Appendix A

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

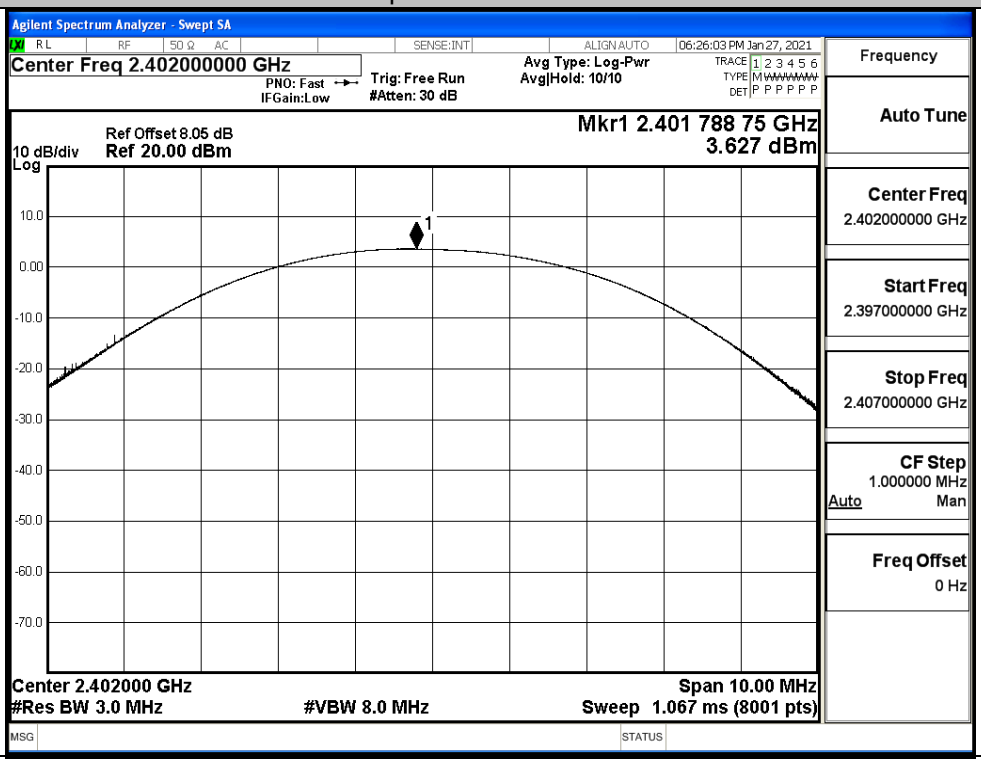
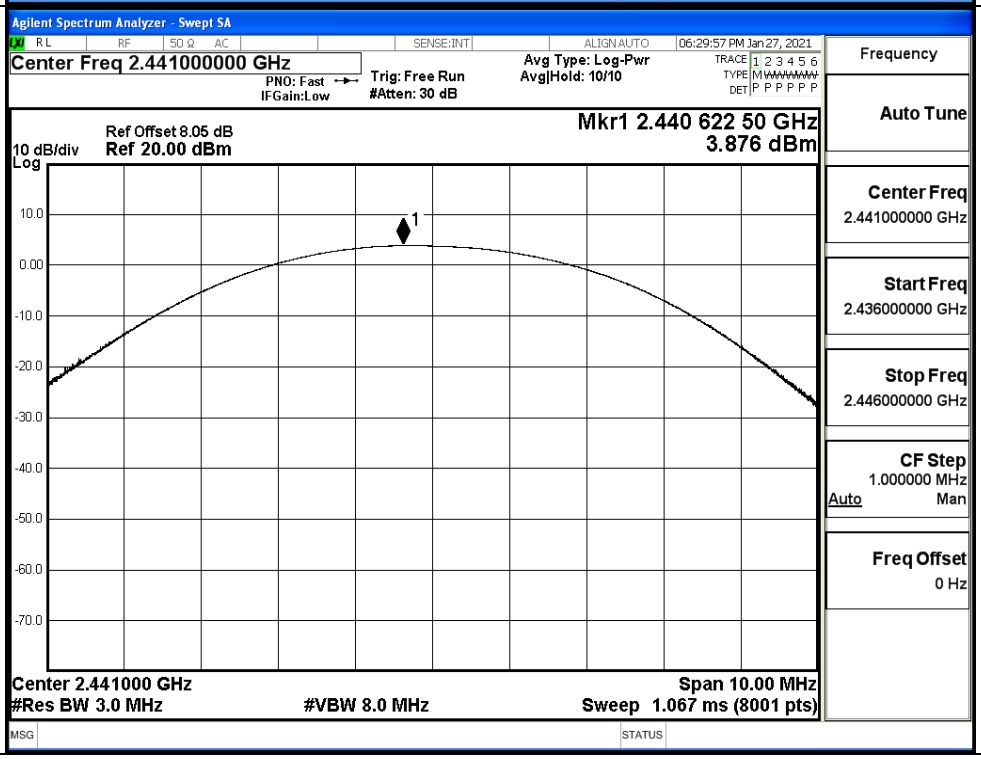
Product Name: CD+G/MP3+G KARAOKE PLAYER WITH BLUETOOTH
Trade Mark: singing machine
Test Model: SML385UBK

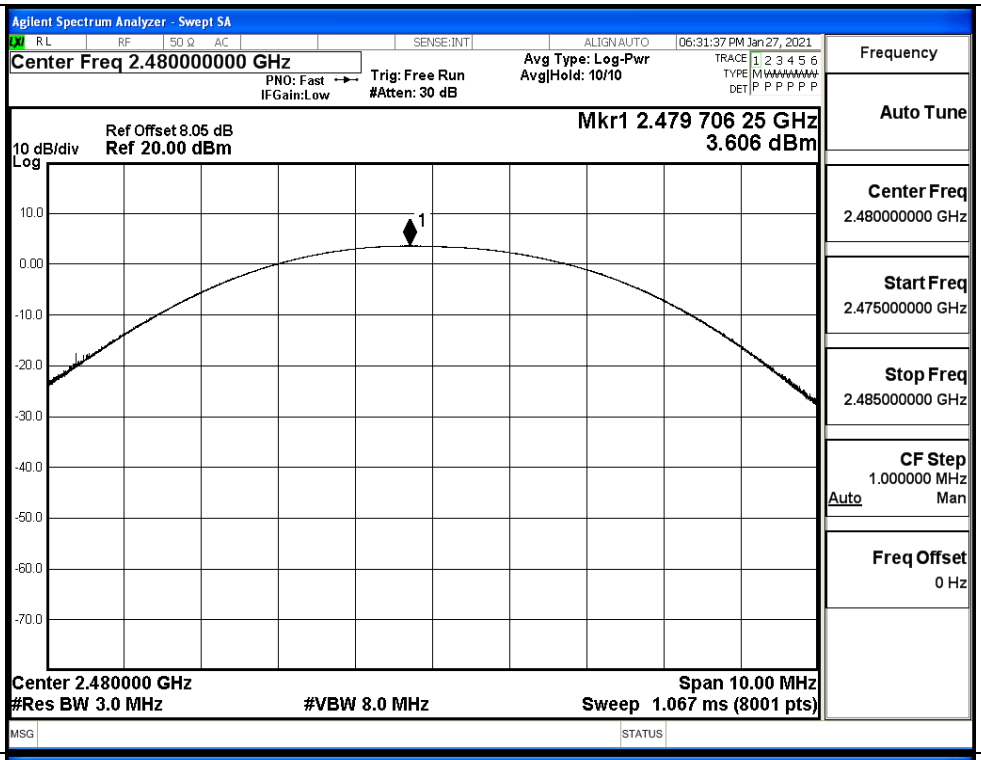
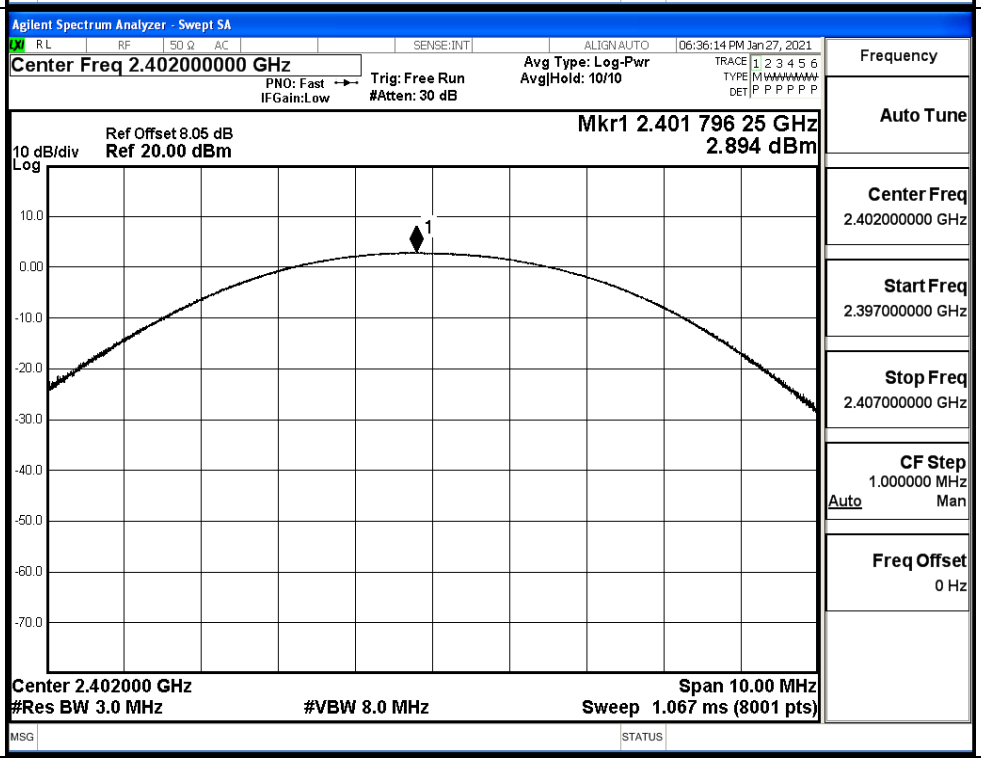
Environmental Conditions

Temperature:	24.6° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan

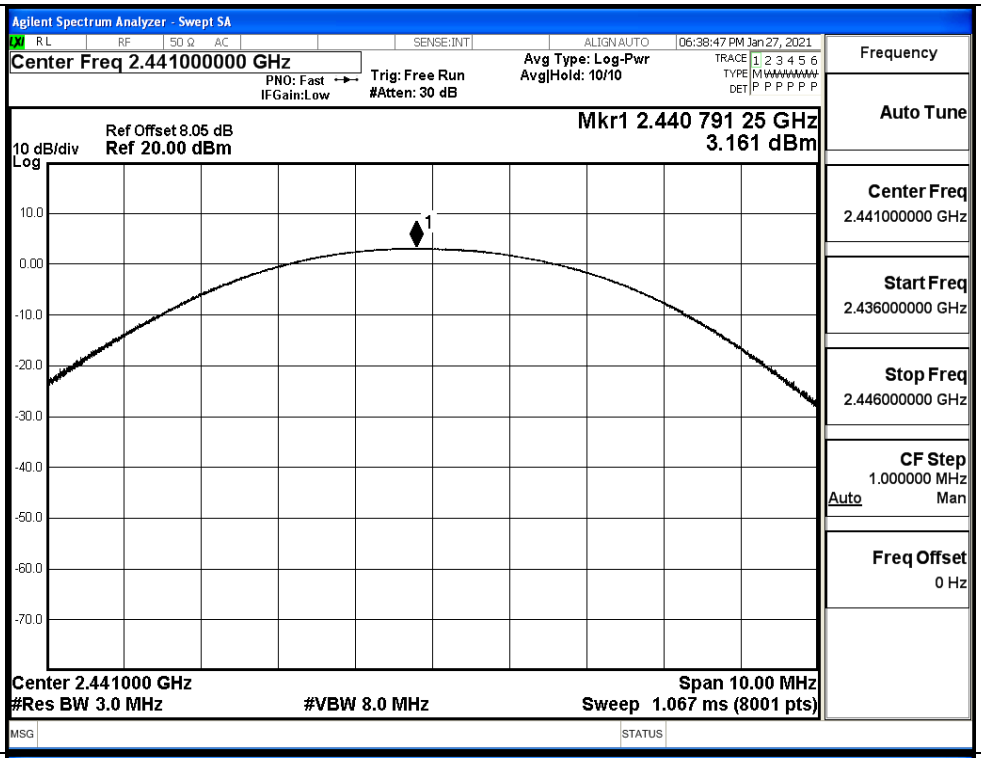
A.1 Maxmum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.627	21	PASS
	MCH	3.876	21	PASS
	HCH	3.606	21	PASS
π/4DQPSK	LCH	2.894	21	PASS
	MCH	3.161	21	PASS
	HCH	2.891	21	PASS

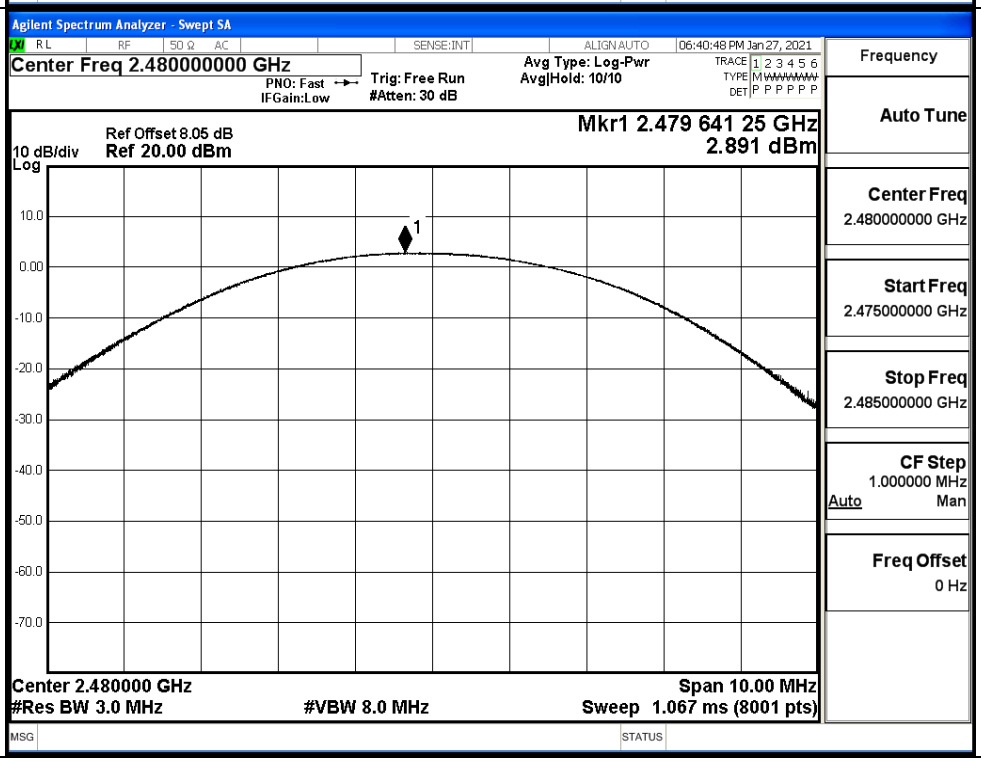
Test Graphs		
GFSK/LCH		
GFSK/MCH		

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH

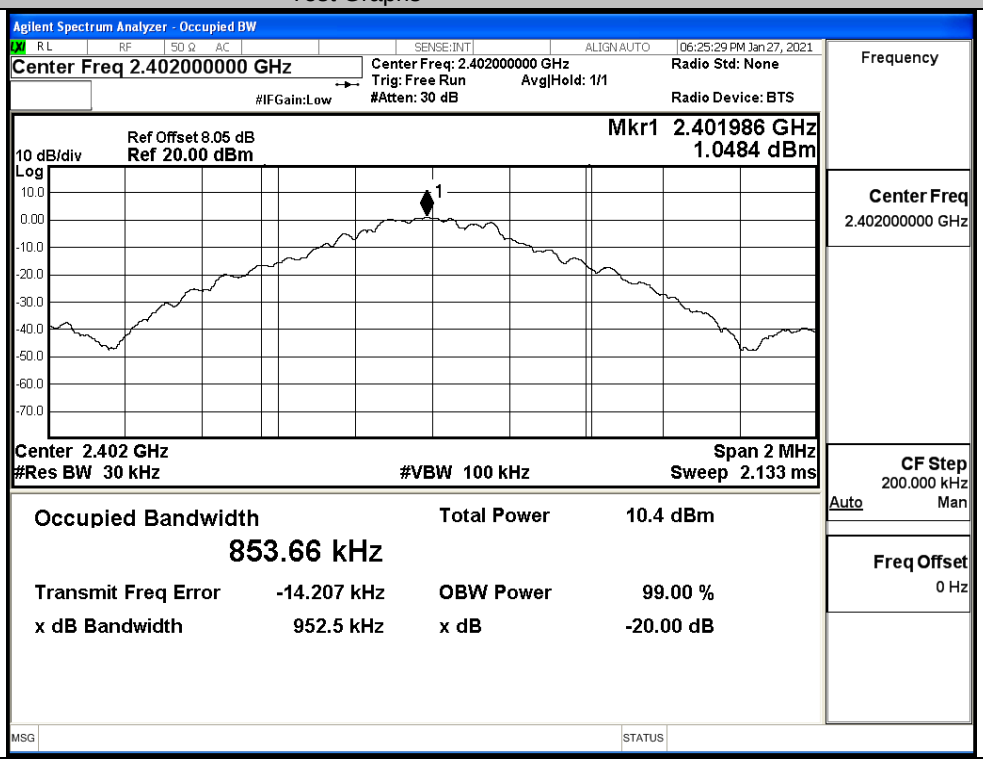


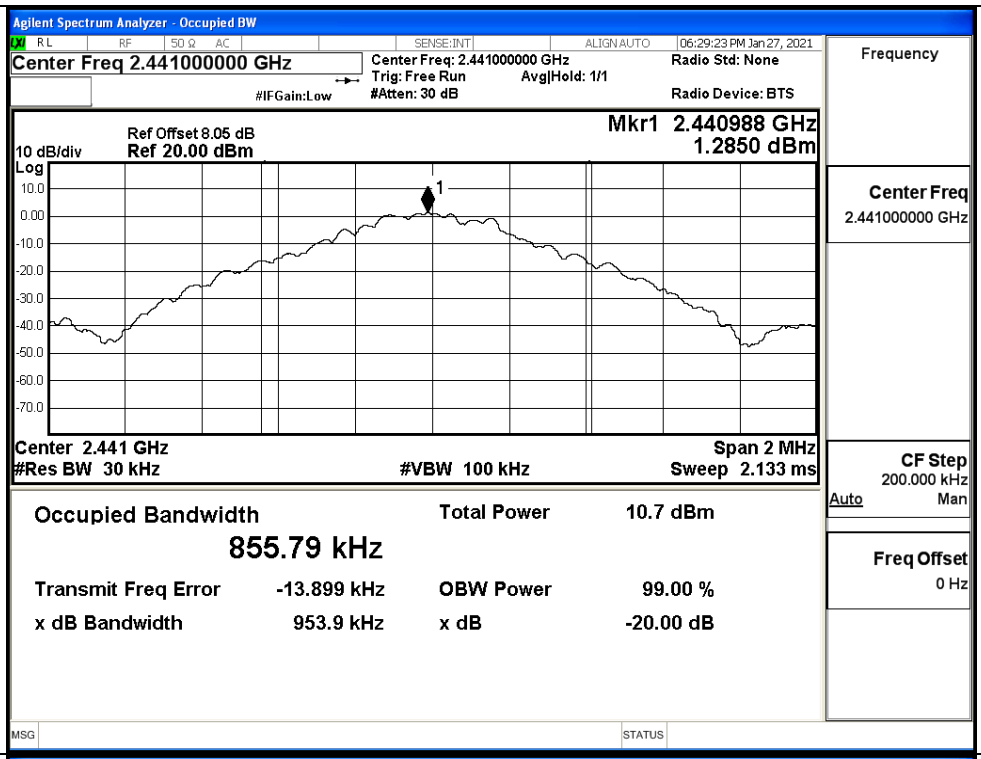
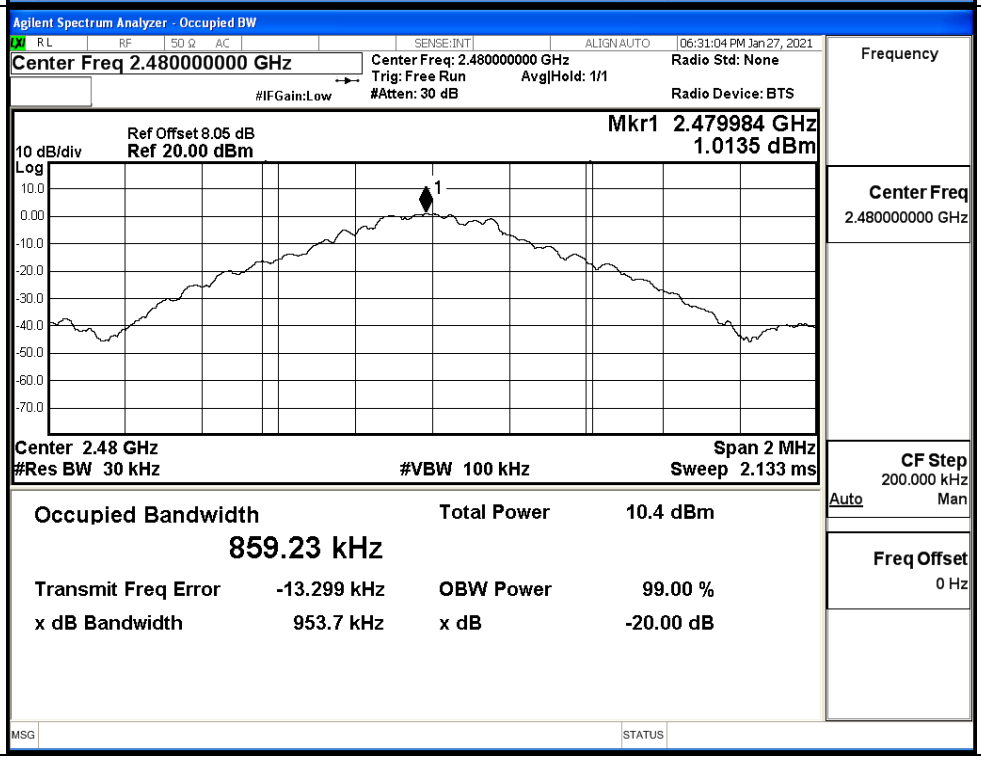
π/4DQPSK/HCH



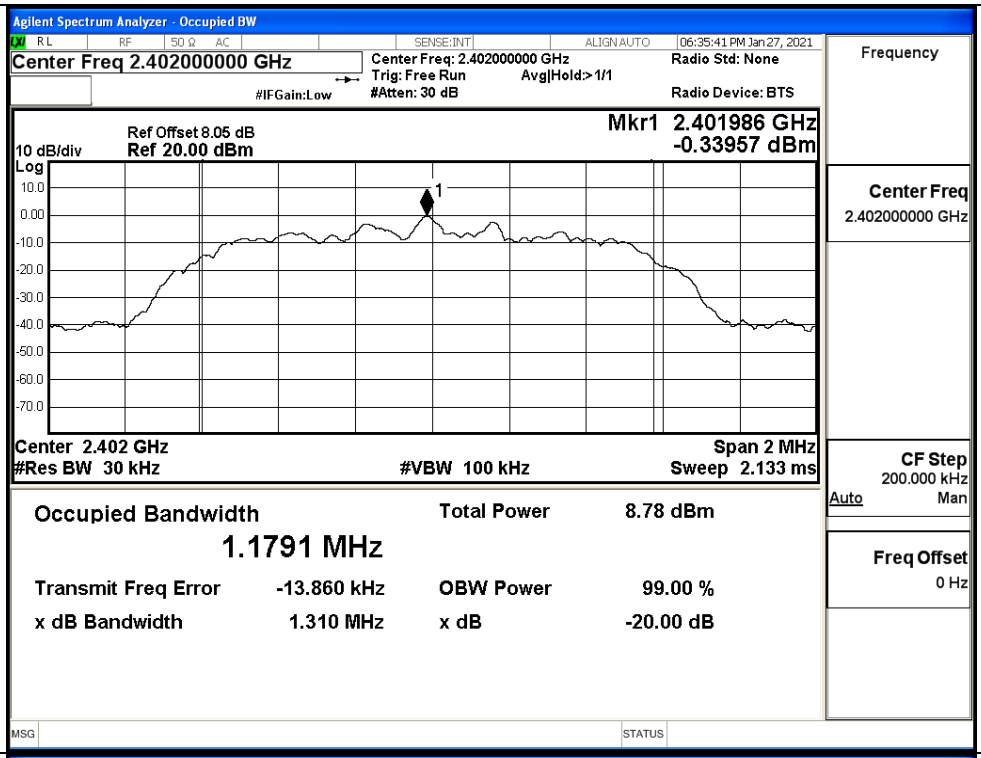
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9525	Not Specified	PASS
	MCH	0.9539	Not Specified	PASS
	HCH	0.9537	Not Specified	PASS
π/4DQPSK	LCH	1.310	Not Specified	PASS
	MCH	1.312	Not Specified	PASS
	HCH	1.312	Not Specified	PASS

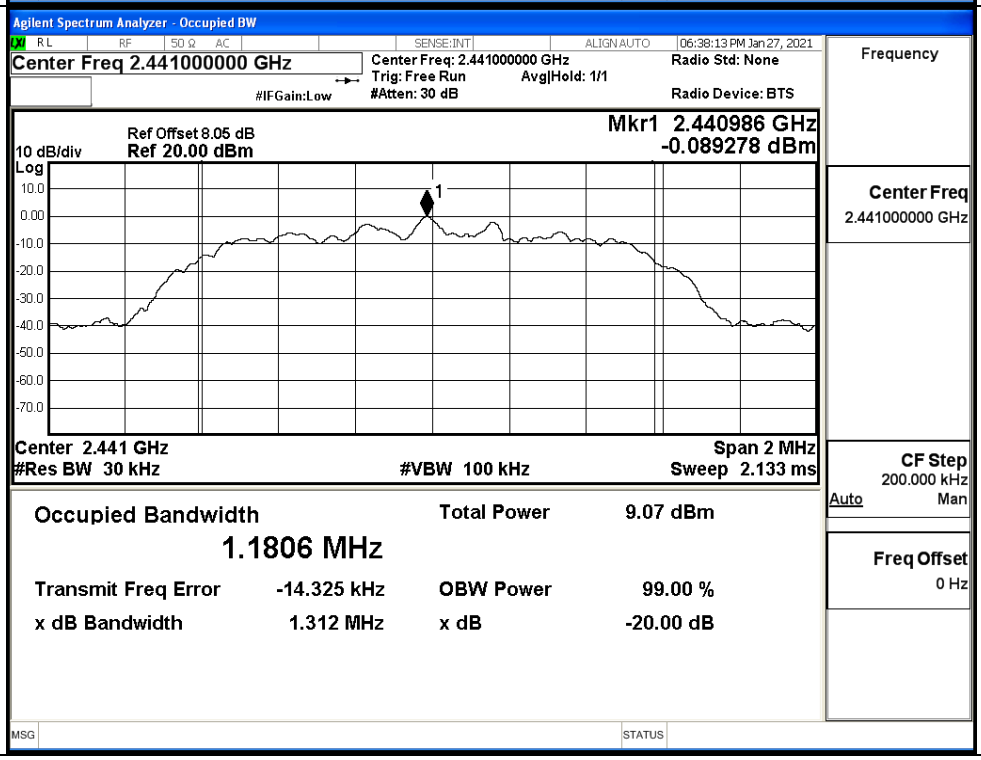
Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

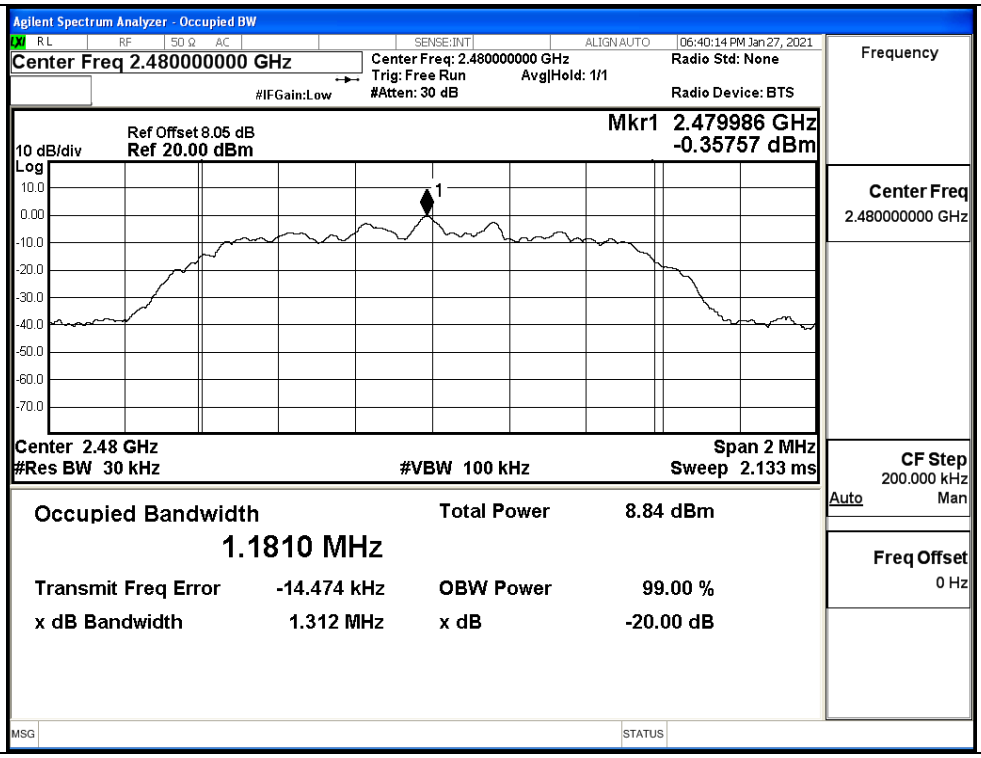
π/4DQPSK/LCH



π/4DQPSK/MCH

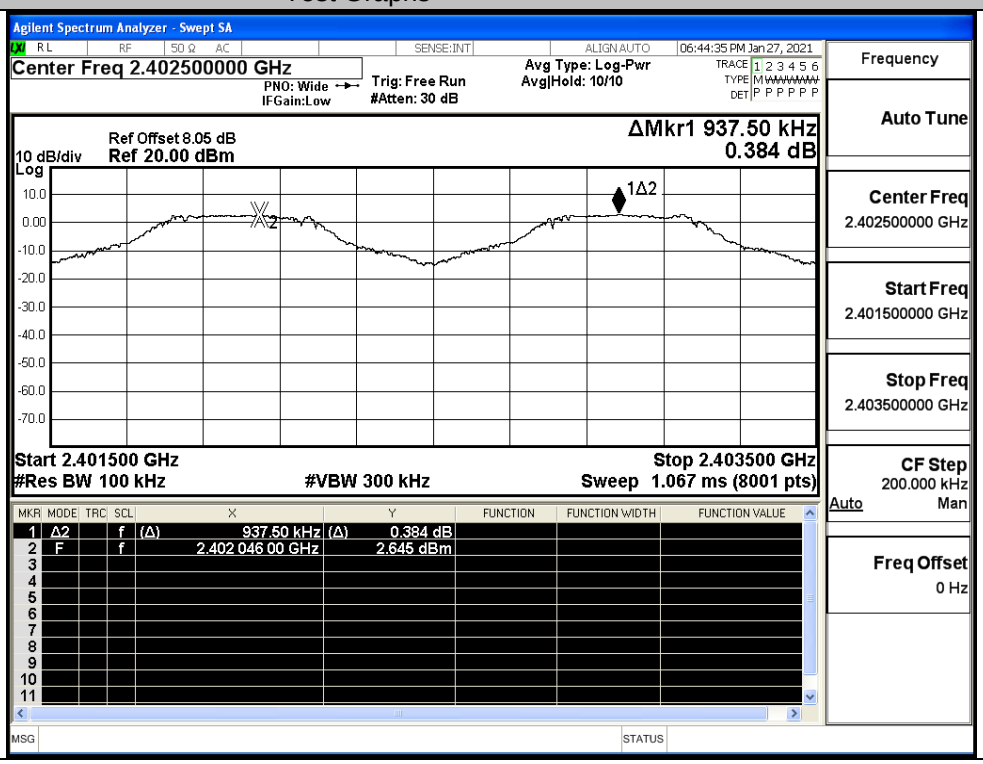


π/4DQPSK/HCH

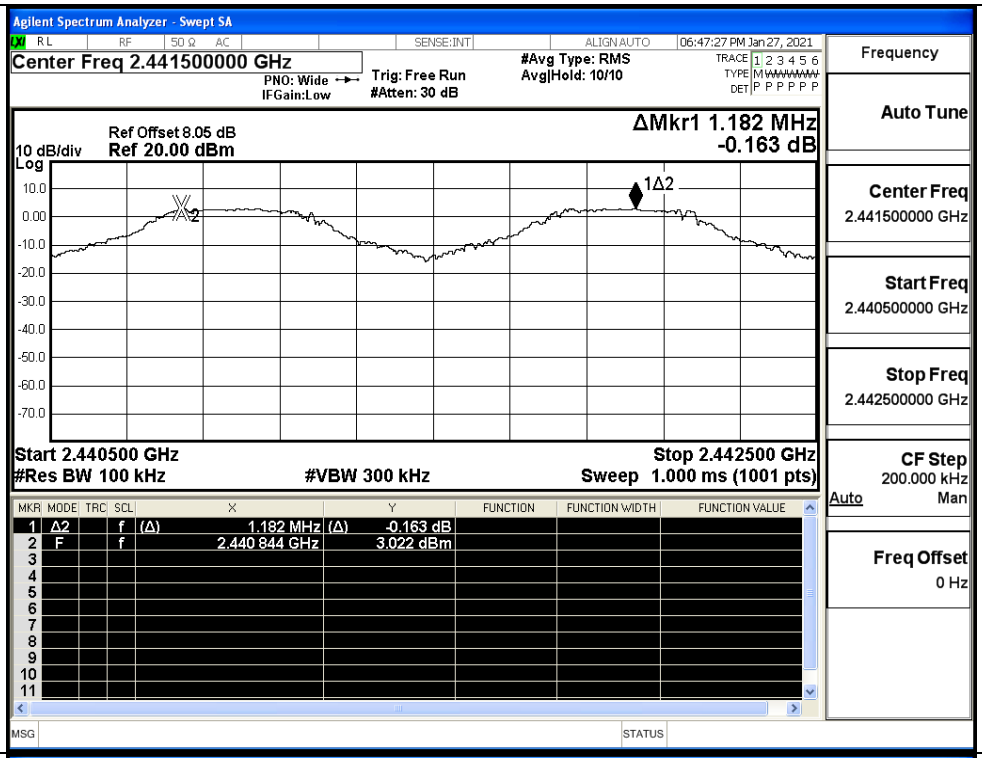

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
06:40:14 PM Jan 27, 2021
Frequency
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479986 GHz
-0.35757 dBm
Center 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
1.1810 MHz
Total Power 8.84 dBm
Transmit Freq Error -14.474 kHz
OBW Power 99.00 %
x dB Bandwidth 1.312 MHz
x dB -20.00 dB
Freq Offset
0 Hz
MSG
STATUS

A.3 Carrier Frequency Separation

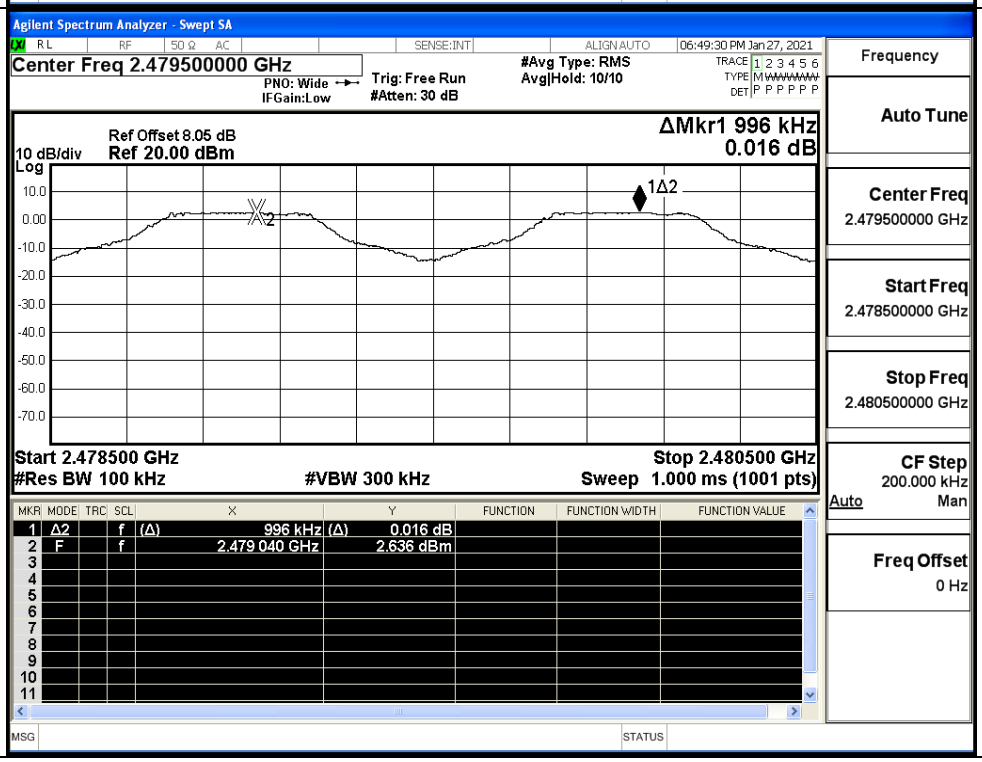
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.938	0.636	PASS
	MCH	1.182	0.636	PASS
	HCH	0.996	0.636	PASS
π/4DQPSK	LCH	1.050	0.875	PASS
	MCH	1.008	0.875	PASS
	HCH	1.008	0.875	PASS

Test Graphs	
GFSK/LCH	

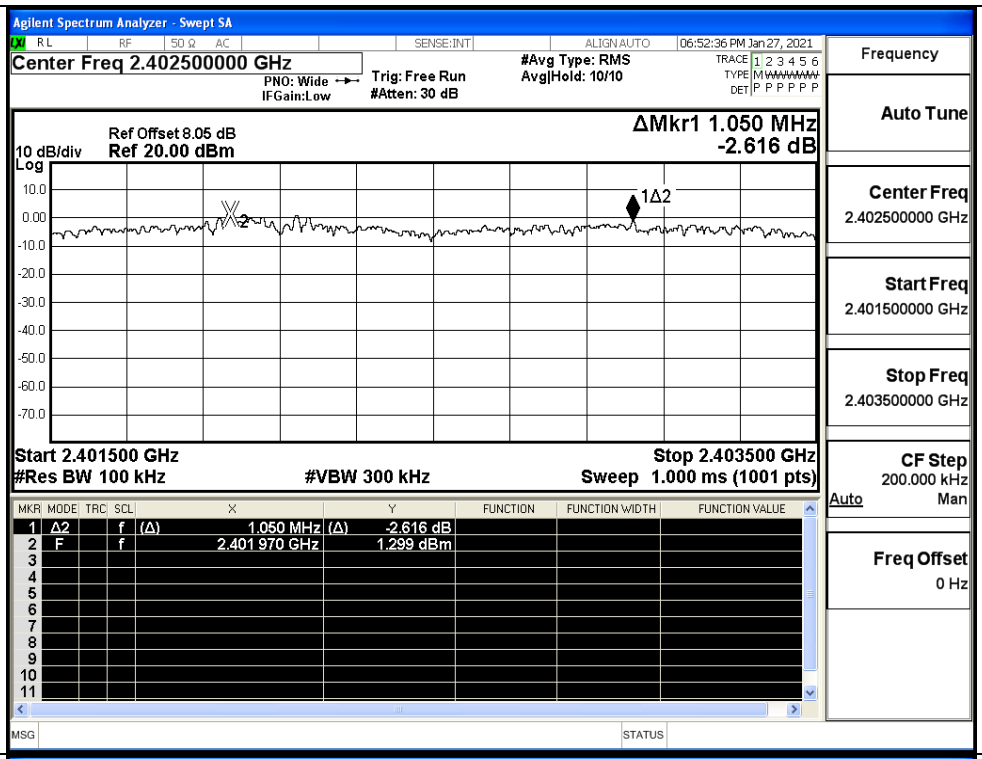
GFSK/MCH



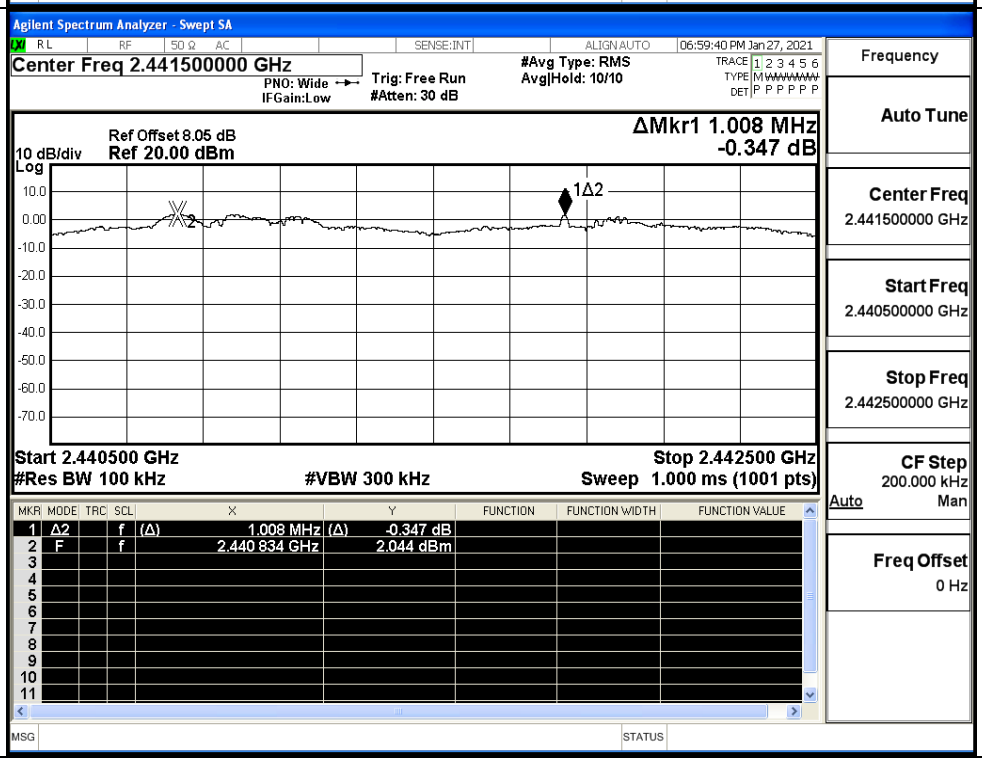
GFSK/HCH



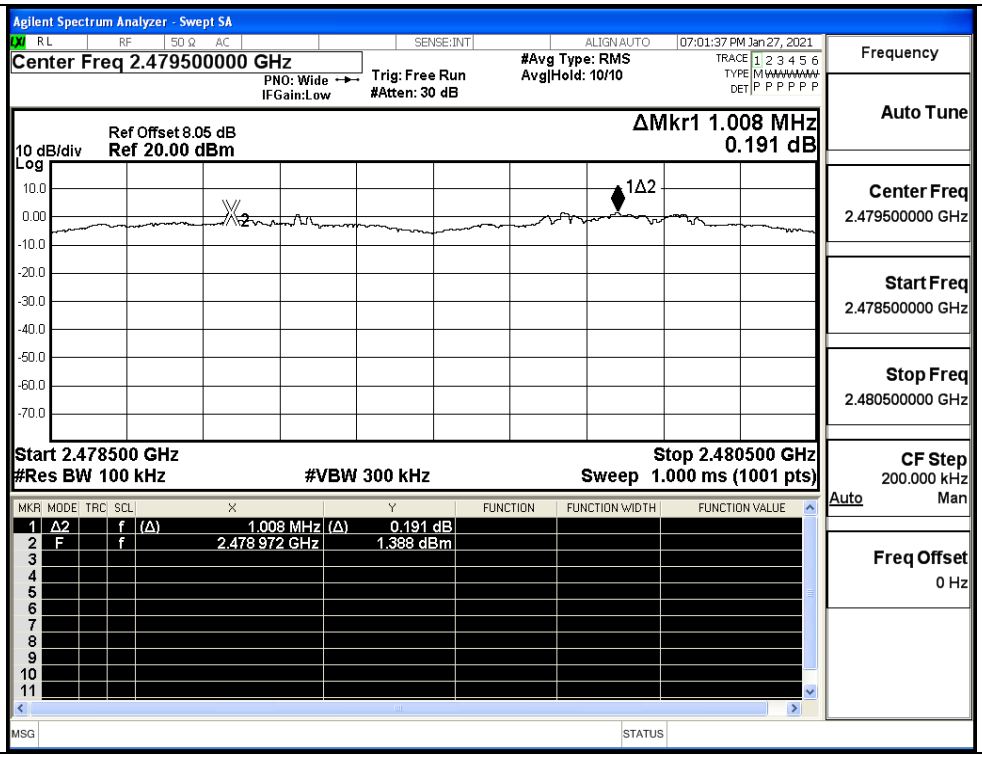
π/4DQPSK/LCH



π/4DQPSK/MCH

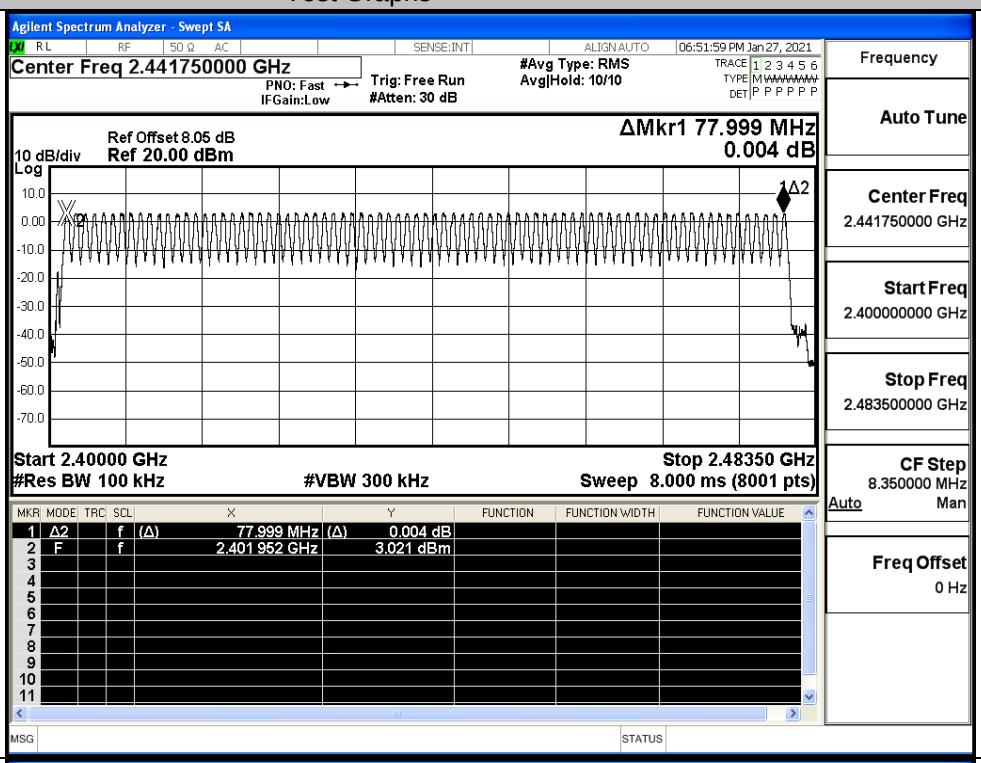
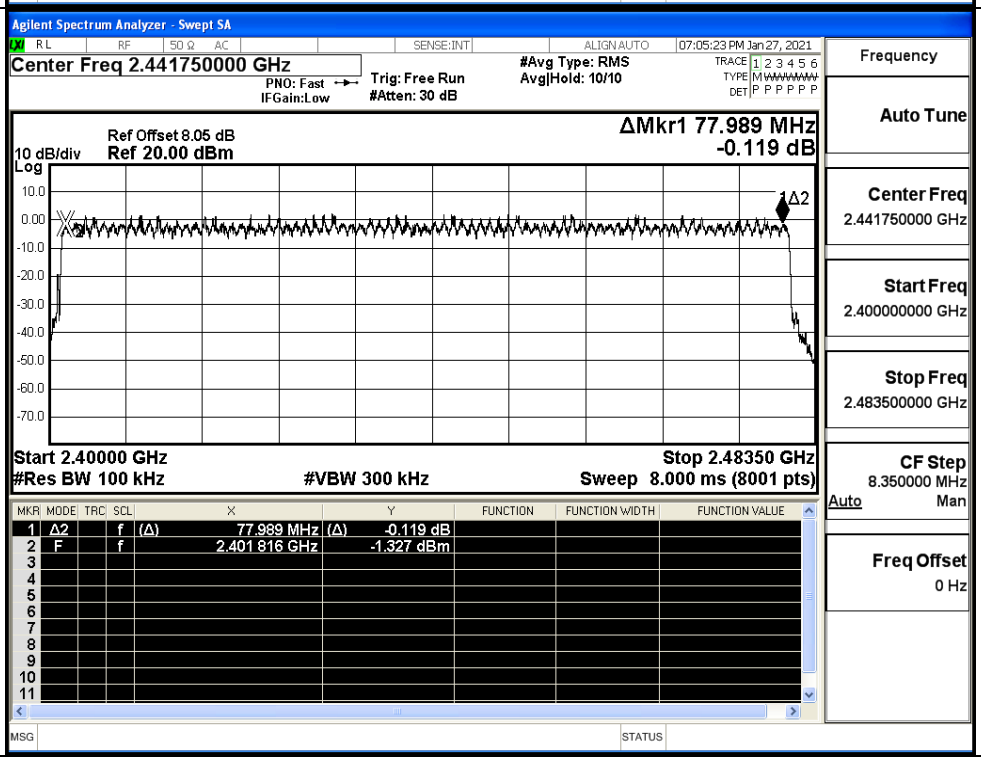


π/4DQPSK/HCH


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
07:01:37 PM Jan 27, 2021
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 1.008 MHz
0.191 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) 1.008 MHz (Δ) 0.191 dB
2 F f 2.478 972 GHz 1.388 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

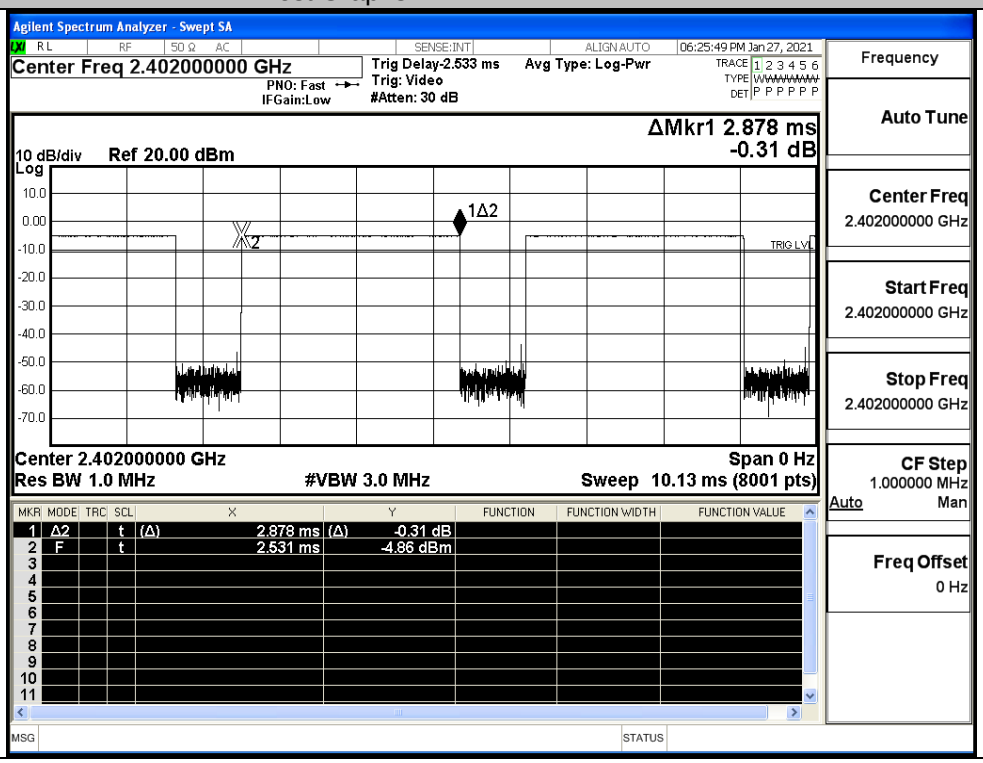
A.4 Hopping Channel Number

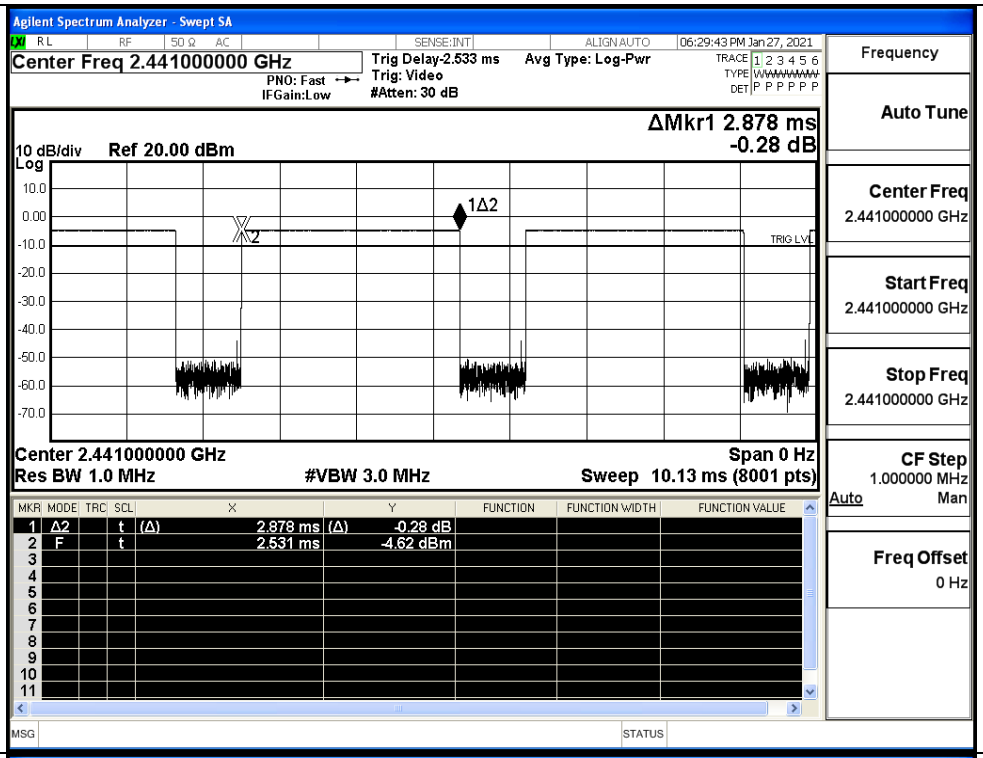
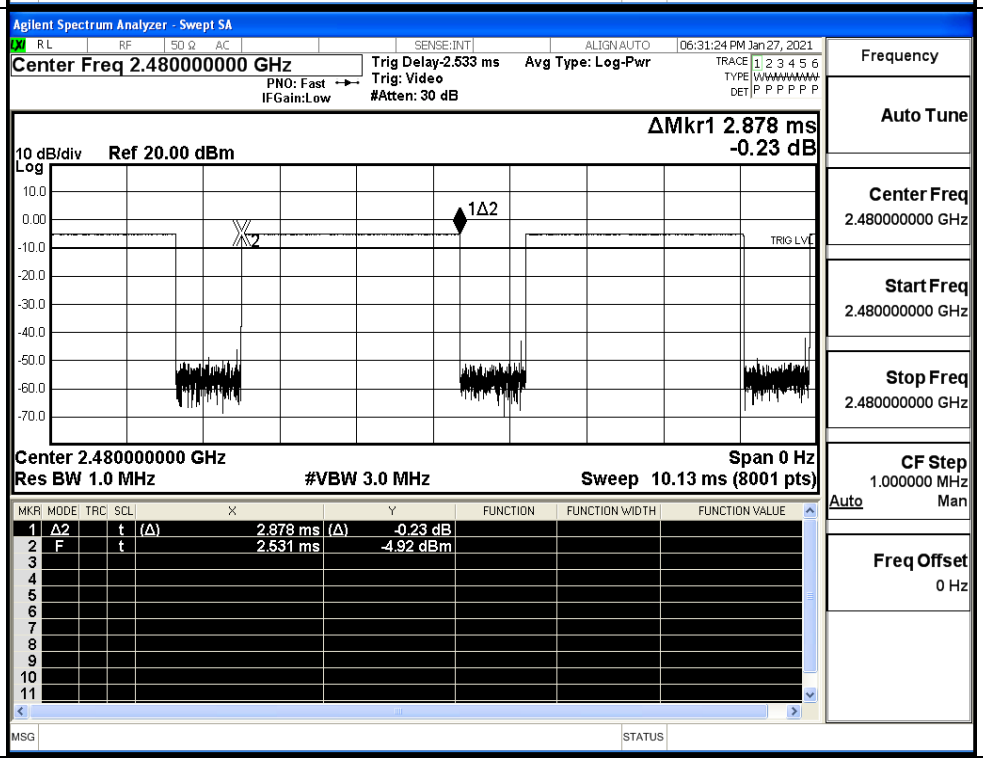
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS

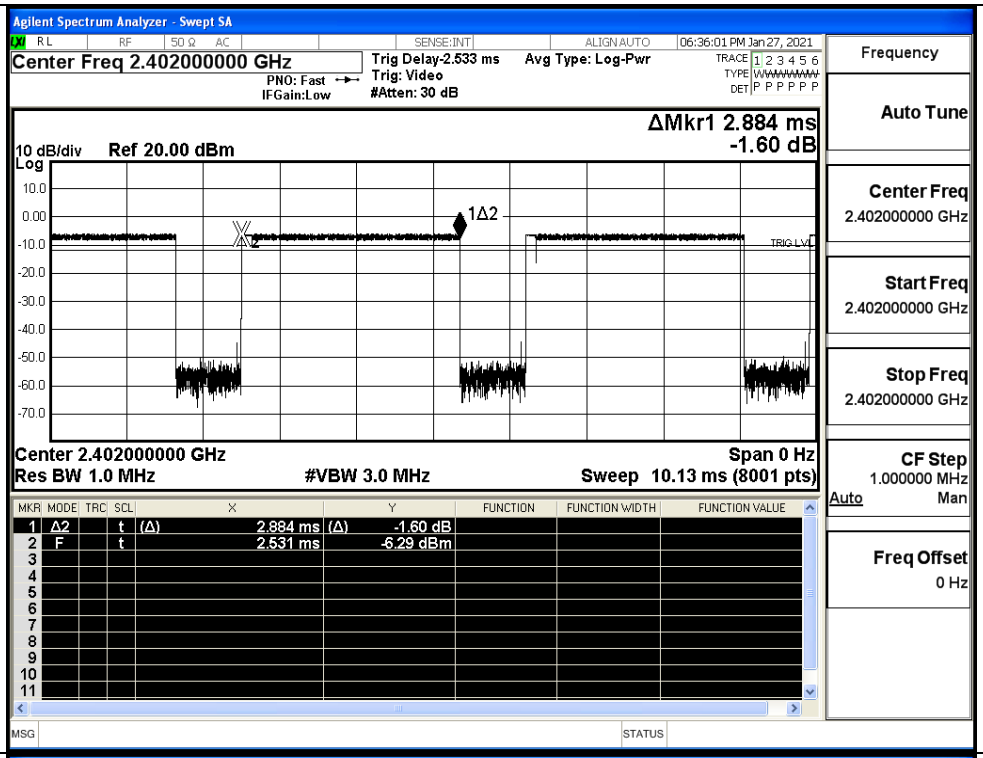
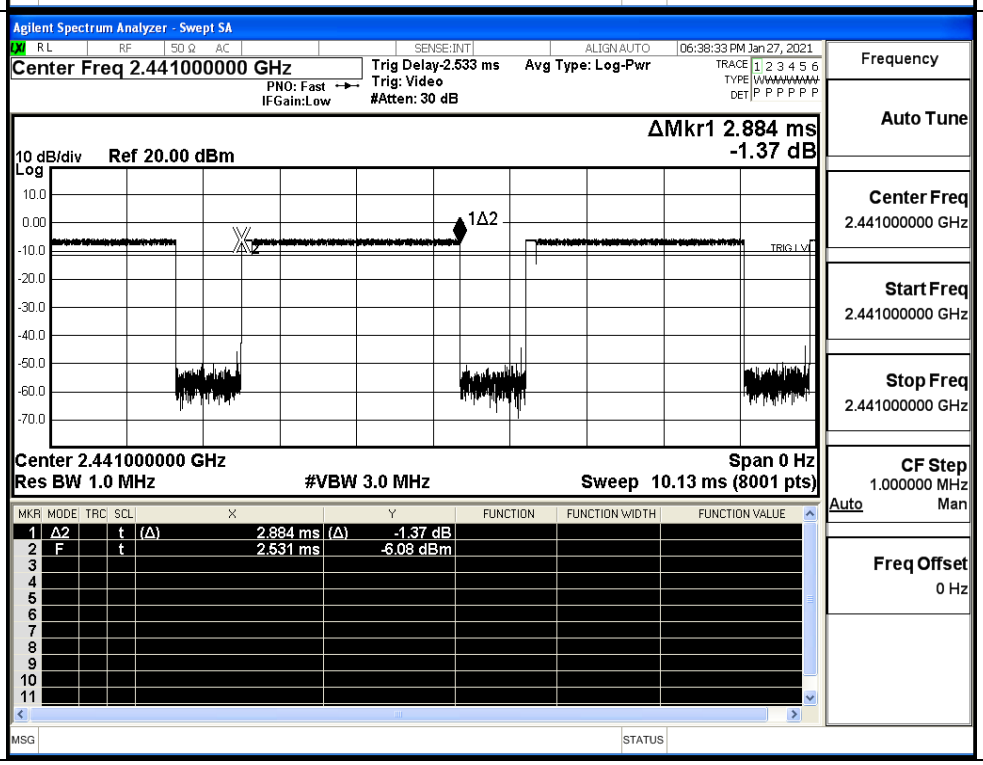
Test Graphs	
GFSK/Hop	
π/4DQPSK/Hop	

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

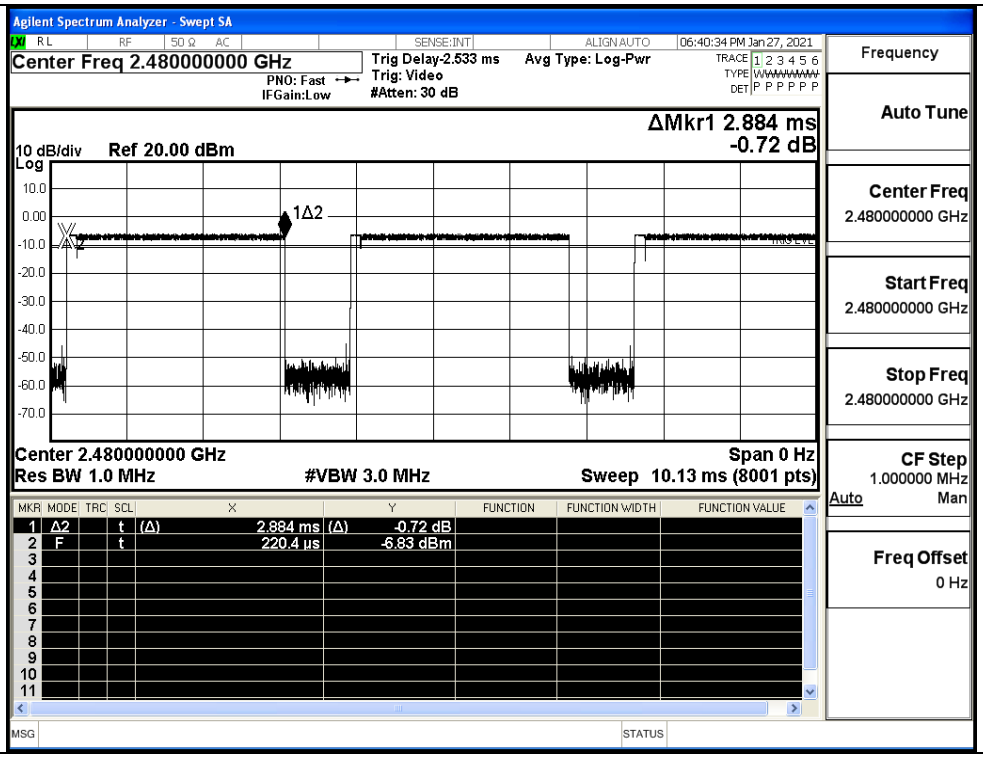
Test Graphs	
GFSK_DH5/LCH	

GFSK_DH5/MCH	
GFSK_DH5/HCH	

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

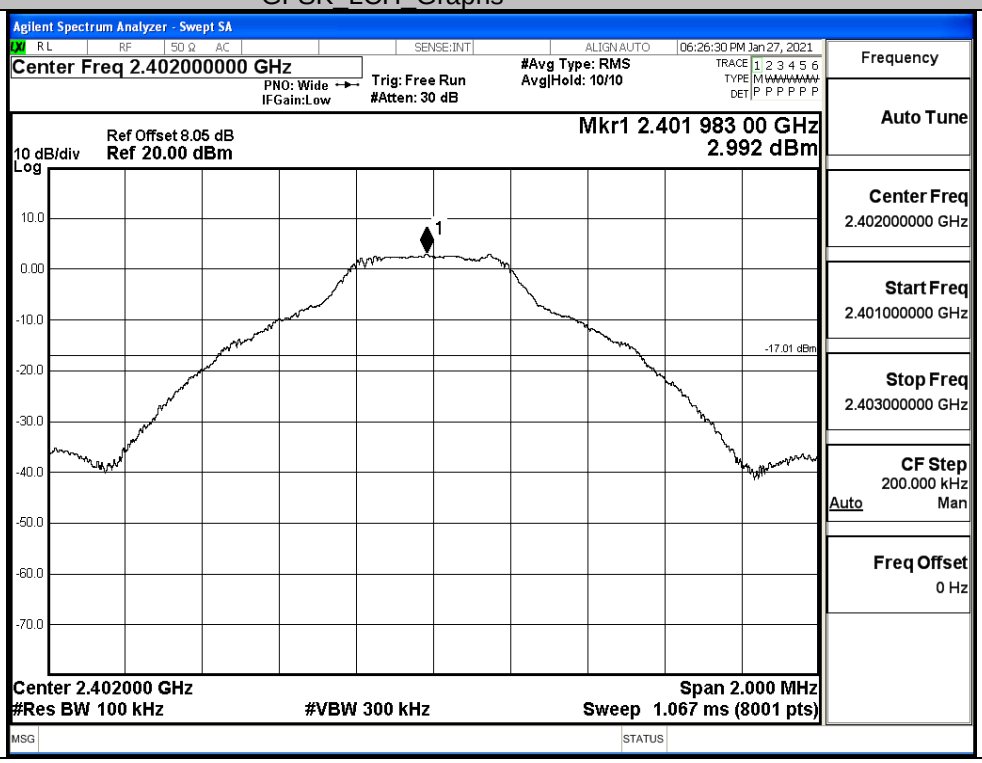
π/4DQPSK

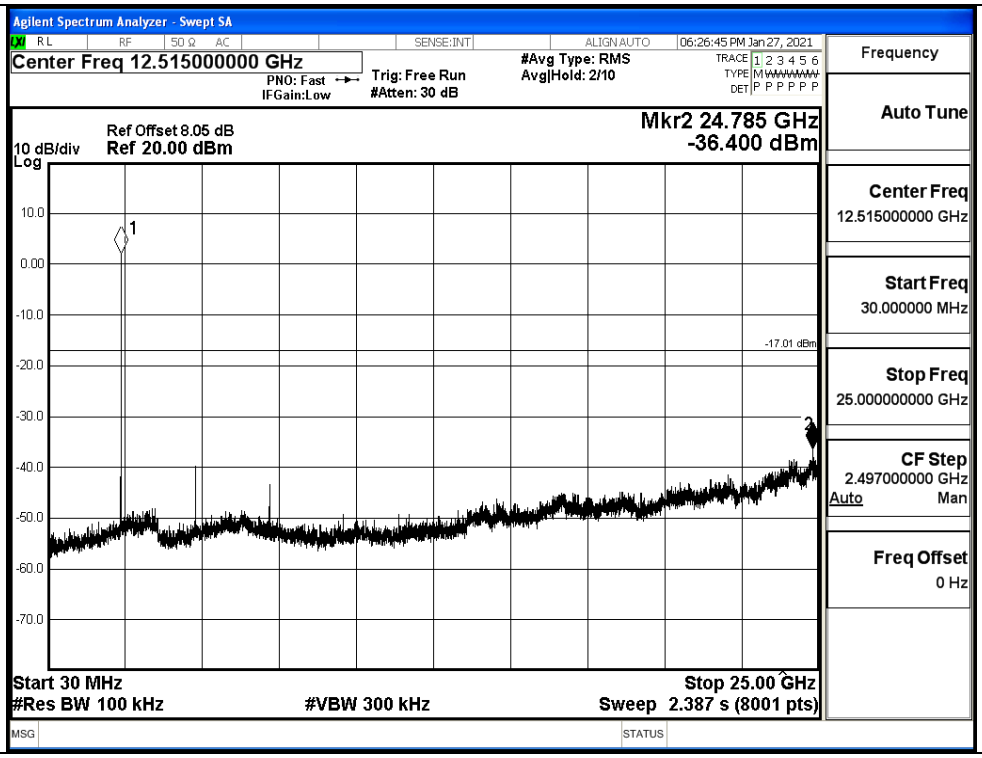
_2DH5/HCH



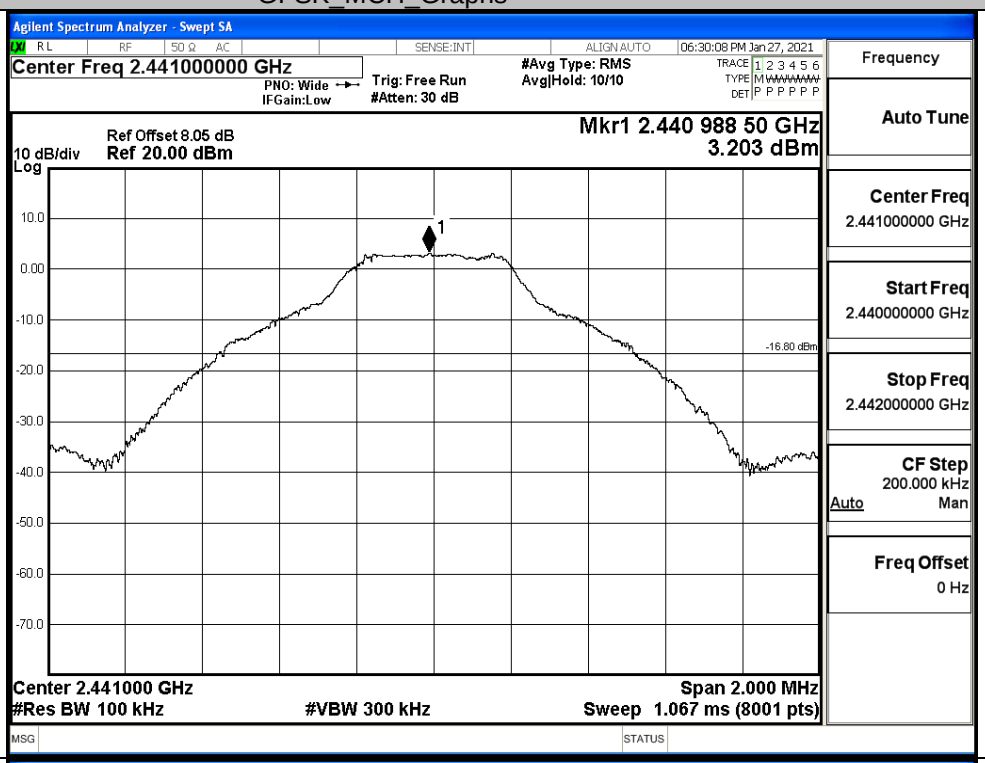
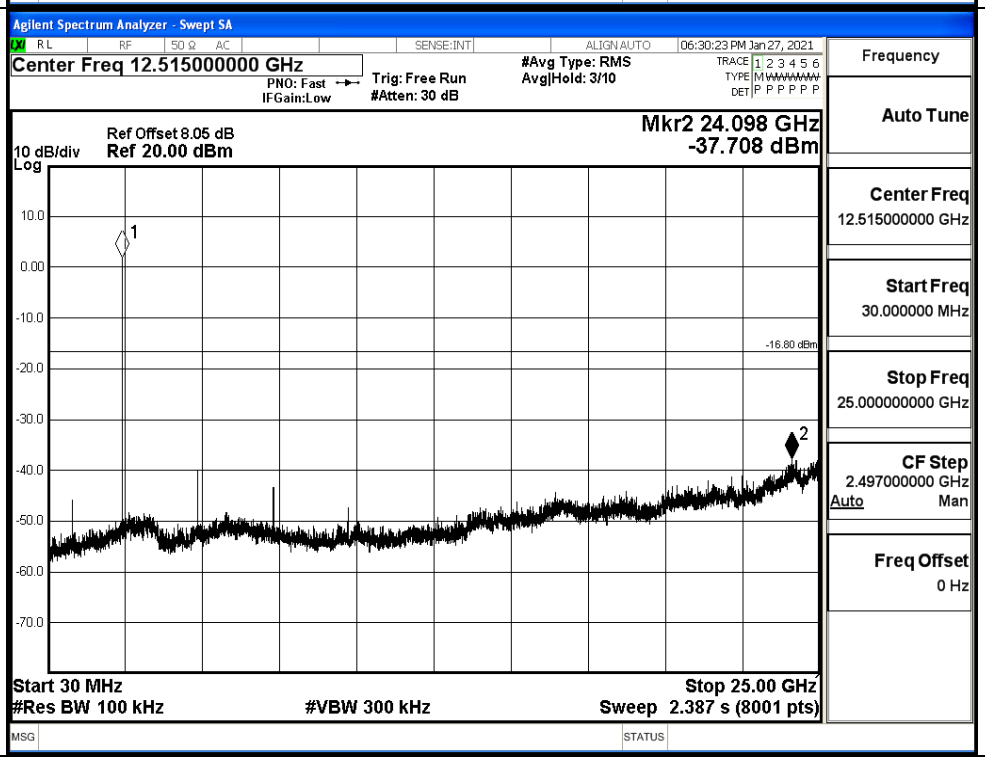
A.6 RF Conducted Spurious Emissions

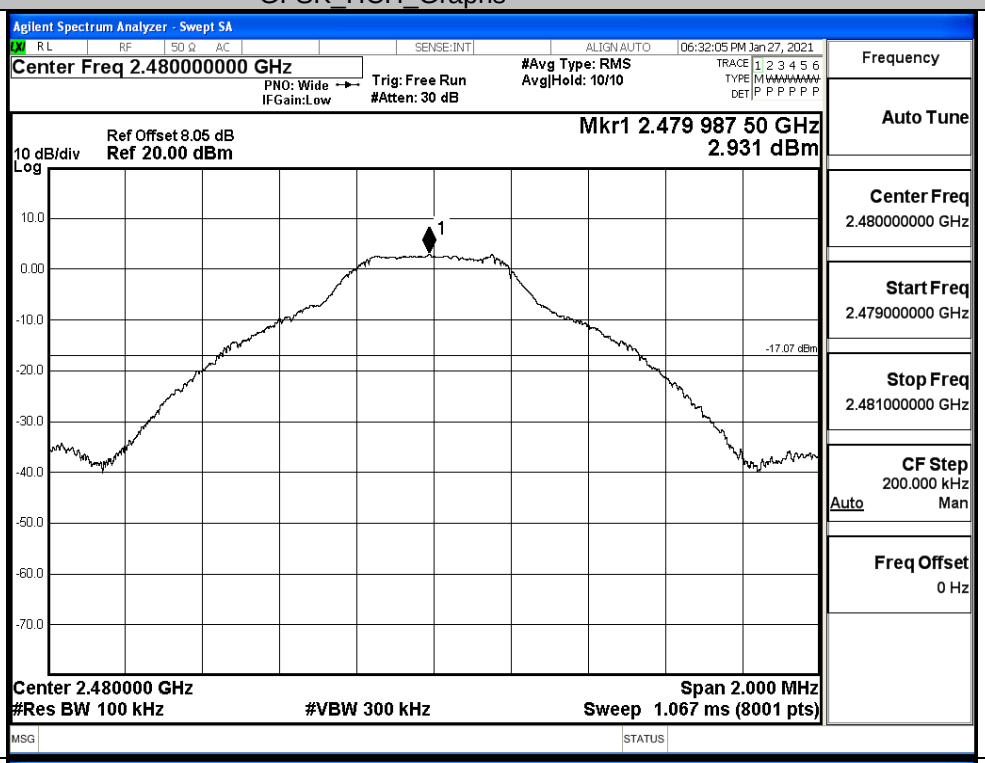
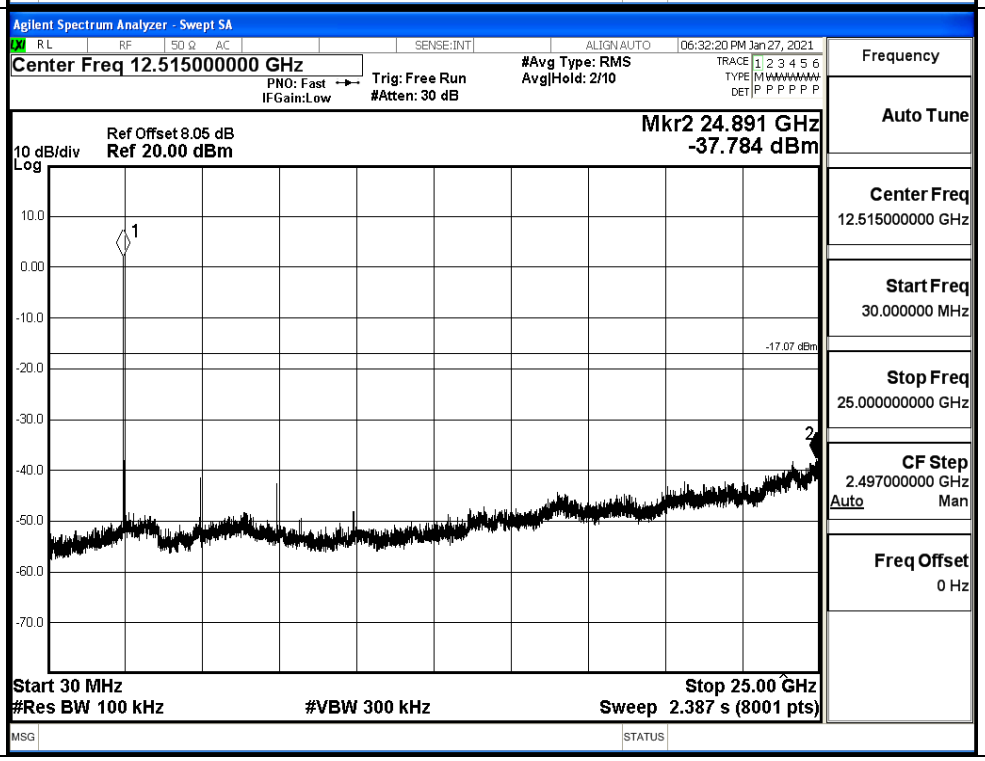
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.992	-36.400	-17.008	PASS
	MCH	3.203	-37.708	-16.797	PASS
	HCH	2.931	-37.784	-17.069	PASS
π/4DQPSK	LCH	1.27	-37.528	-18.730	PASS
	MCH	2.026	-38.065	-17.974	PASS
	HCH	0.941	-37.028	-19.059	PASS

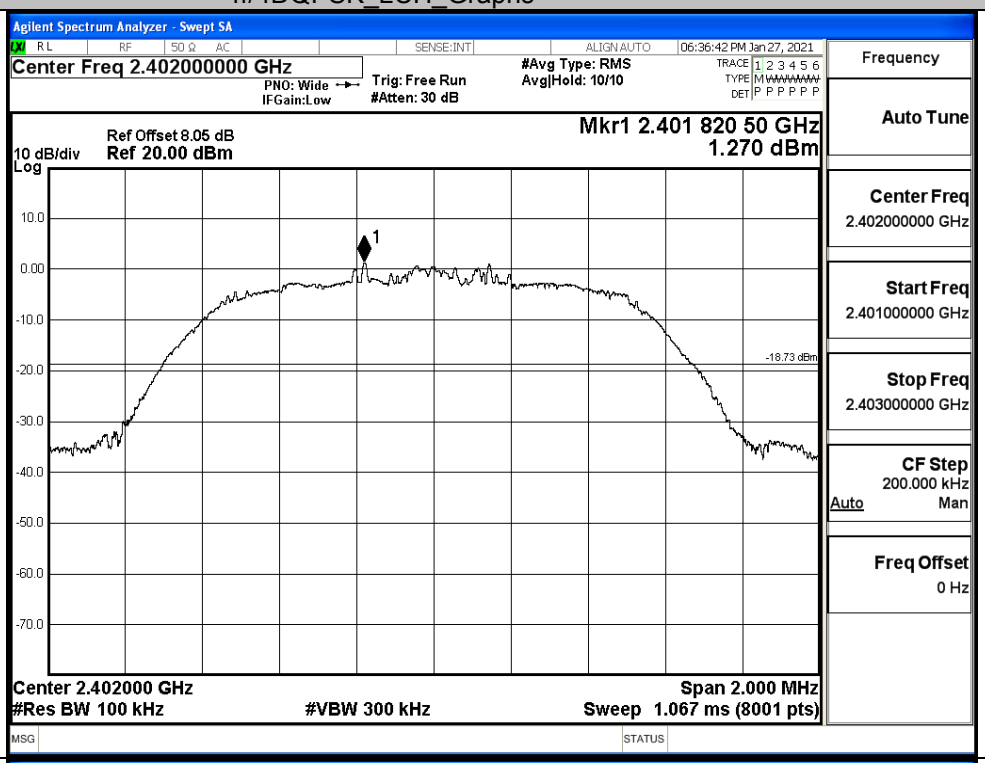
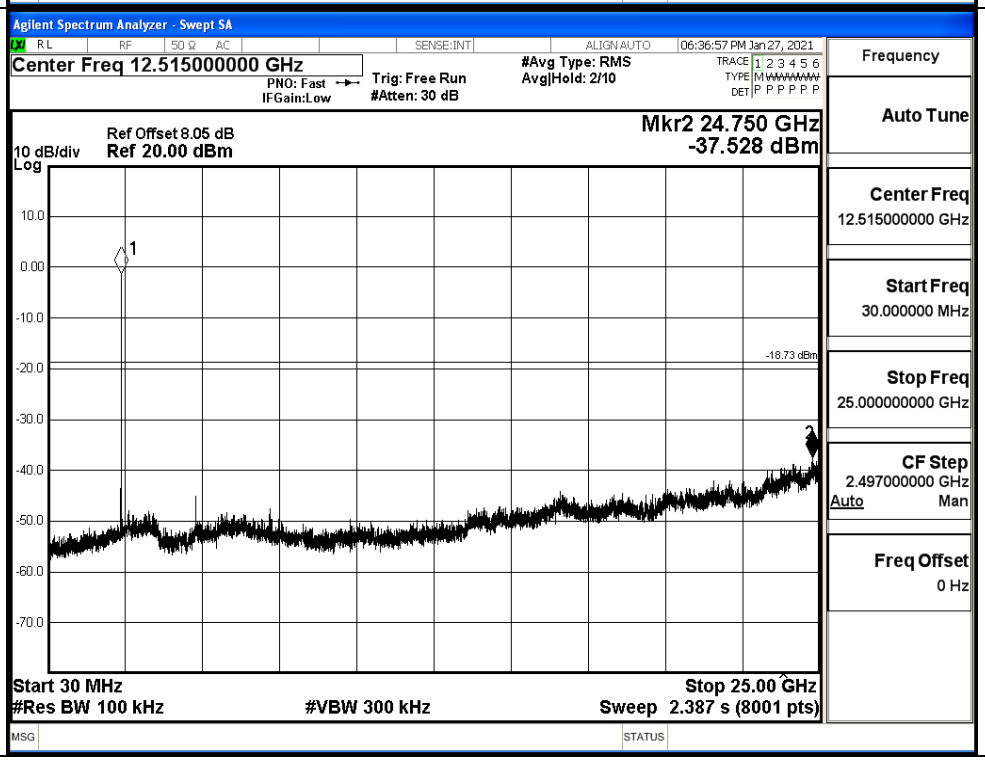
GFSK_LCH_Graphs		
Pref		

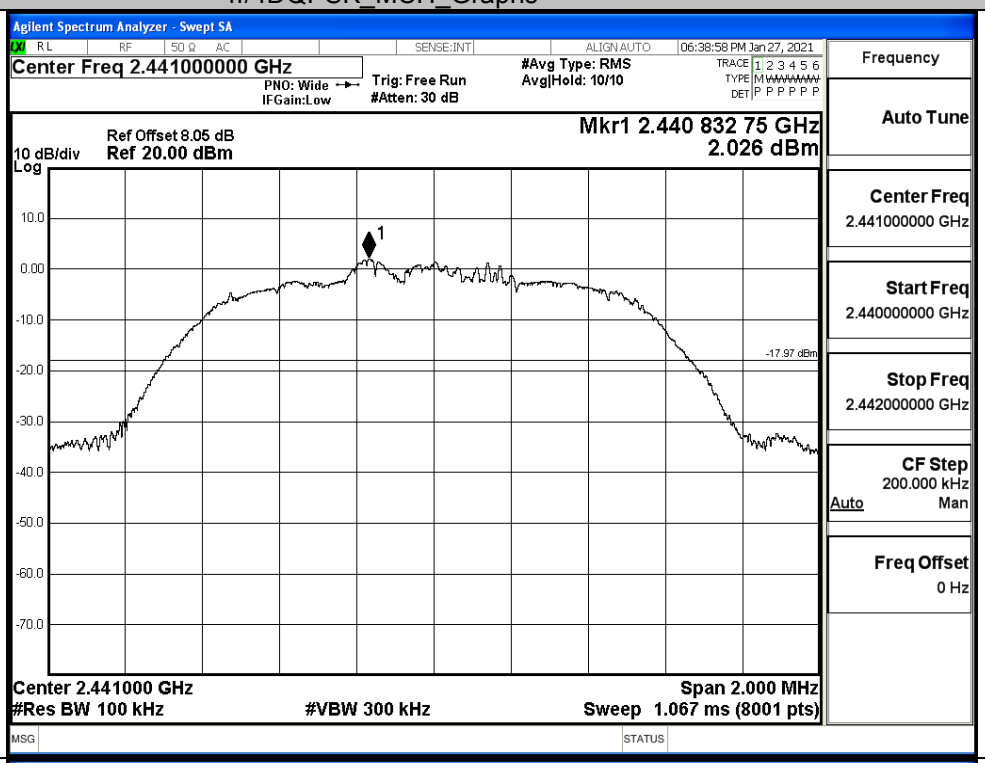
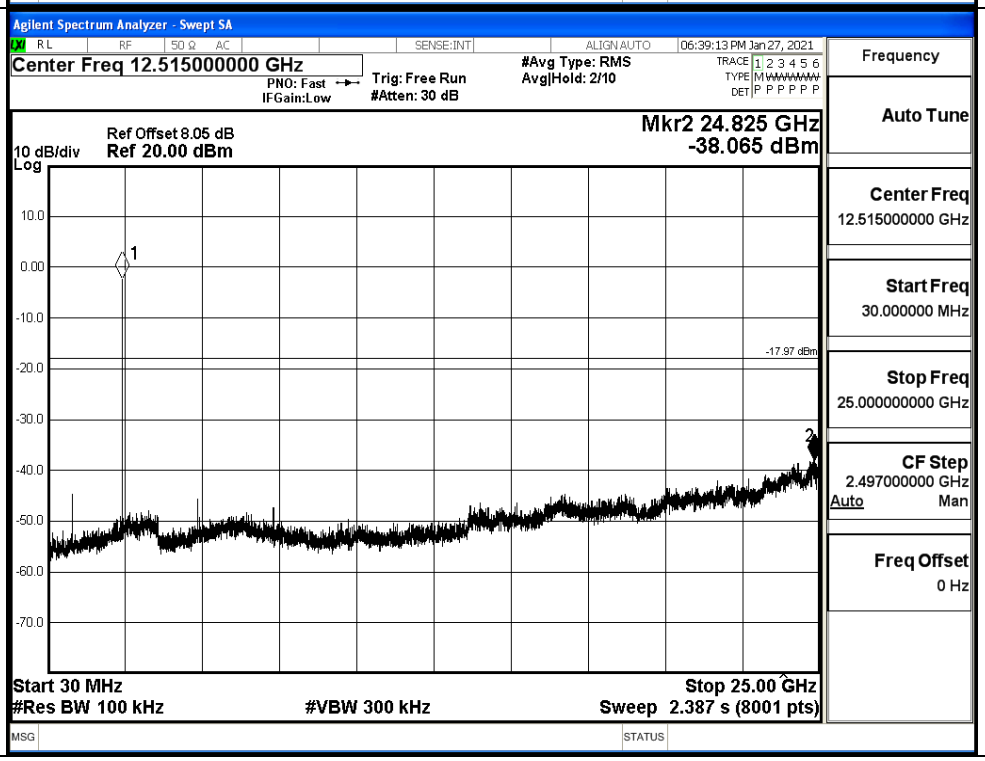
Puw		

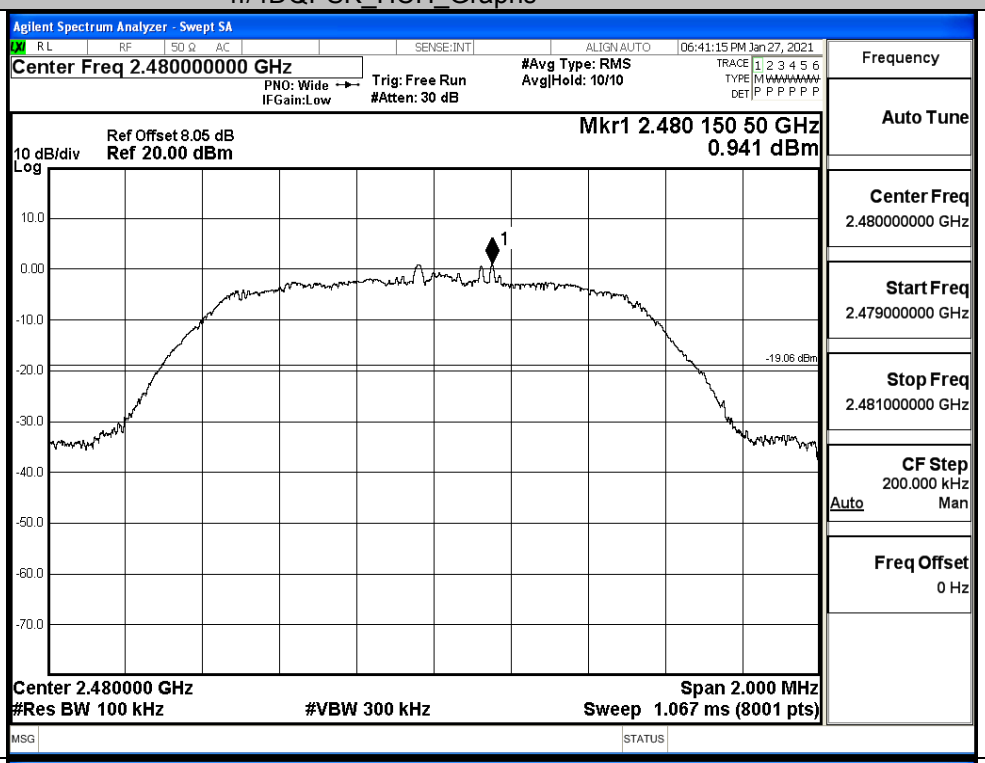
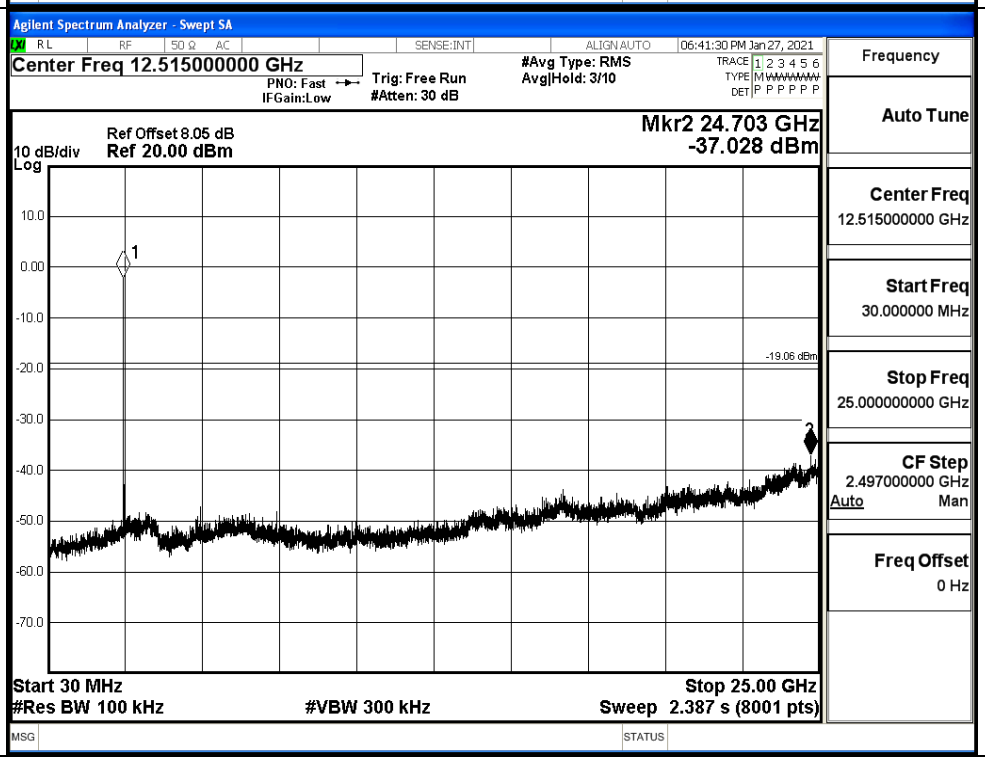
Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 2/10
06:26:45 PM Jan 27, 2021
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr2 24.785 GHz
-36.400 dBm
-17.01 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 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			

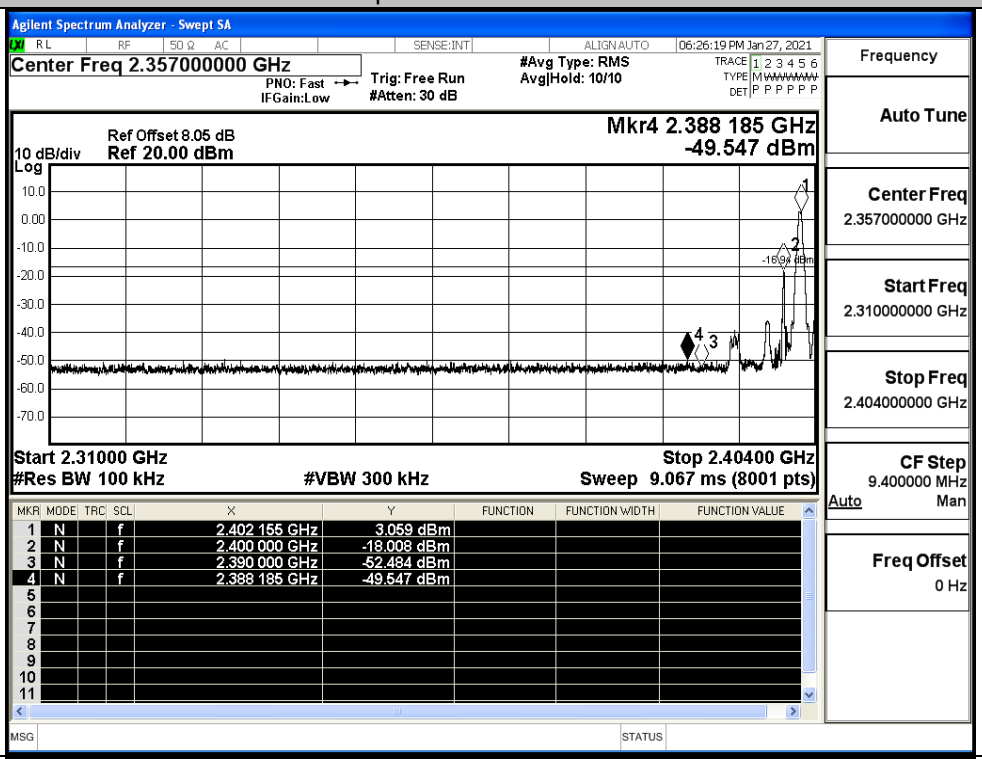
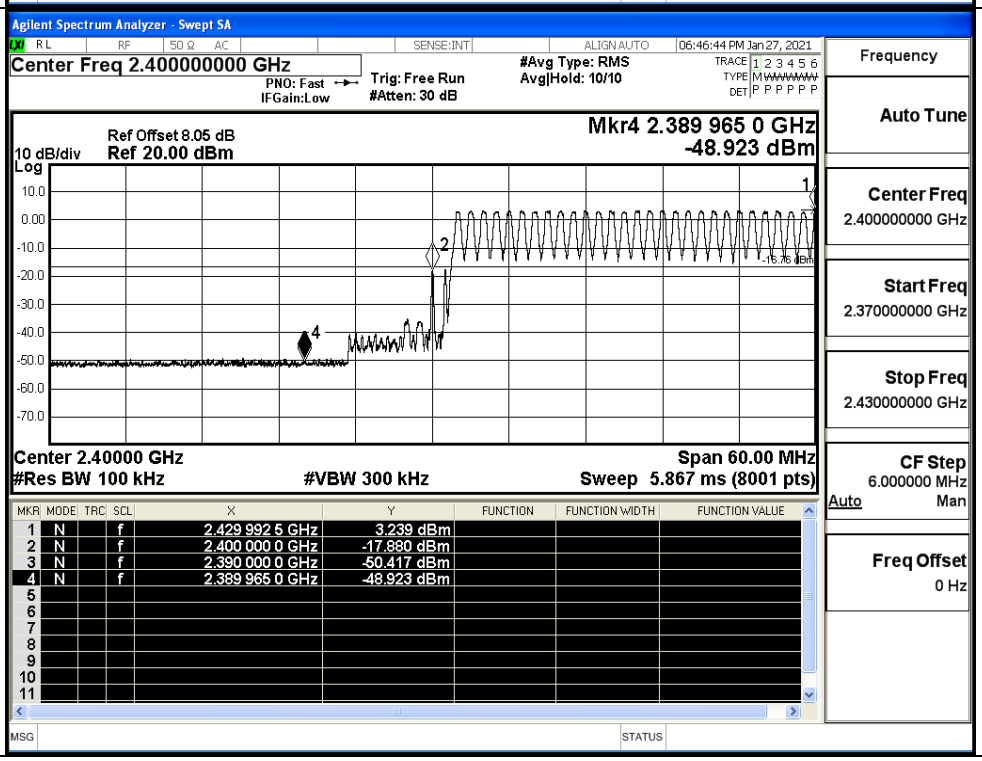
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

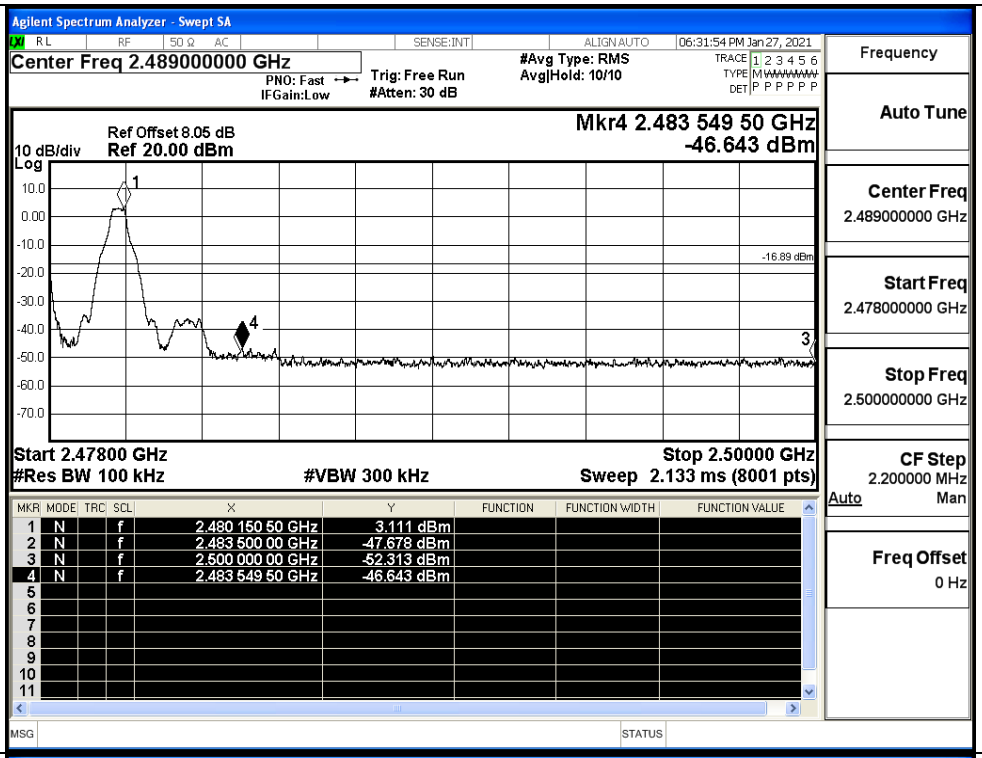
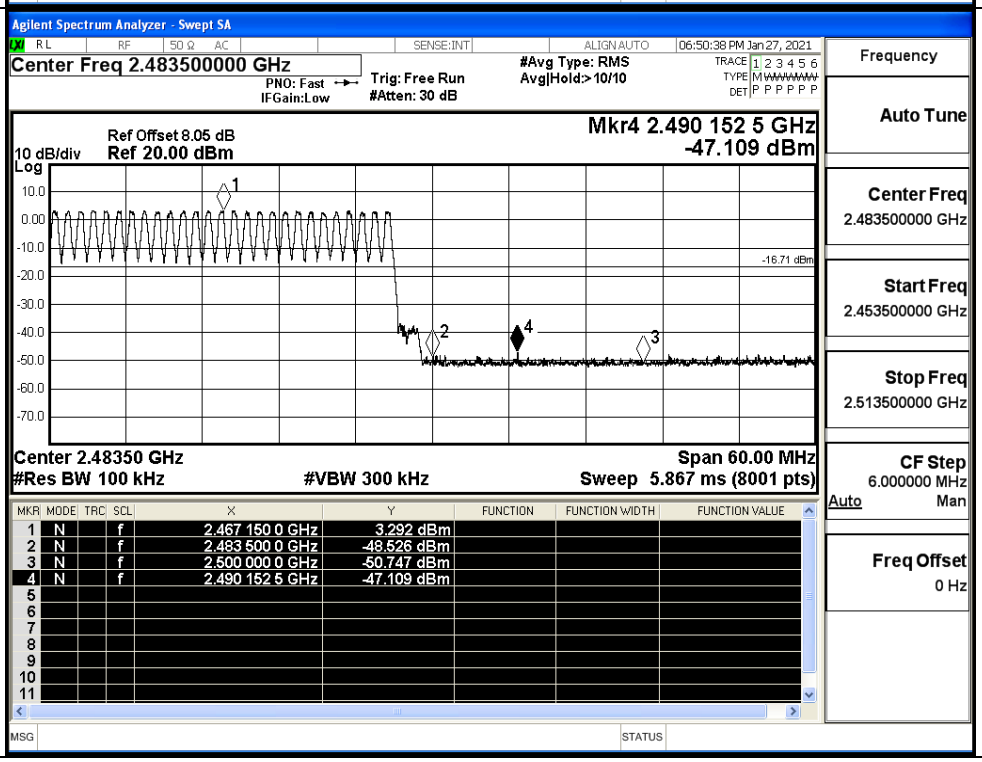
π/4DQPSK_MCH_Graphs			
Pref			
Puw			

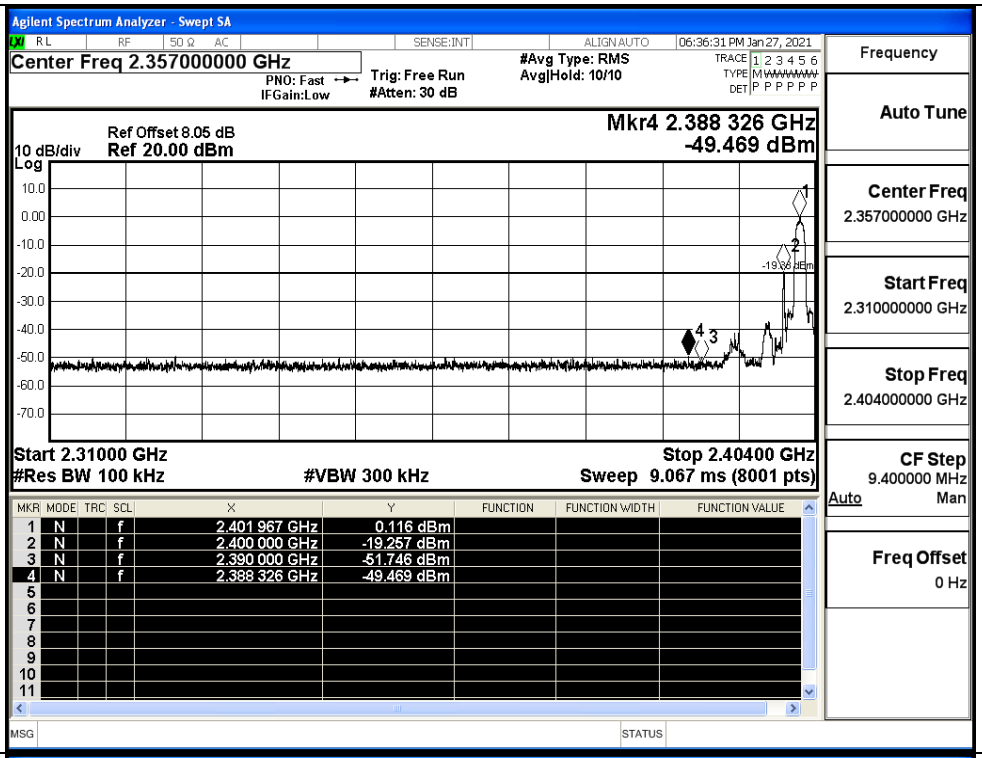
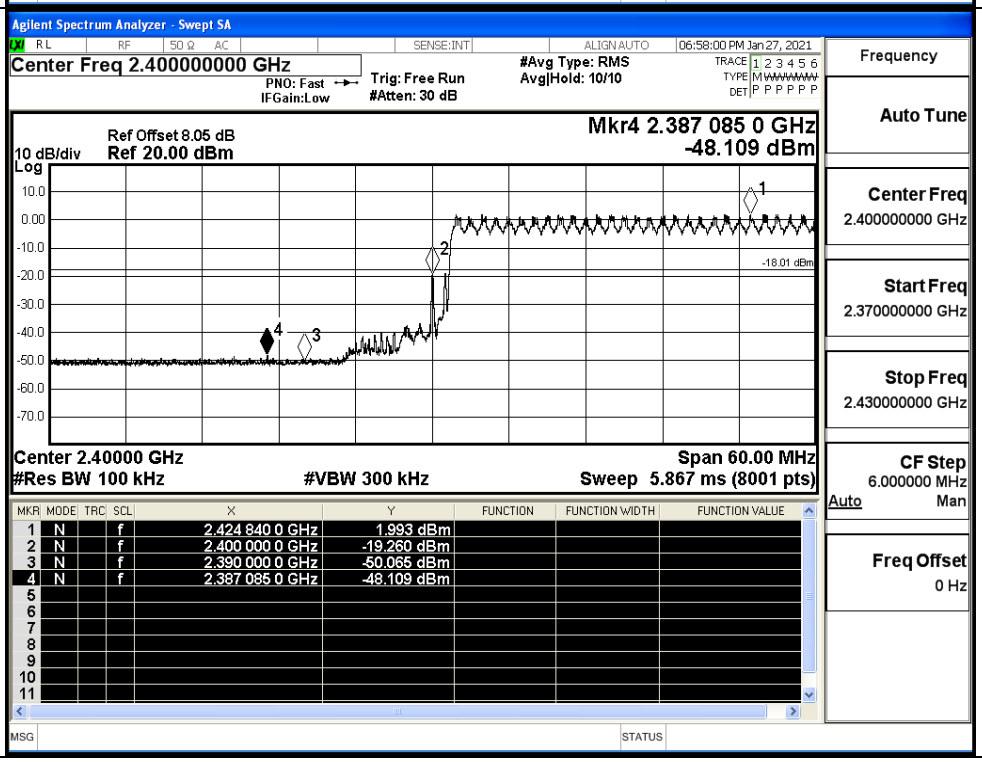
π/4DQPSK_HCH_Graphs			
Pref			
Puw			

A.7 Band-edge for RF Conducted Emissions

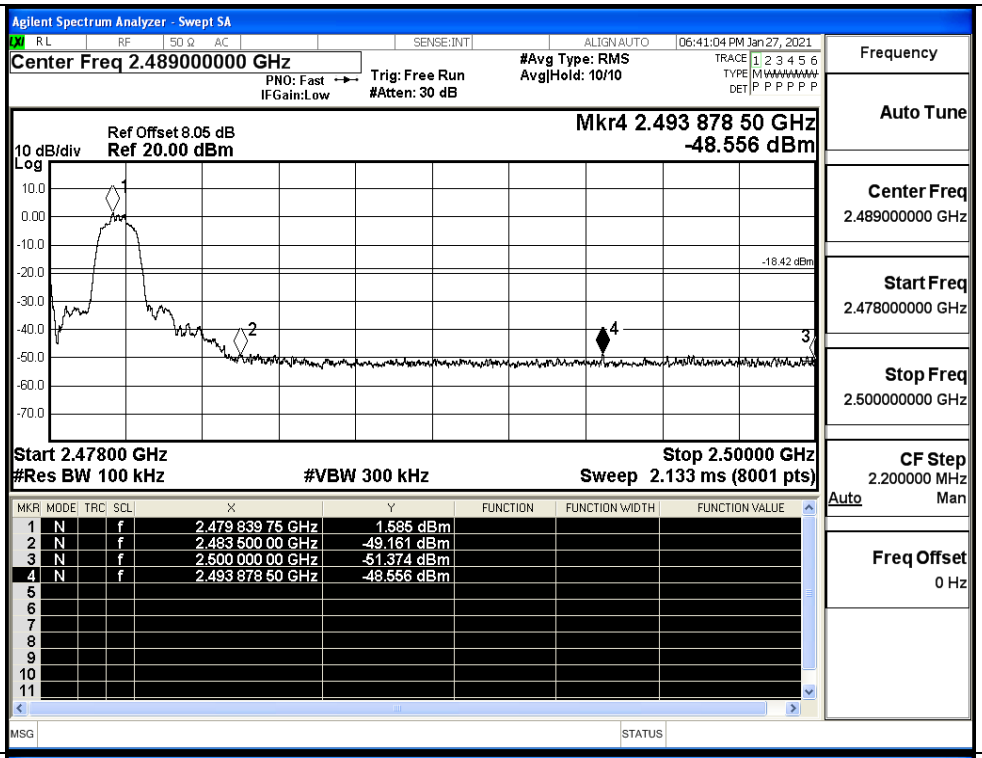
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.059	Off	-49.547	-16.94	PASS
			3.239	On	-48.923	-16.76	PASS
	HCH	2480	3.111	Off	-46.643	-16.89	PASS
			3.292	On	-47.109	-16.71	PASS
π/4DQPSK	LCH	2402	0.116	Off	-49.469	-19.88	PASS
			1.993	On	-48.109	-18.01	PASS
	HCH	2480	1.585	Off	-48.556	-18.42	PASS
			2.029	On	-48.037	-17.97	PASS

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

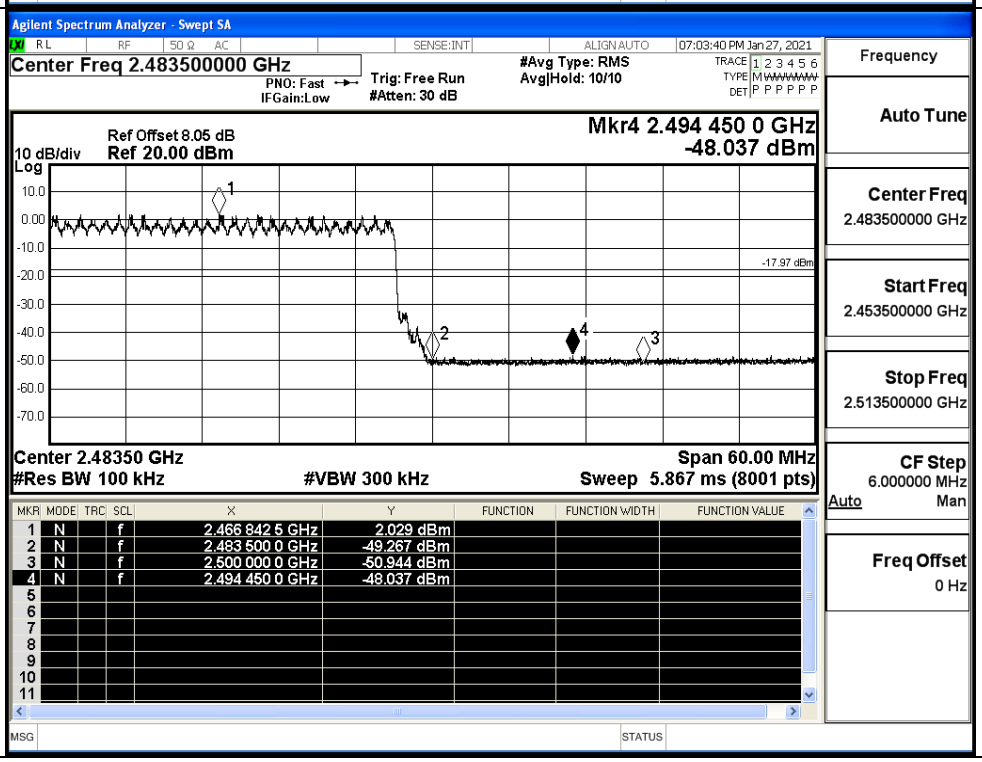
GFSK/HCH/No Hop	
GFSK/HCH/Hop	

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

π/4DQPSK/HCH/No Hop



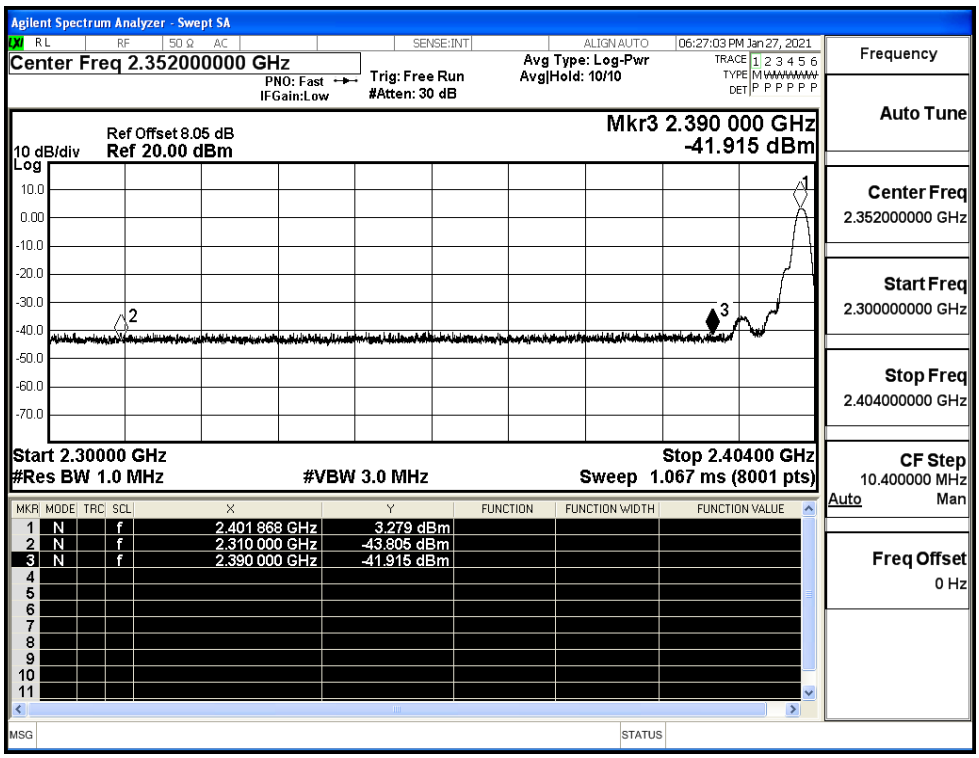
π/4DQPSK/HCH/Hop



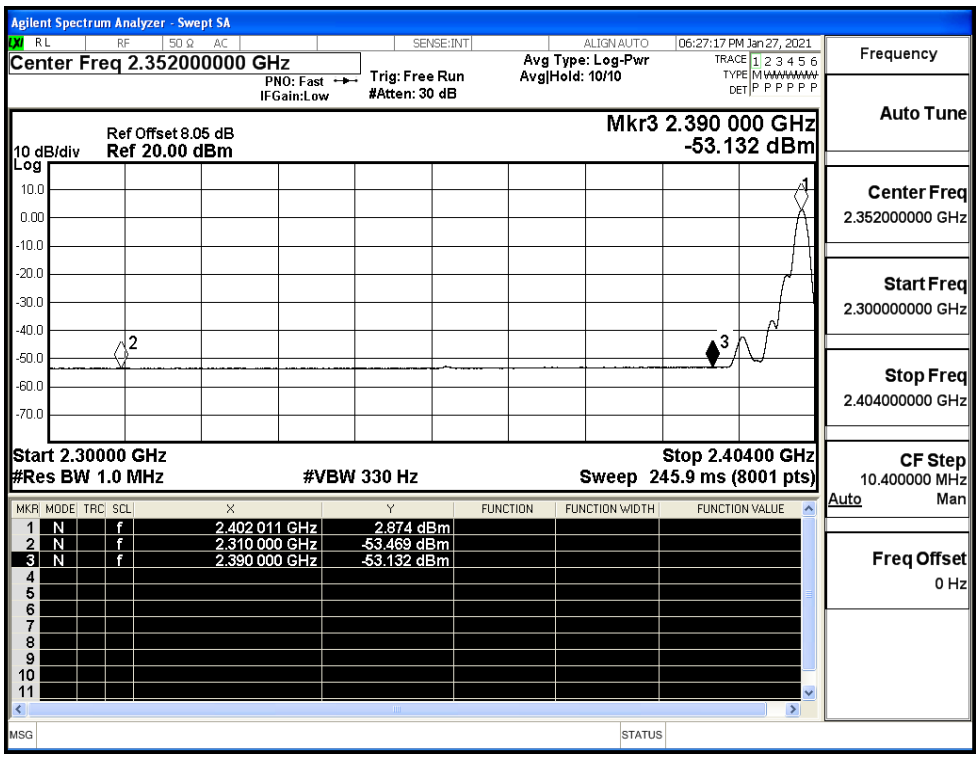
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.81	2.0	0	53.45	PEAK	74	PASS
	Off	2310.0	-53.47	2.0	0	43.79	AV	54	PASS
	Off	2390.0	-41.92	2.0	0	55.34	PEAK	74	PASS
	Off	2390.0	-53.13	2.0	0	44.13	AV	54	PASS
	Off	2483.5	-39.65	2.0	0	57.61	PEAK	74	PASS
	Off	2483.5	-48.49	2.0	0	48.77	AV	54	PASS
	Off	2500.0	-41.35	2.0	0	55.91	PEAK	74	PASS
	Off	2500.0	-52.40	2.0	0	44.86	AV	54	PASS
π/4DQPSK	Off	2310.0	-43.13	2.0	0	54.13	PEAK	74	PASS
	Off	2310.0	-53.52	2.0	0	43.74	AV	54	PASS
	Off	2390.0	-42.70	2.0	0	54.56	PEAK	74	PASS
	Off	2390.0	-53.15	2.0	0	44.11	AV	54	PASS
	Off	2483.5	-39.30	2.0	0	57.96	PEAK	74	PASS
	Off	2483.5	-49.49	2.0	0	47.77	AV	54	PASS
	Off	2500.0	-42.52	2.0	0	54.74	PEAK	74	PASS
	Off	2500.0	-52.51	2.0	0	44.75	AV	54	PASS

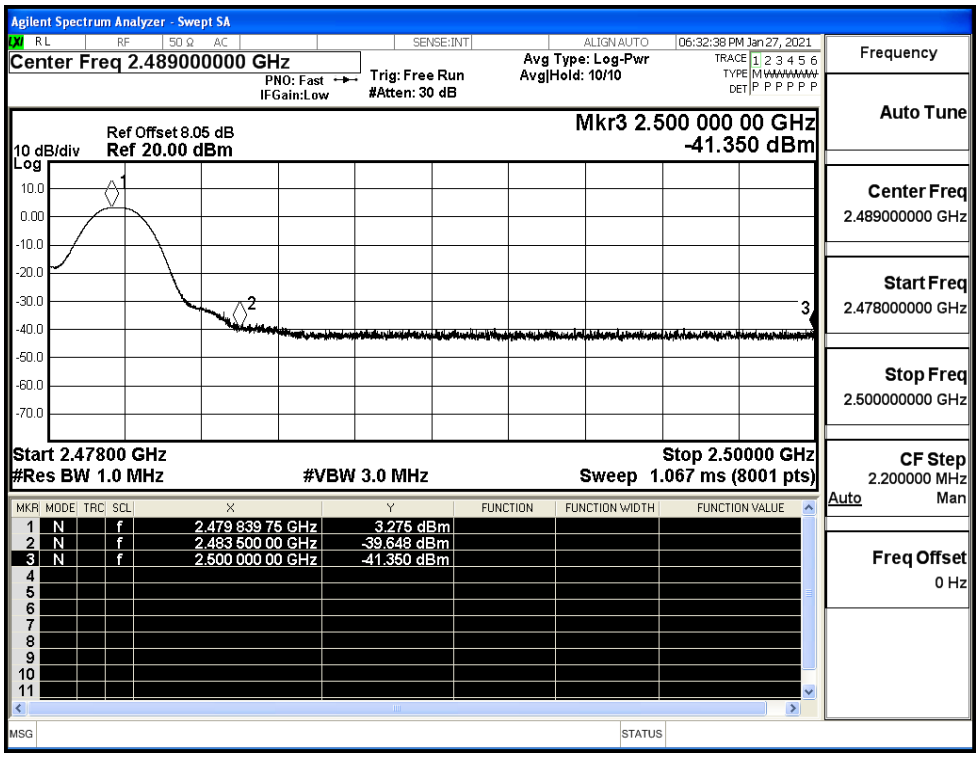
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



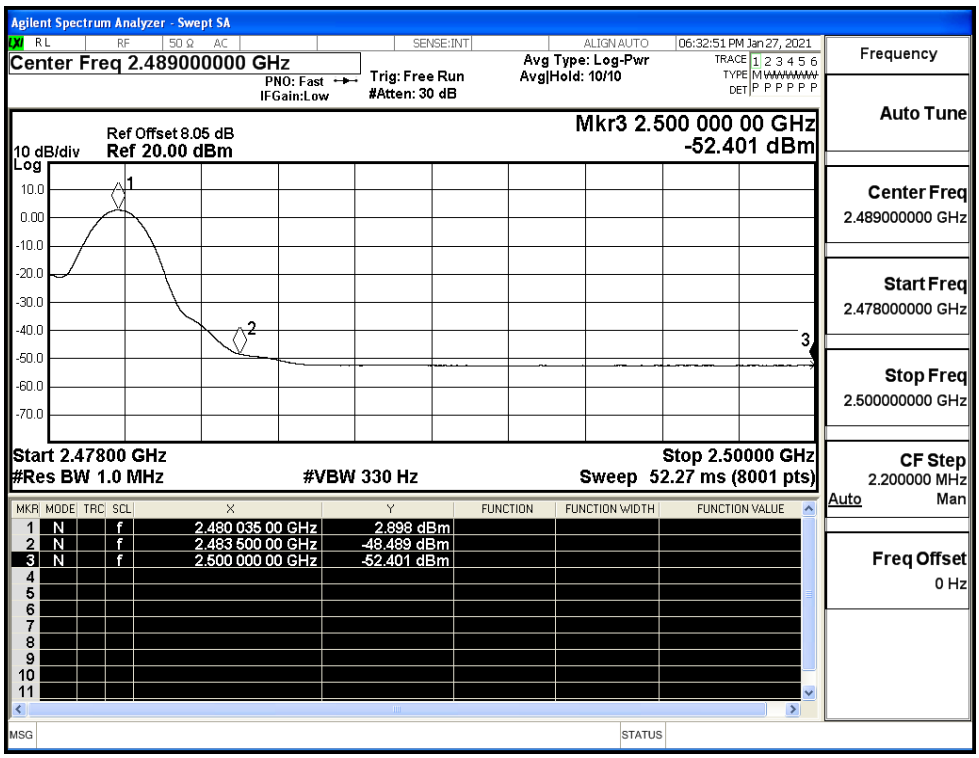
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



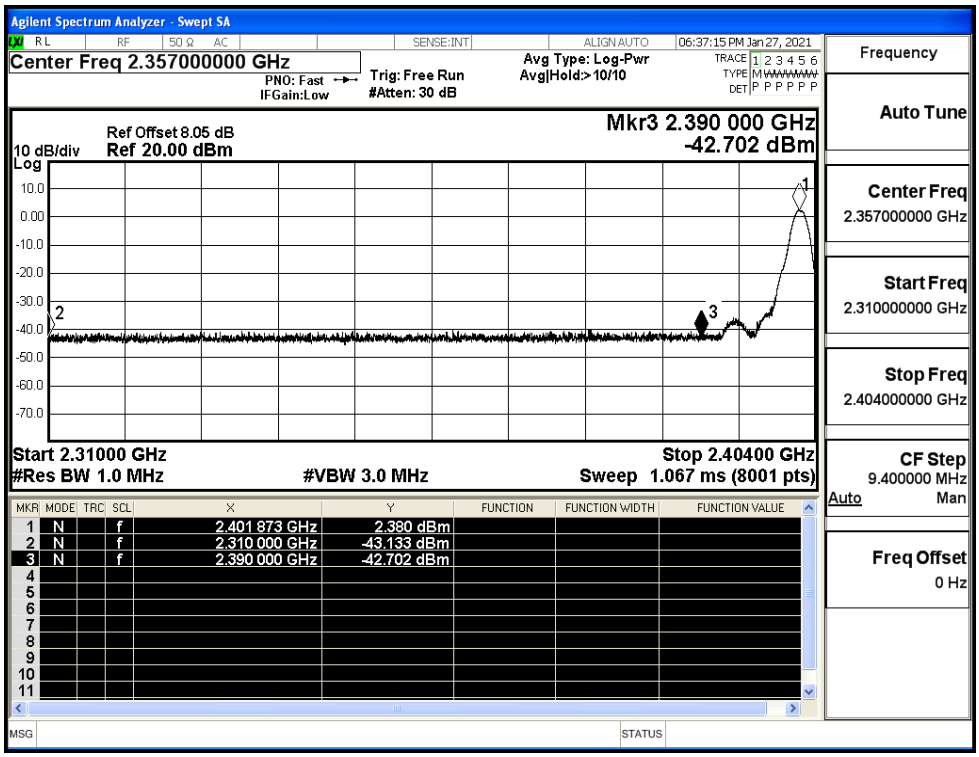
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



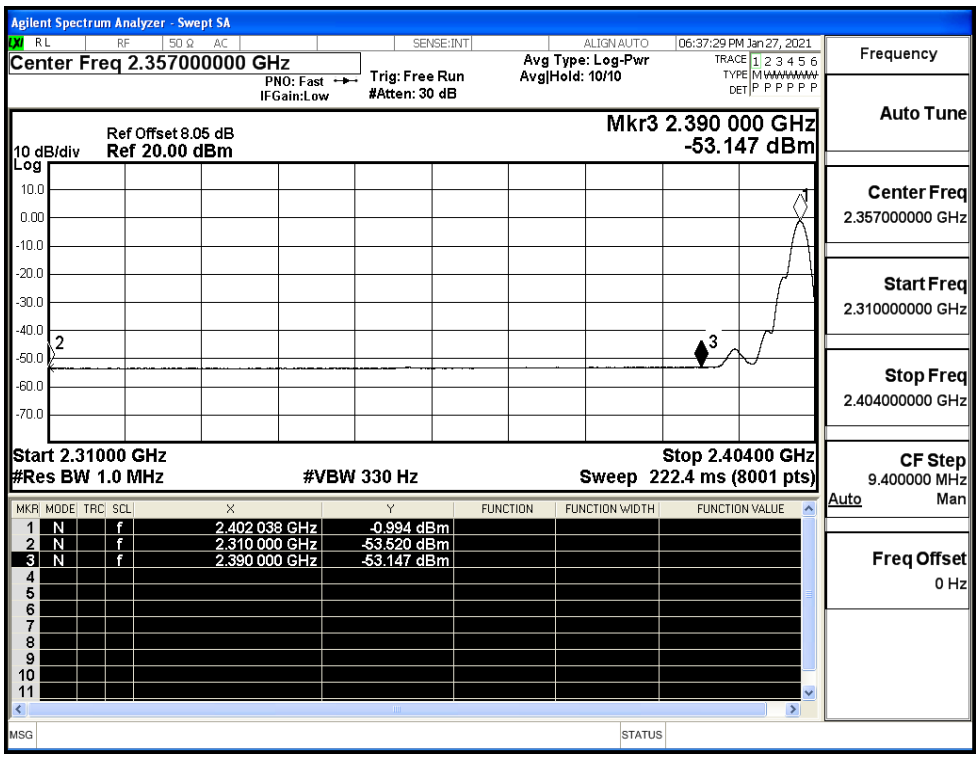
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



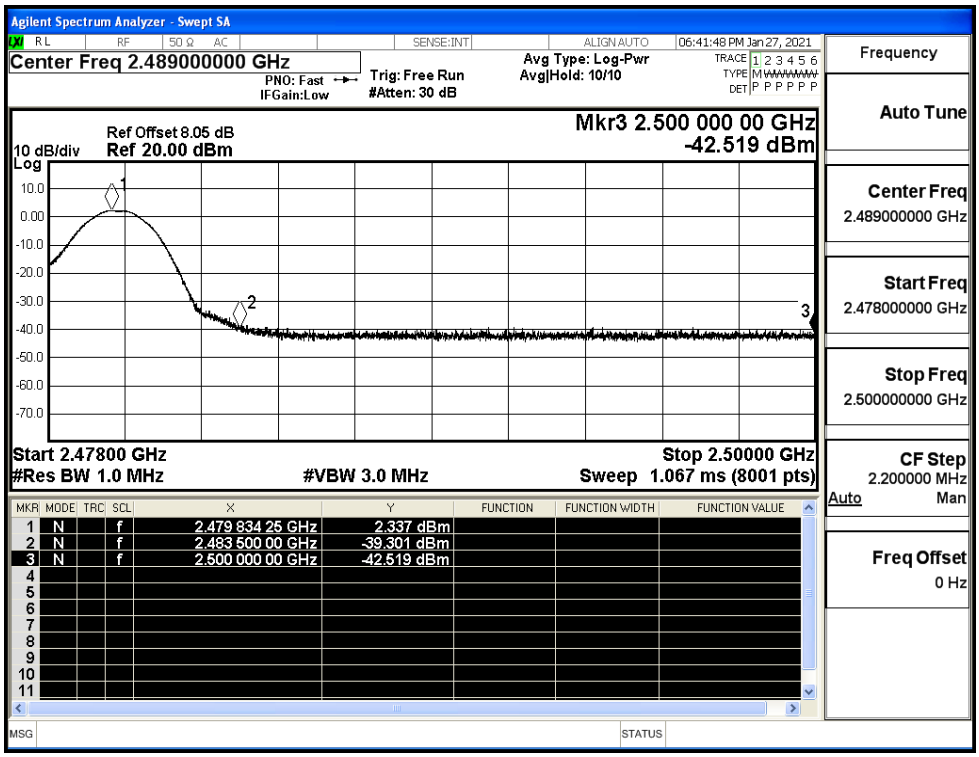
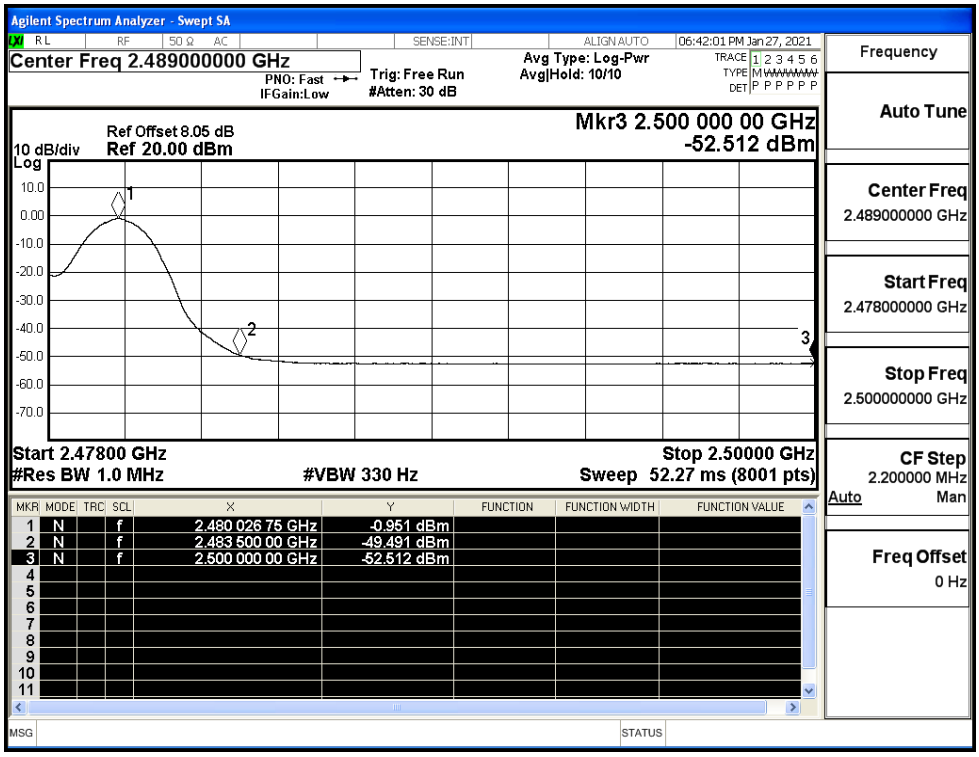
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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)