1 Startup

The startup waveform is shown in the Figure 1. The input voltage was set at 12V, with 12A load on the output.

![Figure 1](image1.png)

The startup waveform is shown in the Figure 2. The input voltage was set at 12V, with 0A load on the output.

![Figure 2](image2.png)
2 Shutdown

The shutdown waveform is shown in the Figure 3. The input voltage was set at 12V, with 12A load on the output.

The shutdown waveform is shown in the Figure 4. The input voltage was set at 12V, with 0A load on the output.
3 Efficiency

The efficiency is shown in the Figure 5 below.

![Figure 5](image)

4 Load Regulation

The load regulation of the output is shown in the Figure 6 below.

![Figure 6](image)
5 Ripple Voltage
The output ripple voltage is shown in Figure 7. The image was taken with a 15A load and 12V at the input.

![Figure 7](image)

The input ripple voltage is shown in Figure 8. The image was taken with a 6A load and 24V at the input.

![Figure 8](image)
6 Control Loop Frequency Response

Figure 9 shows the loop response.
Output current = 13A
Input voltages = 11V, 12V and 18V

![Figure 9](image-url)
Figure 10 shows the loop response.
Output current = 20A
Input voltages = 16V and 18V
7 Load Transients
The Figure 11 shows the response to load transients. The load is switching from 7.5A to 15A.

![Figure 11]

CH1 => output voltage with 12V at the input
CH4 => load step: 100mV = 1A
8 Switch Node Waveform

With input voltage set to 12V result in the waveform shown in Figure 12 and Figure 13. Output current was set to 15A.
9 Thermal Picture

Input voltage = 12V
Output current = 15A

Heatsink 66,0 °C 0,95 20,0 °C
TPS40090  62,1 °C 0,95 20,0 °C

Inductor L4 85,5 °C
UCC27201  58,8 °C
UCC27201  57,4 °C
UCC27201  63,0 °C
UCC27201  65,3 °C
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