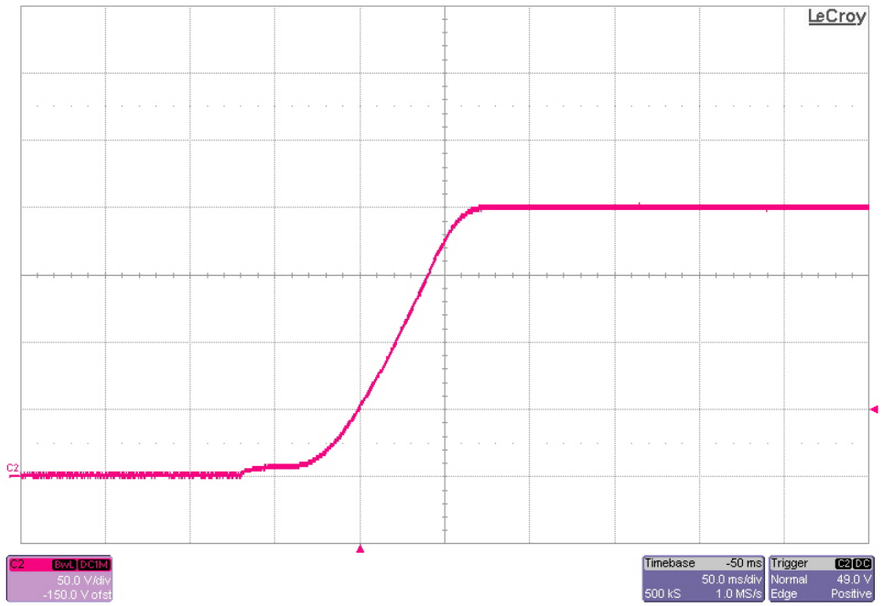
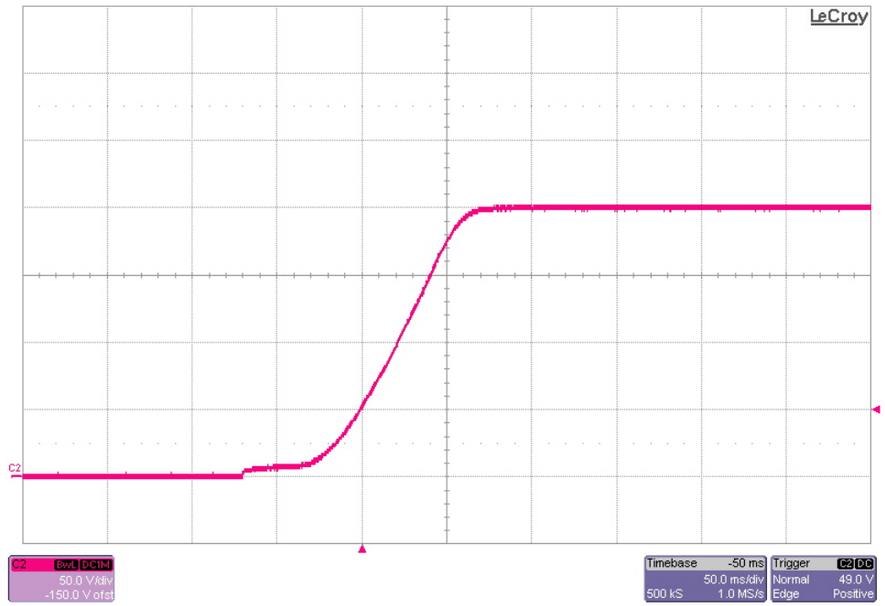
1 Startup

The photo below shows the 200V output voltage startup waveforms after the application of 180Vdc in. The output was loaded to 0A. (50V/DIV, 50mS/DIV)

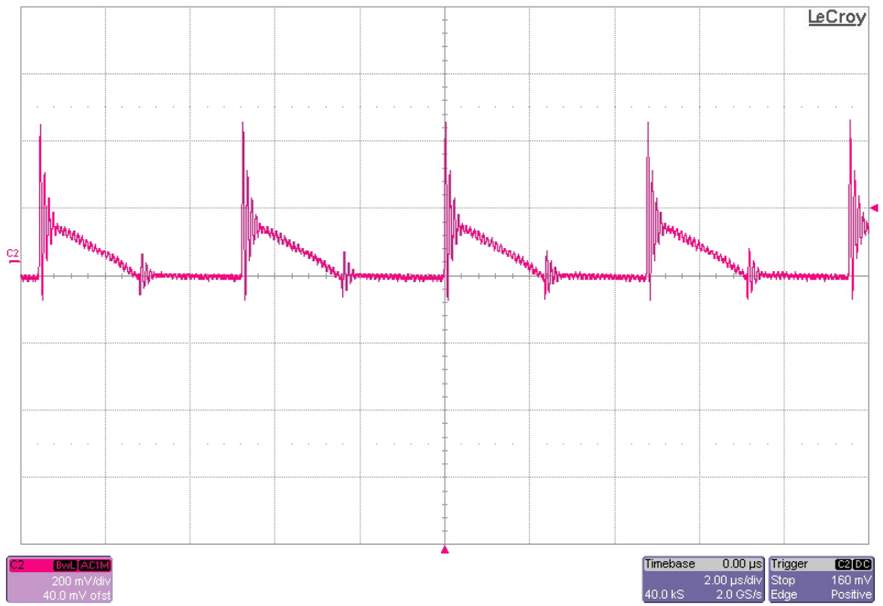


The photo below shows the 200V output voltage startup waveforms after the application of 180Vdc in. The output was loaded to 0.4A. (50V/DIV, 50mS/DIV)

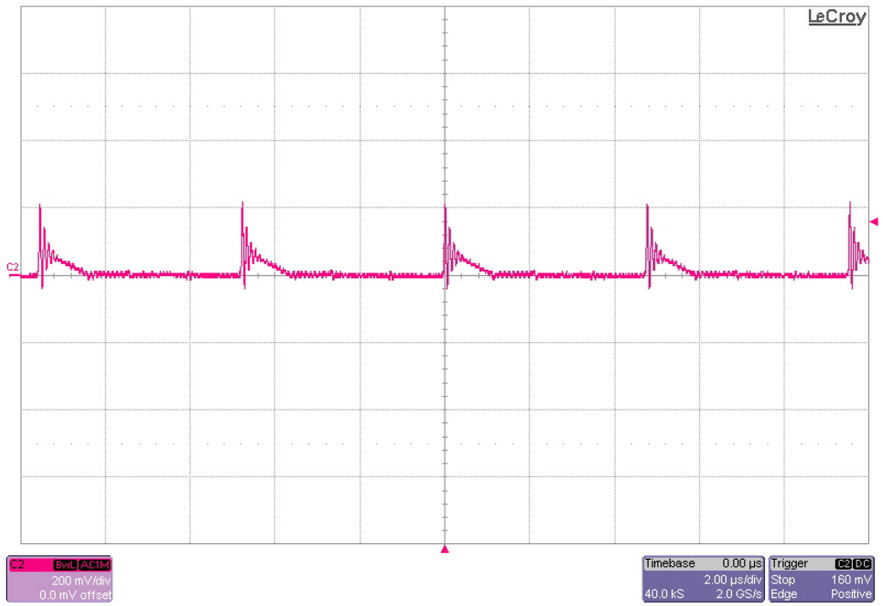


2 Output Ripple Voltage

The 200V output ripple voltage is shown in the figure below. The image was taken with the output loaded to 0.4A and the input voltage set to 200Vdc. (200mV/DIV, 2uS/DIV)

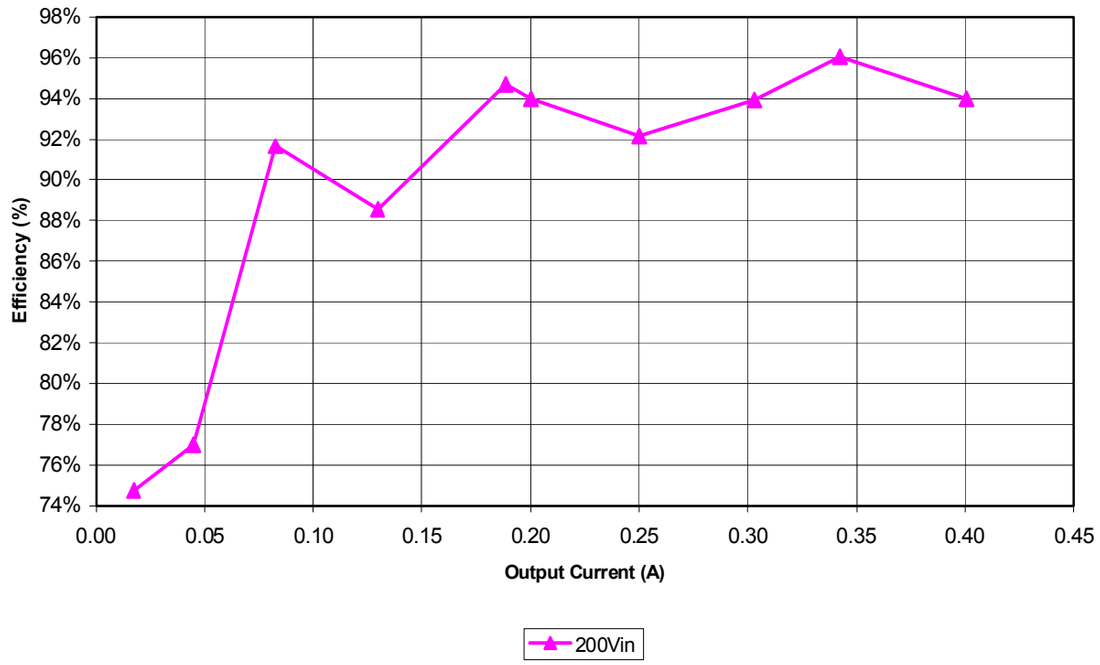


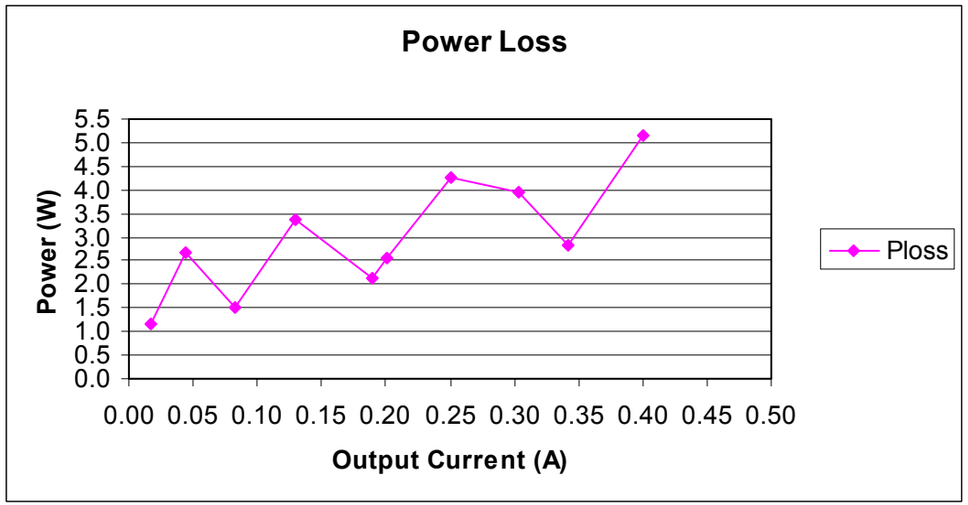
The 200V output ripple voltage is shown in the figure below. The image was taken with the output loaded to 0.1A and the input voltage set to 200Vdc. (200mV/DIV, 2uS/DIV)


LeCroy
C2
C2 BwL AC1M
200 mV/div
0.0 mV offset
Timebase 0.00 µs
2.00 µs/div
40.0 kS 2.0 GS/s
Trigger C2 DC
Stop 160 mV
Edge Positive

3 Efficiency

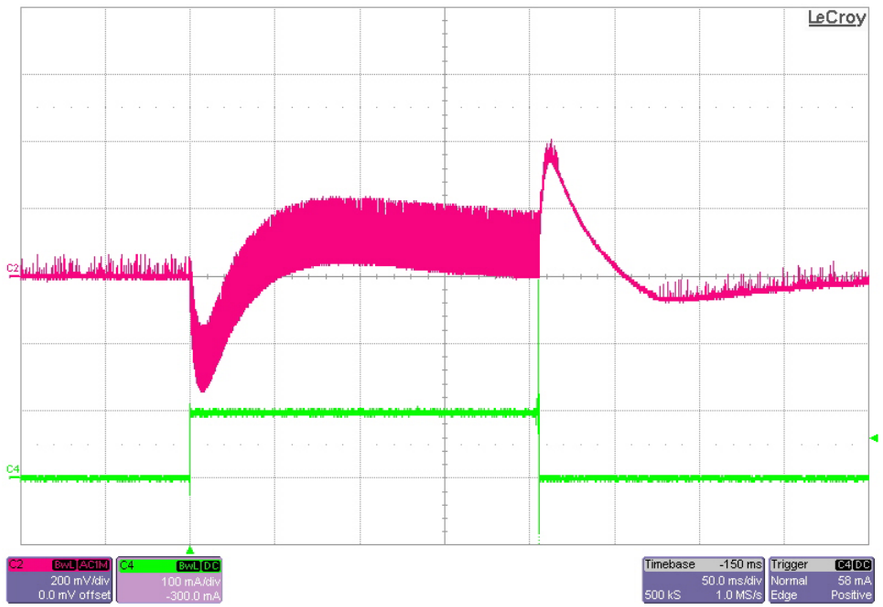
The converter efficiency is shown in the figure below. The converter operates largely in discontinuous mode. Vin = 200V, Vout = 200V



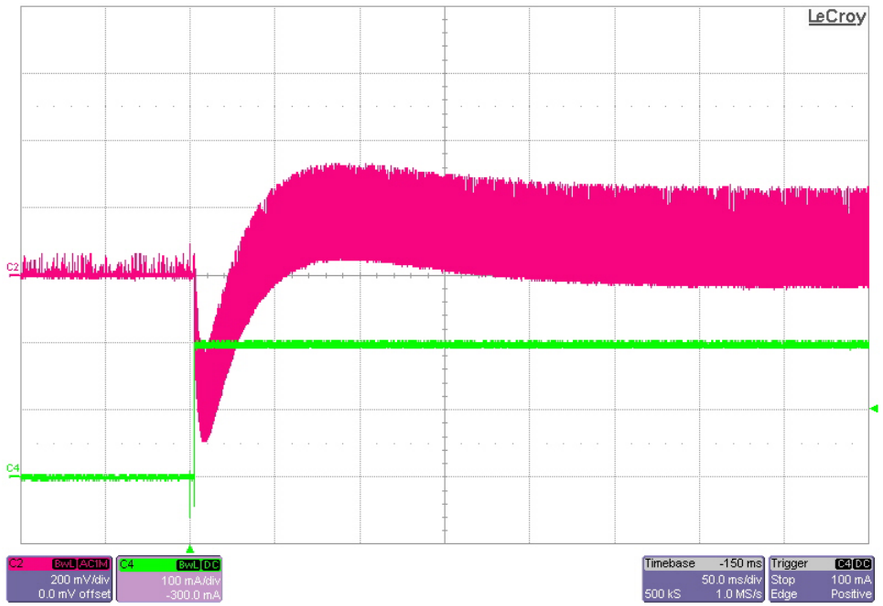


4 Load Transients

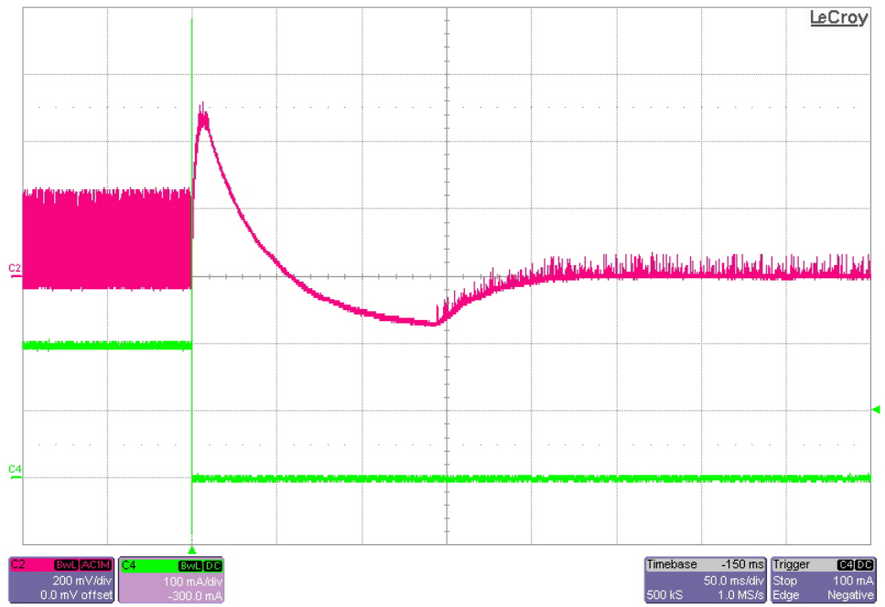
The photo below shows the 200V output voltage (AC coupled) when the load current is pulsed between 0A and 0.1A. Vin = 200Vdc. (200mV/DIV, 100mA/DIV, 50mS/DIV)



The photo below shows the 200V output voltage (AC coupled) when the load current is pulsed between 0A and 0.2A. Rising edge only. Vin = 200Vdc. (200mV/DIV, 100mA/DIV, 50mS/DIV)

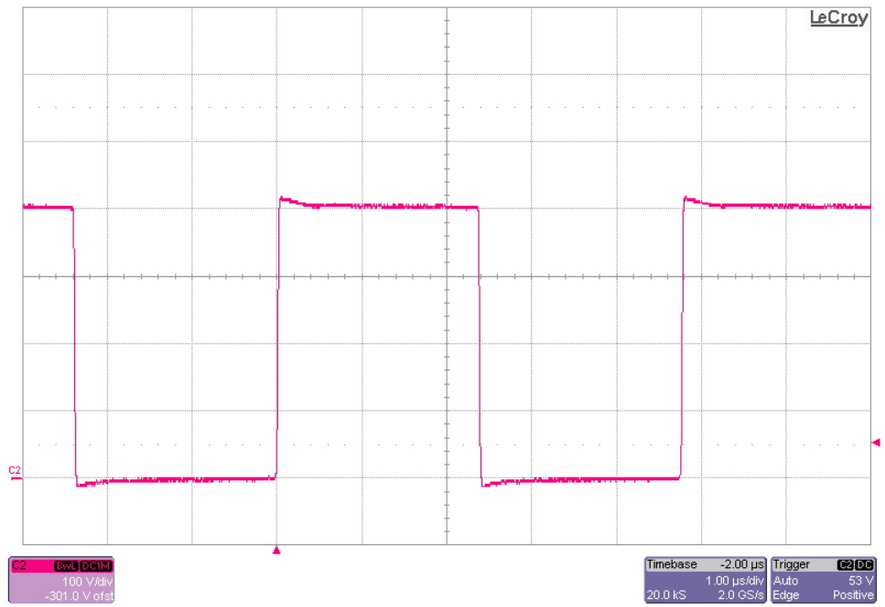


The photo below shows the 200V output voltage (AC coupled) when the load current is pulsed between 0A and 0.2A. Falling edge only. Vin = 200Vdc. (200mV/DIV, 100mA/DIV, 50mS/DIV)

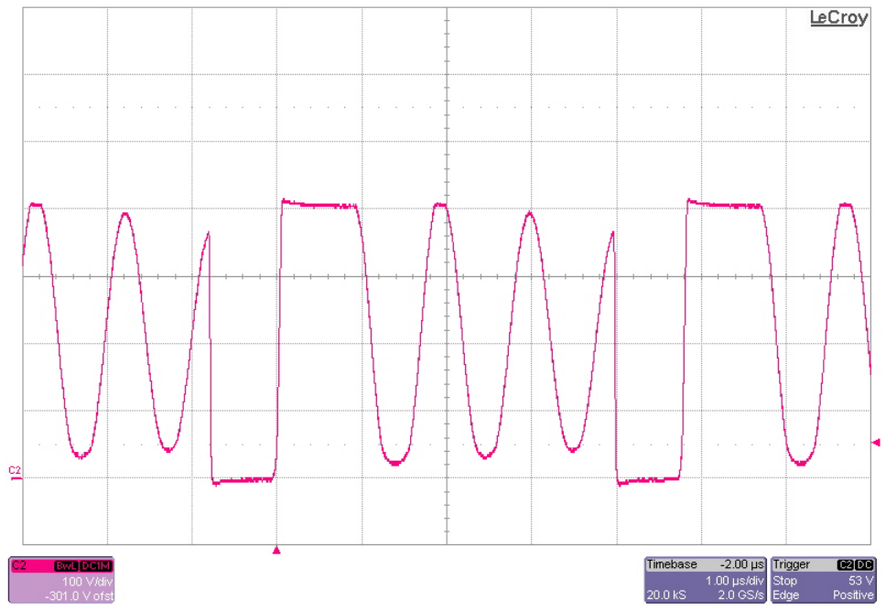

LeCroy
C2
C4
C2 BwL AC1M
200 mV/div
0.0 mV offset
C4 BwL DC
100 mA/div
-300.0 mA
Timebase -150 ms
50.0 ms/div
500 kS 1.0 MS/s
Trigger C4 DC
Stop 100 mA
Edge Negative

5 Waveforms

The photo below is of the N-ch FET drain waveform (TP7). The input voltage is 200Vand the output is loaded to 0.4A. (100V/DIV, 1uS/DIV)



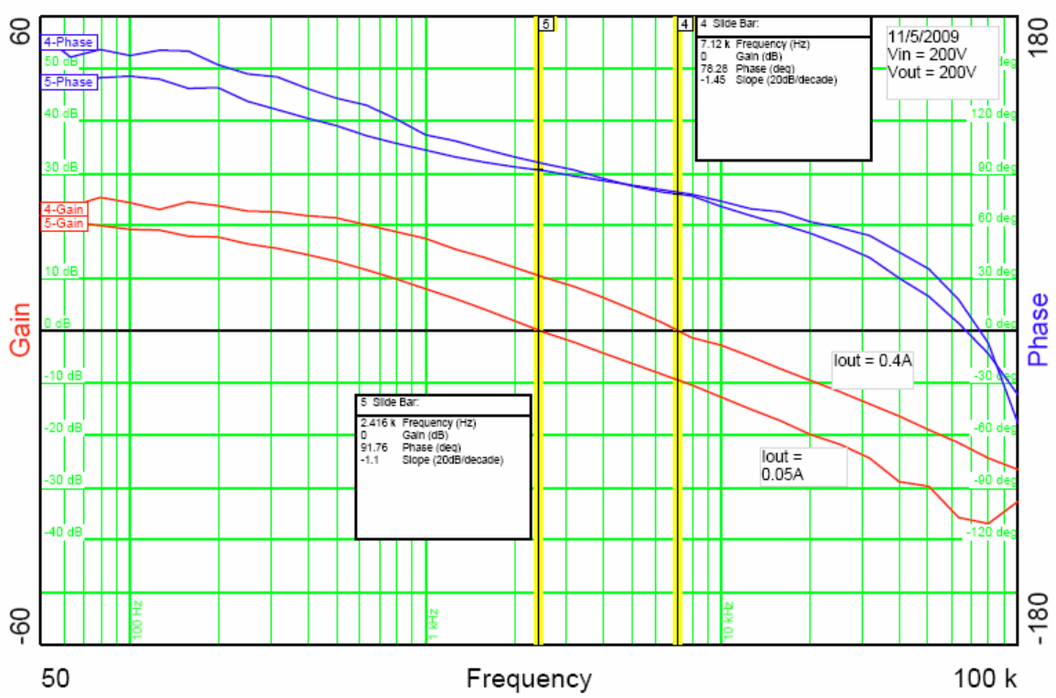
The photo below is of the N-ch FET drain waveform (TP7). The input voltage is 200Vand the output is loaded to 0.05A. (100V/DIV, 1uS/DIV)



6 Loop Gain

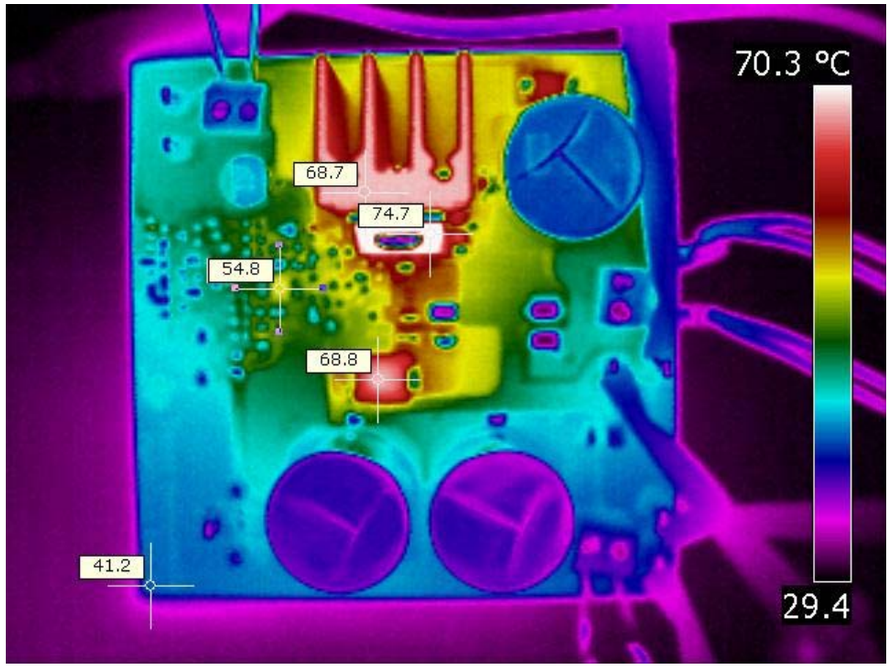
The plot below shows the loop gain with 0.05A and 0.4A loads. The input voltage was 200V.

Loop Gain (0.4A) BW: 7.1KHz PM: 78 degrees
Loop Gain (0.05A) BW: 2.4KHz PM: 92 degrees

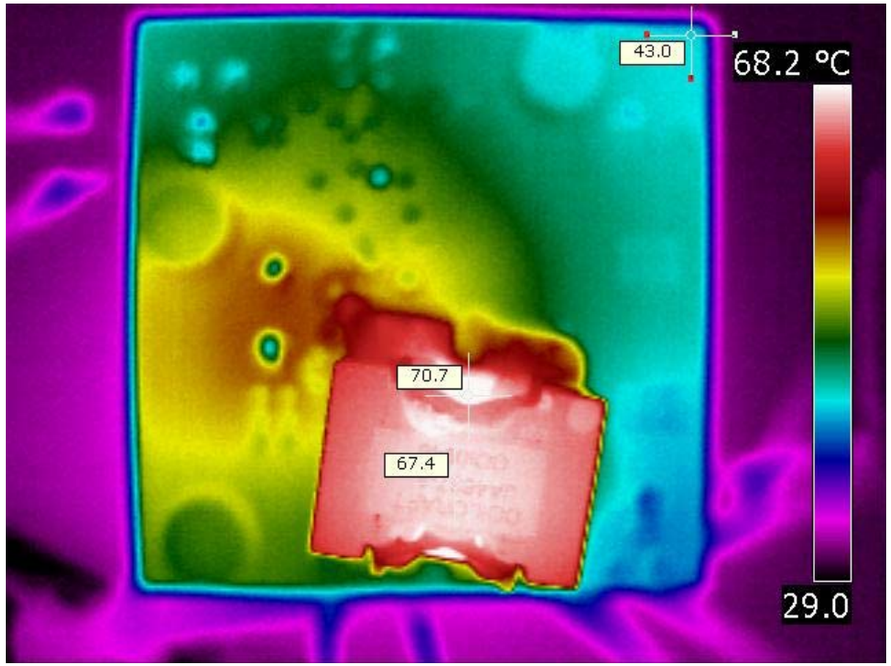

4-Phase
5-Phase
4-Gain
5-Gain
60
50 dB
40 dB
30 dB
10 dB
0 dB
-10 dB
-20 dB
-30 dB
-40 dB
-60
Gain
180
120 deg
90 deg
60 deg
30 deg
0 deg
-30 deg
-60 deg
-90 deg
-120 deg
-180
Phase
100 Hz
1 kHz
10 kHz
50
Frequency
100 k
4 Slide Bar:
7.12 k Frequency (Hz)
0 Gain (dB)
78.28 Phase (deg)
-1.45 Slope (20dB/decade)
5 Slide Bar:
2.416 k Frequency (Hz)
0 Gain (dB)
91.76 Phase (deg)
-1.1 Slope (20dB/decade)
11/5/2009
Vin = 200V
Vout = 200V
Iout = 0.4A
Iout = 0.05A

7 Thermal Image

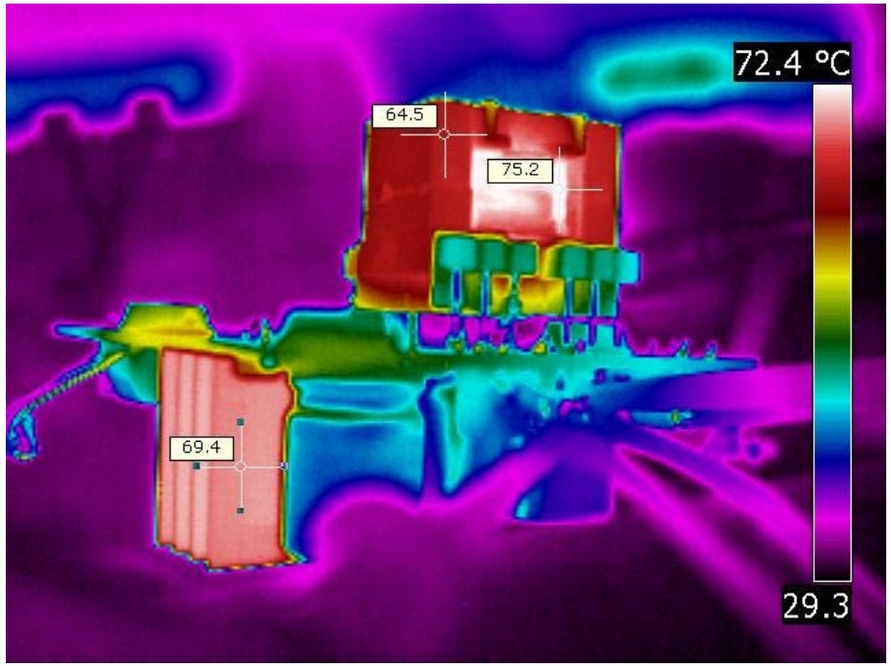
The photo below shows the PMP5143 REV**B** power supply operating temperatures with 200Vin, 200Vout and a 0.4A load. The power transformer (Coilcraft JA4637-AL) is mounted on the back of the PWB.
Top View:



Bottom View:

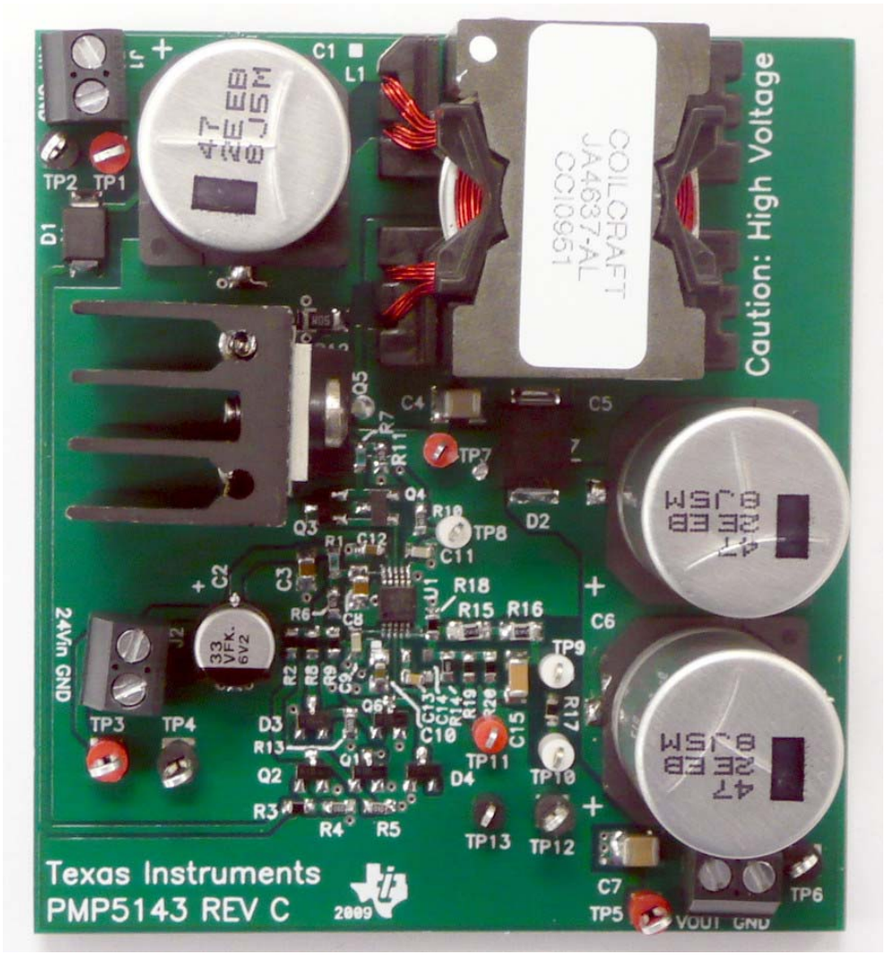


Side view:


72.4 °C
64.5
75.2
69.4
29.3

8 Photo

The photo below shows the PMP5143 REVC assy. Note that the PWB has been updated and locates the transformer on top.


Caution: High Voltage
COILCRAFT
JA4637-AL
CC10951
24Vin GND
VOUT GND
Texas Instruments
PMP5143 REV C
2009

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