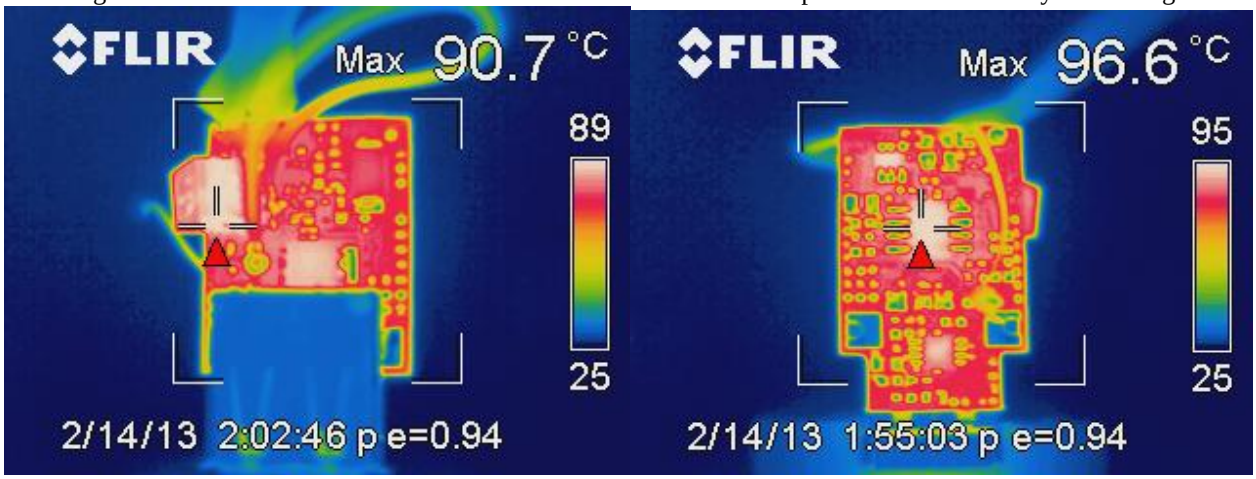
SAT0028

The tests performed were as follows:

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

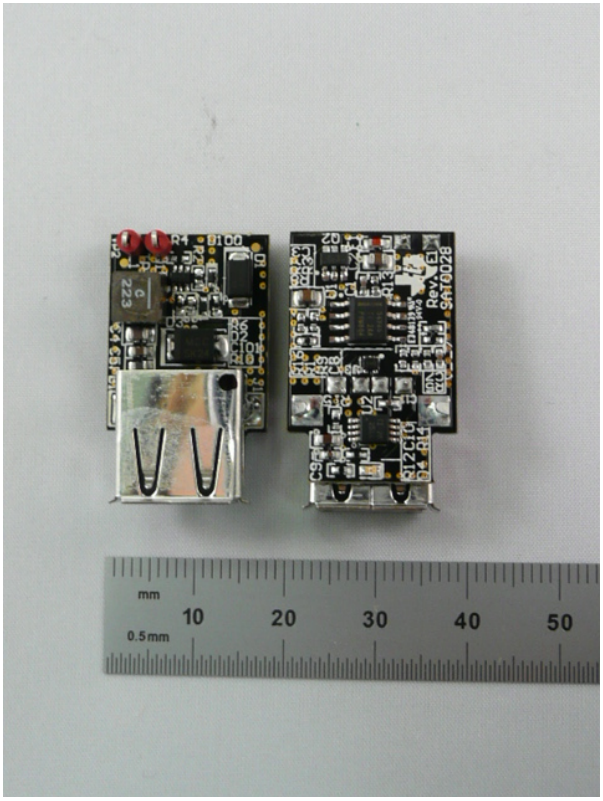
1 Thermal Image

The Image below is the front and back of the board measured once the temperature was minimally fluctuating.



2 Board Photo

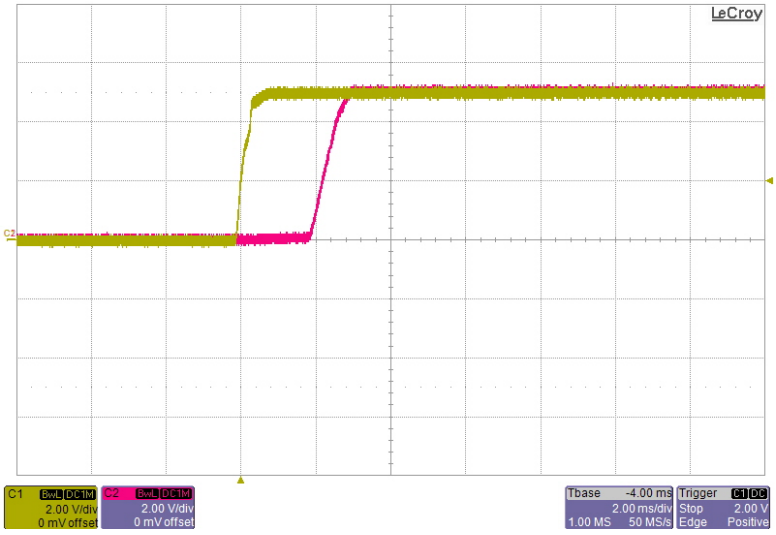
The photo below shows the front and back of the board.



3 Turn-On – (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.

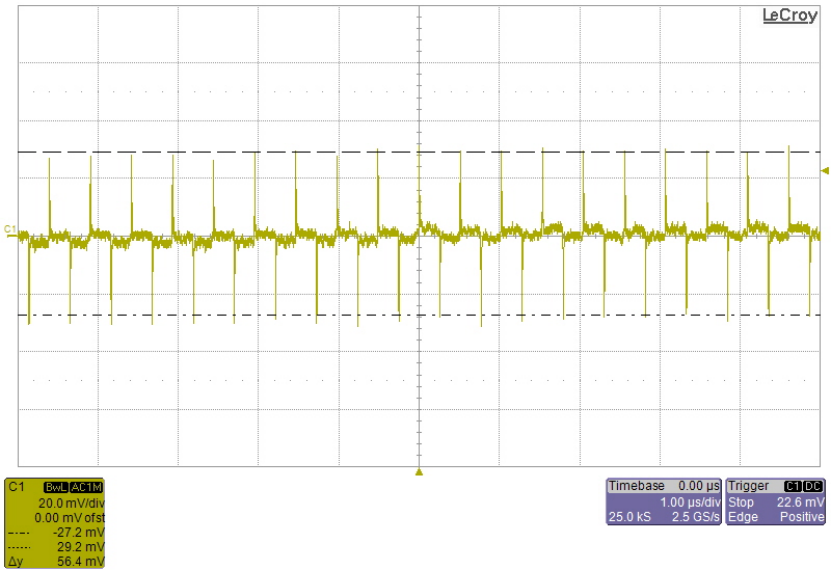
Channel 1 – Yellow : 5V Output Before the USB Switch – (2V/Division)
Channel 2 – Pink : Output Voltage After the USB Switch – (2V/Division)



4 Output Voltage Ripple – (TPS54340 : 5V@2.1A)

The photo below shows the output voltage ripple. The input voltage is 12V. The time base is set to 1us/division. A tip and ring across C5 was used to measure ripple

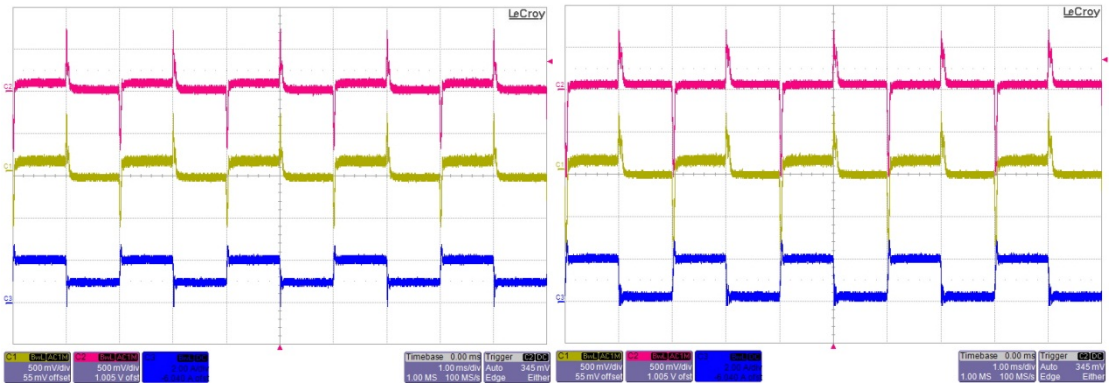
Channel 1 – Yellow : Output Voltage Ripple – (20mV/Division; AC Coupled)



5 Transient Response – (TPS54340 : 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 2.1A and 0.25A to 2.1A. The timebase is set to 2ms/Division.

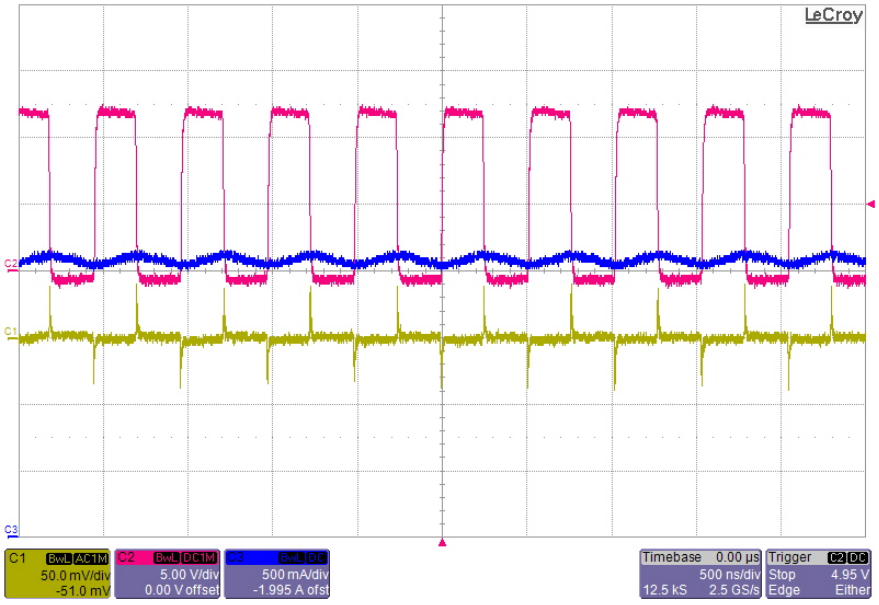
Channel 1 – Yellow : Output Voltage Before the USB Switch – (500mV/Division; AC Coupled)
Channel 2 – Pink : Output Voltage After the USB Switch – (500mV/Division; AC Coupled)
Channel 3 – Blue : Output Current – (2A/Division)



6 Switching Behavior – (TPS54340 : 5V@2.1A)

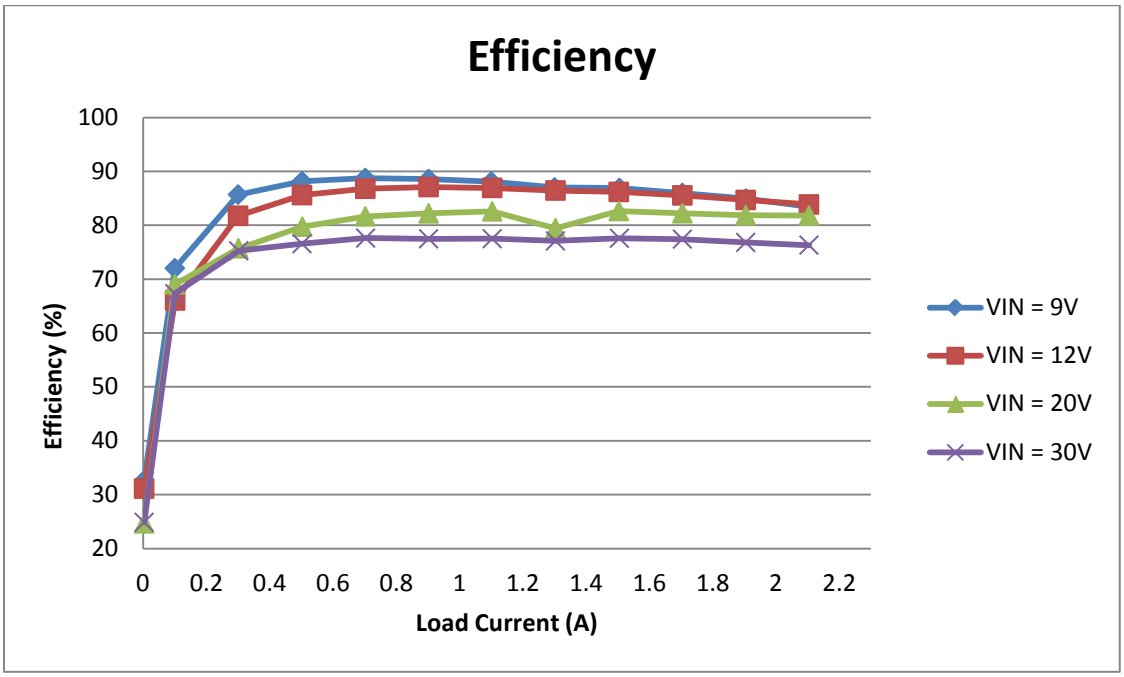
The switching behavior of the converter is shown in the figure below. The input voltage is set to 12V, the output current is set to 2.1A. The timebase is set to 500ns/Divison.

Channel 1 – Yellow : Output Voltage Before the USB Switch – (50mV/Division; AC Coupled)
Channel 2 – Pink : Switch Node – (5V/Division)
Channel 3 – Blue : Inductor Ripple Current – (500mA/Division)

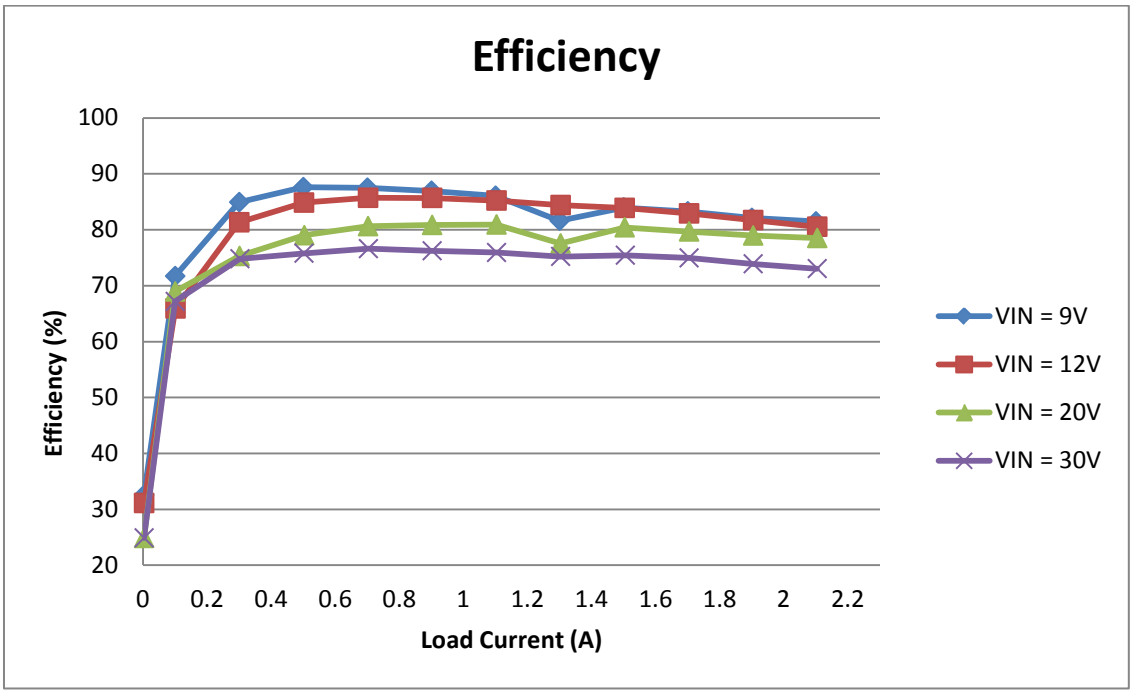


7 Efficiency – (TPS54340 : 5V@2.1A)

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



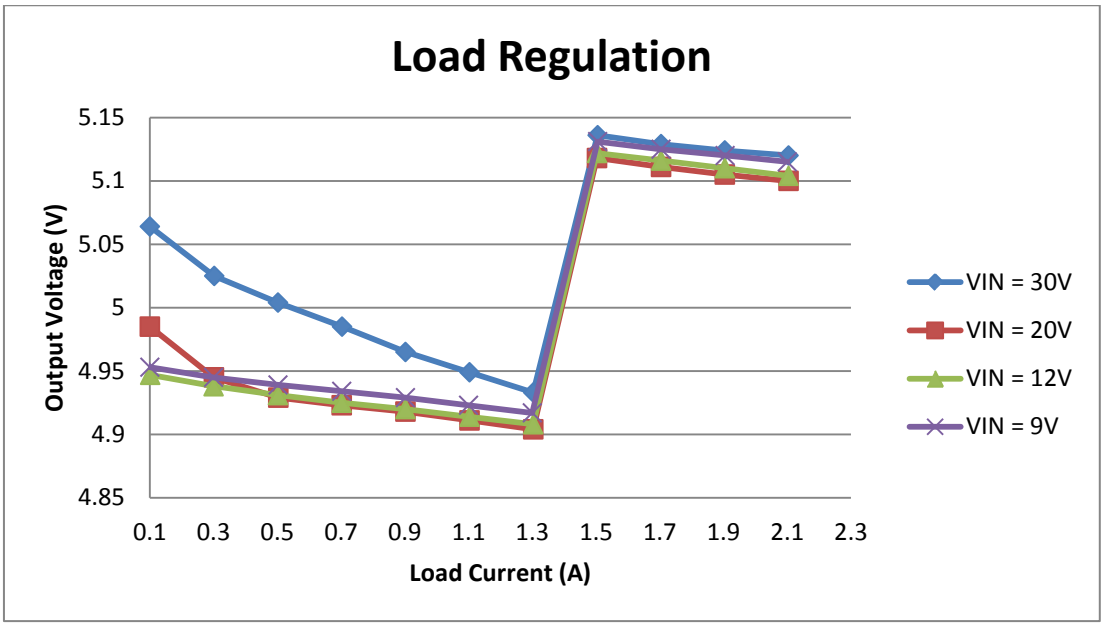
Efficiency Before the USB Switch



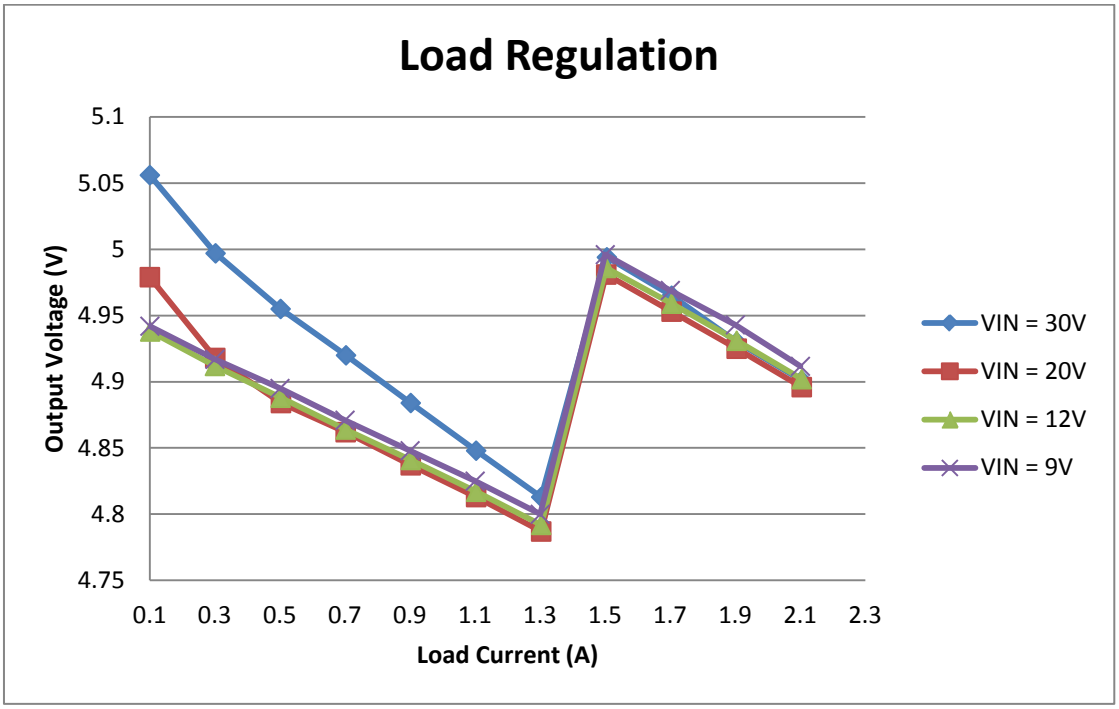
Efficiency After the USB Switch

8 Load Regulation – (TPS54340 : 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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