Appendix A

RF Test Data for BT V4.0(BDR/EDR) (Conducted Measurement)

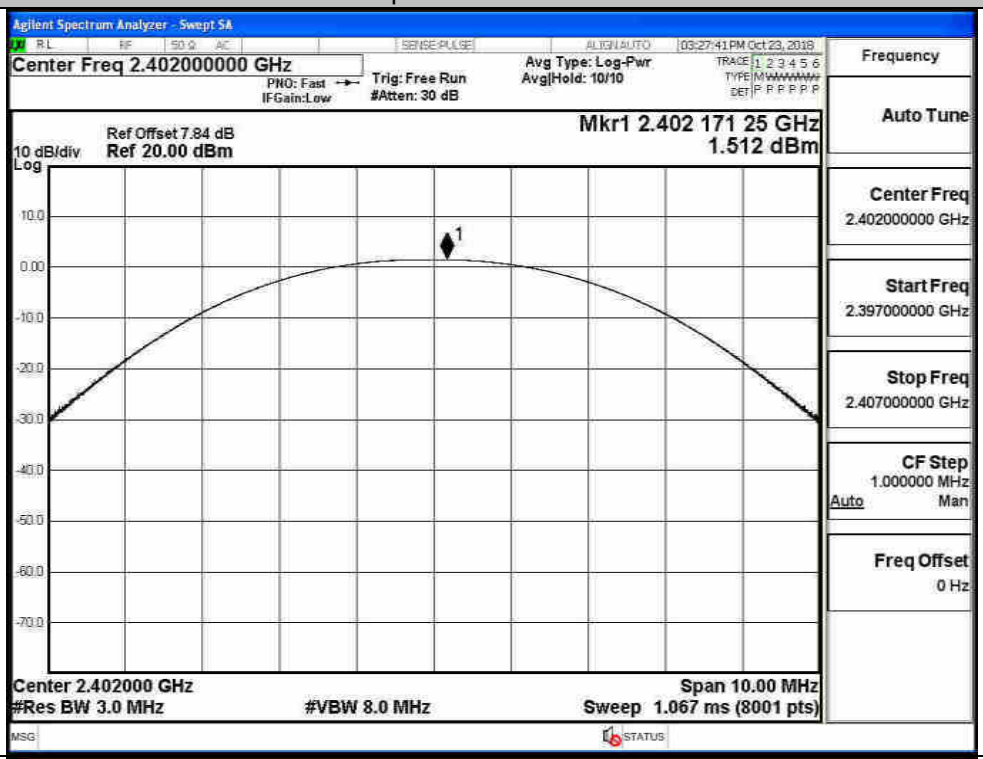
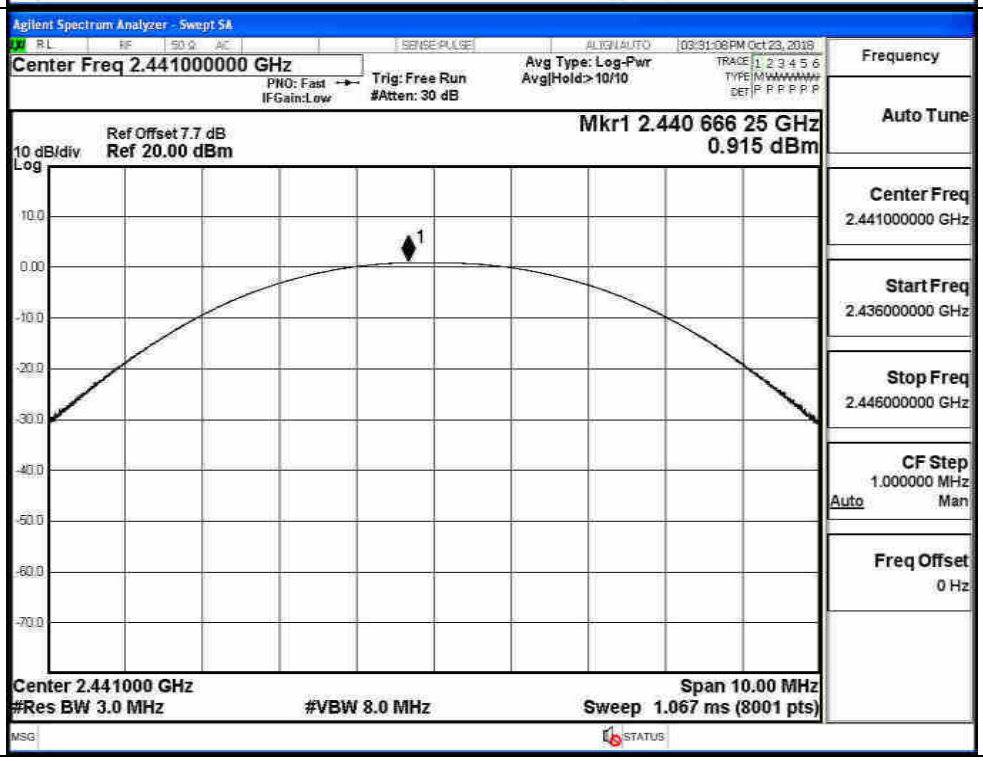
Product Name: GSM/WCDMA Smartphone
Trade Mark: DOOGEE
Test Model: X50

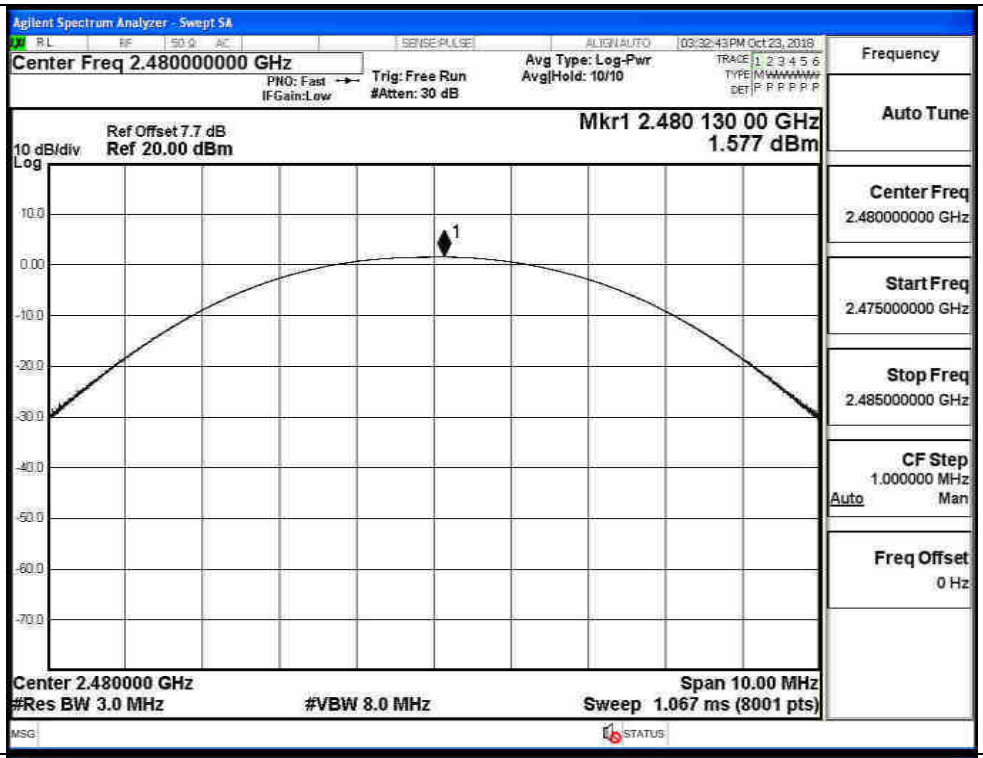
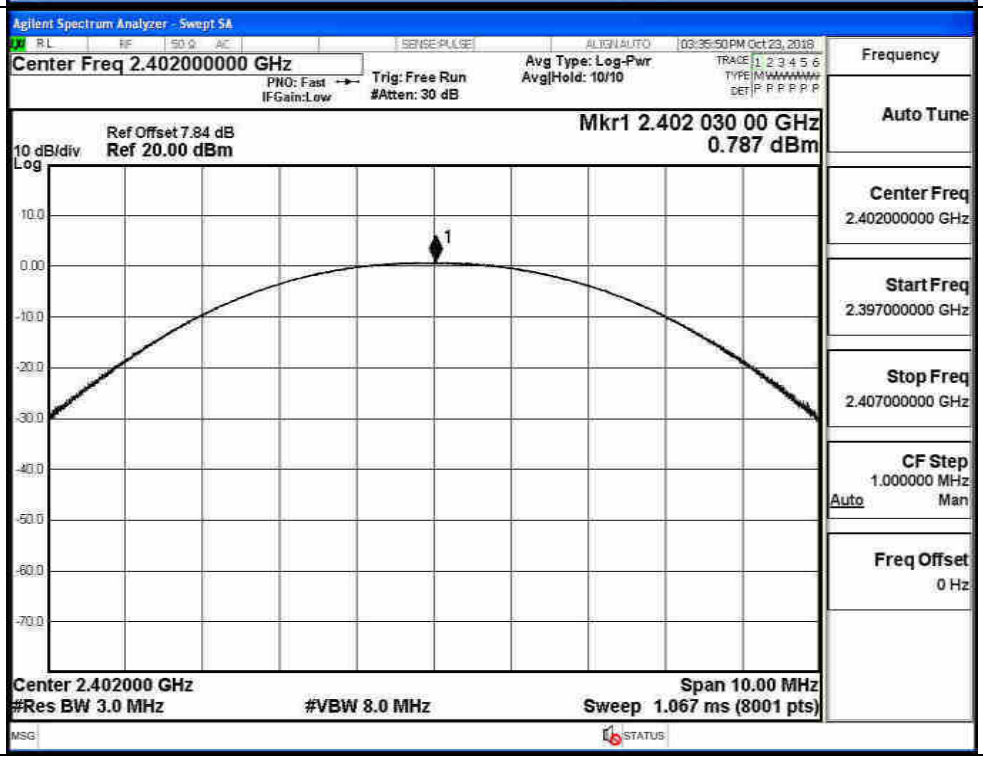
Environmental Conditions

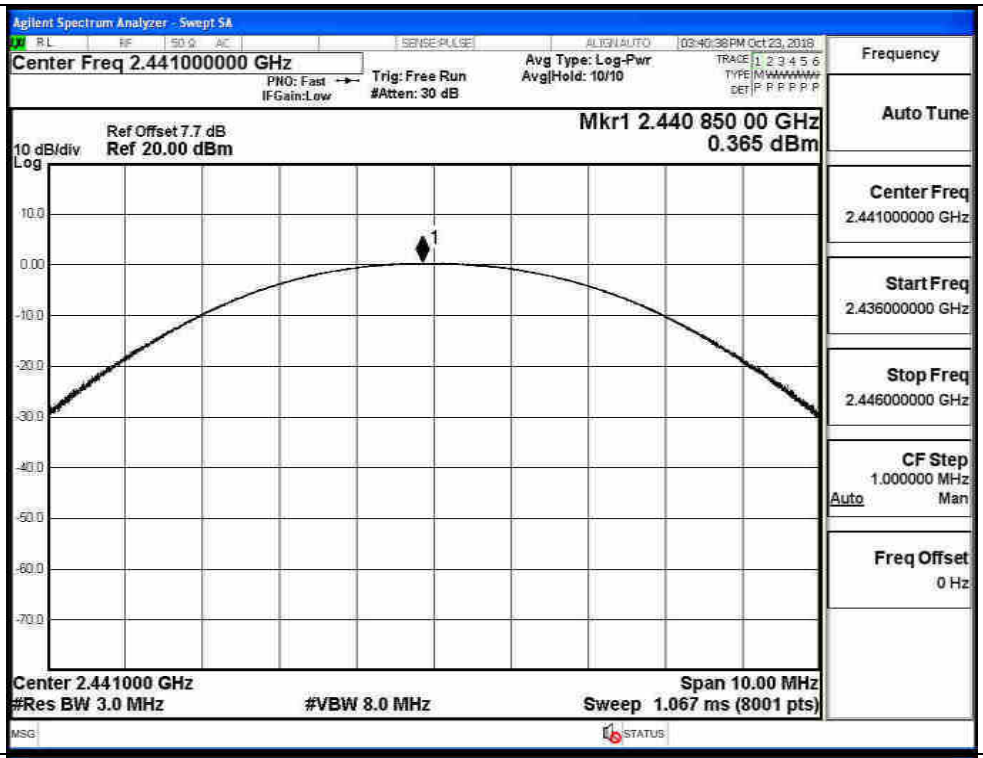
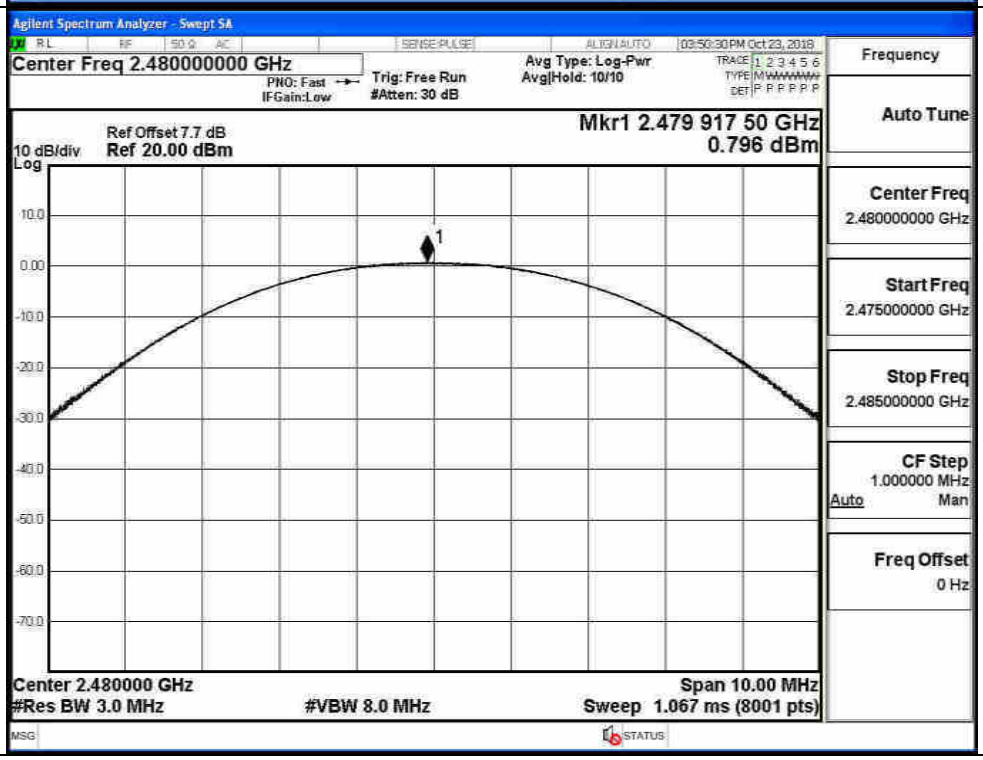
Temperature:	24.6 ° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	WangChuang
Supervised by:	Jayden.Zhuo

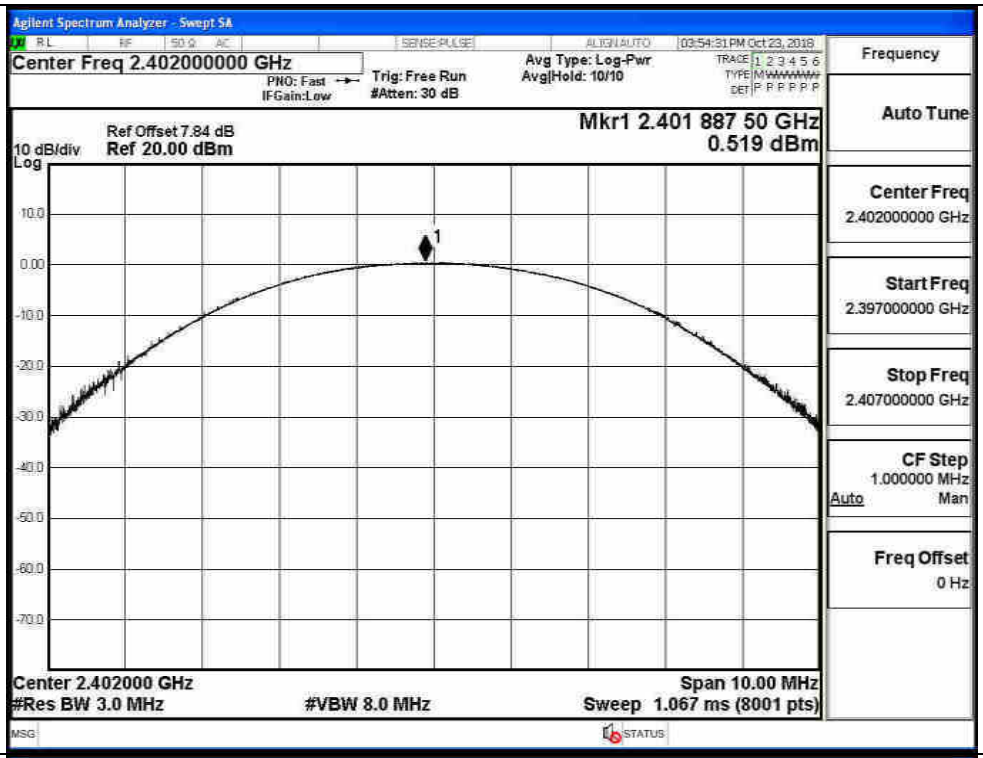
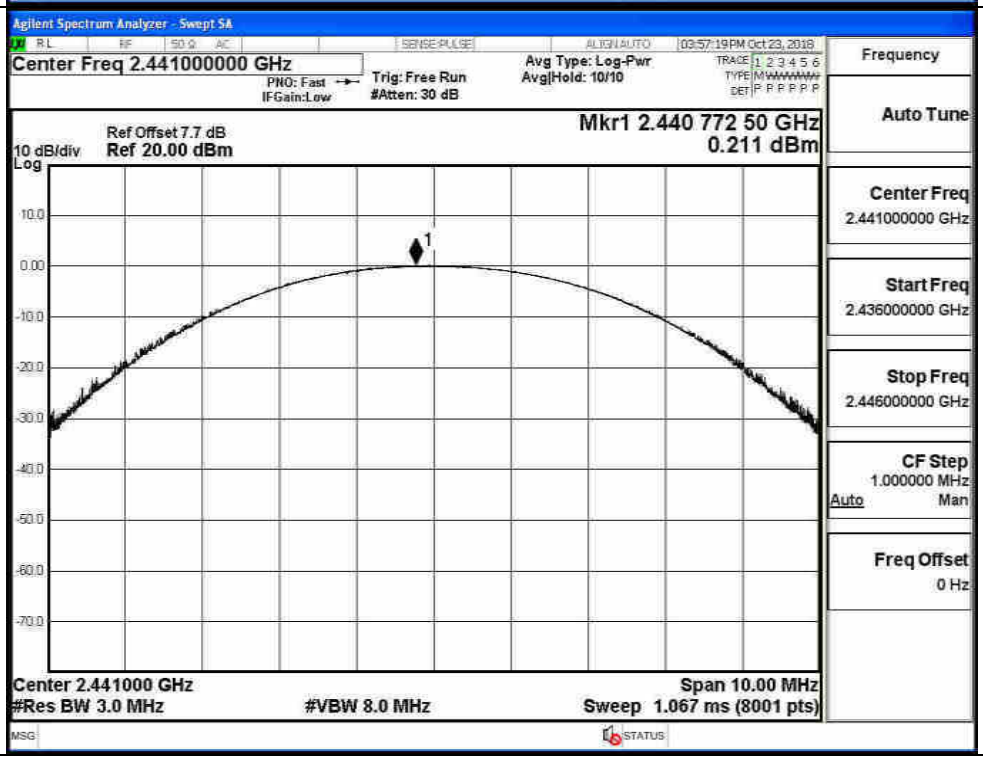
A.1 Maxmum Conducted Peak Output Power

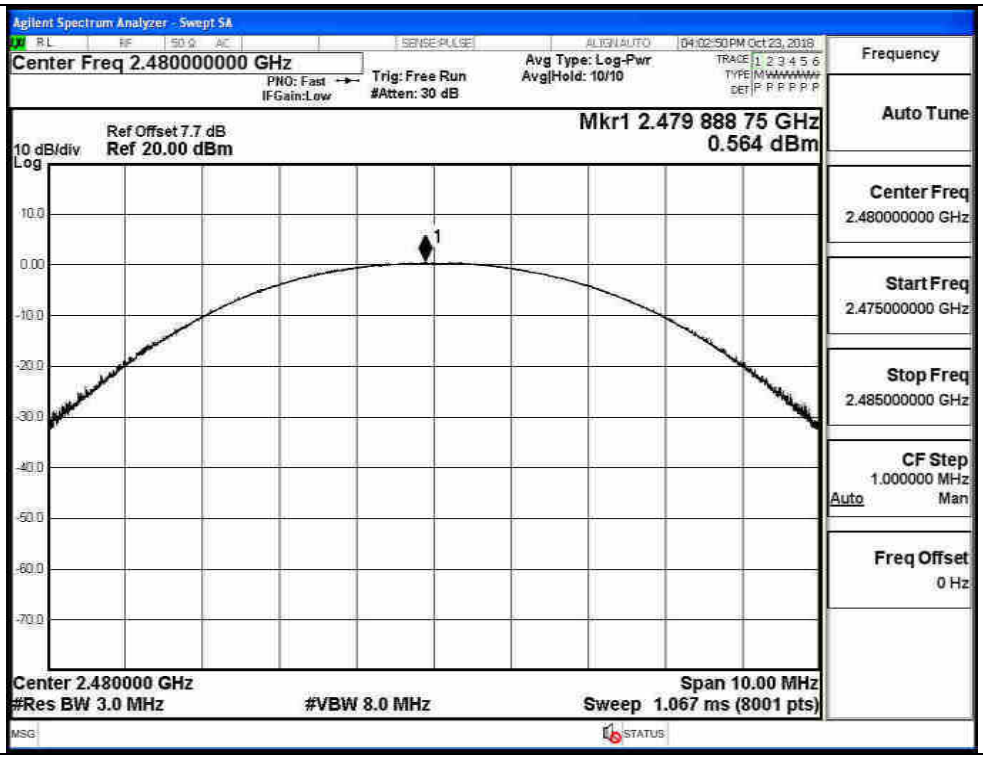
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.512	21	PASS
	MCH	0.915	21	PASS
	HCH	1.577	21	PASS
π/4DQPSK	LCH	0.787	21	PASS
	MCH	0.365	21	PASS
	HCH	0.796	21	PASS
8DPSK	LCH	0.519	21	PASS
	MCH	0.211	21	PASS
	HCH	0.564	21	PASS

Test Graphs		
GFSK/LCH		
GFSK/MCH		

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

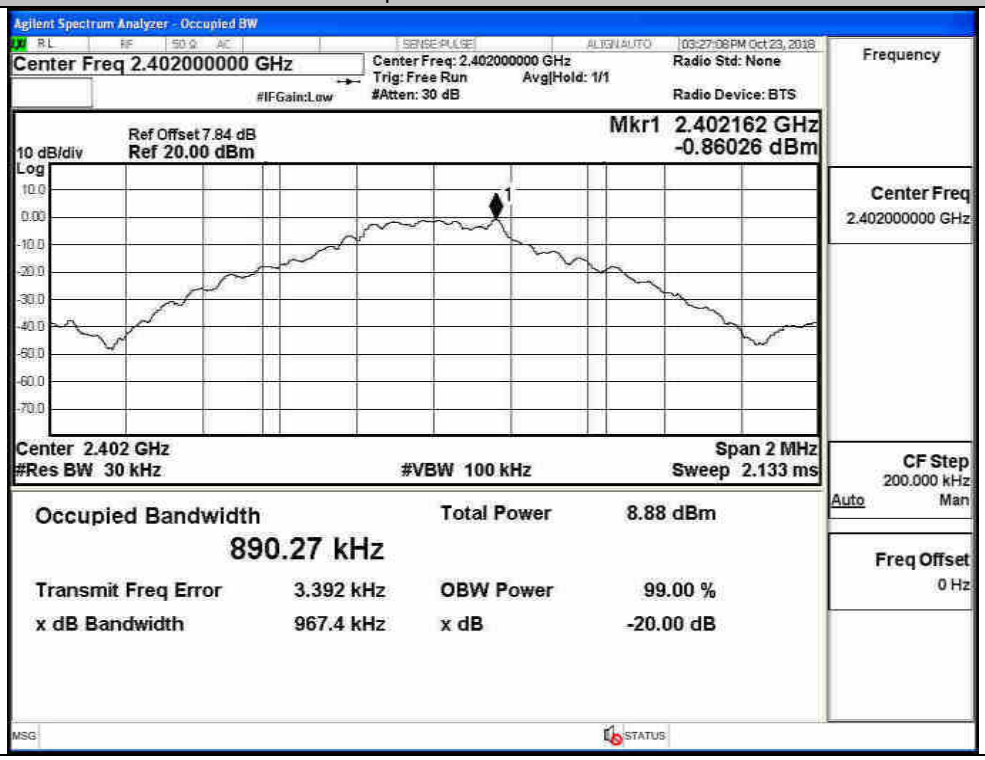
8DPSK/LCH	
8DPSK/MCH	

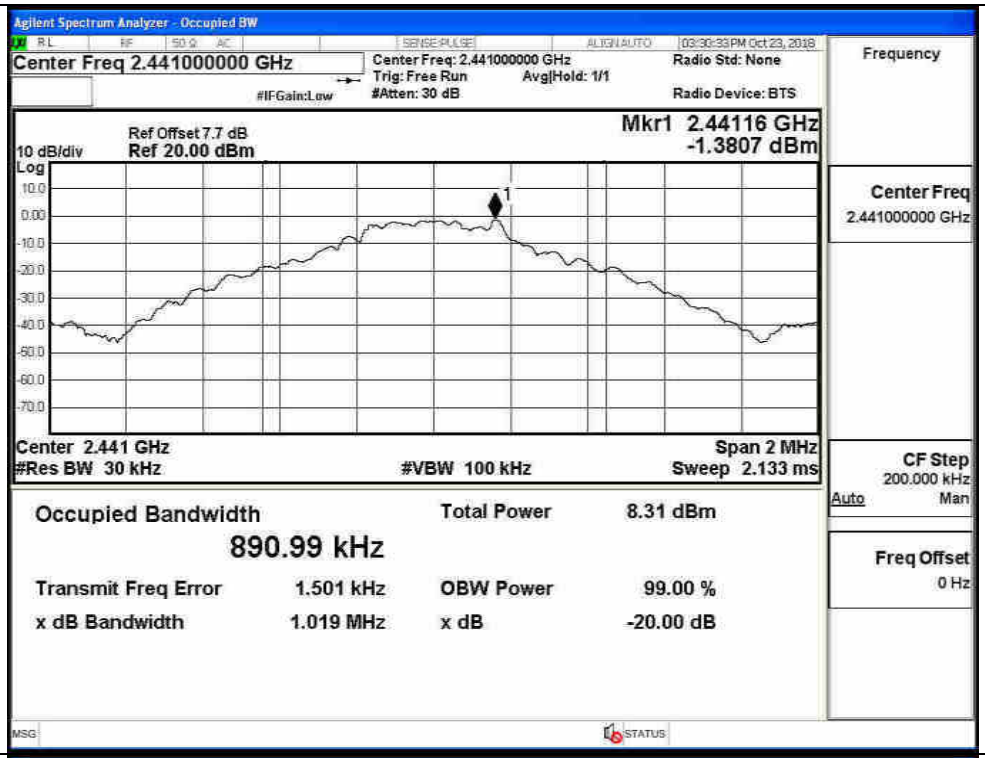
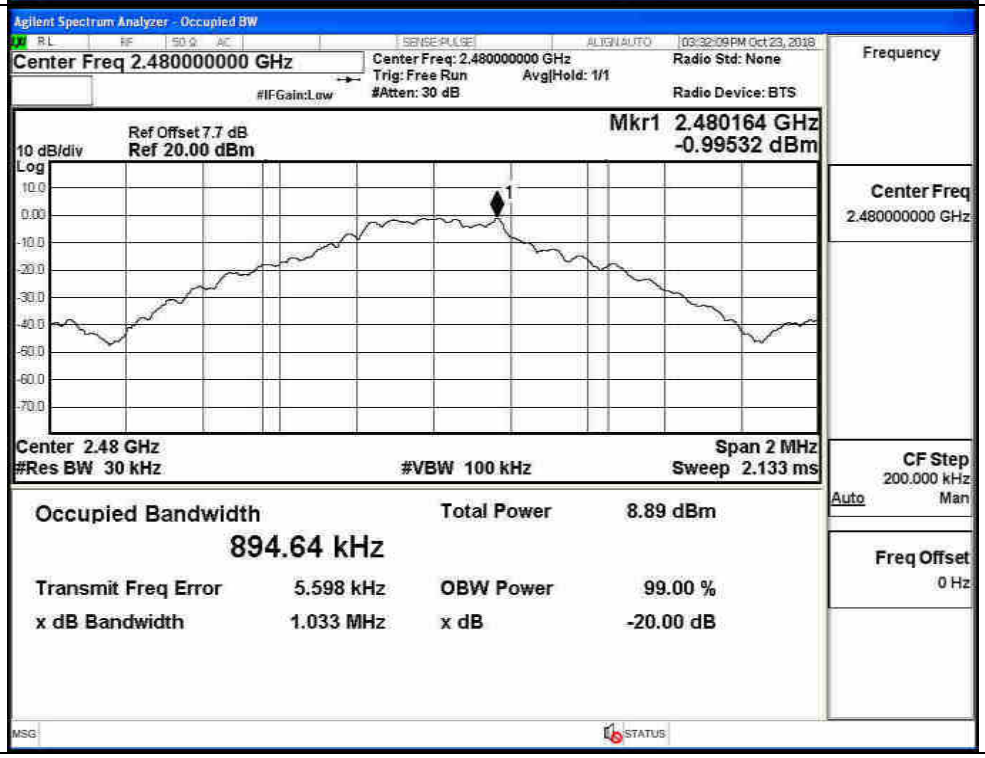
8DPSK/HCH	

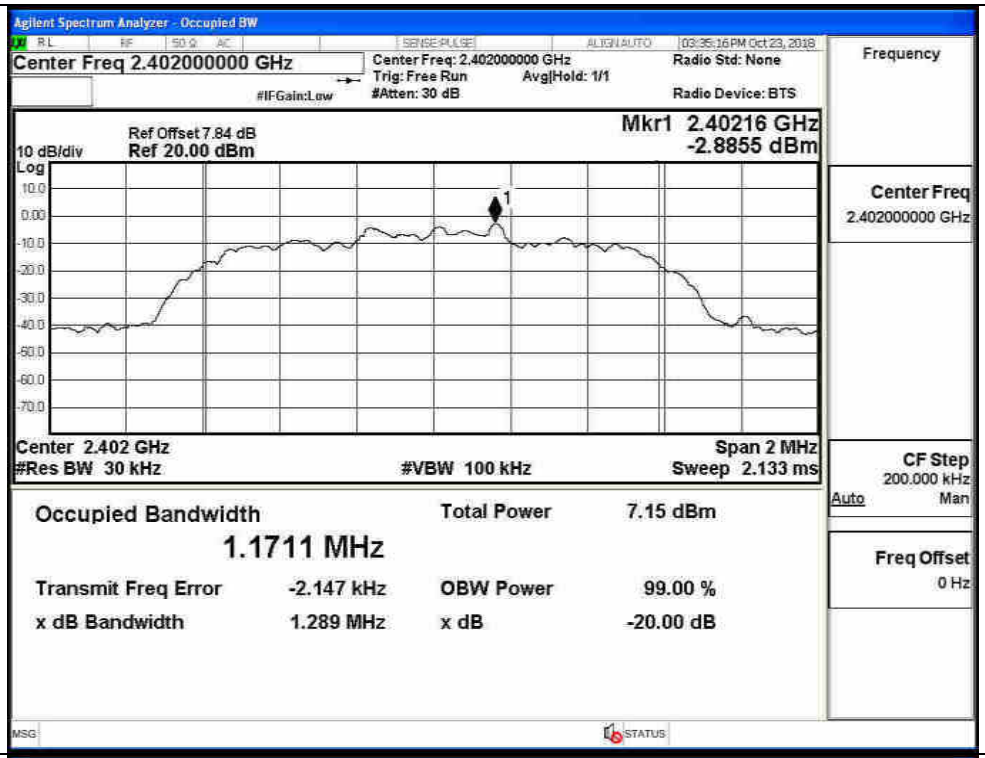
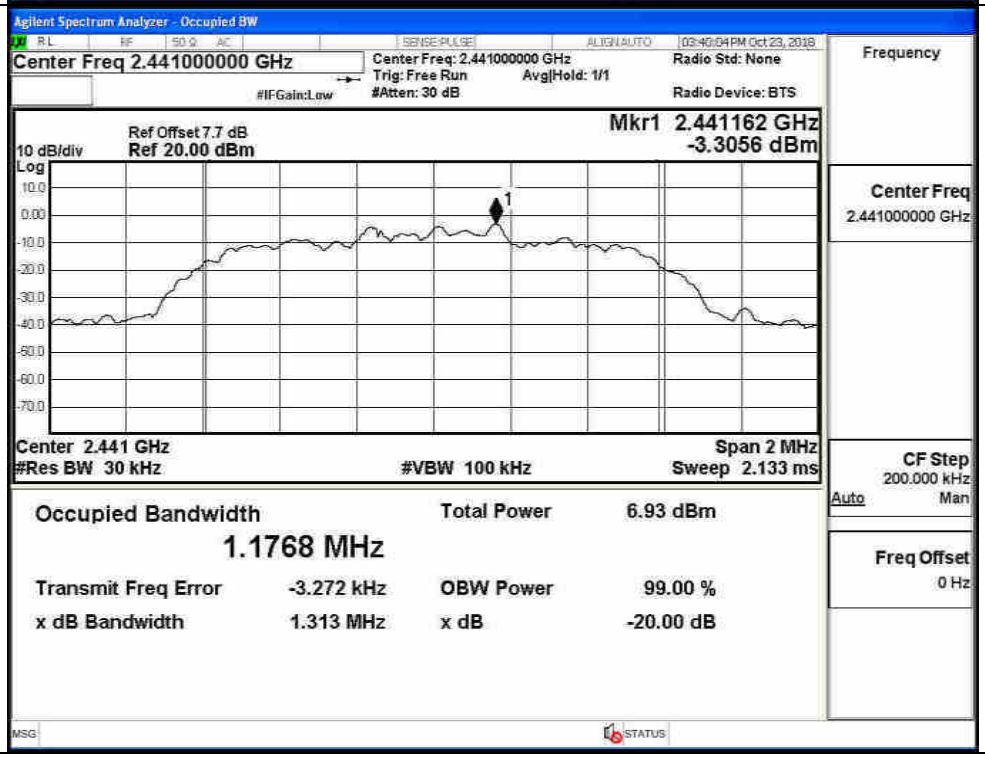
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
04:02:50 PM Oct 23, 2018
Ref Offset 7.7 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 888 75 GHz
0.564 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 10.00 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.475000000 GHz
Stop Freq
2.485000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz

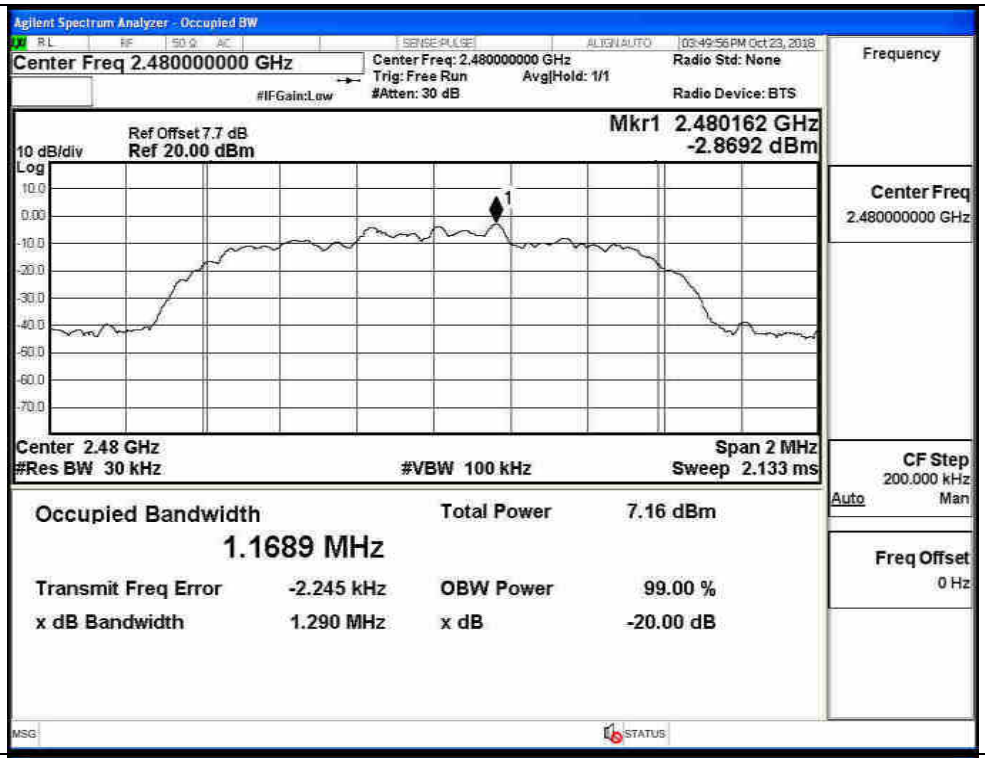
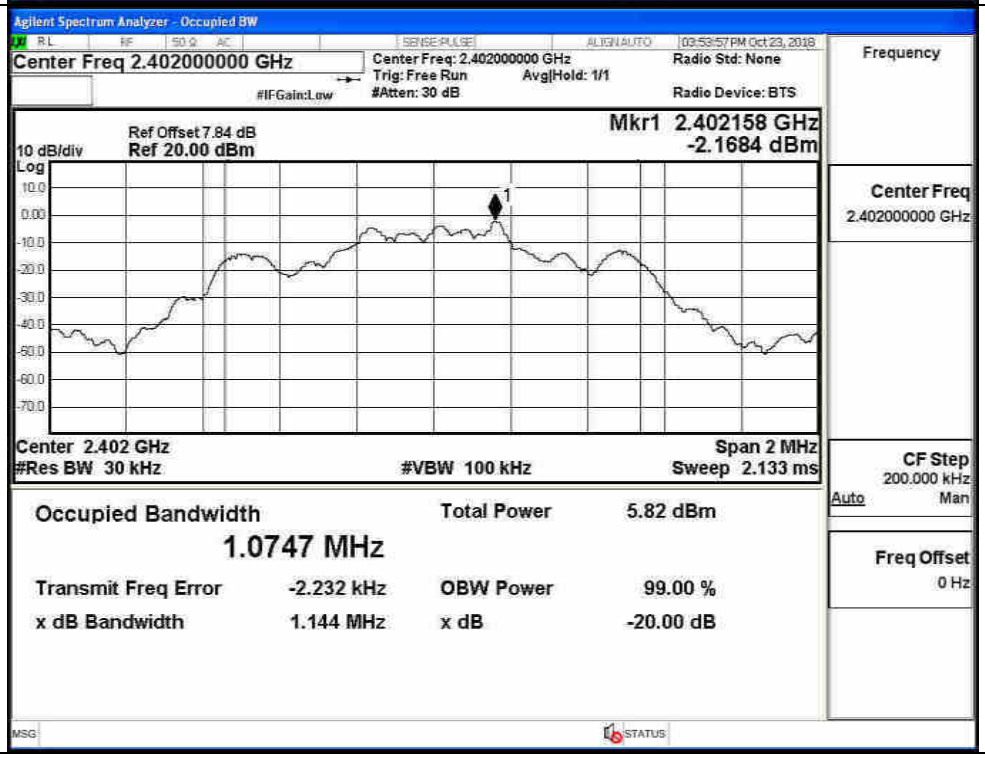
A.2 20dB Bandwidth

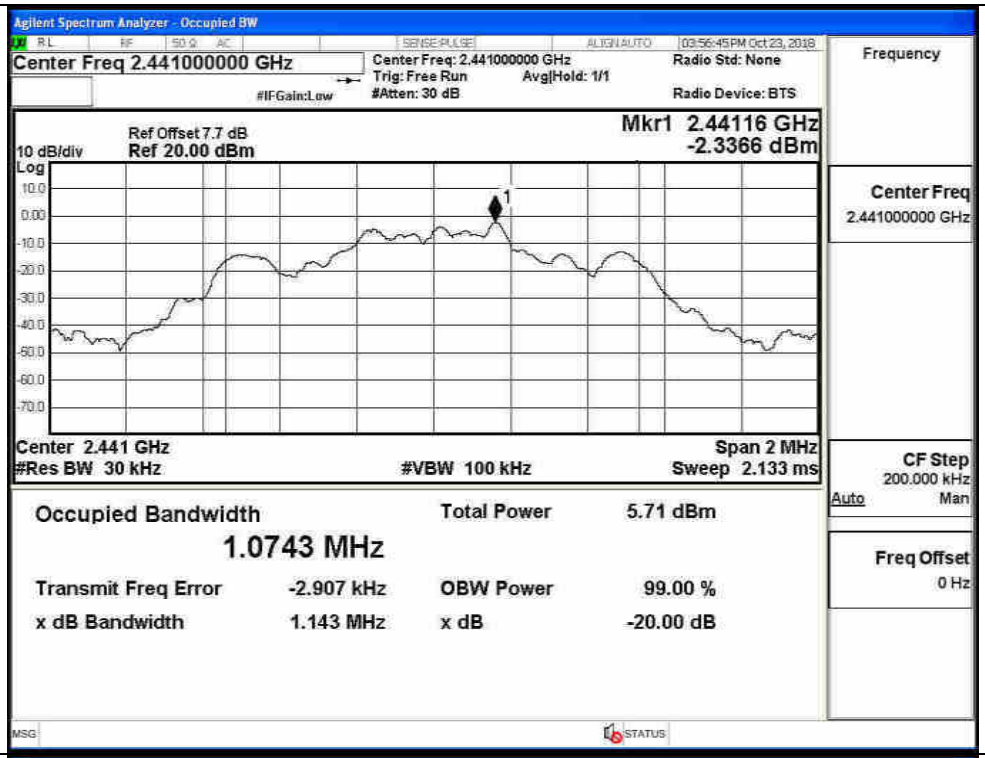
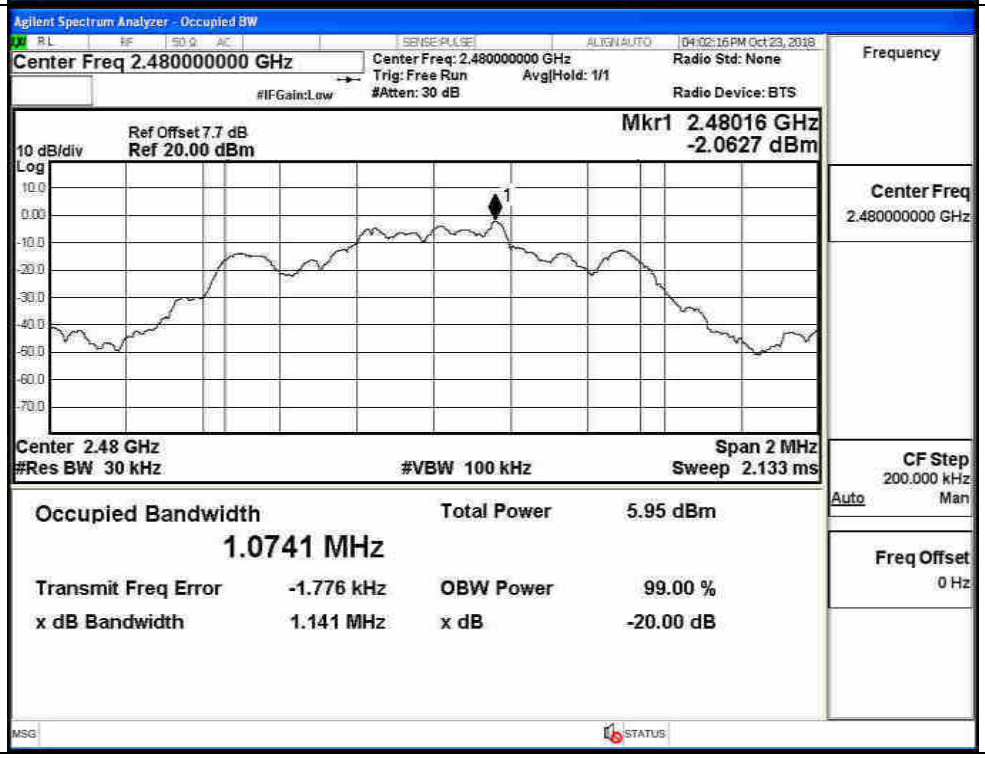
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9674	Not Specified	PASS
	MCH	1.019	Not Specified	PASS
	HCH	1.033	Not Specified	PASS
π/4DQPSK	LCH	1.289	Not Specified	PASS
	MCH	1.313	Not Specified	PASS
	HCH	1.290	Not Specified	PASS
8DPSK	LCH	1.144	Not Specified	PASS
	MCH	1.143	Not Specified	PASS
	HCH	1.141	Not Specified	PASS

Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

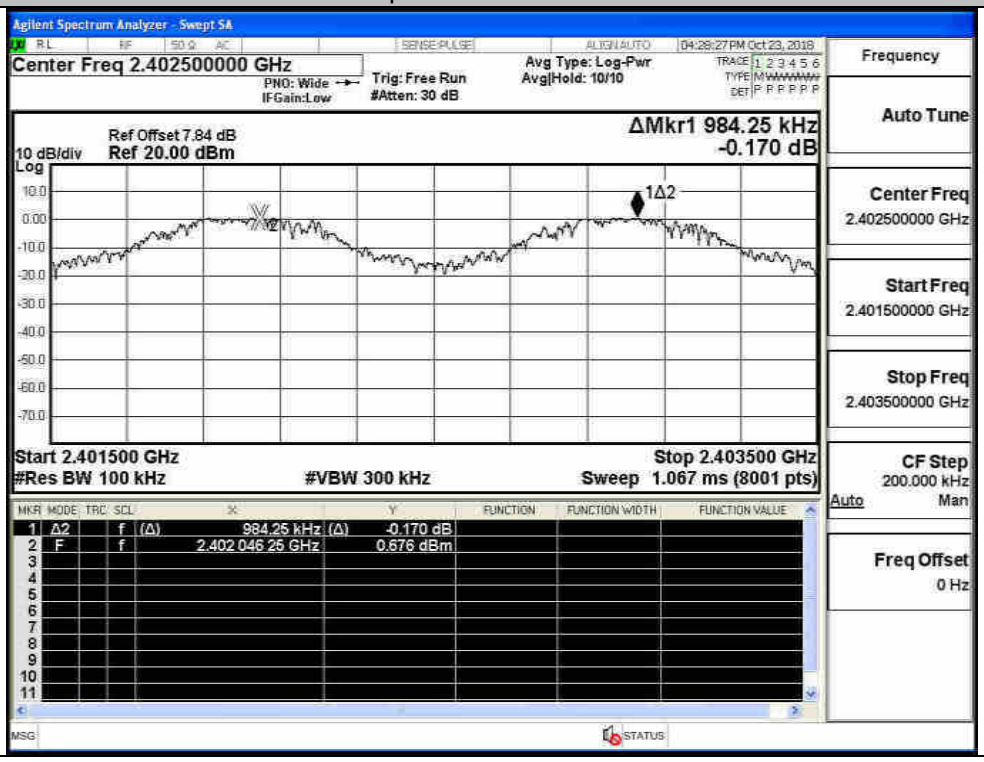
π/4DQPSK/LCH	
π/4DQPSK/MCH	

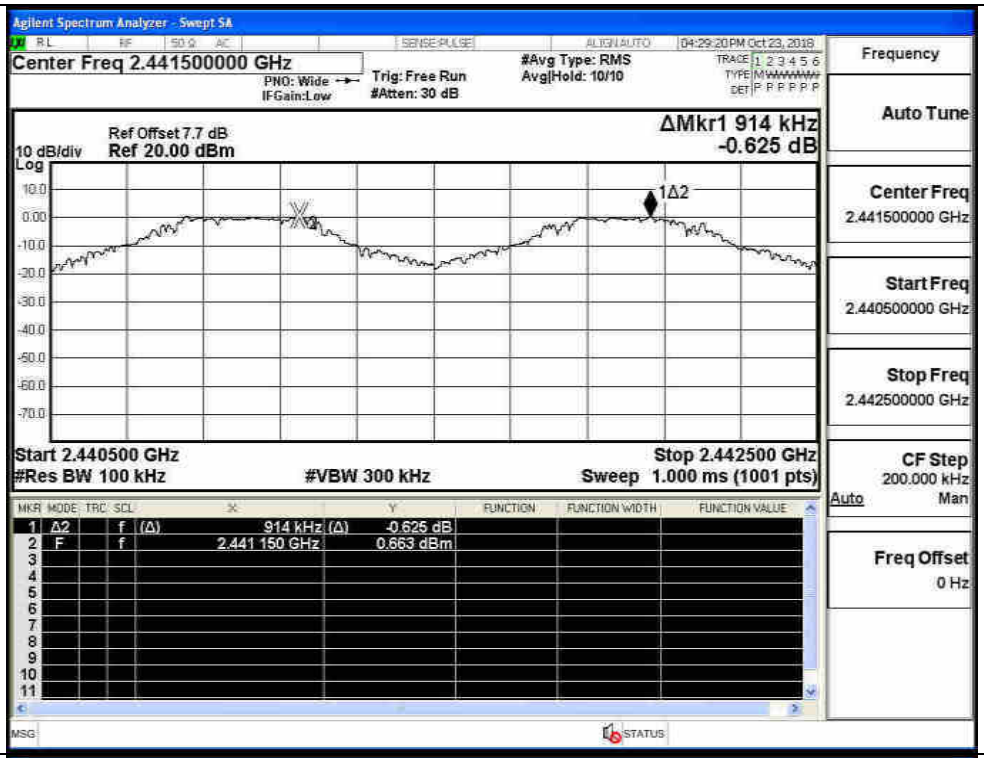
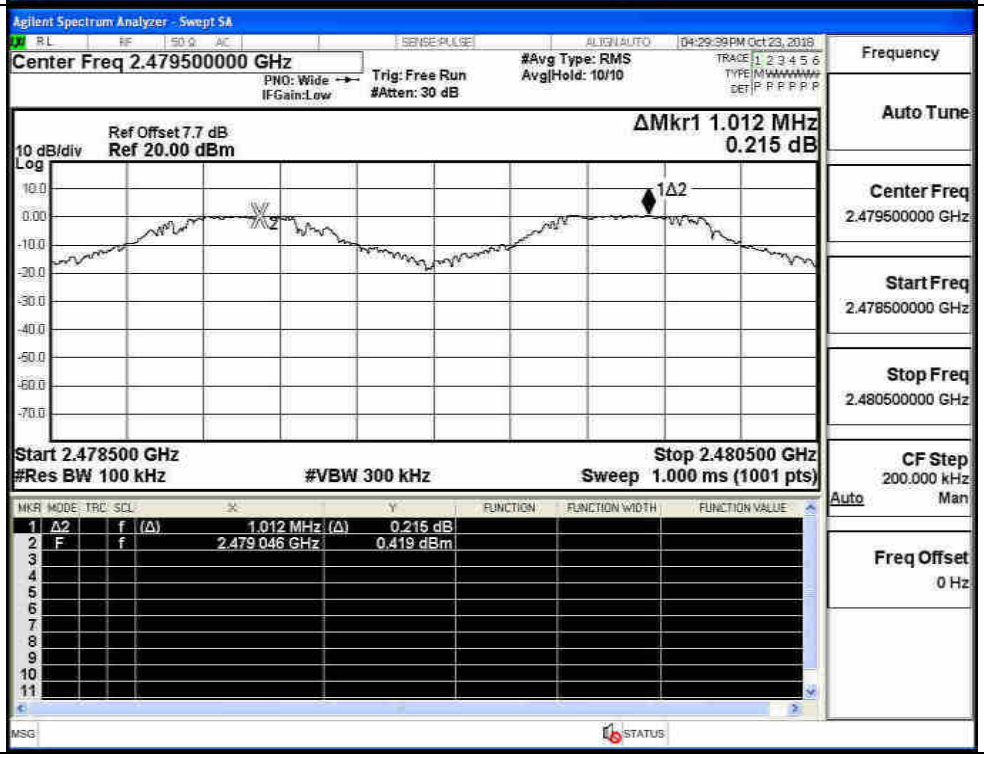
π/4DQPSK/HCH	
8DPSK/LCH	

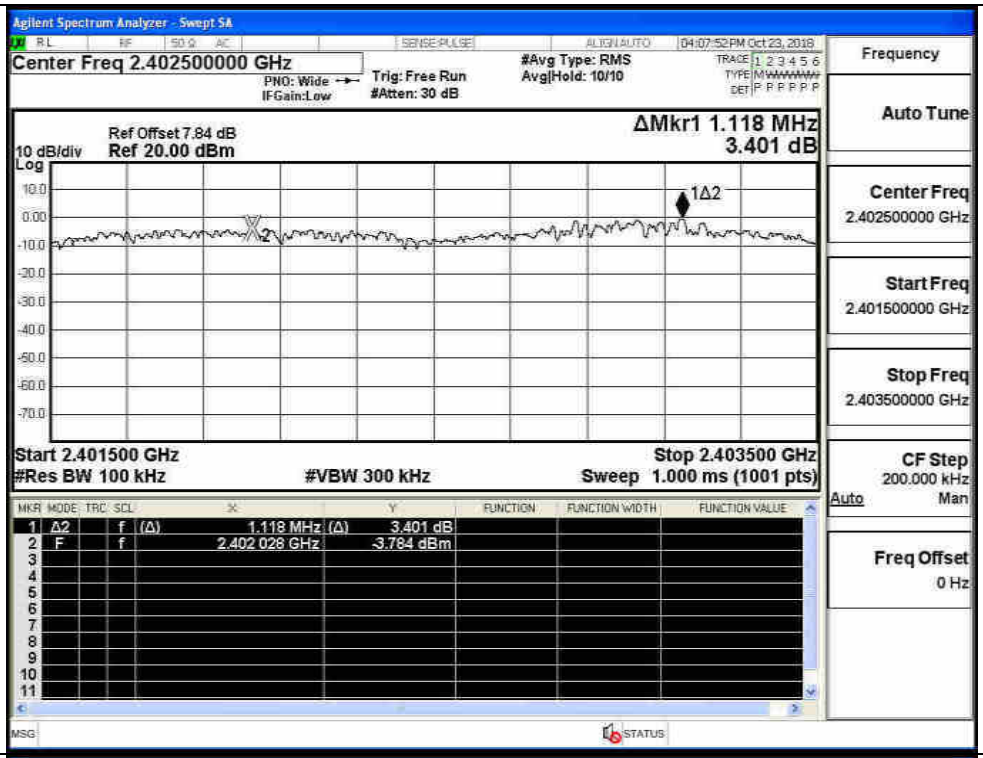
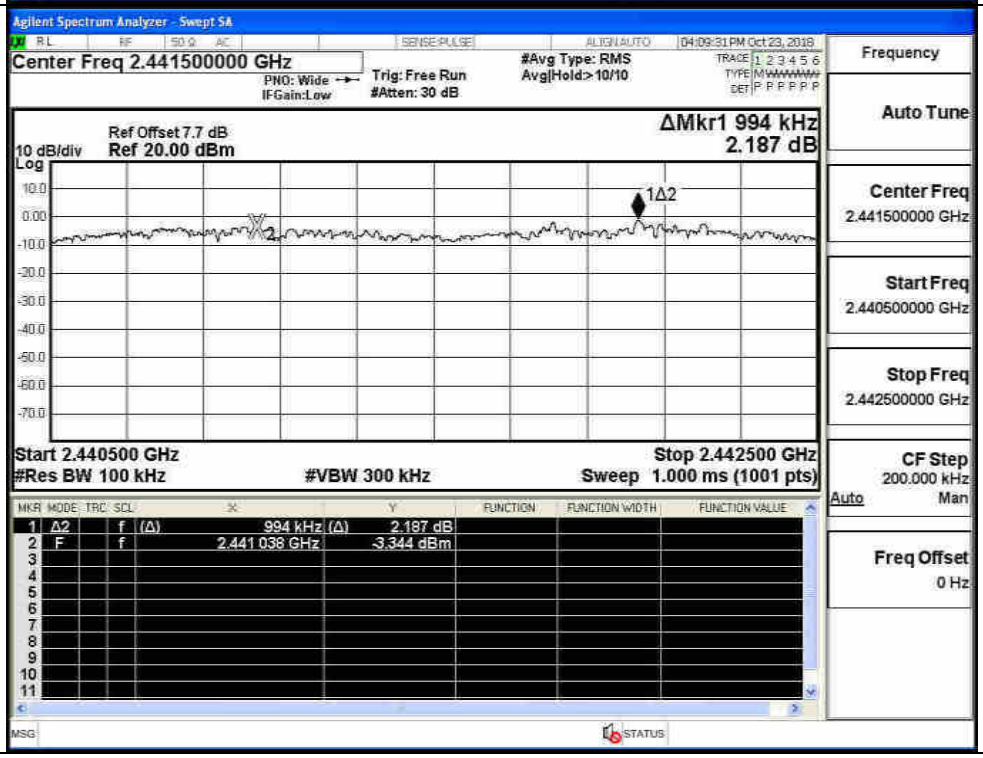
8DPSK/MCH	
8DPSK/HCH	

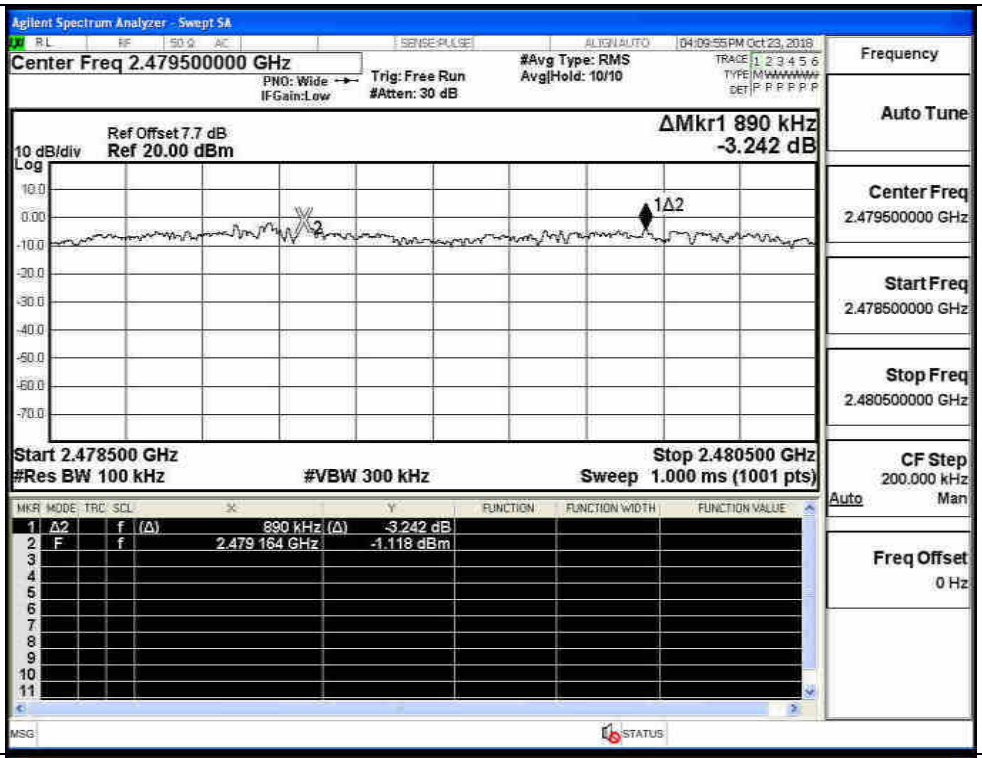
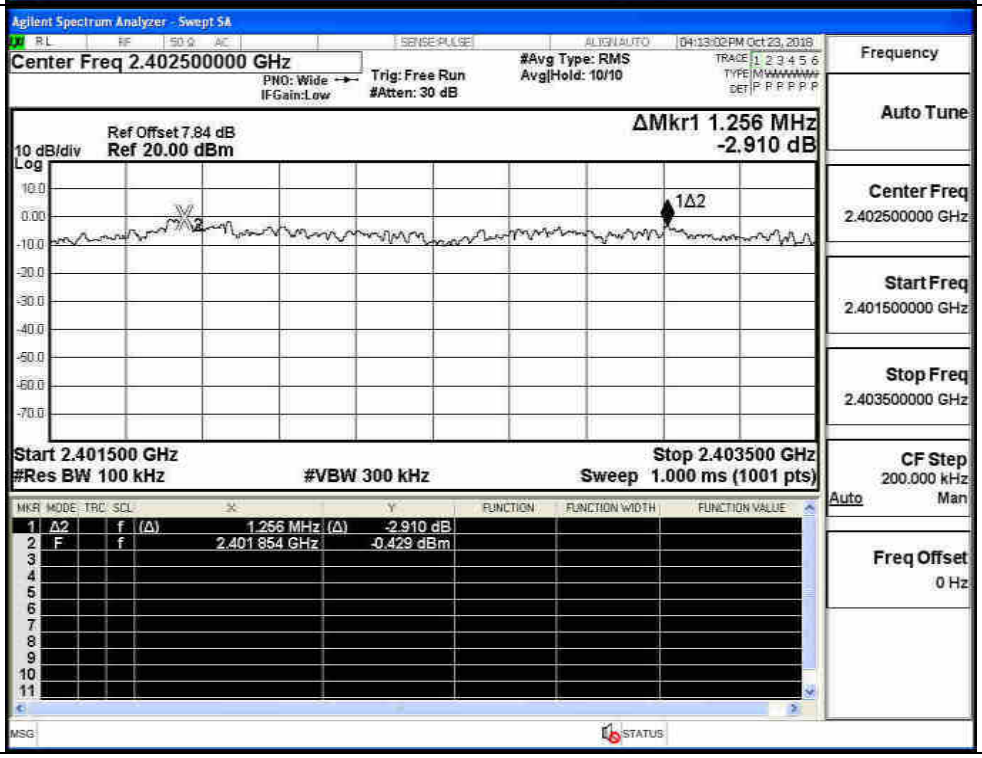
A.3 Carrier Frequency Separation

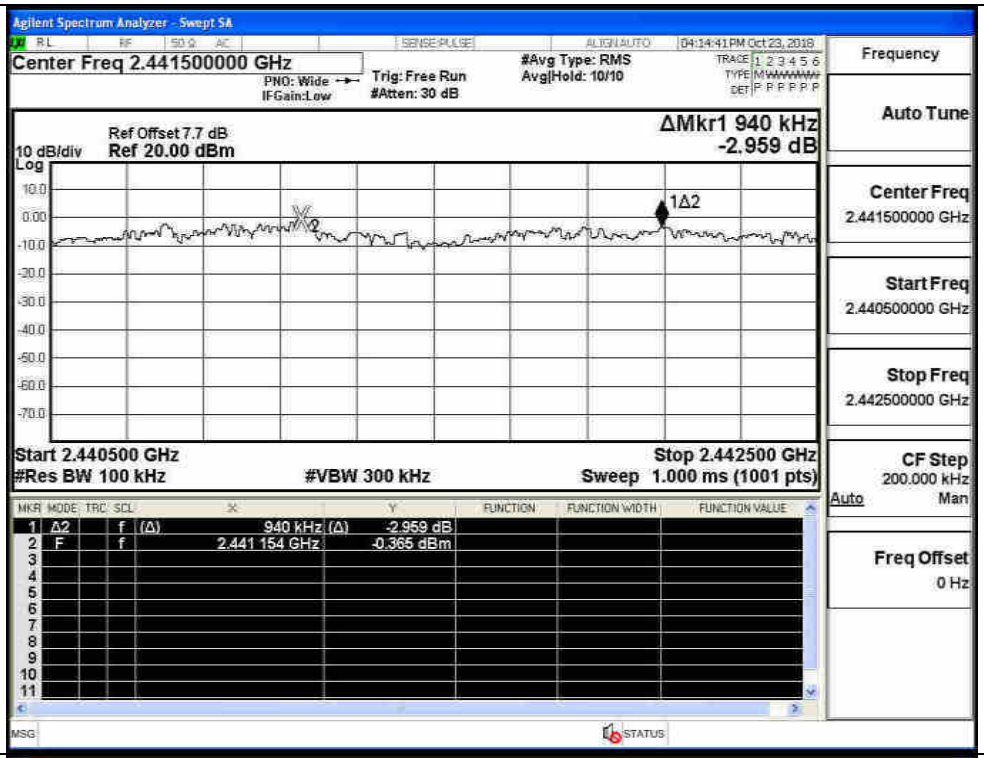
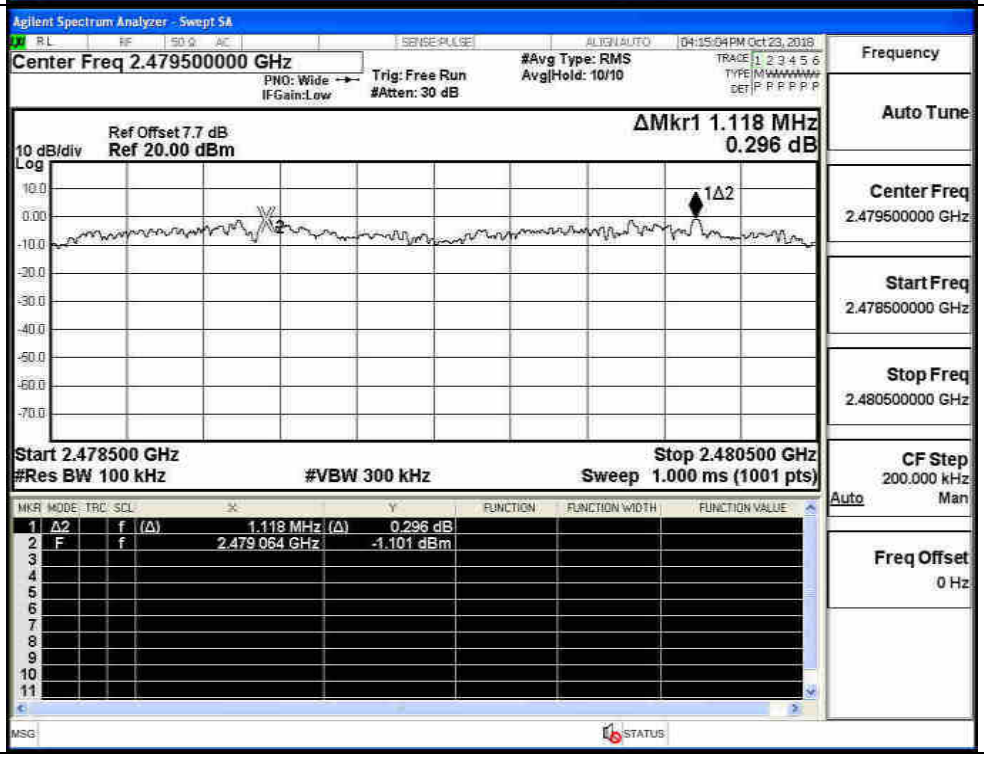
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.984	0.689	PASS
	MCH	0.914	0.689	PASS
	HCH	1.012	0.689	PASS
π/4DQPSK	LCH	1.118	0.875	PASS
	MCH	0.994	0.875	PASS
	HCH	0.890	0.875	PASS
8DPSK	LCH	1.256	0.763	PASS
	MCH	0.940	0.763	PASS
	HCH	1.118	0.763	PASS

Test Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

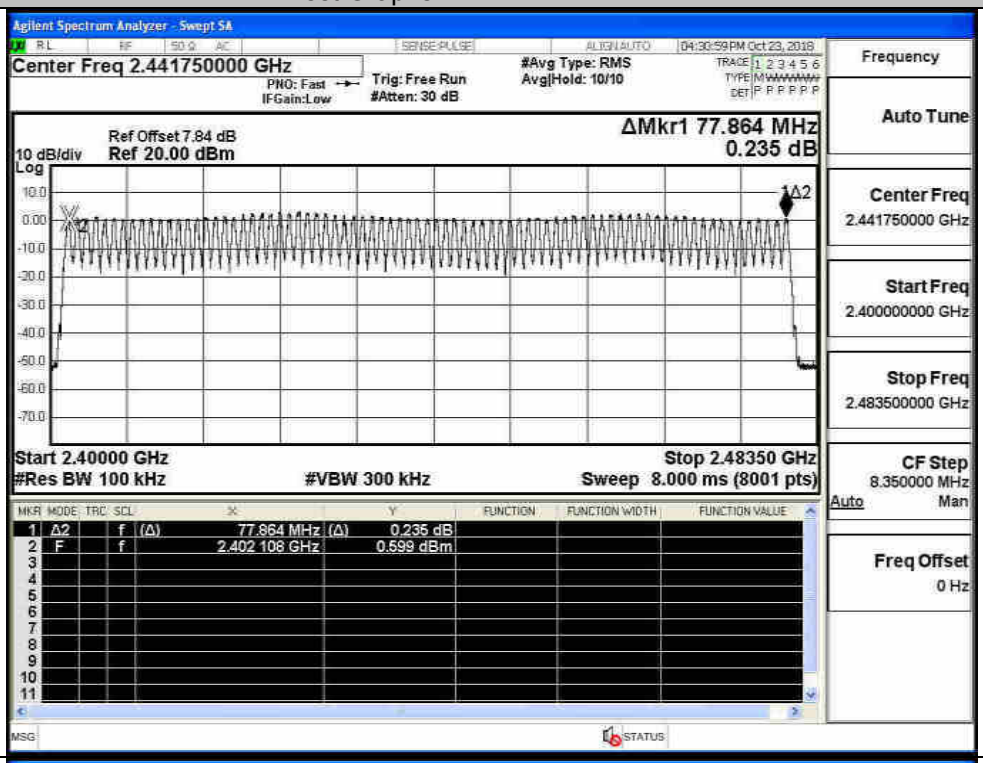
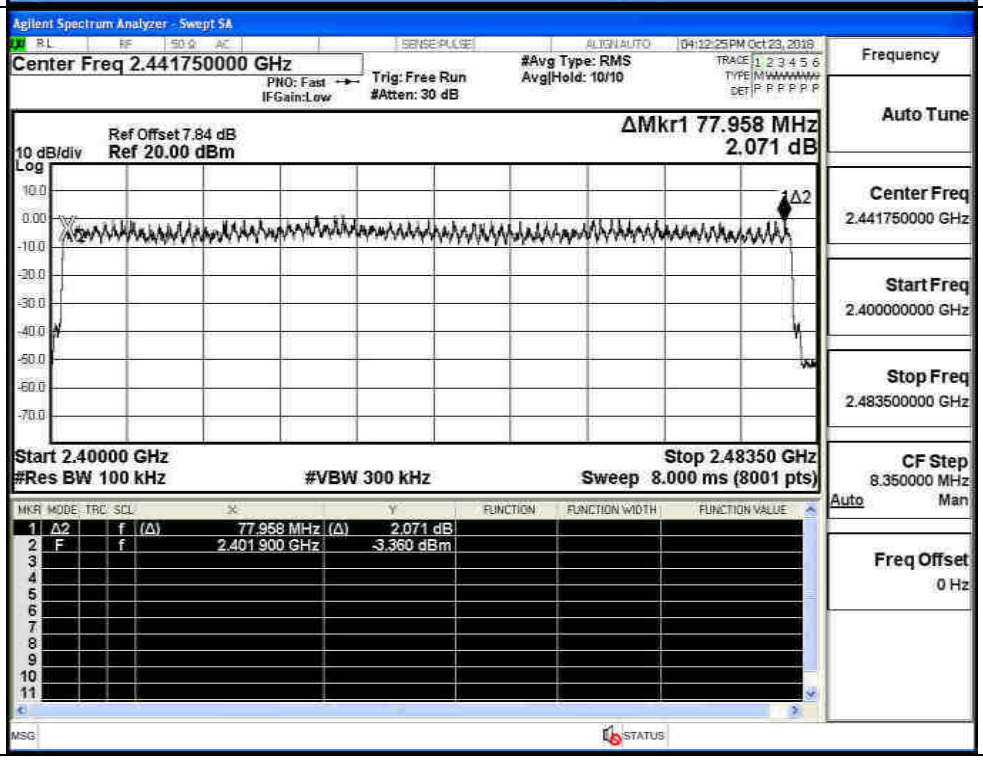
π/4DQPSK/LCH	
π/4DQPSK/MCH	

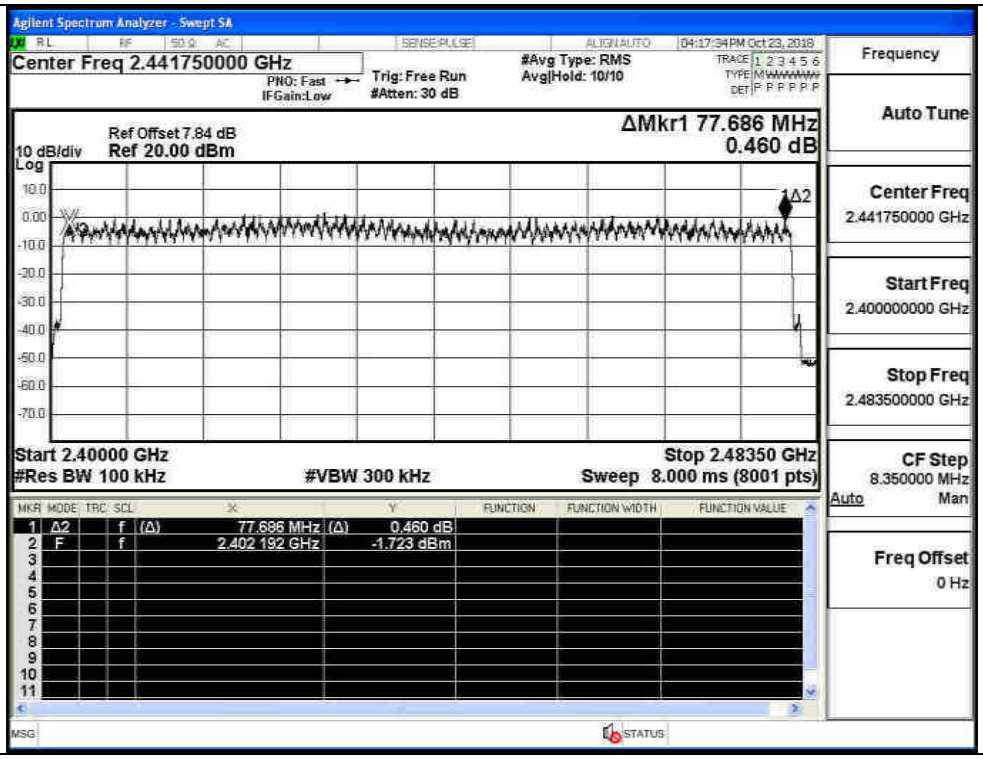
π/4DQPSK/HCH	
8DPSK/LCH	

8DPSK/MCH	
8DPSK/HCH	

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
8DPSK	Hop	79	>=15	PASS

Test Graphs	
GFSK/Hop	
π/4DQPSK/Hop	

8DPSK/Hop	

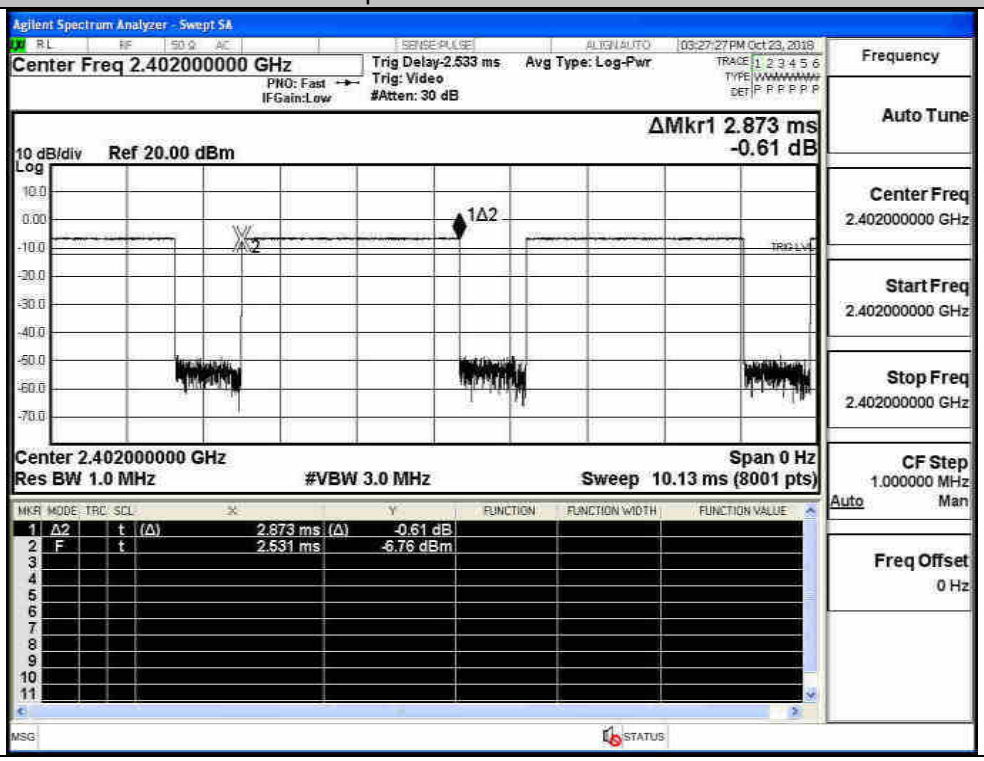
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
04:17:34 PM Oct 23, 2018
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 77.686 MHz
0.460 dB
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (8001 pts)
1 Δ2 f (Δ) 77.686 MHz (Δ) 0.460 dB
2 F f 2.402 192 GHz -1.723 dBm
Frequency
Auto Tune
Center Freq
2.441750000 GHz
Start Freq
2.400000000 GHz
Stop Freq
2.483500000 GHz
CF Step
8.350000 MHz
Auto
Man
Freq Offset
0 Hz

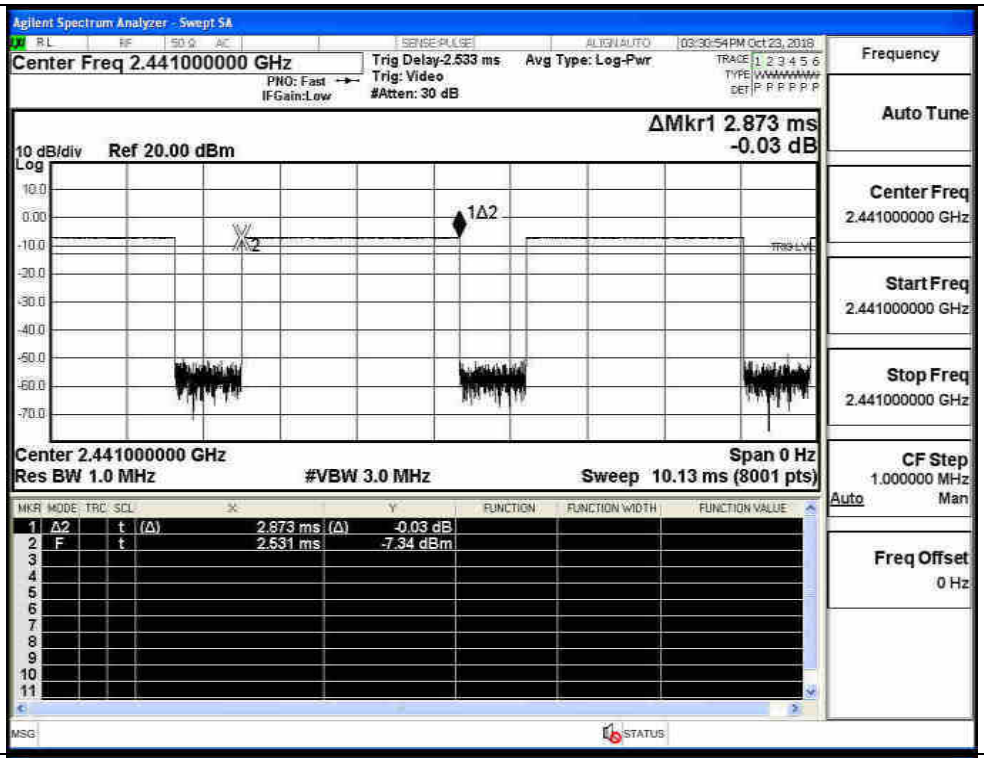
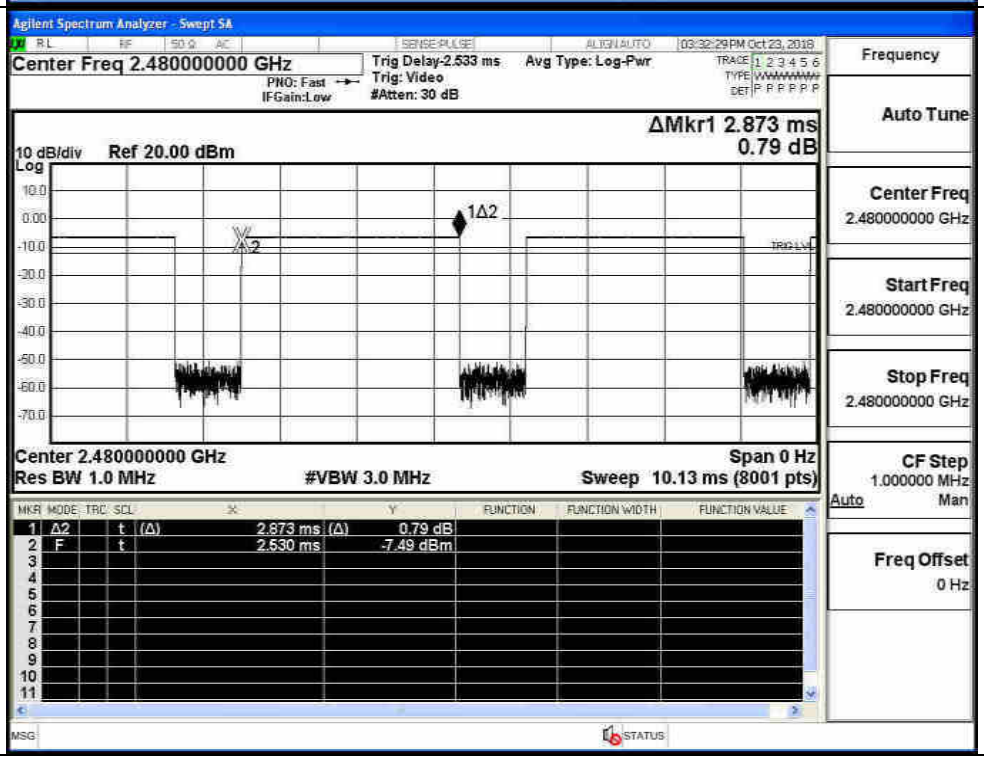
A.5 Dwell Time

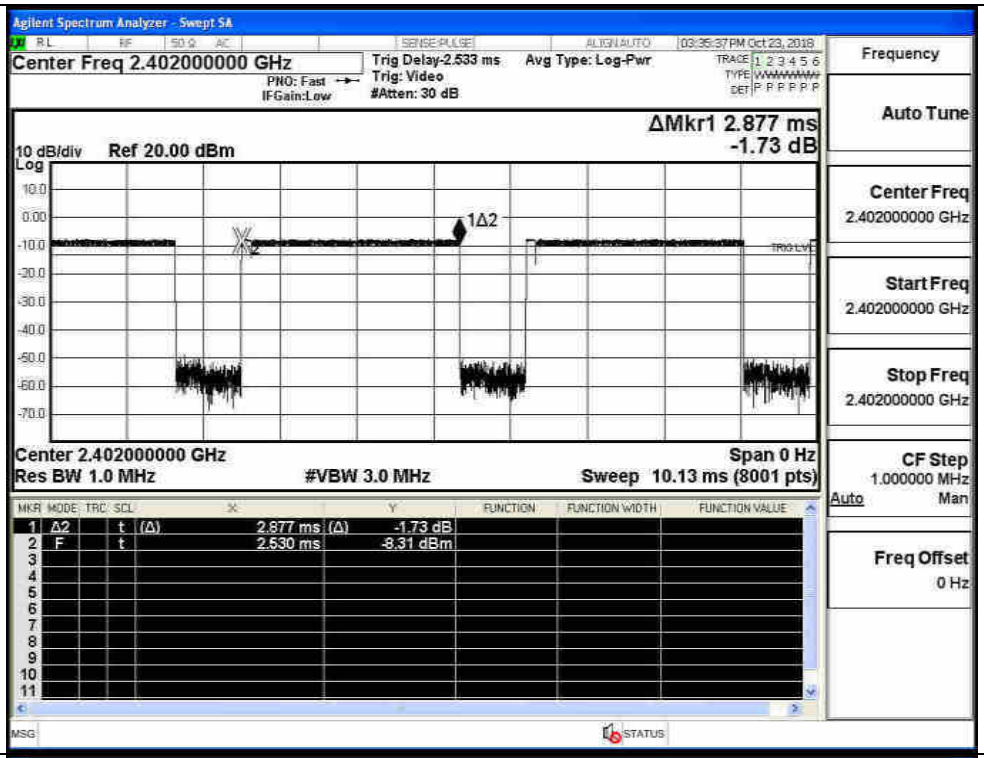
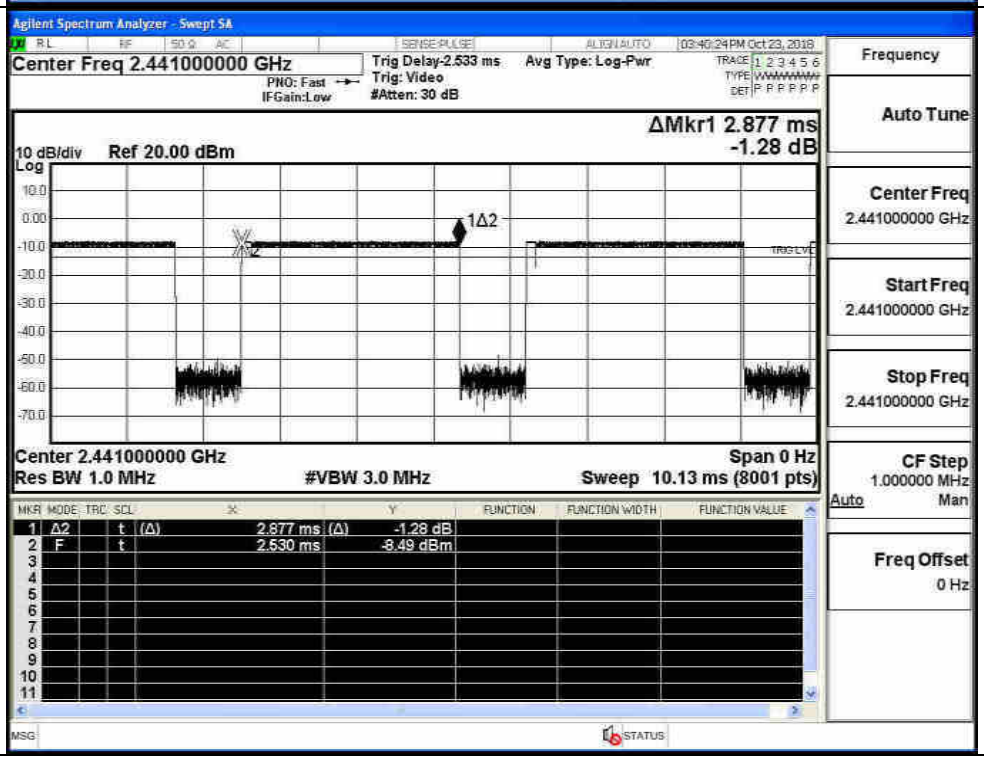
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
π/4DQPSK	2DH5	LCH	2.87	106.7	0.307	0.4	PASS
	2DH5	MCH	2.87	106.7	0.307	0.4	PASS
	2DH5	HCH	2.87	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.87	106.7	0.307	0.4	PASS
	3DH5	MCH	2.87	106.7	0.307	0.4	PASS
	3DH5	HCH	2.87	106.7	0.307	0.4	PASS

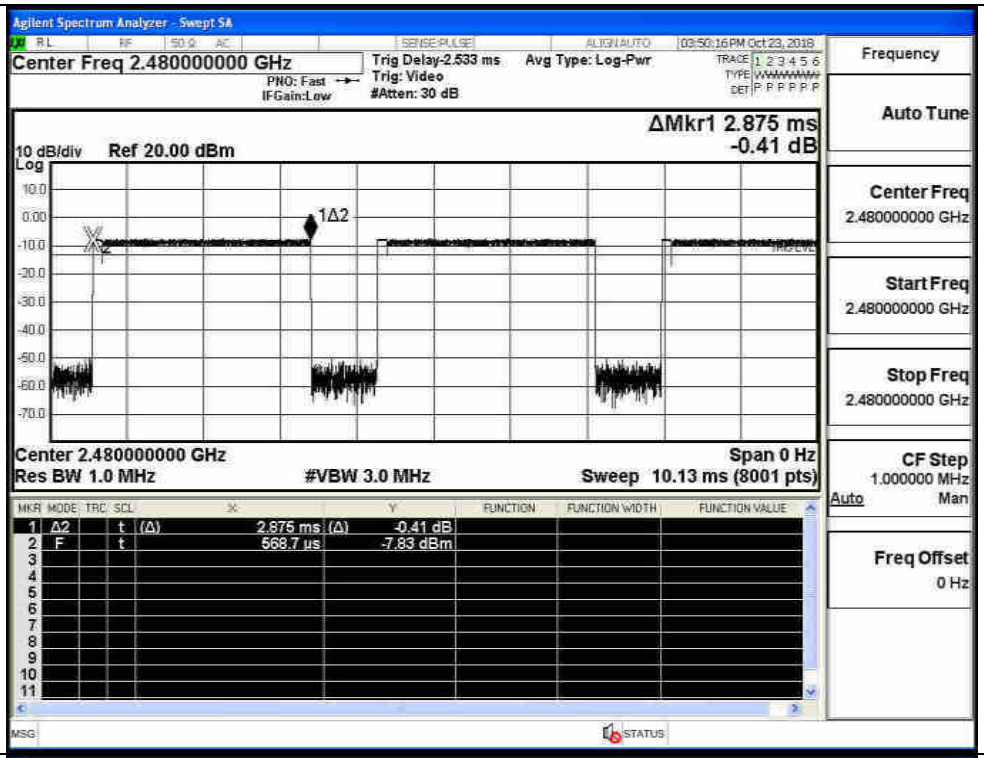
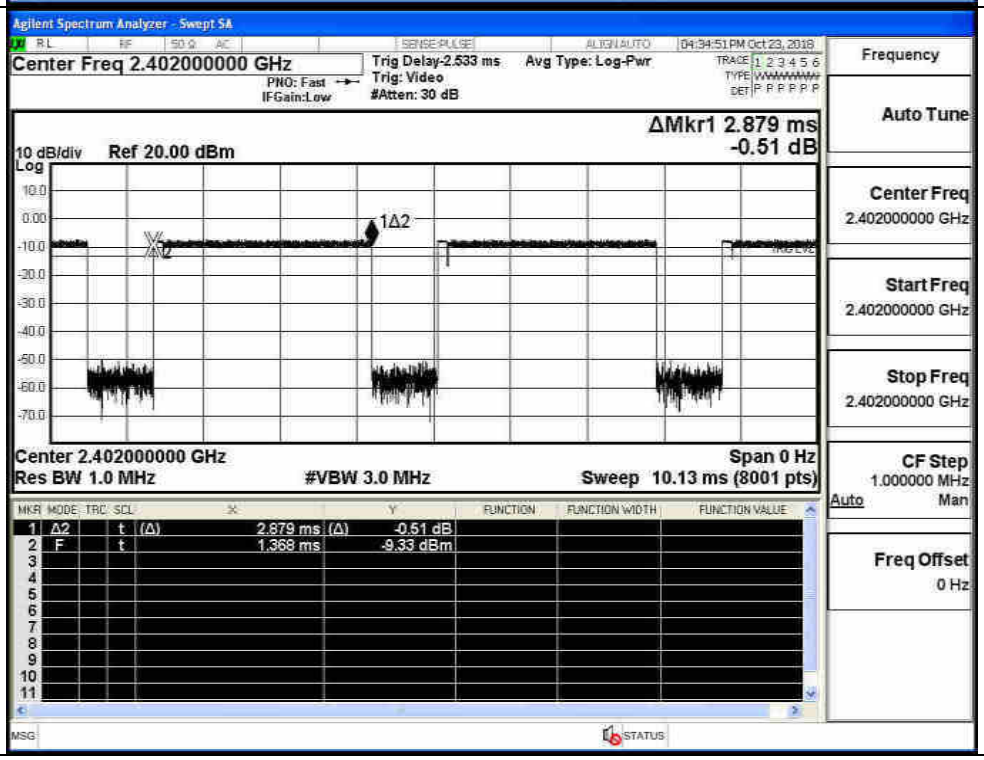
Test Graphs

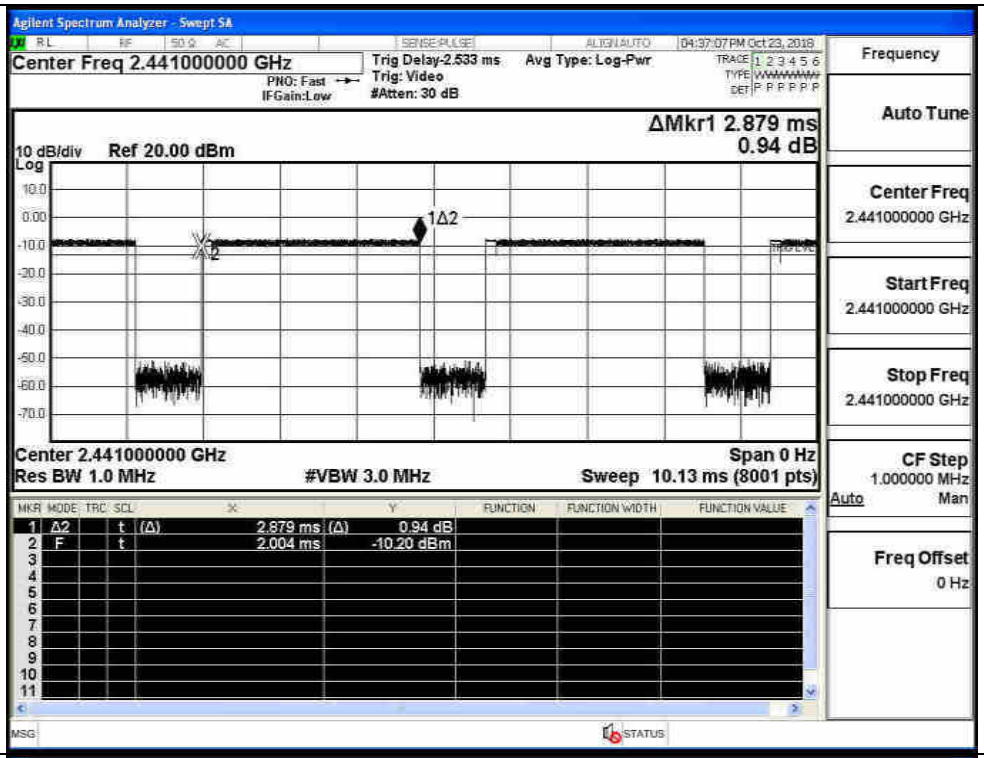
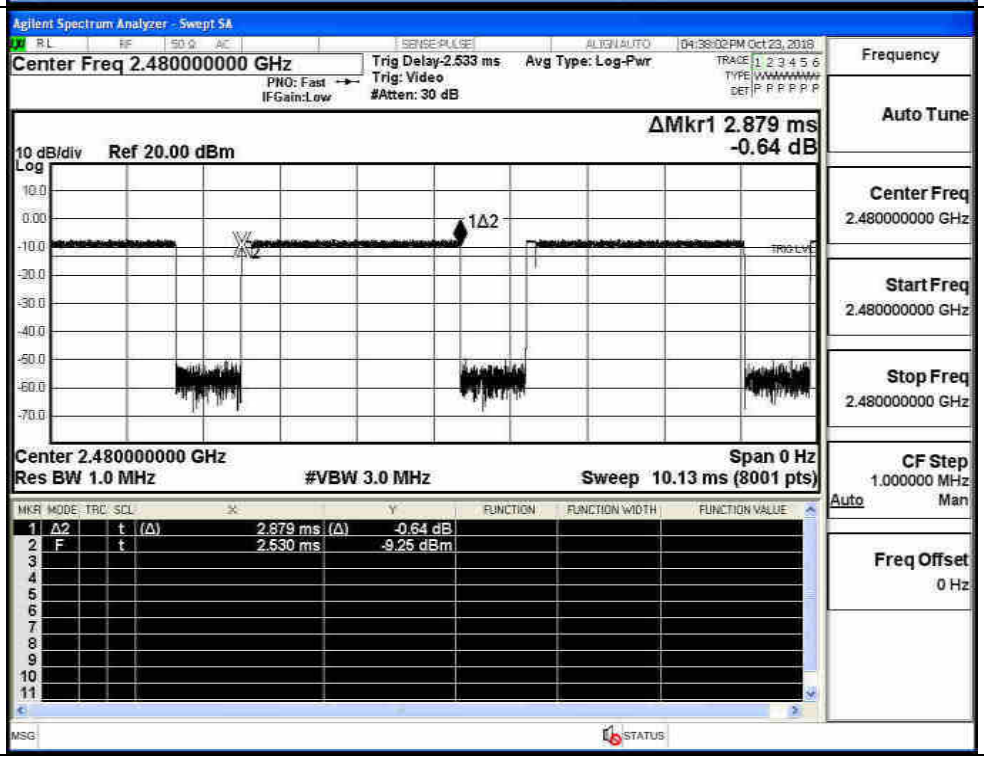
GFSK_DH5/LCH



GFSK_DH5/MCH	
GFSK_DH5/HCH	

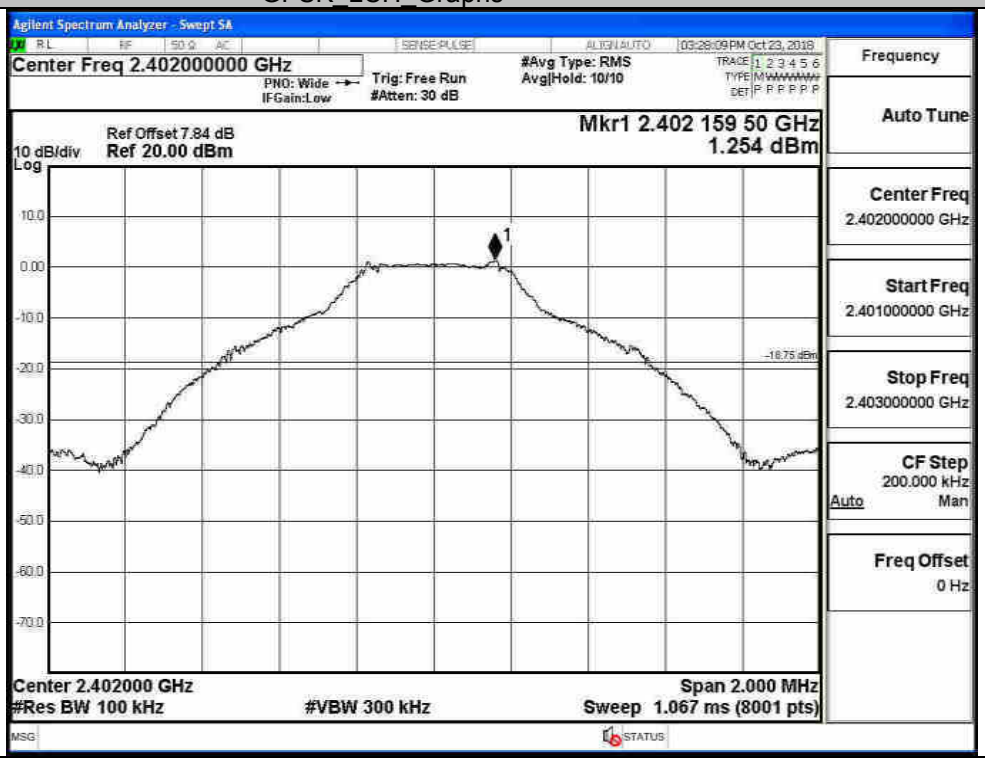
π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

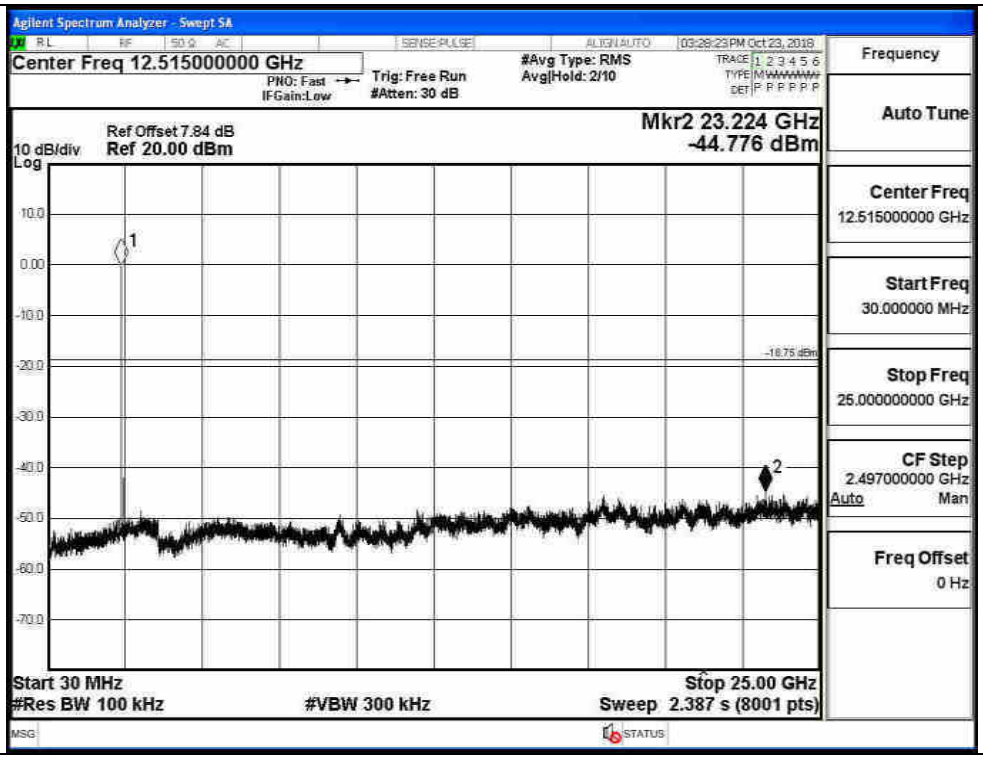
π/4DQPSK _2DH5/HCH	
8DPSK _3DH5/LCH	

8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

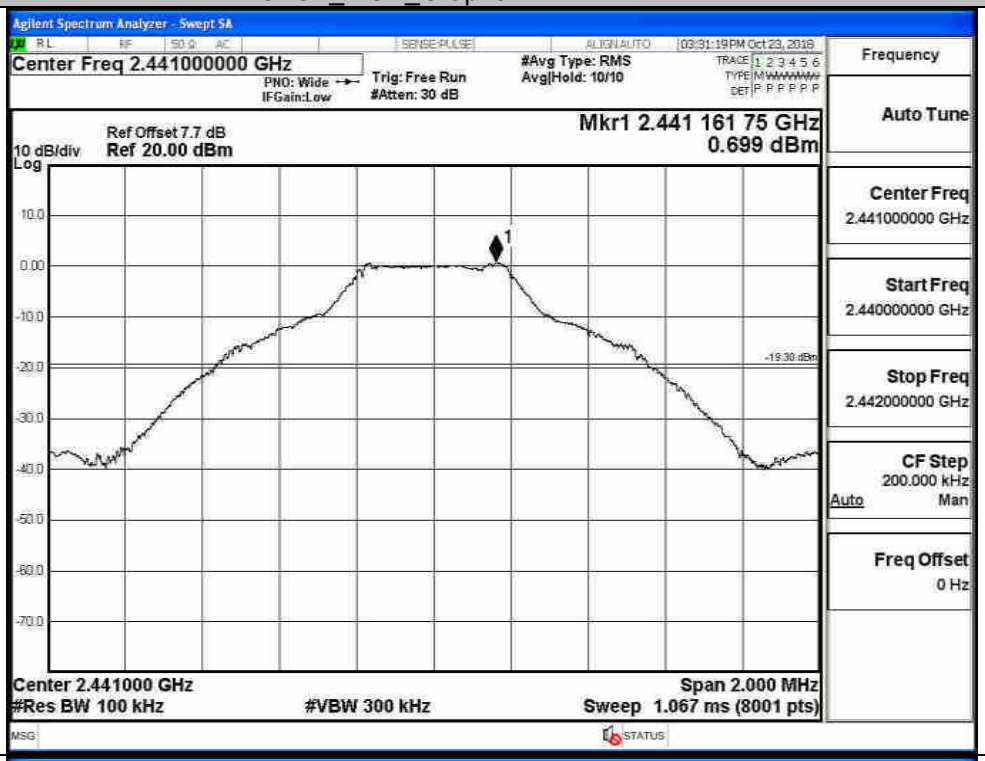
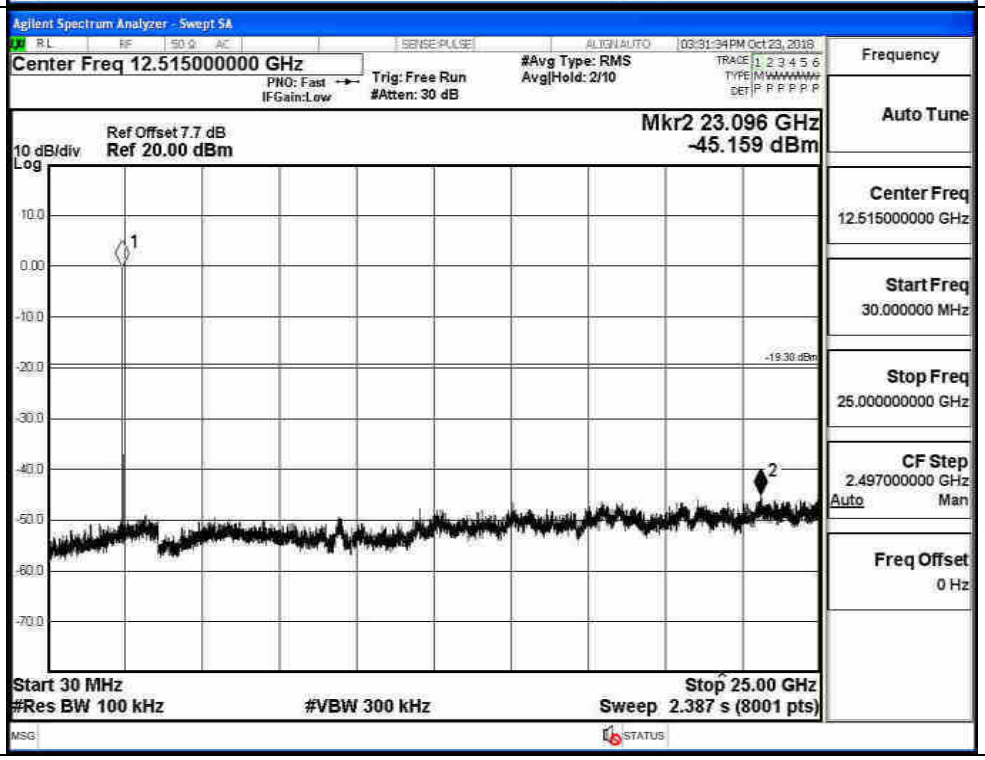
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.254	-44.776	-18.746	PASS
	MCH	0.699	-45.159	-19.301	PASS
	HCH	1.279	-44.130	-18.721	PASS
π/4DQPSK	LCH	-0.115	-44.599	-20.115	PASS
	MCH	-0.34	-44.730	-20.340	PASS
	HCH	-0.143	-45.365	-20.143	PASS
8DPSK	LCH	-0.413	-44.360	-20.413	PASS
	MCH	-0.31	-45.241	-20.310	PASS
	HCH	0.058	-45.005	-19.942	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
03:28:23 PM Oct 23, 2018
Ref Offset 7.84 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr2 23.224 GHz
-44.776 dBm
-18.75 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		

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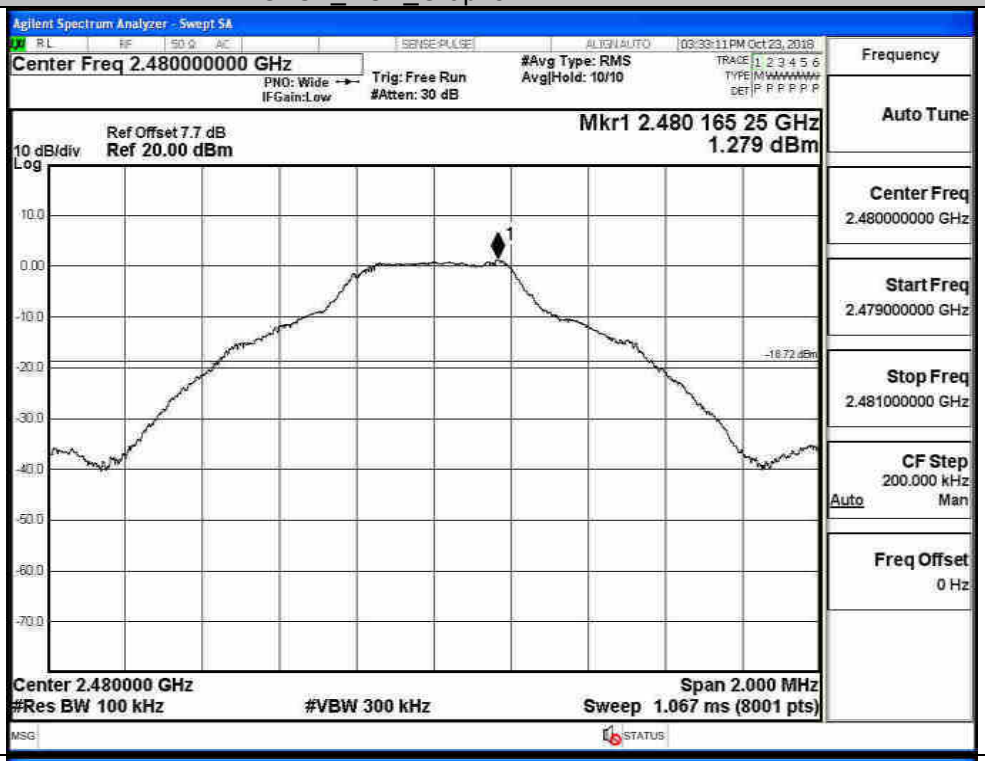
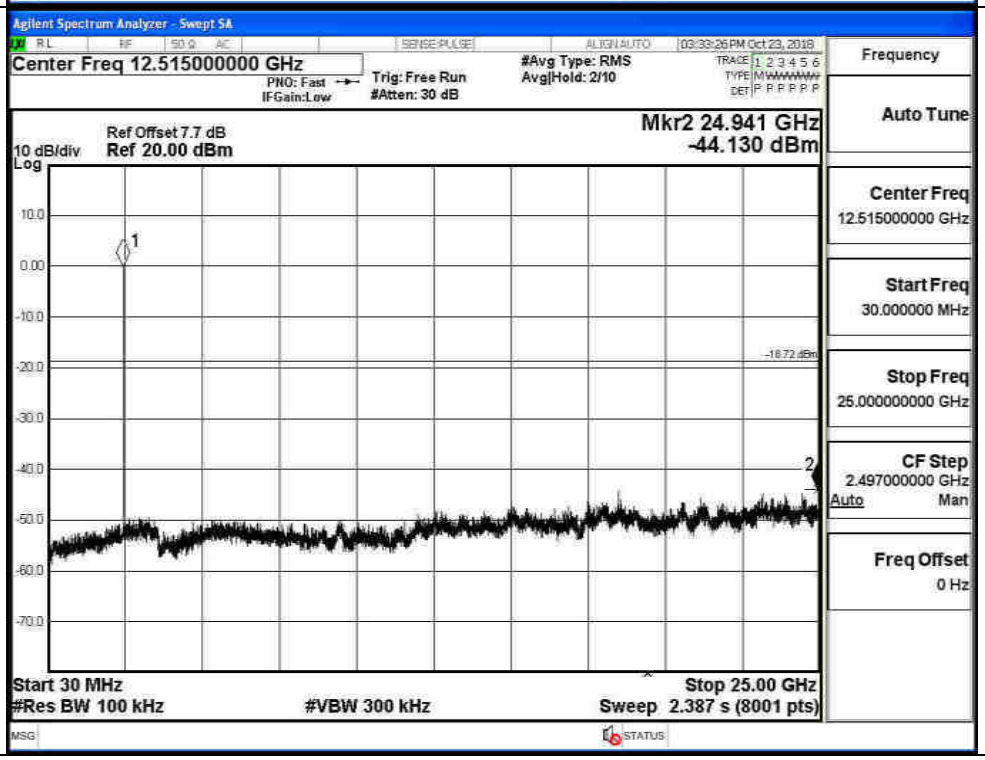
Pref		
Puw		

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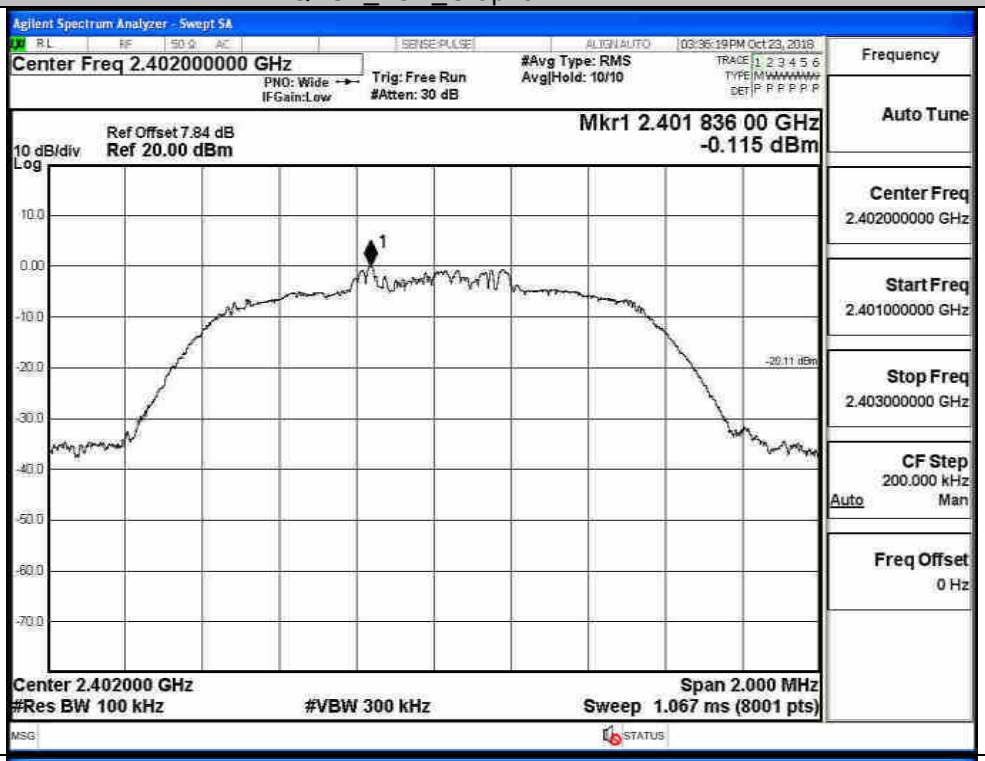
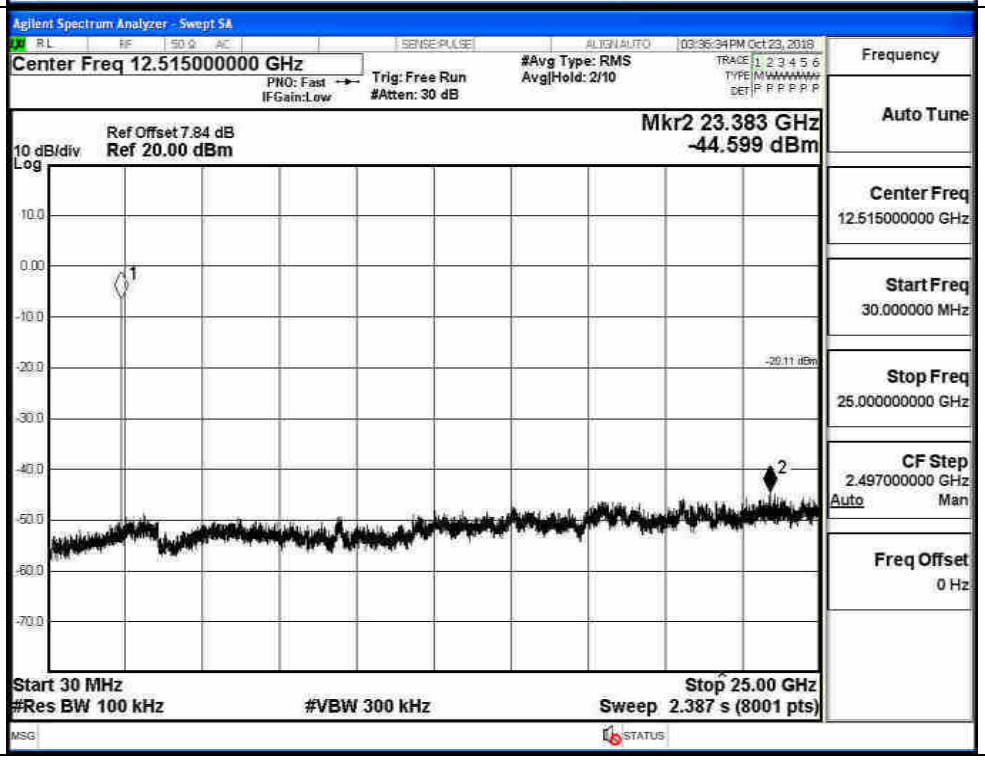
Pref		
Puw		

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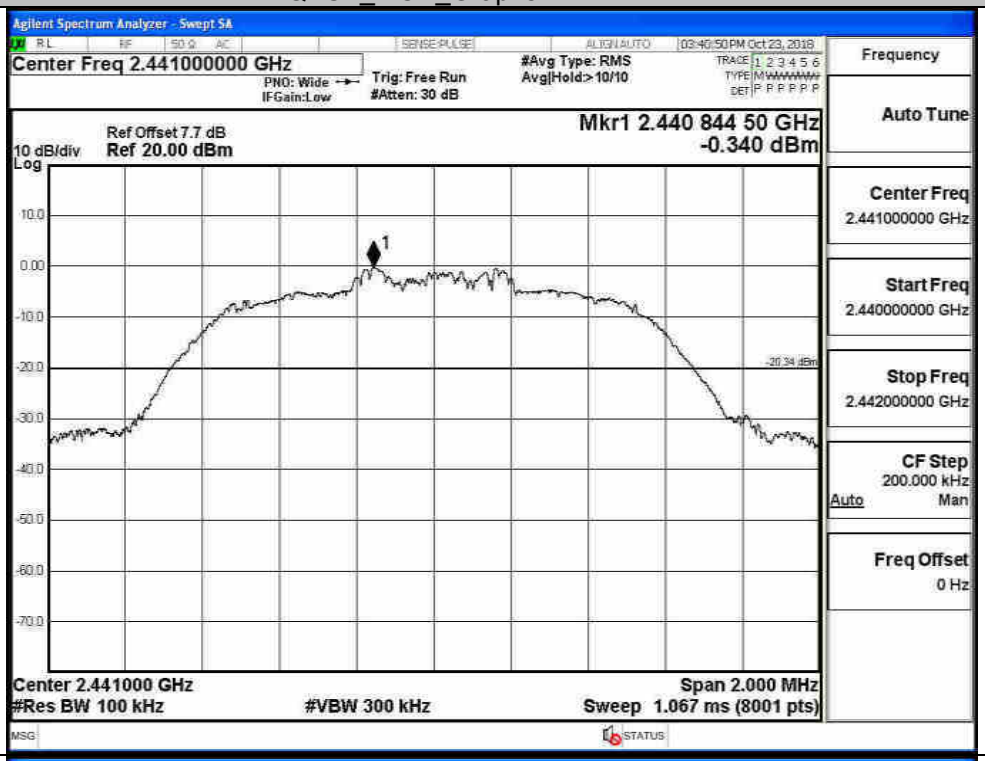
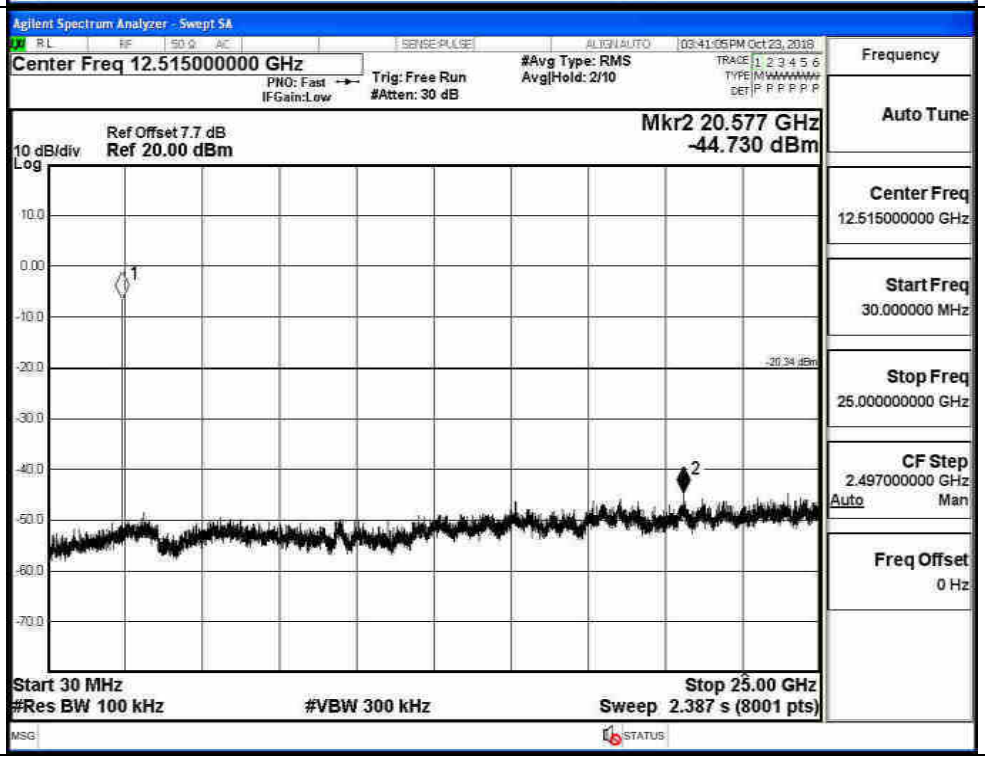
Pref		
Puw		

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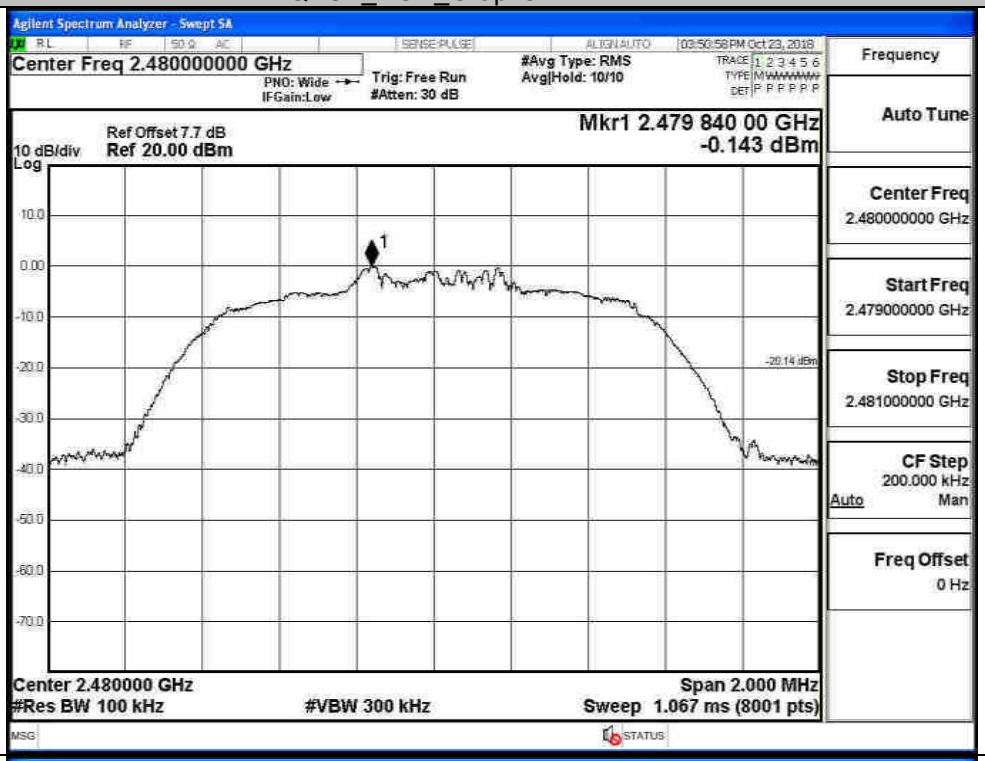
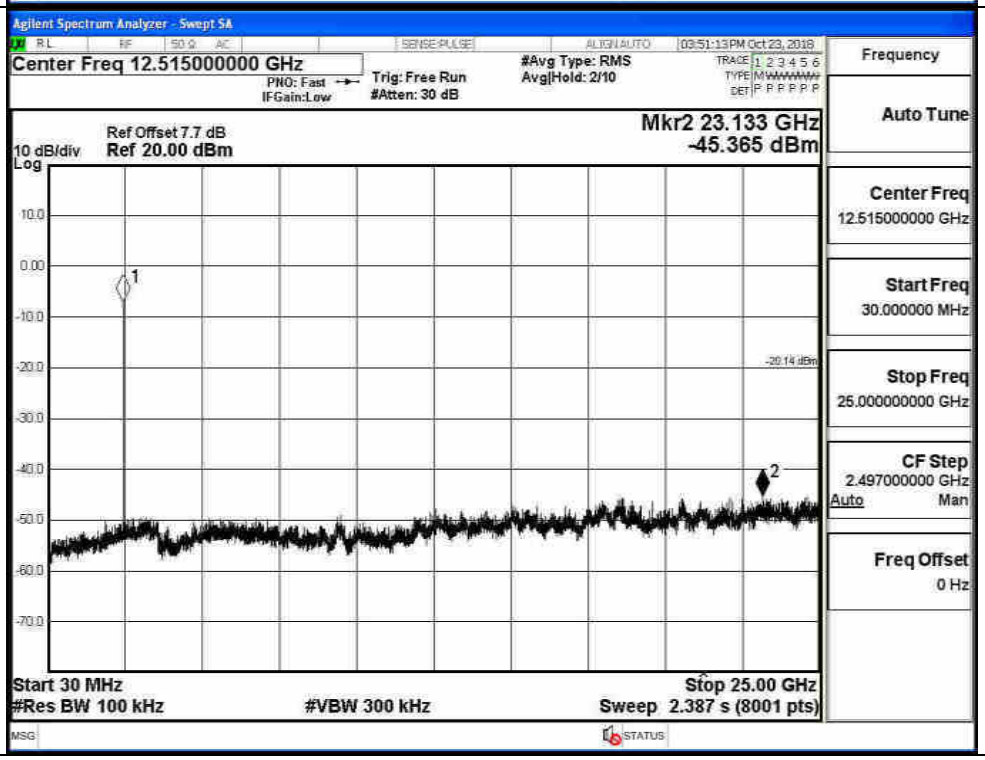
Pref		
Puw		

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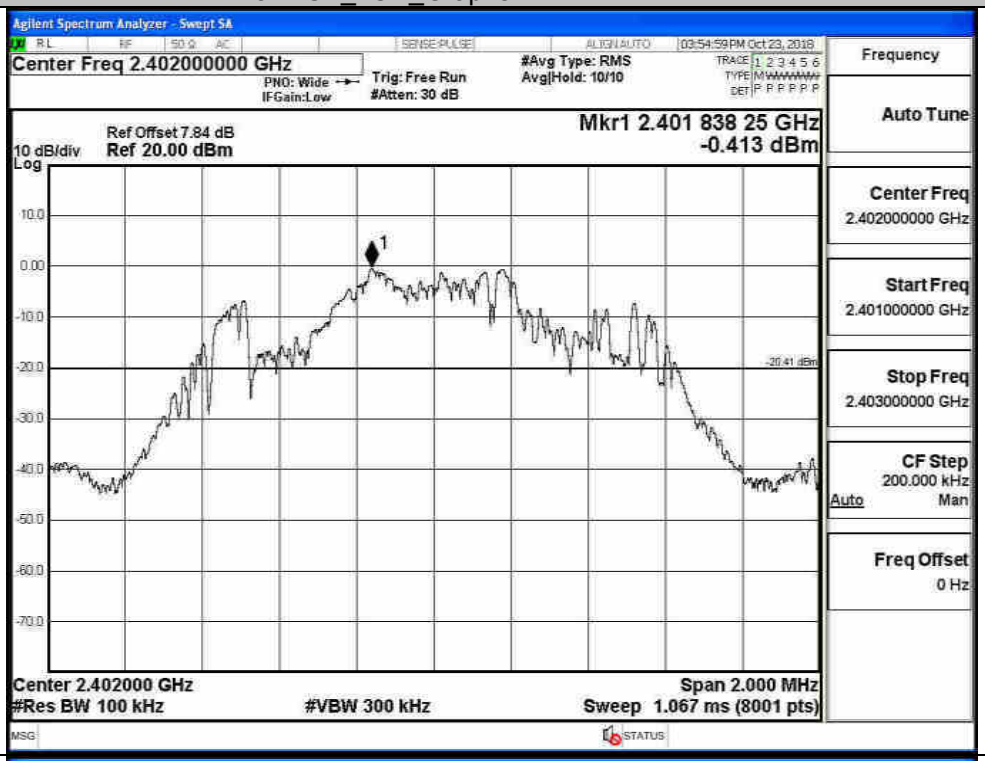
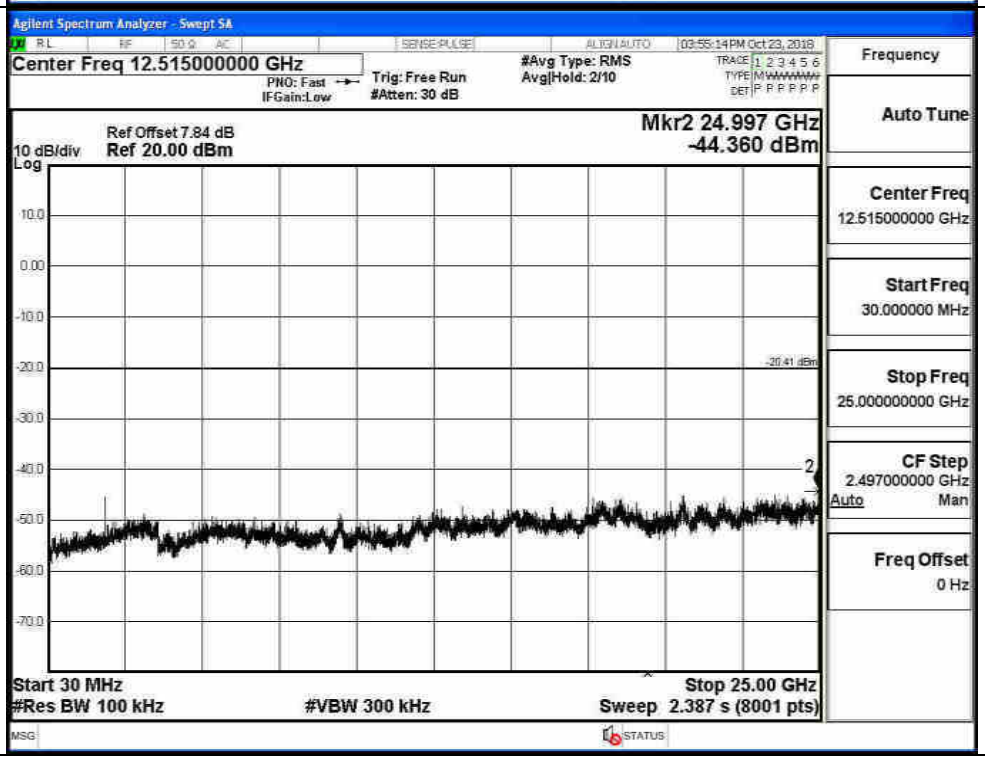
Pref		
Puw		

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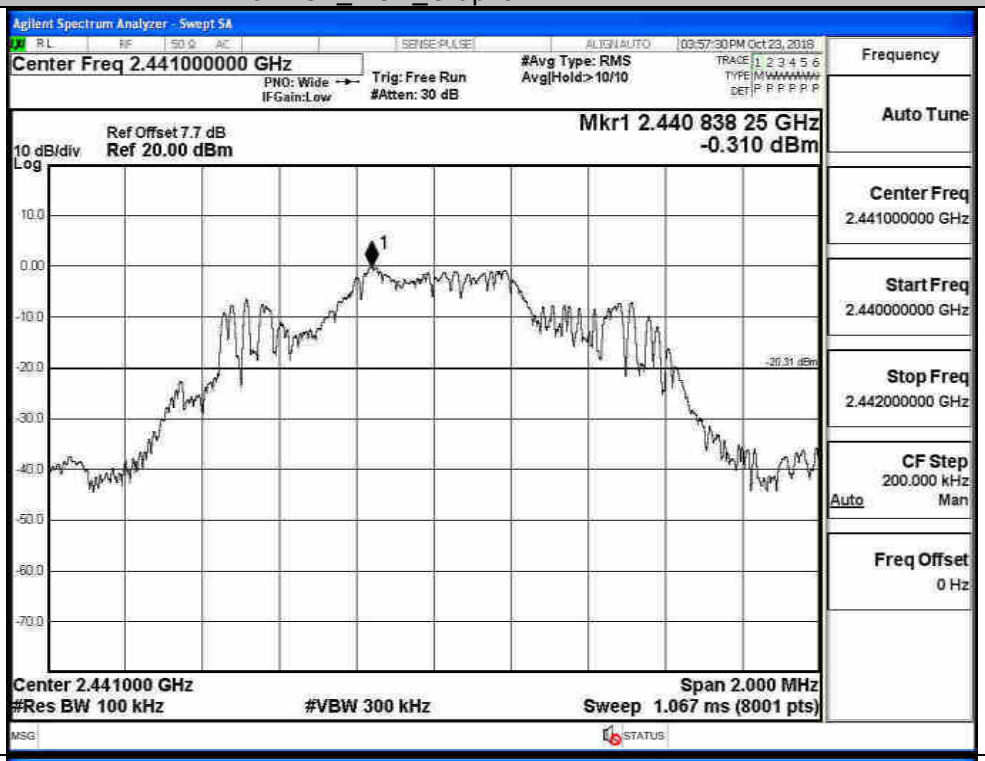
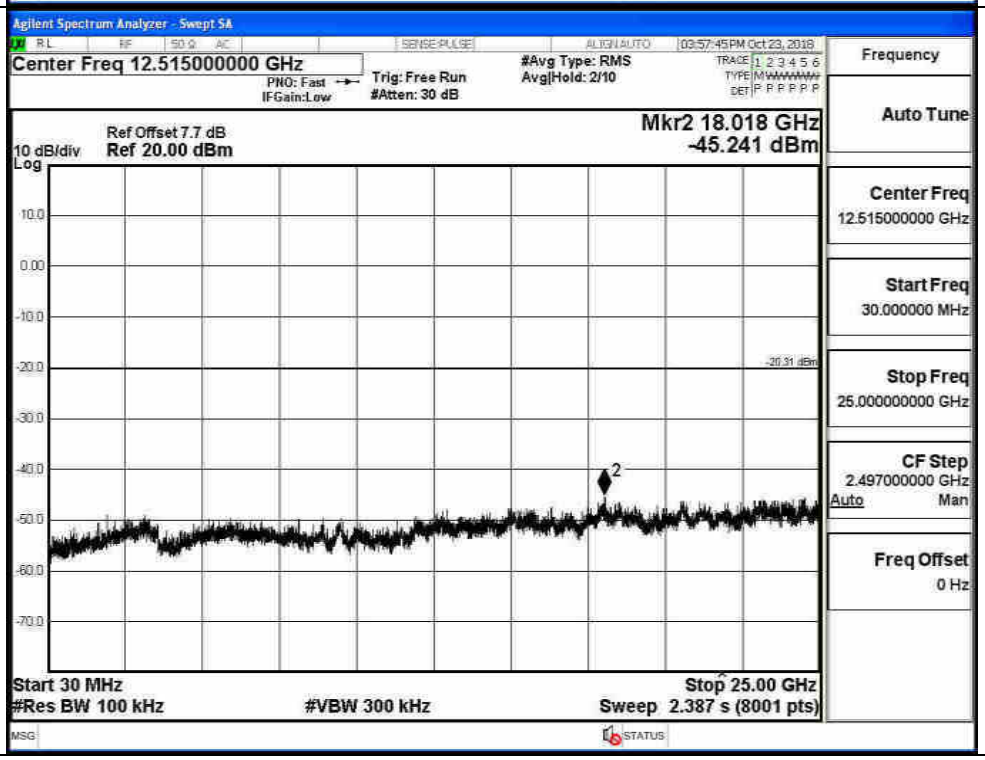
Pref			
Puw			

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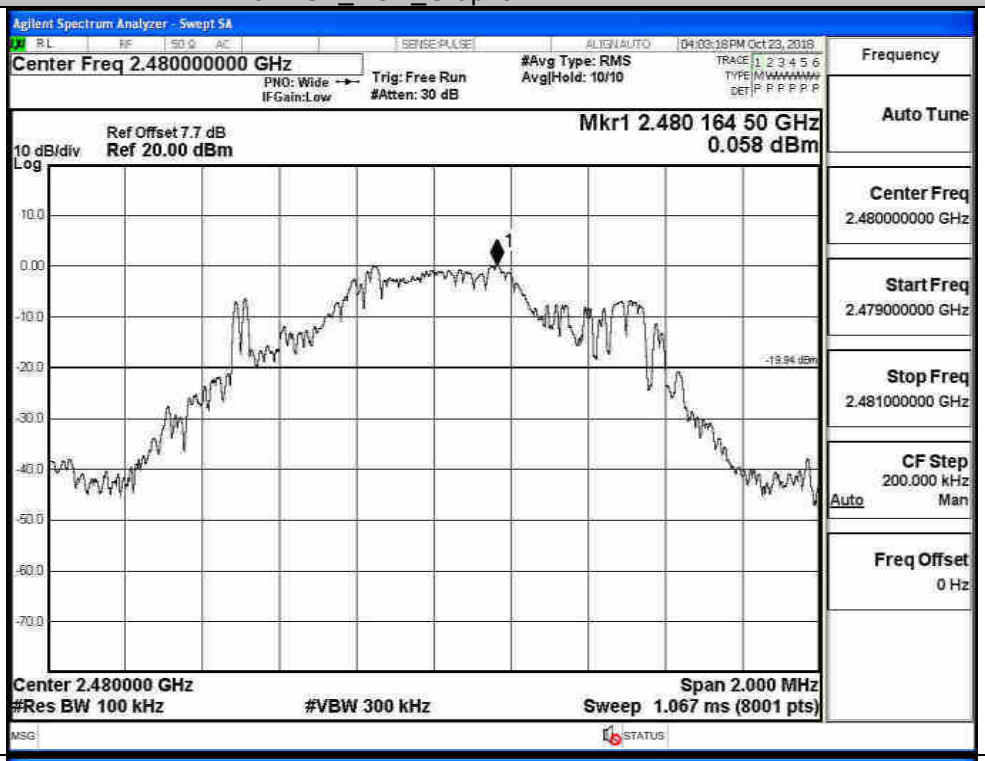
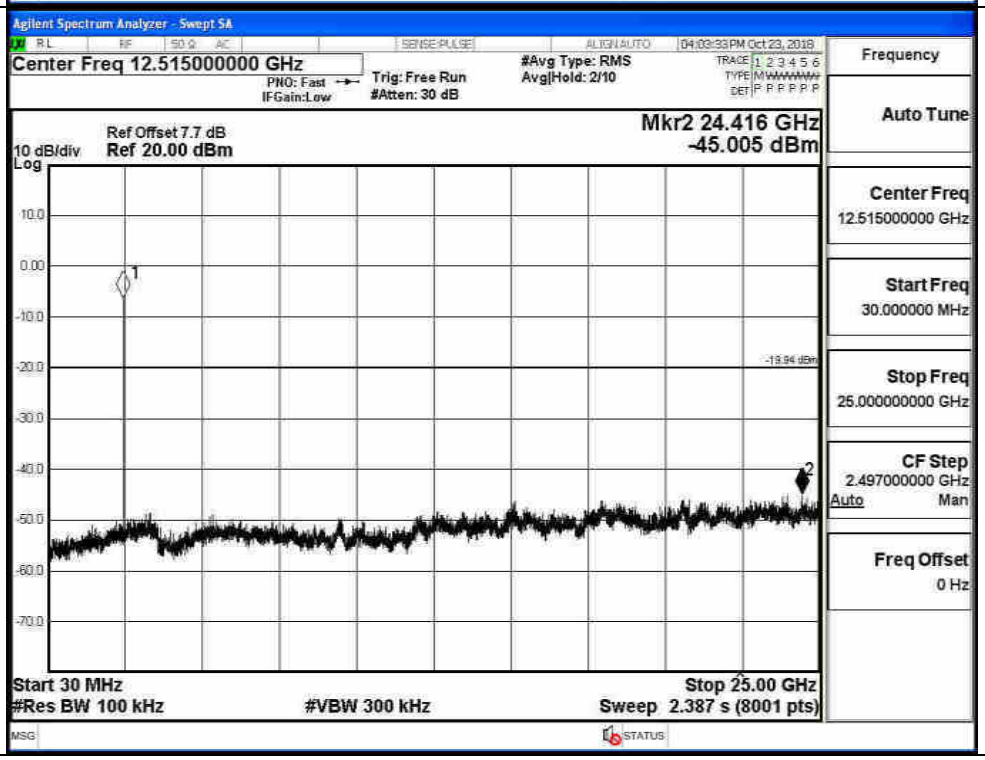
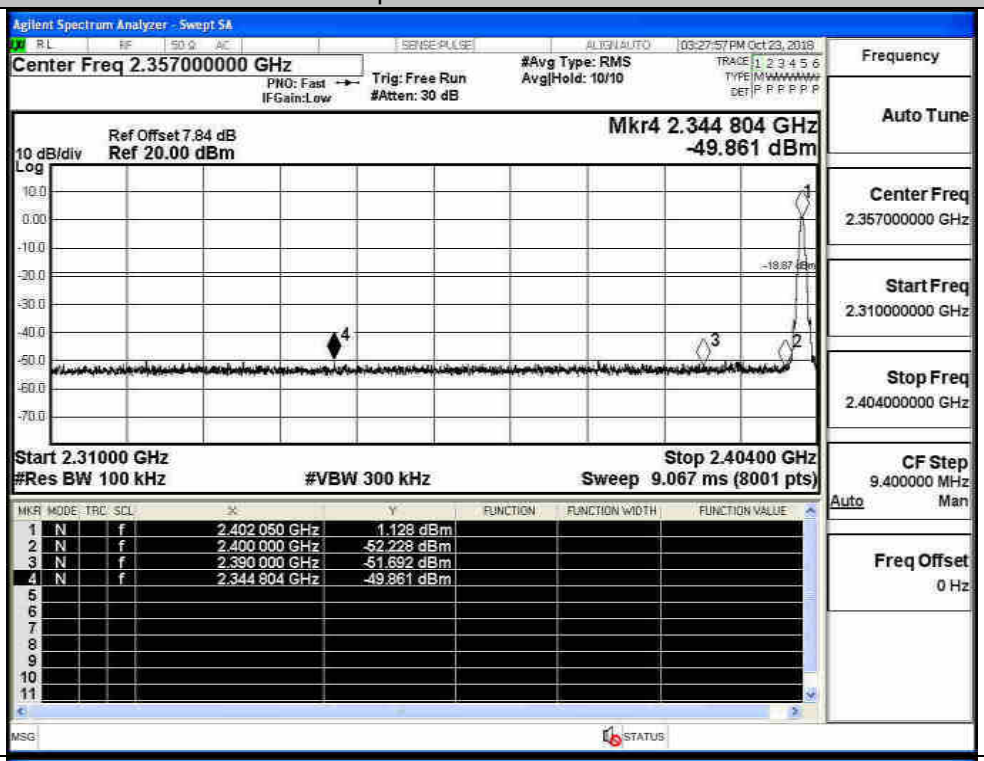
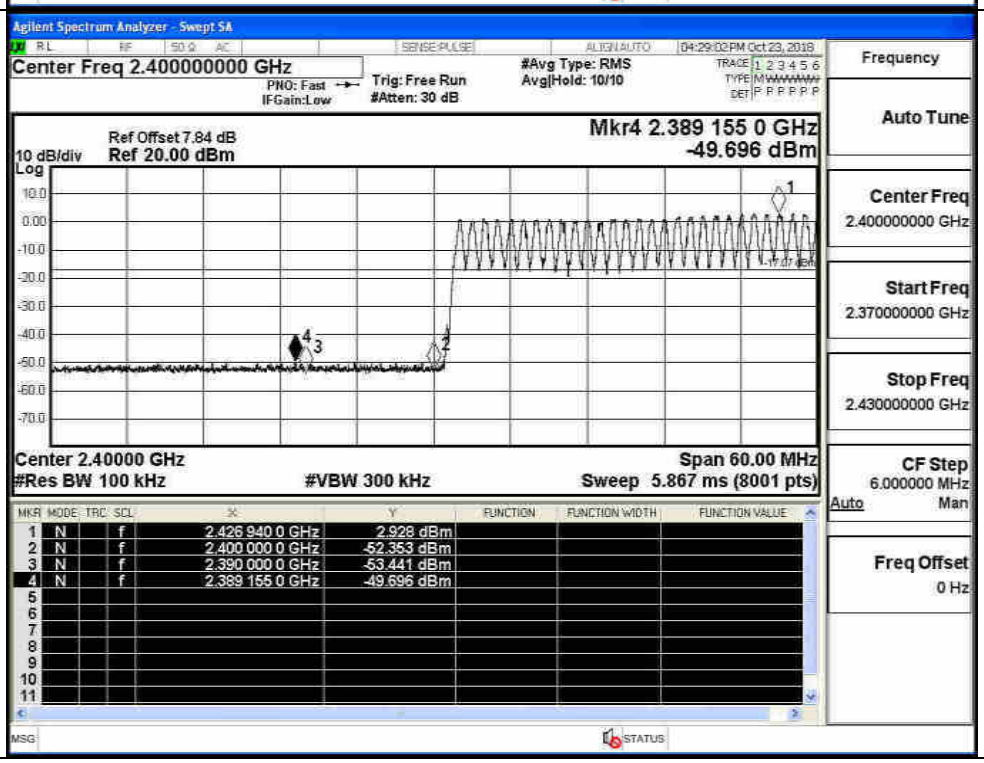
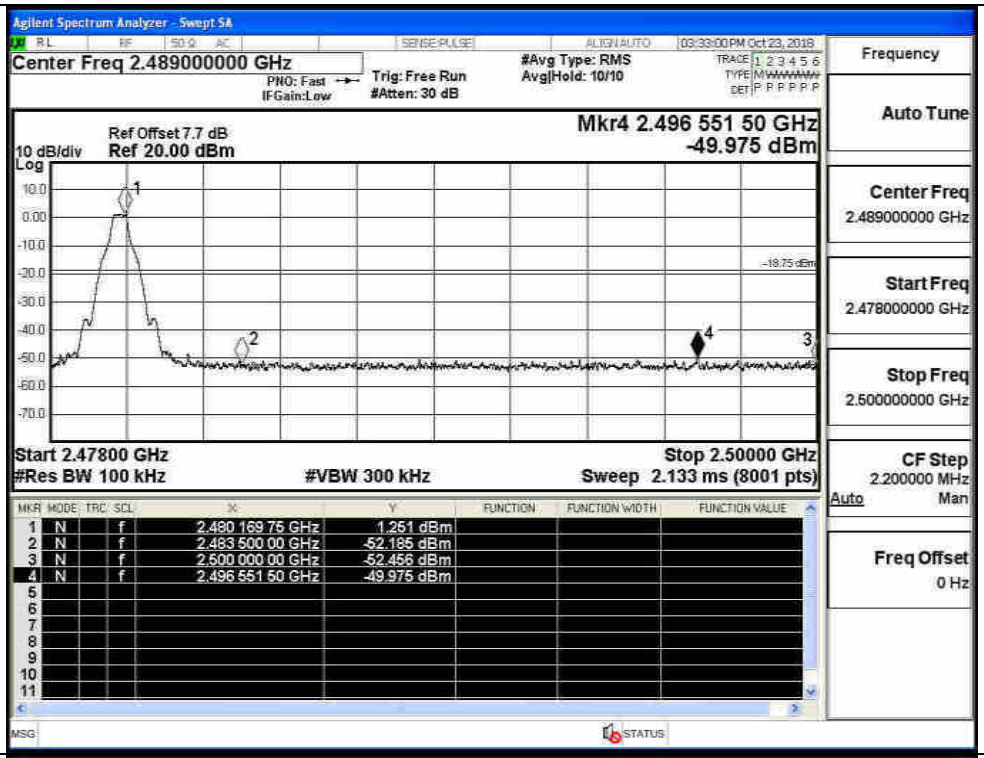
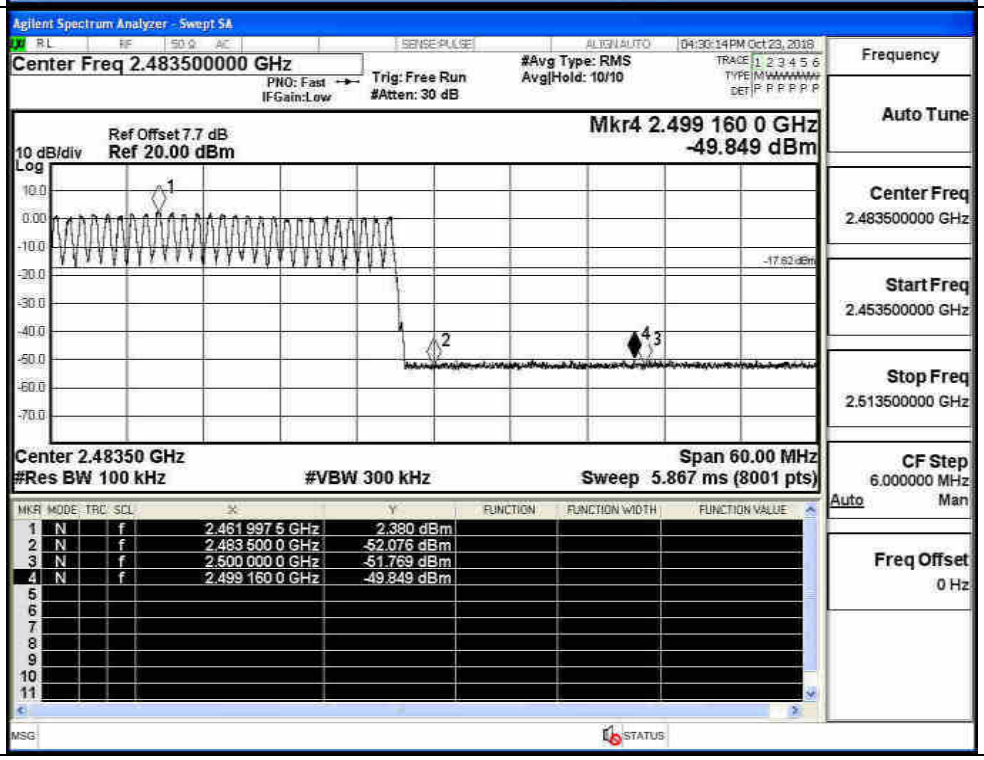
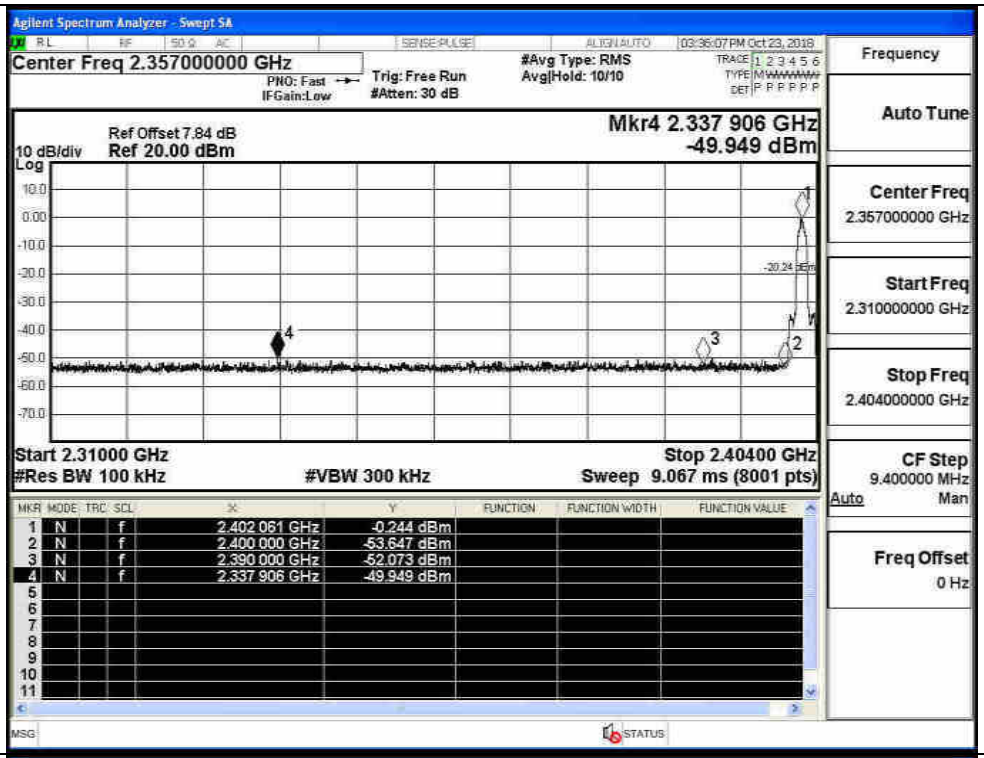
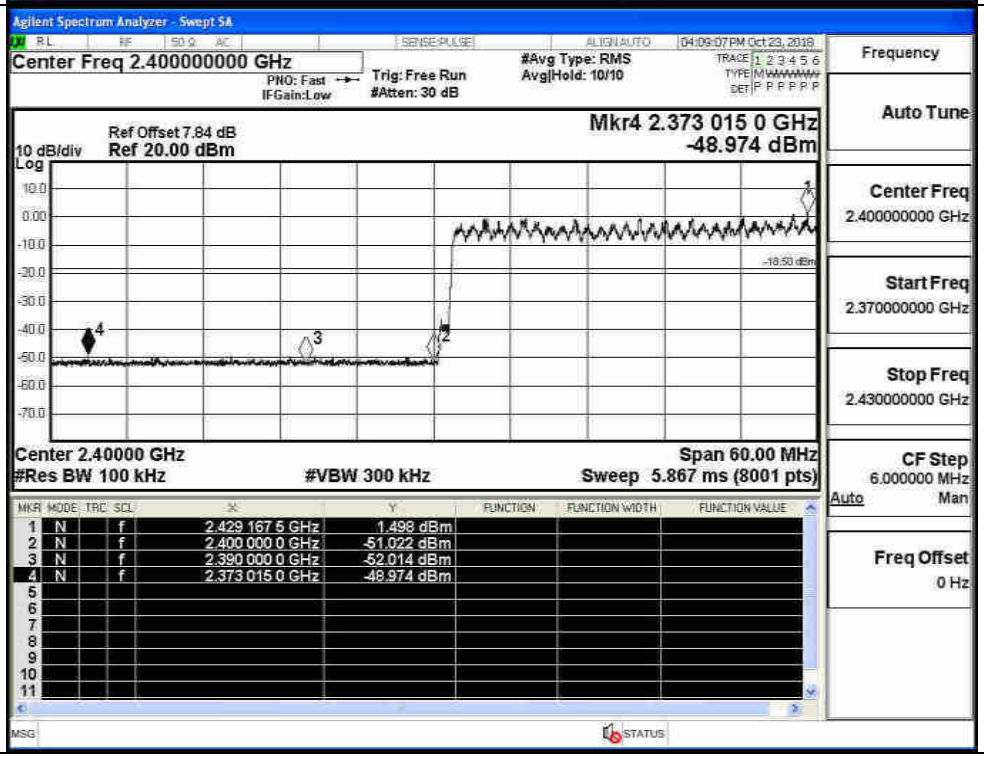
Pref		
Puw		

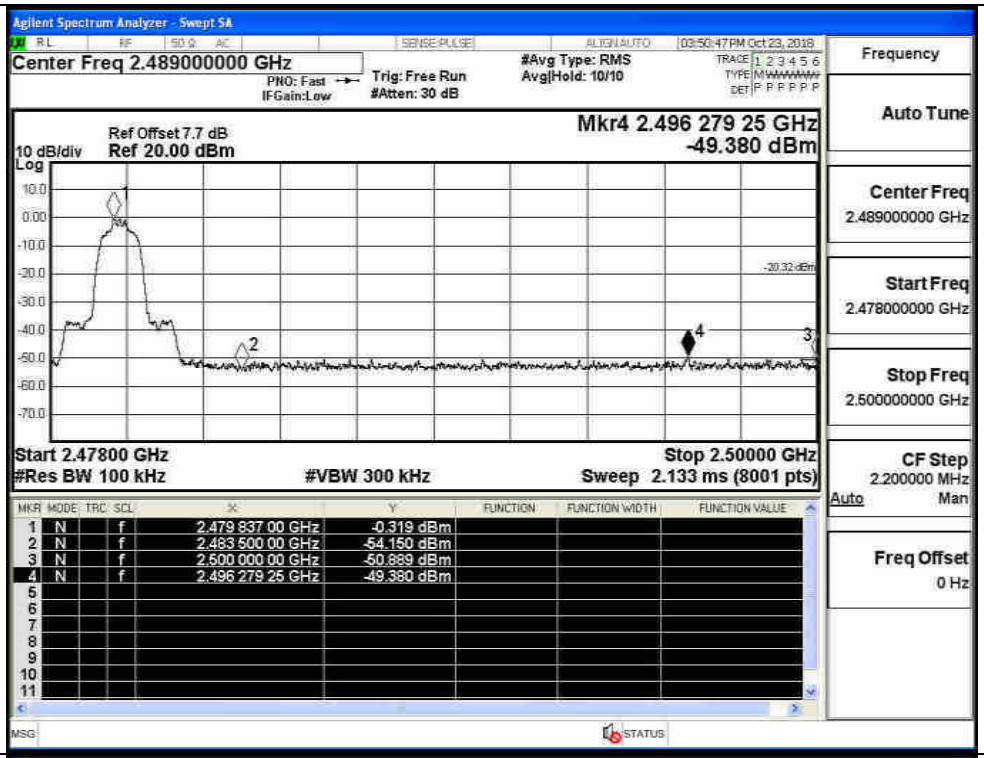
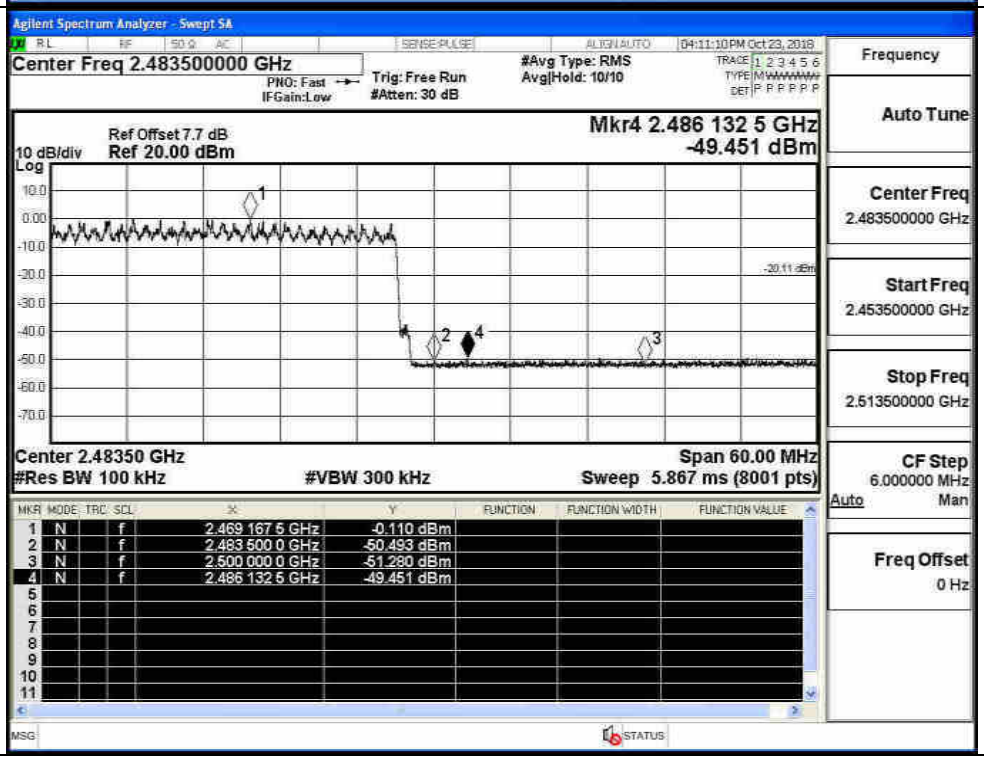
A.7 Band-edge for RF Conducted Emissions

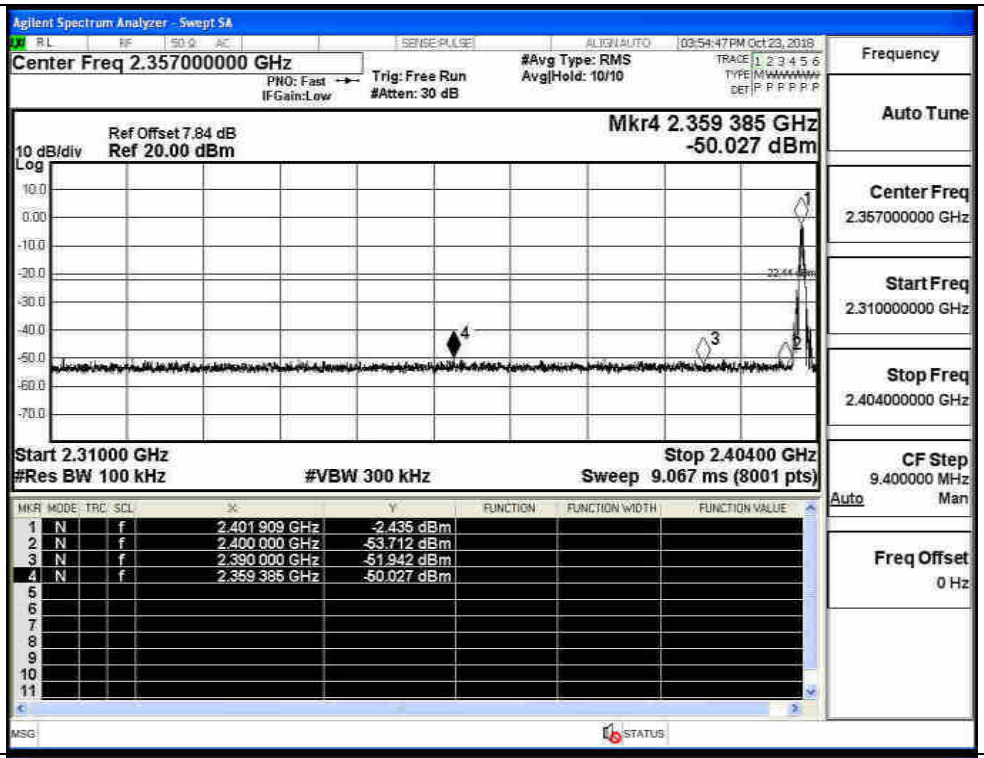
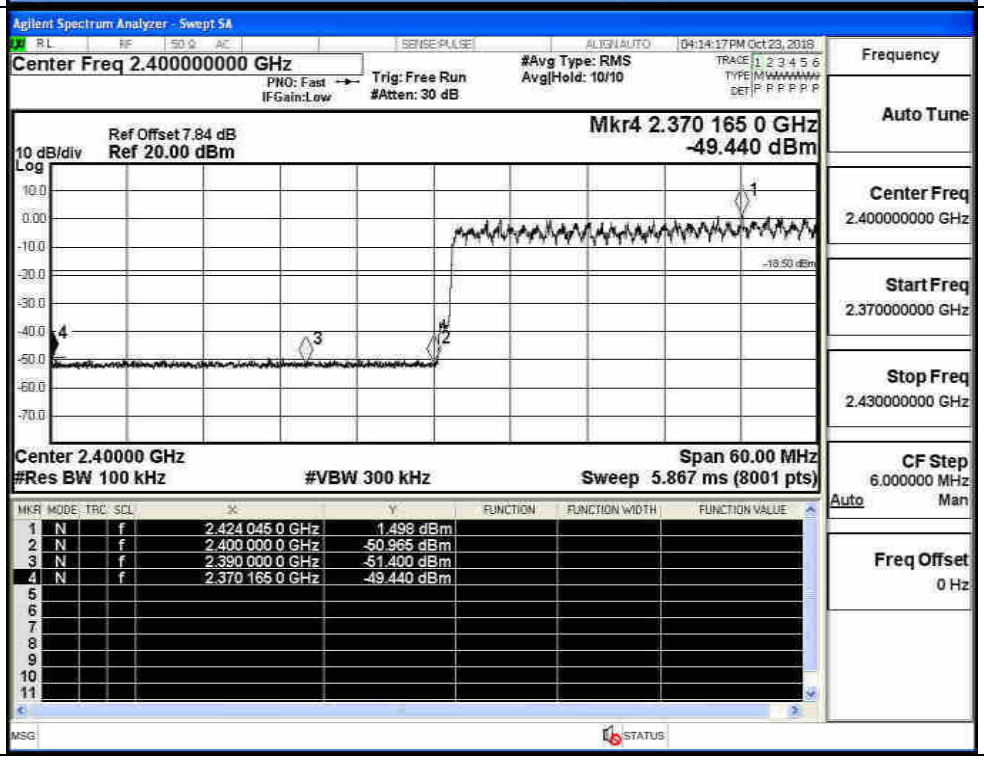
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.128	Off	-49.861	-18.87	PASS
			2.928	On	-49.696	-17.07	PASS
	HCH	2480	1.251	Off	-49.975	-18.75	PASS
			2.380	On	-49.849	-17.62	PASS
π/4DQPSK	LCH	2402	-0.244	Off	-49.949	-20.24	PASS
			1.498	On	-48.974	-18.5	PASS
	HCH	2480	-0.319	Off	-49.380	-20.32	PASS
			-0.110	On	-49.451	-20.11	PASS
8DPSK	LCH	2402	-2.435	Off	-50.027	-22.44	PASS
			1.498	On	-49.440	-18.5	PASS
	HCH	2480	0.136	Off	-49.570	-19.86	PASS
			0.928	On	-49.754	-19.07	PASS

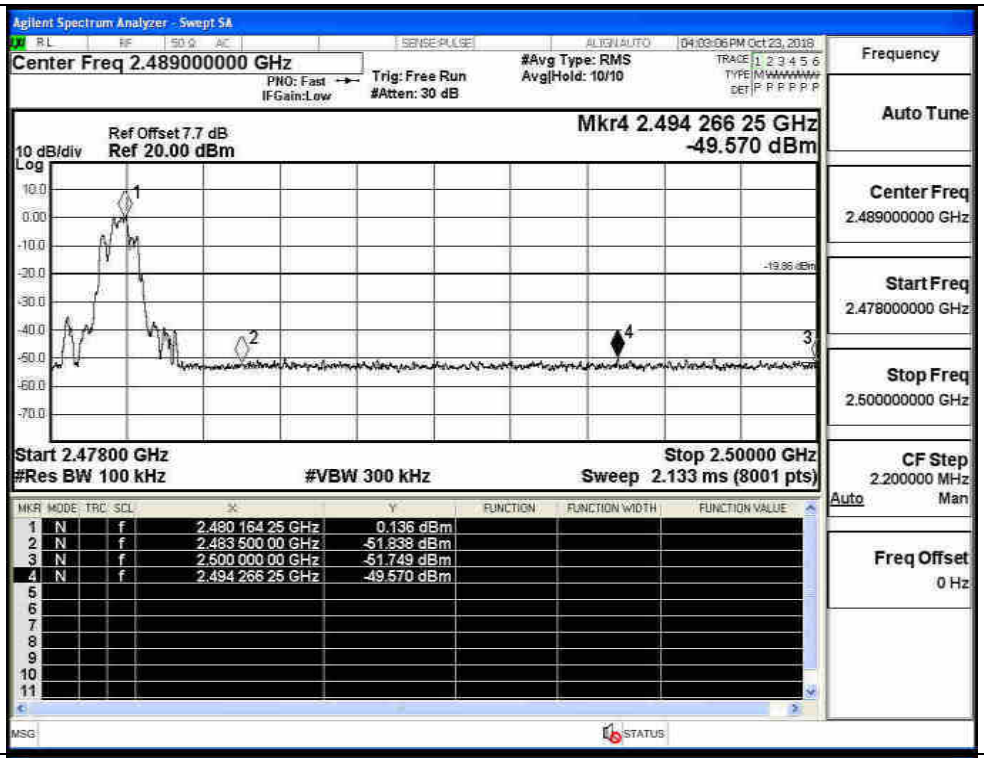
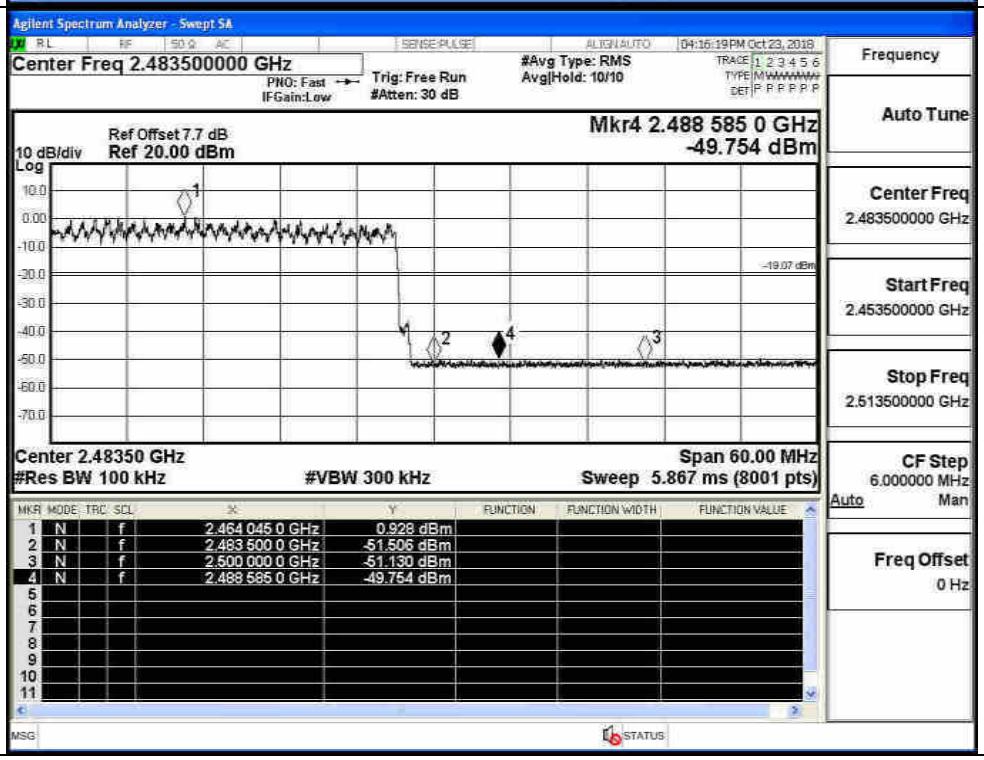
Test Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	

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	

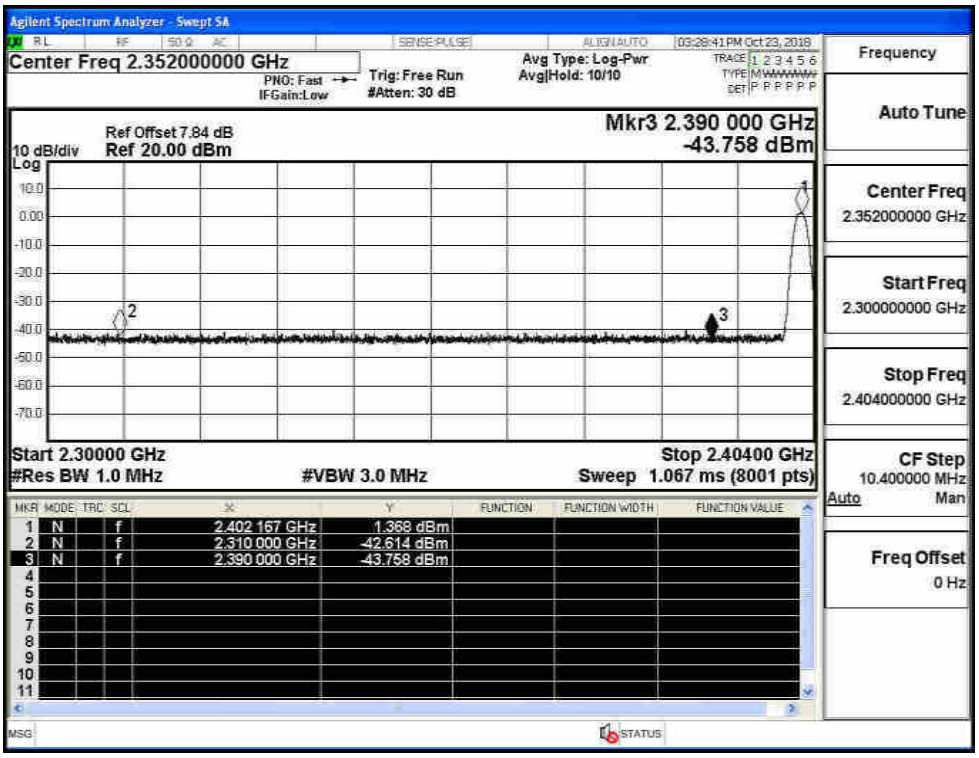
8DPSK/LCH/No Hop	
8DPSK/LCH/Hop	

8DPSK/HCH/No Hop	
8DPSK/HCH/Hop	

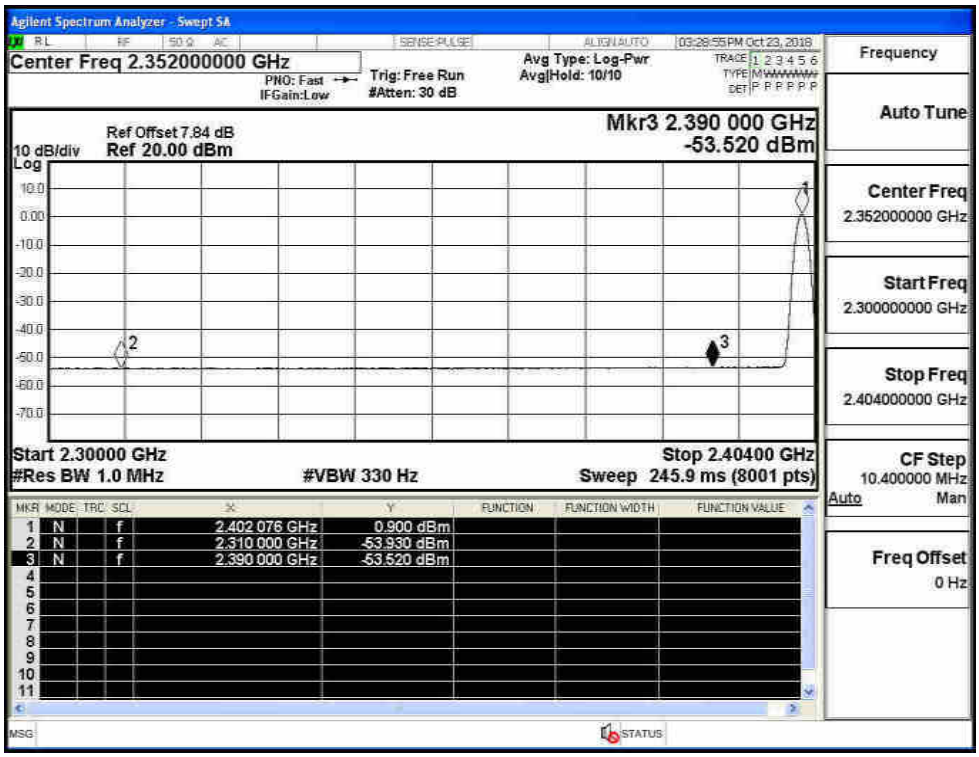
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.61	2.0	0	54.62	PEAK	74	PASS
	Off	2310.0	-53.93	2.0	0	43.30	AV	54	PASS
	Off	2390.0	-43.76	2.0	0	53.47	PEAK	74	PASS
	Off	2390.0	-53.52	2.0	0	43.71	AV	54	PASS
	Off	2483.5	-42.75	2.0	0	54.48	PEAK	74	PASS
	Off	2483.5	-53.40	2.0	0	43.83	AV	54	PASS
	Off	2500.0	-43.52	2.0	0	53.71	PEAK	74	PASS
	Off	2500.0	-53.36	2.0	0	43.87	AV	54	PASS
π/4DQPSK	Off	2310.0	-42.67	2.0	0	54.56	PEAK	74	PASS
	Off	2310.0	-53.83	2.0	0	43.40	AV	54	PASS
	Off	2390.0	-42.44	2.0	0	54.79	PEAK	74	PASS
	Off	2390.0	-53.53	2.0	0	43.70	AV	54	PASS
	Off	2483.5	-42.99	2.0	0	54.24	PEAK	74	PASS
	Off	2483.5	-53.40	2.0	0	43.83	AV	54	PASS
	Off	2500.0	-42.66	2.0	0	54.57	PEAK	74	PASS
	Off	2500.0	-53.25	2.0	0	43.98	AV	54	PASS
8DPSK	Off	2310.0	-43.98	2.0	0	53.25	PEAK	74	PASS
	Off	2310.0	-53.85	2.0	0	43.38	AV	54	PASS
	Off	2390.0	-44.24	2.0	0	52.99	PEAK	74	PASS
	Off	2390.0	-53.39	2.0	0	43.84	AV	54	PASS
	Off	2483.5	-43.30	2.0	0	53.93	PEAK	74	PASS
	Off	2483.5	-53.54	2.0	0	43.69	AV	54	PASS
	Off	2500.0	-43.05	2.0	0	54.18	PEAK	74	PASS
	Off	2500.0	-53.28	2.0	0	43.95	AV	54	PASS

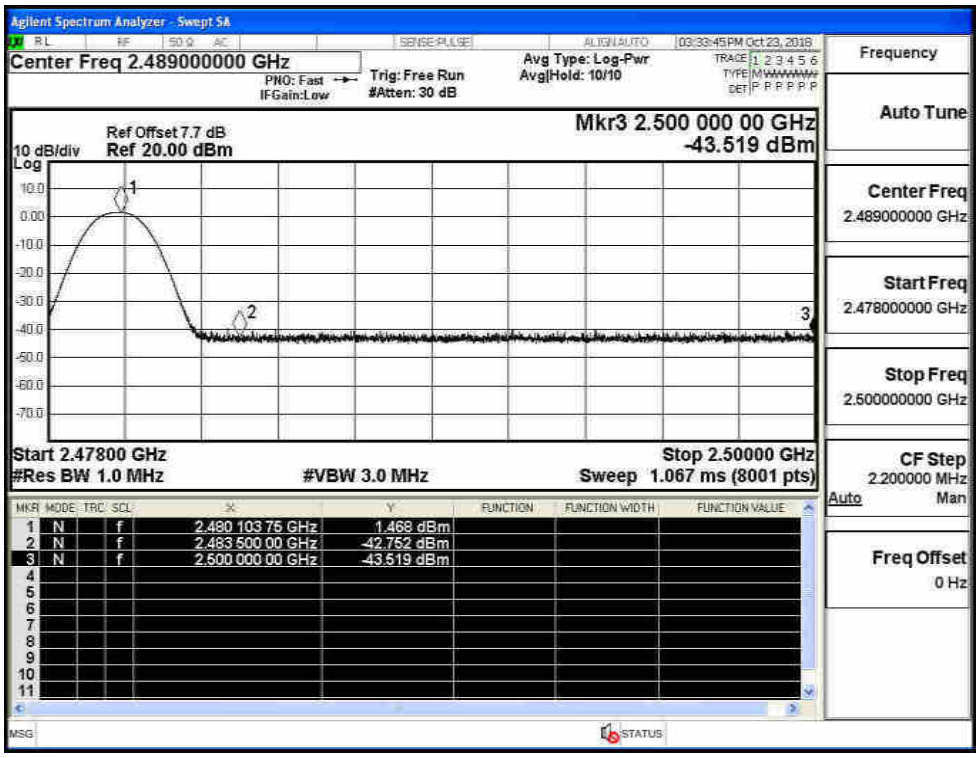
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



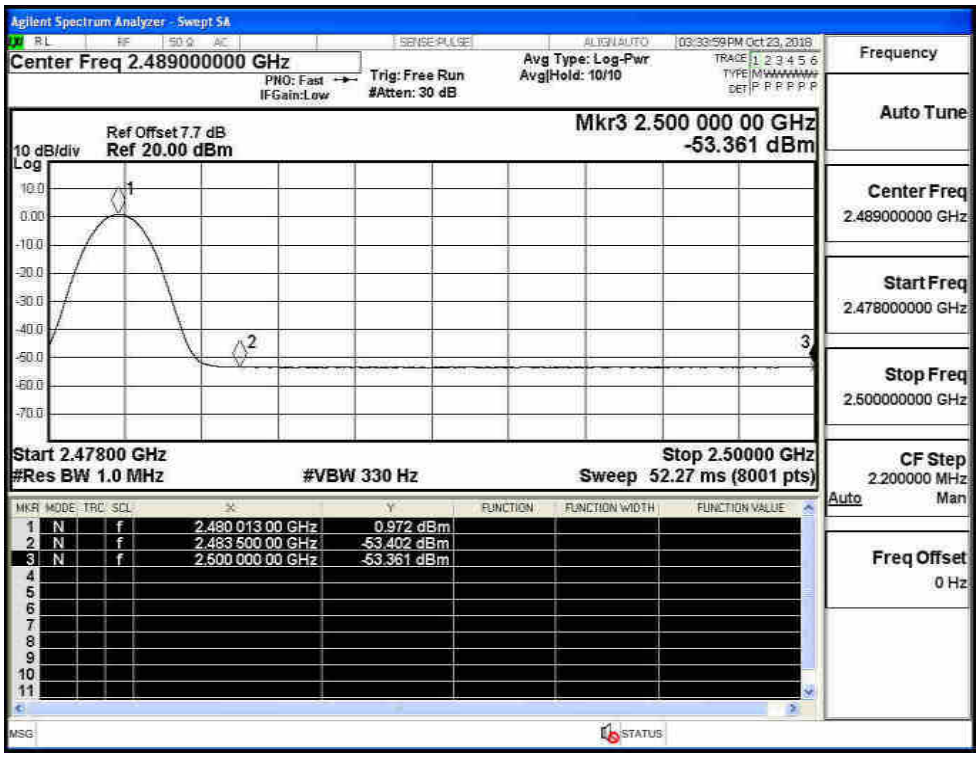
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



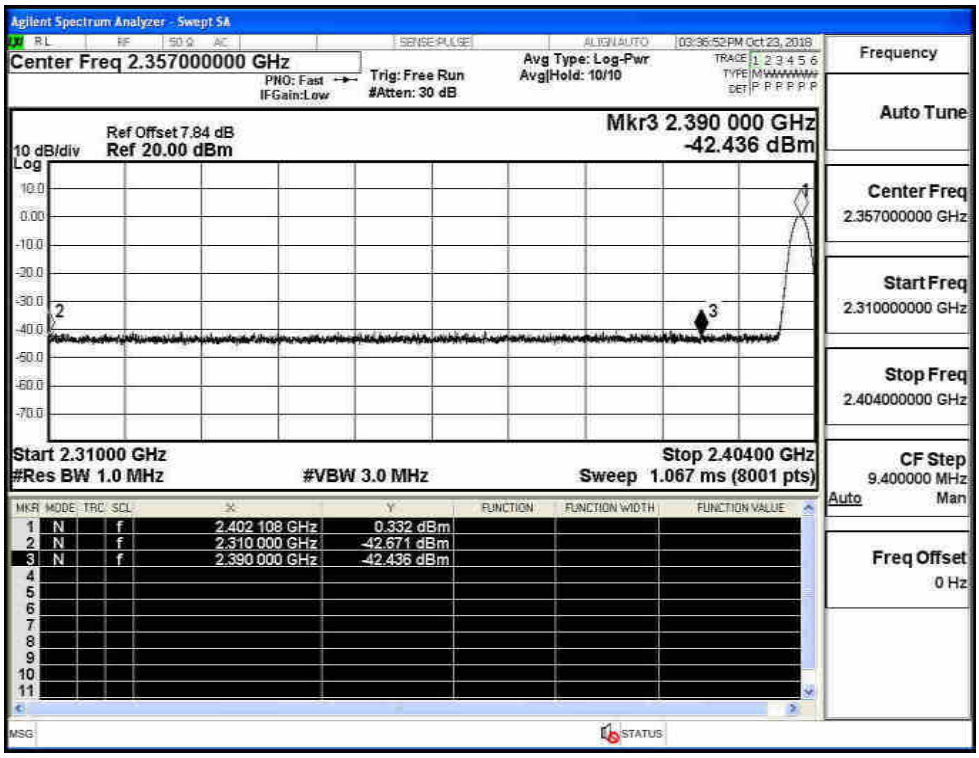
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



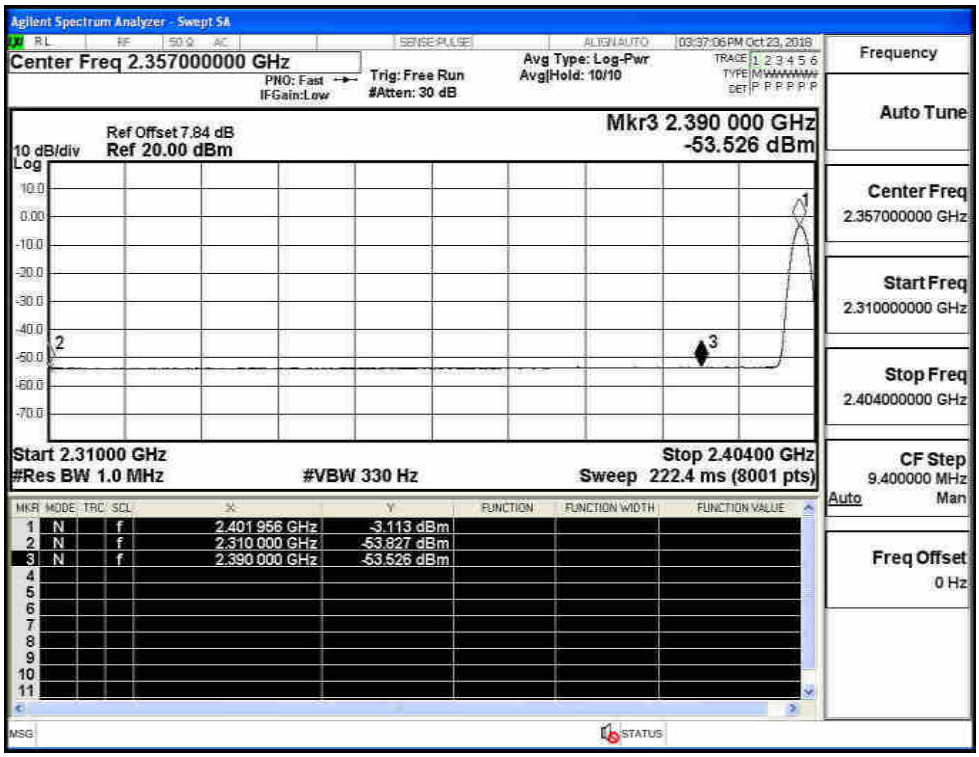
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



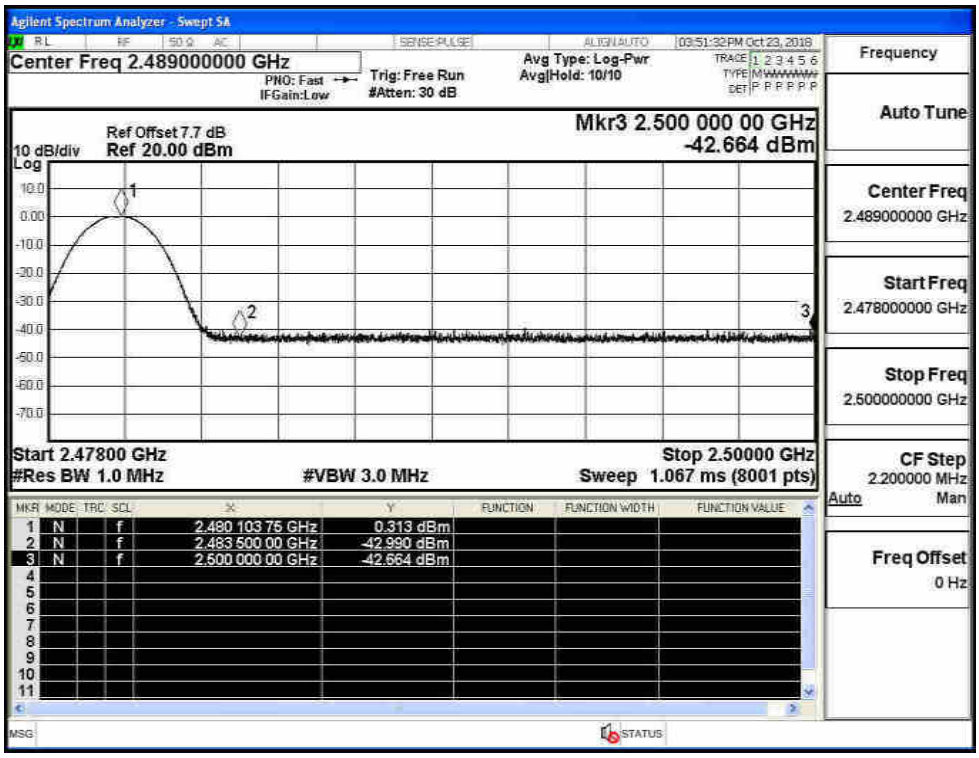
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



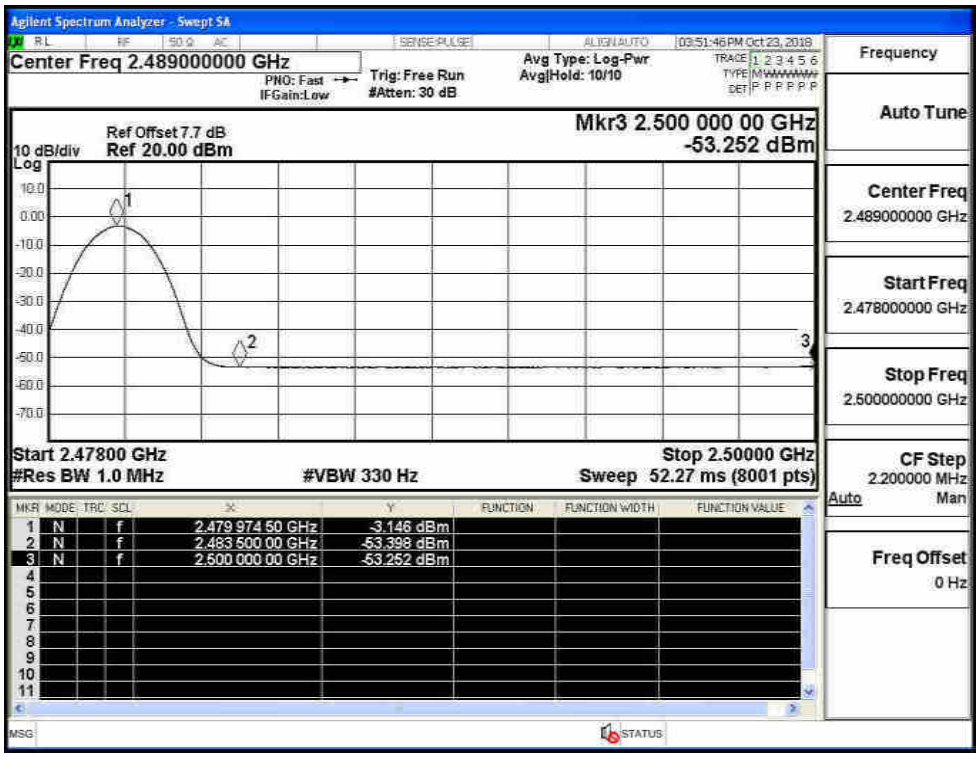
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



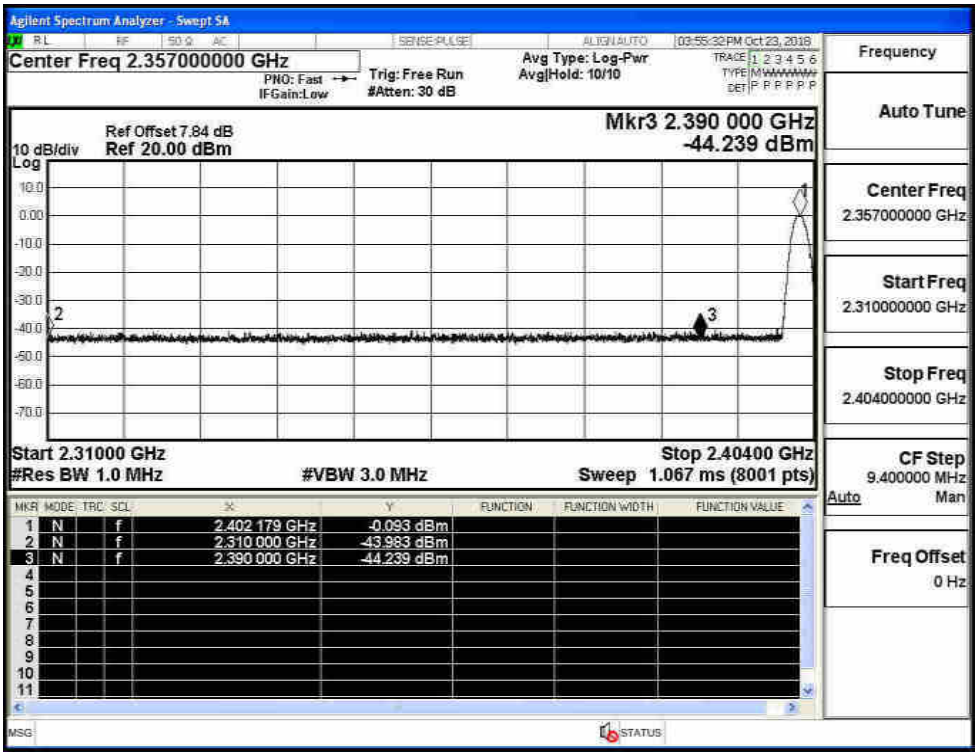
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



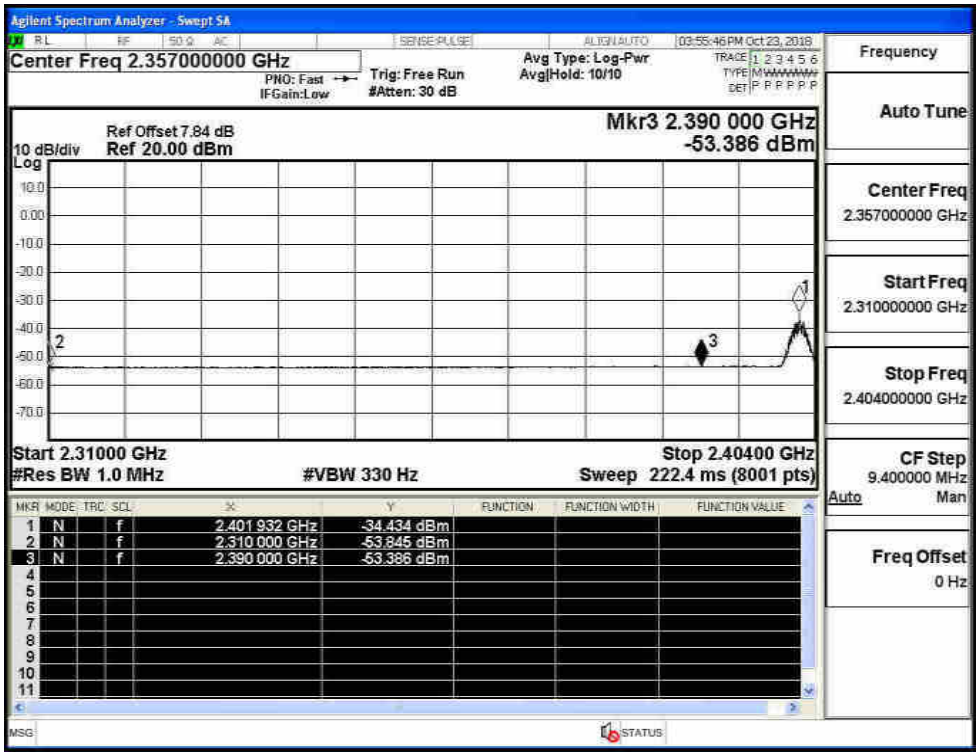
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



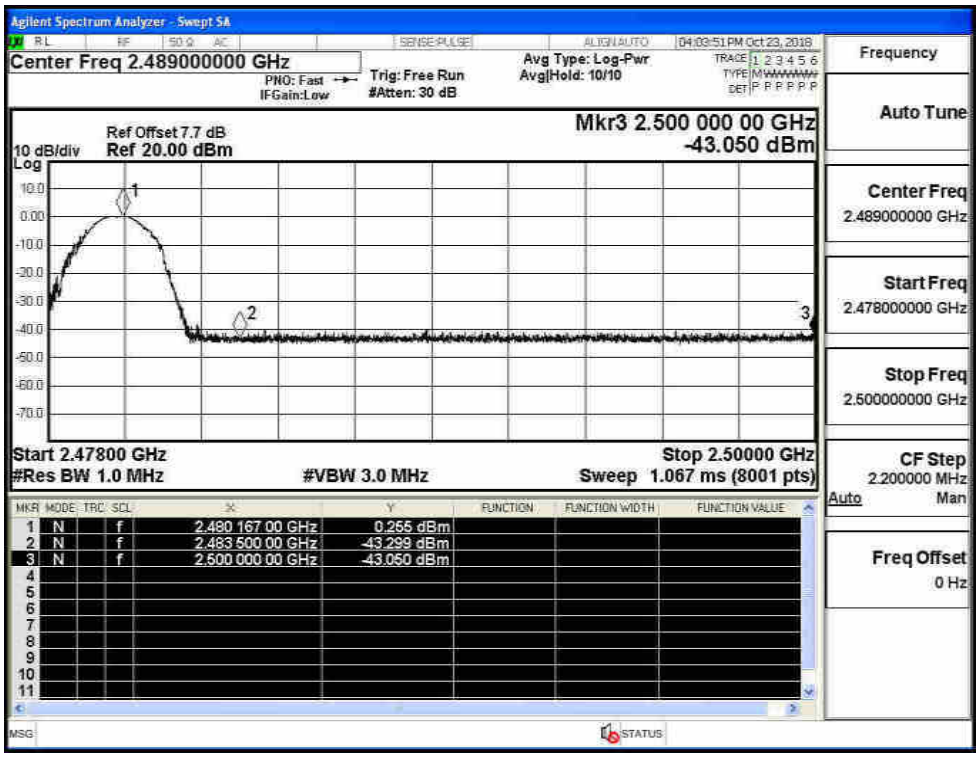
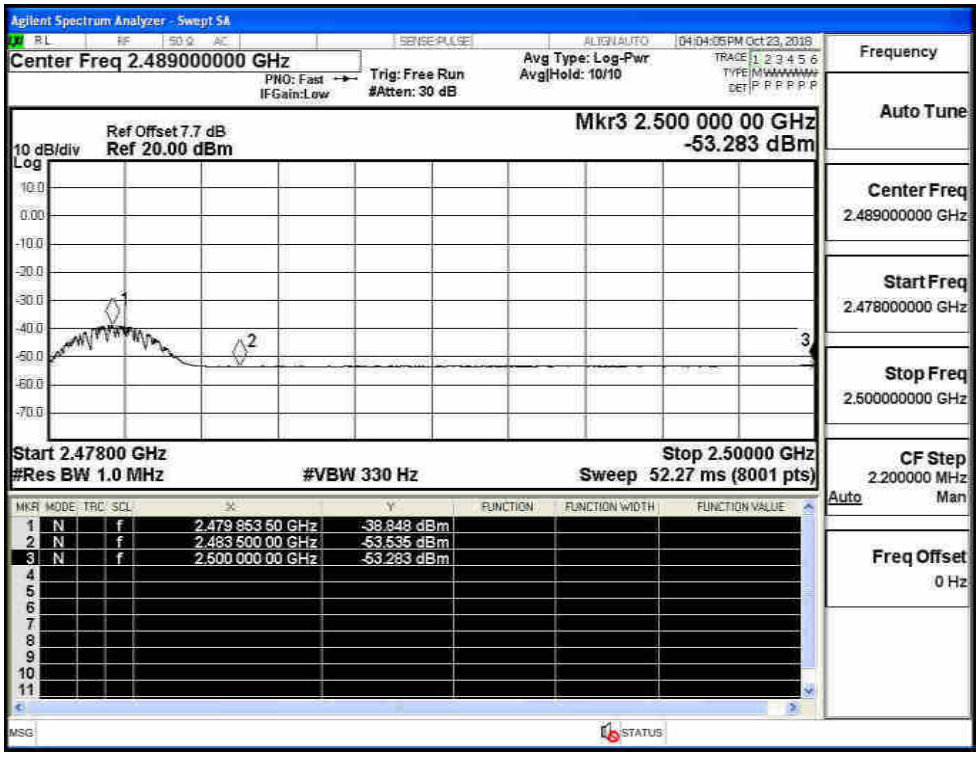
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (High Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)