

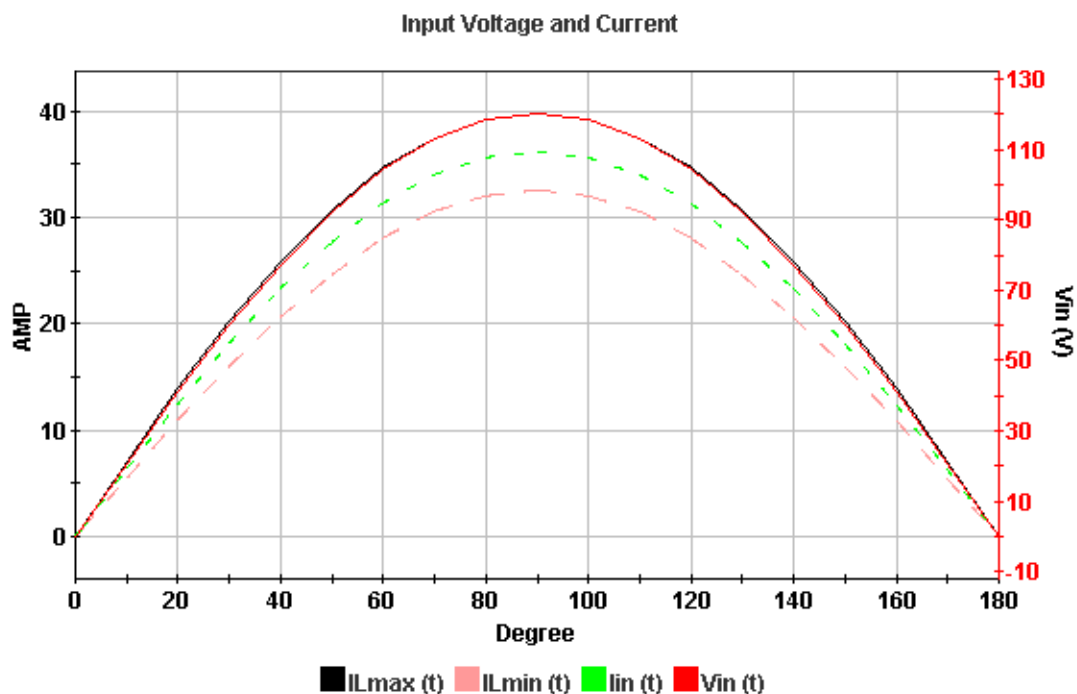
One Cycle Control μ PFC Circuit Featuring the IR1155S IC

Operating Conditions:

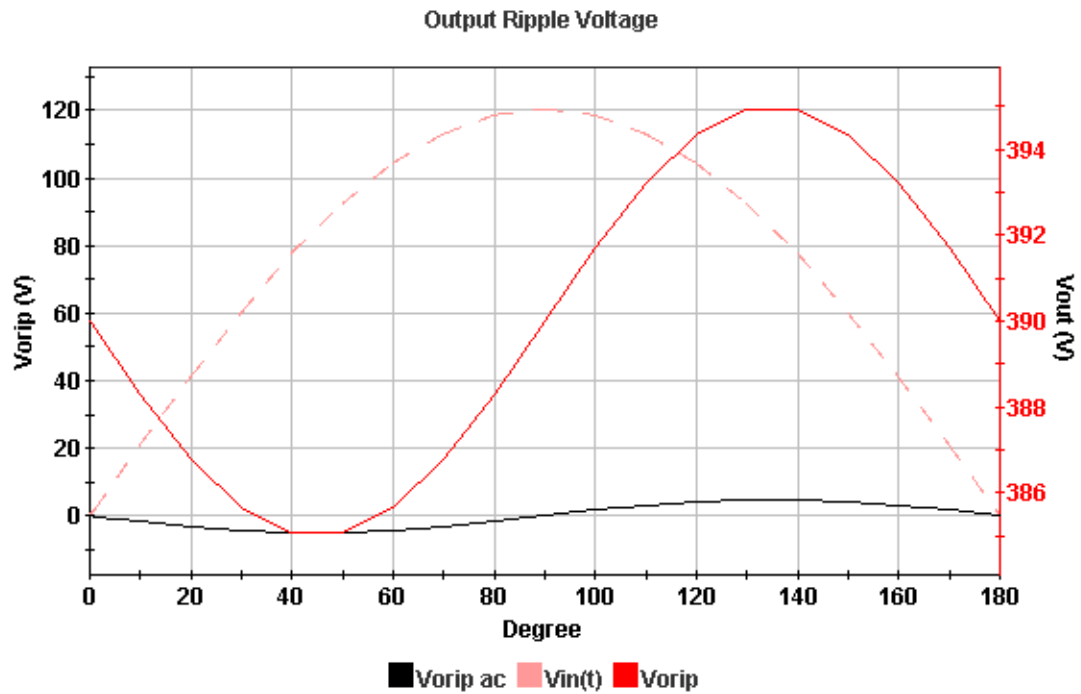
Input		Output	
Min Input Voltage:	85 V	Switching Frequency:	100 kHz
Max Input Voltage:	264 V	Hold-up Time:	20 ms
Input AC Frequency:	50 Hz	Choke Ripple Current:	20 %
Start-up Time:	100 ms	Output Power:	2000 W
Target Efficiency:	92 %	Output Voltage:	390 V
		Output Voltage (min):	312 V
		Output Cap Tolerance:	20 %
		OVP Threshold:	425 V

Calculation Result:

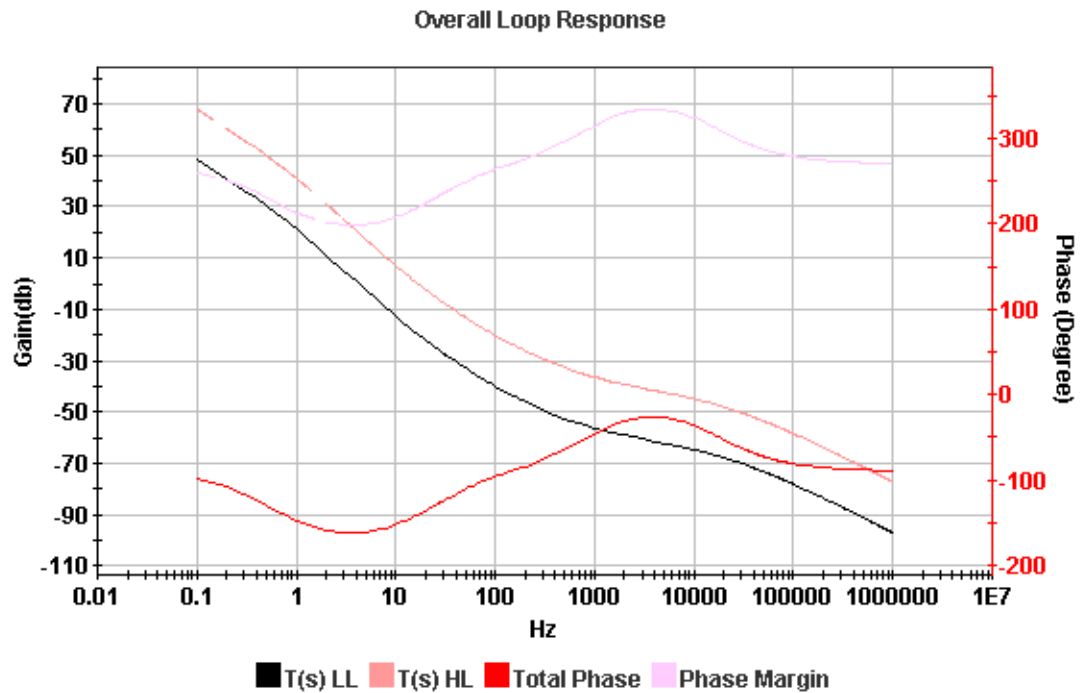
Output Conditions			Component Values			
			Component	Ref Des	Std Value	Calc Value
Max Input Power	2,174	W	High Freq Input Cap	Cin	1.8 μ F	1.60 μ F
Input RMS Current	25.58	A	Boost Choke Value	Lbst	120 μ H	115 μ H
Input Peak Current	36.17	A	Output Capacitor	Cout	2.2 mF	1,826 μ F
Input Average Current	23.03	A	Output Voltage Rset	Rfb3	13 kOhm	13.0 kOhm
Input Pk Voltage (min)	120	V	Output OVP Rset	Rovp3	12.7 kOhm	12.7 kOhm
Duty Cycle - low line	0.69		Current Sense Res	Rs		0.011 Ohm
Ripple Current	7.23	A	Zero Capacitor	Cz	820 nF	898 nF
Peak Inductor Current	39.79	A	Gain Resistor	Rgm	7.68 kOhm	7.67 kOhm
V Current Sense	0.46	V	Pole Capacitor	Cp	1.2 nF	1.25 nF
Peak Current Limit	70.33	A	Current Sense Filter Capacitor	Csf	1 nF	1.00 nF
Input Pk Ovld Current	41.78	A	Current Sense Filter Resistor	Rsf	100 Ohm	100 Ohm
Power Distribution			Timing Capacitor	Cf	1 nF	0.93 nF
Power Dissipation Rfb	74.3		Rfb1, Rfb2, Rovp1 and Rovp2 are 499 kOhms each			
Power Diss Rovp	74.3					
Power Rs	7.16	W				



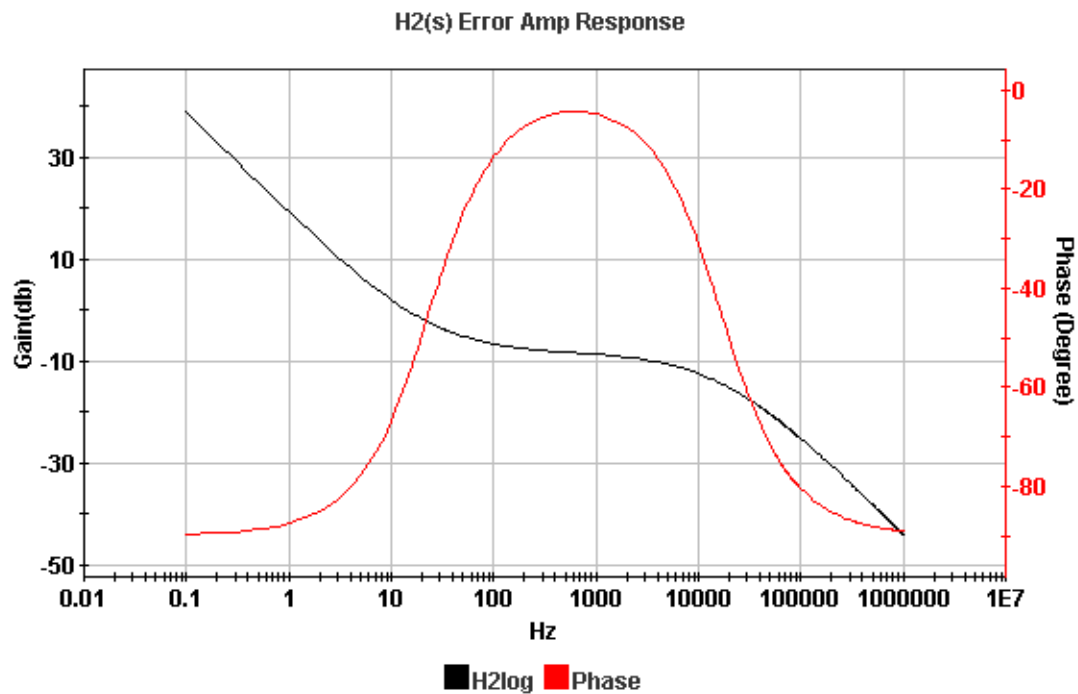
Graph 1: Input voltage and current relationship for this IR1155 power factor correction circuit.



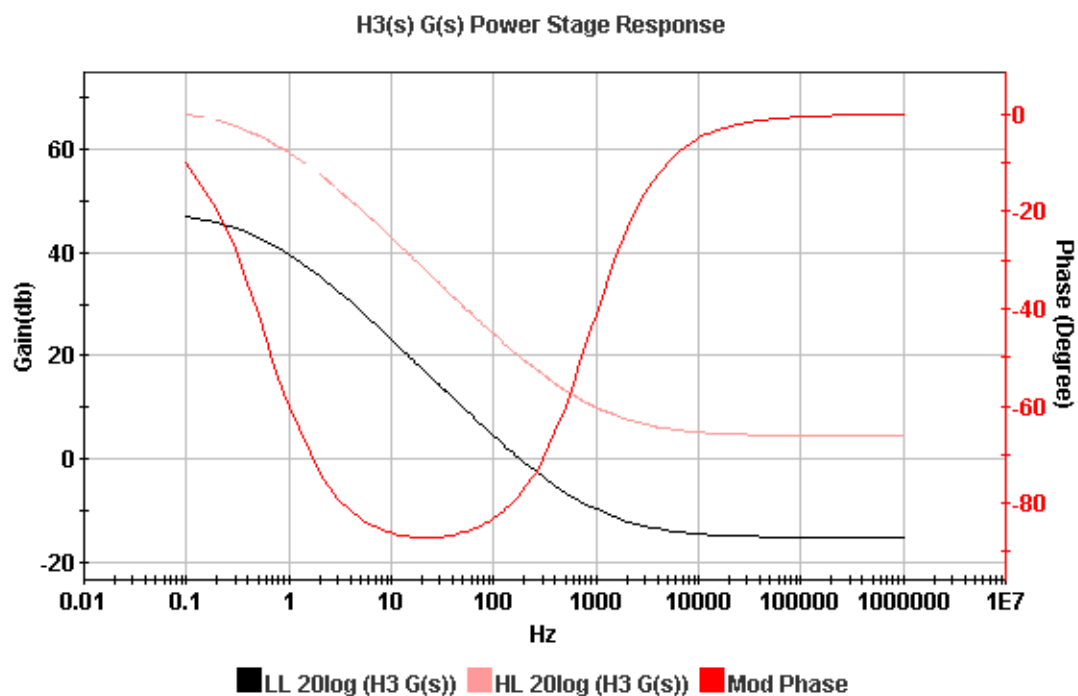
Graph 2: Output voltage ripple amplitude relative to the AC input voltage for this design.



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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