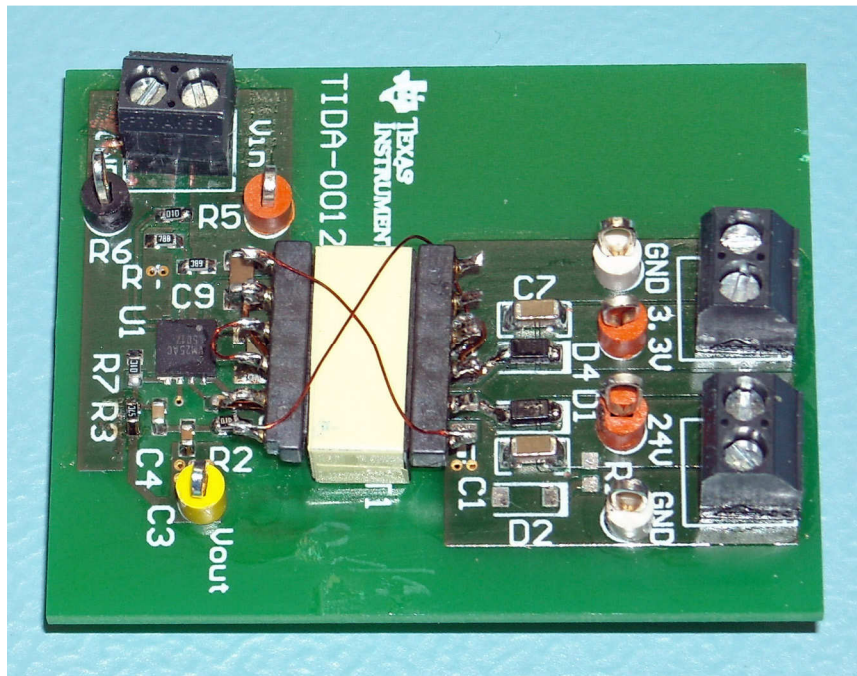


Dual-Output Fly-Buck for Industrial Applications

- Input 12 .. 36V DC
- Outputs
 - Primary: +6.0V (not used)
 - Secondary +17.0V @ 45mA, -17.0V @ 30mA
- Converter LM5017
- Working in continuous conduction mode
- Modified TIDA-00129 Board



1 Startup

The startup waveform is shown in Figure 1. The input voltage is set at 12V, with no load on the outputs.

- Channel C1: **Input voltage**
5V/div, 10ms/div
- Channel C2: **Primary output voltage, +6.0V**
2V/div, 10ms/div
- Channel C3: **Secondary output voltage, +17.0V**
10V/div, 10ms/div
- Channel C4: **Secondary output voltage, -17.0V**
10V/div, 10ms/div

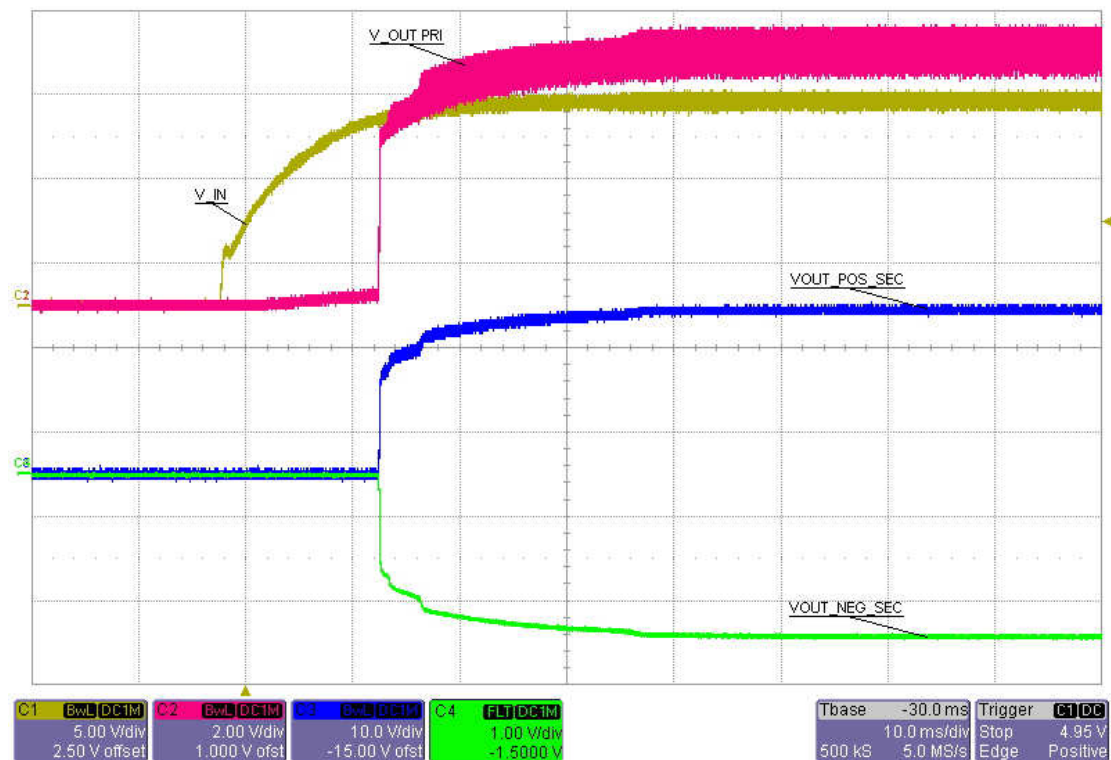


Figure 1

2 Shutdown

The shutdown waveform is shown in Figure 2. The input voltage is set at 12V with full load on the secondary outputs (+17.0V @ 45mA, -17.0V @ 30mA).

- Channel C1: **Input voltage**
5V/div, 10ms/div
- Channel C1: **Primary output voltage, +6.0V**
2V/div, 10ms/div
- Channel C3: **Secondary output voltage, +17.0V**
10V/div, 10ms/div
- Channel C4: **Secondary output voltage, -17.0V**
10V/div, 10ms/div

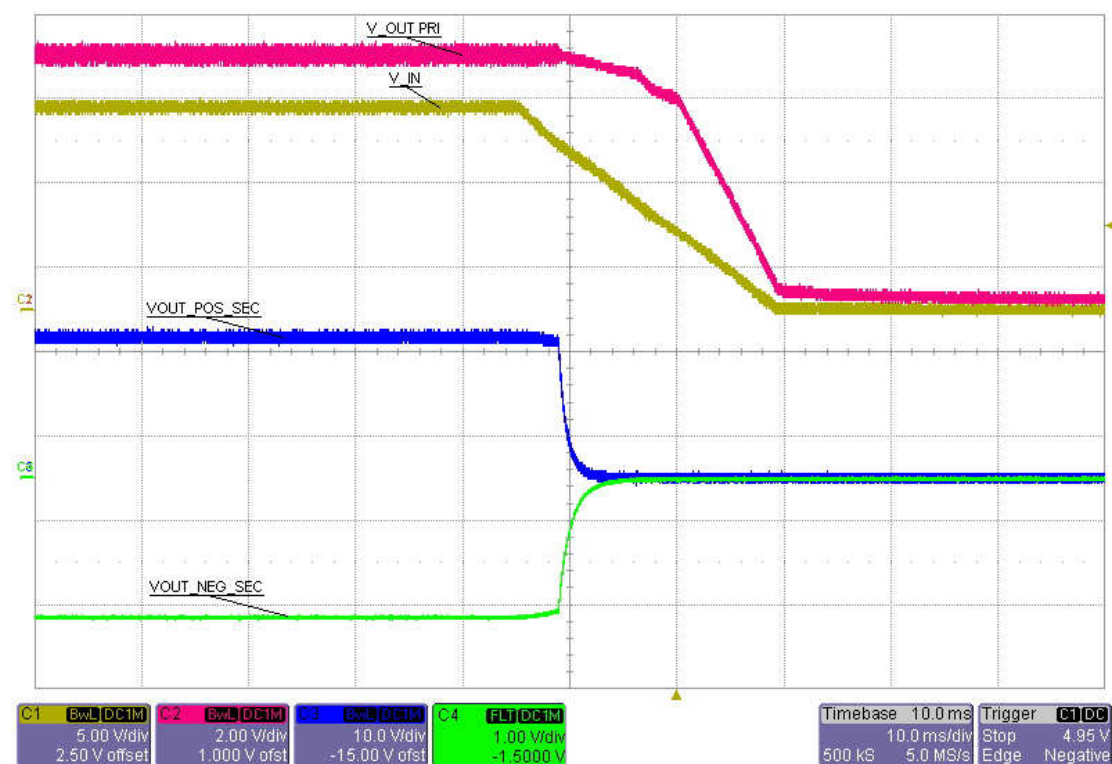


Figure 2

3 Efficiency

The efficiency and load regulation at various input voltages and full load on both secondary outputs are shown in Figure 3 and Figure 4.

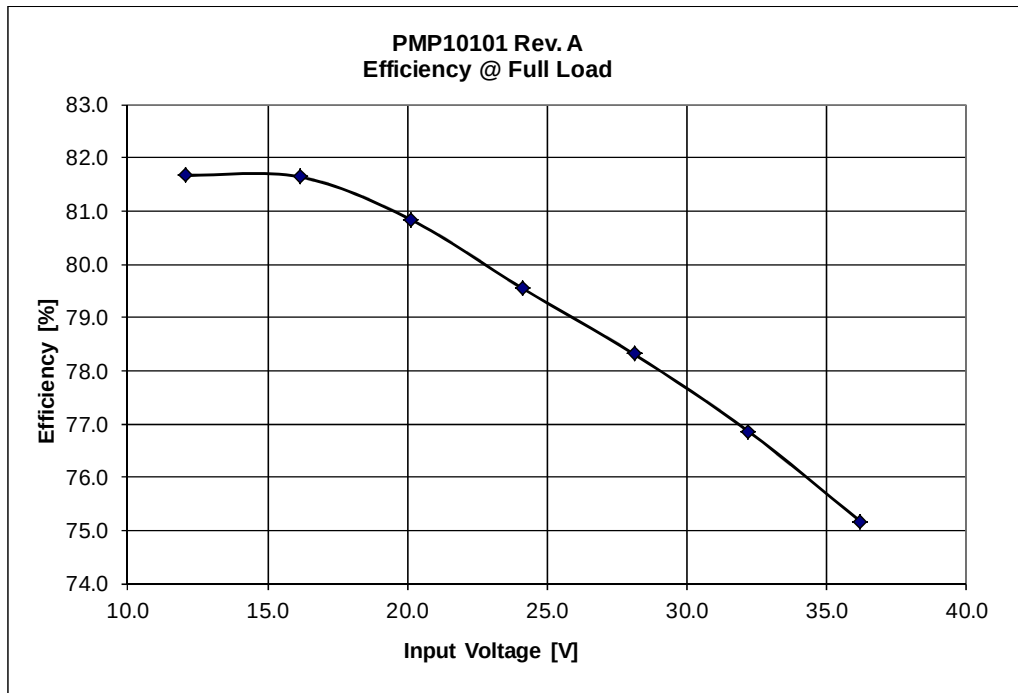


Figure 3

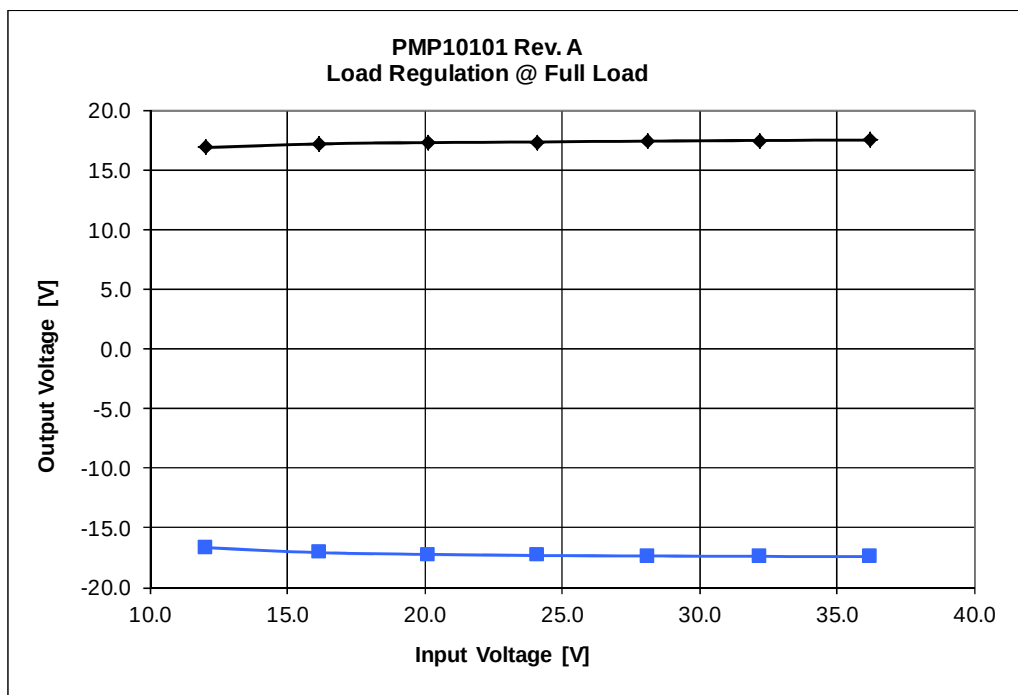


Figure 4

4 Output ripple voltage

The output ripple voltage at 24.0V input voltage and full load on both secondary outputs is shown in Figure 5.

Channel M1: **Primary output voltage +6.0V**, AC coupled
112mV peak-peak @ 24V input voltage
100mV/div, 1us/div

Channel M2: **Secondary output voltage +17.0V**, AC coupled
73mV peak-peak @ 24V input voltage
50mV/div, 1us/div

Channel M3: **Secondary output voltage -17.0V**, AC coupled
55mV peak-peak @ 24V input voltage
50mV/div, 1us/div

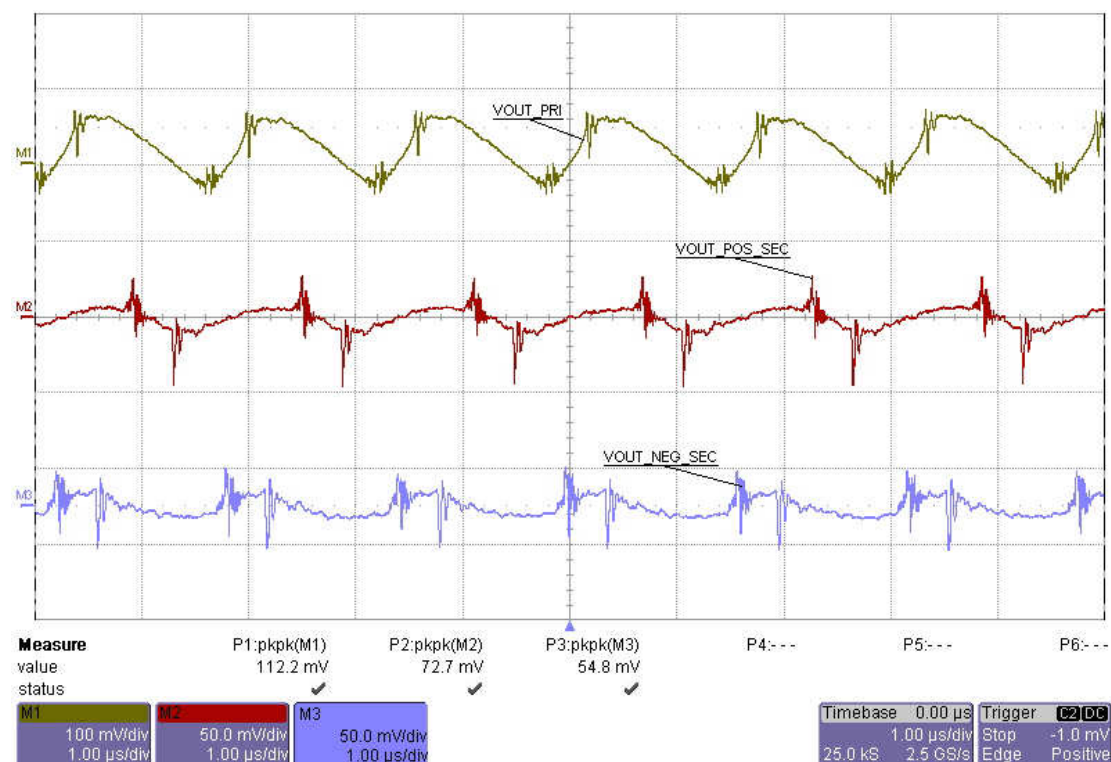


Figure 5

5 Switching Node

The drain-source voltage on the switching node is shown in Figure 6. The image was captured with 36V input and full load on both secondary outputs.

Channel C2: **Drain-source voltage**, -1.7V minimum voltage, 37.4V maximum voltage
10V/div, 1us/div

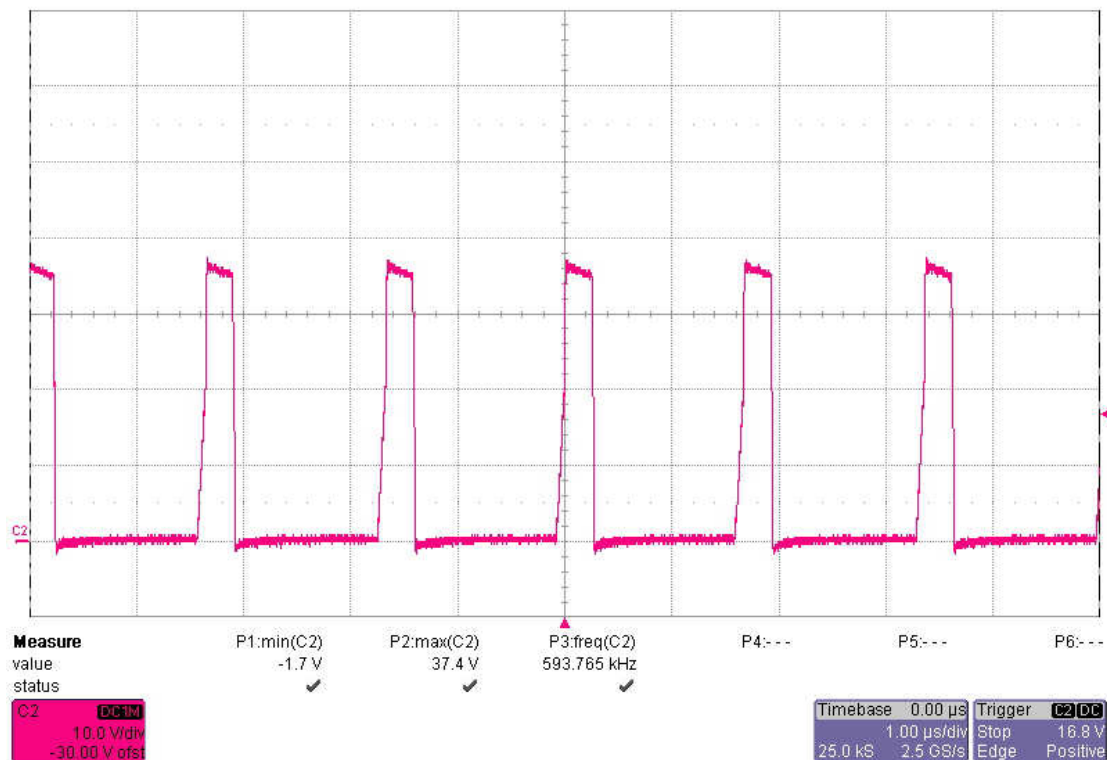


Figure 6

6 Thermal measurement

The thermal image (Figure 7) shows the circuit at an ambient temperature of 21 °C with an input voltage of 24V.

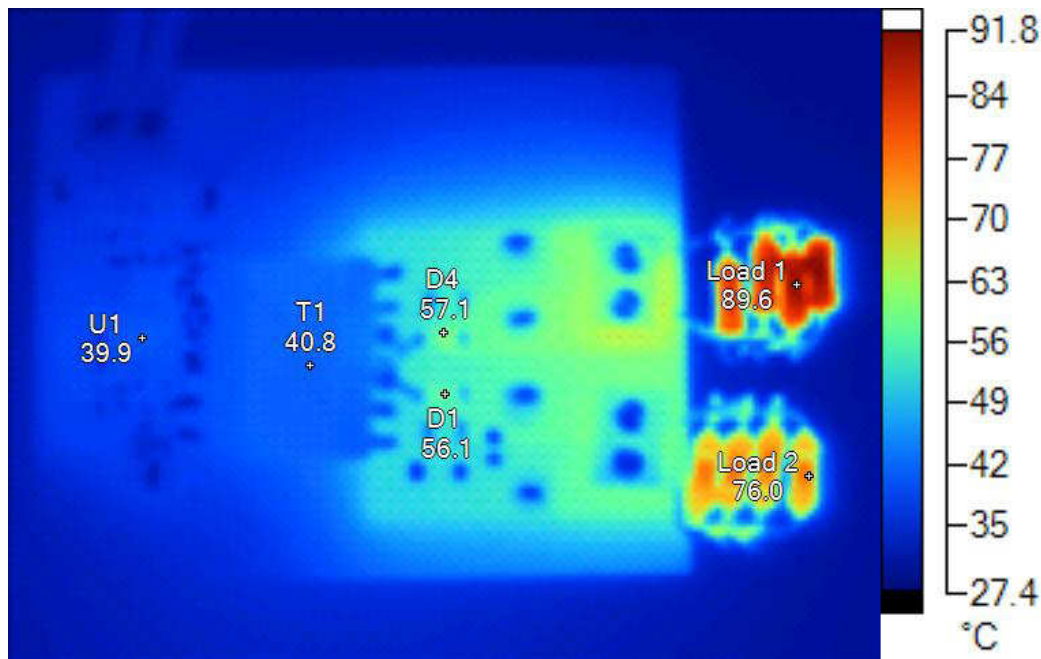


Figure 7

Markers

Label	Temperature	Emissivity	Background
U1	39.9 °C	0.95	21.0 °C
T1	40.8 °C	0.95	21.0 °C
D4	57.1 °C	0.95	21.0 °C
D1	56.1 °C	0.95	21.0 °C

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