



**PMP11220 TPS53819A  
Test Report  
8/6/2015**

The tests performed were as follows:

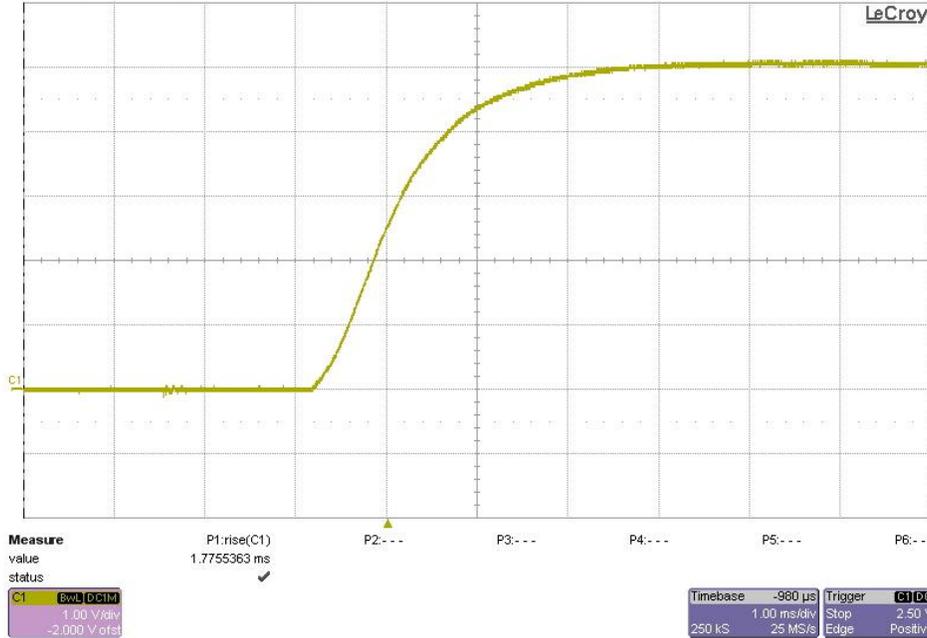
A. TPS53819A

1. Turn-On (No Load)
2. Turn-Off (5 $\Omega$  Load)
3. Switch Node (Full Load)
4. Switch Node (No load)
5. Switch Node Ringing (Full Load)
6. Output Voltage Ripple (No Load and Full Load)
7. Transient Response (100mA to 6A and 3A to 6A Load Step)
8. Efficiency
9. Load Regulation
10. Bode Plot
11. Board Photo
12. Thermal Images

## 1 Turn On – (TPS53819A – No Load)

The photo below shows the startup waveform. The input voltage is 24V, the output is not loaded. The time-base is set to 1ms/Division. This measurement was taken across C15.

Channel 1 – Yellow: Output Voltage – (1V/Division)

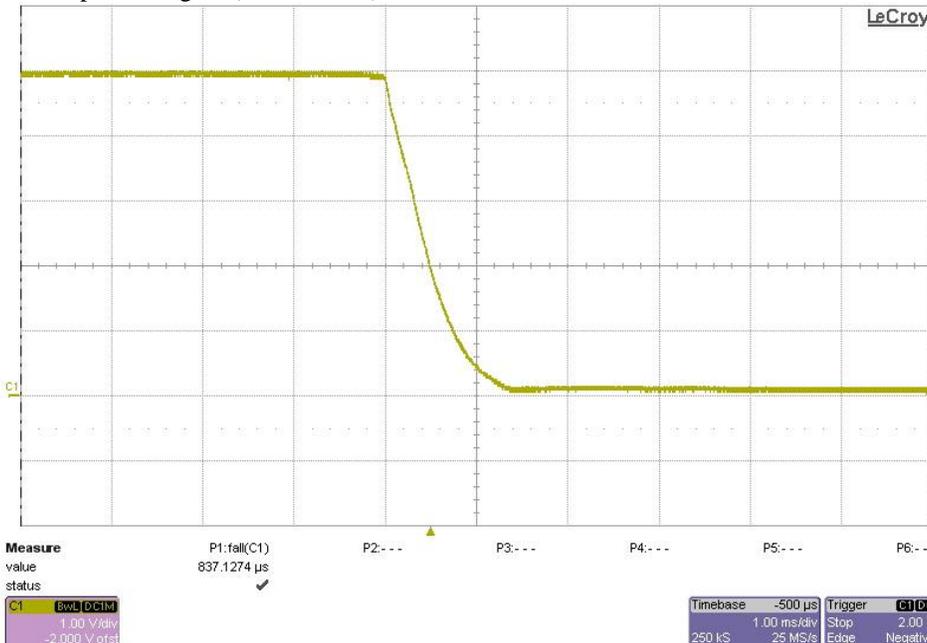


The % 10 - %90 rise time is 1.77ms

## 2 Turn Off – (TPS53819A – 5 $\Omega$ Load)

The photo below shows the turn off waveform. The input voltage is 24V, and the output is loaded with a 5 $\Omega$  load. The time-base is set to 1ms/Division. This measurement was taken across C15.

Channel 1 – Yellow: Output Voltage – (1V/Division)



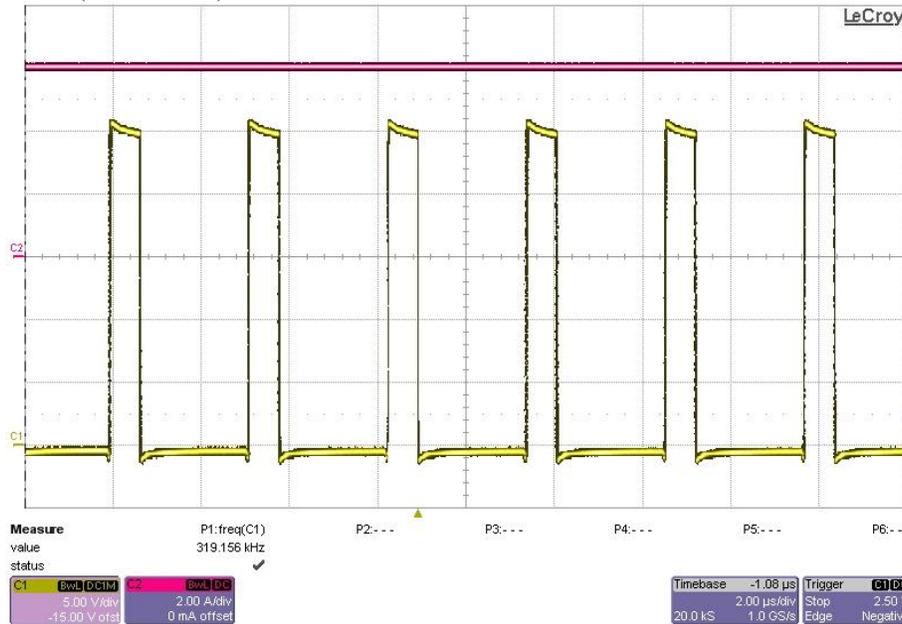
The % 10 - %90 fall time is 837 $\mu$ s

### 3 Switch Node – (TPS53819A – 5V @ 6A)

The picture below shows the switching waveform for the converter. The input voltage is 24V. The time-base is set to 2us/Division. This measurement was taken across Q2.

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

Channel 2 – Pink: Load - (2A/Division)



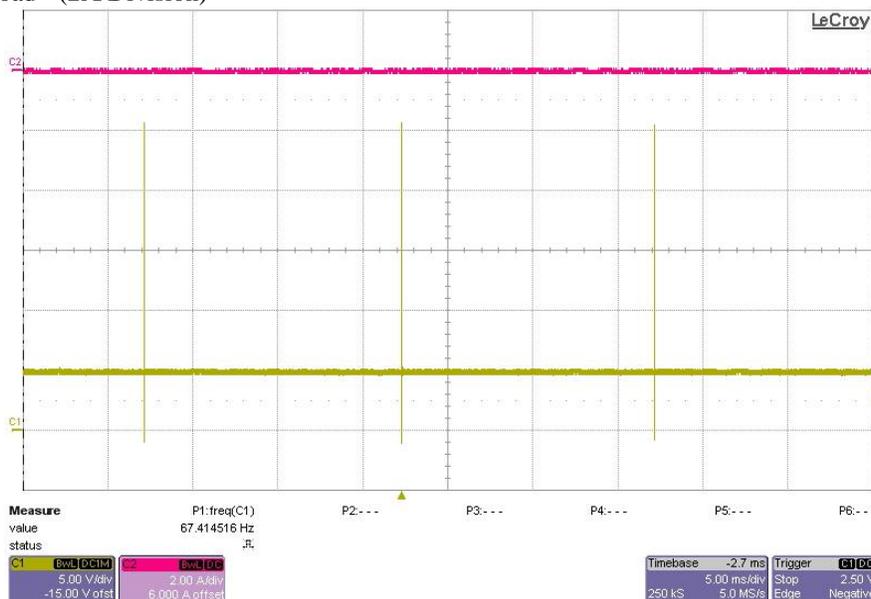
The device is switching at 319 kHz

### 4 Switch Node – (TPS53819A – No Load)

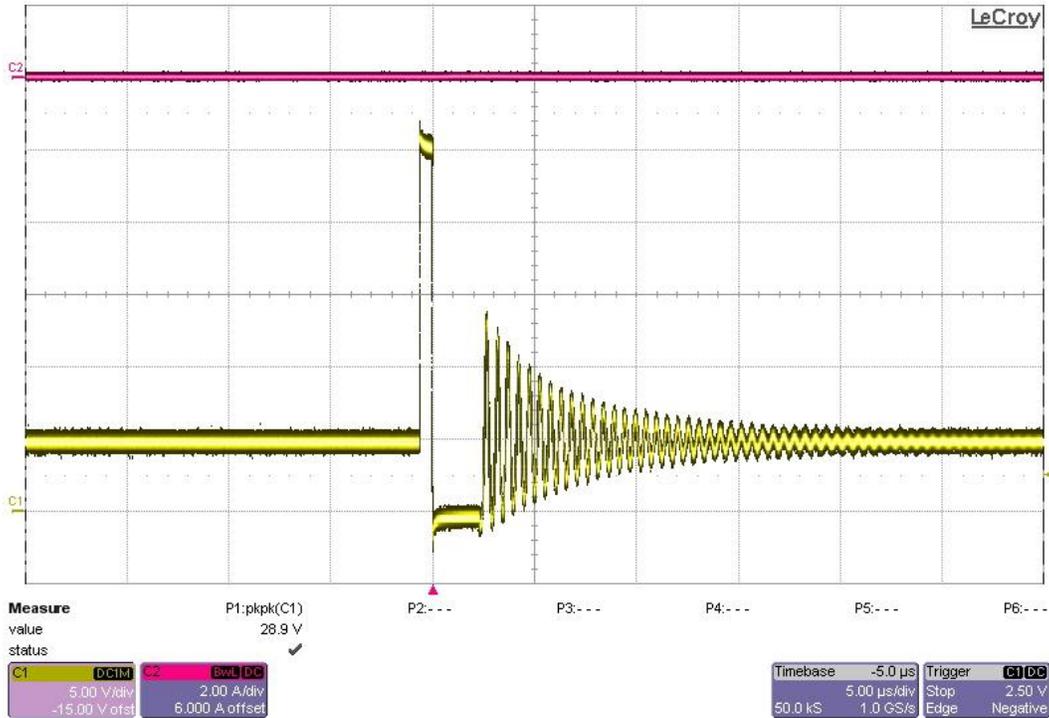
The picture below shows the switching waveform for the converter without a load. The input voltage is 24V. The time-base is set to 5ms/Division for the first figure and 5us for the second. This measurement was taken across Q2.

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

Channel 2 – Pink: Load - (2A/Division)



The device is running at 67Hz



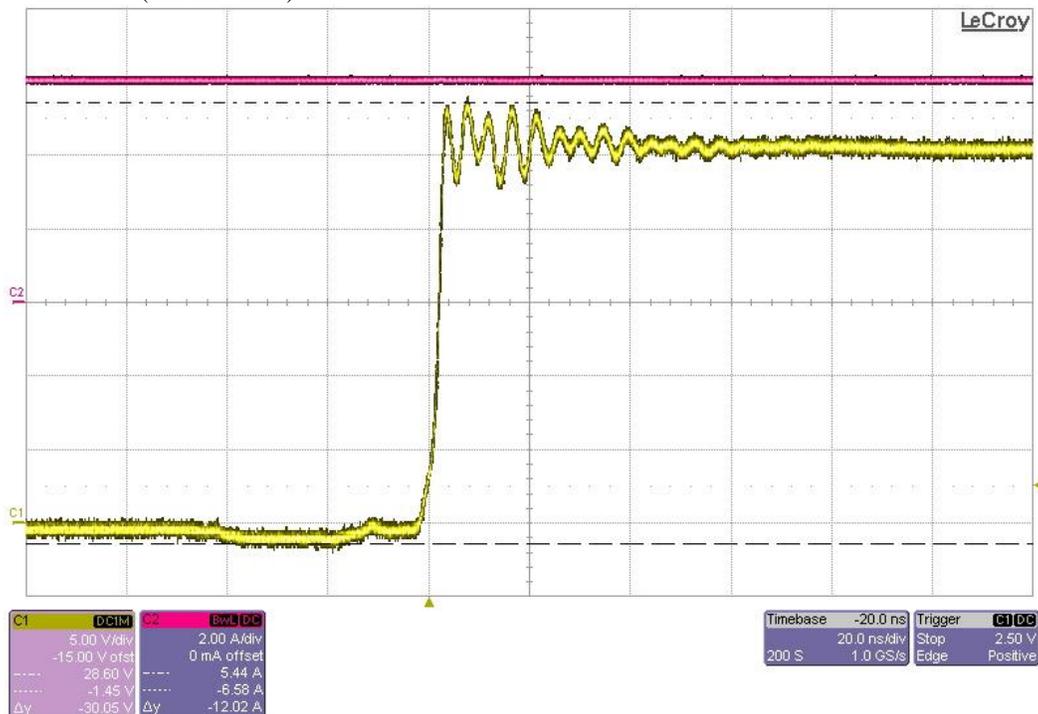
The peak to peak voltage of the switch node with no load is 28.9V

## 5 Switch Node Ringing - (TPS53819A – 5V @ 6A)

The picture below shows the ringing on the rising edge of the switching node. The time-base is set to 20ns/Division. This measurement was taken across Q2.

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

Channel 2 – Pink: Load - (2A/ Division)

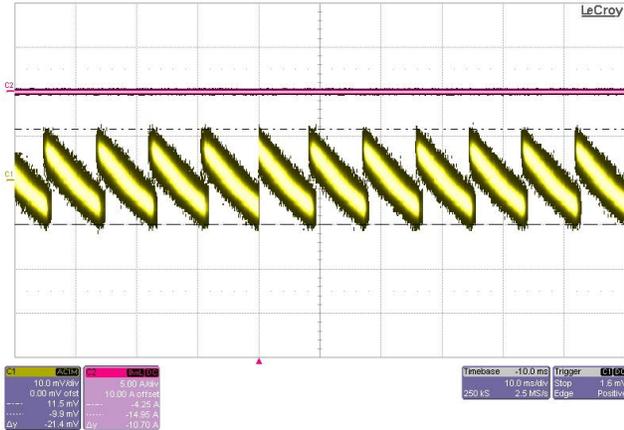


Switch Node Ringing - There is a total change of 30.05V

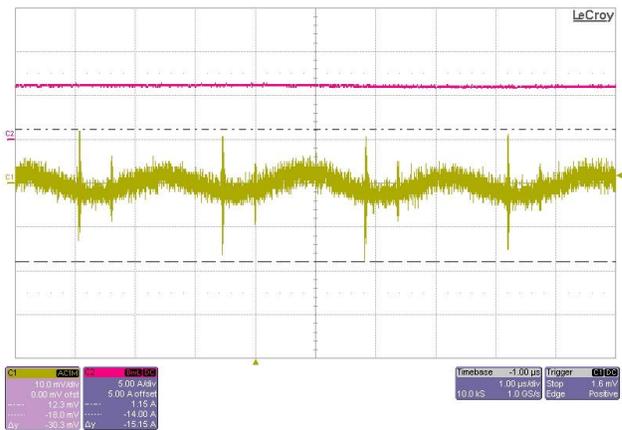
## 6 Output Voltage Ripple – (TPS53819A – 5V @ No load and 6A)

The output voltage ripple of the converter is shown in the figures below. The input voltage is 24V. The time-base is set to 10ms/div for the first figure and 1us/div for the second. These measurements were taken across C24.

Channel 1 – Yellow: Output Voltage (10mV/Division; AC Coupled)  
 Channel 2 – Pink: Load - (5A/Division)



No Load - Vrip = 21.4mV

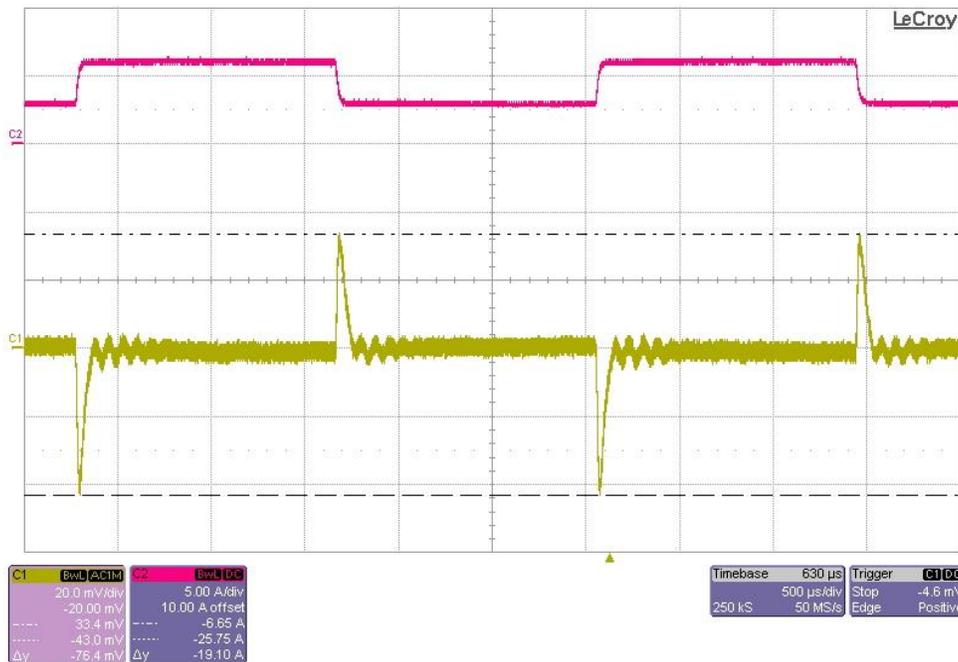


6A Load - Vrip = 30.3mV

## 7 Transient Response – (TPS53819A – 5V)

The transient response of the converter is shown in the figures below. The input voltage is 24V. The load is stepped from 3A to 6A in the first figure with a time base of 500us/Division and 100mA to 6A in the second figure with a time base of 2ms/Division. These measurements were taken across C15.

Channel 1 – Yellow: Output Voltage (20mV/Division; AC Coupled)  
 Channel 2 – Pink: Output Current – (5A/Division)

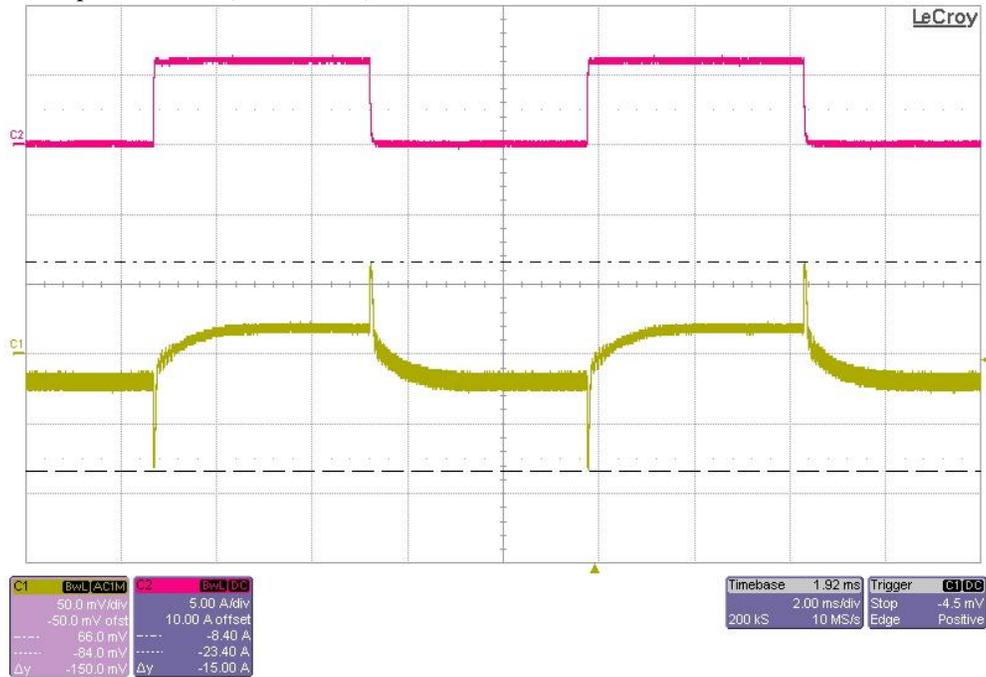


Transient response - There is a total change of 76.4mV

# PMP11220 Test Results Rev. A



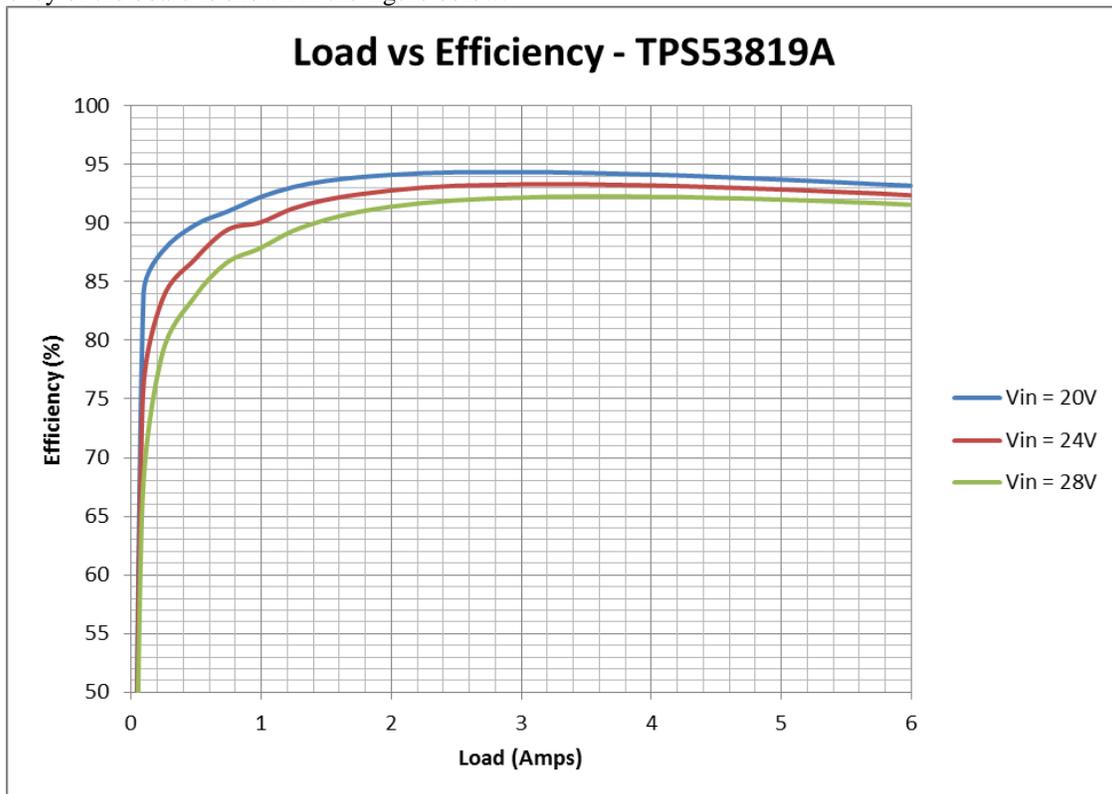
Channel 1 – Yellow: Output Voltage (50mV/Division; AC Coupled)  
 Channel 2 – Pink: Output Current – (5A/Division)



Transient response - There is a total change of 150mV

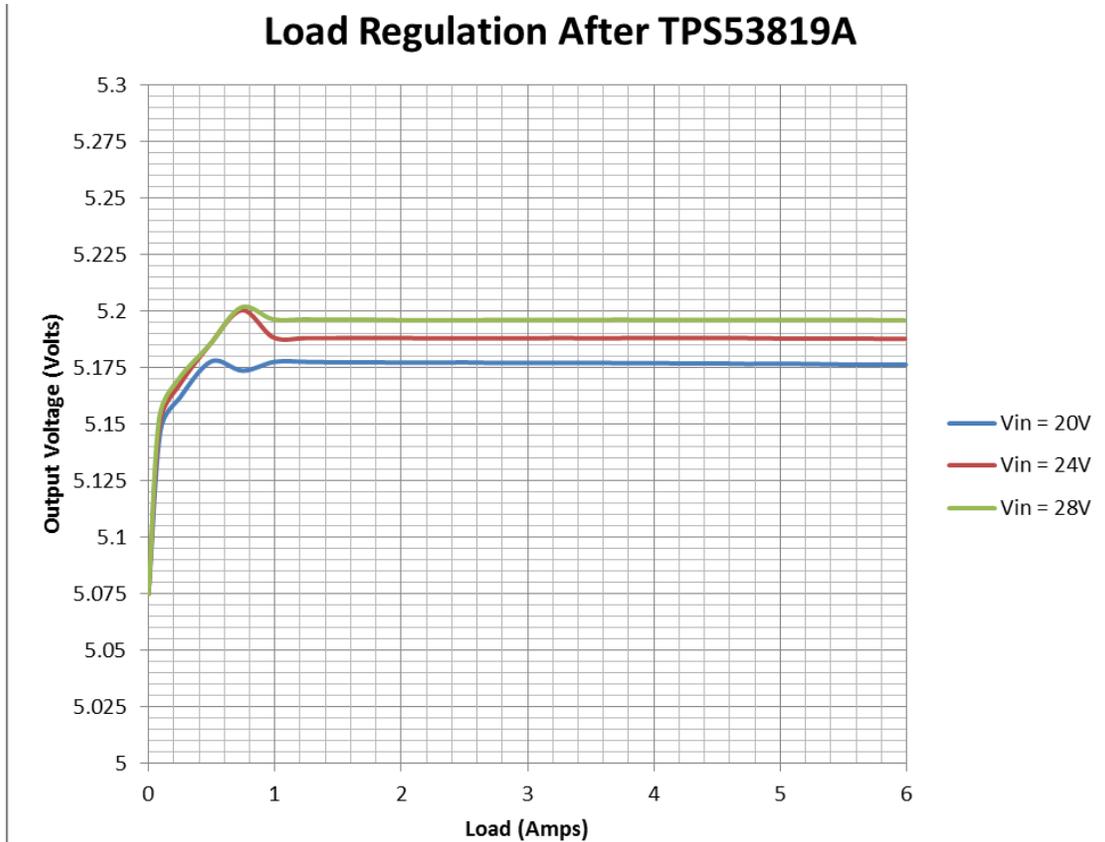
## 8 Efficiency – (TPS53819A – 5V Output)

The efficiency of the board is shown in the figure below.



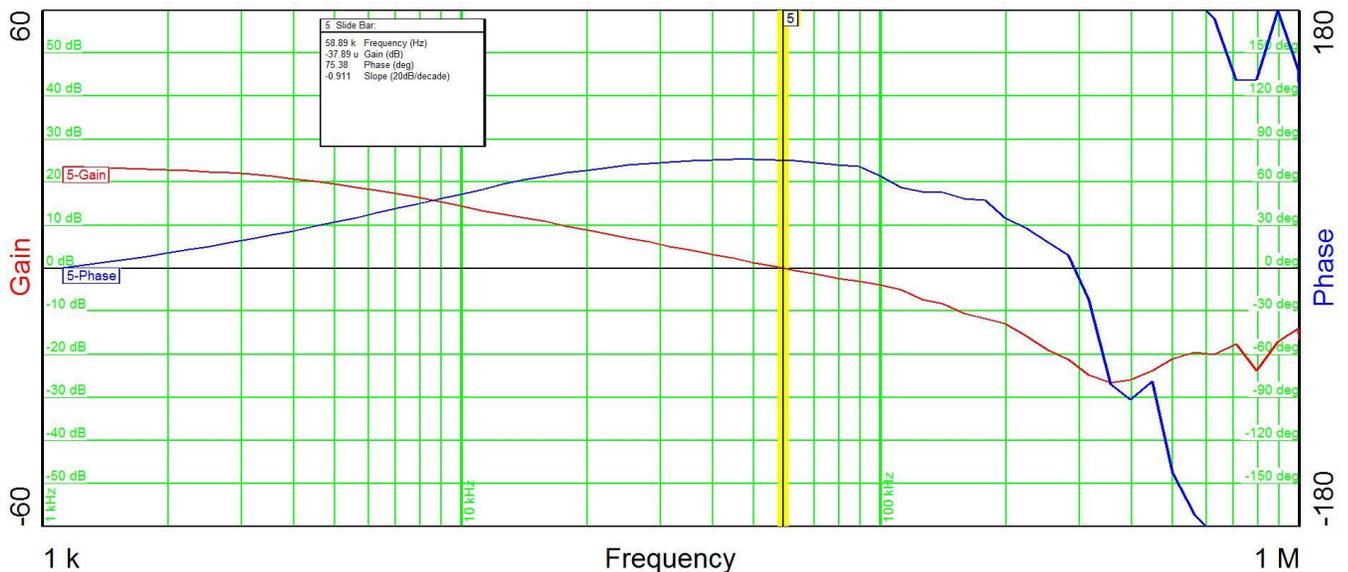
## 9 Load Regulation – (TPS53819A – 5V Output)

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



## 10 Bode Plot – (TPS53819A – 5V @ 6A)

The Bode Plot of the converter is shown in the figure below. The input is 24V.

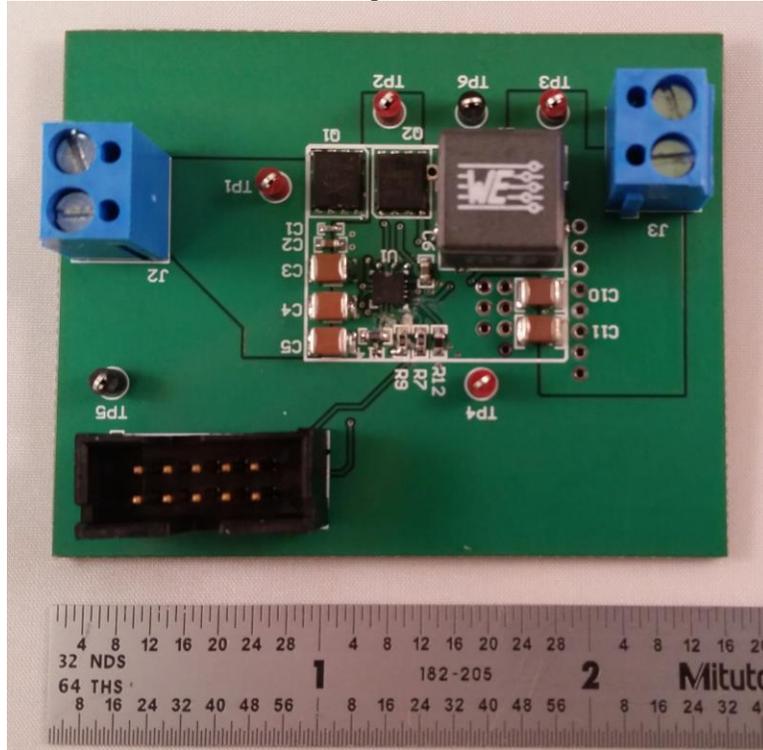


Bode Plot - There is 75.38 degrees of phase margin

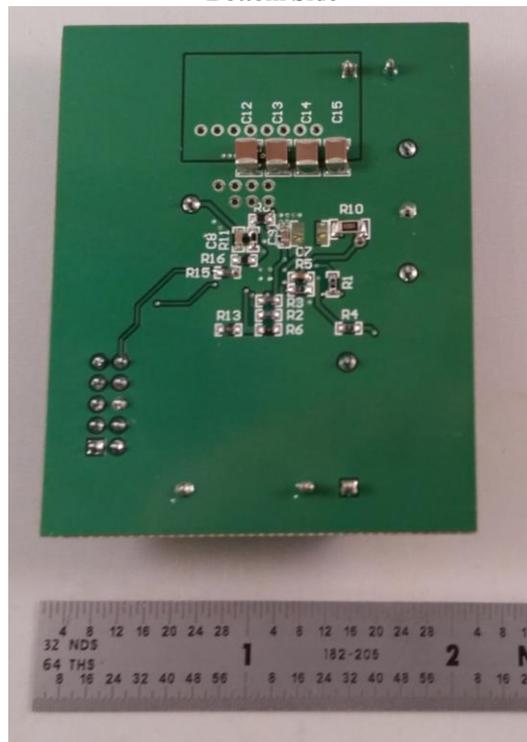
## 11 Board Photo

The photos below shows the PMP11220 board that is used

Top Side

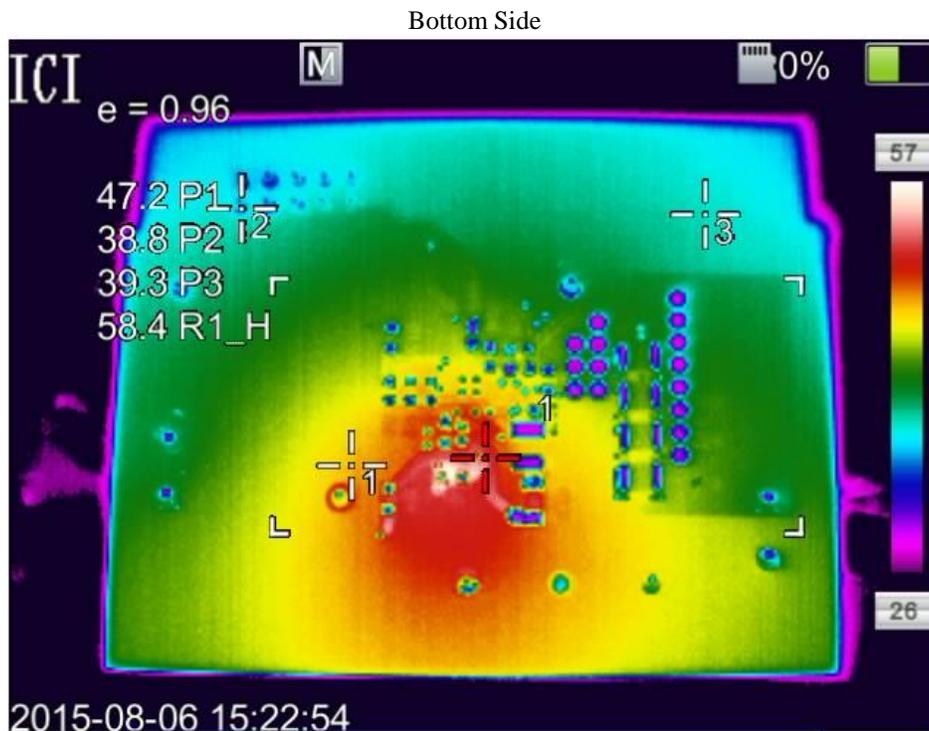


Bottom Side



## 12 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 24V, while 6A was drawn from the output.



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