

PMP10222 Rev. B

TPS92512 – LED-Buck 36V/12-16V @ 0.9A

1 +36V LED-Buck Converter

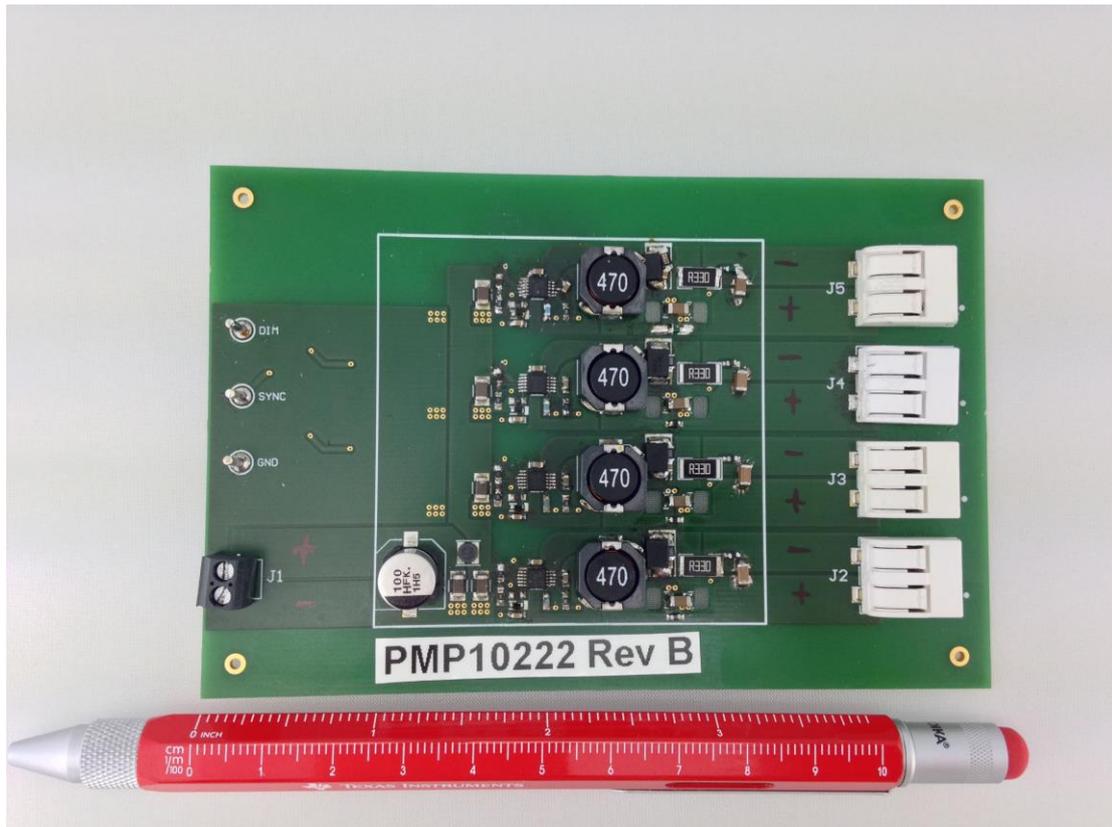


Figure 1: PCB Top

1.1 Output voltage ripple

The output ripple of the 36V LED-Buck converter is shown in Figure 2.

Channel Ch1: **36V input voltage**, 49.1mV peak-peak
20mV/div, 1us/div

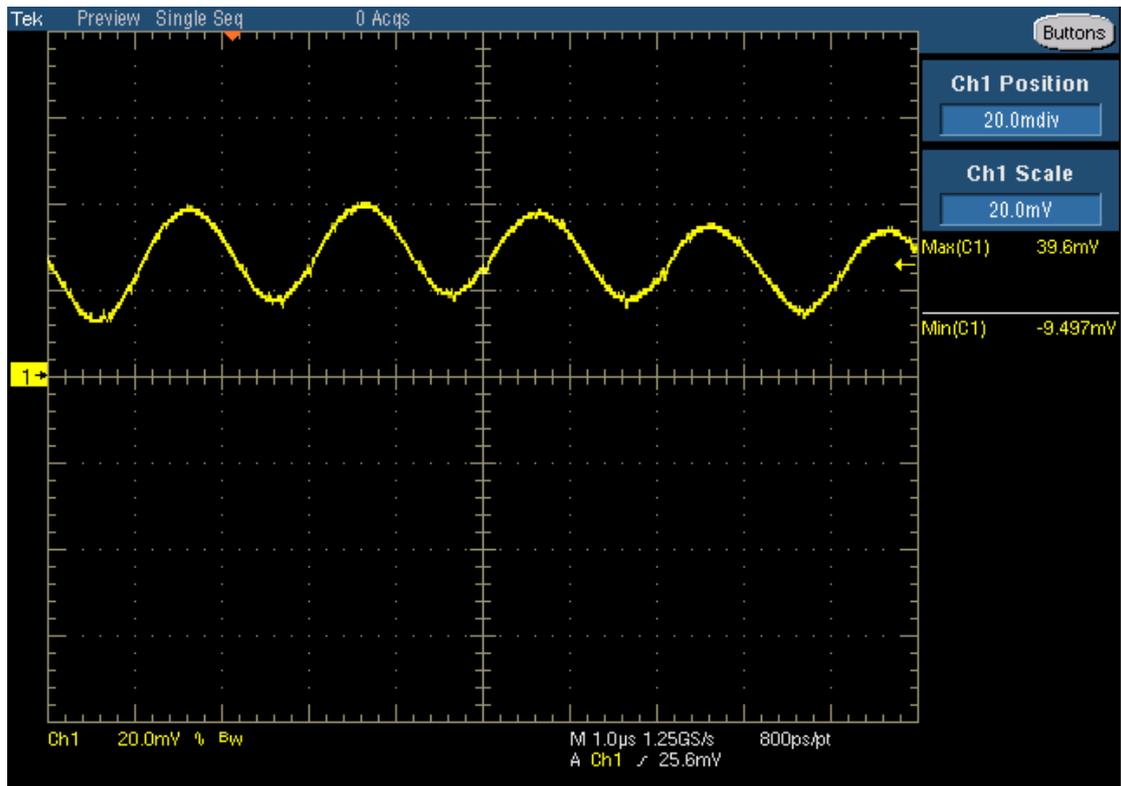


Figure 2

1.2 Switching node

The switching node is shown in Figure 3.

The input voltage is set to 40V with a 0.9A load on the LED output.

Channel Ch2: **Switching node**, -1.311V min, 40.81V max
10V/div, 400ns/div

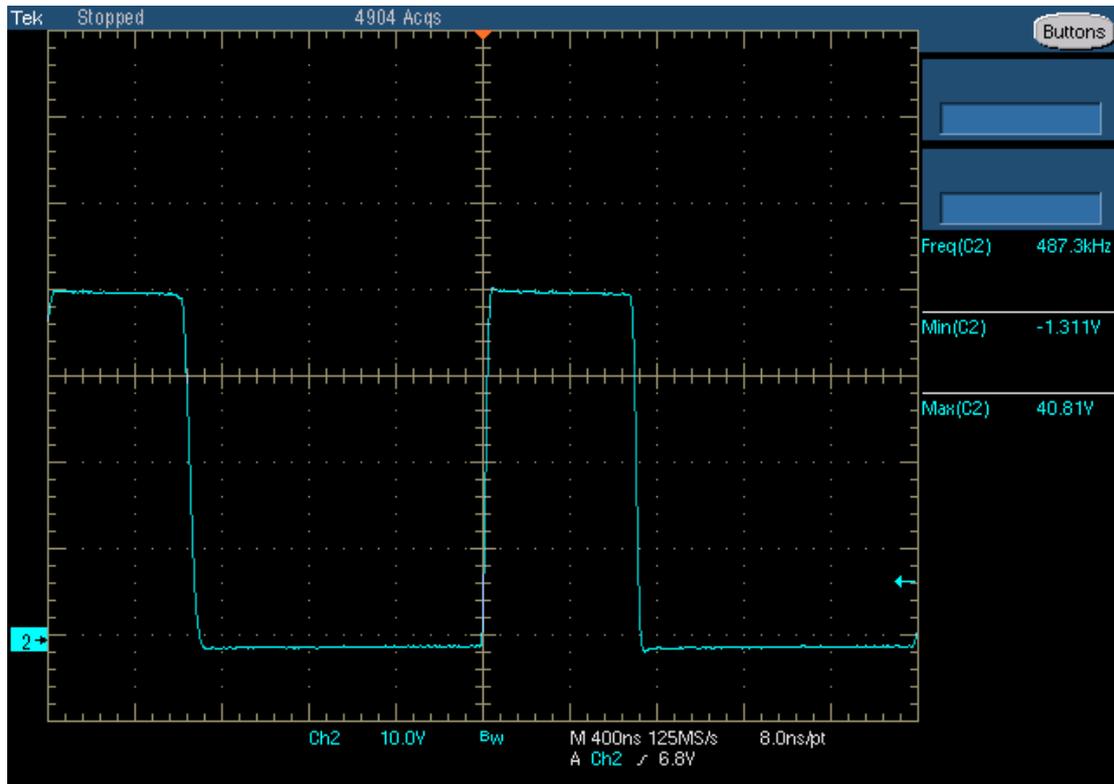


Figure 3

1.3 Start up

Figure 4 shows the startup of the 36V LED-Buck with a 0.9A load.

Channel Ch2: **Input Voltage**, 37V, 10V/div, 40ms/div

Channel Ch4: **Output Current**, 0.9A, 0.5A/div, 40ms/div

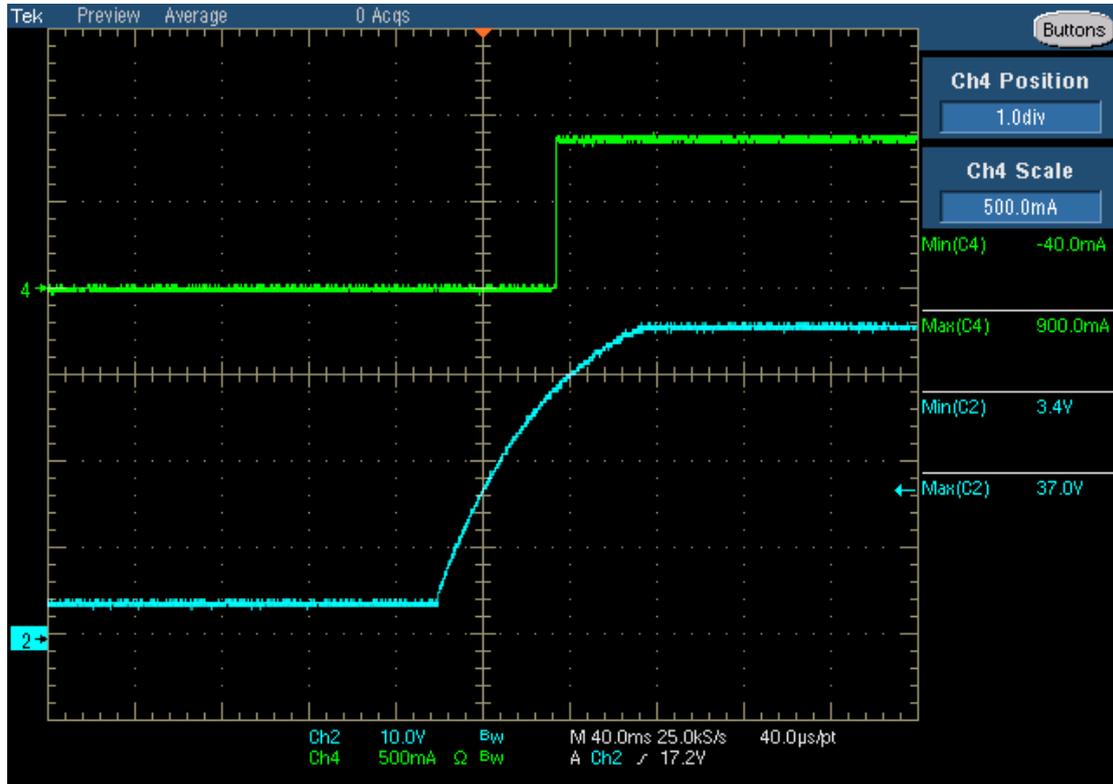


Figure 4

1.4 Shut down

Figure 5 shows the shutdown behavior of the 36V LED-Buck converter with a 0.9A load.

Channel Ch2: **Input Voltage**, 36.6V, 10V/div, 2.0s/div

Channel Ch4: **Output Current**, 0.9A, 0.5A/div, 2.0s/div



Figure 5

1.5 Efficiency (36V LED-Buck Converter)

The efficiency at 30.0V, 36.0V and 40.0V input voltage for different load currents up to 0.9A is shown in Figure 6.

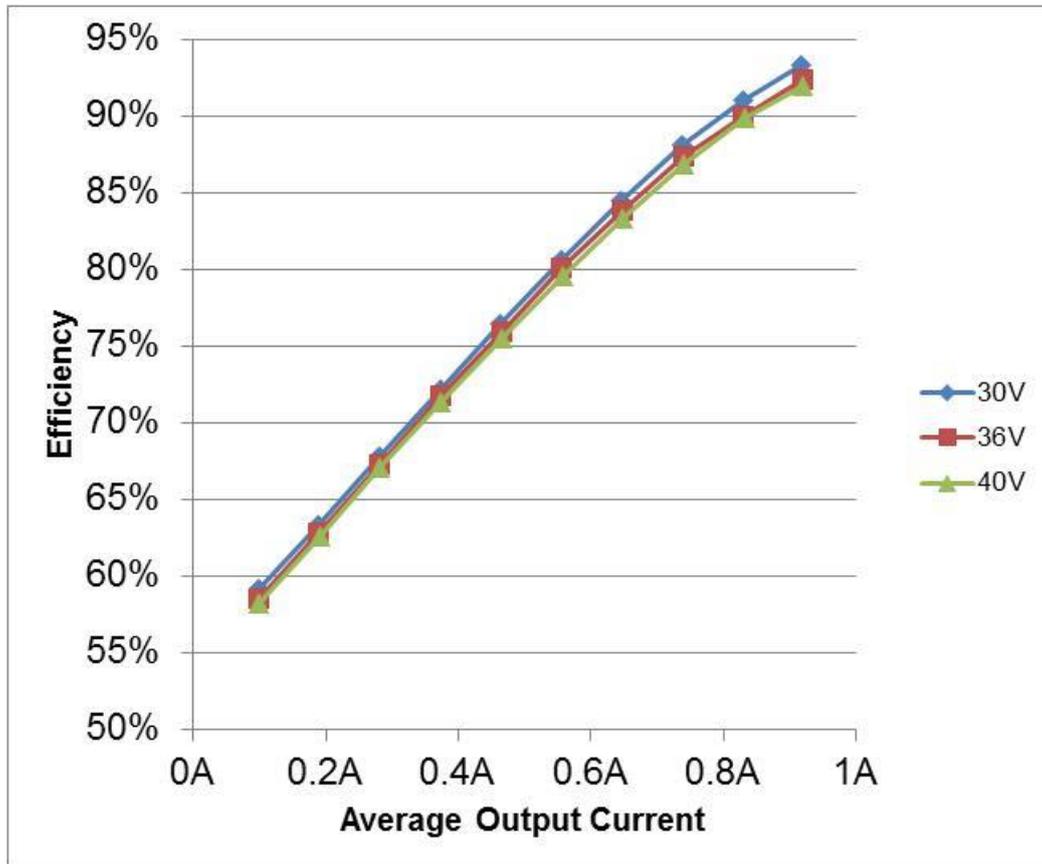


Figure 6

1.6 Load currents – PWM dimming (36V LED-Buck Converter)

Load current and dimming signal of the 36V LED-Buck converter are shown in Figure 7 and Figure 8.

Channel Ch2: **PDIM Input Voltage**, 4V, 2V/div, 1.0ms/div, 10% duty cycle

Channel Ch4: **Output Current**, 0.9A, 0.5A/div, 2.0s/div

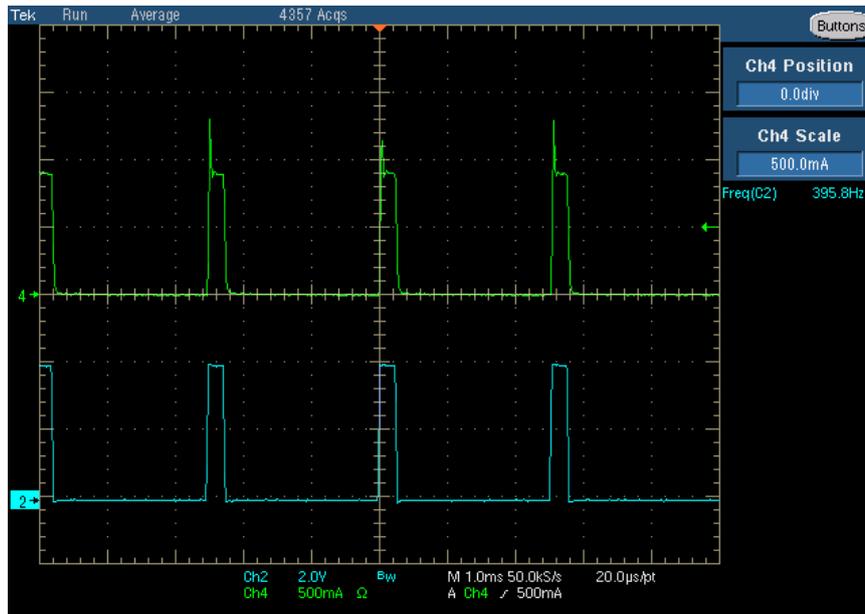


Figure 7

Channel Ch2: **PDIM Input Voltage**, 4V, 2V/div, 1.0ms/div, 10% duty cycle

Channel Ch4: **Output Current**, 0.9A, 0.5A/div, 2.0s/div

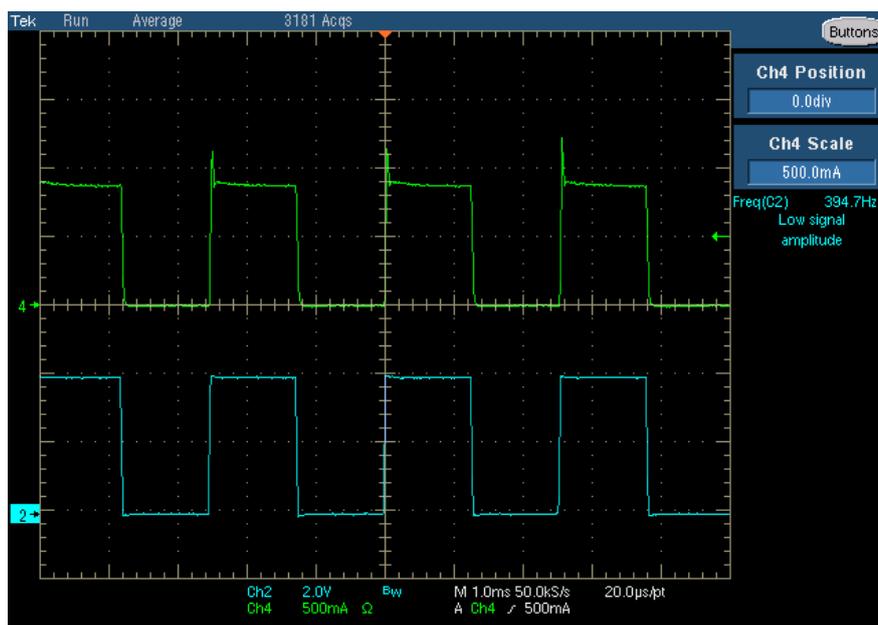


Figure 8

1.7 Frequency response (36V LED-Buck Converter)

The frequency response of the 36V TPS92512 LED-Buck converter is shown in Figure 9.

30V input

- 88 deg phase margin @ crossover frequency of 1.778 kHz
- More than -22 dB gain margin

40V input

- 88 deg phase margin @ crossover frequency of 1.575 kHz
- More than -22 dB gain margin

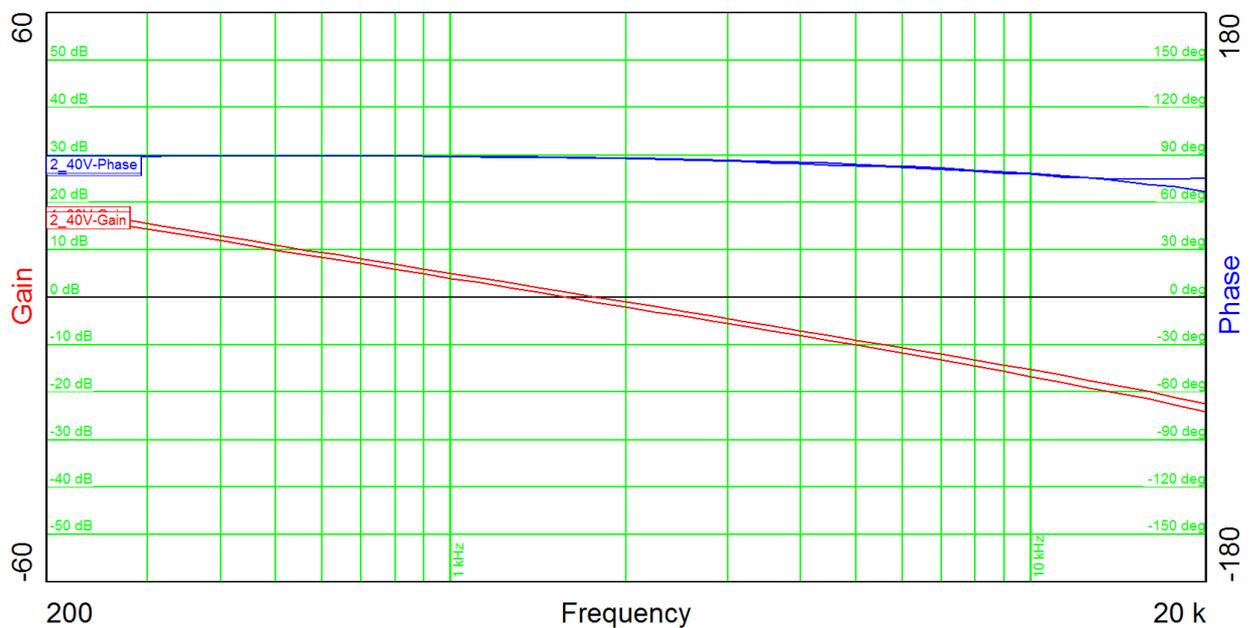


Figure 9

1.8 Thermal measurement

The thermal image (Figure 10) shows the circuit at an ambient temperature of 21 °C with an input voltage of 30V and 0.9A load for each channel @ 16V output.

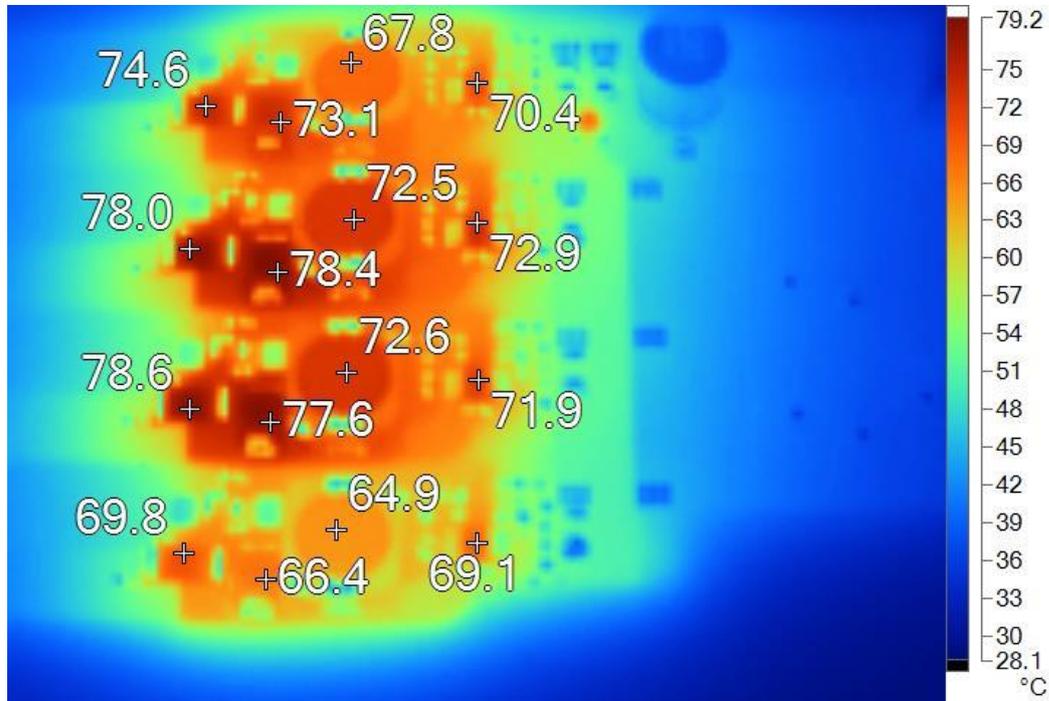


Figure 10: PCB top

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