Appendix A

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

Product Name: Wireless Speaker Diffuser

Trade Mark: zen rox

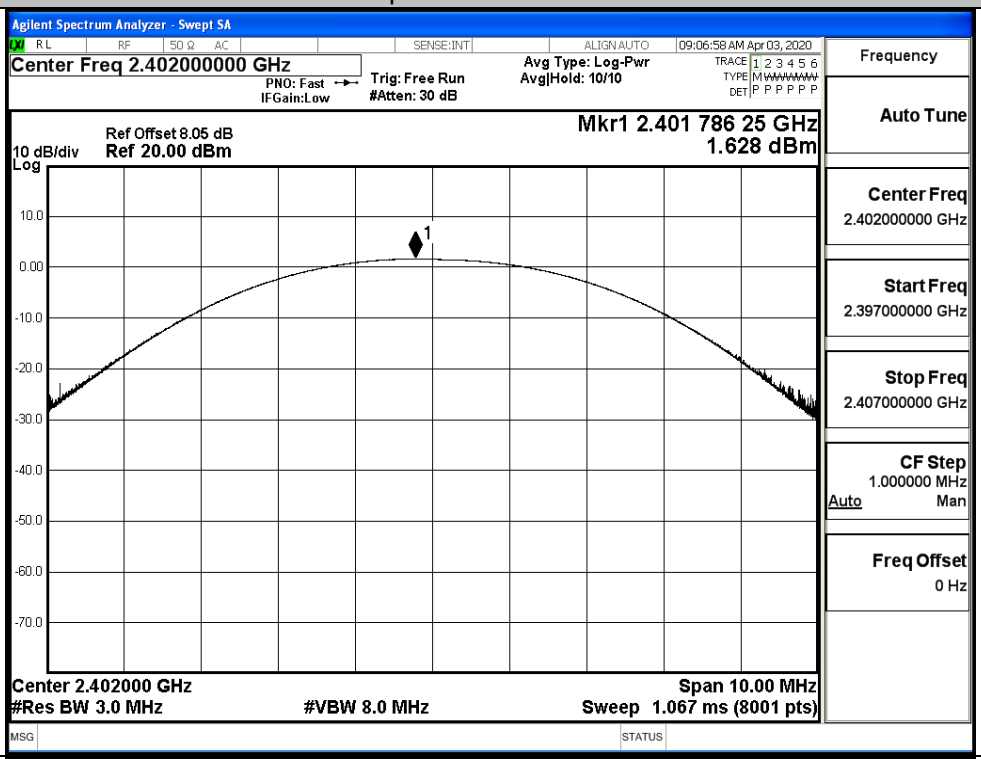
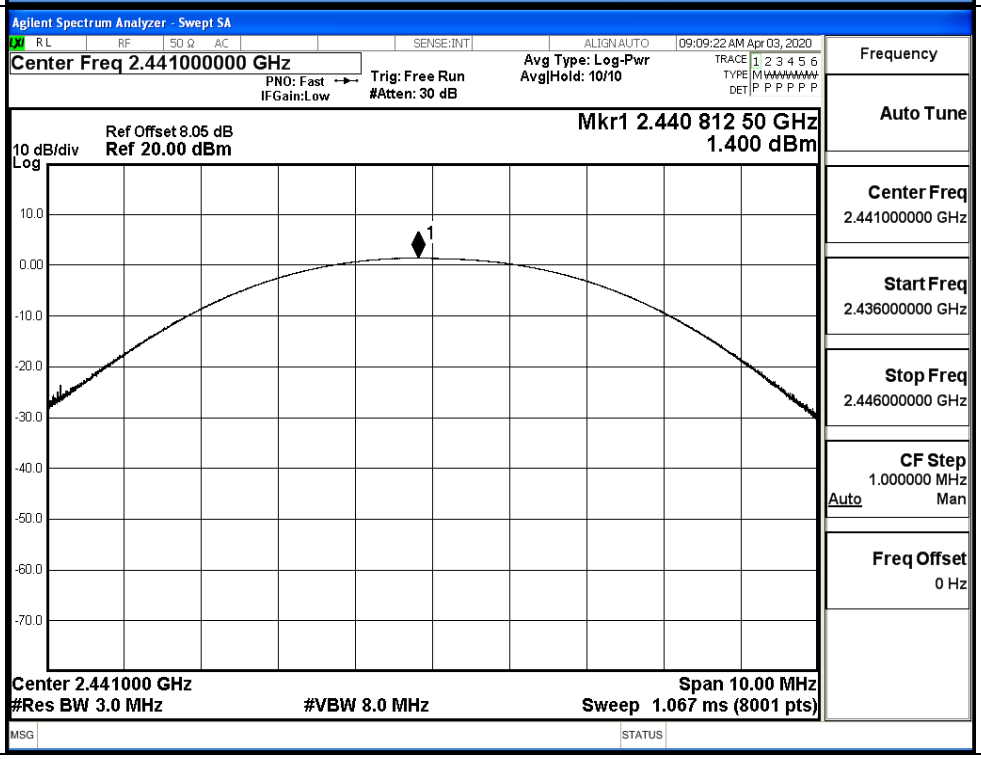
Test Model: CVS-03

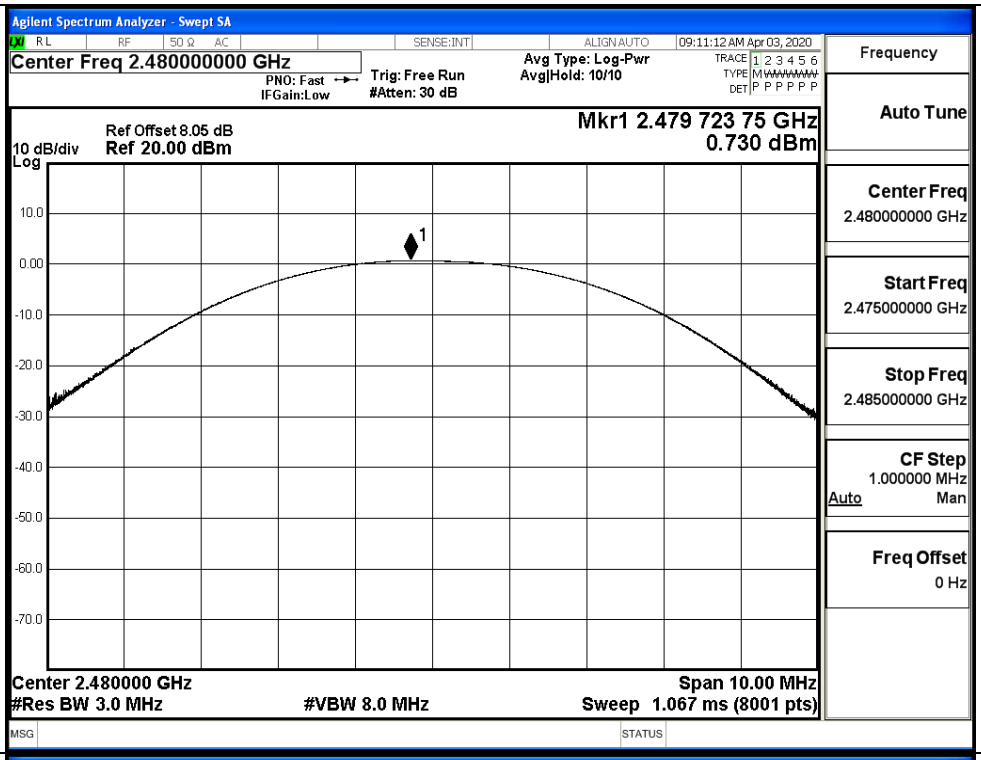
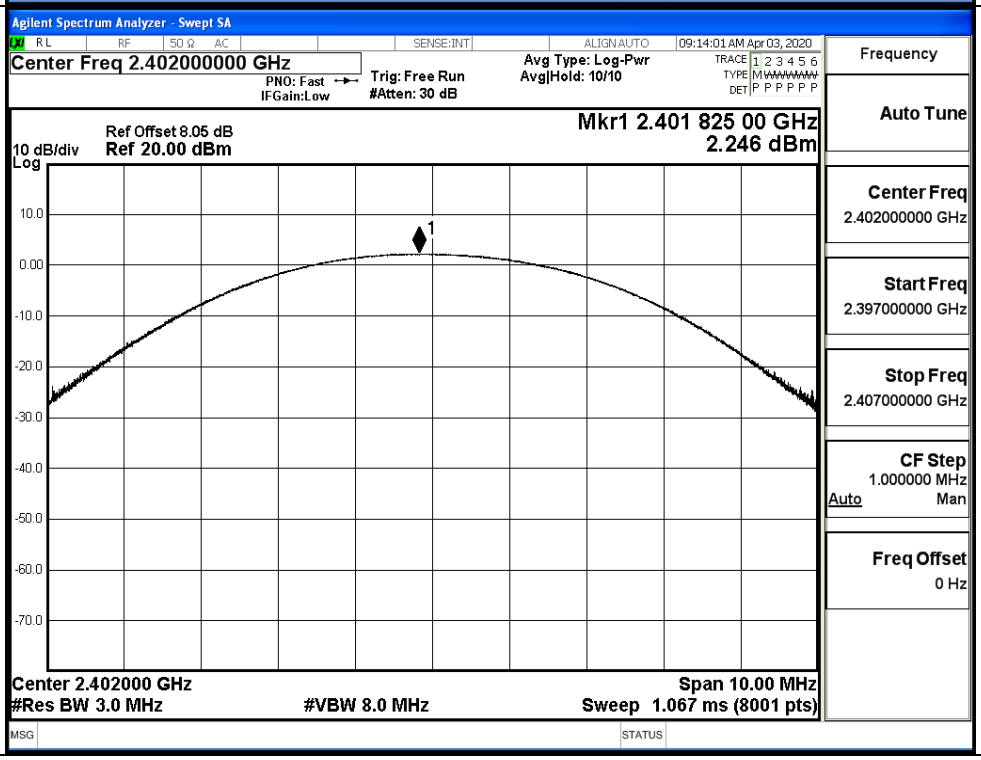
Environmental Conditions

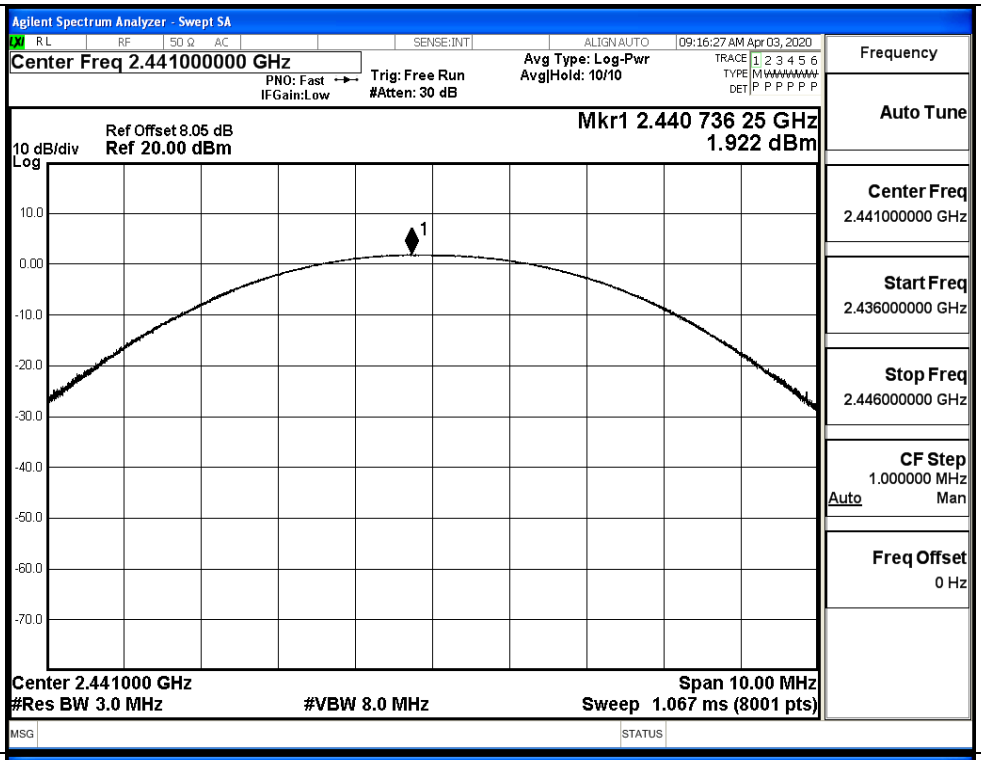
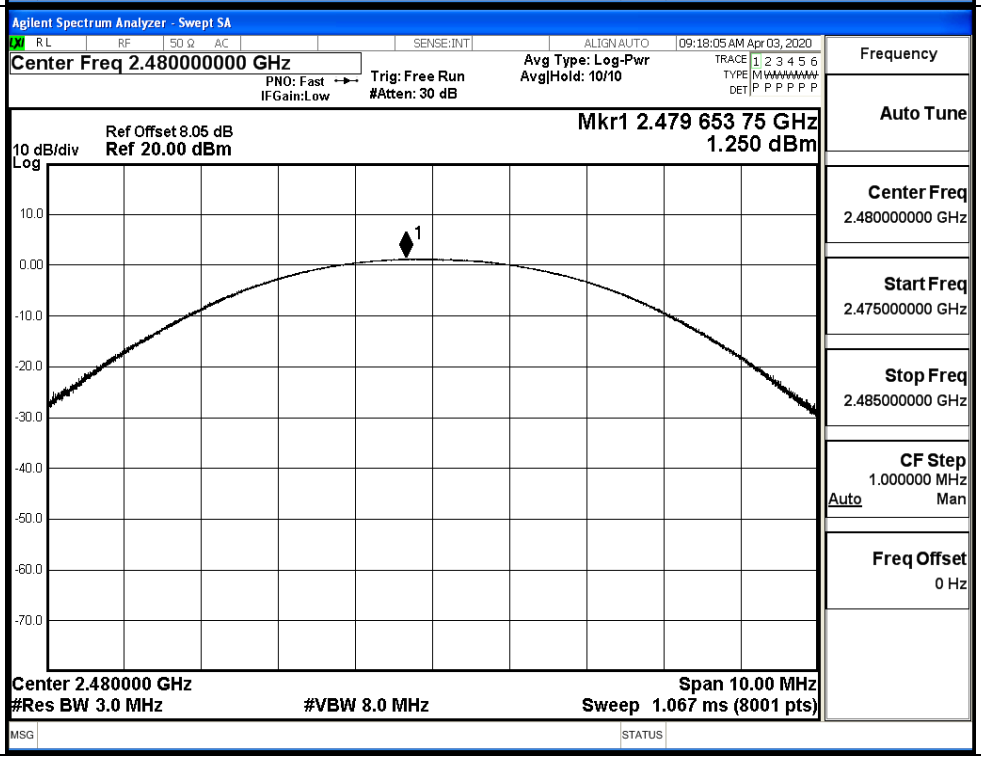
Temperature:	25°C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	Qu Xin
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.628	21	PASS
	MCH	1.400	21	PASS
	HCH	0.730	21	PASS
π/4DQPSK	LCH	2.246	21	PASS
	MCH	1.922	21	PASS
	HCH	1.250	21	PASS

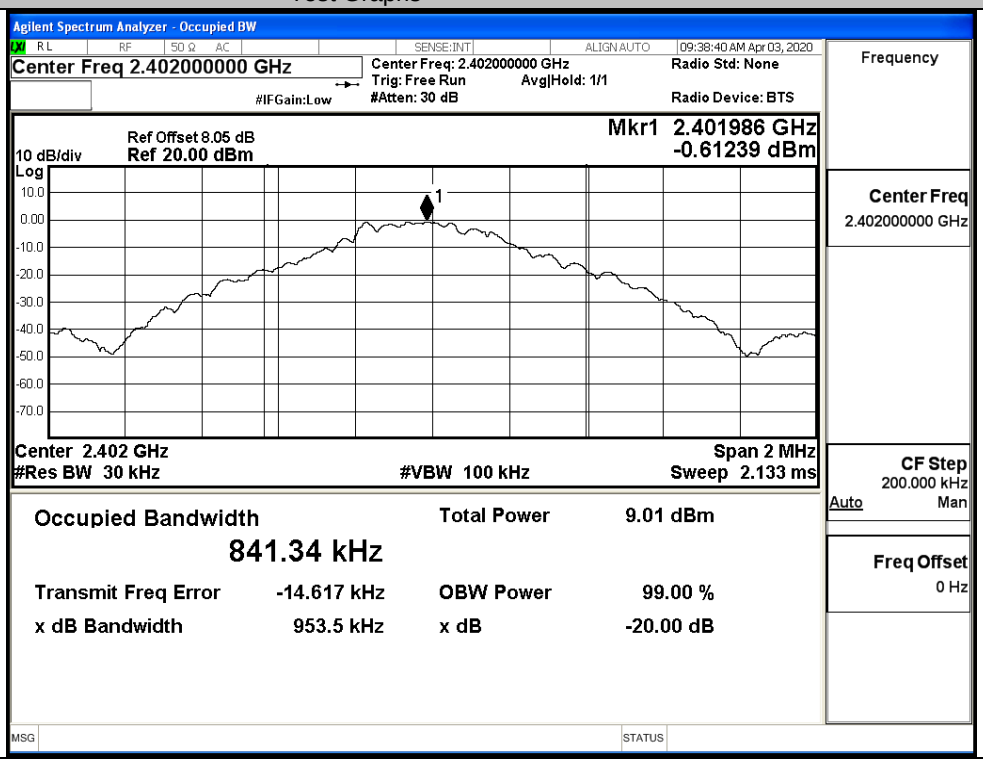
Test Graphs	
GFSK/LCH	
GFSK/MCH	

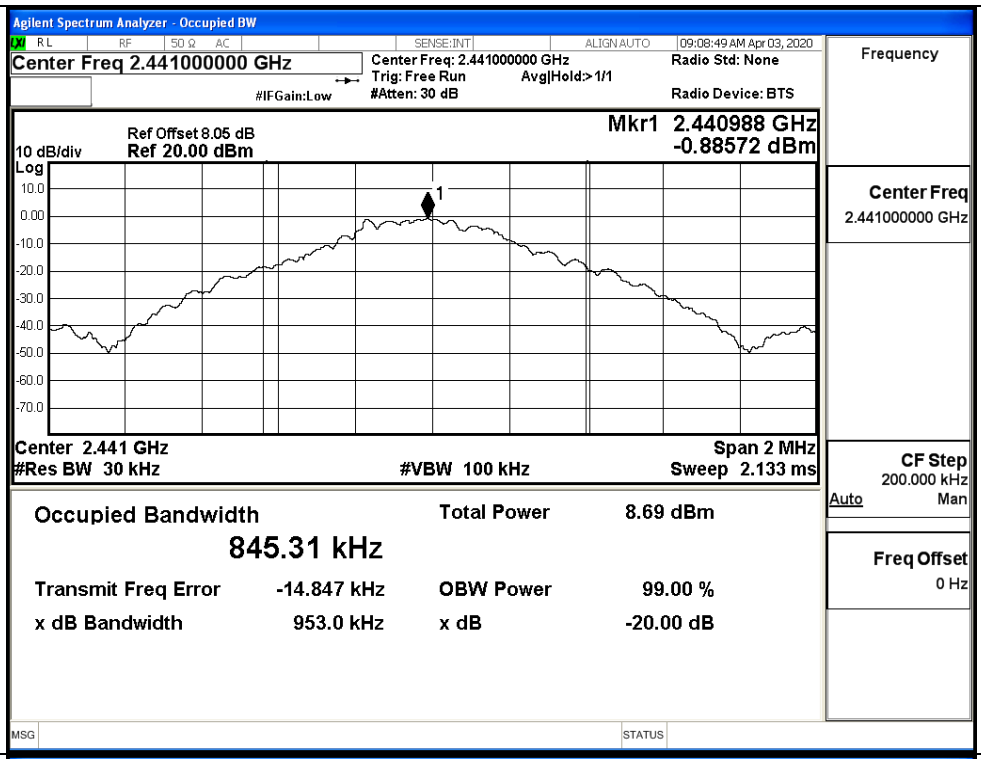
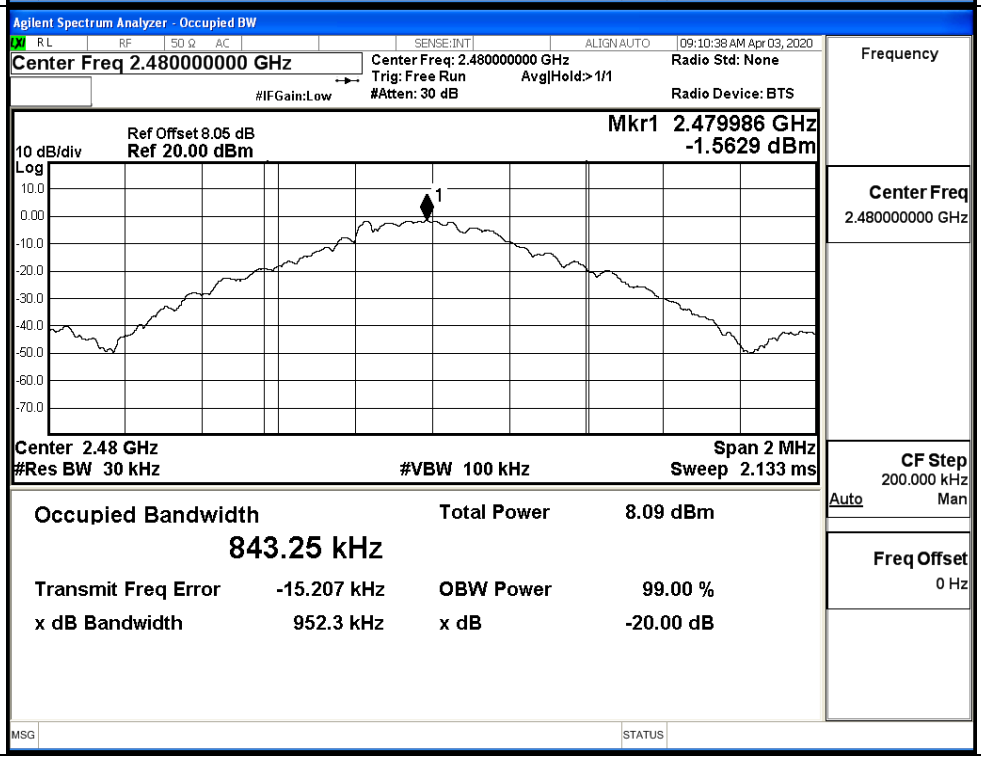
GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH		
π/4DQPSK/HCH		

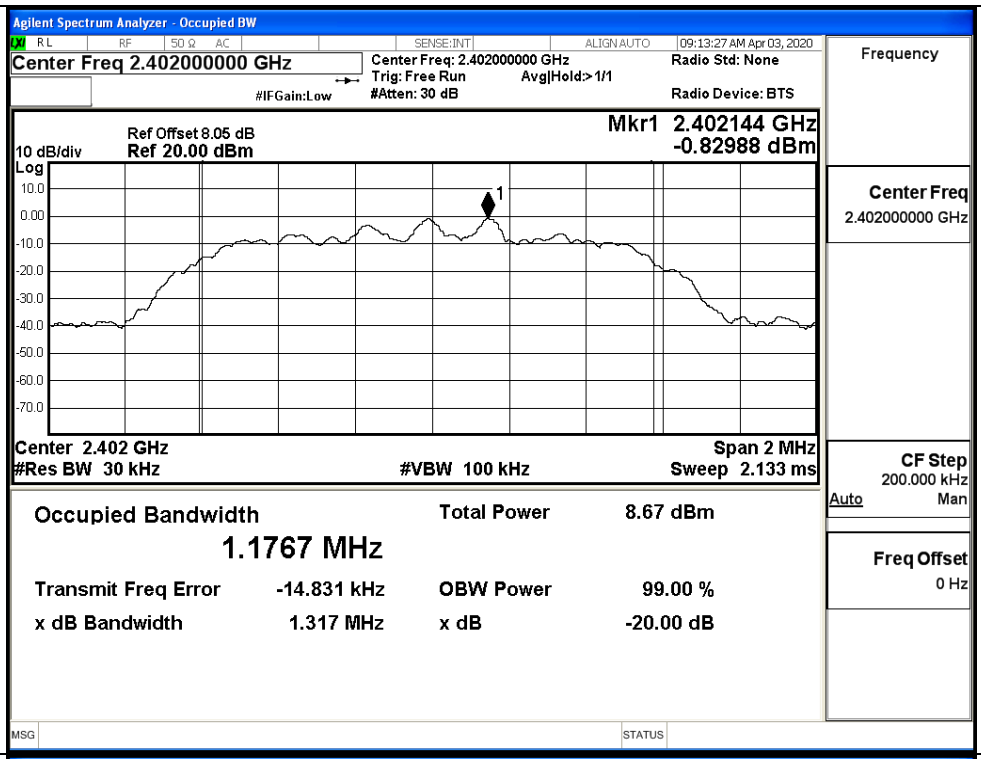
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9535	Not Specified	PASS
	MCH	0.9530	Not Specified	PASS
	HCH	0.9523	Not Specified	PASS
π/4DQPSK	LCH	1.317	Not Specified	PASS
	MCH	1.314	Not Specified	PASS
	HCH	1.316	Not Specified	PASS

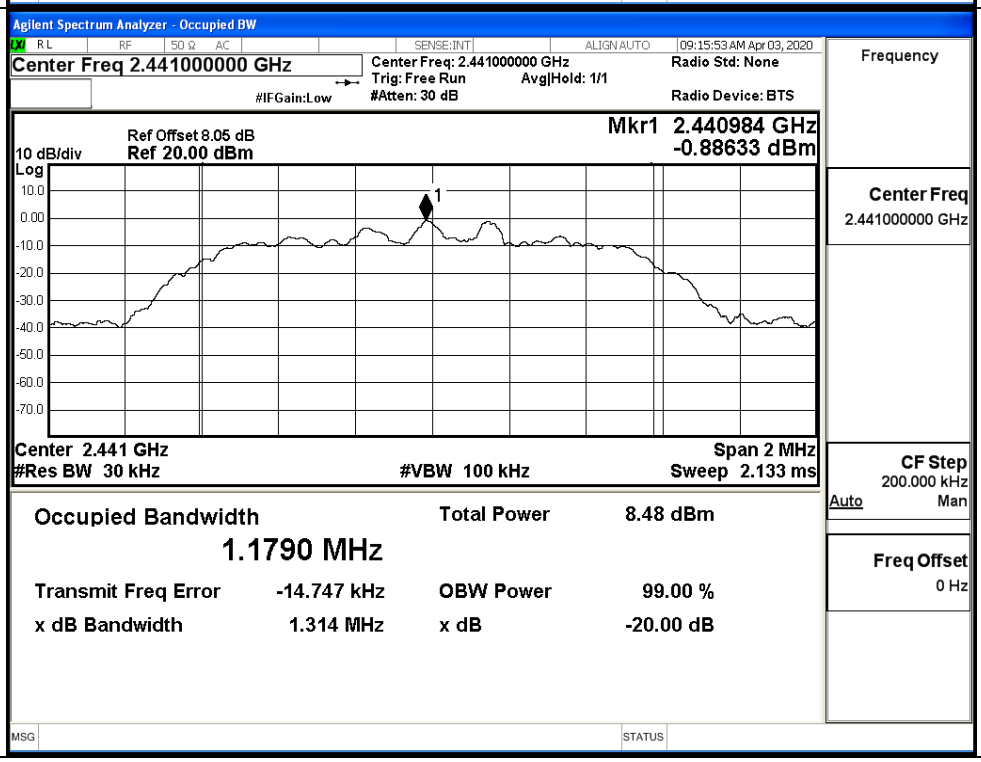
Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

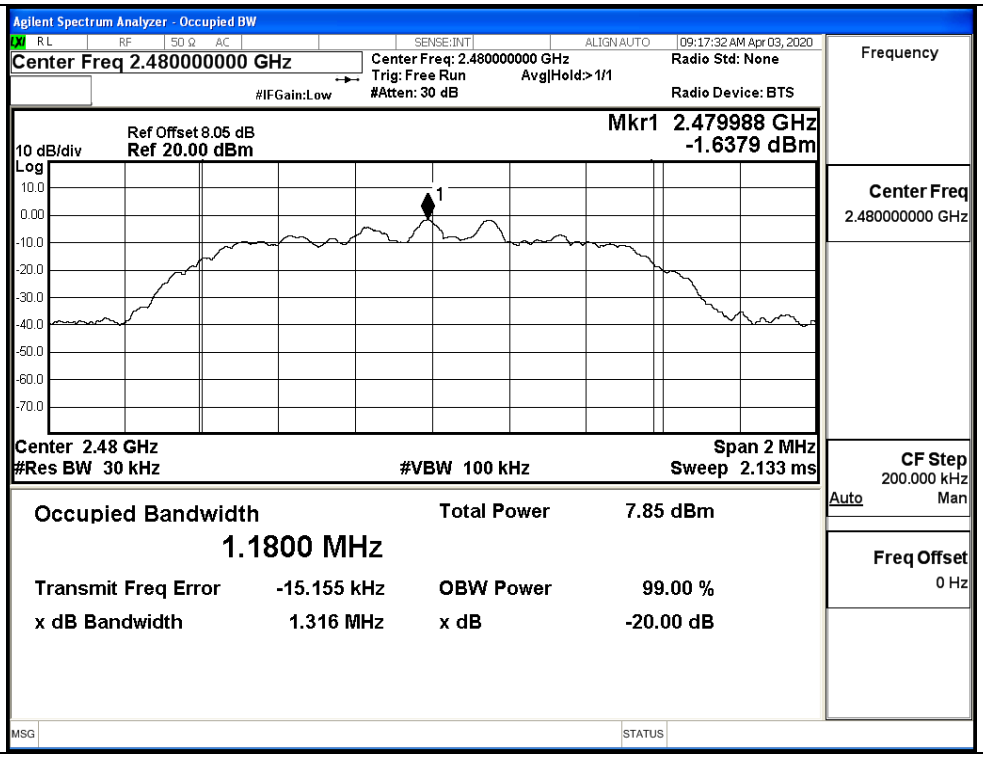
π/4DQPSK/LCH



π/4DQPSK/MCH

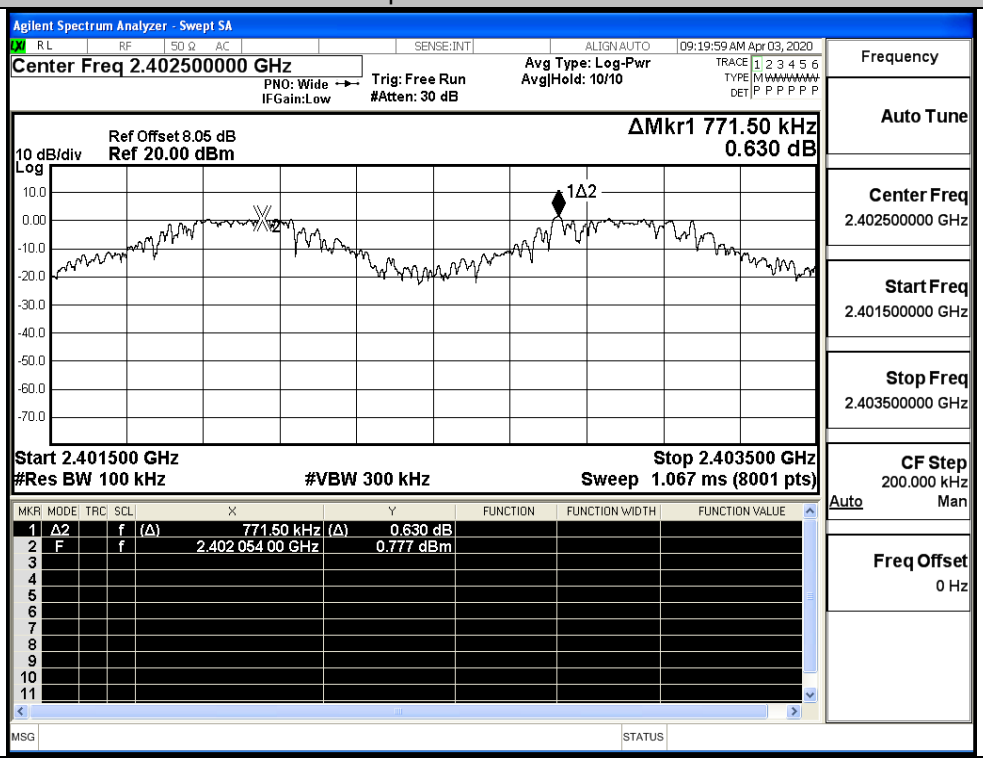


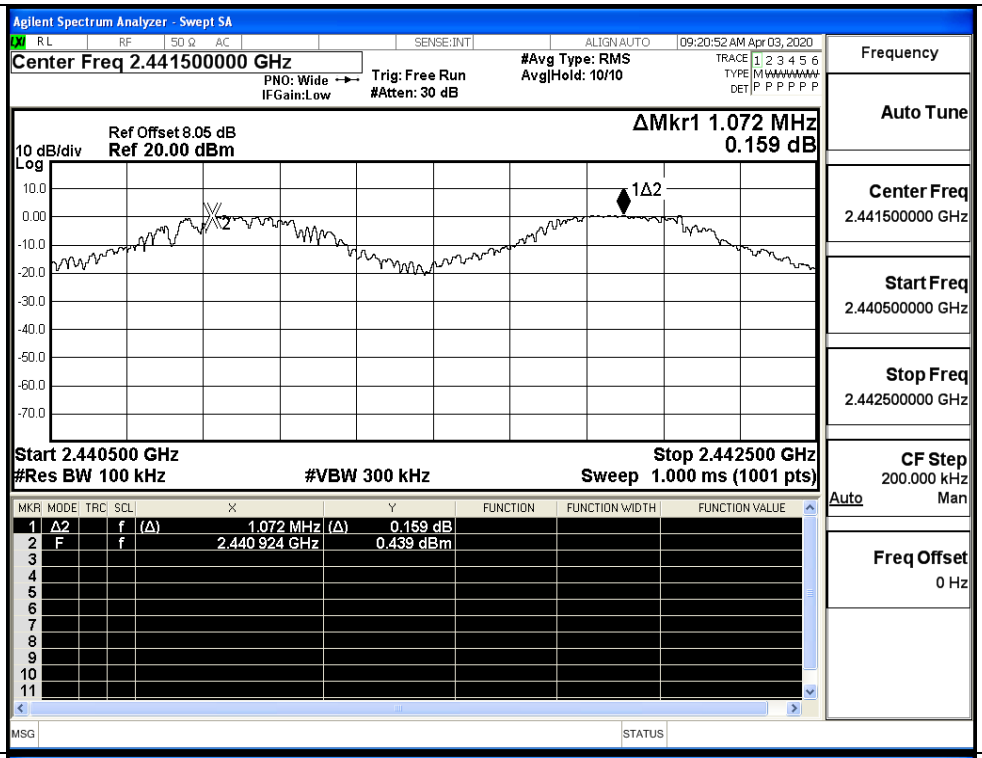
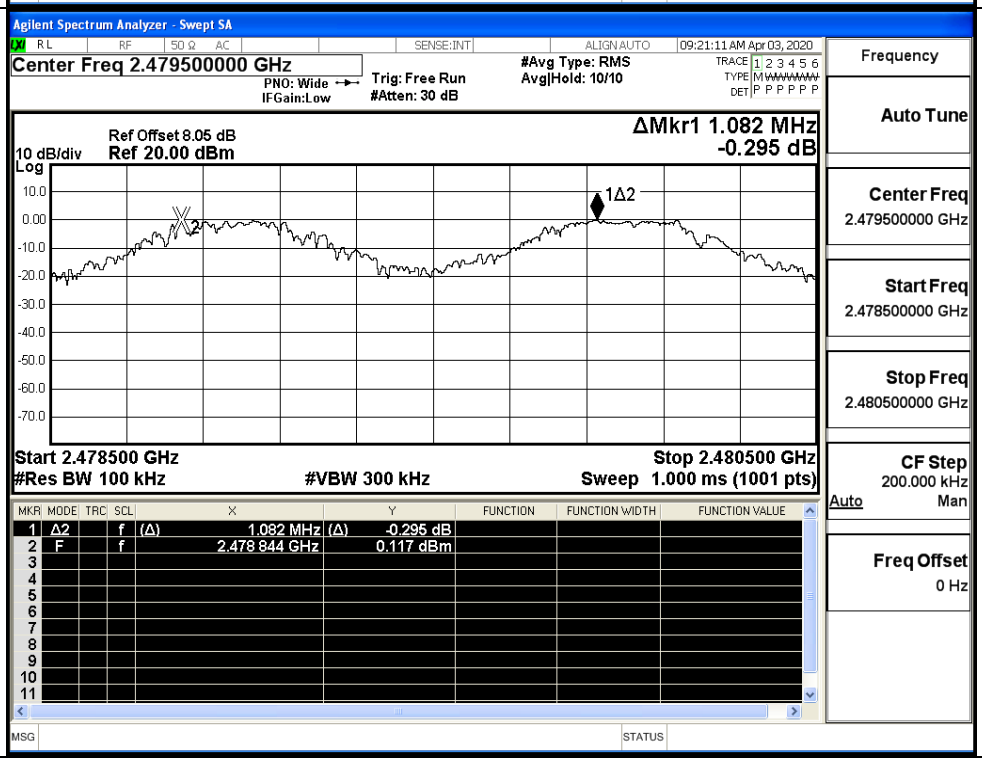
π/4DQPSK/HCH


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
09:17:32 AM Apr 03, 2020
Frequency
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479988 GHz
-1.6379 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
1.1800 MHz
Total Power 7.85 dBm
Transmit Freq Error -15.155 kHz
OBW Power 99.00 %
x dB Bandwidth 1.316 MHz
x dB -20.00 dB
Freq Offset
0 Hz
MSG
STATUS

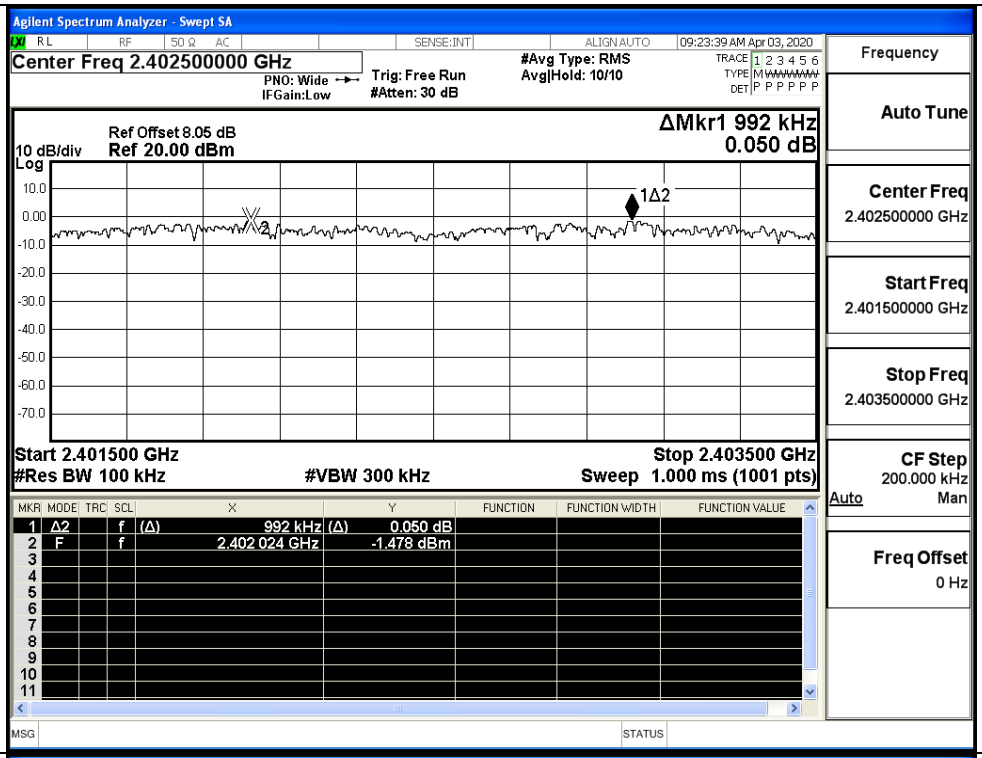
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.771	0.635	PASS
	MCH	1.072	0.635	PASS
	HCH	1.082	0.635	PASS
π/4DQPSK	LCH	0.992	0.878	PASS
	MCH	1.014	0.878	PASS
	HCH	0.960	0.878	PASS

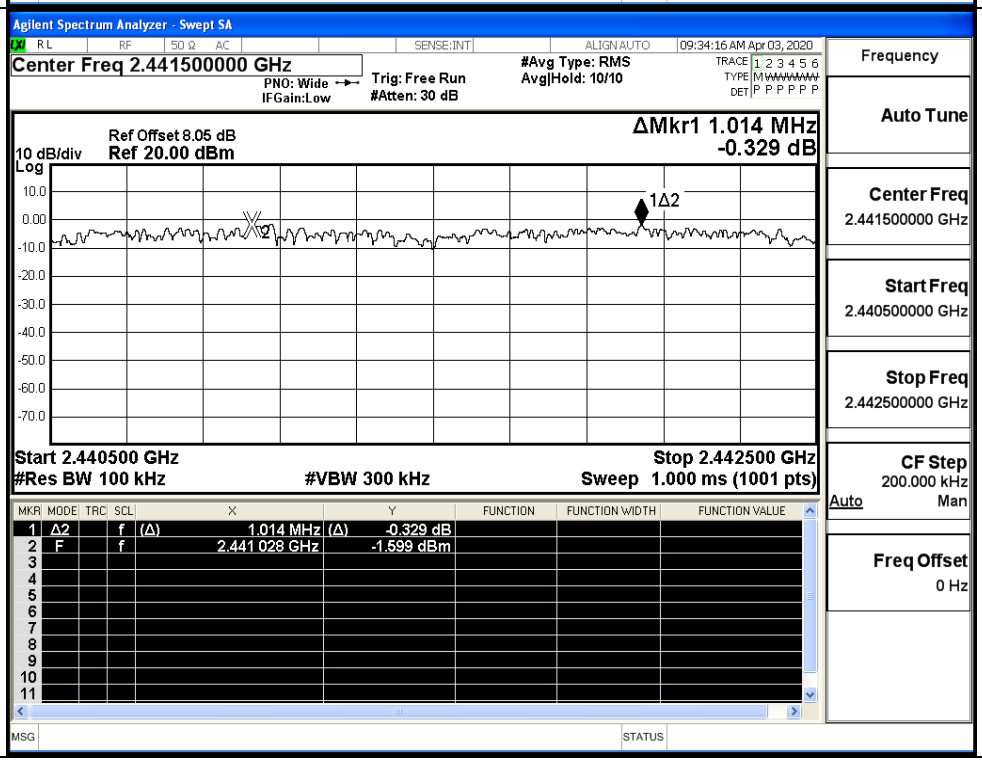
Test Graphs		
GFSK/LCH		

GFSK/MCH		
GFSK/HCH		

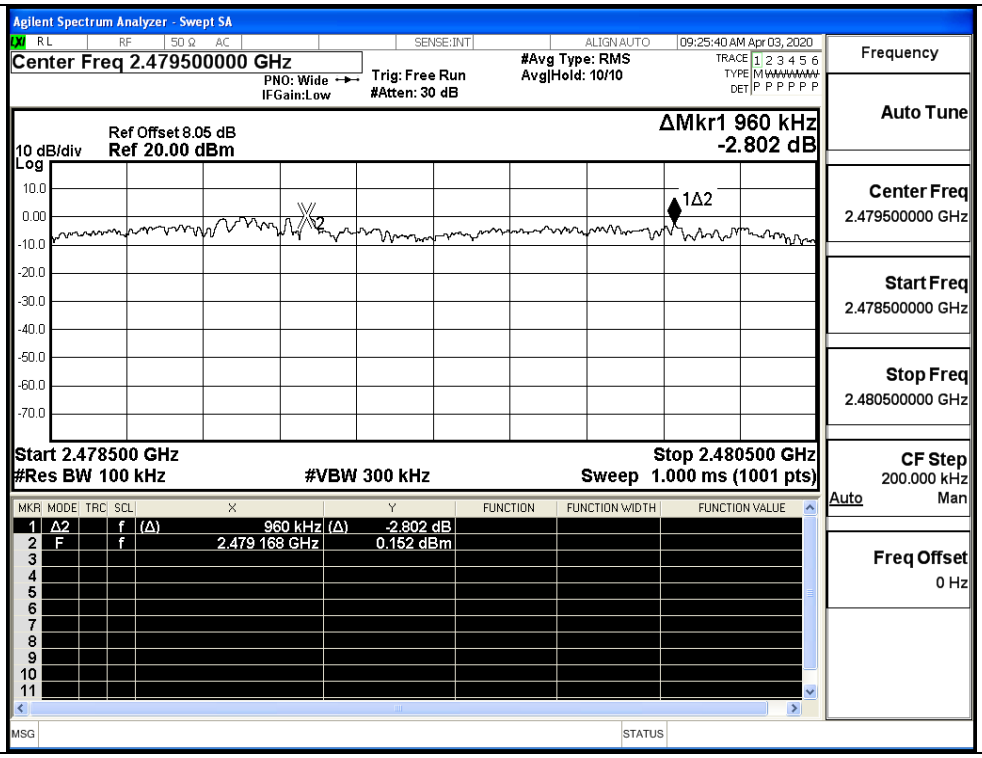
π/4DQPSK/LCH



π/4DQPSK/MCH

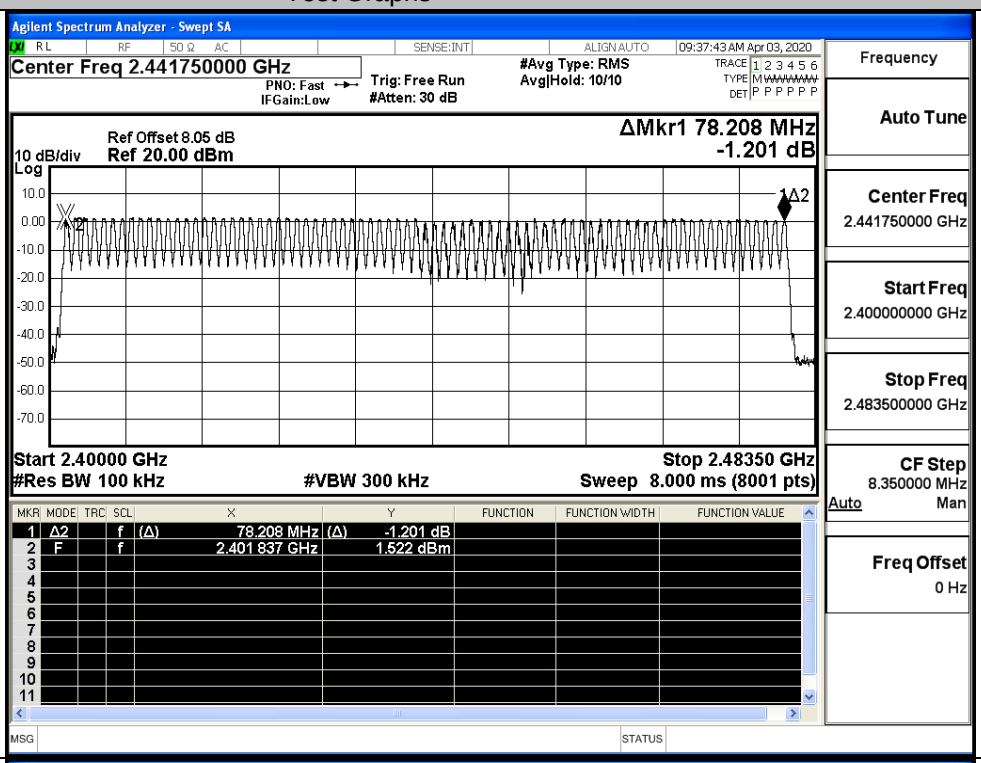
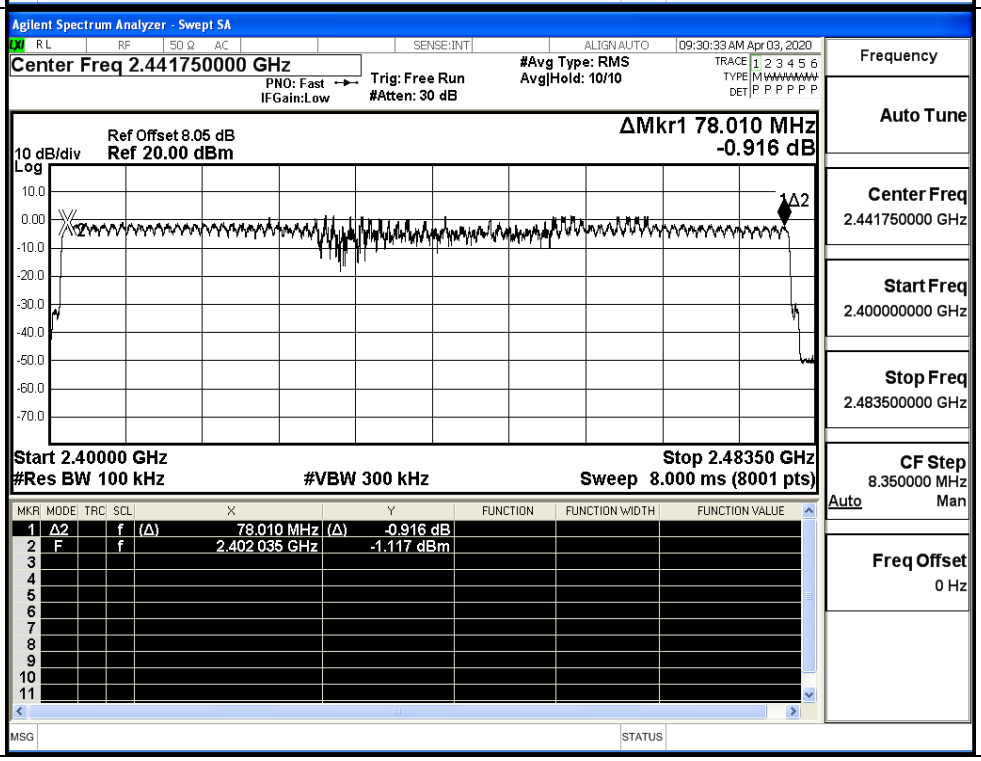


π/4DQPSK/HCH


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
09:25:40 AM Apr 03, 2020
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 960 kHz
-2.802 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) 960 kHz (Δ) -2.802 dB
2 F f 2.479 168 GHz 0.152 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

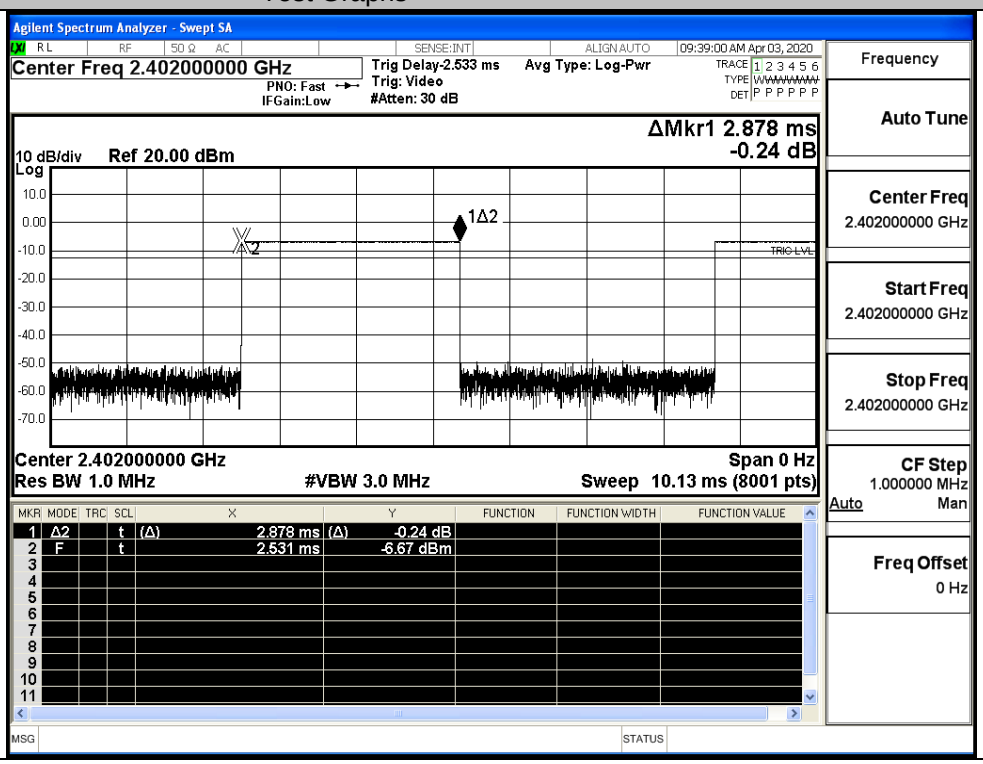
A.4 Hopping Channel Number

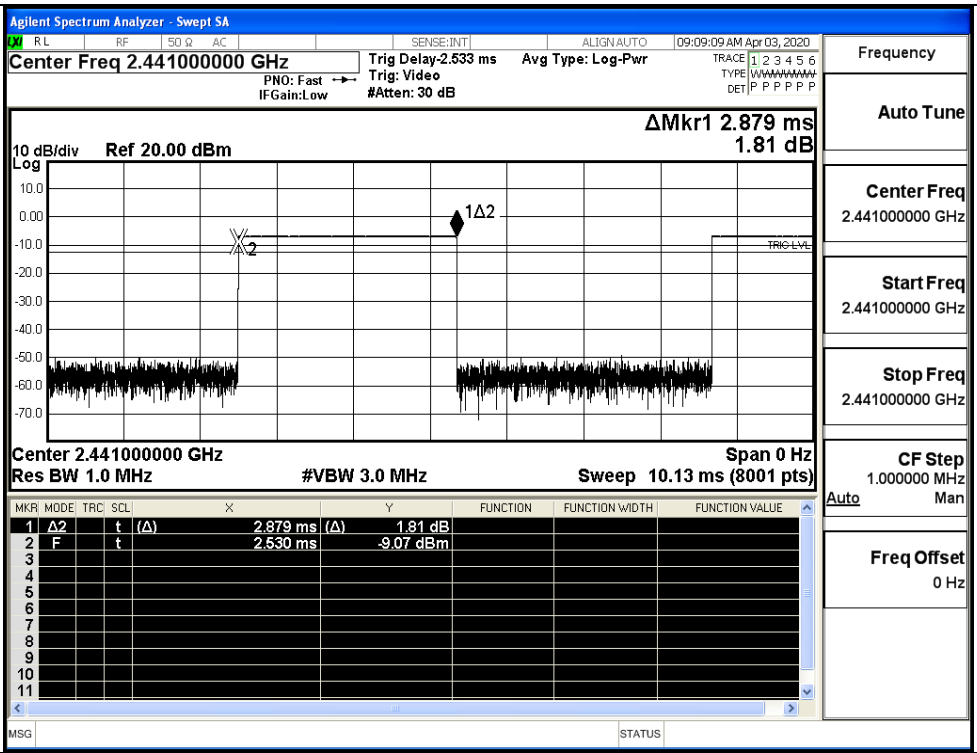
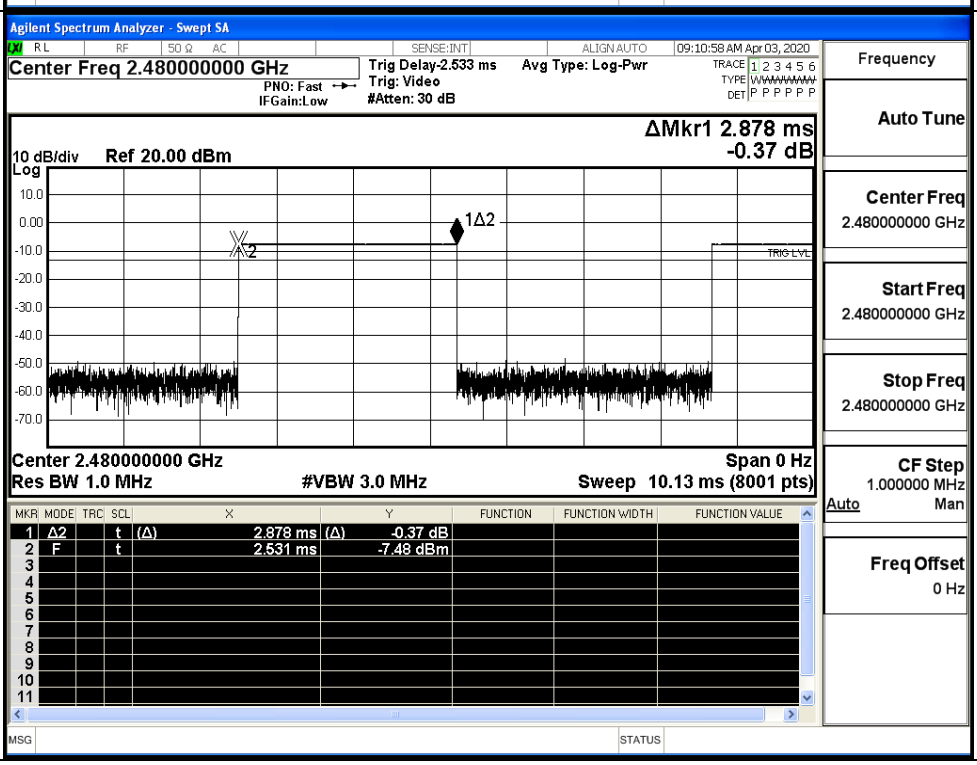
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS

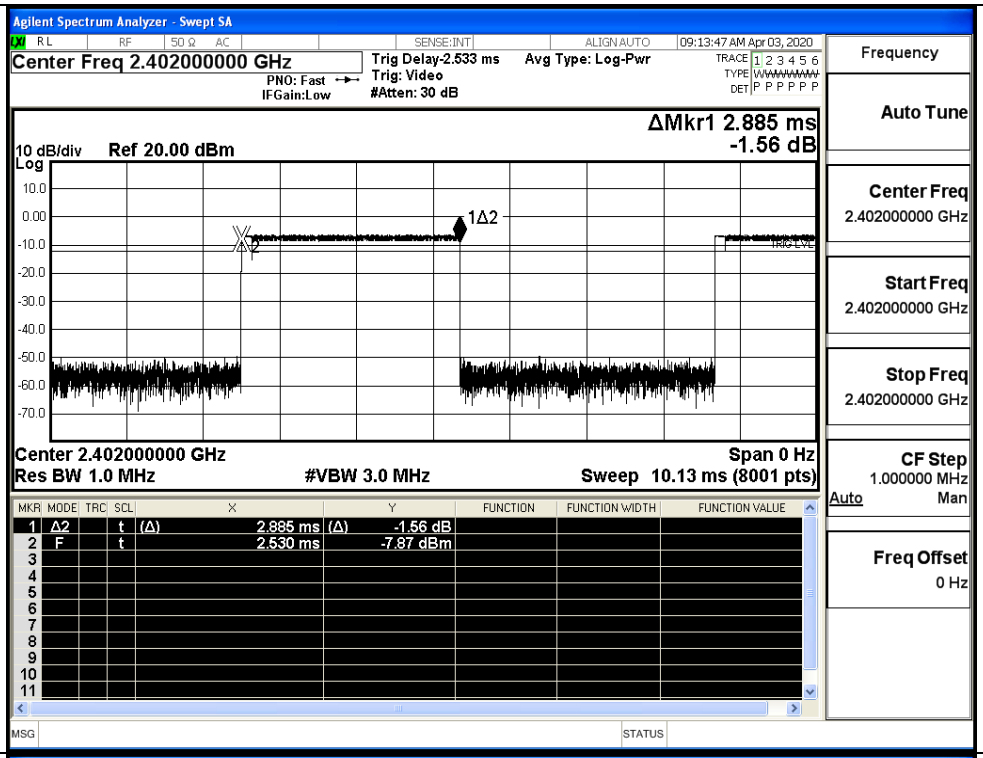
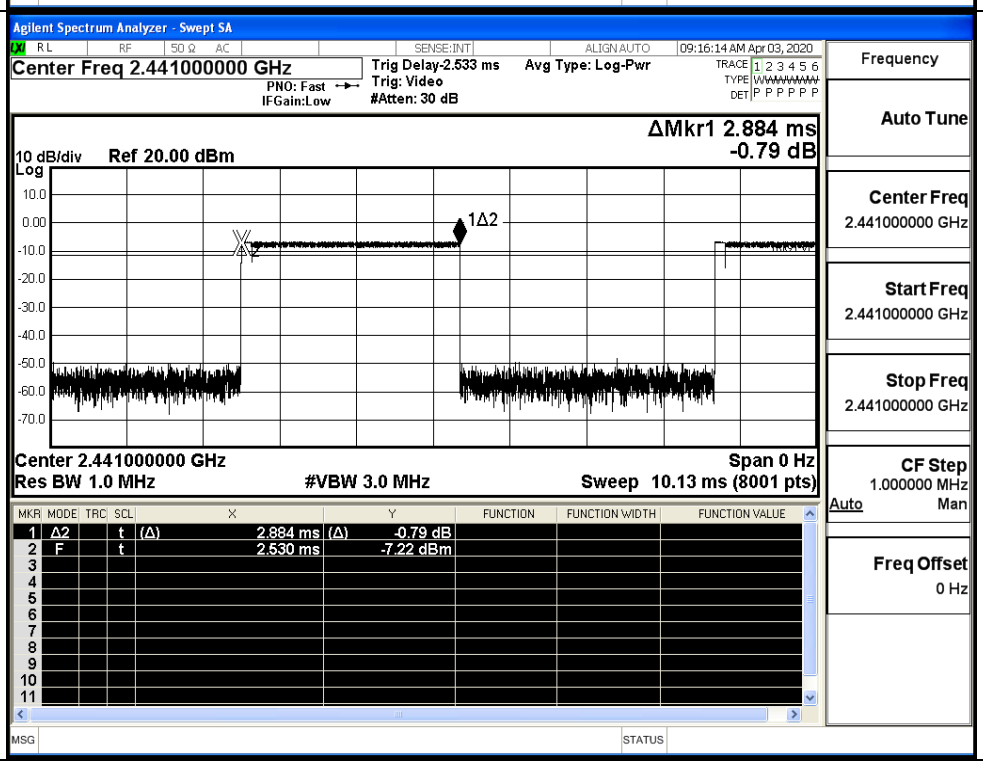
Test Graphs	
GFSK/Hop	
π/4DQPSK/Hop	

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	0.308	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

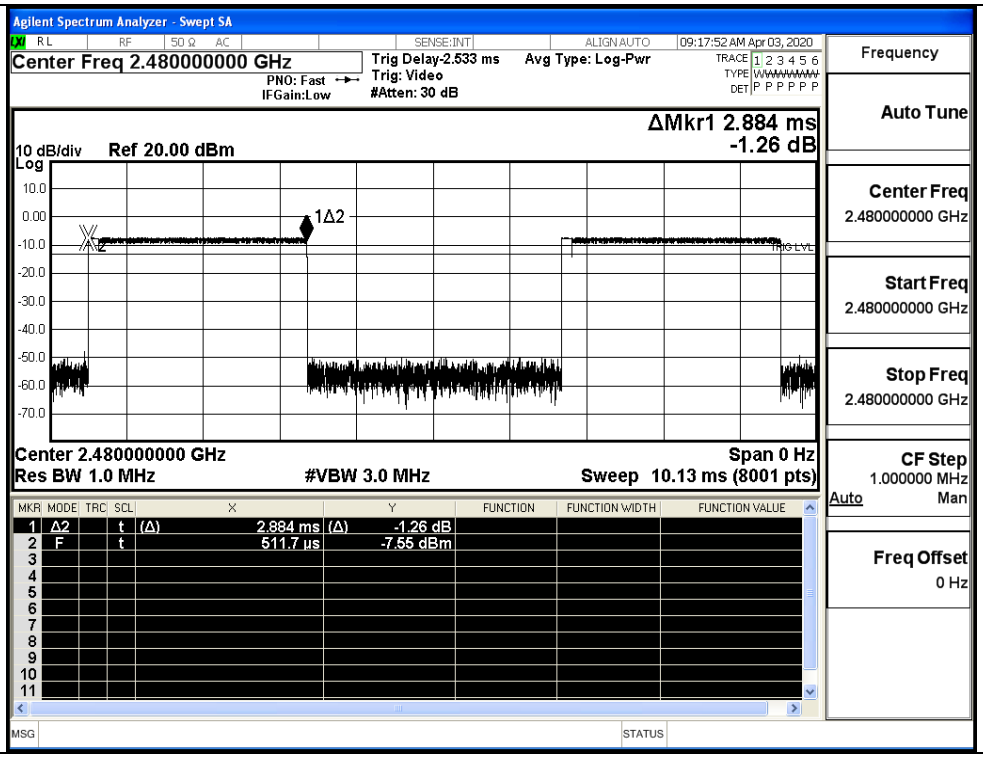
Test Graphs	
GFSK_DH5/LCH	

GFSK_DH5/MCH	
GFSK_DH5/HCH	

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

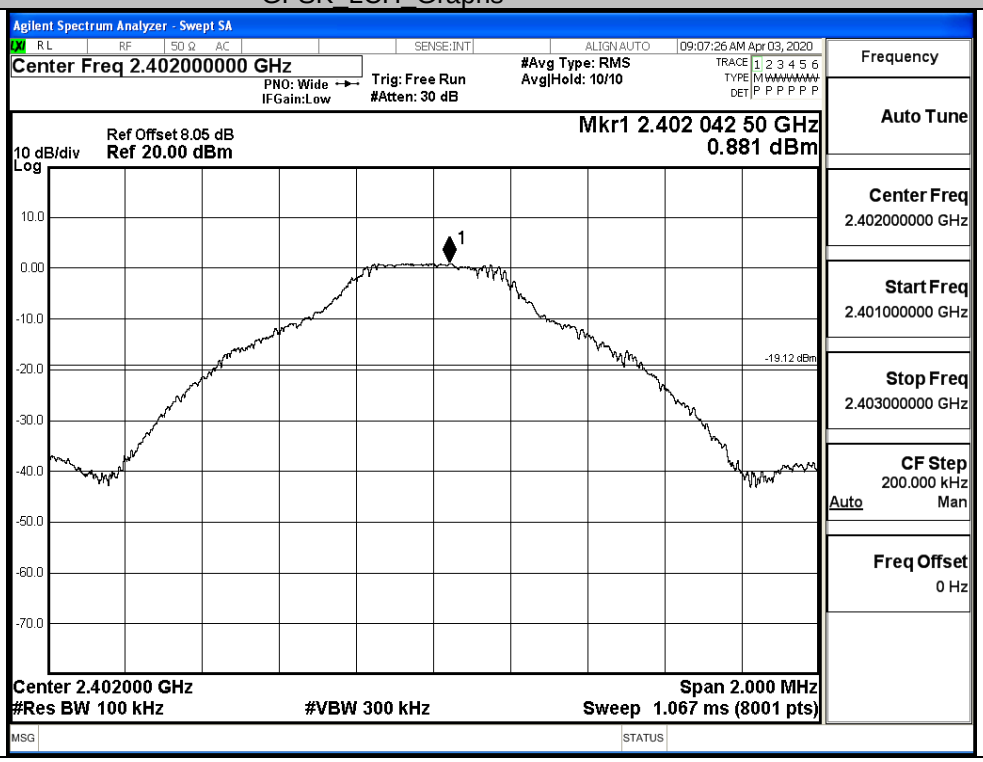
π/4DQPSK

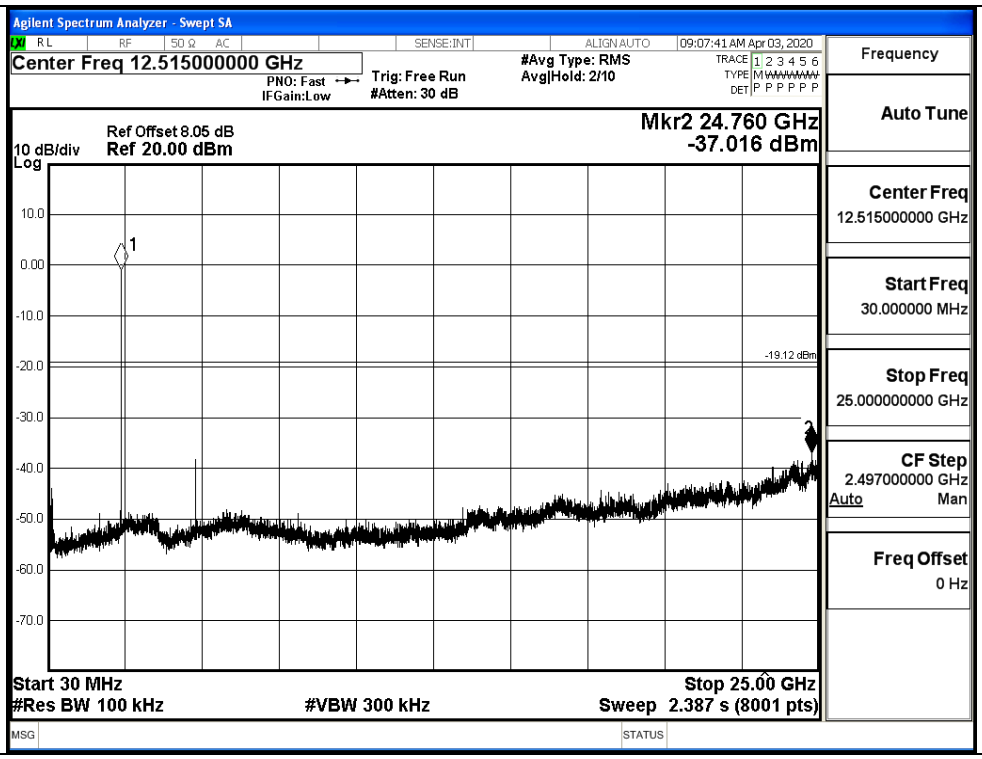
_2DH5/HCH



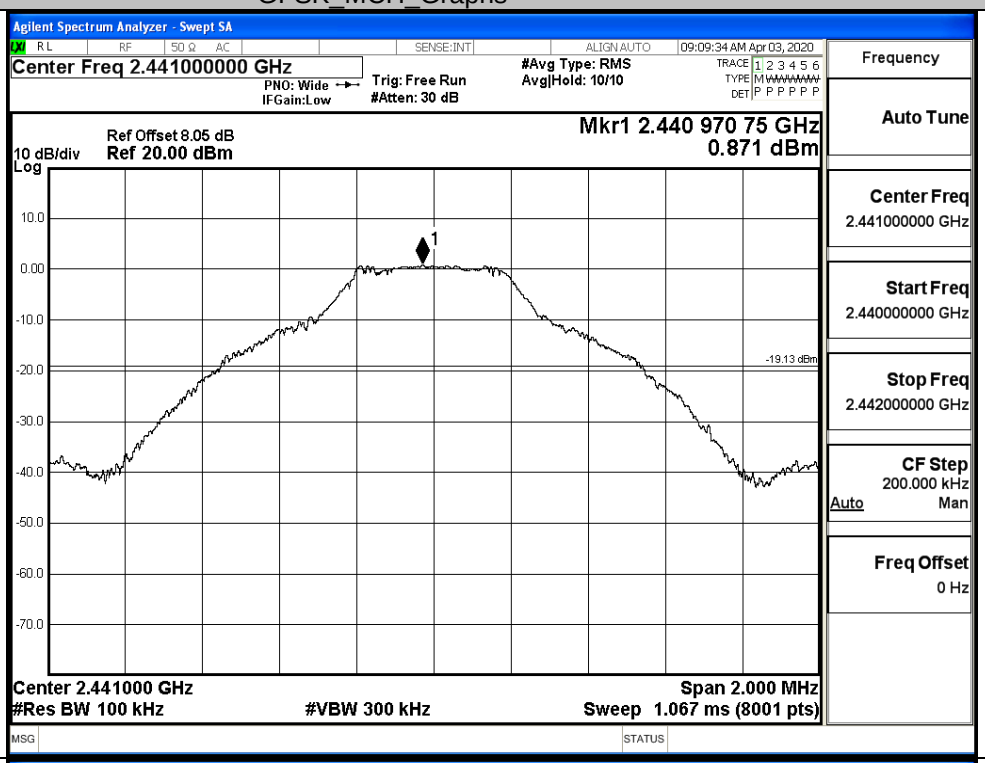
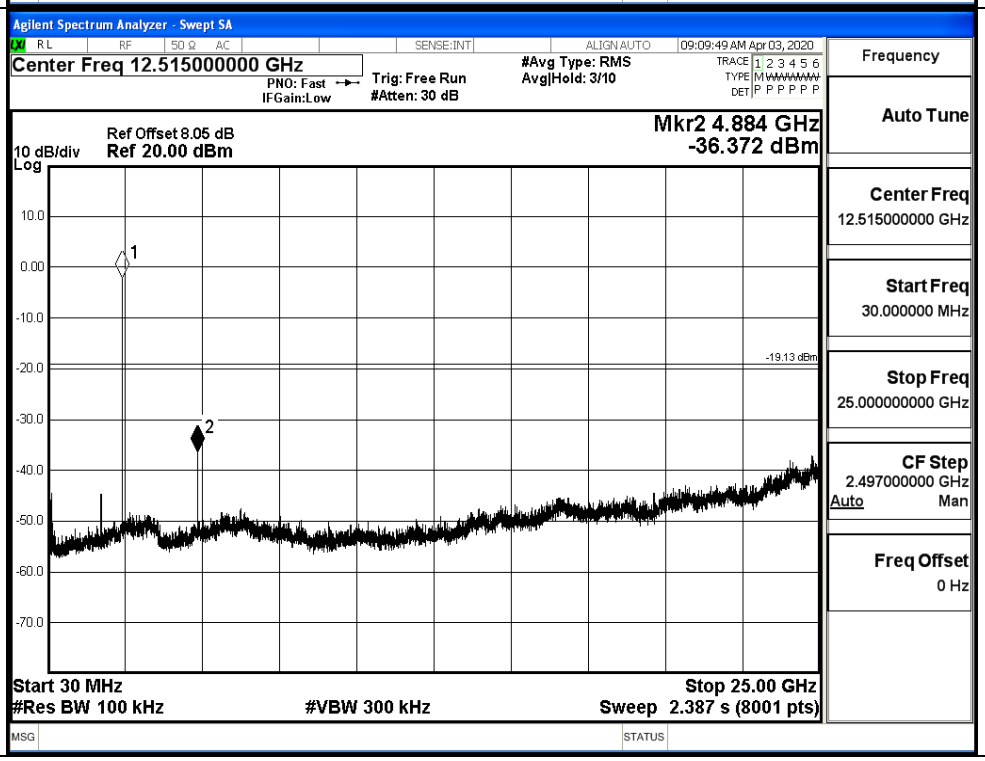
A.6 RF Conducted Spurious Emissions

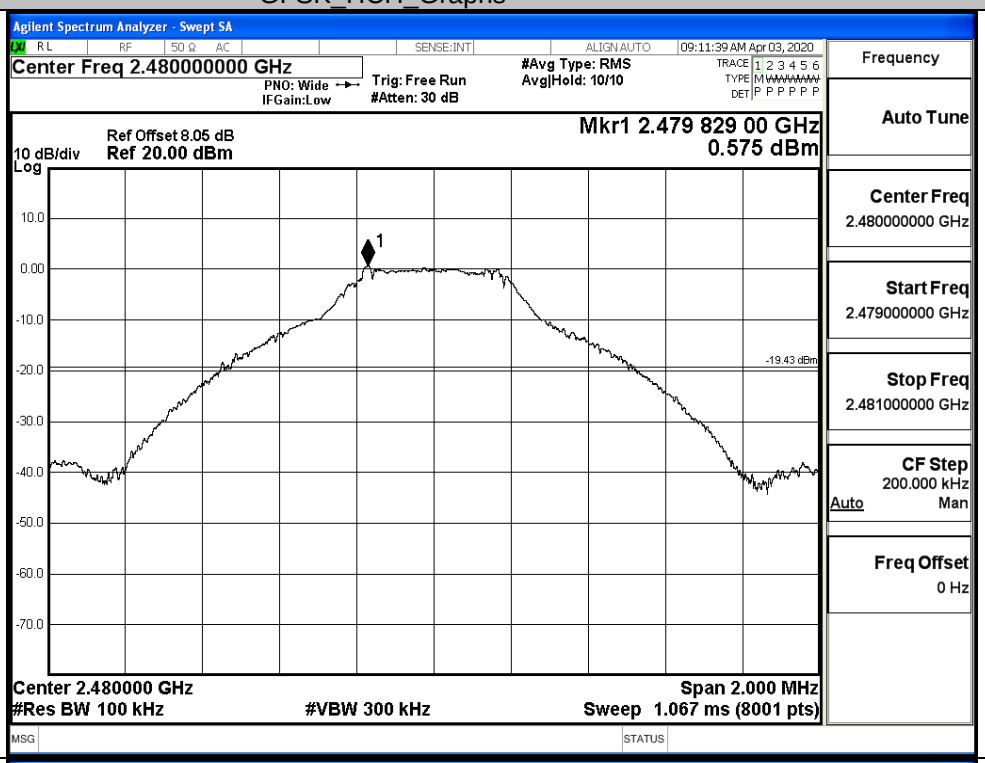
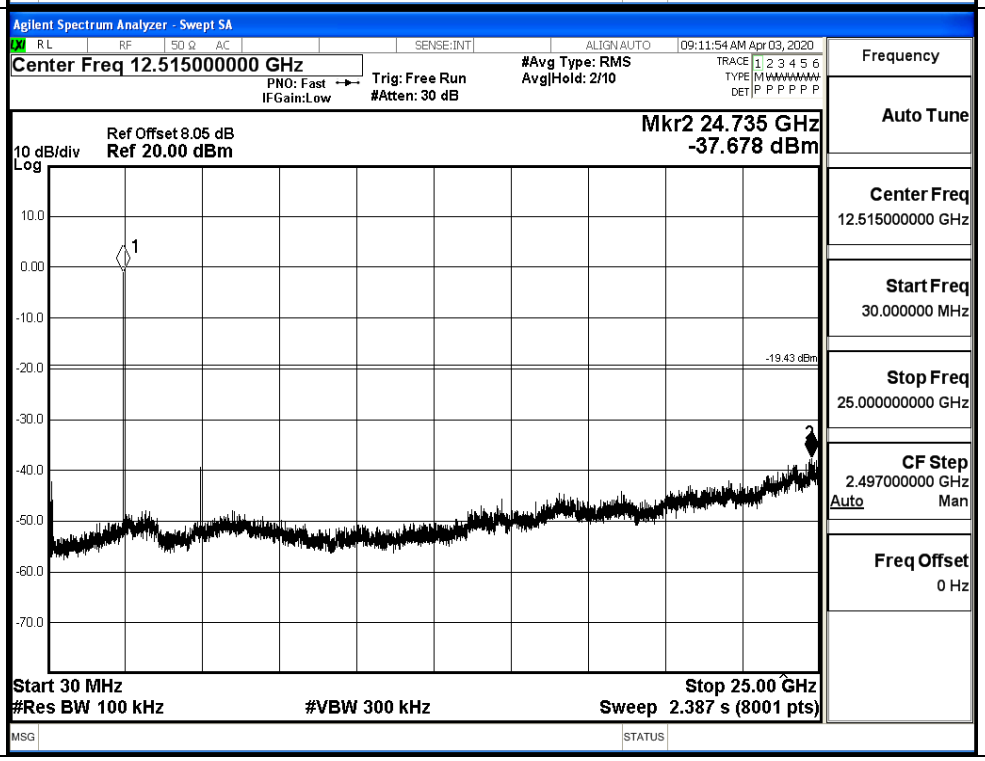
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.881	-37.016	-19.119	PASS
	MCH	0.871	-36.372	-19.129	PASS
	HCH	0.575	-37.678	-19.425	PASS
π/4DQPSK	LCH	1.371	-37.427	-18.629	PASS
	MCH	0.582	-37.385	-19.418	PASS
	HCH	0.462	-37.735	-19.538	PASS

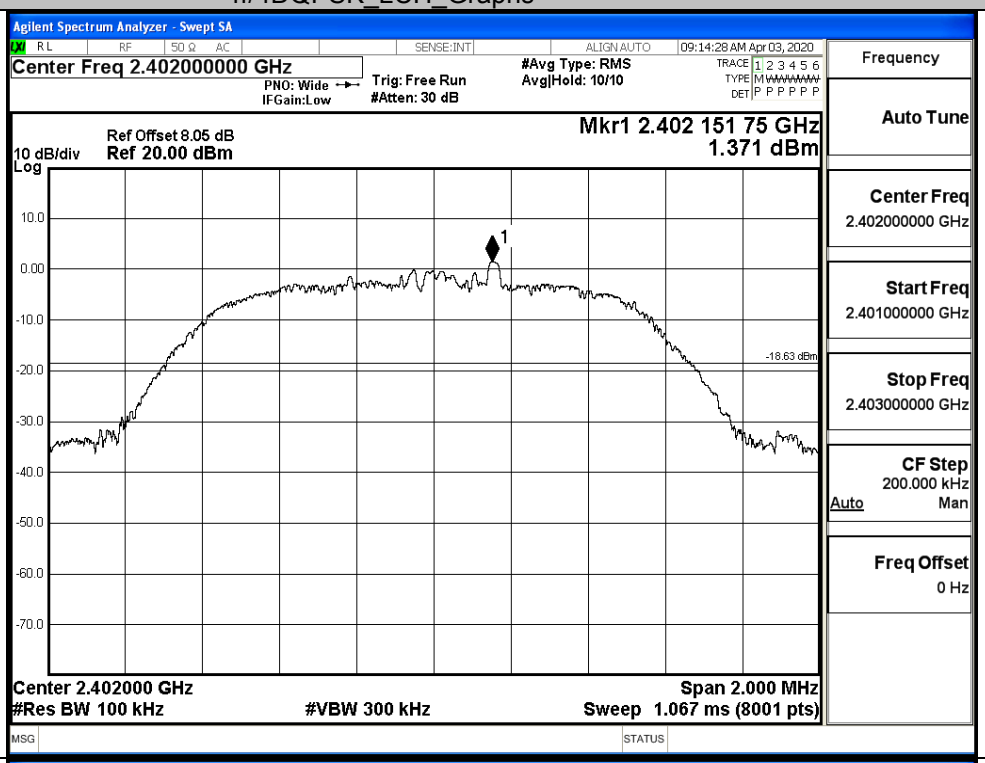
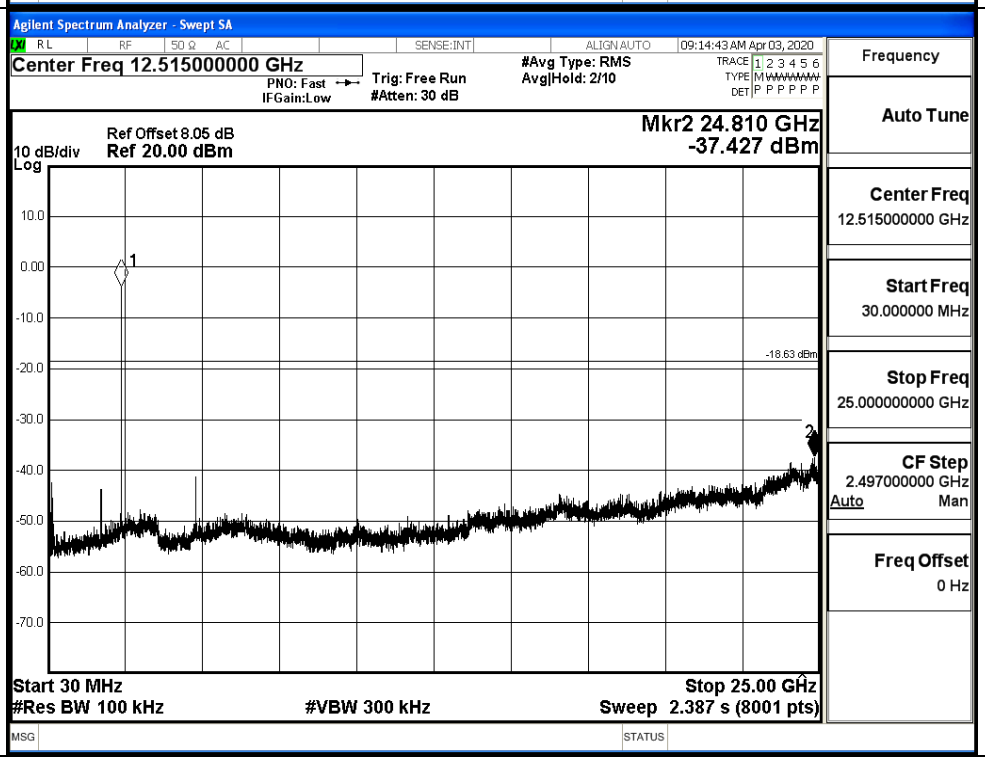
GFSK_LCH_Graphs		
Pref		

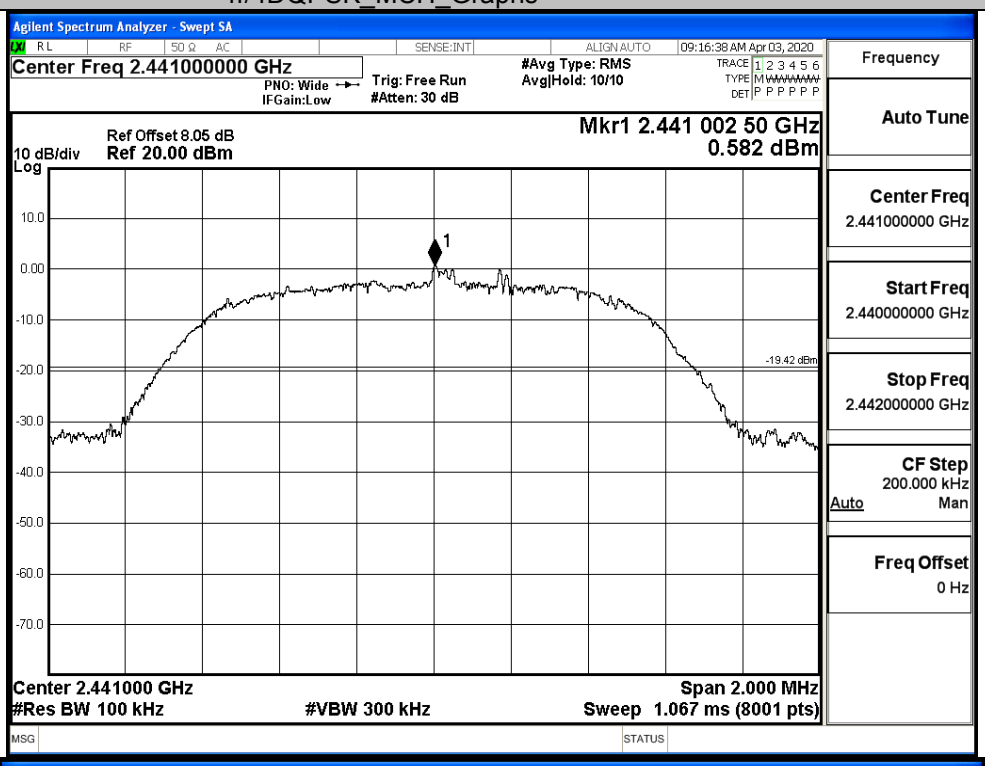
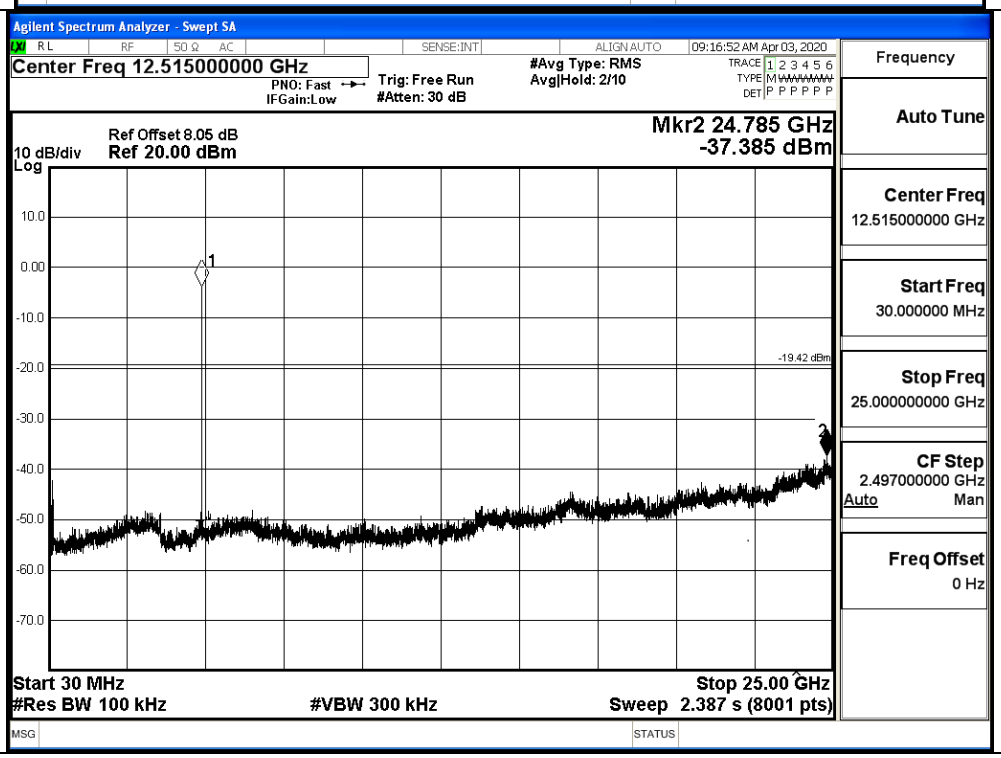
Puw		

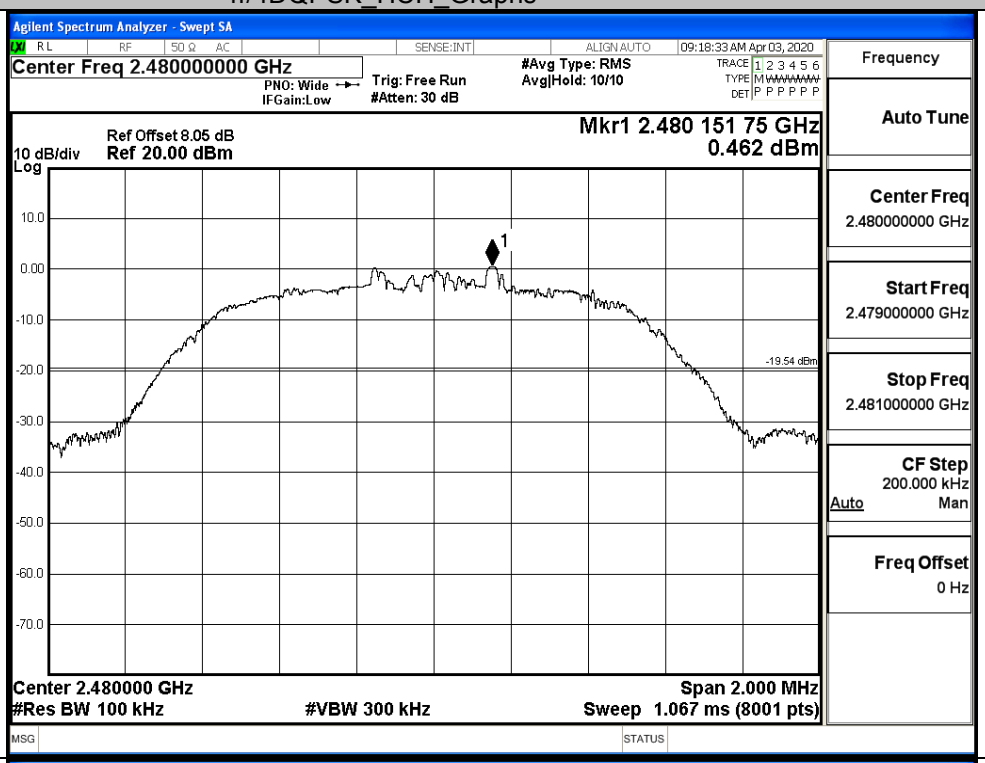
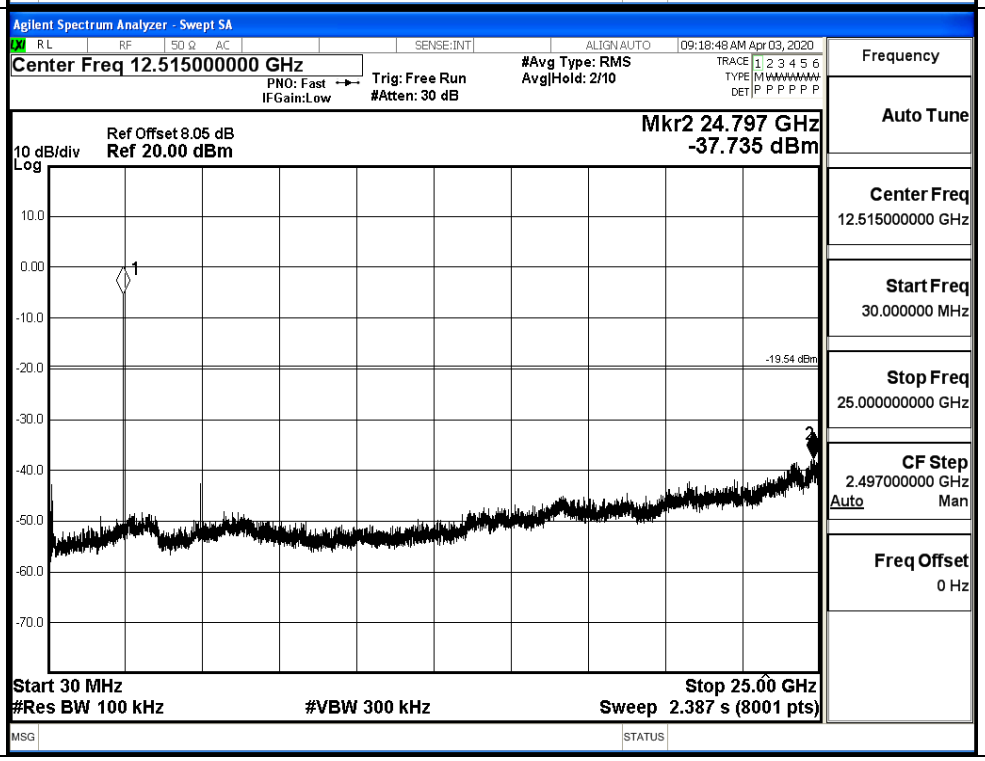
Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 2/10
09:07:41 AM Apr 03, 2020
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr2 24.760 GHz
-37.016 dBm
-19.12 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 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			

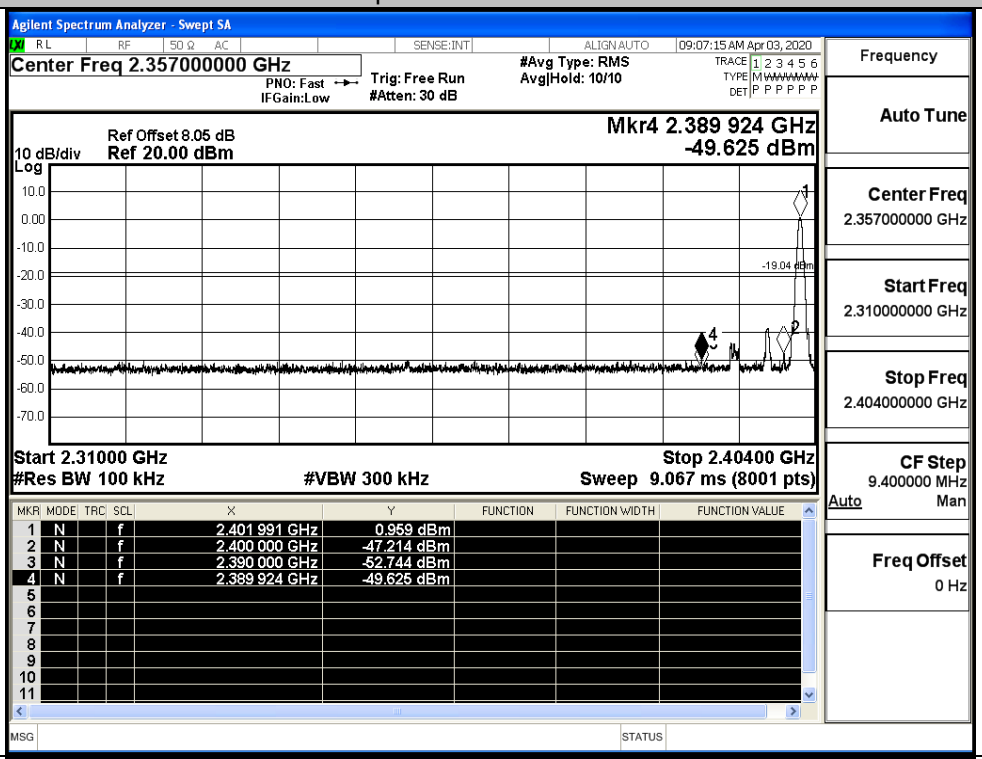
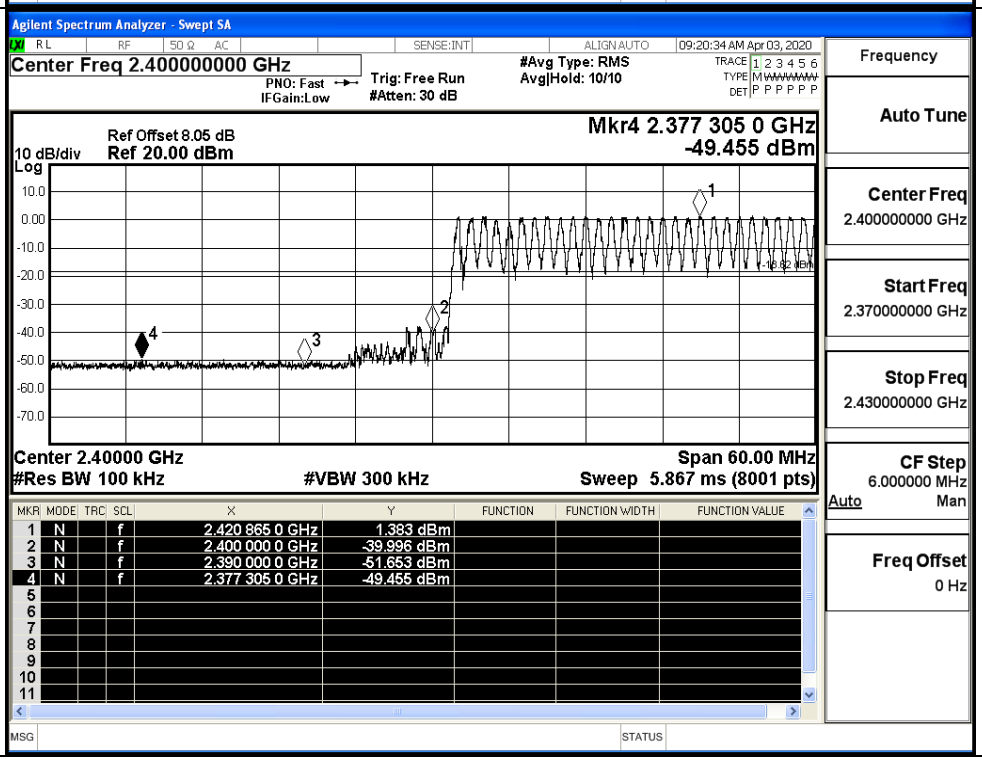
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

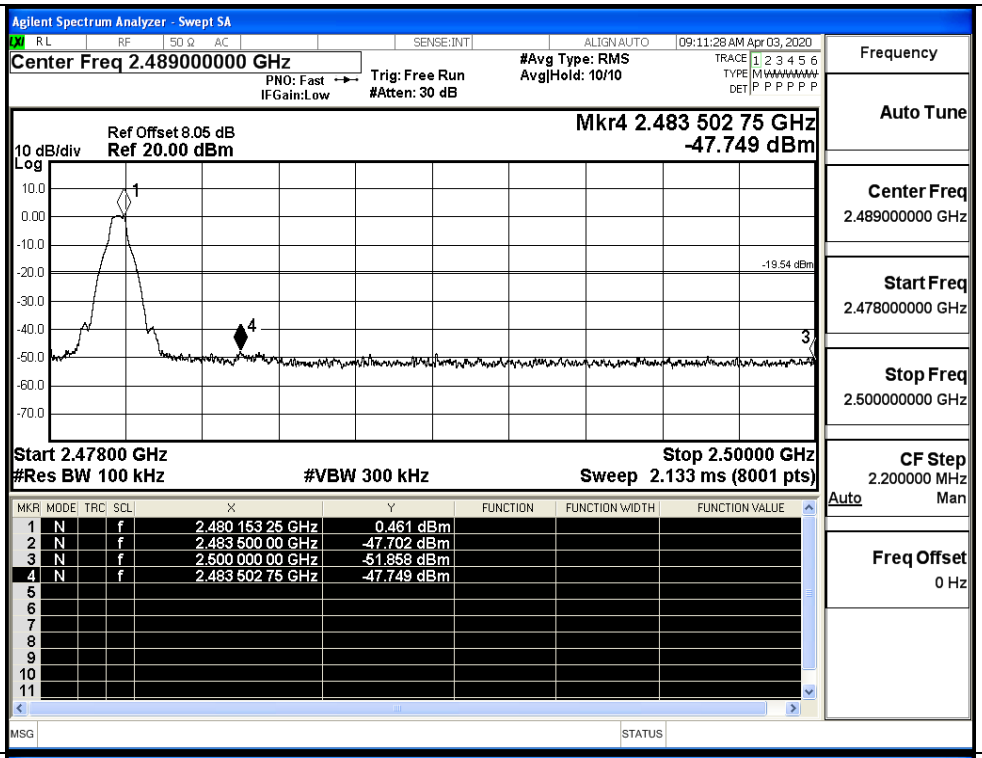
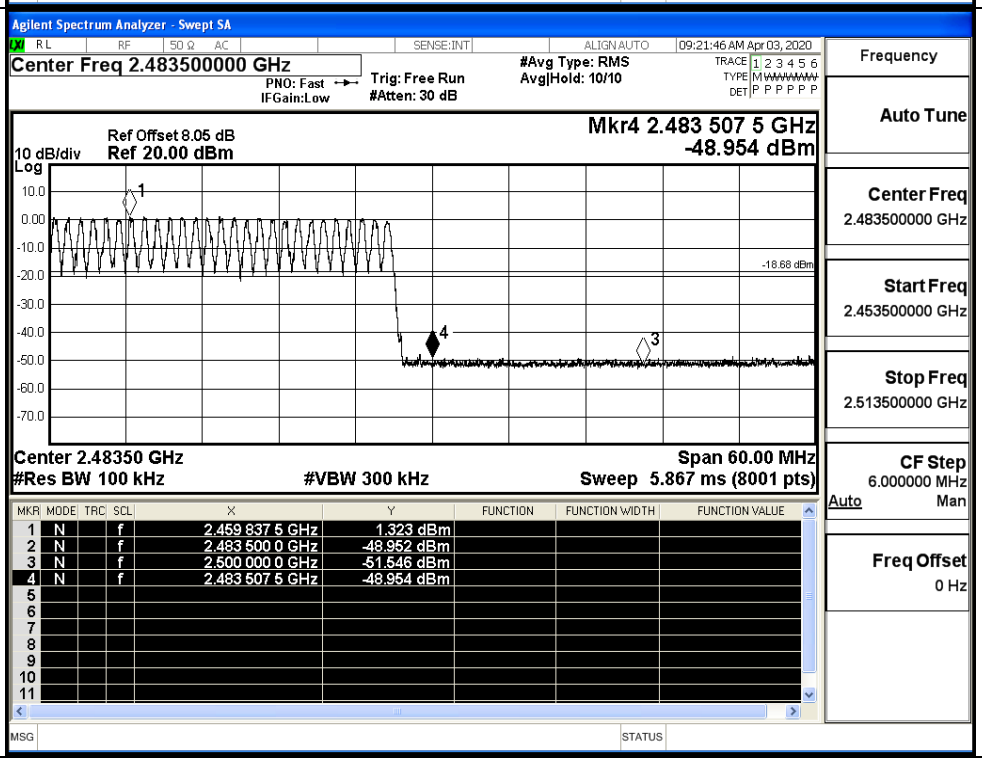
π/4DQPSK_MCH_Graphs		
Pref		
Puw		

π/4DQPSK_HCH_Graphs			
Pref			
Puw			

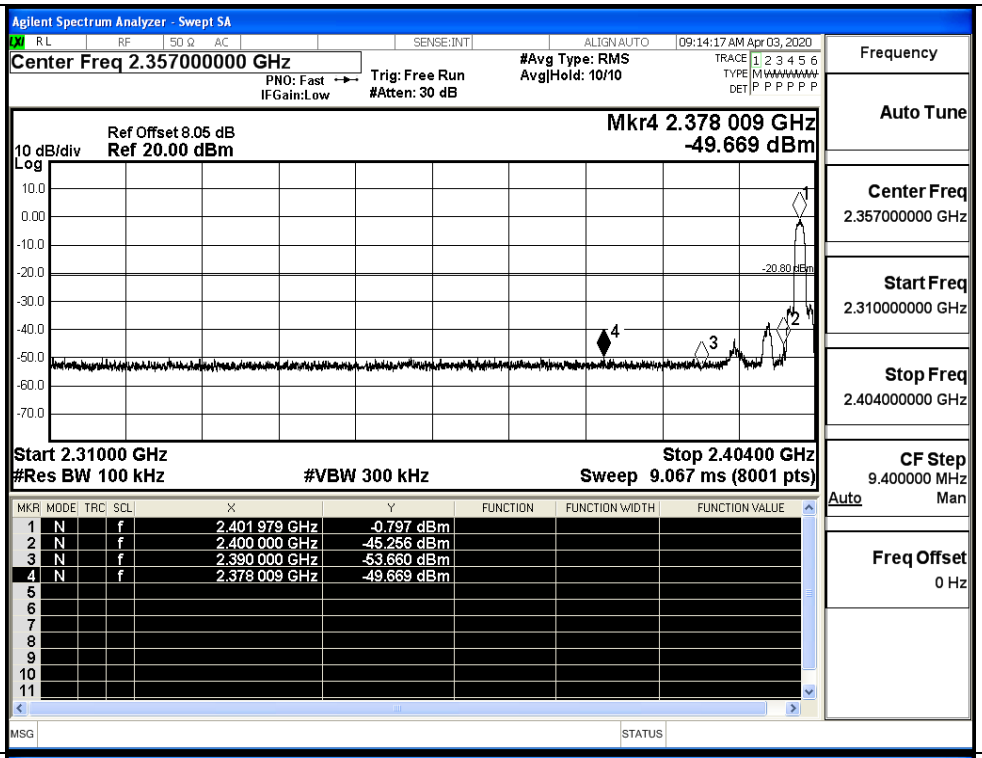
A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.959	Off	-49.625	-19.04	PASS
			1.383	On	-49.455	-18.62	PASS
	HCH	2480	0.461	Off	-47.749	-19.54	PASS
			1.323	On	-48.954	-18.68	PASS
π/4DQPSK	LCH	2402	-0.797	Off	-49.669	-20.8	PASS
			1.550	On	-48.752	-18.45	PASS
	HCH	2480	-1.125	Off	-48.944	-21.13	PASS
			1.149	On	-48.318	-18.85	PASS

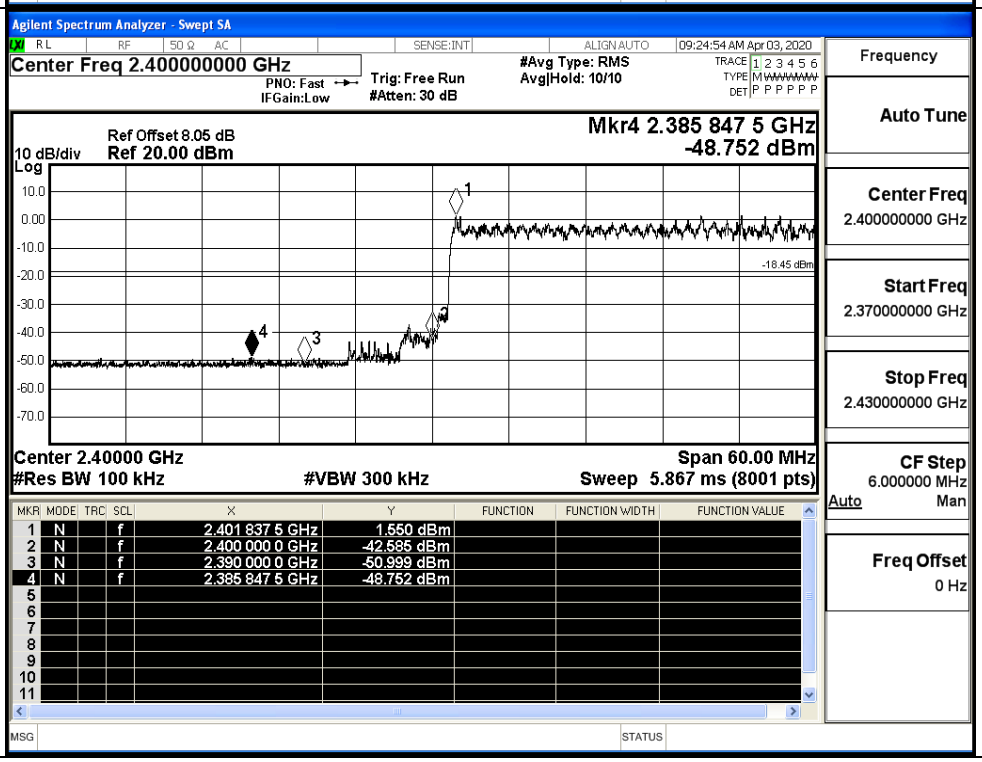
Test Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	

GFSK/HCH/No Hop	
GFSK/HCH/Hop	

π/4DQPSK/LCH/No Hop



π/4DQPSK/LCH/Hop



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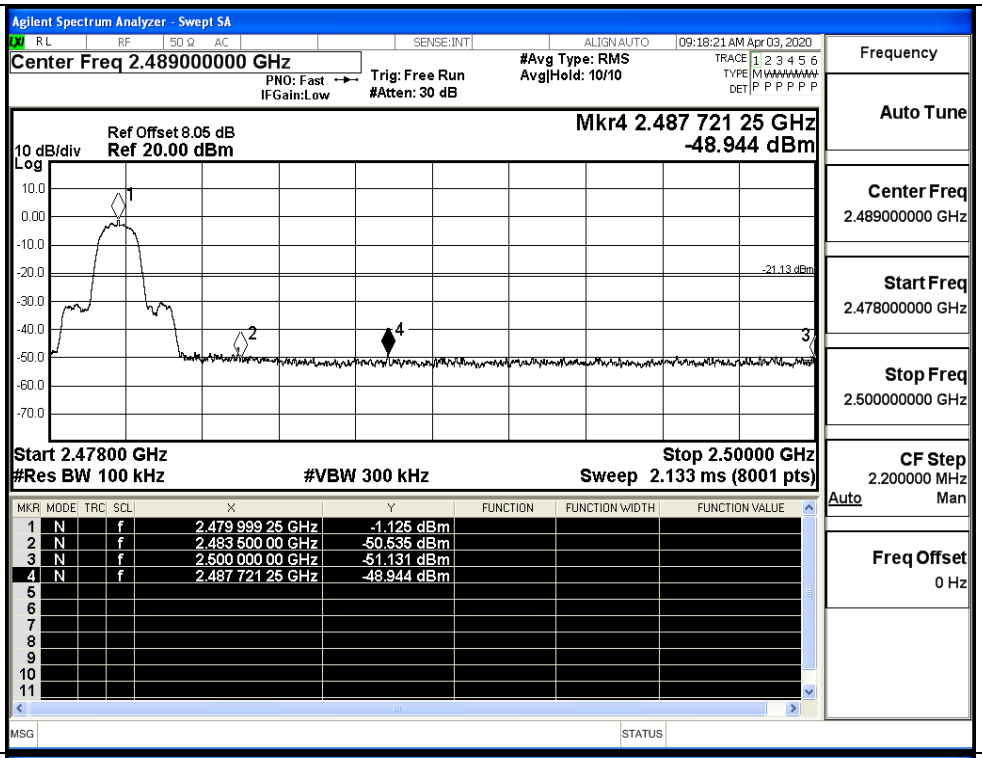

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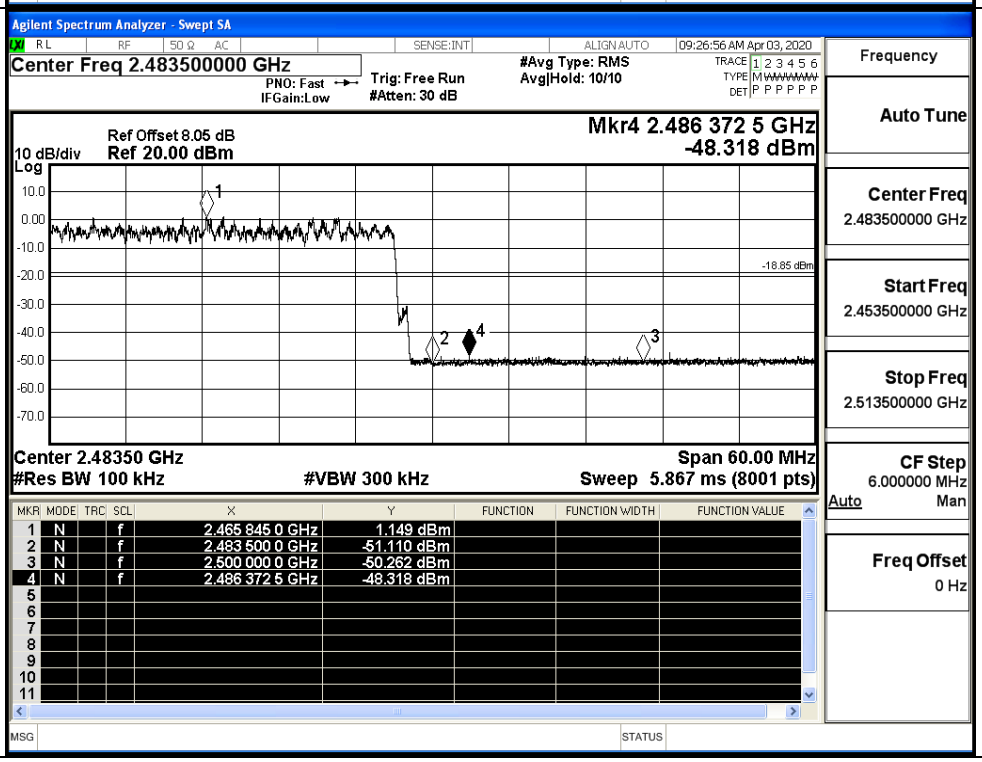
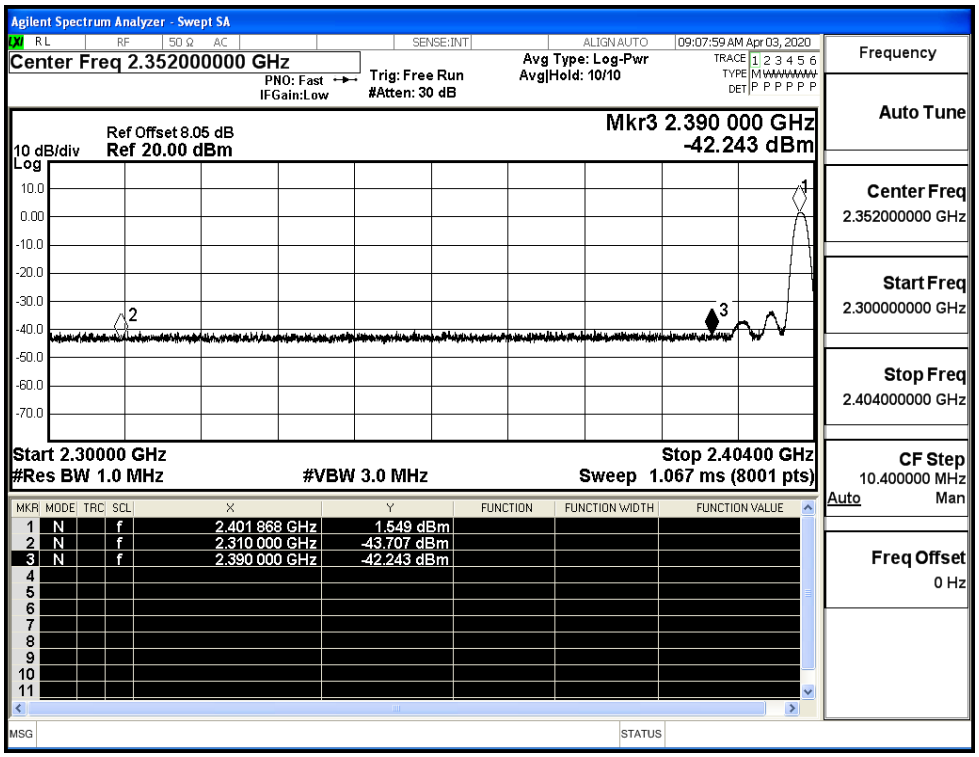


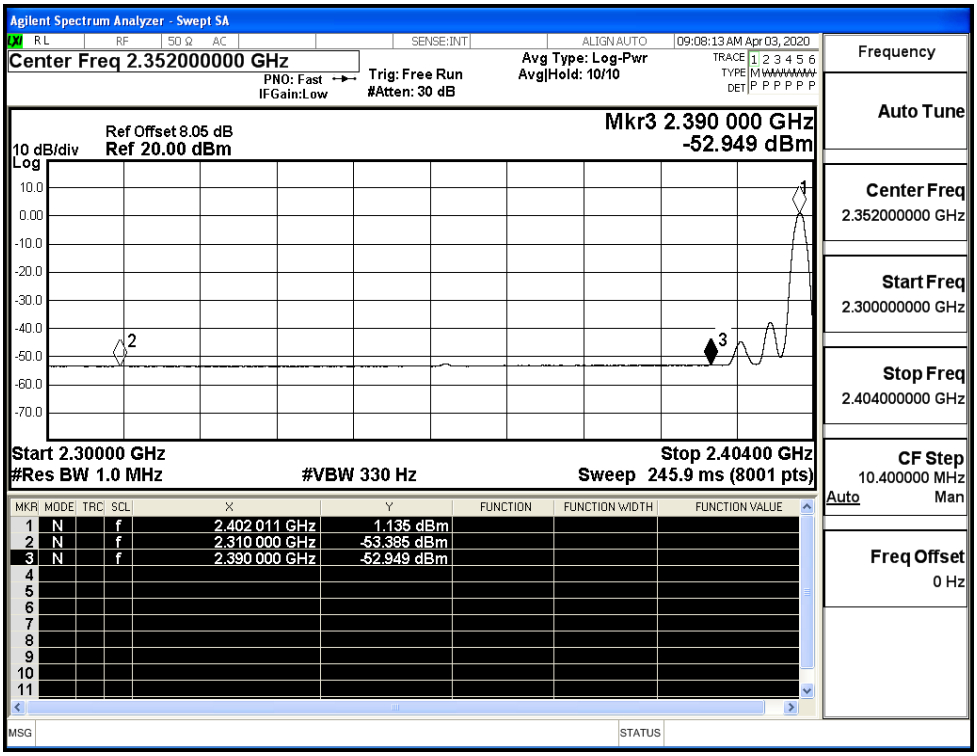
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.71	5.0	0	56.52	PEAK	74	PASS
	Off	2310.0	-53.39	5.0	0	46.84	AV	54	PASS
	Off	2390.0	-42.24	5.0	0	57.99	PEAK	74	PASS
	Off	2390.0	-52.95	5.0	0	47.28	AV	54	PASS
	Off	2483.5	-40.35	5.0	0	59.88	PEAK	74	PASS
	Off	2483.5	-49.93	5.0	0	50.30	AV	54	PASS
	Off	2500.0	-42.75	5.0	0	57.48	PEAK	74	PASS
	Off	2500.0	-52.33	5.0	0	47.90	AV	54	PASS
π/4DQPSK	Off	2310.0	-42.12	5.0	0	58.11	PEAK	74	PASS
	Off	2310.0	-53.39	5.0	0	46.84	AV	54	PASS
	Off	2390.0	-44.00	5.0	0	56.23	PEAK	74	PASS
	Off	2390.0	-53.01	5.0	0	47.22	AV	54	PASS
	Off	2483.5	-41.89	5.0	0	58.34	PEAK	74	PASS
	Off	2483.5	-50.86	5.0	0	49.37	AV	54	PASS
	Off	2500.0	-42.27	5.0	0	57.96	PEAK	74	PASS
	Off	2500.0	-52.37	5.0	0	47.86	AV	54	PASS

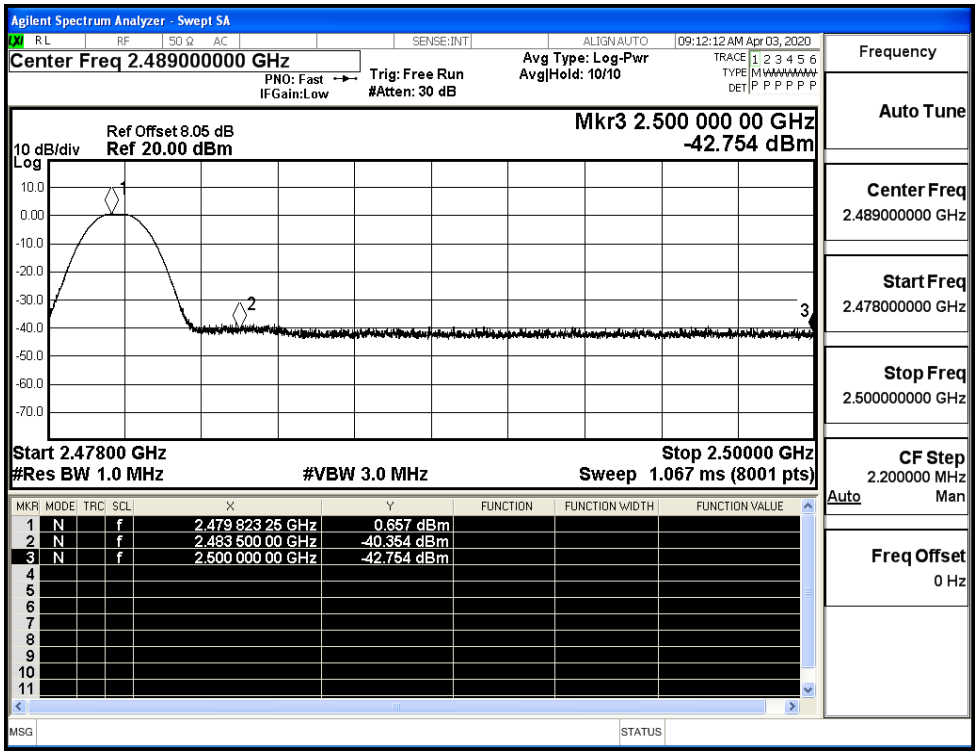
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



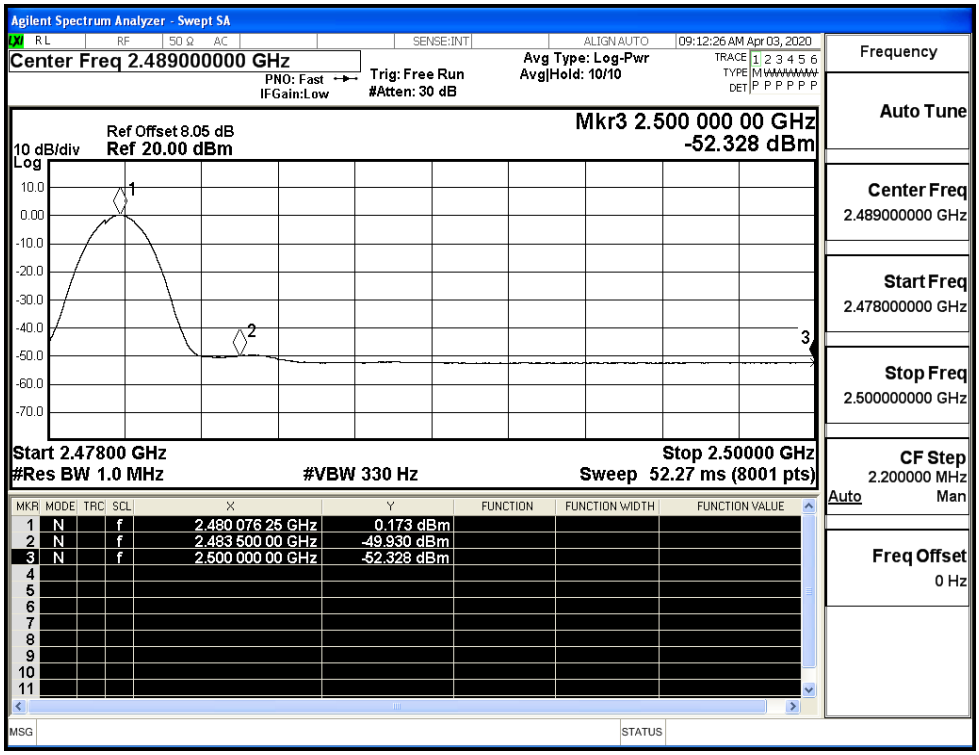
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



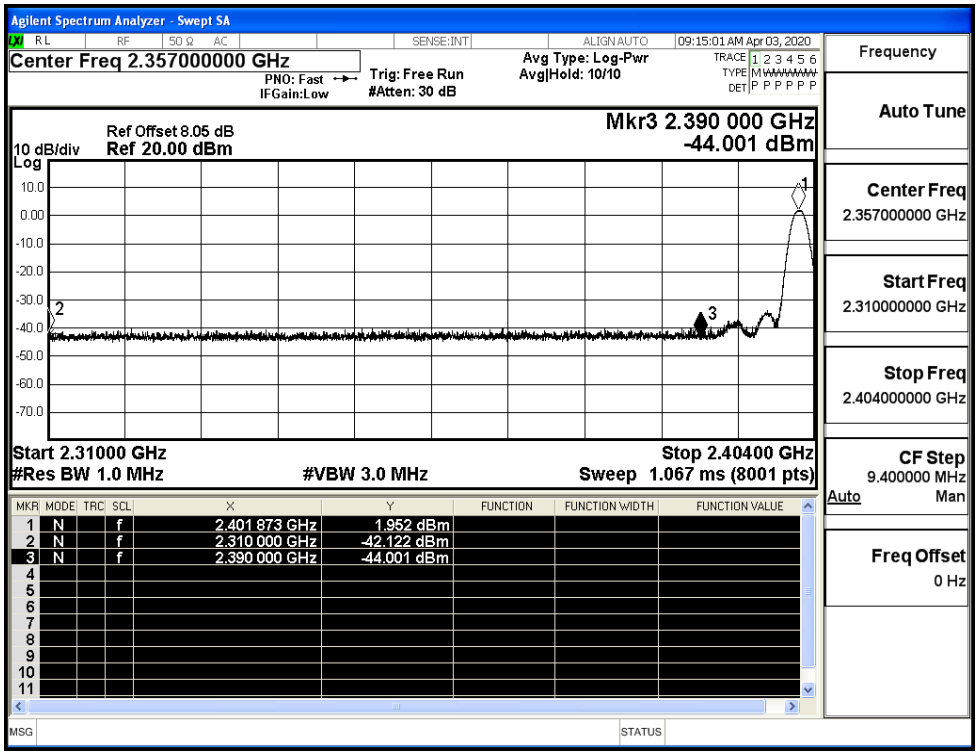
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



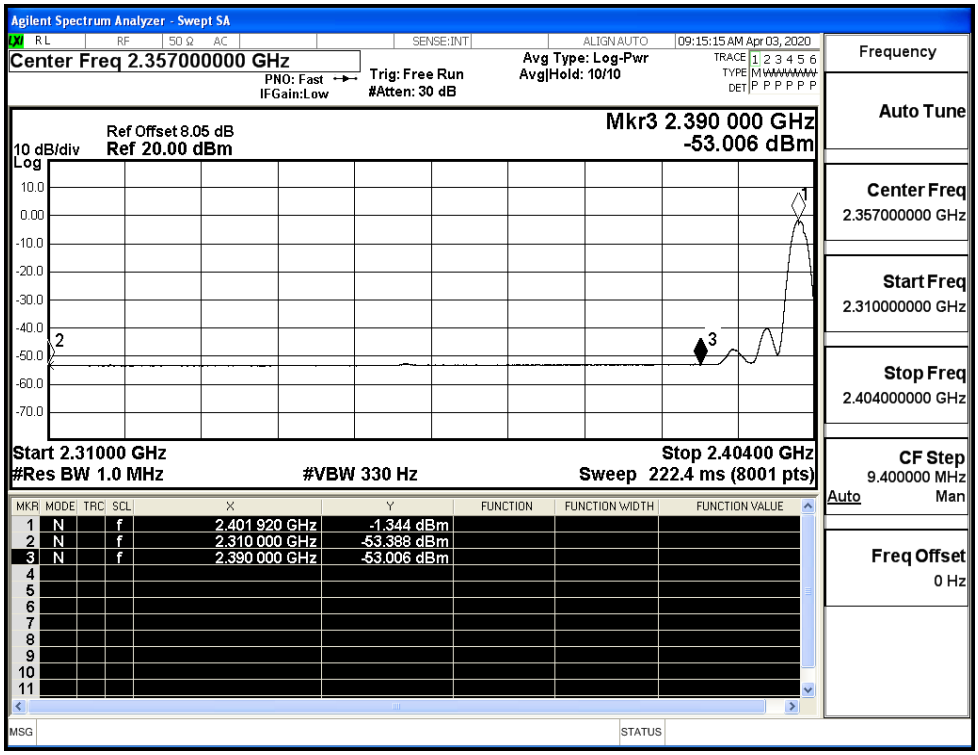
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



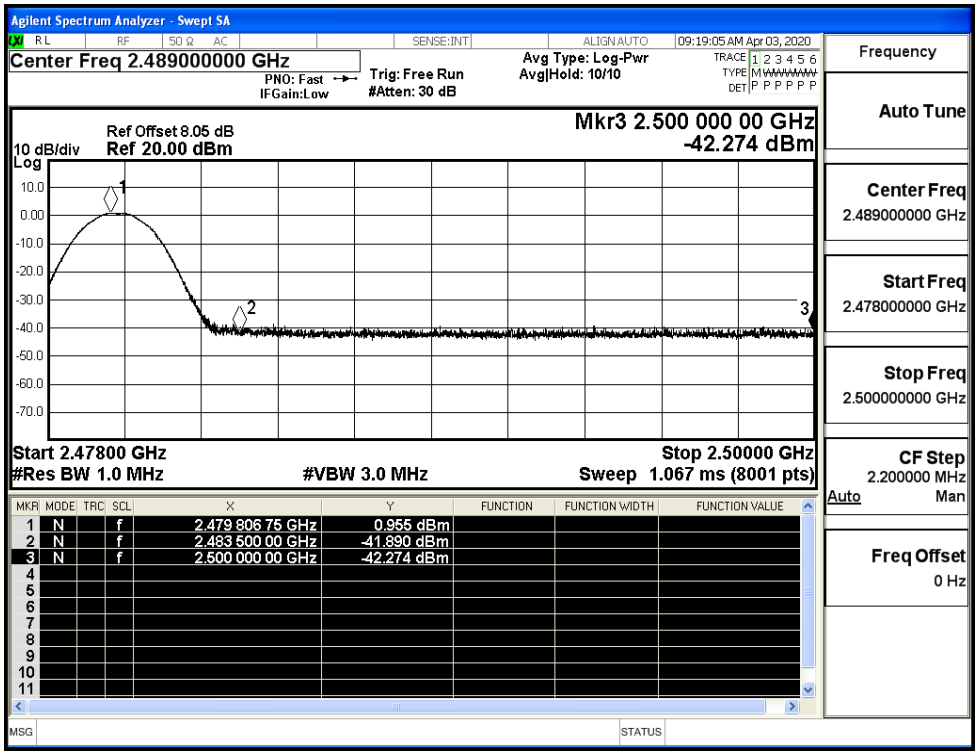
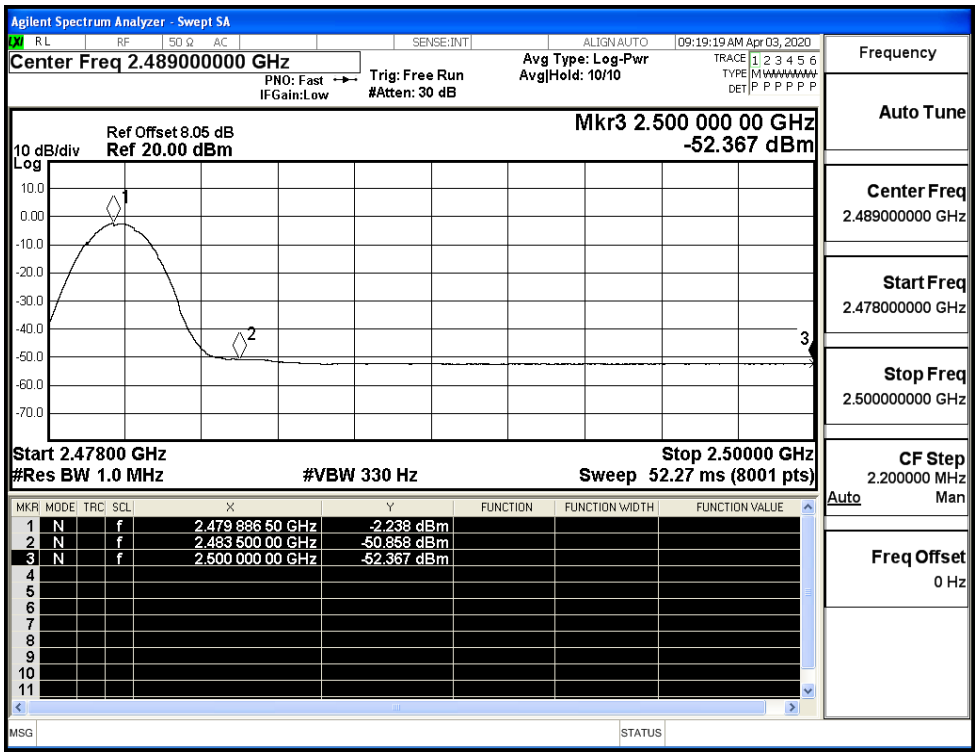
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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)