Appendix A

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

Product Name: Urbanista Chicago

Trade Mark:Urbanista

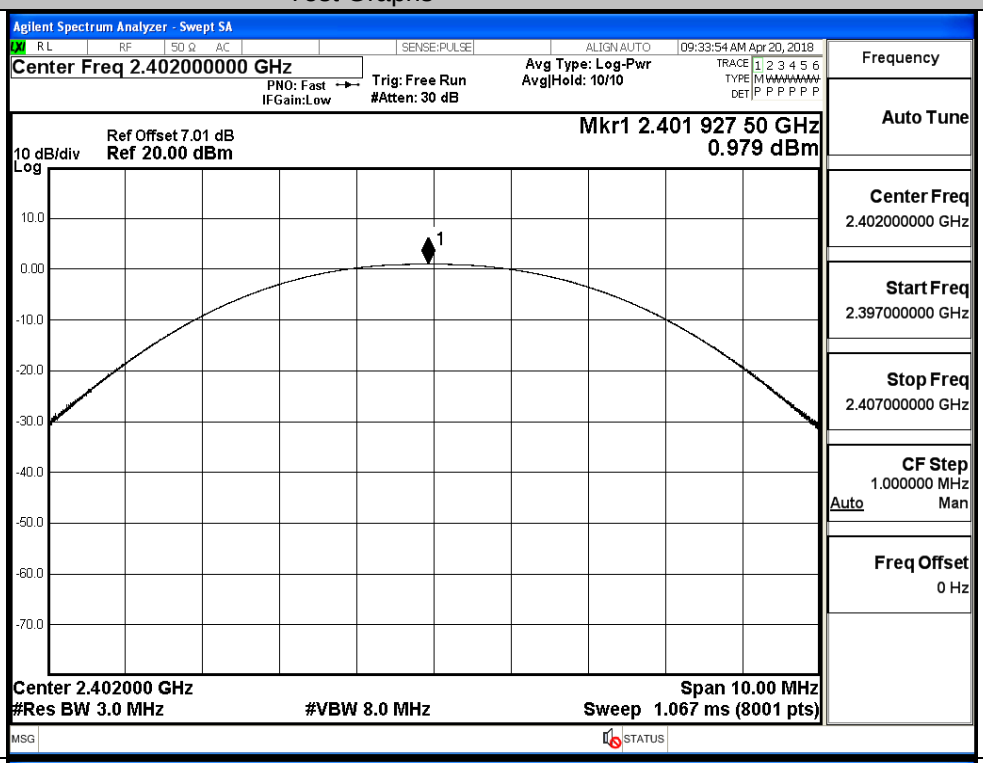
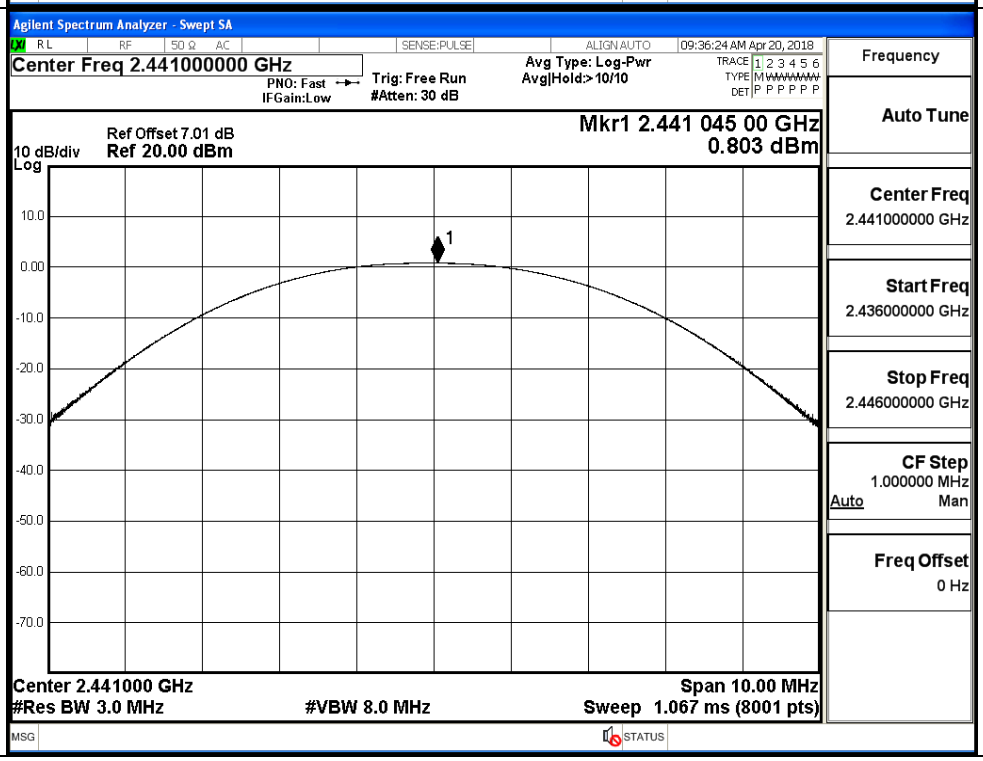
Test Model: Chicago Dark Clown

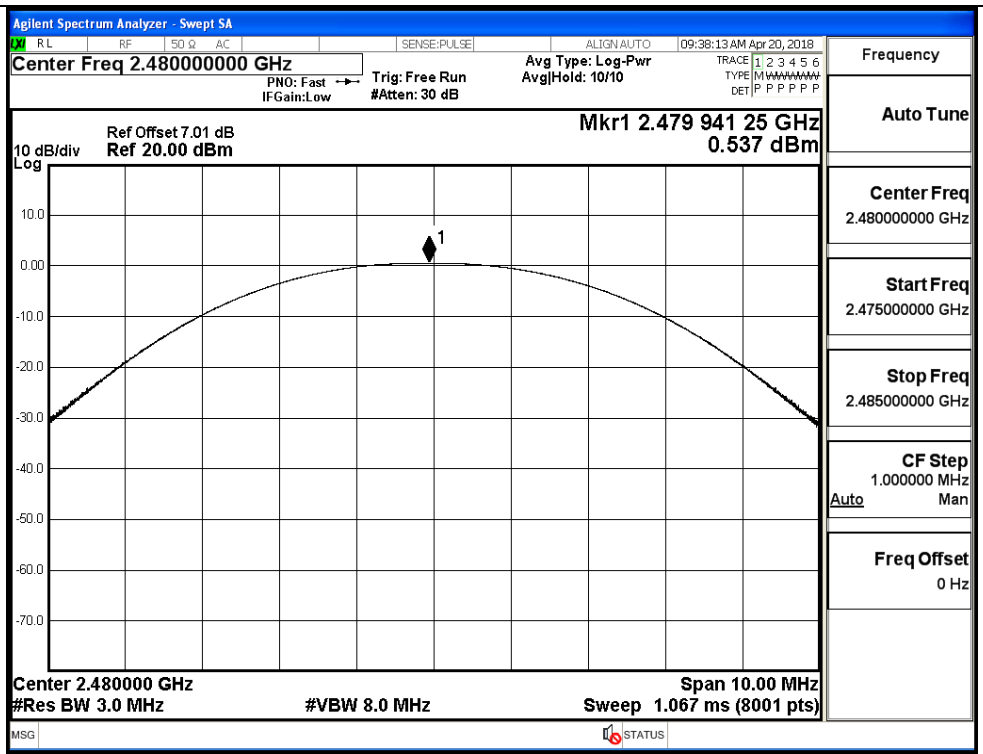
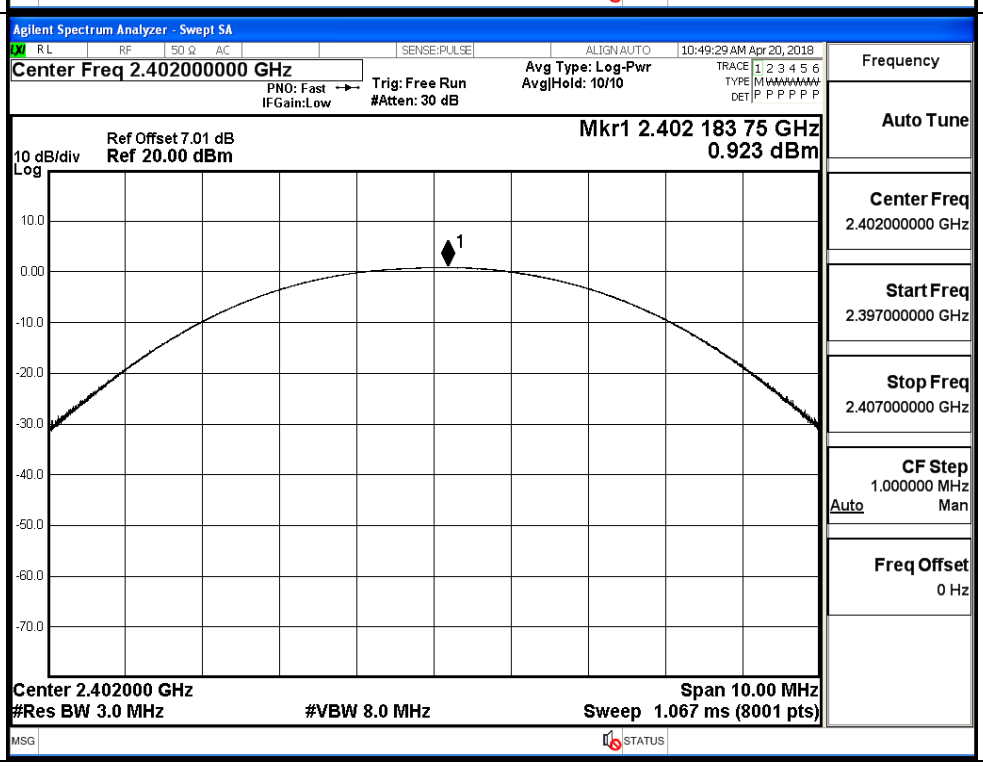
Environmental Conditions

Temperature:	23.8 ° C
Relative Humidity:	51.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Ryan.Hu
Supervised by:	Jayden.Zhuo

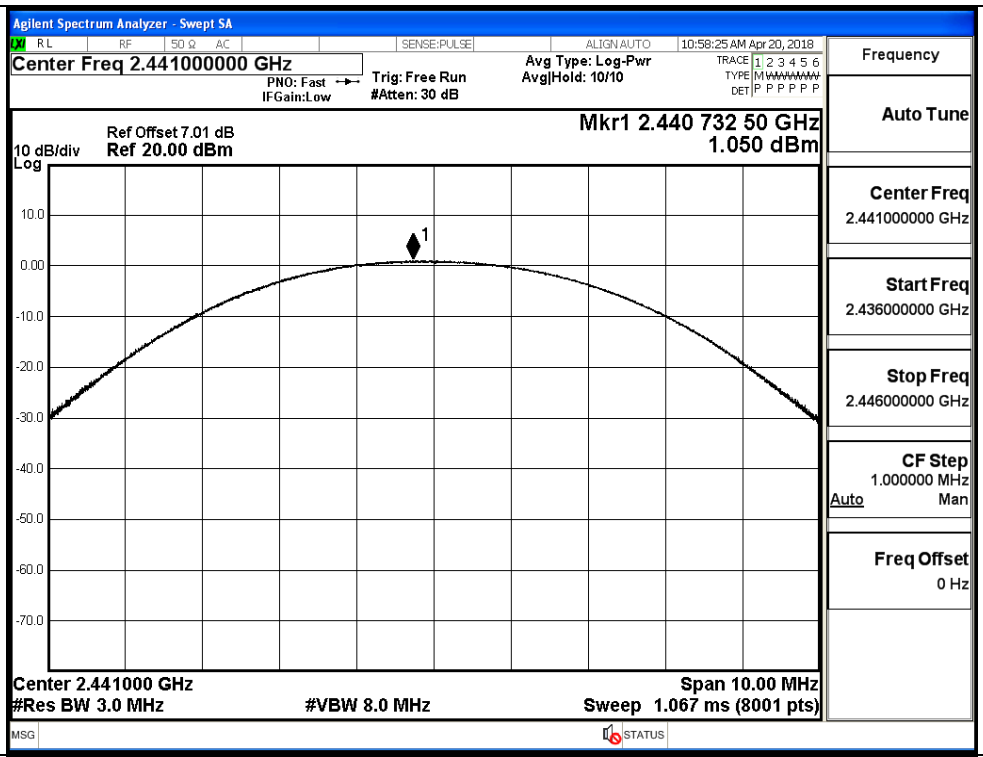
A.1 Maxmum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.979	21	PASS
	MCH	0.803	21	PASS
	HCH	0.537	21	PASS
π/4DQPSK	LCH	0.923	21	PASS
	MCH	1.050	21	PASS
	HCH	1.321	21	PASS
8DPSK	LCH	-1.051	21	PASS
	MCH	-2.618	21	PASS
	HCH	-2.636	21	PASS

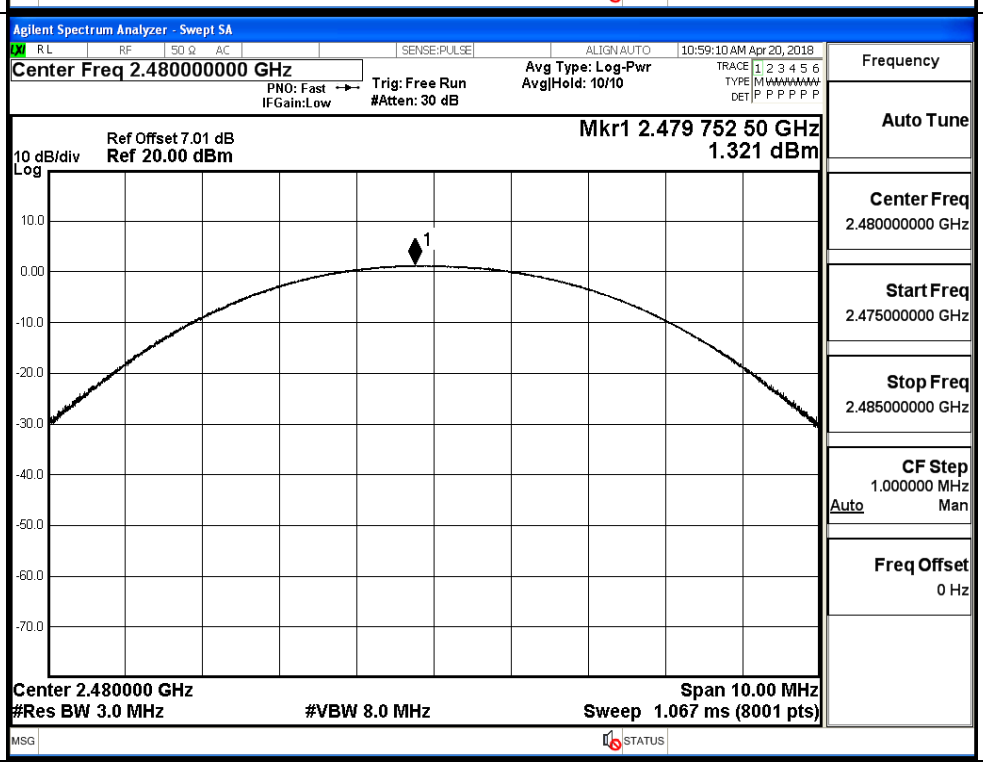
Test Graphs	
GFSK/LCH	
GFSK/MCH	

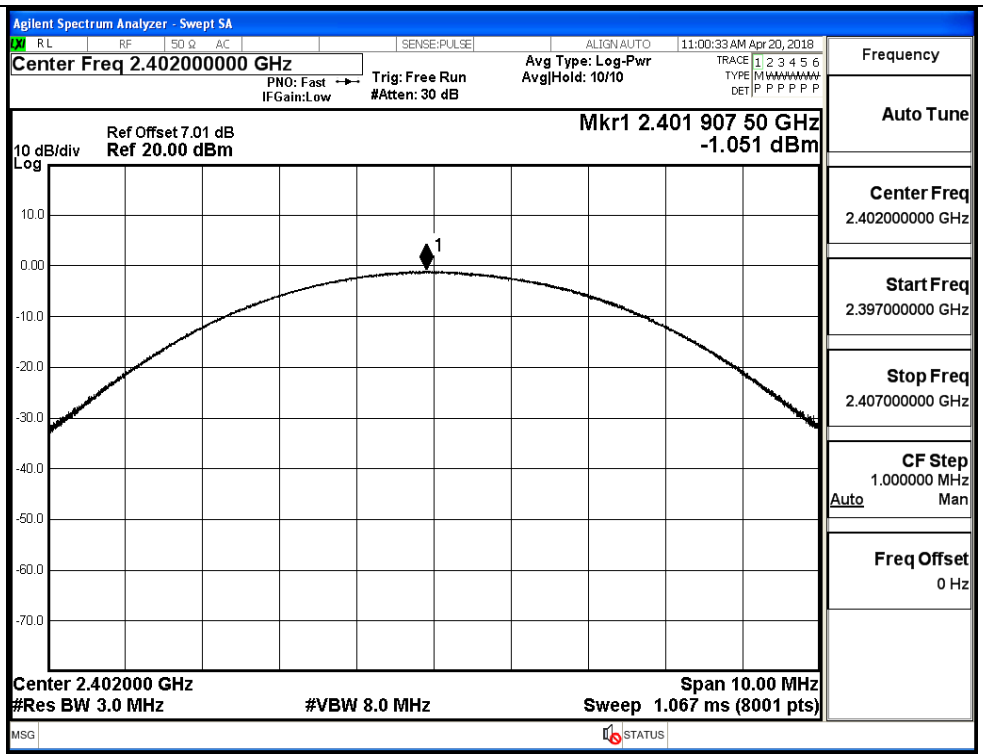
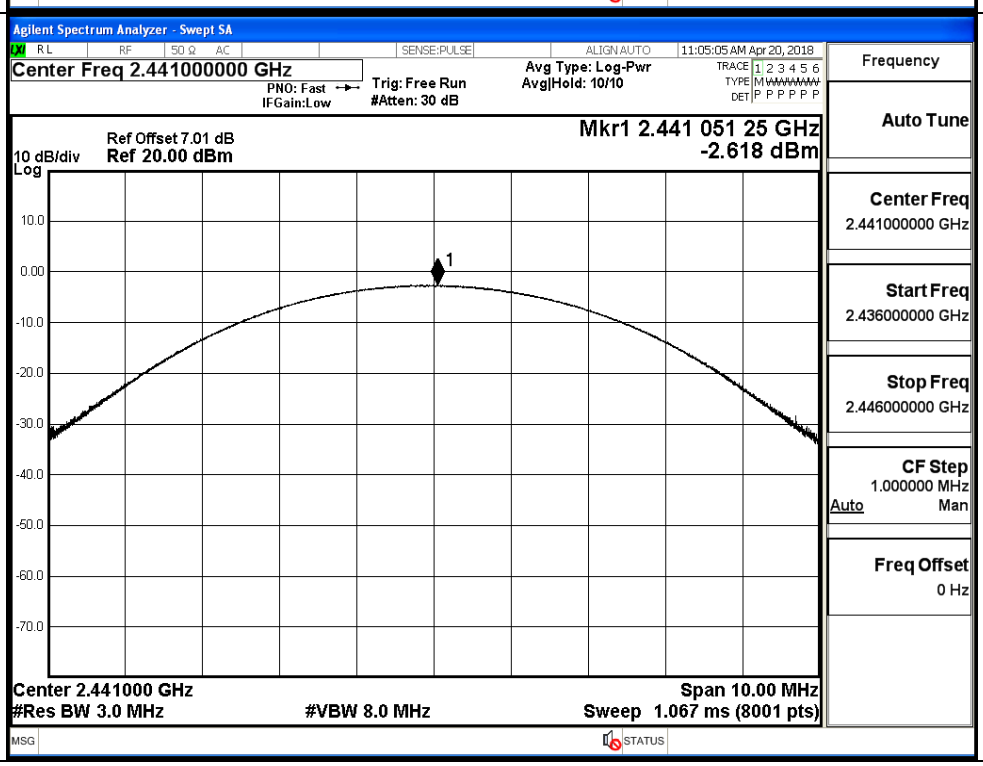
GFSK/HCH	
π/4DQPSK/LCH	

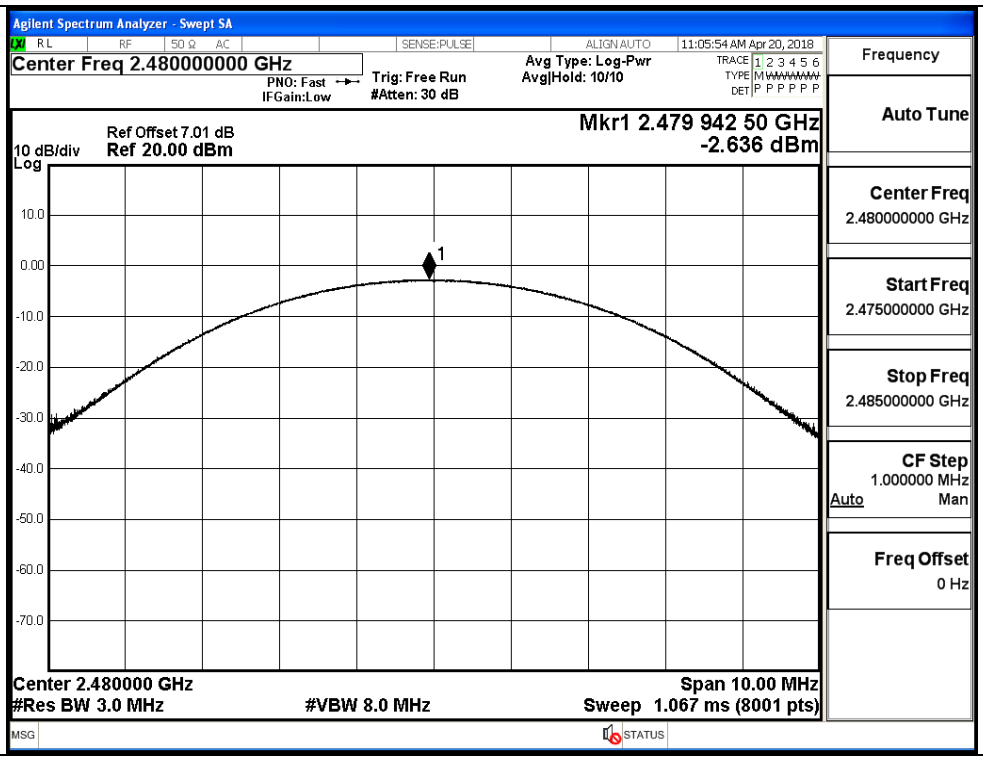
π/4DQPSK/MCH



π/4DQPSK/HCH



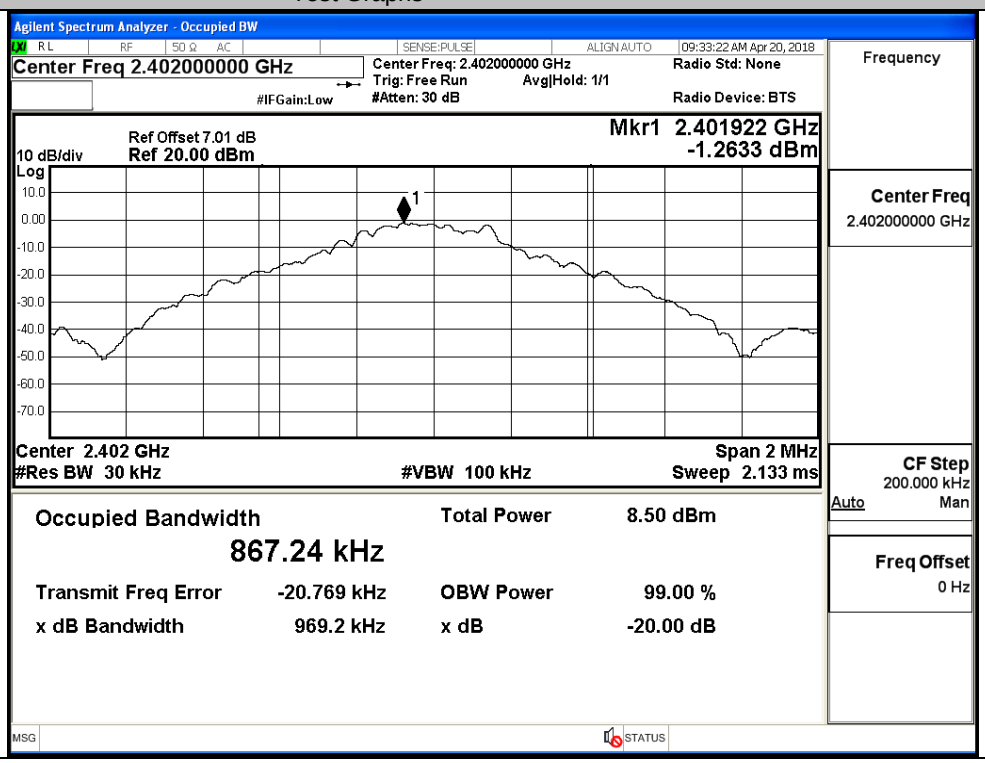
8DPSK/LCH	
8DPSK/MCH	

8DPSK/HCH	

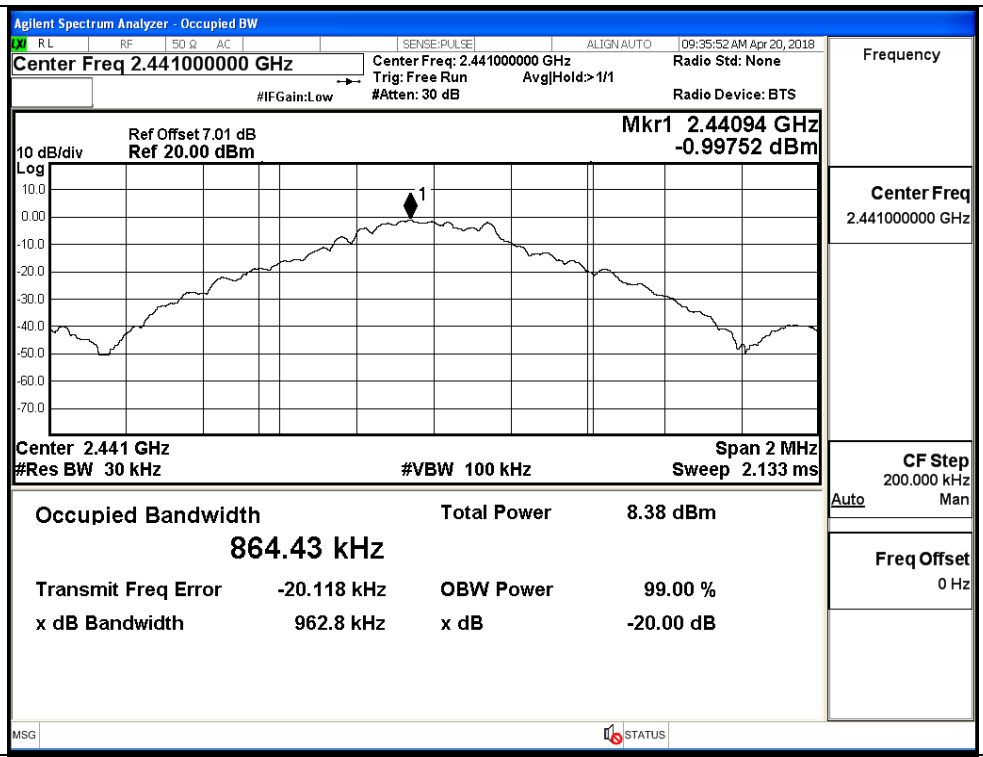
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
11:05:54 AM Apr 20, 2018
Ref Offset 7.01 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 942 50 GHz
-2.636 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
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

A.2 20dB Bandwidth

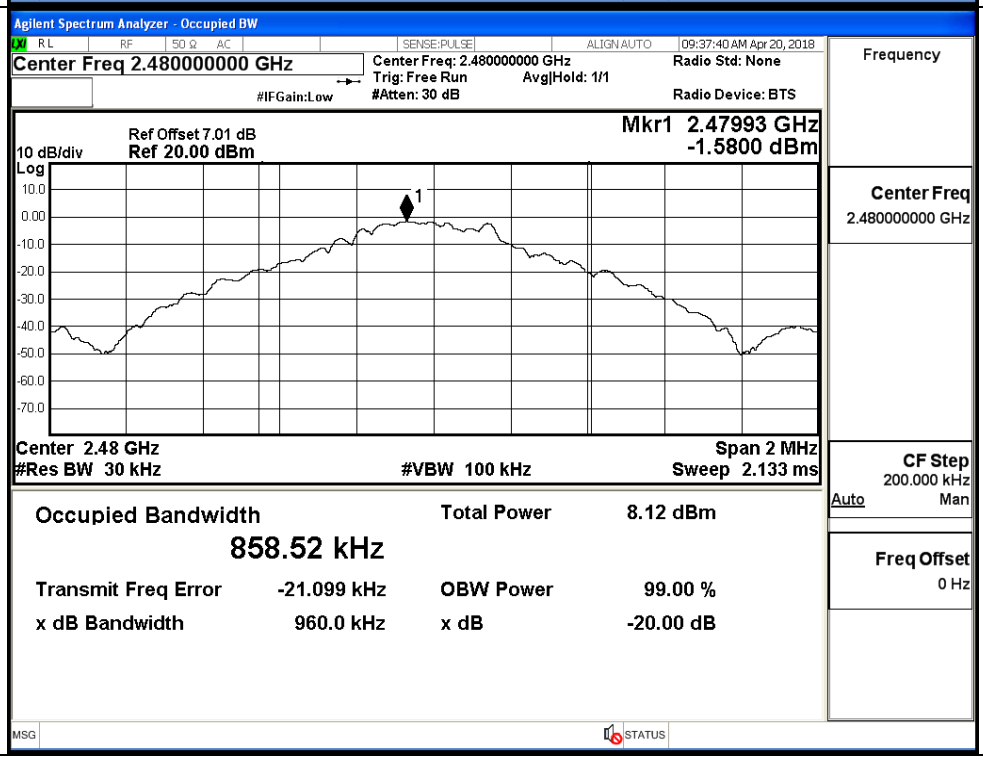
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9692	Not Specified	PASS
	MCH	0.9628	Not Specified	PASS
	HCH	0.9600	Not Specified	PASS
π/4DQPSK	LCH	1.441	Not Specified	PASS
	MCH	1.439	Not Specified	PASS
	HCH	1.439	Not Specified	PASS
8DPSK	LCH	1.486	Not Specified	PASS
	MCH	1.483	Not Specified	PASS
	HCH	1.485	Not Specified	PASS

Test Graphs	
GFSK/LCH	

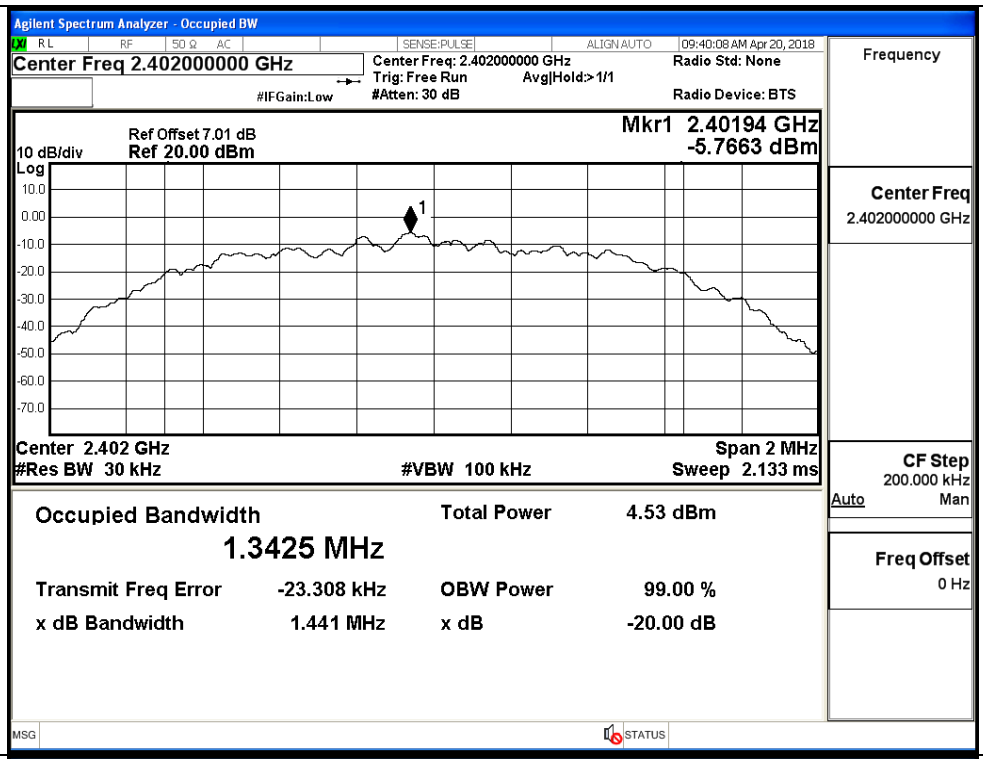
GFSK/MCH



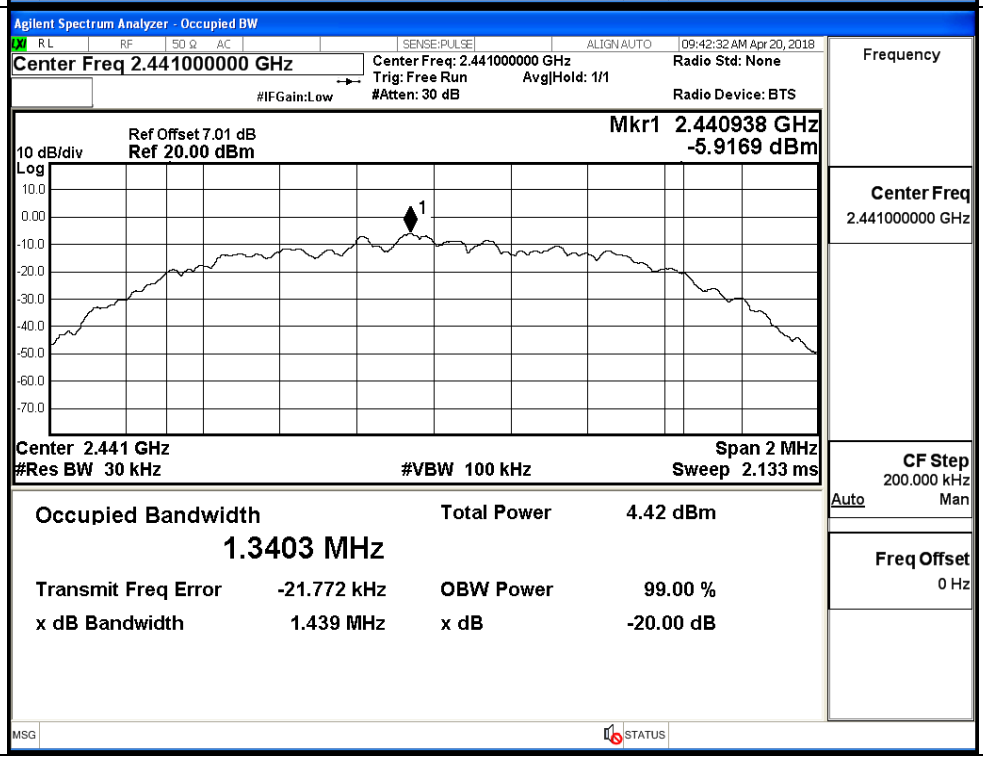
GFSK/HCH



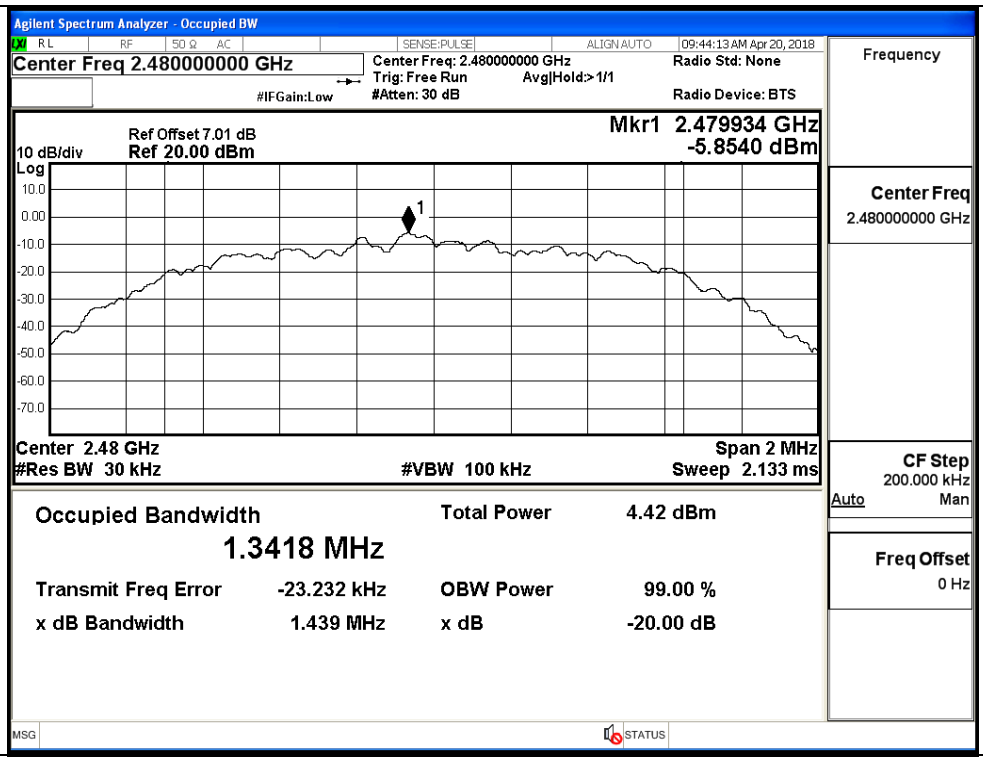
π/4DQPSK/LCH



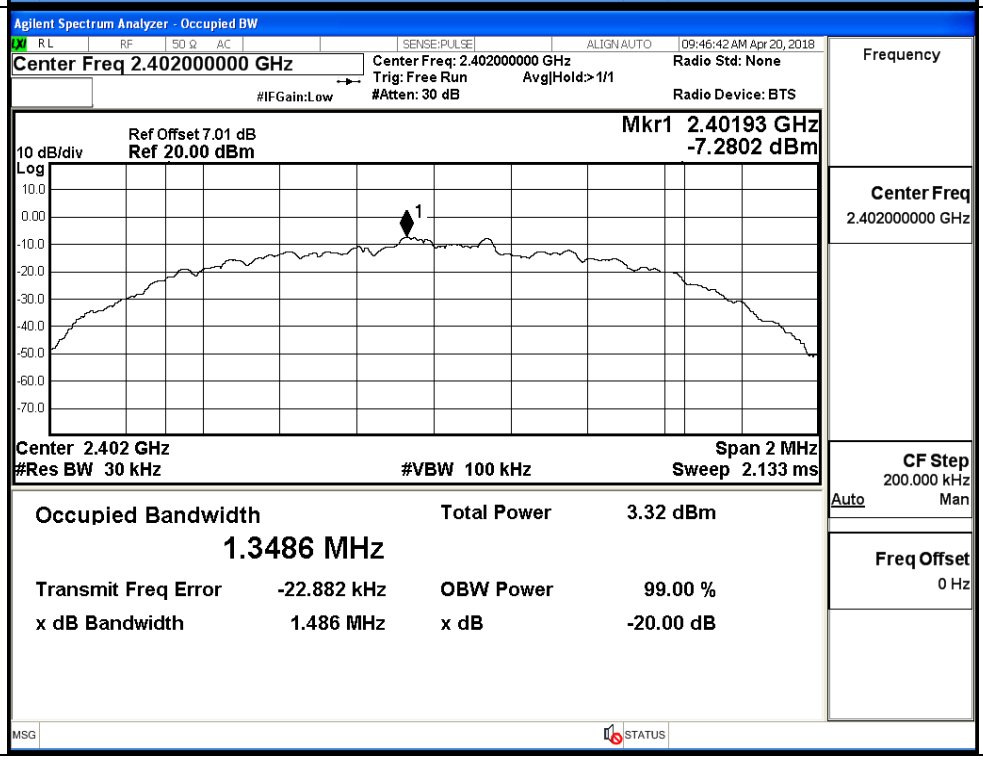
π/4DQPSK/MCH



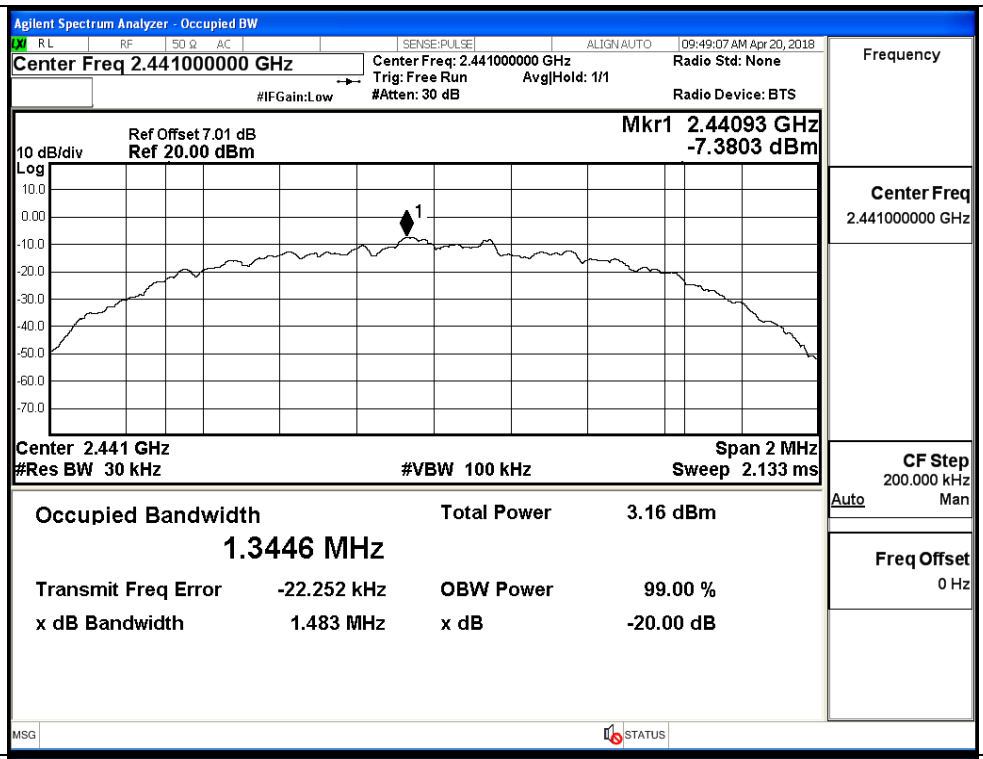
π/4DQPSK/HCH



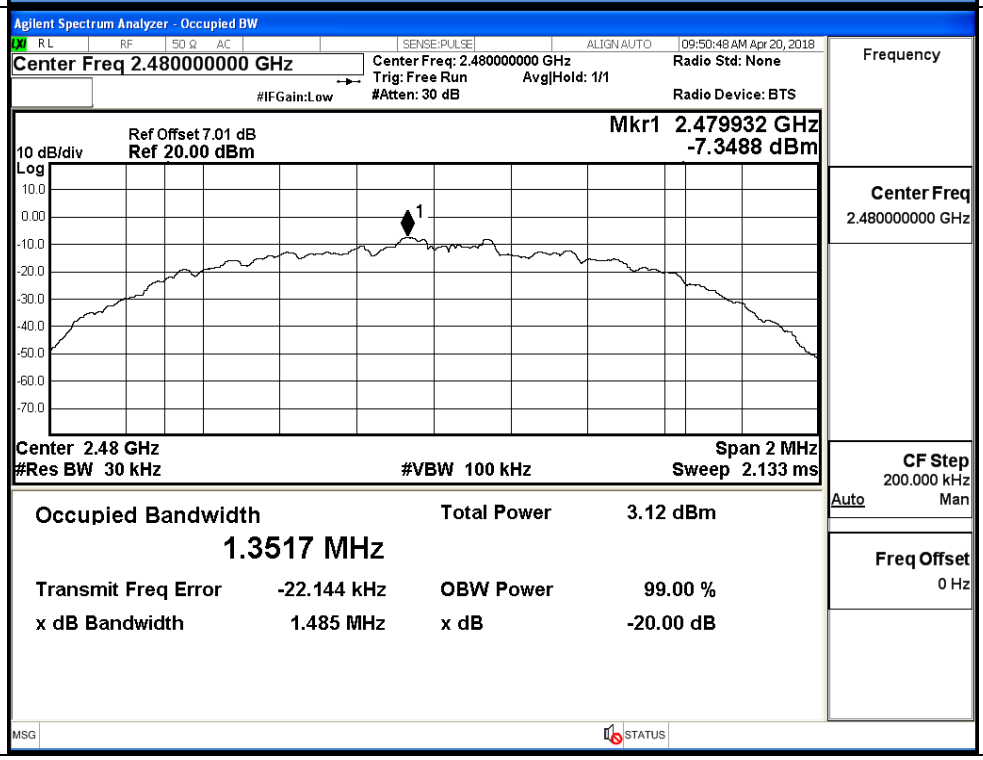
8DPSK/LCH



8DPSK/MCH

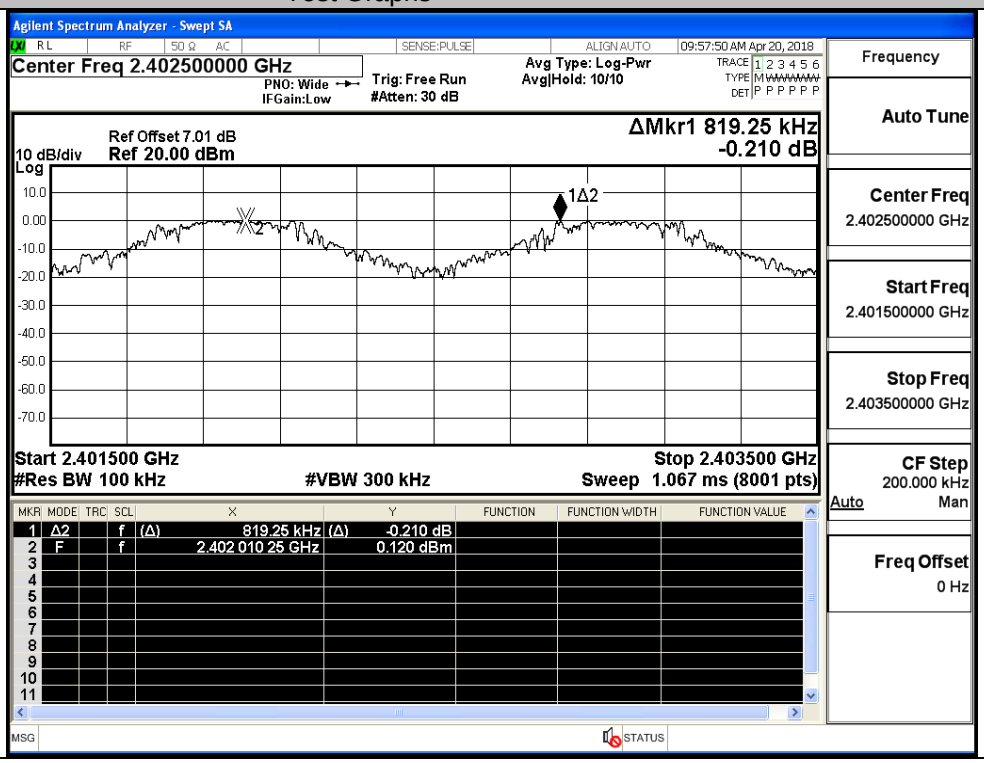


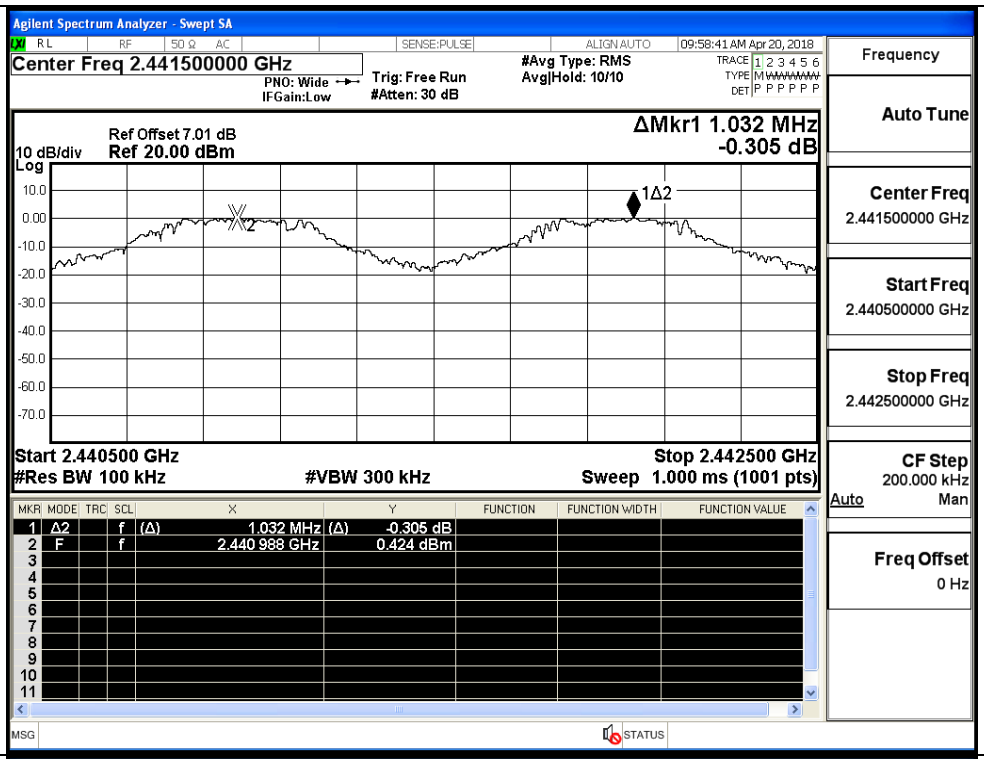
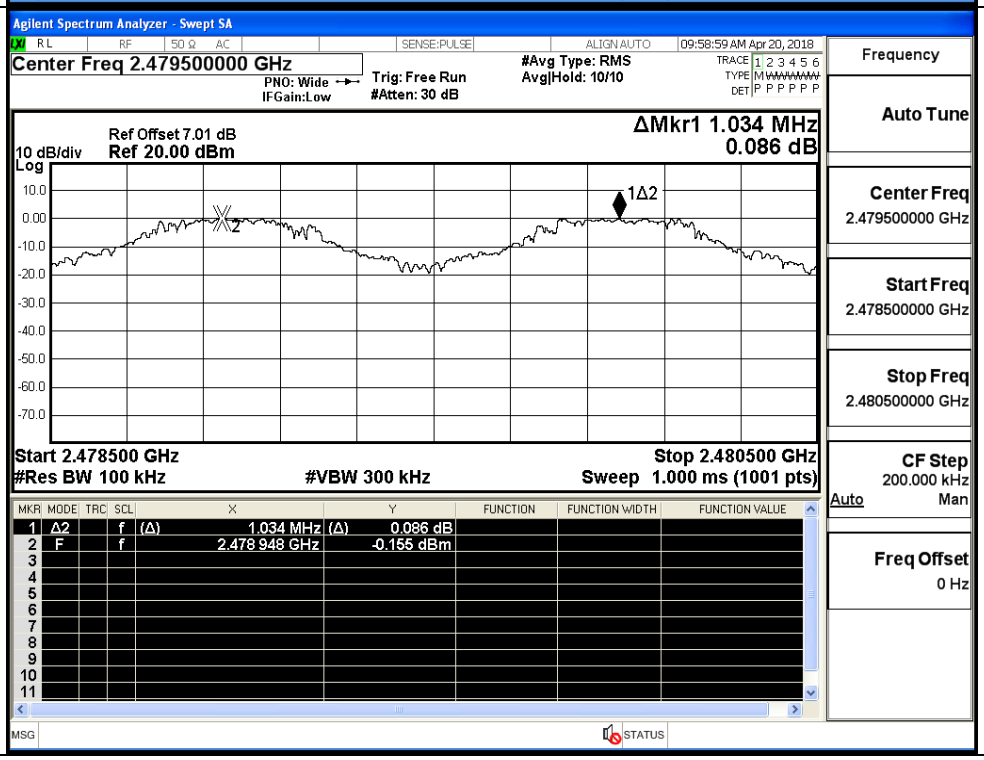
8DPSK/HCH



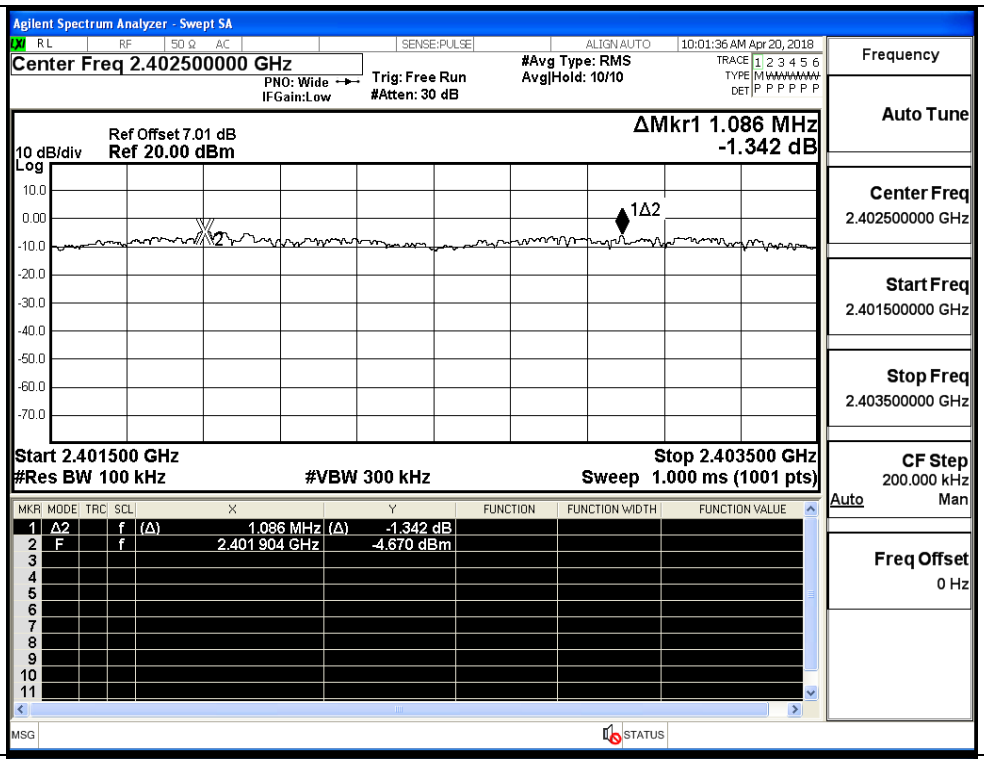
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.819	0.646	PASS
	MCH	1.032	0.646	PASS
	HCH	1.034	0.646	PASS
π/4DQPSK	LCH	1.086	0.960	PASS
	MCH	0.972	0.959	PASS
	HCH	1.086	0.959	PASS
8DPSK	LCH	1.018	0.990	PASS
	MCH	1.070	0.988	PASS
	HCH	0.998	0.990	PASS

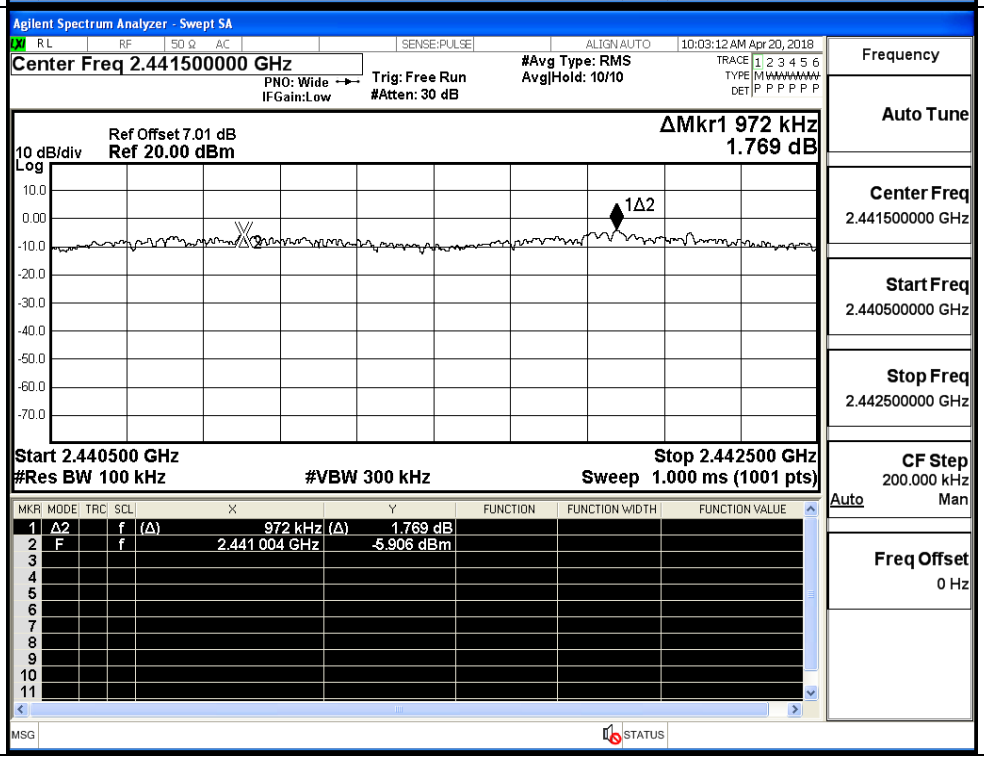
Test Graphs		
GFSK/LCH		

GFSK/MCH	
GFSK/HCH	

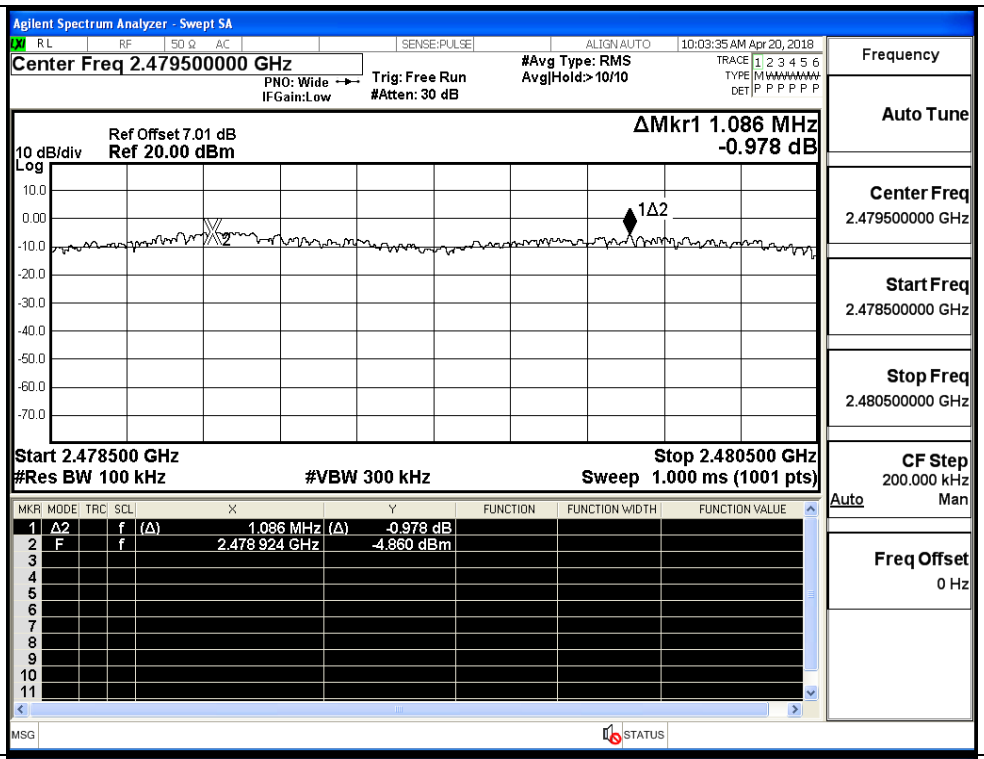
π/4DQPSK/LCH



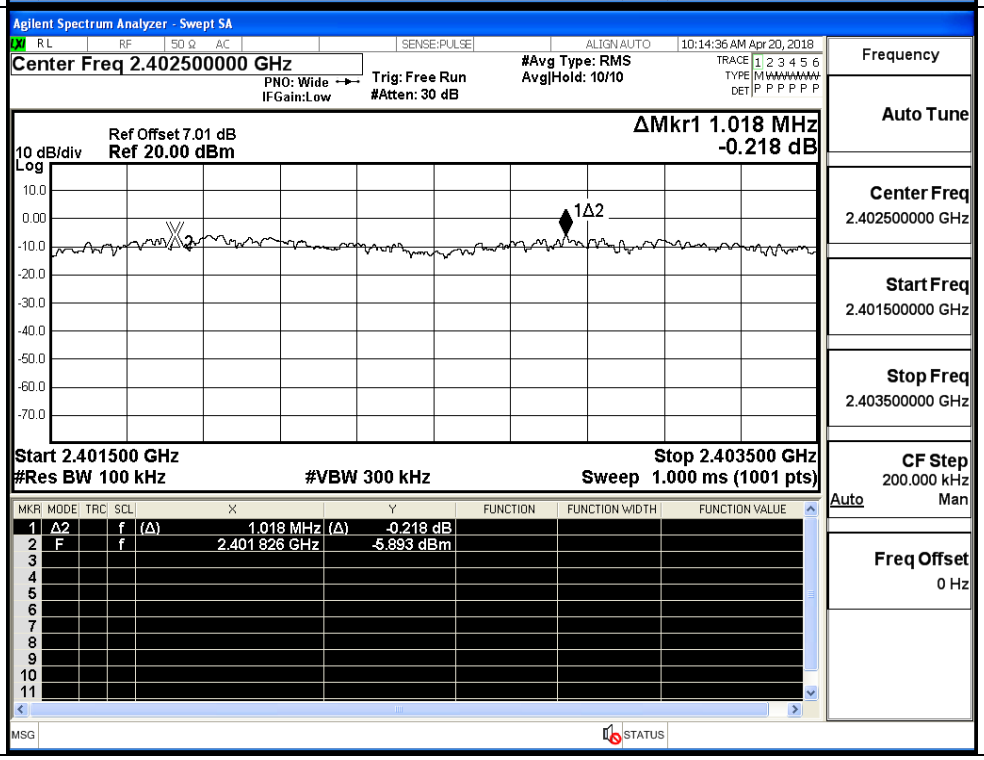
π/4DQPSK/MCH



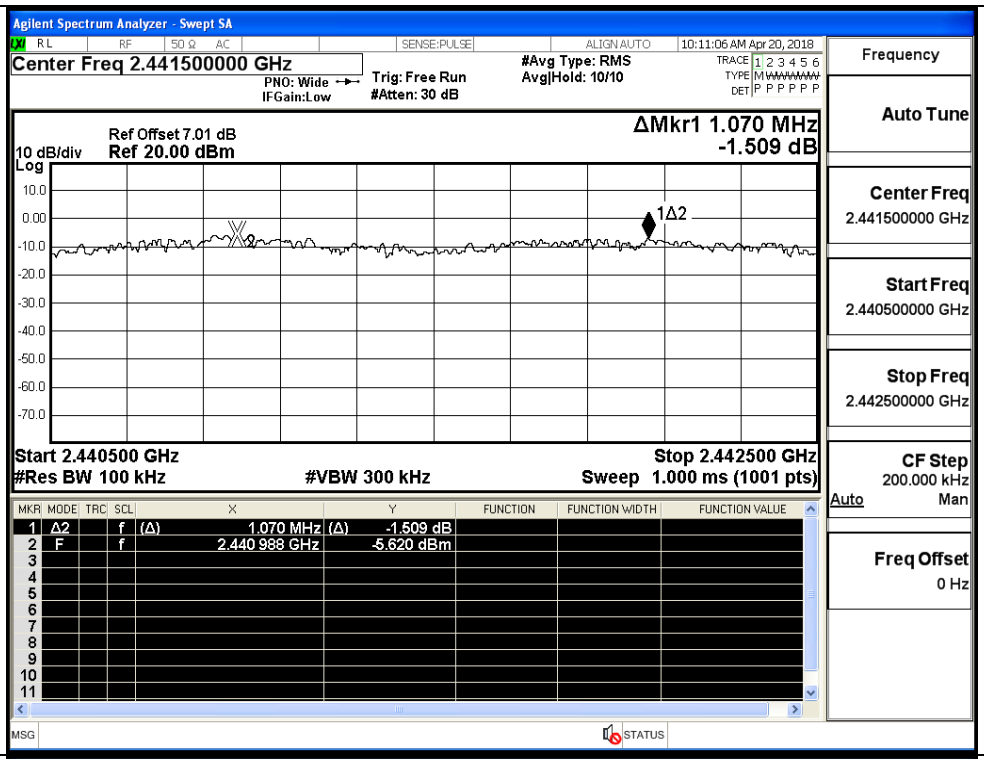
π/4DQPSK/HCH



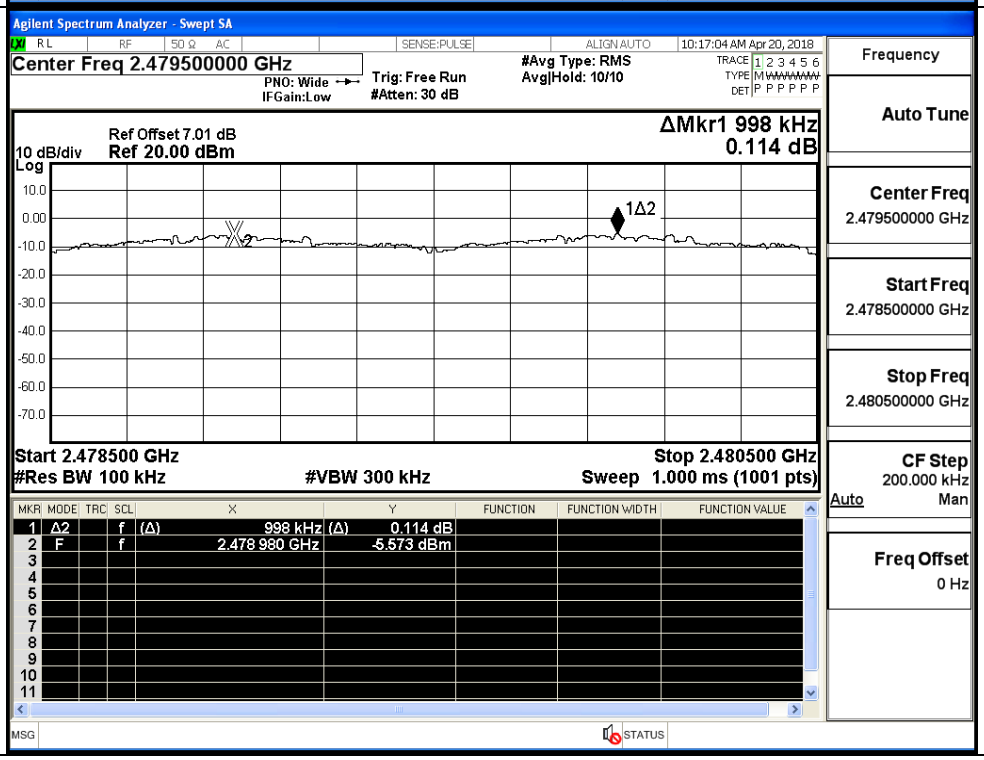
8DPSK/LCH



8DPSK/MCH

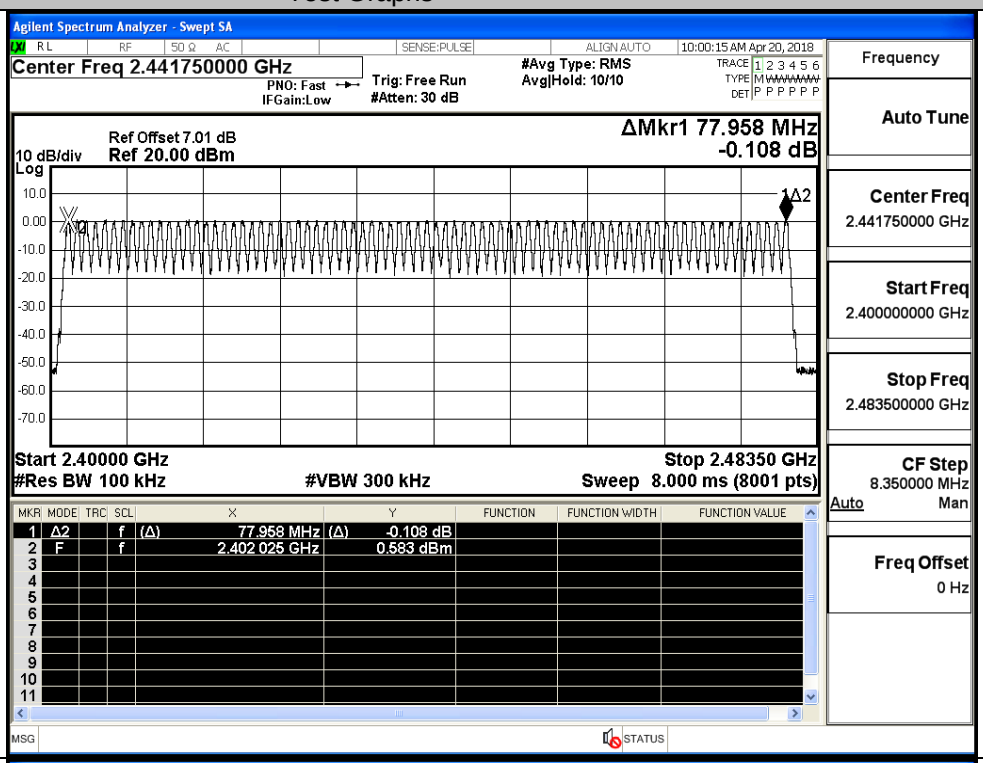
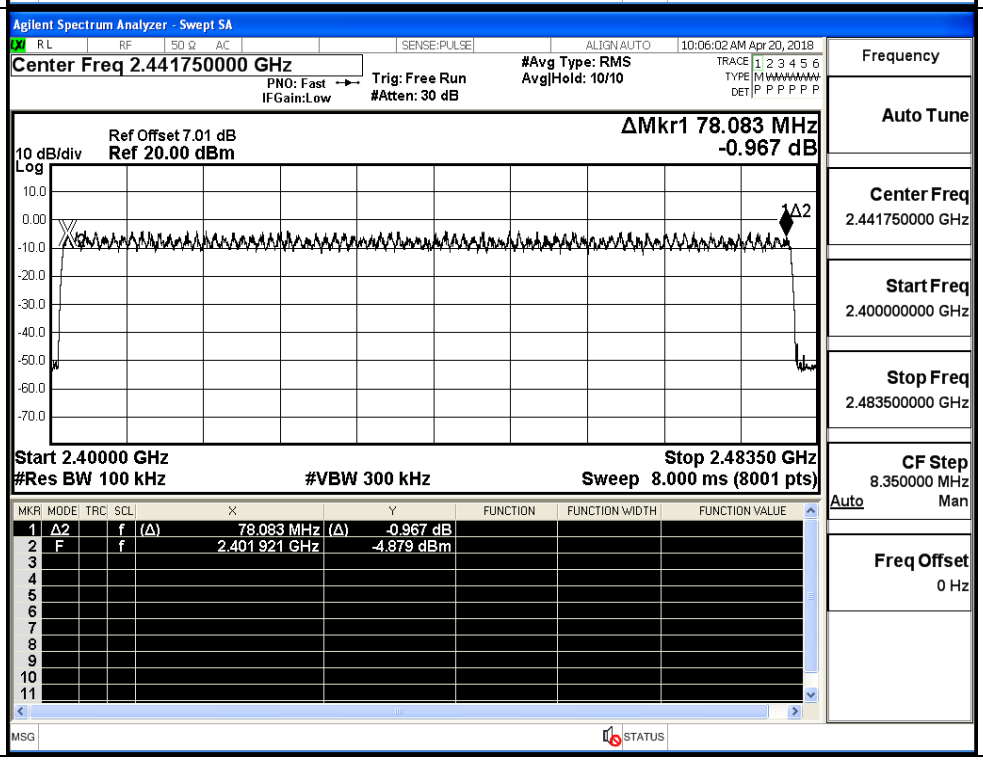


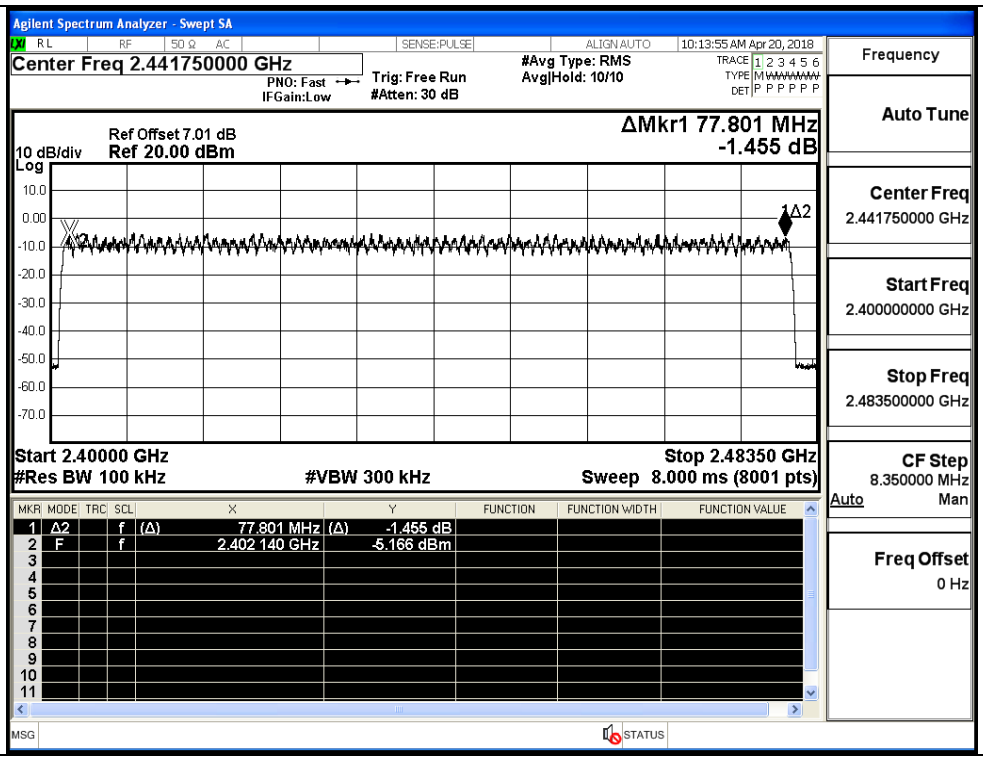
8DPSK/HCH



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

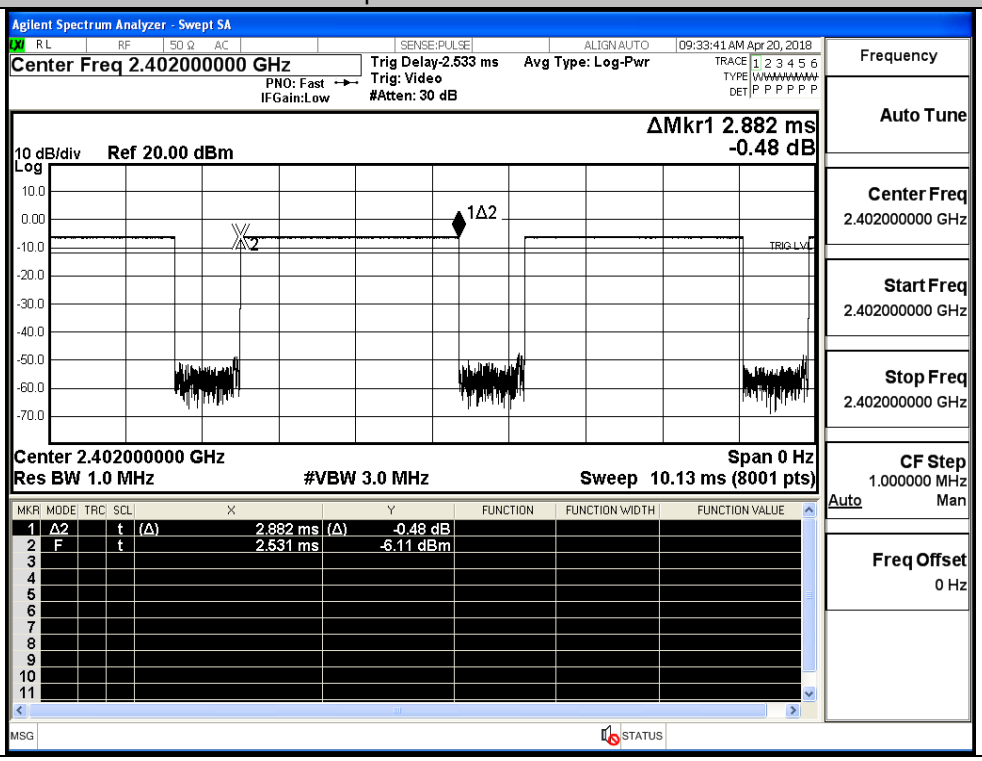
Test Graphs		
GFSK/Hop		
π/4DQPSK/Hop		

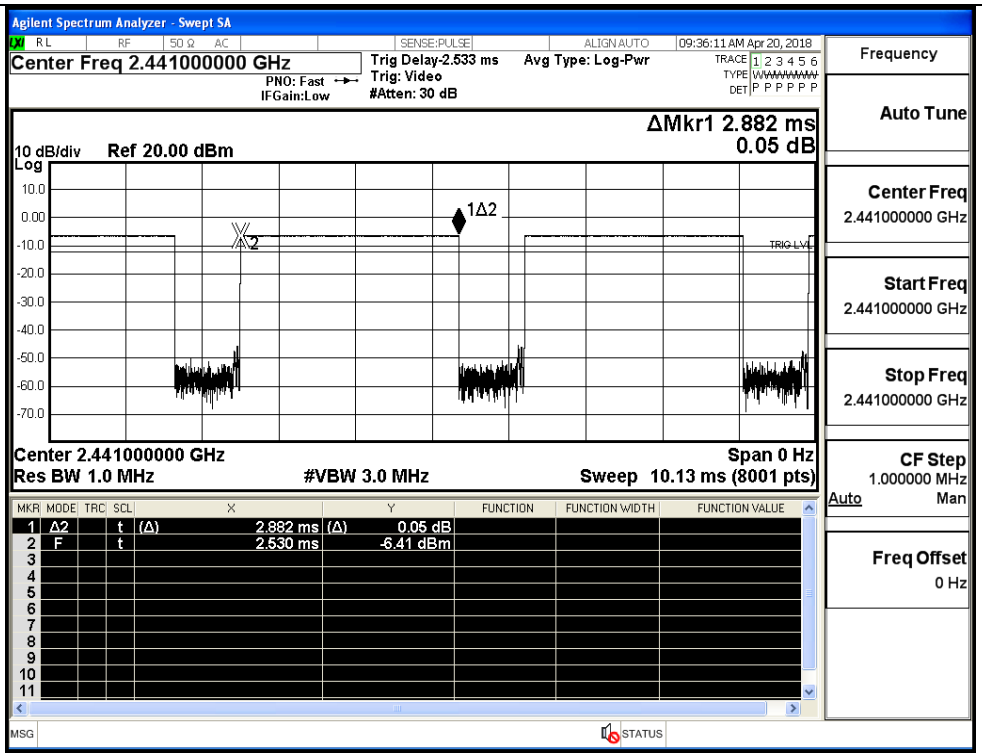
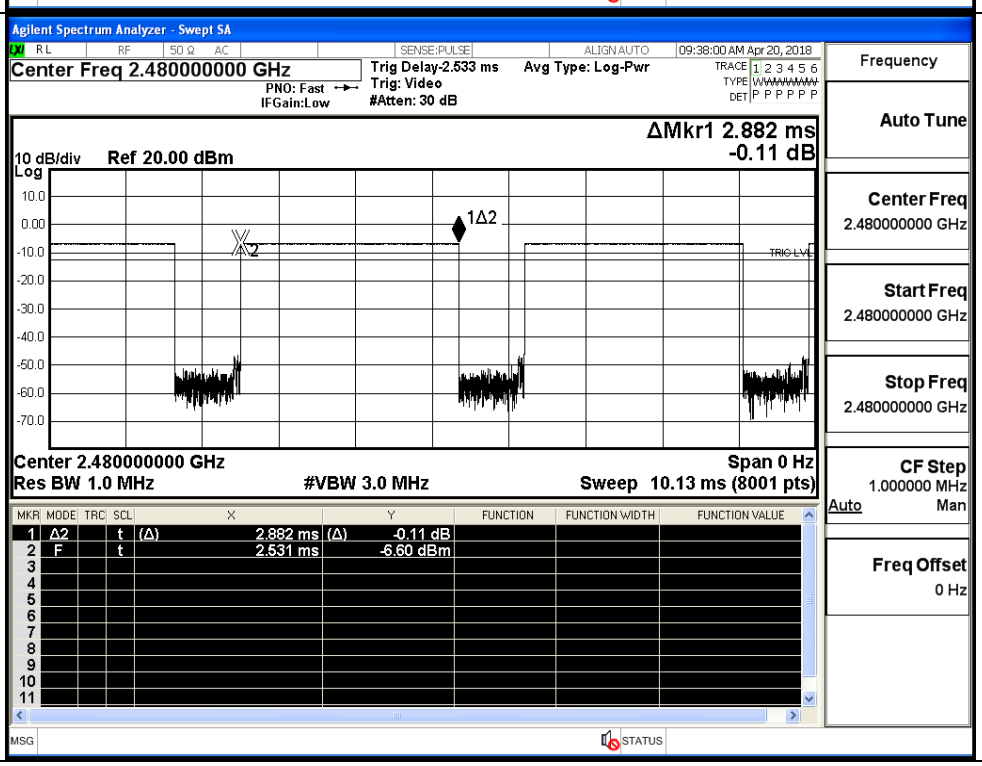
8DPSK/Hop	

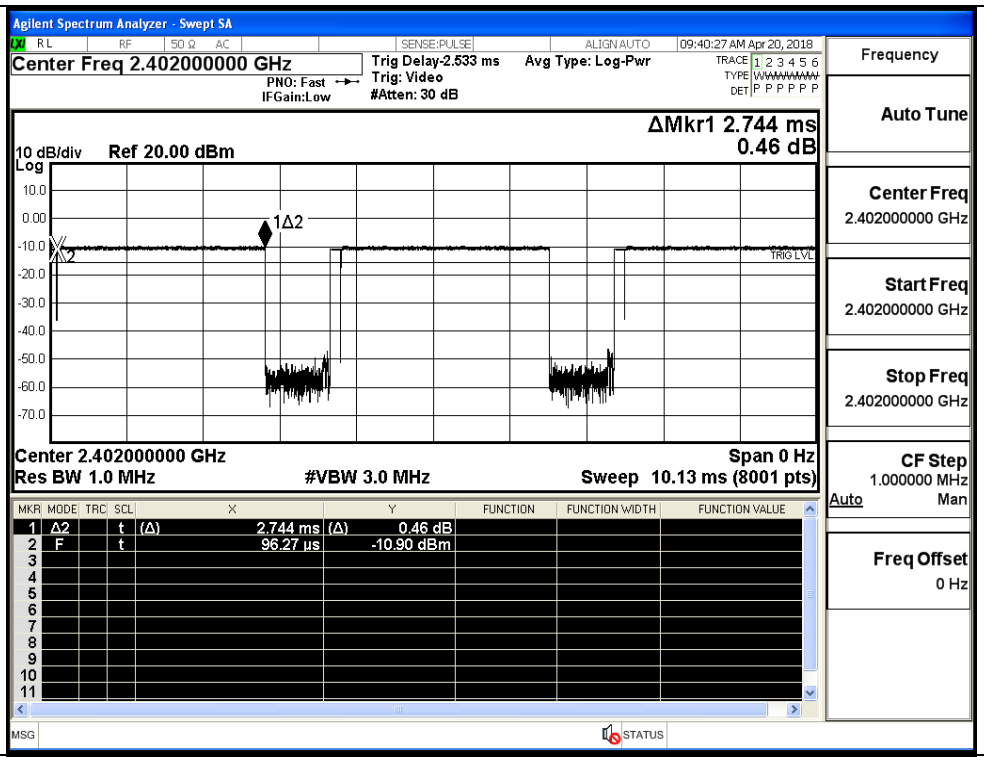
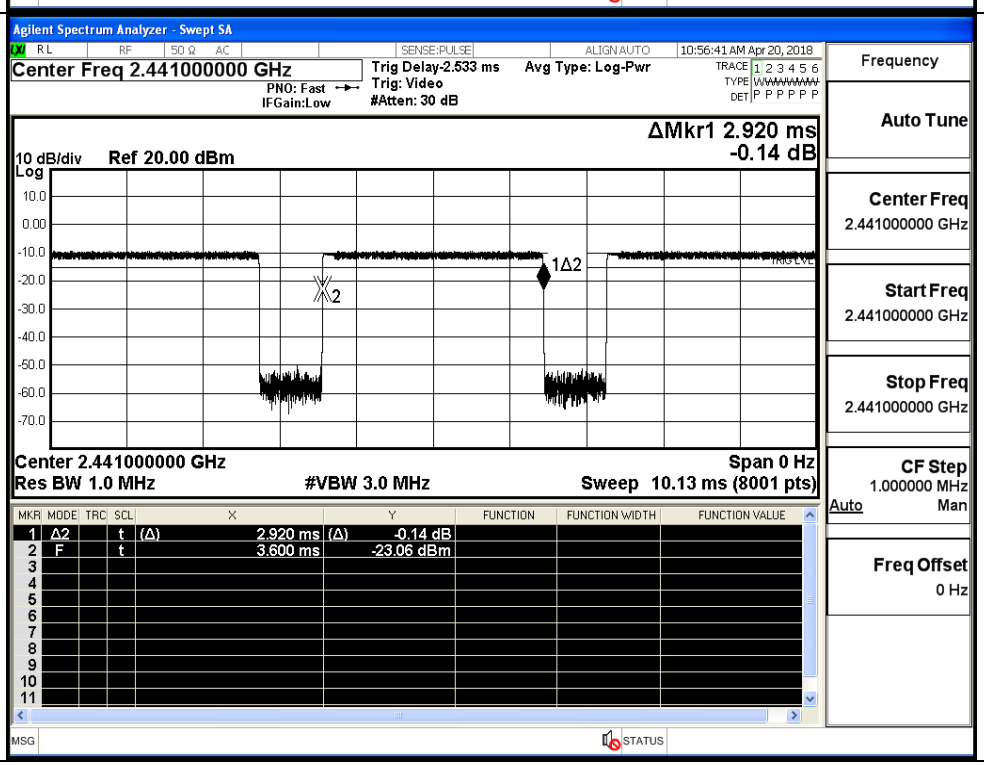
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
10:13:55 AM Apr 20, 2018
Ref Offset 7.01 dB
10 dB/div
Ref 20.00 dBm
Log
ΔMkr1 77.801 MHz
-1.455 dB
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (8001 pts)
1 Δ2 f (Δ) 77.801 MHz (Δ) -1.455 dB
2 F f 2.402 140 GHz -5.166 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

A.5 Dwell Time

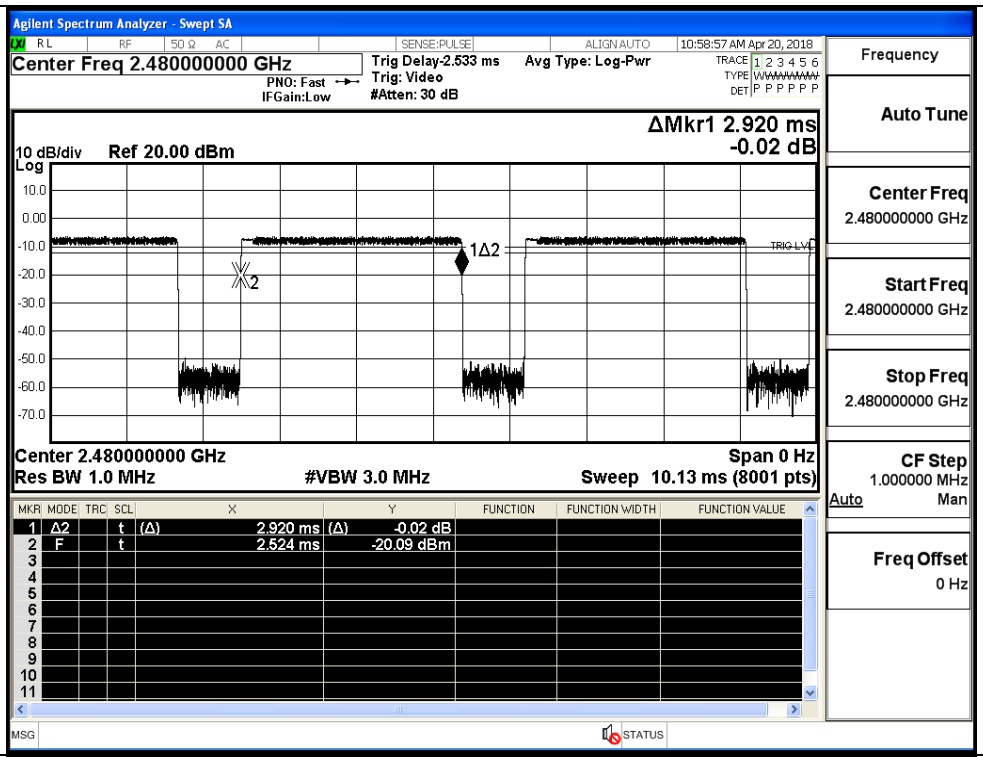
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.74	106.7	0.292	0.4	PASS
	2DH5	MCH	2.92	106.7	0.311	0.4	PASS
	2DH5	HCH	2.92	106.7	0.311	0.4	PASS
8DPSK	3DH5	LCH	2.92	106.7	0.311	0.4	PASS
	3DH5	MCH	2.92	106.7	0.311	0.4	PASS
	3DH5	HCH	2.88	106.7	0.307	0.4	PASS

Test Graphs	
GFSK_DH5/LCH	

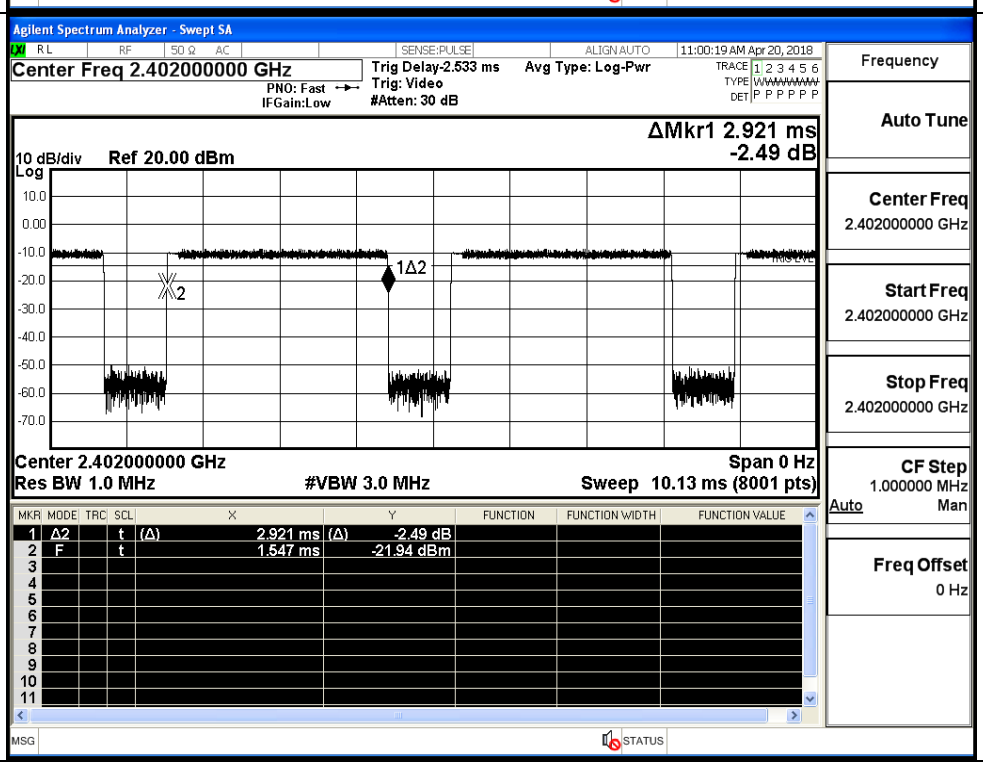
GFSK_DH5/MCH	
GFSK_DH5/HCH	

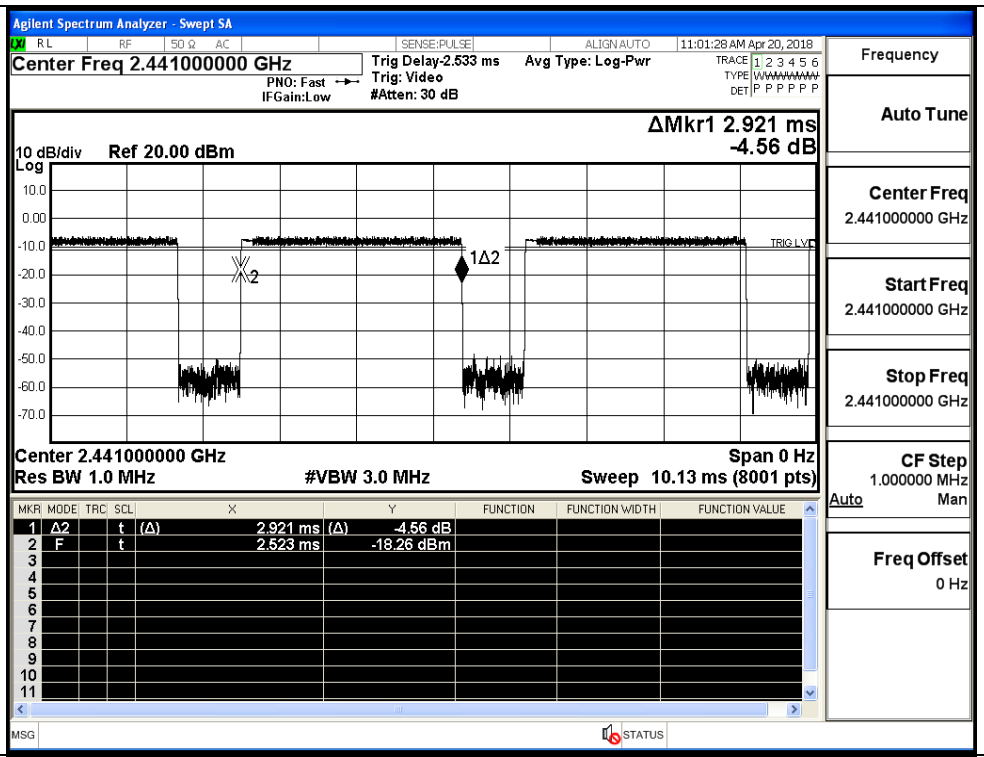
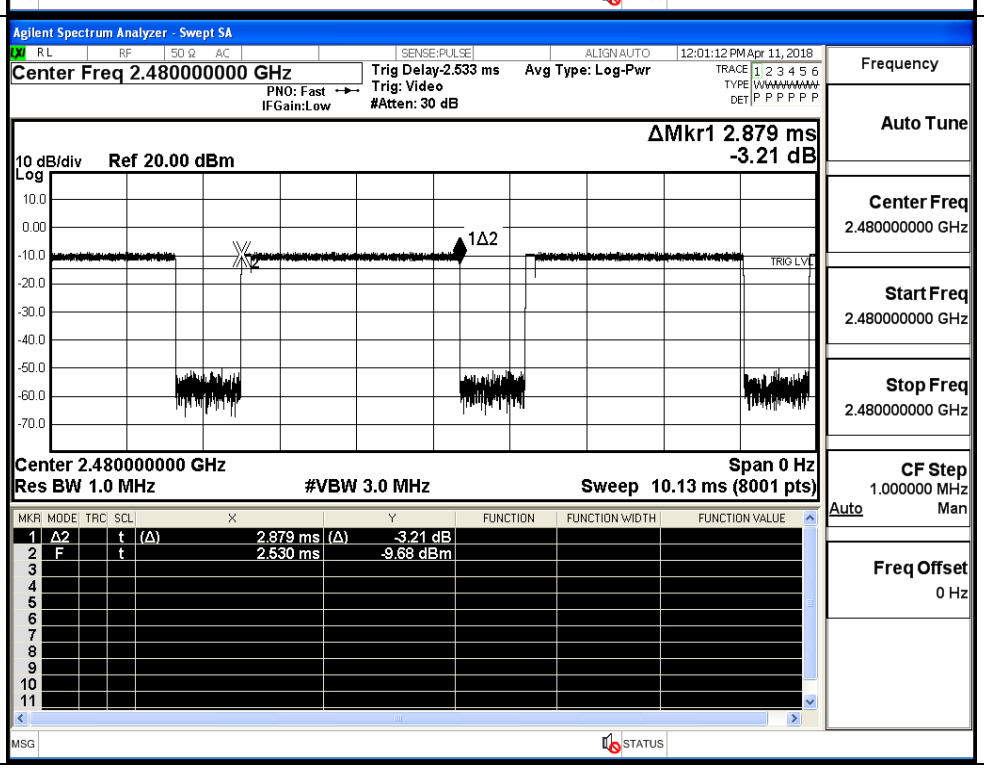
π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

π/4DQPSK _2DH5/HCH



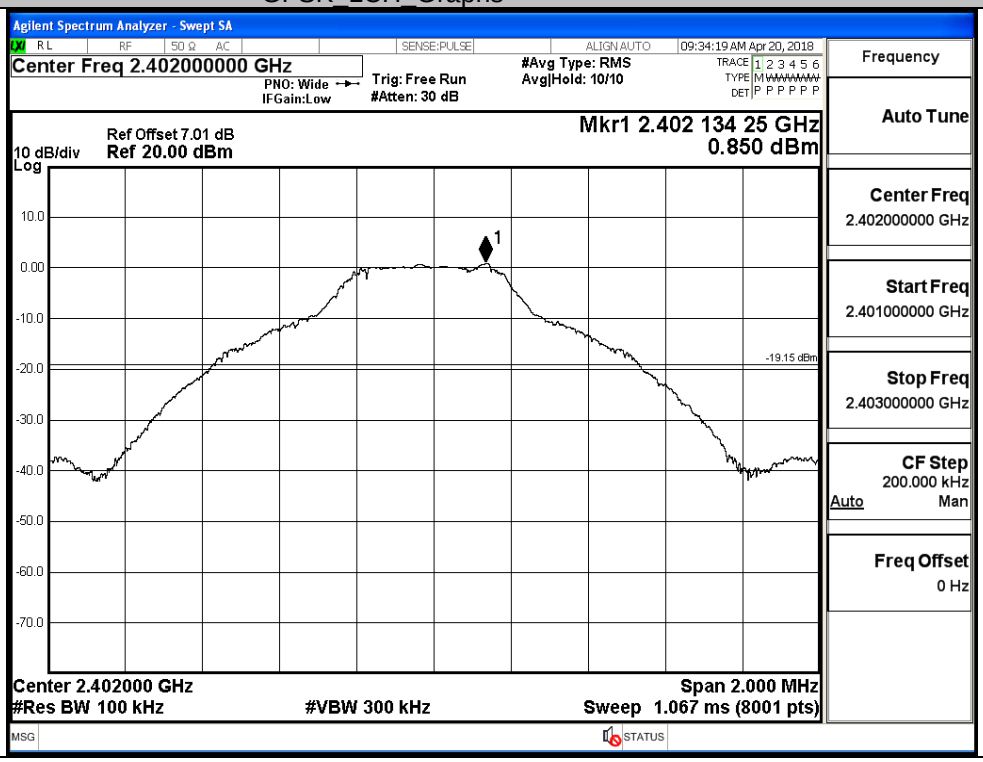
8DPSK _3DH5/LCH

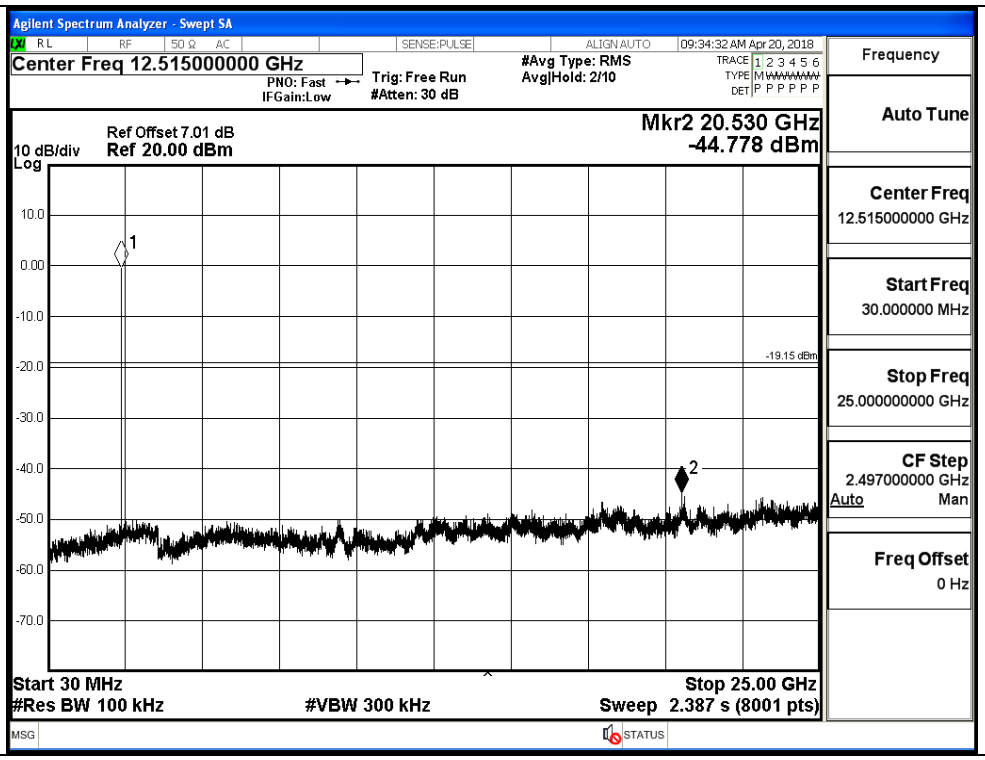


8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

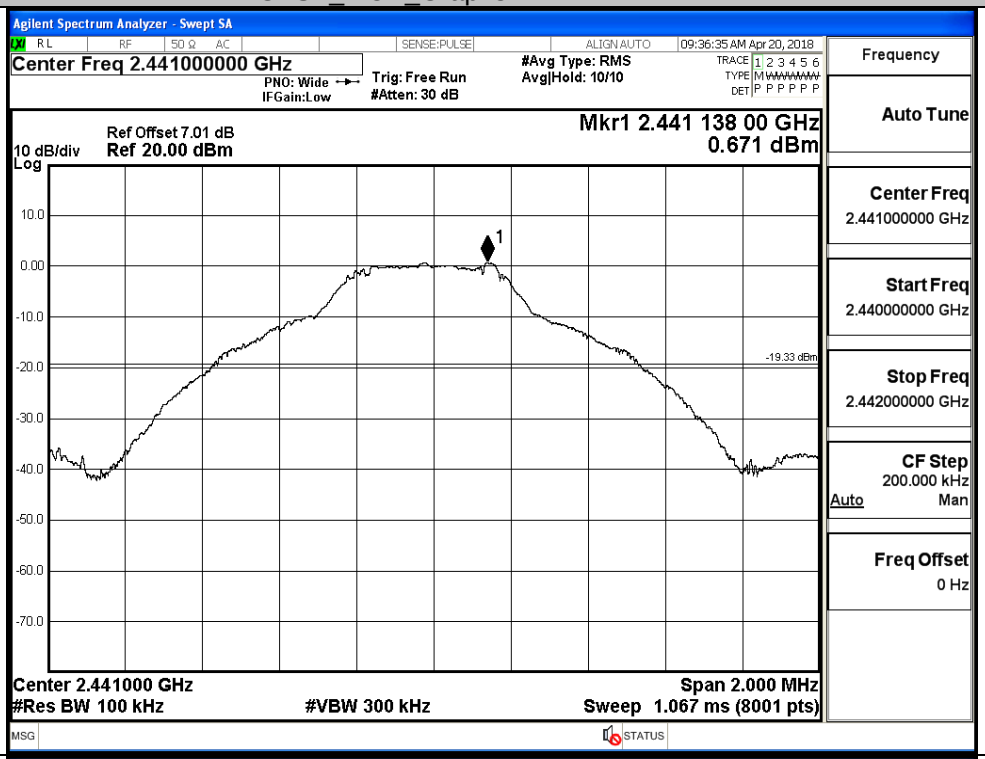
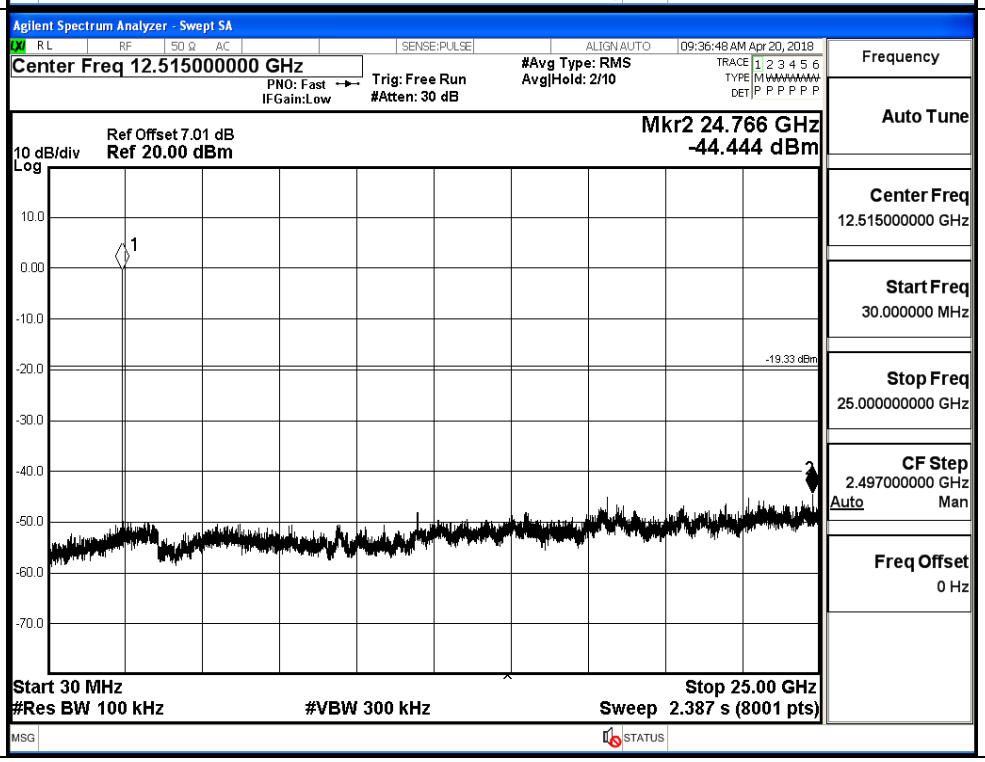
A.6 RF Conducted Spurious Emissions

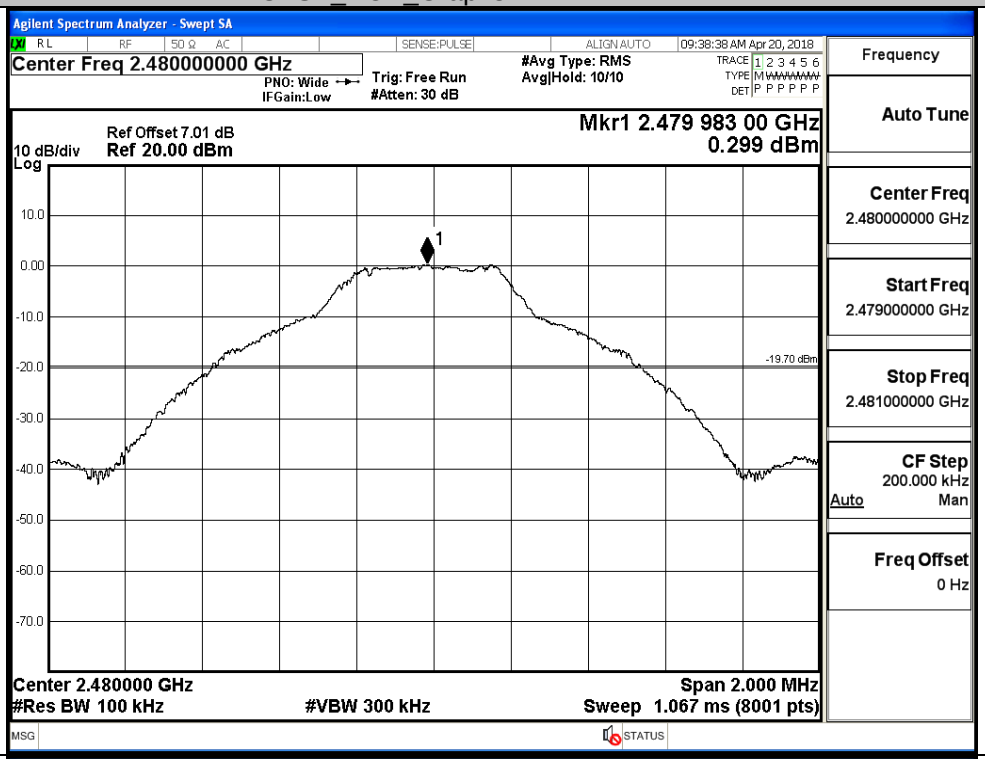
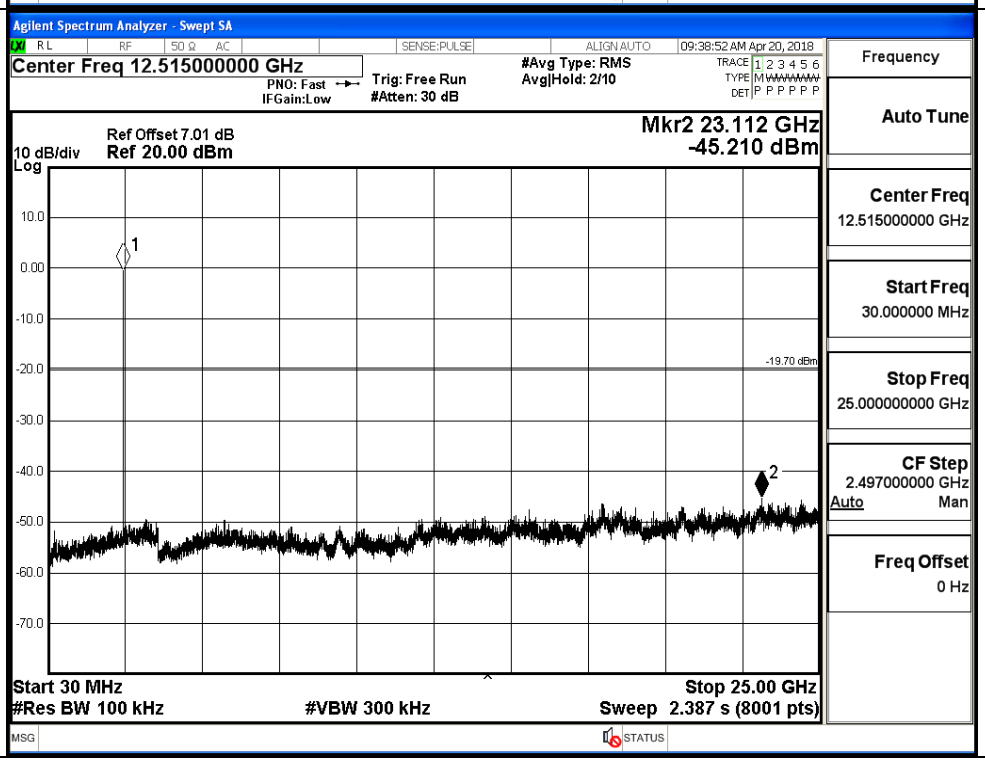
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.85	-44.778	-19.150	PASS
	MCH	0.671	-44.444	-19.329	PASS
	HCH	0.299	-45.210	-19.701	PASS
π/4DQPSK	LCH	-4.052	-44.761	-24.052	PASS
	MCH	-4.107	-44.946	-24.107	PASS
	HCH	-4.191	-44.328	-24.191	PASS
8DPSK	LCH	-5.154	-45.171	-25.154	PASS
	MCH	-5.376	-45.972	-25.376	PASS
	HCH	-5.372	-45.604	-25.372	PASS

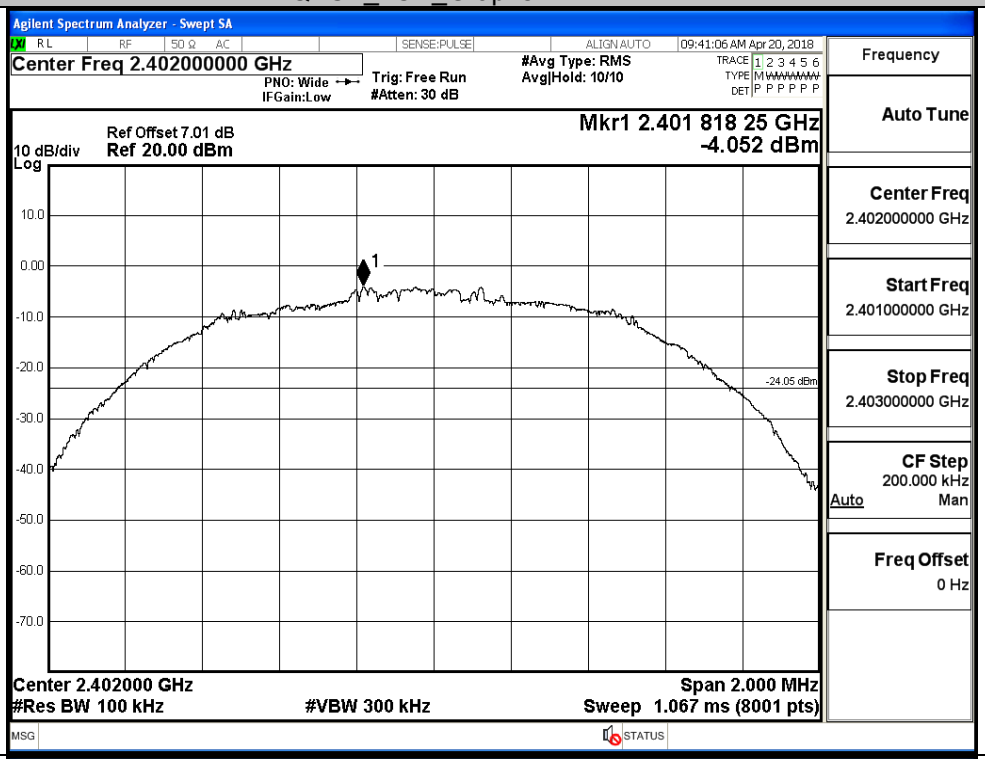
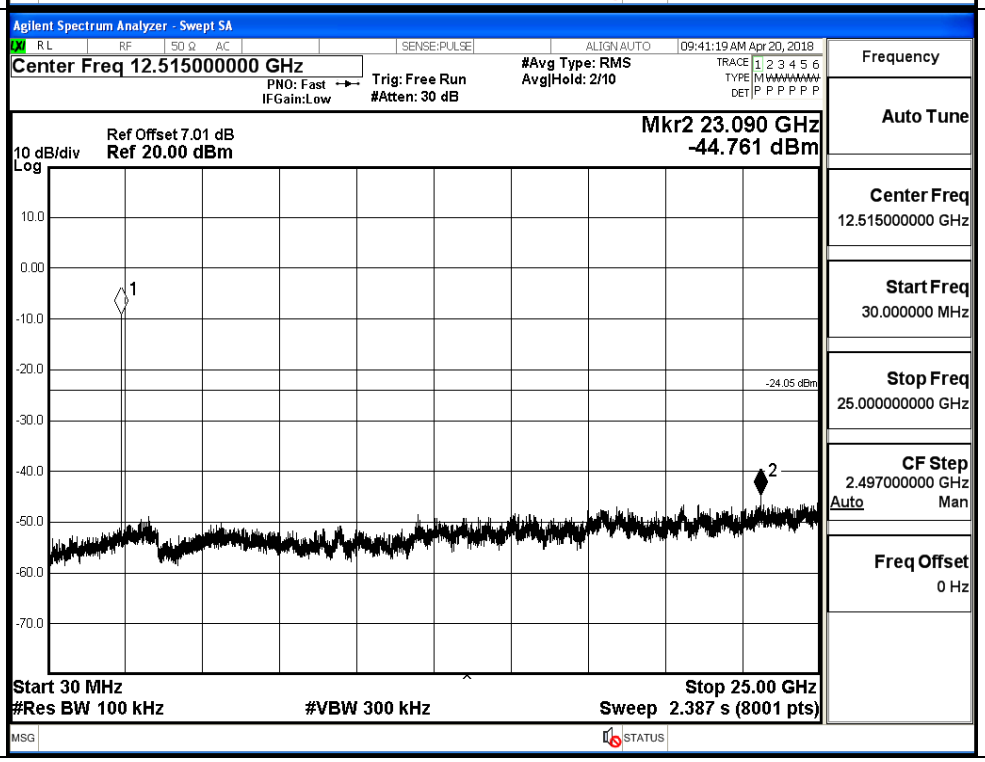
GFSK_LCH_Graphs		
Pref		

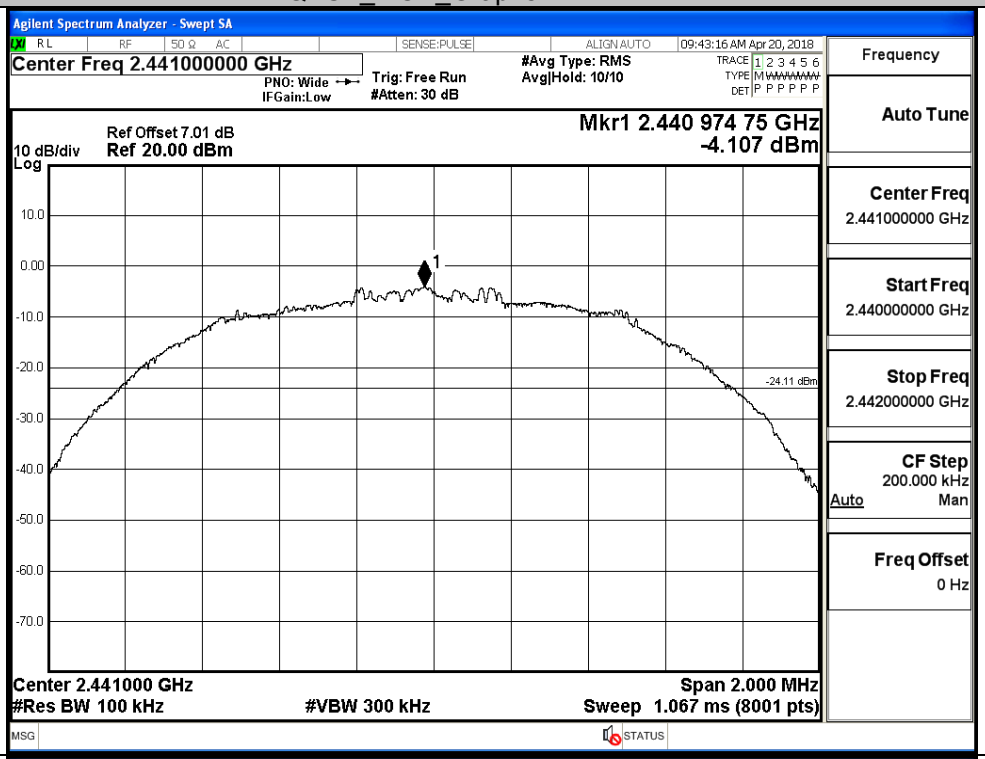
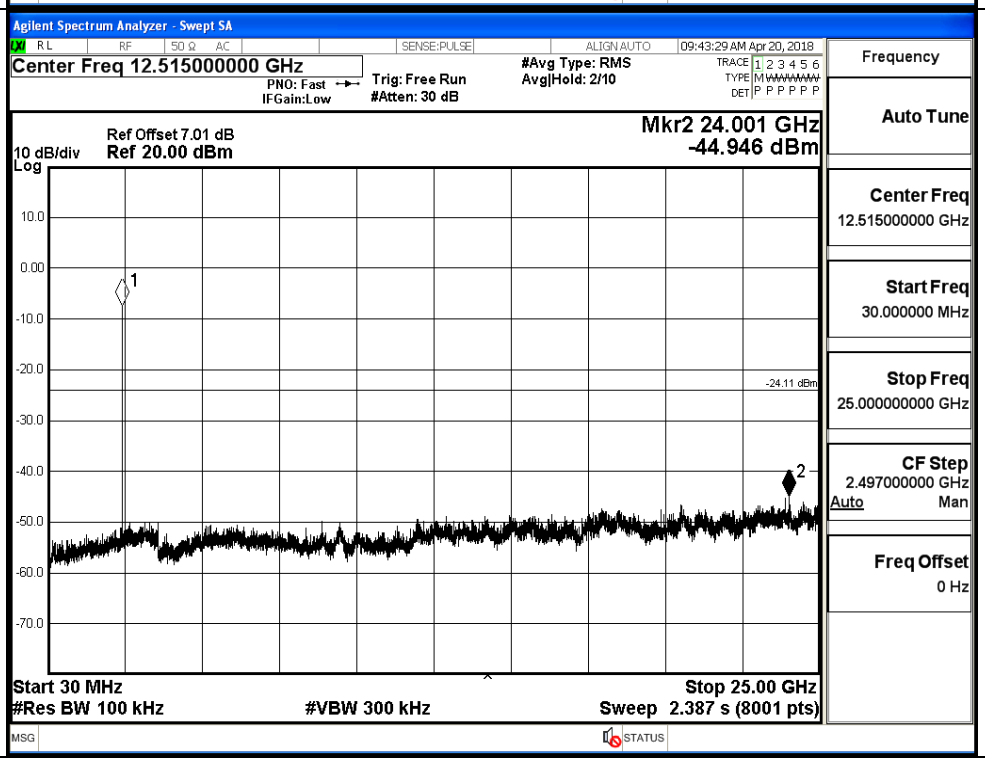
Puw		

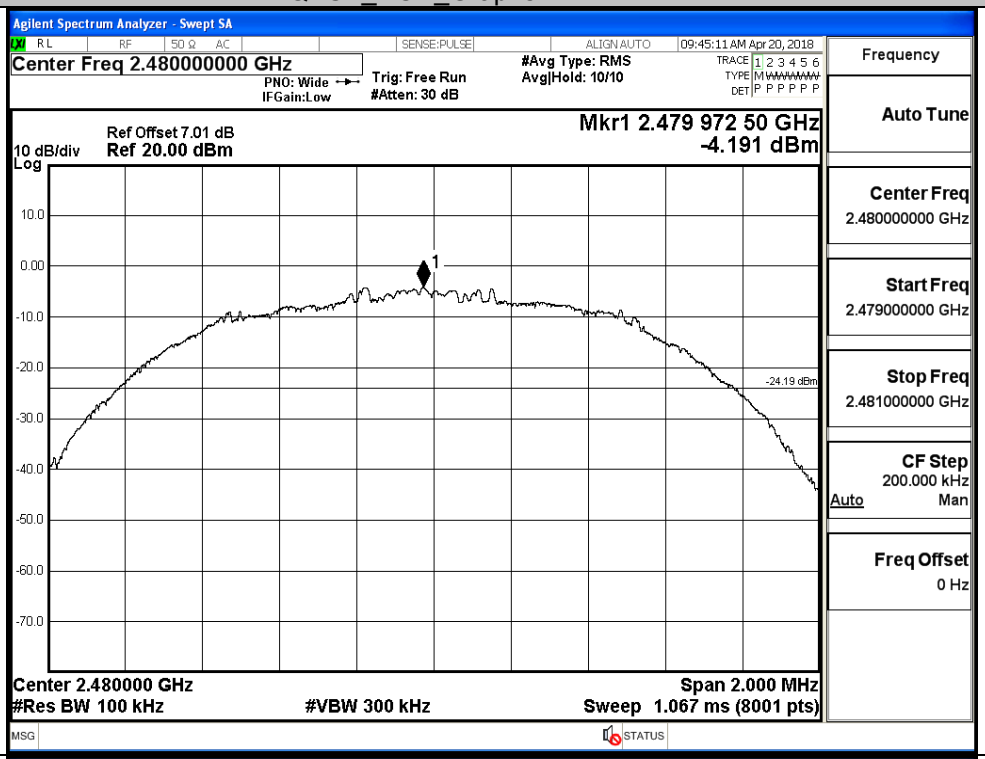
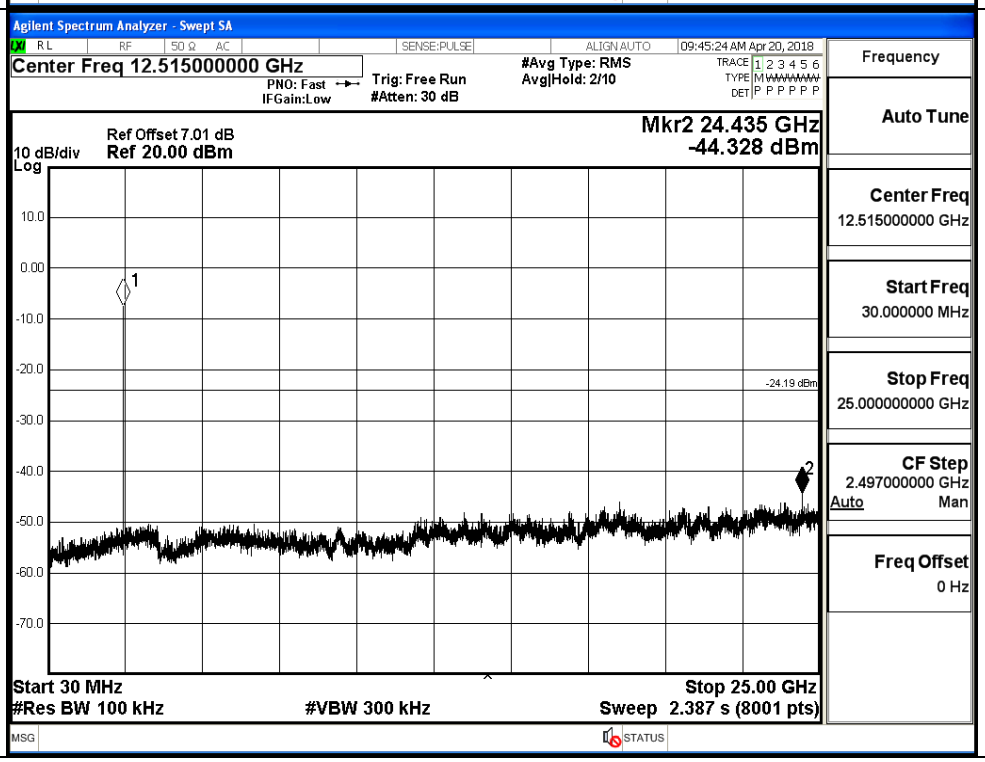
Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 2/10
09:34:32 AM Apr 20, 2018
Ref Offset 7.01 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr2 20.530 GHz
-44.778 dBm
-19.15 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 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

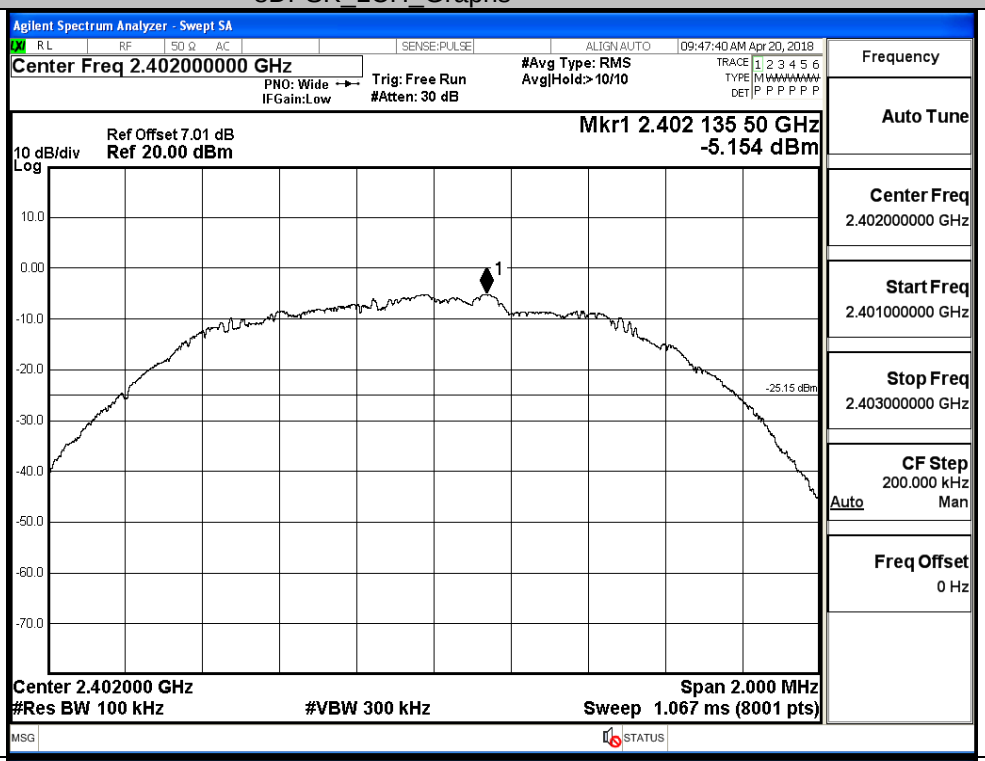
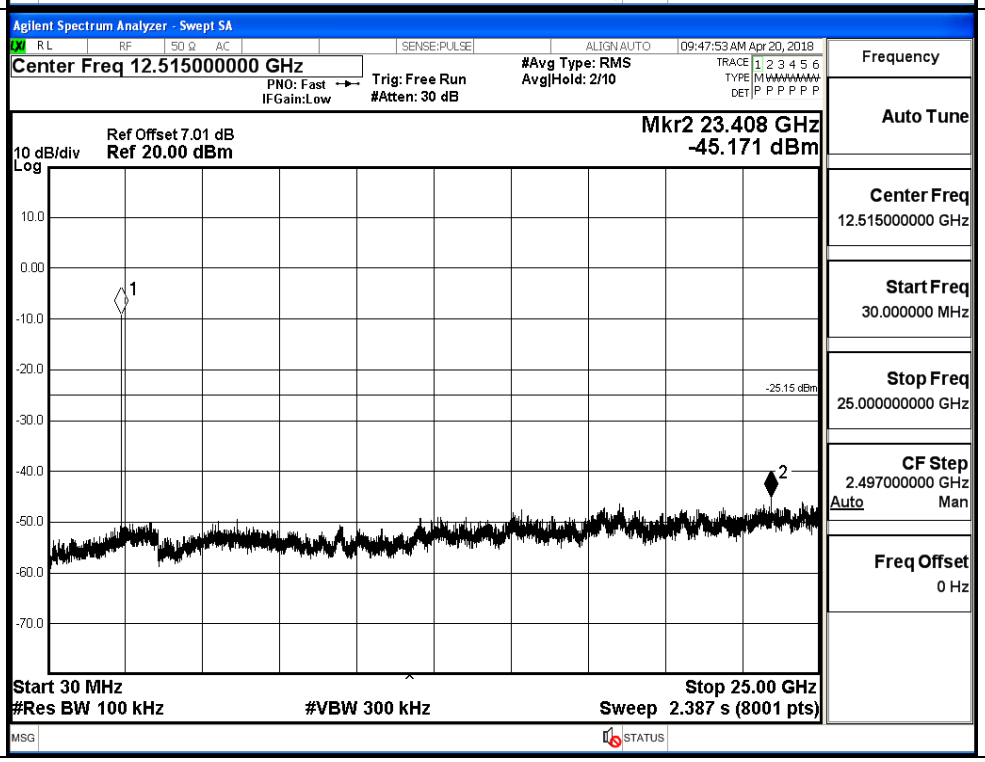
GFSK_MCH_Graphs		
Pref		
Puw		

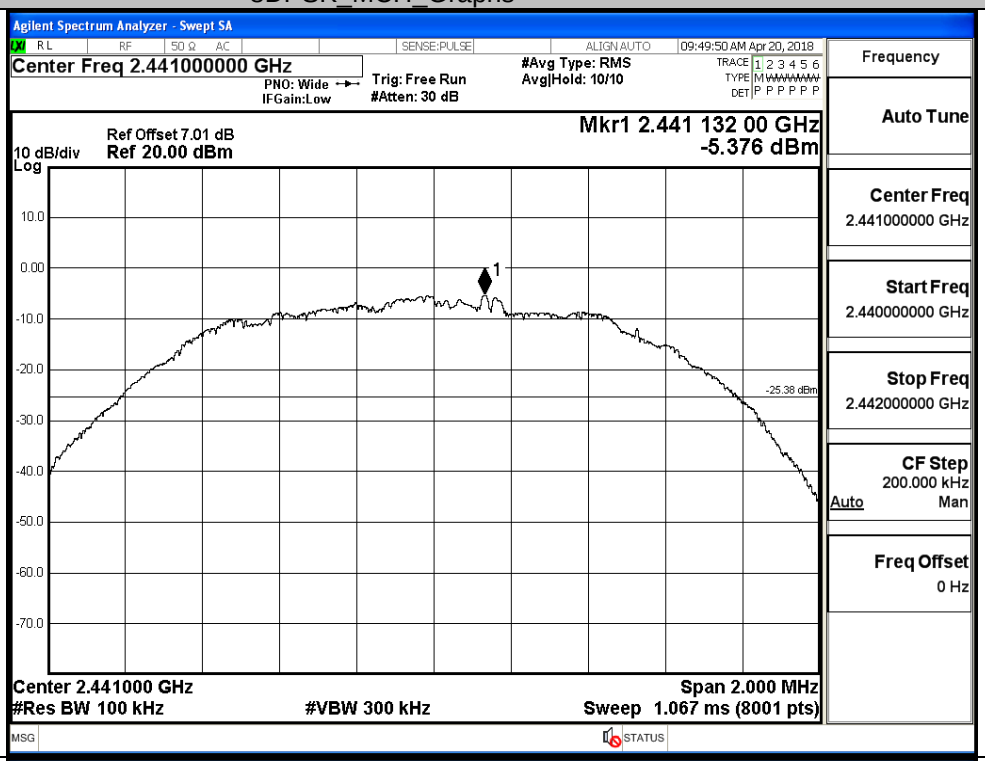
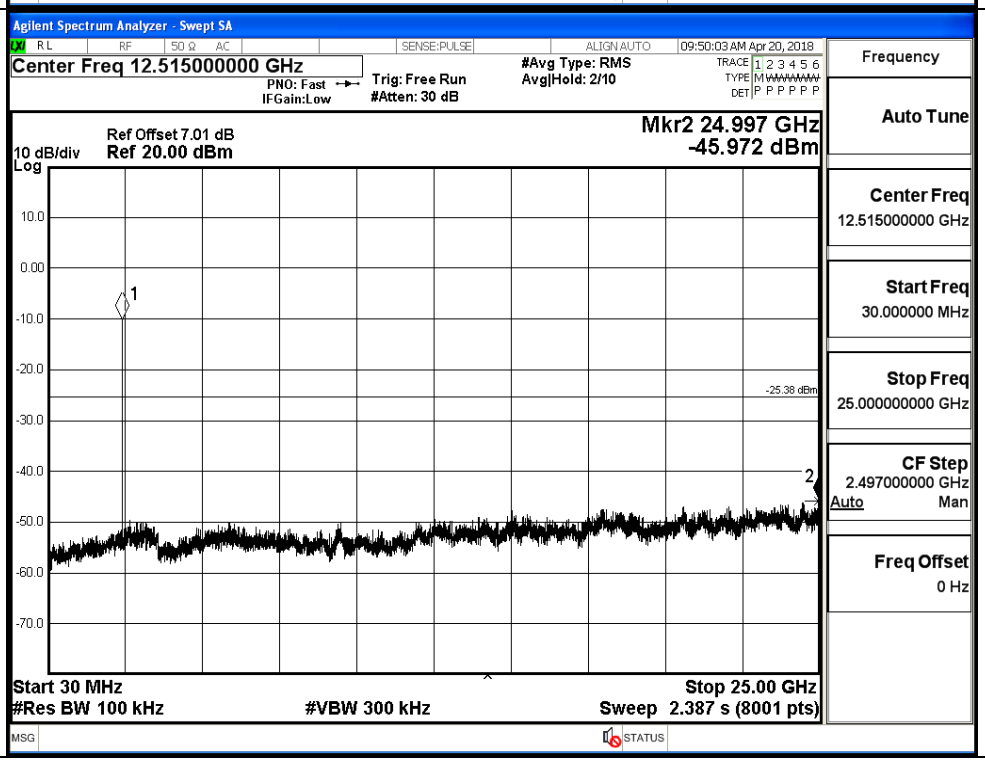
GFSK_HCH_Graphs		
Pref		
Puw		

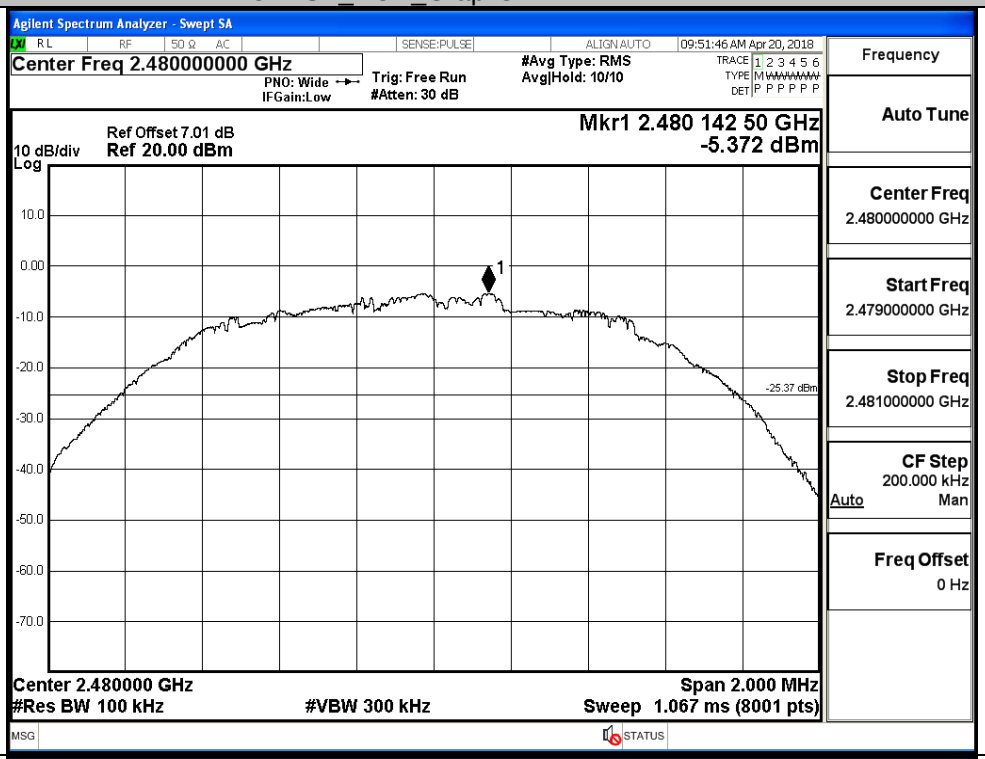
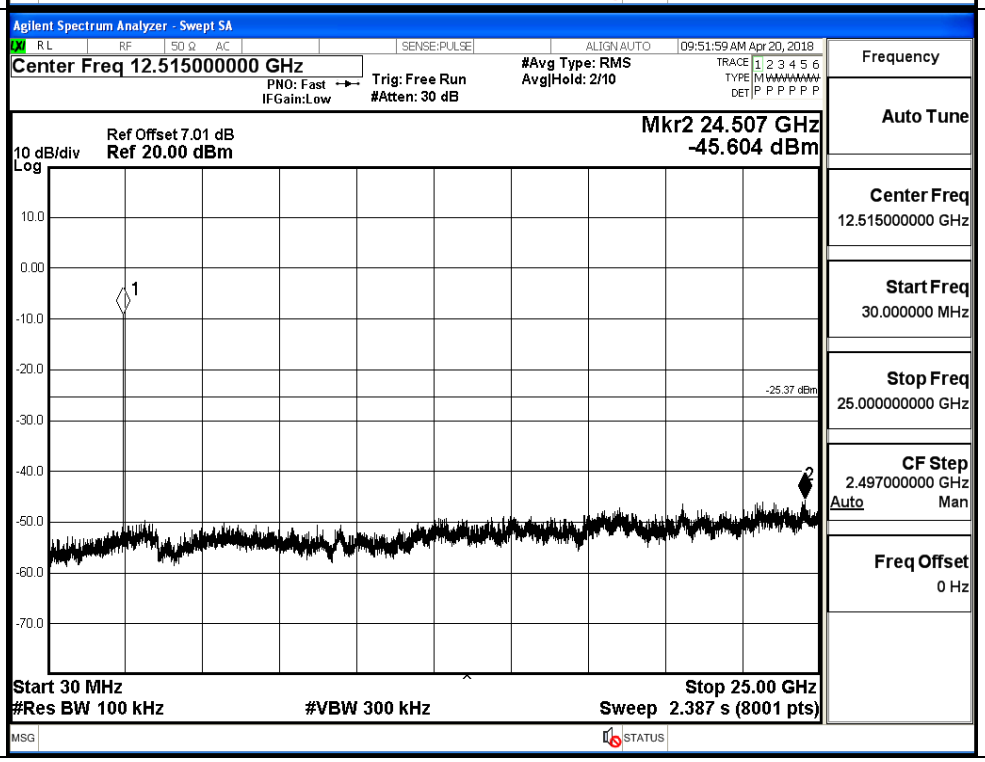
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

π/4DQPSK_MCH_Graphs		
Pref		
Puw		

π/4DQPSK_HCH_Graphs		
Pref		
Puw		

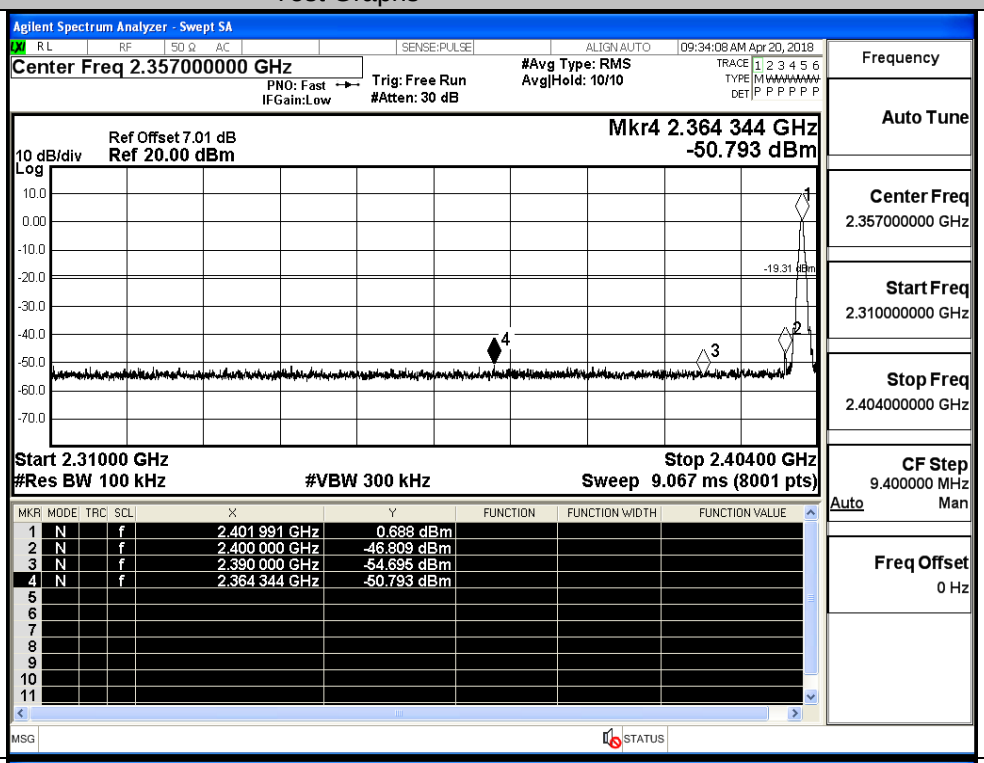
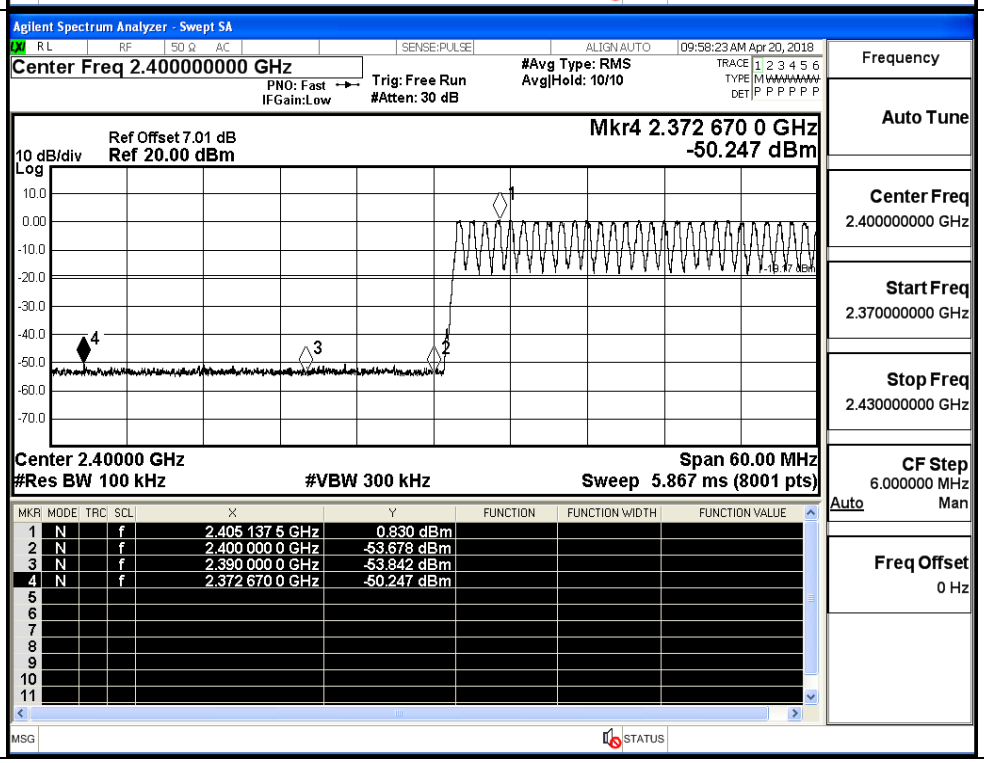
8DPSK_LCH_Graphs		
Pref		
Puw		

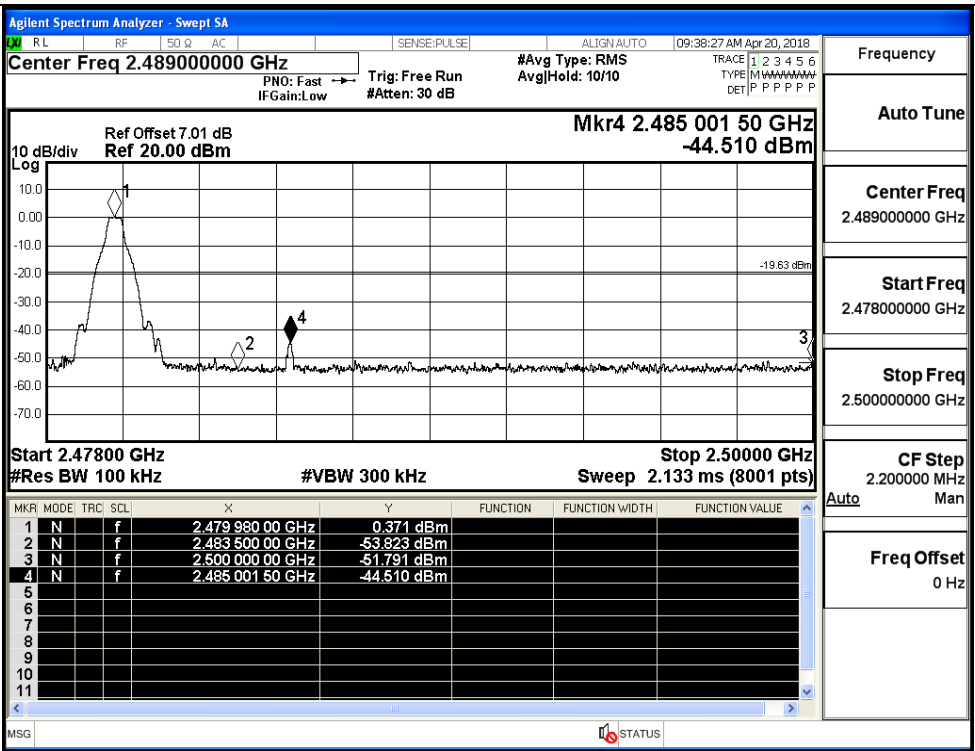
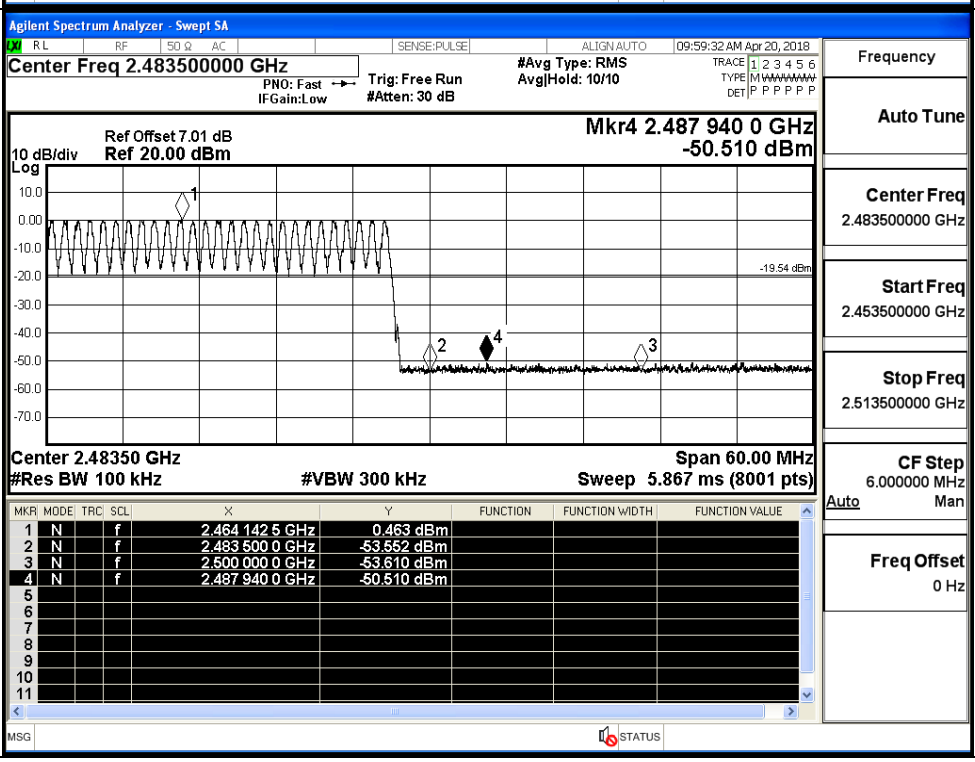
8DPSK_MCH_Graphs		
Pref		
Puw		

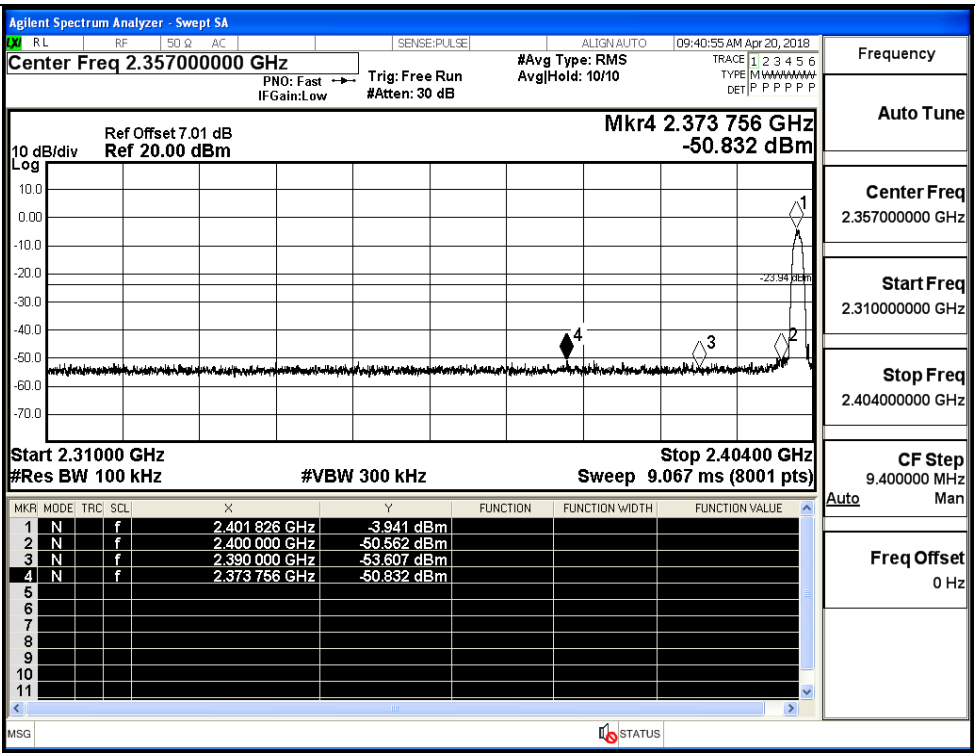
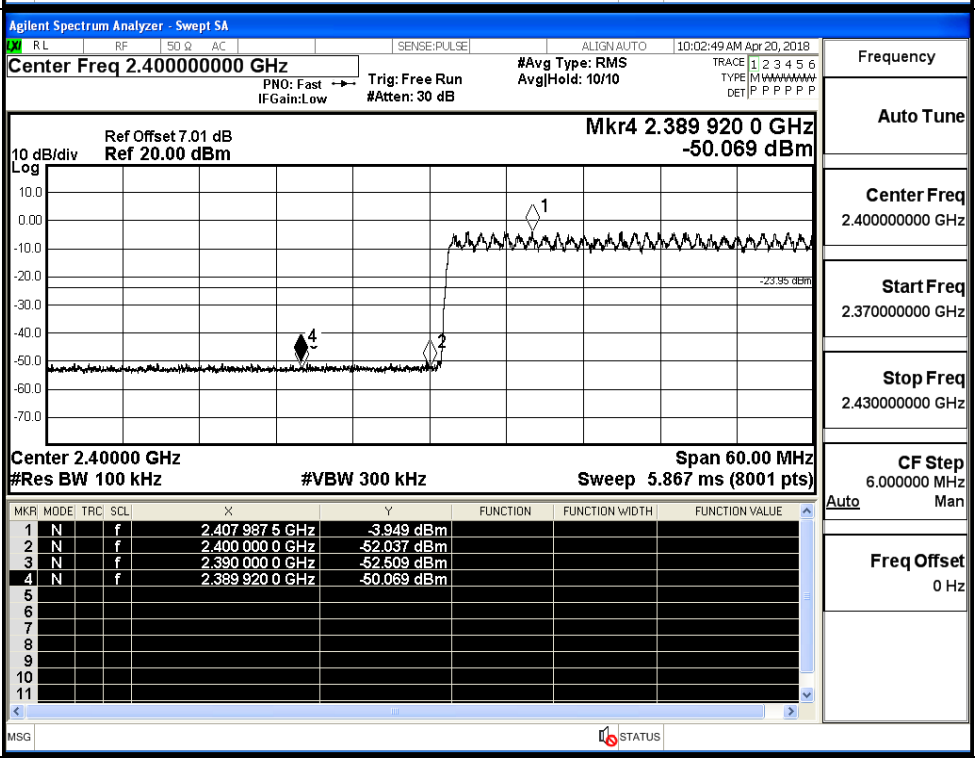
8DPSK_HCH_Graphs		
Pref		
Puw		

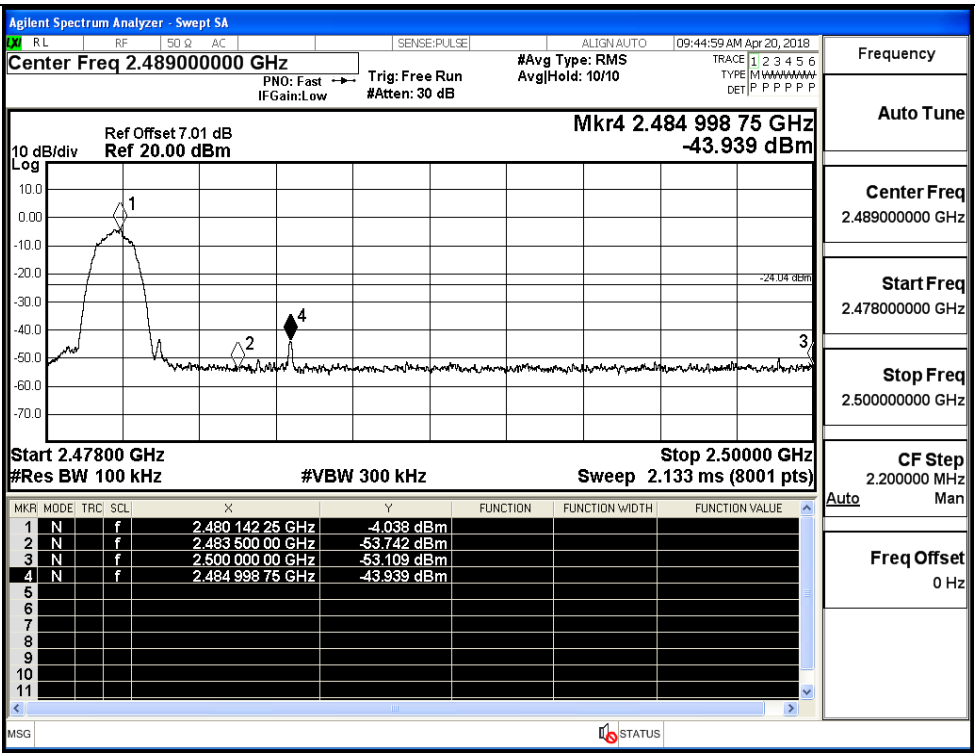
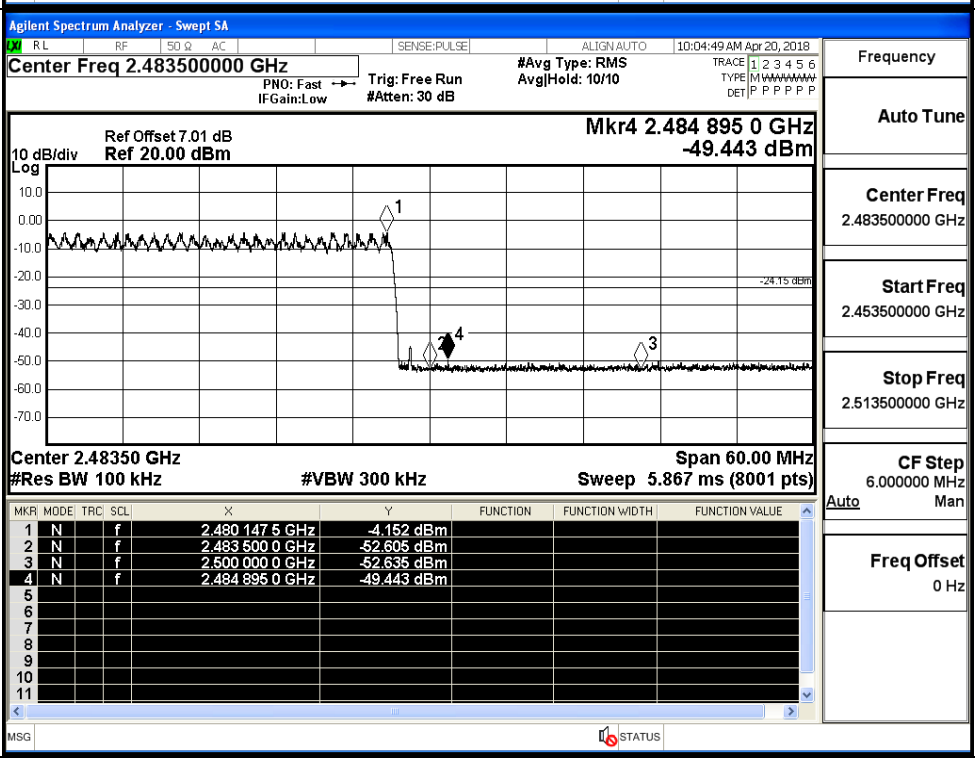
A.7 Band-edge for RF Conducted Emissions

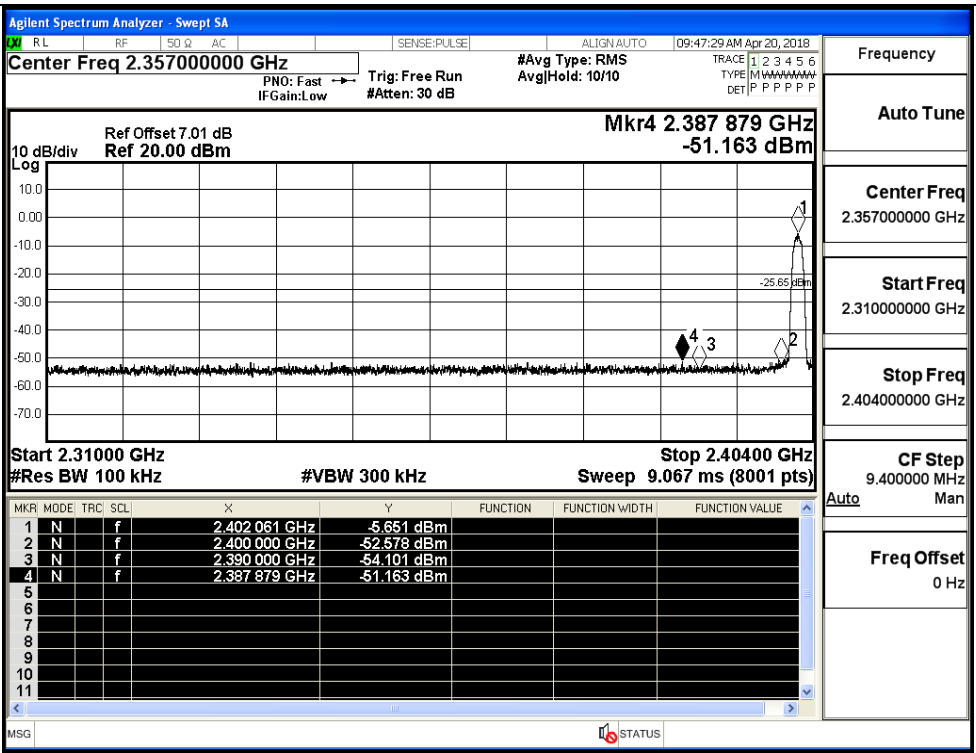
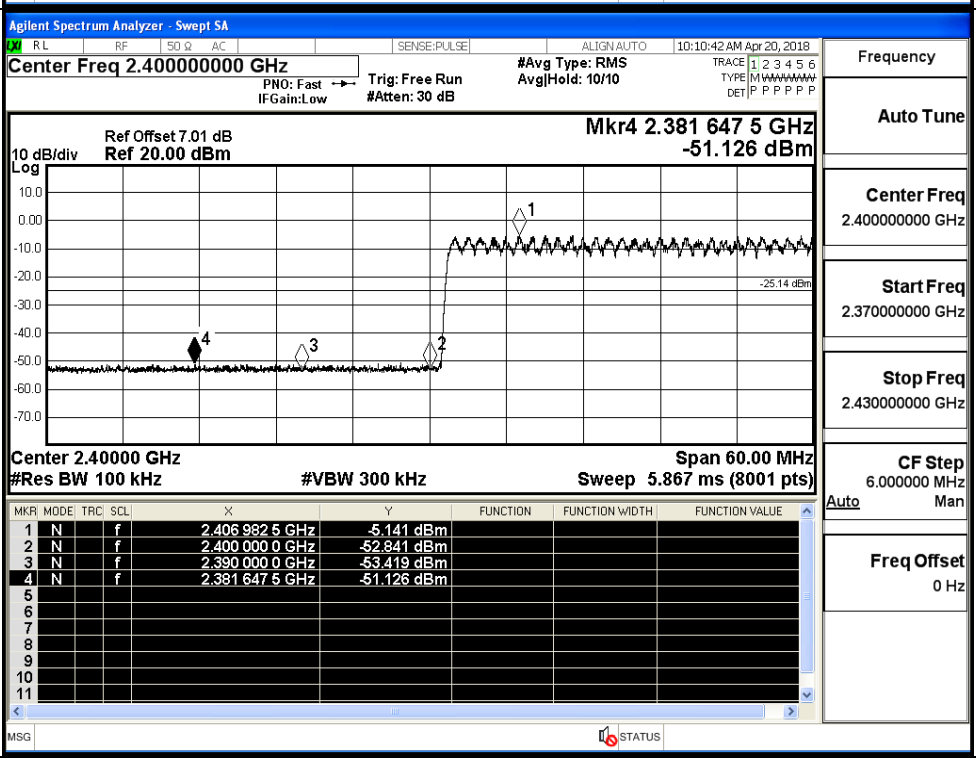
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.688	Off	-50.793	-19.31	PASS
			0.830	On	-50.247	-19.17	PASS
	HCH	2480	0.371	Off	-44.510	-19.63	PASS
			0.463	On	-50.510	-19.54	PASS
π/4DQPSK	LCH	2402	-3.941	Off	-50.832	-23.94	PASS
			-3.949	On	-50.069	-23.95	PASS
	HCH	2480	-4.038	Off	-43.939	-24.04	PASS
			-4.152	On	-49.443	-24.15	PASS
8DPSK	LCH	2402	-5.651	Off	-51.163	-25.65	PASS
			-5.141	On	-51.126	-25.14	PASS
	HCH	2480	-5.461	Off	-43.900	-25.46	PASS
			-5.411	On	-46.029	-25.41	PASS

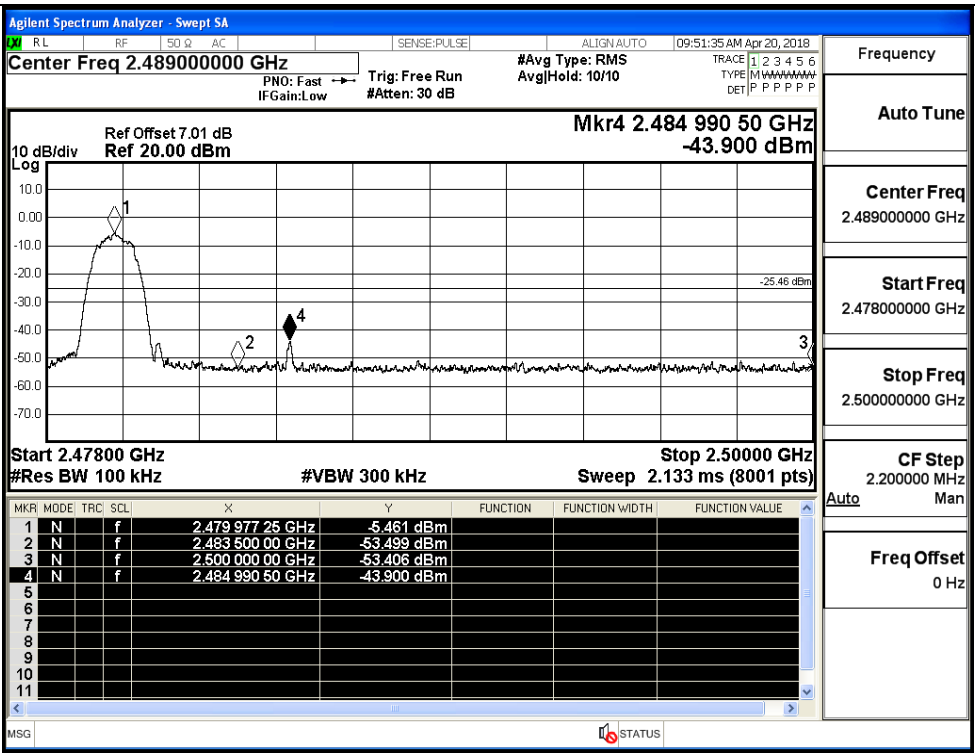
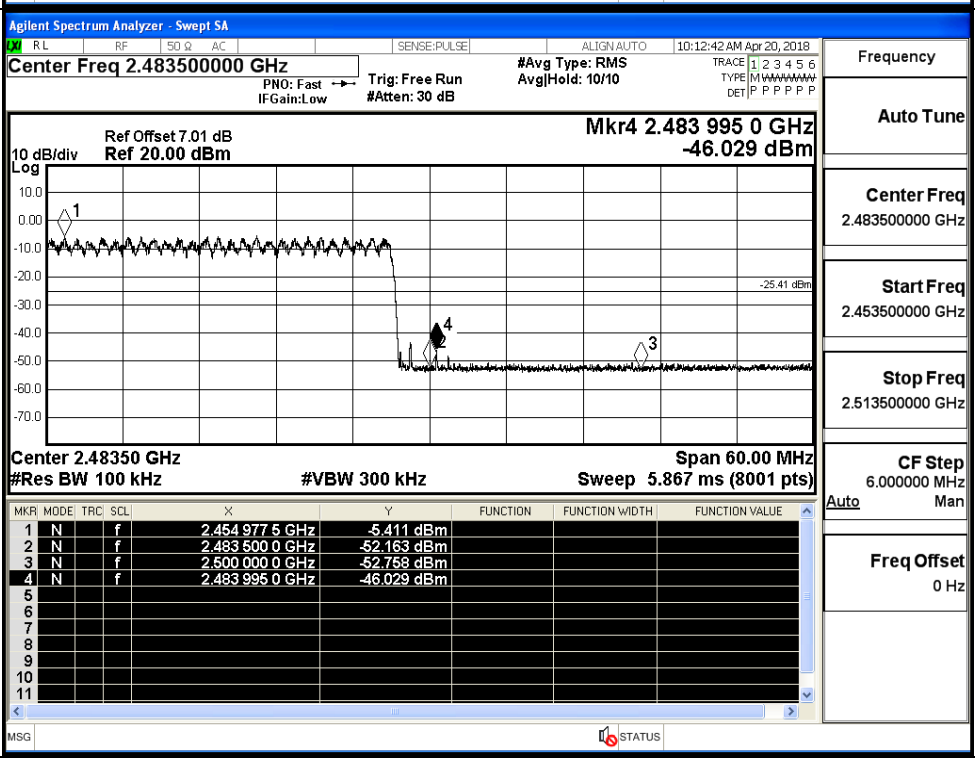
Test Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	

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	

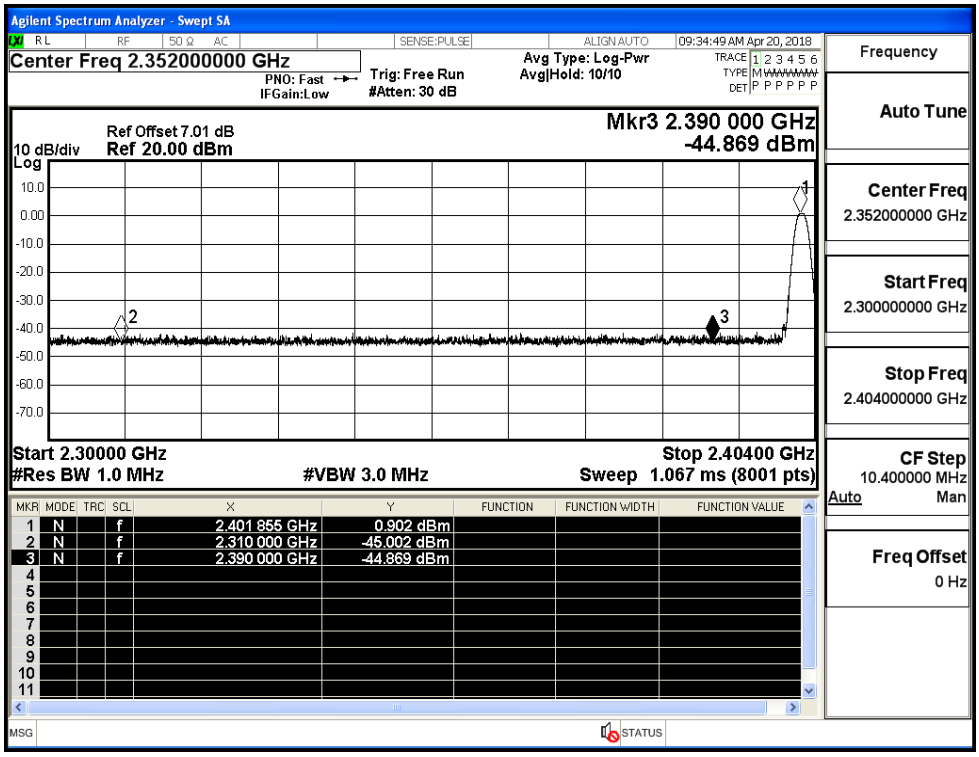
8DPSK/LCH/No Hop	
8DPSK/LCH/Hop	

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

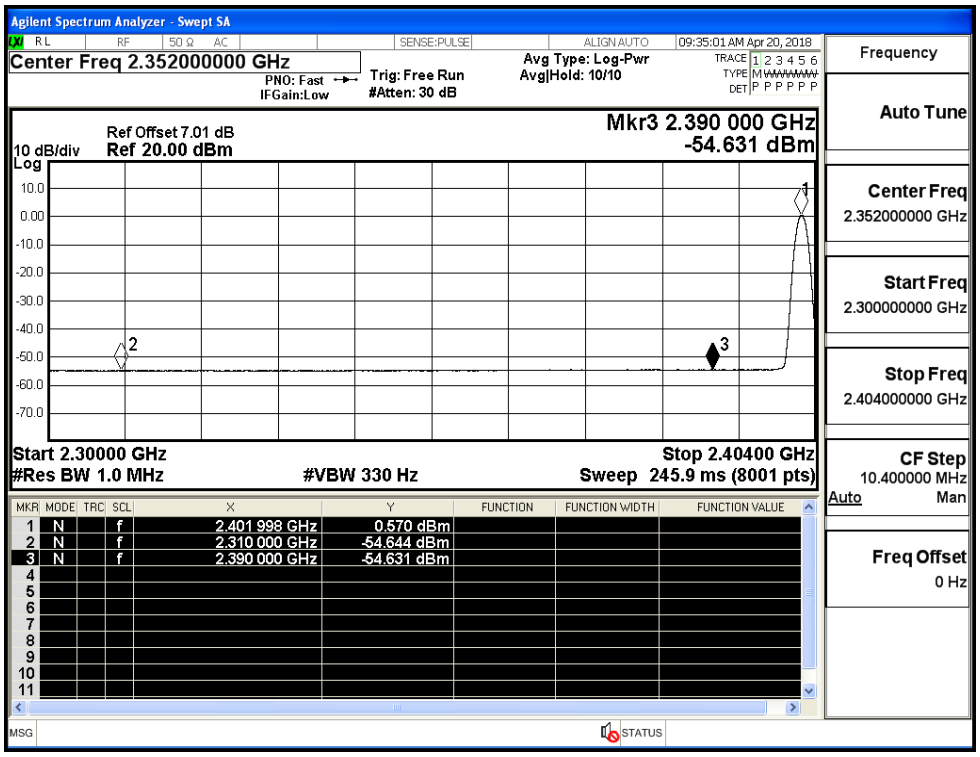
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-45.00	2.0	0	50.26	PEAK	74	PASS
	Off	2310.0	-54.64	2.0	0	40.61	AV	54	PASS
	Off	2390.0	-44.87	2.0	0	50.39	PEAK	74	PASS
	Off	2390.0	-54.63	2.0	0	40.63	AV	54	PASS
	Off	2483.5	-43.57	2.0	0	51.69	PEAK	74	PASS
	Off	2483.5	-54.24	2.0	0	41.02	AV	54	PASS
	Off	2500.0	-43.26	2.0	0	52.00	PEAK	74	PASS
	Off	2500.0	-54.16	2.0	0	41.10	AV	54	PASS
π/4DQPSK	Off	2310.0	-45.08	2.0	0	50.18	PEAK	74	PASS
	Off	2310.0	-54.90	2.0	0	40.36	AV	54	PASS
	Off	2390.0	-44.46	2.0	0	50.79	PEAK	74	PASS
	Off	2390.0	-54.43	2.0	0	40.82	AV	54	PASS
	Off	2483.5	-44.39	2.0	0	50.87	PEAK	74	PASS
	Off	2483.5	-54.02	2.0	0	41.23	AV	54	PASS
	Off	2500.0	-43.01	2.0	0	52.24	PEAK	74	PASS
	Off	2500.0	-54.14	2.0	0	41.11	AV	54	PASS
8DPSK	Off	2310.0	-44.69	2.0	0	50.57	PEAK	74	PASS
	Off	2310.0	-54.80	2.0	0	40.46	AV	54	PASS
	Off	2390.0	-45.06	2.0	0	50.20	PEAK	74	PASS
	Off	2390.0	-54.54	2.0	0	40.71	AV	54	PASS
	Off	2483.5	-45.22	2.0	0	50.04	PEAK	74	PASS
	Off	2483.5	-54.03	2.0	0	41.23	AV	54	PASS
	Off	2500.0	-44.06	2.0	0	51.20	PEAK	74	PASS
	Off	2500.0	-54.18	2.0	0	41.08	AV	54	PASS

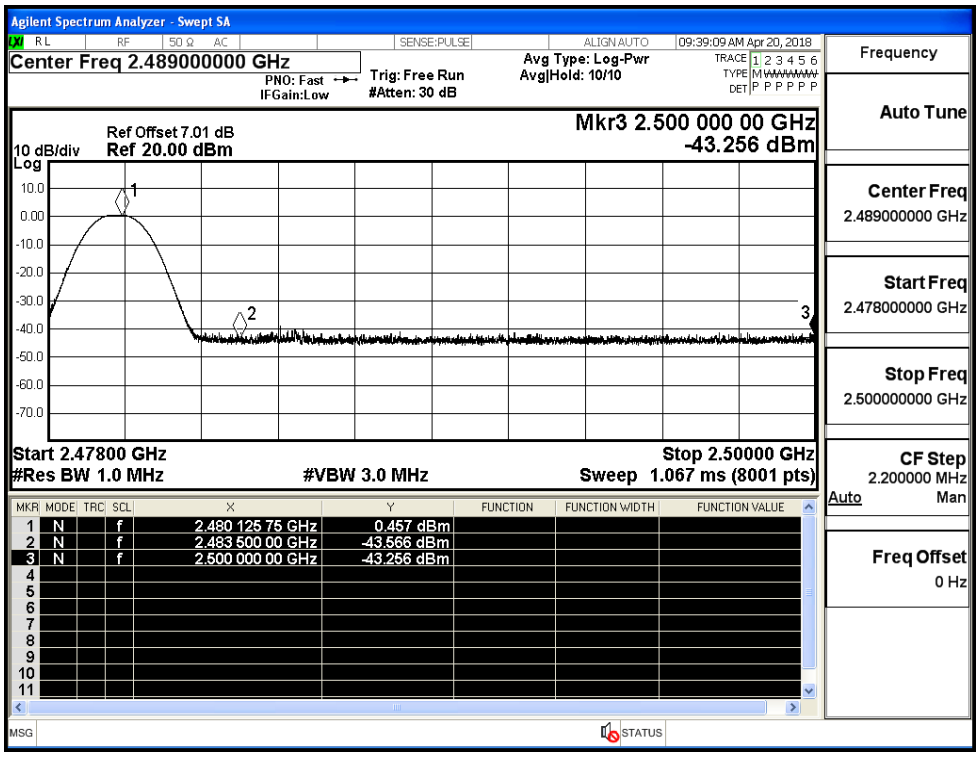
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



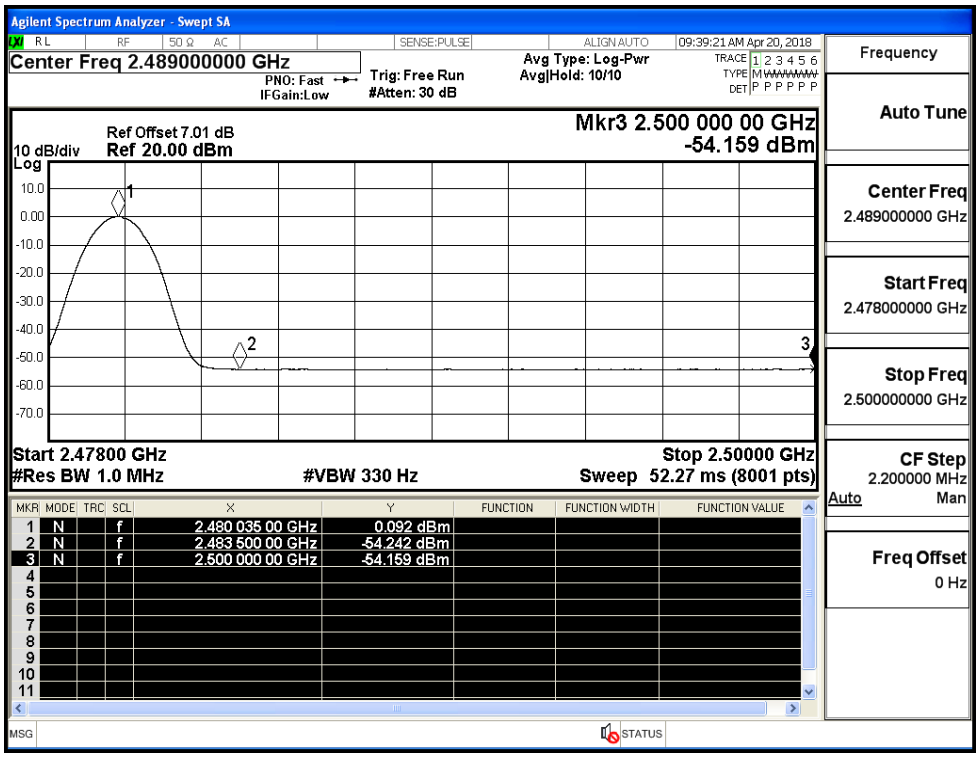
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



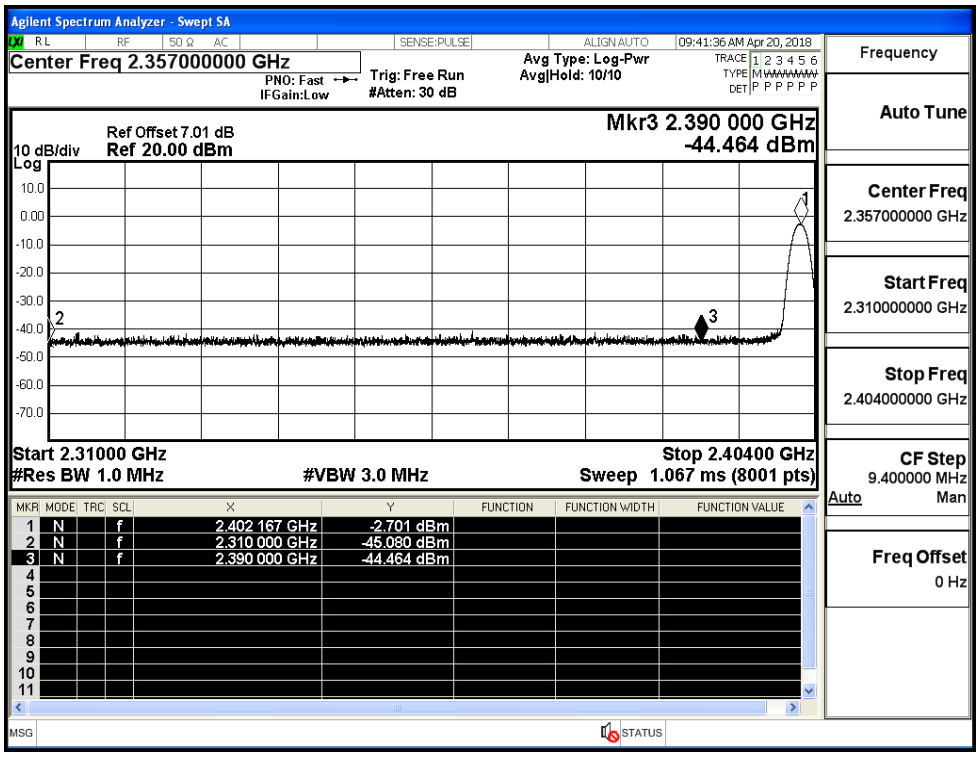
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



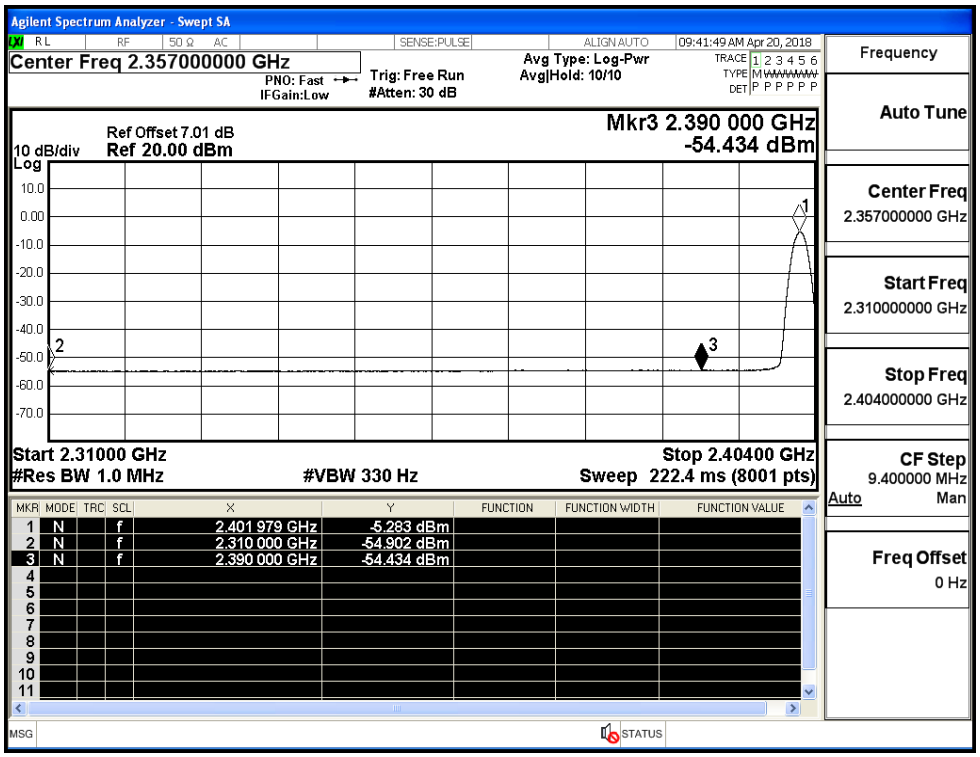
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



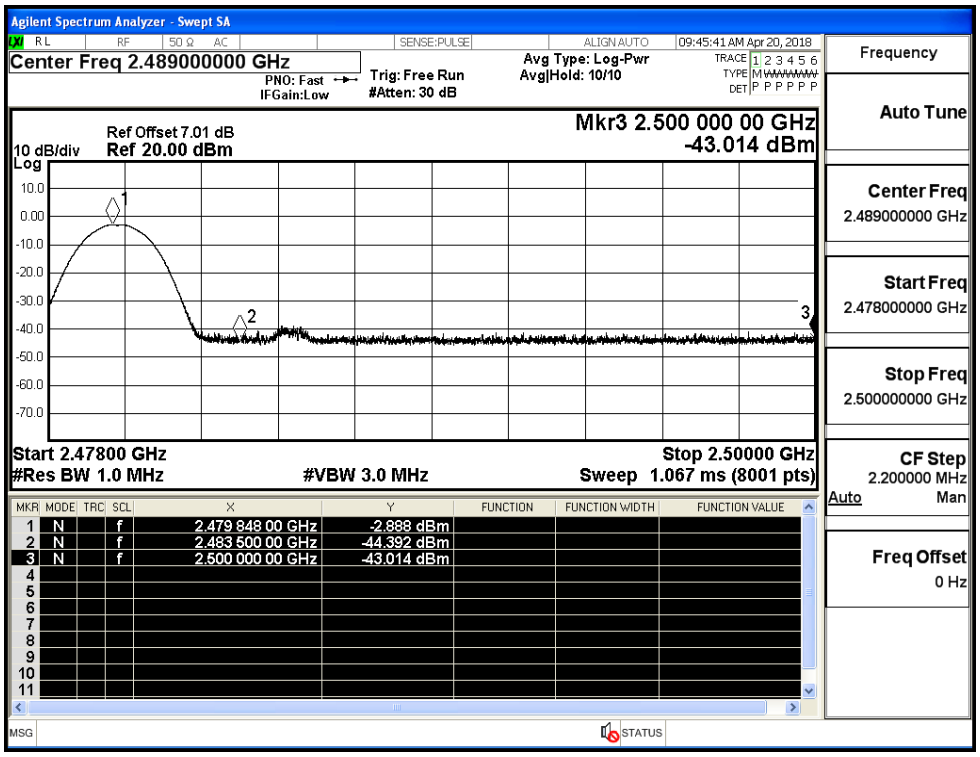
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



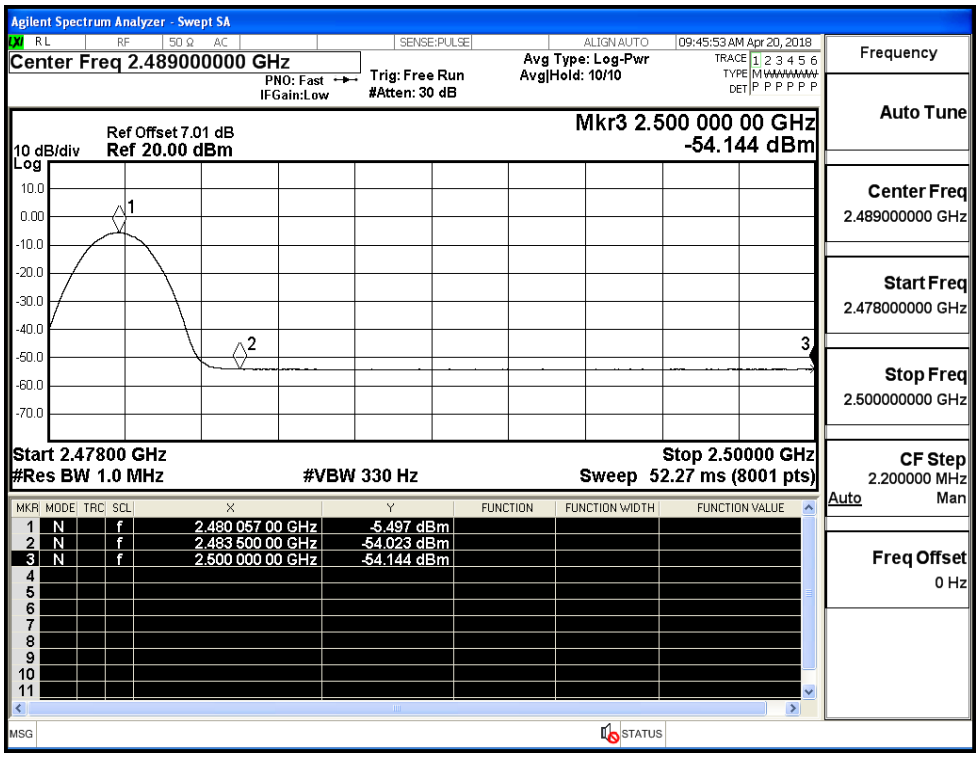
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



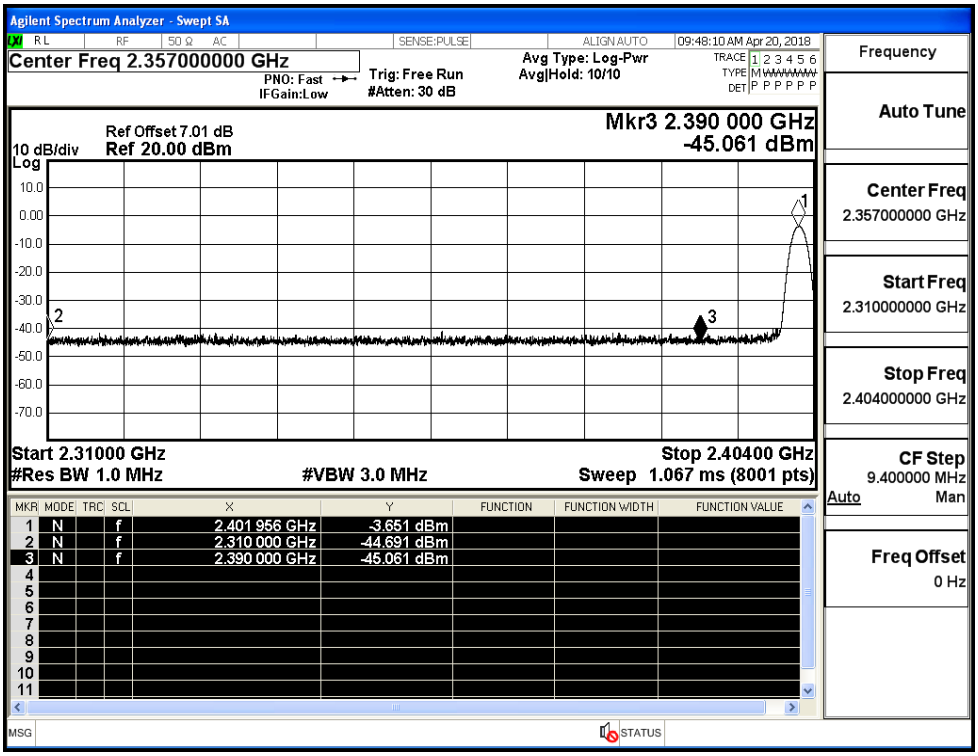
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



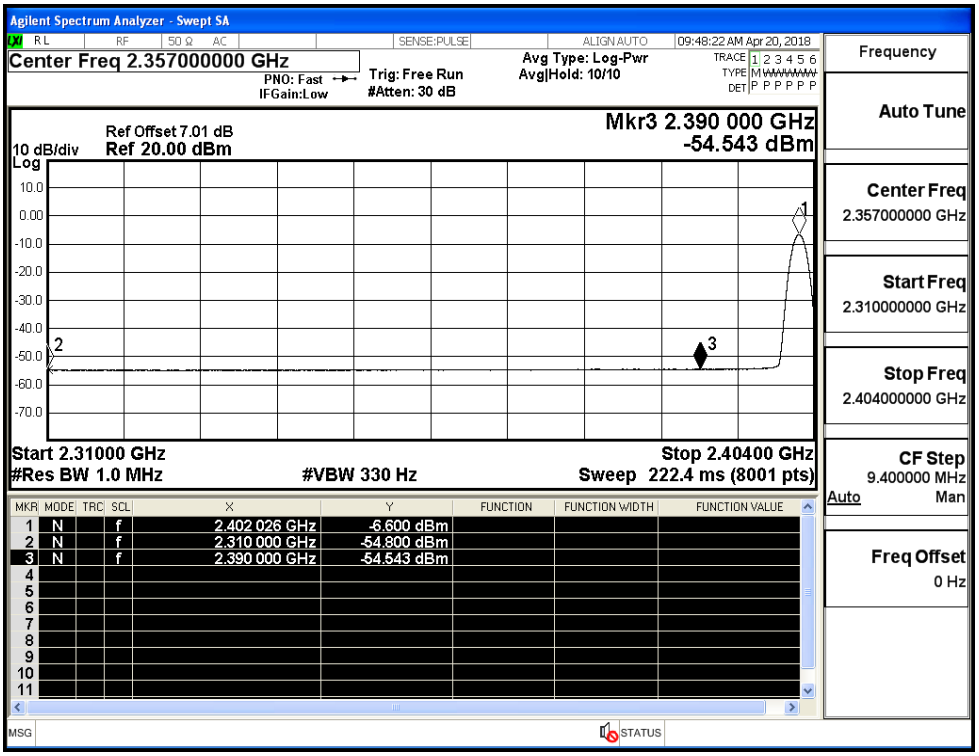
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



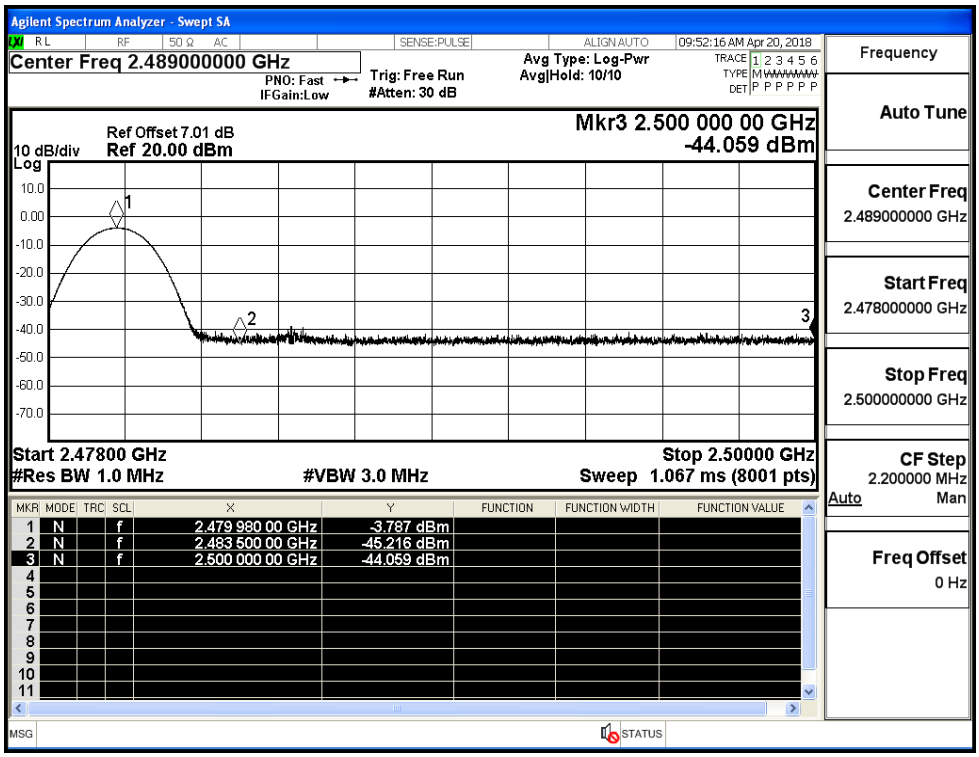
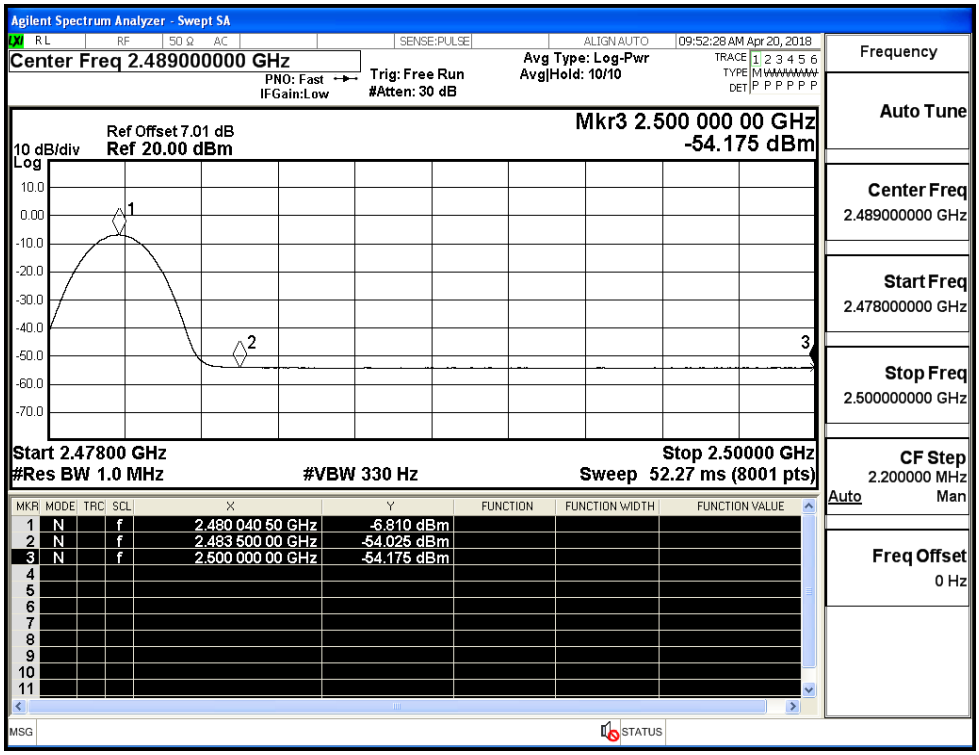
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)