

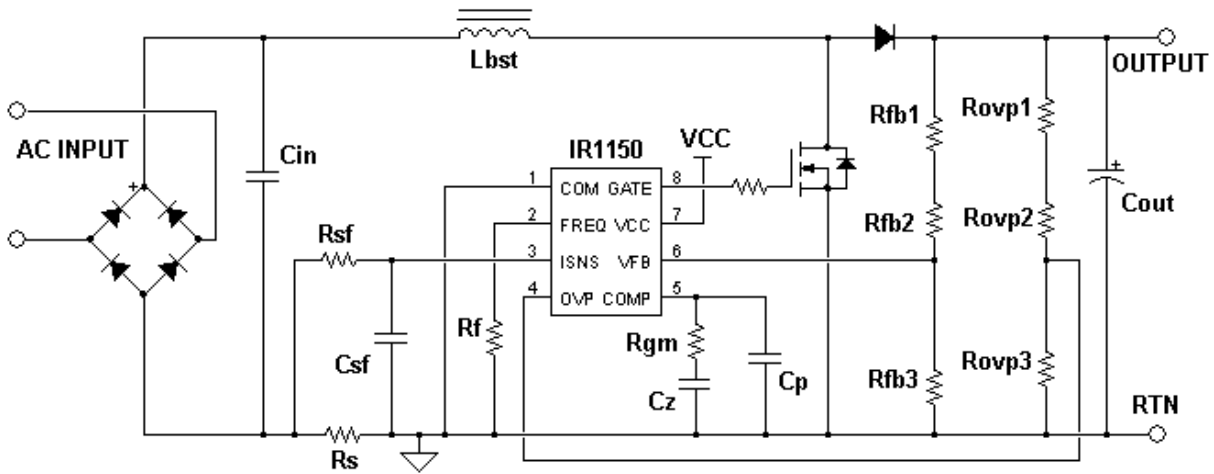
One Cycle Control μ PFC Circuit Featuring the IR1150S IC

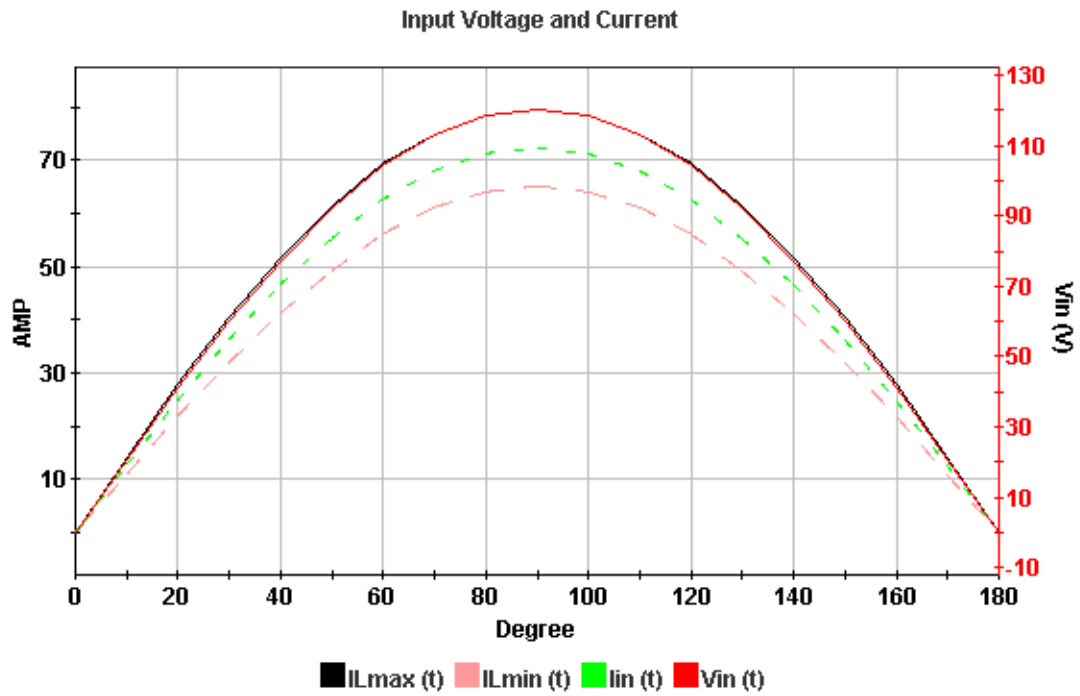
Operating Conditions:

Input		Output	
Min Input Voltage:	85 V	Switching Frequency:	50 kHz
Max Input Voltage:	250 V	Hold-up Time:	20 ms
Input AC Frequency:	50 Hz	Choke Ripple Current:	20 %
Start-up Time:	50 ms	Output Power:	4000 W
Target Efficiency:	92 %	Output Voltage:	400 V
		Output Voltage (min):	320 V
		Output Cap Tolerance:	10 %
		OVP Threshold:	440 V

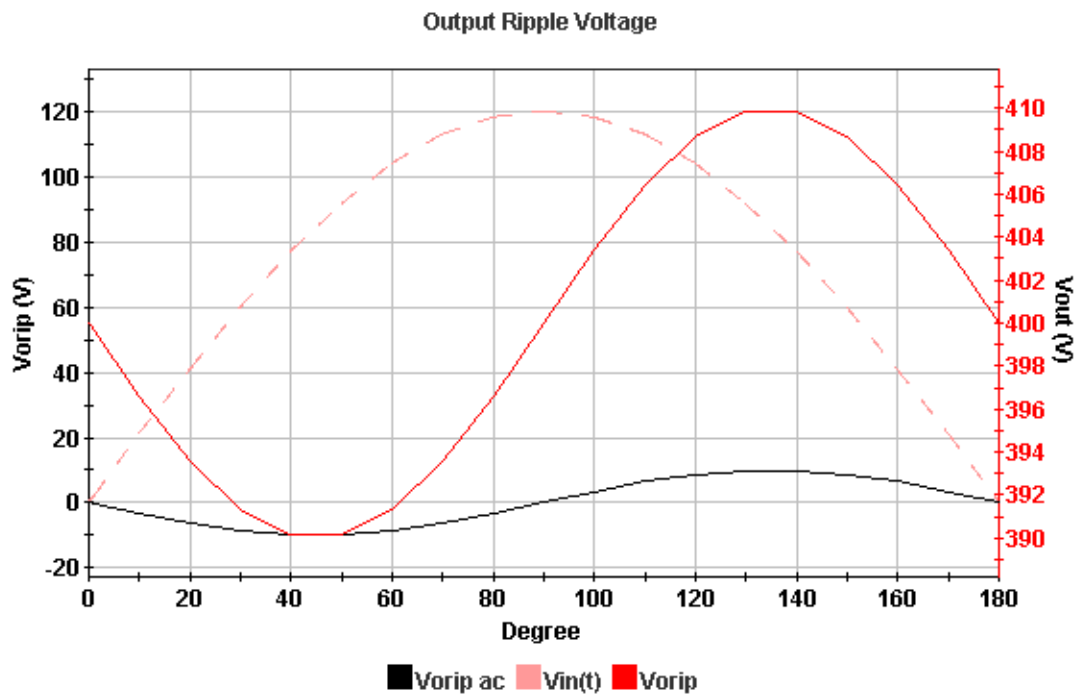
Calculation Result:

Output Conditions			Component Values			
Max Input Power	4,348	W	Component	Ref Des	Std Value	Calc Value
Input RMS Current	51.15	A	High Freq Input Cap	Cin	6.8 μ F	6.39 μ F
Input Peak Current	72.34	A	Boost Choke Value	Lbst	120 μ H	116 μ H
Input Average Current	46.05	A	Output Capacitor	Cout	3.3 mF	3,086 μ F
Input Pk Voltage (min)	120	V	Output Voltage Rset	Rfb3	17.8 kOhm	17.8 kOhm
Duty Cycle - low line	0.70		Output OVP Rset	Rovp3	17.4 kOhm	17.3 kOhm
Ripple Current	14.47	A	Current Sense Res	Rs		0.009 Ohm
Peak Inductor Current	79.57	A	Zero Capacitor	Cz	330 nF	331 nF
V Current Sense	0.73	V	Gain Resistor	Rgm	3.92 kOhm	3.86 kOhm
Peak Current Limit	114.88	A	Pole Capacitor	Cp	5.1 nF	4.95 nF
Input Pk Ovld Current	83.55	A	Current Sense Filter Capacitor	Csf	1 nF	1.00 nF
Power Distribution			Current Sense Filter Resistor	Rsf	100 Ohm	100 Ohm
Power Dissipation Rfb	77.4	mW	Timing Resistor	Rf	165 kOhm	162.7 kOhm
Power Diss Rovp	77.2	mW	Rfb1, Rfb2, Rovp1 and Rovp2 are 499 kOhms each			
Power Rs	22.77	W				

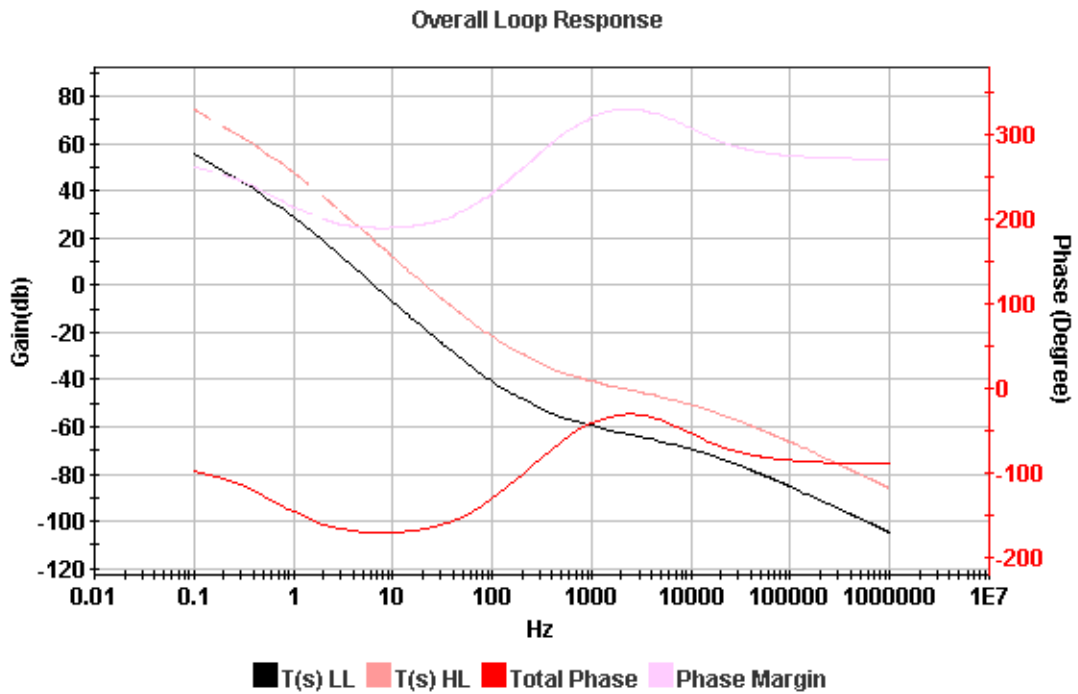




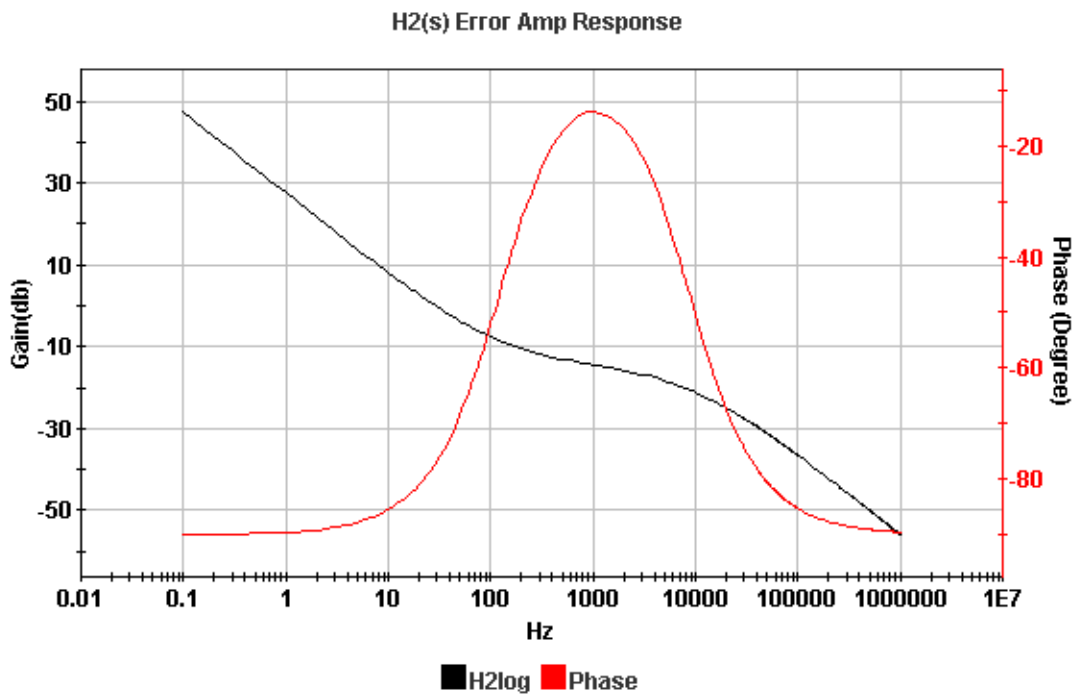
Graph 1: Input voltage and current relationship for this IR1150 power factor correction circuit.



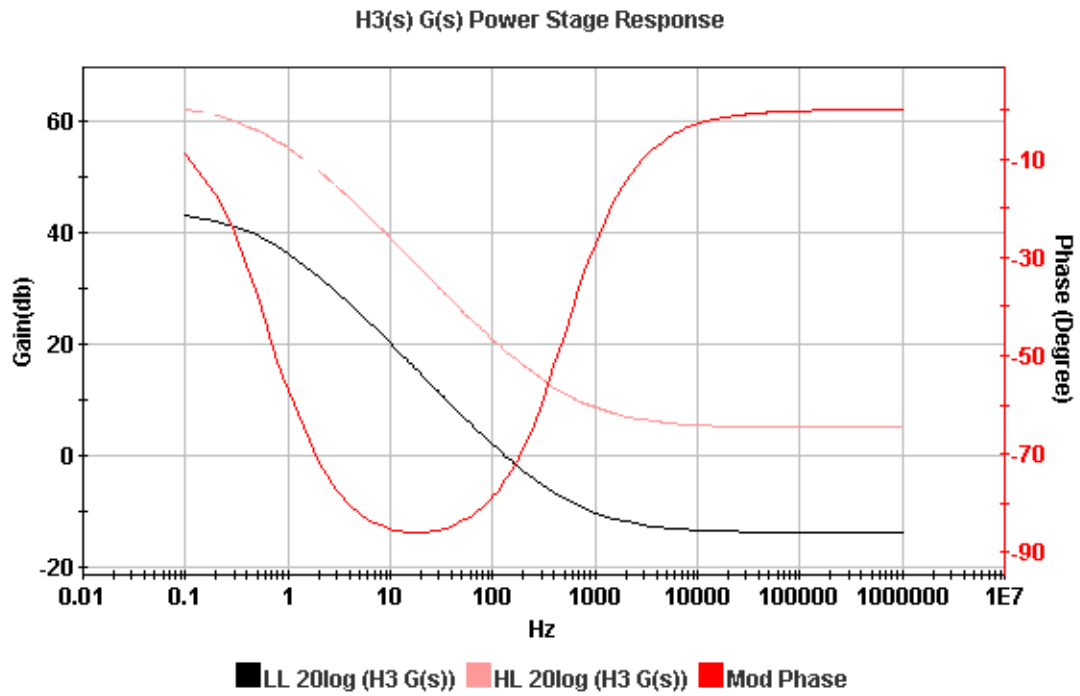
Graph 2: Output voltage ripple amplitude relative to the AC input voltage for this design.



Graph 3: This is the overall feedback loop response of the power factor correction circuit showing phase and gain.



Graph 4: This is the error amplifier response of the power factor correction circuit showing phase and gain.



Graph 5: This is the power stage response of the power factor correction circuit showing phase and gain.

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