

Appendix A

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

Product Name: 30inch 2.0CH Bluetooth soundbar speaker

Trade Mark:

atune analog

Test Model: SBB-A5528

Environmental Conditions

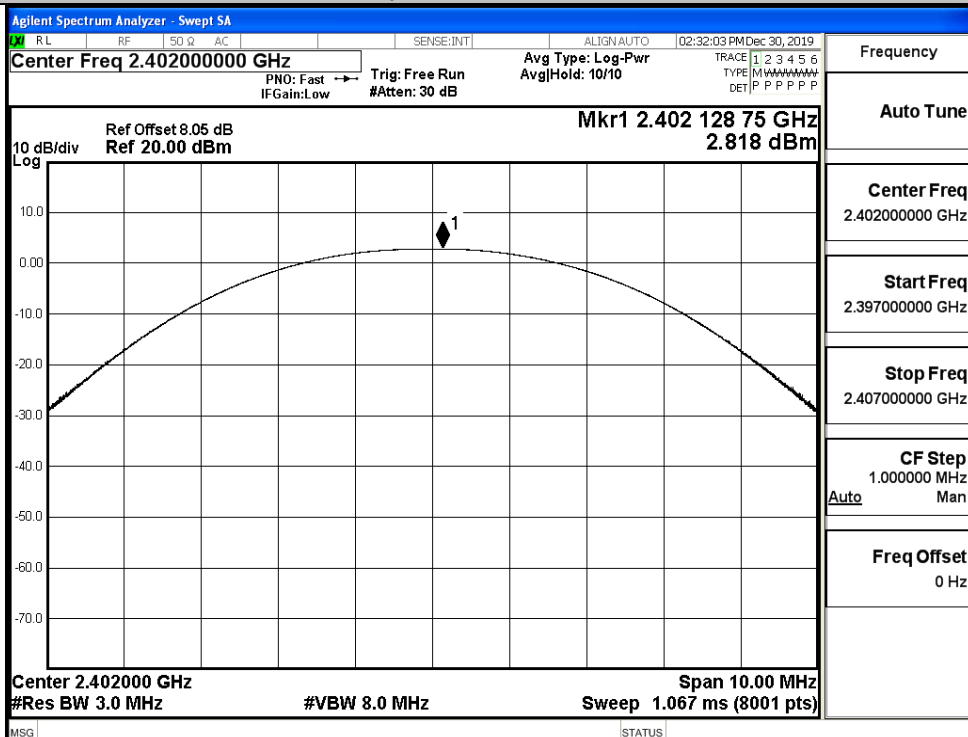
Temperature:	23.2 °C
Relative Humidity:	54.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Qu Xin
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

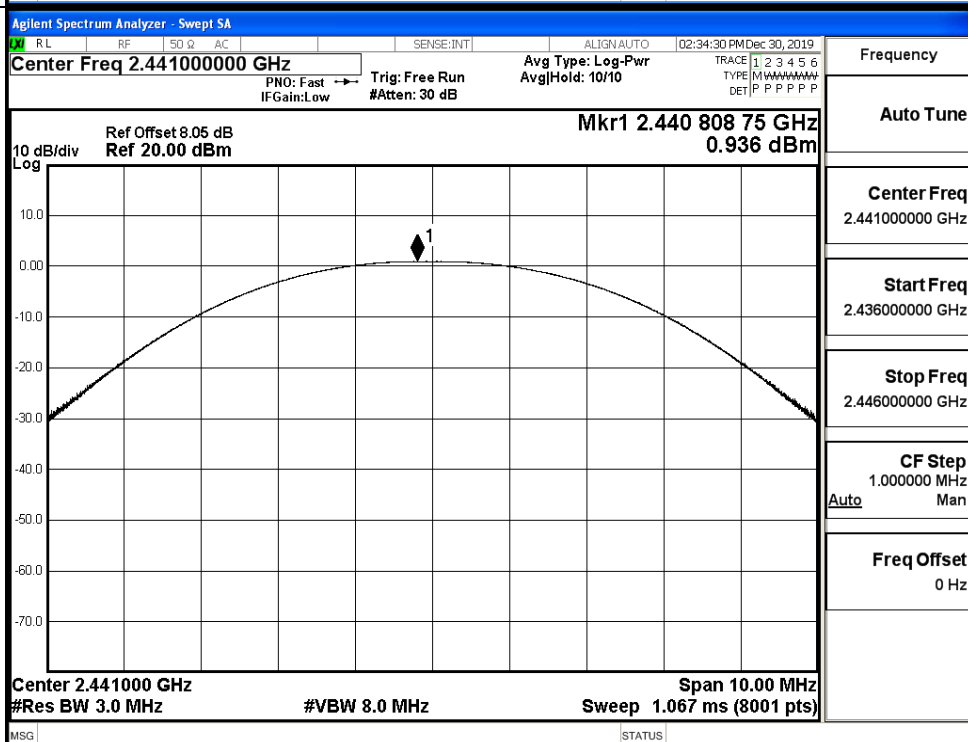
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.818	21	PASS
	MCH	0.936	21	PASS
	HCH	2.103	21	PASS
$\pi/4$ DQPSK	LCH	2.052	21	PASS
	MCH	0.358	21	PASS
	HCH	1.367	21	PASS
8DPSK	LCH	2.285	21	PASS
	MCH	0.532	21	PASS
	HCH	1.624	21	PASS

Test Graphs

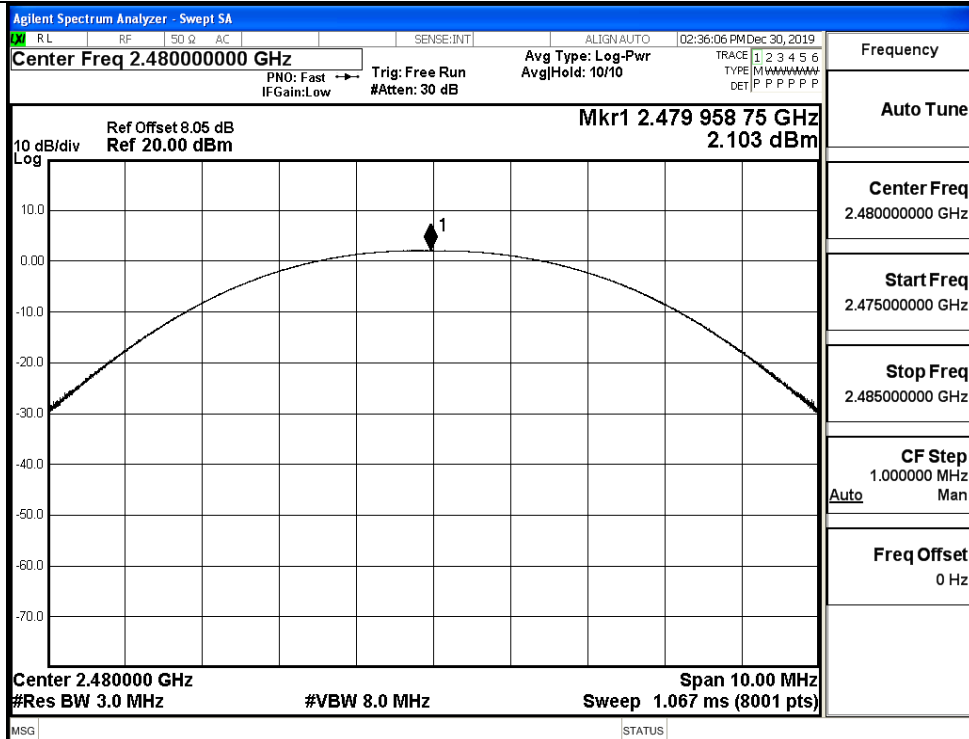
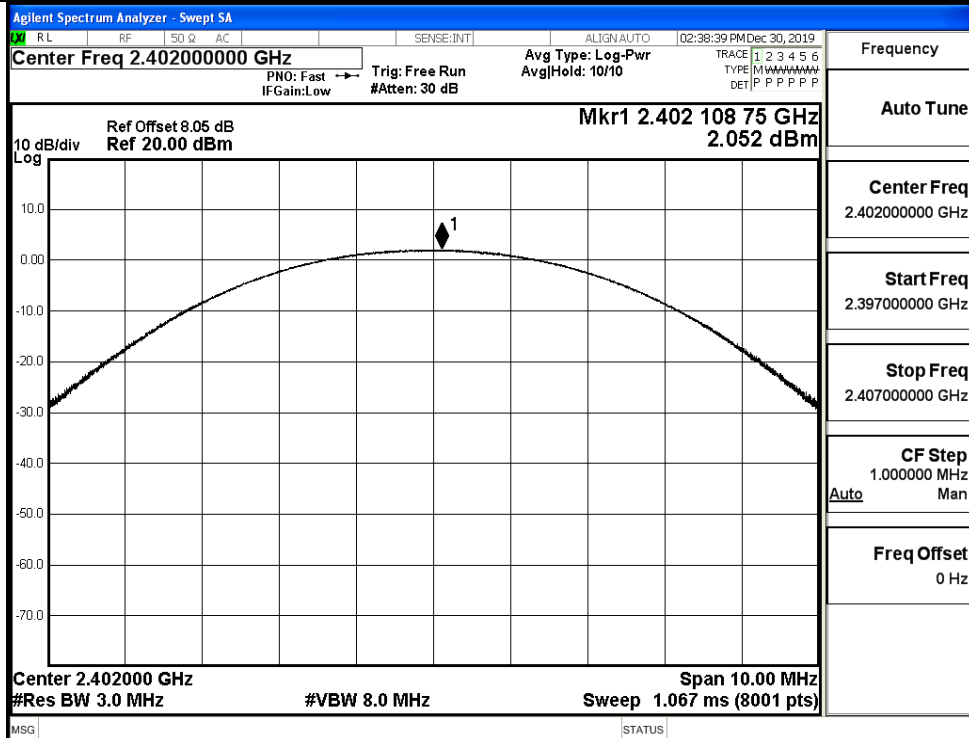
GFSK/LCH

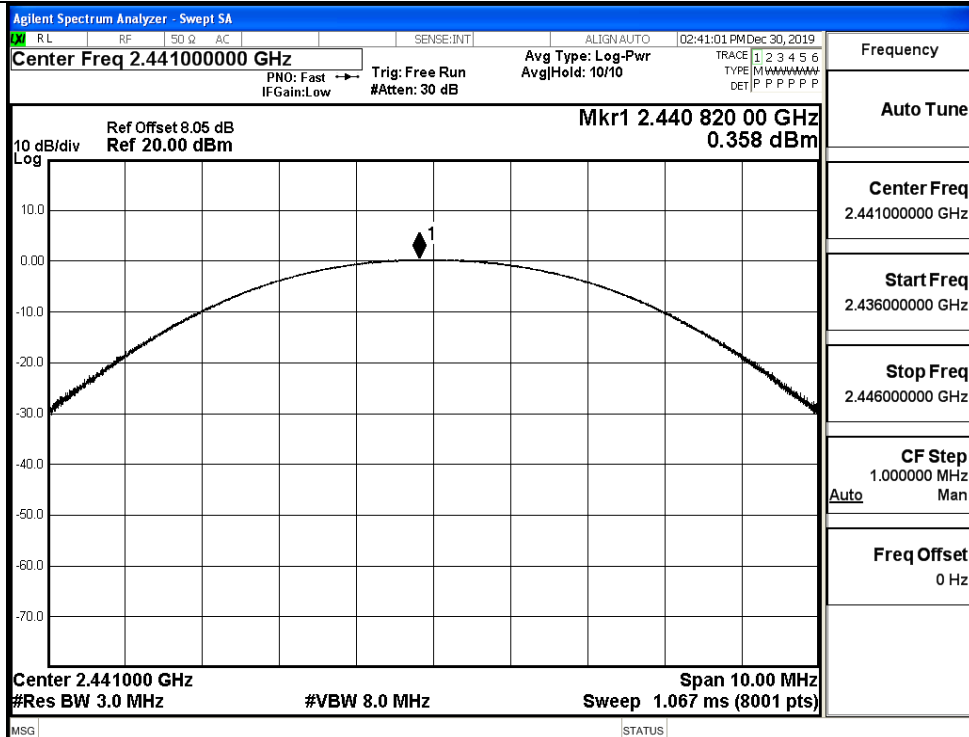
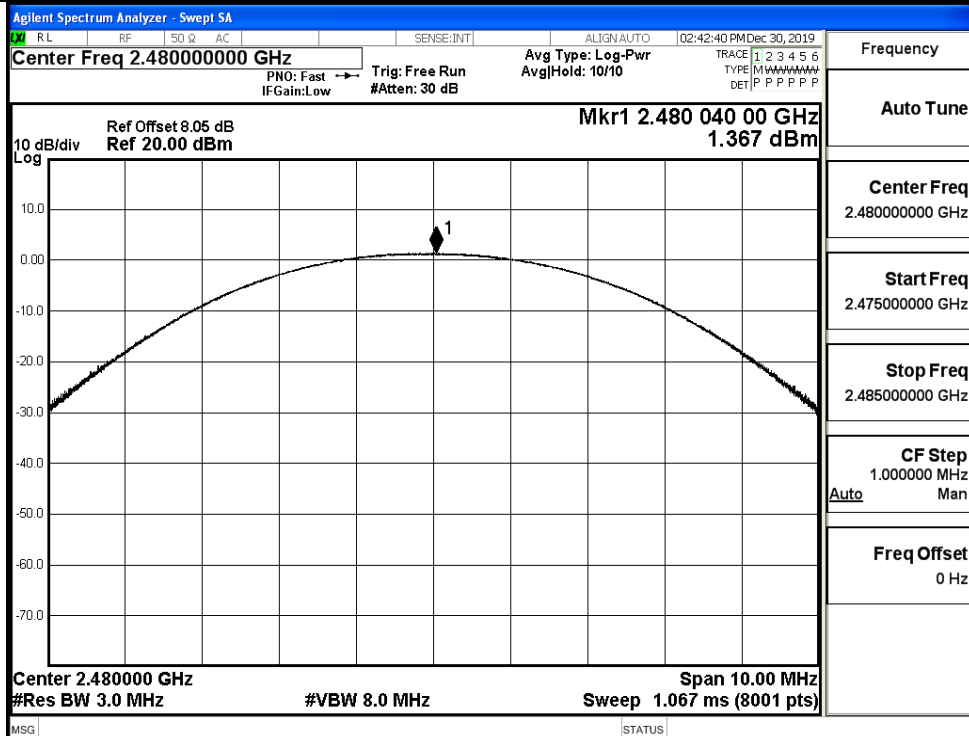


GFSK/MCH

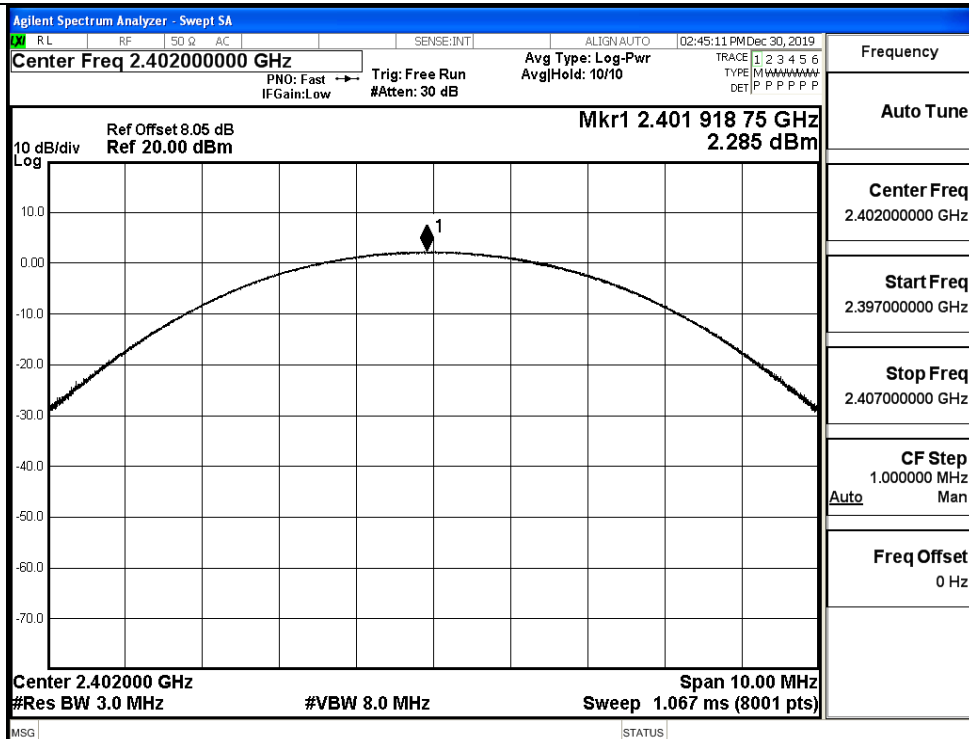


GFSK/HCH

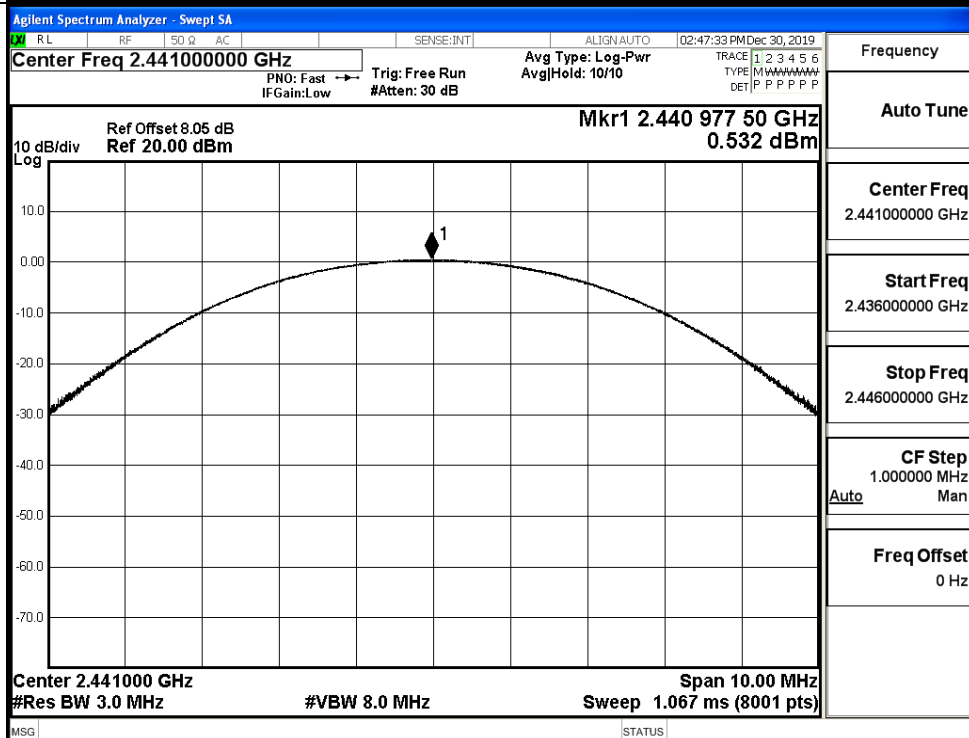
 $\pi/4$ DQPSK/LCH

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

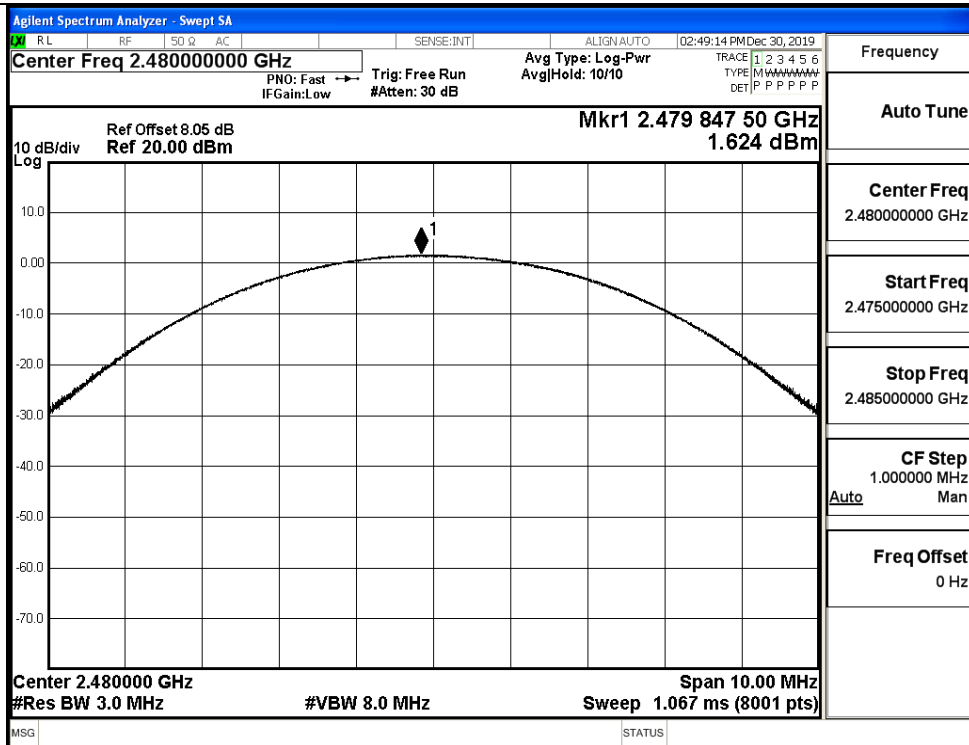
8DPSK/LCH



8DPSK/MCH



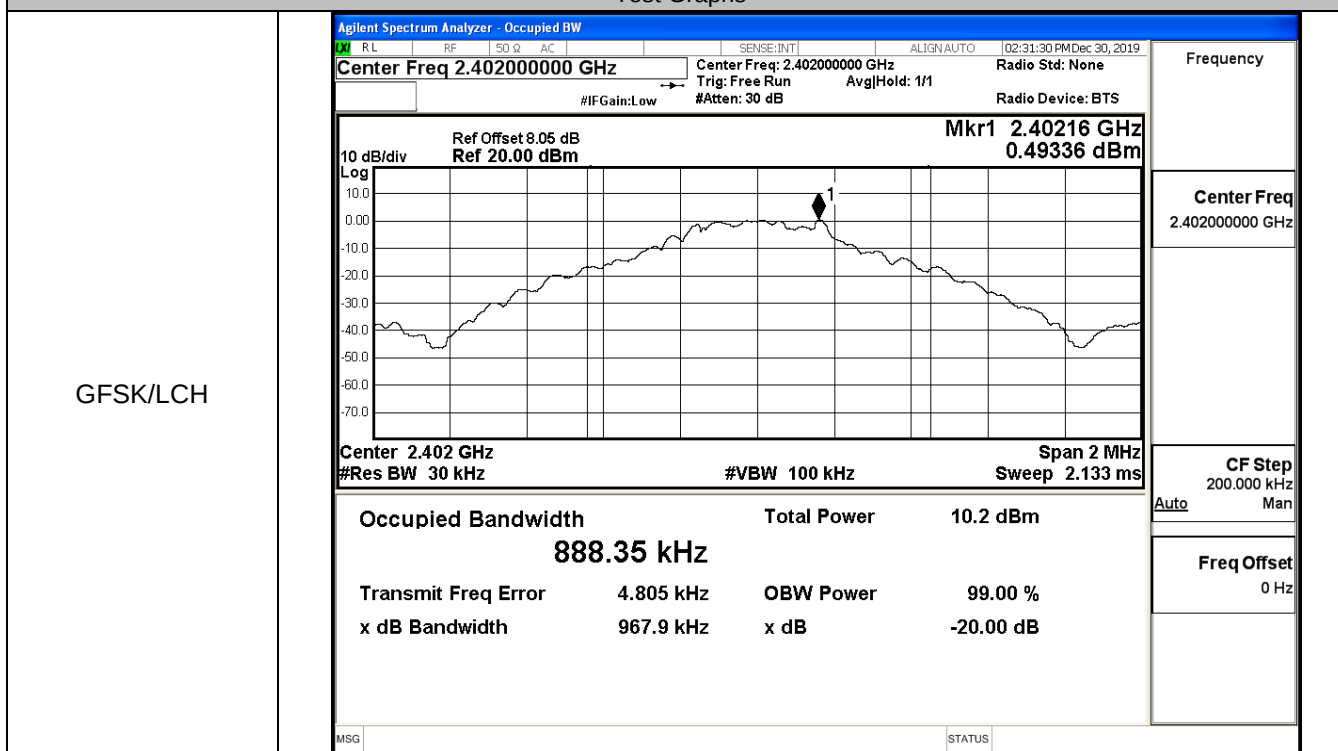
8DPSK/HCH



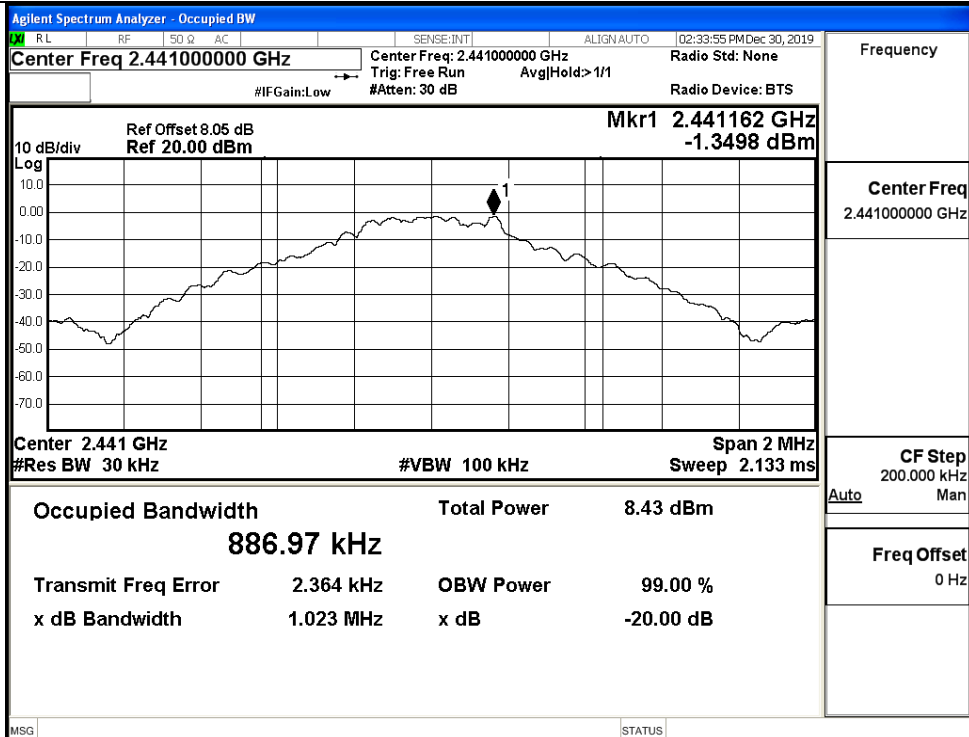
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9679	Not Specified	PASS
	MCH	1.023	Not Specified	PASS
	HCH	1.027	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.289	Not Specified	PASS
	MCH	1.318	Not Specified	PASS
	HCH	1.291	Not Specified	PASS
8DPSK	LCH	1.293	Not Specified	PASS
	MCH	1.304	Not Specified	PASS
	HCH	1.295	Not Specified	PASS

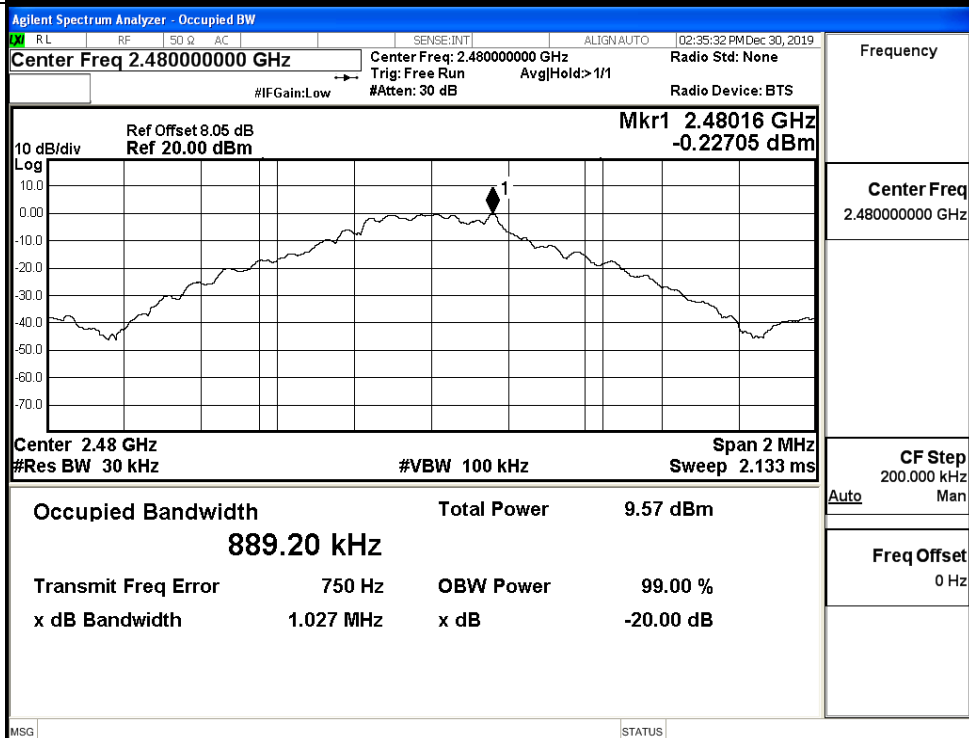
Test Graphs

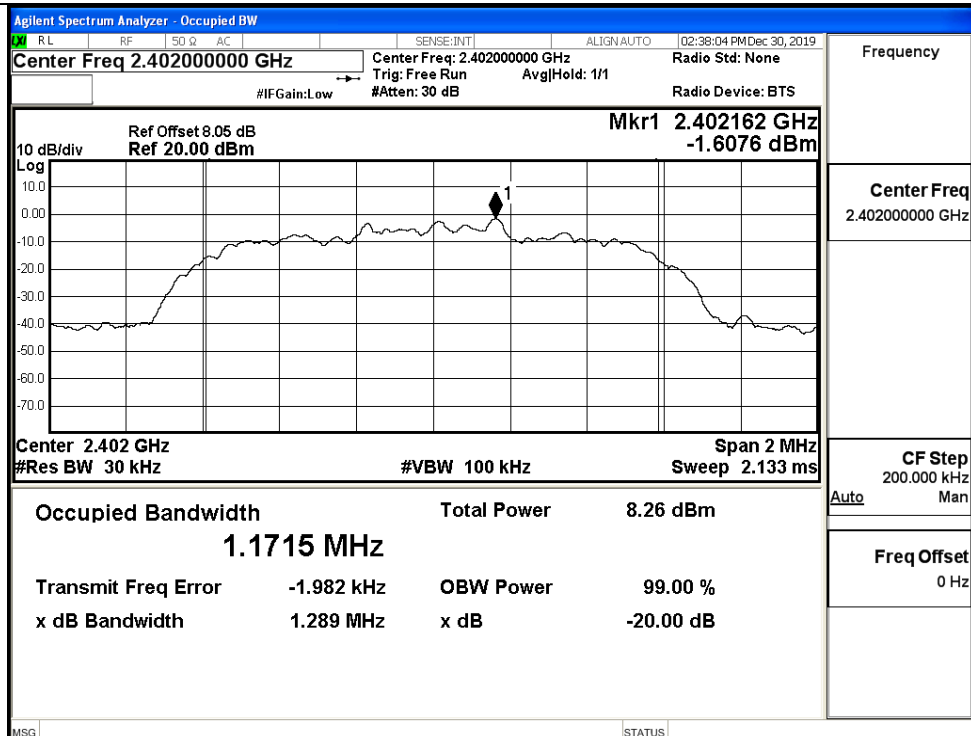
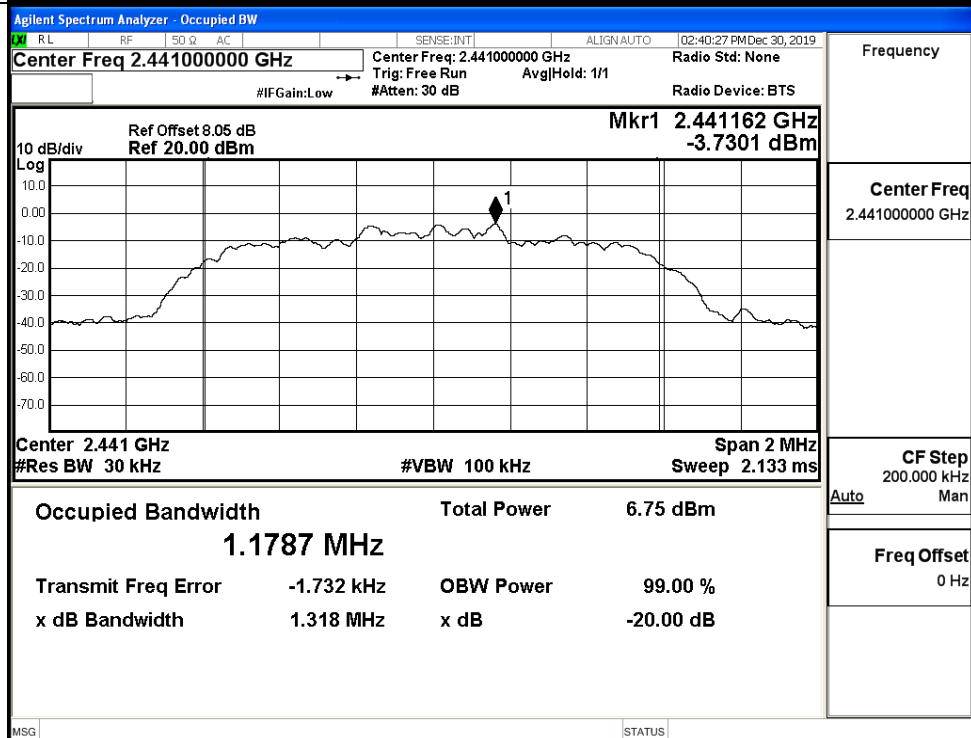


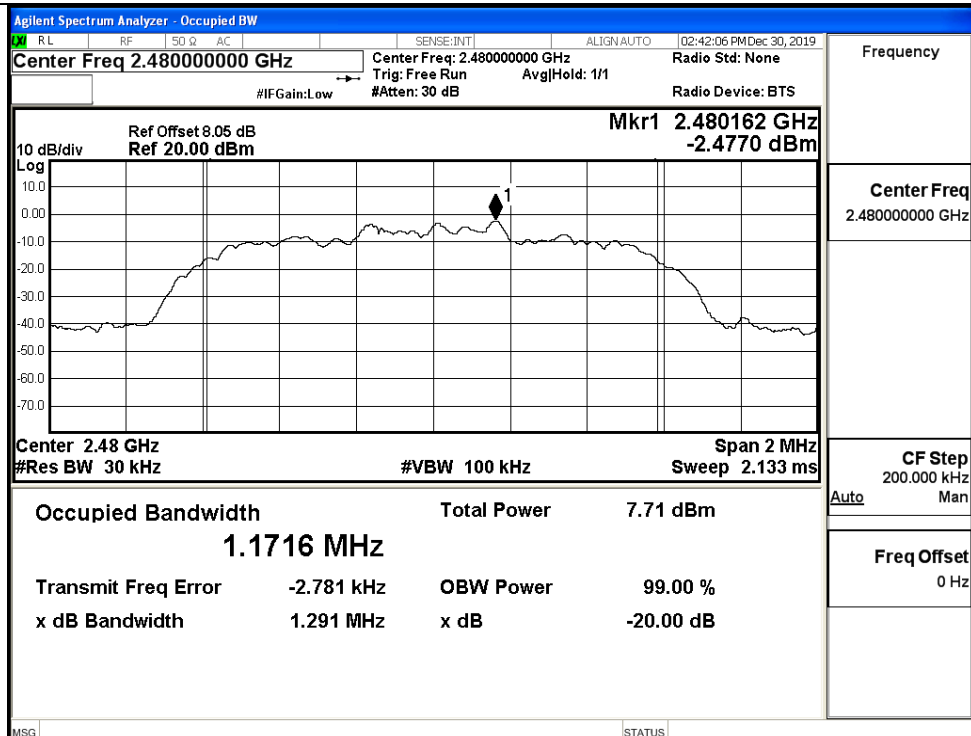
GFSK/MCH



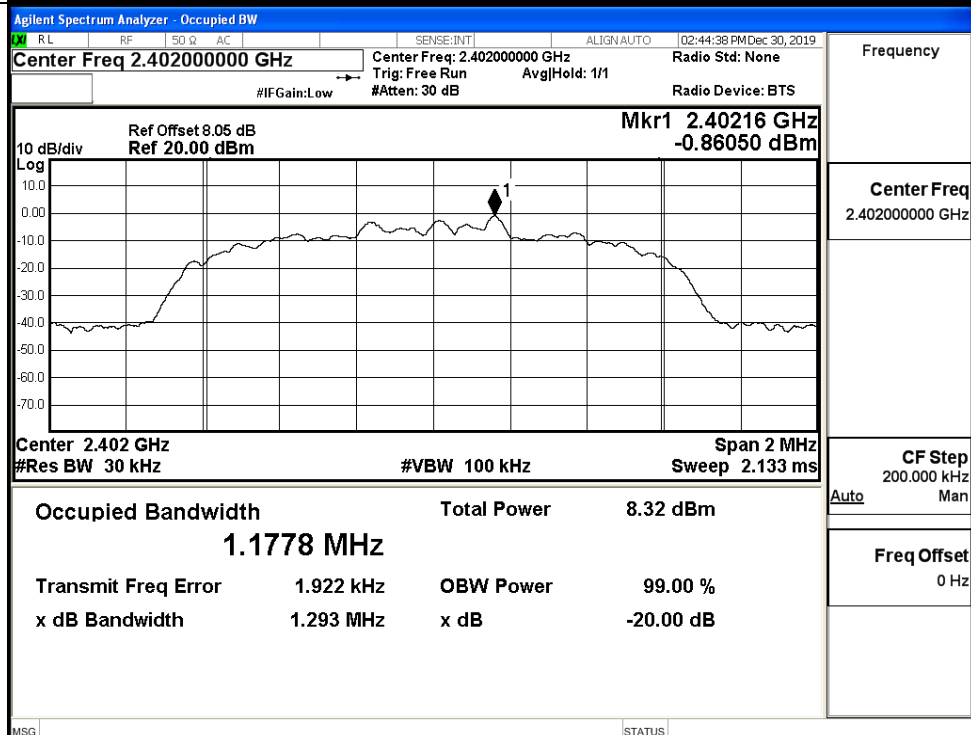
GFSK/HCH



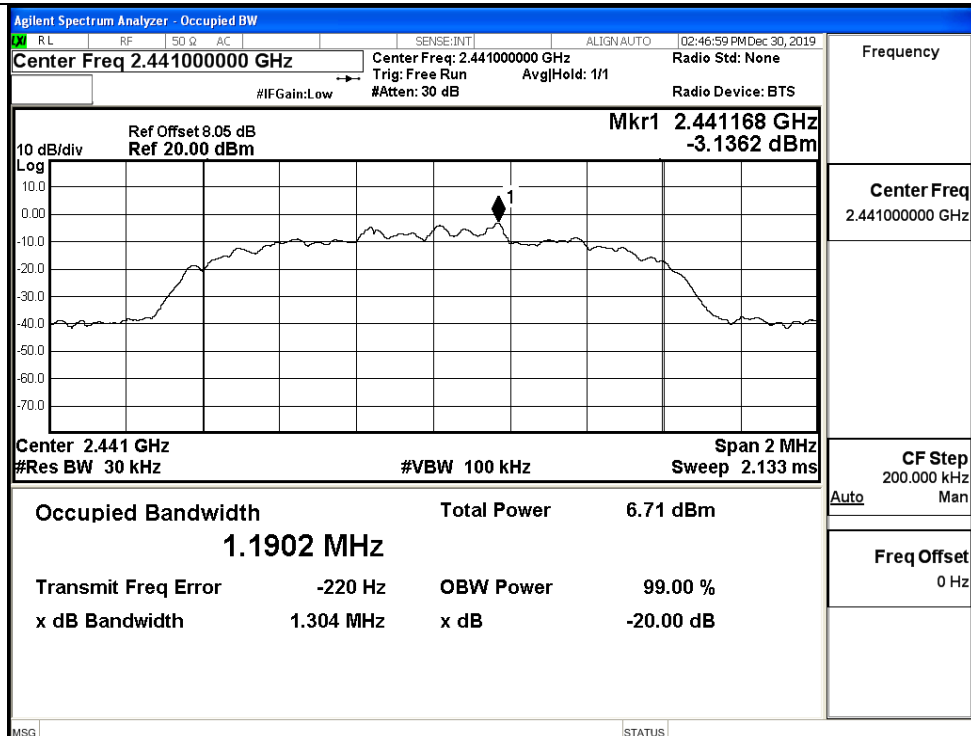
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

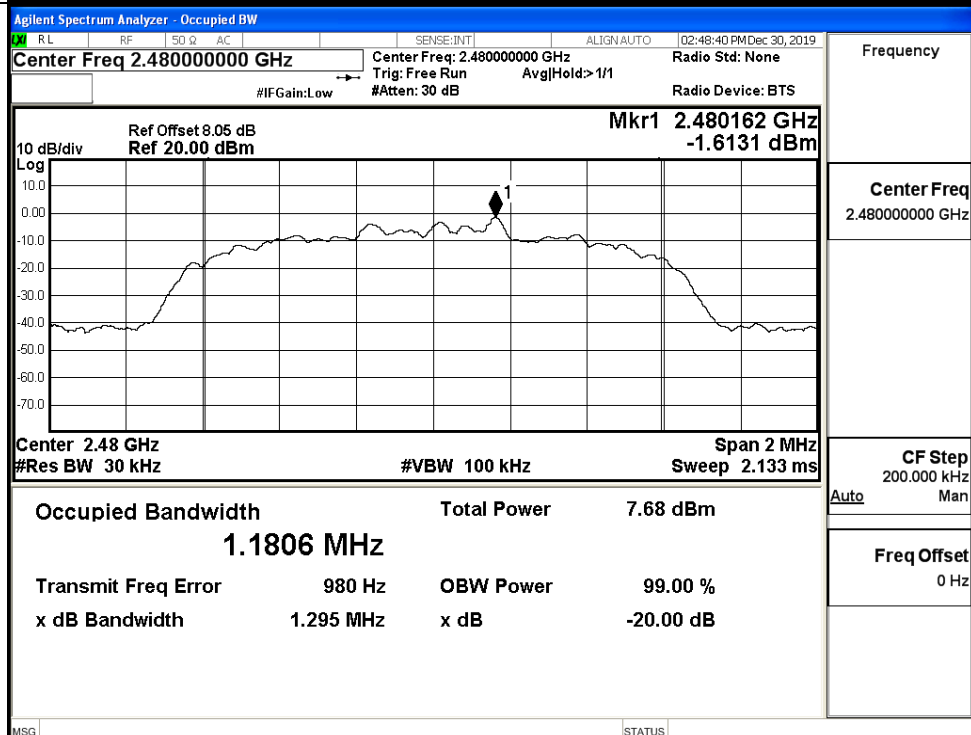
8DPSK/LCH



8DPSK/MCH



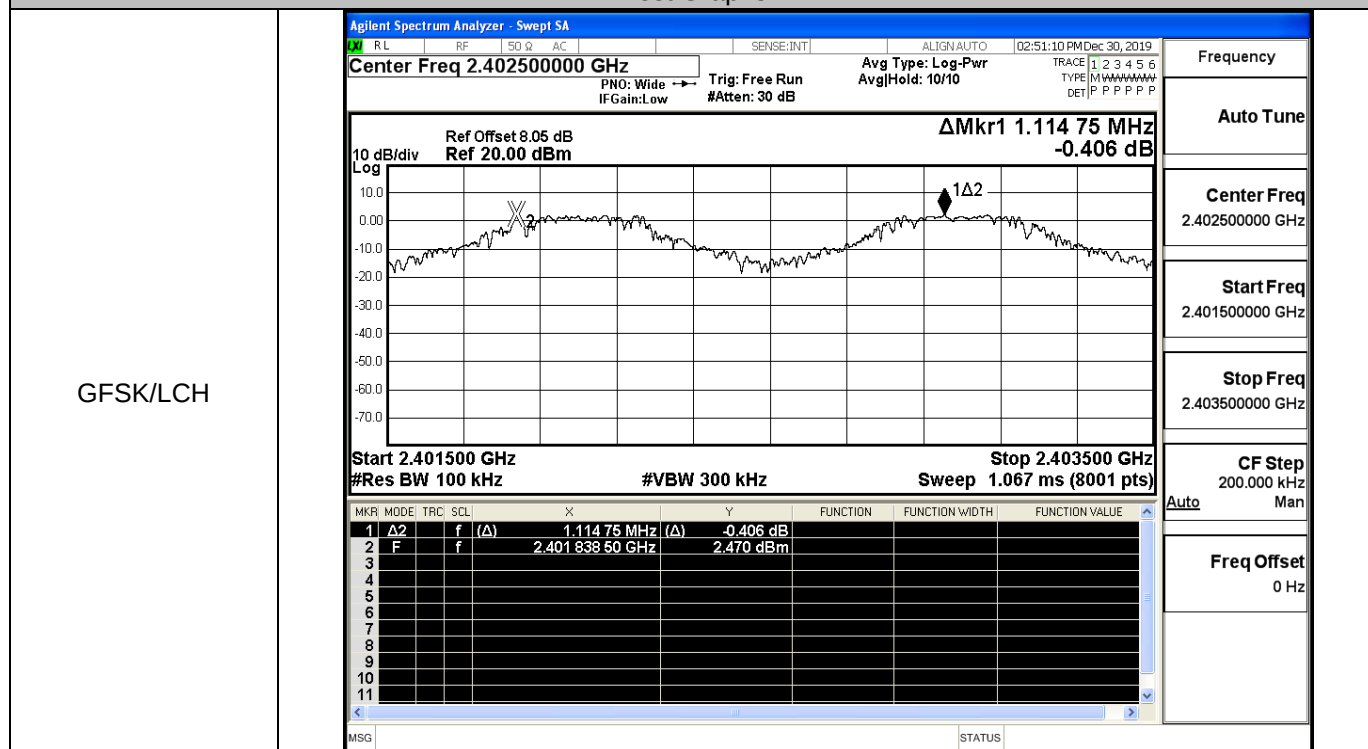
8DPSK/HCH



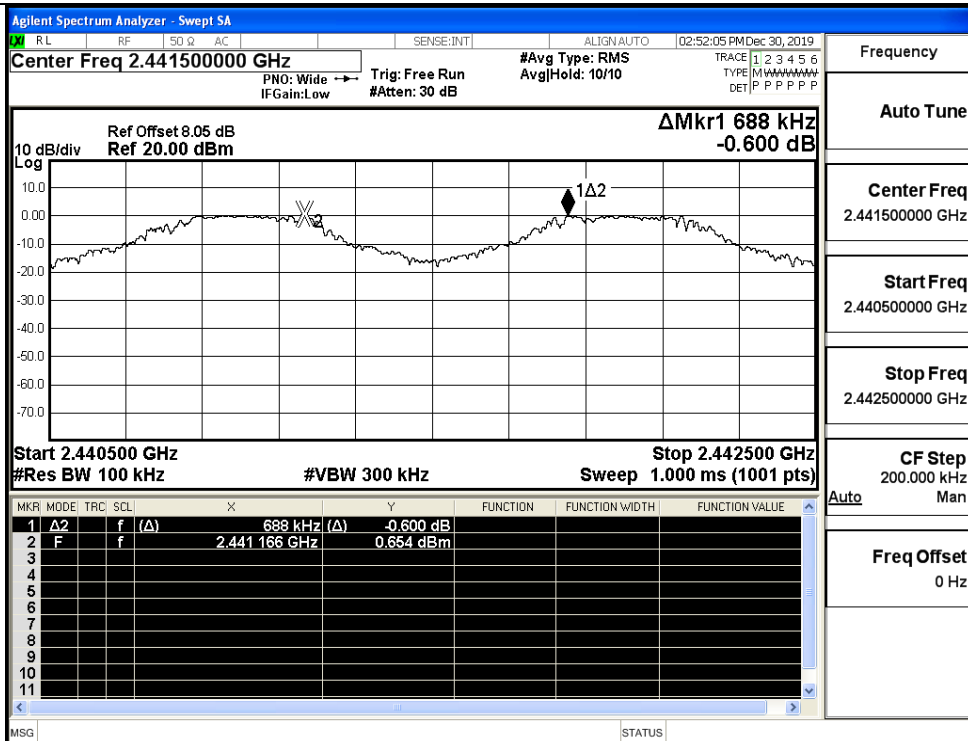
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.115	0.645	PASS
	MCH	0.688	0.682	PASS
	HCH	0.816	0.685	PASS
$\pi/4$ DQPSK	LCH	1.004	0.859	PASS
	MCH	1.154	0.879	PASS
	HCH	1.180	0.861	PASS
8DPSK	LCH	1.216	0.862	PASS
	MCH	1.140	0.869	PASS
	HCH	0.980	0.863	PASS

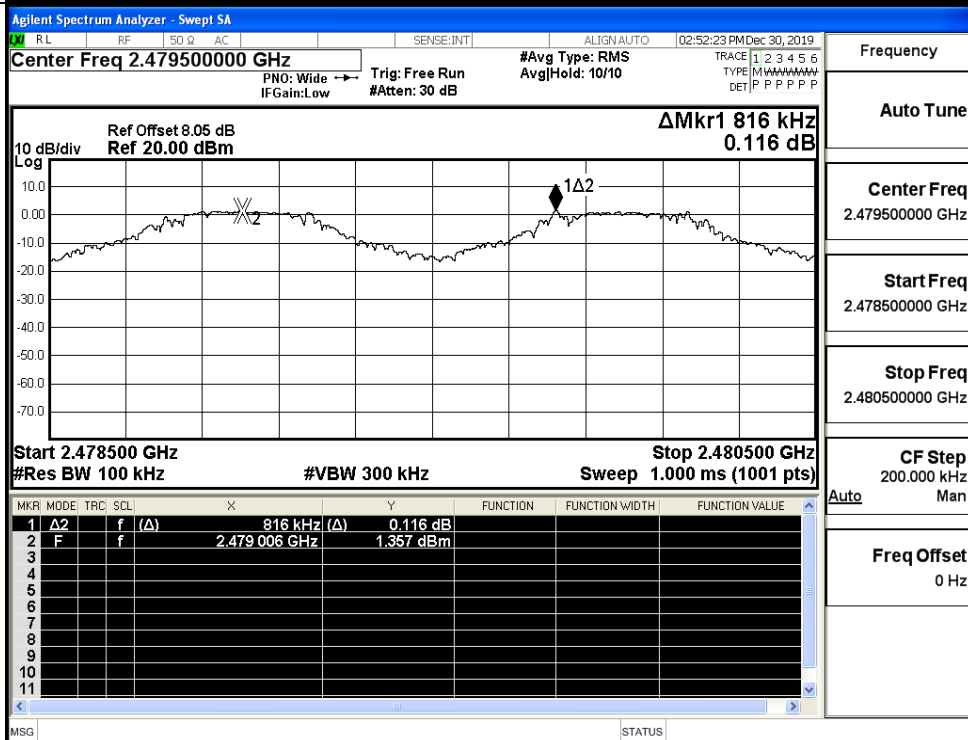
Test Graphs

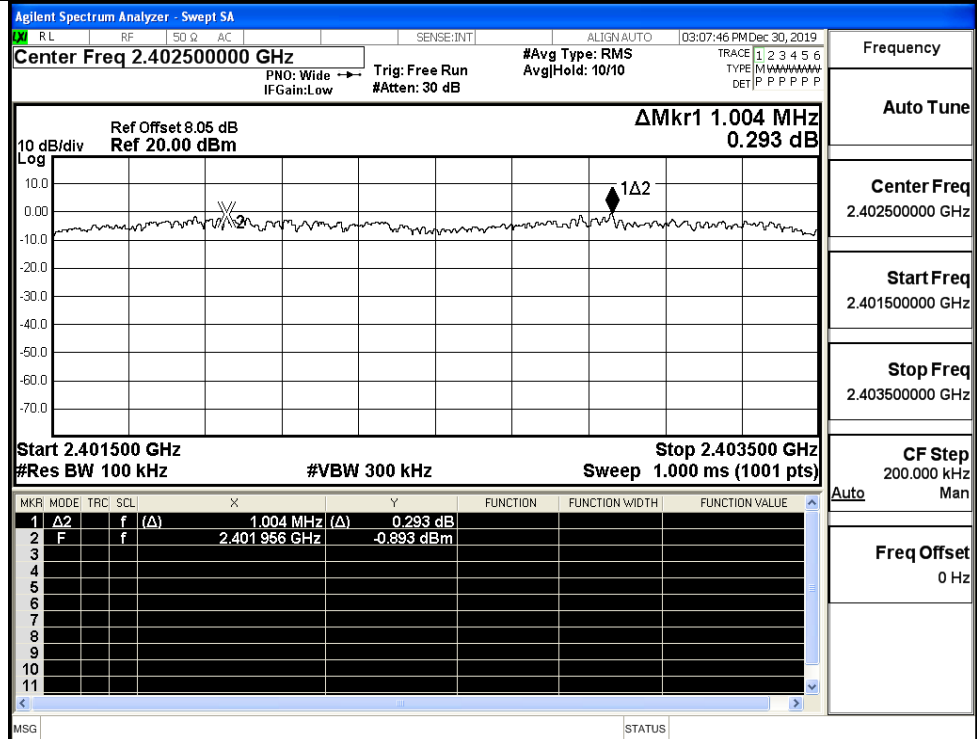
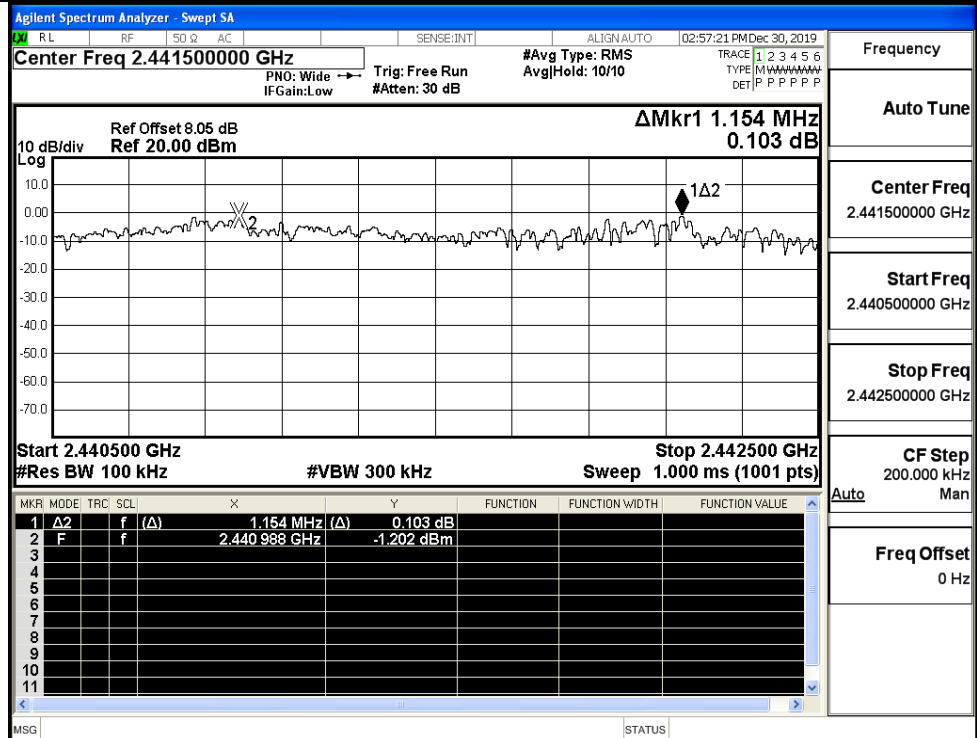


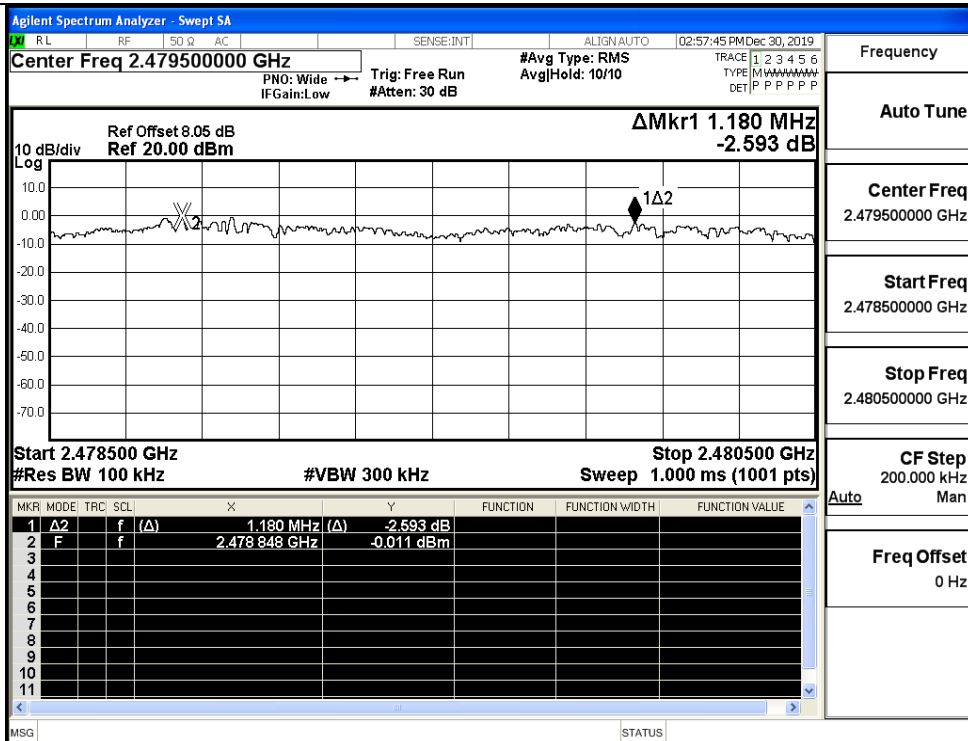
GFSK/MCH



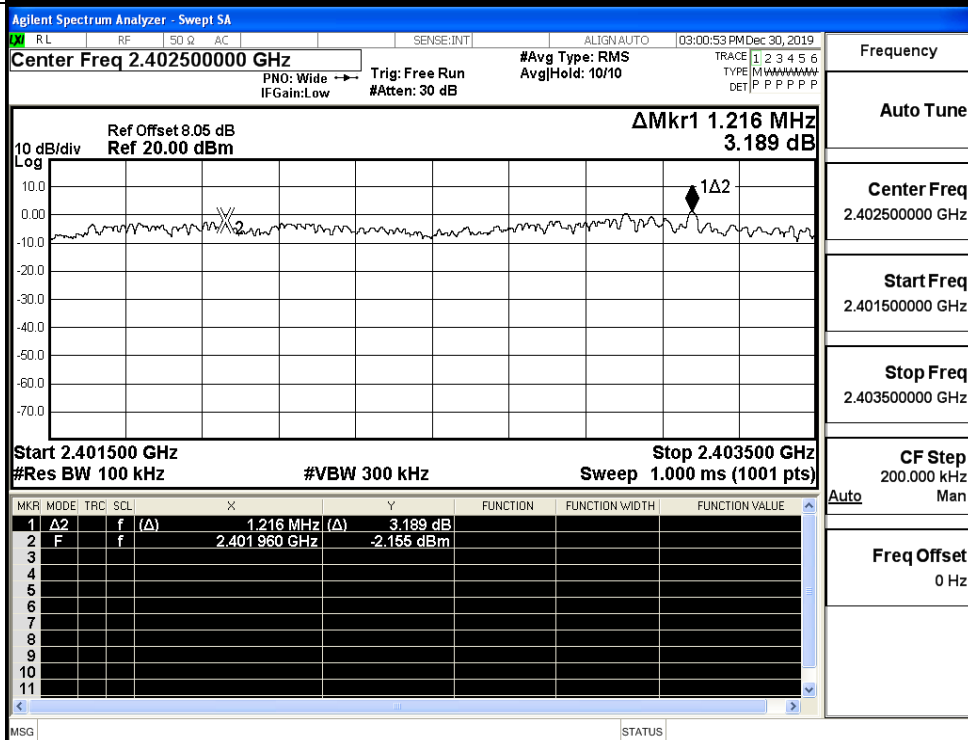
GFSK/HCH



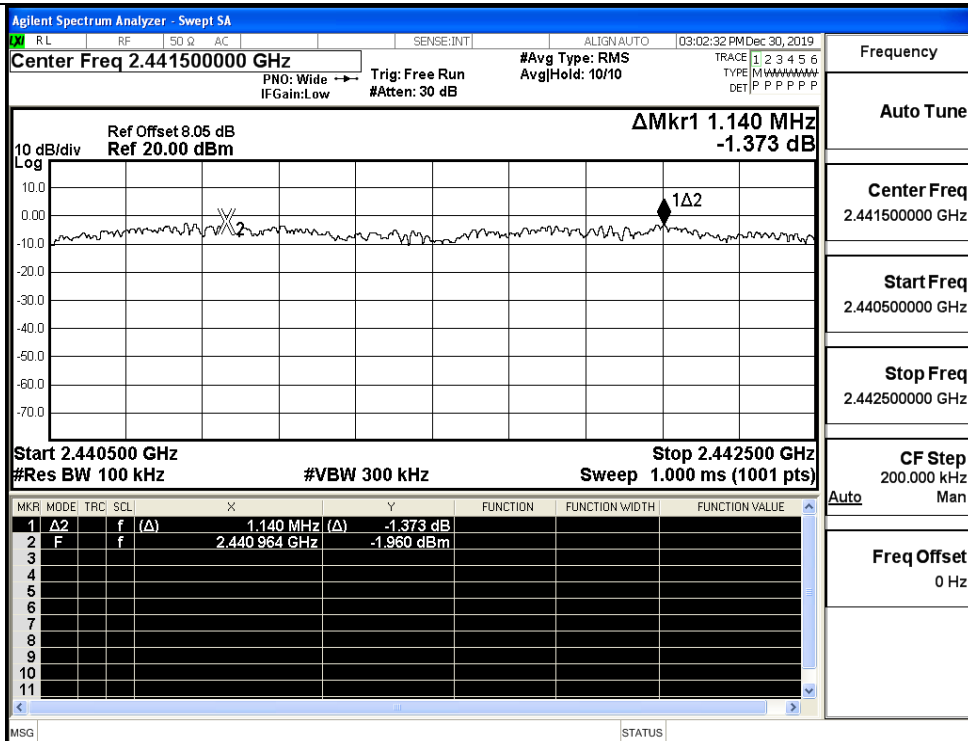
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

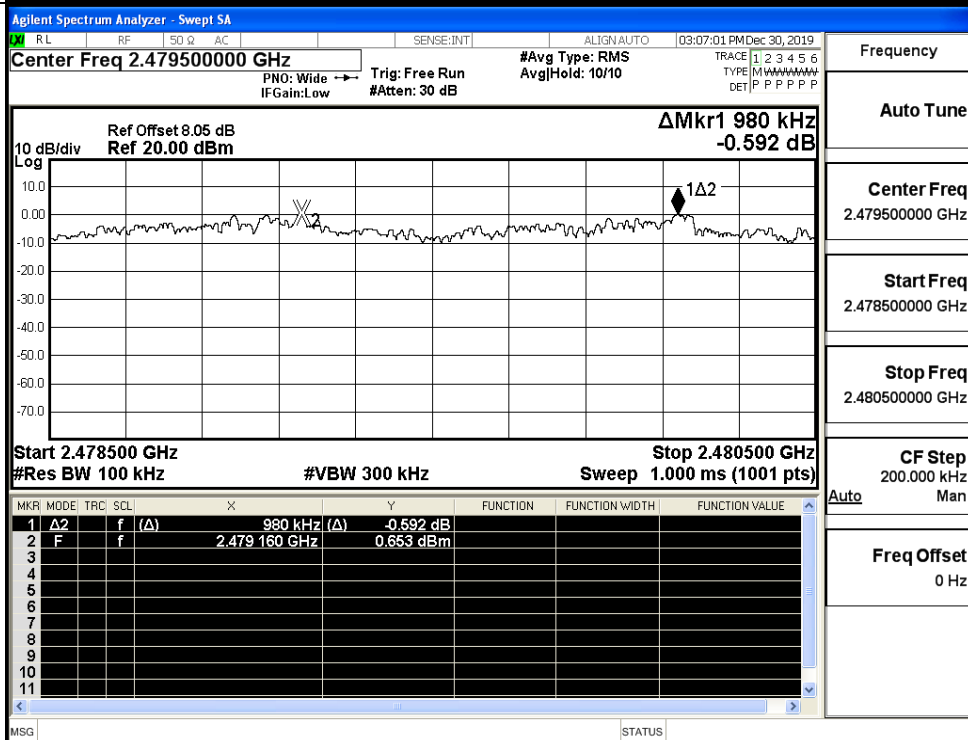
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

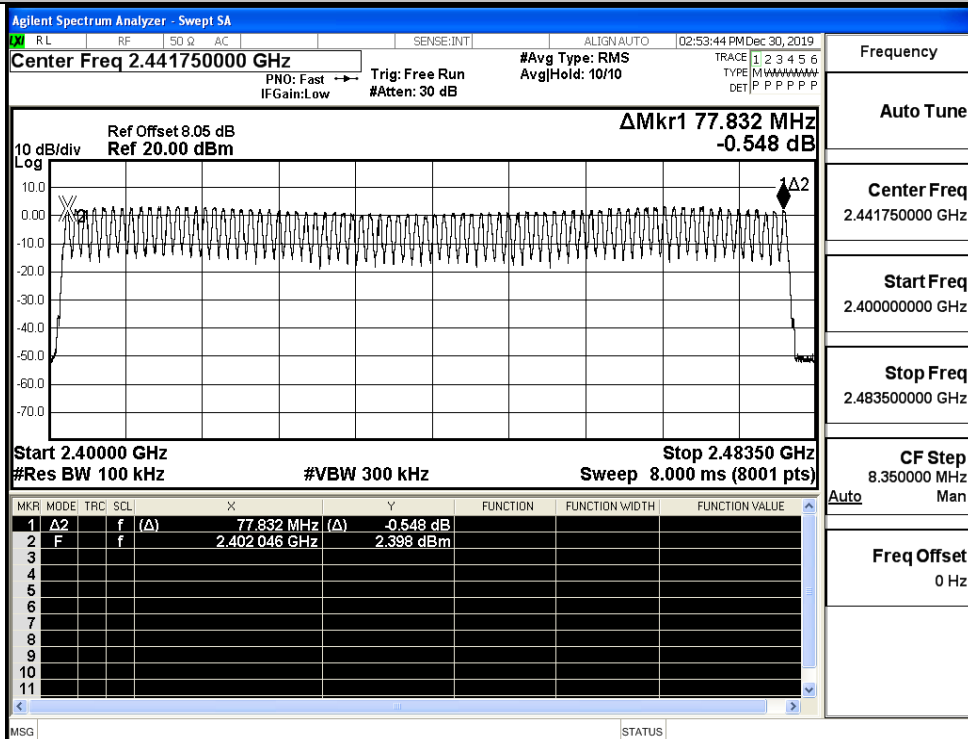
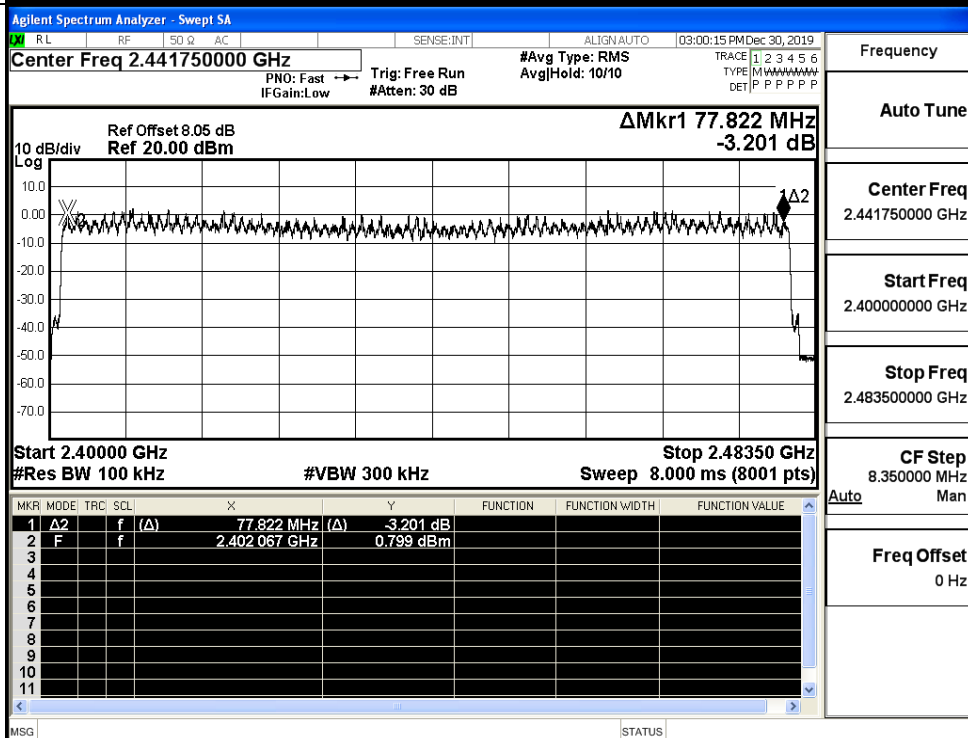


A.4 Hopping Channel Number

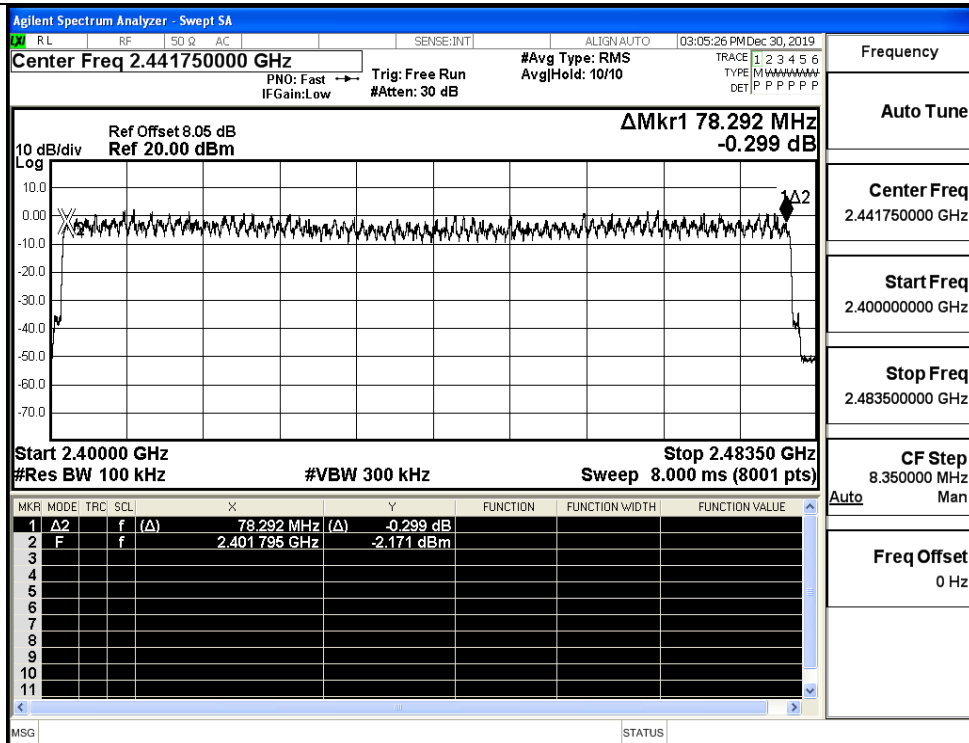
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

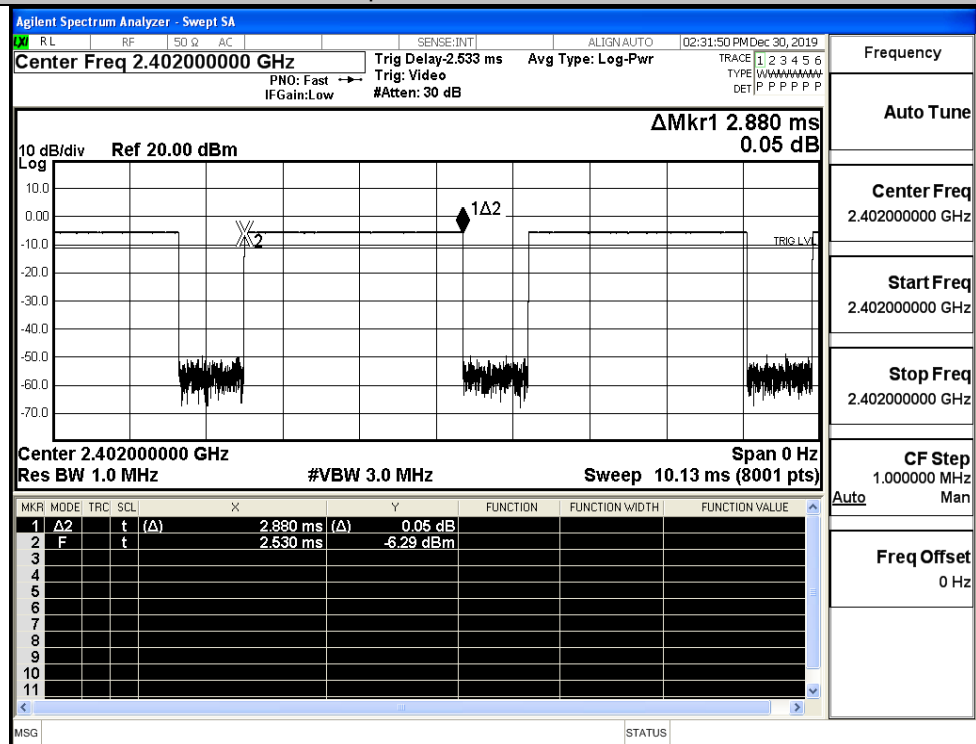


A.5 Dwell Time

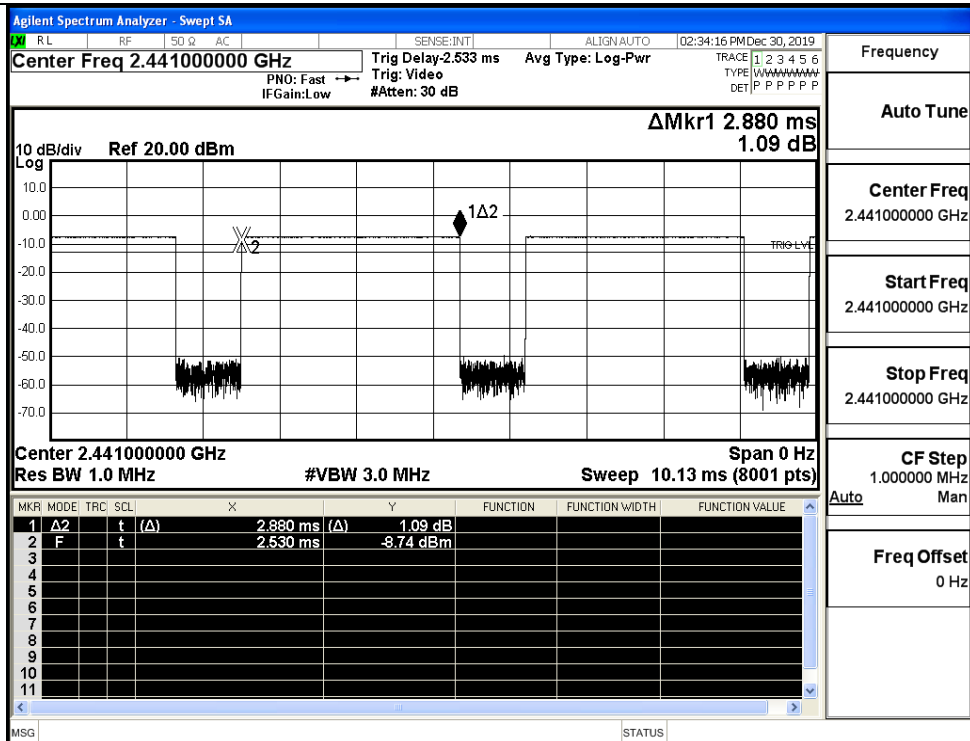
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.88	106.7	0.308	0.4	PASS
	3DH5	MCH	2.88	106.7	0.308	0.4	PASS
	3DH5	HCH	2.88	106.7	0.308	0.4	PASS

Test Graphs

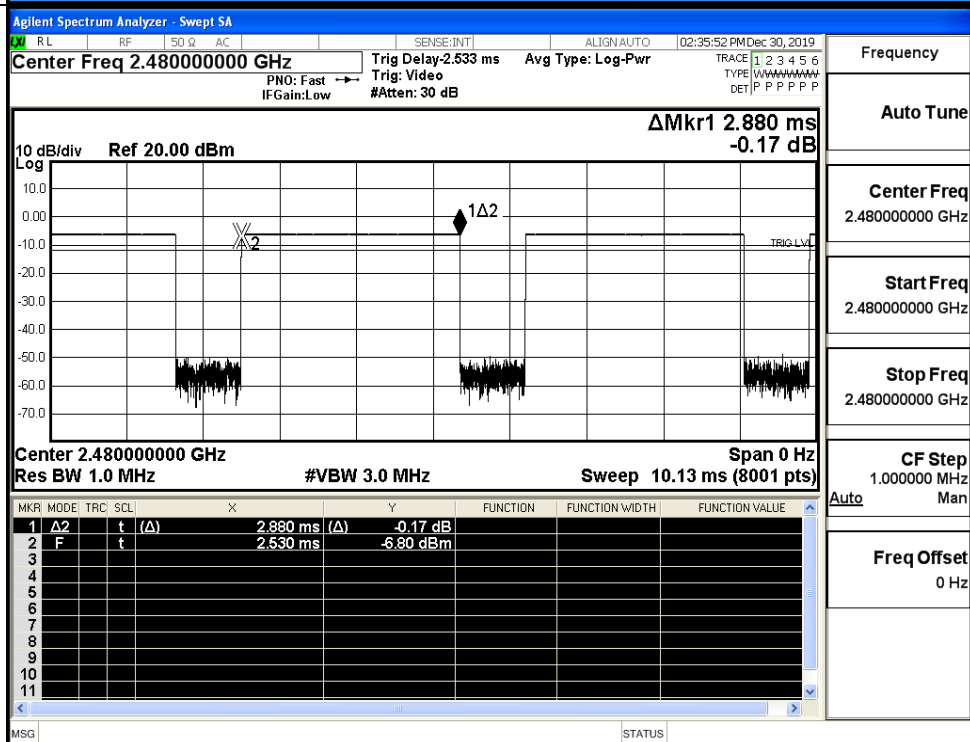
GFSK_DH5/LCH



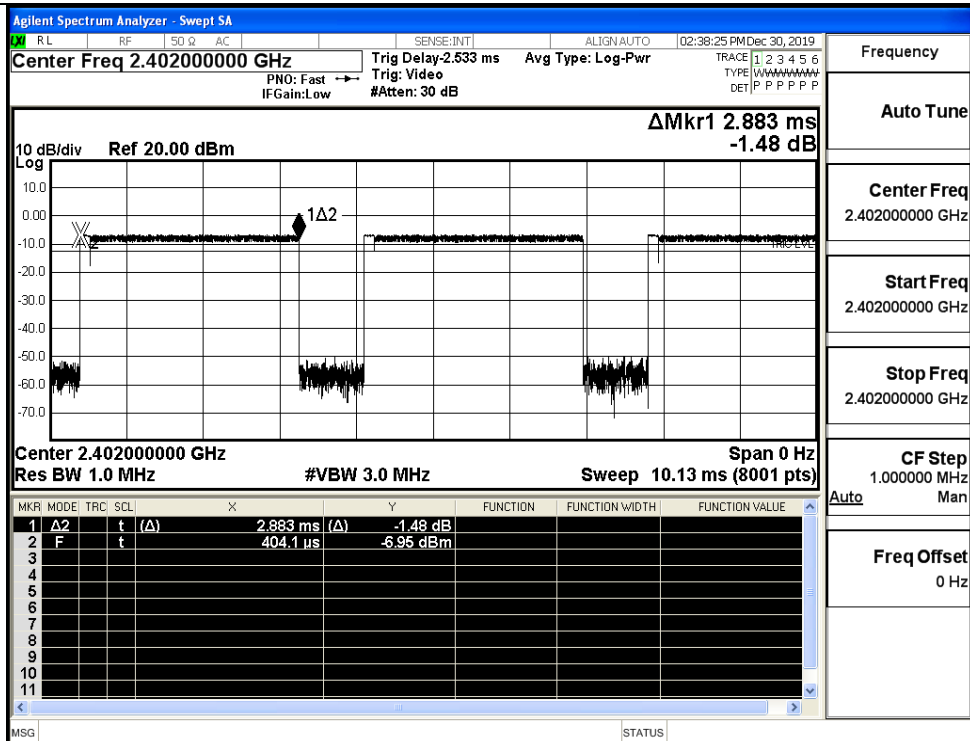
GFSK_DH5/MCH



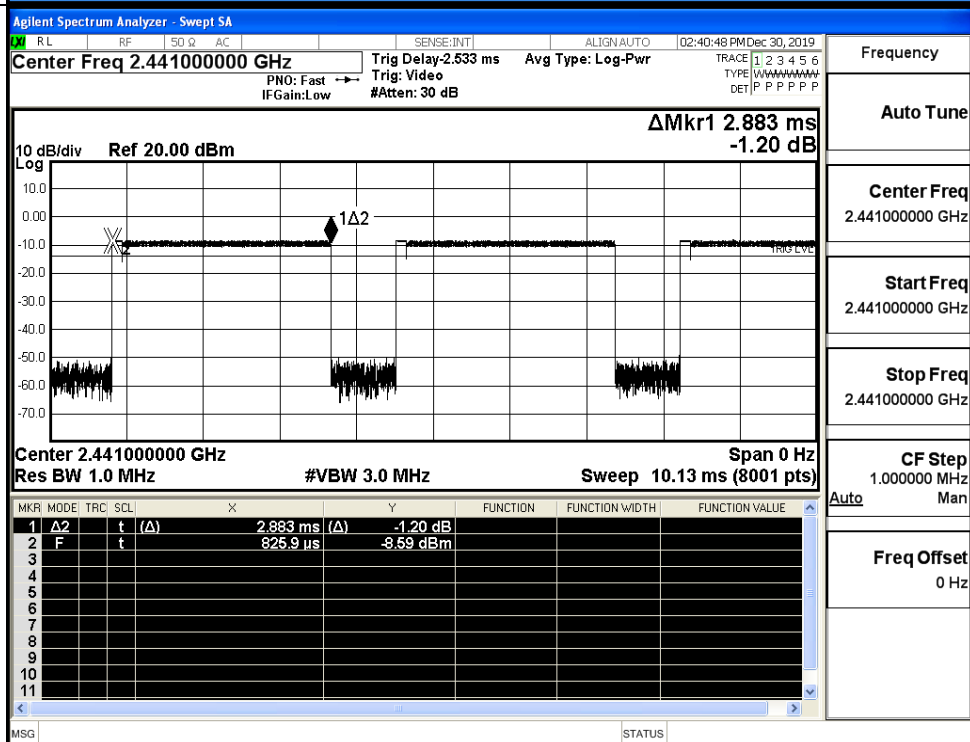
GFSK_DH5/HCH



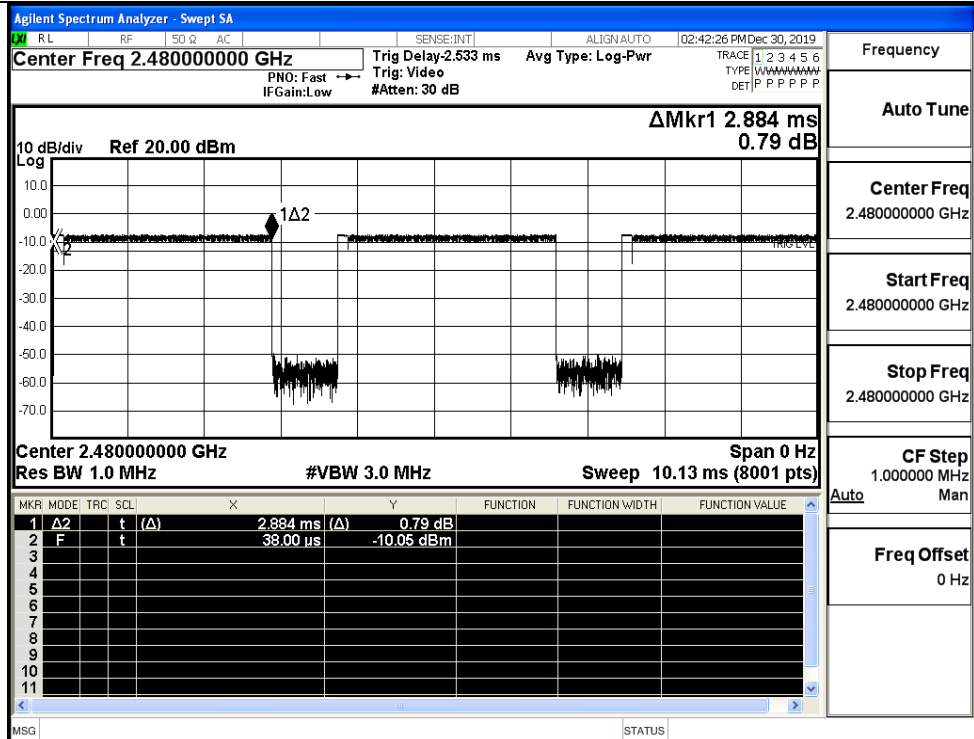
$\pi/4$ DQPSK
_2DH5/LCH



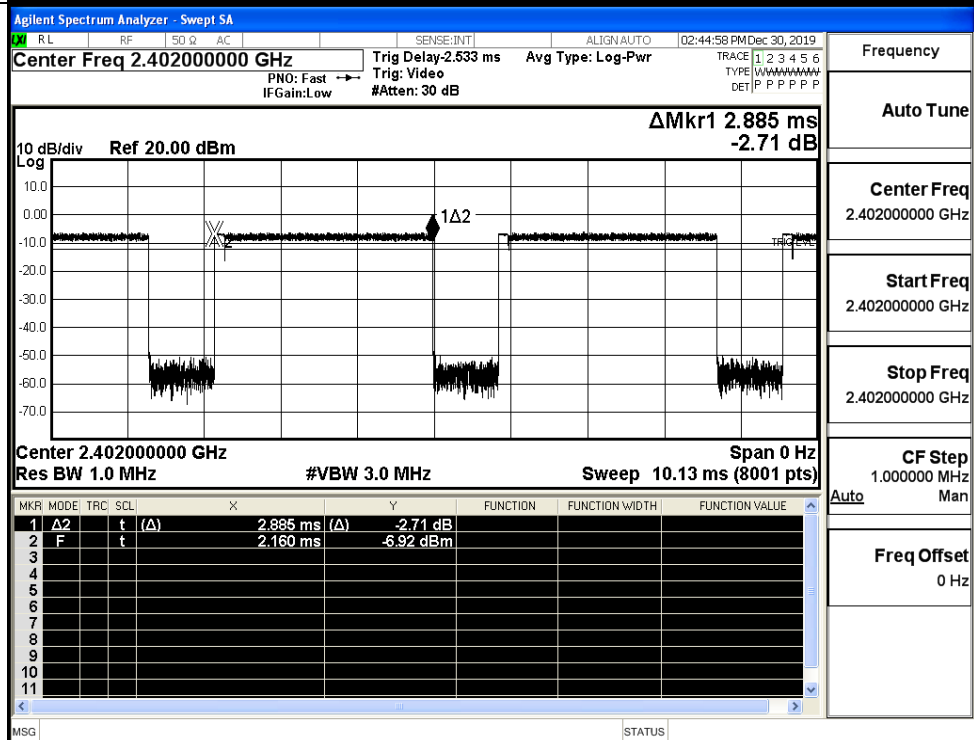
$\pi/4$ DQPSK
_2DH5/MCH



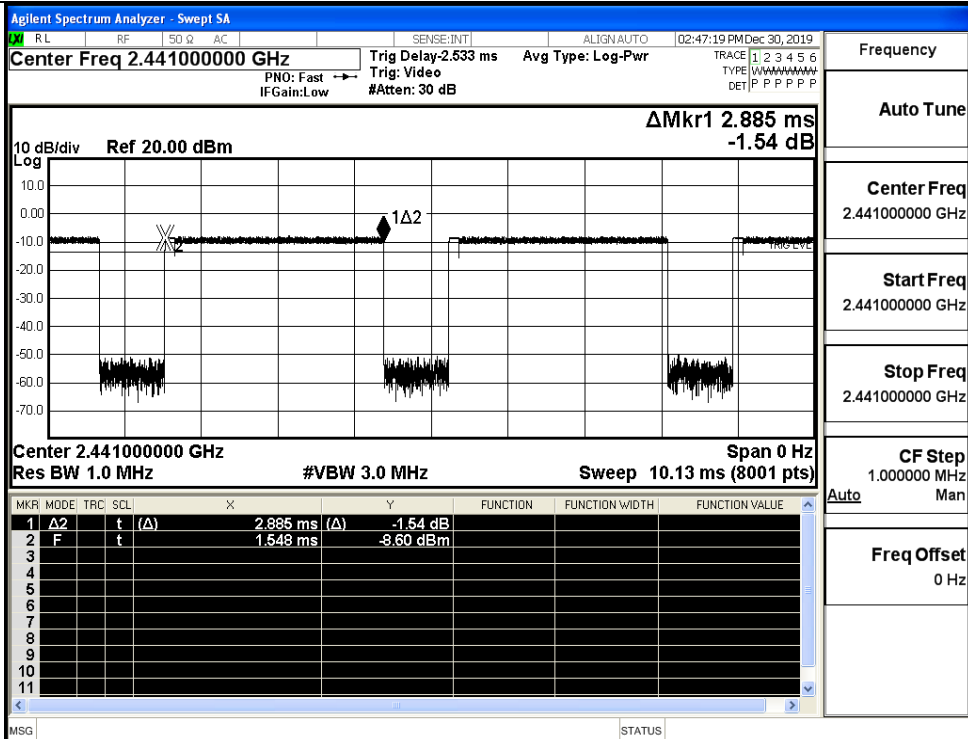
$\pi/4$ DQPSK
_2DH5/HCH



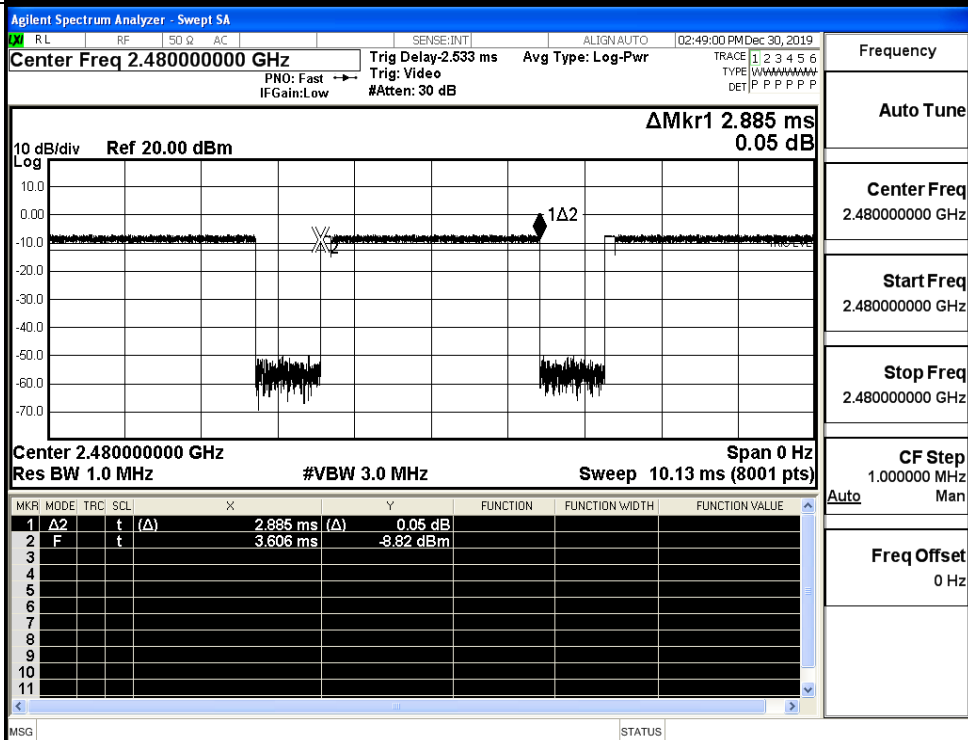
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



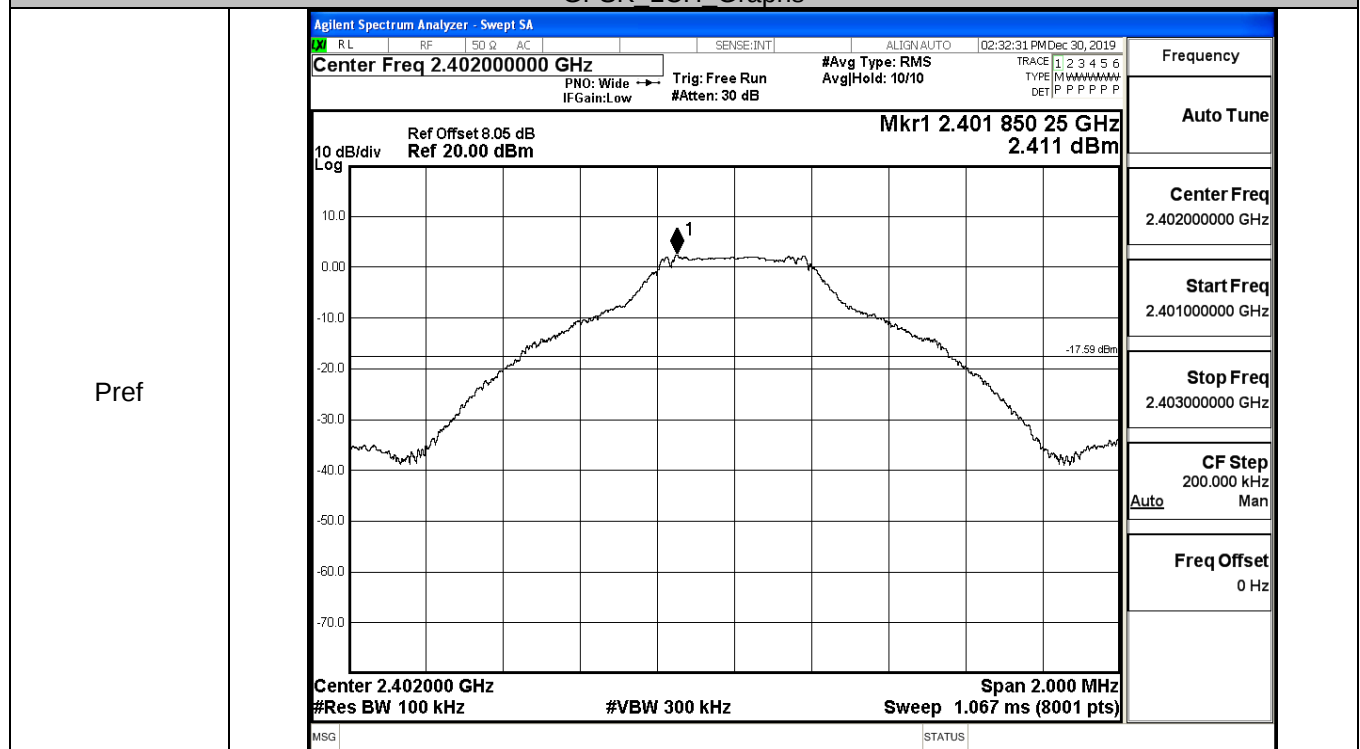
8DPSK_3DH5/HCH



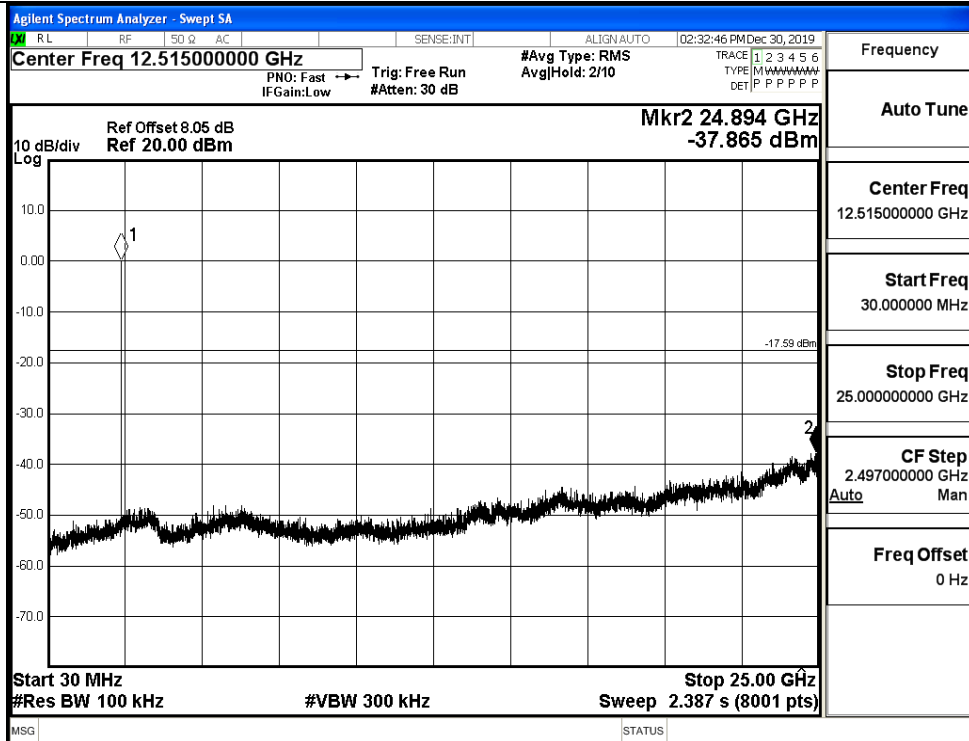
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.411	-37.865	-17.589	PASS
	MCH	0.716	-36.381	-19.284	PASS
	HCH	1.809	-37.803	-18.191	PASS
$\pi/4$ DQPSK	LCH	1.057	-36.801	-18.943	PASS
	MCH	-0.551	-37.052	-20.551	PASS
	HCH	0.384	-37.104	-19.616	PASS
8DPSK	LCH	1.216	-37.179	-18.784	PASS
	MCH	-0.489	-37.008	-20.489	PASS
	HCH	0.469	-37.441	-19.531	PASS

GFSK LCH Graphs

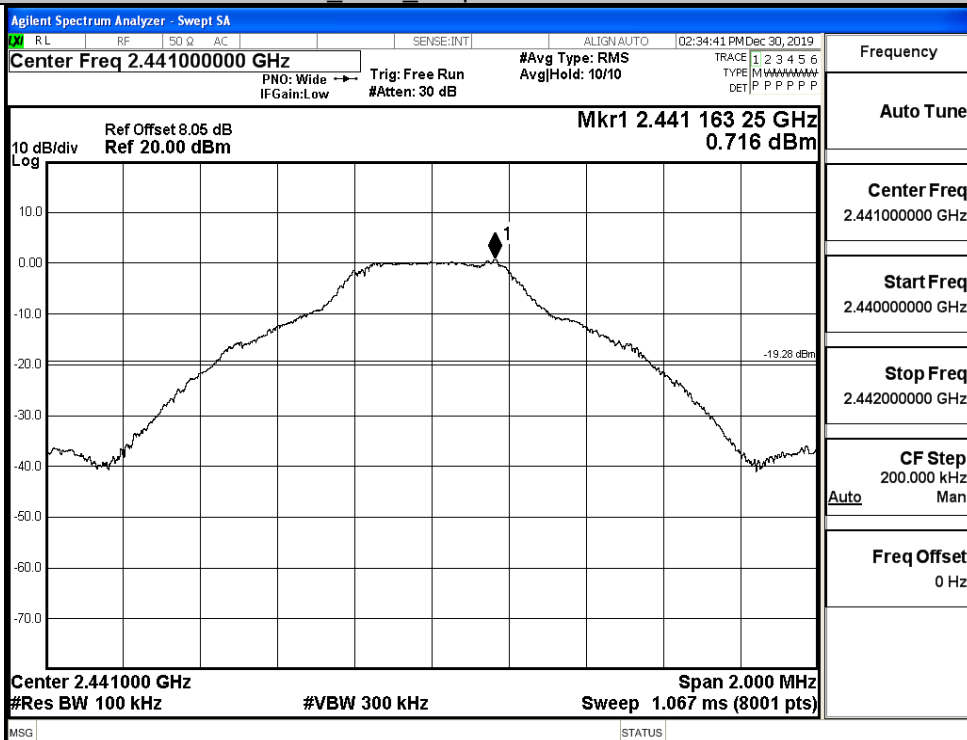


Puw

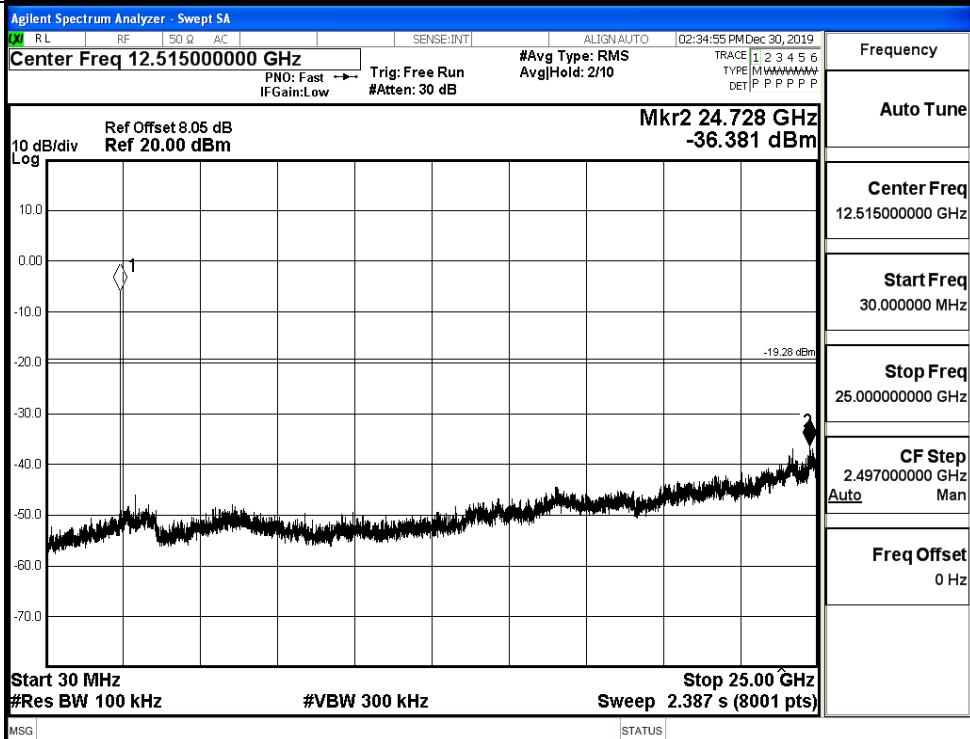


GFSK_MCH_Graphs

Pref

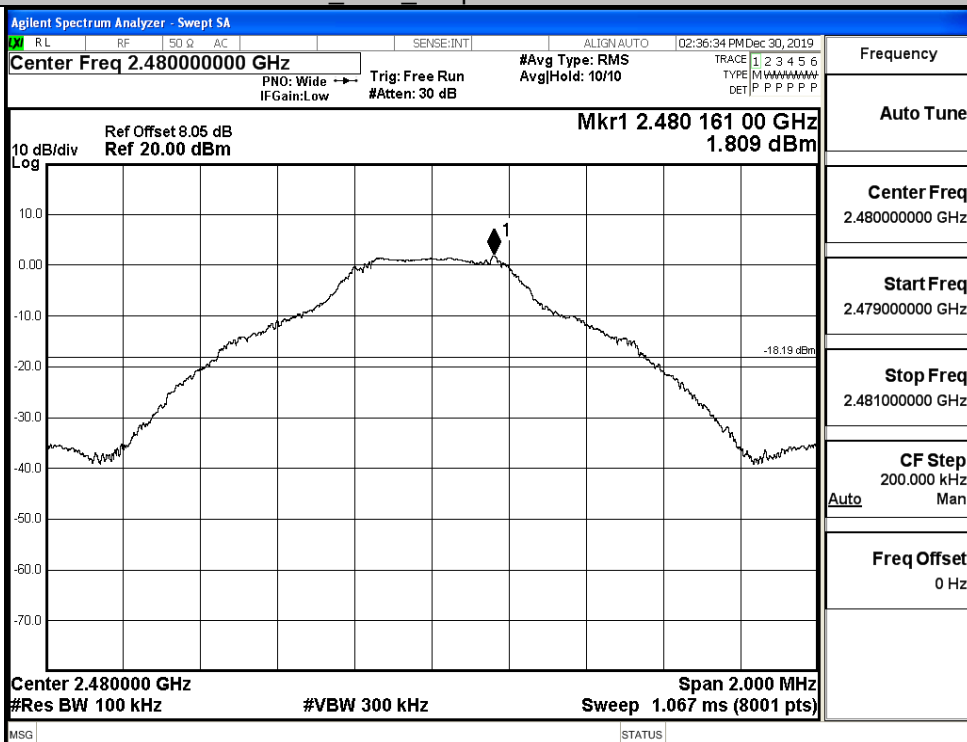


Puw

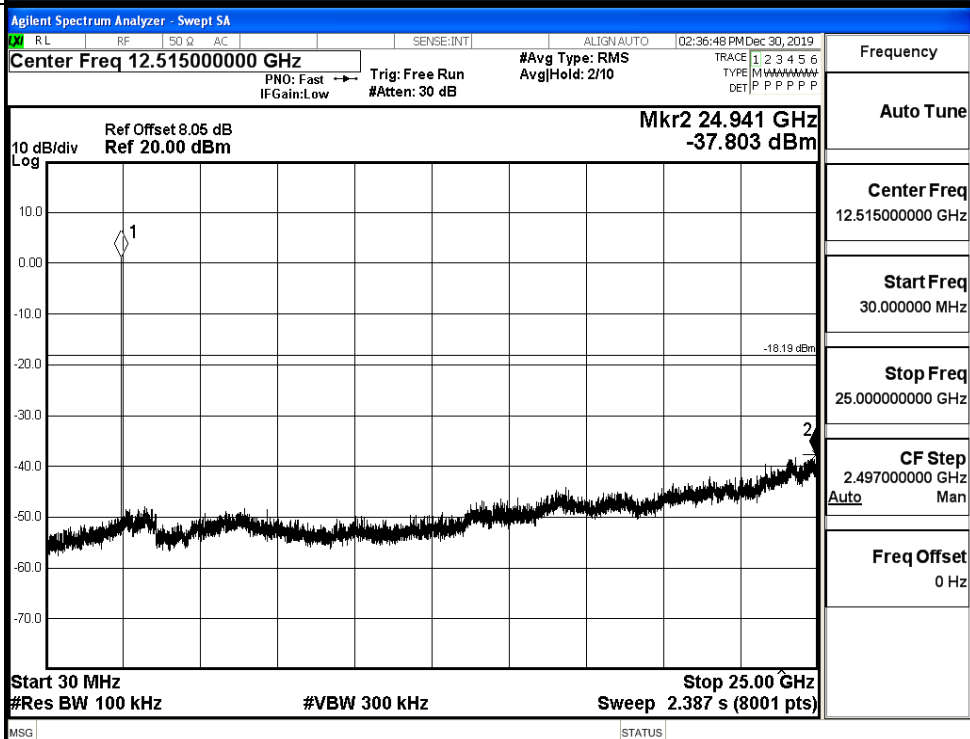


GFSK HCH Graphs

Pref

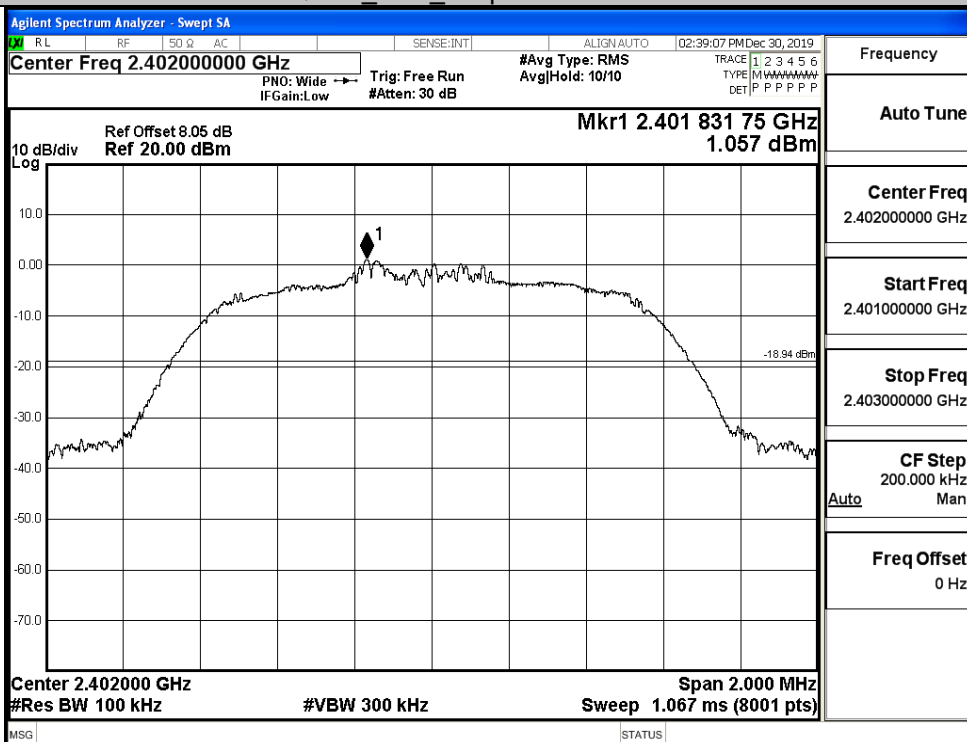


Puw

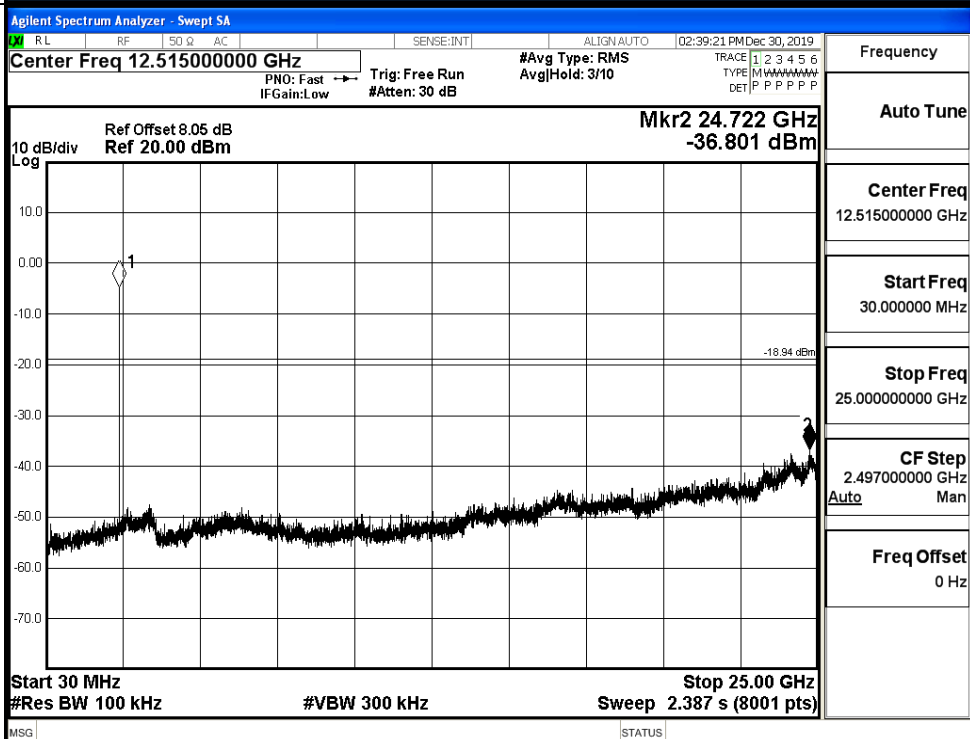


$\pi/4$ DQPSK_LCH_Graphs

Pref

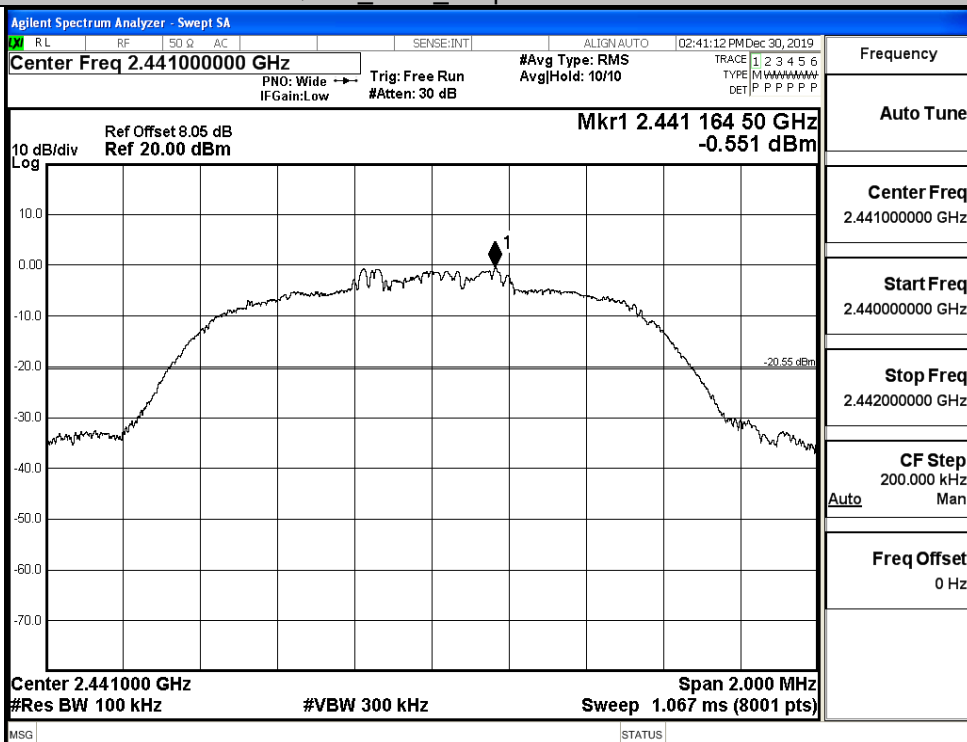


Puw

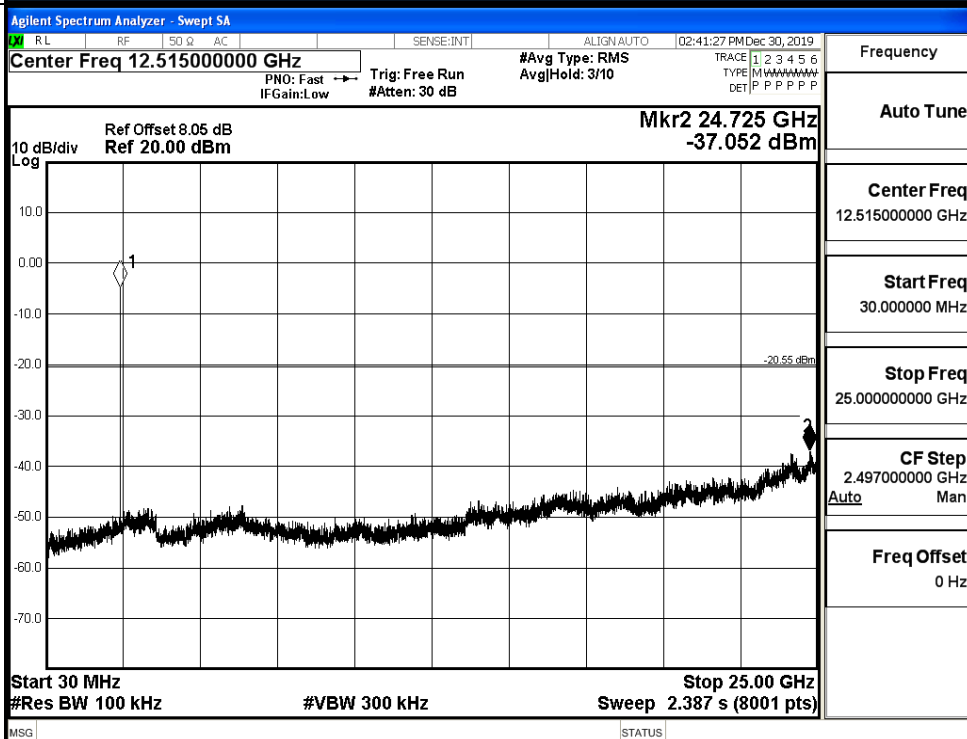


π /4DQPSK_MCH_Graphs

Pref

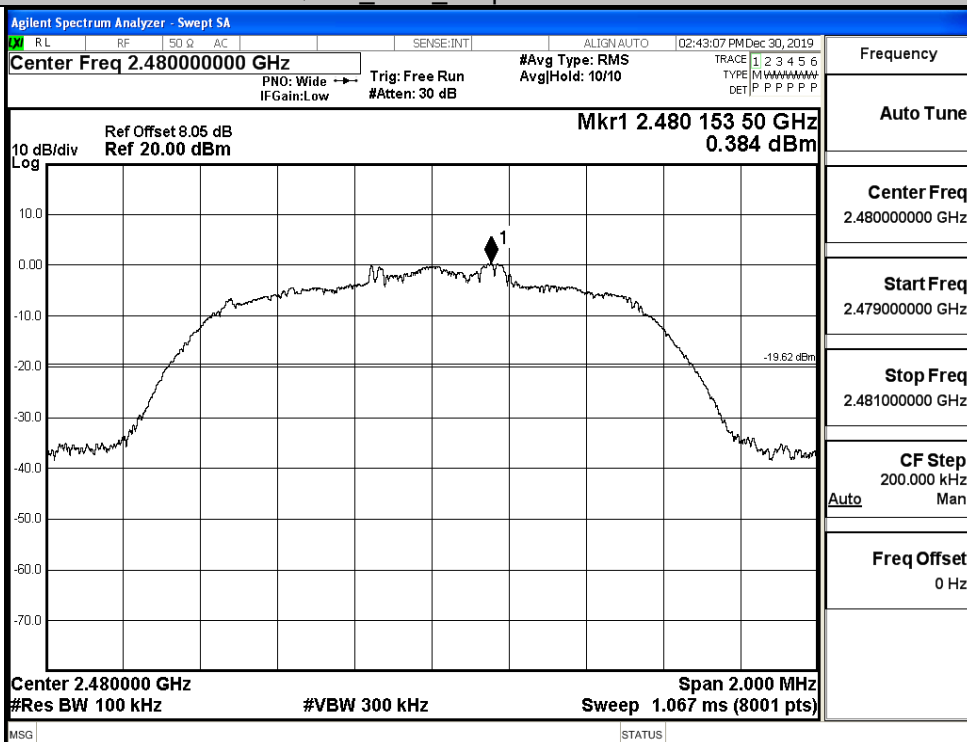


Puw

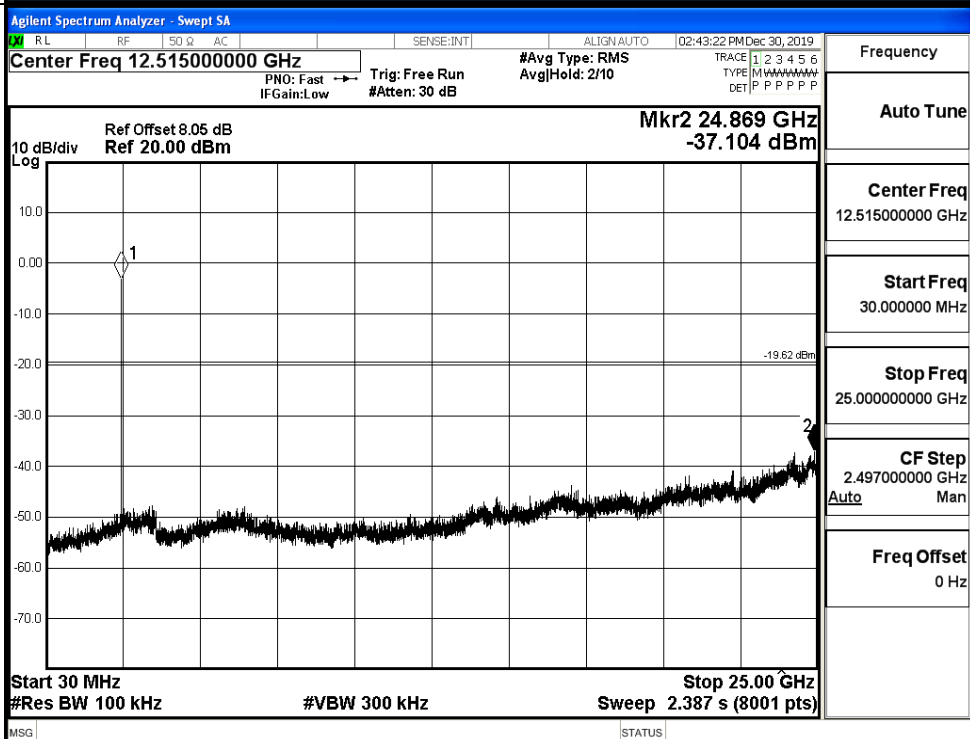


π /4DQPSK_HCH_Graphs

Pref

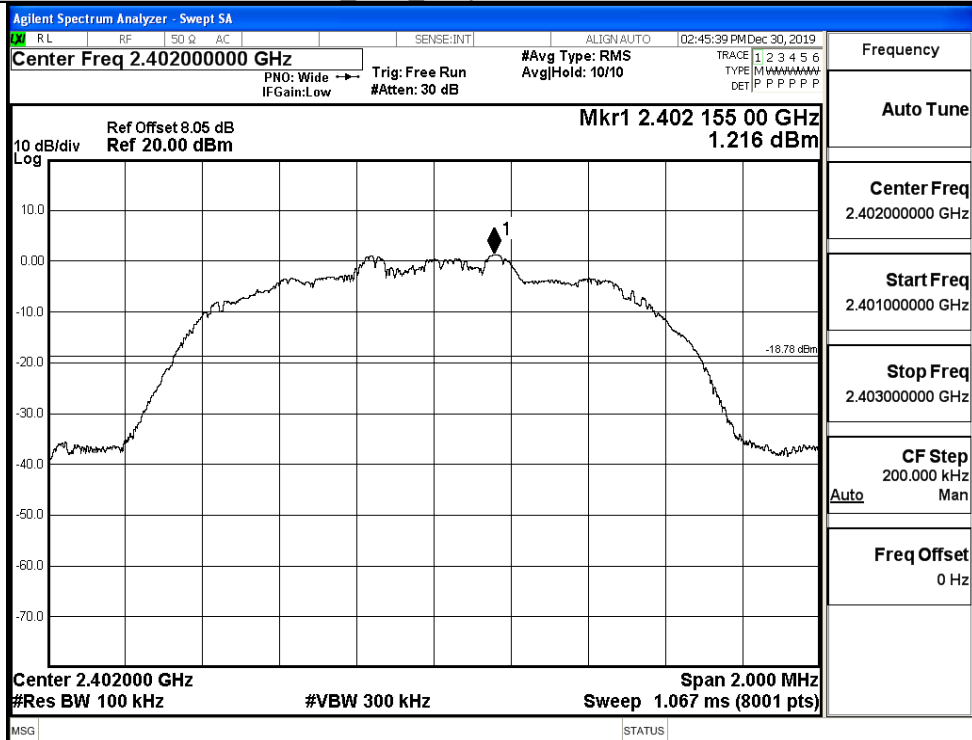


Puw

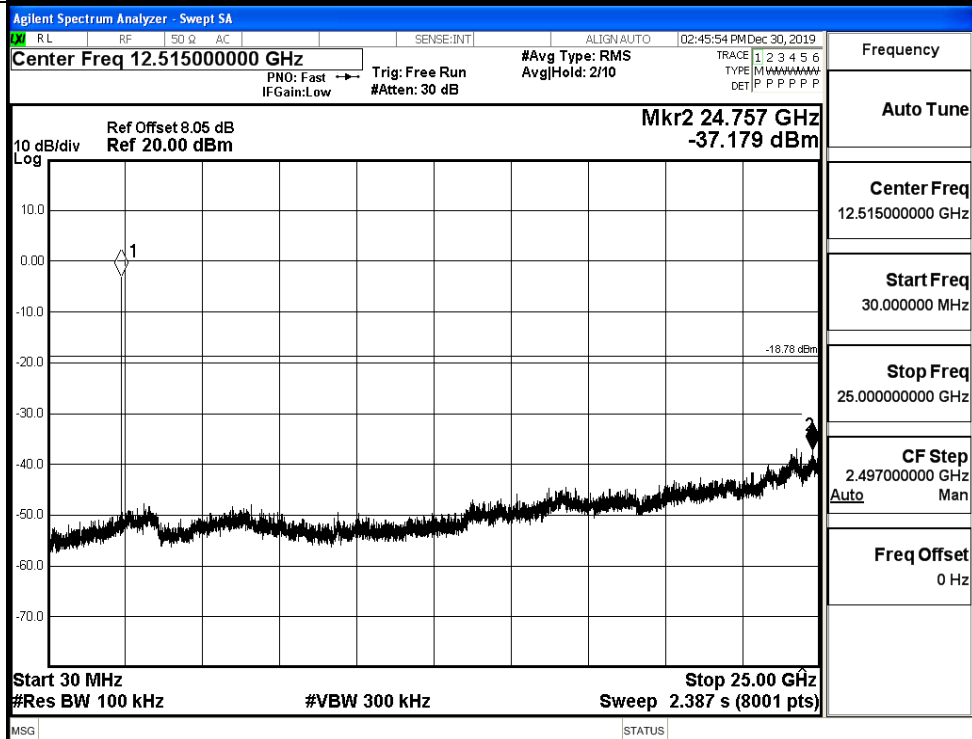


8DPSK_LCH_Graphs

Pref

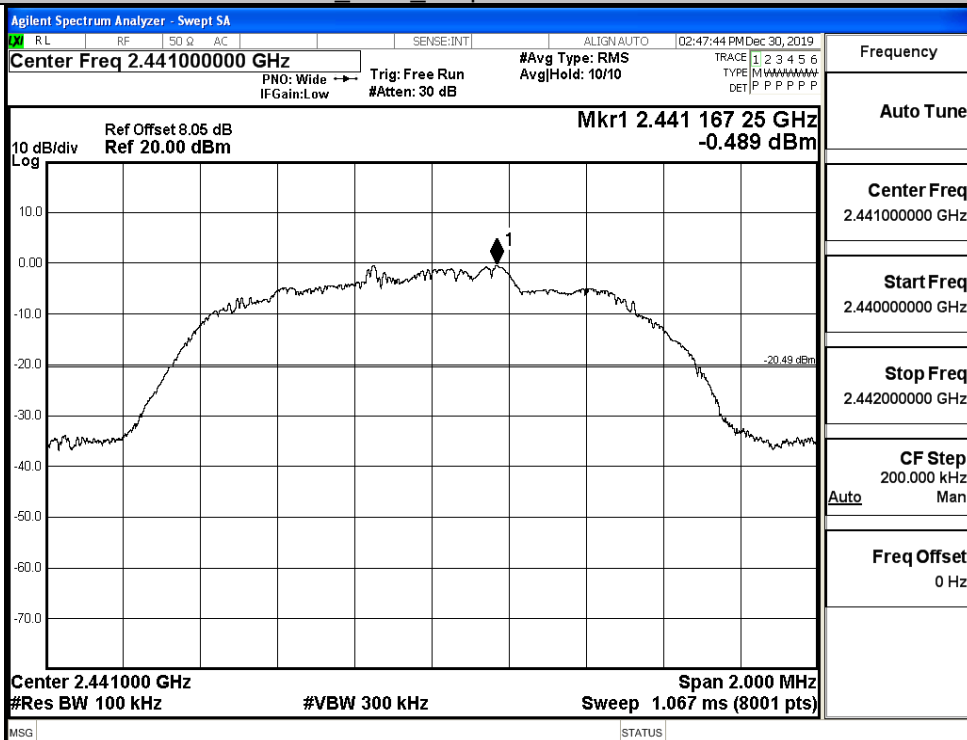


Puw

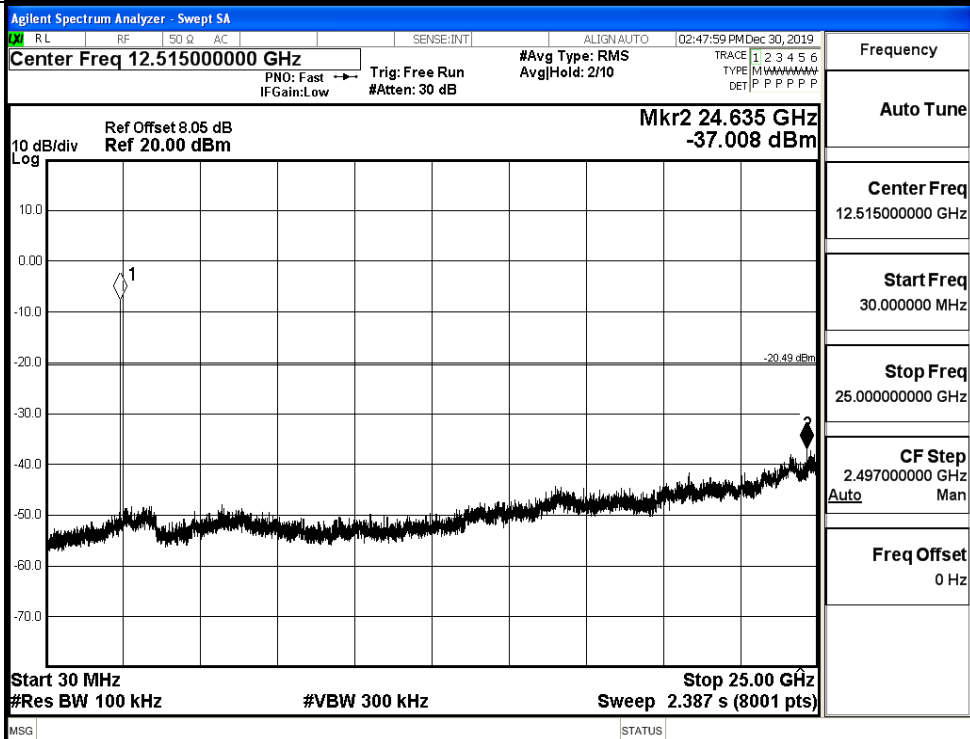


8DPSK_MCH_Graphs

Pref

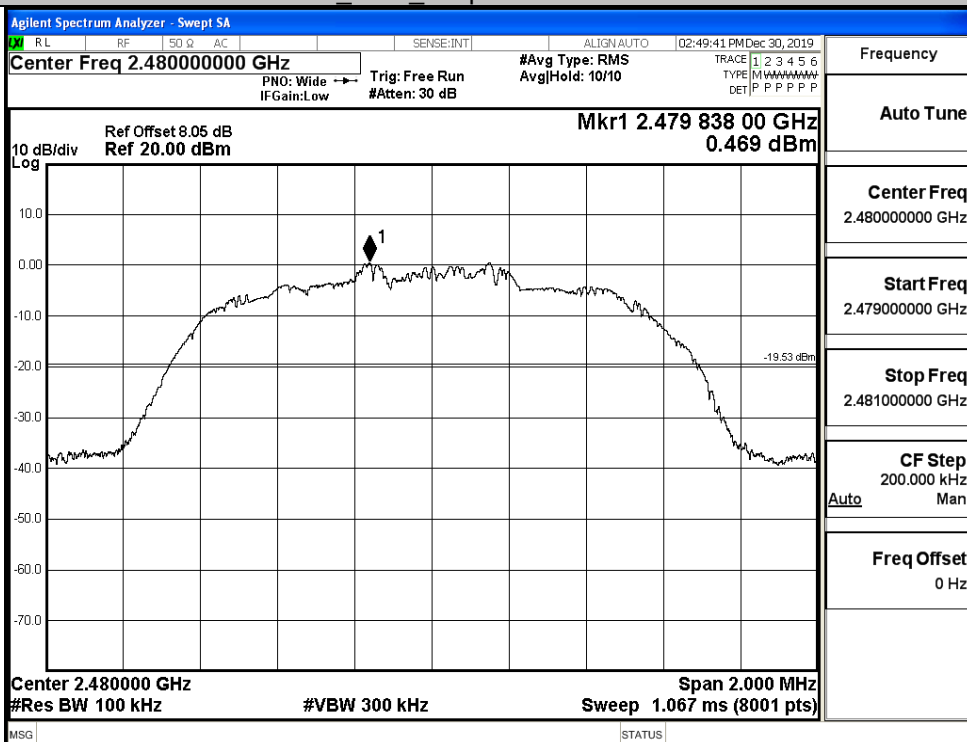


Puw

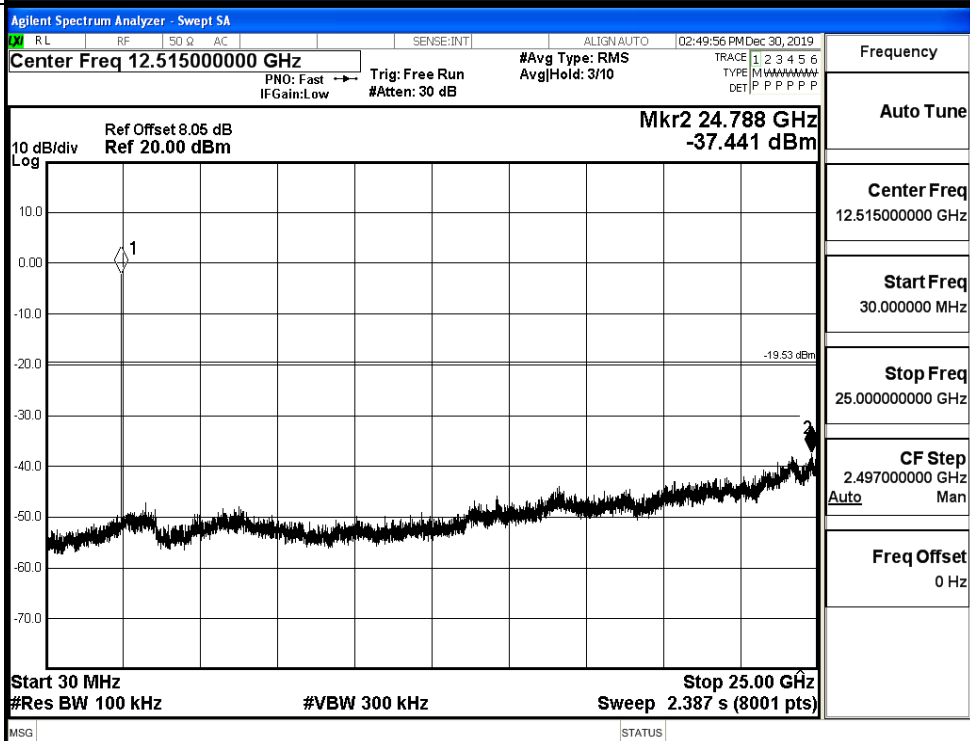


8DPSK_HCH_Graphs

Pref



Puw

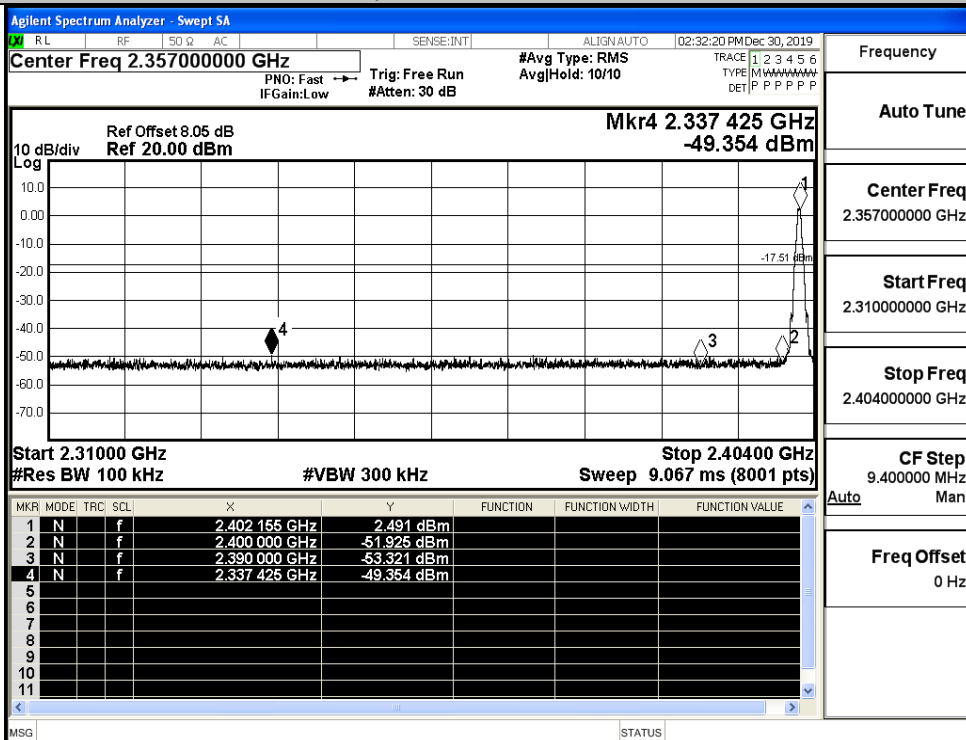


A.7 Band-edge for RF Conducted Emissions

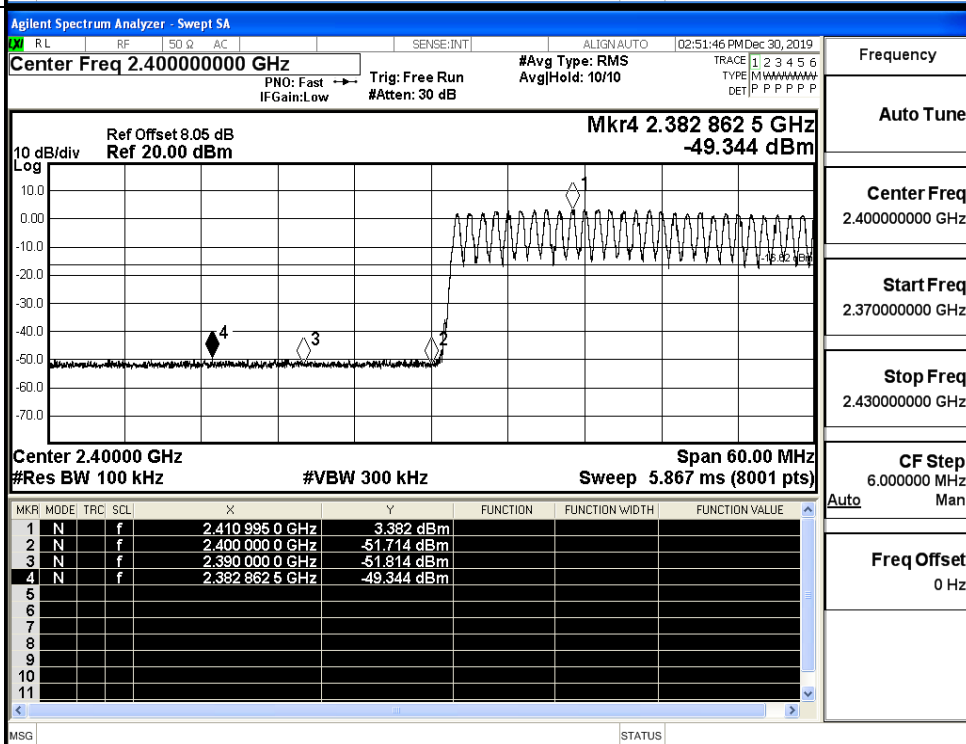
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	2.491	Off	-49.354	-17.51	PASS
			3.382	On	-49.344	-16.62	PASS
	HCH	2480	1.823	Off	-49.456	-18.18	PASS
			3.275	On	-48.678	-16.73	PASS
$\pi/4$ DQPSK	LCH	2402	0.361	Off	-48.885	-19.64	PASS
			1.987	On	-49.035	-18.01	PASS
	HCH	2480	0.279	Off	-48.861	-19.72	PASS
			1.641	On	-46.895	-18.36	PASS
8DPSK	LCH	2402	1.236	Off	-48.777	-18.76	PASS
			1.966	On	-48.772	-18.03	PASS
	HCH	2480	0.503	Off	-48.259	-19.5	PASS
			1.677	On	-48.179	-18.32	PASS

Test Graphs

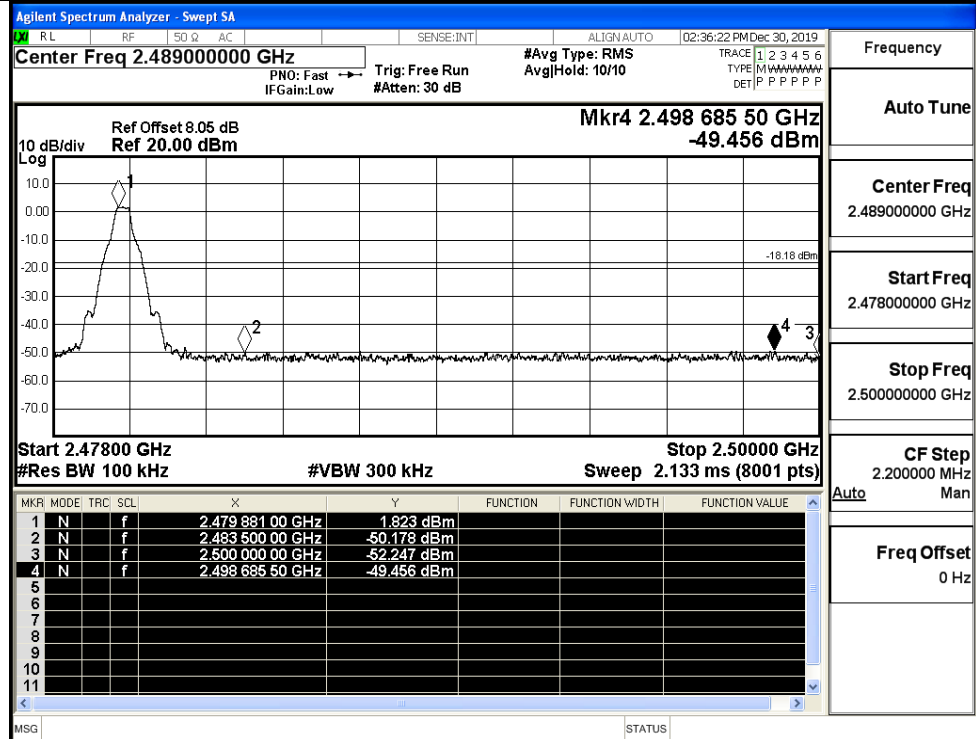
GFSK/LCH/No Hop



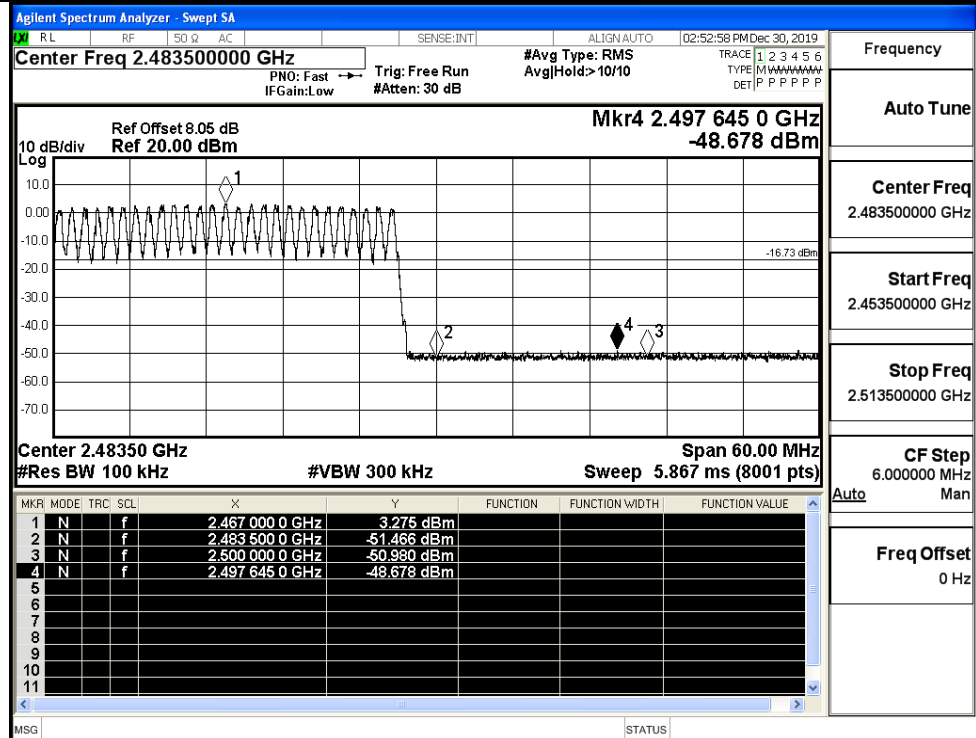
GFSK/LCH/Hop



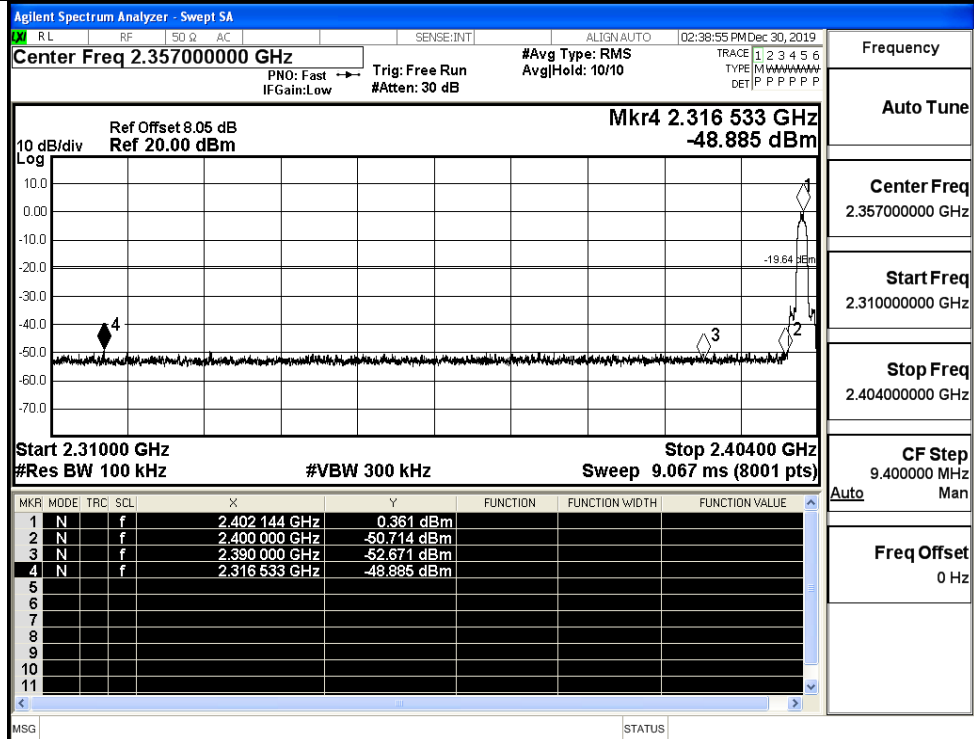
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

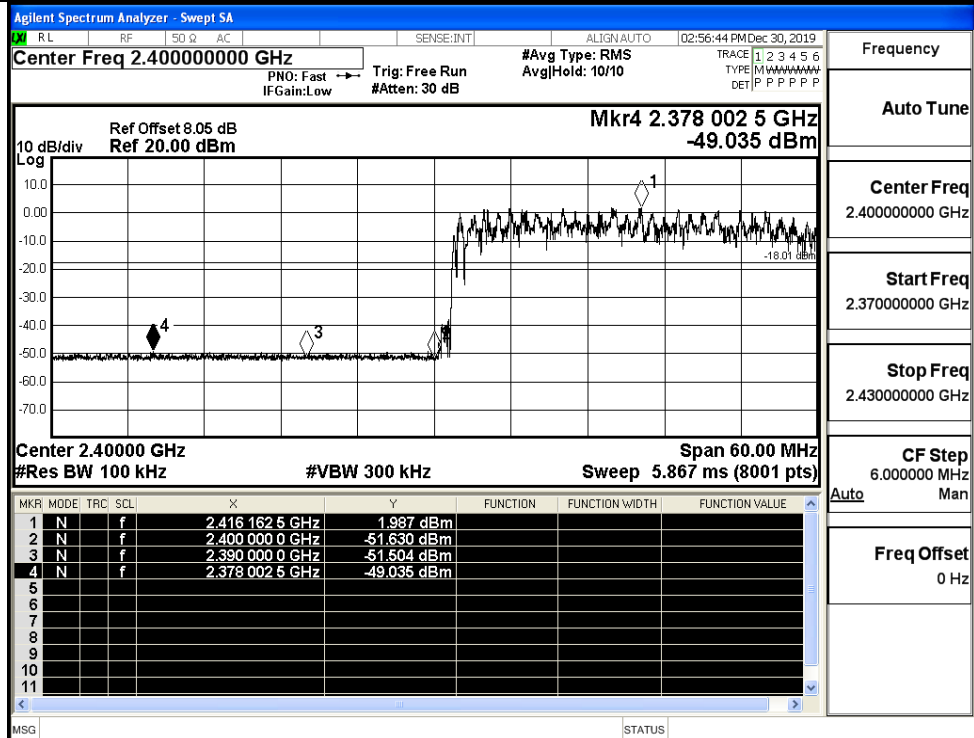
Start Freq
2.310000000 GHz

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

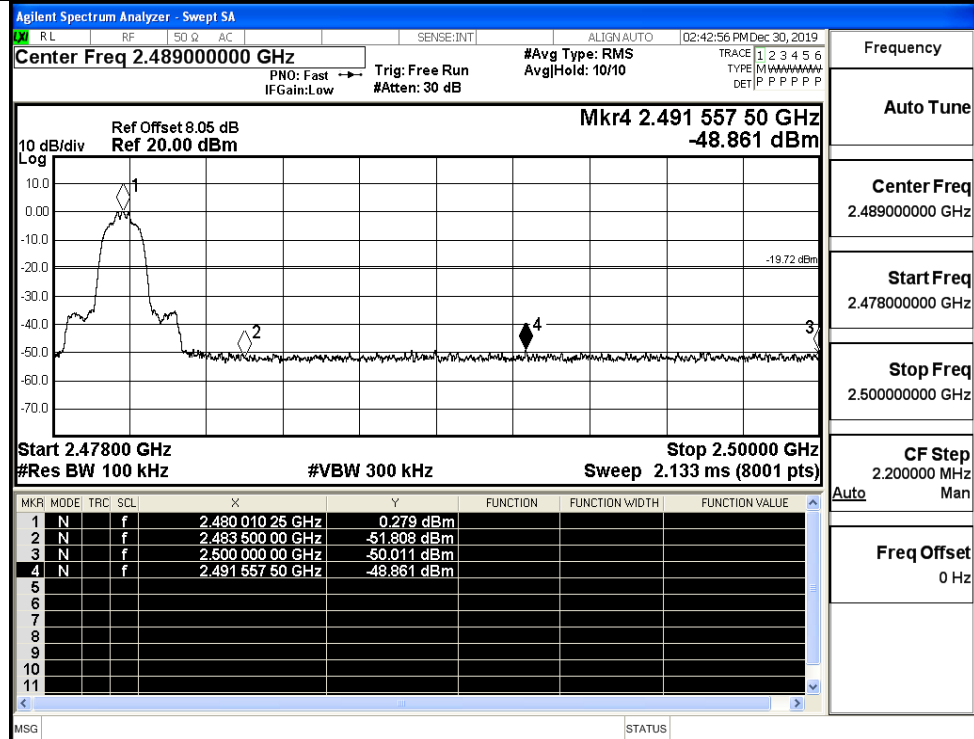
Start Freq
2.370000000 GHz

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

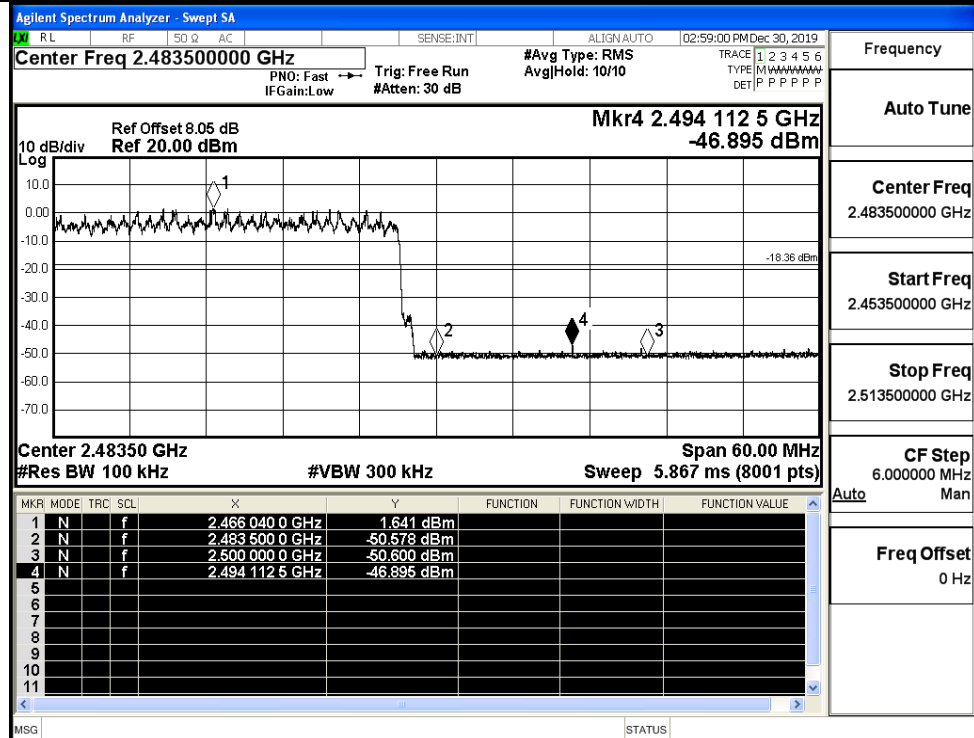
Stop Freq
2.500000000 GHz

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

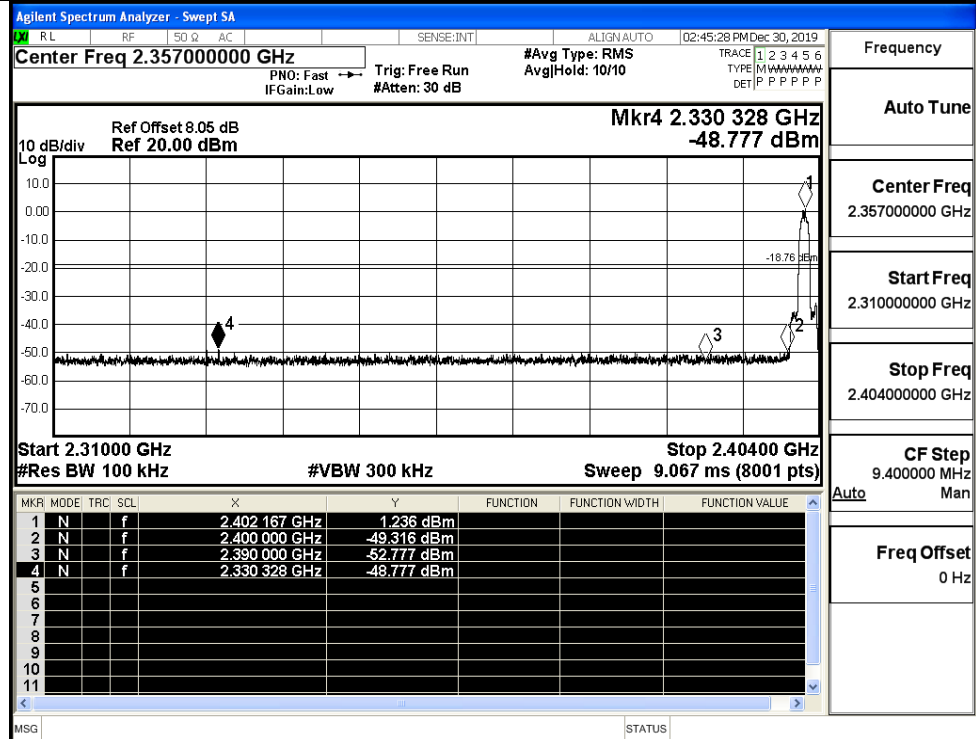
Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz

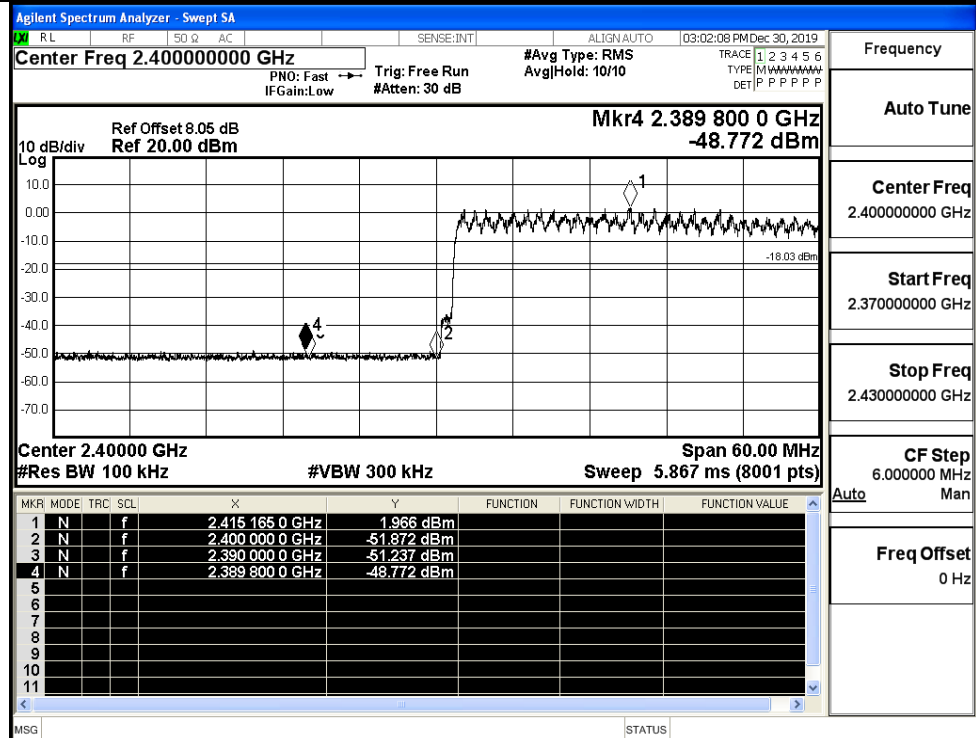
Auto Man

Freq Offset
0 Hz

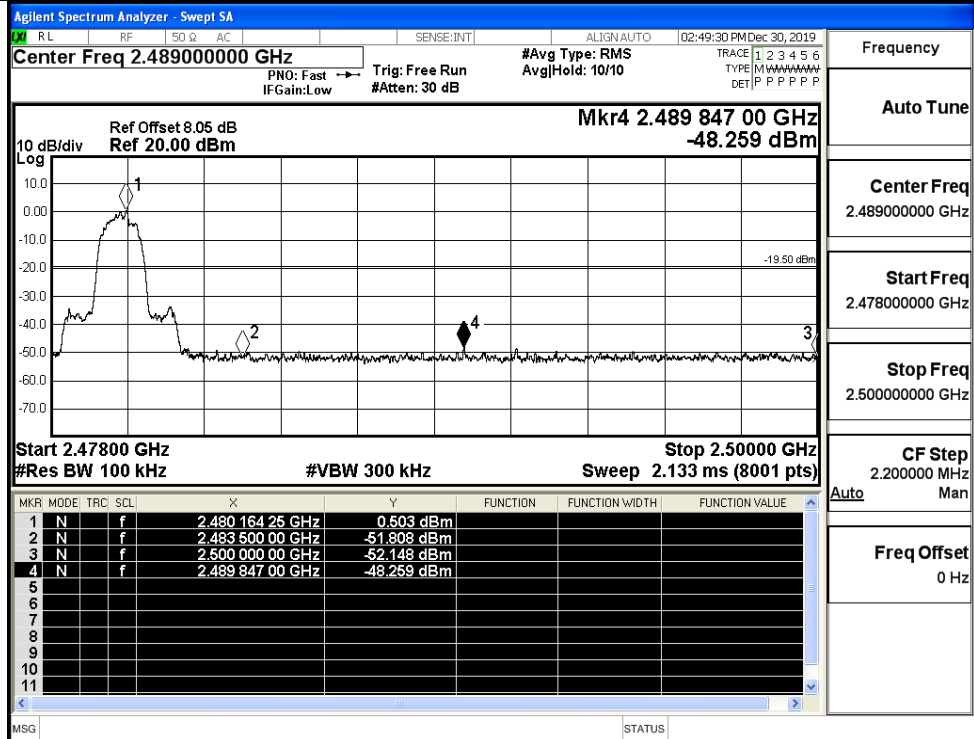
8DPSK/LCH/No Hop



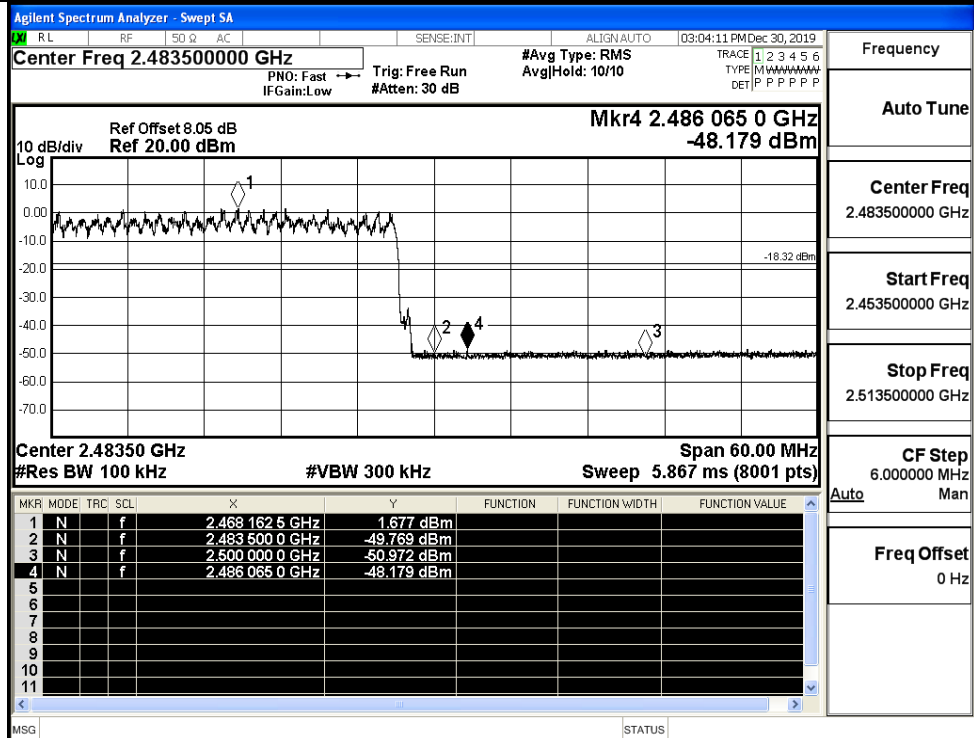
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



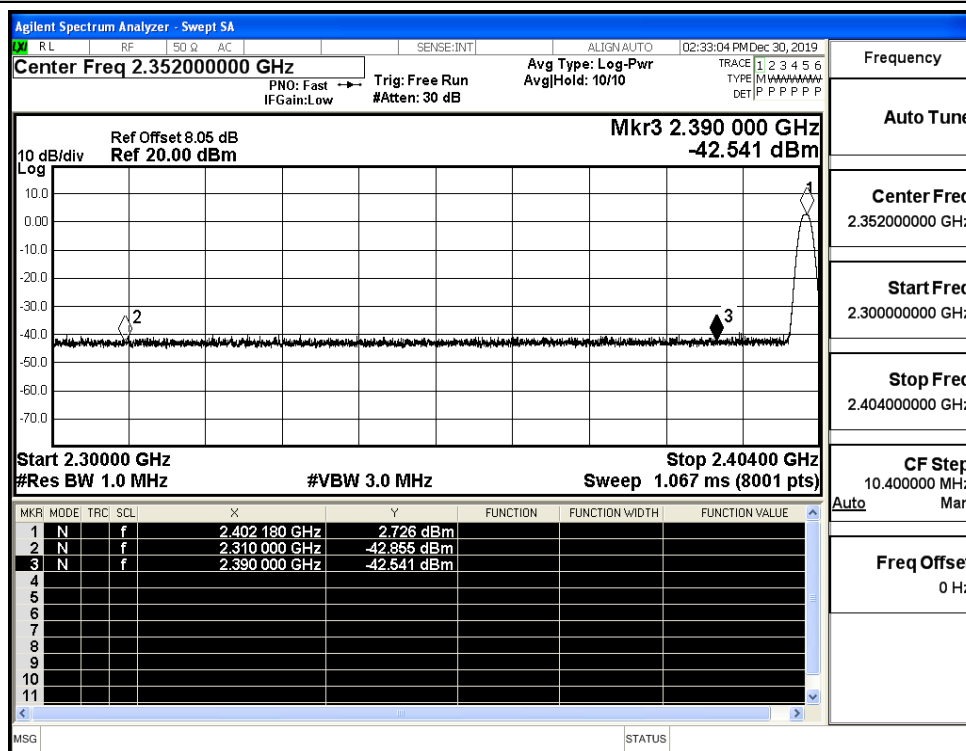
8DPSK/HCH/Hop



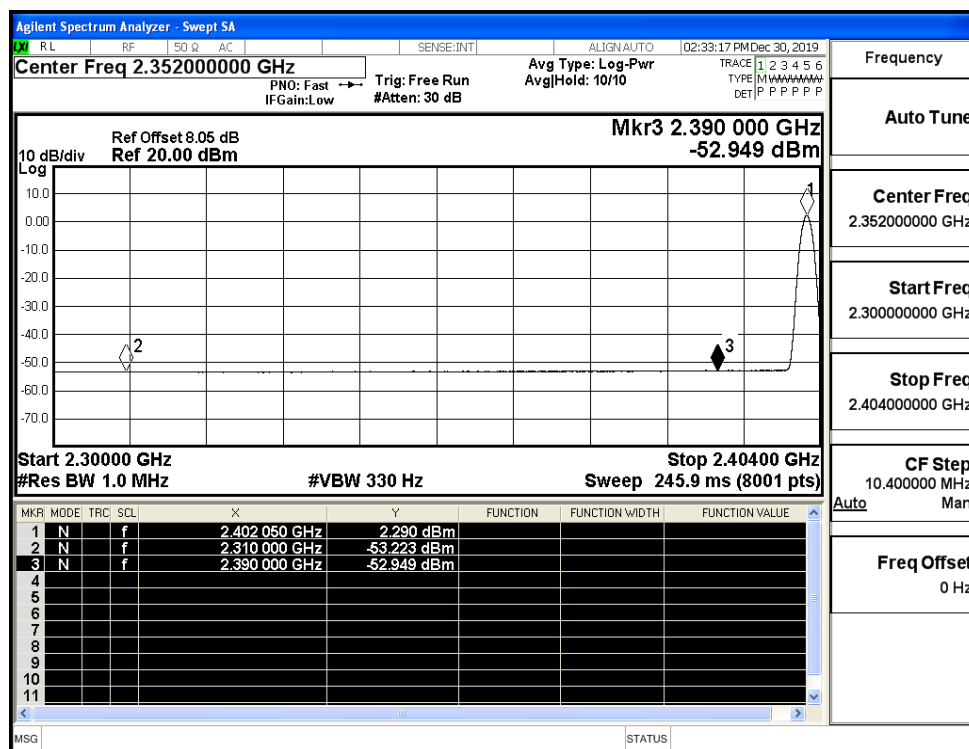
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.86	0	0	54.40	PEAK	74	PASS
	Off	2310.0	-53.22	0	0	44.03	AV	54	PASS
	Off	2390.0	-42.54	0	0	54.72	PEAK	74	PASS
	Off	2390.0	-52.95	0	0	44.31	AV	54	PASS
	Off	2483.5	-42.69	0	0	54.57	PEAK	74	PASS
	Off	2483.5	-52.46	0	0	44.79	AV	54	PASS
	Off	2500.0	-41.36	0	0	55.90	PEAK	74	PASS
	Off	2500.0	-52.35	0	0	44.90	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.34	0	0	54.92	PEAK	74	PASS
	Off	2310.0	-53.38	0	0	43.88	AV	54	PASS
	Off	2390.0	-40.48	0	0	56.77	PEAK	74	PASS
	Off	2390.0	-53.01	0	0	44.25	AV	54	PASS
	Off	2483.5	-41.10	0	0	56.16	PEAK	74	PASS
	Off	2483.5	-52.36	0	0	44.89	AV	54	PASS
	Off	2500.0	-40.58	0	0	56.68	PEAK	74	PASS
	Off	2500.0	-52.21	0	0	45.05	AV	54	PASS
8DPSK	Off	2310.0	-43.86	0	0	53.40	PEAK	74	PASS
	Off	2310.0	-53.32	0	0	43.94	AV	54	PASS
	Off	2390.0	-43.21	0	0	54.04	PEAK	74	PASS
	Off	2390.0	-52.93	0	0	44.32	AV	54	PASS
	Off	2483.5	-41.43	0	0	55.83	PEAK	74	PASS
	Off	2483.5	-52.44	0	0	44.82	AV	54	PASS
	Off	2500.0	-41.81	0	0	55.45	PEAK	74	PASS
	Off	2500.0	-52.32	0	0	44.94	AV	54	PASS

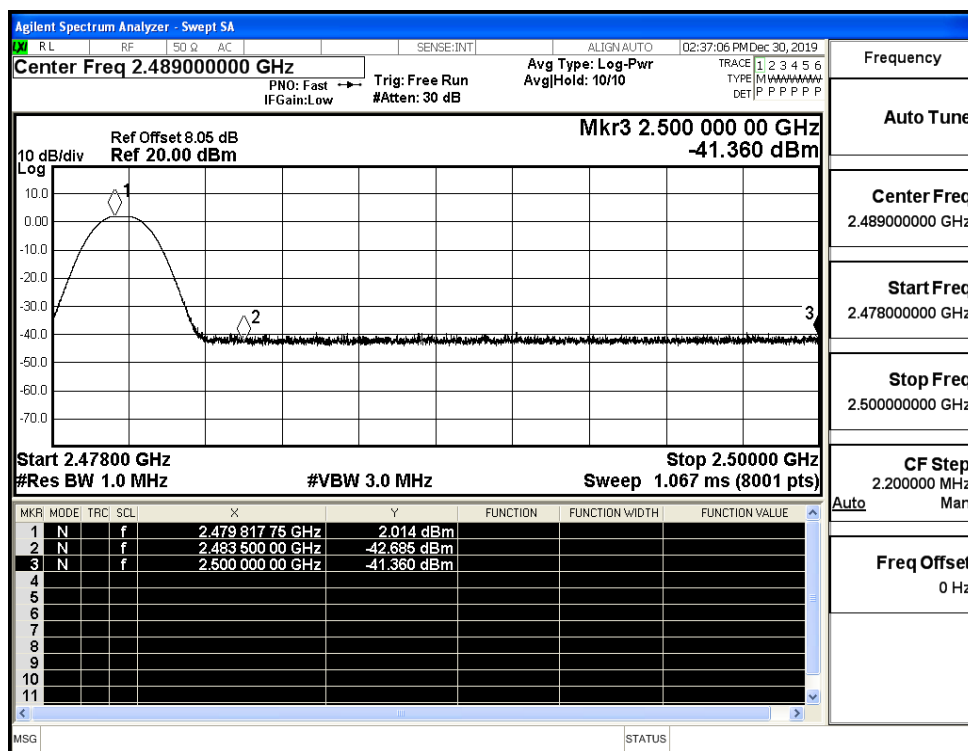
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



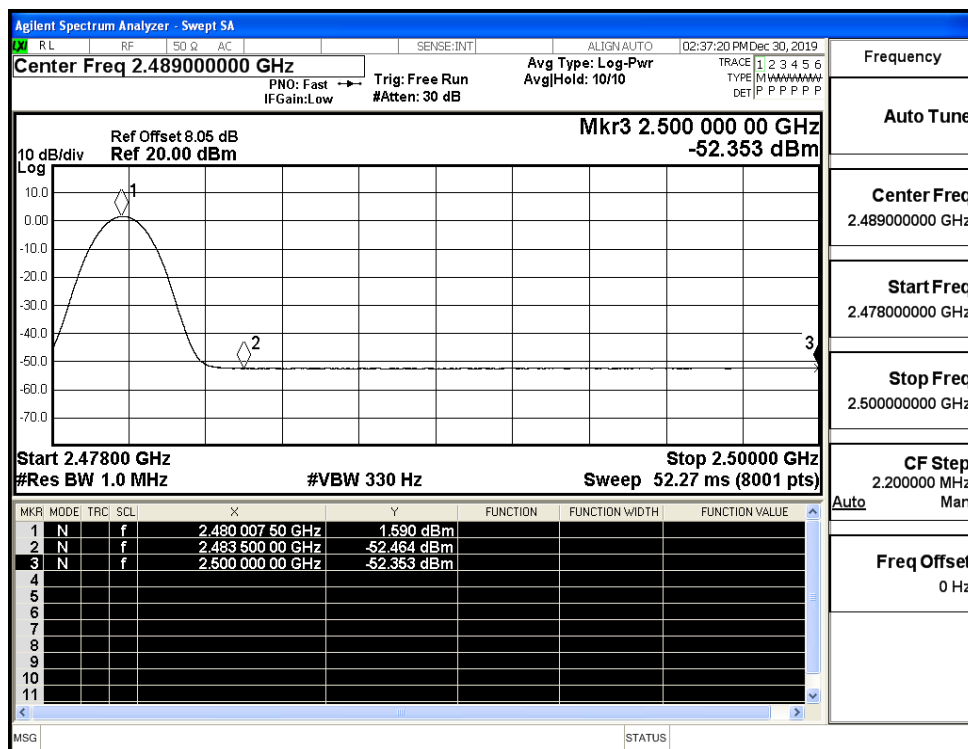
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

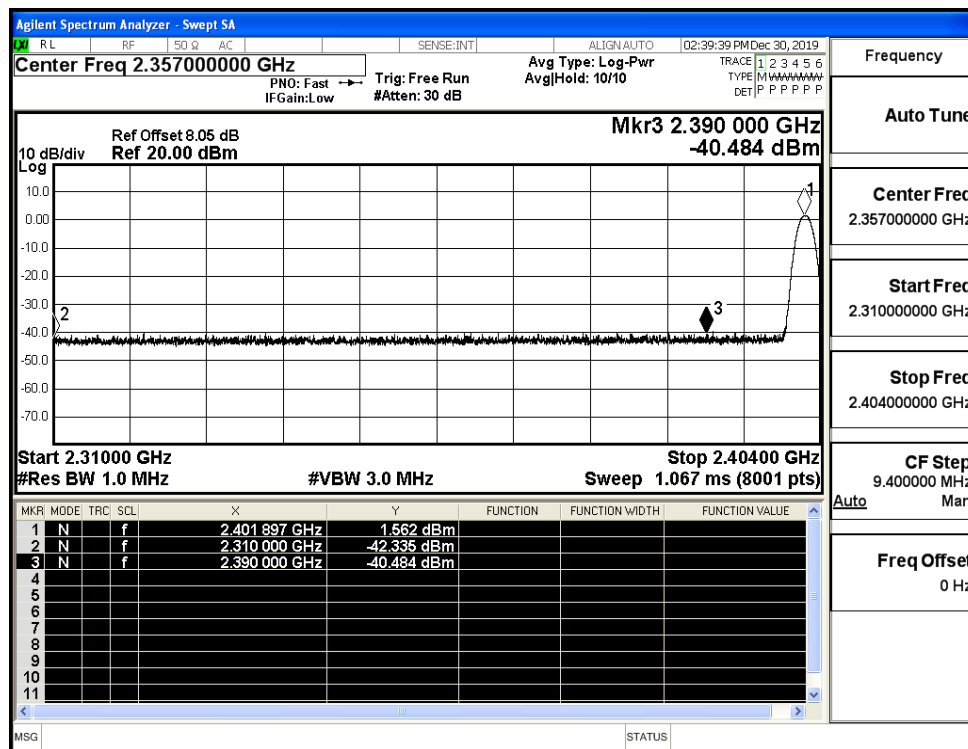
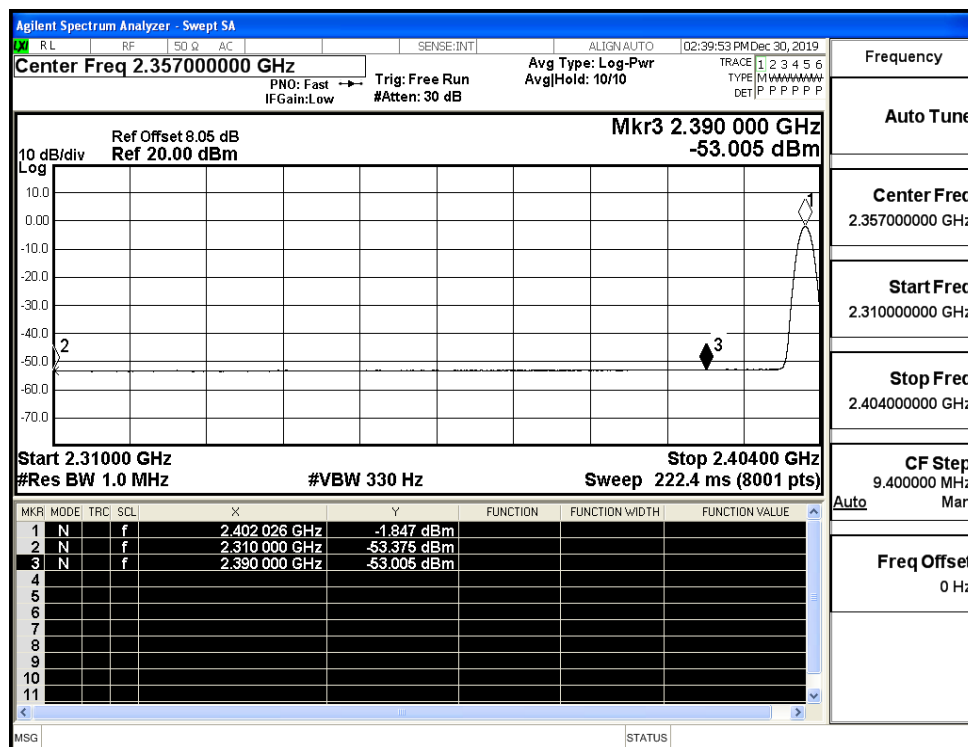


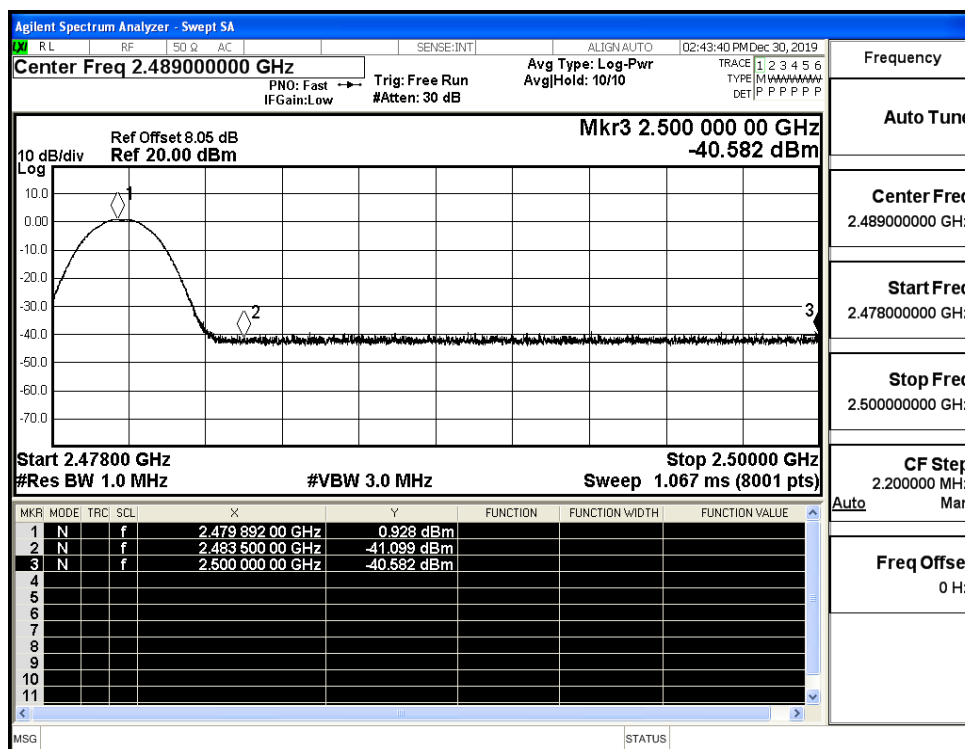
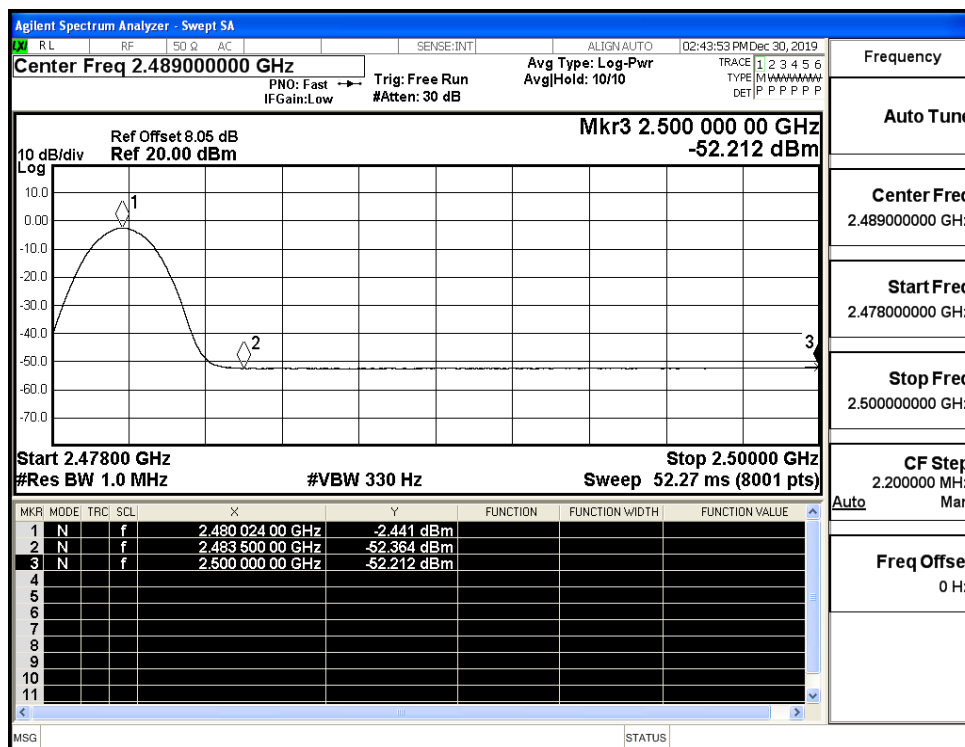
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



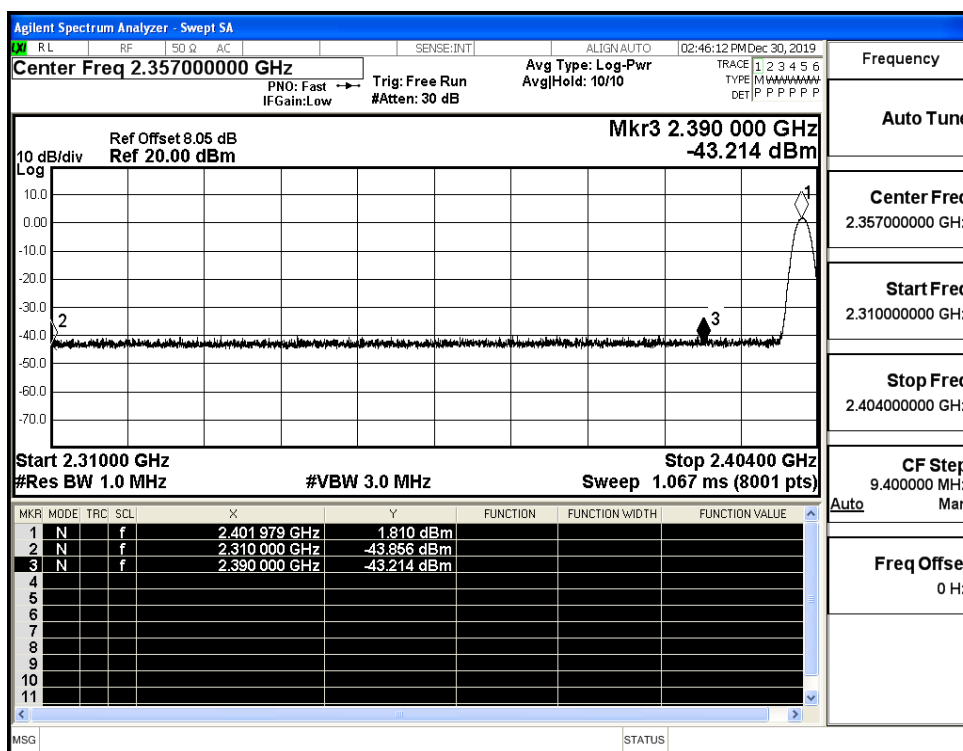
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



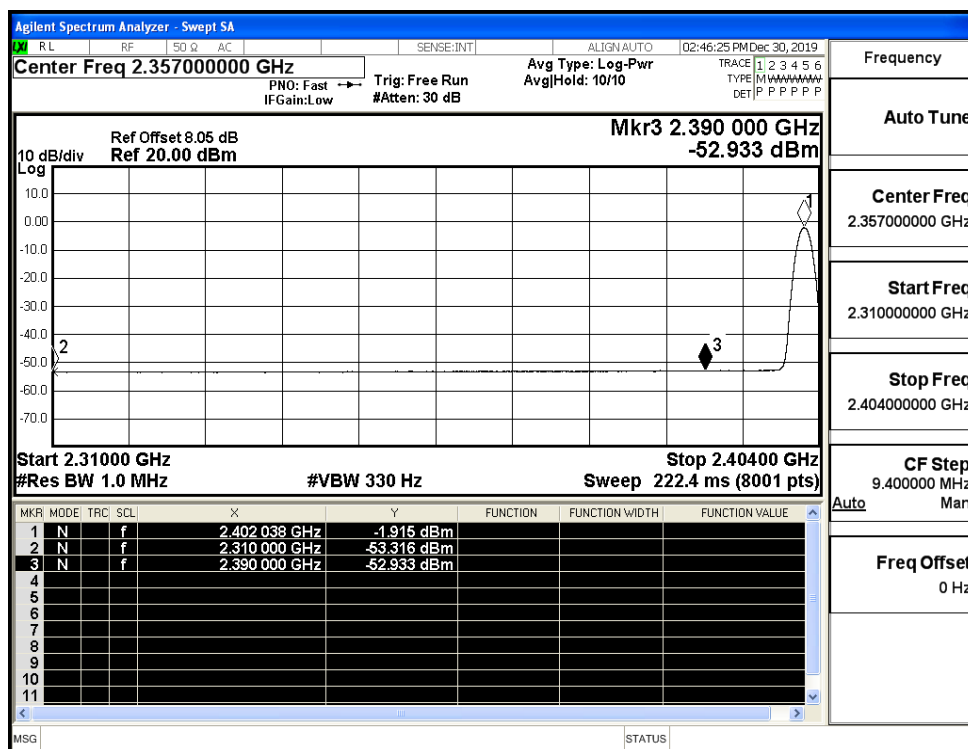
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

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)

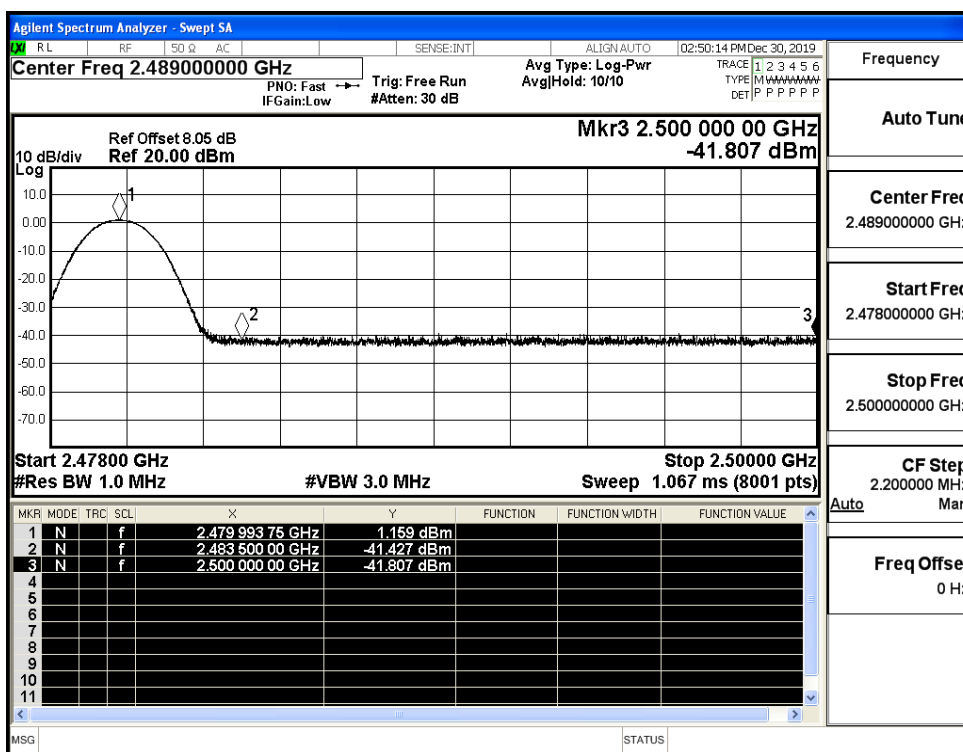
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

