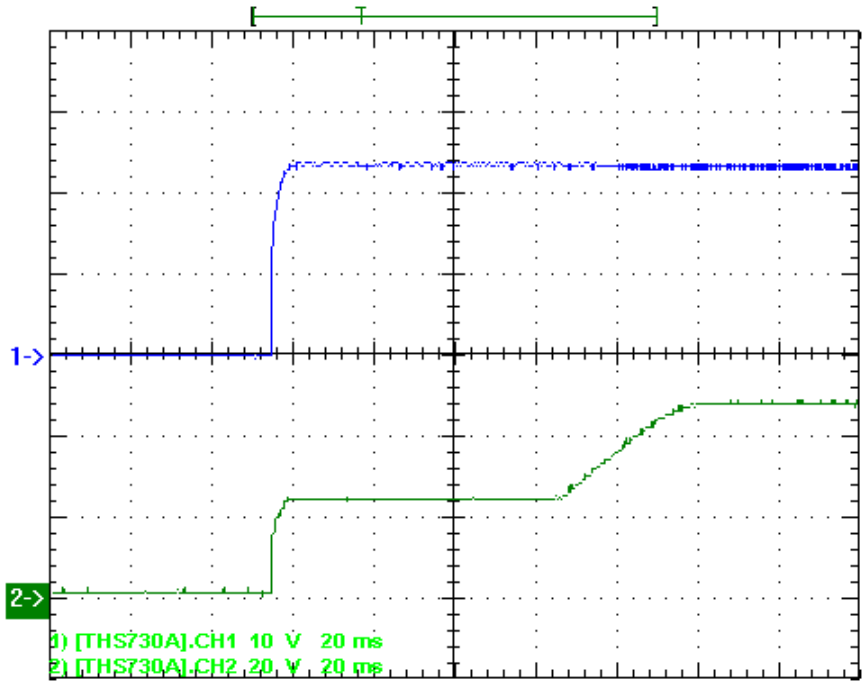
PMP7118RevA Test Results

Topology: Boost with TPS40210

1. Startup

The startup waveform is shown in the Figure 1. The input voltage was set to 24V, with 5A load at the output.



Ch1> input voltage 10V/div

Ch2=> output voltage 20V/div

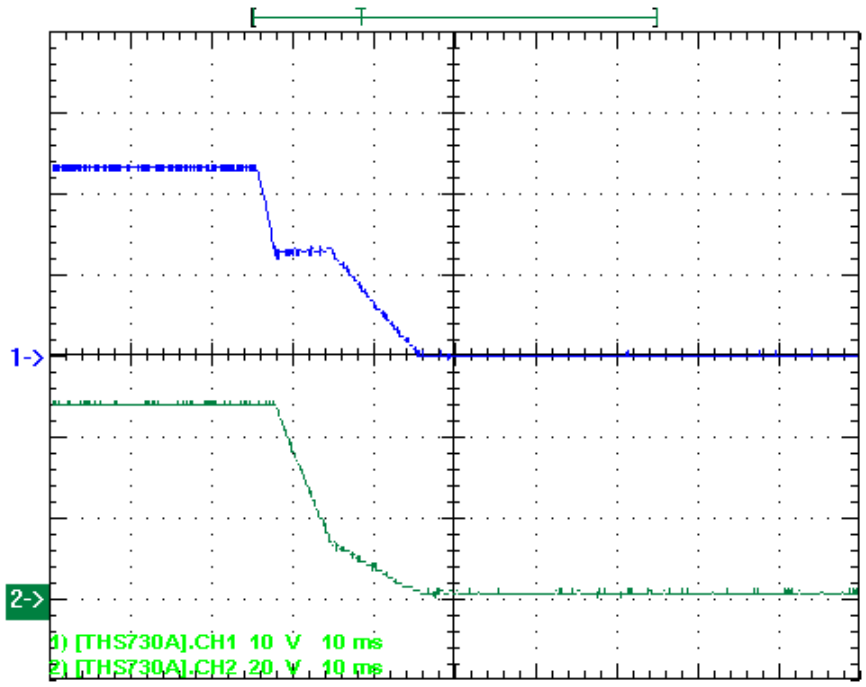
20ms/div

20MHz bandwidth

Figure 1

2. Shutdown

The shutdown waveform is shown in the Figure 2 to 24V input voltage. With 5A load applied at the output.



Ch1=> input voltage 10V/div

Ch2=> output voltage 20V/div

0ms/div

20MHz bandwidth

Figure 2

3. Efficiency

The efficiency is shown in the Figure 3 below. The input voltage was adjusted to 24V. The irregularity between 1A and 1.5 are related to the transition from discontinuous and continuous mode.

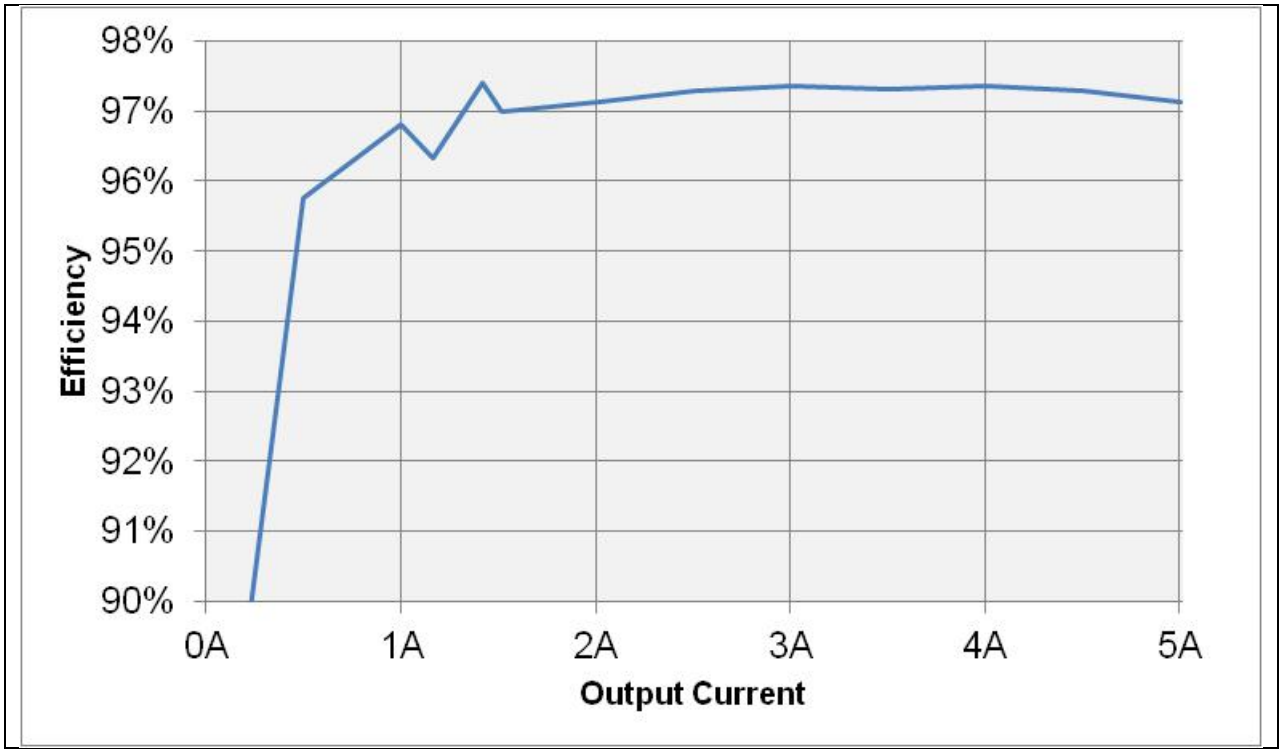


Figure 3

4. Load regulation

The load regulation for 24V input voltage is shown in Figure 4.

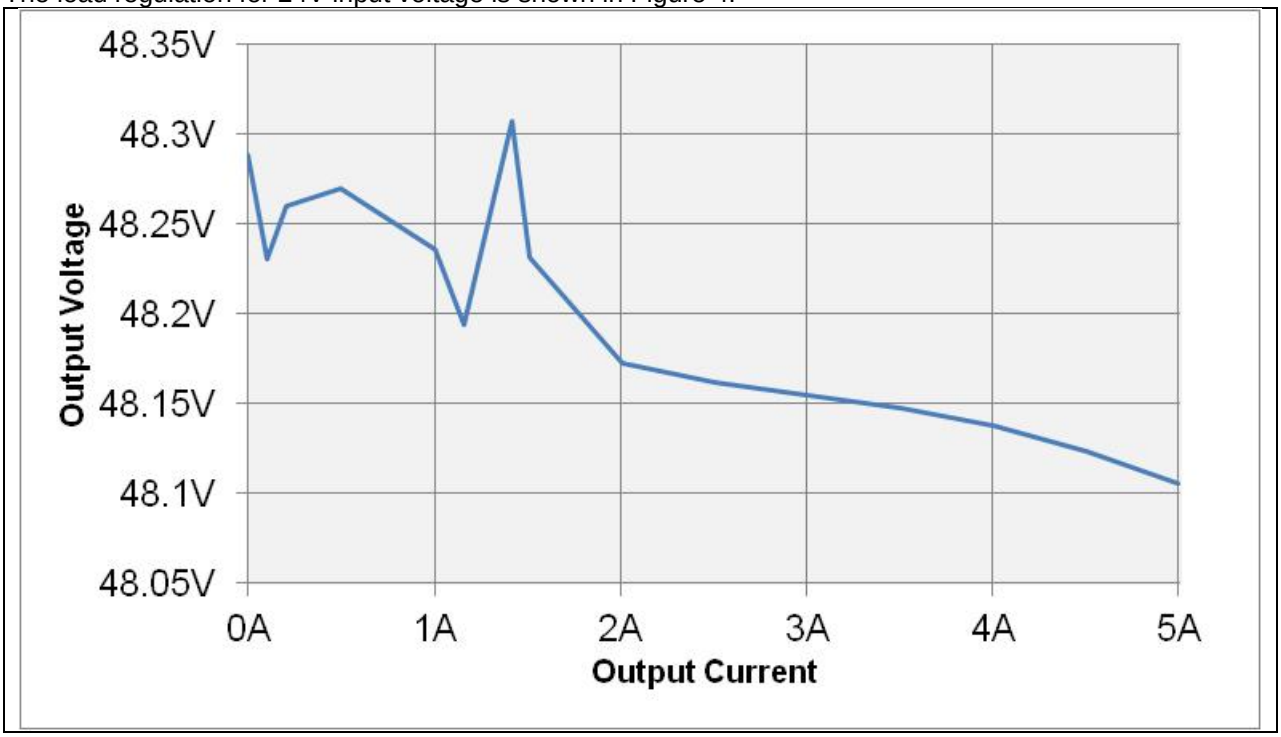


Figure 4

5. Control Loop Frequency Response

Figure 5 shows the loop response. 5A-load applied. The input voltage was set to 9.2V.

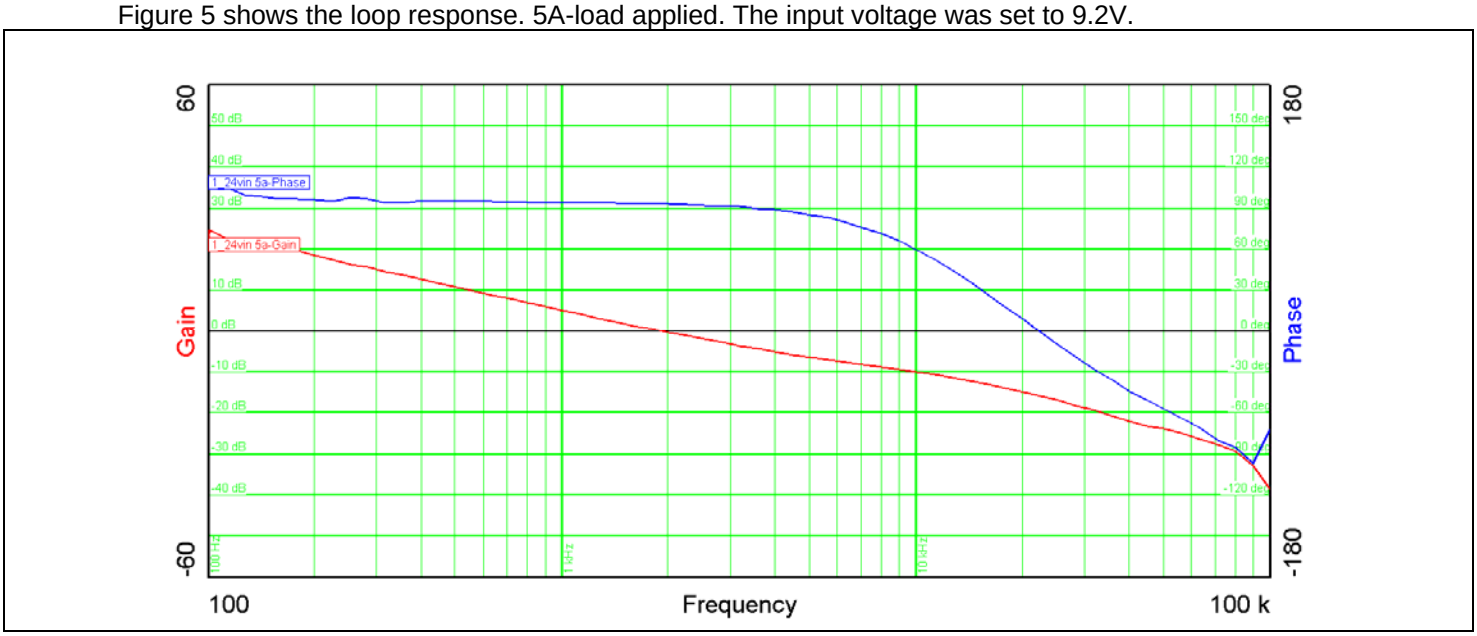


Figure 5

Table 1 summarizes the results from Figure 5, and **Error! Reference source not found.**

Vin	24V
Bandwidth (kHz)	1.9
Phase margin	93°
slope (20dB/decade)	-0.866
gain margin (dB)	-16
slope (20dB/decade)	-1.1
freq (kHz)	22

Table 1

6. Switch Node Waveform

With 5A load results in the waveforms shown in Figure 6 and Figure 7. 24V were applied to the input.

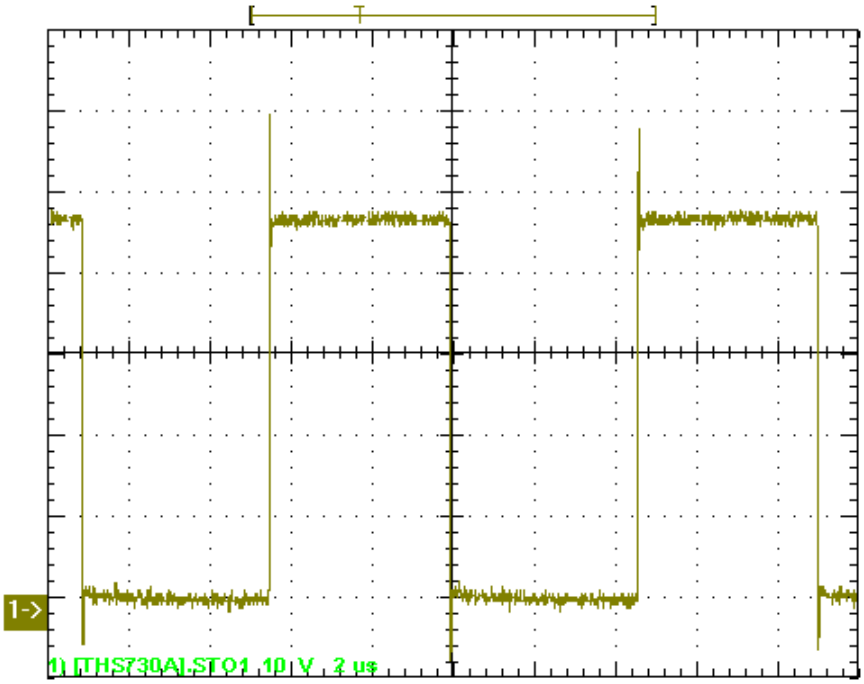
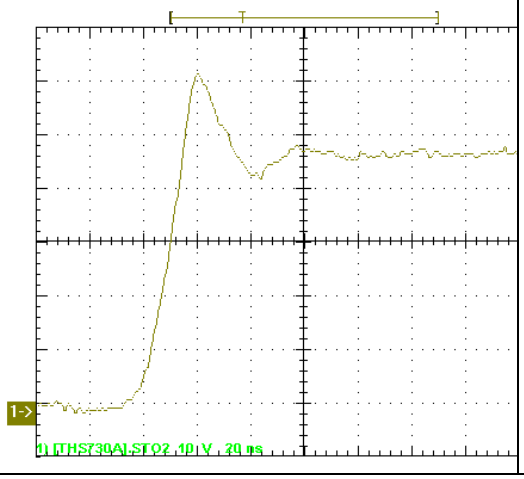


Figure 6

Ch1 => switchnode
10V/div

1µs/div

full bandwidth



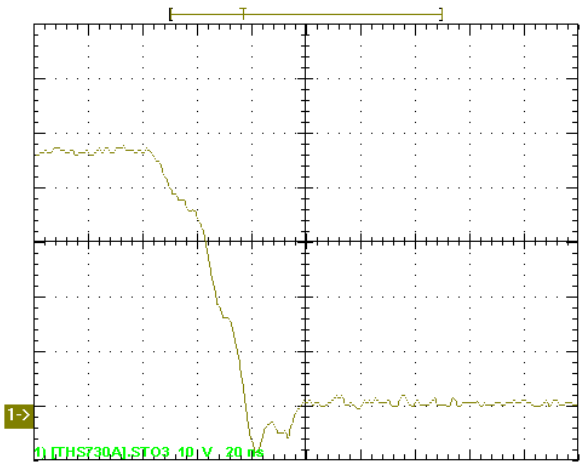


Figure 7

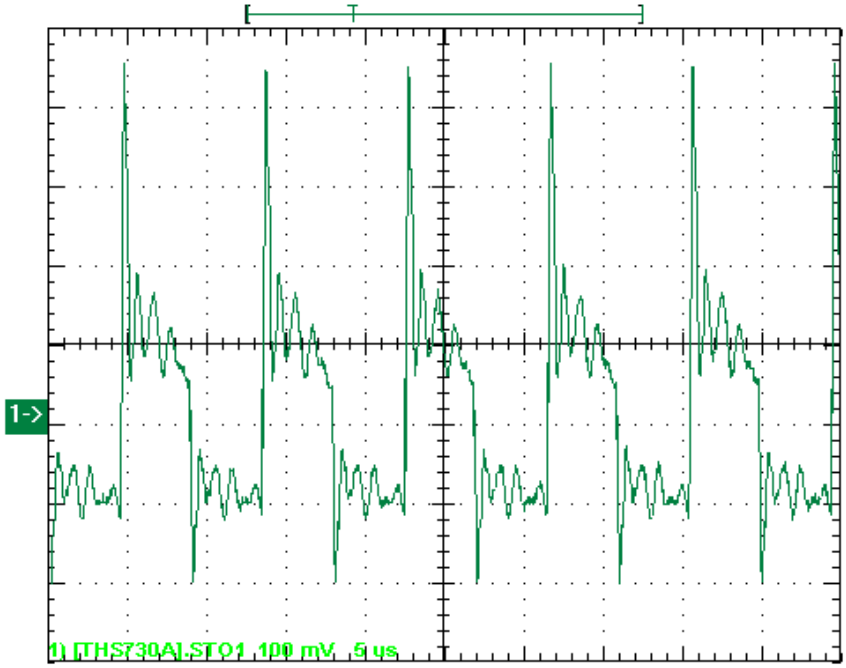
Ch1 => switchnode
5V/div

50ns/div

full bandwidth

7. Ripple Voltages

The output ripple voltage is displayed in Figure 8. The input voltage was set to 24V with output current 5A.



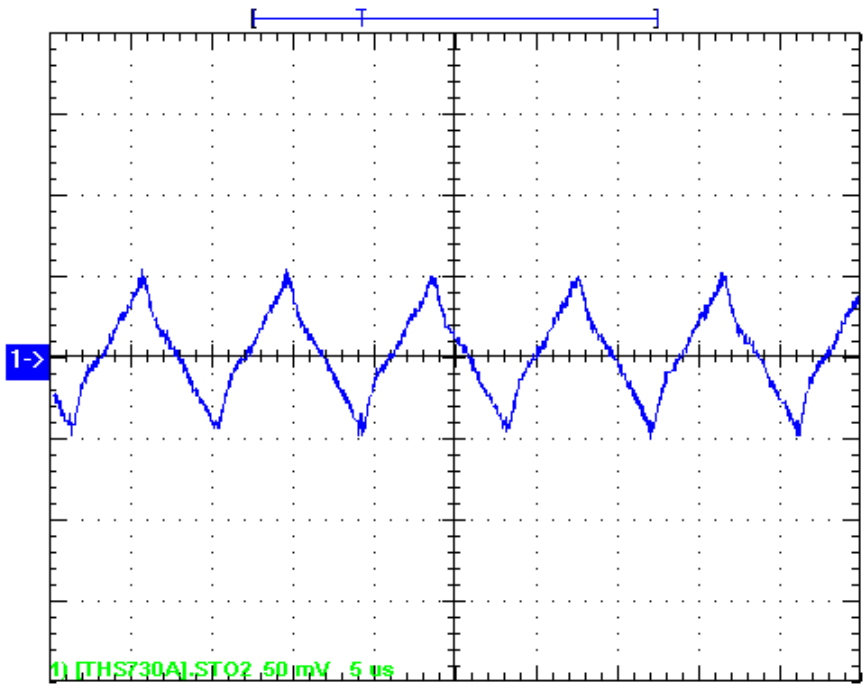
Ch1=> output voltage @ 24Vin

100mV/div

5µs/div
AC coupling
20MHz bandwidth

Figure 8

The input ripple voltage is displayed in. The input voltage was set to 24V with output current 5A.



Ch1=> input voltage @ 24Vin

50mV/div

5µs/div
AC coupling
20MHz bandwidth

Figure 9

8. Load Transients

A output current change from 2.5A to 5A (20Hz) results in following Figure 10.The input voltage was set to 24V.

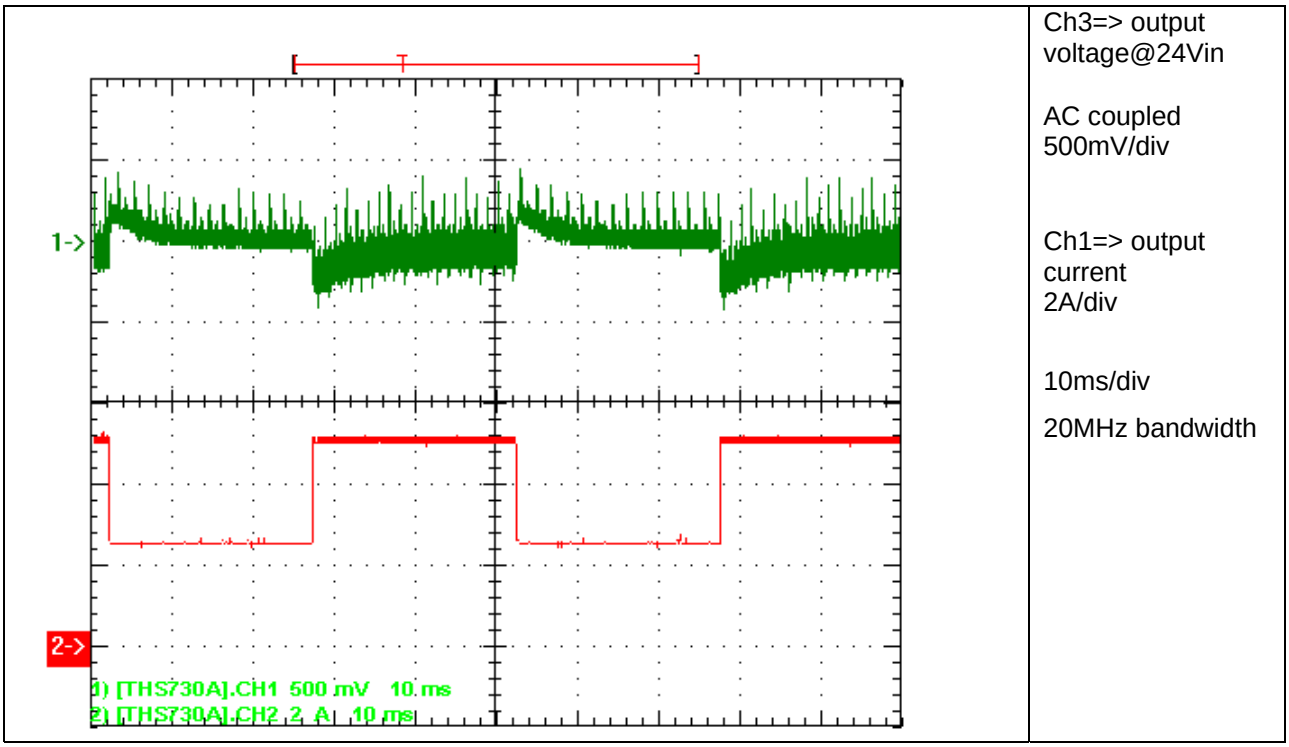


Figure 10

9. Thermal Image

Figure 11 shows the thermal image with 5A output current and 24V input voltage

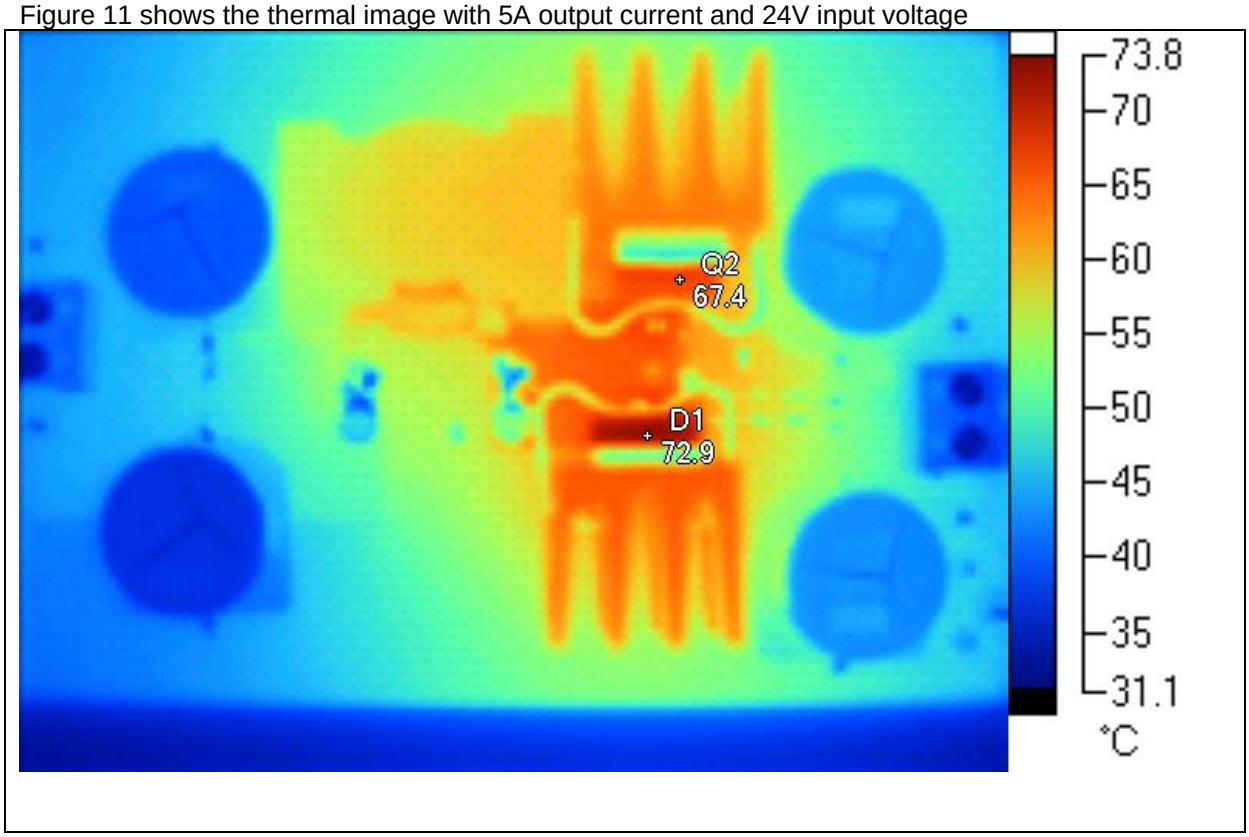


Figure 11

Name	Temperature
D1	72.9°C
Q2	67.4°C

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