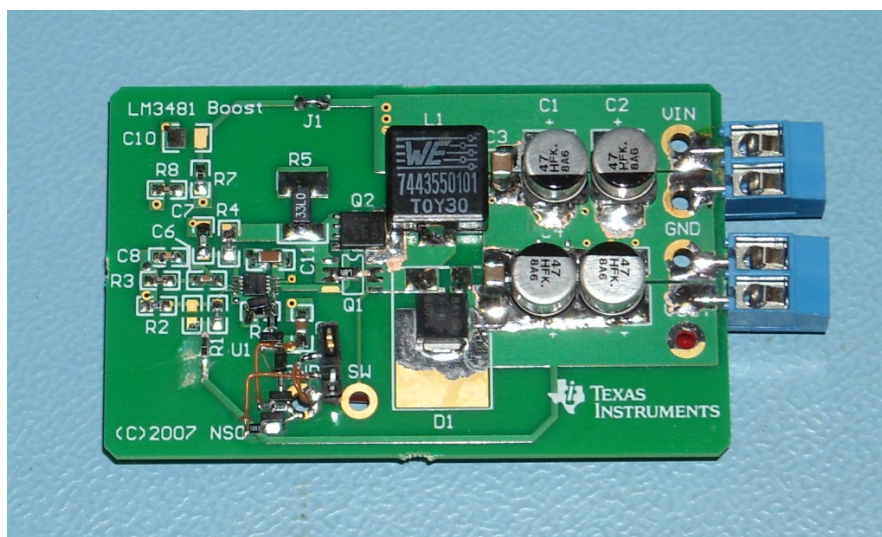


LM3481 Boost Circuit - 9.5V @ 1.5A

- Input 4..10V DC
Can withstand up to 40V
- Output 9.5V @ 1.5A
- Working in continuous conduction mode
- Enable/disable by logic signal (3.3V or 5.0V)
- Built on PCB LM3481 Boost EVM



1 Startup

The startup waveform is shown in Figure 1. The input voltage is set at 4.0V, with no load on the 9.5V output.

Channel C1: **Input voltage**
1V/div, 5ms/div

Channel C2: **Output voltage**
2V/div, 5ms/div

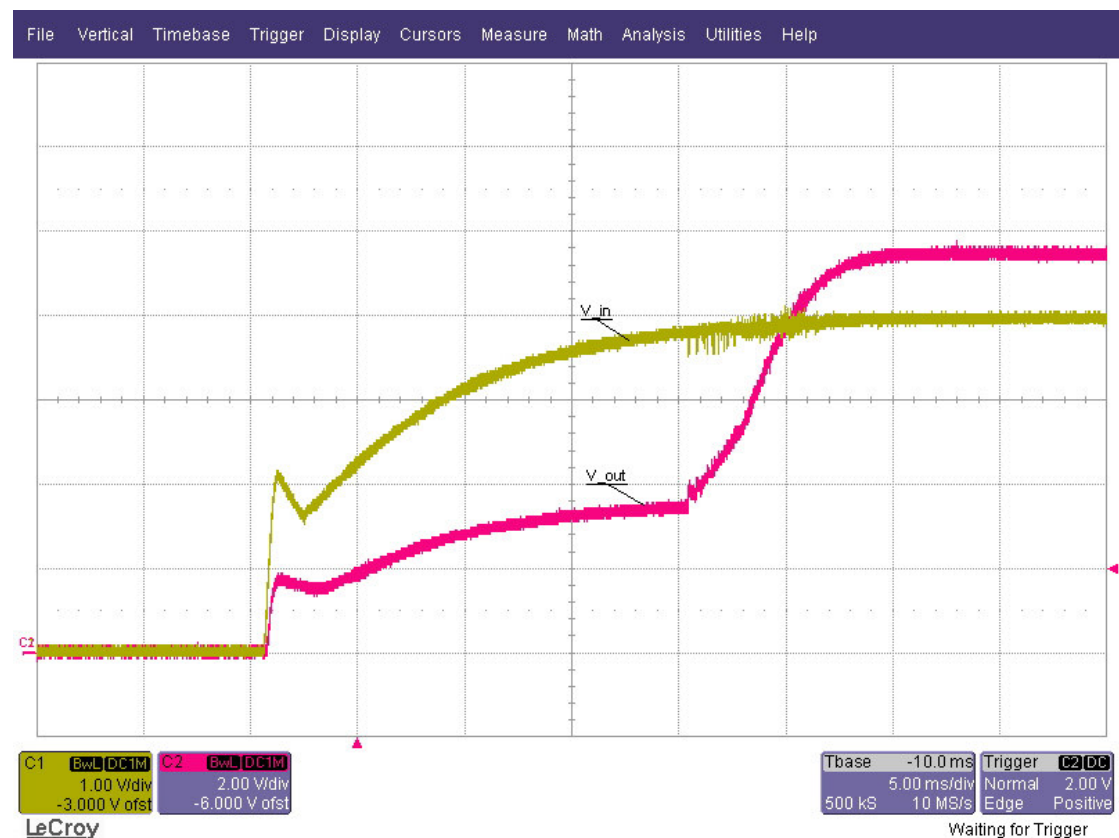


Figure 1

2 Shutdown

The shutdown waveform is shown in Figure 2. The input voltage is set at 4.0V with a 1.5A load on the 9.5V output.

Channel C1: **Input voltage**
2V/div, 100us/div

Channel C2: **Output voltage**
1V/div, 100us/div

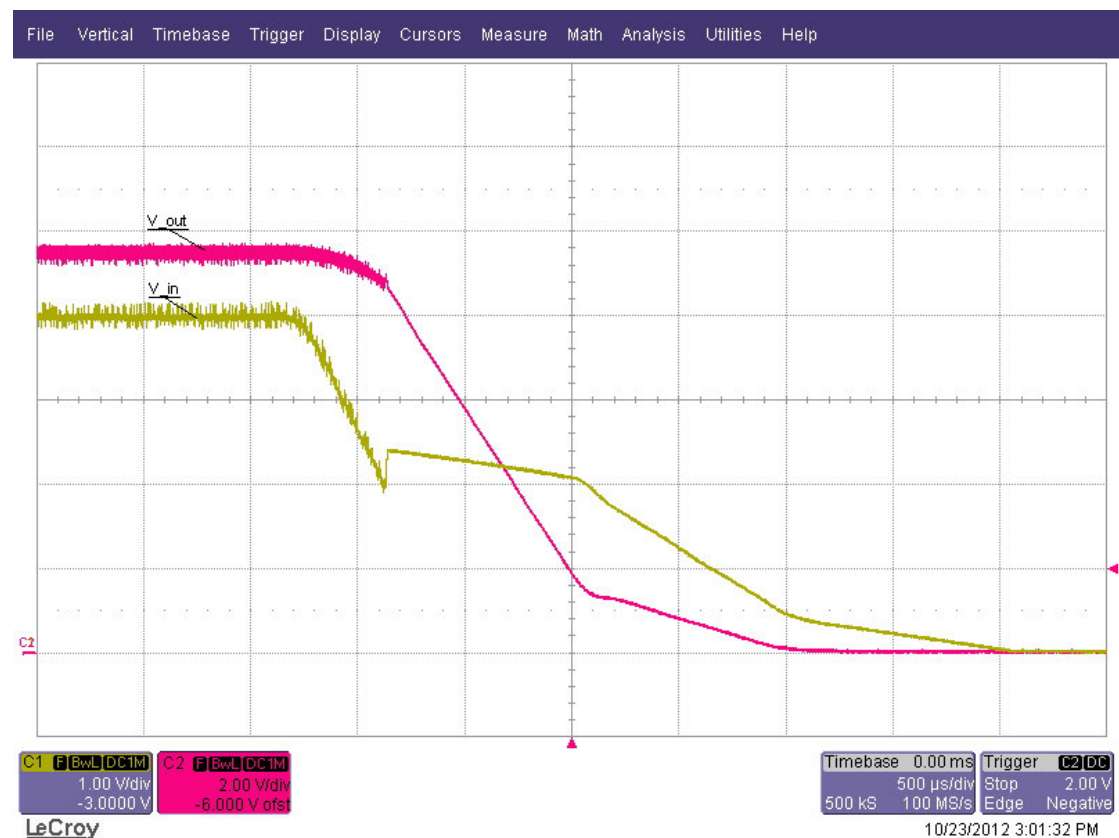


Figure 2

3 Efficiency

The efficiency and load regulation at 4.0V, 6.0V and 9.0V input voltage are shown in Figure 3 and Figure 4.

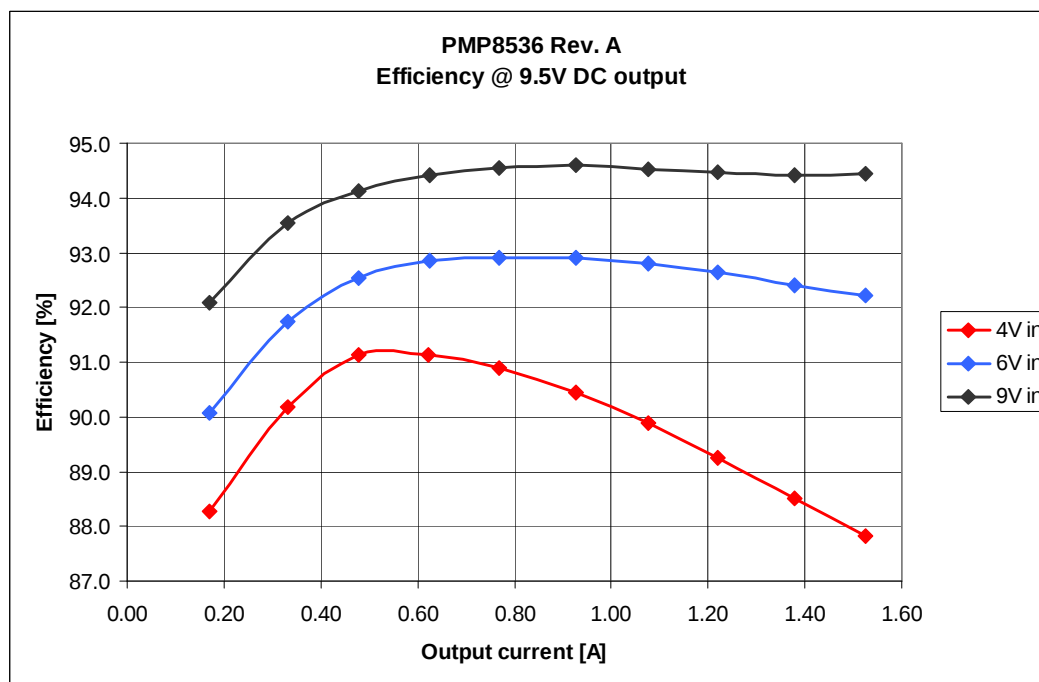


Figure 3

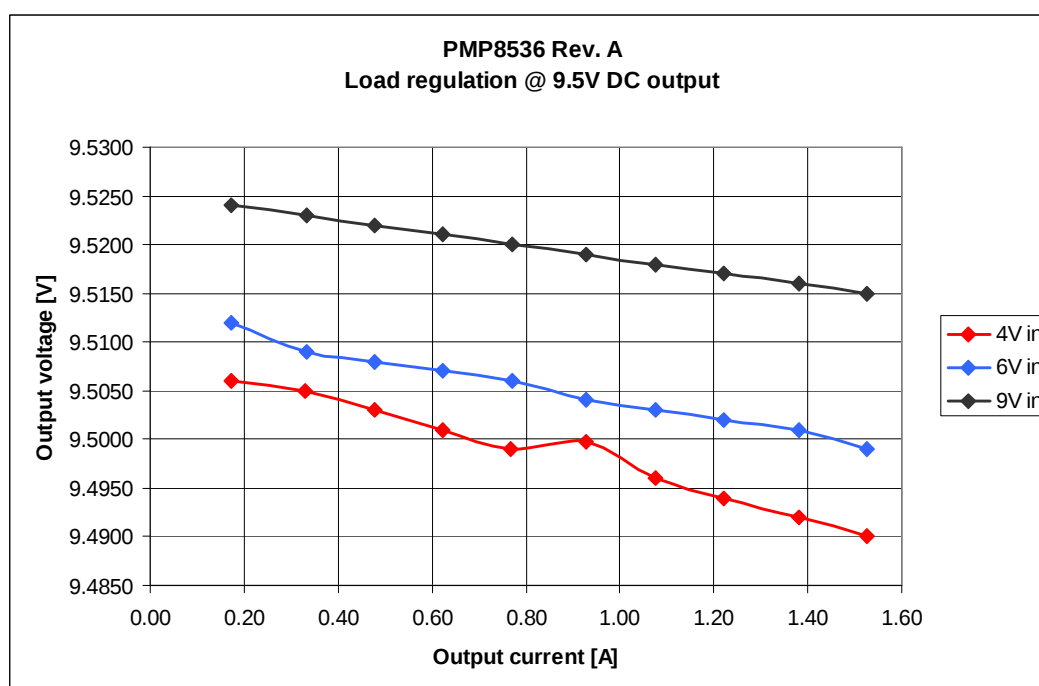


Figure 4

4 Output ripple voltage

The output ripple voltage at 1.5A load and 4.0V, 6.0V and 9.0V input voltage is shown in Figure 5.

Channel M1: **Output voltage**, AC coupled, 36mV peak-peak, **4.0V in**
50mV/div, 5us/div

Channel M2: **Output voltage**, AC coupled, 36mV peak-peak, **6.0V in**
50mV/div, 5us/div

Channel M2: **Output voltage**, AC coupled, 15mV peak-peak, **9.0V in**
50mV/div, 5us/div

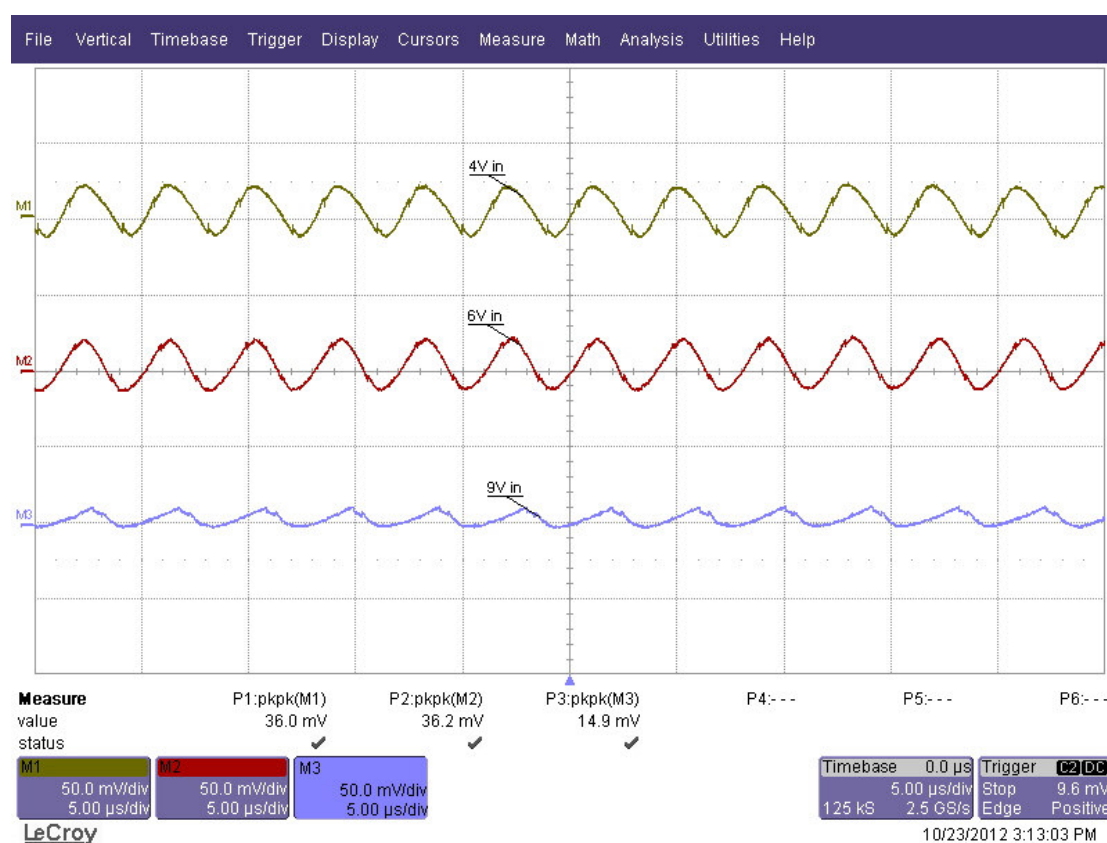


Figure 5

5 Load step

The response to a load step and a load dump at an input voltage of 4.0V is shown in Figure 6.

Channel C2: **Output voltage**, -552mV undershoot, 504mV overshoot
500mV/div, 1ms/div, AC coupled

Channel C1: **Load current**, load step **0.75A to 1.5A** and vice versa
1A/div, 1ms/div

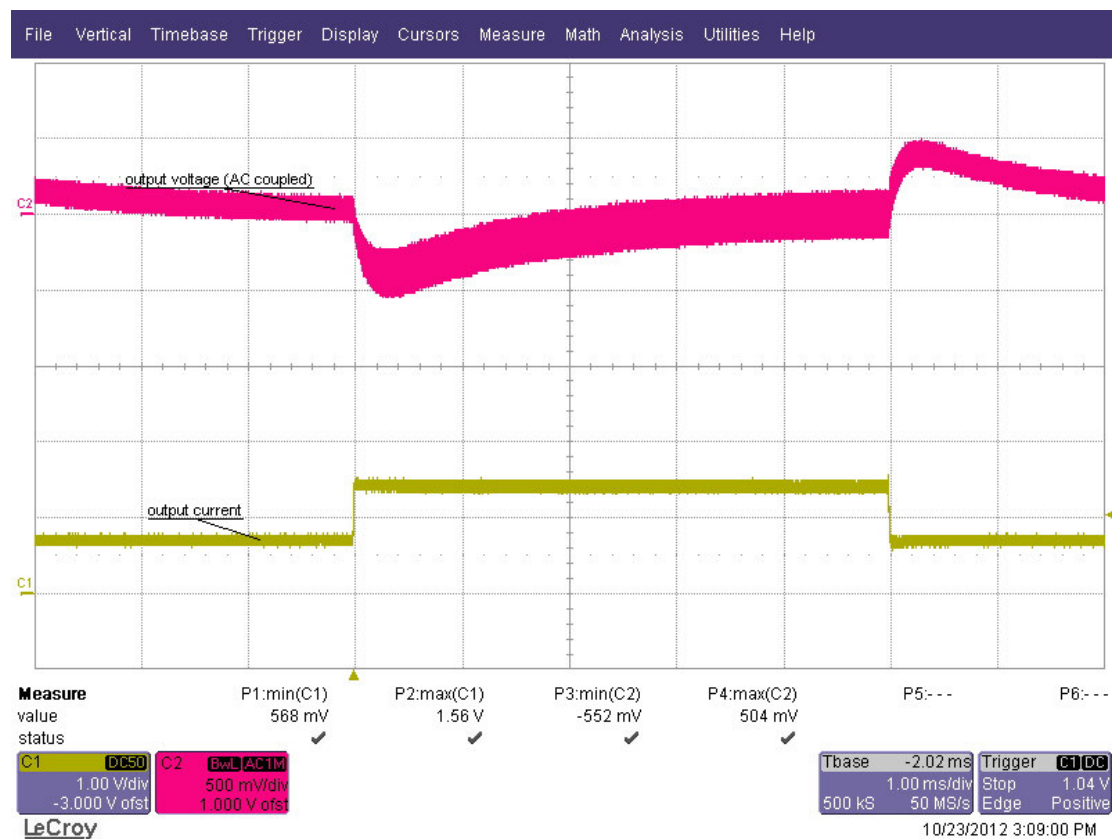


Figure 6

6 Frequency response

Figure 7 shows the loop response of the 9.5V output with 4.0V and 6.0V input voltage and a 1.5A load.

4.0V in 85 deg phase margin @ crossover frequency 1.1 kHz
 -22 db gain margin

6.0V in 85 deg phase margin @ crossover frequency 1.9 kHz
 -27 db gain margin

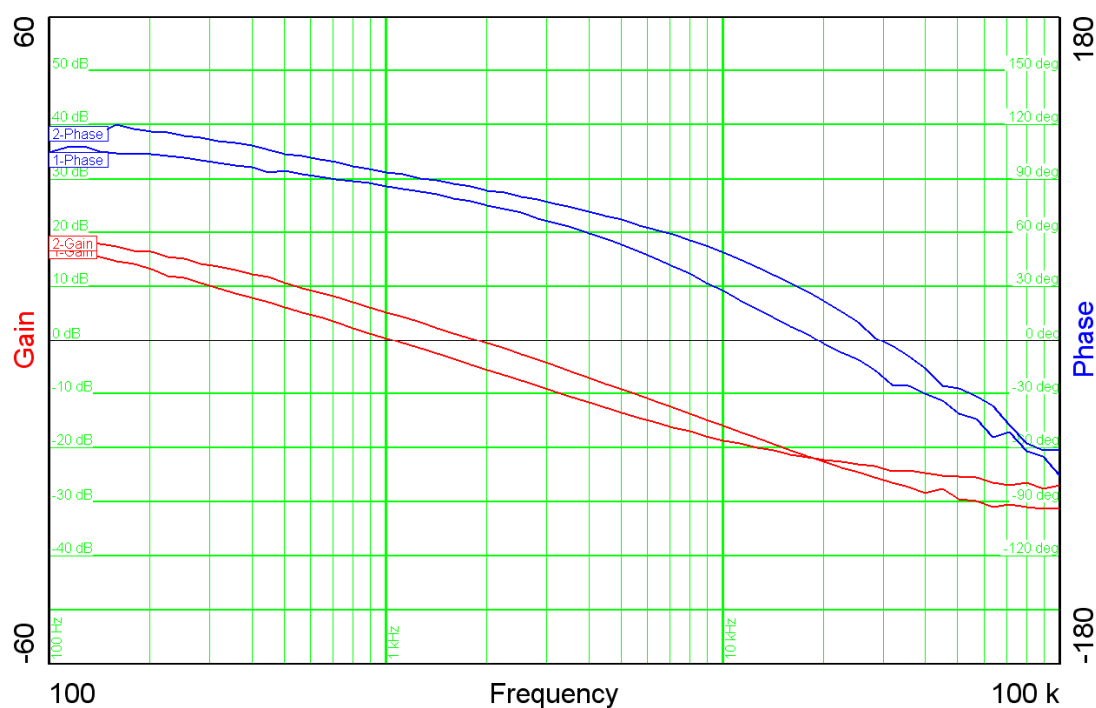


Figure 7

7 Miscellaneous waveforms

The drain-source voltage on the switching node is shown in Figure 8. The image was captured with 4.0V input and a 1.5A load.

Channel C2: **Drain-source voltage**, -0.6V minimum voltage, 18.9V maximum voltage
5V/div, 2 μ s/div

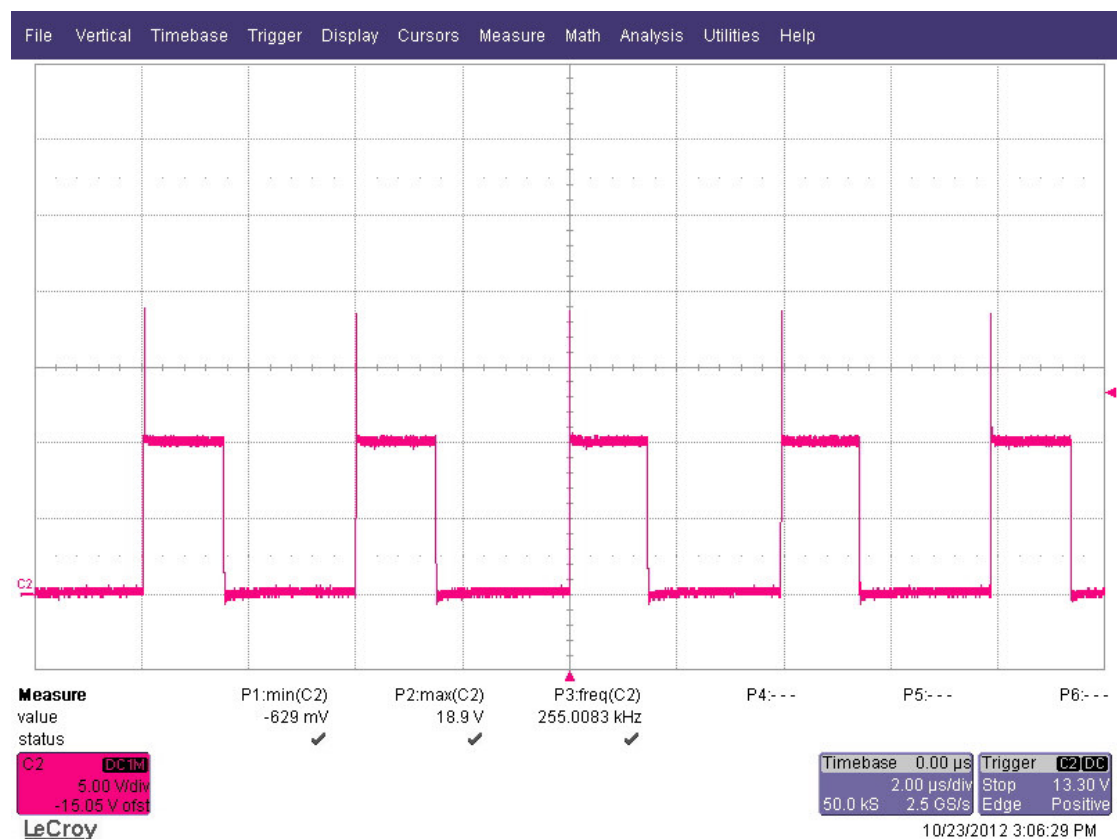


Figure 8

8 Thermal measurement

The thermal image (Figure 9) shows the circuit at an ambient temperature of 21 °C with an input voltage of 12.0V and a load of 2.5A.

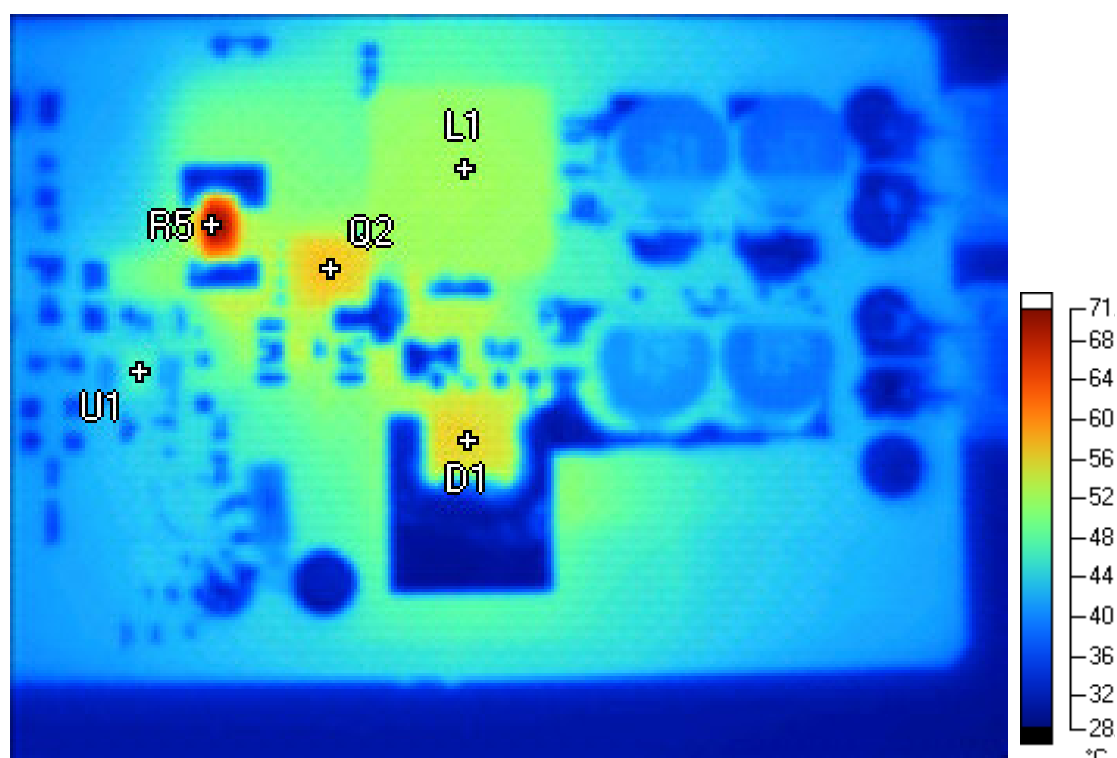


Figure 9

Markers

Label	Temperature	Emissivity	Background
L1	52.0 °C	0.95	21.0 °C
R5	70.4 °C	0.95	21.0 °C
Q2	56.7 °C	0.95	21.0 °C
D1	55.9 °C	0.95	21.0 °C
U1	46.5 °C	0.95	21.0 °C

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