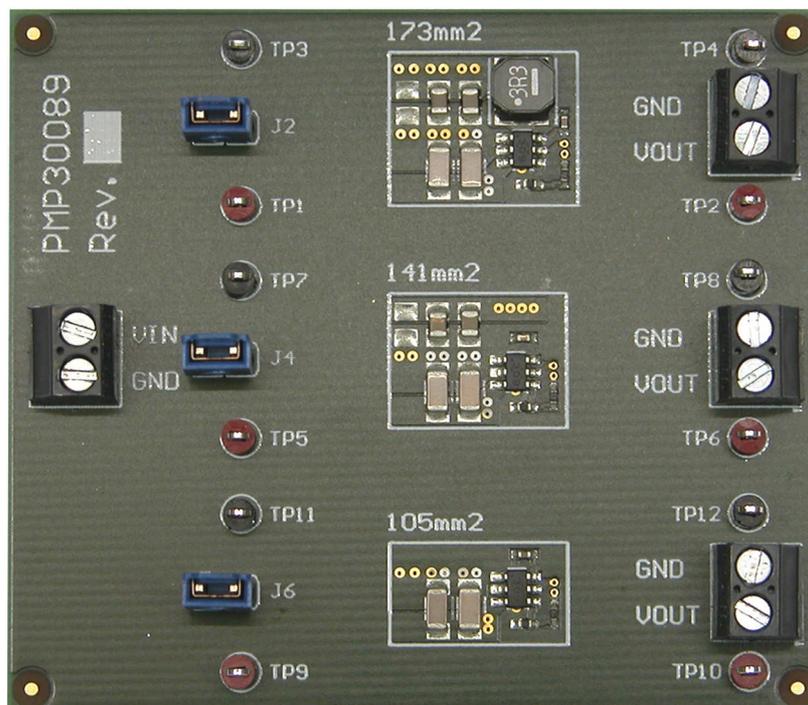


## Synchronous Buck Converter with 2.5V @ 2.5A

- Input 10.0 .. 14.0V
- Output 2.5V @ 2.5A
- Free-Running-Switching Frequency of 650 kHz



## 1. Startup

The startup waveform at 12.0V input voltage and no load on the output is shown in Figure 1.

Channel C1 **12.0V Input Voltage**

2V/div, 200us/div

Channel C2 **2.5V Output Voltage**

500mV/div, 200us/div

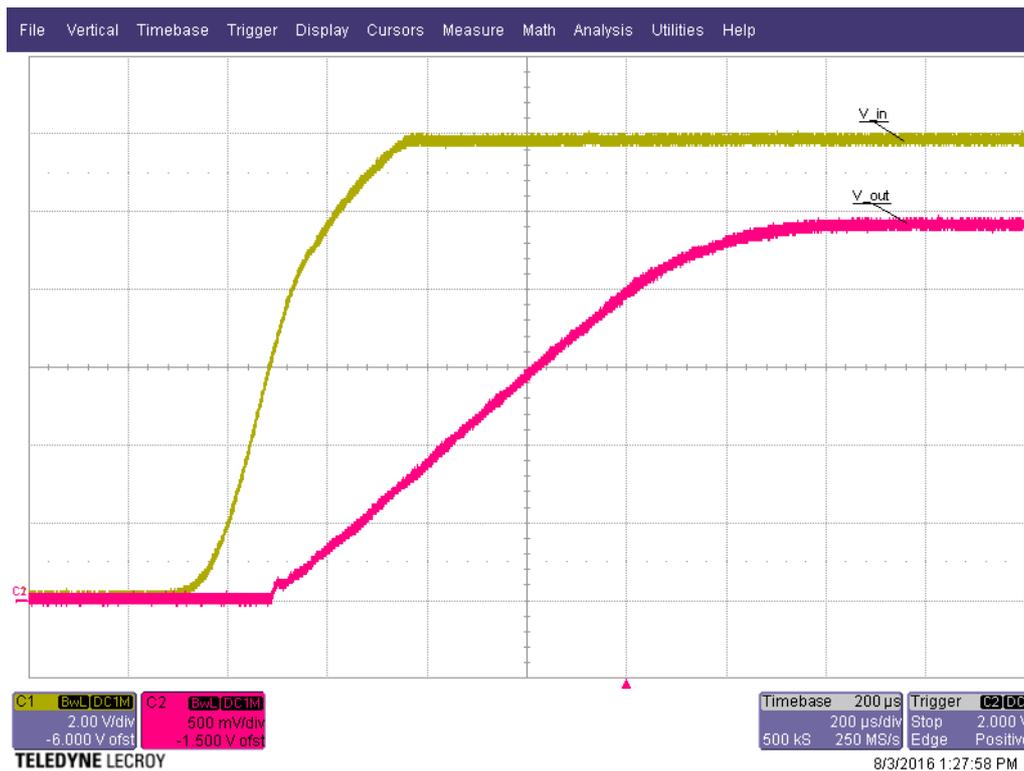


Figure 1

## 2. Shutdown

The shutdown waveform at 12.0V input voltage and 2.5A load on the output is shown in Figure 2.

- Channel C1 **12.0V Input Voltage**  
2V/div, 50us/div
- Channel C2 **2.5V Output Voltage**  
500mV/div, 50us/div



Figure 2

### 3. Efficiency

The efficiency and load regulation are shown in Figure 3 and Figure 4.

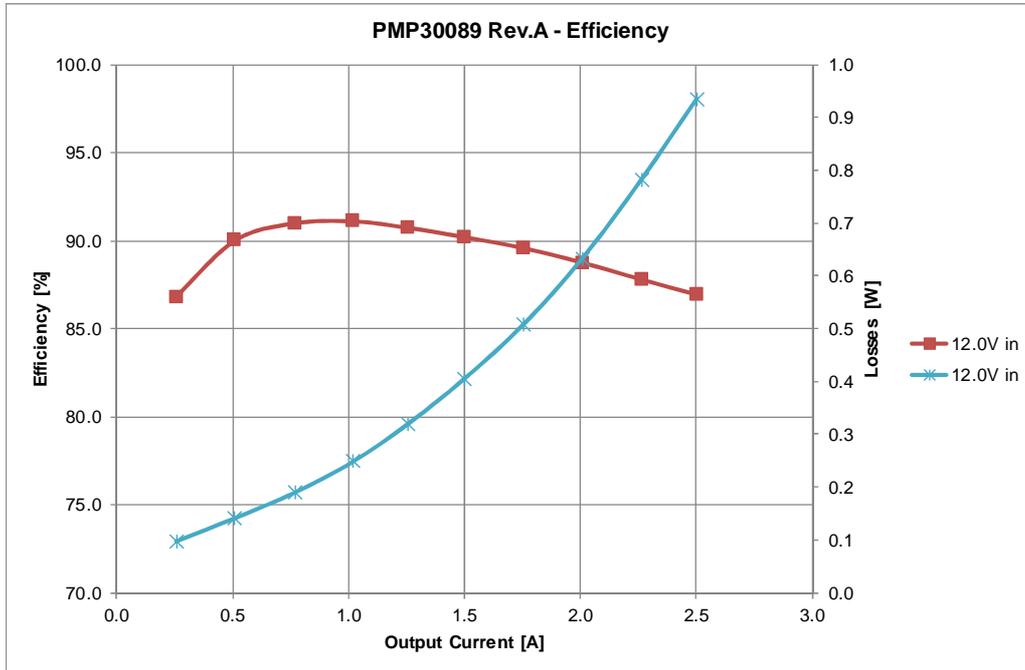


Figure 3

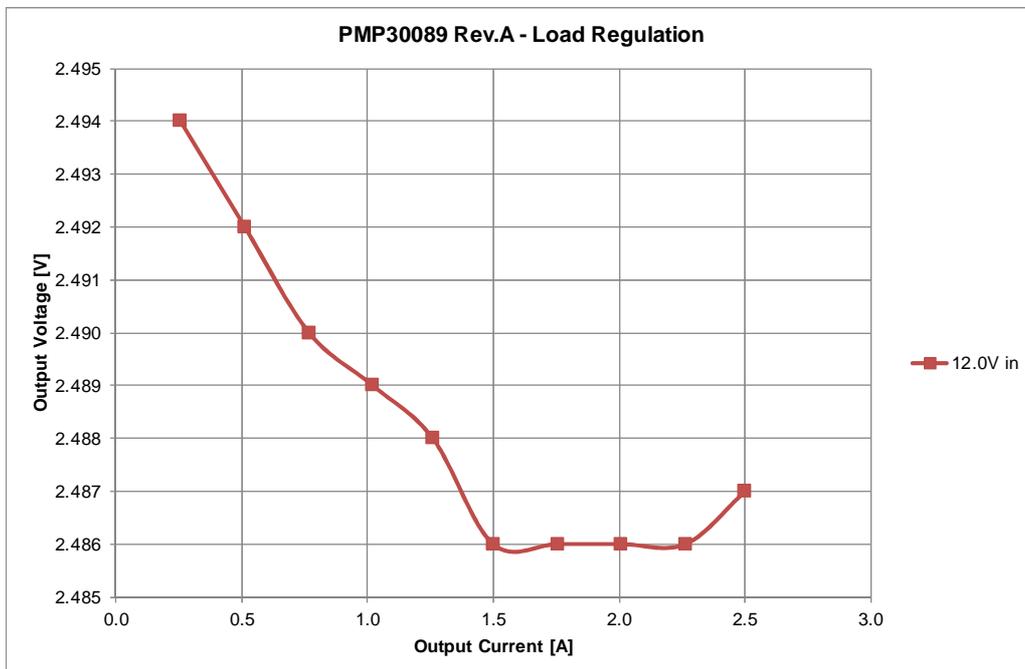


Figure 4

## 4. Transient Response

The response to a load step at 12.0V input voltage is shown in Figure 5.

Channel C1 **Output Current**, Load Step 1.0A to 2.0A  
1A/div, 1ms/div

Channel C2 **Output Voltage**, -16mV undershoot (0.6%), 15mV overshoot (0.6%)  
20mV/div, 1ms/div, AC coupled

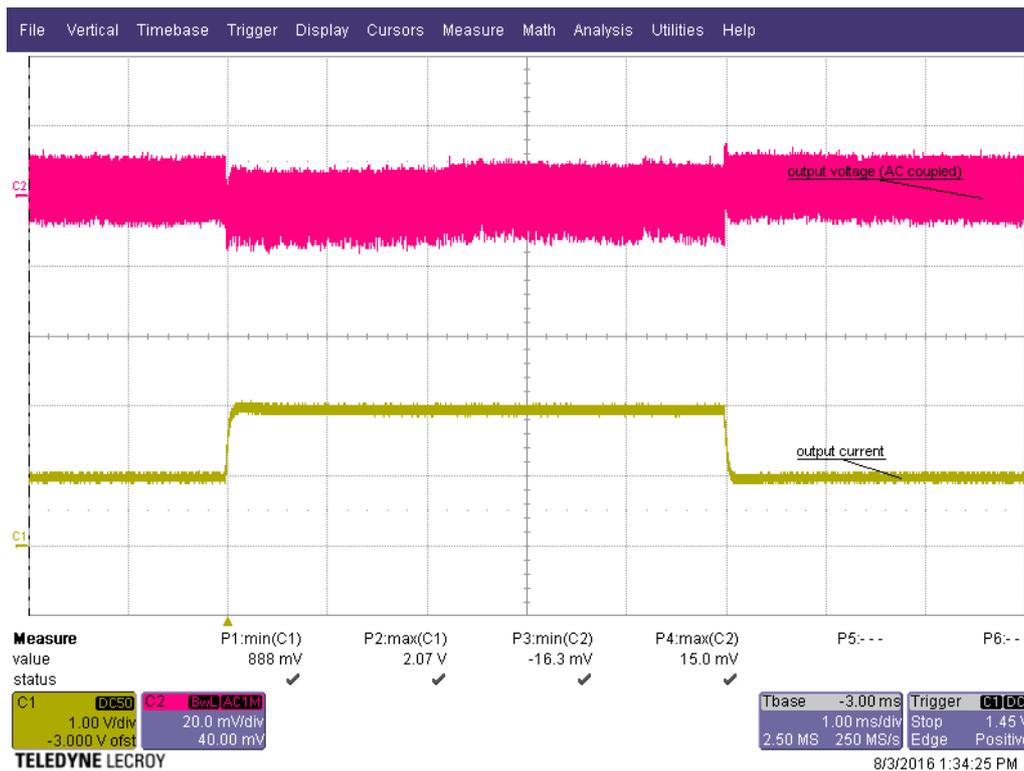


Figure 5

## 5. Input Ripple

The input ripple voltage at 2.5A load is shown in Figure 6

Channel C2 **Input Voltage @ 12.0V Input**, 96mV peak-peak  
20mV/div, 1us/div

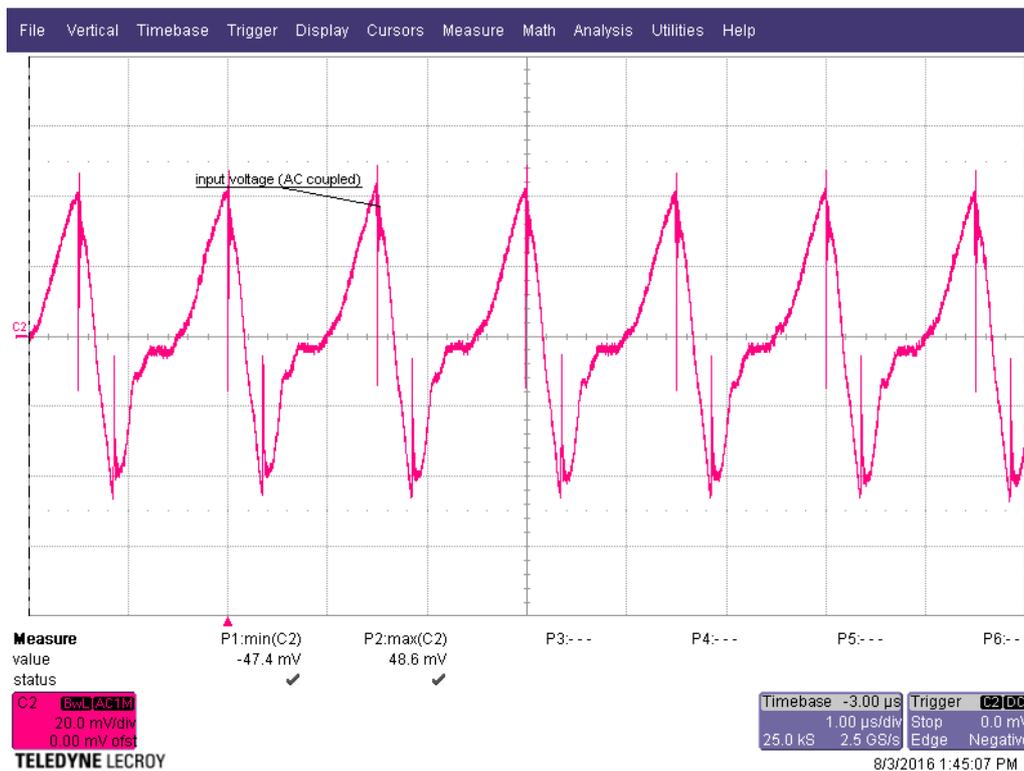


Figure 6

## 6. Output Ripple

The output ripple voltage at 2.5A load is shown in Figure 7. Figure 6

Channel M3 **Output Voltage @ 12.0V Input**, 40mV peak-peak  
20mV/div, 1 $\mu$ s/div

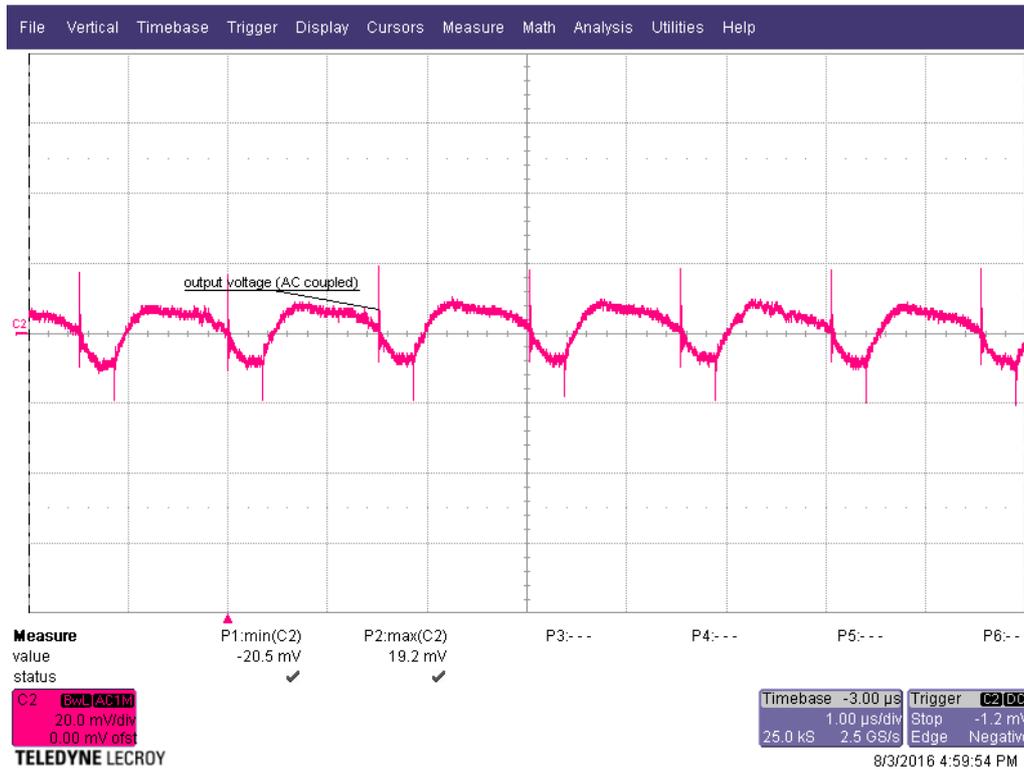


Figure 7

## 7. Low-Side FET (Switching Node)

The drain-source voltage of the low-side FET at 12.0V input voltage and 2.5A load on the output is shown in Figure 8.

Channel C1 **Drain-Source Voltage**, -2.1V minimum, 13.0V maximum  
2V/div, 500ns/div

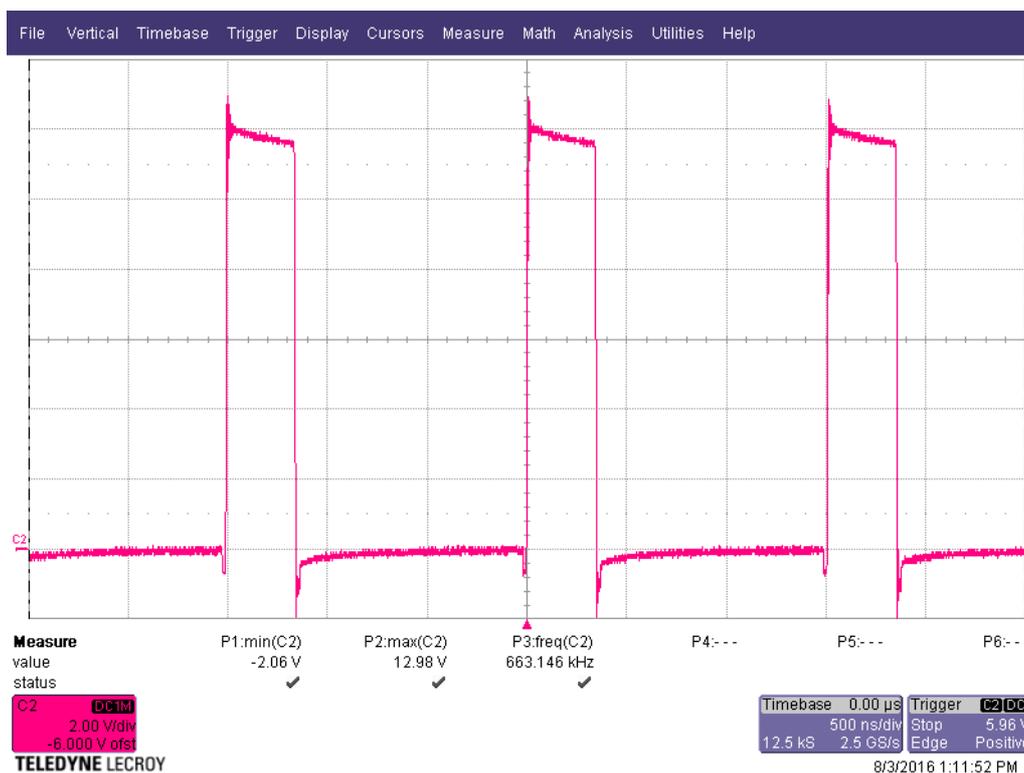


Figure 8

## 8. Thermal Image

The thermal image (Figure 9) shows the circuit at an ambient temperature of 20°C with an input voltage of 12.0V and 2.5A load on the output.



Figure 9

Name	Temperature	Emissivity	Background
L1	57.1°C	0.95	20.0°C
U1	73.8°C	0.95	20.0°C

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