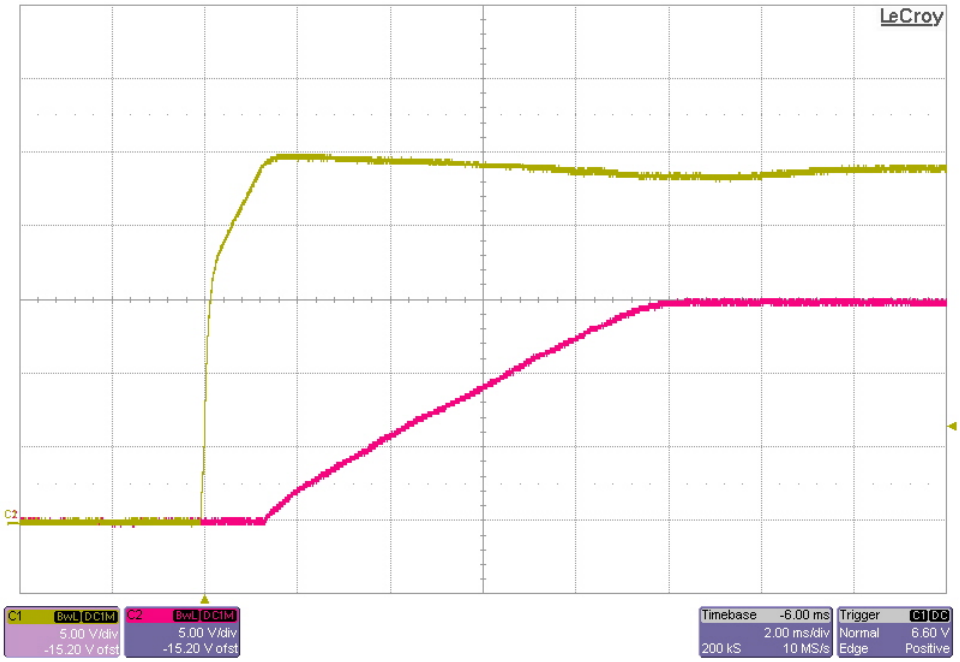
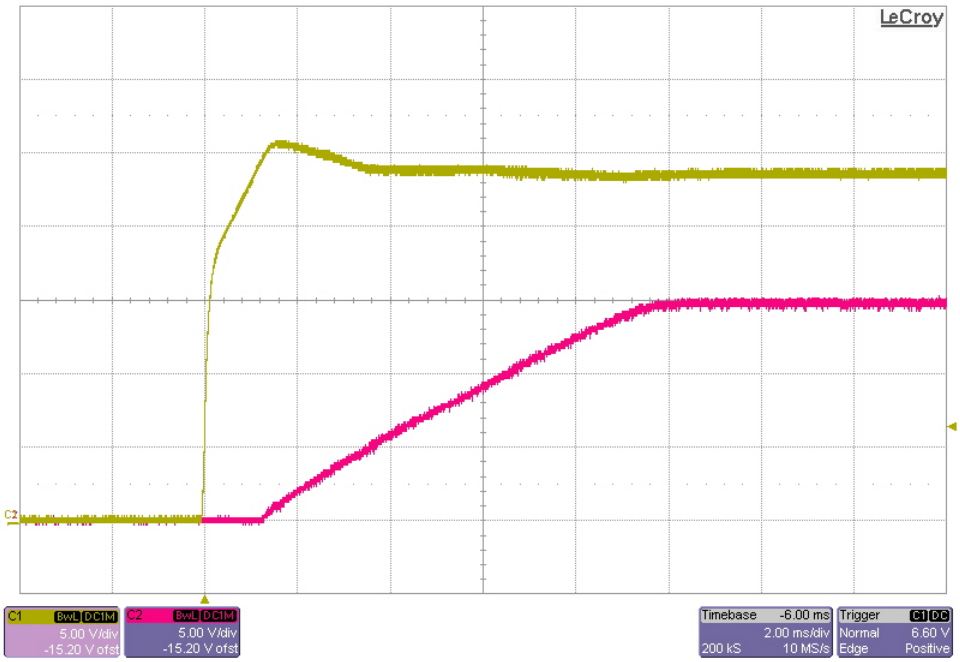
1 Startup

The photo below shows the output voltage startup waveform after the application of 24V in. The 15V output was loaded to 0A. (5V/DIV, 2mS/DIV)

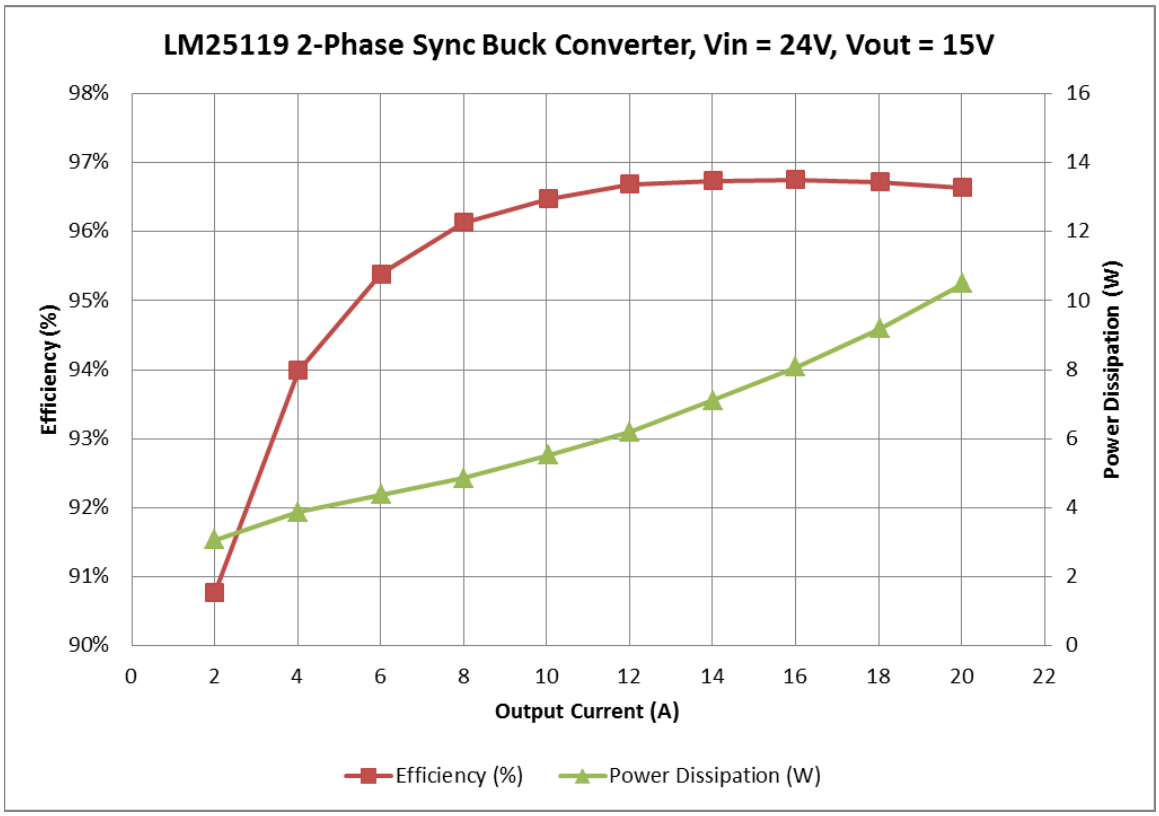


The photo below shows the output voltage startup waveform after the application of 24V in. The 15V output was loaded to 20A. (5V/DIV, 2mS/DIV)



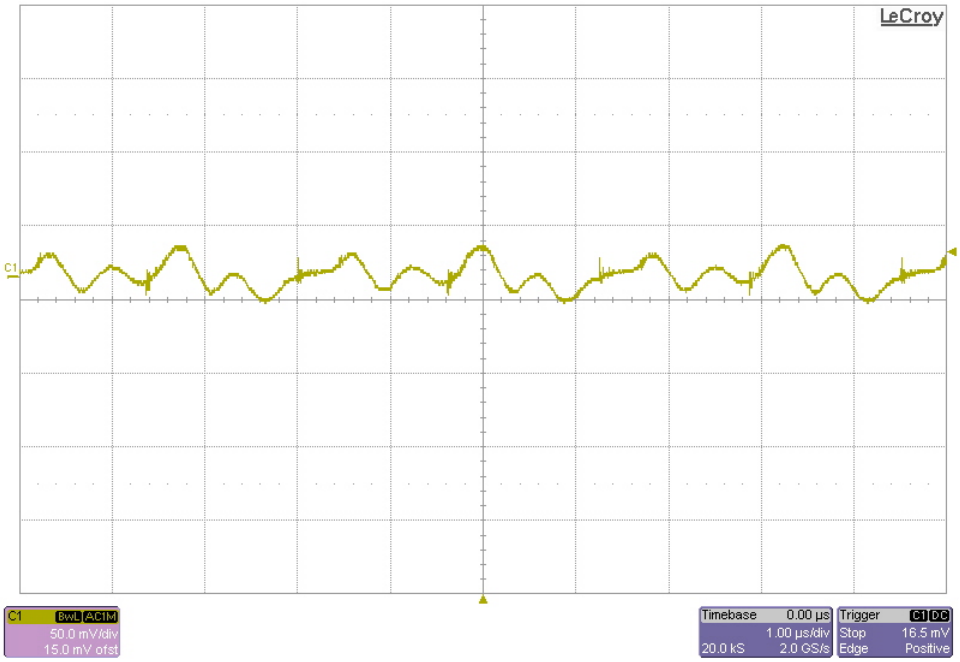
2 Efficiency

The converter efficiency is shown below.

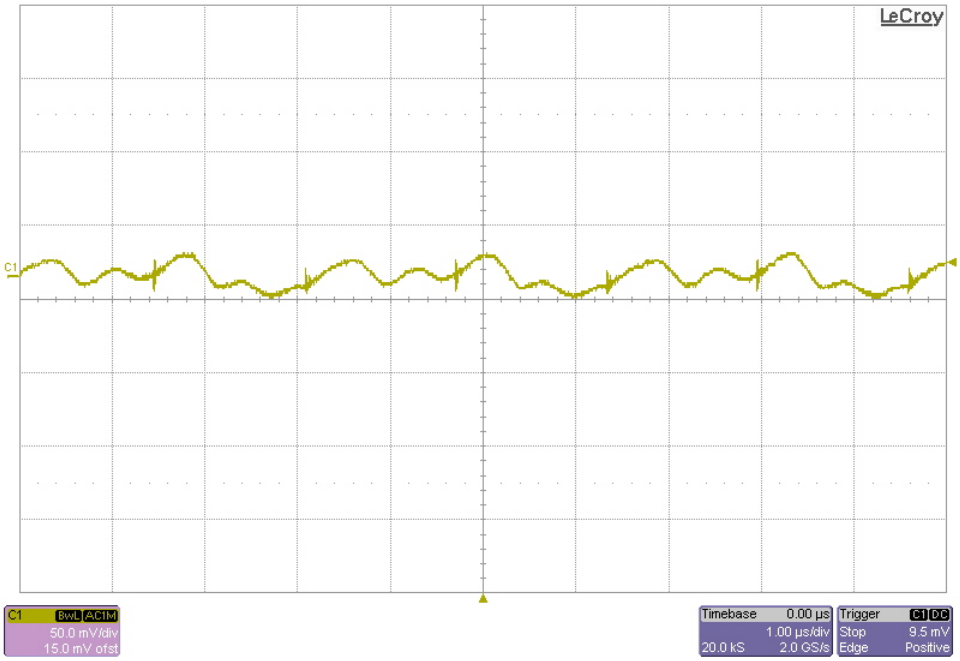


3 Output Ripple Voltage

The 15V output ripple voltage (AC coupled) is shown in the figure below. The image was taken with the output loaded to 20A. The input voltage is set to 24V. (50mV/DIV, 1uS/DIV)

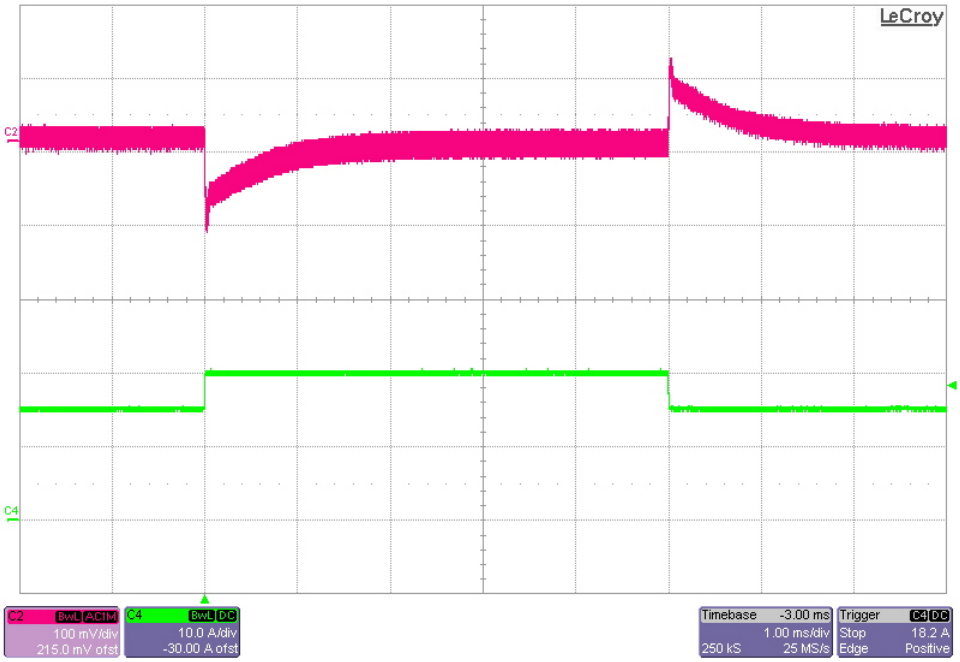


The 15V output ripple voltage (AC coupled) is shown in the figure below. The image was taken with the output loaded to 10A. The input voltage is set to 24V. (50mV/DIV, 1uS/DIV)

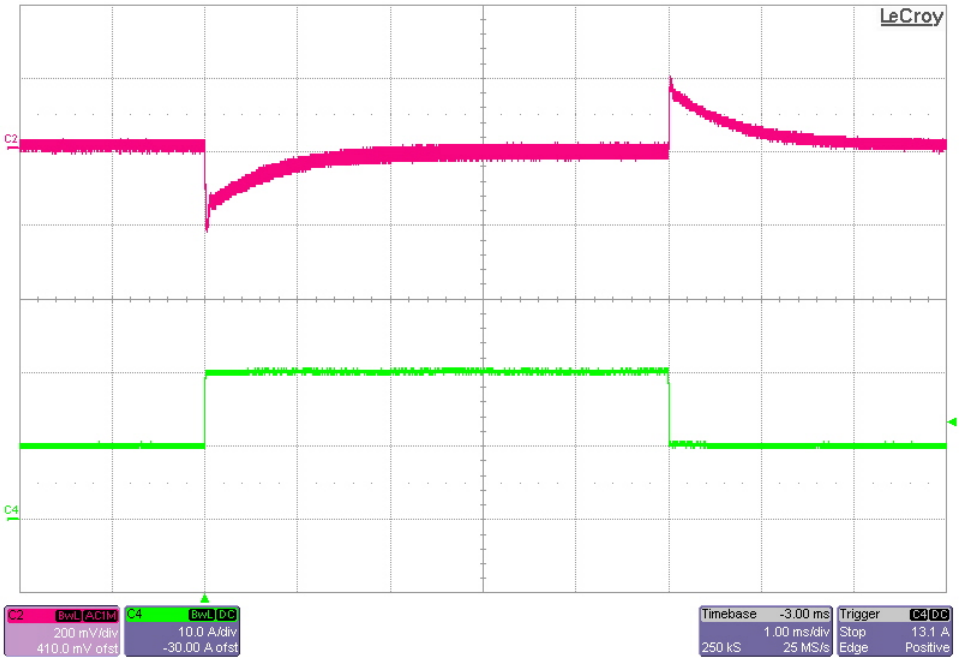


4 Load Transients

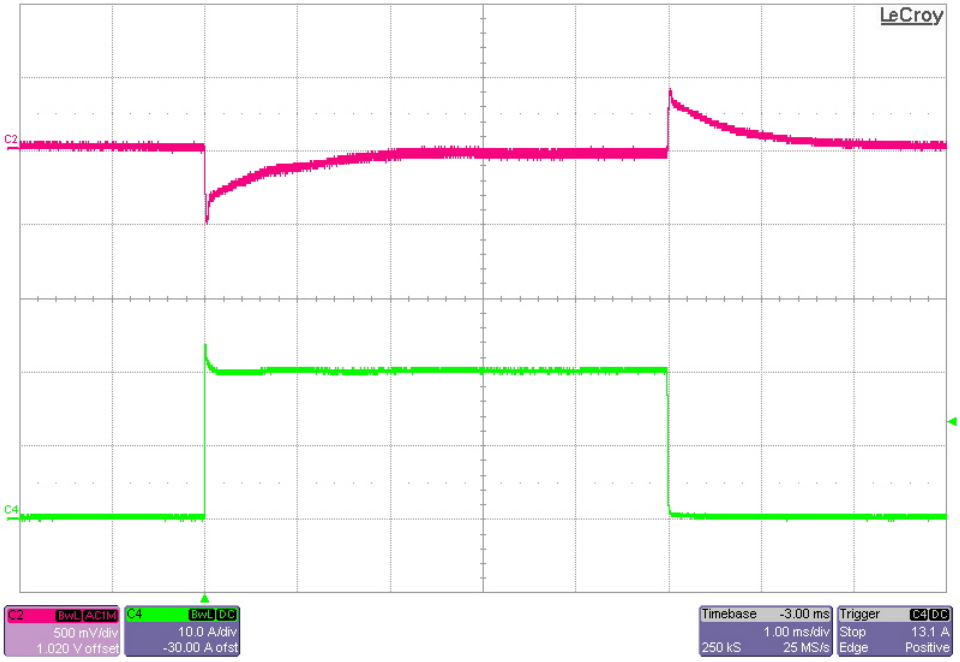
The photo below shows the 15V output voltage (ac coupled) when the load current is stepped between 15A and 20A. Vin = 24V. (100mV/DIV, 10A/DIV, 1mS/DIV)



The photo below shows the 15V output voltage (ac coupled) when the load current is stepped between 10A and 20A. Vin = 24V. (200mV/DIV, 10A/DIV, 1mS/DIV)

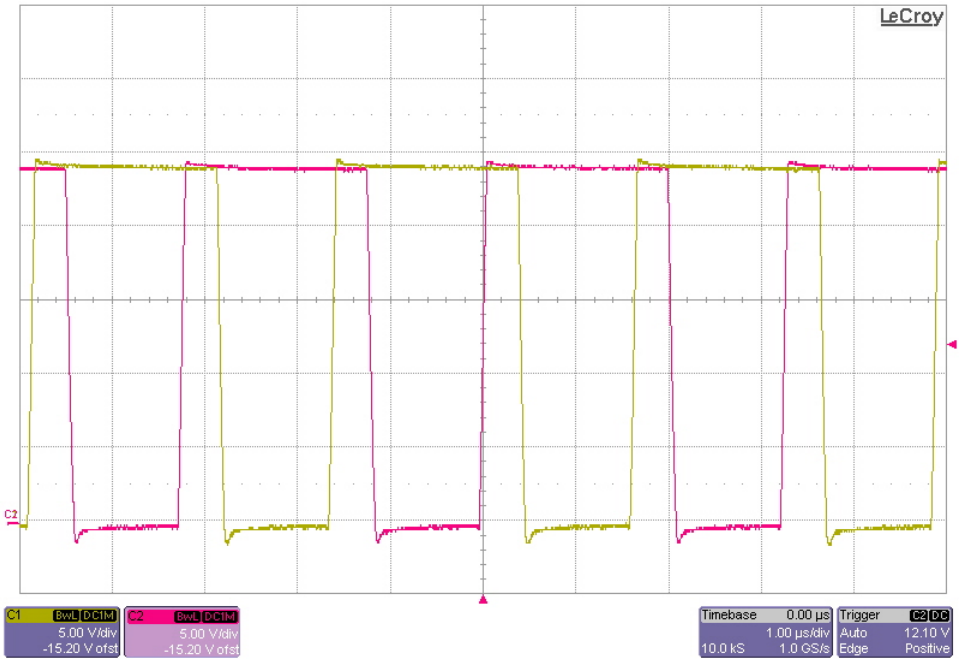


The photo below shows the 15V output voltage (ac coupled) when the load current is stepped between 0A and 20A. Vin = 24V. (500mV/DIV, 10A/DIV, 1mS/DIV)

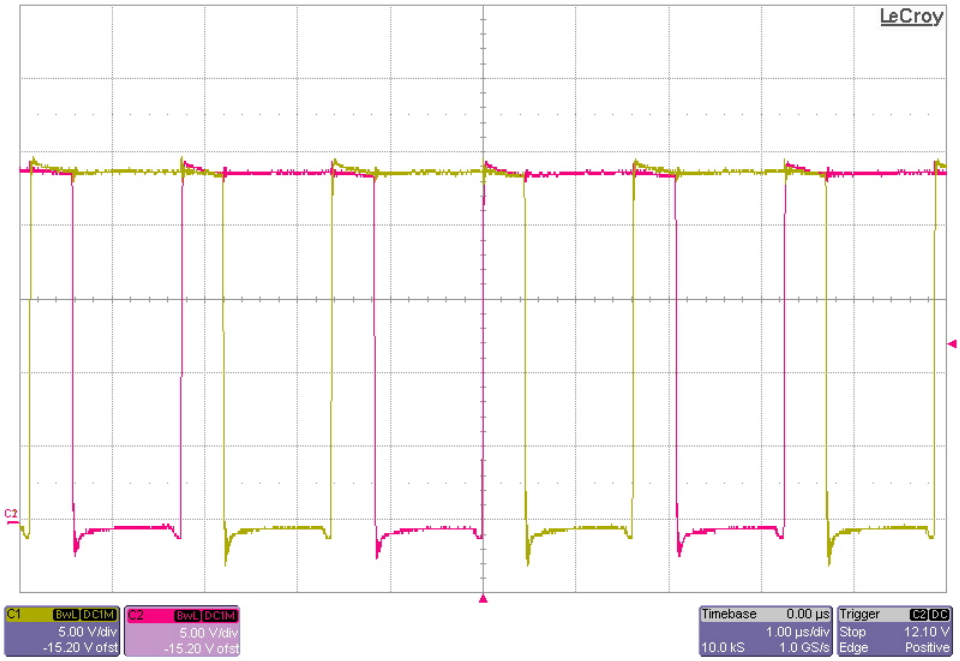


5 Switch Node Waveforms

The photo below shows the FET switching voltages of each phase for an input voltage of 24V and a 0A load. (5V/DIV, 1uS/DIV)

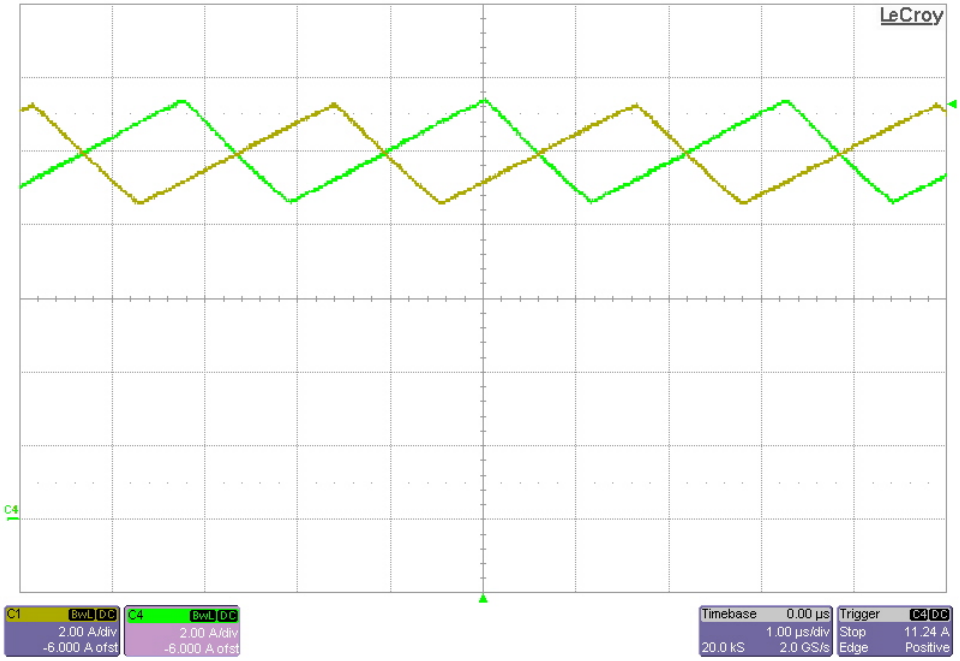


The photo below shows the FET switching voltages of each phase for an input voltage of 24V and a 20A load. (5V/DIV, 1uS/DIV)

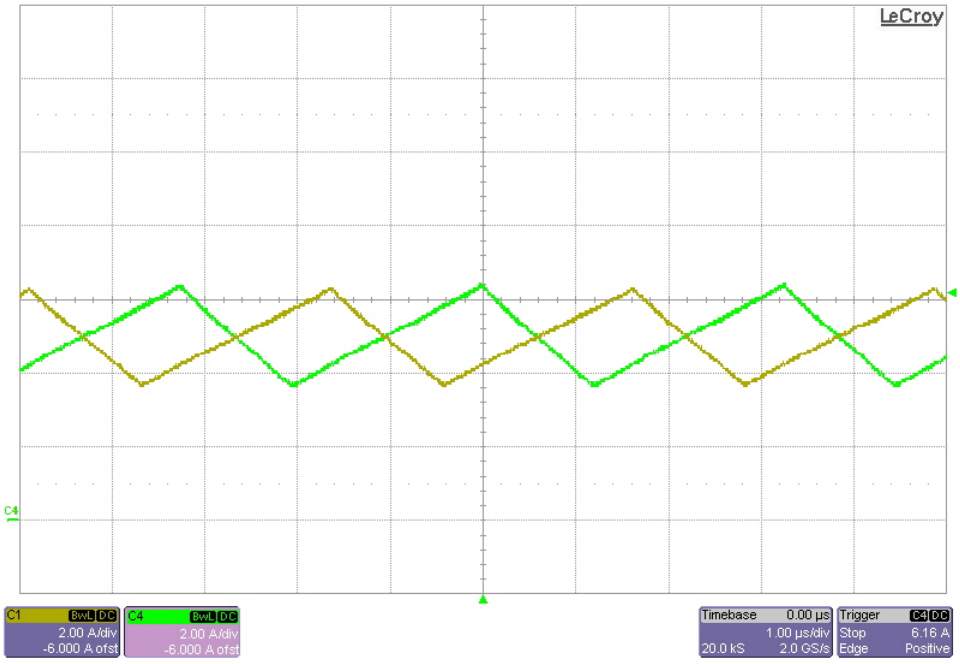


6 Current Balance Waveforms

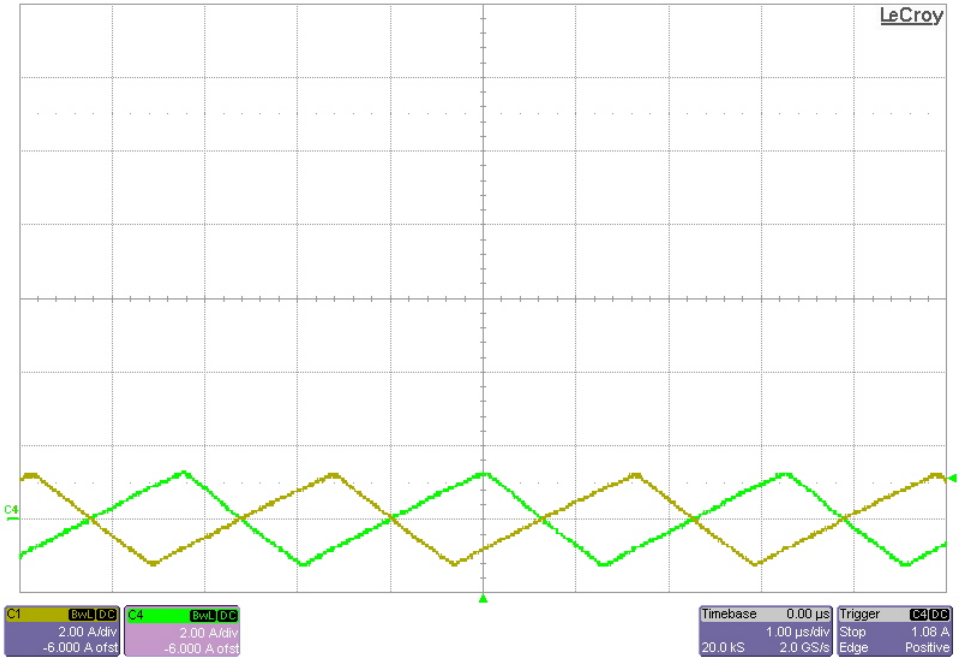
The photo below shows the measured inductor current in each phase. The input voltage was set to 24V with a 20A load. (2A/DIV, 1uS/DIV)



The photo below shows the measured inductor current in each phase. The input voltage was set to 24V with a 10A load. (2A/DIV, 1uS/DIV)



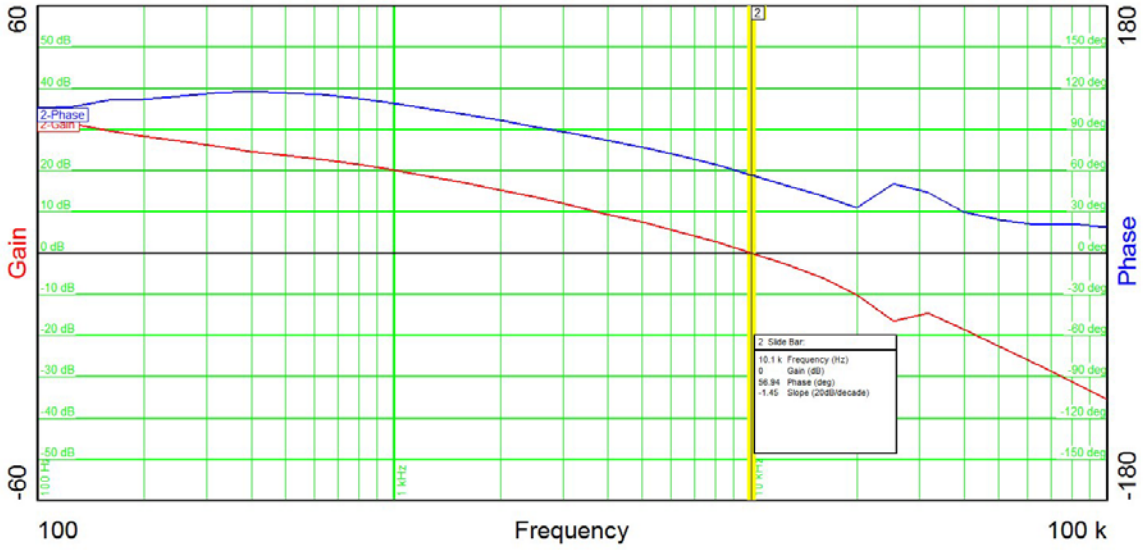
The photo below shows the measured inductor current in each phase. The input voltage was set to 24V with a 0A load. (2A/DIV, 1uS/DIV)



7 Loop Gain

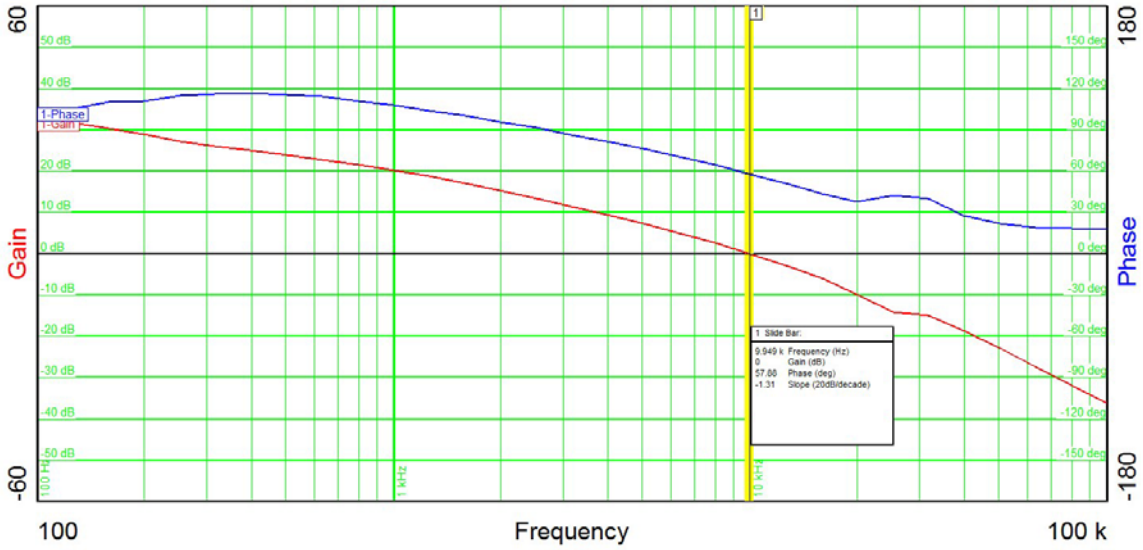
The plot below shows the loop gain with the input voltage set to 24V and for an output load of 20A.

Loop Gain (Vin = 24V) BW: 10.1KHz PM: 57 degrees



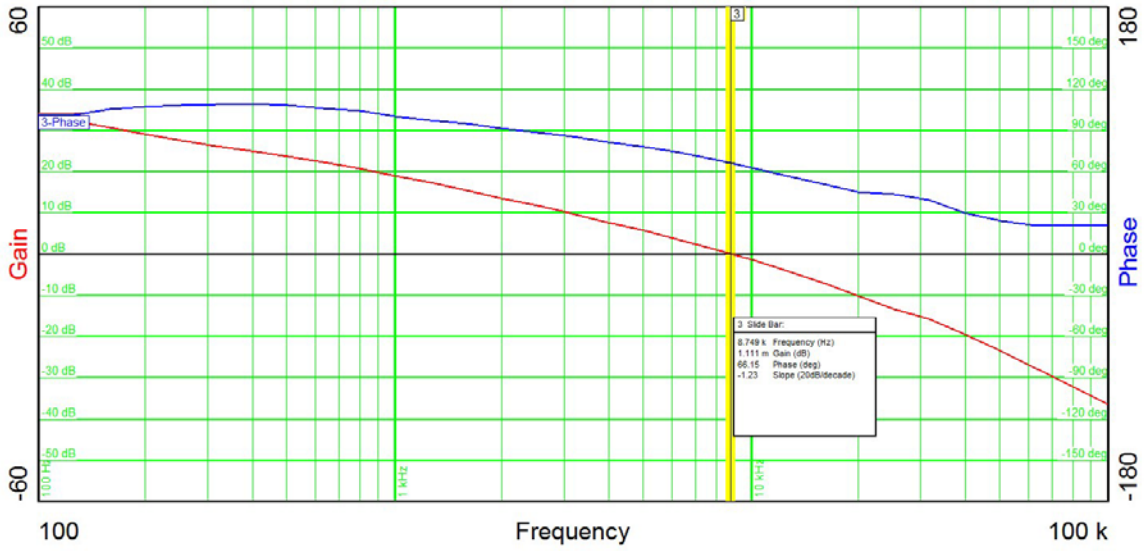
The plot below shows the loop gain with the input voltage set to 24V and for an output load of 10A.

Loop Gain (Vin = 24V) BW: 9.95KHz PM: 58 degrees



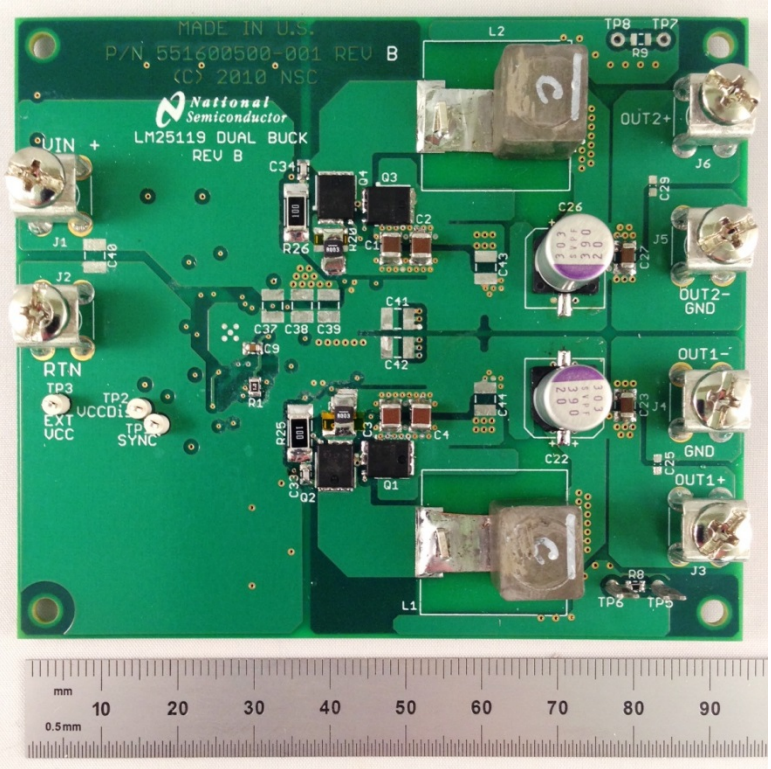
The plot below shows the loop gain with the input voltage set to 24V and for an output load of 0A.

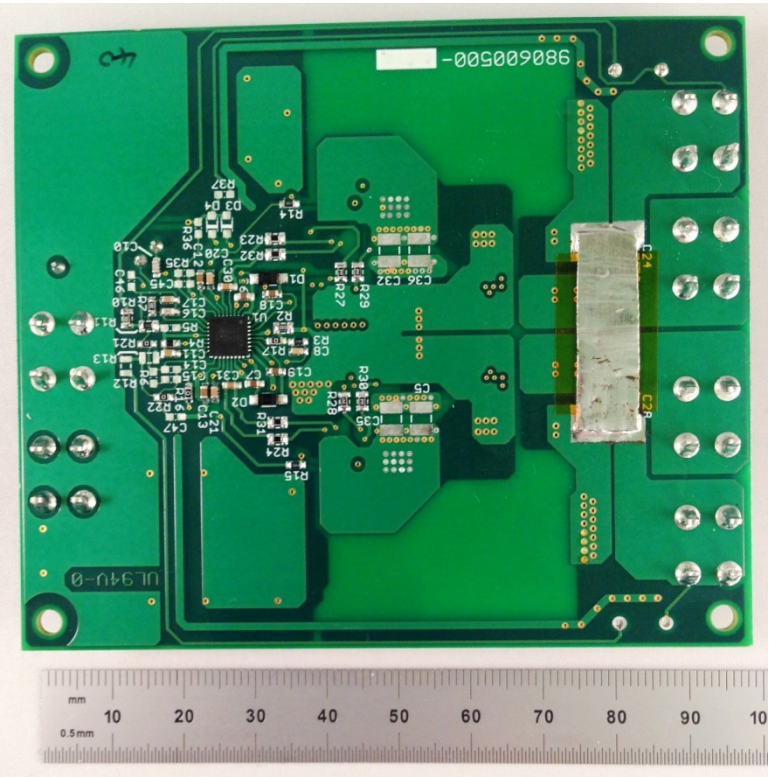
Loop Gain (Vin = 24V) BW: 8.75KHz PM: 66 degrees



8 Photo

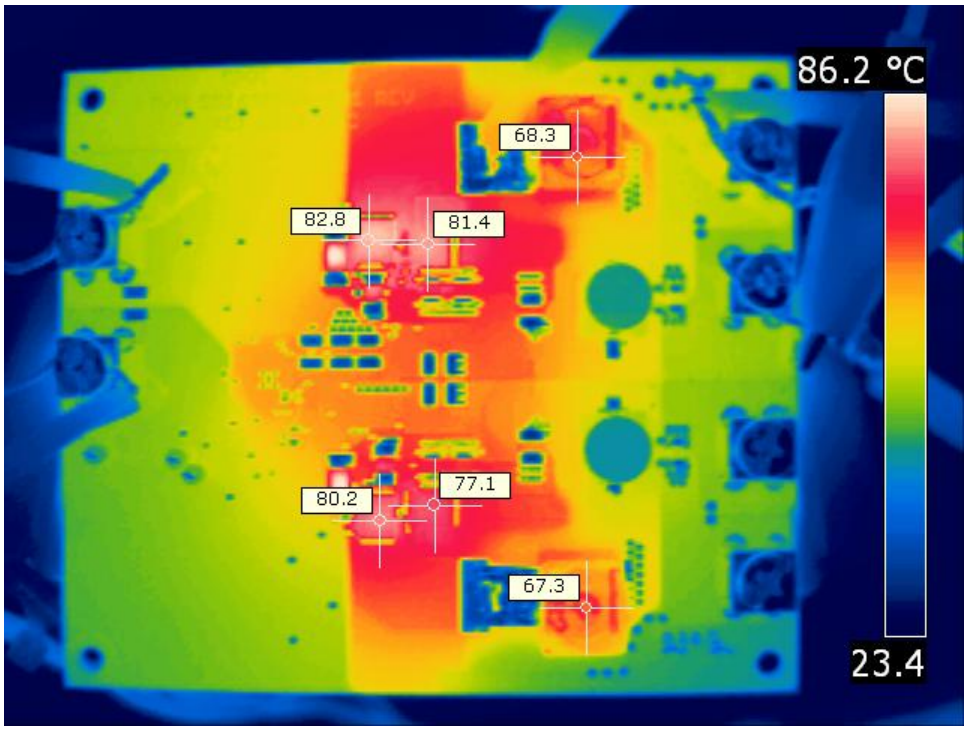
The photo below shows the PMP9700 REVA assy built on the LM25119 EVM.

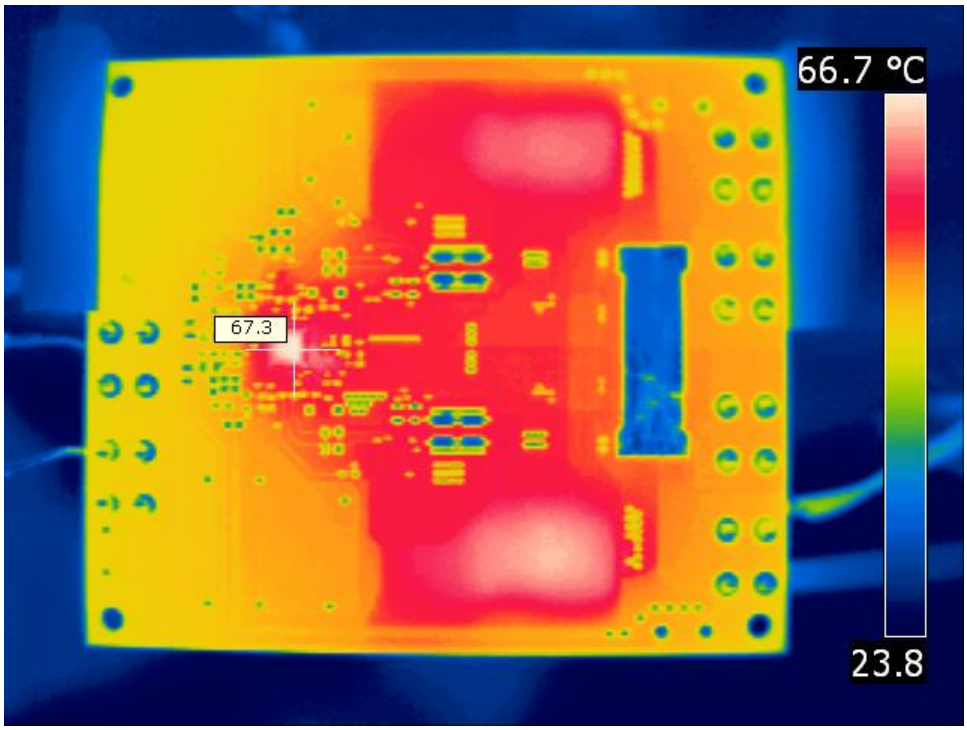




9 Thermal Image

A thermal image is shown below operating at 24V input and 15V@20A output (room temp, no airflow).





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