Appendix A

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

Product Name: Bluetooth Earphone

Trade Mark: N/A

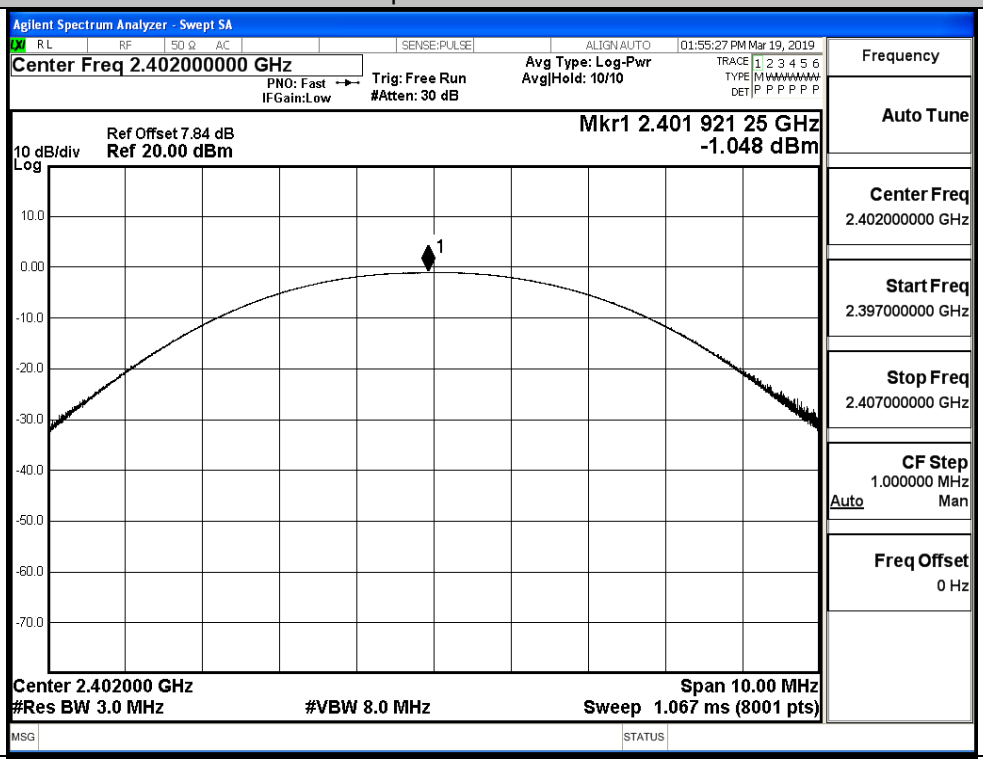
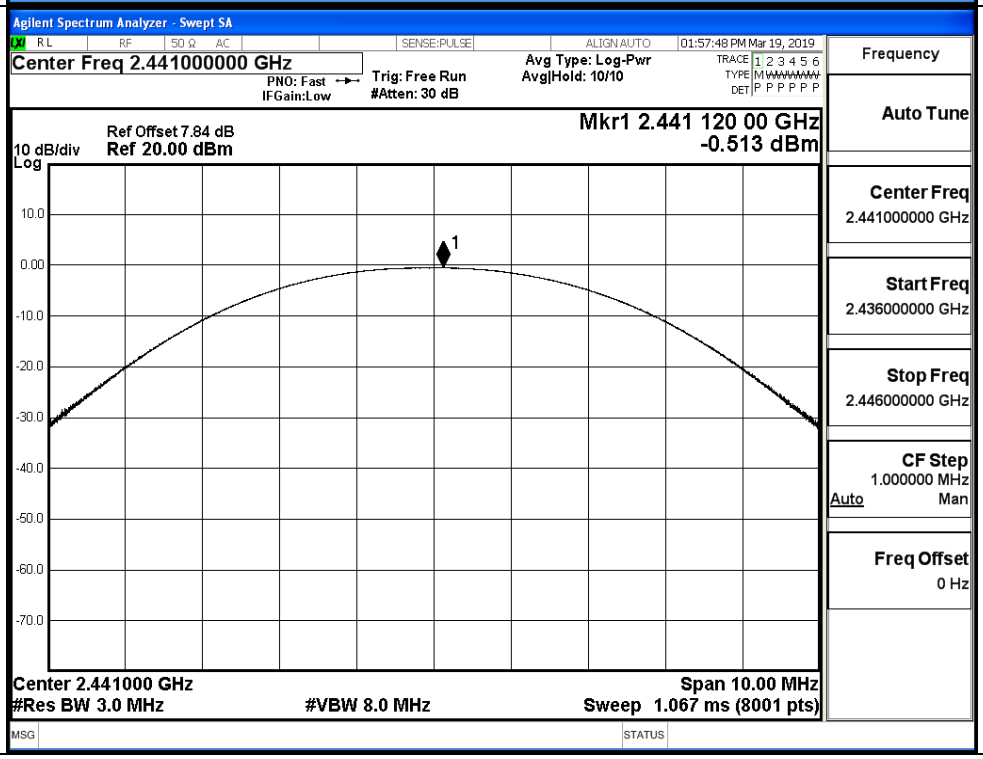
Test Model: MBZPA232

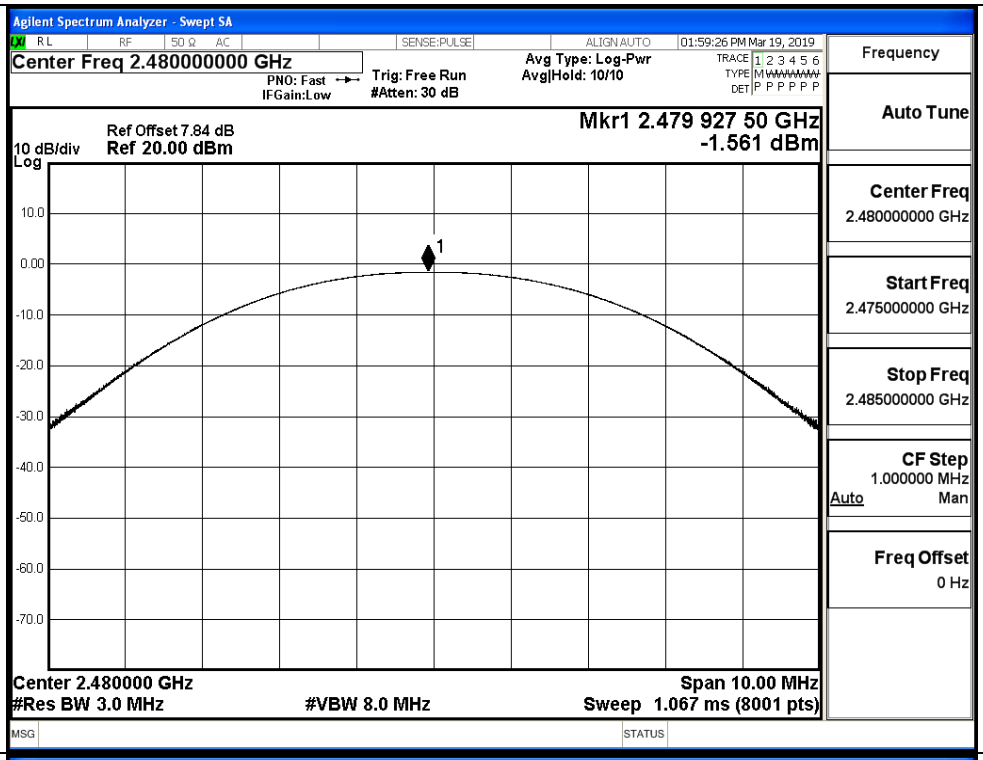
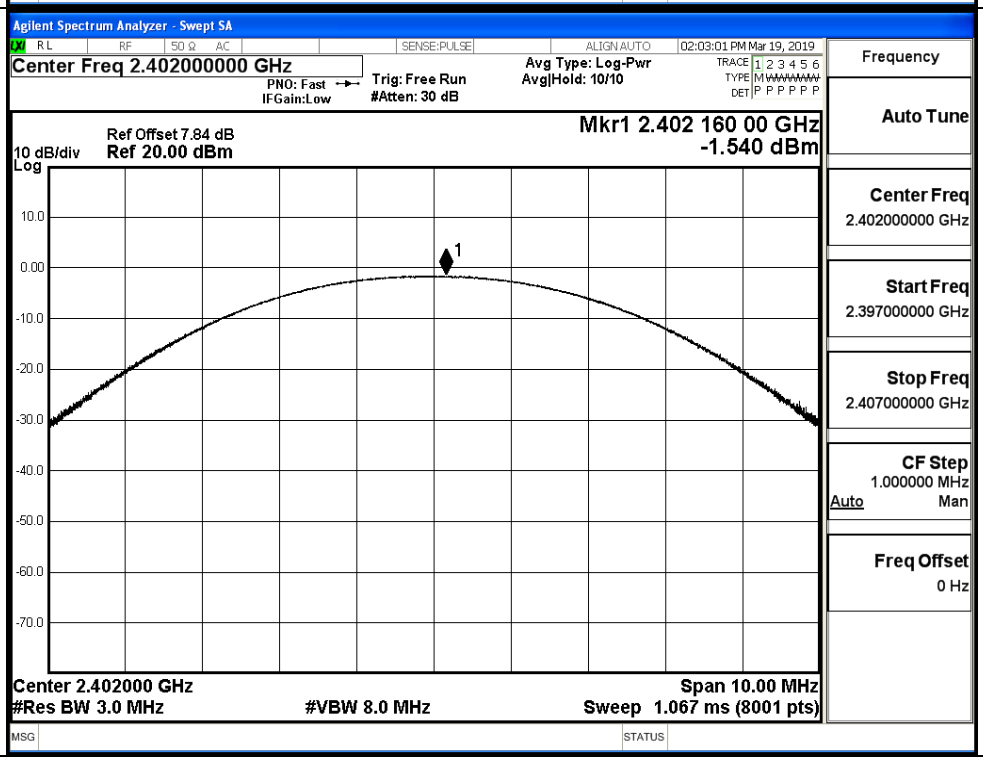
Environmental Conditions

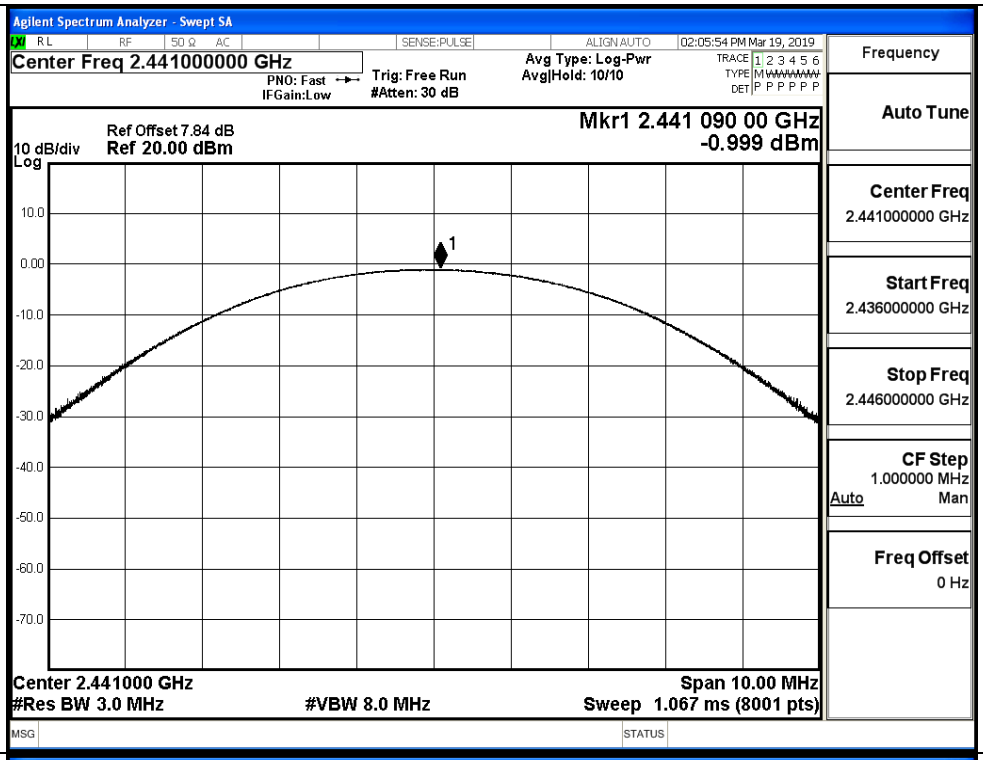
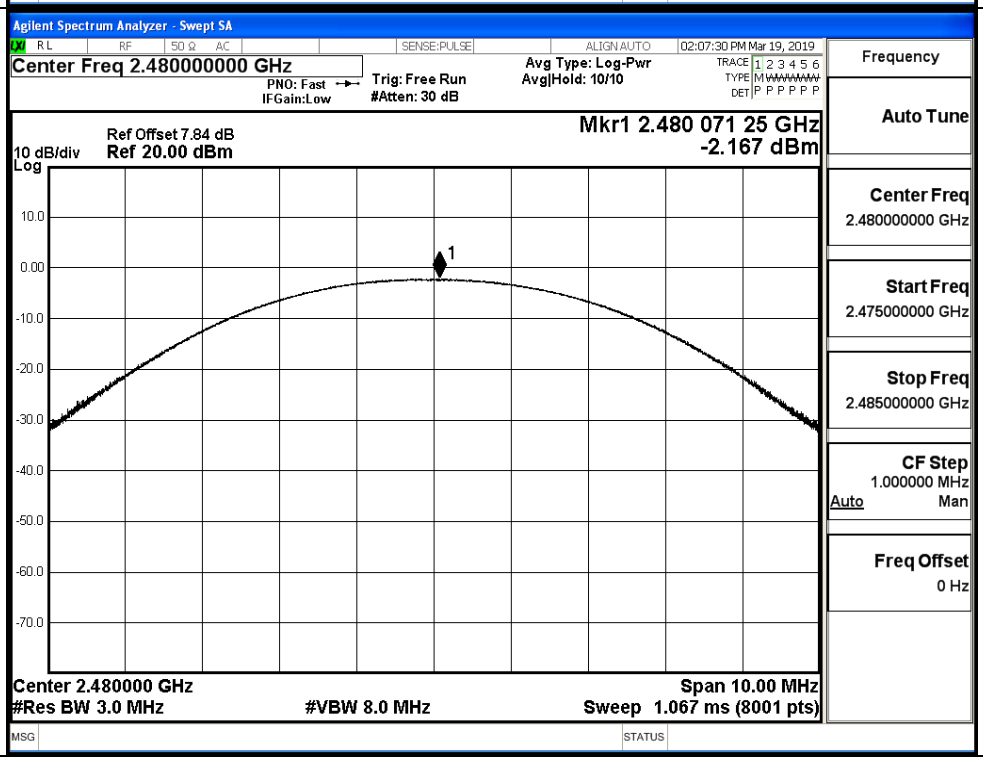
Temperature:	24.1 ° C
Relative Humidity:	53.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.048	21	PASS
	MCH	-0.513	21	PASS
	HCH	-1.561	21	PASS
π/4DQPSK	LCH	-1.540	21	PASS
	MCH	-0.999	21	PASS
	HCH	-2.167	21	PASS

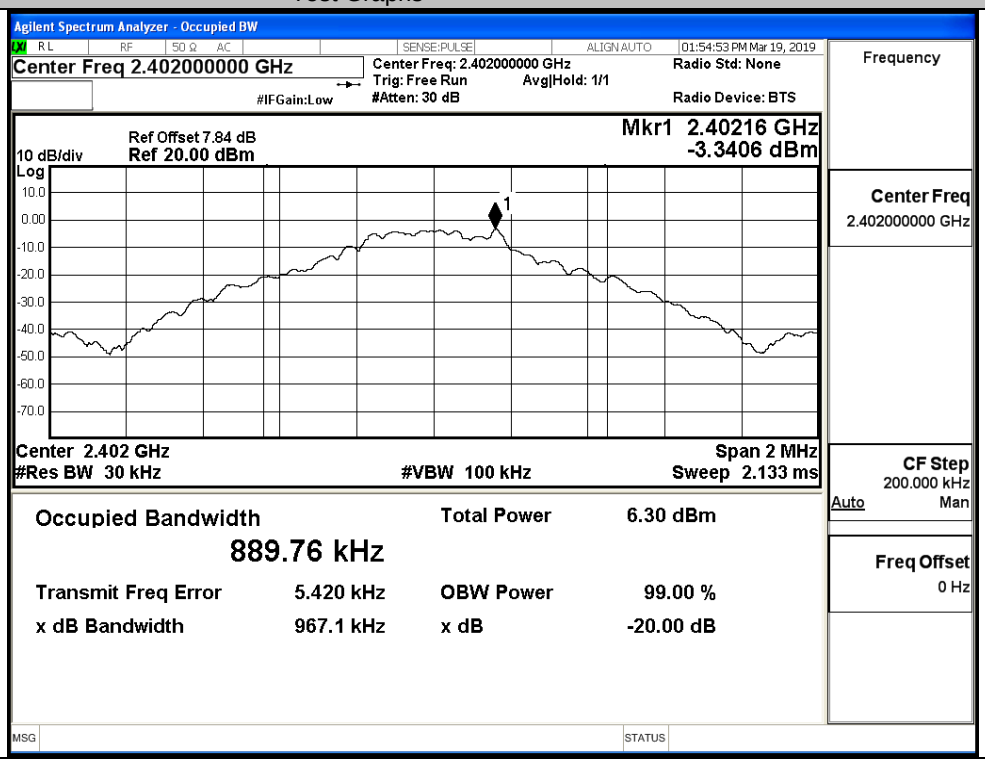
Test Graphs		
GFSK/LCH		
GFSK/MCH		

GFSK/HCH	
π/4DQPSK/LCH	

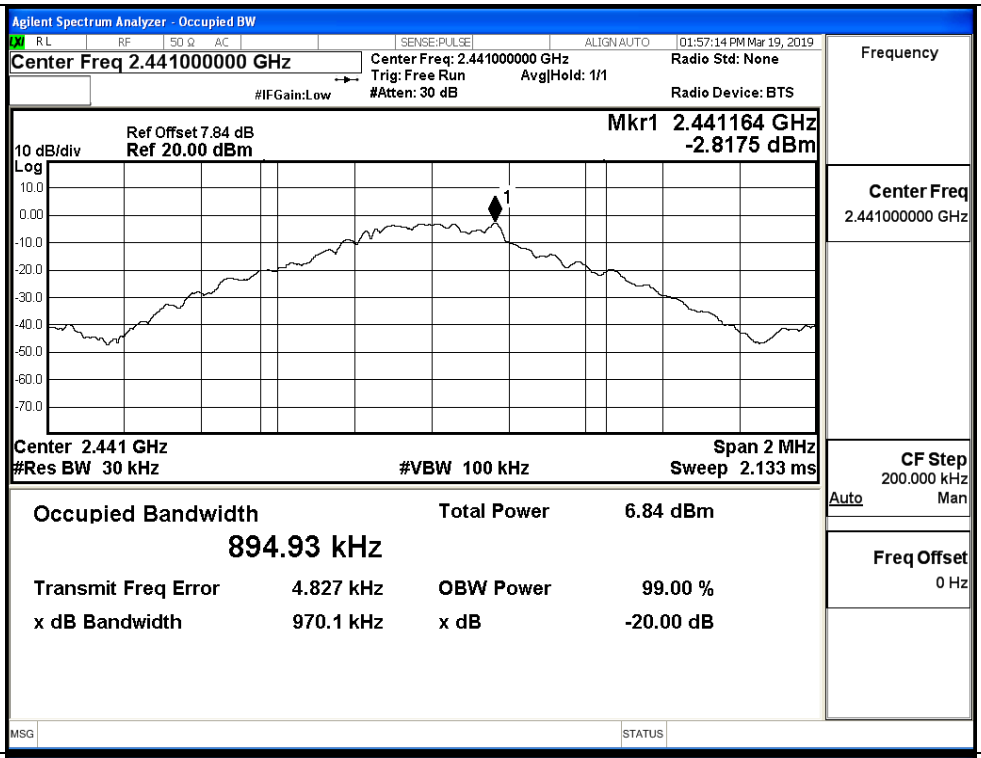
π/4DQPSK/MCH		
π/4DQPSK/HCH		

A.2 99% and 20dB Bandwidth

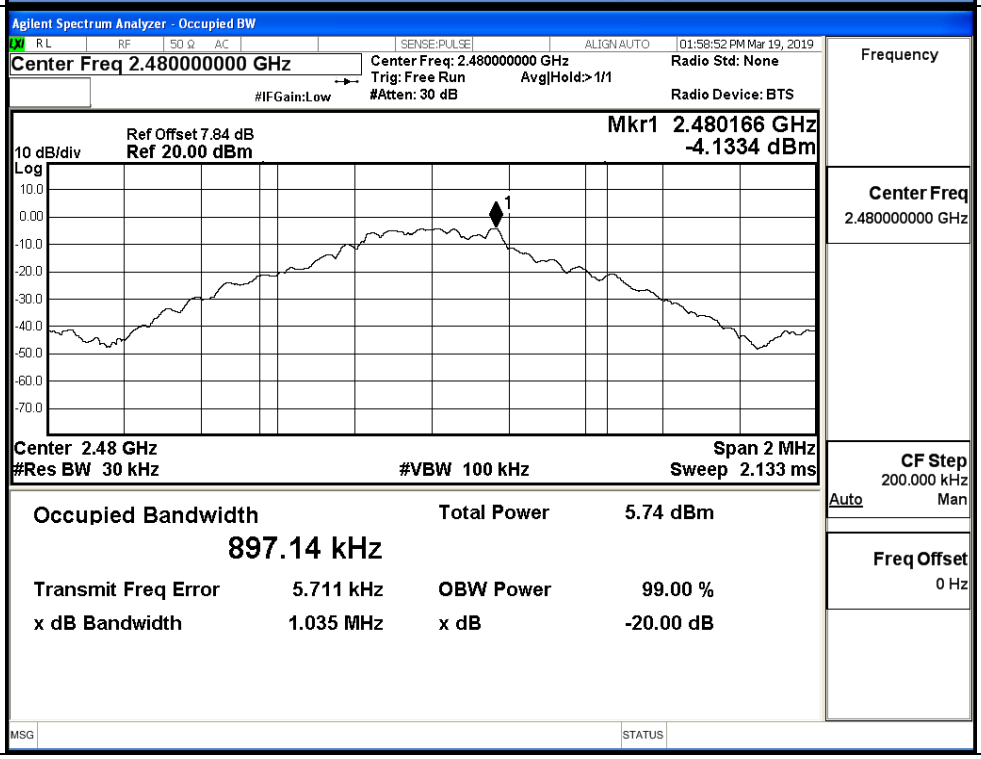
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.88976	0.9671	Not Specified	PASS
	MCH	0.89493	0.9701	Not Specified	PASS
	HCH	0.89714	1.035	Not Specified	PASS
π/4DQPSK	LCH	1.1807	1.311	Not Specified	PASS
	MCH	1.1777	1.321	Not Specified	PASS
	HCH	1.1751	1.310	Not Specified	PASS

Test Graphs	
GFSK/LCH	

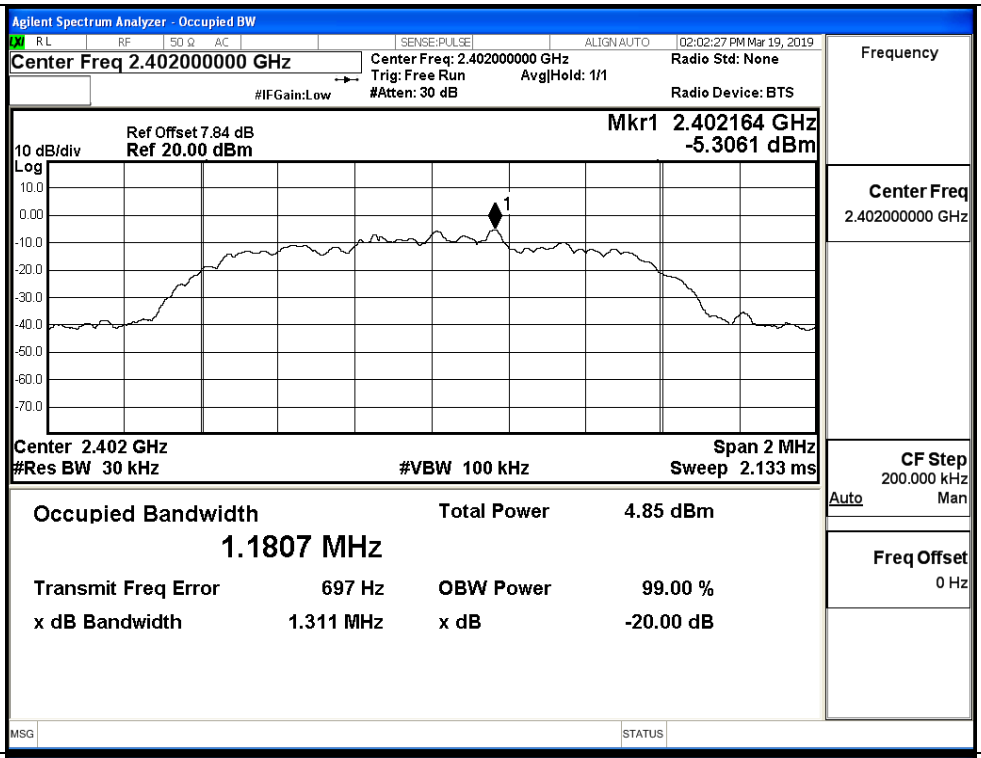
GFSK/MCH



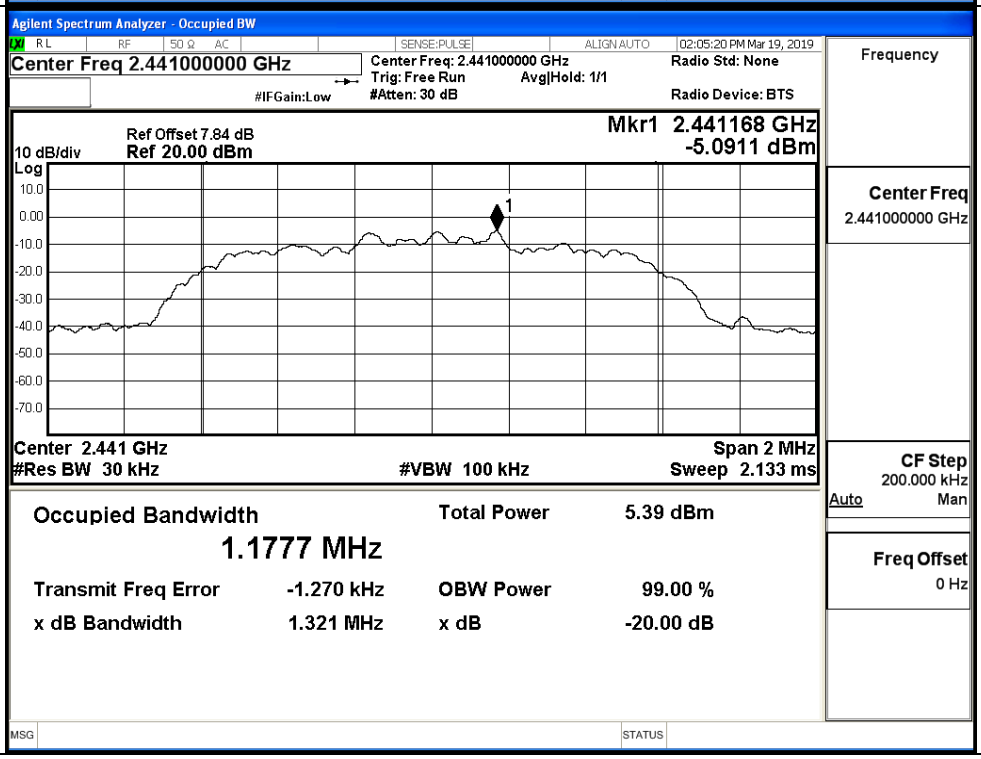
GFSK/HCH



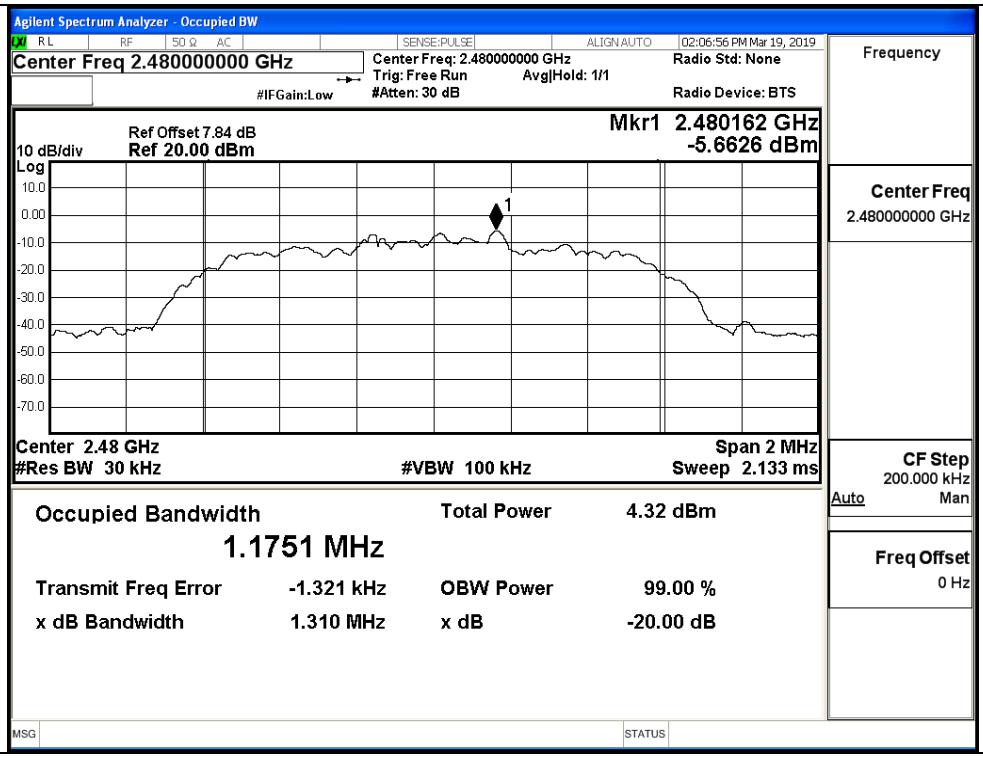
π/4DQPSK/LCH



π/4DQPSK/MCH

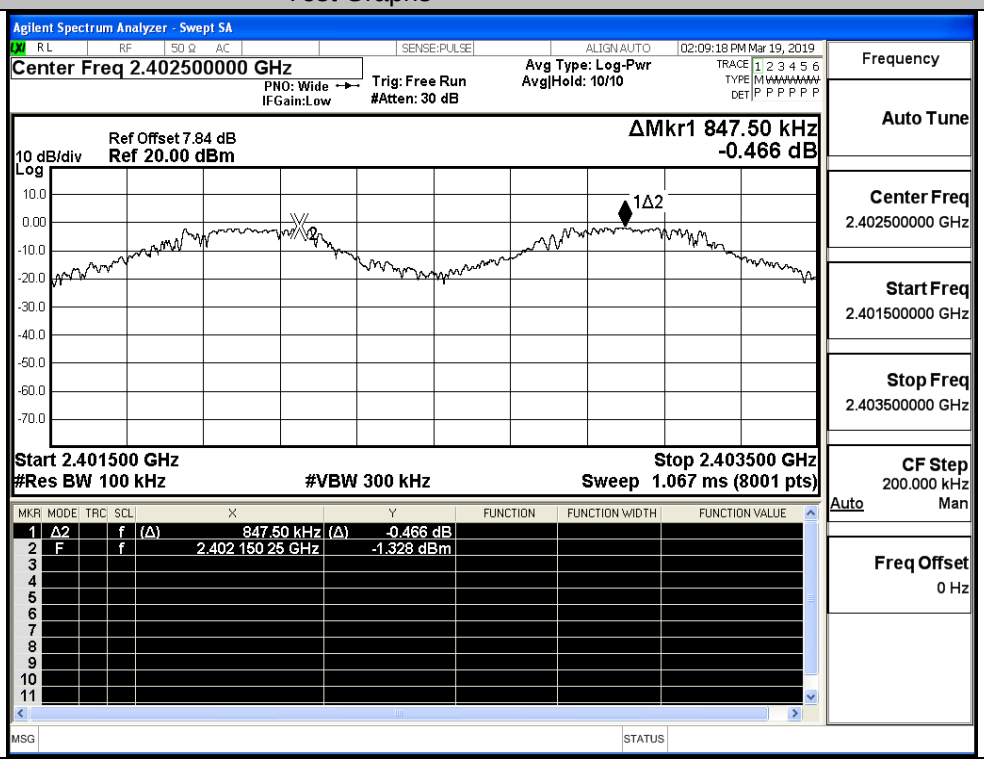


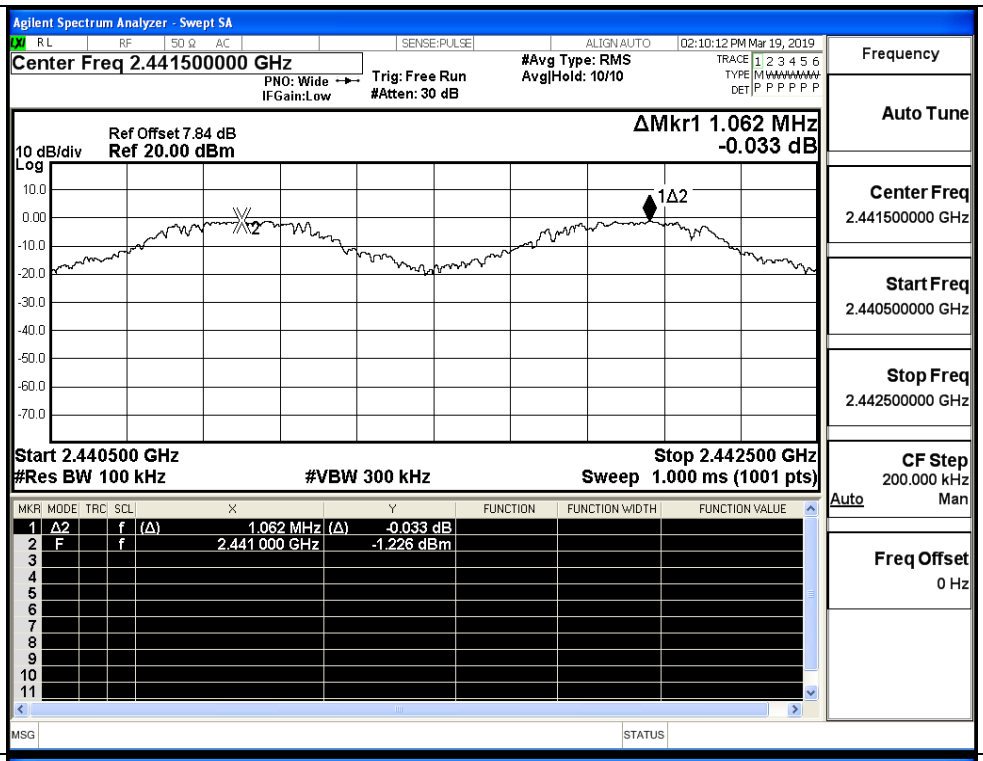
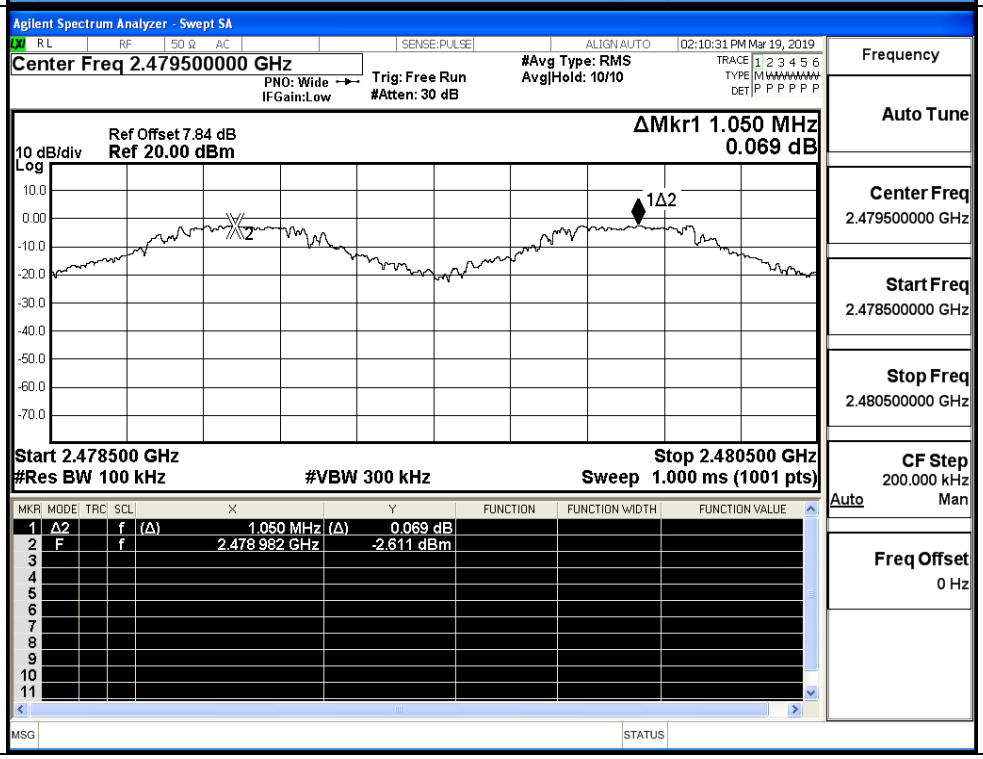
π/4DQPSK/HCH


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
02:06:56 PM Mar 19, 2019
#IFGain:Low
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
Mkr1 2.480162 GHz
-5.6626 dBm
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2 MHz
Sweep 2.133 ms
Occupied Bandwidth
1.1751 MHz
Total Power 4.32 dBm
Transmit Freq Error -1.321 kHz
OBW Power 99.00 %
x dB Bandwidth 1.310 MHz
x dB -20.00 dB
Frequency
Center Freq
2.480000000 GHz
CF Step
200.000 kHz
Auto Man
Freq Offset
0 Hz

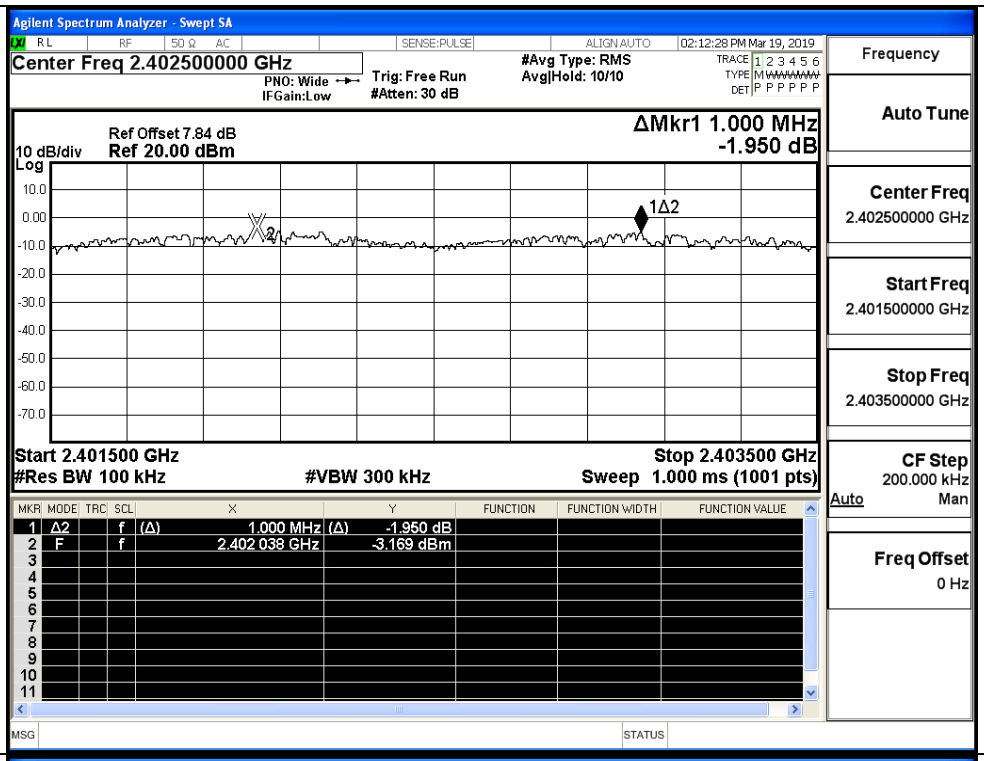
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.847	0.690	PASS
	MCH	1.062	0.690	PASS
	HCH	1.050	0.690	PASS
π/4DQPSK	LCH	1.000	0.881	PASS
	MCH	0.932	0.881	PASS
	HCH	1.298	0.881	PASS

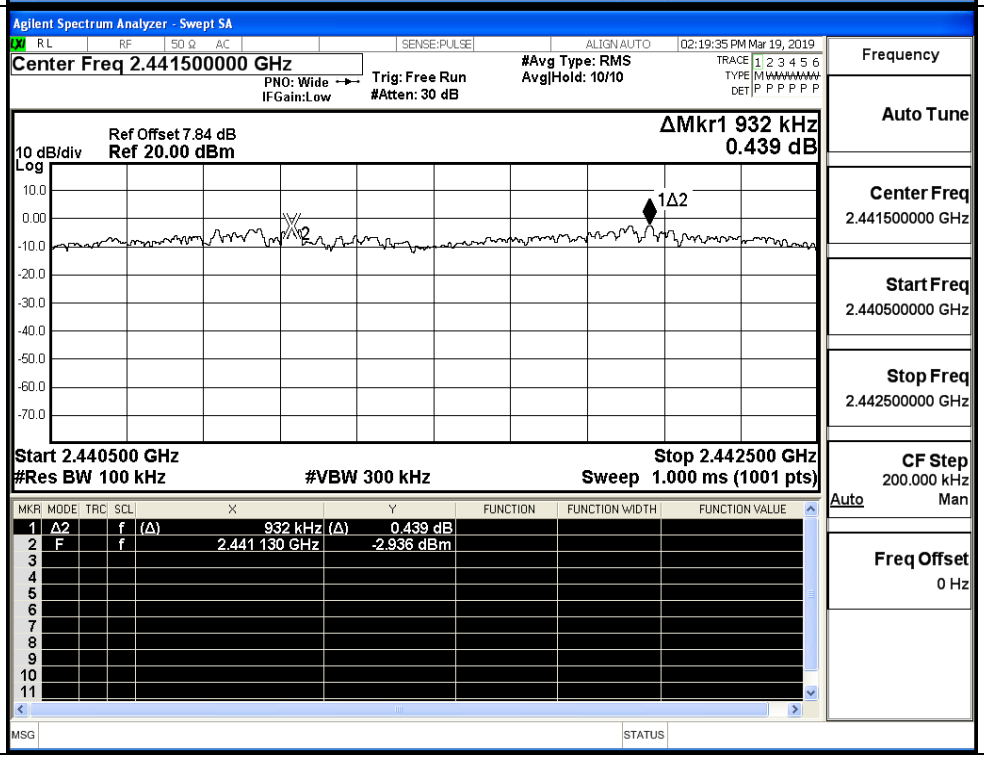
Test Graphs	
GFSK/LCH	

GFSK/MCH		
GFSK/HCH		

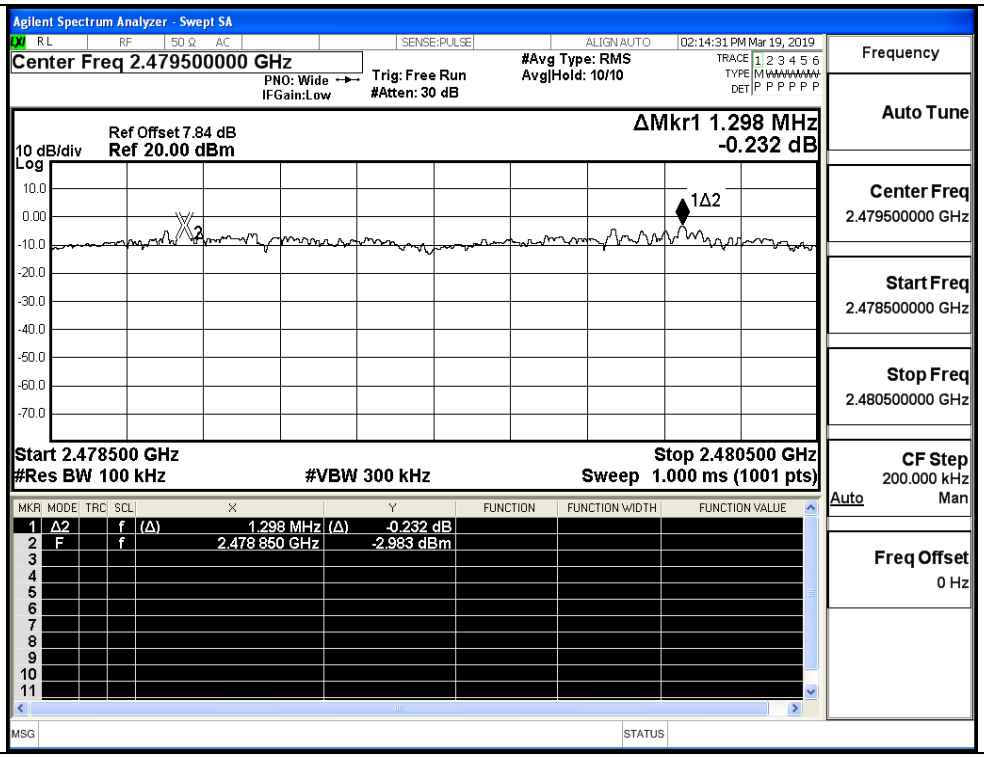
π/4DQPSK/LCH



π/4DQPSK/MCH

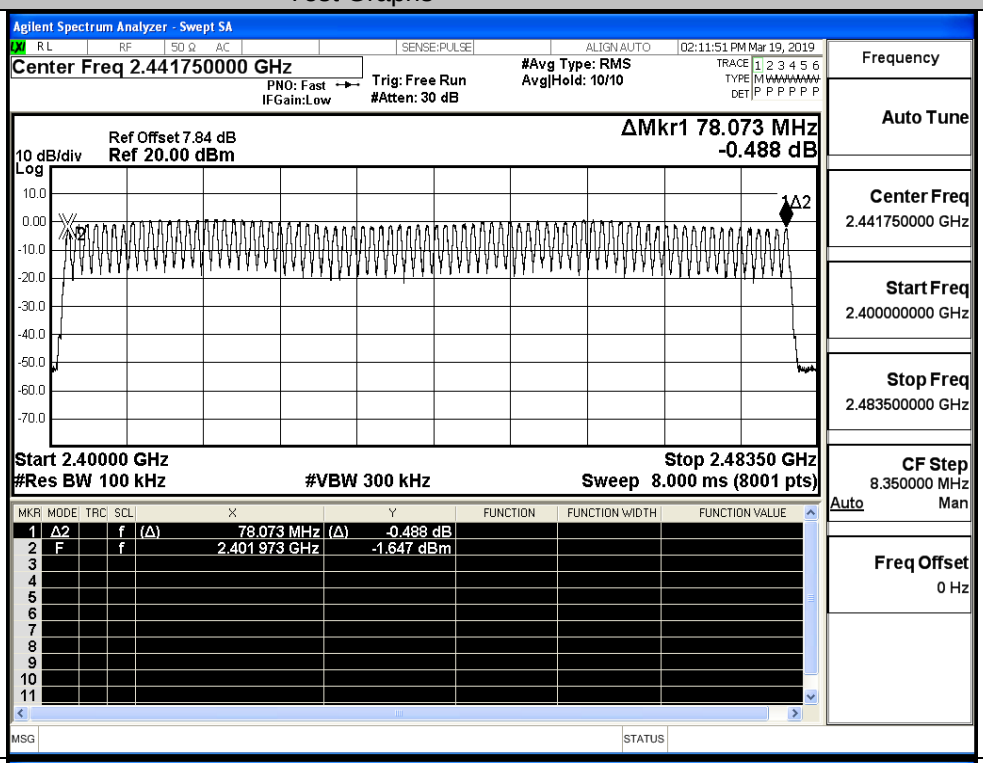
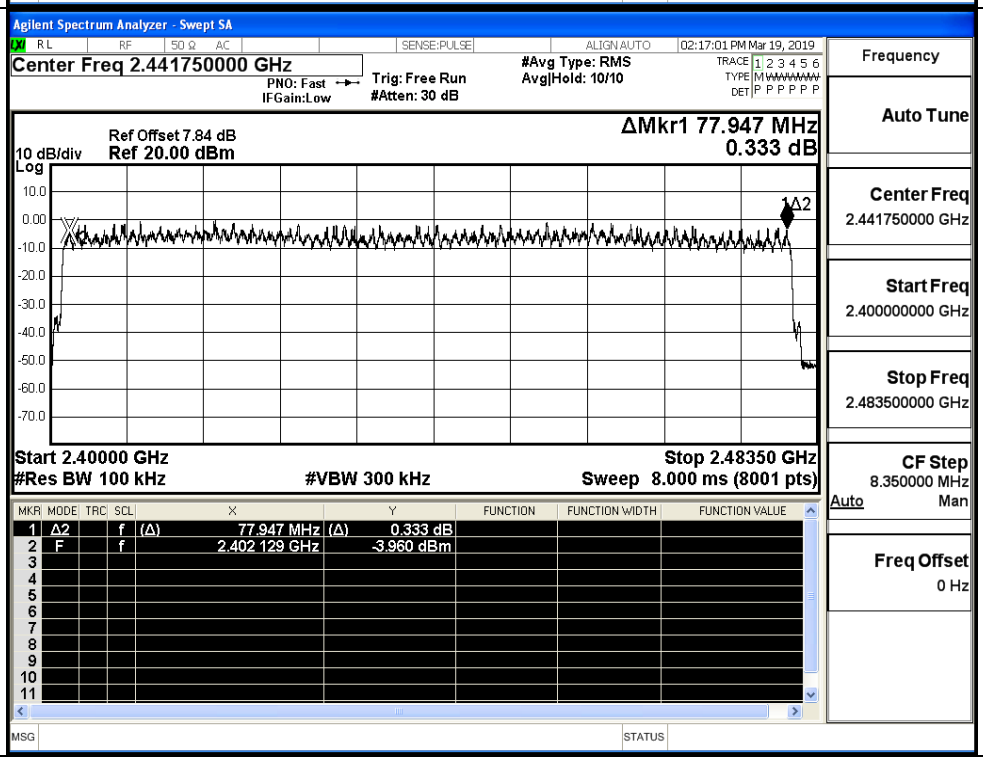


π/4DQPSK/HCH


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.479500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
02:14:31 PM Mar 19, 2019
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 1.298 MHz
-0.232 dB
1Δ2
Start 2.478500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.480500 GHz
Sweep 1.000 ms (1001 pts)
1 Δ2 f (Δ) 1.298 MHz (Δ) -0.232 dB
2 F f 2.478 850 GHz -2.983 dBm
Frequency
Auto Tune
Center Freq 2.479500000 GHz
Start Freq 2.478500000 GHz
Stop Freq 2.480500000 GHz
CF Step 200.000 kHz
Auto Man
Freq Offset 0 Hz

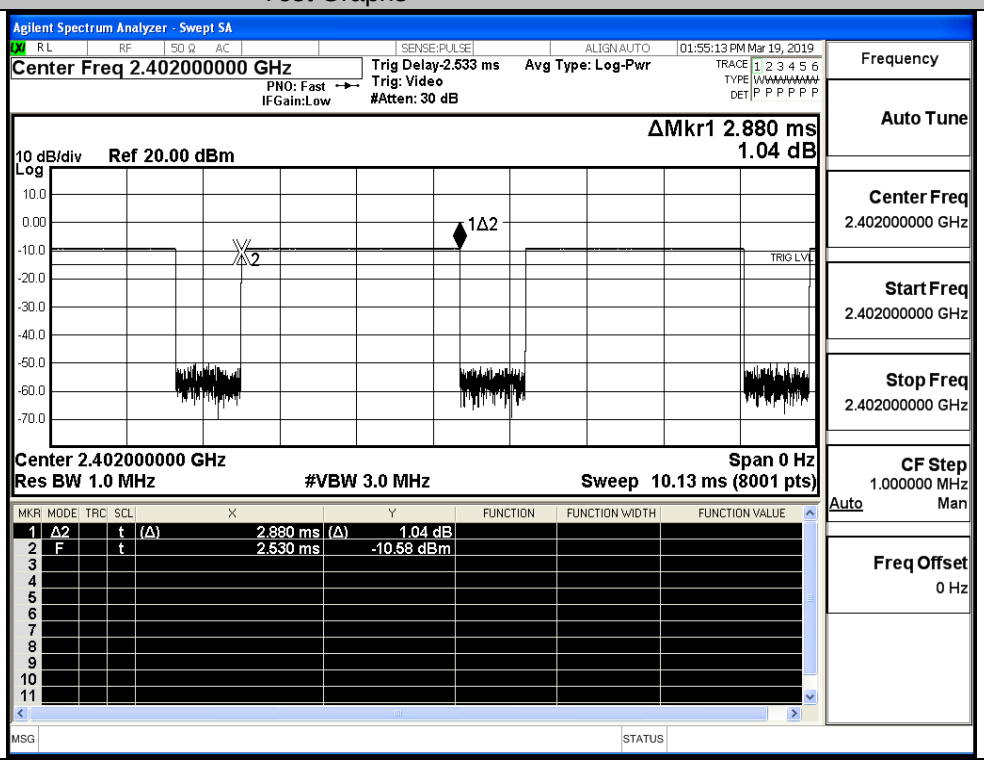
A.4 Hopping Channel Number

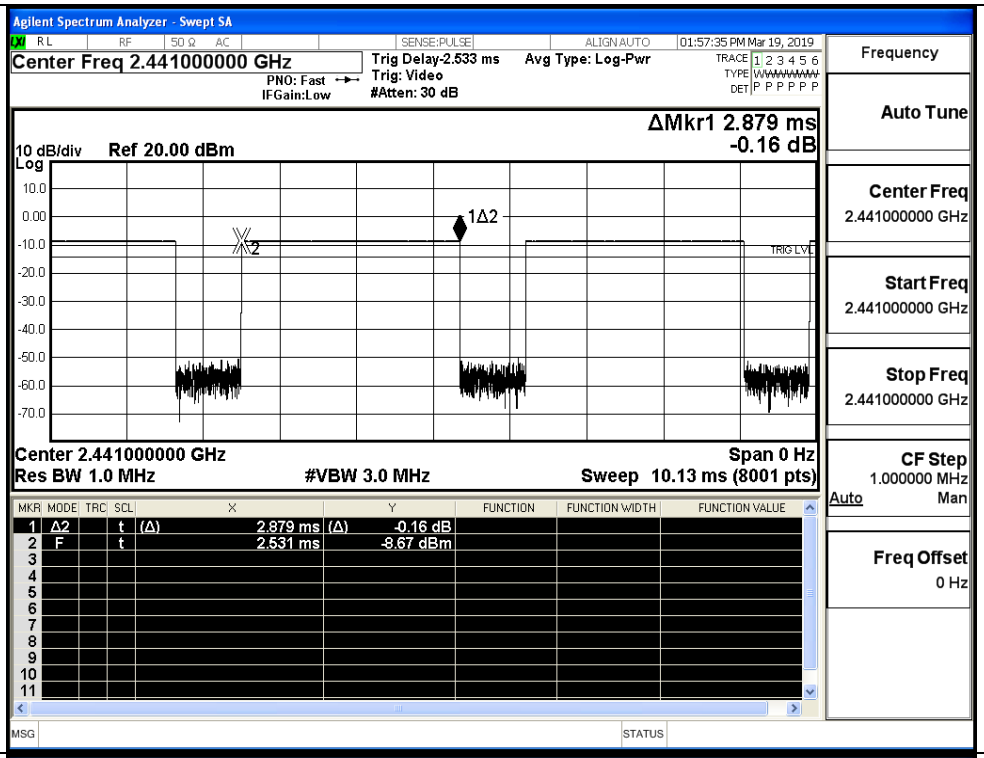
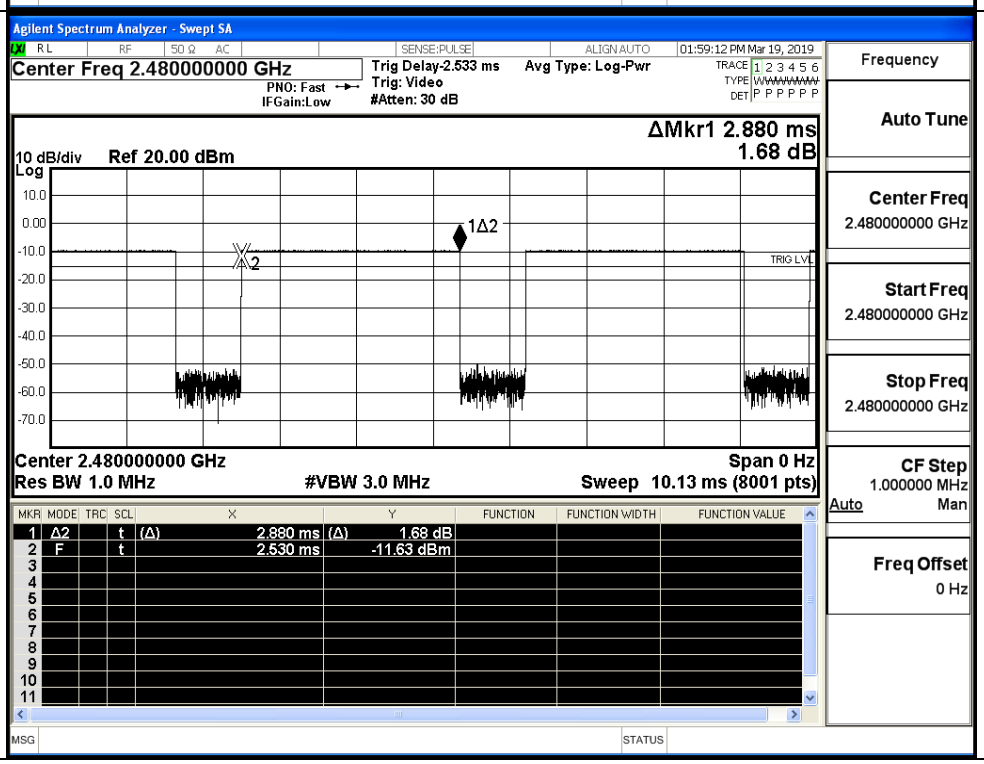
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS

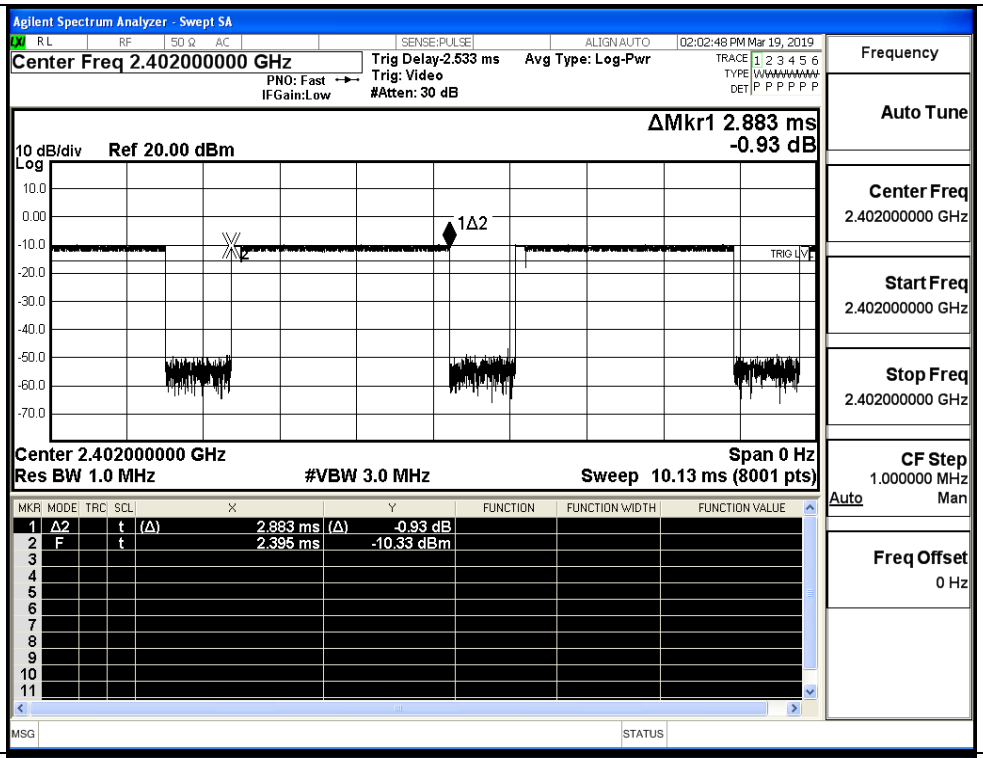
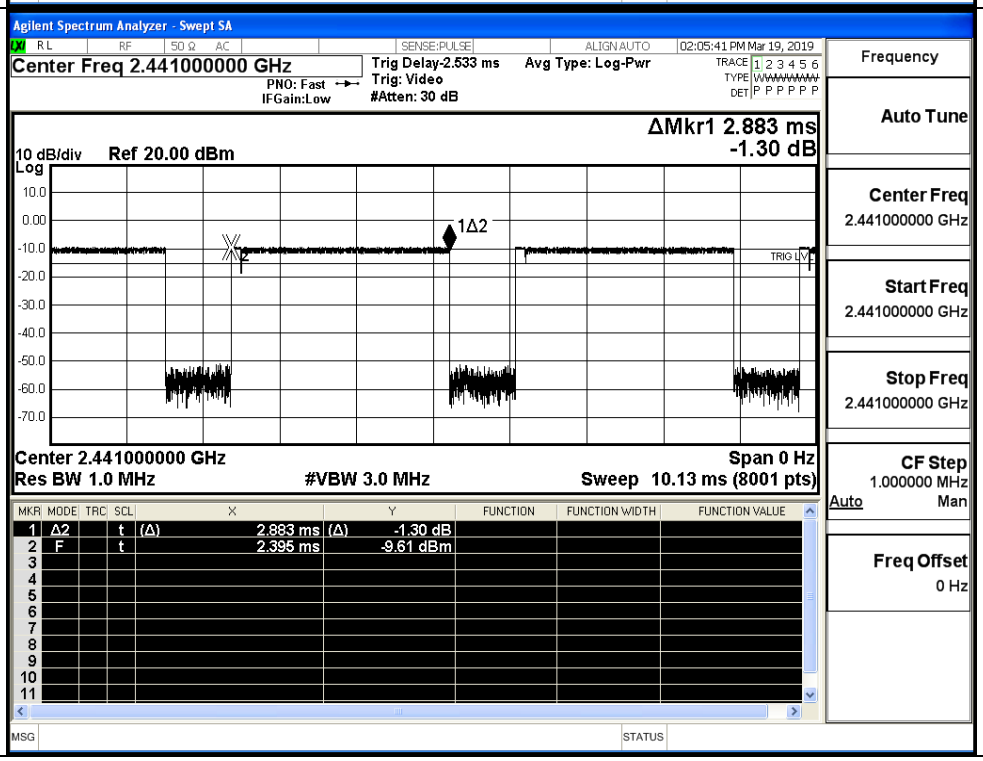
Test Graphs	
GFSK/Hop	
π/4DQPSK/Hop	

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	2.88	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

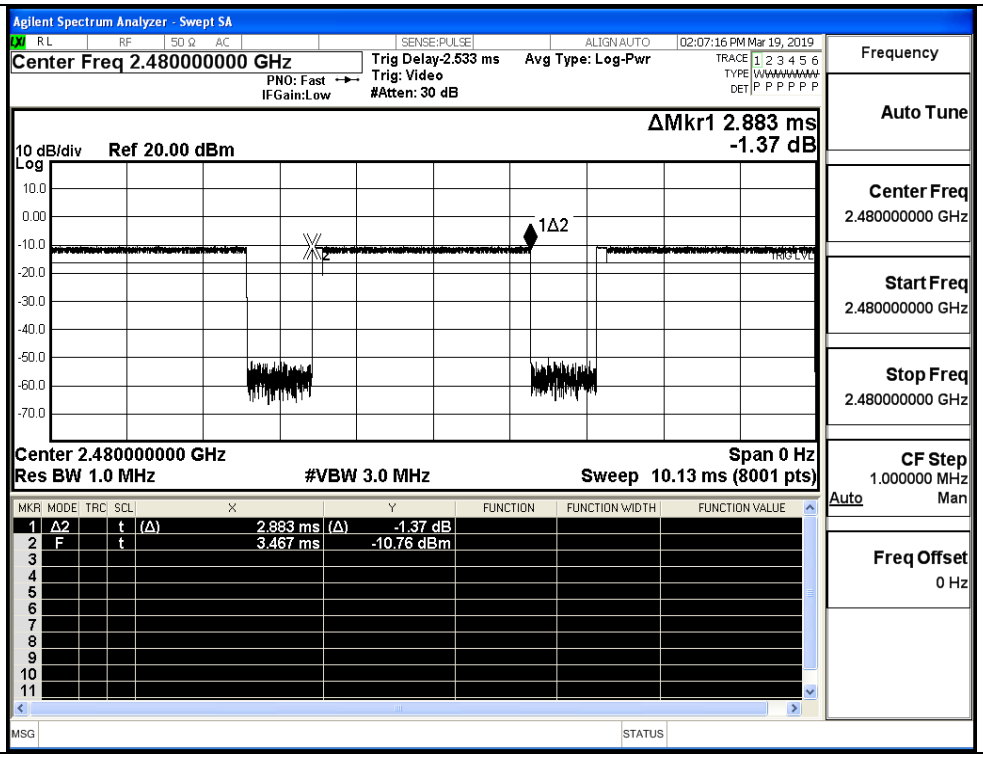
Test Graphs	
GFSK_DH5/LCH	

GFSK_DH5/MCH	
GFSK_DH5/HCH	

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

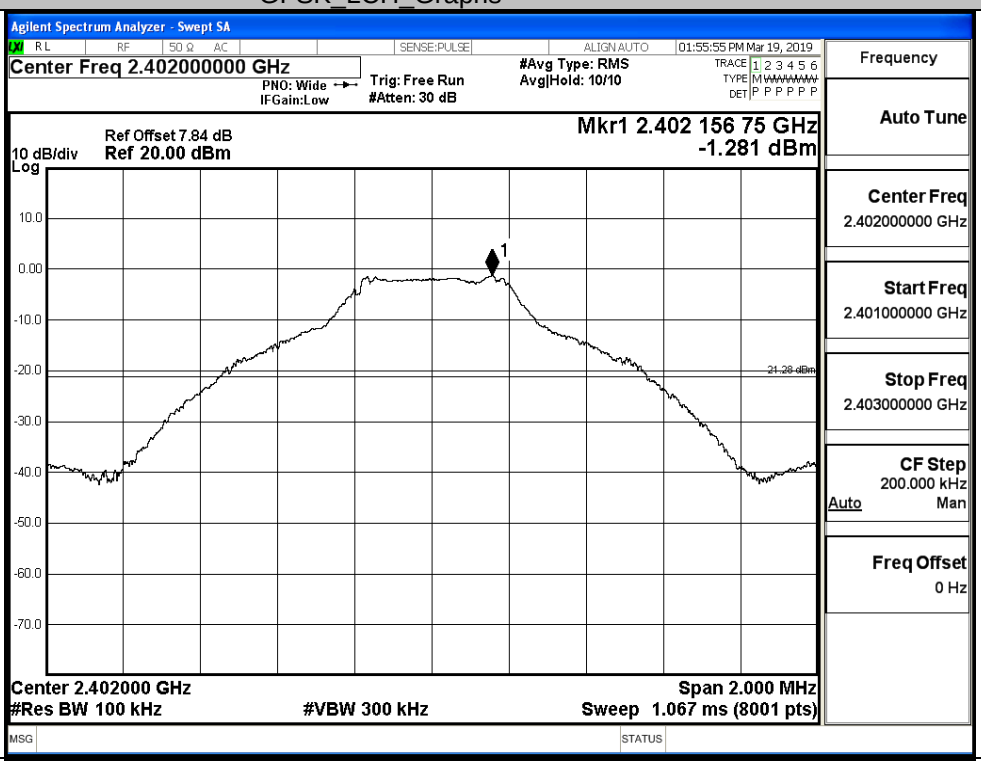
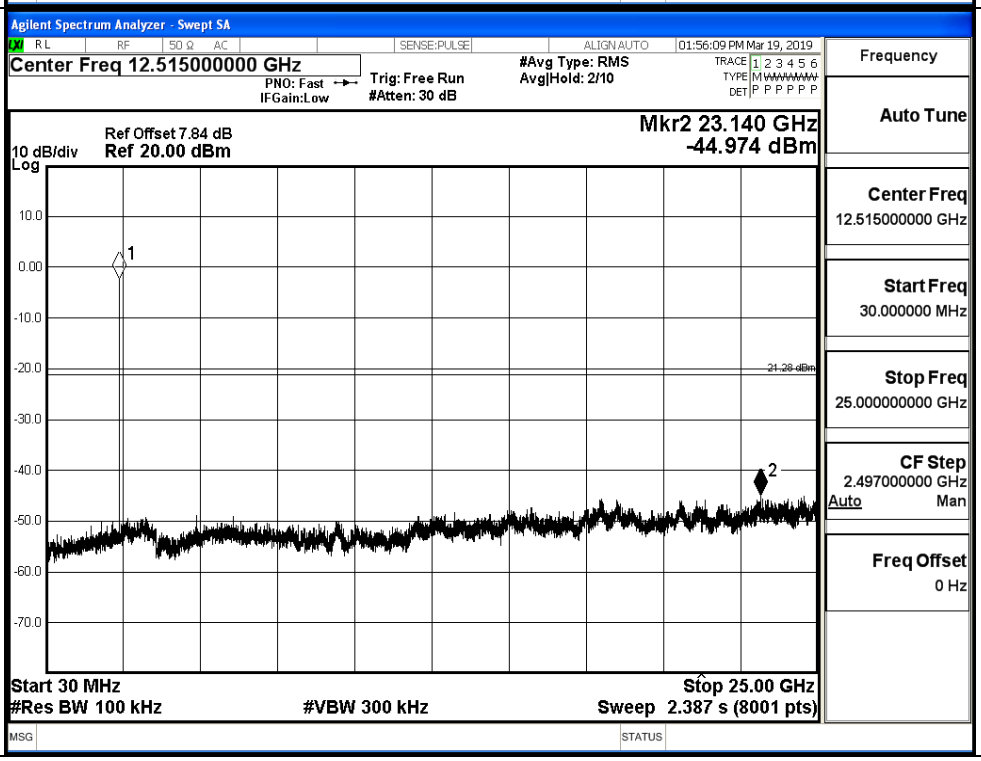
π/4DQPSK

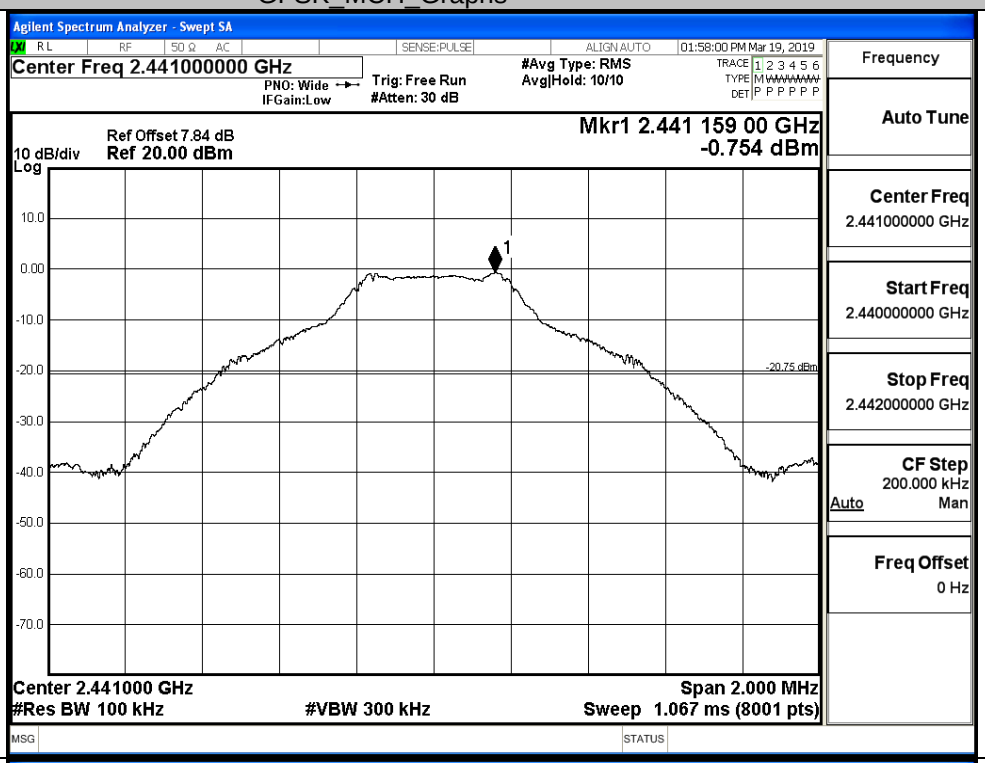
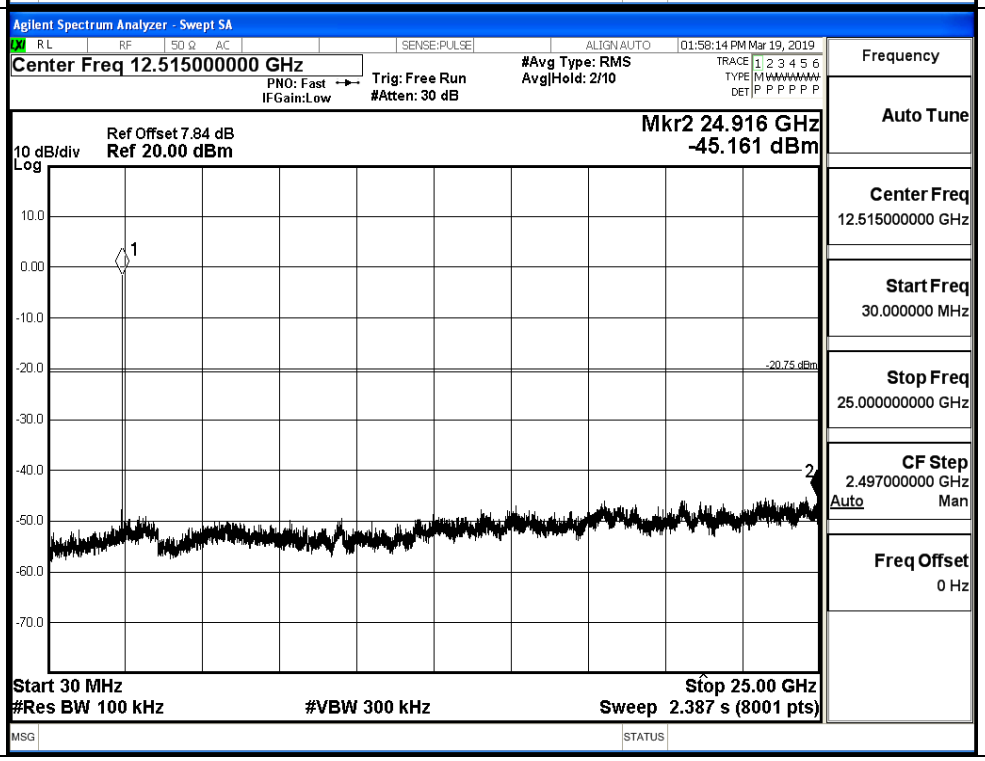
_2DH5/HCH

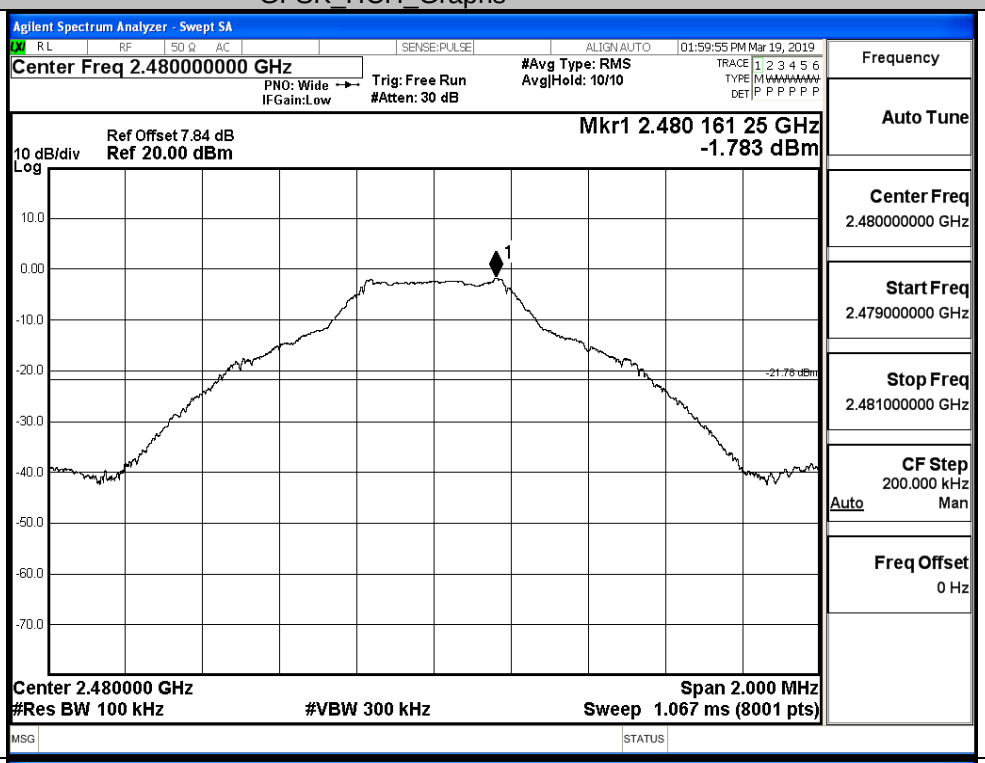
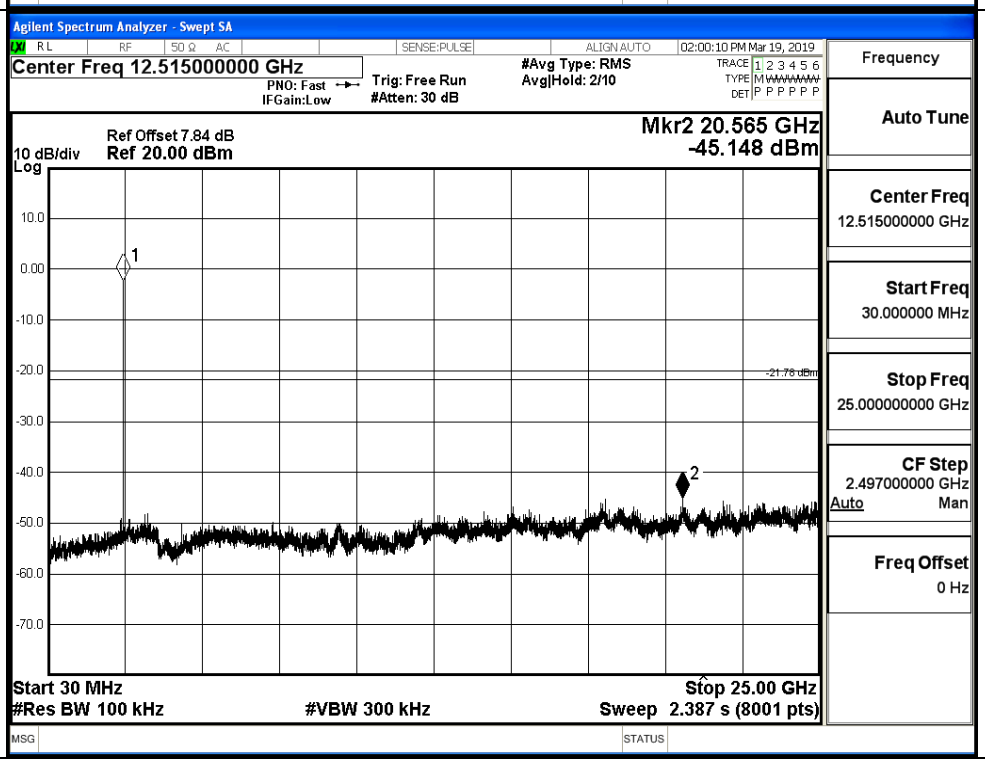


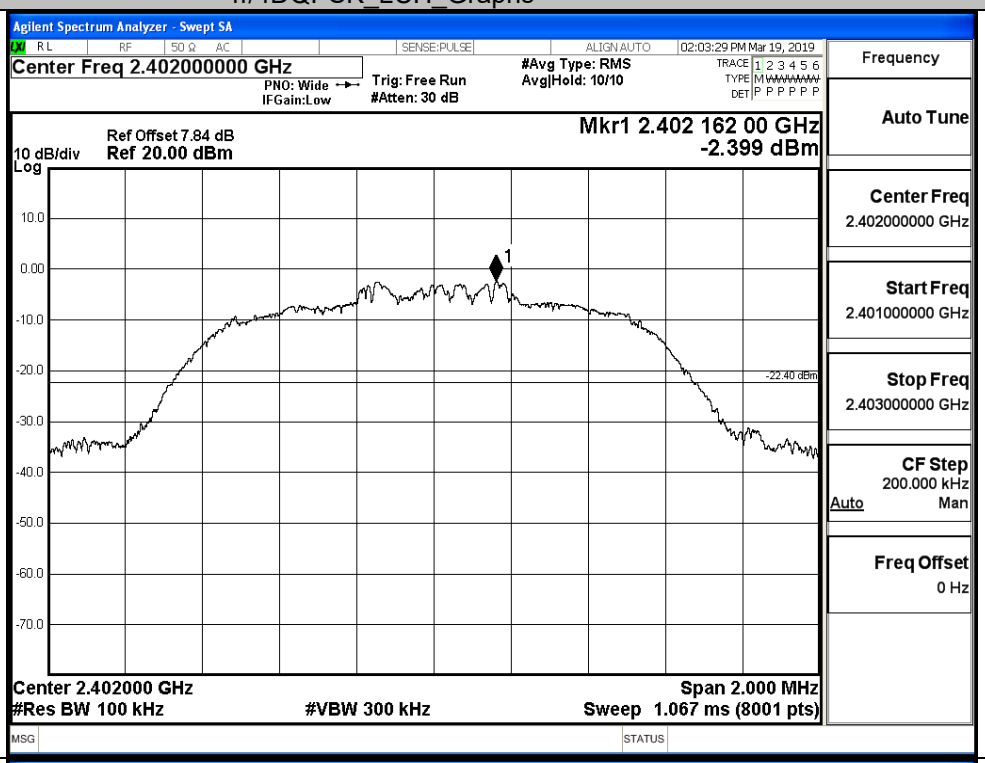
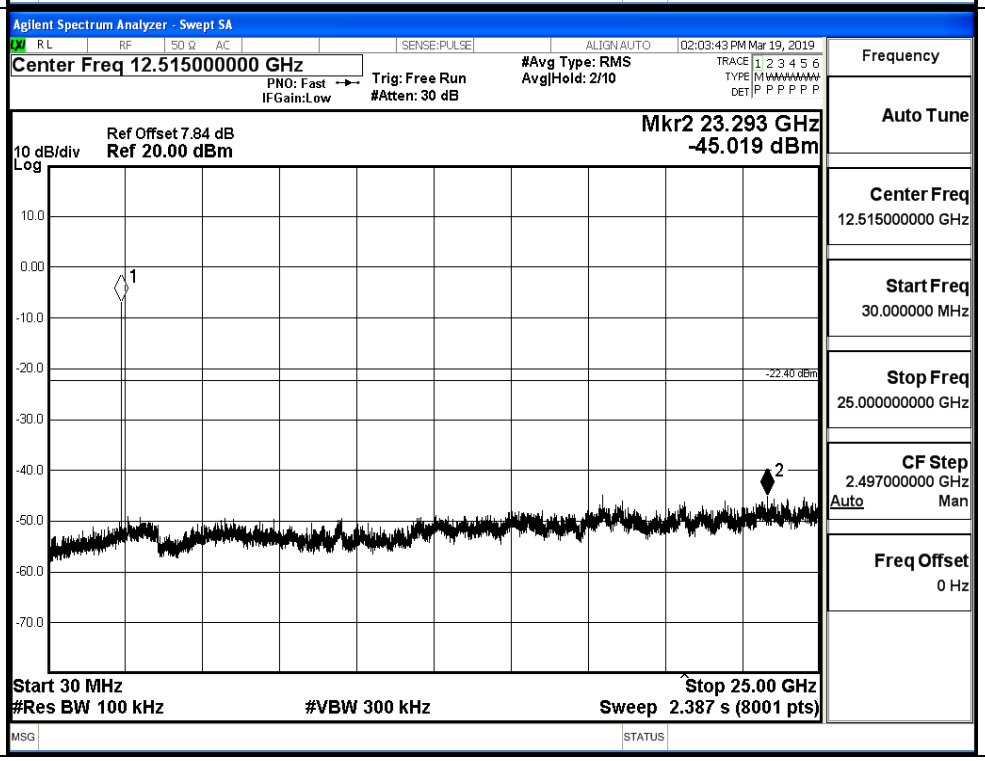
A.6 RF Conducted Spurious Emissions

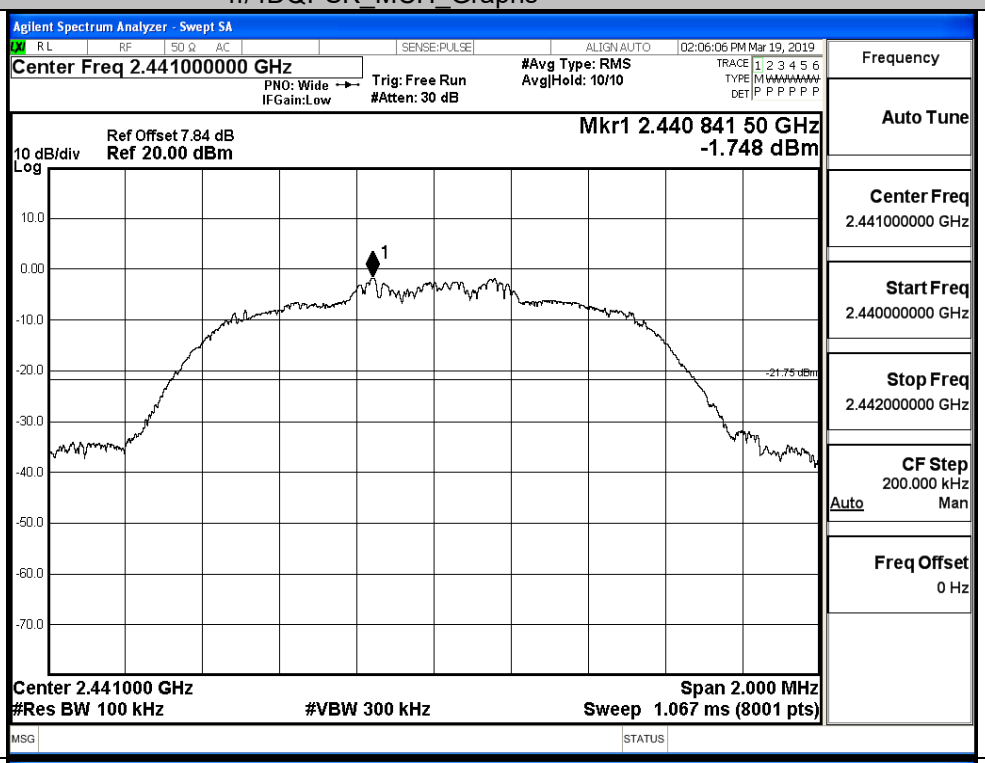
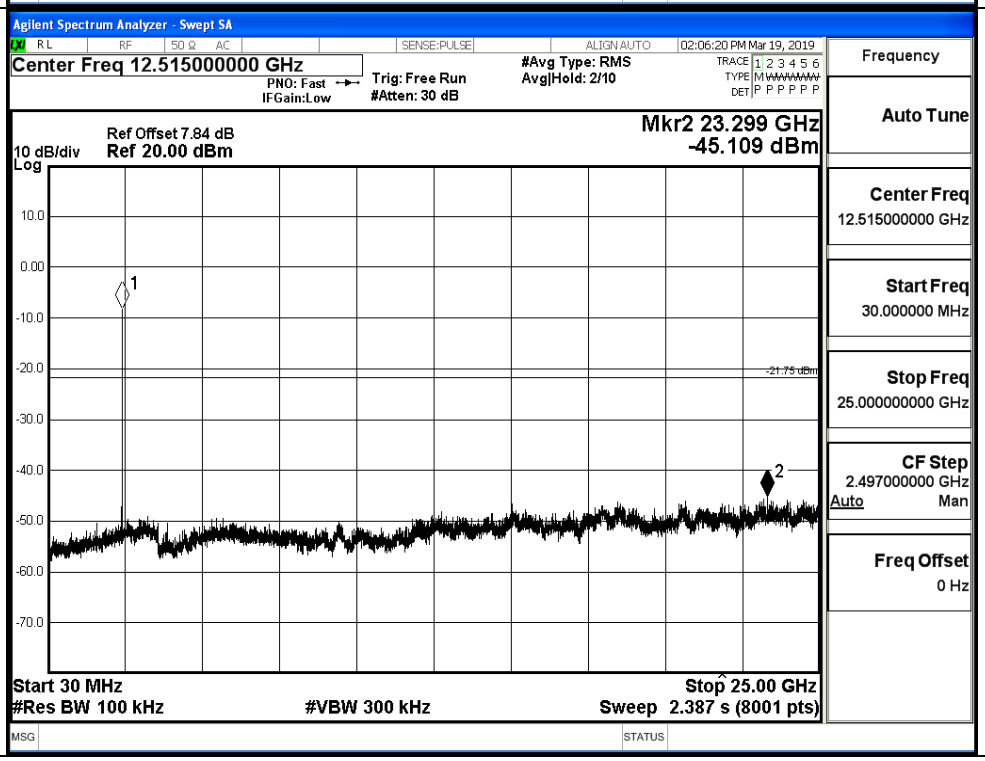
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.281	-44.974	-21.281	PASS
	MCH	-0.754	-45.161	-20.754	PASS
	HCH	-1.783	-45.148	-21.783	PASS
π/4DQPSK	LCH	-2.399	-45.019	-22.399	PASS
	MCH	-1.748	-45.109	-21.748	PASS
	HCH	-3.342	-44.978	-23.342	PASS

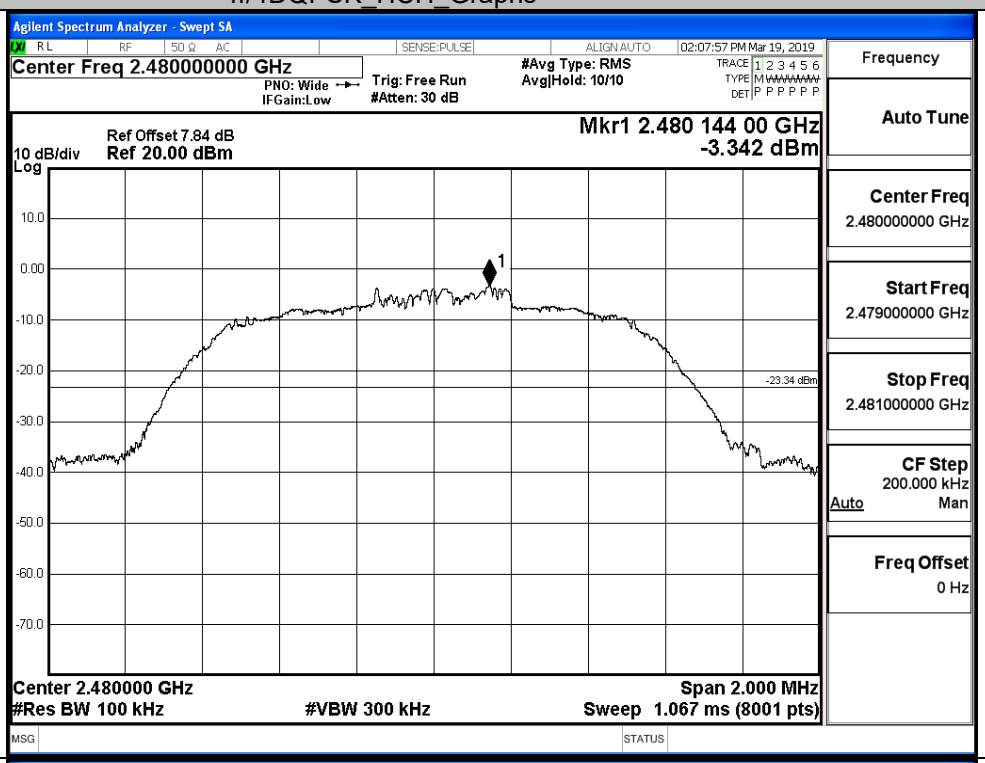
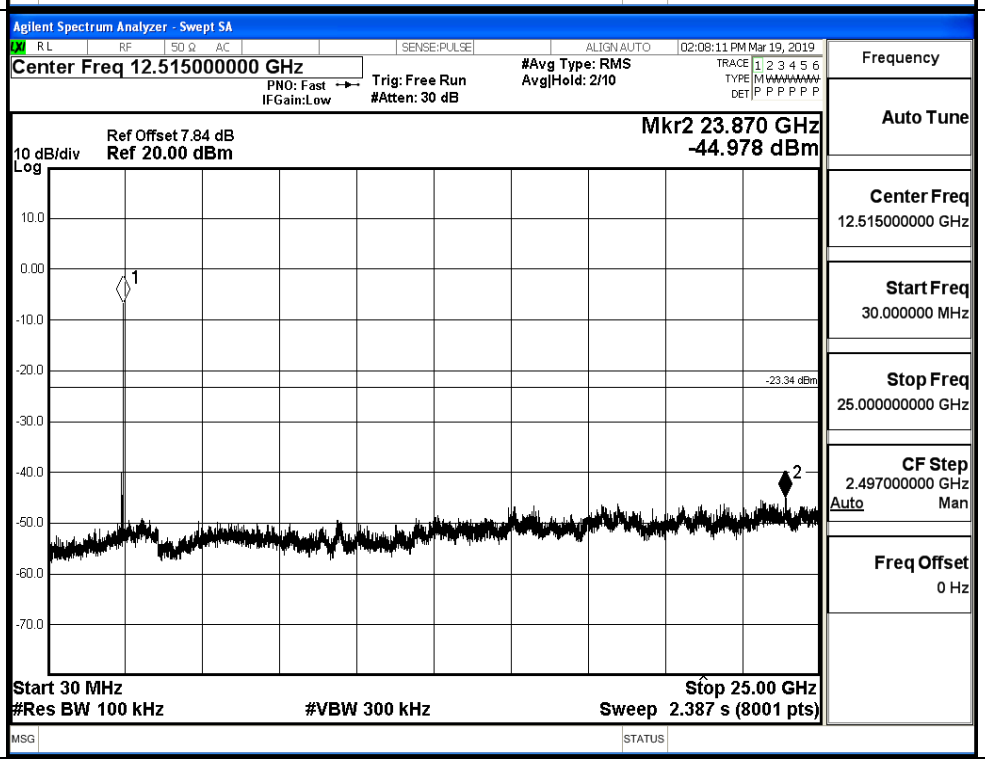
GFSK_LCH_Graphs			
Pref			
Puw			

GFSK_MCH_Graphs			
Pref			
Puw			

GFSK_HCH_Graphs			
Pref			
Puw			

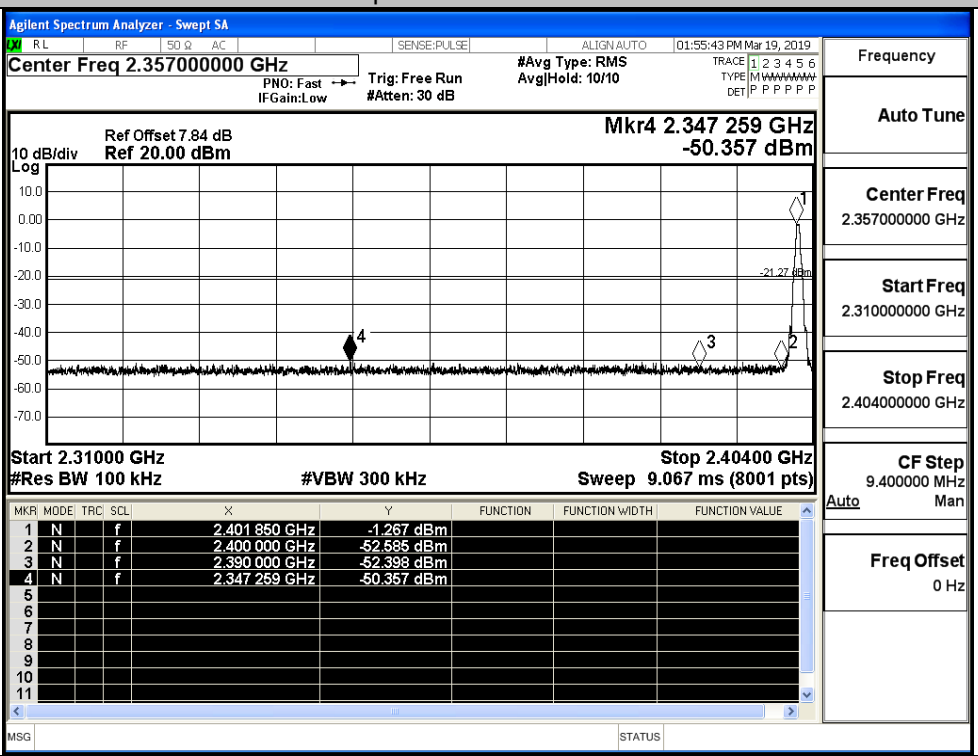
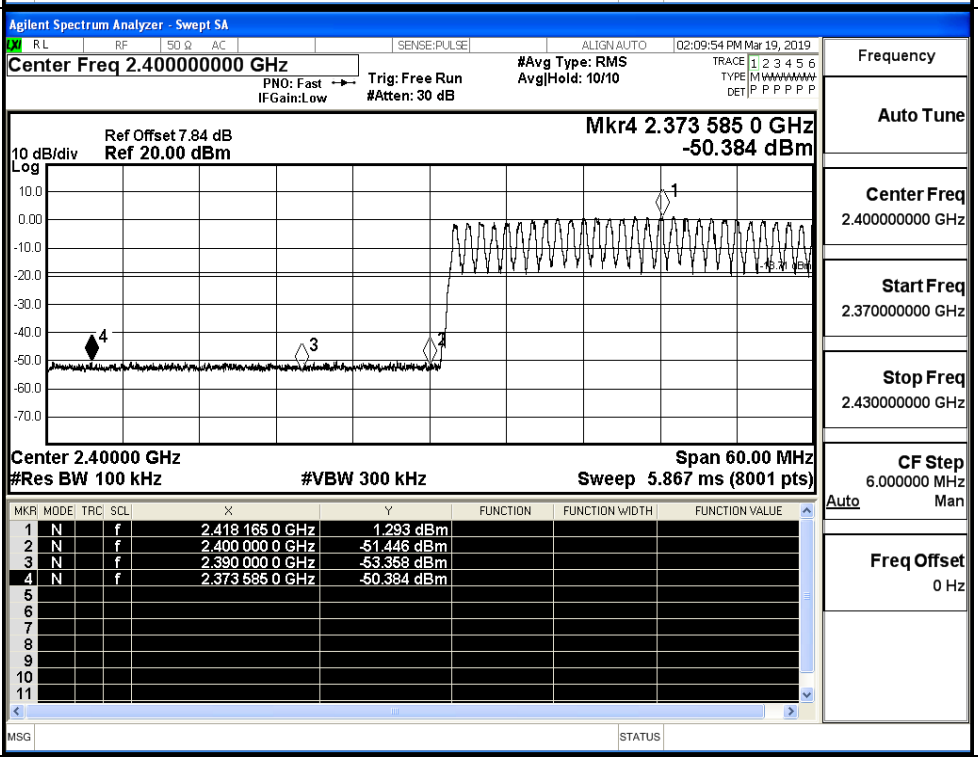
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

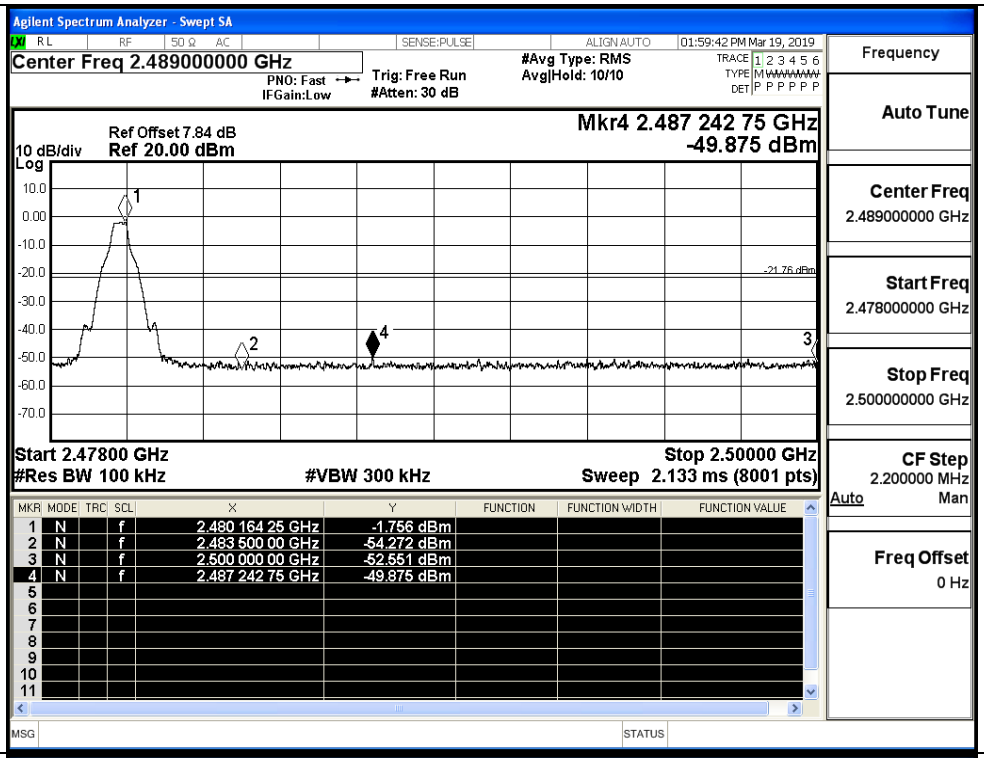
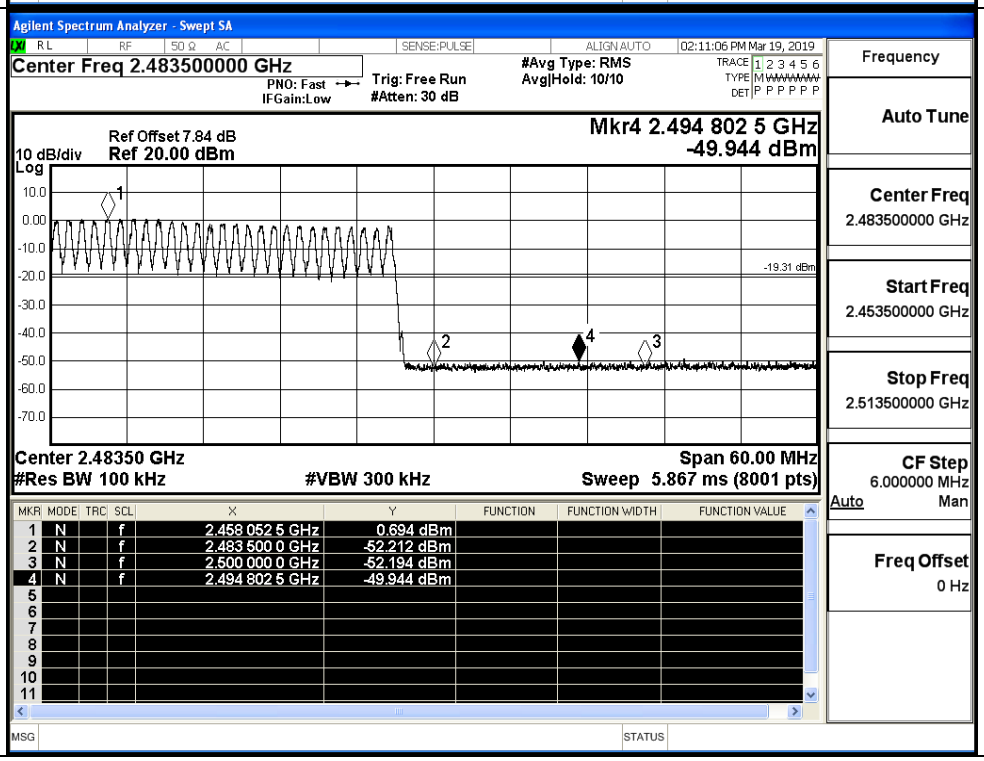
π/4DQPSK_MCH_Graphs		
Pref		
Puw		

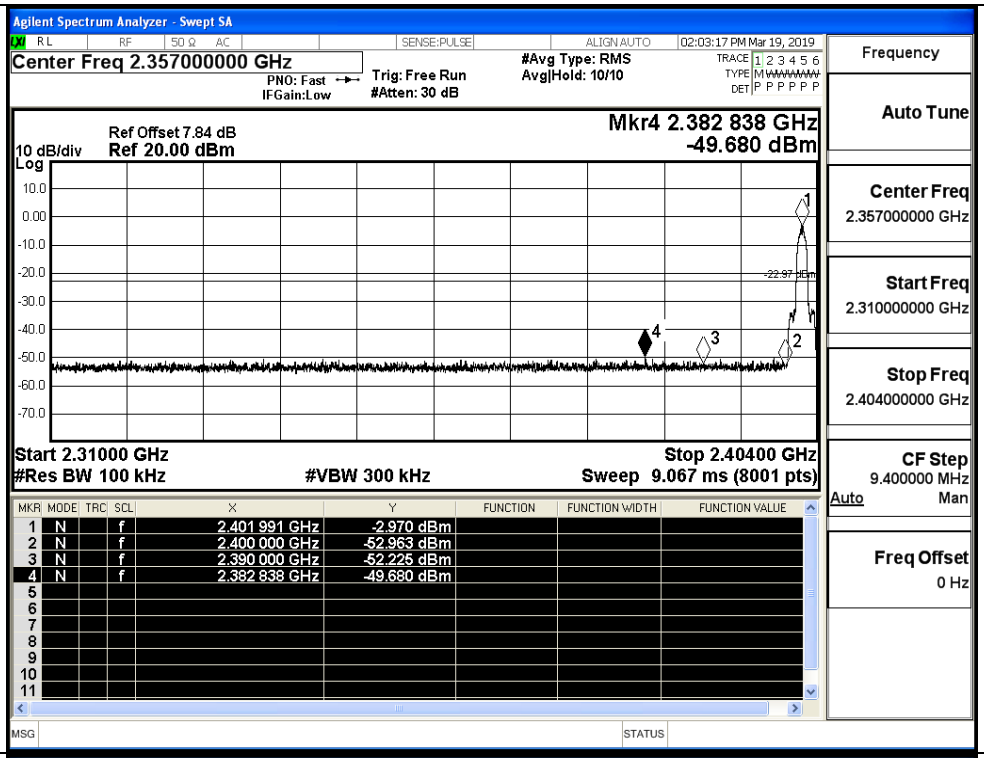
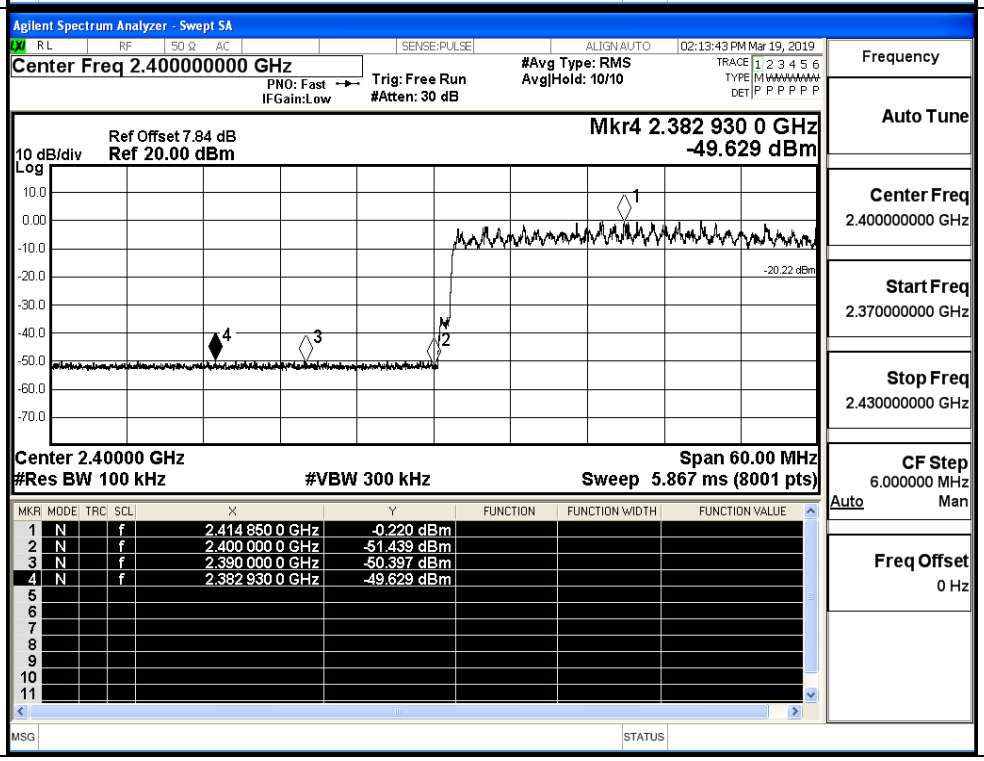
π/4DQPSK_HCH_Graphs			
Pref			
Puw			

A.7 Band-edge for RF Conducted Emissions

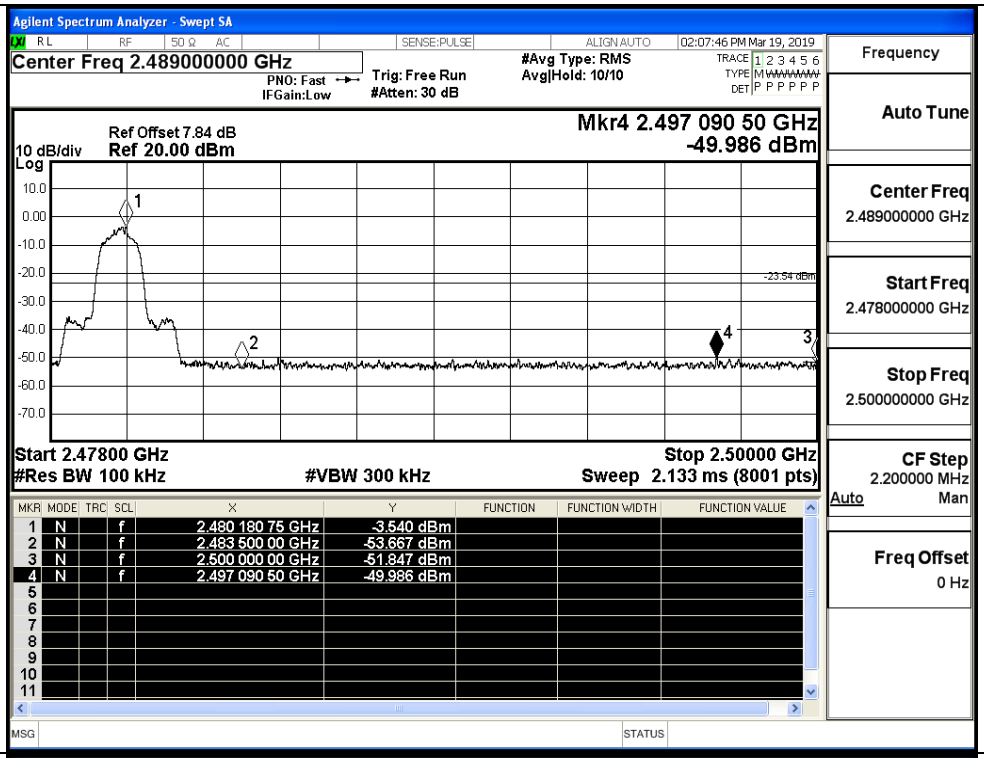
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-1.267	Off	-50.357	-21.27	PASS
			1.293	On	-50.384	-18.71	PASS
	HCH	2480	-1.756	Off	-49.875	-21.76	PASS
			0.694	On	-49.944	-19.31	PASS
π/4DQPSK	LCH	2402	-2.970	Off	-49.680	-22.97	PASS
			-0.220	On	-49.629	-20.22	PASS
	HCH	2480	-3.540	Off	-49.986	-23.54	PASS
			-0.649	On	-49.818	-20.65	PASS

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

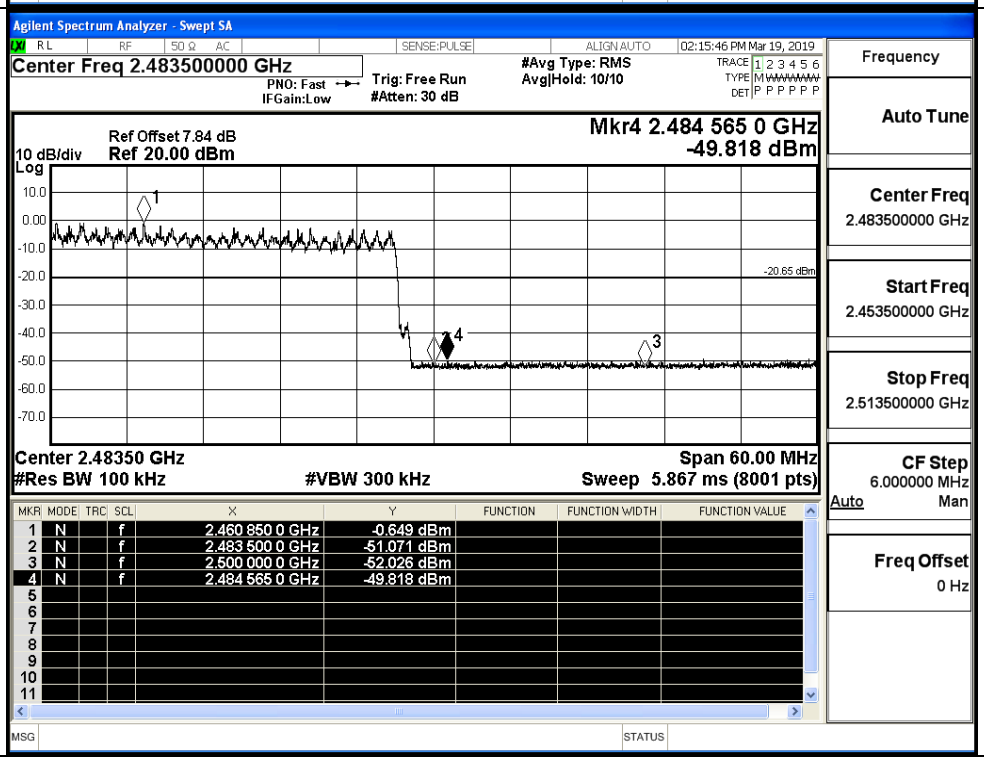
GFSK/HCH/No Hop	
GFSK/HCH/Hop	

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

π/4DQPSK/HCH/No Hop



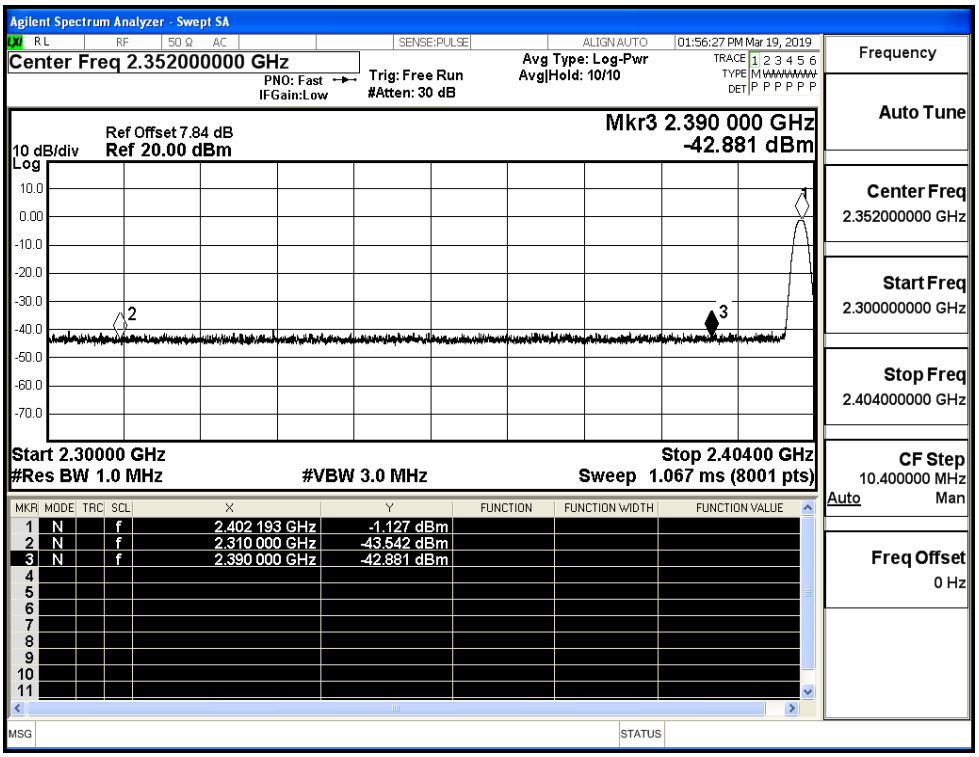
π/4DQPSK/HCH/Hop



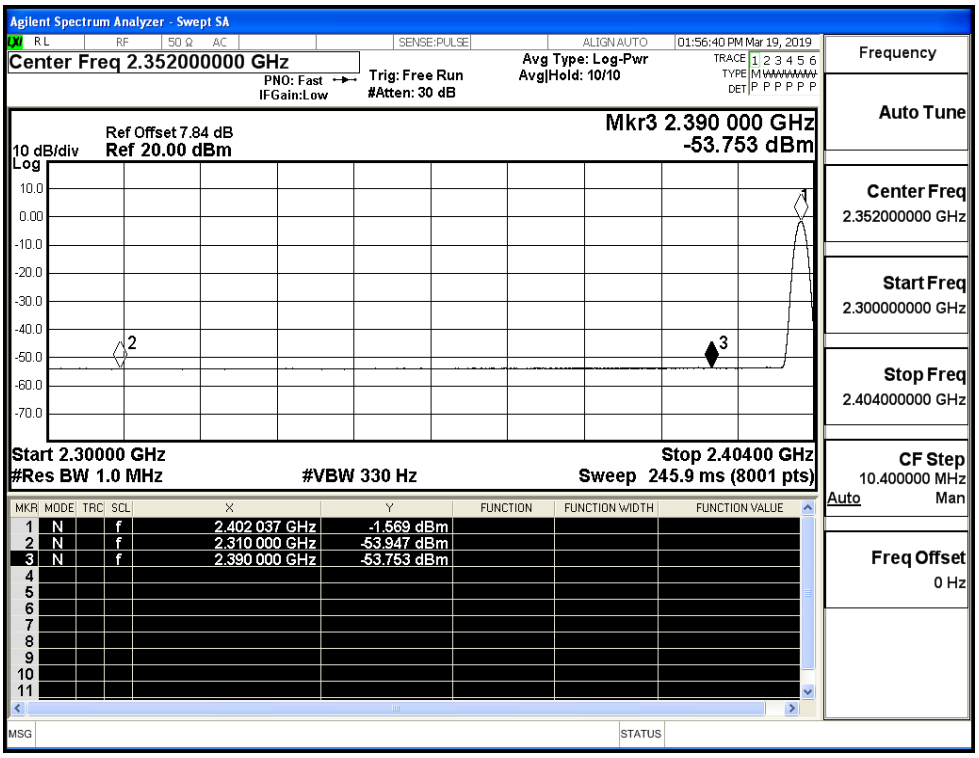
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.54	2.0	0	53.72	PEAK	74	PASS
	Off	2310.0	-53.95	2.0	0	43.31	AV	54	PASS
	Off	2390.0	-42.88	2.0	0	54.38	PEAK	74	PASS
	Off	2390.0	-53.75	2.0	0	43.50	AV	54	PASS
	Off	2483.5	-43.91	2.0	0	53.34	PEAK	74	PASS
	Off	2483.5	-53.49	2.0	0	43.77	AV	54	PASS
	Off	2500.0	-41.79	2.0	0	55.47	PEAK	74	PASS
	Off	2500.0	-53.34	2.0	0	43.92	AV	54	PASS
π/4DQPSK	Off	2310.0	-44.85	2.0	0	52.40	PEAK	74	PASS
	Off	2310.0	-53.91	2.0	0	43.35	AV	54	PASS
	Off	2390.0	-43.72	2.0	0	53.54	PEAK	74	PASS
	Off	2390.0	-53.72	2.0	0	43.54	AV	54	PASS
	Off	2483.5	-42.88	2.0	0	54.38	PEAK	74	PASS
	Off	2483.5	-53.29	2.0	0	43.97	AV	54	PASS
	Off	2500.0	-43.36	2.0	0	53.90	PEAK	74	PASS
	Off	2500.0	-53.19	2.0	0	44.07	AV	54	PASS

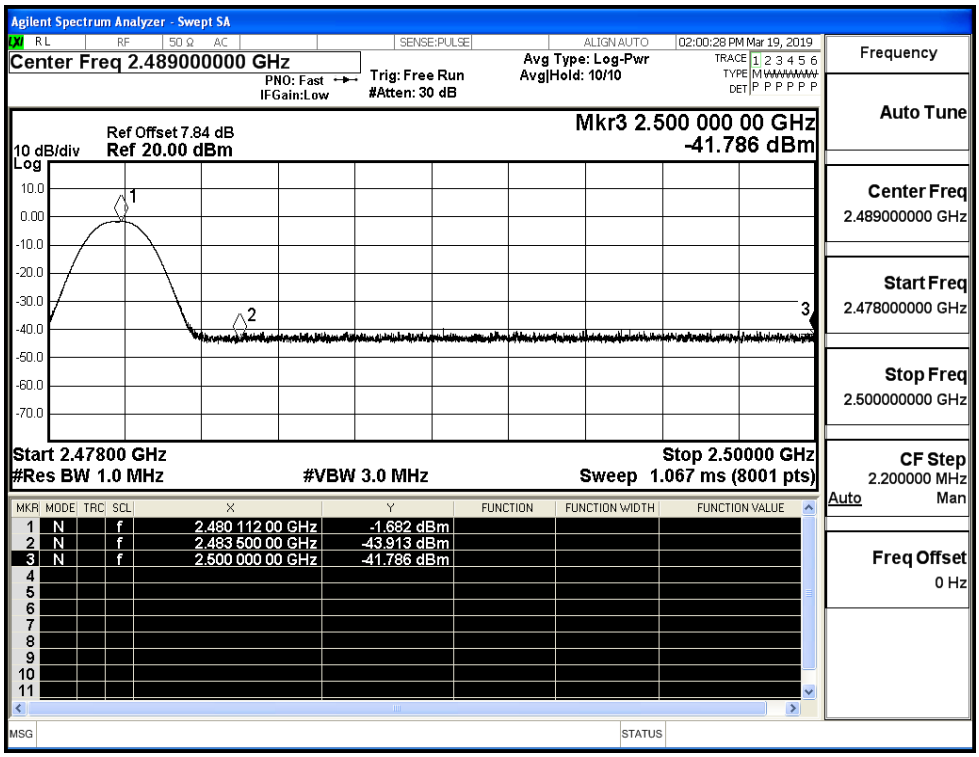
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



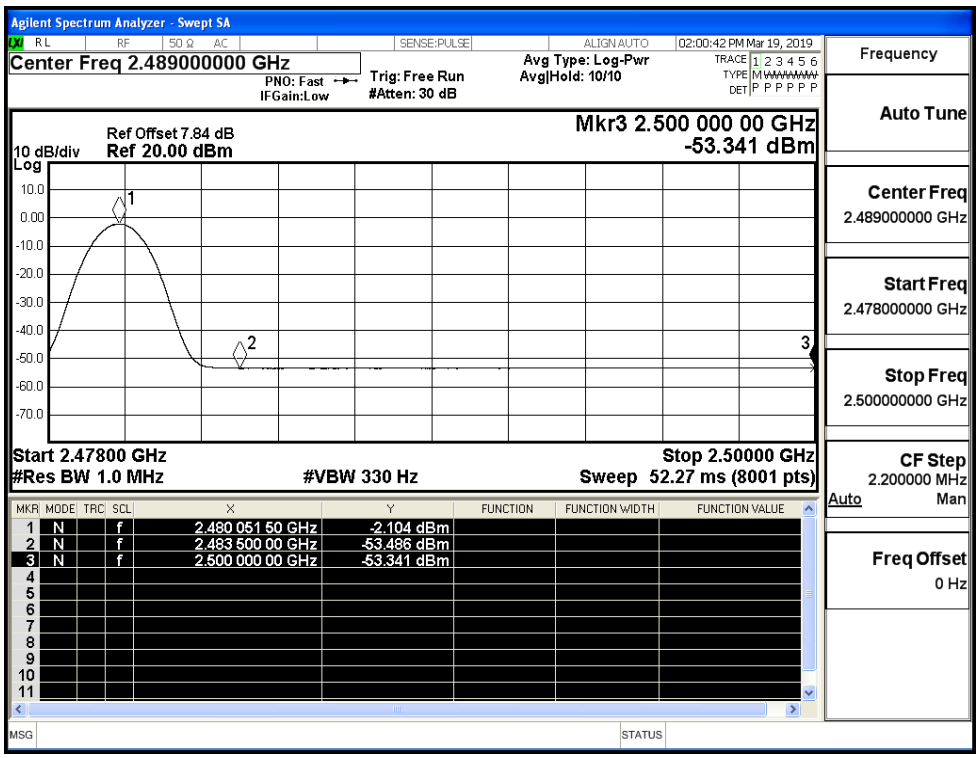
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



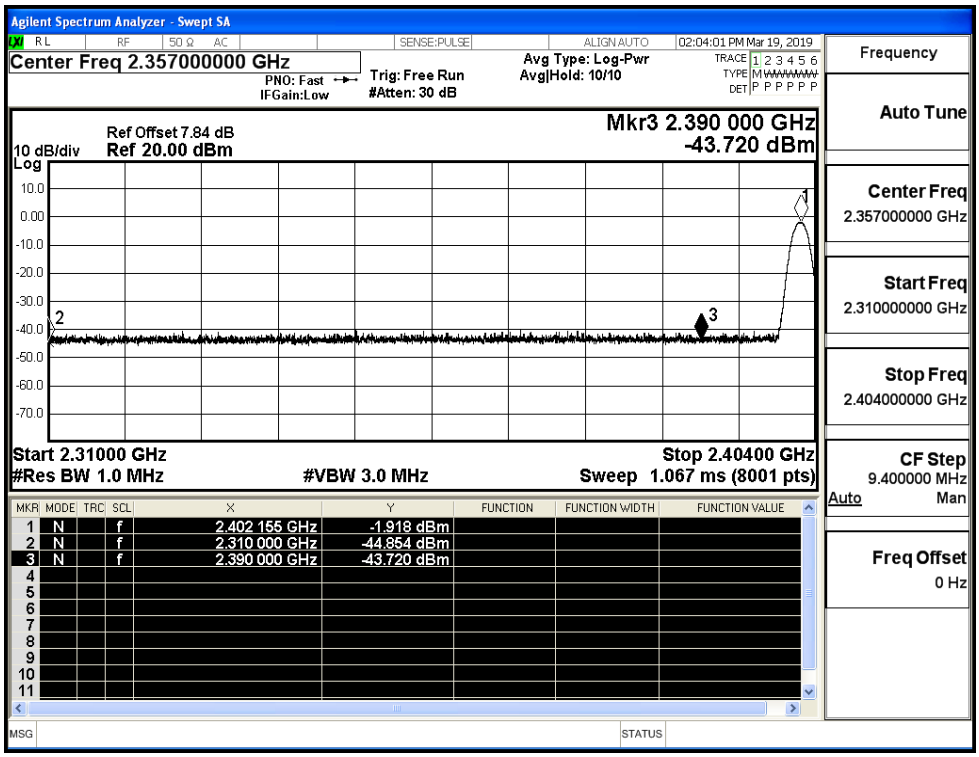
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



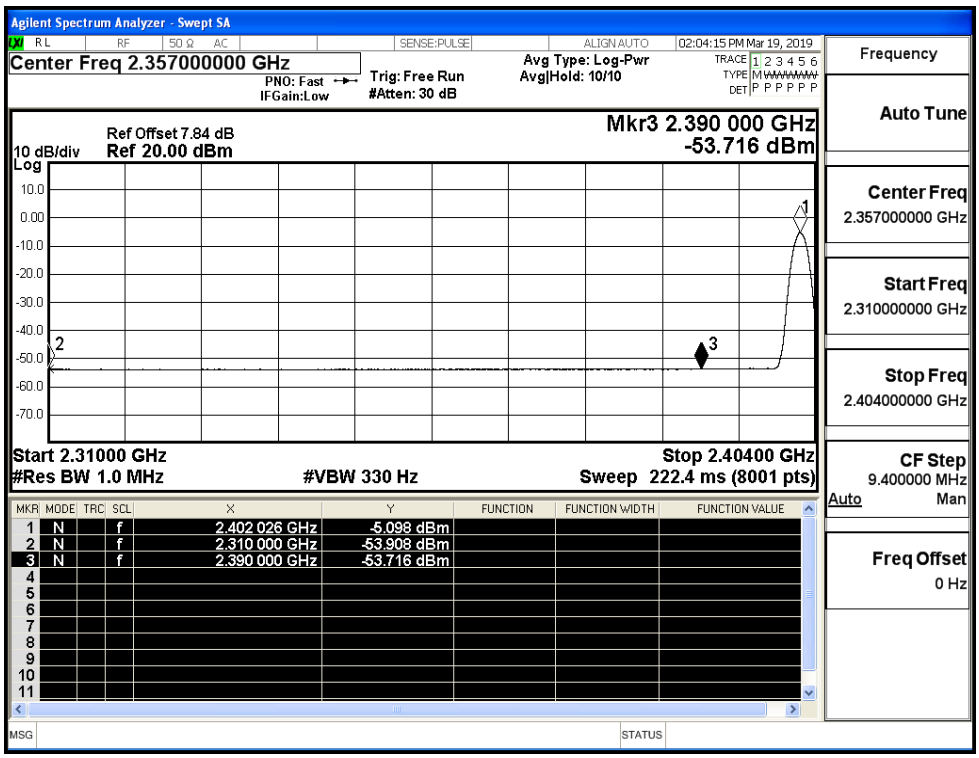
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



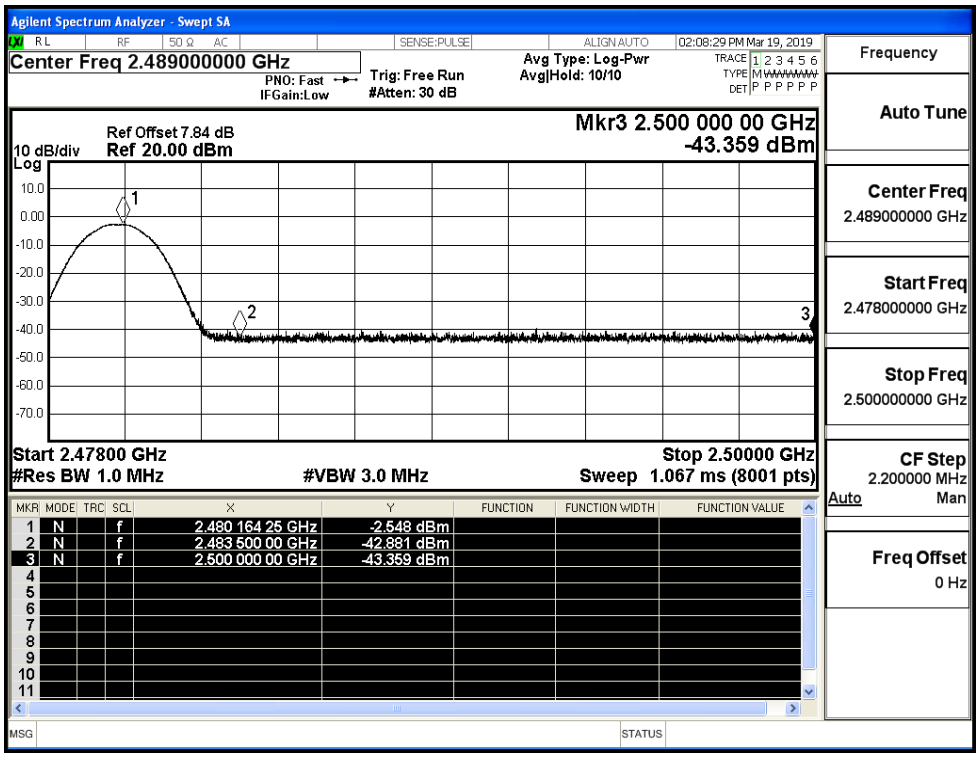
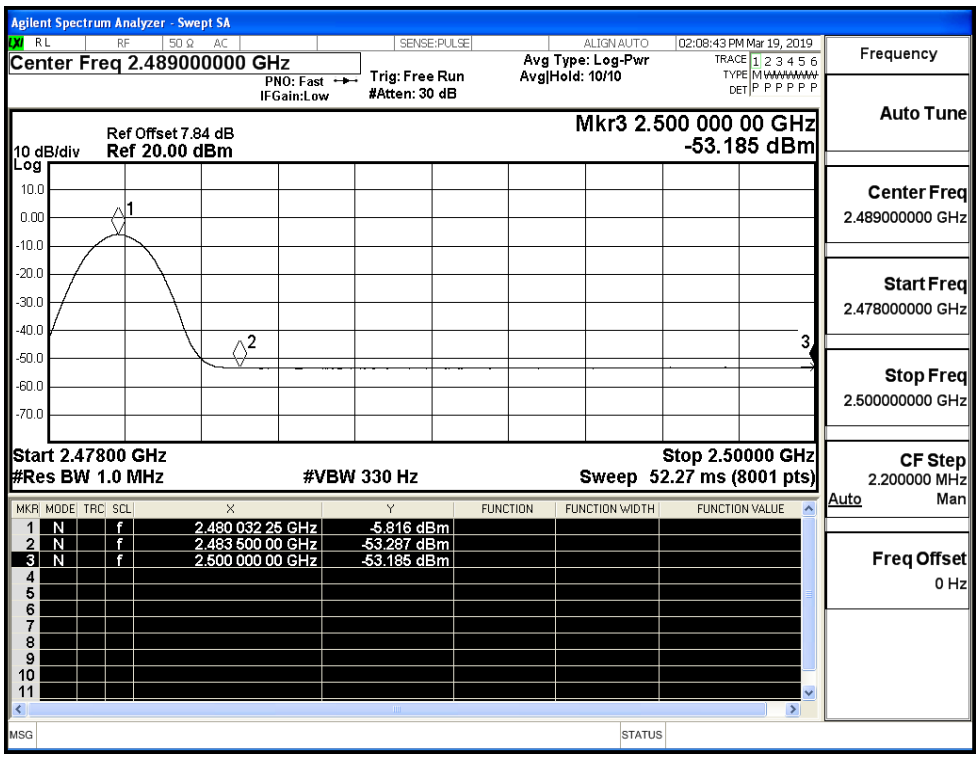
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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)