

Appendix A

RF Test Data for BT V4.0 (BDR/EDR) (Conducted Measurement)

Product Name: USB Bluetooth Adapter

Trade Mark: XFANIC

Test Model: XF-B9001

Environmental Conditions

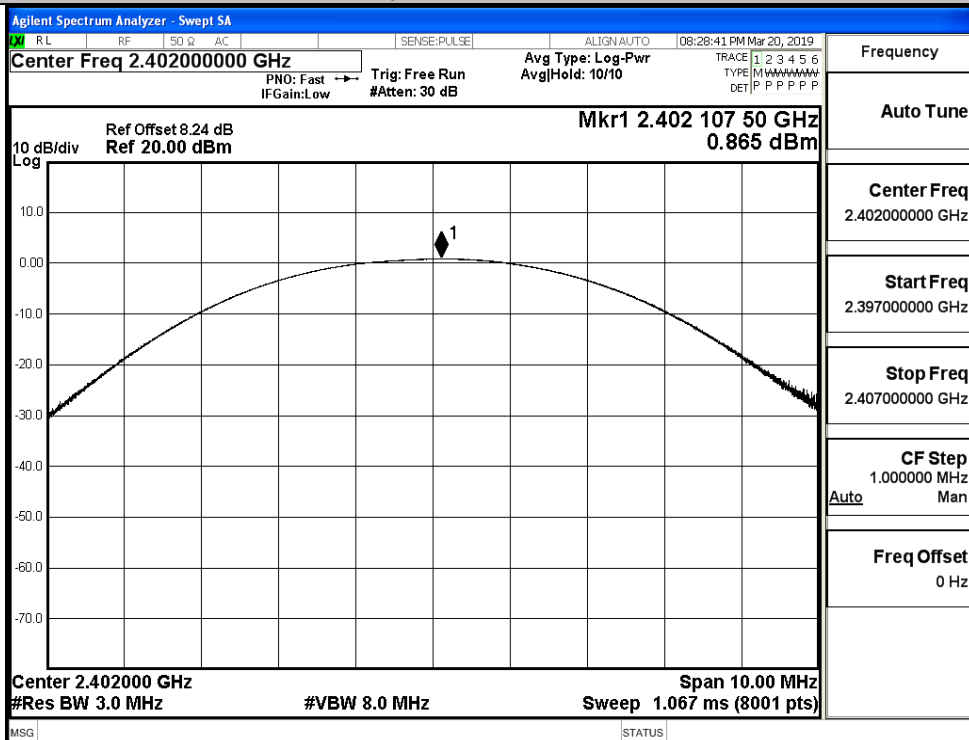
Temperature:	22.8 ° C
Relative Humidity:	53.9%
ATM Pressure:	100.0 kPa
Test Engineer:	David.Luo
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

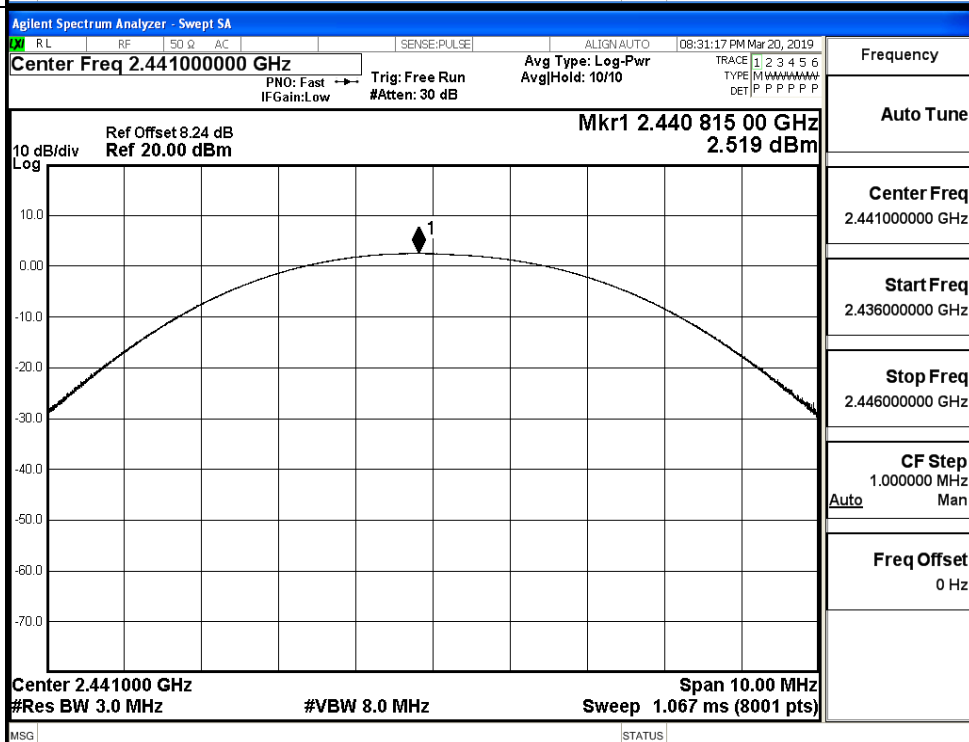
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.865	21	PASS
	MCH	2.519	21	PASS
	HCH	2.556	21	PASS
$\pi/4$ DQPSK	LCH	-1.349	21	PASS
	MCH	0.474	21	PASS
	HCH	0.664	21	PASS
8DPSK	LCH	-0.995	21	PASS
	MCH	0.888	21	PASS
	HCH	1.152	21	PASS

Test Graphs

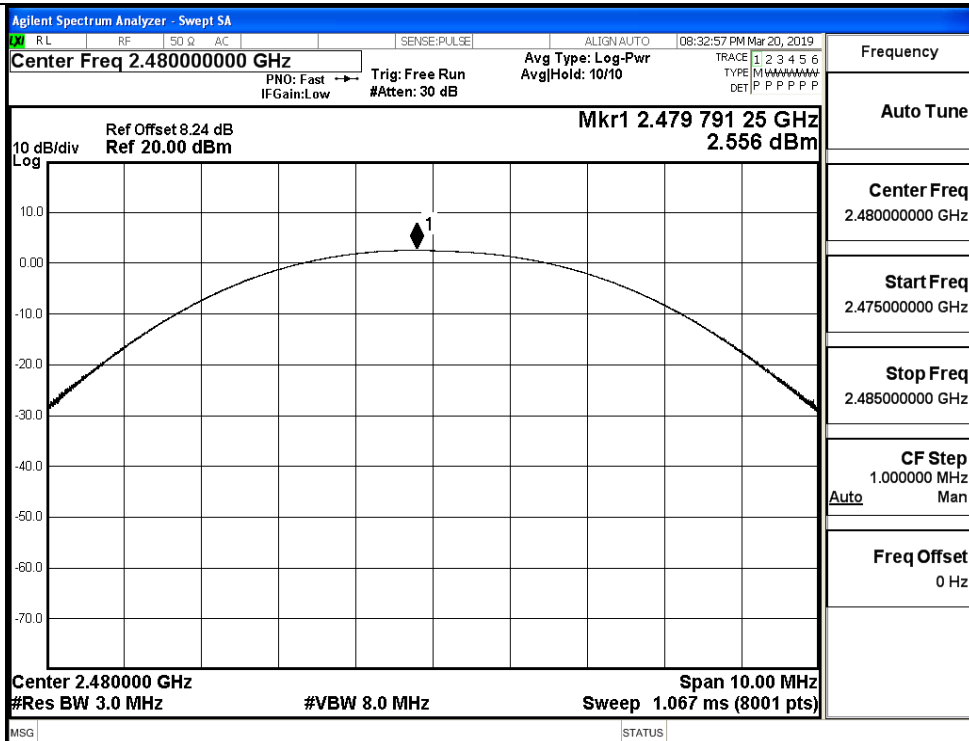
GFSK/LCH



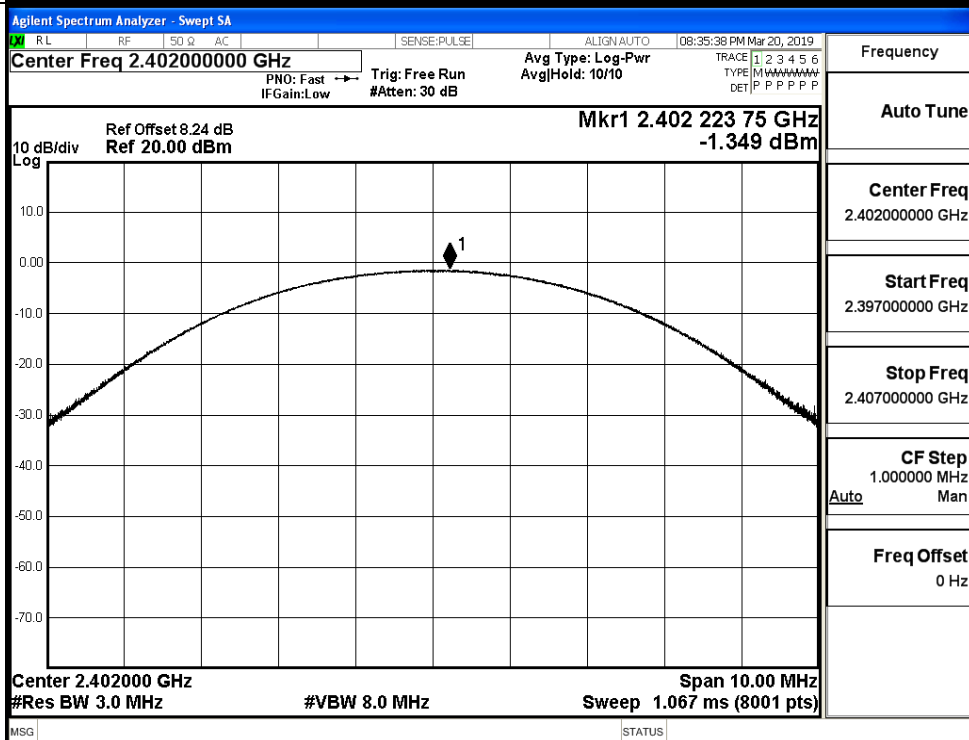
GFSK/MCH



GFSK/HCH

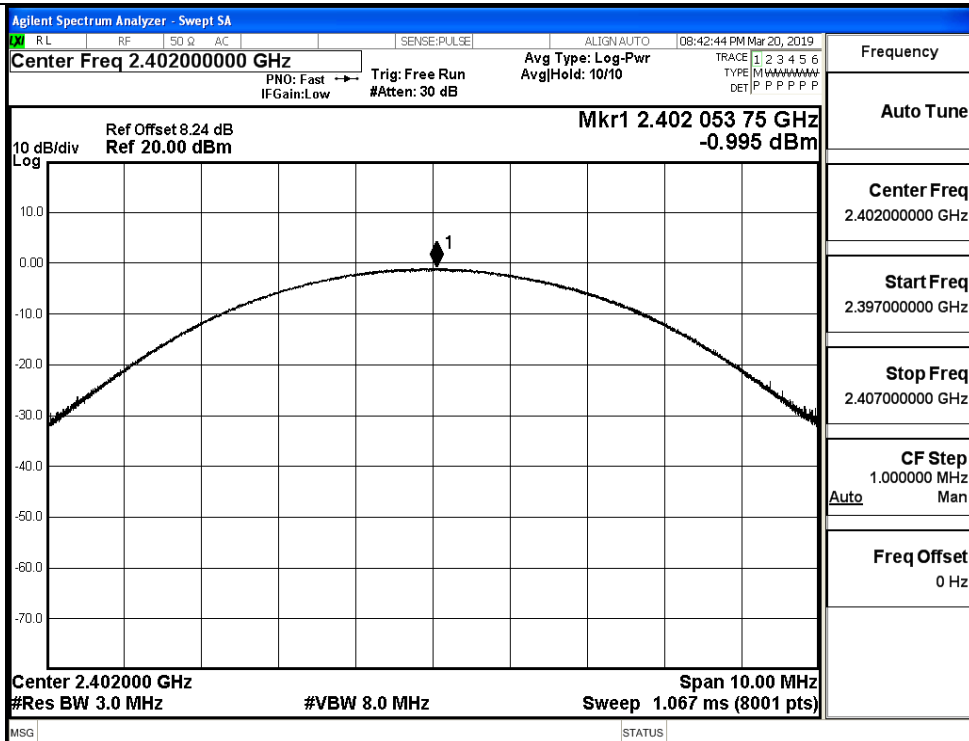


$\pi/4$ DQPSK/LCH

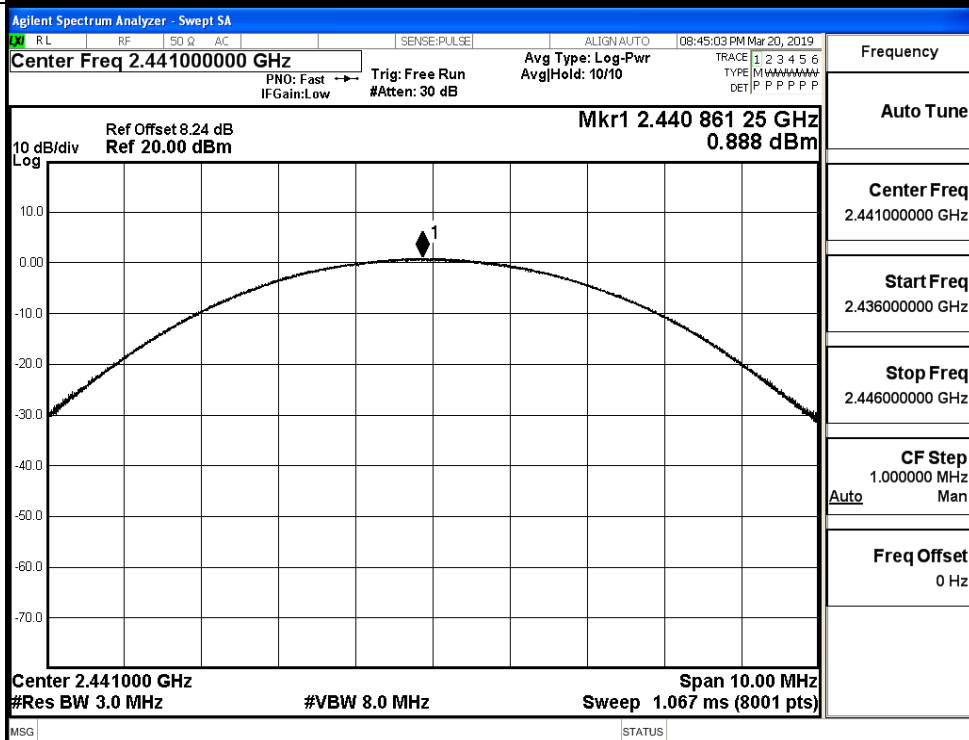


$\pi/4$DQPSK/MCH	Agilent Spectrum Analyzer - Swept SA ☒ R L ☐ RF ☐ 50 Ω ☐ AC ☐ SENSE:PULSE ☐ ALIGN:AUTO 08:38:05 PM Mar 20, 2019 Center Freq 2.441000000 GHz PNO: Fast ☐ Trig: Free Run Avg Type: Log-Pwr IF Gain: Low #Atten: 30 dB AvgHld: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W W DET P P P P P P P Ref Offset 8.24 dB Ref 20.00 dBm Mkr1 2.440 757 50 GHz 0.474 dBm Center 2.441000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Span 10.00 MHz Sweep 1.067 ms (8001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.436000000 GHz Stop Freq 2.446000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz
$\pi/4$DQPSK/HCH	Agilent Spectrum Analyzer - Swept SA ☒ R L ☐ RF ☐ 50 Ω ☐ AC ☐ SENSE:PULSE ☐ ALIGN:AUTO 08:39:50 PM Mar 20, 2019 Center Freq 2.480000000 GHz PNO: Fast ☐ Trig: Free Run Avg Type: Log-Pwr IF Gain: Low #Atten: 30 dB AvgHld: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W W DET P P P P P P P Ref Offset 8.24 dB Ref 20.00 dBm Mkr1 2.479 915 00 GHz 0.664 dBm Center 2.480000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Span 10.00 MHz Sweep 1.067 ms (8001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.480000000 GHz Start Freq 2.475000000 GHz Stop Freq 2.485000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz

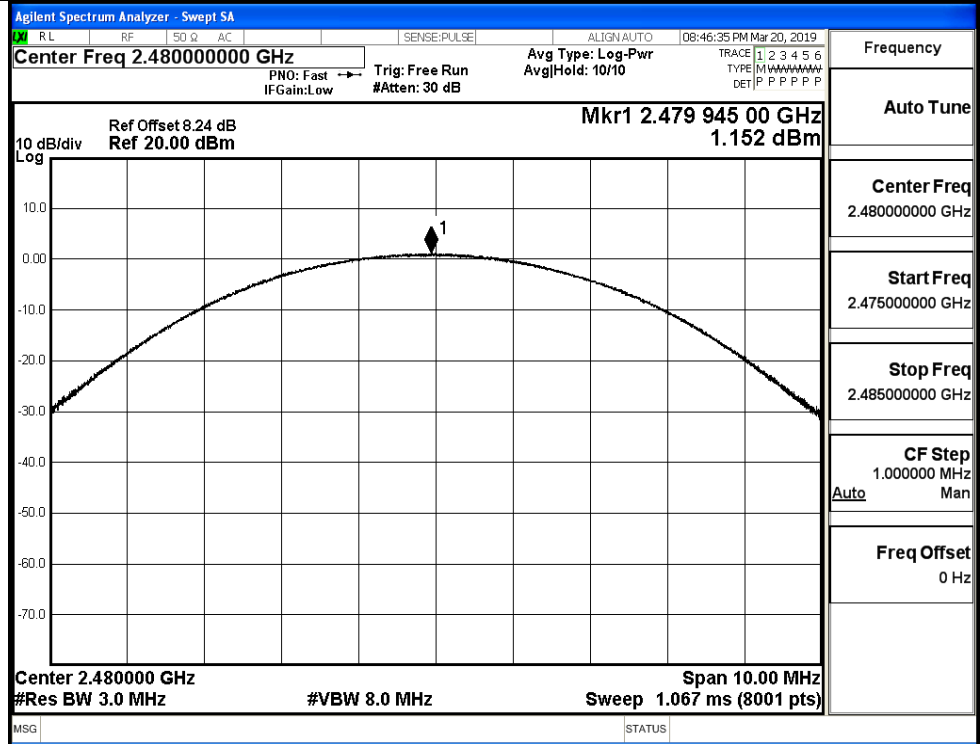
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

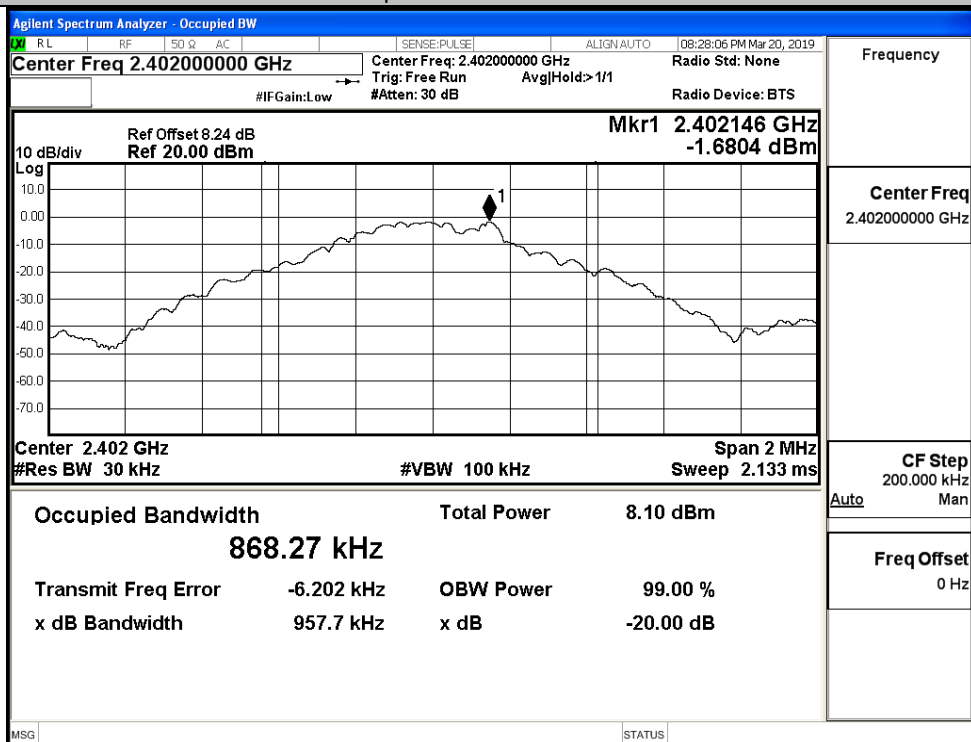


A.2 99% and 20dB Bandwidth

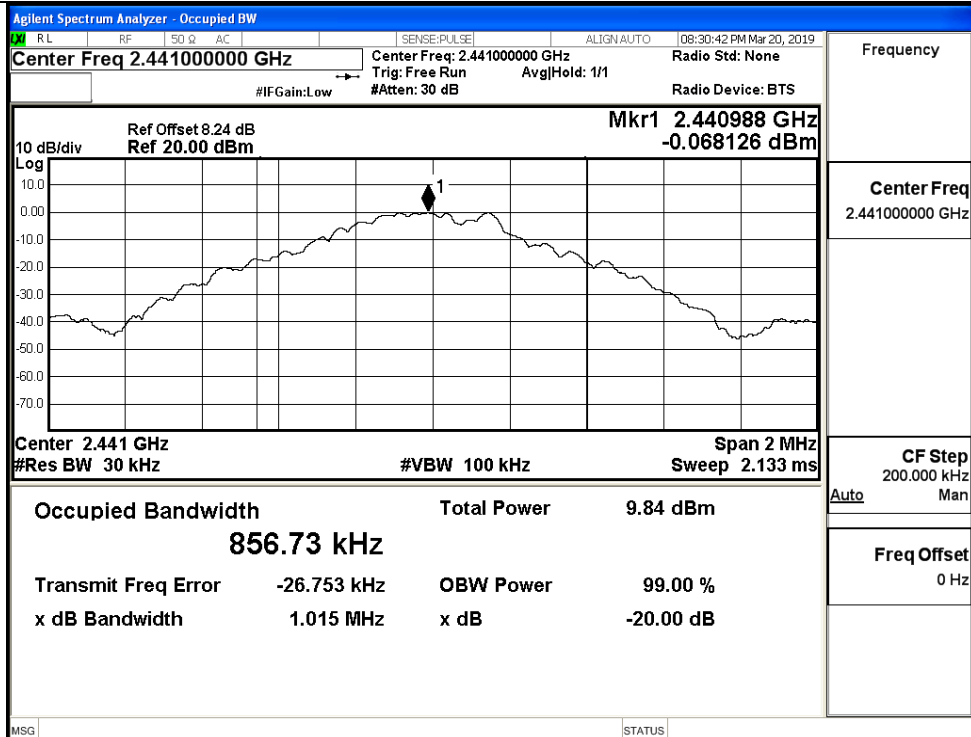
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.86827	0.9577	Not Specified	PASS
	MCH	0.85673	1.015	Not Specified	PASS
	HCH	0.86132	1.011	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.1638	1.280	Not Specified	PASS
	MCH	1.1629	1.276	Not Specified	PASS
	HCH	1.1649	1.305	Not Specified	PASS
8DPSK	LCH	1.1566	1.291	Not Specified	PASS
	MCH	1.1553	1.285	Not Specified	PASS
	HCH	1.1569	1.285	Not Specified	PASS

Test Graphs

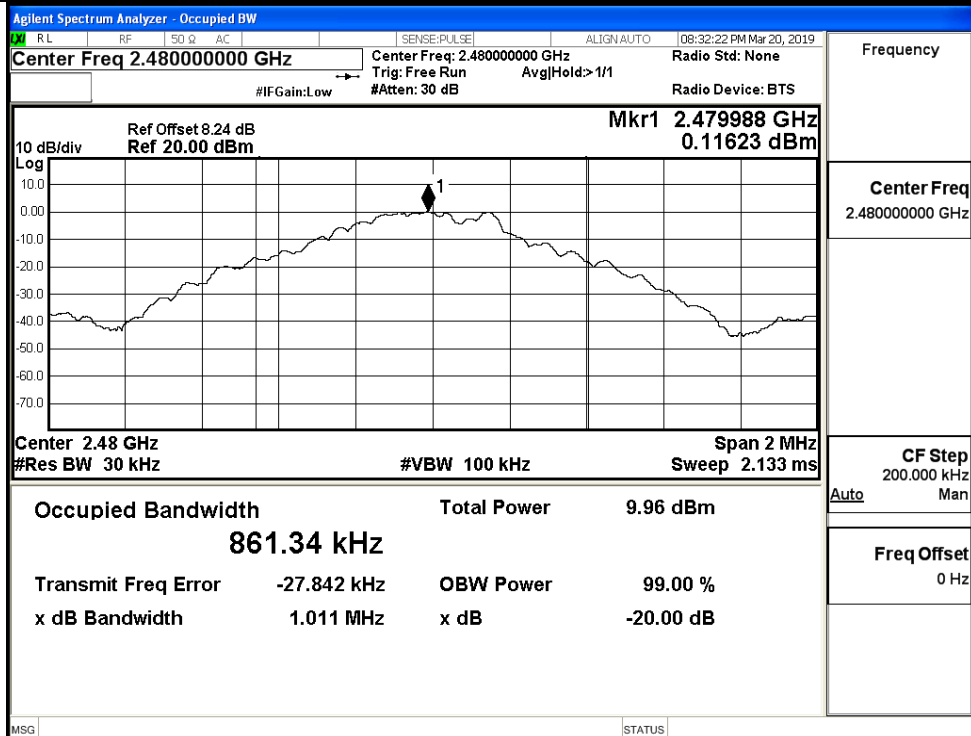
GFSK/LCH

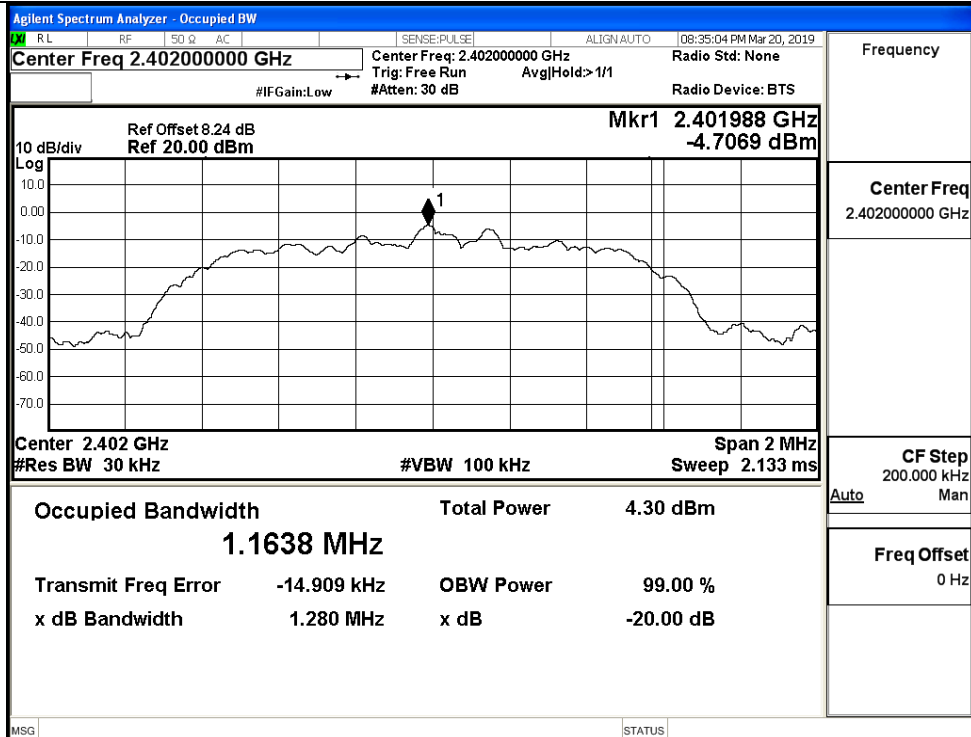
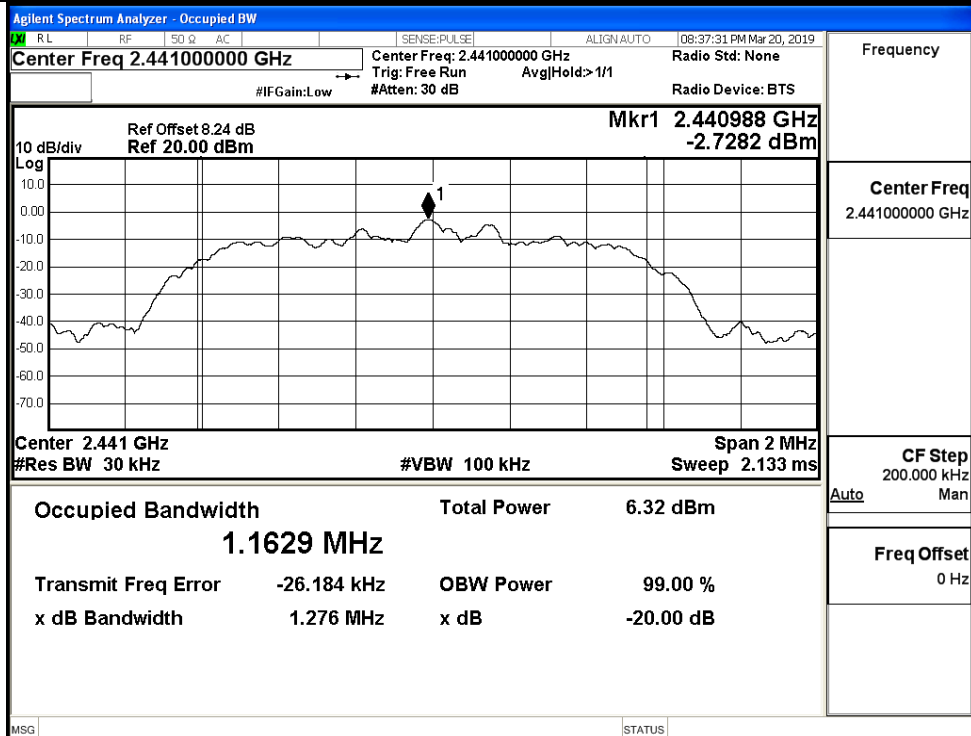


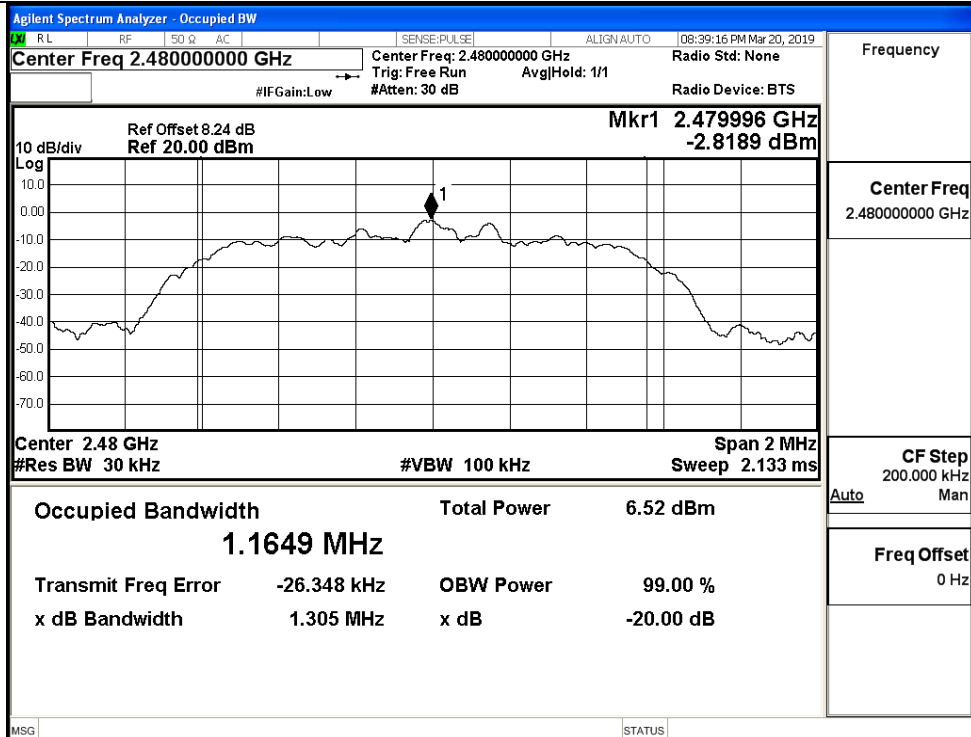
GFSK/MCH



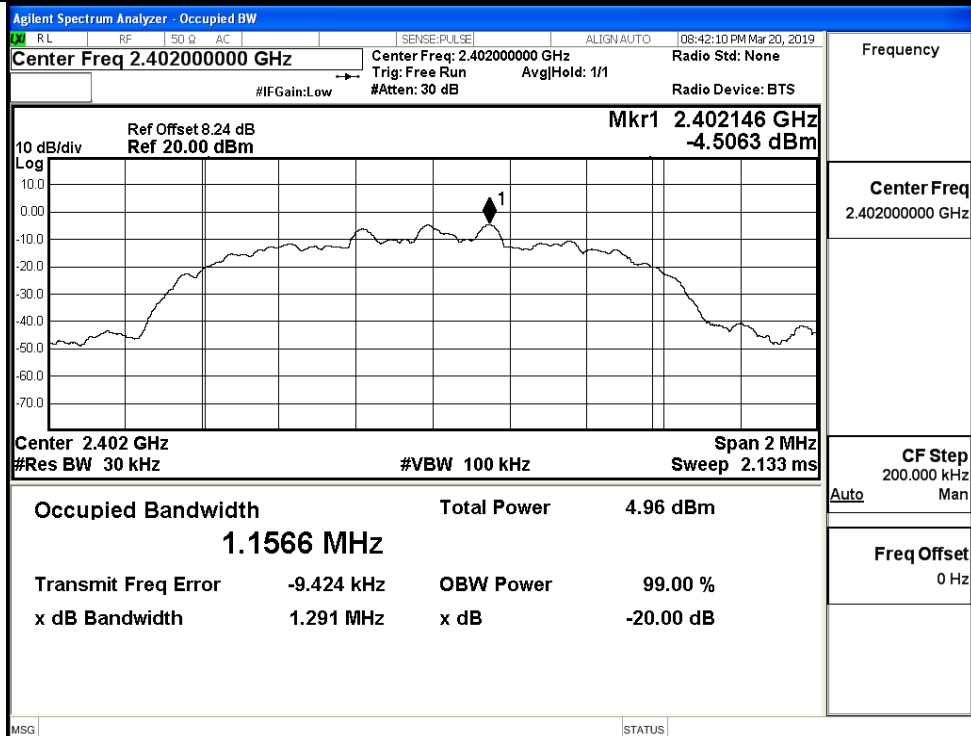
GFSK/HCH



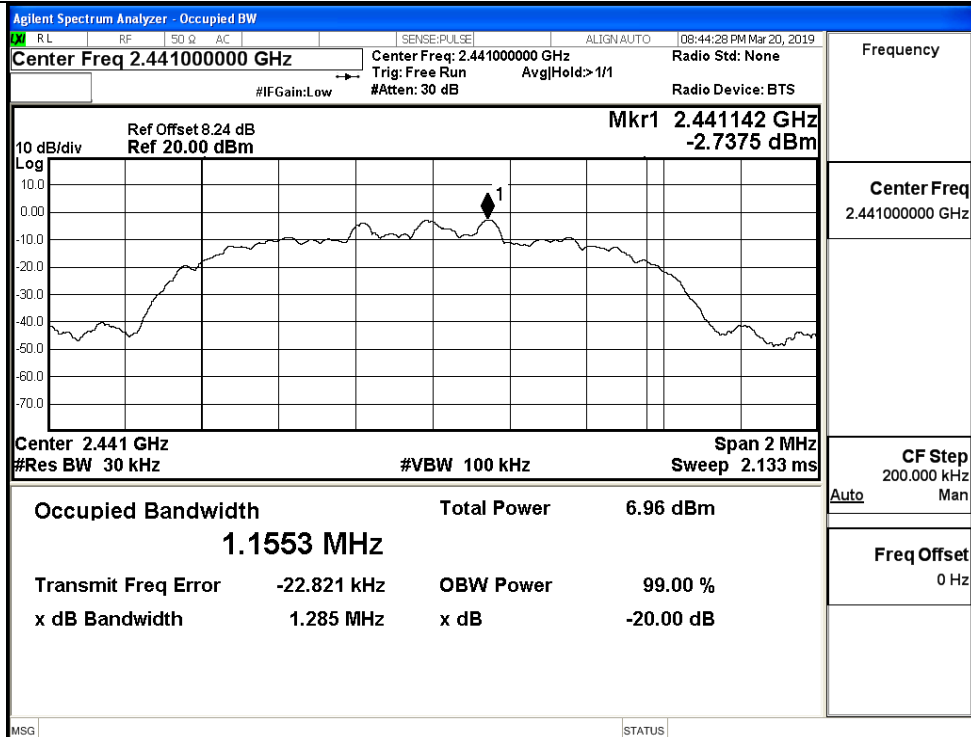
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

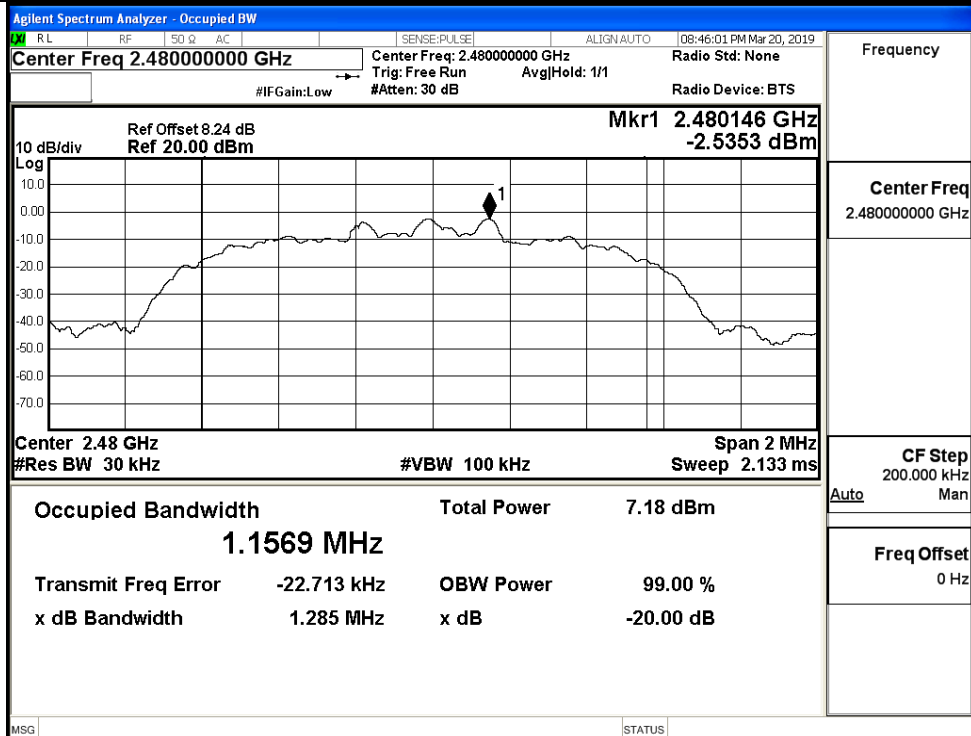
8DPSK/LCH



8DPSK/MCH



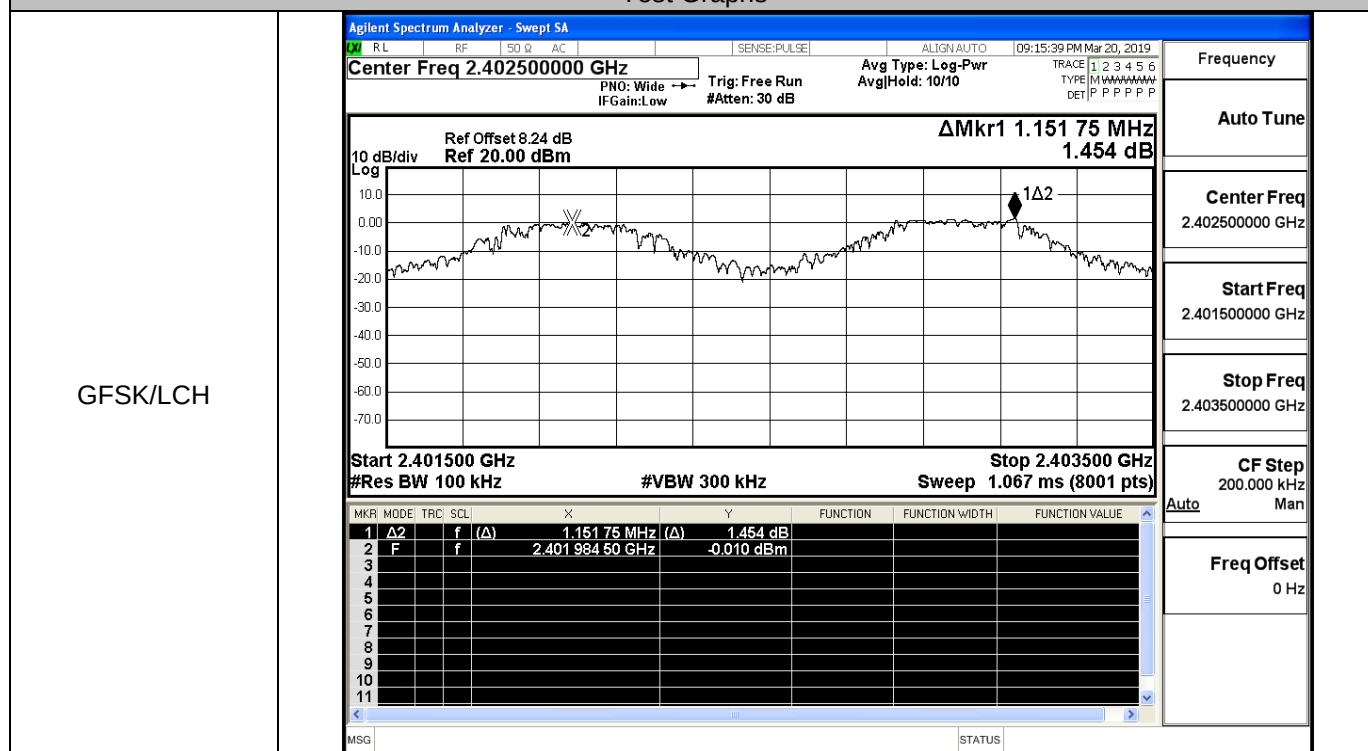
8DPSK/HCH



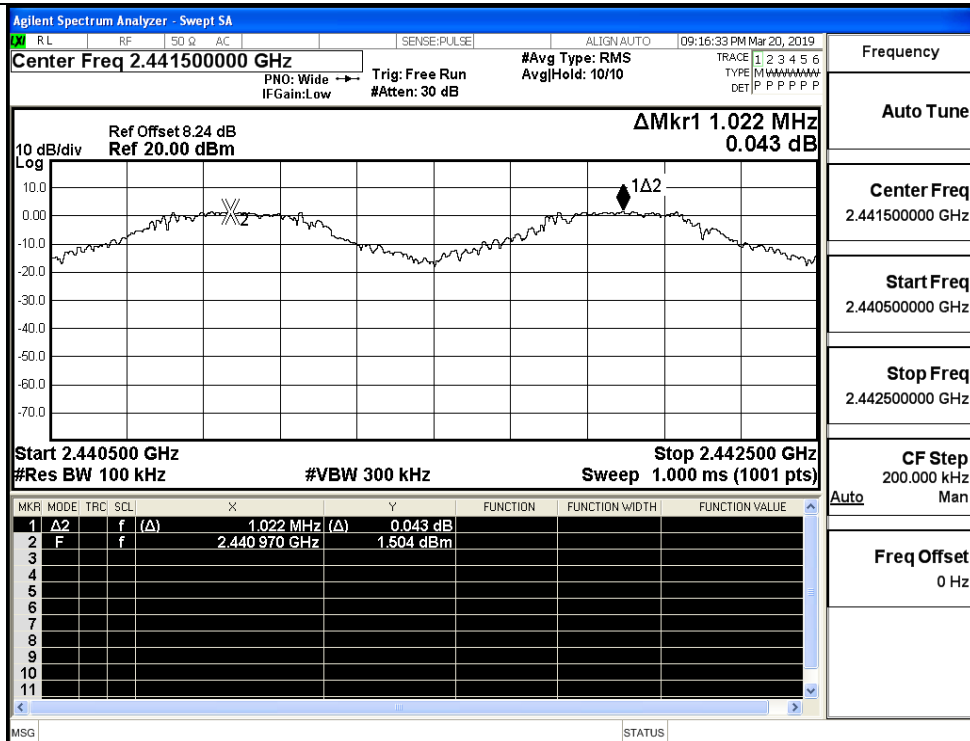
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.152	0.677	PASS
	MCH	1.022	0.677	PASS
	HCH	1.134	0.677	PASS
$\pi/4$ DQPSK	LCH	1.180	0.870	PASS
	MCH	1.004	0.870	PASS
	HCH	1.268	0.870	PASS
8DPSK	LCH	1.108	0.861	PASS
	MCH	0.968	0.861	PASS
	HCH	0.998	0.861	PASS

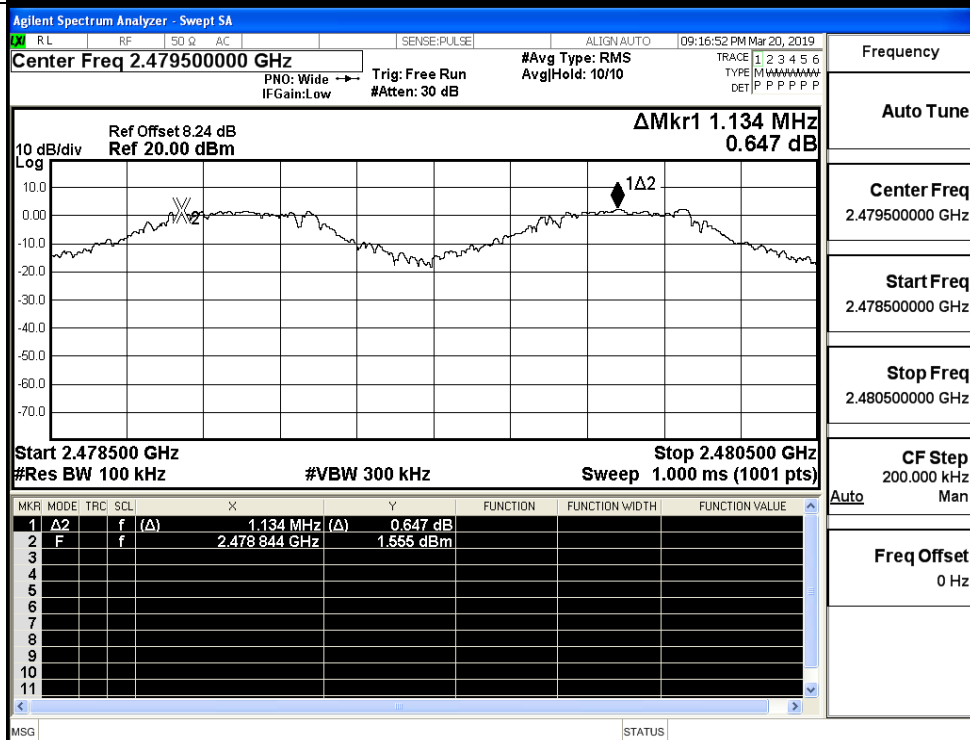
Test Graphs

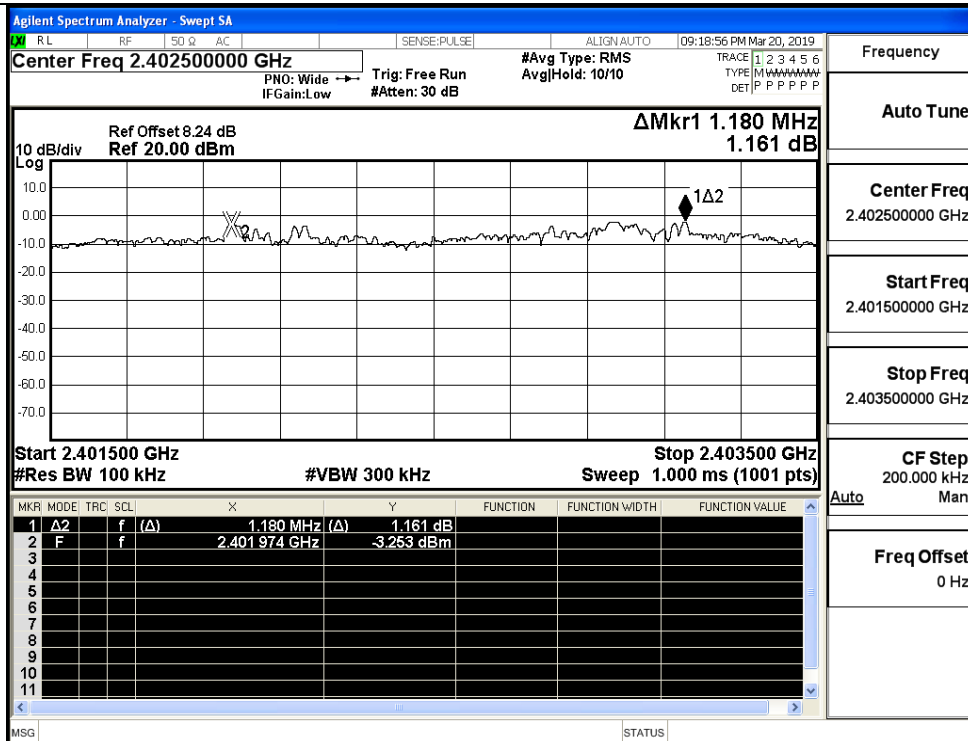
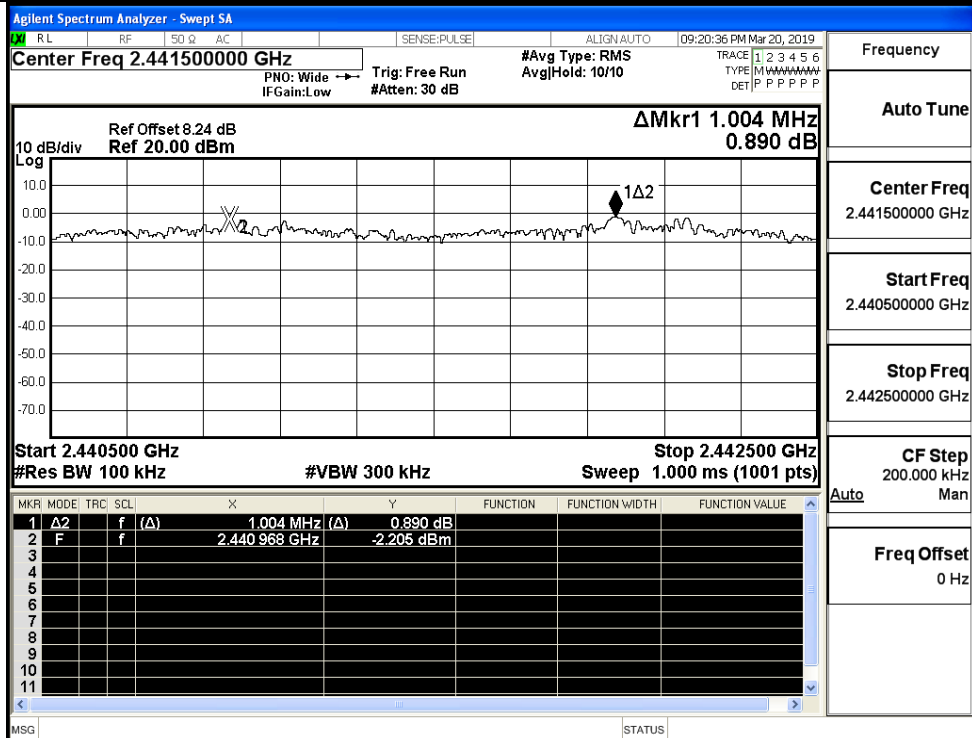


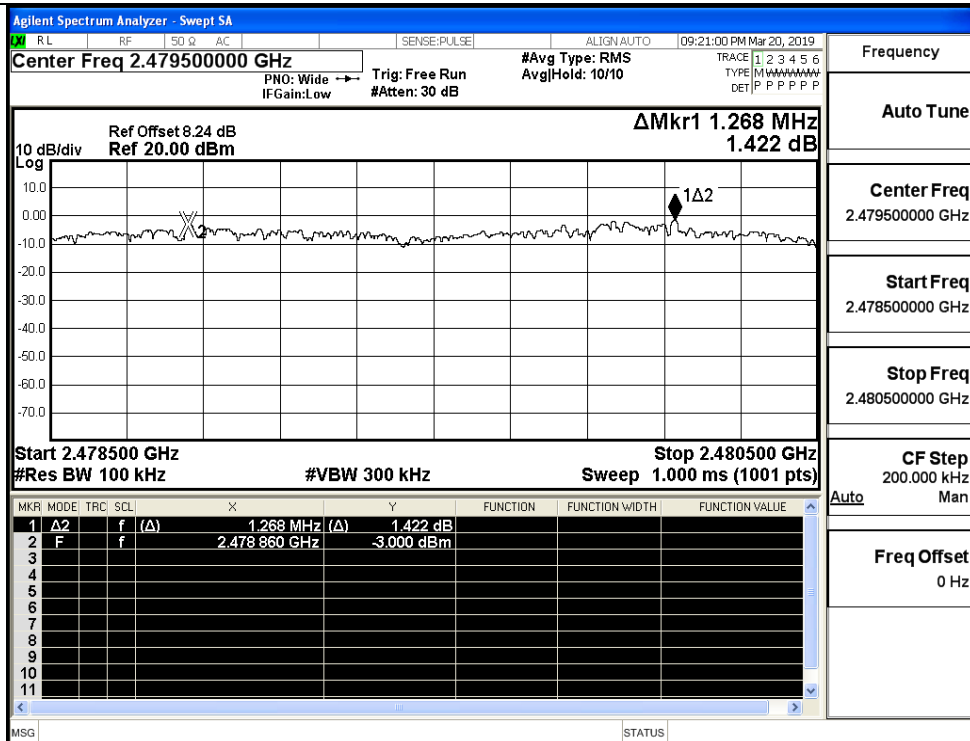
GFSK/MCH



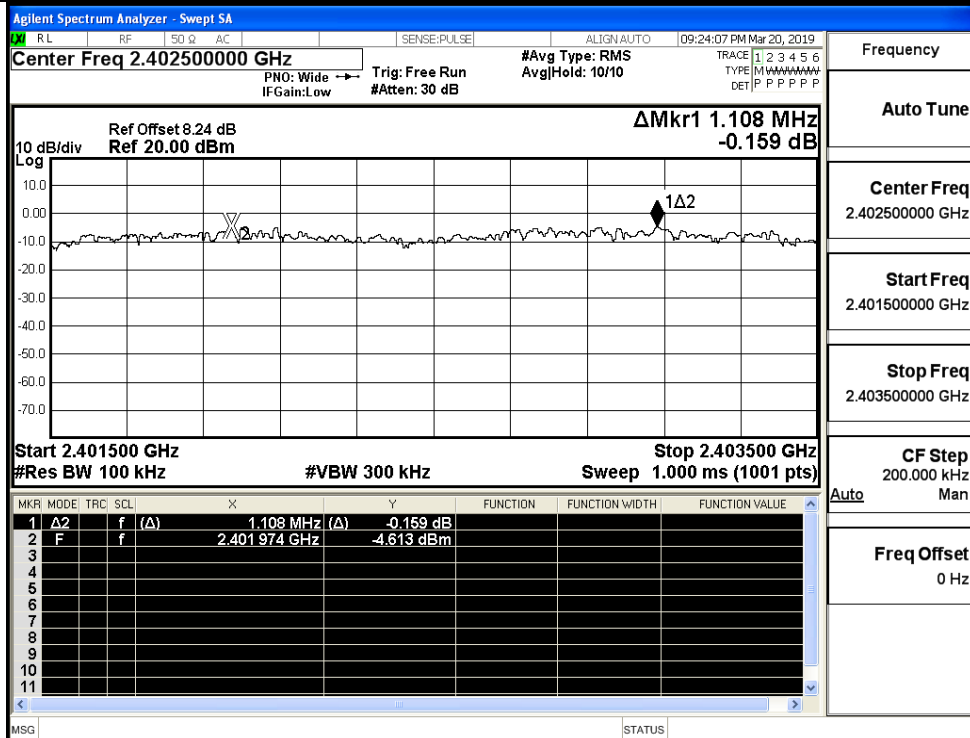
GFSK/HCH



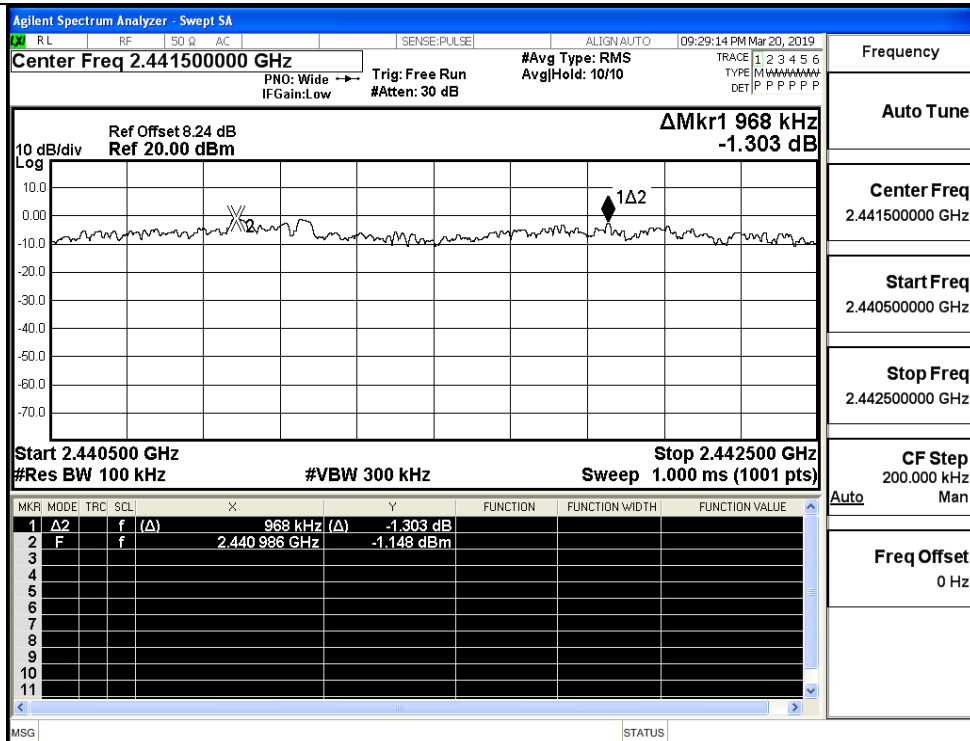
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

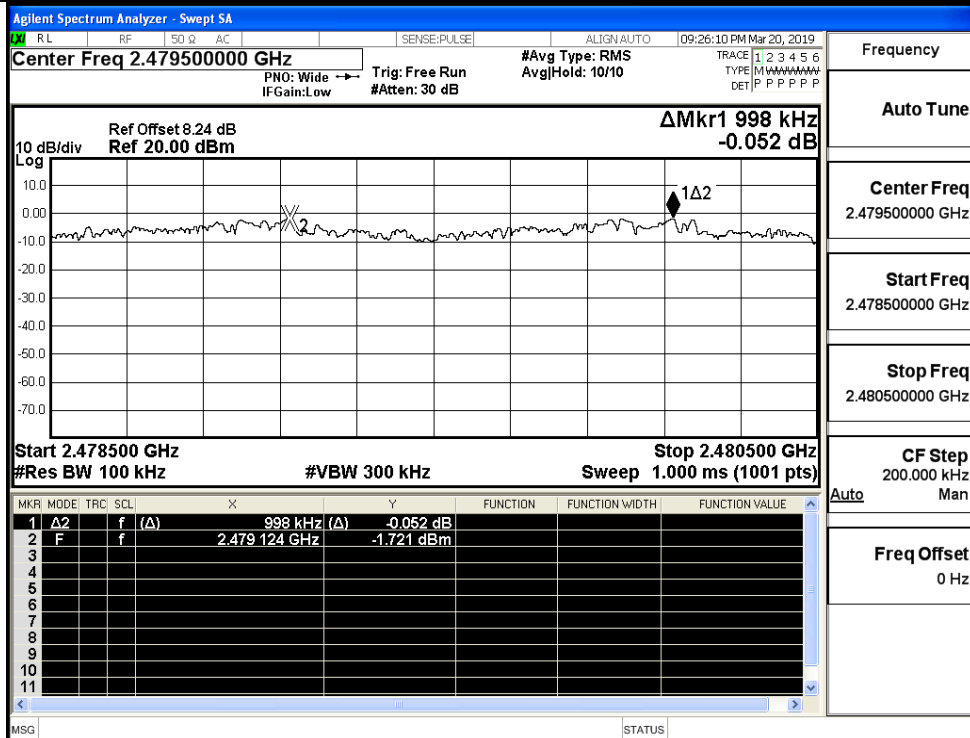
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

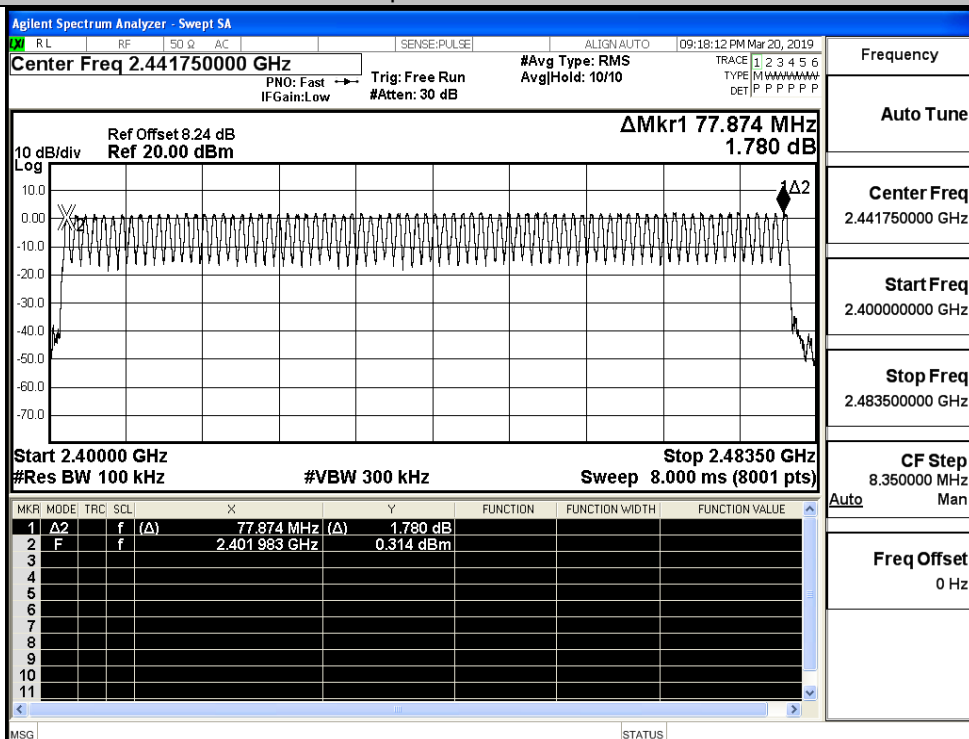


A.4 Hopping Channel Number

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

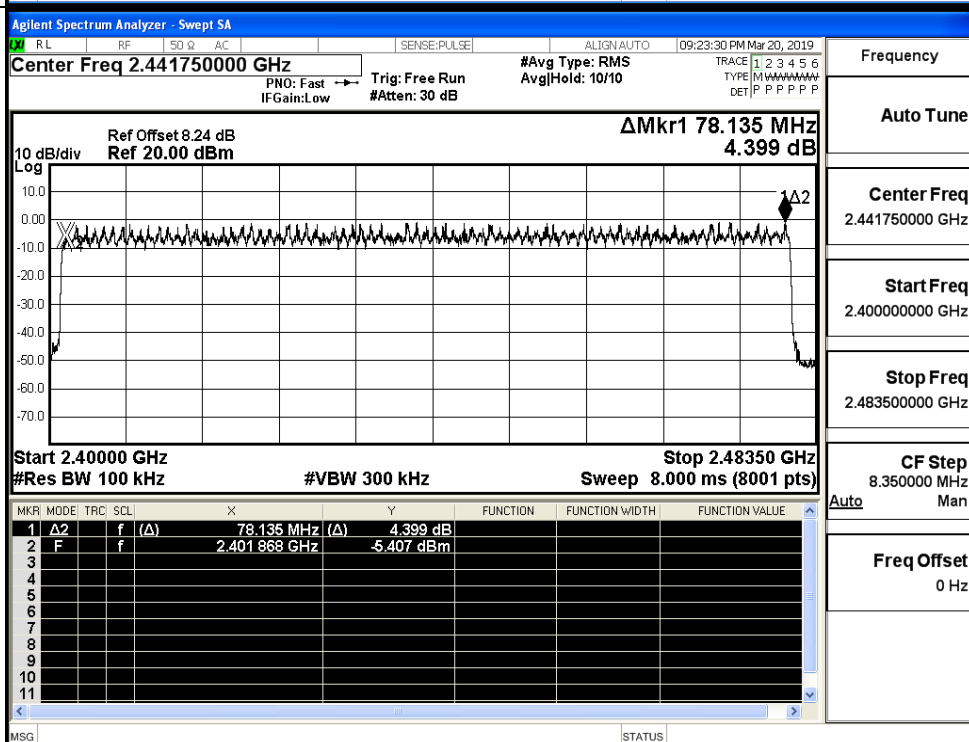
Test Graphs

GFSK/Hop



Frequency

Auto Tune

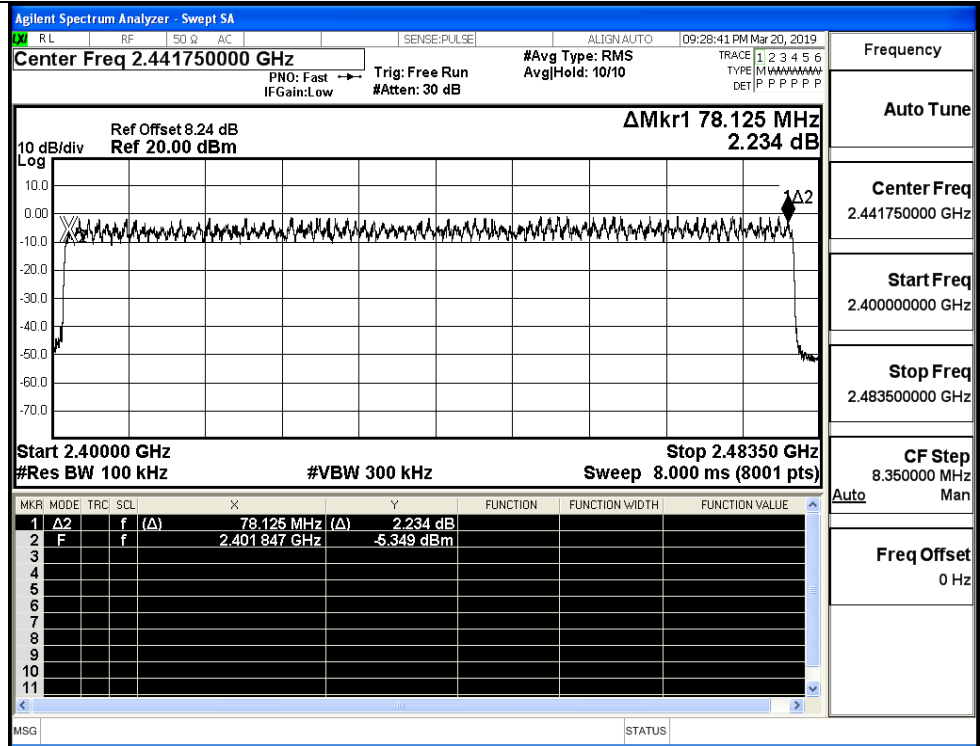
Center Freq
2.441750000 GHzStart Freq
2.400000000 GHzStop Freq
2.483500000 GHzCF Step
8.350000 MHz
ManFreq Offset
0 Hz $\pi/4$ DQPSK/Hop

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

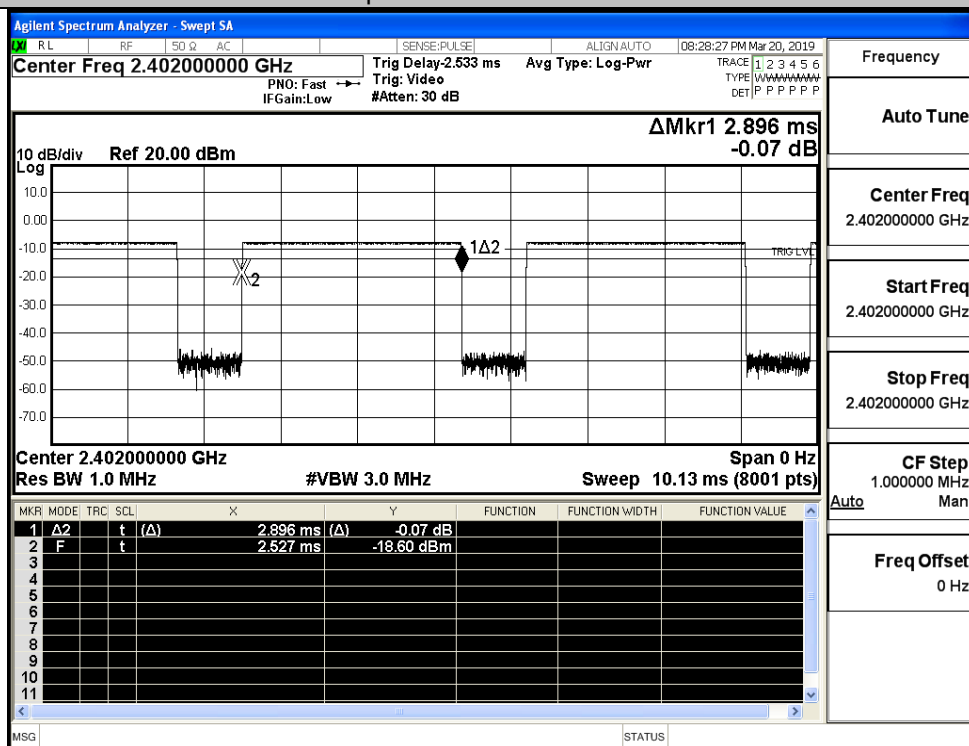


A.5 Dwell Time

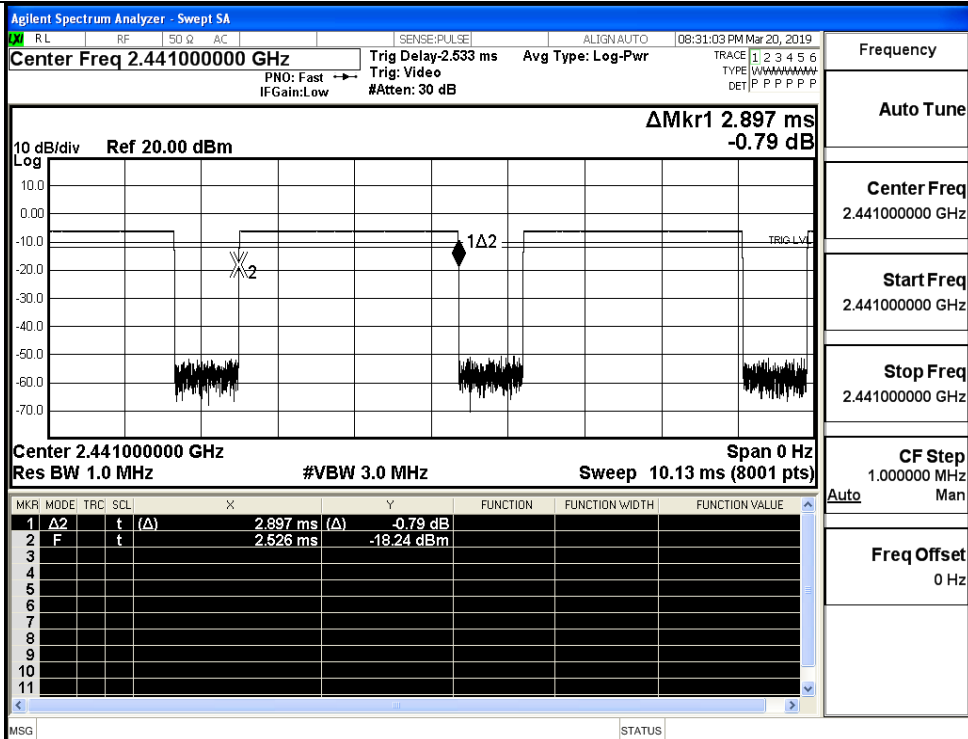
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7	0.309	0.4	PASS
8DPSK	3DH5	LCH	2.9	106.7	0.309	0.4	PASS
	3DH5	MCH	2.9	106.7	0.310	0.4	PASS
	3DH5	HCH	2.9	106.7	0.309	0.4	PASS

Test Graphs

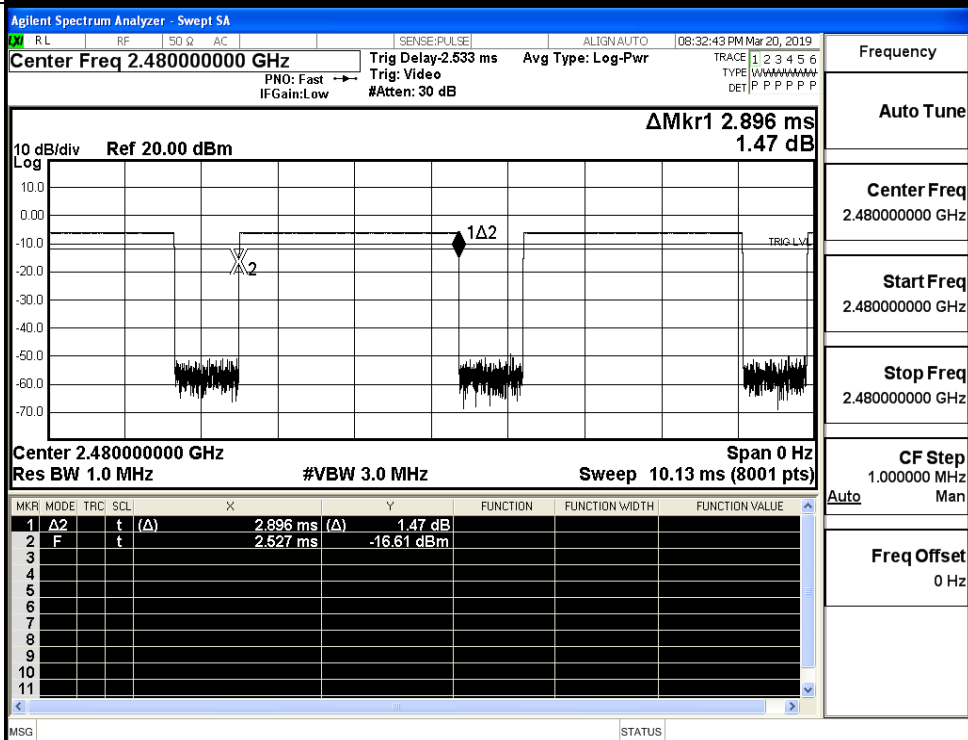
GFSK_DH5/LCH



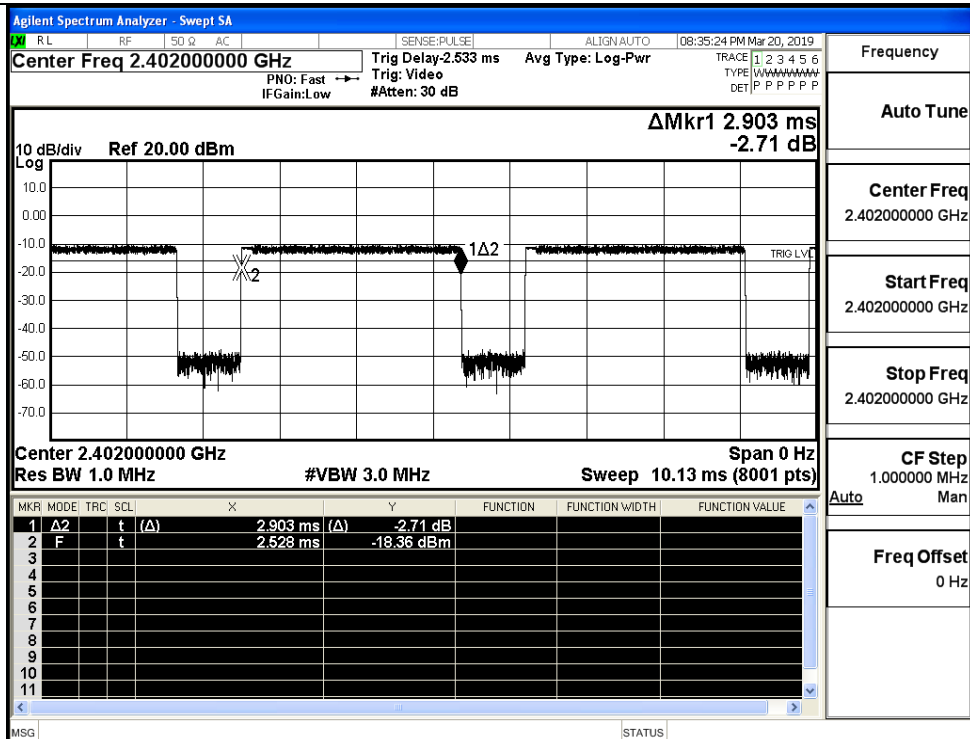
GFSK_DH5/MCH



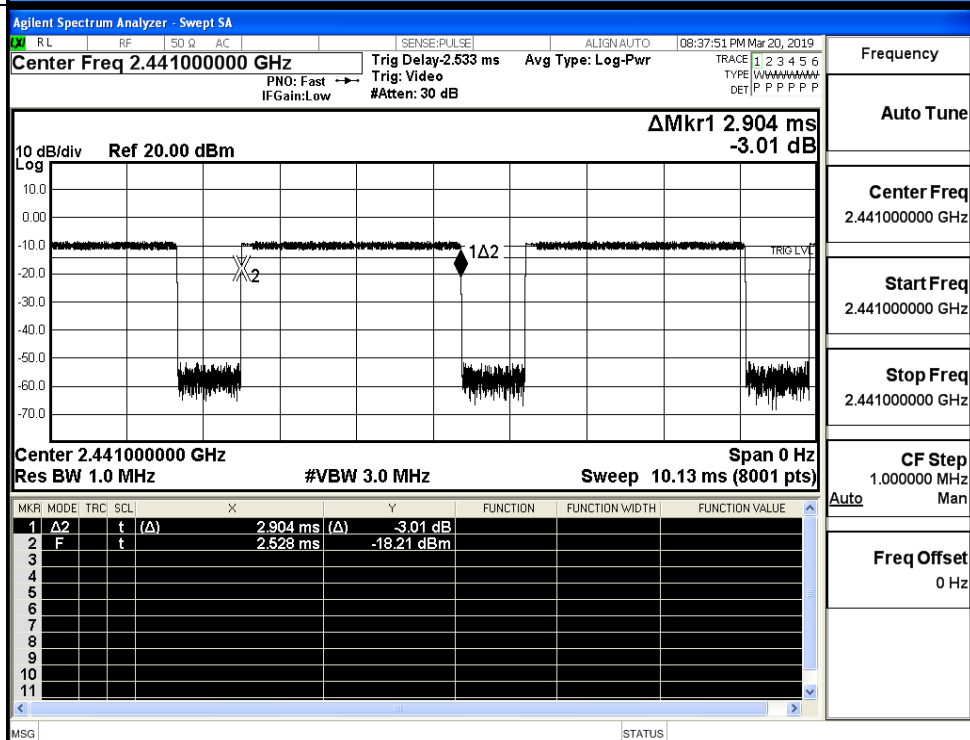
GFSK_DH5/HCH



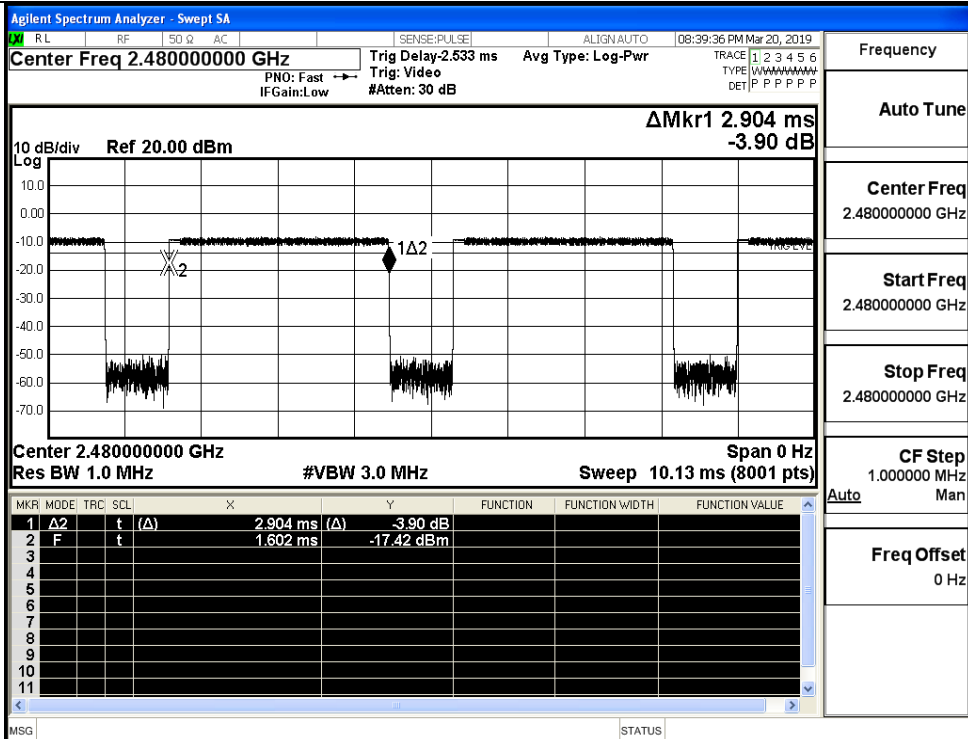
$\pi/4$ DQPSK
_2DH5/LCH



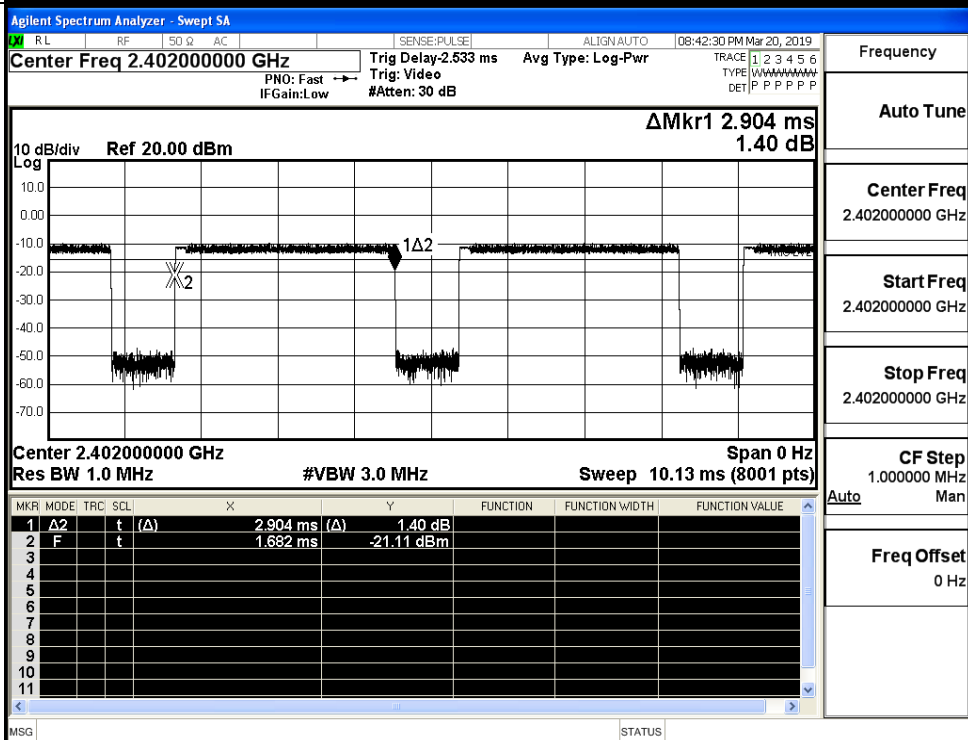
$\pi/4$ DQPSK
_2DH5/MCH



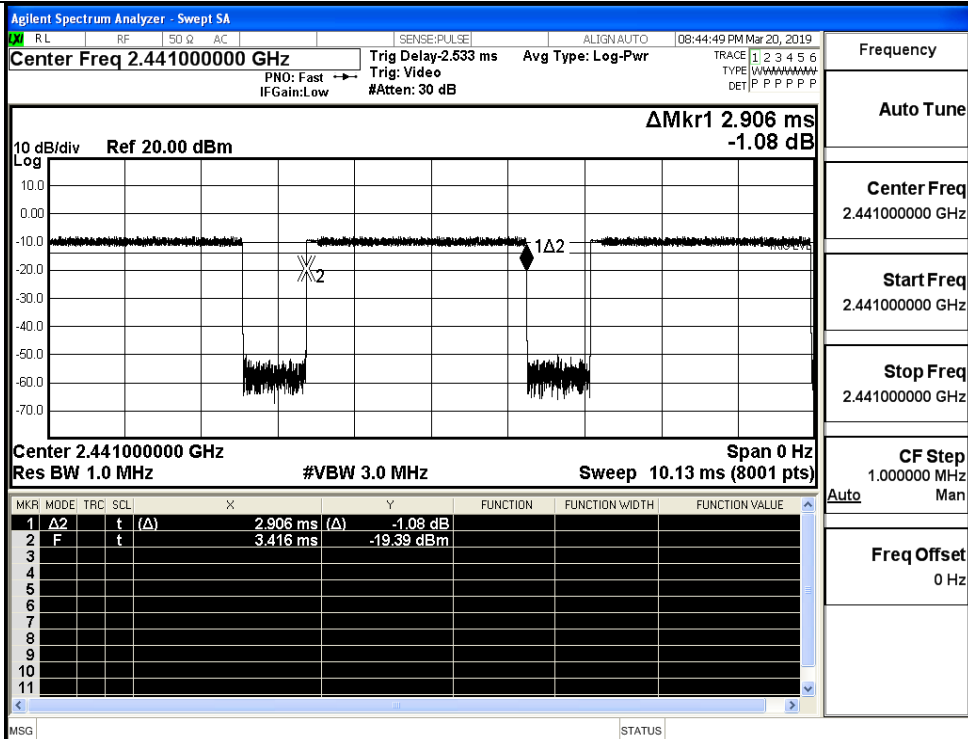
$\pi/4$ DQPSK
_2DH5/HCH



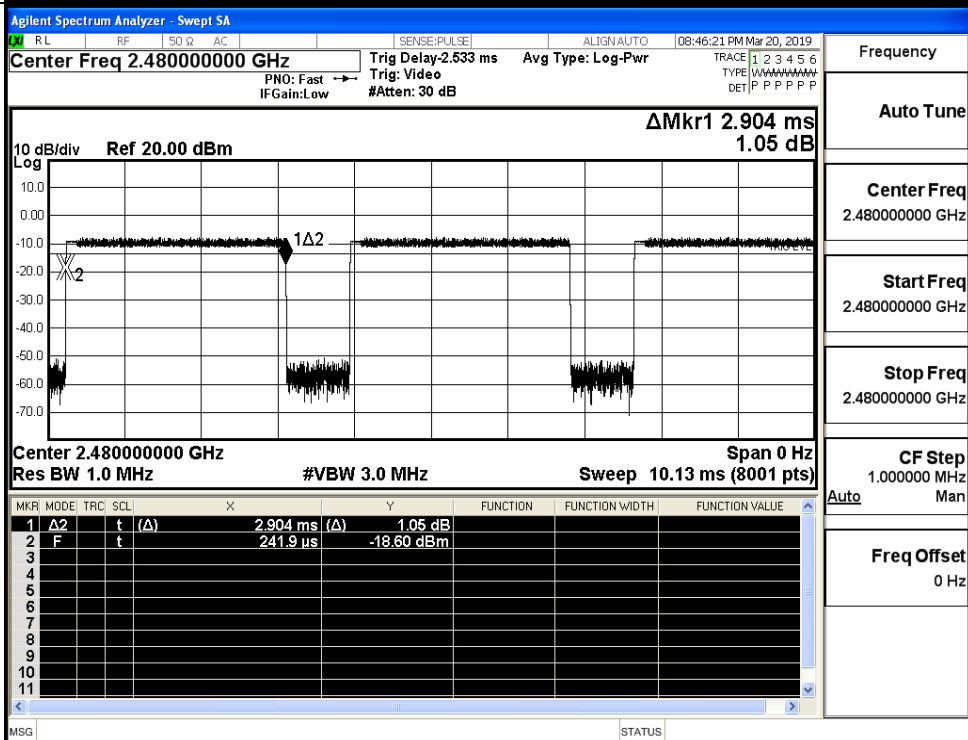
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

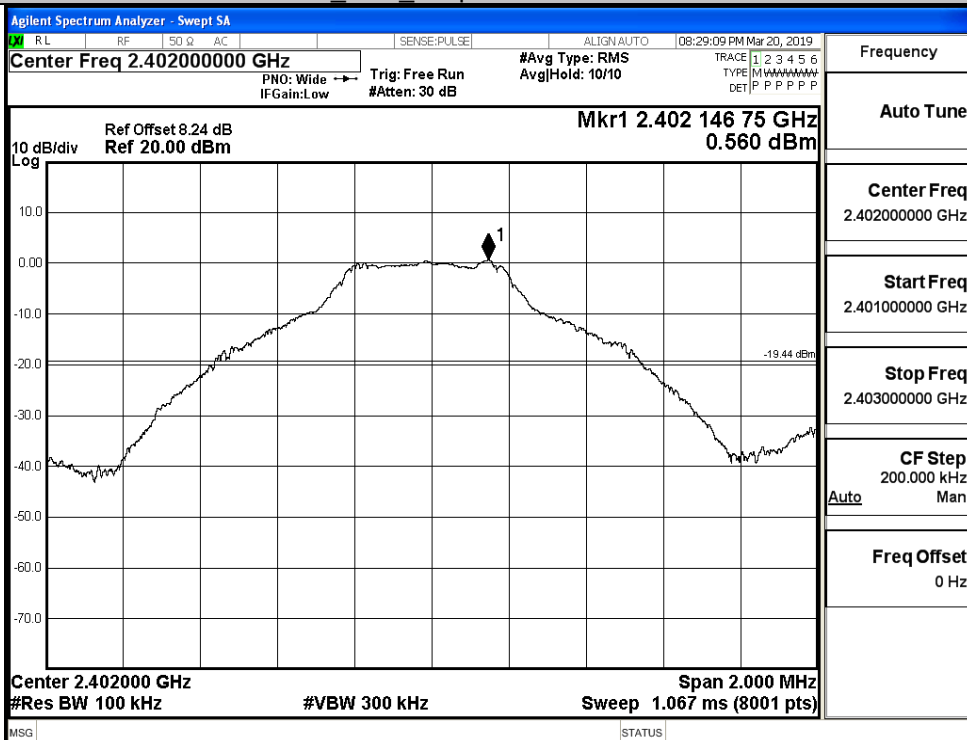


A.6 RF Conducted Spurious Emissions

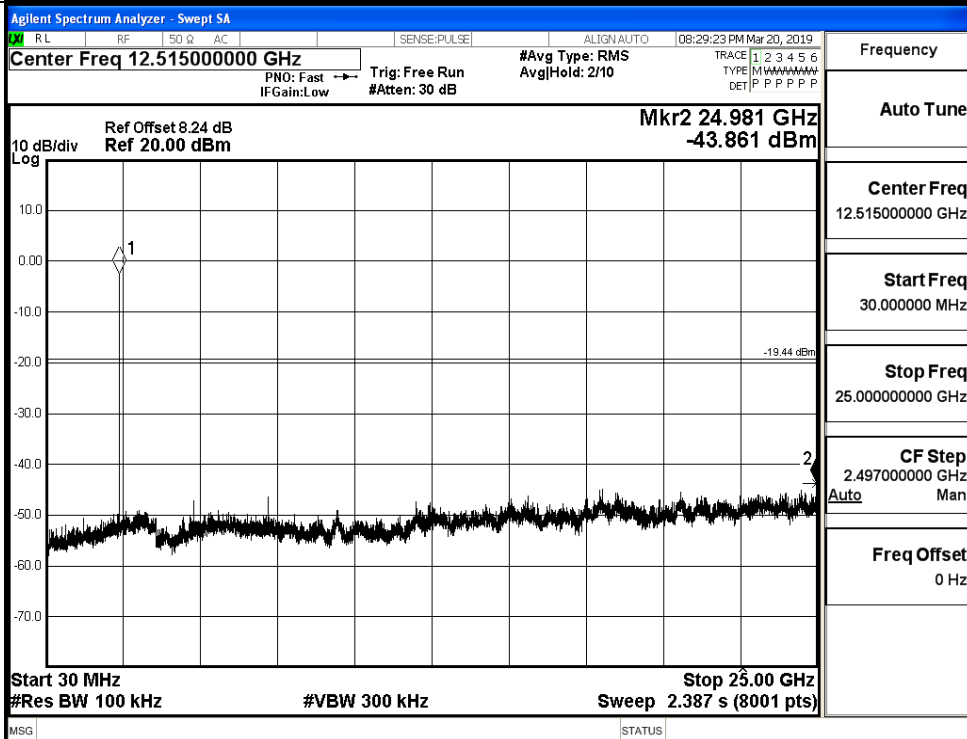
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.56	-43.861	-19.440	PASS
	MCH	1.921	-44.236	-18.079	PASS
	HCH	2.208	-40.429	-17.792	PASS
$\pi/4$ DQPSK	LCH	-3.112	-43.736	-23.112	PASS
	MCH	-1.165	-44.253	-21.165	PASS
	HCH	-0.891	-44.894	-20.891	PASS
8DPSK	LCH	-2.937	-44.404	-22.937	PASS
	MCH	-1.101	-45.030	-21.101	PASS
	HCH	-0.89	-44.441	-20.890	PASS

GFSK LCH Graphs

Pref

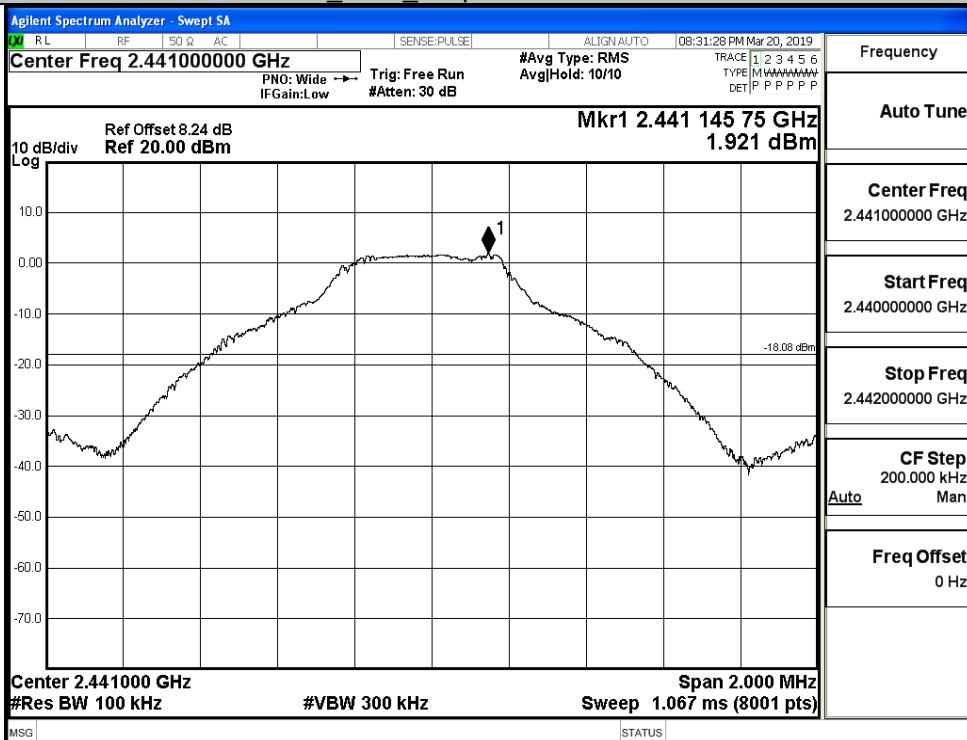


Puw

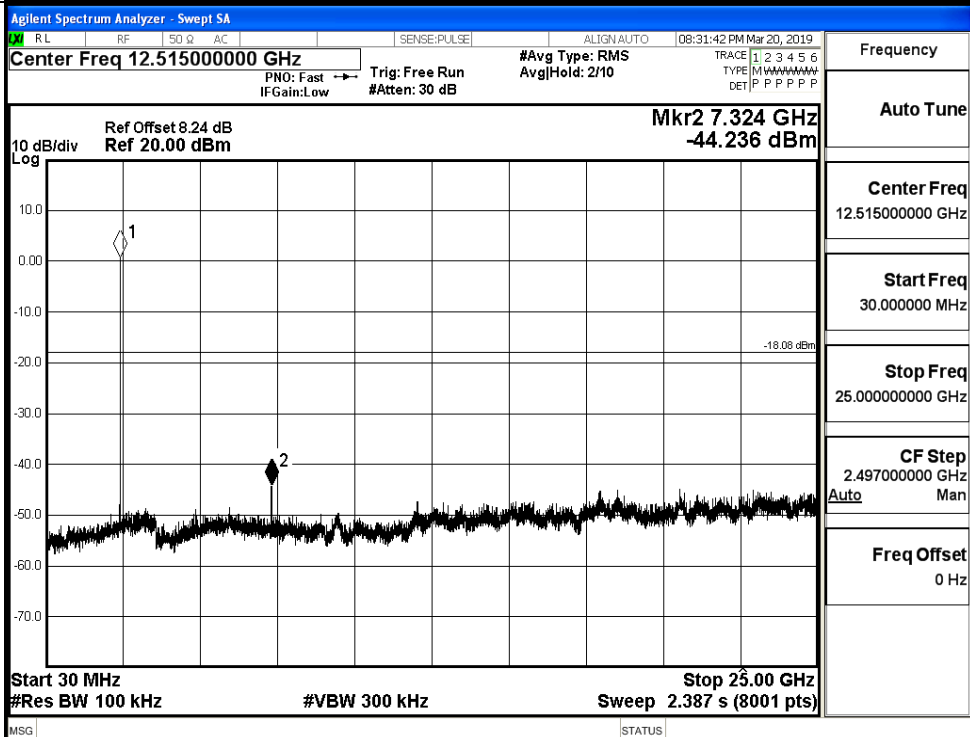


GFSK_MCH_Graphs

Pref

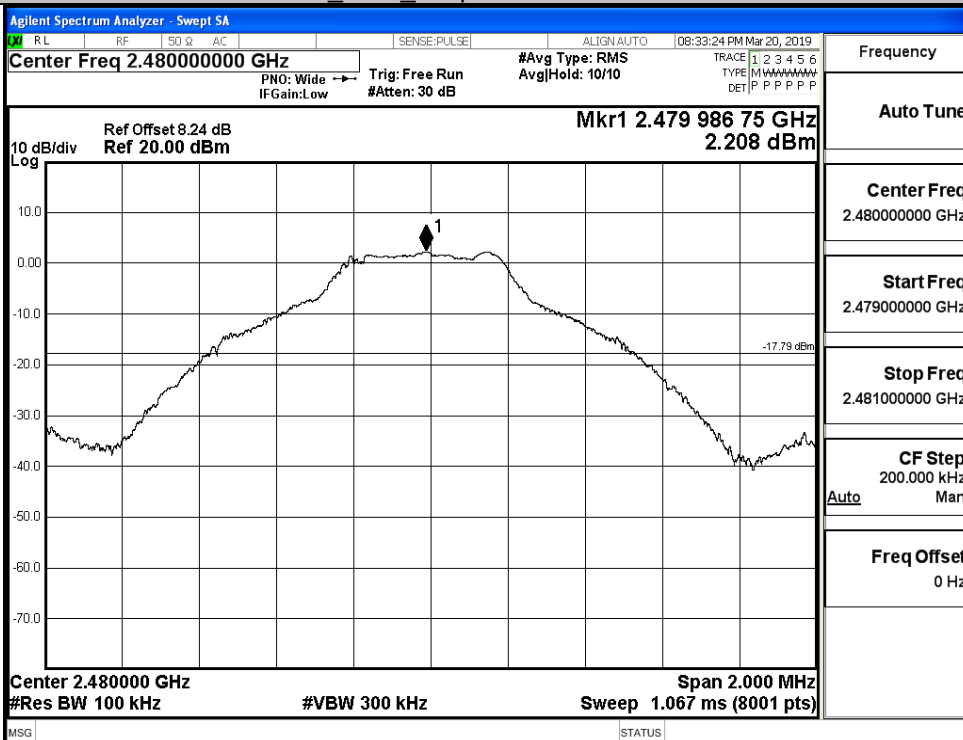


Puw

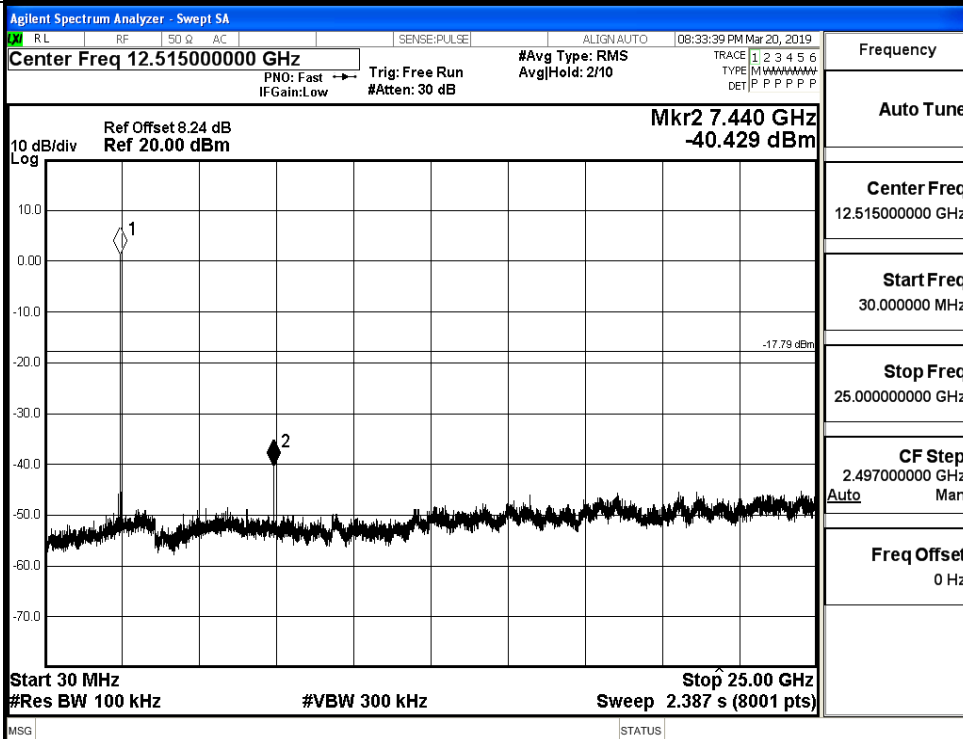


GFSK HCH Graphs

Pref

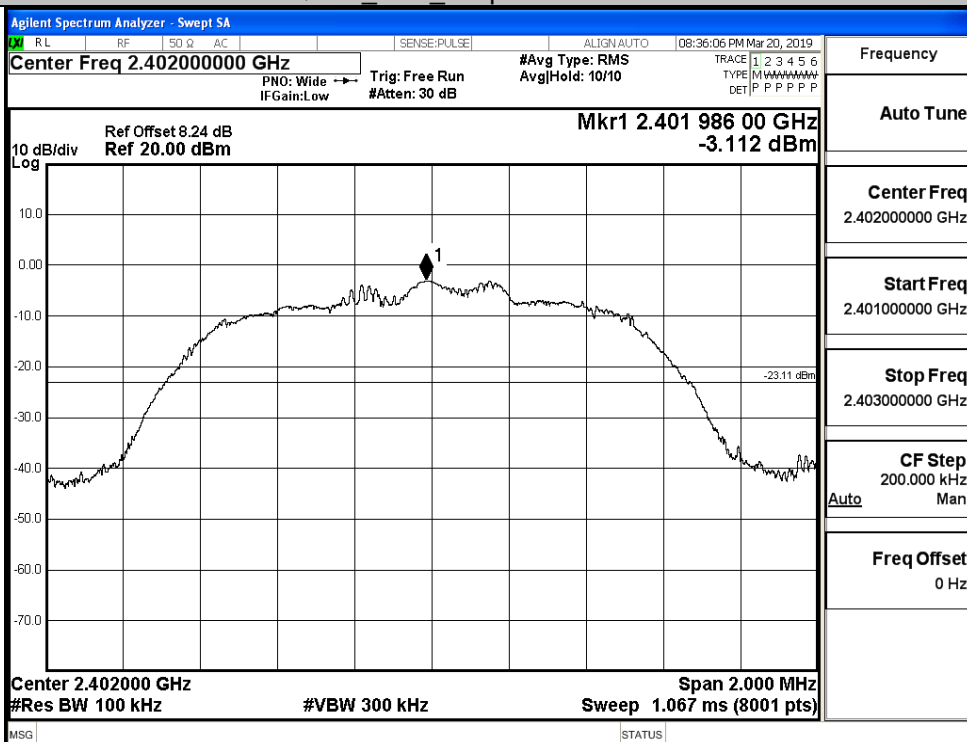


Puw

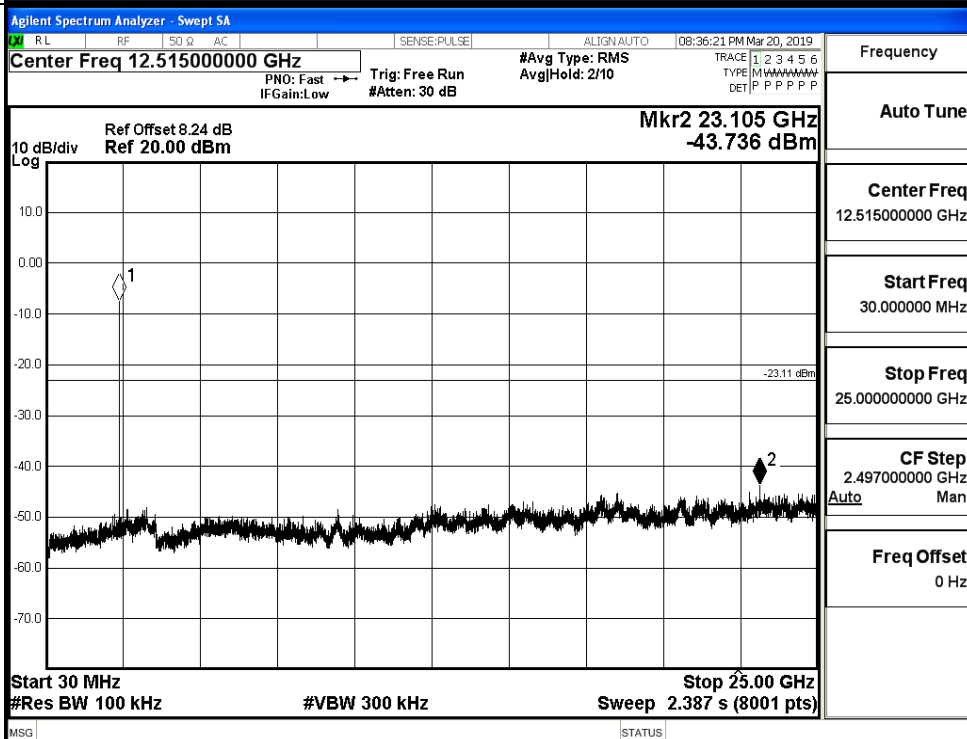


$\pi/4$ DQPSK LCH_Graphs

Pref

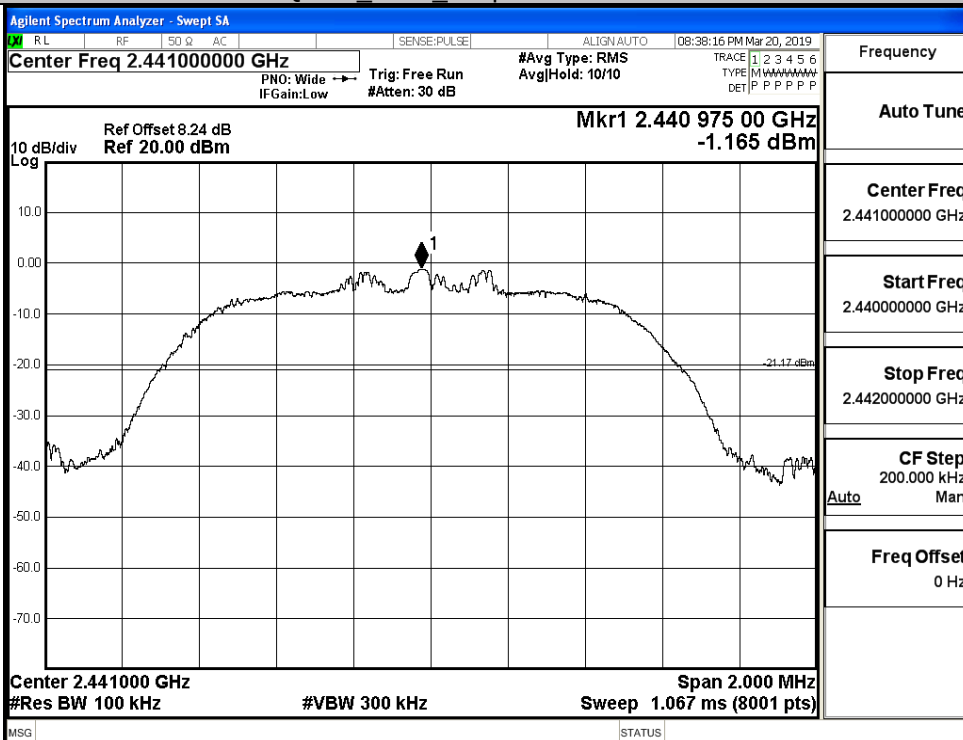


Puw

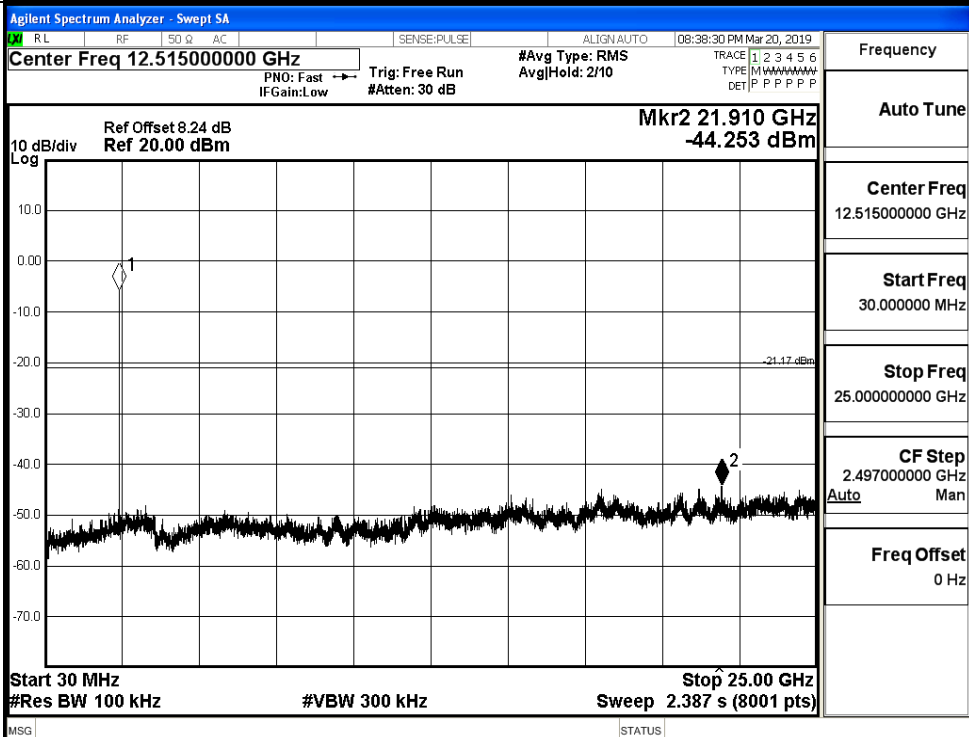


π /4DQPSK_MCH_Graphs

Pref

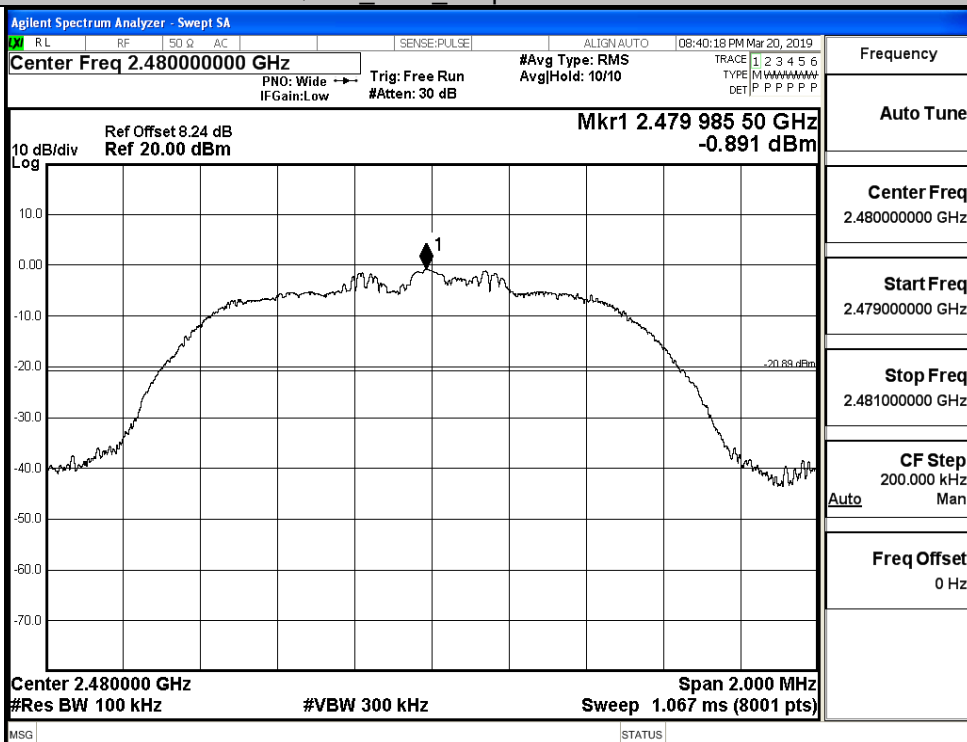


Puw

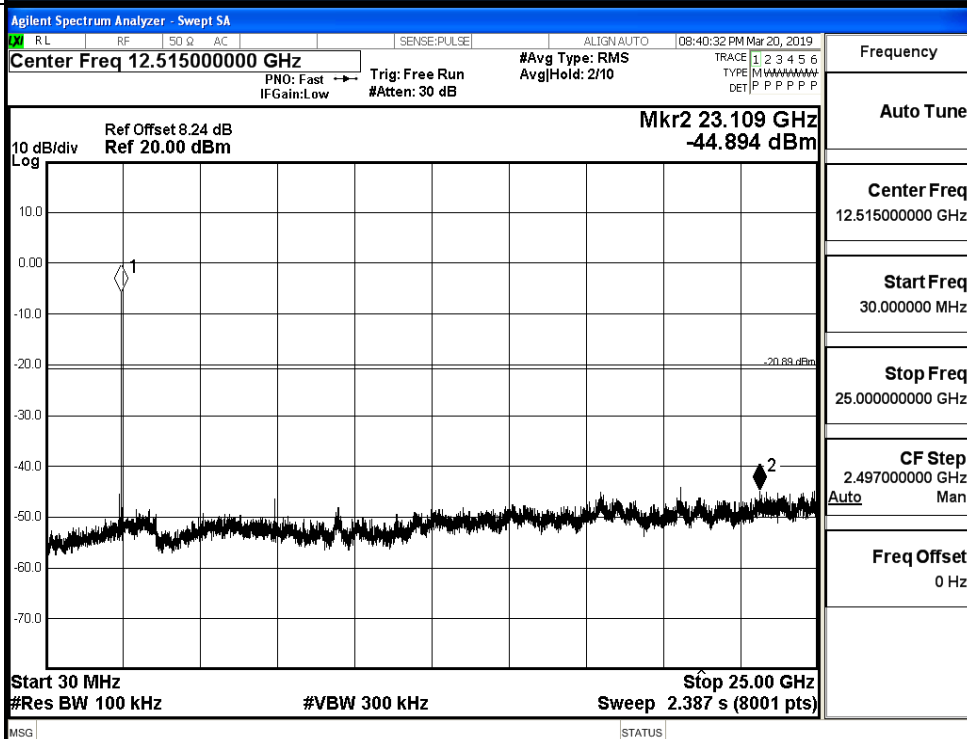


$\pi/4$ DQPSK_HCH_Graphs

Pref

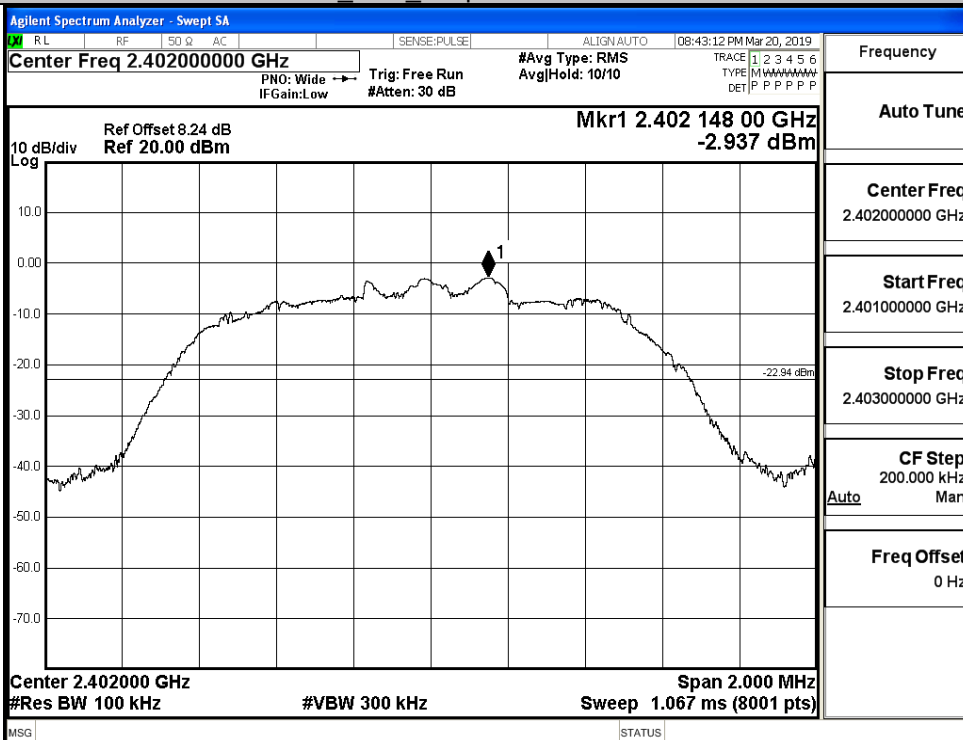


Puw

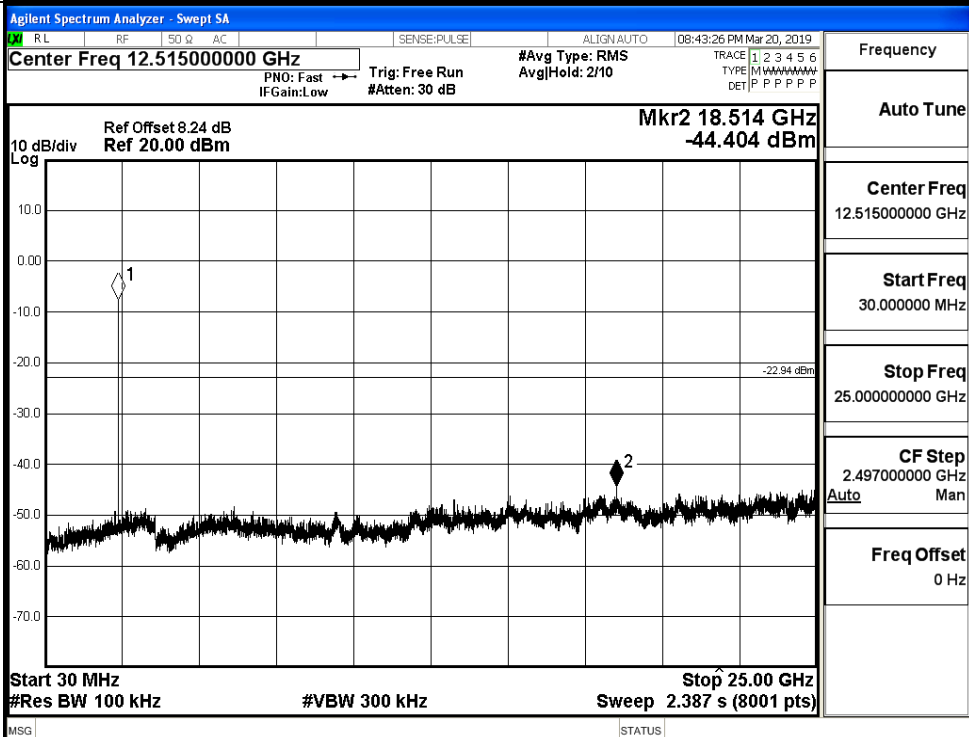


8DPSK_LCH_Graphs

Pref

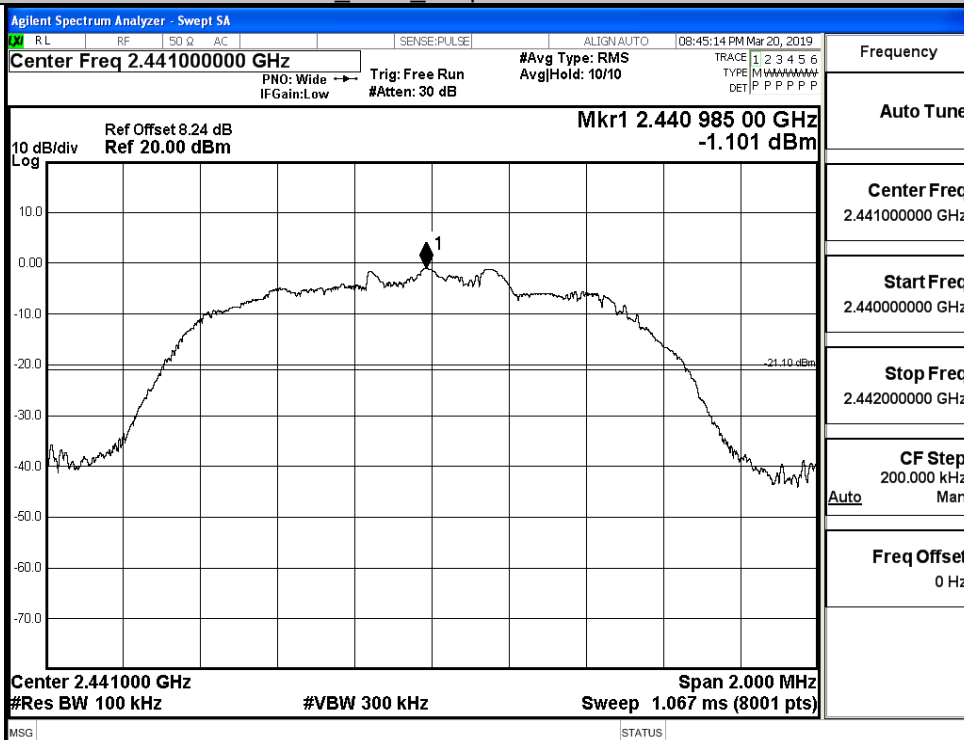


Puw

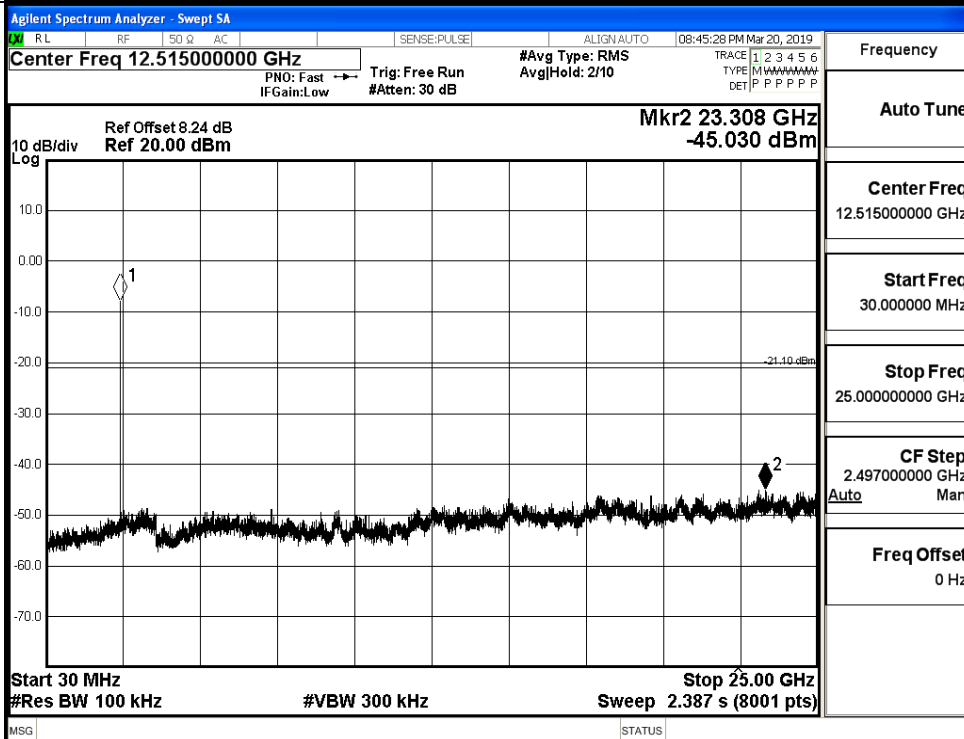


8DPSK_MCH_Graphs

Pref

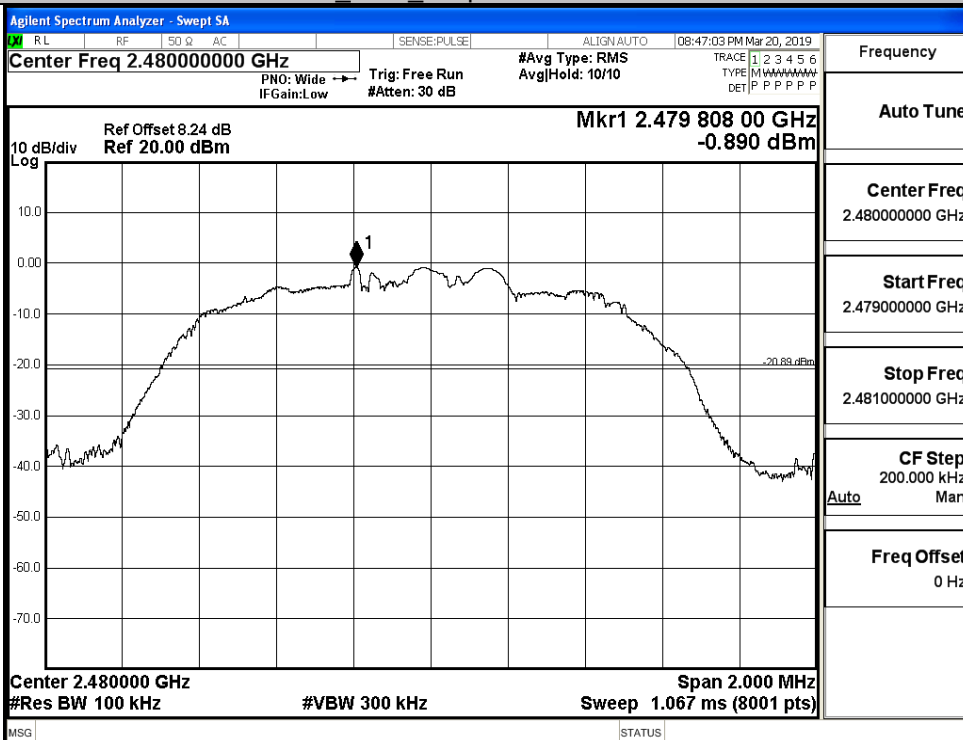


Puw

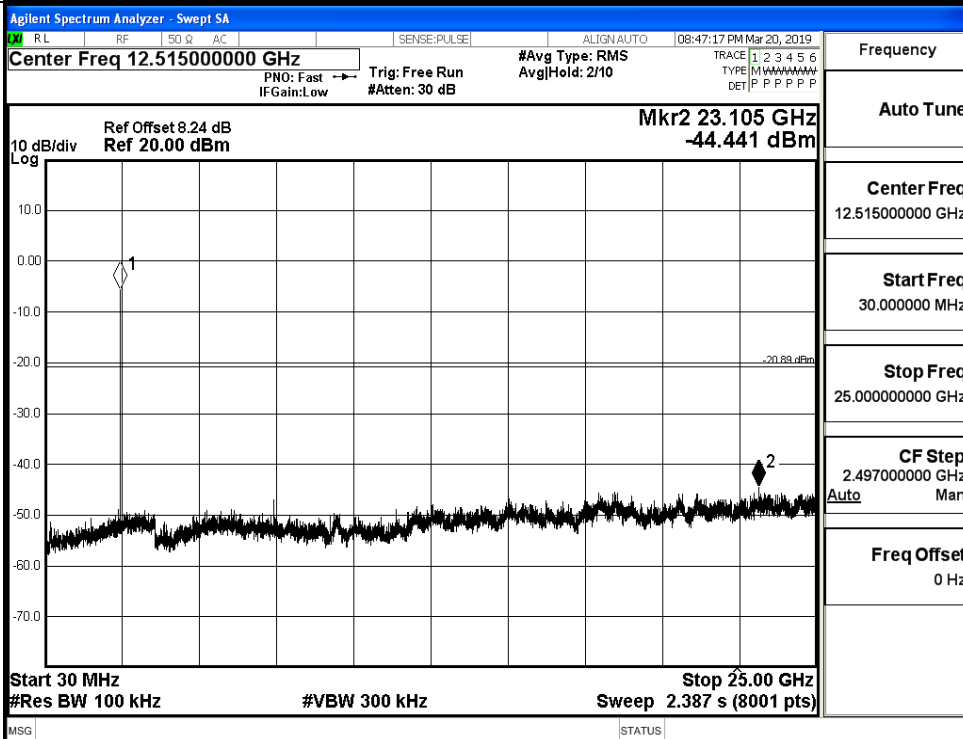


8DPSK_HCH_Graphs

Pref



Puw

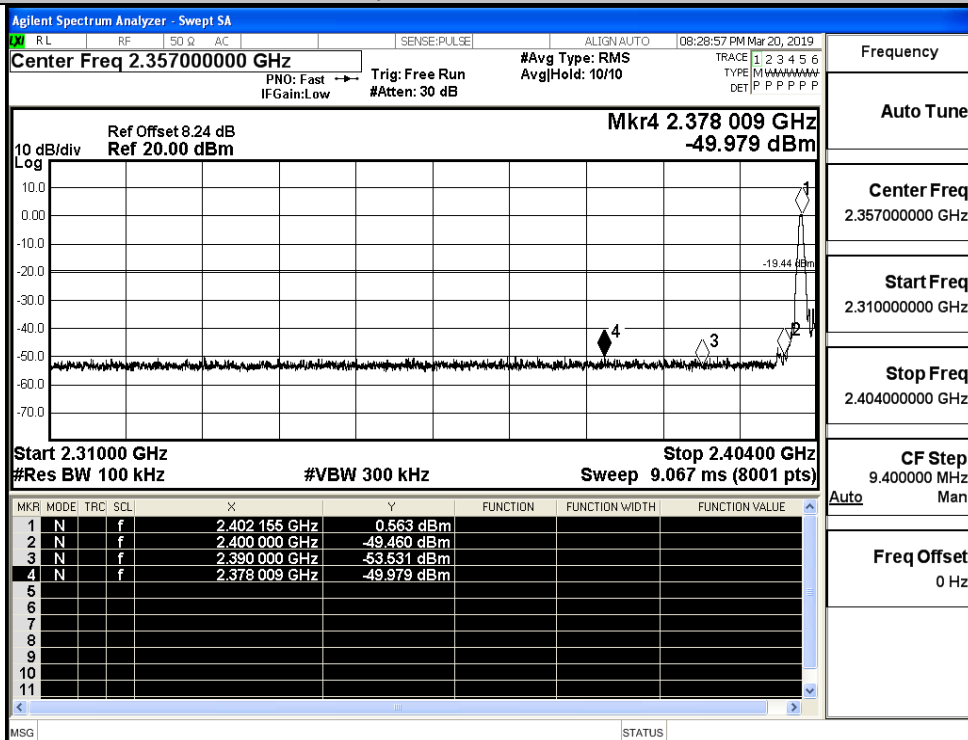


A.7 Band-edge for RF Conducted Emissions

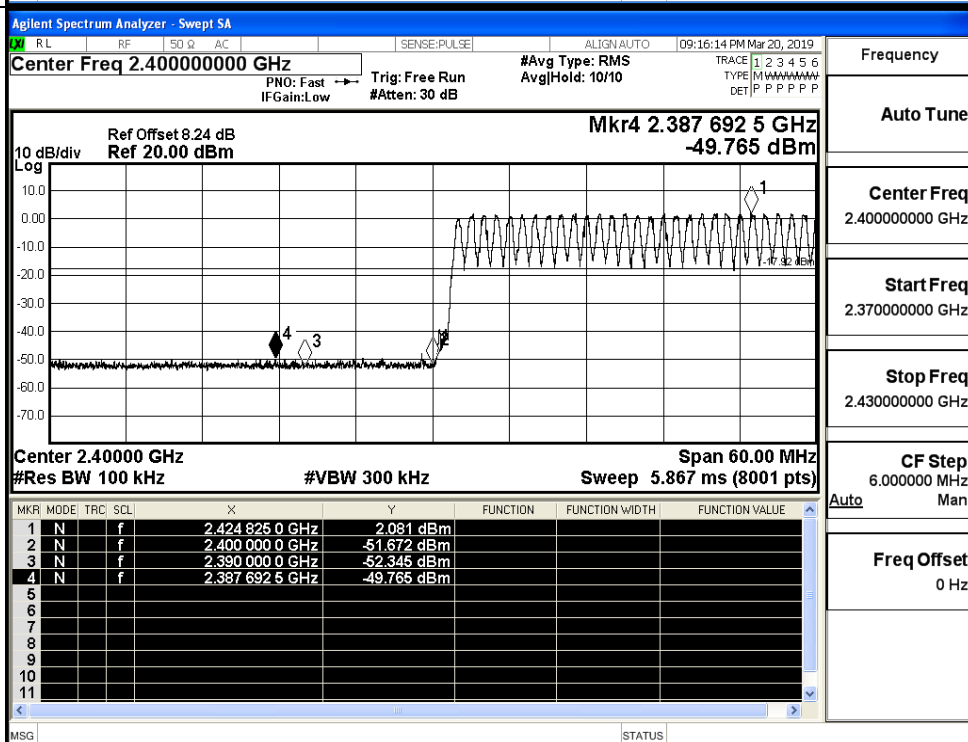
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.563	Off	-49.979	-19.44	PASS
			2.081	On	-49.765	-17.92	PASS
	HCH	2480	2.269	Off	-49.452	-17.73	PASS
			2.190	On	-49.104	-17.81	PASS
$\pi/4$ DQPSK	LCH	2402	-4.669	Off	-49.916	-24.67	PASS
			-1.335	On	-49.351	-21.34	PASS
	HCH	2480	-0.804	Off	-49.534	-20.8	PASS
			-0.857	On	-48.958	-20.86	PASS
8DPSK	LCH	2402	-3.007	Off	-49.505	-23.01	PASS
			-1.268	On	-49.026	-21.27	PASS
	HCH	2480	-0.731	Off	-49.199	-20.73	PASS
			-0.922	On	-49.313	-20.92	PASS

Test Graphs

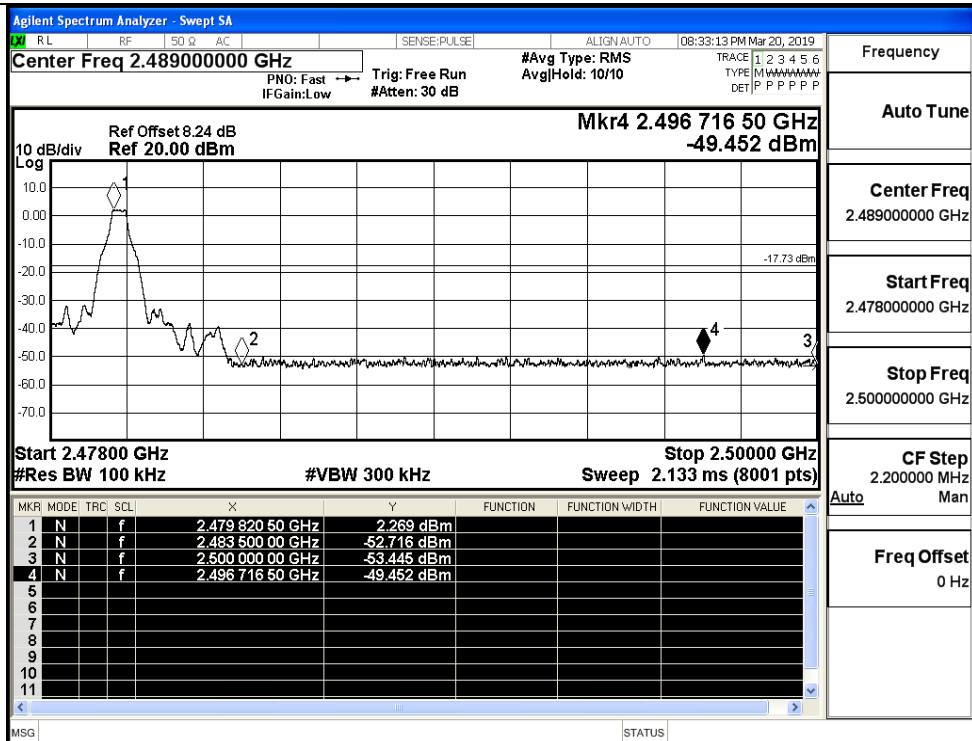
GFSK/LCH/No Hop



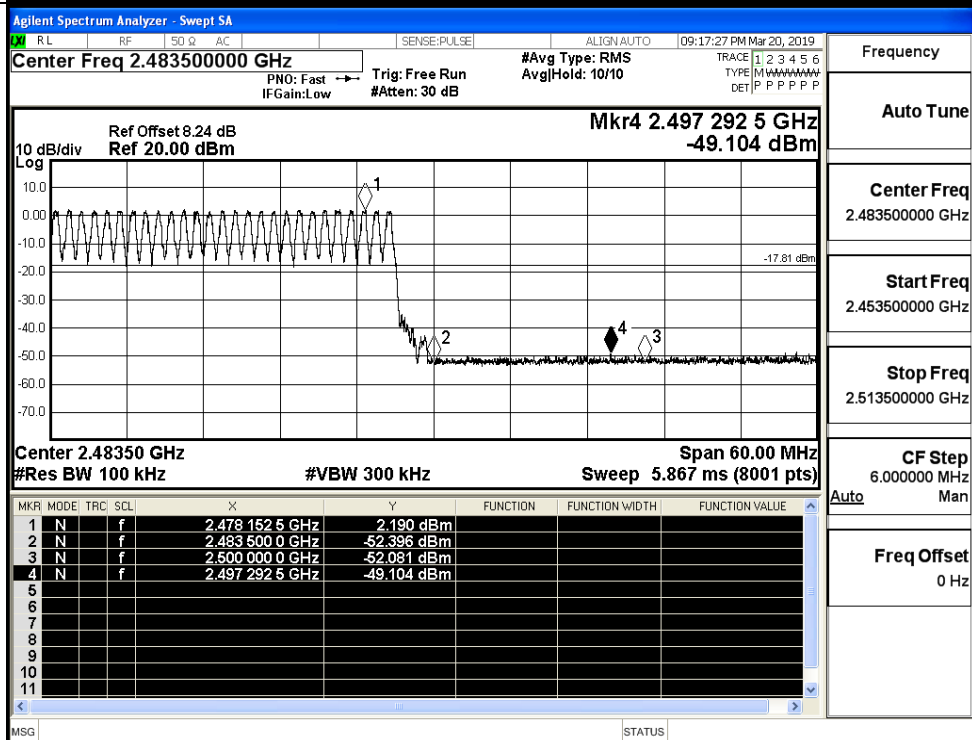
GFSK/LCH/Hop



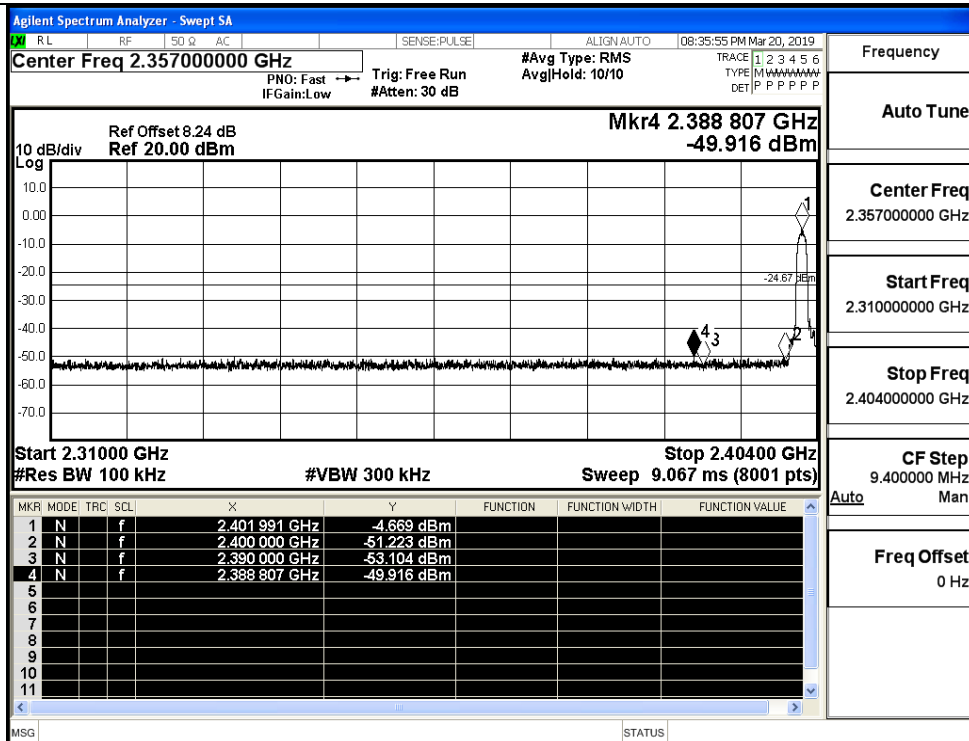
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

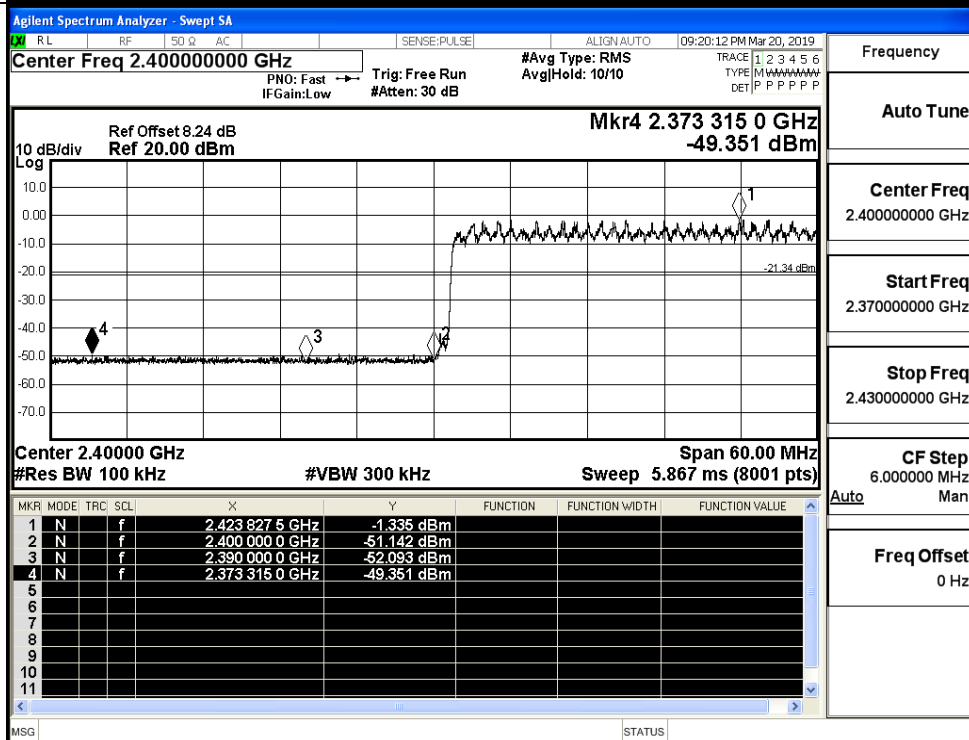
Start Freq
2.310000000 GHz

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

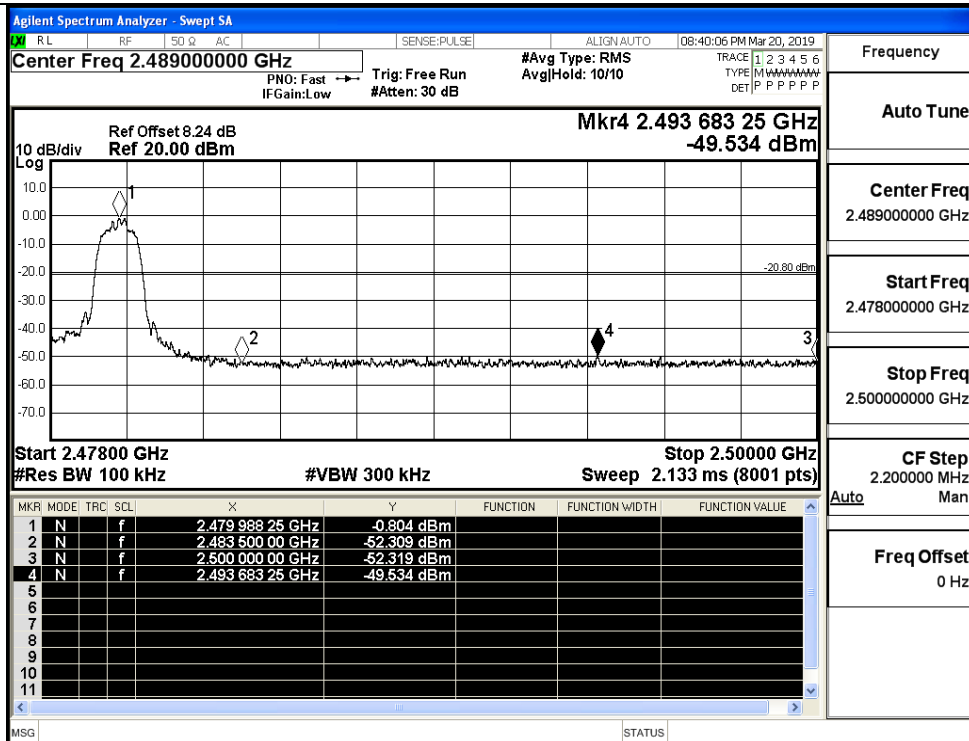
Start Freq
2.370000000 GHz

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

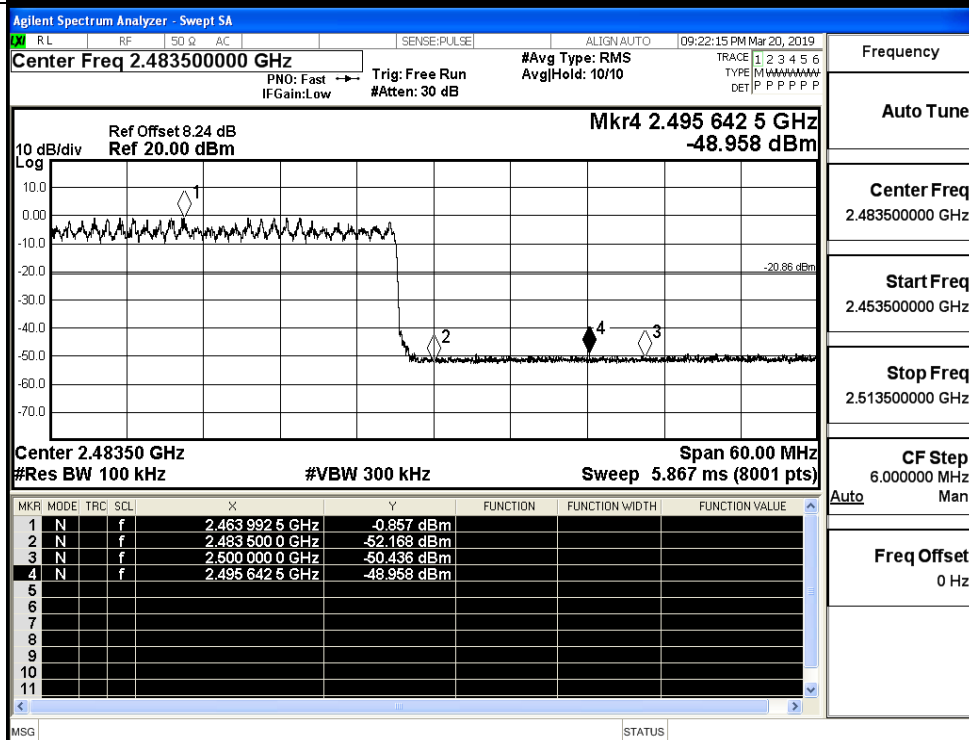
Start Freq
2.478000000 GHz

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

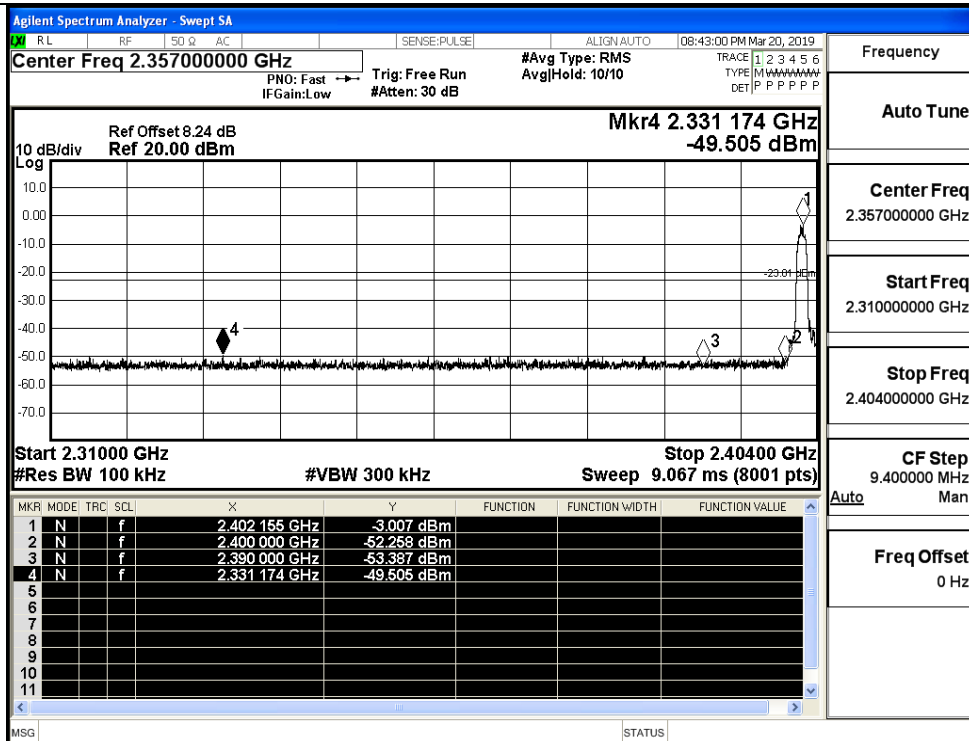
Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

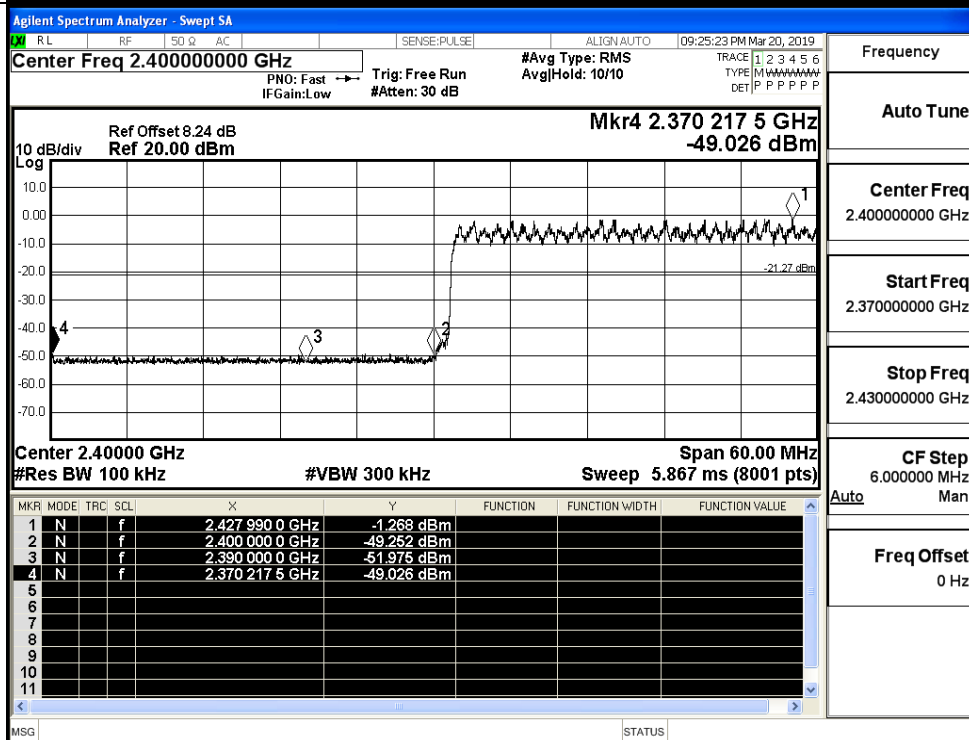
CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

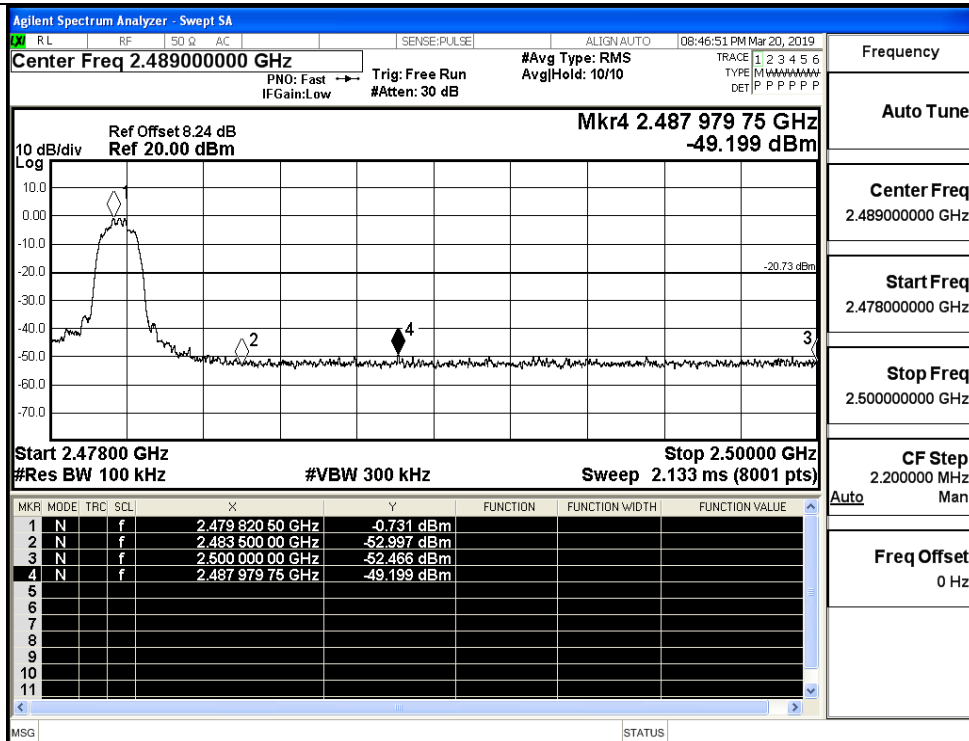
8DPSK/LCH/No Hop



8DPSK/LCH/Hop



8DPSK/HCH/No Hop

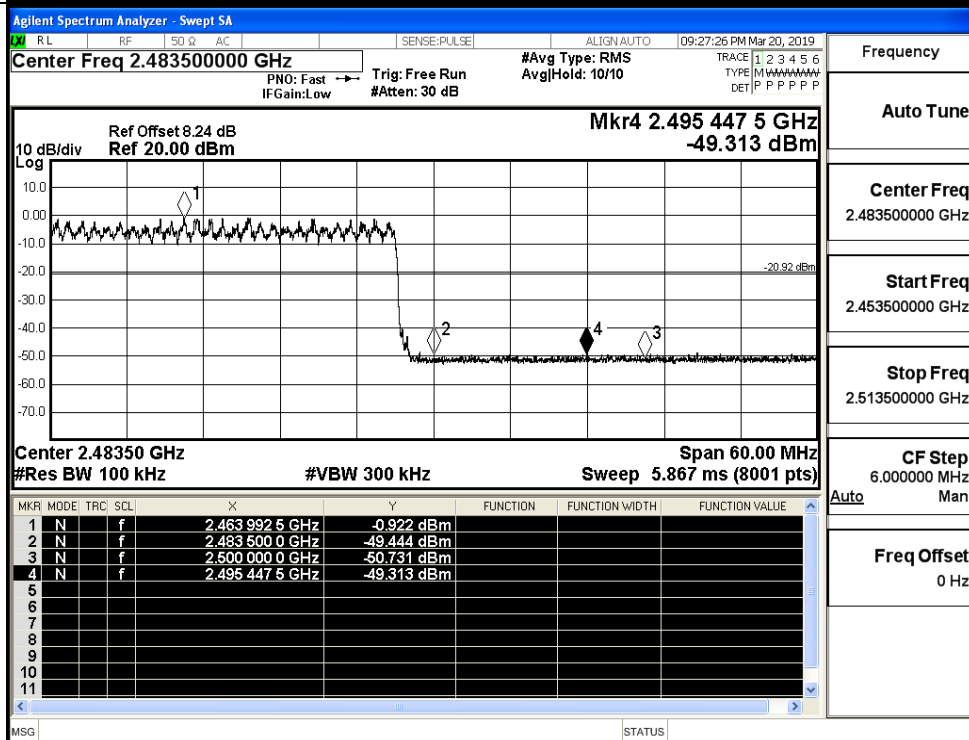


Frequency

Auto Tune

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

8DPSK/HCH/Hop



Frequency

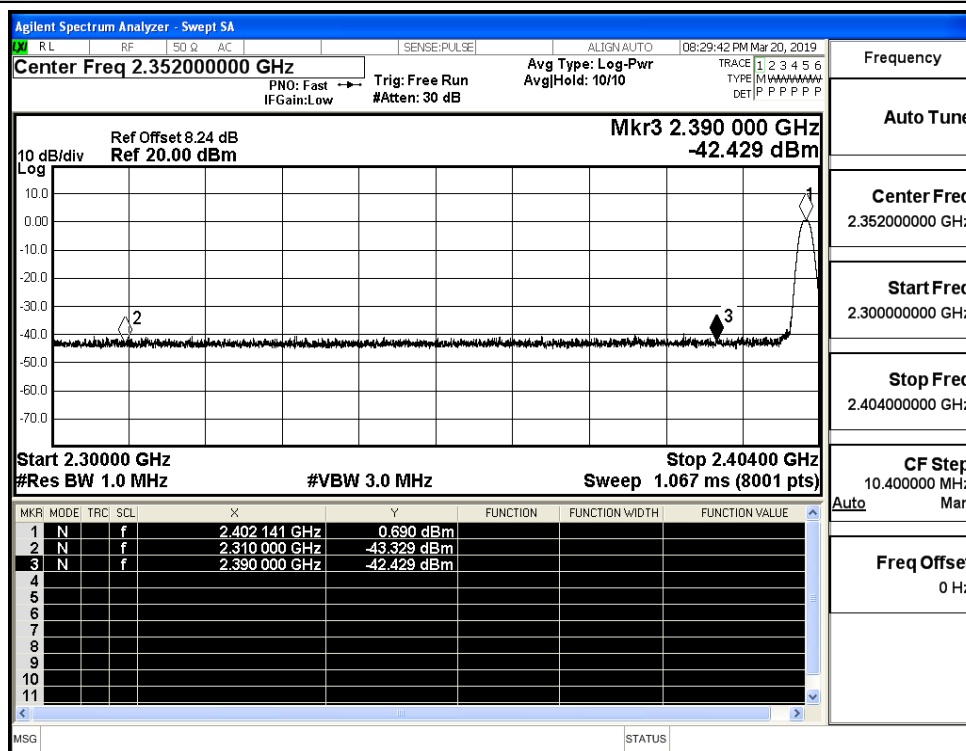
Auto Tune

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

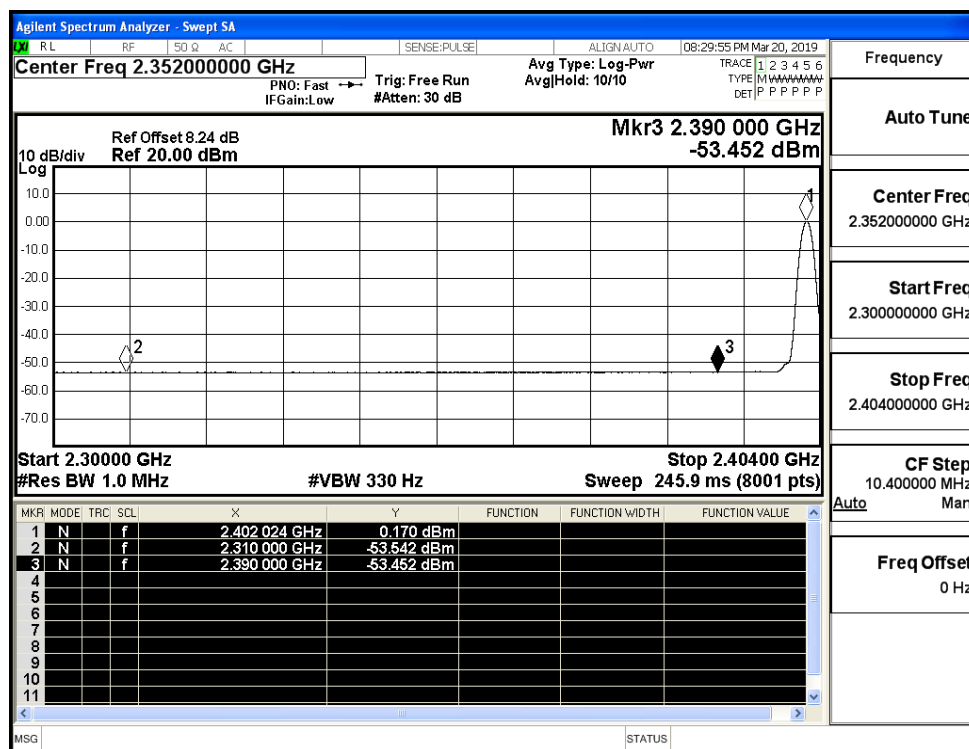
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.33	2.0	0	51.93	PEAK	74	PASS
	Off	2310.0	-53.54	2.0	0	41.72	AV	54	PASS
	Off	2390.0	-42.43	2.0	0	52.83	PEAK	74	PASS
	Off	2390.0	-53.45	2.0	0	41.81	AV	54	PASS
	Off	2483.5	-39.75	2.0	0	55.51	PEAK	74	PASS
	Off	2483.5	-49.64	2.0	0	45.61	AV	54	PASS
	Off	2500.0	-41.12	2.0	0	54.14	PEAK	74	PASS
	Off	2500.0	-52.85	2.0	0	42.41	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.06	2.0	0	52.20	PEAK	74	PASS
	Off	2310.0	-53.59	2.0	0	41.66	AV	54	PASS
	Off	2390.0	-41.09	2.0	0	54.17	PEAK	74	PASS
	Off	2390.0	-53.33	2.0	0	41.93	AV	54	PASS
	Off	2483.5	-42.90	2.0	0	52.36	PEAK	74	PASS
	Off	2483.5	-52.71	2.0	0	42.54	AV	54	PASS
	Off	2500.0	-43.46	2.0	0	51.80	PEAK	74	PASS
	Off	2500.0	-52.90	2.0	0	42.36	AV	54	PASS
8DPSK	Off	2310.0	-43.32	2.0	0	51.94	PEAK	74	PASS
	Off	2310.0	-53.53	2.0	0	41.73	AV	54	PASS
	Off	2390.0	-42.95	2.0	0	52.31	PEAK	74	PASS
	Off	2390.0	-53.30	2.0	0	41.96	AV	54	PASS
	Off	2483.5	-42.44	2.0	0	52.81	PEAK	74	PASS
	Off	2483.5	-52.65	2.0	0	42.61	AV	54	PASS
	Off	2500.0	-42.67	2.0	0	52.59	PEAK	74	PASS
	Off	2500.0	-52.87	2.0	0	42.39	AV	54	PASS

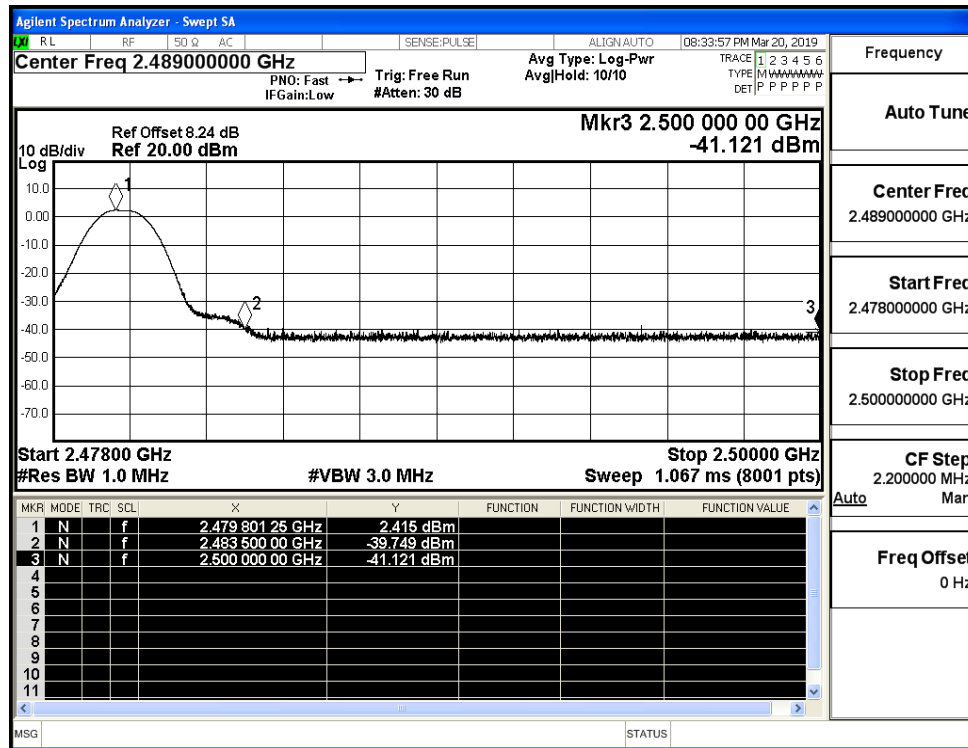
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



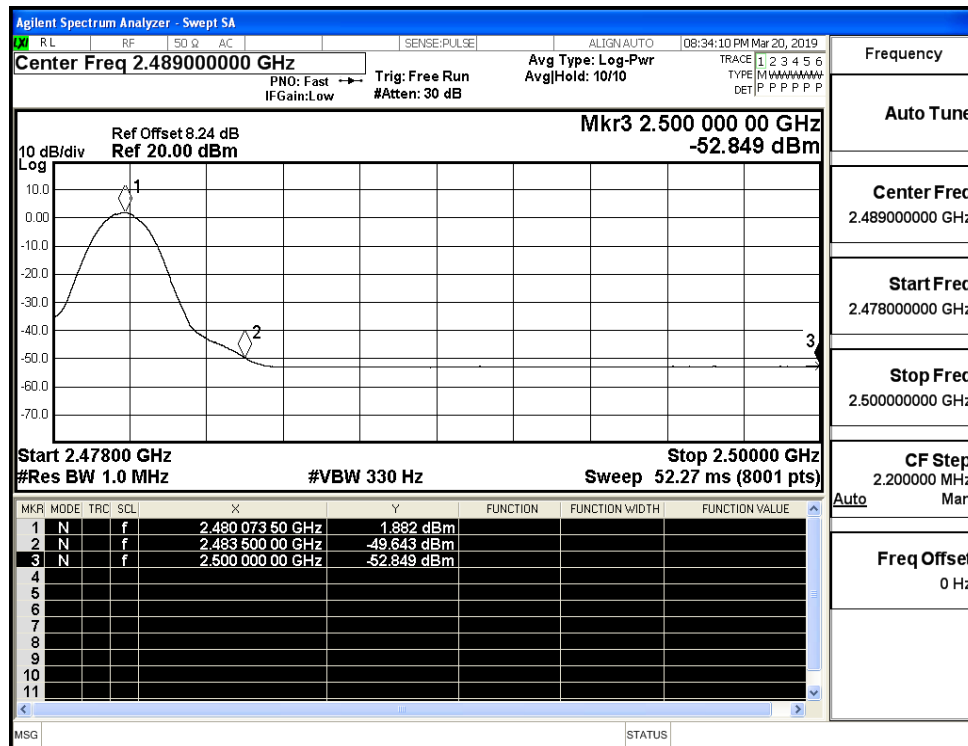
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

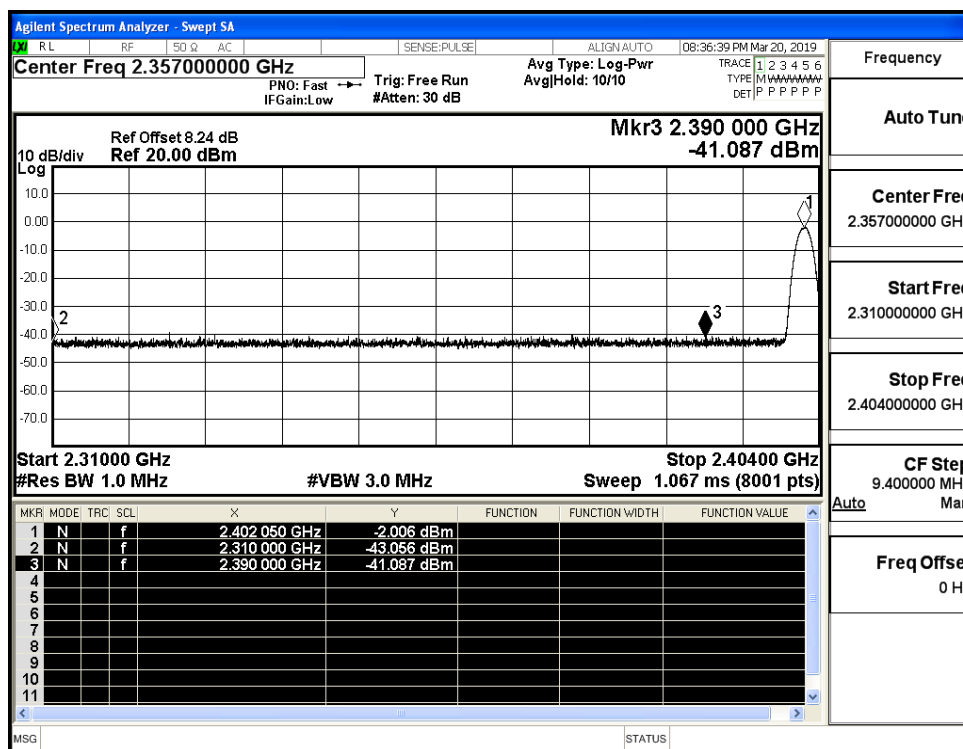
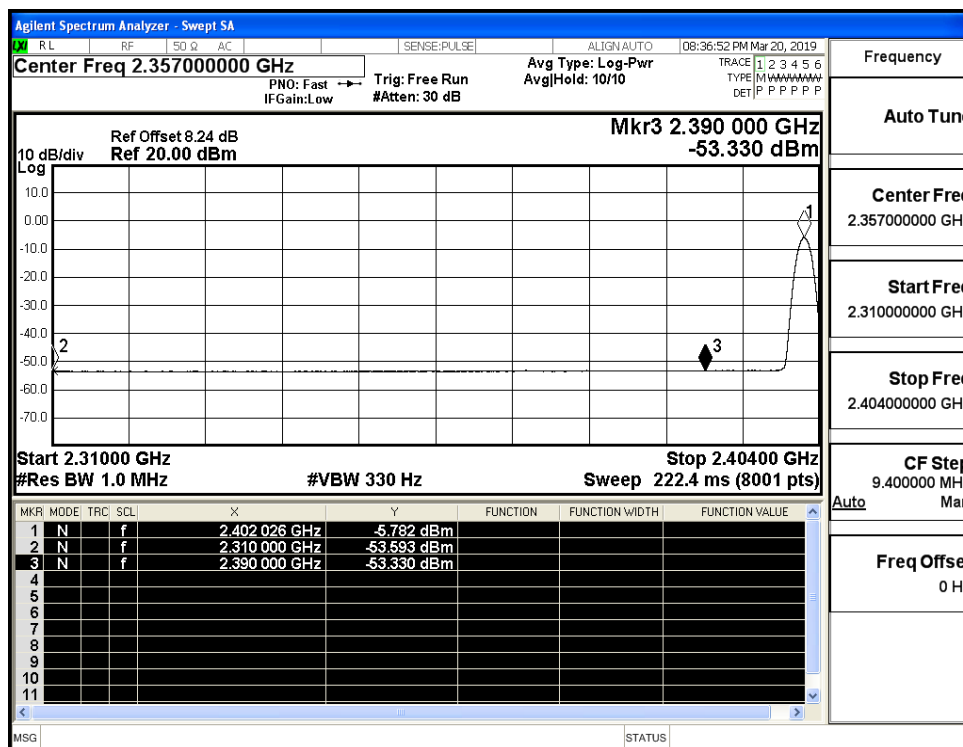


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

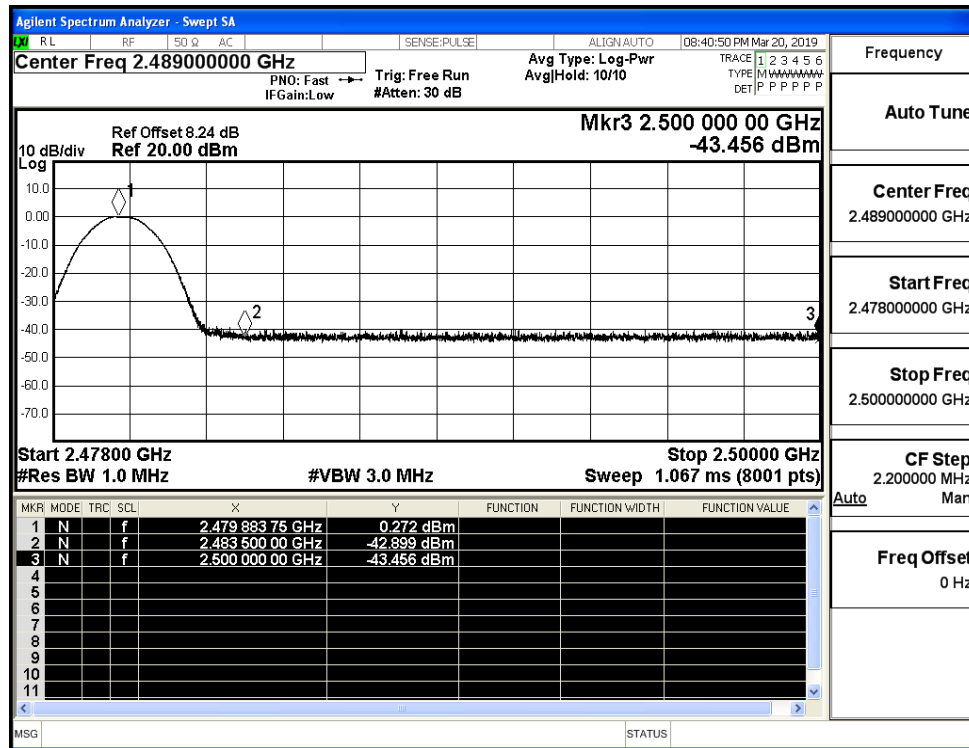


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

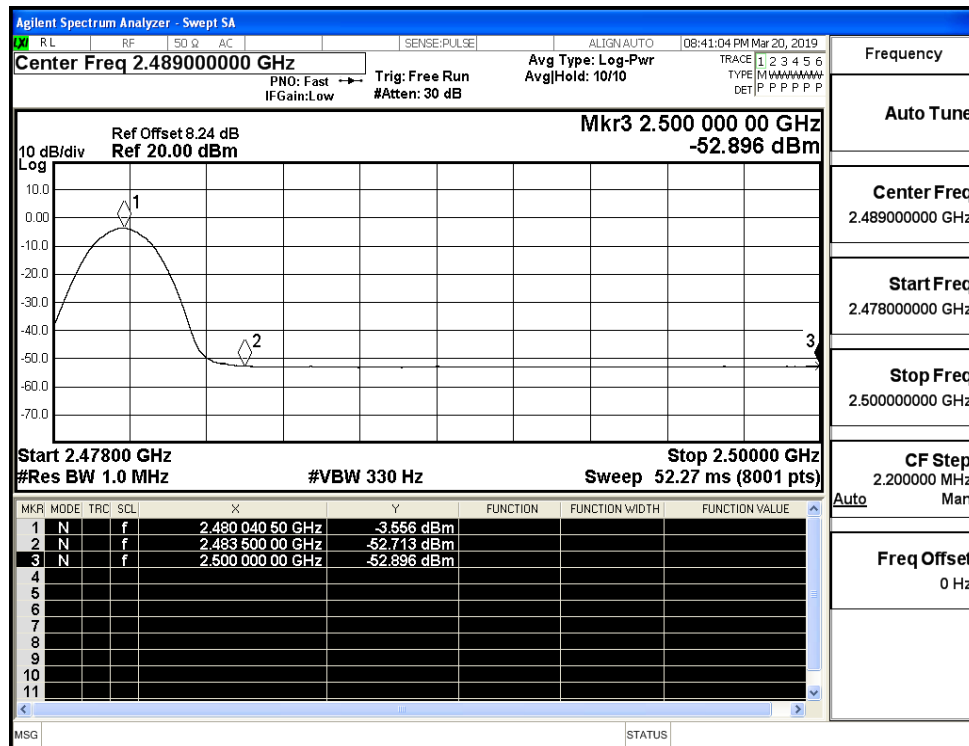


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

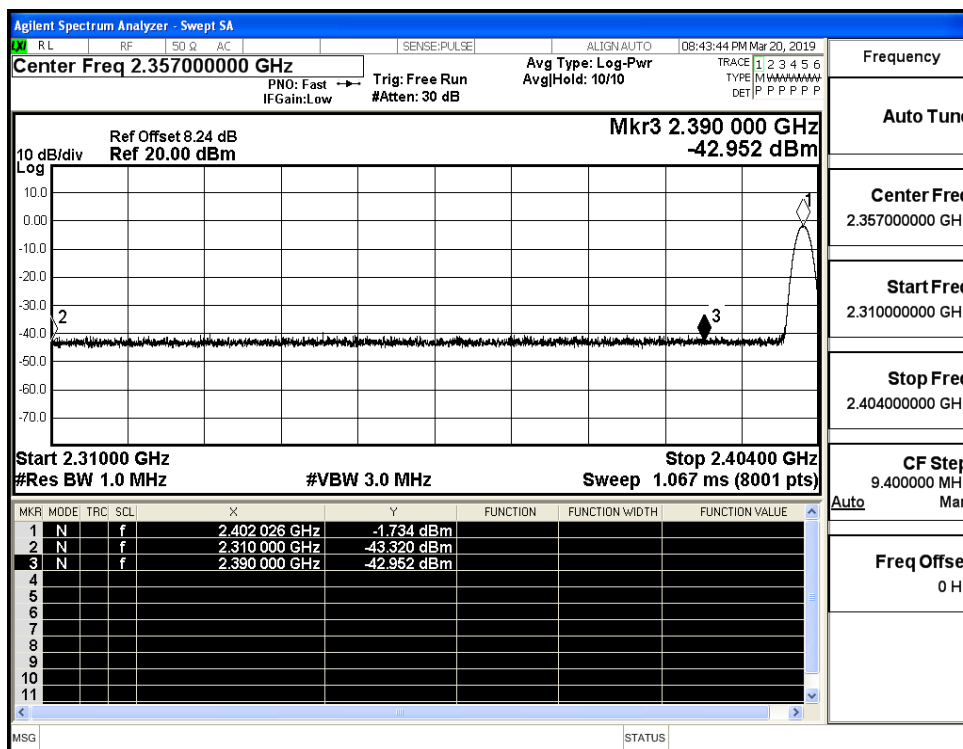
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



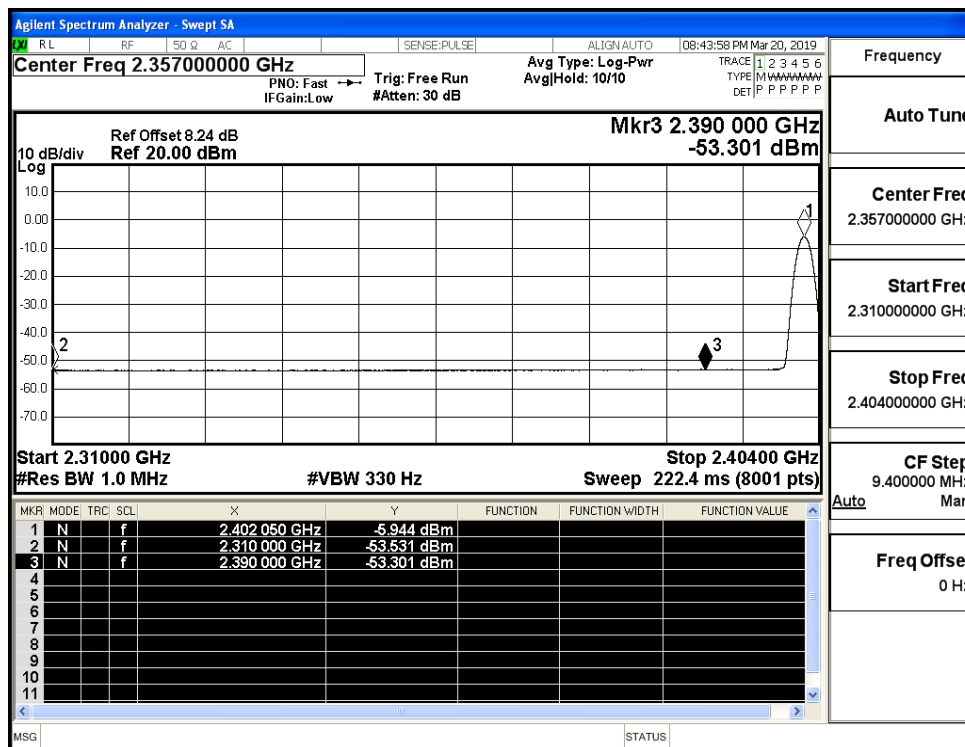
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



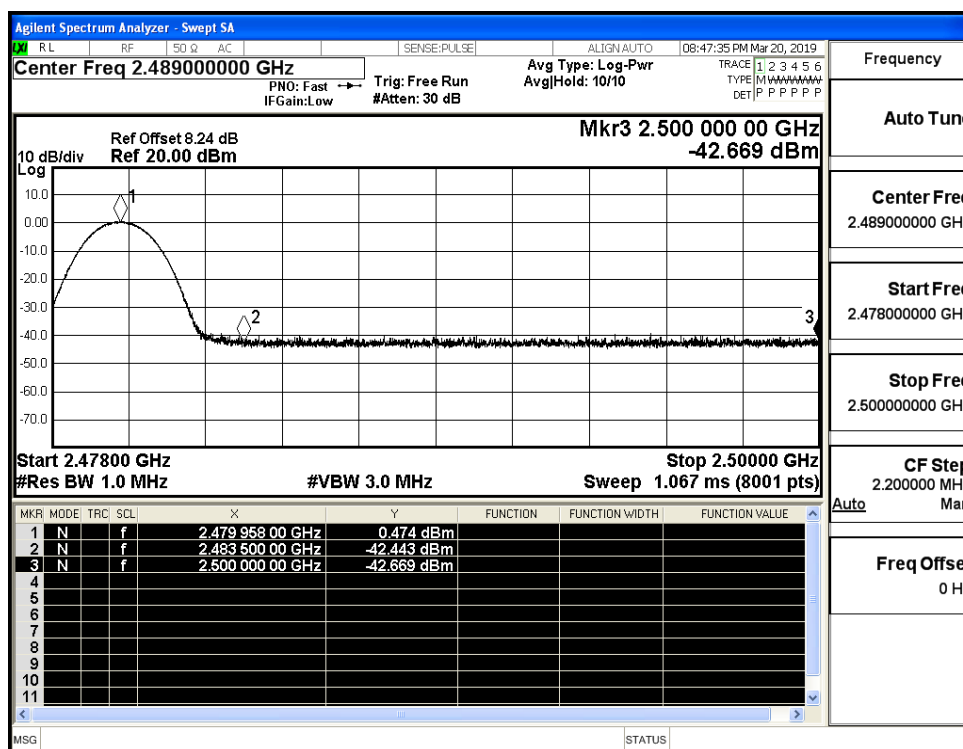
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

