1 Startup

The photo below shows the output voltage startup waveform after the application of 24V in with the 12V output loaded to 0A. (5V/DIV, 2mS/DIV)

The photo below shows the output voltage startup waveform after the application of 24V in with the 12V output loaded to 8A. (5V/DIV, 2mS/DIV)
2 Efficiency

The TPS40170 12V converter efficiency is shown in the figure below.

![Efficiency Graph](image)
Efficiency, $V_{in} = 19V$, $V_{out} = 12V$, CSD18504Q5A FETs

Efficiency, $V_{in} = 32V$, $V_{out} = 12V$, CSD18504Q5A FETs
3 Output Ripple Voltage

The output ripple voltage is shown in the figure below. The image was taken with the 12V output loaded to 8A and the input voltage set to 32V.  

(50mV/DIV, 2uS/DIV)

The output ripple voltage is shown in the figure below. The image was taken with the 12V output loaded to 8A and 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 12V output loaded to 8A and the input voltage set to 19V. (50mV/DIV, 2uS/DIV)
4 Load Transients

The photo below shows the output voltage (ac coupled) when the load current is stepped between 4A and 8A. Vin = 24V. (100mV/DIV, 5A/DIV, 200uS/DIV)

The photo below shows the output voltage (ac coupled) when the load current is stepped between 0A and 8A. Vin = 24V. (200mV/DIV, 5A/DIV, 200uS/DIV)
5 Switch Node Waveforms

The photo below shows the switch node voltage (TP4). The input voltage is 32V and the 12V output is loaded to 8A. (5V/DIV, 1uS/DIV)

The photo below shows the switch node voltage (TP4). The input voltage is 19V and the 12V output is loaded to 8A. (5V/DIV, 1uS/DIV)
6 Control Loop Gain / Stability

The plot below shows the boost converter’s loop gain and phase margin when the 12V output is loaded to 8A.

Vin = 24V  Band Width = 36.4KHz  Phase Margin = 64 degrees

Vin = 32V  Band Width = 27.6KHz  Phase Margin = 68 degrees

Vin = 19V  Band Width = 34.2KHz  Phase Margin = 66 degrees
The photo below shows the PMP10799 REVB assy.
8 Thermal Image

The thermal image below shows sustained operation while at 24V input / 8A output, with no airflow.
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