

Appendix A

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

Product Name: Bluetooth Speaker

Trade Mark: N/A

Test Model: ZQS-4210

Environmental Conditions

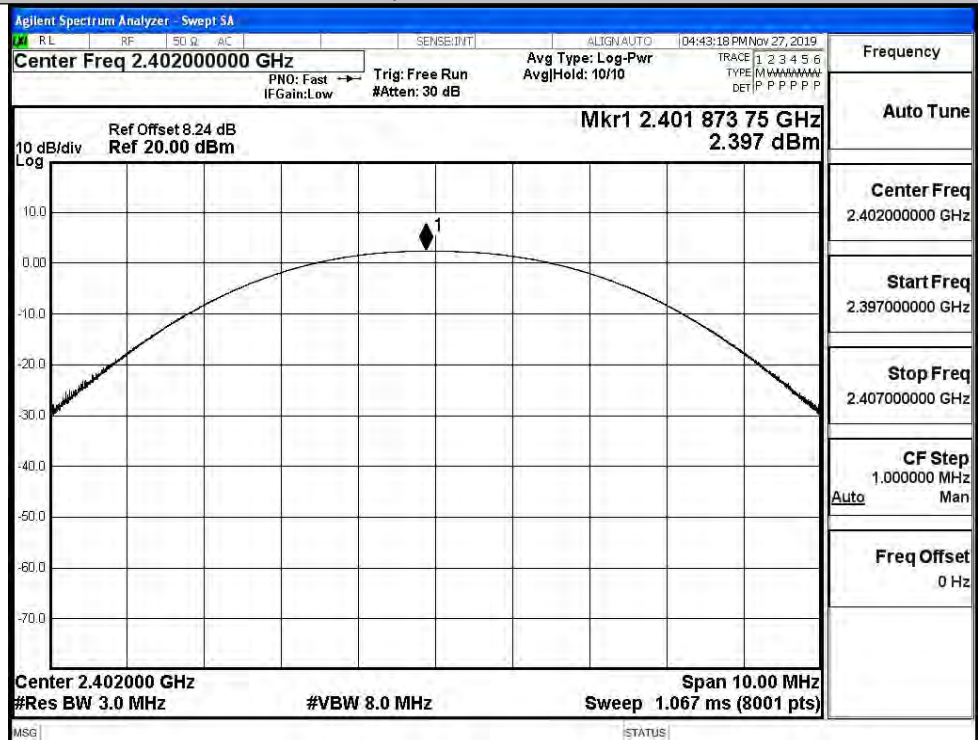
Temperature:	22.6 ° C
Relative Humidity:	53.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Scout Wu
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

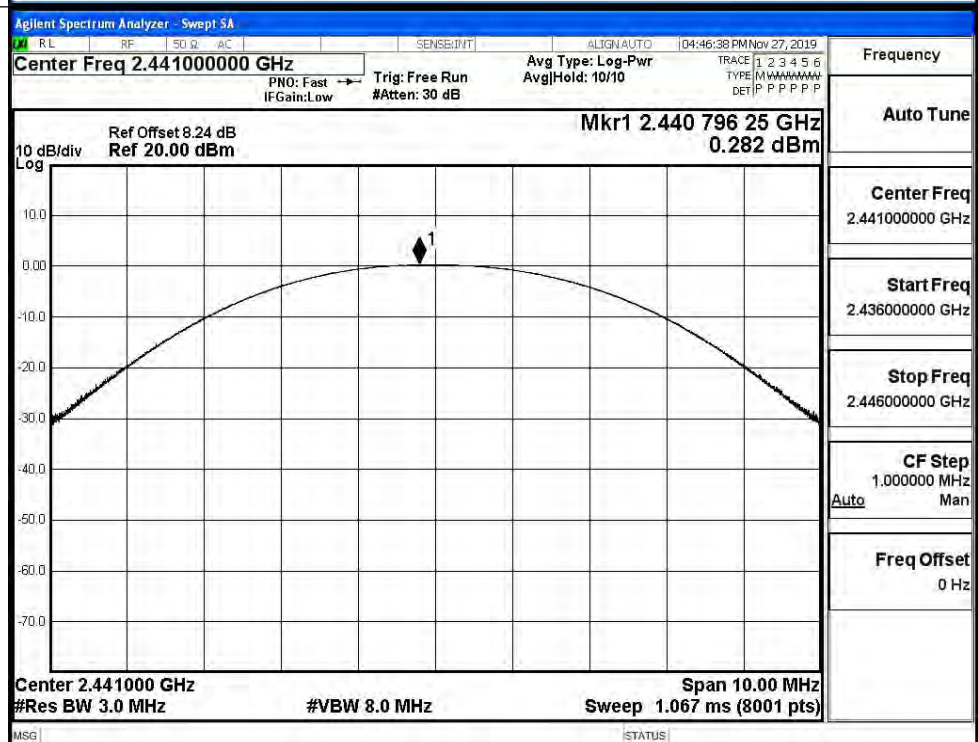
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.397	30	PASS
	MCH	0.282	30	PASS
	HCH	-1.460	30	PASS
$\pi/4$ DQPSK	LCH	1.389	21	PASS
	MCH	2.299	21	PASS
	HCH	0.641	21	PASS
8DPSK	LCH	1.750	21	PASS
	MCH	2.711	21	PASS
	HCH	0.994	21	PASS

Test Graphs

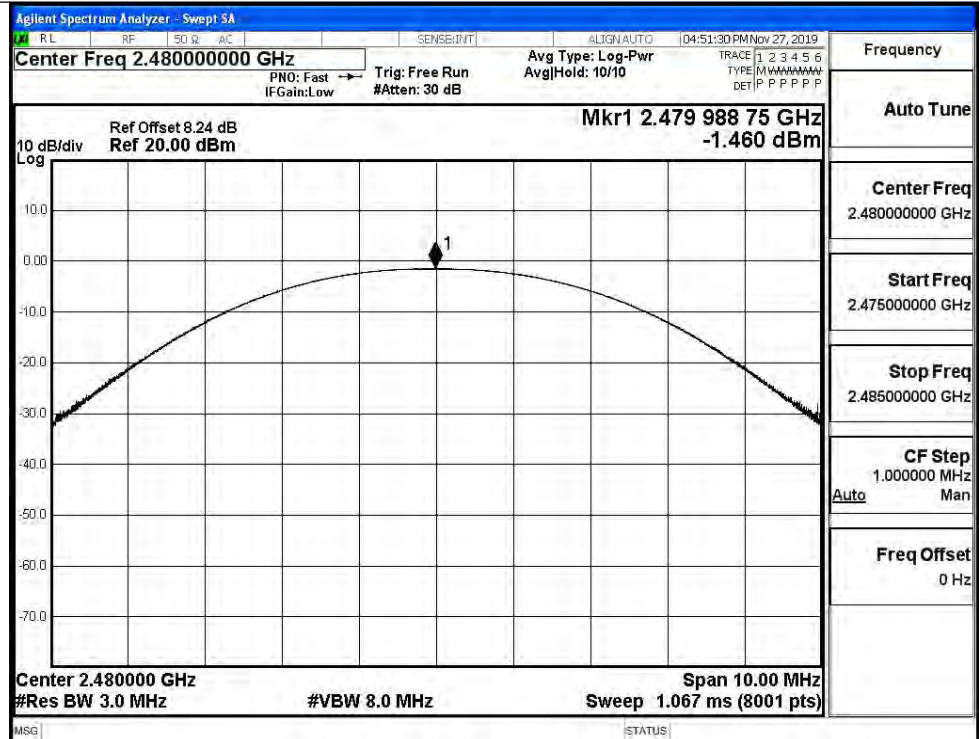
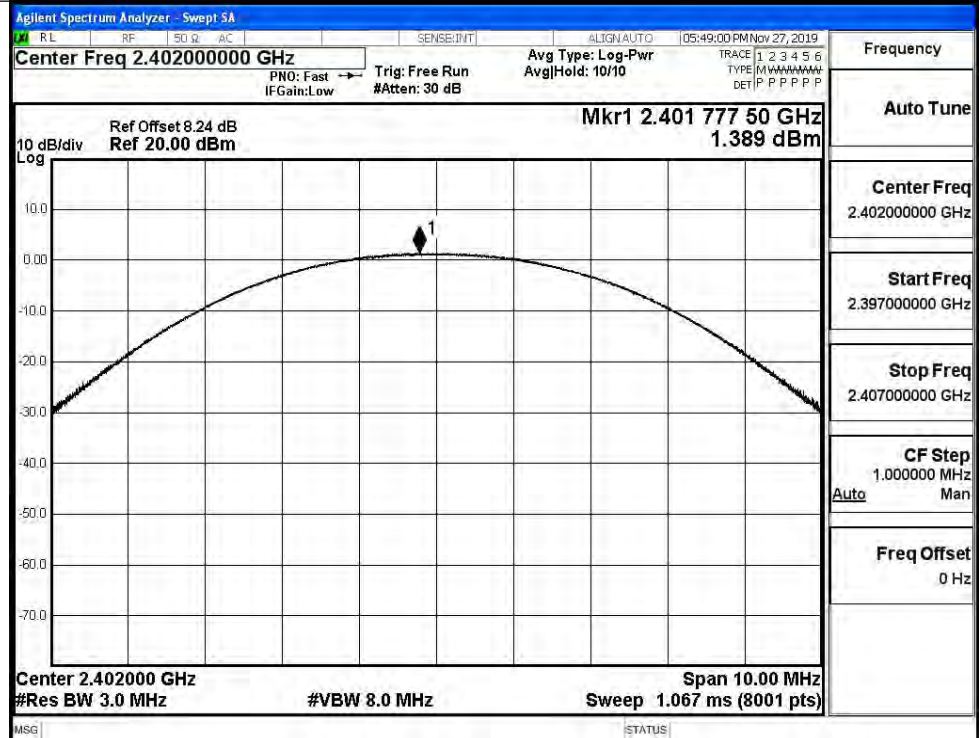
GFSK/LCH

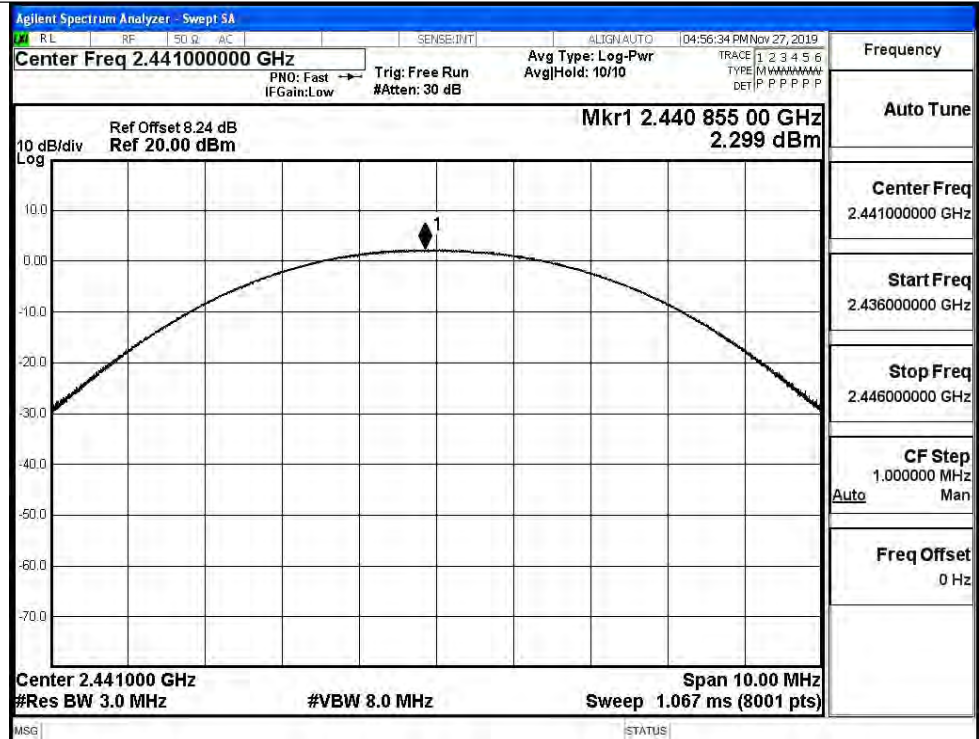
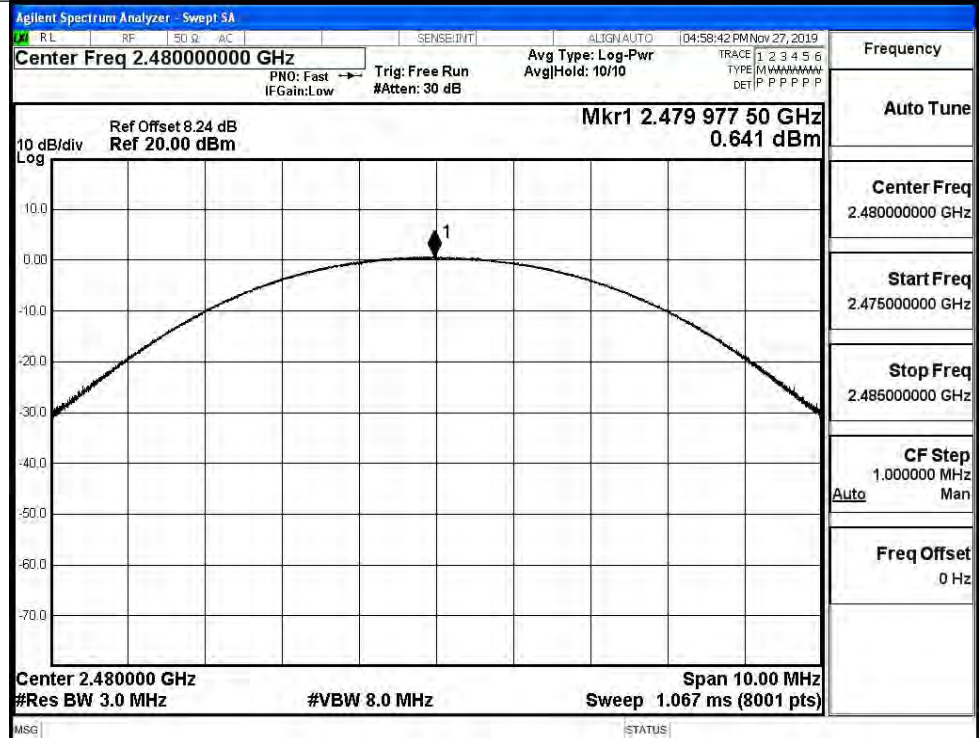


GFSK/MCH

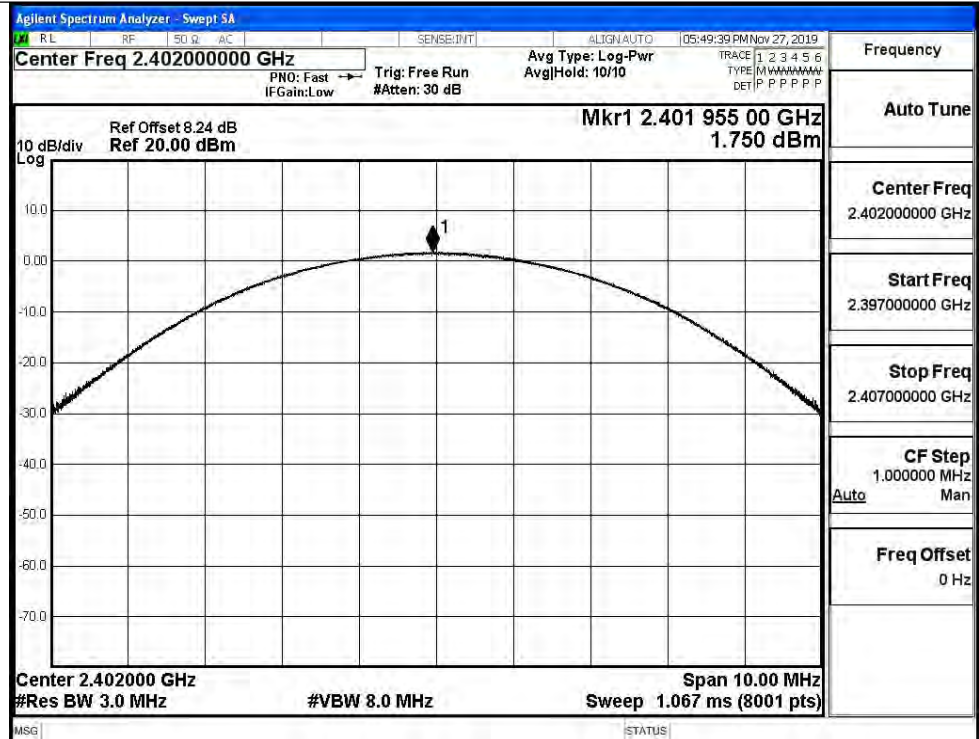


GFSK/HCH

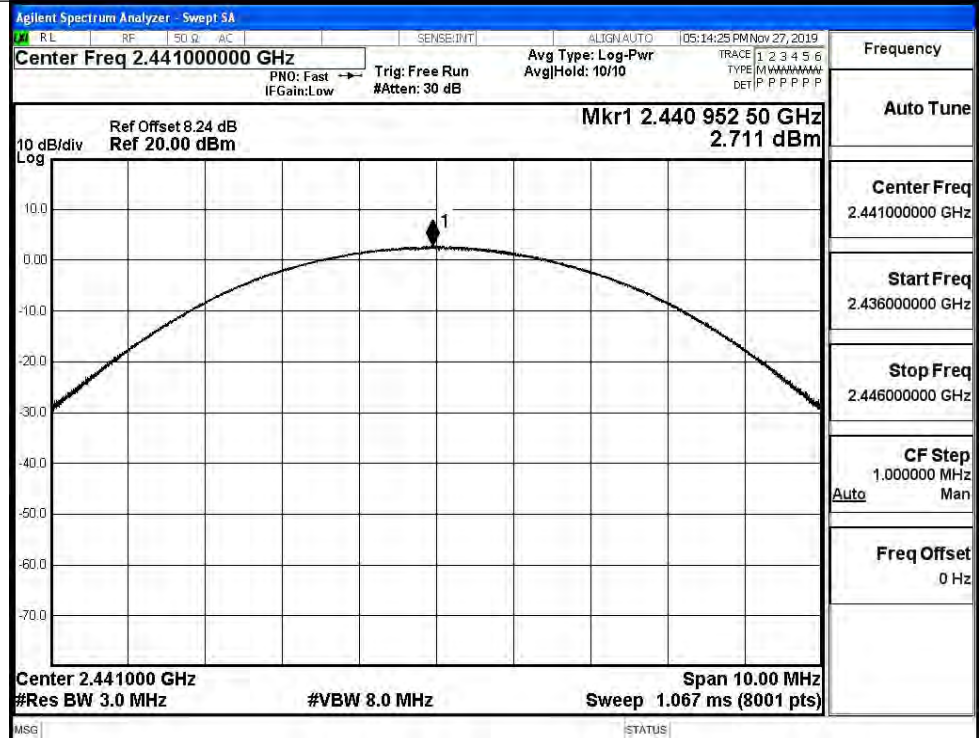
 π /4DQPSK/LCH

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

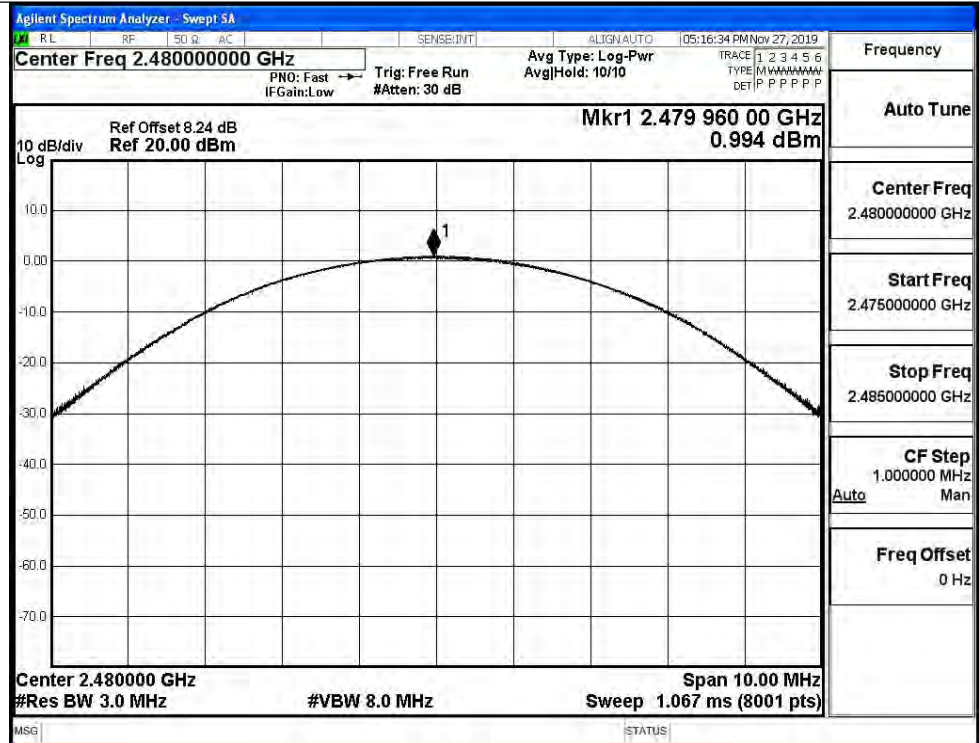
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

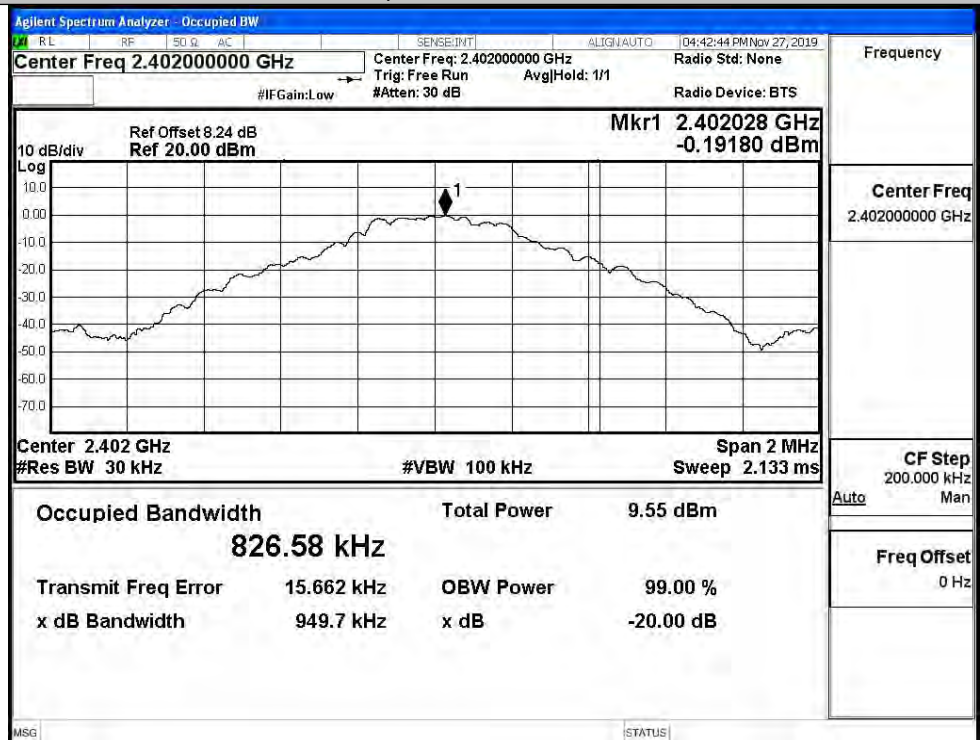


A.2 20dB Bandwidth

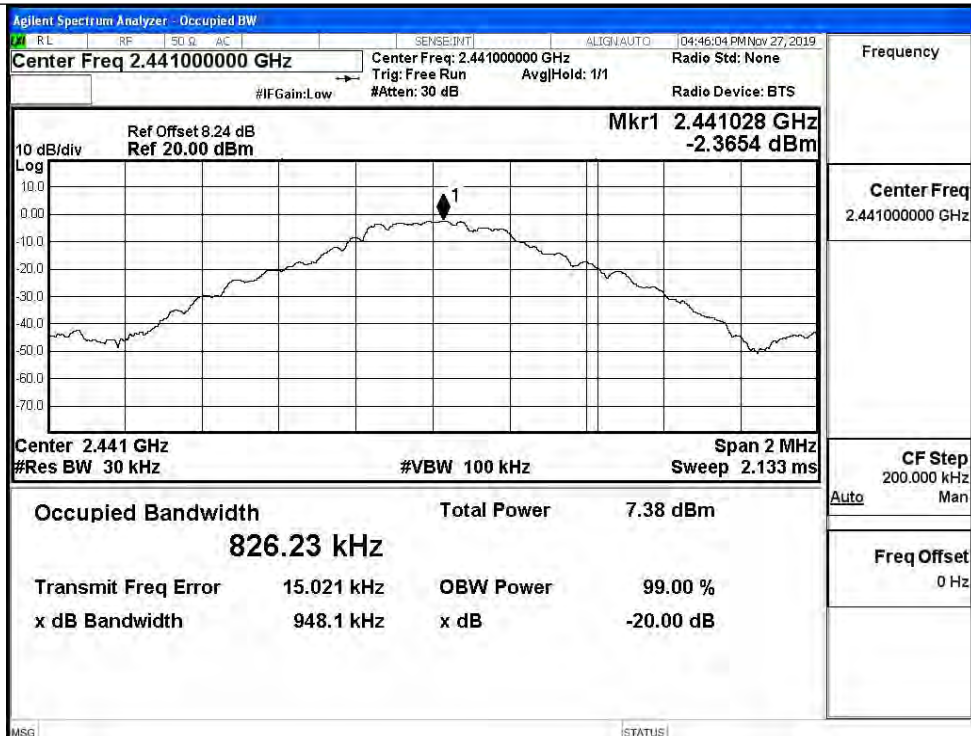
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9497	Not Specified	PASS
	MCH	0.9481	Not Specified	PASS
	HCH	0.9520	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.326	Not Specified	PASS
	MCH	1.325	Not Specified	PASS
	HCH	1.324	Not Specified	PASS
8DPSK	LCH	1.317	Not Specified	PASS
	MCH	1.317	Not Specified	PASS
	HCH	1.317	Not Specified	PASS

Test Graphs

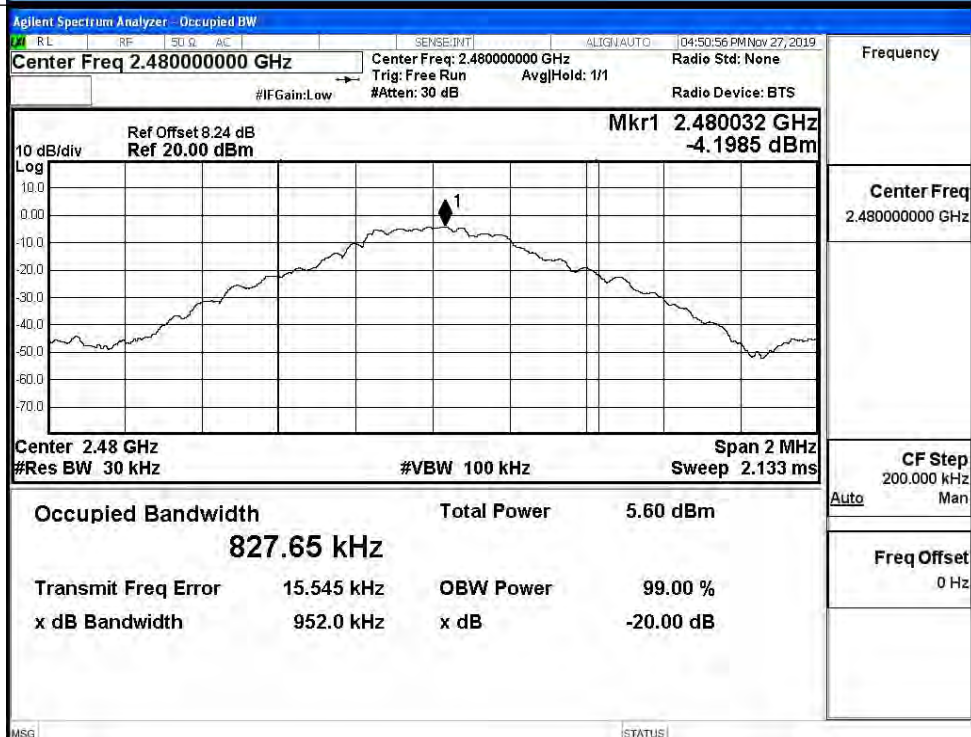
GFSK/LCH

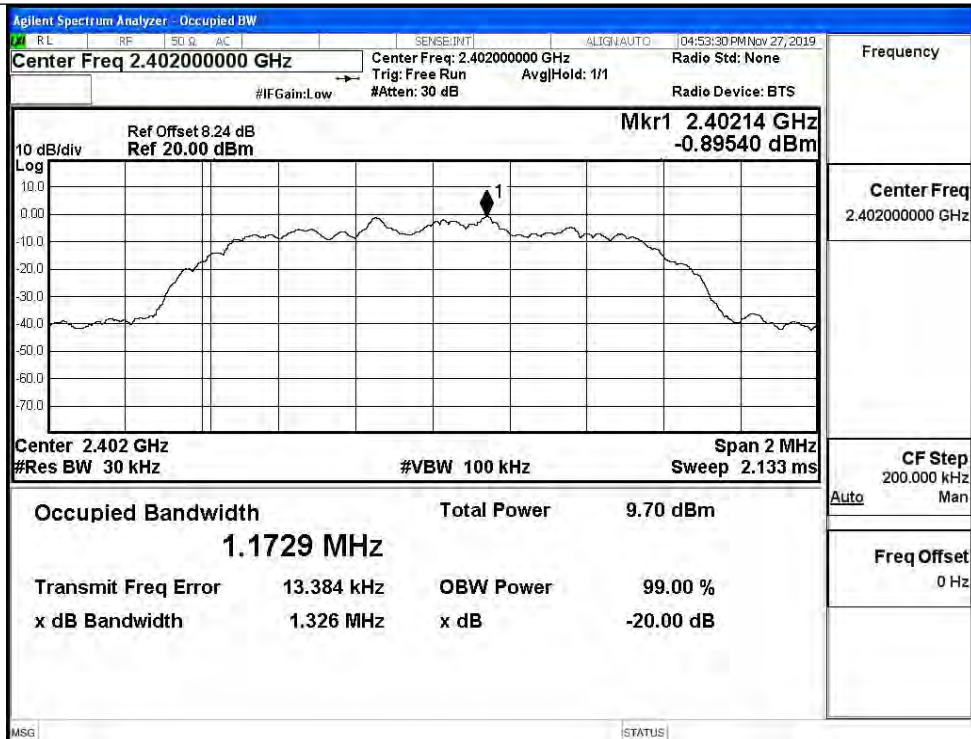
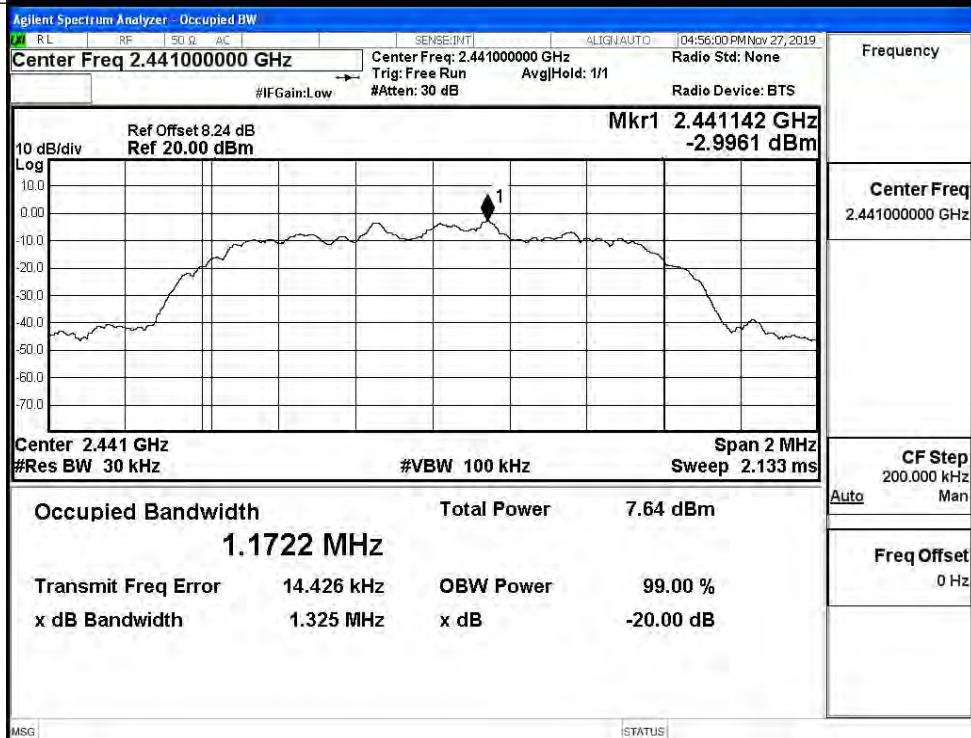


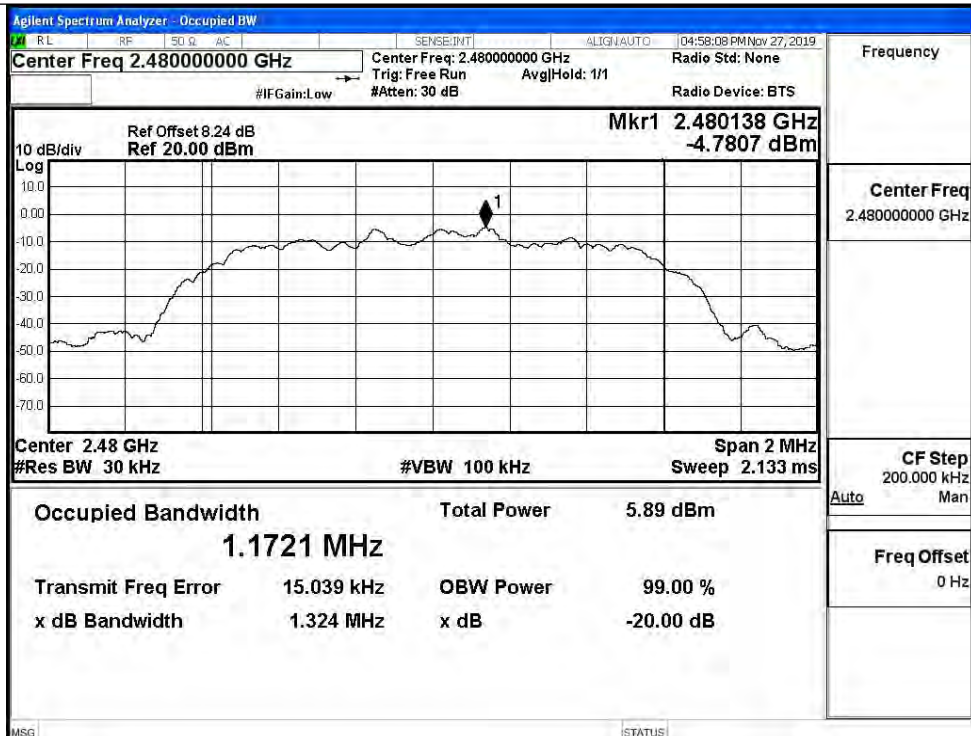
GFSK/MCH



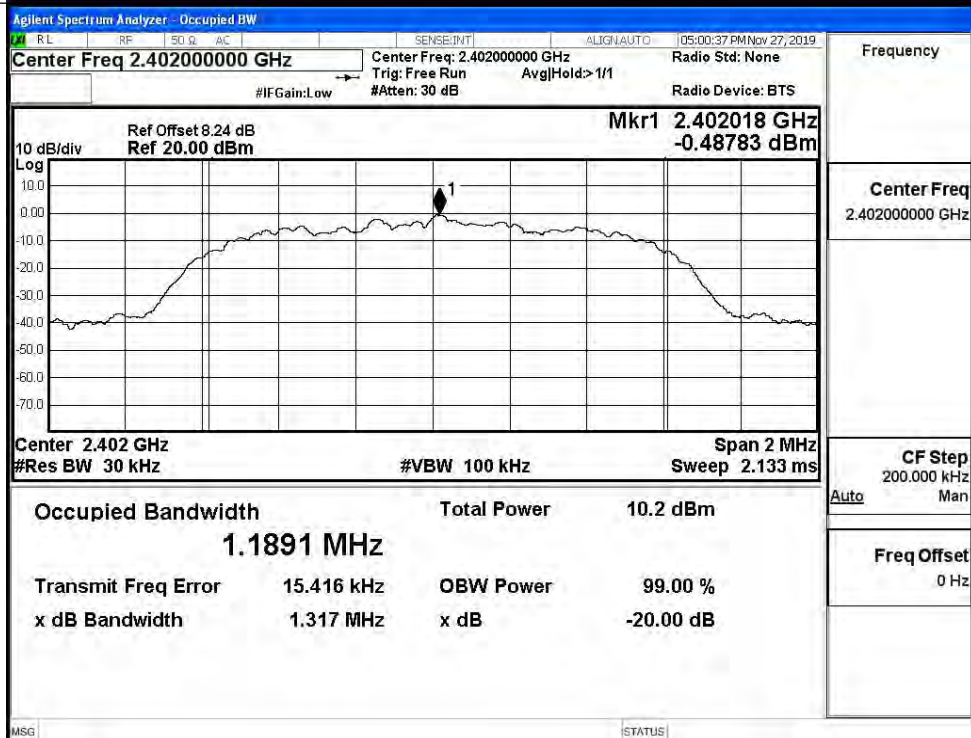
GFSK/HCH



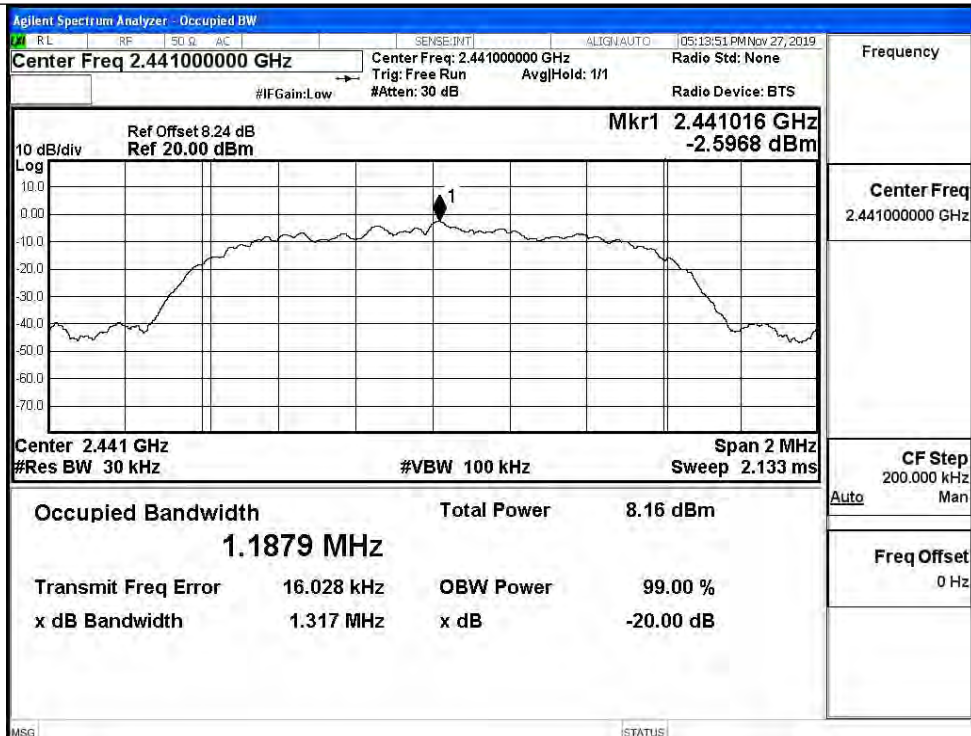
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

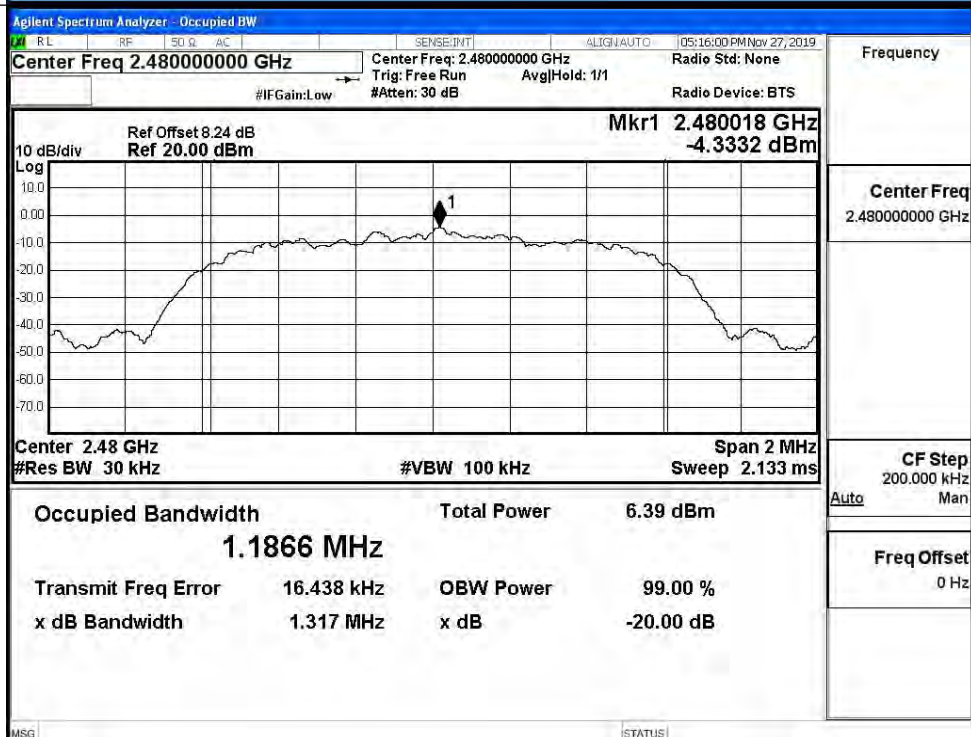
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

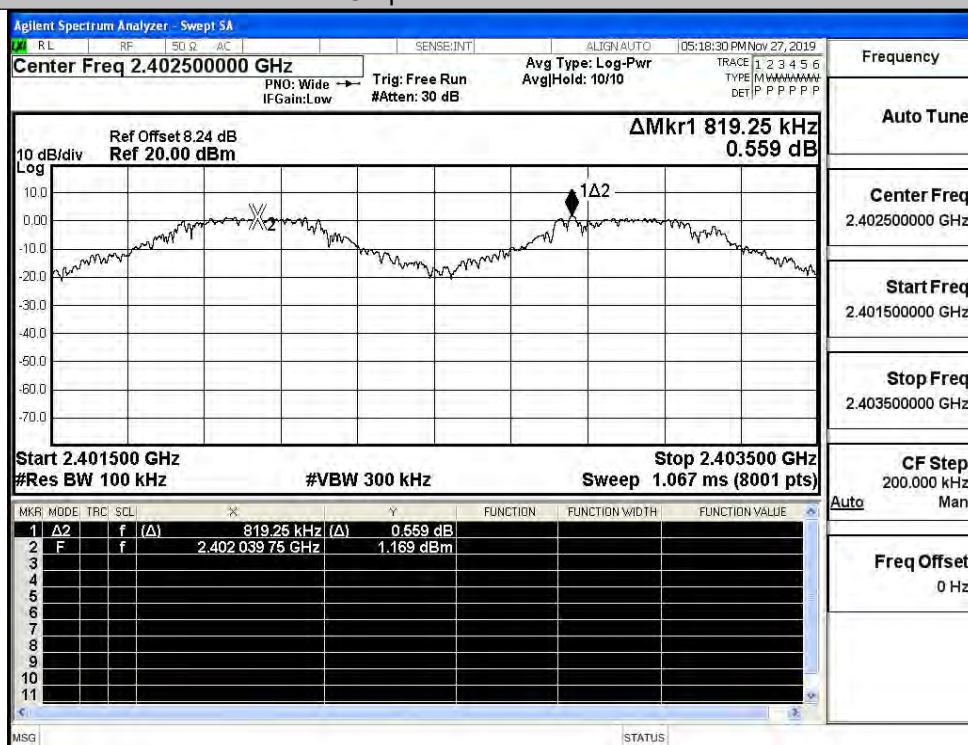


A.3 Carrier Frequency Separation

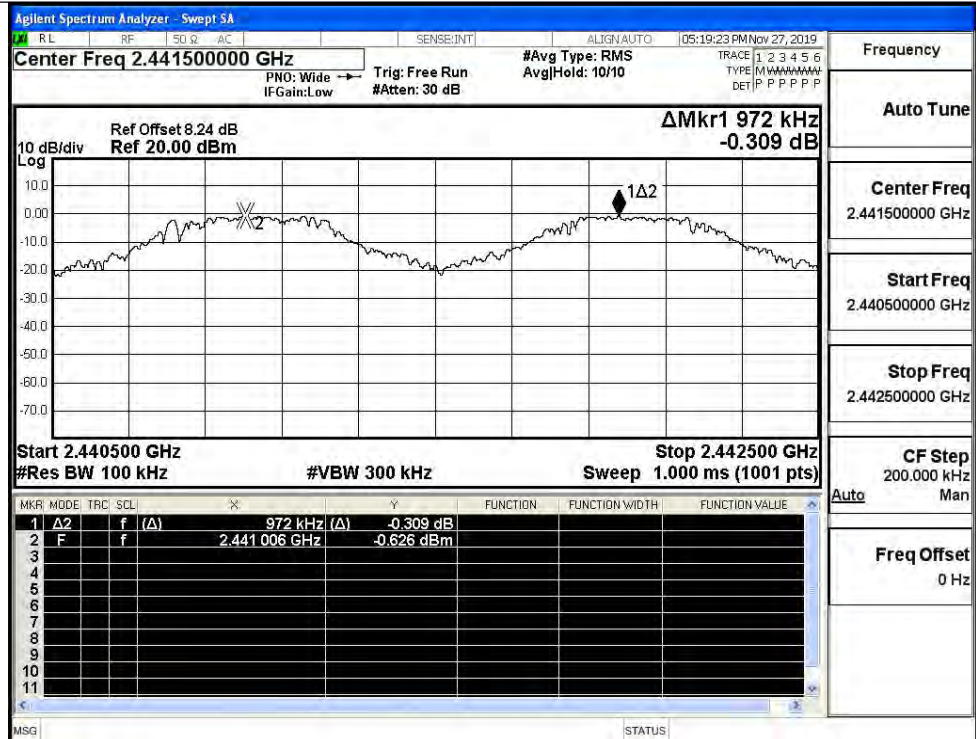
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.819	0.635	PASS
	MCH	0.972	0.635	PASS
	HCH	1.090	0.635	PASS
$\pi/4$ DQPSK	LCH	1.146	0.884	PASS
	MCH	1.002	0.884	PASS
	HCH	1.286	0.884	PASS
8DPSK	LCH	1.248	0.878	PASS
	MCH	0.912	0.878	PASS
	HCH	1.248	0.878	PASS

Test Graphs

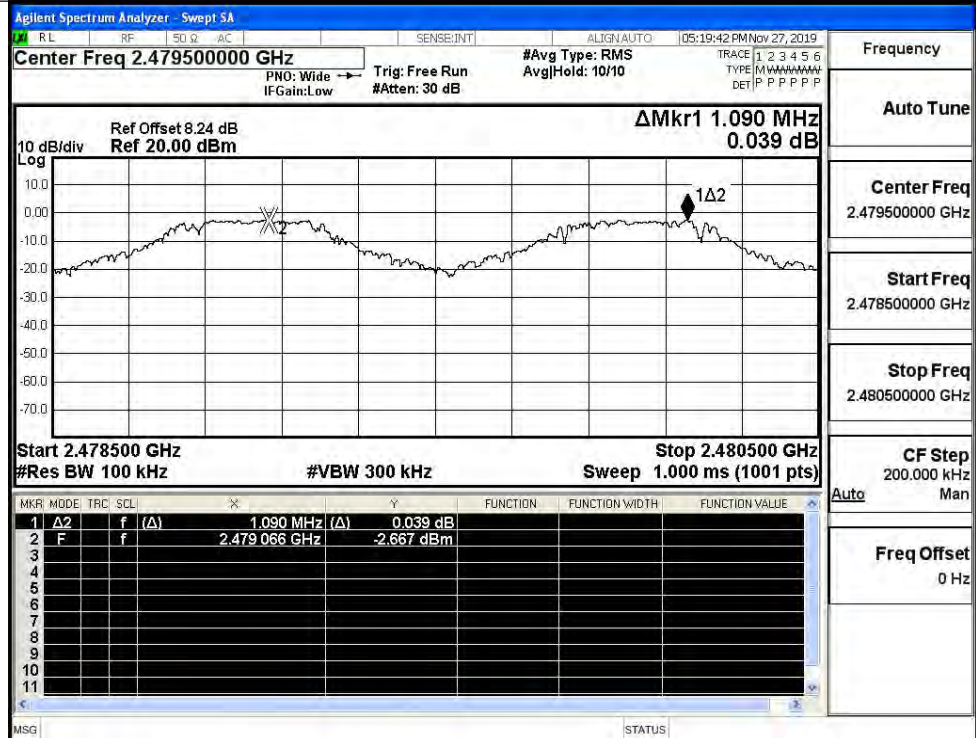
GFSK/LCH

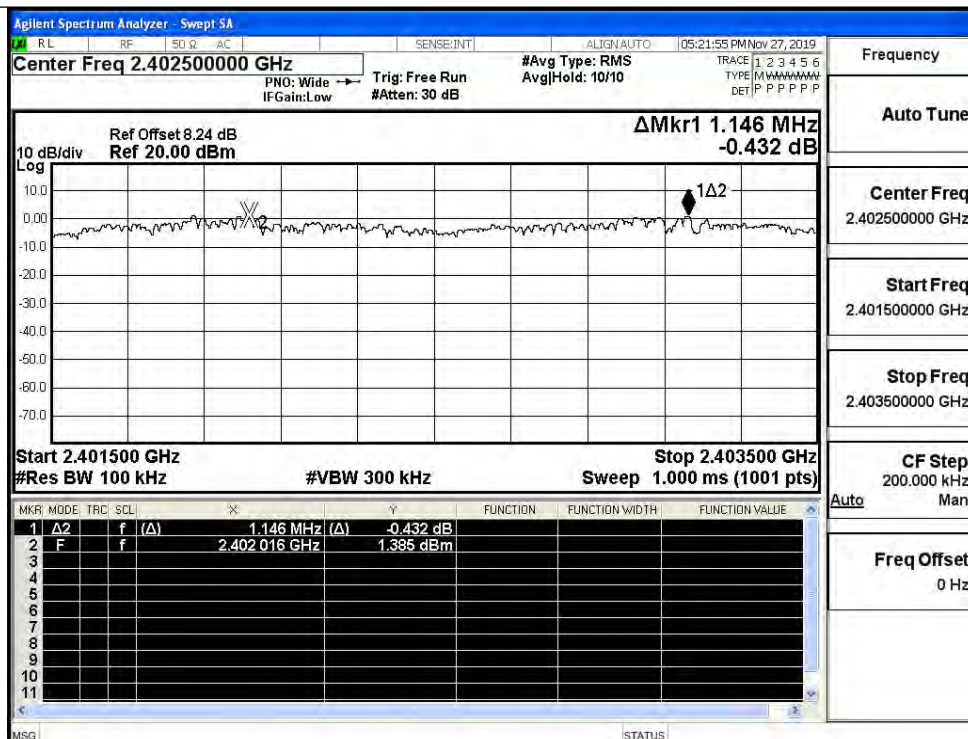
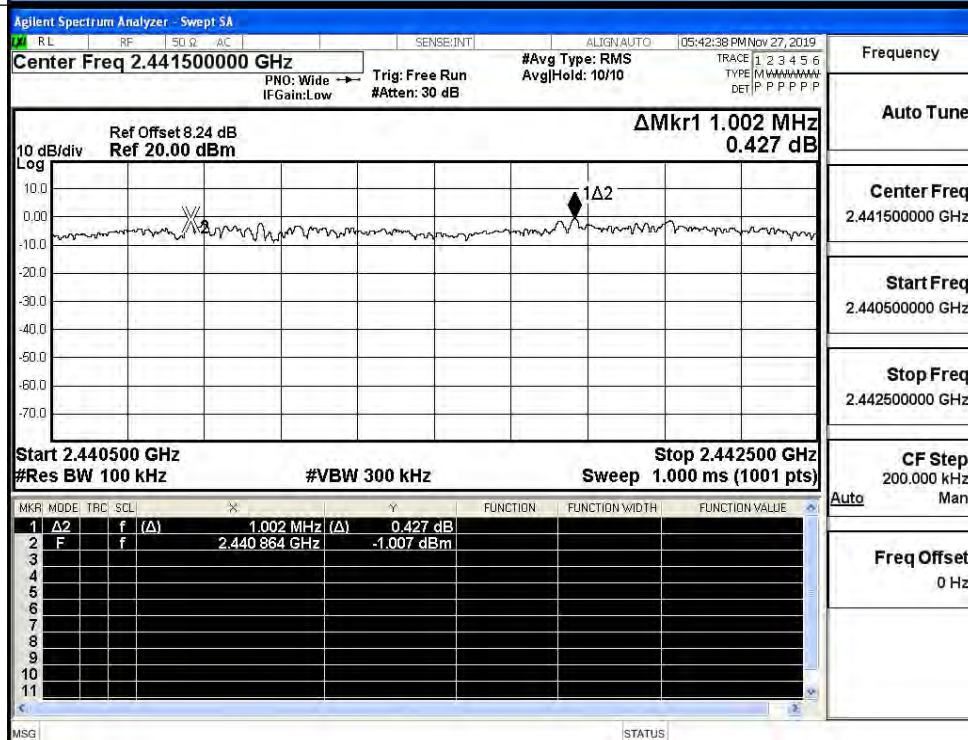


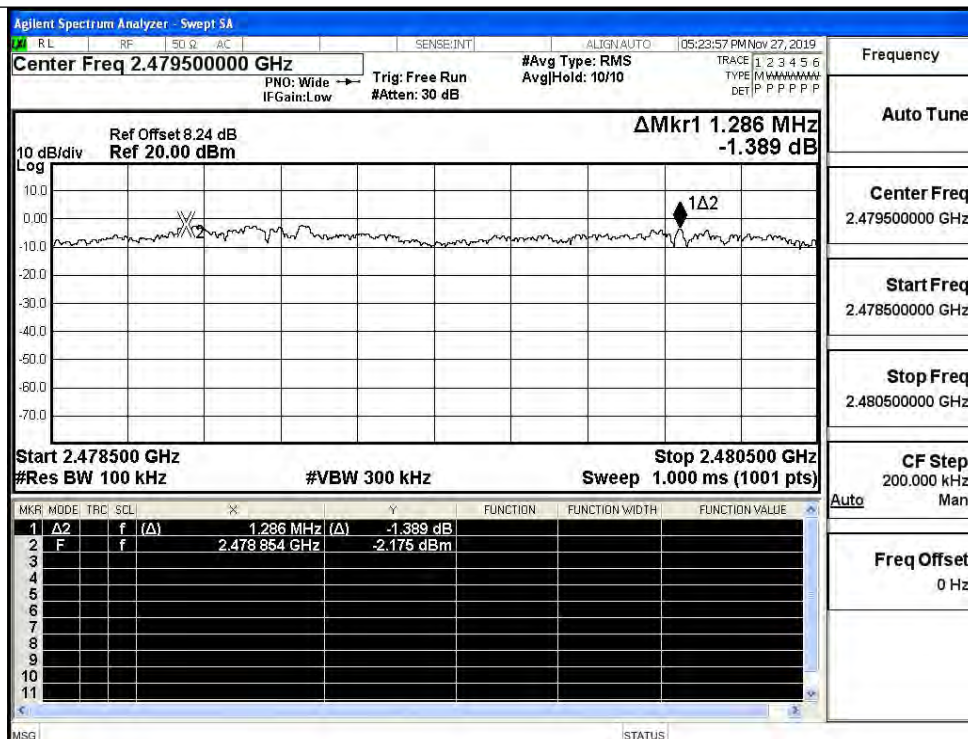
GFSK/MCH



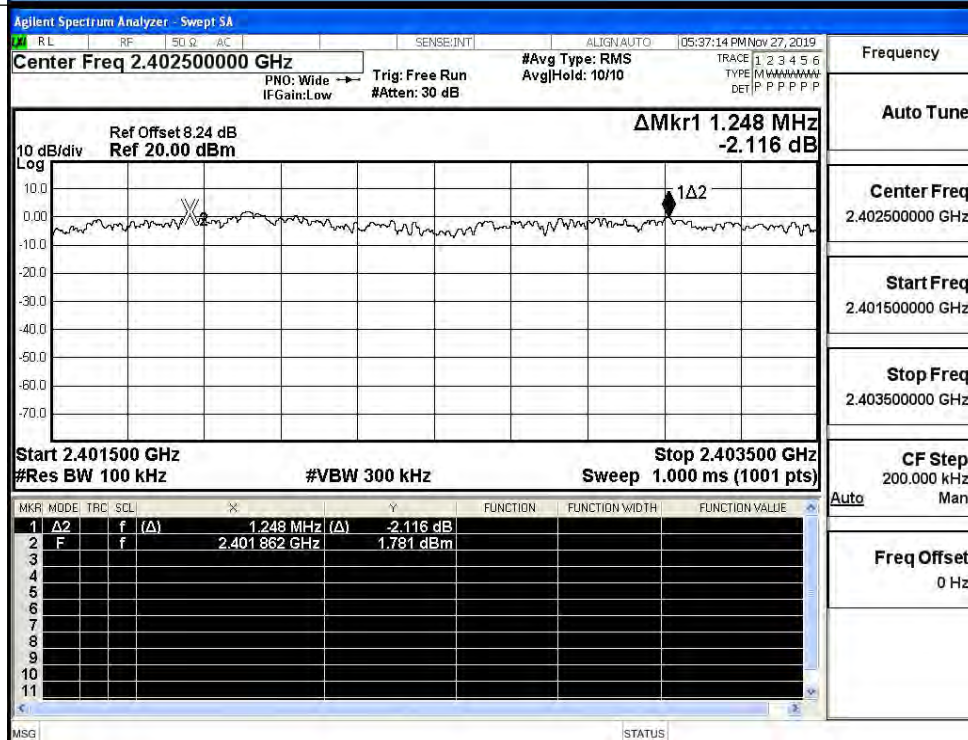
GFSK/HCH



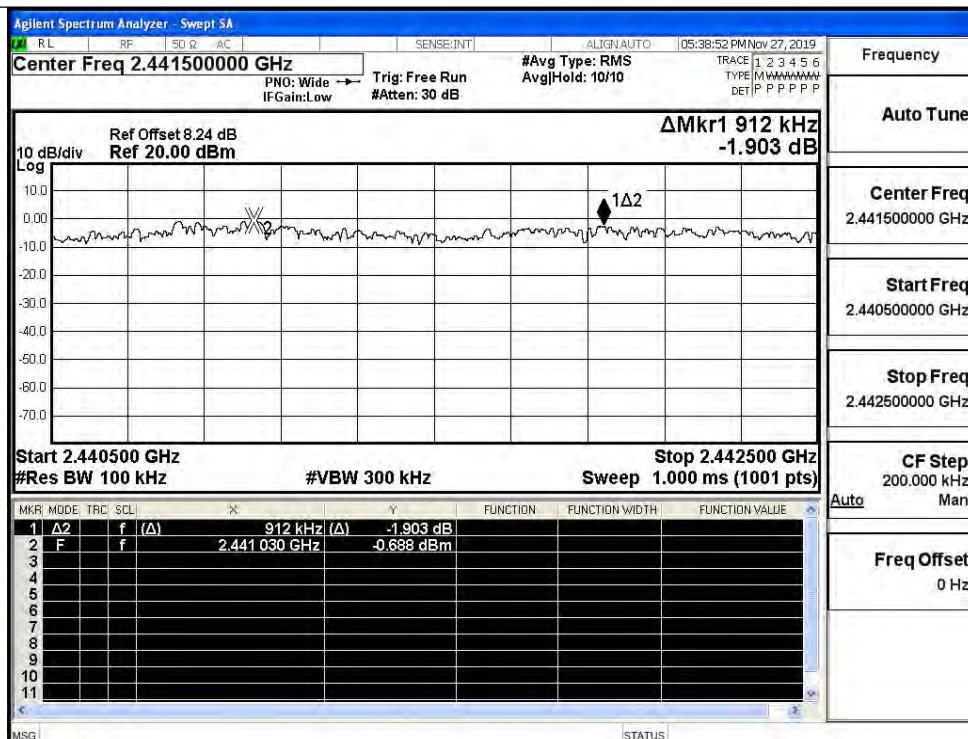
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

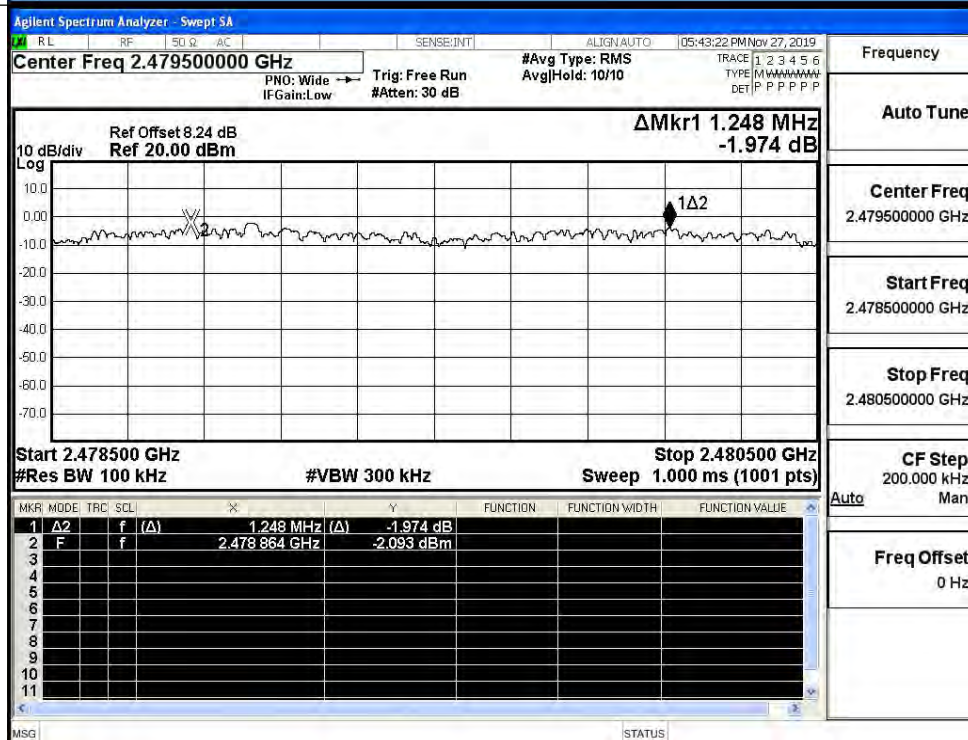
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

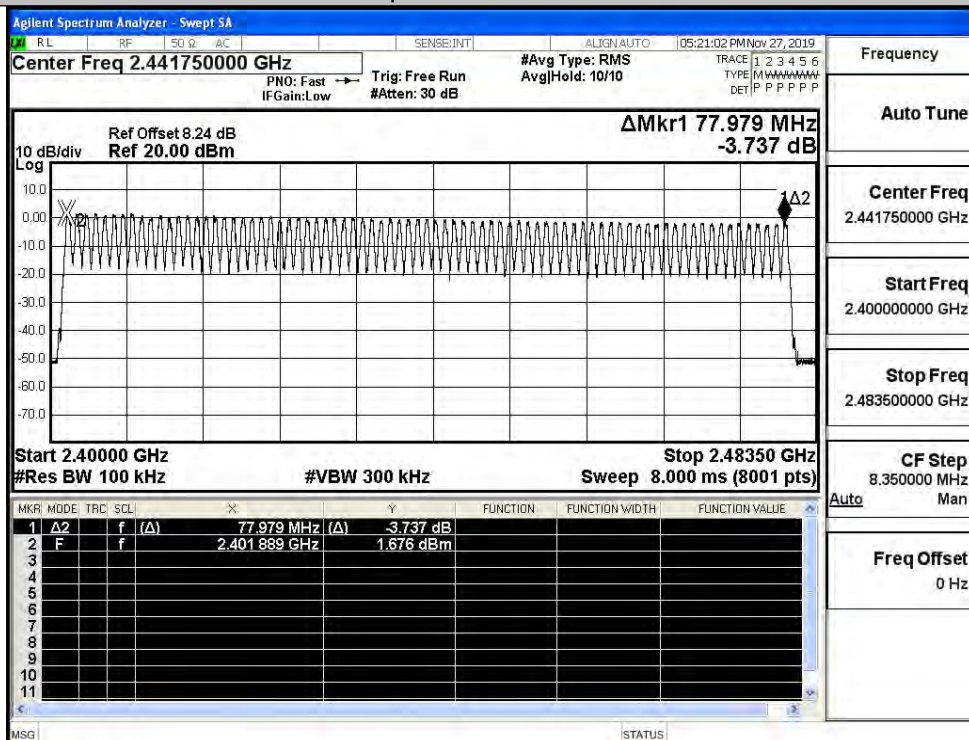
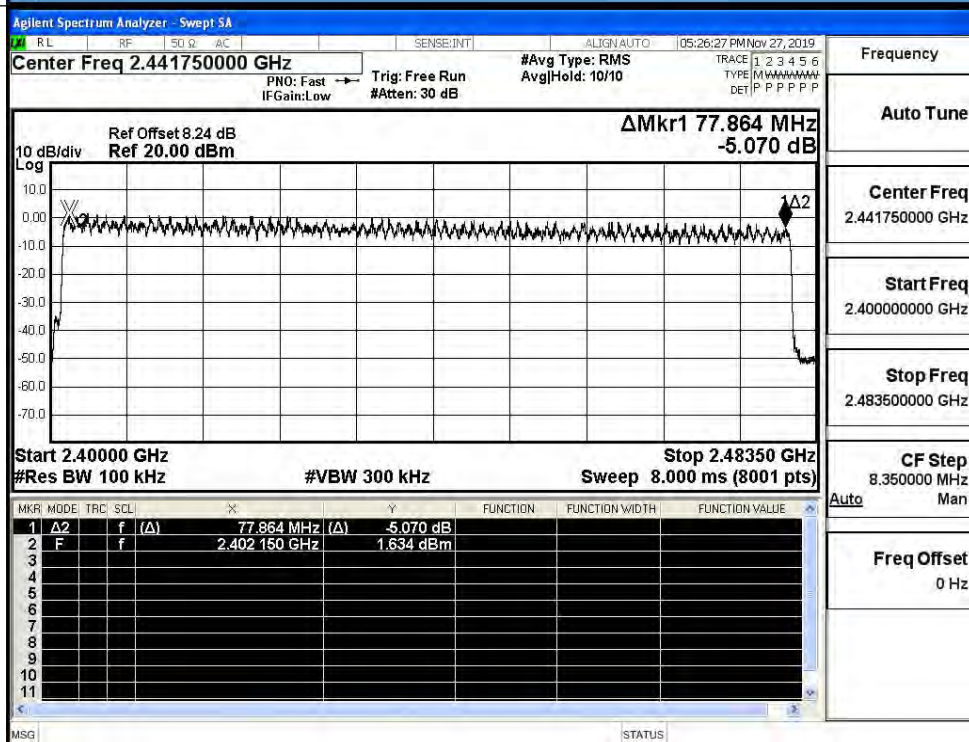


A.4 Hopping Channel Number

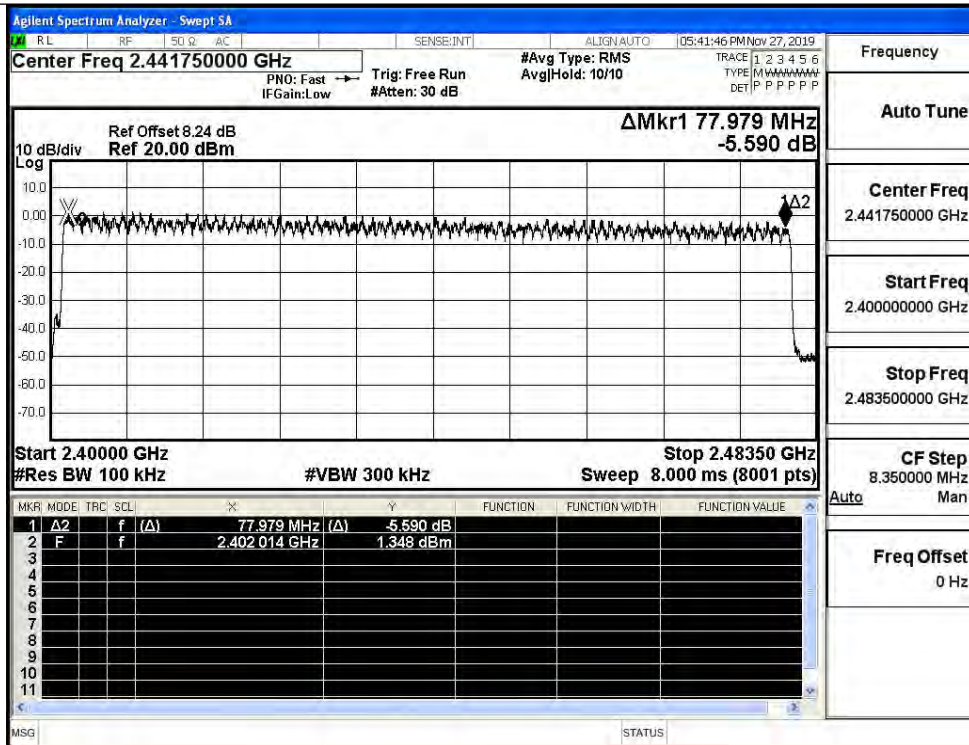
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

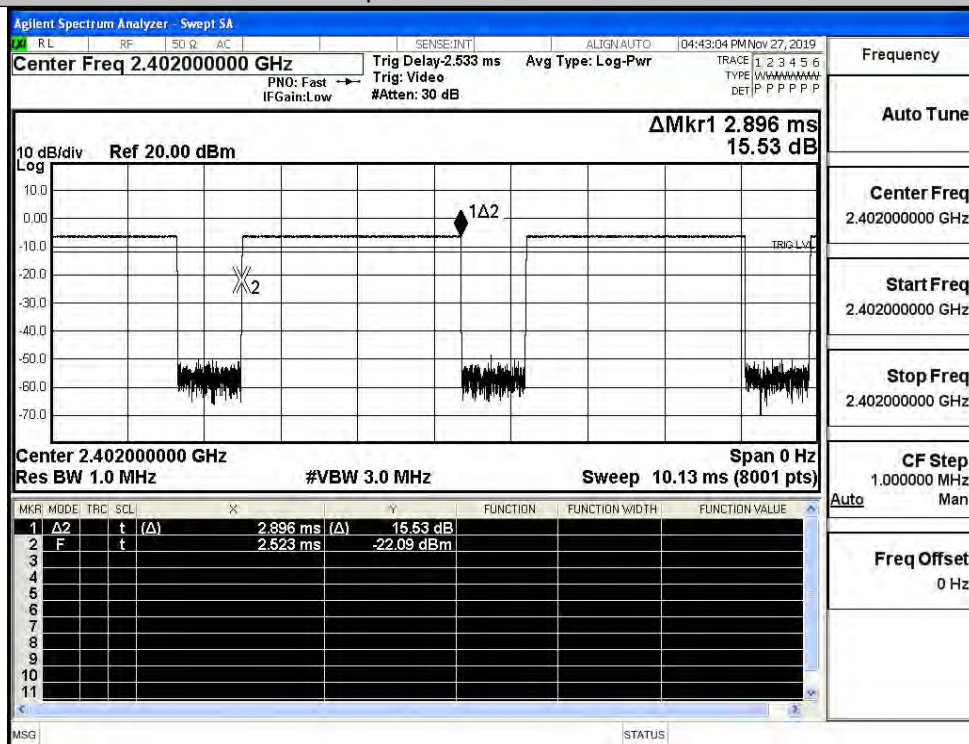


A.5 Dwell Time

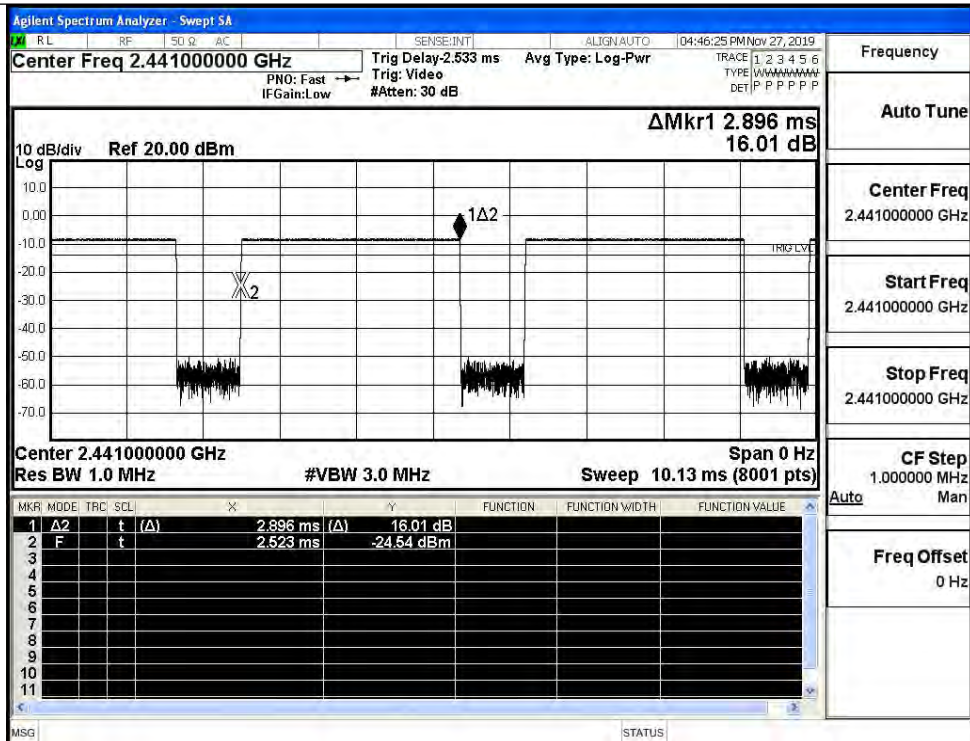
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7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

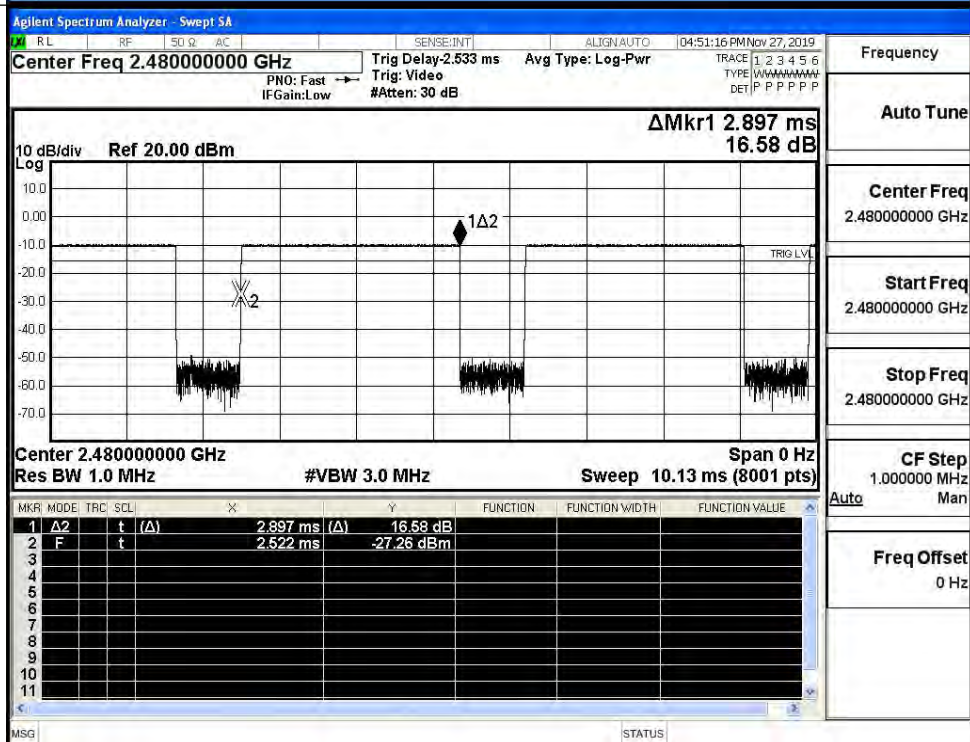
GFSK_DH5/LCH



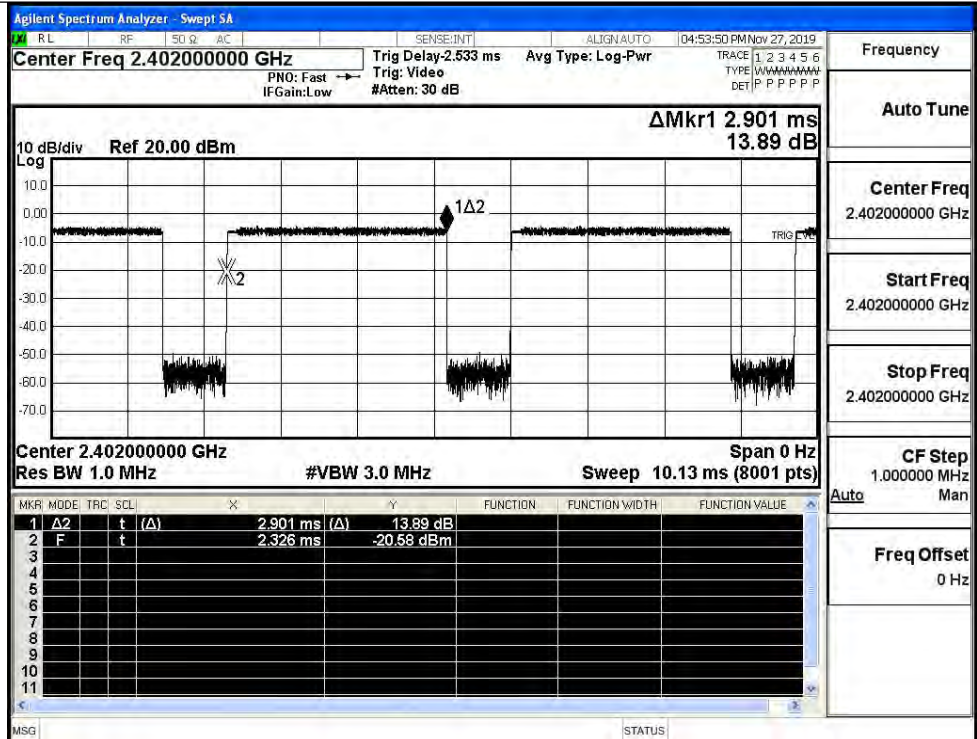
GFSK_DH5/MCH



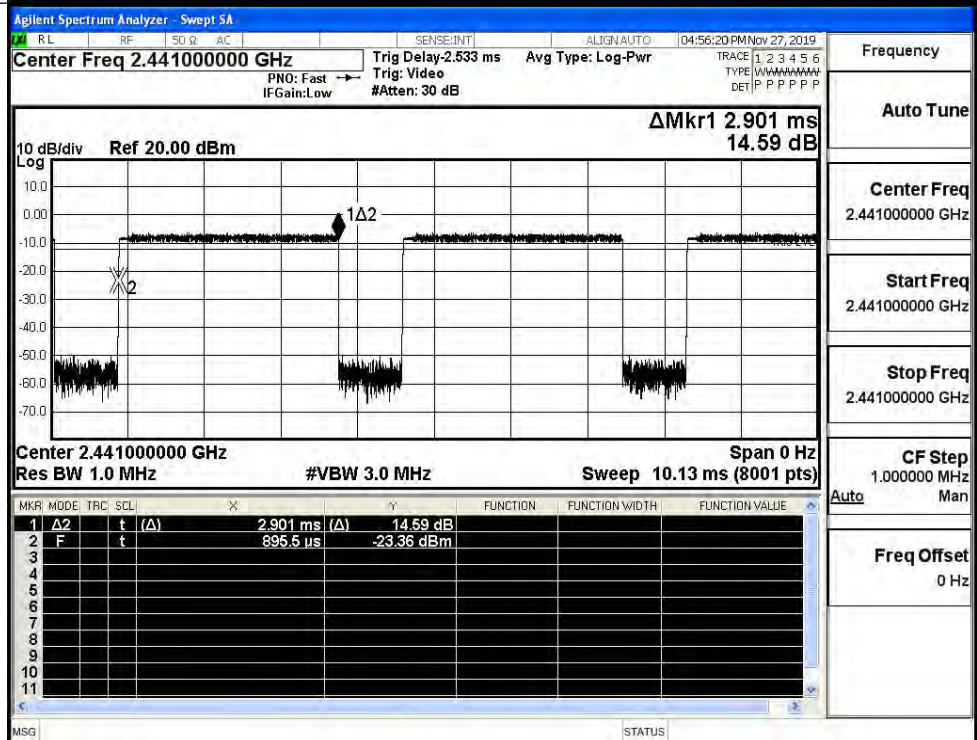
GFSK_DH5/HCH



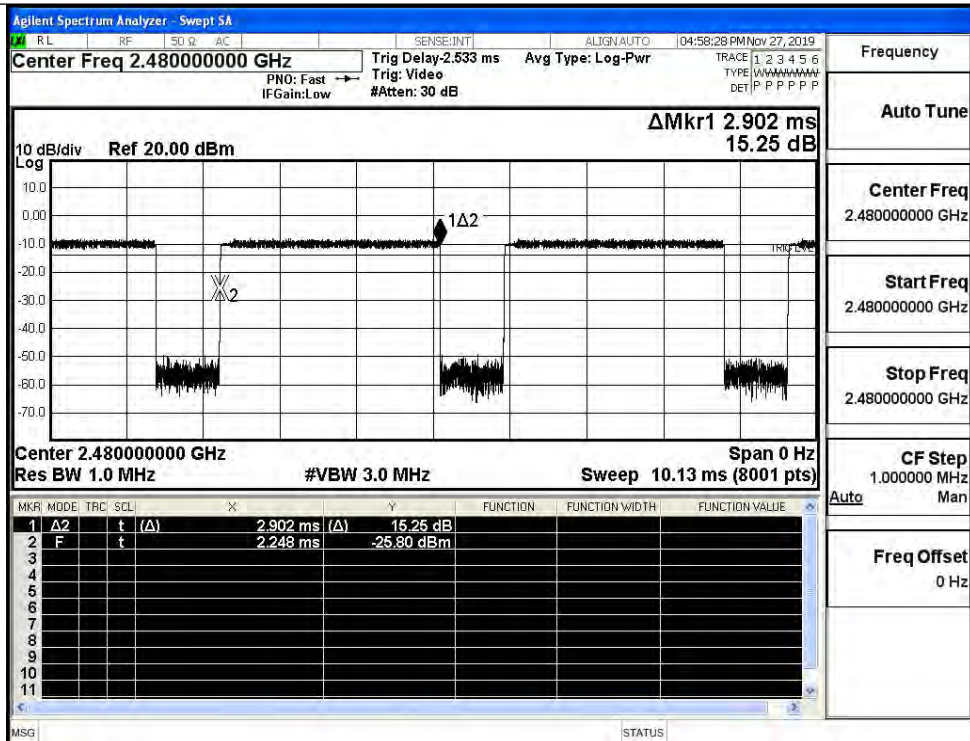
$\pi/4$ DQPSK
_2DH5/LCH



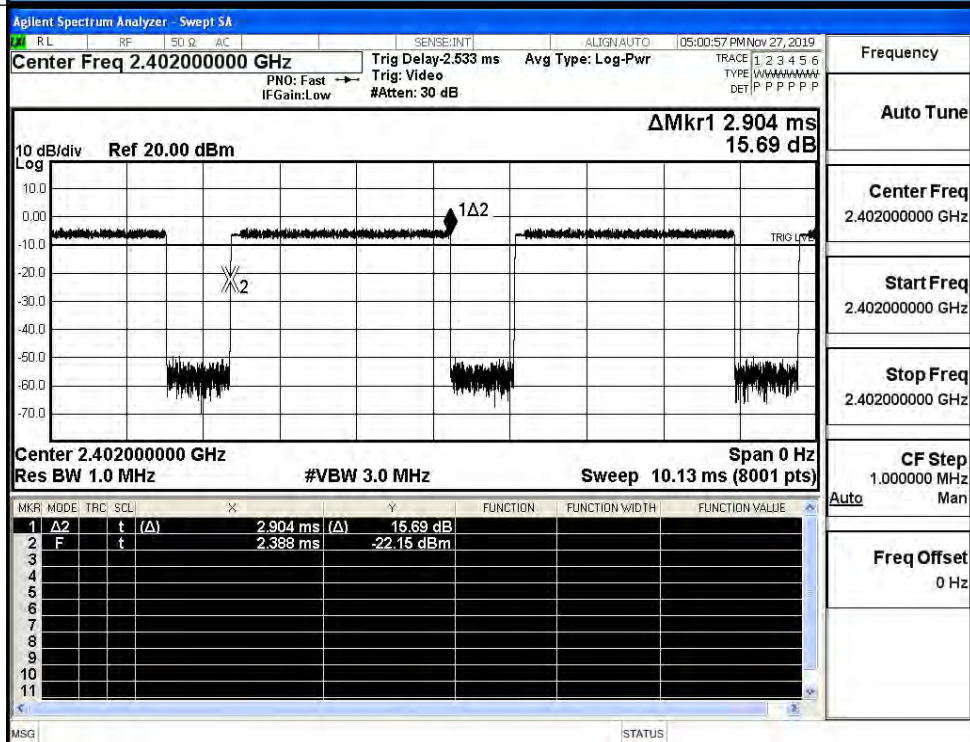
$\pi/4$ DQPSK
_2DH5/MCH



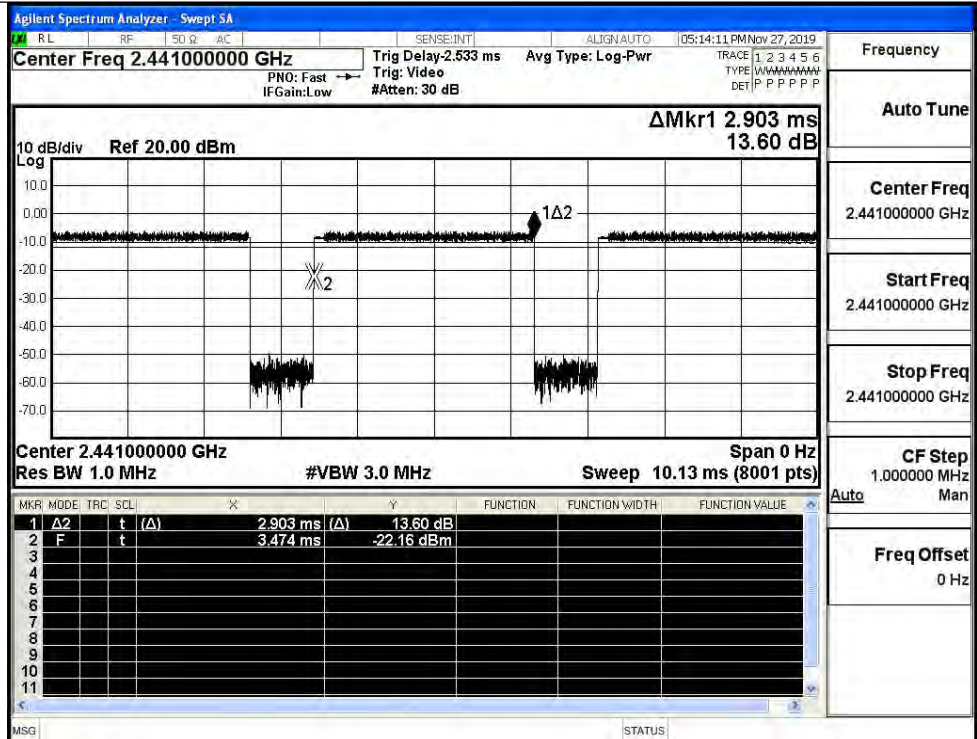
$\pi/4$ DQPSK
_2DH5/HCH



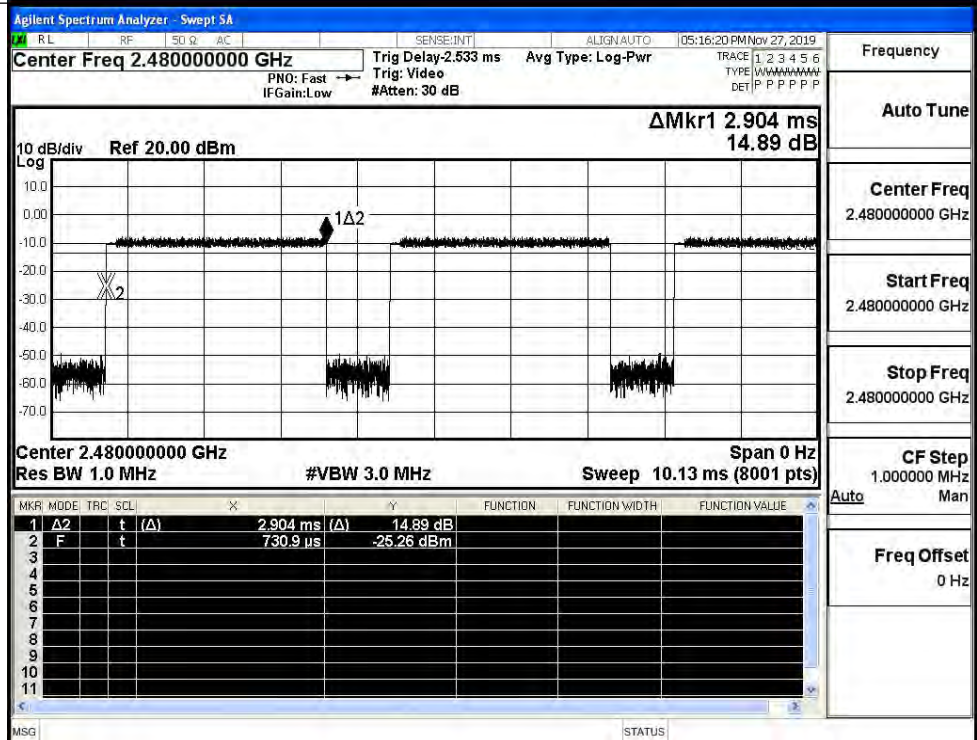
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

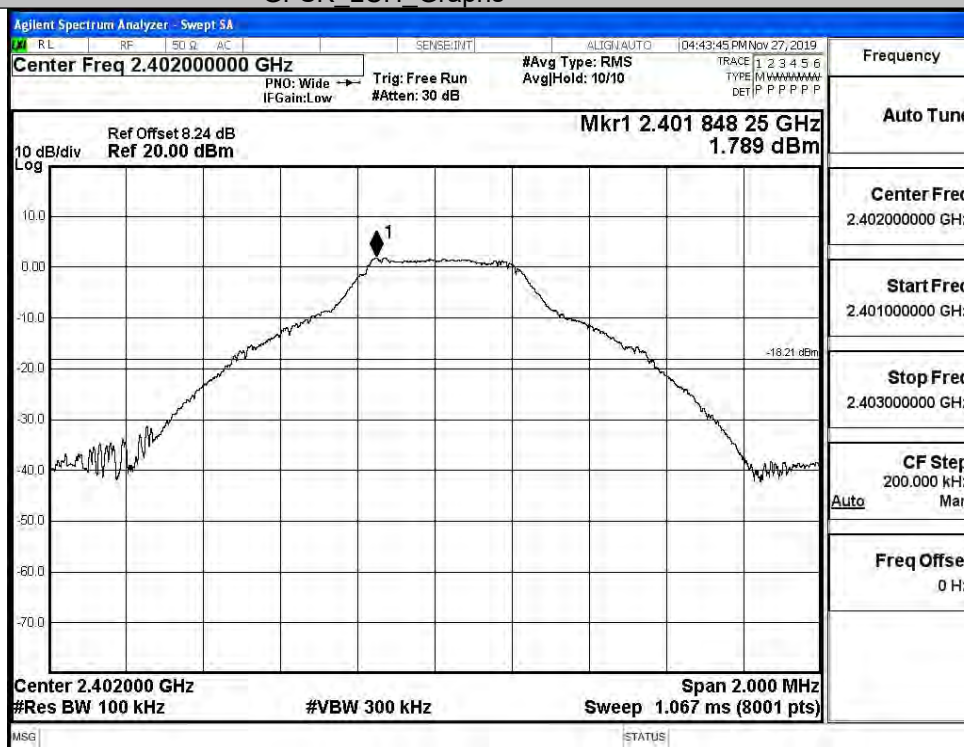


A.6 RF Conducted Spurious Emissions

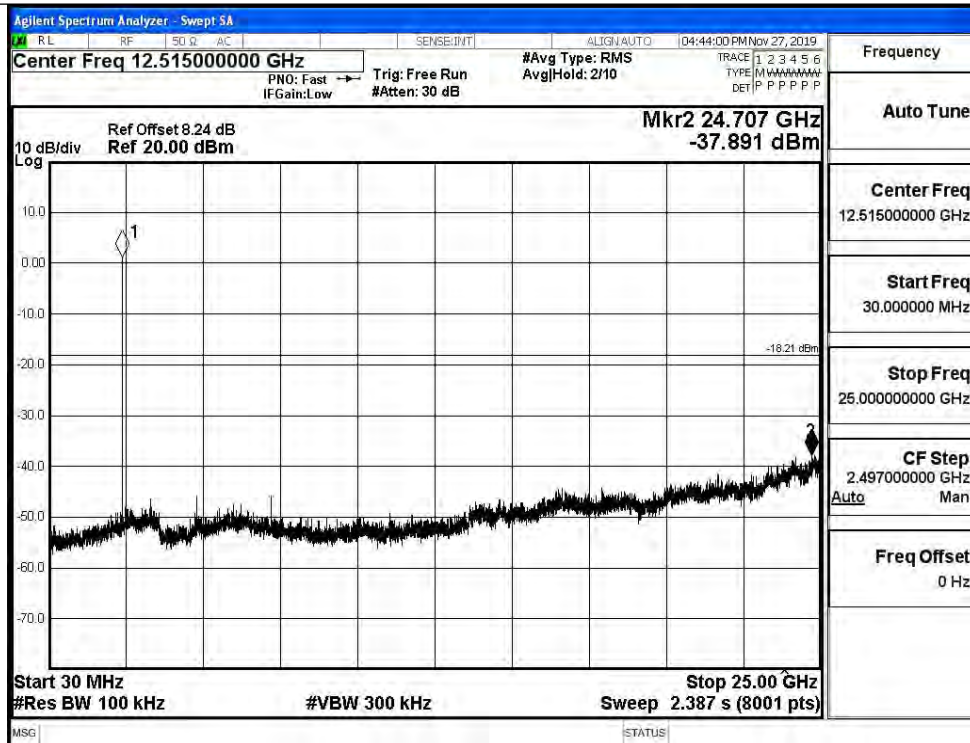
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.789	-37.891	-18.211	PASS
	MCH	-0.238	-37.254	-20.238	PASS
	HCH	-1.973	-37.280	-21.973	PASS
$\pi/4$ DQPSK	LCH	1.711	-37.340	-18.289	PASS
	MCH	-0.417	-37.463	-20.417	PASS
	HCH	-2.138	-37.465	-22.138	PASS
8DPSK	LCH	1.757	-37.505	-18.243	PASS
	MCH	-0.235	-37.998	-20.235	PASS
	HCH	-2.306	-37.861	-22.306	PASS

GFSK LCH Graphs

Pref

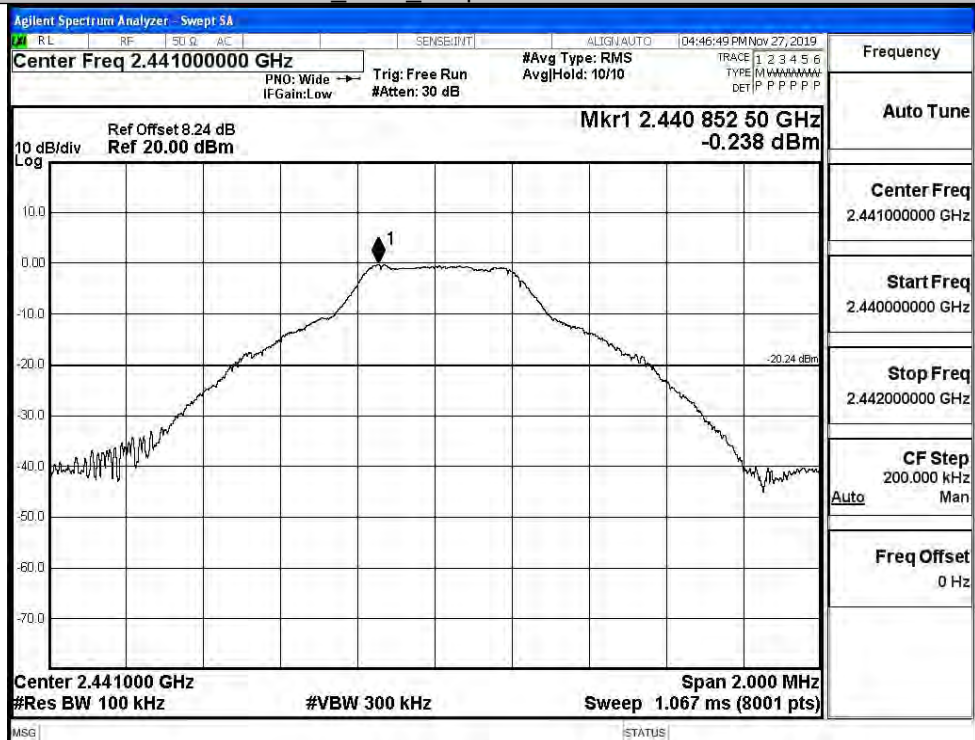


Puw

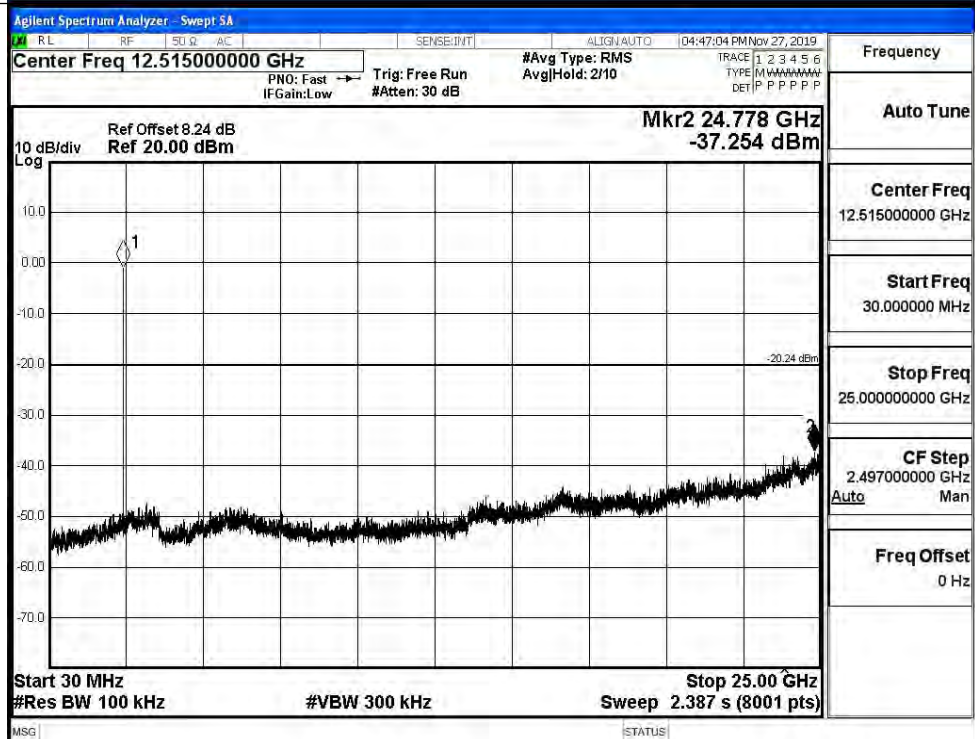


GFSK MCH_Graphs

Pref

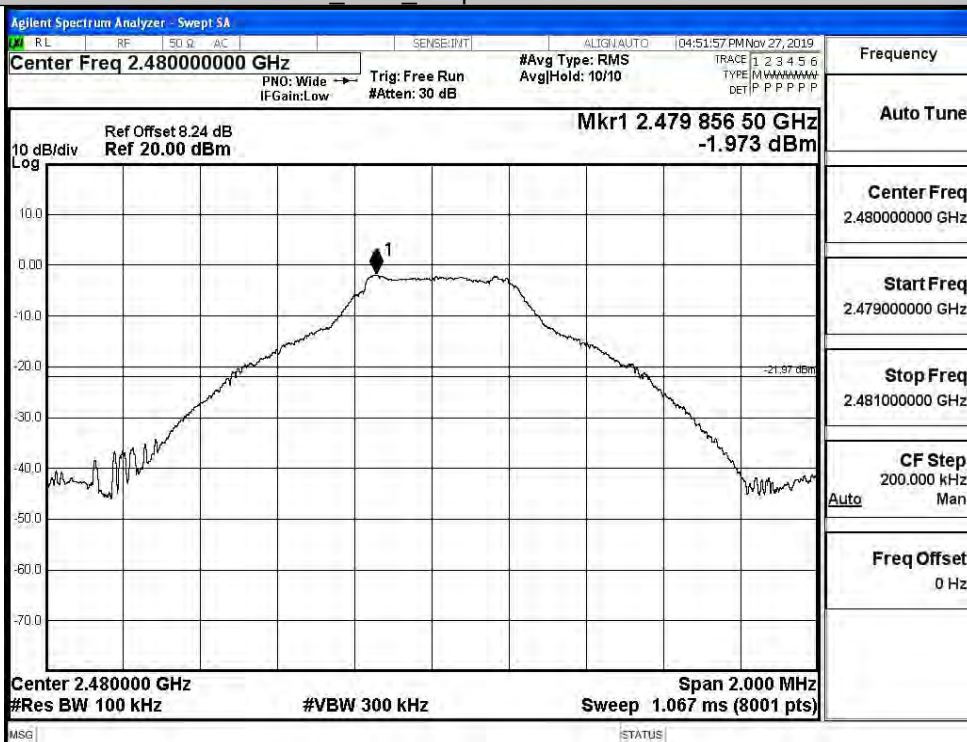


Puw

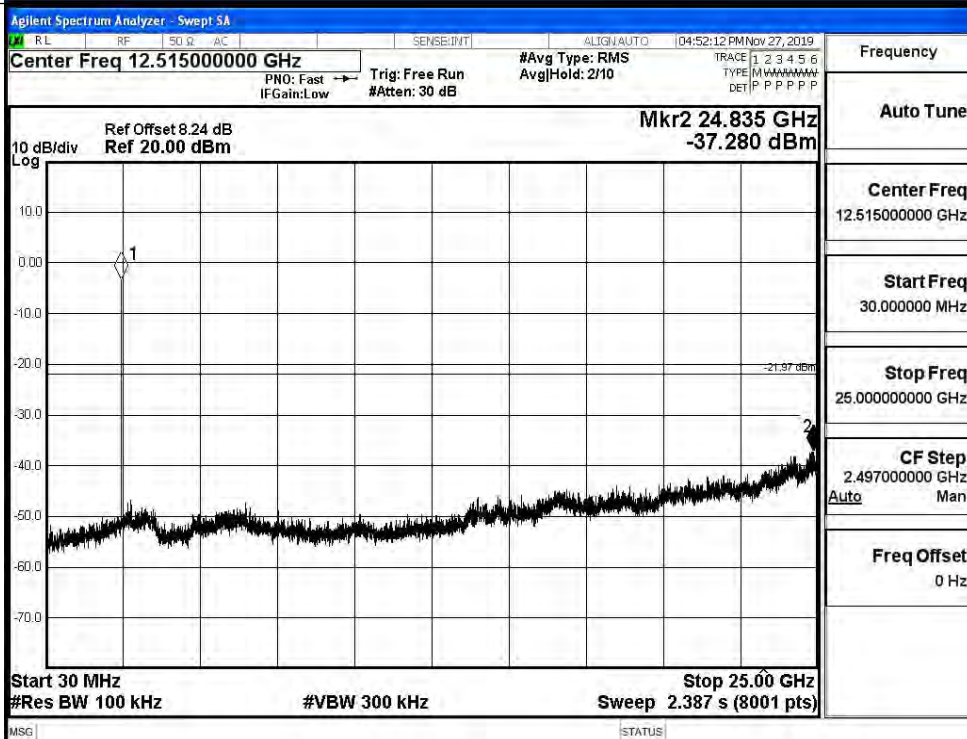


GFSK HCH_Graphs

Pref

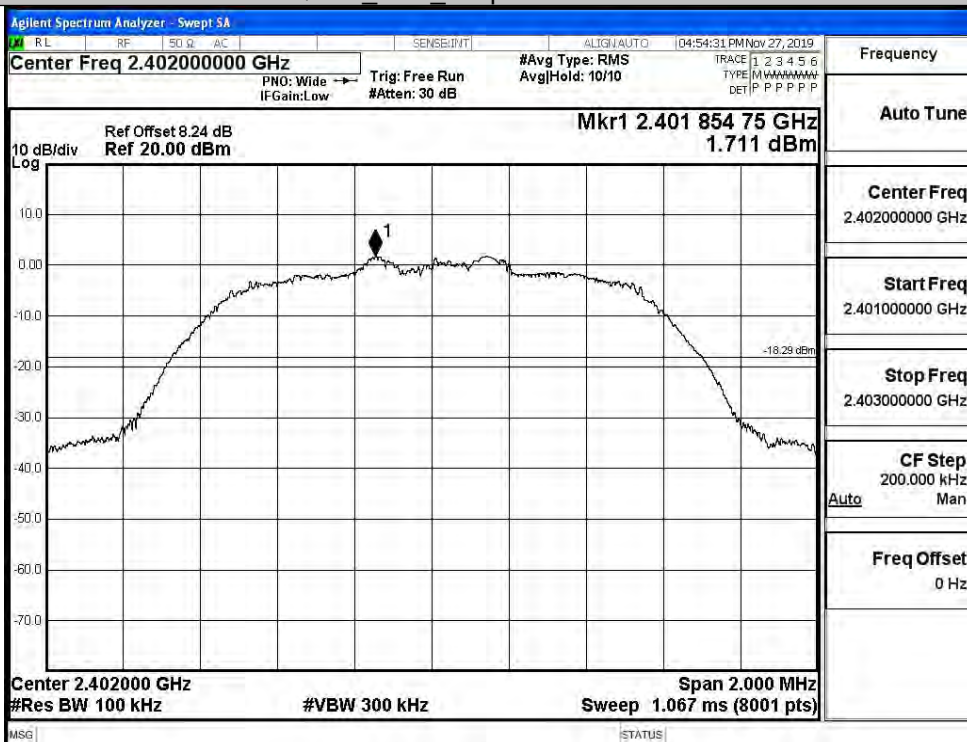


Puw

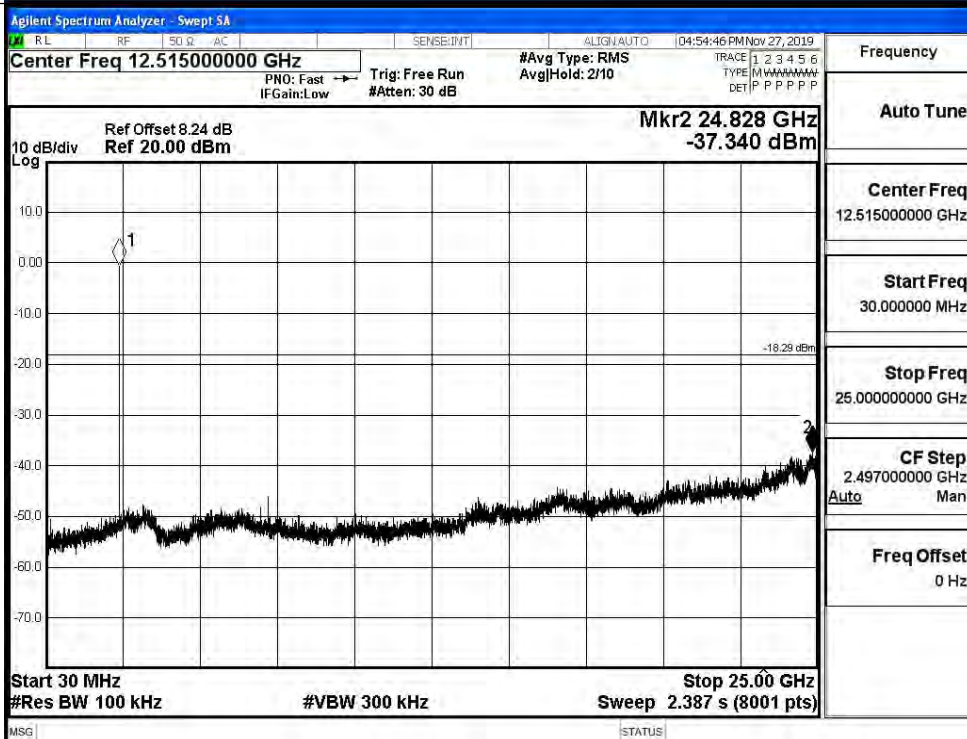


$\pi/4$ DQPSK LCH_Graphs

Pref

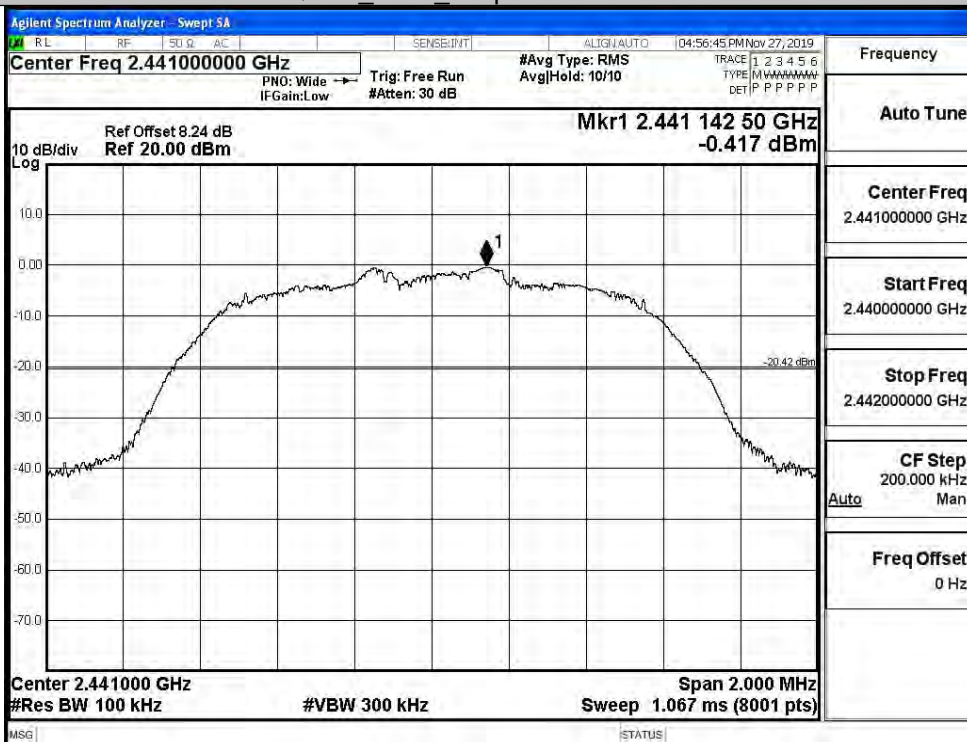


Puw

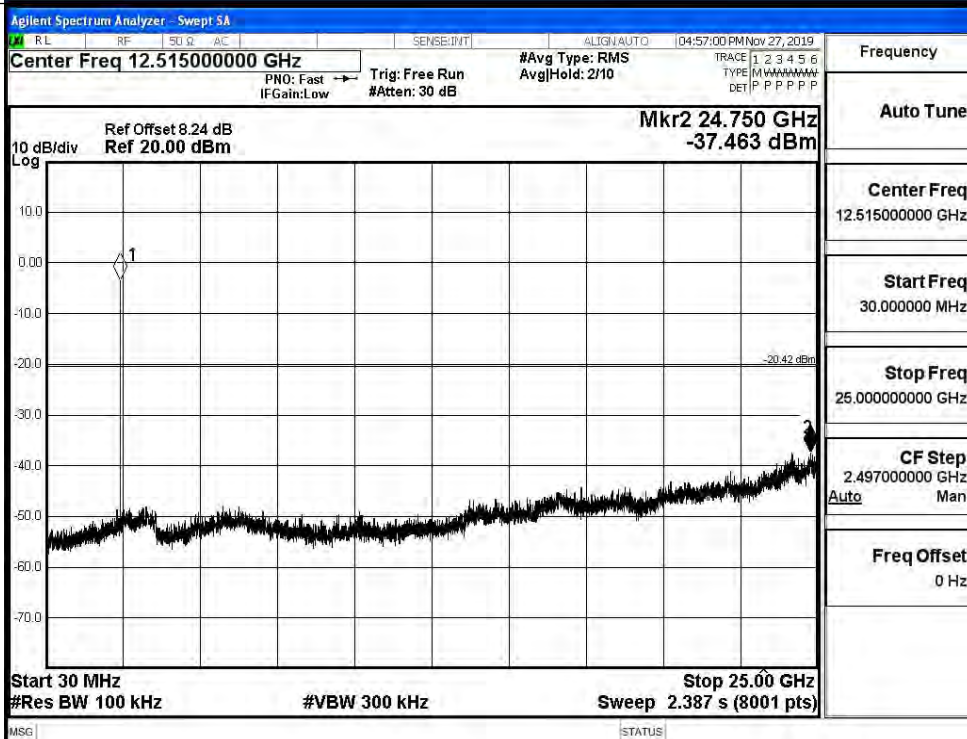


$\pi/4$ DQPSK_MCH_Graphs

Pref

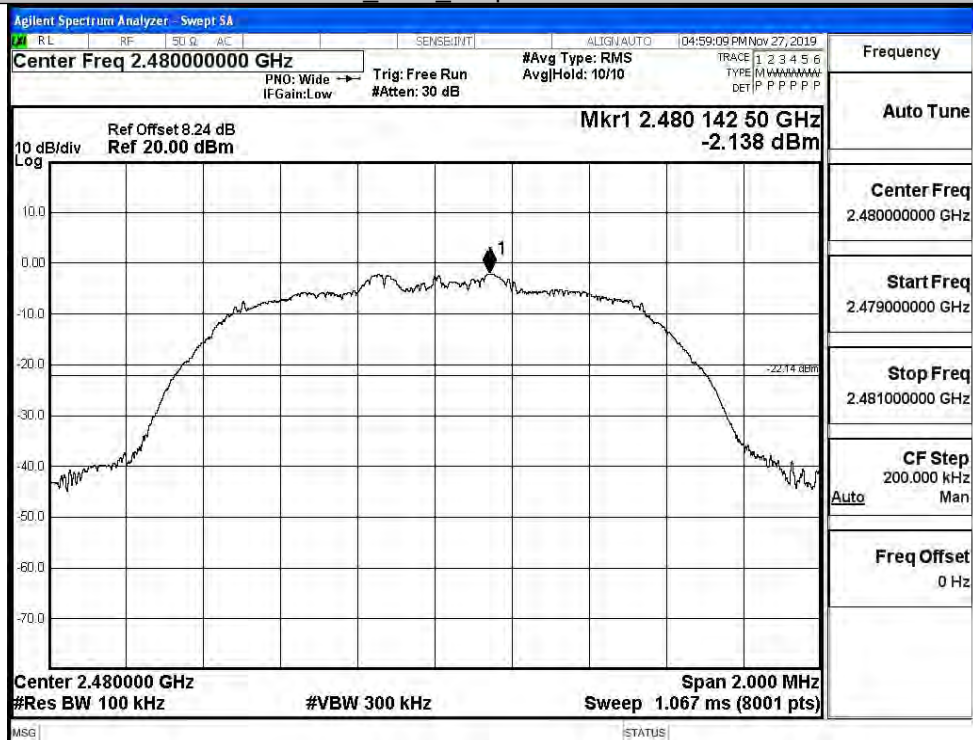


Puw

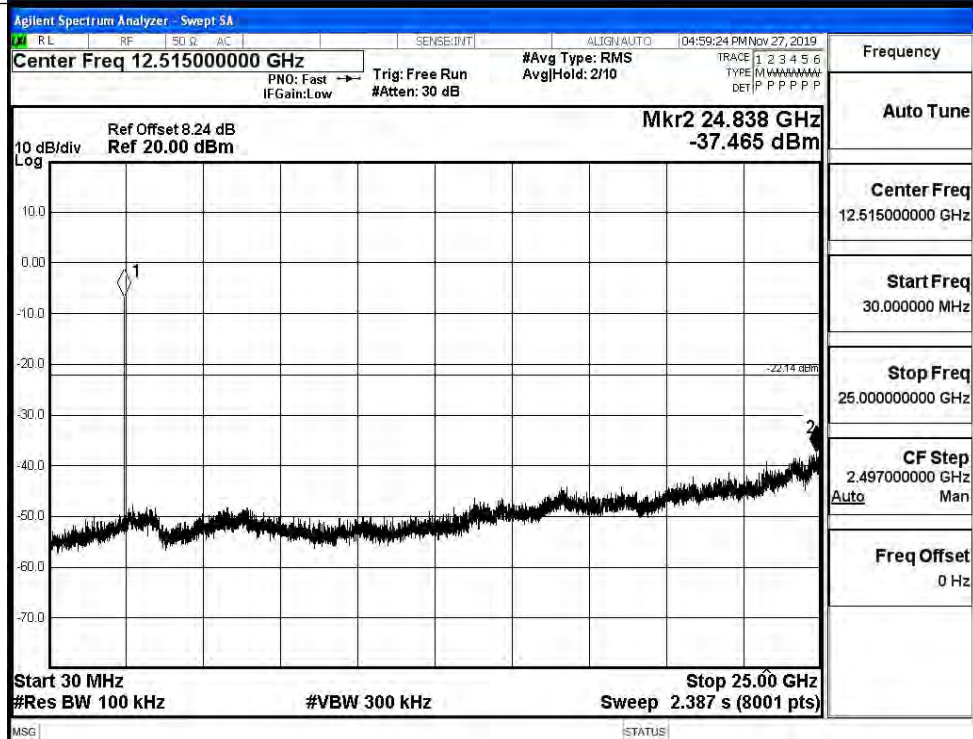


$\pi/4$ DQPSK HCH_Graphs

Pref

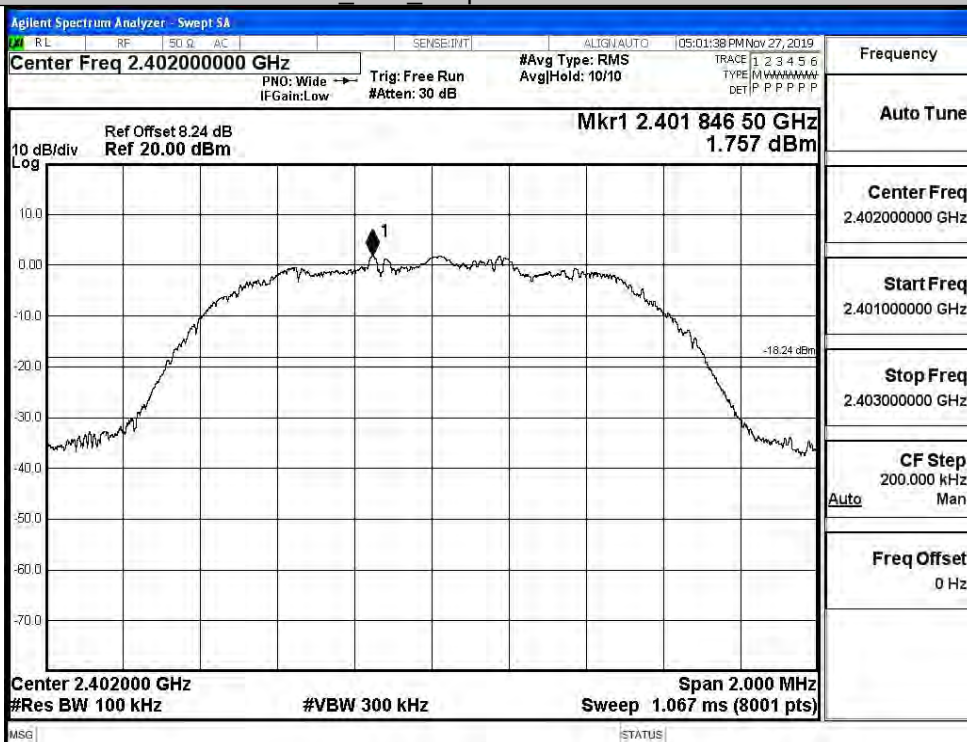


Puw

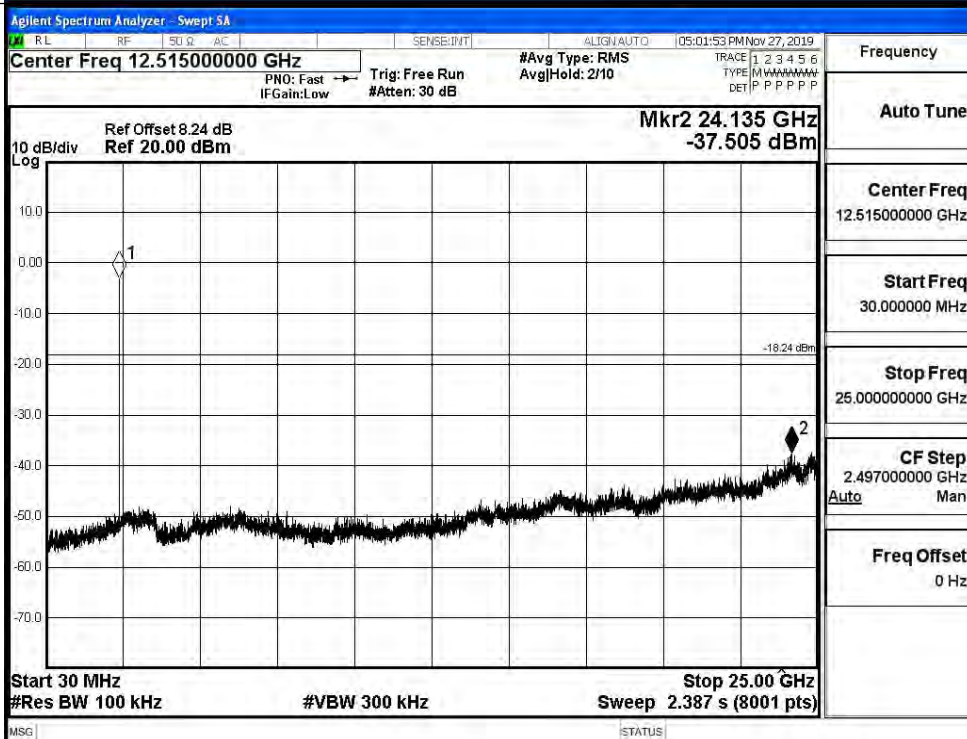


8DPSK_LCH_Graphs

Pref

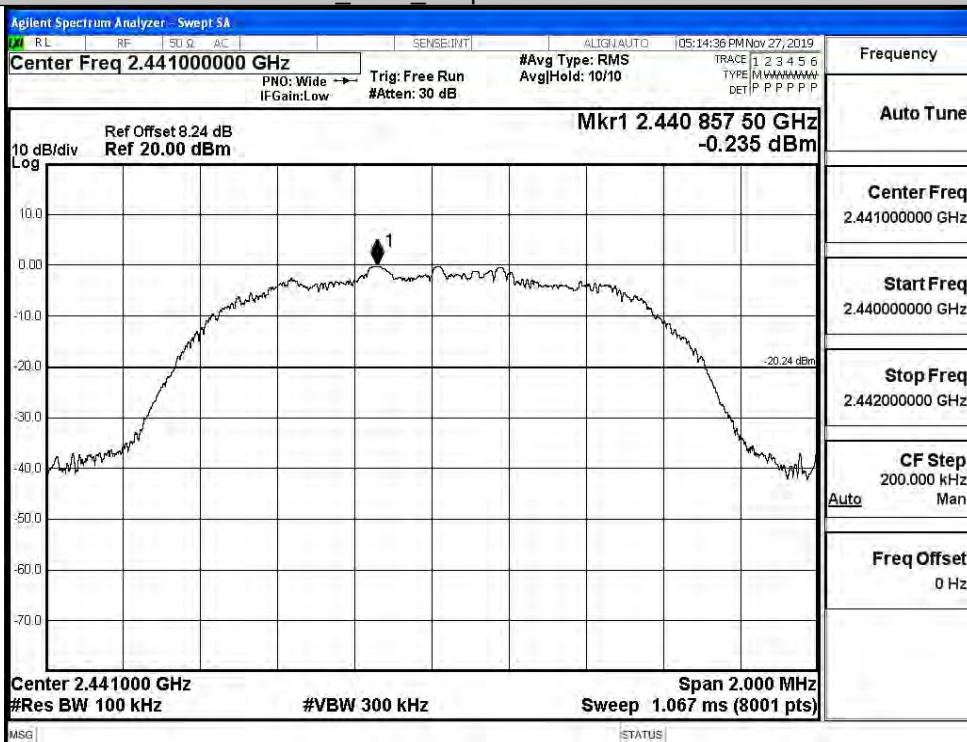


Puw

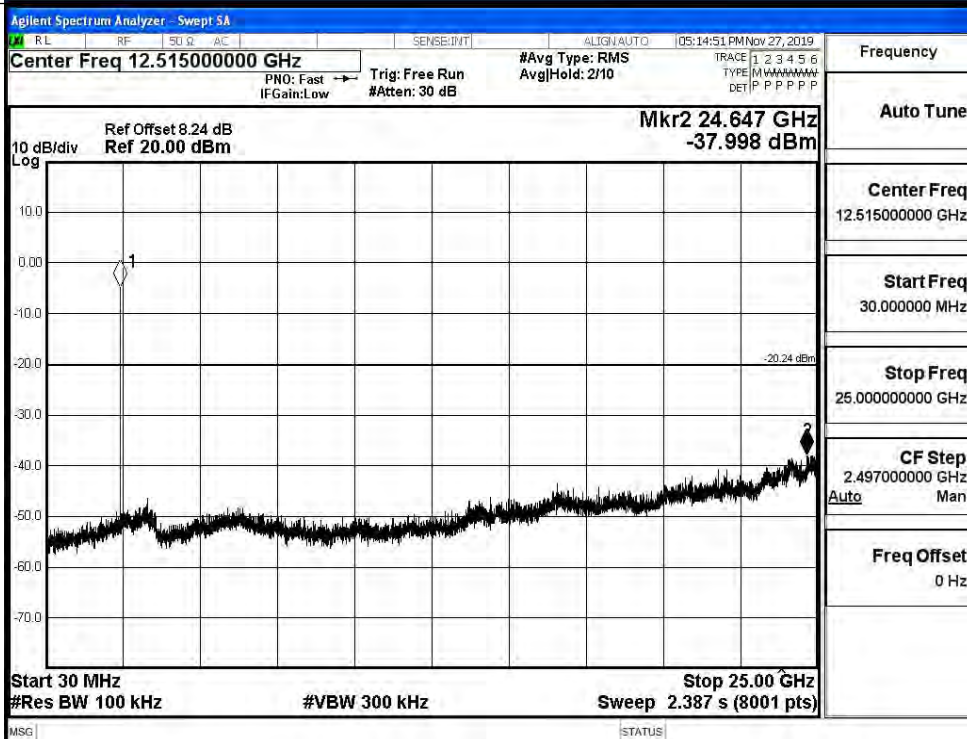


8DPSK_MCH_Graphs

Pref

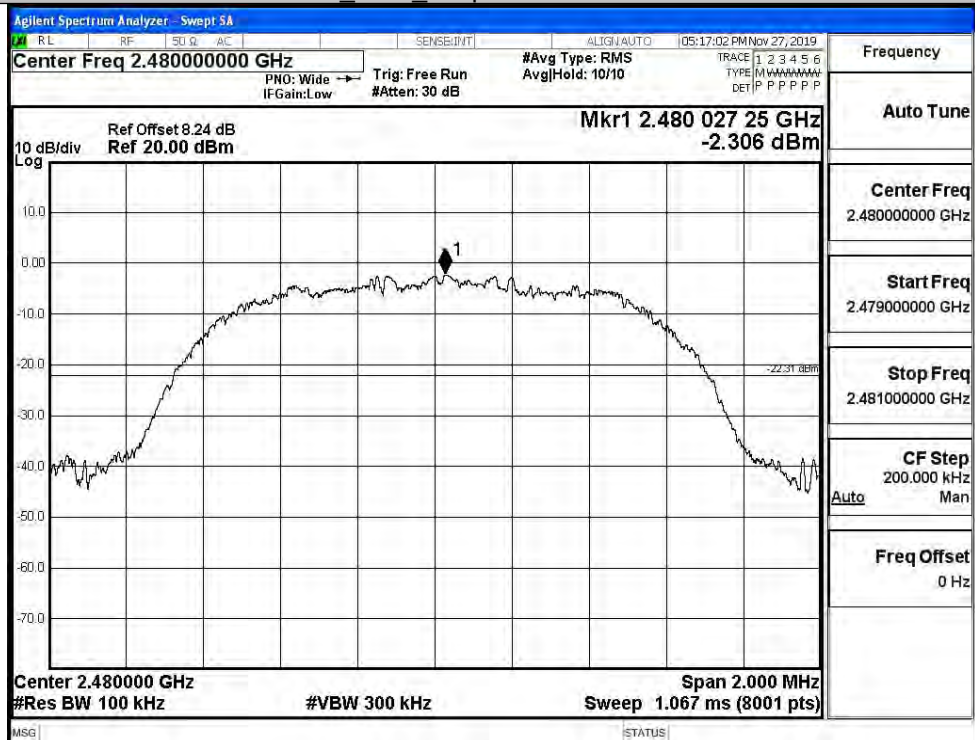


Puw

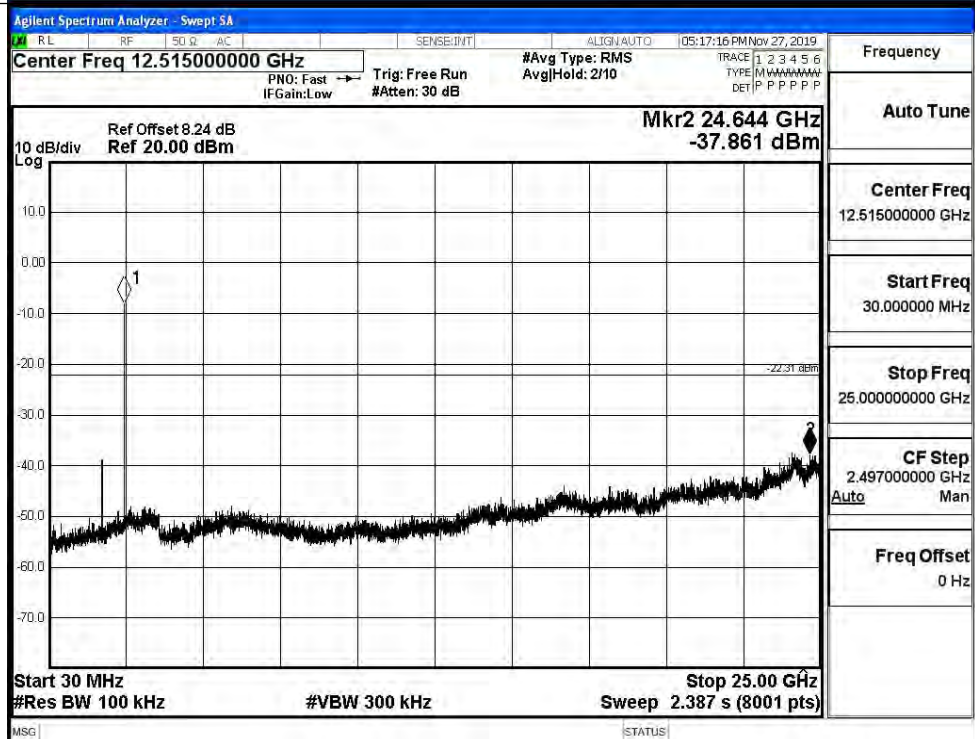


8DPSK_HCH_Graphs

Pref



Puw

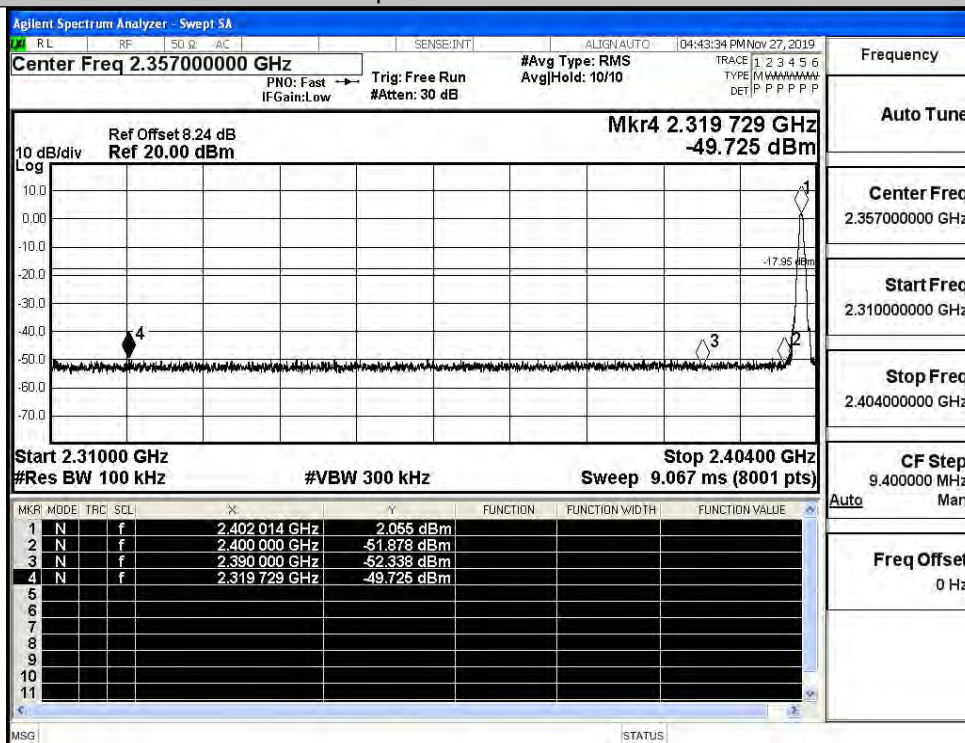


A.7 Band-edge for RF Conducted Emissions

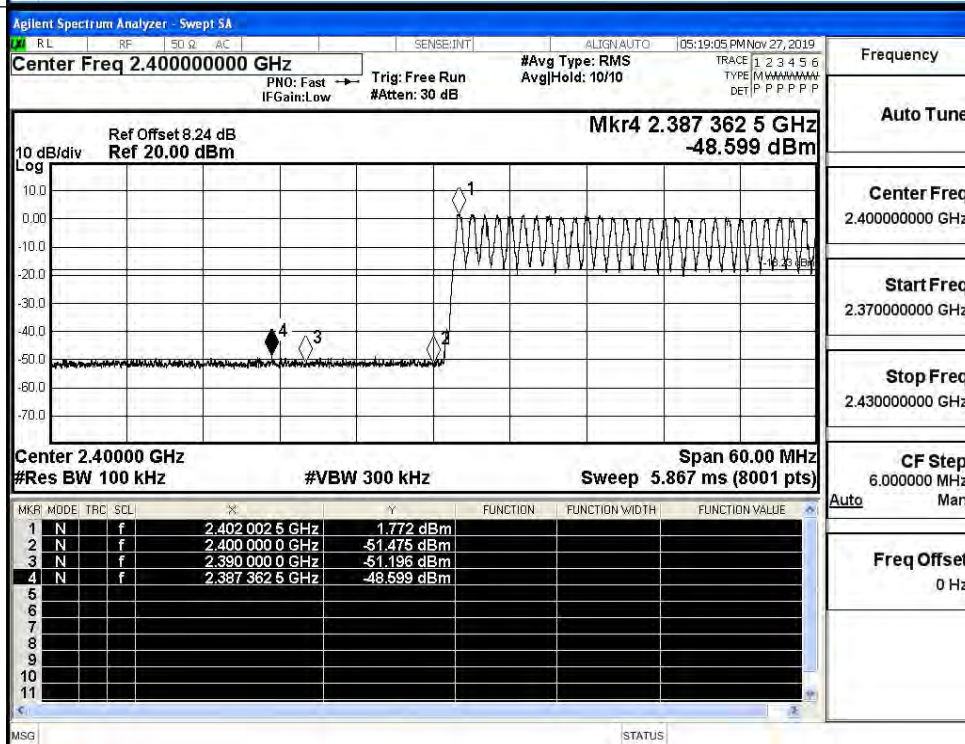
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	2.055	Off	-49.725	-17.95	PASS
			1.772	On	-48.599	-18.23	PASS
	HCH	2480	-1.944	Off	-49.171	-21.94	PASS
			-1.122	On	-48.775	-21.12	PASS
$\pi/4$ DQPSK	LCH	2402	1.490	Off	-49.054	-18.51	PASS
			1.722	On	-48.857	-18.28	PASS
	HCH	2480	-1.852	Off	-48.986	-21.85	PASS
			-1.458	On	-48.299	-21.46	PASS
8DPSK	LCH	2402	1.952	Off	-48.475	-18.05	PASS
			1.894	On	-48.944	-18.11	PASS
	HCH	2480	-1.921	Off	-49.089	-21.92	PASS
			-1.090	On	-48.333	-21.09	PASS

Test Graphs

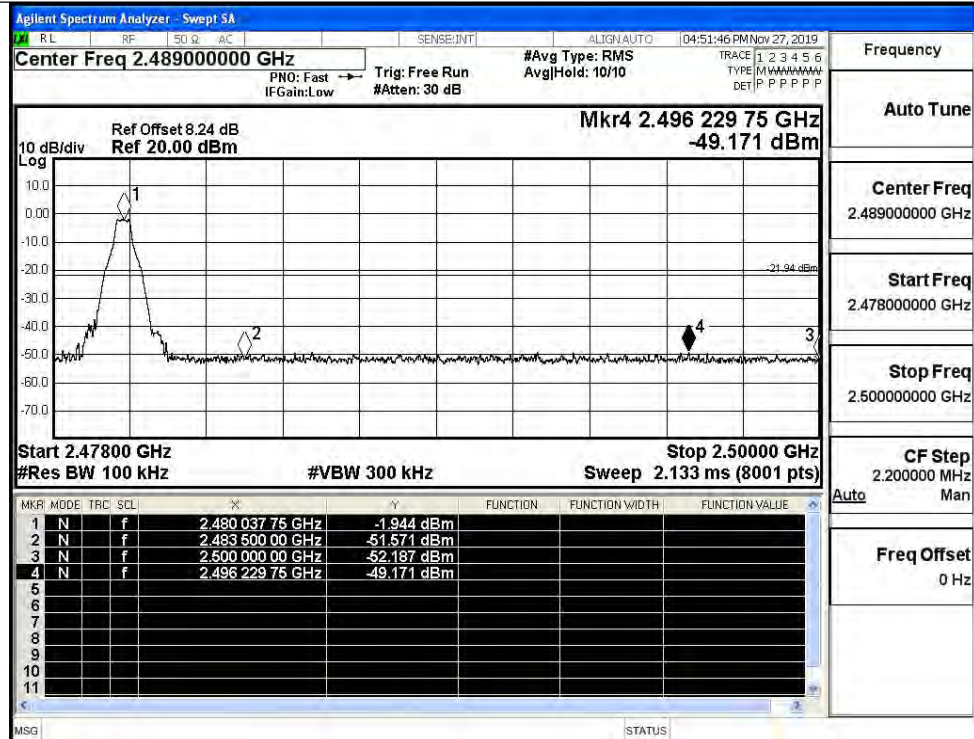
GFSK/LCH/No Hop



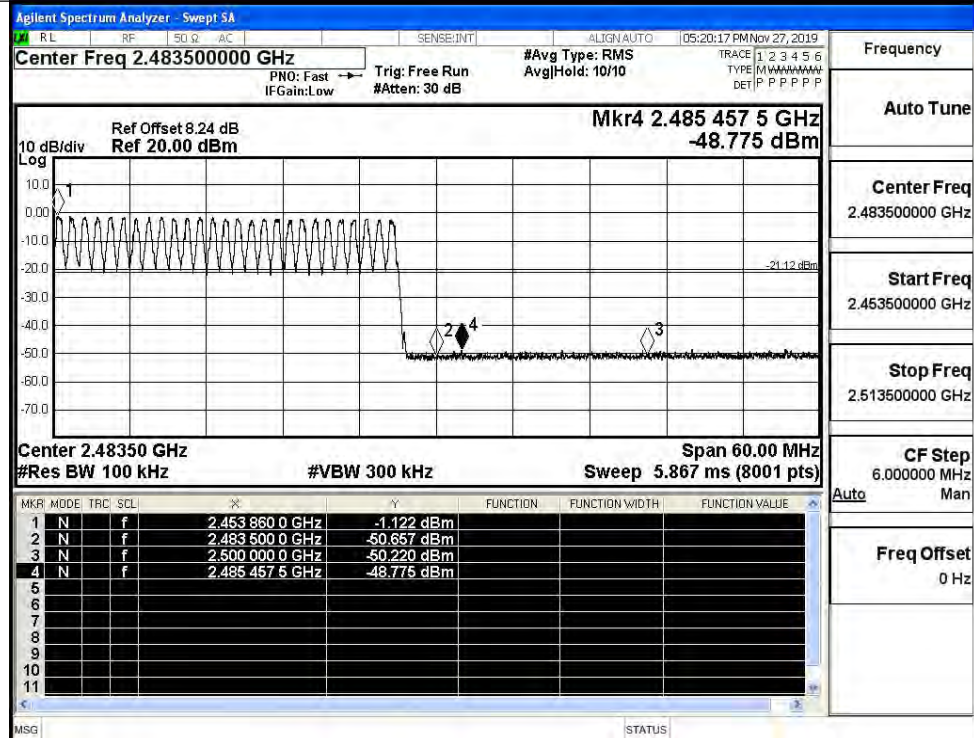
GFSK/LCH/Hop



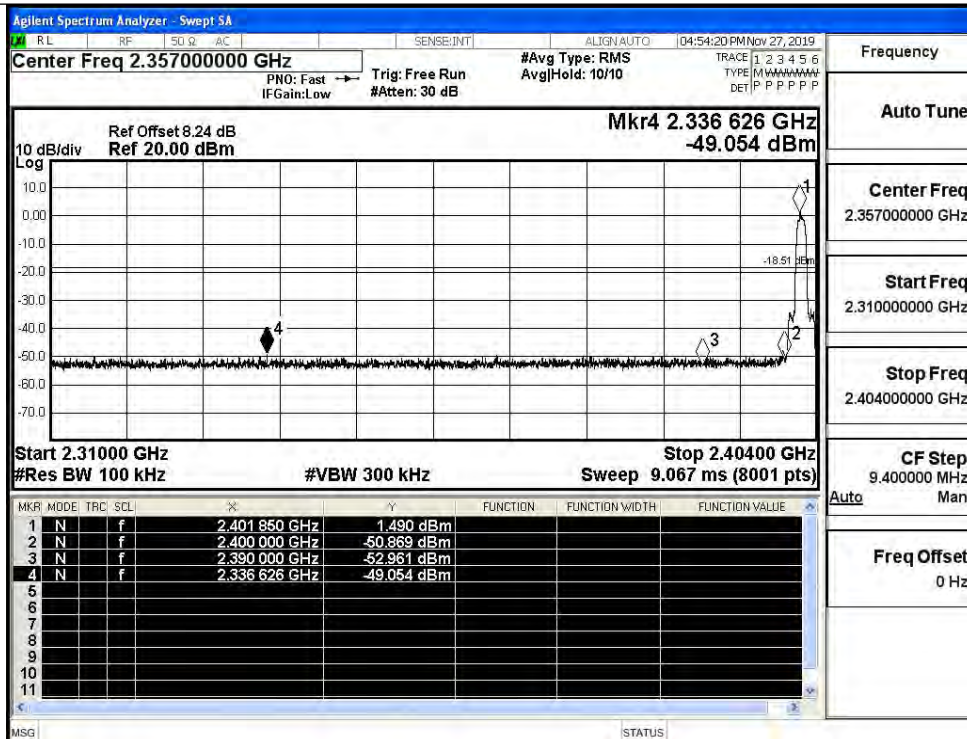
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

Start Freq
2.310000000 GHz

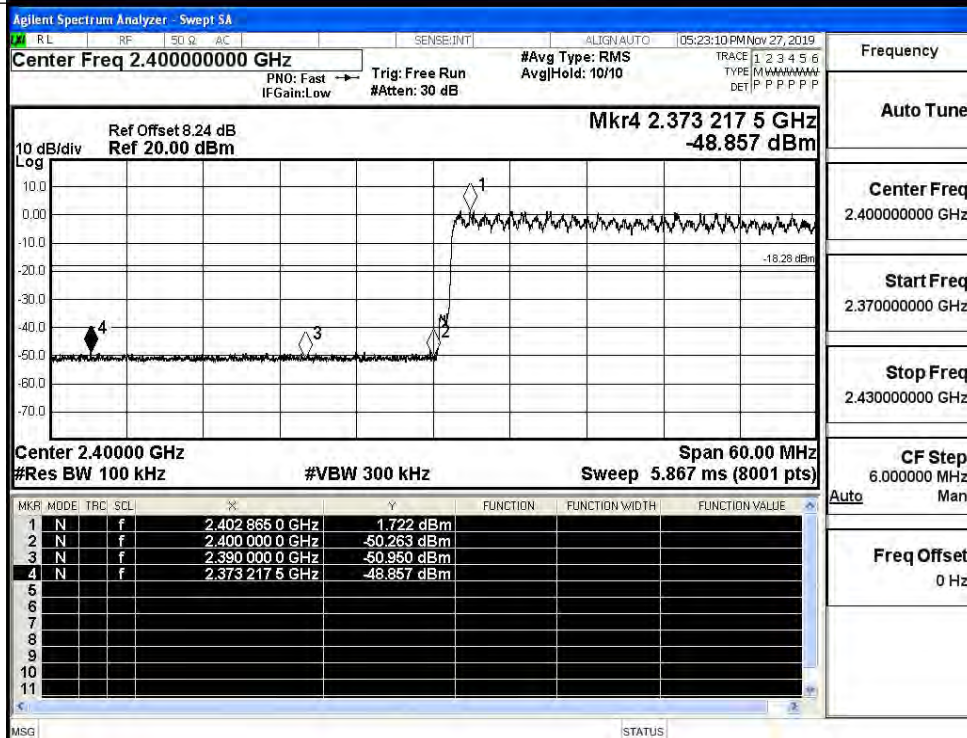
Stop Freq
2.404000000 GHz

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

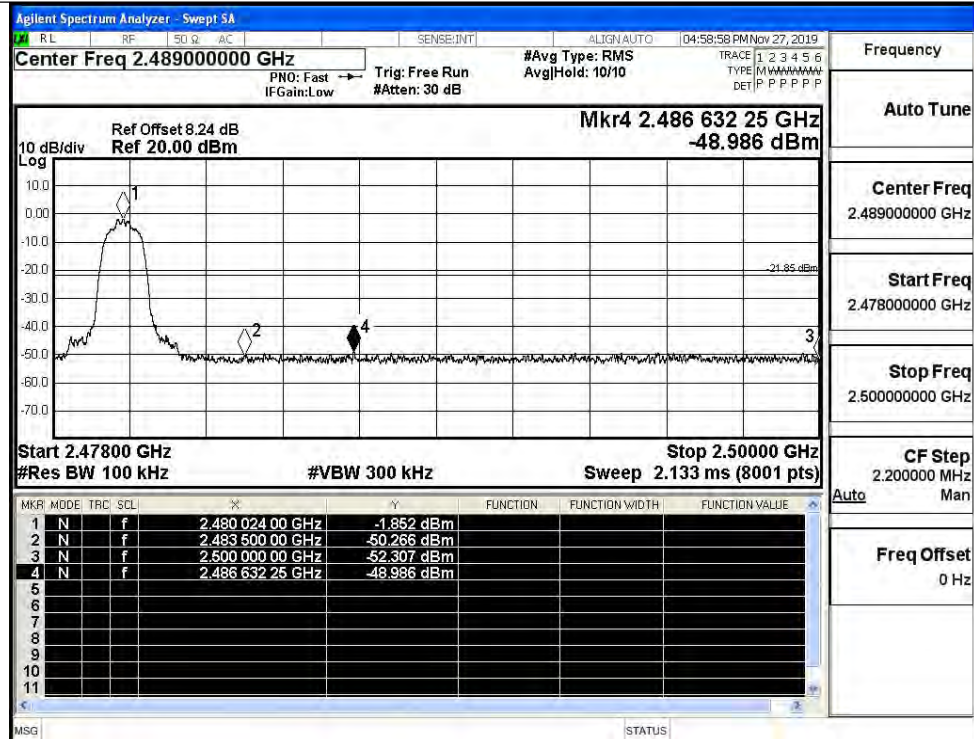
Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz

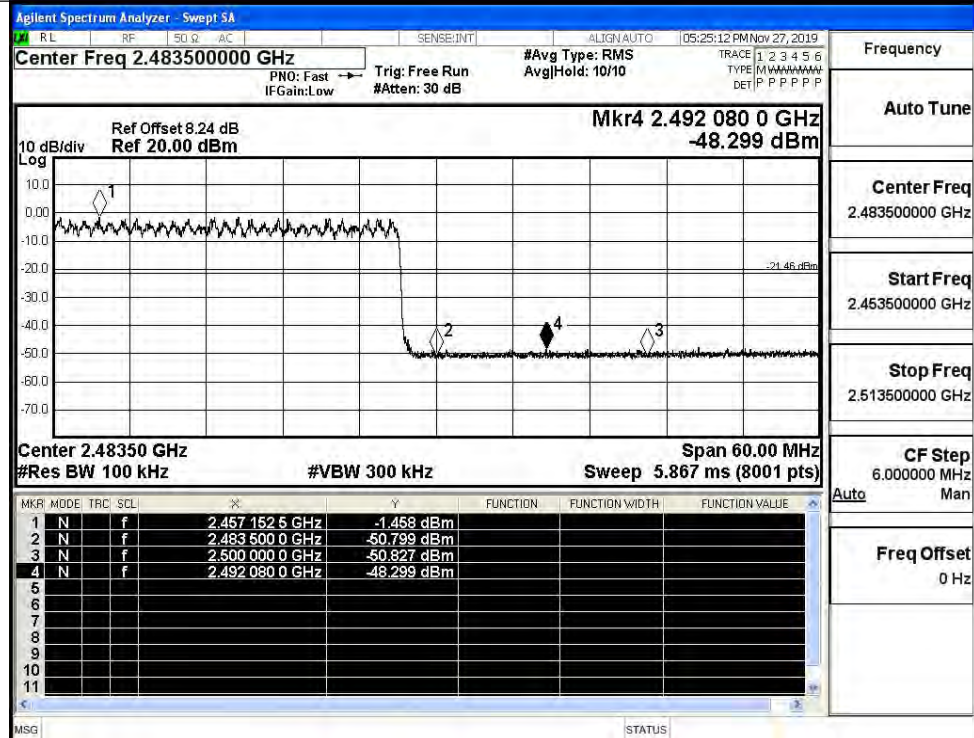
Auto Man

Freq Offset
0 Hz

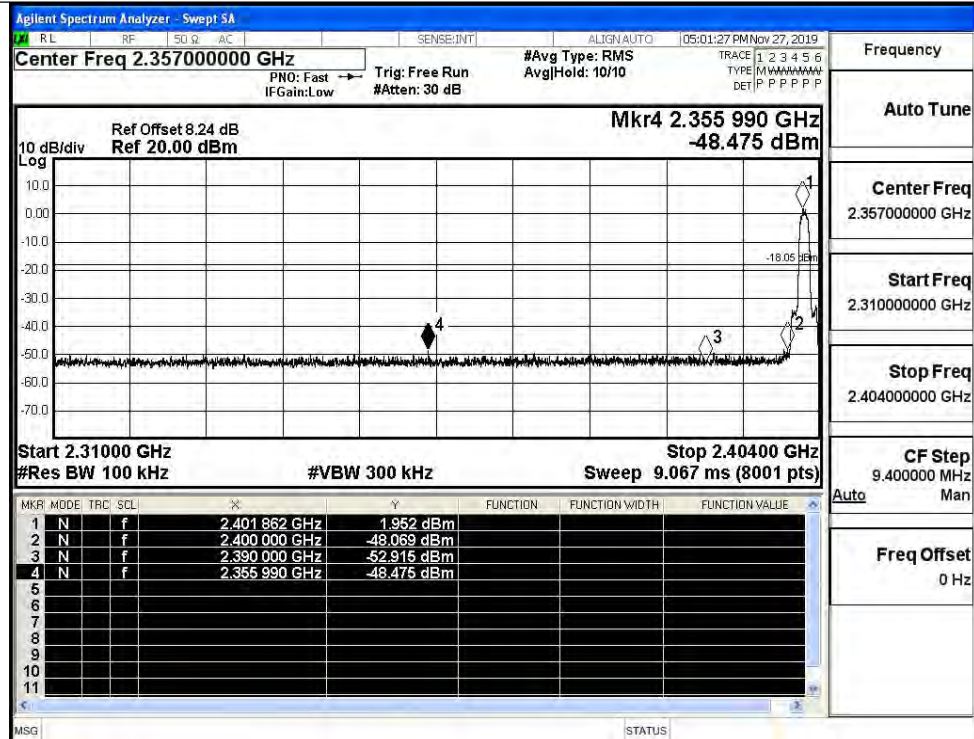
$\pi/4$ DQPSK/HCH/No
Hop



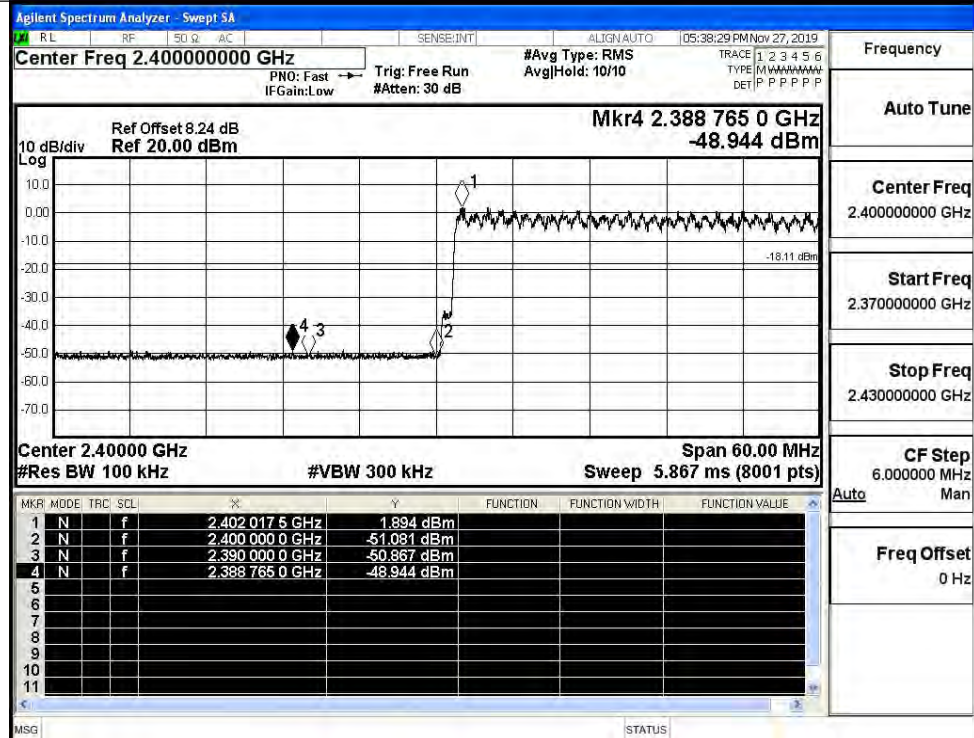
$\pi/4$ DQPSK/HCH/Hop



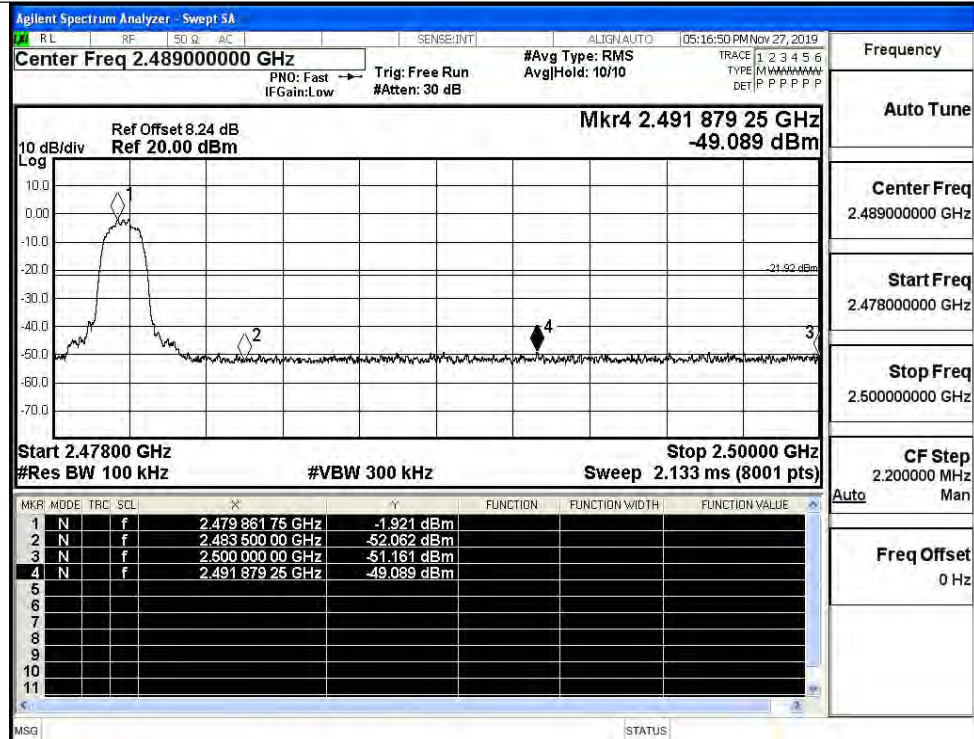
8DPSK/LCH/No Hop



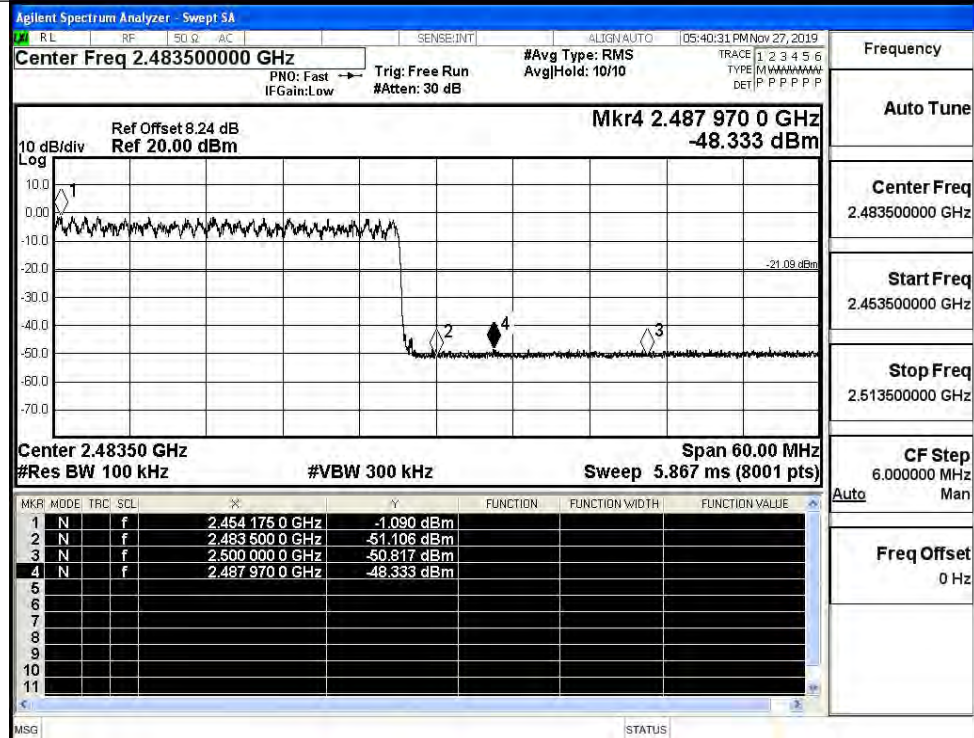
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



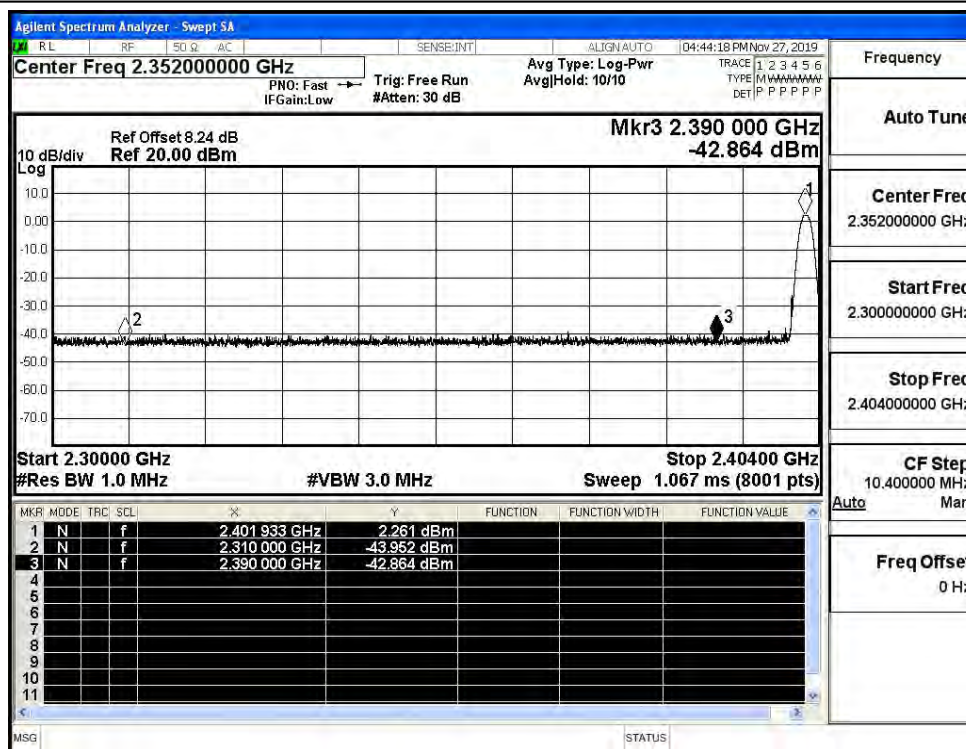
8DPSK/HCH/Hop



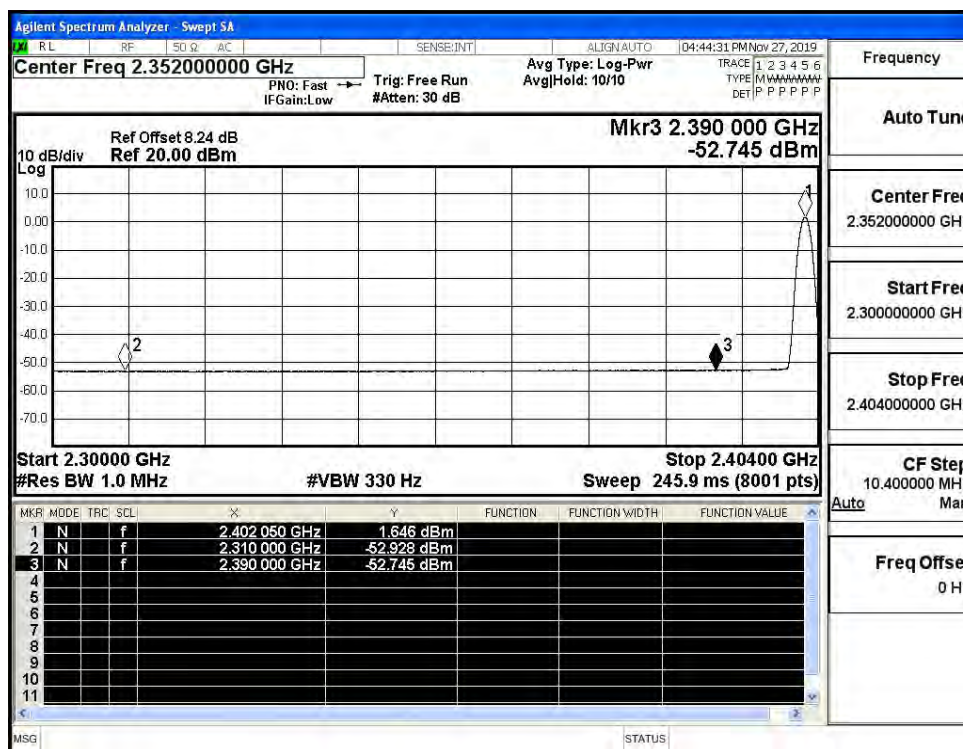
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.95	0	0	51.31	PEAK	74	PASS
	Off	2310.0	-52.93	0	0	42.33	AV	54	PASS
	Off	2390.0	-42.86	0	0	52.39	PEAK	74	PASS
	Off	2390.0	-52.75	0	0	42.51	AV	54	PASS
	Off	2483.5	-41.49	0	0	53.77	PEAK	74	PASS
	Off	2483.5	-52.30	0	0	42.96	AV	54	PASS
	Off	2500.0	-39.85	0	0	55.41	PEAK	74	PASS
	Off	2500.0	-52.01	0	0	43.25	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.61	0	0	51.65	PEAK	74	PASS
	Off	2310.0	-53.15	0	0	42.11	AV	54	PASS
	Off	2390.0	-42.66	0	0	52.60	PEAK	74	PASS
	Off	2390.0	-52.82	0	0	42.44	AV	54	PASS
	Off	2483.5	-42.77	0	0	52.49	PEAK	74	PASS
	Off	2483.5	-52.24	0	0	43.02	AV	54	PASS
	Off	2500.0	-41.16	0	0	54.10	PEAK	74	PASS
	Off	2500.0	-52.12	0	0	43.14	AV	54	PASS
8DPSK	Off	2310.0	-43.18	0	0	52.08	PEAK	74	PASS
	Off	2310.0	-53.22	0	0	42.03	AV	54	PASS
	Off	2390.0	-42.57	0	0	52.69	PEAK	74	PASS
	Off	2390.0	-52.77	0	0	42.48	AV	54	PASS
	Off	2483.5	-42.89	0	0	52.36	PEAK	74	PASS
	Off	2483.5	-52.26	0	0	43.00	AV	54	PASS
	Off	2500.0	-41.99	0	0	53.27	PEAK	74	PASS
	Off	2500.0	-52.09	0	0	43.17	AV	54	PASS

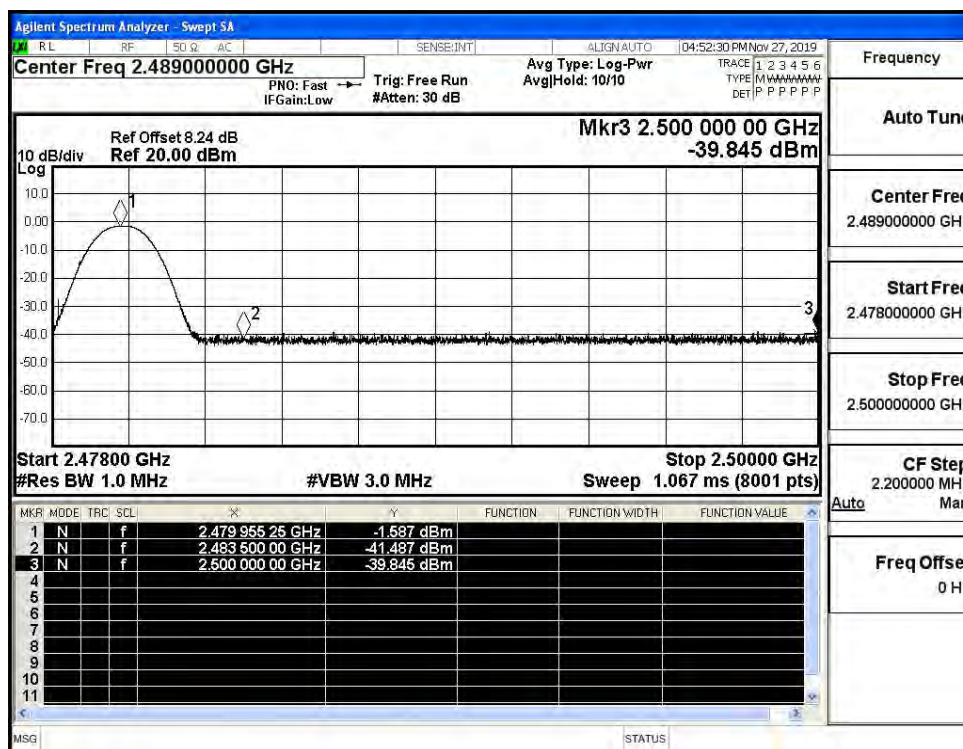
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



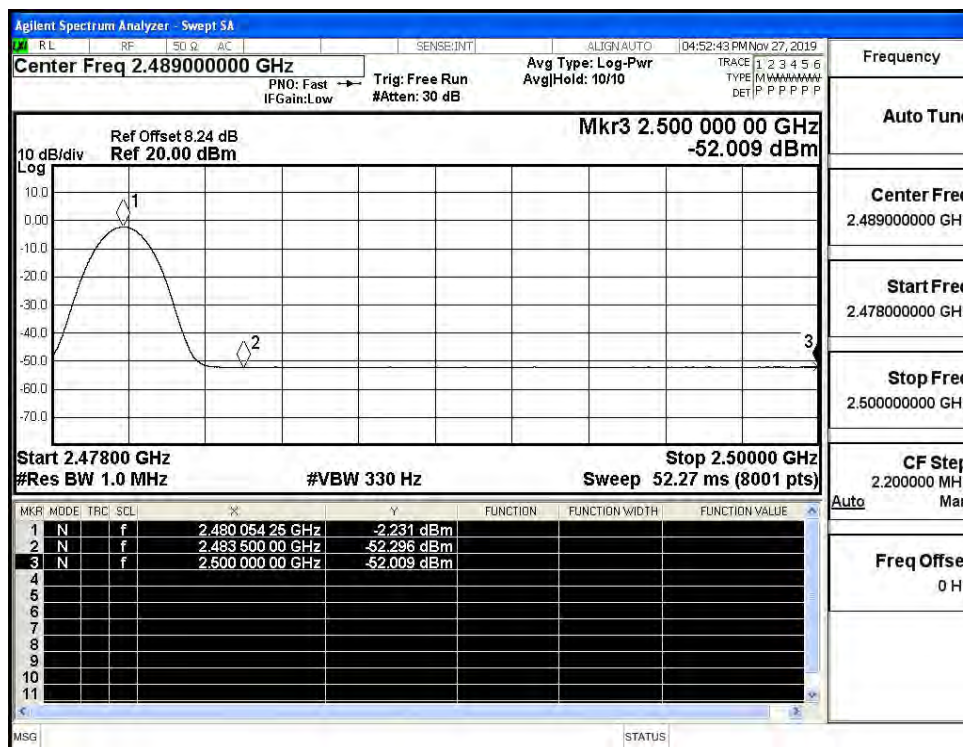
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

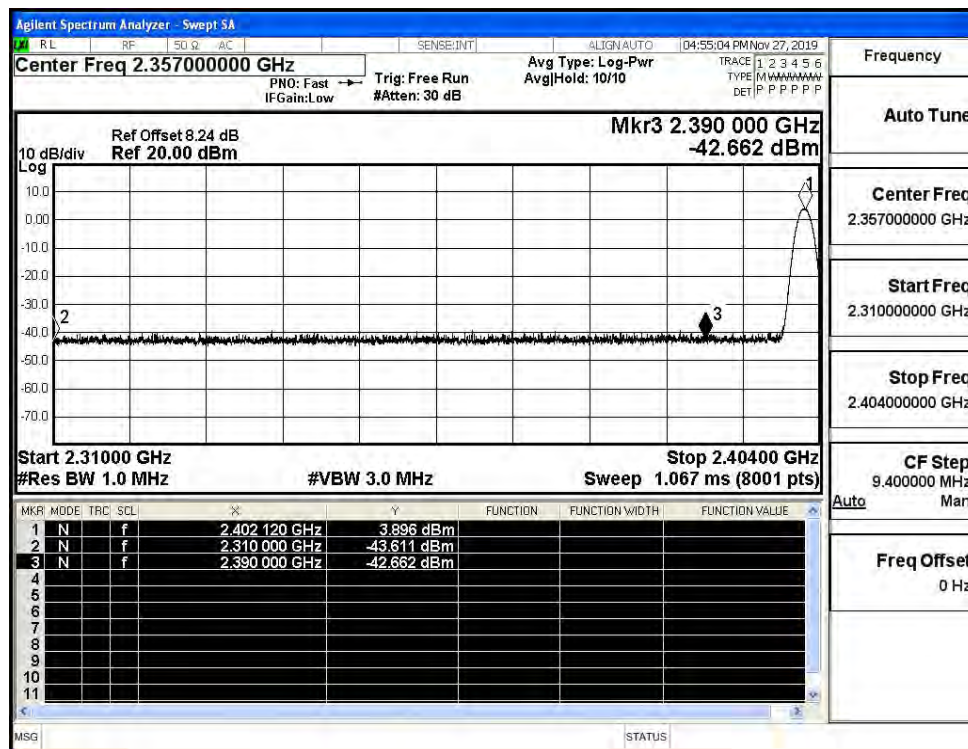
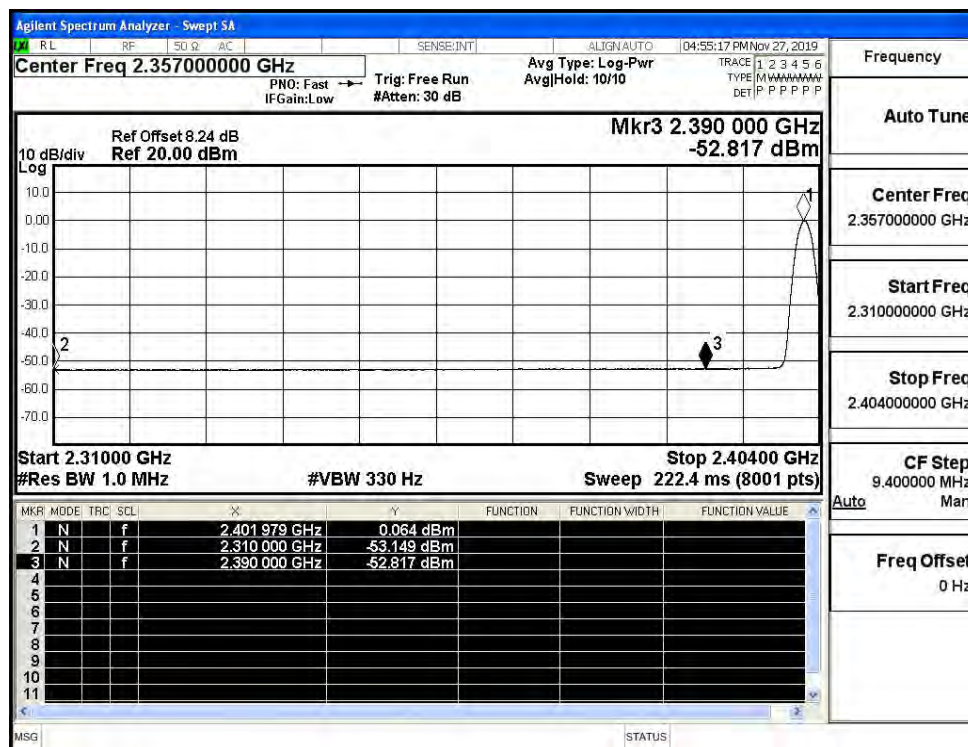


Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)

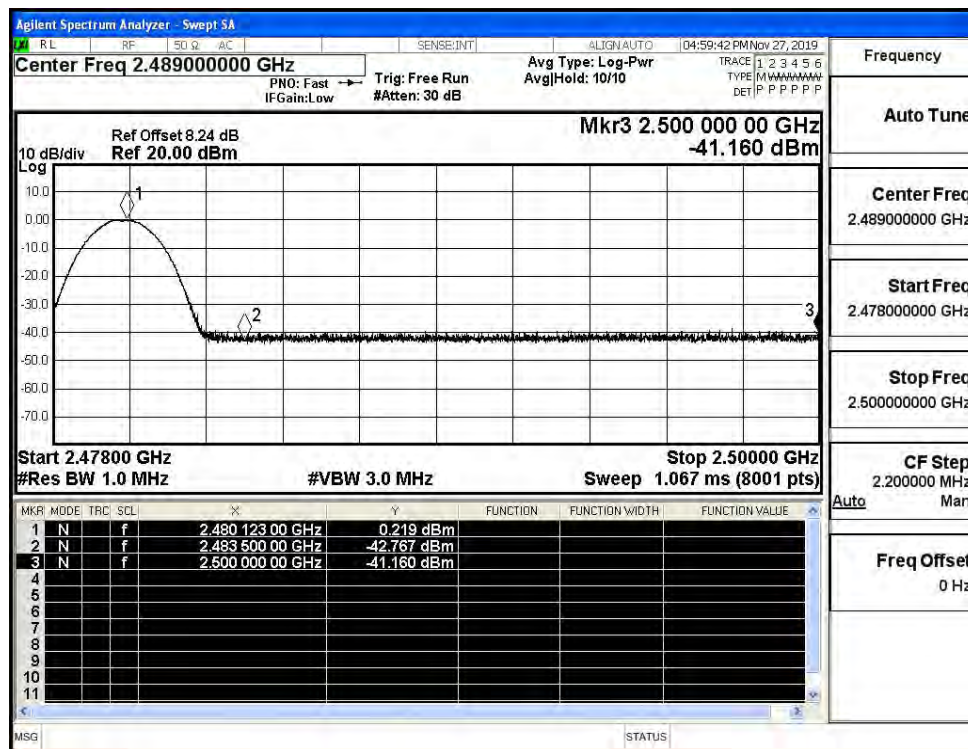


Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)

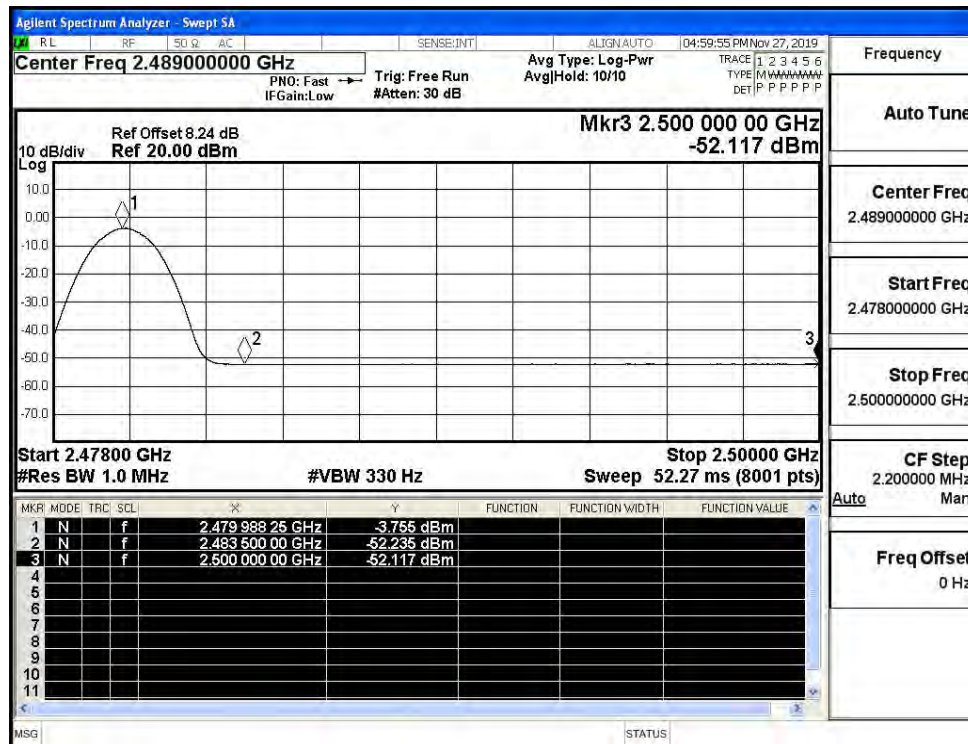


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

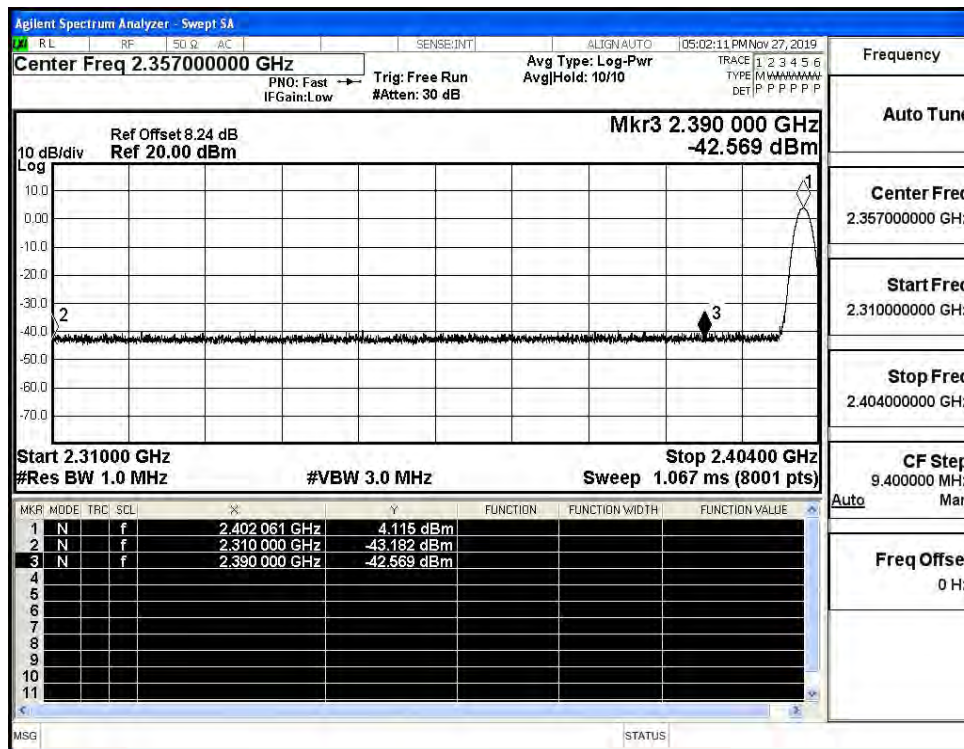
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



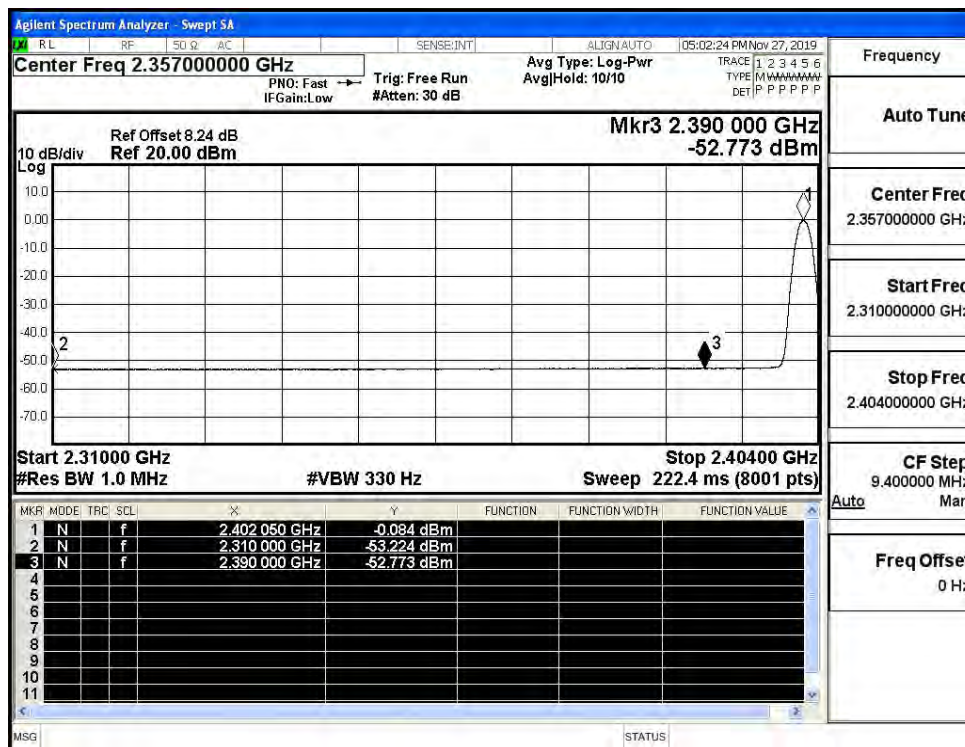
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



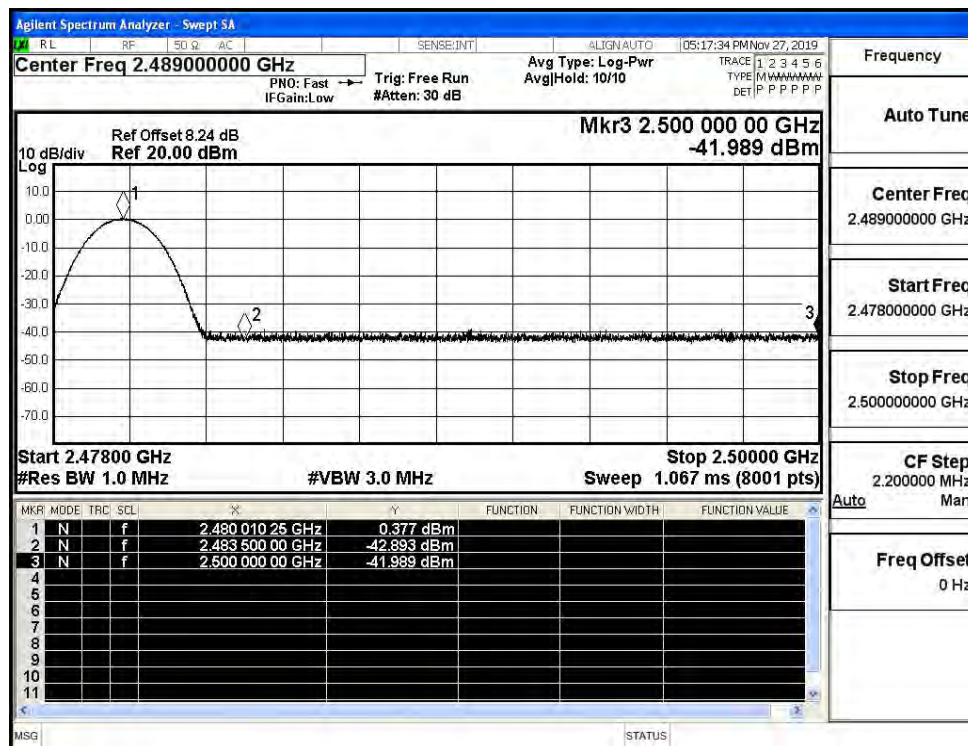
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

