

Appendix A

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

Product Name: Portable Bluetooth Speaker with Wireless Charging

Trade Mark: i-box

Test Model: WJ-202

Environmental Conditions

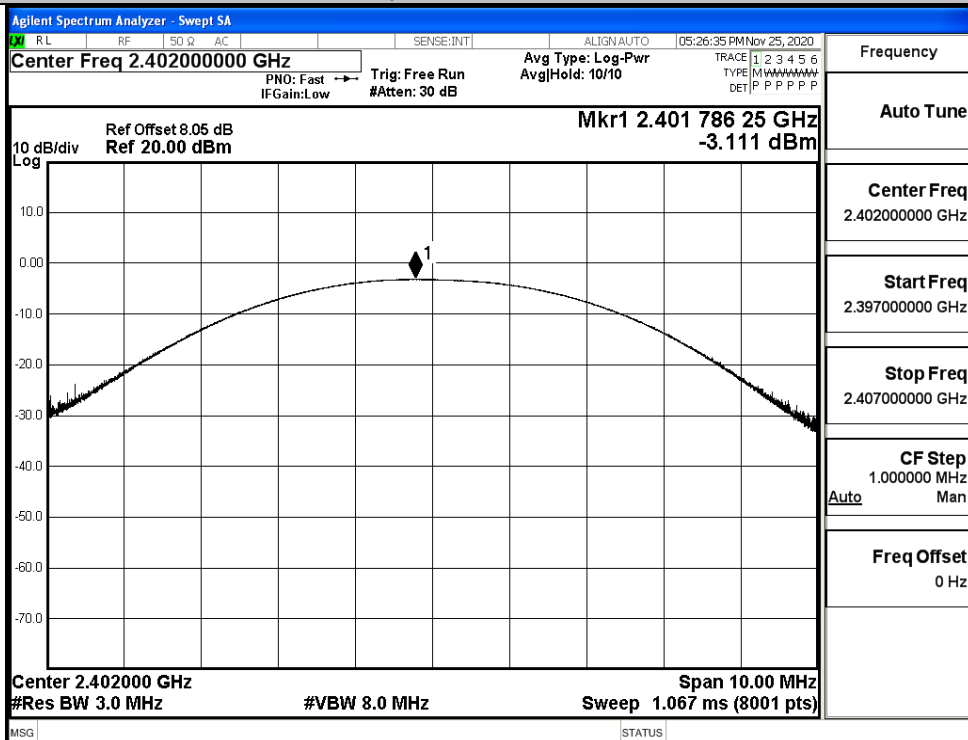
Temperature:	25.3 ° C
Relative Humidity:	53.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan

A.1 Maximum Conducted Peak Output Power

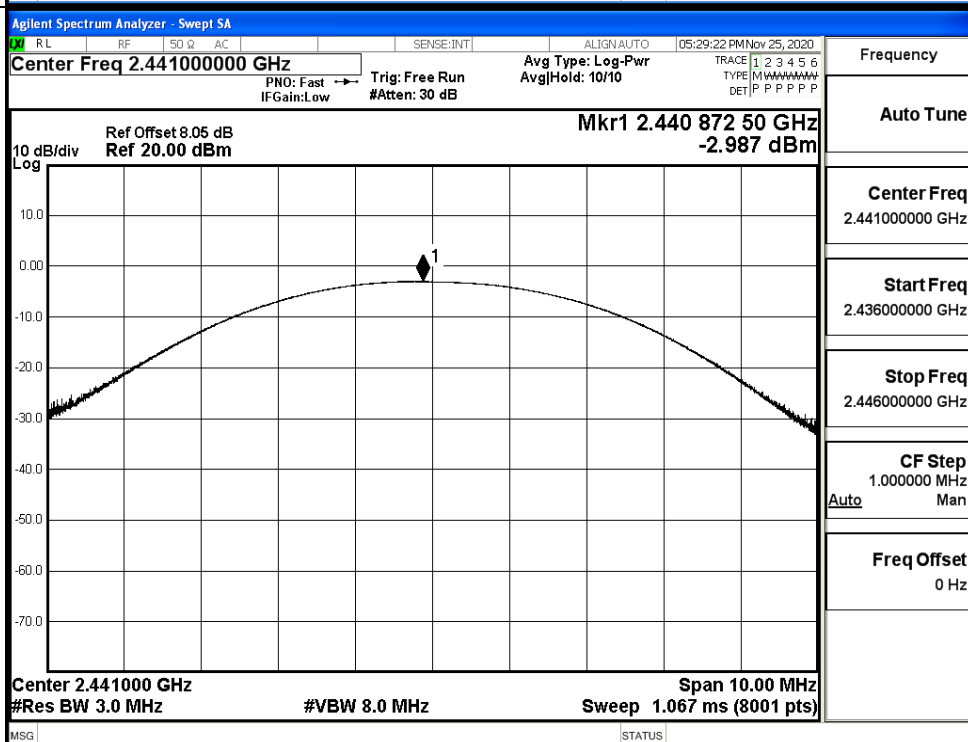
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.111	21	PASS
	MCH	-2.987	21	PASS
	HCH	-3.172	21	PASS
$\pi/4$ DQPSK	LCH	-2.357	21	PASS
	MCH	-2.234	21	PASS
	HCH	-2.500	21	PASS

Test Graphs

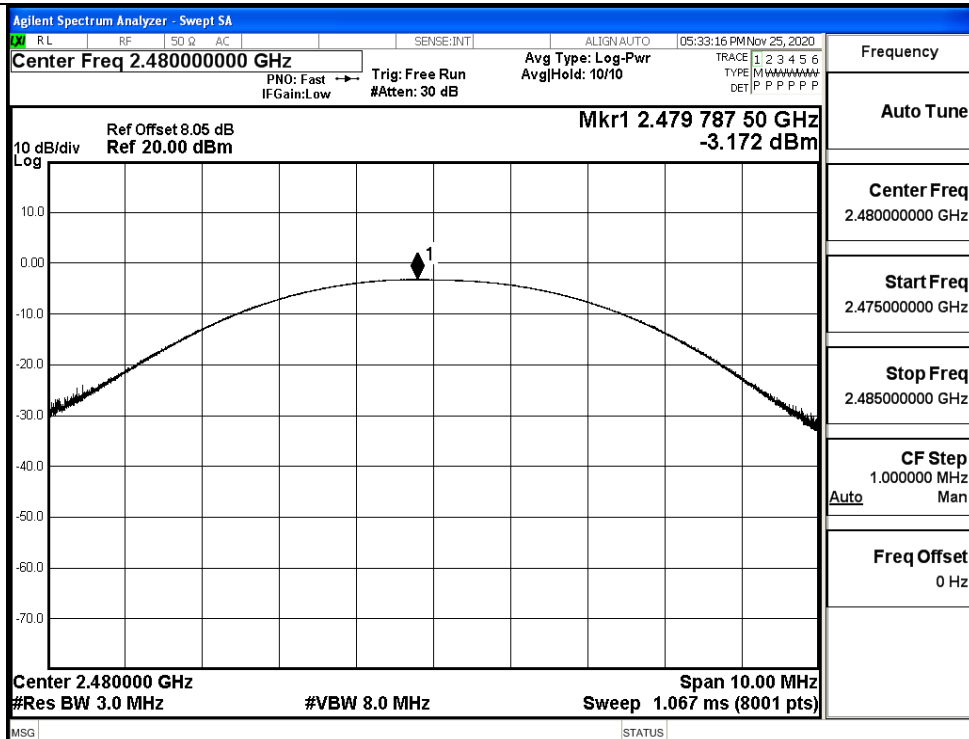
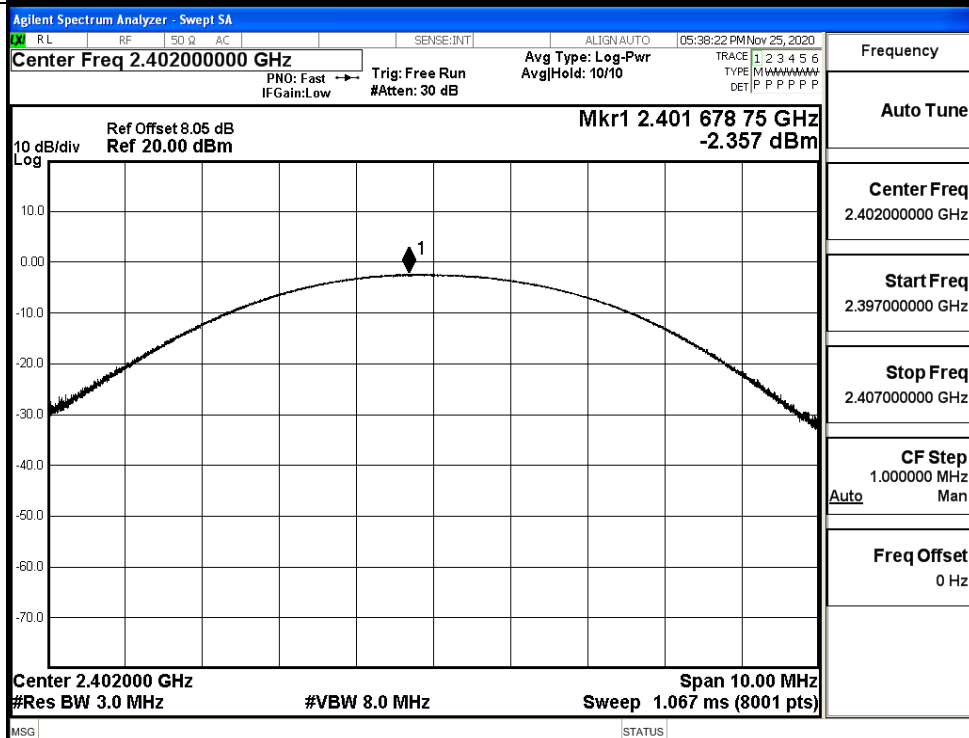
GFSK/LCH

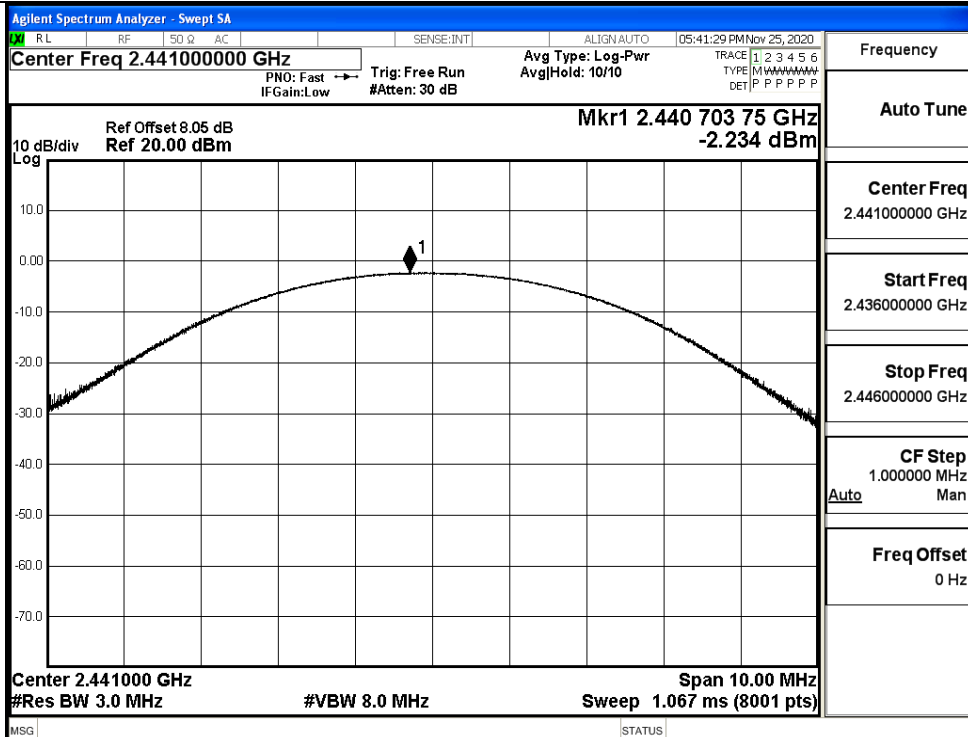
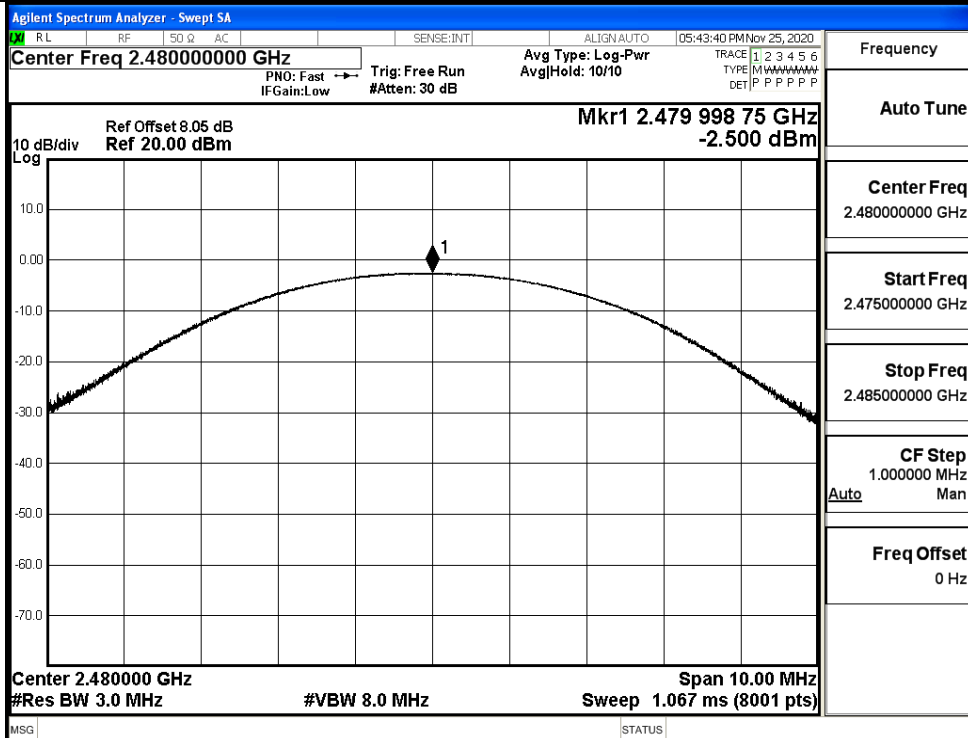


GFSK/MCH



GFSK/HCH

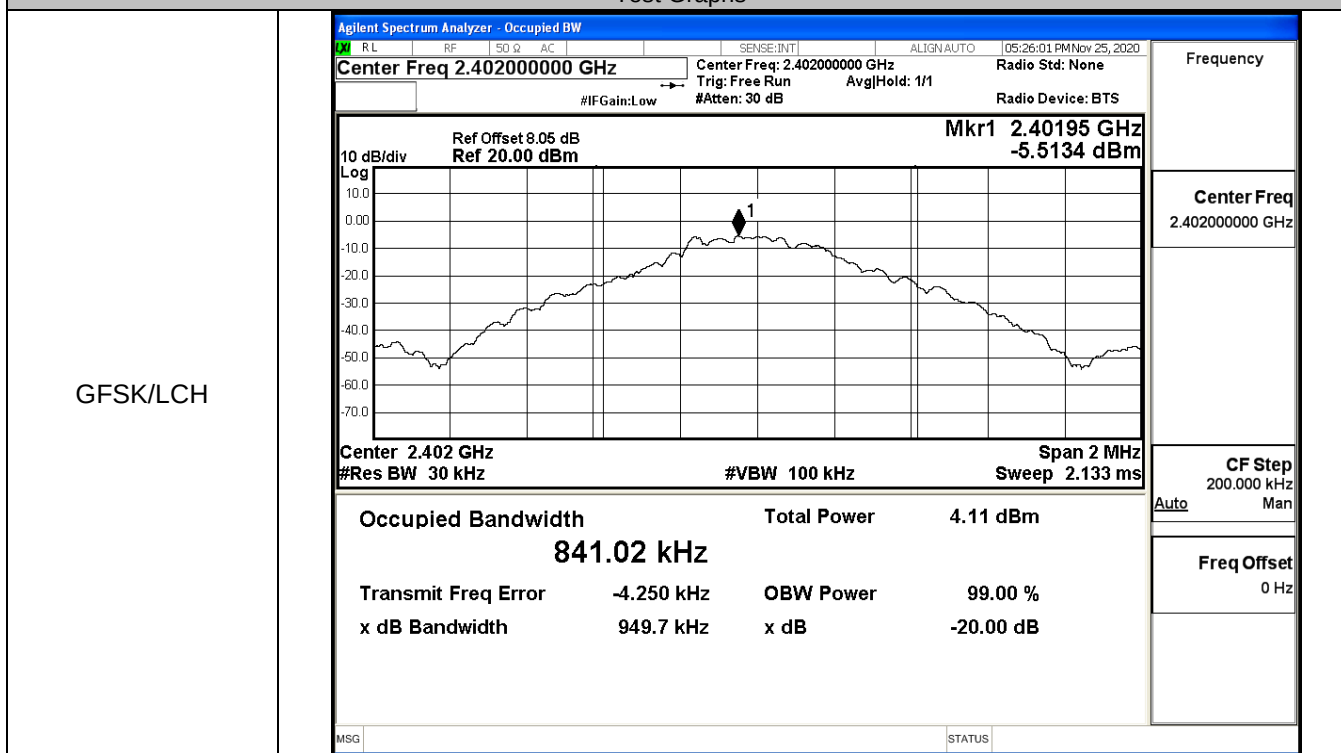
 $\pi/4$ DQPSK/LCH

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

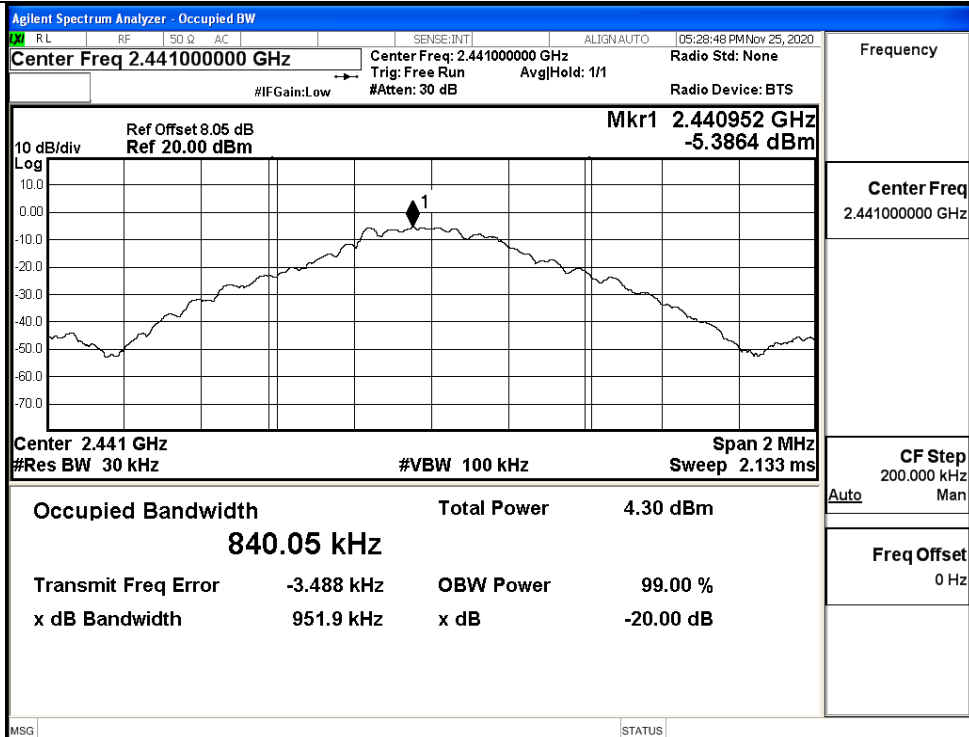
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9497	Not Specified	PASS
	MCH	0.9519	Not Specified	PASS
	HCH	0.9523	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.314	Not Specified	PASS
	MCH	1.314	Not Specified	PASS
	HCH	1.314	Not Specified	PASS

Test Graphs



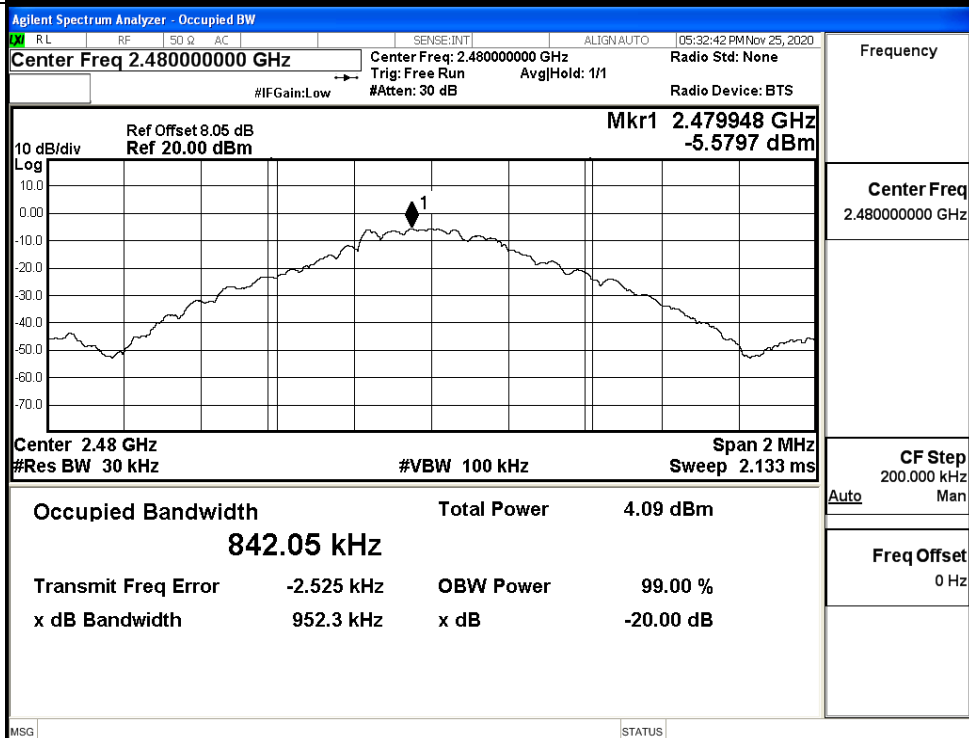
GFSK/MCH



Frequency

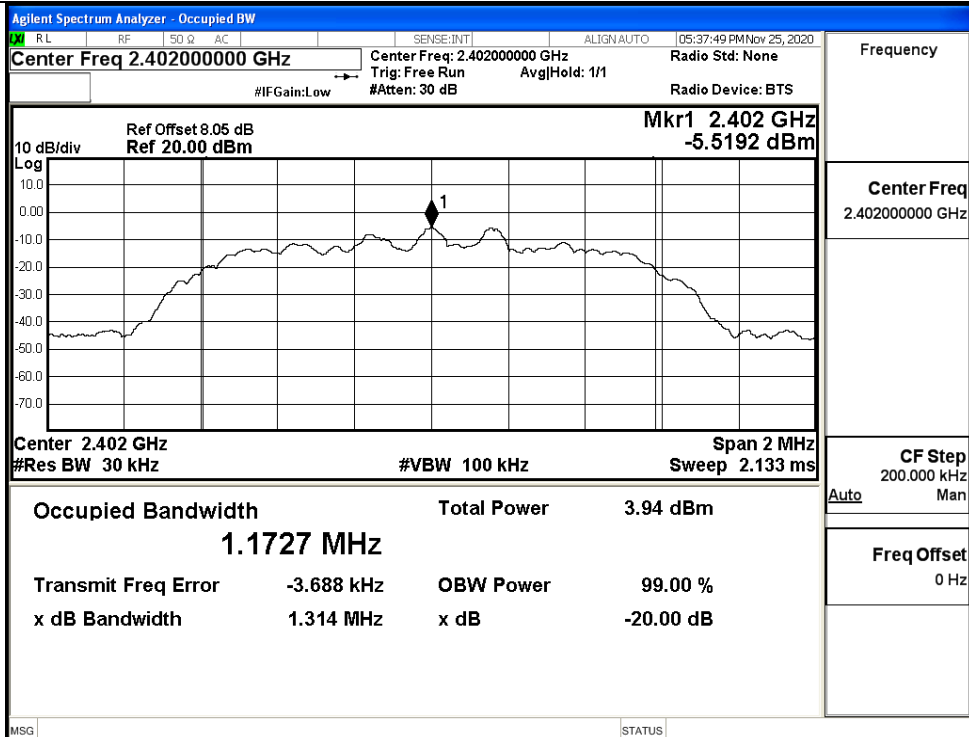
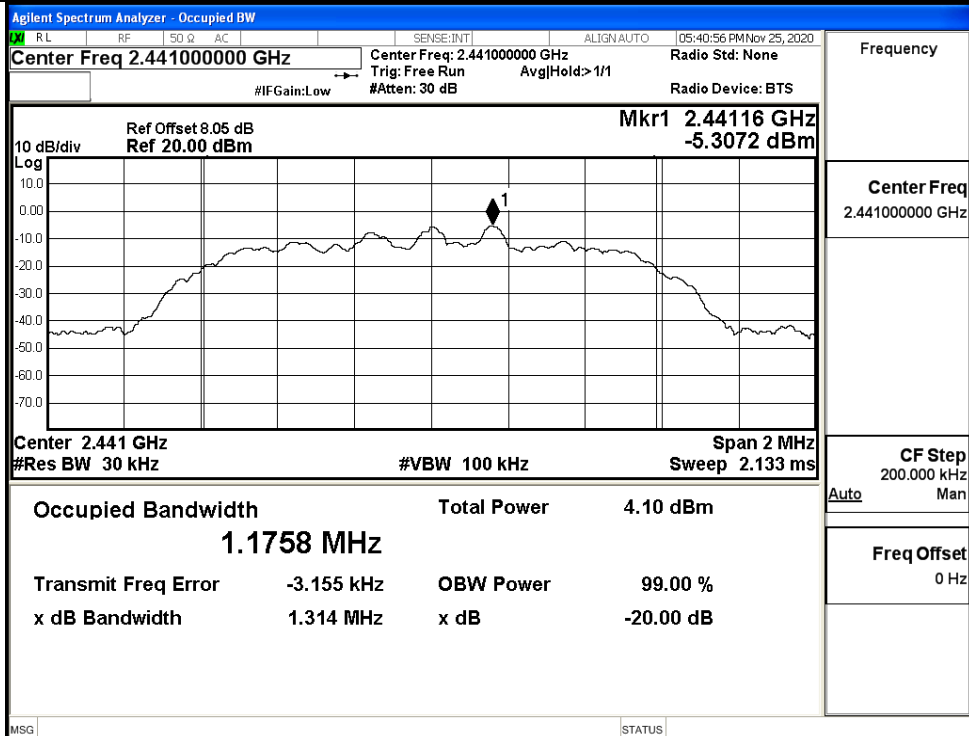
Center Freq
2.441000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

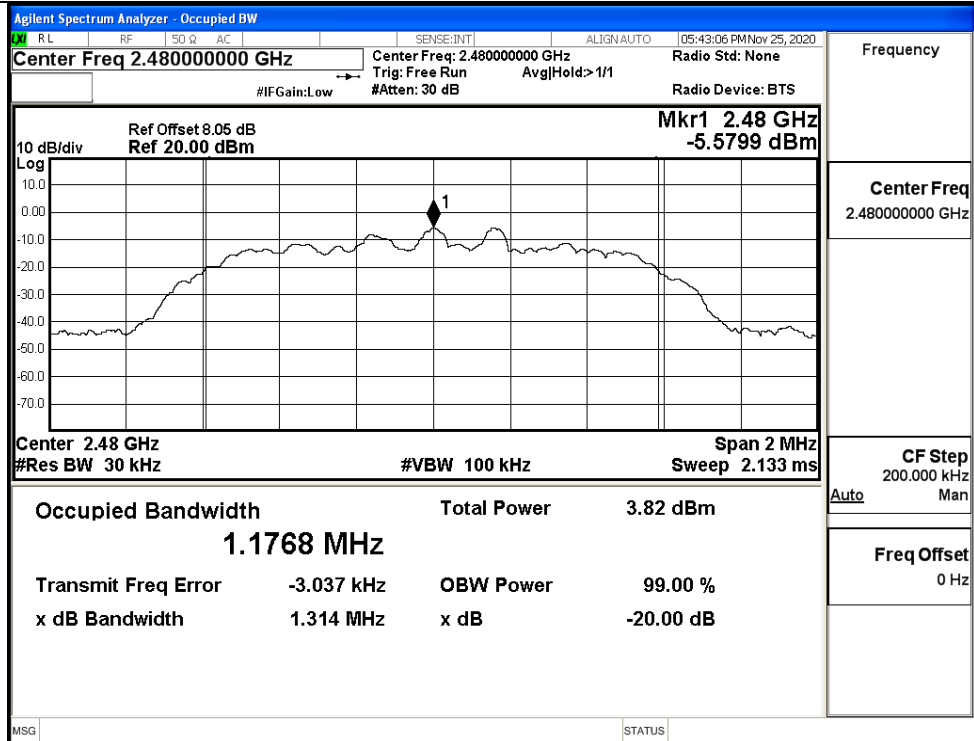
GFSK/HCH



Frequency

Center Freq
2.480000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

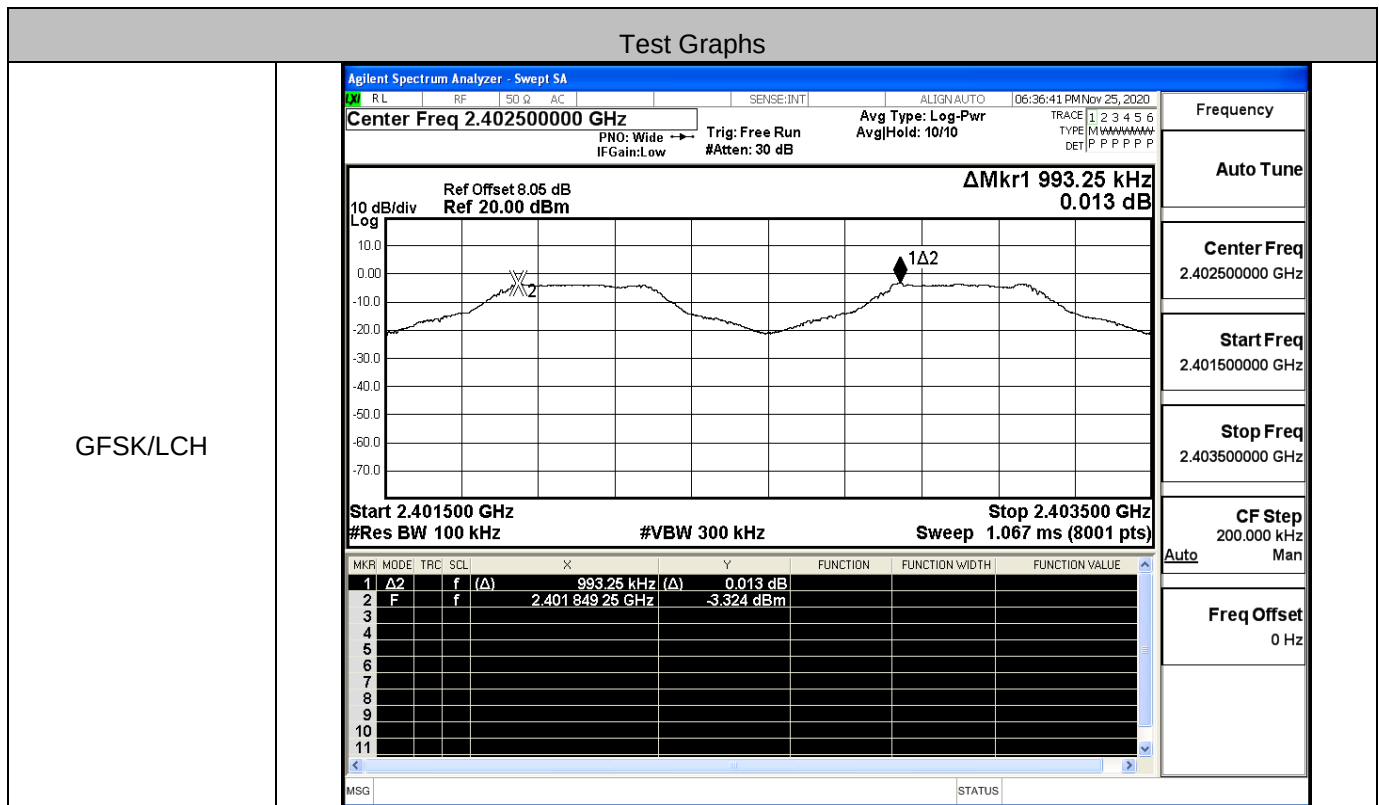
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

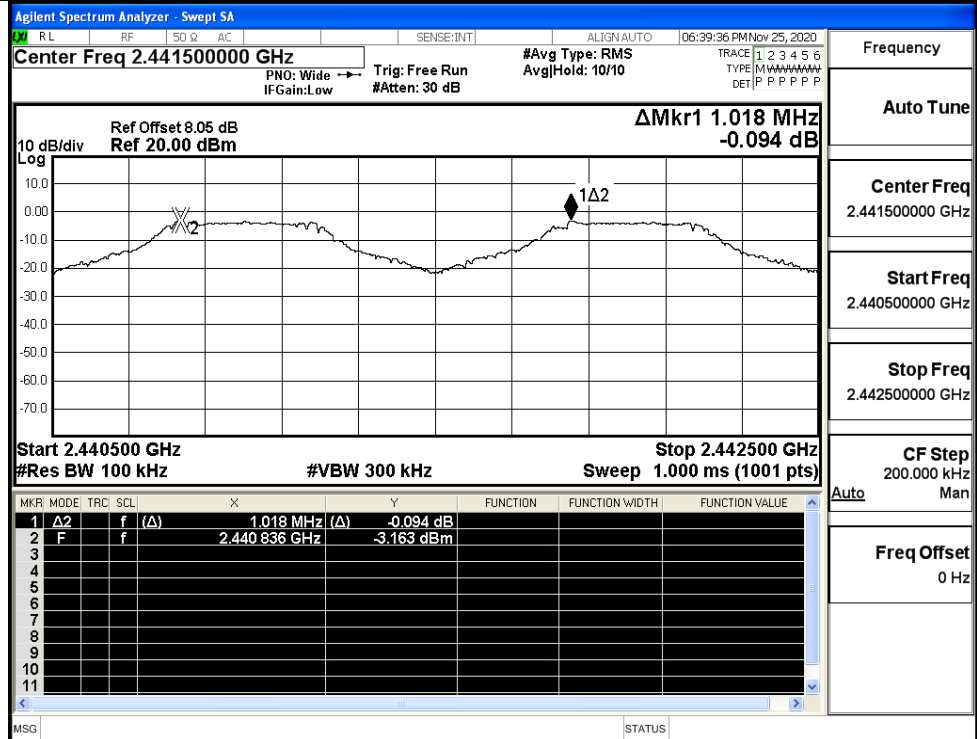
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.993	0.633	PASS
	MCH	1.018	0.635	PASS
	HCH	0.998	0.635	PASS
π /4DQPSK	LCH	1.314	0.876	PASS
	MCH	1.120	0.876	PASS
	HCH	1.182	0.876	PASS

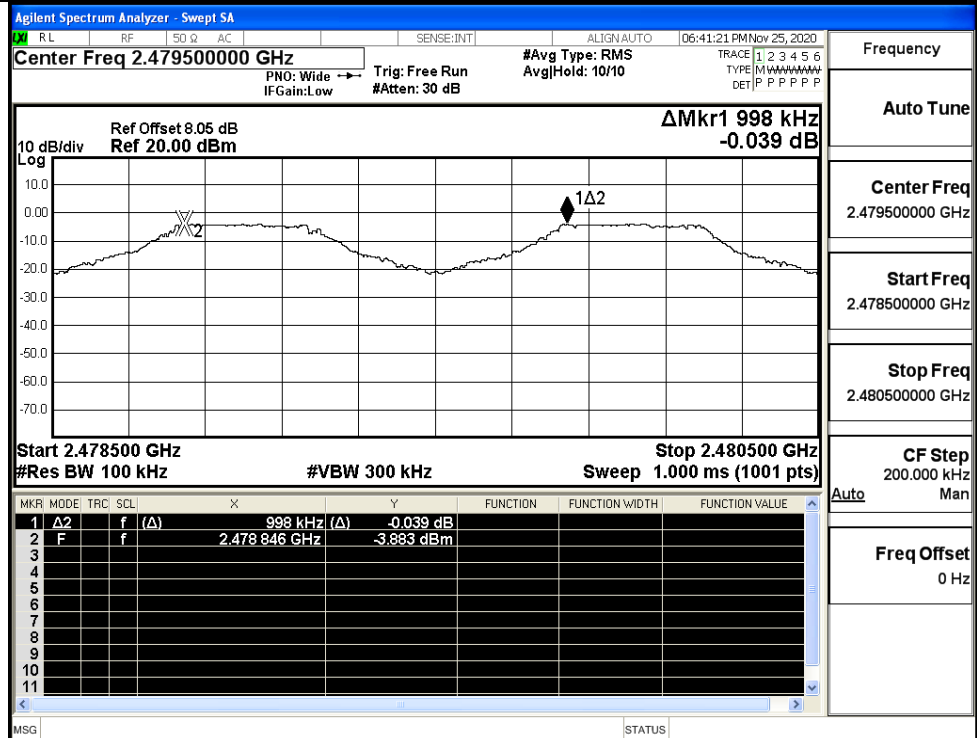
Test Graphs

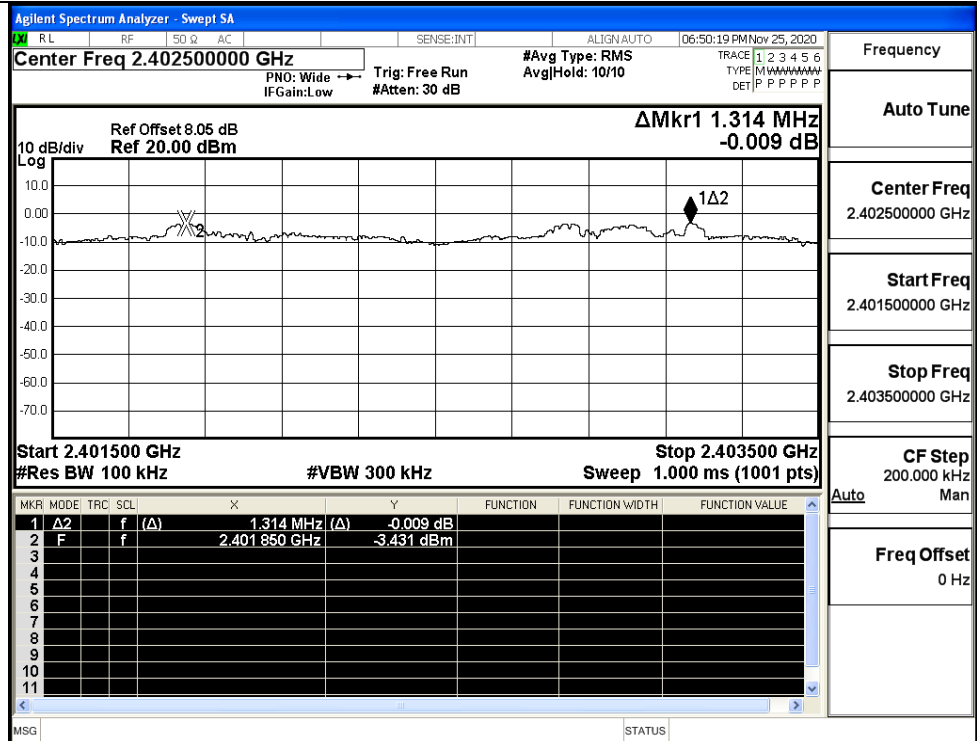


GFSK/MCH



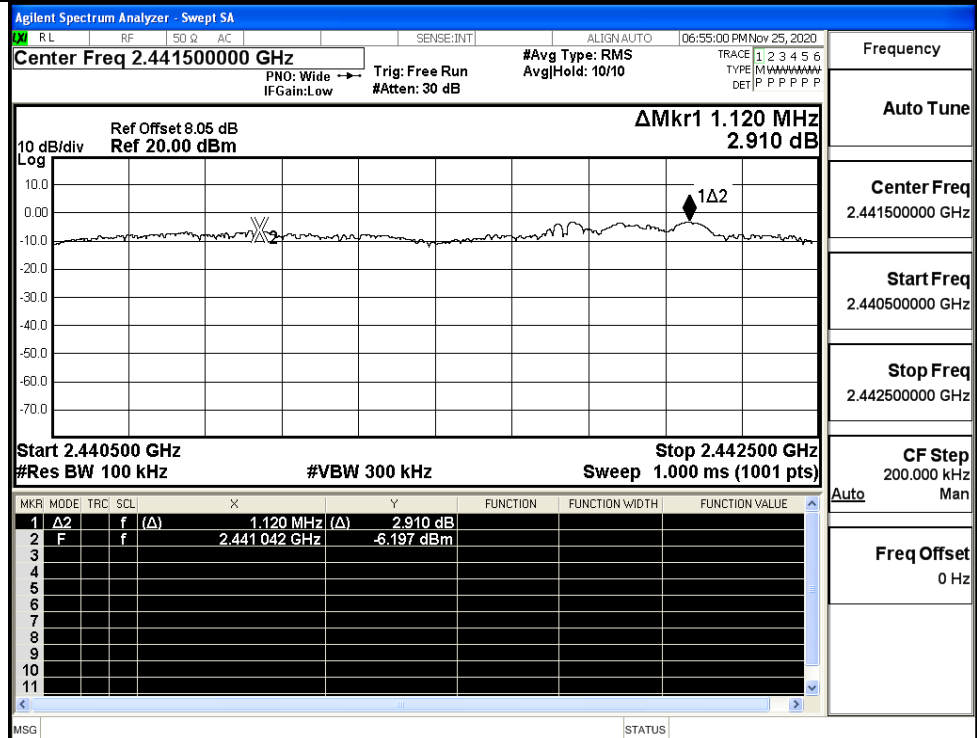
GFSK/HCH



$\pi/4$ DQPSK/LCH

Frequency

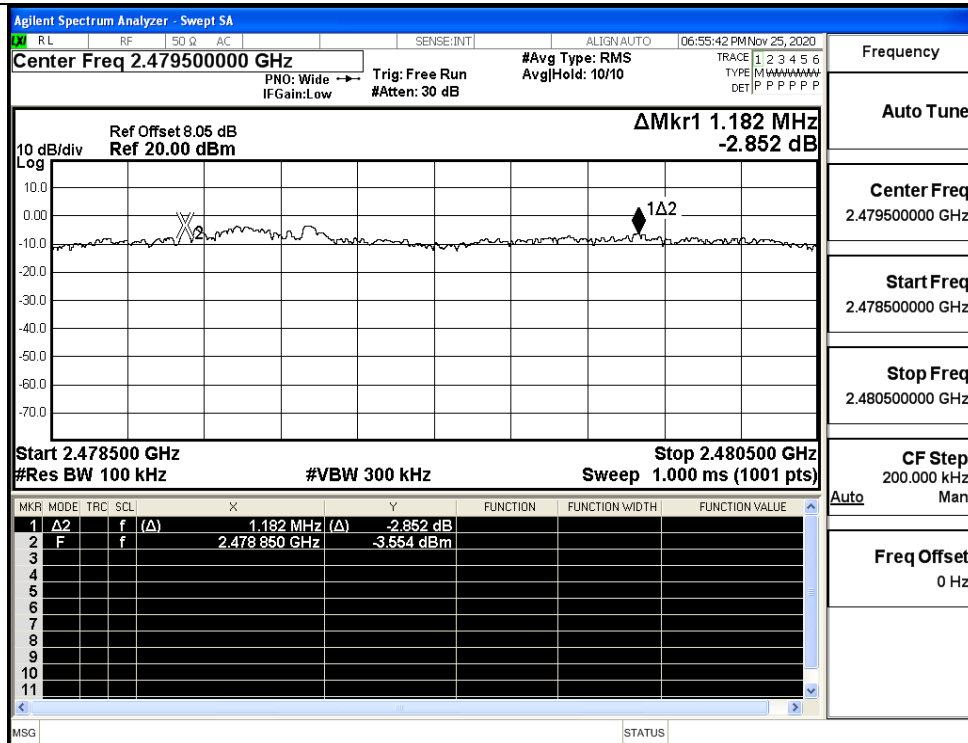
Auto Tune

Center Freq
2.402500000 GHzStart Freq
2.401500000 GHzStop Freq
2.403500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz $\pi/4$ DQPSK/MCH

Frequency

Auto Tune

Center Freq
2.441500000 GHzStart Freq
2.440500000 GHzStop Freq
2.442500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

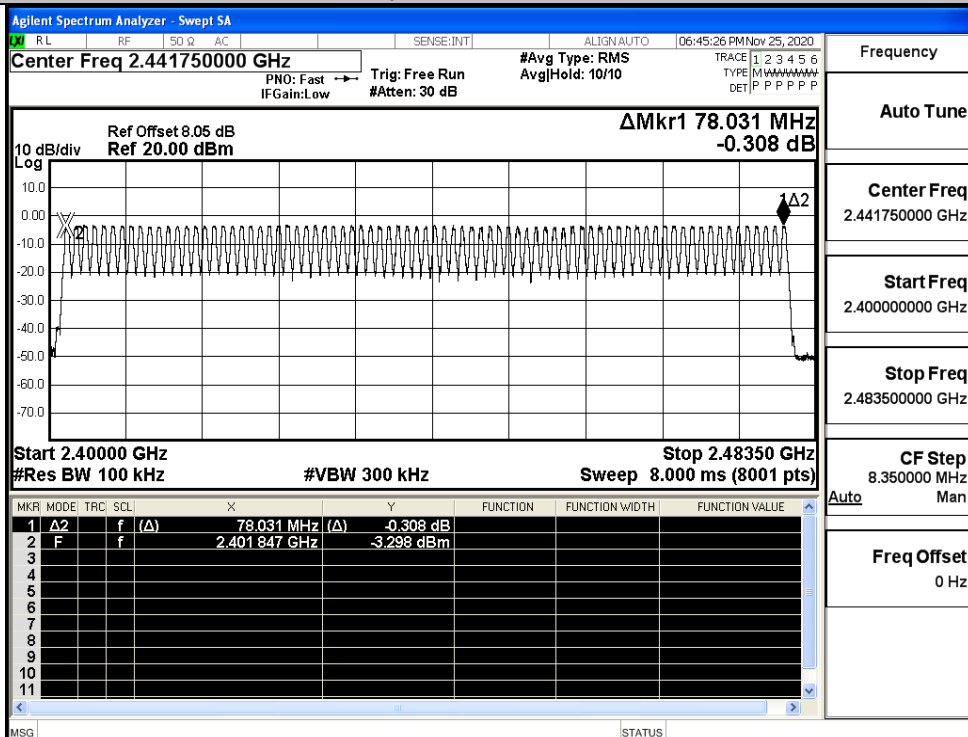
$\pi/4$ DQPSK/HCH

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



Frequency

Auto Tune

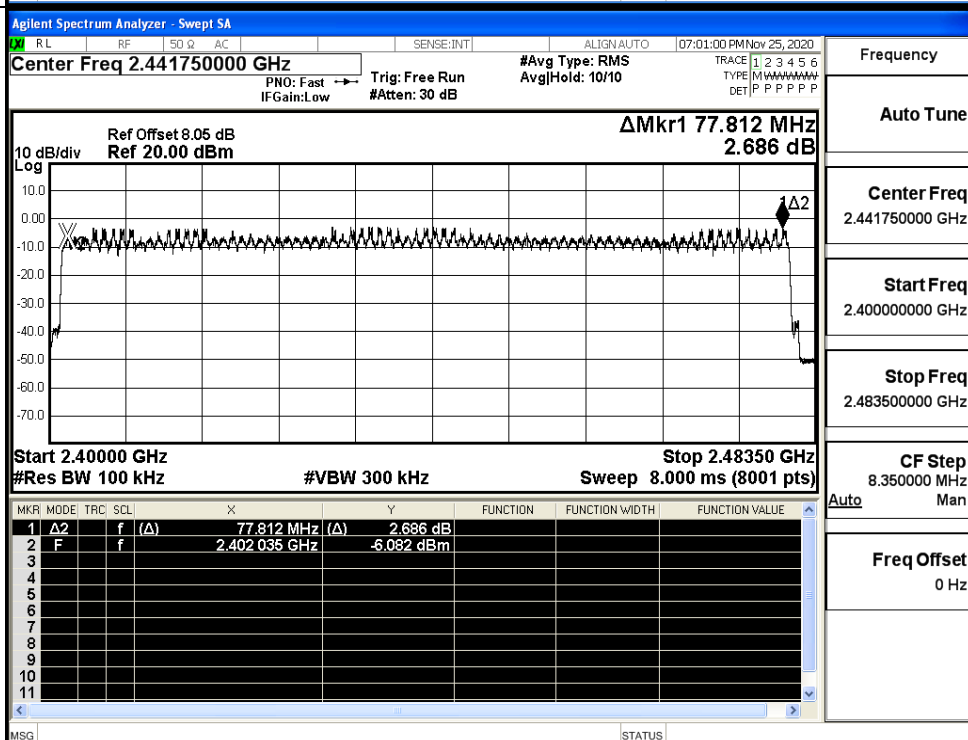
Center Freq
2.441750000 GHz

Start Freq
2.400000000 GHz

Stop Freq
2.483500000 GHz

CF Step
8.350000 MHz
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
Man

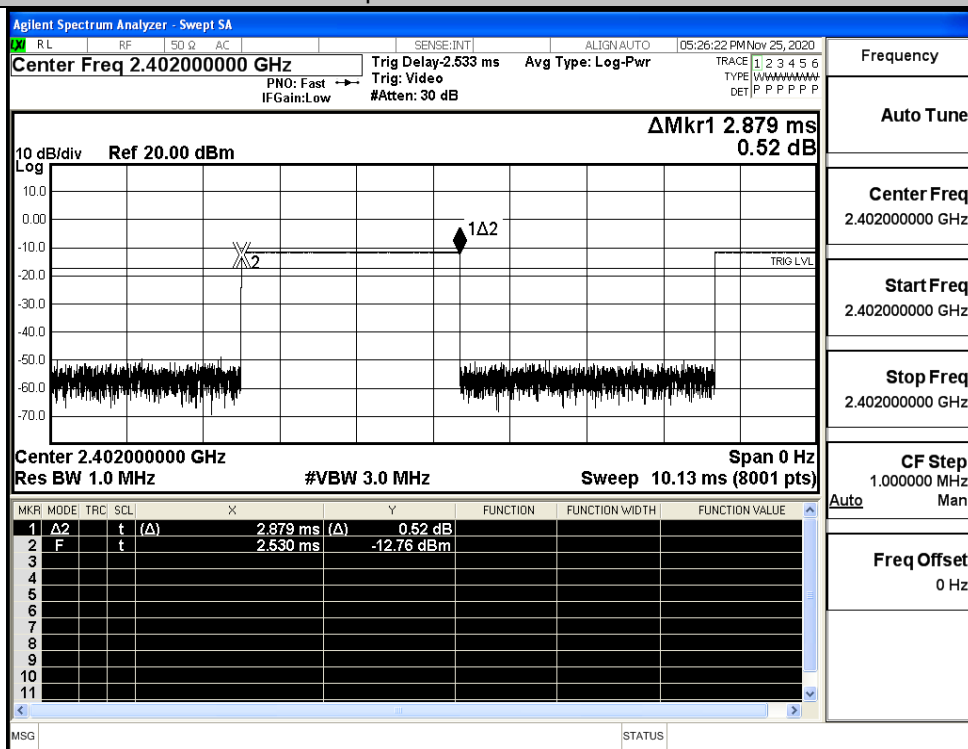
Freq Offset
0 Hz

A.5 Dwell Time

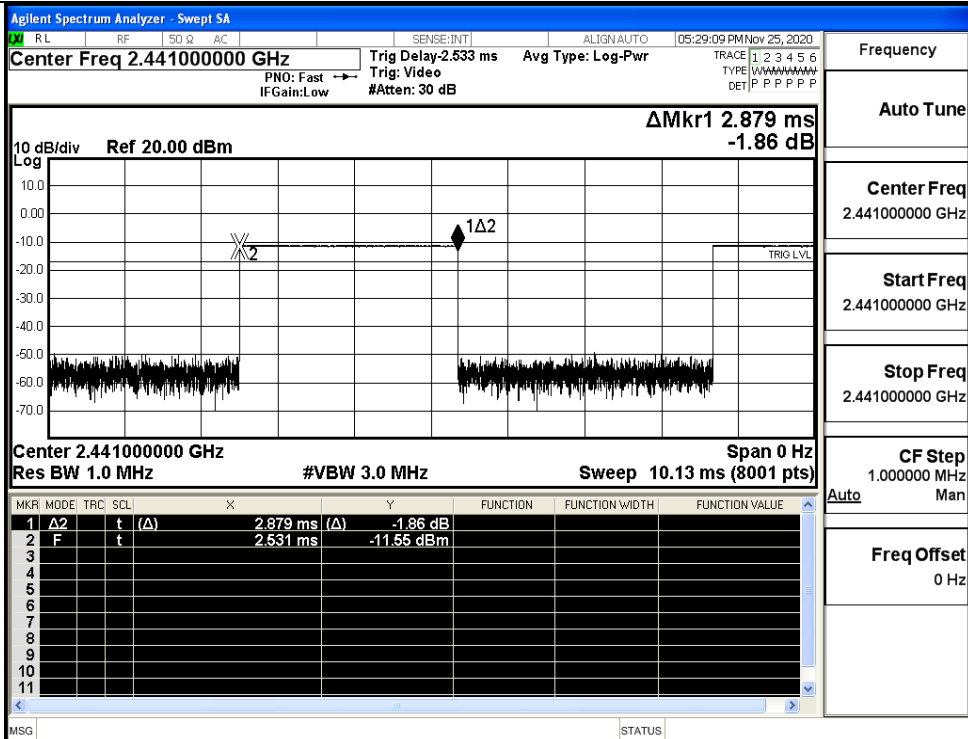
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.308	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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

Test Graphs

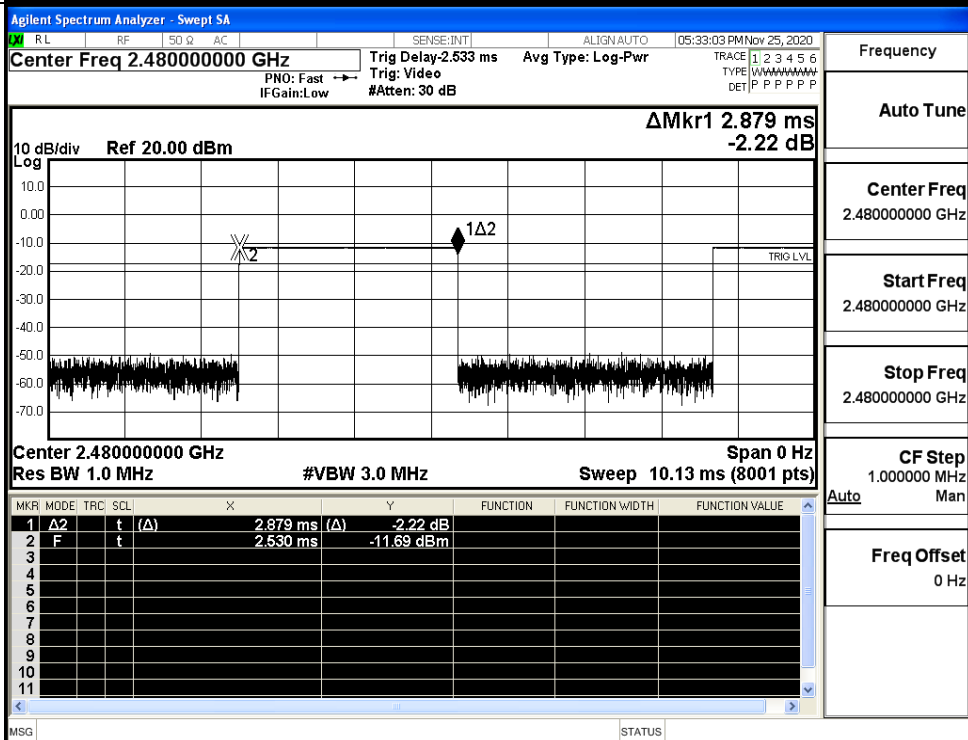
GFSK_DH5/LCH



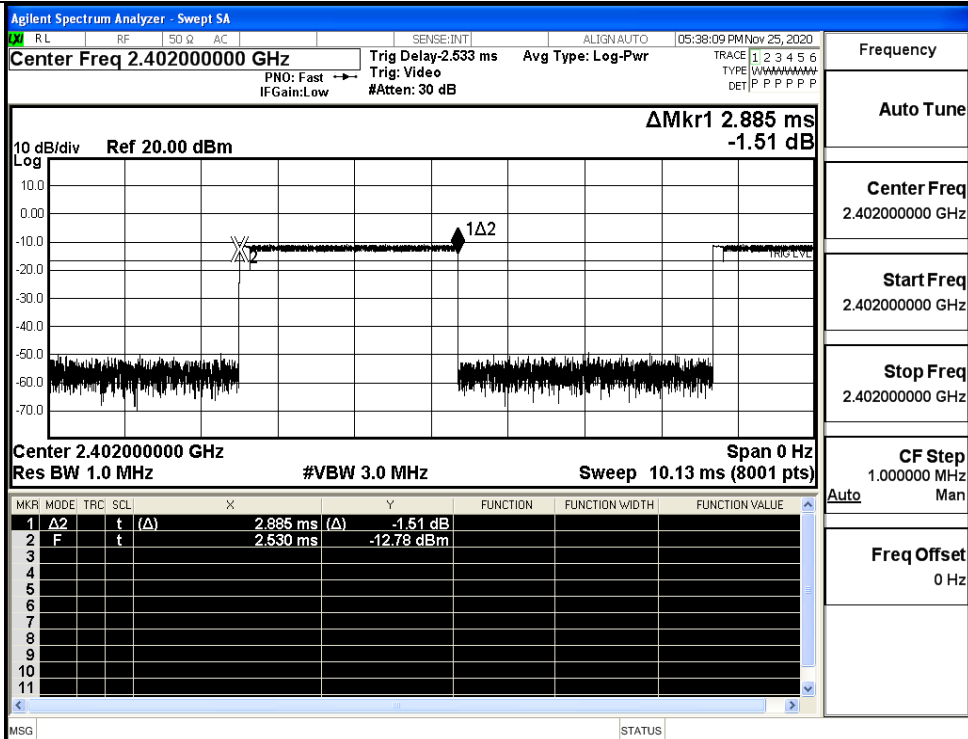
GFSK_DH5/MCH



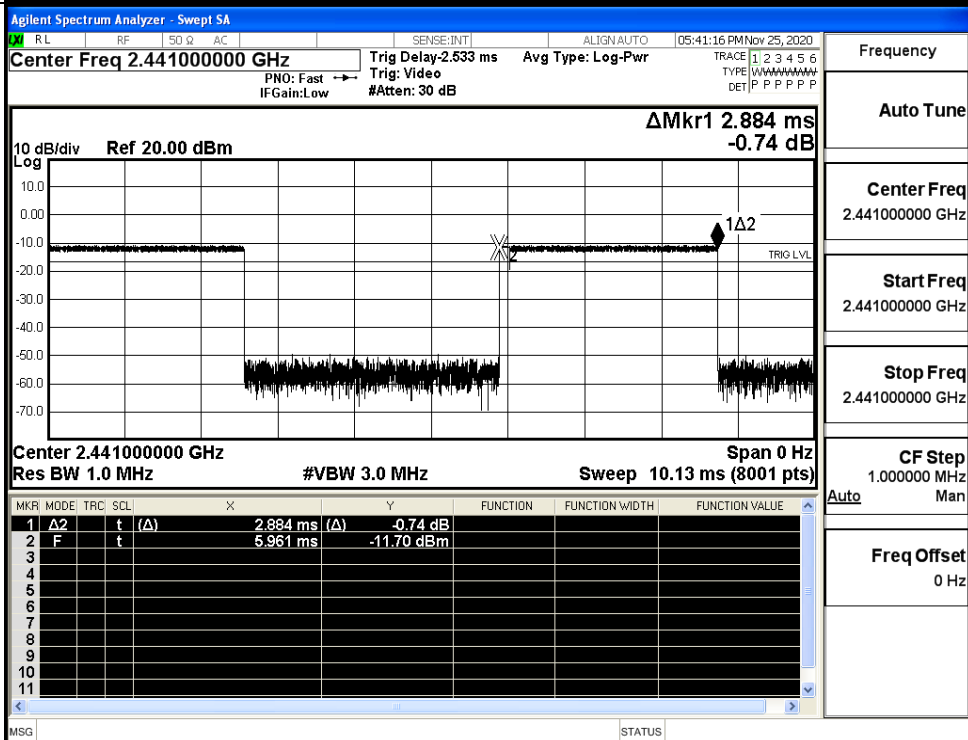
GFSK_DH5/HCH



$\pi/4$ DQPSK
_2DH5/LCH



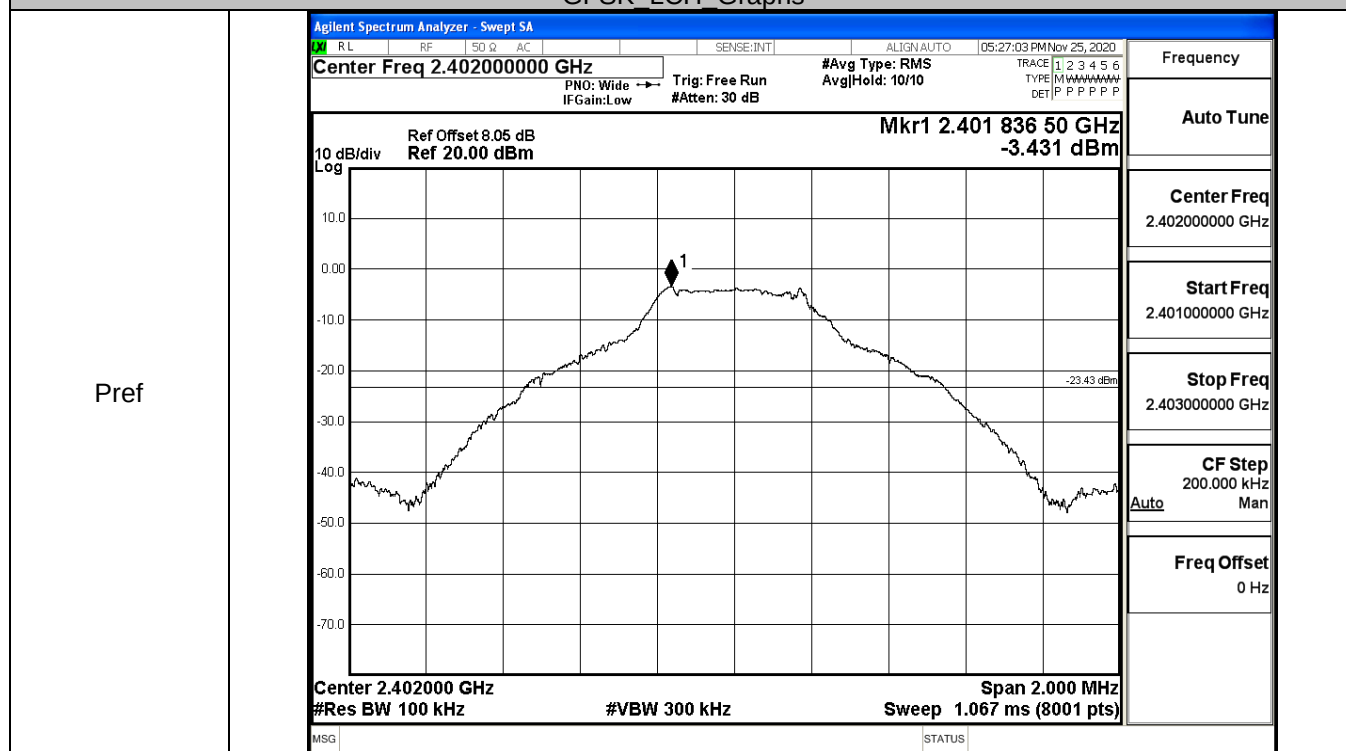
$\pi/4$ DQPSK
_2DH5/MCH



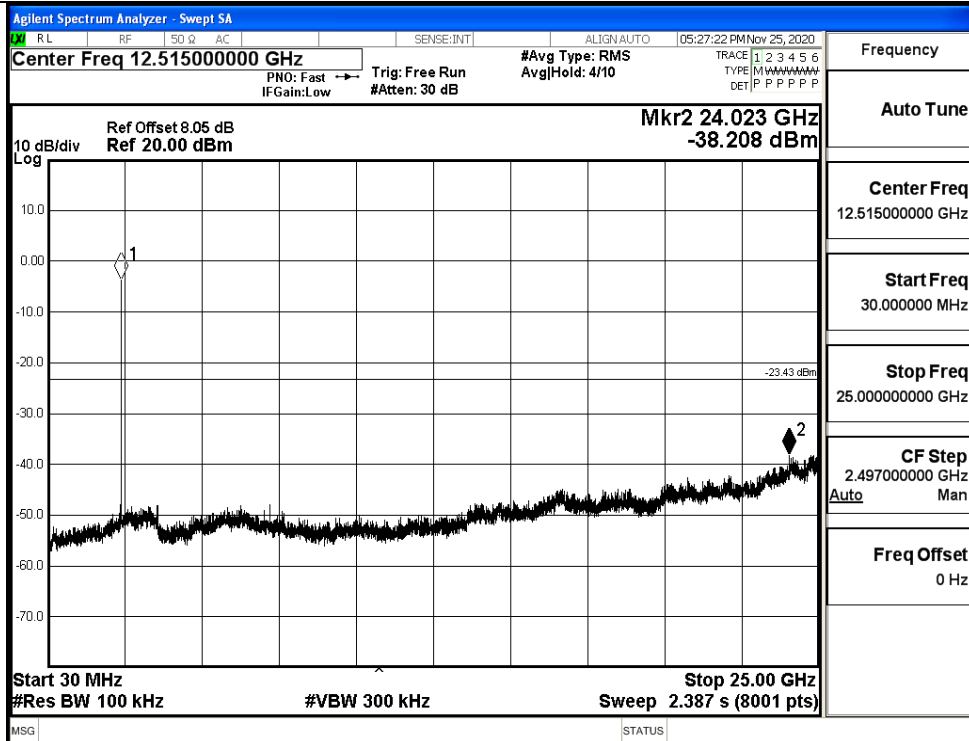
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.431	-38.208	-23.431	PASS
	MCH	-3.656	-37.528	-23.656	PASS
	HCH	-3.402	-38.270	-23.402	PASS
$\pi/4$ DQPSK	LCH	-3.296	-38.299	-23.296	PASS
	MCH	-3.154	-38.004	-23.154	PASS
	HCH	-3.448	-37.811	-23.448	PASS

GFSK LCH Graphs

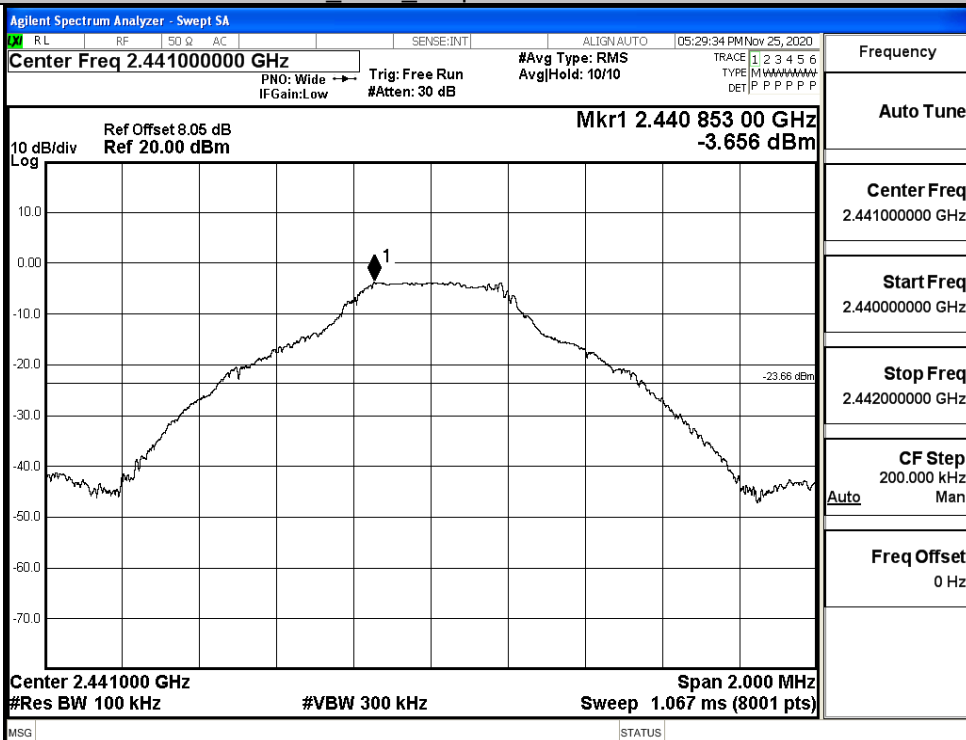


Puw

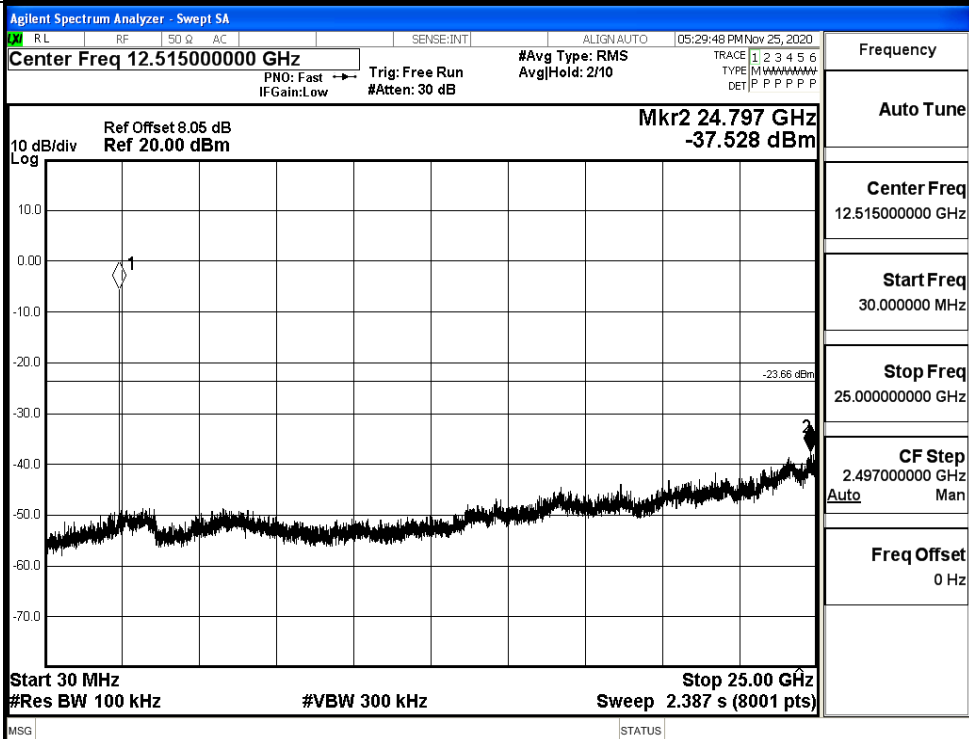


GFSK_MCH_Graphs

Pref

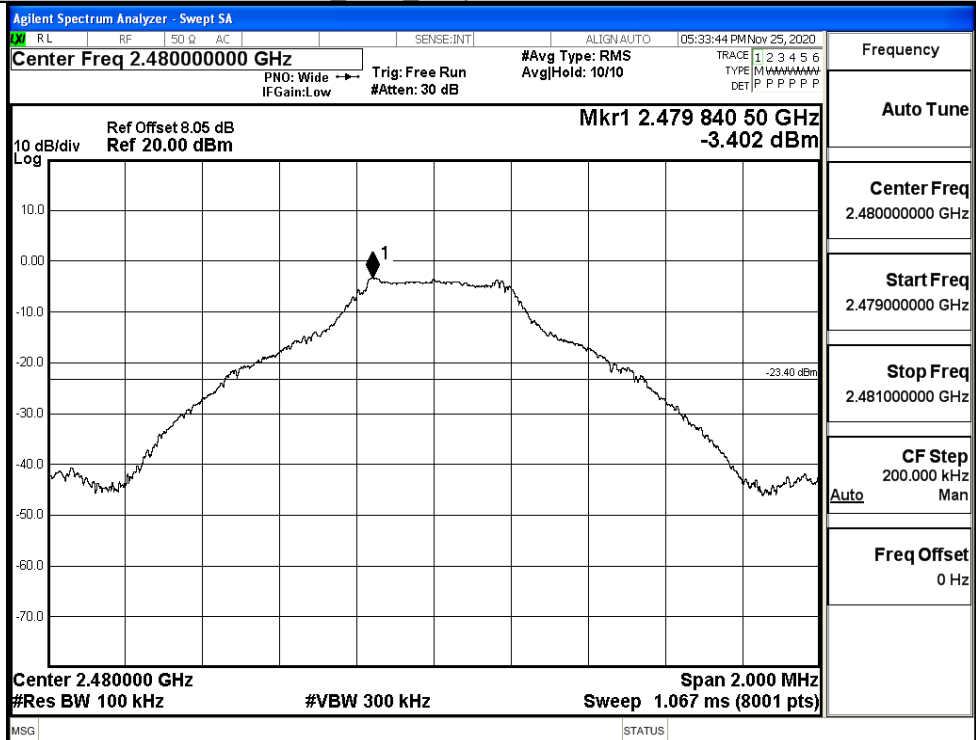


Puw

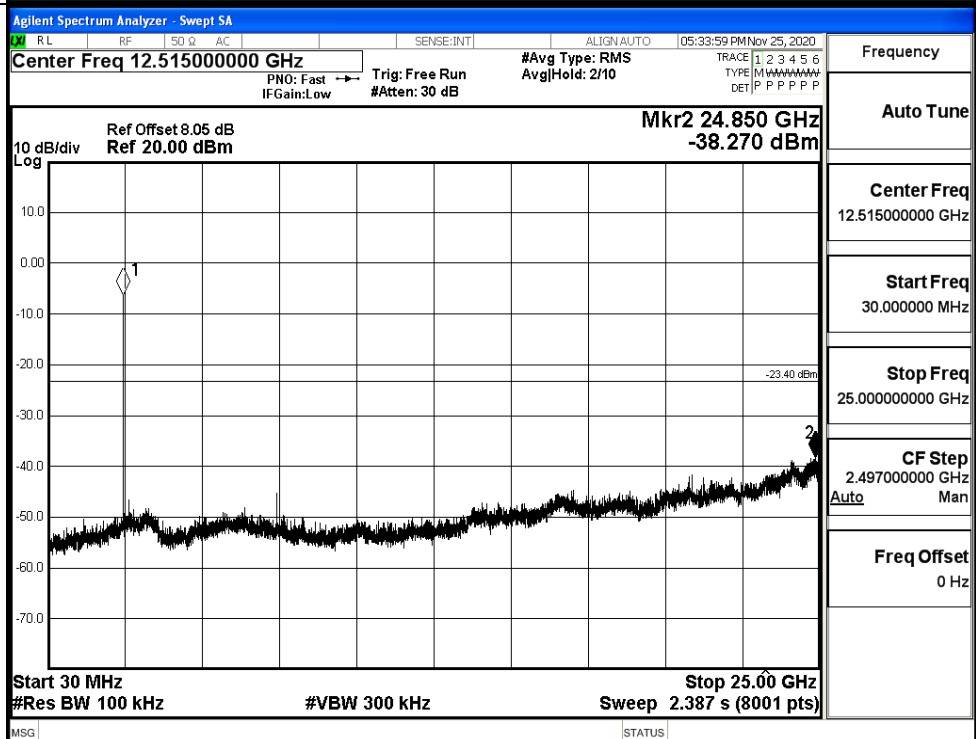


GFSK HCH Graphs

Pref

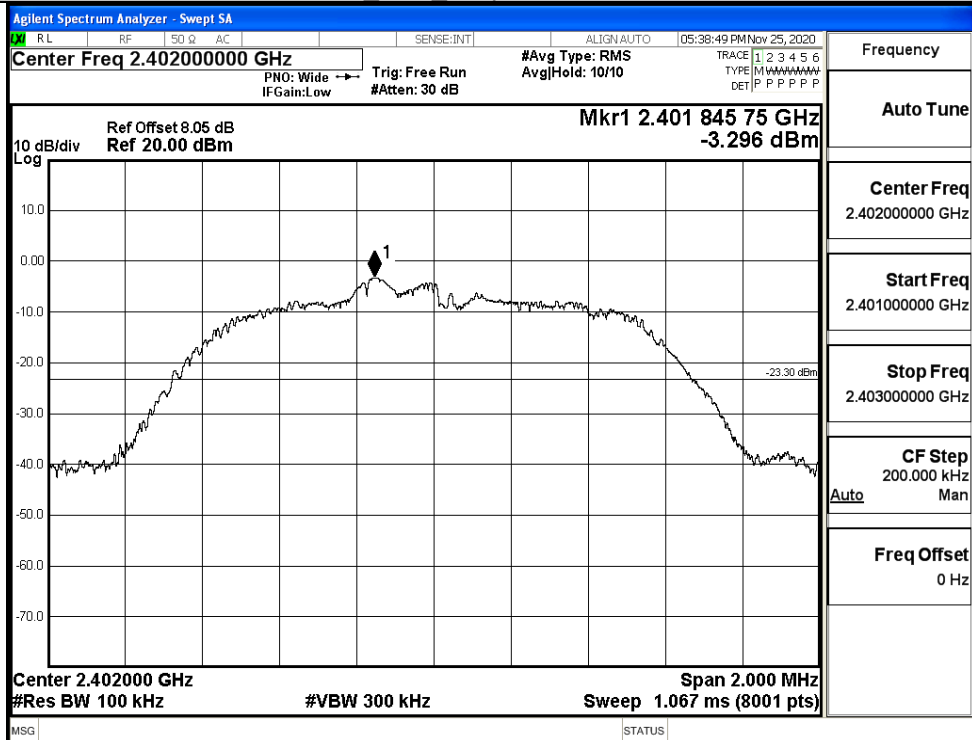


Puw

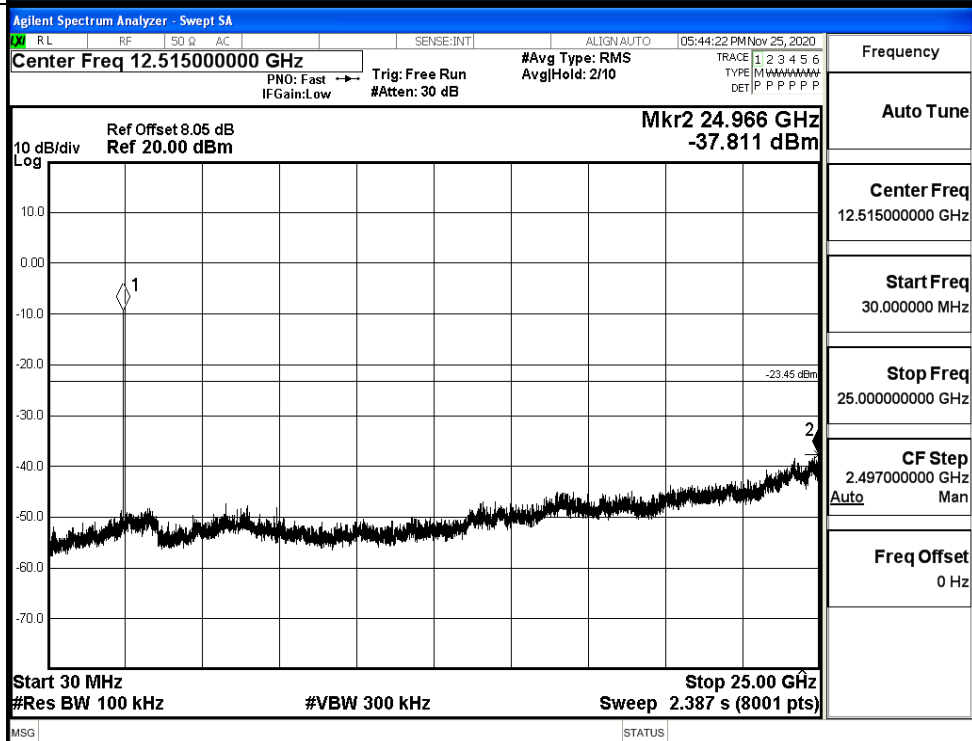


$\pi/4$ DQPSK_LCH_Graphs

Pref

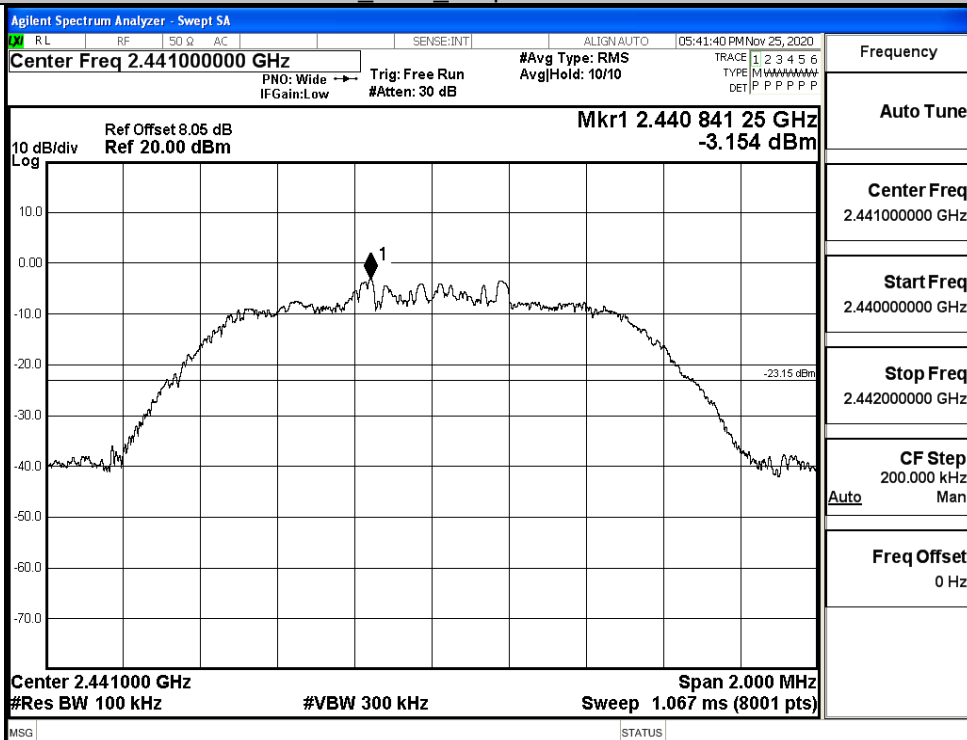


Puw

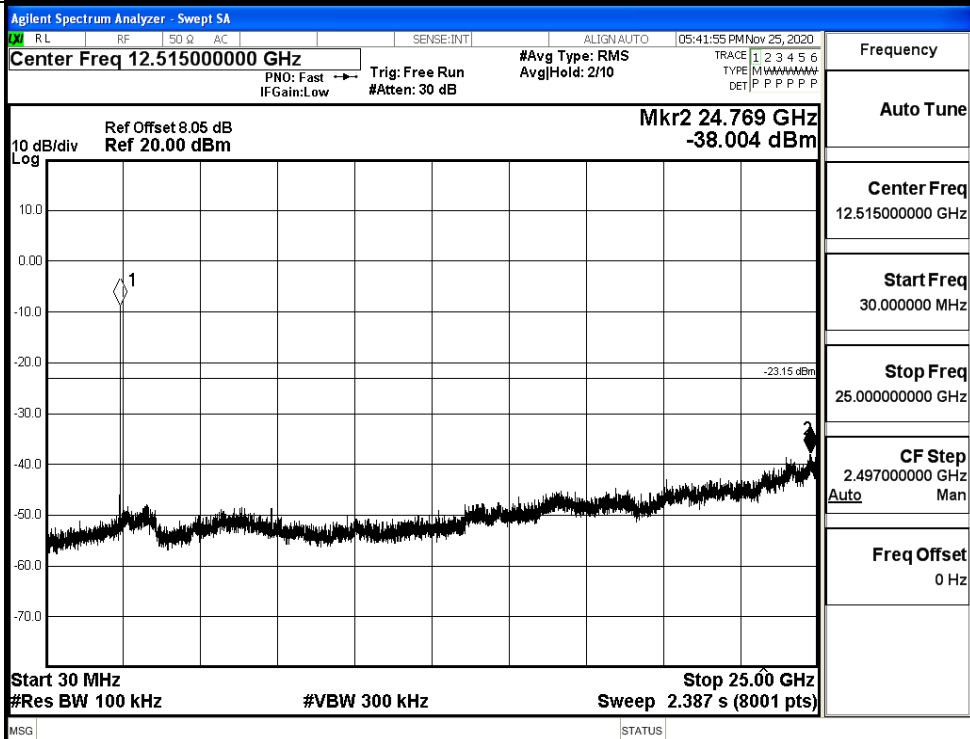


π /4DQPSK_MCH_Graphs

Pref

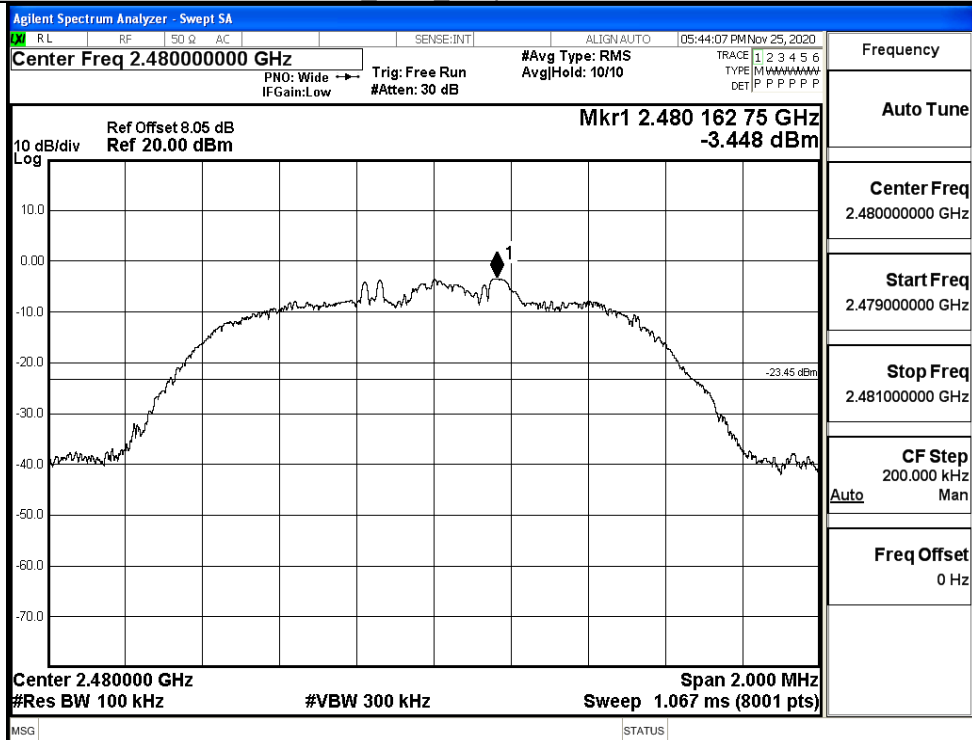


Puw

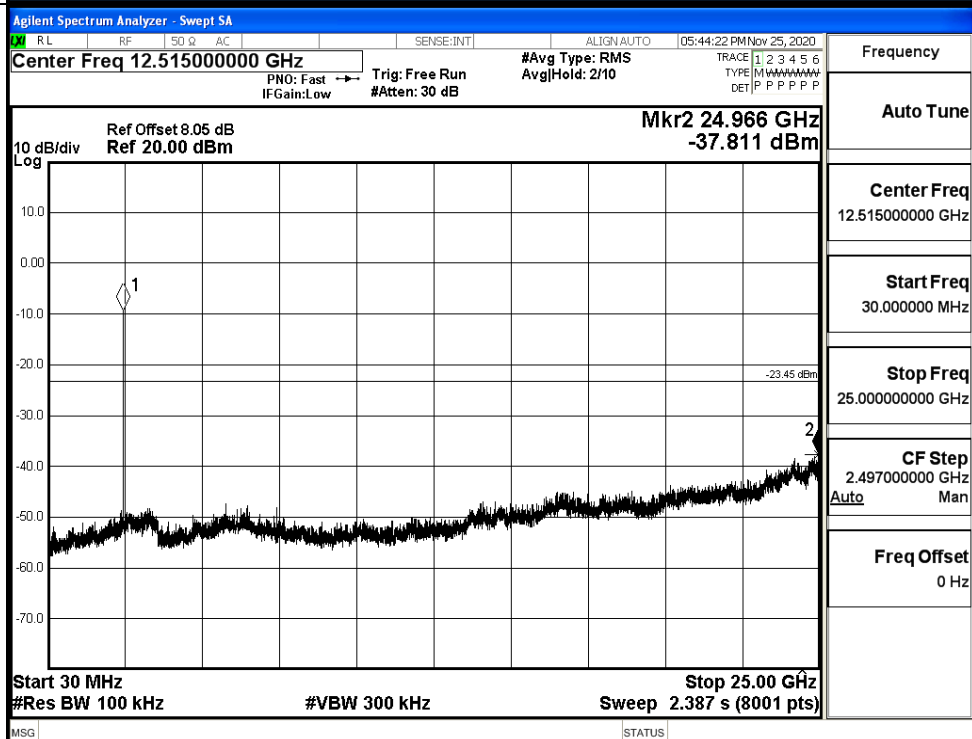


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

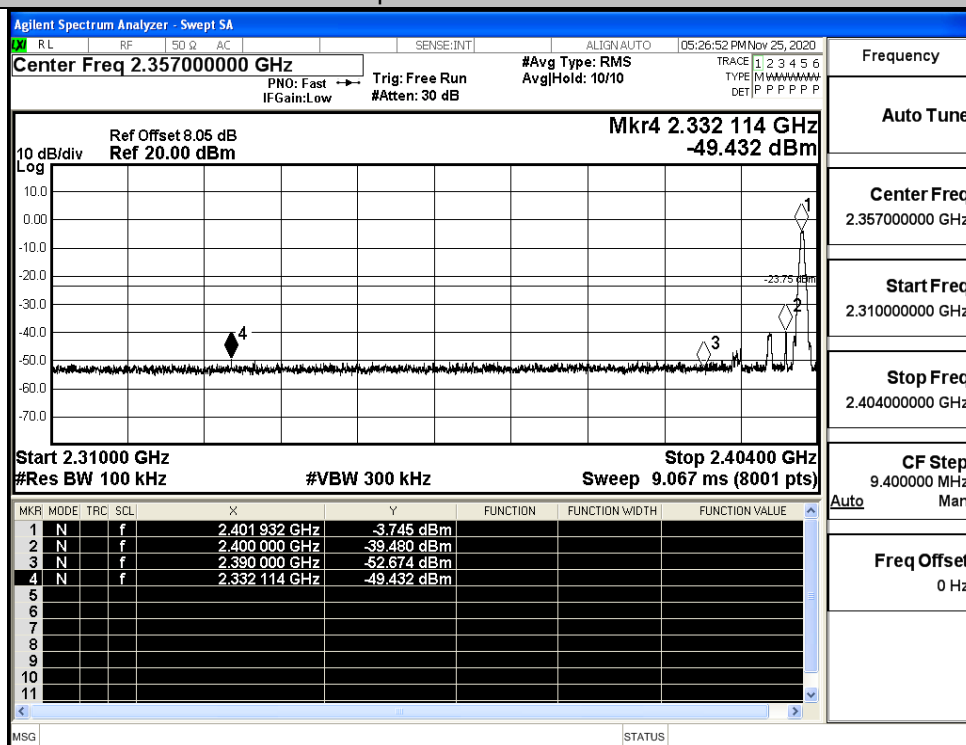


A.7 Band-edge for RF Conducted Emissions

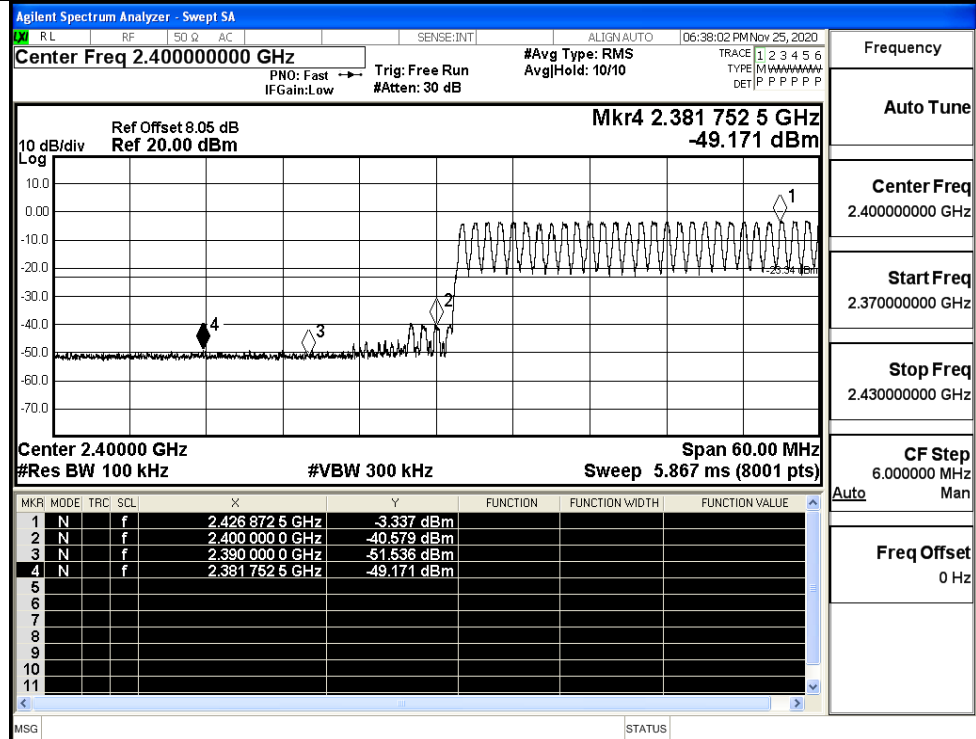
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-3.745	Off	-49.432	-23.75	PASS
			-3.337	On	-49.171	-23.34	PASS
	HCH	2480	-3.608	Off	-48.088	-23.61	PASS
			-3.406	On	-48.422	-23.41	PASS
π /4DQPSK	LCH	2402	-4.462	Off	-49.252	-24.46	PASS
			-3.223	On	-48.873	-23.22	PASS
	HCH	2480	-3.313	Off	-48.514	-23.31	PASS
			-3.484	On	-48.005	-23.48	PASS

Test Graphs

GFSK/LCH/No Hop



GFSK/LCH/Hop



Frequency

Auto Tune

Center Freq
2.400000000 GHz

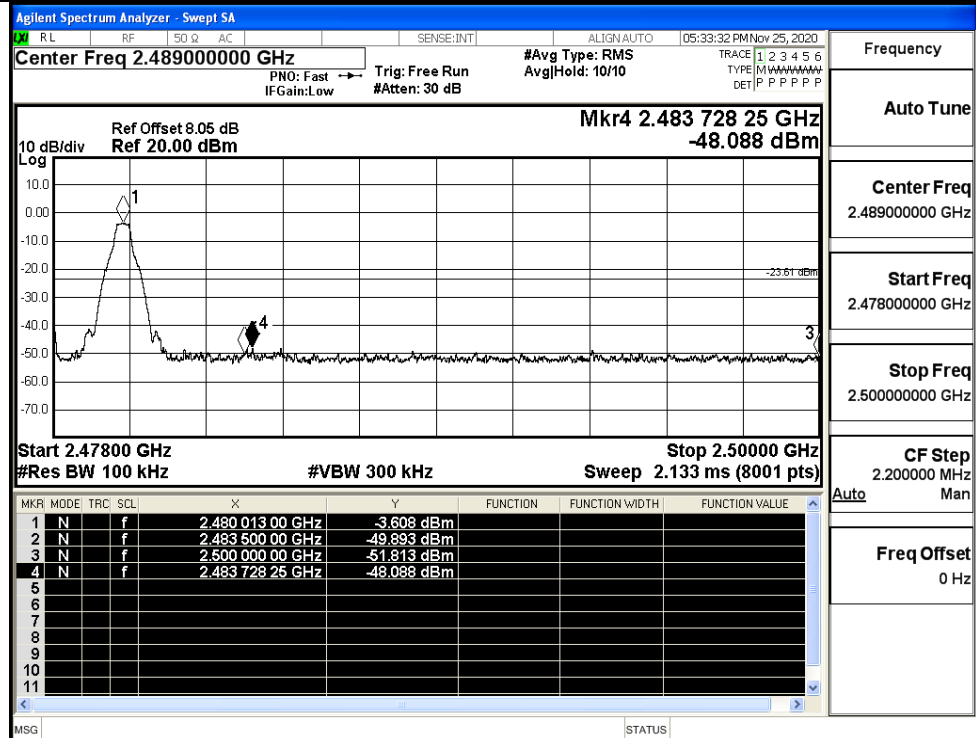
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

GFSK/HCH/No Hop



Frequency

Auto Tune

Center Freq
2.489000000 GHz

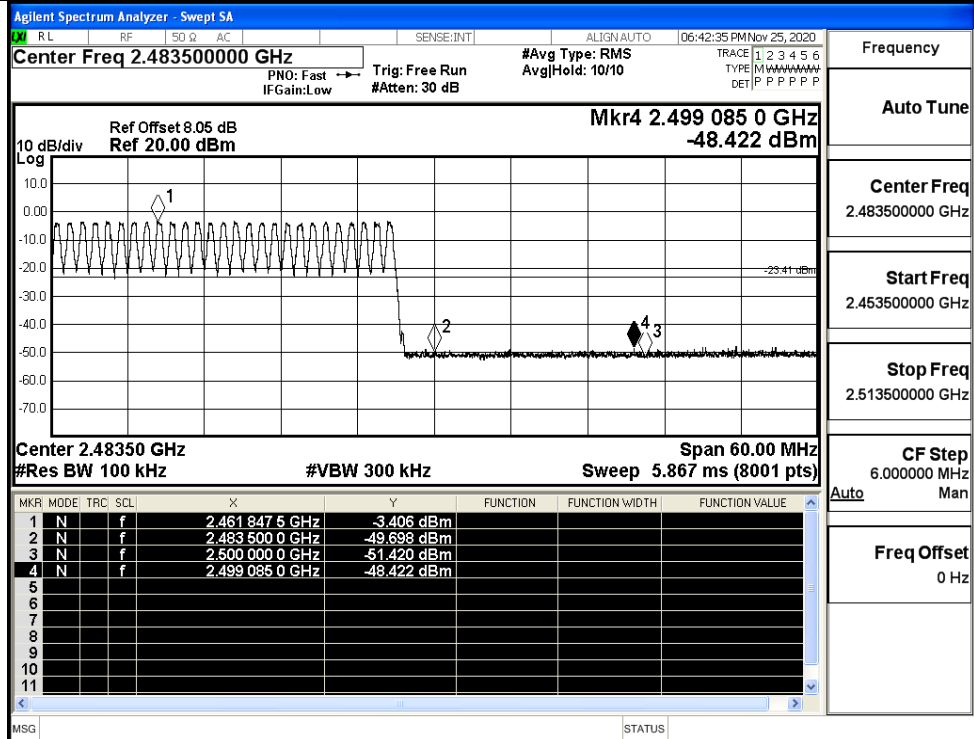
Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz
Auto Man

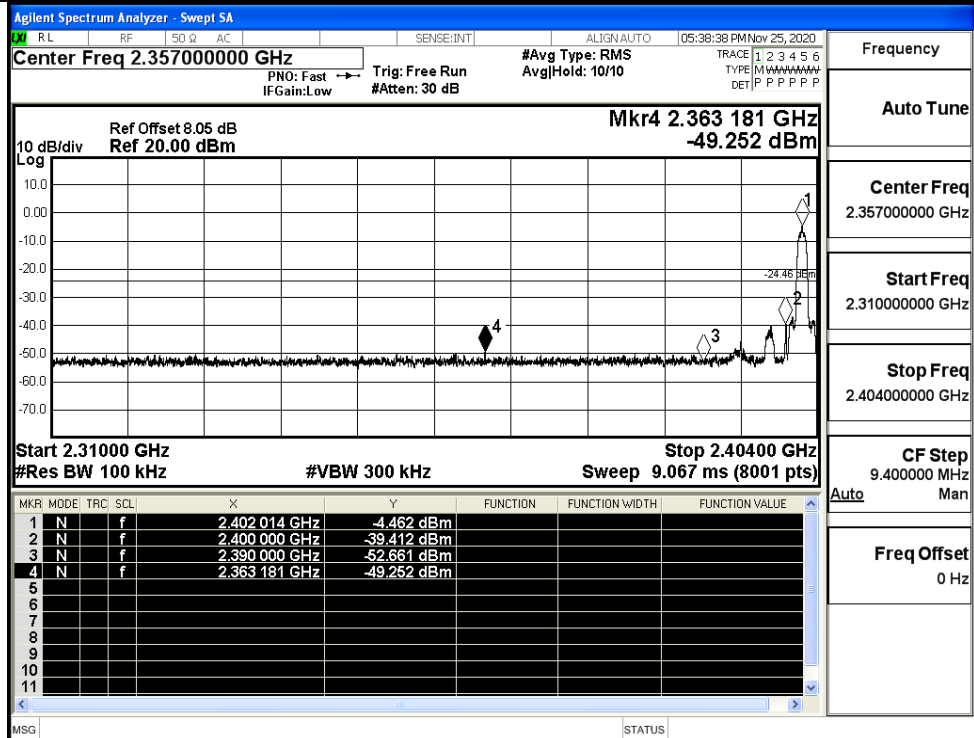
Freq Offset
0 Hz

GFSK/HCH/Hop



Frequency

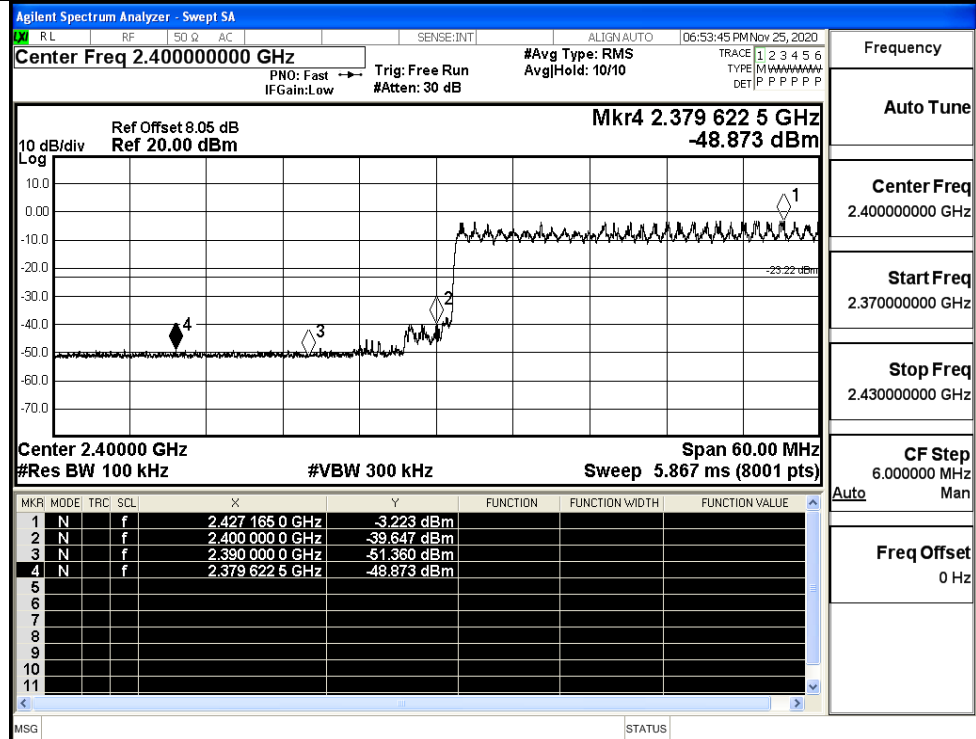
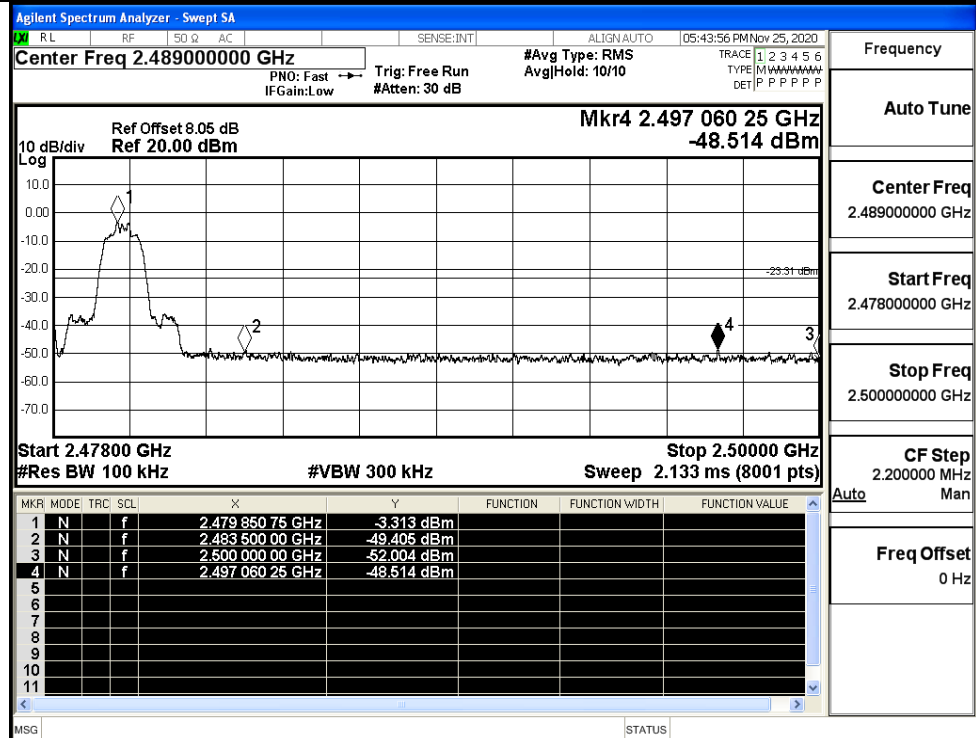
Auto Tune

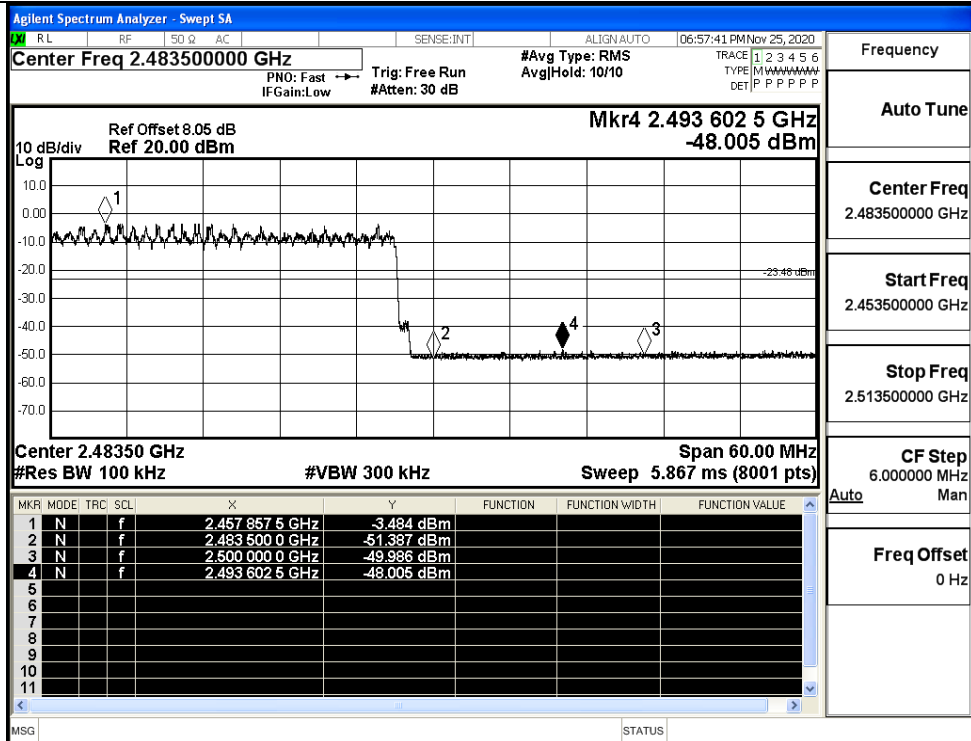
Center Freq
2.483500000 GHzStart Freq
2.453500000 GHzStop Freq
2.513500000 GHzCF Step
6.000000 MHz
Auto ManFreq Offset
0 Hz π /4DQPSK/LCH/No
Hop

Frequency

Auto Tune

Center Freq
2.357000000 GHzStart Freq
2.310000000 GHzStop Freq
2.404000000 GHzCF Step
9.400000 MHz
Auto ManFreq Offset
0 Hz

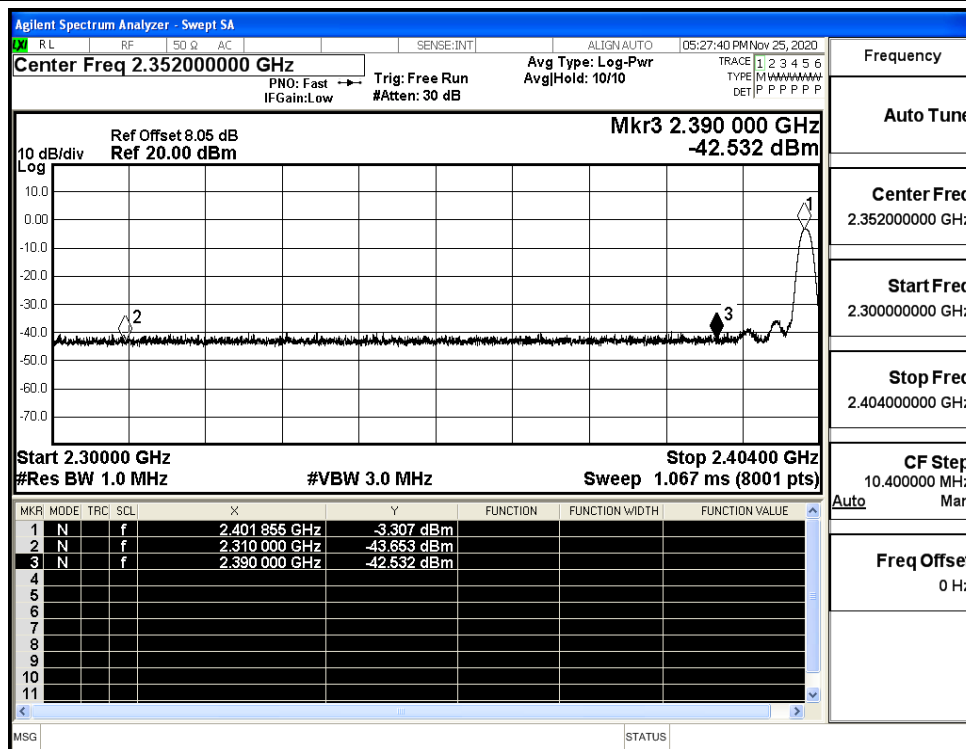
$\pi/4$ DQPSK/LCH/Hop $\pi/4$ DQPSK/HCH/No
Hop

$\pi/4$ DQPSK/HCH/Hop

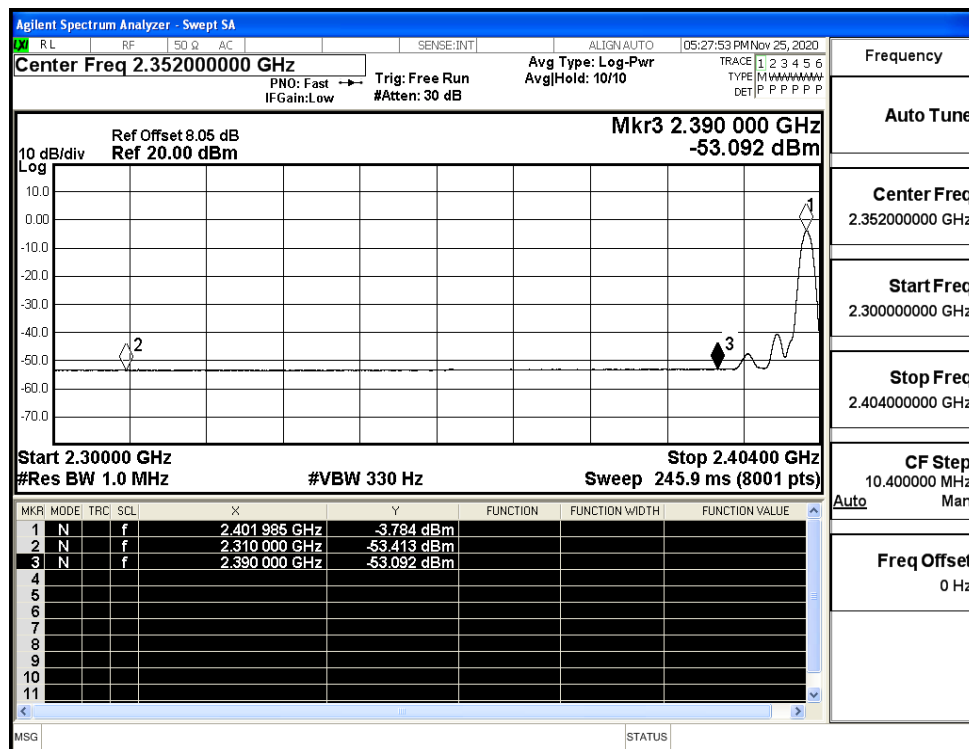
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.65	2.0	0	53.58	PEAK	74	PASS
	Off	2310.0	-53.41	2.0	0	43.82	AV	54	PASS
	Off	2390.0	-42.53	2.0	0	54.70	PEAK	74	PASS
	Off	2390.0	-53.09	2.0	0	44.14	AV	54	PASS
	Off	2483.5	-41.03	2.0	0	56.20	PEAK	74	PASS
	Off	2483.5	-51.15	2.0	0	46.08	AV	54	PASS
	Off	2500.0	-40.94	2.0	0	56.29	PEAK	74	PASS
	Off	2500.0	-52.39	2.0	0	44.84	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.55	2.0	0	54.68	PEAK	74	PASS
	Off	2310.0	-53.37	2.0	0	43.86	AV	54	PASS
	Off	2390.0	-42.52	2.0	0	54.71	PEAK	74	PASS
	Off	2390.0	-52.93	2.0	0	44.30	AV	54	PASS
	Off	2483.5	-41.73	2.0	0	55.50	PEAK	74	PASS
	Off	2483.5	-51.34	2.0	0	45.89	AV	54	PASS
	Off	2500.0	-42.58	2.0	0	54.65	PEAK	74	PASS
	Off	2500.0	-52.33	2.0	0	44.90	AV	54	PASS

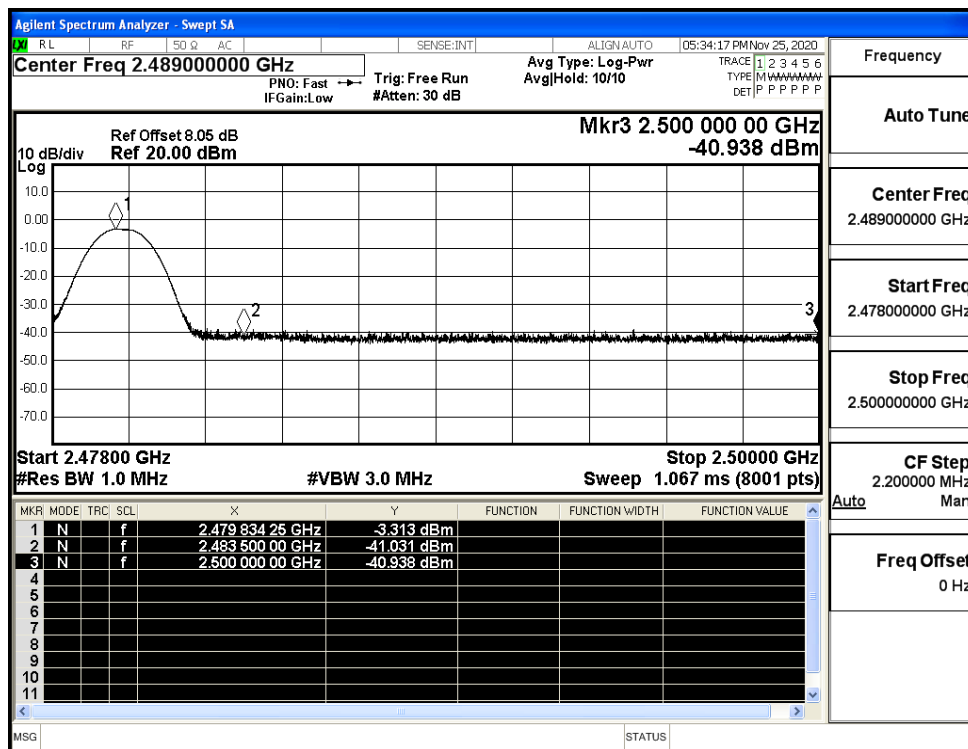
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



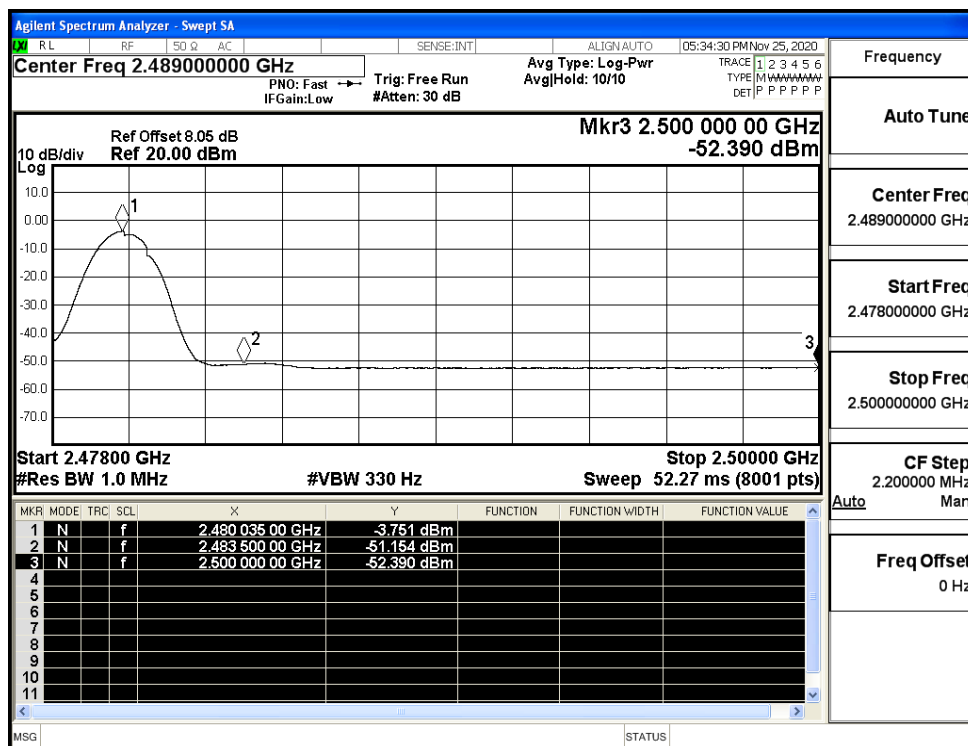
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



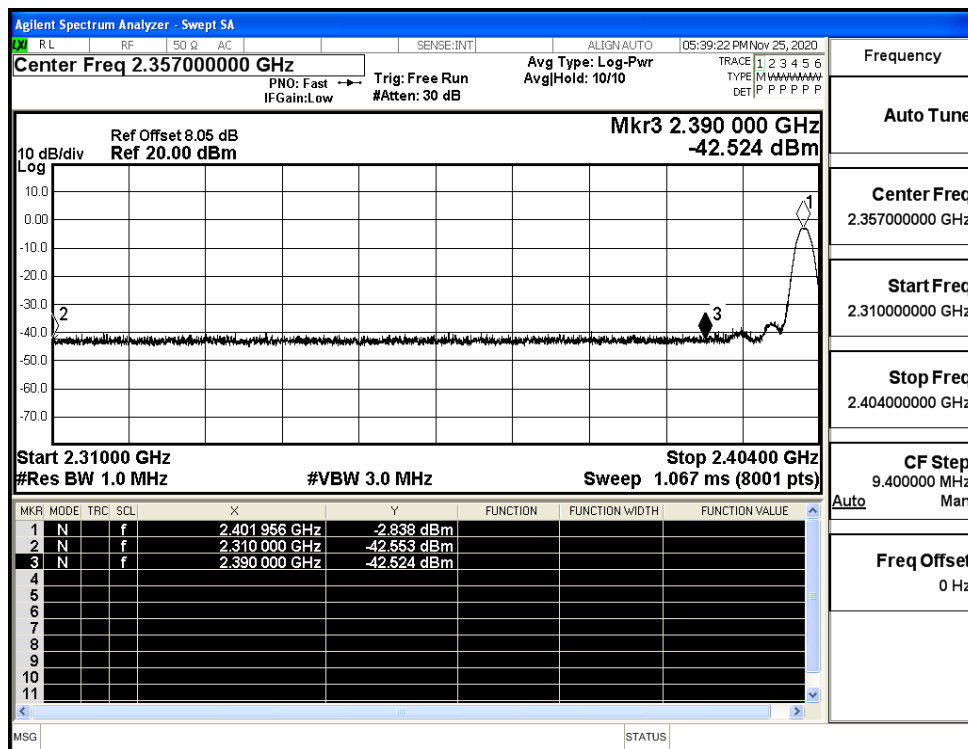
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



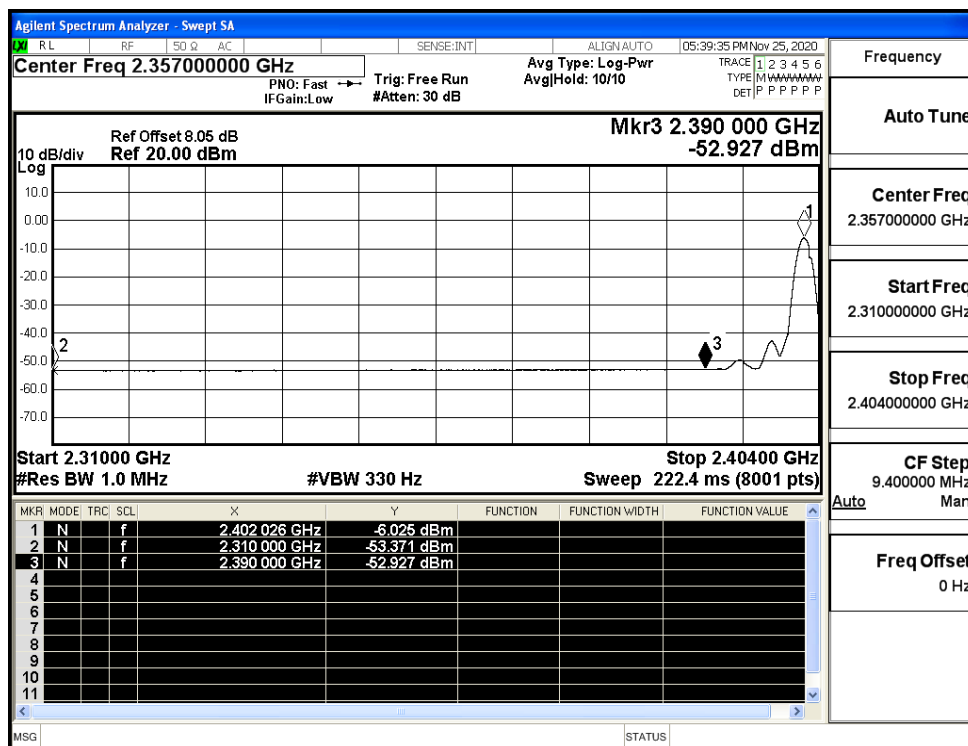
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



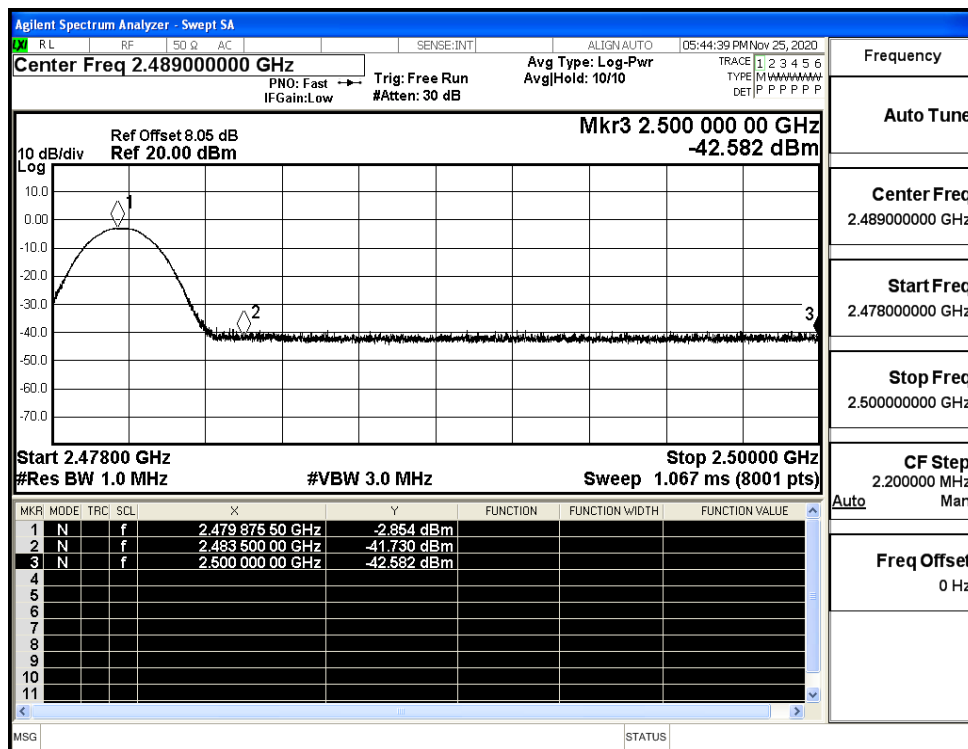
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



Restrict-band band-edge measurements_Hopping Off_π/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)

