

Appendix A

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

Product Name: TWS Bluetooth earbuds

Trade Mark: 1Mii

Test Model: E300

Environmental Conditions

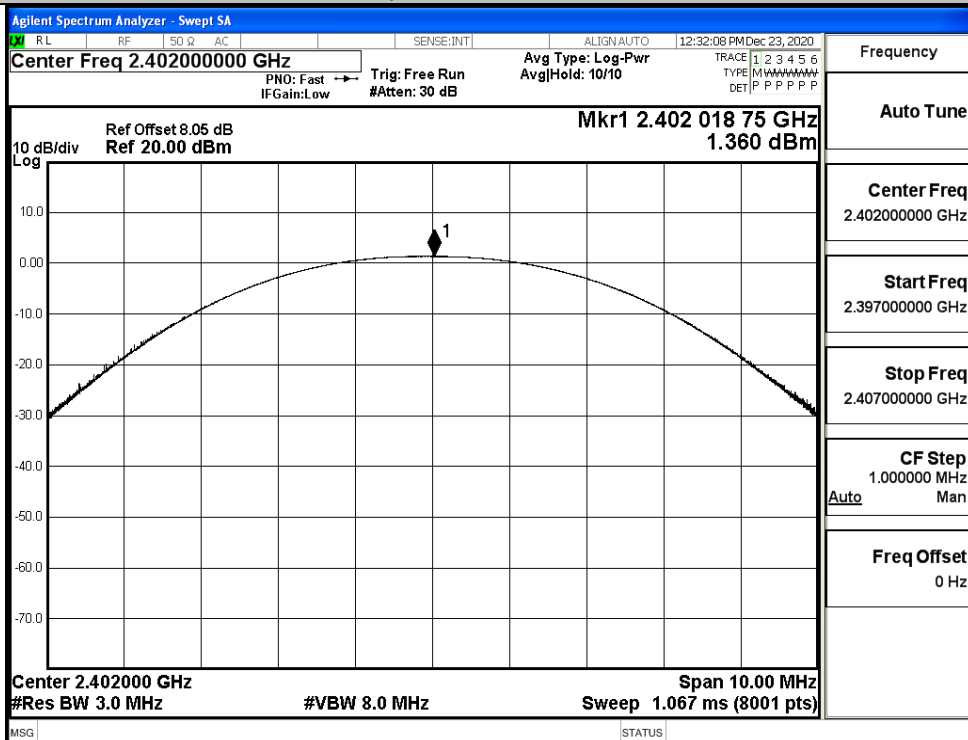
Temperature:	24.6° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Ken He
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

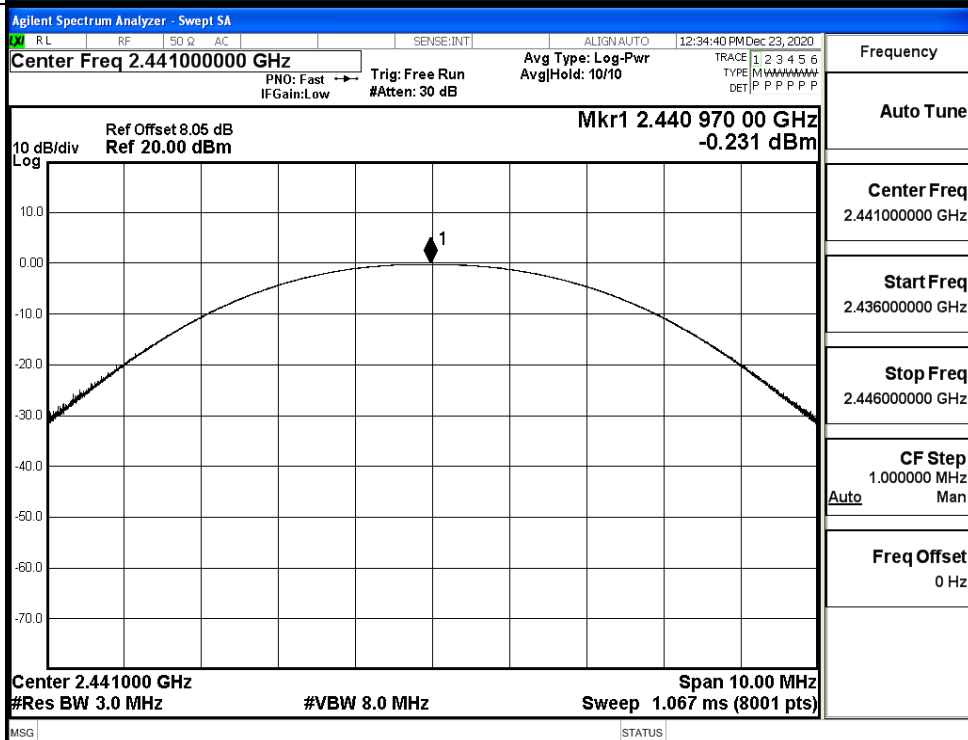
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.360	21	PASS
	MCH	-0.231	21	PASS
	HCH	-2.257	21	PASS
$\pi/4$ DQPSK	LCH	3.691	21	PASS
	MCH	2.017	21	PASS
	HCH	-0.077	21	PASS
8DPSK	LCH	4.167	21	PASS
	MCH	2.493	21	PASS
	HCH	0.417	21	PASS

Test Graphs

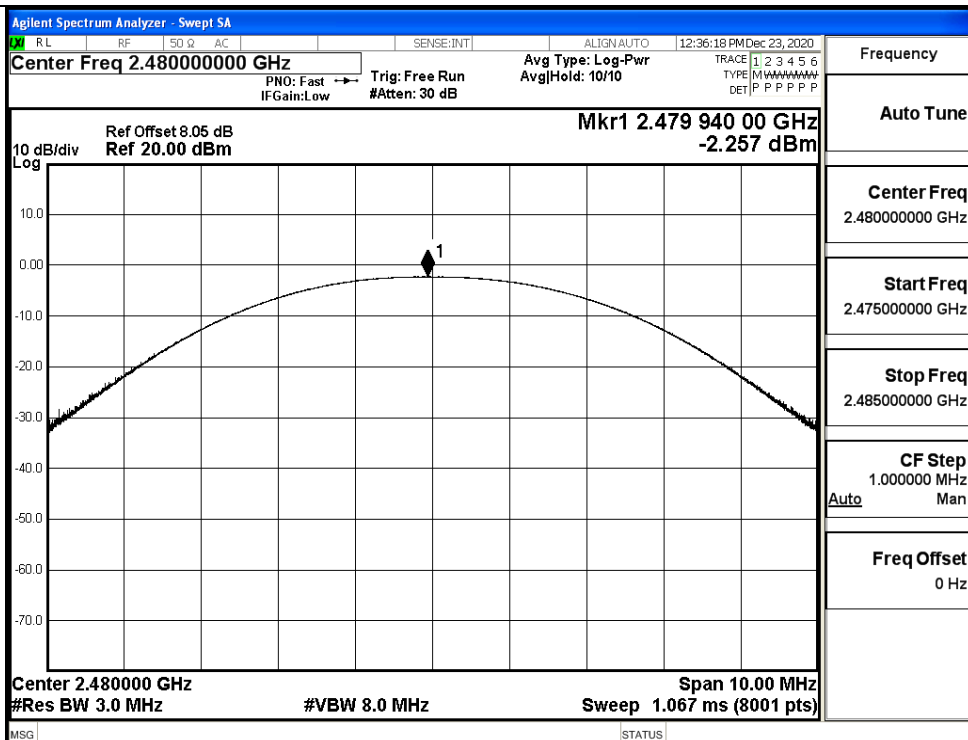
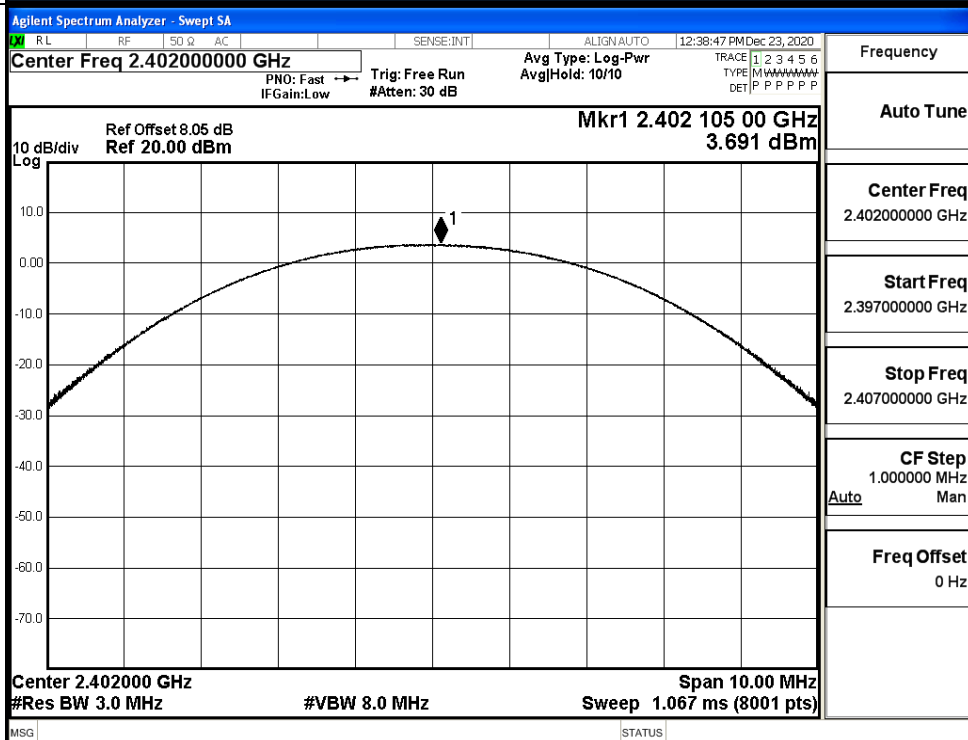
GFSK/LCH

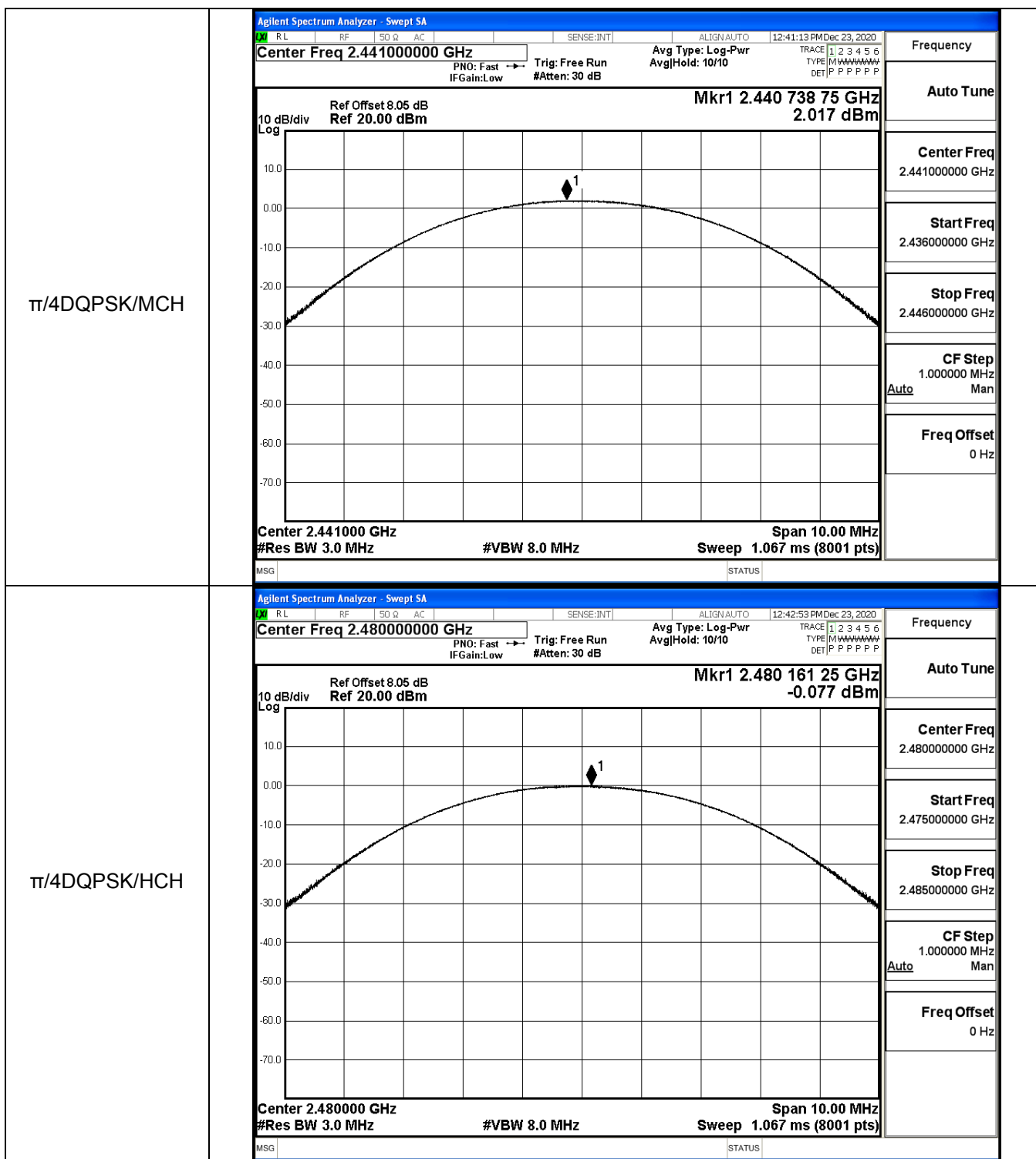


GFSK/MCH

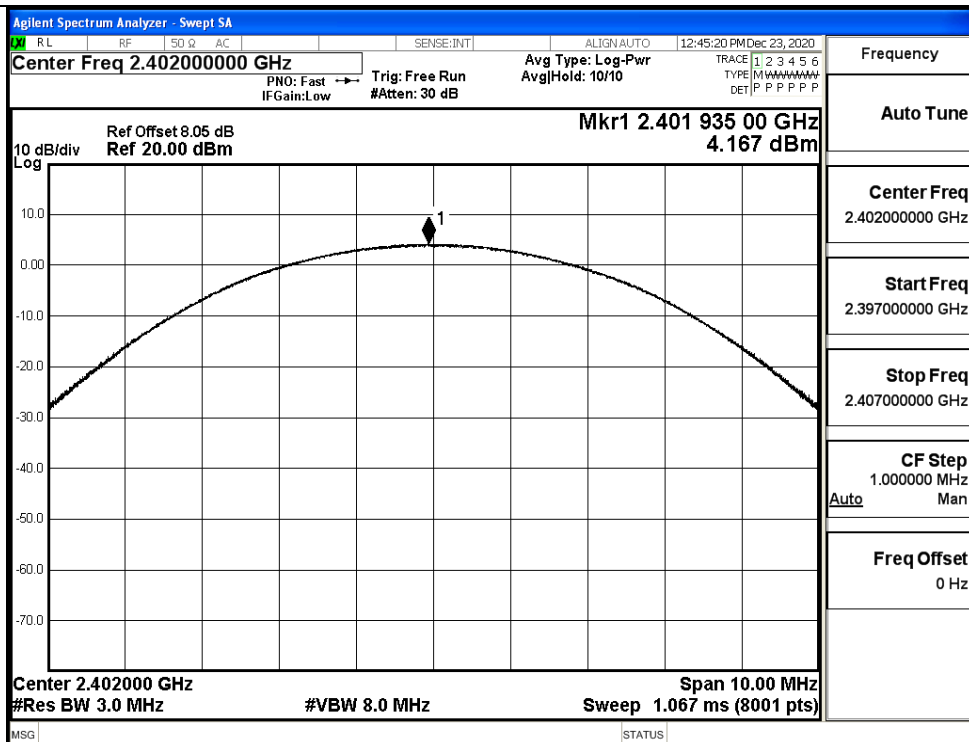


GFSK/HCH

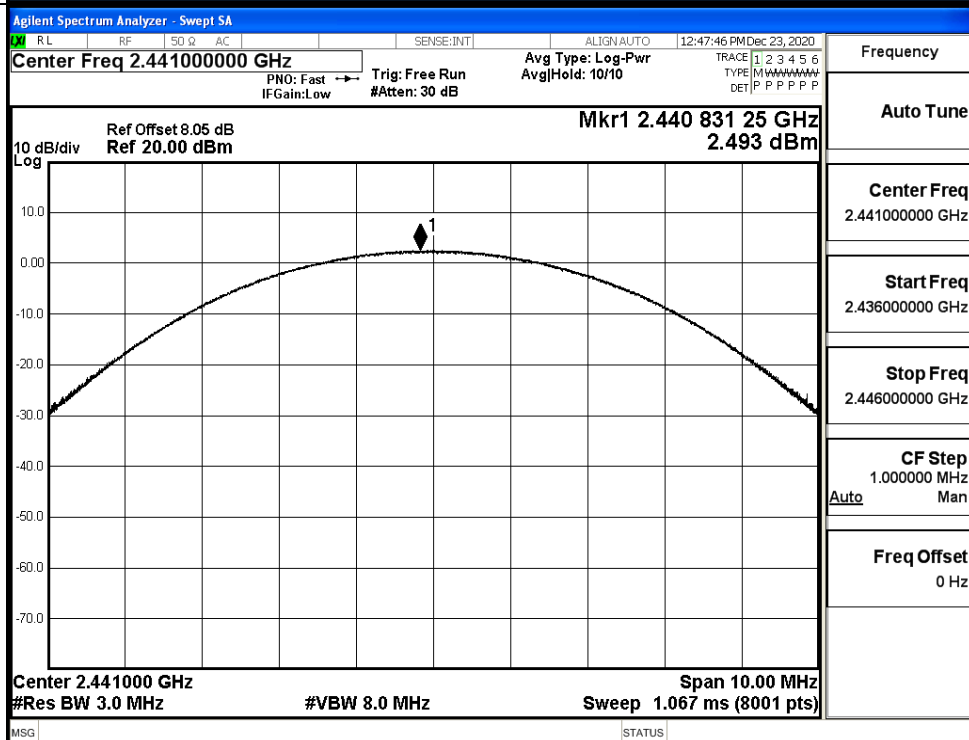
 π /4DQPSK/LCH



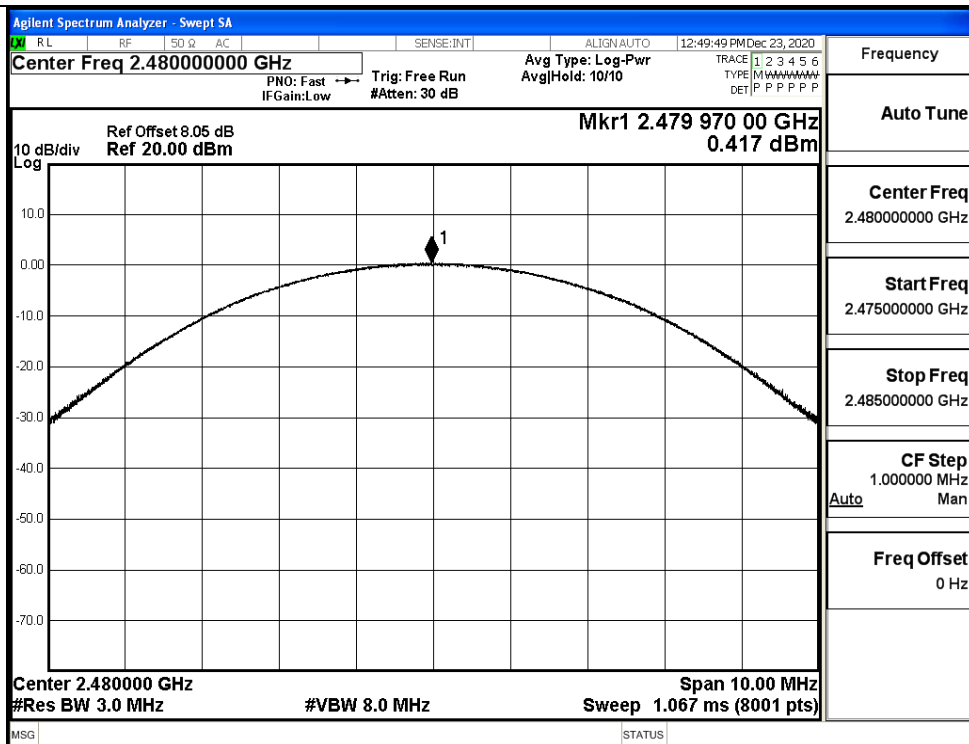
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

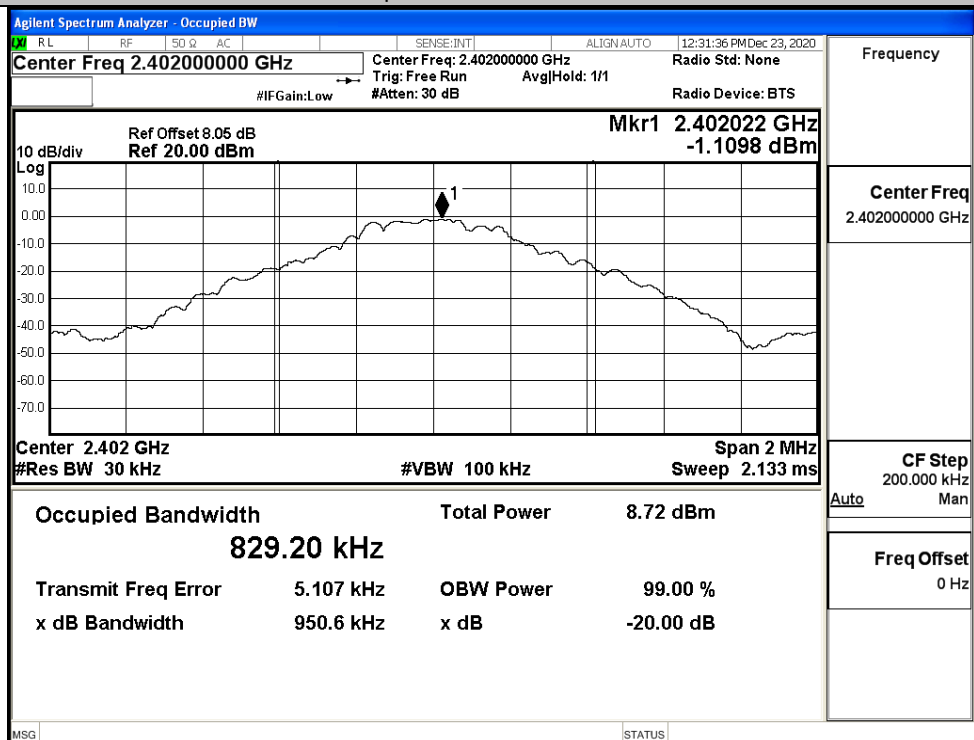


A.2 20dB Bandwidth

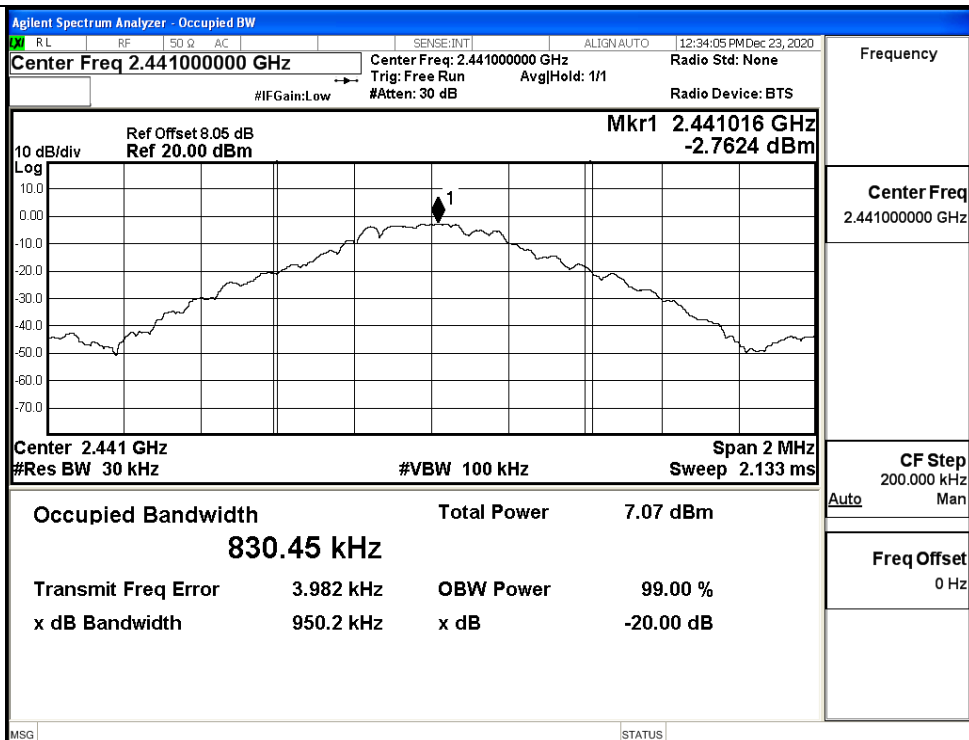
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9506	Not Specified	PASS
	MCH	0.9502	Not Specified	PASS
	HCH	0.9516	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.320	Not Specified	PASS
	MCH	1.320	Not Specified	PASS
	HCH	1.319	Not Specified	PASS
8DPSK	LCH	1.303	Not Specified	PASS
	MCH	1.305	Not Specified	PASS
	HCH	1.302	Not Specified	PASS

Test Graphs

GFSK/LCH



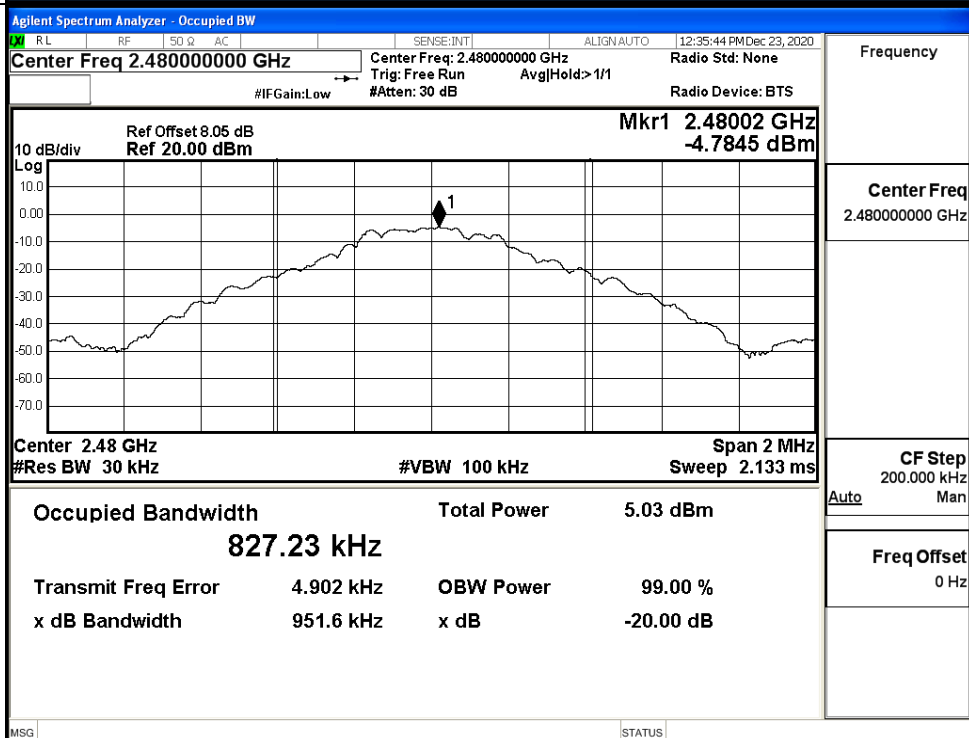
GFSK/MCH



Frequency

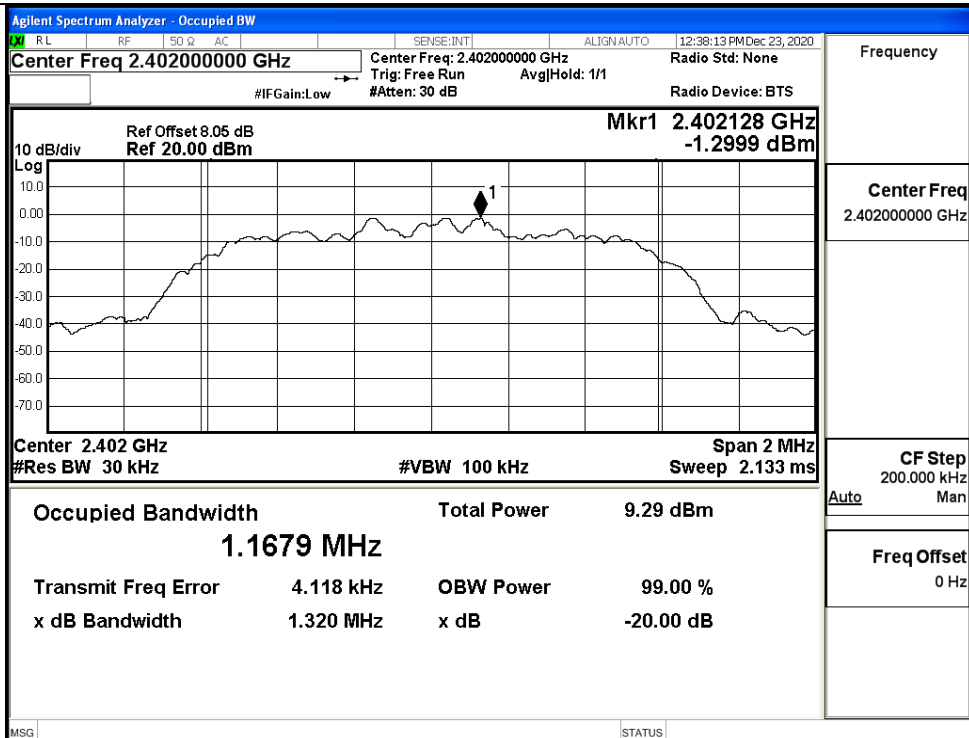
Center Freq
2.441000000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

GFSK/HCH



Frequency

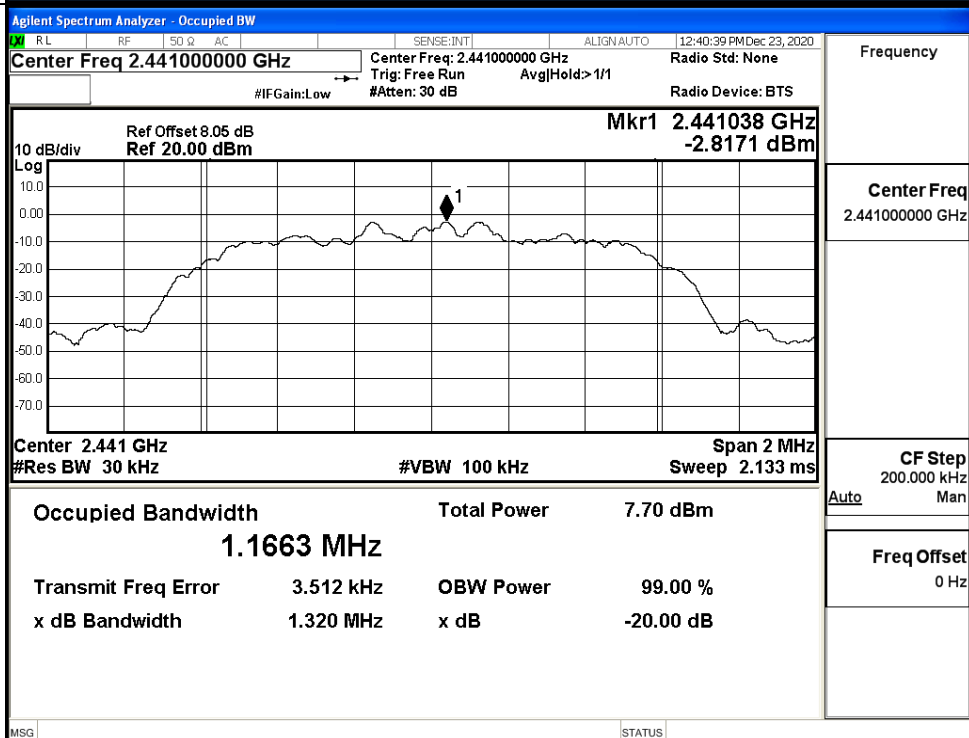
Center Freq
2.480000000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

$\pi/4$ DQPSK/LCH

Frequency

Center Freq
2.402000000 GHzCF Step
200.000 kHz
Man

Auto

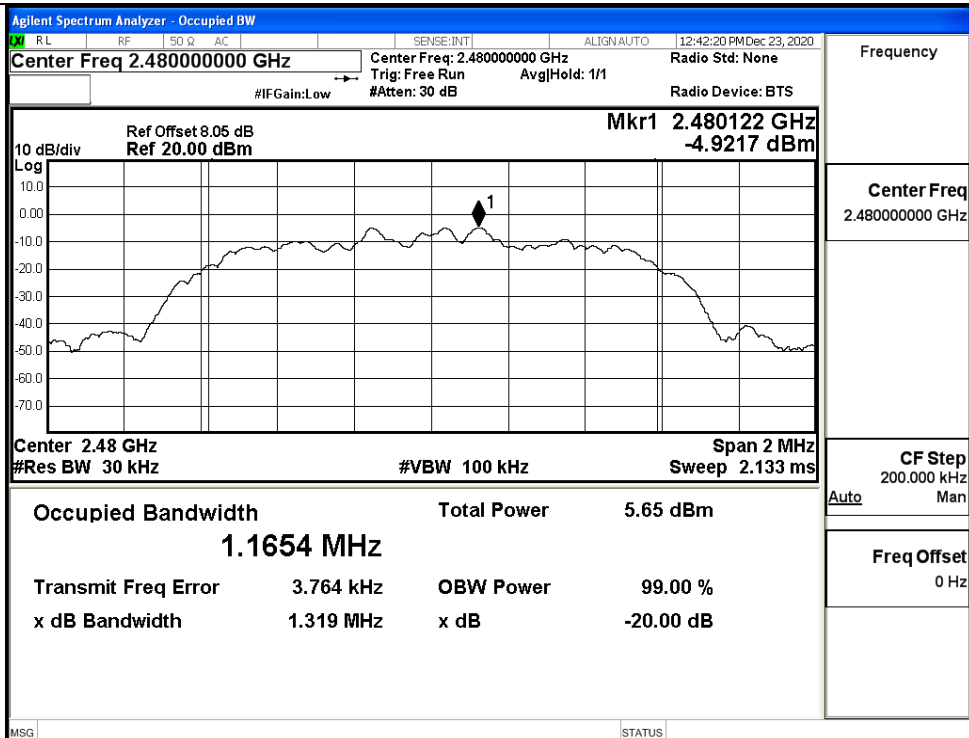
Freq Offset
0 Hz $\pi/4$ DQPSK/MCH

Frequency

Center Freq
2.441000000 GHzCF Step
200.000 kHz
Man

Auto

Freq Offset
0 Hz

$\pi/4$ DQPSK/HCH

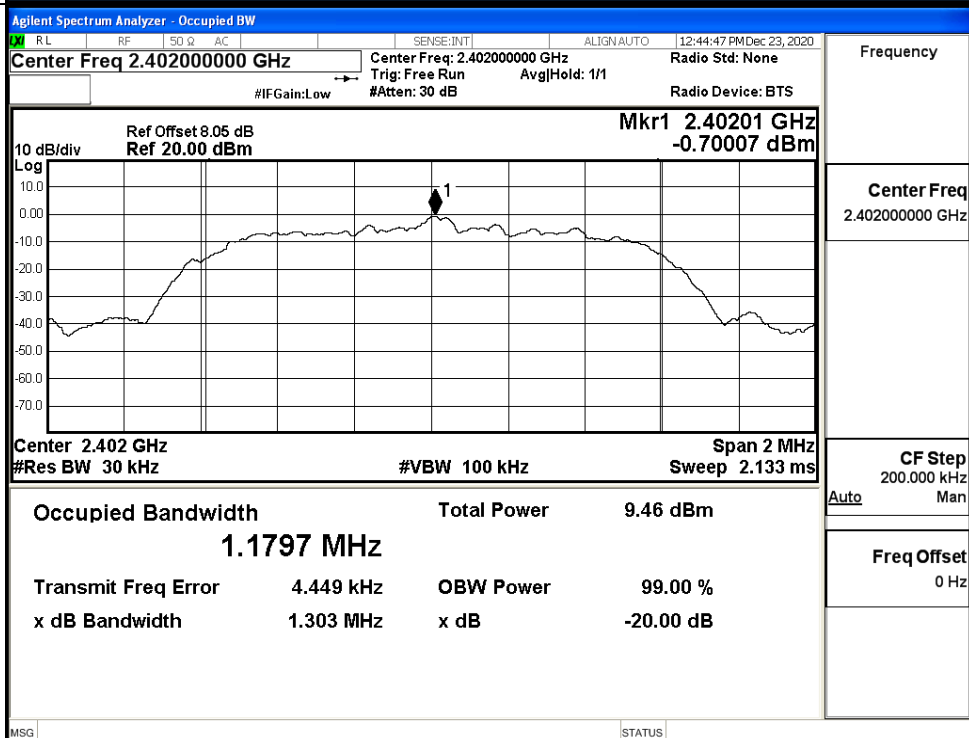
Frequency

Center Freq
2.480000000 GHzCF Step
200.000 kHz
Man

Auto

Freq Offset
0 Hz

8DPSK/LCH



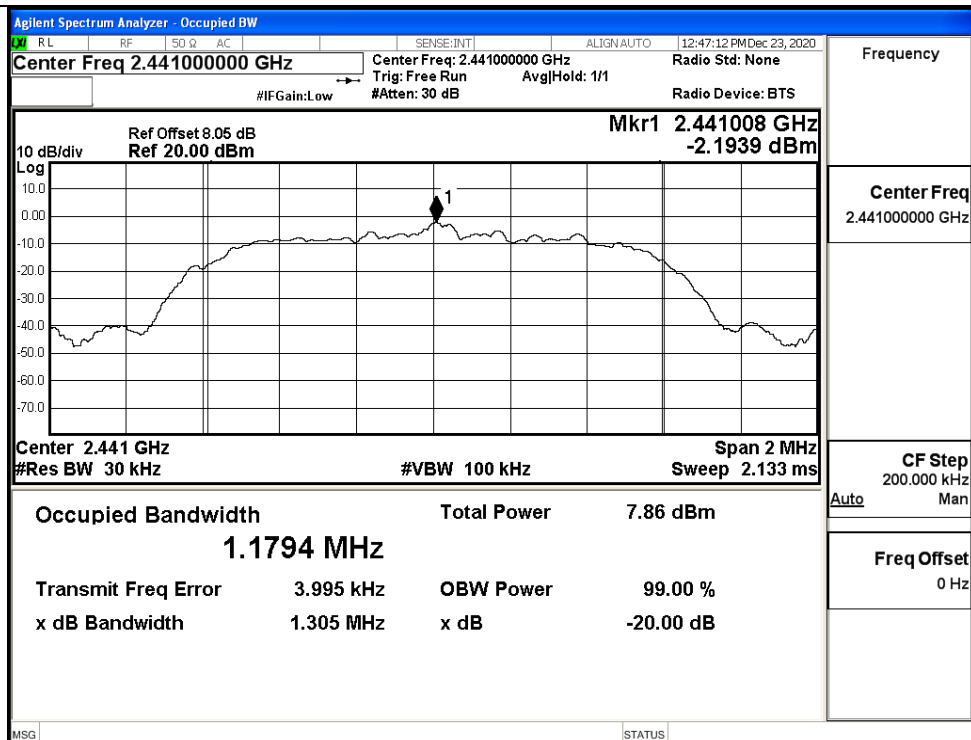
Frequency

Center Freq
2.402000000 GHzCF Step
200.000 kHz
Man

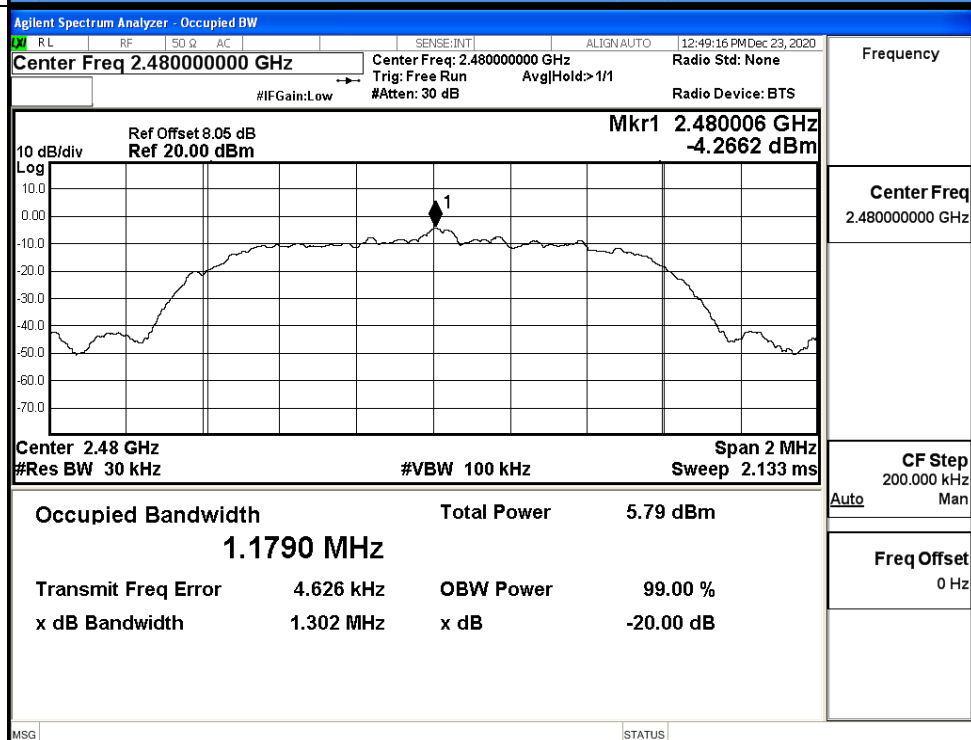
Auto

Freq Offset
0 Hz

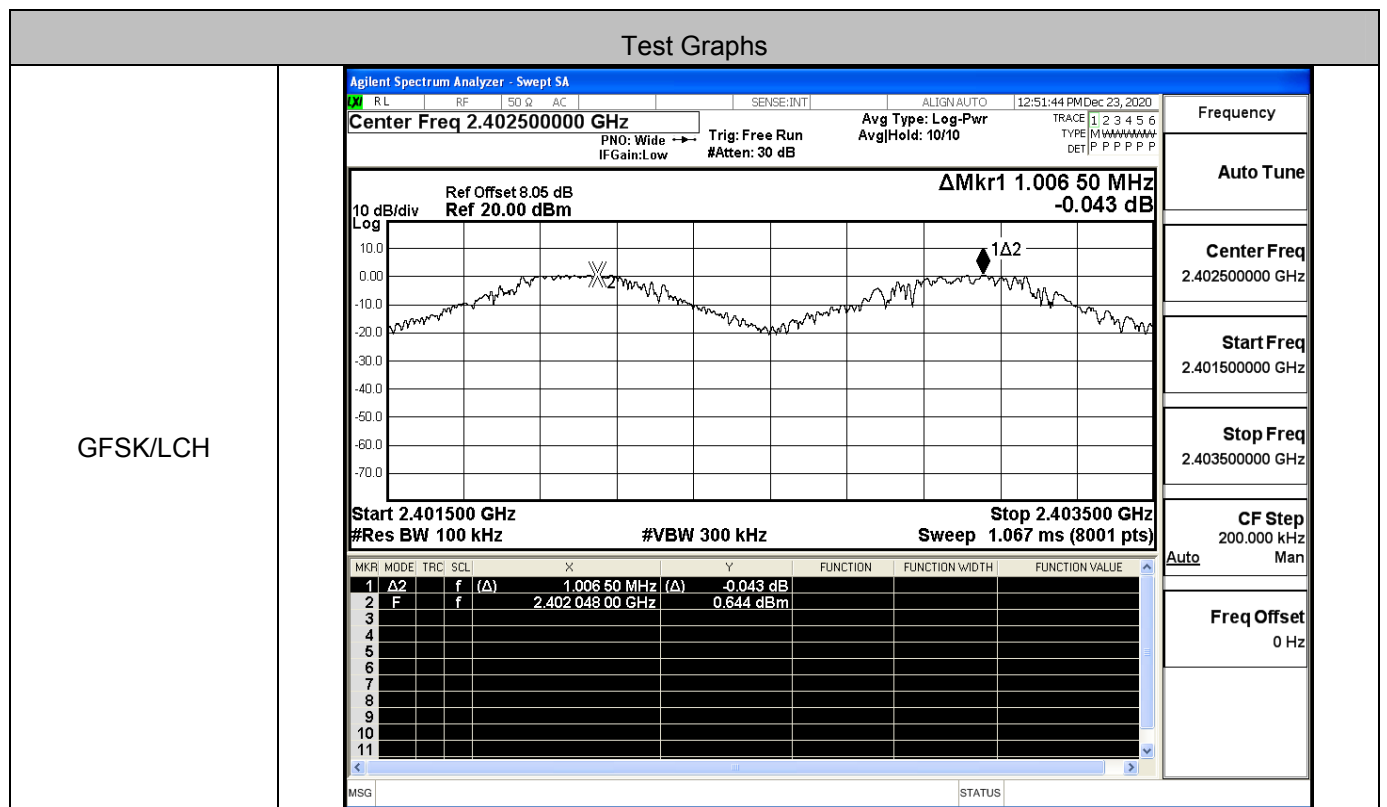
8DPSK/MCH



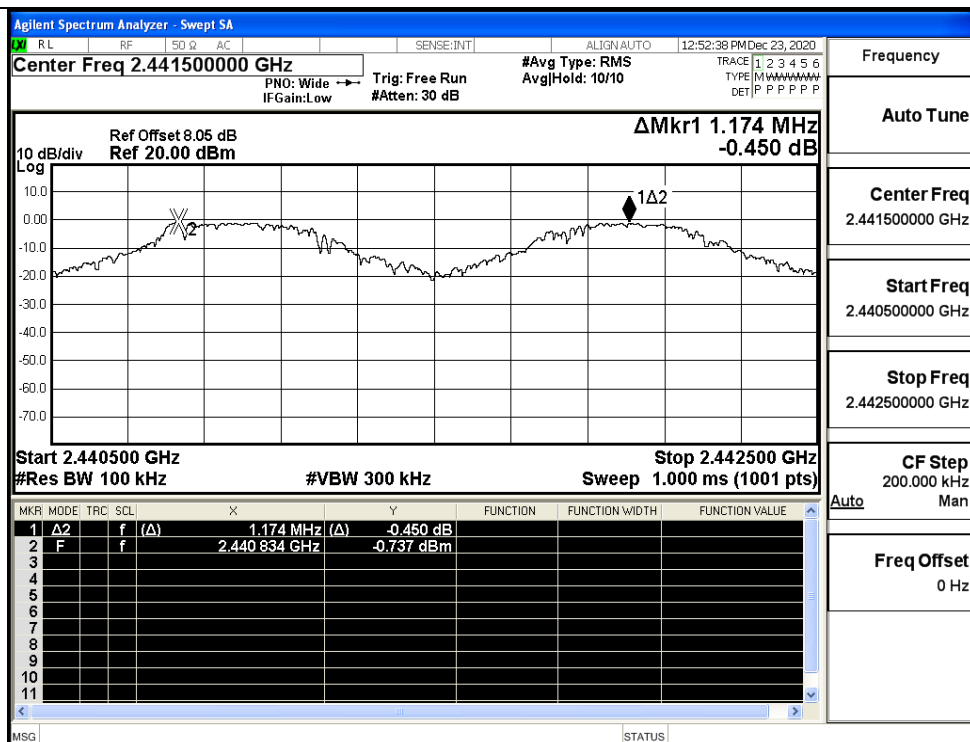
8DPSK/HCH



Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.007	0.634	PASS
	MCH	1.174	0.634	PASS
	HCH	1.208	0.634	PASS
π /4DQPSK	LCH	0.964	0.880	PASS
	MCH	1.008	0.880	PASS
	HCH	1.202	0.880	PASS
8DPSK	LCH	1.066	0.870	PASS
	MCH	1.116	0.870	PASS
	HCH	1.306	0.870	PASS



GFSK/MCH

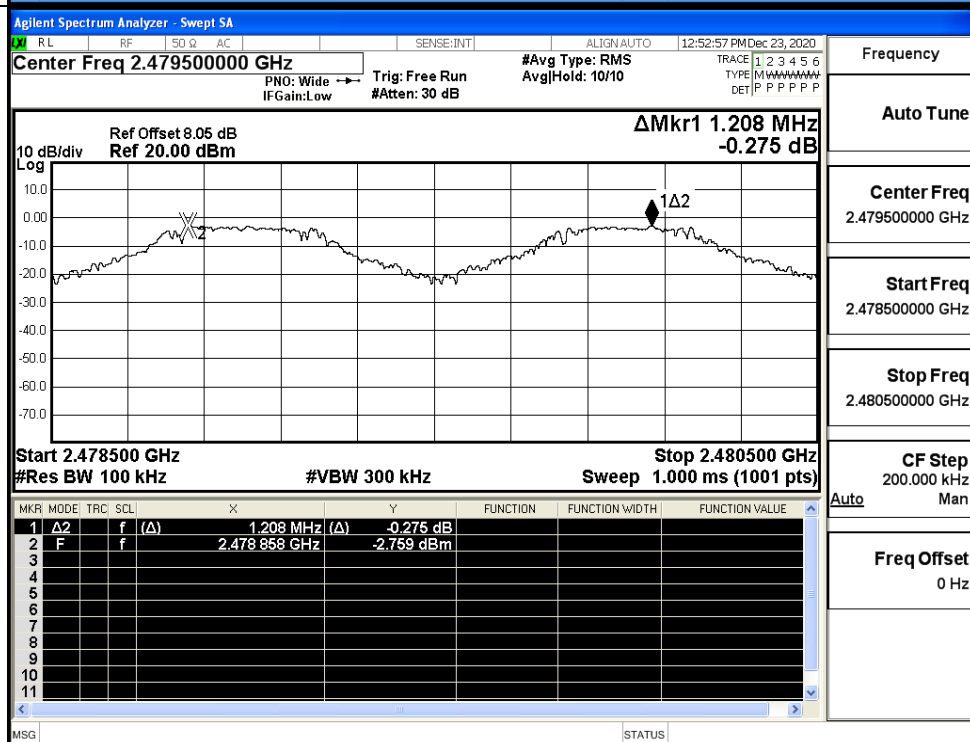


Frequency

Auto Tune

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

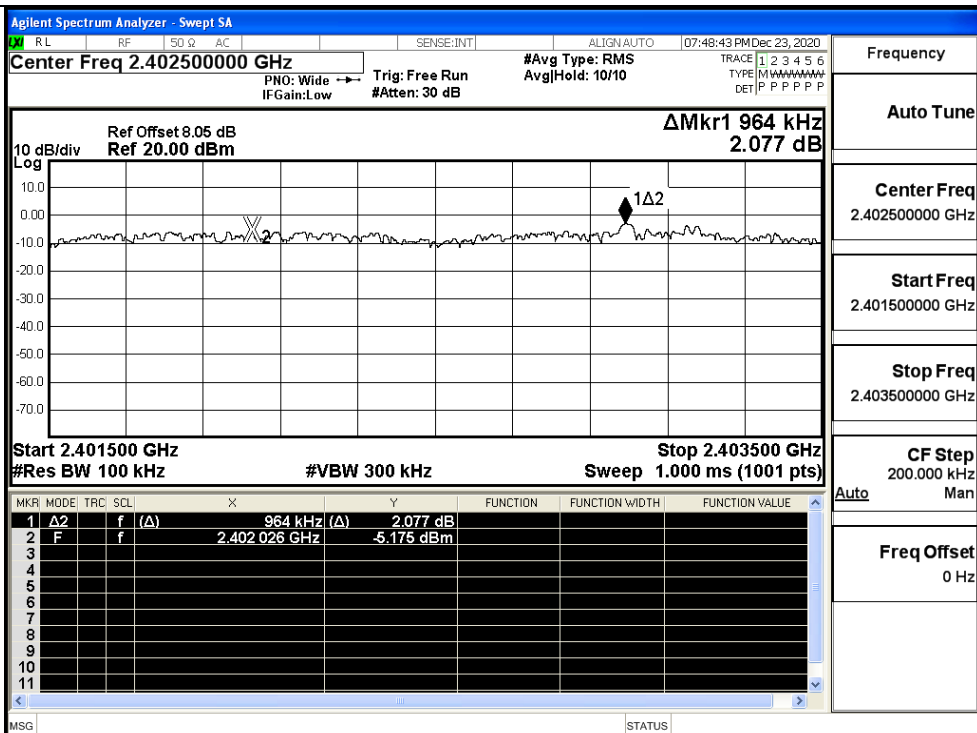
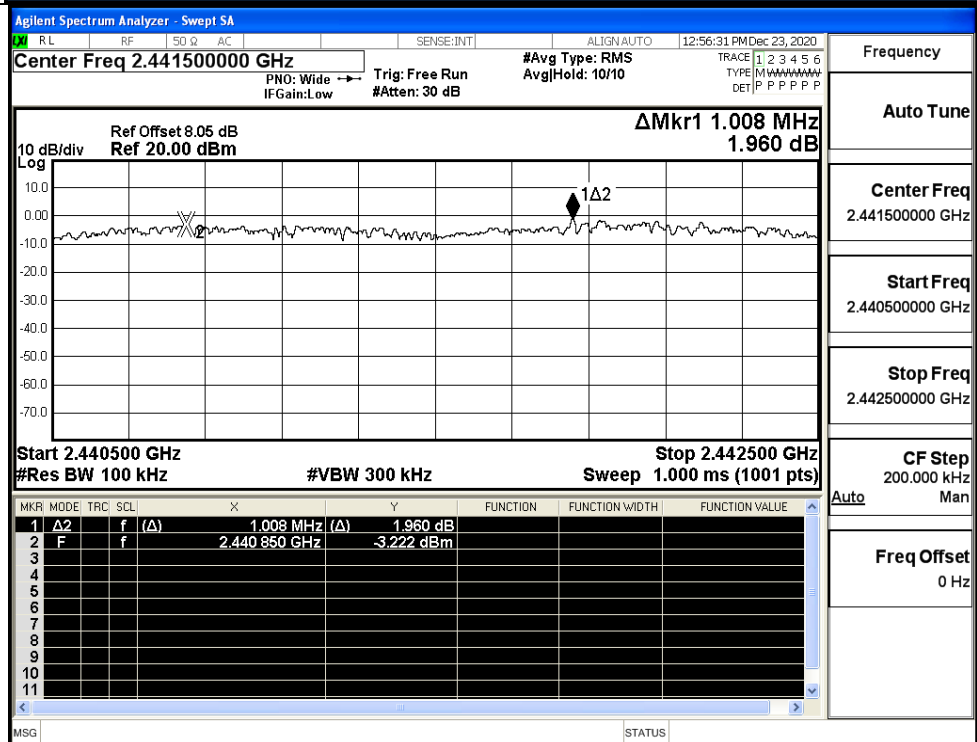
GFSK/HCH

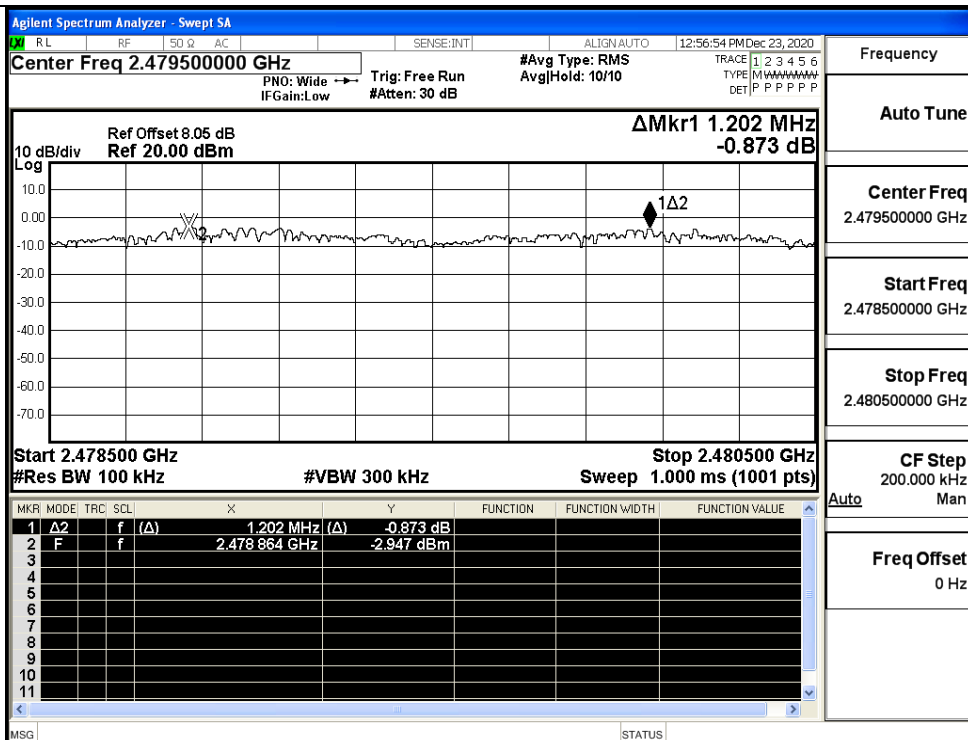


Frequency

Auto Tune

Center Freq
2.479500000 GHzStart Freq
2.478500000 GHzStop Freq
2.480500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

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

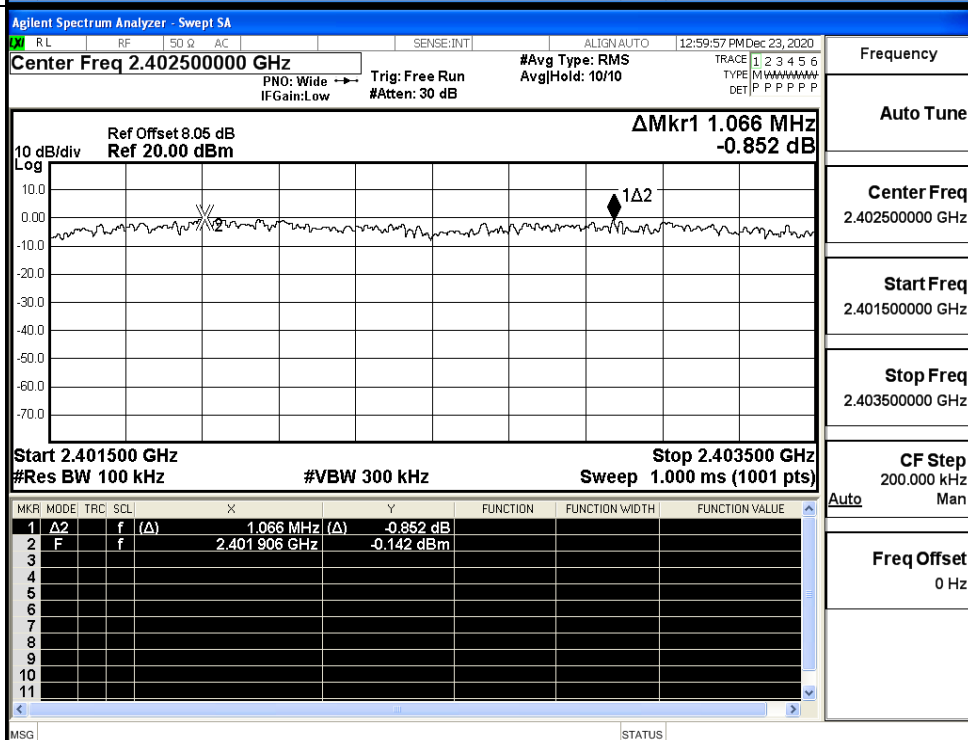
$\pi/4$ DQPSK/HCH

Frequency

Auto Tune

Center Freq
2.479500000 GHzStart Freq
2.478500000 GHzStop Freq
2.480500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

8DPSK/LCH

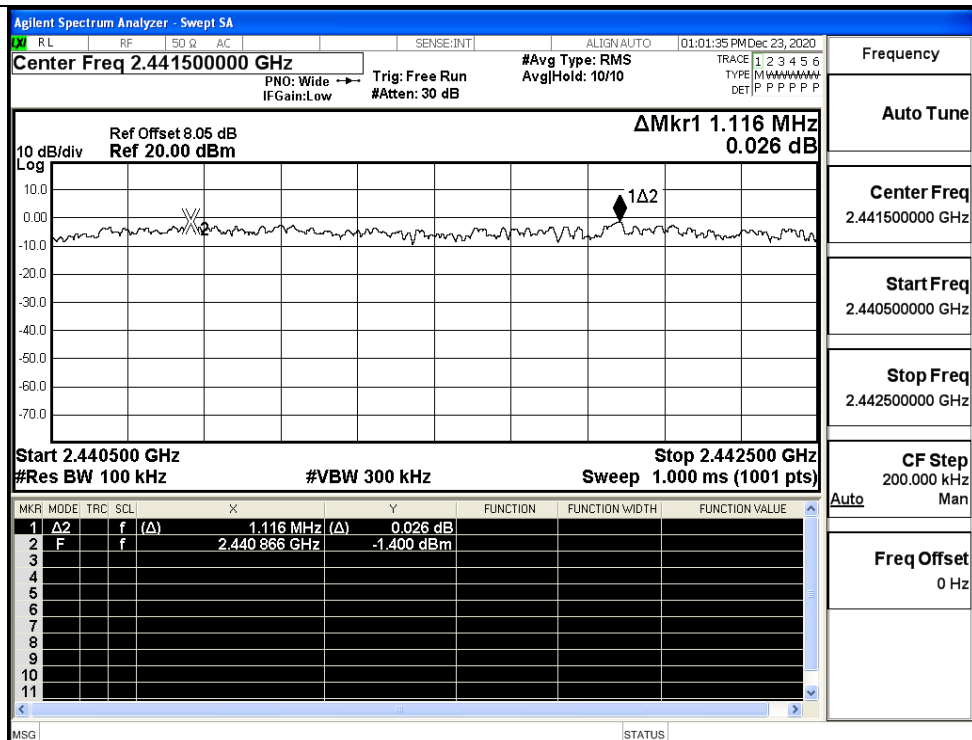


Frequency

Auto Tune

Center Freq
2.402500000 GHzStart Freq
2.401500000 GHzStop Freq
2.403500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

8DPSK/MCH

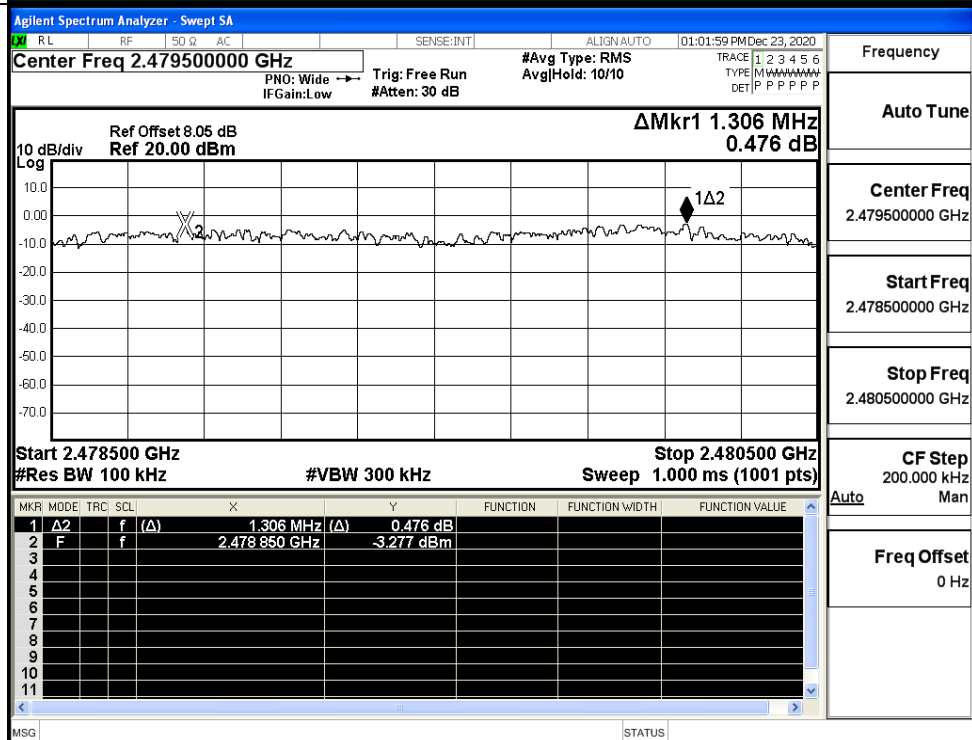


Frequency

Auto Tune

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

8DPSK/HCH



Frequency

Auto Tune

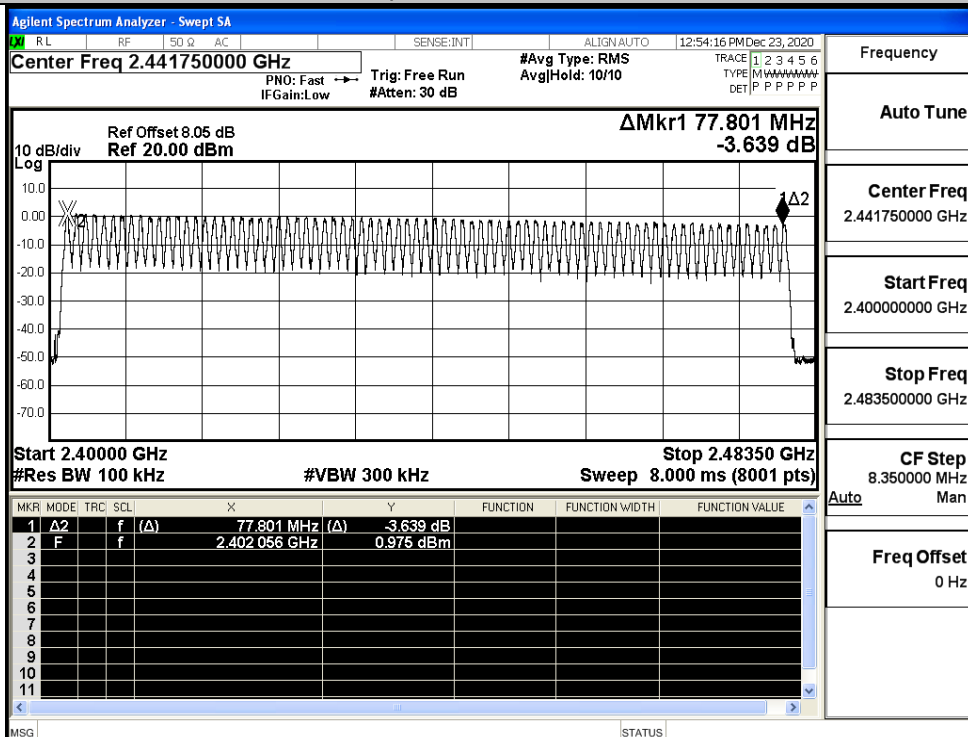
Center Freq
2.479500000 GHzStart Freq
2.478500000 GHzStop Freq
2.480500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

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

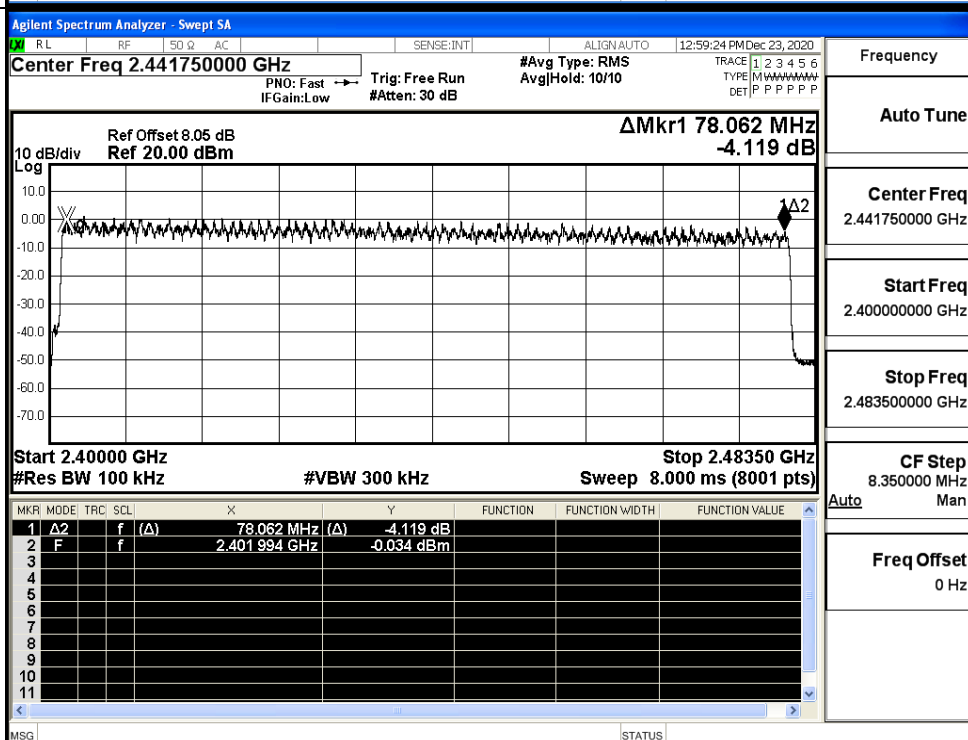
Test Graphs

GFSK/Hop



Frequency

Auto Tune

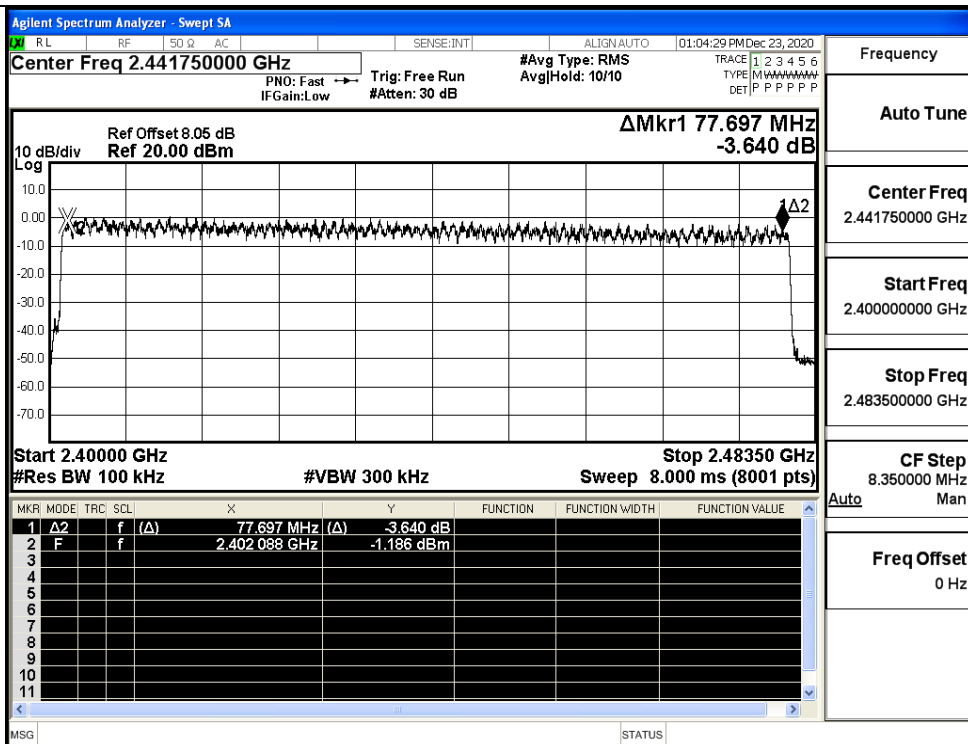
Center Freq
2.441750000 GHzStart Freq
2.400000000 GHzStop Freq
2.483500000 GHzCF Step
8.350000 MHz
ManFreq Offset
0 Hz $\pi/4$ DQPSK/Hop

Frequency

Auto Tune

Center Freq
2.441750000 GHzStart Freq
2.400000000 GHzStop Freq
2.483500000 GHzCF Step
8.350000 MHz
ManFreq Offset
0 Hz

8DPSK/Hop

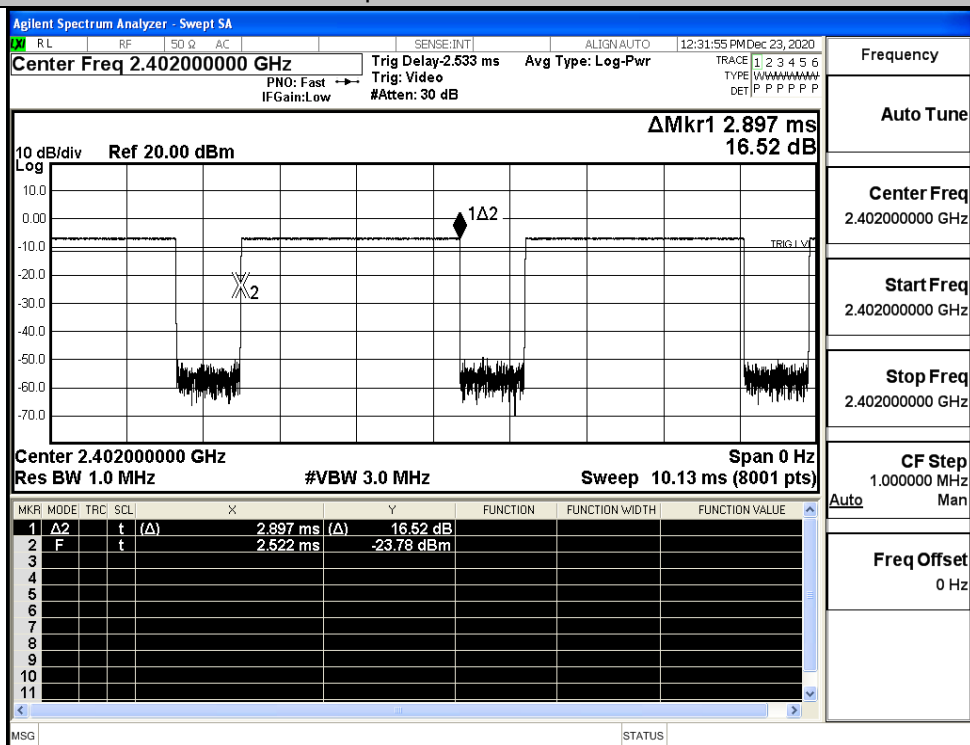


A.5 Dwell Time

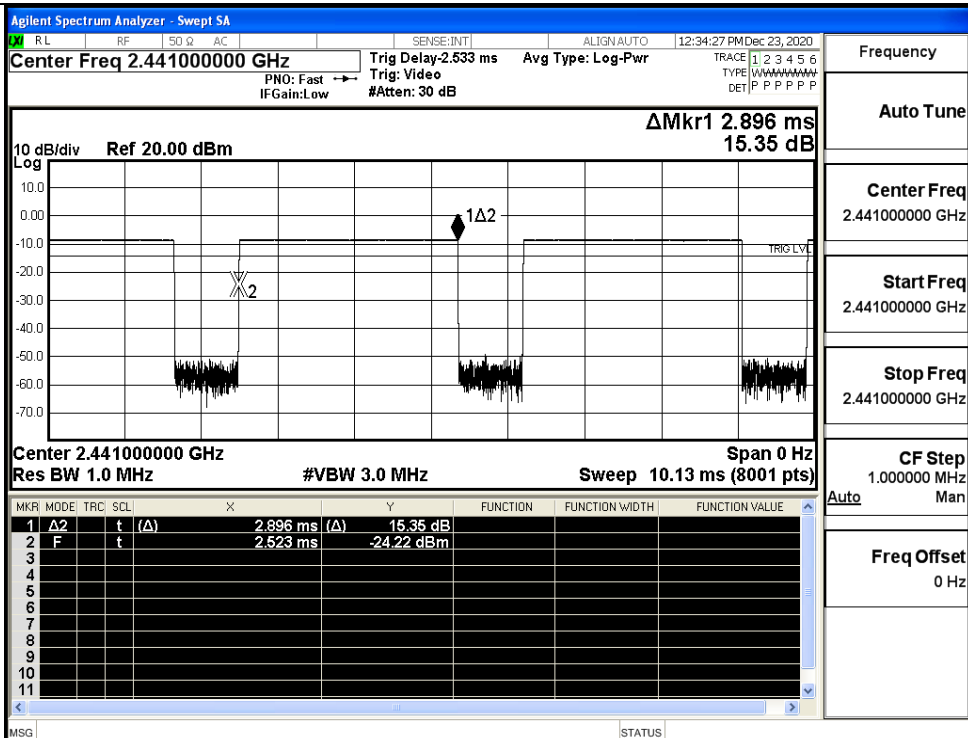
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7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

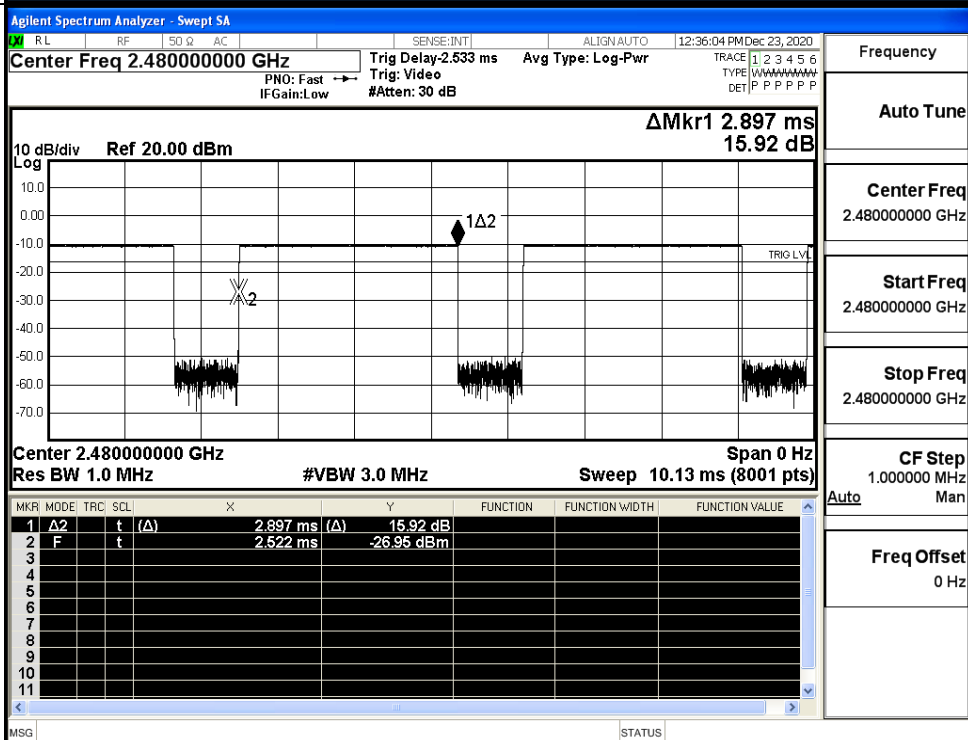
GFSK_DH5/LCH

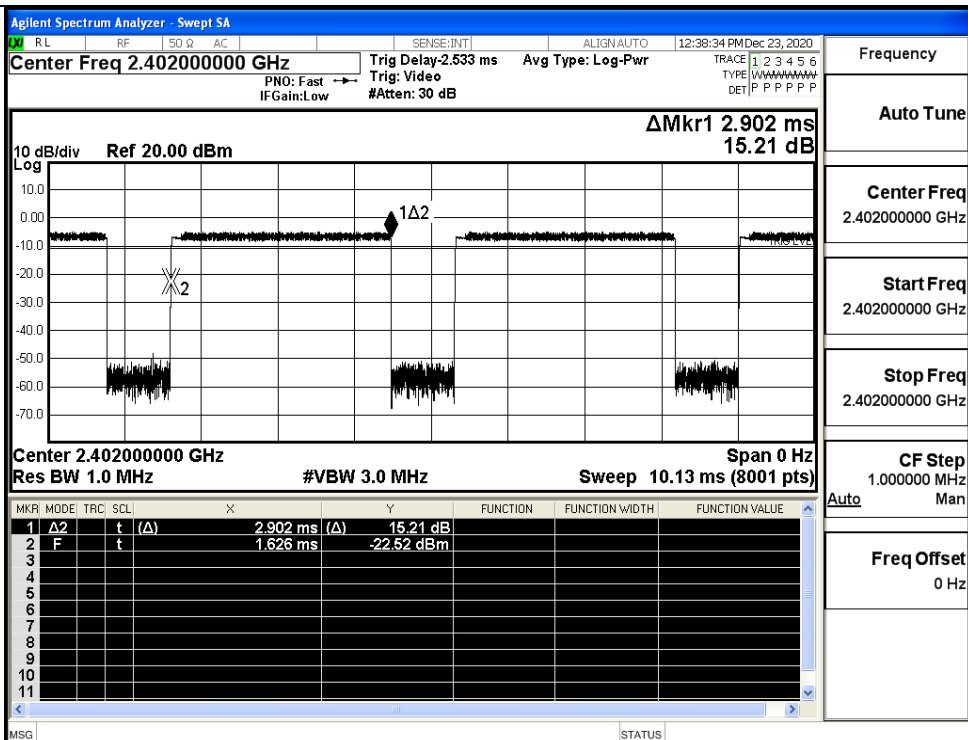
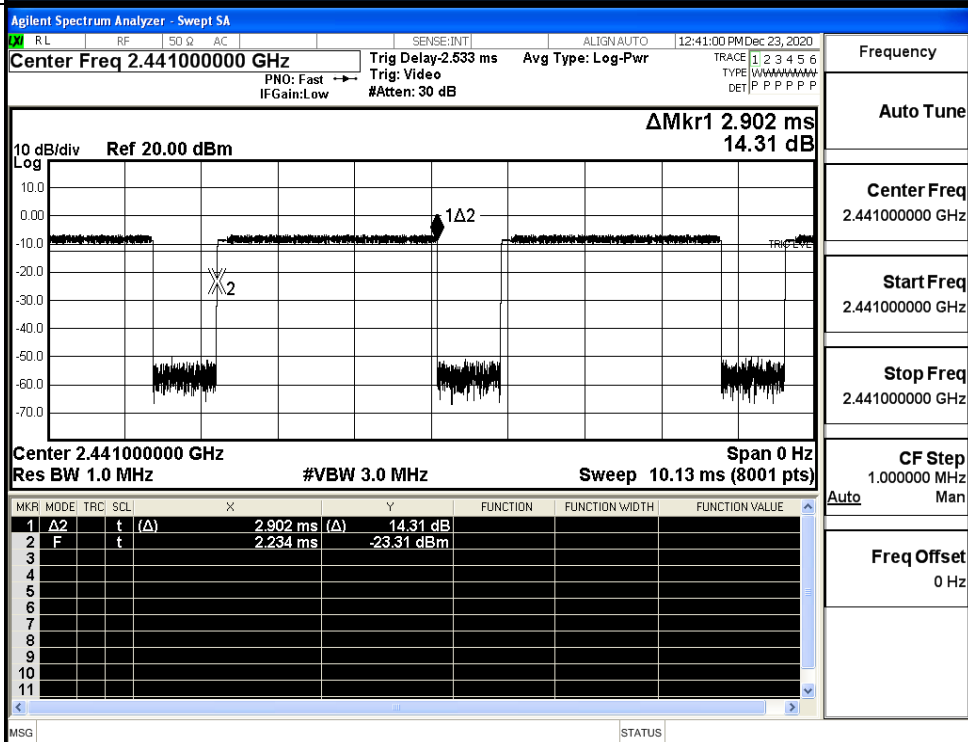


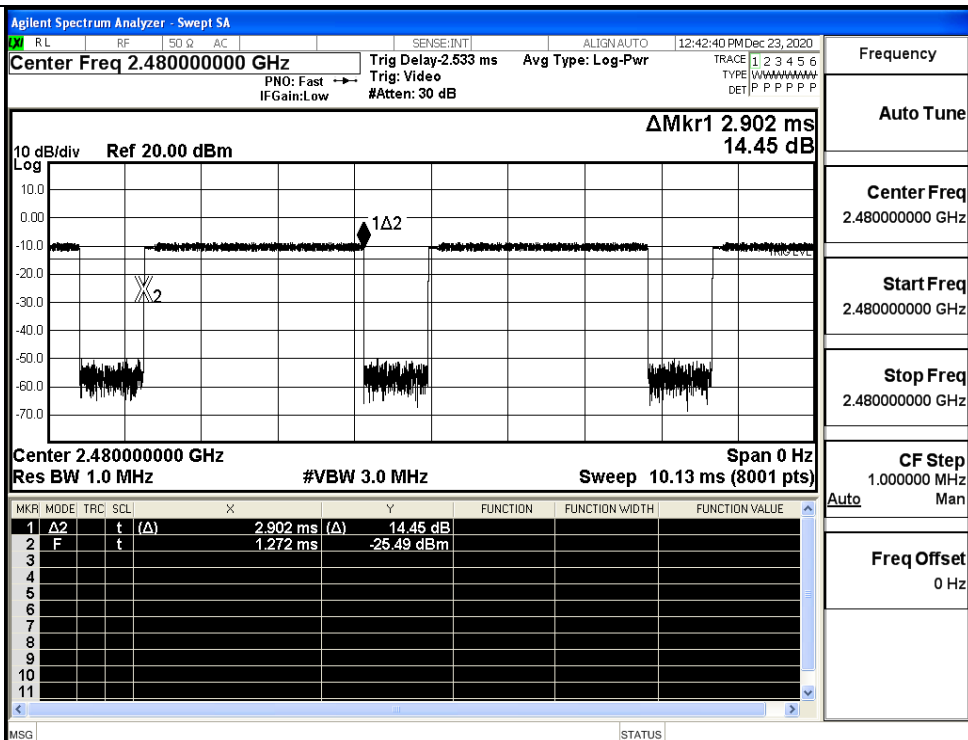
GFSK_DH5/MCH



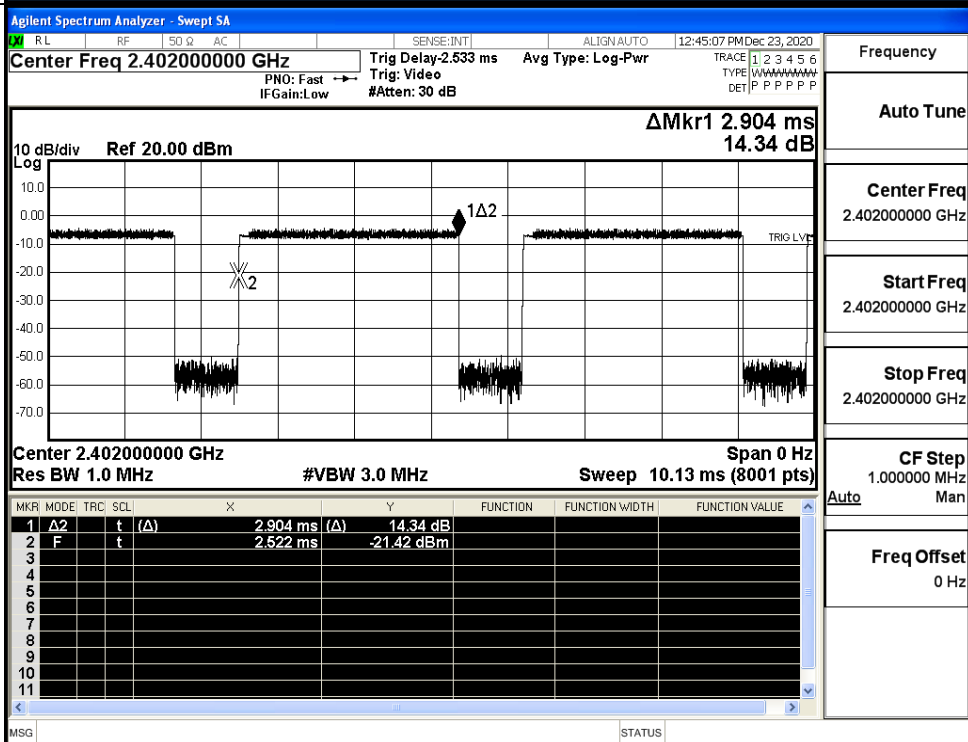
GFSK_DH5/HCH



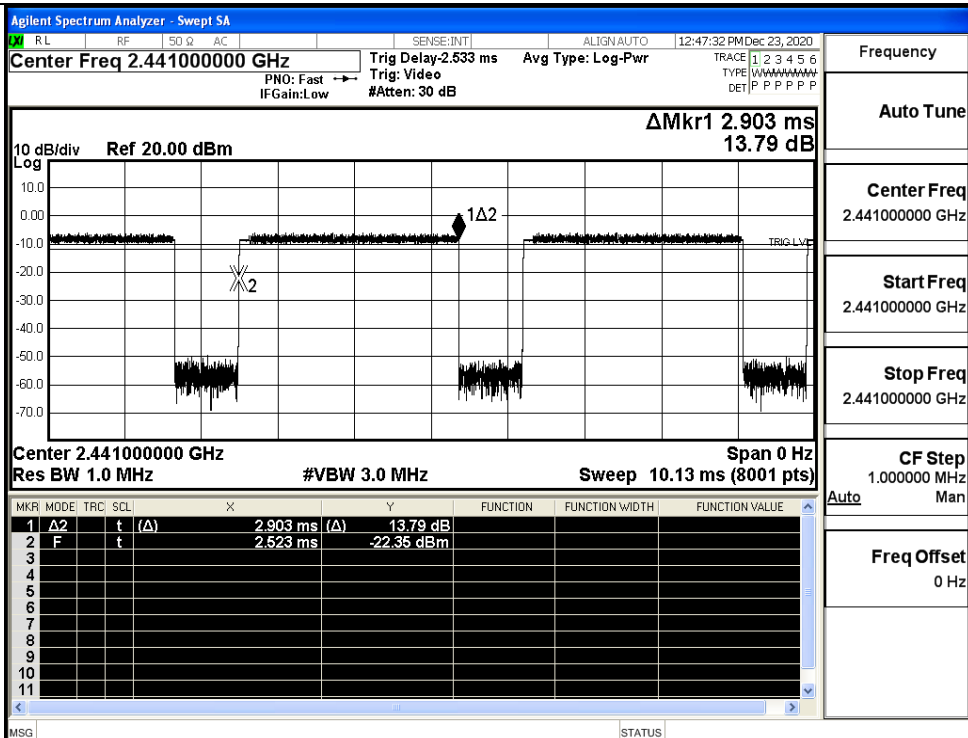
$\pi/4$ DQPSK
_2DH5/LCH $\pi/4$ DQPSK
_2DH5/MCH

$\pi/4$ DQPSK
_2DH5/HCH

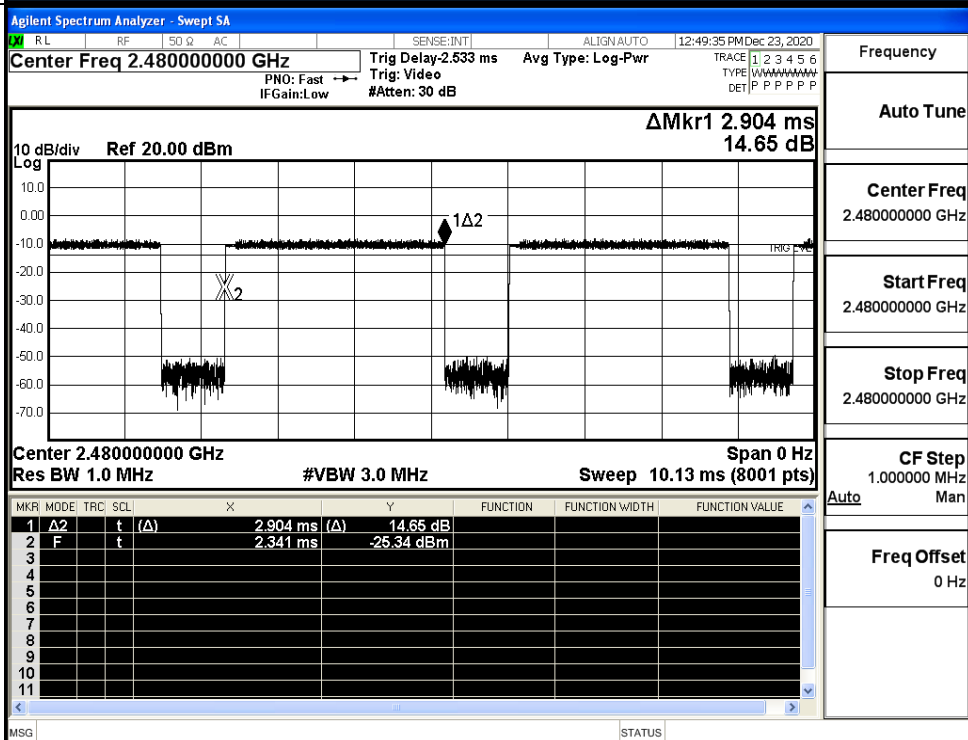
8DPSK_3DH5/LCH



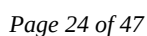
8DPSK_3DH5/MCH

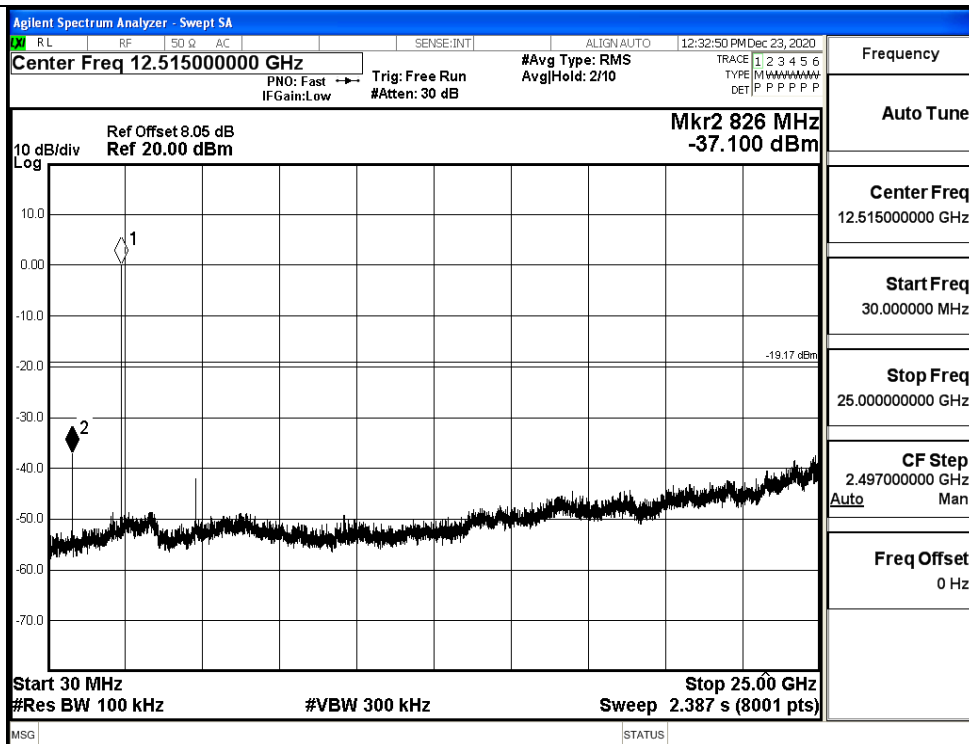


8DPSK_3DH5/HCH



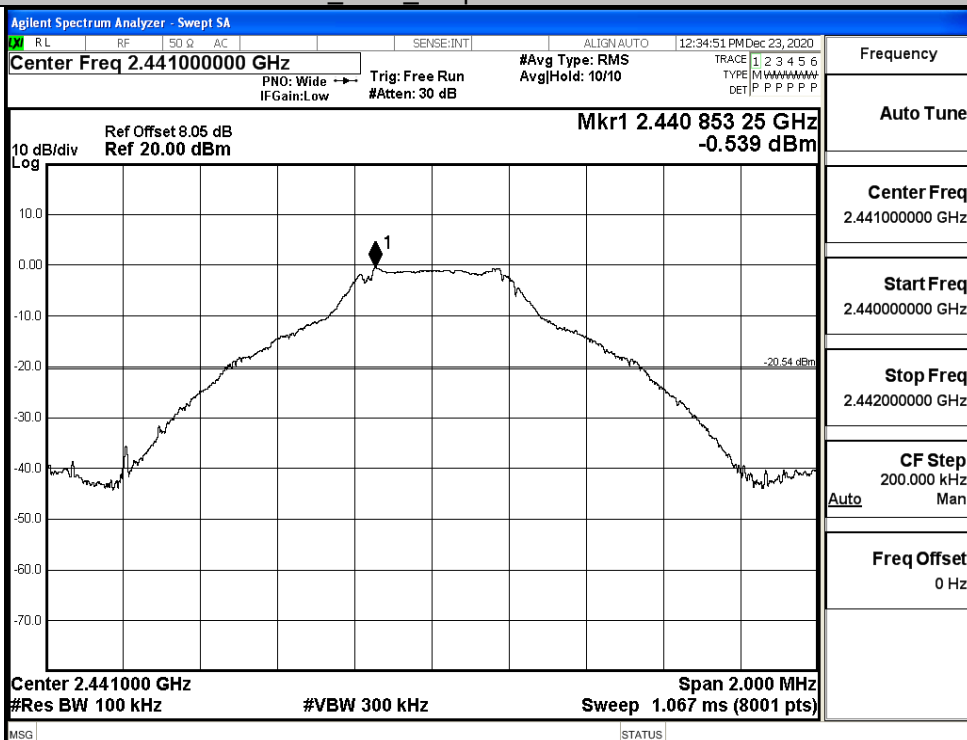
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.835	-37.100	-19.165	PASS
	MCH	-0.539	-37.601	-20.539	PASS
	HCH	-2.831	-37.574	-22.831	PASS
$\pi/4$ DQPSK	LCH	0.517	-37.737	-19.483	PASS
	MCH	-0.531	-38.118	-20.531	PASS
	HCH	-2.775	-37.644	-22.775	PASS
8DPSK	LCH	1.023	-36.507	-18.977	PASS
	MCH	-0.637	-37.871	-20.637	PASS
	HCH	-2.656	-38.432	-22.656	PASS



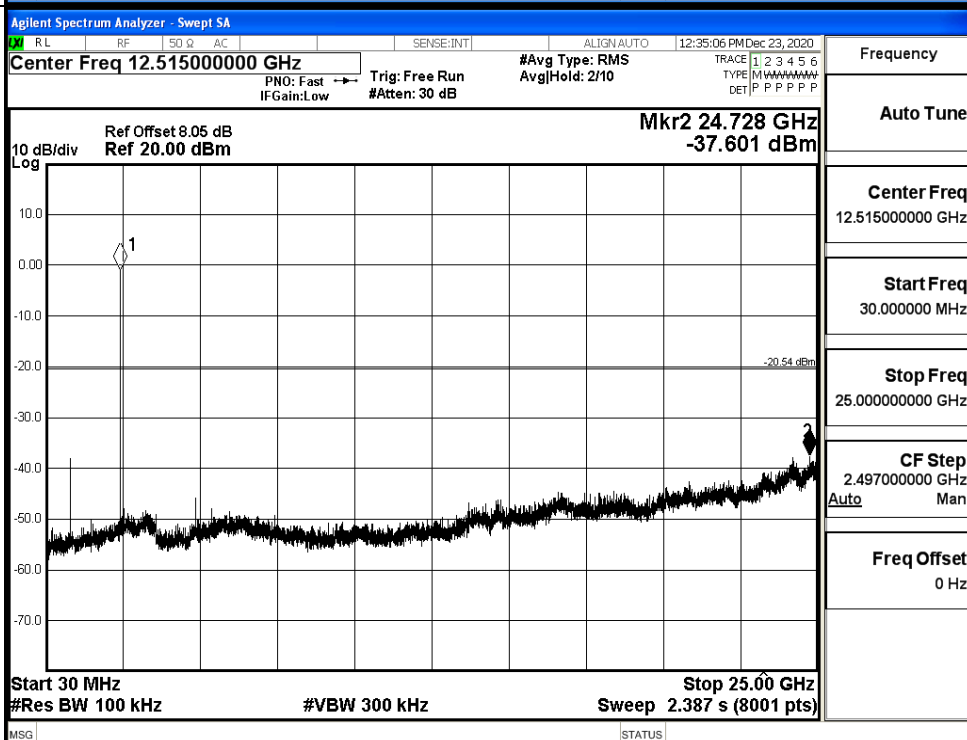
P_{uw}

GFSK_MCH_Graphs

Pref

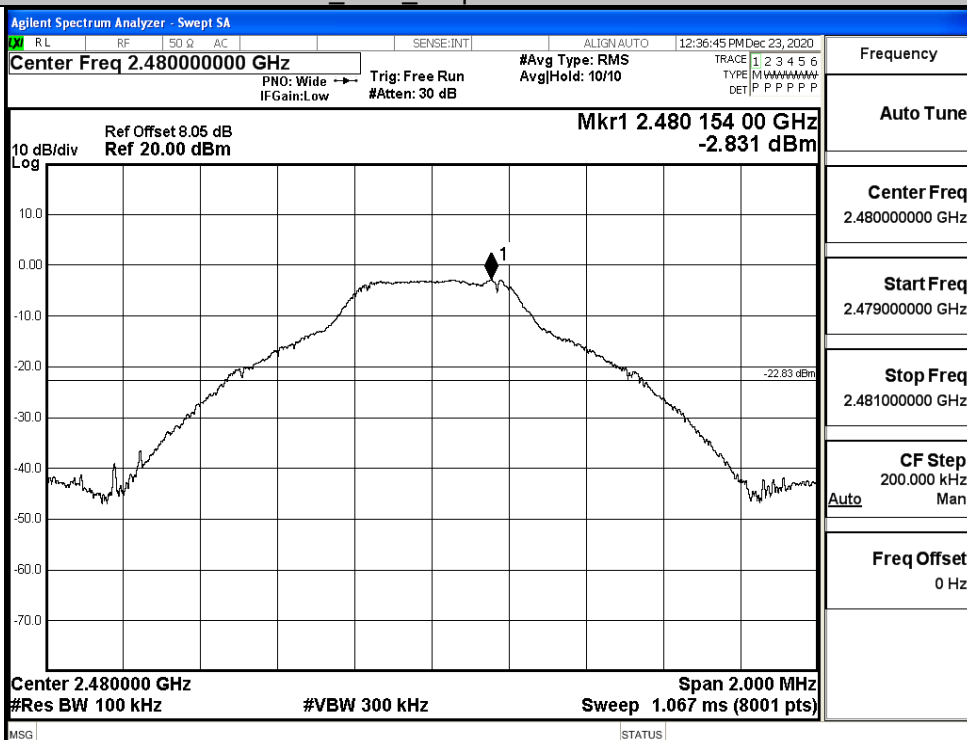


Puw

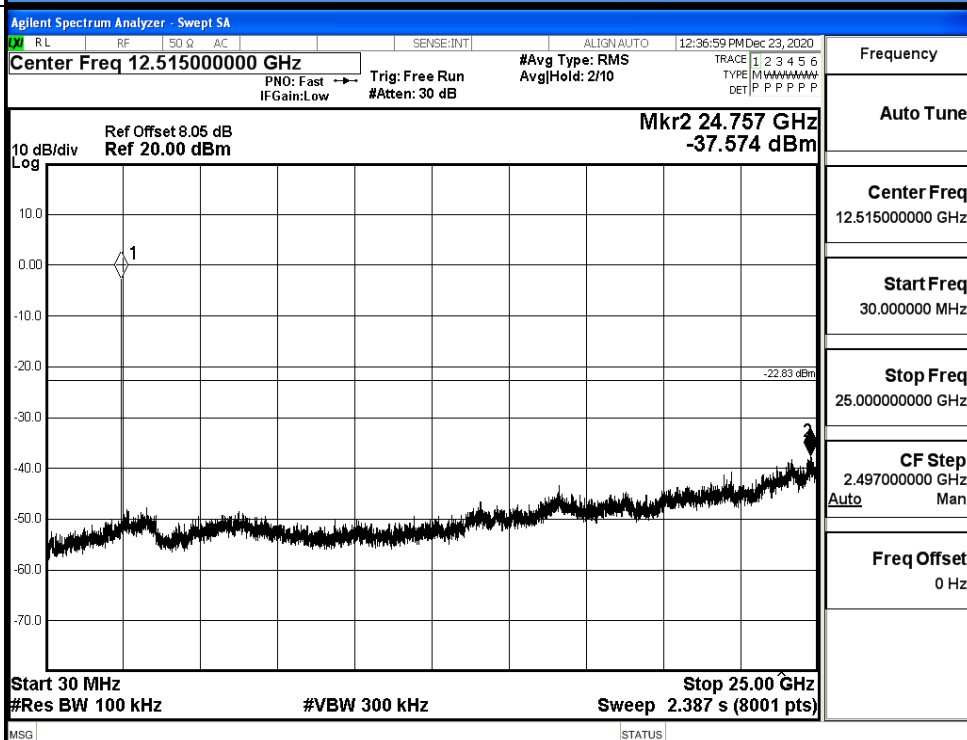


GFSK HCH_Graphs

Pref

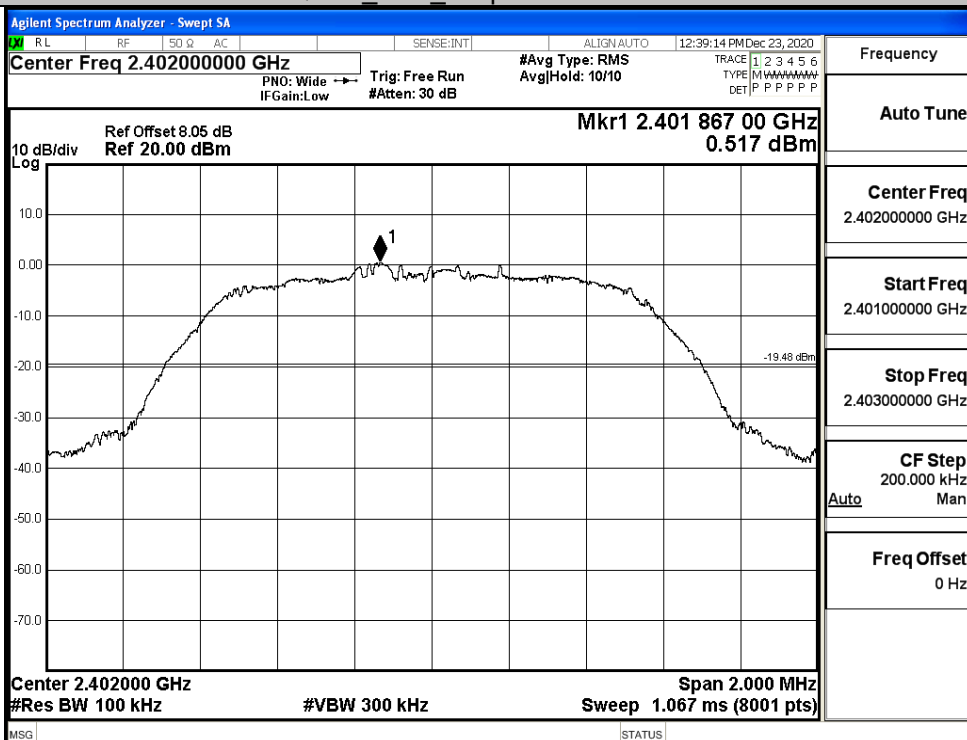


Puw

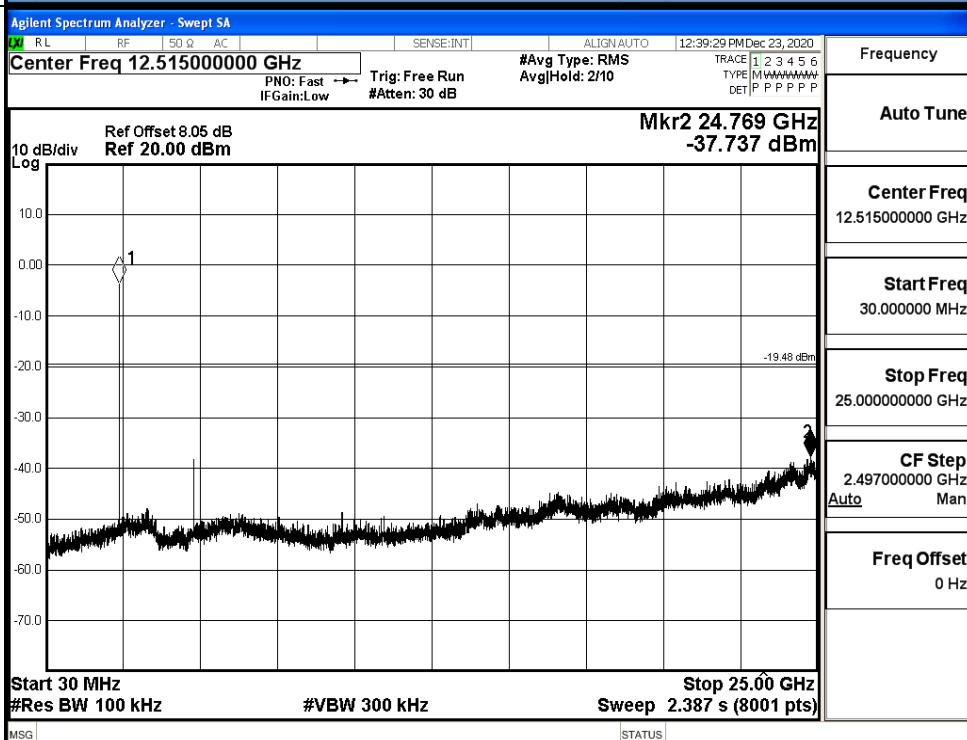


$\pi/4$ DQPSK LCH_Graphs

Pref

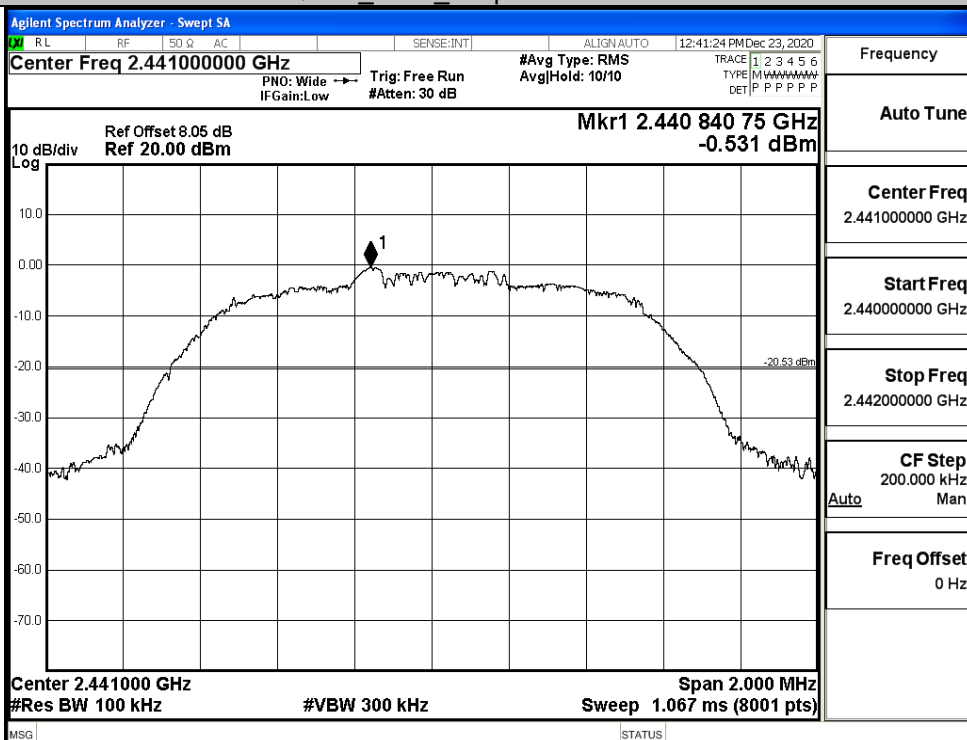


Puw

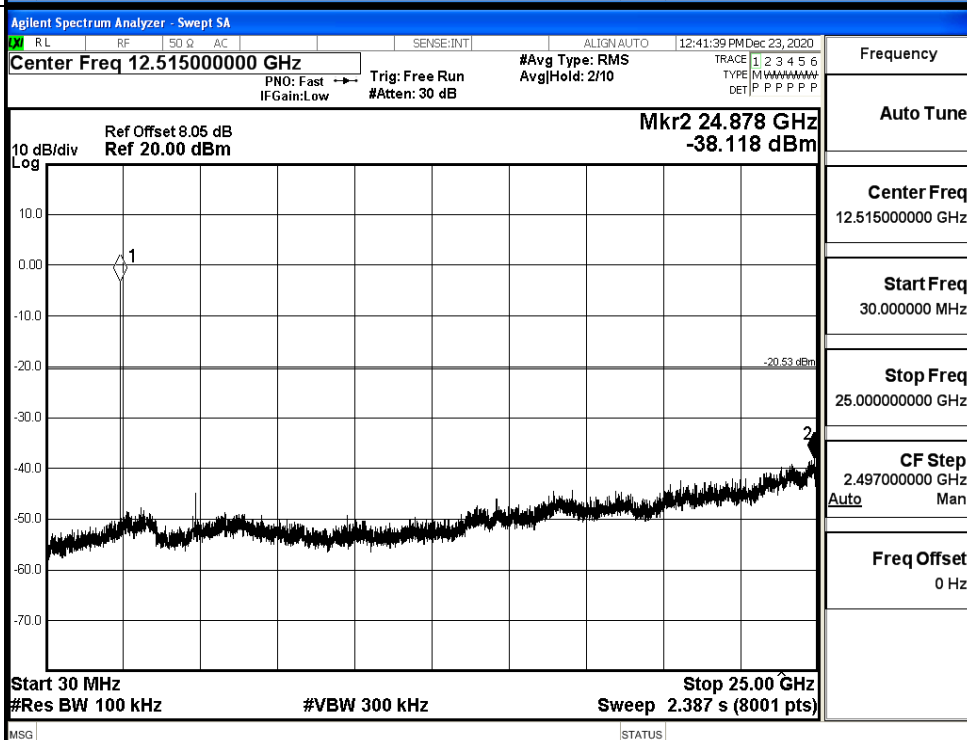


$\pi/4$ DQPSK_MCH_Graphs

Pref

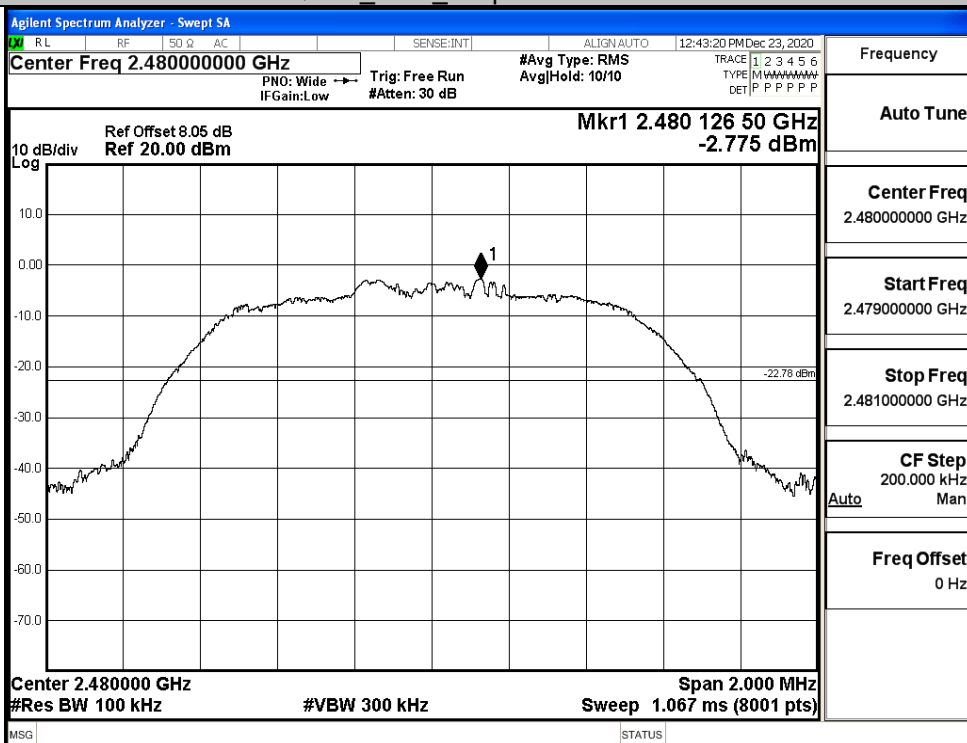


Puw

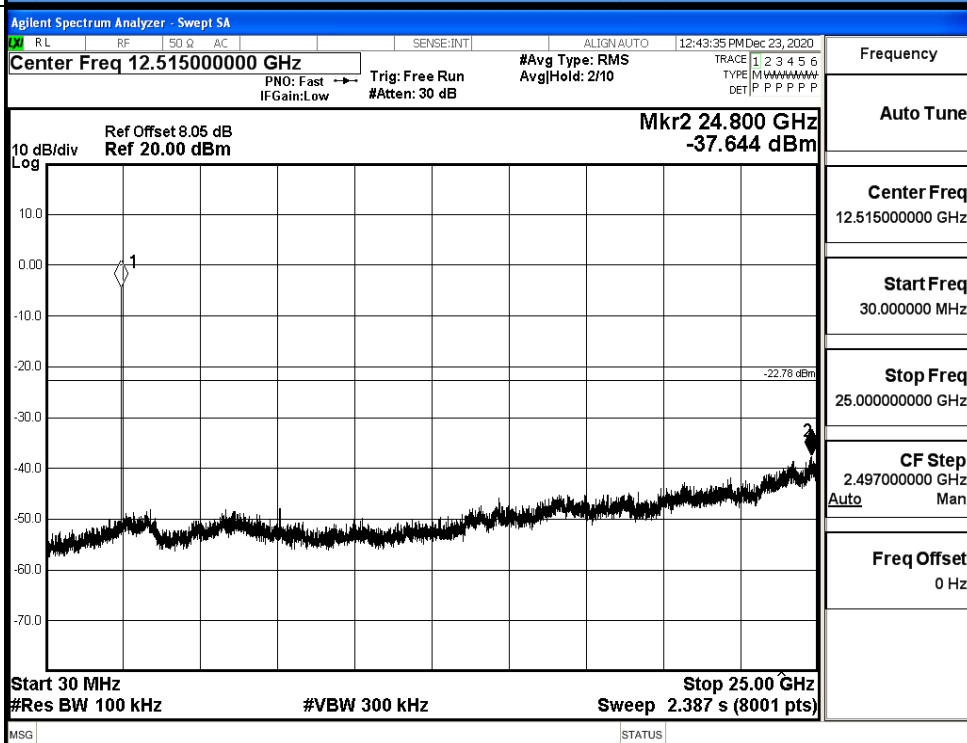


$\pi/4$ DQPSK_HCH_Graphs

Pref

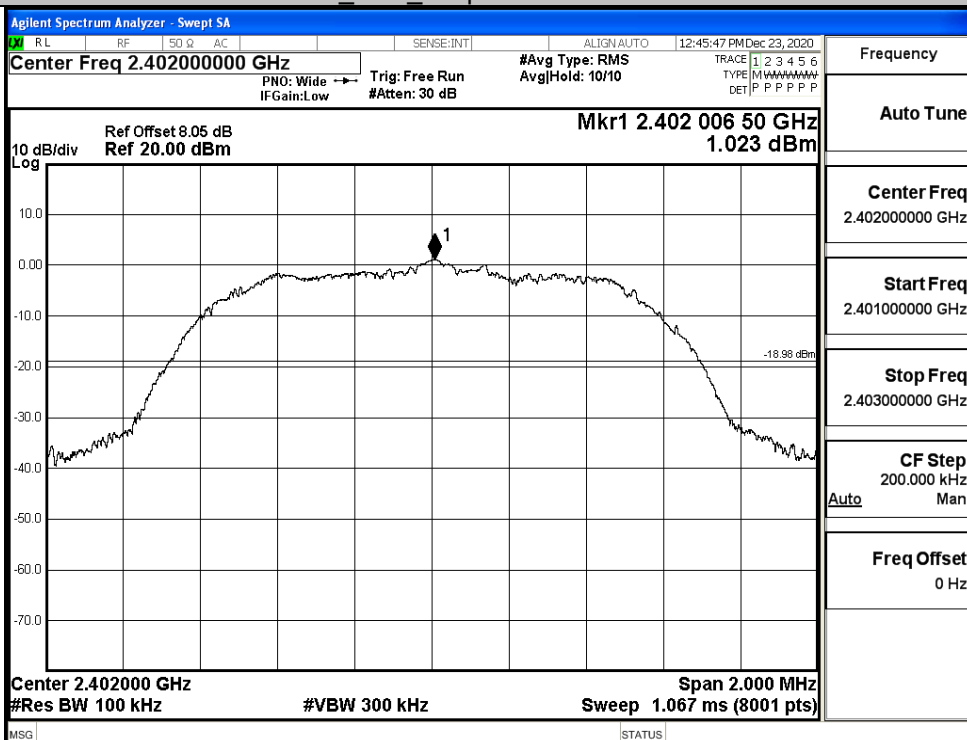


Puw

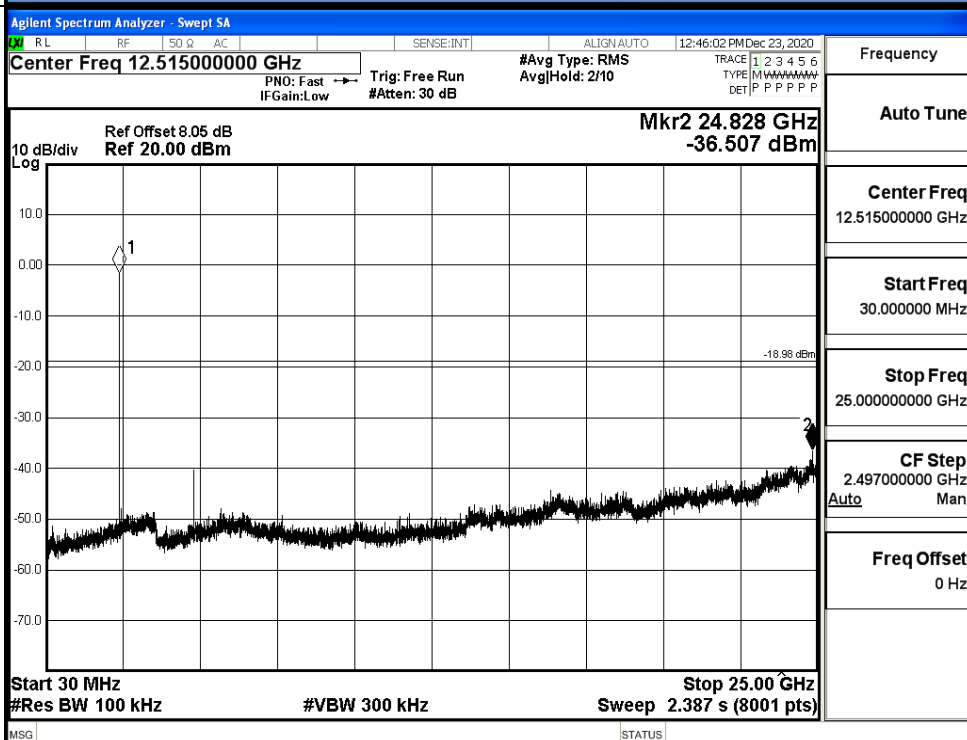


8DPSK_LCH_Graphs

Pref

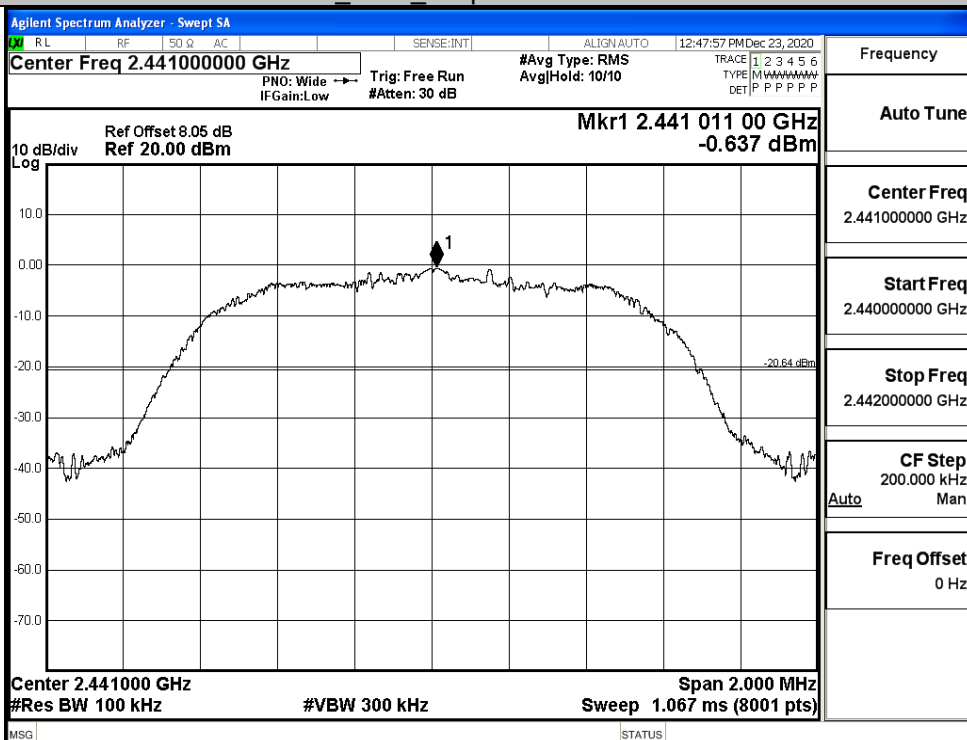


Puw

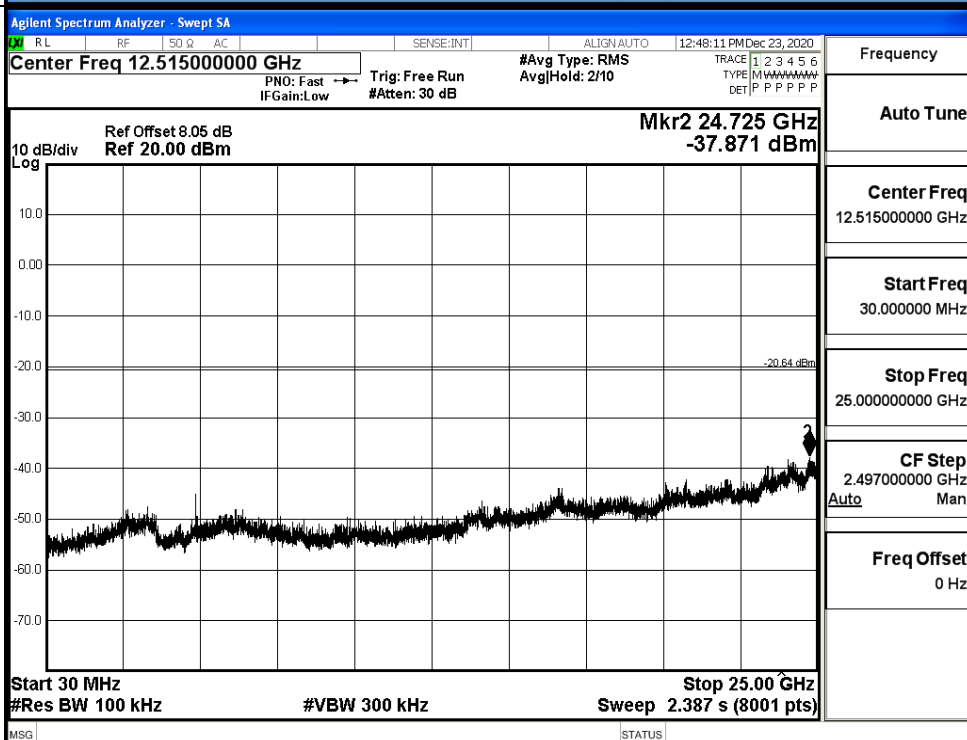


8DPSK MCH_Graphs

Pref

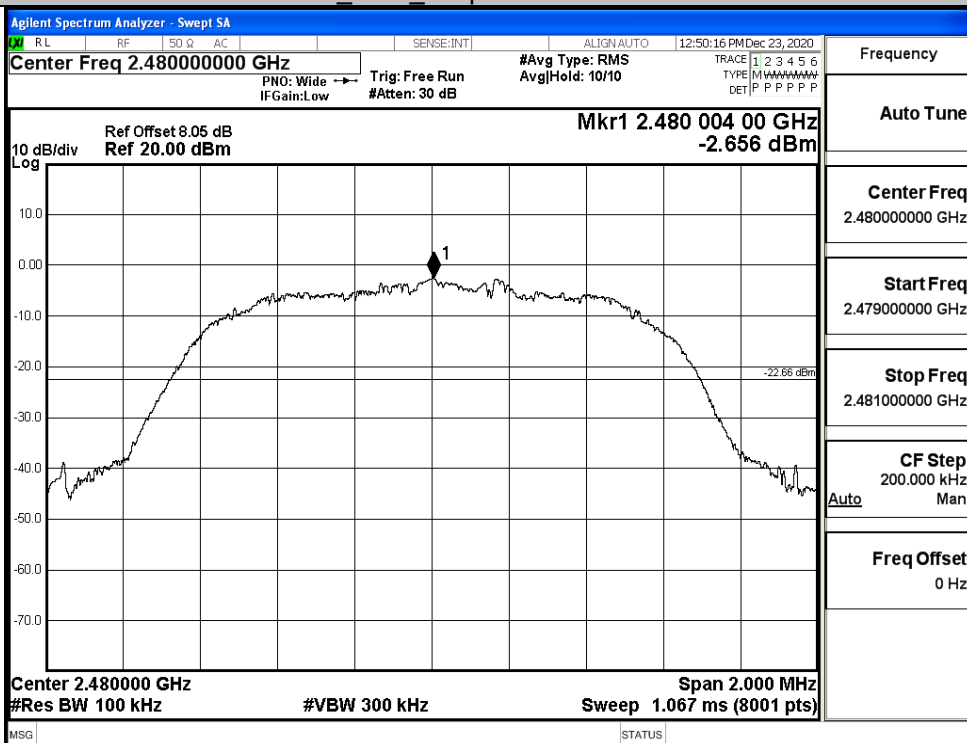


Puw



8DPSK_HCH_Graphs

Pref



Puw

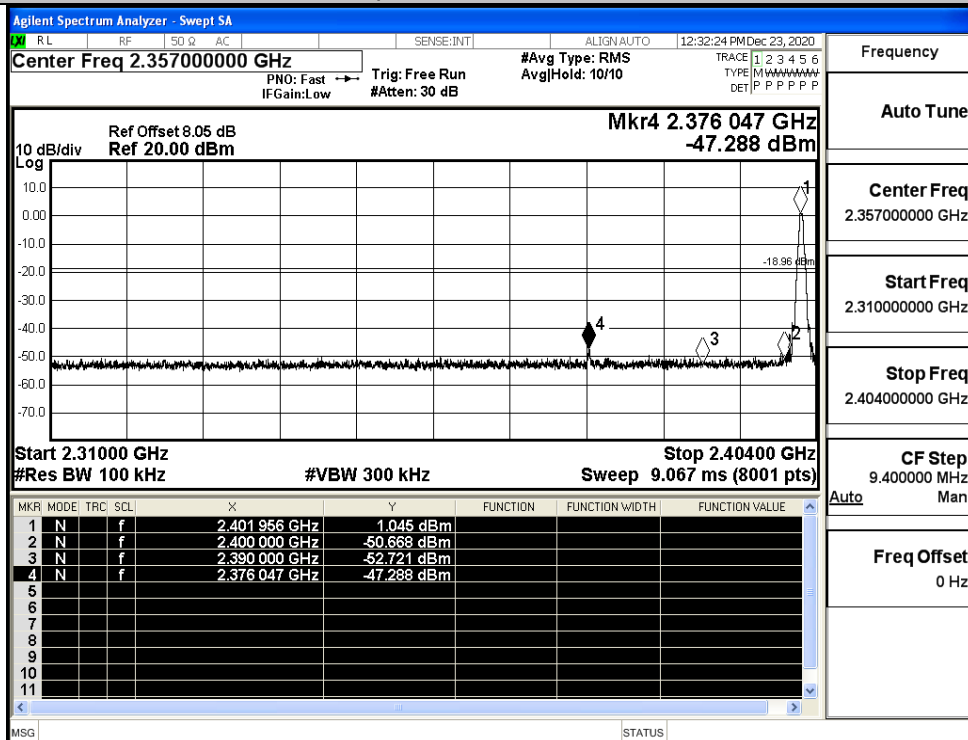


A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.045	Off	-47.288	-18.96	PASS
			0.849	On	-47.901	-19.15	PASS
	HCH	2480	-2.652	Off	-48.976	-22.65	PASS
			-1.630	On	-48.559	-21.63	PASS
$\pi/4$ DQPSK	LCH	2402	1.018	Off	-48.287	-18.98	PASS
			0.711	On	-46.702	-19.29	PASS
	HCH	2480	-2.567	Off	-48.627	-22.57	PASS
			-1.306	On	-48.665	-21.31	PASS
8DPSK	LCH	2402	0.091	Off	-46.819	-19.91	PASS
			0.612	On	-48.469	-19.39	PASS
	HCH	2480	-2.598	Off	-49.466	-22.6	PASS
			-1.427	On	-48.297	-21.43	PASS

Test Graphs

GFSK/LCH/No Hop

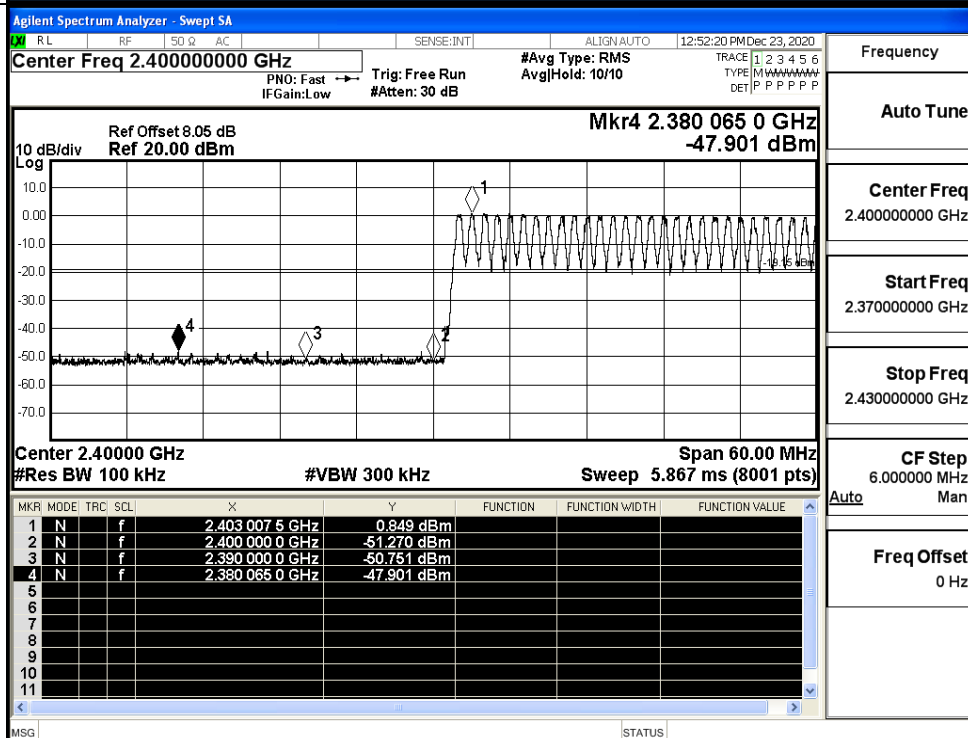


Frequency

Auto Tune

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

GFSK/LCH/Hop

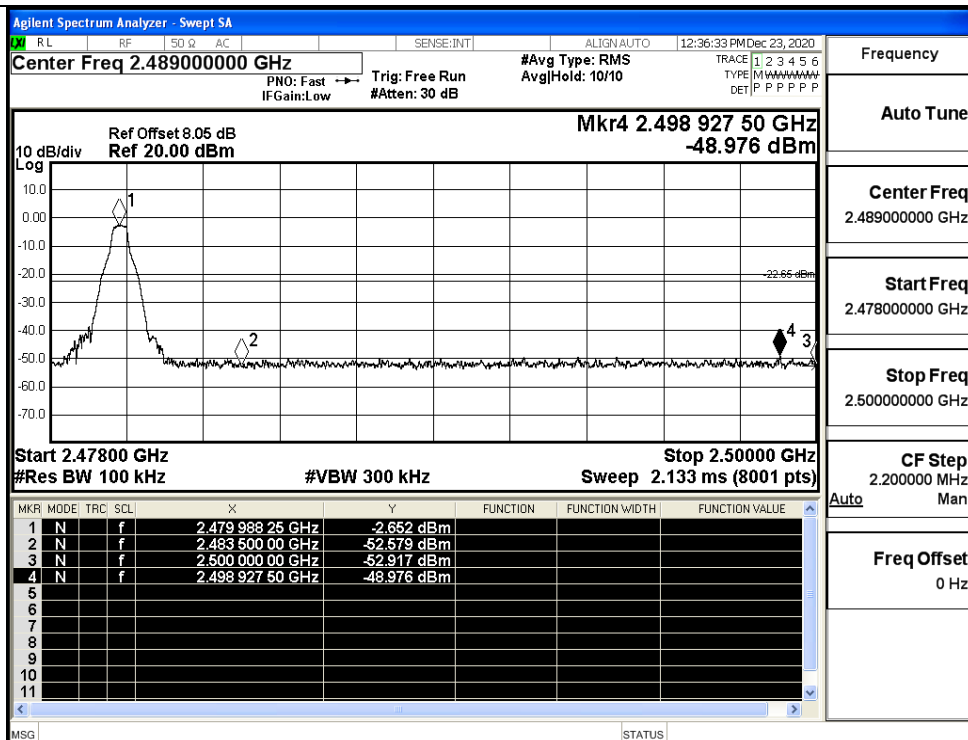


Frequency

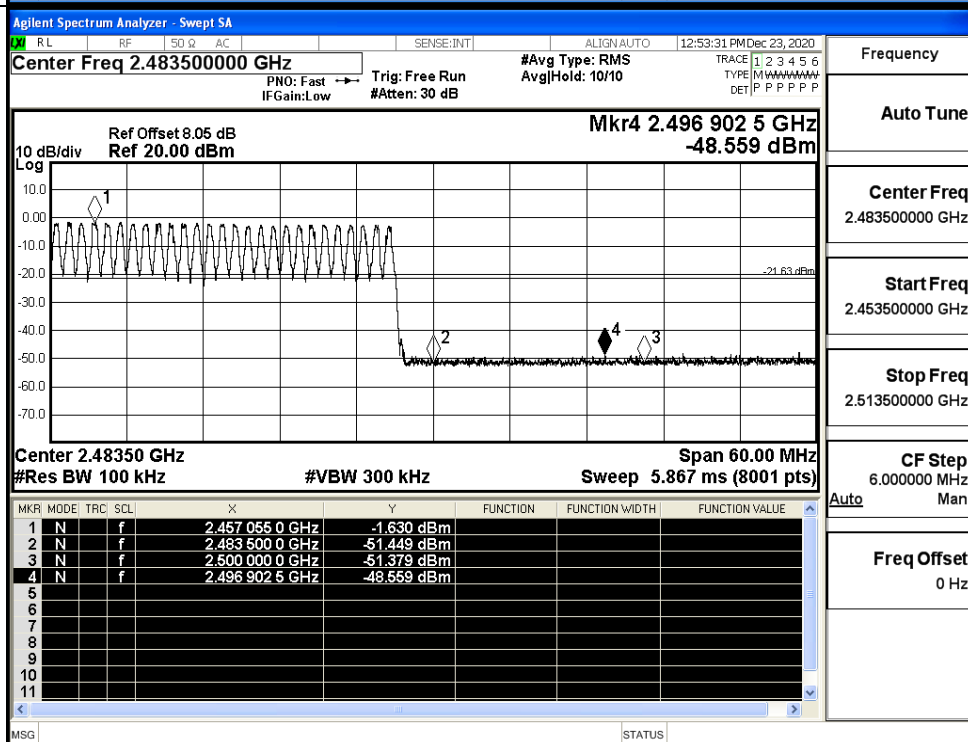
Auto Tune

Center Freq
2.400000000 GHzStart Freq
2.370000000 GHzStop Freq
2.430000000 GHzCF Step
6.000000 MHz
ManFreq Offset
0 Hz

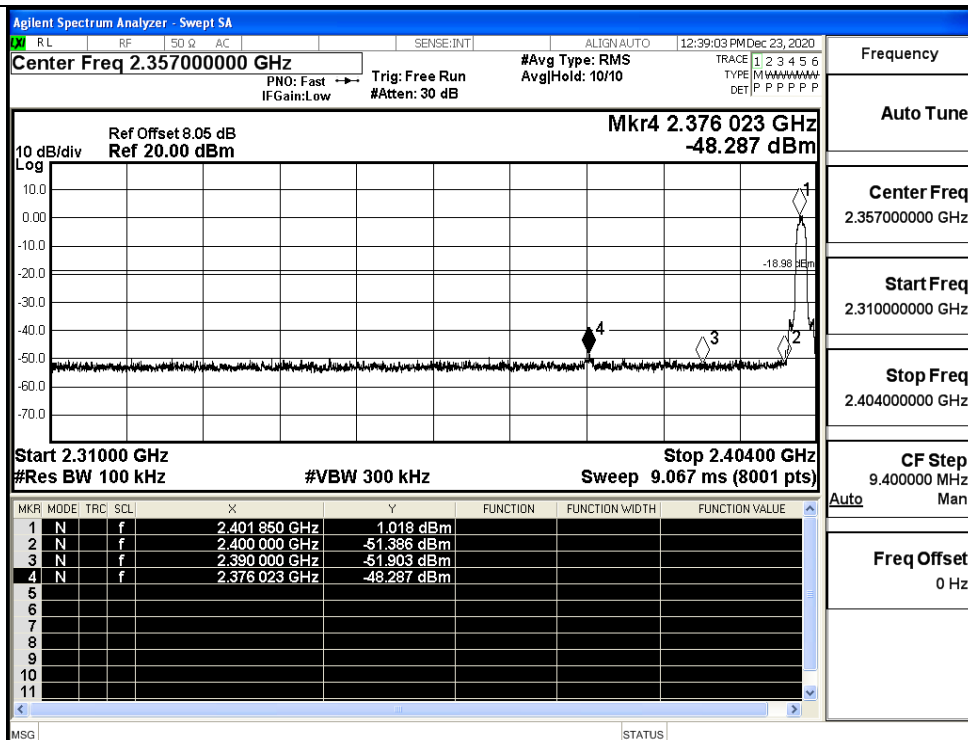
GFSK/HCH/No Hop



GFSK/HCH/Hop



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

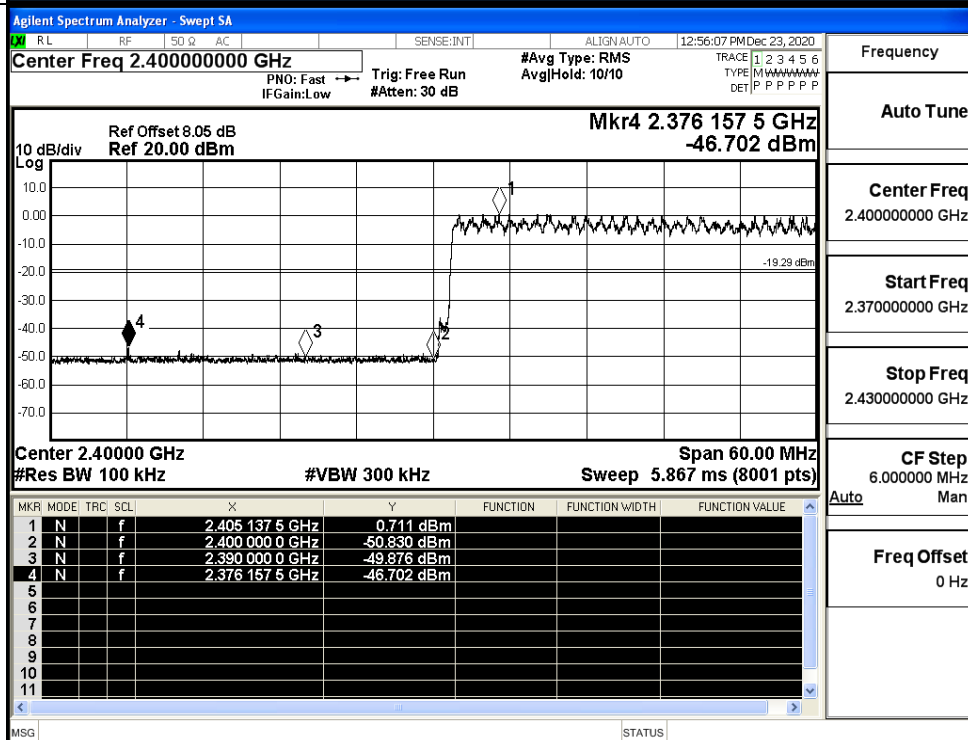


Frequency

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

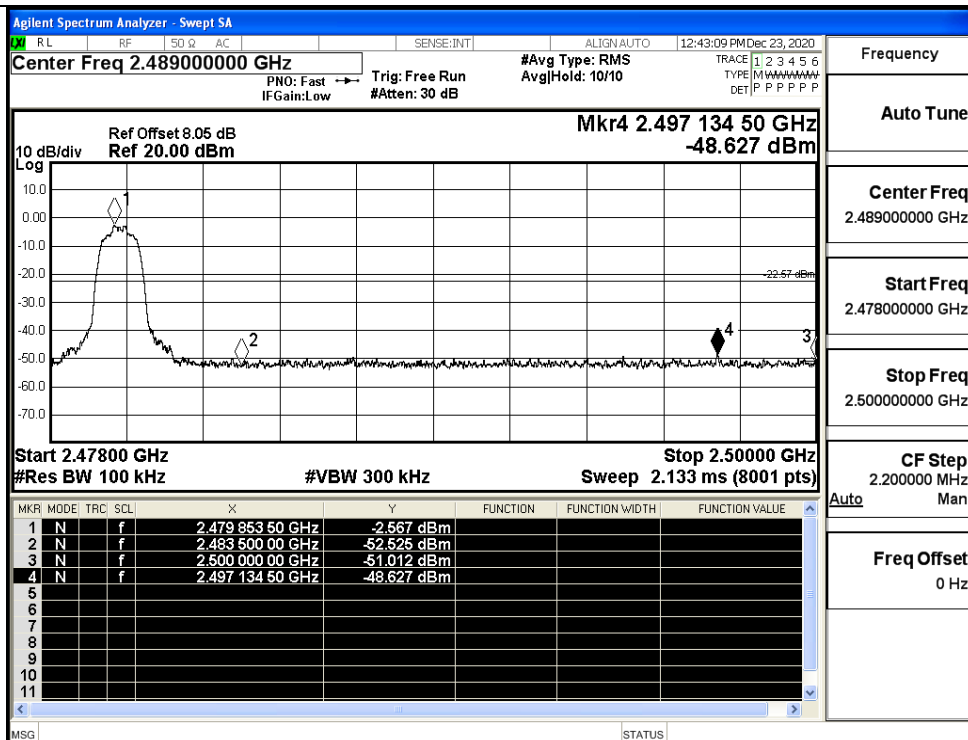


Frequency

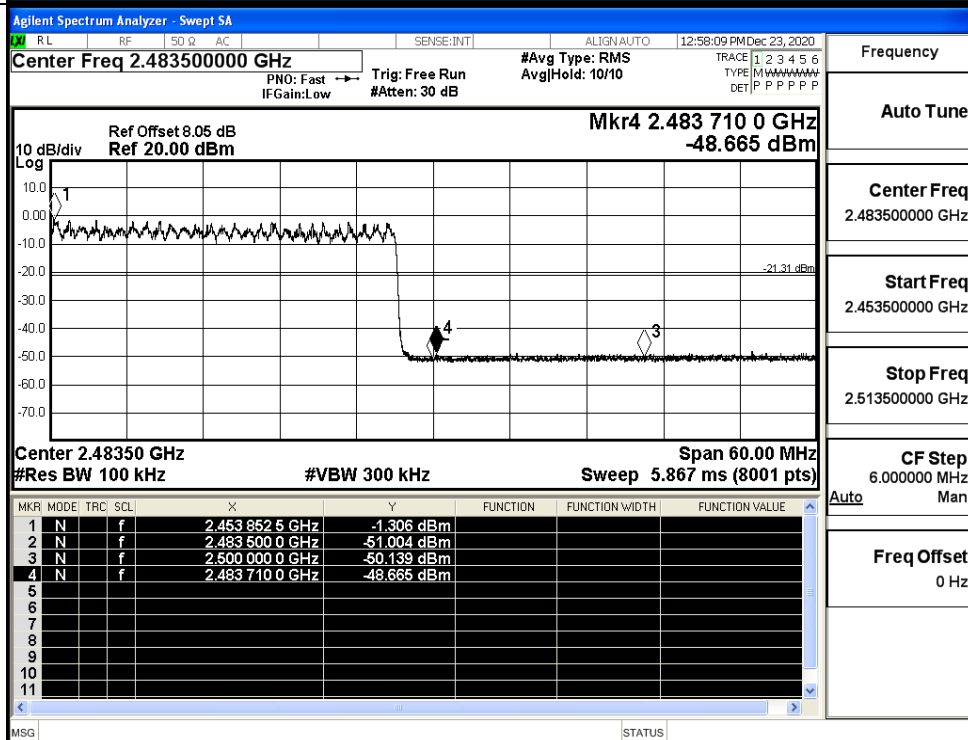
Auto Tune

Center Freq
2.400000000 GHzStart Freq
2.370000000 GHzStop Freq
2.430000000 GHzCF Step
6.000000 MHz
Auto ManFreq Offset
0 Hz

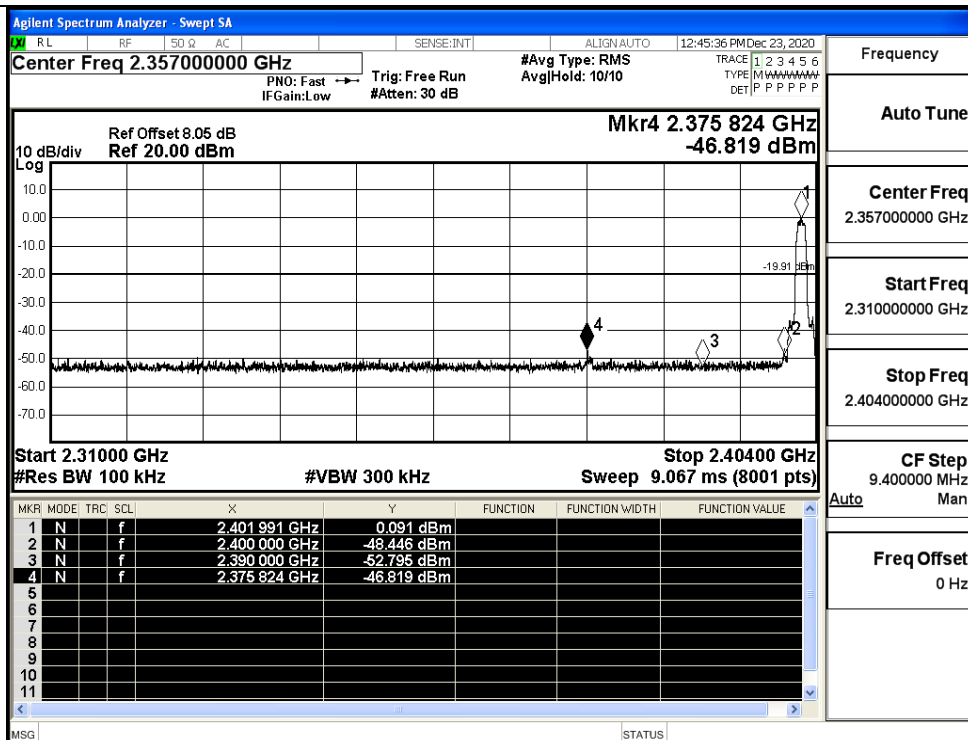
$\pi/4$ DQPSK/HCH/No
Hop



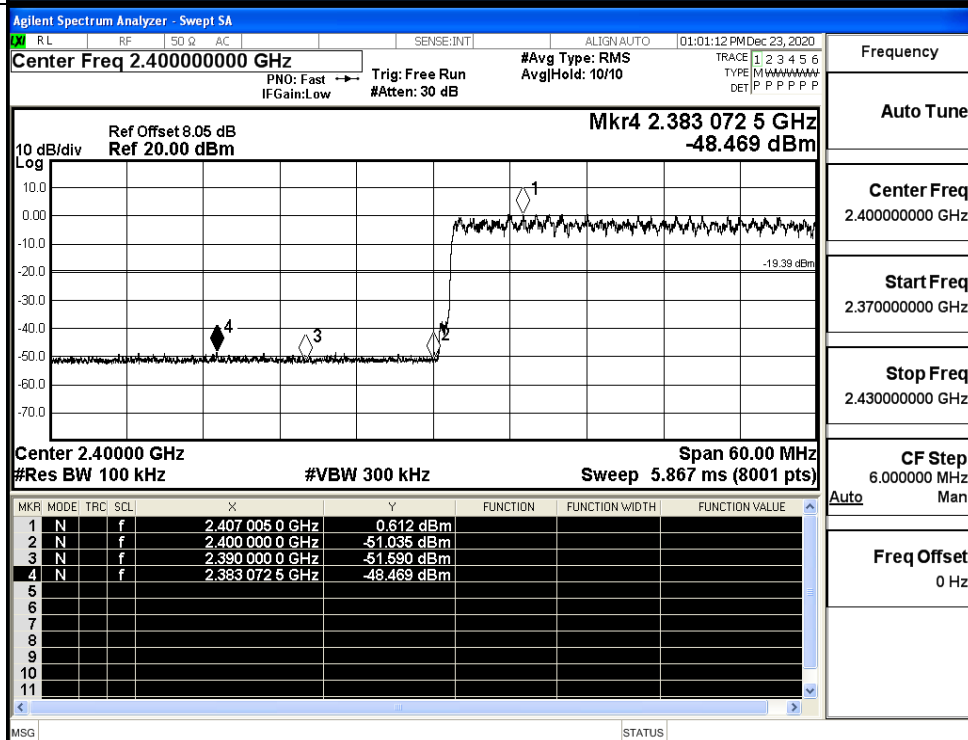
$\pi/4$ DQPSK/HCH/Hop



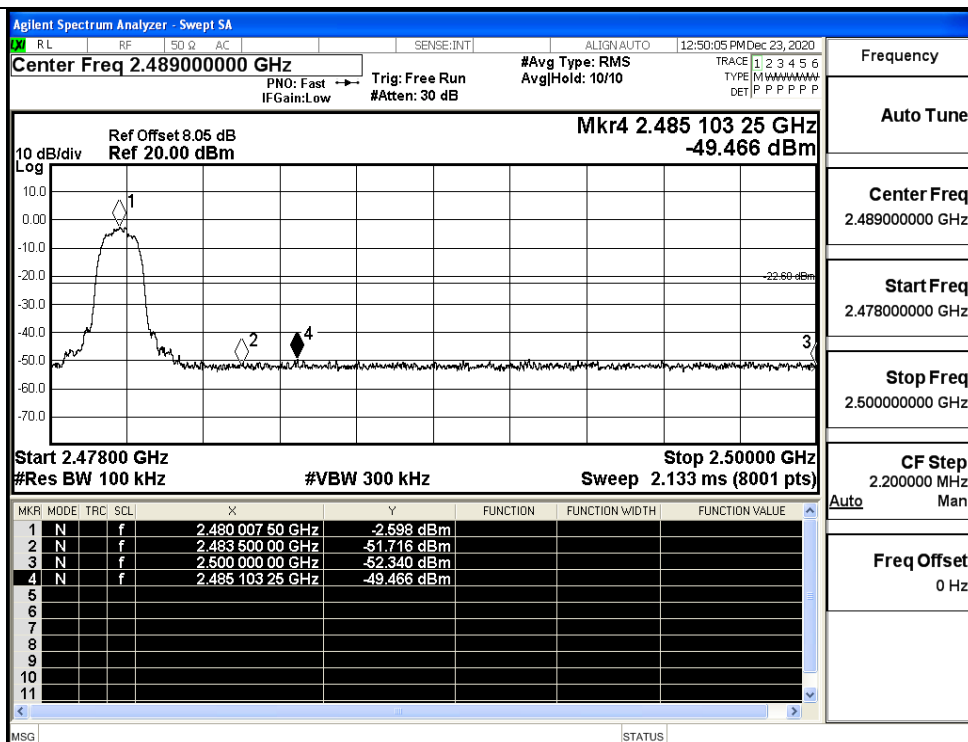
8DPSK/LCH/No Hop



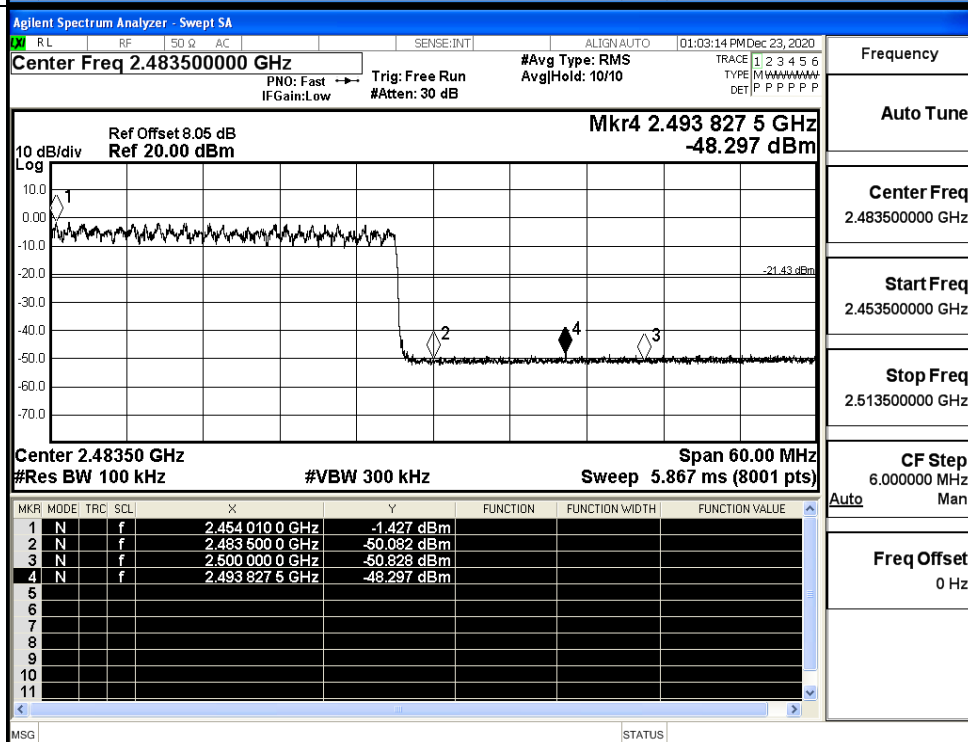
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



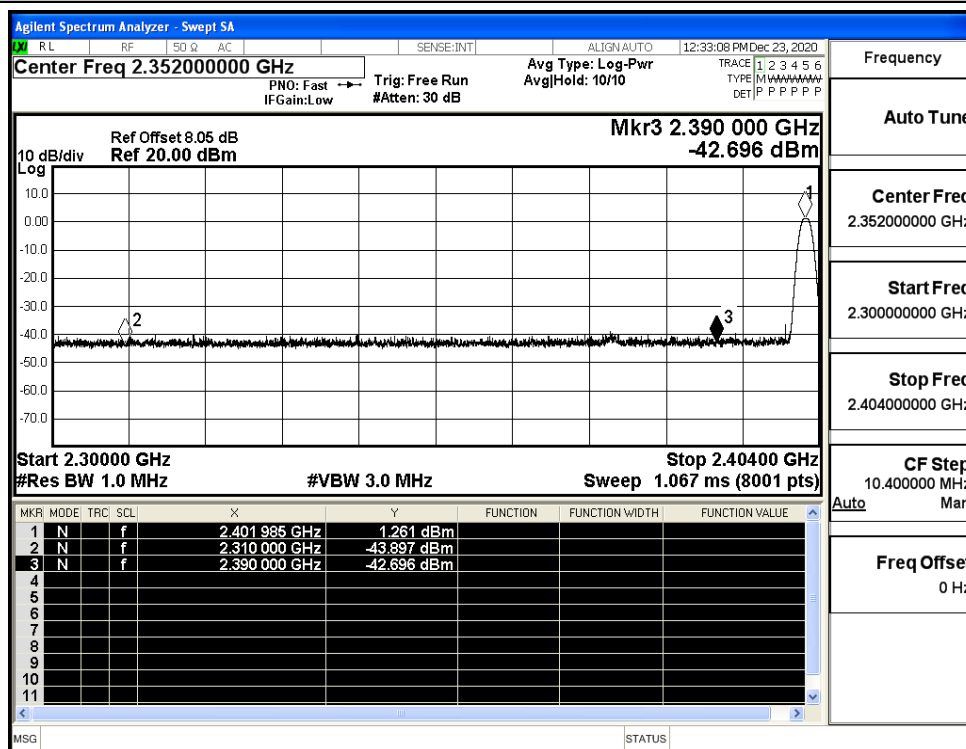
8DPSK/HCH/Hop



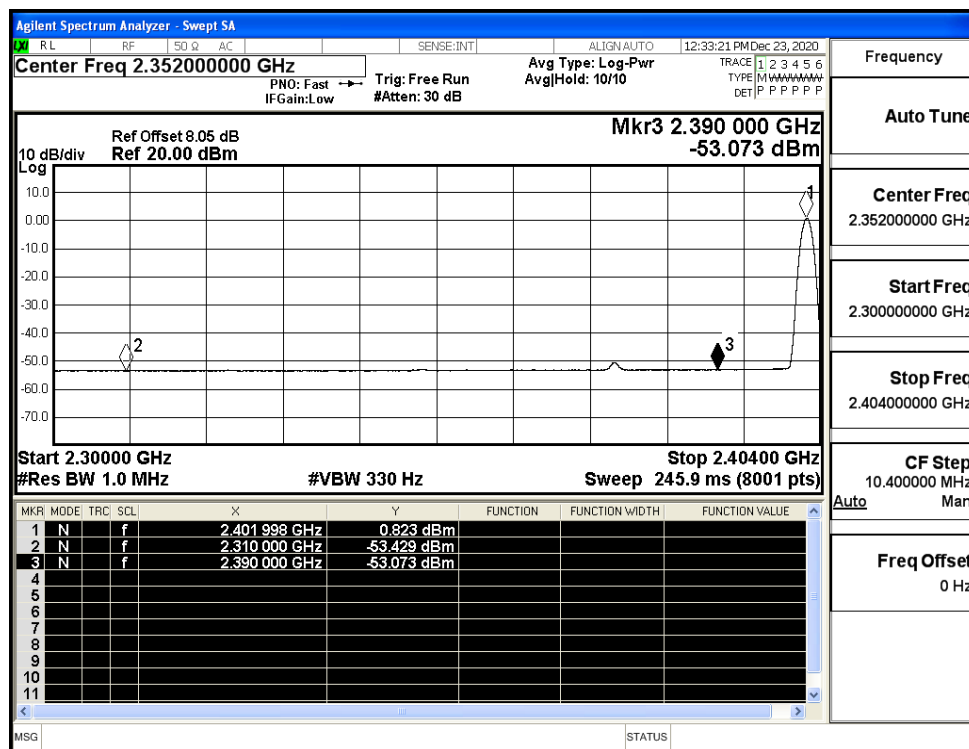
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.90	2.0	0	51.36	PEAK	74	PASS
	Off	2310.0	-53.43	2.0	0	41.83	AV	54	PASS
	Off	2390.0	-42.70	2.0	0	52.56	PEAK	74	PASS
	Off	2390.0	-53.07	2.0	0	42.18	AV	54	PASS
	Off	2483.5	-40.64	2.0	0	54.62	PEAK	74	PASS
	Off	2483.5	-52.43	2.0	0	42.83	AV	54	PASS
	Off	2500.0	-41.16	2.0	0	54.10	PEAK	74	PASS
	Off	2500.0	-52.33	2.0	0	42.93	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-41.33	2.0	0	53.93	PEAK	74	PASS
	Off	2310.0	-53.36	2.0	0	41.90	AV	54	PASS
	Off	2390.0	-43.20	2.0	0	52.05	PEAK	74	PASS
	Off	2390.0	-53.11	2.0	0	42.14	AV	54	PASS
	Off	2483.5	-42.94	2.0	0	52.32	PEAK	74	PASS
	Off	2483.5	-52.54	2.0	0	42.72	AV	54	PASS
	Off	2500.0	-42.56	2.0	0	52.70	PEAK	74	PASS
	Off	2500.0	-52.34	2.0	0	42.92	AV	54	PASS
8DPSK	Off	2310.0	-41.96	2.0	0	53.30	PEAK	74	PASS
	Off	2310.0	-53.42	2.0	0	41.84	AV	54	PASS
	Off	2390.0	-43.34	2.0	0	51.92	PEAK	74	PASS
	Off	2390.0	-52.98	2.0	0	42.28	AV	54	PASS
	Off	2483.5	-42.65	2.0	0	52.61	PEAK	74	PASS
	Off	2483.5	-52.55	2.0	0	42.71	AV	54	PASS
	Off	2500.0	-42.62	2.0	0	52.64	PEAK	74	PASS
	Off	2500.0	-52.40	2.0	0	42.86	AV	54	PASS

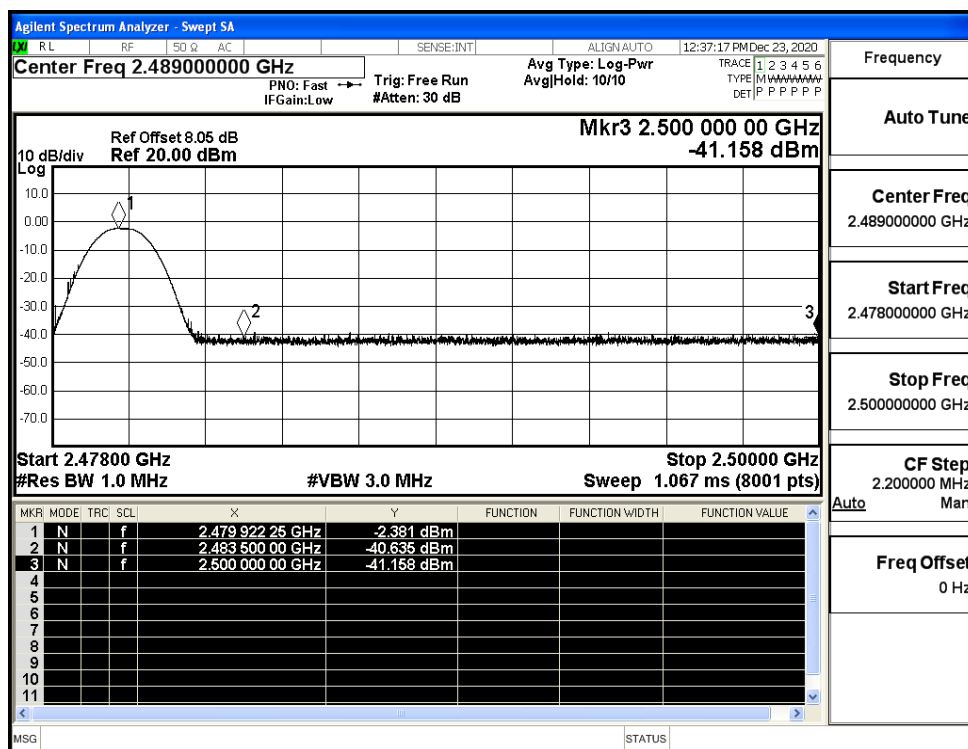
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



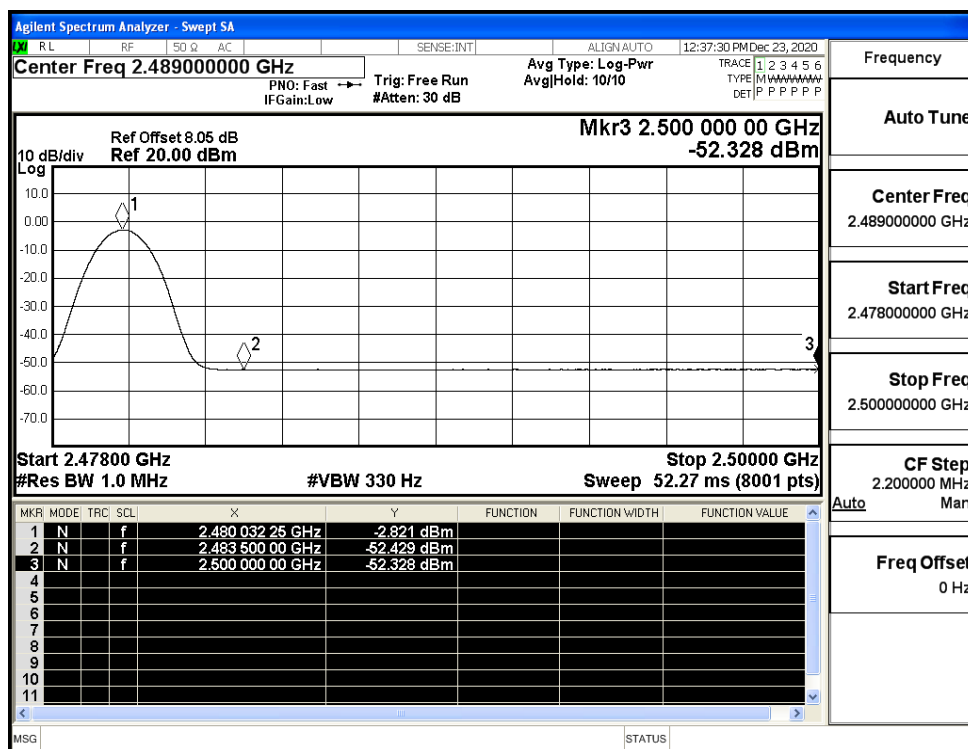
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

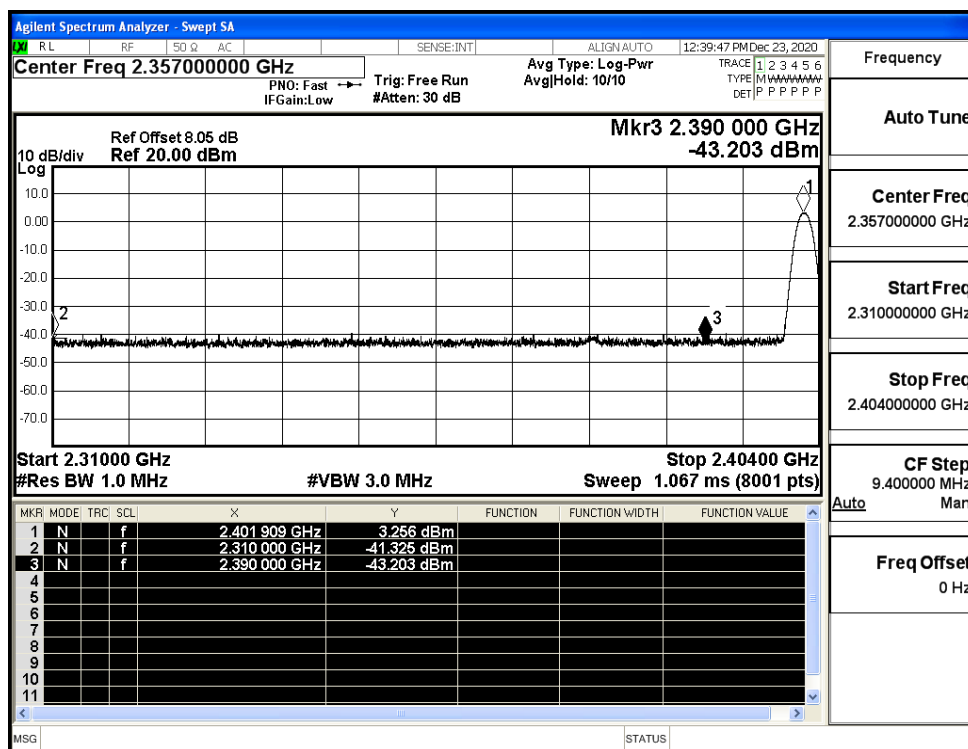
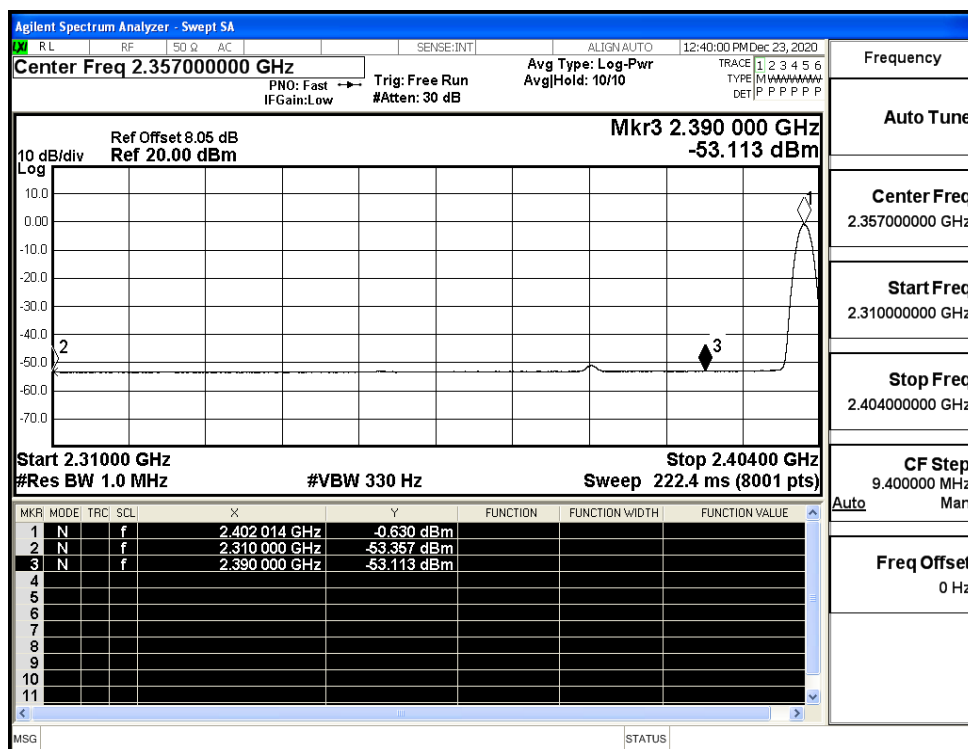


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

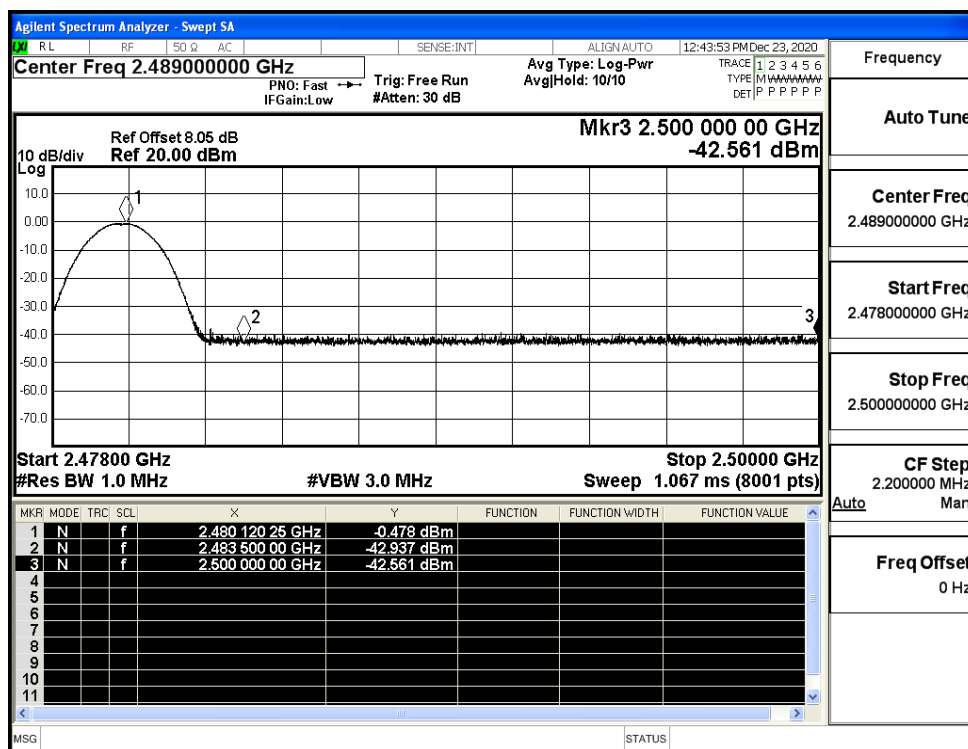


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

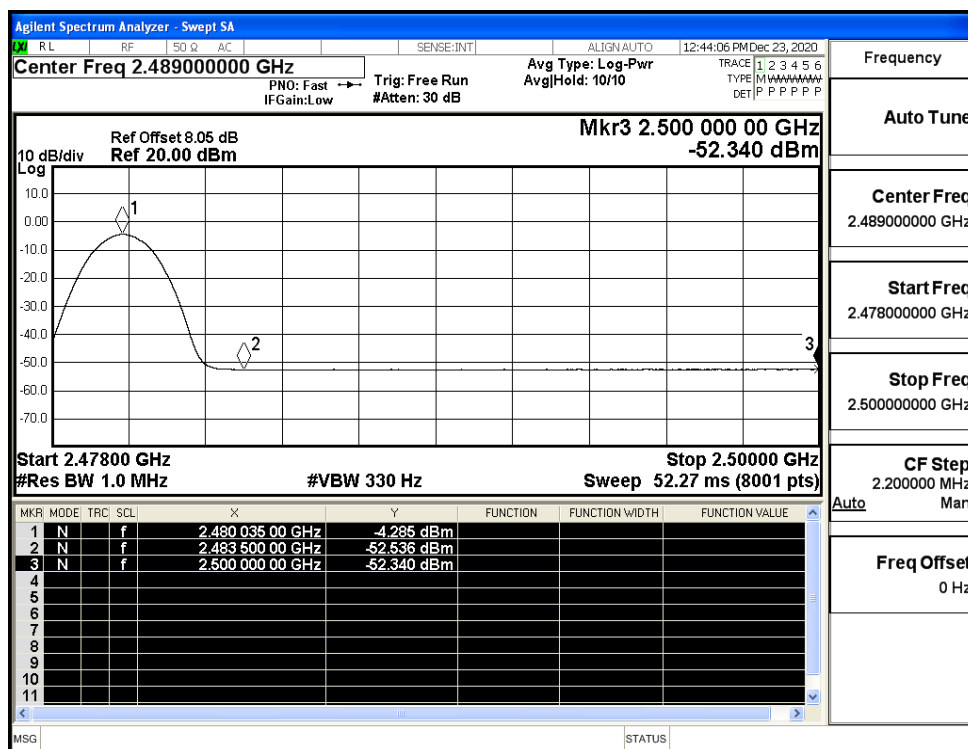


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

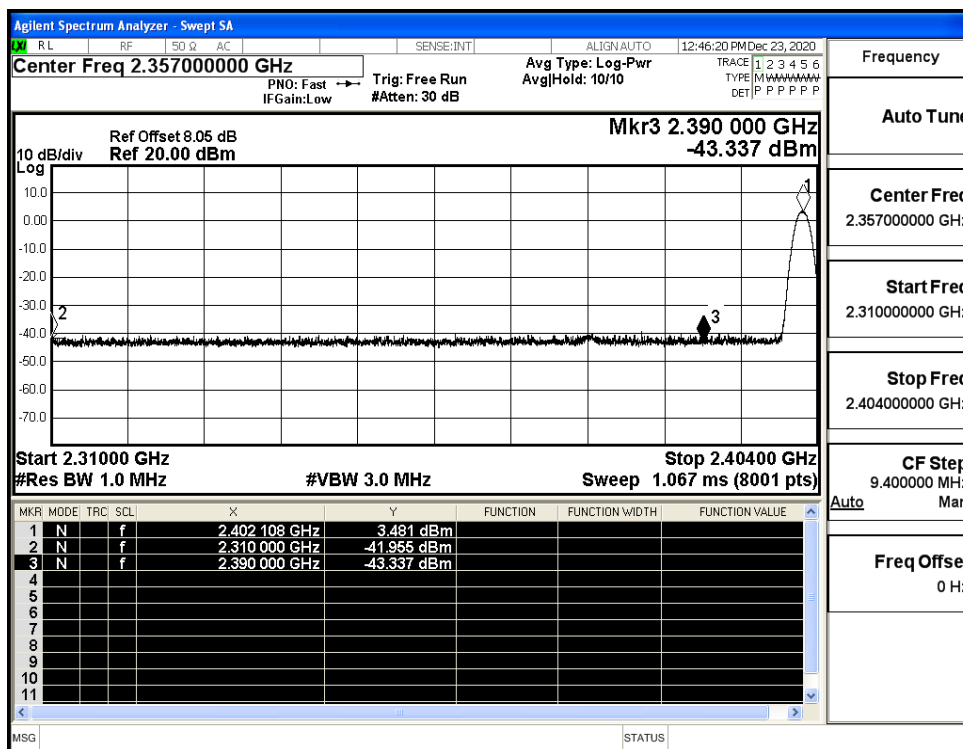
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



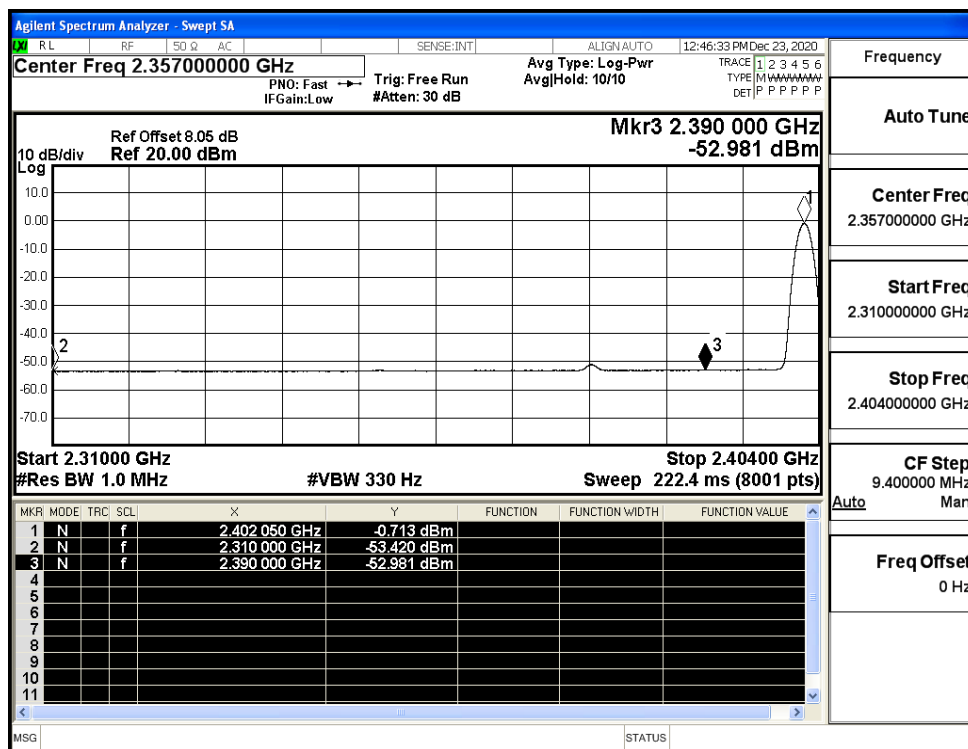
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



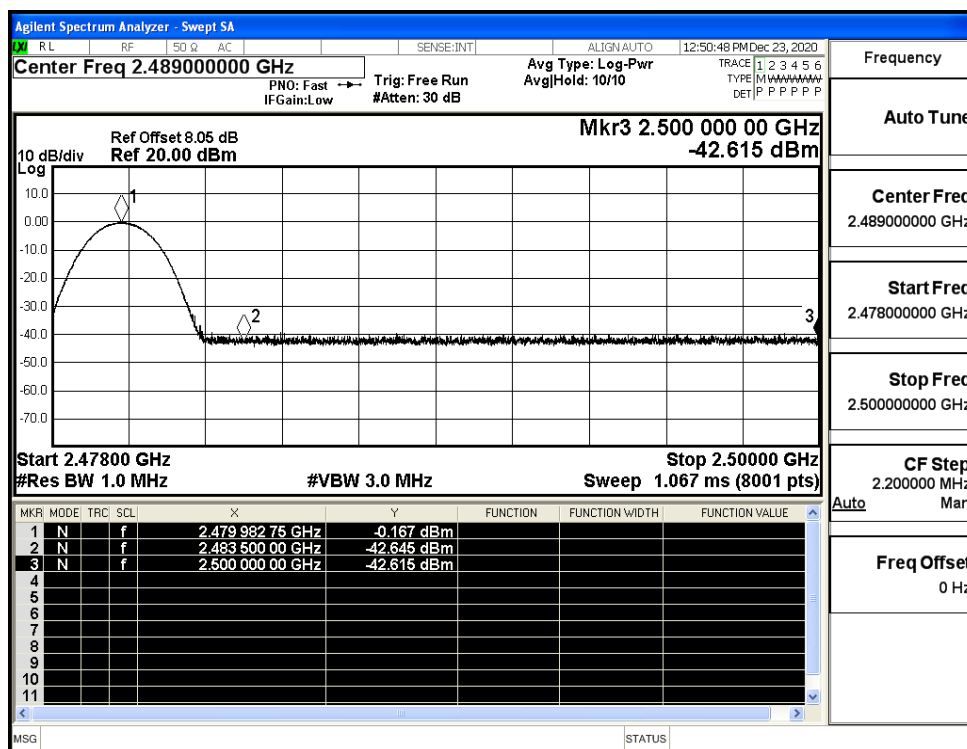
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

