Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Netbox Duo

Test Model: Netbox Duo

Environmental Conditions

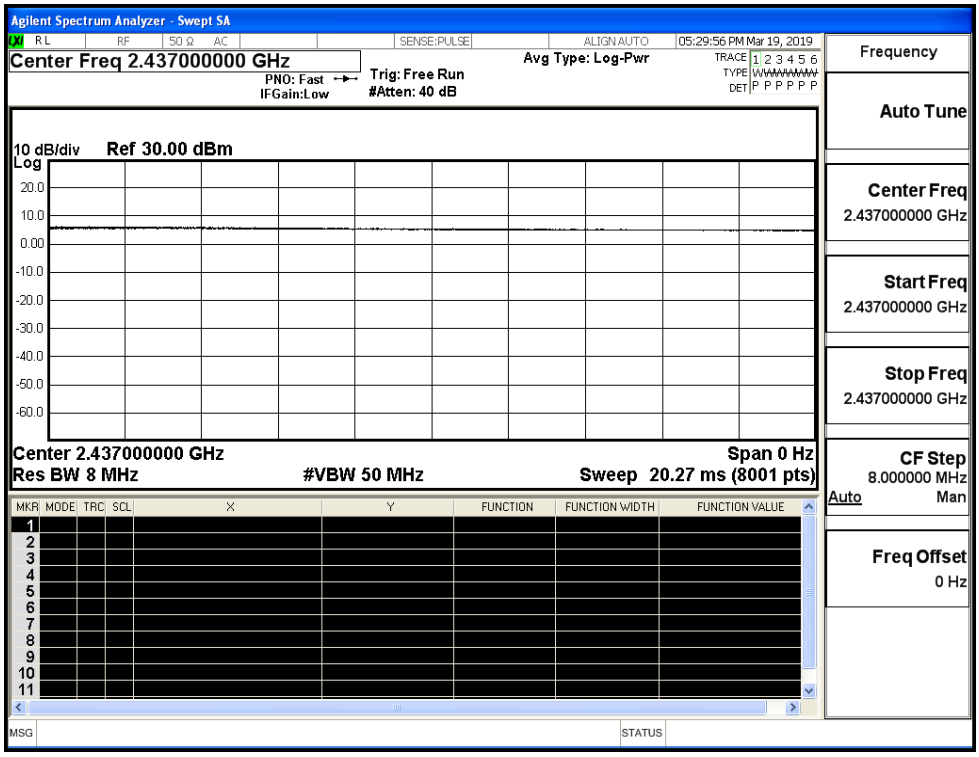
Temperature:	24.1 ° C
Relative Humidity:	53.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Wang Chuang
Supervised by:	Jayden Zhuo

A.1 Duty Cycle

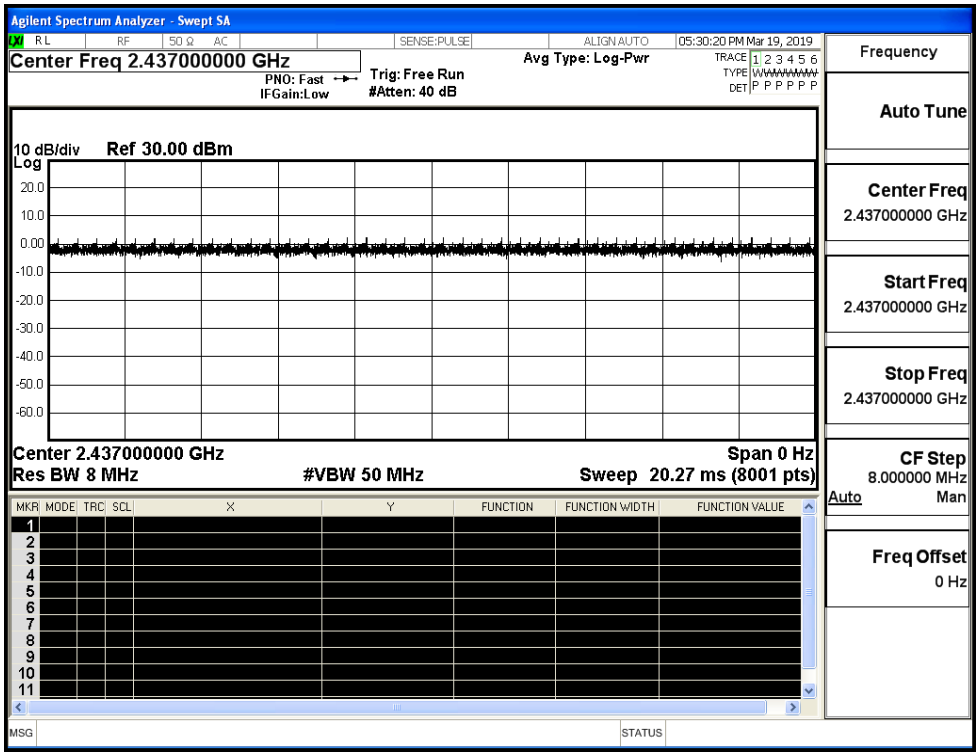
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
11B	2437	Ant_1	100	PASS
11G	2437	Ant_1	100	PASS
11N20	2437	Ant_1	100	PASS
11N40	2437	Ant_1	100	PASS

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
11B	2437	Ant_2	100	PASS
11G	2437	Ant_2	100	PASS
11N20	2437	Ant_2	100	PASS
11N40	2437	Ant_2	100	PASS

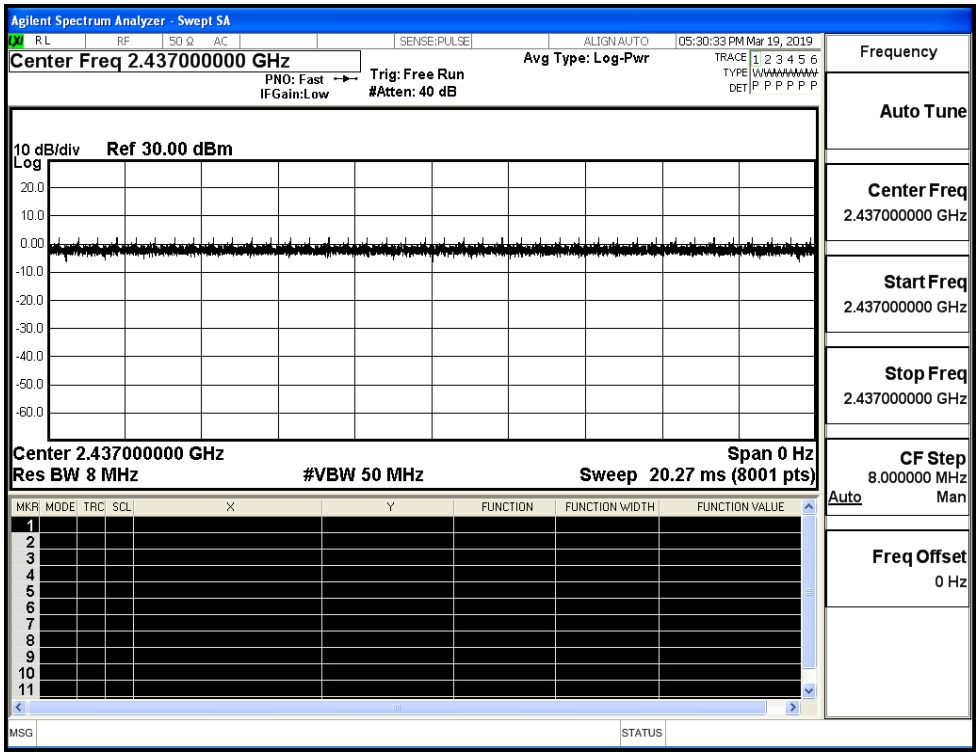
Duty Cycle_11B_2437_Ant_1



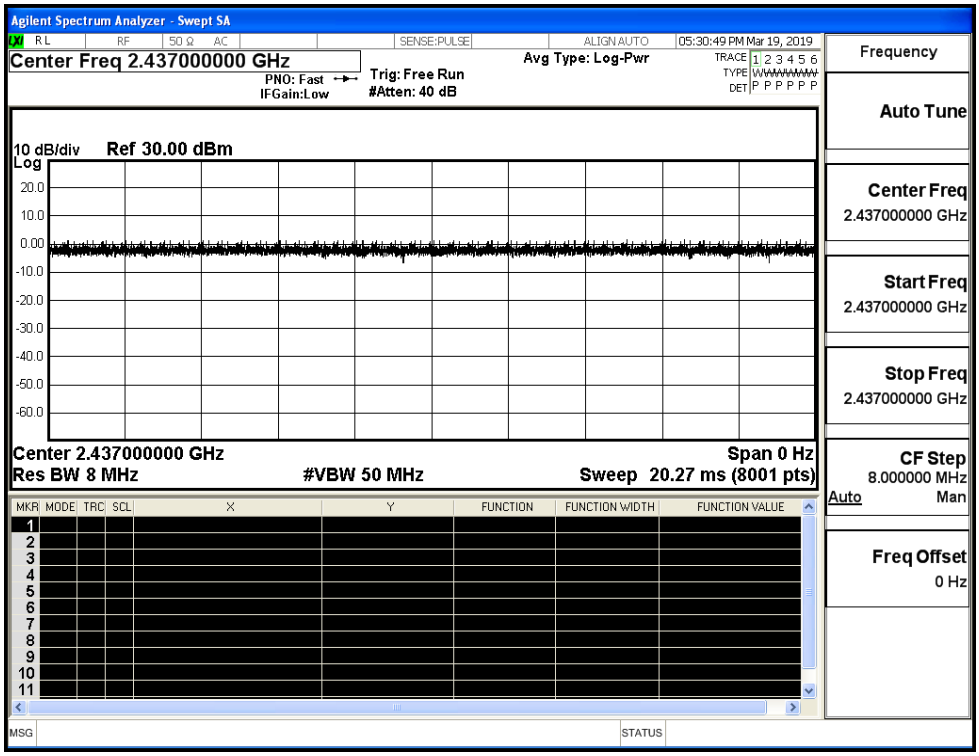
Duty Cycle_11G_2437_Ant_1



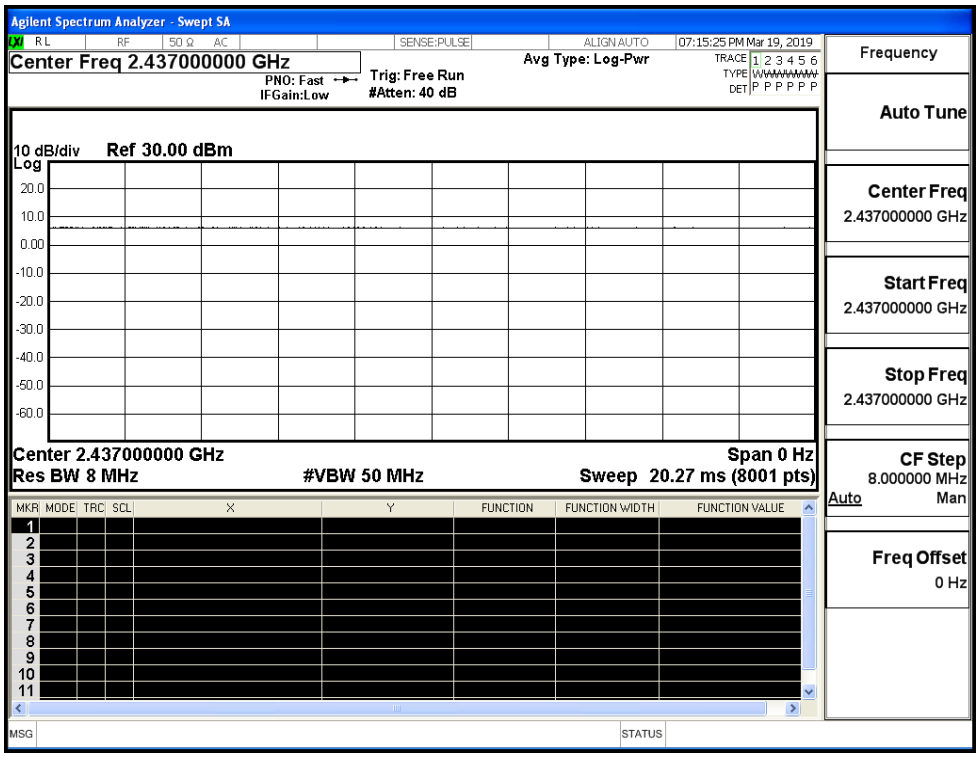
Duty Cycle_11N20_2437_Ant_1



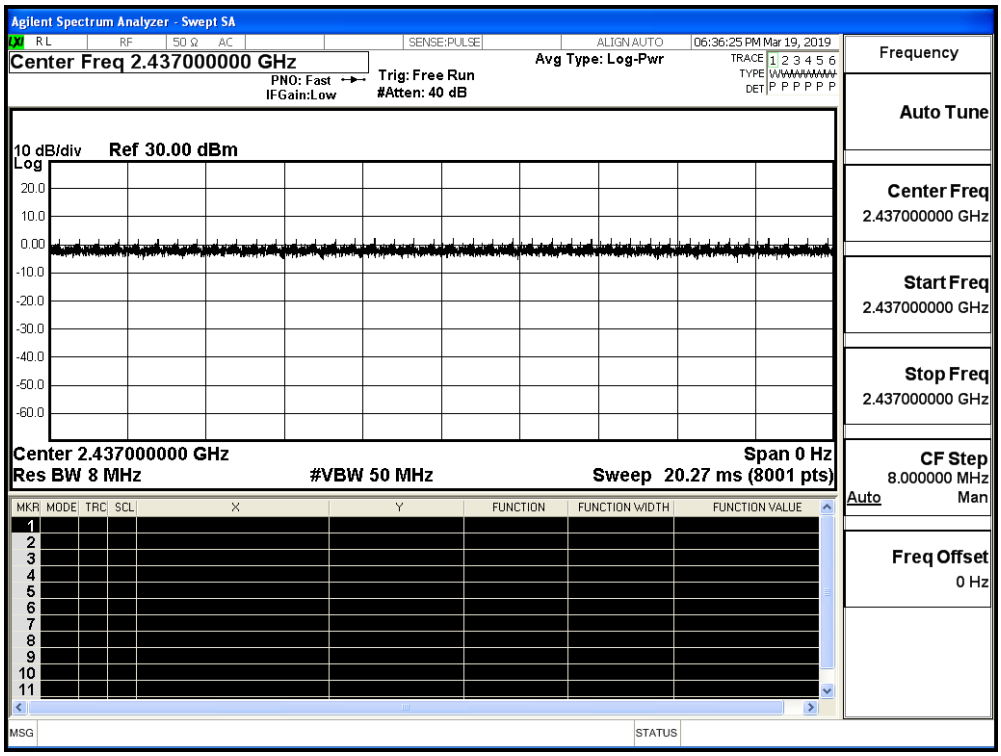
Duty Cycle_11N40_2437_Ant_1



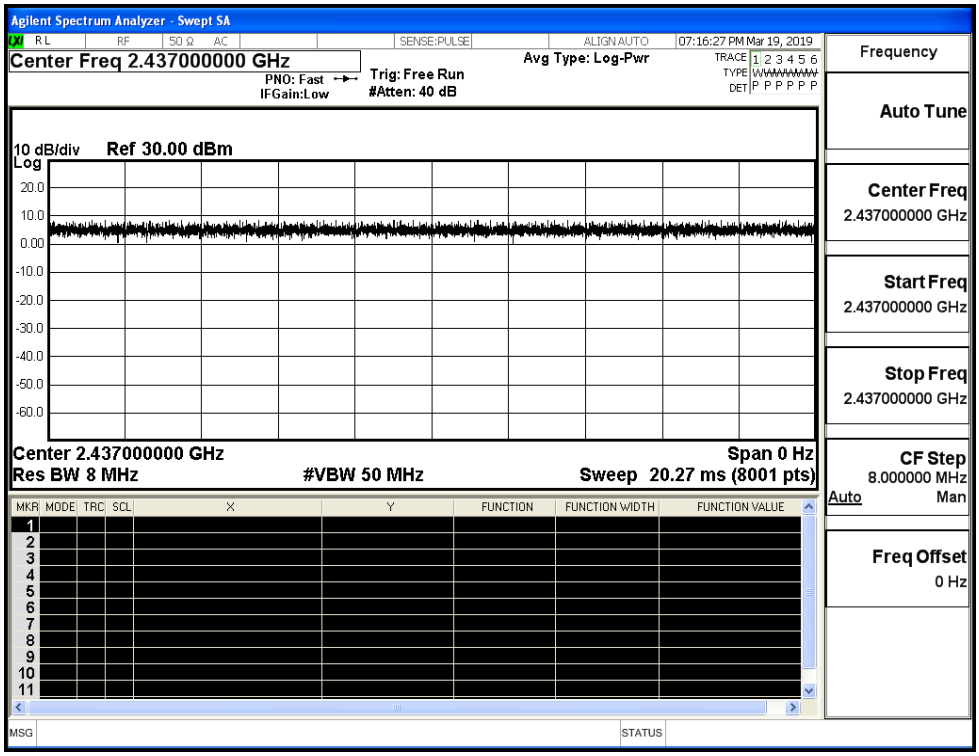
Duty Cycle_11B_2437_Ant_2



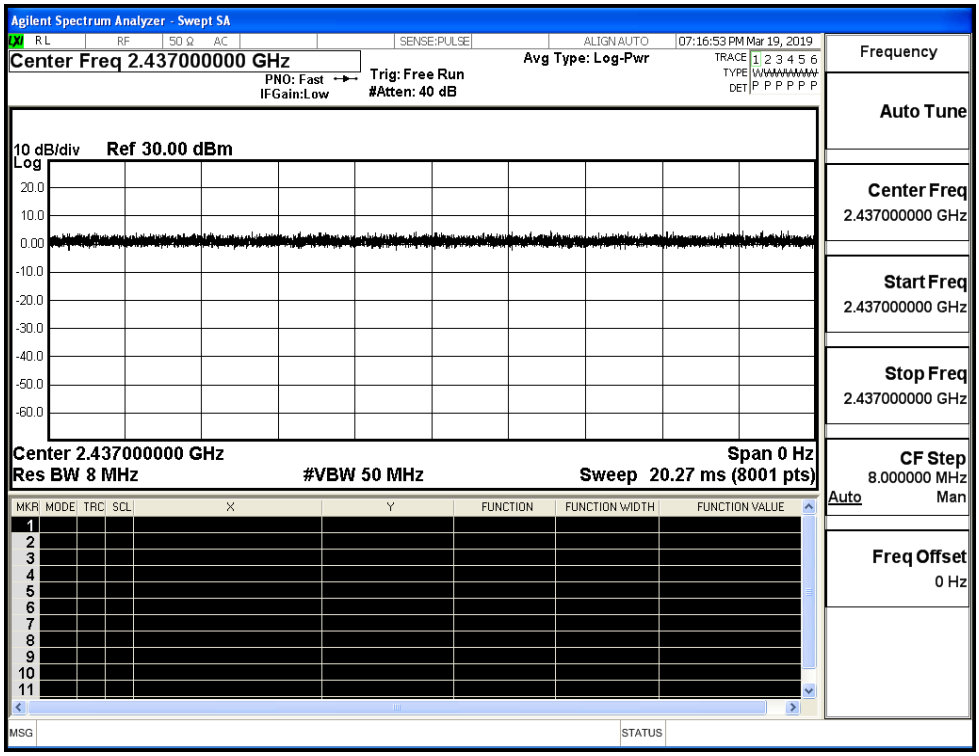
Duty Cycle_11G_2437_Ant_2



Duty Cycle_11N20_2437_Ant_2



Duty Cycle_11N40_2437_Ant_2



A.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm]			Limit [dBm]	Verdict
		Ant_1	Ant_2	Sum		
11B	LCH	7.88	7.20	/	30	PASS
	MCH	8.21	8.33	/	30	PASS
	HCH	7.95	8.02	/	30	PASS
11G	LCH	8.80	8.76	/	30	PASS
	MCH	8.60	8.62	/	30	PASS
	HCH	7.67	8.49	/	30	PASS
11N20	LCH	7.43	7.72	10.59	27.99	PASS
	MCH	7.46	8.71	11.14	27.99	PASS
	HCH	8.42	8.24	11.34	27.99	PASS
11N40	LCH	7.71	8.79	11.29	27.99	PASS
	MCH	7.43	8.67	11.10	27.99	PASS
	HCH	7.12	7.87	10.52	27.99	PASS

A.3 Maximum Power Spectral Density

Ant_1

Mode	Channel	Meas.Level [dBm/30KHz]	Convert Factor	Result [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-0.648	-10	-10.648	8	PASS
	MCH	-4.361	-10	-14.361	8	PASS
	HCH	-4.345	-10	-14.345	8	PASS
11G	LCH	-7.585	-10	-17.585	8	PASS
	MCH	-8.440	-10	-18.440	8	PASS
	HCH	-10.255	-10	-20.255	8	PASS
11N20	LCH	-6.784	-10	-16.784	8	PASS
	MCH	-7.478	-10	-17.478	8	PASS
	HCH	-7.327	-10	-17.327	8	PASS
11N40	LCH	-11.325	-10	-21.325	8	PASS
	MCH	-11.375	-10	-21.375	8	PASS
	HCH	-9.138	-10	-19.138	8	PASS

***Note: The Convert Factor = 10*log(3KHz/30KHz) = -10

Ant_2

Mode	Channel	Meas.Level [dBm/30KHz]	Convert Factor	Result [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-4.663	-10	-14.663	8	PASS
	MCH	-4.392	-10	-14.392	8	PASS
	HCH	-4.609	-10	-14.609	8	PASS
11G	LCH	-6.036	-10	-16.036	8	PASS
	MCH	-6.576	-10	-16.576	8	PASS
	HCH	-5.530	-10	-15.530	8	PASS
11N20	LCH	-5.643	-10	-15.643	8	PASS
	MCH	-5.572	-10	-15.572	8	PASS
	HCH	-5.463	-10	-15.463	8	PASS
11N40	LCH	-10.095	-10	-20.095	8	PASS
	MCH	-10.675	-10	-20.675	8	PASS
	HCH	-8.105	-10	-18.105	8	PASS

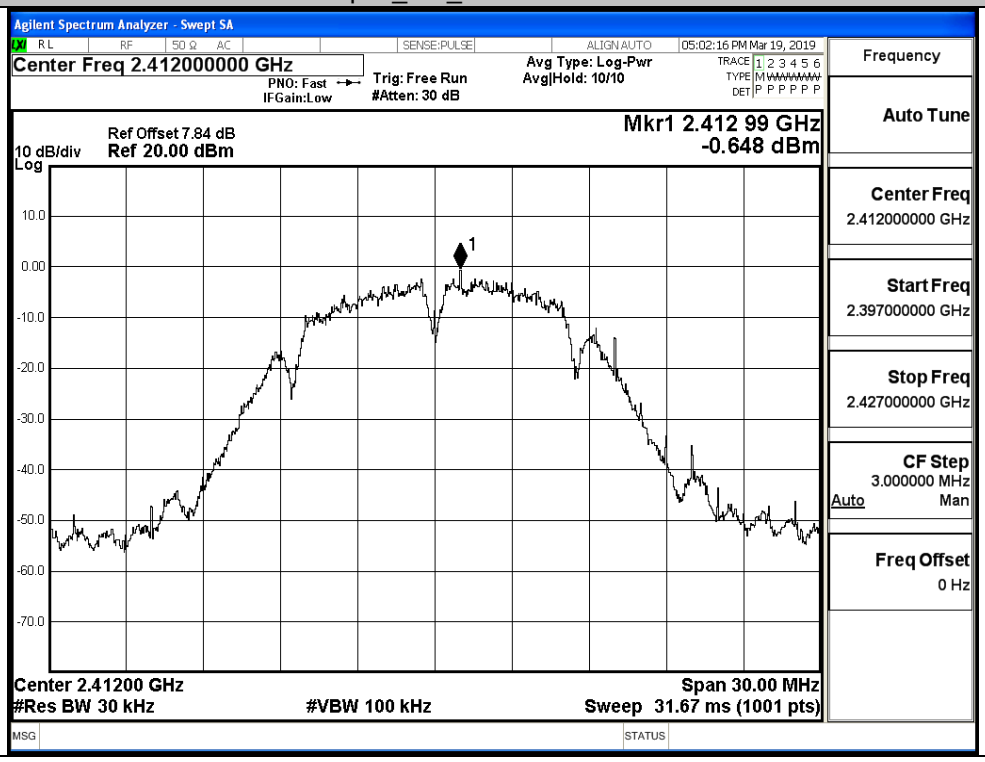
***Note: The Convert Factor = 10*log(3KHz/30KHz) = -10

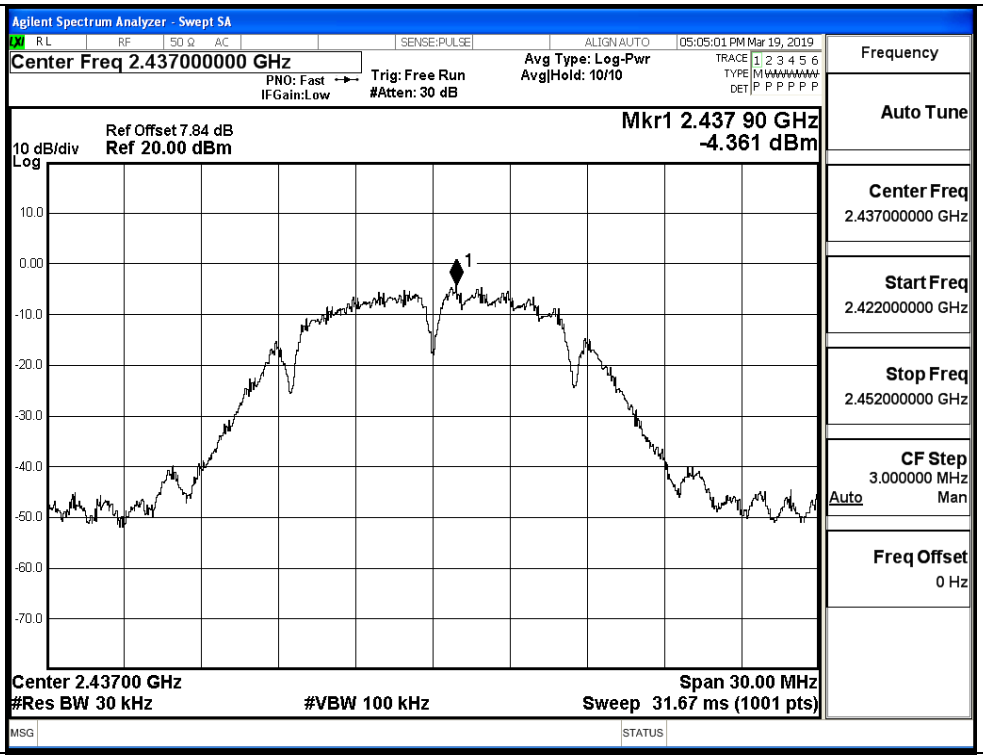
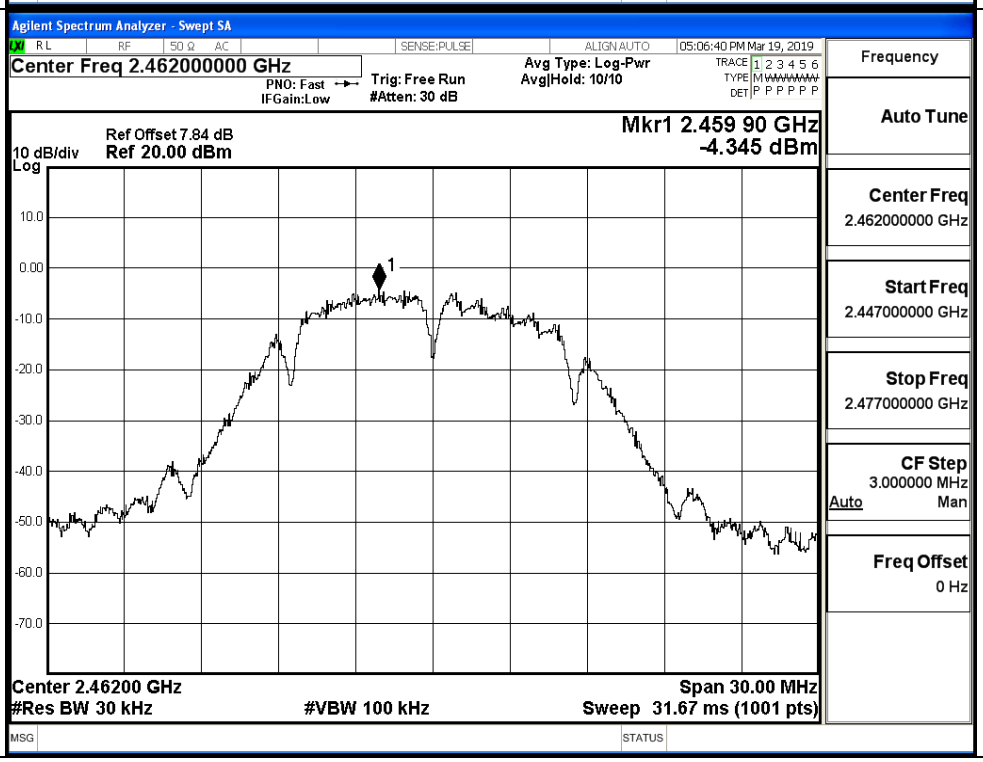
Combined Ant_1 and Ant_2

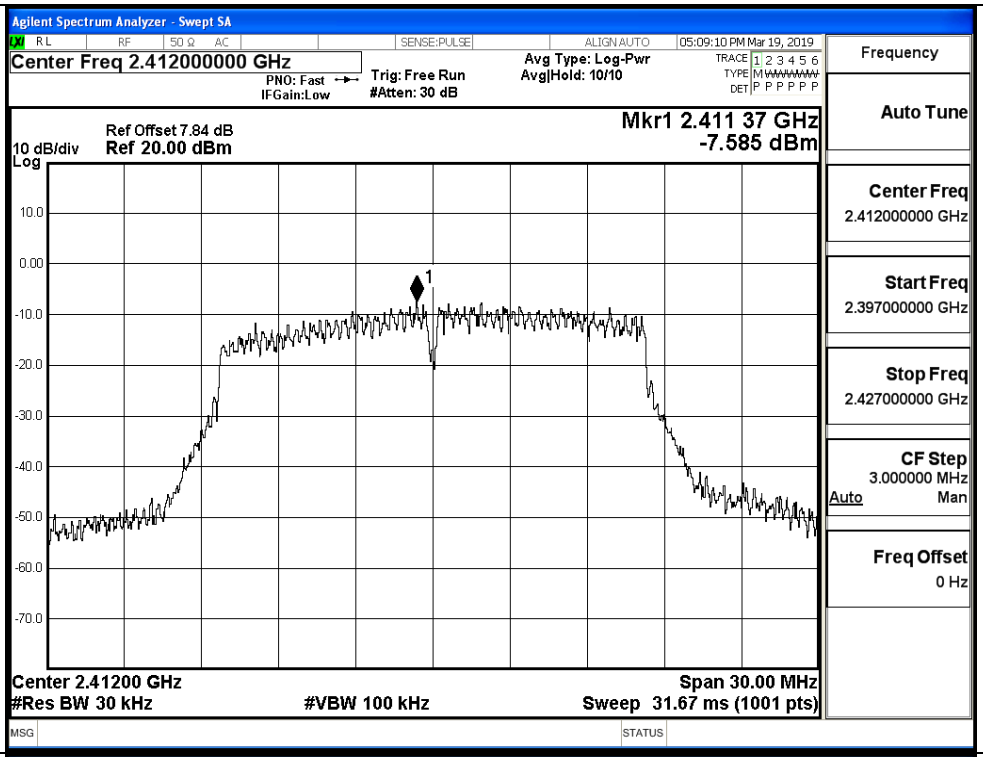
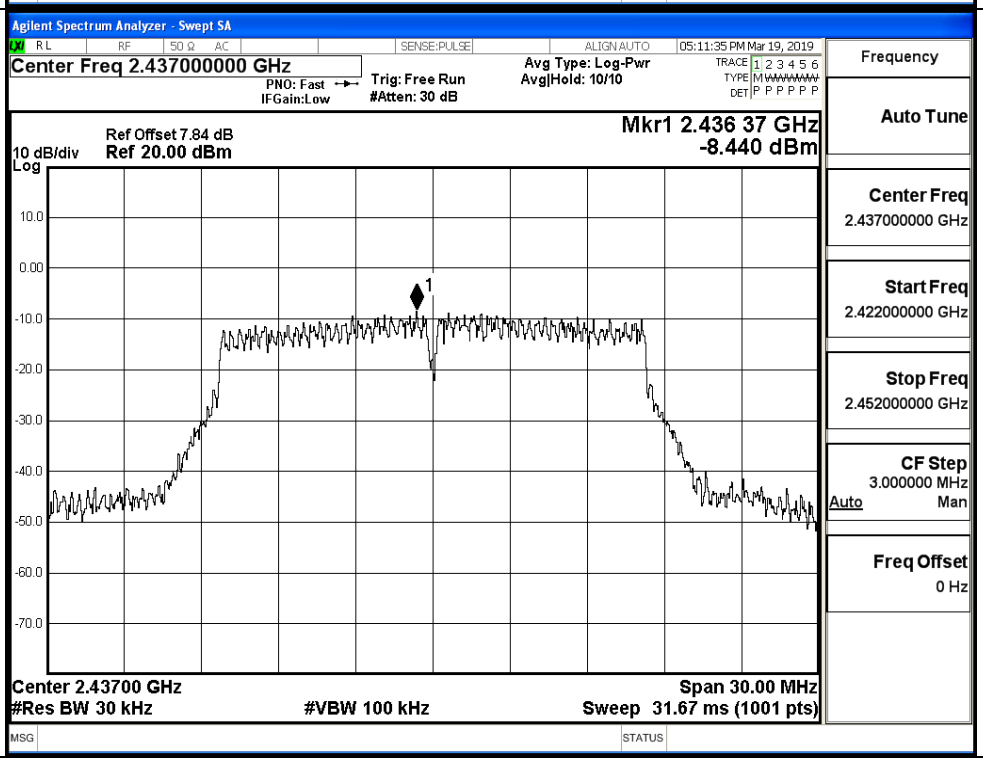
Mode	Channel	Result [dBm/3KHz]			Limit [dBm/3KHz]	Verdict
		Ant_1	Ant_2	Sum		
11N20	LCH	-16.784	-15.643	-13.17	5.99	PASS
	MCH	-17.478	-15.572	-13.41	5.99	PASS
	HCH	-17.327	-15.463	-13.29	5.99	PASS
11N40	LCH	-21.325	-20.095	-17.66	5.99	PASS
	MCH	-21.375	-20.675	-18.00	5.99	PASS
	HCH	-19.138	-18.105	-15.58	5.99	PASS

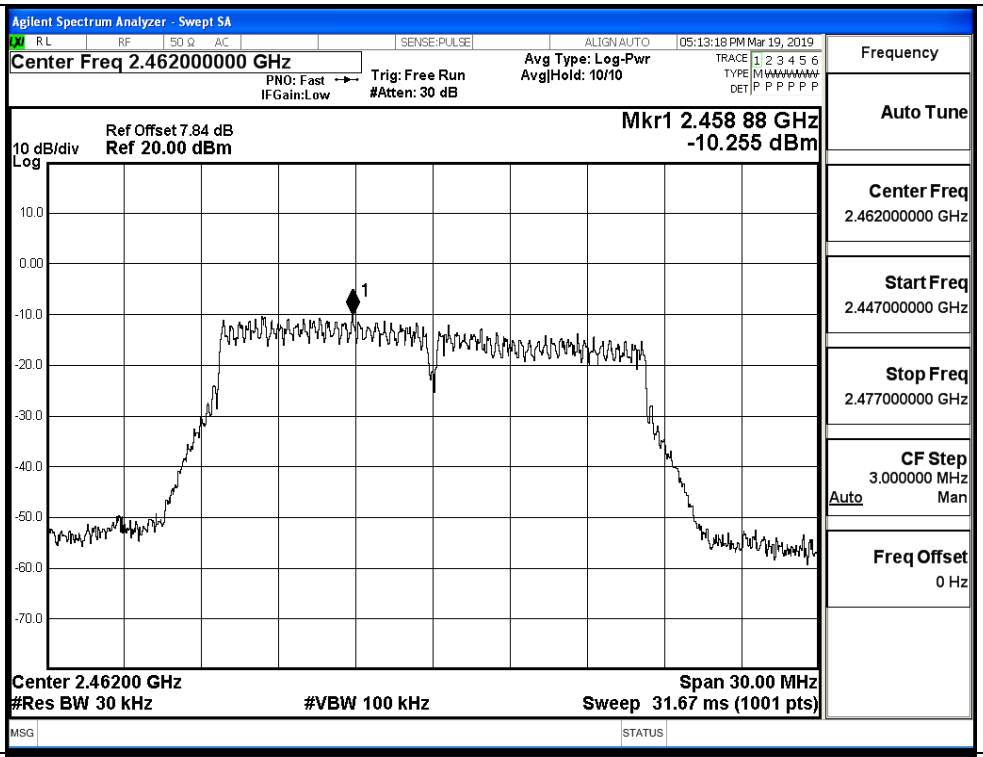
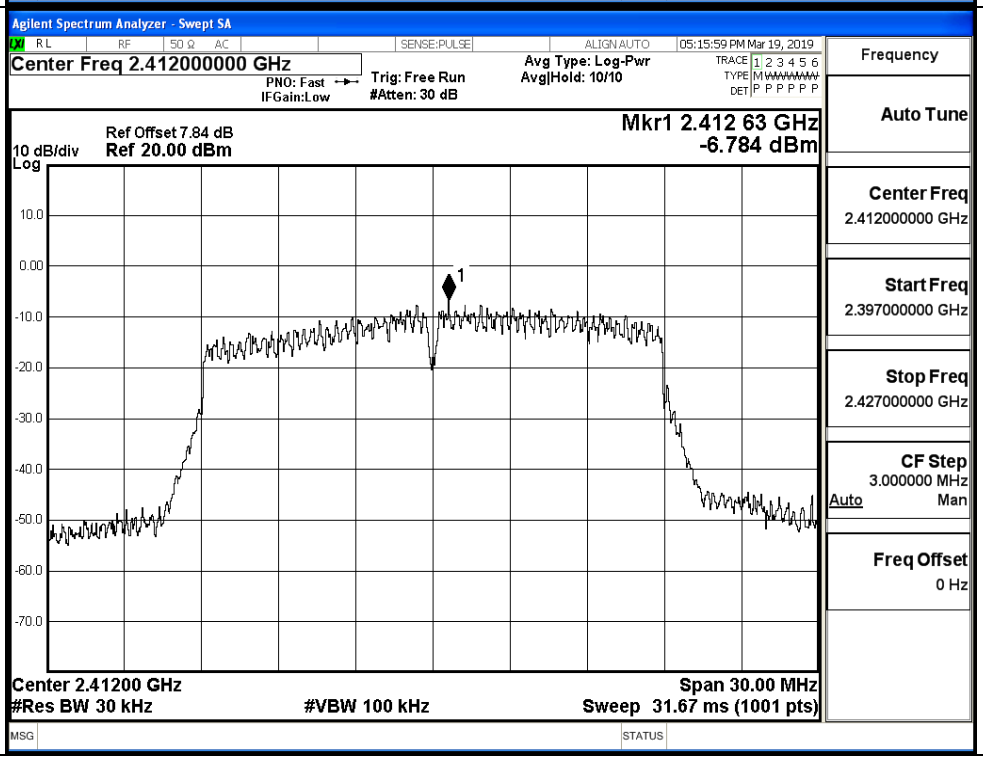
Test Graphs_Ant_1

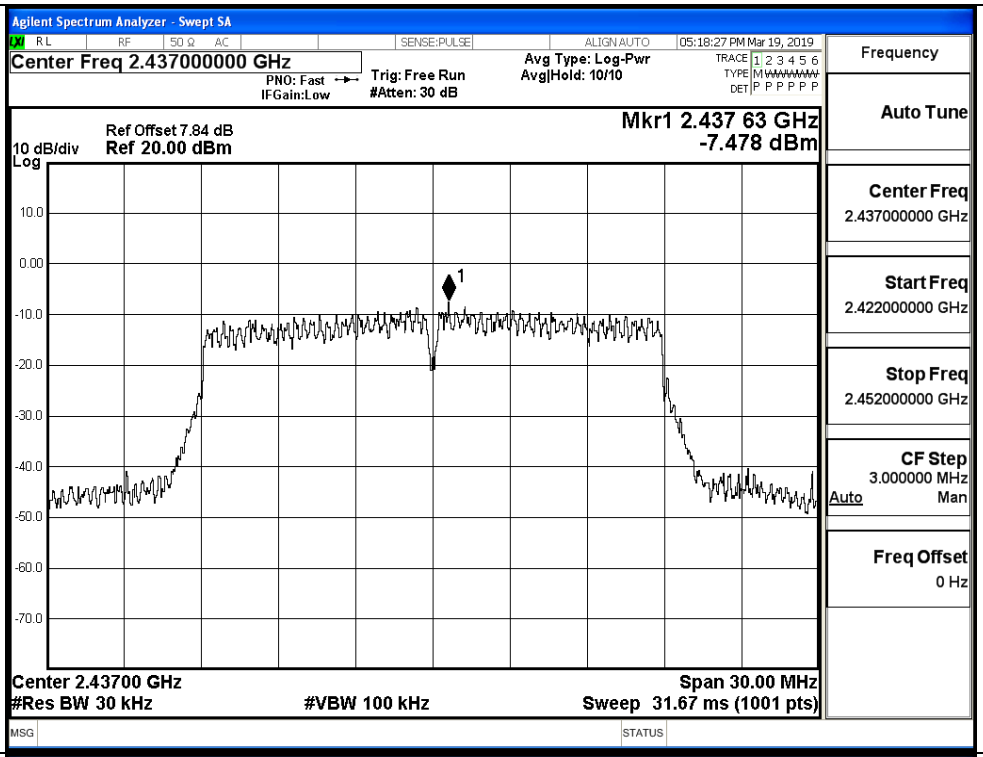
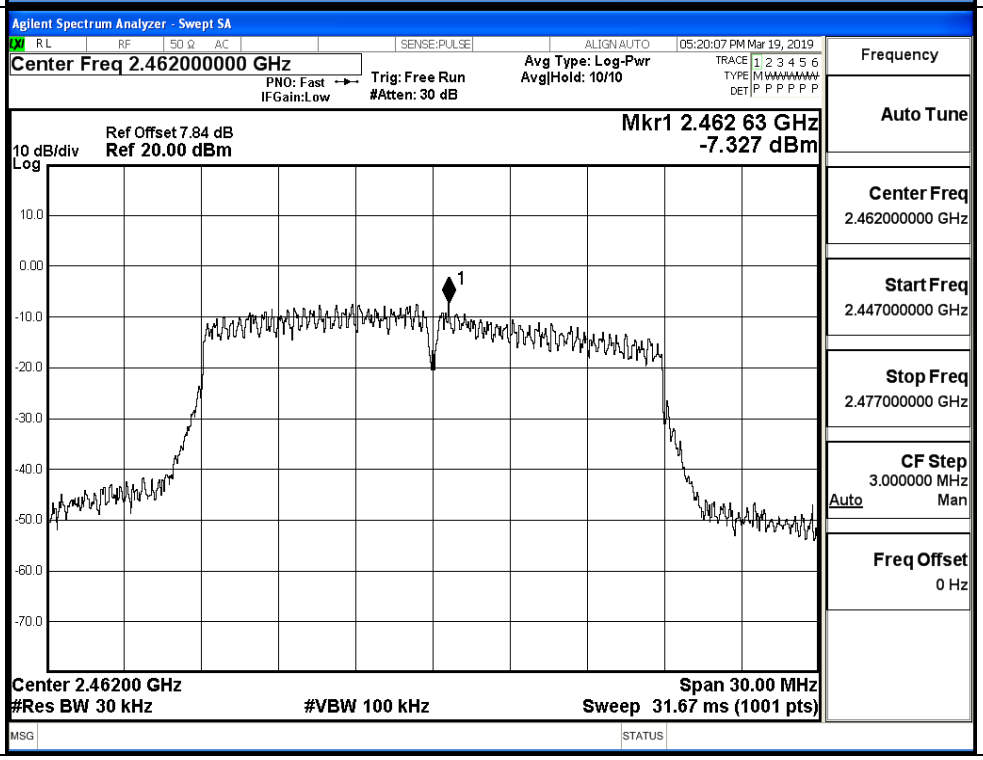
11B/LCH

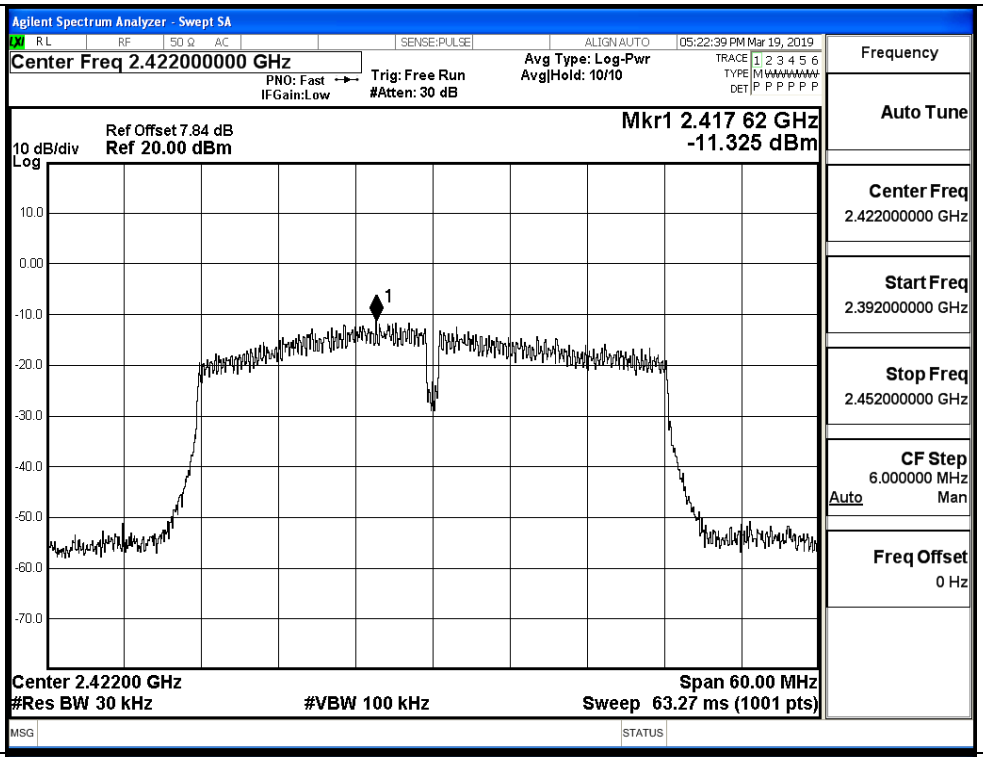
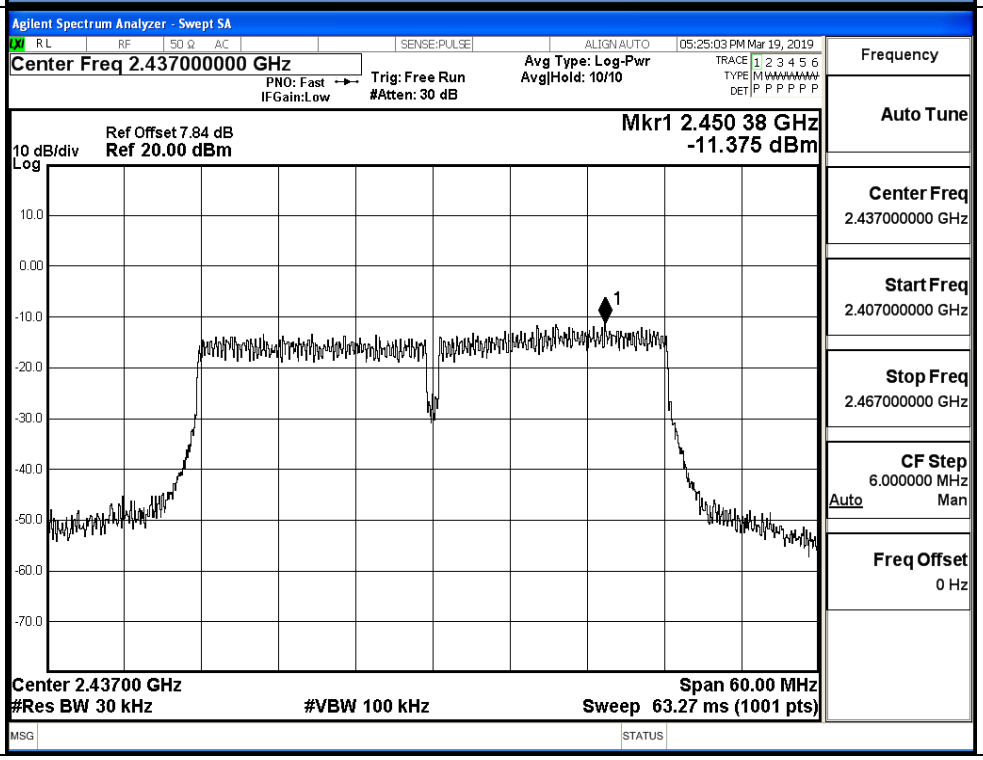


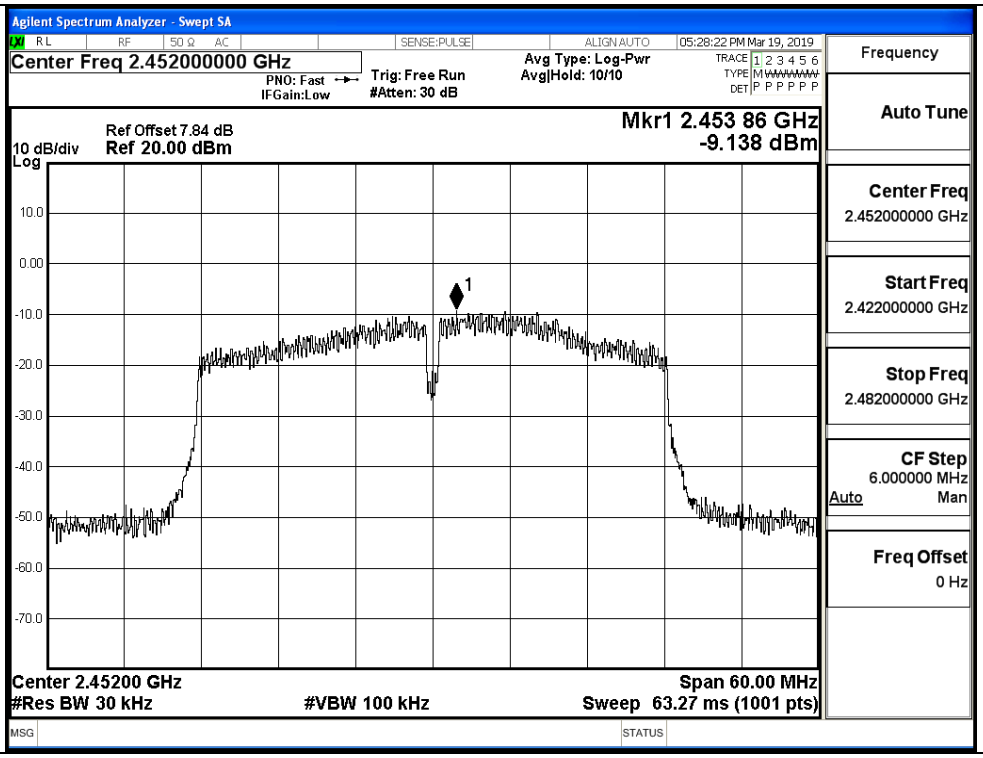
11B/MCH	
11B/HCH	

11G/LCH	
11G/MCH	

11G/HCH	
11N20/LCH	

11N20/MCH	
11N20/HCH	

11N40/LCH	
11N40/MCH	

11N40/HCH	

Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
05:28:22 PM Mar 19, 2019
Center Freq 2.452000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P P
Ref Offset 7.84 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.453 86 GHz
-9.138 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.45200 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 60.00 MHz
Sweep 63.27 ms (1001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.452000000 GHz
Start Freq
2.422000000 GHz
Stop Freq
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CF Step
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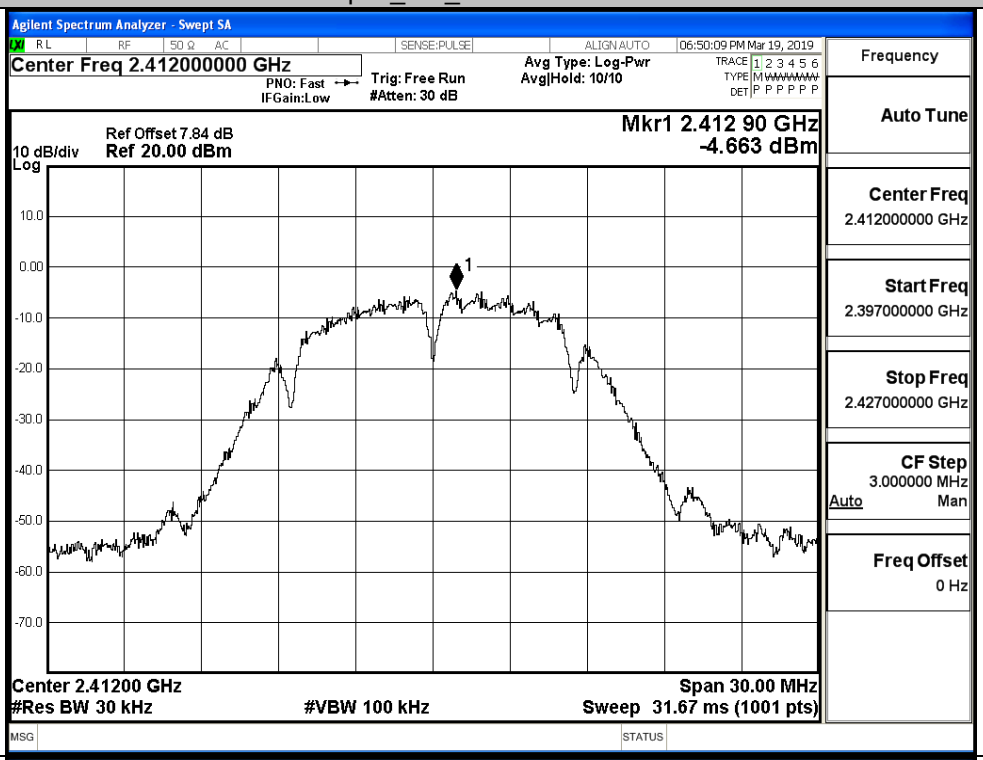
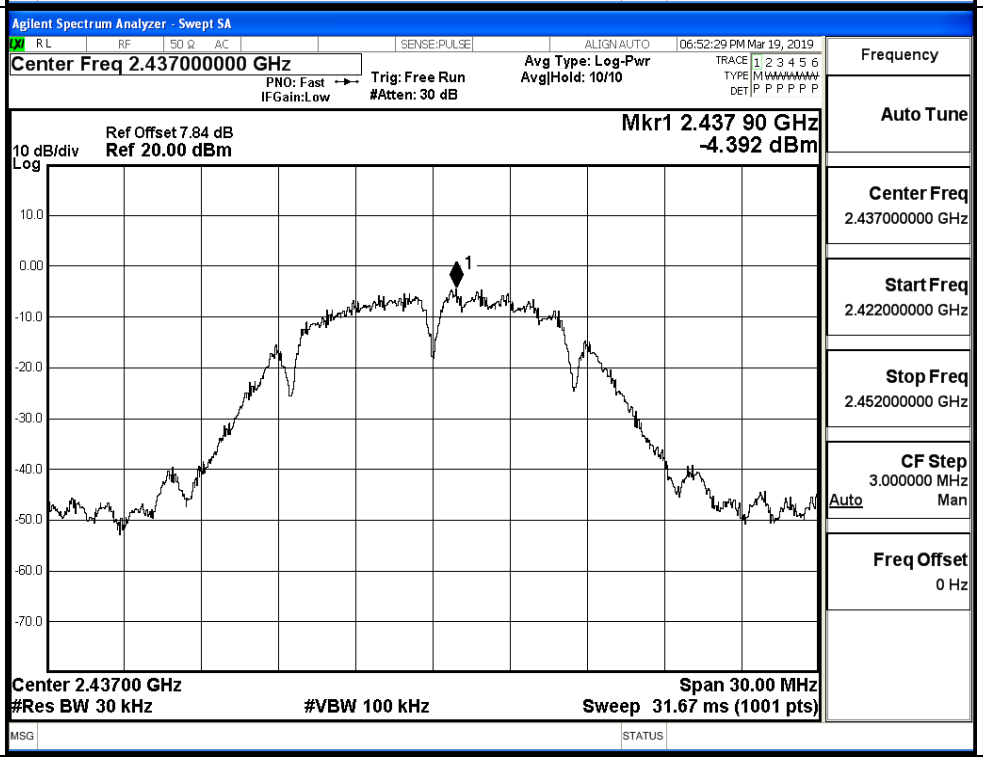
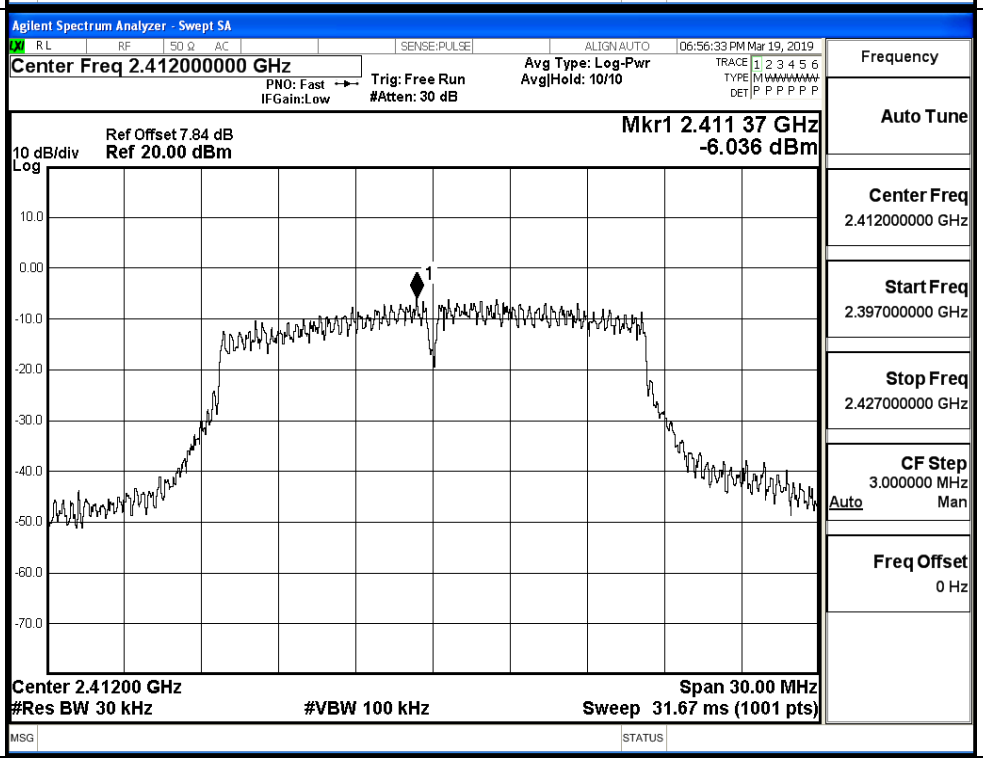
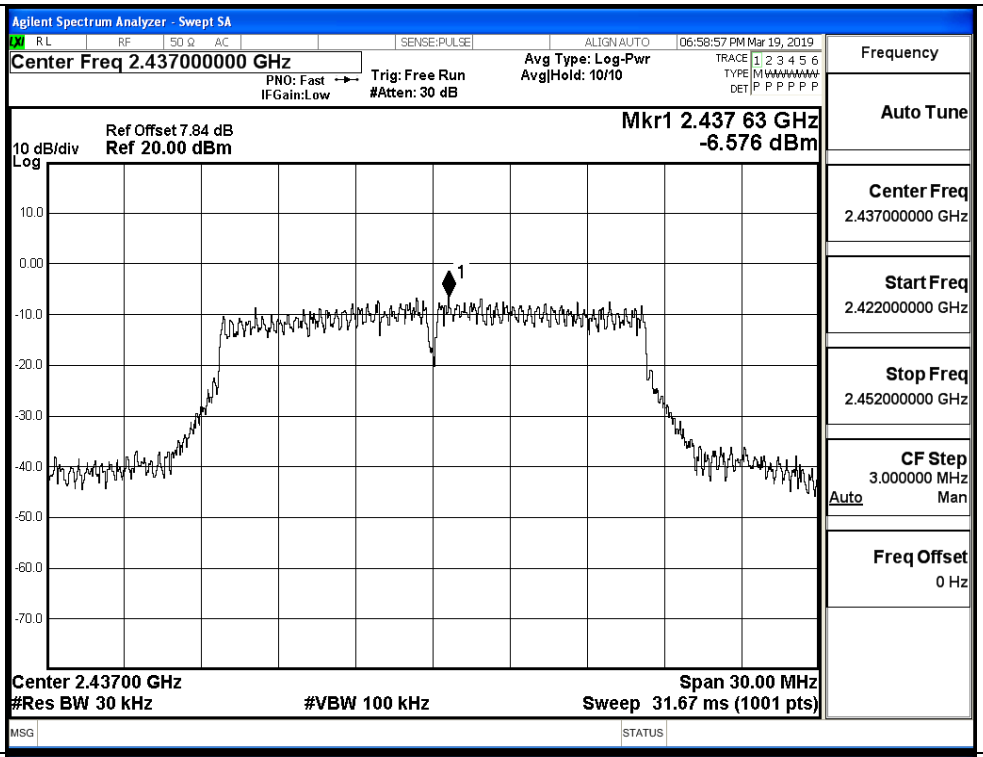
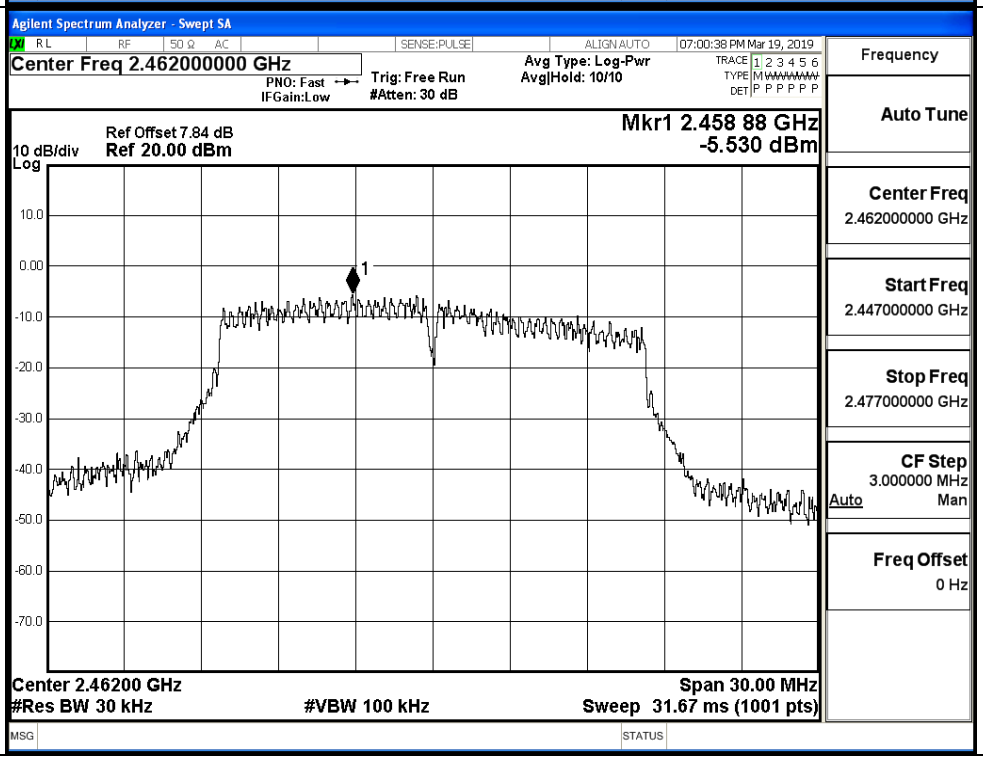
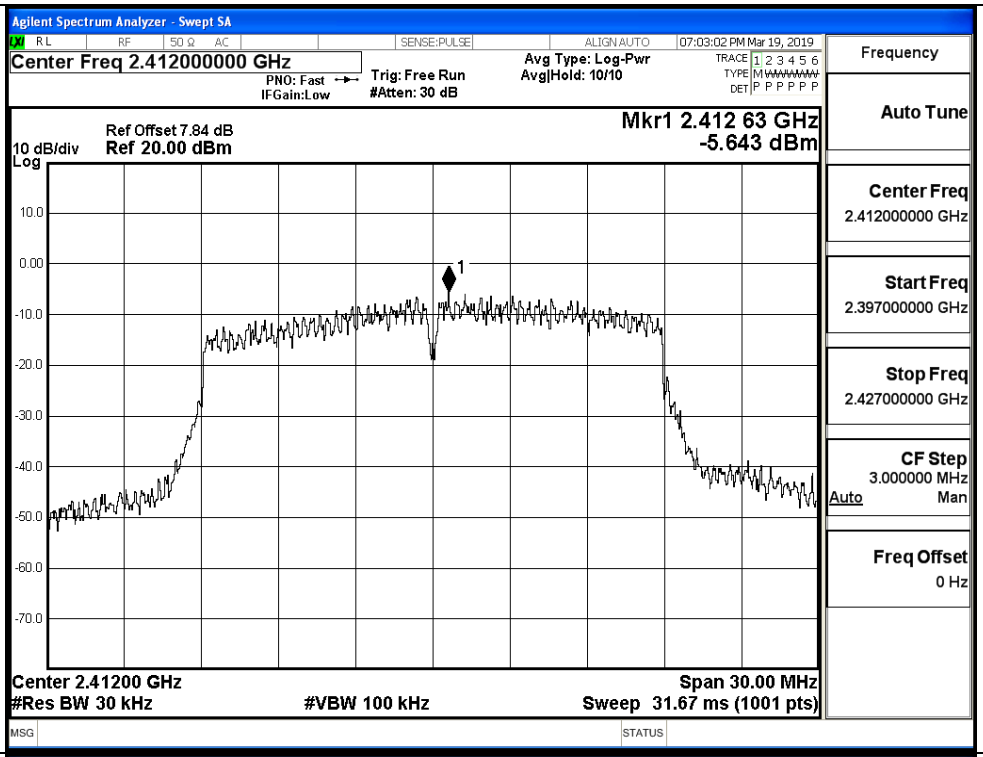
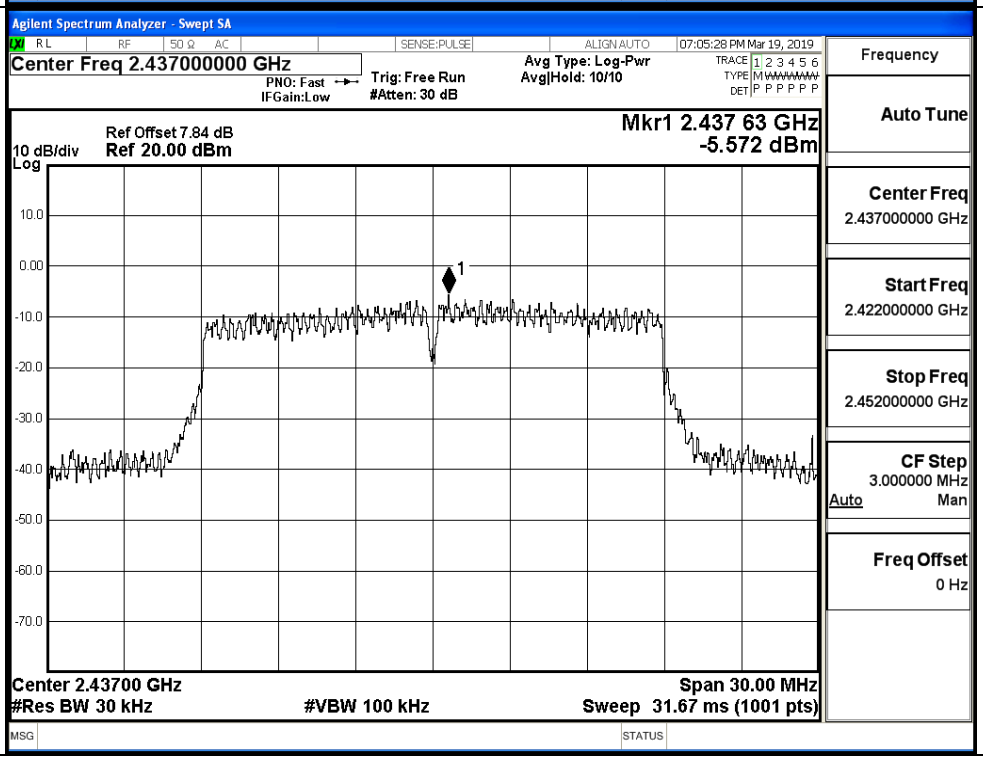
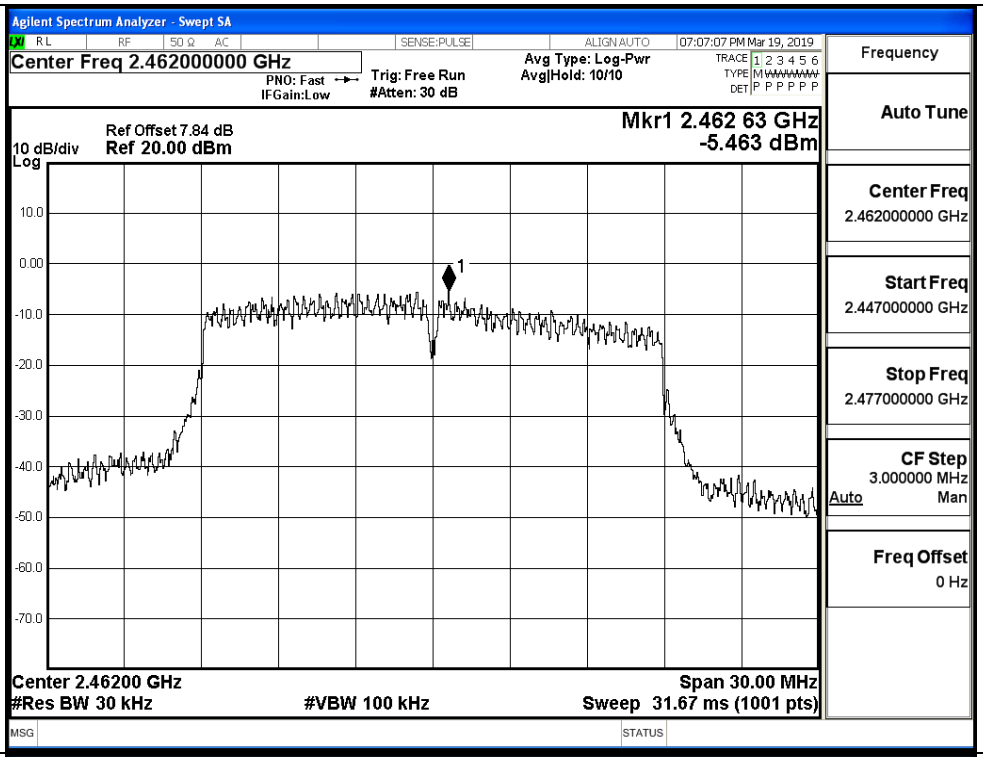
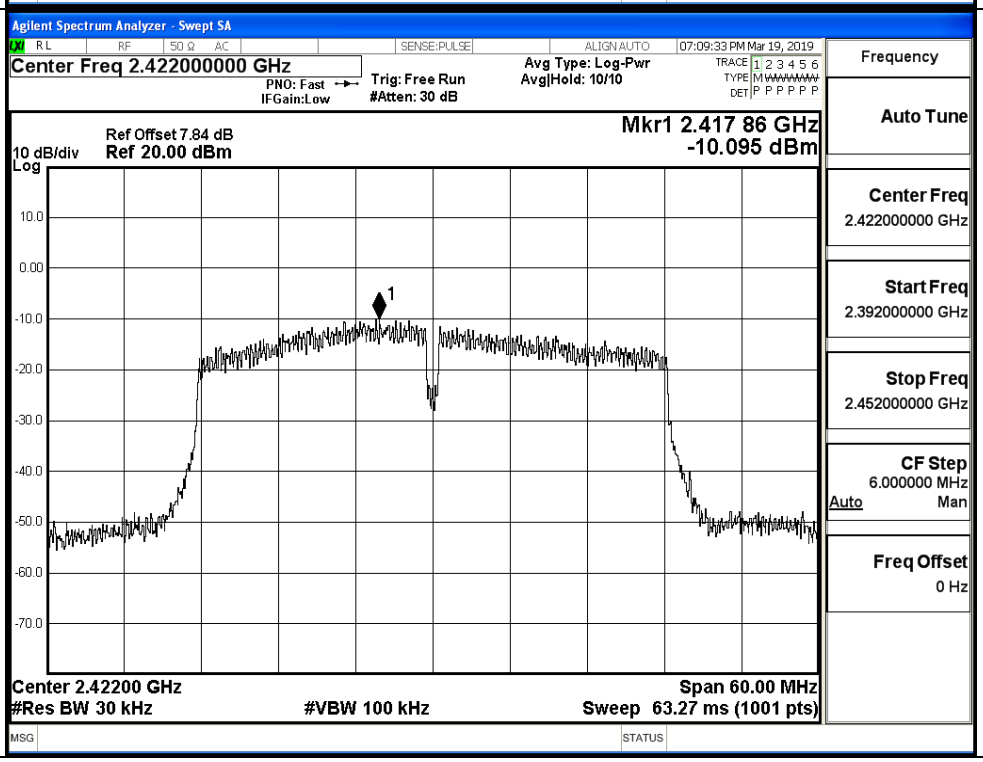
Auto
Man
Freq Offset
0 Hz

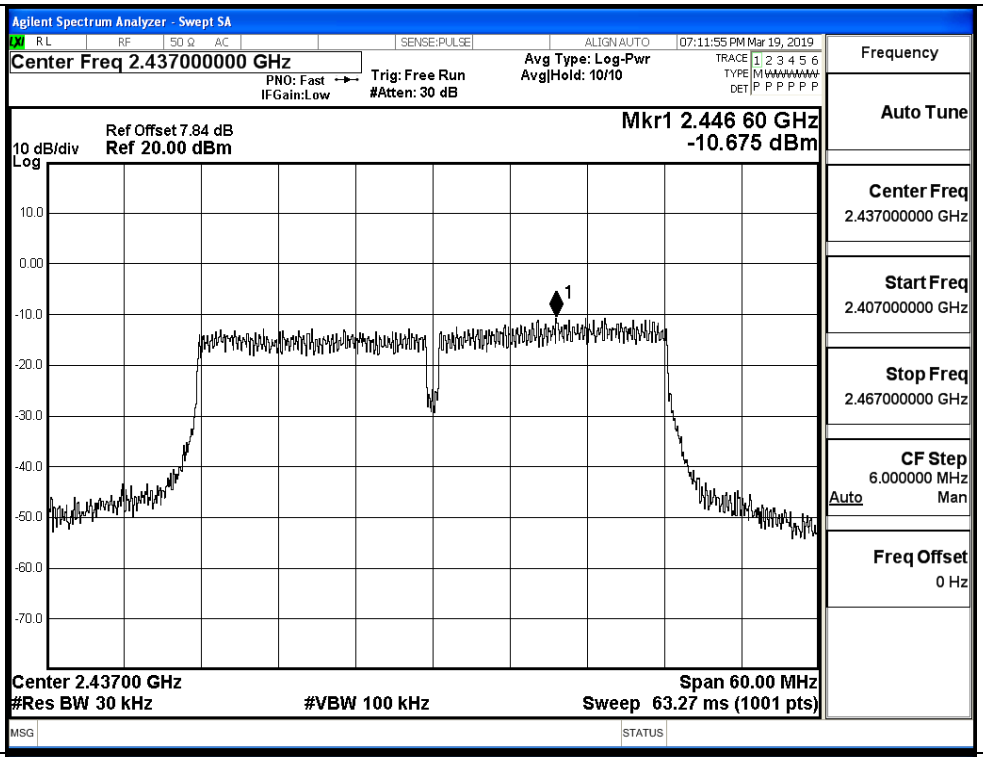
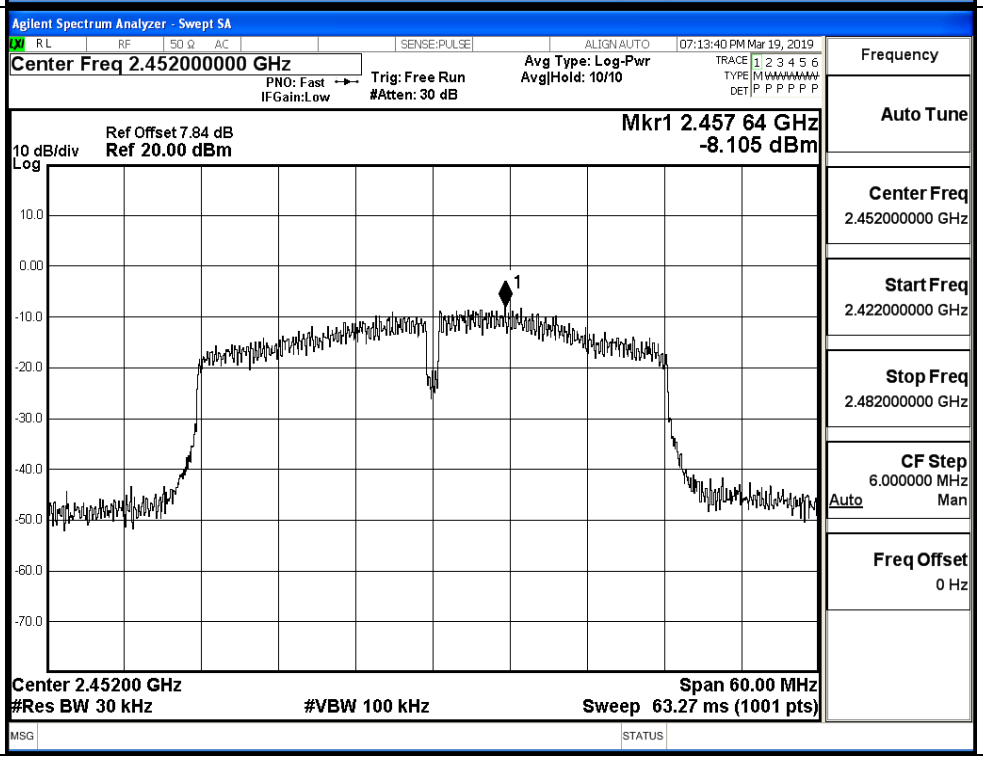
Test Graphs_Ant_2		
11B/LCH		
11B/MCH		

11B/HCH	
11G/LCH	

11G/MCH	
11G/HCH	

11N20/LCH	
11N20/MCH	

11N20/HCH		
11N40/LCH		

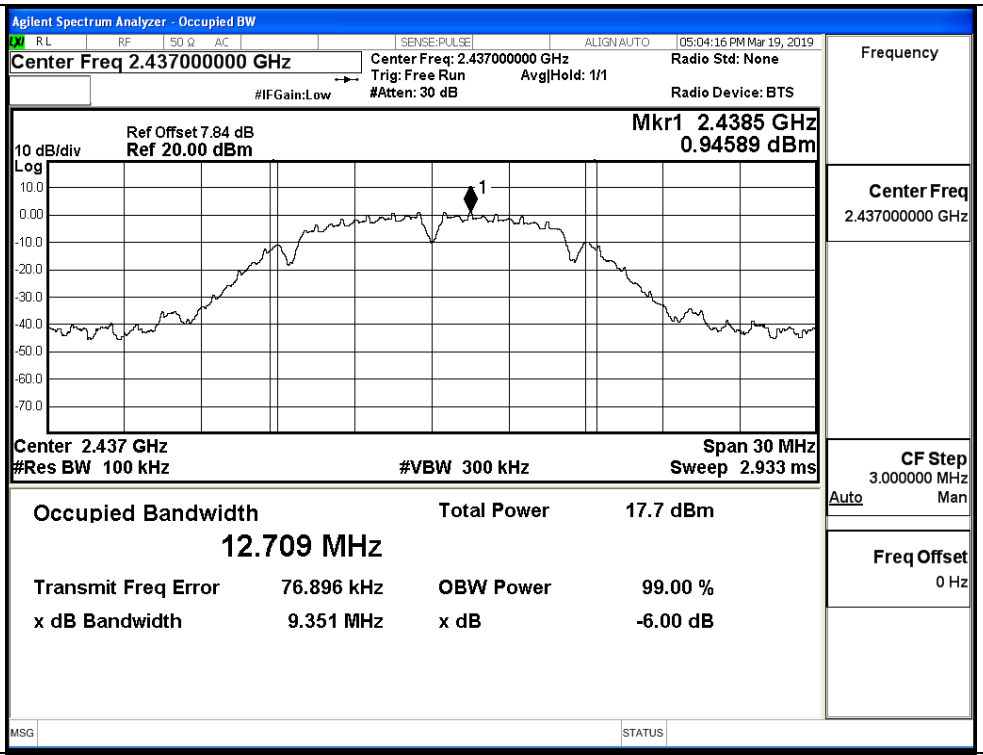
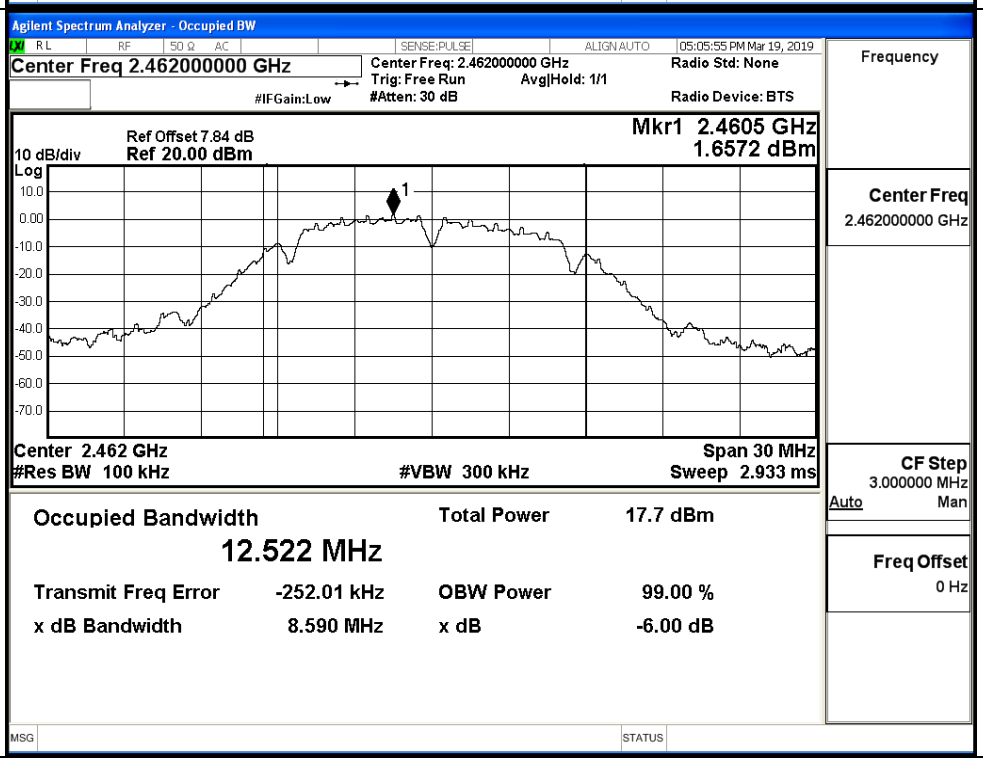
11N40/MCH	
11N40/HCH	

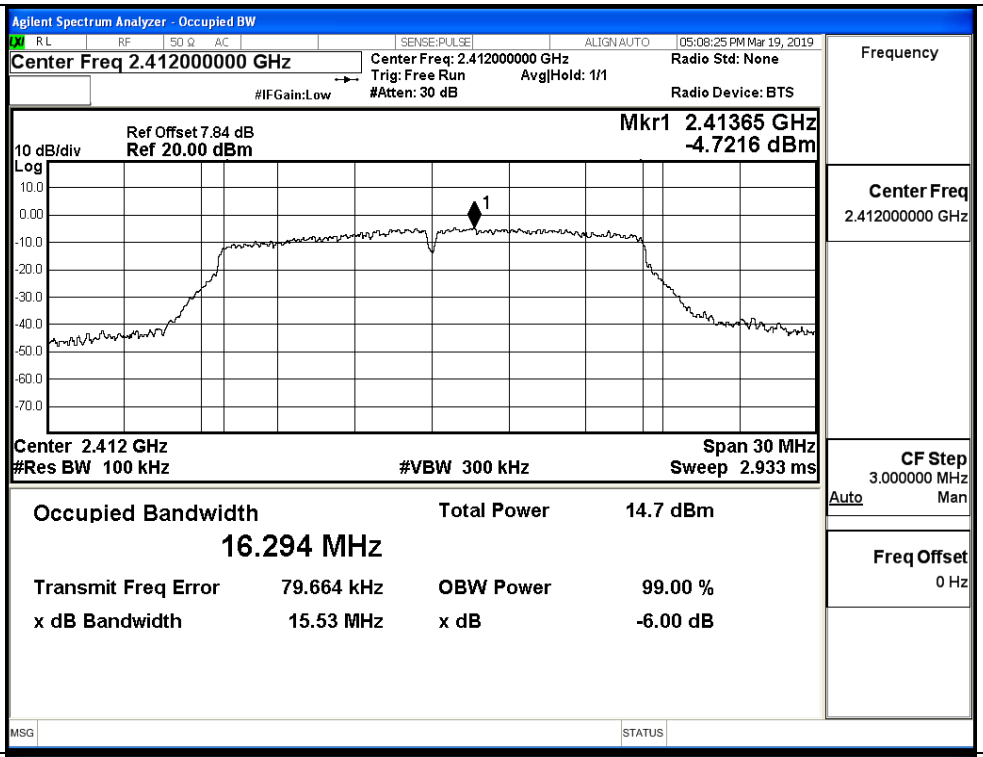
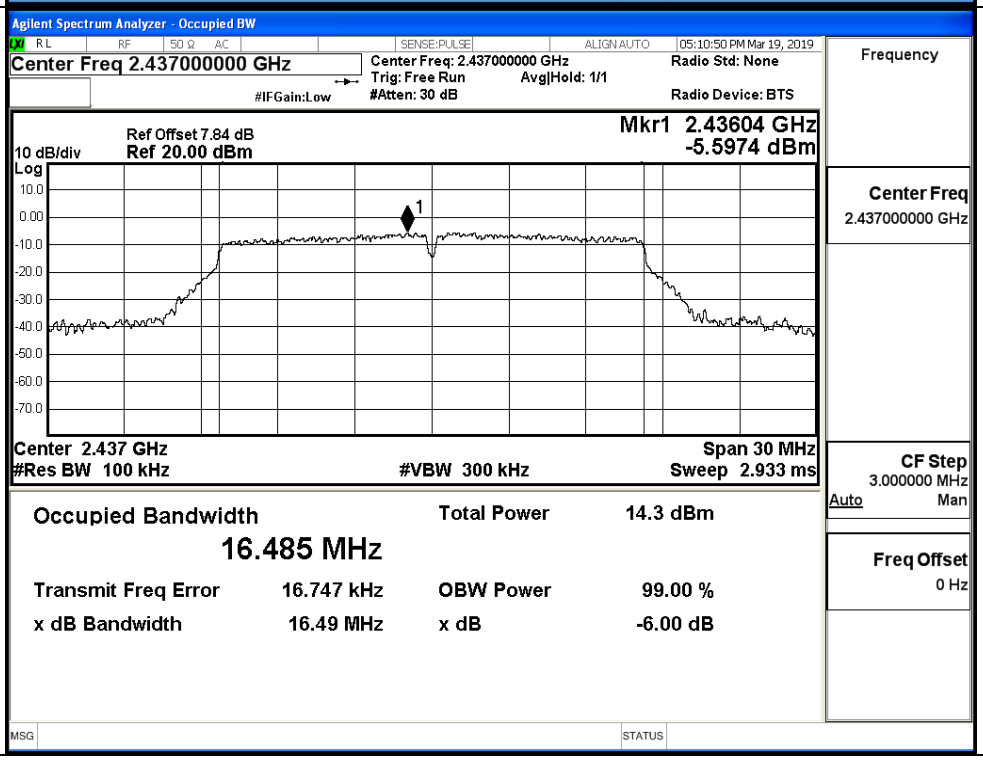
A.4 6dB Bandwidth

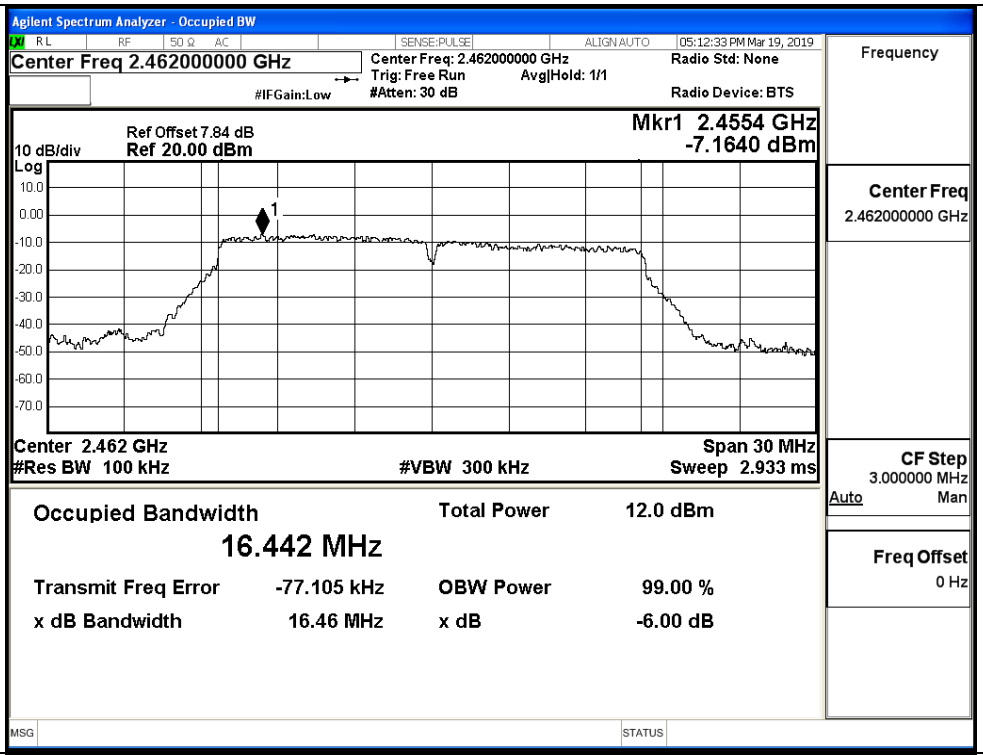
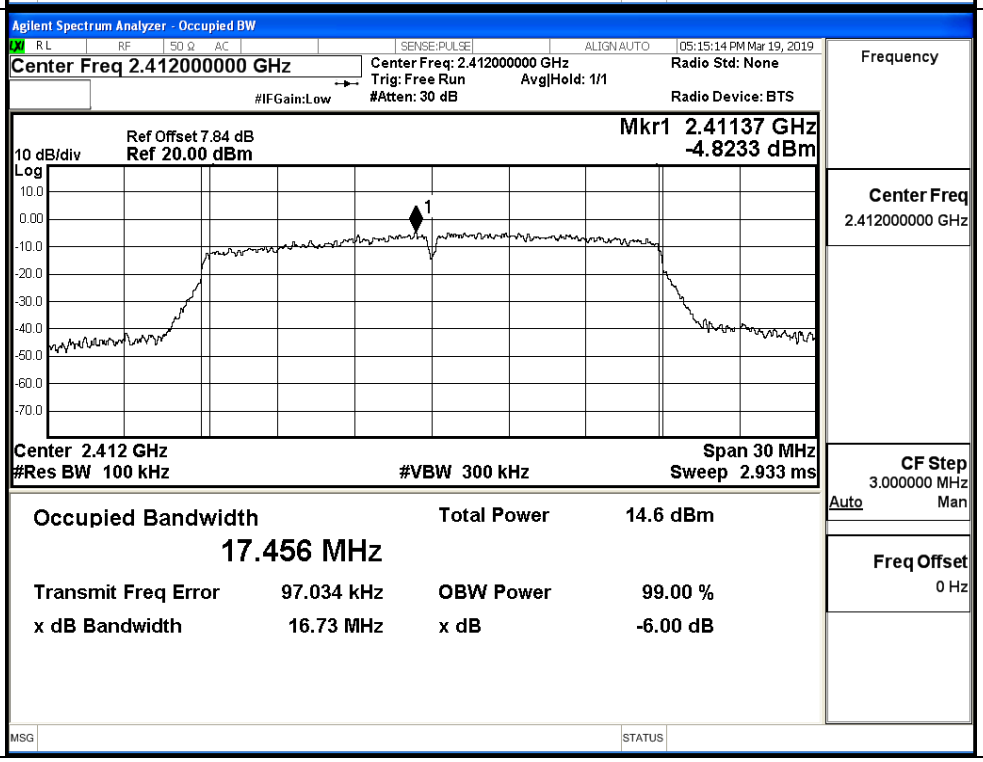
Mode	Channel	6dB Bandwidth [MHz]		Limit [MHz]	Verdict
		Ant_1	Ant_2		
11B	LCH	9.106	8.741	≥0.5	PASS
	MCH	9.351	9.521	≥0.5	PASS
	HCH	8.590	8.598	≥0.5	PASS
11G	LCH	15.53	15.14	≥0.5	PASS
	MCH	16.49	16.48	≥0.5	PASS
	HCH	16.46	15.15	≥0.5	PASS
11N20	LCH	16.73	16.71	≥0.5	PASS
	MCH	17.72	17.75	≥0.5	PASS
	HCH	15.46	15.49	≥0.5	PASS
11N40	LCH	32.97	33.82	≥0.5	PASS
	MCH	36.49	36.50	≥0.5	PASS
	HCH	28.44	25.83	≥0.5	PASS

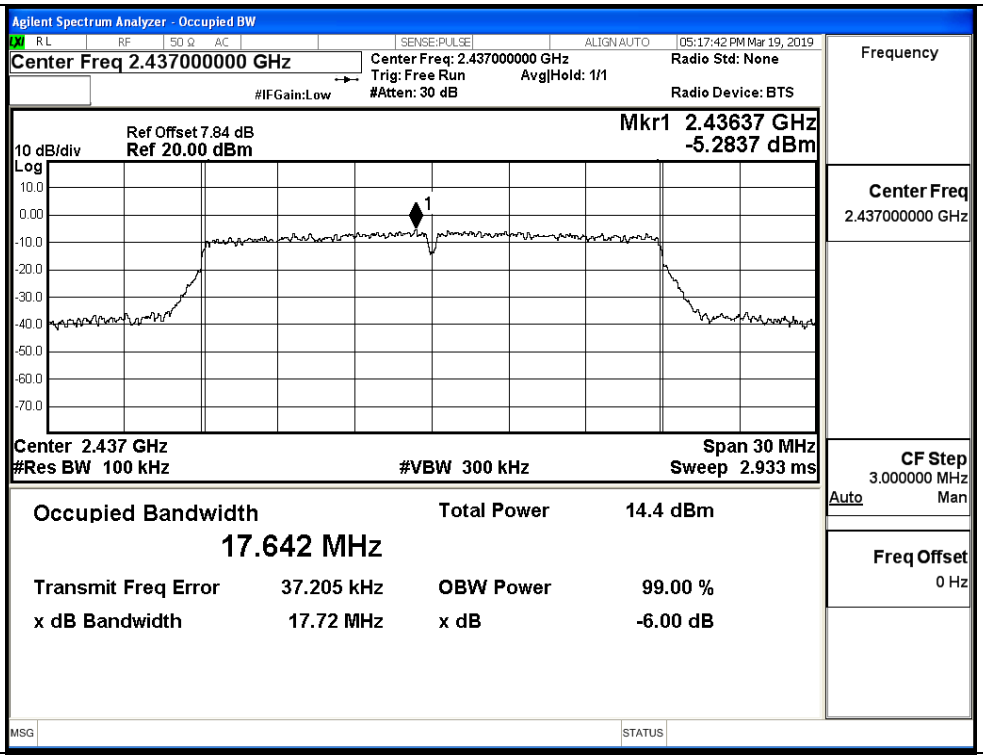
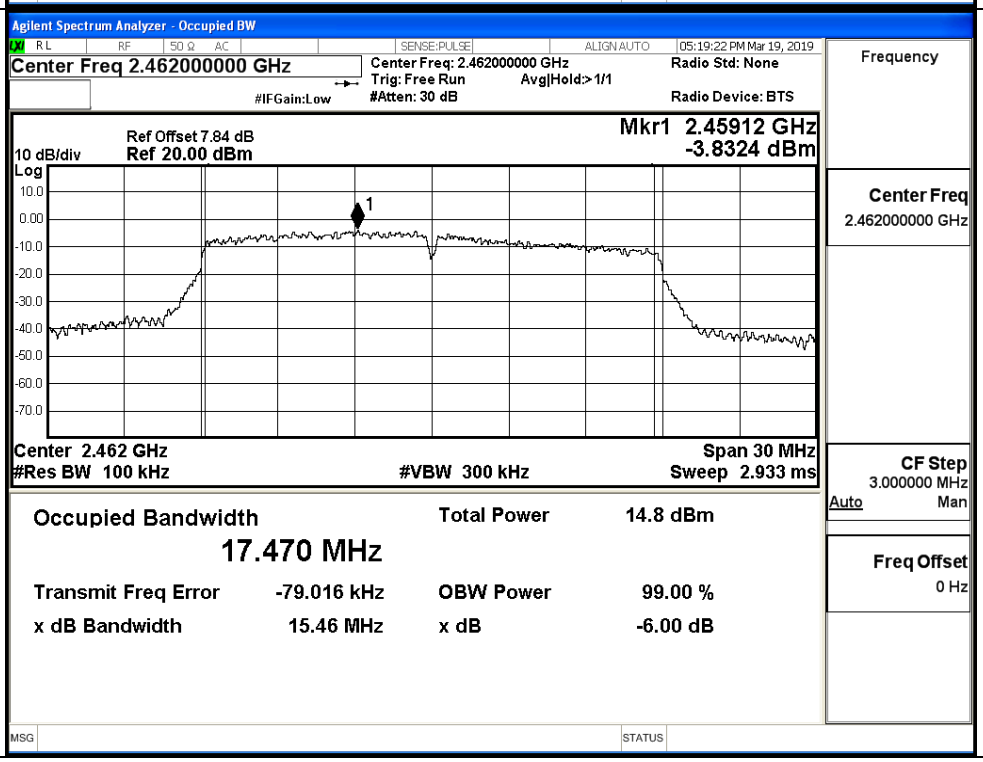
Test Graphs_Ant_1

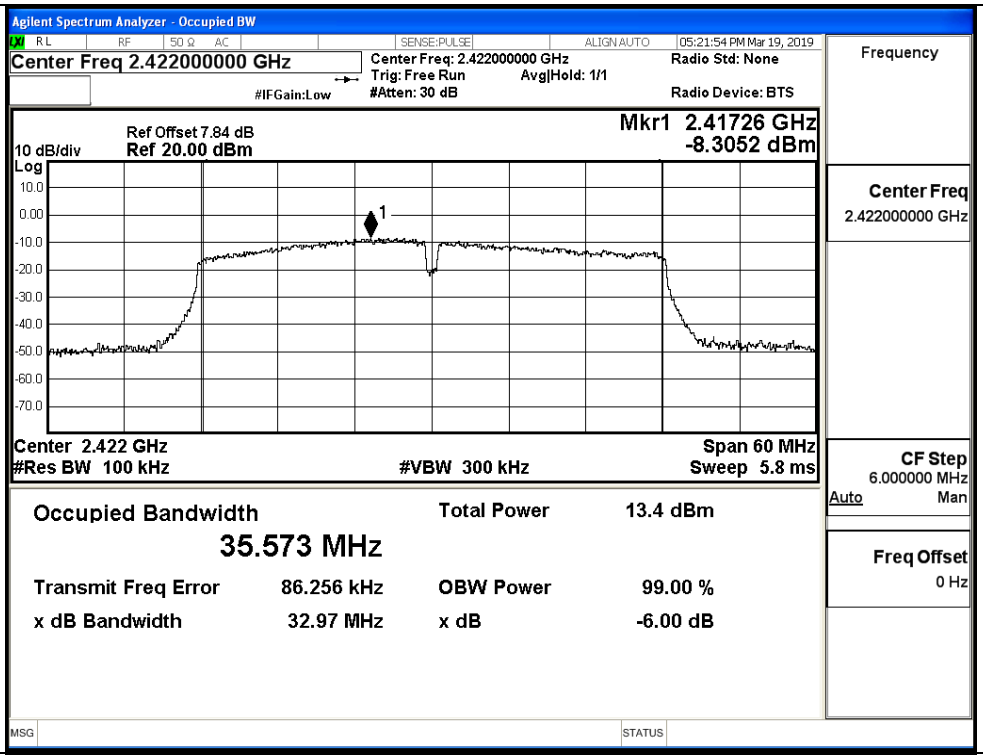
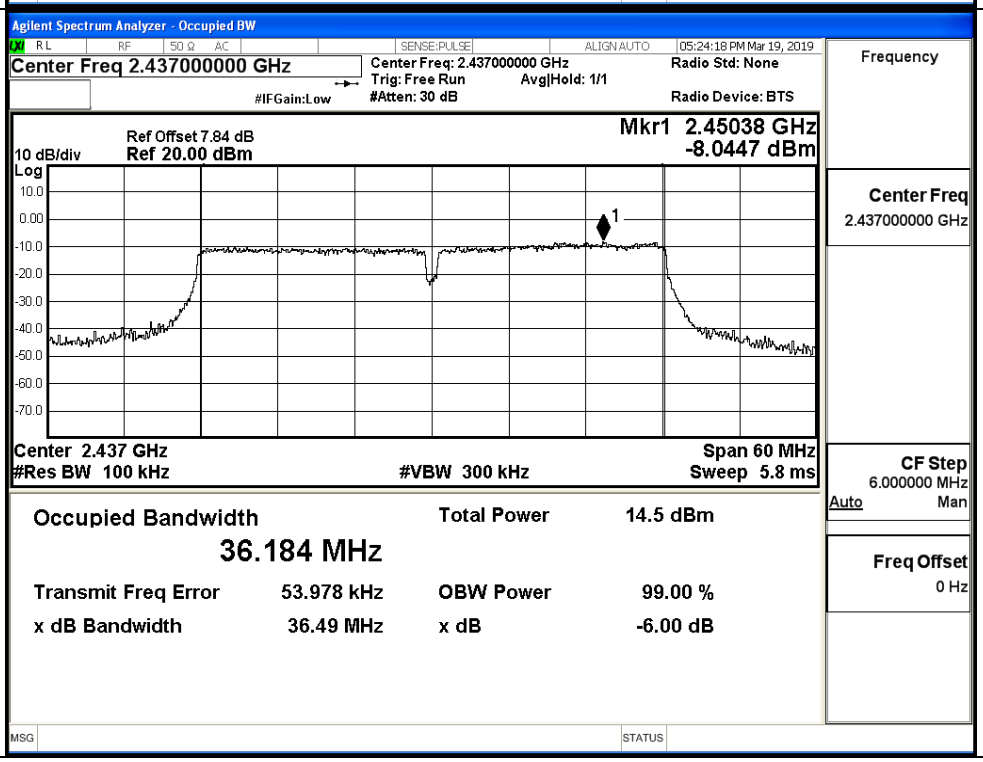
11B/LCH

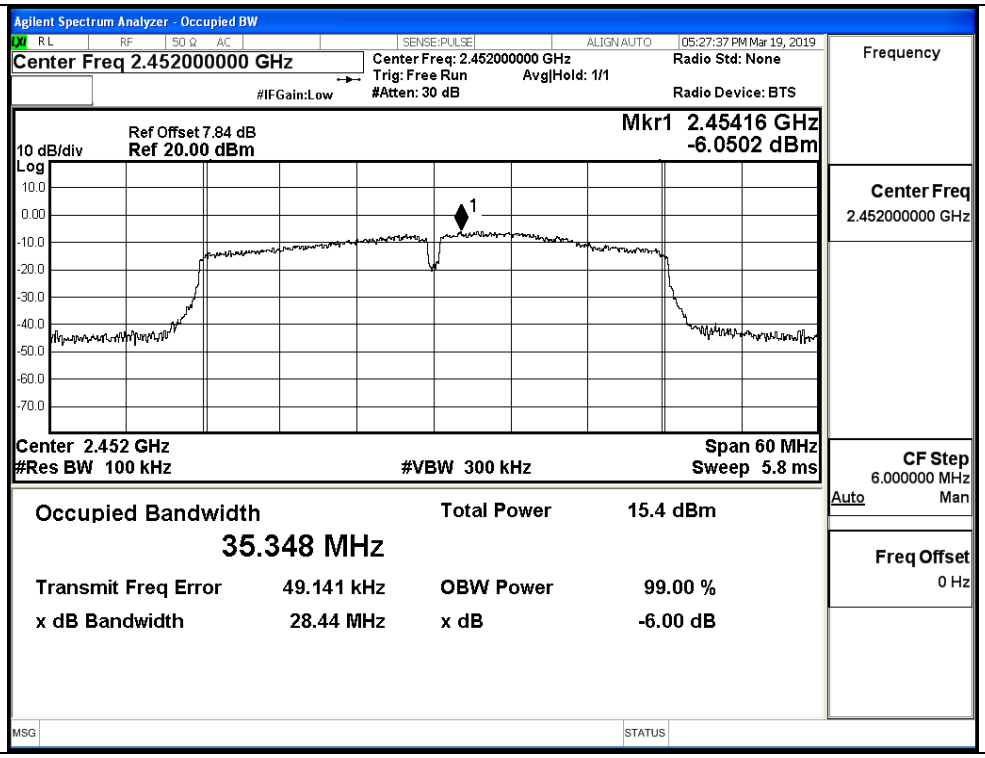
11B/MCH	
11B/HCH	

11G/LCH	
11G/MCH	

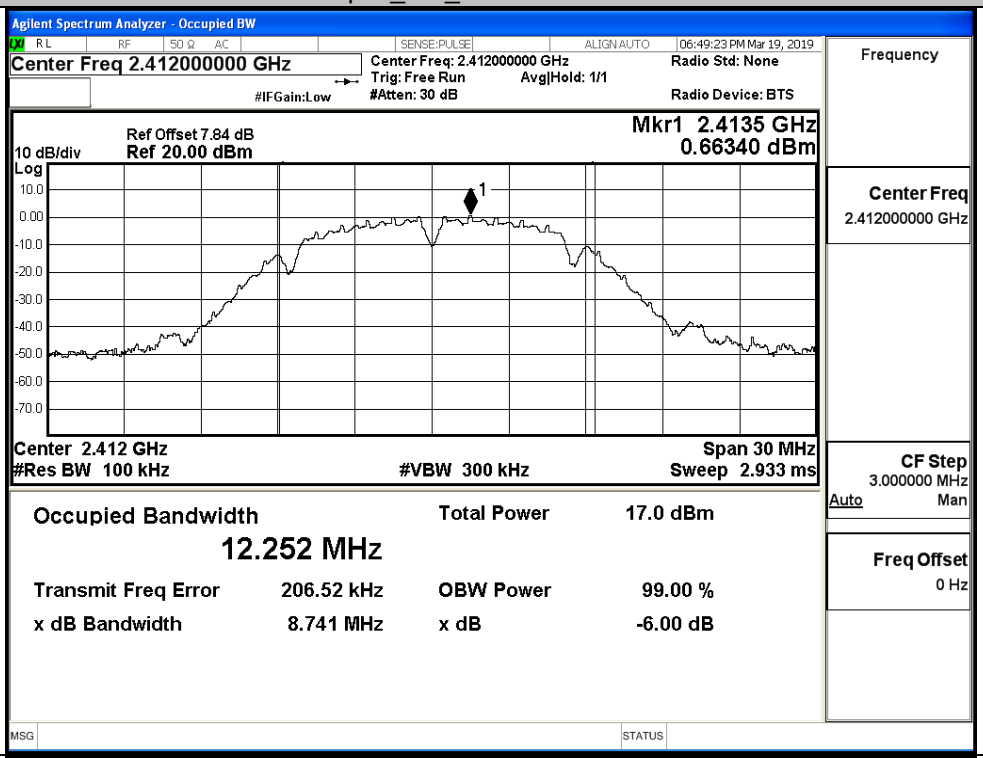
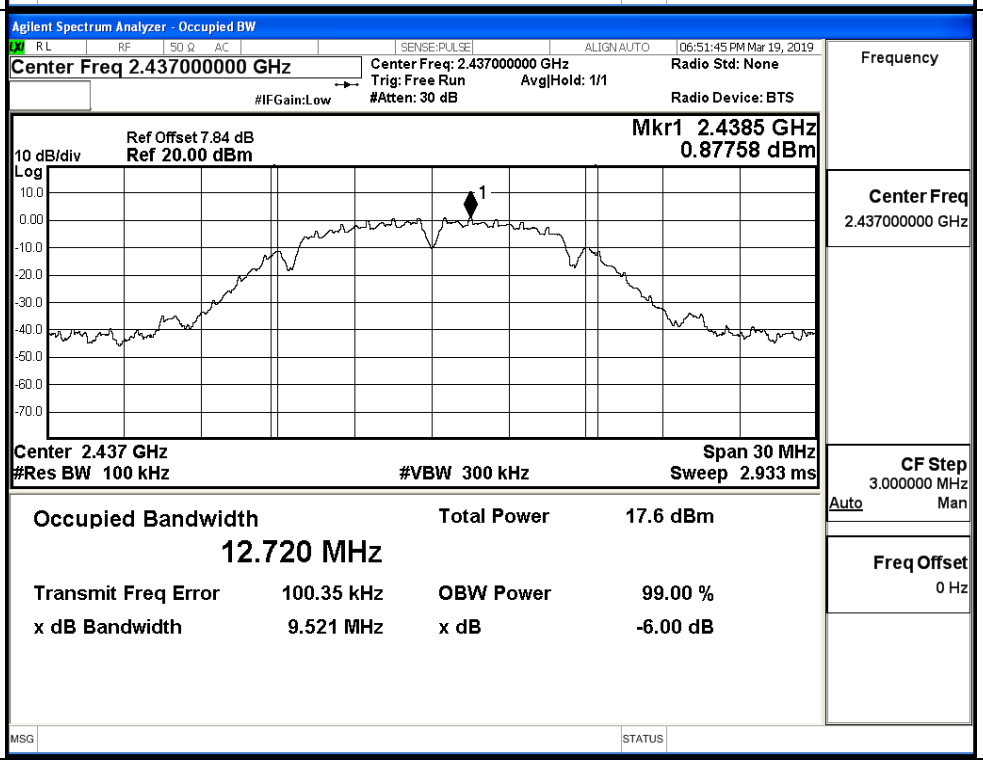
11G/HCH	
11N20/LCH	

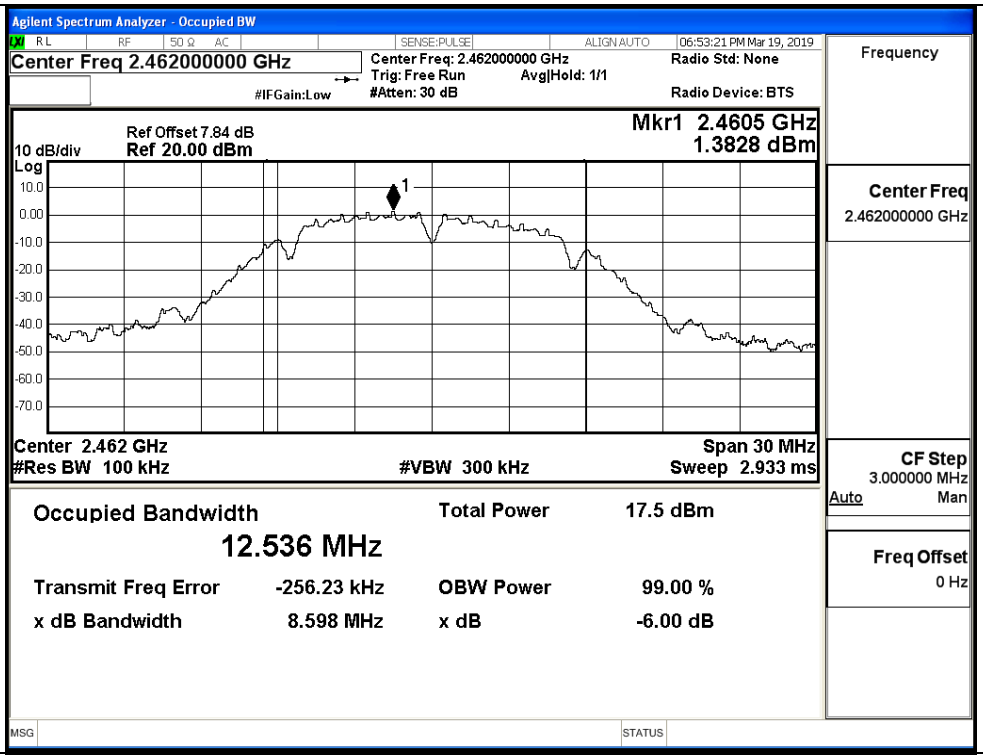
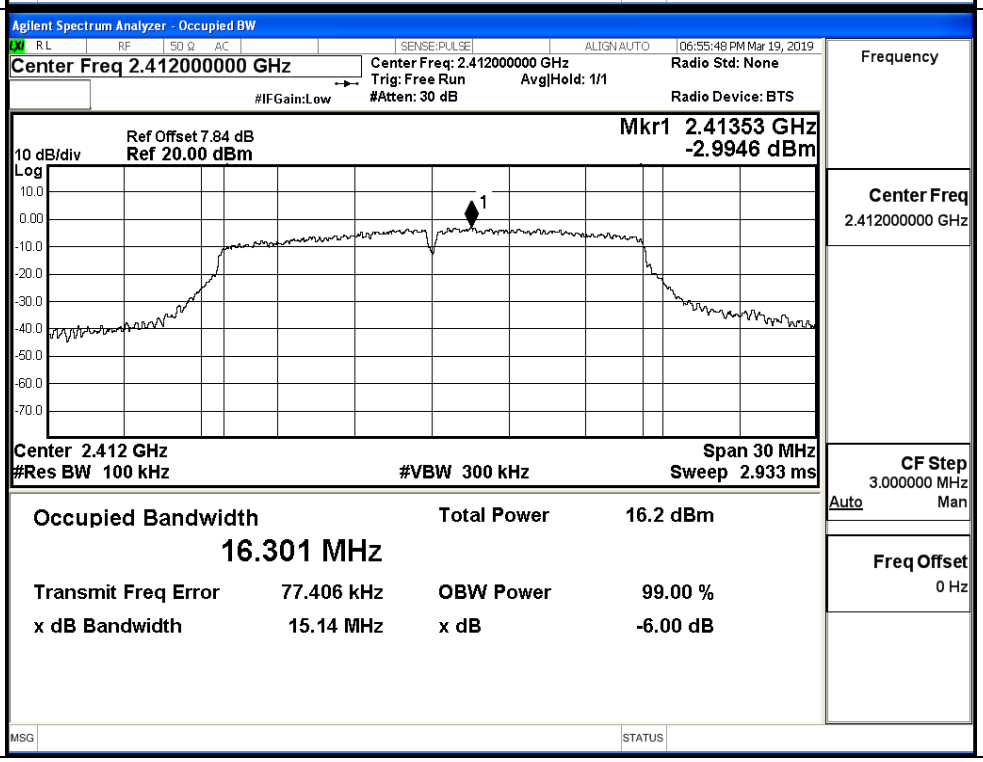
11N20/MCH	
11N20/HCH	

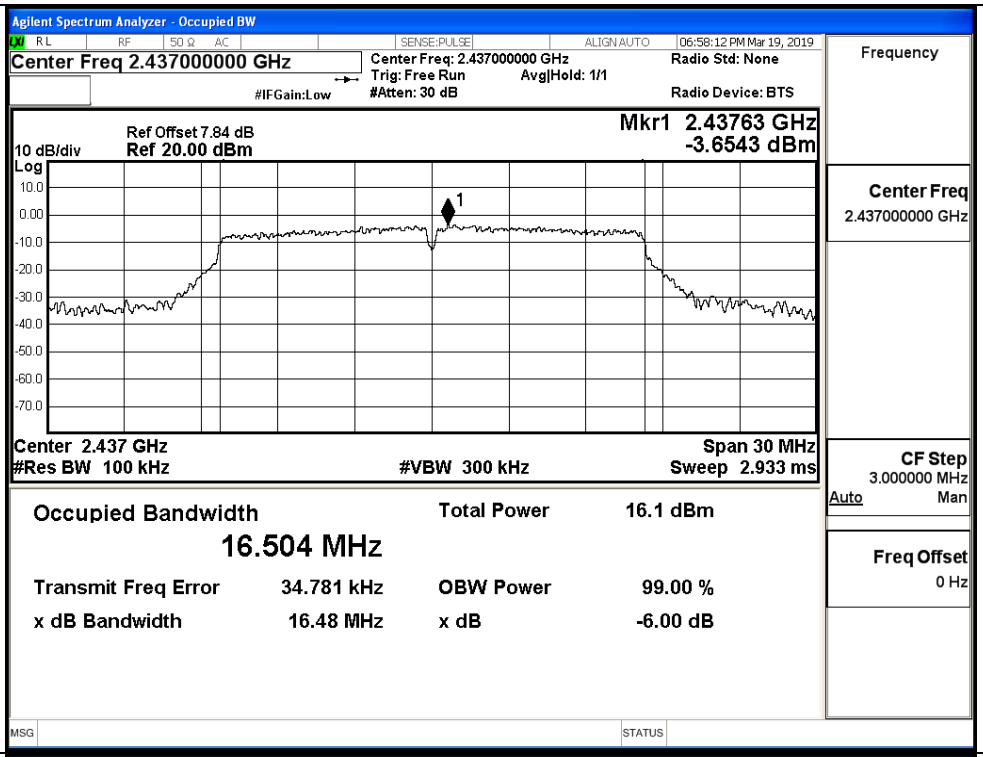
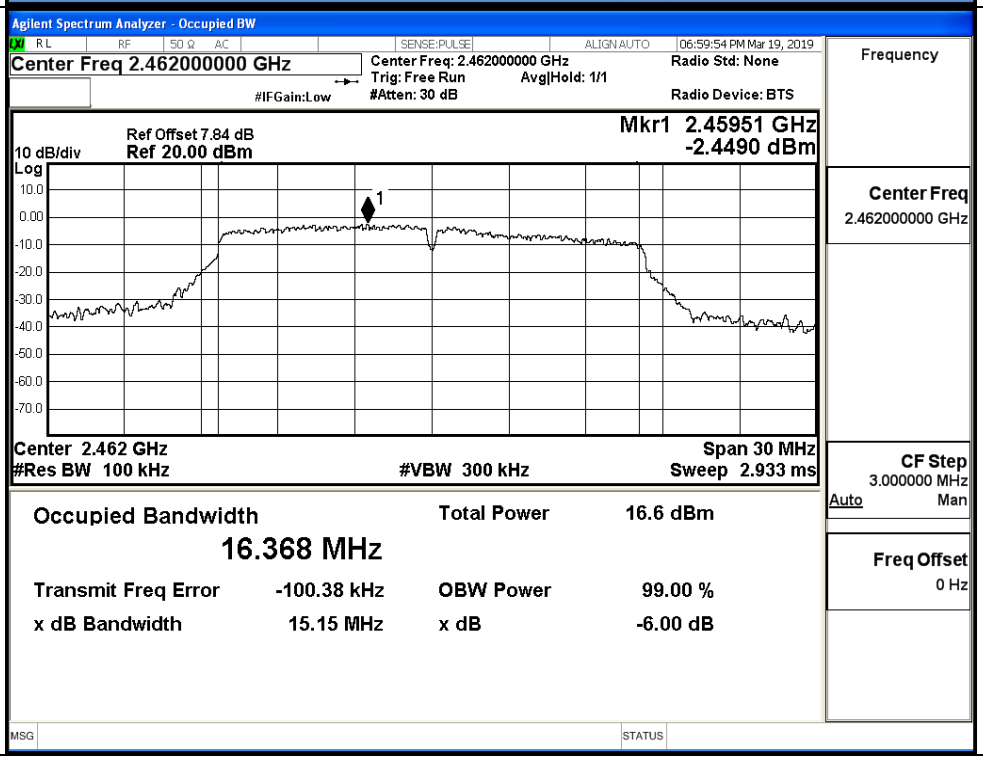
11N40/LCH	
11N40/MCH	

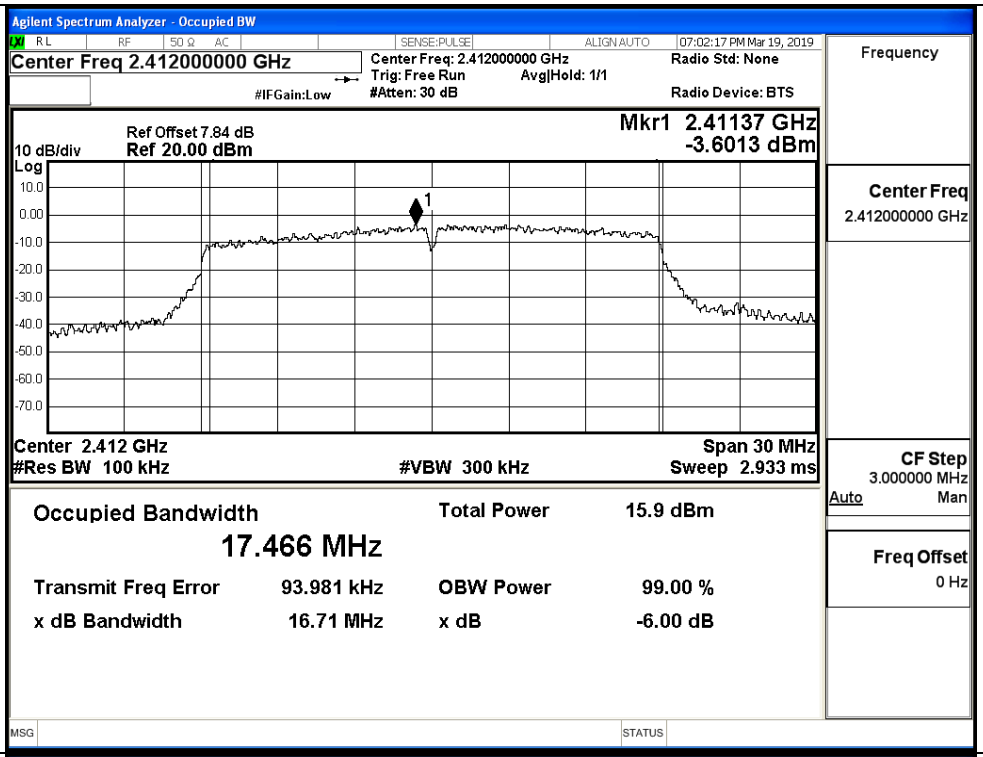
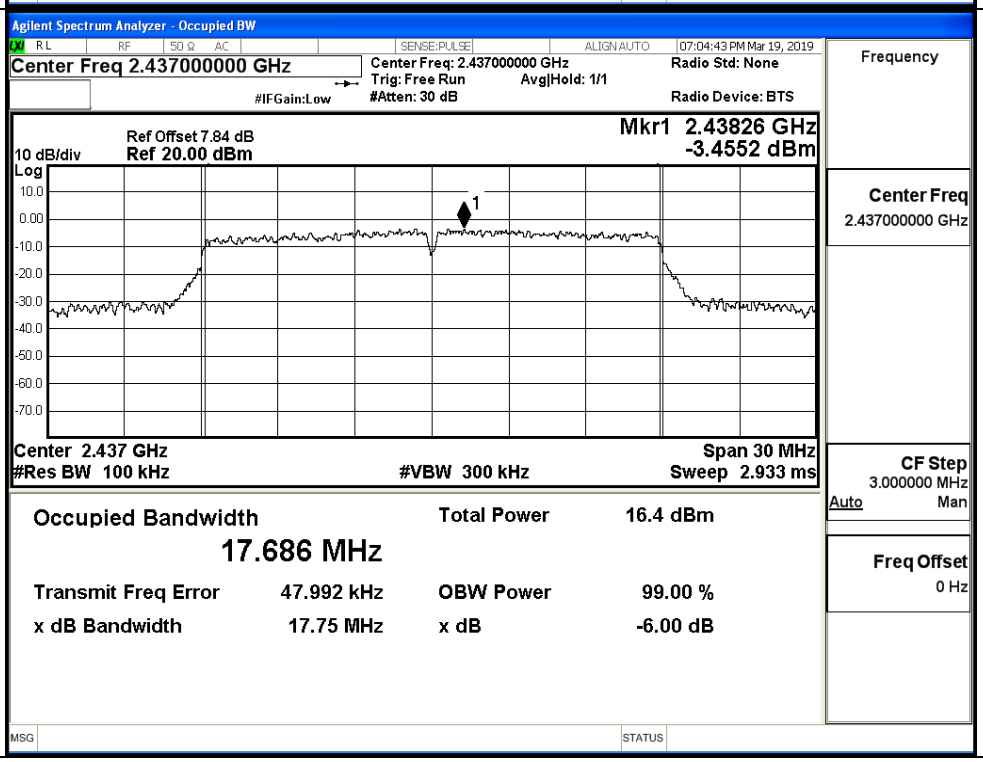
11N40/HCH	

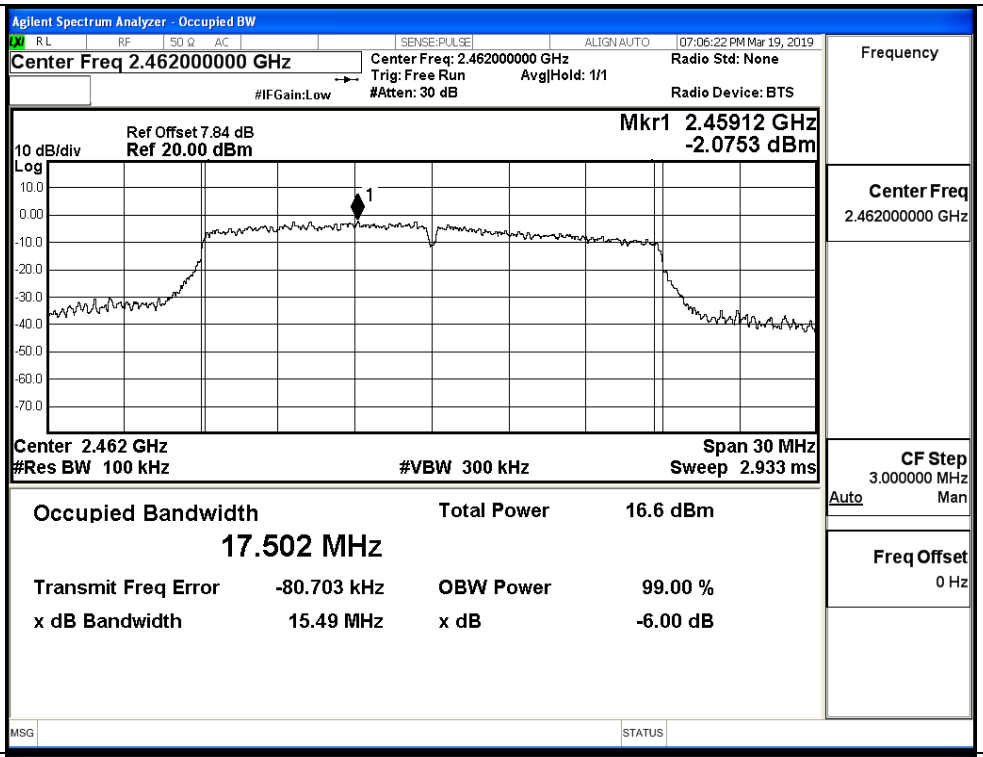
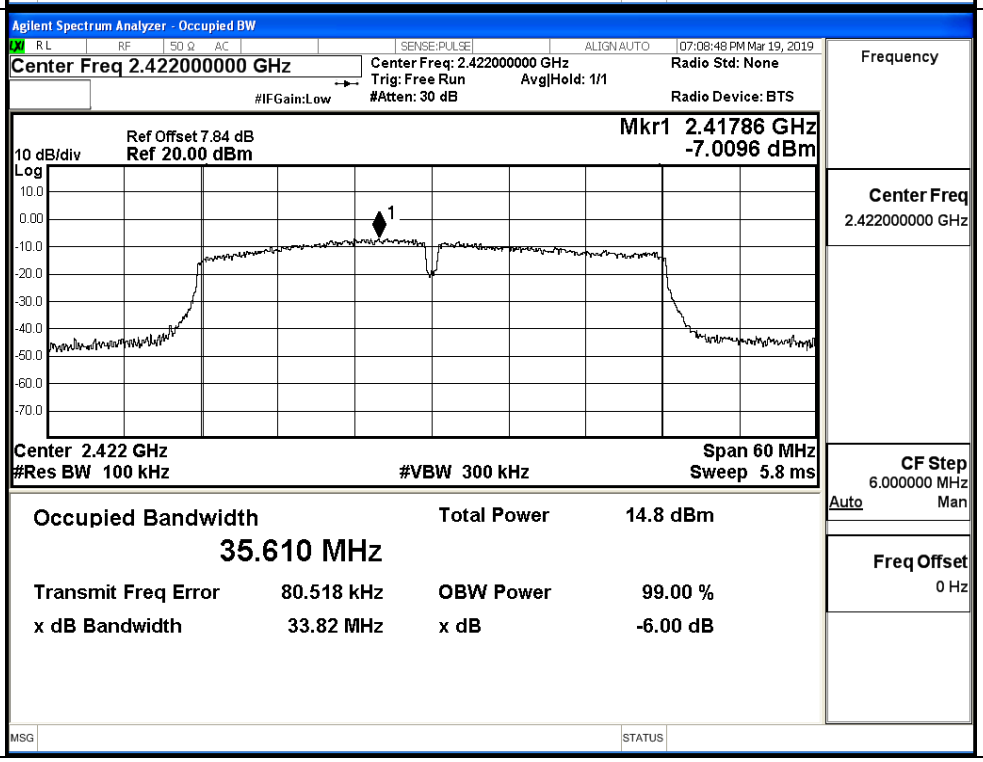
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
05:27:37 PM Mar 19, 2019
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.45416 GHz
-6.0502 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center Freq
2.452000000 GHz
Center 2.452 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 5.8 ms
CF Step
6.000000 MHz
Auto
Man
Occupied Bandwidth
35.348 MHz
Total Power 15.4 dBm
Transmit Freq Error 49.141 kHz
OBW Power 99.00 %
x dB Bandwidth 28.44 MHz
x dB -6.00 dB
Freq Offset
0 Hz
MSG
STATUS

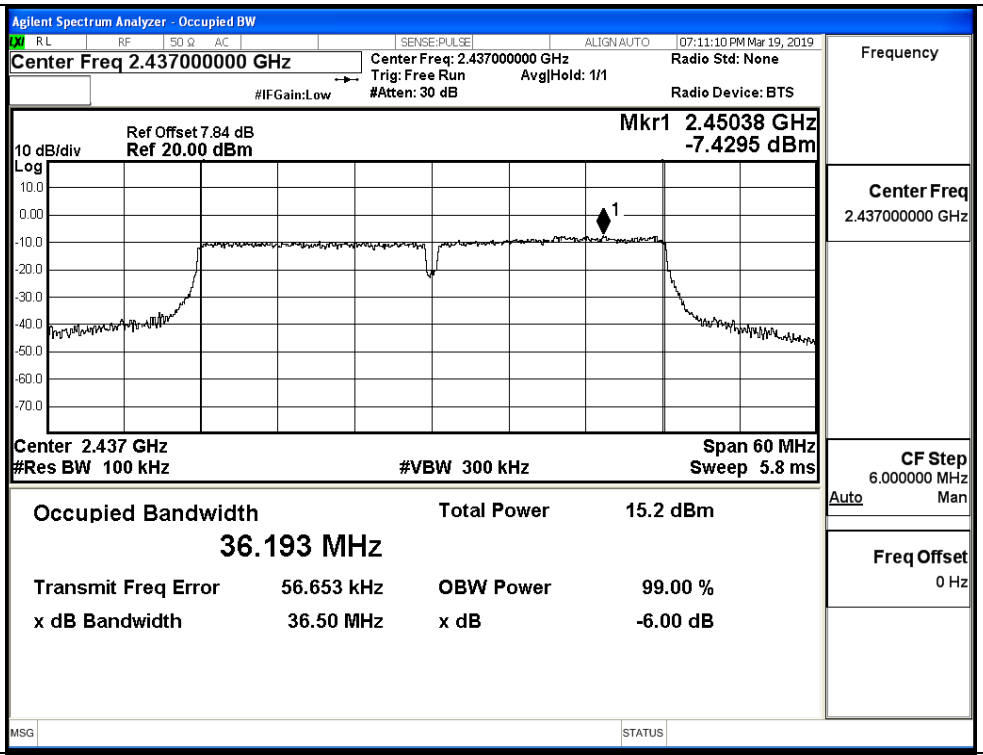
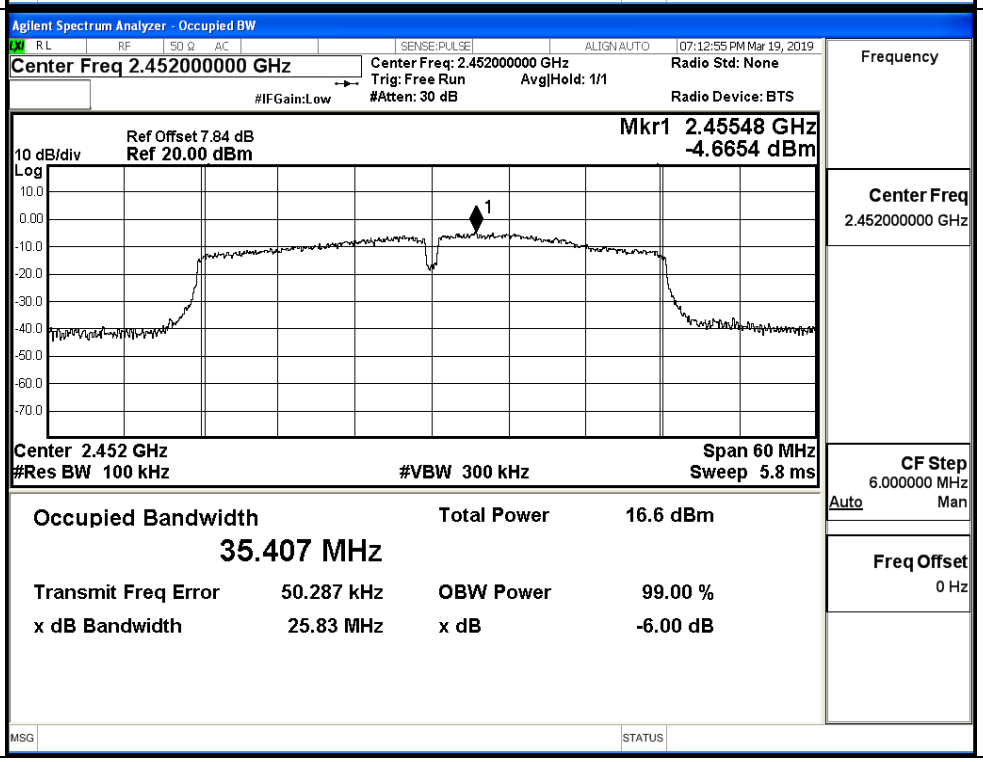
Test Graphs_Ant_2		
11B/LCH		
11B/MCH		

11B/HCH		
11G/LCH		

11G/MCH	
11G/HCH	

11N20/LCH	
11N20/MCH	

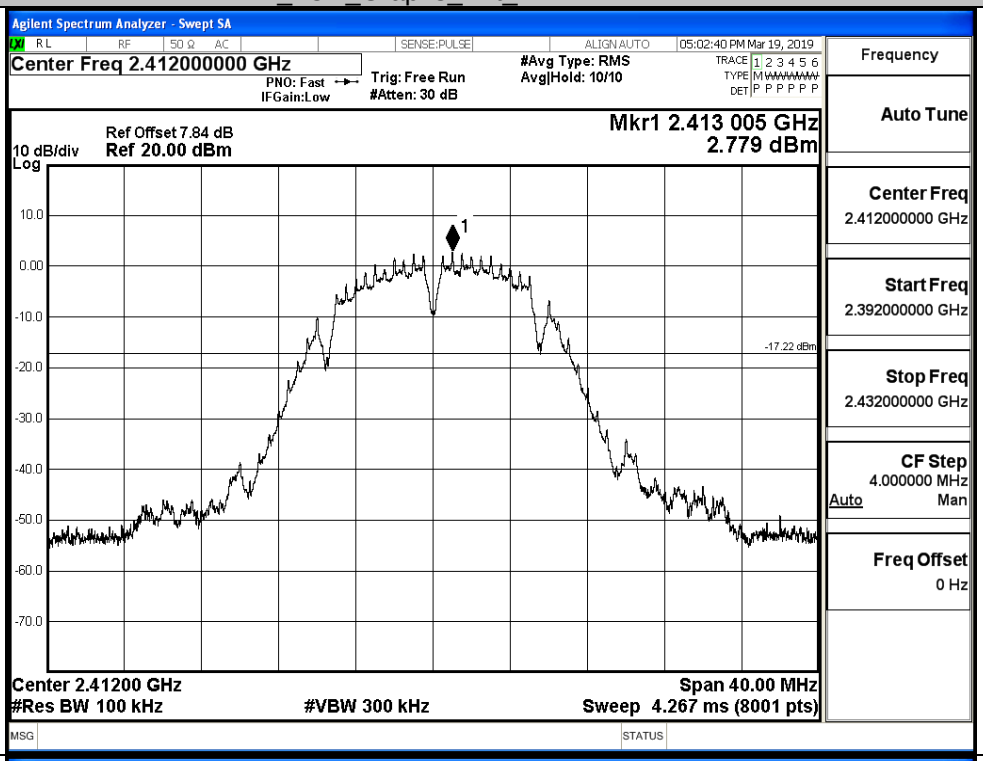
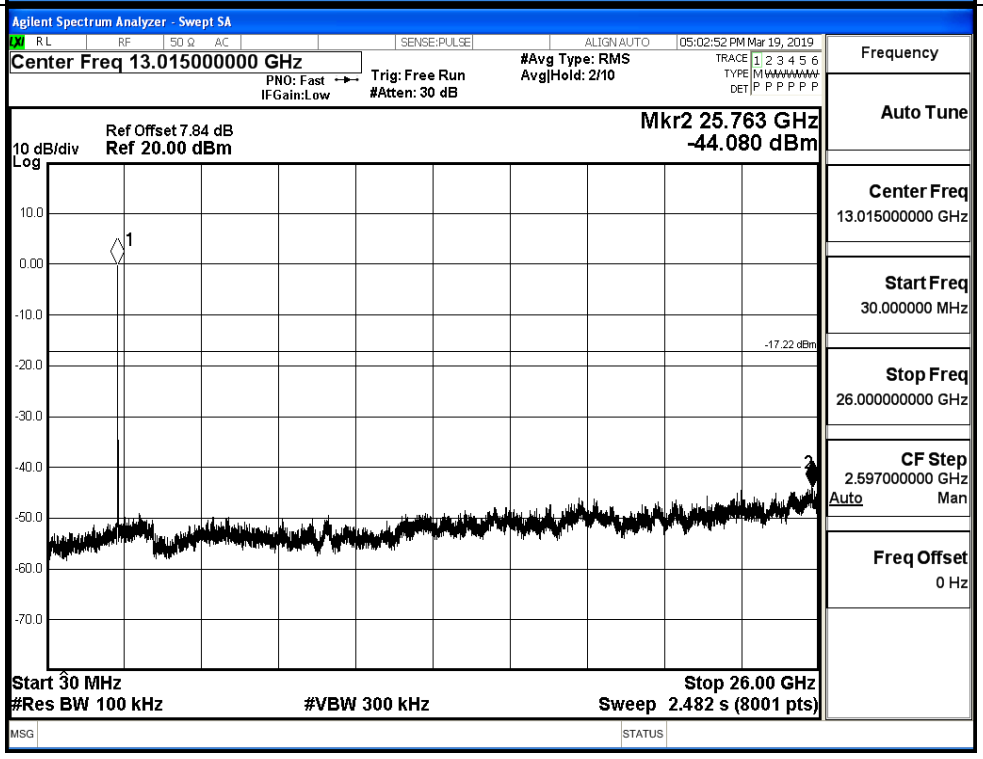
11N20/HCH	
11N40/LCH	

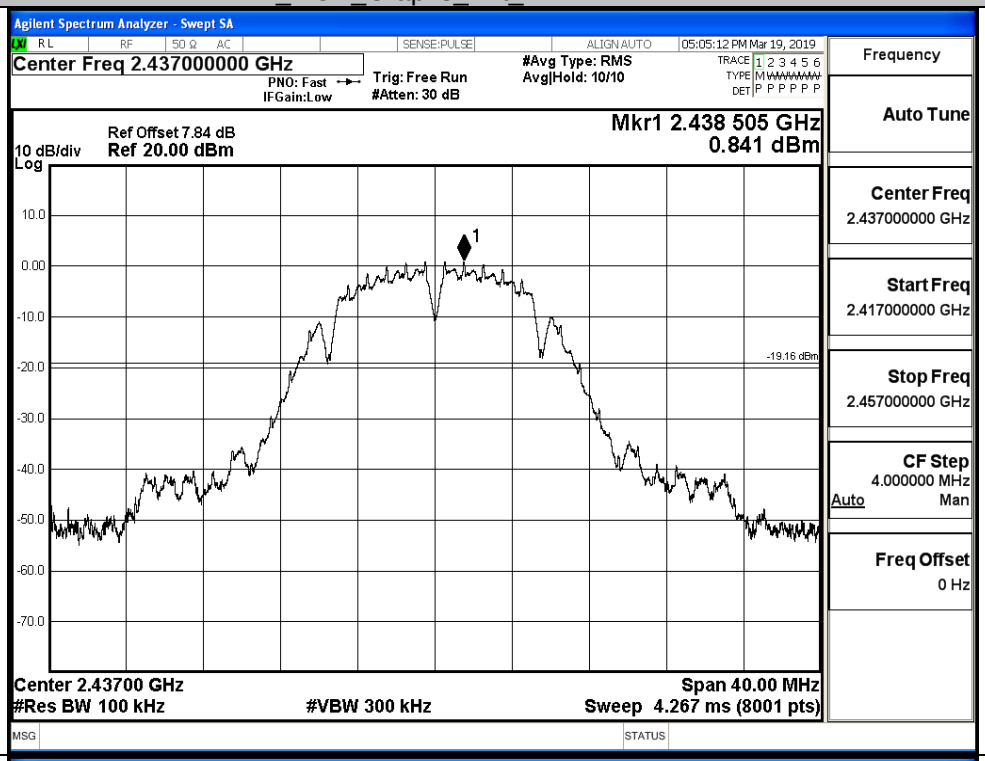
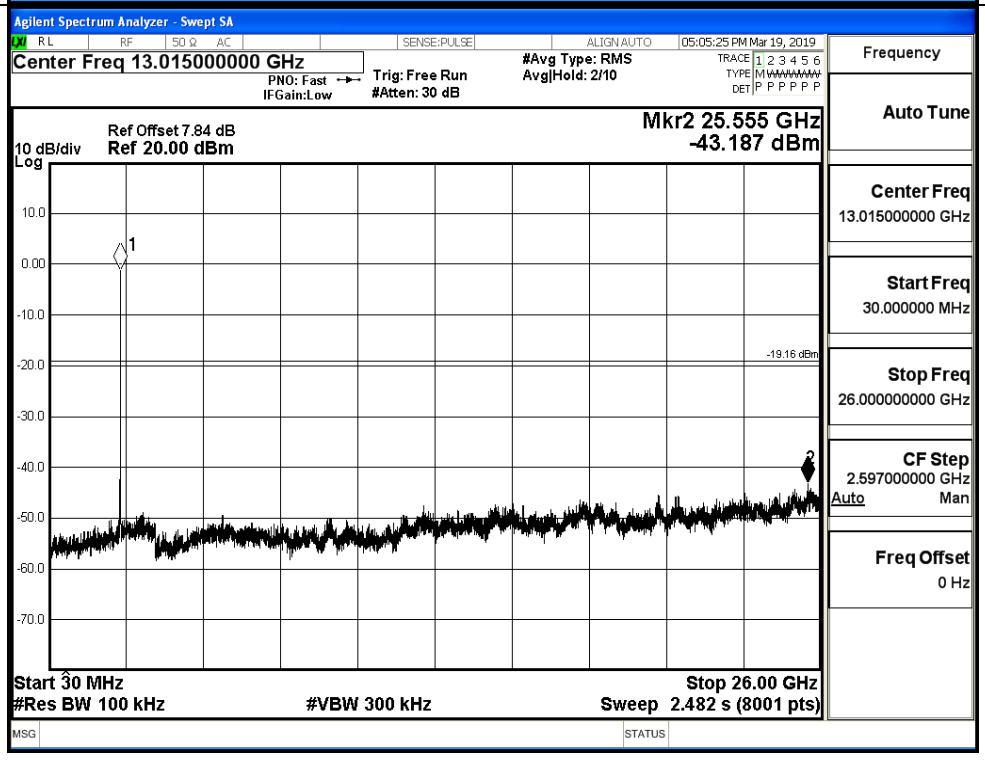
11N40/MCH	
11N40/HCH	

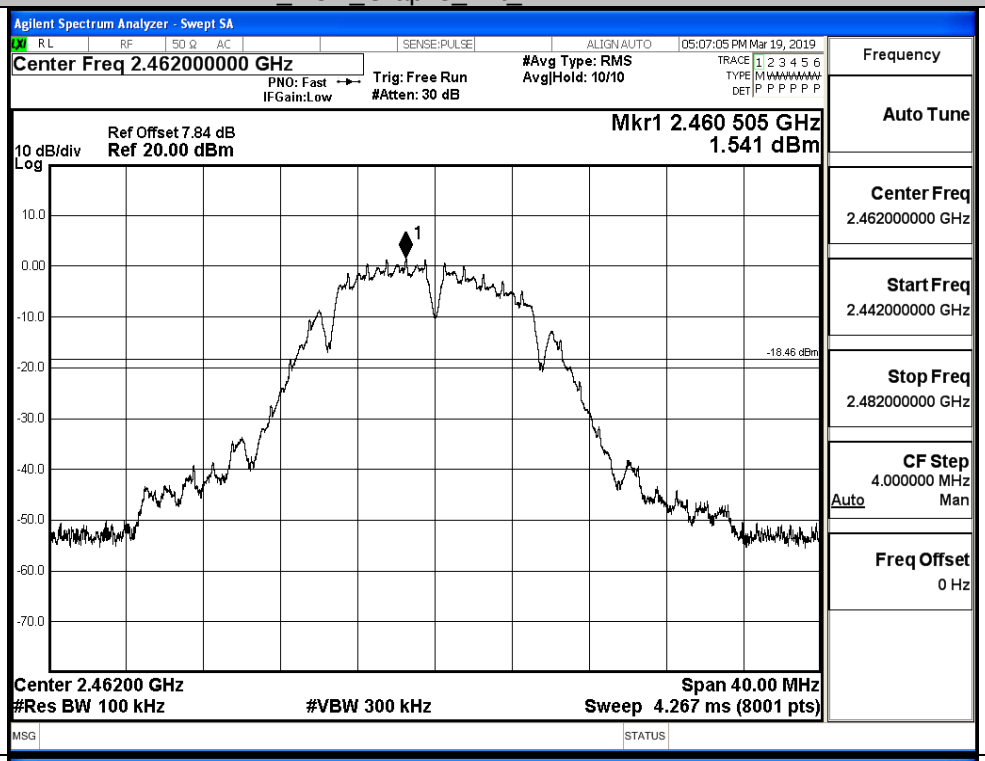
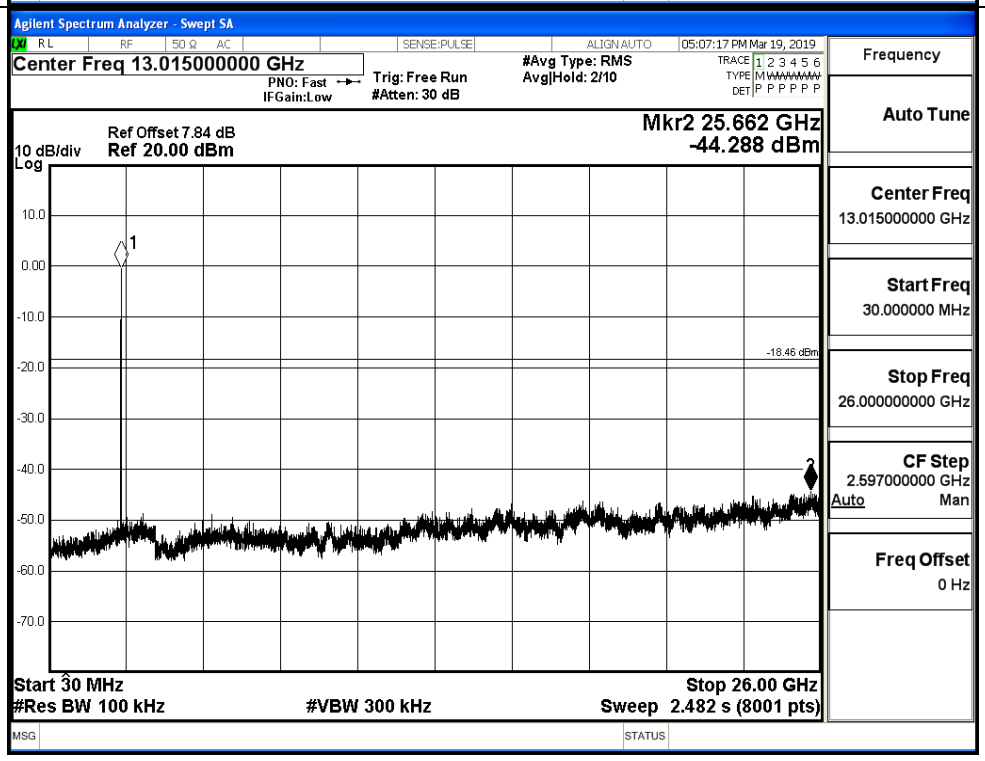
A.5 RF Conducted Spurious Emissions

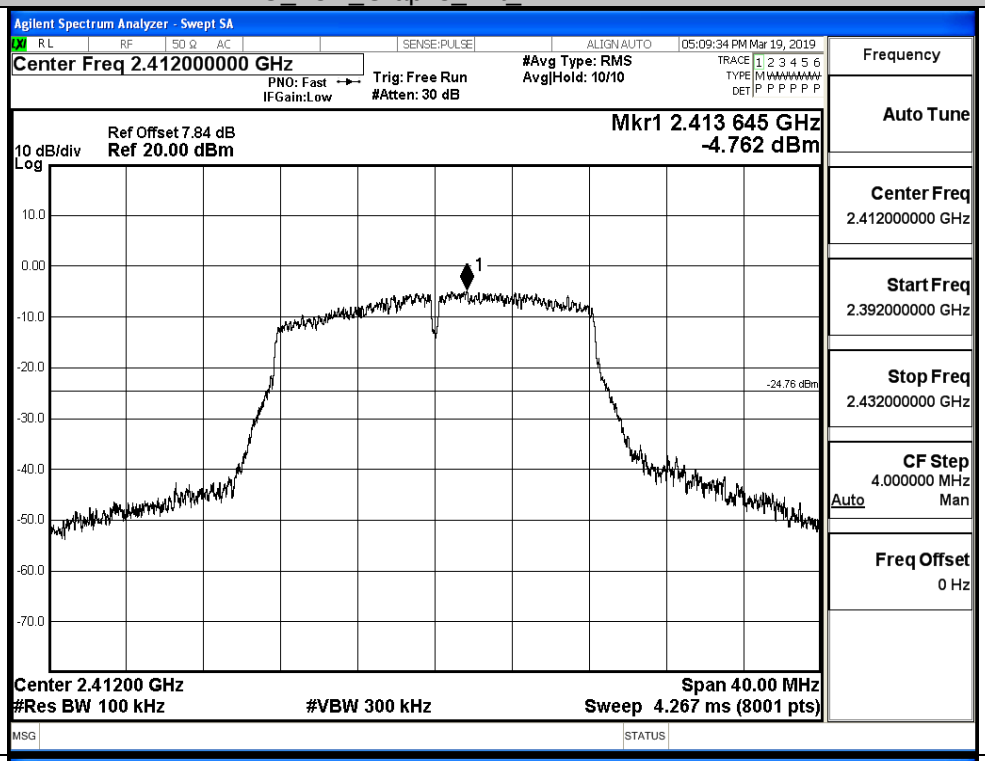
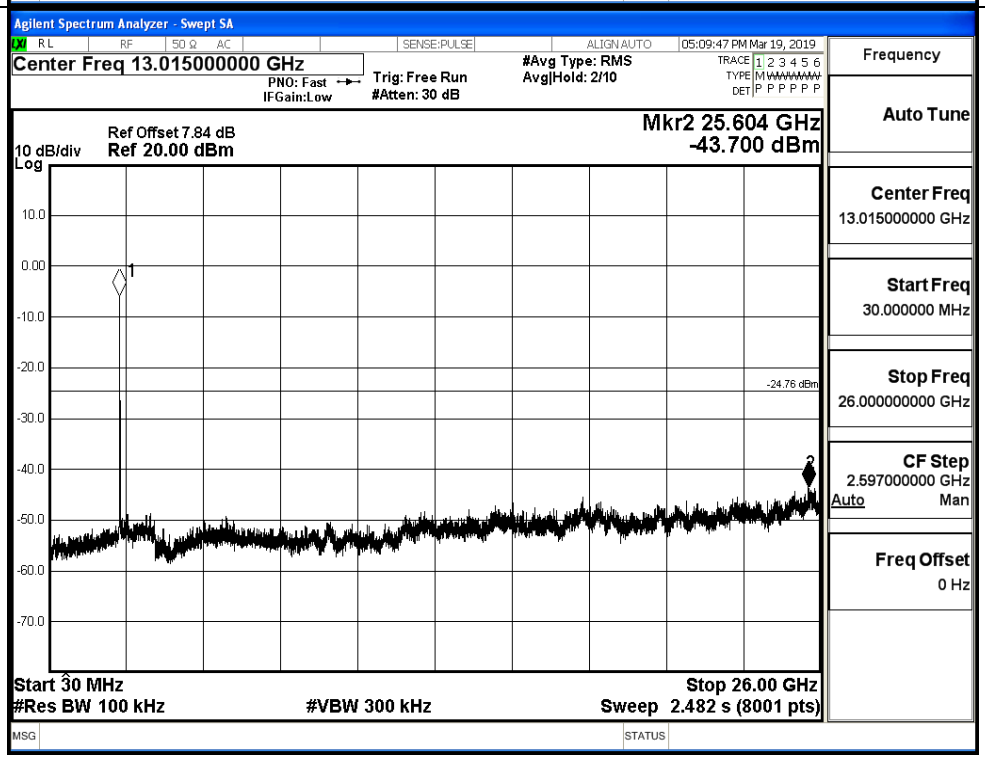
Ant_1

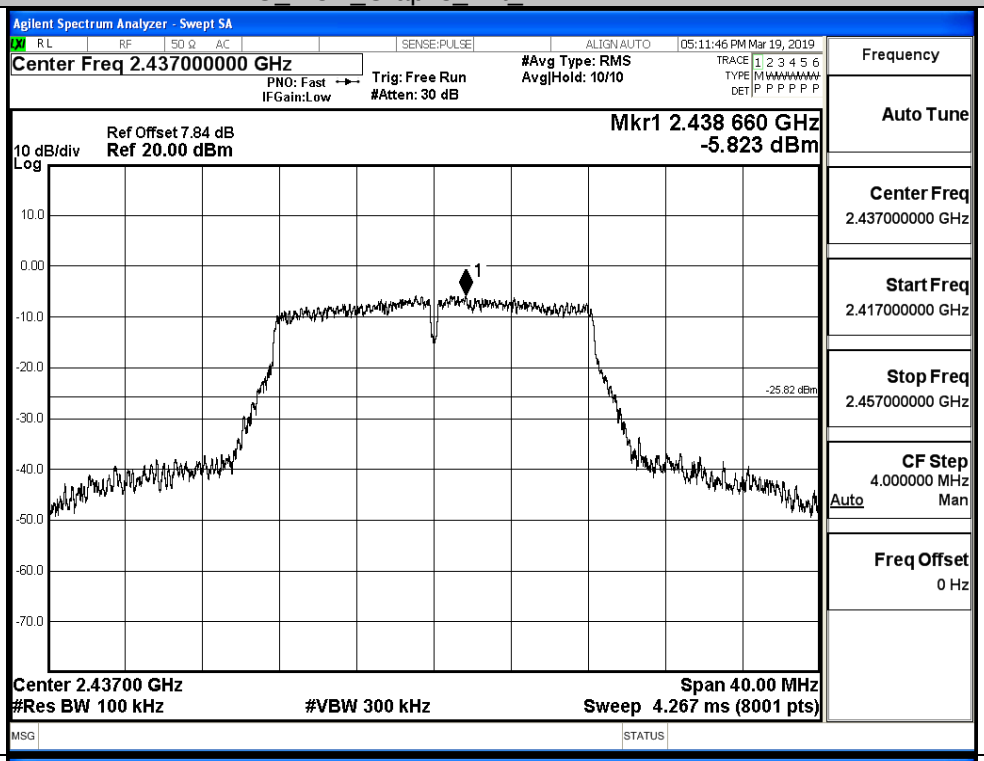
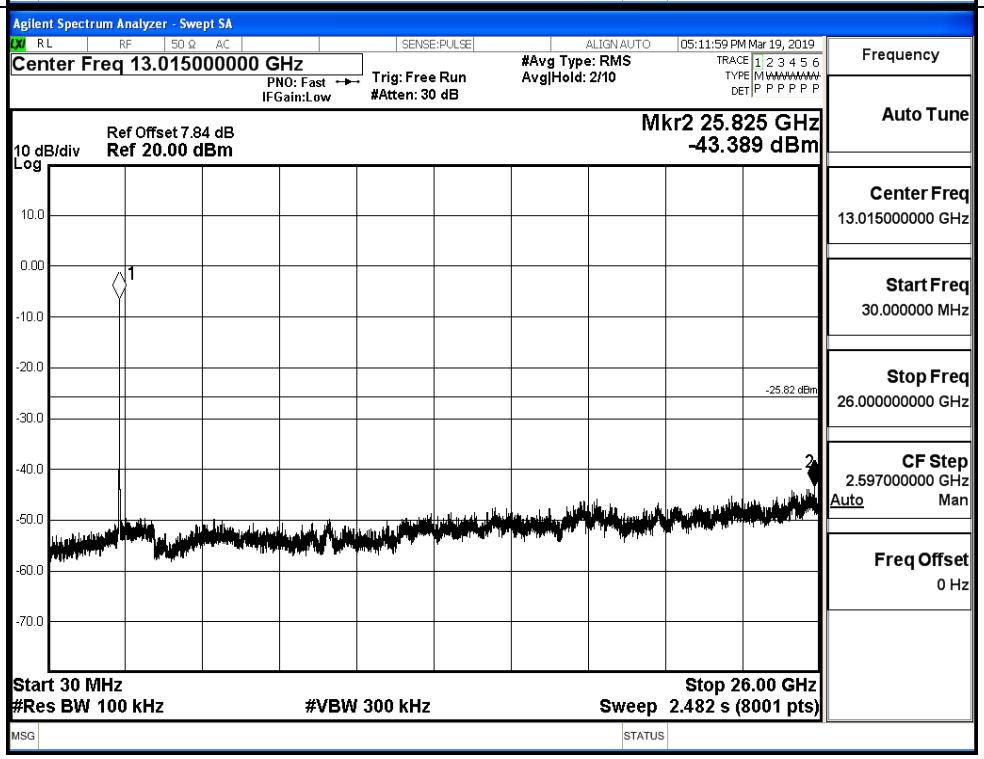
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	2.779	-44.080	-17.221	PASS
	MCH	0.841	-43.187	-19.159	PASS
	HCH	1.541	-44.288	-18.459	PASS
11G	LCH	-4.762	-43.700	-24.762	PASS
	MCH	-5.823	-43.389	-25.823	PASS
	HCH	-7.344	-43.535	-27.344	PASS
11N20	LCH	-4.796	-44.097	-24.796	PASS
	MCH	-5.408	-44.160	-25.408	PASS
	HCH	-3.683	-44.270	-23.683	PASS
11N40	LCH	-8.523	-44.110	-28.523	PASS
	MCH	-8.286	-43.197	-28.286	PASS
	HCH	-6.127	-43.845	-26.127	PASS

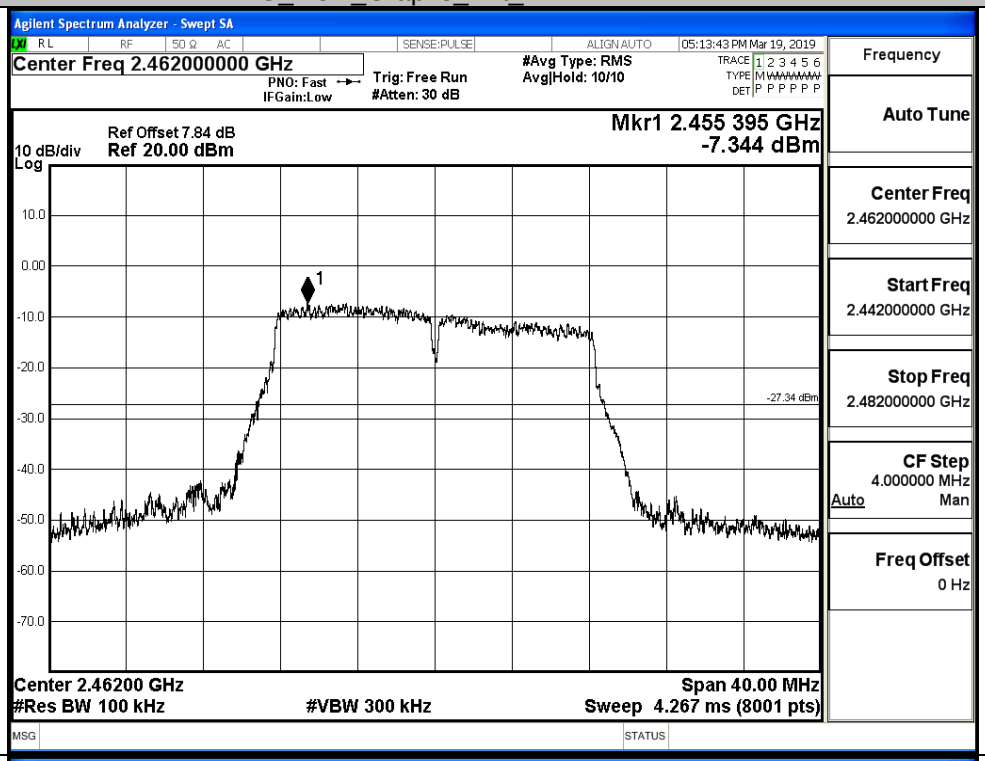
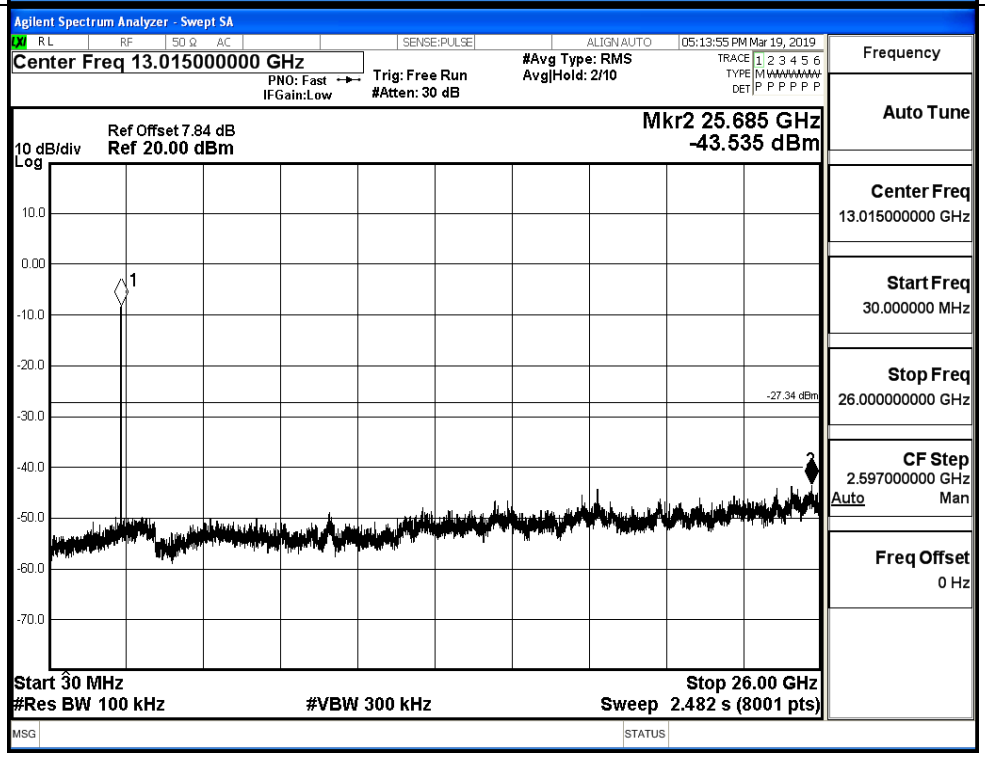
11B_LCH_Graphs_Ant_1	
Pref/11B/LCH	
Puw/11B/LCH	

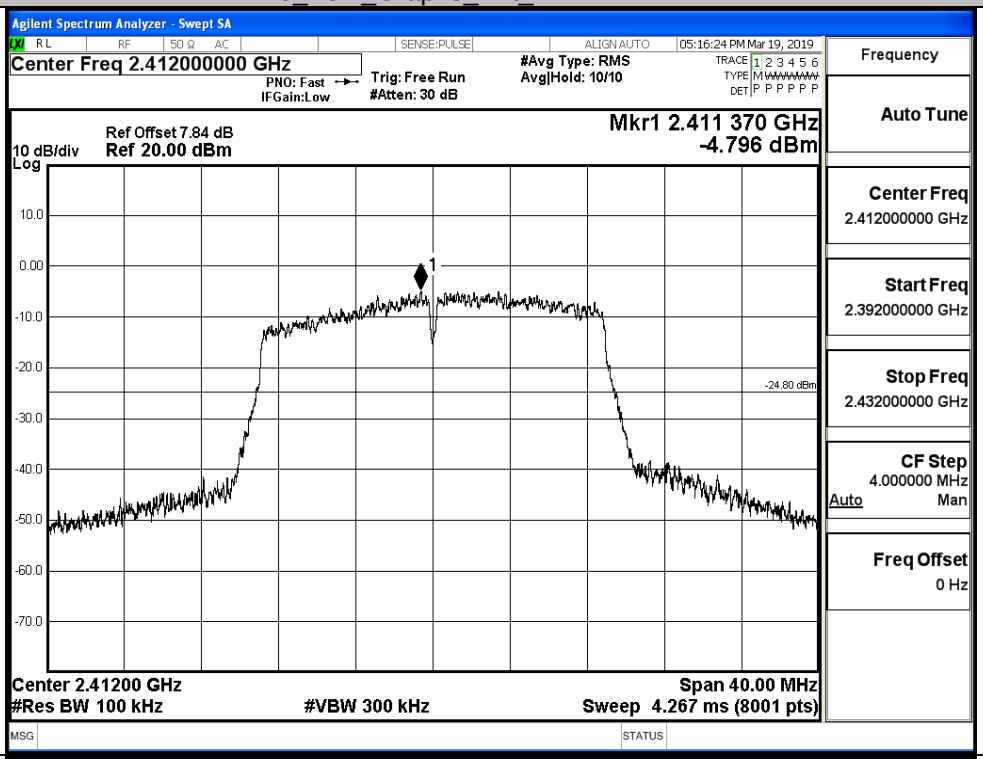
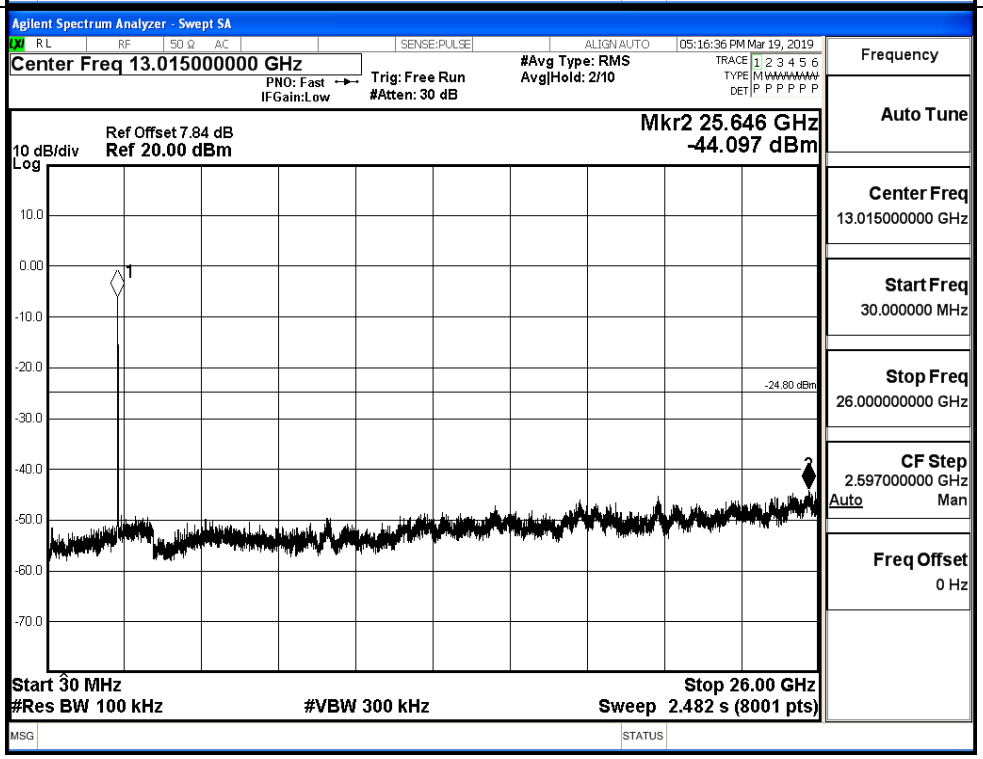
11B_MCH_Graphs_Ant_1	
Pref/11B/MCH	
Puw/11B/MCH	

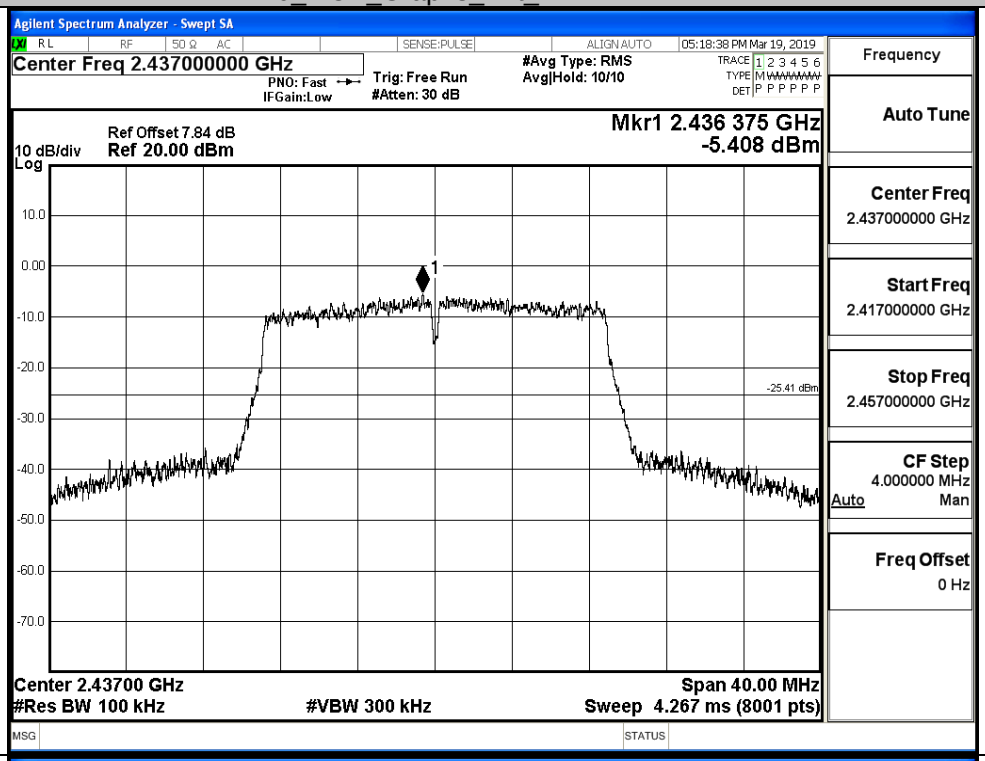
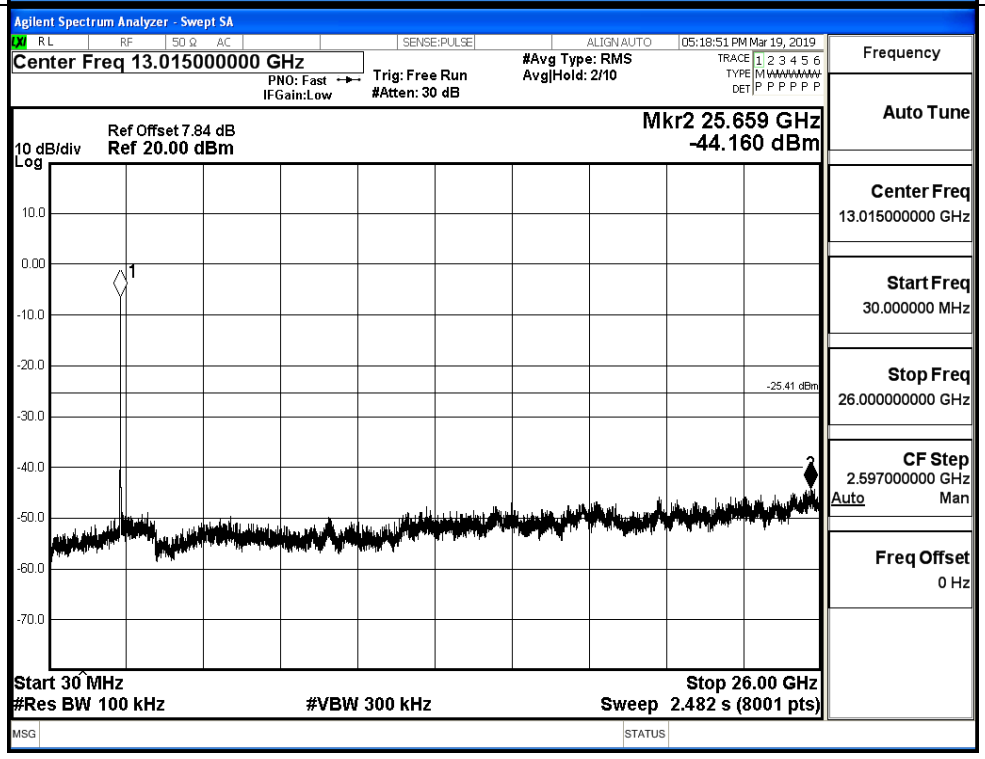
11B_HCH_Graphs_Ant_1	
Pref/11B/HCH	
Puw/11B/HCH	

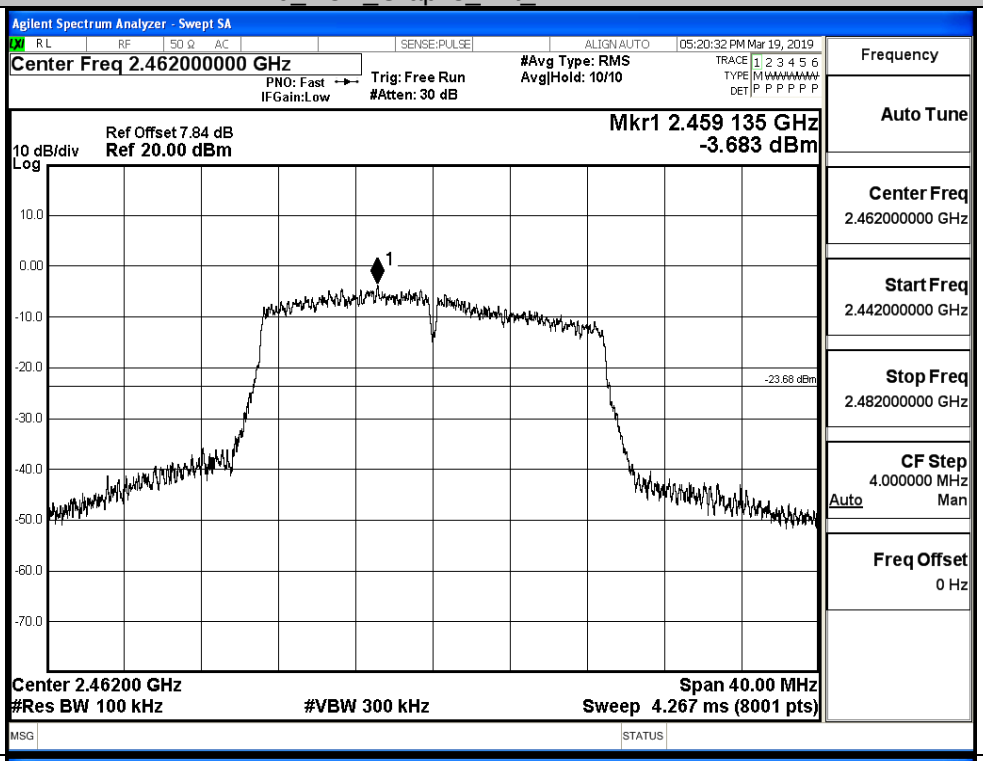
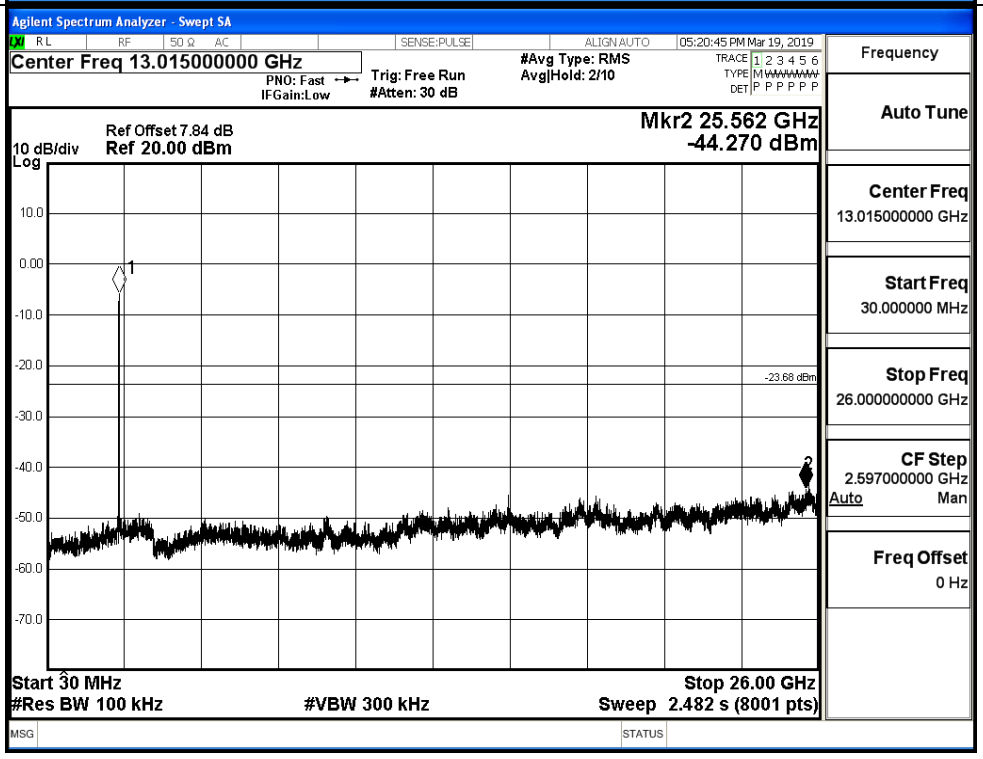
11G_LCH_Graphs_Ant_1	
Pref/11G/LCH	
Puw/11G/LCH	

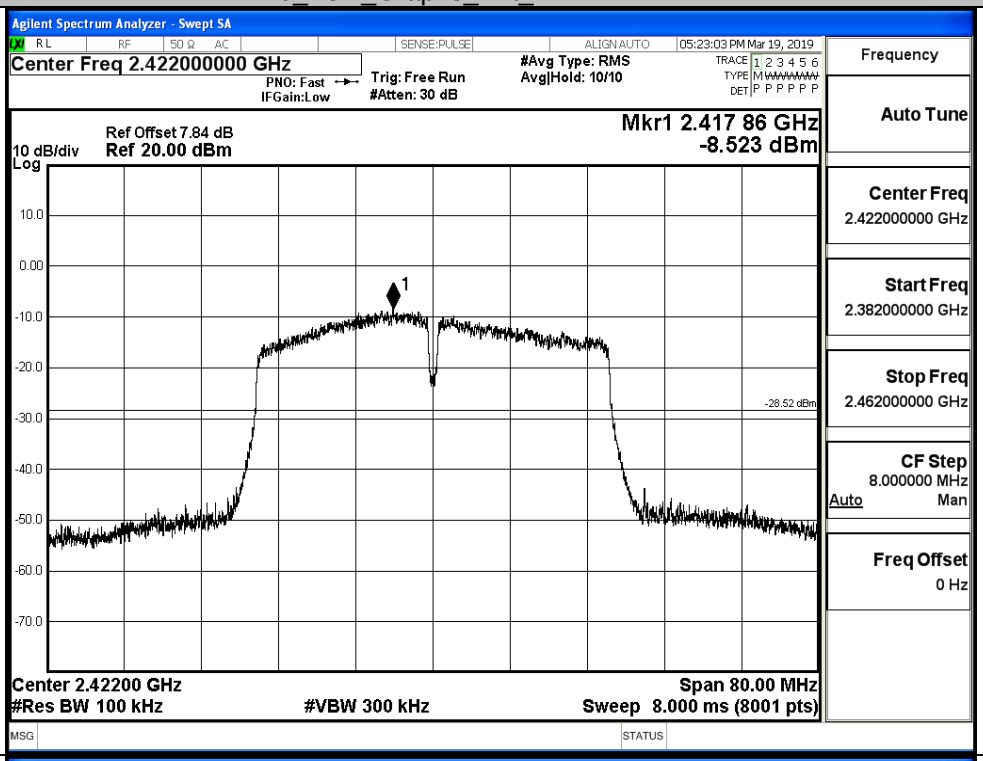
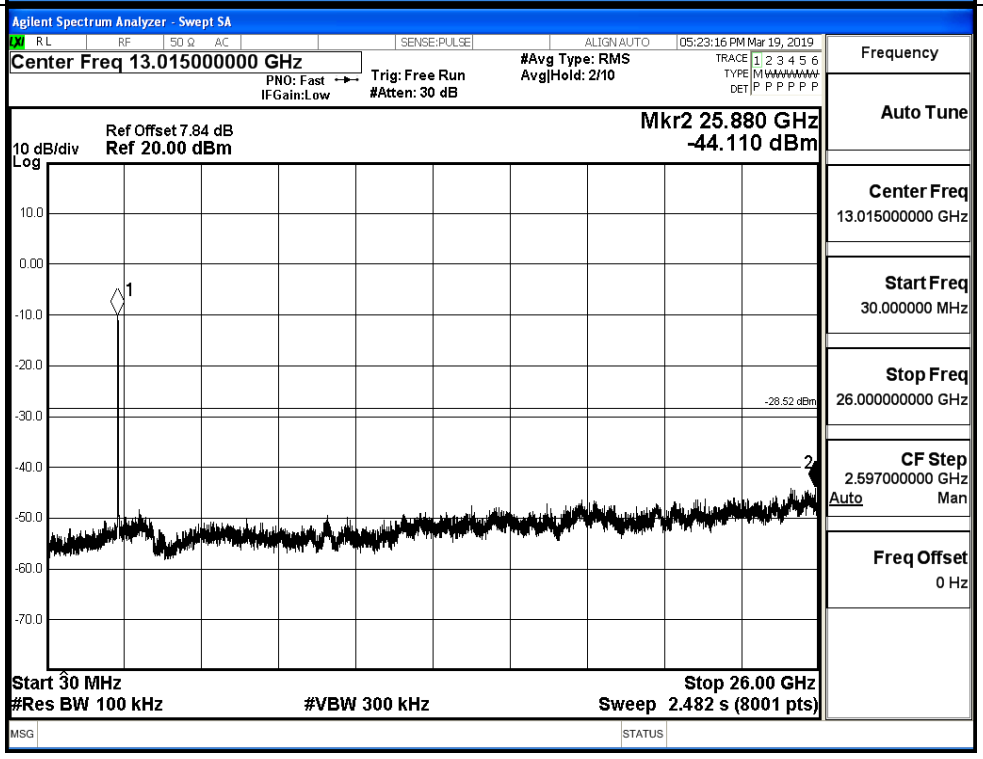
11G_MCH_Graphs_Ant_1	
Pref/11G/MCH	
Puw/11G/MCH	

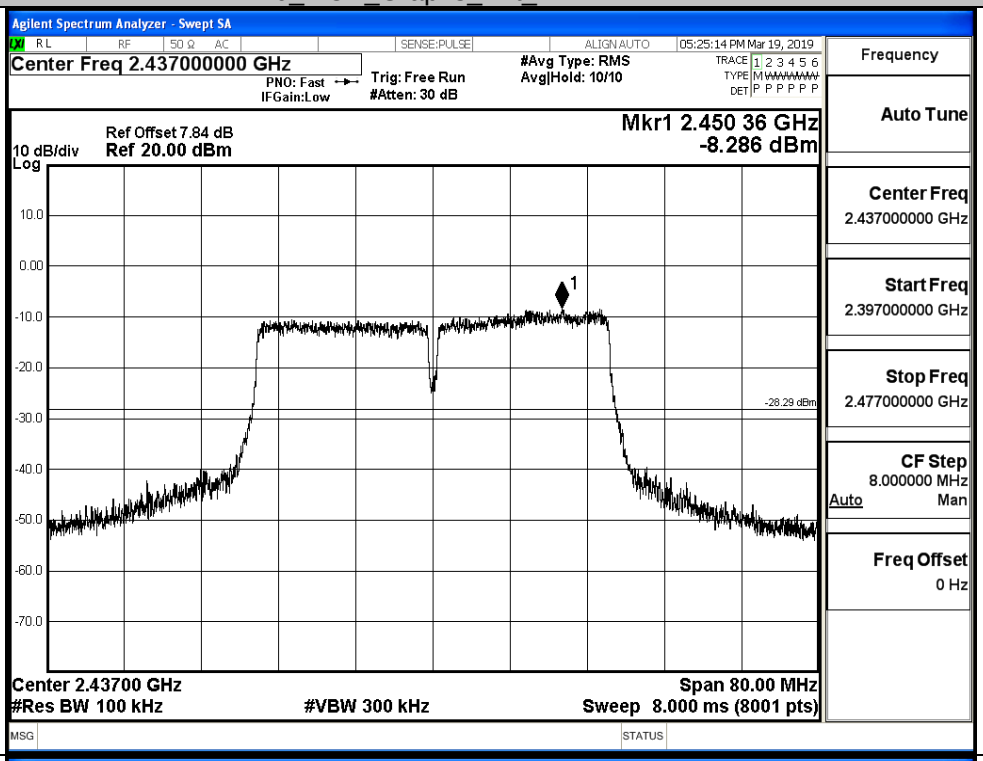
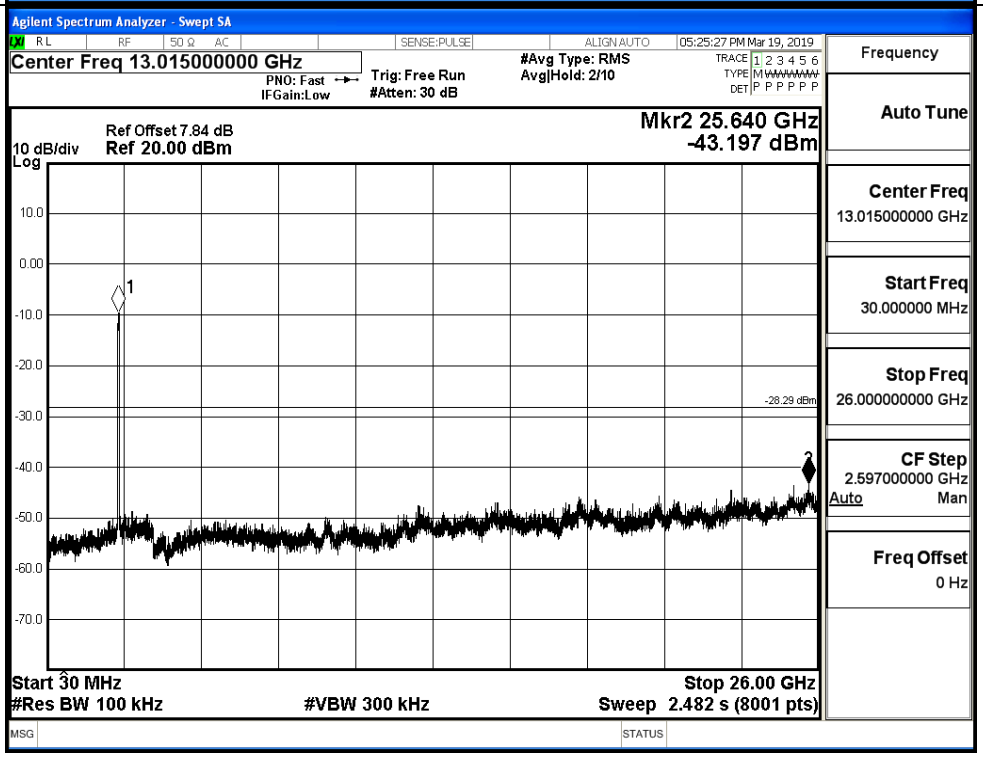
11G_HCH_Graphs_Ant_1	
Pref/11G/HCH	
Puw/11G/HCH	

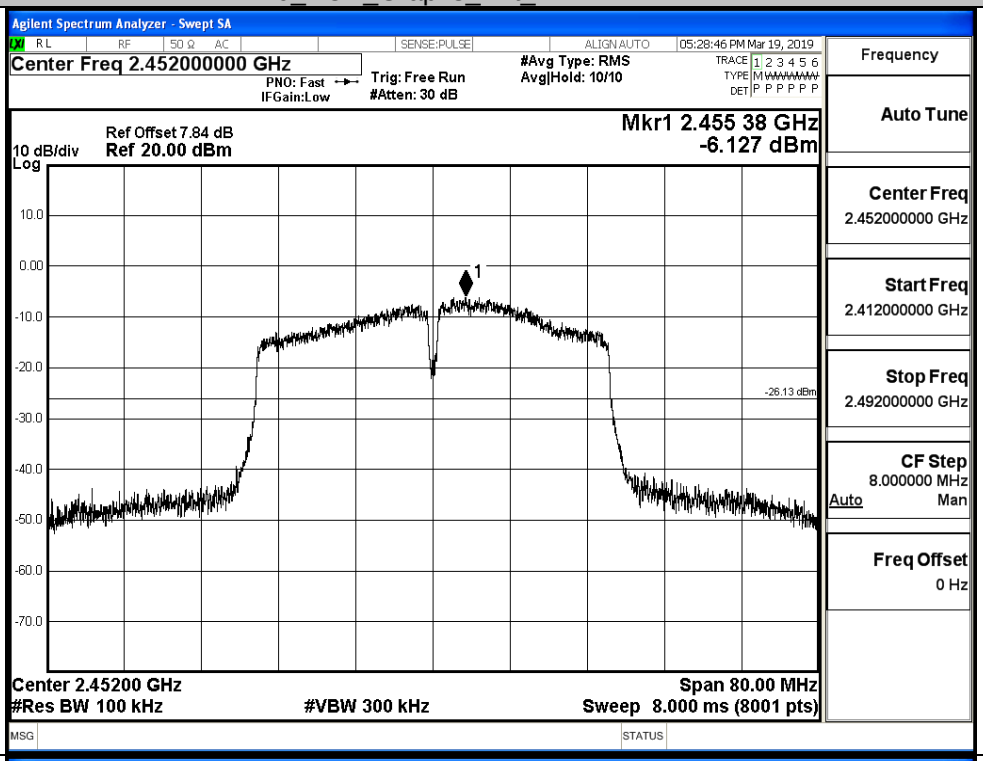
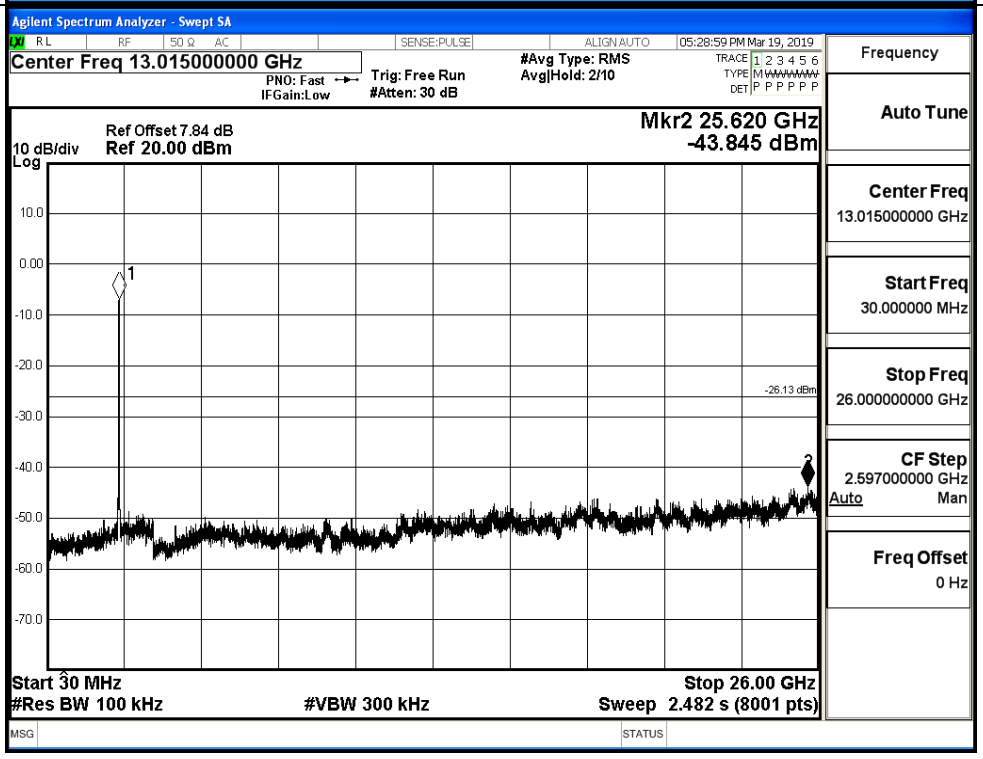
11N20_LCH_Graphs_Ant_1	
Pref/11N20/ LCH	
Puw/11N20/ LCH	

11N20_MCH_Graphs_Ant_1	
Pref/11N20/ MCH	
Puw/11N20/ MCH	

11N20_HCH_Graphs_Ant_1	
Pref/11N20/ HCH	
Puw/11N20/ HCH	

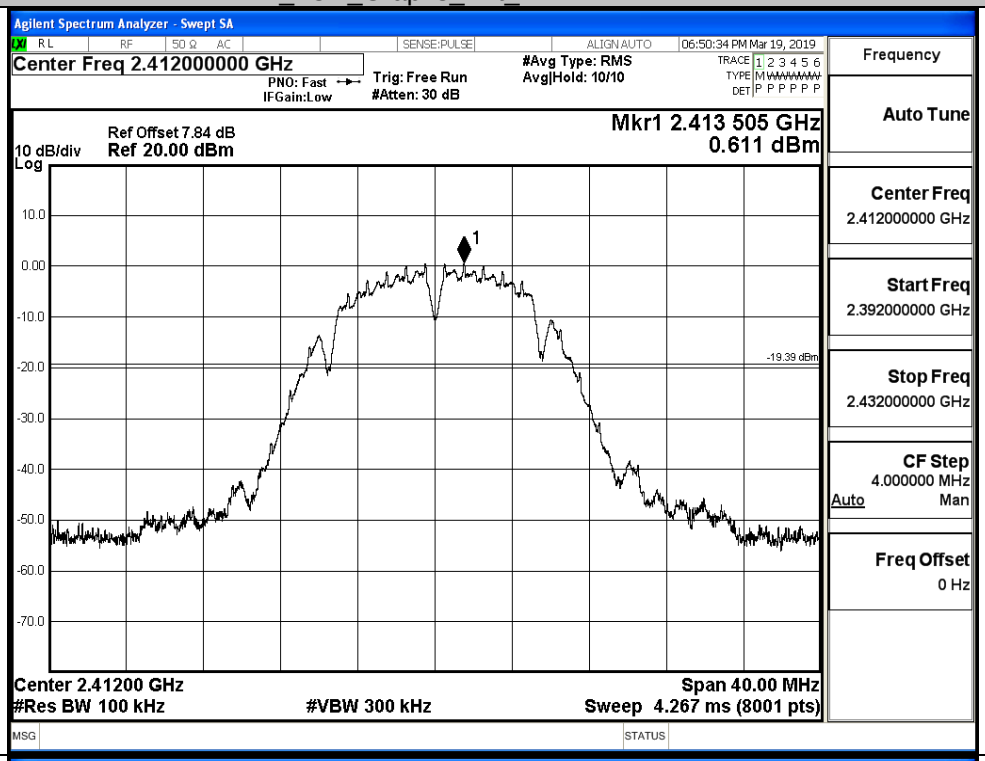
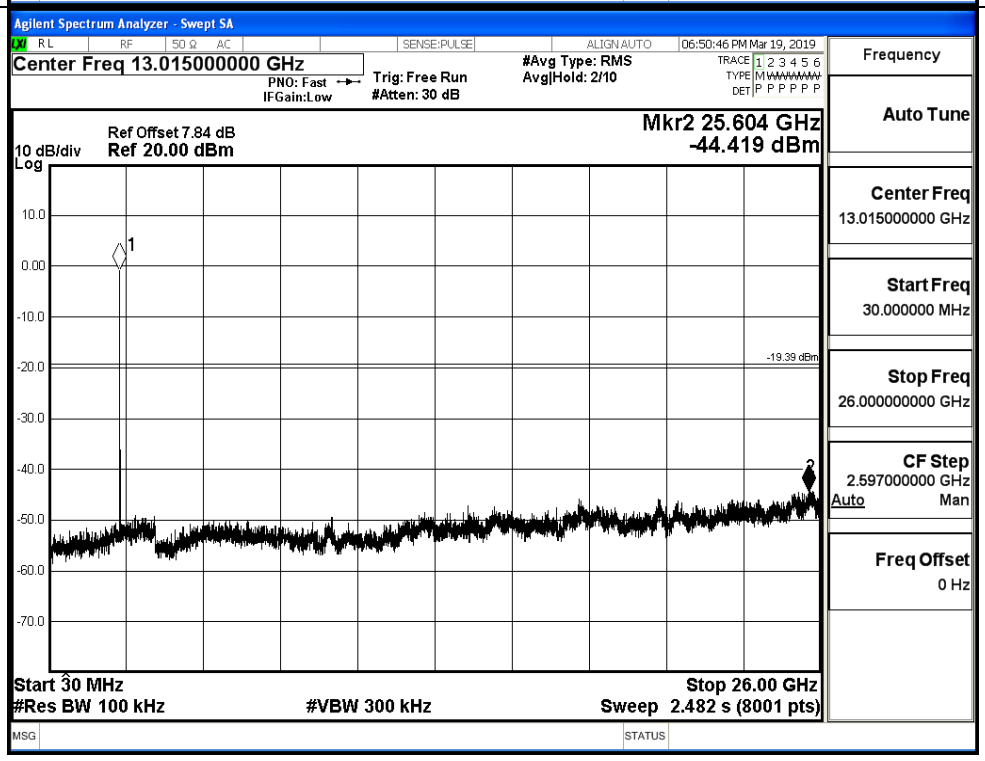
11N40_LCH_Graphs_Ant_1	
Pref/11N40/ LCH	
Puw/11N40/ LCH	

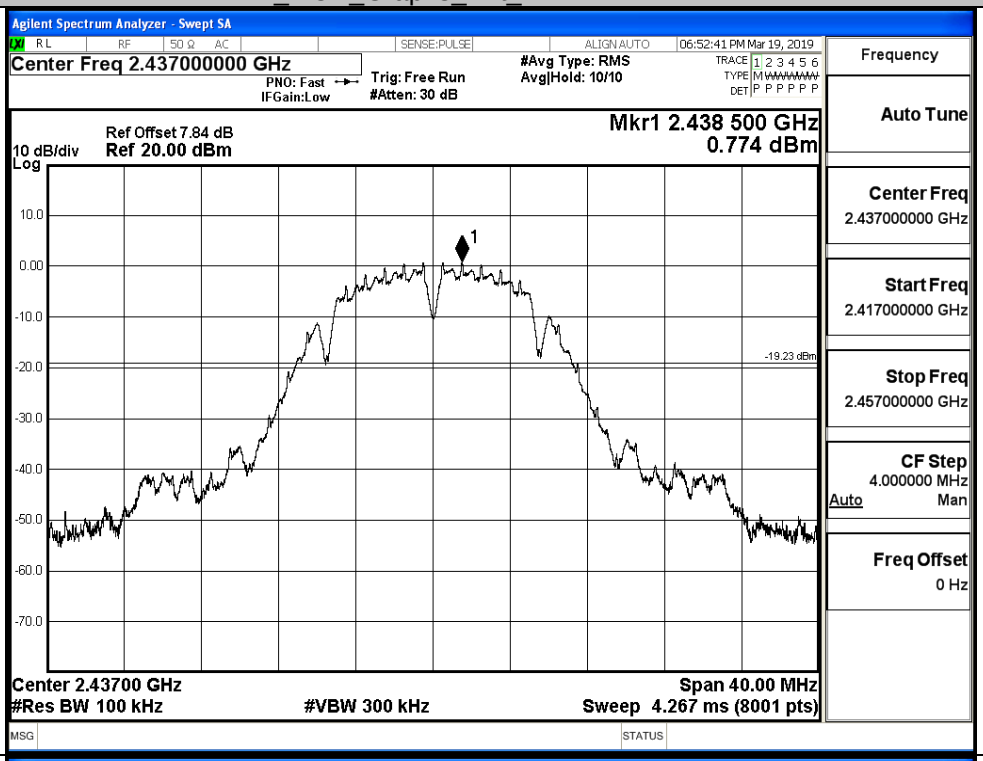
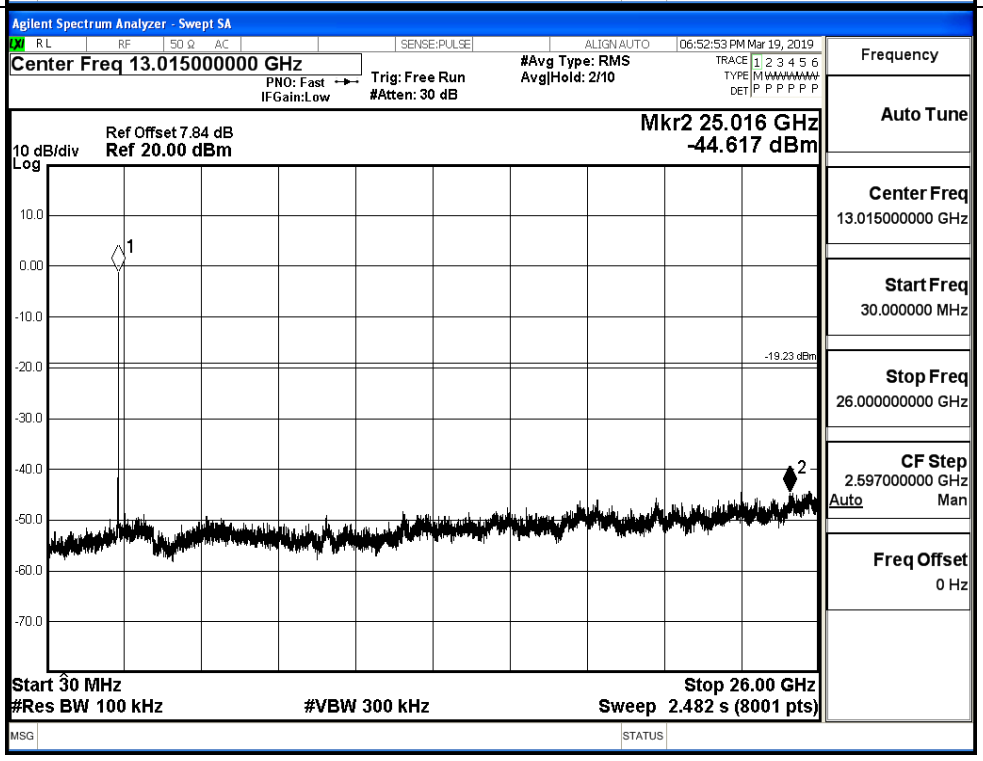
11N40_MCH_Graphs_Ant_1	
Pref/11N40/ MCH	
Puw/11N40/ MCH	

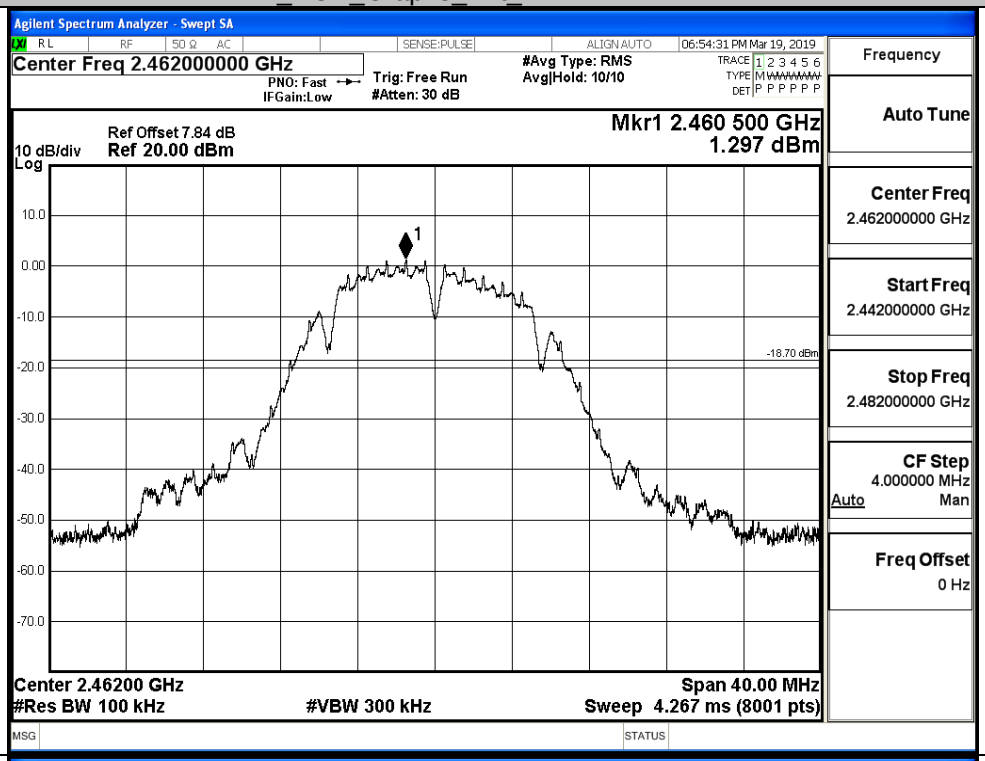
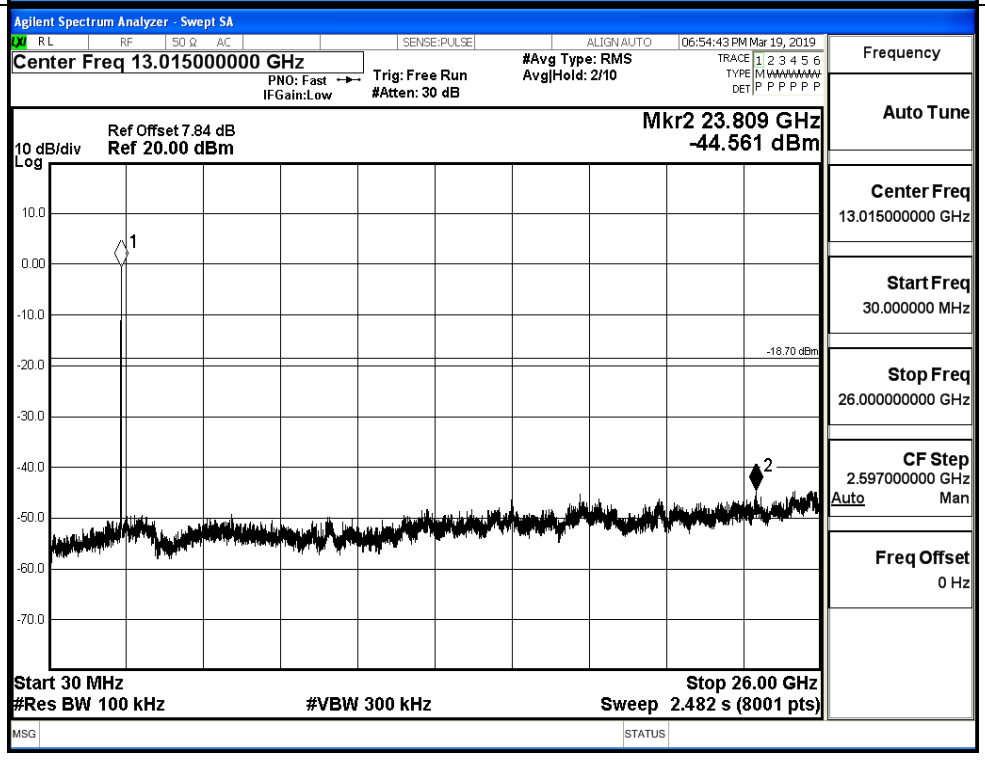
11N40_HCH_Graphs_Ant_1	
Pref/11N40/ HCH	
Puw/11N40/ HCH	

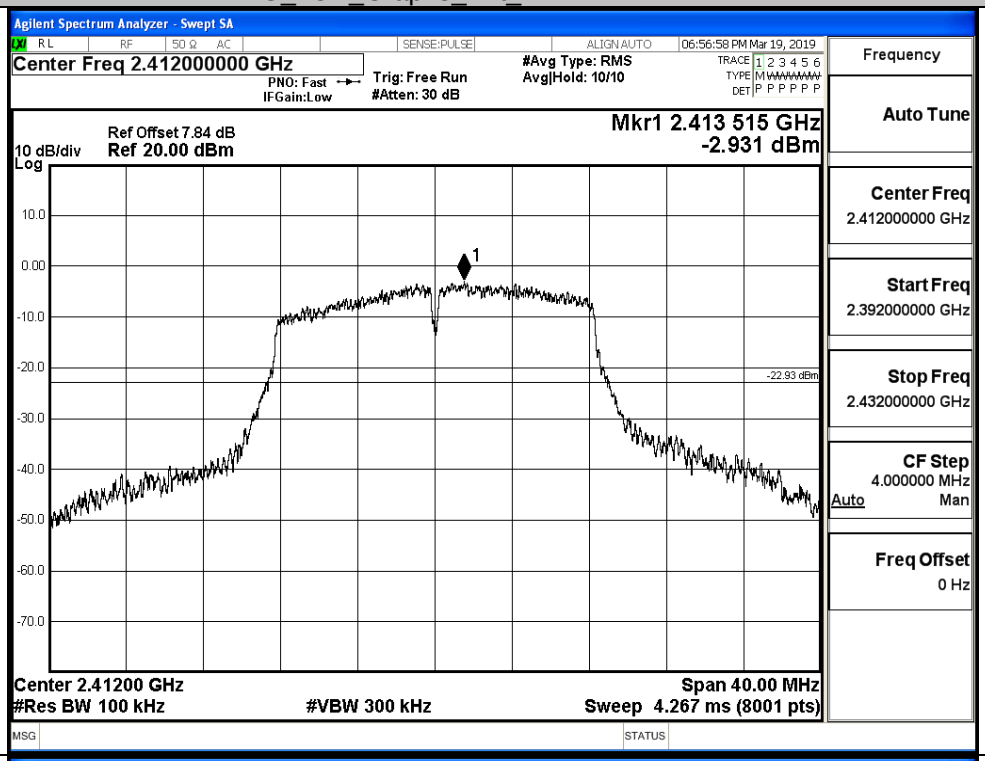
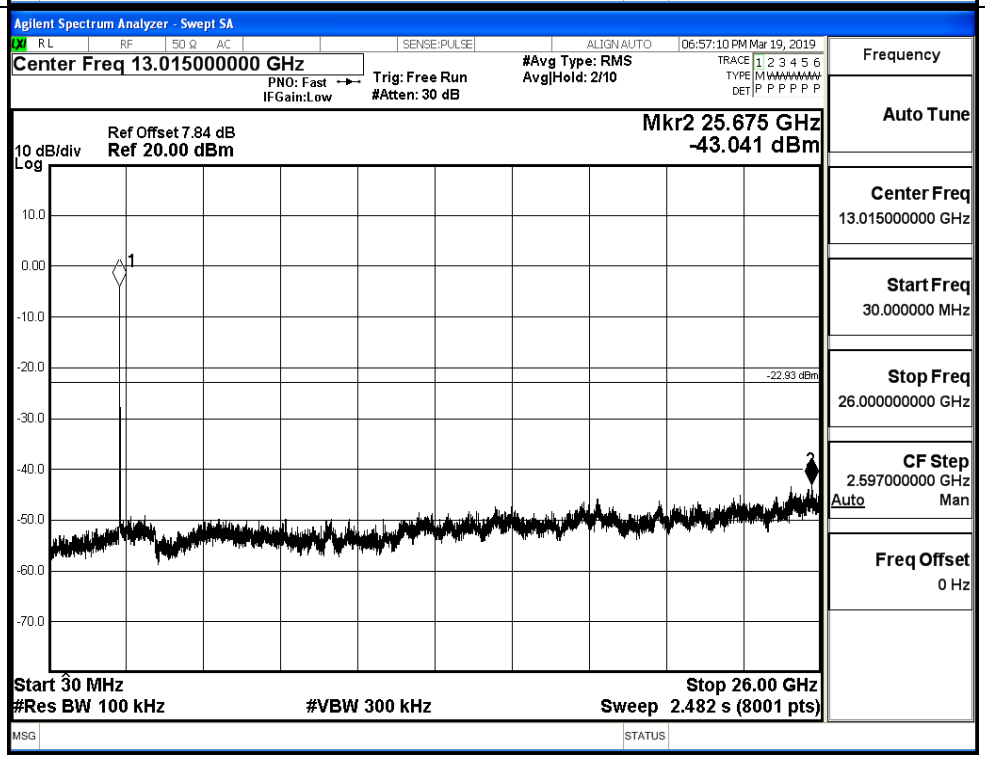
Ant_2

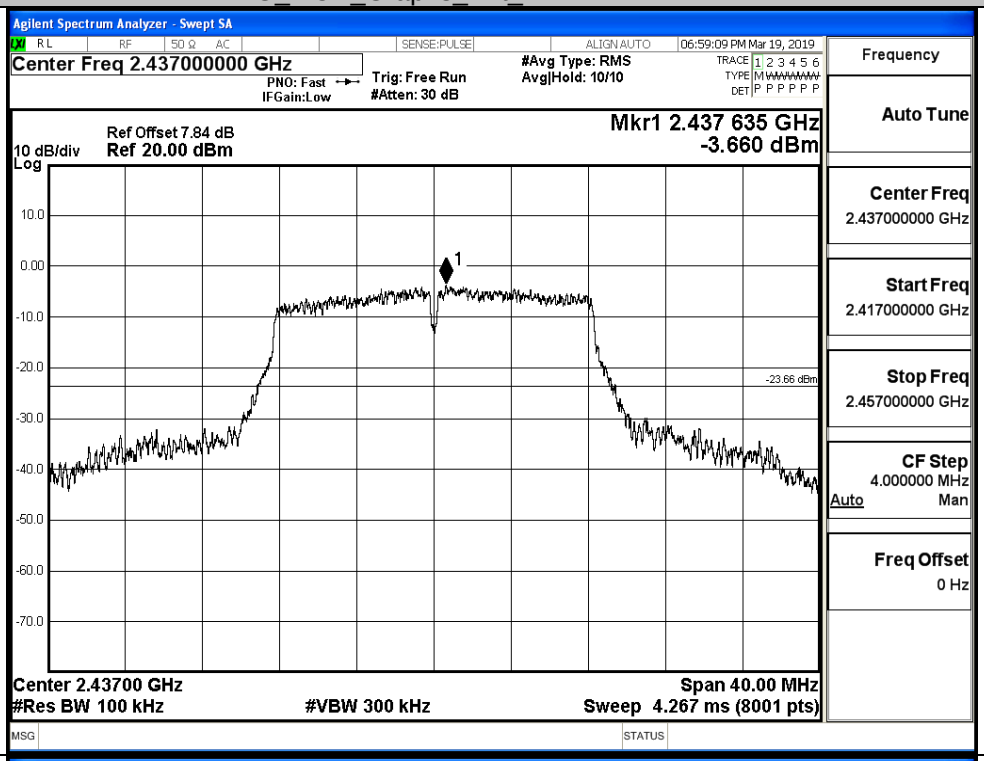
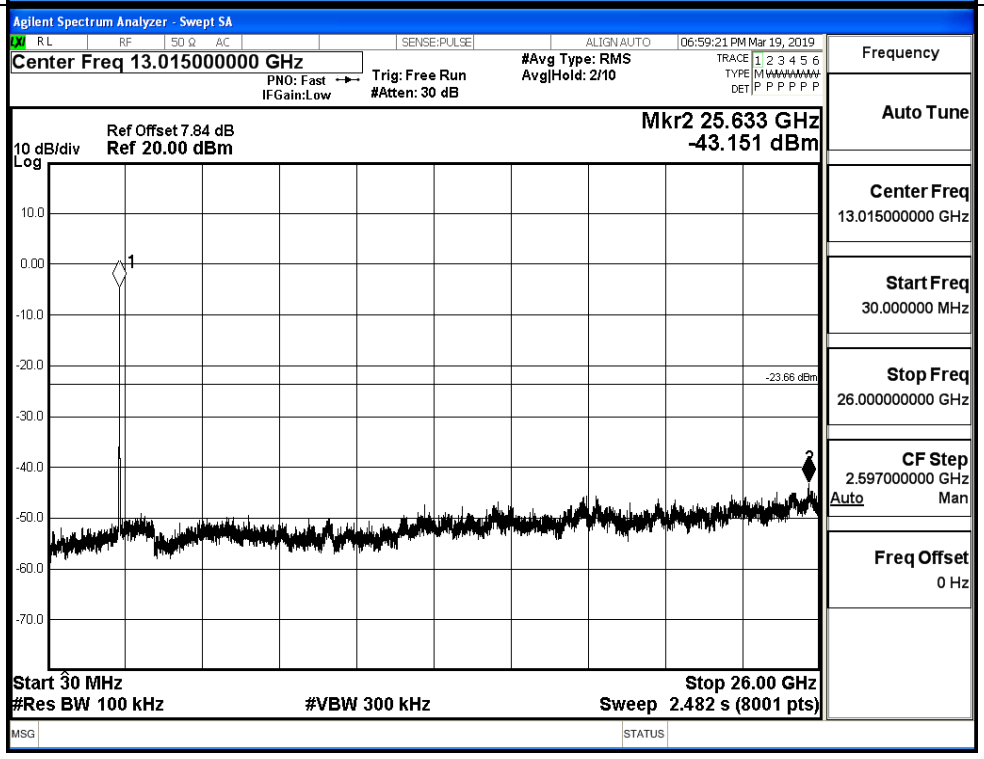
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	0.611	-44.419	-19.389	PASS
	MCH	0.774	-44.617	-19.226	PASS
	HCH	1.297	-44.561	-18.703	PASS
11G	LCH	-2.931	-43.041	-22.931	PASS
	MCH	-3.66	-43.151	-23.660	PASS
	HCH	-2.736	-43.835	-22.736	PASS
11N20	LCH	-3.721	-44.497	-23.721	PASS
	MCH	-3.516	-43.767	-23.516	PASS
	HCH	-2.152	-43.655	-22.152	PASS
11N40	LCH	-7.106	-43.031	-27.106	PASS
	MCH	-7.731	-43.887	-27.731	PASS
	HCH	-5.034	-43.839	-25.034	PASS

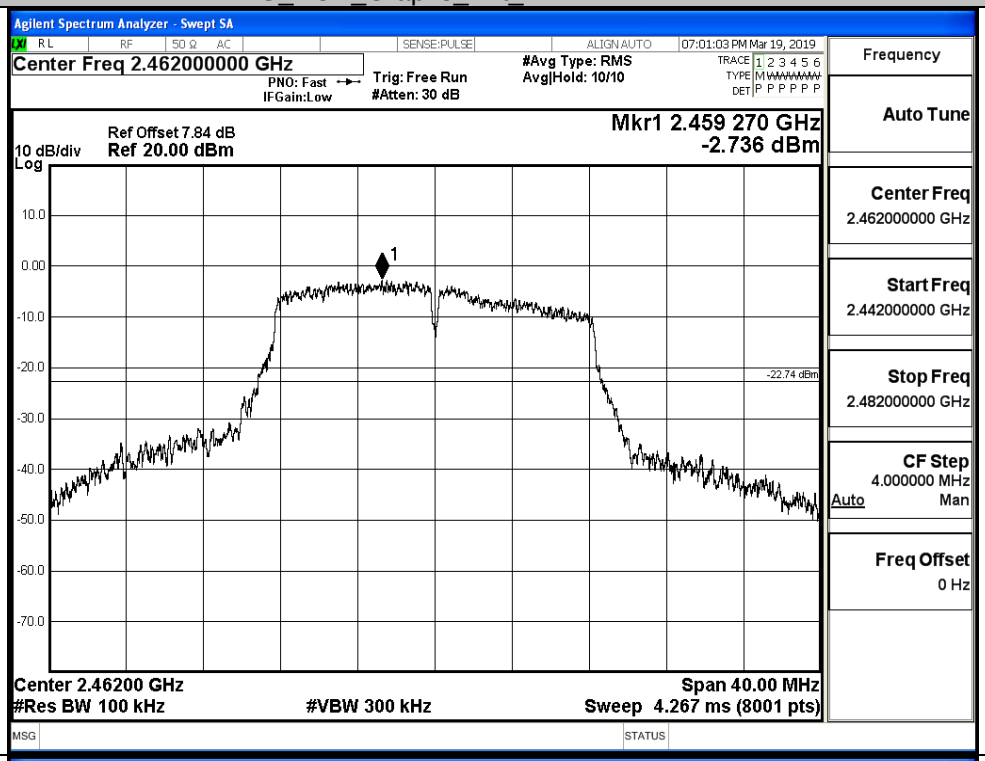
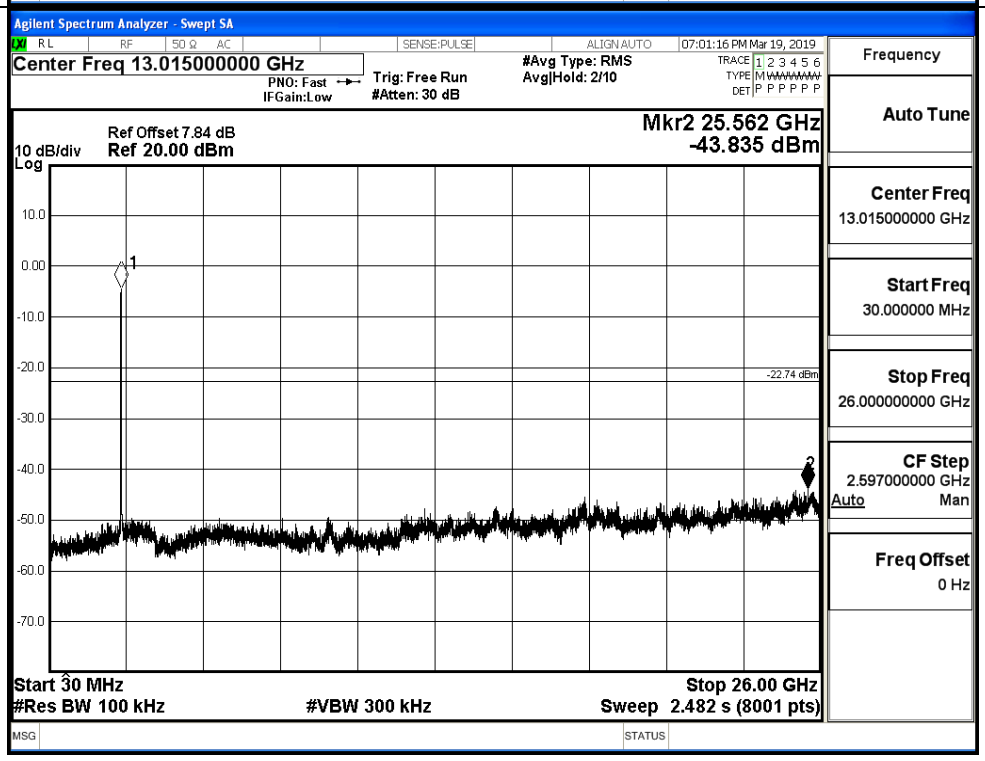
11B_LCH_Graphs_Ant_2	
Pref/11B/LCH	
Puw/11B/LCH	

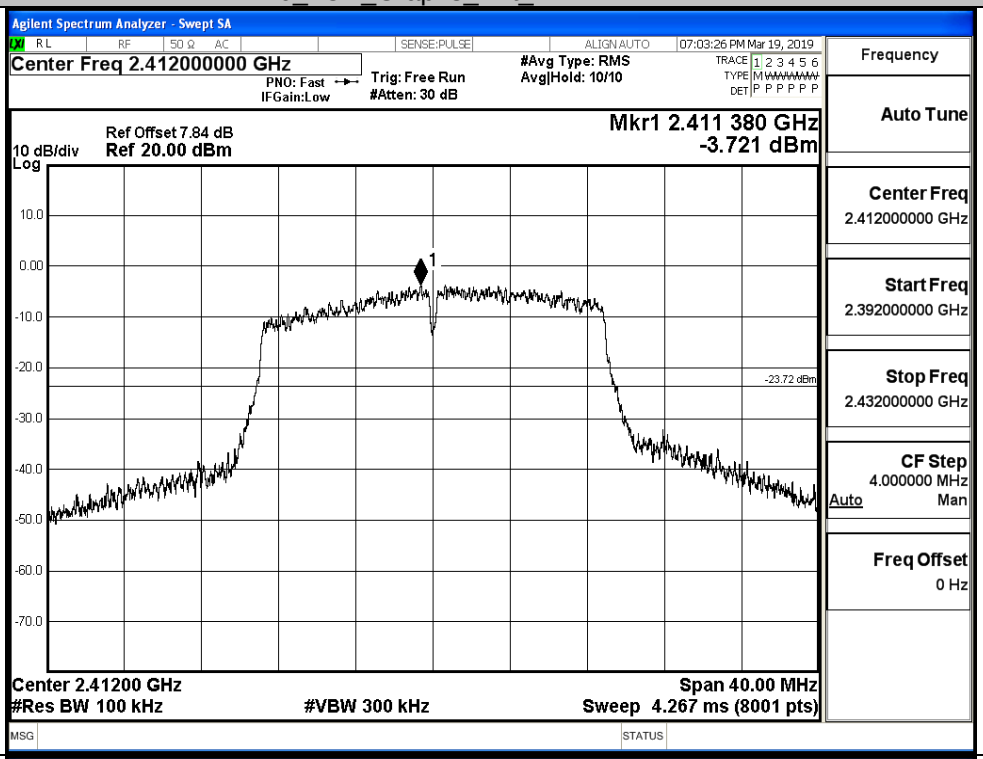
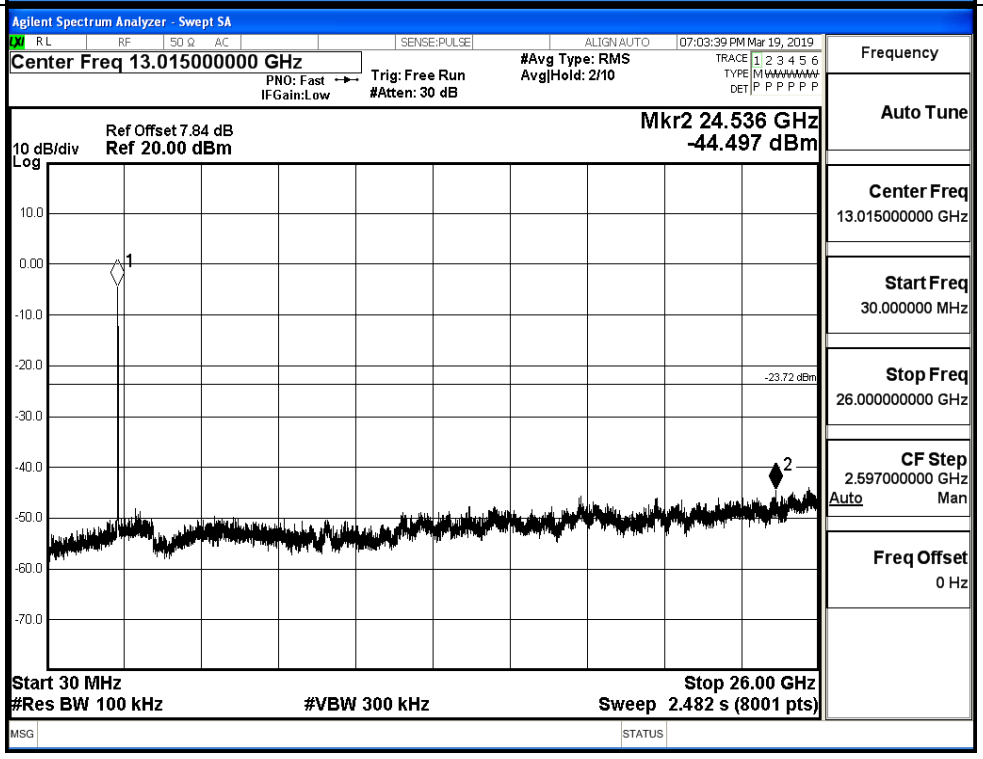
11B_MCH_Graphs_Ant_2	
Pref/11B/MCH	
Puw/11B/MCH	

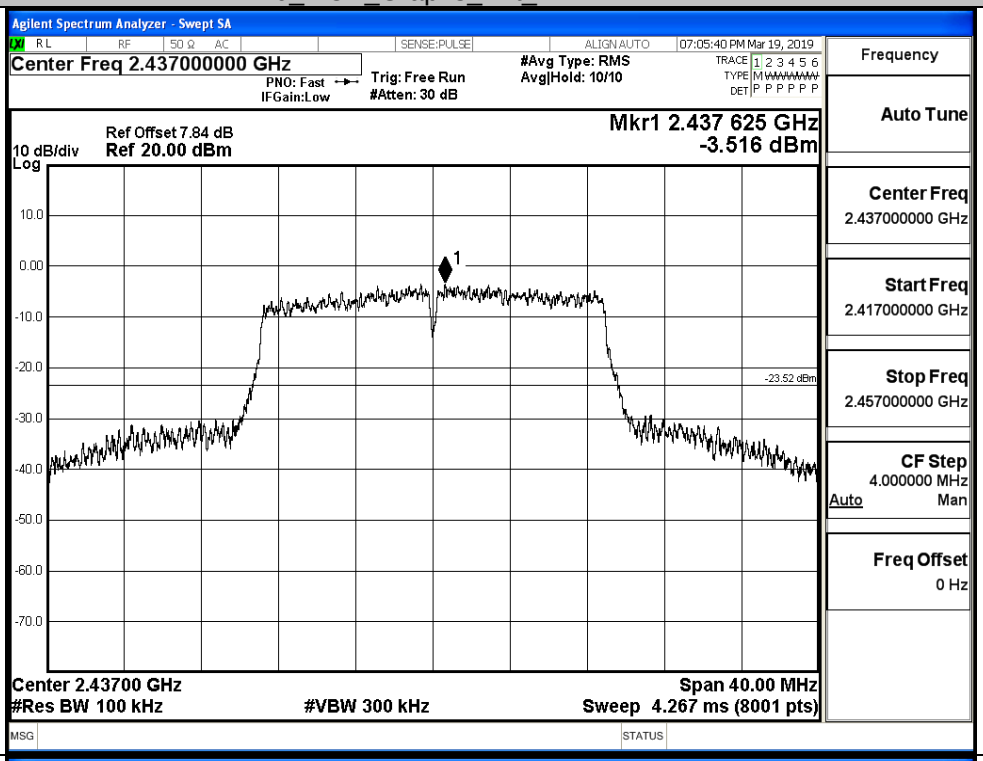
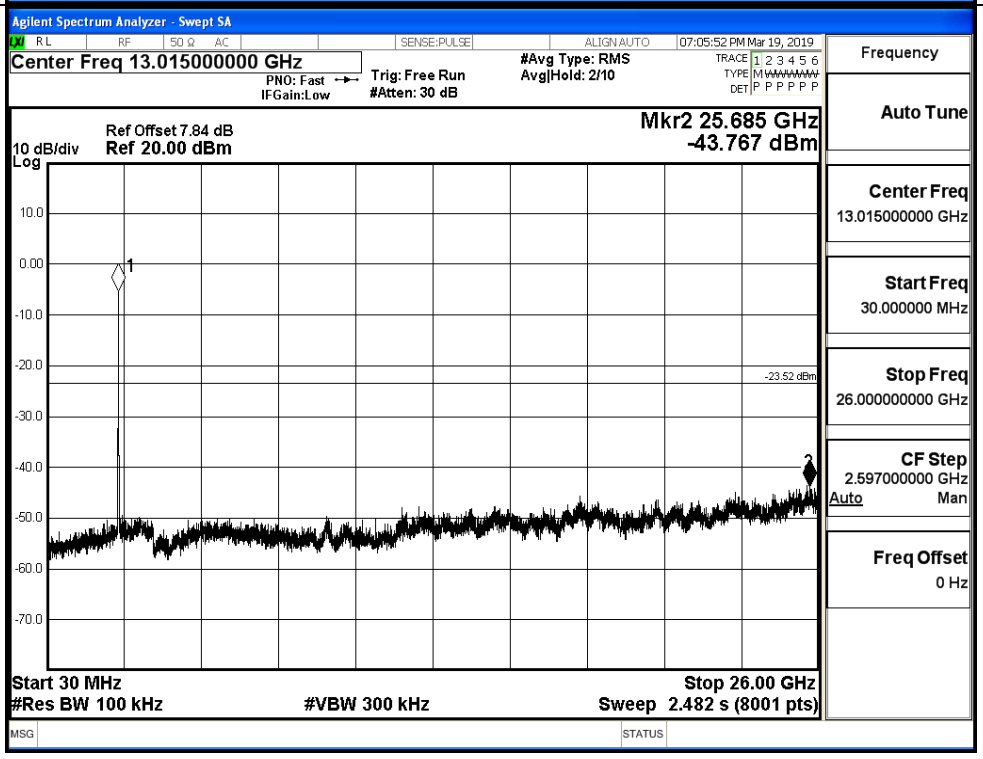
11B_HCH_Graphs_Ant_2	
Pref/11B/HCH	
Puw/11B/HCH	

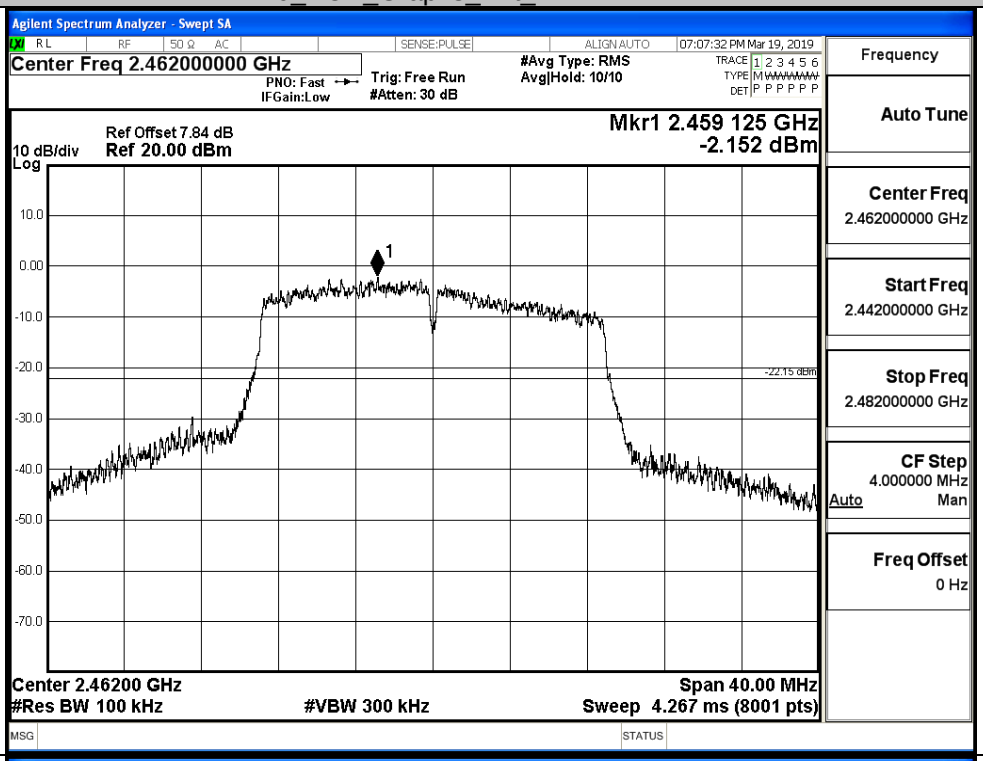
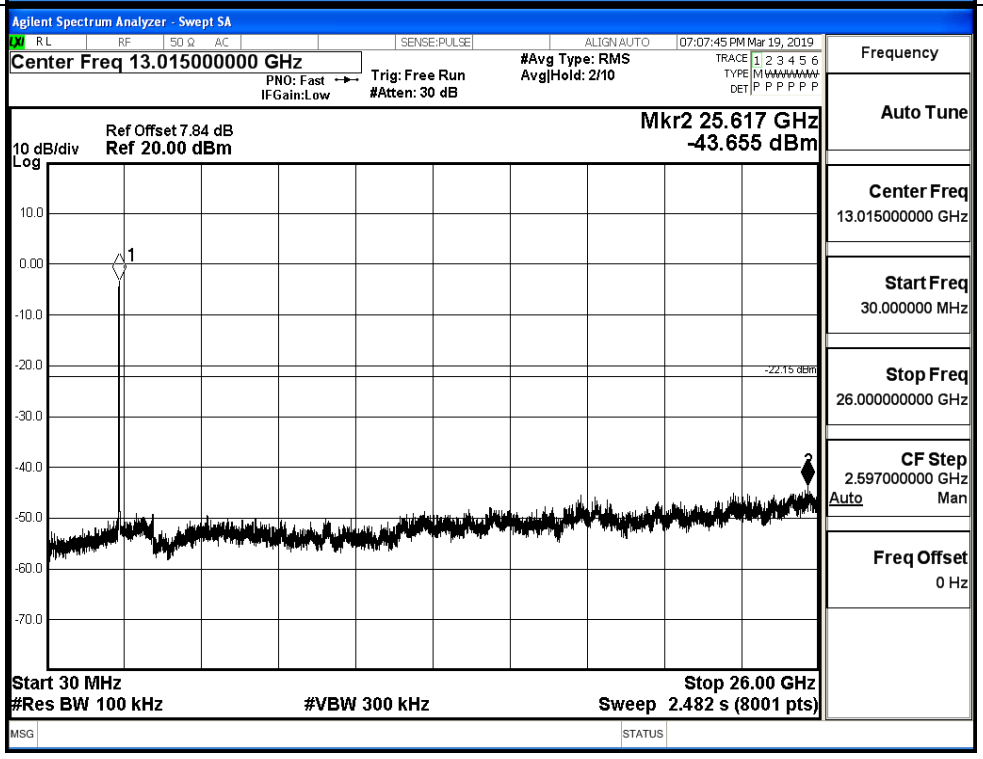
11G_LCH_Graphs_Ant_2	
Pref/11G/LCH	
Puw/11G/LCH	

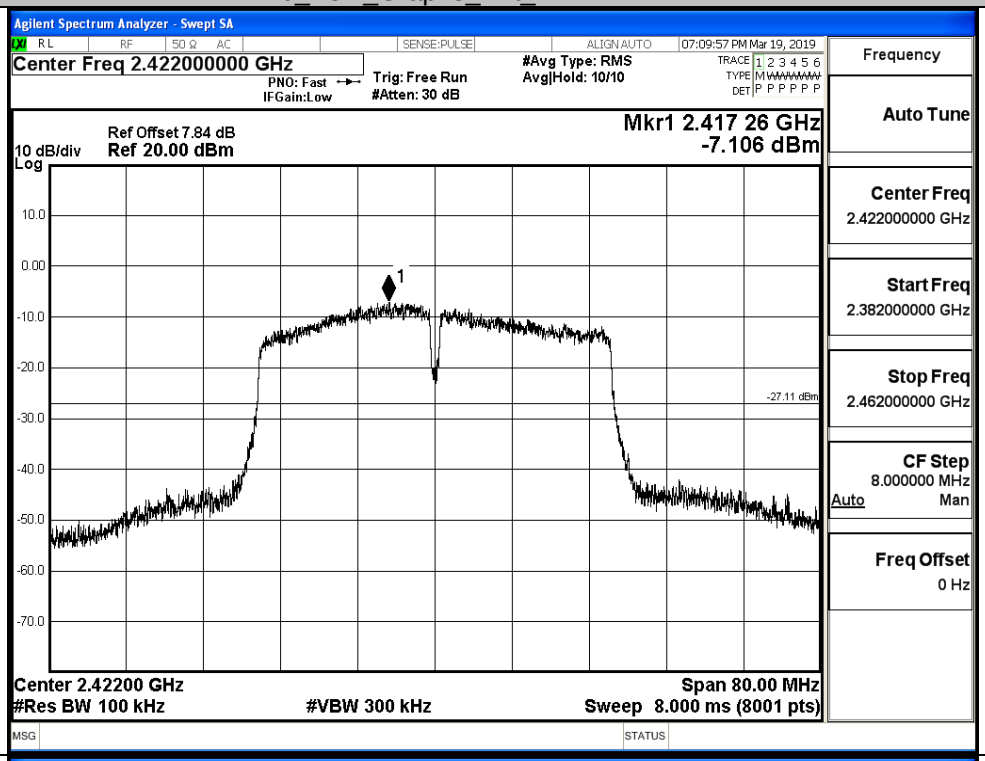
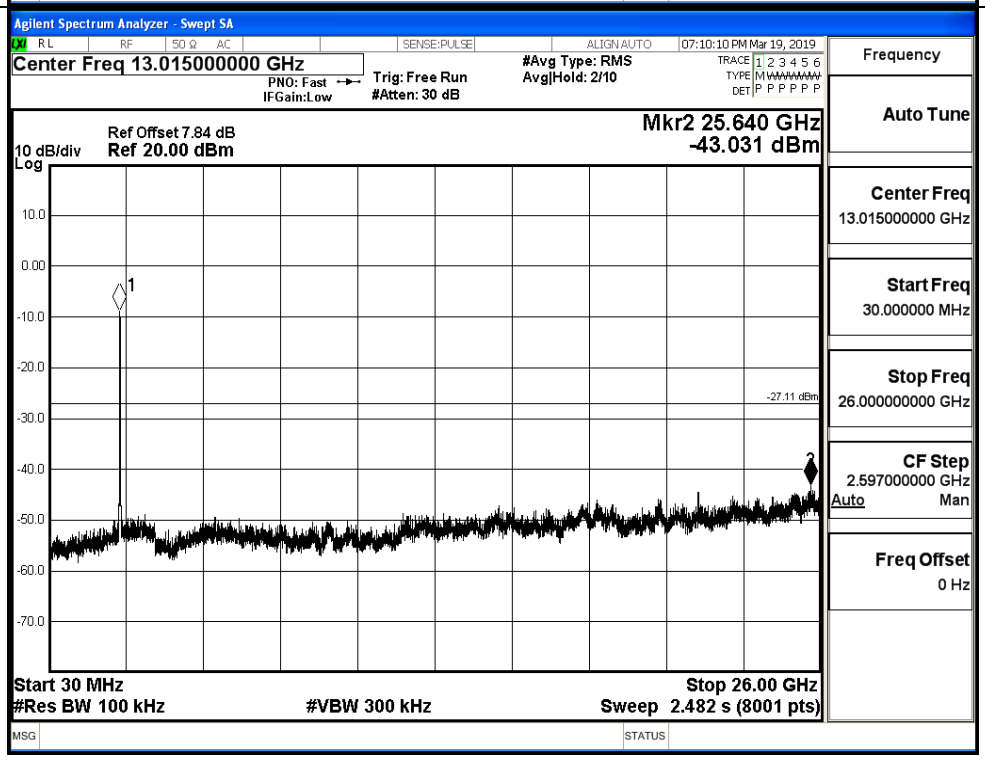
11G_MCH_Graphs_Ant_2	
Pref/11G/MCH	
Puw/11G/MCH	

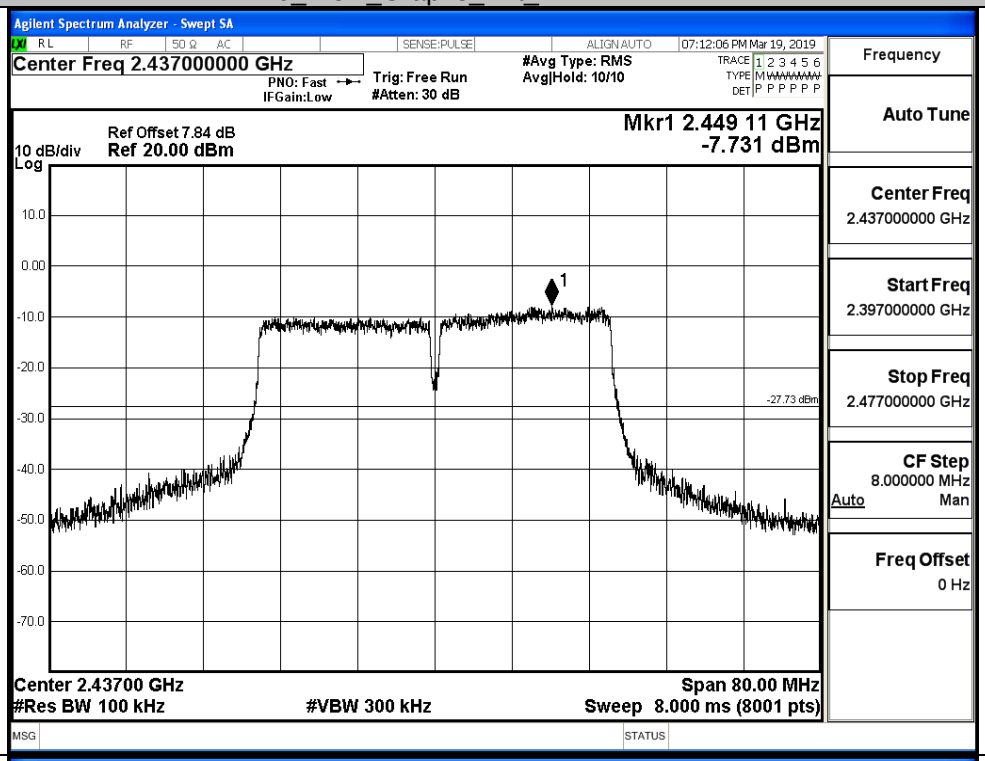
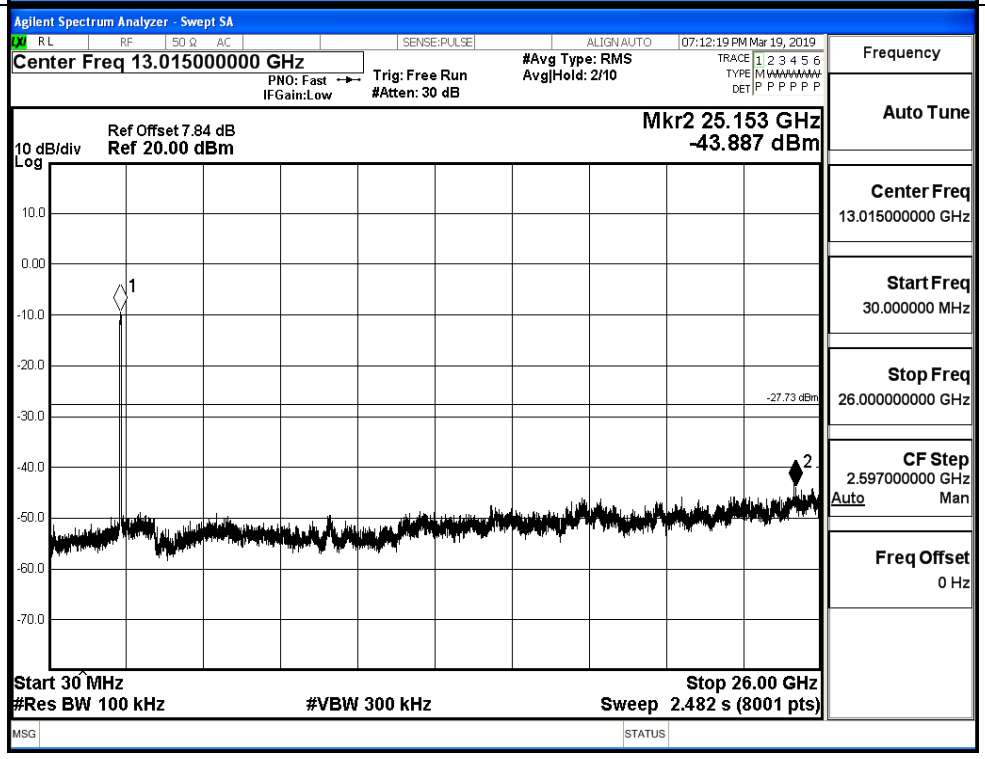
11G_HCH_Graphs_Ant_2	
Pref/11G/HCH	
Puw/11G/HCH	

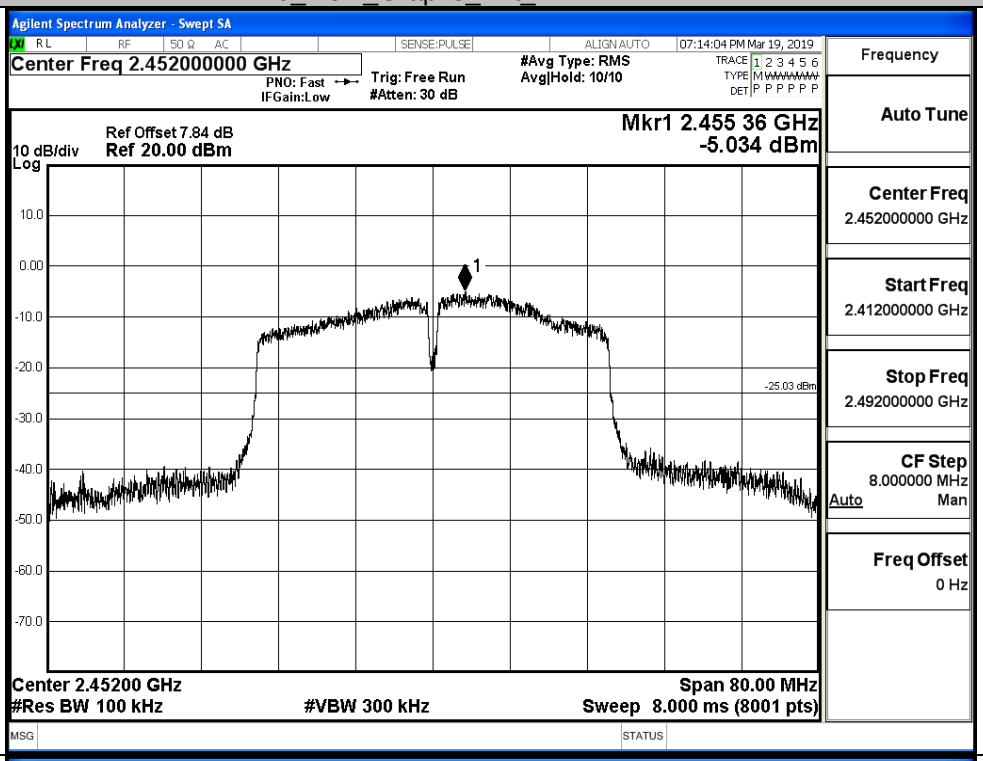
11N20_LCH_Graphs_Ant_2	
Pref/11N20/ LCH	
Puw/11N20/ LCH	

11N20_MCH_Graphs_Ant_2	
Pref/11N20/ MCH	
Puw/11N20/ MCH	

11N20_HCH_Graphs_Ant_2	
Pref/11N20/ HCH	
Puw/11N20/ HCH	

11N40_LCH_Graphs_Ant_2	
Pref/11N40/ LCH	
Puw/11N40/ LCH	

11N40_MCH_Graphs_Ant_2	
Pref/11N40/ MCH	
Puw/11N40/ MCH	

11N40_HCH_Graphs_Ant_2	
Pref/11N40/ HCH	
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