Appendix A

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

Product Name: BLUETOOTH SPEAKER

Trade Mark: N/A

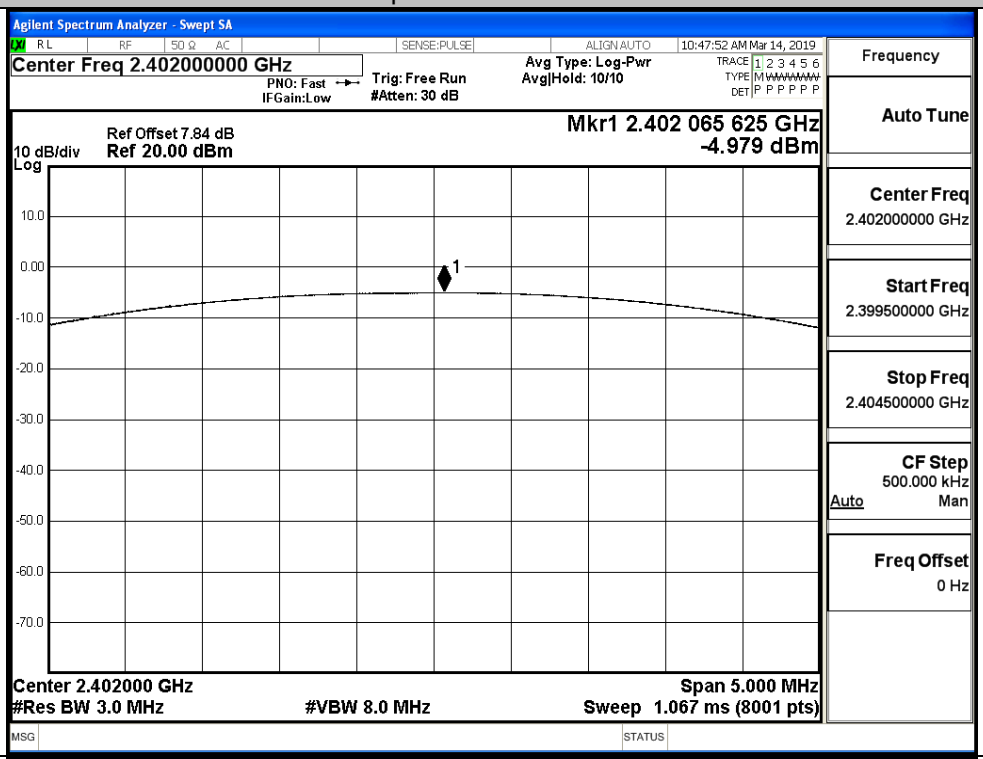
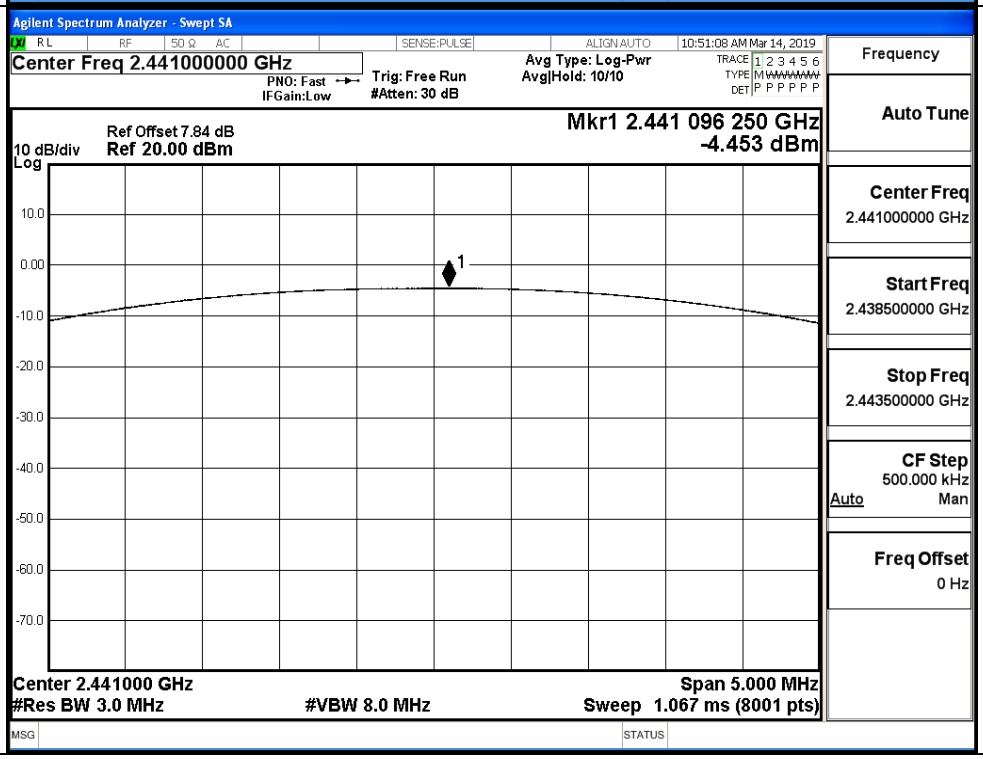
Test Model: BS-672

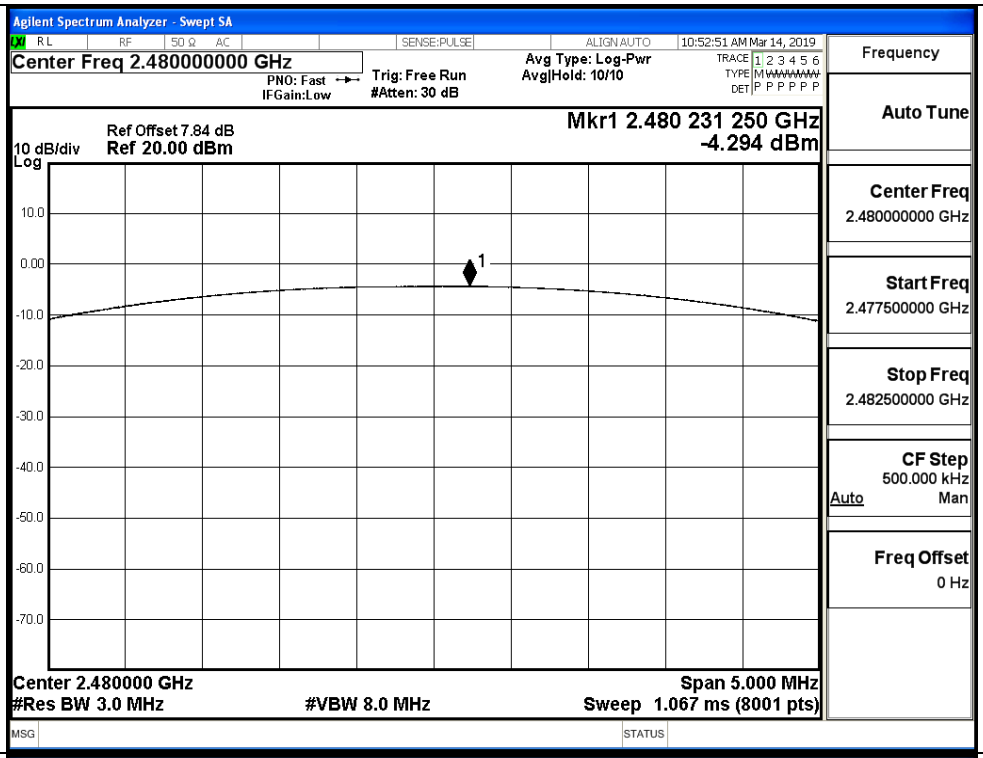
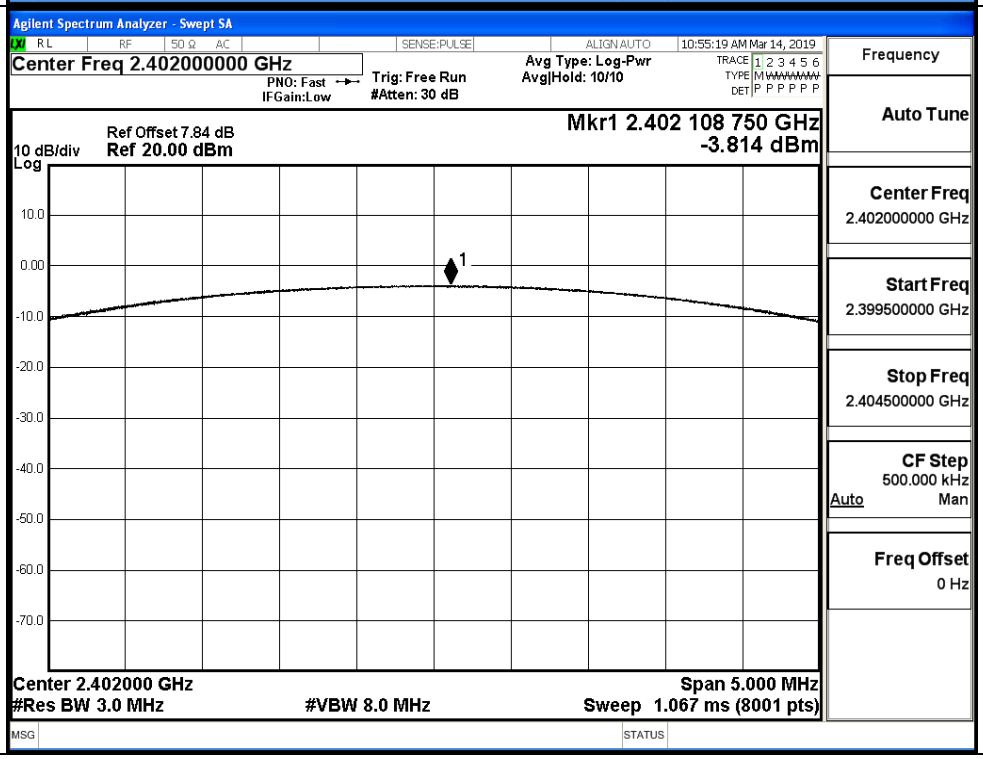
Environmental Conditions

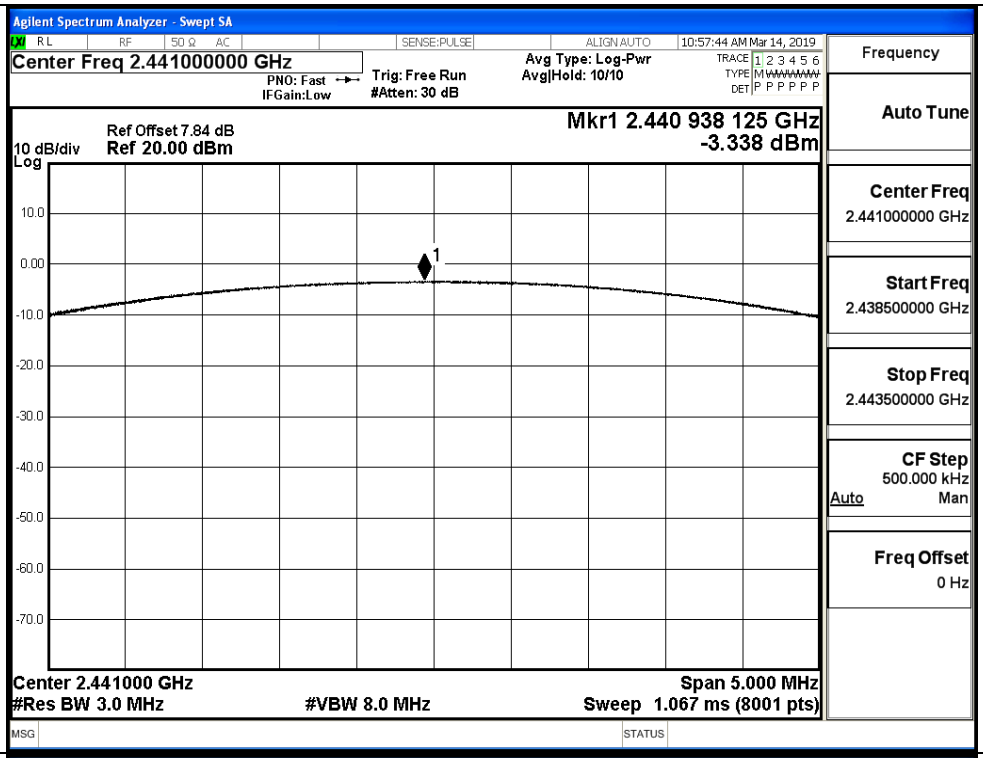
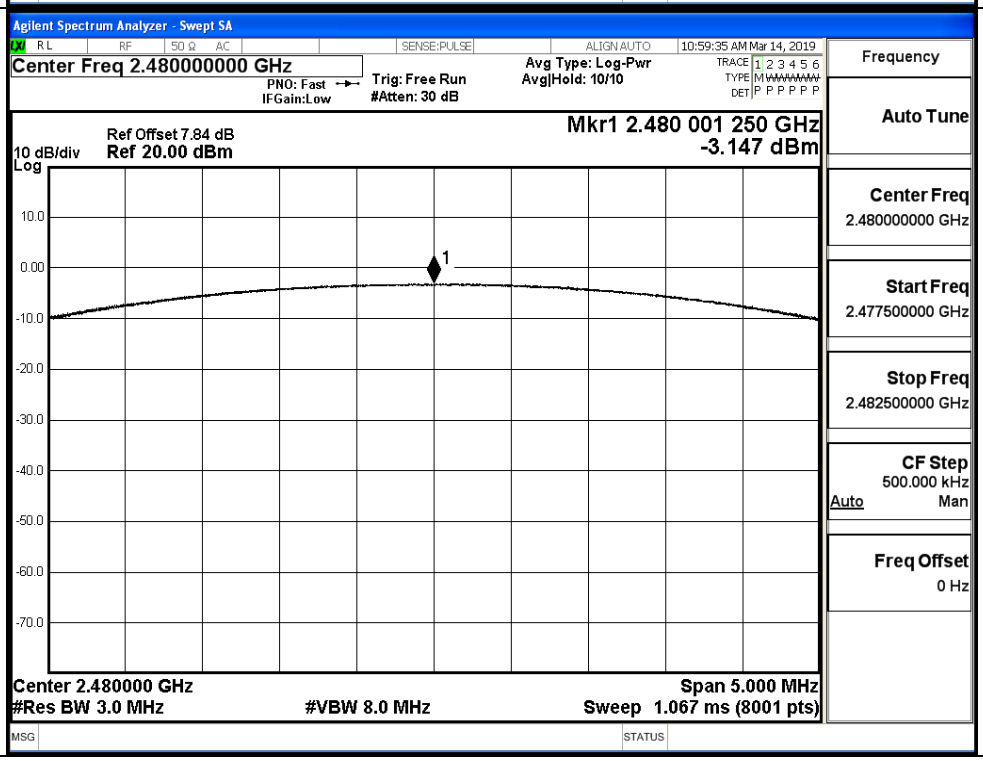
Temperature:	24.5 ° C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Tom Liu

A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-4.979	21	PASS
	MCH	-4.453	21	PASS
	HCH	-4.294	21	PASS
π/4DQPSK	LCH	-3.814	21	PASS
	MCH	-3.338	21	PASS
	HCH	-3.147	21	PASS

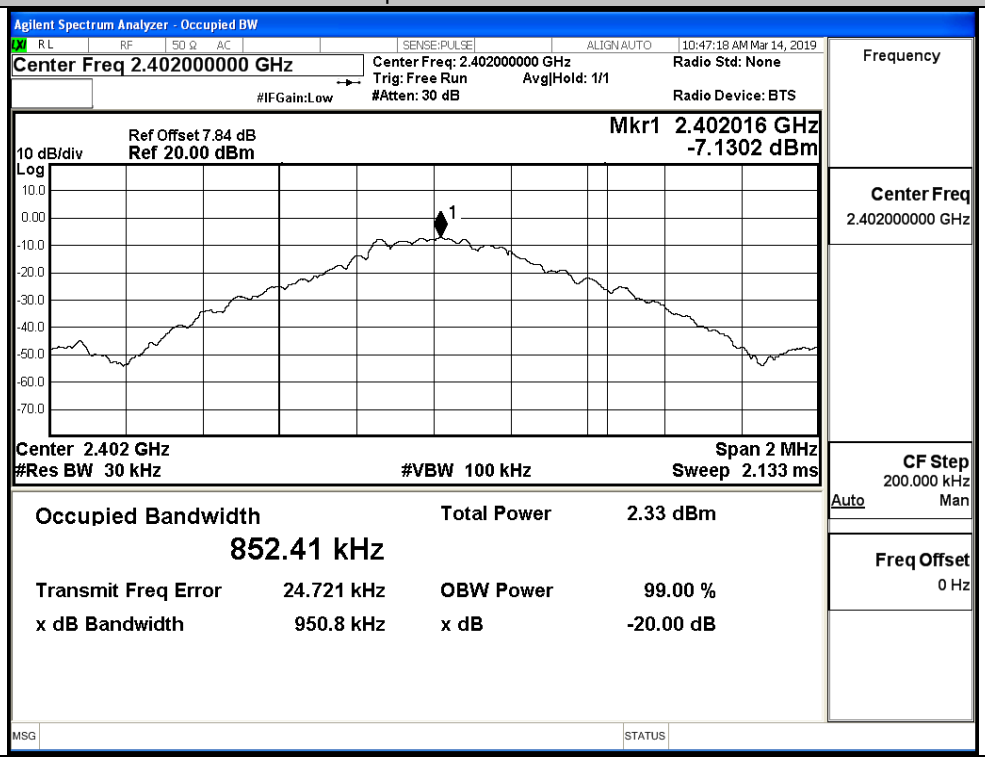
Test Graphs		
GFSK/LCH		
GFSK/MCH		

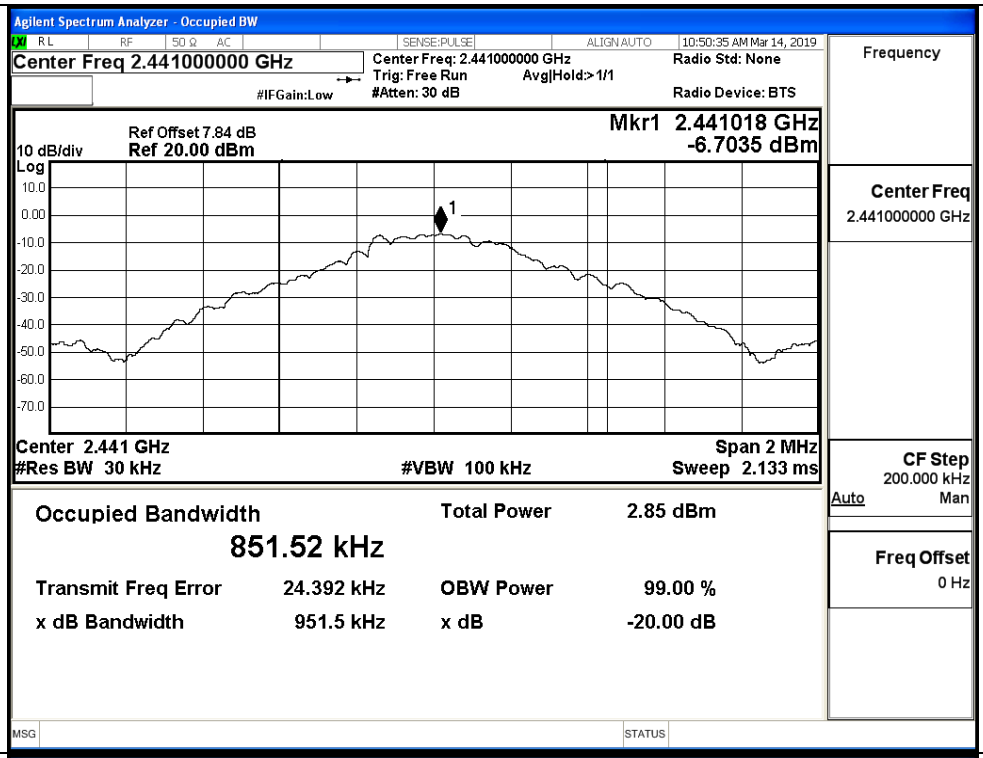
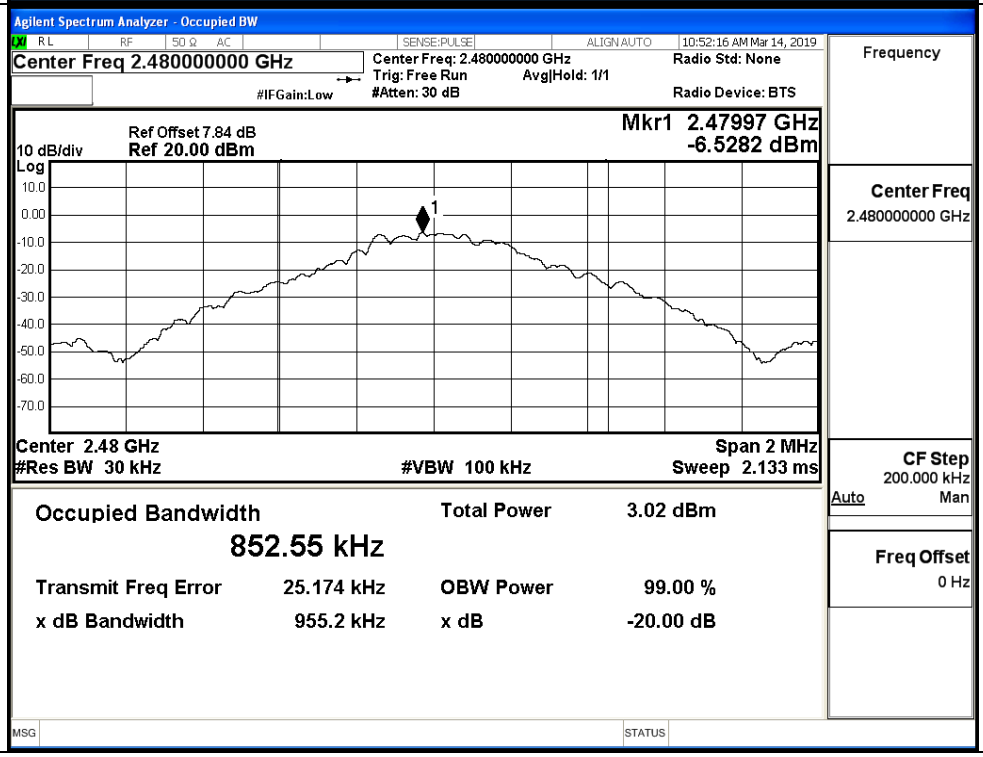
GFSK/HCH	
π/4DQPSK/LCH	

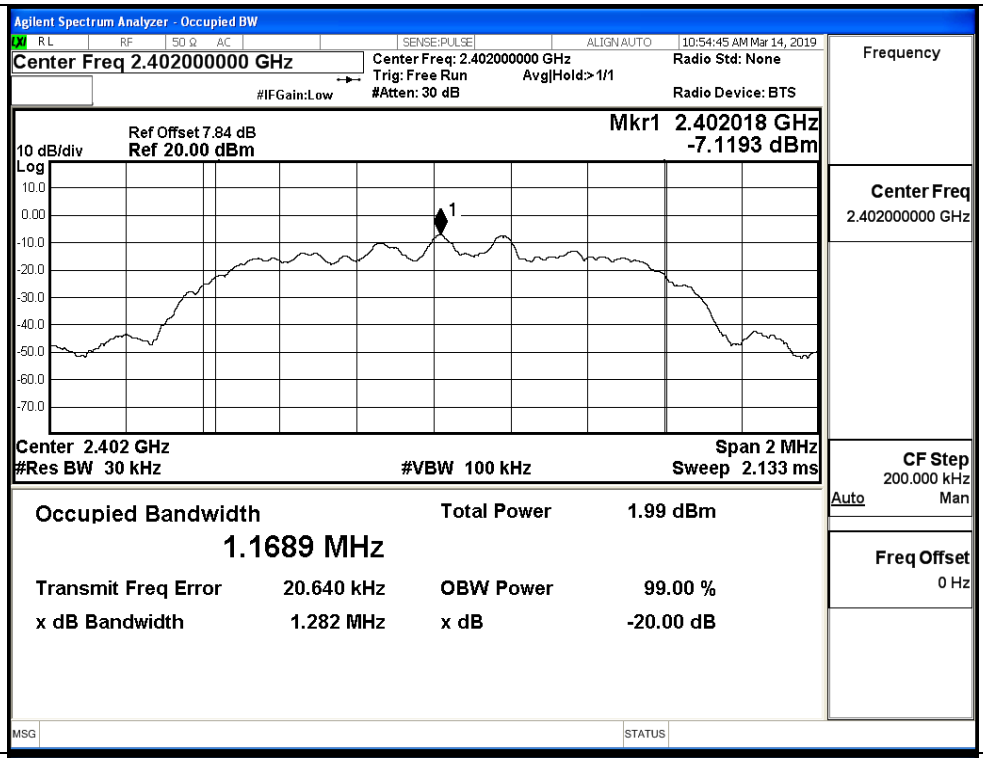
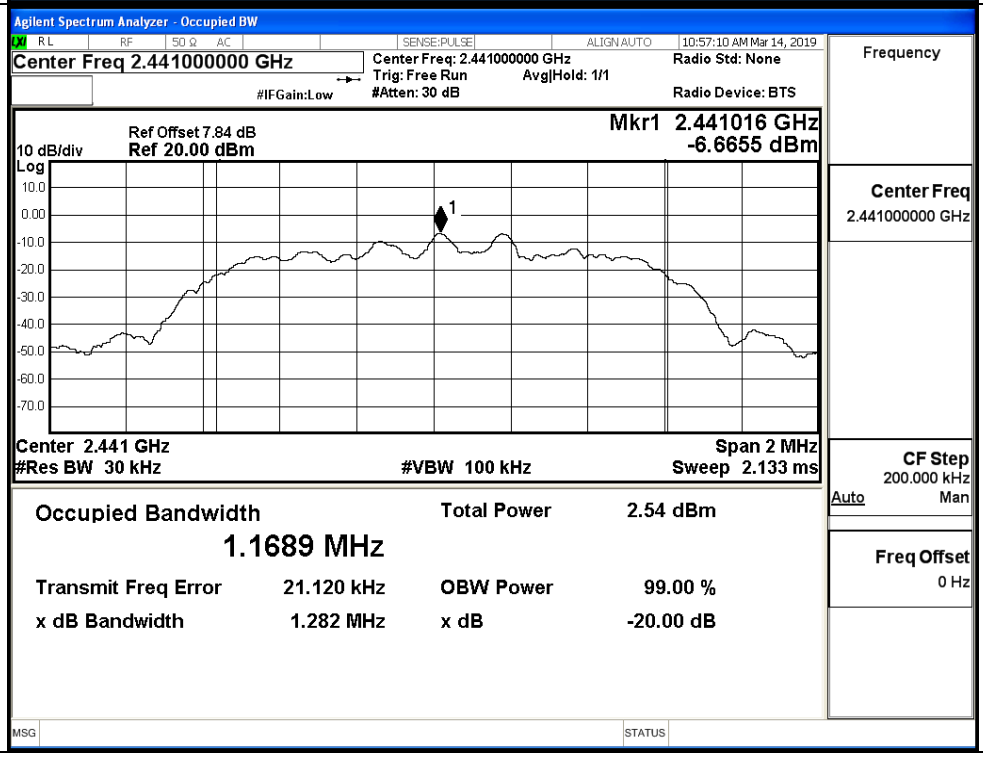
π/4DQPSK/MCH	
π/4DQPSK/HCH	

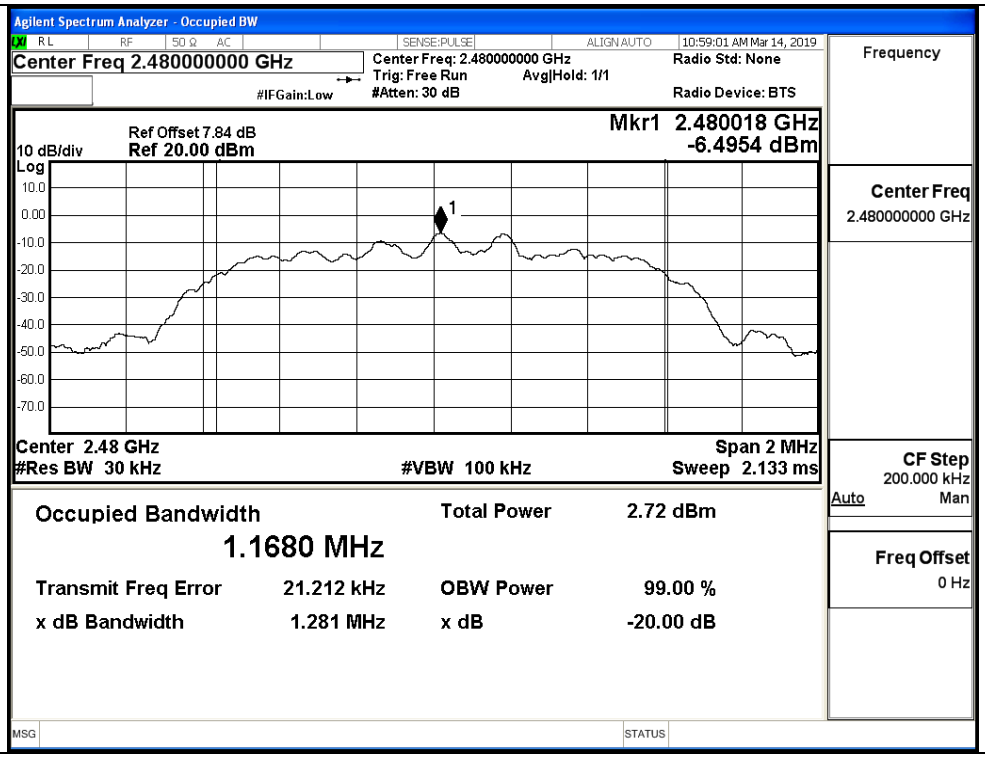
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.85241	0.9508	Not Specified	PASS
	MCH	0.85152	0.9515	Not Specified	PASS
	HCH	0.85255	0.9552	Not Specified	PASS
π/4DQPSK	LCH	1.1689	1.282	Not Specified	PASS
	MCH	1.1689	1.282	Not Specified	PASS
	HCH	1.1680	1.281	Not Specified	PASS

Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

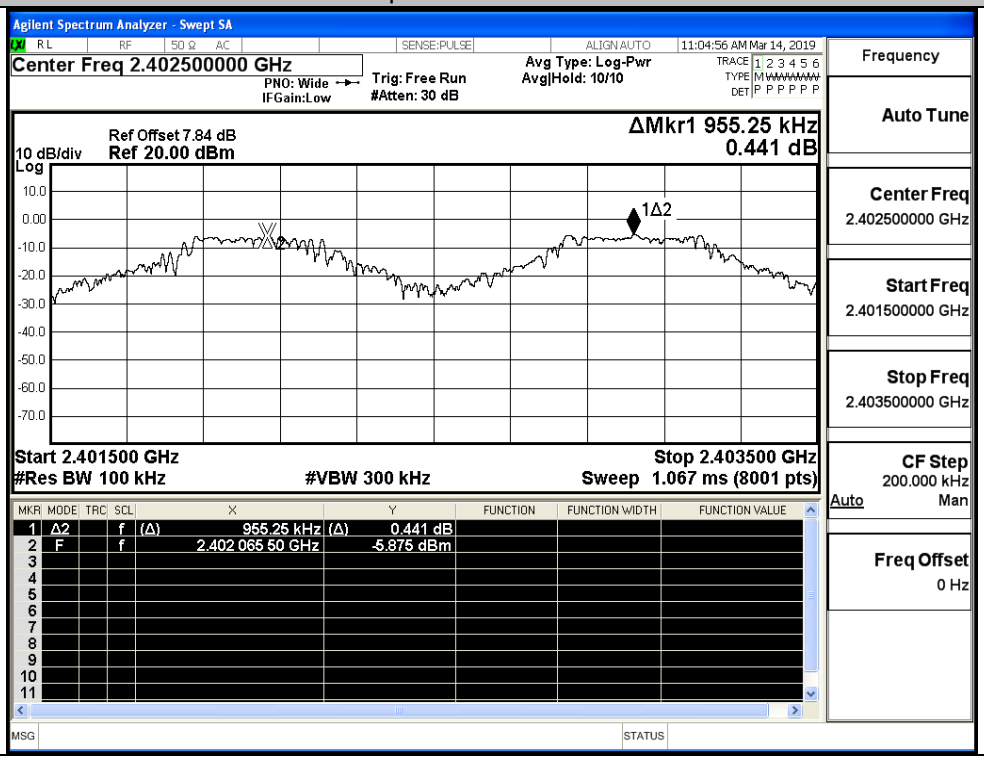
π/4DQPSK/LCH	
π/4DQPSK/MCH	

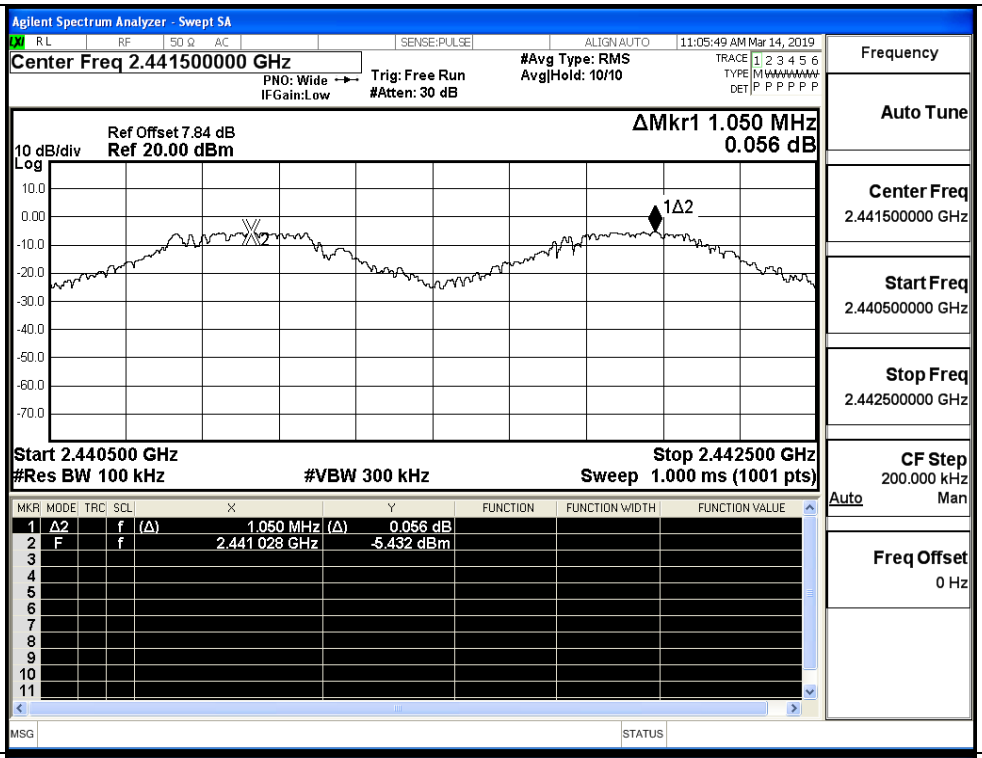
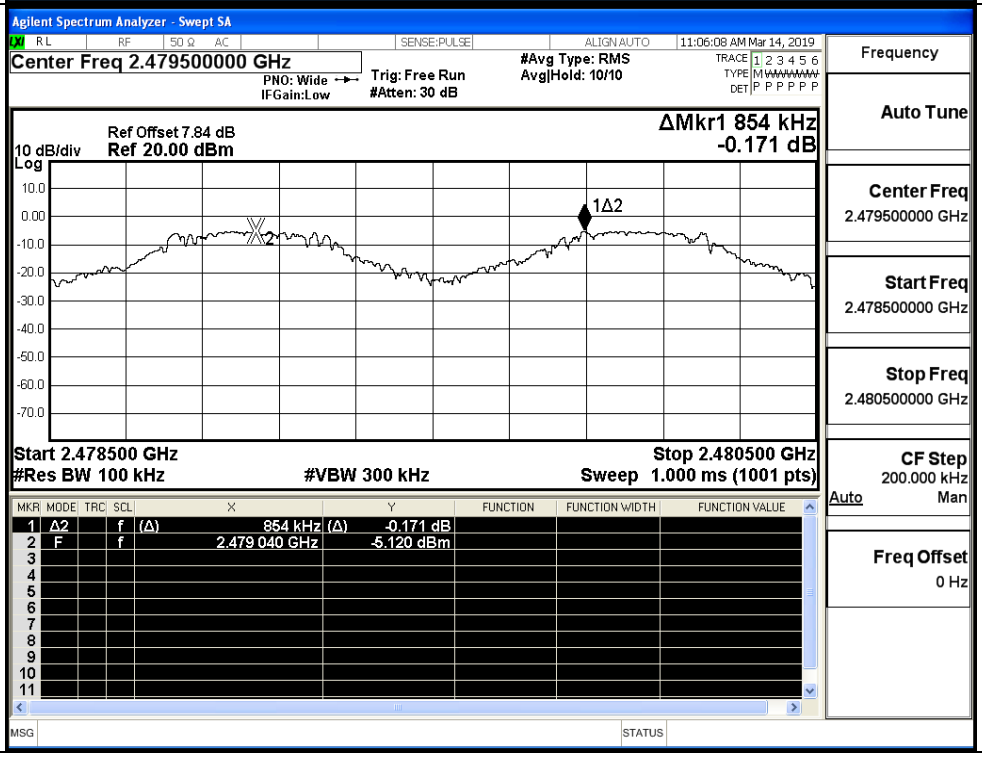
π/4DQPSK/HCH	

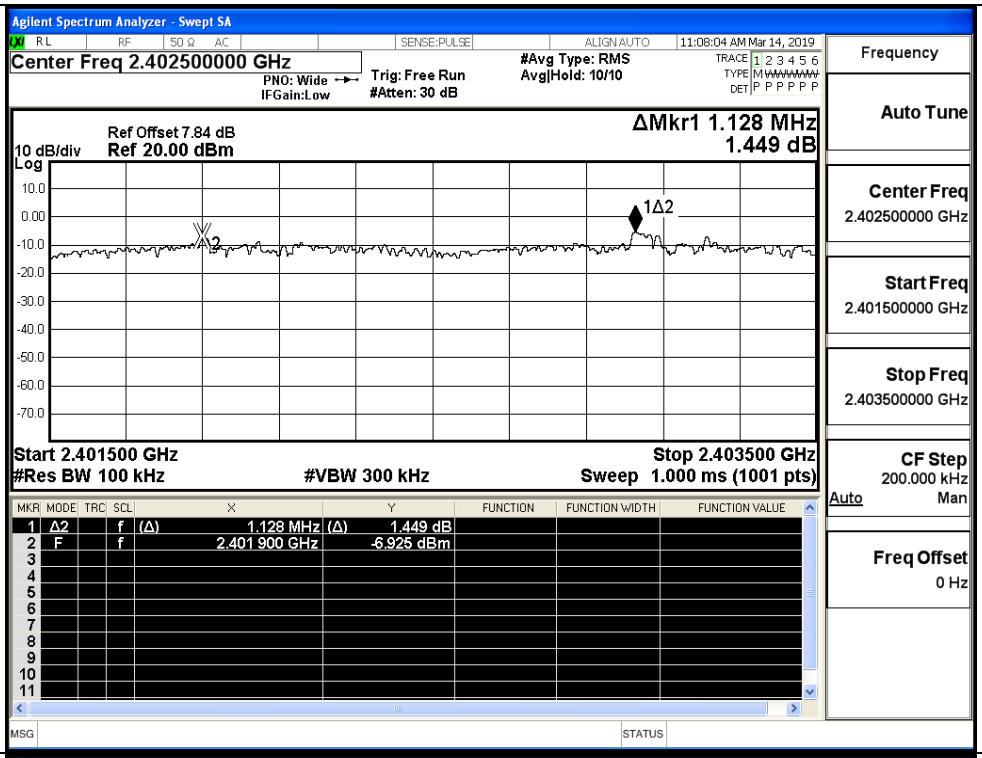
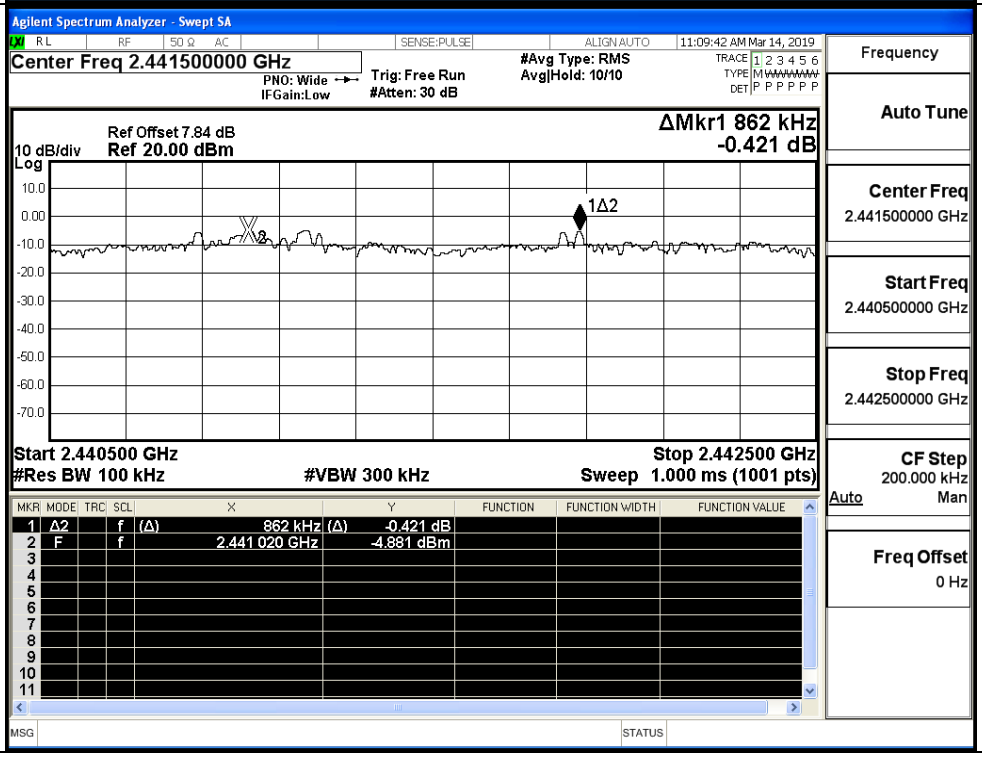
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
10:59:01 AM Mar 14, 2019
Center Freq 2.480000000 GHz
#IFGain:Low
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.480018 GHz
-6.4954 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2 MHz
Sweep 2.133 ms
Occupied Bandwidth
1.1680 MHz
Total Power 2.72 dBm
Transmit Freq Error 21.212 kHz
OBW Power 99.00 %
x dB Bandwidth 1.281 MHz
x dB -20.00 dB
Center Freq
2.480000000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

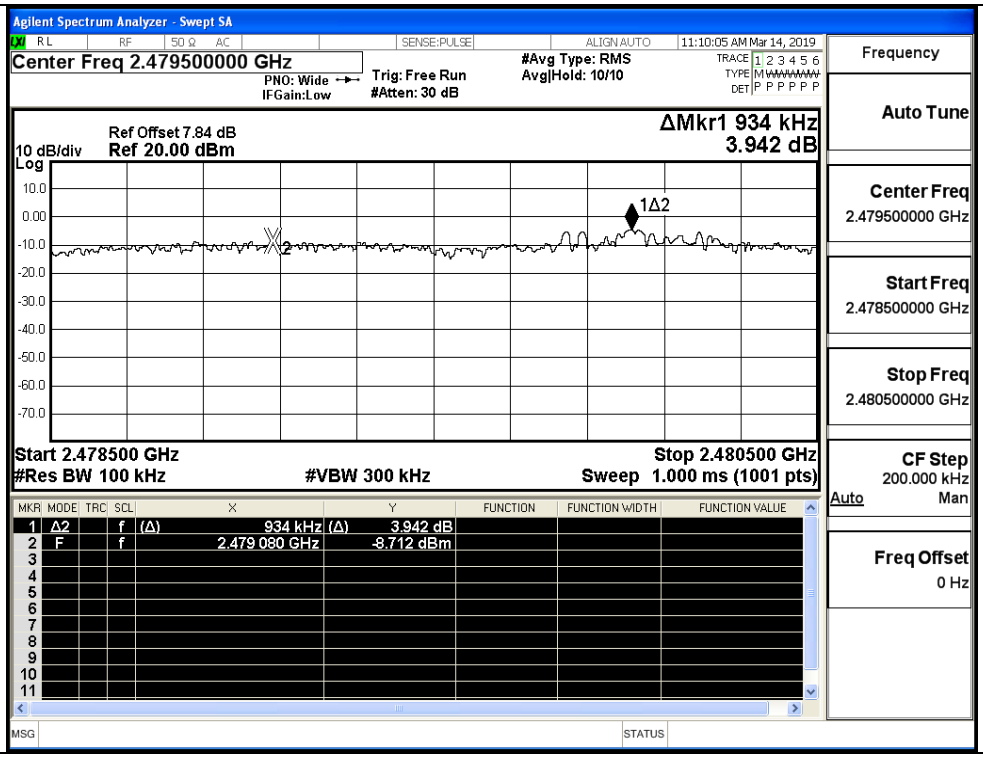
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.955	0.637	PASS
	MCH	1.050	0.637	PASS
	HCH	0.854	0.637	PASS
π/4DQPSK	LCH	1.128	0.855	PASS
	MCH	0.862	0.855	PASS
	HCH	0.934	0.855	PASS

Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

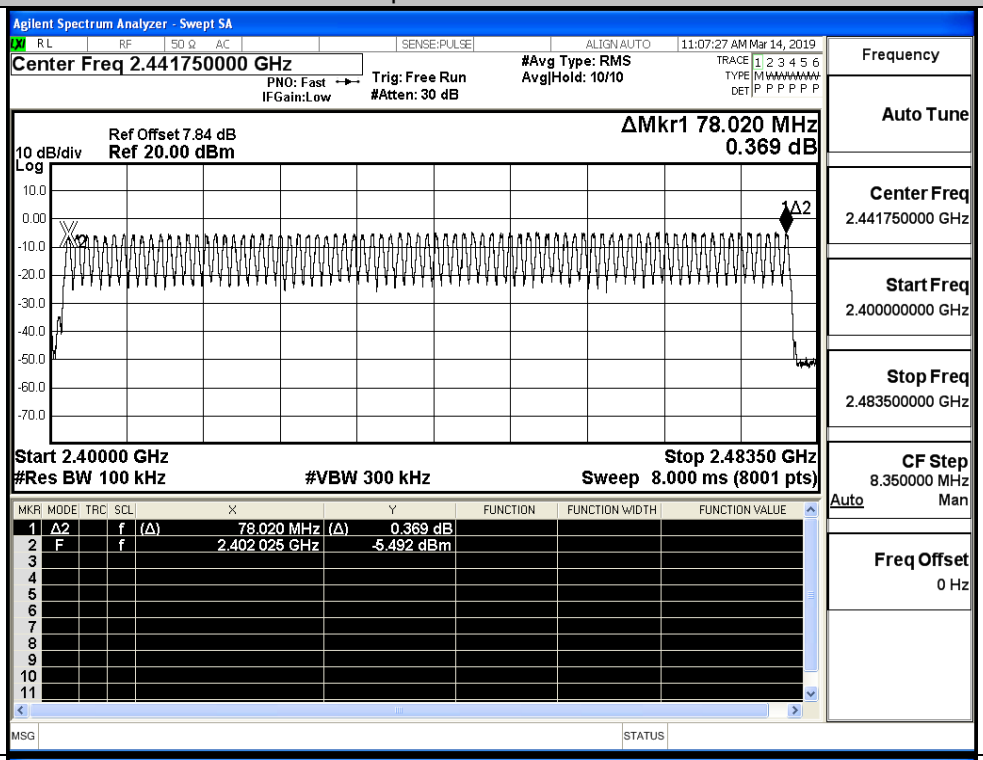
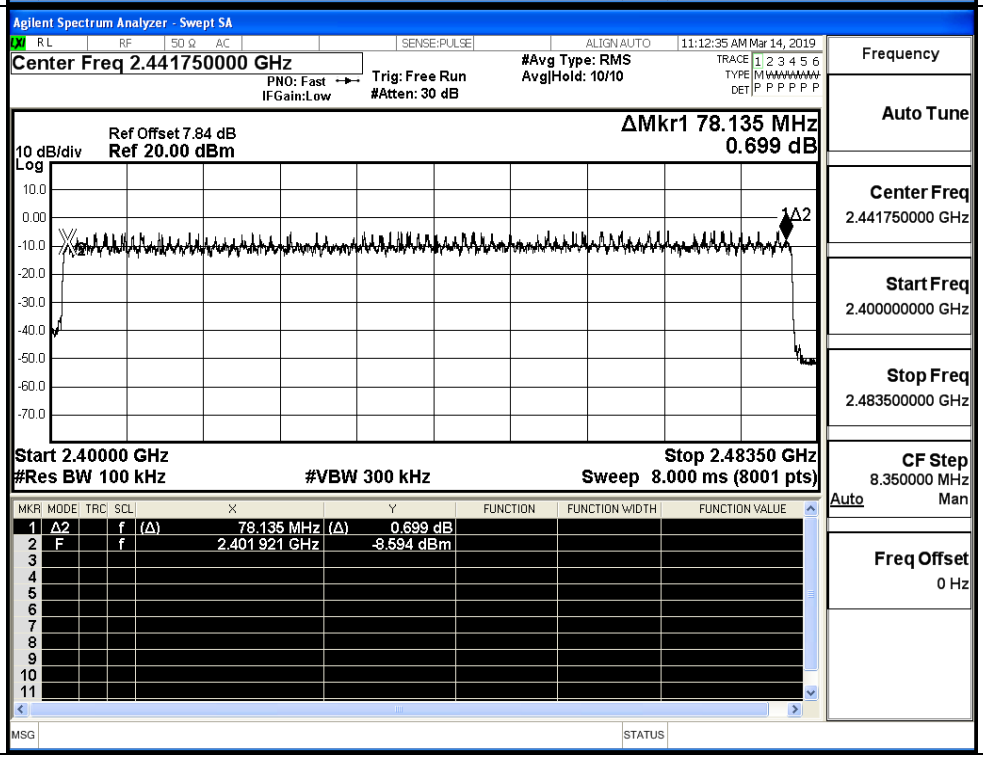
π/4DQPSK/LCH	
π/4DQPSK/MCH	

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
11:10:05 AM Mar 14, 2019
Ref Offset 7.84 dB
10 dB/div
Log
Ref 20.00 dBm
ΔMkr1 934 kHz
3.942 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) 934 kHz (Δ) 3.942 dB
2 F f 2.479 080 GHz -8.712 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

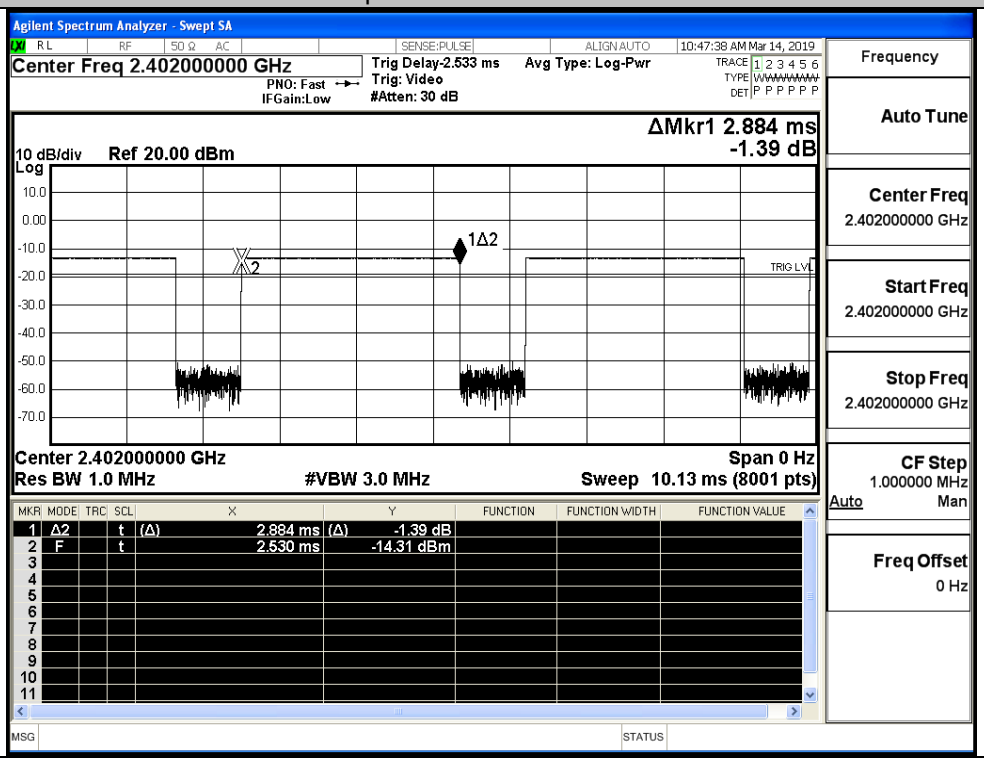
A.4 Hopping Channel Number

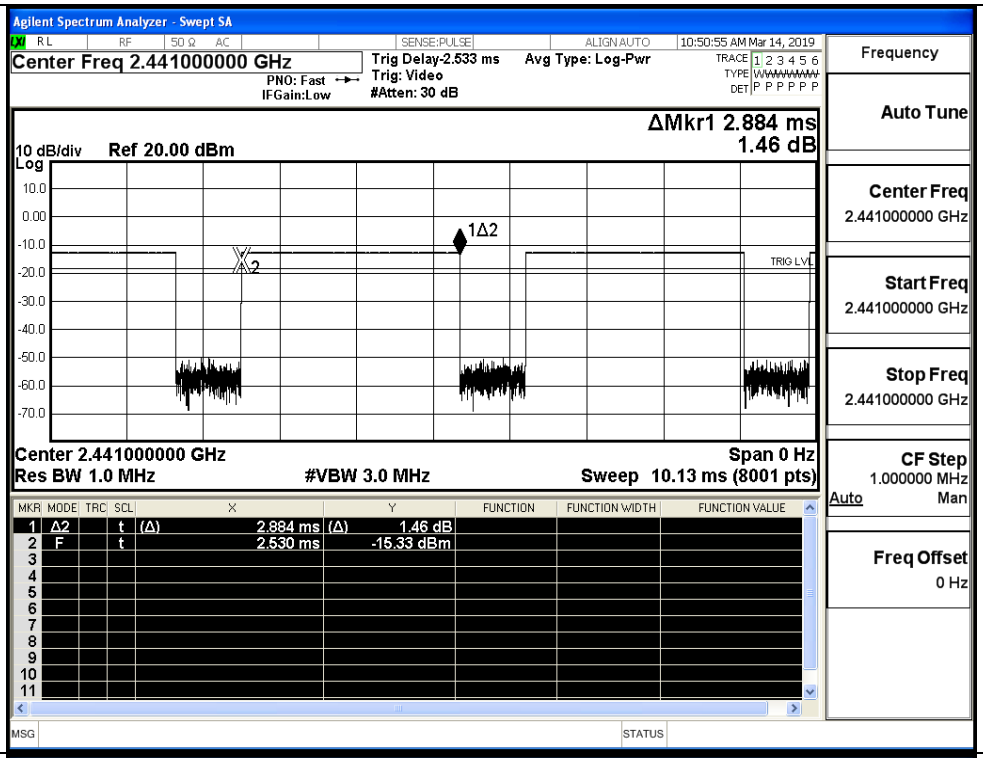
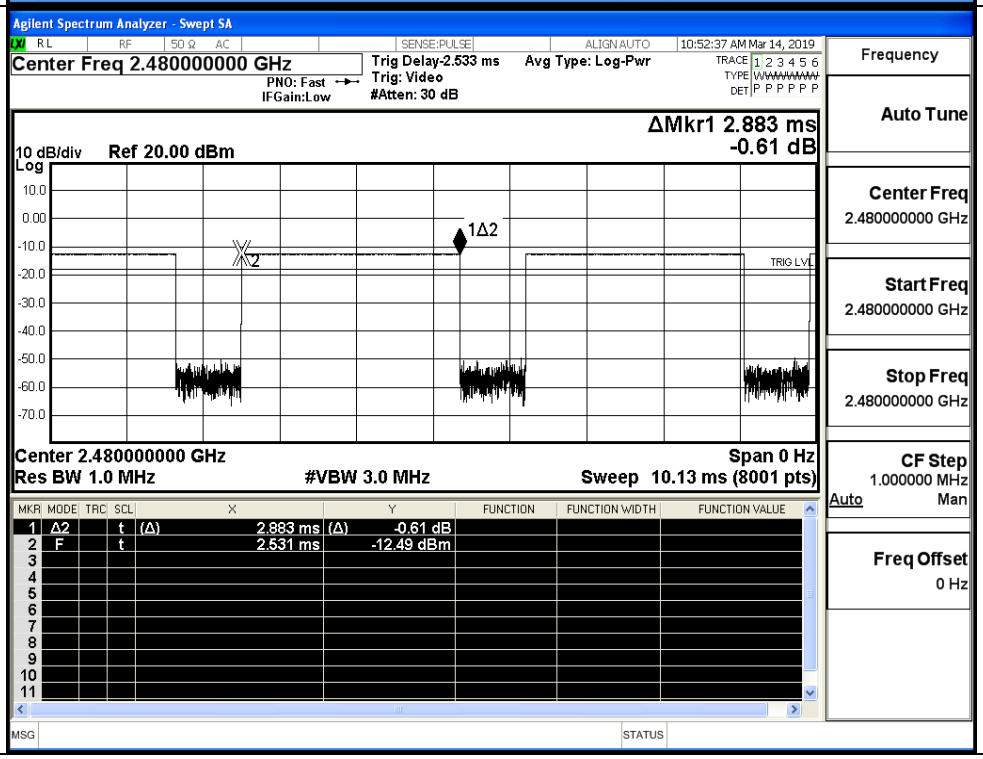
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS

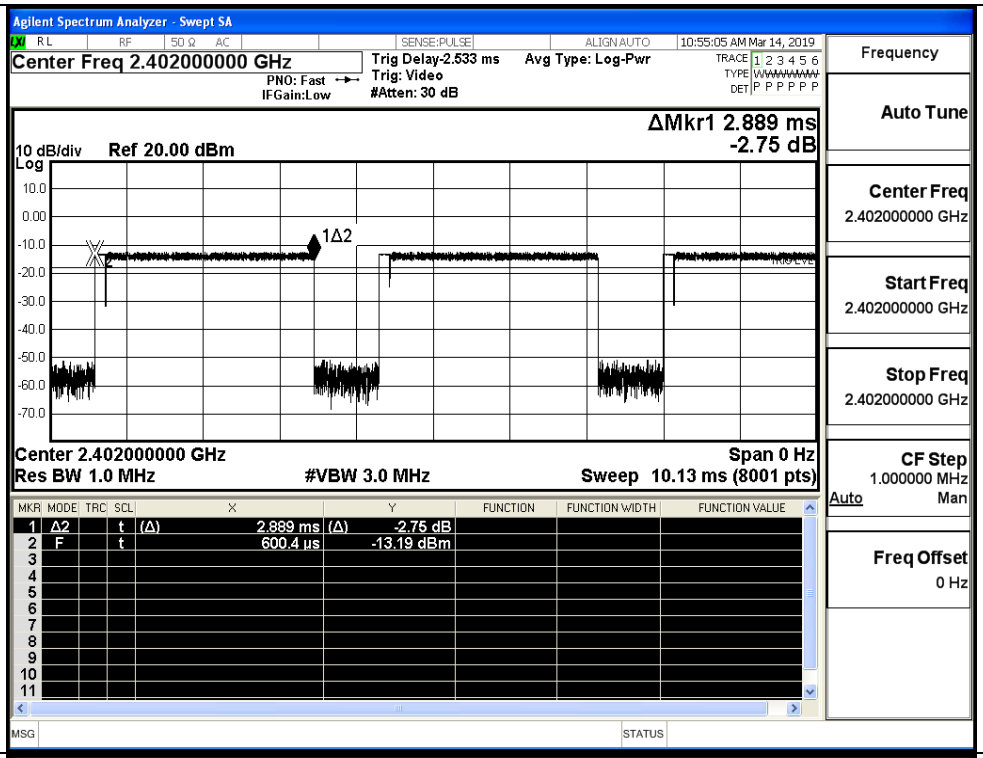
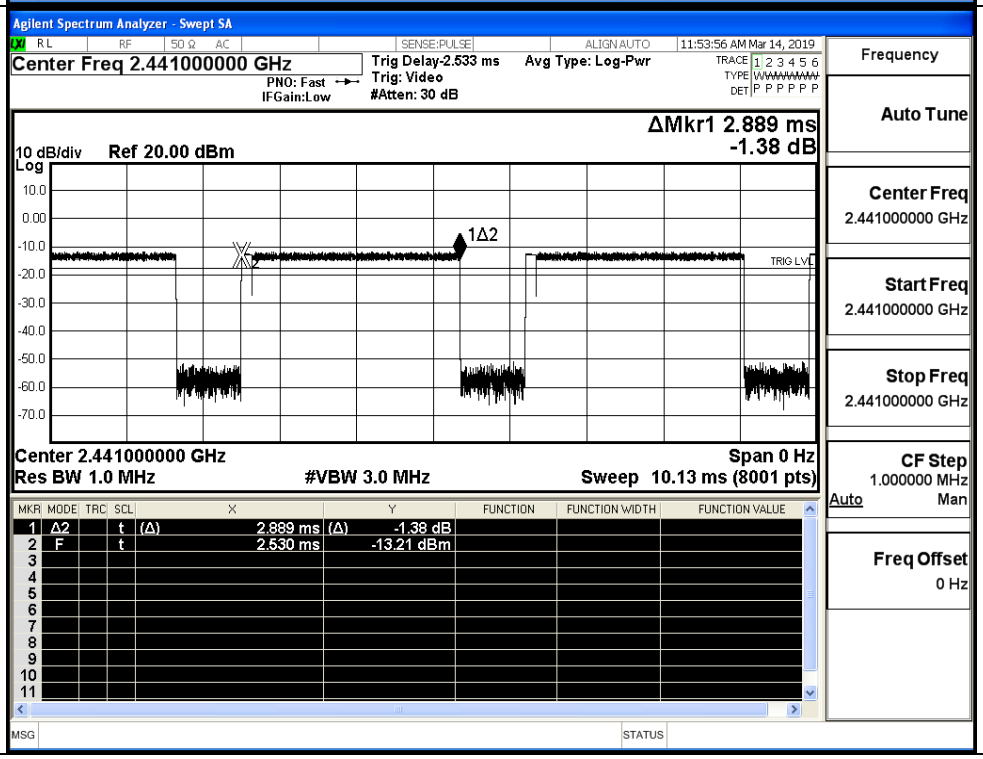
Test Graphs		
GFSK/Hop		
π/4DQPSK/Hop		

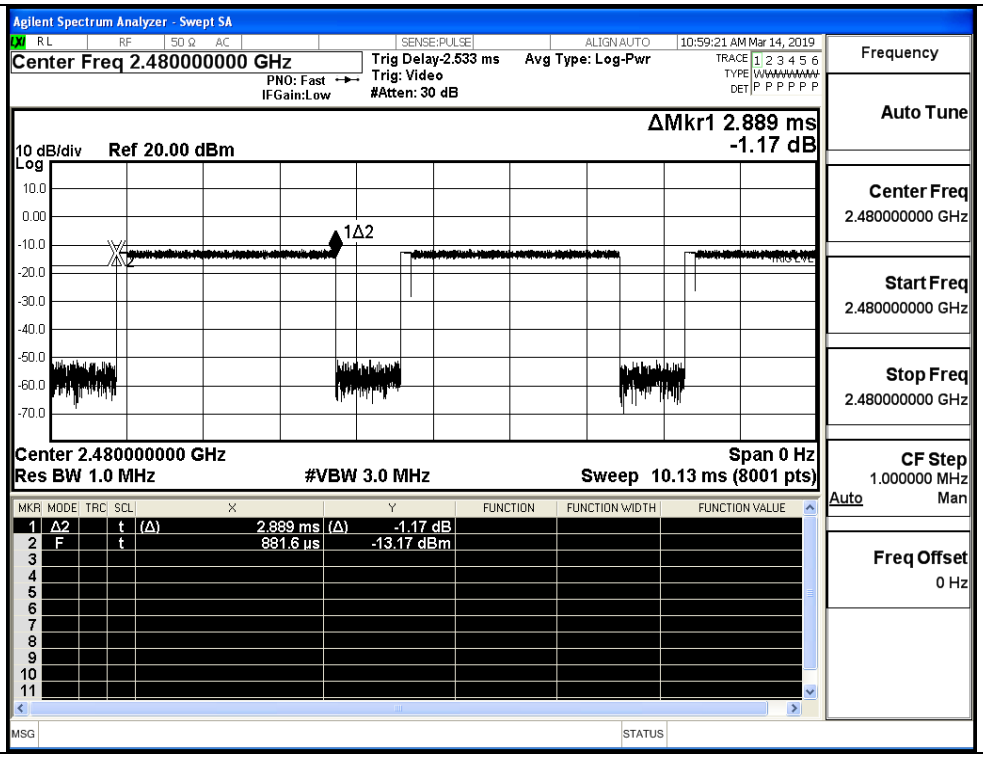
A.5 Dwell Time

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	2.89	106.7	0.308	0.4	PASS
	2DH5	MCH	2.89	106.7	0.308	0.4	PASS
	2DH5	HCH	2.89	106.7	0.308	0.4	PASS

Test Graphs	
GFSK_DH5/LCH	

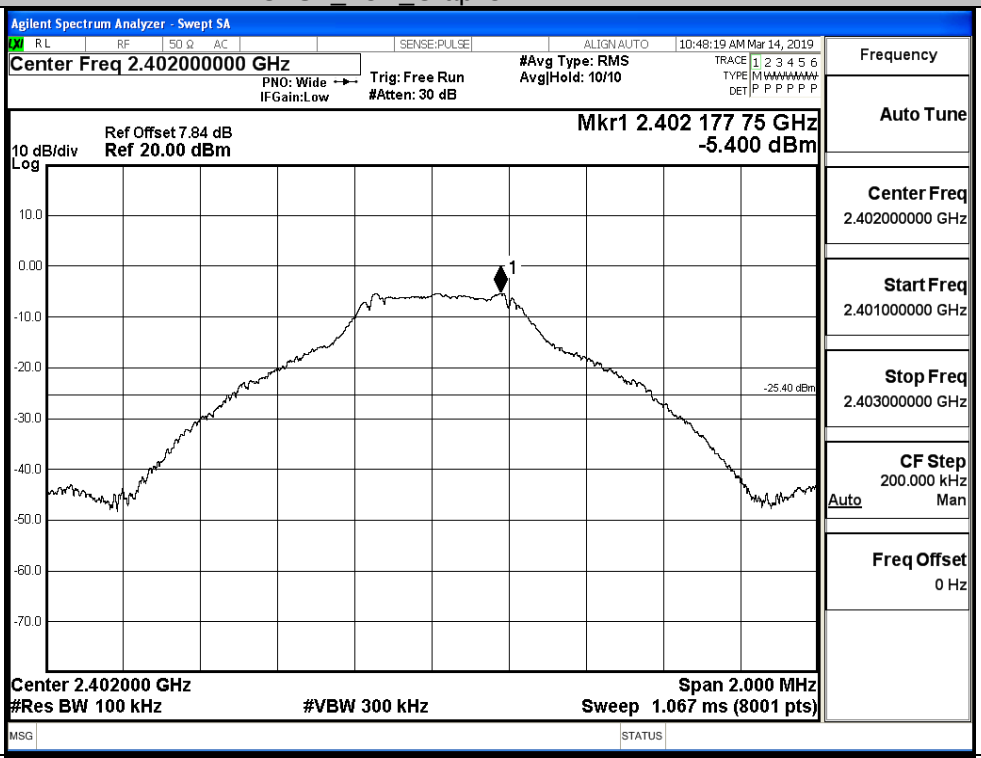
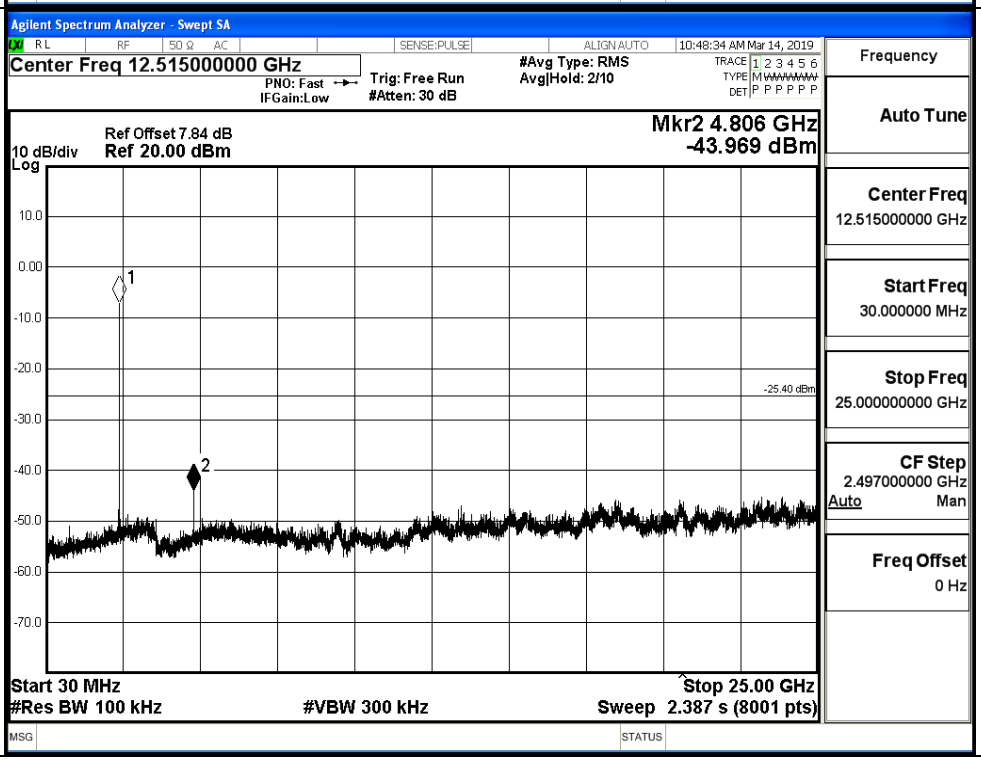
GFSK_DH5/MCH	
GFSK_DH5/HCH	

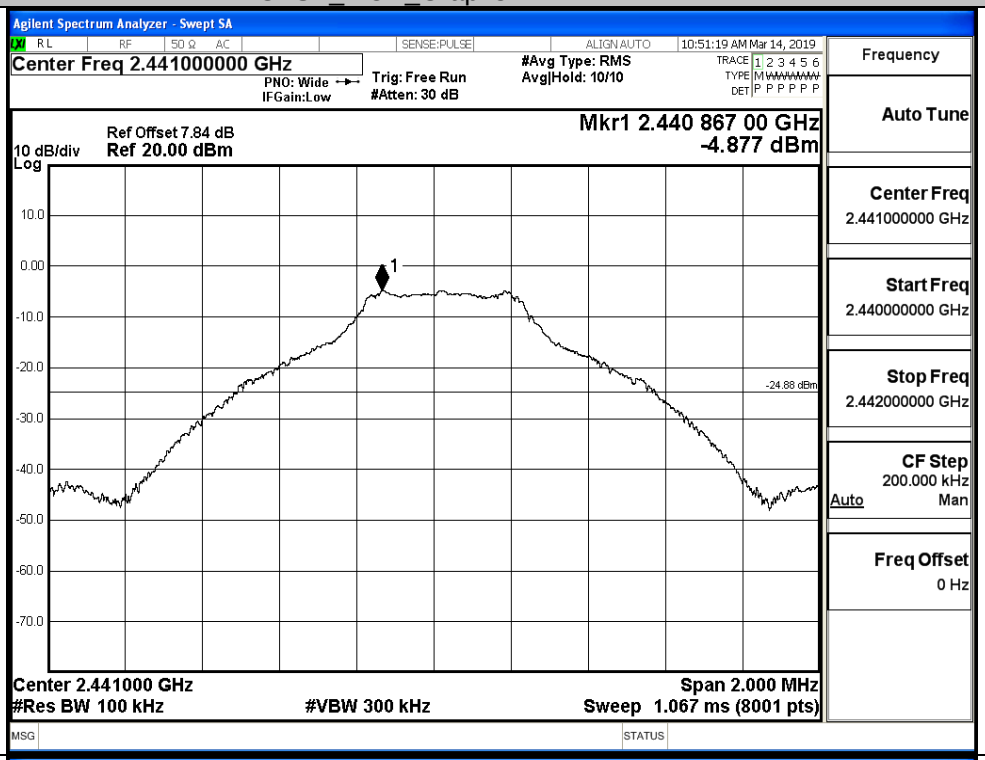
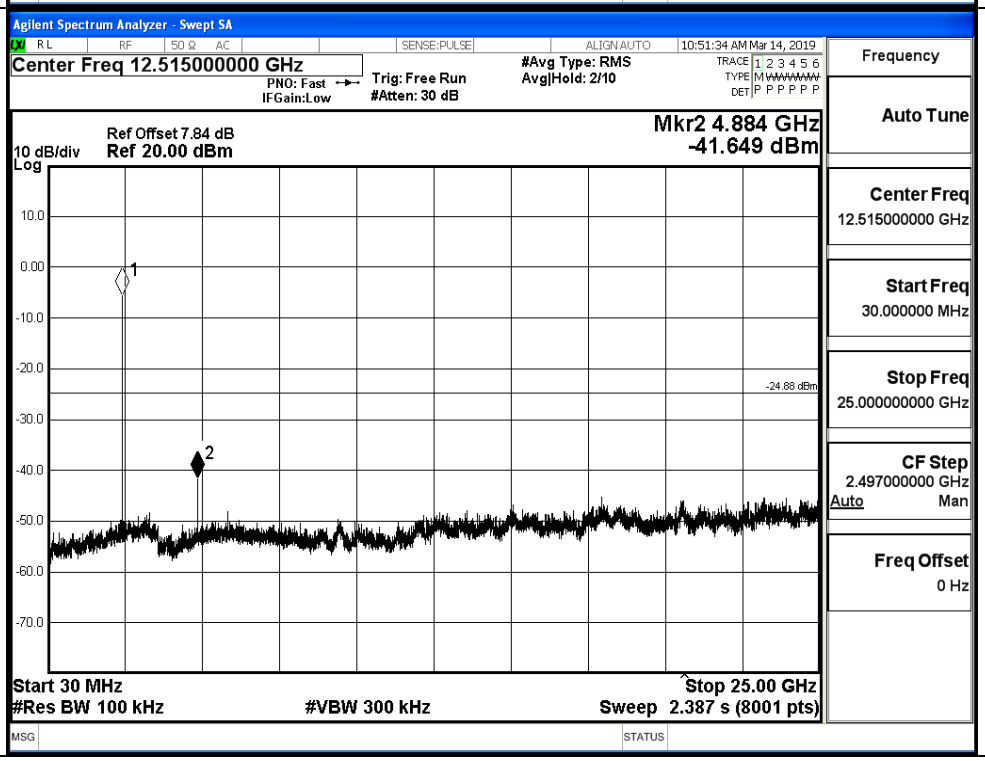
π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

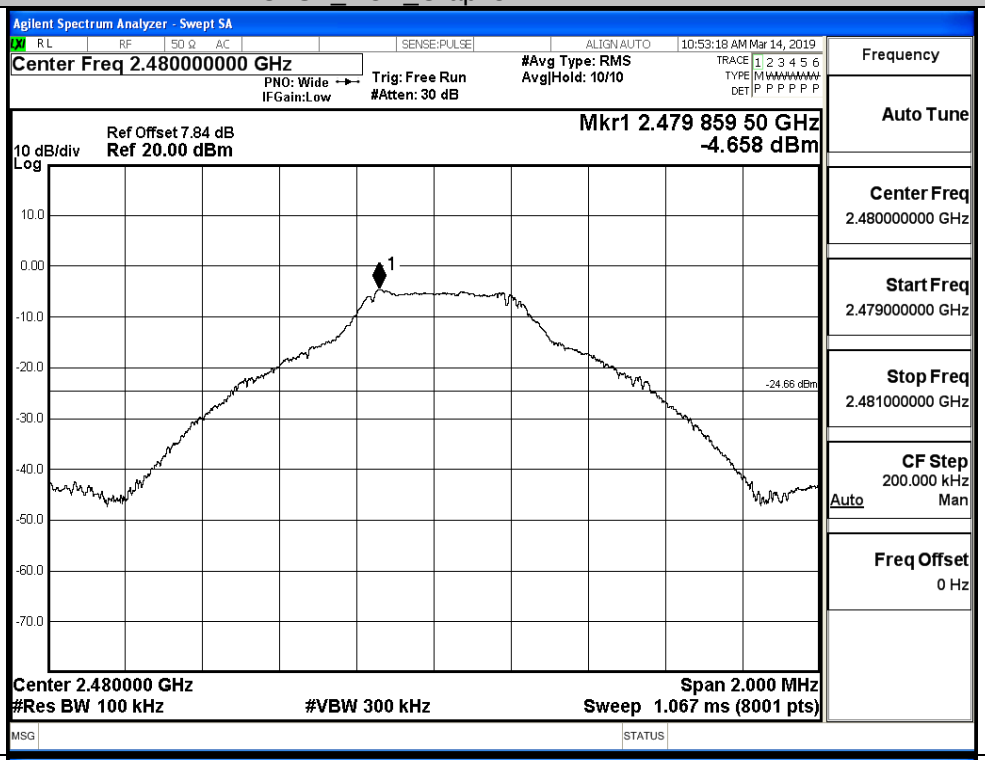
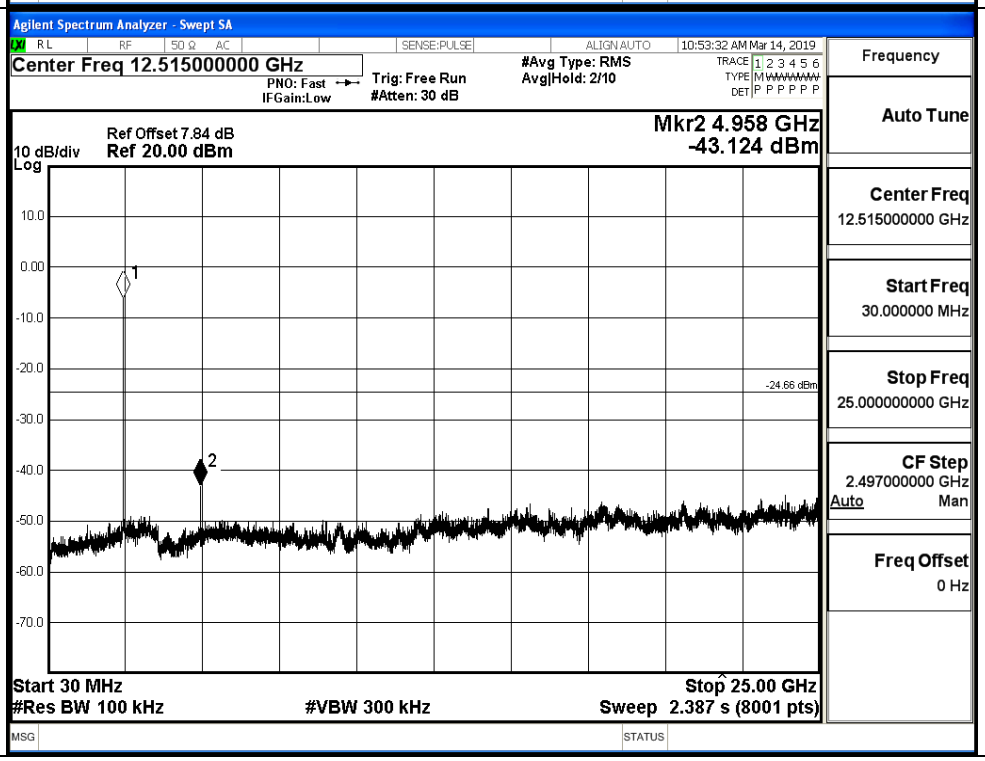
π/4DQPSK _2DH5/HCH	

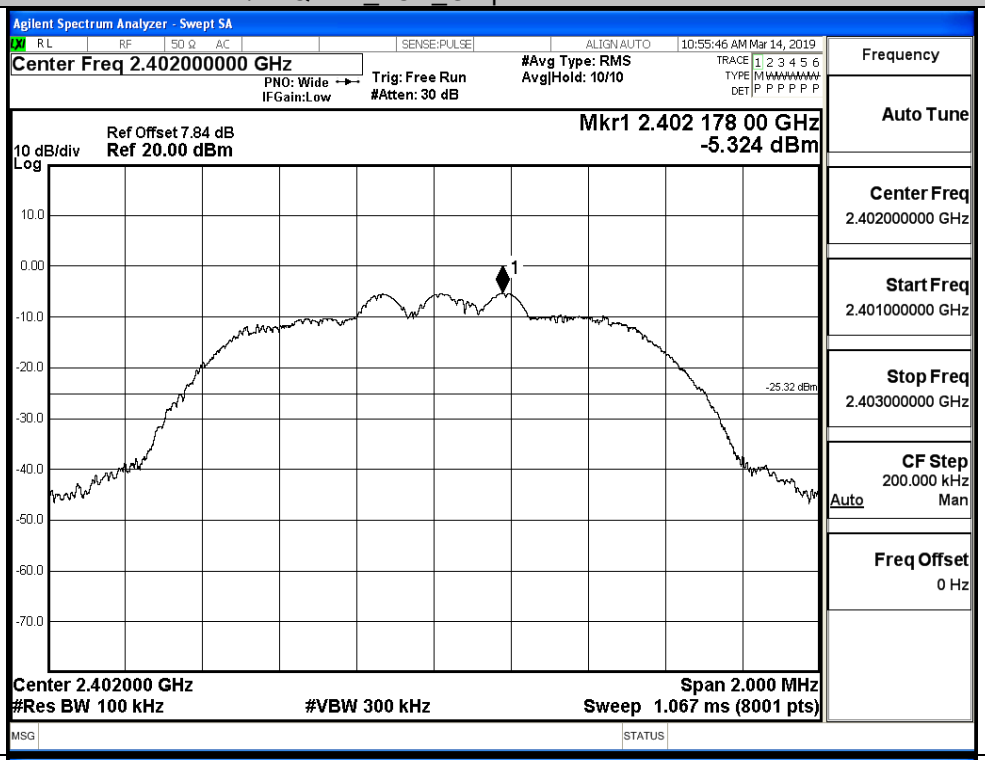
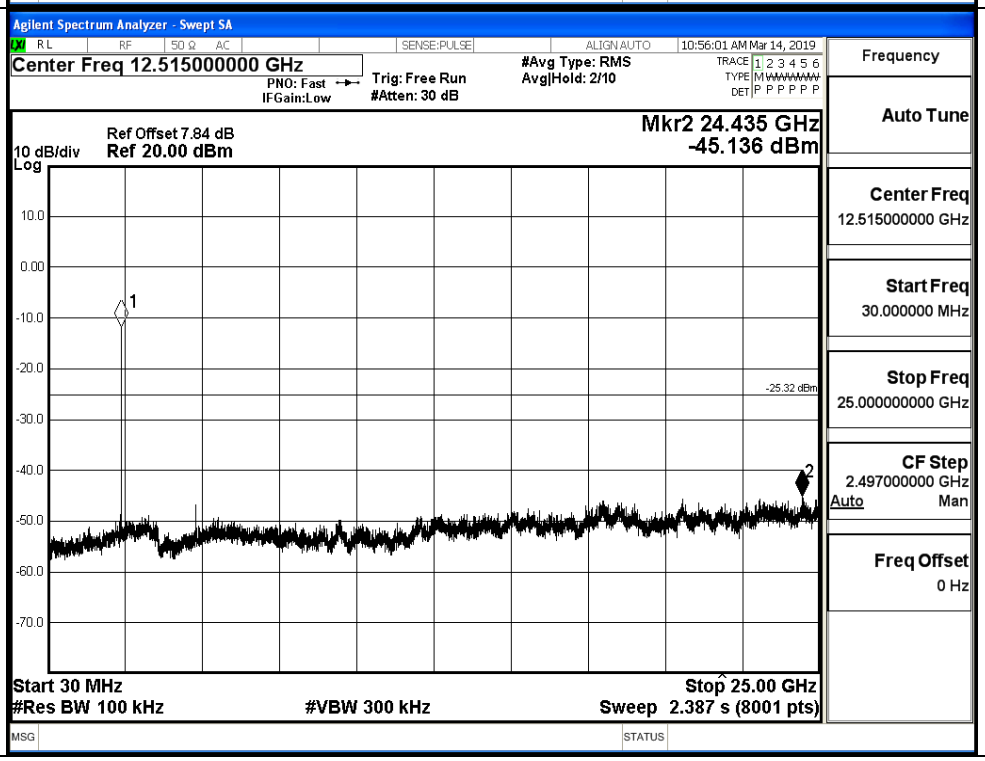
A.6 RF Conducted Spurious Emissions

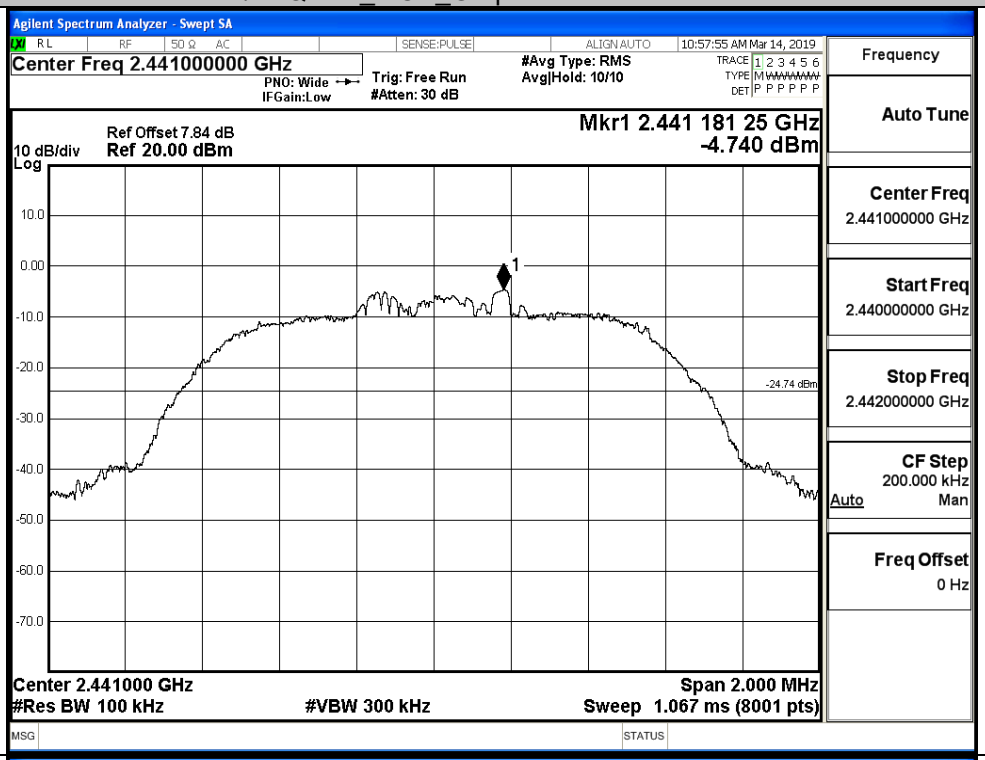
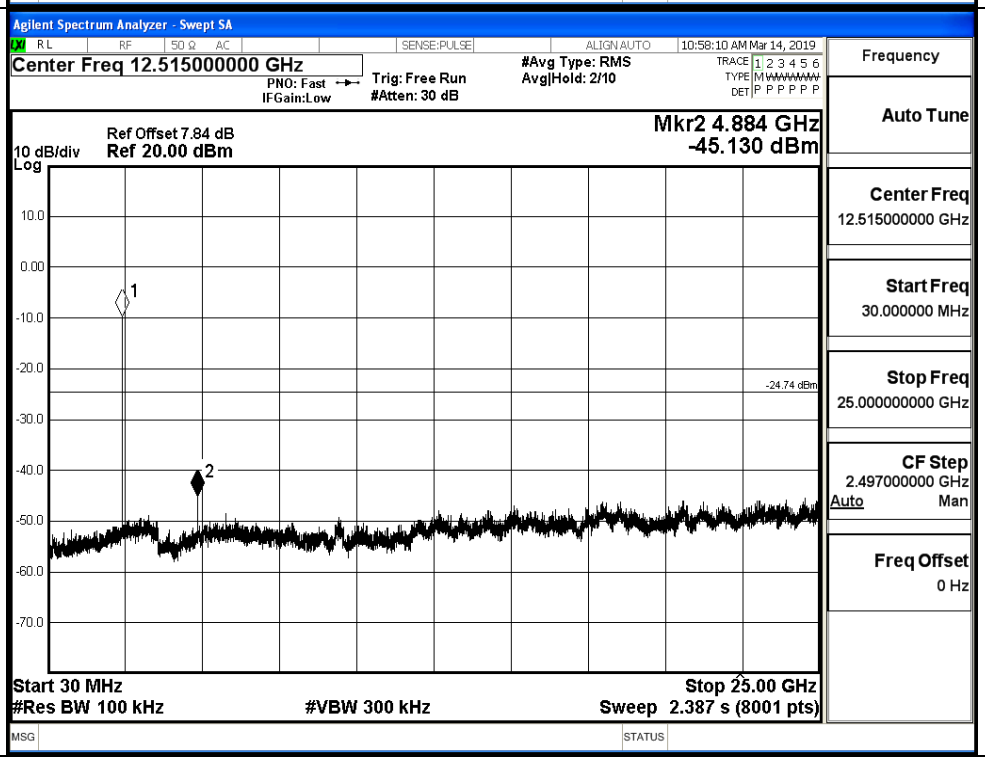
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-5.400	-43.969	-25.400	PASS
	MCH	-4.877	-41.649	-24.877	PASS
	HCH	-4.658	-43.124	-24.658	PASS
π/4DQPSK	LCH	-5.324	-45.136	-25.324	PASS
	MCH	-4.740	-45.130	-24.740	PASS
	HCH	-4.565	-45.255	-24.565	PASS

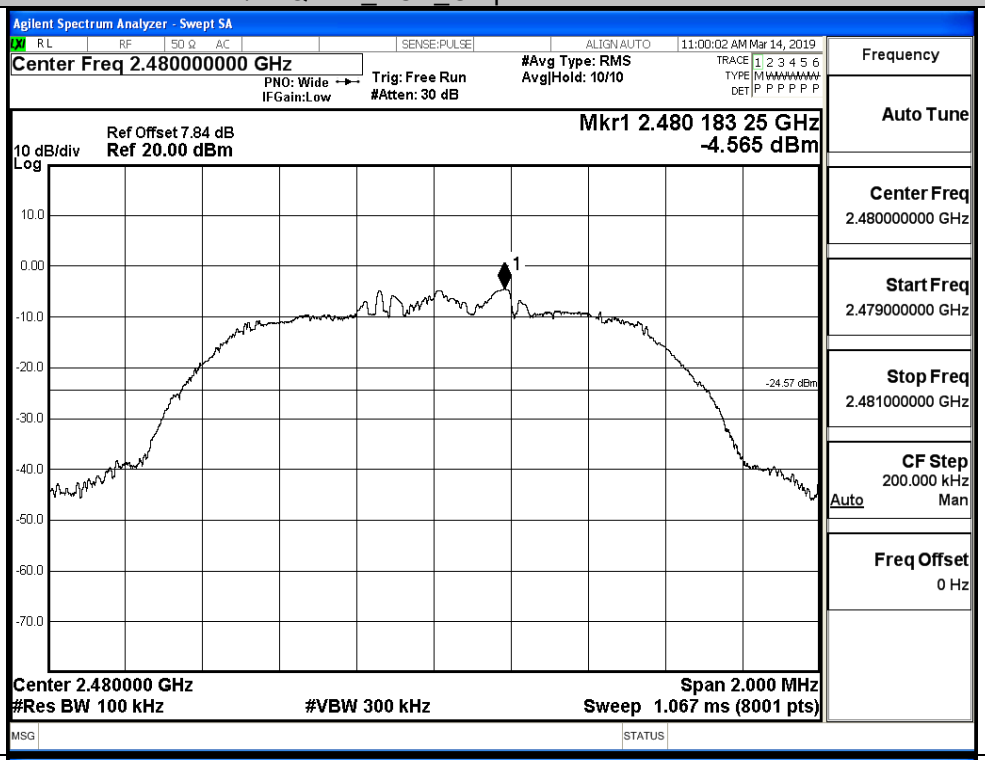
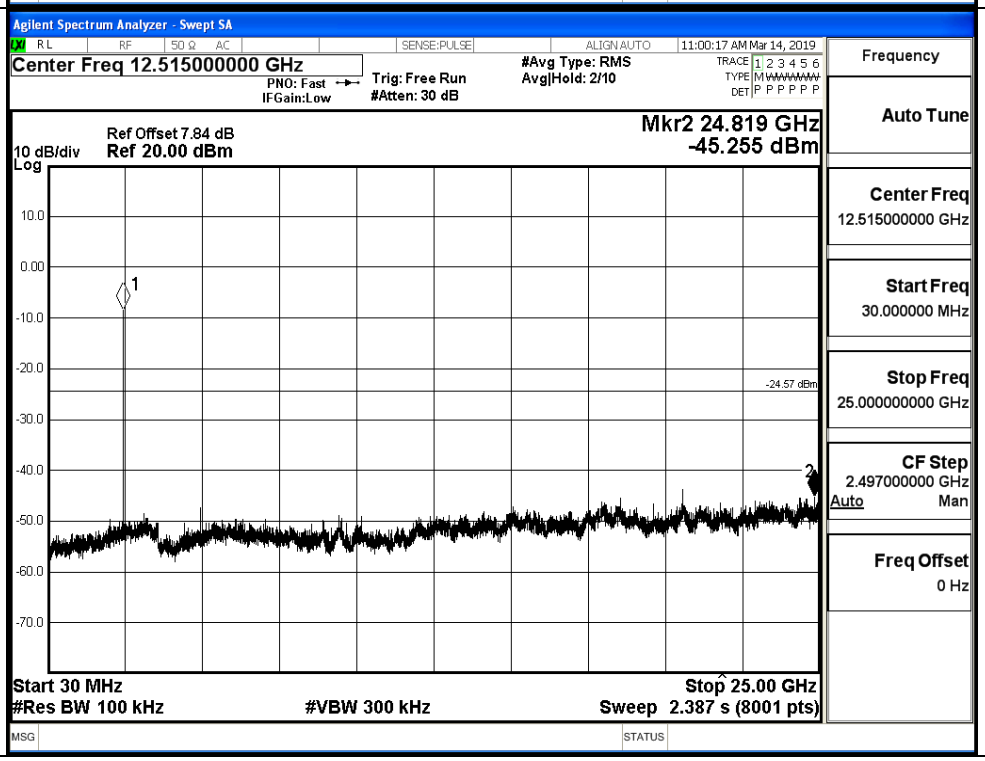
GFSK_LCH_Graphs			
Pref			
Puw			

GFSK_MCH_Graphs		
Pref		
Puw		

GFSK_HCH_Graphs			
Pref			
Puw			

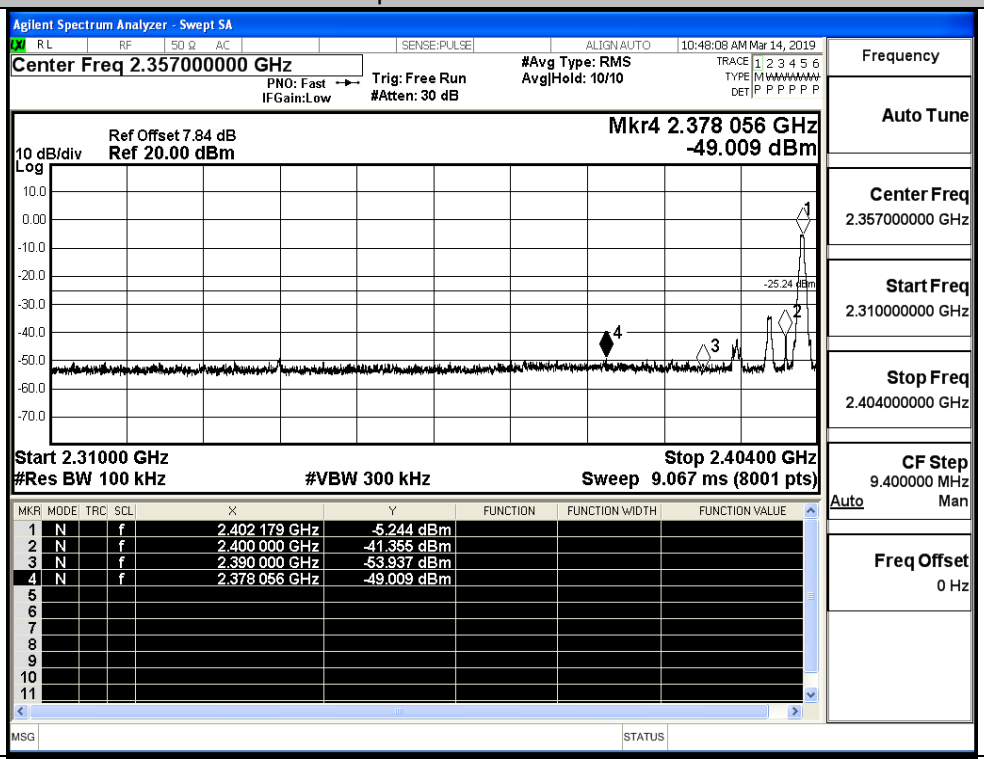
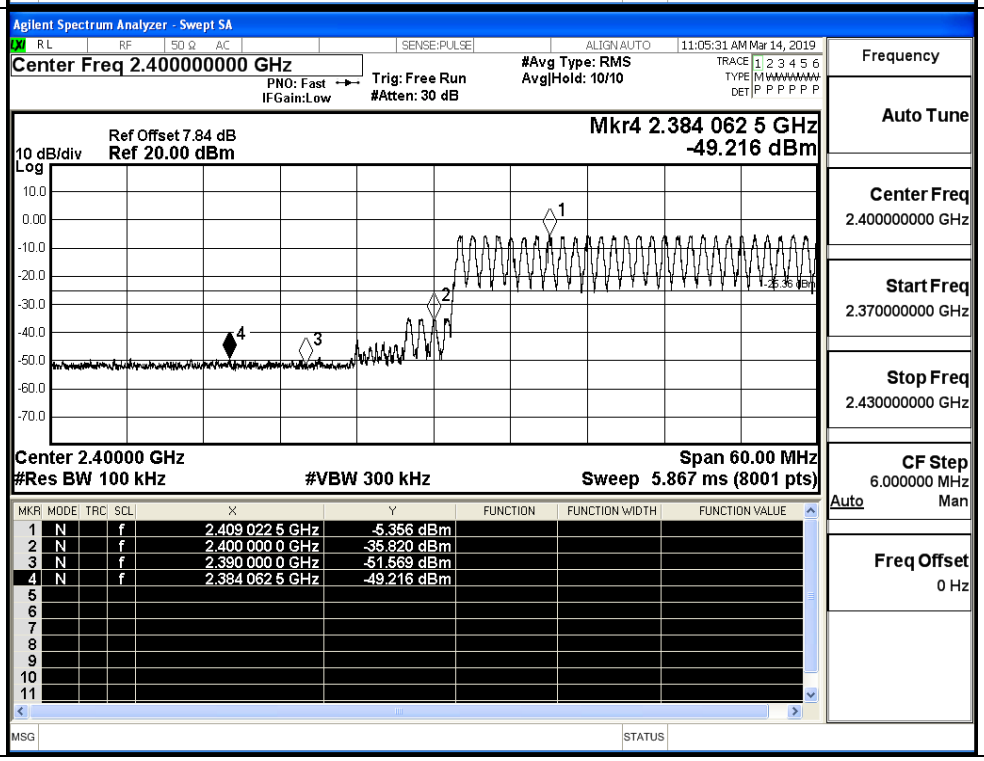
π/4DQPSK_LCH_Graphs			
Pref			
Puw			

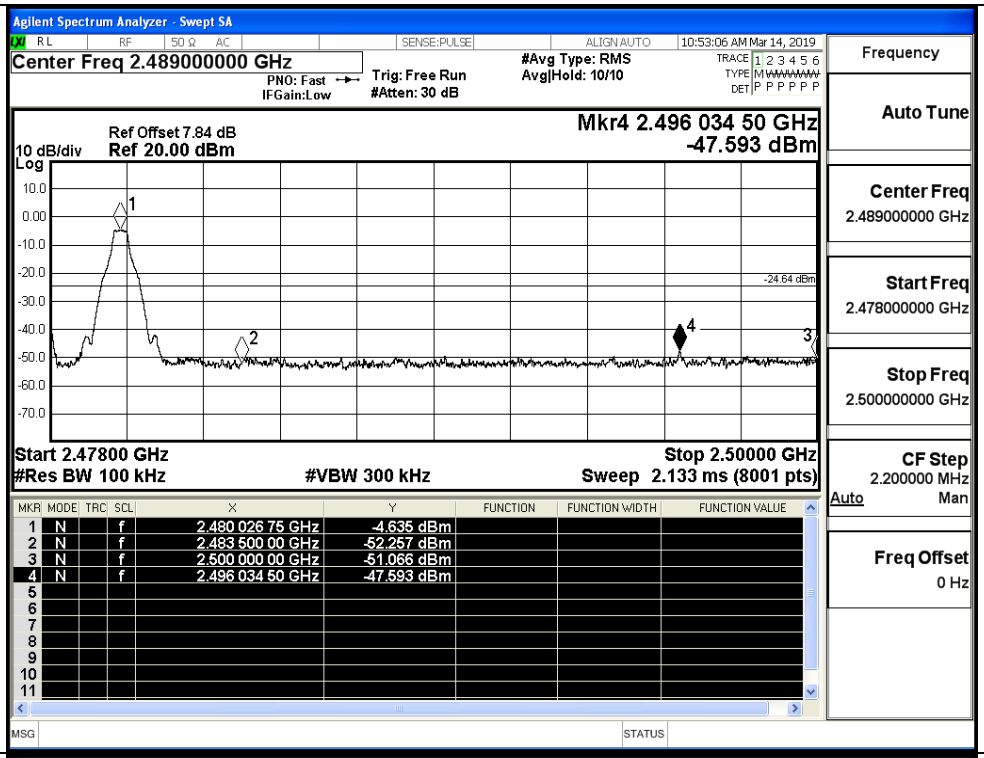
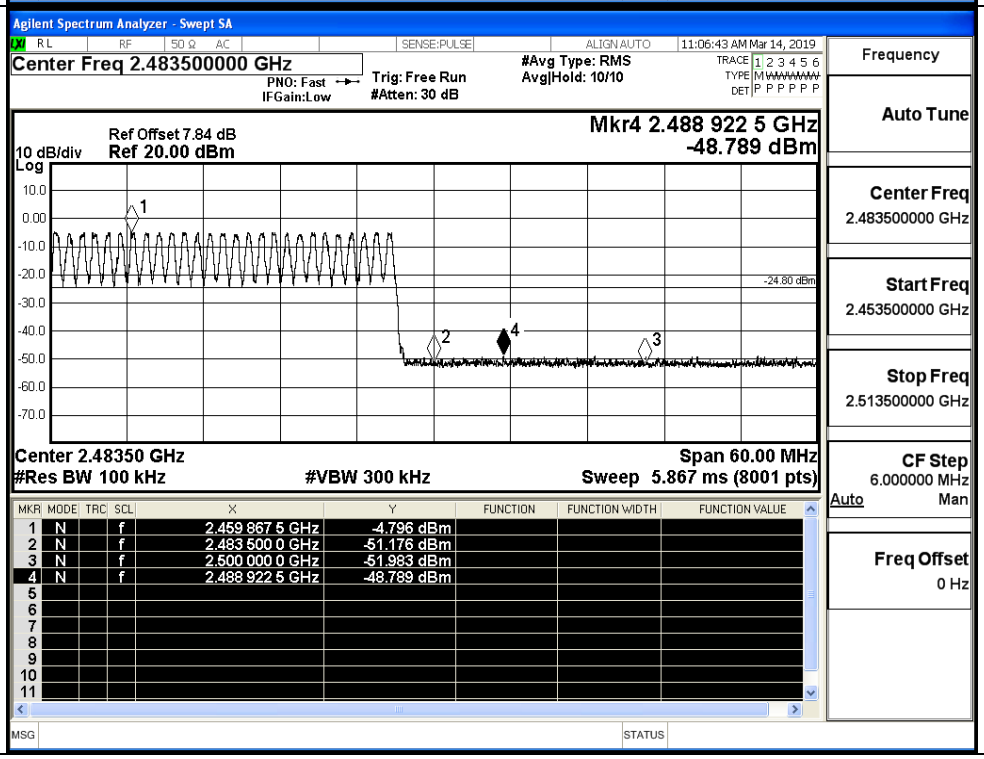
π/4DQPSK_MCH_Graphs		
Pref		
Puw		

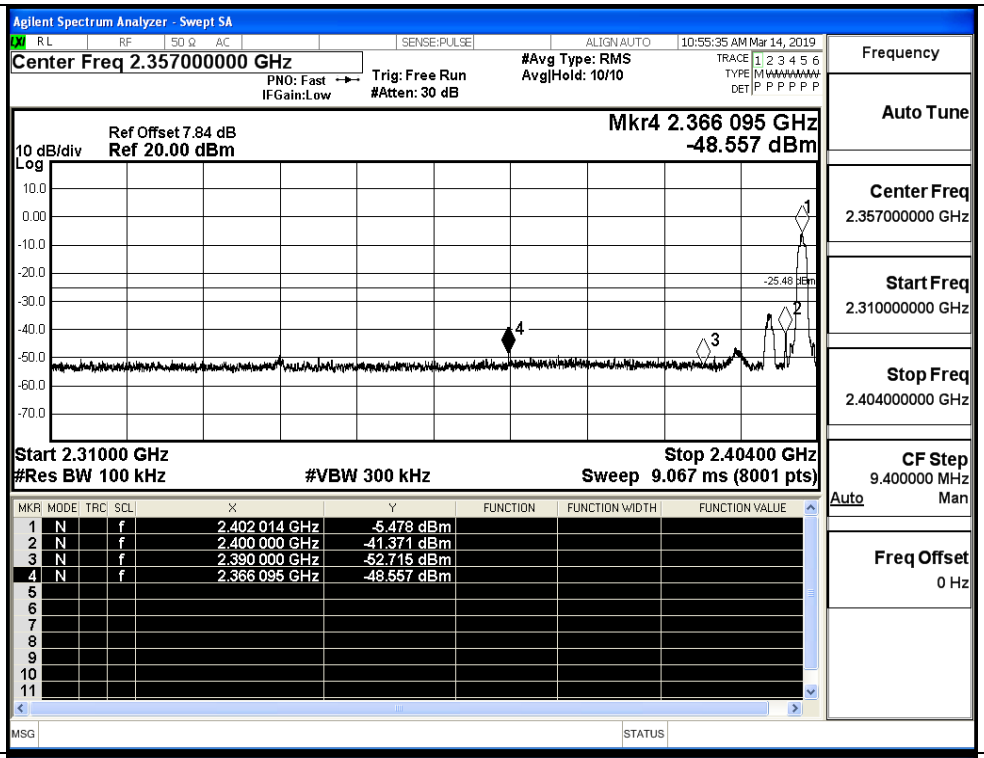
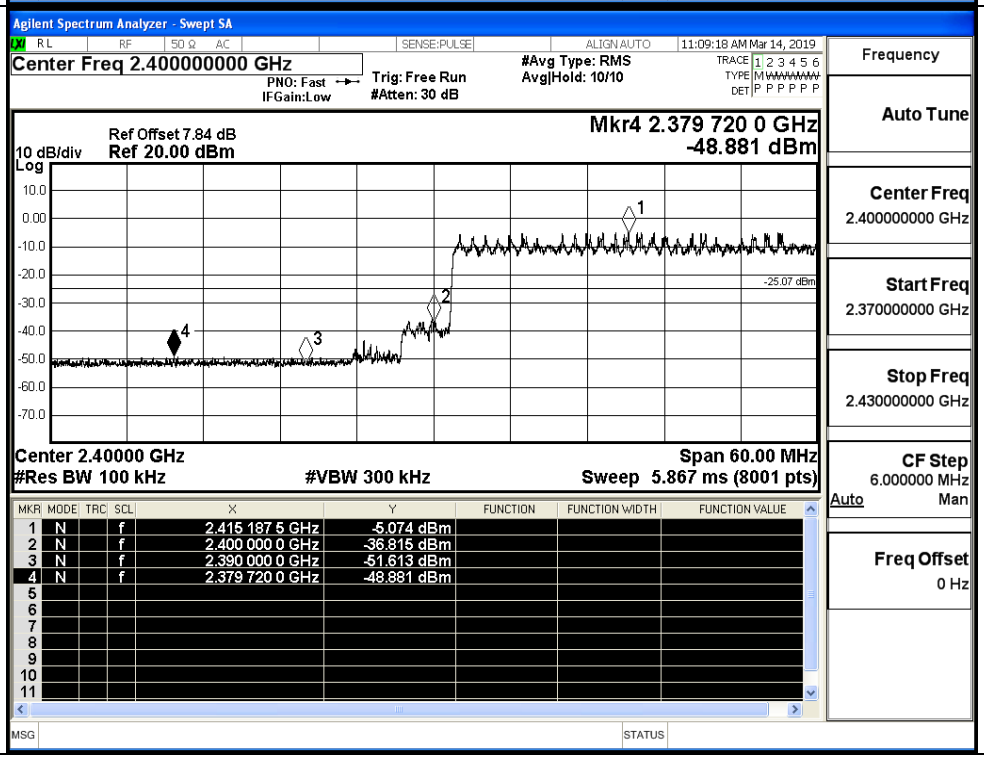
π/4DQPSK_HCH_Graphs		
Pref		
Puw		

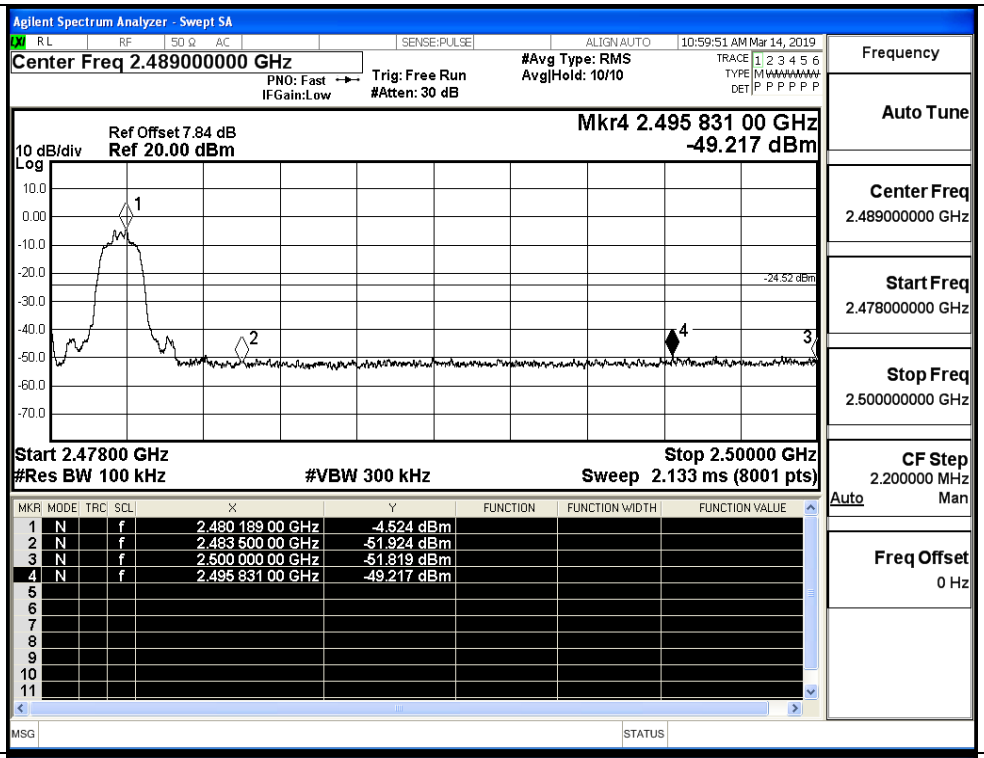
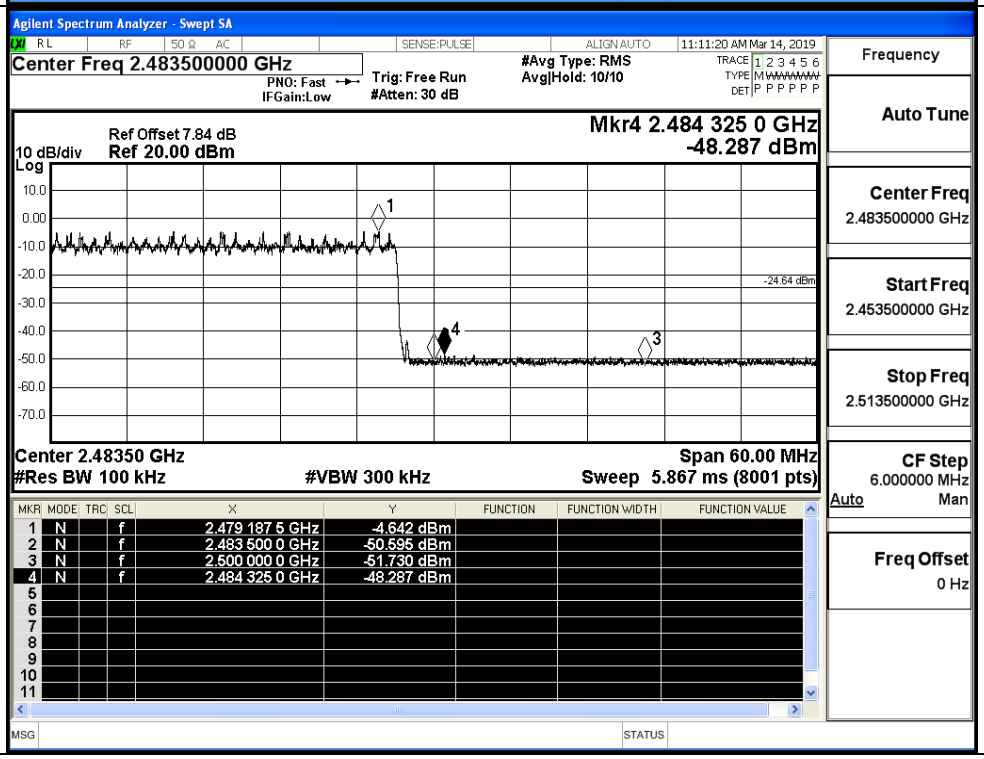
A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-5.244	Off	-49.009	-25.24	PASS
			-5.356	On	-49.216	-25.36	PASS
	HCH	2480	-4.635	Off	-47.593	-24.64	PASS
			-4.796	On	-48.789	-24.80	PASS
π/4DQPSK	LCH	2402	-5.478	Off	-48.557	-25.48	PASS
			-5.074	On	-48.881	-25.07	PASS
	HCH	2480	-4.524	Off	-49.217	-24.52	PASS
			-4.642	On	-48.287	-24.64	PASS

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

GFSK/HCH/No Hop	
GFSK/HCH/Hop	

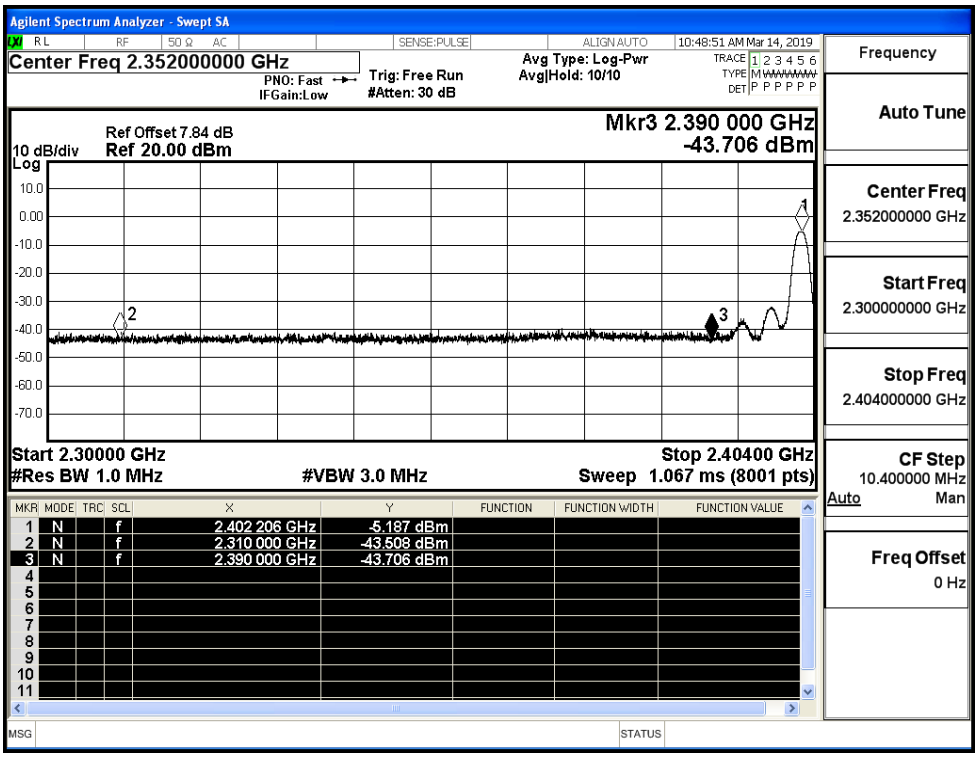
π/4DQPSK/LCH/No Hop	
π/4DQPSK/LCH/Hop	

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

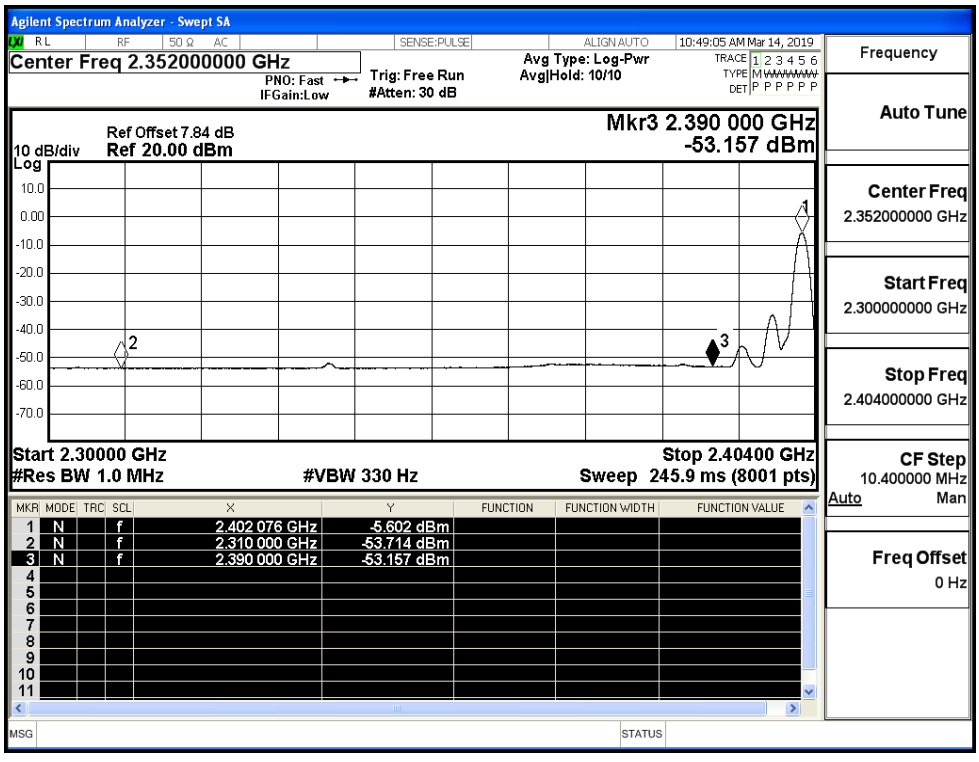
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.51	2.0	0	53.75	PEAK	74	PASS
	Off	2310.0	-53.71	2.0	0	43.54	AV	54	PASS
	Off	2390.0	-43.71	2.0	0	53.55	PEAK	74	PASS
	Off	2390.0	-53.16	2.0	0	44.10	AV	54	PASS
	Off	2483.5	-41.43	2.0	0	55.83	PEAK	74	PASS
	Off	2483.5	-52.44	2.0	0	44.82	AV	54	PASS
	Off	2500.0	-41.98	2.0	0	55.28	PEAK	74	PASS
	Off	2500.0	-51.95	2.0	0	45.31	AV	54	PASS
π/4DQPSK	Off	2310.0	-43.93	2.0	0	53.32	PEAK	74	PASS
	Off	2310.0	-53.80	2.0	0	43.45	AV	54	PASS
	Off	2390.0	-43.22	2.0	0	54.04	PEAK	74	PASS
	Off	2390.0	-53.40	2.0	0	43.86	AV	54	PASS
	Off	2483.5	-42.70	2.0	0	54.56	PEAK	74	PASS
	Off	2483.5	-52.74	2.0	0	44.52	AV	54	PASS
	Off	2500.0	-42.59	2.0	0	54.67	PEAK	74	PASS
	Off	2500.0	-52.02	2.0	0	45.23	AV	54	PASS

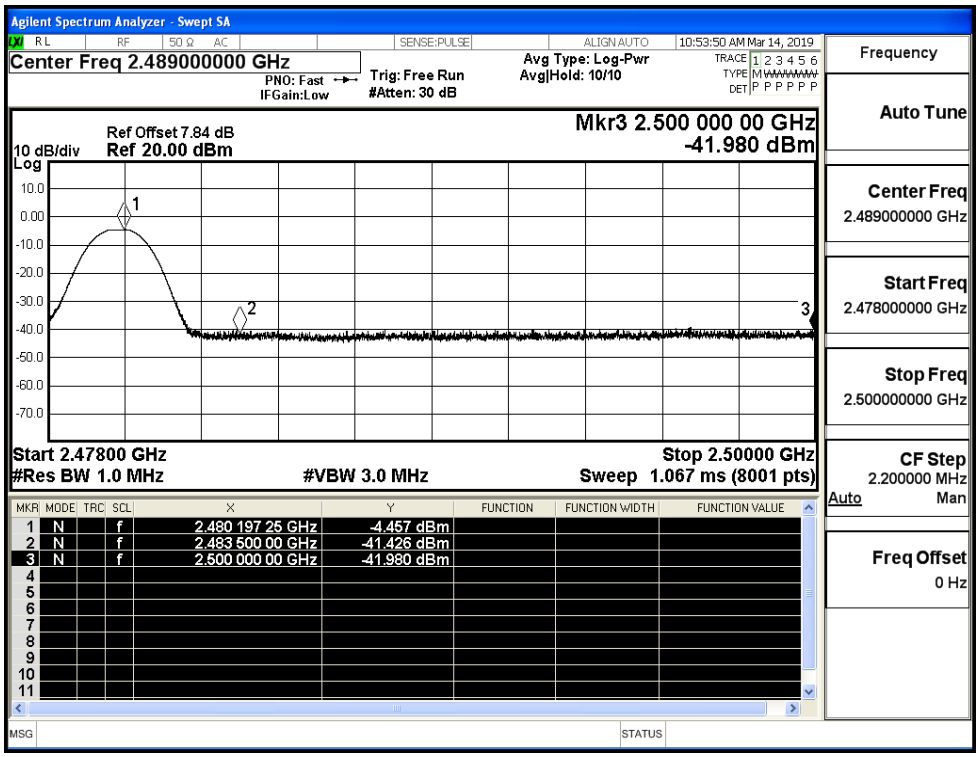
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



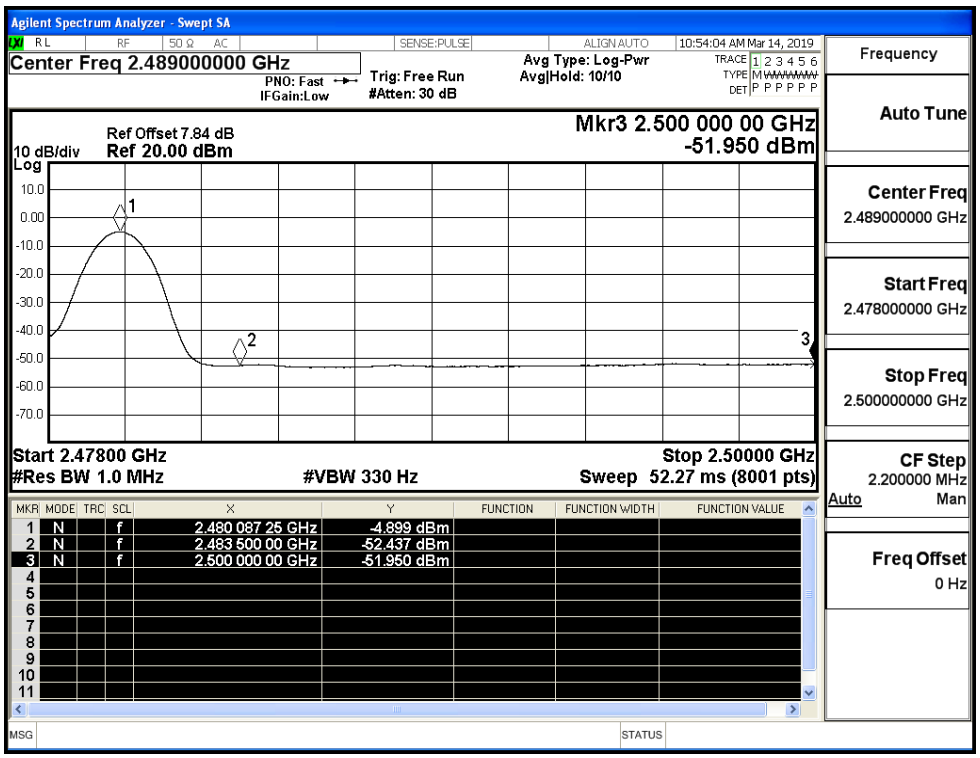
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



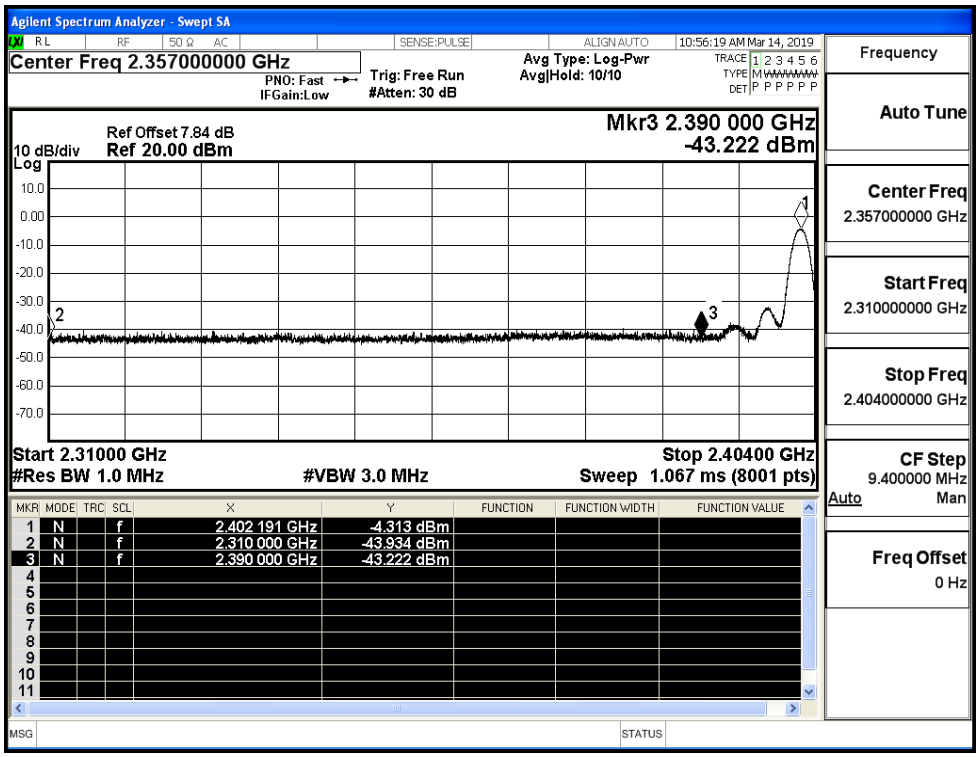
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



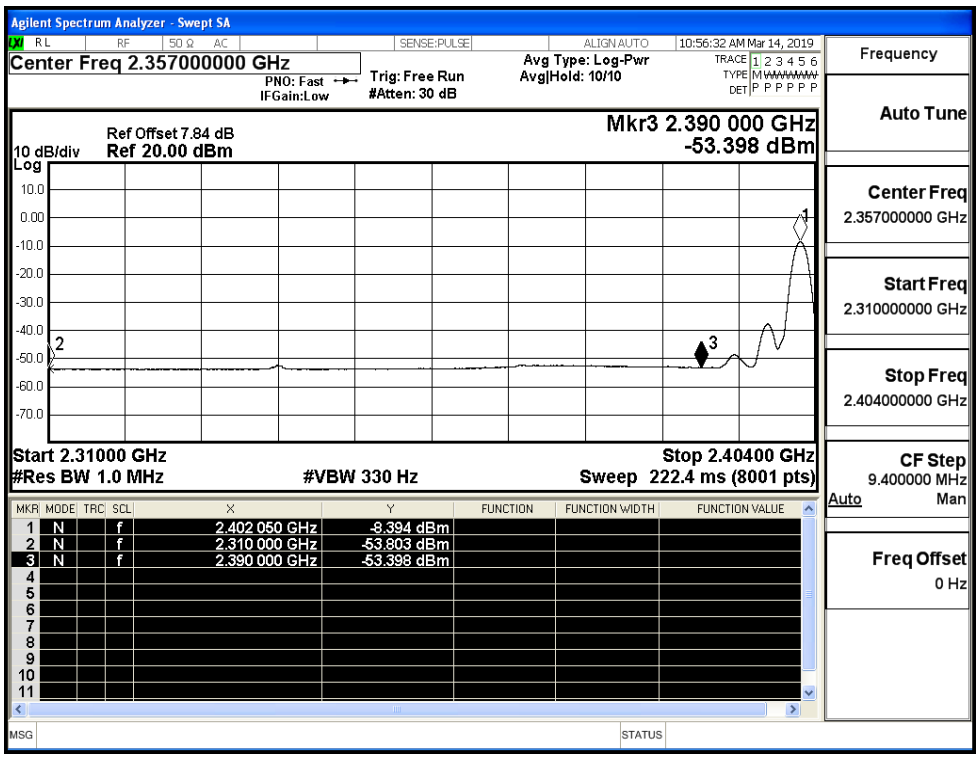
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



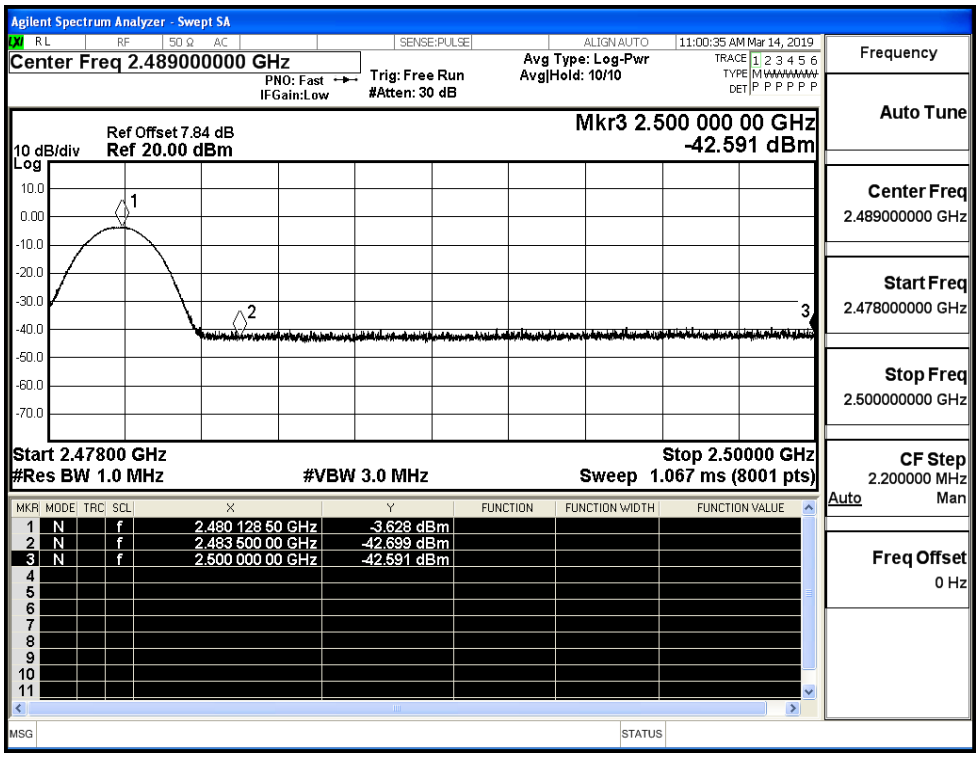
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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)