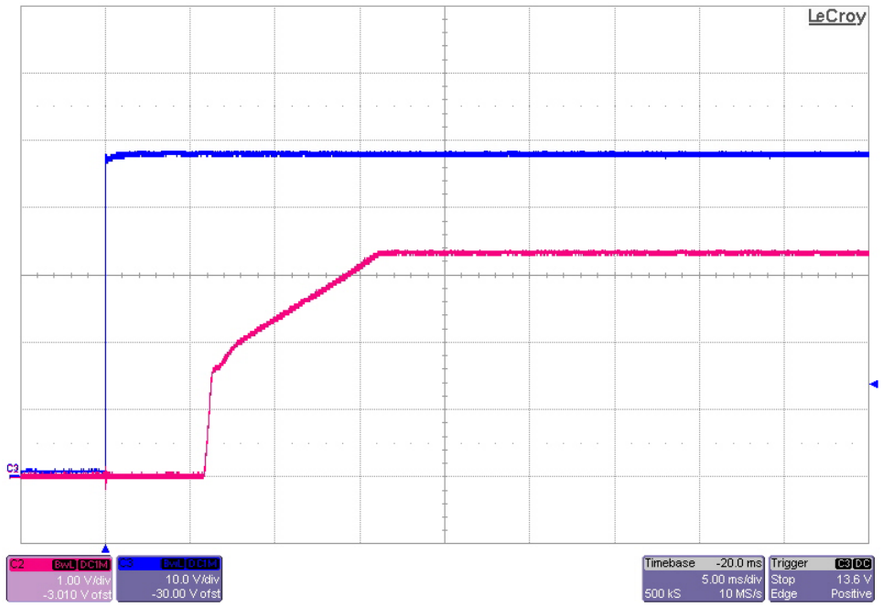
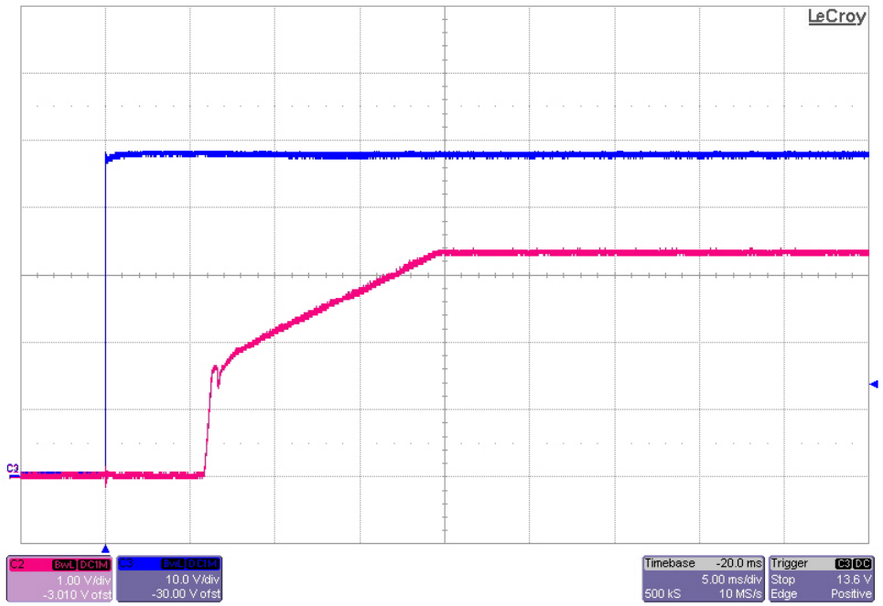
1 Startup

The photo below shows the 3.3V output voltage startup waveforms after the application of 48Vdc in. The output was loaded to 0A. (Vin is 10V/DIV, Vout is 1V/DIV, 5mS/DIV)

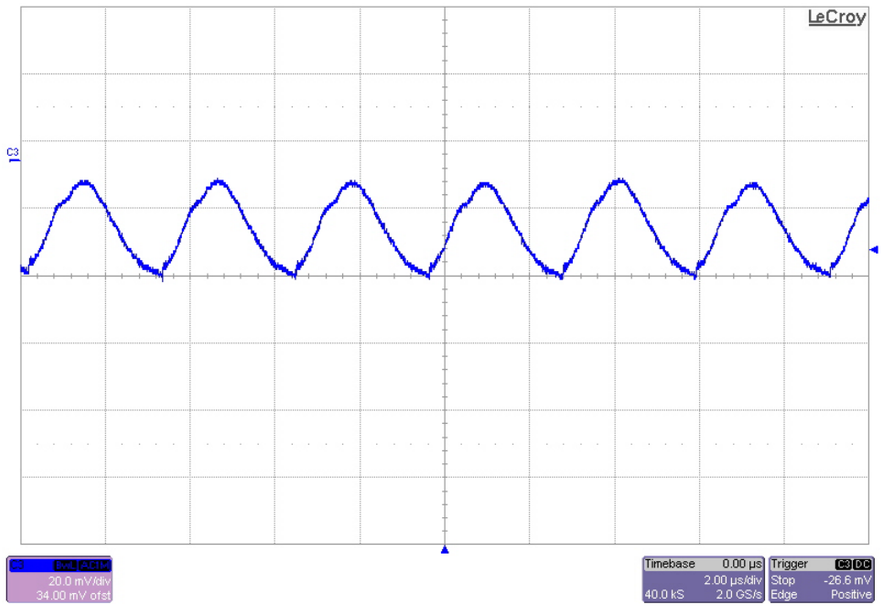


The photo below shows the 3.3V output voltage startup waveforms after the application of 48Vdc in. The output was loaded to 1.5A. (Vin is 10V/DIV, Vout is 1V/DIV, 5mS/DIV)

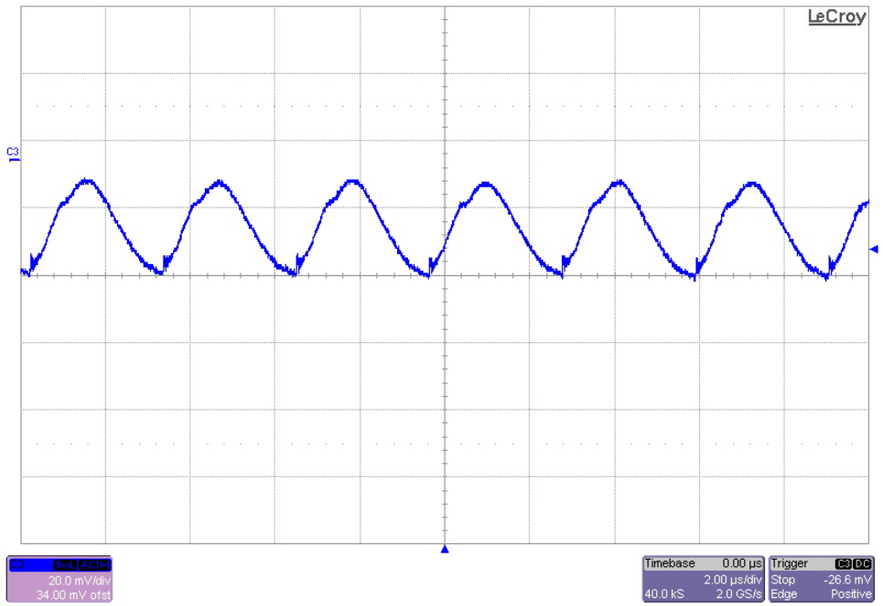


2 Output Ripple Voltage

The 3.3V output ripple voltage is shown in the figure below. The image was taken with the output loaded to 1.5A and the input voltage set to 48Vdc. (20mV/DIV, 2uS/DIV)

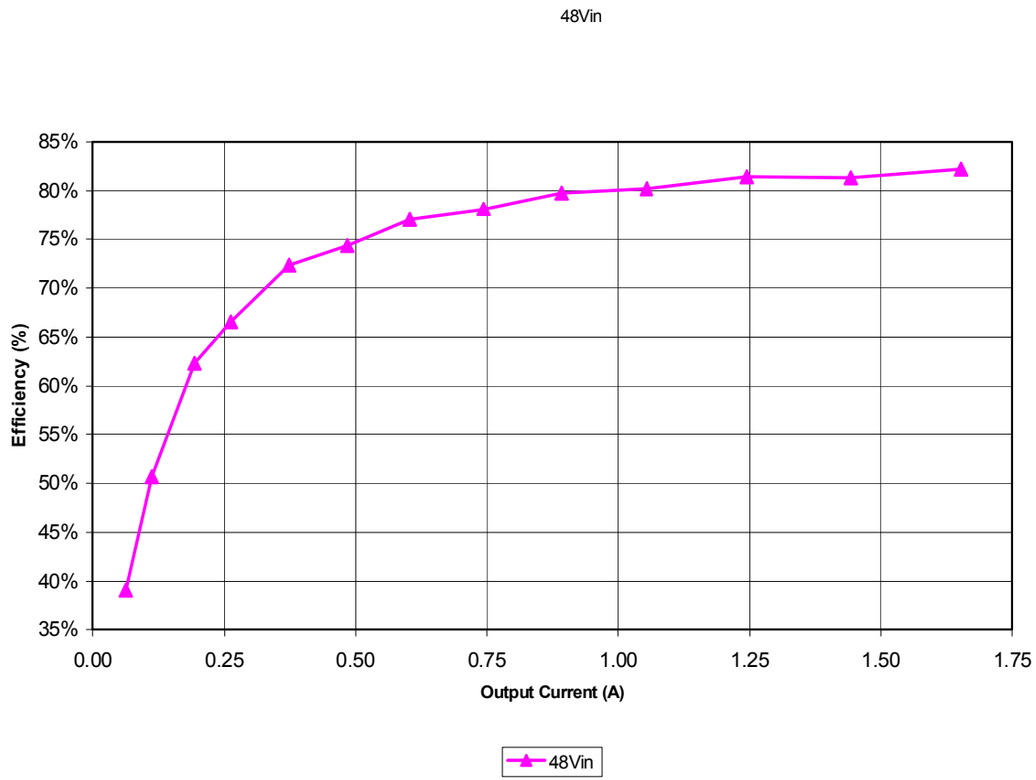


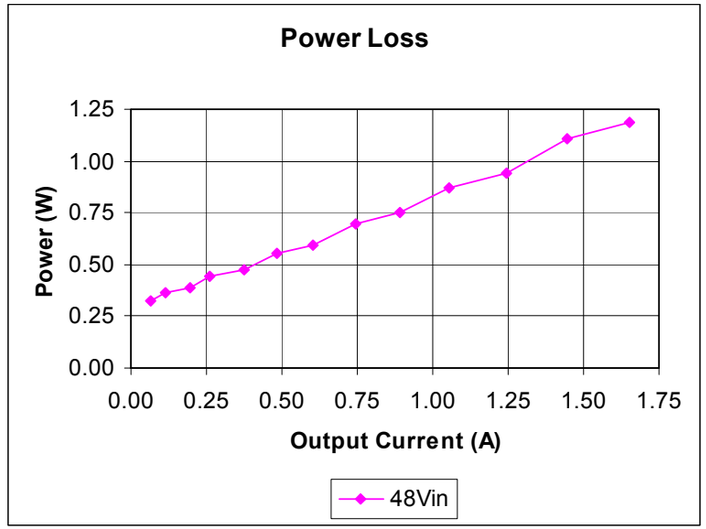
The 3.3V output ripple voltage is shown in the figure below. The image was taken with the output loaded to 1.5A and the input voltage set to 60Vdc. (20mV/DIV, 2uS/DIV)


LeCroy
C3
C3 DC 1MΩ BW
20.0 mV/div
34.00 mV ofst
Timebase 0.00 µs
2.00 µs/div
40.0 kS 2.0 GS/s
Trigger DC
Stop -26.6 mV
Edge Positive

3 Efficiency

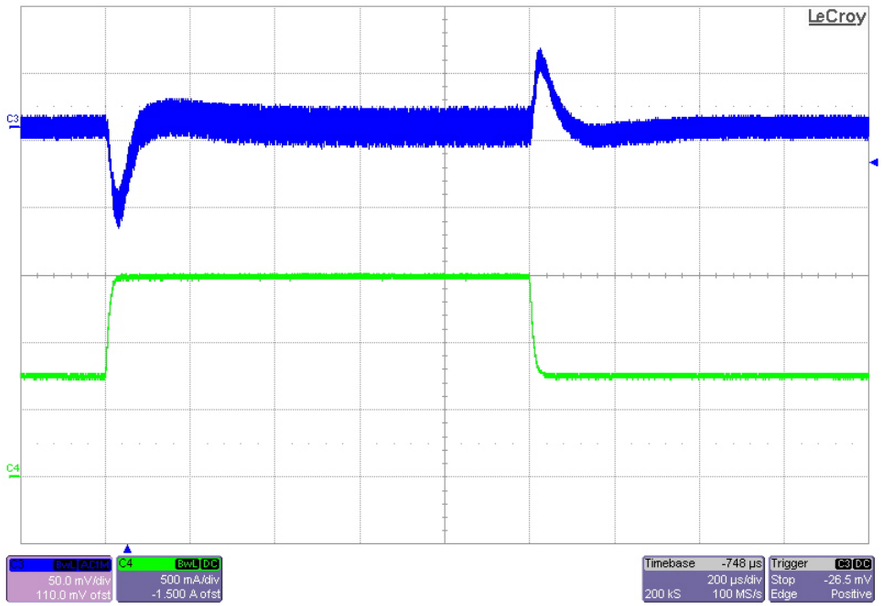
The converter efficiency is shown in the figure below.



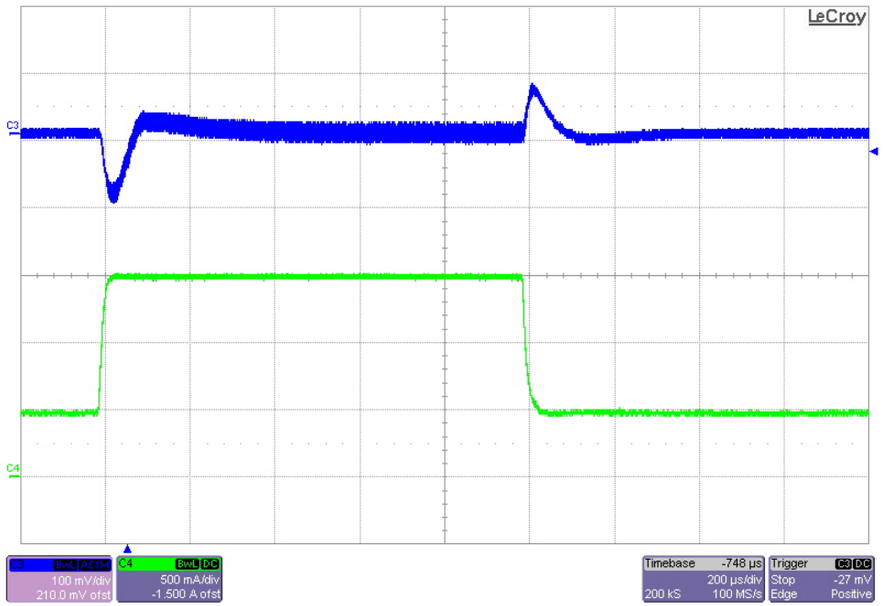


4 Load Transients

The photo below shows the 3.3V output voltage (top, ac coupled) when the load current is stepped between 0.75A to 1.5A. Vin = 48Vdc (50mV/DIV, 500mA/DIV, 200uS/DIV)

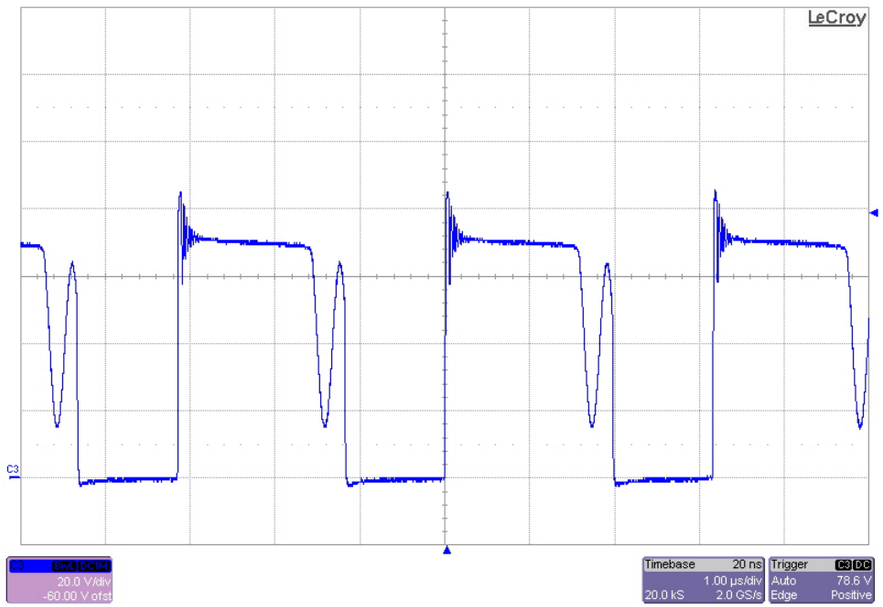


The photo below shows the 3.3V output voltage (top, ac coupled) when the load current is stepped between 0.5A to 1.5A. Vin = 48Vdc (100mV/DIV, 500mA/DIV, 200uS/DIV)

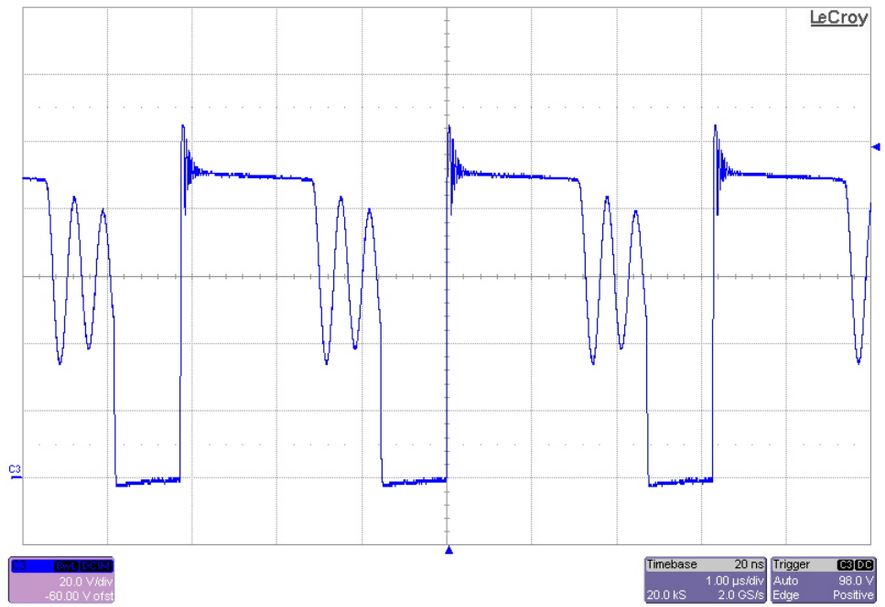


5 Waveforms

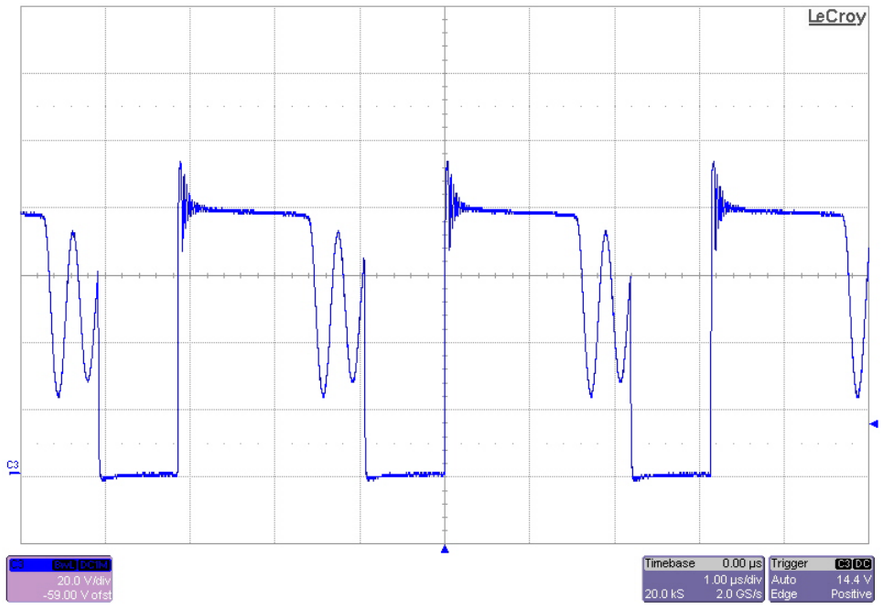
The photo below is the N-ch FET drain waveform. The input voltage is 40Vand the output is loaded to 1.5A. (20V/DIV, 1uS/DIV)



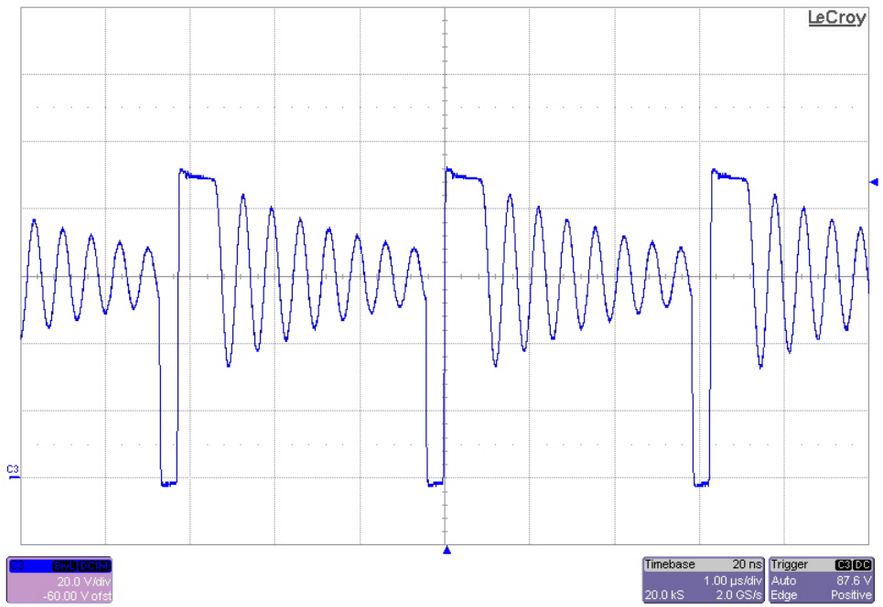
The photo below is the N-ch FET drain waveform. The input voltage is 60Vand the output is loaded to 1.5A. (20V/DIV, 1uS/DIV)



The photo below is the N-ch FET drain waveform. The input voltage is 48Vand the output is loaded to 1.5A. (20V/DIV, 1uS/DIV)



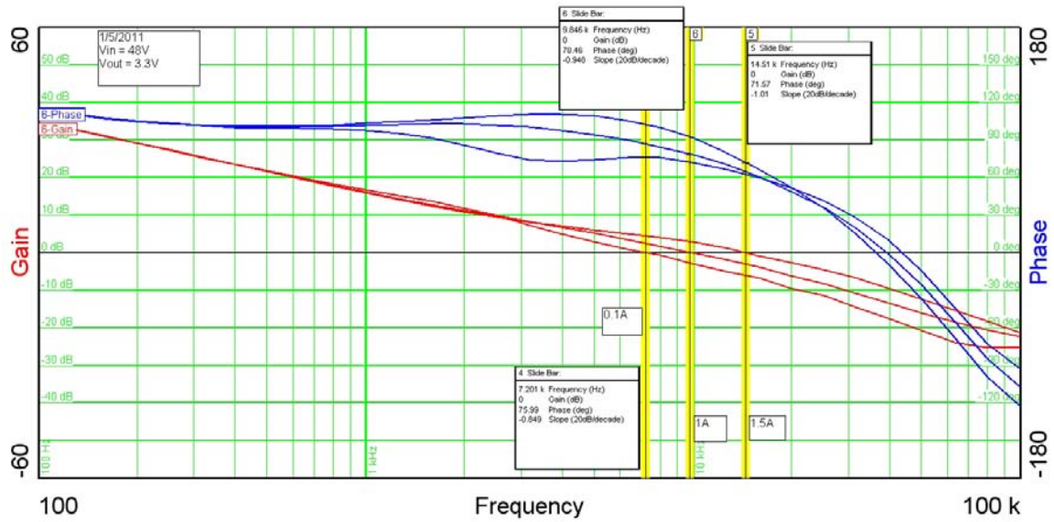
The photo below is the N-ch FET drain waveform. The input voltage is 60Vand the output is loaded to 0.1A. (20V/DIV, 1uS/DIV)



6 Loop Gain

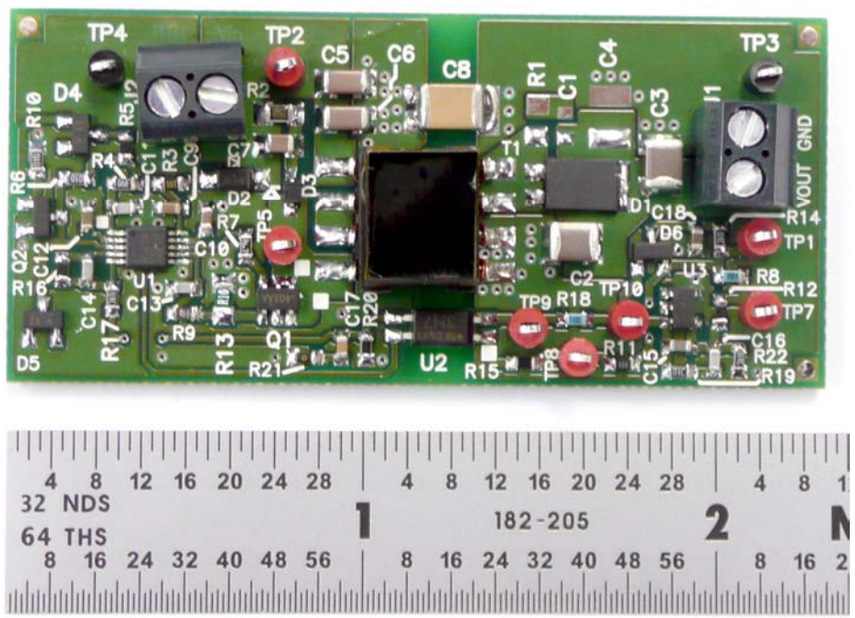
The plot below shows the loop gain with the input voltage at 48V.

Loop Gain (Iout = 0.1A)	BW: 7.2KHz	PM: 76 degrees
Loop Gain (Iout = 1.0A)	BW: 9.8KHz	PM: 78 degrees
Loop Gain (Iout = 1.5A)	BW: 14.5KHz	PM: 72 degrees


1/5/2011
Vin = 48V
Vout = 3.3V
8-Phase
8-Gain
6 Slide Bar:
9.846 k Frequency (Hz)
0 Gain (dB)
70.46 Phase (deg)
-0.940 Slope (20dB/decade)
5 Slide Bar:
14.51 k Frequency (Hz)
0 Gain (dB)
71.57 Phase (deg)
-1.01 Slope (20dB/decade)
4 Slide Bar:
7.201 k Frequency (Hz)
0 Gain (dB)
75.99 Phase (deg)
-0.849 Slope (20dB/decade)
0.1A
1A
1.5A
60
-60
180
-180
Gain
Phase
100
Frequency
100 k

7 Photo

The photo below shows the PMP6516 prototype circuit.



8 Thermal Image

A thermal image is shown below when operating at 48V input and 3.3V@1.5A output.

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