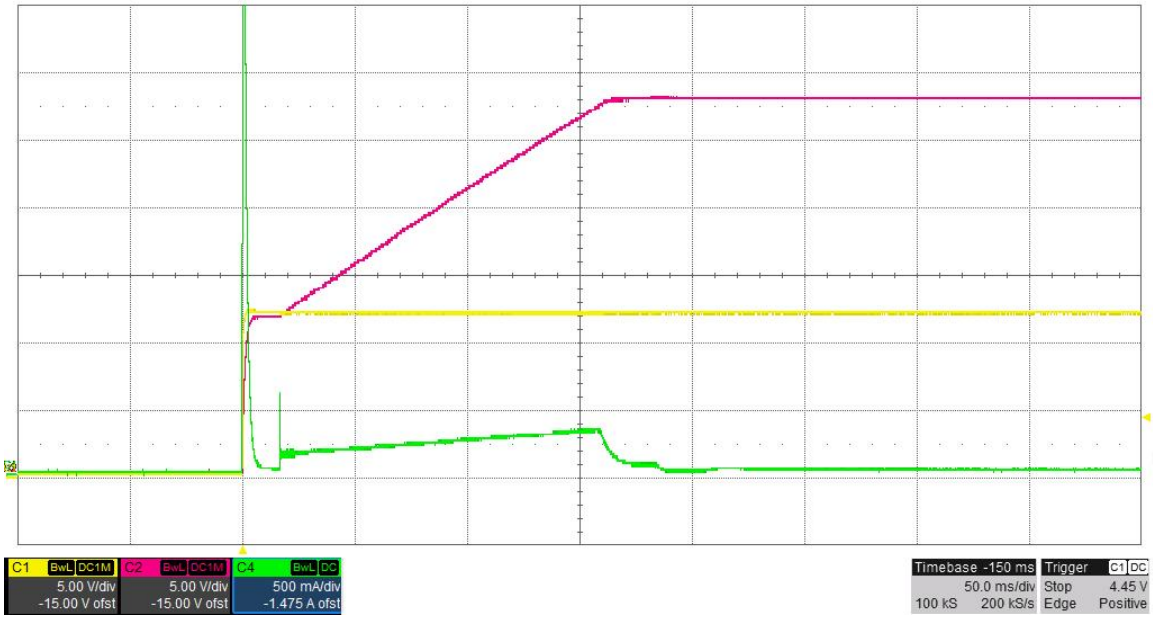
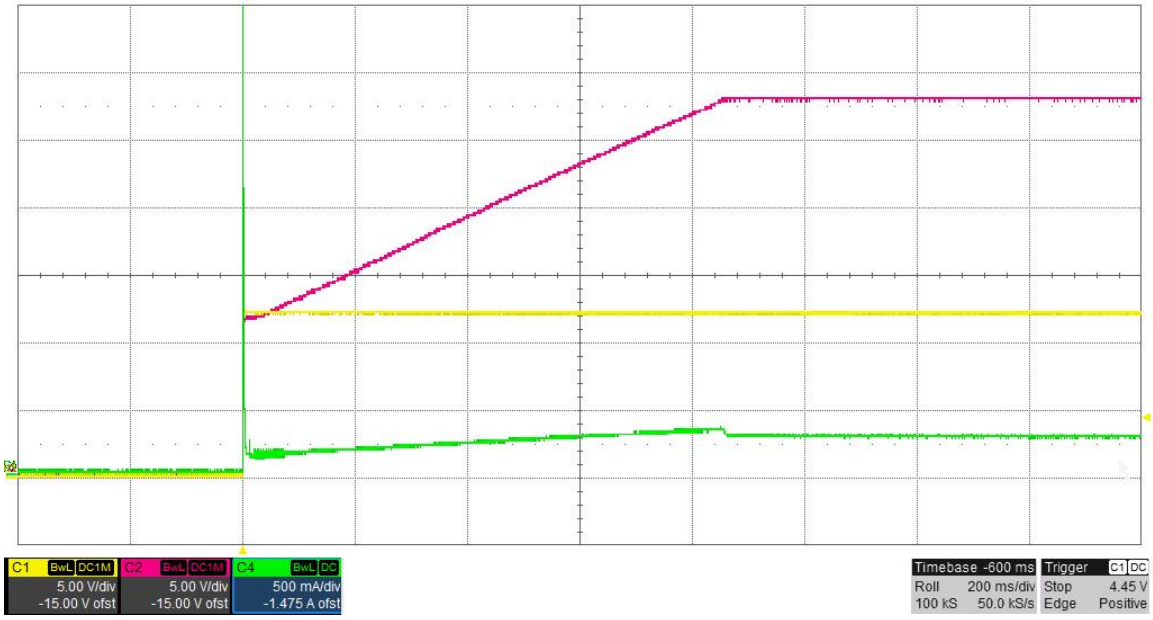
1 Startup

The photo below shows the output voltage startup waveform after the application of 12V in with the 28V output loaded to 0A. The input current is shown in green. (5V/DIV, 500mA/DIV, 50mS/DIV)

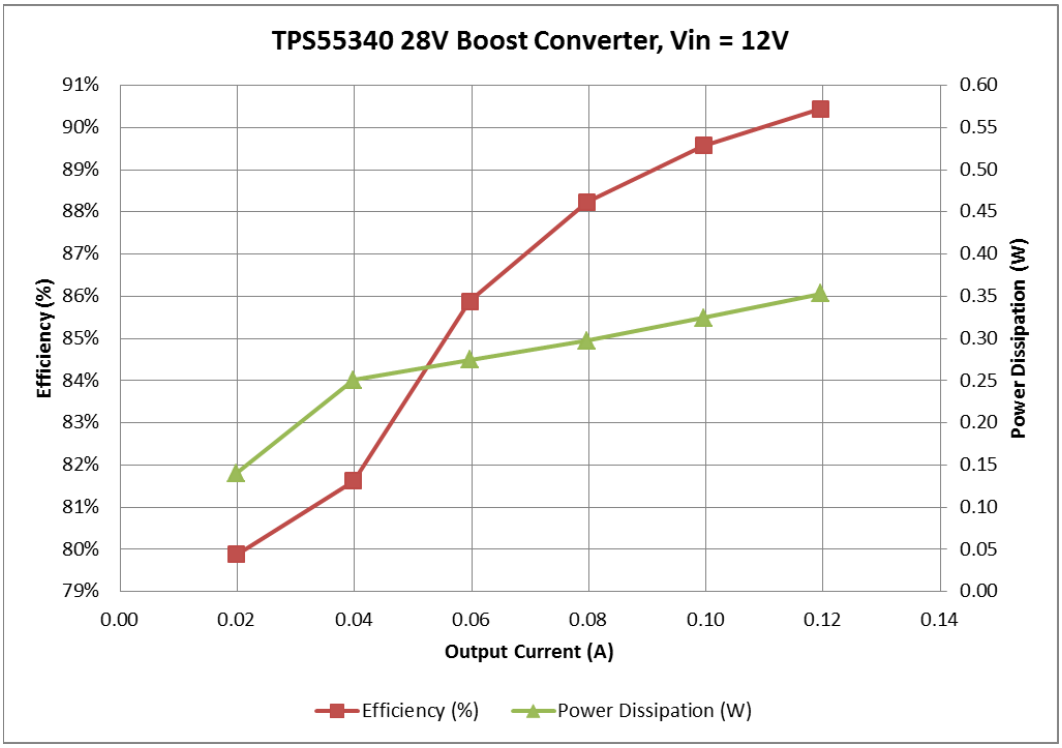


The photo below shows the output voltage startup waveform after the application of 12V in with the 28V output loaded to 0.10A. The input current is shown in green. (5V/DIV, 500mA/DIV, 50mS/DIV)



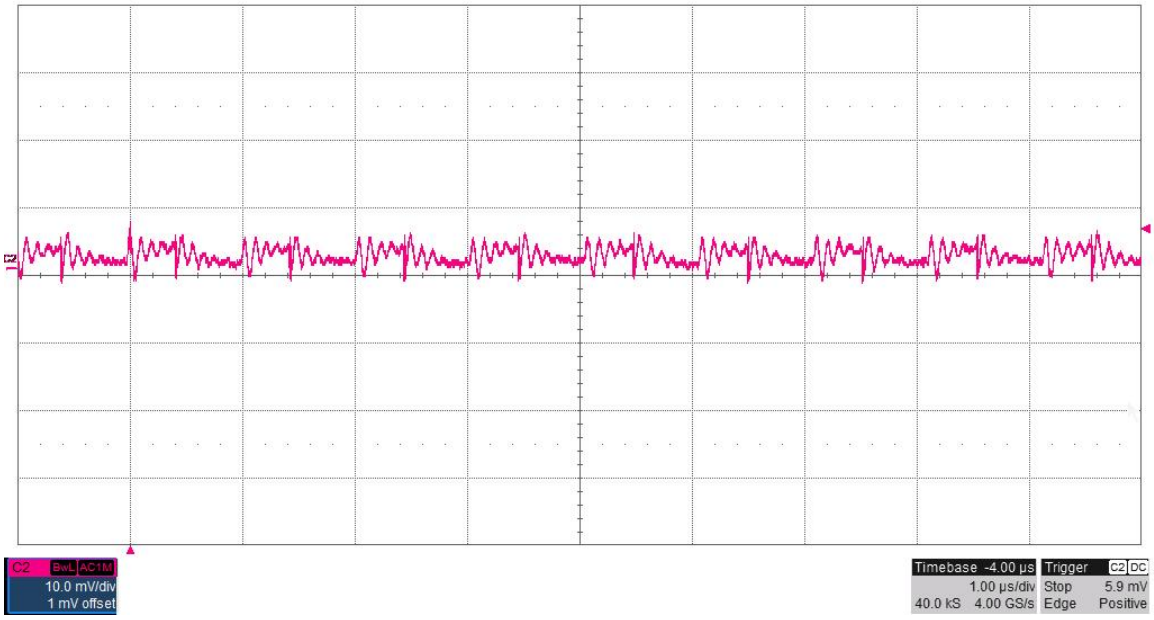
2 Efficiency

The TPS55340 28V@0.12A boost converter efficiency is shown in the figure below. The converter is operating in voltage regulation mode.



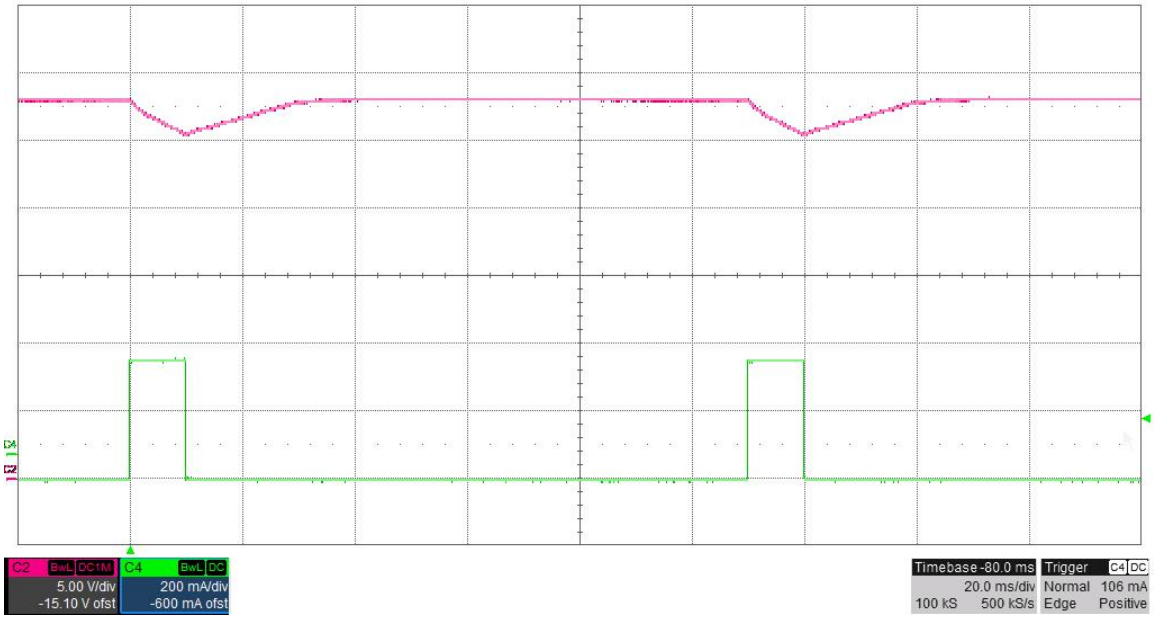
3 Output Ripple Voltage

The output ripple voltage is shown in the figure below. The image was taken with the 28V output loaded to 0.12A and the input voltage set to 12V. (10mV/DIV, 1uS/DIV)

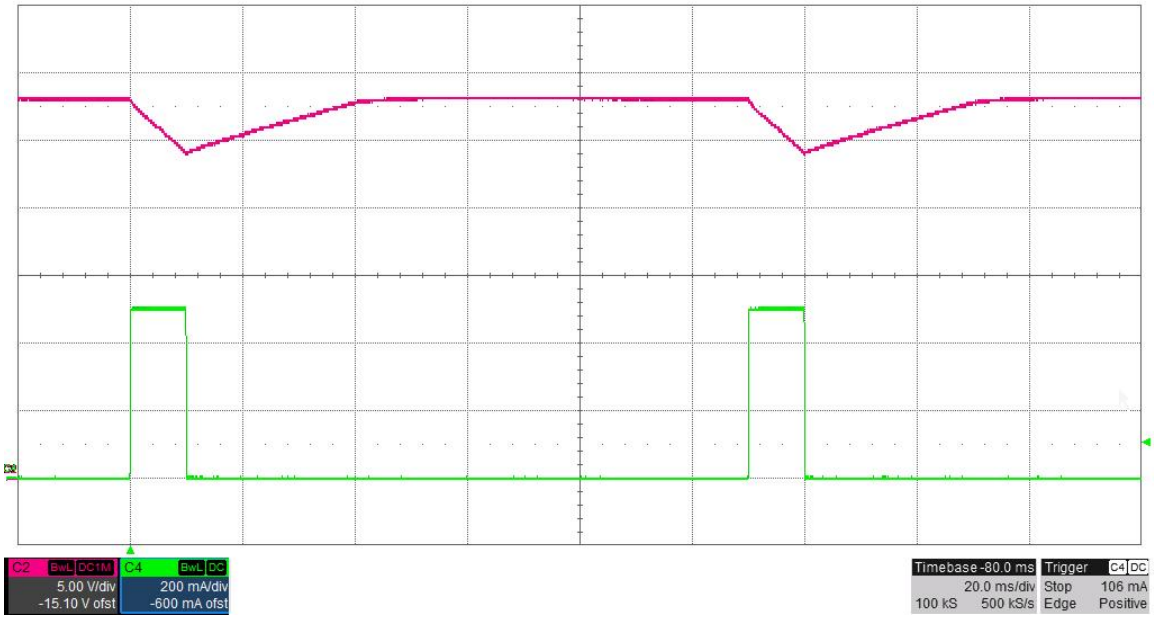


4 Load Transients

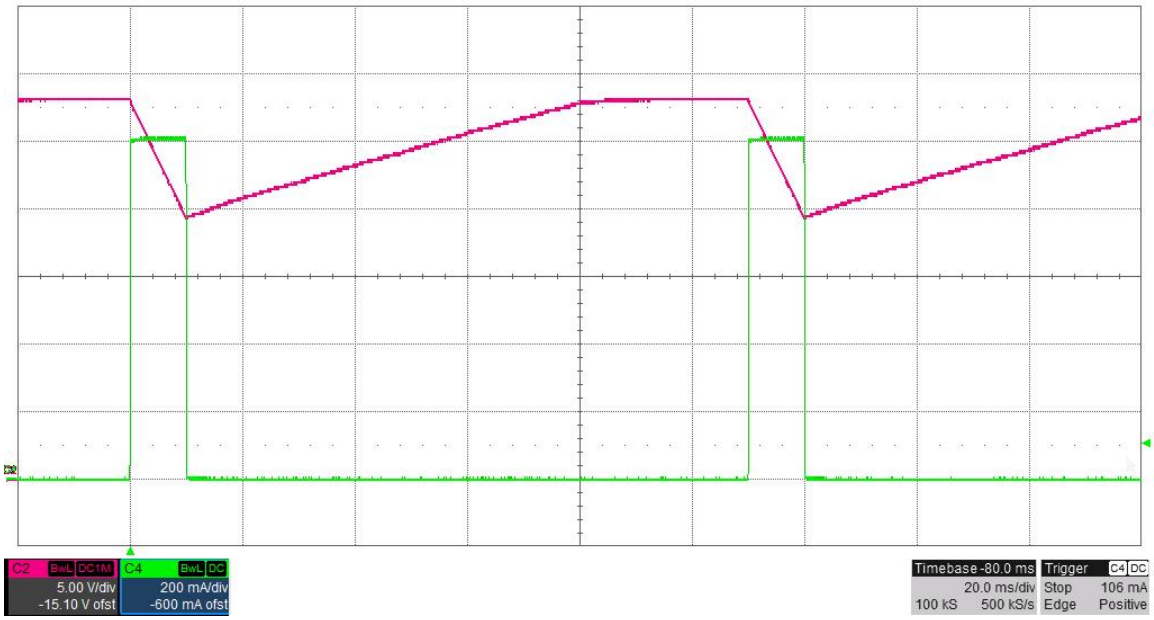
The photo below shows the output voltage when the load current is stepped between 0A and 0.35A.
Vin = 12V. (5V/DIV, 200mA/DIV, 20mS/DIV)



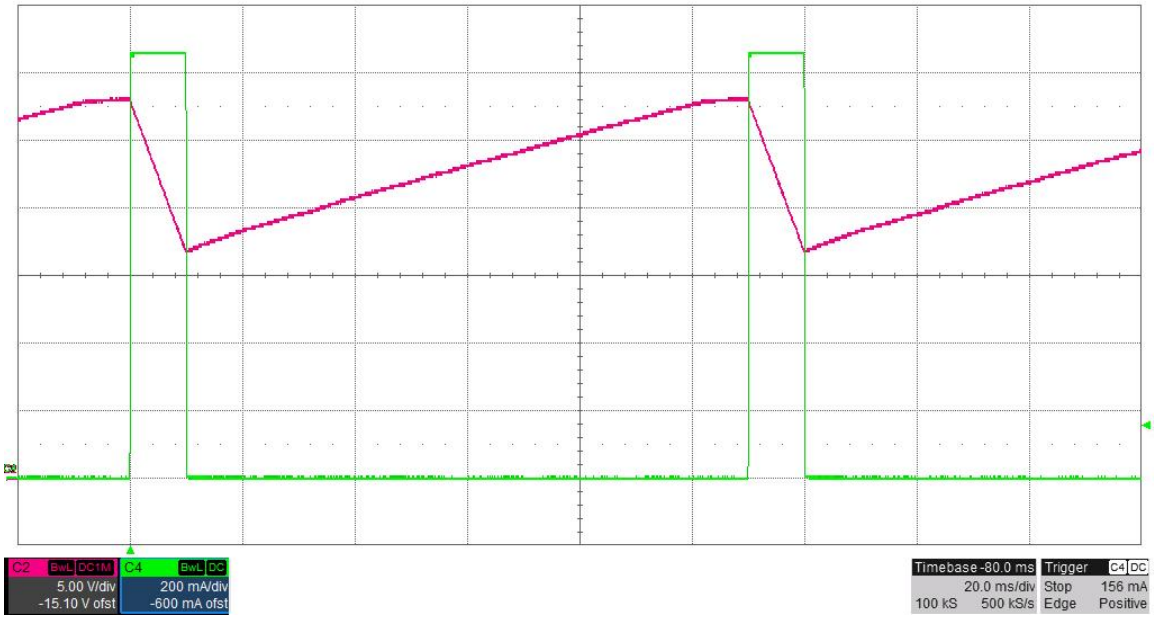
The photo below shows the output voltage when the load current is stepped between 0A and 0.5A.
Vin = 12V. (5V/DIV, 200mA/DIV, 20mS/DIV)



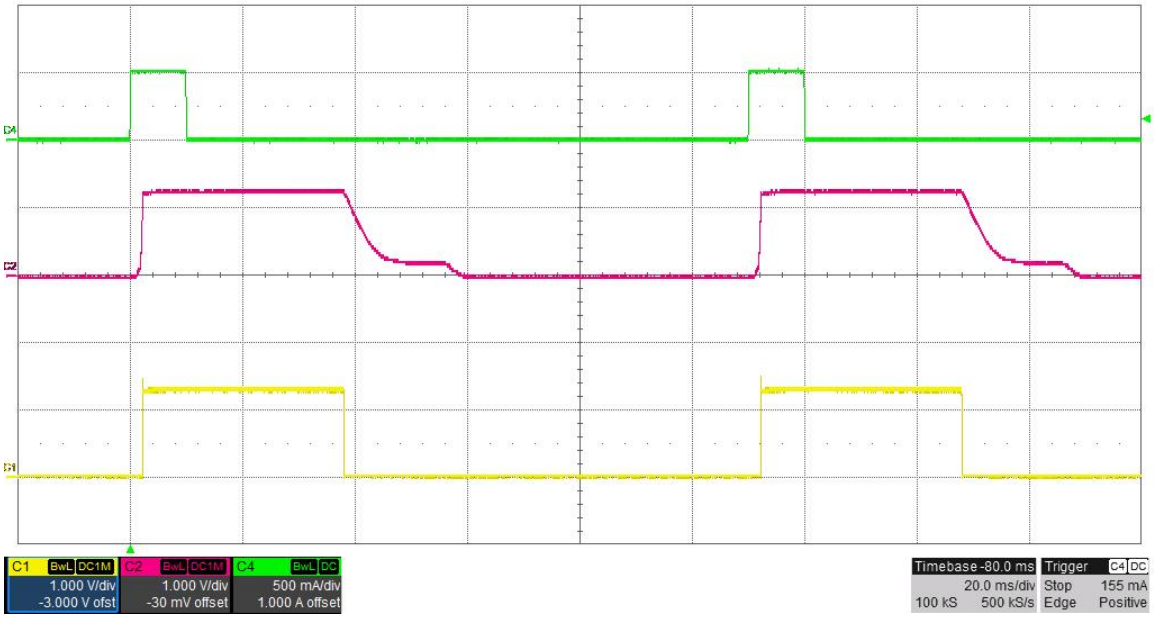
The photo below shows the output voltage when the load current is stepped between 0A and 1A.
Vin = 12V. (5V/DIV, 200mA/DIV, 20mS/DIV)



The photo below shows the output voltage when the load current is stepped between 0A and 1.25A.
Vin = 12V. (5V/DIV, 200mA/DIV, 20mS/DIV)

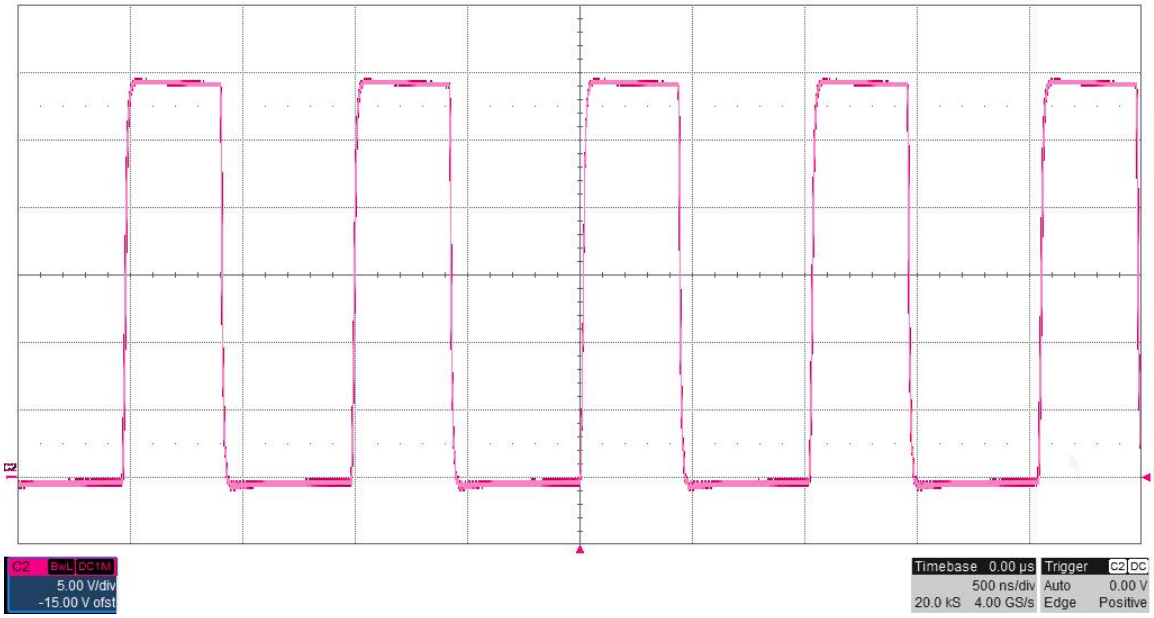


The photo below shows the output voltage when the load current is stepped between 0A and 0.35A. Vin = 12V. Ch2 is the voltage at R2 (output of INA139). Ch1 is the voltage at diode D2 Anode. The current loop is in control when Vout is less than 28V. (1V/DIV, 500mA/DIV, 20mS/DIV)

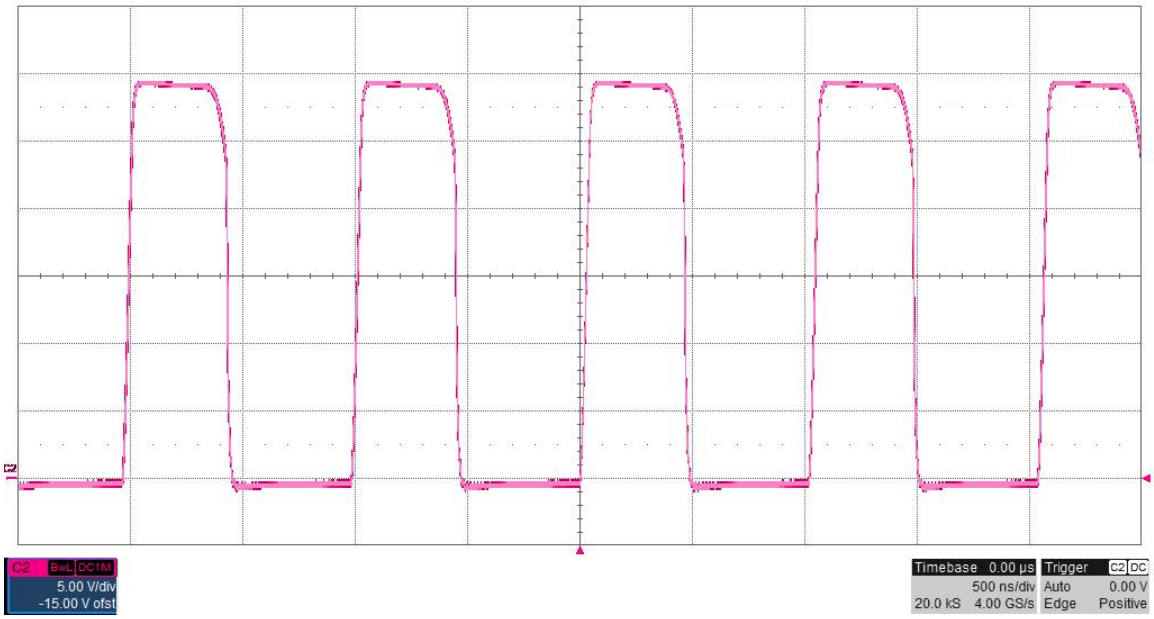


5 Switch Node Waveforms

The photo below shows the switch node voltage (SW pin). The input voltage is 12V and the 28V output is loaded to 0.12A. (5V/DIV, 500nS/DIV)



The photo below shows the switch node voltage (SW pin). The input voltage is 12V and the 28V output is loaded to 0.025A. The converter is operating in discontinuous conduction mode. (5V/DIV, 500nS/DIV)

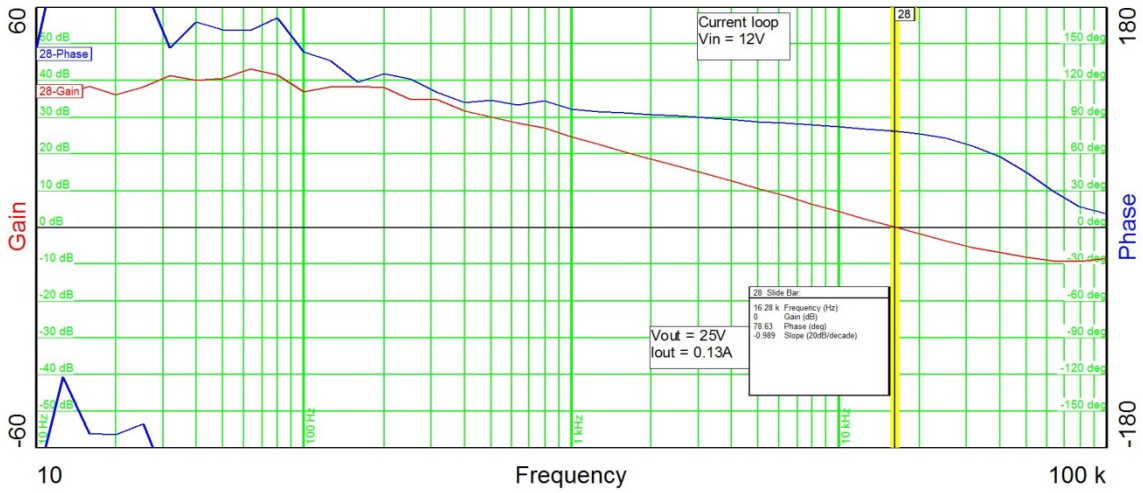


The photo below shows the switch node voltage (SW pin). The input voltage is 12V and the 28V output is loaded to 0A. The converter is operating in discontinuous conduction mode. (5V/DIV, 500nS/DIV)

6 Control Loop Gain / Stability

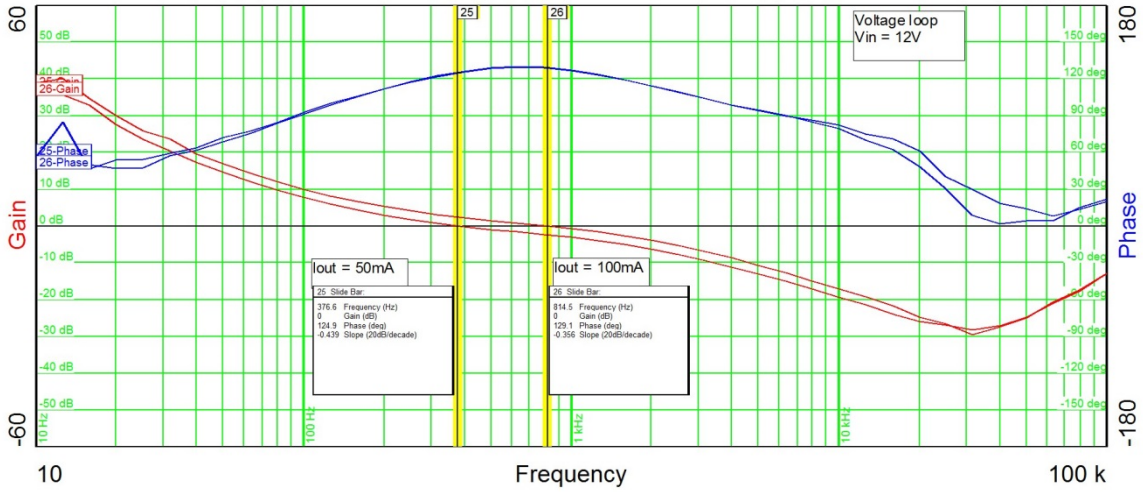
The plot below shows the boost converter's loop gain and phase margin when the 28V output is loaded to 0.13A. The converter is regulating the output **current** with Vout ~ 25V.

Vin = 12V Band Width = 16.3KHz Phase Margin = 79 degrees



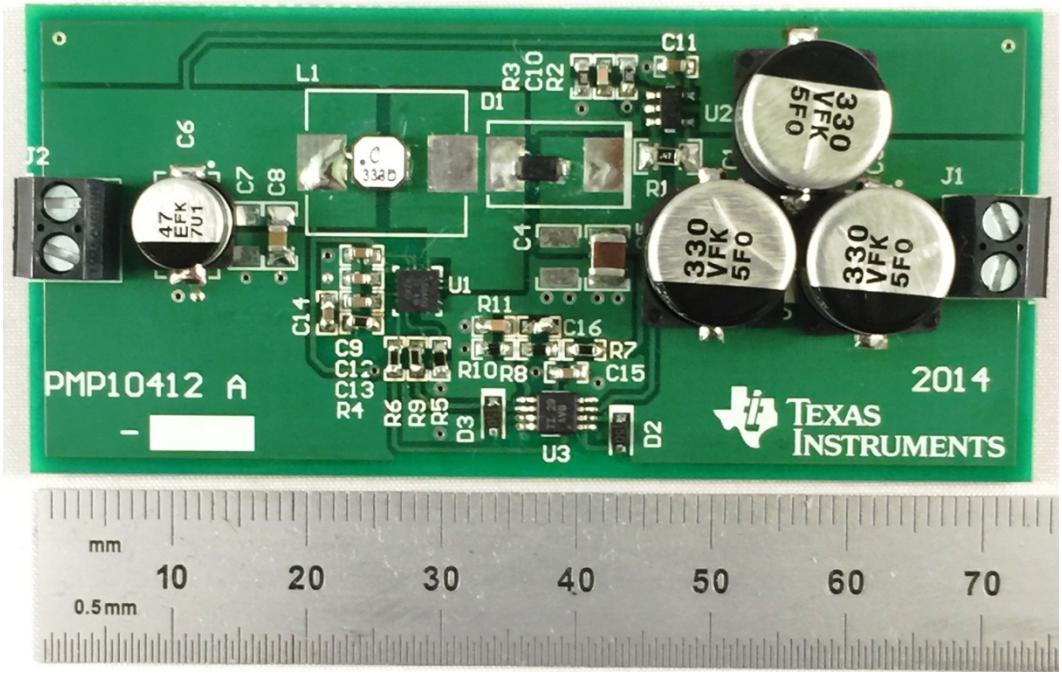
The plot below shows the boost converter's loop gain and phase margin when the 28V output is loaded to 0.05A and 0.10A. The converter is regulating the output **voltage**.

Vin = 12V (Iout = 50mA) Band Width = 377Hz Phase Margin = 125 degrees
Vin = 12V (Iout = 100mA) Band Width = 815Hz Phase Margin = 129 degrees



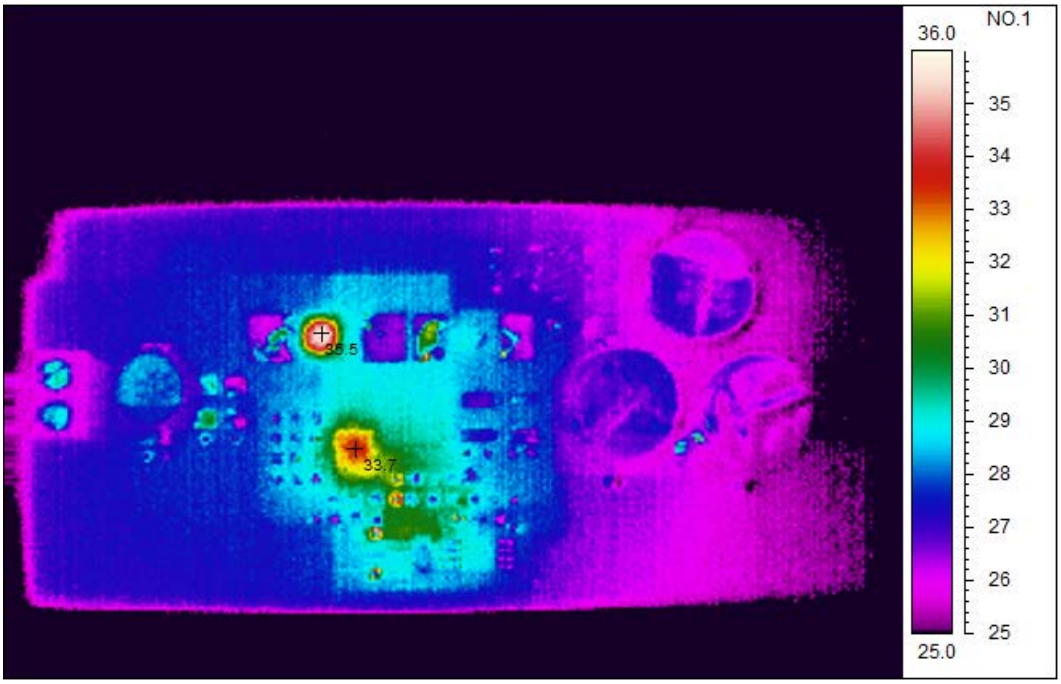
7 Photo

The photo below shows the PMP11228 REVB assy built on the PMP10412 REVA PWB.



8 Thermal Image

The thermal image below shows sustained operation while at a 12V input and 0.12A output, with no airflow.



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