PMP10778 TPS53819A Test Report

12/3/2014

The following test report is for the PMP10884 TPS53819A:

VIN = 12V
VOUT = 1V @ 20A

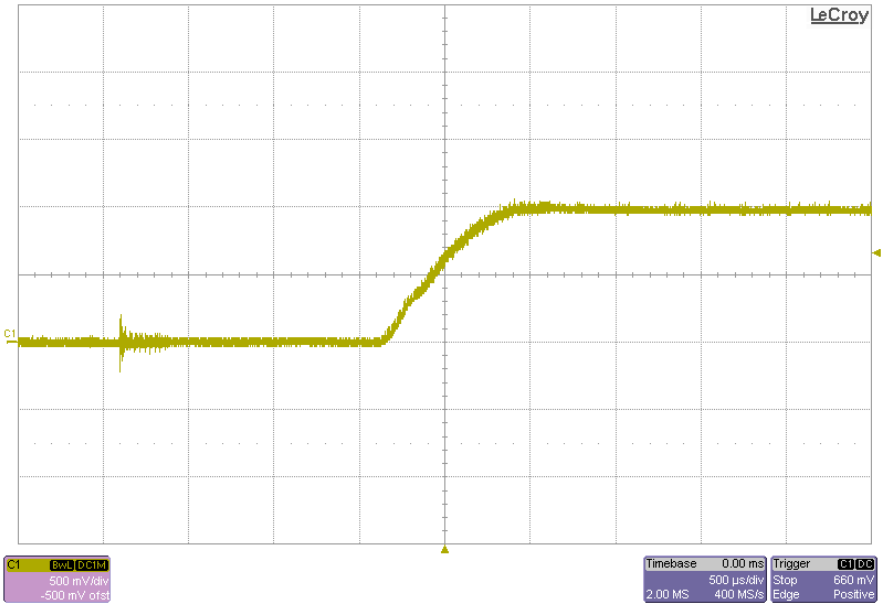
The tests performed were as follows:

1. Startup (No load)
2. Shutdown (10Ω Load)
3. Output Voltage Ripple
4. Load Transient
5. Load Regulation
6. Efficiency
7. Switching Waveform
8. PMBus Voltage Scaling
9. Thermal Profile
10. EVM Photo

1 Startup

The picture below shows the startup waveform. The input voltage is 12V, the output is not loaded.

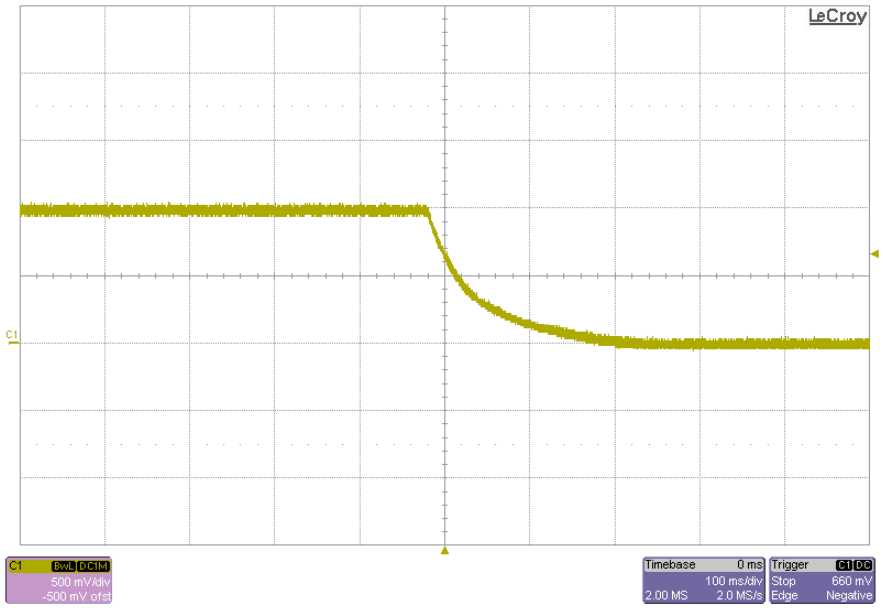
Channel 1 (yellow): VOUT (500mV/div)



2 Shutdown

The picture below shows the startup waveform. The input voltage is 12V, the output is loaded to a 10Ω load.

Channel 1 (yellow): VOUT (500mV/div)

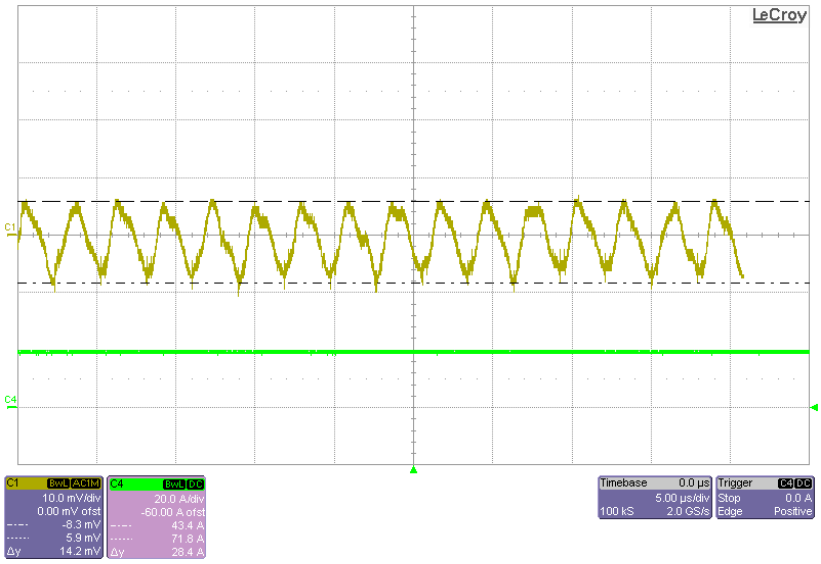


3 Output Voltage Ripple

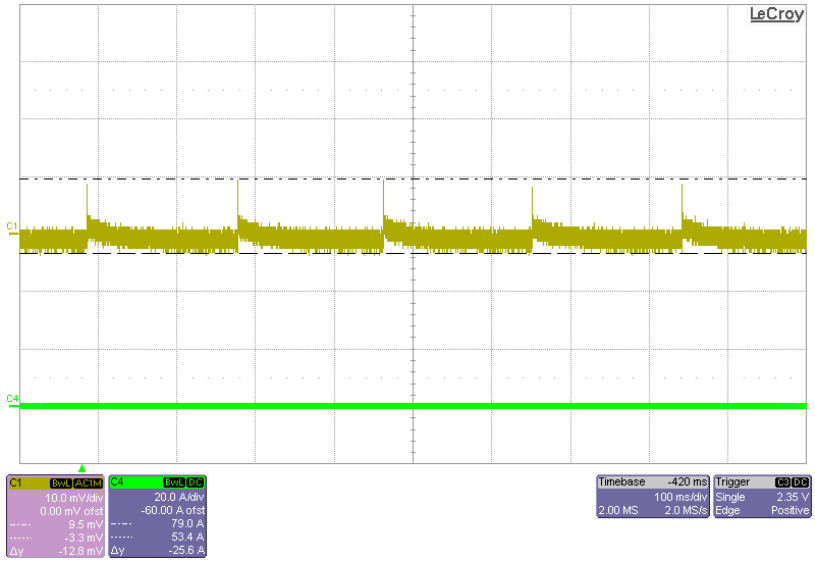
The output voltage ripple for VOUT is shown in the figure below. The input is 12V. The output is fully loaded to 20A. Ripple is < ±8mV

Channel 1 (yellow): VOUT (10mV/div)
Channel 4 (green): Output Current (20A/div)

Full Load:



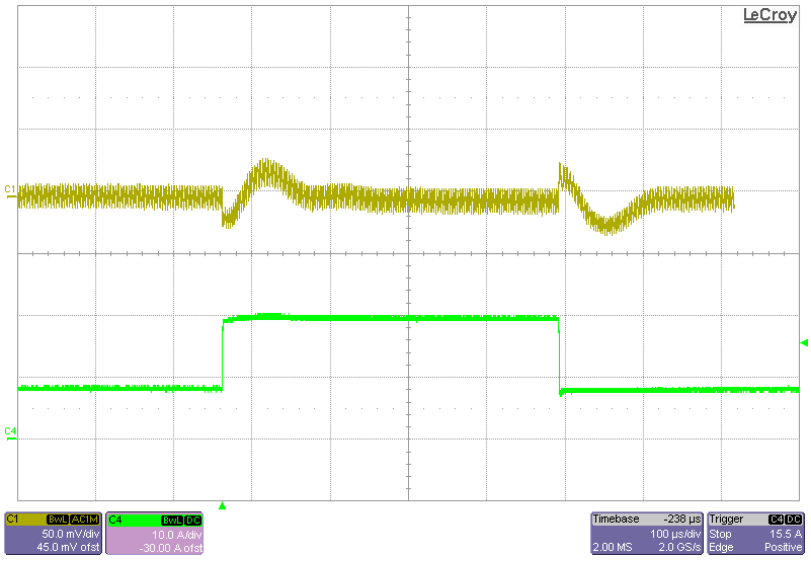
No Load:



4 Load Transient

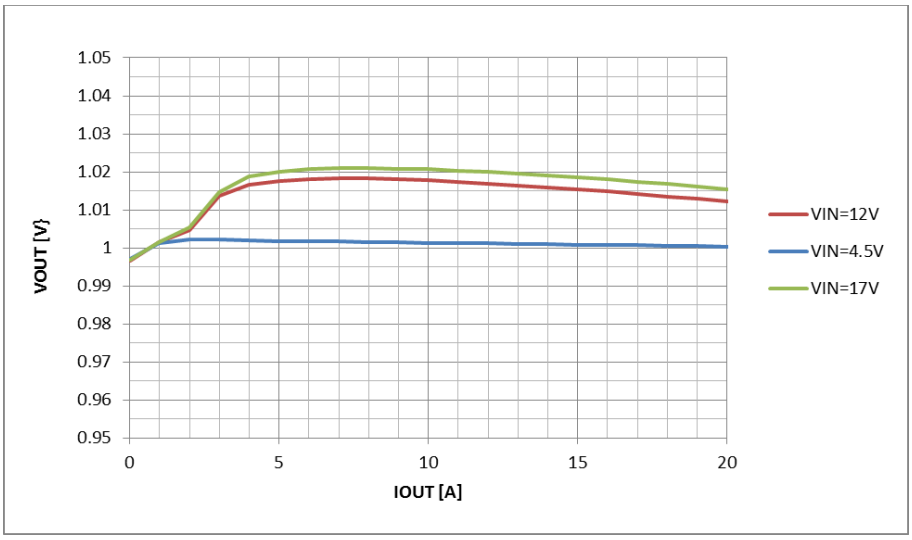
The transient response is shown in the figure below. The input voltage is 12V. The current is pulsed from 8A to 20A at 20A/us rise load slew. Output voltage change is < ±30mV.

Channel 1 (yellow): VOUT output (50mV/div)
Channel 4 (green): Output Current (10A/div)



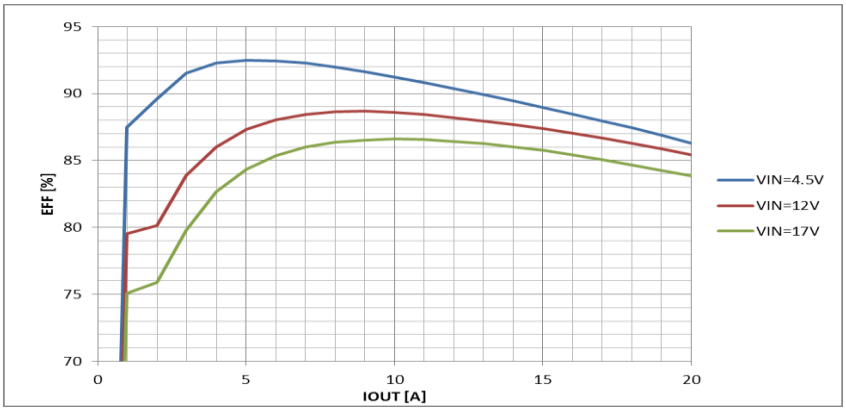
5 Load Regulation

A plot of the load regulation at VOUT is shown in the figure below. The load regulation is plotted vs load current for VIN=4.5, 12, & 17V.



6 Efficiency

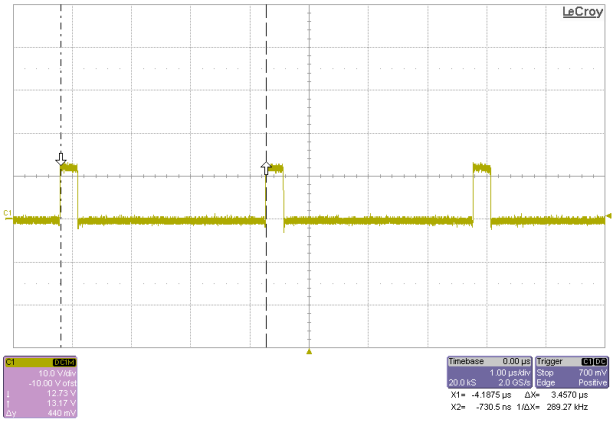
The efficiency of the converter is shown in the pictures below at VIN=4.5, 12, & 17V.



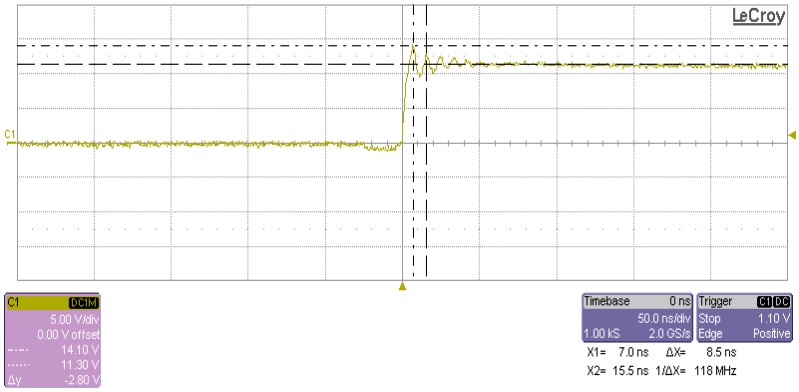
7 Switching Waveform

The waveform below shows the switch nodes. The input is 12V.

Channel 1 (yellow): SW pin output (10V/div)



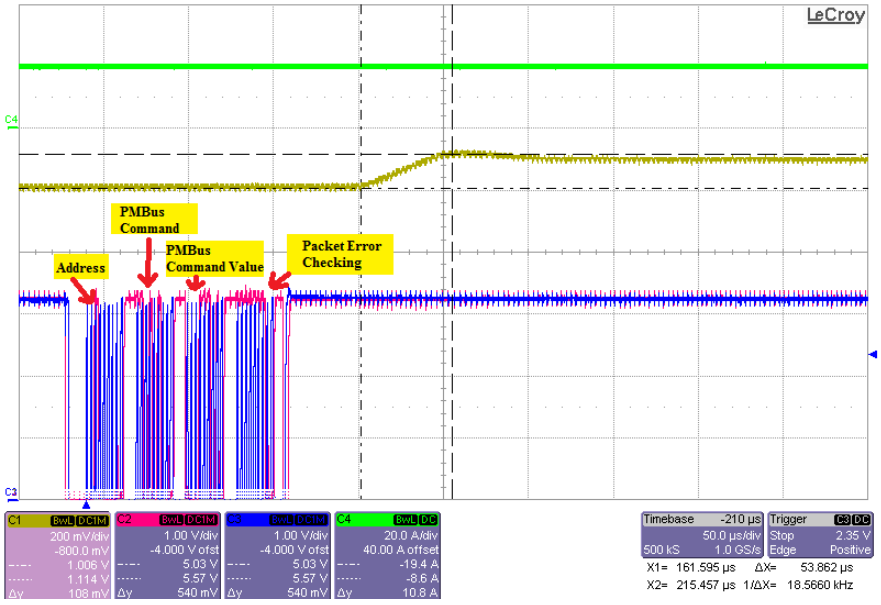
Channel 1 (yellow): SW pin output (5V/div)



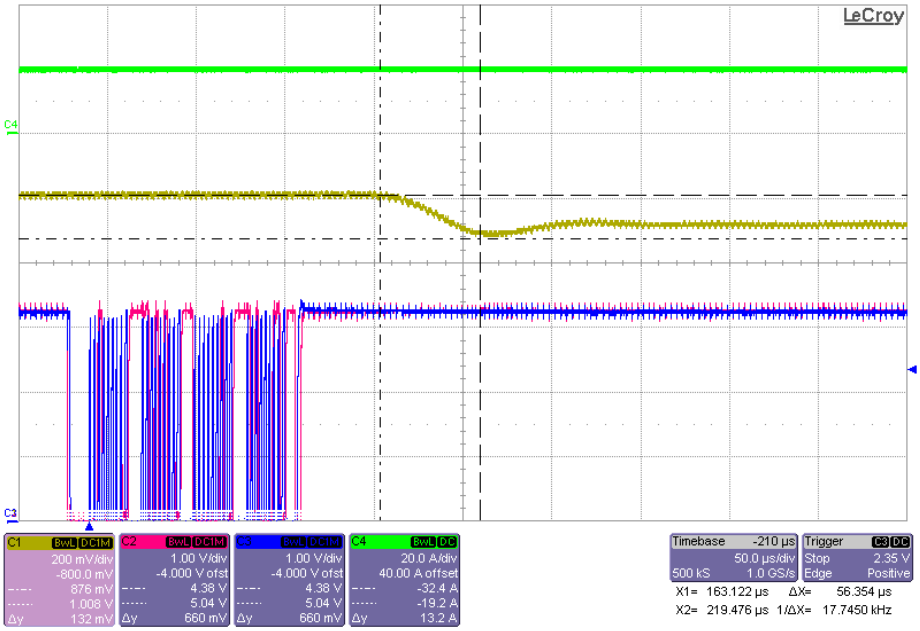
8 PMBus Voltage Scaling

Channel 1 (Yellow): VOUT output (200mV/div)
Channel 1 (Pink): SDA pin output (1V/div)
Channel 1 (Blue): SCL pin output (1V/div)
Channel 1 (Green): IOUT output (20V/div)

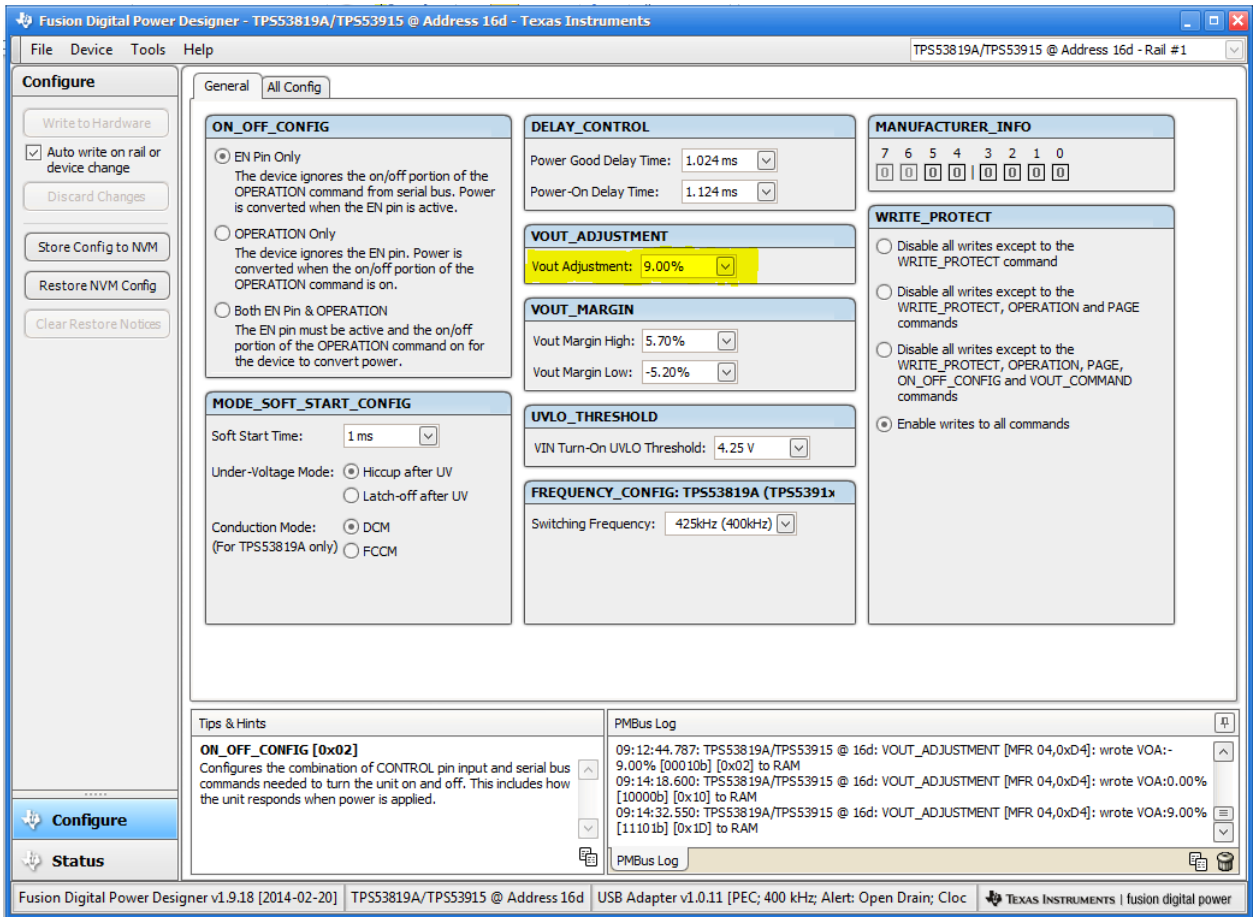
VOUT +9% Adjustment:



VOUT -9% Adjustment:

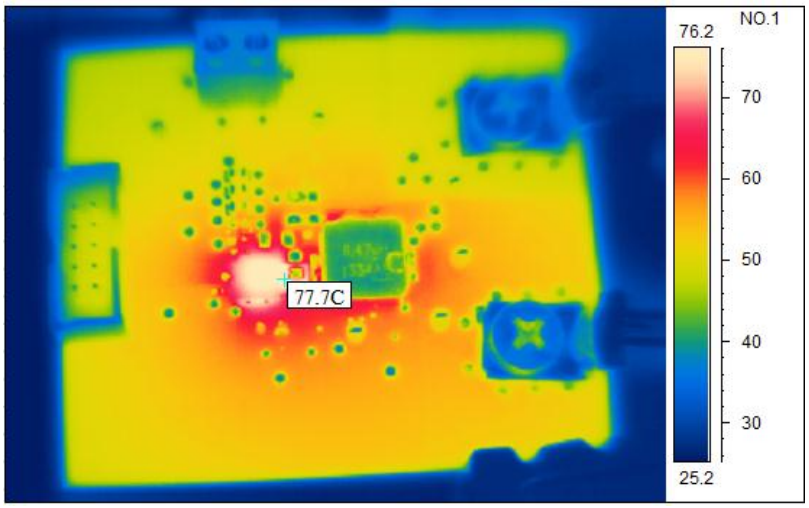


Fusion GUI Setup:

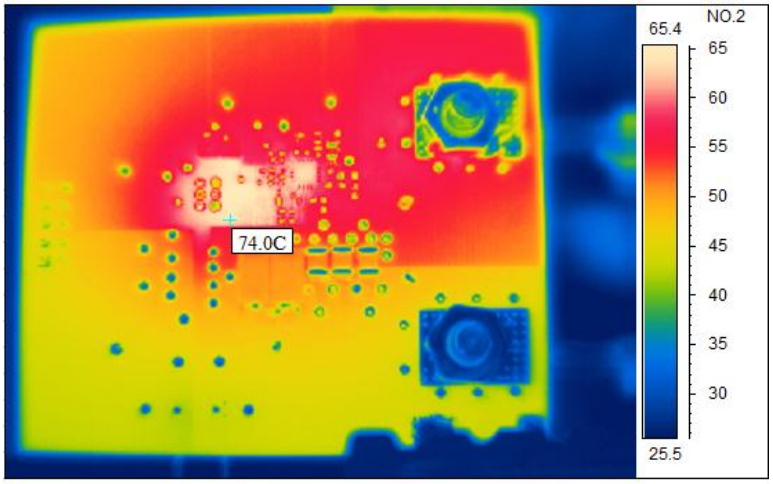


9 Thermal Profile

The figure below shows the thermal profile of the board at full load and Vin = 12V.

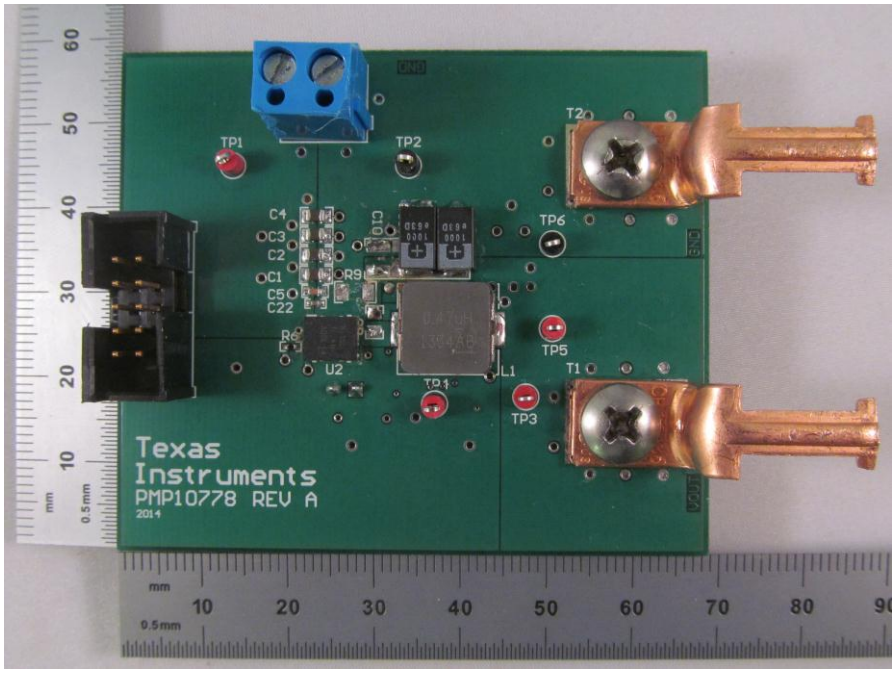


Front of Board

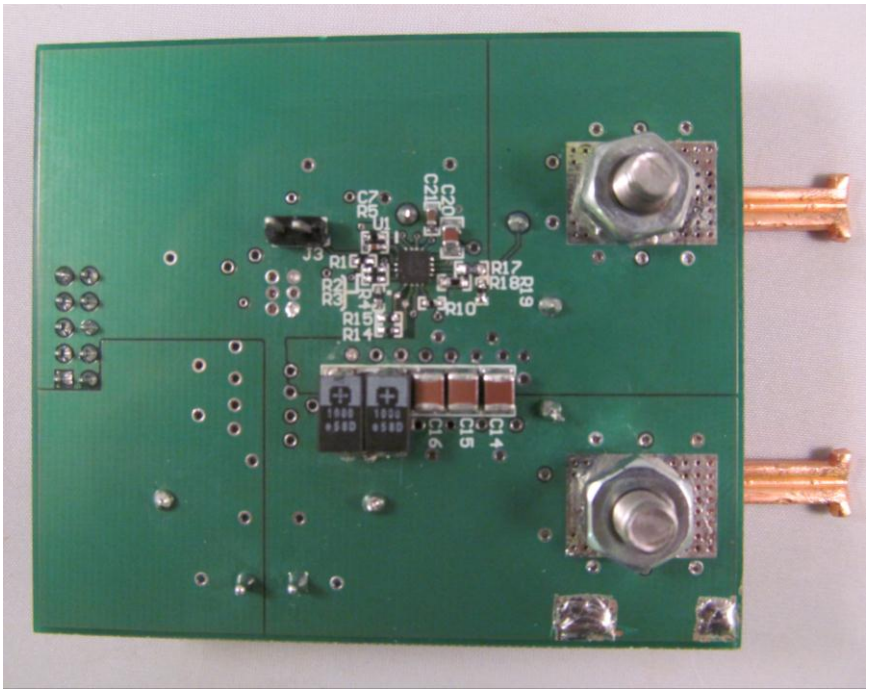


Back of Board

10 EVM Photo



Front of Board



Back of Board

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