



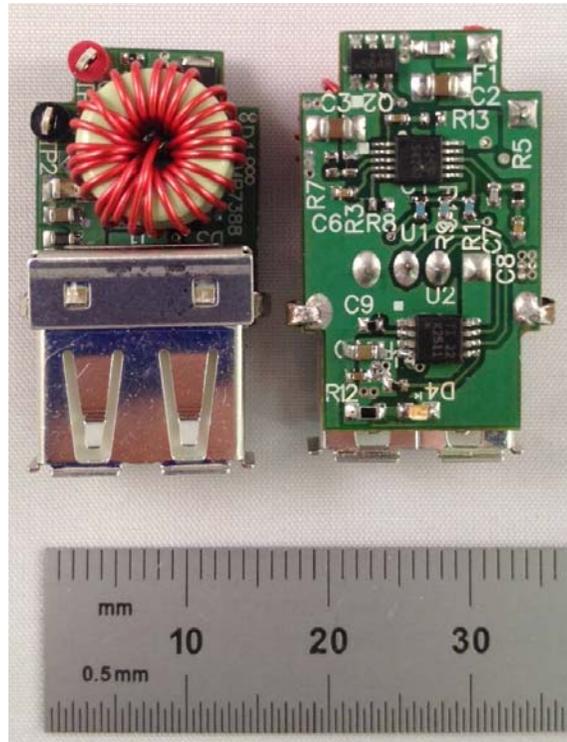
TPS54240 + TPS2511 – 5V@2.1A
Universal USB Car Charger
PMP7388_REVA
3/20/12

The tests performed were as follows:

- A. TPS54240 – 5V@2.1A
 - 1. Board Photo
 - 2. Thermal Image
 - 3. Turn-On (No Load)
 - 4. Output Voltage Ripple
 - 5. Transient Response
 - 6. Switching Behavior
 - 7. Efficiency
 - 8. Load Regulation
 - 9. Loop Response

1 Board Photo

The photo below shows the front and back of the PMP7388 board.



2 Thermal Image

The thermal images of the board are taken with 2A load. The input voltage is 12V.



3 Turn-On – (TPS54240 : 5V@0A)

The photo below shows the startup waveforms. The output is not loaded. The timebase is set to 2ms/Division. The input voltage is 12V.

Channel 1 – Yellow : 5V Output Before the USB Switch – (2V/Division)

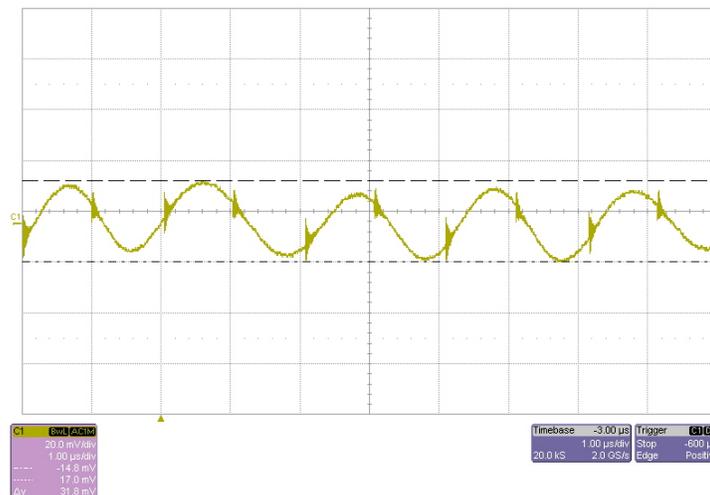
Channel 2 – Pink : Output Voltage After the USB Switch – (2V/Division)



4 Output Voltage Ripple – (TPS54240 : 5V@2.1A)

The photo below shows the output voltage ripple. The input voltage is 12V. The timebase is set to 1us/division.

Channel 1 – Yellow : Output Voltage Ripple – (20mV/Division; AC Coupled)



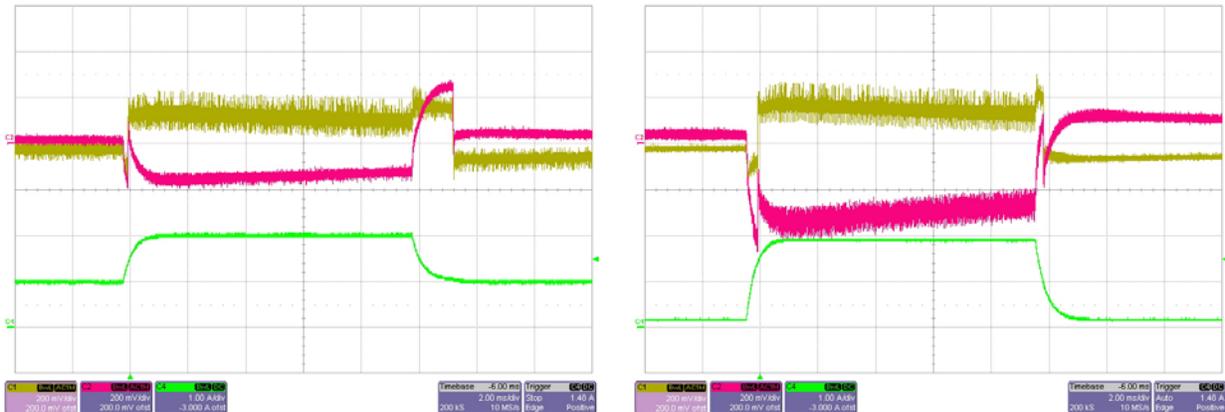
5 Transient Response – (TPS54240 : 5V@2.1A)

The transient response of the converter is shown in the figure below. The input voltage is 12V. The current is pulsed from 1A to 2A and 0.1A to 2A. The timebase is set to 2ms/Division. The cable droop compensation is set to increase the output voltage 200mV at ~1.4A

Channel 1 – Yellow : Output Voltage Before the USB Switch – (200mV/Division; AC Coupled)

Channel 2 – Pink : Output Voltage After the USB Switch – (200mV/Division; AC Coupled)

Channel 4 – Green : Output Current – (1A/Division)



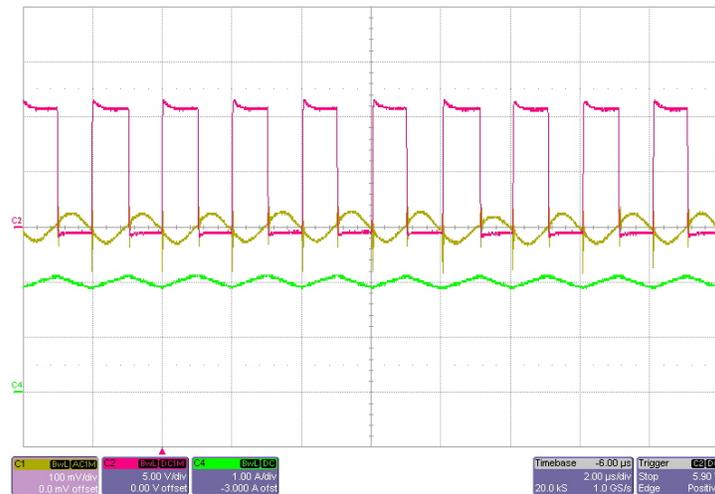
6 Switching Behavior – (TPS54240 : 5V@2.1A)

The switching behavior of the converter is shown in the figure below. The input voltage is set to 12V, the output current is set to 2A. The timebase is set to 2us/Division.

Channel 1 – Yellow : Output Voltage Before the USB Switch – (100mV/Division; AC Coupled)

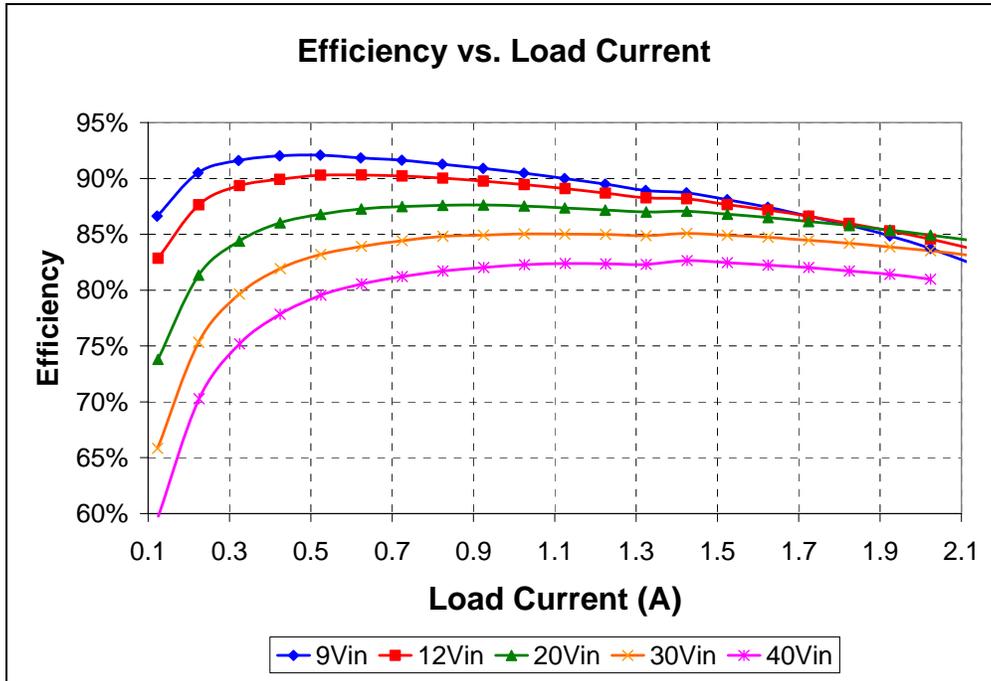
Channel 2 – Pink : Switch Node – (5V/Division)

Channel 4 – Green : Inductor Ripple Current – (1A/Division)

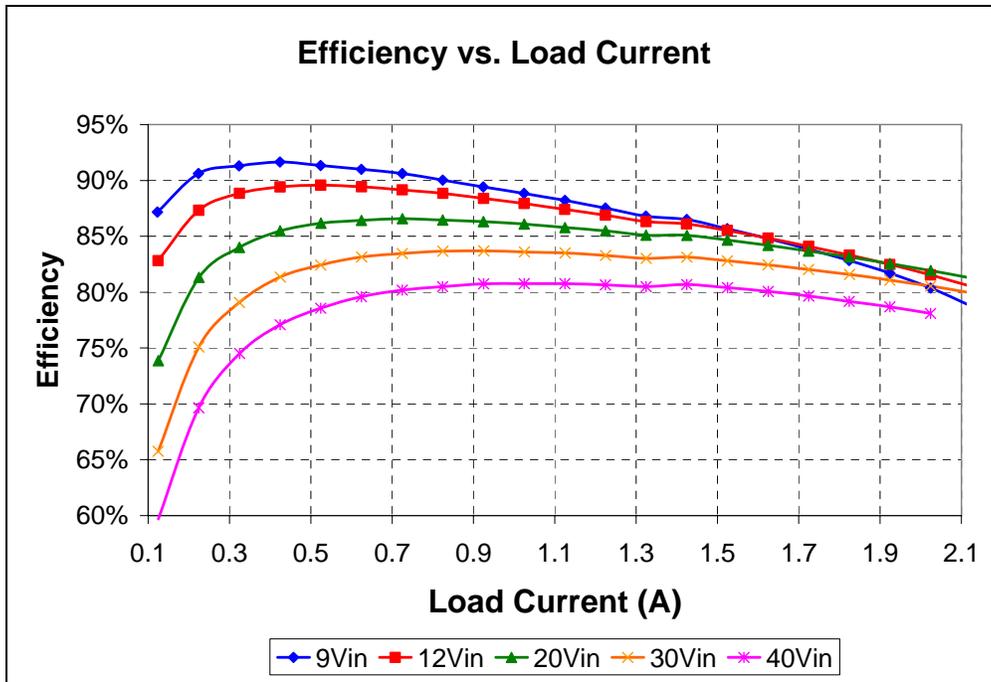


7 Efficiency – (TPS54240 : 5V@2.1A)

The efficiency of the converter is shown in the figures below.



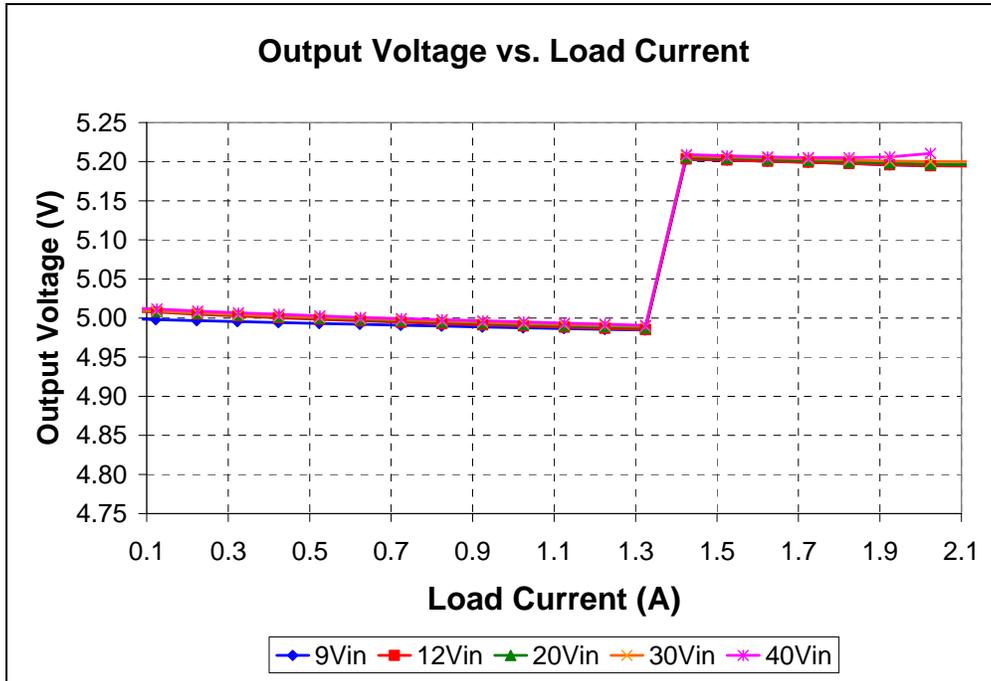
Efficiency Before the USB Switch



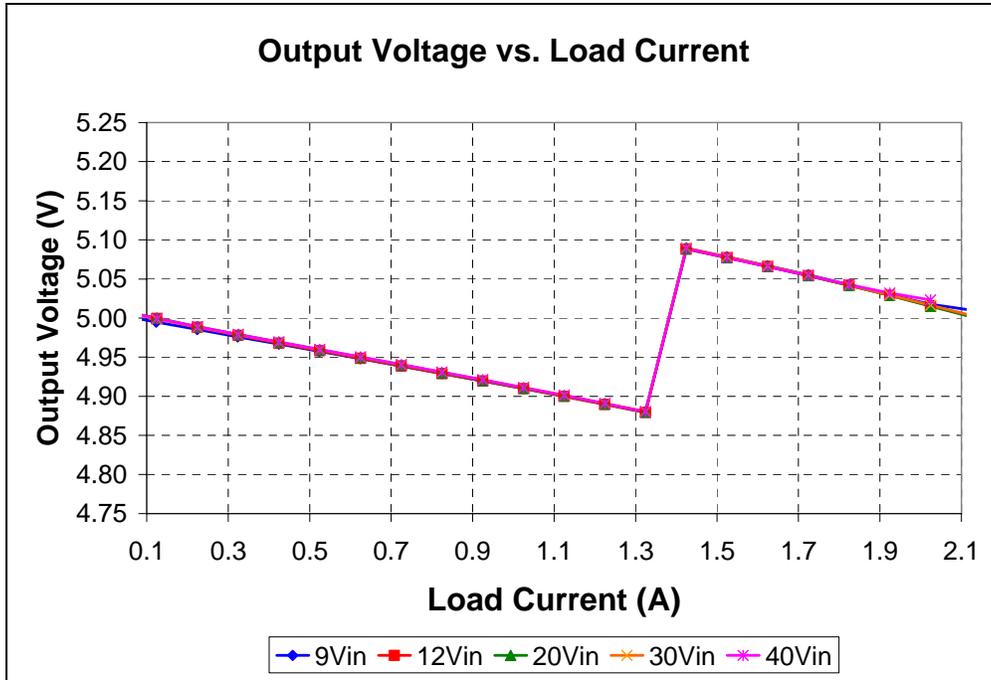
Efficiency After the USB Switch

8 Load Regulation – (TPS54240 : 5V@2.1A)

The load regulation of the converter is shown in the figure below.



Output Load Regulation Before the USB Switch



Output Load Regulation After the USB Switch

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