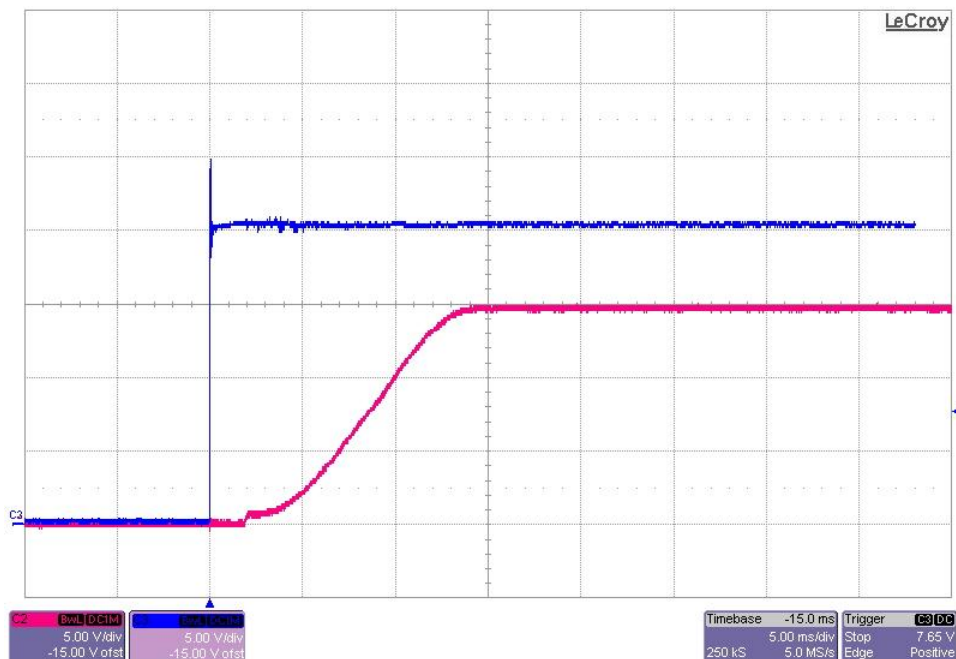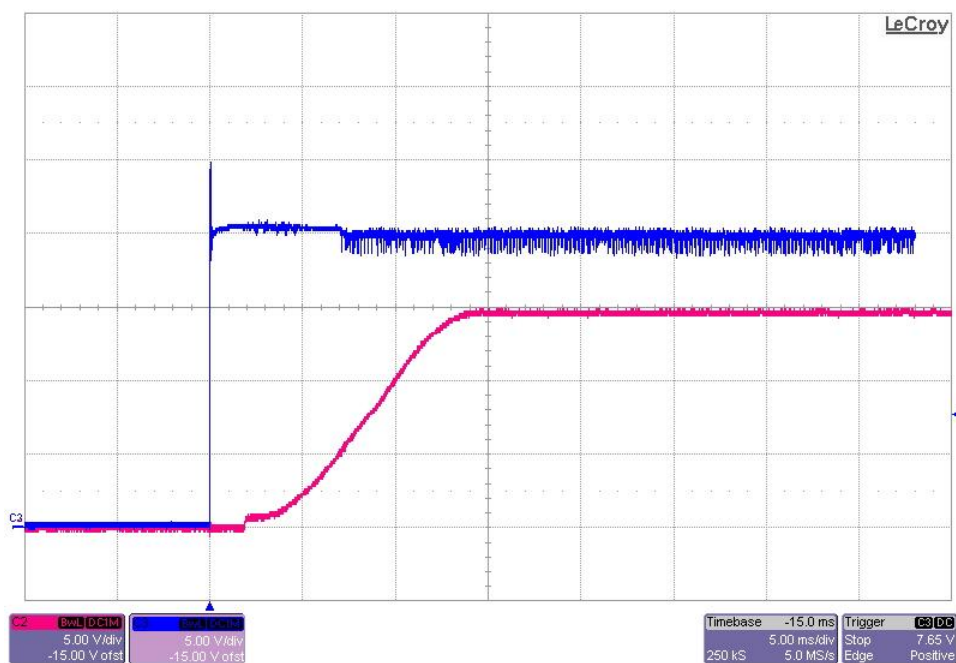TEXAS
INSTRUMENTS

1   Startup

The photo below shows the output voltage startup waveforms after the application of 20V in. The 15V output was loaded to 0A. (5V/DIV, 5mS/DIV)
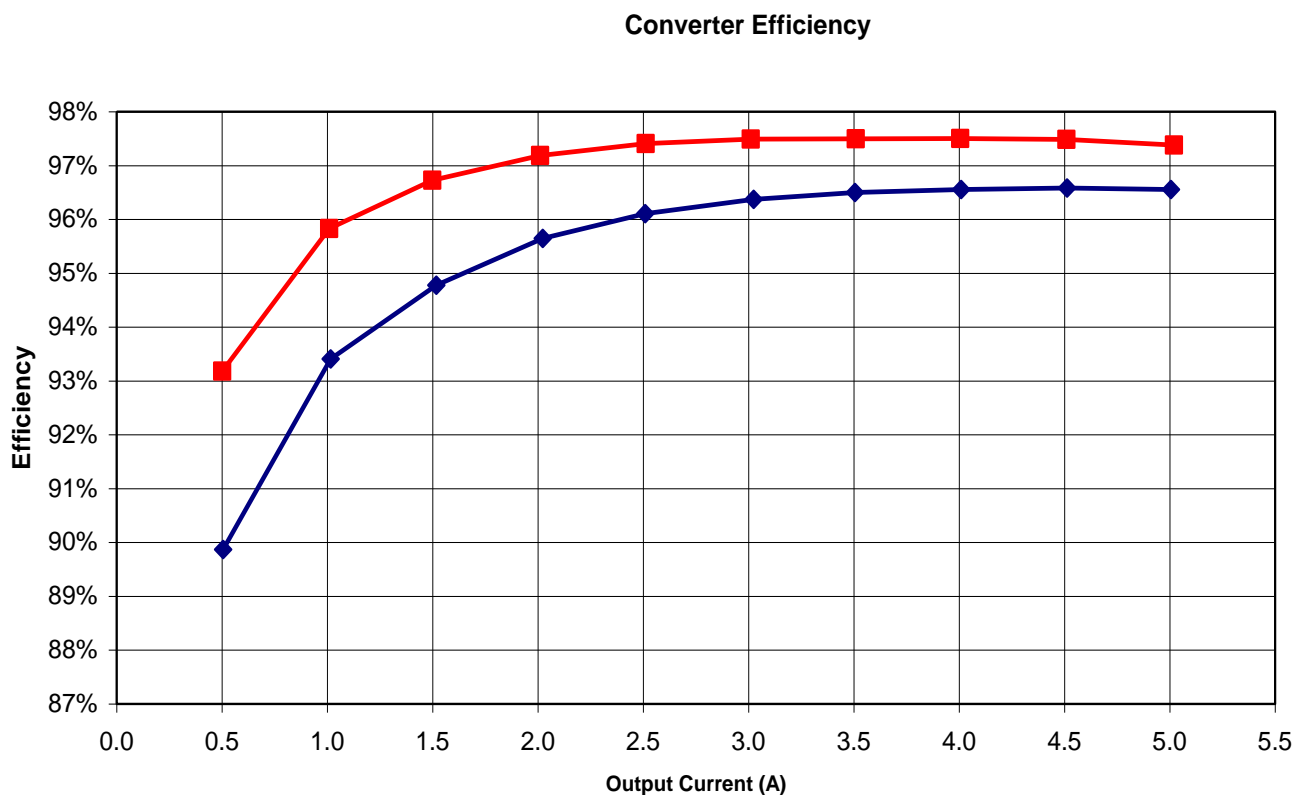

The photo below shows the output voltage startup waveforms after the application of 20V in. The 15V output was loaded to 5A. (5V/DIV, 5mS/DIV)
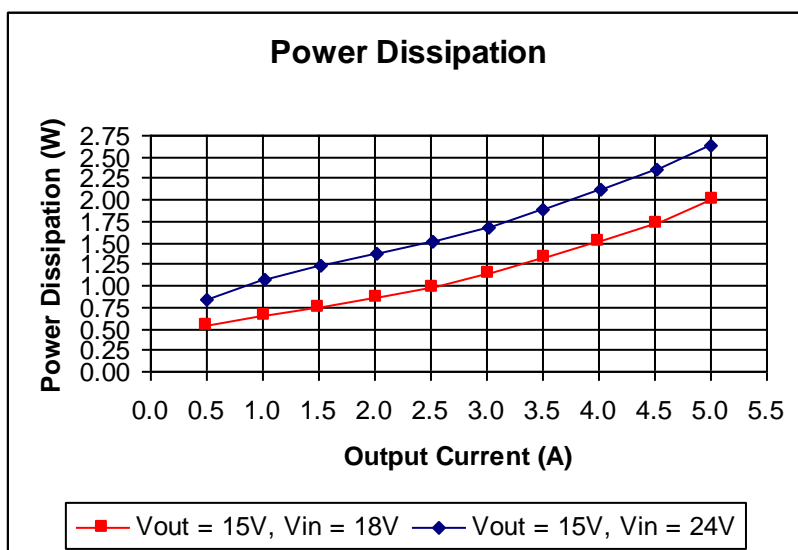
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PMP8493 REVB Test Results

2 Efficiency

The converter efficiency is shown in the figure below for Vout = 15V.

Converter Efficiency

Power Dissipation

Power Management Solutions

PMP8493 REVB Test Results

The converter efficiency is shown in the figure below for Vout = 12V.

Converter Efficiency

Power Dissipation

Power Management Solutions

TEXAS INSTRUMENTS
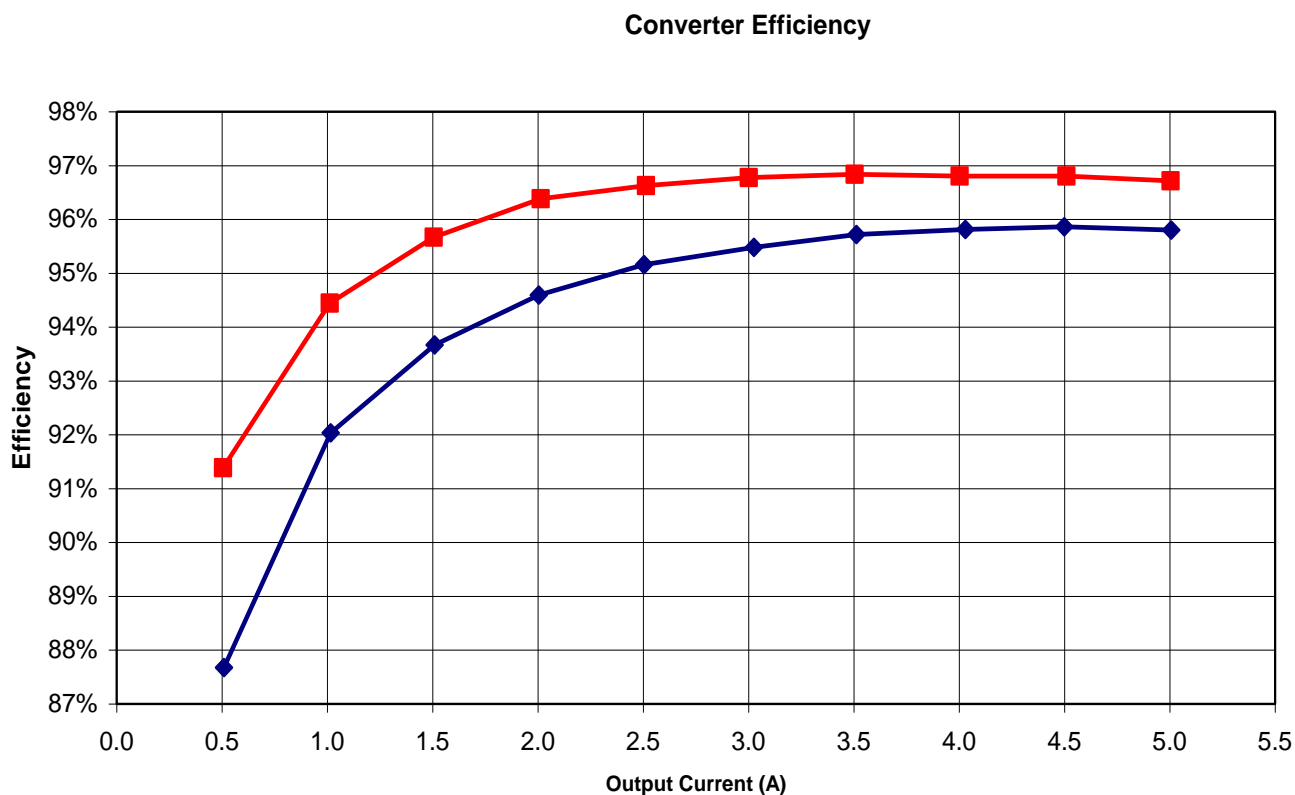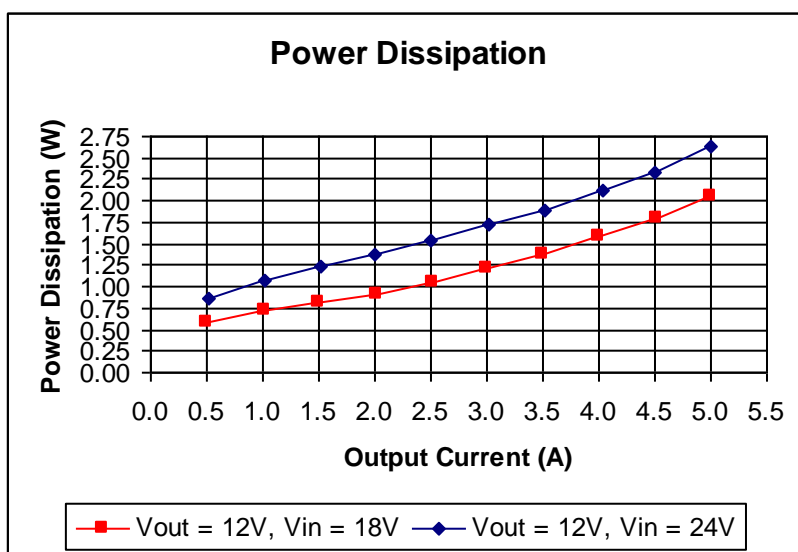
3 Output Ripple Voltage

The output ripple voltage is shown in the figure below. The image was taken with the 15V output loaded to 5A. The input voltage set to 24V.   (50mV/DIV, 2uS/DIV)
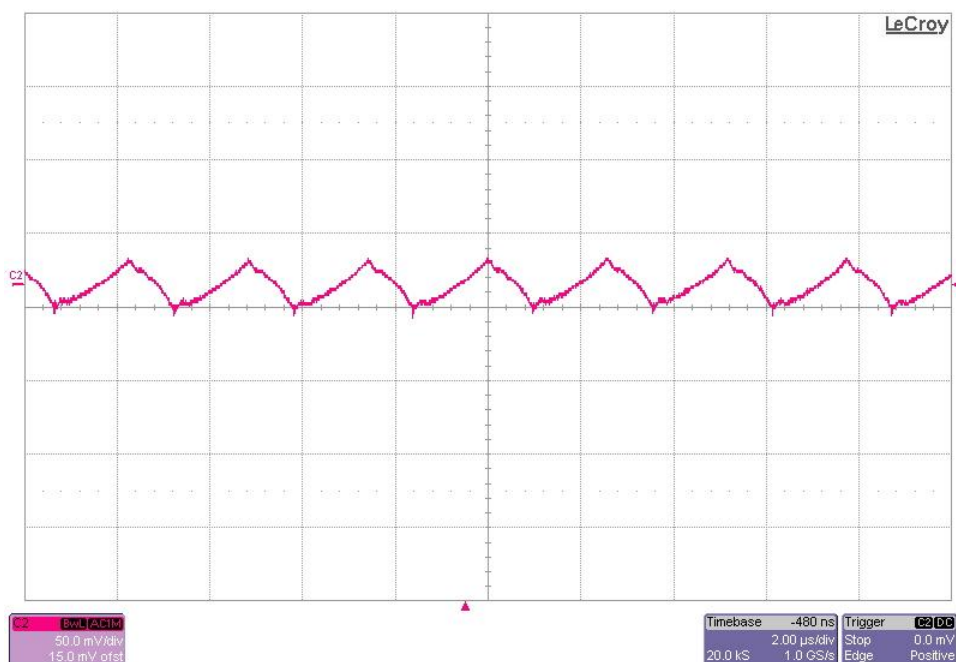

The output ripple voltage is shown in the figure below. The image was taken with the 15V output loaded to 5A. The input voltage set to 18V.   (50mV/DIV, 2uS/DIV)
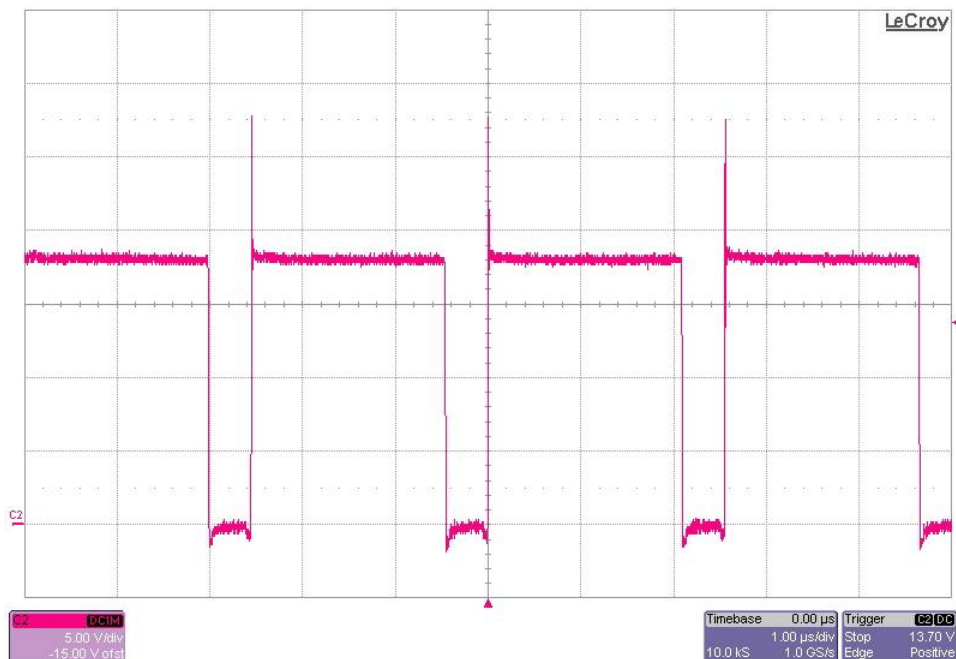
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TEXAS INSTRUMENTS
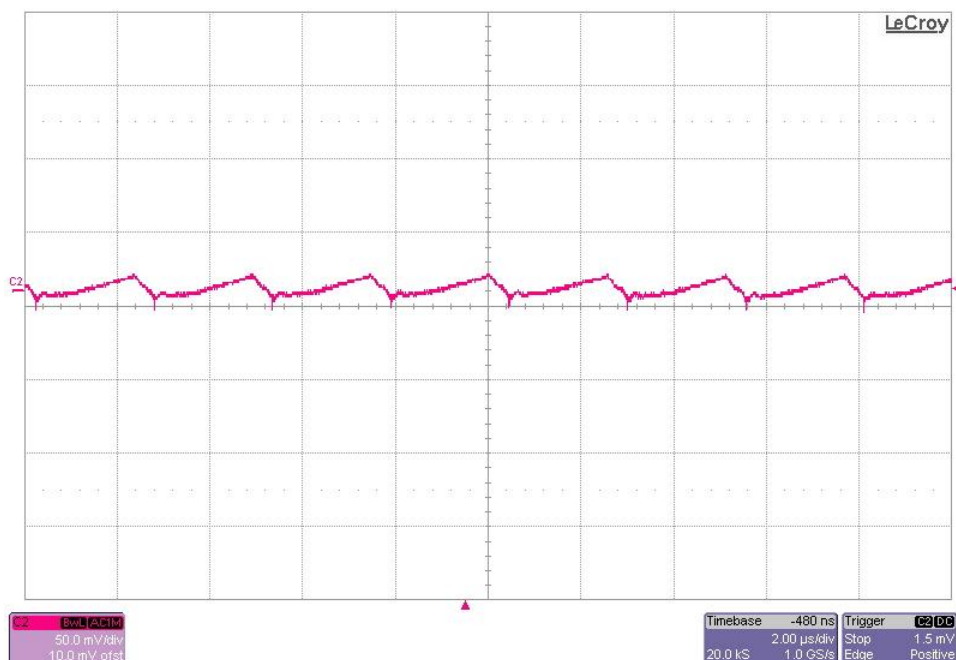
4   Load Transients

The photo below shows the 15V output voltage (ac coupled) when the load current is stepped between 1A and 3A. Vin = 20V. (50mV/DIV, 1A/DIV, 20mS/DIV)

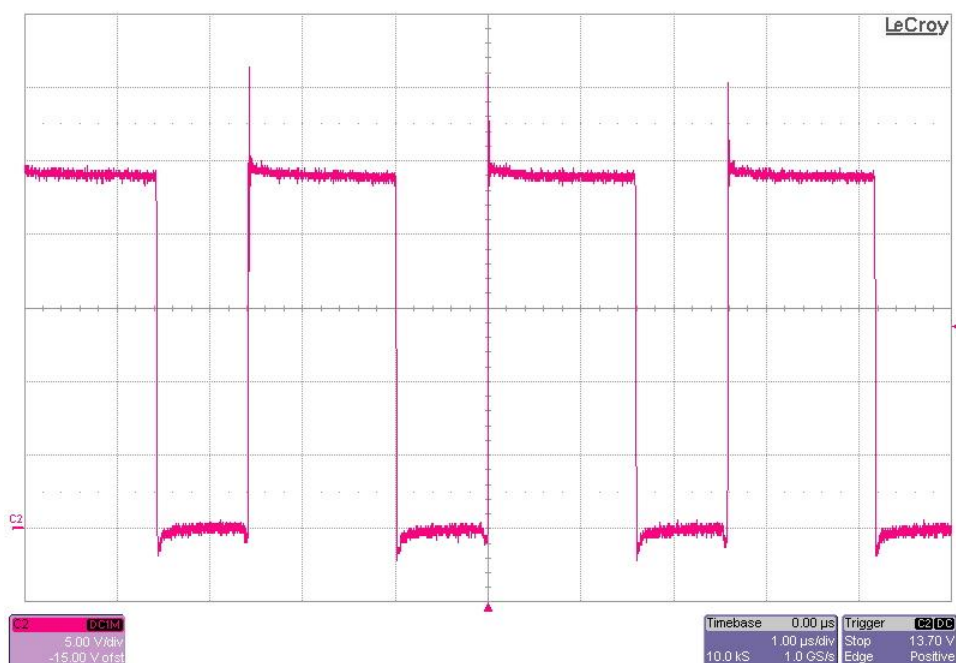Power Management Solutions

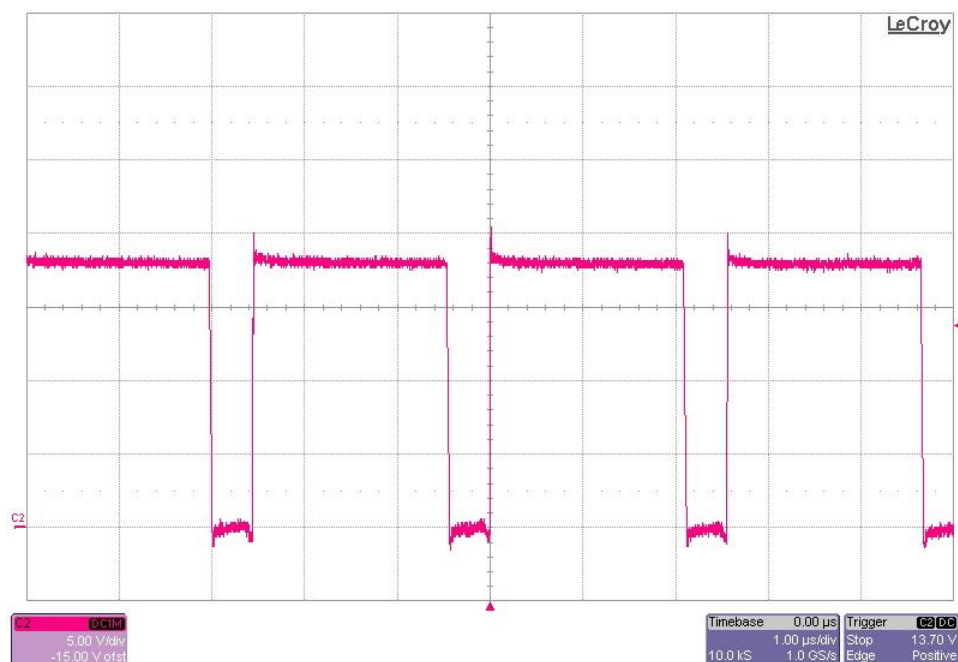TEXAS
INSTRUMENTS
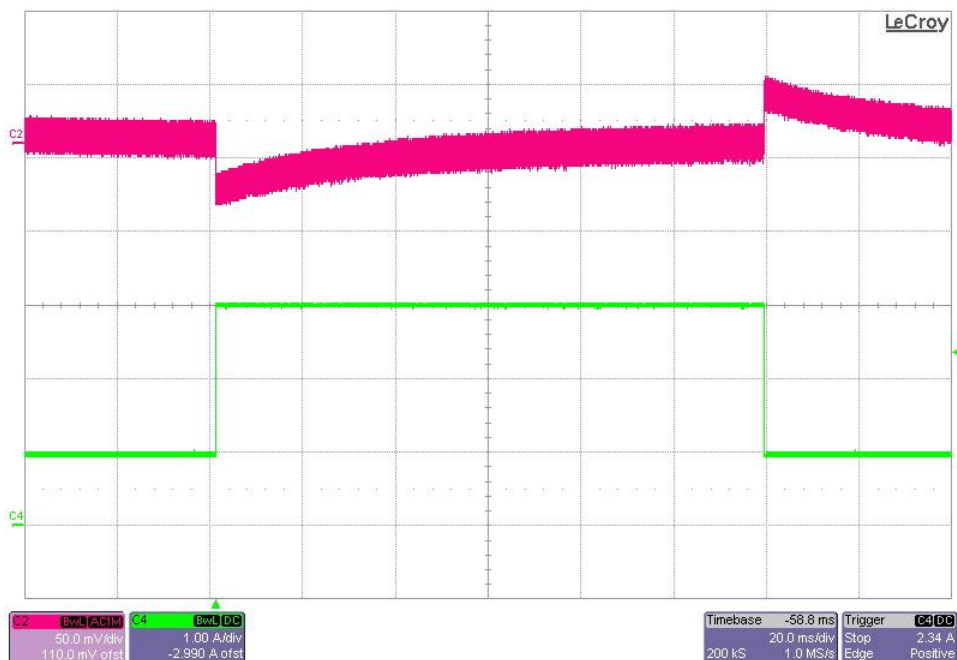
5 Switch Node Waveforms

The photo below shows the switch node measured with 200MHZ bandwidth. The input voltage is 18V and the output is loaded to 5A.   (5V/DIV, 1uS/DIV)
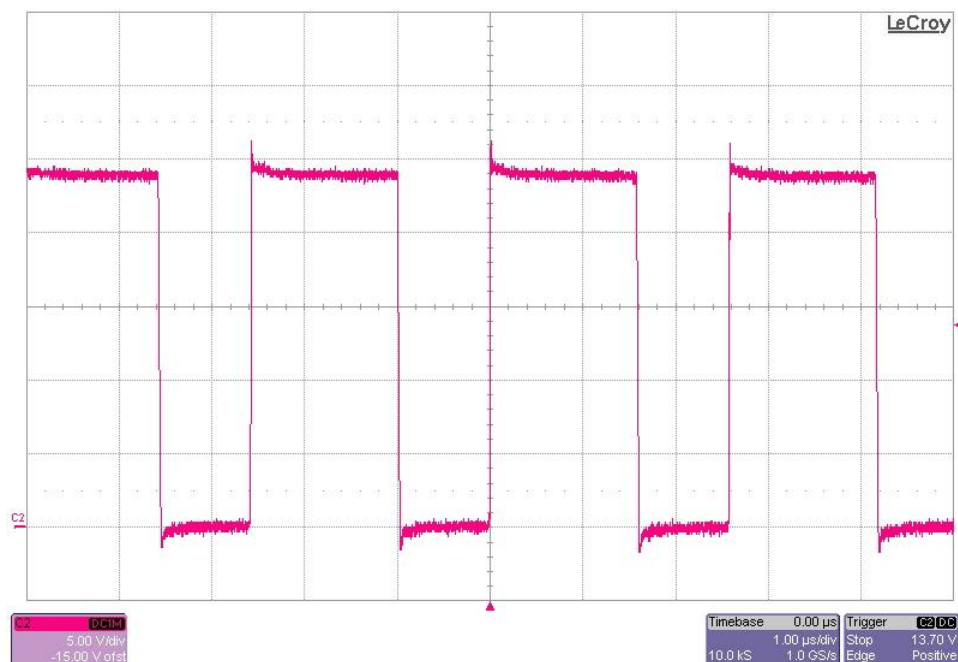

The photo below shows the switch node measured with 200MHZ bandwidth. The input voltage is 24V and the output is loaded to 5A.   (5V/DIV, 1uS/DIV)
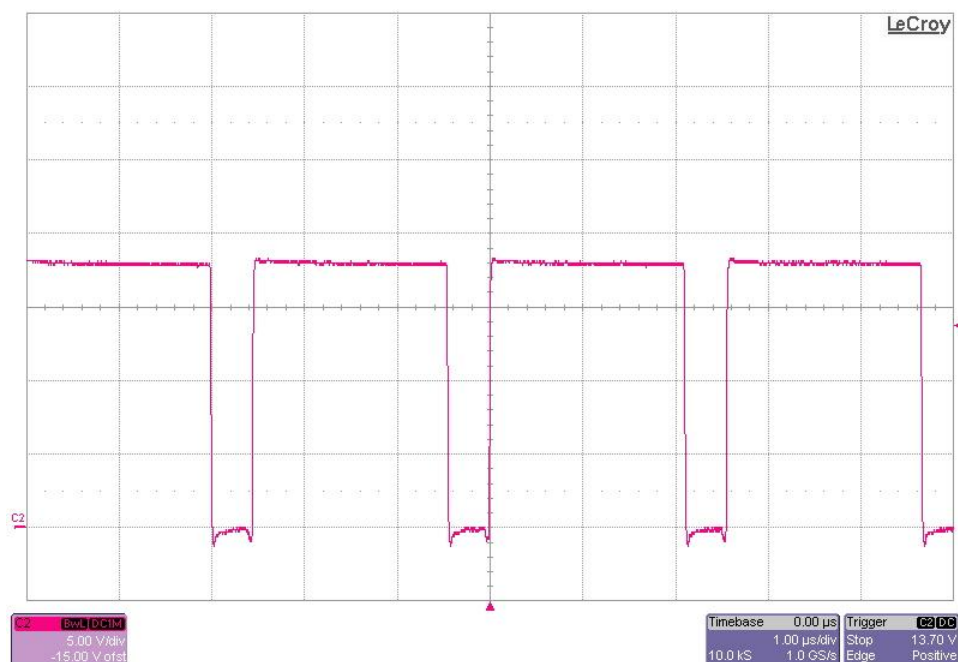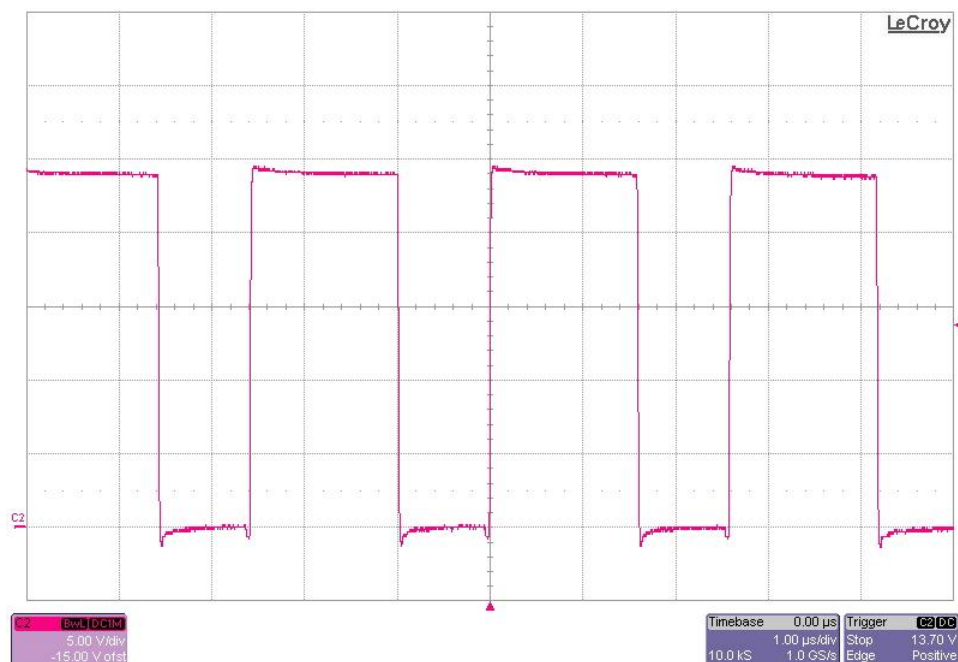

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The photo below shows the switch node measured with 200MHZ bandwidth. The input voltage is 18V and the output is loaded to 1A.　　　(5V/DIV, 1uS/DIV)

The photo below shows the switch node measured with 200MHZ bandwidth. The input voltage is 24V and the output is loaded to 1A.　　　(5V/DIV, 1uS/DIV)

PMP8493 REVB Test Results

The photo below shows the switch node measured with 20MHZ bandwidth. The input voltage is 18V and the output is loaded to 5A.   (5V/DIV, 1uS/DIV)

The photo below shows the switch node measured with 20MHZ bandwidth. The input voltage is 24V and the output is loaded to 5A.   (5V/DIV, 1uS/DIV)


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6 Short Circuit Waveforms

The photo below shows the switch node during a hard short across the 15V output. The input voltage is 20V and the output was previously loaded to 5A. (5V/DIV, 100mS/DIV)
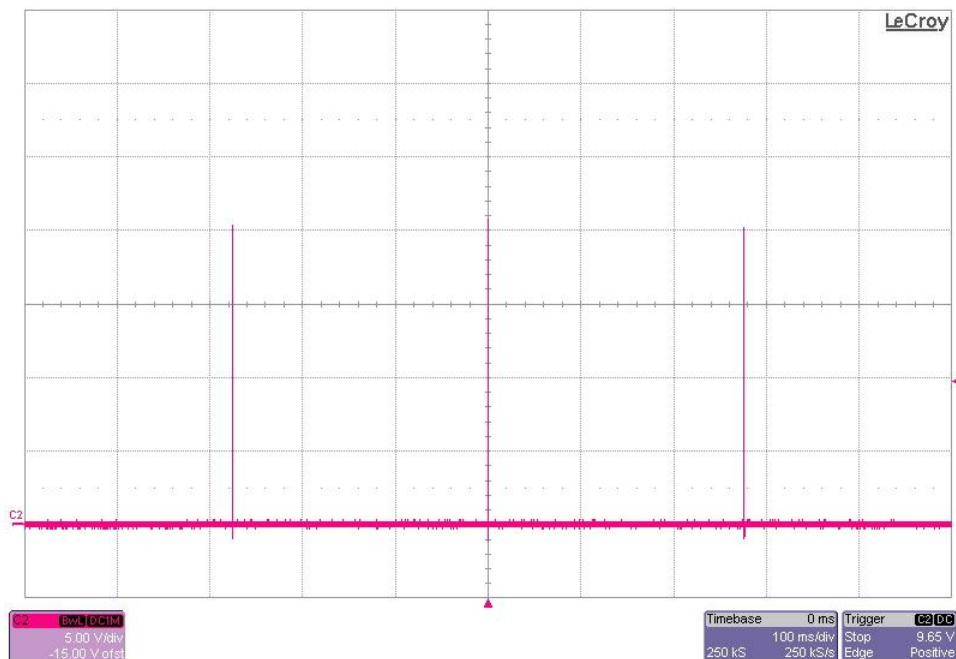
The photo below shows the output voltage recovery after the removal of a hard short across the 15V output. The input voltage is 20V and the output was loaded to 5A. (5V/DIV, 5mS/DIV)
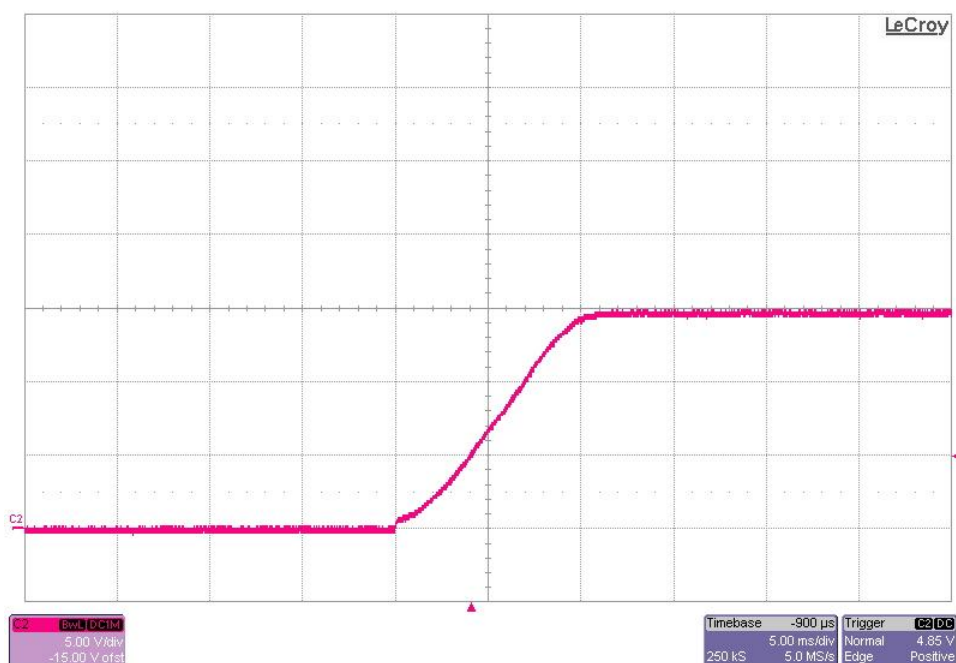
7   Control Loop Gain / Stability

The plot below shows the loop gain and phase margin with the input voltage at 20V and the output voltage at 15V.

1A Output:	Band Width = 50.0KHz	Phase Margin = 71 degrees
5A Output:	Band Width = 53.4KHz	Phase Margin = 68 degrees
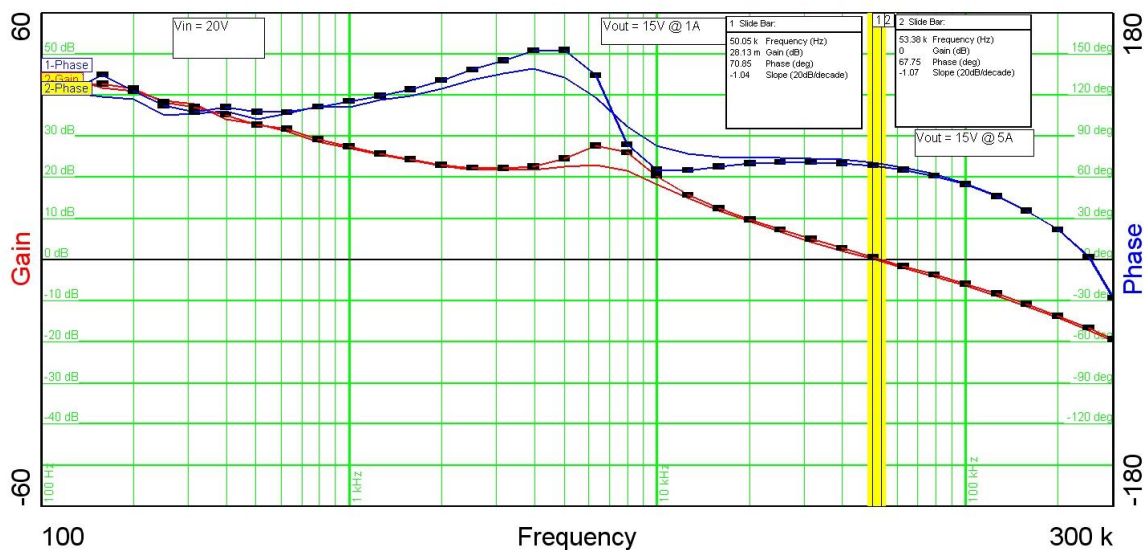
The plot below shows the loop gain and phase margin with the output current at 3A and the output voltage at 15V.
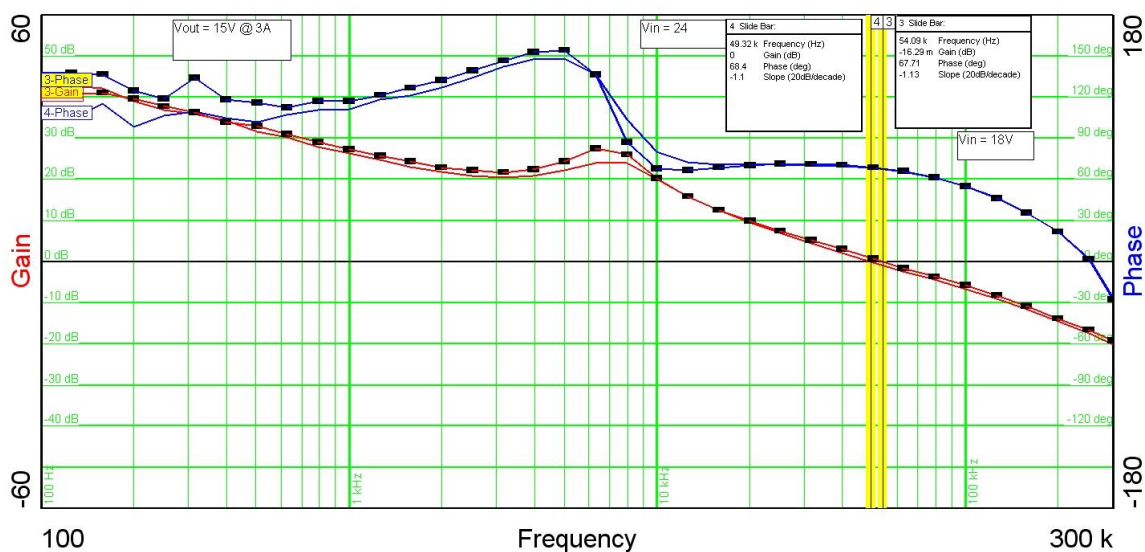
Vin = 18V:	Band Width = 54.1KHz	Phase Margin = 68 degrees
Vin = 24V:	Band Width = 49.3KHz	Phase Margin = 68 degrees

PMP8493 REVB Test Results

8 Photo

The photo below shows the PMP8493 REVB assembly built on the PMP5959 REVA PWB, with mods.
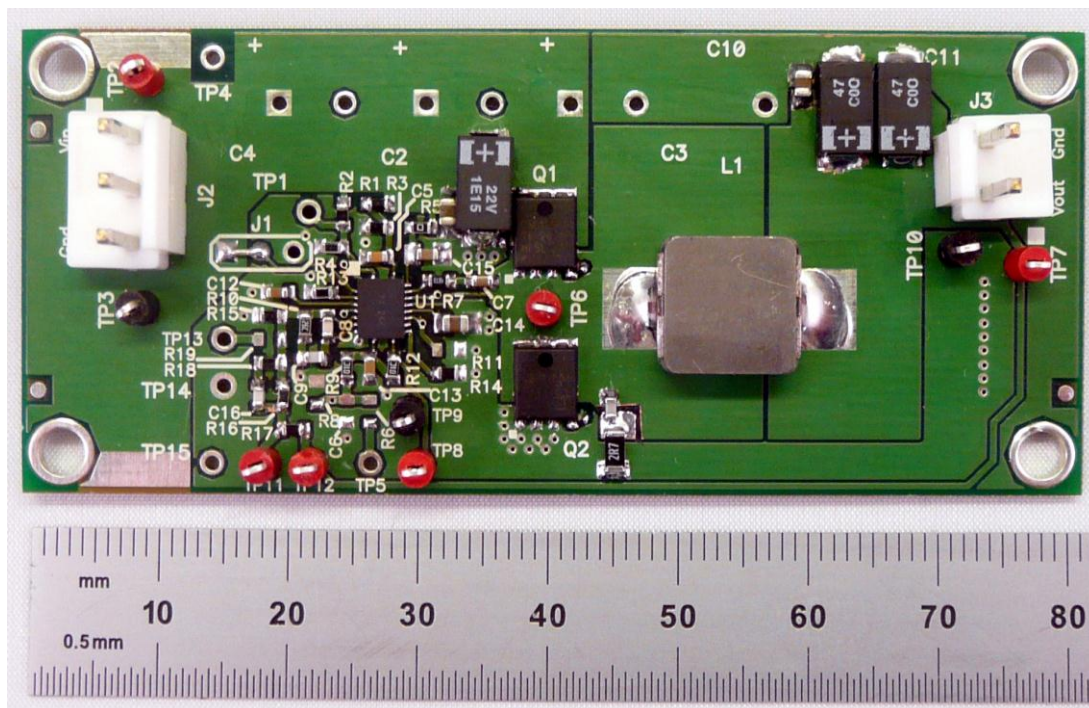
9 Thermal Image

A thermal image is shown below when operating at 20V input and 15V@ 5A output, with no airflow.
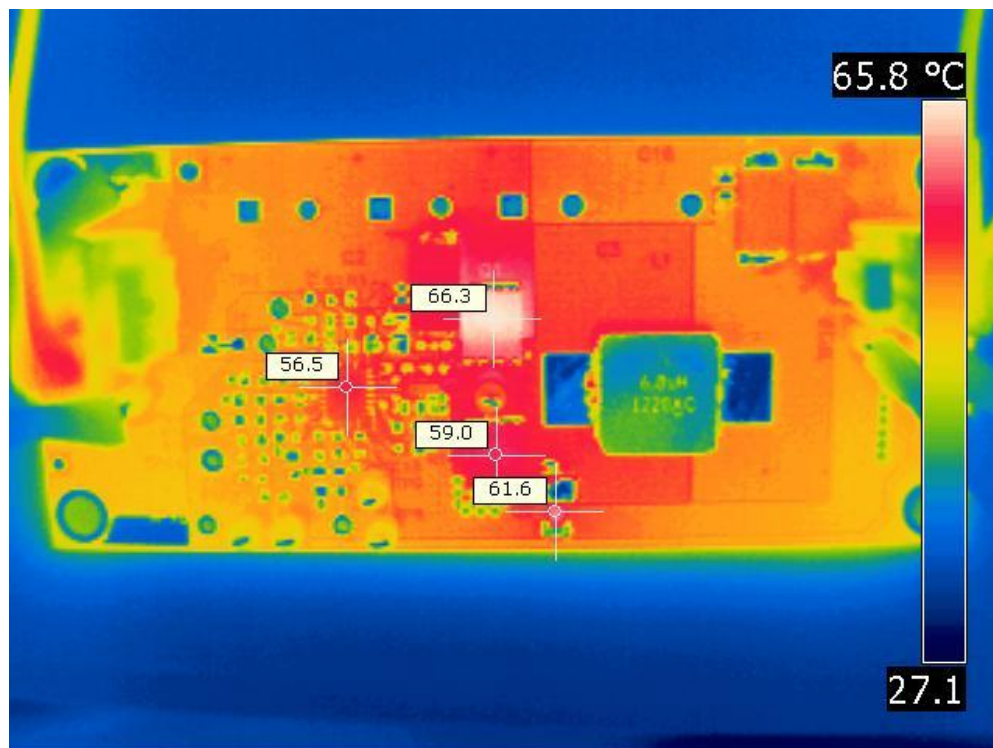
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