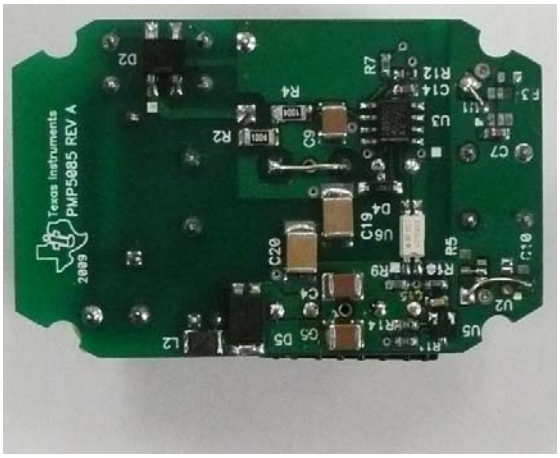
1 Photo

The photographs below show the top and bottom views of the PMP5191 Rev B demo board. This circuit was built on a PMP5085 Rev A PCB.



2 Efficiency

2.1 Energy Star

According to the "ENERGY STAR® Program Requirements for Single Voltage External Ac-Dc and Ac-Ac Power Supplies" version 2.0, the average efficiency must be greater than: [0.0750 * Ln (10W)] + 0.561 = 0.73, and the no load power consumption must be less than or equal to 0.3W.

2.1.1 Average Efficiency

115VAC/60Hz

Load level	Iout	Vout	Pin	Pout	Efficiency
25% Pno	0.500	4.97	3.39	2.49	0.73
50% Pno	1.003	4.97	6.41	4.98	0.78
75% Pno	1.500	4.97	9.56	7.46	0.78
100% Pno	2.000	4.97	12.73	9.94	0.78
			average efficiency :		**0.77**

230VAC/50Hz

Load level	Iout	Vout	Pin	Pout	Efficiency
25% Pno	0.499	4.97	3.60	2.48	0.69
50% Pno	1.000	4.97	6.62	4.97	0.75
75% Pno	1.500	4.97	9.67	7.46	0.77
100% Pno	2.000	4.97	12.76	9.94	0.78
			average efficiency :		**0.75**

2.1.2 No Load Power Consumption

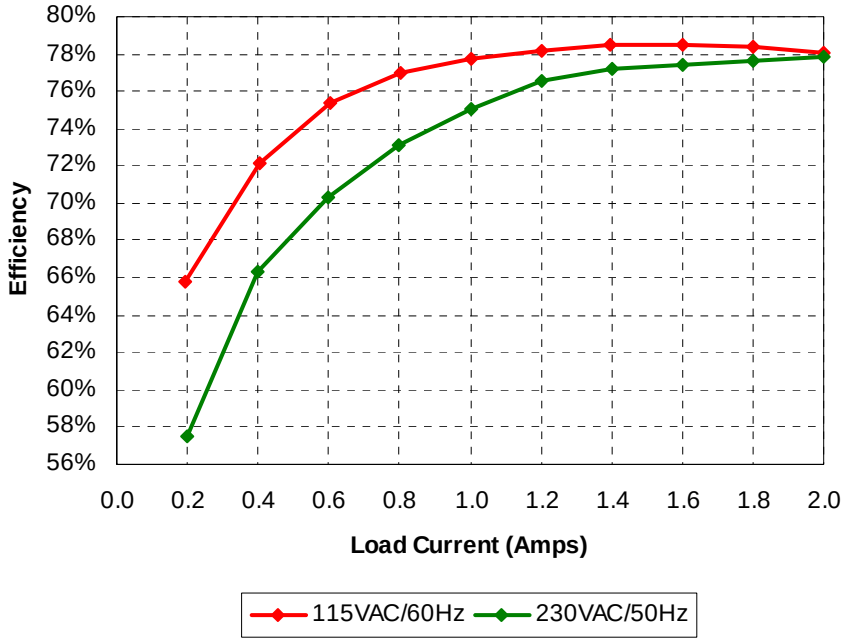
115VAC/60Hz

Iout	Vout	Vin	Iin (mA)	Pin	PF	Pout	Losses	Efficiency
0.000	5.02	115.3	3.4	0.07	0.18	0.00	0.07	0.0%
0.050	4.97	115.3	11.8	0.46	0.34	0.25	0.21	54.0%
0.098	4.97	115.3	19.4	0.80	0.36	0.49	0.31	60.9%

230VAC/50Hz

Iout	Vout	Vin	Iin (mA)	Pin	PF	Pout	Losses	Efficiency
0.000	5.00	231.4	4.9	0.16	0.14	0.00	0.16	0.0%
0.049	4.97	231.4	9.0	0.55	0.27	0.24	0.31	44.3%
0.098	4.97	231.4	13.3	0.92	0.30	0.49	0.43	52.9%

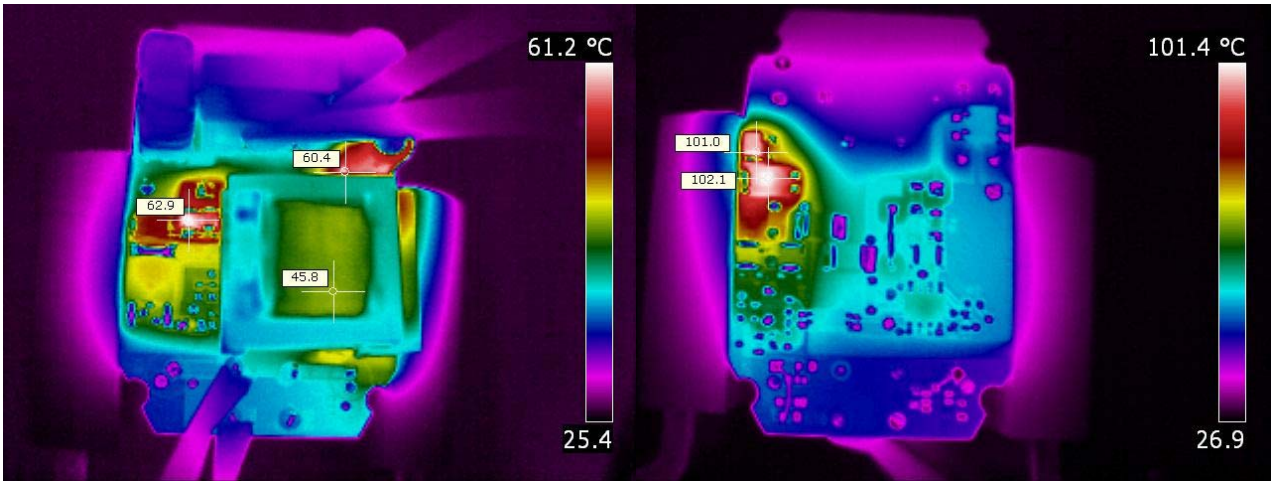
2.2 Efficiency Graph



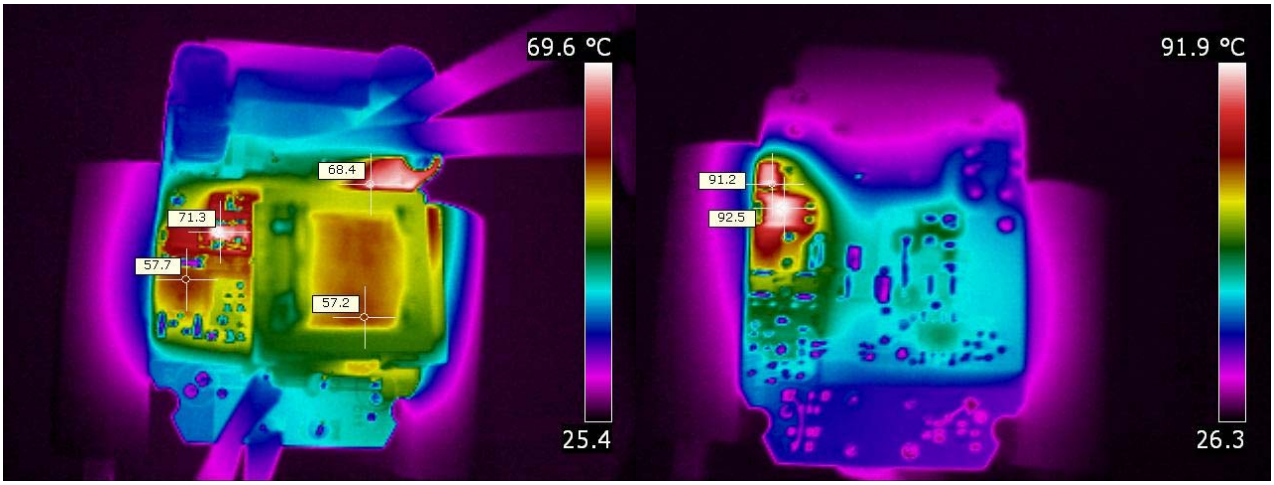
3 Thermal Images

The thermal images below show a top view (left) and bottom view (right) of the board. The ambient temperature was 26ºC with no forced air flow. The output was loaded with 2A. For the top view, the input capacitor (C2) was moved to the bottom of the board.

3.1 115VAC, 60Hz Input

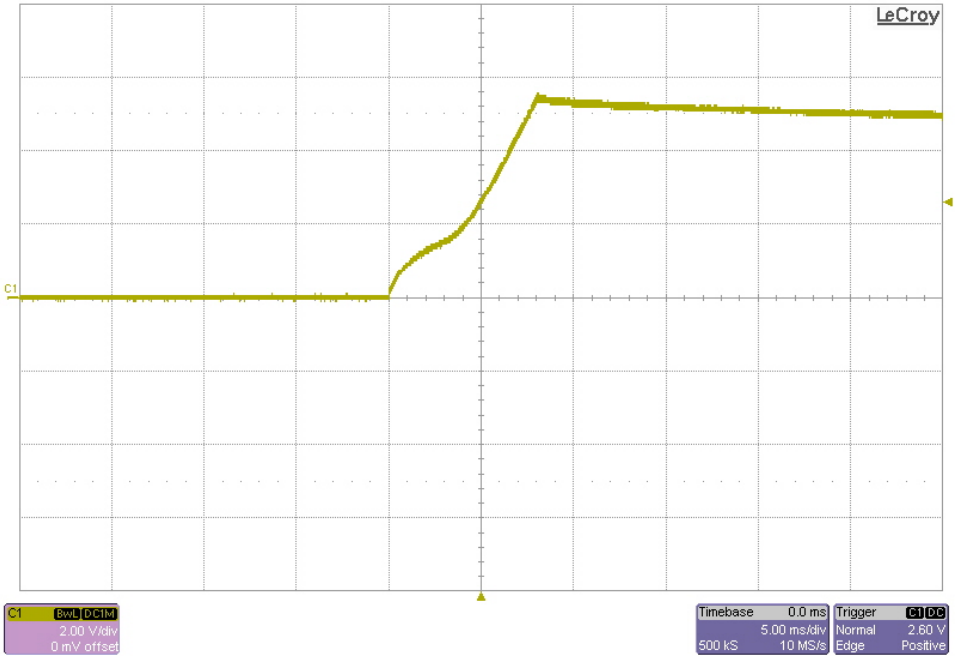


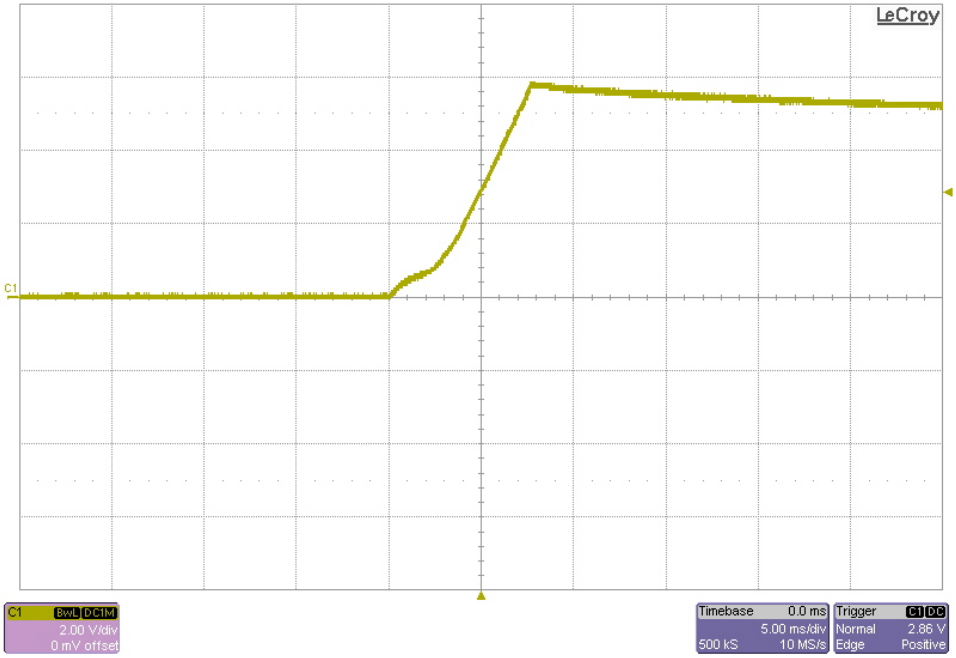
3.2 230VAC, 50Hz Input



4 Startup – No Load

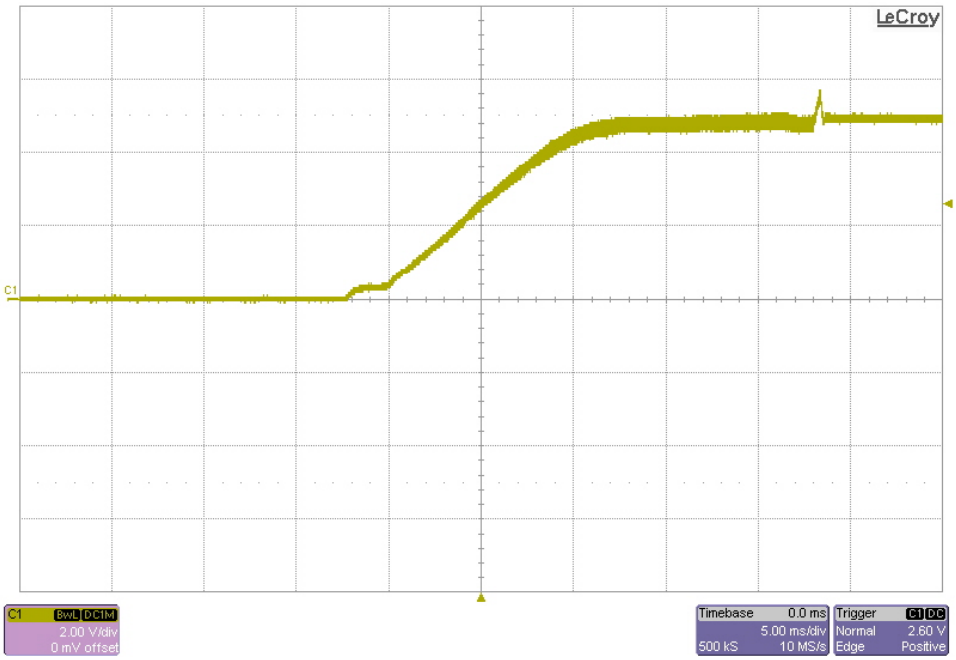
The output voltage at startup is shown in the images below. The output was unloaded. For the top image, the input was 115VAC/60Hz. For the bottom image, the input was 230VAC/50Hz.

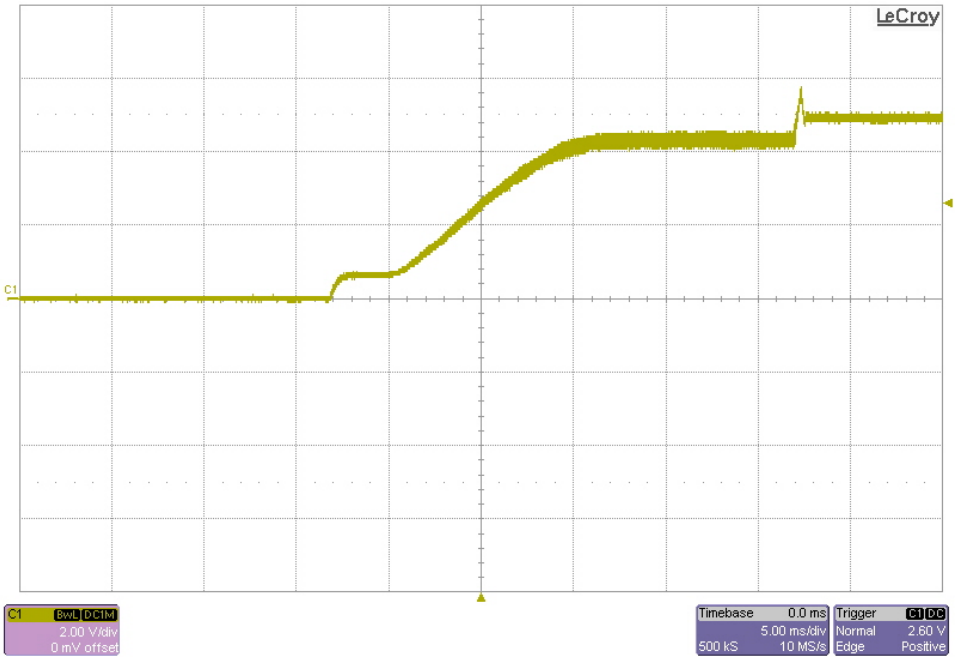




5 Startup – Full Load

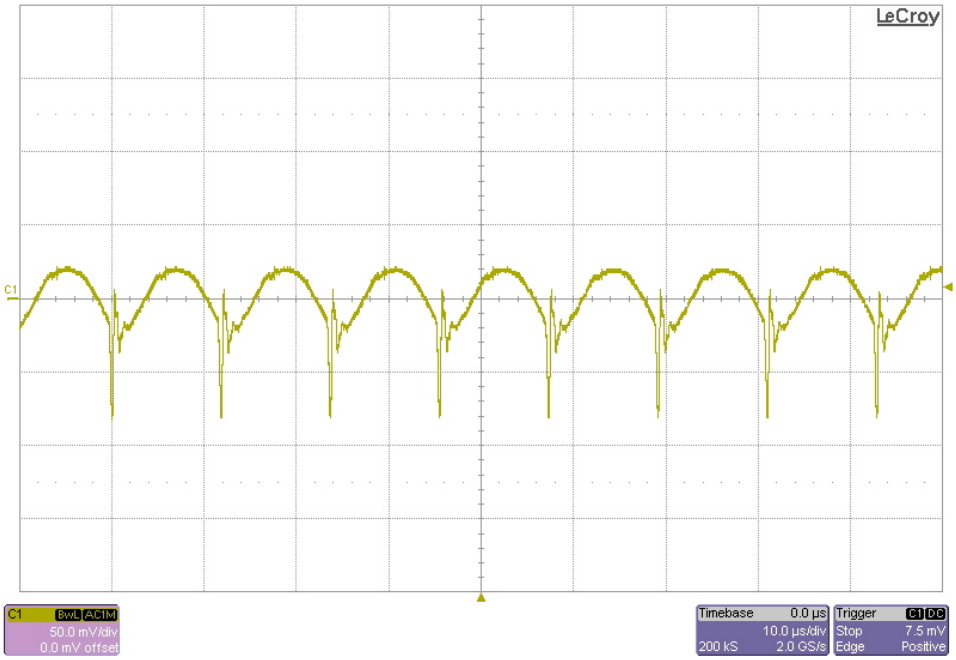
The output voltage at startup is shown in the images below. The output was 2A. For the top image, the input was 115VAC/60Hz. For the bottom image, the input was 230VAC/50Hz.

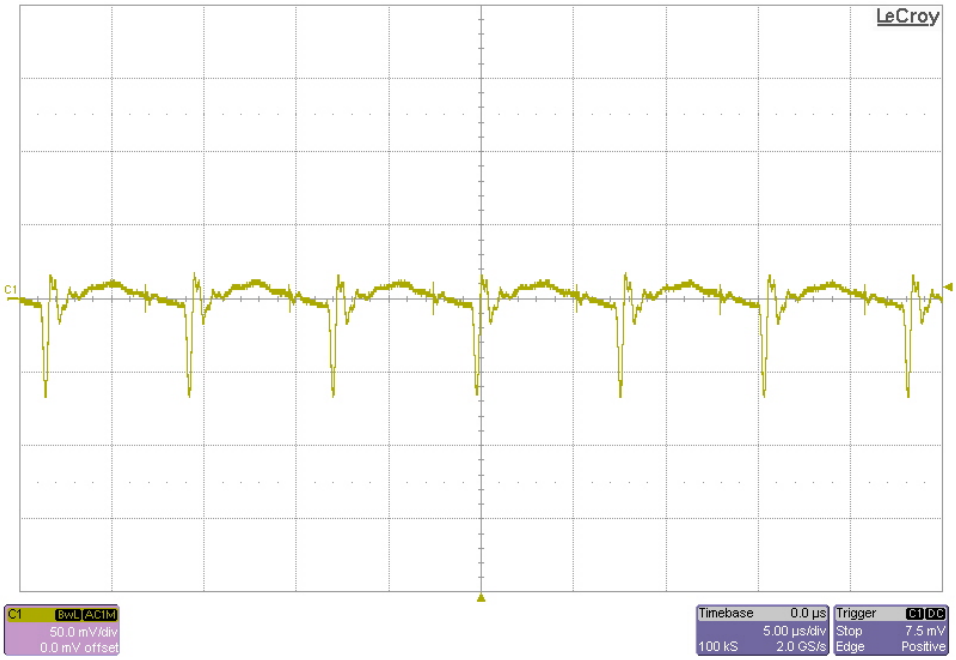




6 Output Ripple Voltage – Full Load

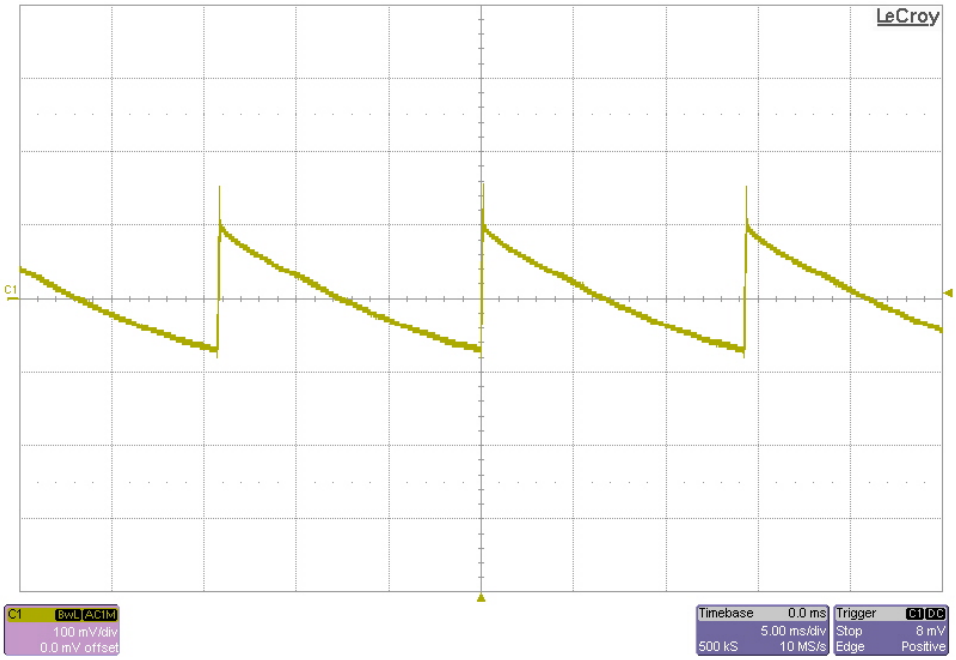
The output ripple voltage during full load (2A) operation is shown in the plots below. The top image shows the ripple with a 115VAC/60Hz input. The bottom image shows the ripple with a 230VAC/50Hz.

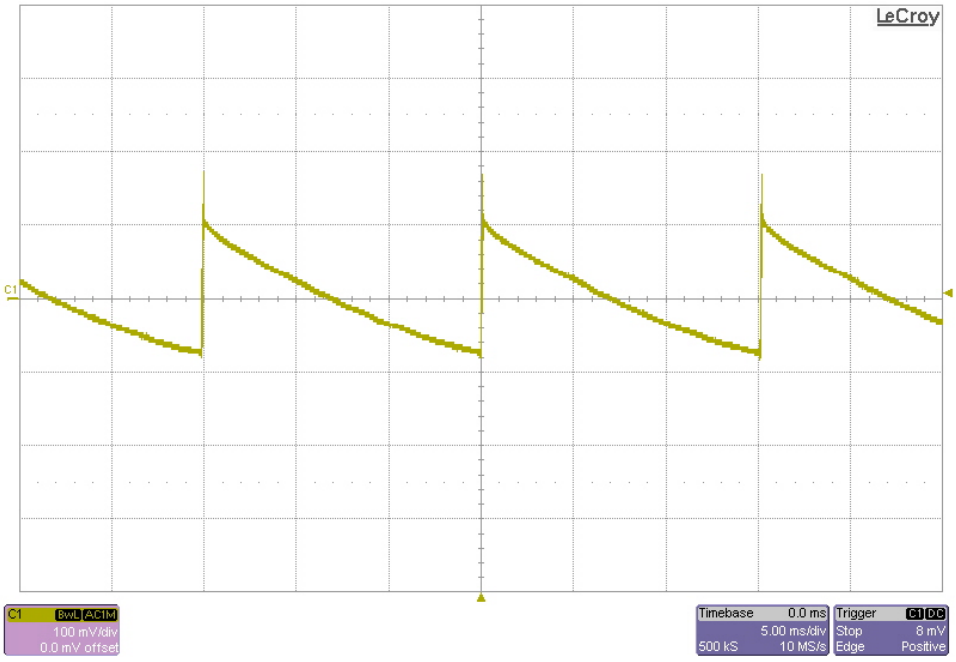




7 Output Ripple Voltage – No Load

The output ripple voltage during no load operation is shown in the plots below. The top image shows the ripple with a 115VAC/60Hz input. The bottom image shows the ripple with a 230VAC/50Hz.

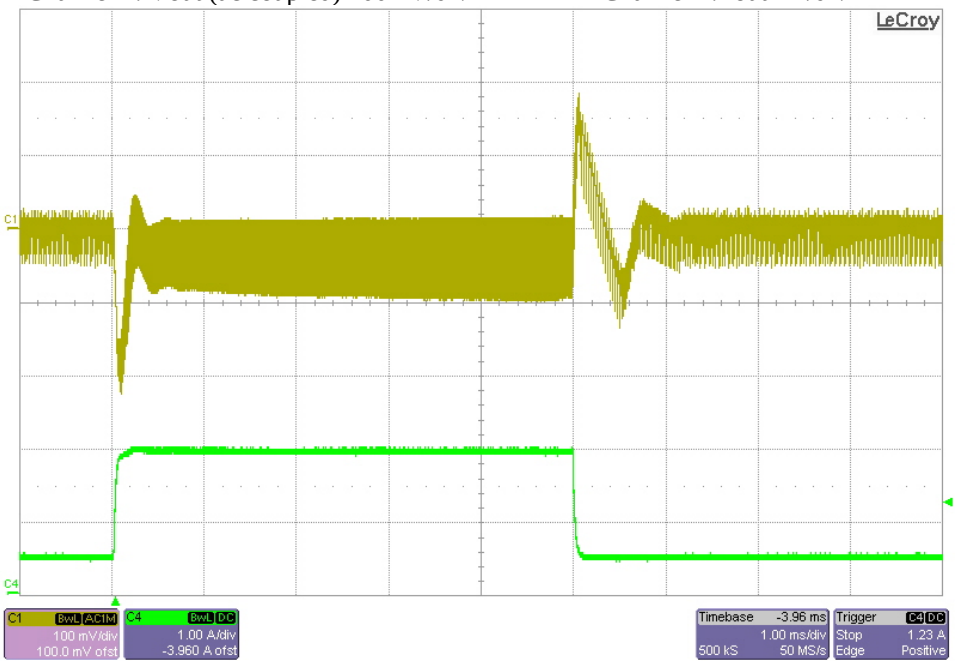


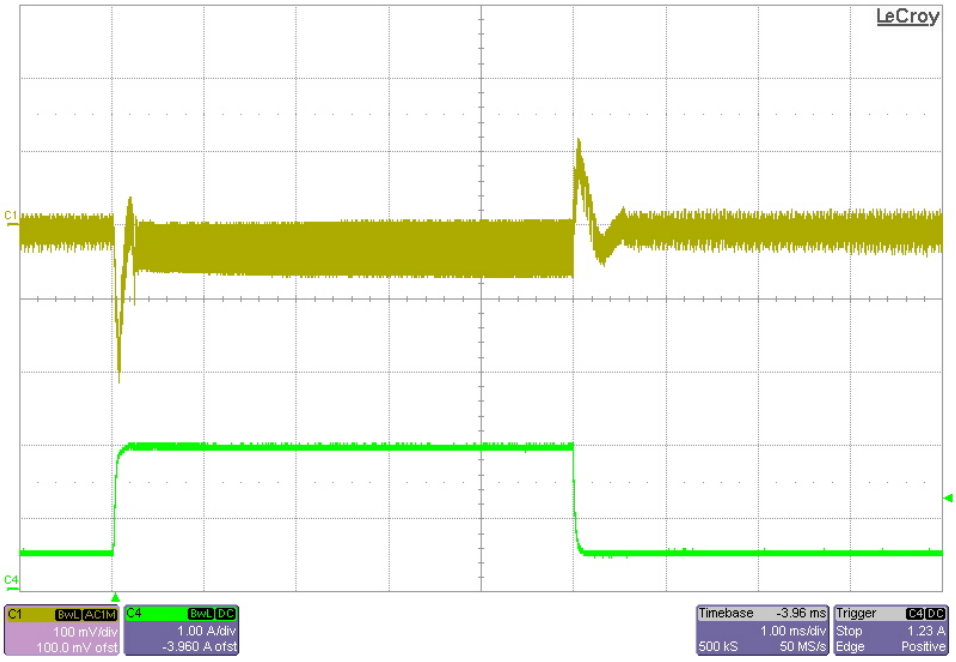


8 Load Transients

The images below show the response to a 0.5A to 2A load transient. For the top image, the input voltage was set to 115VAC/60Hz. For the bottom image, the input was set to 230VAC/50Hz.

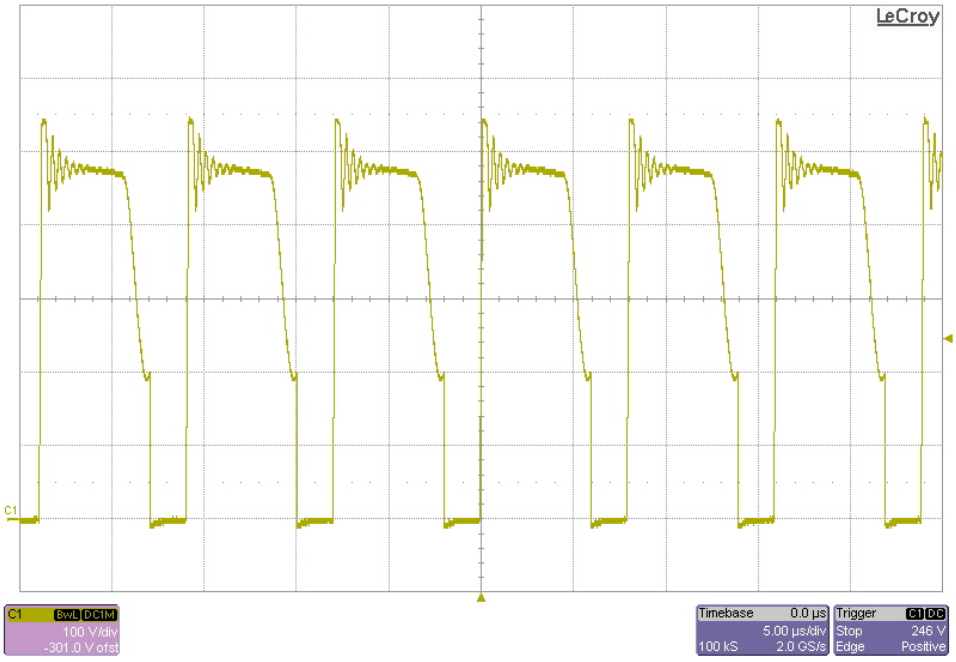
Channel 1: Vout (ac coupled) 100mV/div Channel 4: Iout 1A/div





9 Switching Waveforms

The image below shows the drain-to-source voltage waveform on the primary MOSFET (Q2). The load was 2A and the input was set to 230VAC/50Hz.



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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265