Appendix A

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

Product Name: LED Lighting Speaker

Trade Mark: N/A

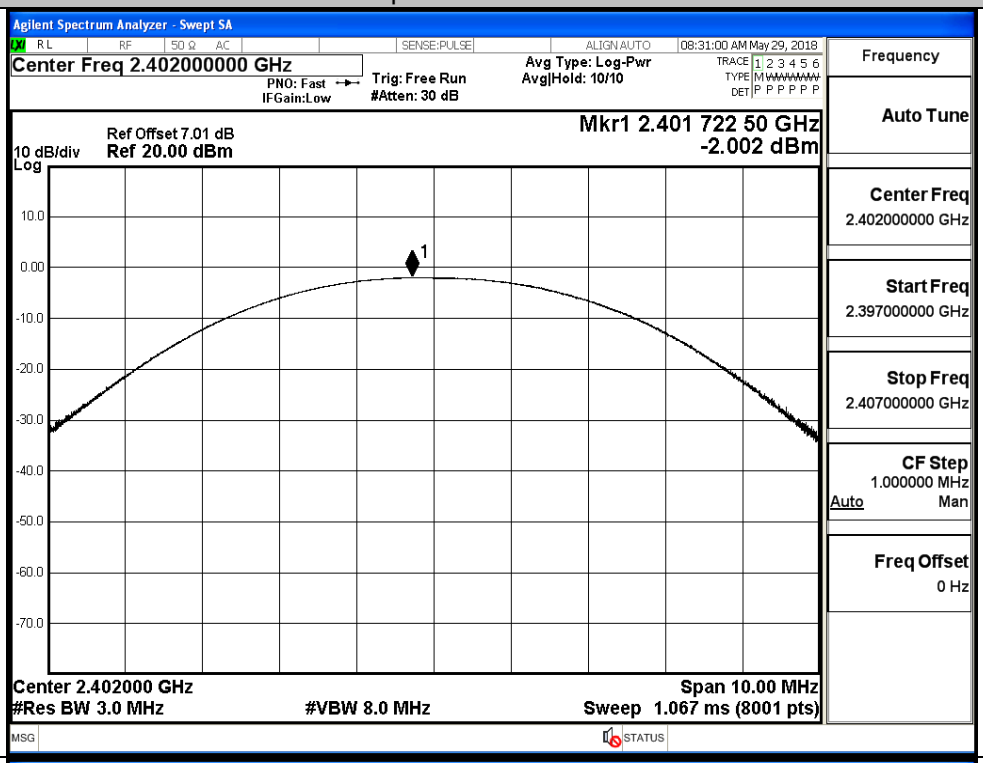
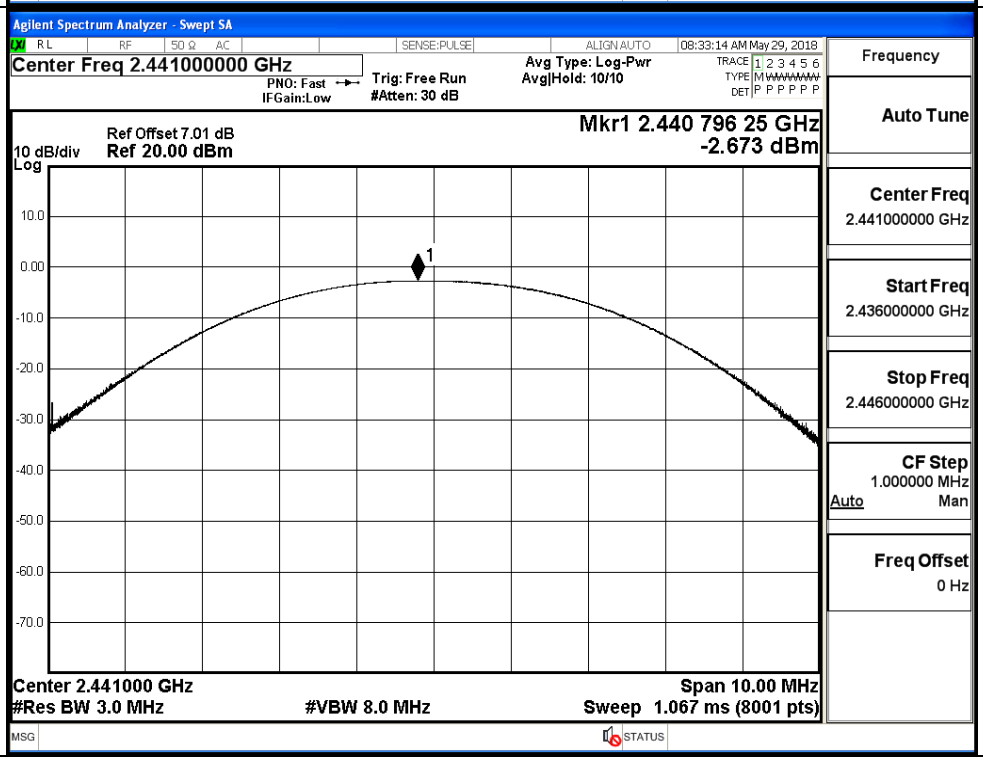
Test Model: SP0011/ORB

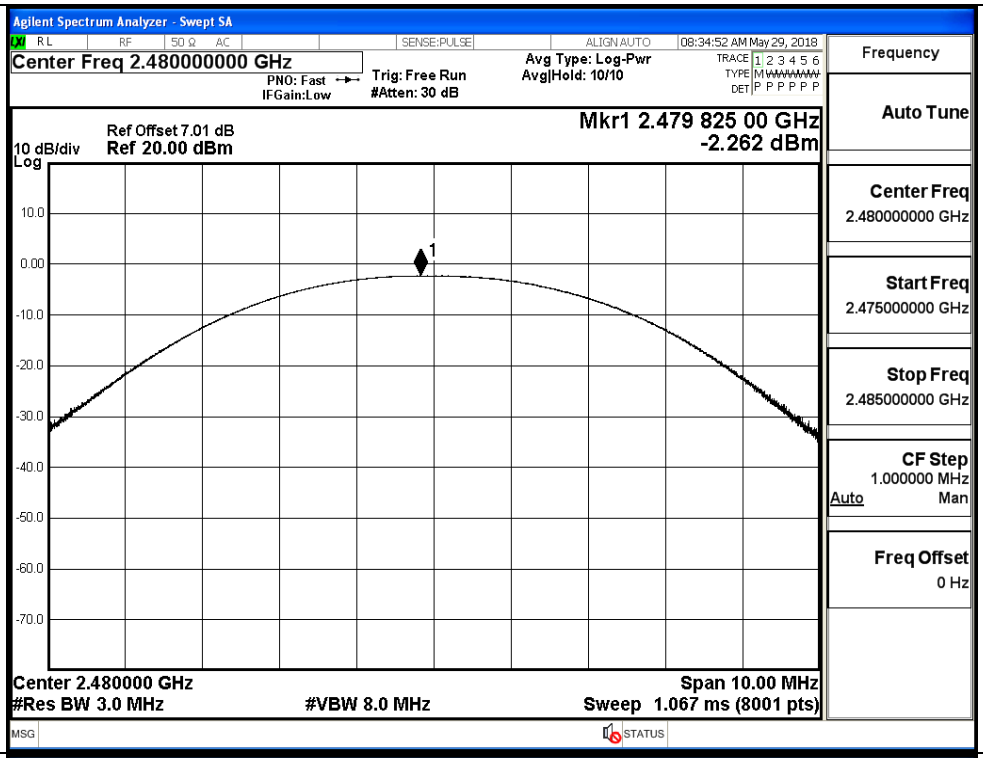
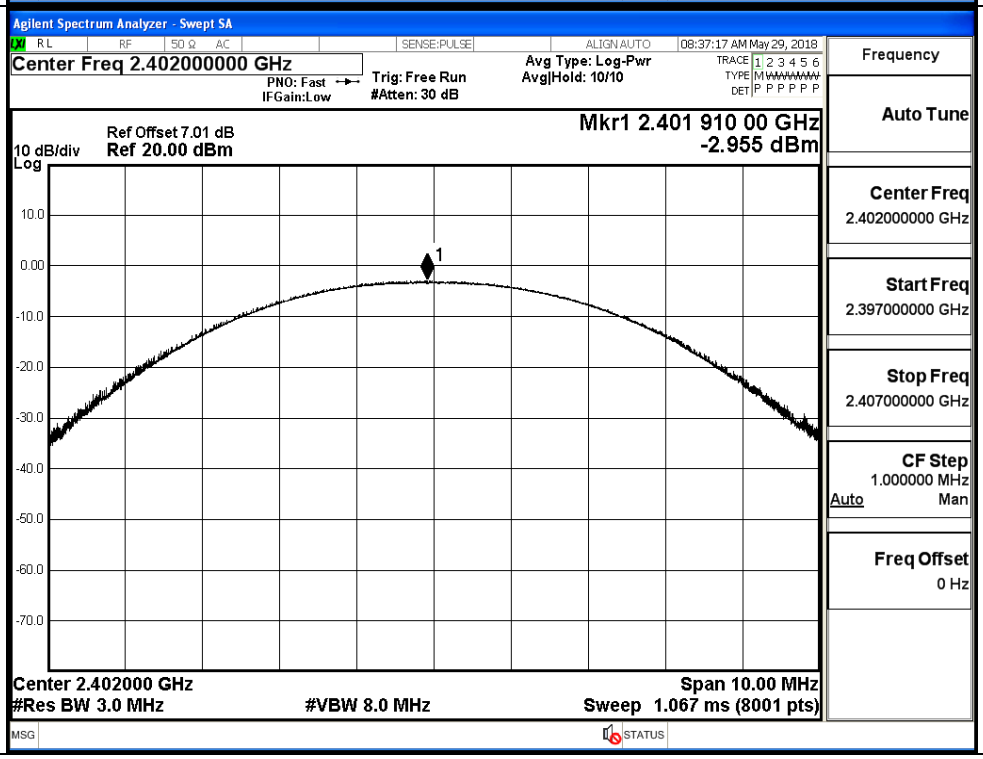
Environmental Conditions

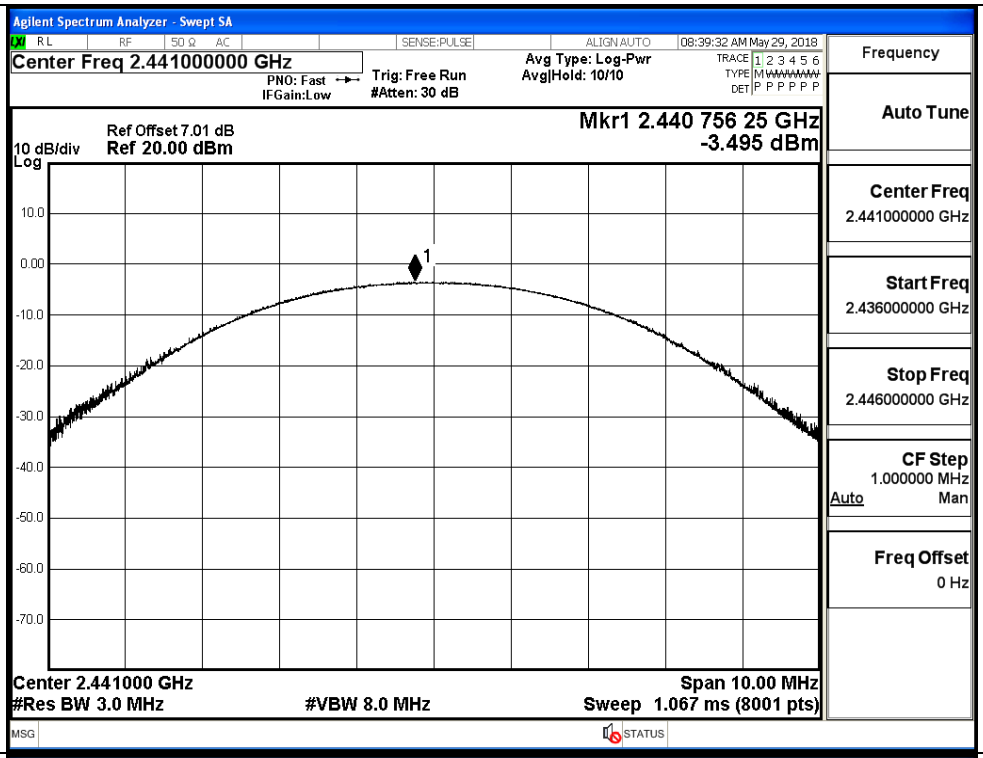
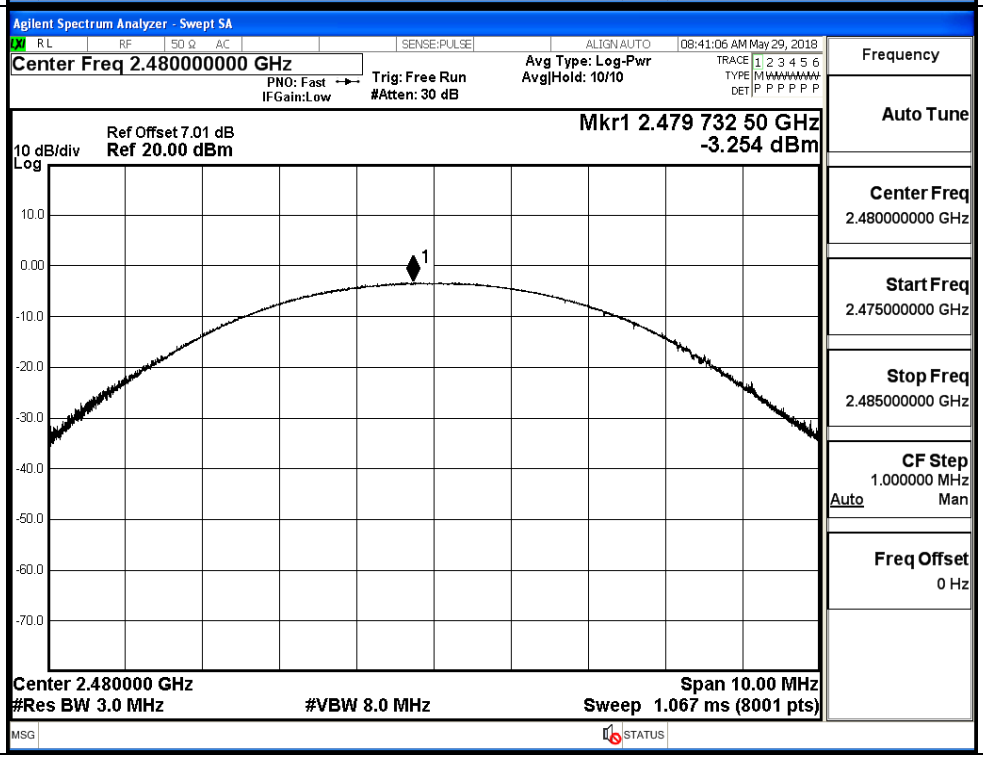
Temperature:	24.5 ° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	WANGCHUANG
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.002	30	PASS
	MCH	-2.673	30	PASS
	HCH	-2.262	30	PASS
π/4DQPSK	LCH	-2.955	21	PASS
	MCH	-3.495	21	PASS
	HCH	-3.254	21	PASS

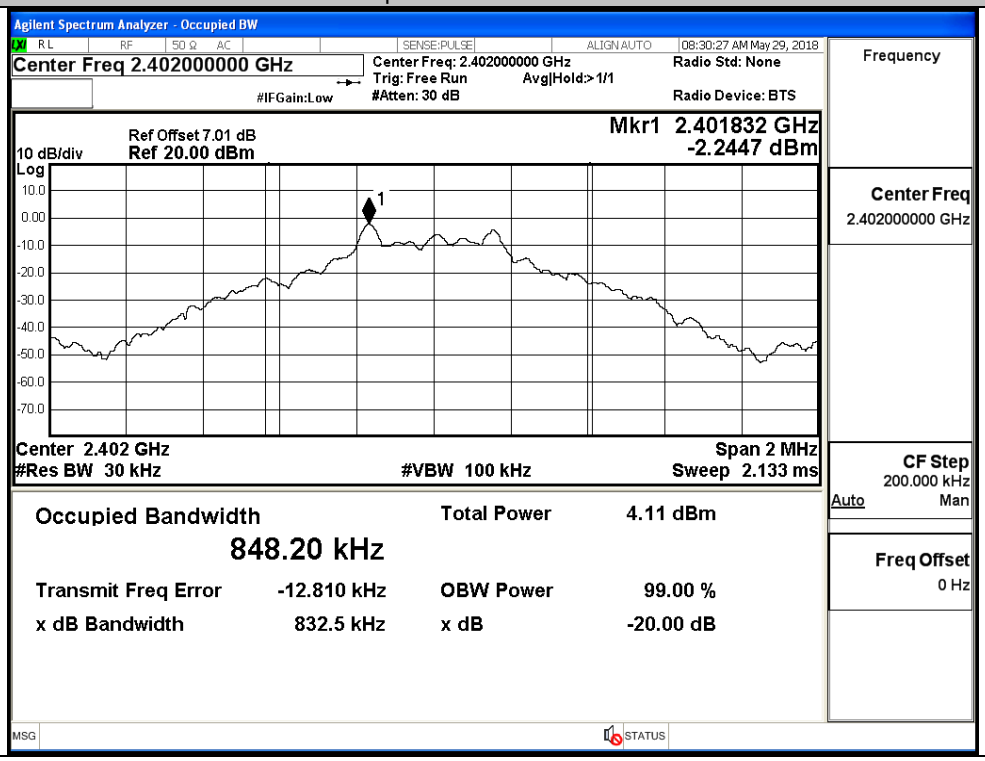
Test Graphs		
GFSK/LCH		
GFSK/MCH		

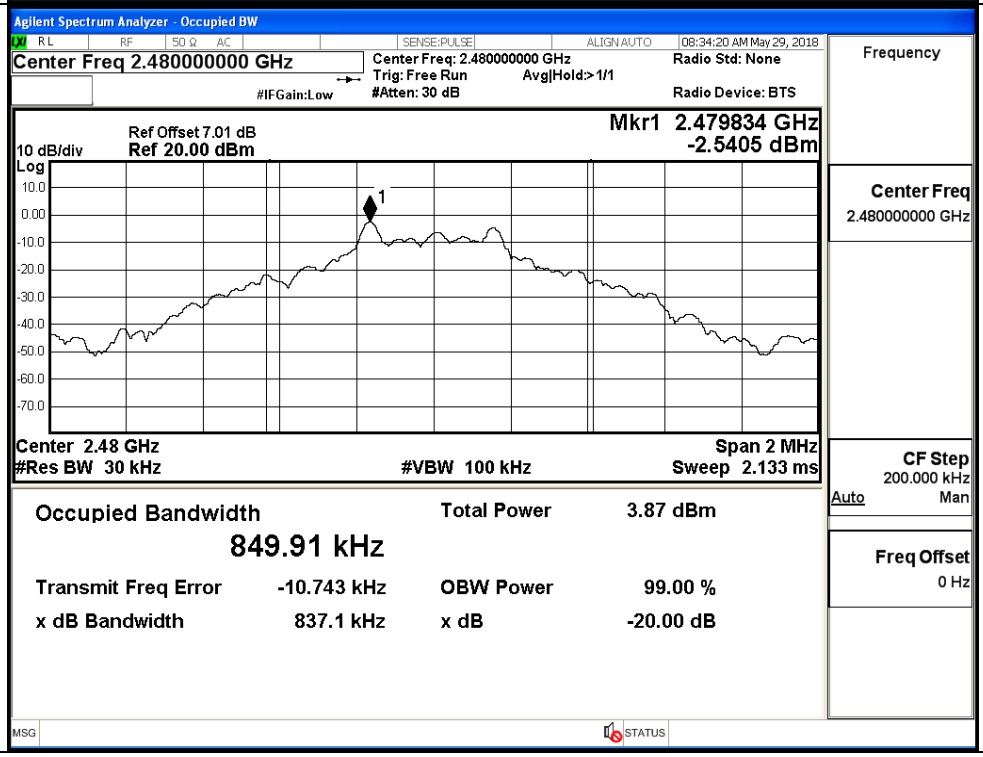
GFSK/HCH	
π/4DQPSK/LCH	

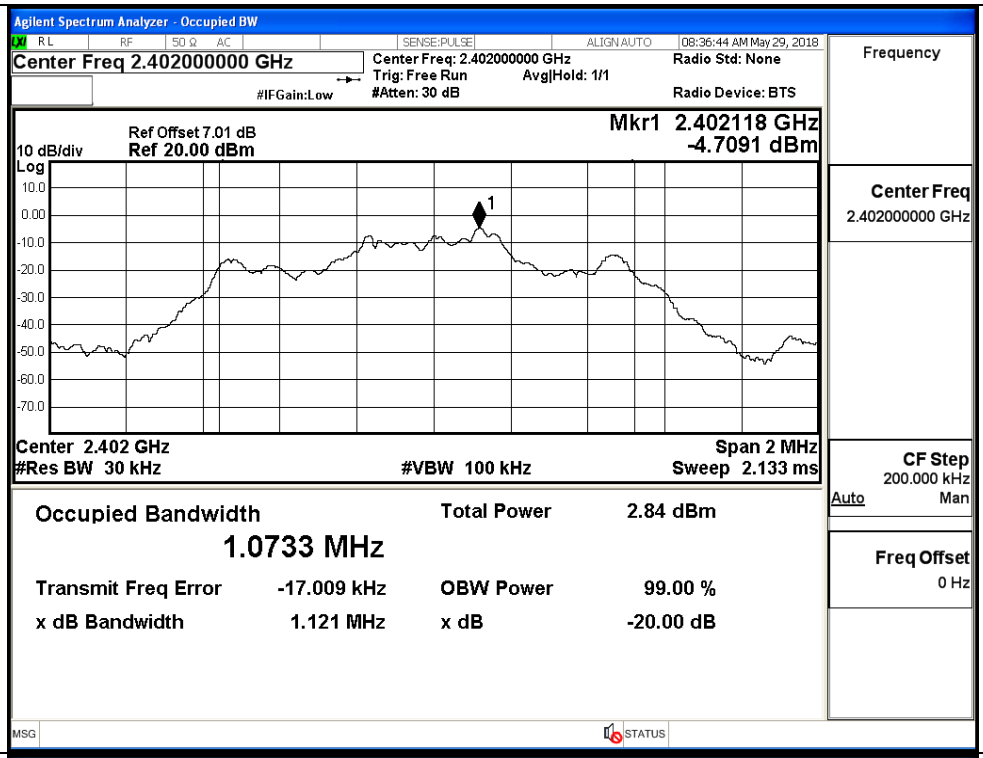
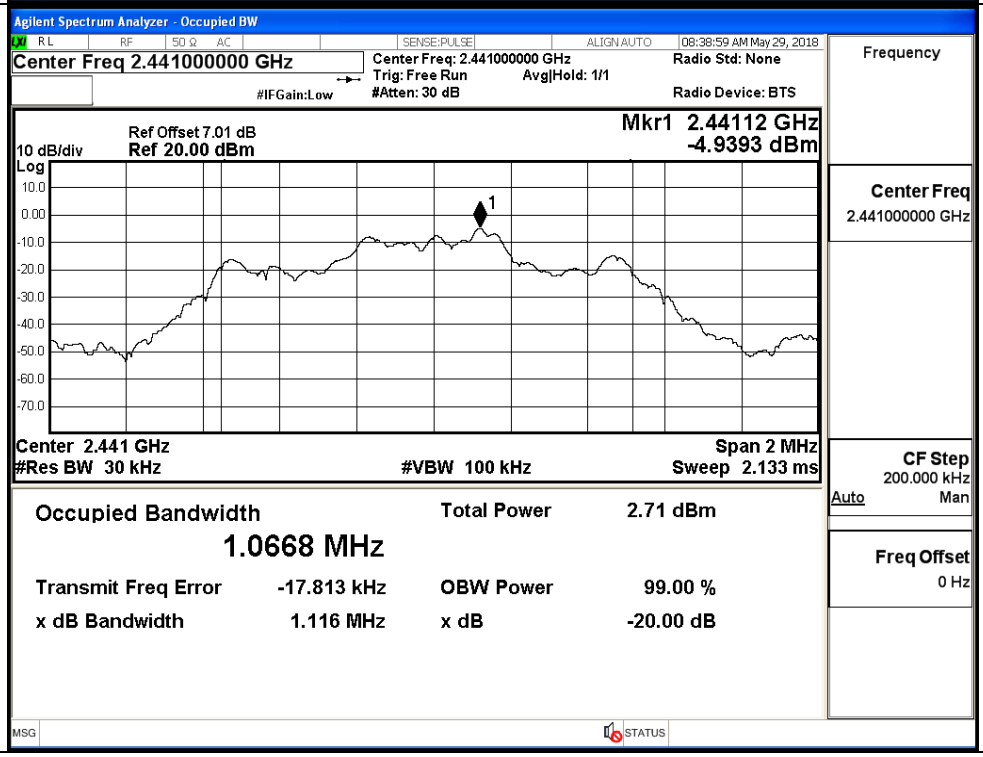
π/4DQPSK/MCH	
π/4DQPSK/HCH	

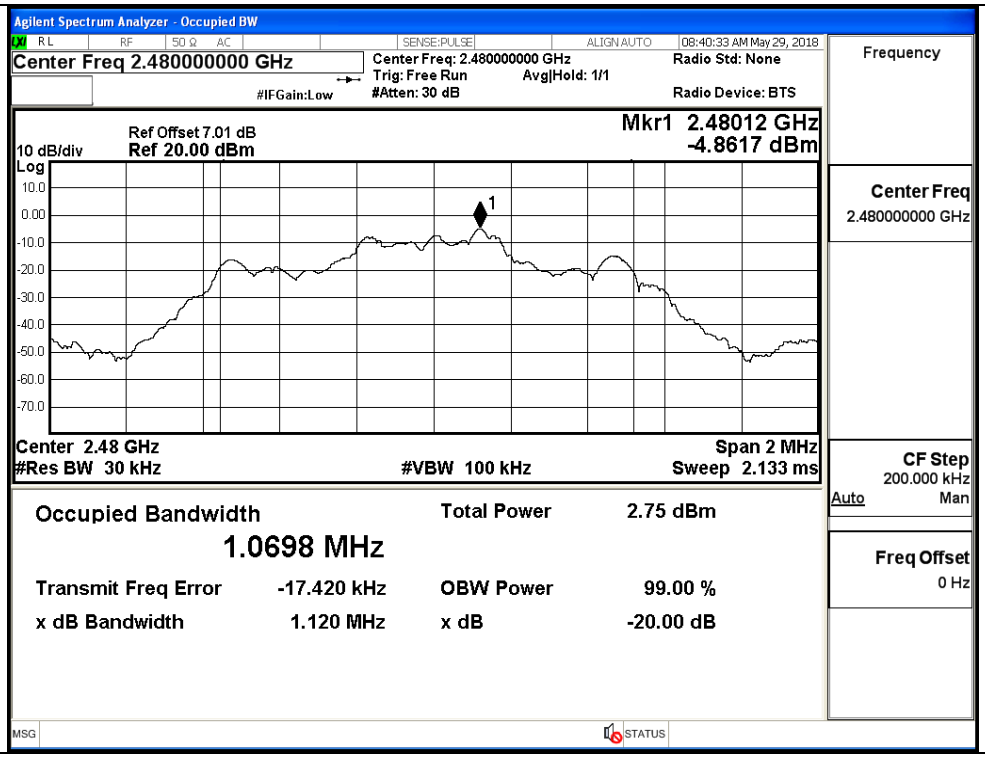
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.8325	Not Specified	PASS
	MCH	0.8329	Not Specified	PASS
	HCH	0.8371	Not Specified	PASS
π/4DQPSK	LCH	1.121	Not Specified	PASS
	MCH	1.116	Not Specified	PASS
	HCH	1.120	Not Specified	PASS

Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

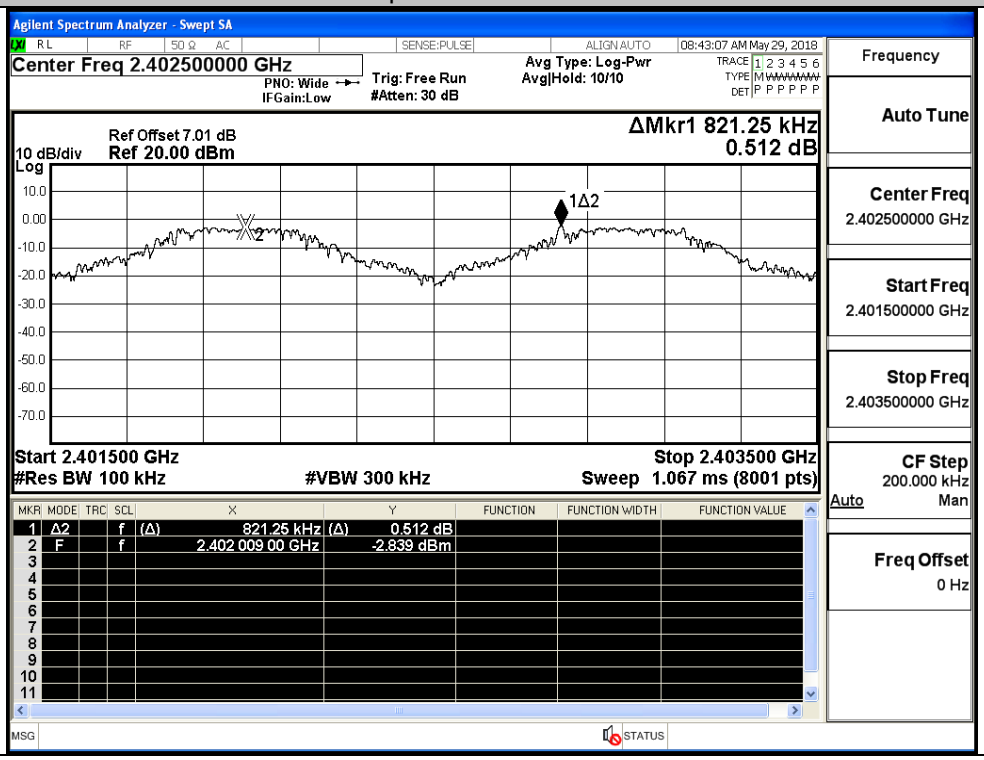
π/4DQPSK/LCH	
π/4DQPSK/MCH	

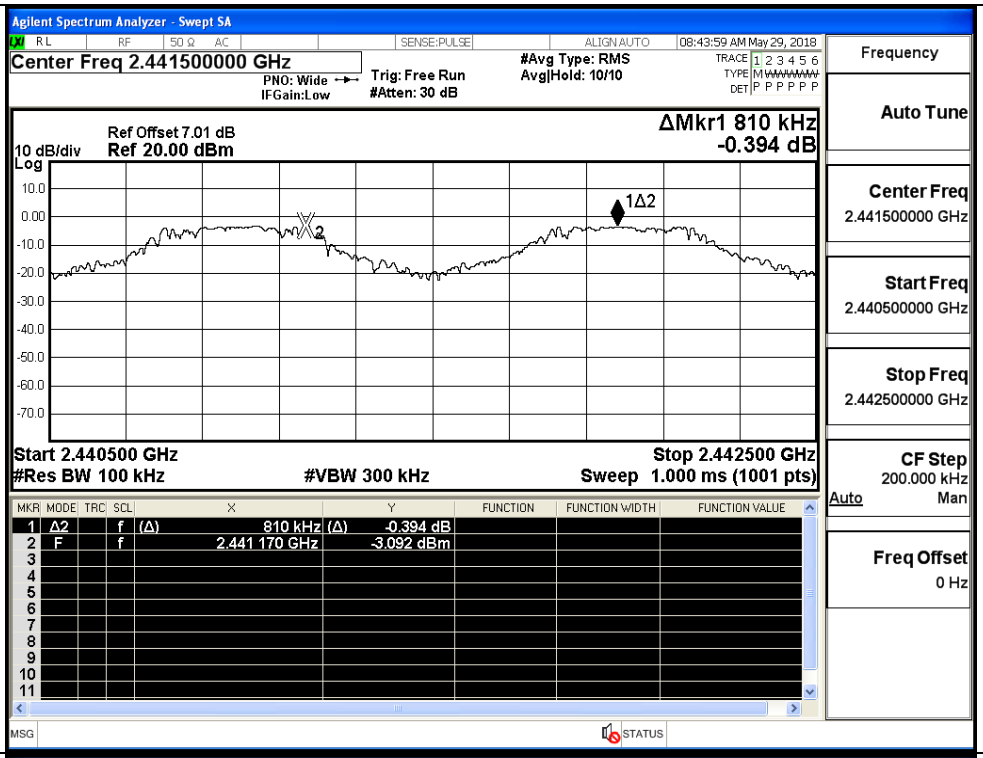
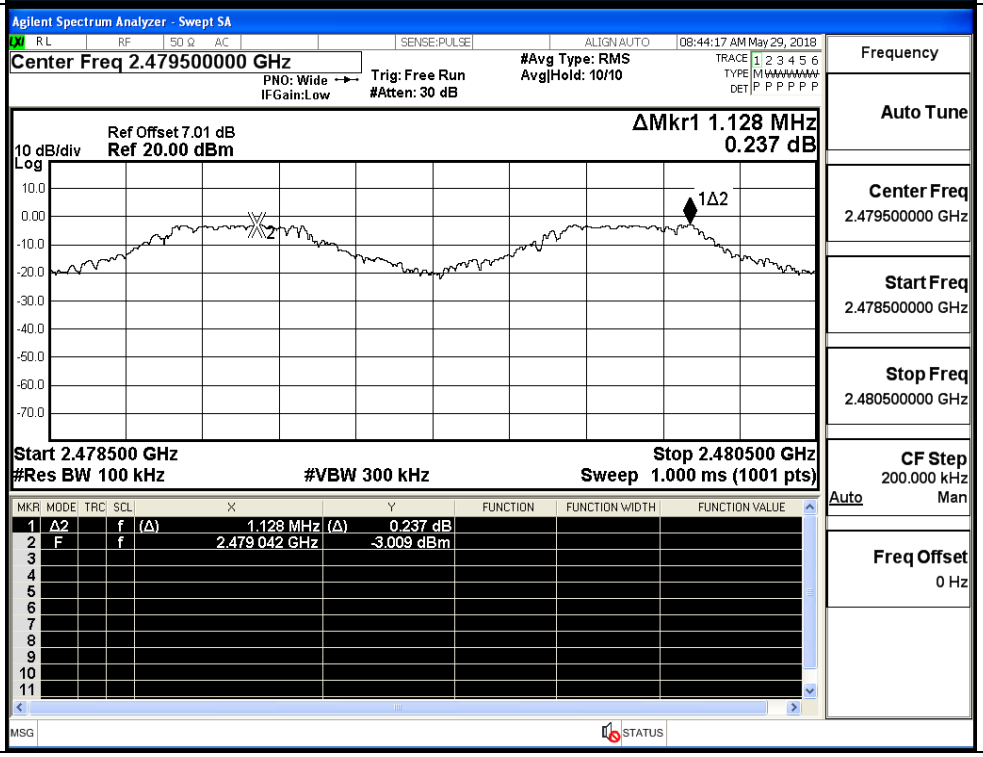
π/4DQPSK/HCH	

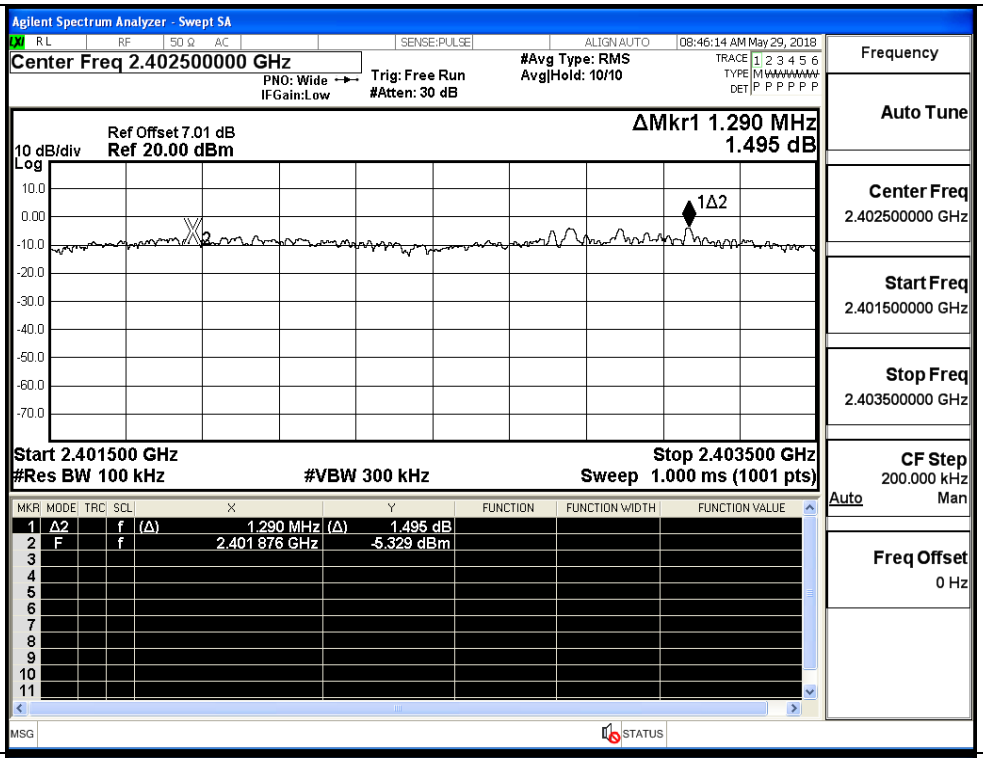
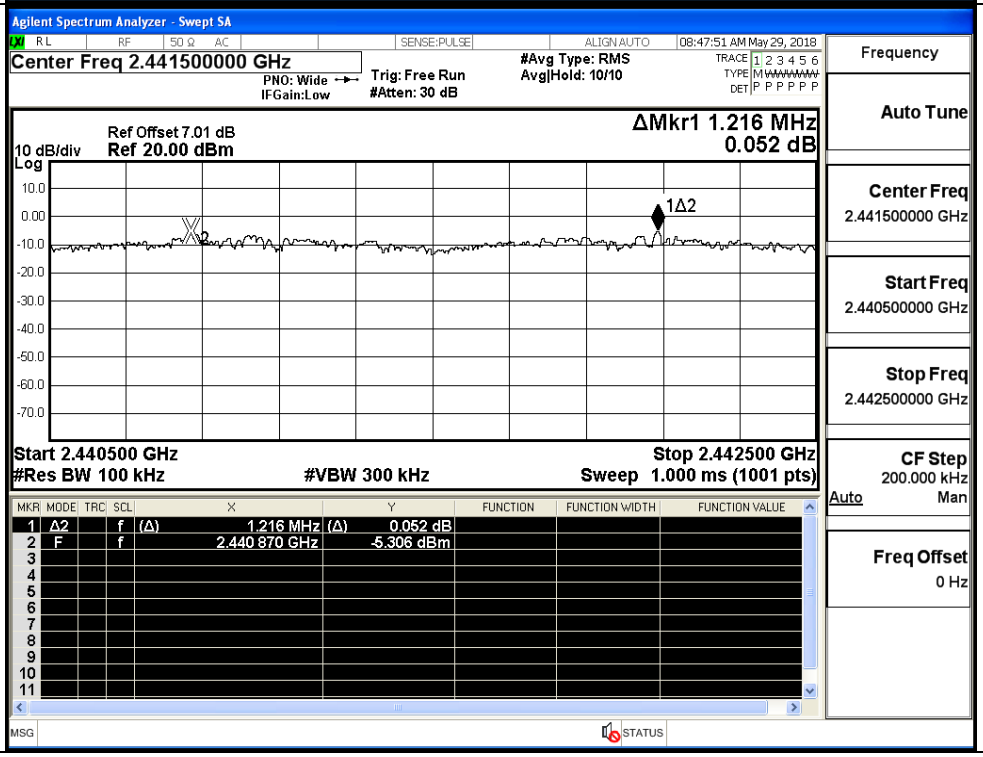
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
08:40:33 AM May 29, 2018
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 7.01 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.48012 GHz
-4.8617 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
1.0698 MHz
Total Power
2.75 dBm
Transmit Freq Error
-17.420 kHz
OBW Power
99.00 %
x dB Bandwidth
1.120 MHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS

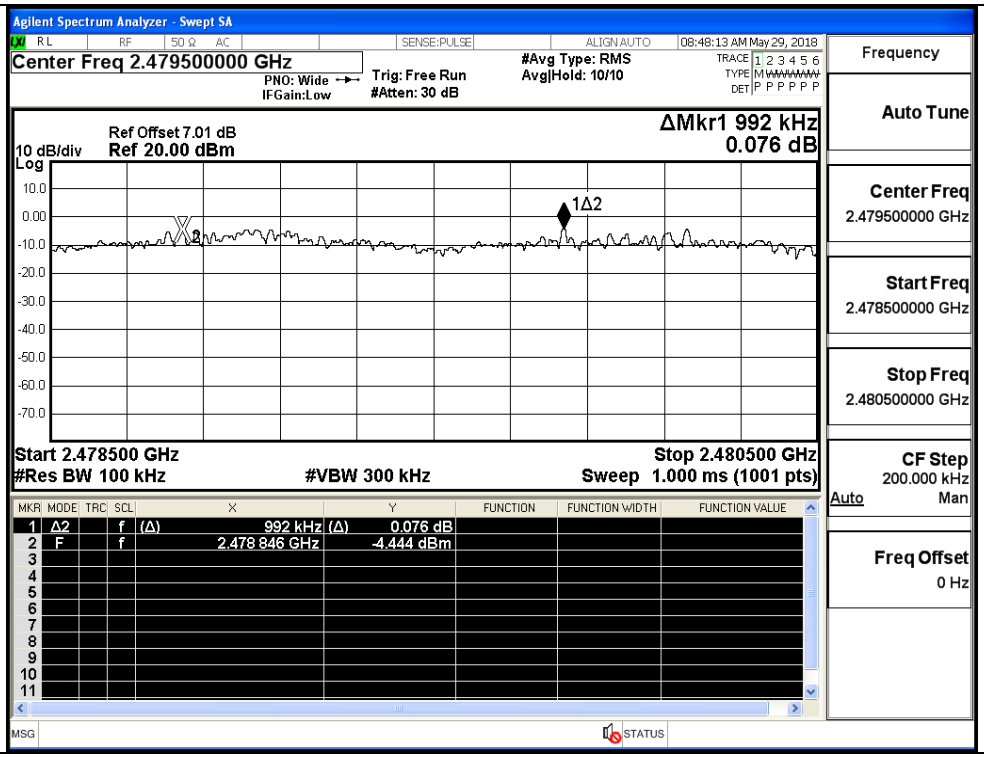
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.821	0.558	PASS
	MCH	0.810	0.558	PASS
	HCH	1.128	0.558	PASS
π/4DQPSK	LCH	1.290	0.747	PASS
	MCH	1.216	0.747	PASS
	HCH	0.992	0.747	PASS

Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

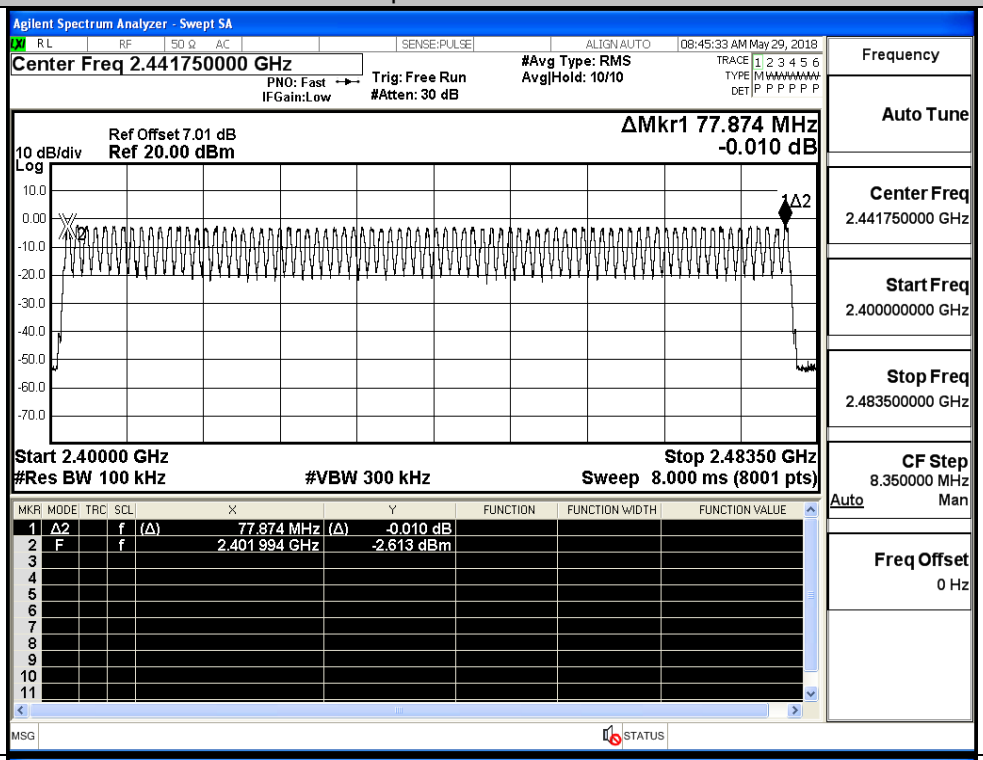
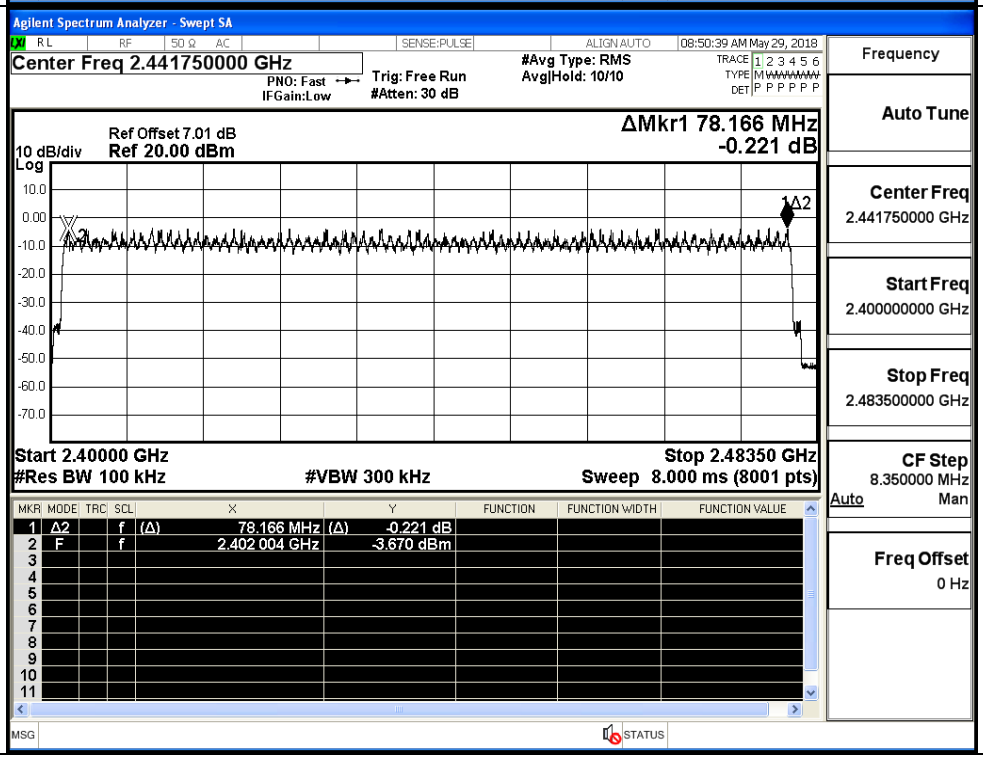
π/4DQPSK/LCH	
π/4DQPSK/MCH	

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
08:48:13 AM May 29, 2018
Ref Offset 7.01 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 992 kHz
0.076 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) 992 kHz (Δ) 0.076 dB
2 F f 2.478 846 GHz -4.444 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

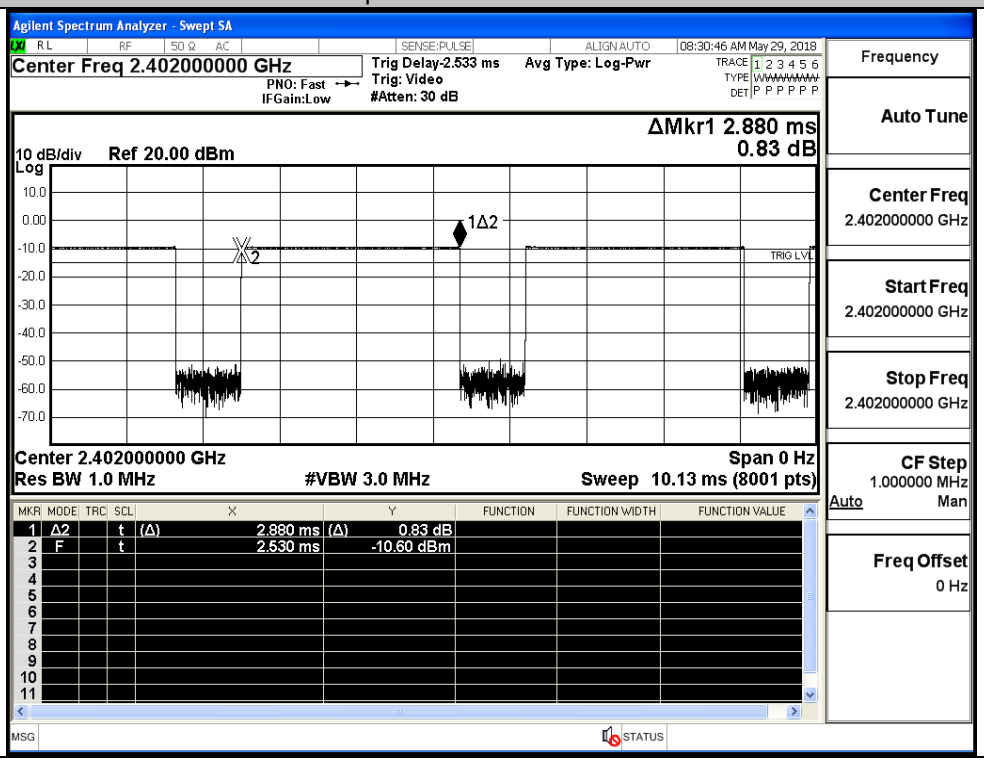
A.4 Hopping Channel Number

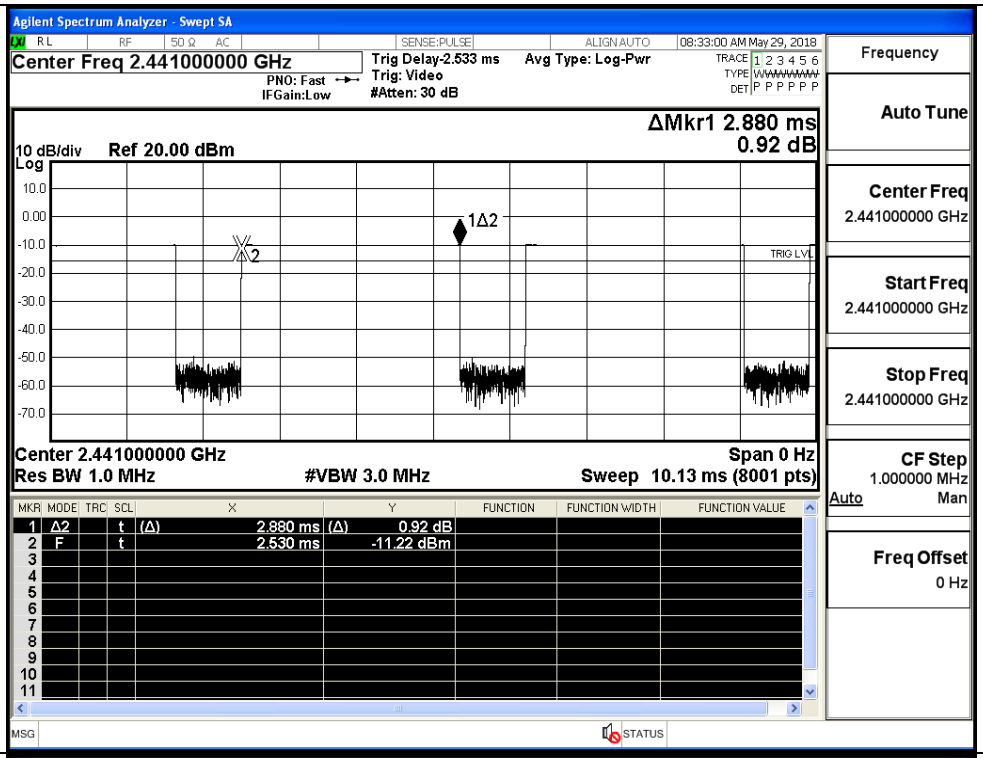
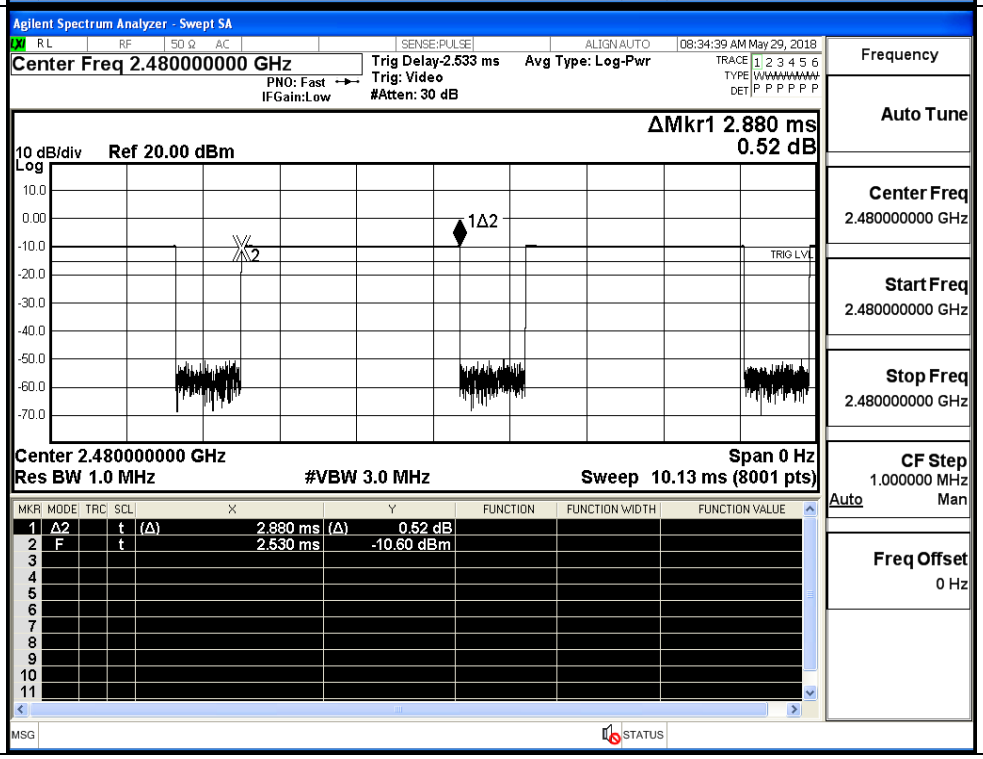
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS

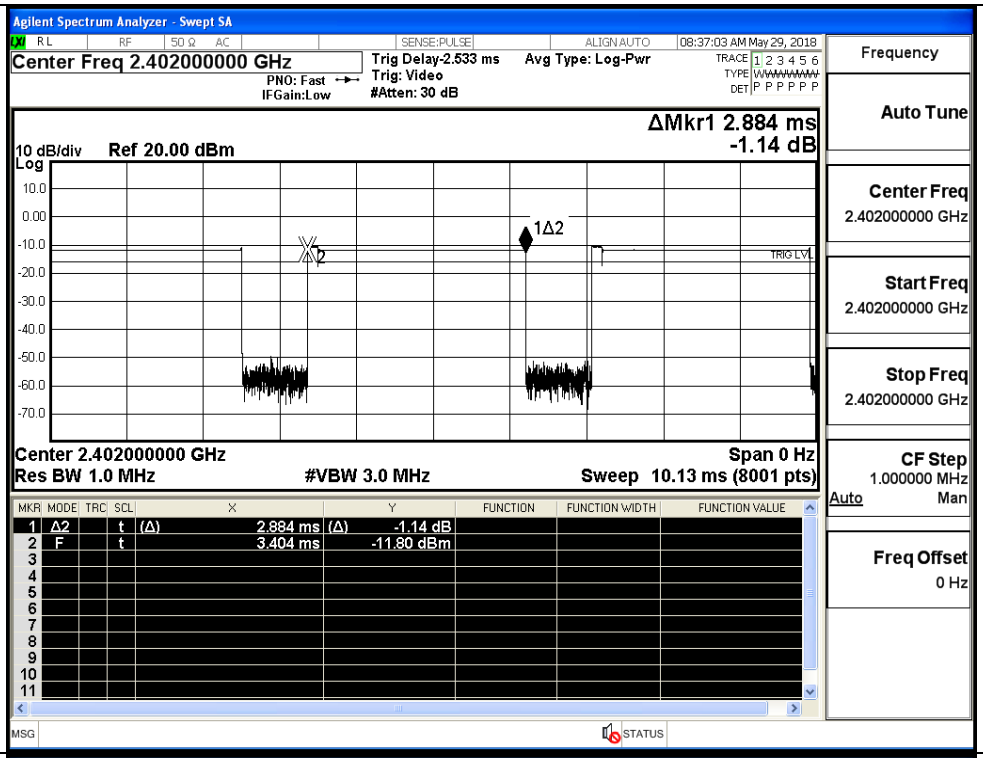
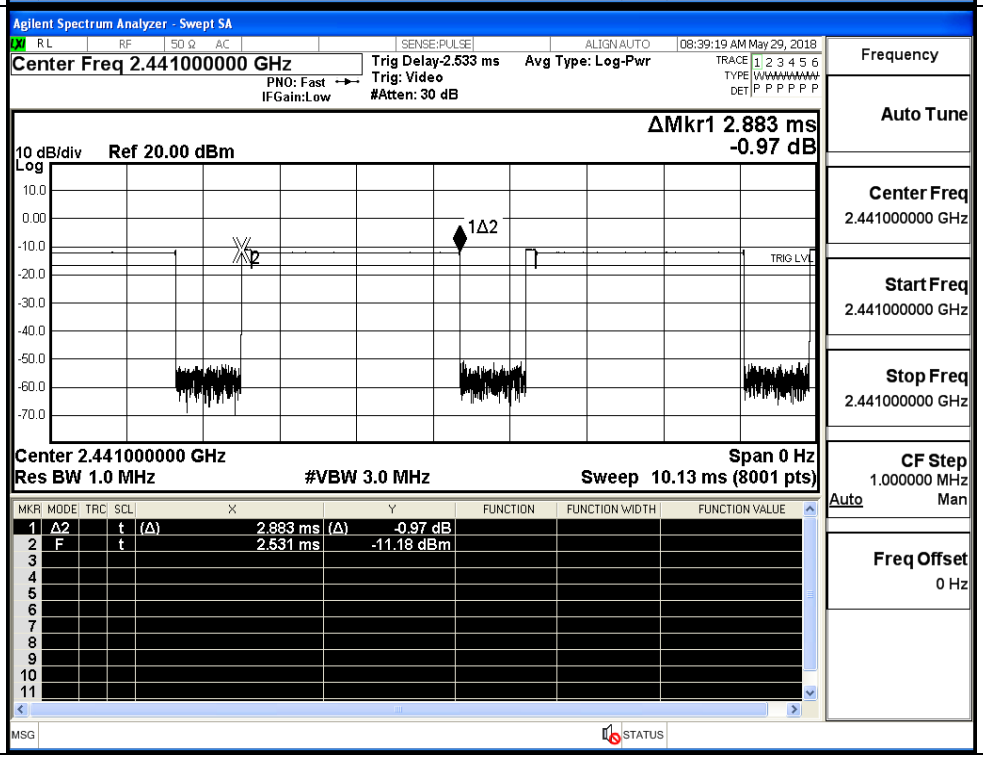
Test Graphs		
GFSK/Hop		
π/4DQPSK/Hop		

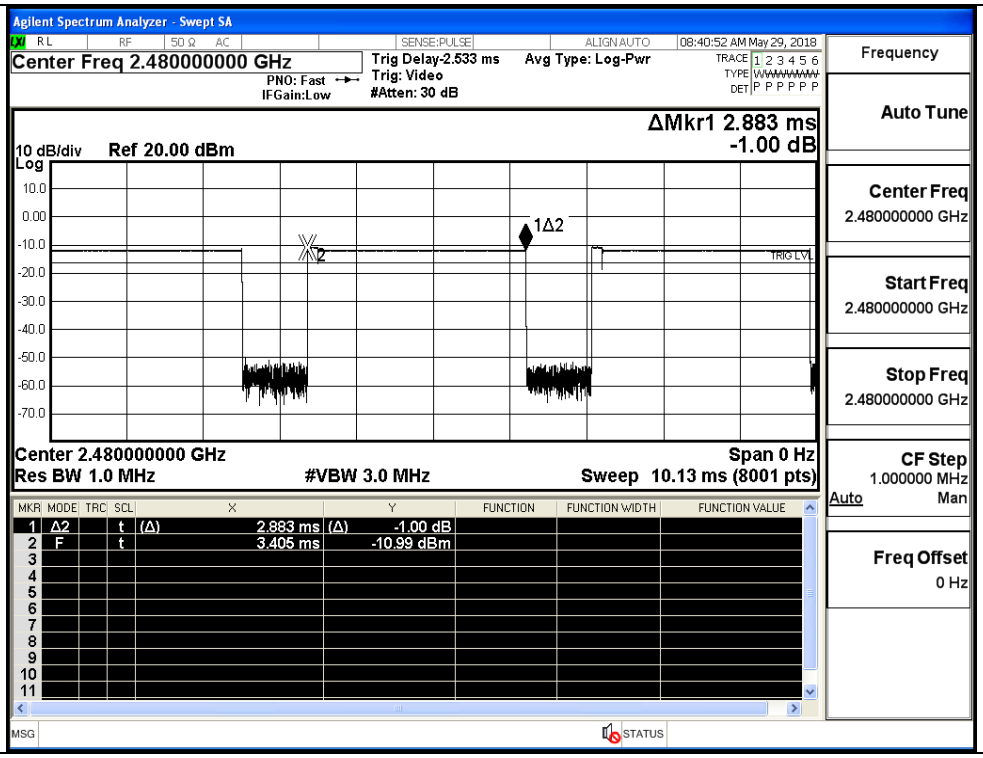
A.5 Dwell Time

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	

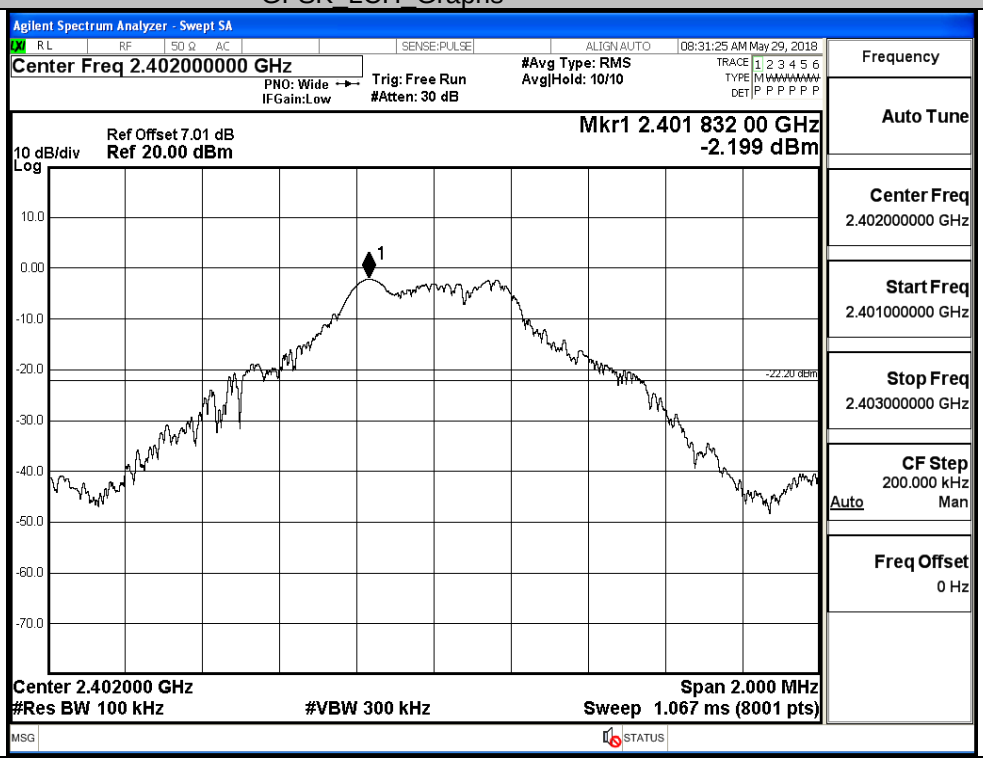
GFSK_DH5/MCH	
GFSK_DH5/HCH	

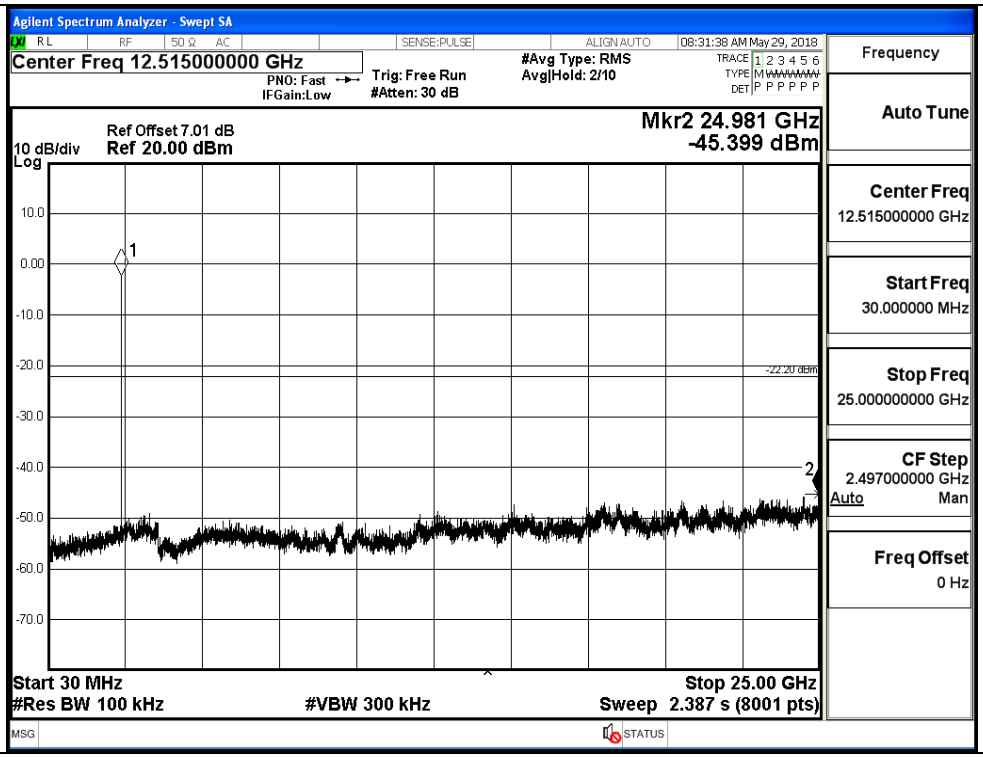
π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

π/4DQPSK _2DH5/HCH	

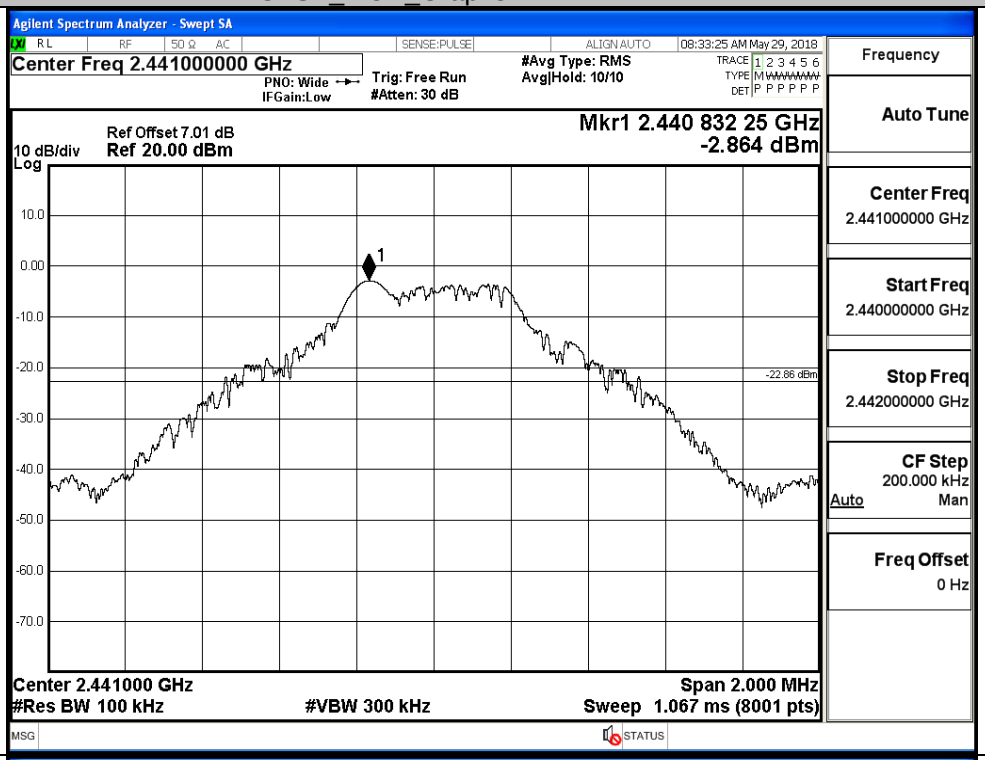
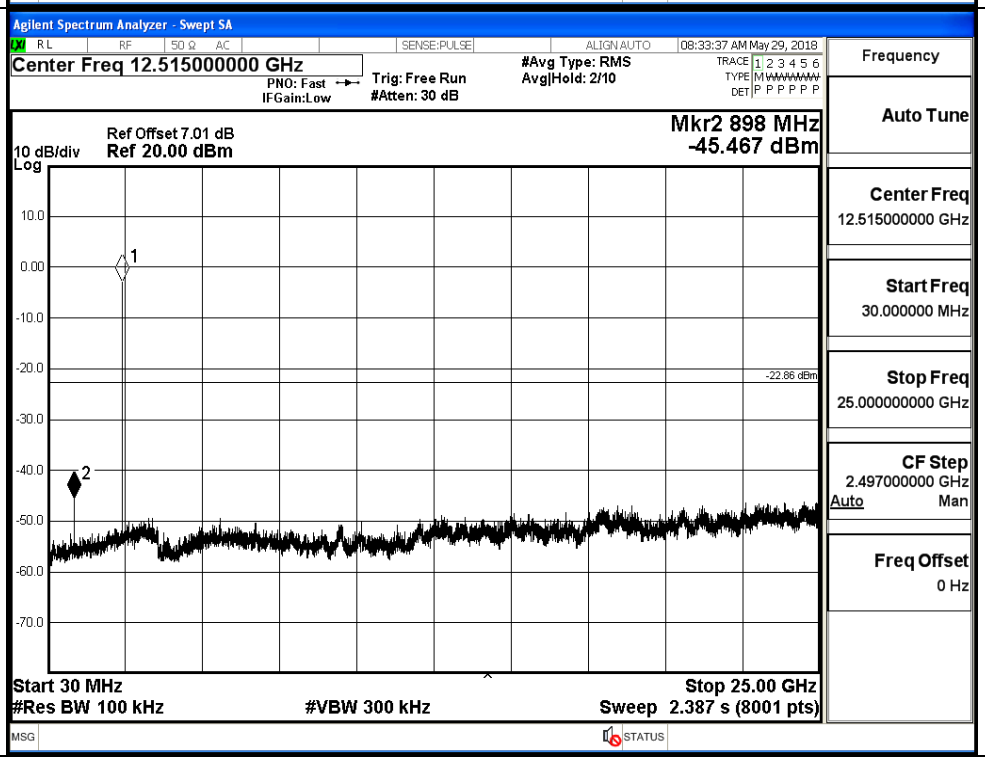
A.6 RF Conducted Spurious Emissions

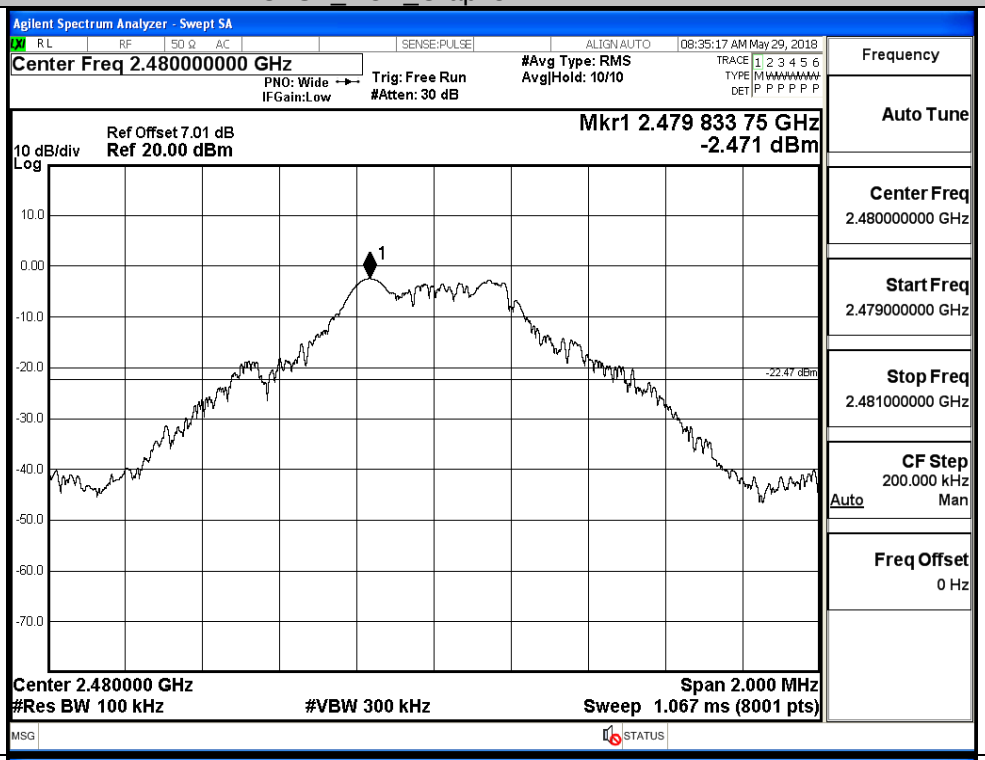
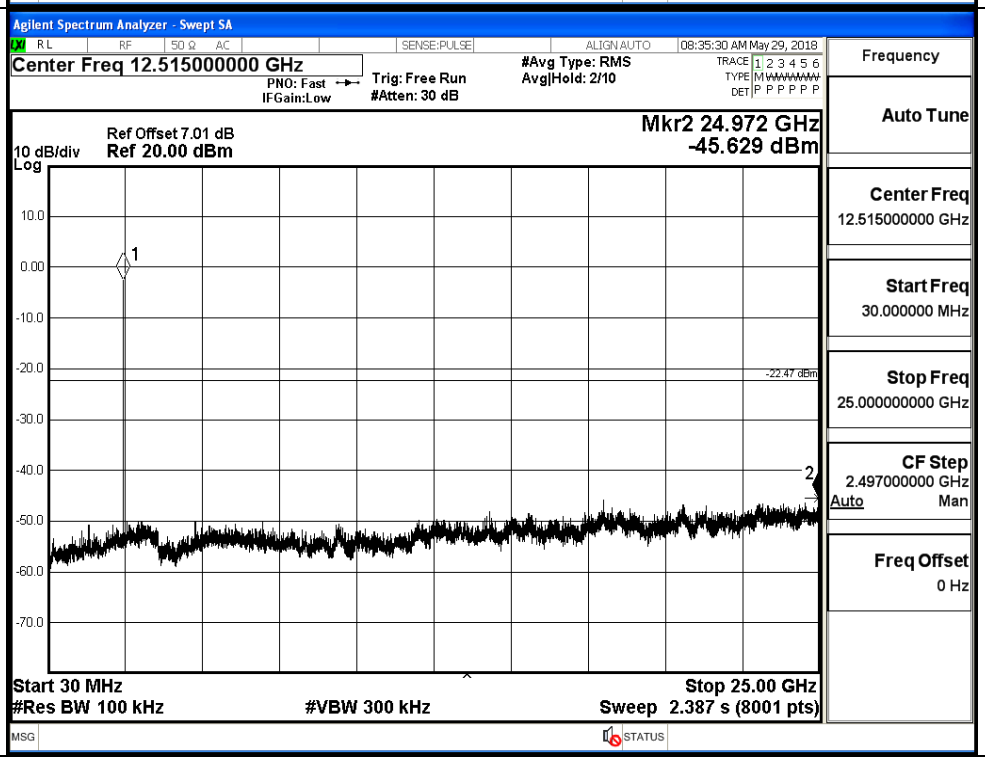
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.199	-45.399	-22.199	PASS
	MCH	-2.864	-45.467	-22.864	PASS
	HCH	-2.471	-45.629	-22.471	PASS
π/4DQPSK	LCH	-3.631	-45.951	-23.631	PASS
	MCH	-4.097	-45.834	-24.097	PASS
	HCH	-3.712	-44.576	-23.712	PASS

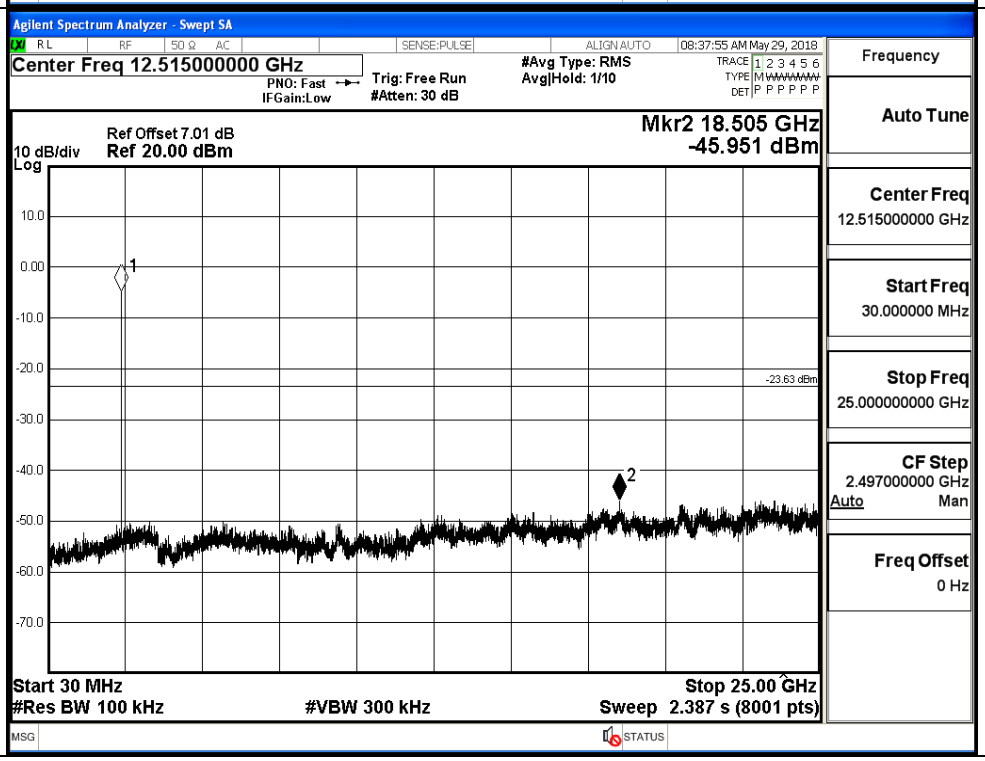
GFSK_LCH_Graphs	
Pref	

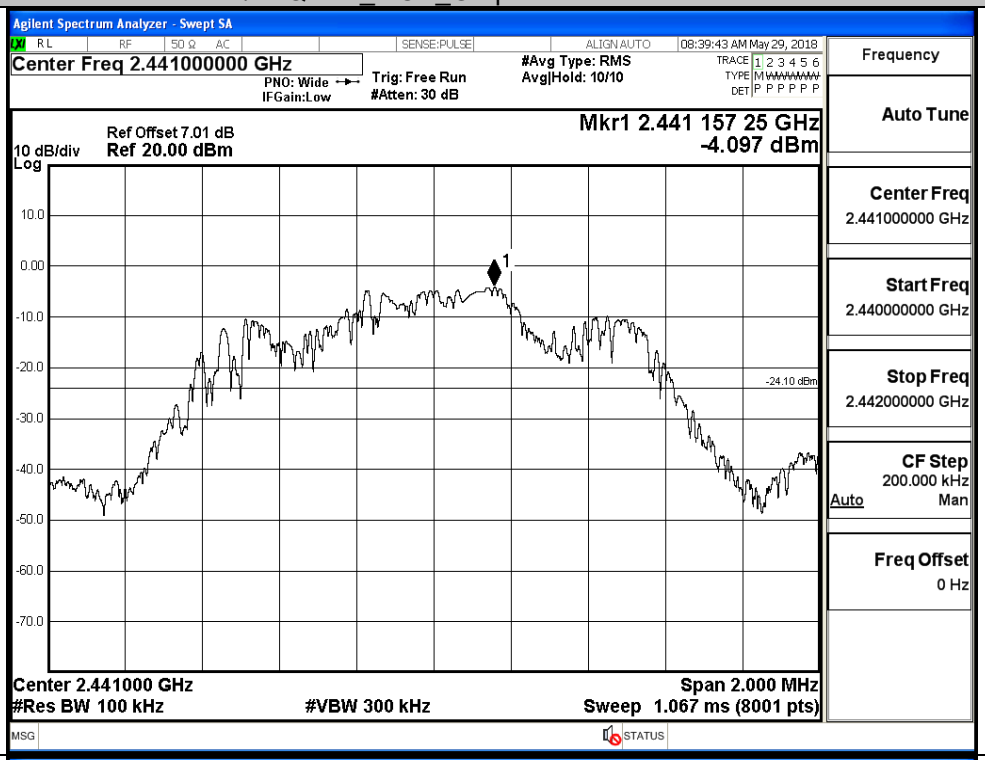
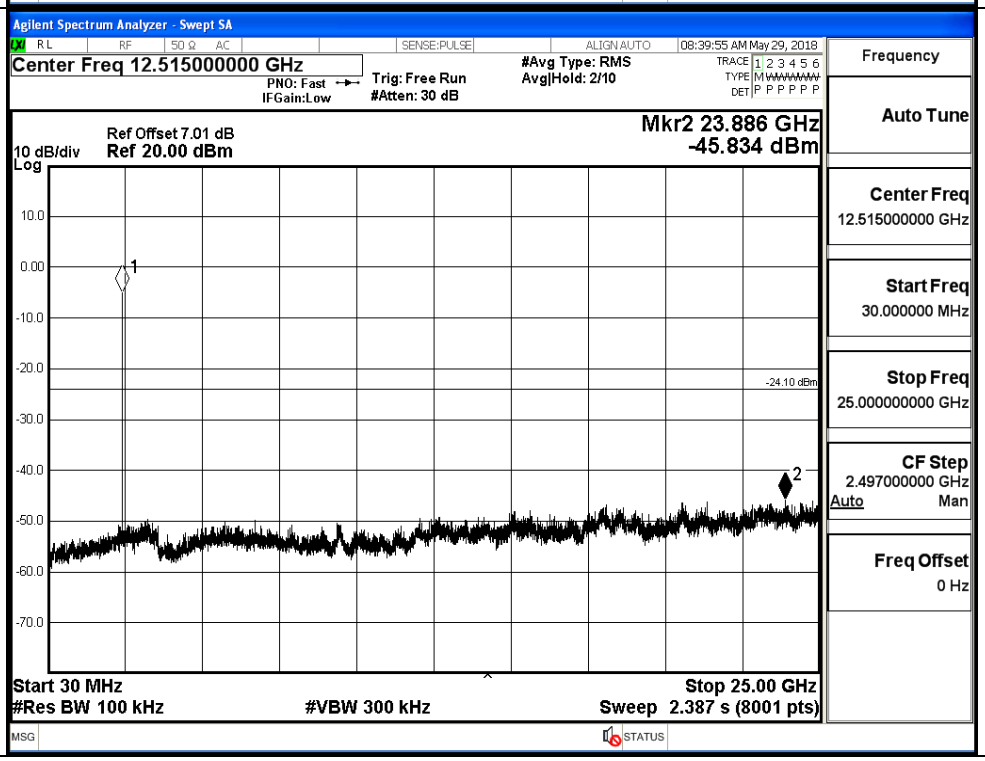
Puw		

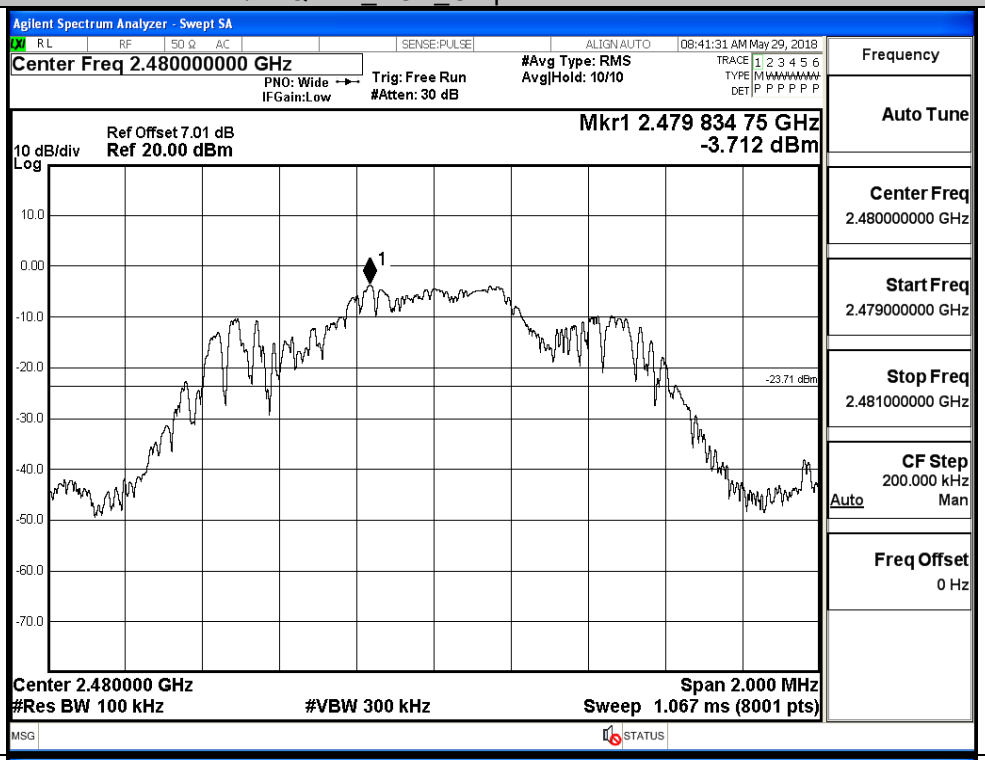
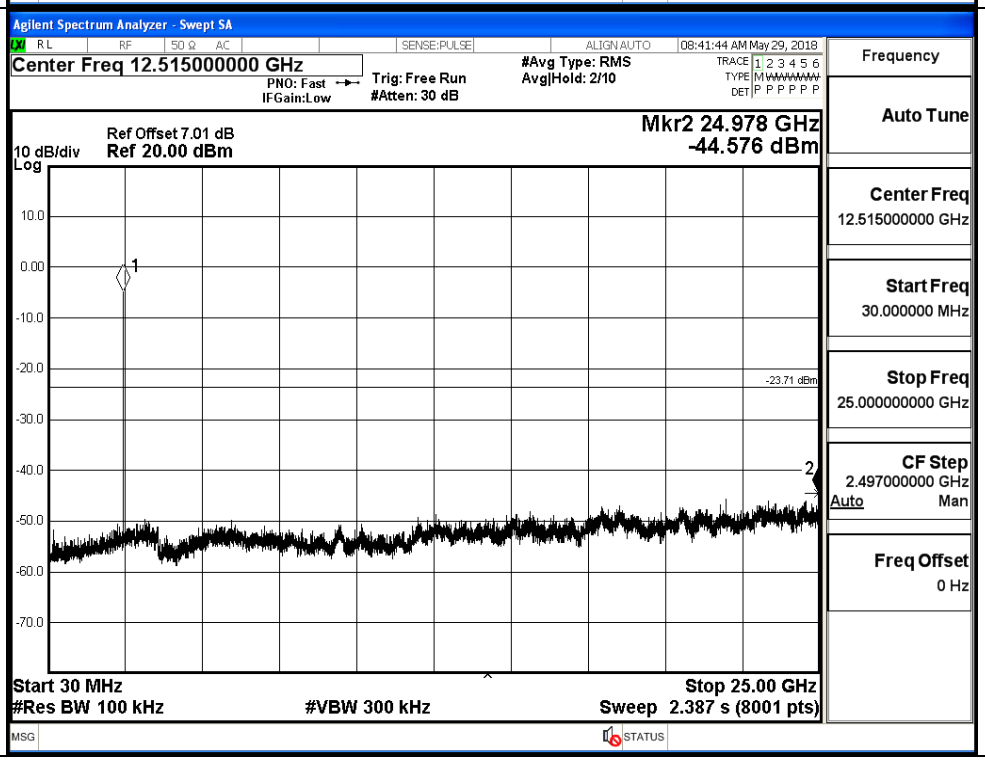
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
08:31:38 AM May 29, 2018
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 2/10
TRACE 1 2 3 4 5 6
TYPE M
DET P P P P P
Ref Offset 7.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr2 24.981 GHz
-45.399 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-22.20 dBm
1
2
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.387 s (8001 pts)
MSG
STATUS
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		

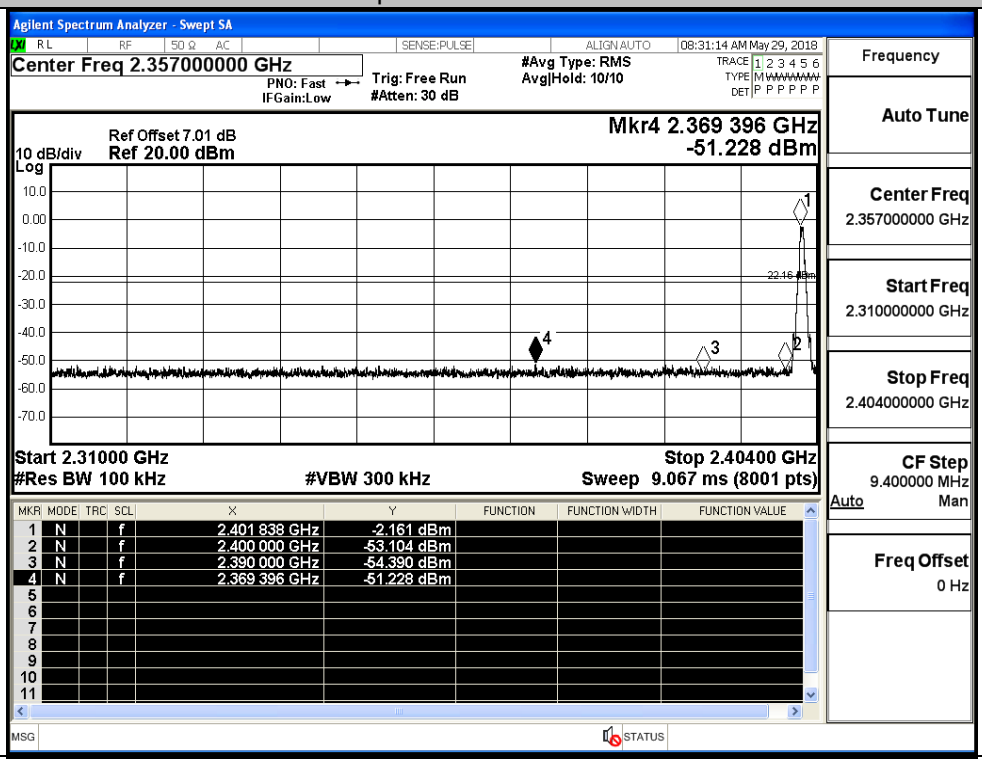
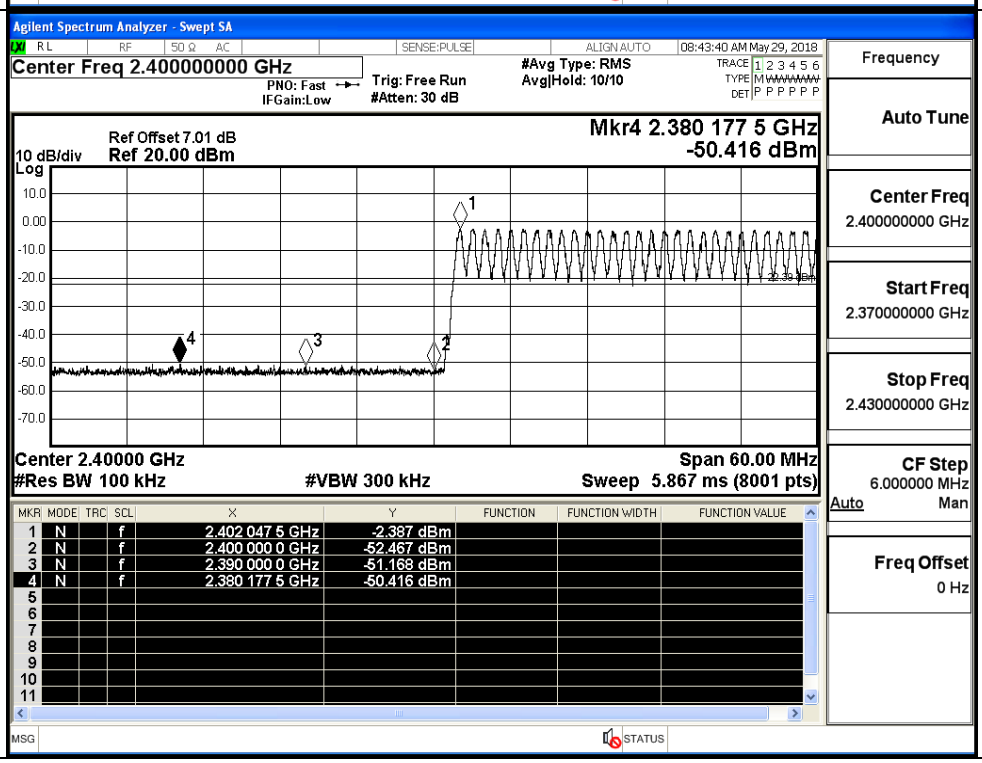
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

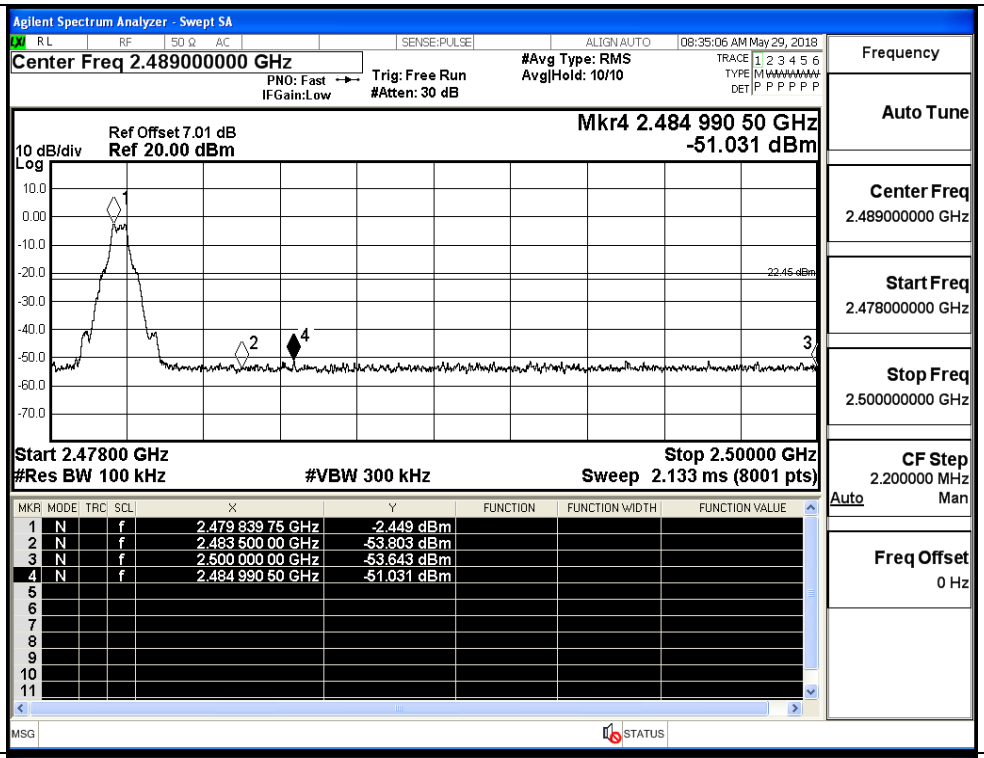
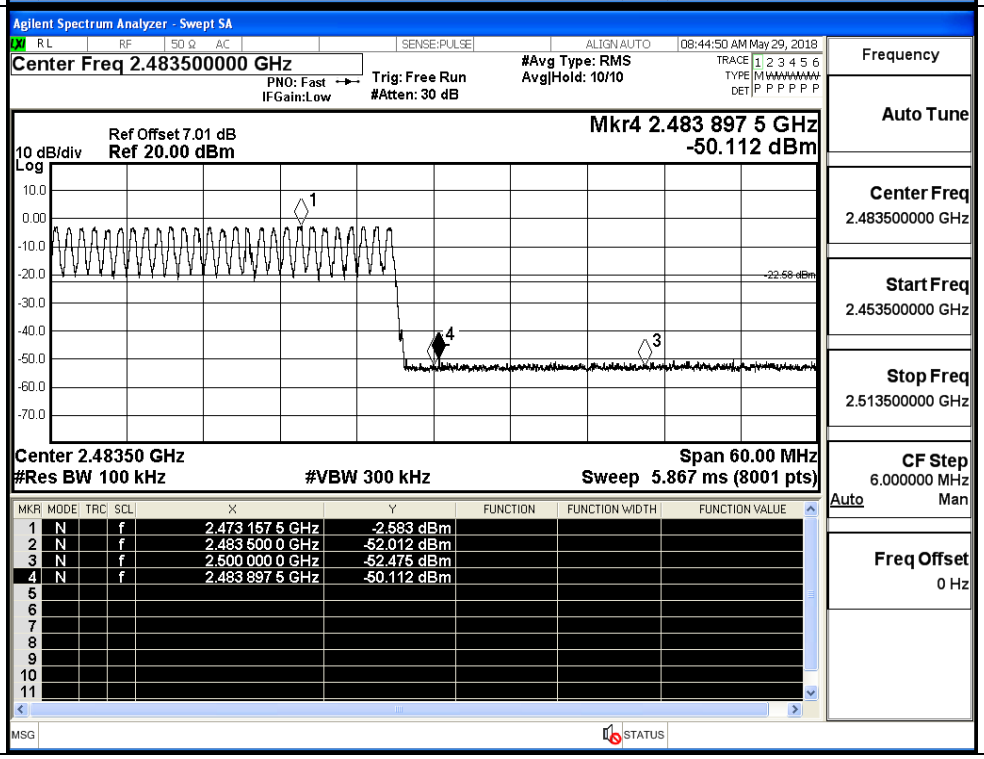
π/4DQPSK_MCH_Graphs		
Pref		
Puw		

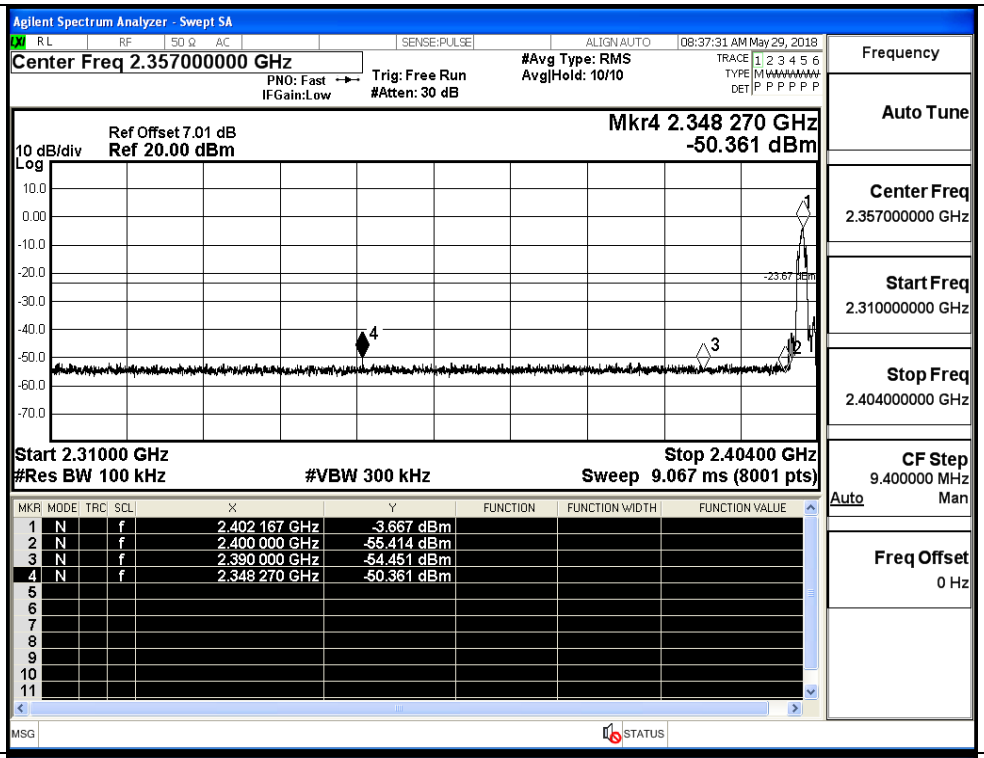
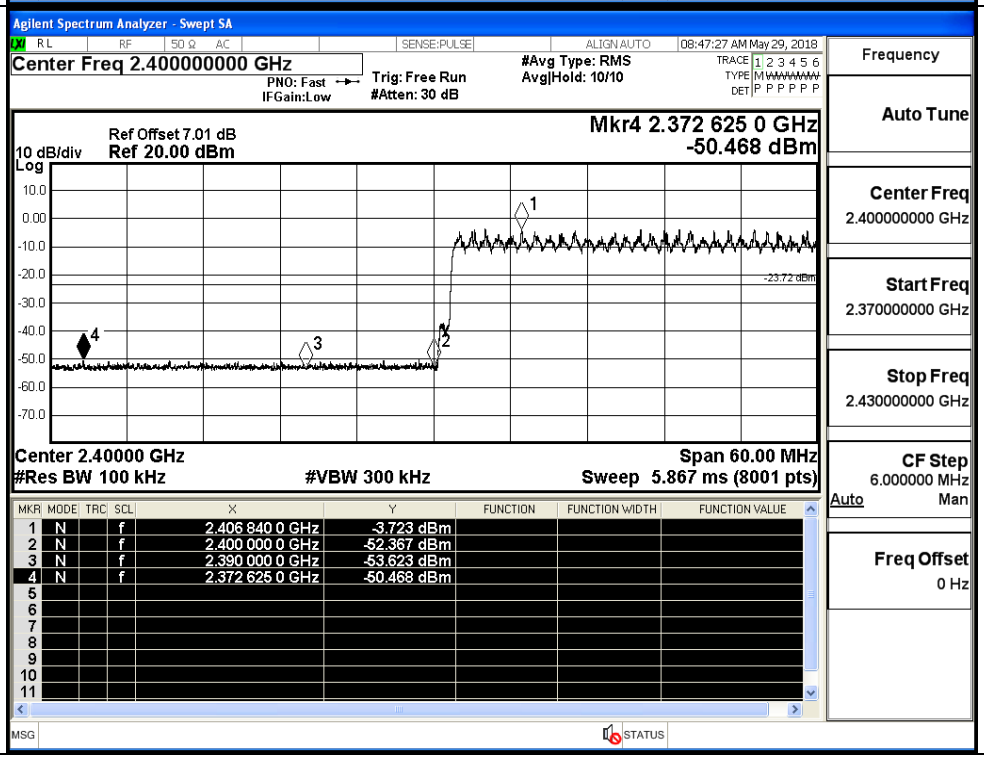
π/4DQPSK_HCH_Graphs		
Pref		
Puw		

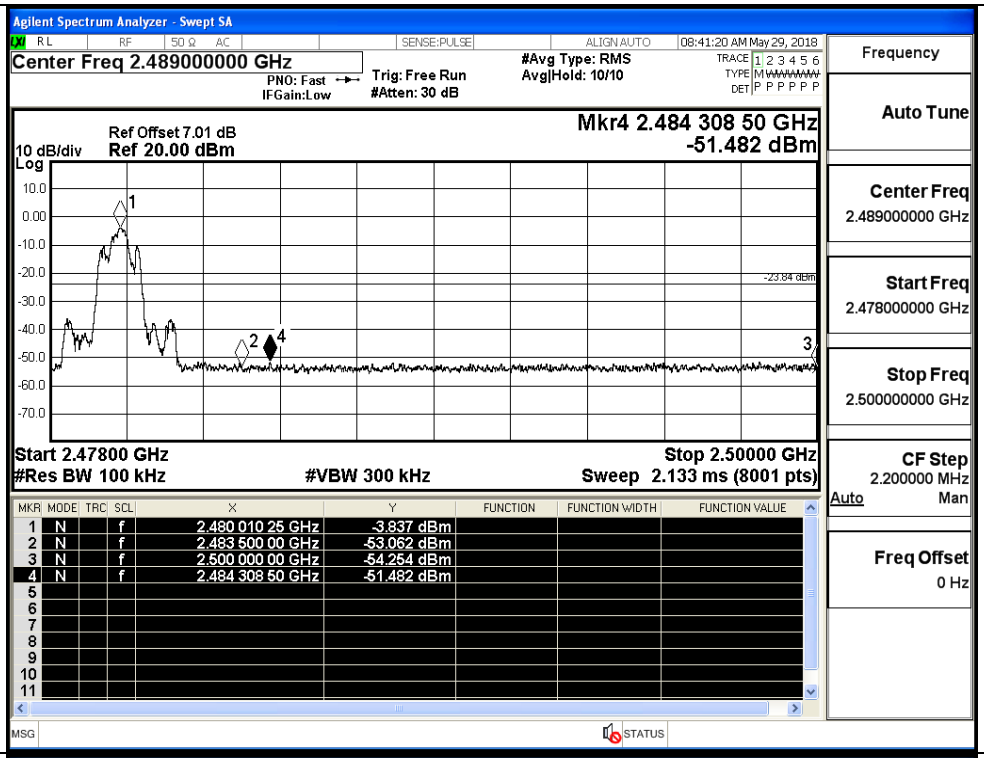
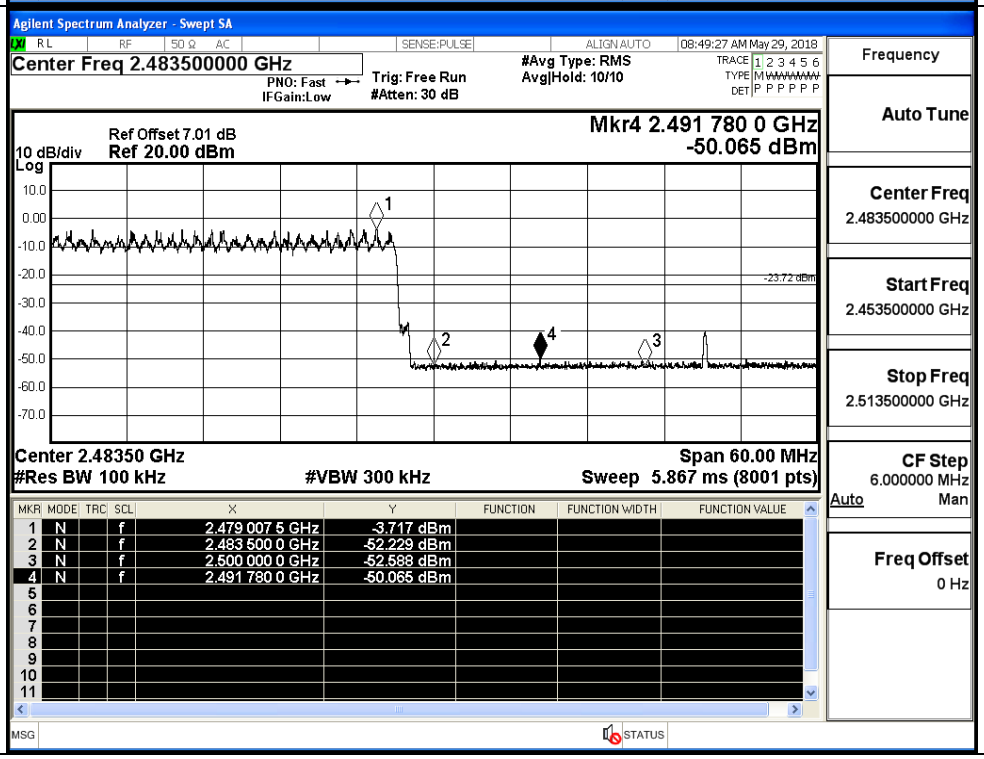
A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-2.161	Off	-51.228	-22.16	PASS
			-2.387	On	-50.416	-22.39	PASS
	HCH	2480	-2.449	Off	-51.031	-22.45	PASS
			-2.583	On	-50.112	-22.58	PASS
π/4DQPSK	LCH	2402	-3.667	Off	-50.361	-23.67	PASS
			-3.723	On	-50.468	-23.72	PASS
	HCH	2480	-3.837	Off	-51.482	-23.84	PASS
			-3.717	On	-50.065	-23.72	PASS

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

GFSK/HCH/No Hop	
GFSK/HCH/Hop	

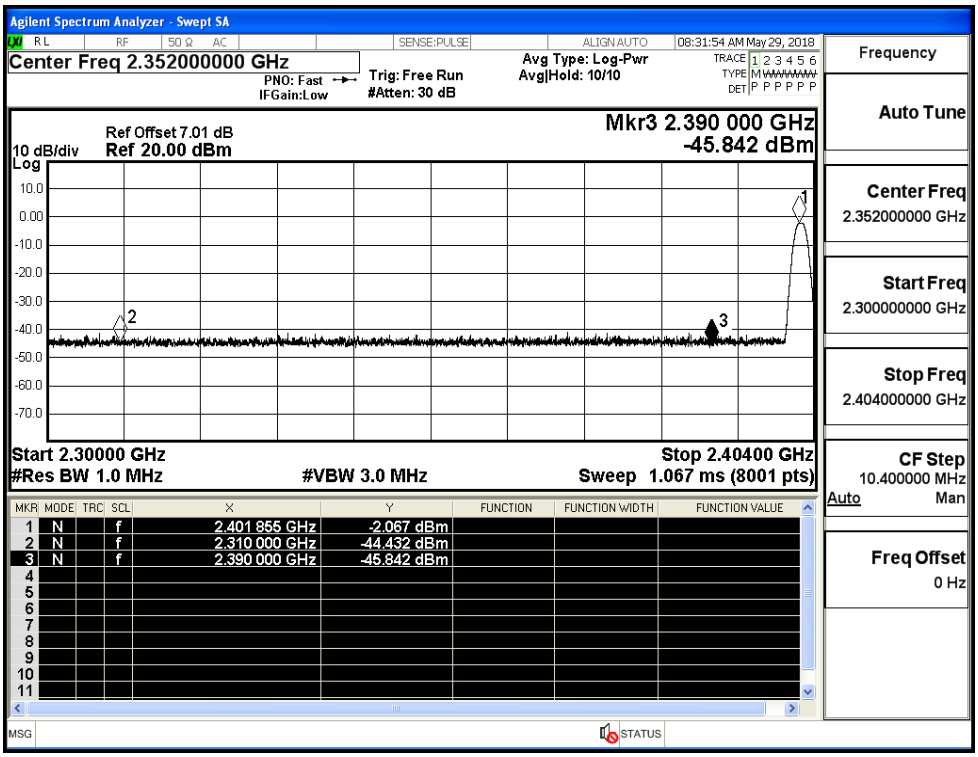
π/4DQPSK/LCH/No Hop	
π/4DQPSK/LCH/Hop	

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

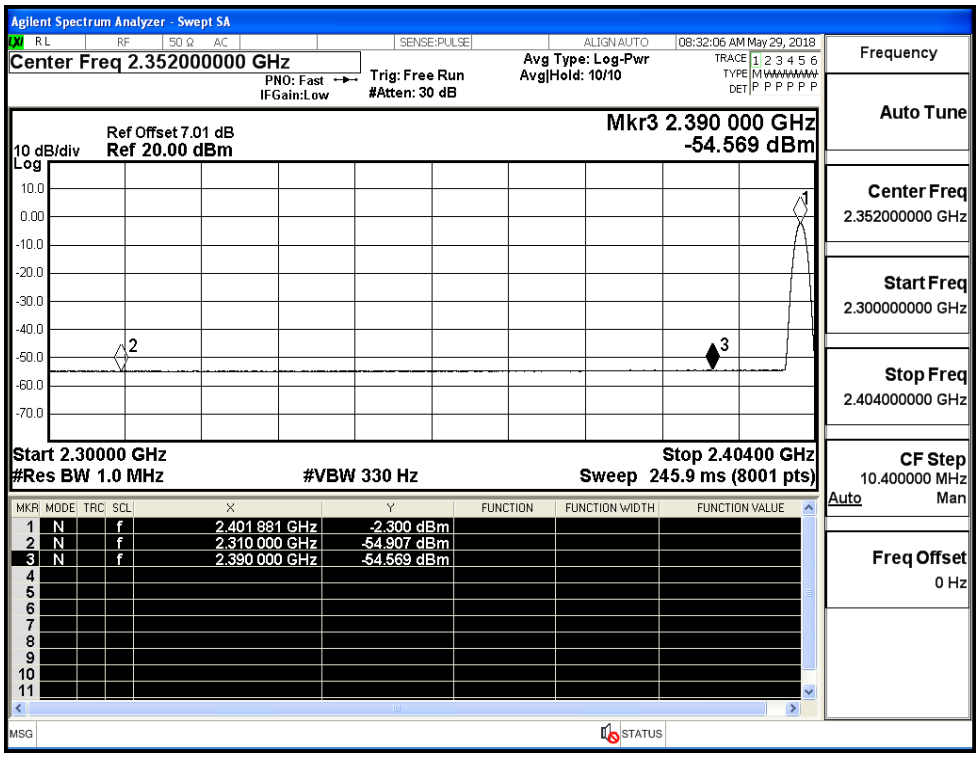
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.43	2.0	0	52.83	PEAK	74	PASS
	Off	2310.0	-54.91	2.0	0	42.35	AV	54	PASS
	Off	2390.0	-45.84	2.0	0	51.42	PEAK	74	PASS
	Off	2390.0	-54.57	2.0	0	42.69	AV	54	PASS
	Off	2483.5	-43.22	2.0	0	54.03	PEAK	74	PASS
	Off	2483.5	-54.32	2.0	0	42.93	AV	54	PASS
	Off	2500.0	-44.80	2.0	0	52.46	PEAK	74	PASS
	Off	2500.0	-54.23	2.0	0	43.03	AV	54	PASS
π/4DQPSK	Off	2310.0	-44.52	2.0	0	52.74	PEAK	74	PASS
	Off	2310.0	-54.80	2.0	0	42.46	AV	54	PASS
	Off	2390.0	-43.82	2.0	0	53.44	PEAK	74	PASS
	Off	2390.0	-54.58	2.0	0	42.68	AV	54	PASS
	Off	2483.5	-43.41	2.0	0	53.85	PEAK	74	PASS
	Off	2483.5	-54.31	2.0	0	42.95	AV	54	PASS
	Off	2500.0	-44.40	2.0	0	52.86	PEAK	74	PASS
	Off	2500.0	-54.22	2.0	0	43.04	AV	54	PASS

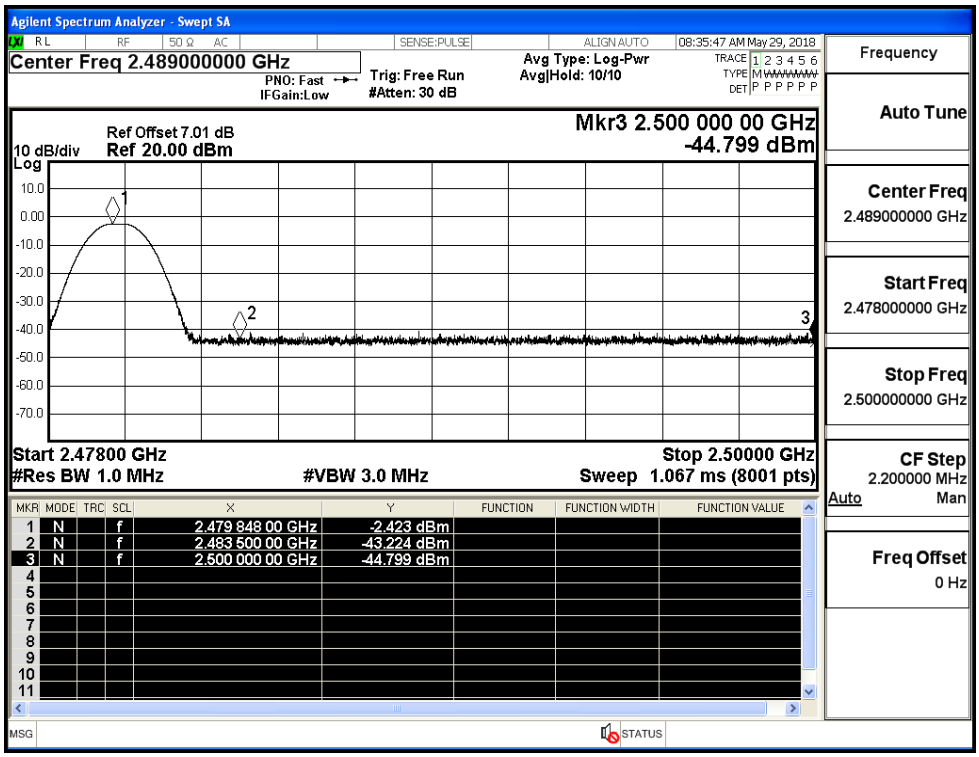
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



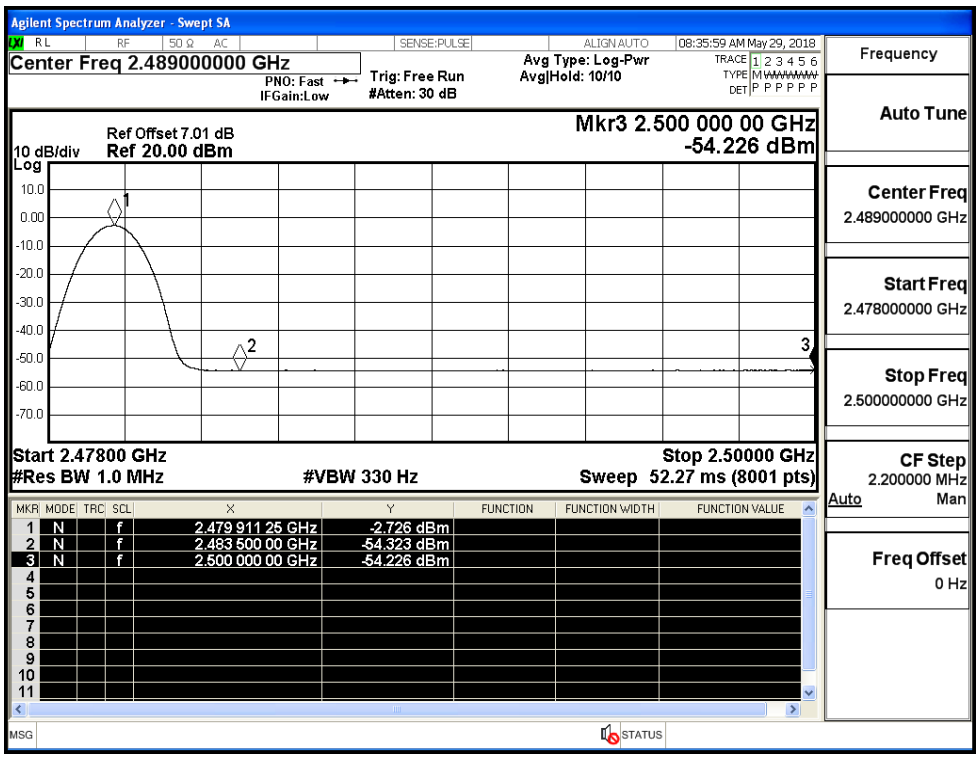
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



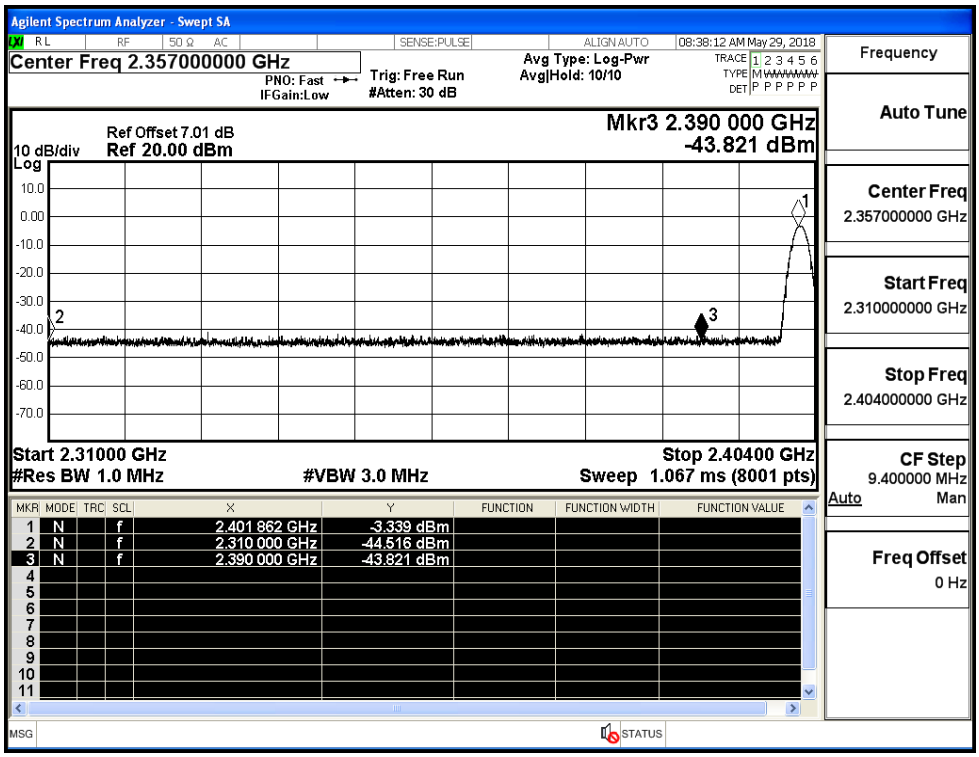
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



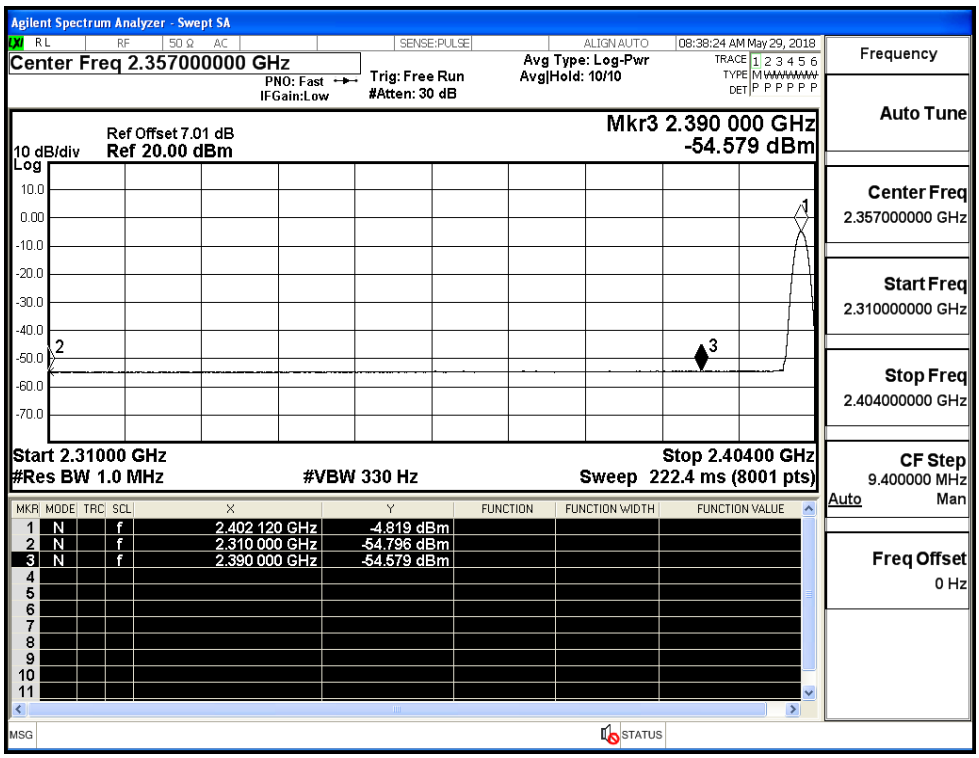
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



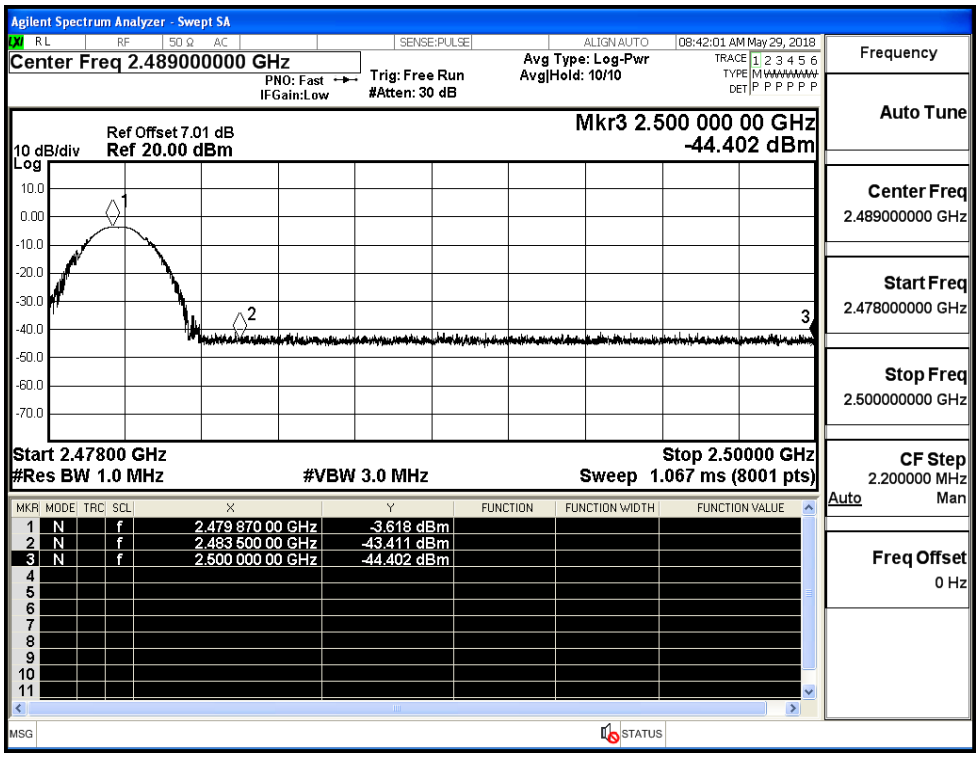
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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)