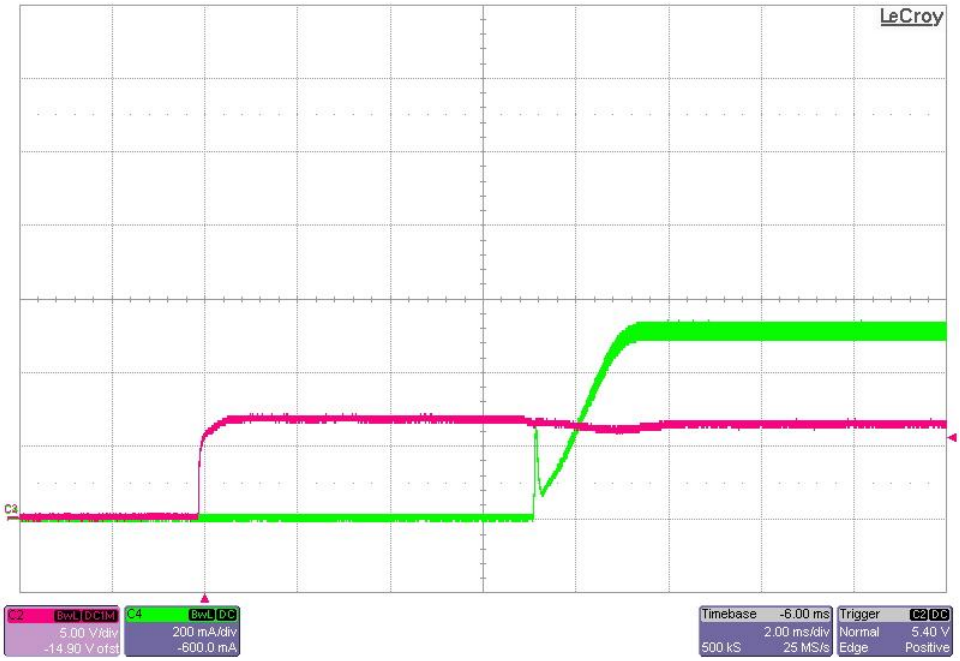
1 Startup

The photo below shows the output current startup waveforms after the application of 6V in. 8 LEDs were used in series and regulated to 0.515A. (5V/DIV, 200mA/DIV, 2mS/DIV)

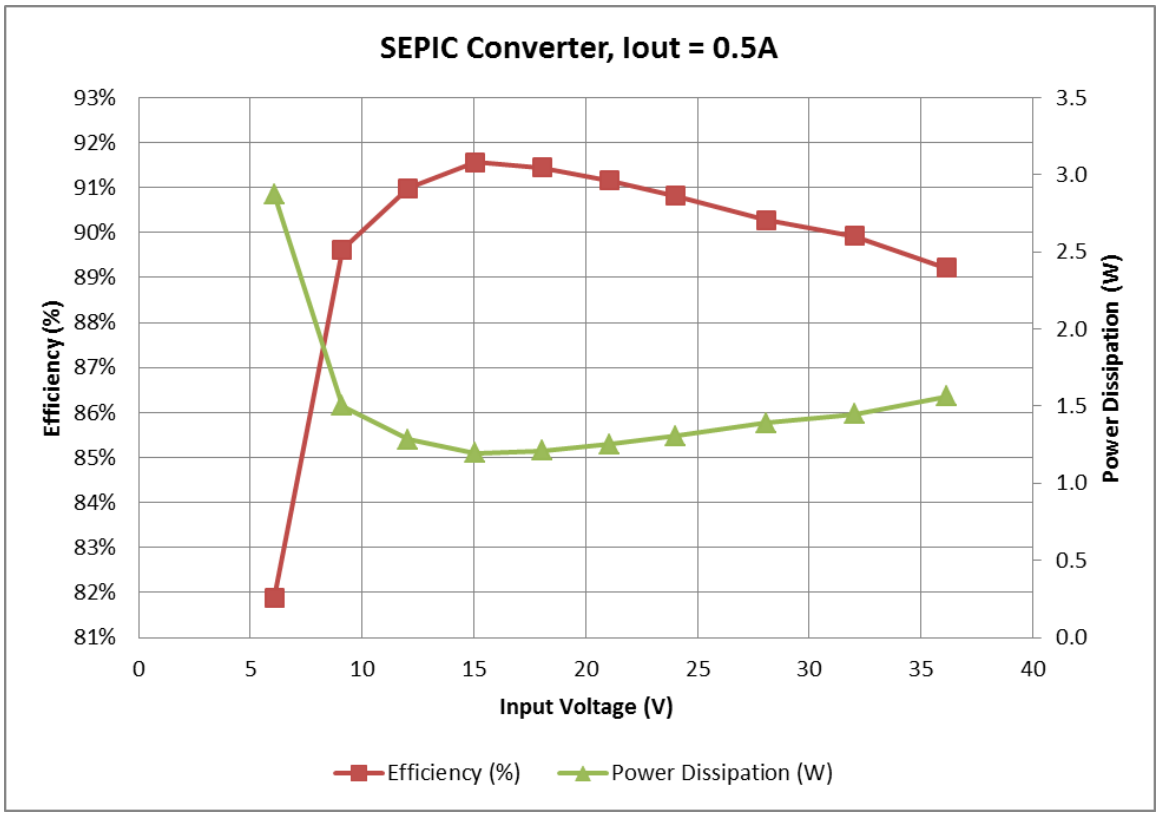


The photo below shows the output current startup waveforms after the application of 12V in. 8 LEDs were used in series and regulated to 0.515A. (5V/DIV, 200mA/DIV, 2mS/DIV)

The photo below shows the output current startup waveforms after the application of 36V in. 8 LEDs were used in series and regulated to 0.515A. (10V/DIV, 200mA/DIV, 2mS/DIV)

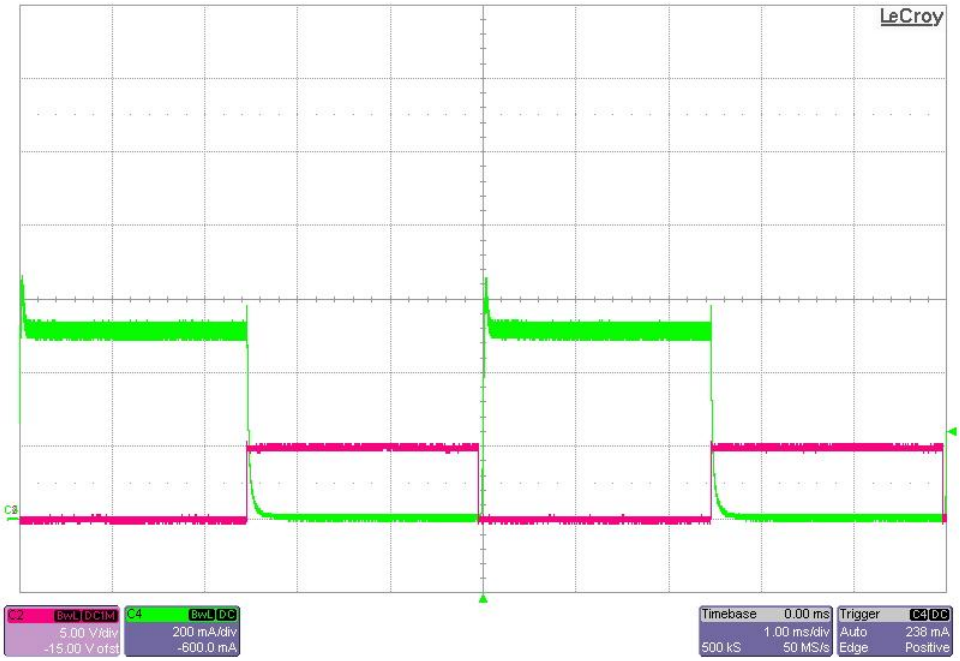
2 Efficiency

The converter efficiency is shown in the figure below. The LED current is regulated to 0.515

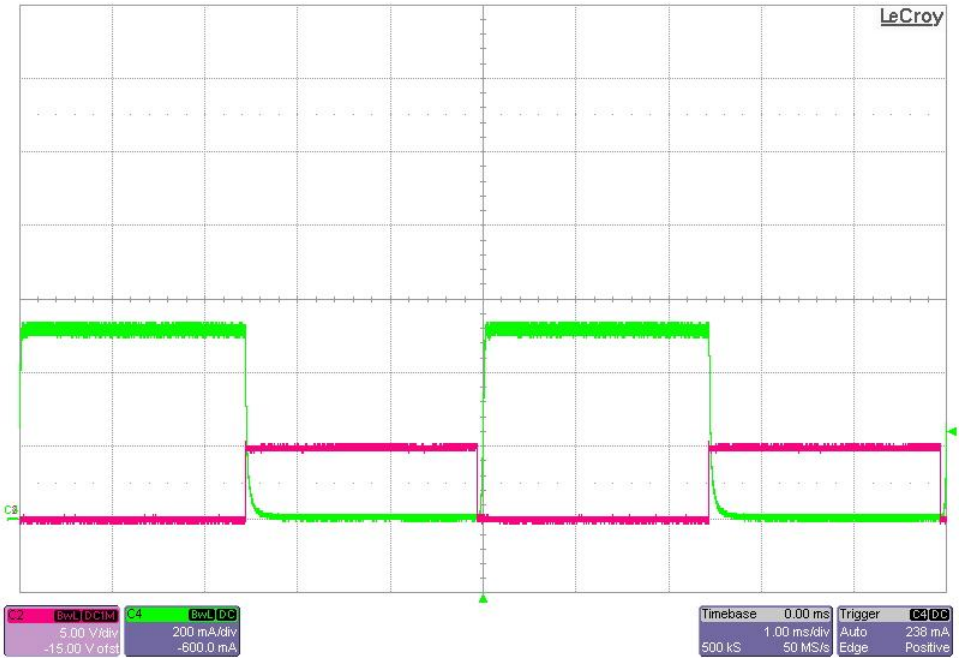


3 PWM of LEDs

The photo below shows an external PWM input (50%) and the LED current. The image was taken with an output of 8 LEDss and regulated to 0.515A. The input voltage was set to 12V. (5V/DIV, 200mA/DIV, 1mS/DIV)

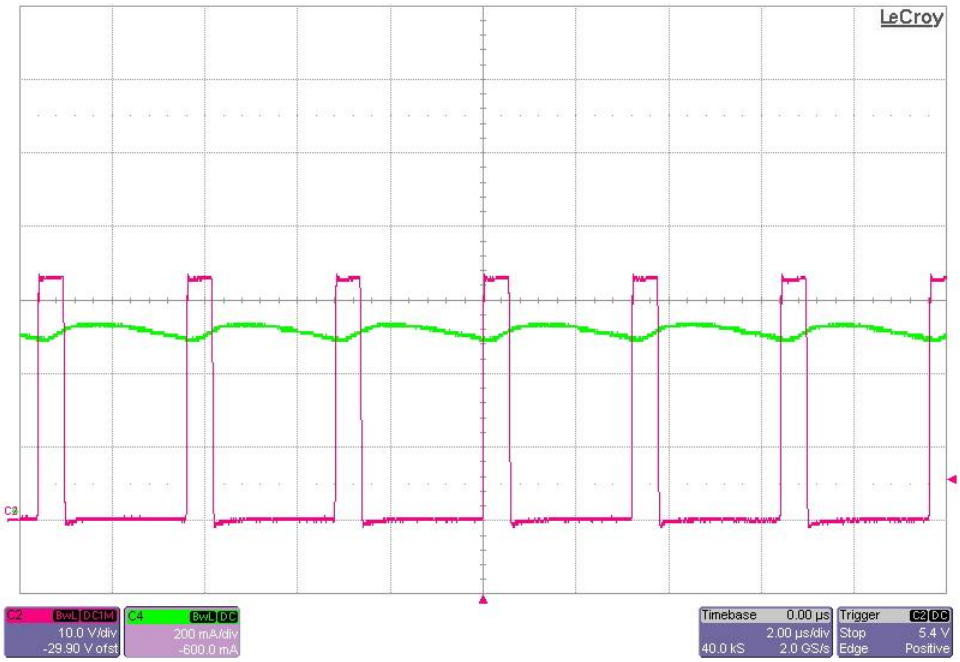


The photo below shows an external PWM input (50%) and the LED current. The image was taken with an output of 8 LEDss and regulated to 0.515A. The input voltage was set to 36V. (5V/DIV, 200mA/DIV, 1mS/DIV)

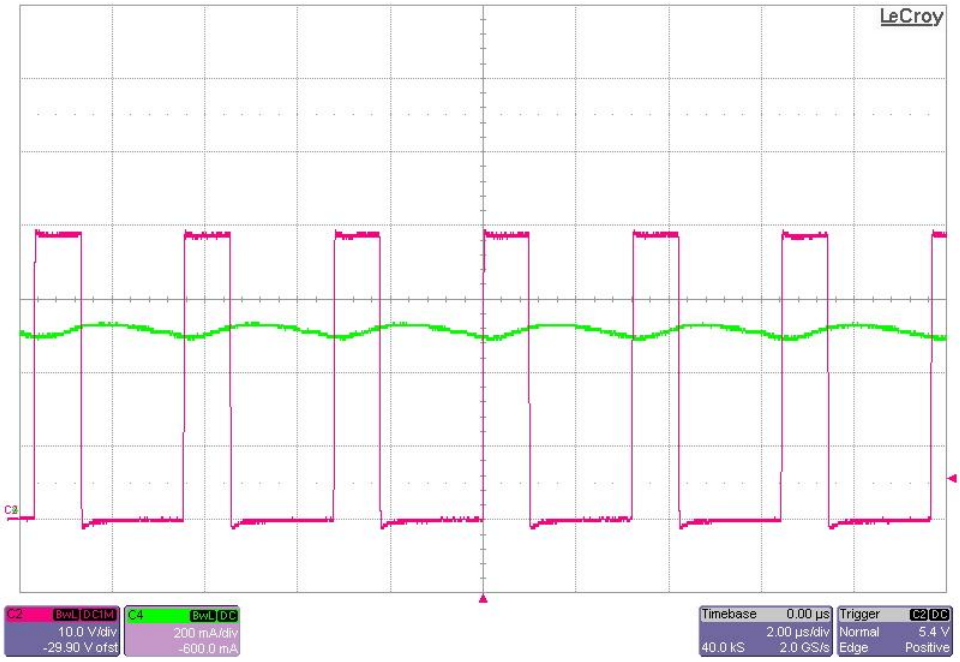


4 Switch Node Waveforms

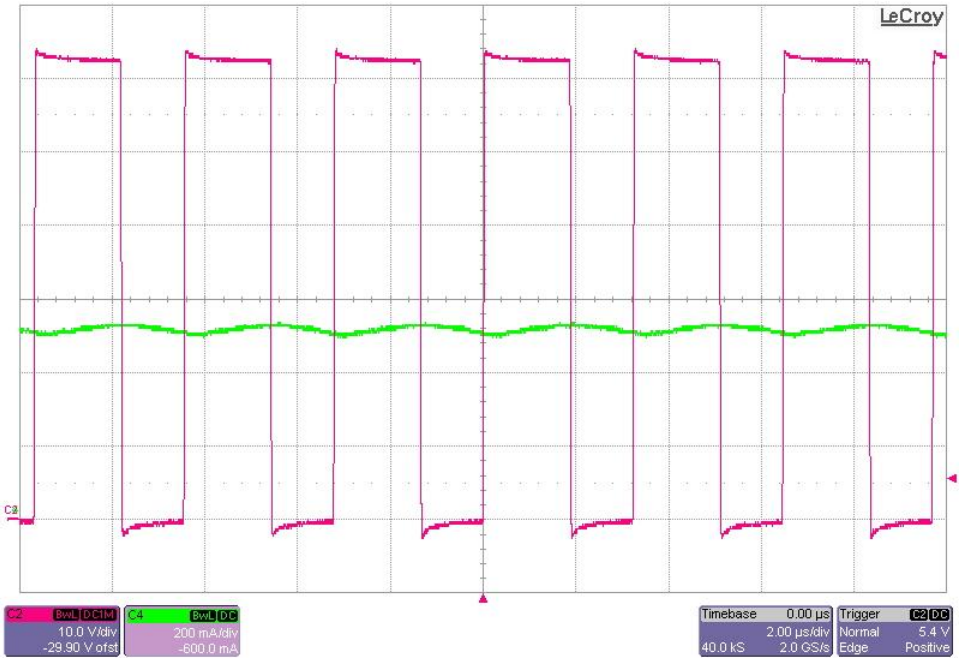
The photo below shows the (Q1) FET switch node and the LED current. The image was taken with an output of 8 LEDs and regulated to 0.515A. The input voltage was set to 6V. (10V/DIV, 200mA/DIV, 2uS/DIV)



The photo below shows the (Q1) FET switch node and the LED current. The image was taken with an output of 8 LEDs and regulated to 0.515A. The input voltage was set to 12V. (10V/DIV, 200mA/DIV, 2uS/DIV)

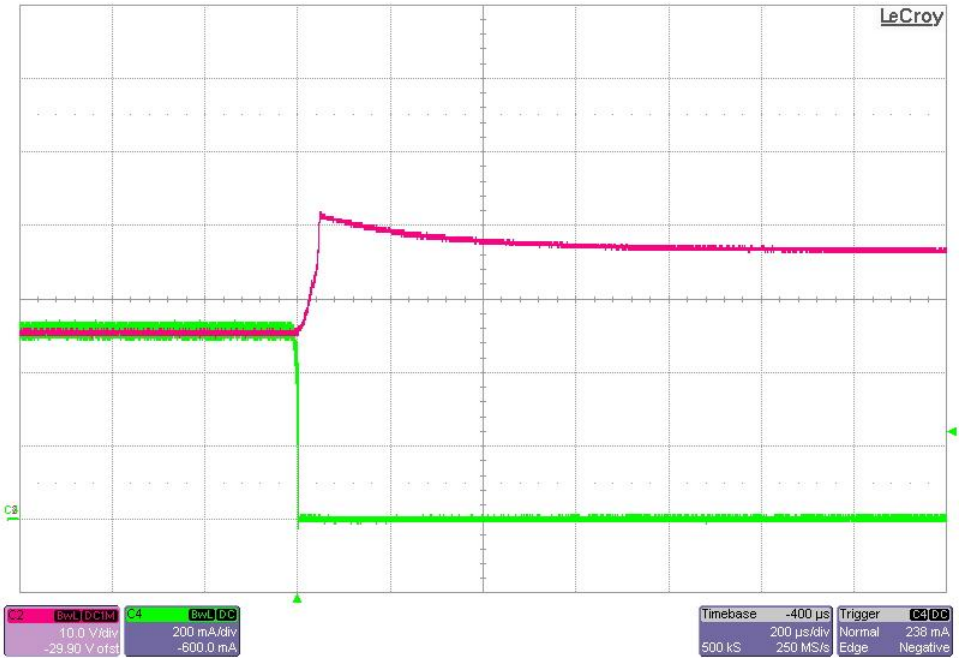


The photo below shows the (Q1) FET switch node and the LED current. The image was taken with an output of 8 LEDs and regulated to 0.515A. The input voltage was set to 36V. (10V/DIV, 200mA/DIV, 2uS/DIV)

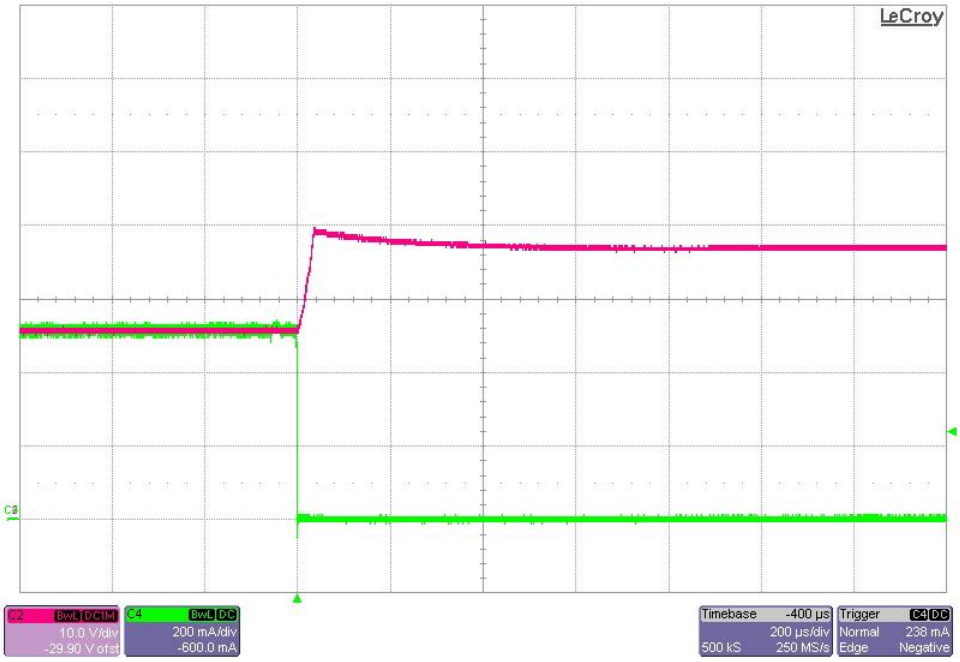


5 Open LED Test

The photo below shows the LED Anode voltage (with respect to ground) and the LED current during an open LED test. The image was taken with an output of 8 LEDs and regulated to 0.515A. The input voltage was set to 12V. (10V/DIV, 200mA/DIV, 200uS/DIV)



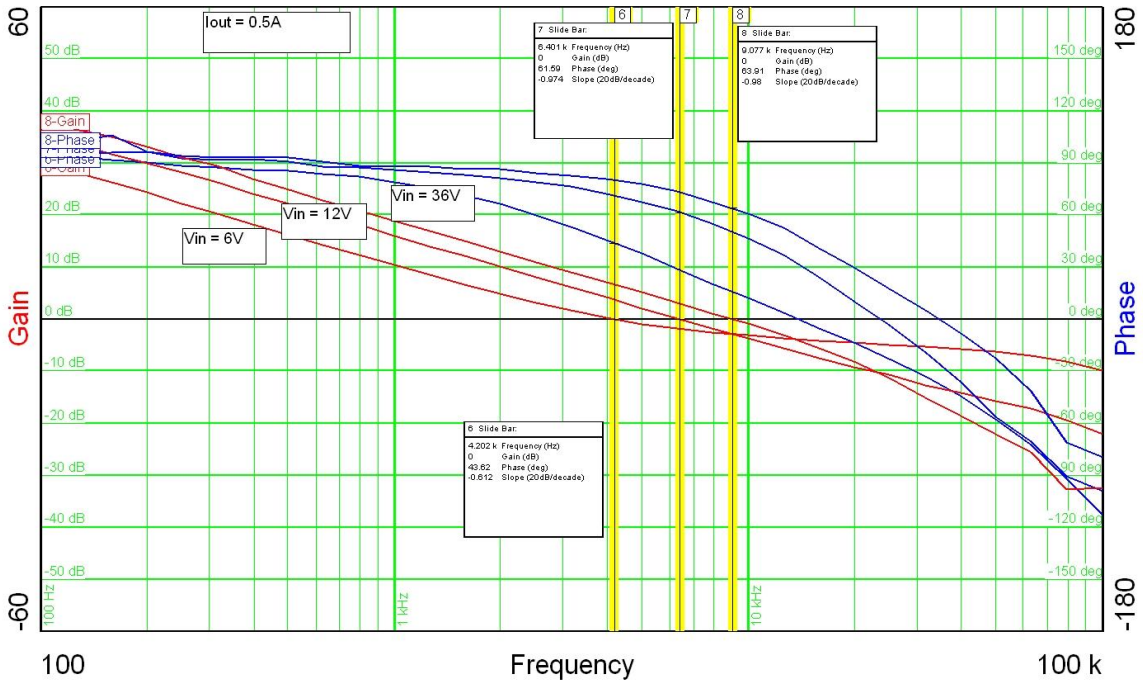
The photo below shows the LED Anode voltage (with respect to ground) and the LED current during an open LED test. The image was taken with an output of 8 LEDs and regulated to 0.515A. The input voltage was set to 36V. (10V/DIV, 200mA/DIV, 200uS/DIV)



6 Control Loop Gain / Stability

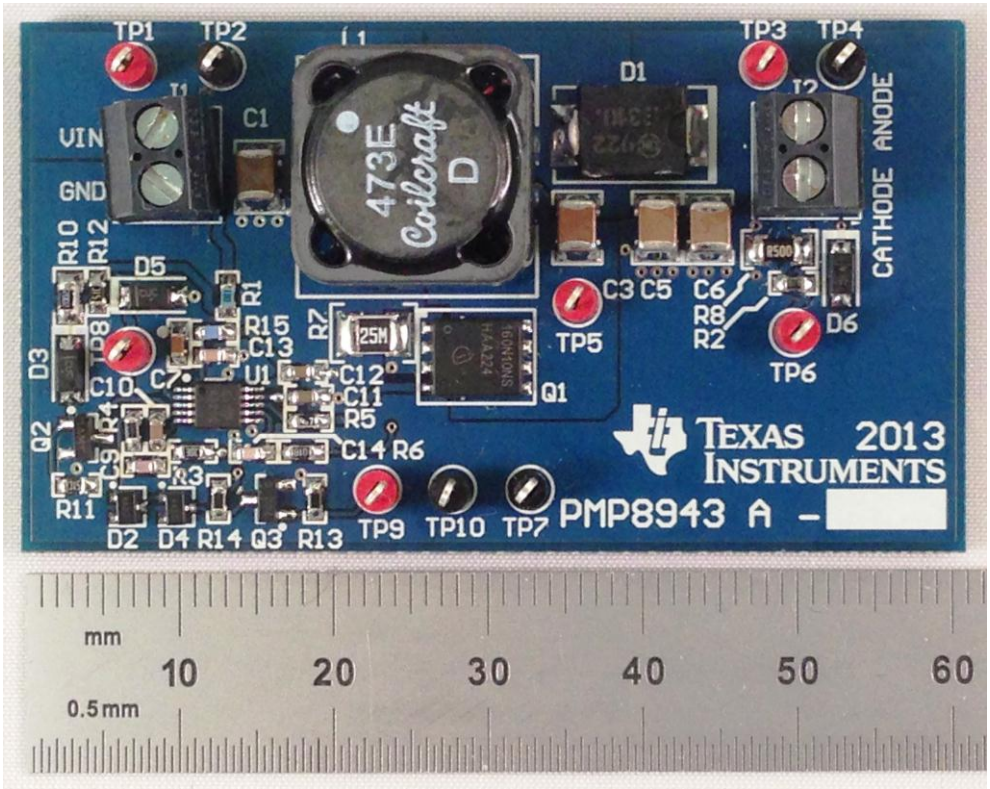
The plot below shows the loop gain and phase margin with 8 LEDs regulated to 0.515A. The input voltage was set to 6V, 12V, and 36V. An aluminum input cap was added to lower the input impedance.

Band Width = 9.1KHz,	Phase Margin = 64 degrees	(Vin = 36V)
Band Width = 6.4KHz,	Phase Margin = 62 degrees	(Vin = 12V)
Band Width = 4.2KHz,	Phase Margin = 44 degrees	(Vin = 6V)



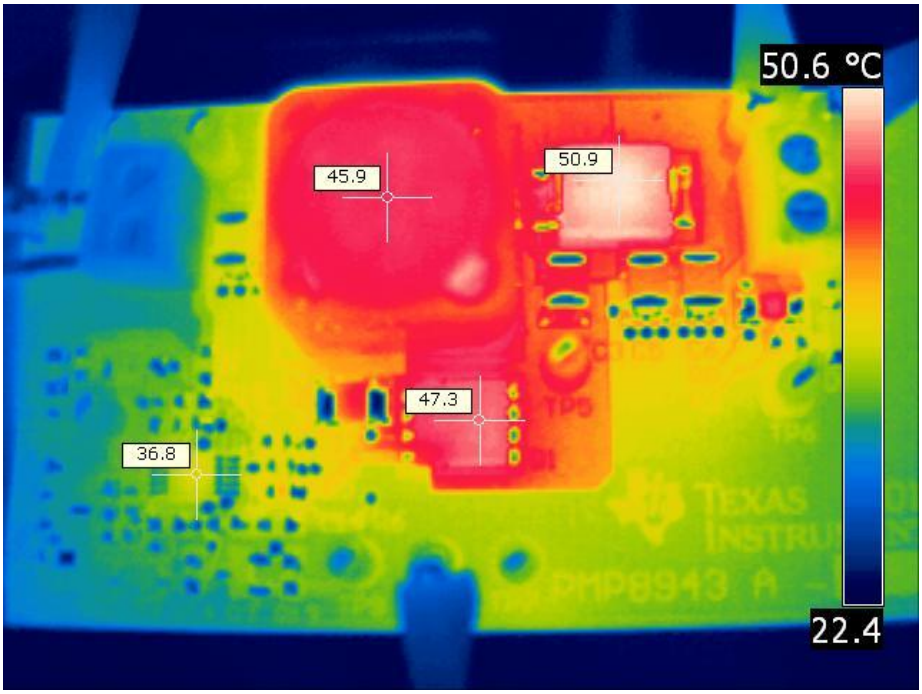
7 Photo

The photo below shows the PMP8943 REVA assy.



8 Thermal Image

A thermal image is shown below driving 8 LEDs at 12V input and 0.515A output, with no airflow.



IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale (https:www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265