

1 Startup

The startup waveform is shown in Figure 1. The input voltage is set at 5.0V, with no load on the 1.2V output.

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

Channel C2: **output voltage**
500mV/div, 5ms/div

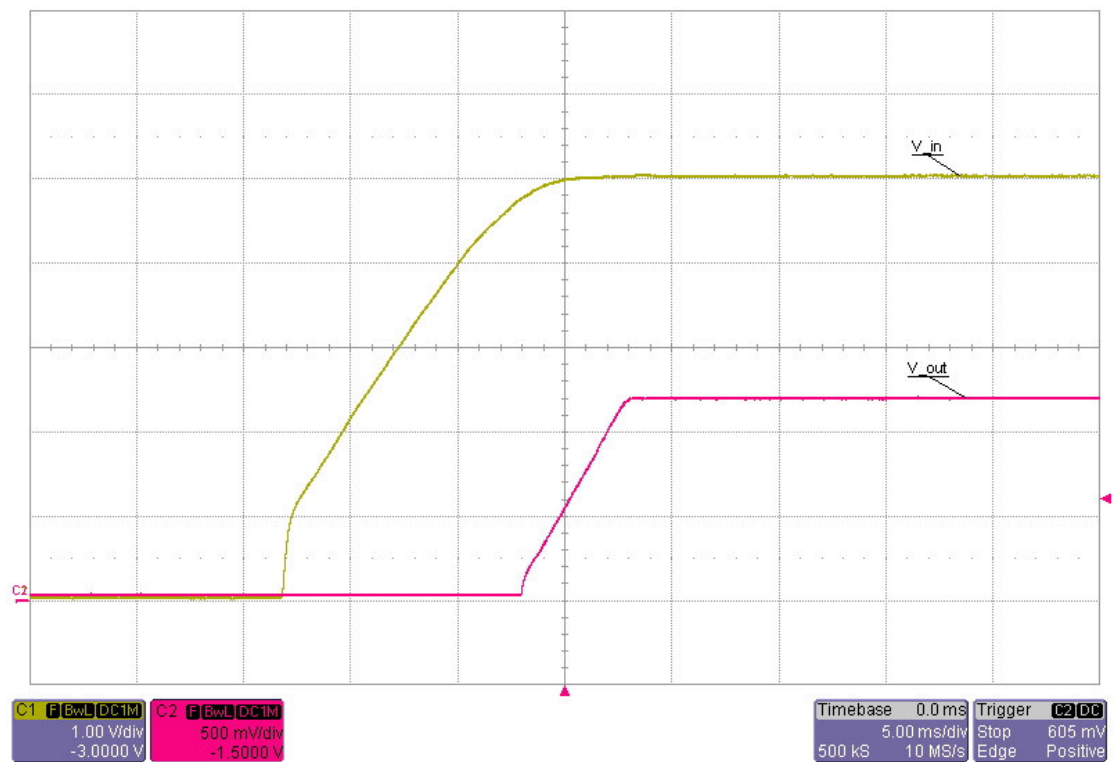


Figure 1

2 Shutdown

The shutdown waveform is shown in Figure 2. The input voltage is set at 5.0V with a 6.0A load on the 1.2V output.

Channel C1: **input voltage**
1V/div, 2ms/div

Channel C2: **output voltage**
500mV/div, 2ms/div

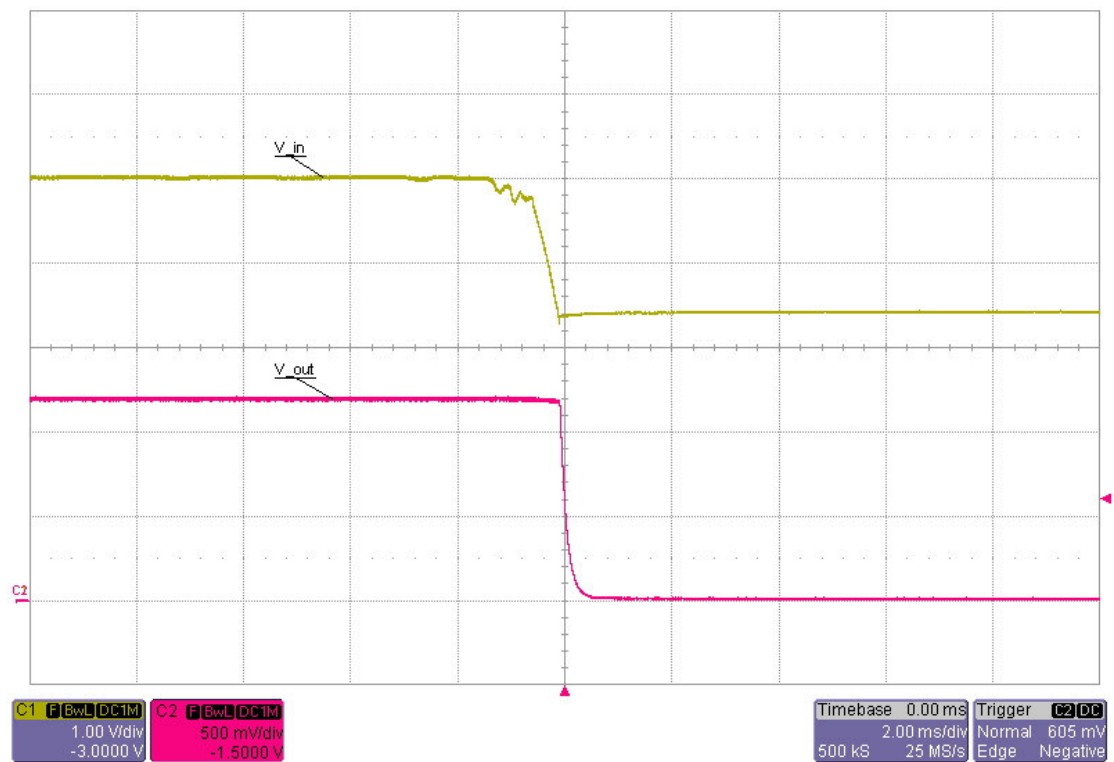


Figure 2

3 Efficiency

The efficiency is shown in Figure 3.

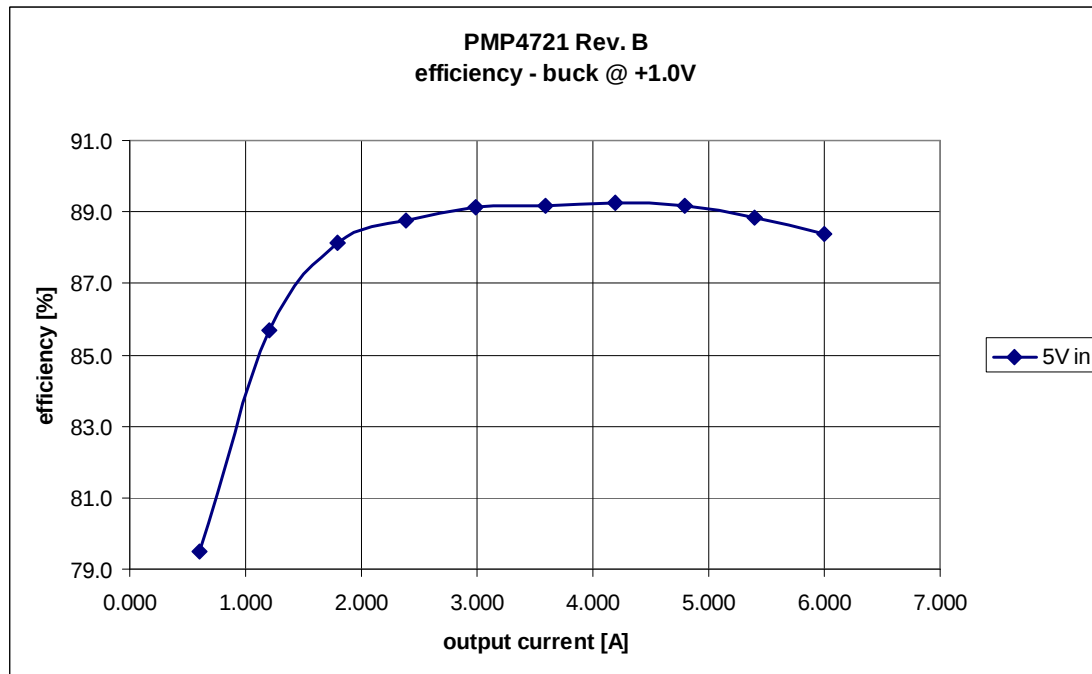


Figure 3

4 Load regulation

The load regulation of the 1.0V output is shown in Figure 4.

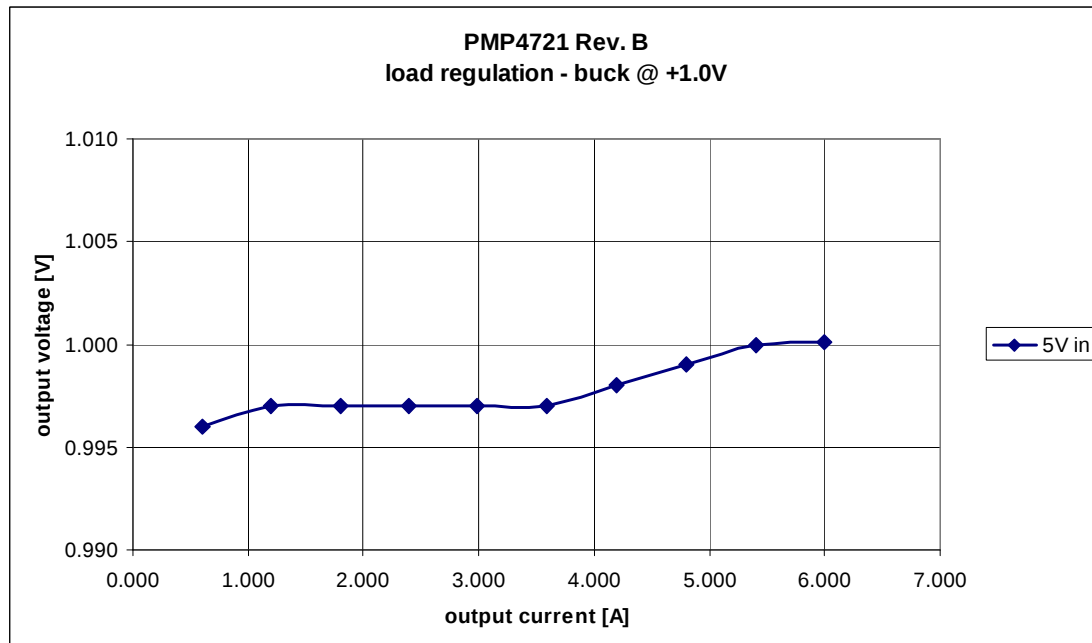


Figure 4

5 Output ripple voltage

The output ripple voltage at 6.0A load and 5.0V input voltage is shown in Figure 5.

Channel C1: **switching node**

5V/div, 1 μ s/div

Channel C2: **output voltage, 10mV peak-peak**

20mV/div, 1 μ s/div, AC coupled

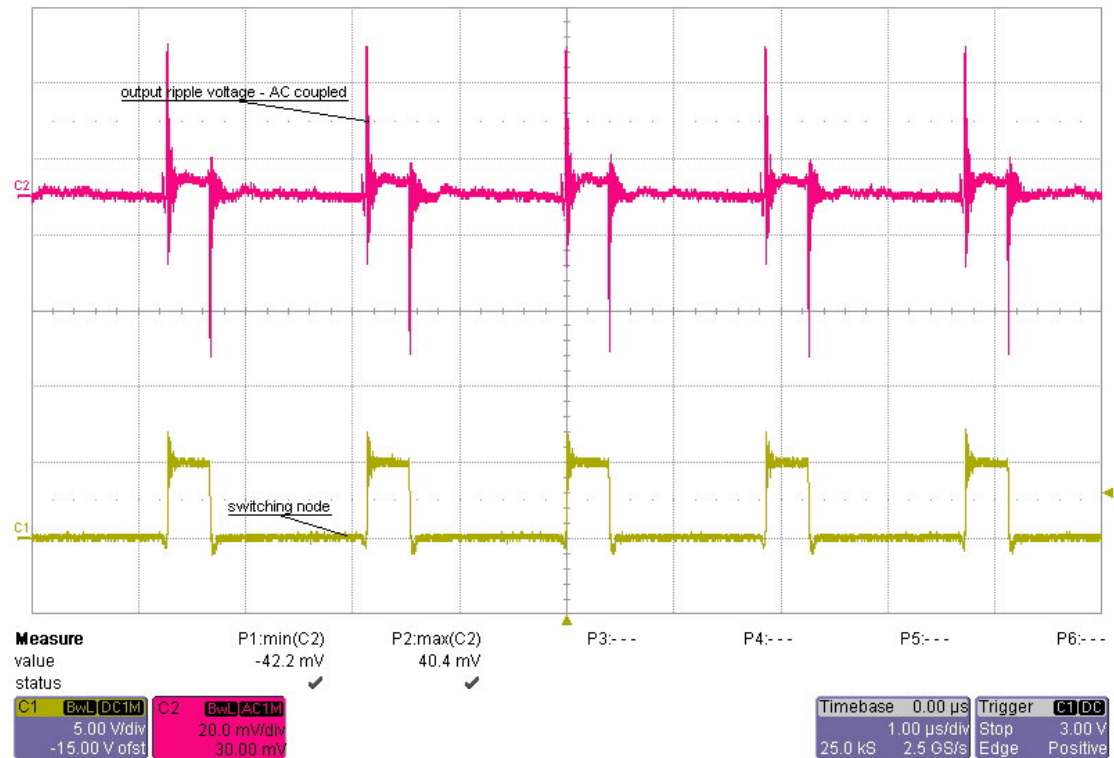


Figure 5

6 Load transients

The response to a load step and a load dump at an input voltage of 5.0V is shown in Figure 6 and Figure 7.

Channel C2: **output voltage**, -10mV undershoot, 10mV overshoot
20mV/div, 50us/div, AC coupled

Channel C1: **load current**, load step 3.0A to 6.0A
5A/div, 50us/div

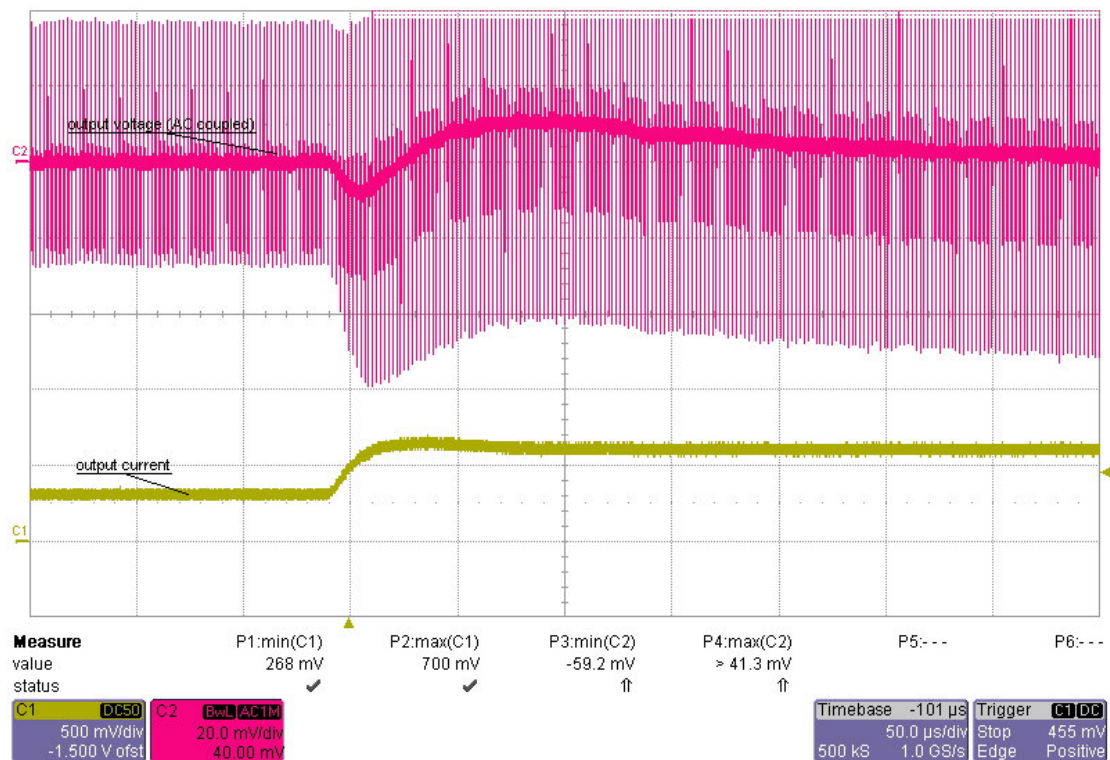


Figure 6

Channel C2: **output voltage**, 10mV overshoot, 10mV undershoot
20mV/div, 50us/div, AC coupled

Channel C1: **load current**, load dump 6.0A to 3.0A
5A/div, 50us/div

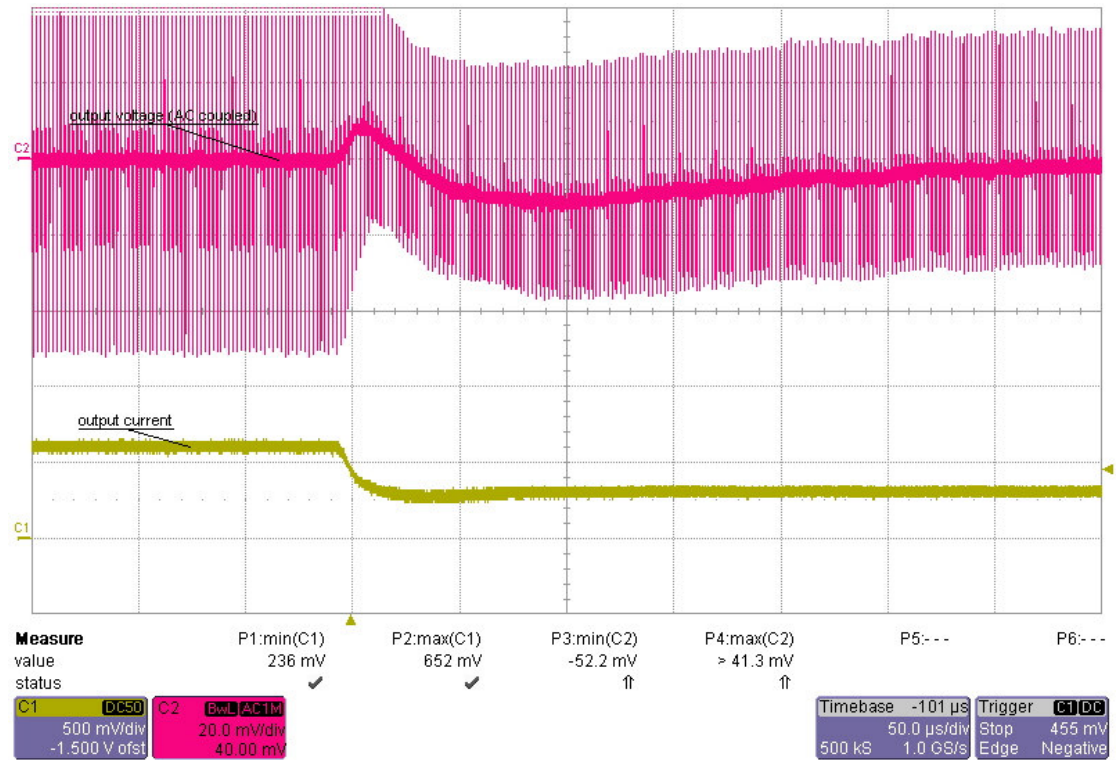


Figure 7

7 Frequency response

Figure 8 shows the loop response of the 1.0V output with 5.0V input and a 6.0A load.

57 deg phase margin @ crossover frequency 64.0 kHz

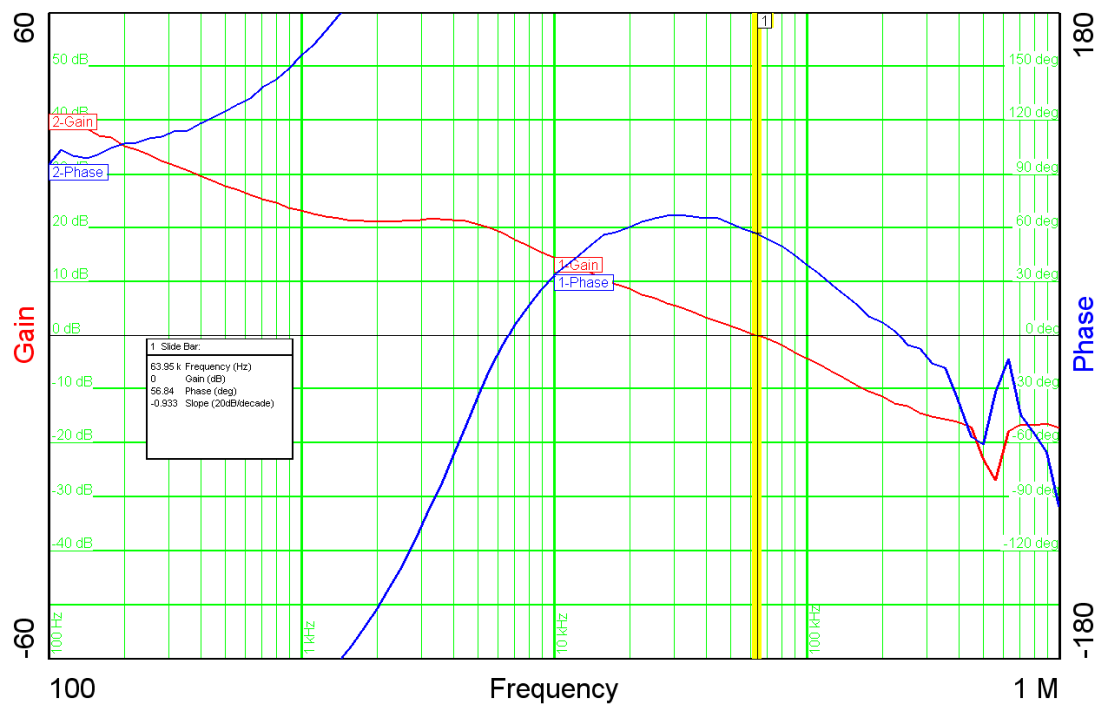


Figure 8

Due to the high Q of the output filter the phase is shifted to more than 180 degree which causes the program to plot the phase coming from the bottom up.

8 Miscellaneous waveforms

The drain-source voltage on the switching node is shown in Figure 9. The image was captured with a 5.0V input and a 6.0A load.

Channel C2: **drain-source voltage**, -1.5V minimum voltage, 11.8V maximum voltage
2V/div, 1us/div

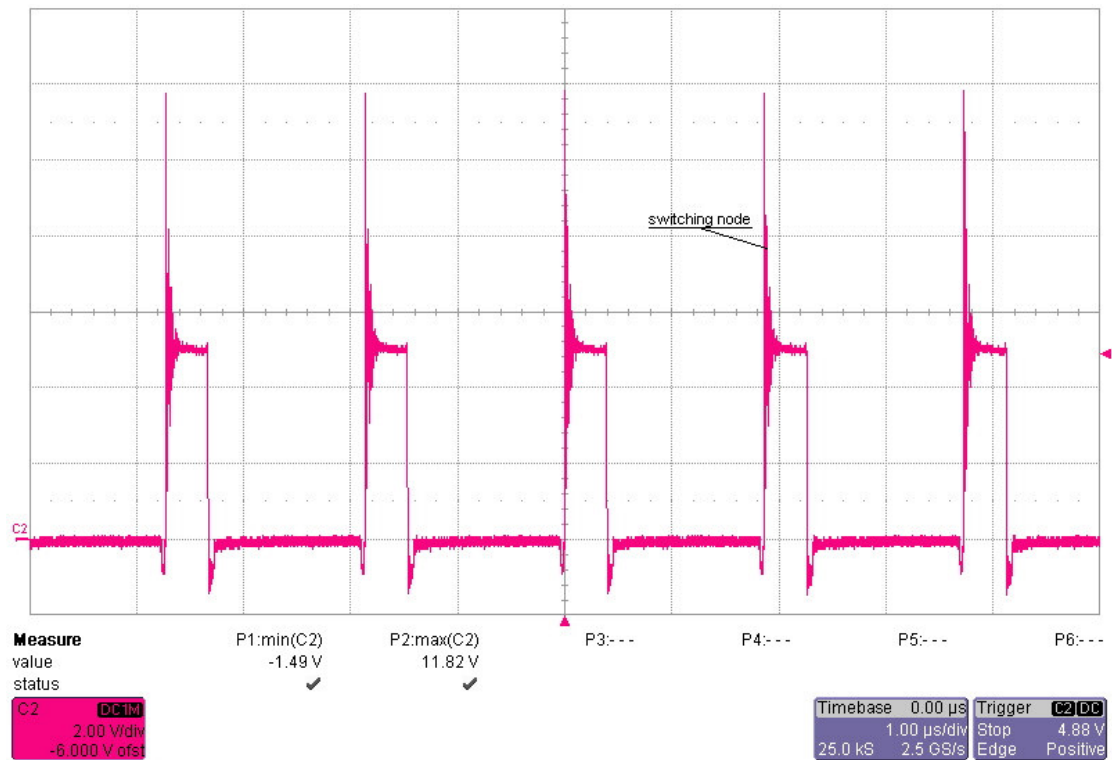


Figure 9

9 Thermal measurement

The thermal image (Figure 10) shows the circuit at an ambient temperature of 21 °C with an input voltage of 5.0V and a load of 6.0A.

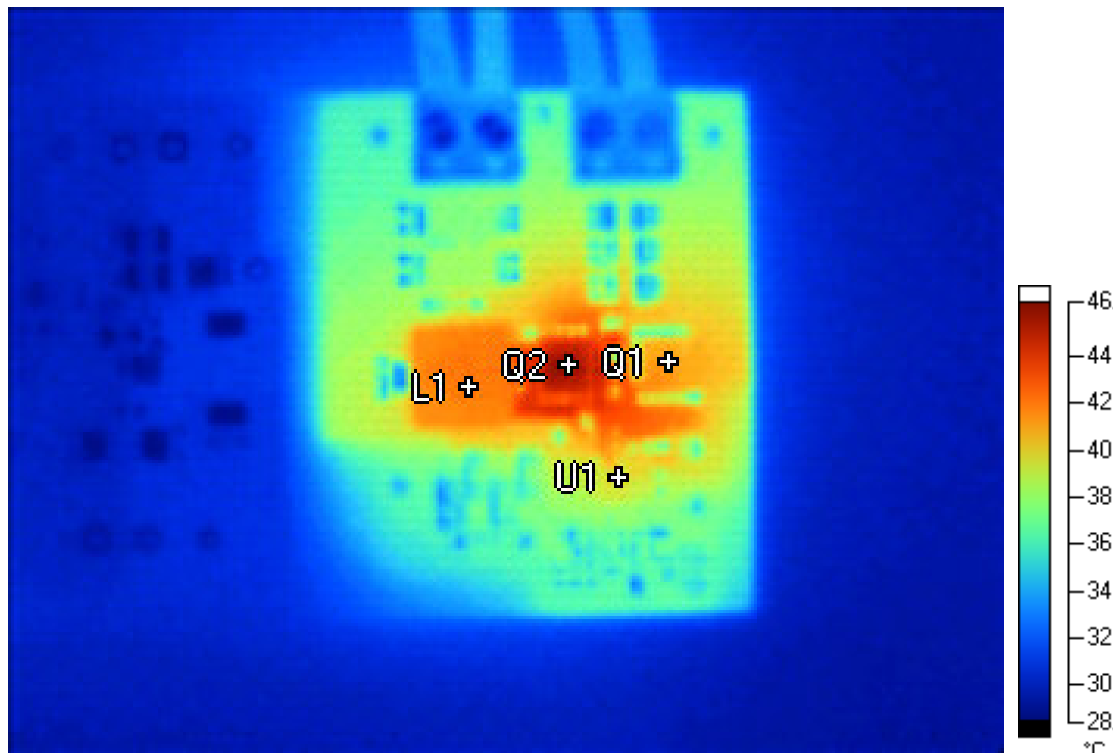


Figure 10

device	max. temperature	measured temp. @ 21 °C
Q1 – CSD16322Q5	150 °C	41.2 °C
Q2 – CSD16322Q5	150 °C	46.0 °C
L1 – MLC1250-132MLC	85 °C	42.1 °C
U1 – TPS40197RGY	85 °C	39.9 °C

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