Buck 15.0V

1 Startup

The startup waveform is shown in Figure 1. The input voltage is set at 24V, with no load on the output.

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

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

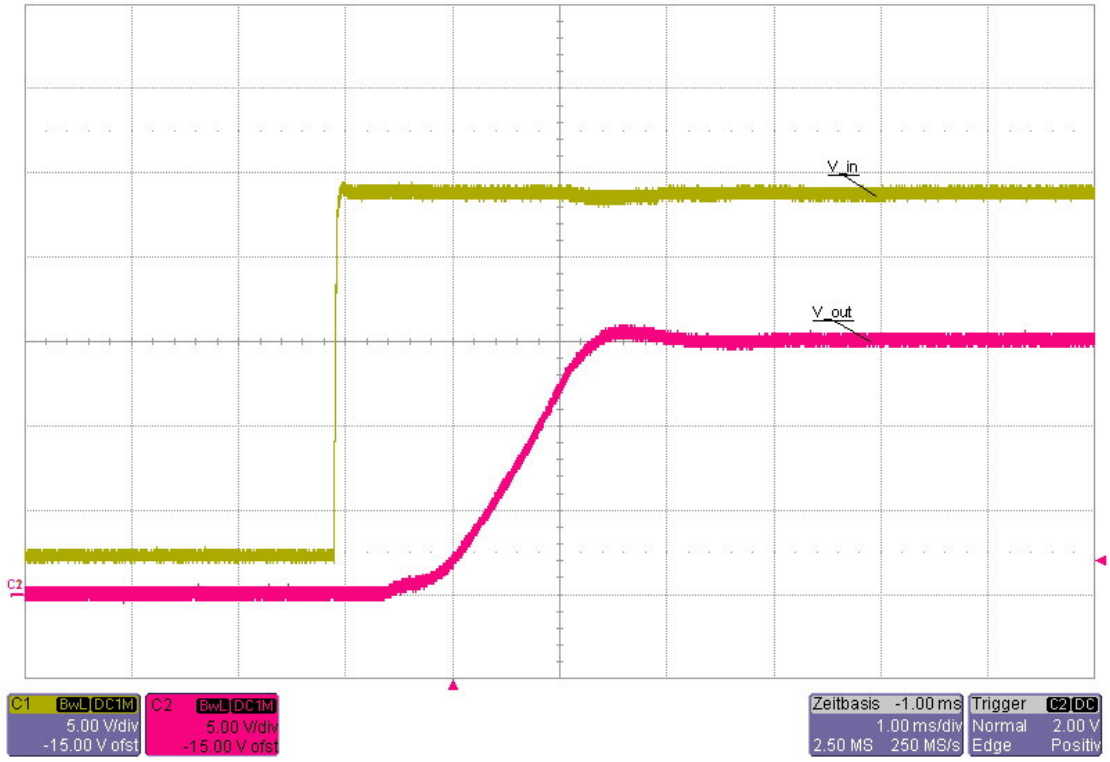

Figure 1

2 Shutdown

The shutdown waveform is shown in Figure 2. The input voltage is set at 24V with a 2.0A load on the output.

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

Channel C2: **output voltage**
5V/div, 1ms/div

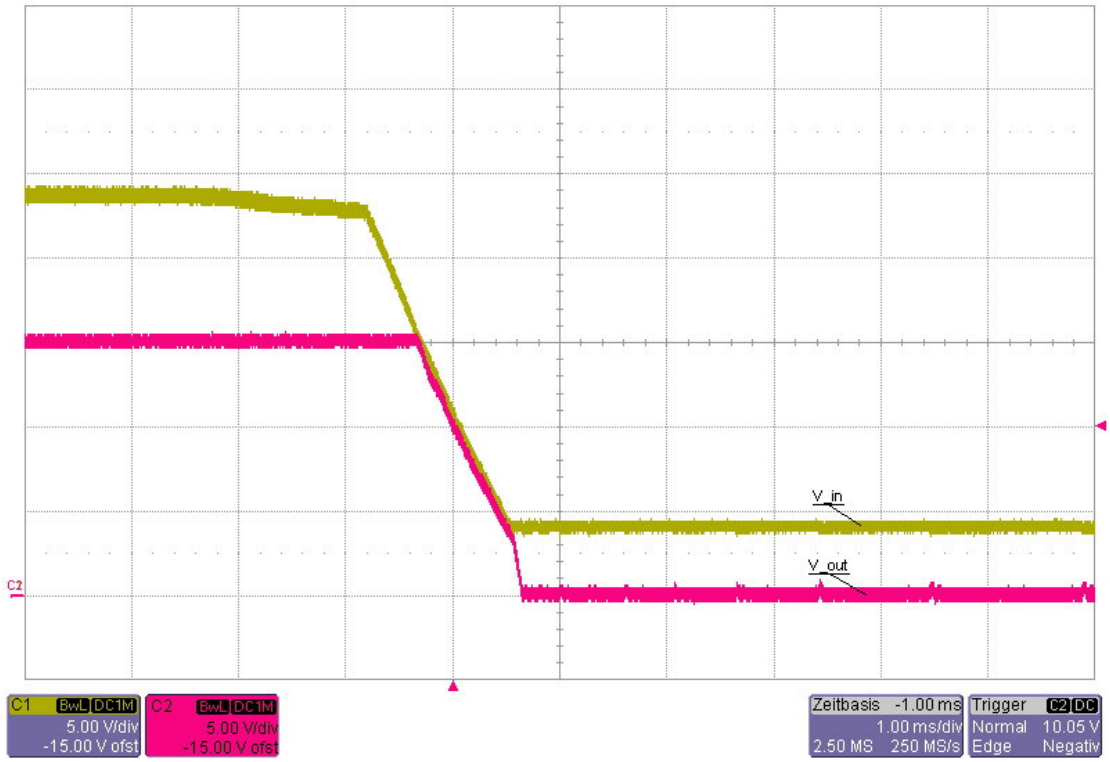

Figure 2

3 Efficiency

The efficiency is shown in Figure 3.

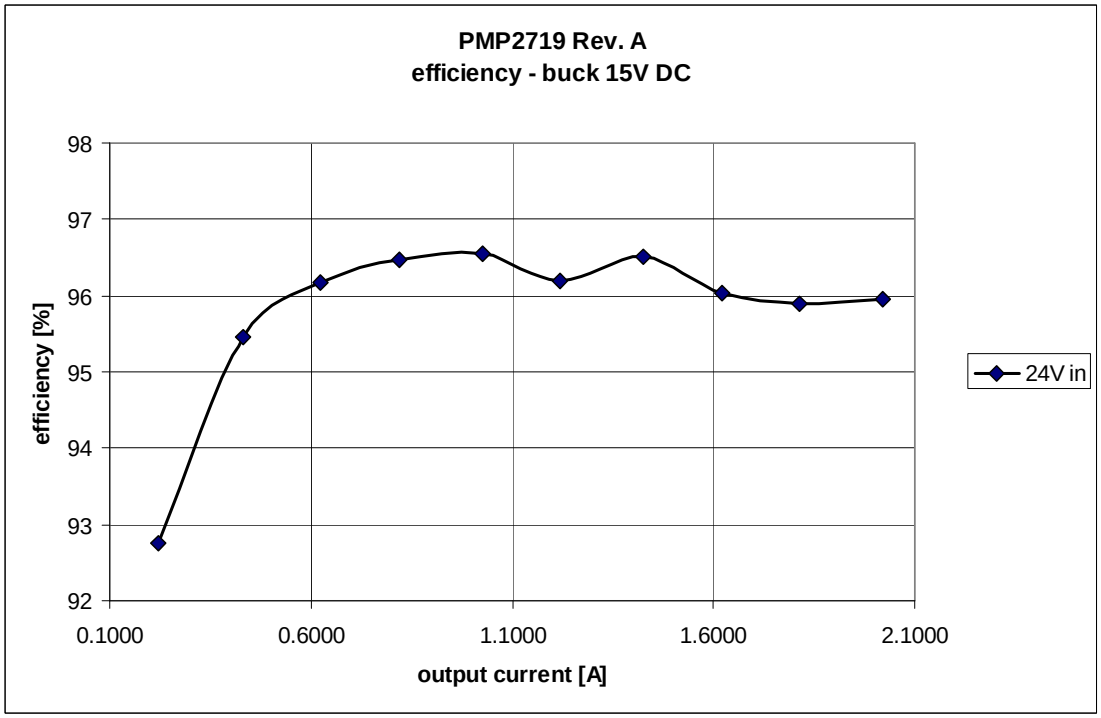

Figure 3

4 Load regulation

The load regulation of the 15V output is shown in Figure 4.

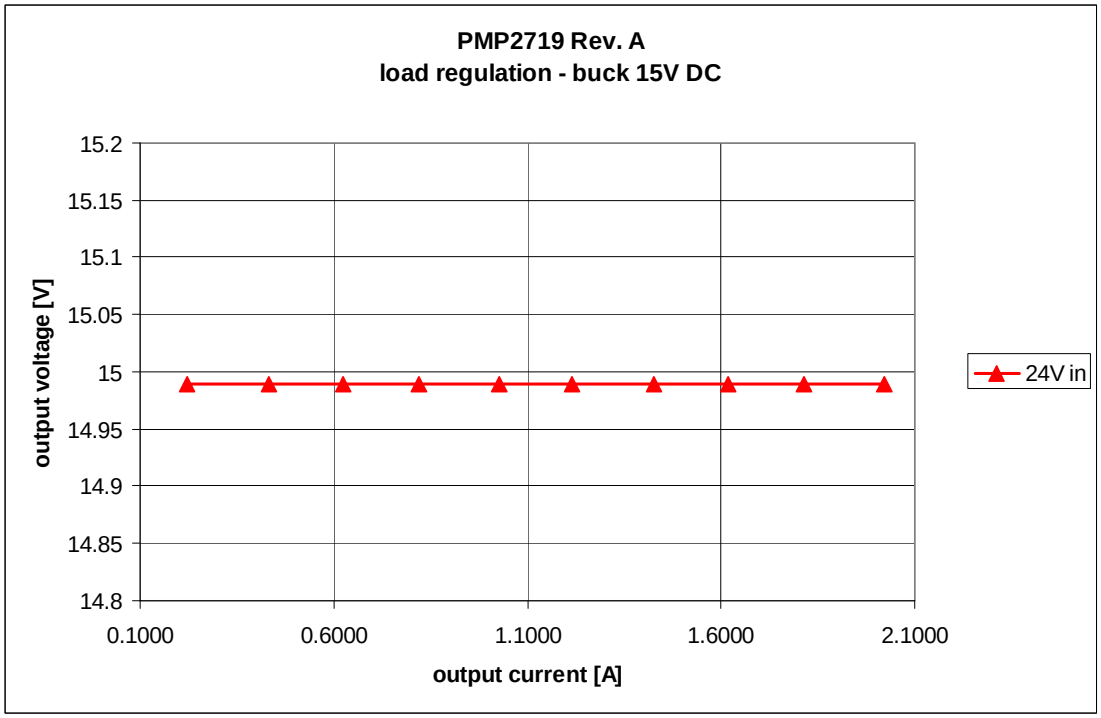

Figure 4

5 Output ripple voltage

The output ripple voltage at 2.0A load and 19V, 24V and 30V input voltage is shown in Figure 5.

Channel M1: **output voltage**, 18.9mV peak-peak
20mV/div, 5us/div, AC coupled

Channel M1: **output voltage**, 25.5mV peak-peak
20mV/div, 5us/div, AC coupled

Channel M3: **output voltage**, 29.4mV peak-peak
20mV/div, 5us/div, AC coupled

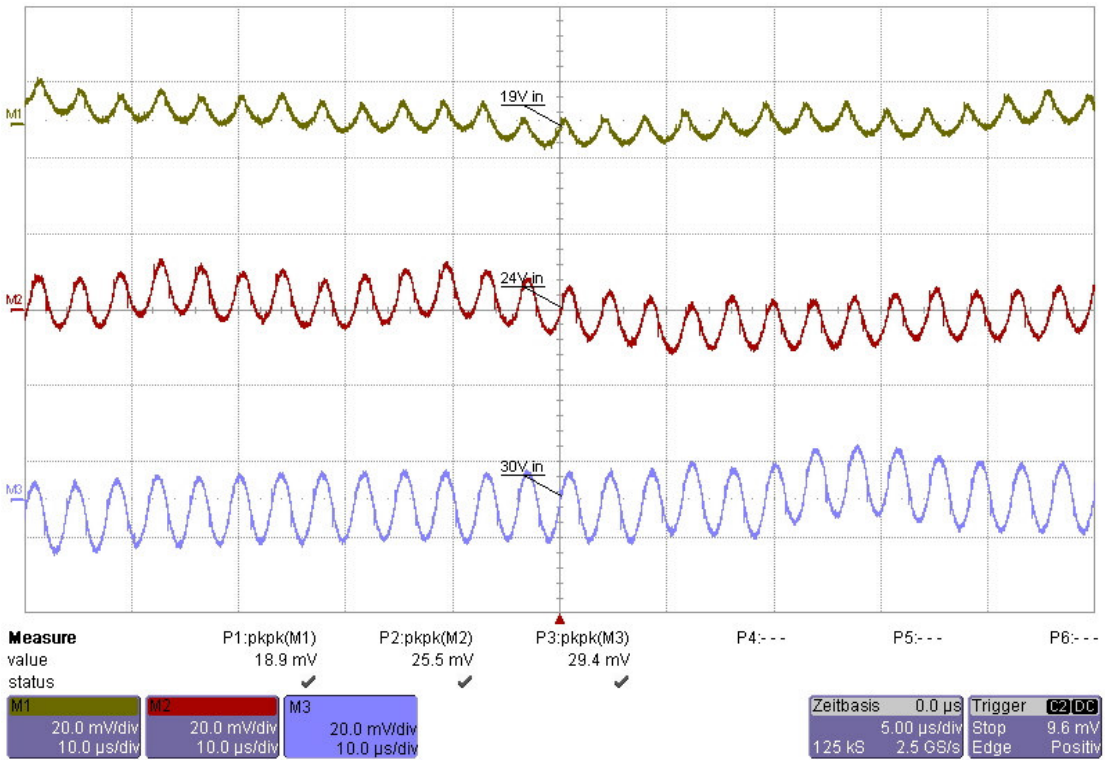

Figure 5

6 Load transients

The response to a load step and a load dump at an input voltage of 24V is shown in Figure 6 and Figure 7.

Channel C2: **output voltage**, -246mV undershoot, 35mV overshoot
200mV/div, 50us/div, AC coupled

Channel C1: **load current**, load step 1.0A to 2.0A
1A/div, 50us/div

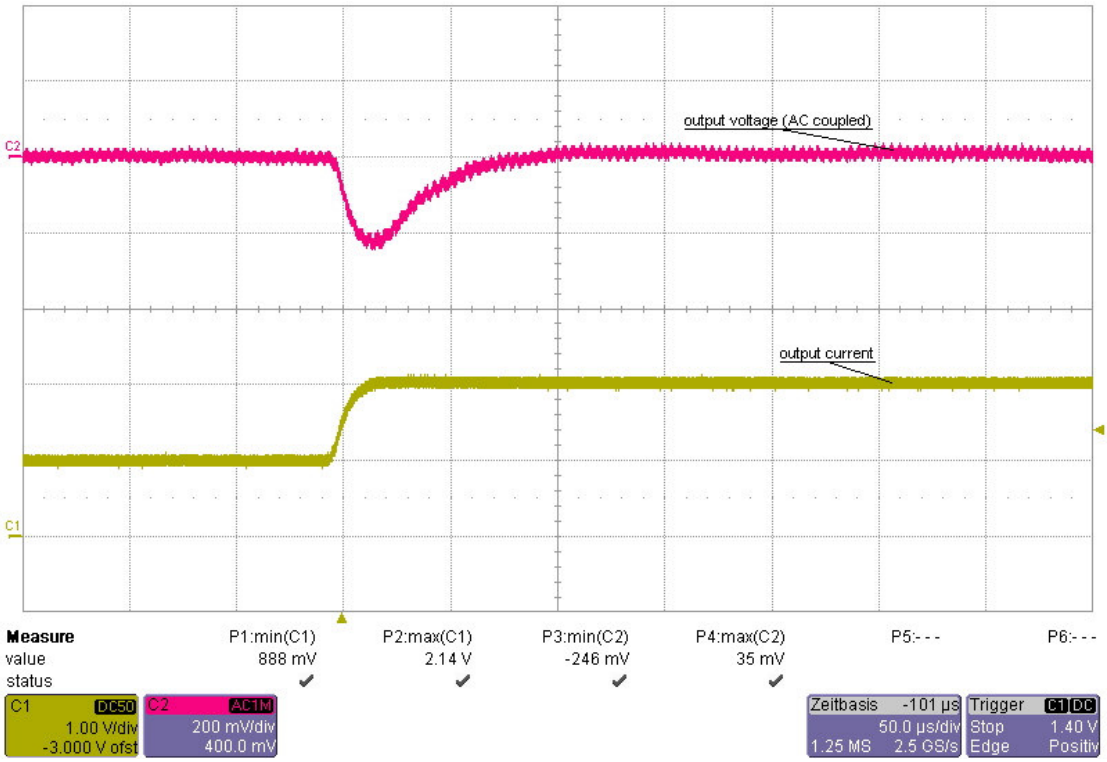

Figure 6

Channel C2: **output voltage**, 246mV overshoot, -35mV undershoot
200mV/div, 50us/div, AC coupled

Channel C1: **load current**, load dump 2.0A to 1.0A
1A/div, 50us/div

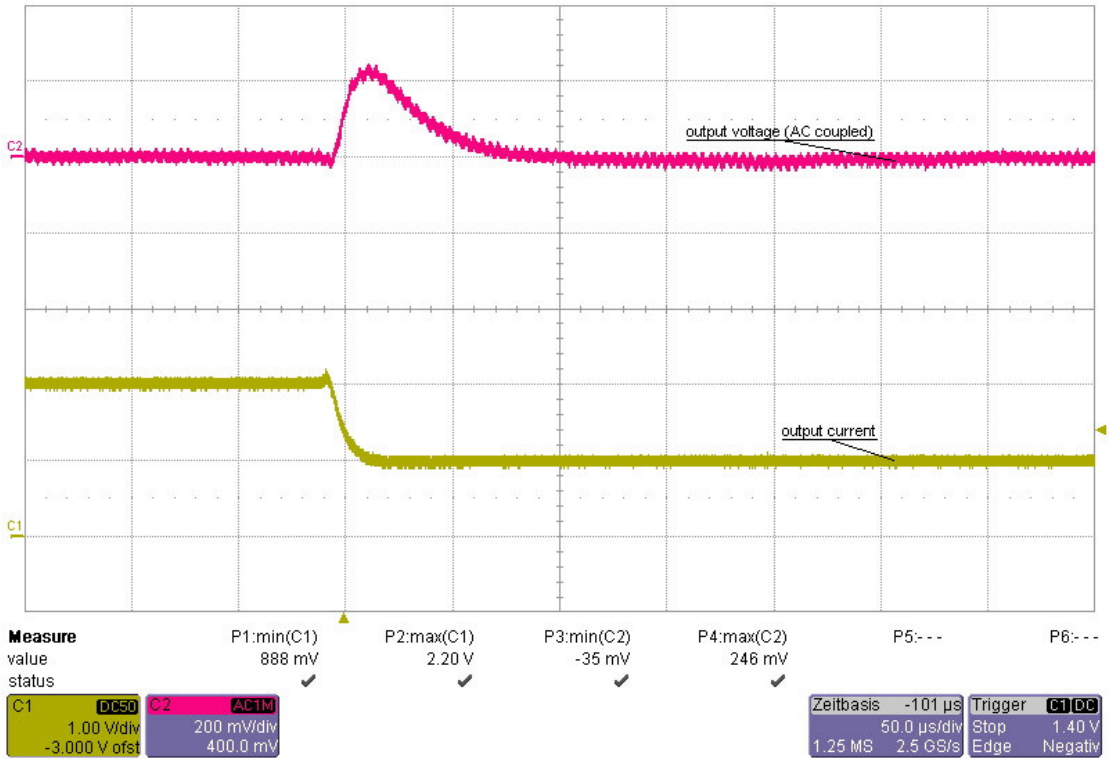

Figure 7

7 Frequency response

Figure 8 shows the loop response of the 15.0V output with 24V input and a 1.0A load.

68 deg phase margin @ crossover frequency 33.5kHz

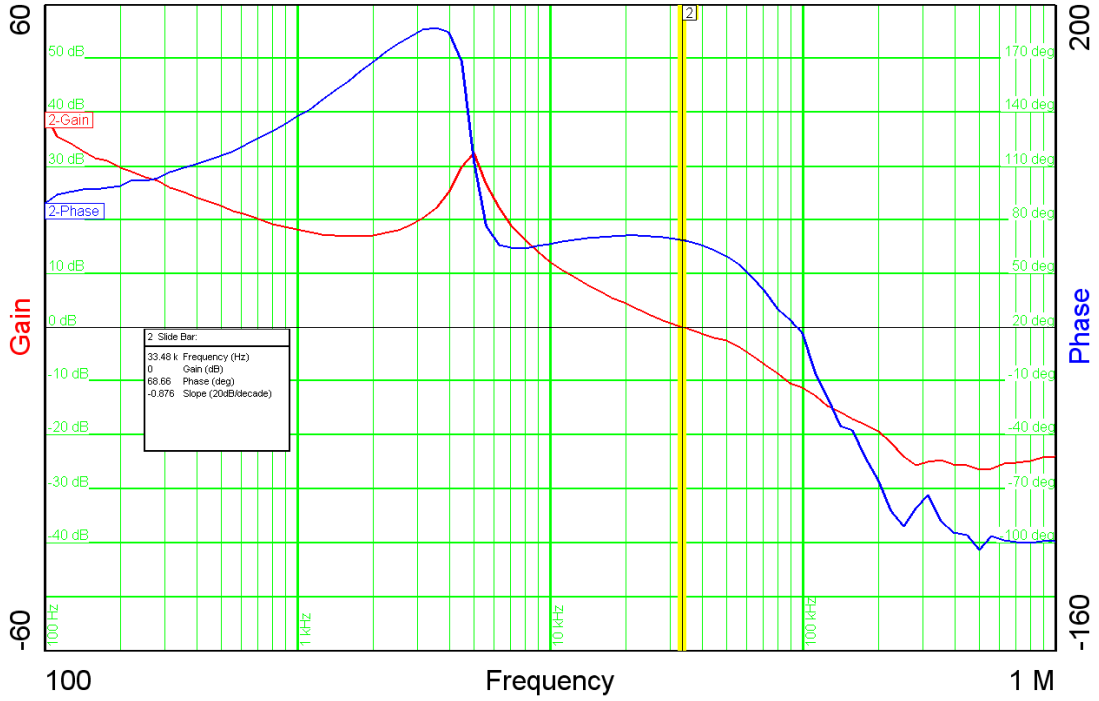

Figure 8

8 Miscellaneous waveforms

The voltage on the switch node is shown in Figure 9. The image was captured with a 30V input and a 2.0A load.

Channel C2: **switch node voltage**, -3.2V minimum voltage, 32.1V maximum voltage 5V/div, 2us/div

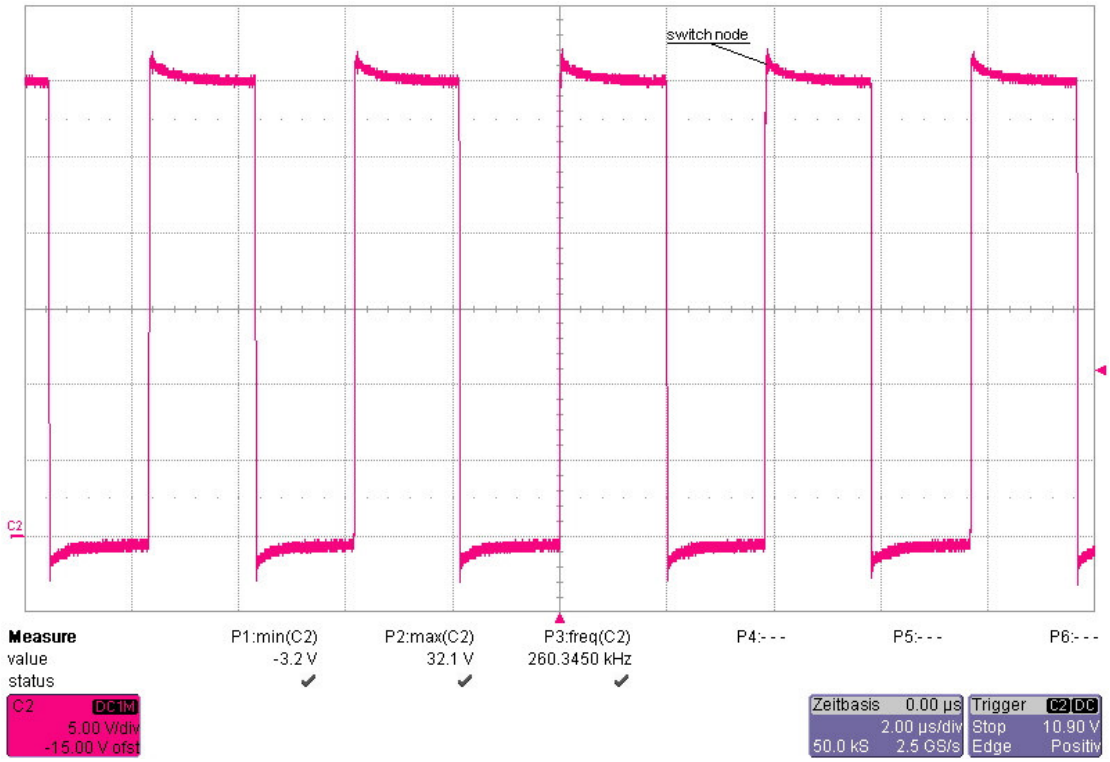

Figure 9

9 Thermal measurement

The thermal image (Figure 10) shows the circuit at an ambient temperature of 25 °C with an input voltage of 24V and a load of 2.0A.

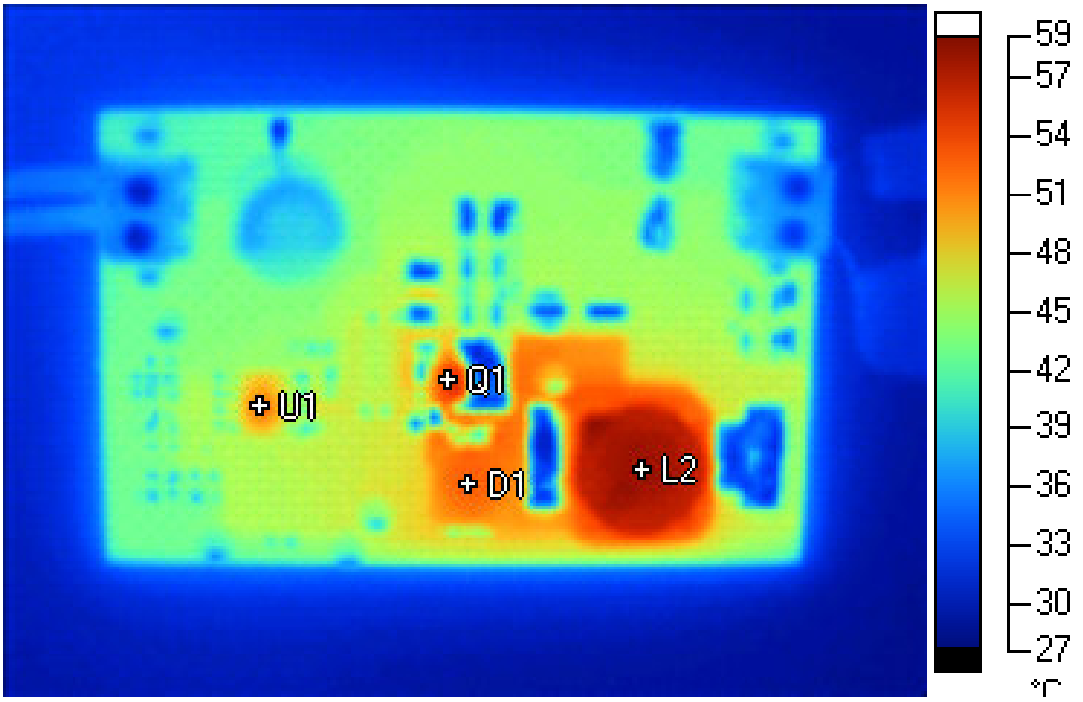

Figure 10

device	max. temperature	measured temp. @ 25 °C
U1	85.0	51.7
Q1	150.0	53.6
D1	150.0	53.0
L2	85.0	58.6

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