Appendix A

RF Test Data for BT V5.0 (BDR/EDR) (Conducted Measurement)

Product Name: BLUETOOTH SPEAKER

Trade Mark: N/A

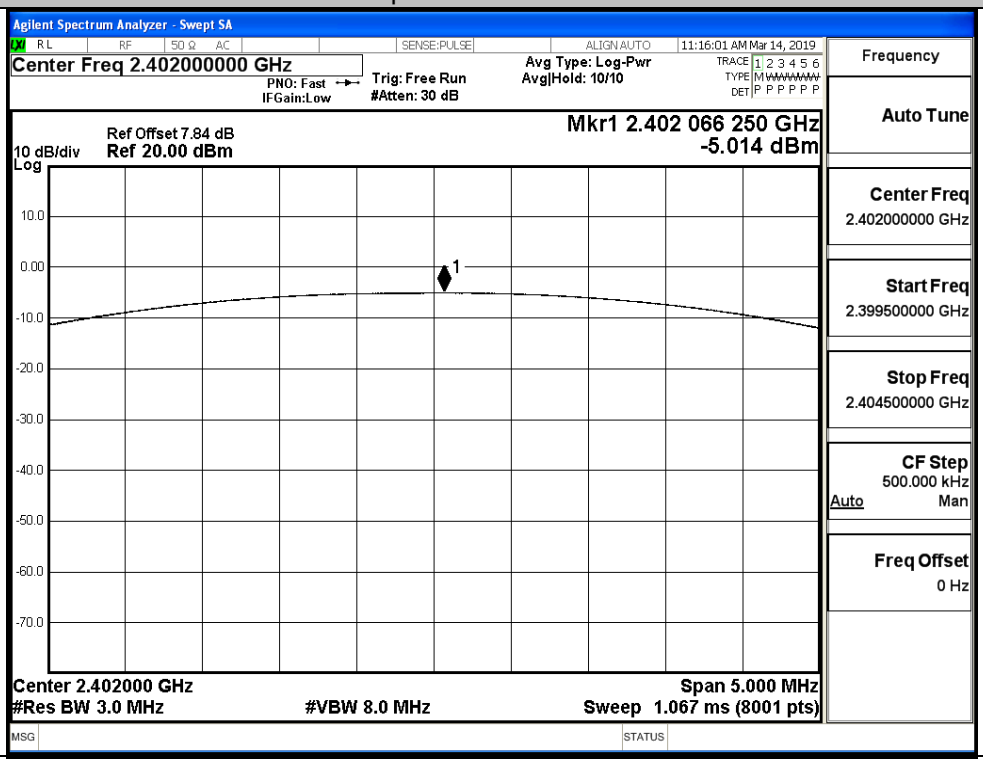
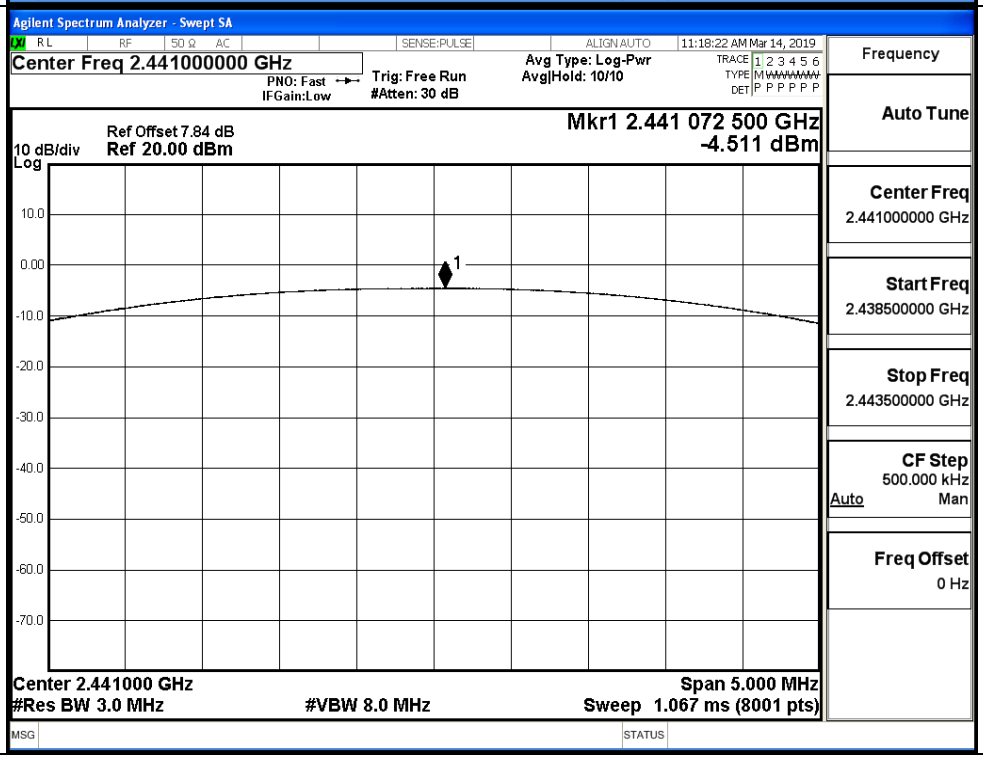
Test Model: M-1145

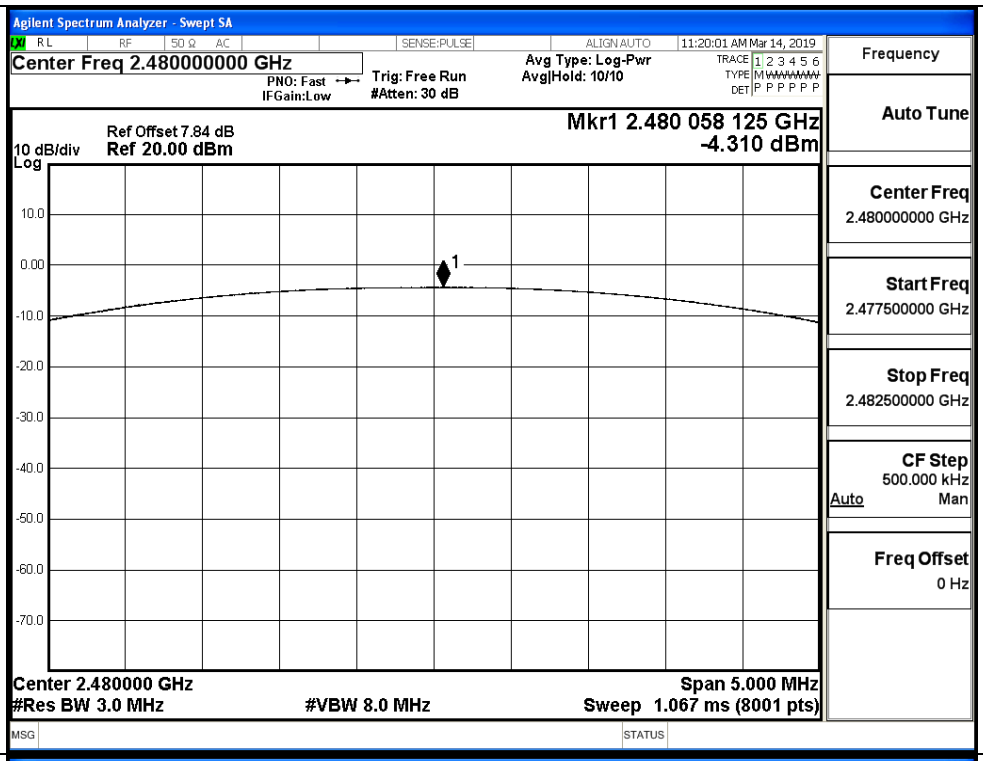
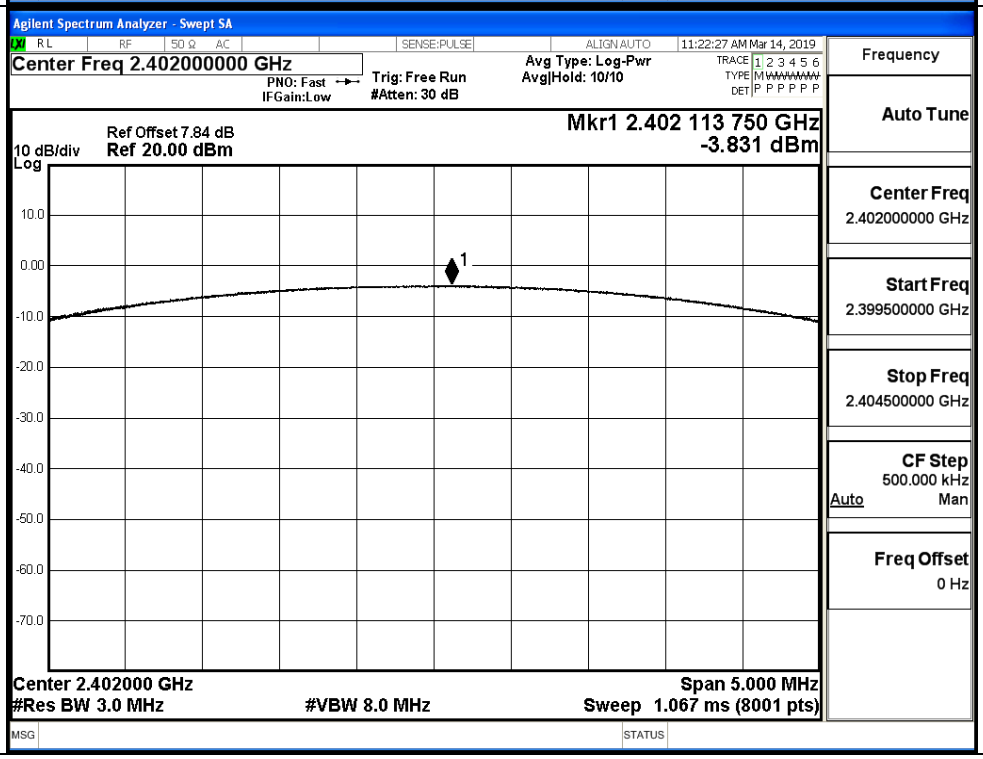
Environmental Conditions

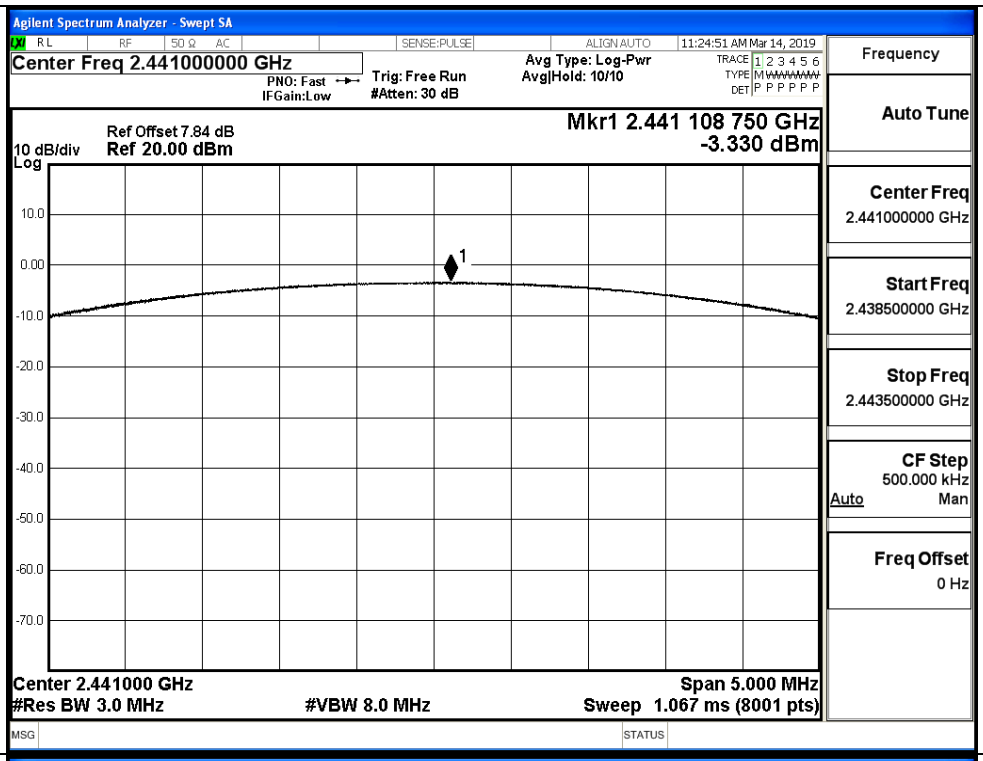
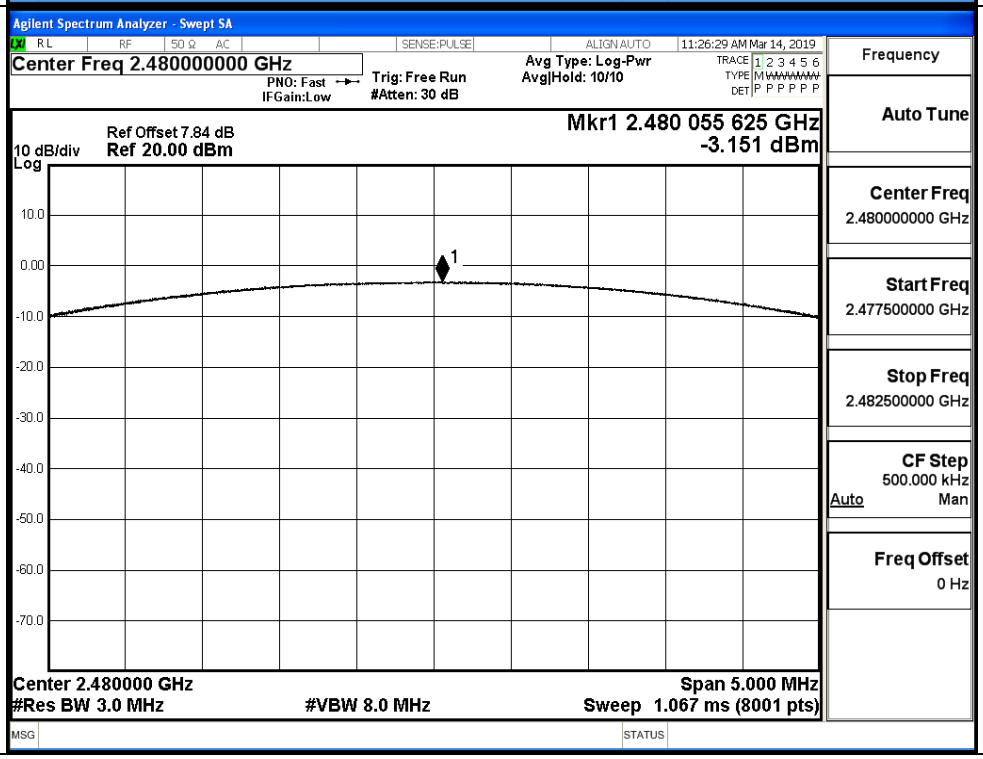
Temperature:	24.5 ° C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-5.014	21	PASS
	MCH	-4.511	21	PASS
	HCH	-4.310	21	PASS
π/4DQPSK	LCH	-3.831	21	PASS
	MCH	-3.330	21	PASS
	HCH	-3.151	21	PASS

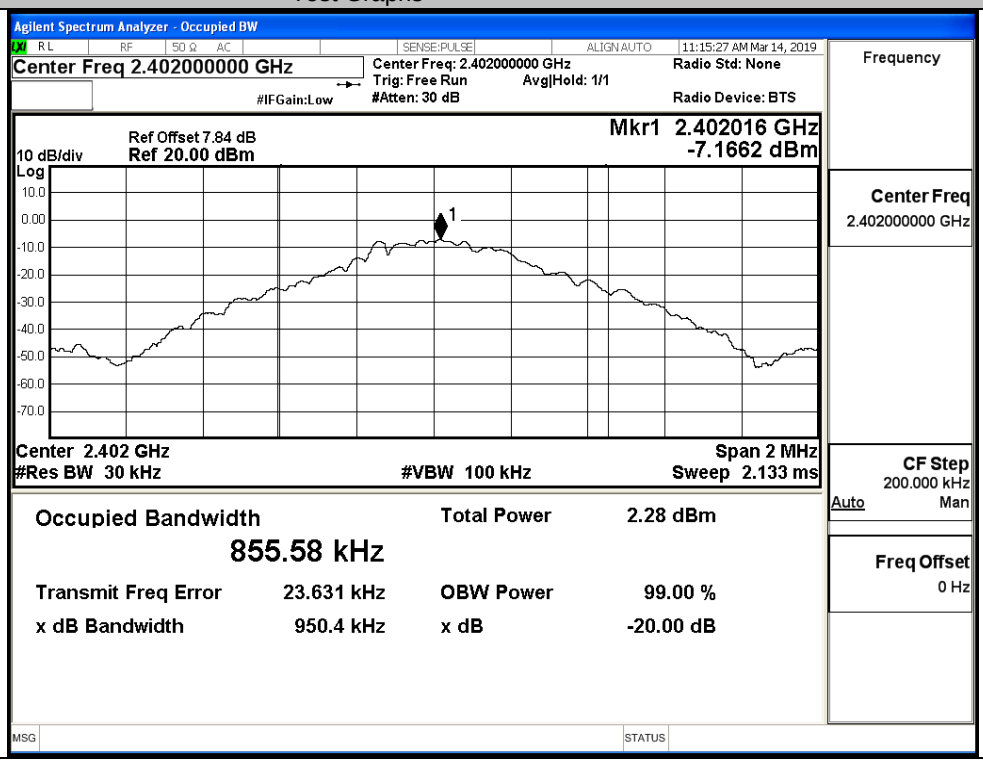
Test Graphs		
GFSK/LCH		
GFSK/MCH		

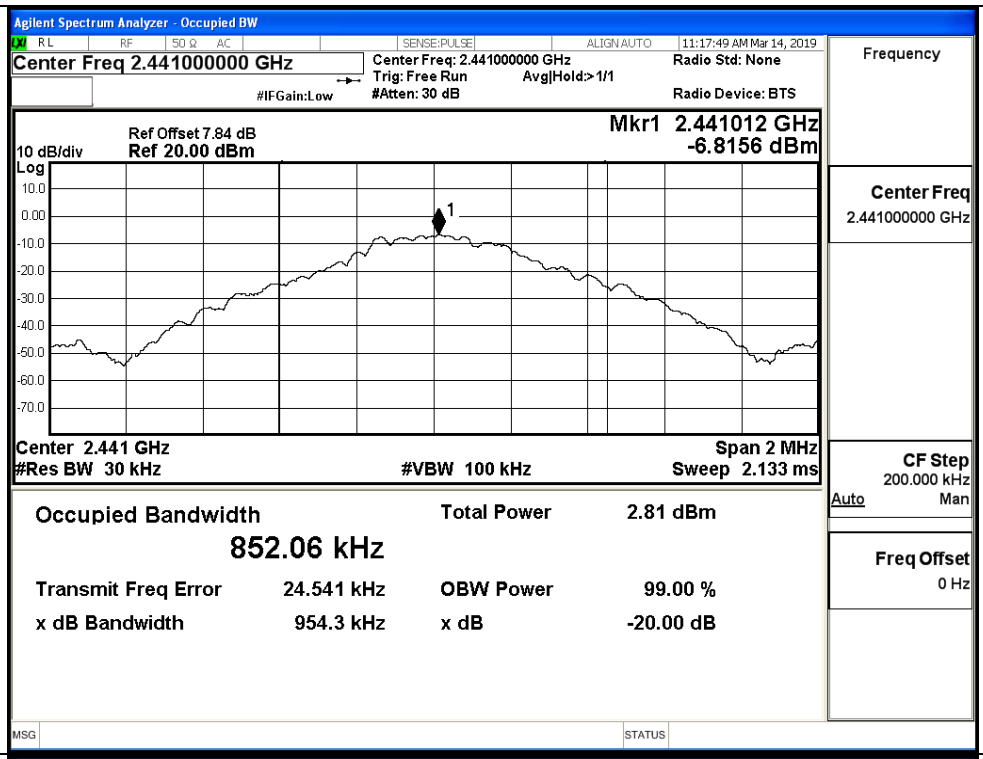
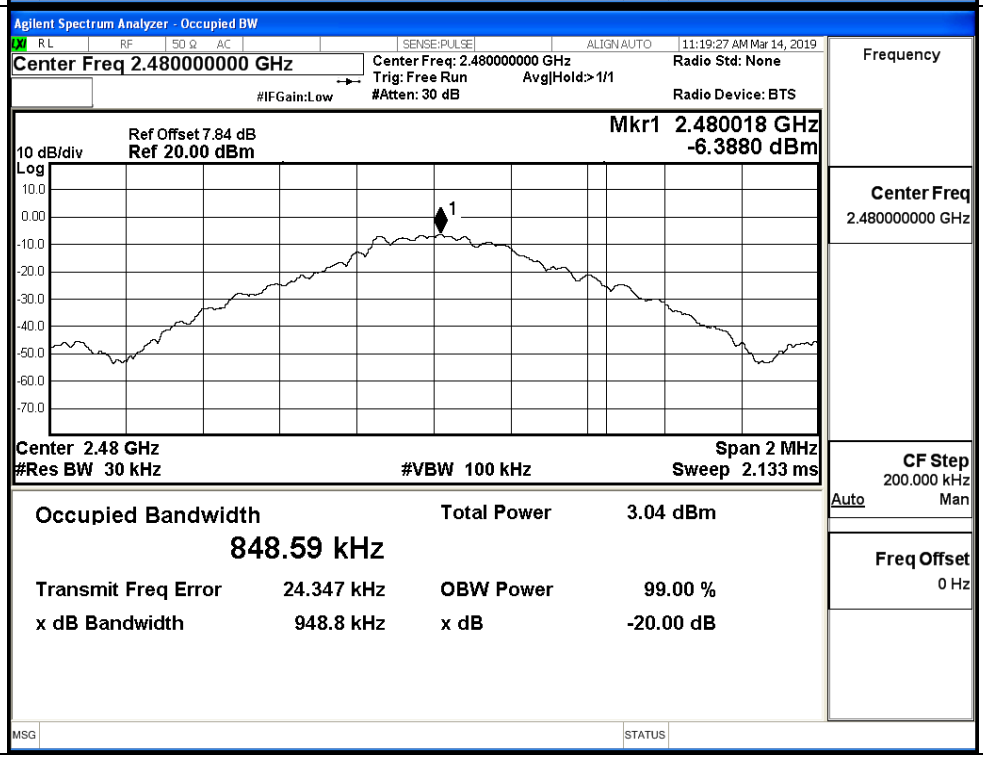
GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

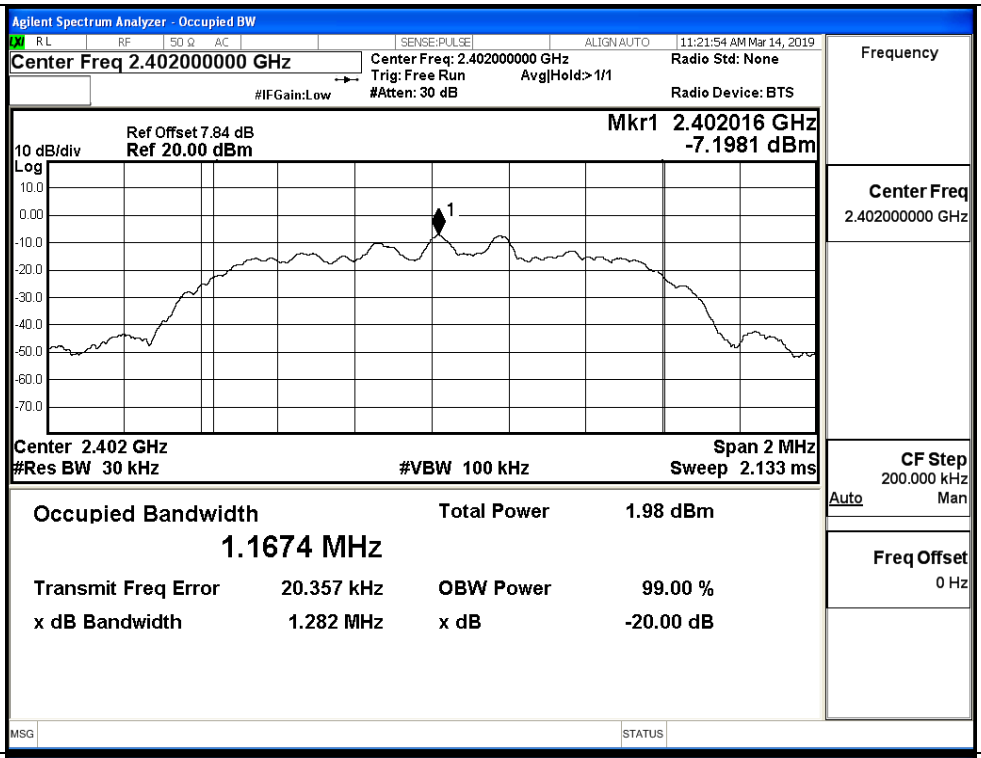
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.85558	0.9504	Not Specified	PASS
	MCH	0.85206	0.9543	Not Specified	PASS
	HCH	0.84859	0.9488	Not Specified	PASS
π/4DQPSK	LCH	1.1674	1.282	Not Specified	PASS
	MCH	1.1671	1.280	Not Specified	PASS
	HCH	1.1683	1.283	Not Specified	PASS

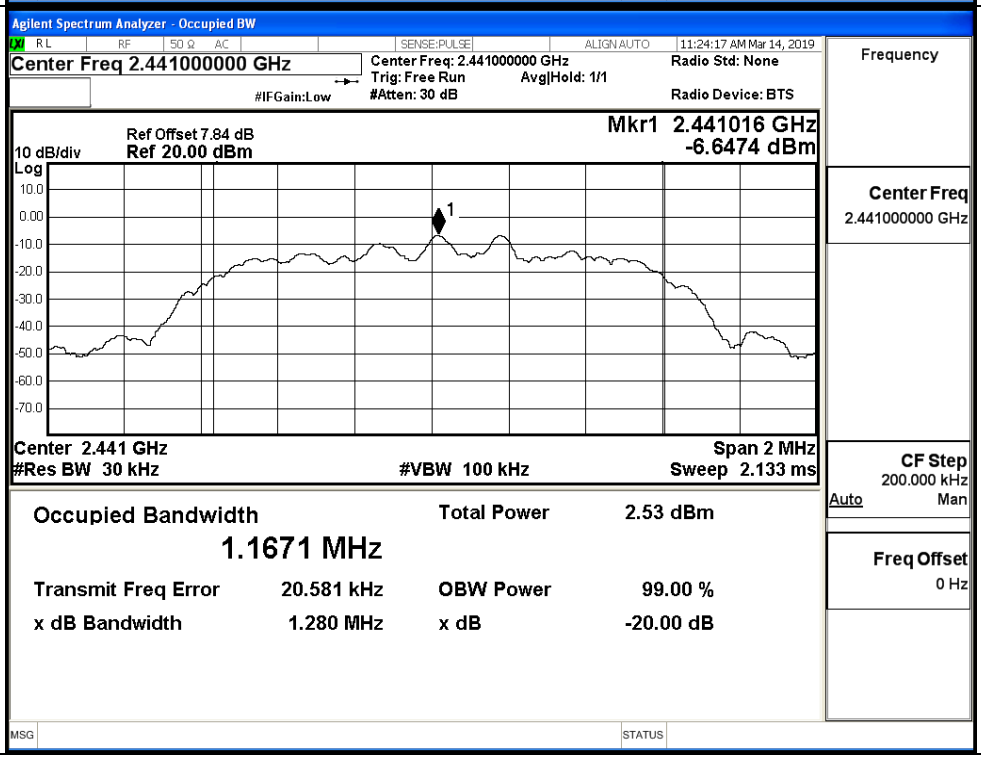
Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

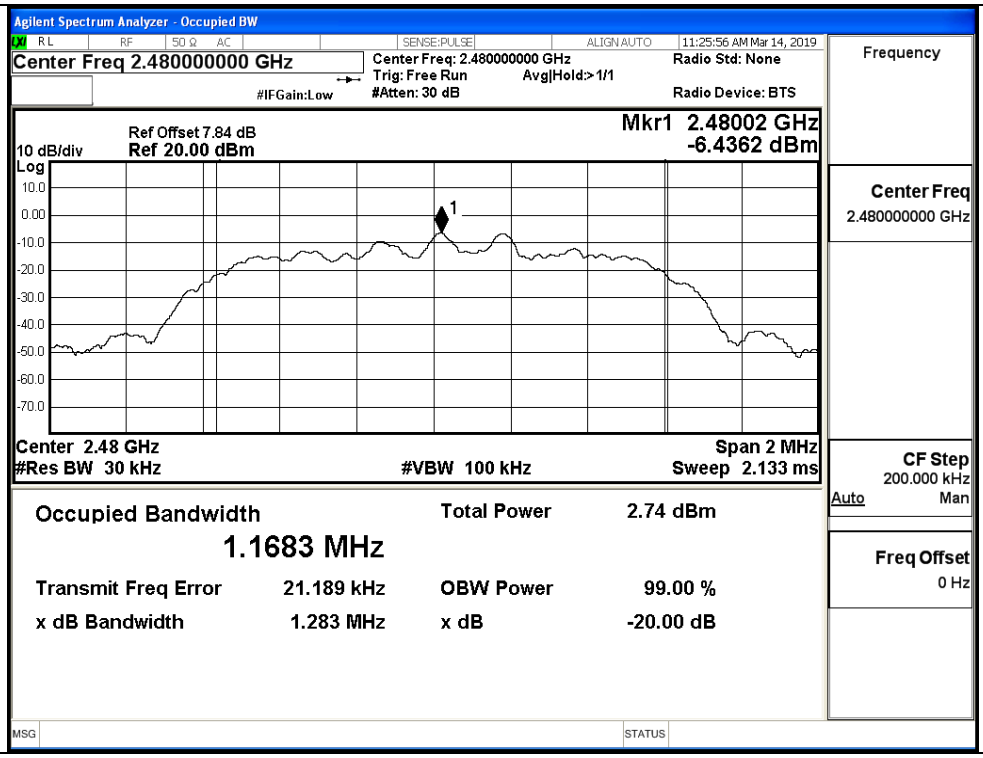
π/4DQPSK/LCH



π/4DQPSK/MCH

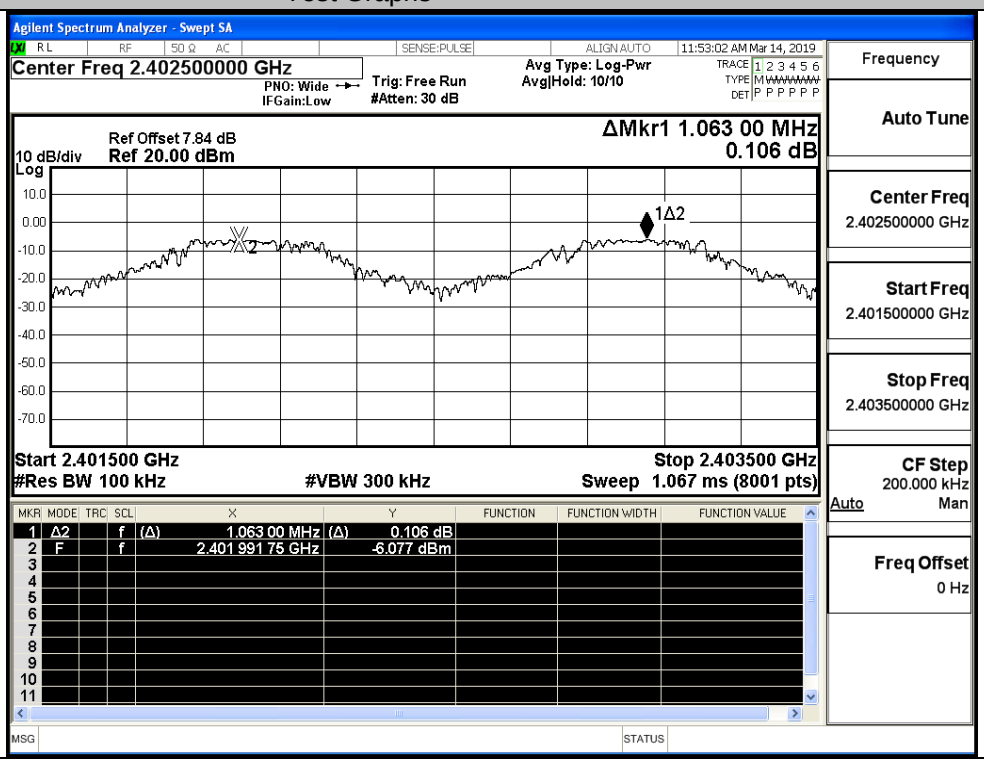


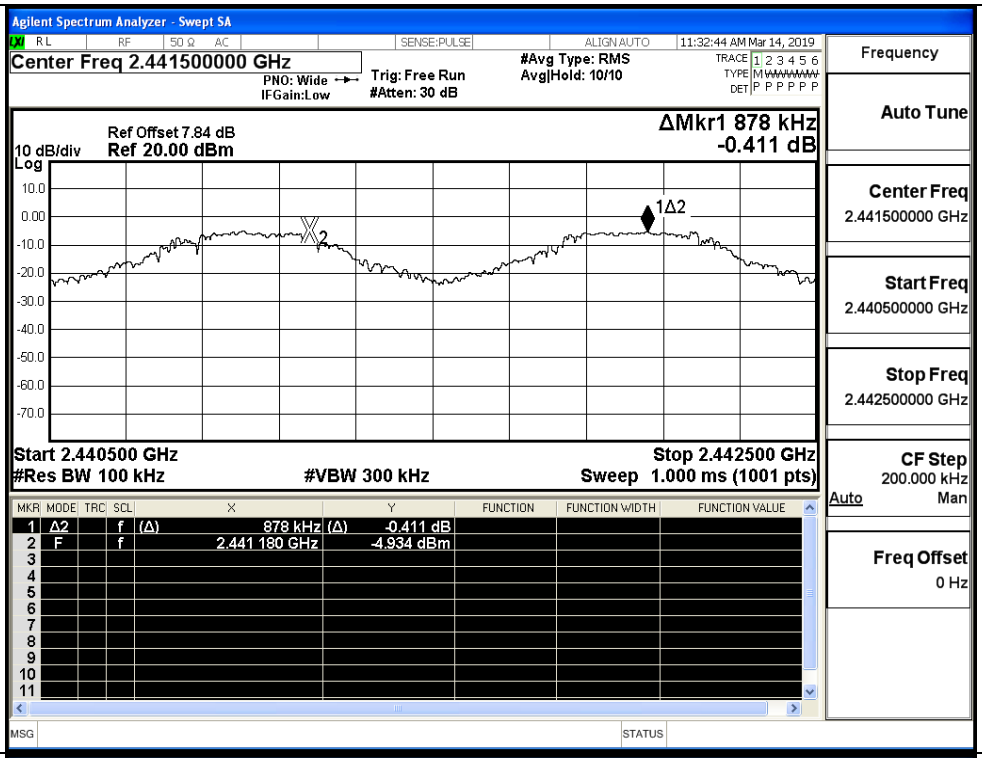
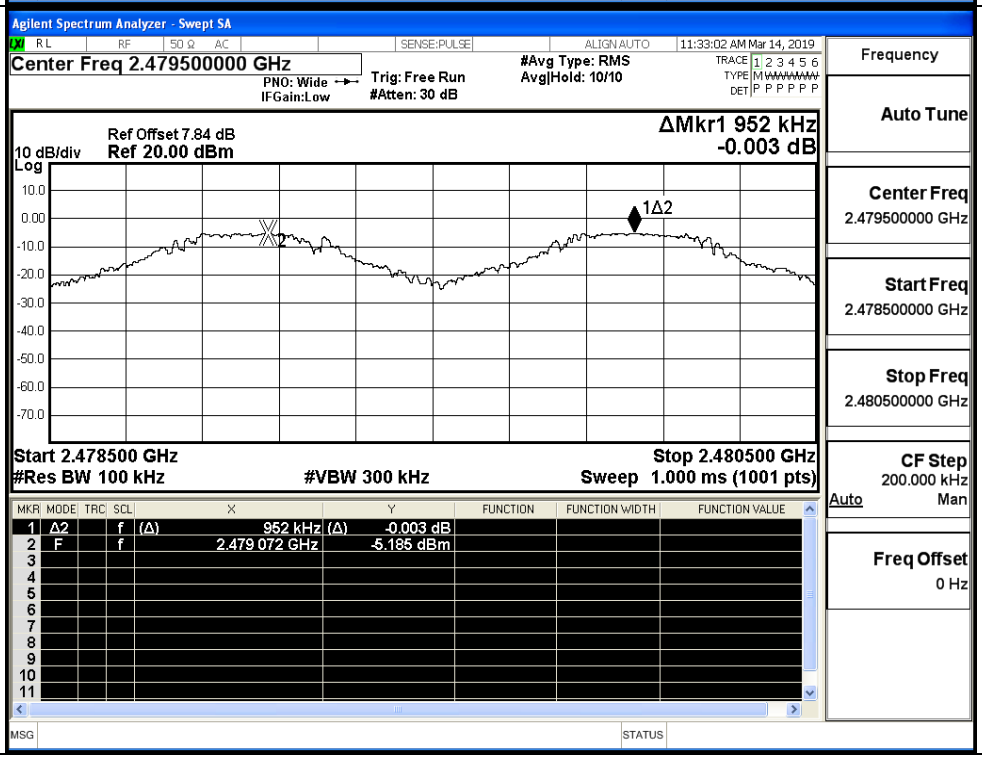
π/4DQPSK/HCH


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
#IFGain:Low
Radio Std: None
Radio Device: BTS
11:25:56 AM Mar 14, 2019
Frequency
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
Mkr1 2.48002 GHz
-6.4362 dBm
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2 MHz
Sweep 2.133 ms
CF Step
200.000 kHz
Auto
Man
Occupied Bandwidth
1.1683 MHz
Total Power 2.74 dBm
Transmit Freq Error 21.189 kHz
OBW Power 99.00 %
x dB Bandwidth 1.283 MHz
x dB -20.00 dB
Freq Offset
0 Hz
MSG
STATUS

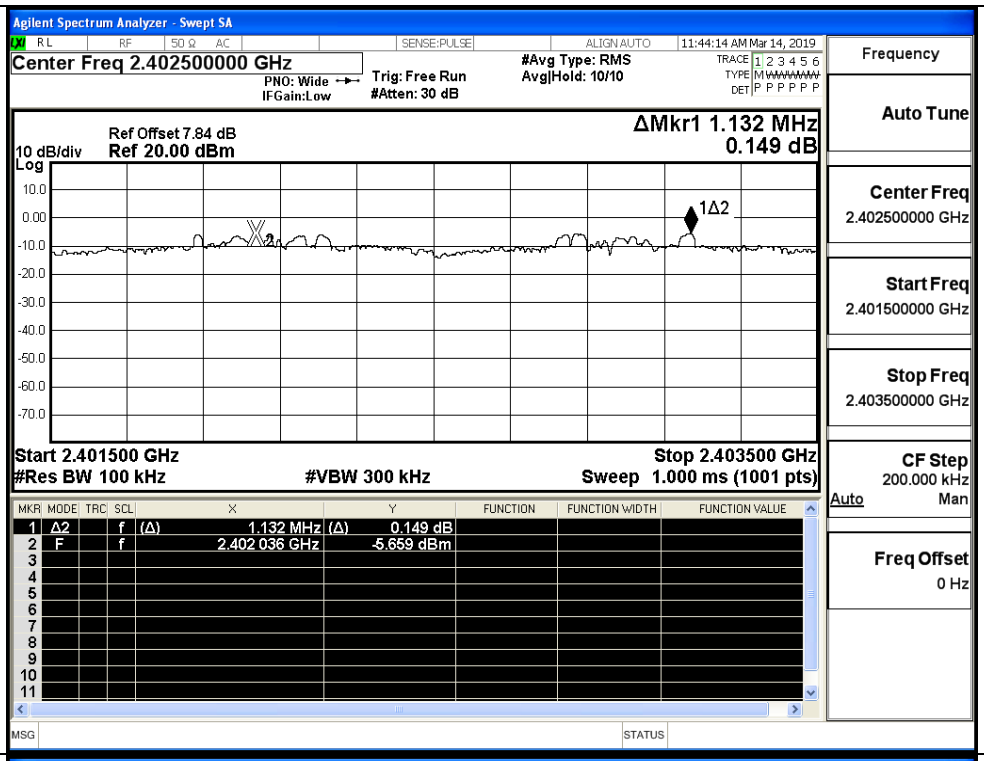
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.063	0.636	PASS
	MCH	0.878	0.636	PASS
	HCH	0.952	0.636	PASS
π/4DQPSK	LCH	1.132	0.855	PASS
	MCH	0.872	0.855	PASS
	HCH	0.982	0.855	PASS

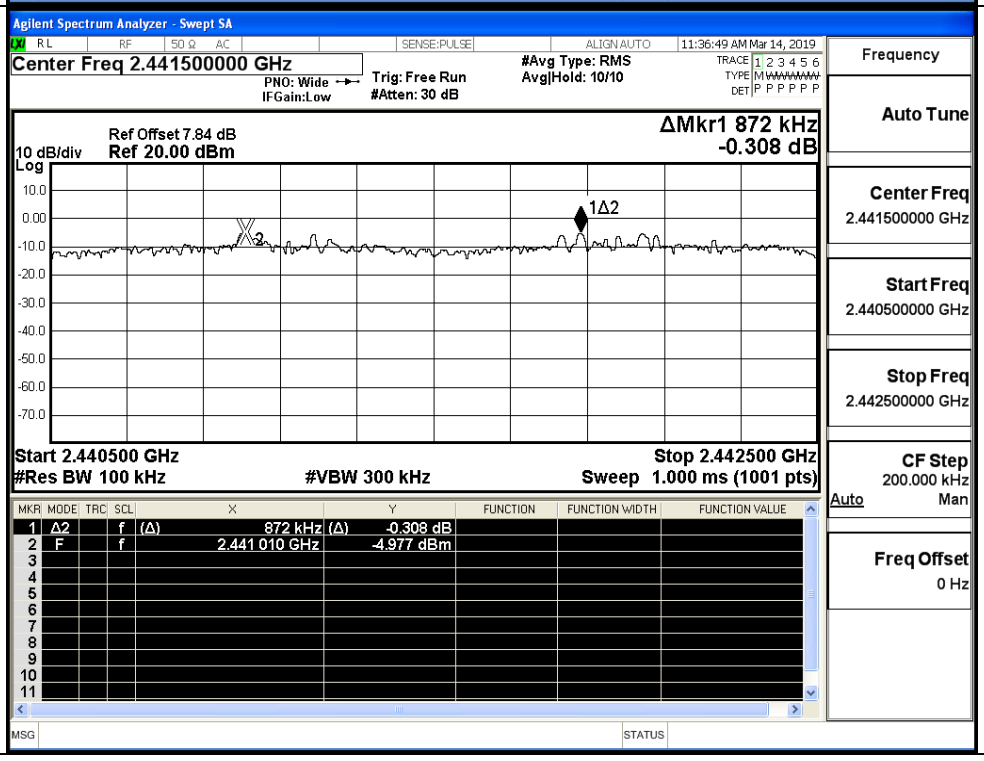
Test Graphs		
GFSK/LCH		

GFSK/MCH		
GFSK/HCH		

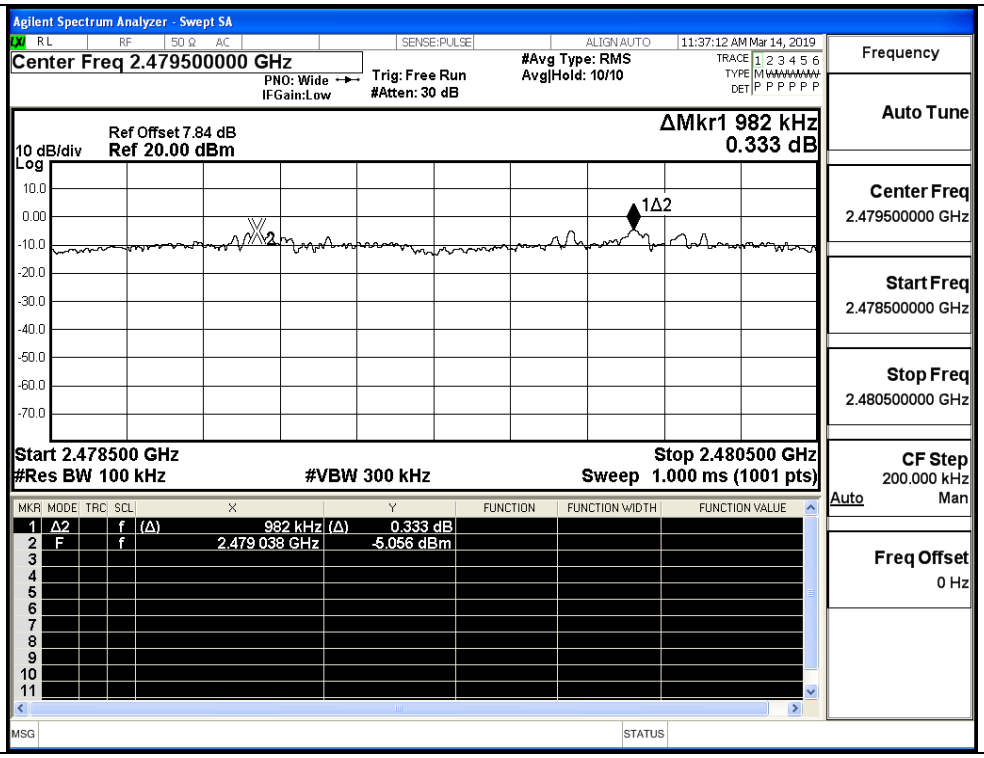
π/4DQPSK/LCH



π/4DQPSK/MCH

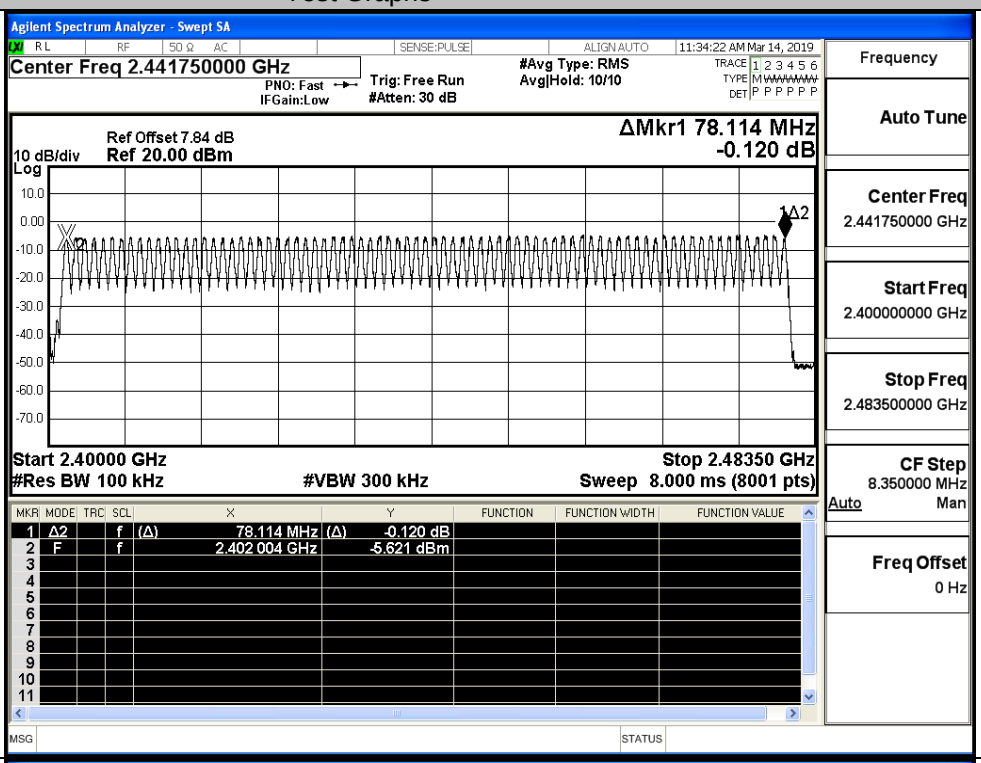
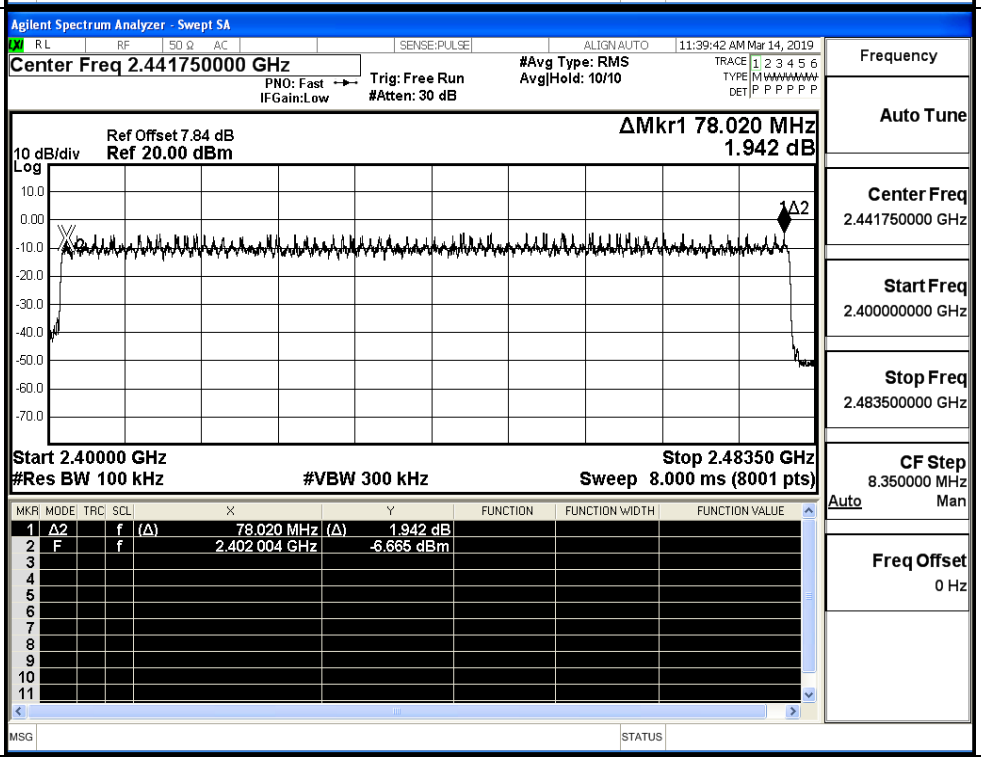


π/4DQPSK/HCH


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
11:37:12 AM Mar 14, 2019
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 982 kHz
0.333 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) 982 kHz (Δ) 0.333 dB
2 F f 2.479 038 GHz -5.056 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

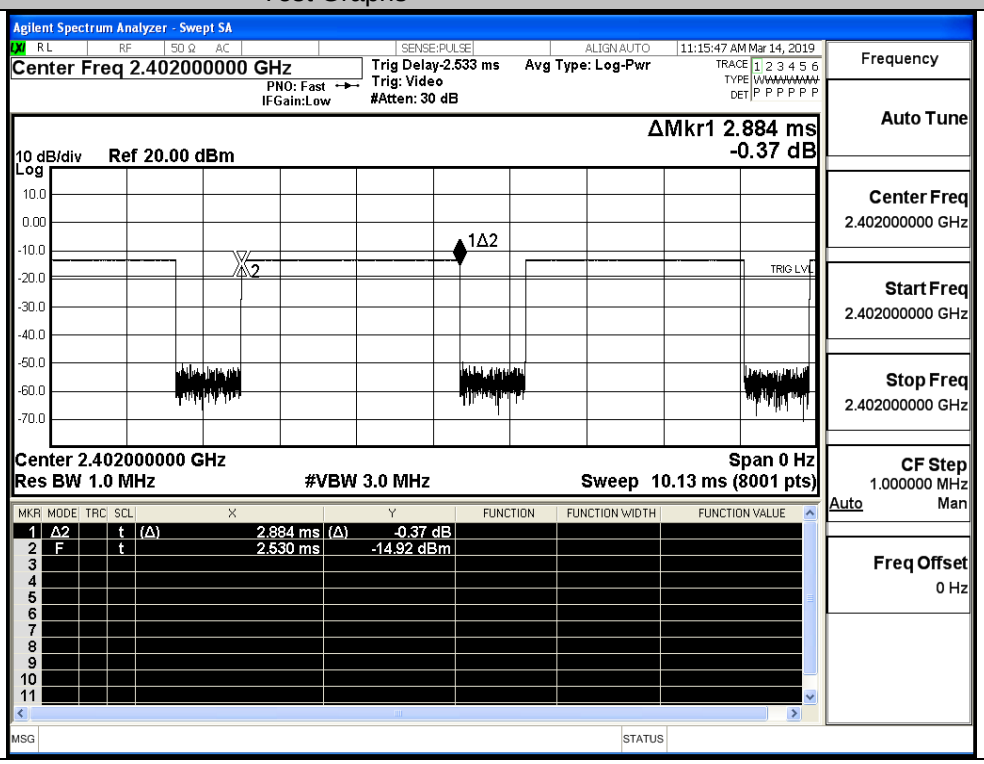
A.4 Hopping Channel Number

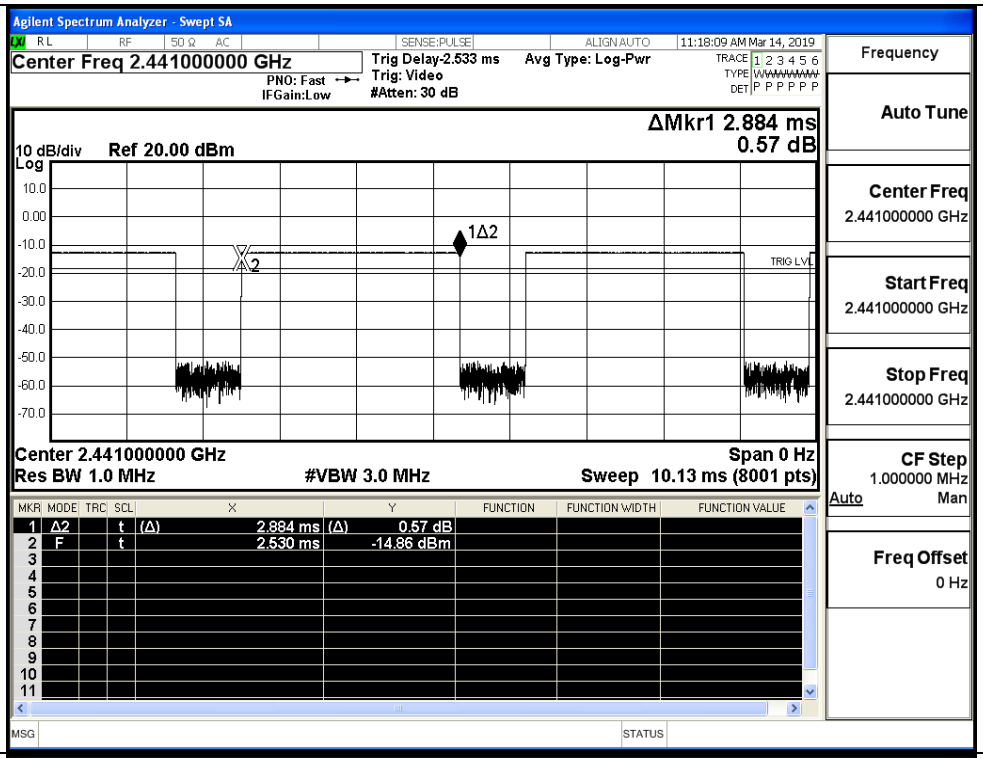
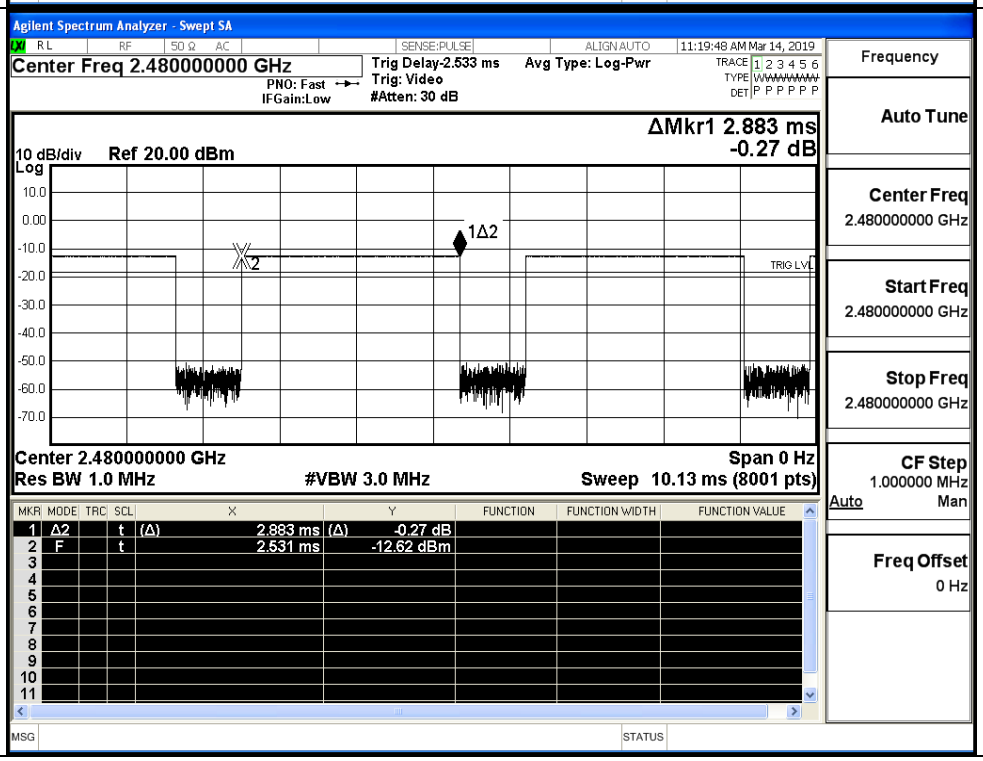
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS

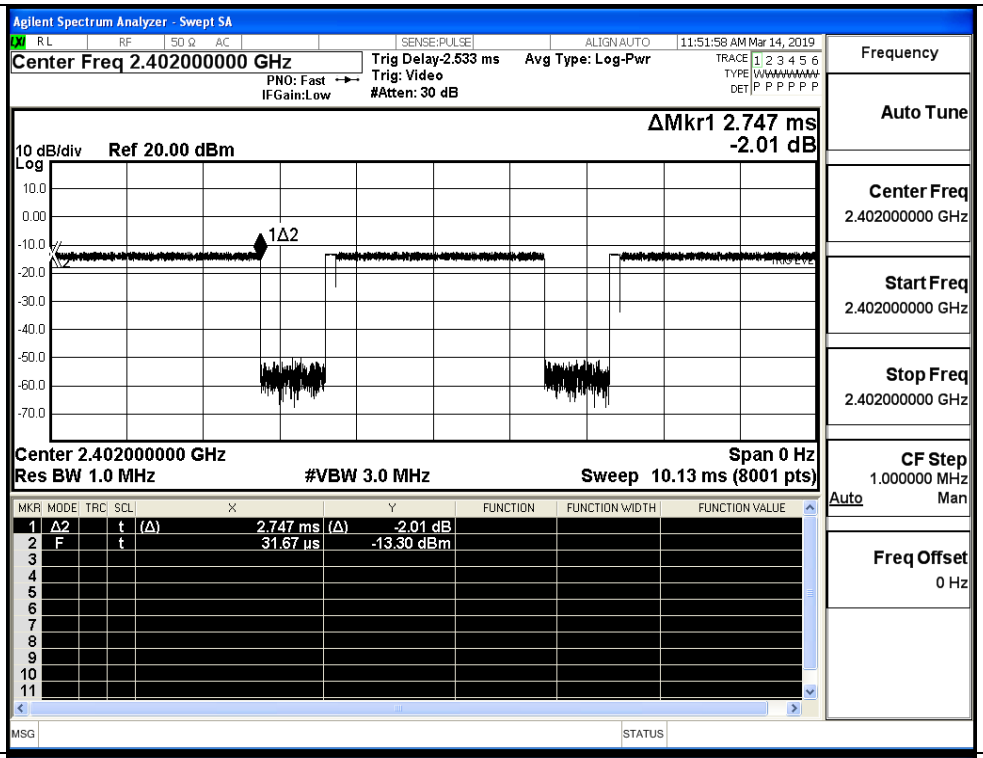
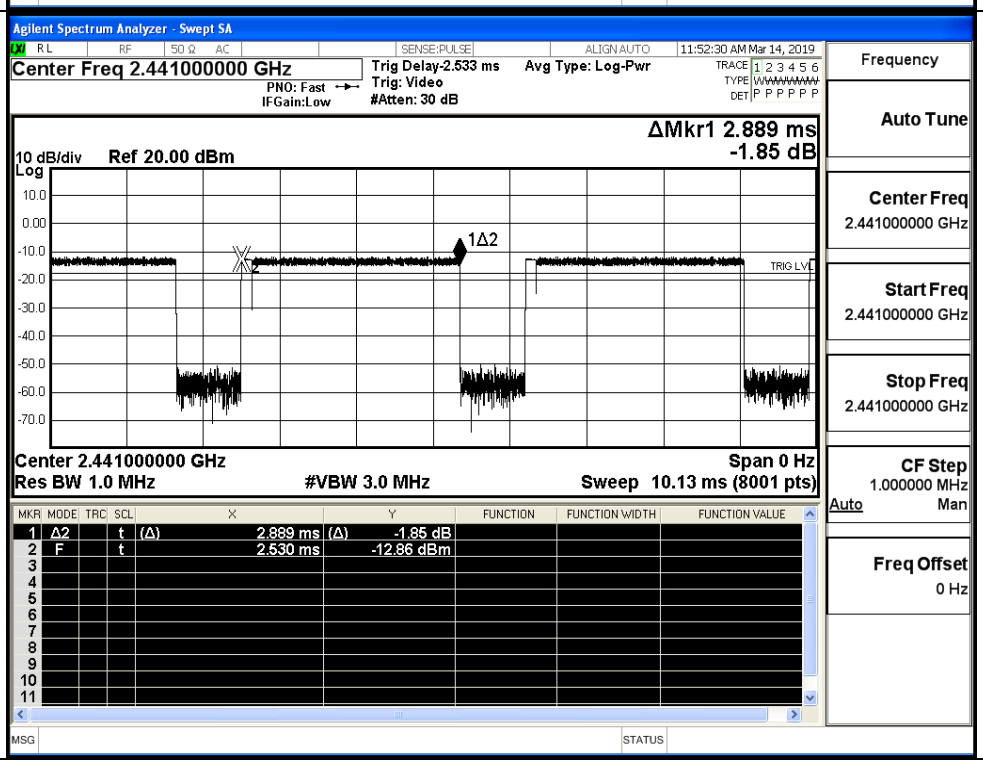
Test Graphs		
GFSK/Hop		
π/4DQPSK/Hop		

A.5 Dwell Time

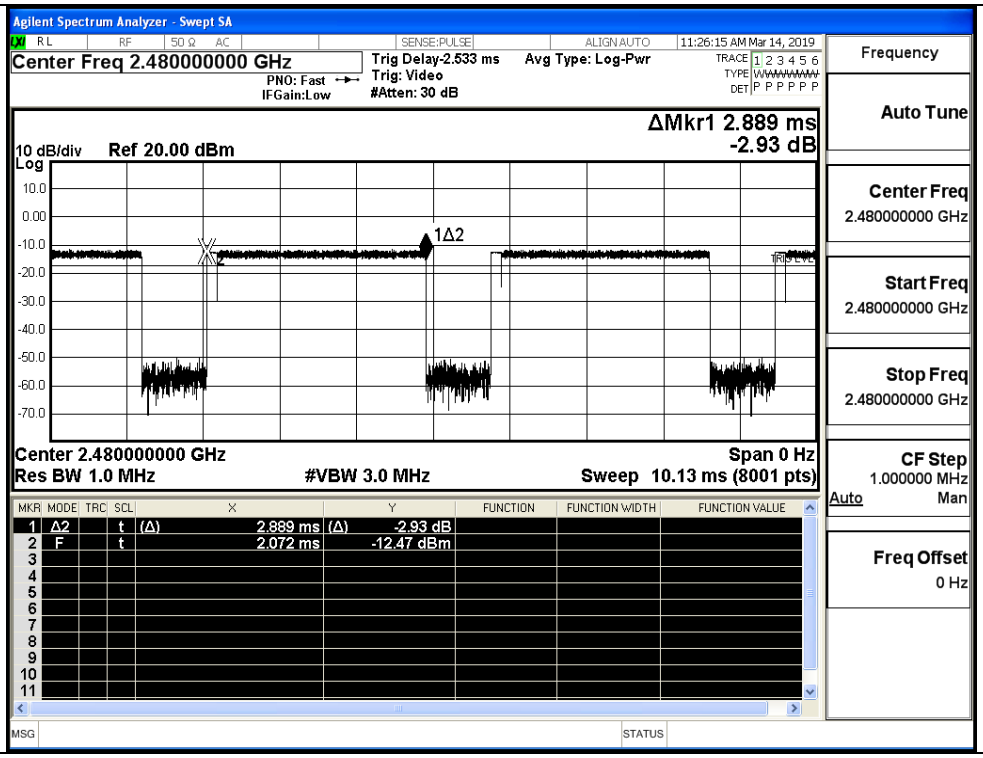
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.74	106.7	0.293	0.4	PASS
	2DH5	MCH	2.89	106.7	0.308	0.4	PASS
	2DH5	HCH	2.89	106.7	0.308	0.4	PASS

Test Graphs	
GFSK_DH5/LCH	

GFSK_DH5/MCH	
GFSK_DH5/HCH	

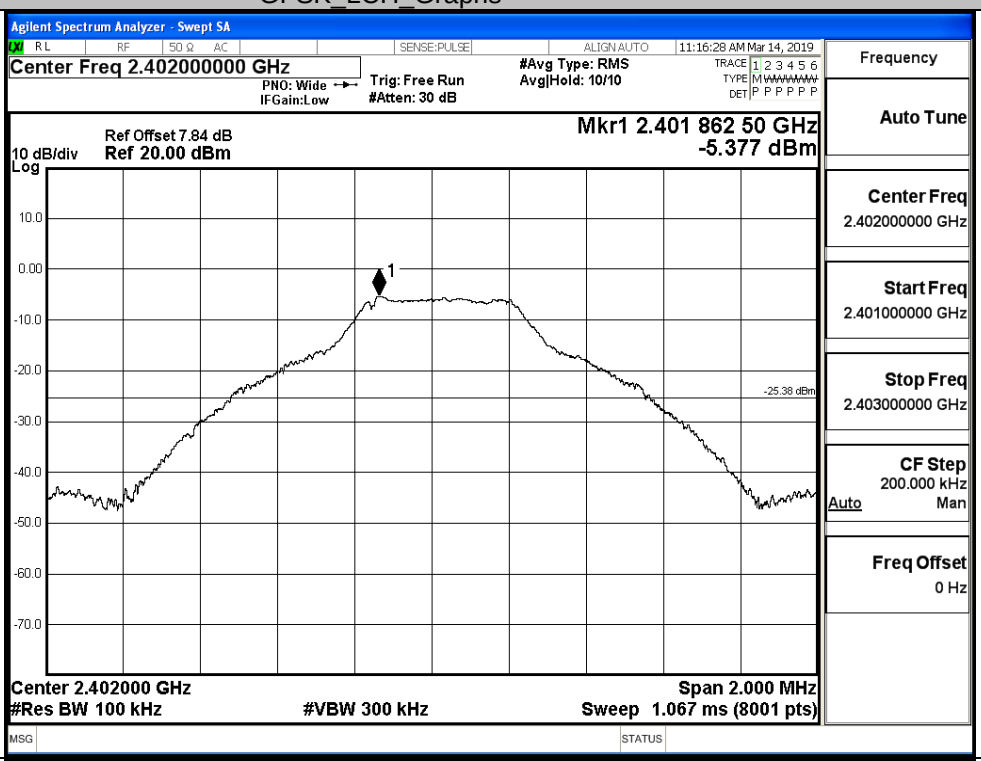
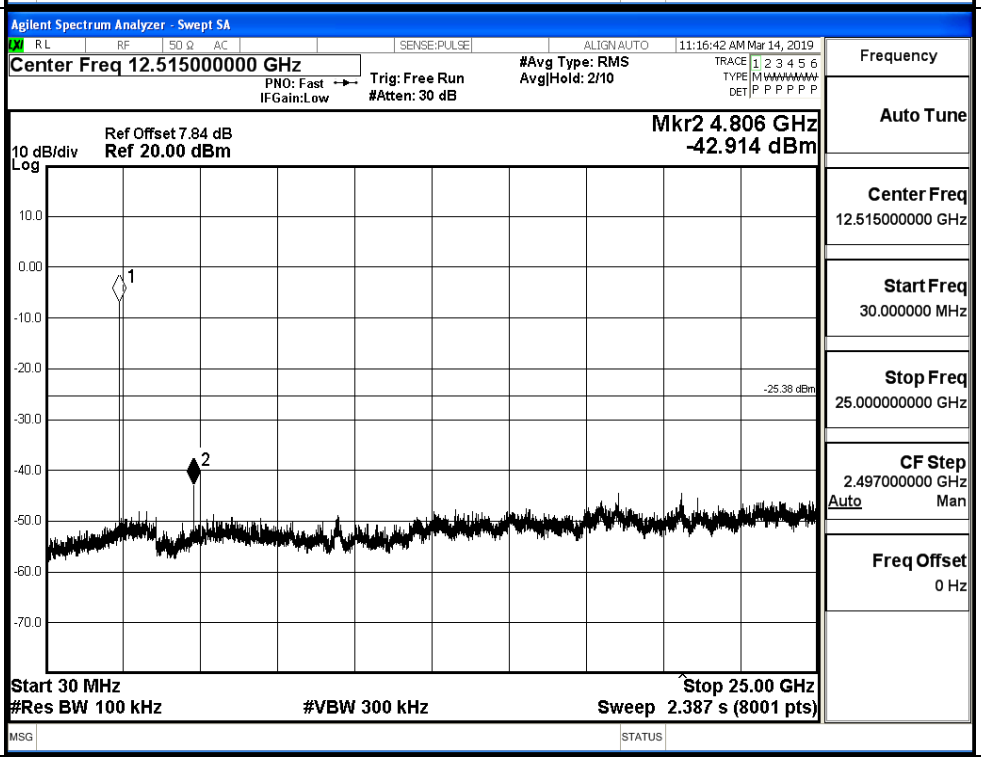
π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

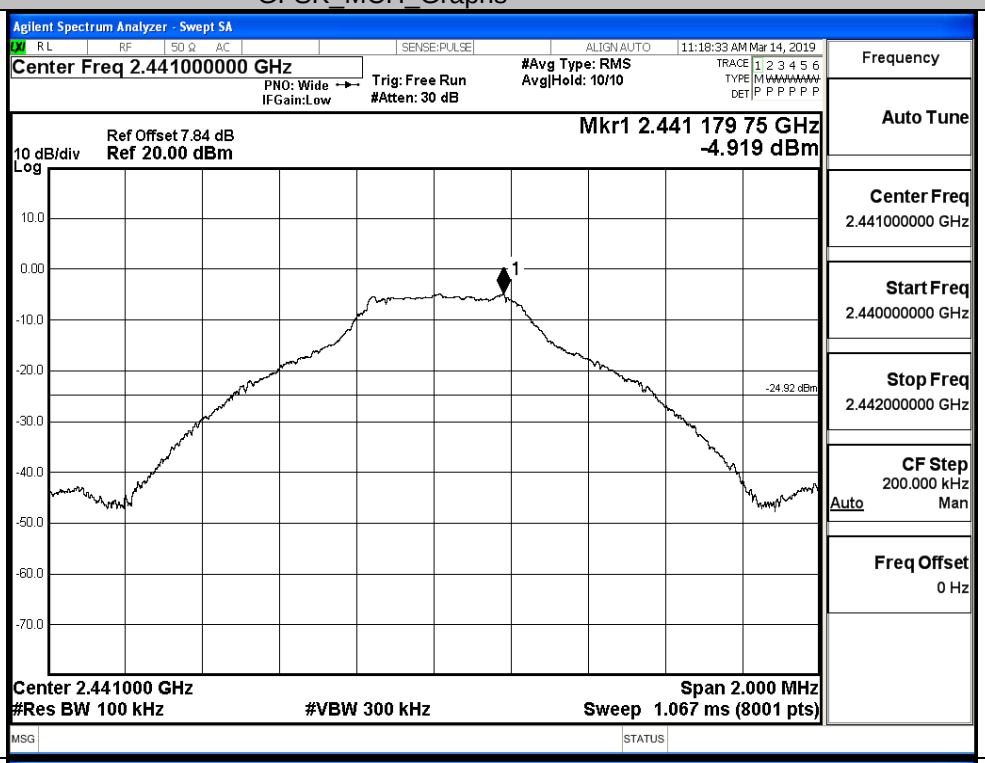
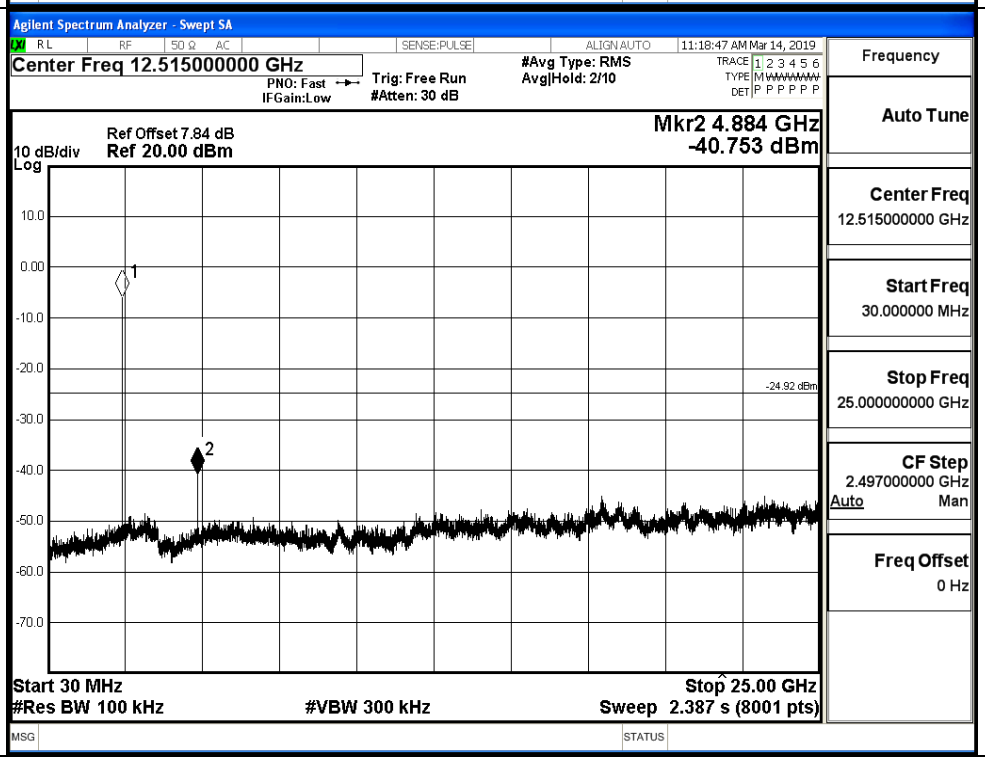
π/4DQPSK
_2DH5/HCH

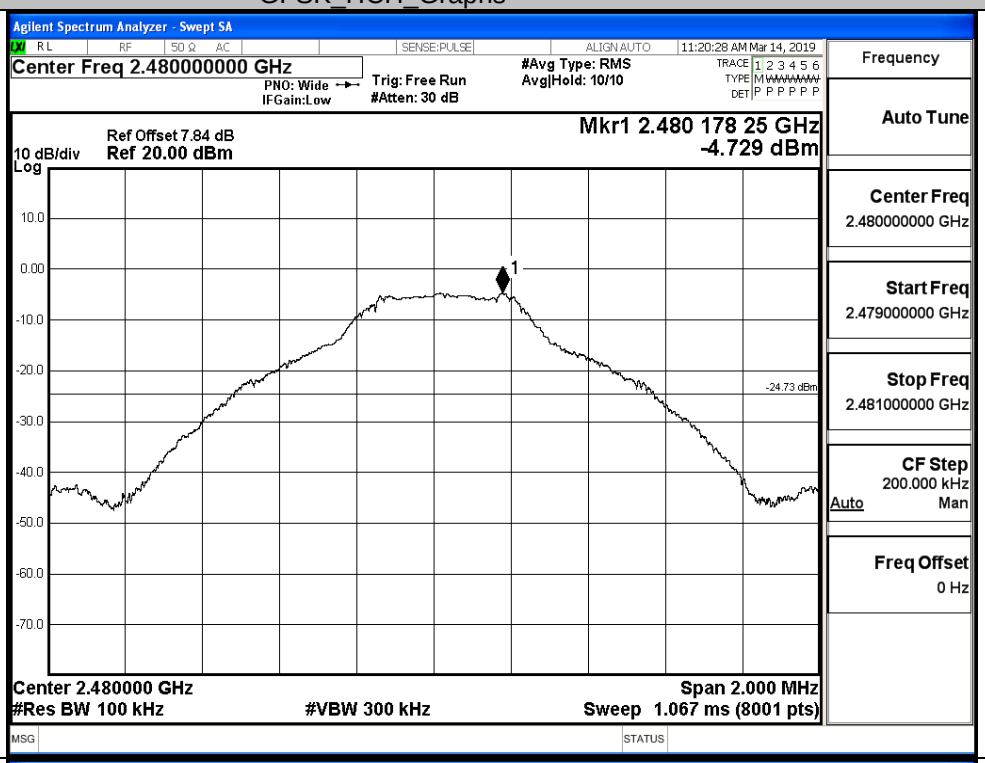
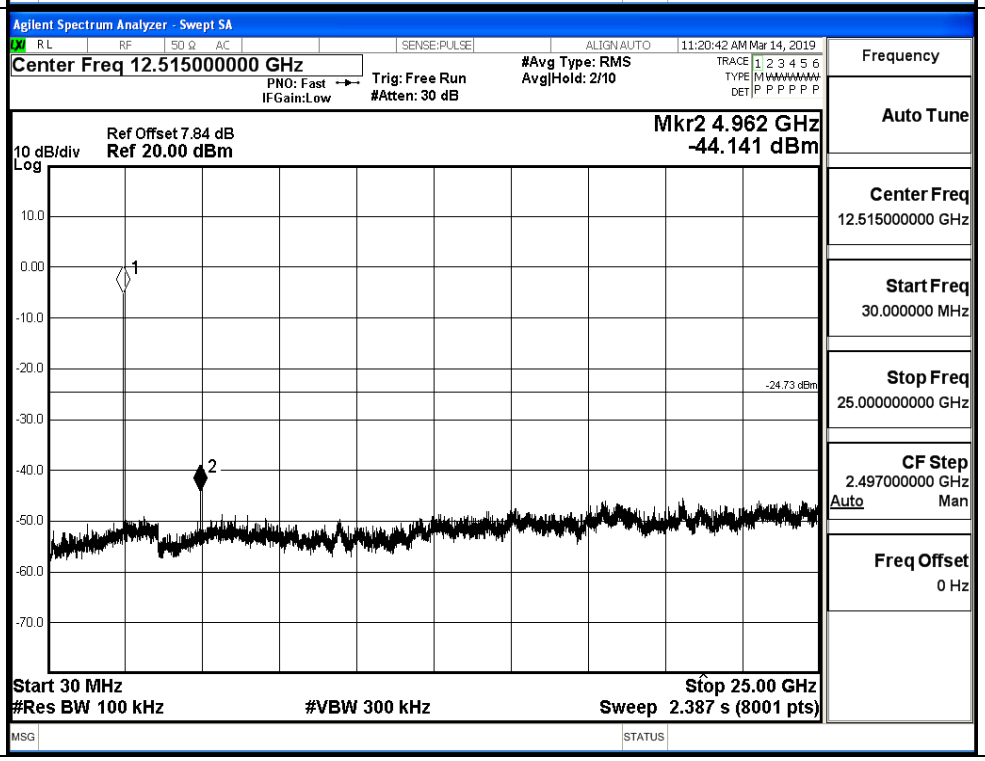


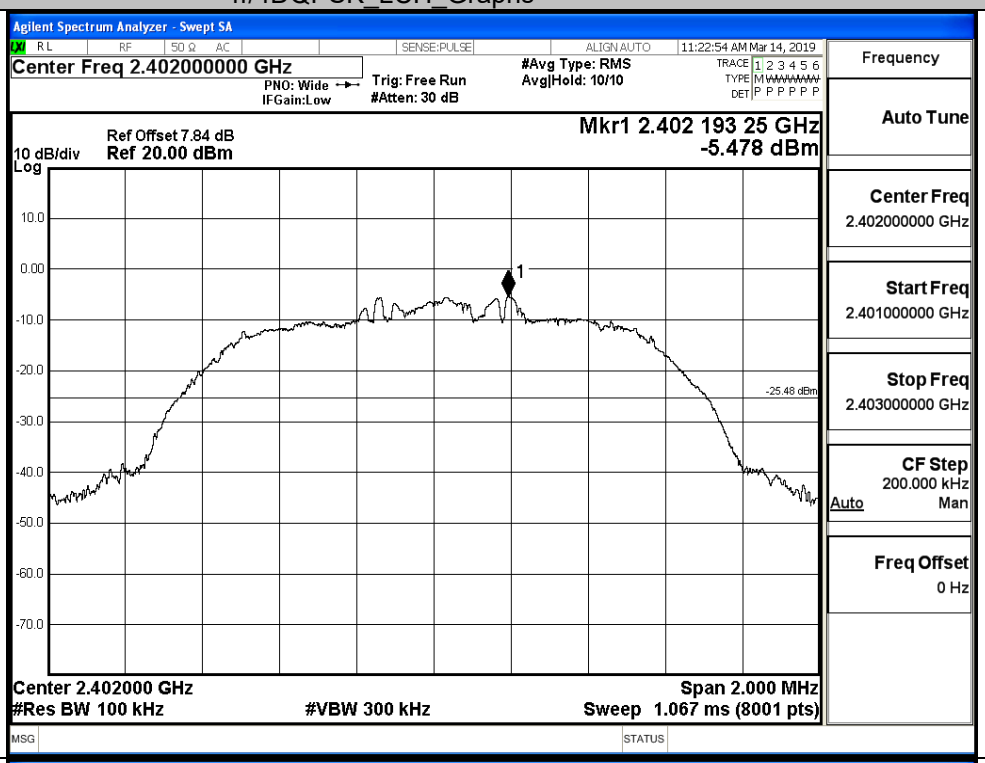
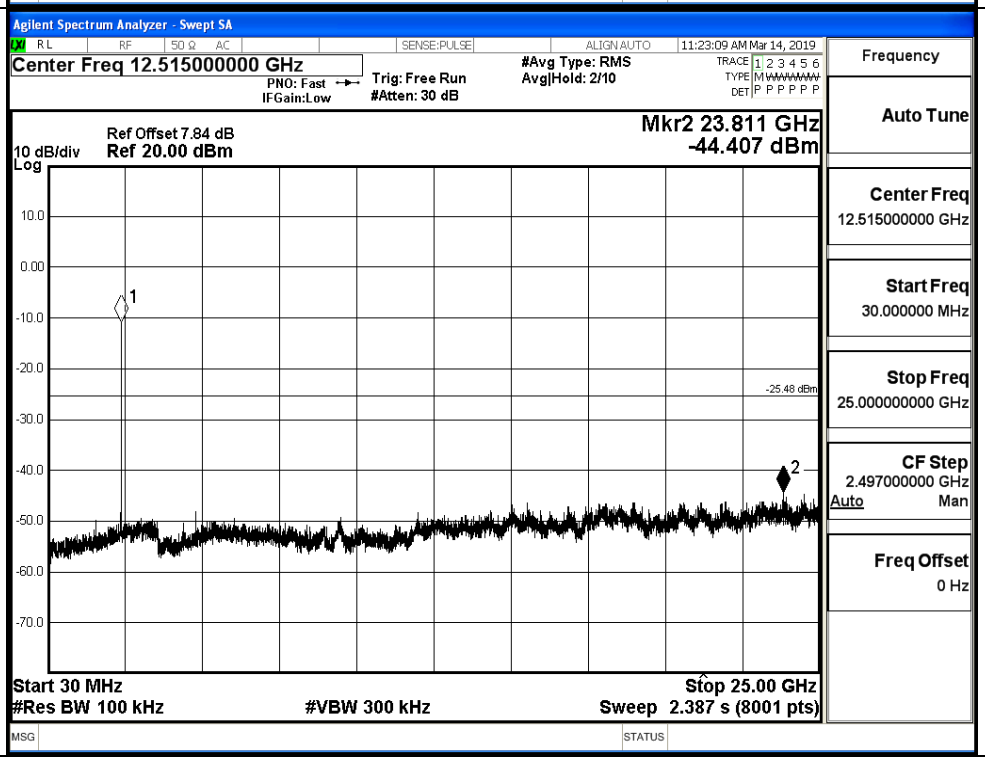
A.6 RF Conducted Spurious Emissions

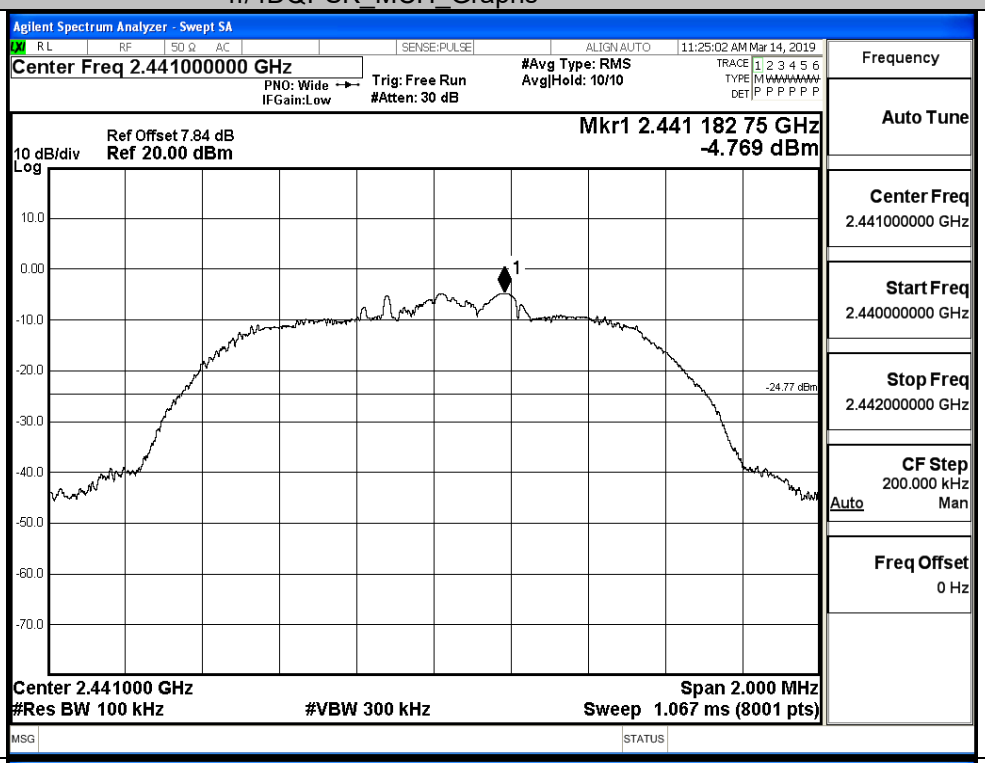
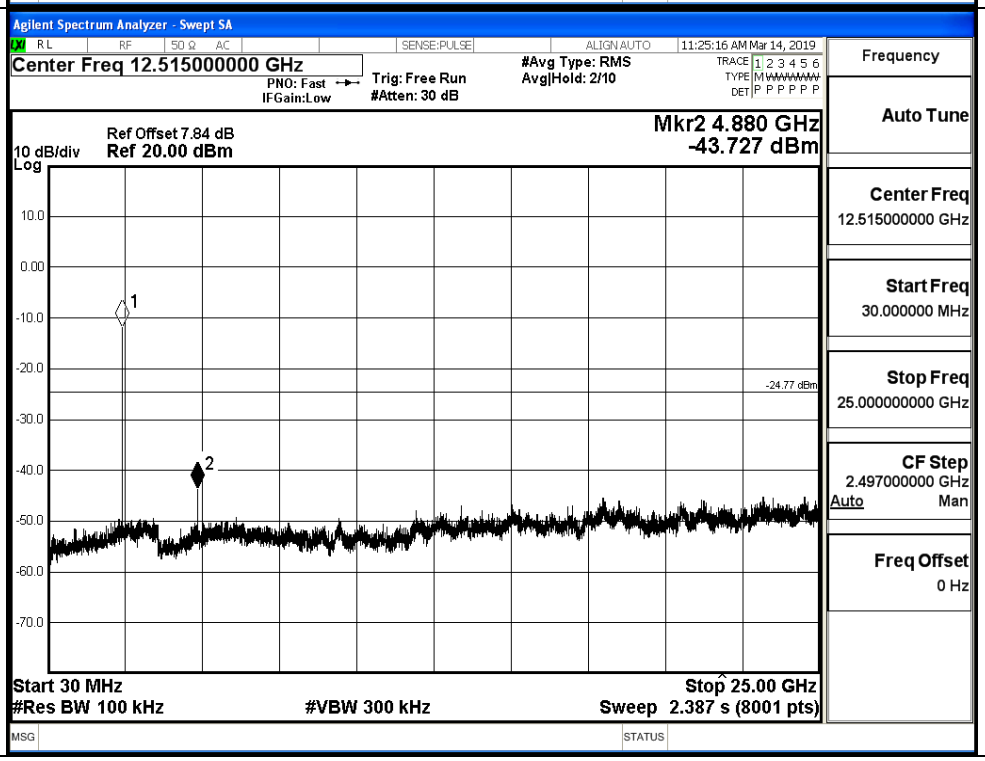
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-5.377	-42.914	-25.377	PASS
	MCH	-4.919	-40.753	-24.919	PASS
	HCH	-4.729	-44.141	-24.729	PASS
π/4DQPSK	LCH	-5.478	-44.407	-25.478	PASS
	MCH	-4.769	-43.727	-24.769	PASS
	HCH	-4.551	-45.320	-24.551	PASS

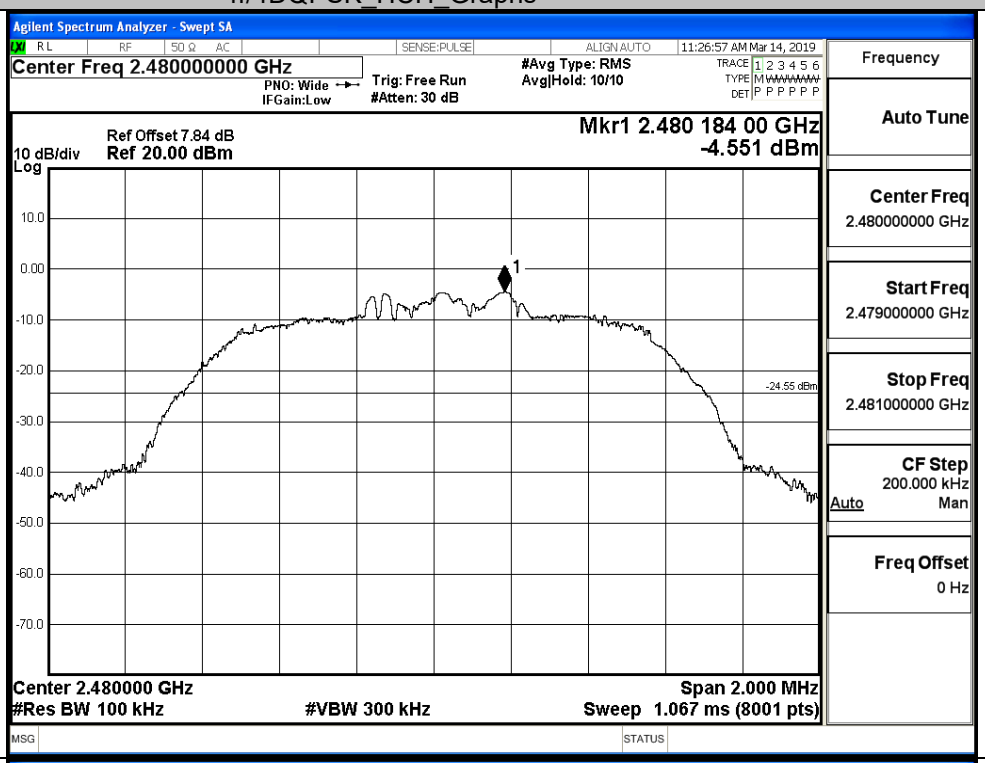
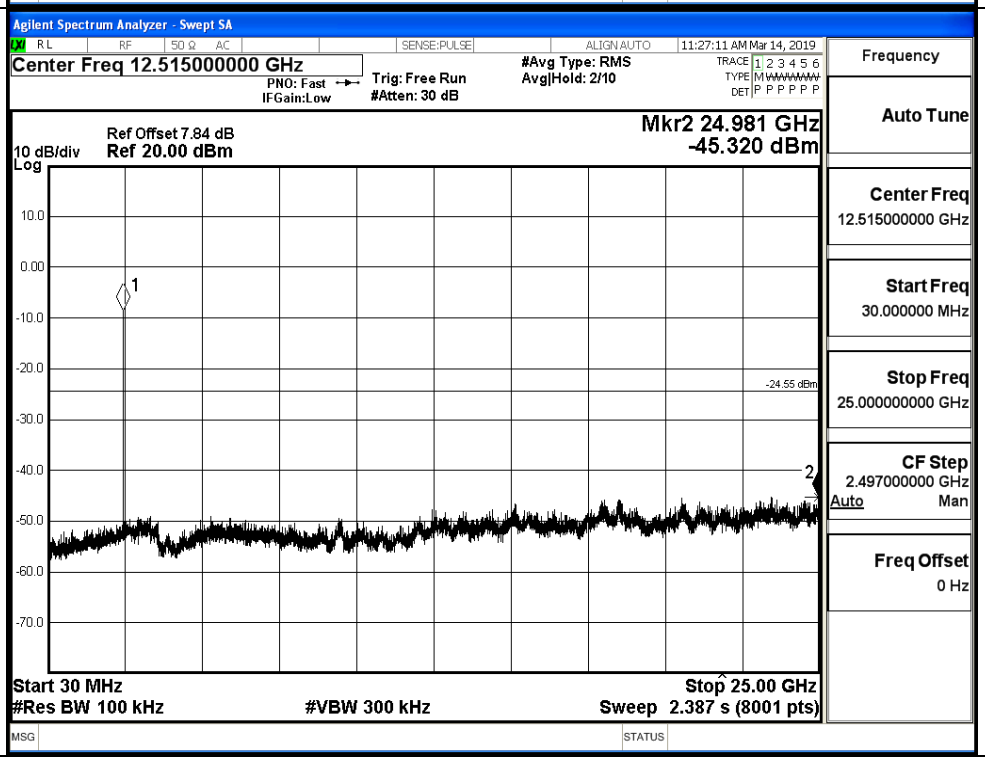
GFSK_LCH_Graphs		
Pref		
Puw		

GFSK_MCH_Graphs		
Pref		
Puw		

GFSK_HCH_Graphs		
Pref		
Puw		

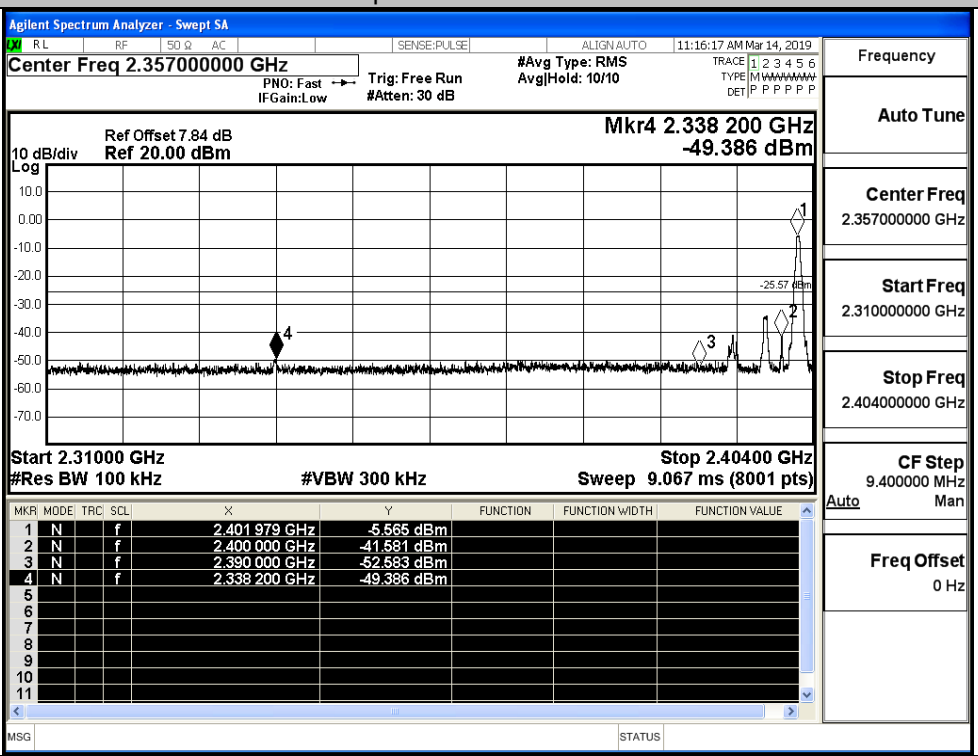
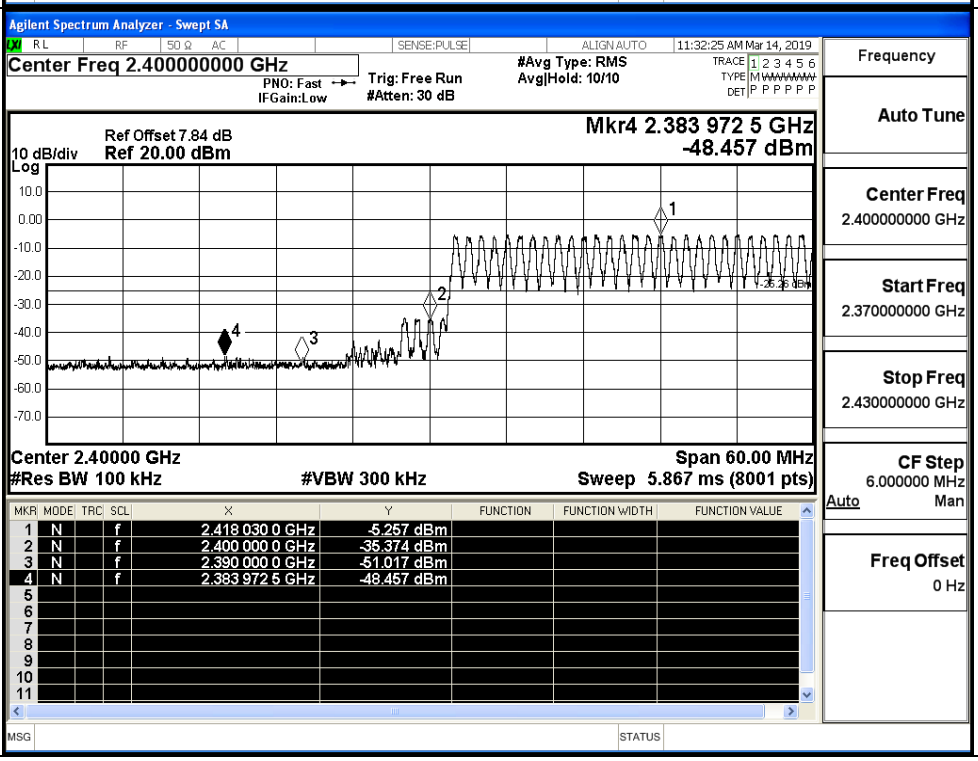
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

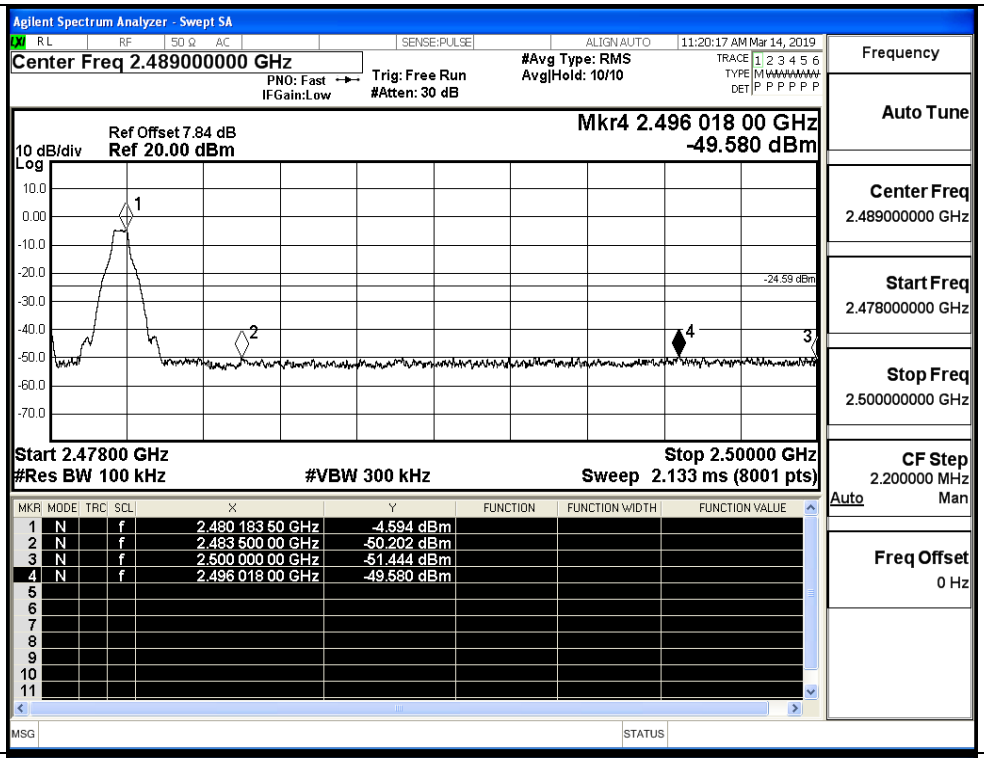
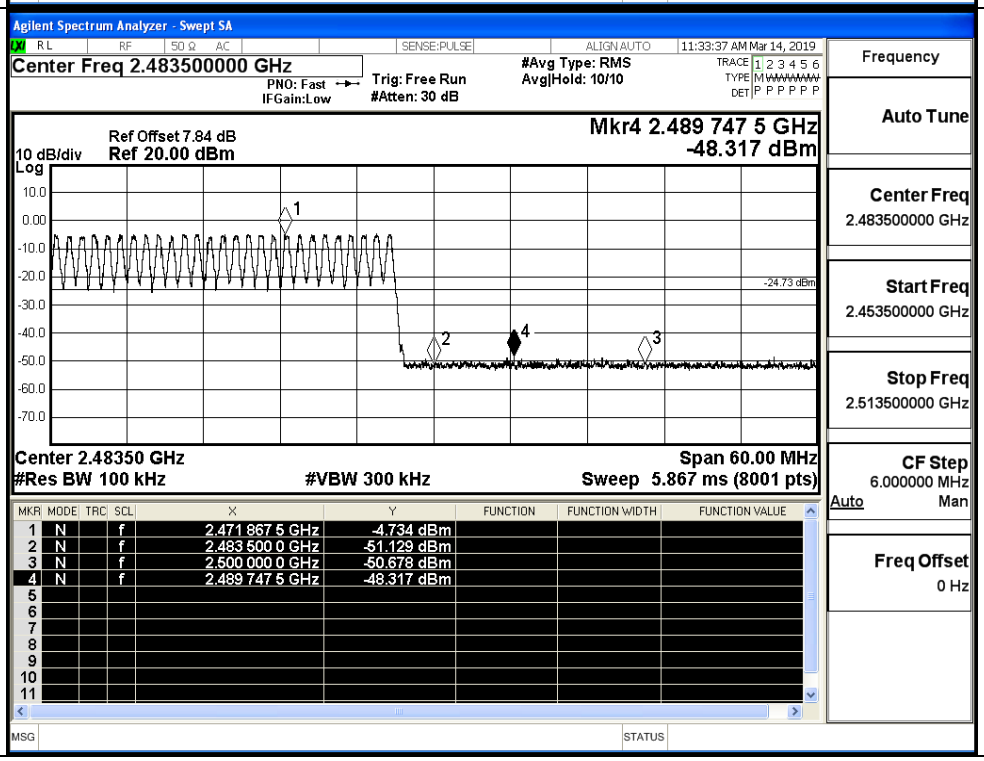
π/4DQPSK_MCH_Graphs		
Pref		
Puw		

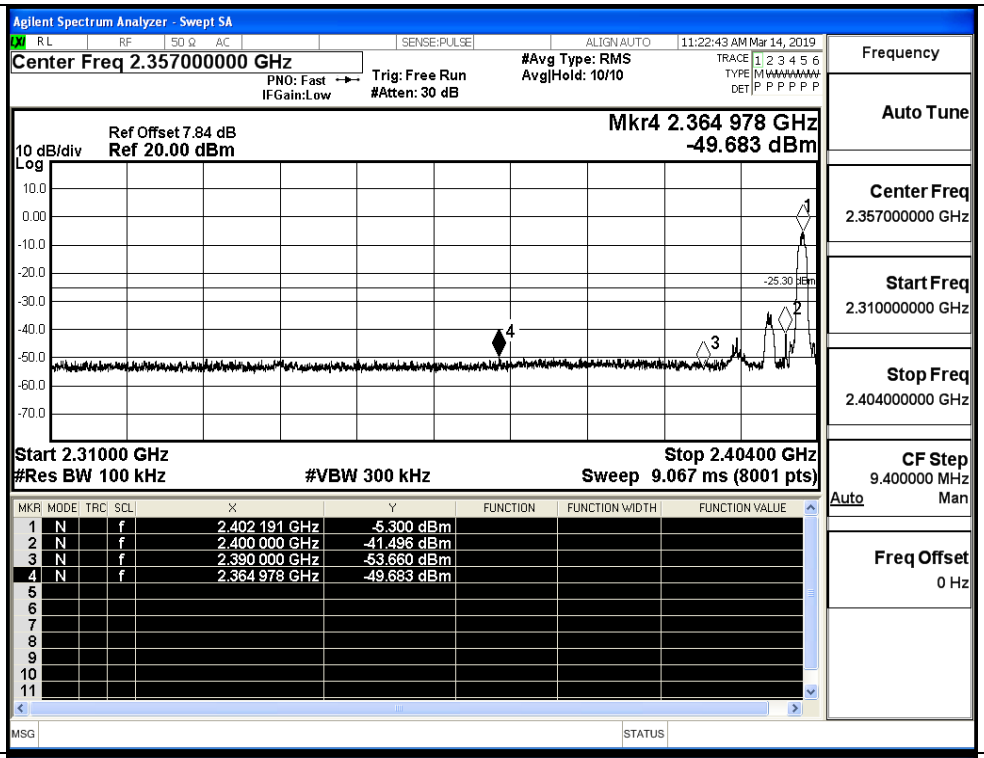
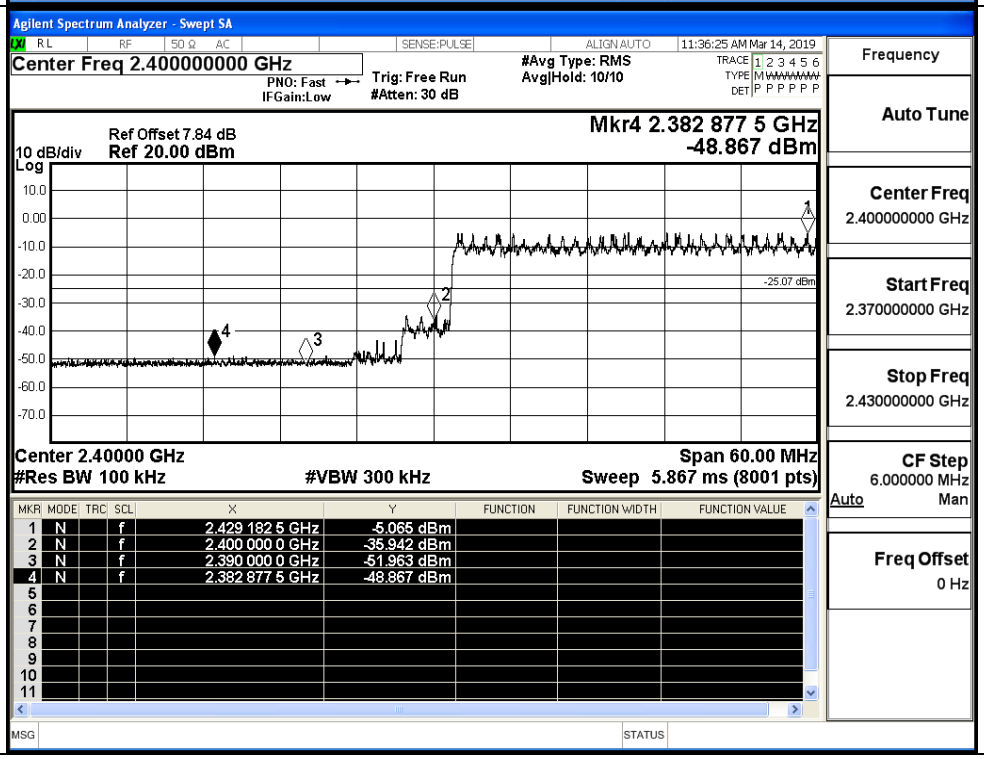
π/4DQPSK_HCH_Graphs		
Pref		
Puw		

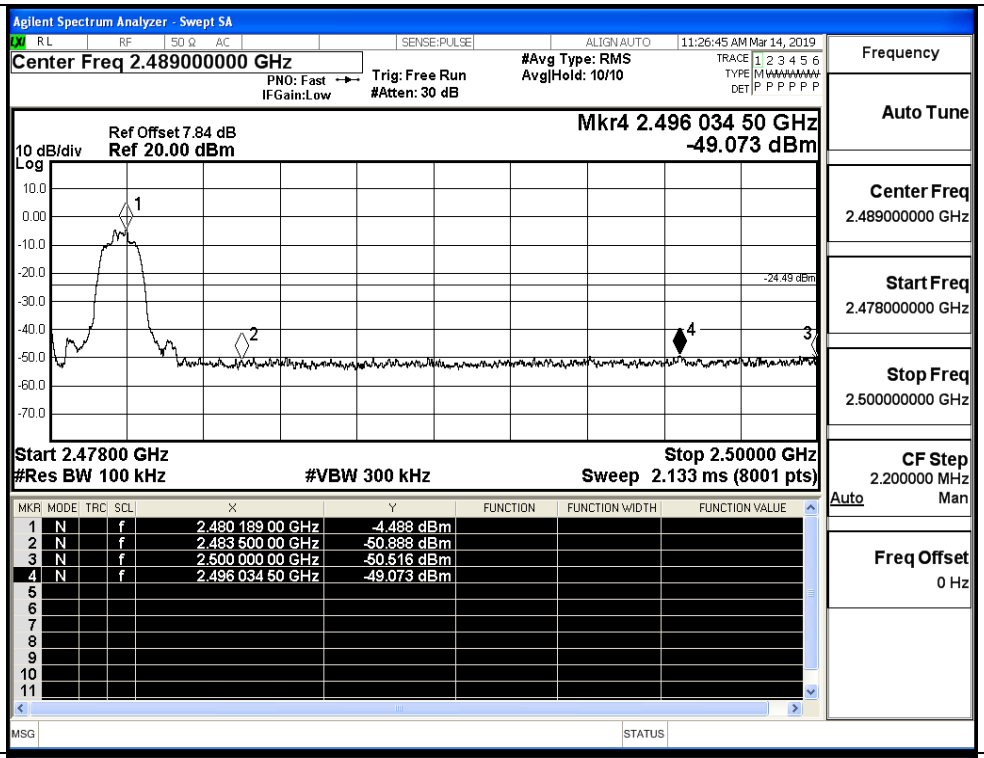
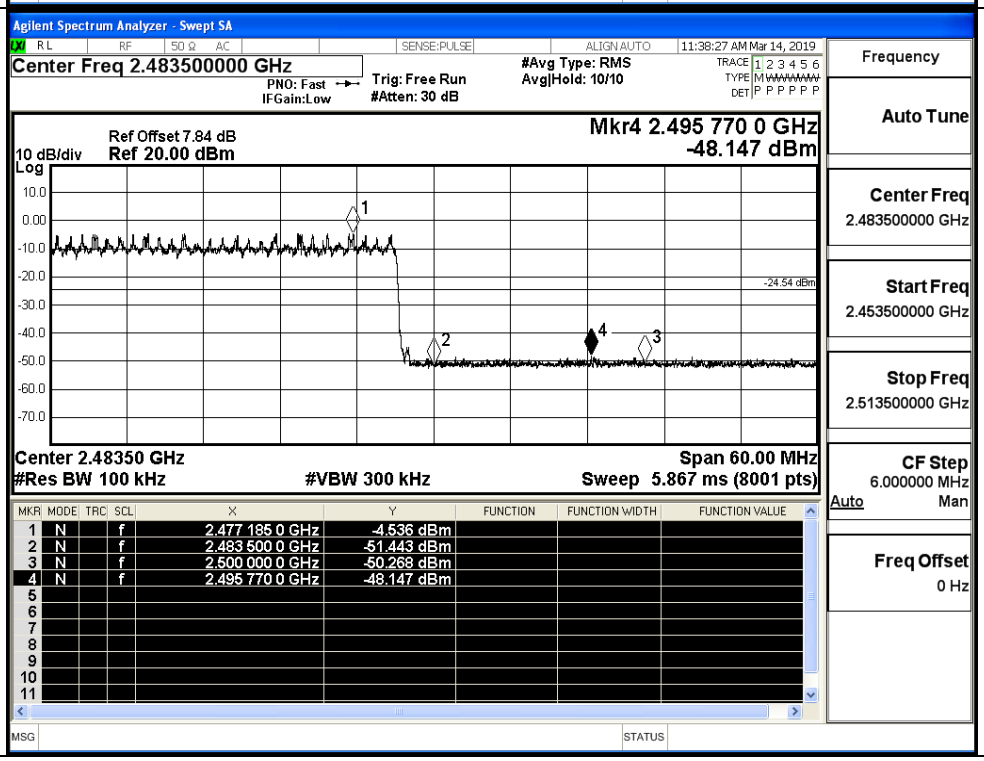
A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-5.565	Off	-49.386	-25.57	PASS
			-5.257	On	-48.457	-25.26	PASS
	HCH	2480	-4.594	Off	-49.580	-24.59	PASS
			-4.734	On	-48.317	-24.73	PASS
π/4DQPSK	LCH	2402	-5.300	Off	-49.683	-25.3	PASS
			-5.065	On	-48.867	-25.07	PASS
	HCH	2480	-4.488	Off	-49.073	-24.49	PASS
			-4.536	On	-48.147	-24.54	PASS

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

GFSK/HCH/No Hop	
GFSK/HCH/Hop	

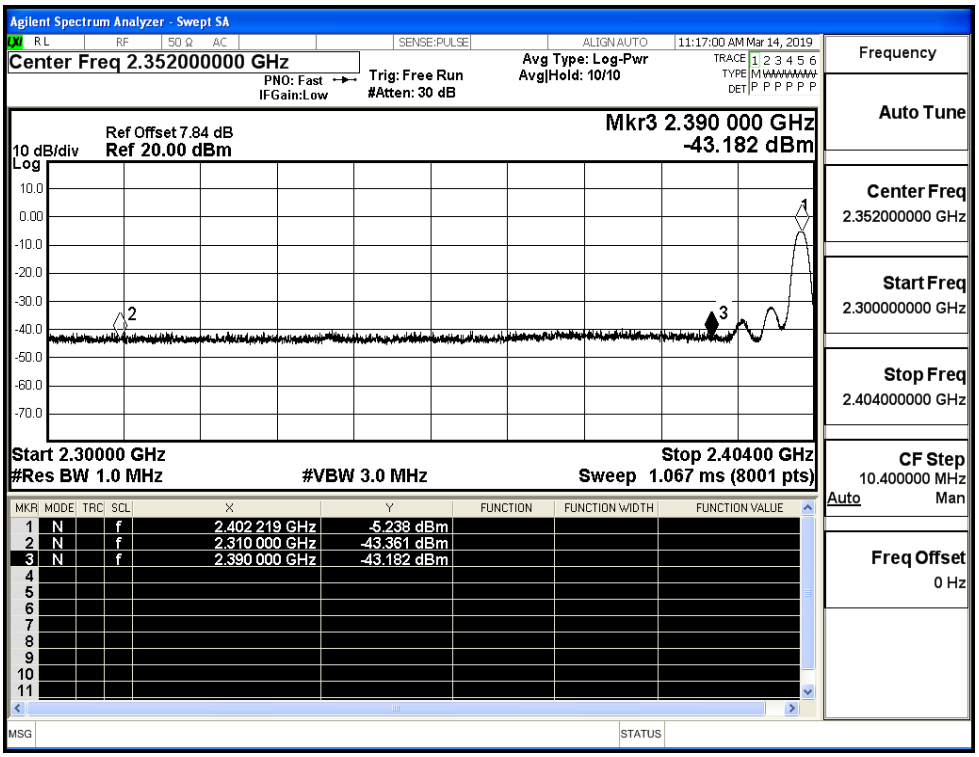
π/4DQPSK/LCH/No Hop	
π/4DQPSK/LCH/Hop	

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

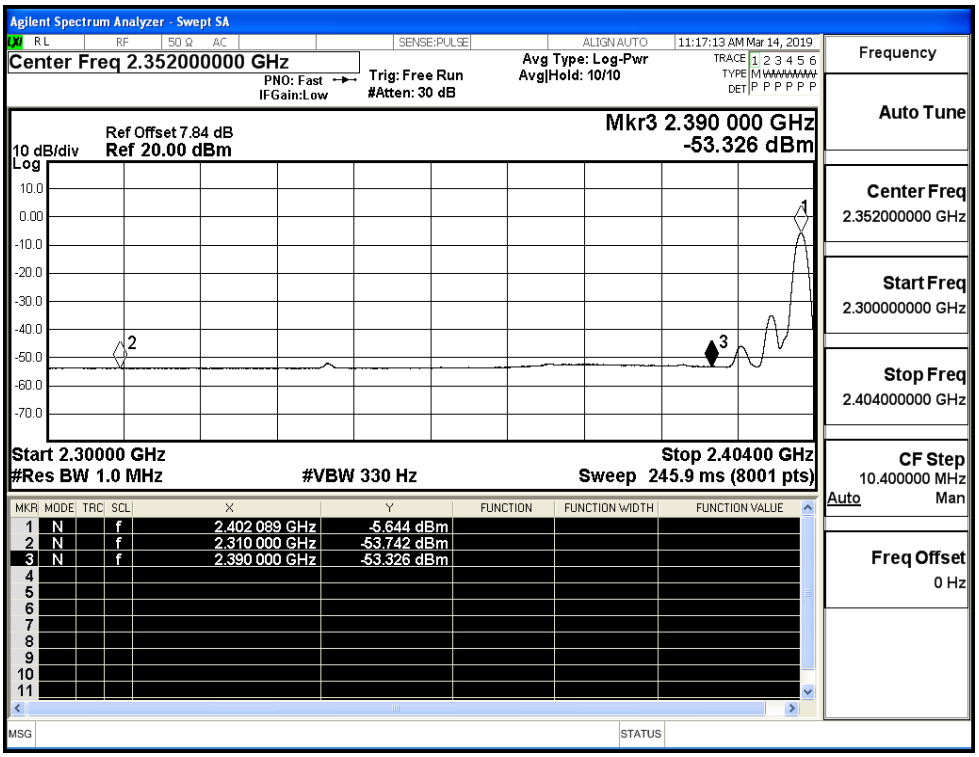
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.36	2.0	0	53.90	PEAK	74	PASS
	Off	2310.0	-53.74	2.0	0	43.52	AV	54	PASS
	Off	2390.0	-43.18	2.0	0	54.08	PEAK	74	PASS
	Off	2390.0	-53.33	2.0	0	43.93	AV	54	PASS
	Off	2483.5	-41.47	2.0	0	55.78	PEAK	74	PASS
	Off	2483.5	-52.37	2.0	0	44.89	AV	54	PASS
	Off	2500.0	-42.44	2.0	0	54.81	PEAK	74	PASS
	Off	2500.0	-52.01	2.0	0	45.25	AV	54	PASS
π/4DQPSK	Off	2310.0	-41.19	2.0	0	56.07	PEAK	74	PASS
	Off	2310.0	-53.76	2.0	0	43.50	AV	54	PASS
	Off	2390.0	-43.73	2.0	0	53.53	PEAK	74	PASS
	Off	2390.0	-53.35	2.0	0	43.91	AV	54	PASS
	Off	2483.5	-42.17	2.0	0	55.08	PEAK	74	PASS
	Off	2483.5	-52.75	2.0	0	44.51	AV	54	PASS
	Off	2500.0	-41.83	2.0	0	55.42	PEAK	74	PASS
	Off	2500.0	-52.05	2.0	0	45.21	AV	54	PASS

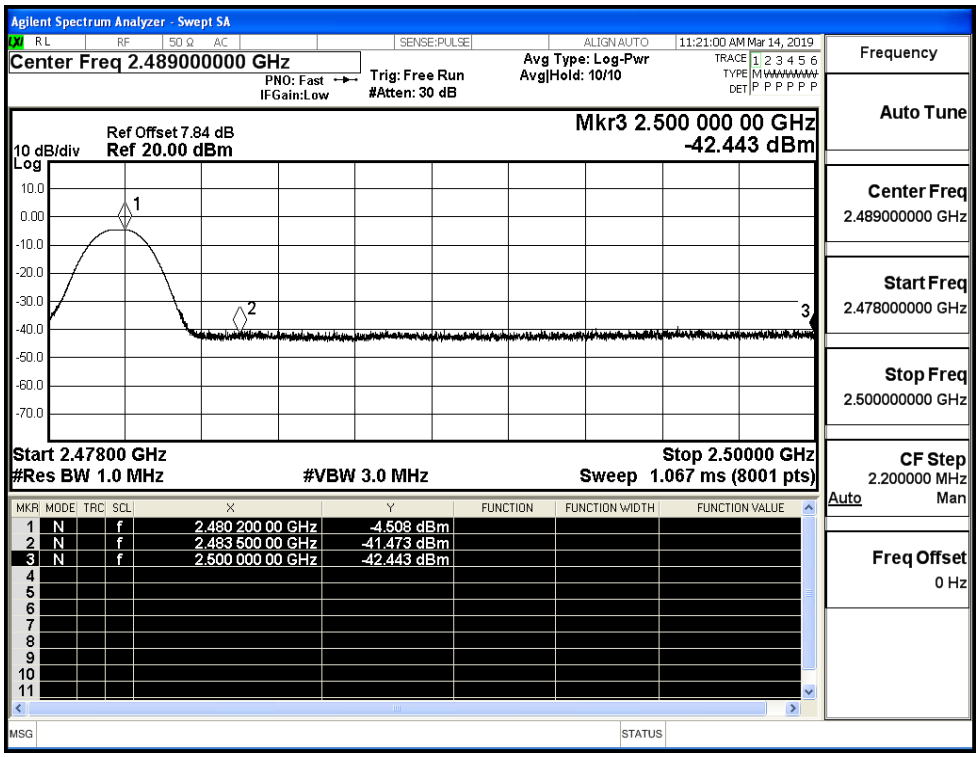
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



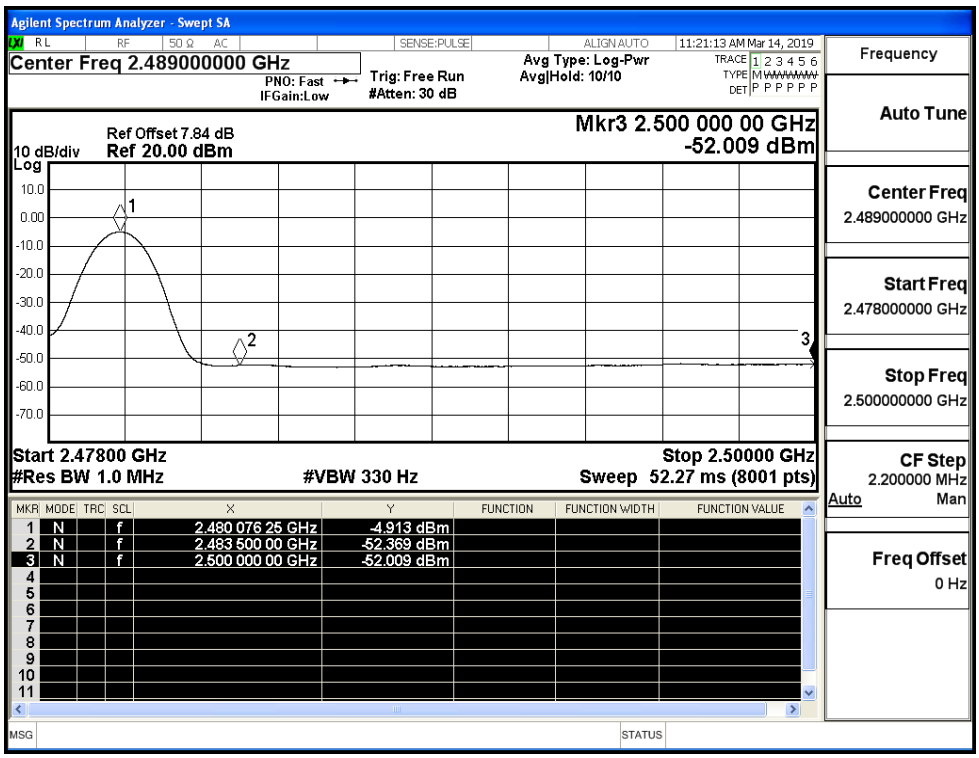
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



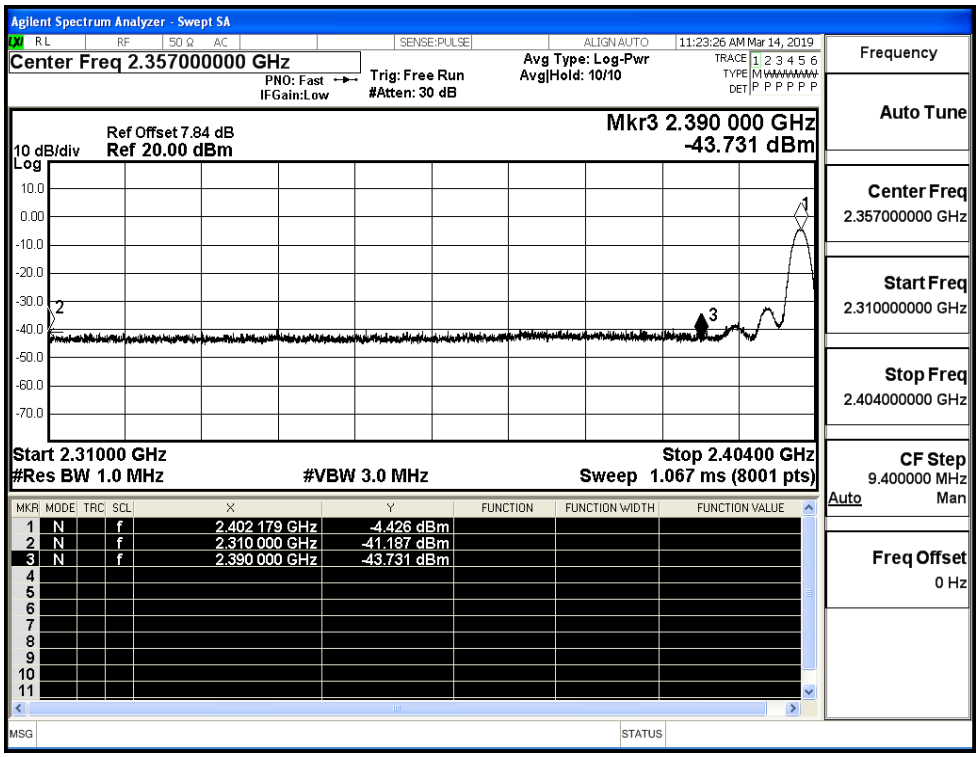
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



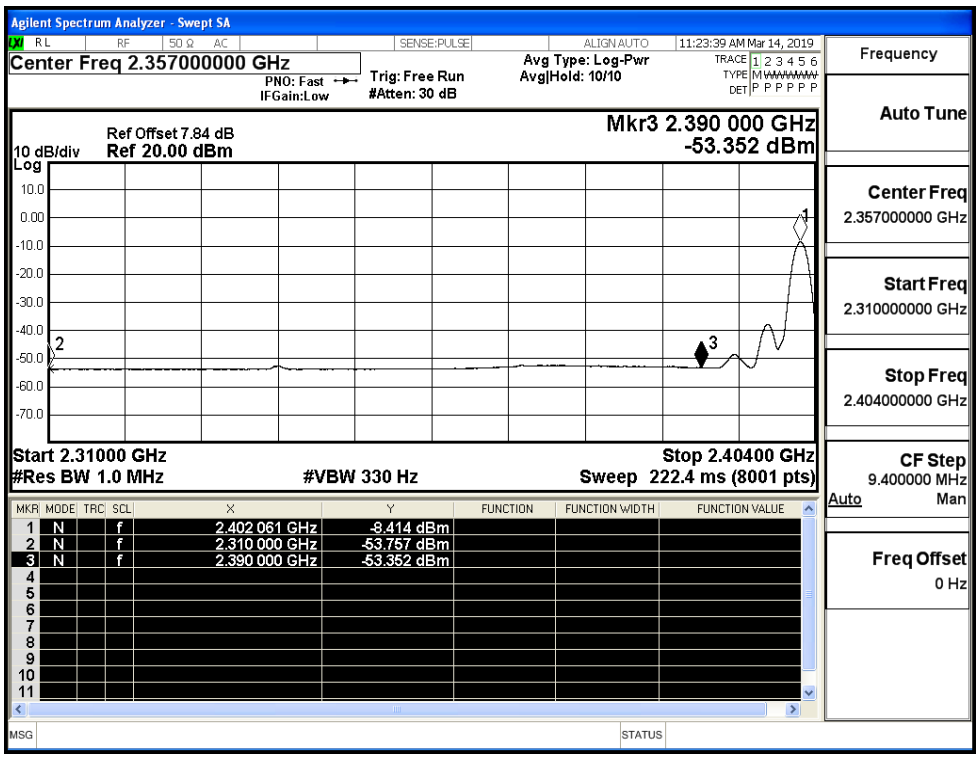
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



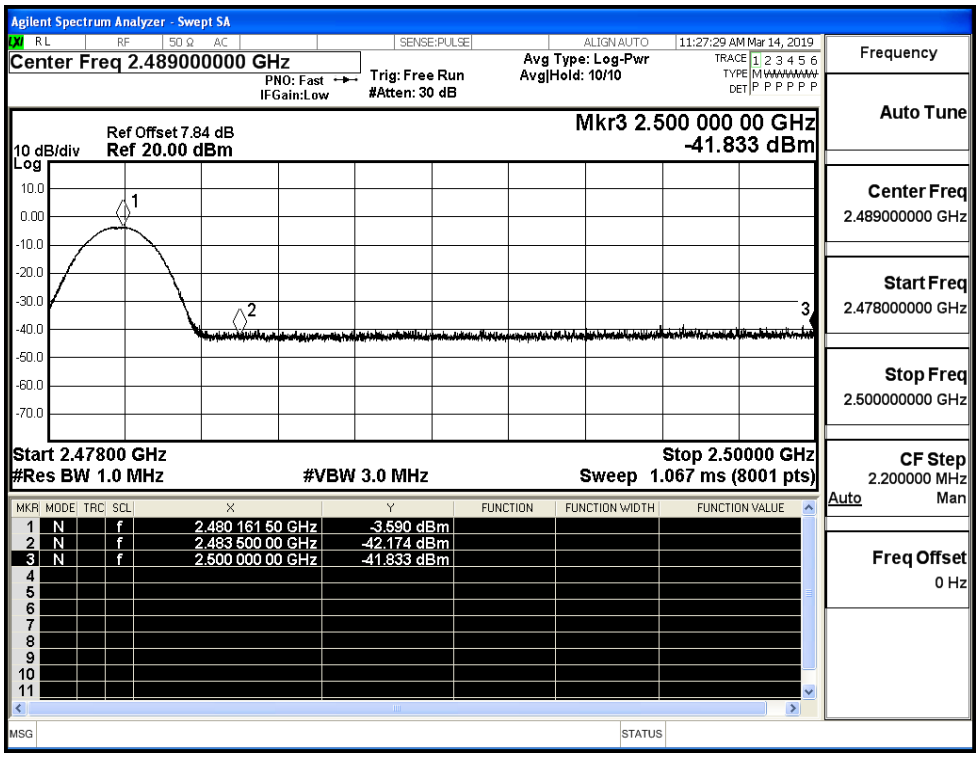
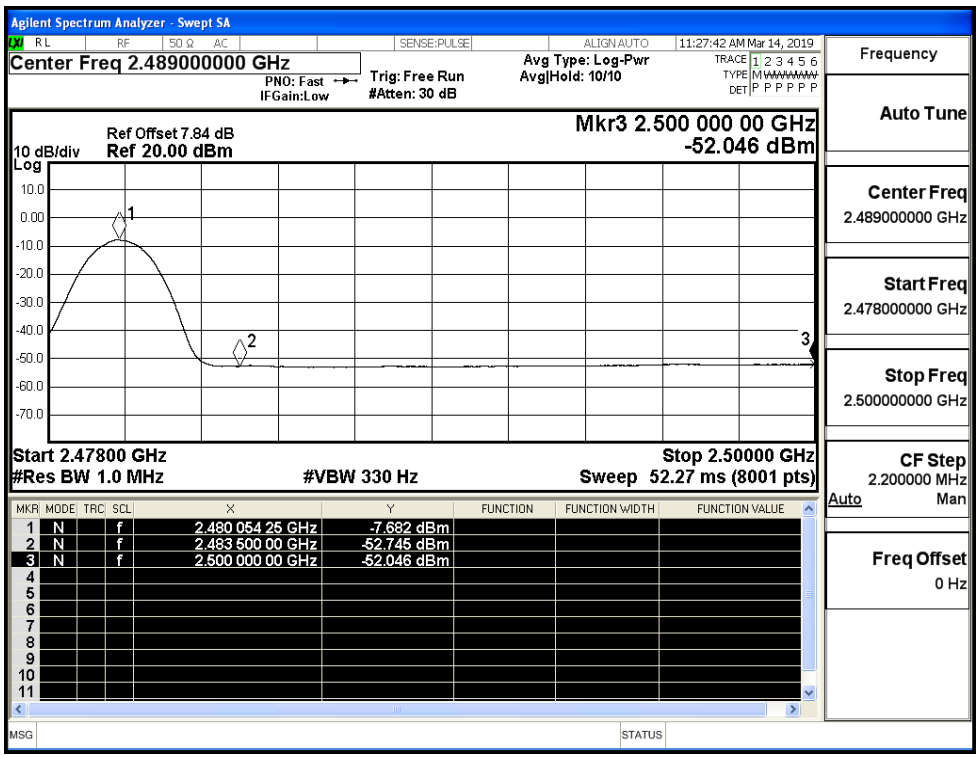
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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)