

Appendix A

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

Product Name: WIRELESS EARBUDS

Trade Mark: iWorld

Test Model: FVBT1001-GRY

Environmental Conditions

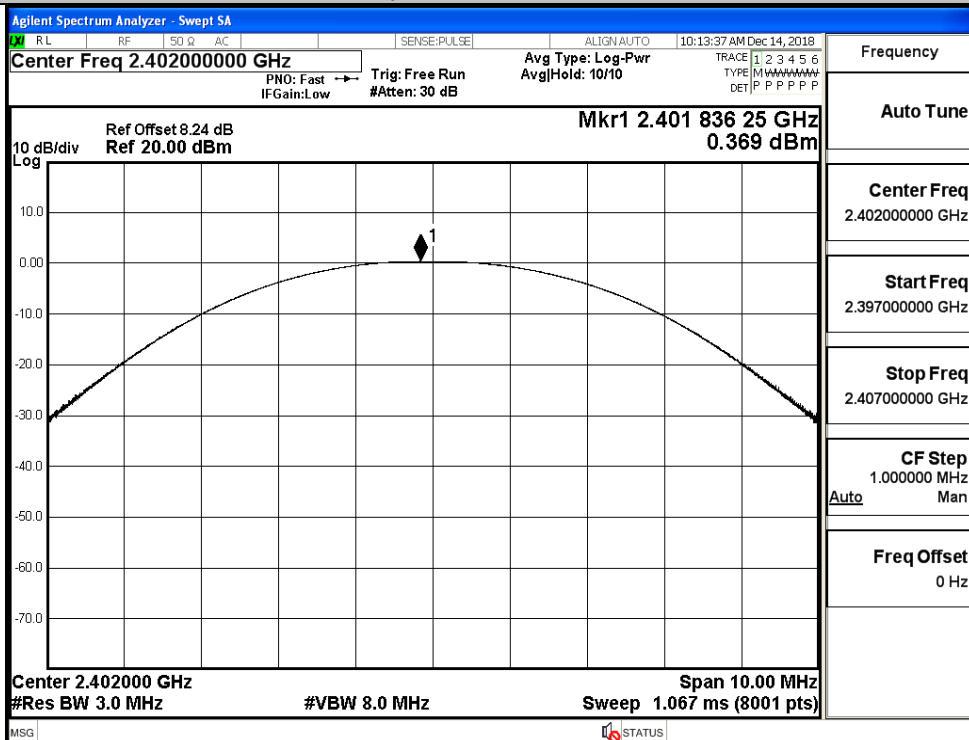
Temperature:	23.4 ° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Diamond Lu
Supervised by:	Jayden Zhuo

A.1 Maximum Conducted Peak Output Power

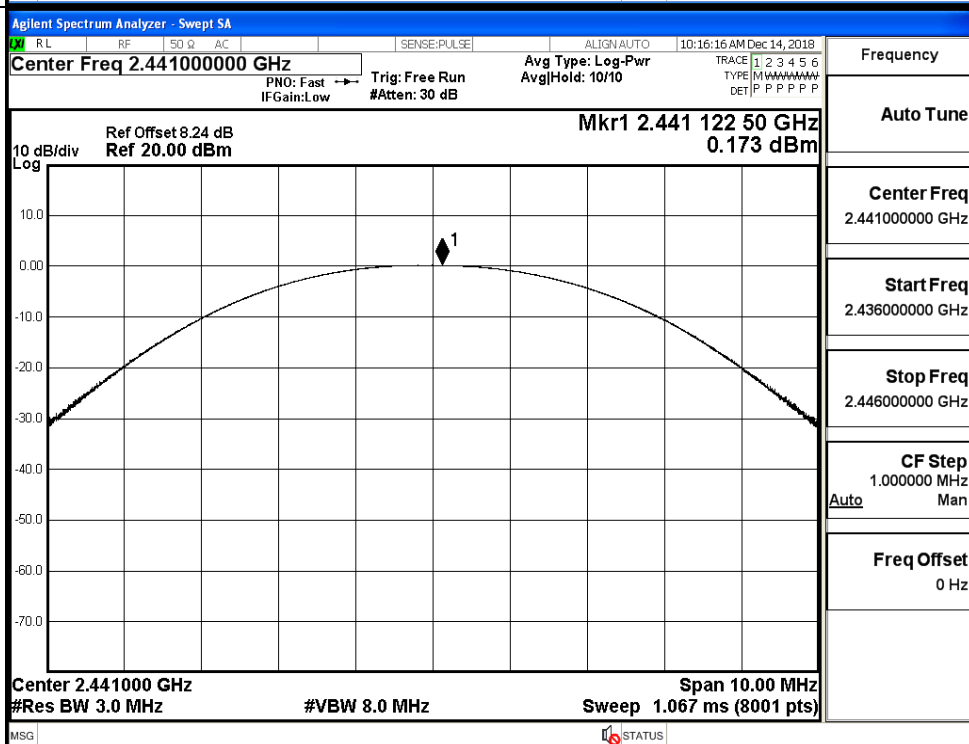
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.369	21	PASS
	MCH	0.173	21	PASS
	HCH	-0.559	21	PASS
$\pi/4$ DQPSK	LCH	-0.179	21	PASS
	MCH	-1.197	21	PASS
	HCH	-1.085	21	PASS

Test Graphs

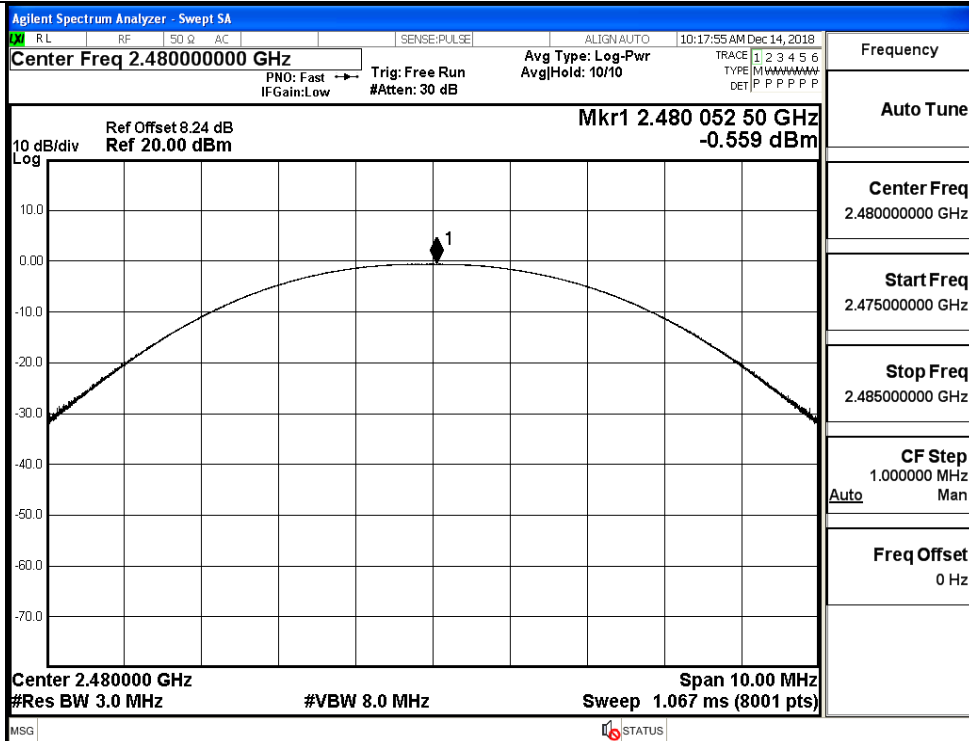
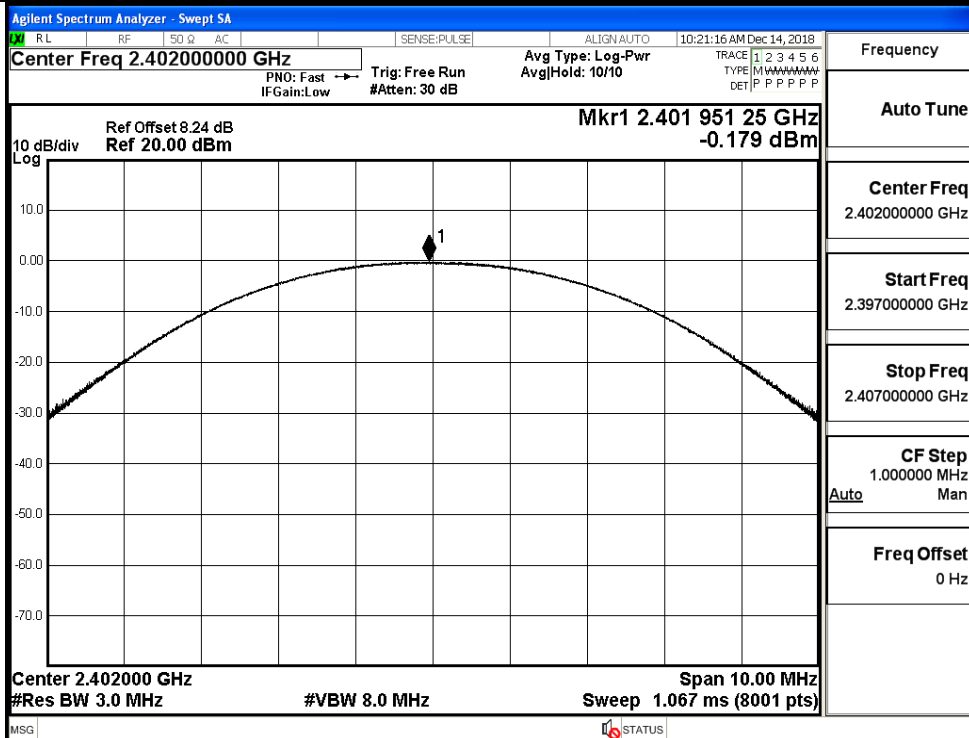
GFSK/LCH

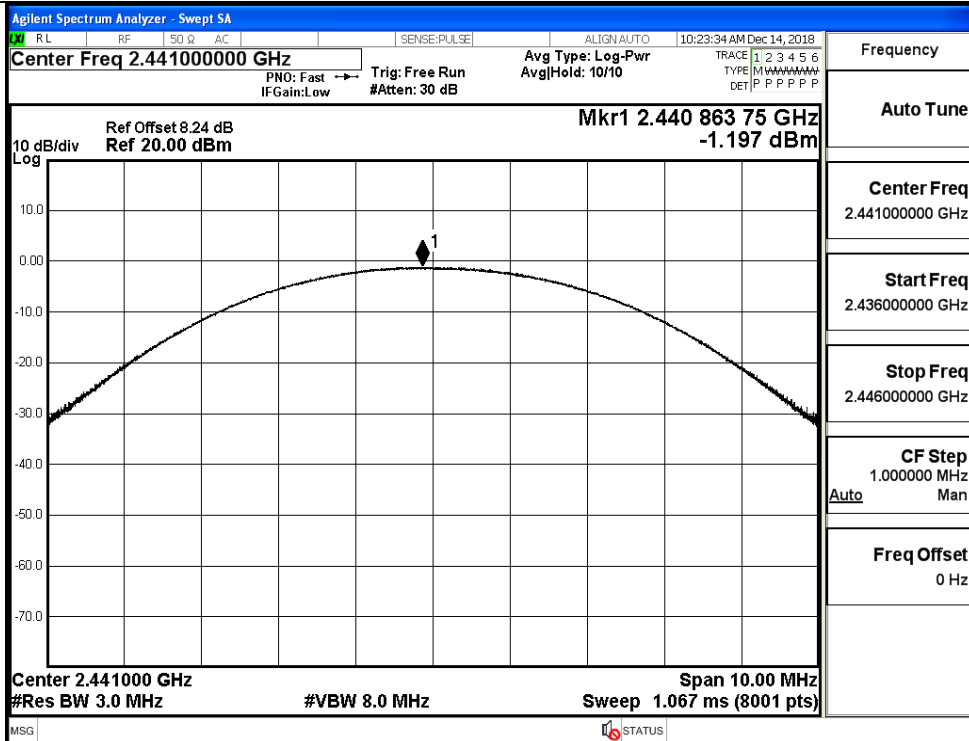
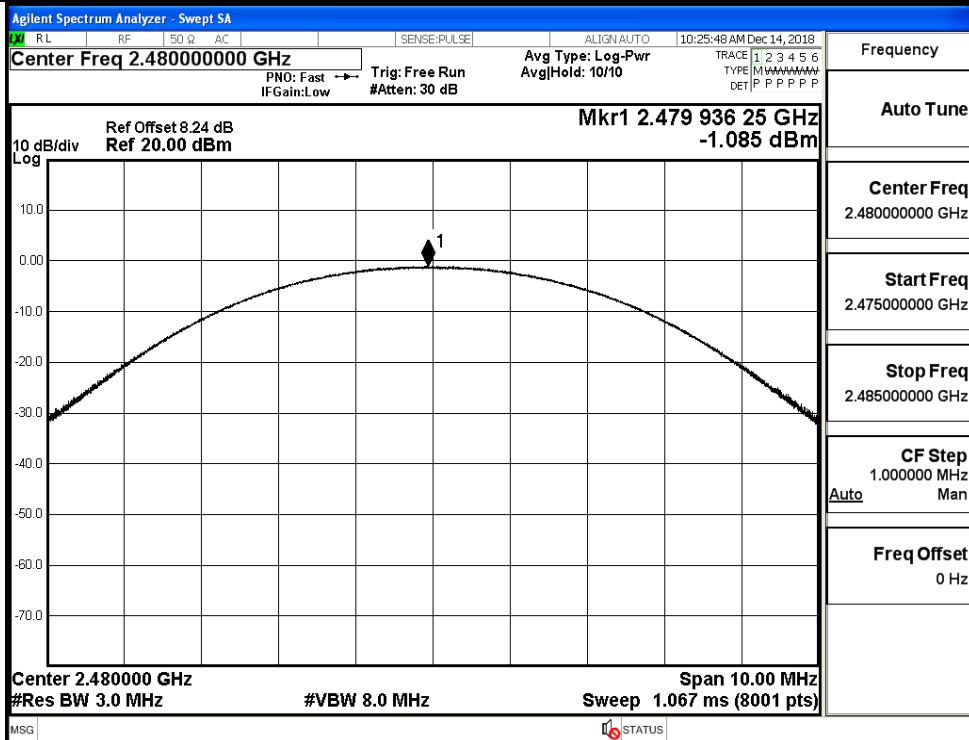


GFSK/MCH



GFSK/HCH

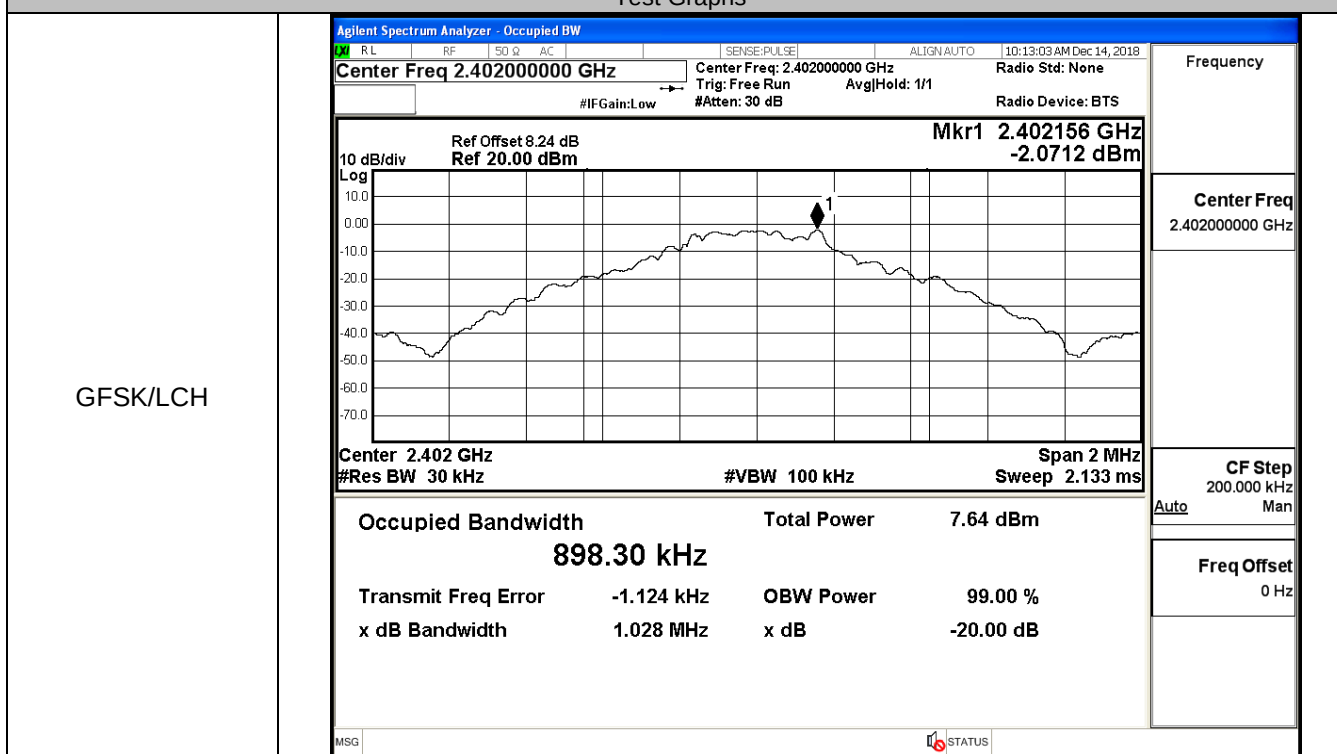
 $\pi/4$ DQPSK/LCH

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

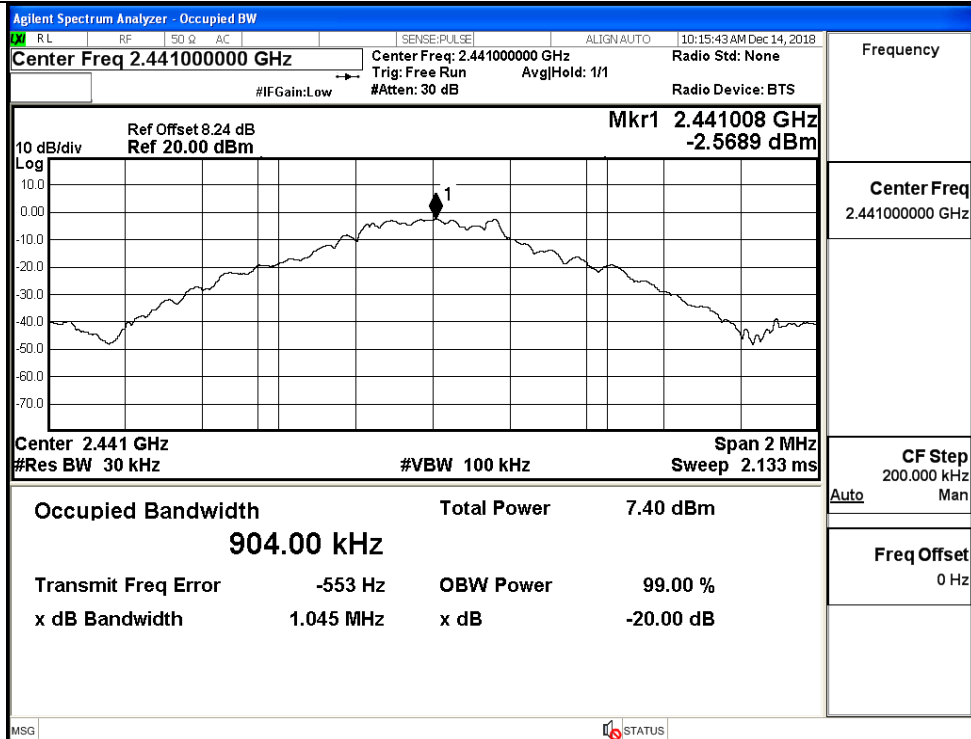
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89830	1.028	Not Specified	PASS
	MCH	0.90400	1.045	Not Specified	PASS
	HCH	0.89840	1.039	Not Specified	PASS
π /4DQPSK	LCH	1.1695	1.290	Not Specified	PASS
	MCH	1.1673	1.286	Not Specified	PASS
	HCH	1.1701	1.290	Not Specified	PASS

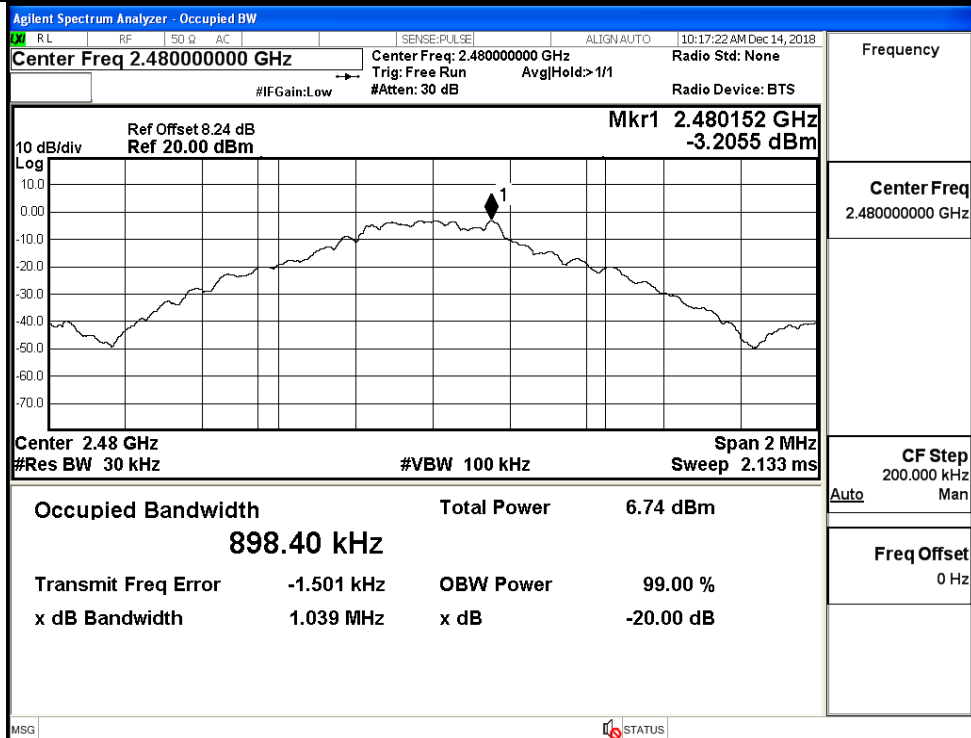
Test Graphs

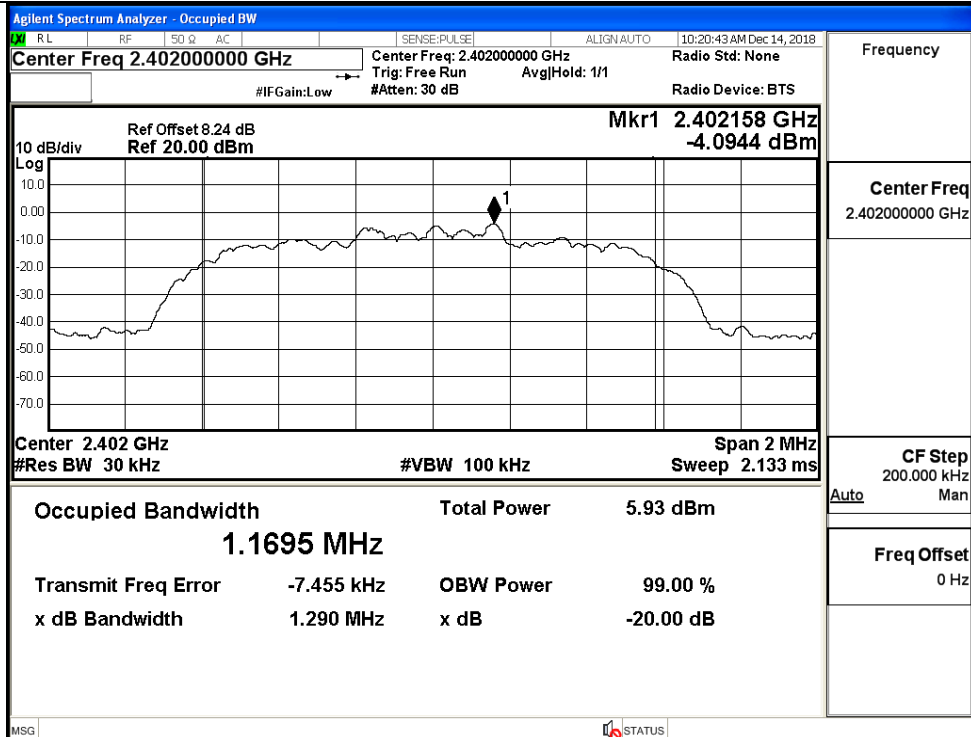
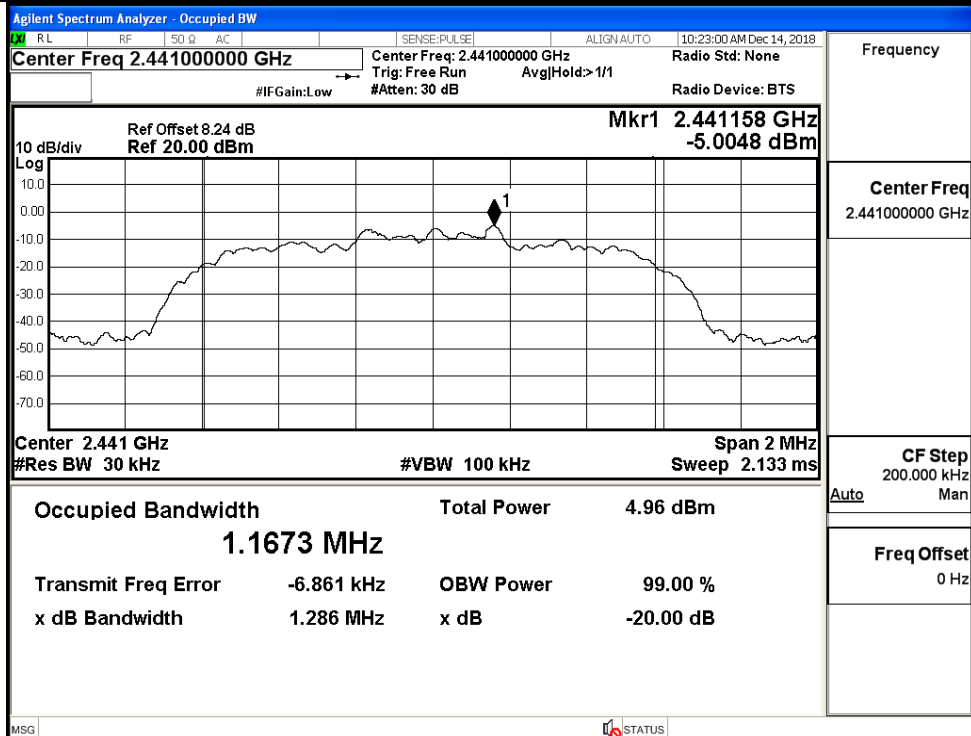


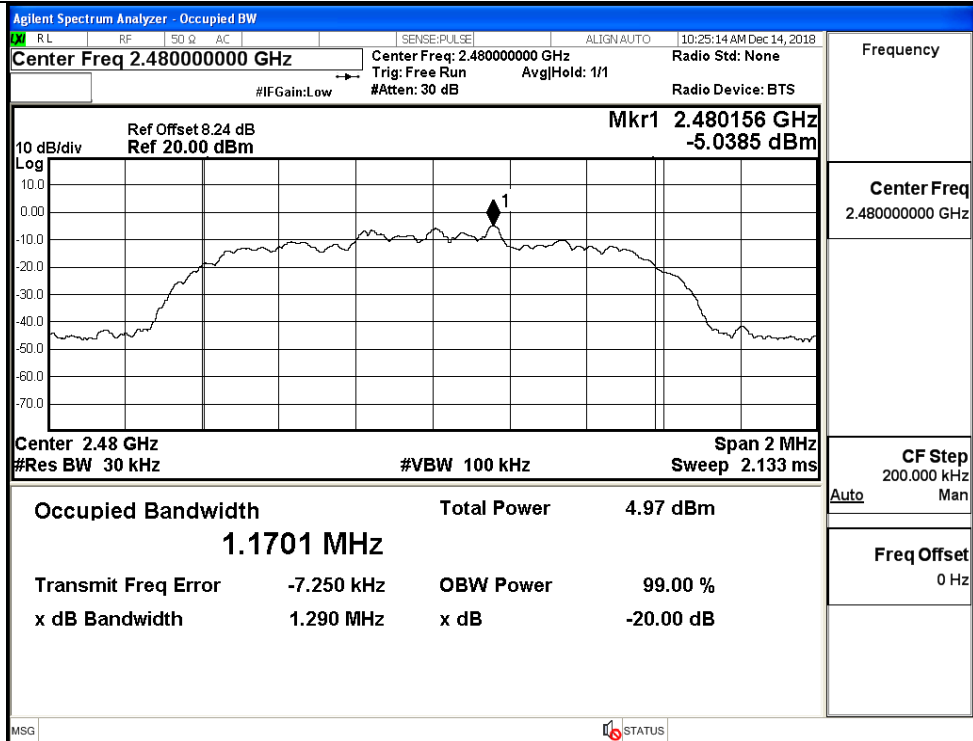
GFSK/MCH



GFSK/HCH

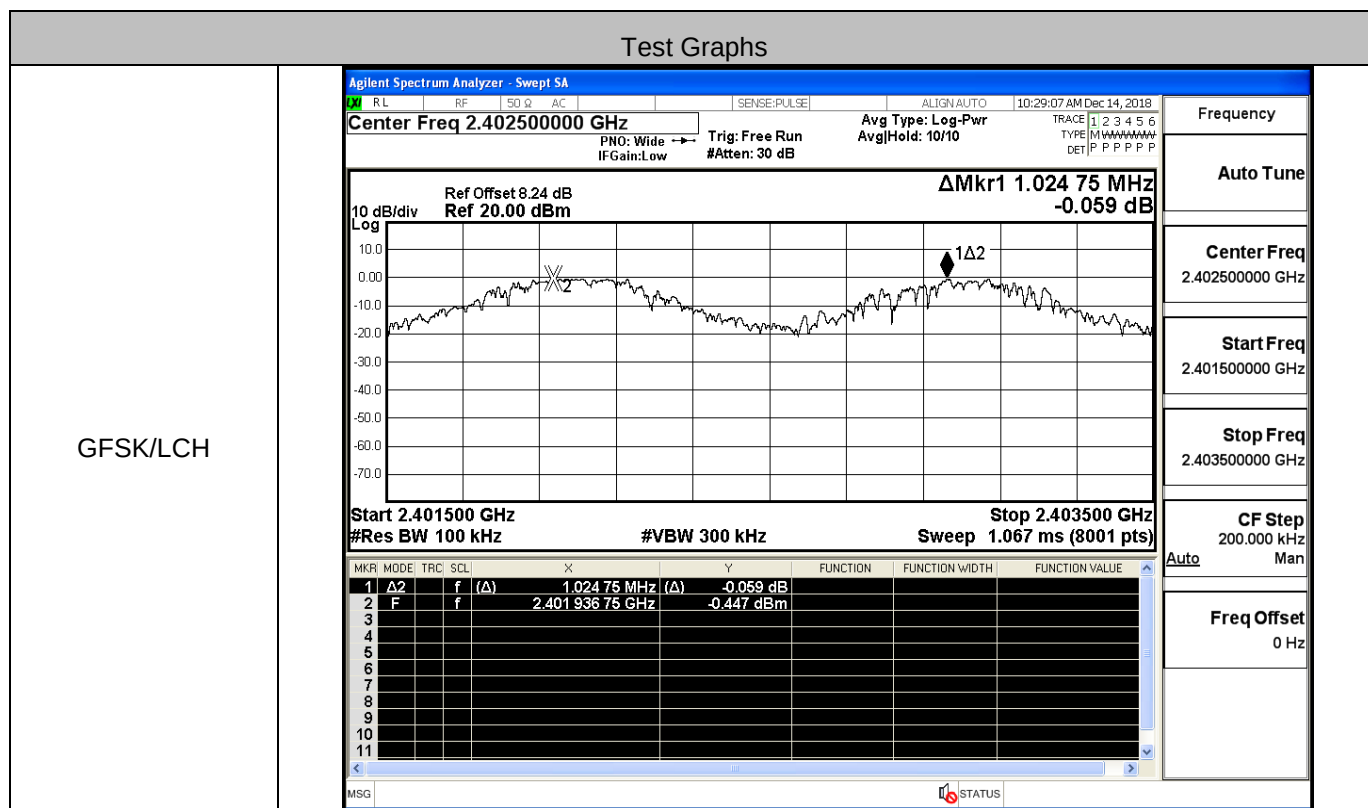


$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

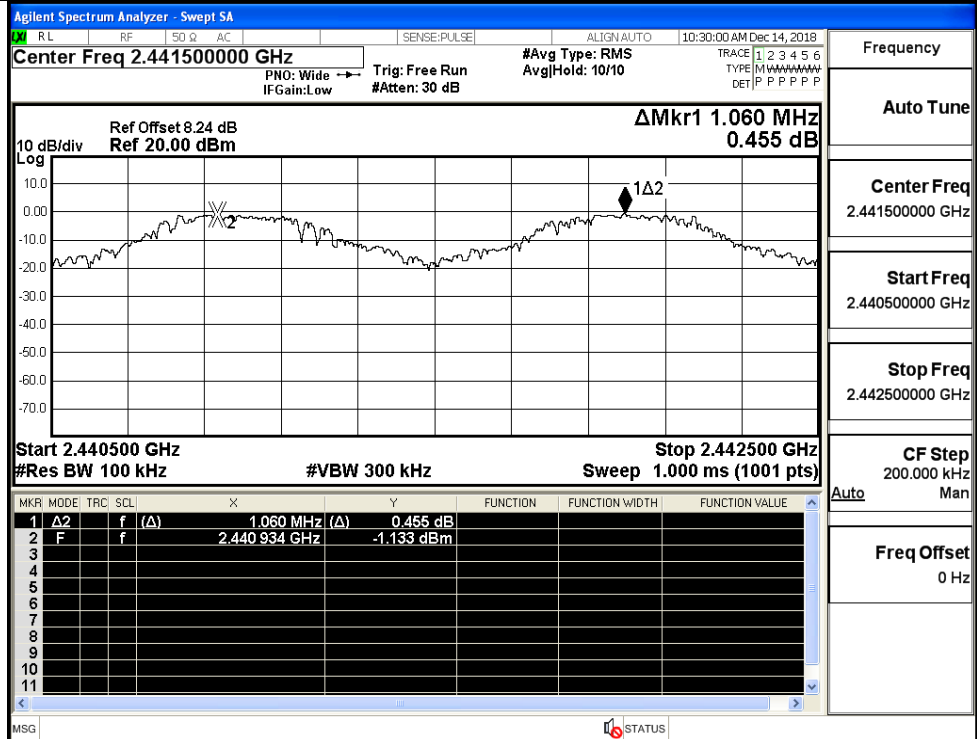
$\pi/4$ DQPSK/HCH

A.3 Carrier Frequency Separation

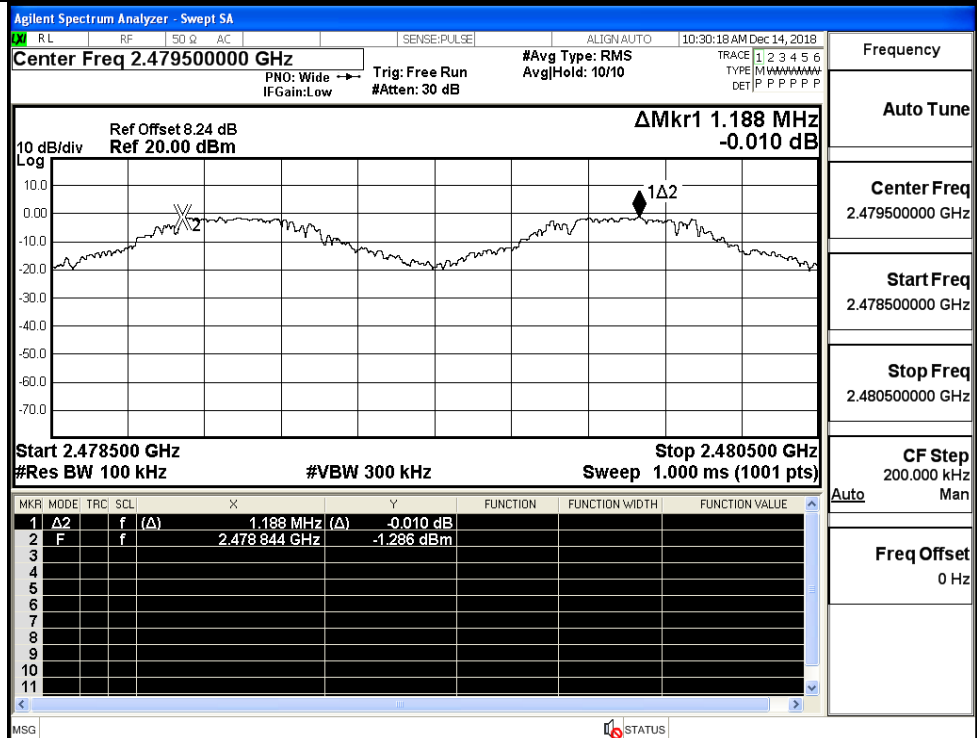
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.025	0.697	PASS
	MCH	1.060	0.697	PASS
	HCH	1.188	0.697	PASS
π /4DQPSK	LCH	0.880	0.860	PASS
	MCH	0.982	0.860	PASS
	HCH	0.878	0.860	PASS

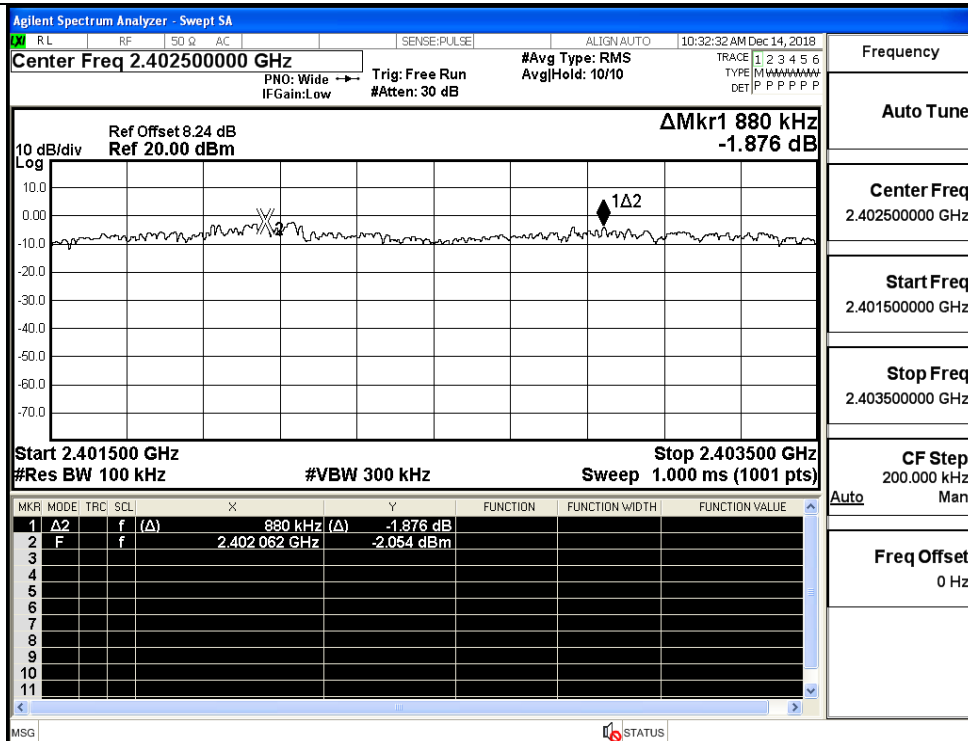
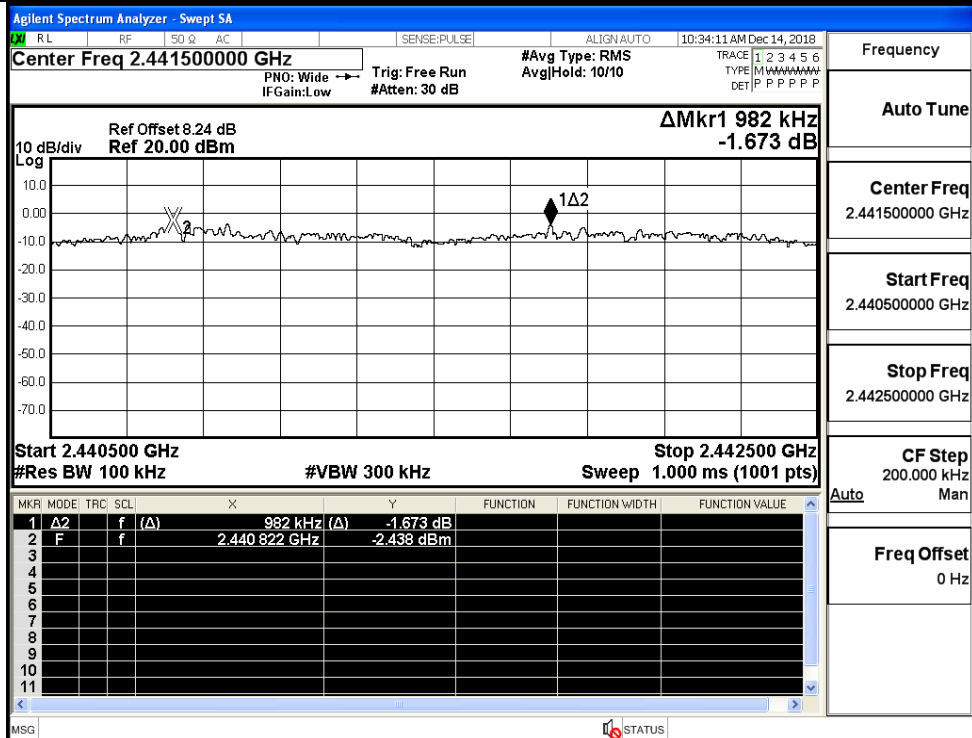


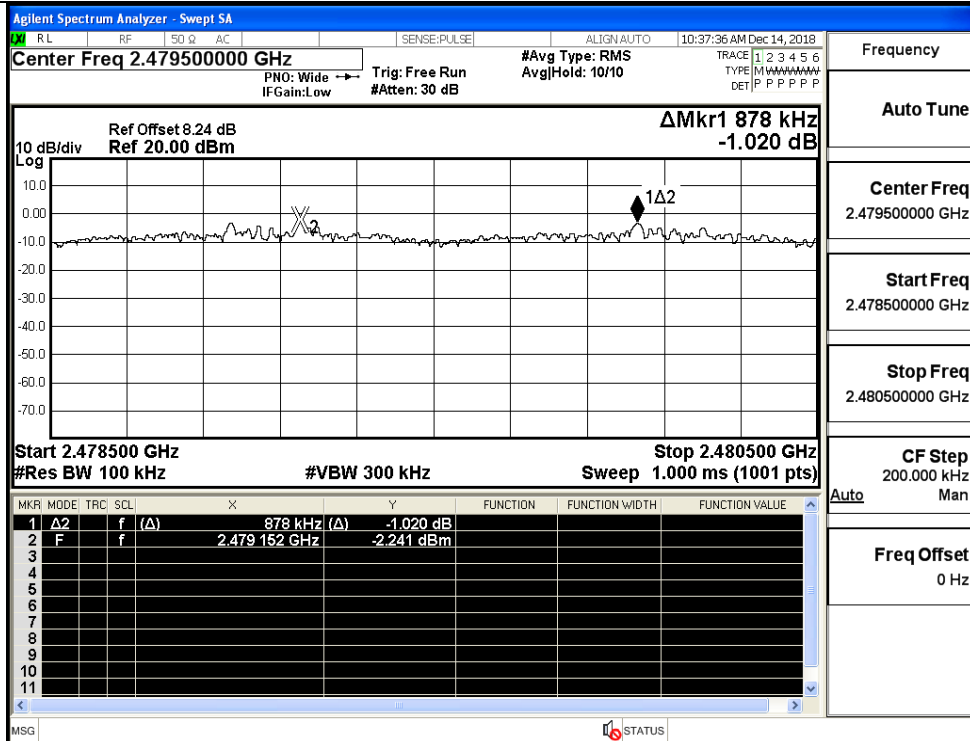
GFSK/MCH



GFSK/HCH



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

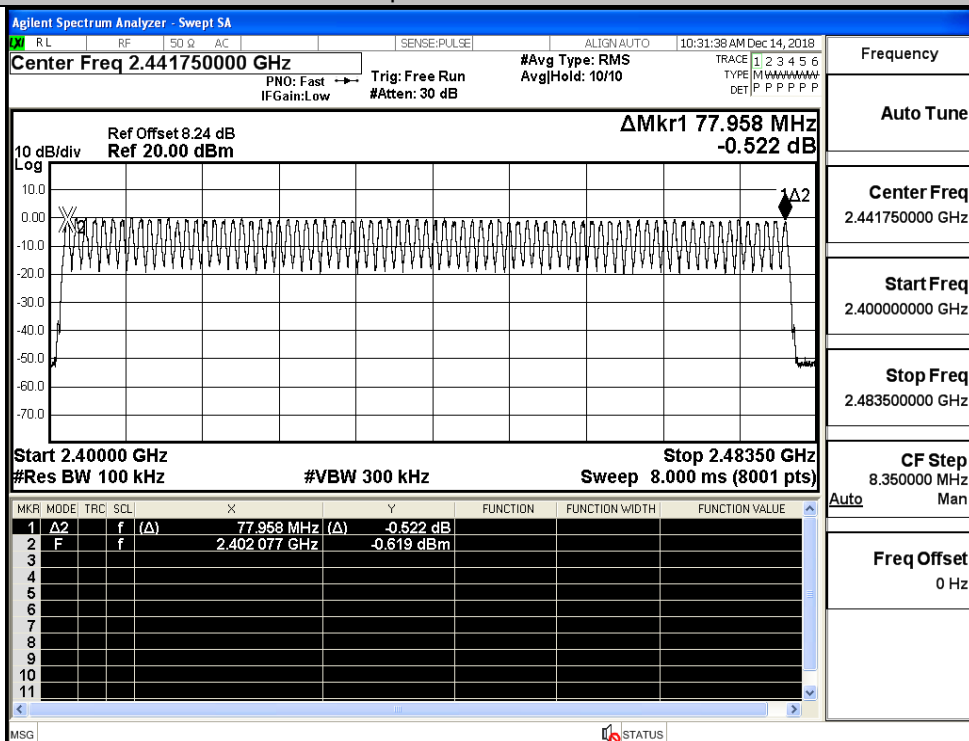
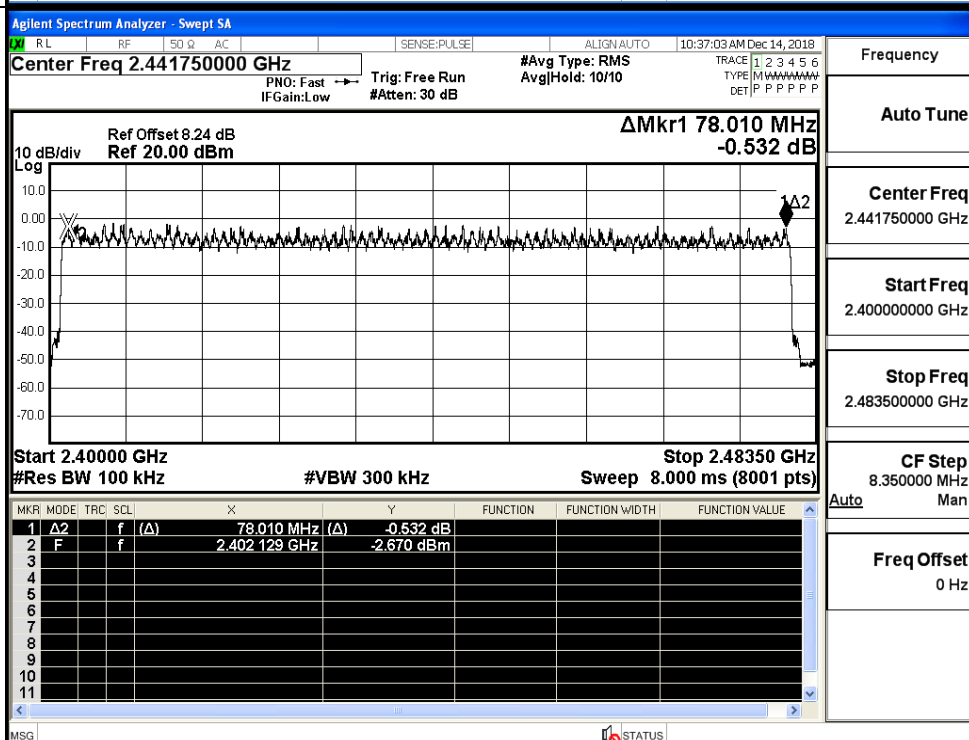
$\pi/4$ DQPSK/HCH

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

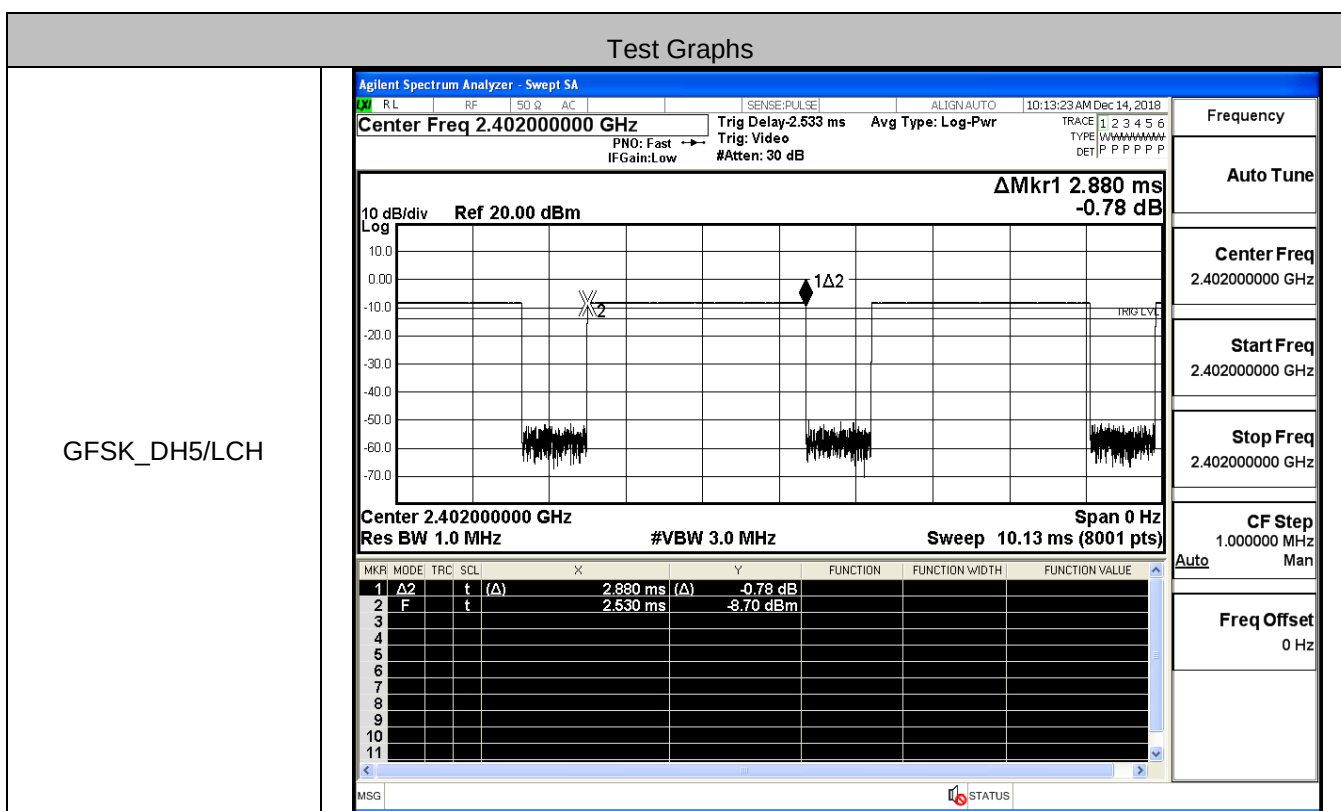
Test Graphs

GFSK/Hop

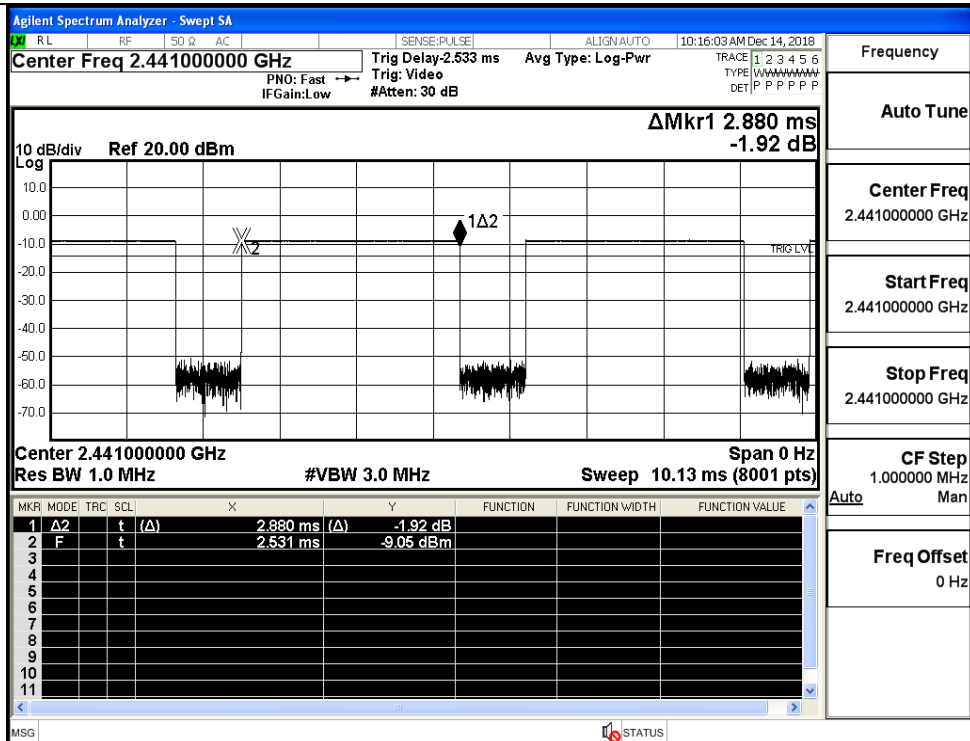
 $\pi/4$ DQPSK/Hop

A.5 Dwell Time

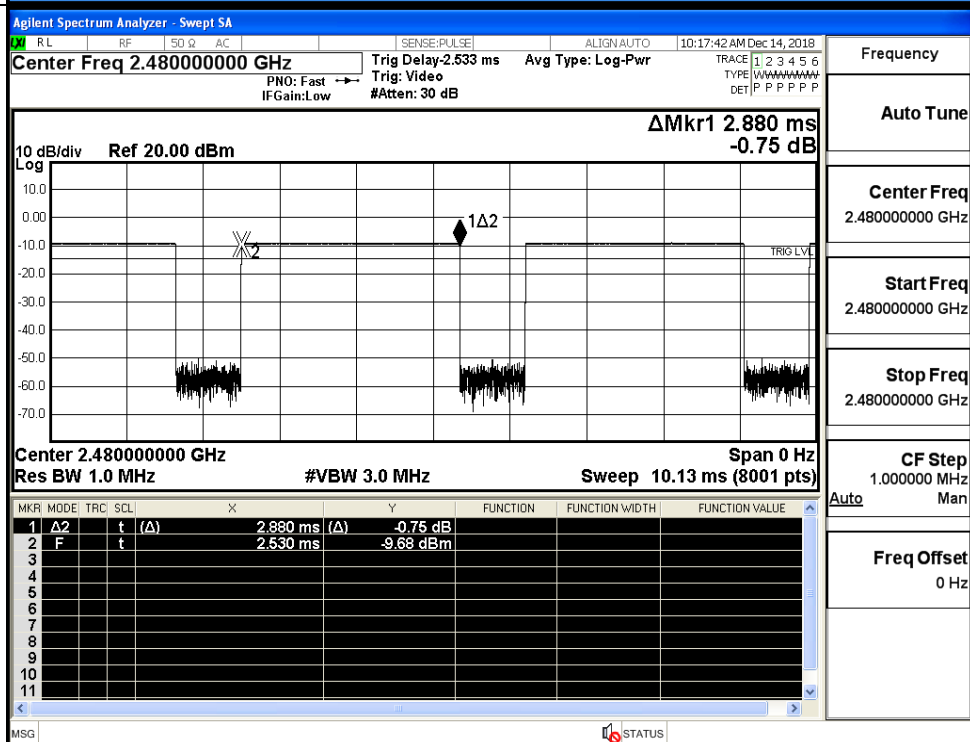
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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



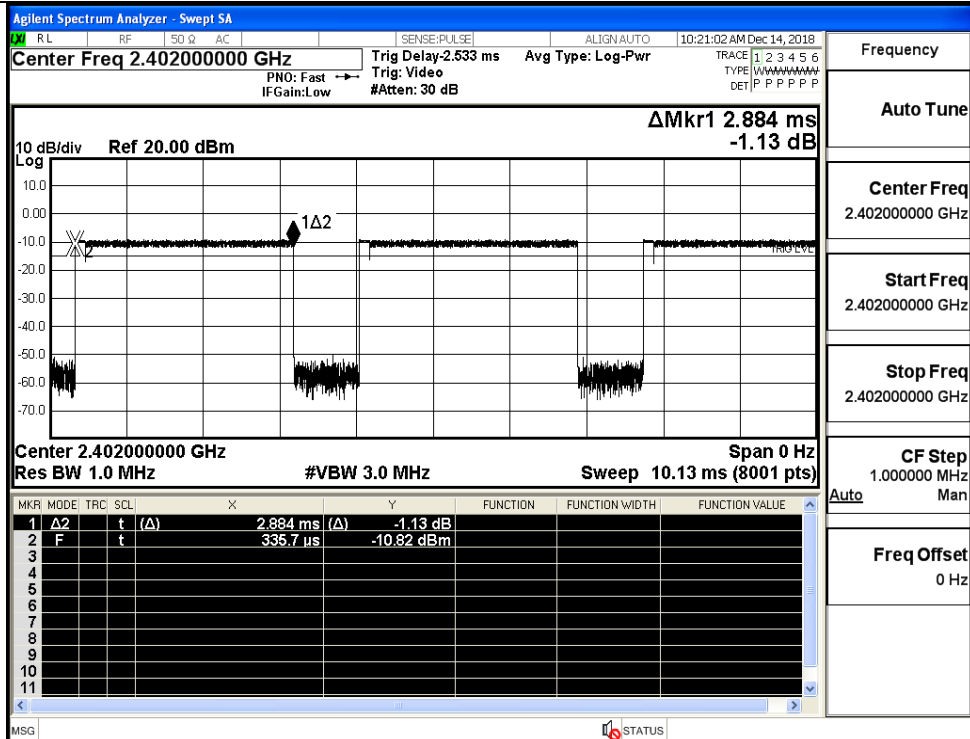
GFSK_DH5/MCH



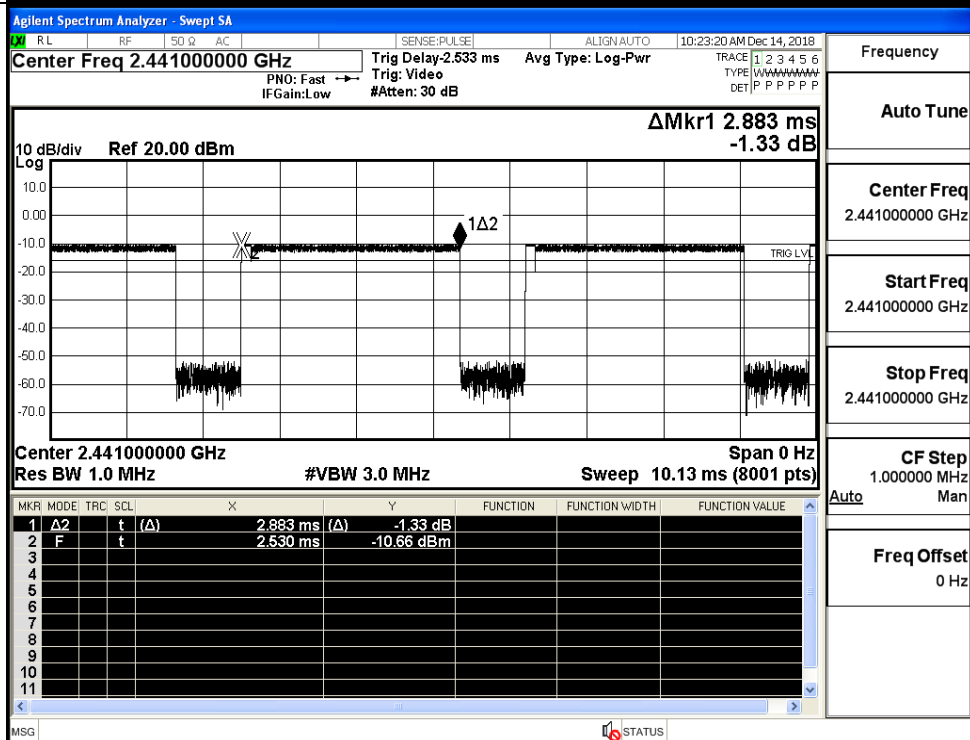
GFSK_DH5/HCH



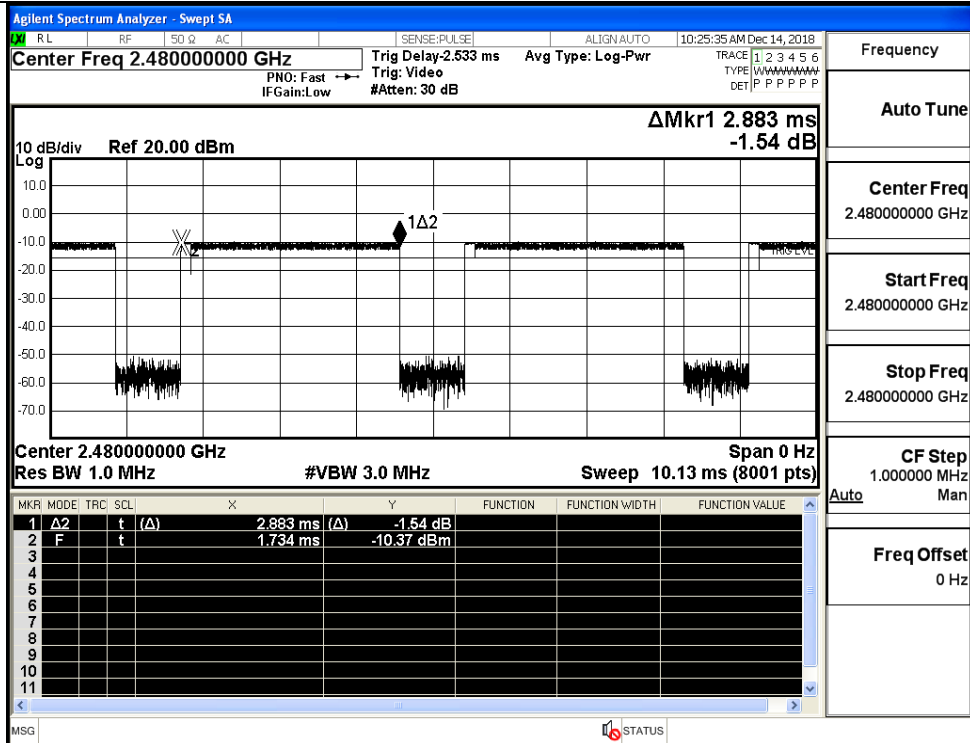
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



$\pi/4$ DQPSK
_2DH5/HCH

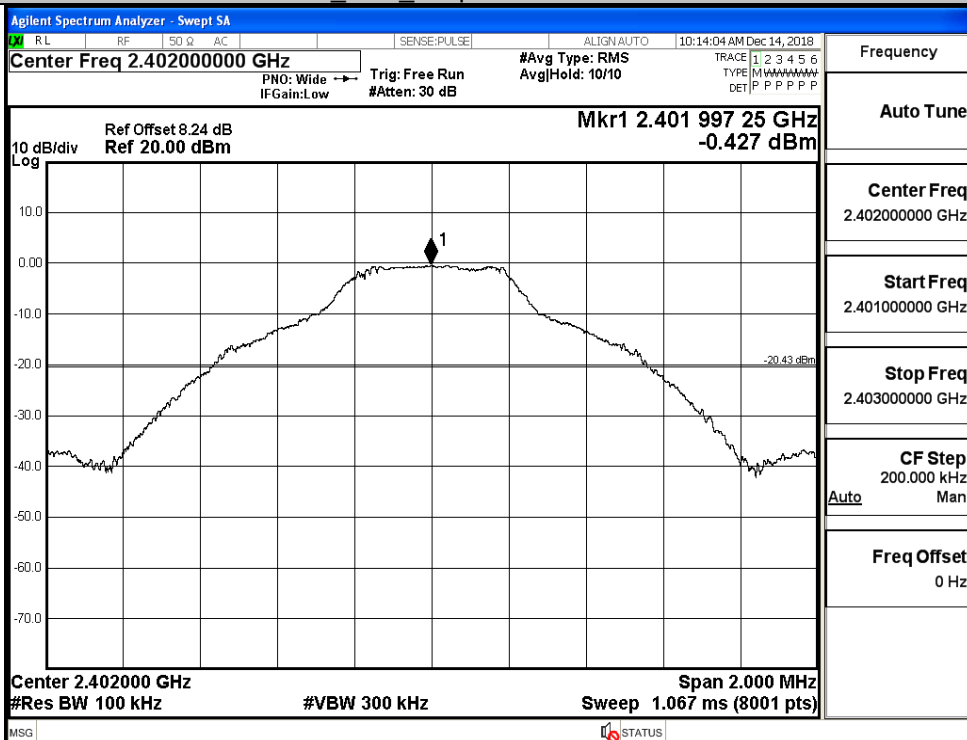


A.6 RF Conducted Spurious Emissions

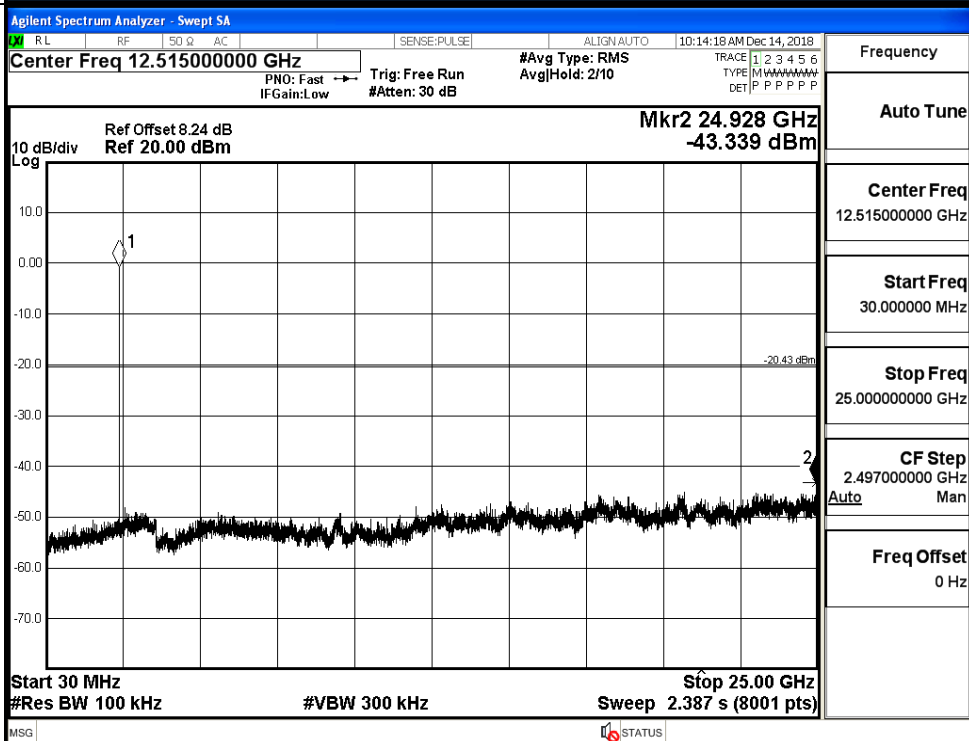
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.427	-43.339	-20.427	PASS
	MCH	-0.616	-43.848	-20.616	PASS
	HCH	-0.948	-44.957	-20.948	PASS
$\pi/4$ DQPSK	LCH	-1.697	-44.536	-21.697	PASS
	MCH	-2.23	-44.441	-22.230	PASS
	HCH	-2.196	-44.968	-22.196	PASS

GFSK LCH Graphs

Pref

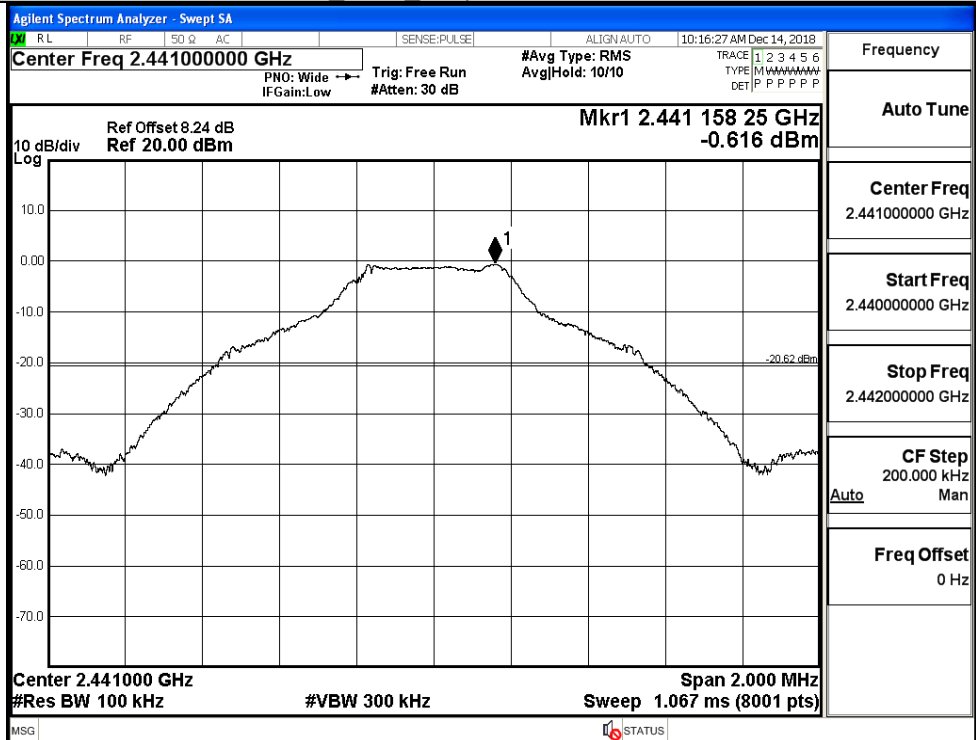


Puw

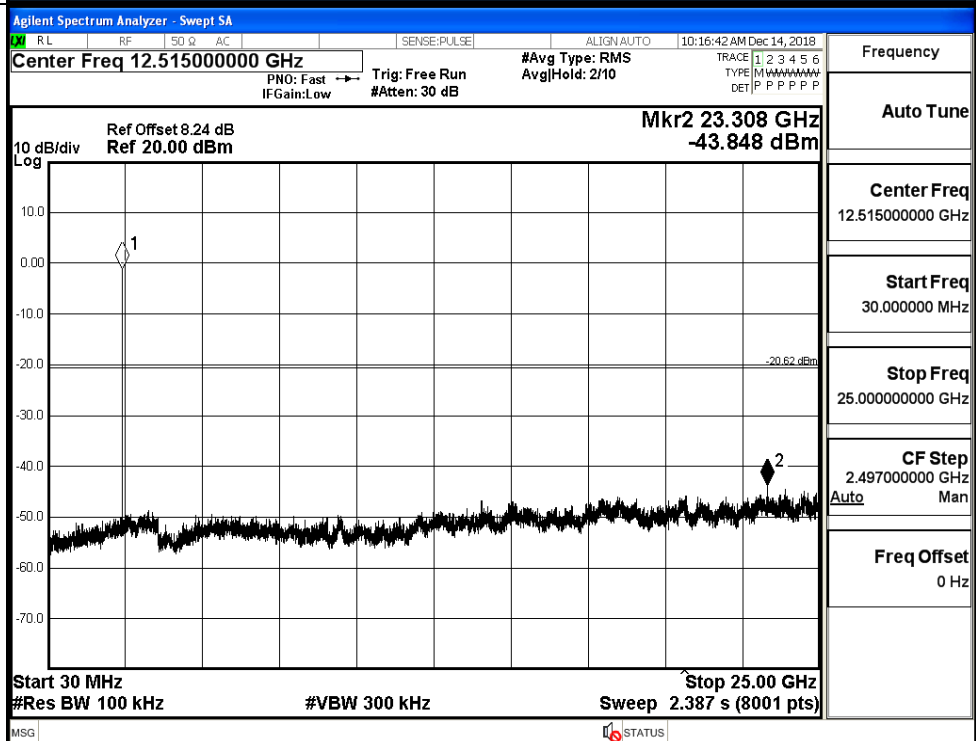


GFSK_MCH_Graphs

Pref

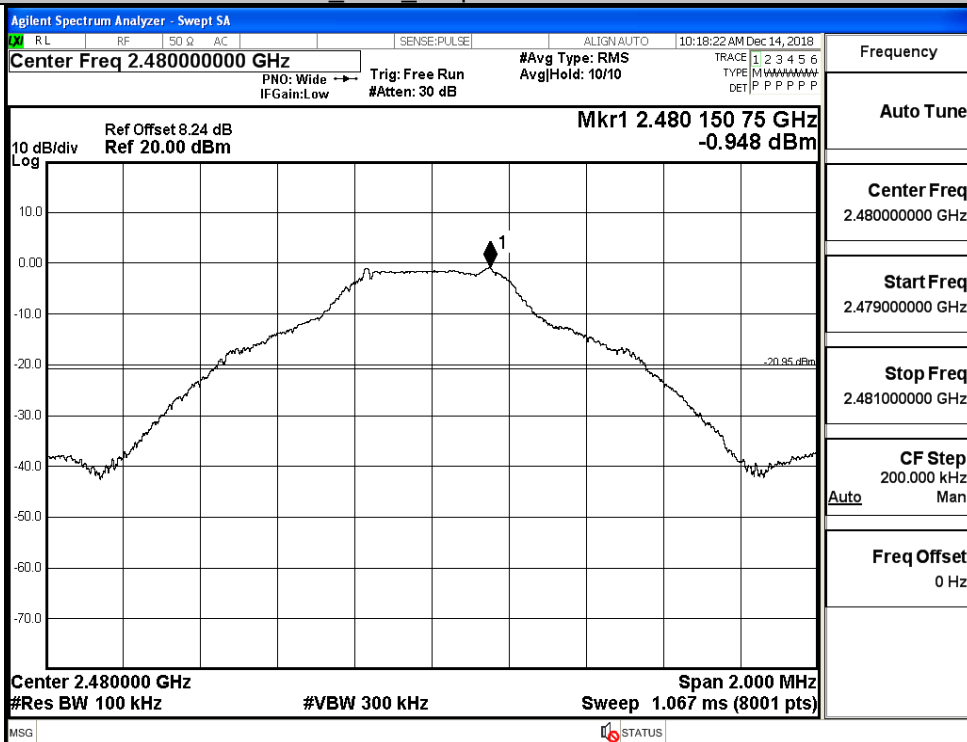


Puw

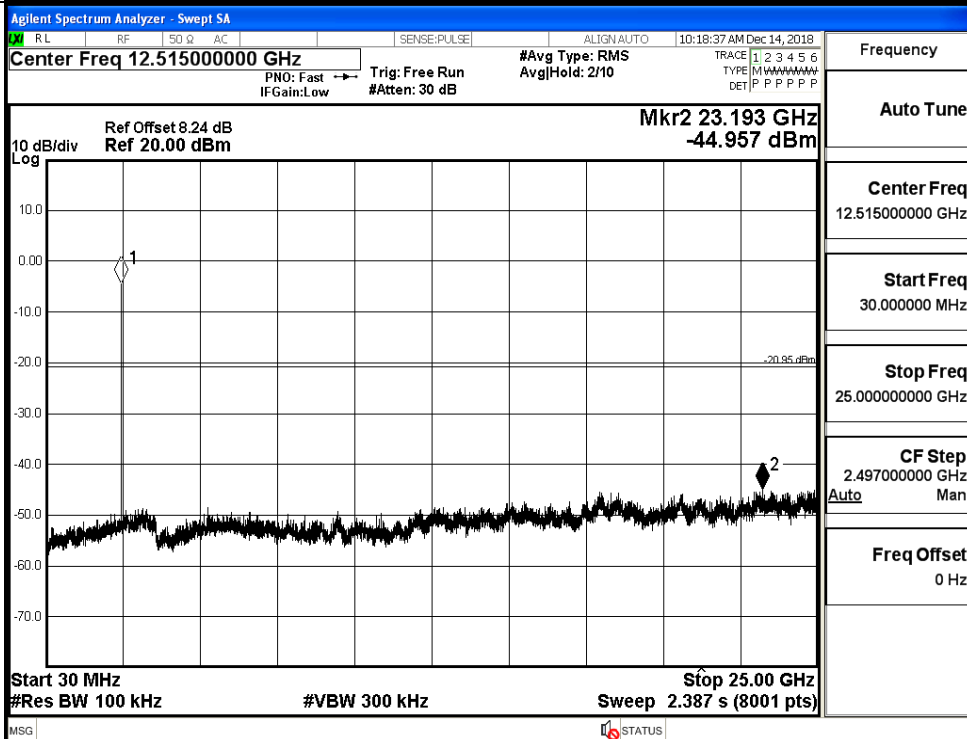


GFSK_HCH_Graphs

Pref

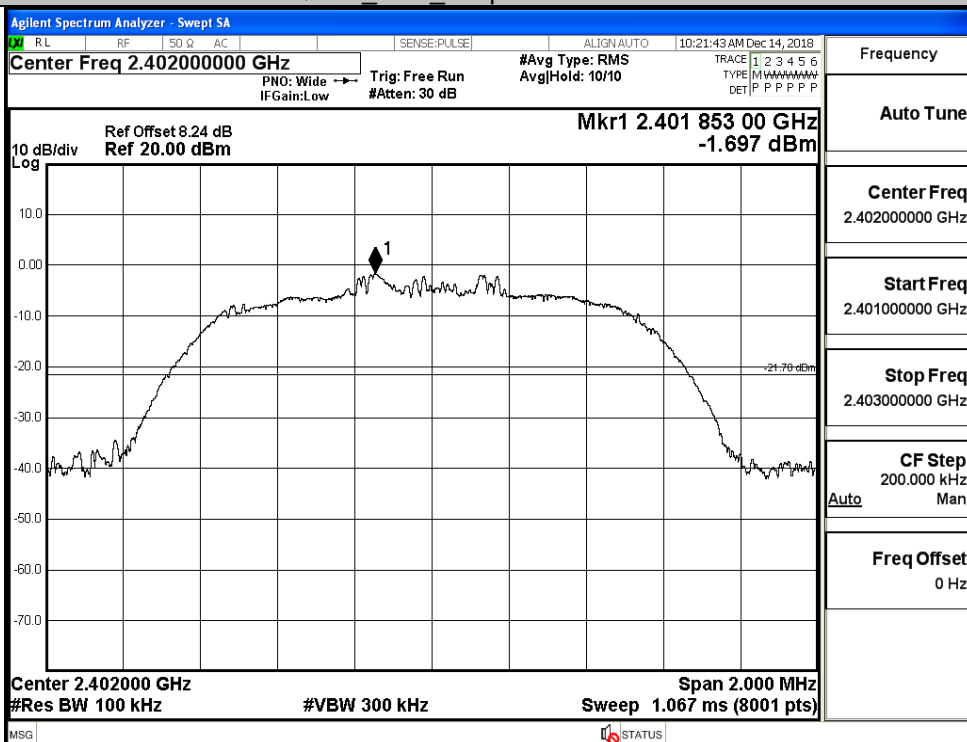


Puw

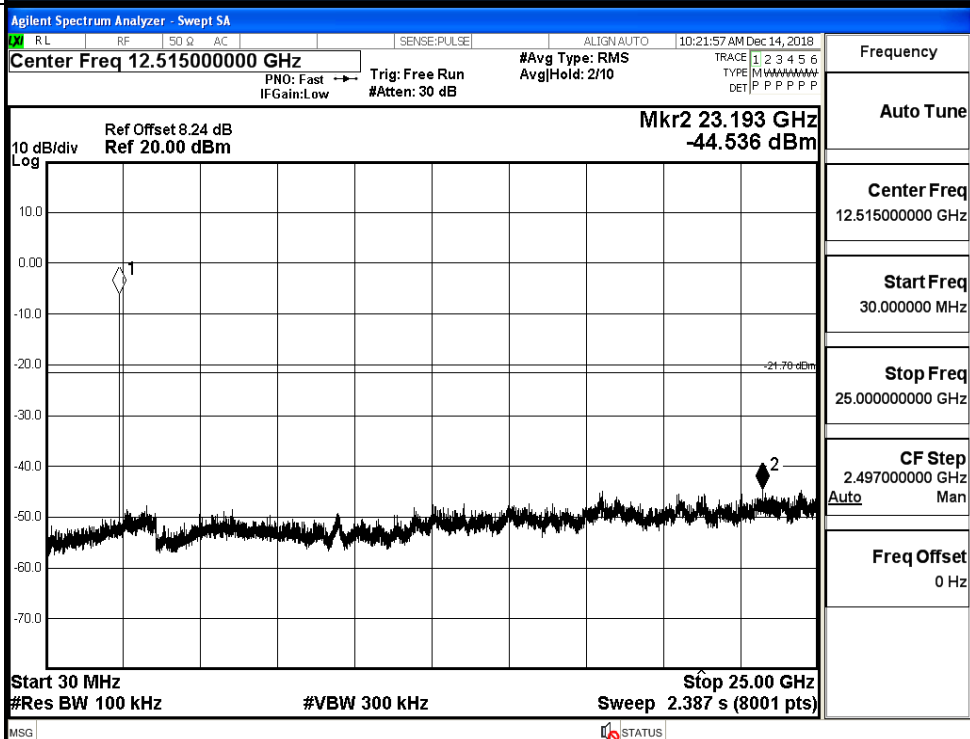


$\pi/4$ DQPSK LCH_Graphs

Pref

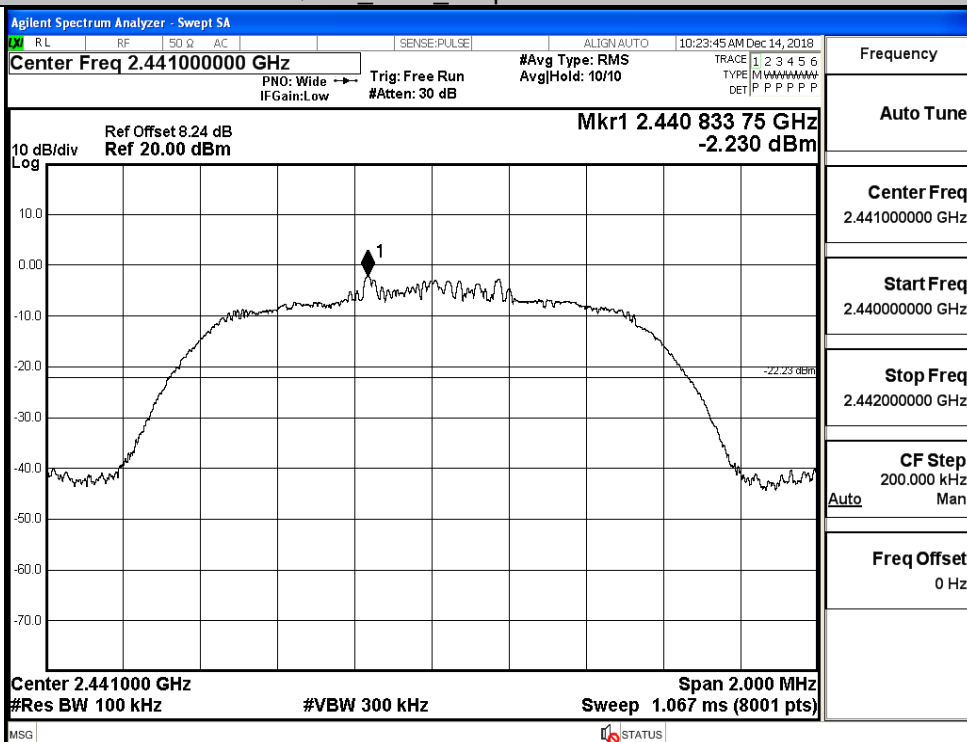


Puw

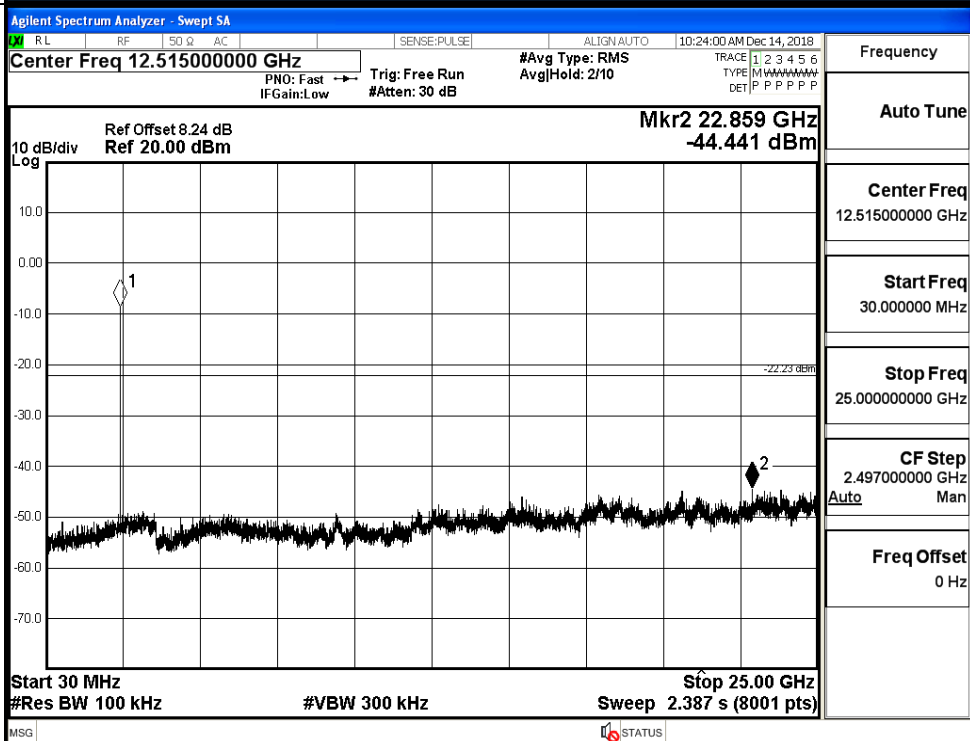


$\pi/4$ DQPSK_MCH_Graphs

Pref

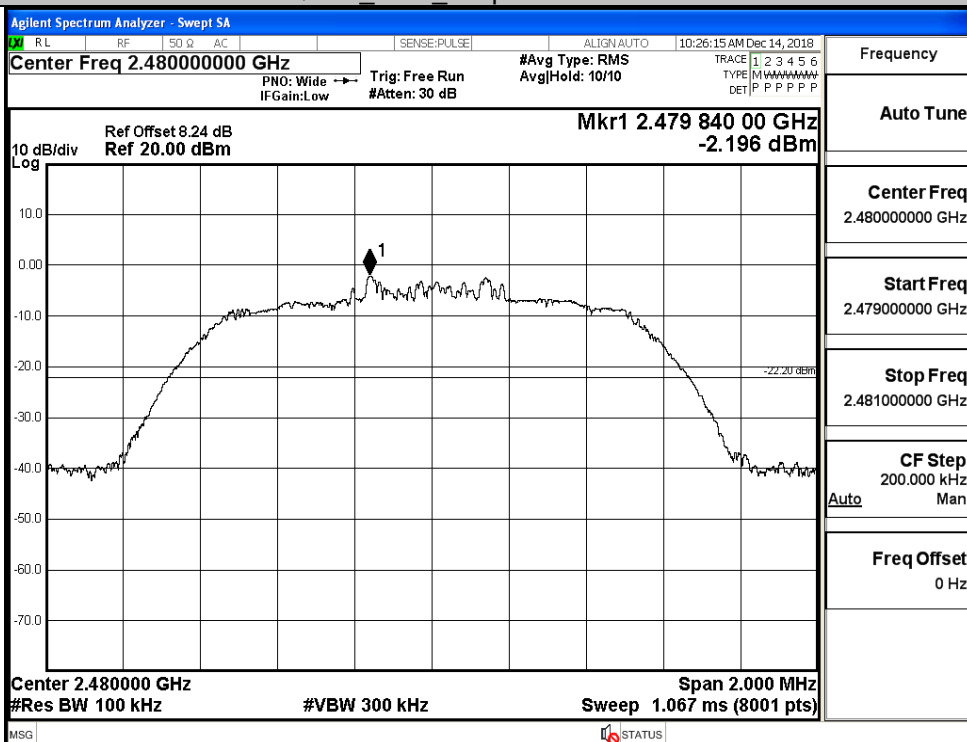


Puw

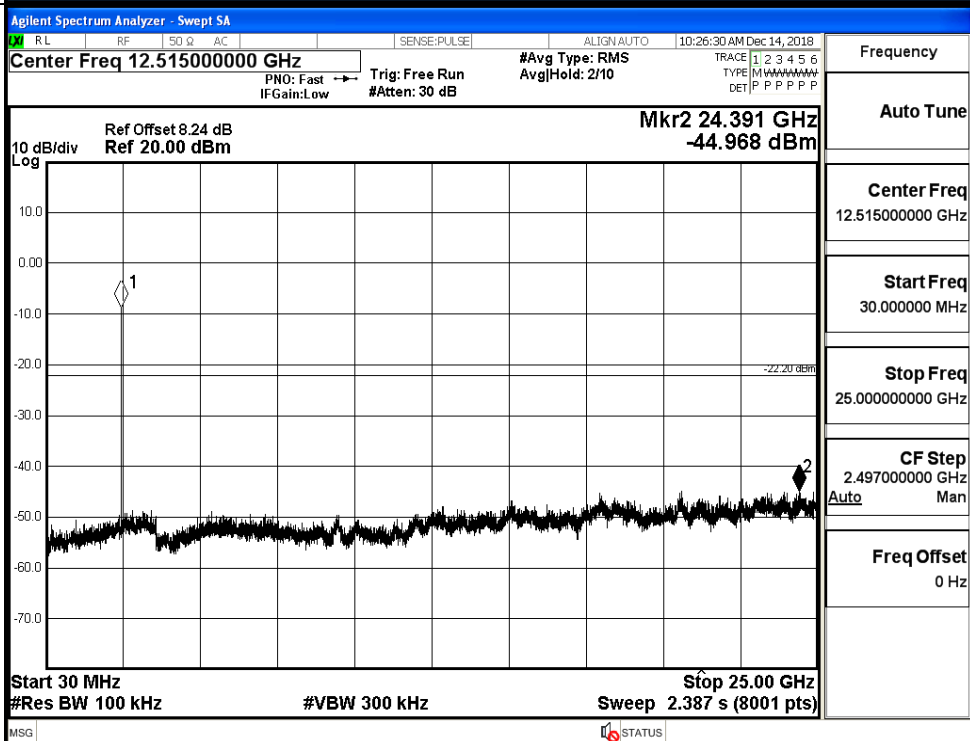


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

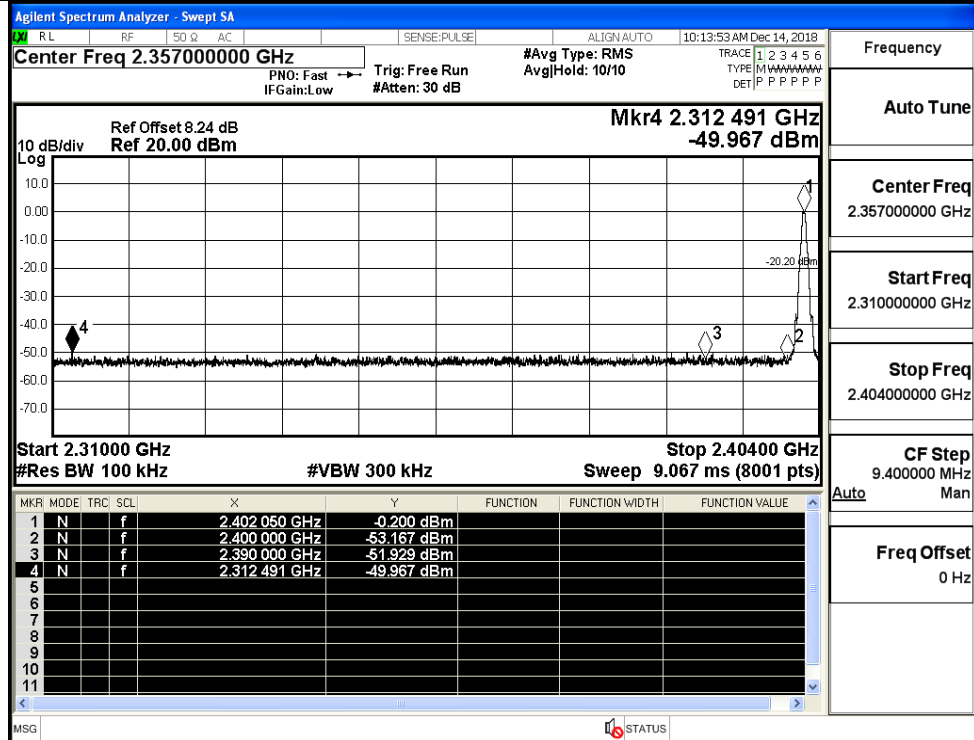


A.7 Band-edge for RF Conducted Emissions

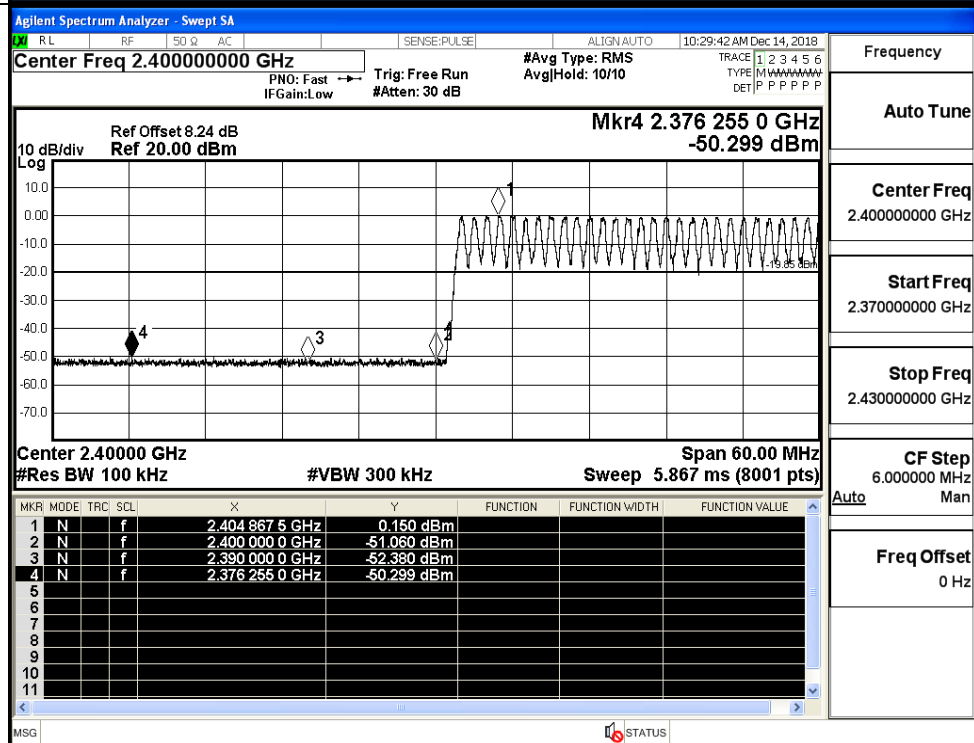
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.200	Off	-49.967	-20.2	PASS
			0.150	On	-50.299	-19.85	PASS
	HCH	2480	-0.955	Off	-50.140	-20.96	PASS
			-0.545	On	-49.764	-20.55	PASS
$\pi/4$ DQPSK	LCH	2402	-1.418	Off	-49.570	-21.42	PASS
			-0.756	On	-49.453	-20.76	PASS
	HCH	2480	-2.095	Off	-50.077	-22.1	PASS
			-2.073	On	-49.235	-22.07	PASS

Test Graphs

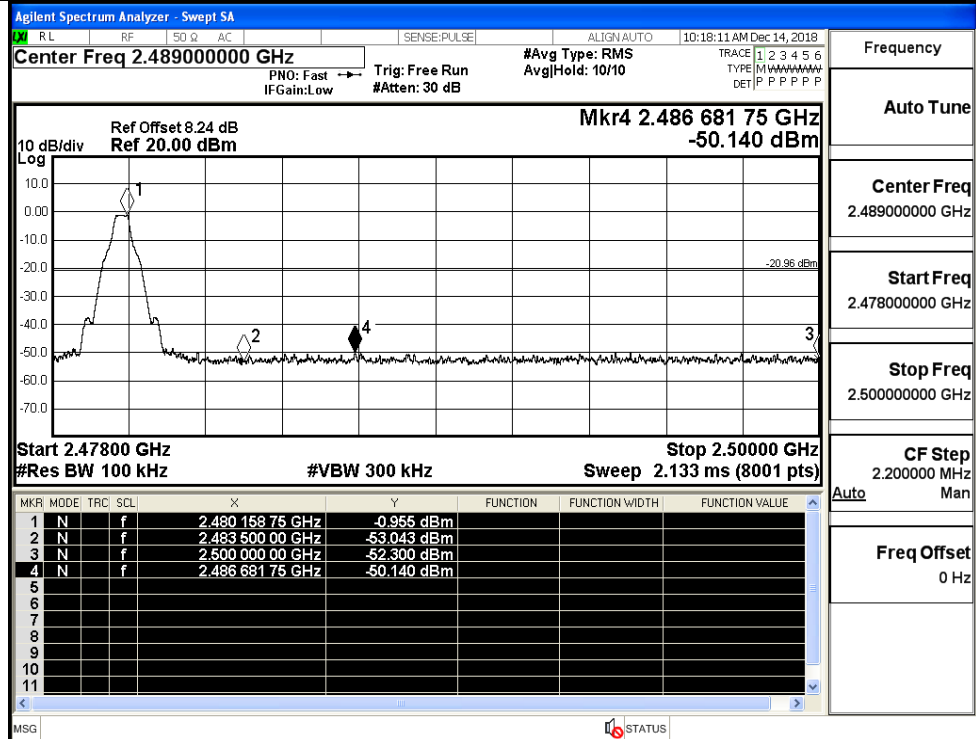
GFSK/LCH/No Hop



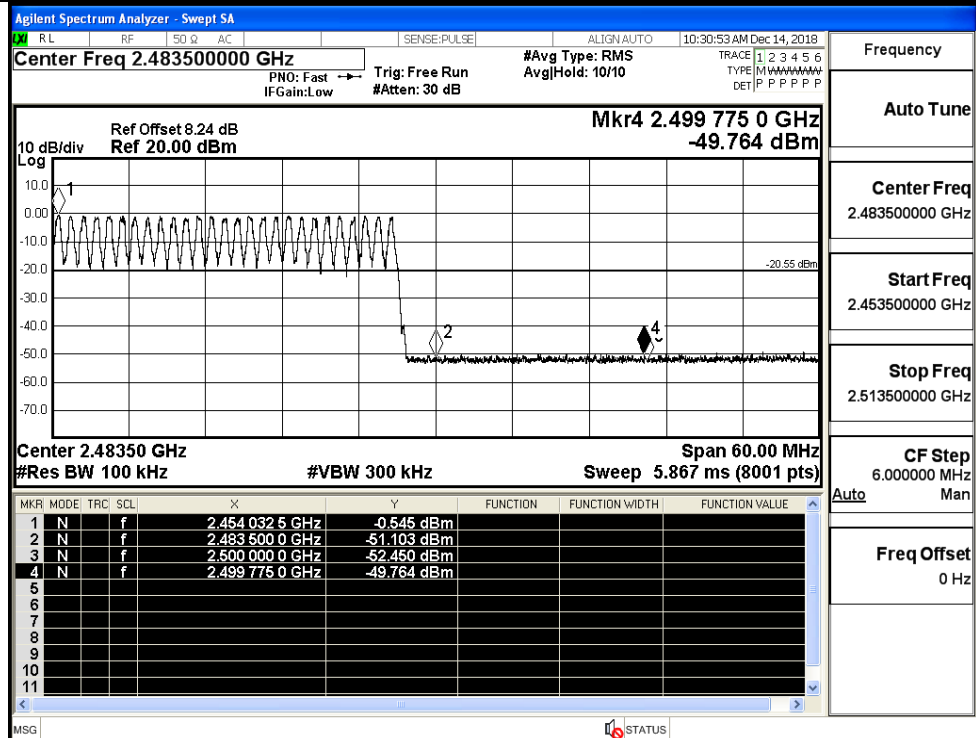
GFSK/LCH/Hop



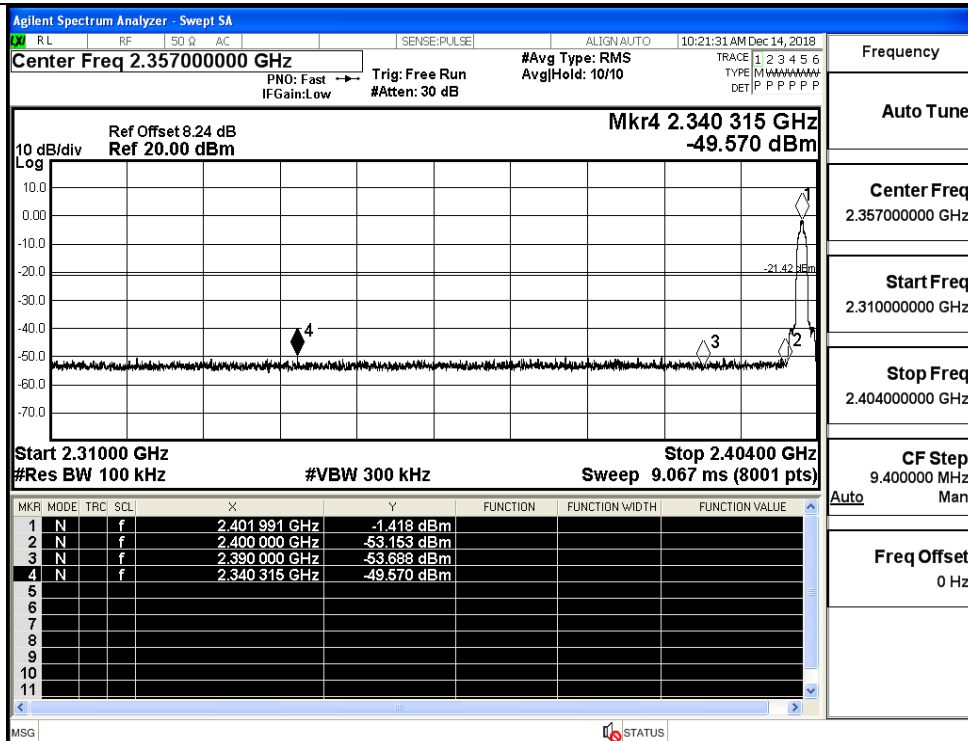
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

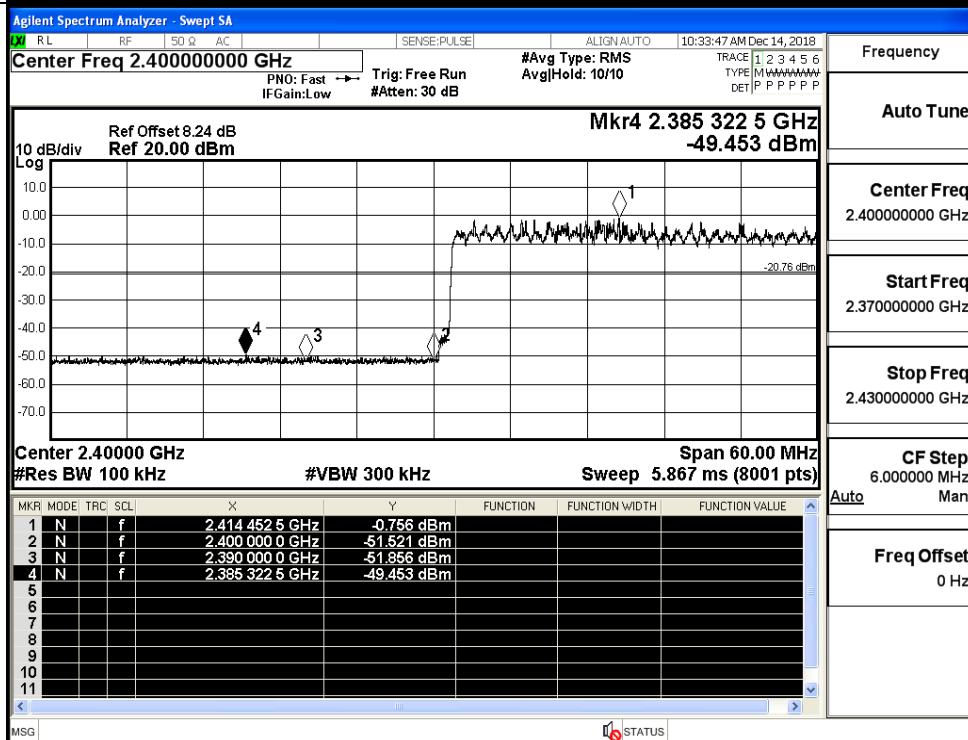
Start Freq
2.310000000 GHz

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

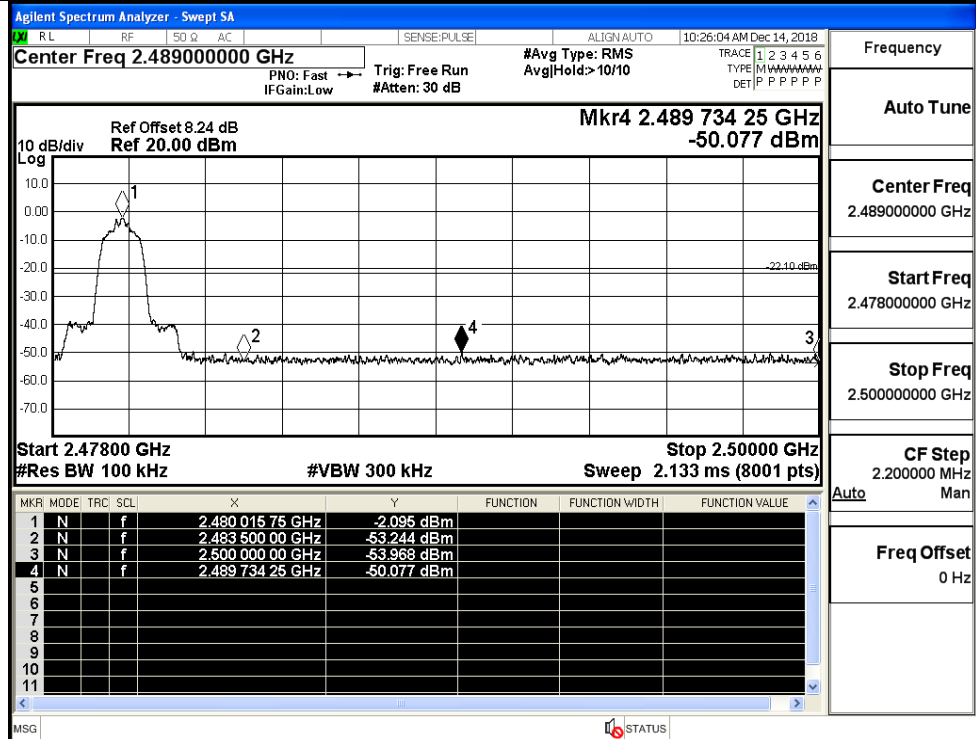
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

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

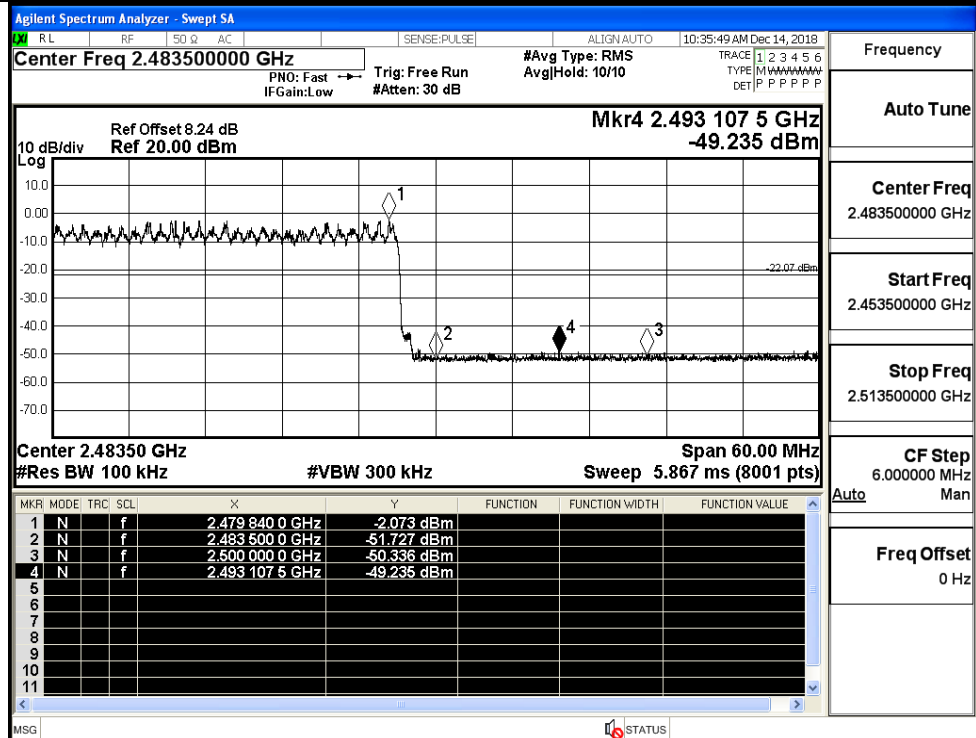


Frequency

Auto Tune

Center Freq
2.489000000 GHzStart Freq
2.478000000 GHzStop Freq
2.500000000 GHzCF Step
2.200000 MHz
Auto ManFreq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

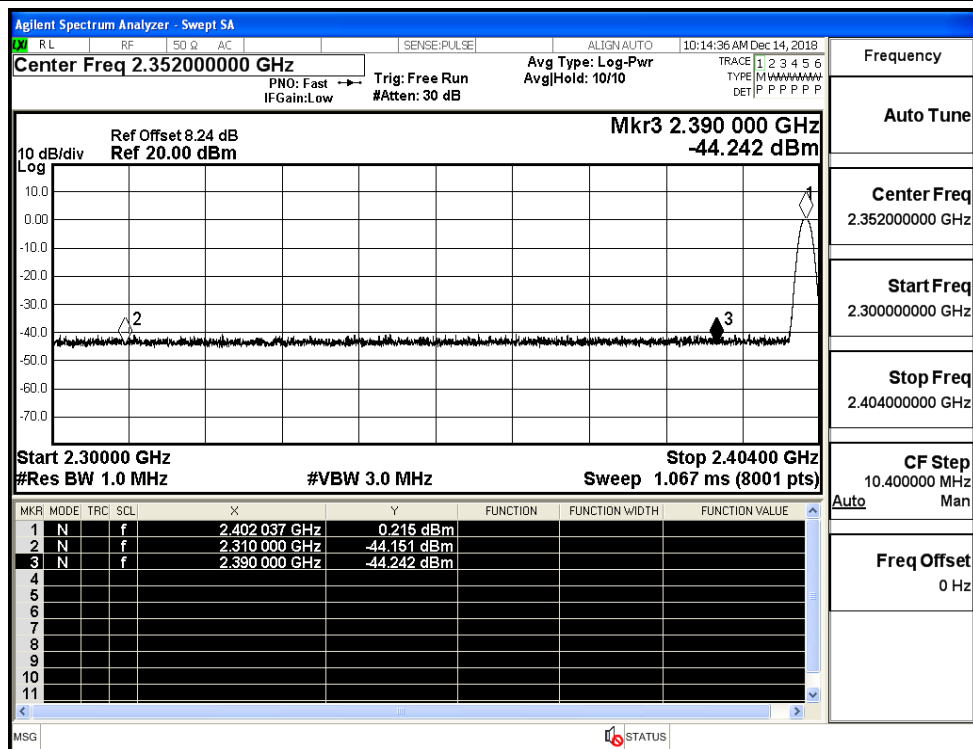
Auto Tune

Center Freq
2.483500000 GHzStart Freq
2.453500000 GHzStop Freq
2.513500000 GHzCF Step
6.000000 MHz
Auto ManFreq Offset
0 Hz

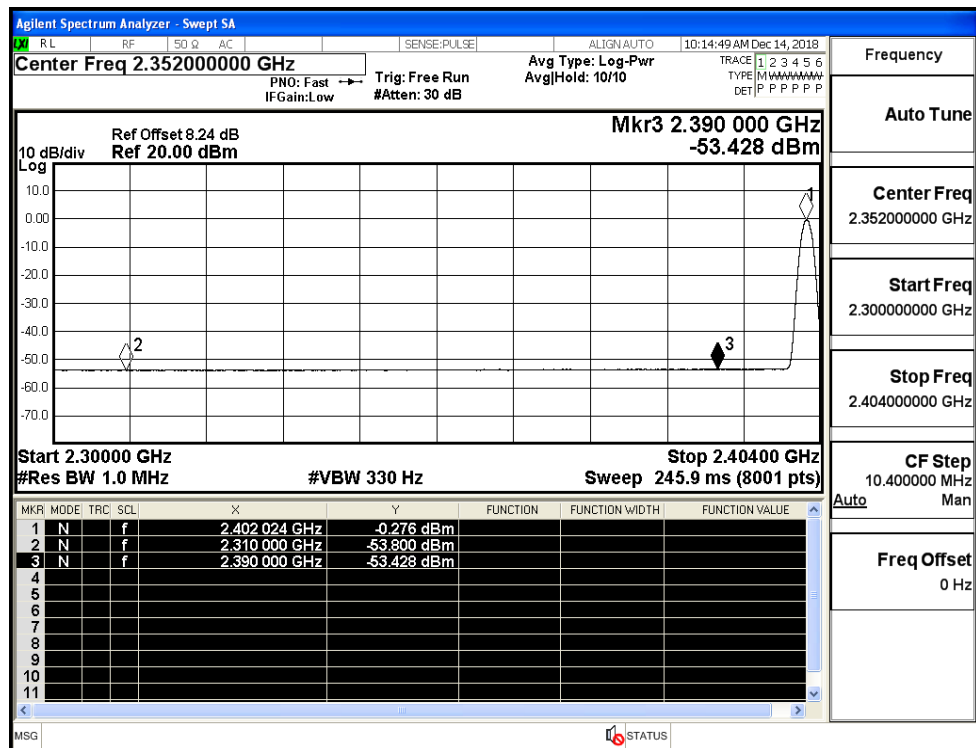
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.15	2.0	0	51.11	PEAK	74	PASS
	Off	2310.0	-53.80	2.0	0	41.46	AV	54	PASS
	Off	2390.0	-44.24	2.0	0	51.02	PEAK	74	PASS
	Off	2390.0	-53.43	2.0	0	41.83	AV	54	PASS
	Off	2483.5	-43.54	2.0	0	51.72	PEAK	74	PASS
	Off	2483.5	-53.17	2.0	0	42.09	AV	54	PASS
	Off	2500.0	-42.85	2.0	0	52.41	PEAK	74	PASS
	Off	2500.0	-53.10	2.0	0	42.16	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.04	2.0	0	51.21	PEAK	74	PASS
	Off	2310.0	-53.82	2.0	0	41.44	AV	54	PASS
	Off	2390.0	-42.97	2.0	0	52.29	PEAK	74	PASS
	Off	2390.0	-53.54	2.0	0	41.72	AV	54	PASS
	Off	2483.5	-42.88	2.0	0	52.38	PEAK	74	PASS
	Off	2483.5	-53.25	2.0	0	42.01	AV	54	PASS
	Off	2500.0	-42.73	2.0	0	52.53	PEAK	74	PASS
	Off	2500.0	-53.11	2.0	0	42.15	AV	54	PASS

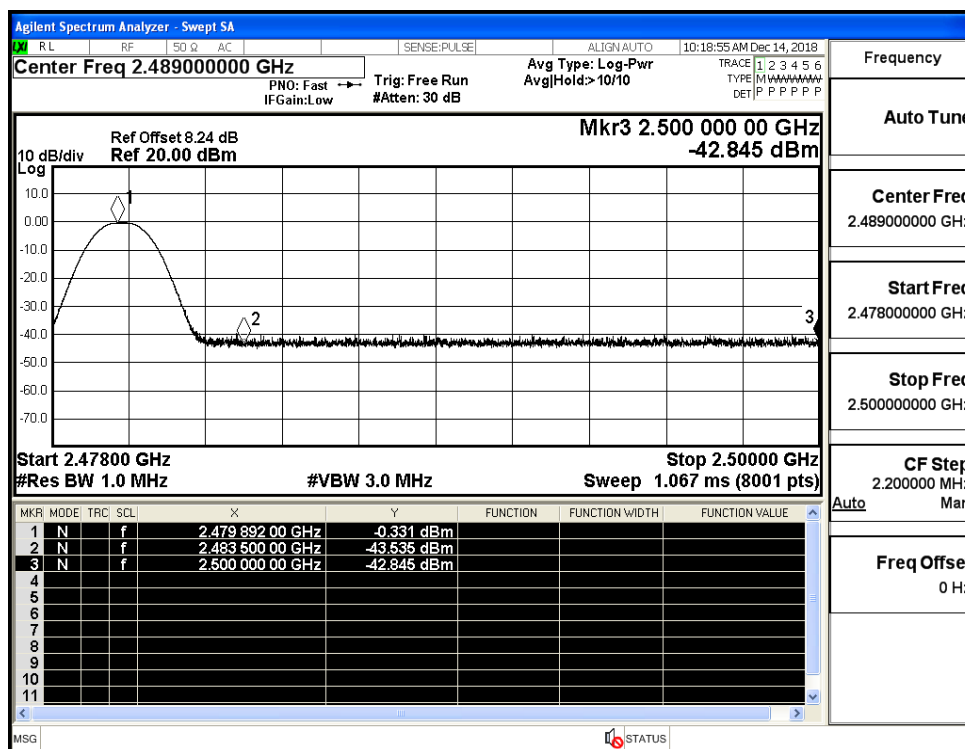
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



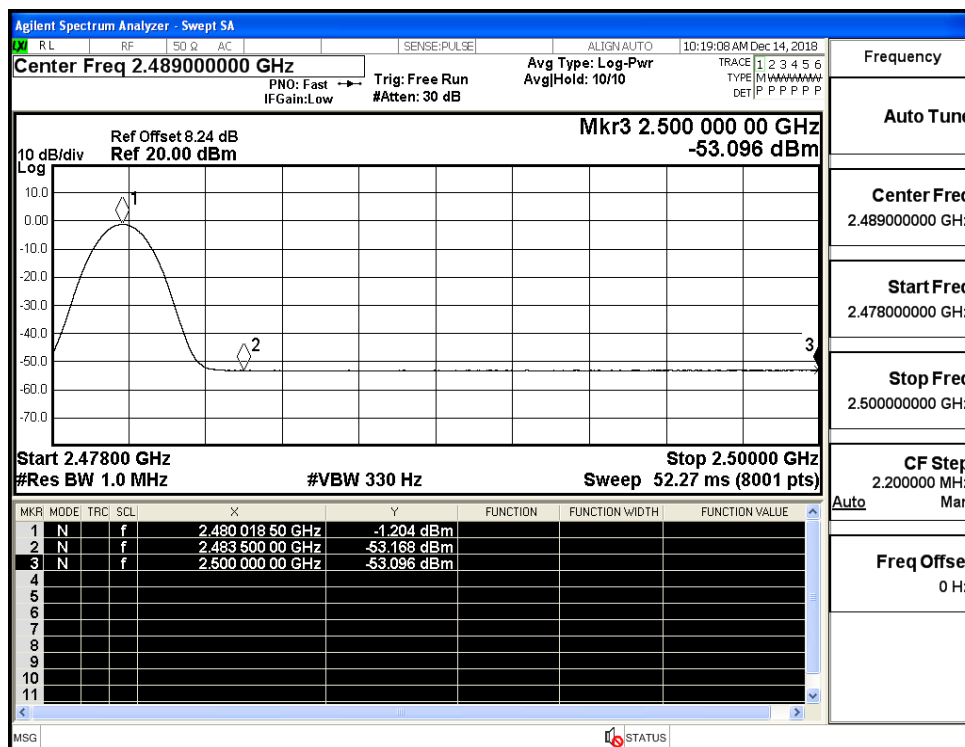
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



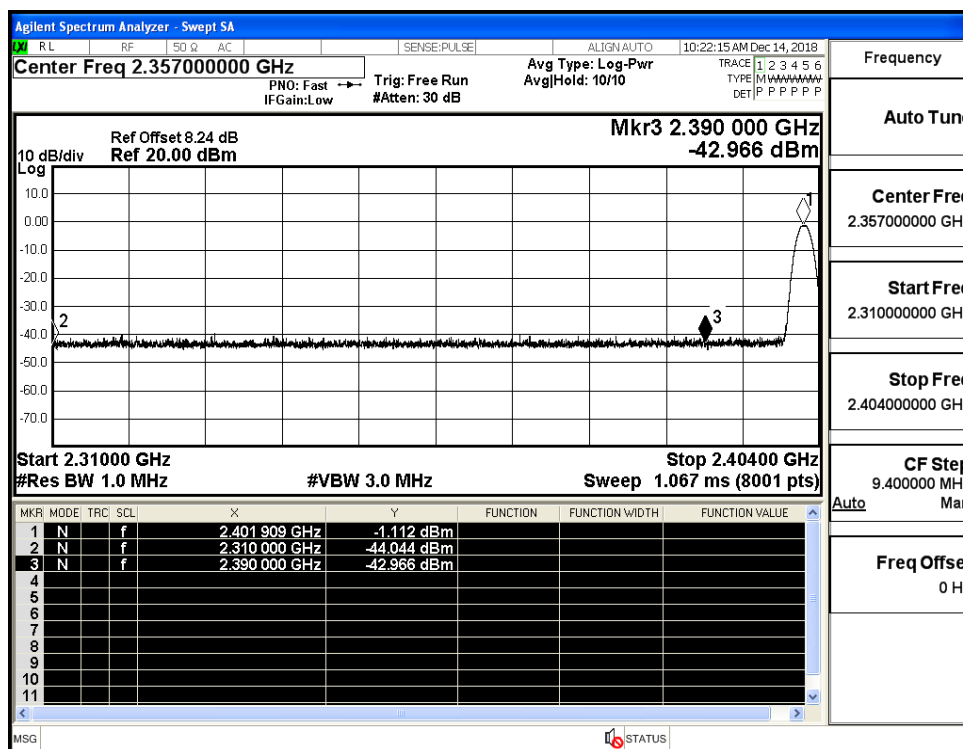
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



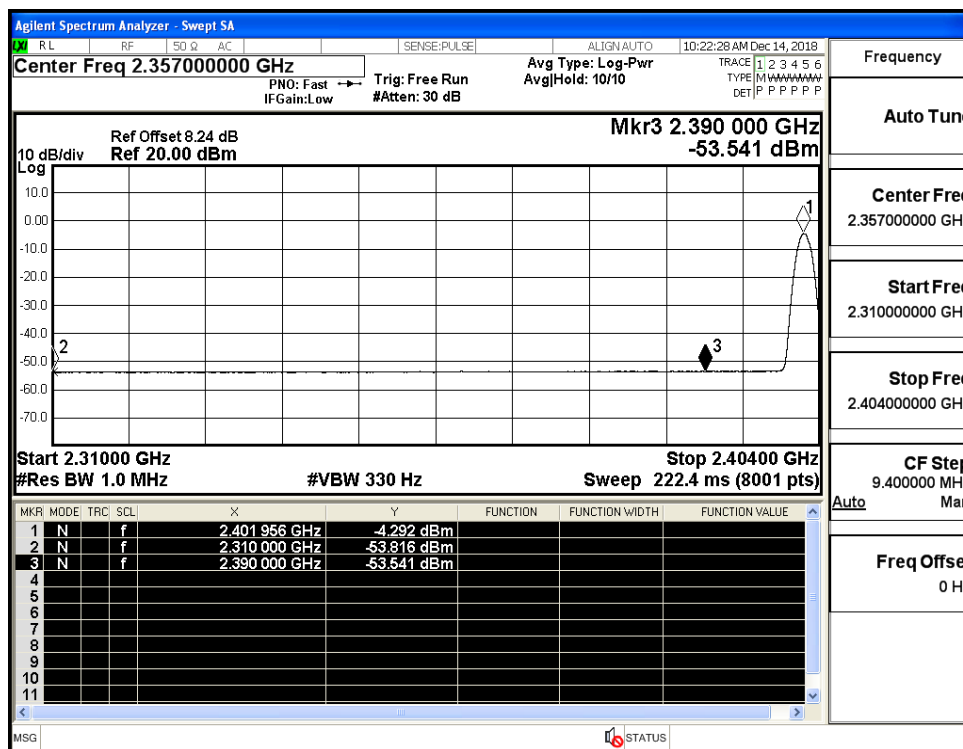
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



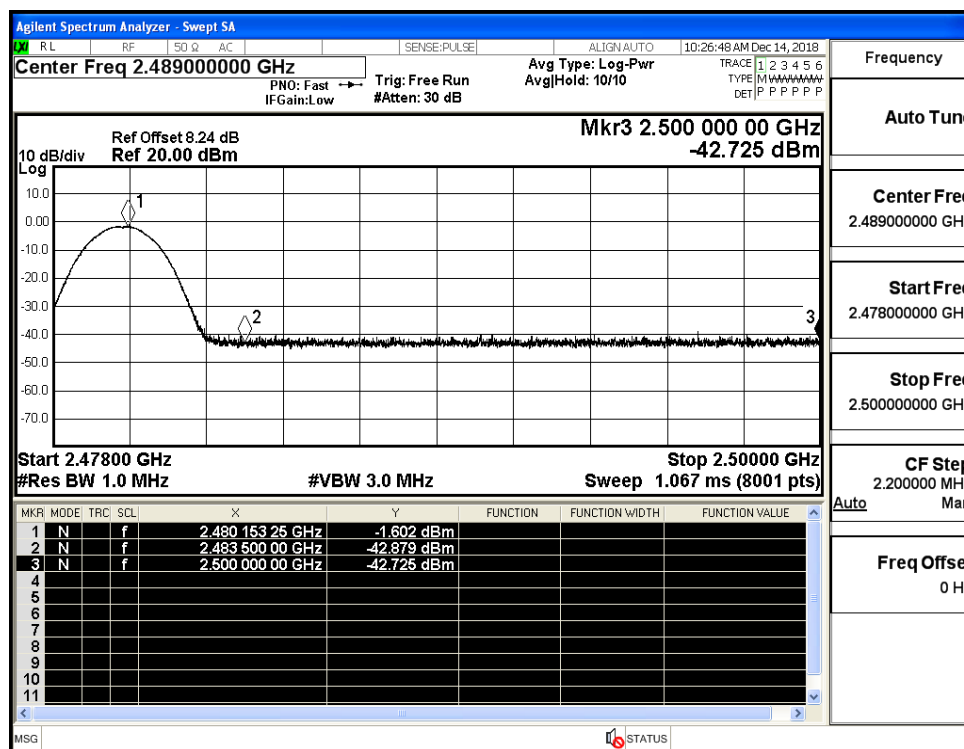
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



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)

