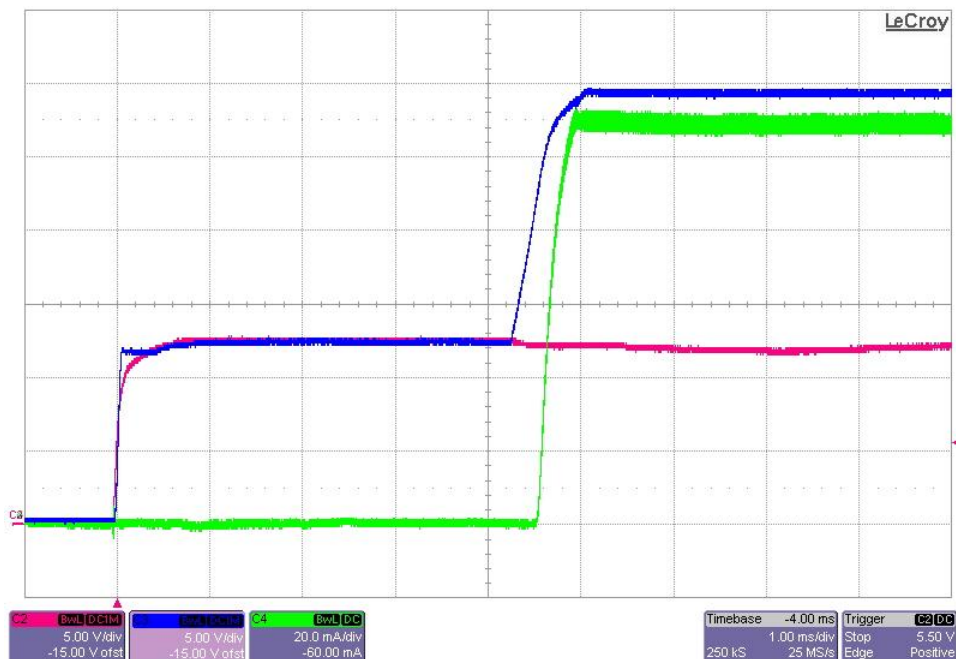
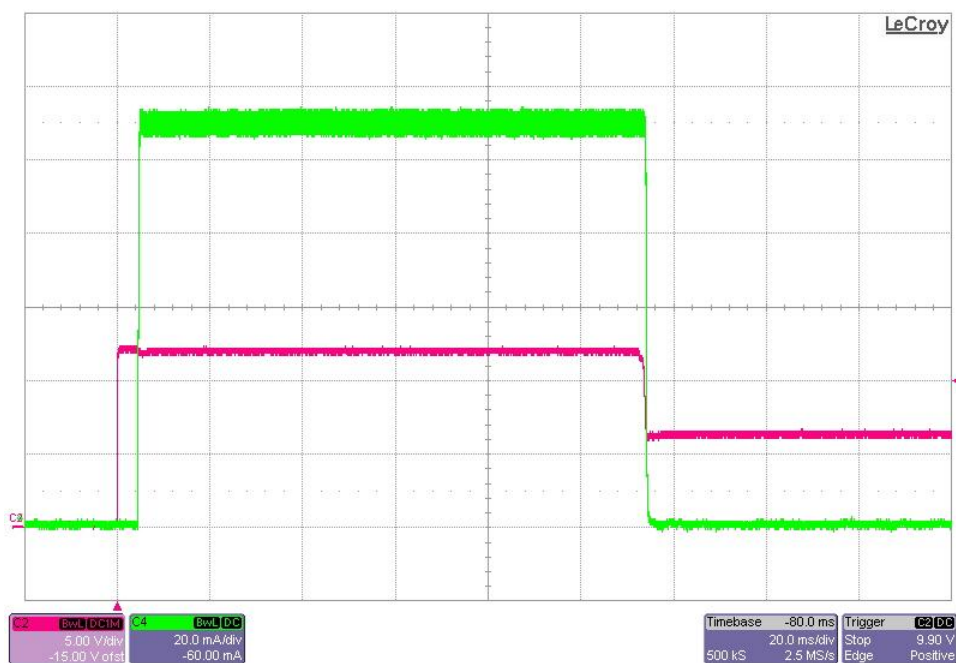


1 Startup

The photo below shows the input voltage, boost output voltage and LED current startup waveforms after the application of 12Vdc in. (5V/DIV, 20mA/DIV, 1mS/DIV)

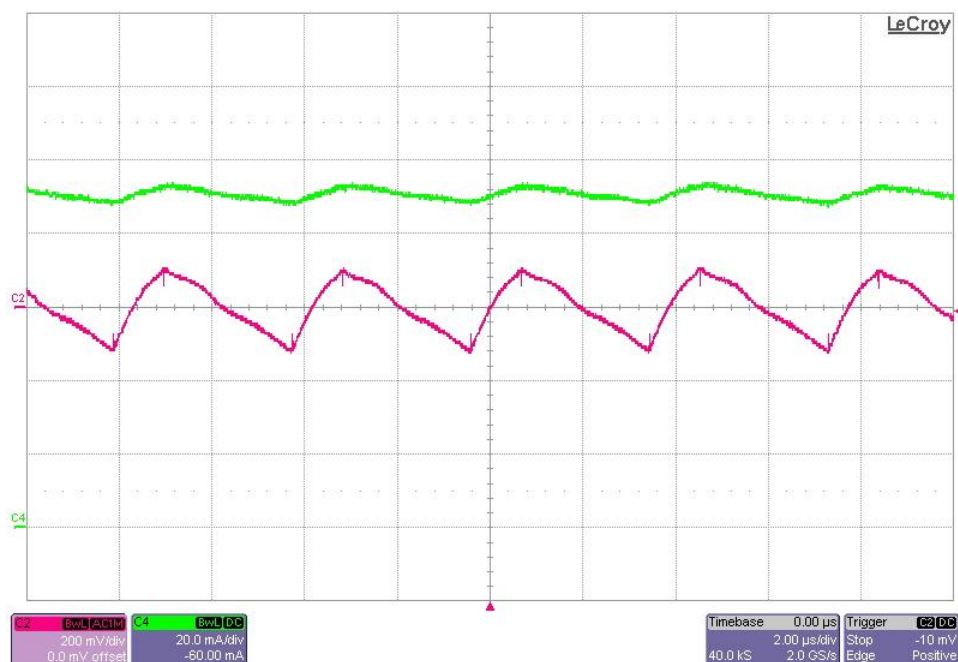


The photo below shows the input voltage and LED current after the application and removal of 12Vdc input. (5V/DIV, 20mA/DIV, 20mS/DIV)

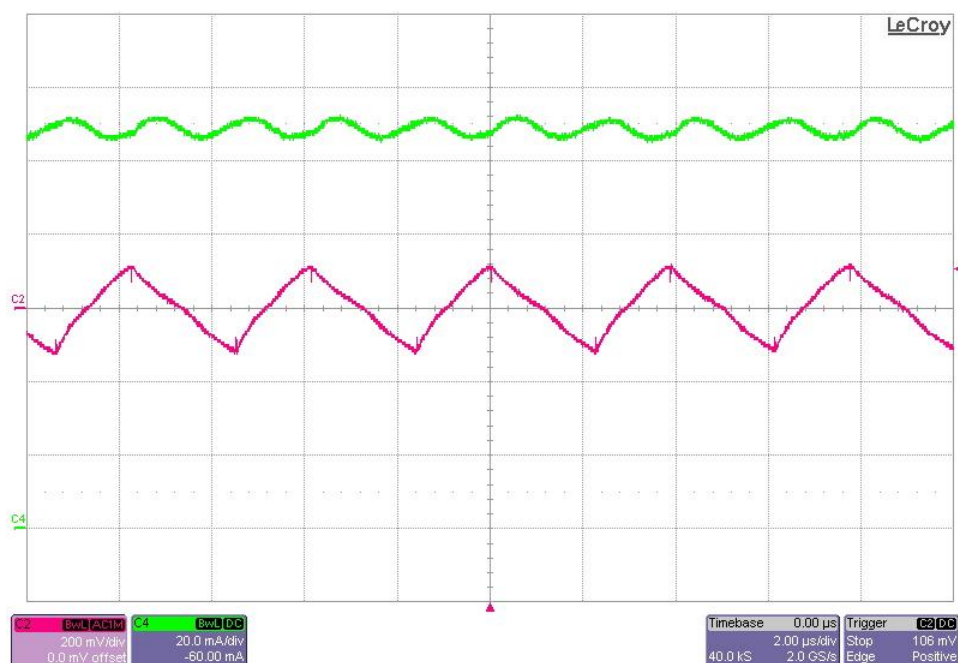


2 Output Ripple Voltage and Current

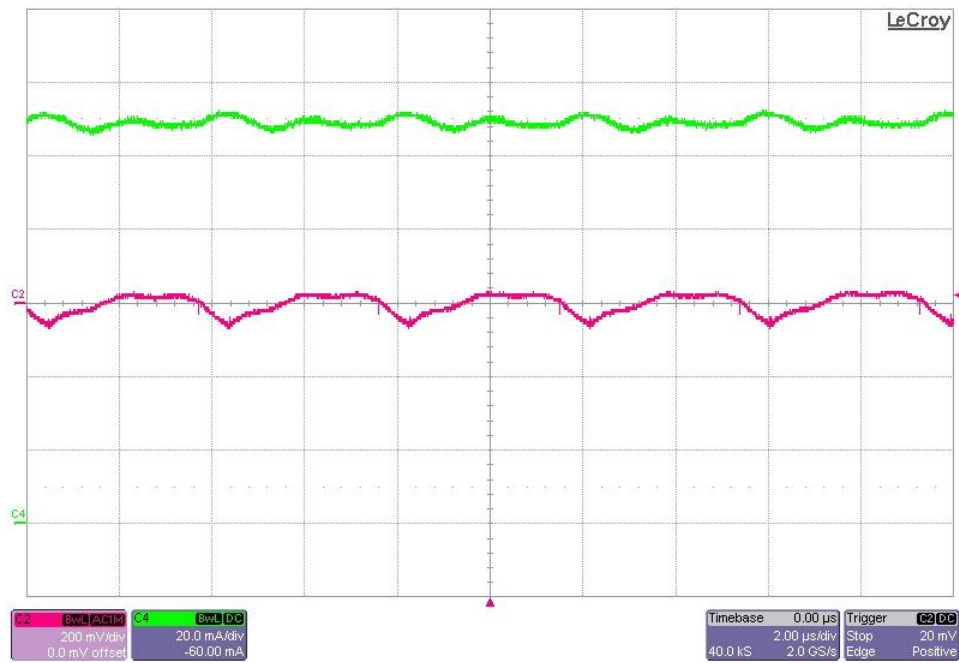
The boost output ripple voltage (AC coupled) and LED ripple current are shown in the figure below. The input voltage was set to 8Vin. (200mV/DIV, 20mA/DIV, 2uS/DIV)



The boost output ripple voltage (AC coupled) and LED ripple current are shown in the figure below. The input voltage was set to 12Vin. (200mV/DIV, 20mA/DIV, 2uS/DIV)

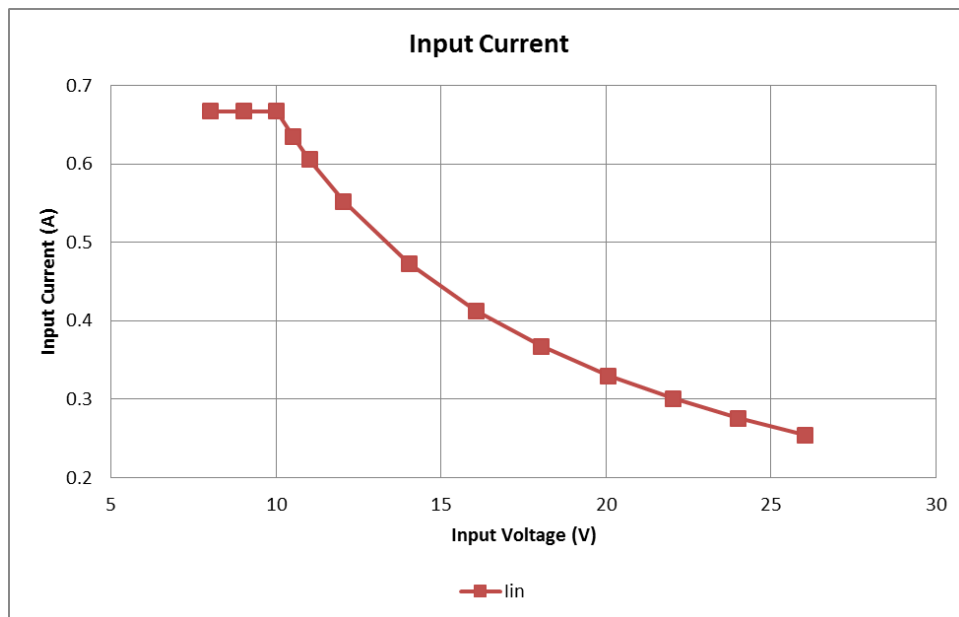
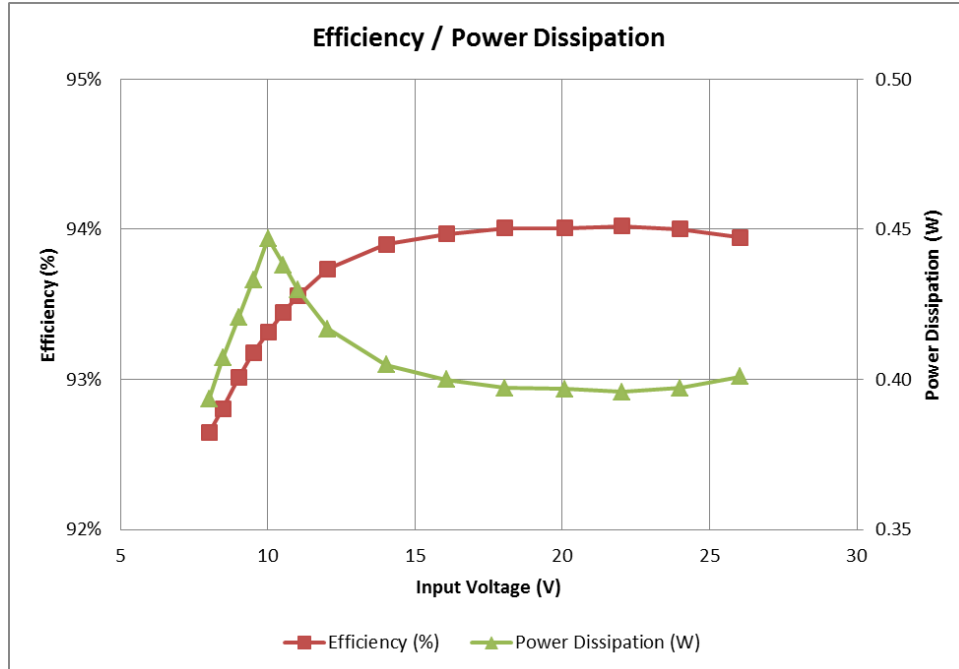


The boost output ripple voltage (AC coupled) and LED ripple current are shown in the figure below. The input voltage was set to 24V_{in}. (200mV/DIV, 20mA/DIV, 2uS/DIV)



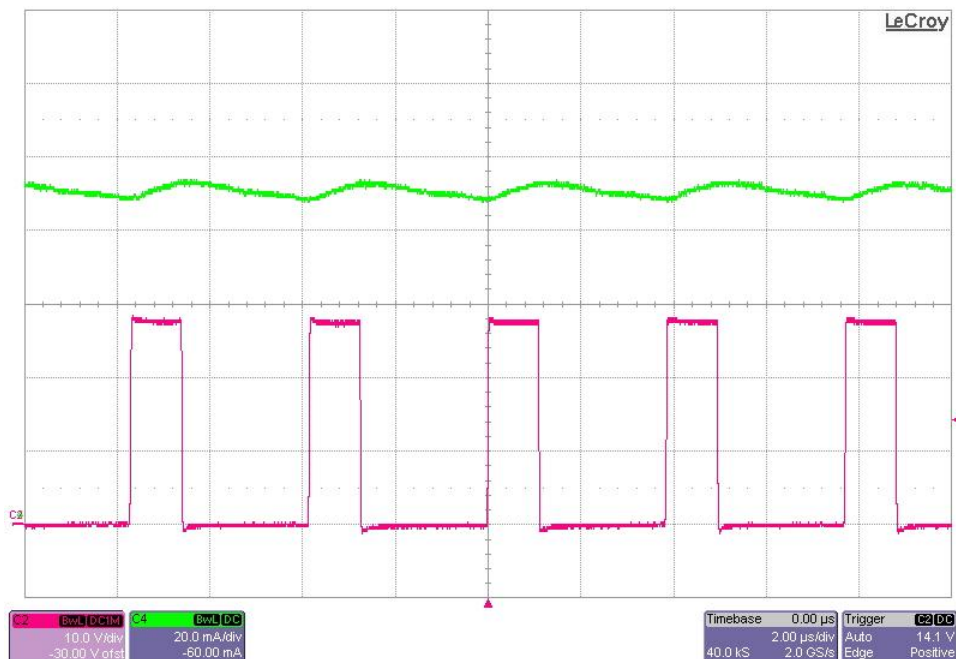
3 Efficiency

The converter efficiency and power dissipation are shown in the figure below. Efficiency shown is for two strings of LEDs with output power measured as $V_{out} \cdot (I_{out1} + I_{out2})$. For input voltages less than 10V, the LED current decreases as the input current is regulated.

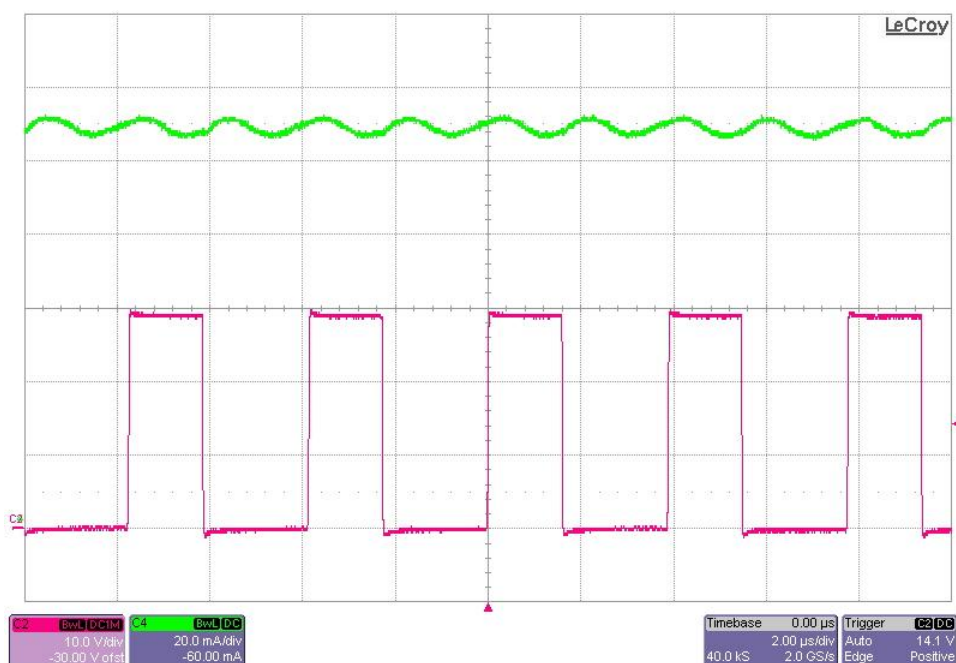


4 Switching Waveforms

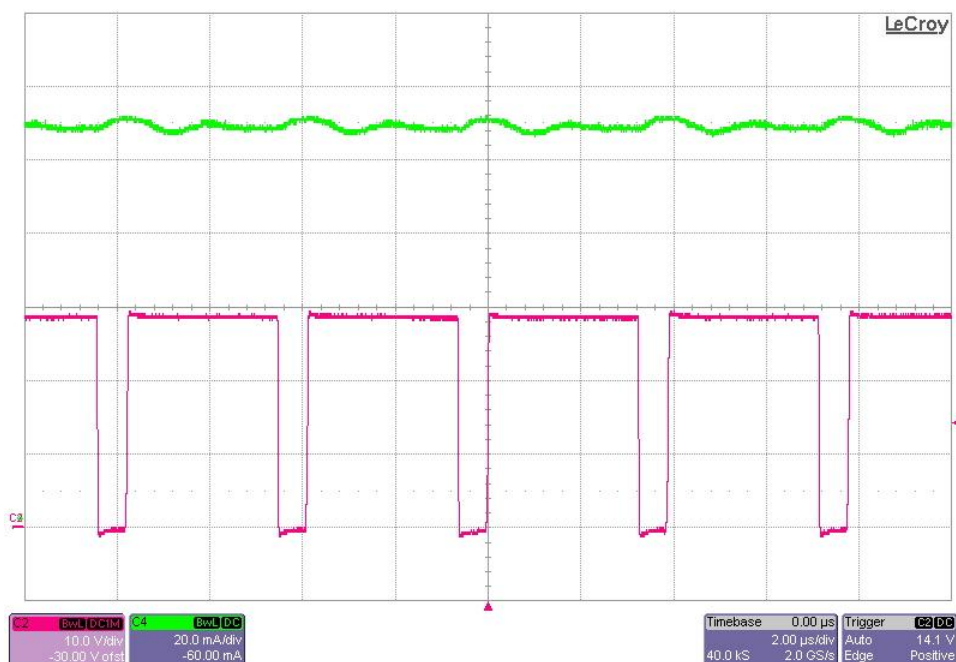
The photo below shows the boost converter N-ch FET drain waveform and the LED current. The input voltage is set to 8Vin. (10V/DIV, 20mA/DIV, 2uS/DIV)



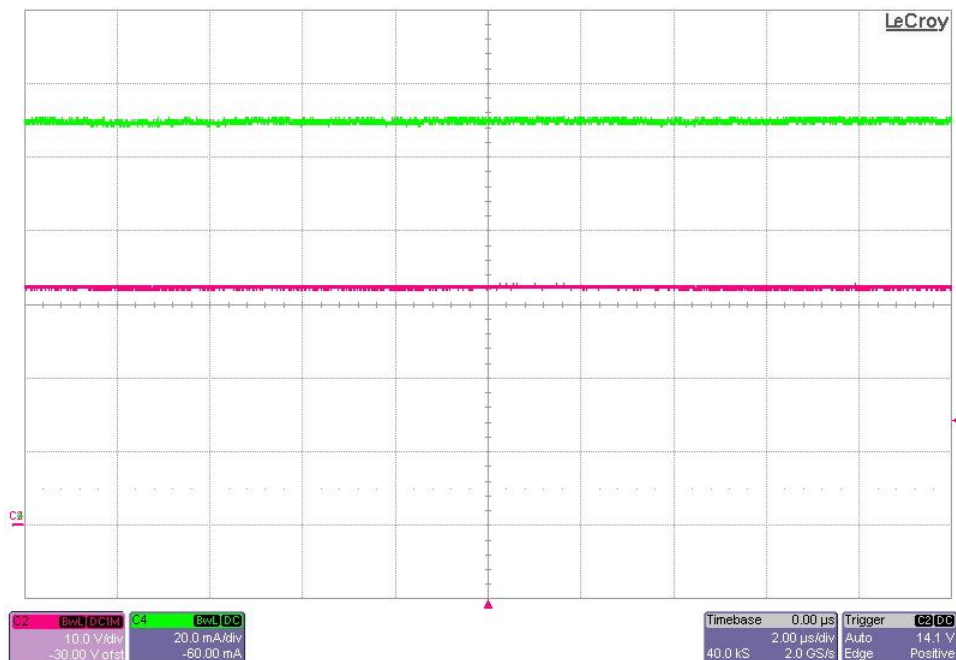
The photo below shows the boost converter N-ch FET drain waveform and the LED current. The input voltage is set to 12Vin. (10V/DIV, 20mA/DIV, 2uS/DIV)



The photo below shows the boost converter N-ch FET drain waveform and the LED current. The input voltage is set to 24Vin.
(10V/DIV, 20mA/DIV, 2uS/DIV)



The photo below shows the boost converter N-ch FET drain waveform and the LED current. The input voltage is set to 32Vin.
(10V/DIV, 20mA/DIV, 2uS/DIV)



5 Loop Gain

The plot below shows the voltage loop gain when regulating the LED current at input voltages of 12V and 26V.

Loop Gain (Vin = 12V)

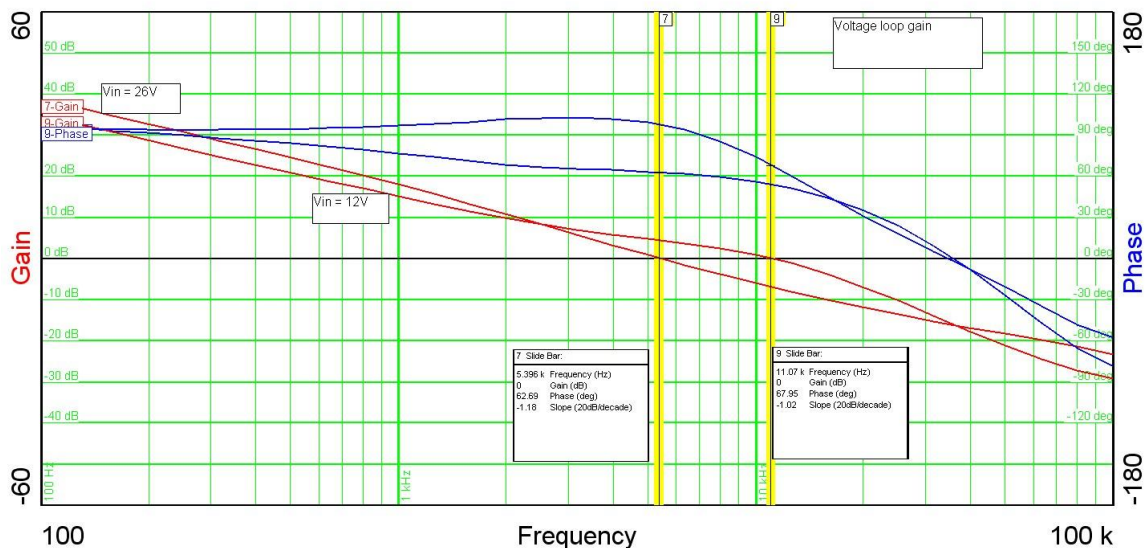
BW: 11.1KHz

PM: 68 degrees

Loop Gain (Vin = 26V)

BW: 5.40KHz

PM: 63 degrees

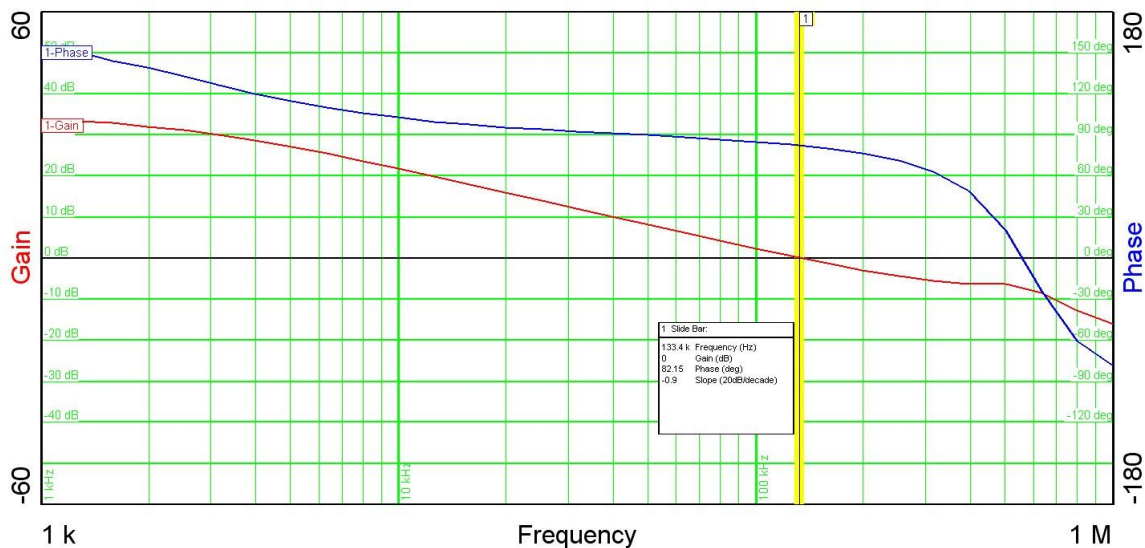


The plot below shows the LED current loop gain when the LED current is regulating at 108mA and the input voltage is 14V.

Loop Gain (Vin = 14V)

BW: 133KHz

PM: 82 degrees

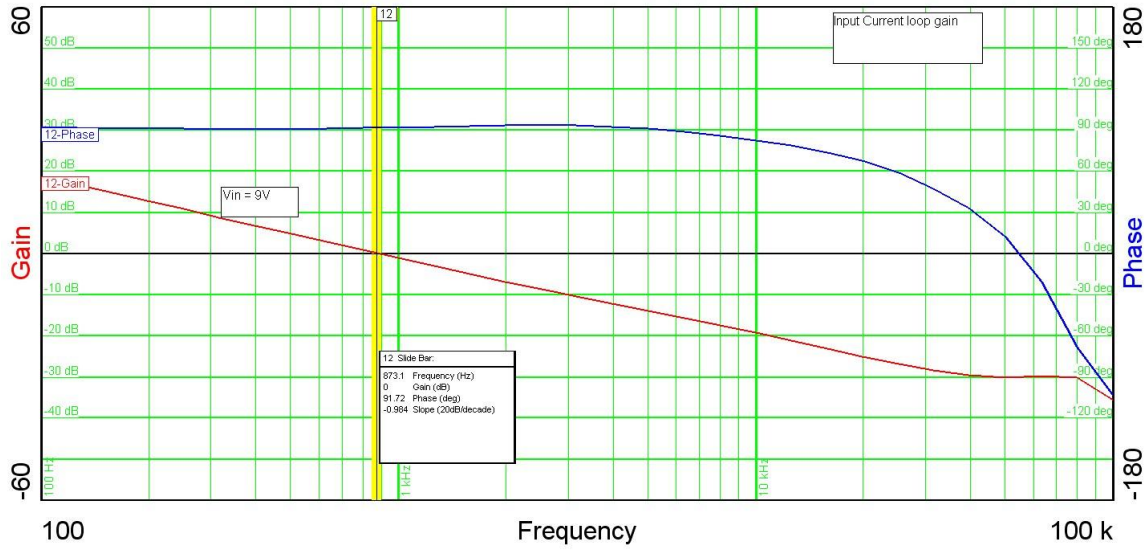


The plot below shows the input current loop gain while at an input voltage of 9V.

Loop Gain ($V_{in} = 9V$)

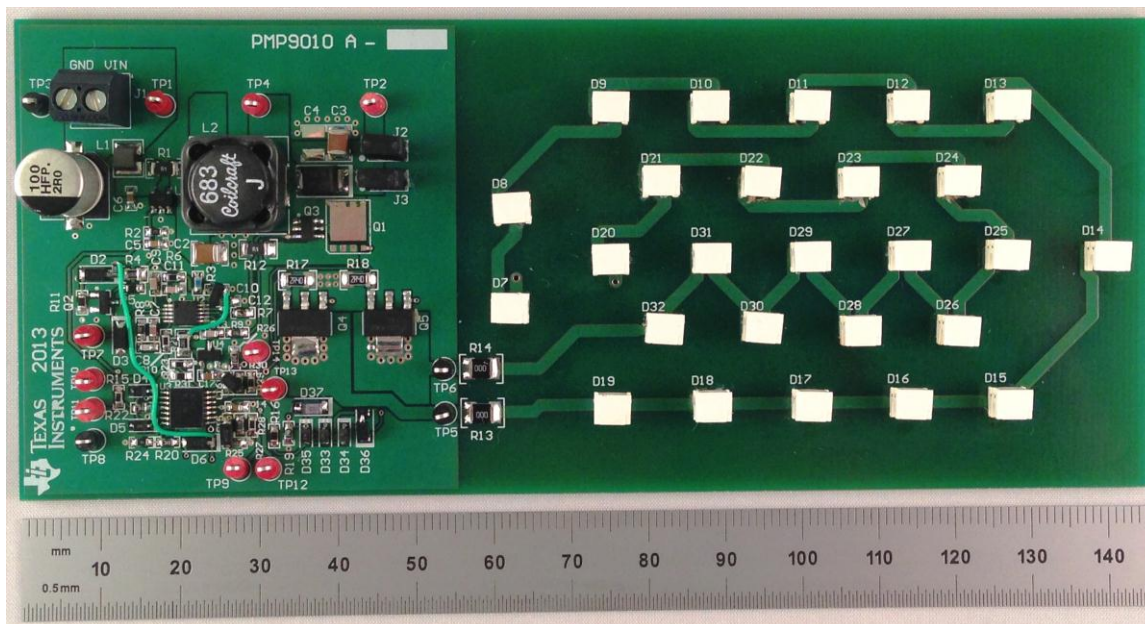
BW: 873Hz

PM: 92 degrees



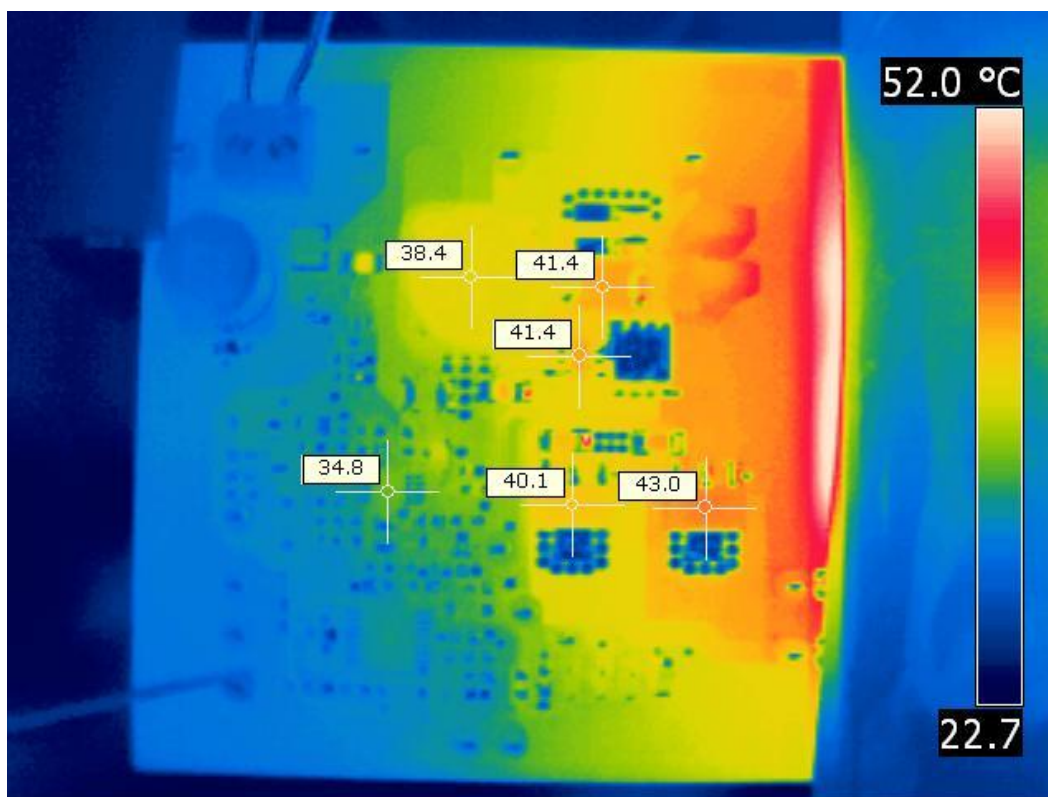
6 Photo

The photo below shows the PMP9010 REVB assembly.



7 Thermal Image

A thermal image is shown below when operating at 12Vin and no air flow.



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