PMP10852 Rev B Synchronous Buck Converter
Test Report
3/11/15

The tests performed were as follows:

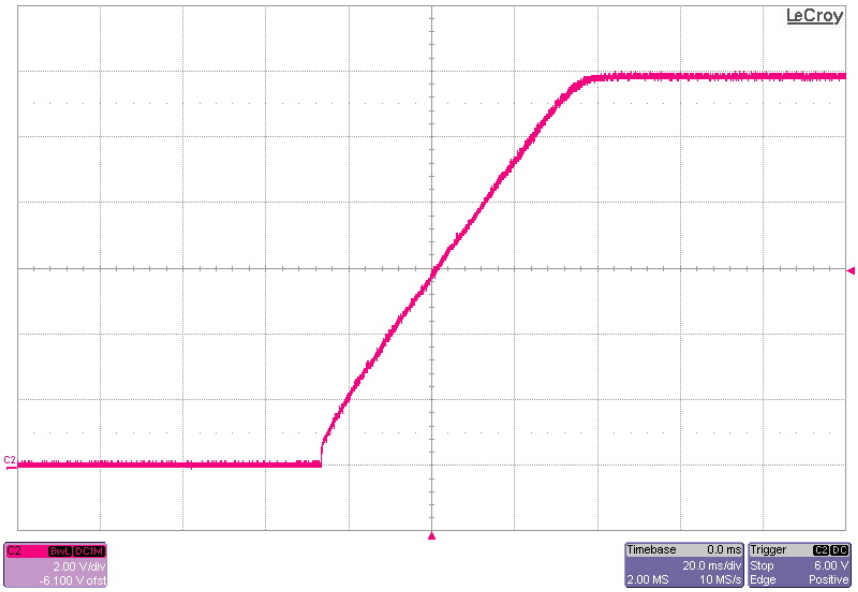
A. LM5117
   1. Turn-On (No Load)
   2. Turn-Off (10 mΩ Load)
   3. Switch Node (Full Load, Ringing, No Load)
   4. Output Voltage Ripple (No Load and Full Load)
   5. Transient Response (100mA to 2.4A Load Step)
   6. Efficiency
   7. Bode Plot
   8. Board Photos
   9. Thermal Images

PMP10852 Test Results Rev. B

1 Startup – (LM5117– No Load)

The photo below shows the startup waveform. The input voltage is 34V, the output is not loaded. The time-base is set to 20ms/Division.

Channel 2 – Pink: Output Voltage – (2V/Division)

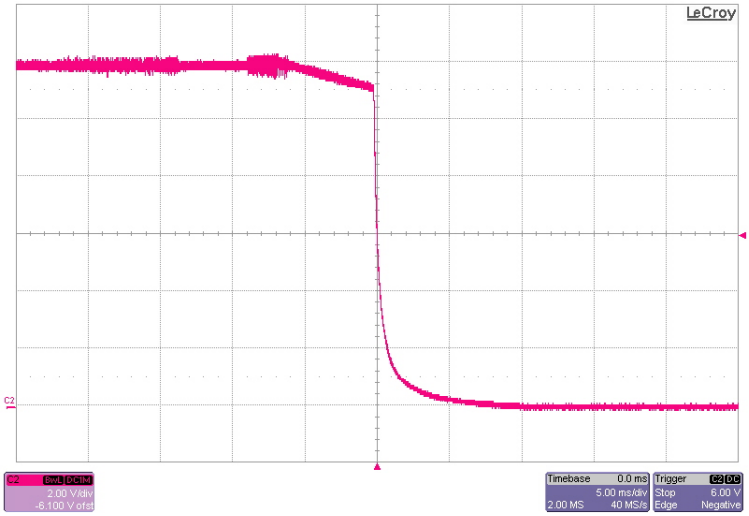


Turn on Waveform

2 Shutdown – (LM5117– 10 mΩ load)

The photo below shows the turn off waveform. The input voltage is 34V, the output is loaded with 10 mΩ load. The time-base is set to 5ms/Division.

Channel 2 – Pink: Output Voltage – (2V/Division)

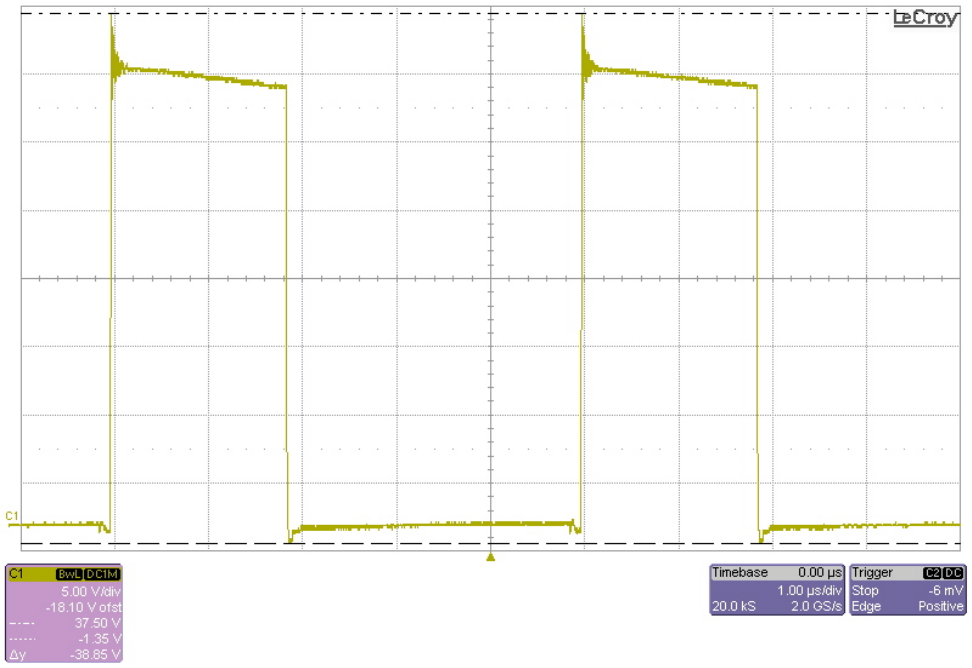


Turn off Waveform

3 Switch Node – (LM5117– 12V @ 15A)

The picture below shows the switching node waveform for the converter. The input voltage is 34V. The time-base is set to 1us/Division

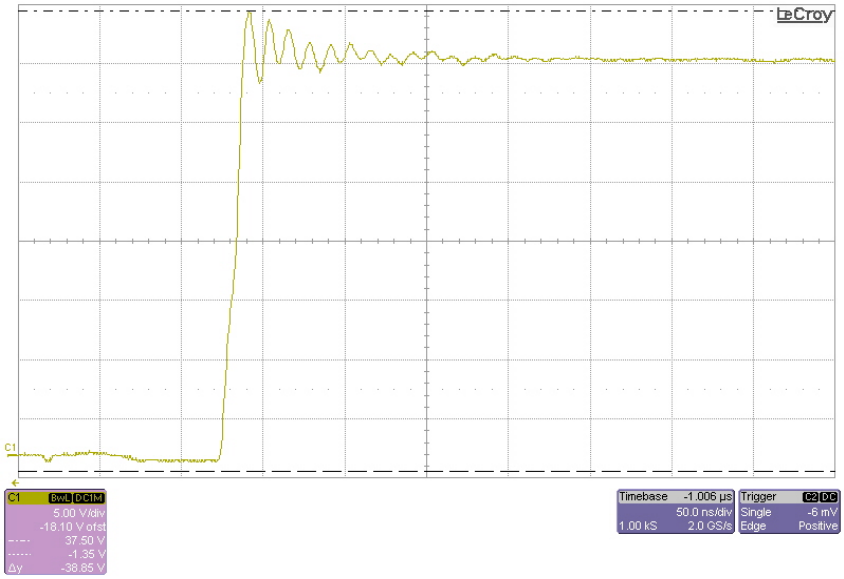
Channel 1 – Yellow: Switch Node – (5V/Division)



Switch Node Ringing: There is a total change of 38.85V

The picture below zooms in on the ringing on the rising edge of the switching node. The time-base is set to 50ns/Division

Channel 1 – Yellow: Switch Node – (5V/Division)



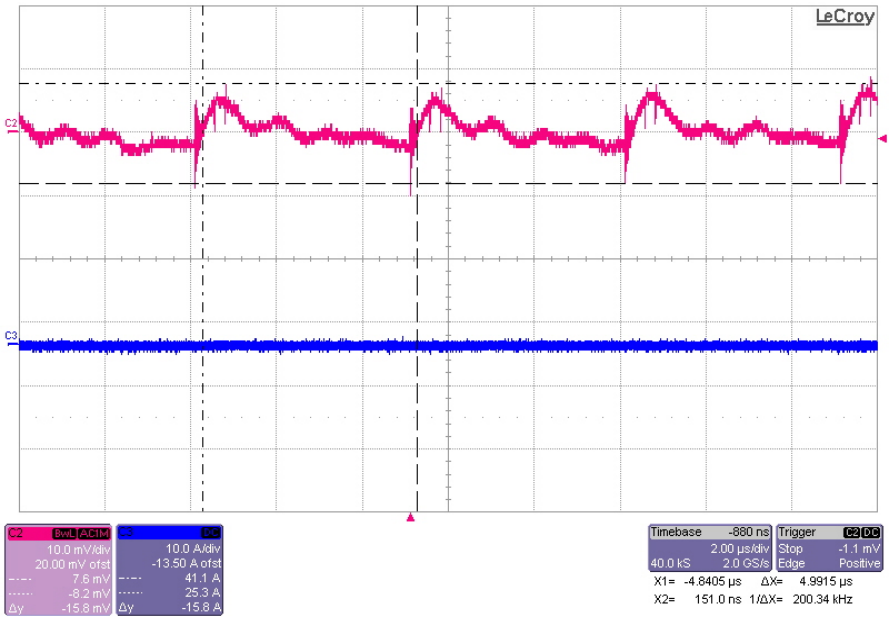
Switch Node Ringing: There is a total change of 38.85V

PMP10852 Test Results Rev. B

4 Output Voltage Ripple – (LM5117– 12V @ 15A)

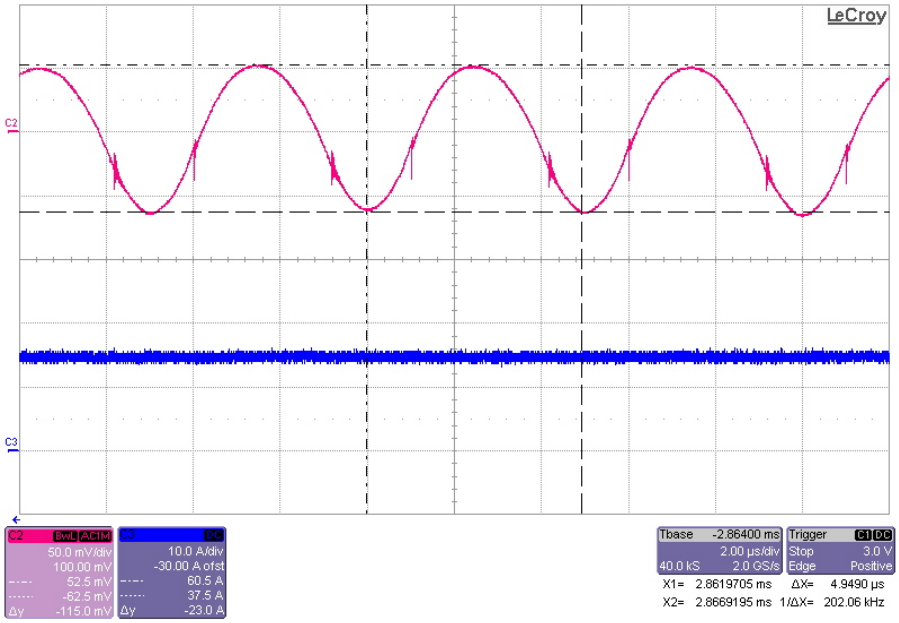
The output voltage ripple of the converter is shown in the figures below. The input voltage is 34V. The time-base is set to 2us/div. The first image is Vrip without a load, and the second image is Vrip with a 15A load.

Channel 2 – Pink: Output Voltage (10mV/div; AC Coupled)
Channel 3 – Blue: Output Load



No Load: Vrip = 15.8mV

Channel 2 – Pink: Output Voltage (50mV/div; AC Coupled)
Channel 3 – Blue: Output Load (10A/div)

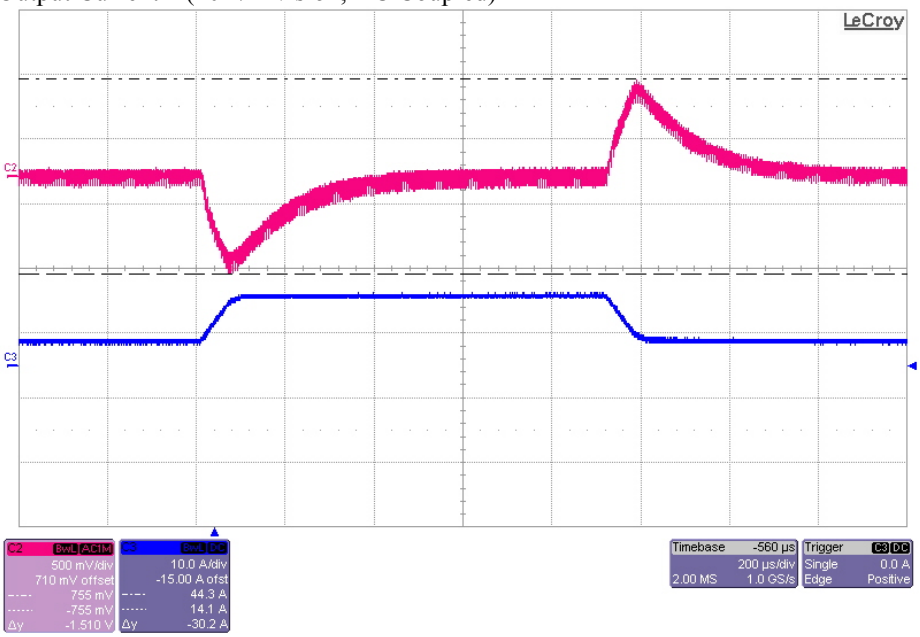


15A Load: Vrip = 115mV

5 Transient Response – (LM5117– 12V @ 15A)

The transient response of the converter is shown in the figures below. The input voltage is 34V. The load is stepped from 3.75A to 11.25A. The time-base is set to 200us/div.

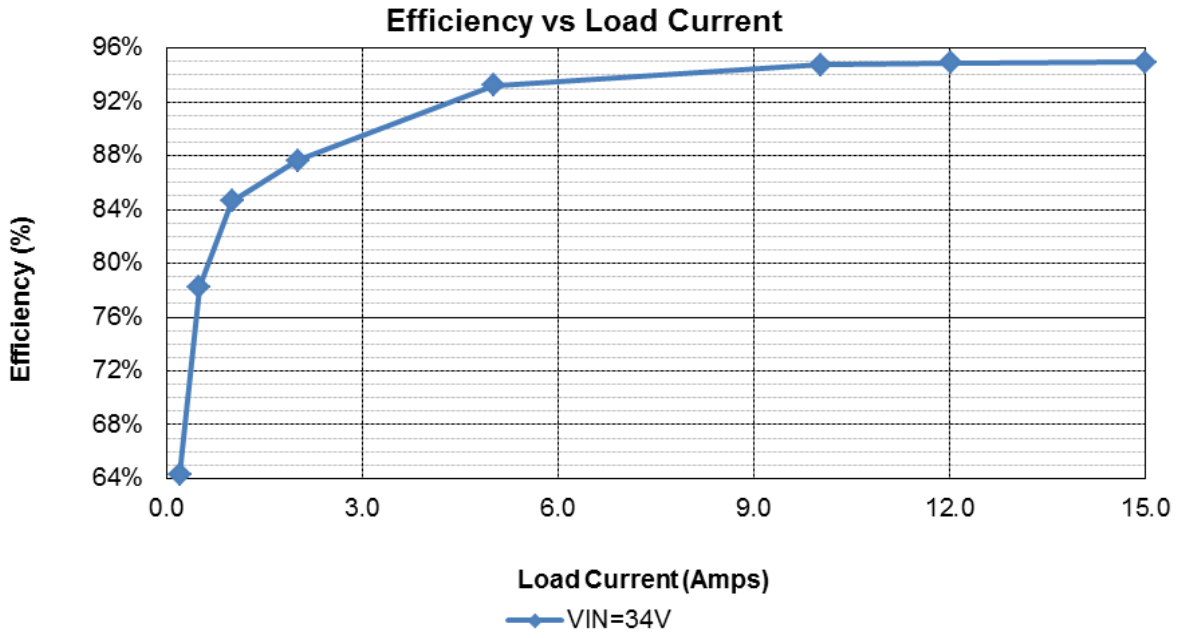
Channel 2 – Pink: Output Voltage : (500mV/Division; AC Coupled)
Channel 3 – Blue: Output Current – (10A/Division; DC Coupled)



Transient Response – There is a total change of 1.51V to the output voltage

6 Efficiency – (LM5117– 12V Output)

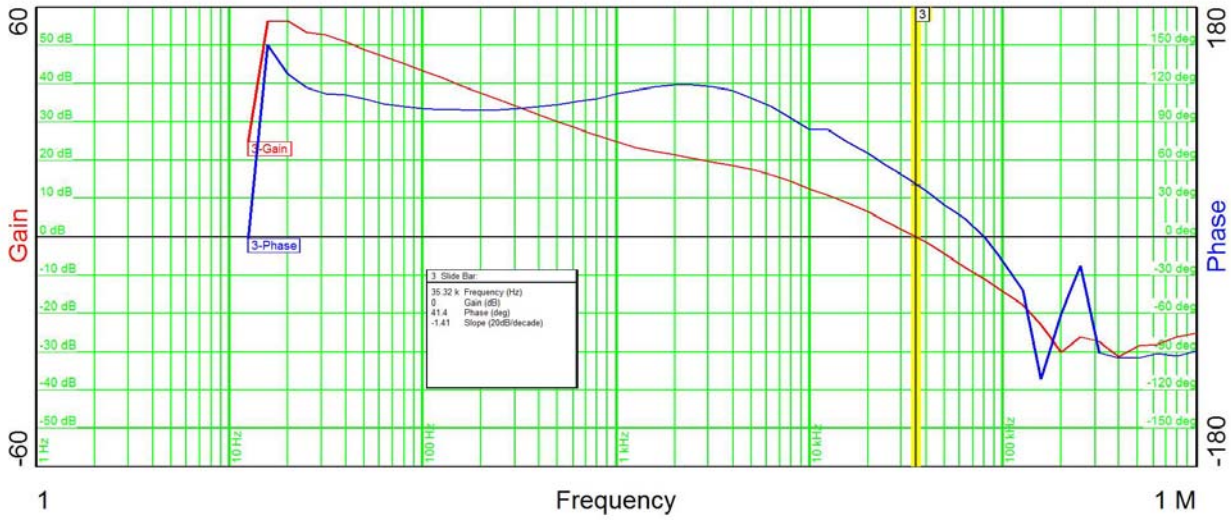
The efficiency of the board measured at the output of switching converter is shown in the picture below.



Efficiency Curve

7 Bode Plot – (LM5117– 12V @ 15A)

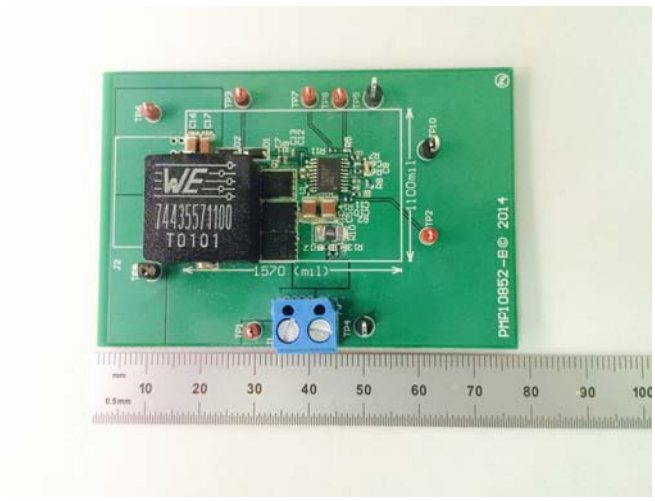
The Bode Plot of the converter is shown in the figure below. The input is 34V.

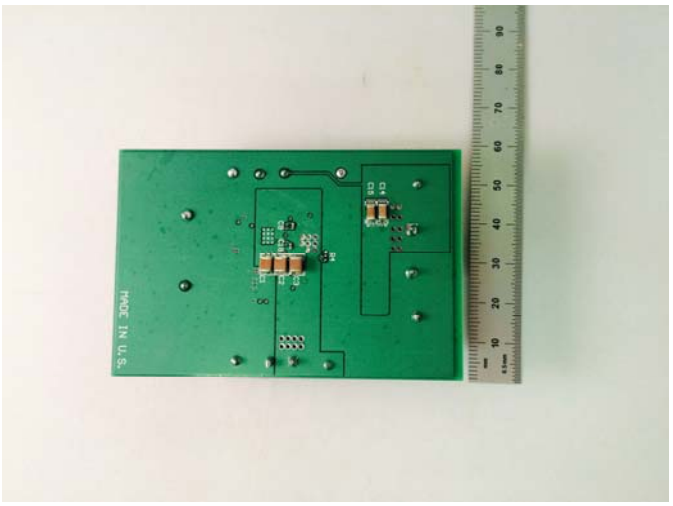


Bode Plot - There is 41.4 degrees of phase margin

8 Board Photos

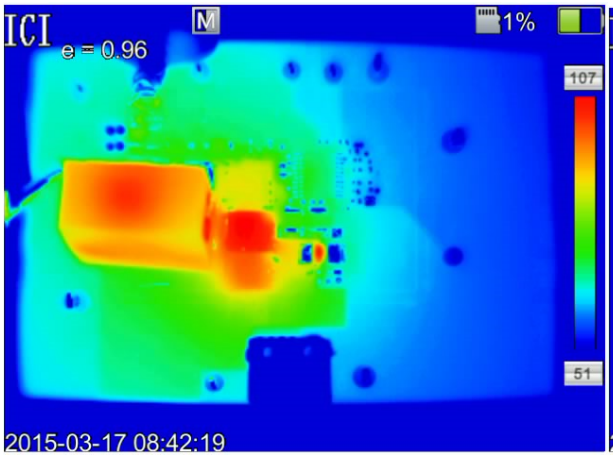
The images below show the PMP10852 Rev. B board which was used for testing.



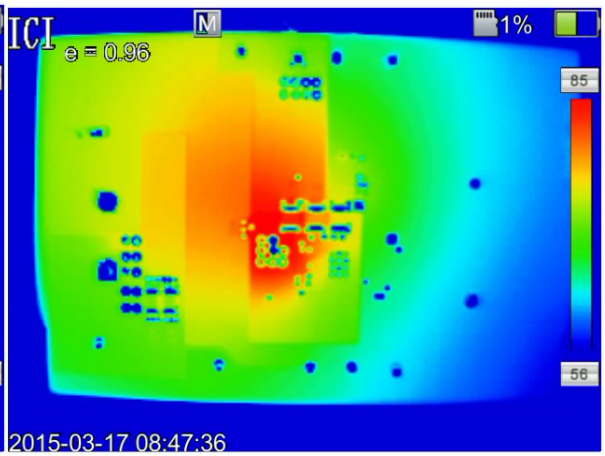


9 Thermal Images

The images below show the thermal performance of the design. It is important to note that thermal performance is directly proportional to power loss and board size. Different sized and shaped boards will perform differently. The input voltage is 34V, the output current is 15A.



Top Side



Bottom Side

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