Appendix A

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

Product Name: Bluetooth Speaker

Trade Mark: KZY

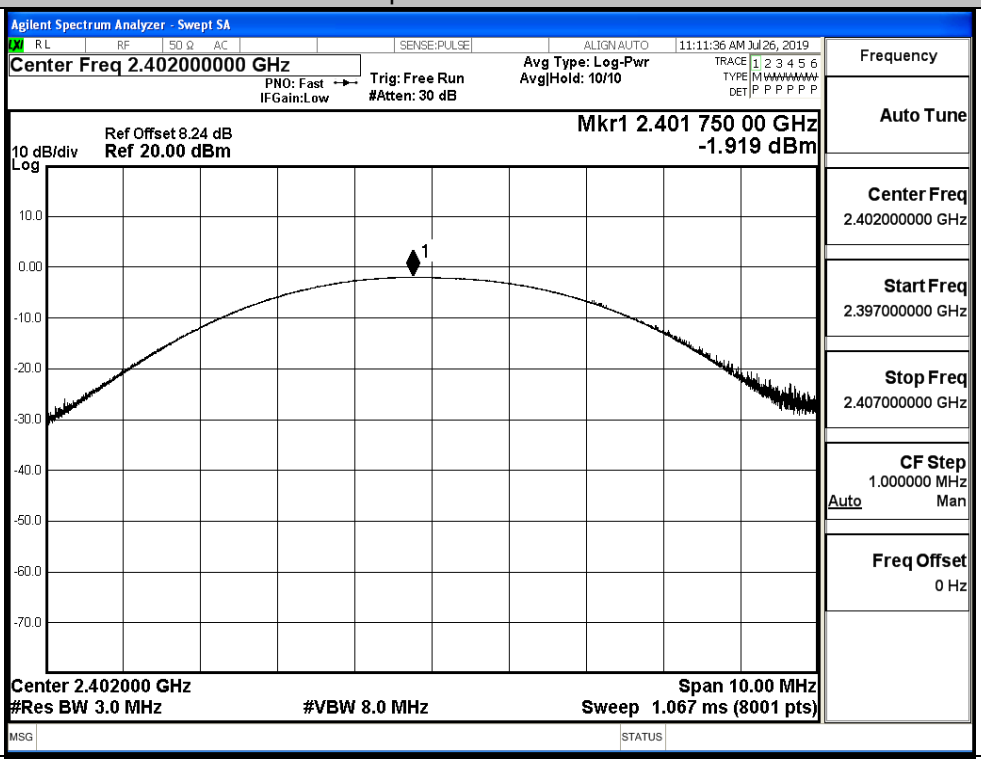
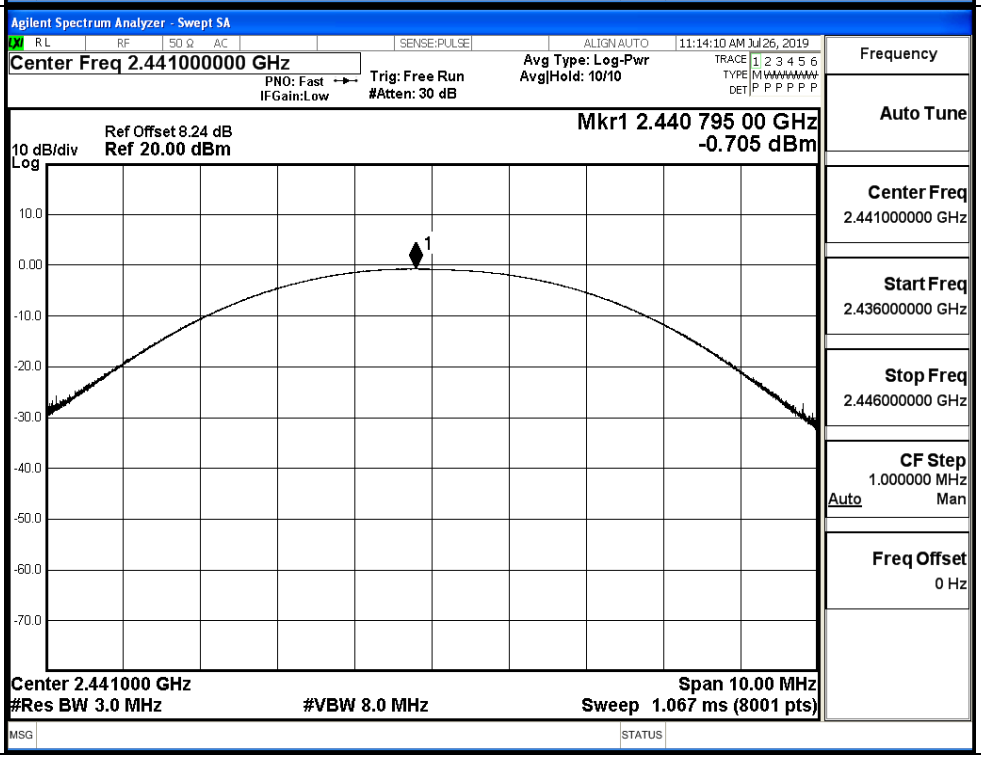
Test Model: K40

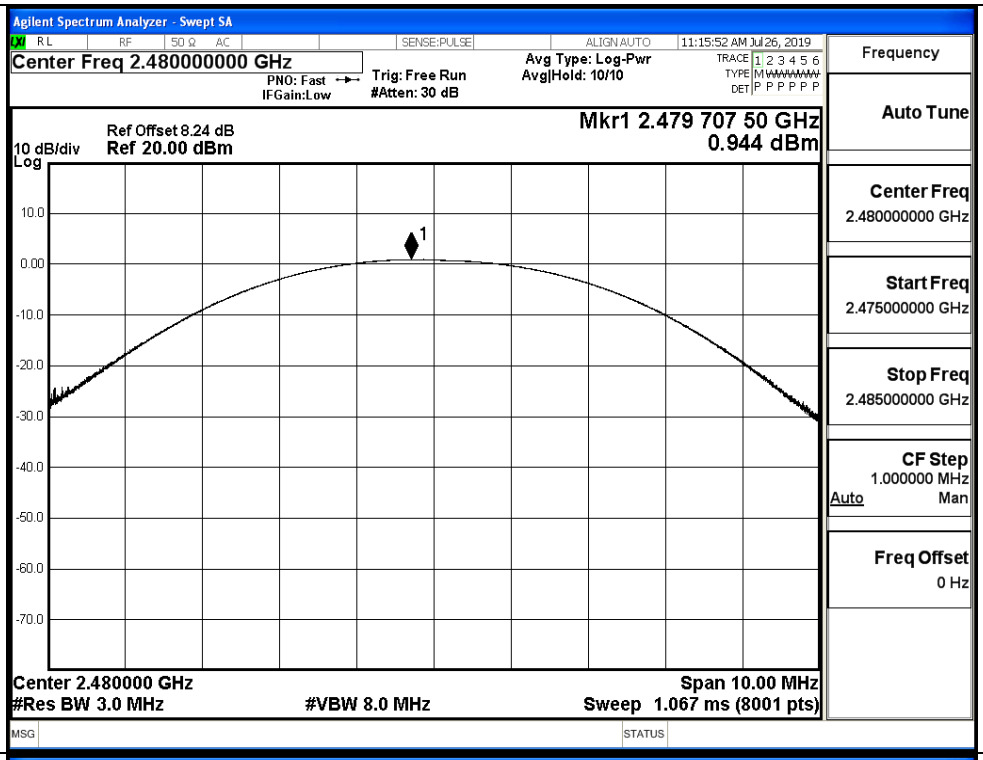
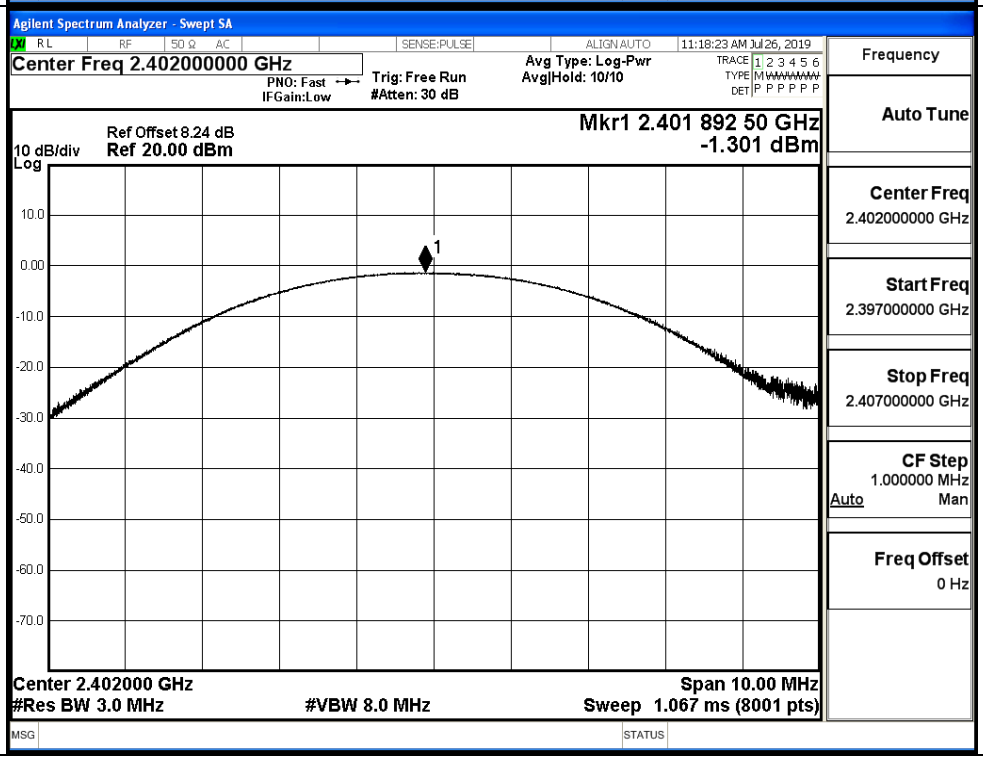
Environmental Conditions

Temperature:	23.9 ° C
Relative Humidity:	52.7 %
ATM Pressure:	100.0 kPa
Test Engineer:	SCENT HU
Supervised by:	Wang.Chuang

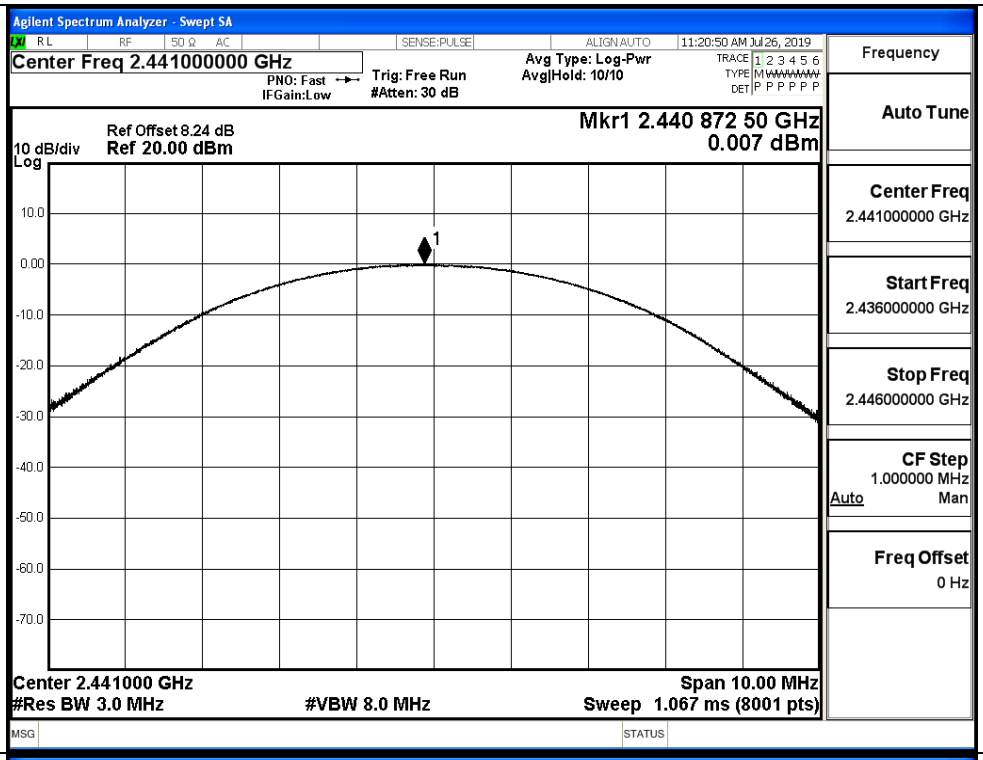
A.1 Maxmum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.919	21	PASS
	MCH	-0.705	21	PASS
	HCH	0.944	21	PASS
π/4DQPSK	LCH	-1.301	21	PASS
	MCH	0.007	21	PASS
	HCH	1.616	21	PASS

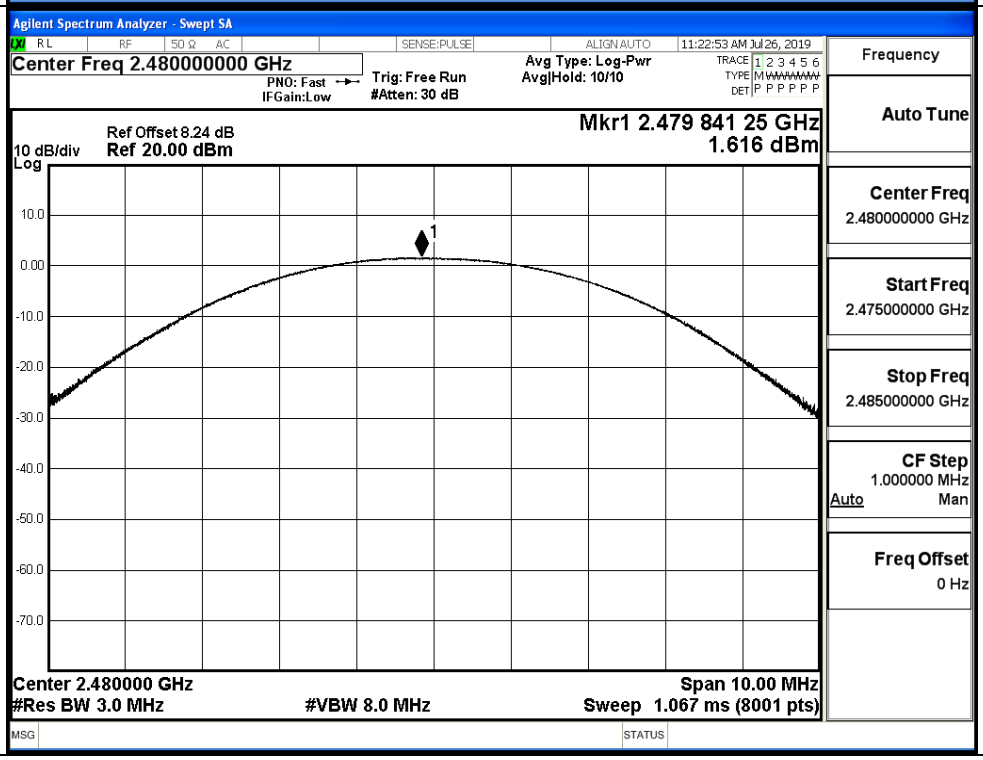
Test Graphs		
GFSK/LCH		
GFSK/MCH		

GFSK/HCH		
π/4DQPSK/LCH		

π/4DQPSK/MCH

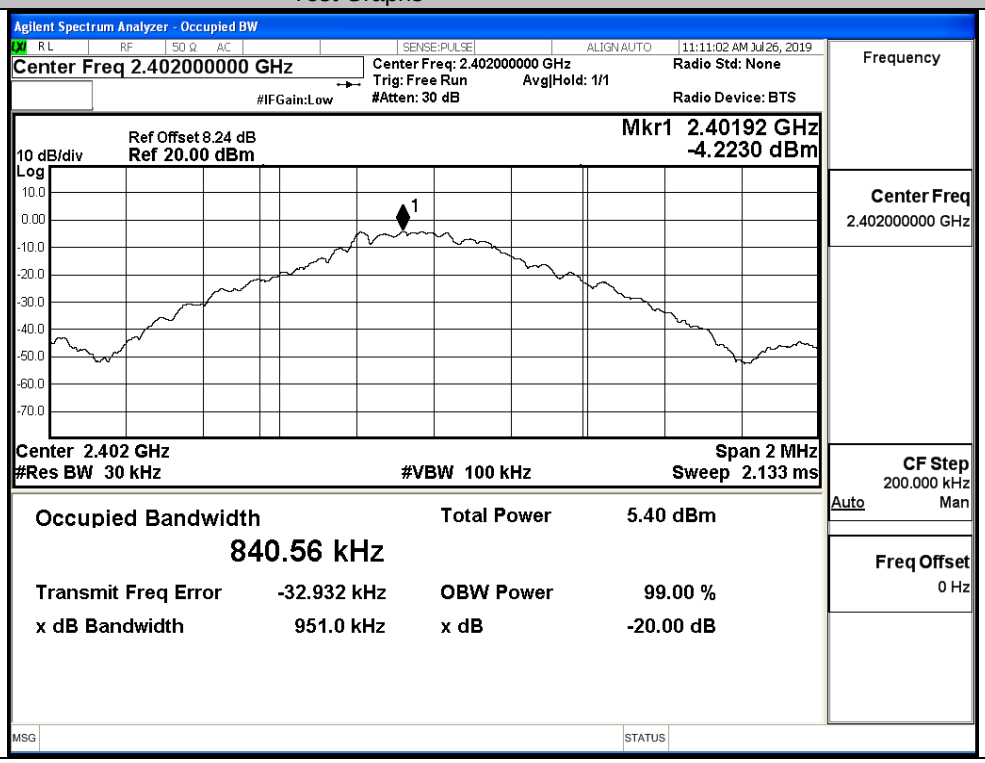


π/4DQPSK/HCH

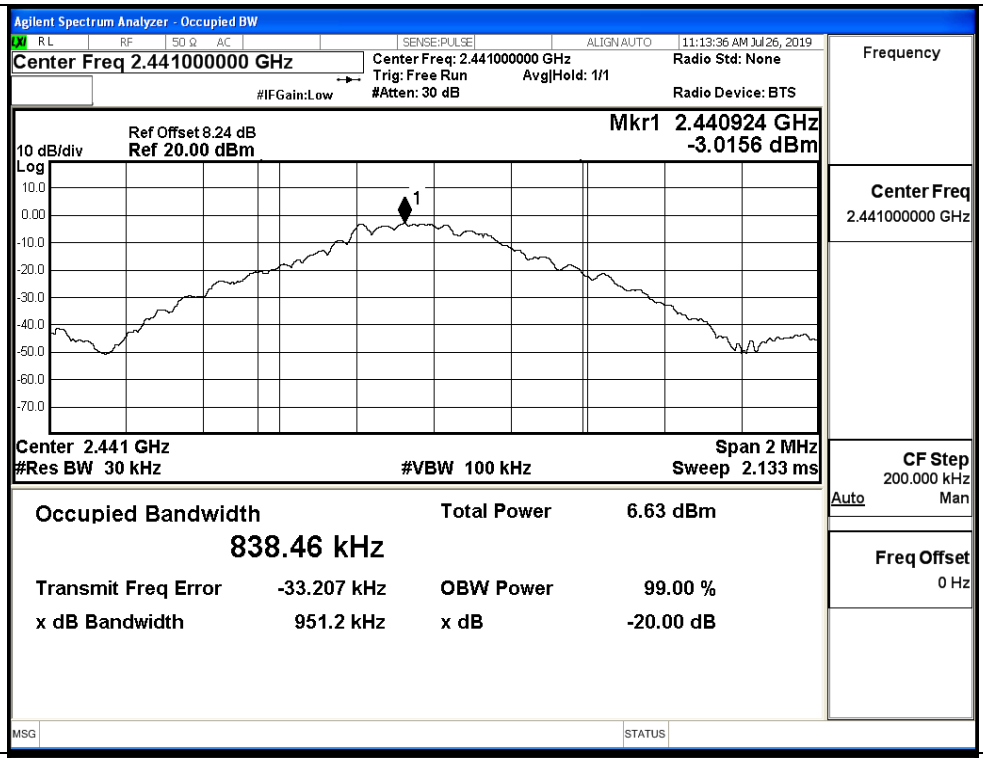


A.2 20dB Bandwidth

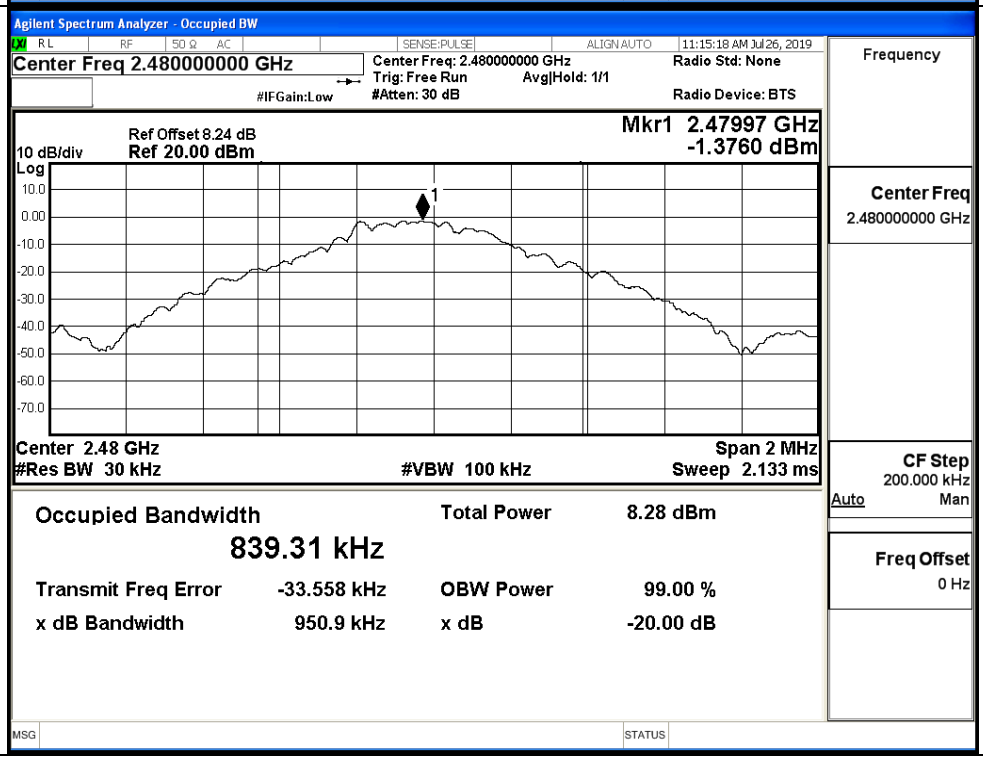
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9510	Not Specified	PASS
	MCH	0.9512	Not Specified	PASS
	HCH	0.9509	Not Specified	PASS
π/4DQPSK	LCH	1.311	Not Specified	PASS
	MCH	1.313	Not Specified	PASS
	HCH	1.313	Not Specified	PASS

Test Graphs	
GFSK/LCH	

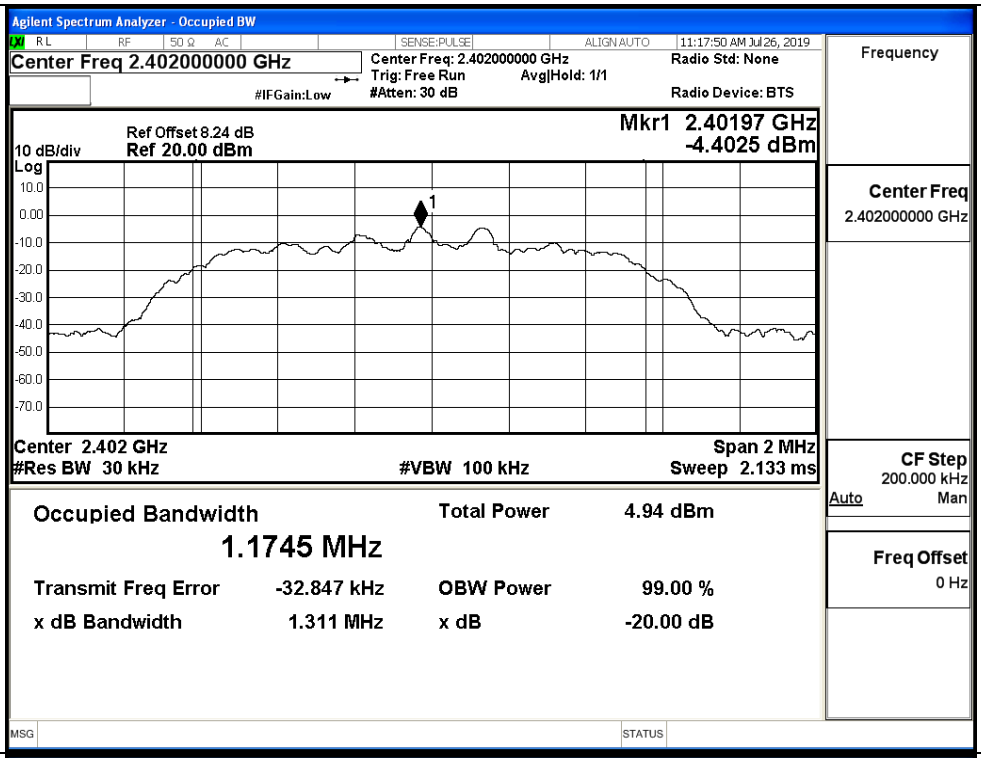
GFSK/MCH



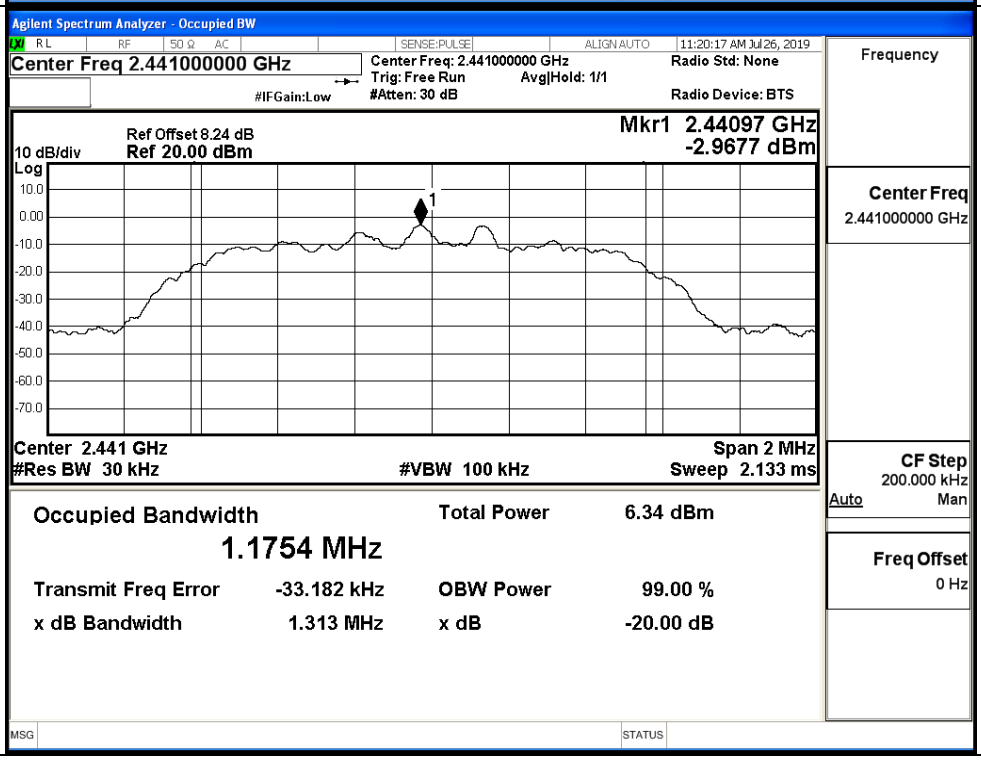
GFSK/HCH



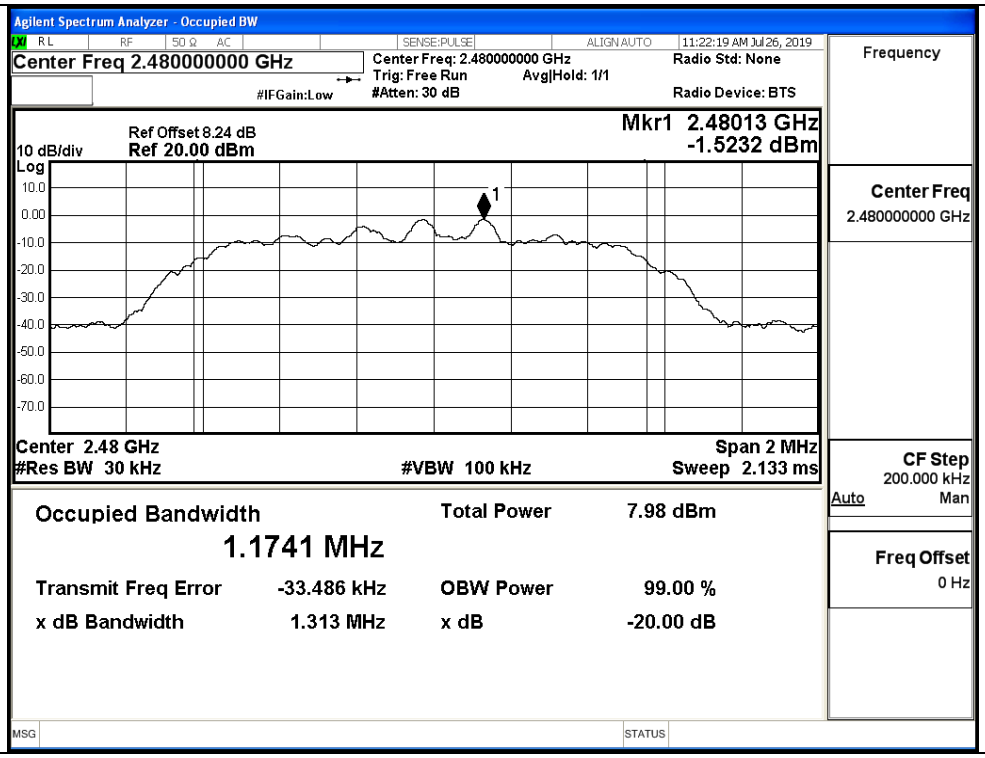
π/4DQPSK/LCH



π/4DQPSK/MCH

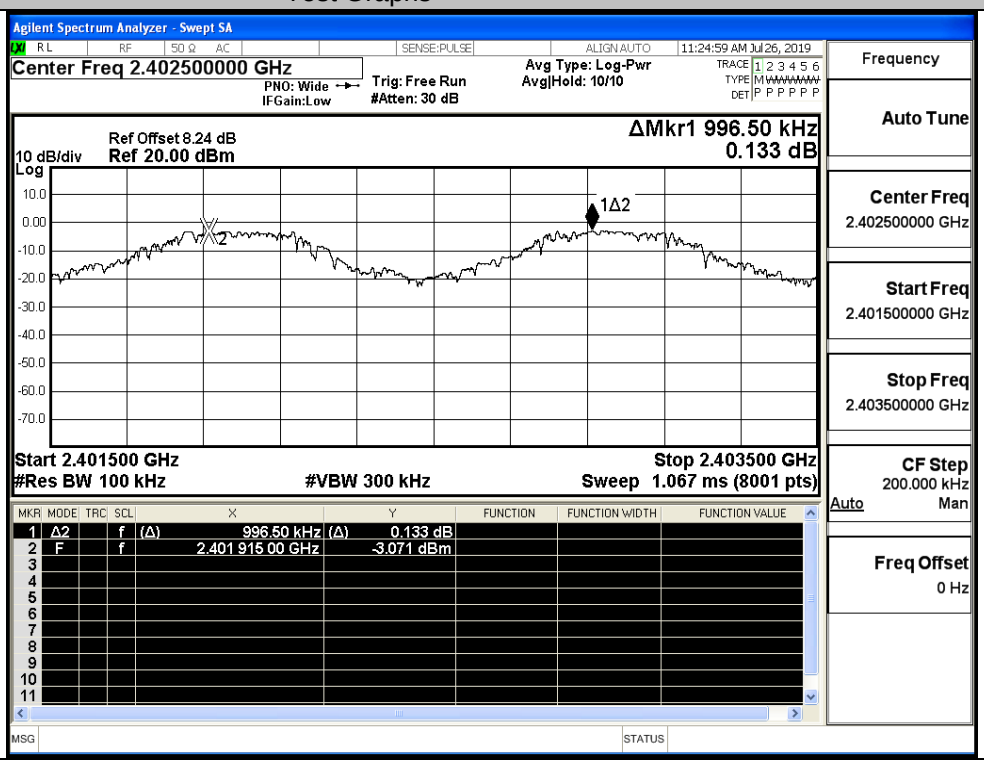


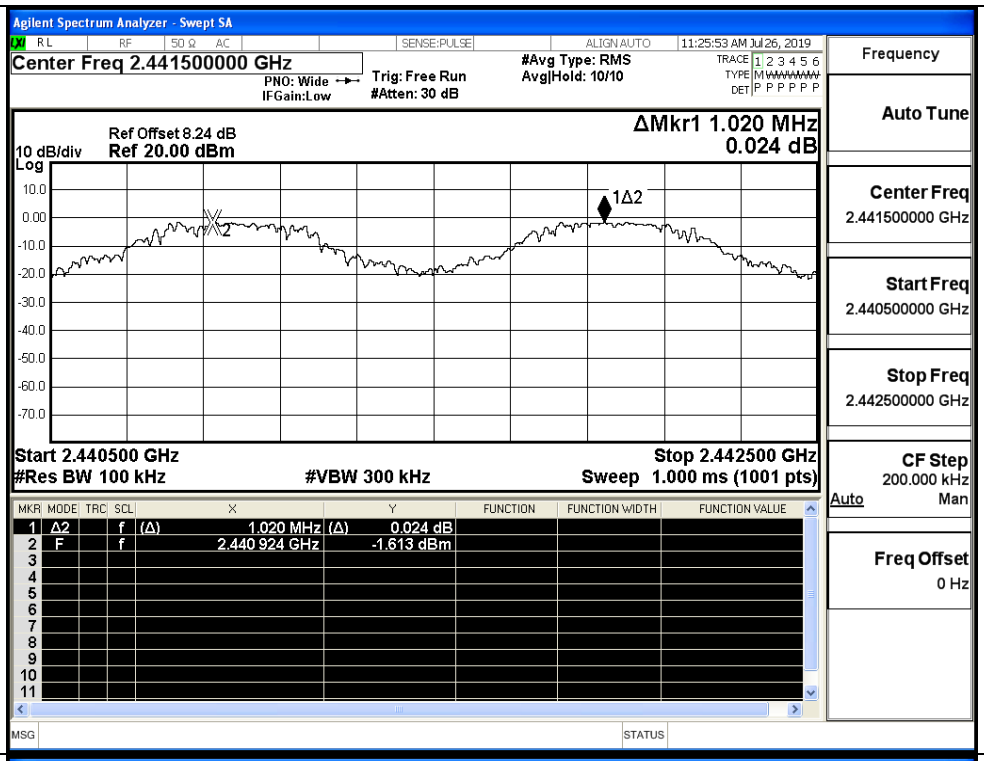
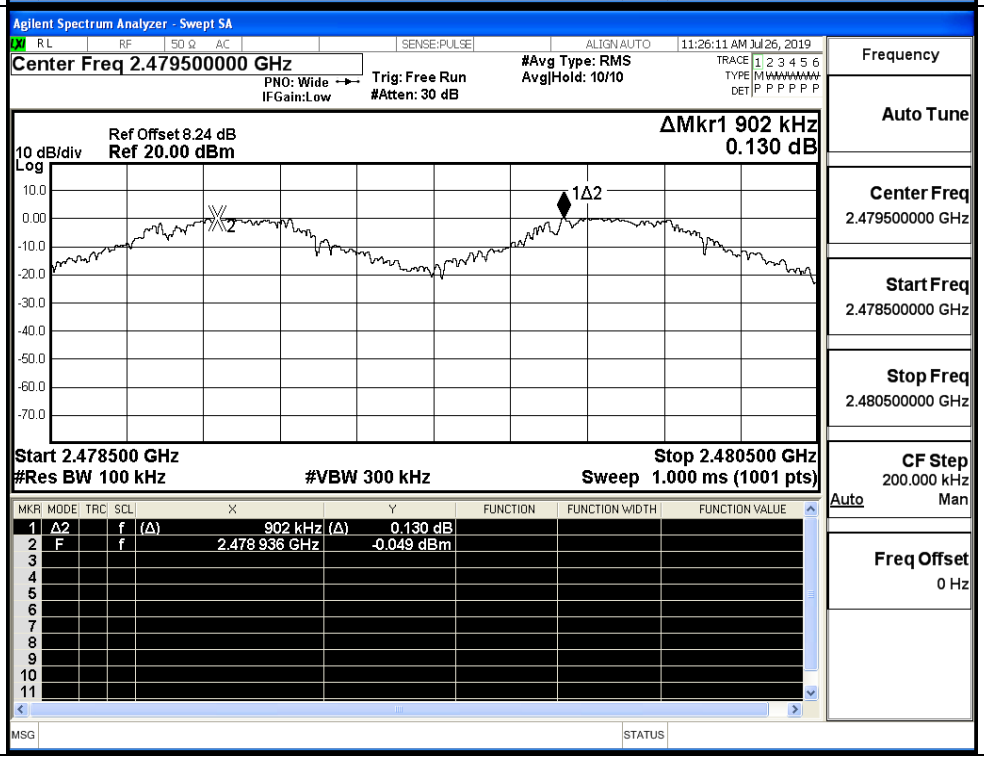
π/4DQPSK/HCH


Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
11:22:19 AM Jul 26, 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 8.24 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.48013 GHz
-1.5232 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
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
1.1741 MHz
Total Power
7.98 dBm
Freq Offset
0 Hz
Transmit Freq Error
-33.486 kHz
OBW Power
99.00 %
x dB Bandwidth
1.313 MHz
x dB
-20.00 dB
MSG
STATUS

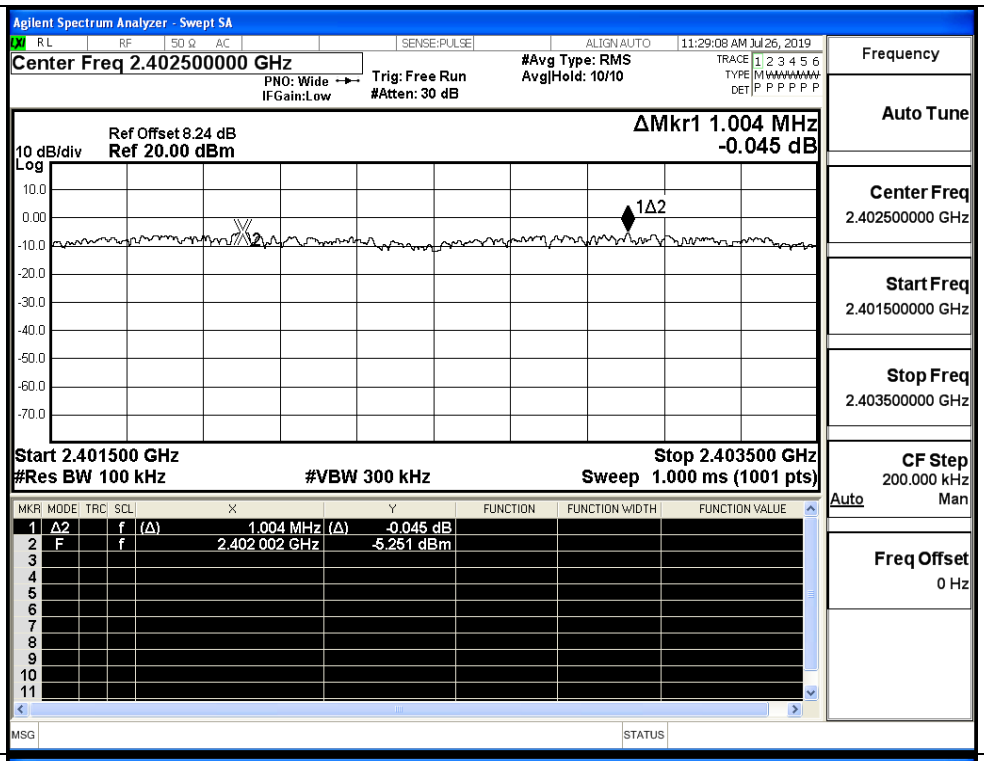
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.997	0.634	PASS
	MCH	1.020	0.634	PASS
	HCH	0.902	0.634	PASS
π/4DQPSK	LCH	1.004	0.875	PASS
	MCH	0.910	0.875	PASS
	HCH	1.020	0.875	PASS

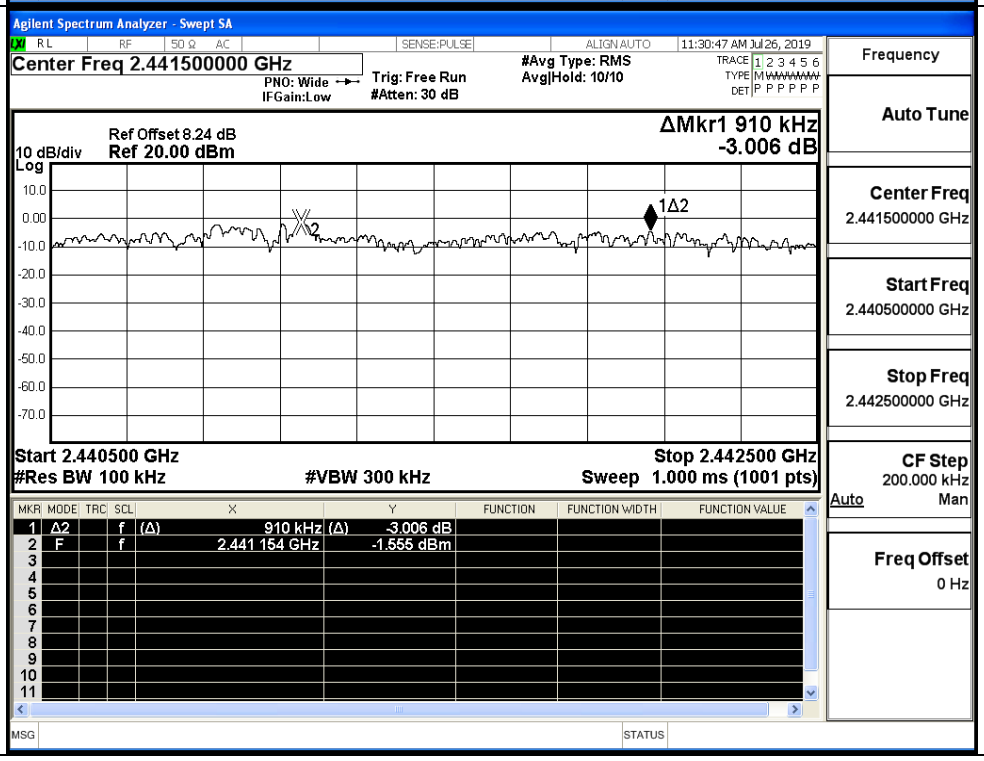
Test Graphs		
GFSK/LCH		

GFSK/MCH		
GFSK/HCH		

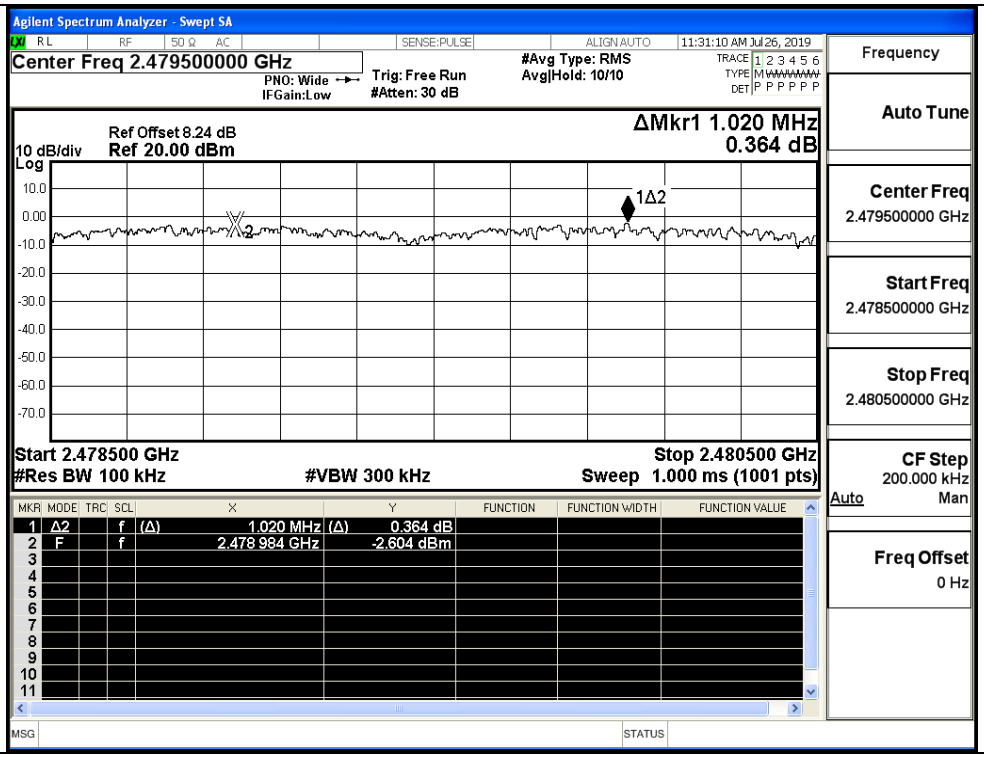
π/4DQPSK/LCH



π/4DQPSK/MCH

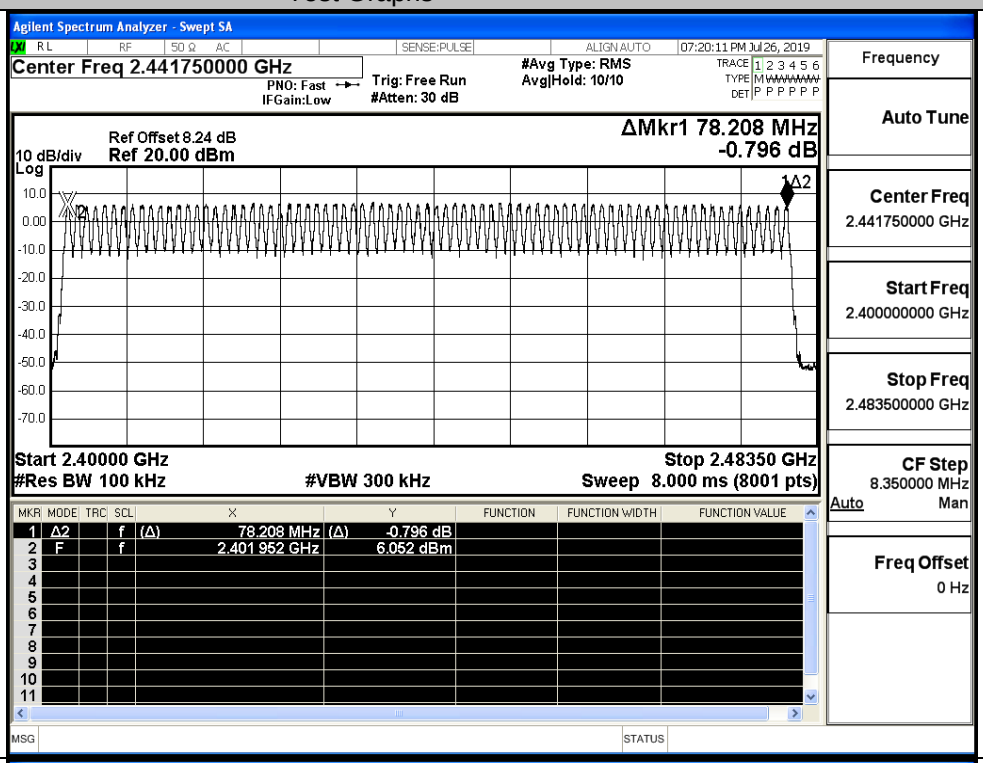
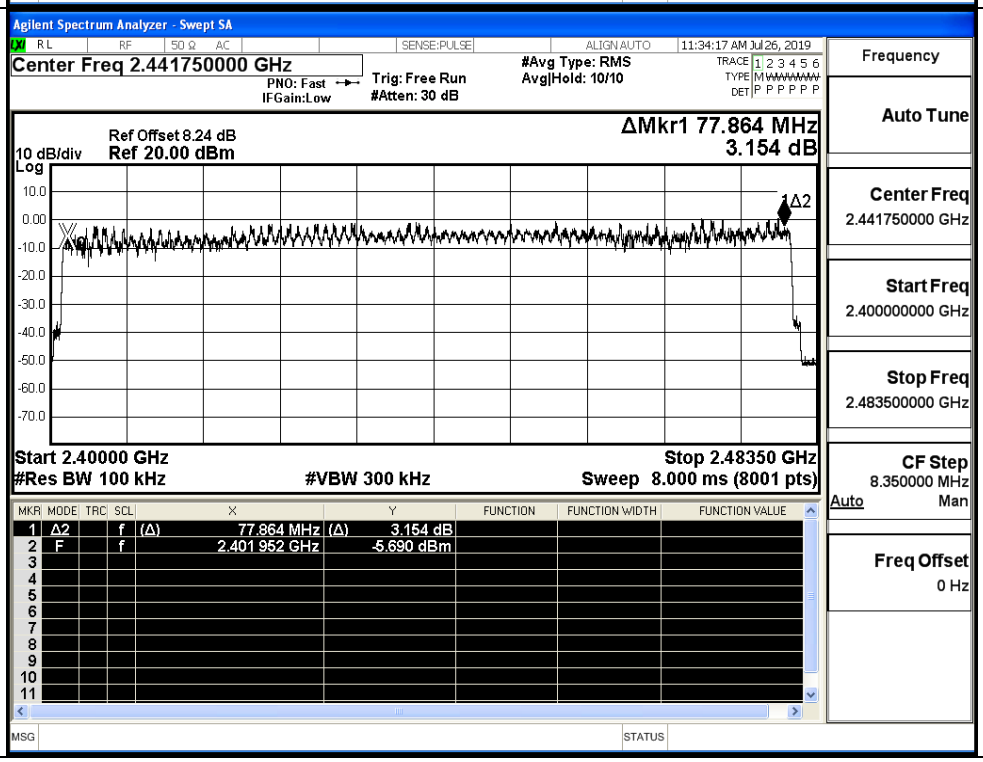


π/4DQPSK/HCH


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
11:31:10 AM Jul 26, 2019
Ref Offset 8.24 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 1.020 MHz
0.364 dB
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) 1.020 MHz (Δ) 0.364 dB
2 F f 2.478 984 GHz -2.604 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

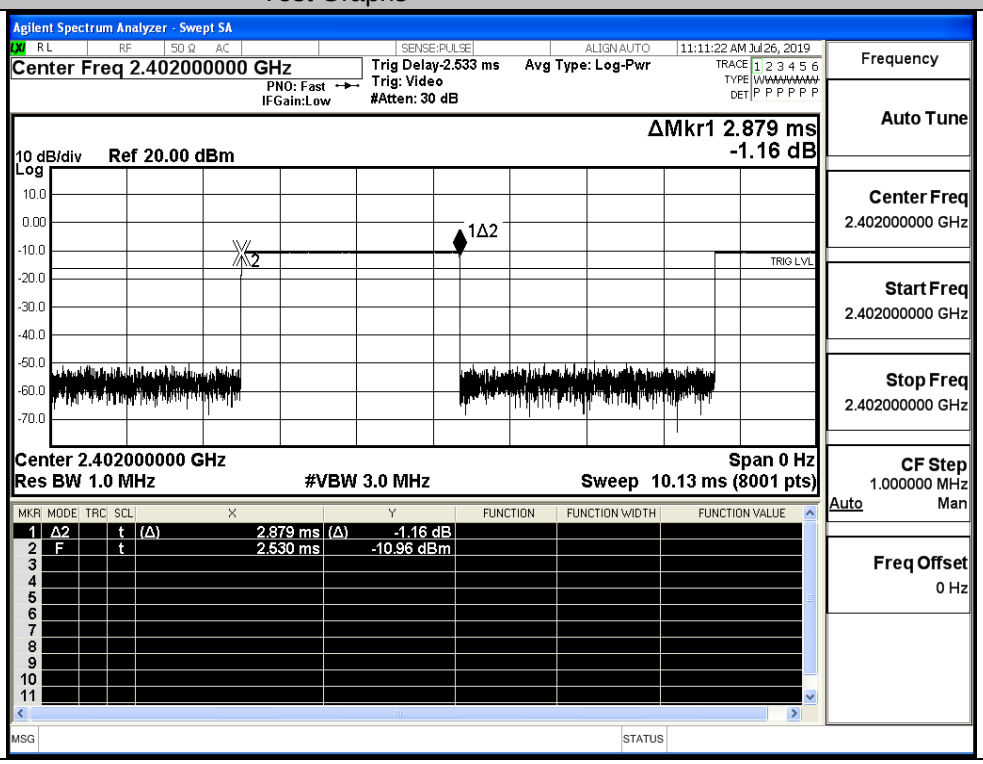
A.4 Hopping Channel Number

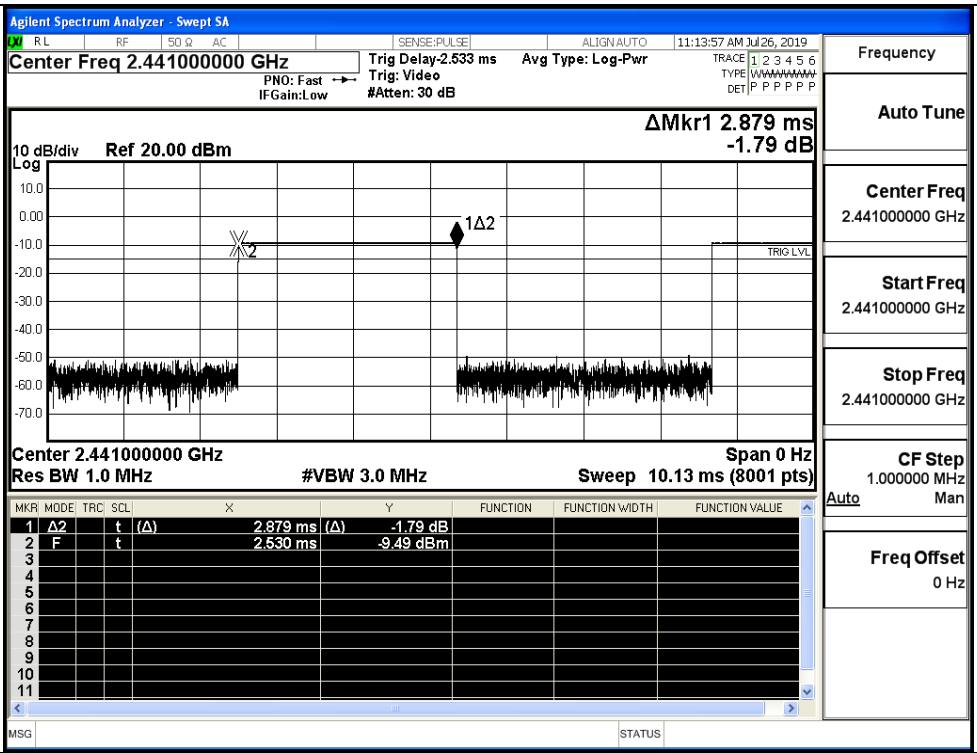
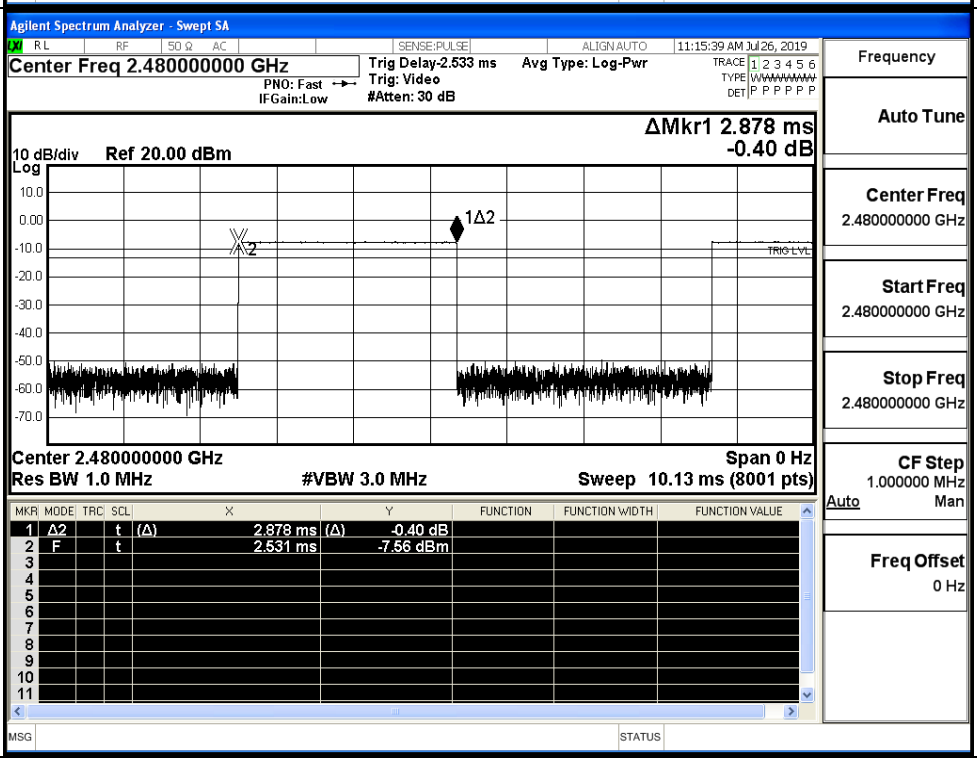
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS

Test Graphs	
GFSK/Hop	
π/4DQPSK/Hop	

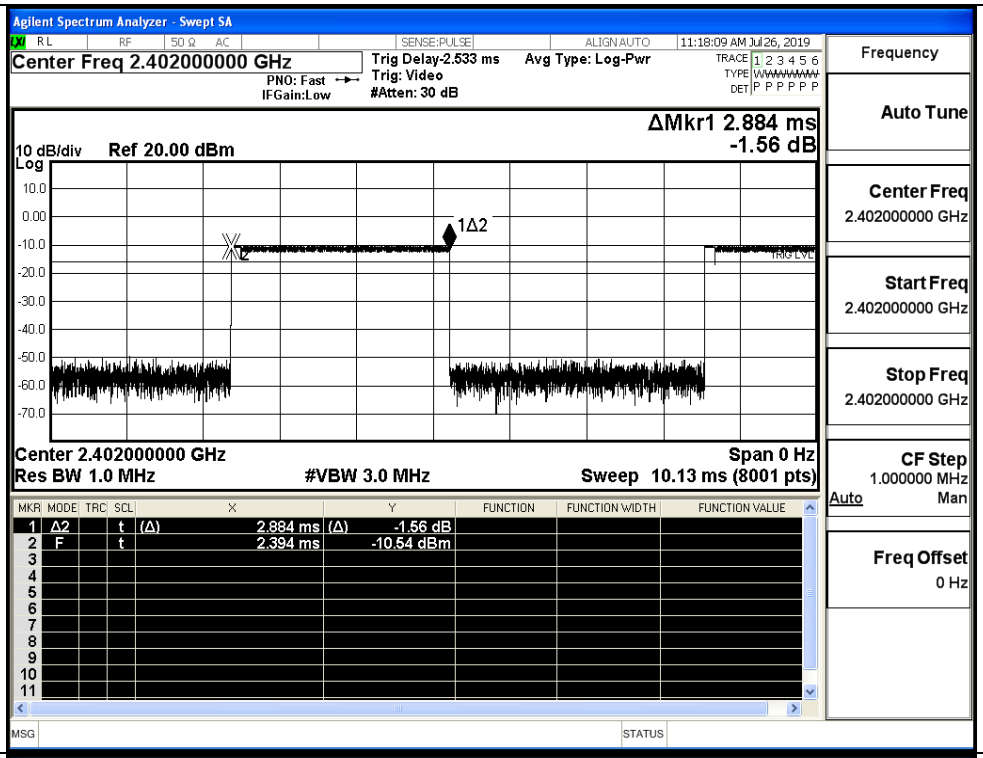
A.5 Dwell Time

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

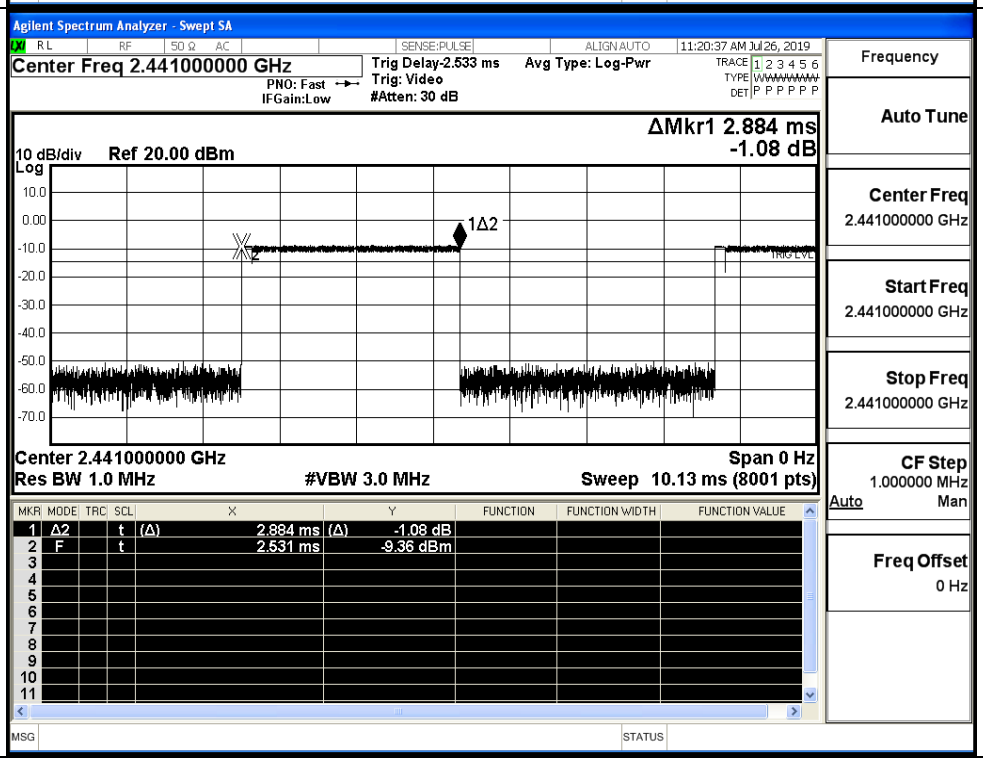
Test Graphs	
GFSK_DH5/LCH	

GFSK_DH5/MCH	
GFSK_DH5/HCH	

π/4DQPSK
_2DH5/LCH

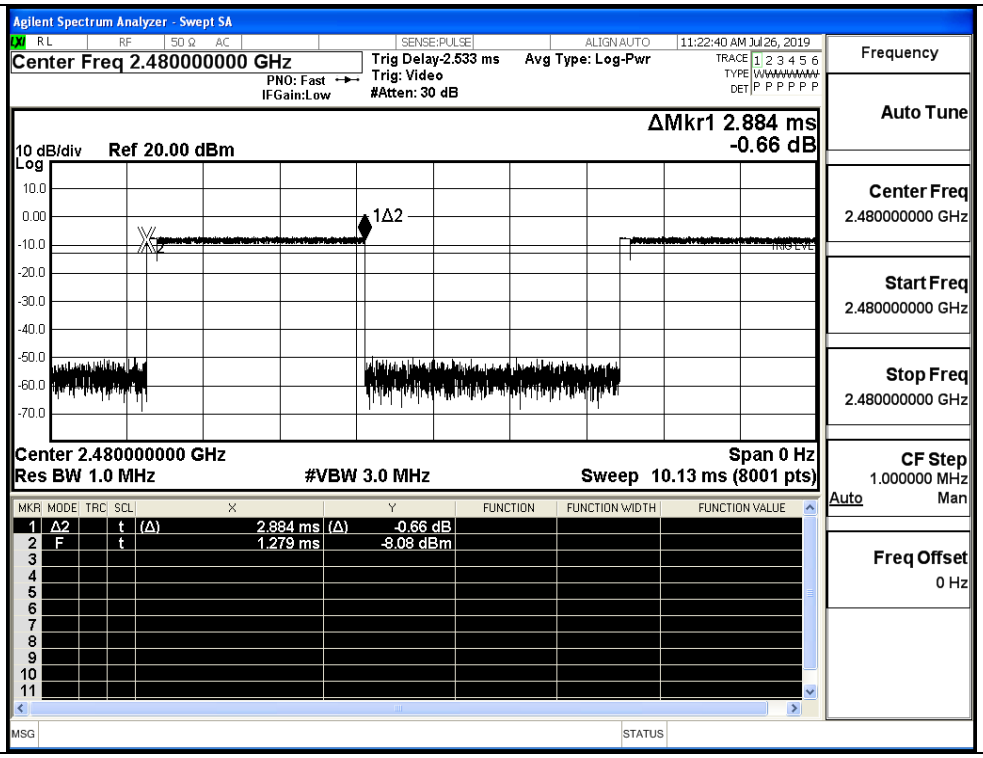


π/4DQPSK
_2DH5/MCH



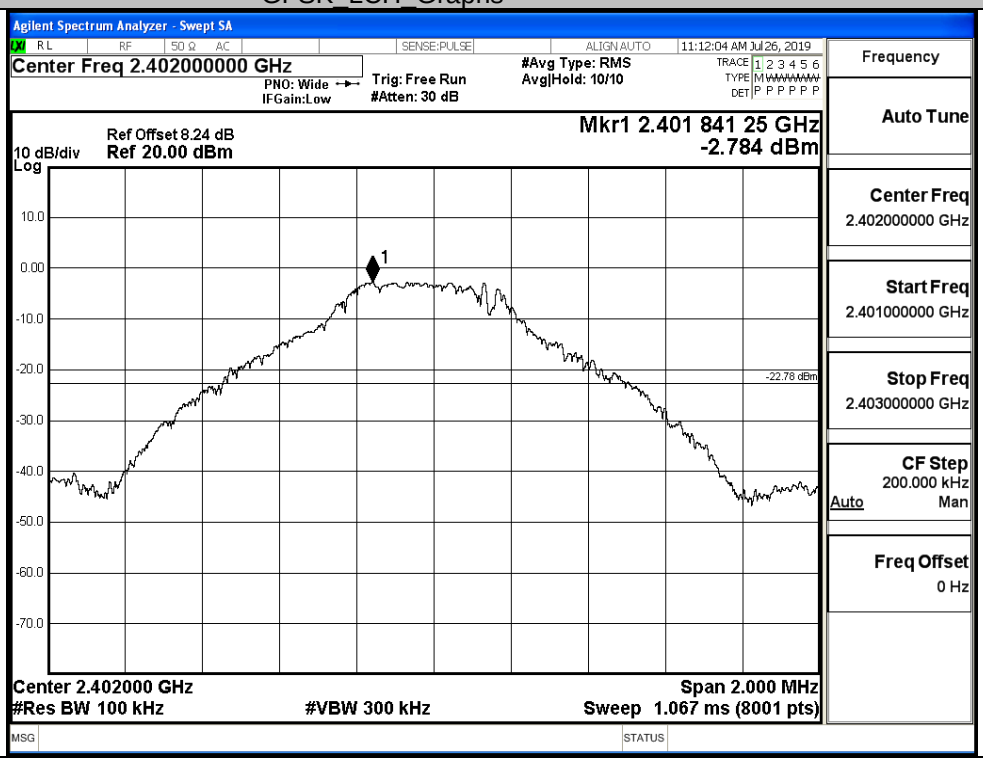
π/4DQPSK

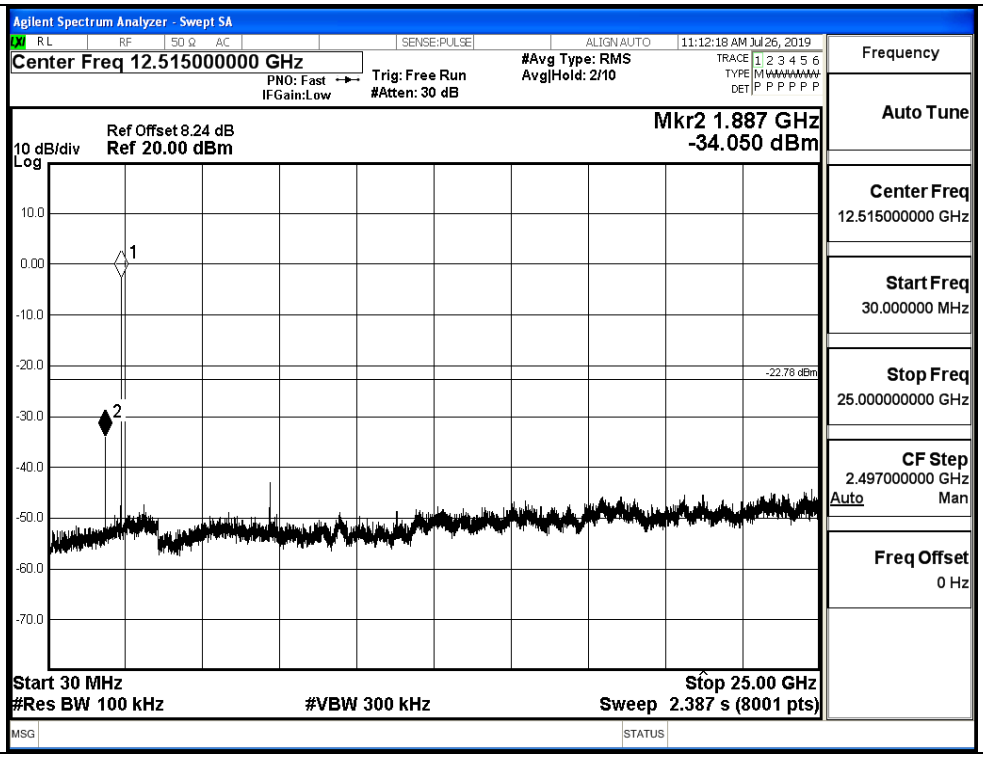
_2DH5/HCH



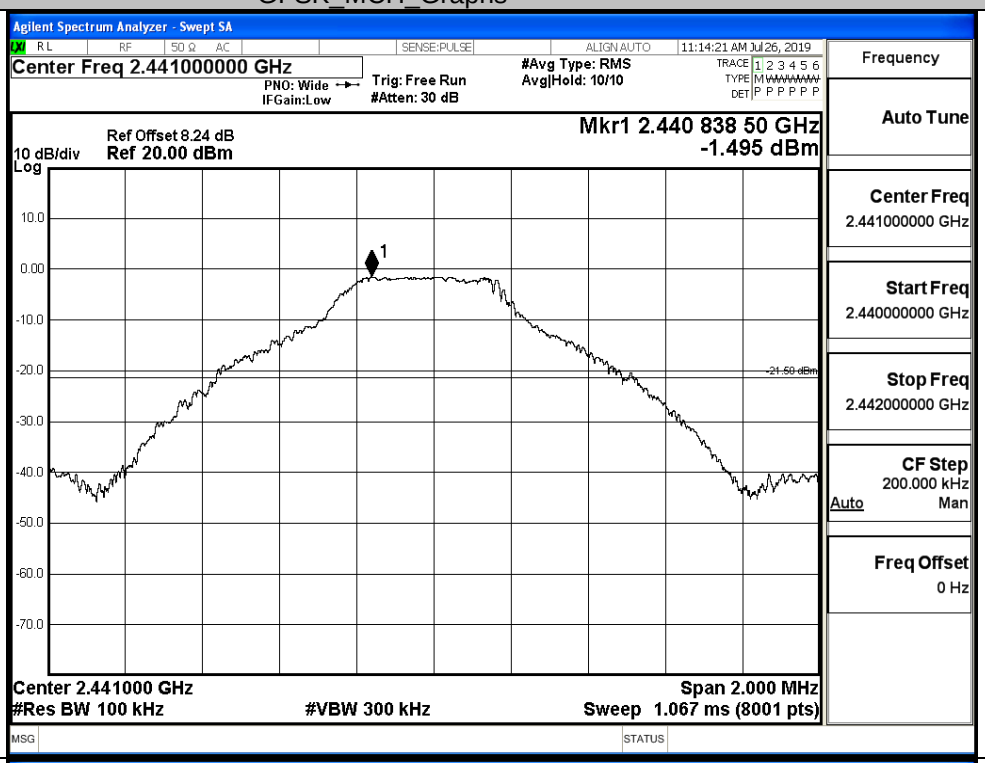
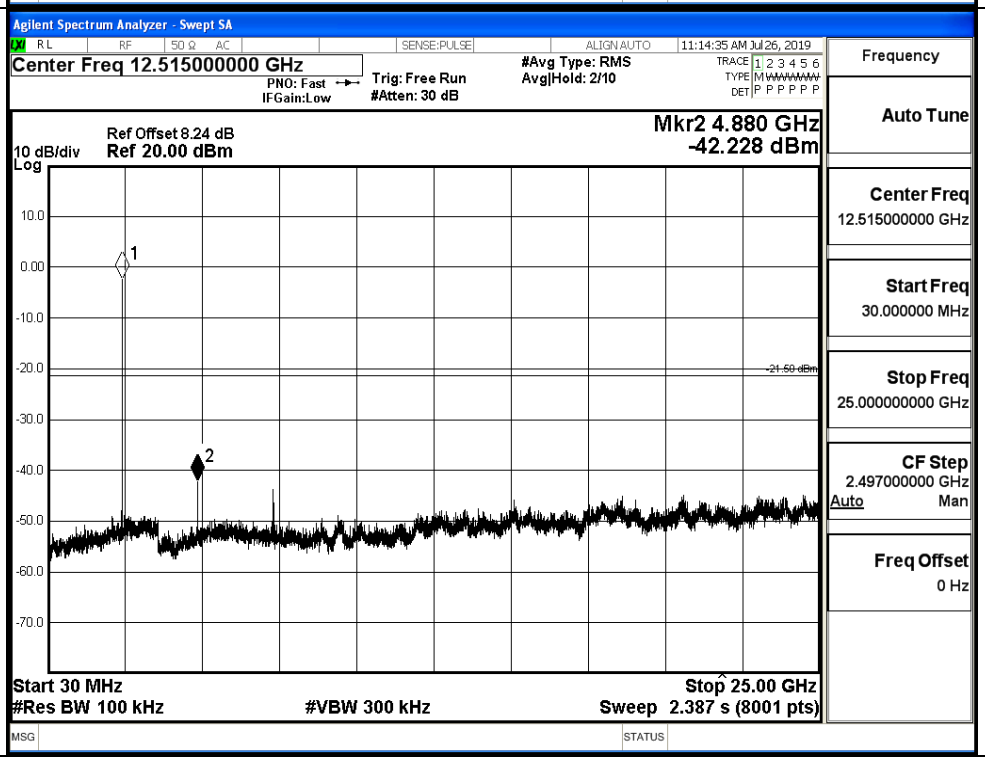
A.6 RF Conducted Spurious Emissions

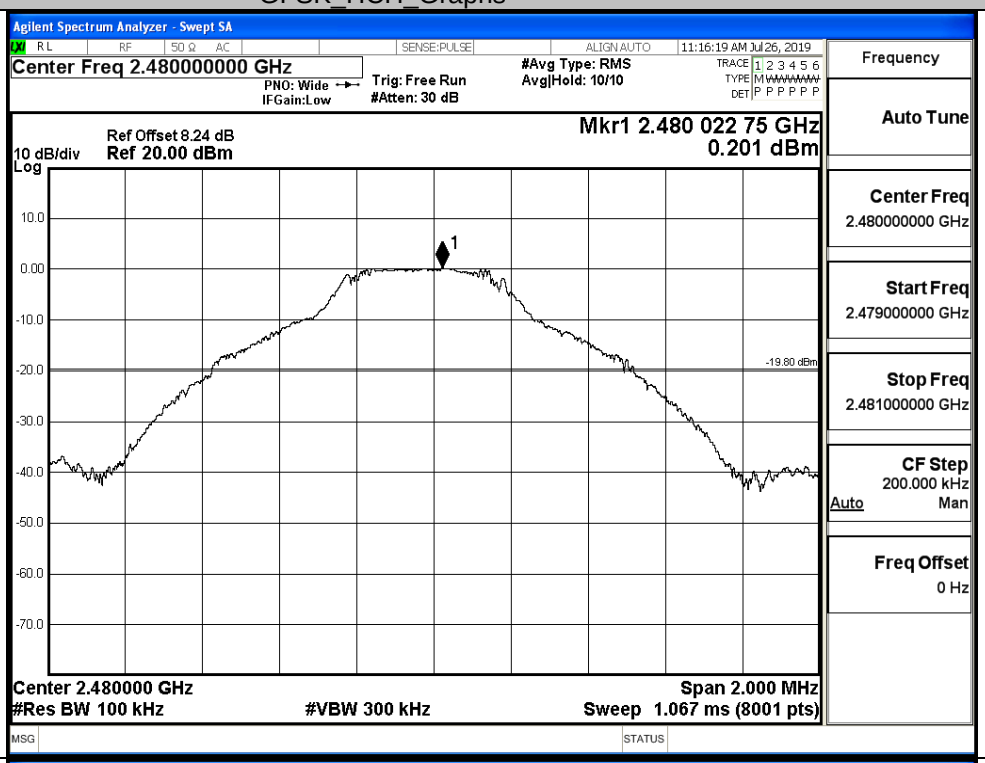
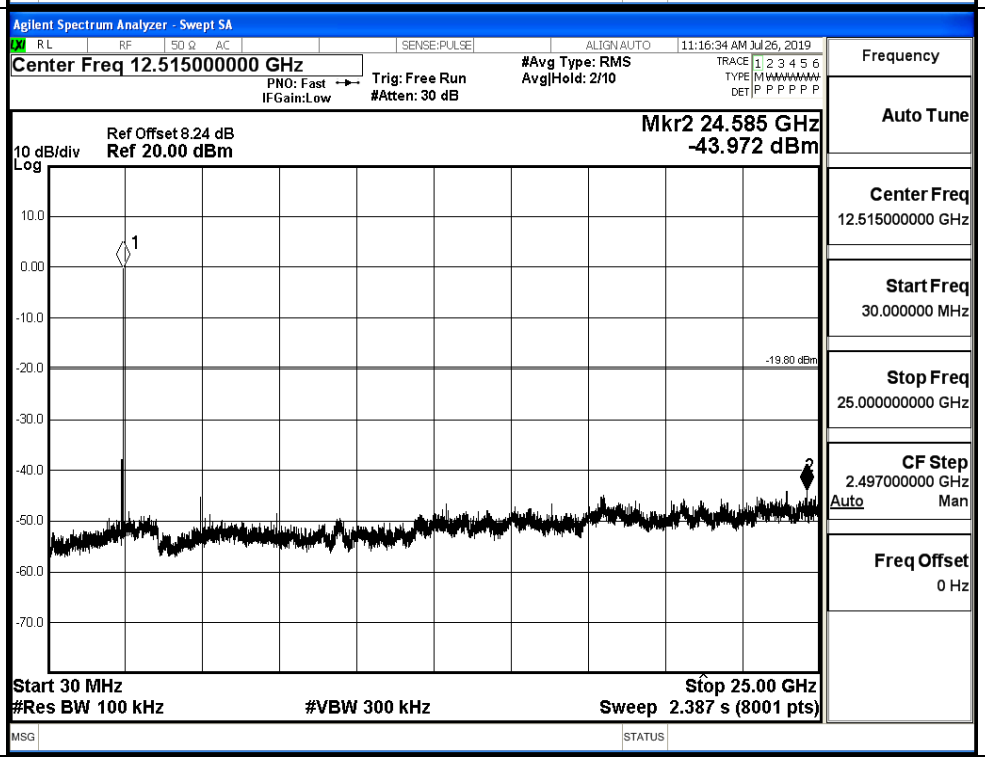
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.784	-34.050	-22.784	PASS
	MCH	-1.495	-42.228	-21.495	PASS
	HCH	0.201	-43.972	-19.799	PASS
π/4DQPSK	LCH	-2.306	-43.394	-22.306	PASS
	MCH	-3.629	-44.319	-23.629	PASS
	HCH	0.487	-41.358	-19.513	PASS

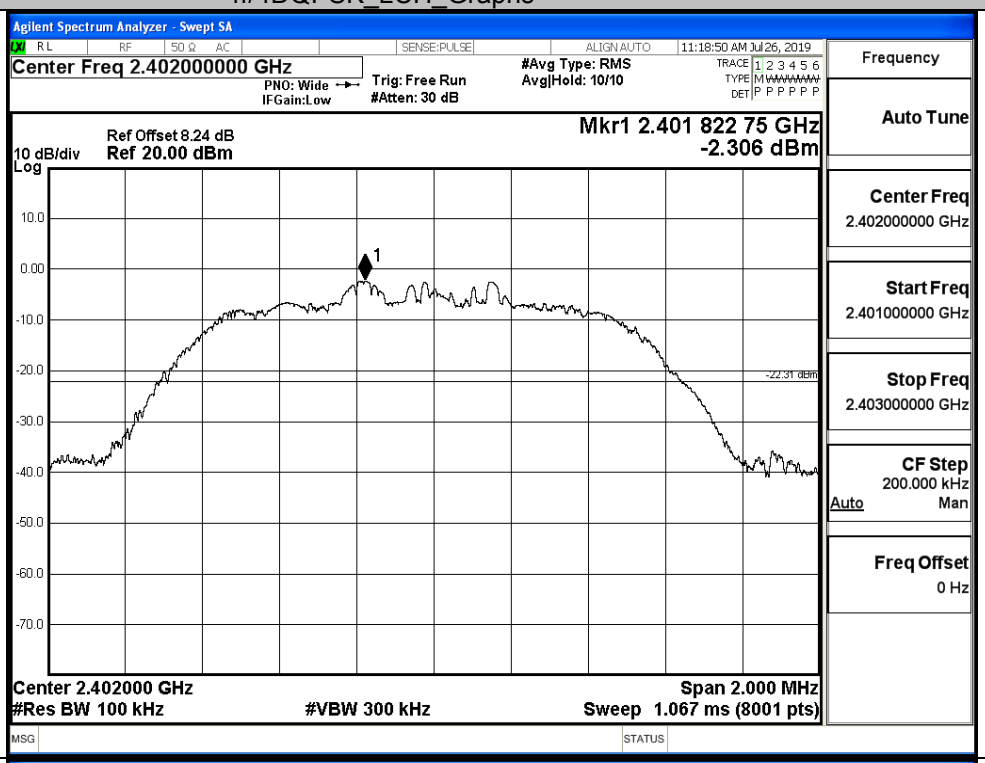
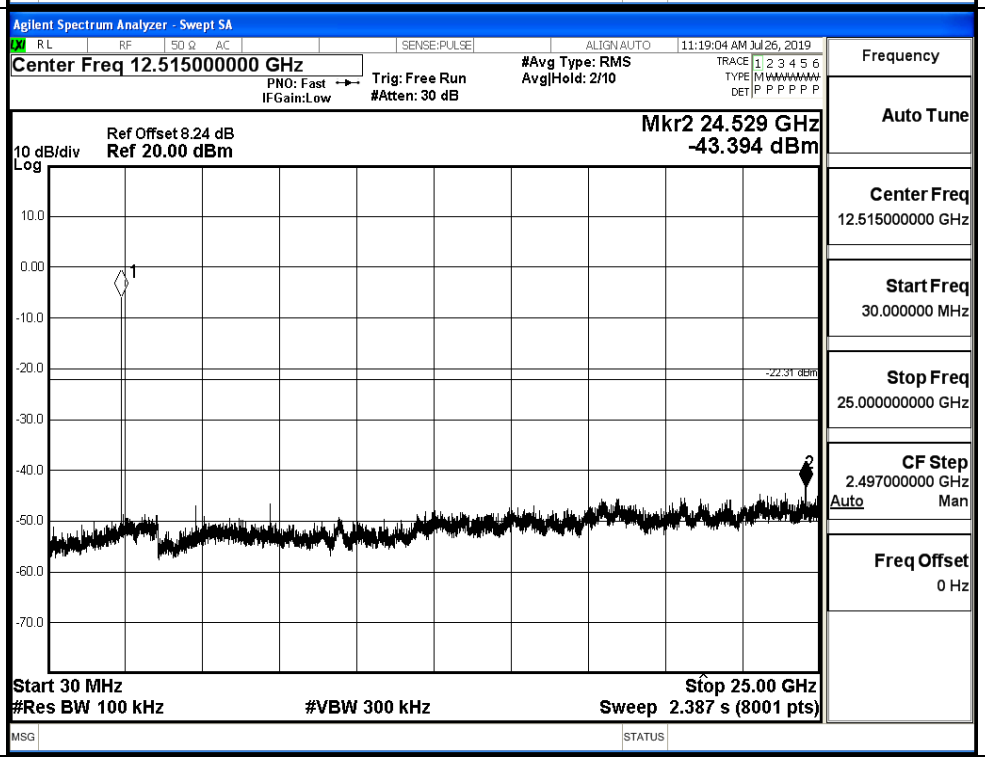
GFSK_LCH_Graphs		
Pref		

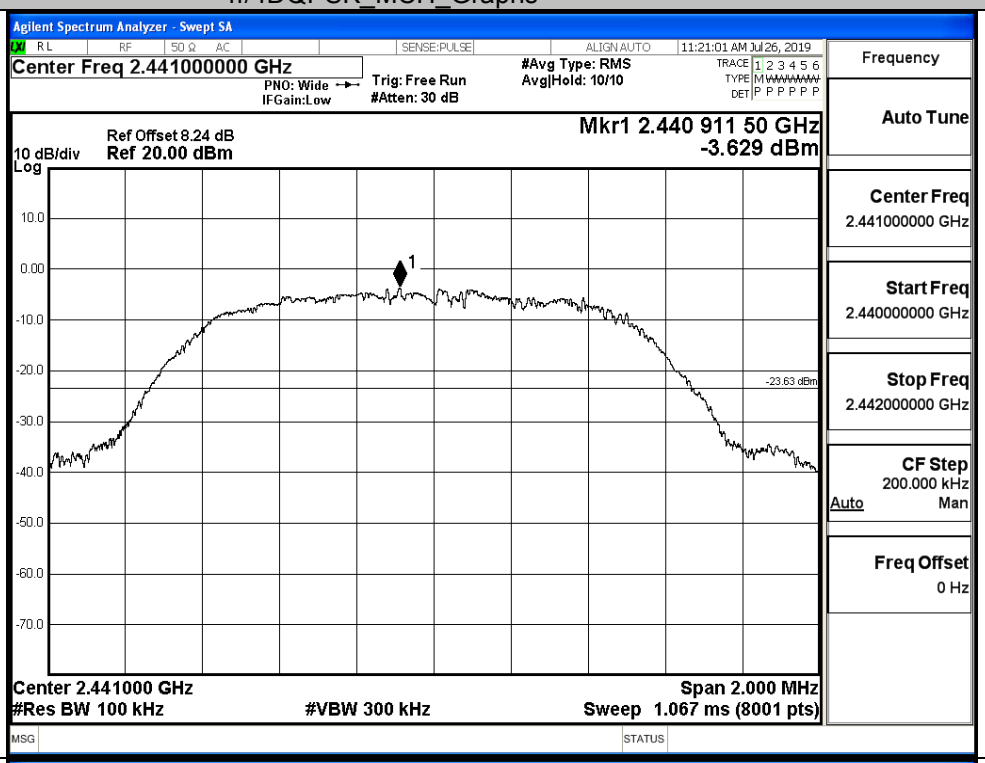
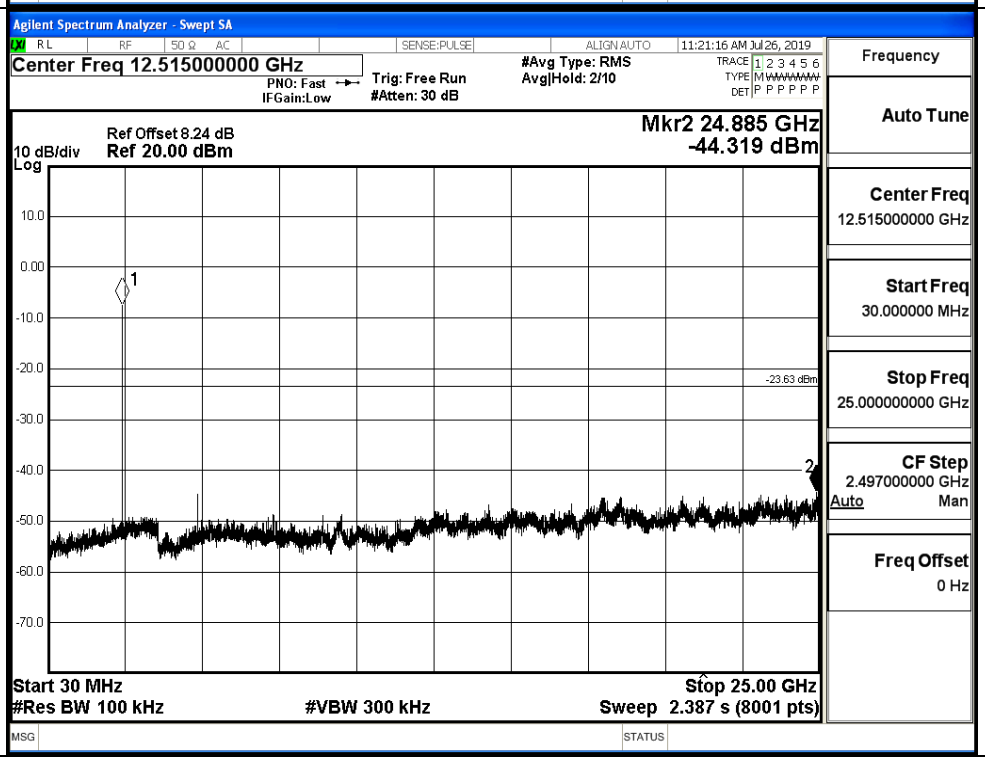
Puw		

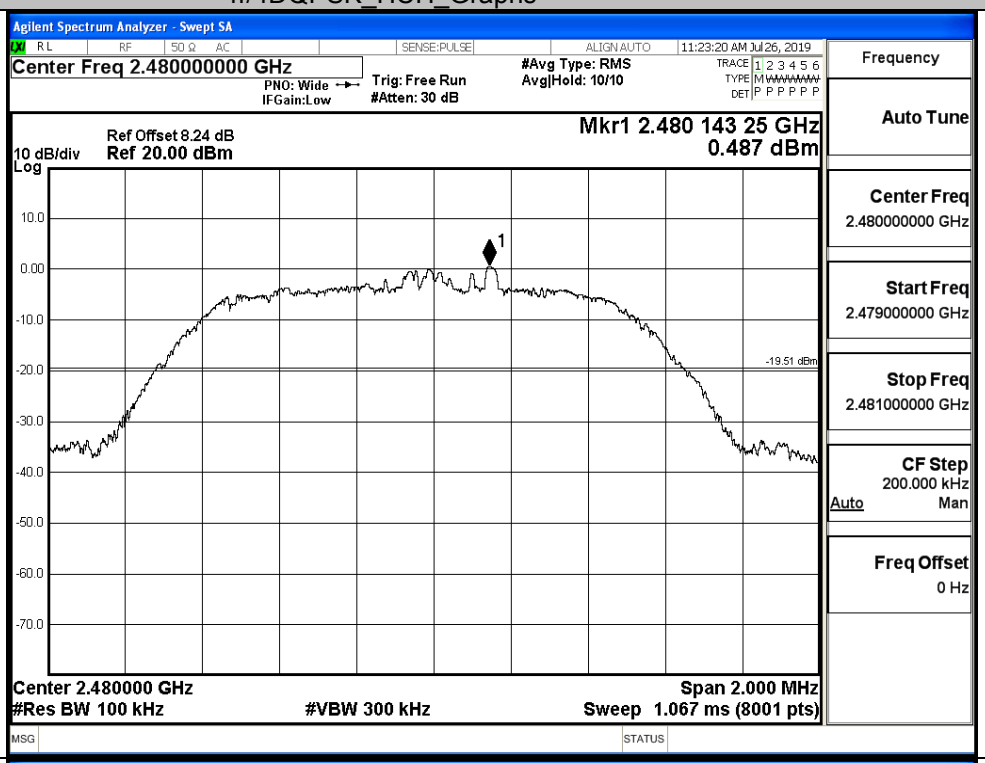
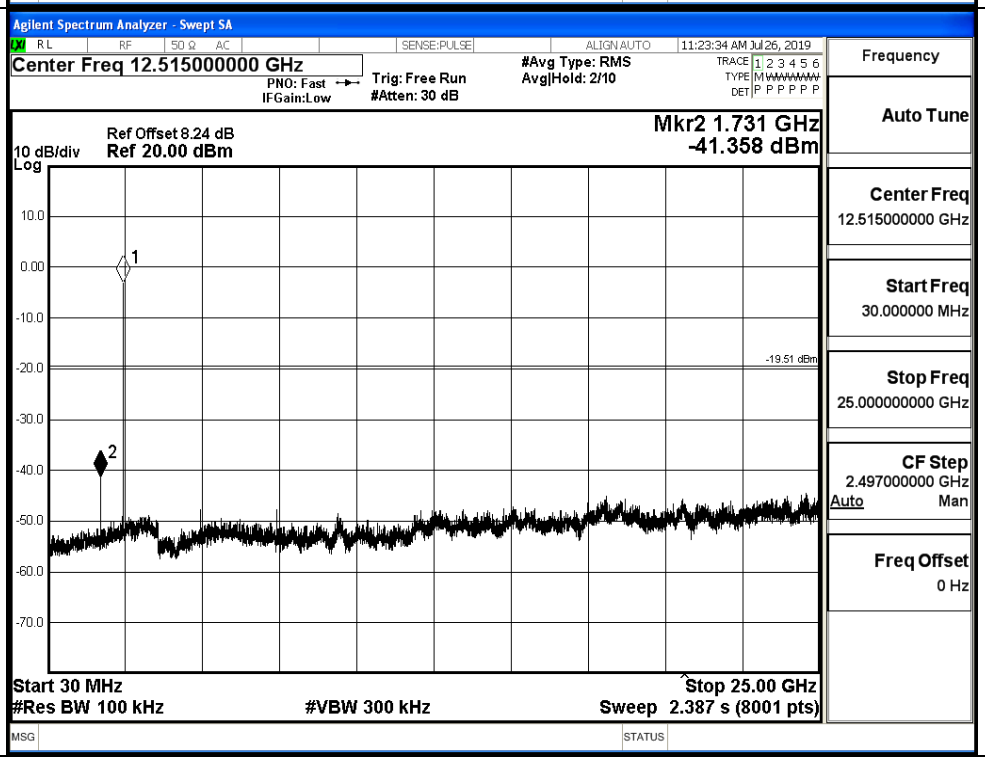
Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 2/10
11:12:18 AM Jul 26, 2019
Ref Offset 8.24 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr2 1.887 GHz
-34.050 dBm
-22.78 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 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			

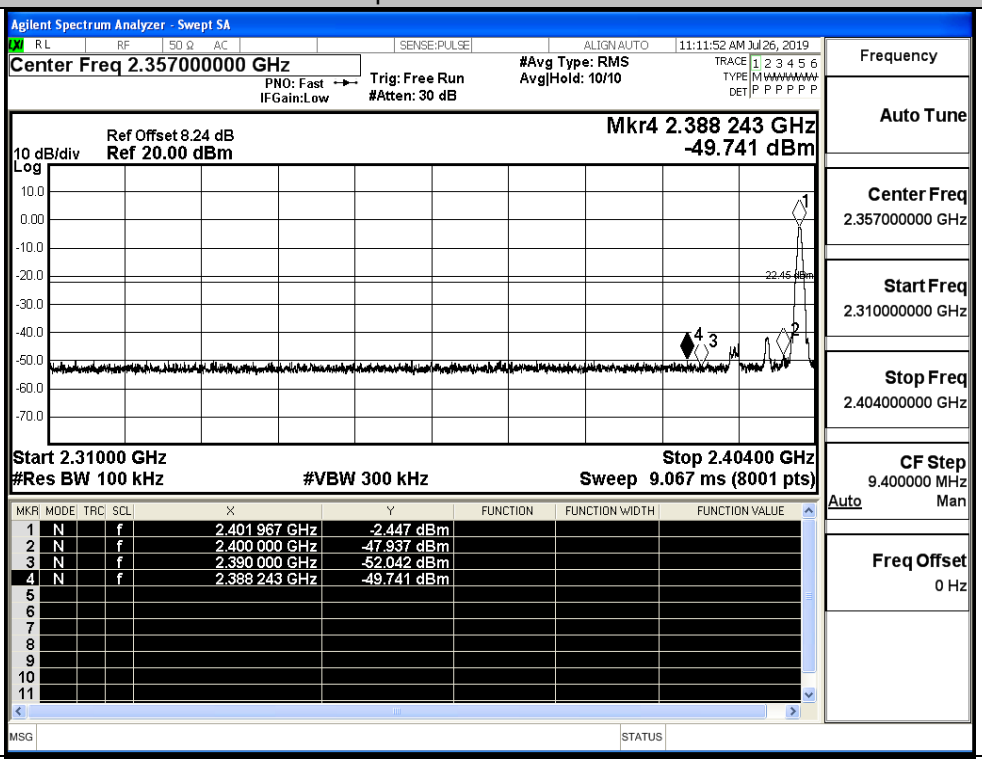
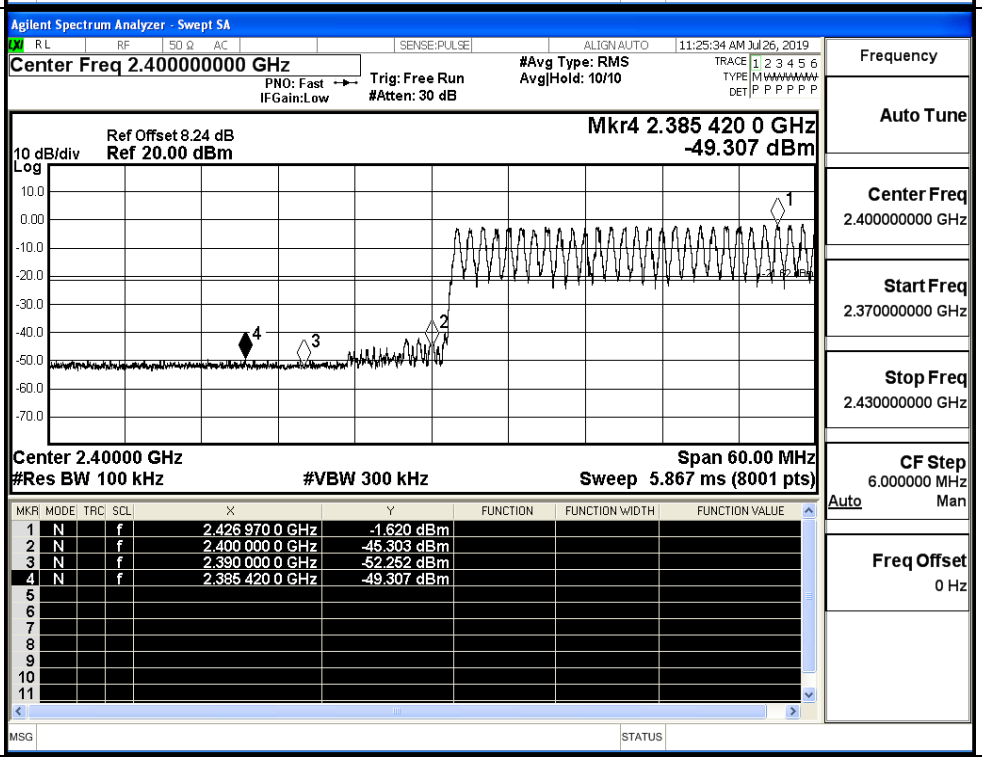
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

π/4DQPSK_MCH_Graphs			
Pref			
Puw			

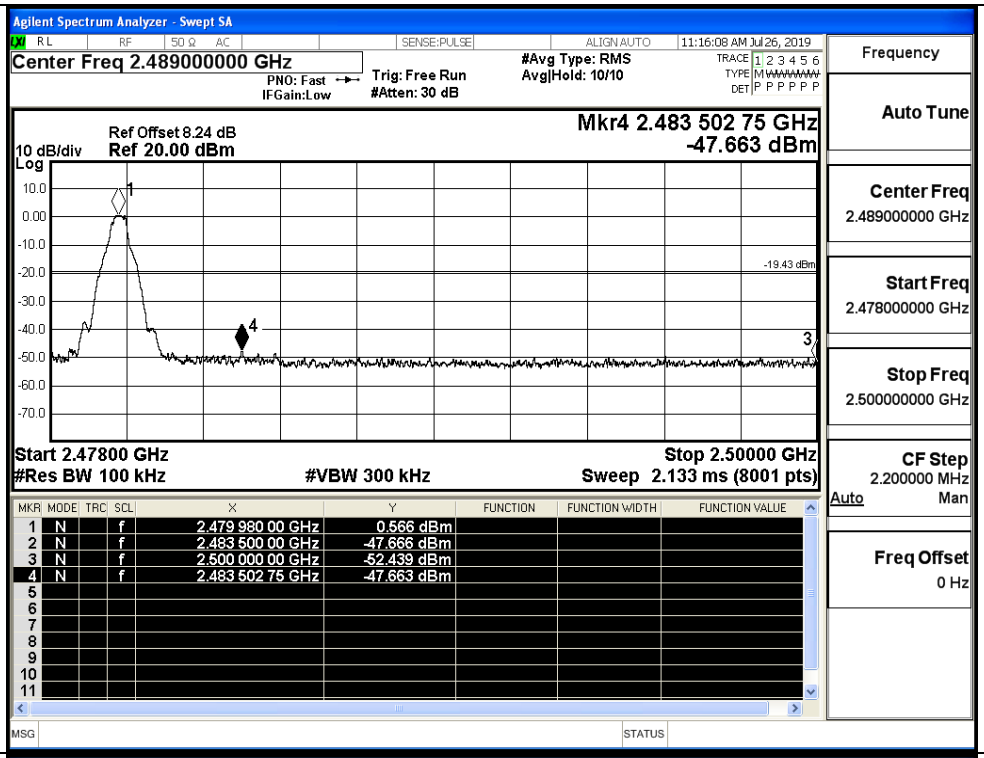
π/4DQPSK_HCH_Graphs			
Pref			
Puw			

A.7 Band-edge for RF Conducted Emissions

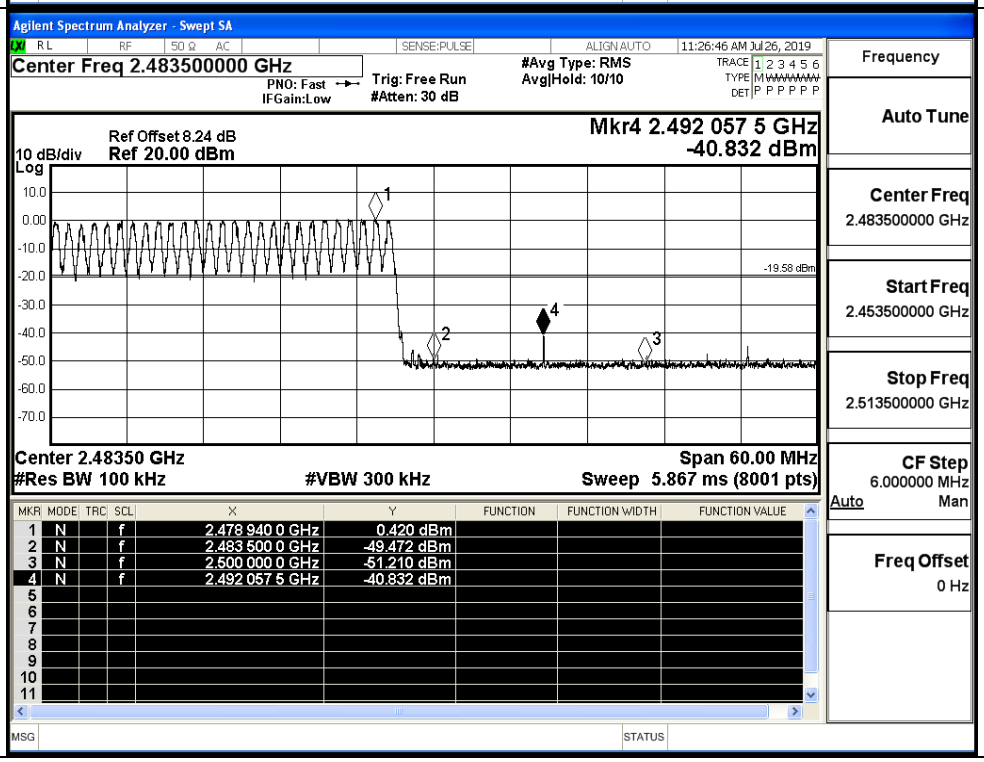
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-2.447	Off	-49.741	-22.45	PASS
			-1.620	On	-49.307	-21.62	PASS
	HCH	2480	0.566	Off	-47.663	-19.43	PASS
			0.420	On	-40.832	-19.58	PASS
π/4DQPSK	LCH	2402	-4.278	Off	-48.103	-24.28	PASS
			-1.959	On	-49.028	-21.96	PASS
	HCH	2480	-2.052	Off	-49.202	-22.05	PASS
			0.669	On	-47.216	-19.33	PASS

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

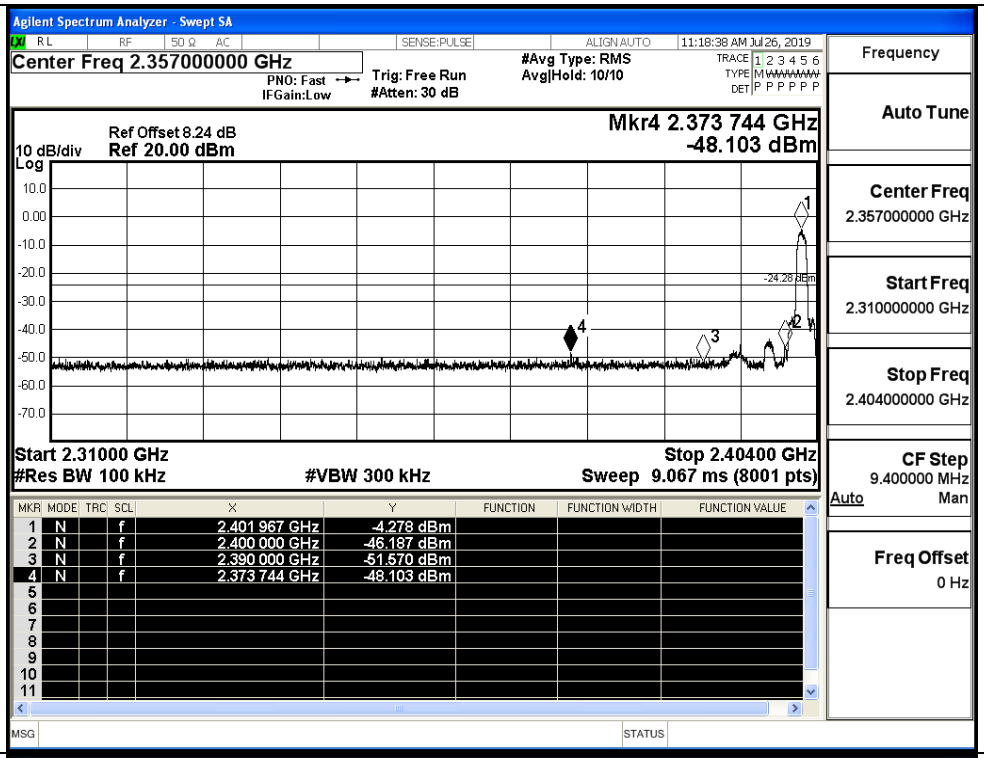
GFSK/HCH/No Hop



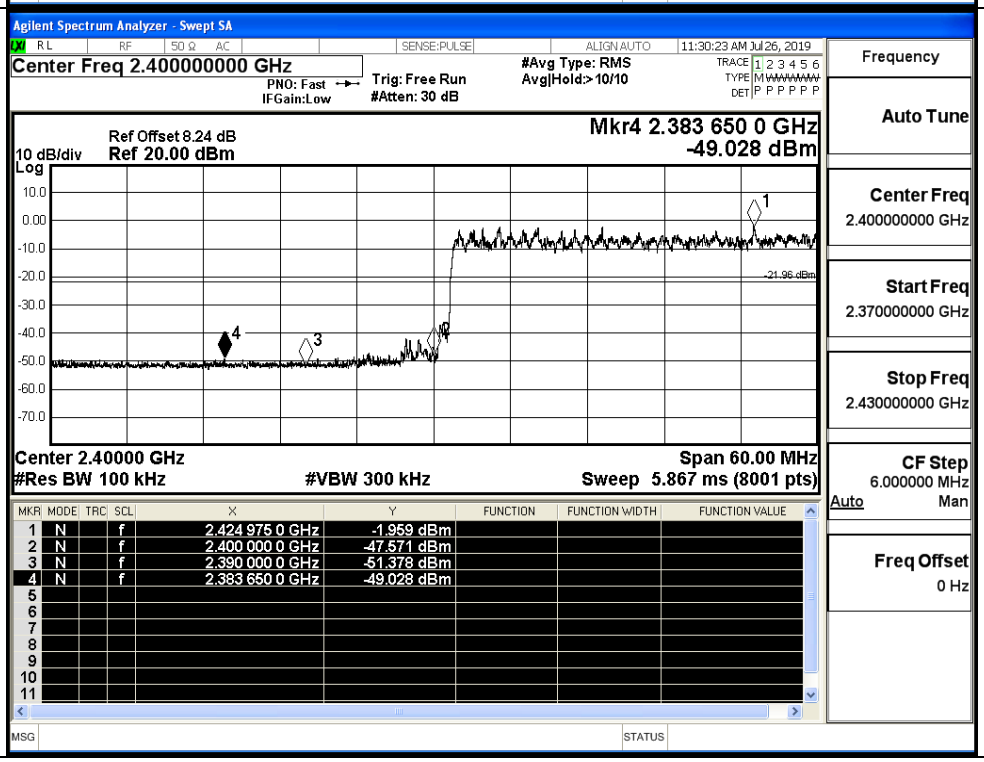
GFSK/HCH/Hop



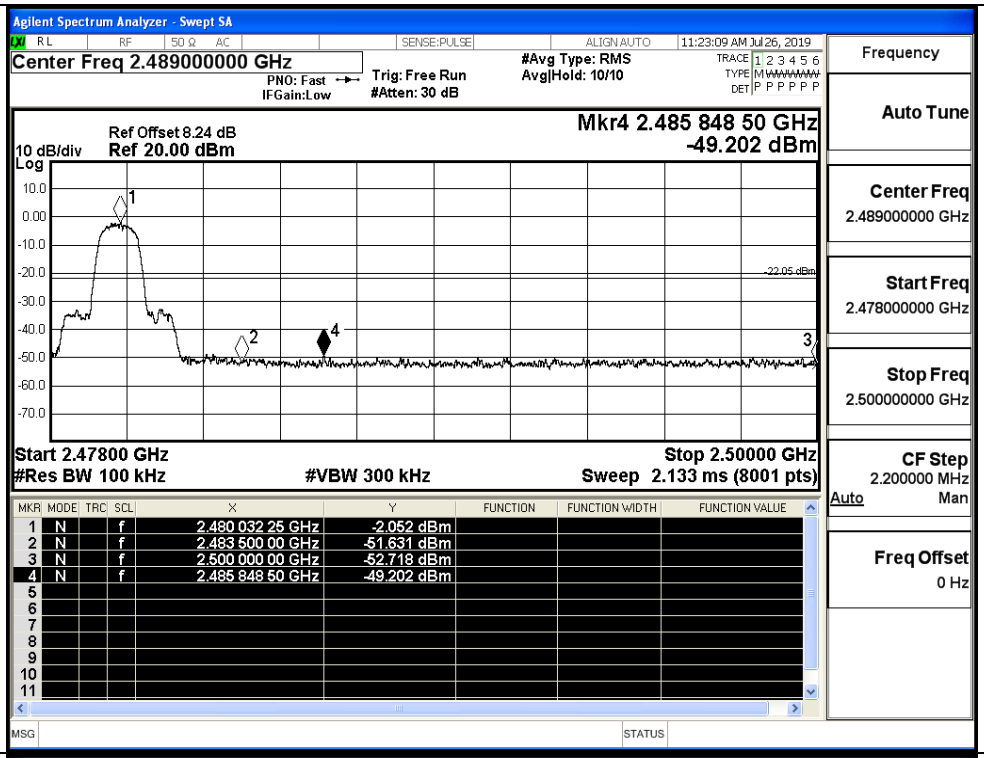
π/4DQPSK/LCH/No Hop



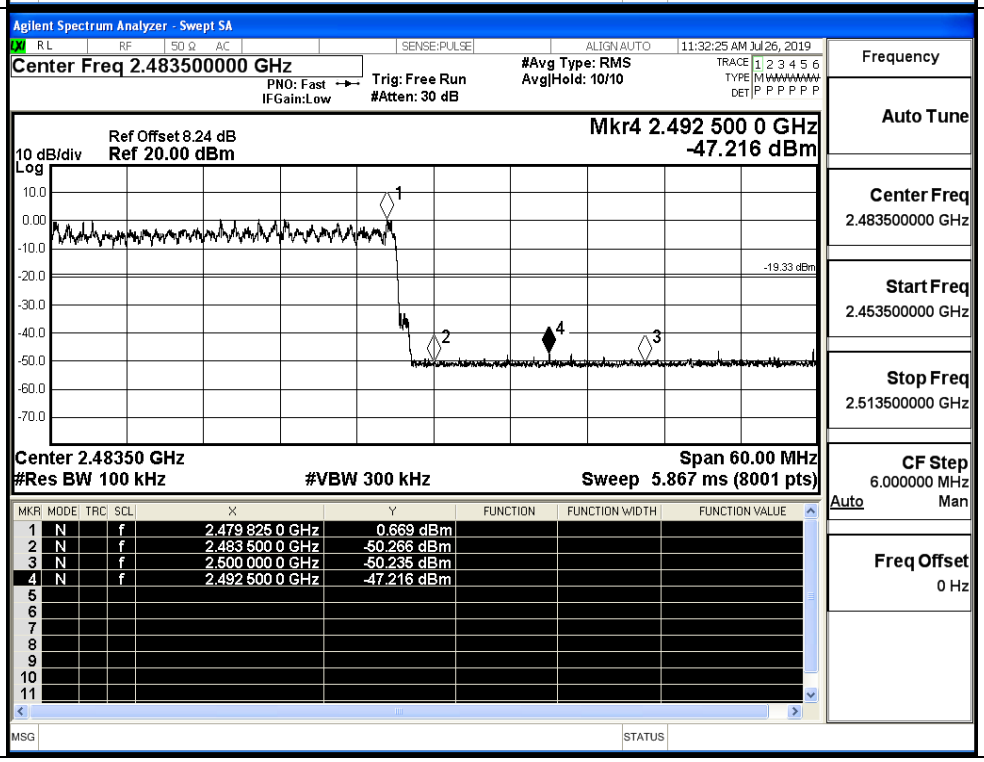
π/4DQPSK/LCH/Hop



π/4DQPSK/HCH/No Hop



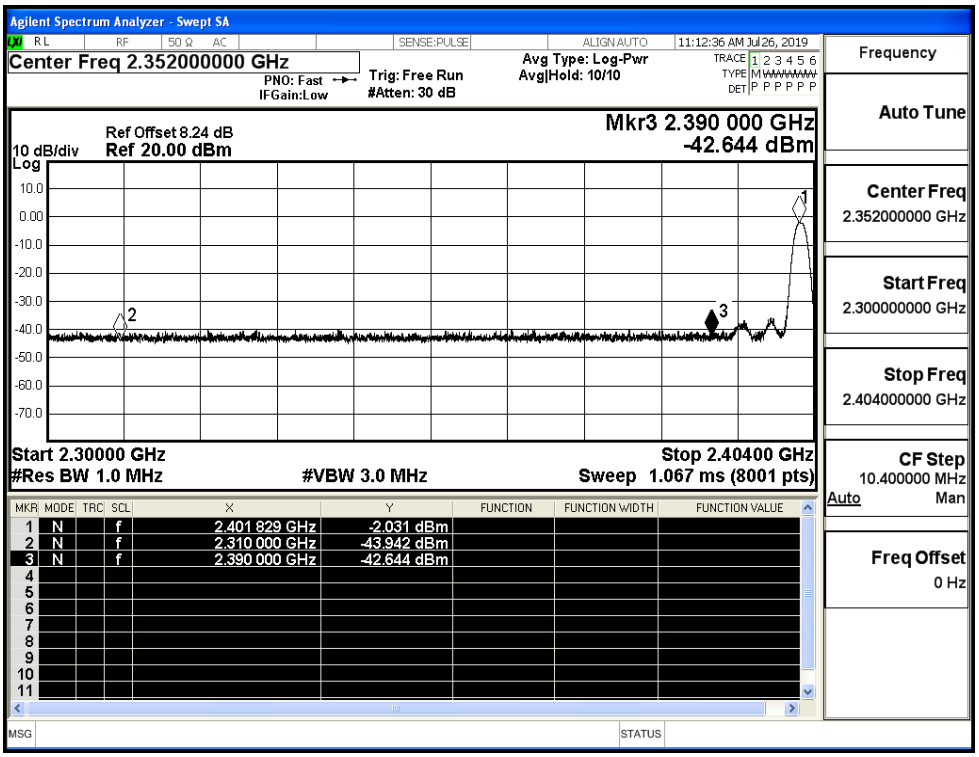
π/4DQPSK/HCH/Hop



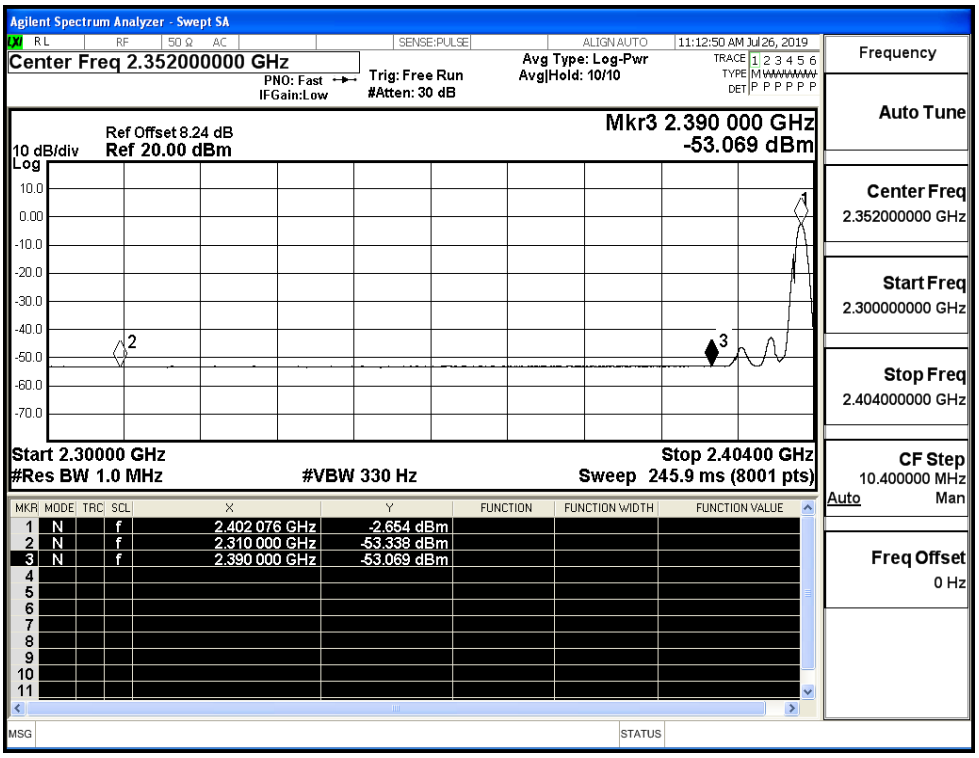
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.94	2.0	0	51.32	PEAK	74	PASS
	Off	2310.0	-53.34	2.0	0	41.92	AV	54	PASS
	Off	2390.0	-42.64	2.0	0	52.61	PEAK	74	PASS
	Off	2390.0	-53.07	2.0	0	42.19	AV	54	PASS
	Off	2483.5	-41.20	2.0	0	54.05	PEAK	74	PASS
	Off	2483.5	-50.25	2.0	0	45.01	AV	54	PASS
	Off	2500.0	-42.60	2.0	0	52.65	PEAK	74	PASS
	Off	2500.0	-52.67	2.0	0	42.58	AV	54	PASS
π/4DQPSK	Off	2310.0	-42.50	2.0	0	52.76	PEAK	74	PASS
	Off	2310.0	-53.32	2.0	0	41.93	AV	54	PASS
	Off	2390.0	-43.36	2.0	0	51.90	PEAK	74	PASS
	Off	2390.0	-52.99	2.0	0	42.27	AV	54	PASS
	Off	2483.5	-41.06	2.0	0	54.20	PEAK	74	PASS
	Off	2483.5	-51.53	2.0	0	43.73	AV	54	PASS
	Off	2500.0	-42.20	2.0	0	53.06	PEAK	74	PASS
	Off	2500.0	-52.72	2.0	0	42.54	AV	54	PASS

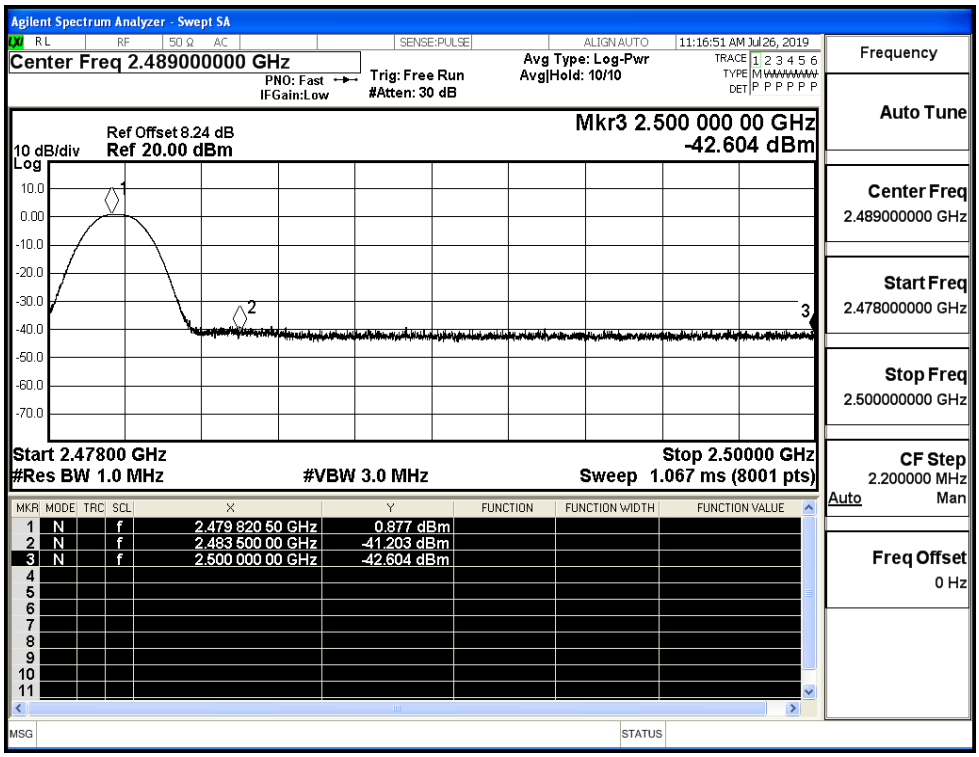
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



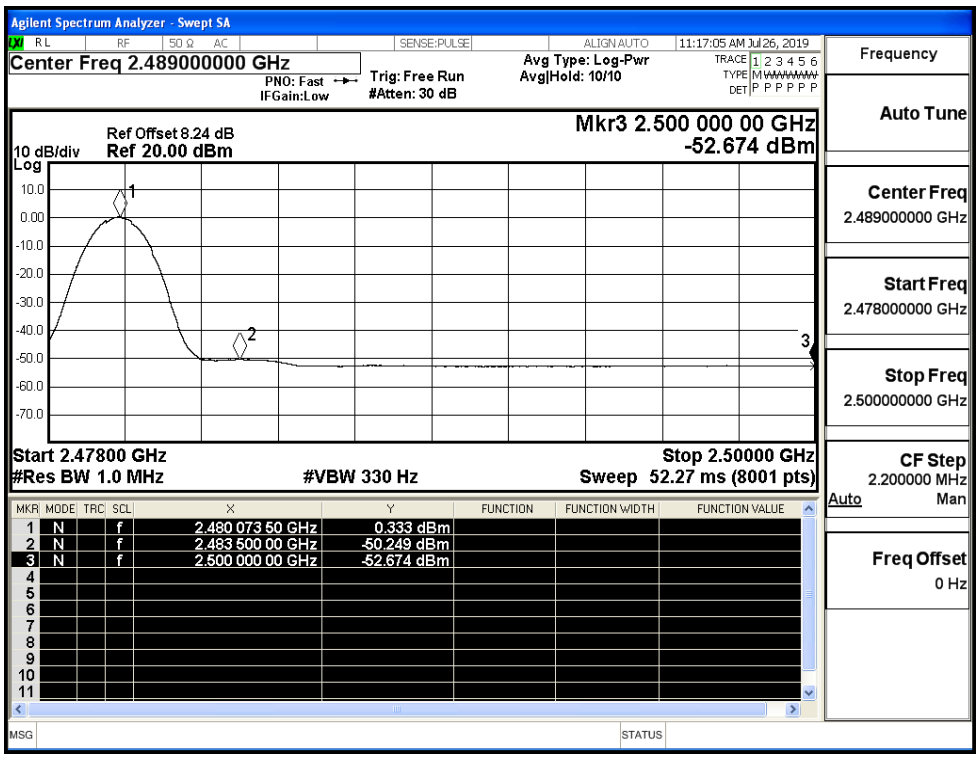
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



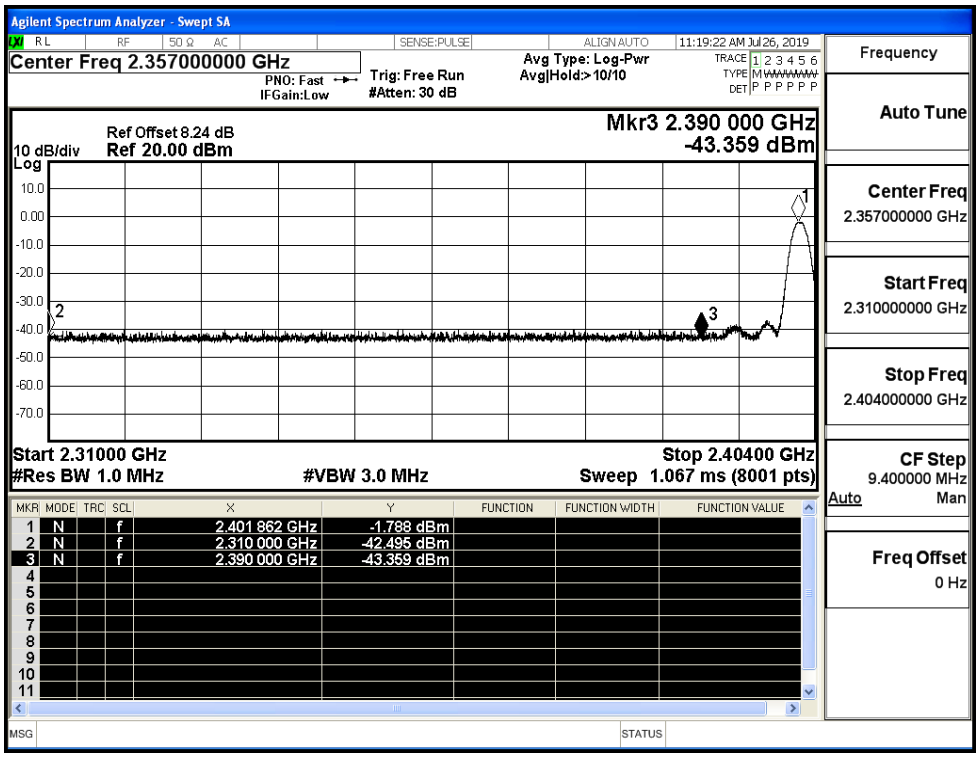
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



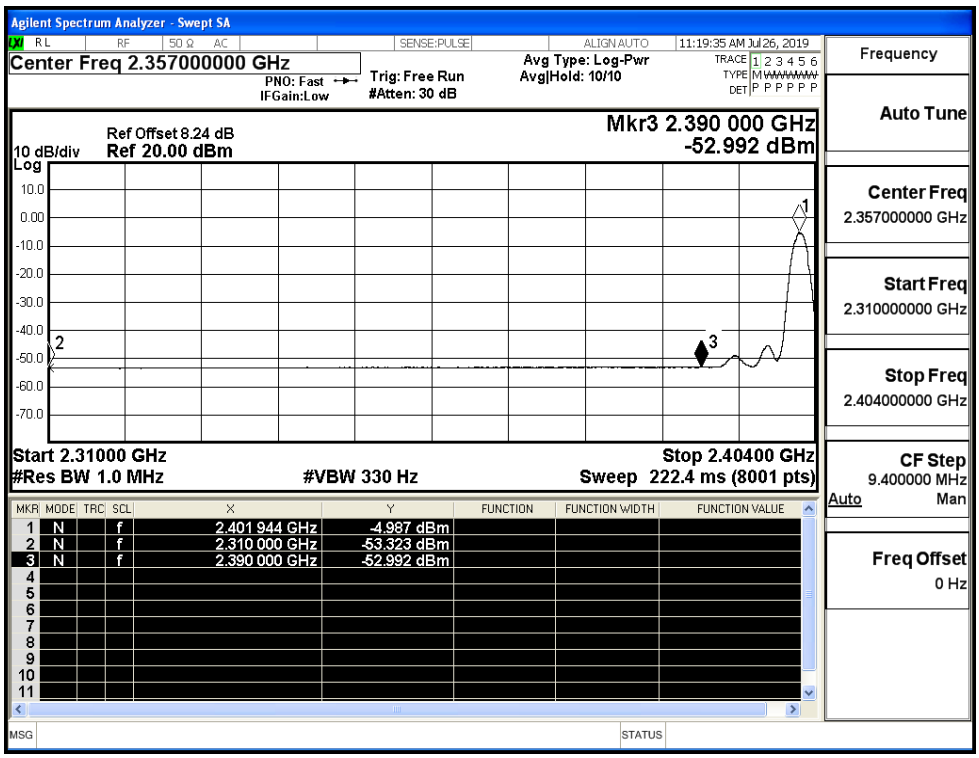
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



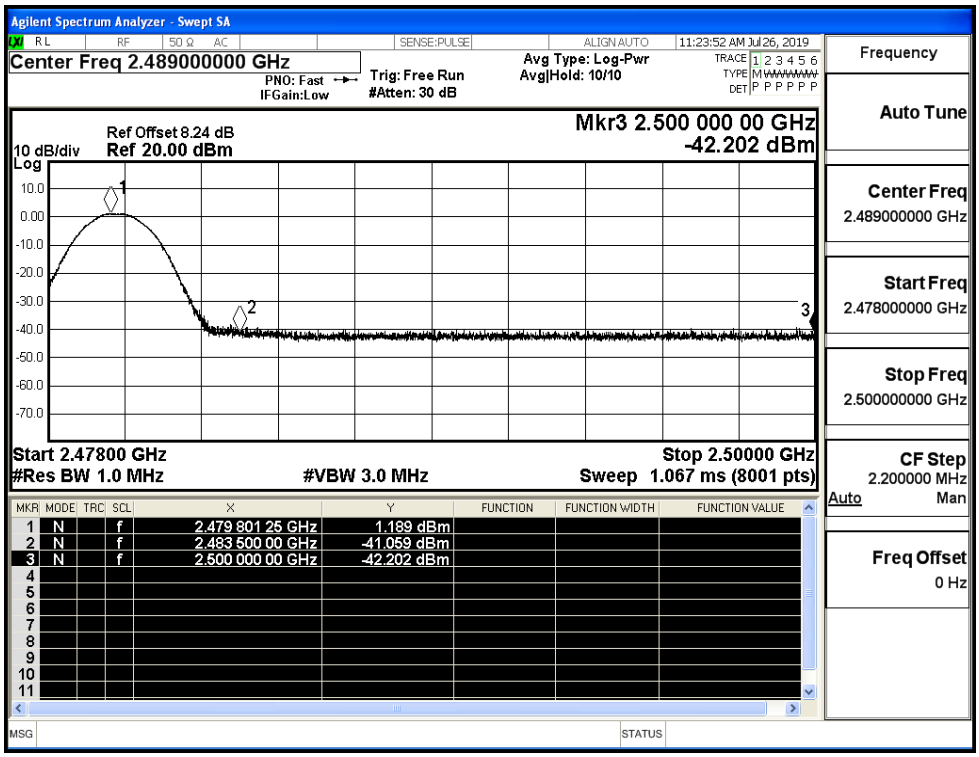
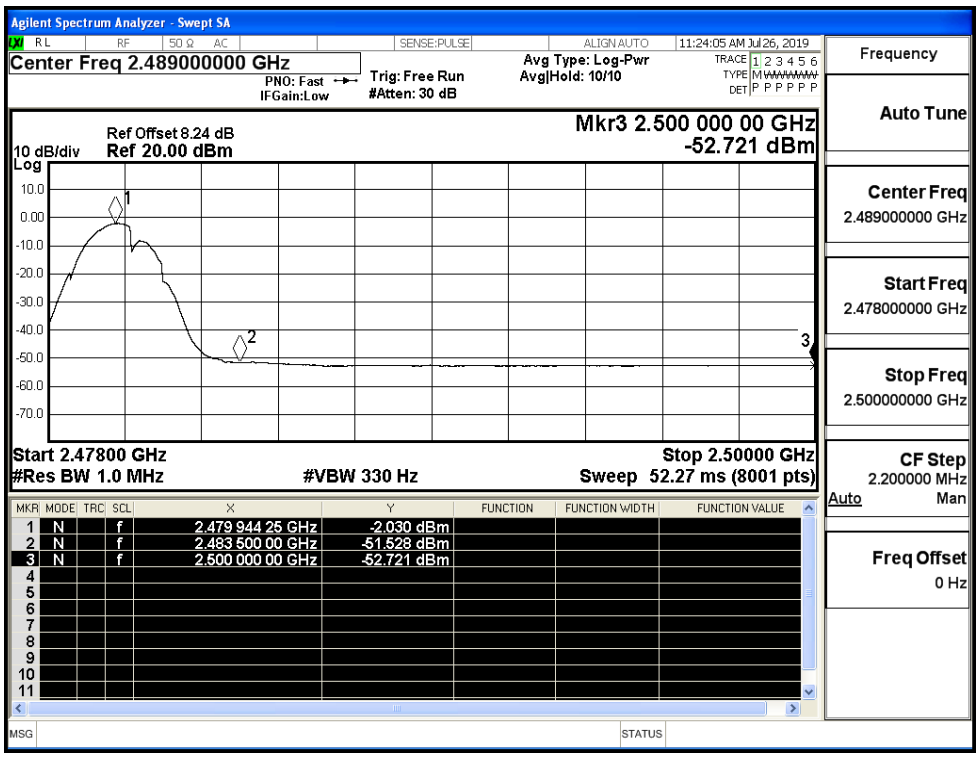
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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)