Appendix A

RF Test Data for BT V4.2(BDR/EDR) (Conducted Measurement)

Product Name: Bluetooth Rechargeable Speaker

Trade Mark: iHome, iH

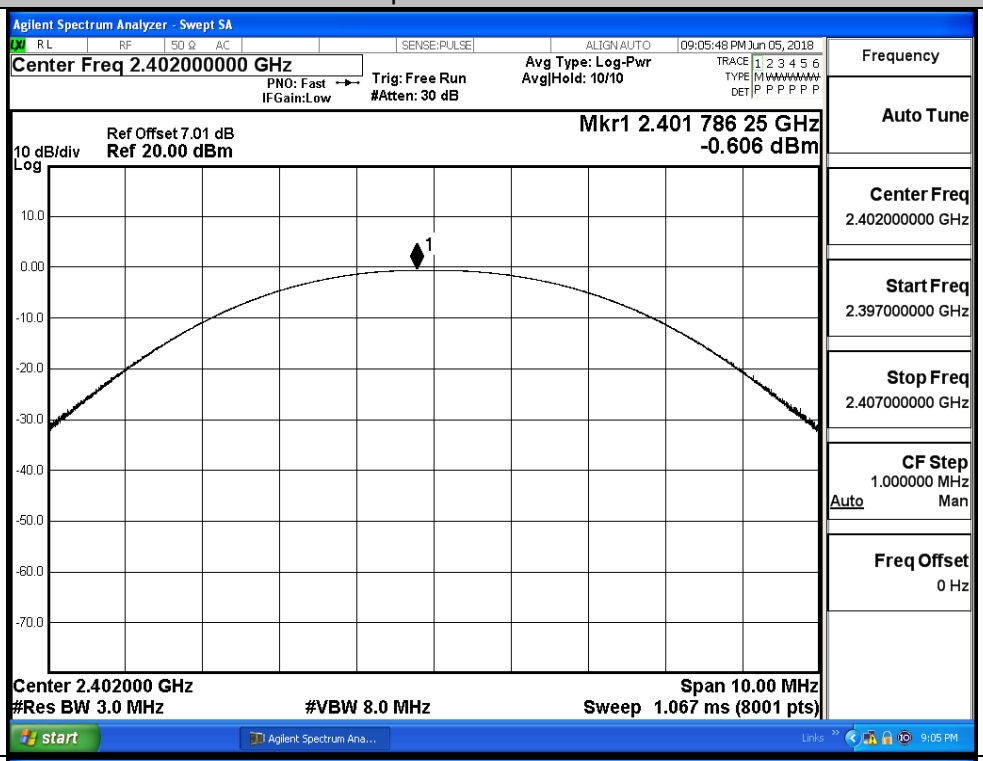
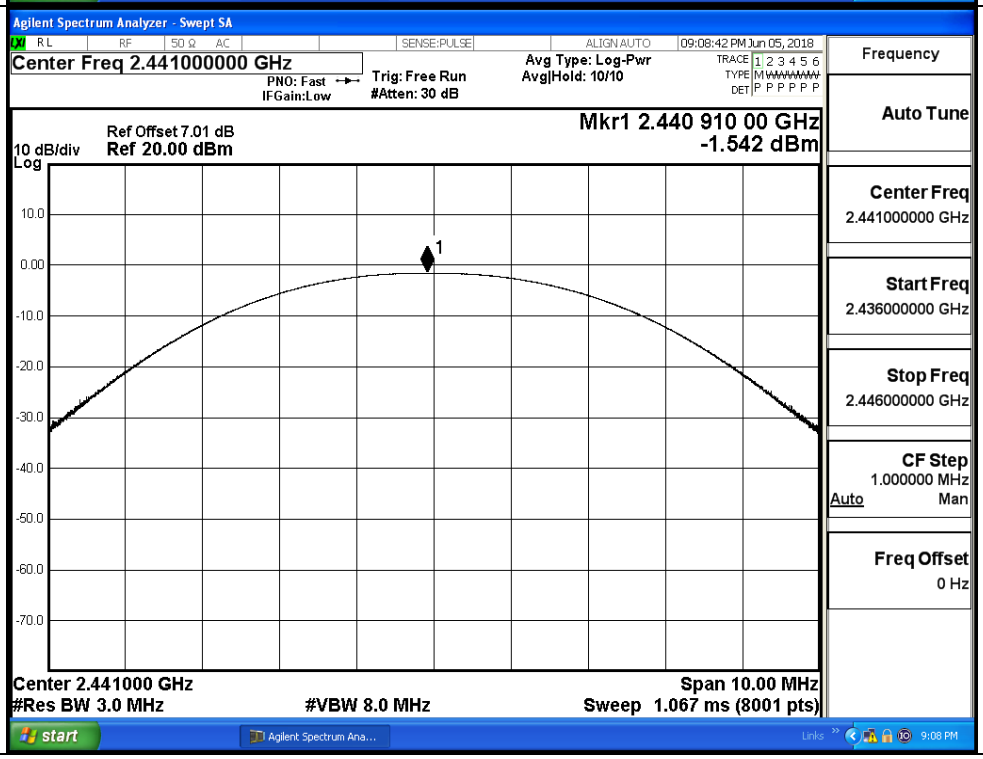
Test Model: Q501

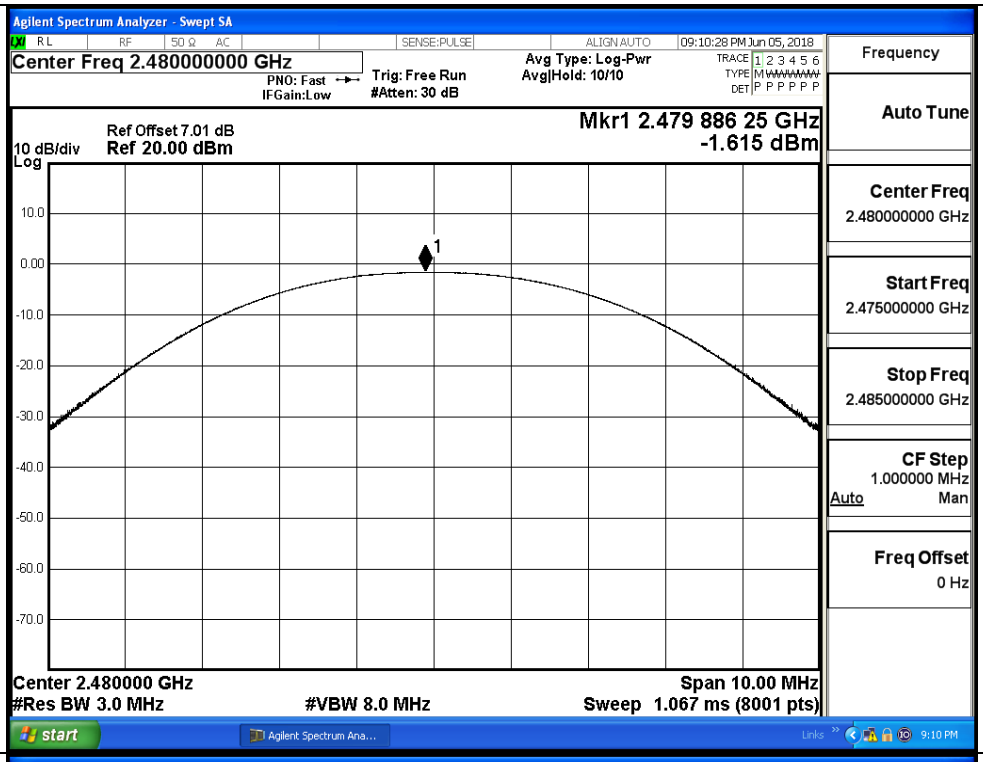
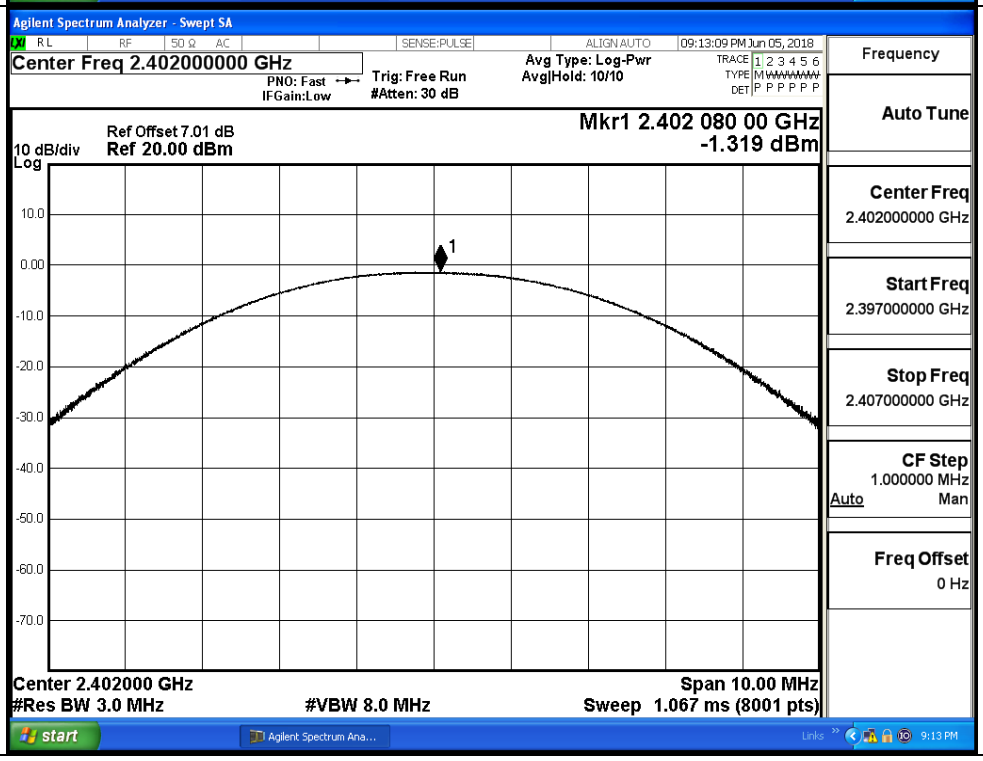
Environmental Conditions

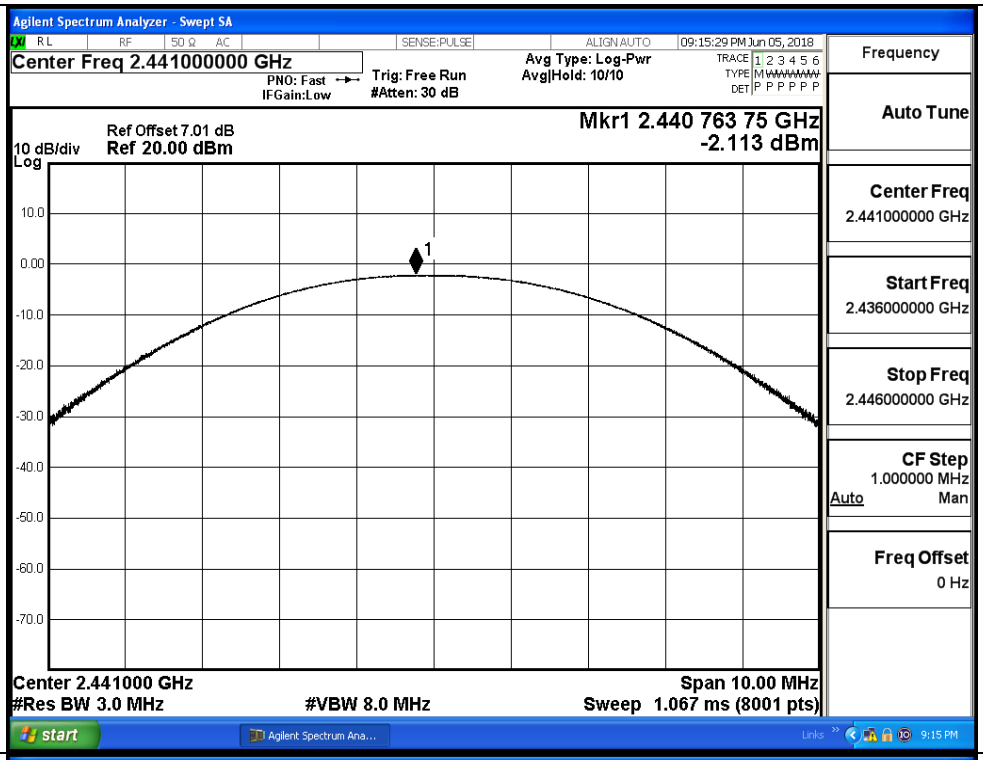
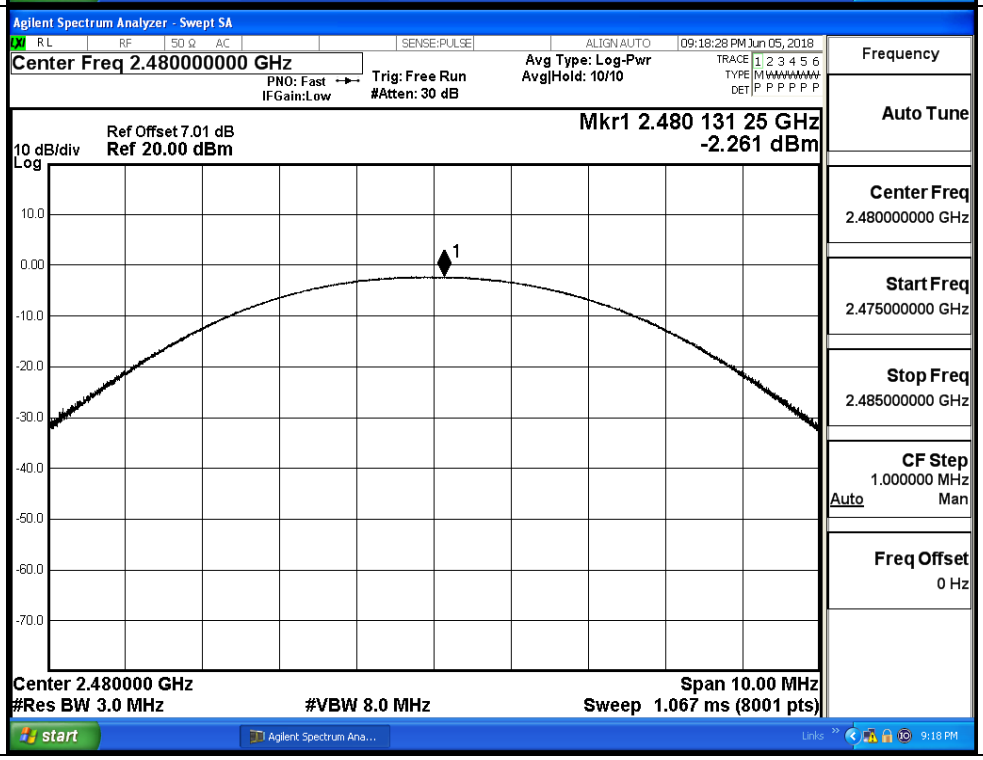
Temperature:	24.6 ° C
Relative Humidity:	54.4%
ATM Pressure:	100.0 kPa
Test Engineer:	WANGCHUANG
Supervised by:	Jayden.Zhuo

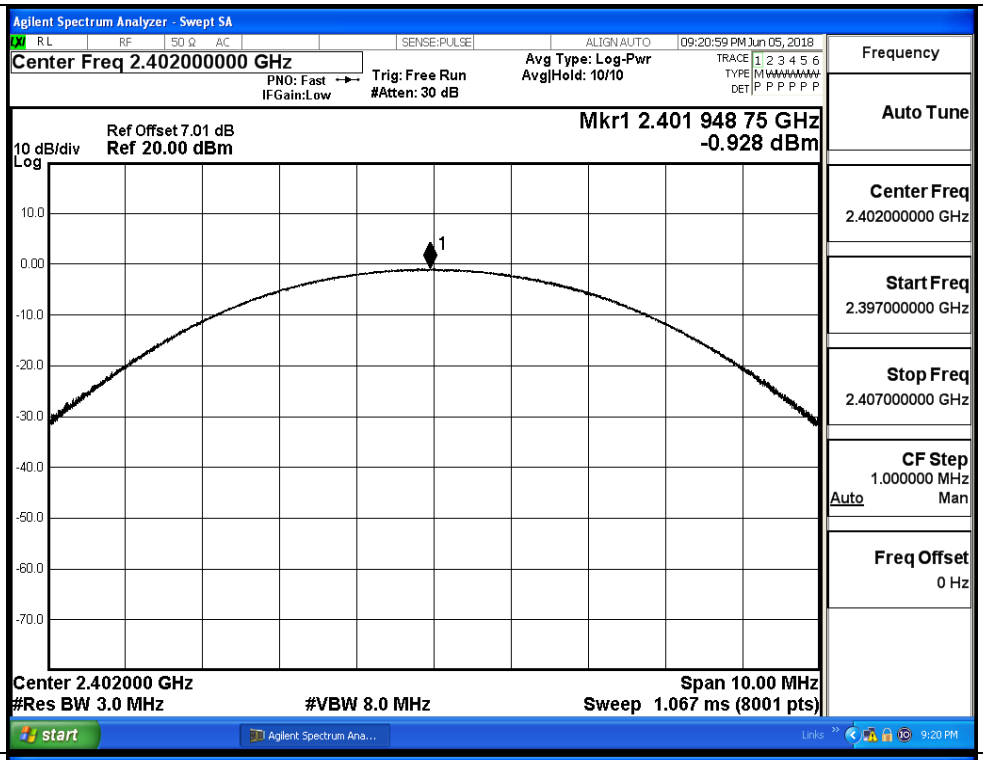
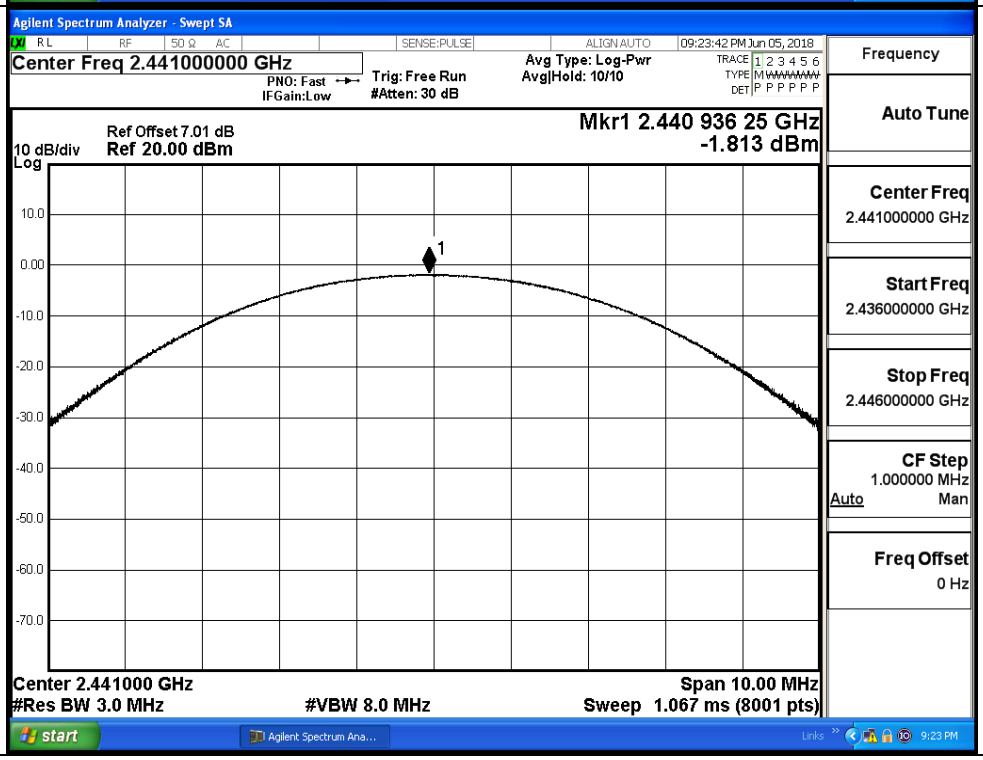
A.1 Maxmum Conducted Peak Output Power

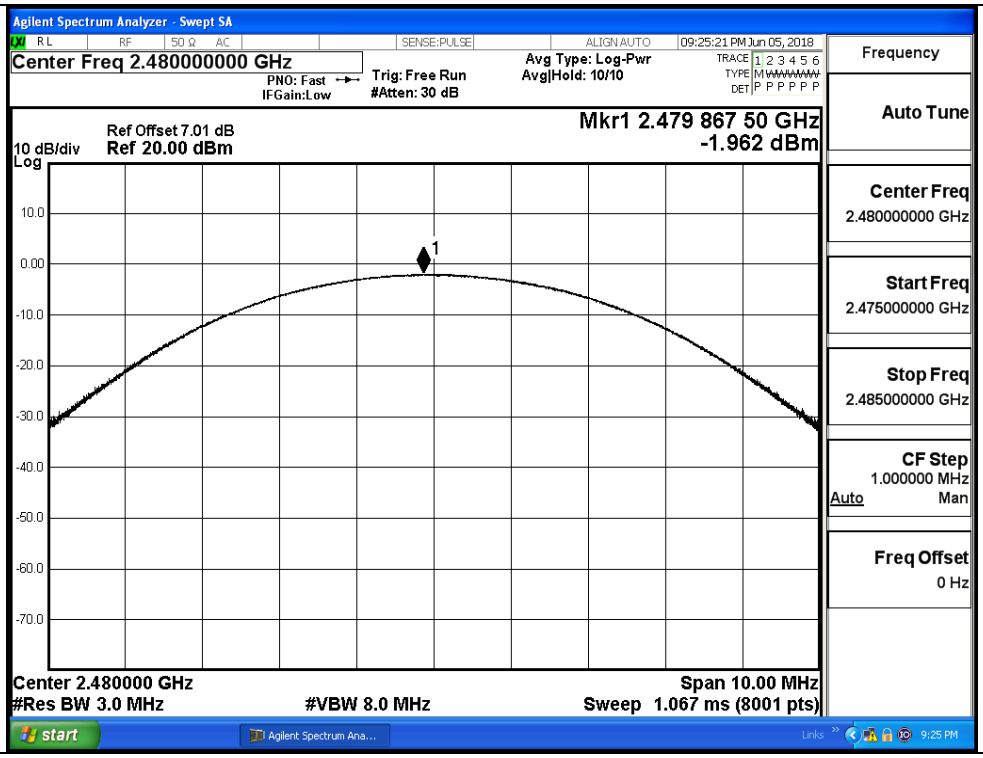
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.606	30	PASS
	MCH	-1.542	30	PASS
	HCH	-1.615	30	PASS
π/4DQPSK	LCH	-1.319	21	PASS
	MCH	-2.113	21	PASS
	HCH	-2.261	21	PASS
8DPSK	LCH	-0.928	21	PASS
	MCH	-1.813	21	PASS
	HCH	-1.962	21	PASS

Test Graphs		
GFSK/LCH		
GFSK/MCH		

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

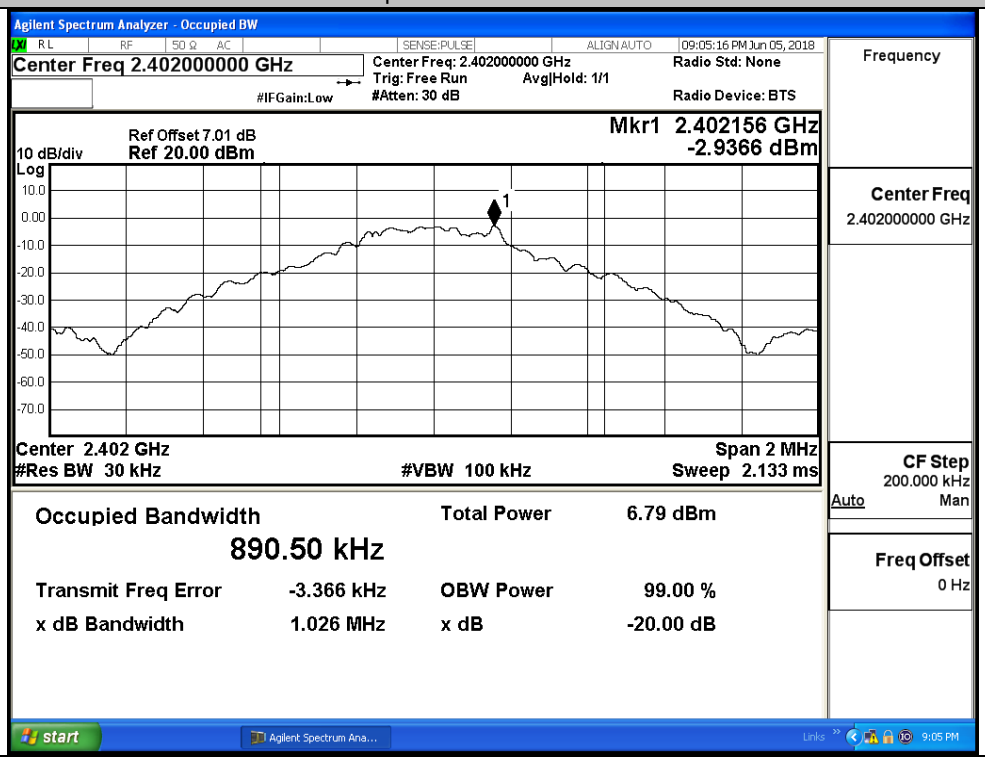
8DPSK/LCH	
8DPSK/MCH	

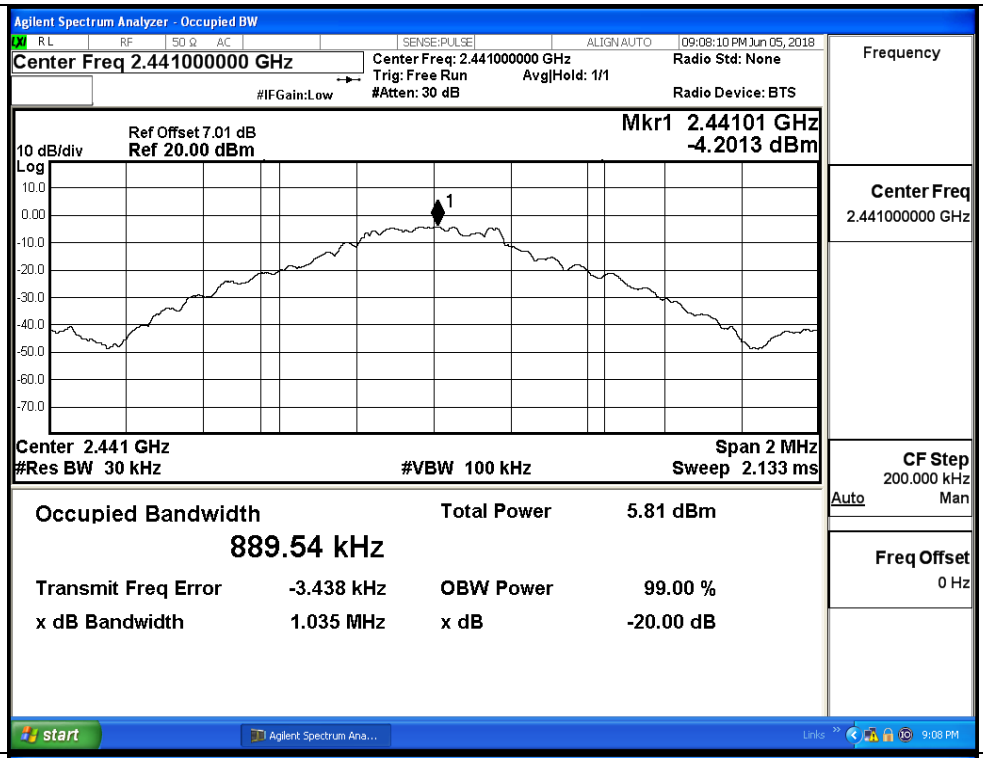
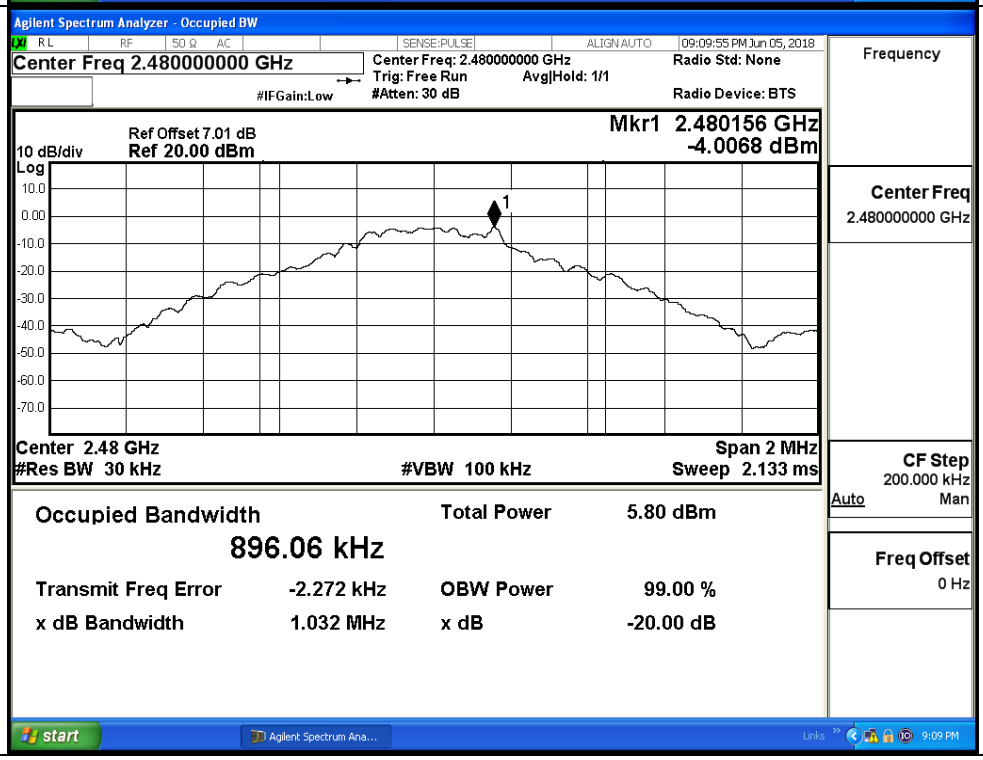
8DPSK/HCH	

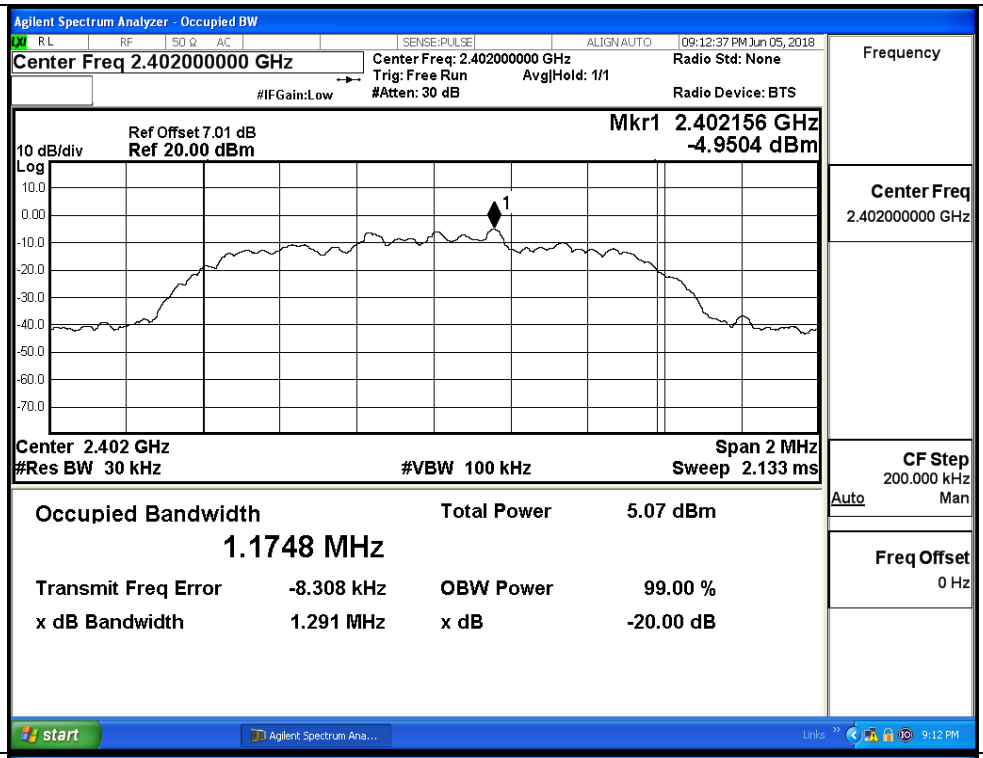
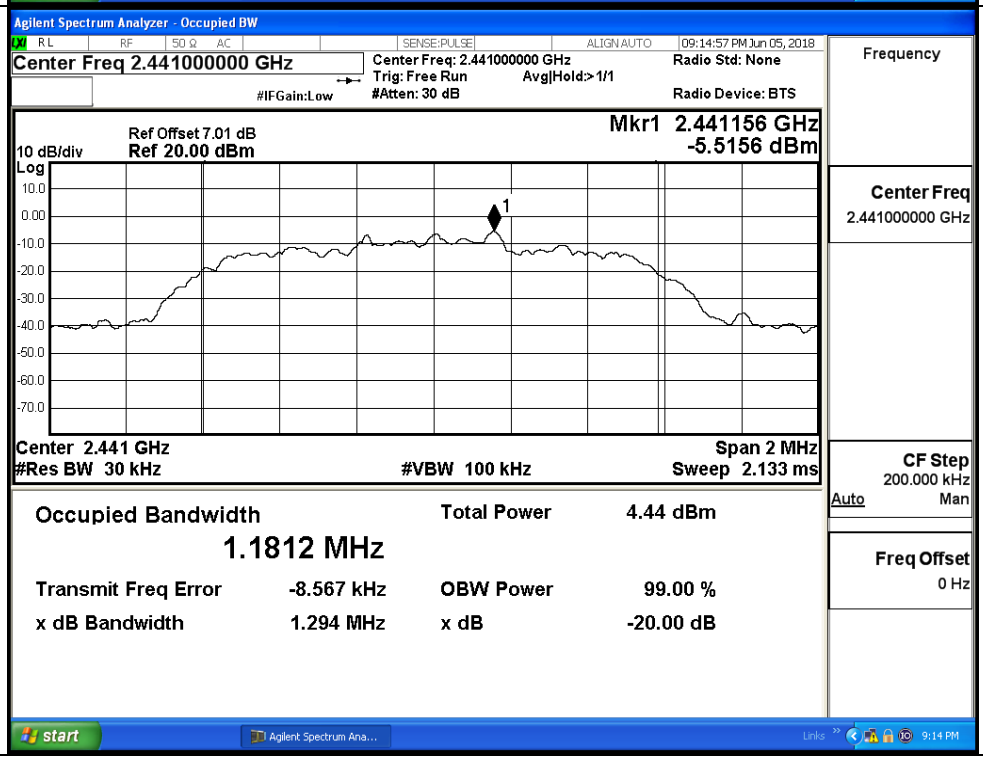
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
09:25:21 PM Jun 05, 2018
Ref Offset 7.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 867 50 GHz
-1.962 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 10.00 MHz
Sweep 1.067 ms (8001 pts)
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
start
9:25 PM

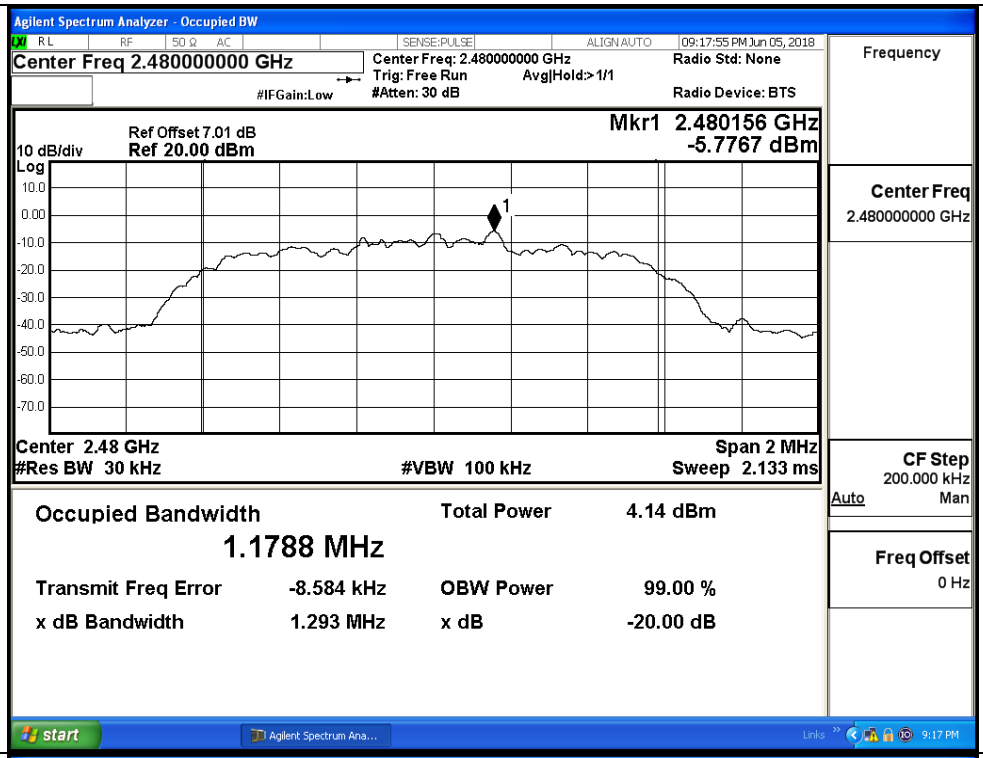
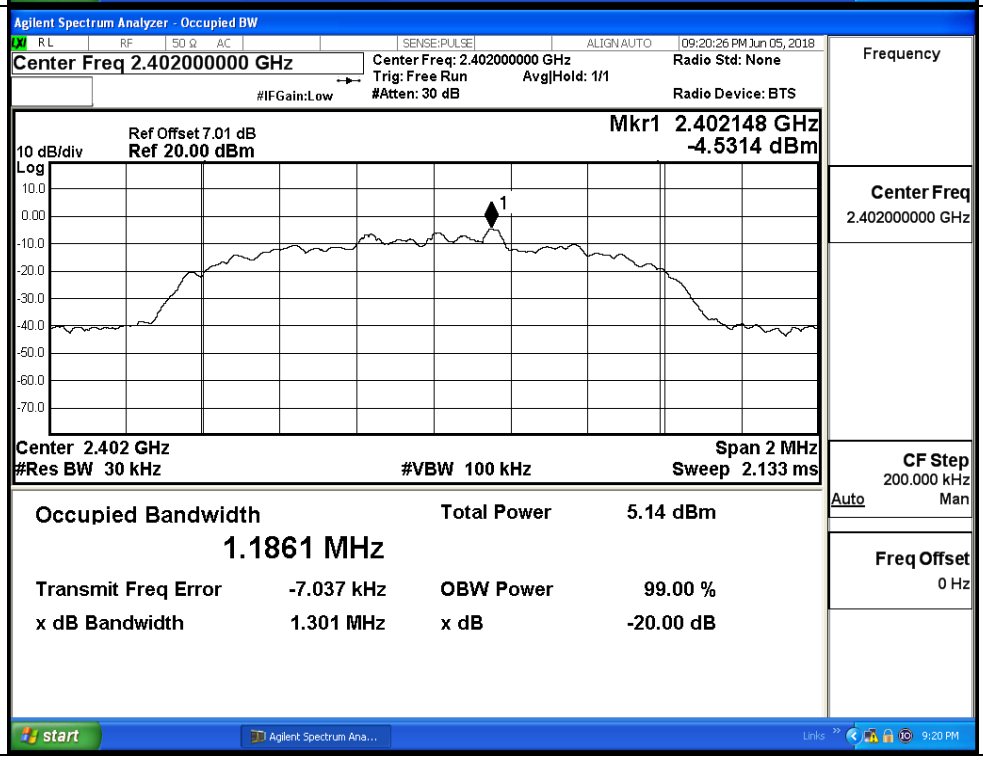
A.2 20dB Bandwidth

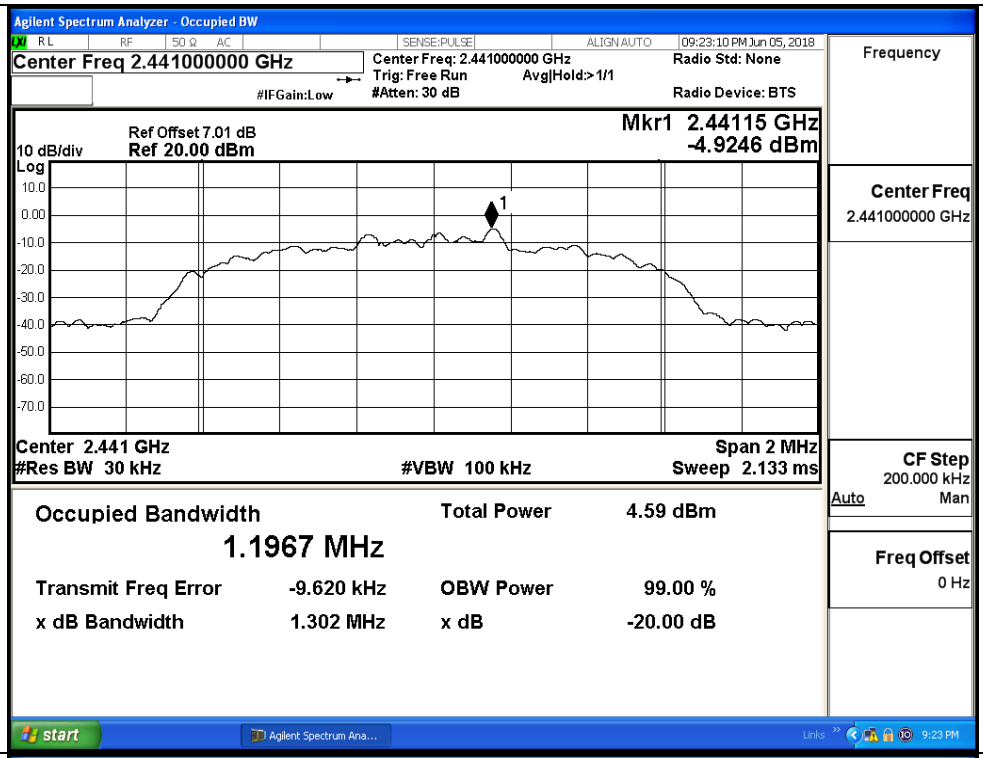
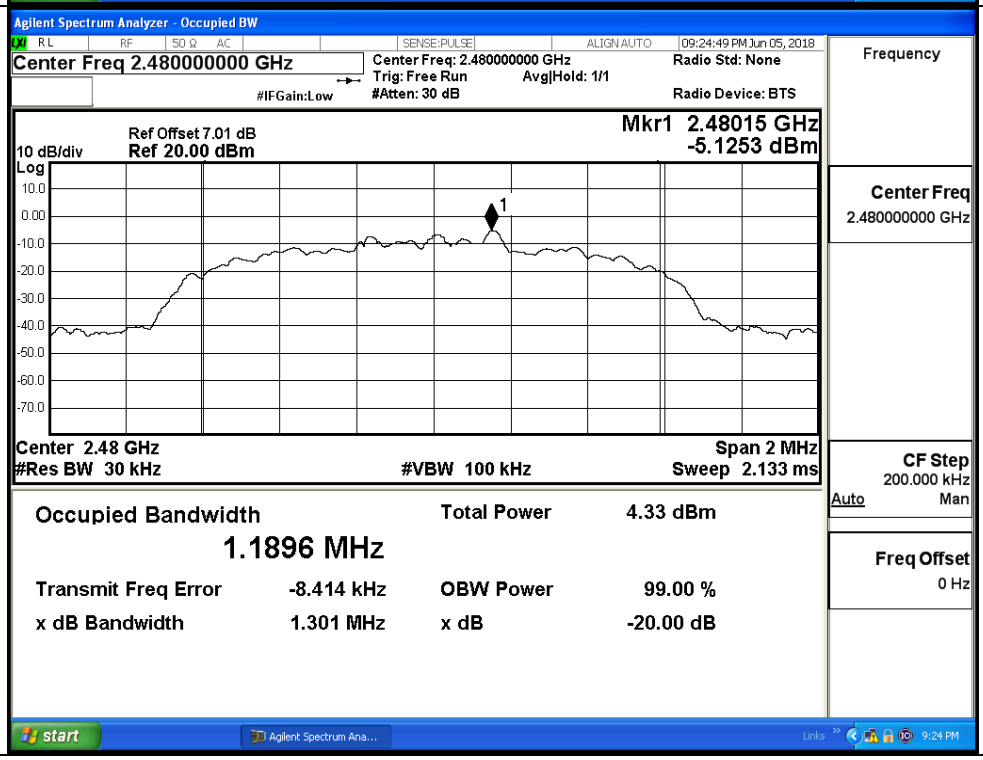
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.026	Not Specified	PASS
	MCH	1.035	Not Specified	PASS
	HCH	1.032	Not Specified	PASS
π/4DQPSK	LCH	1.291	Not Specified	PASS
	MCH	1.294	Not Specified	PASS
	HCH	1.293	Not Specified	PASS
8DPSK	LCH	1.301	Not Specified	PASS
	MCH	1.302	Not Specified	PASS
	HCH	1.301	Not Specified	PASS

Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

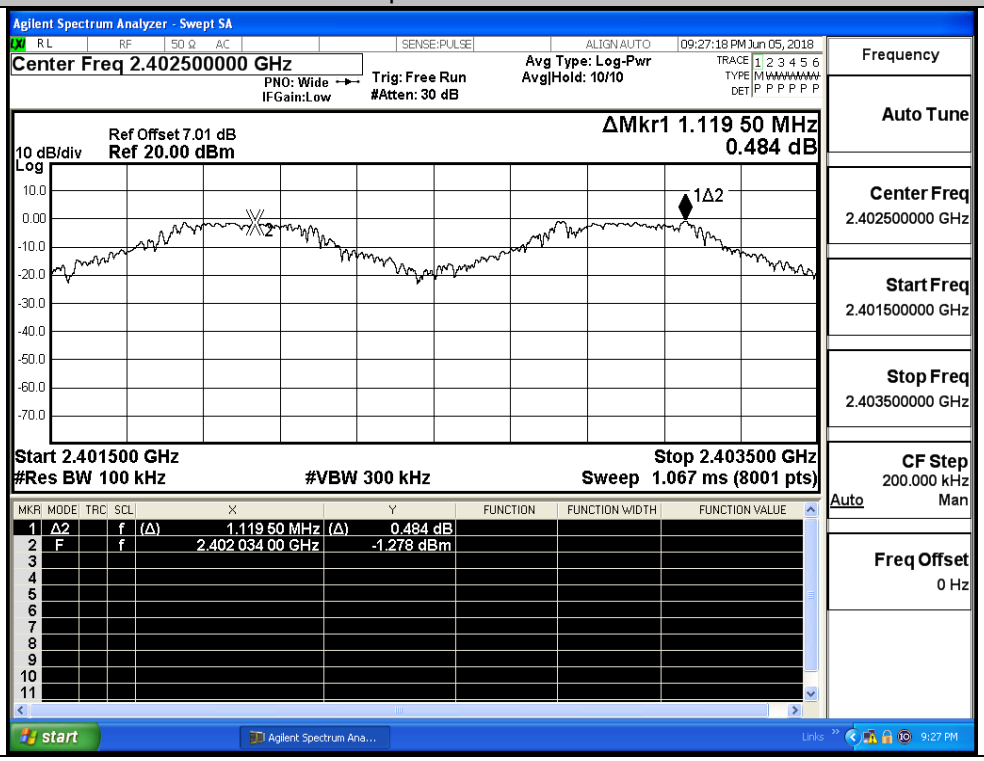
π/4DQPSK/LCH	
π/4DQPSK/MCH	

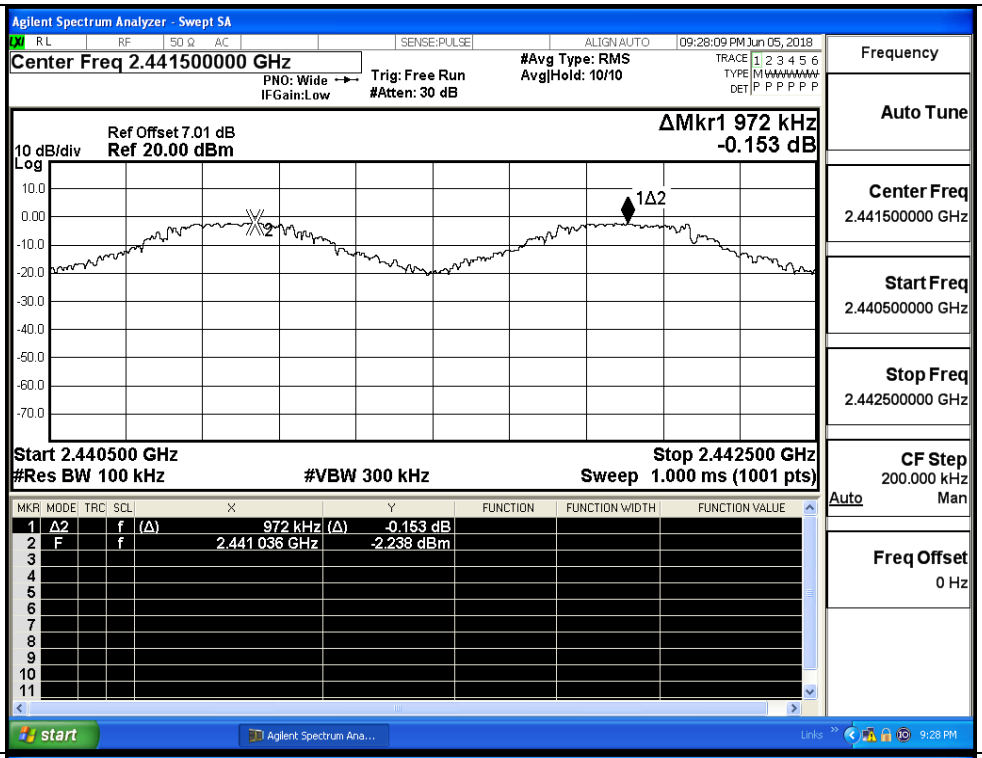
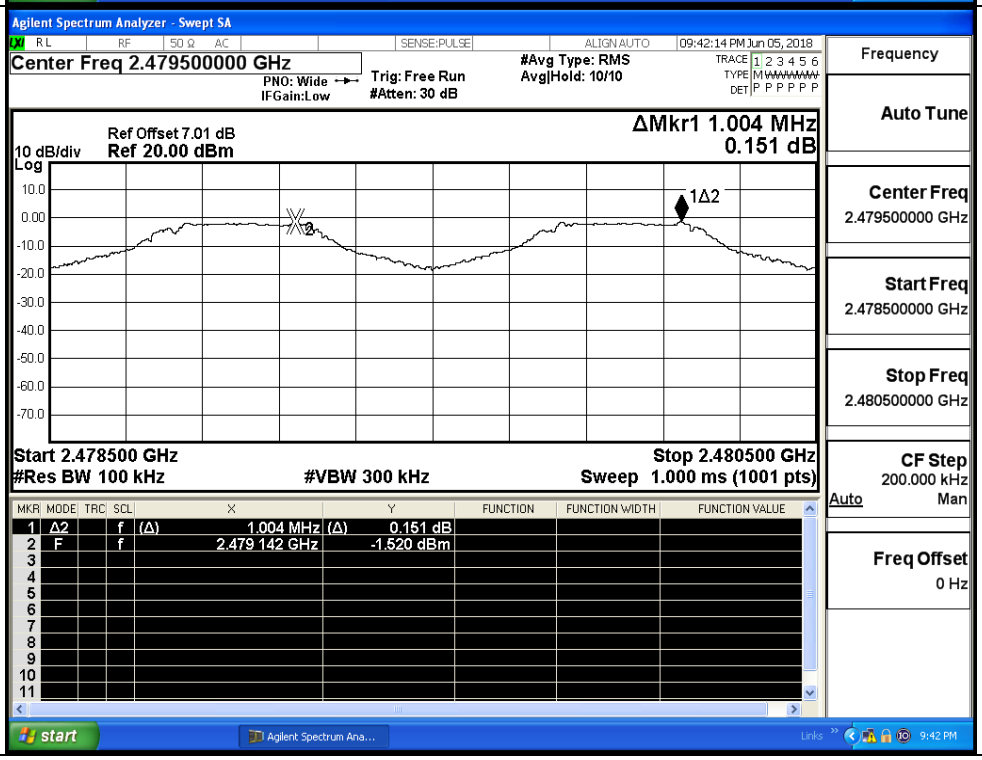
π/4DQPSK/HCH	
8DPSK/LCH	

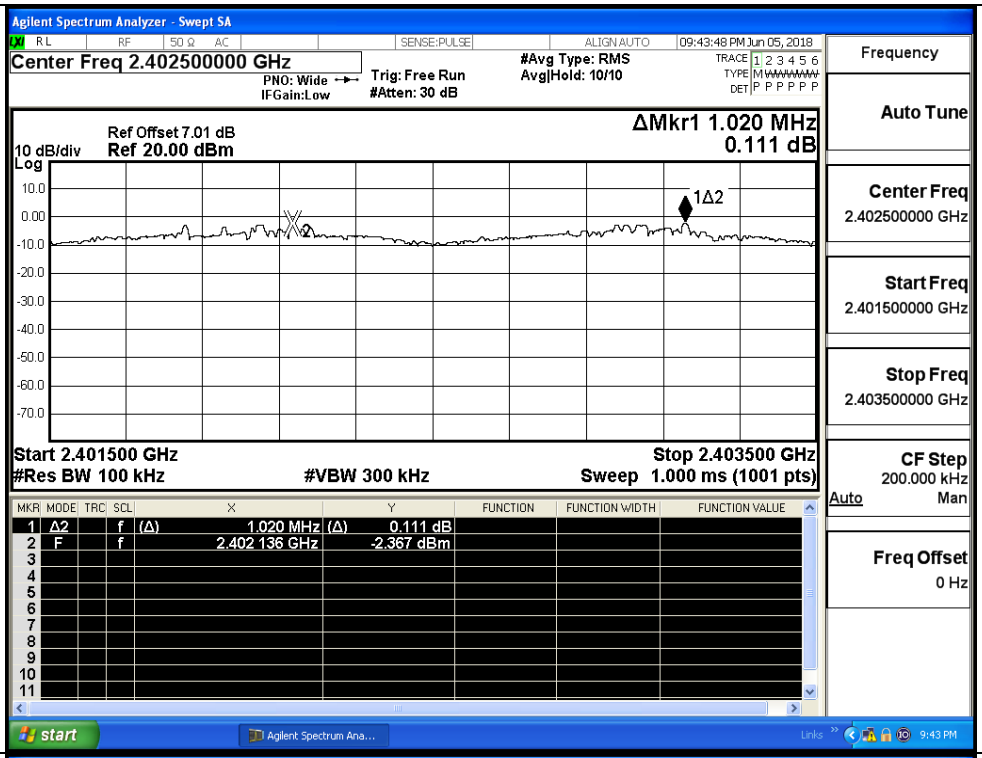
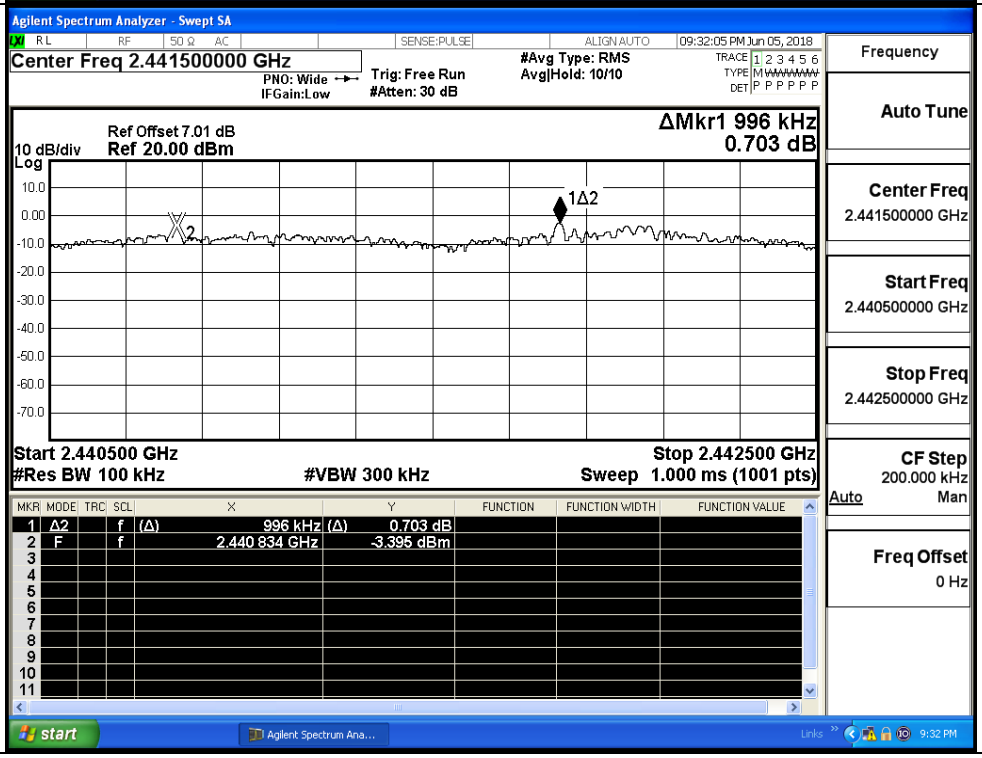
8DPSK/MCH	
8DPSK/HCH	

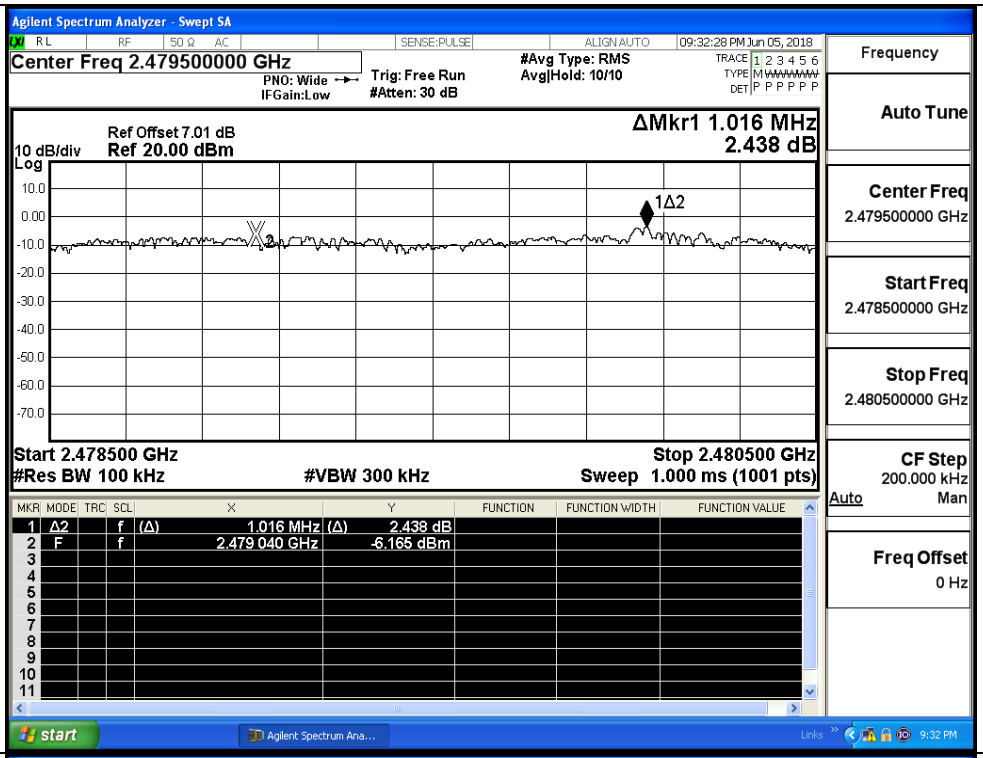
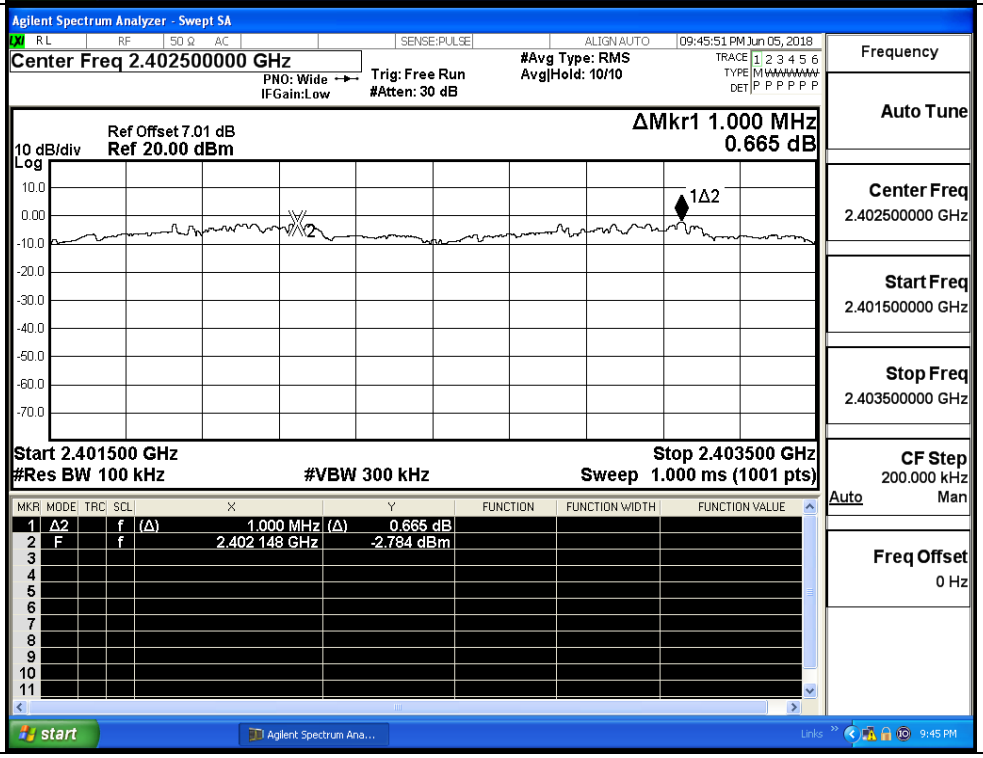
A.3 Carrier Frequency Separation

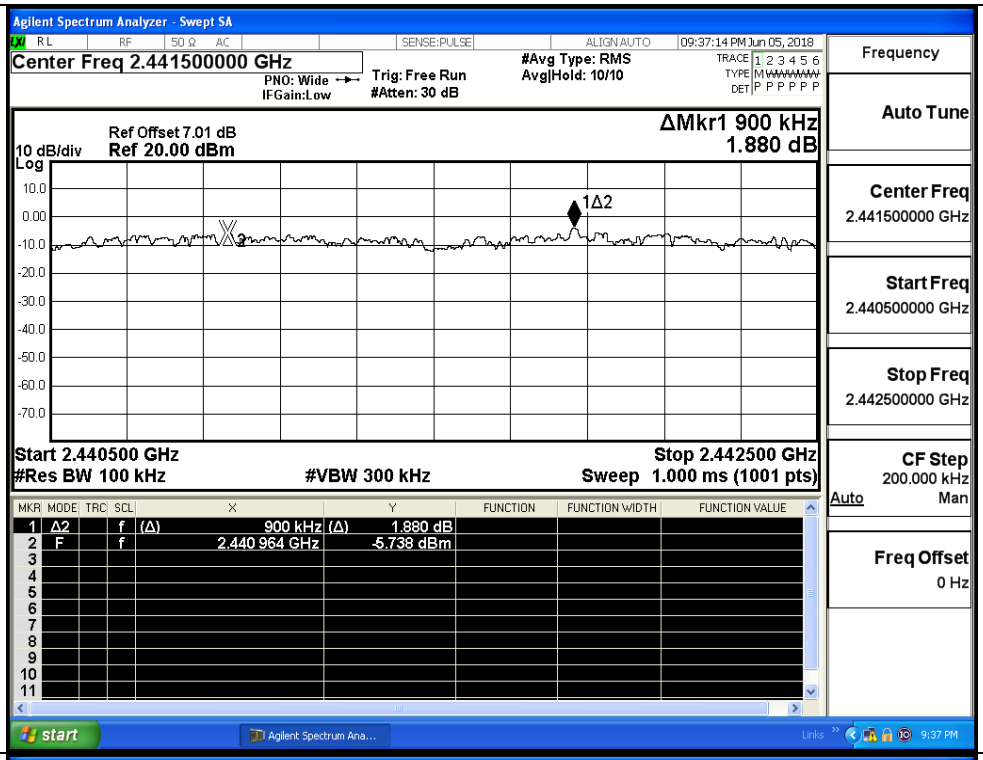
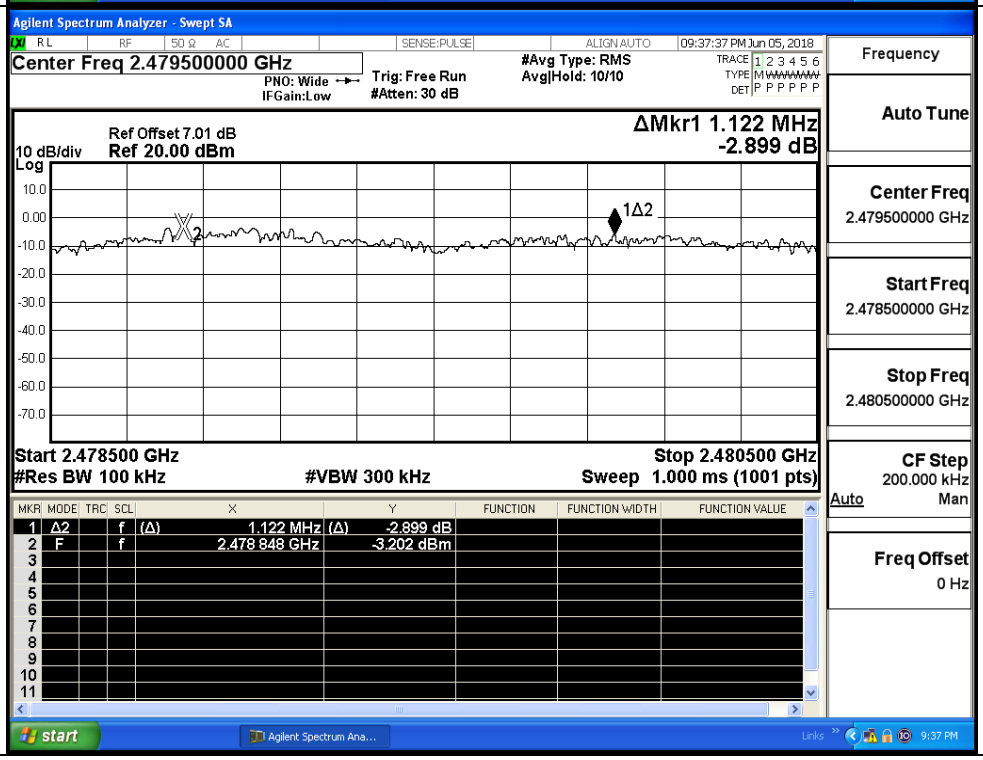
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.119	0.690	PASS
	MCH	0.972	0.690	PASS
	HCH	1.004	0.690	PASS
π/4DQPSK	LCH	1.020	0.863	PASS
	MCH	0.996	0.863	PASS
	HCH	1.016	0.863	PASS
8DPSK	LCH	1.000	0.868	PASS
	MCH	0.900	0.868	PASS
	HCH	1.122	0.868	PASS

Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

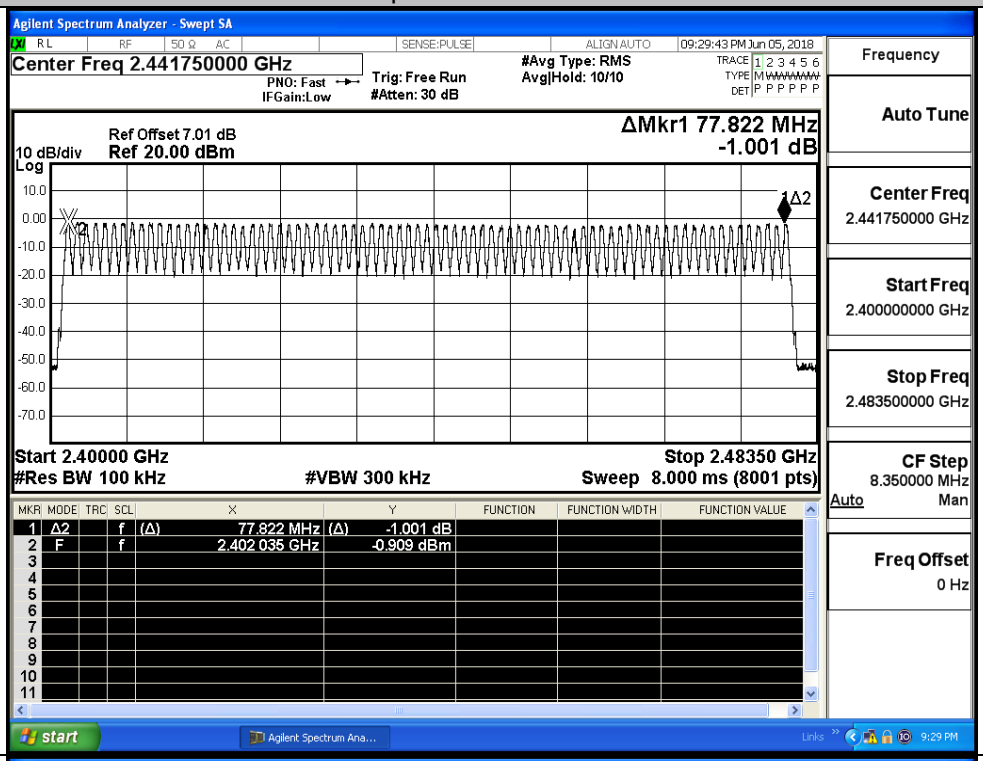
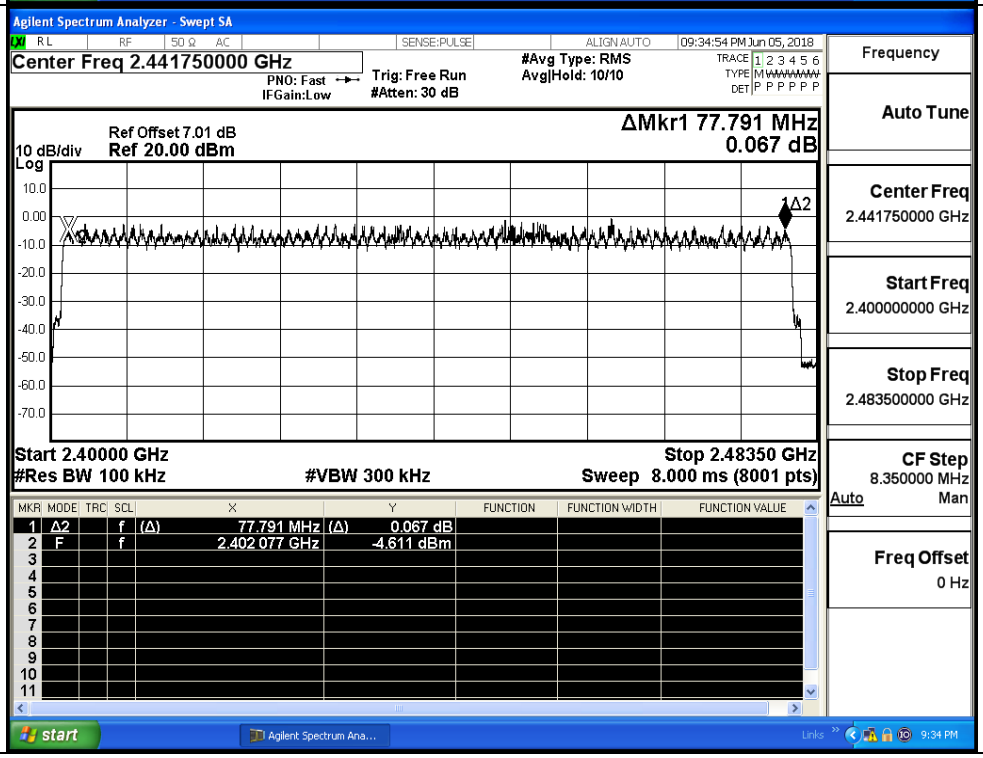
π/4DQPSK/LCH	
π/4DQPSK/MCH	

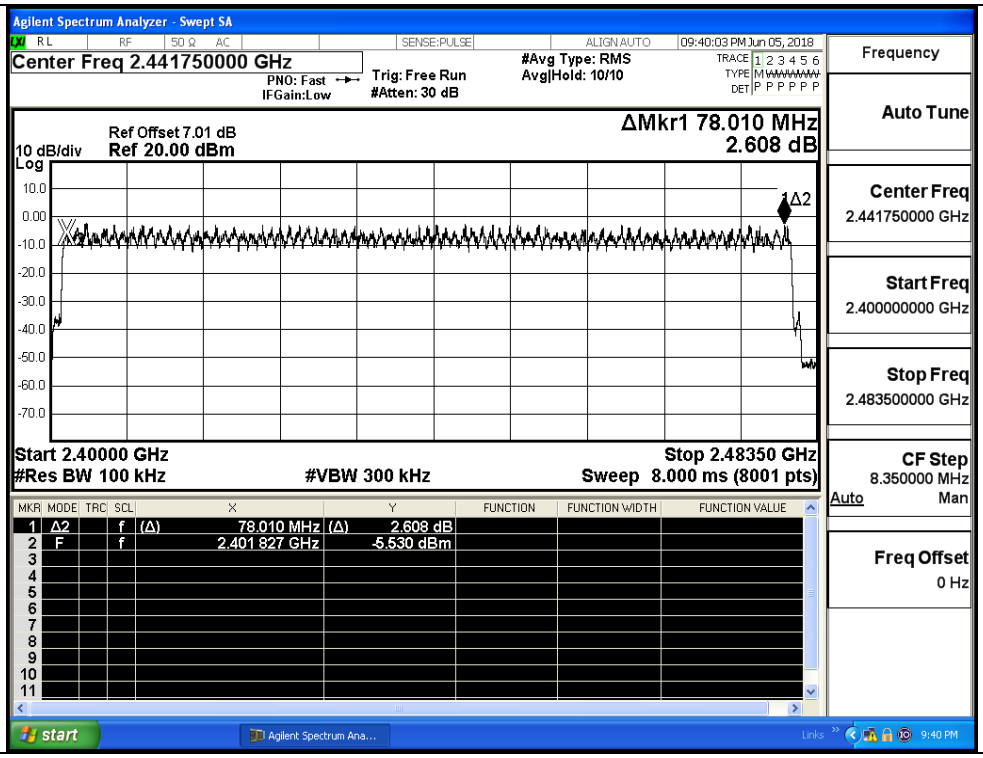
π/4DQPSK/HCH	
8DPSK/LCH	

8DPSK/MCH	
8DPSK/HCH	

A.4 Hopping Channel Number

Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs		
GFSK/Hop		
π/4DQPSK/Hop		

8DPSK/Hop	

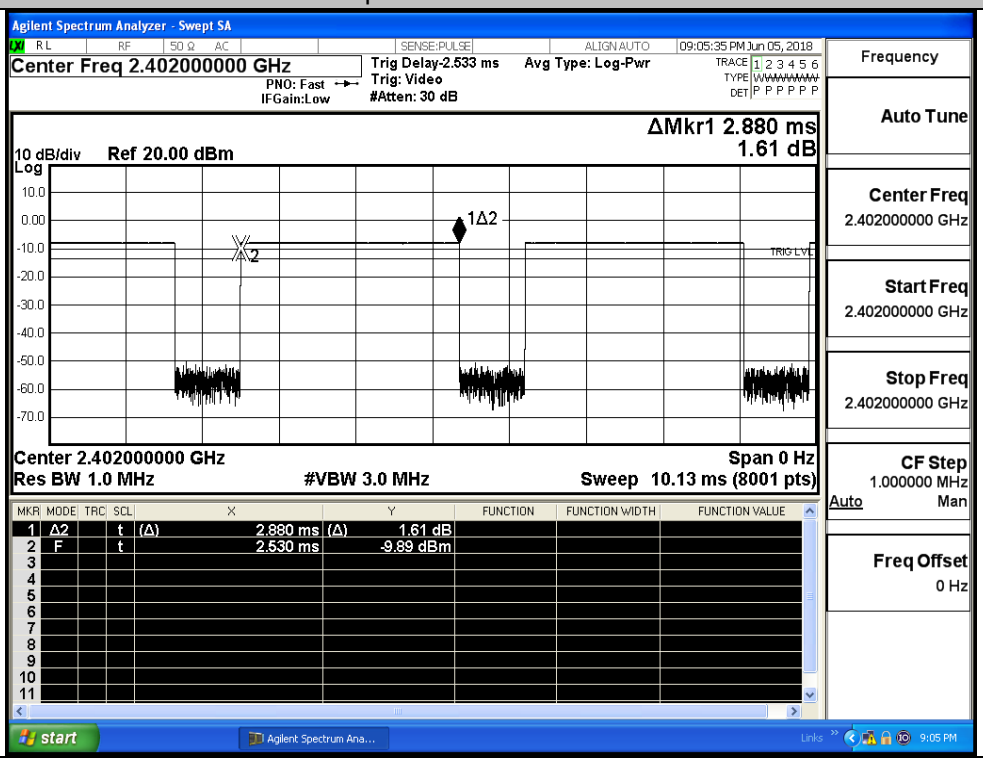
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
09:40:03 PM Jun 05, 2018
Ref Offset 7.01 dB
10 dB/div
Log
Ref 20.00 dBm
ΔMkr1 78.010 MHz
2.608 dB
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (8001 pts)
1 Δ2 f (Δ) 78.010 MHz (Δ) 2.608 dB
2 F f 2.401 827 GHz -5.530 dBm
Frequency
Auto Tune
Center Freq
2.441750000 GHz
Start Freq
2.400000000 GHz
Stop Freq
2.483500000 GHz
CF Step
8.350000 MHz
Auto
Man
Freq Offset
0 Hz
start
9:40 PM

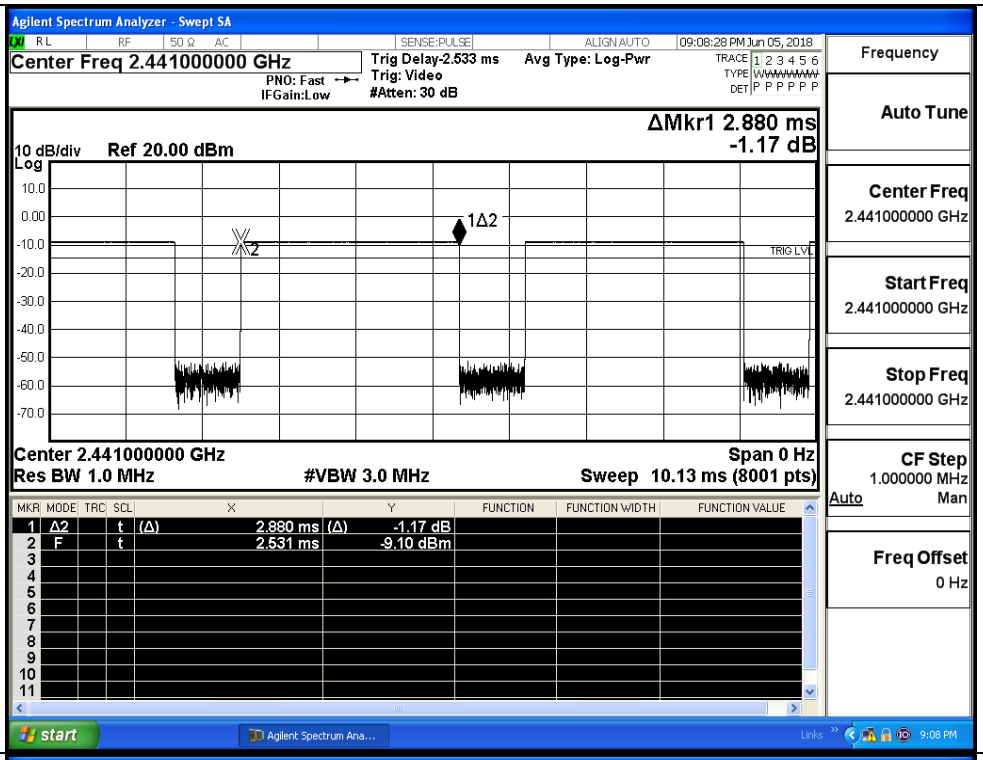
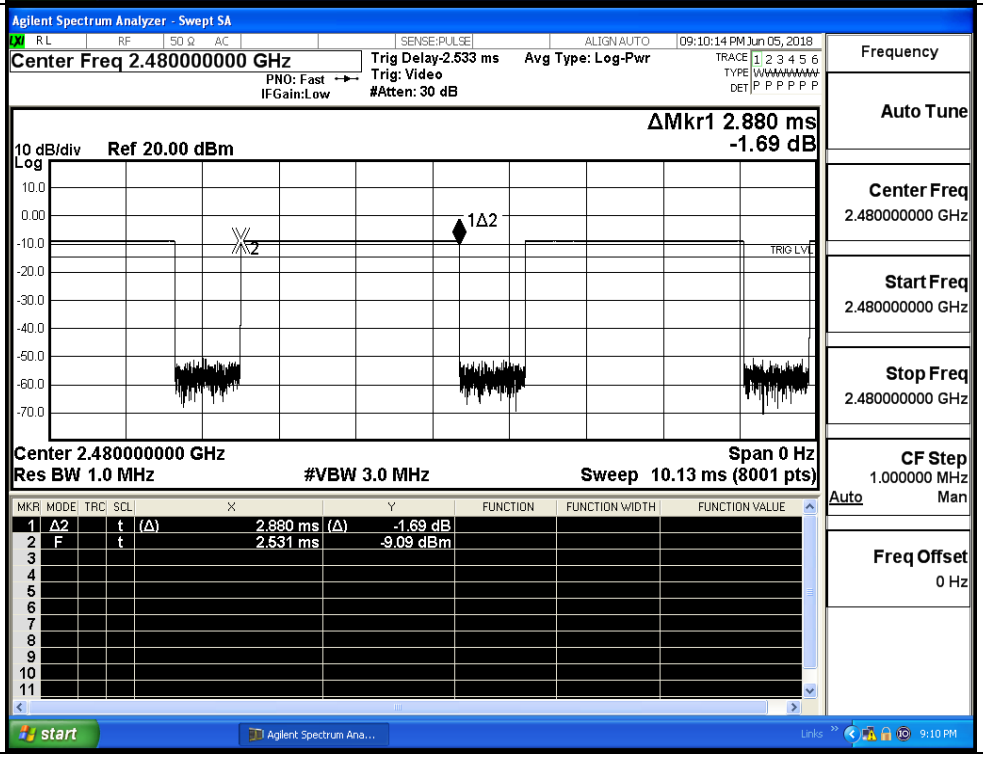
A.5 Dwell Time

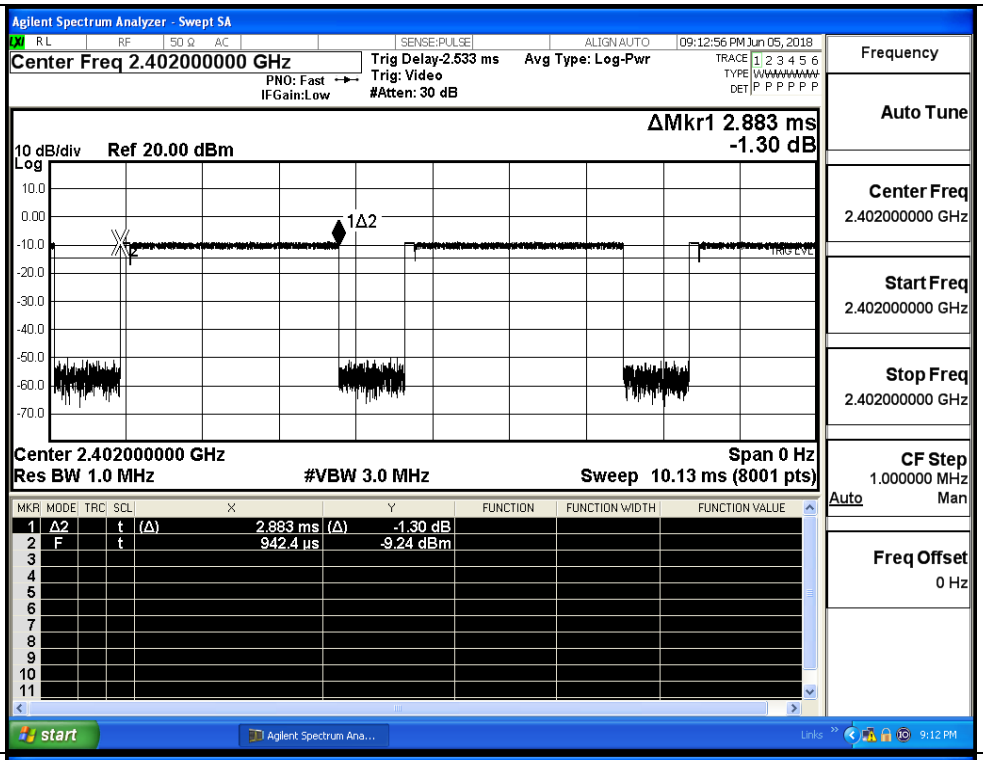
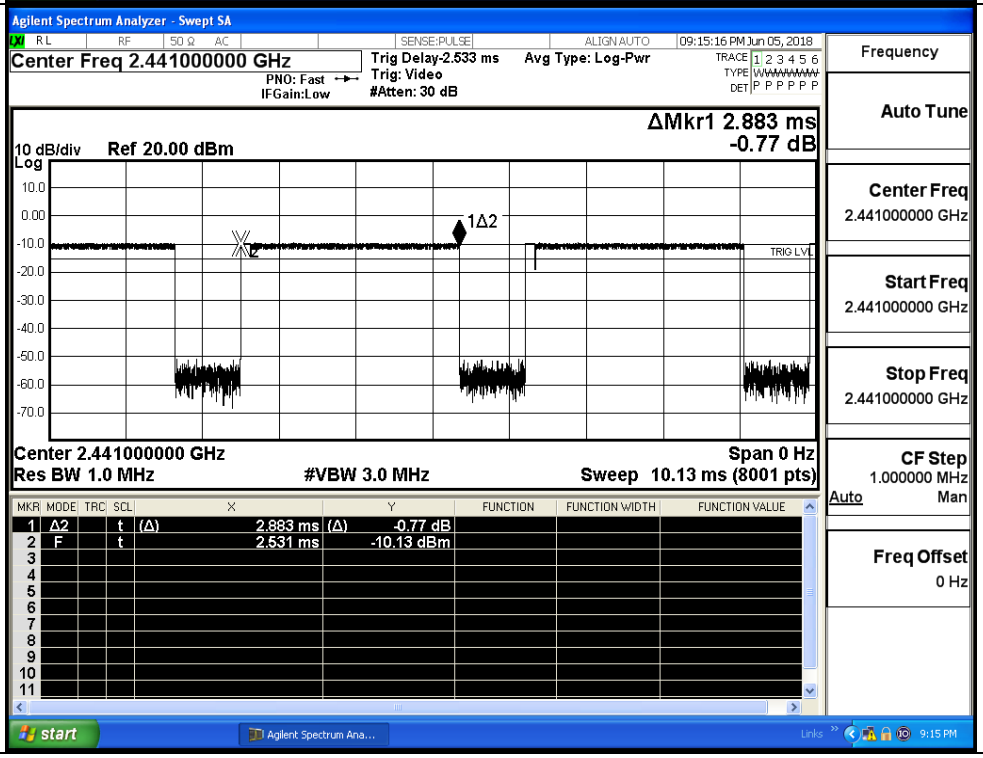
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7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

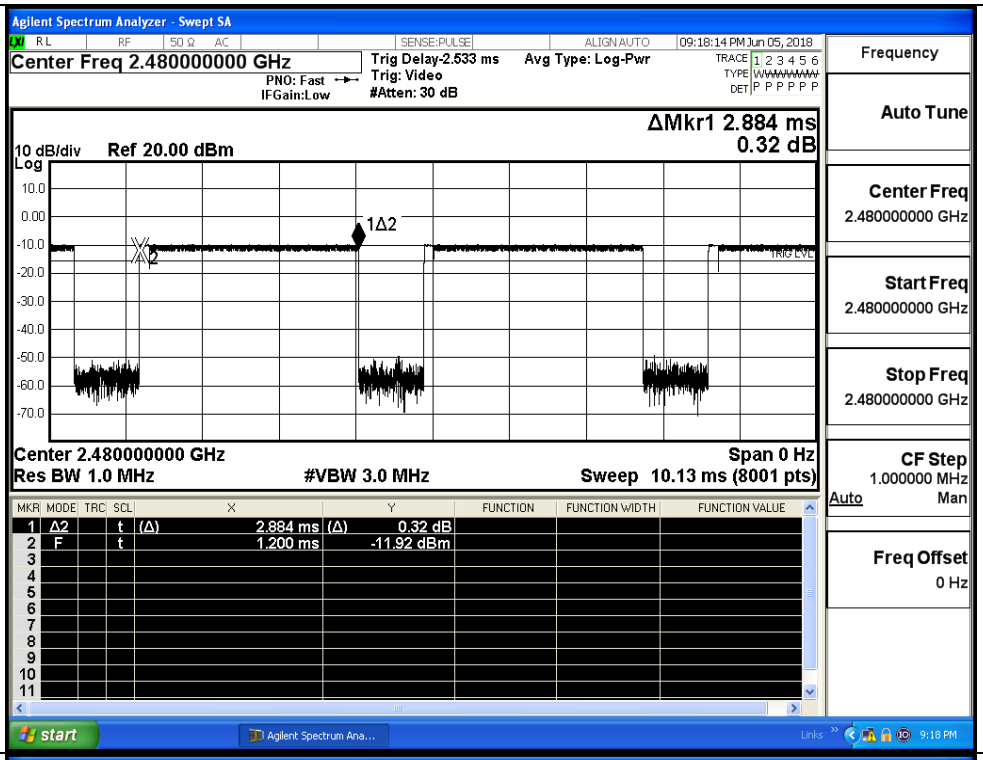
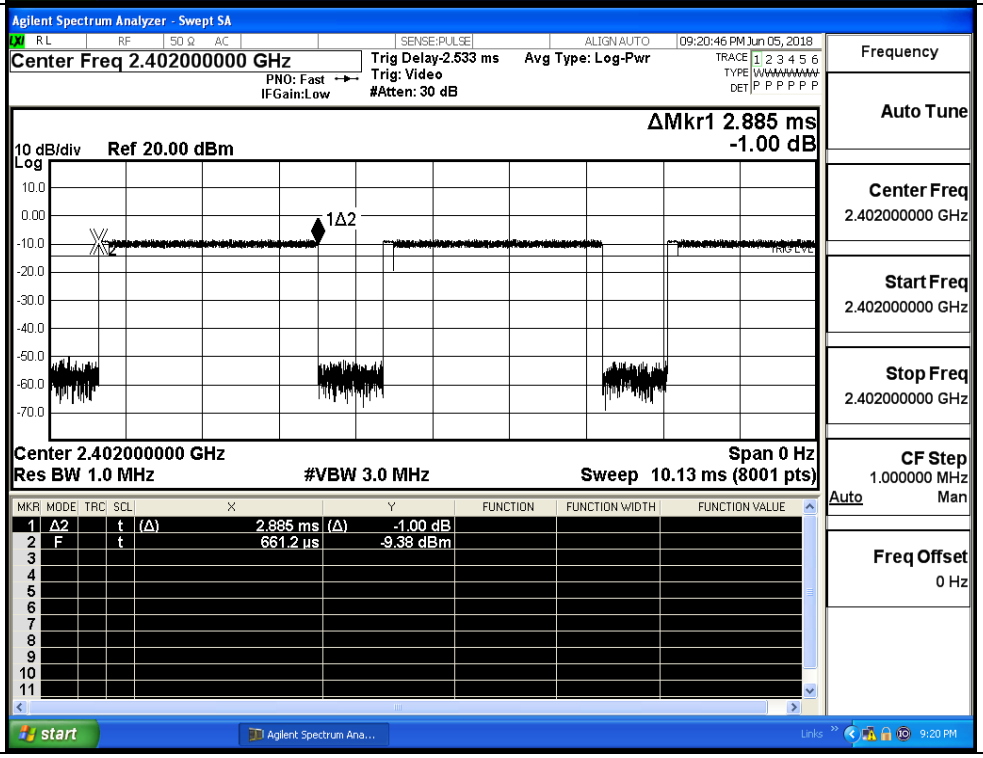
Test Graphs

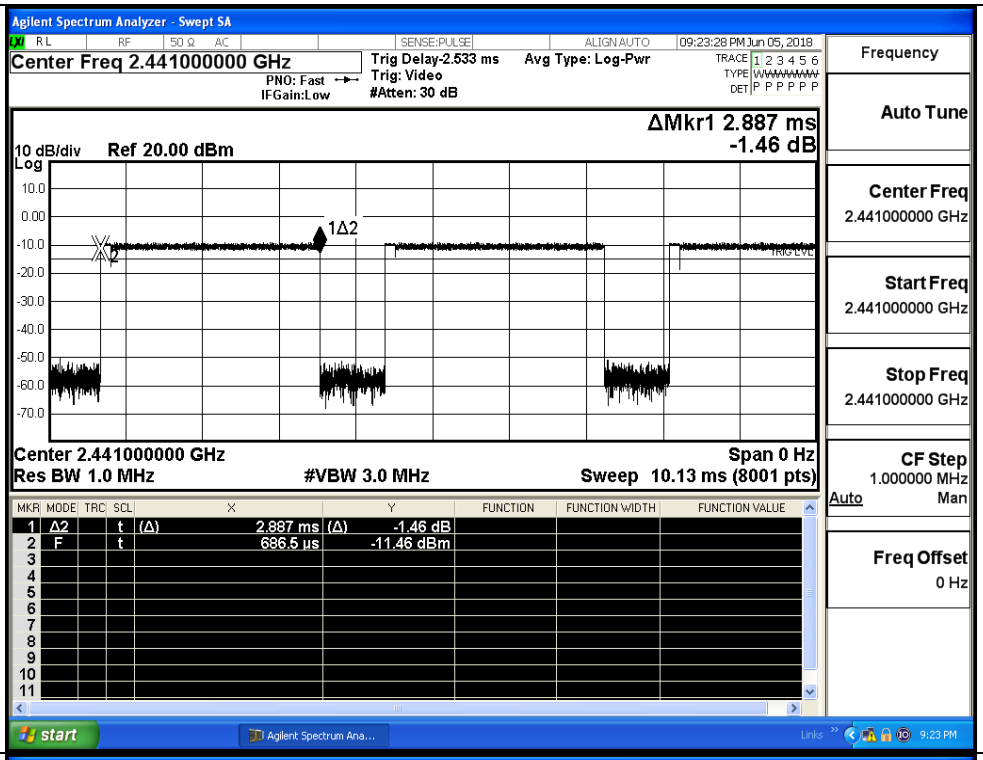
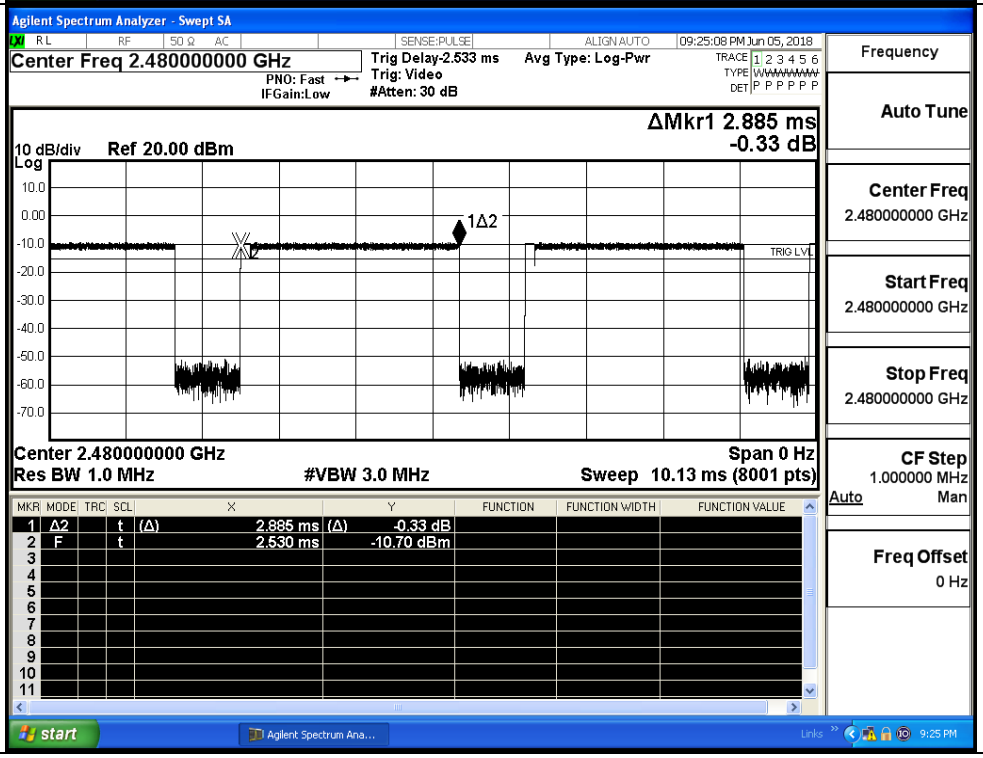
GFSK_DH5/LCH



GFSK_DH5/MCH	
GFSK_DH5/HCH	

π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

π/4DQPSK _2DH5/HCH	
8DPSK _3DH5/LCH	

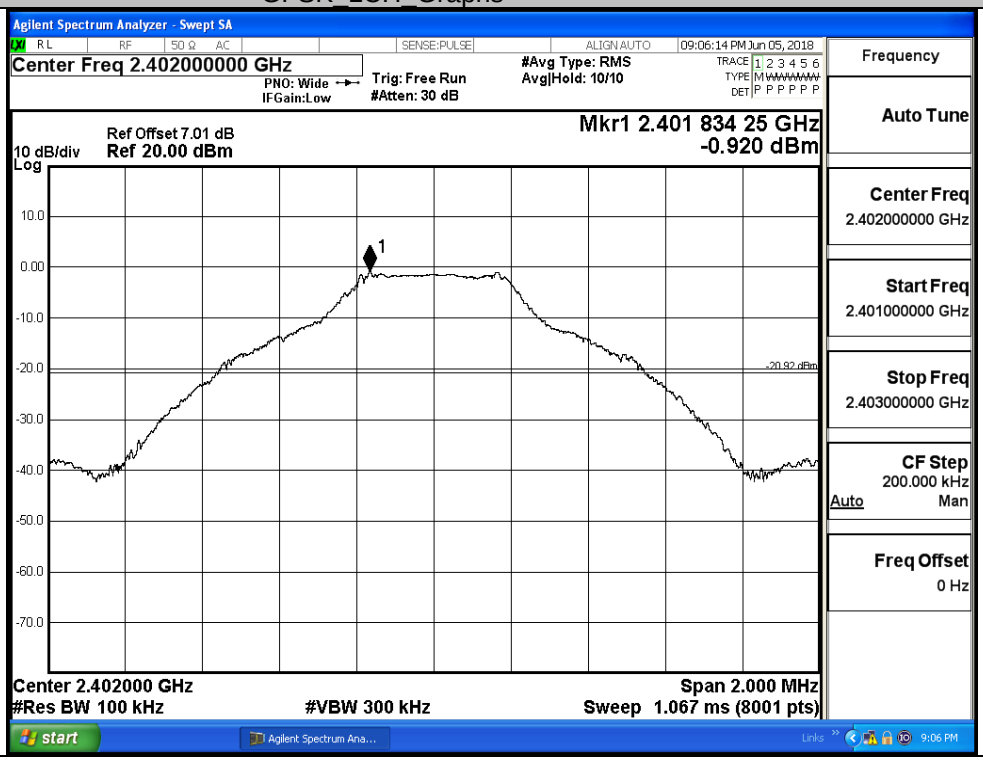
8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

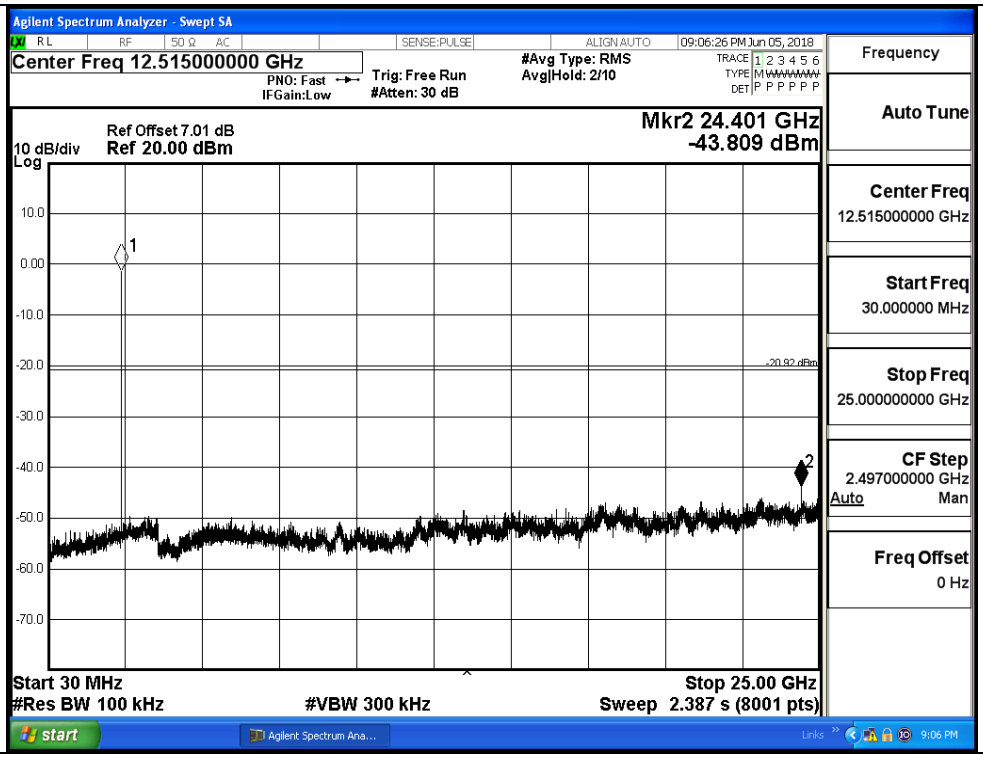
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.92	-43.809	-20.920	PASS
	MCH	-2.3	-45.625	-22.300	PASS
	HCH	-1.819	-44.994	-21.819	PASS
π/4DQPSK	LCH	-2.137	-45.531	-22.137	PASS
	MCH	-2.752	-44.953	-22.752	PASS
	HCH	-3.013	-45.344	-23.013	PASS
8DPSK	LCH	-2.093	-45.595	-22.093	PASS
	MCH	-2.676	-44.620	-22.676	PASS
	HCH	-2.994	-44.759	-22.994	PASS

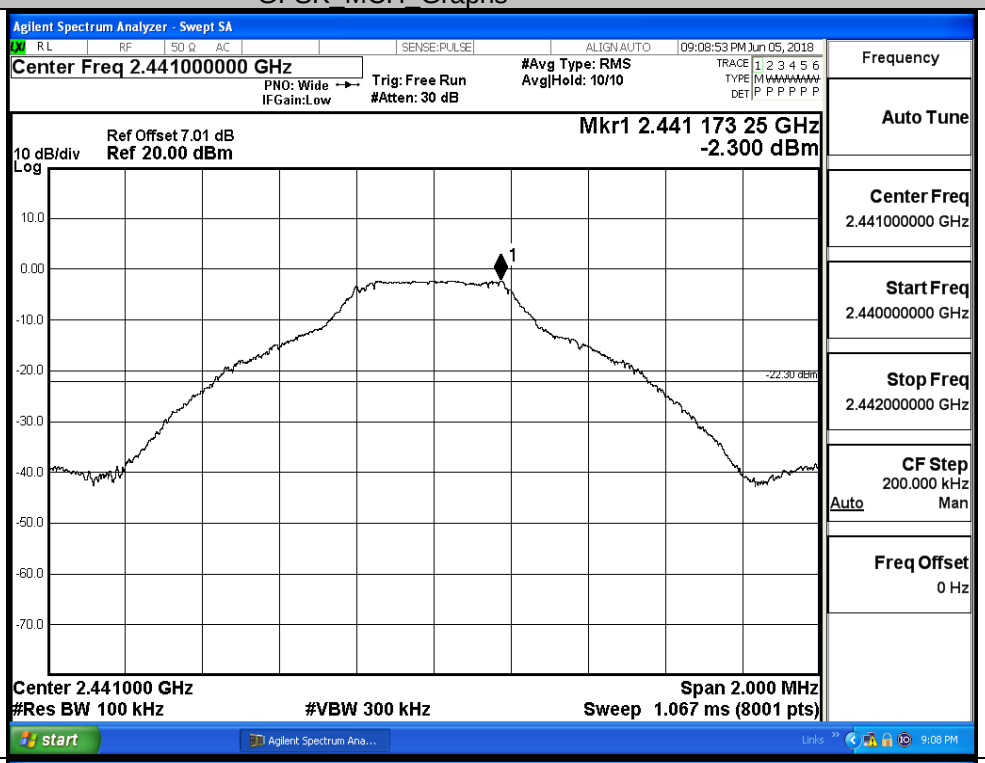
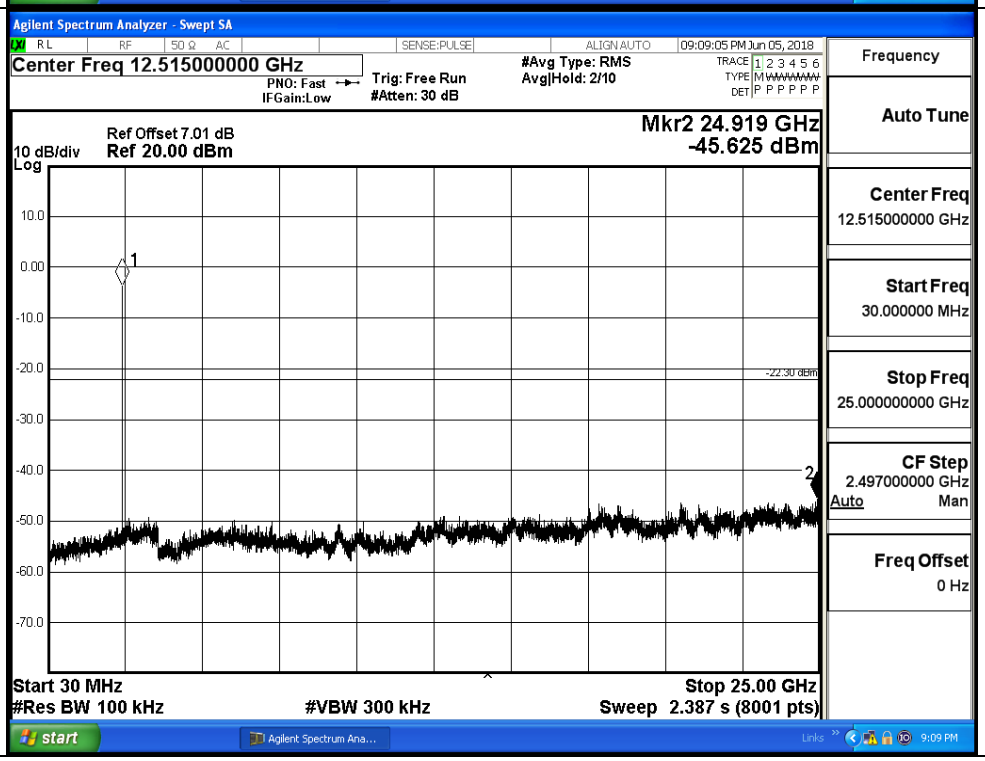
GFSK_LCH_Graphs

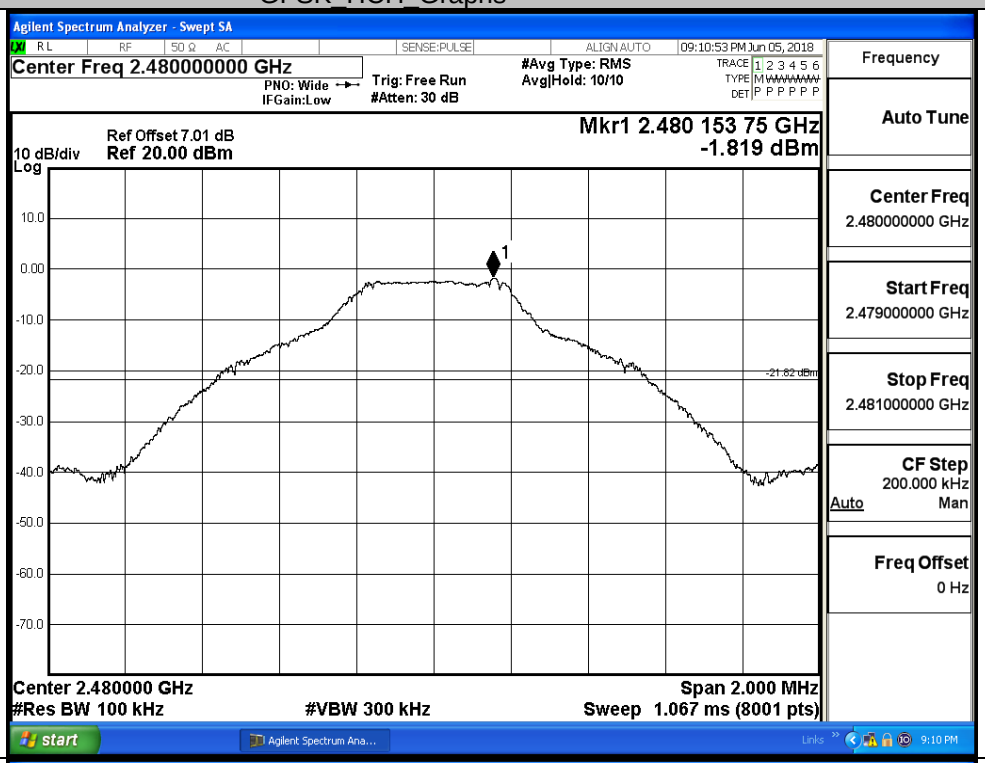
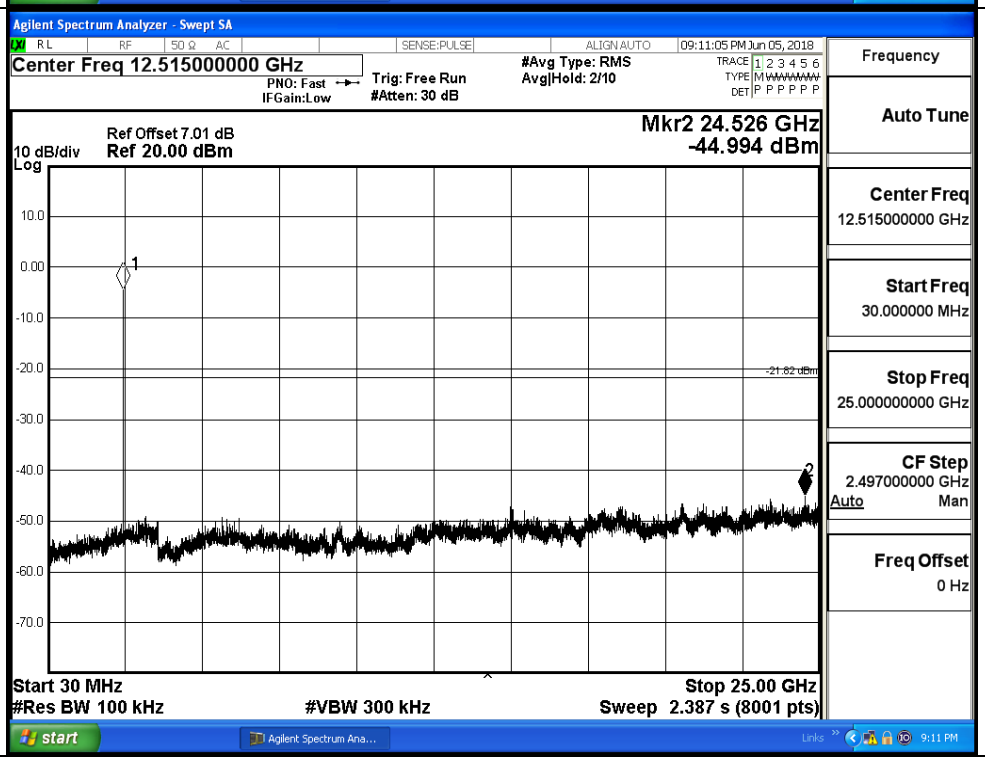
Pref

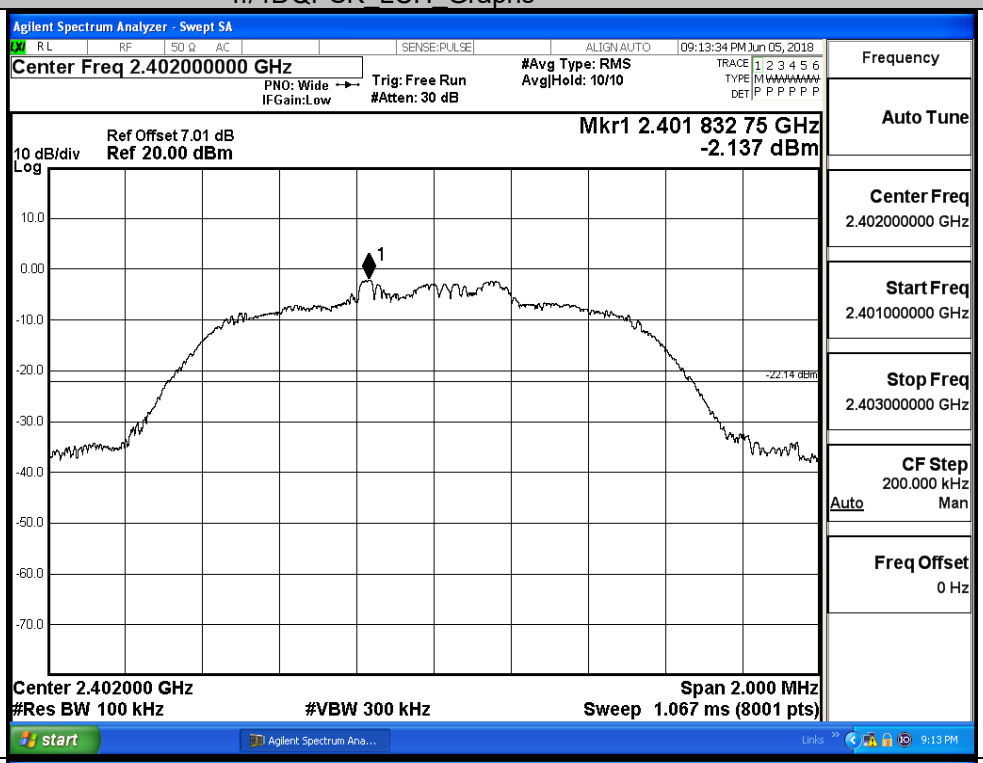
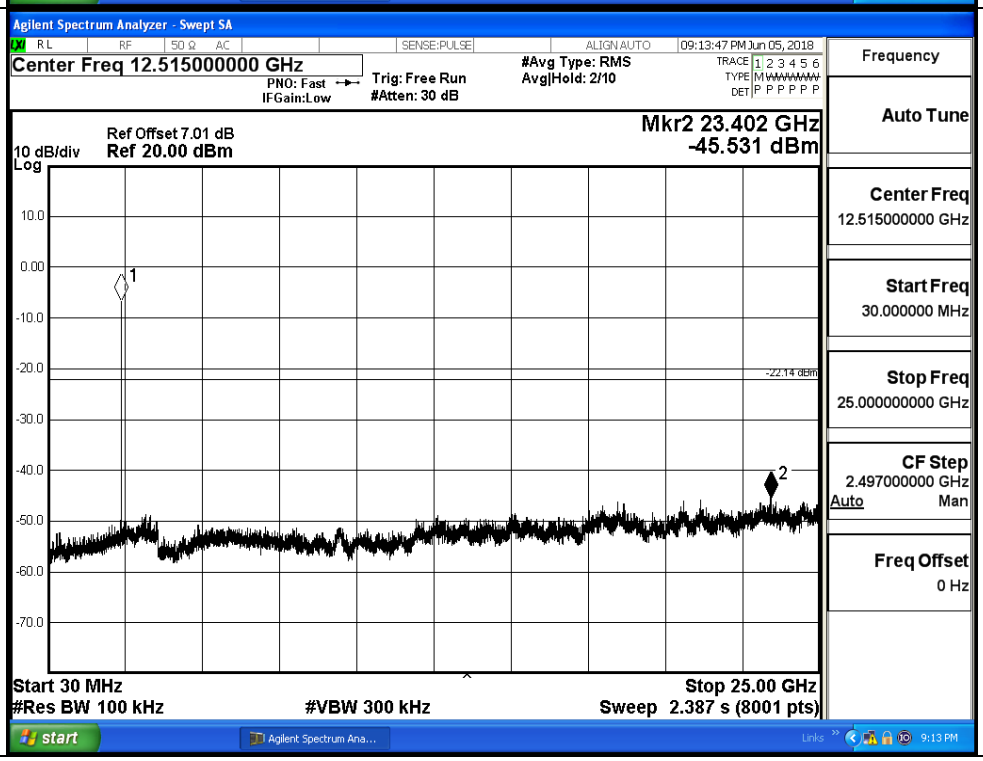


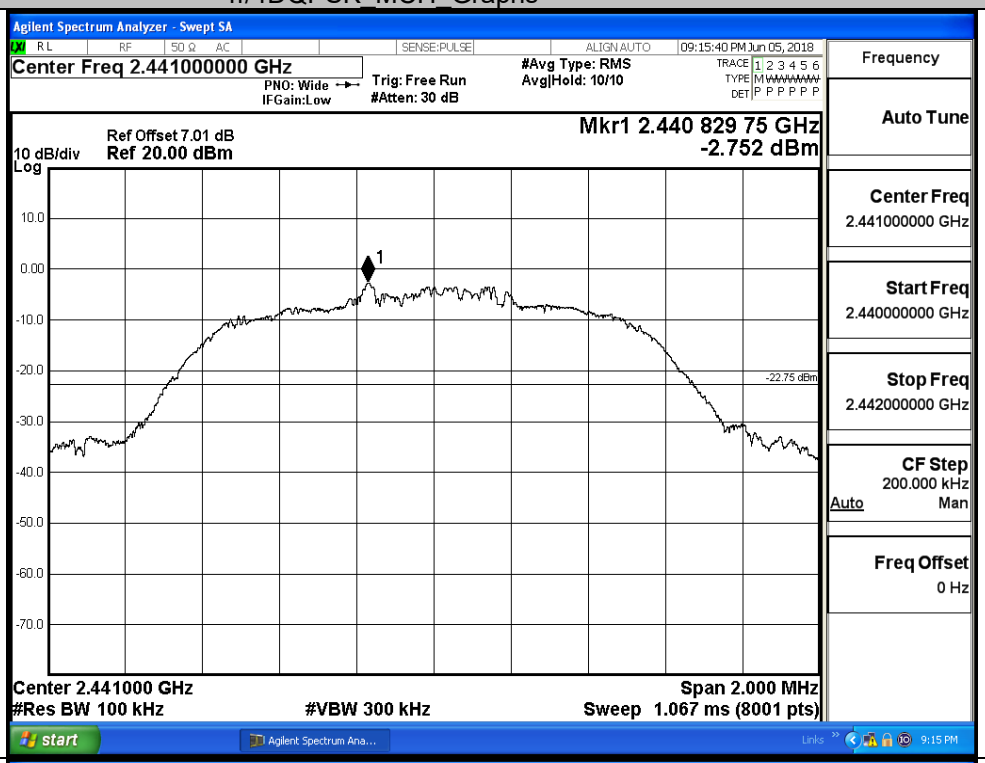
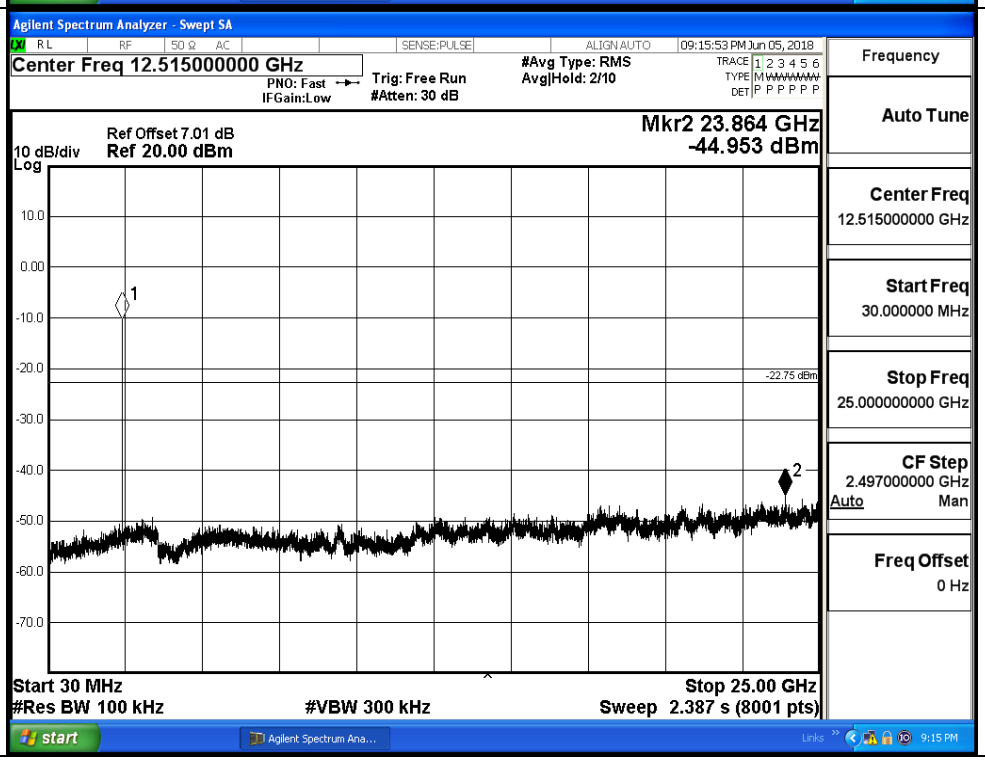
Puw		

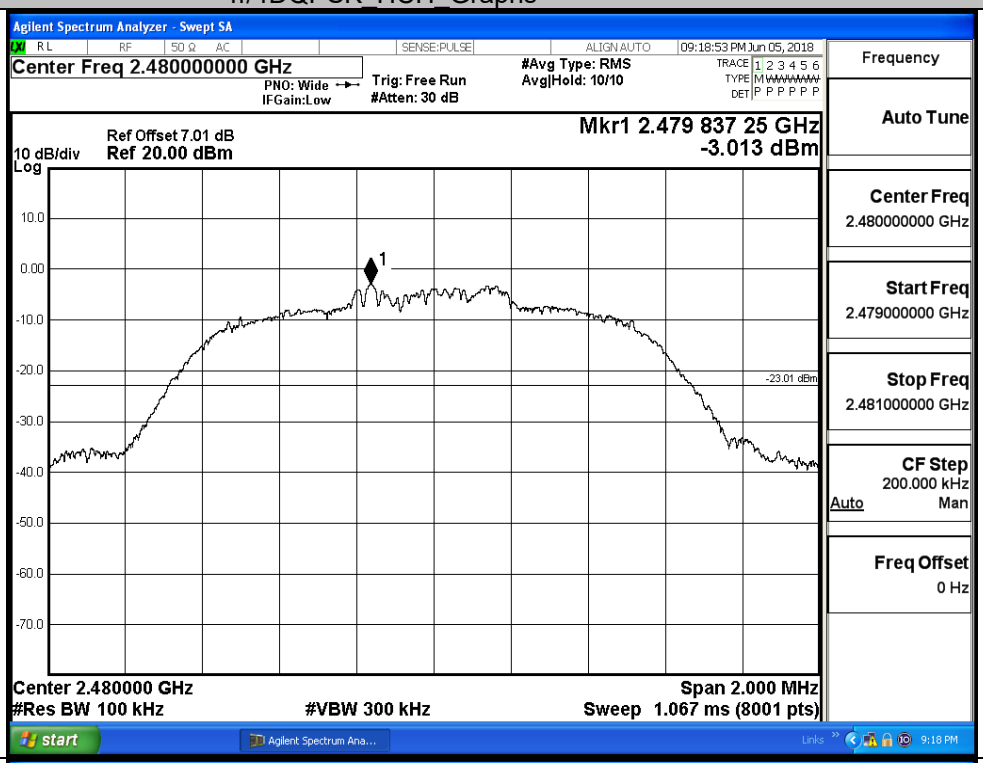
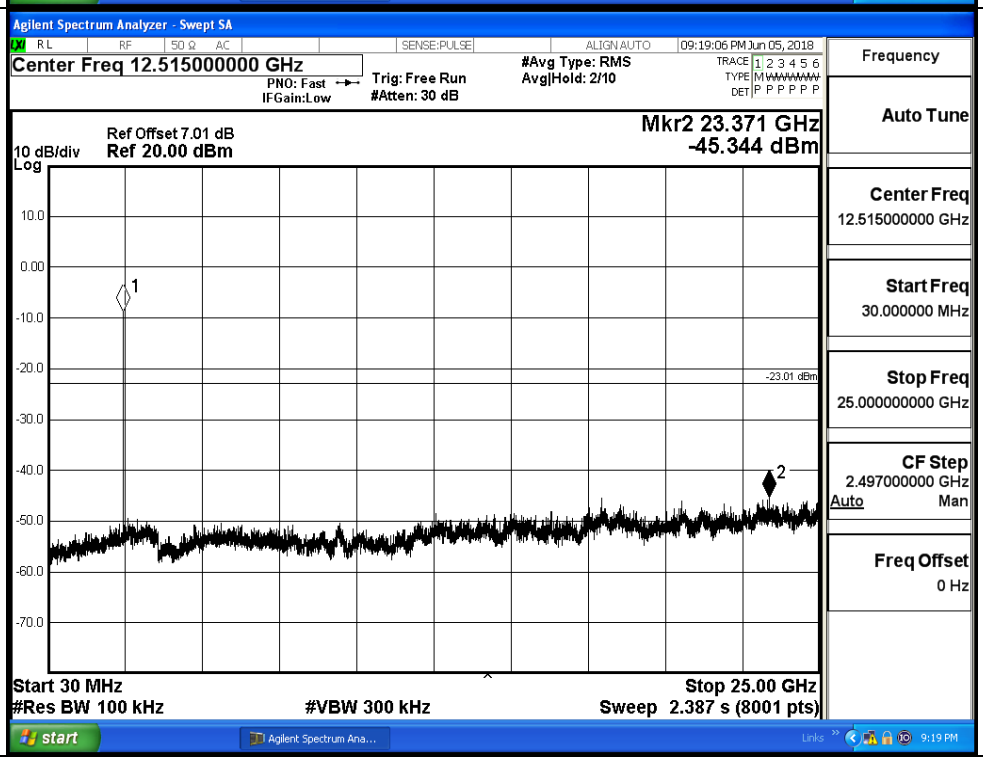
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
09:06:26 PM Jun 05, 2018
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 2/10
TRACE 1 2 3 4 5 6
TYPE M
DET P P P P P
Ref Offset 7.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr2 24.401 GHz
-43.809 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-20.92 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.387 s (8001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz
start
Agilent Spectrum Ana...
9:06 PM

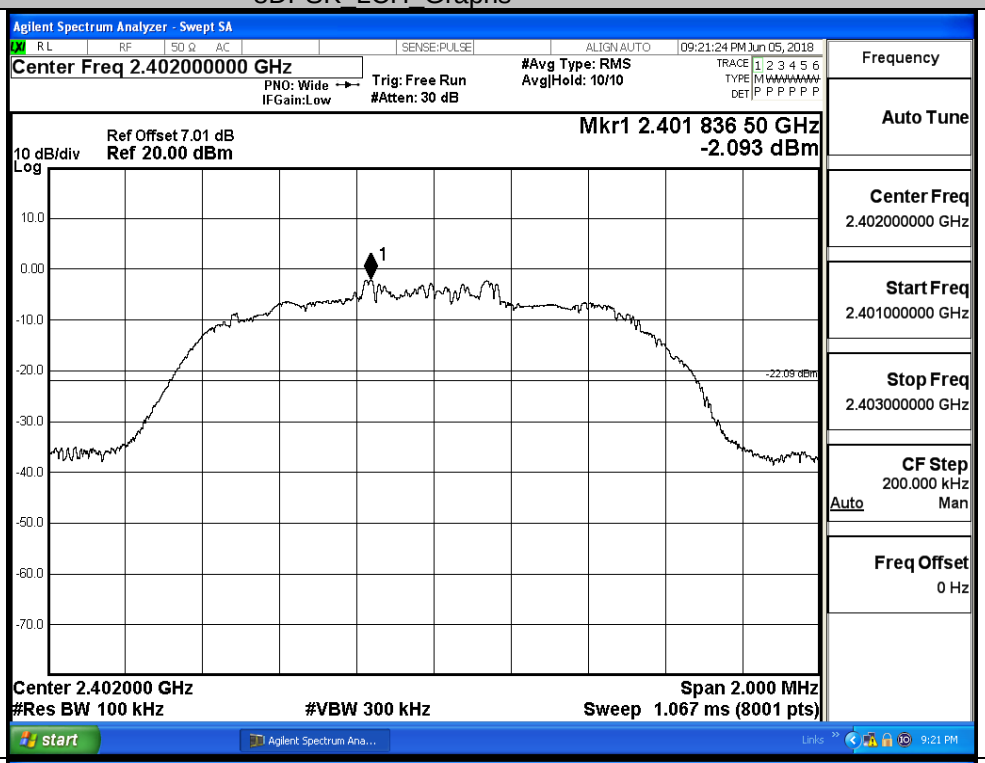
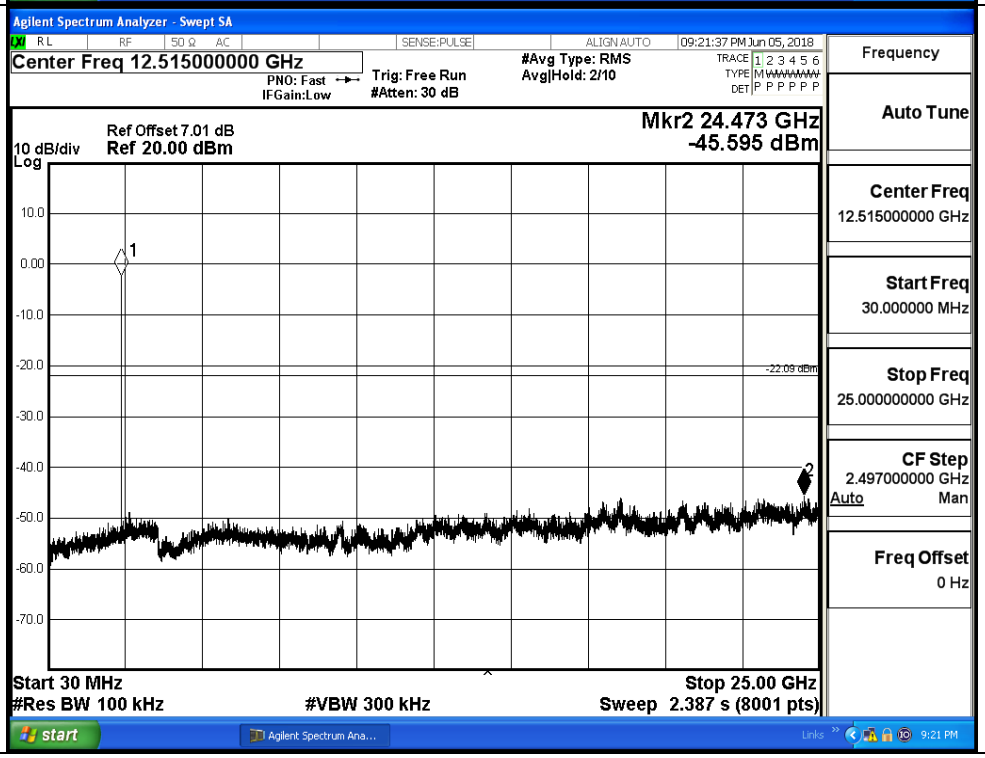
GFSK_MCH_Graphs		
Pref		
Puw		

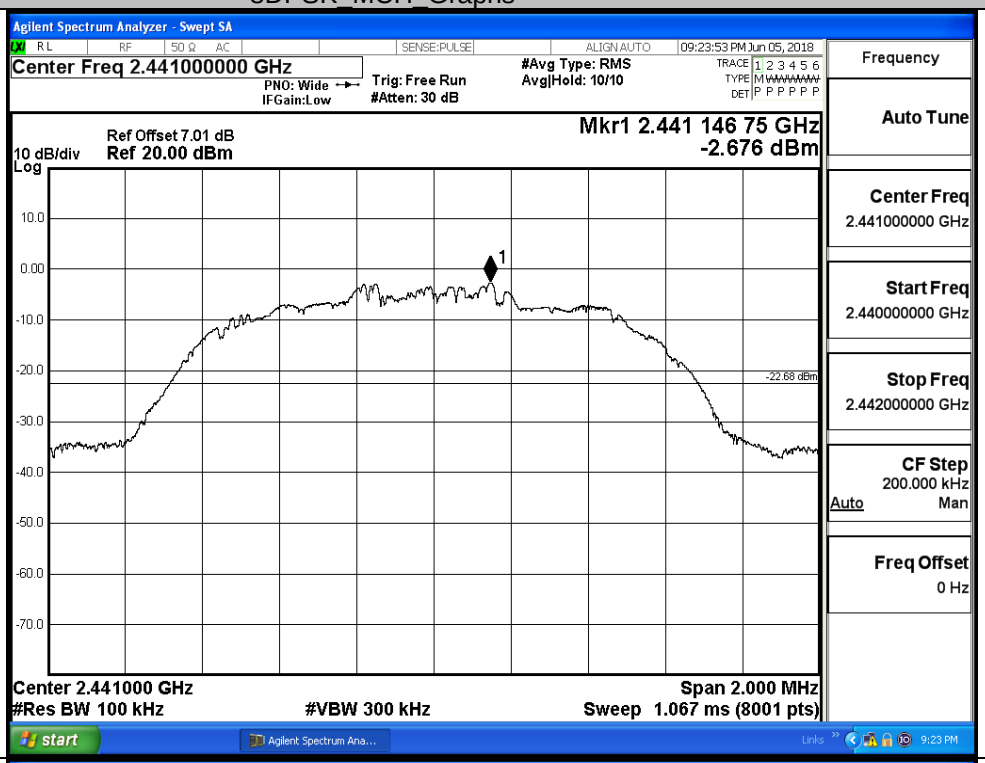
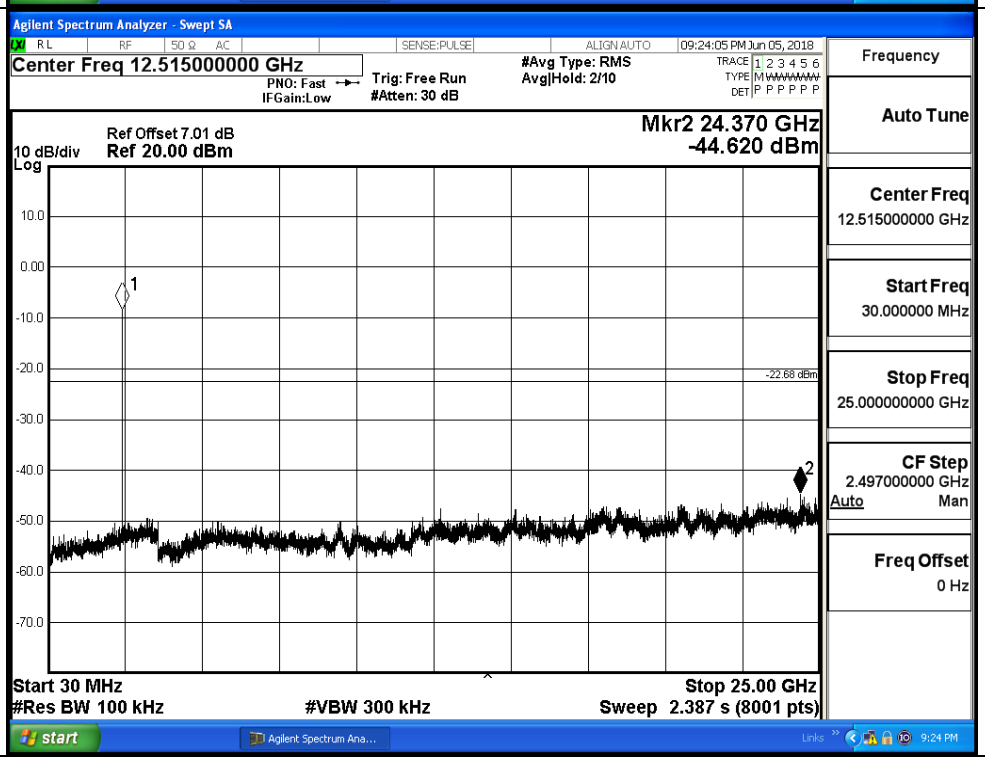
GFSK_HCH_Graphs			
Pref			
Puw			

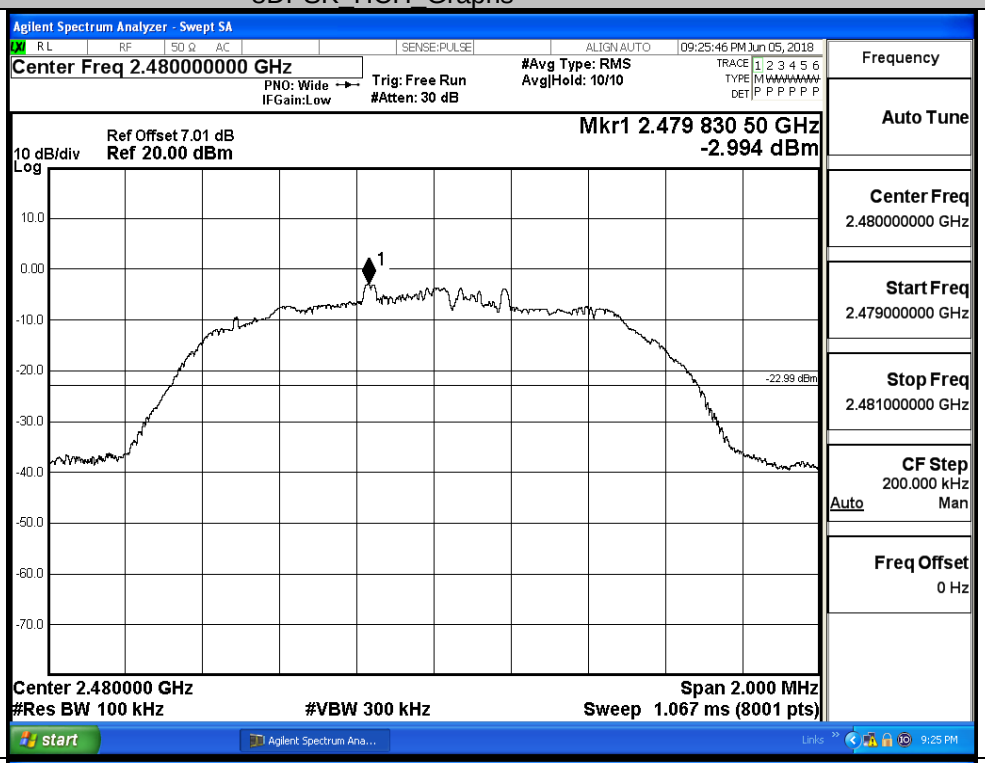
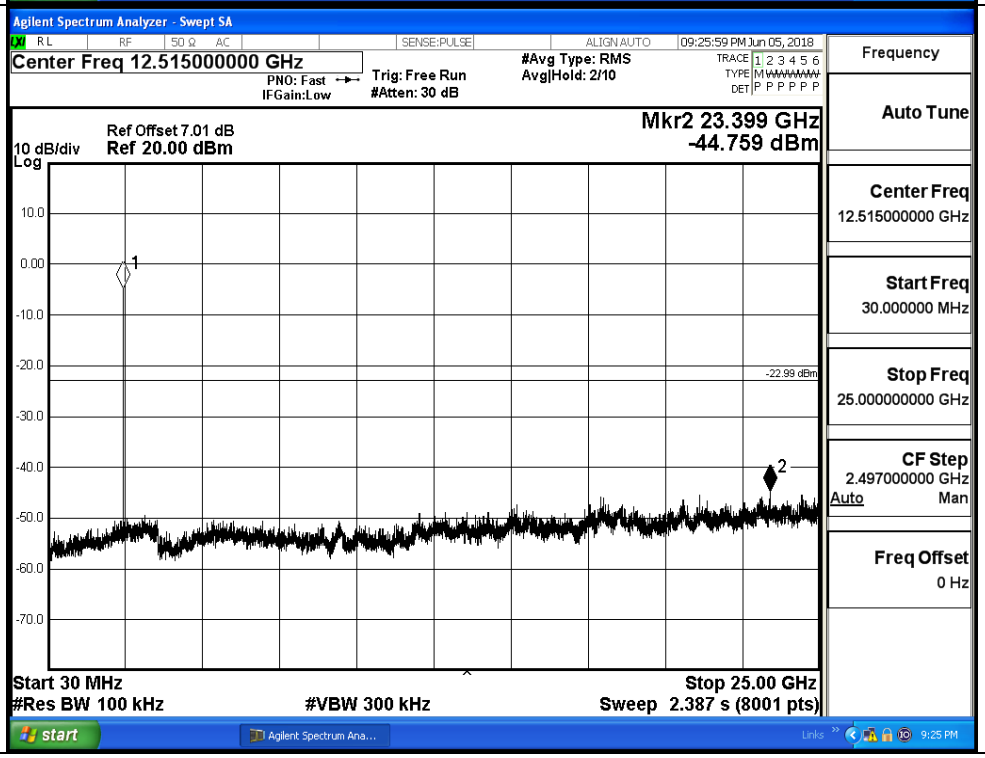
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

π/4DQPSK_MCH_Graphs		
Pref		
Puw		

π/4DQPSK_HCH_Graphs		
Pref		
Puw		

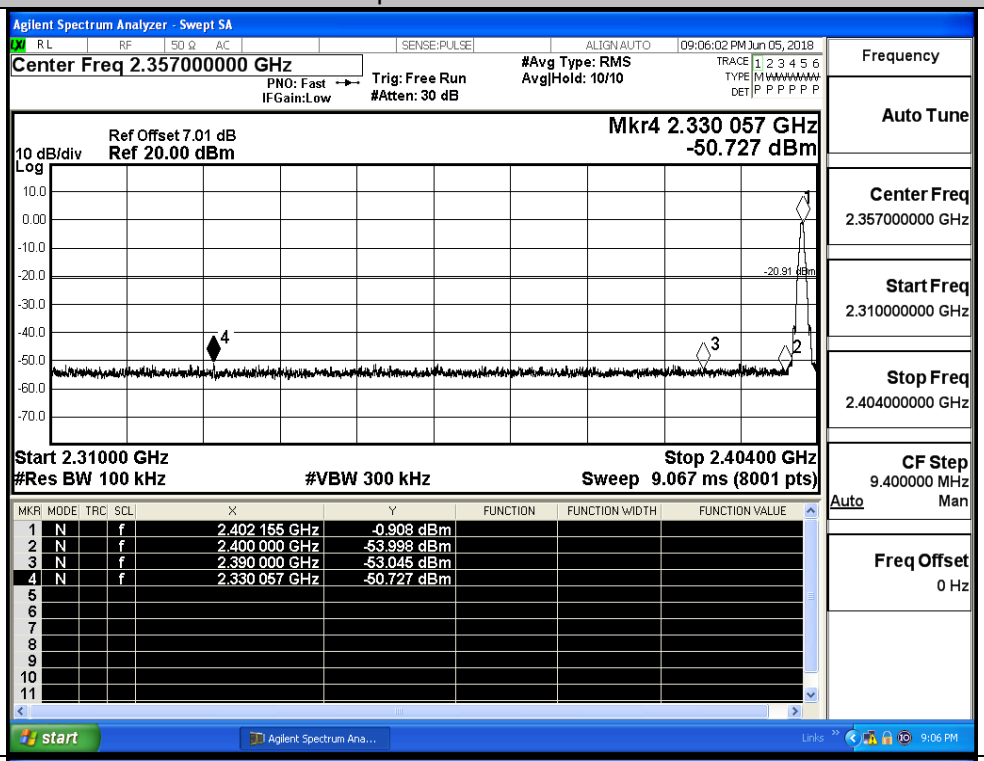
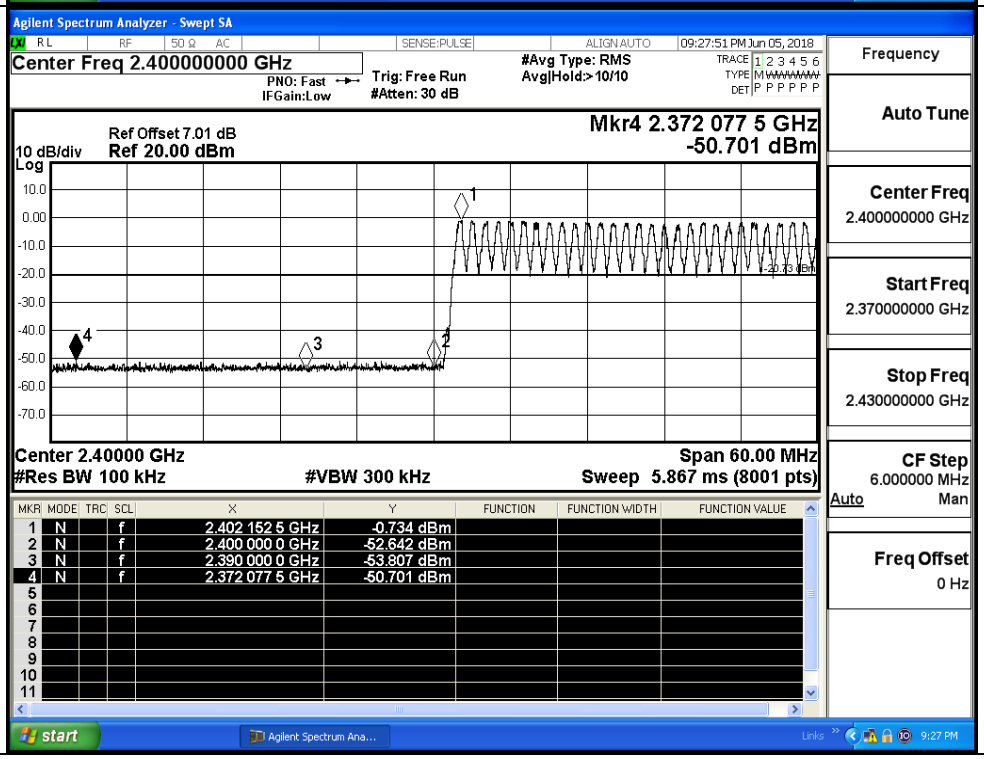
8DPSK_LCH_Graphs		
Pref		
Puw		

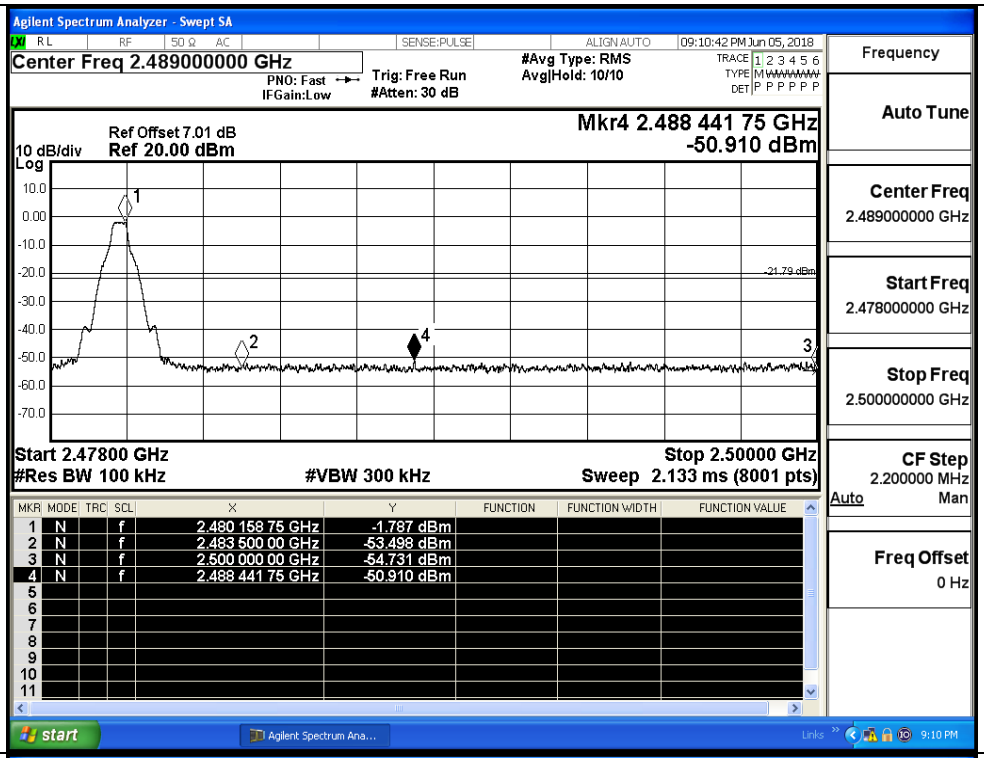
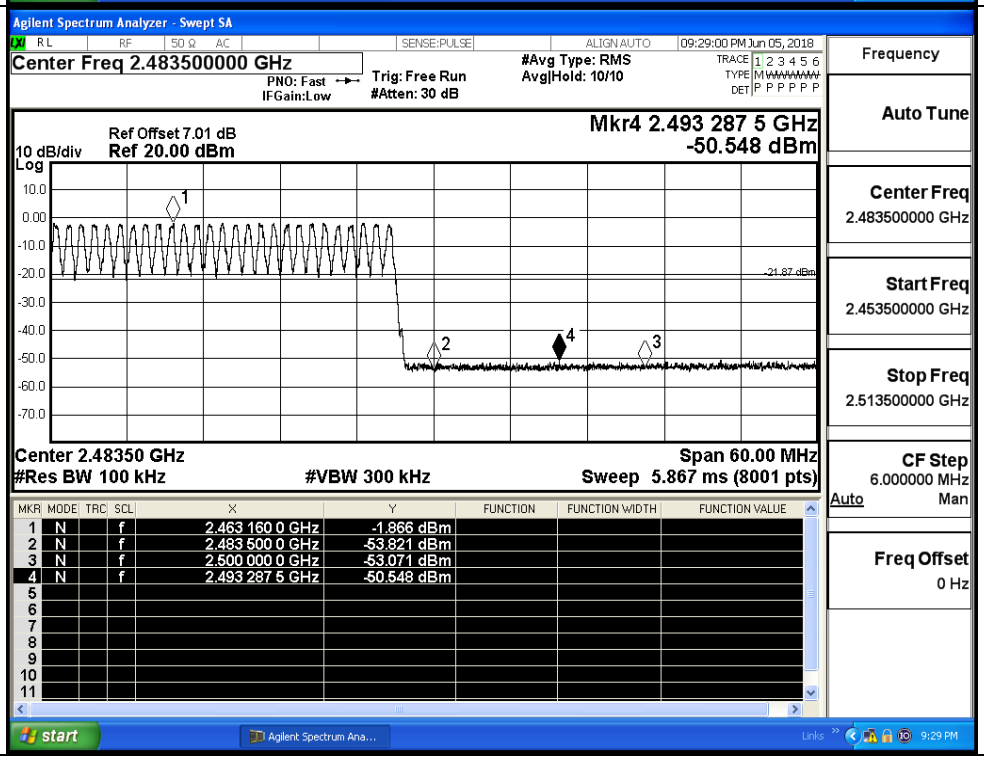
8DPSK_MCH_Graphs		
Pref		
Puw		

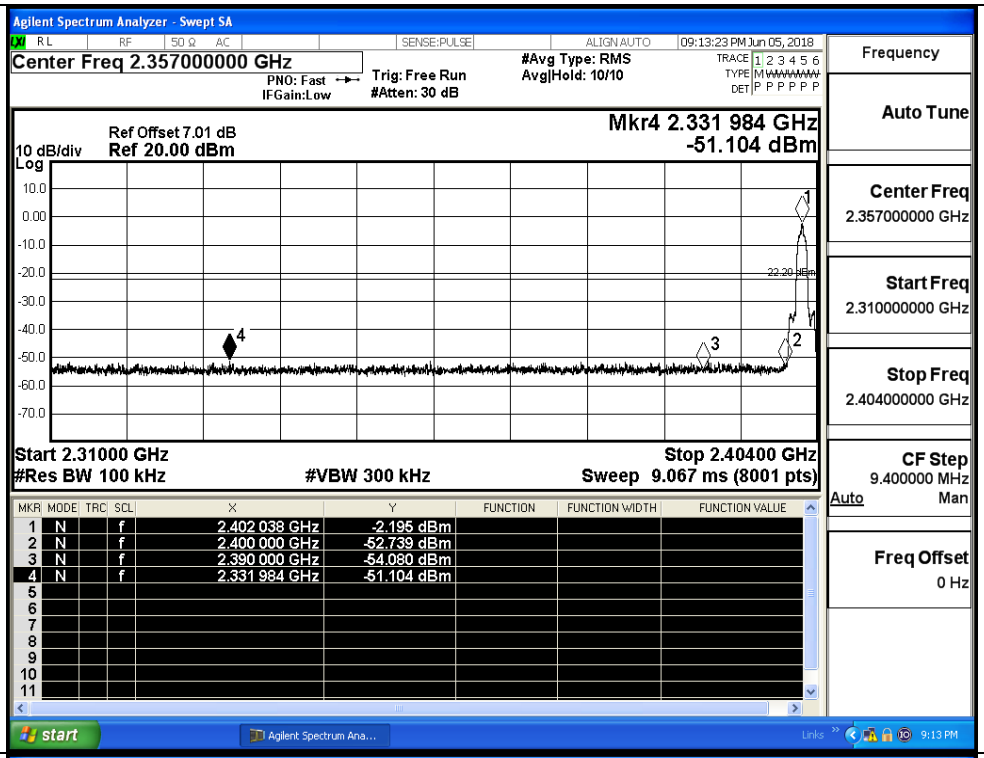
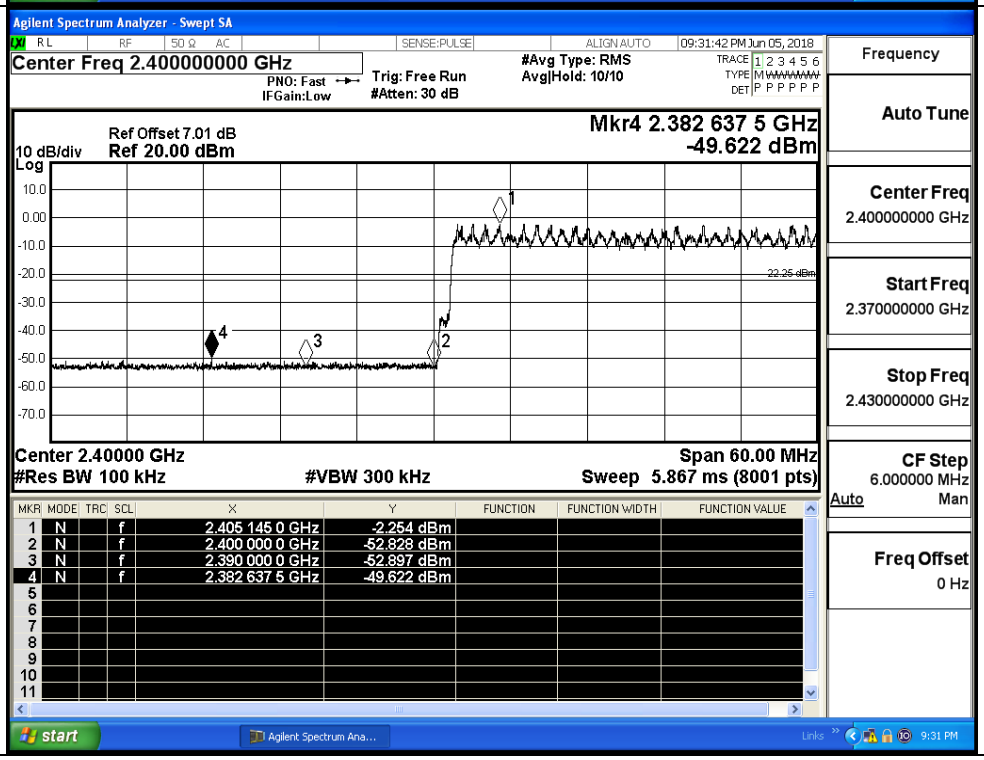
8DPSK_HCH_Graphs		
Pref		
Puw		

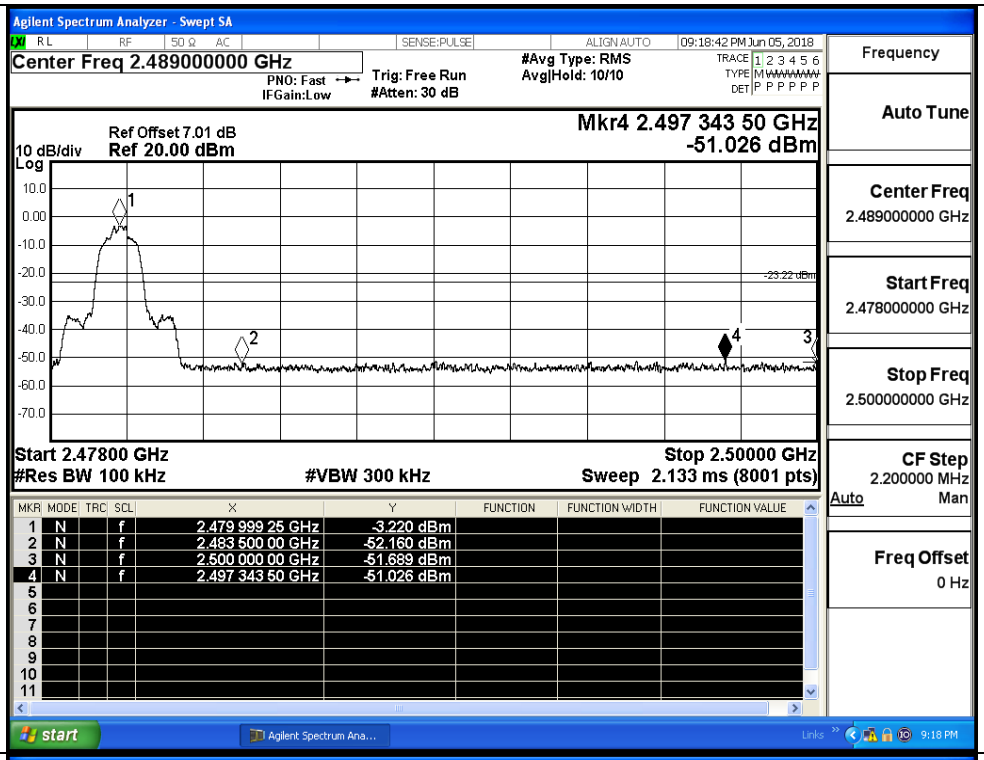
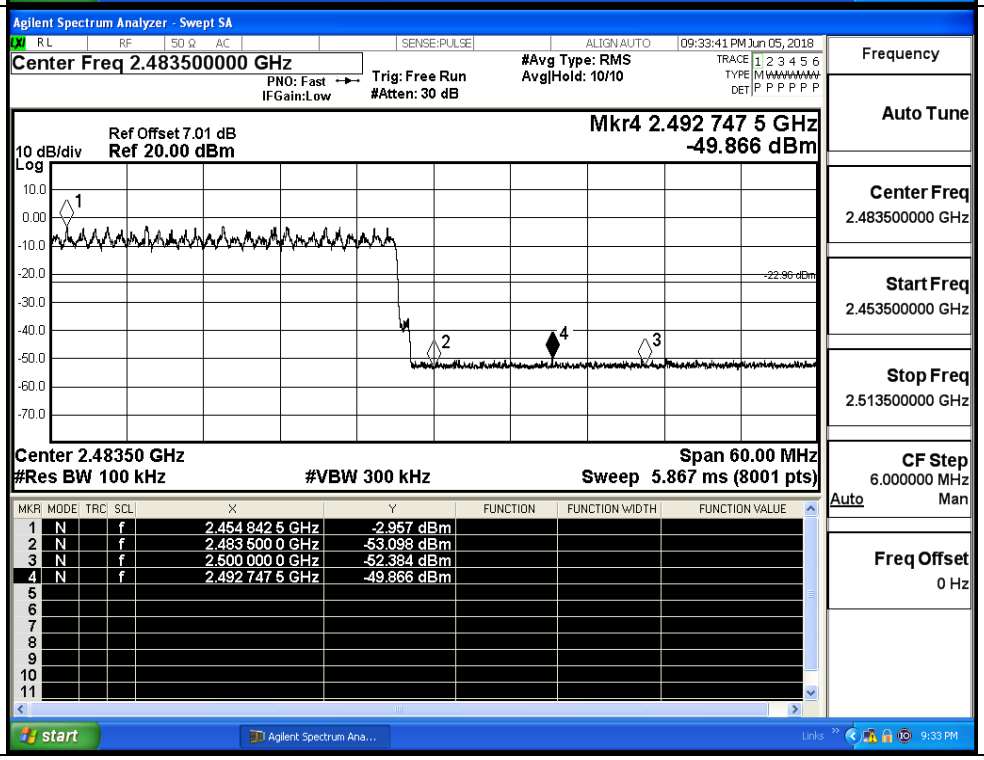
A.7 Band-edge for RF Conducted Emissions

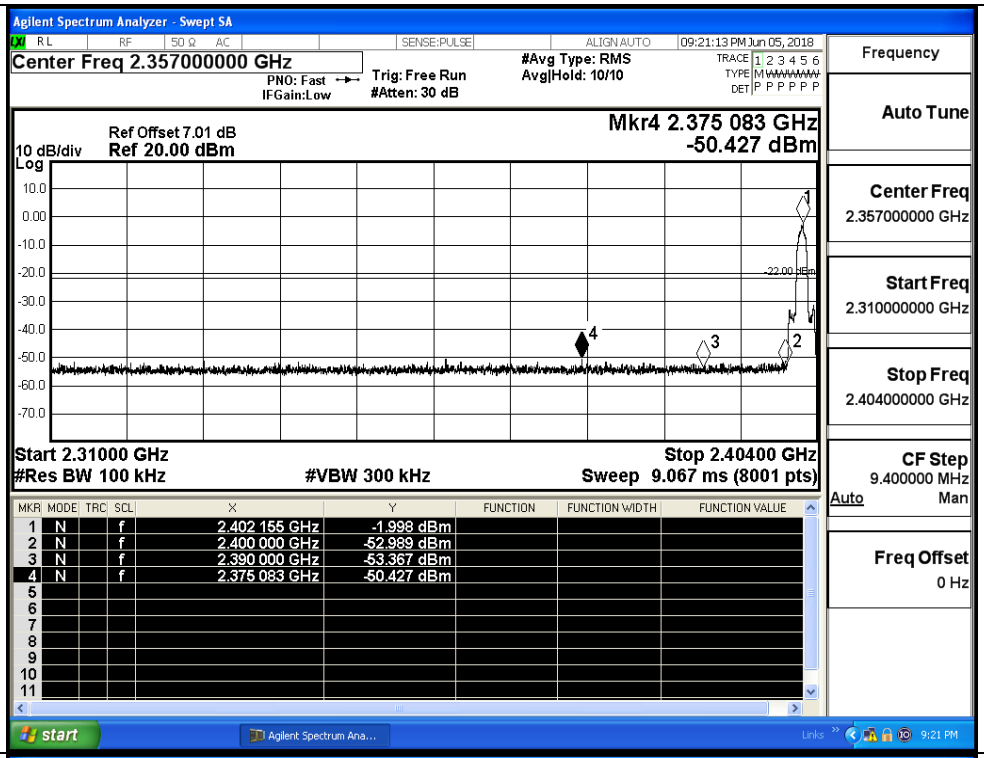
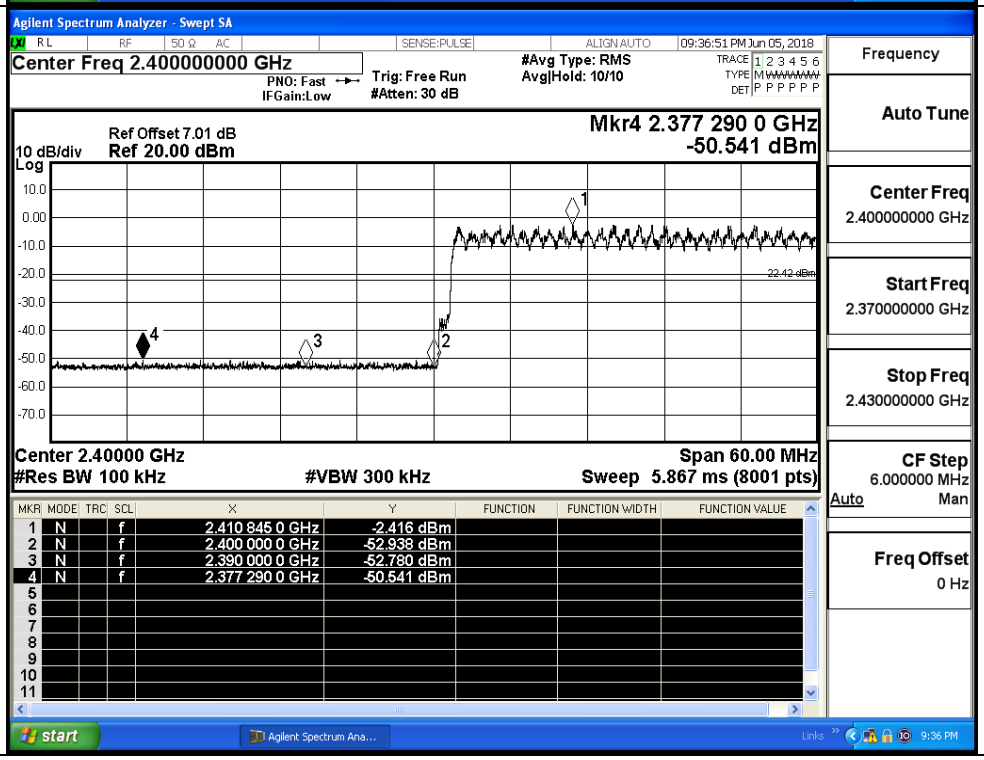
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.908	Off	-50.727	-20.91	PASS
			-0.734	On	-50.701	-20.73	PASS
	HCH	2480	-1.787	Off	-50.910	-21.79	PASS
			-1.866	On	-50.548	-21.87	PASS
π/4DQPSK	LCH	2402	-2.195	Off	-51.104	-22.2	PASS
			-2.254	On	-49.622	-22.25	PASS
	HCH	2480	-3.220	Off	-51.026	-23.22	PASS
			-2.957	On	-49.866	-22.96	PASS
8DPSK	LCH	2402	-1.998	Off	-50.427	-22	PASS
			-2.416	On	-50.541	-22.42	PASS
	HCH	2480	-2.833	Off	-51.286	-22.83	PASS
			-2.885	On	-50.199	-22.89	PASS

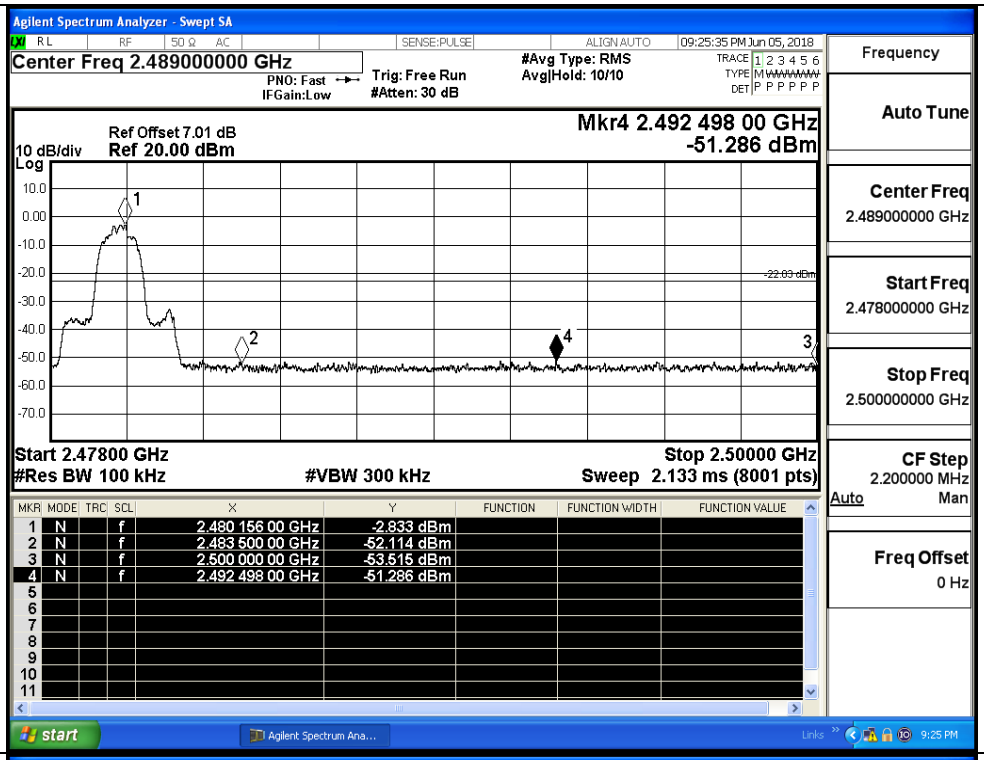
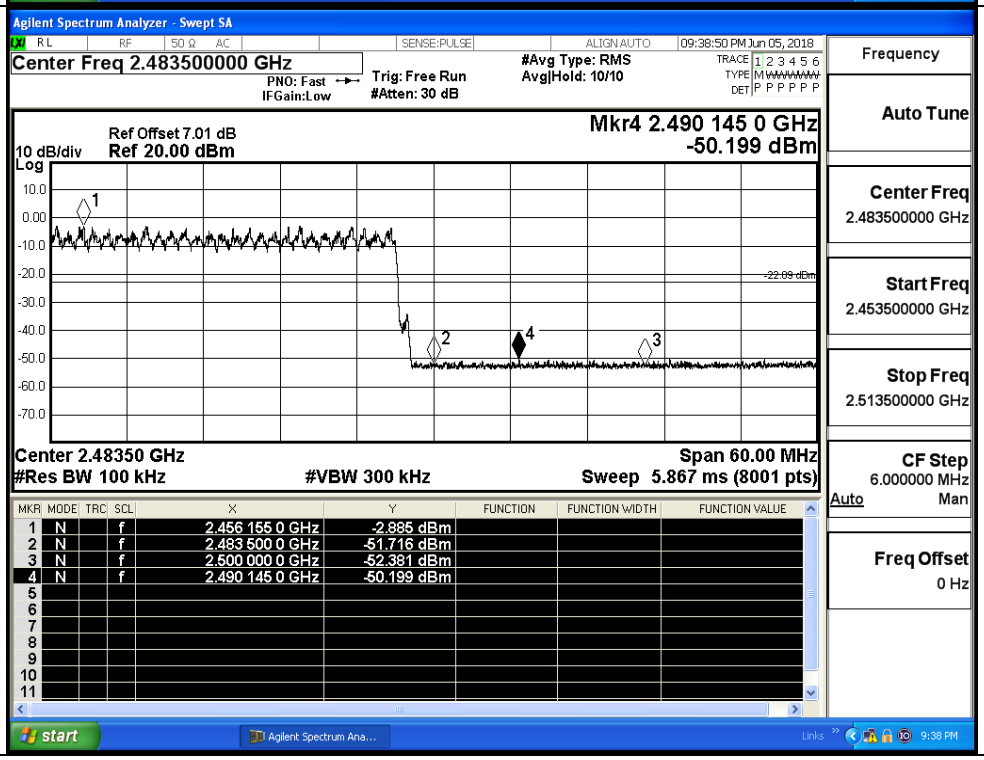
Test Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	

GFSK/HCH/No Hop	
GFSK/HCH/Hop	

π/4DQPSK/LCH/No Hop	
π/4DQPSK/LCH/Hop	

π/4DQPSK/HCH/No Hop	
π/4DQPSK/HCH/Hop	

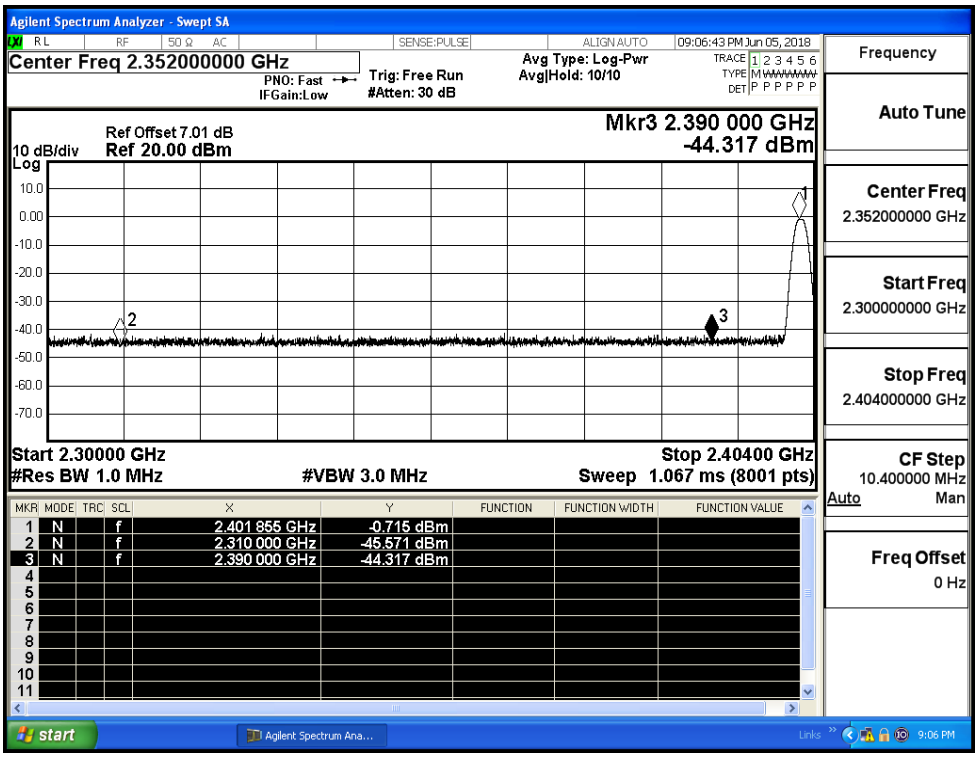
8DPSK/LCH/No Hop	
8DPSK/LCH/Hop	

8DPSK/HCH/No Hop	
8DPSK/HCH/Hop	

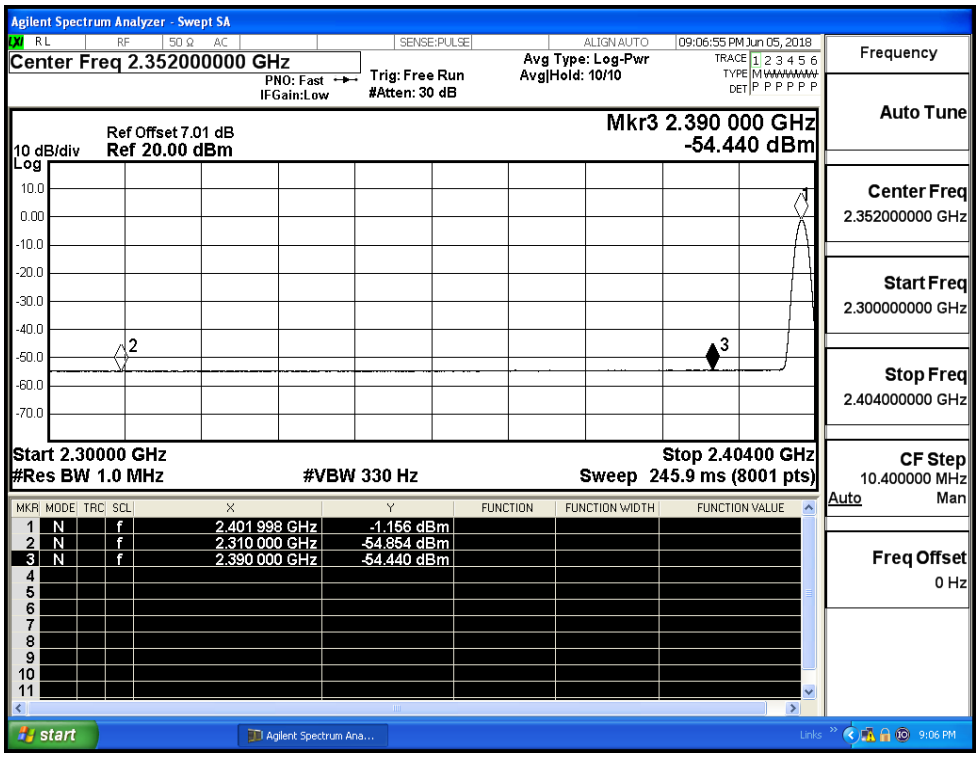
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-45.57	2.0	0	51.69	PEAK	74	PASS
	Off	2310.0	-54.85	2.0	0	42.40	AV	54	PASS
	Off	2390.0	-44.32	2.0	0	52.94	PEAK	74	PASS
	Off	2390.0	-54.44	2.0	0	42.82	AV	54	PASS
	Off	2483.5	-42.68	2.0	0	54.58	PEAK	74	PASS
	Off	2483.5	-54.05	2.0	0	43.21	AV	54	PASS
	Off	2500.0	-43.95	2.0	0	53.31	PEAK	74	PASS
	Off	2500.0	-54.01	2.0	0	43.25	AV	54	PASS
π/4DQPSK	Off	2310.0	-44.03	2.0	0	53.23	PEAK	74	PASS
	Off	2310.0	-54.86	2.0	0	42.39	AV	54	PASS
	Off	2390.0	-44.17	2.0	0	53.09	PEAK	74	PASS
	Off	2390.0	-54.61	2.0	0	42.65	AV	54	PASS
	Off	2483.5	-44.69	2.0	0	52.56	PEAK	74	PASS
	Off	2483.5	-54.21	2.0	0	43.05	AV	54	PASS
	Off	2500.0	-44.97	2.0	0	52.29	PEAK	74	PASS
	Off	2500.0	-54.14	2.0	0	43.11	AV	54	PASS
8DPSK	Off	2310.0	-44.68	2.0	0	52.57	PEAK	74	PASS
	Off	2310.0	-54.80	2.0	0	42.45	AV	54	PASS
	Off	2390.0	-42.77	2.0	0	54.49	PEAK	74	PASS
	Off	2390.0	-54.53	2.0	0	42.73	AV	54	PASS
	Off	2483.5	-42.58	2.0	0	54.68	PEAK	74	PASS
	Off	2483.5	-54.16	2.0	0	43.09	AV	54	PASS
	Off	2500.0	-42.23	2.0	0	55.03	PEAK	74	PASS
	Off	2500.0	-54.19	2.0	0	43.07	AV	54	PASS

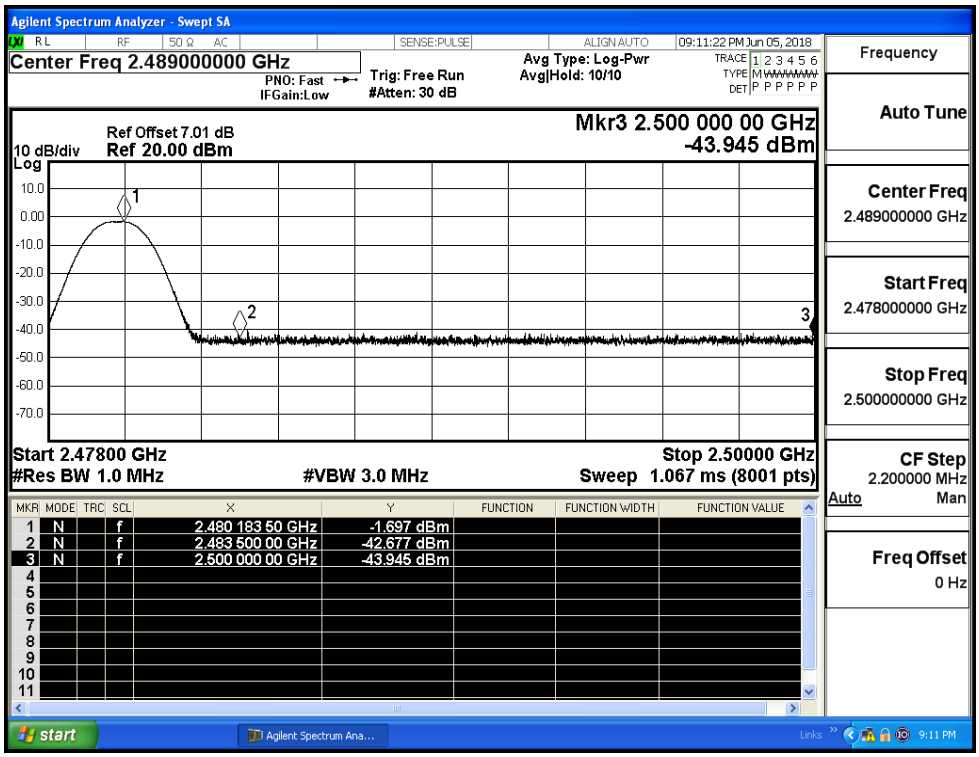
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



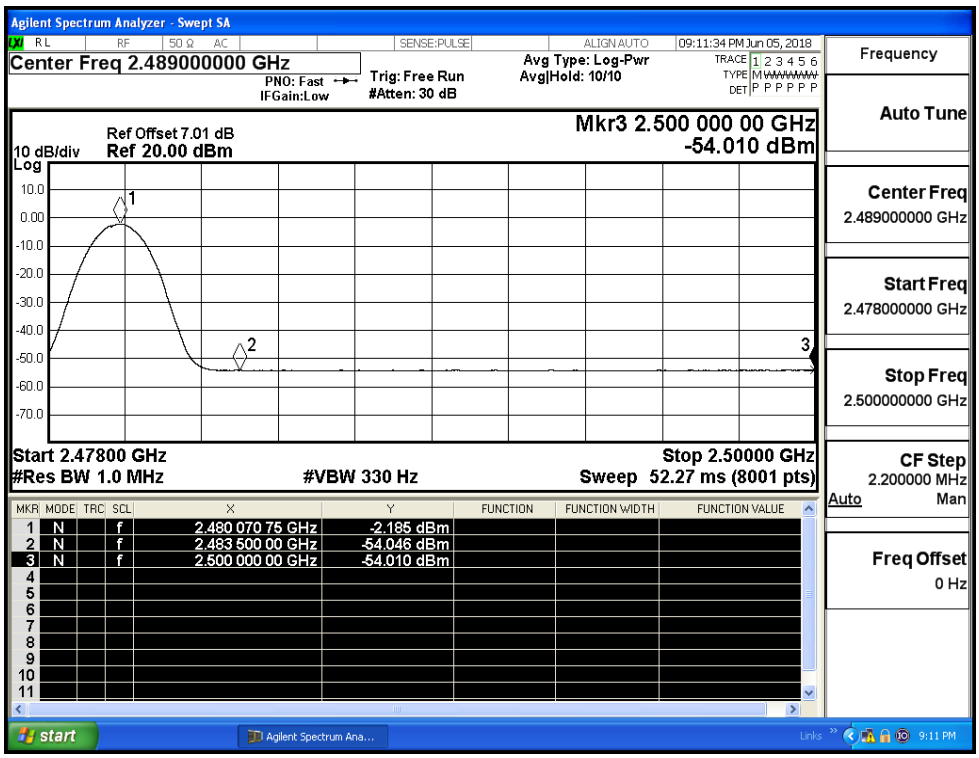
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



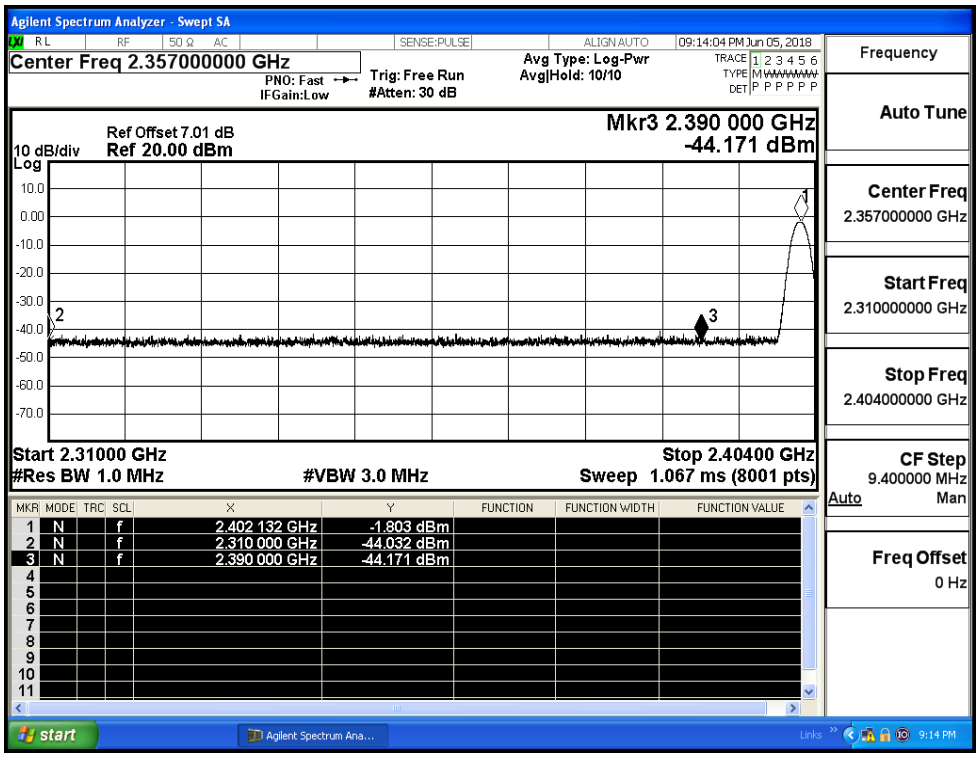
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



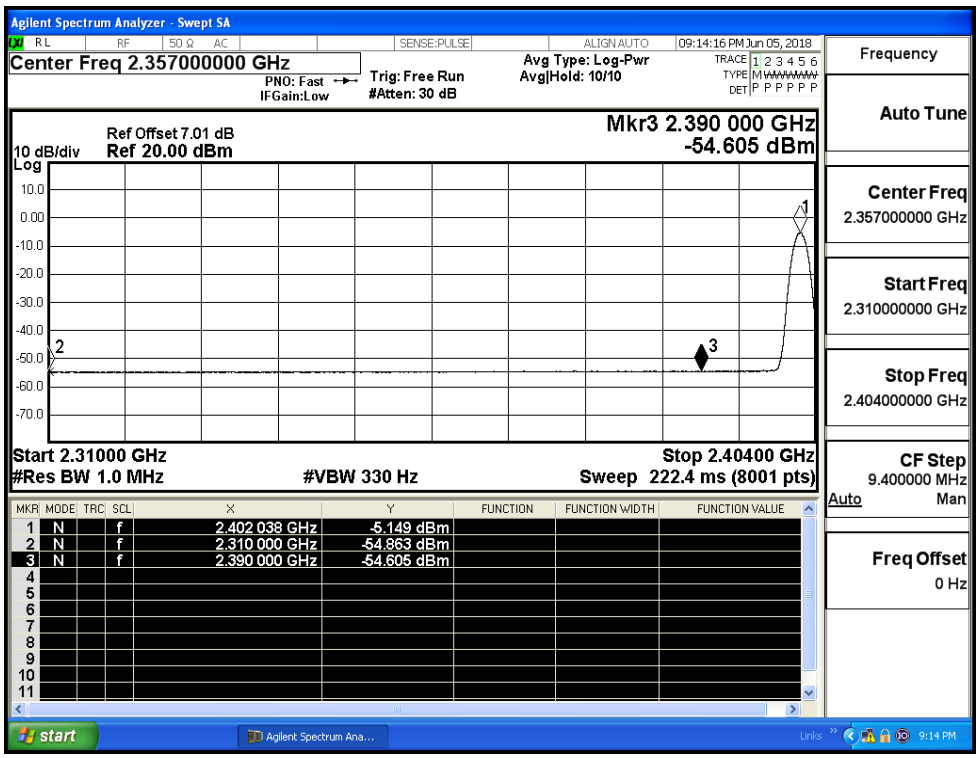
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



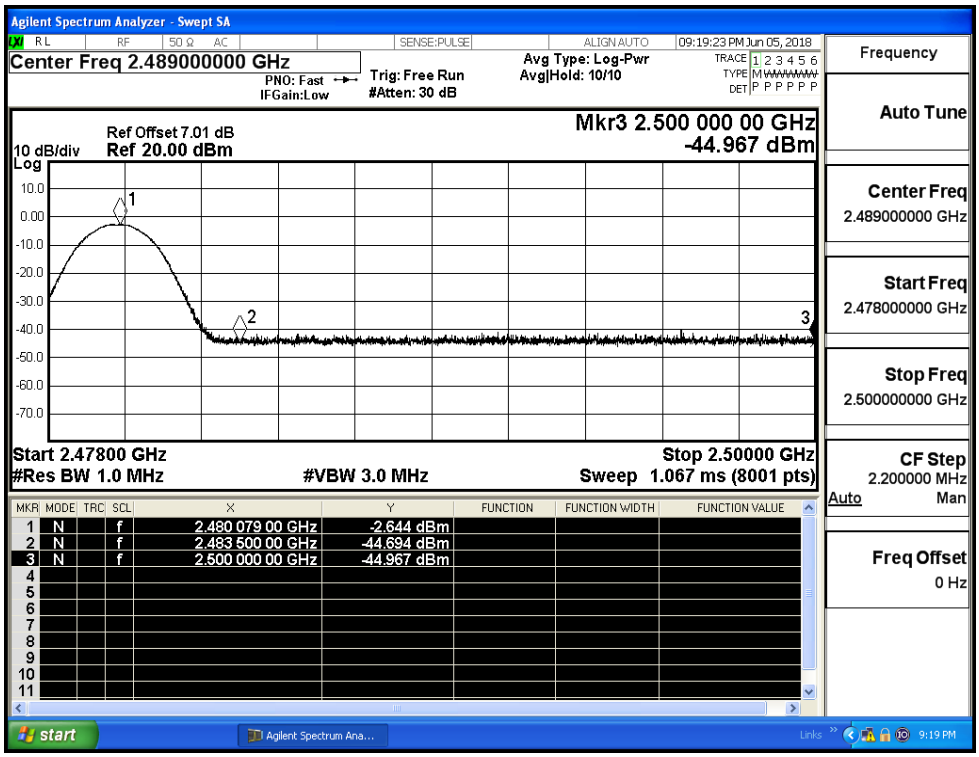
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



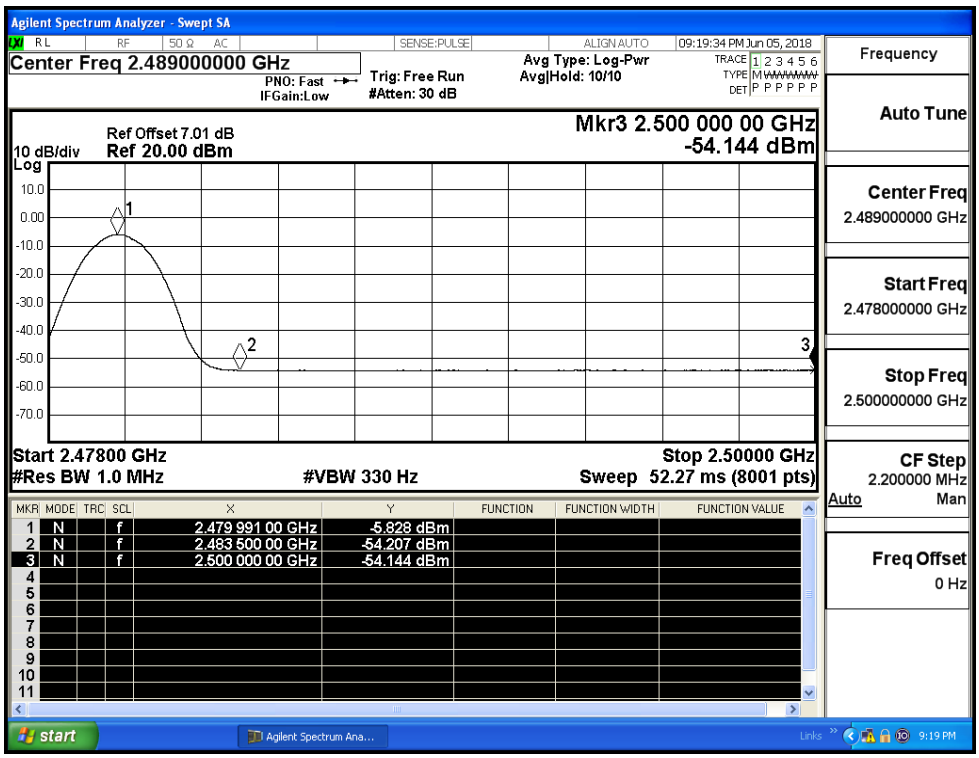
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



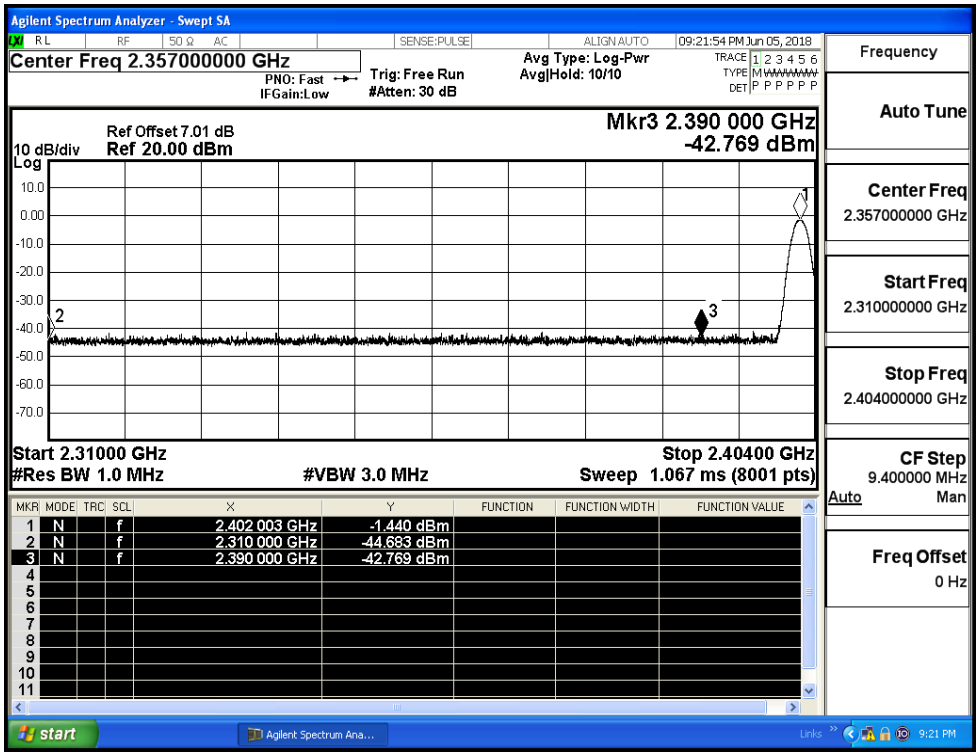
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



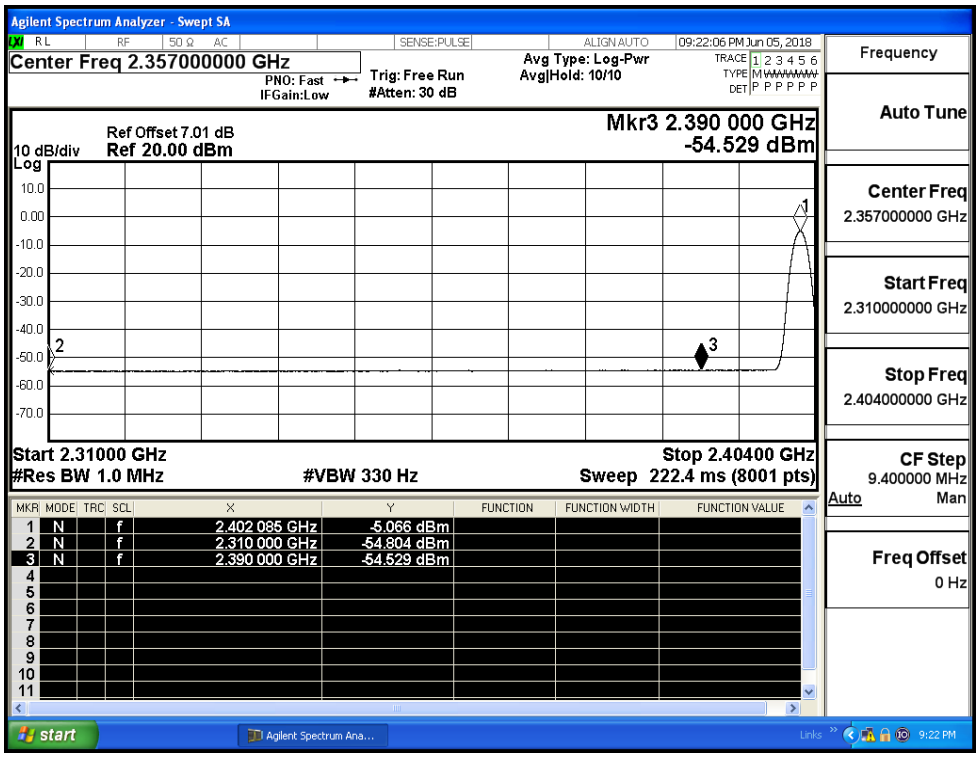
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



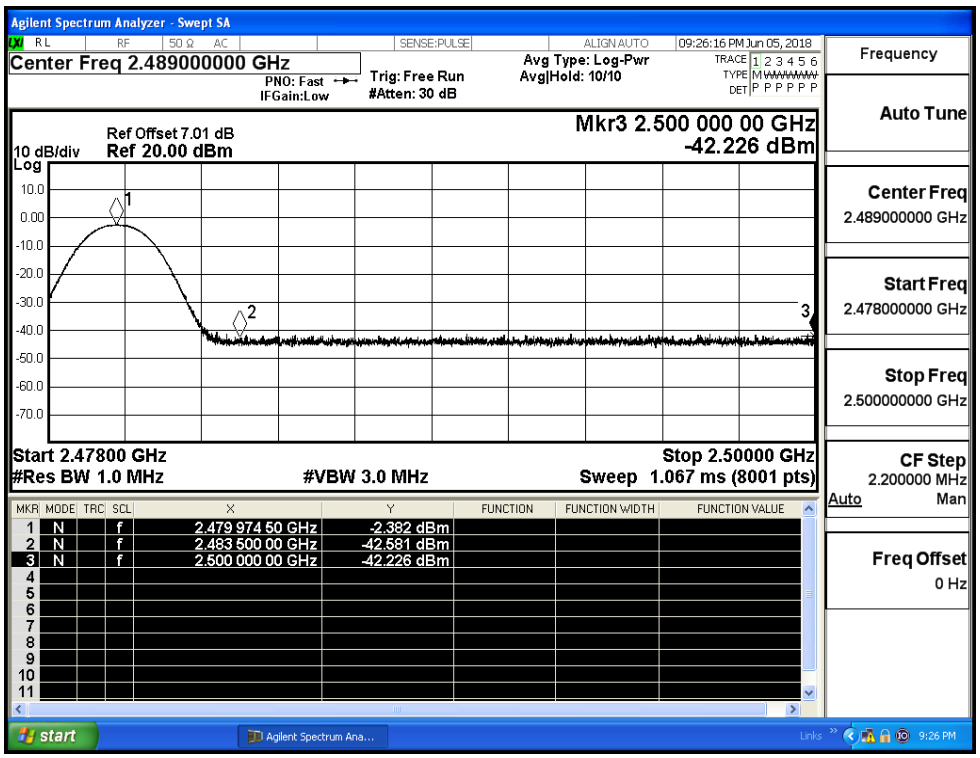
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)