

1 Startup

The startup waveform is shown in Figure 1. The input voltage is set at 24.0V and the output voltage to 12.0V with no load.

Channel C1: **input voltage**
5V/div, 2ms/div

Channel C2: **output voltage**
2V/div, 2ms/div

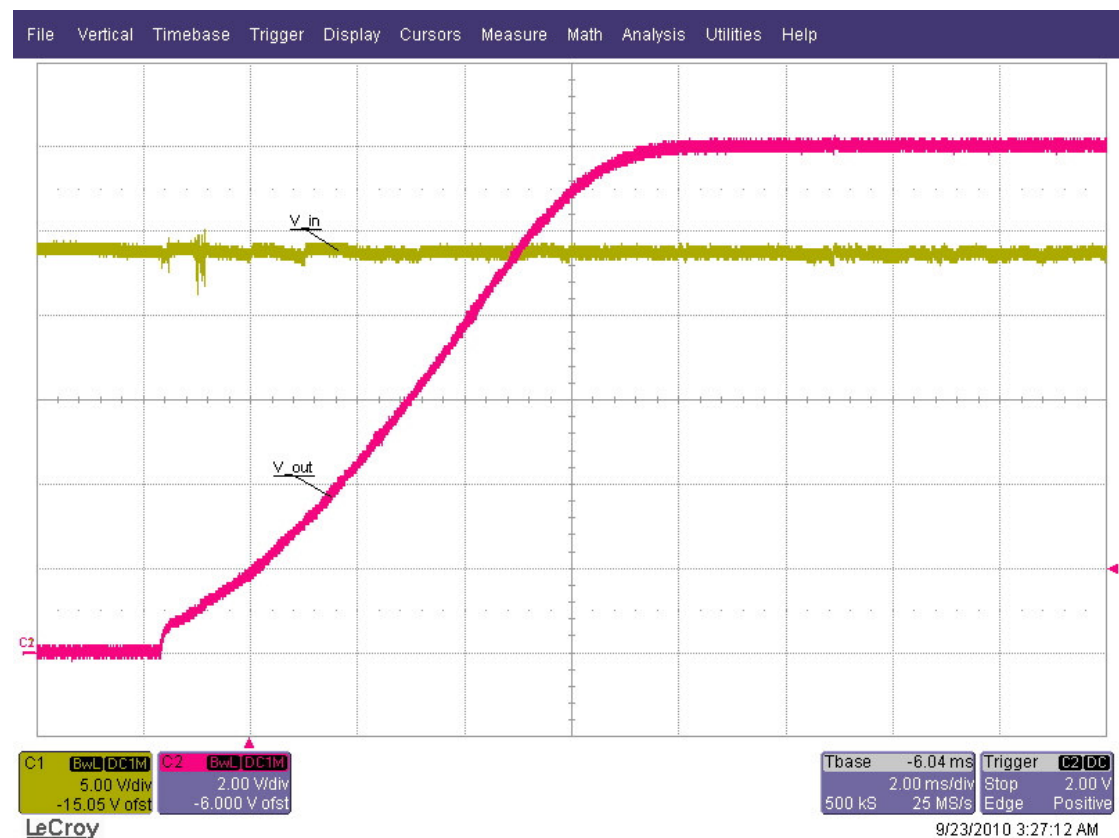


Figure 1

2 Shutdown

The shutdown waveform is shown in Figure 2. The input voltage is set at 24.0V and the output voltage to 12.0V with 6.0A load.

Channel C1: **input voltage**
5V/div, 50us/div

Channel C2: **output voltage**
2mV/div, 50us/div

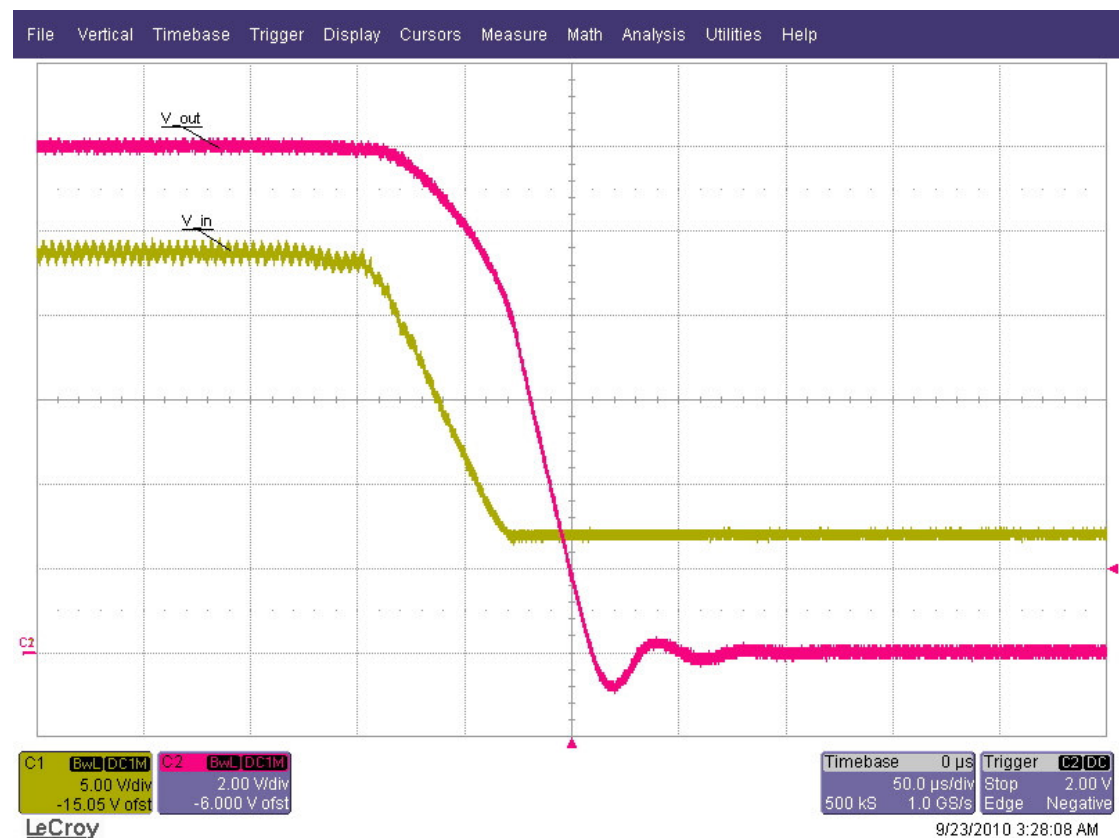


Figure 2

1. Efficiency

The efficiency is shown in Figure 3.

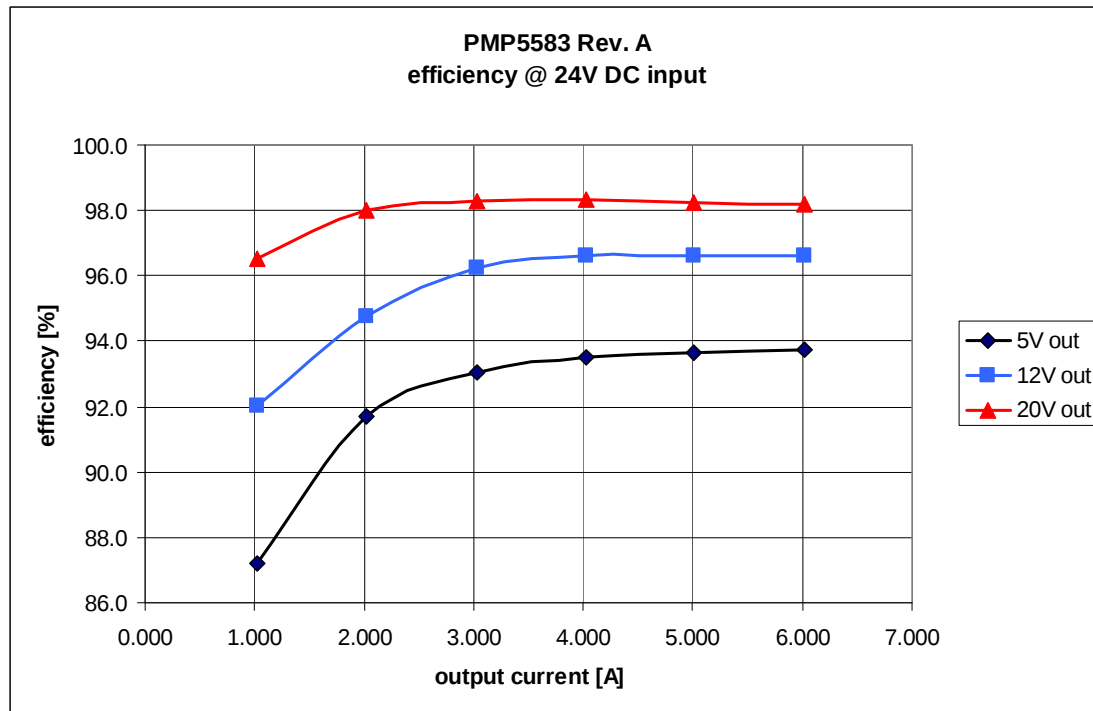


Figure 3

3 Load regulation

The load regulation at three different output voltages is shown in Figure 4.

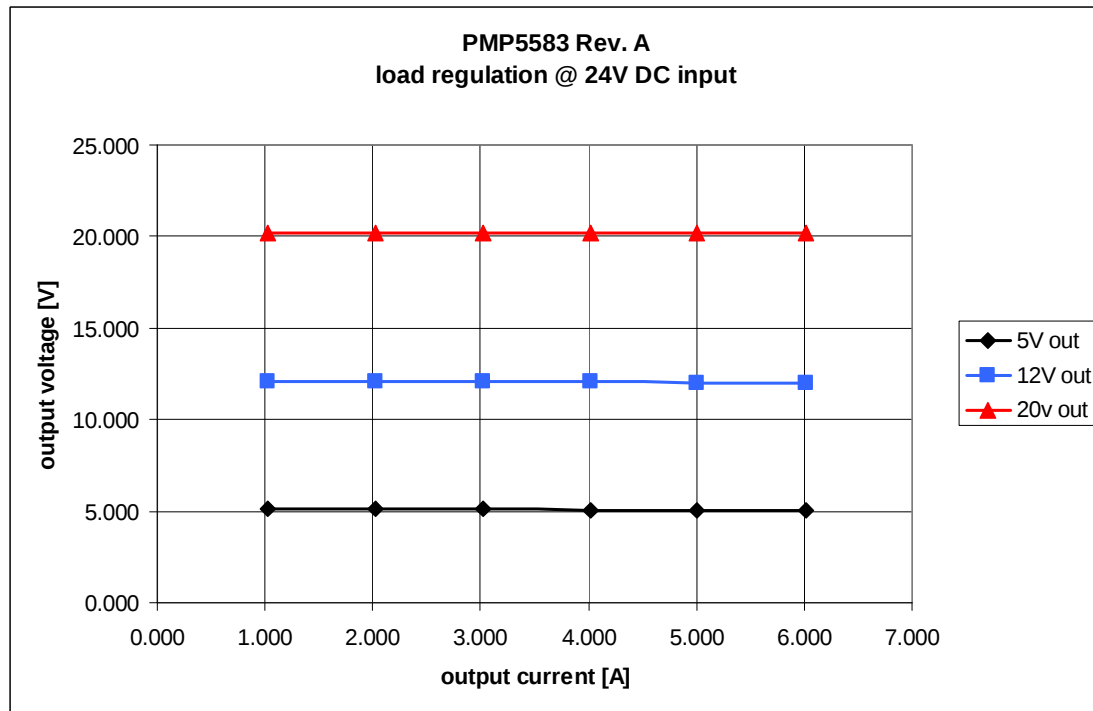


Figure 4

4 Output ripple voltage

The output ripple voltage at 12.0V output voltage and a load of 6.0A is shown in Figure 5. The input voltage is set to 24.0V.

Channel C2: **output voltage**, 66mV peak-peak
20mV/div, 2us/div, AC coupled

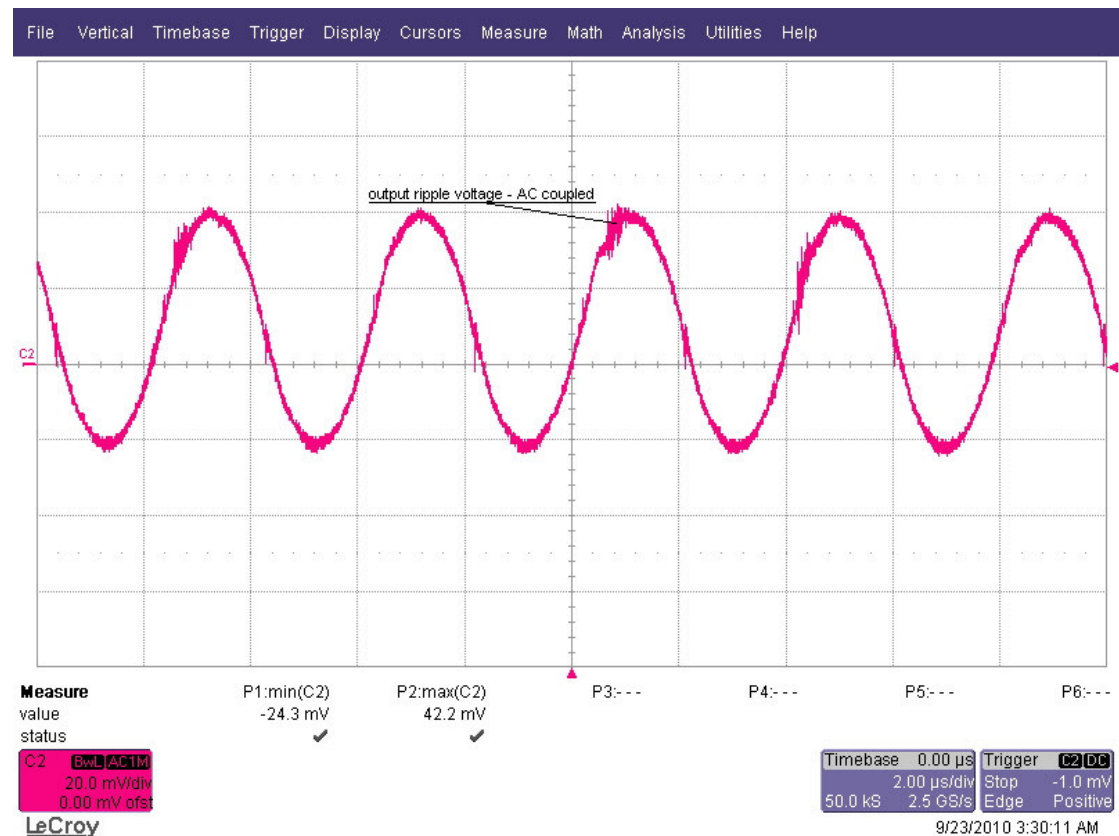


Figure 5

5 Load transients

The response to a load step and a load dump at an input voltage of 24.0V is shown in Figure 6 and Figure 7.

The output voltage is set to 12.0V.

Due to specification only little output capacitance is needed. Therefore the voltage over-/undershoot is pretty high.

Channel C2: **output voltage**, -616mV undershoot, 280mV overshoot
500mV/div, 20us/div, AC coupled

Channel C1: **load current**, load step 3.0A to 6.0A
5A/div, 20us/div

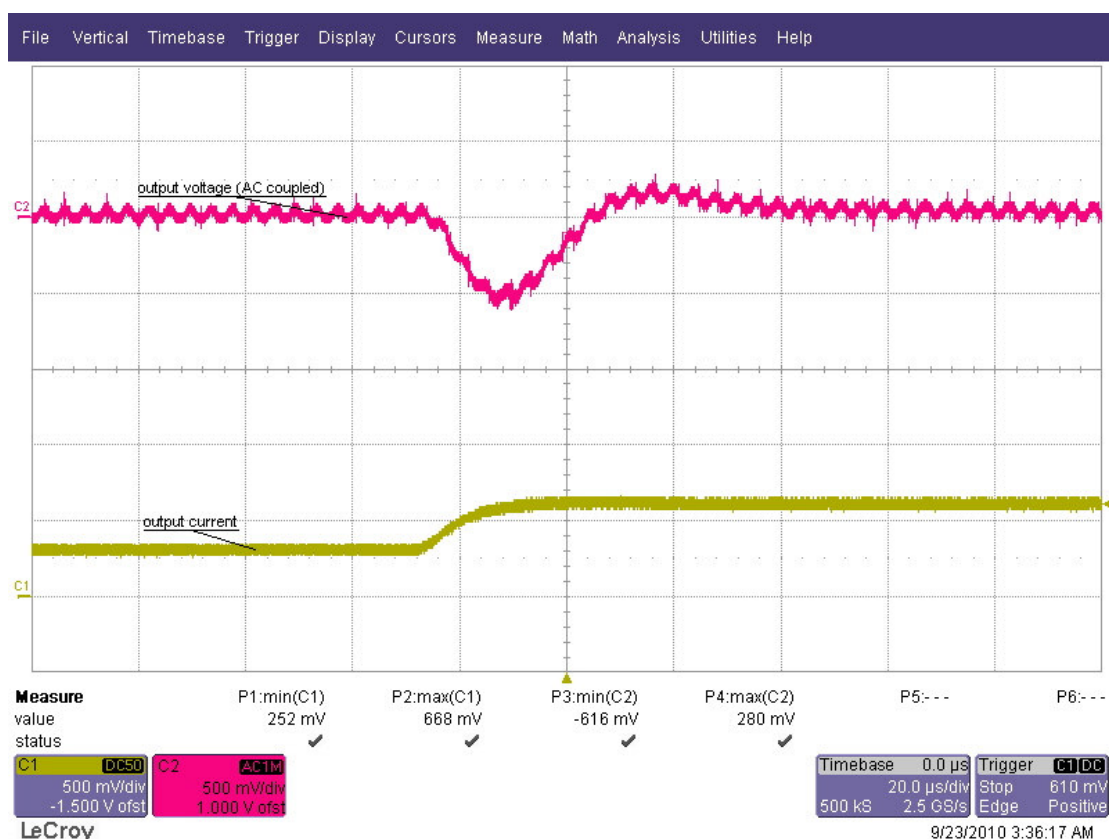


Figure 6

Channel C2: **output voltage**, 652mV overshoot, 168mV undershoot
500mV/div, 20us/div, AC coupled

Channel C1: **load current**, load dump 6.0A to 3.0A
5A/div, 20us/div

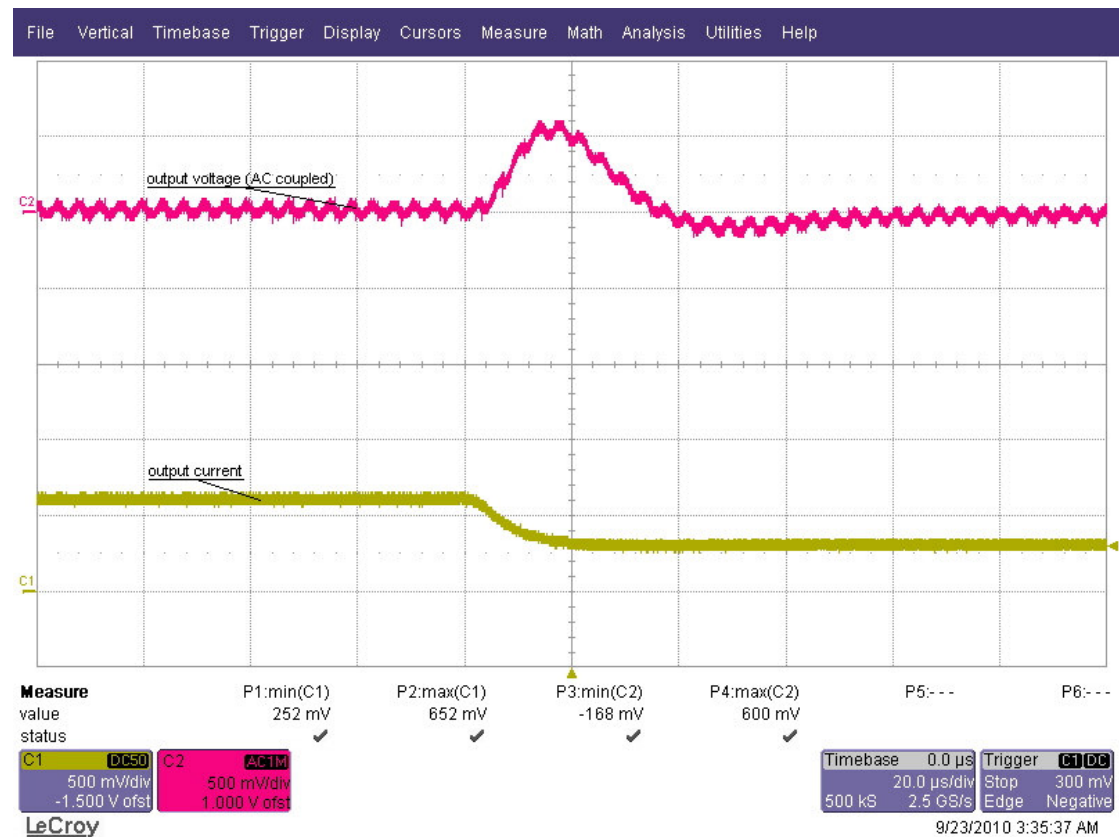


Figure 7

6 Frequency response

Figure 8 shows the loop response at 24.0V input voltage and 12.0V output voltage. The load is set to 6.0A.

57 deg phase margin @ crossover frequency 29.6 kHz

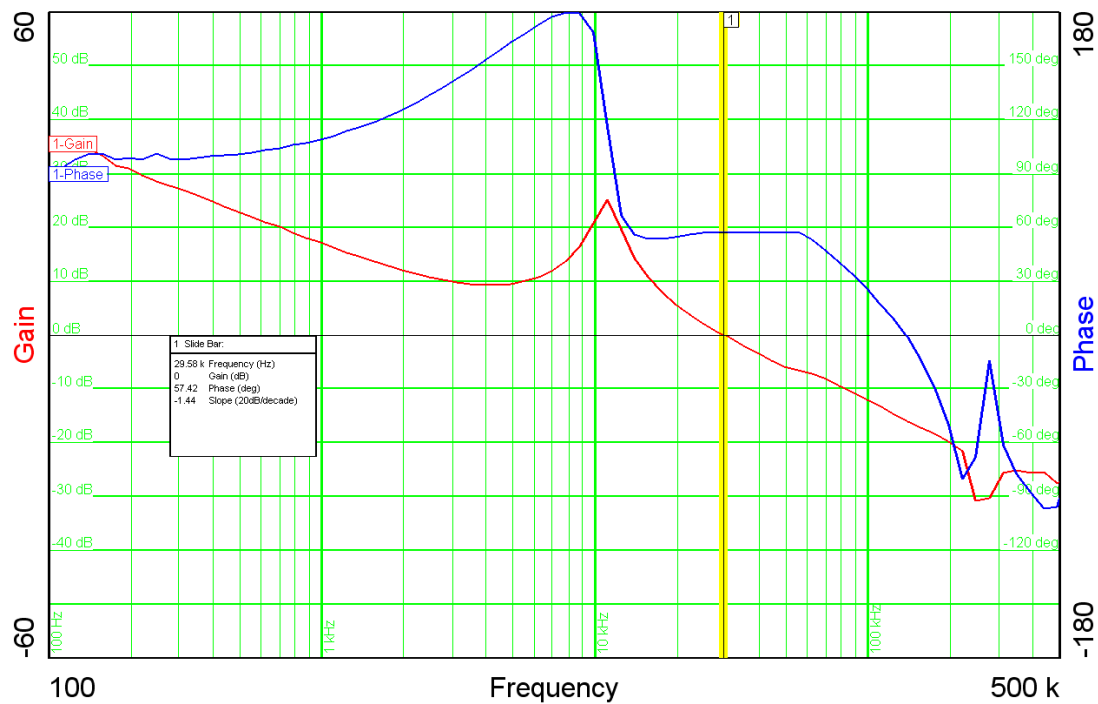


Figure 8

7 Miscellaneous waveforms

The drain-source voltage on the switching node is shown in Figure 9. The image was captured with a 24.0V input voltage, 12.0V output voltage and a 6.0A load.

Channel C2: **drain-source voltage**, -2.6V minimum voltage, 25.9V maximum voltage
5V/div, 2 μ s/div

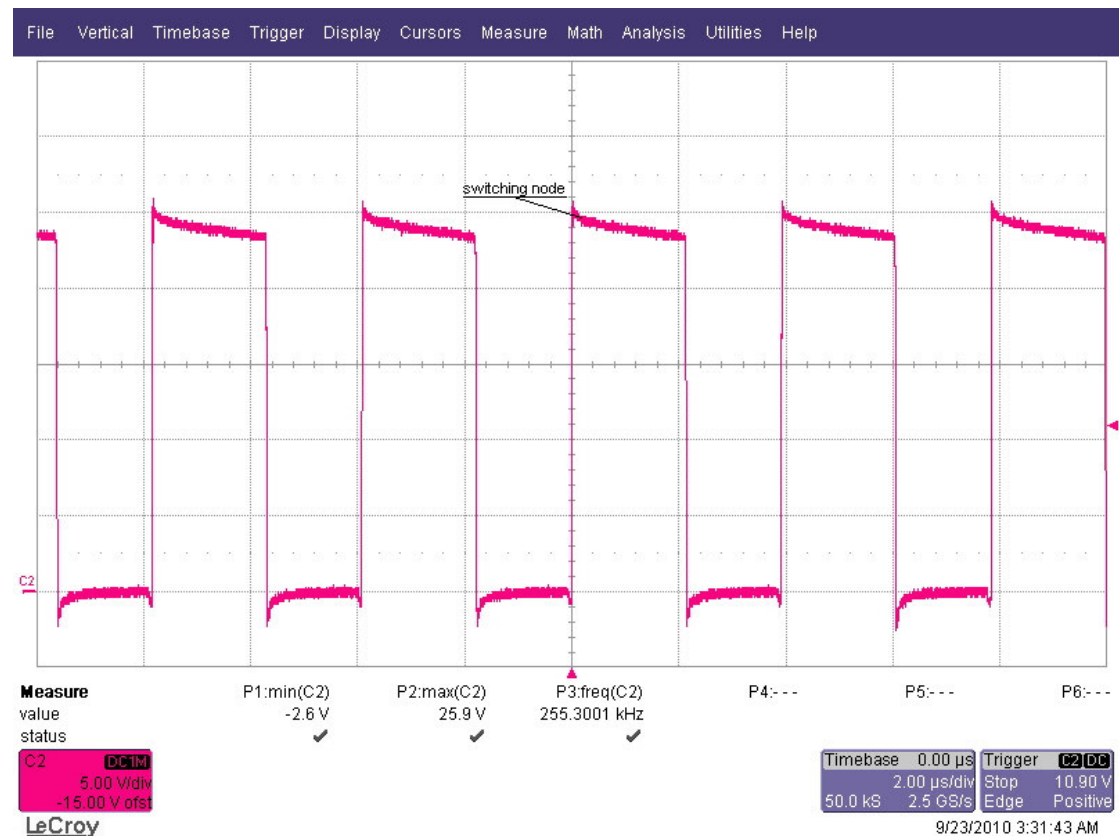


Figure 9

8 Thermal measurement

The thermal image (Figure 10) shows the circuit at an ambient temperature of 21 °C with an input voltage of 24.0V and an output voltage of 12V. The load is set to 6.0A.

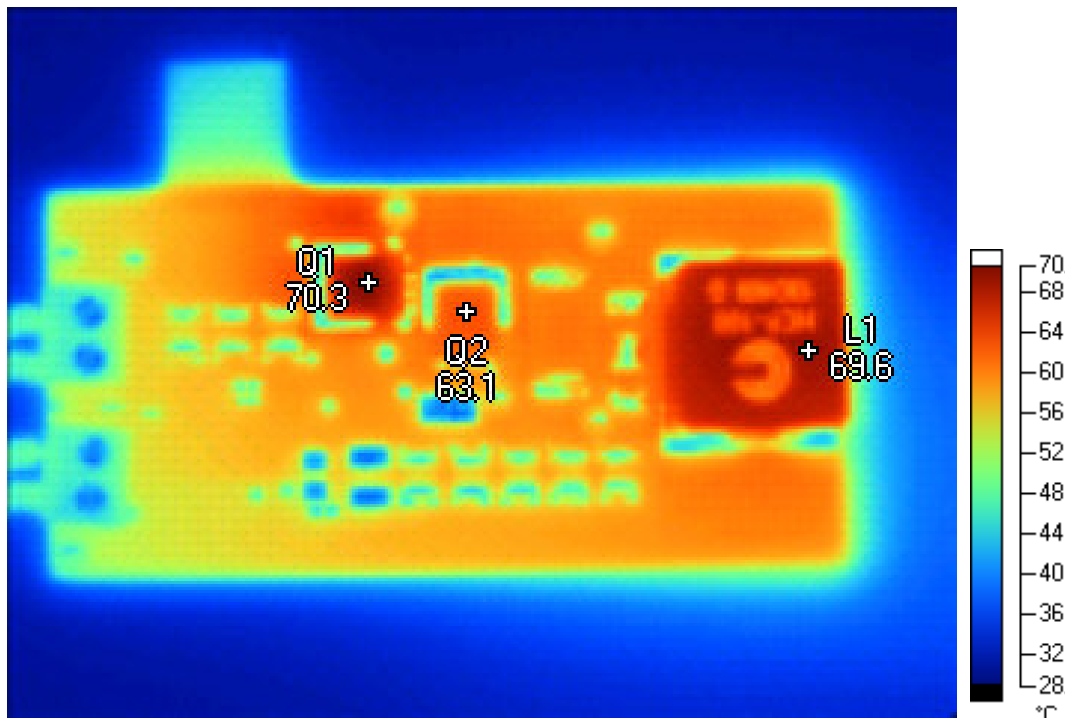


Figure 10

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