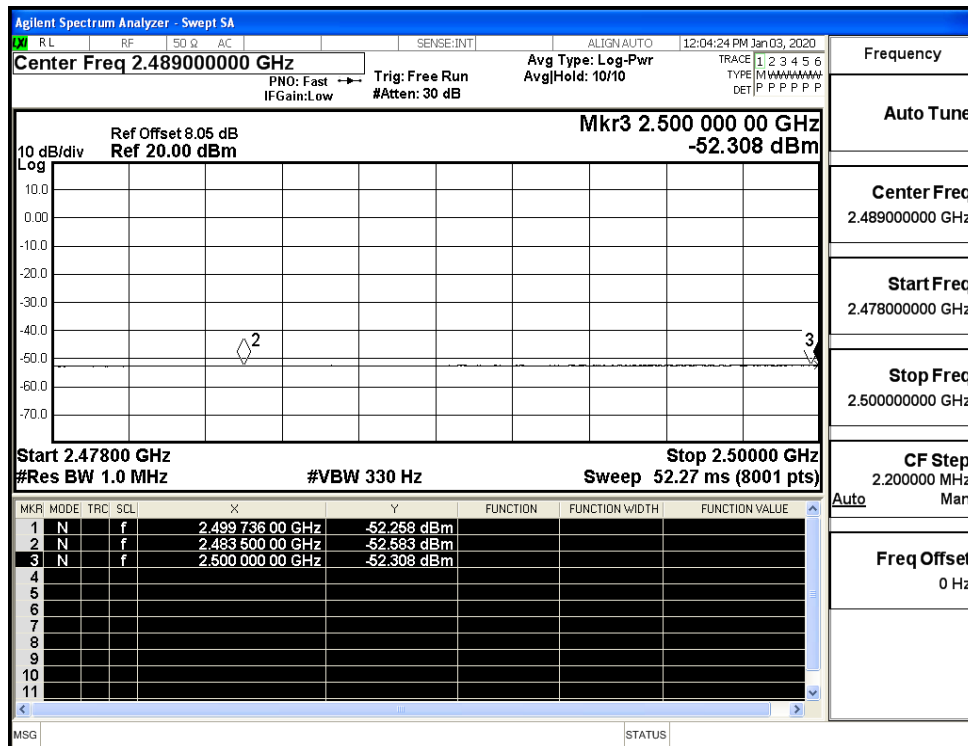
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



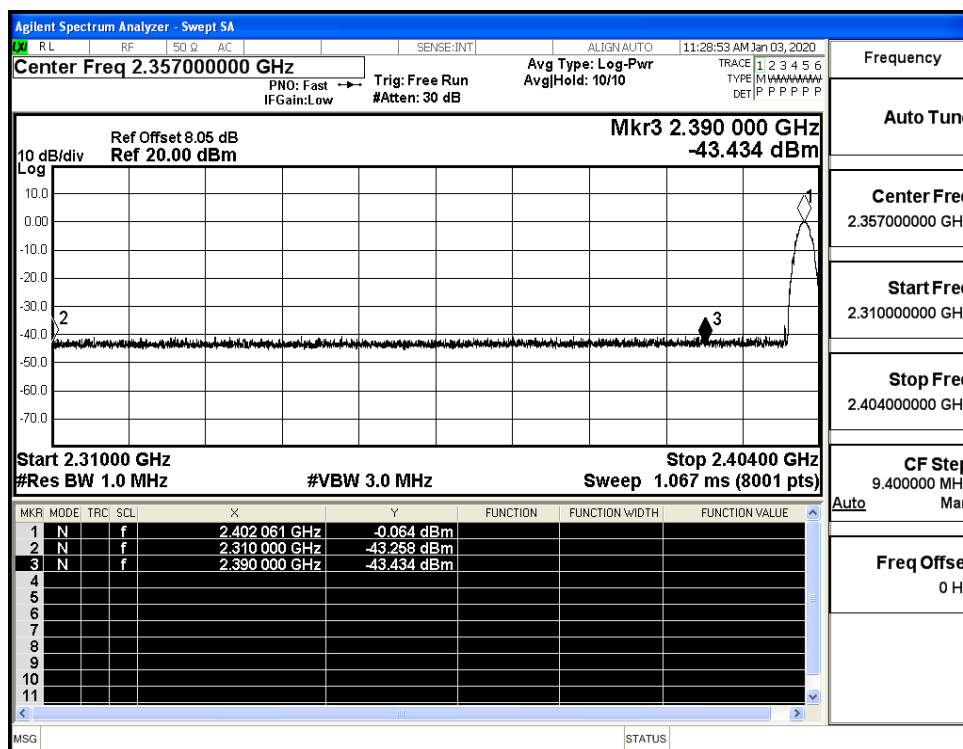
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



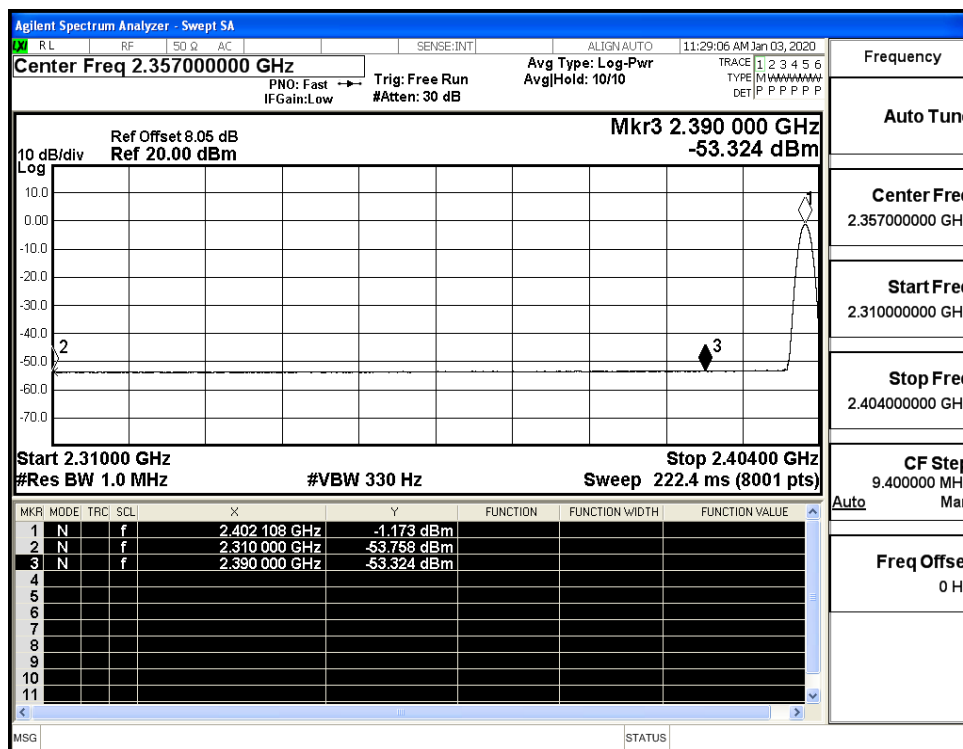
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



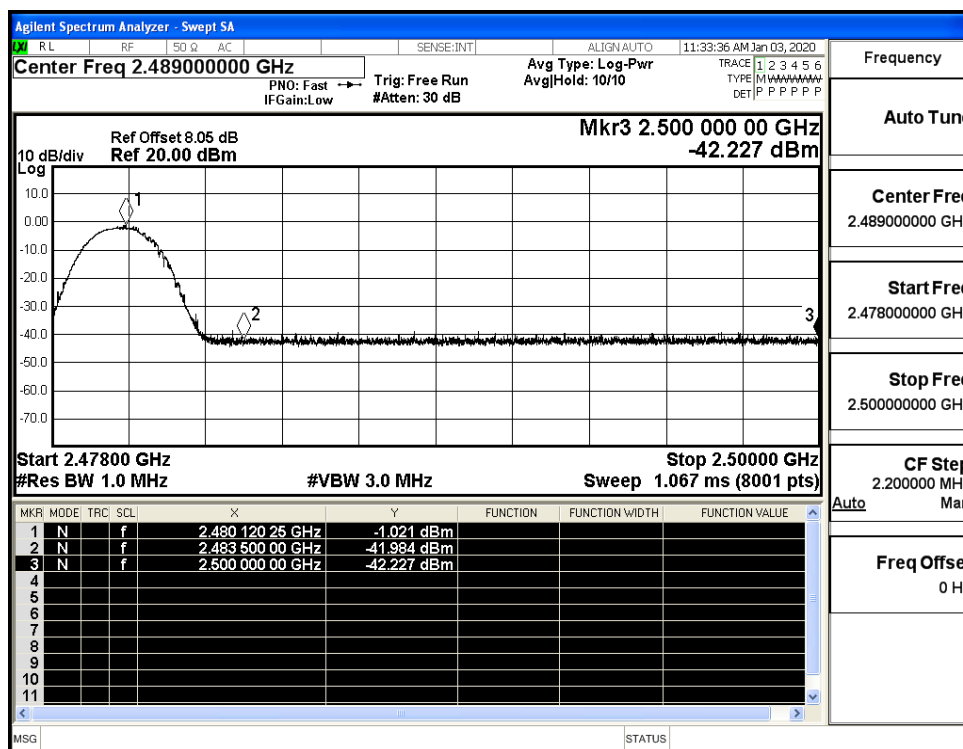
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



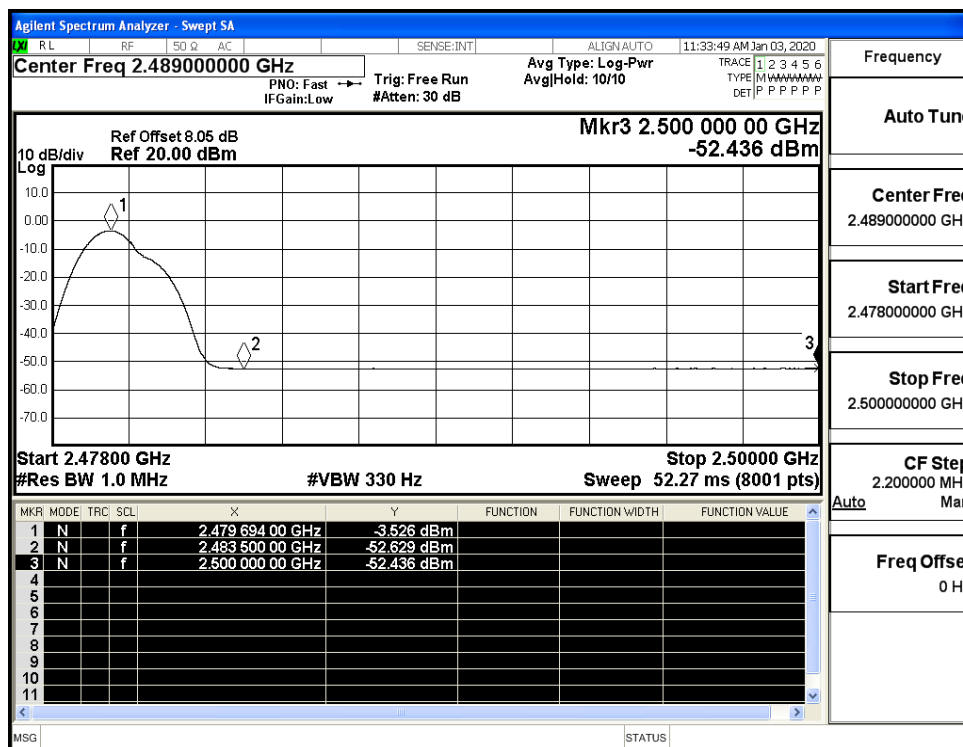
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



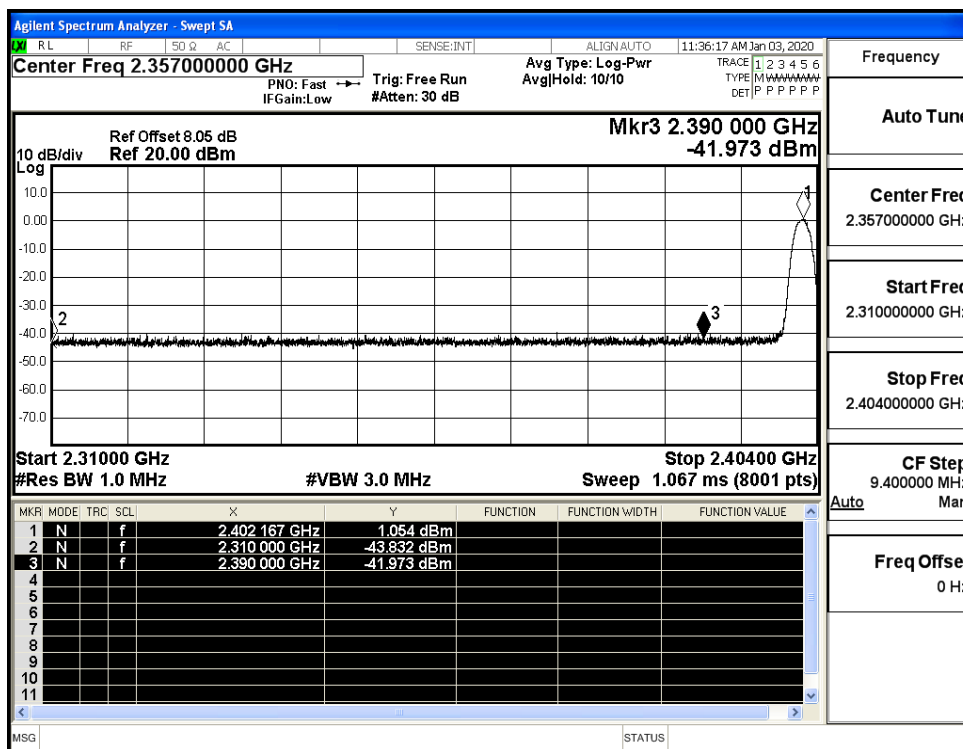
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



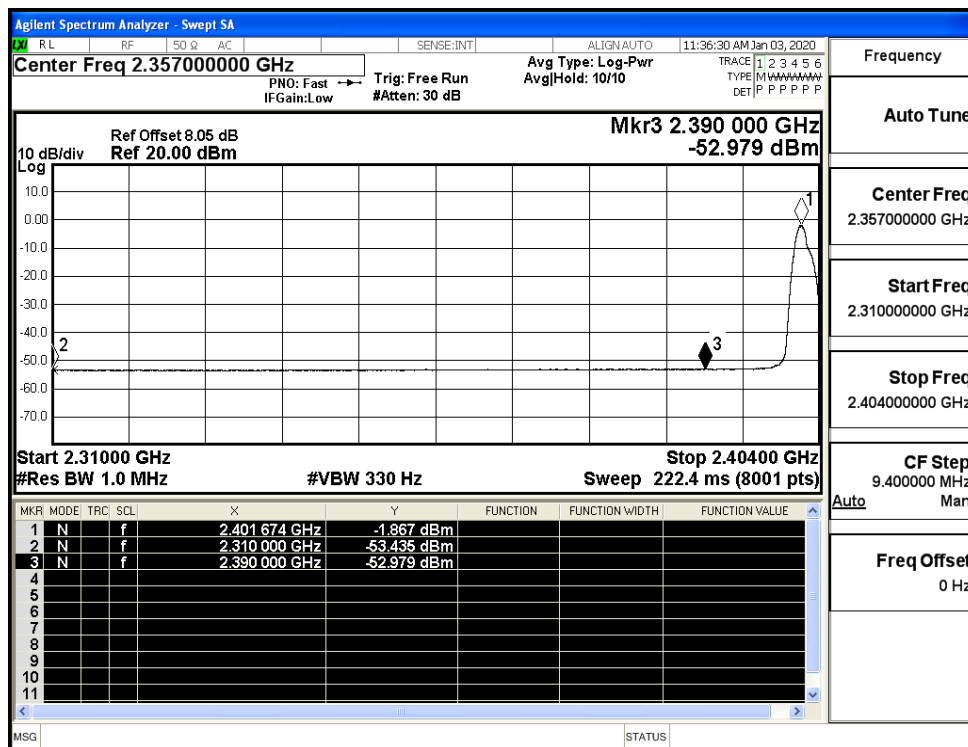
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



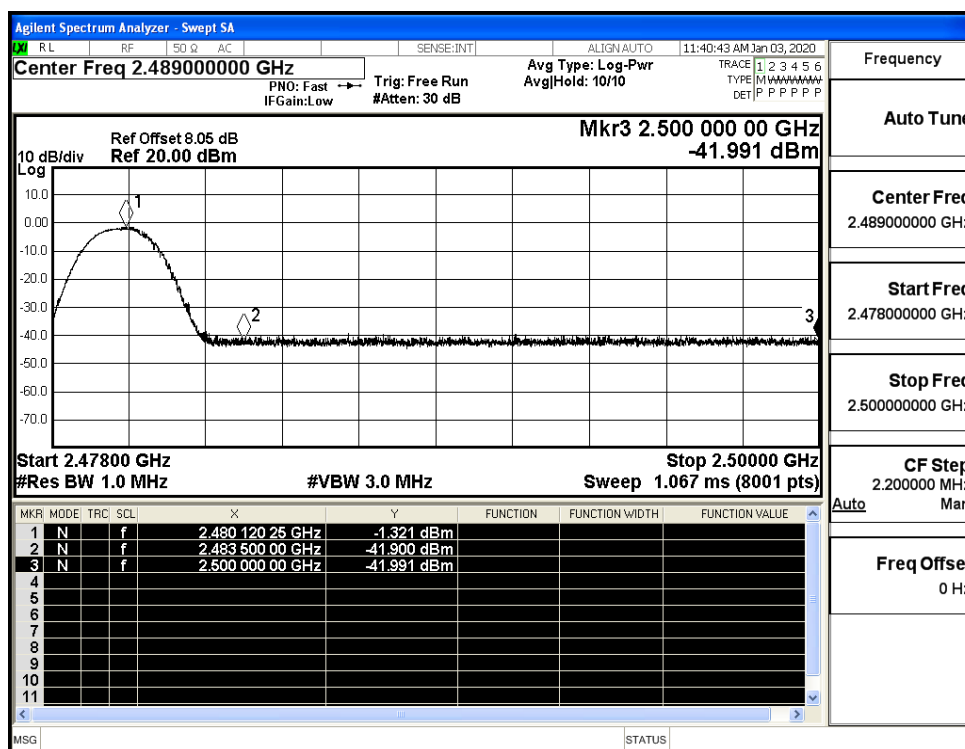
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

