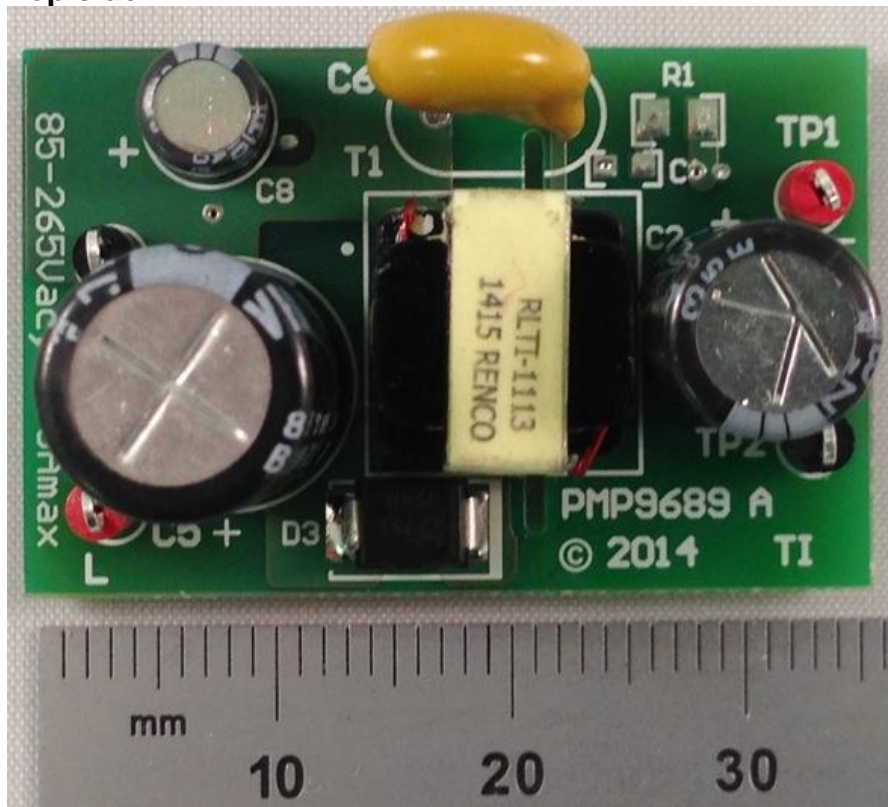


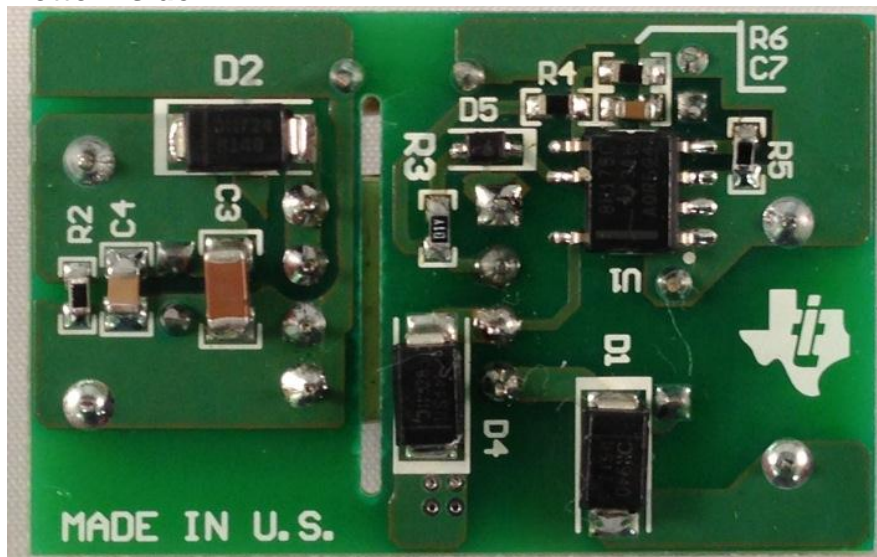
1 Photo

The photographs below show the PMP9689 Rev A assembly. This circuit was built on a PMP9689 Rev A PCB.

Top side

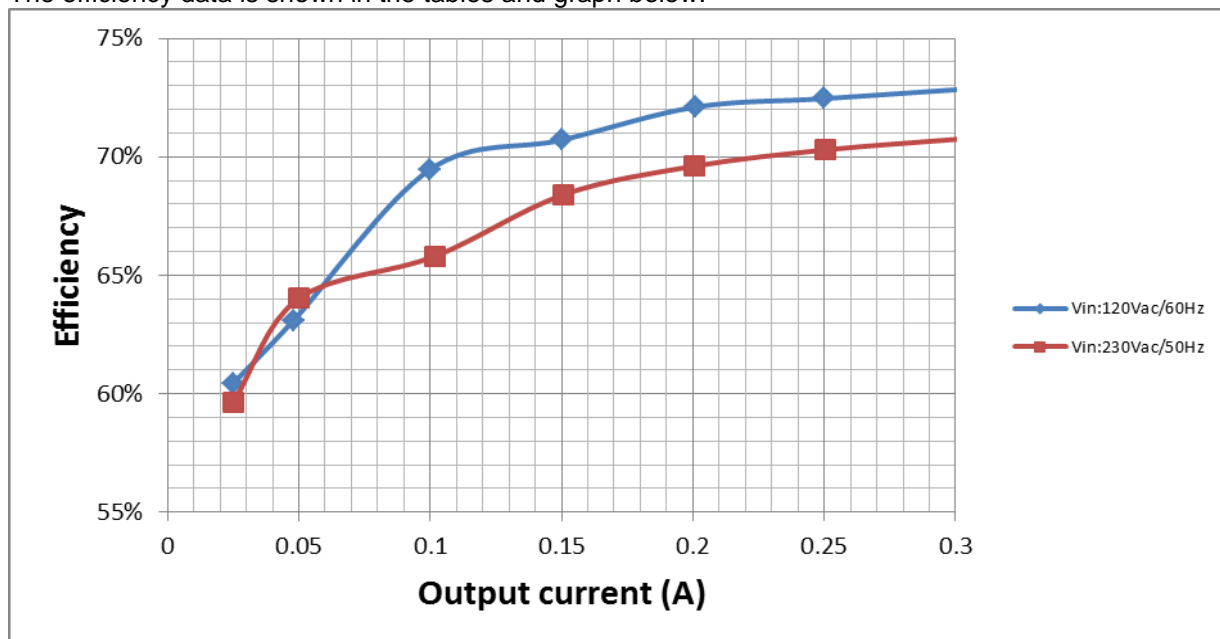


Bottom side



2 Converter Efficiency

The efficiency data is shown in the tables and graph below.



V_{in}=120V_{AC}/60Hz

V _{in} (V)	I _{in} (mA)	P _{in} (W)	V _{out} (V)	I _{out} (A)	P _{out} (W)	Losses(W)	Efficiency (%)
120.07	45.68	2.111	5.06	0.304	1.53824	0.57276	72.87%
120.08	38.97	1.744	5.055	0.25	1.26375	0.48025	72.46%
120.09	32.76	1.408	5.051	0.201	1.015251	0.392749	72.11%
120.09	26.32	1.071	5.049	0.15	0.75735	0.31365	70.71%
120.1	19.542	0.7273	5.053	0.1	0.5053	0.222	69.48%
120.11	11.872	0.3852	5.064	0.048	0.243072	0.142128	63.10%
120.12	7.38	0.2097	5.07	0.025	0.12675	0.08295	60.44%
120.12	1.205	0.03	5.081	0	0	0.03	0.00%

V_{in}=230V_{AC}/50Hz

V _{in} (V)	I _{in} (mA)	P _{in} (W)	V _{out} (V)	I _{out} (A)	P _{out} (W)	Losses(W)	Efficiency (%)
230	30.25	2.142	5.043	0.3005	1.515422	0.6265785	70.75%
230.1	26.4	1.797	5.041	0.2506	1.263275	0.5337254	70.30%
230.1	22.38	1.452	5.039	0.2006	1.010823	0.4411766	69.62%
230.1	18.208	1.111	5.04	0.1508	0.760032	0.350968	68.41%
230.1	13.893	0.7794	5.043	0.1017	0.512873	0.2665269	65.80%
230.1	8.09	0.3931	5.053	0.0498	0.251639	0.1414606	64.01%
230.1	4.703	0.2109	5.058	0.02486	0.125742	0.08515812	59.62%
230.1	0.7492	0.025	5.064	0	0	0.025	0.00%

3 Thermal Images

The thermal images below show a top view and bottom view of the board. The ambient temperature was 20°C with no forced air flow. The output was at full load: 5V/0.3A.

$V_{in}=120V_{AC}/60Hz$

Top Side

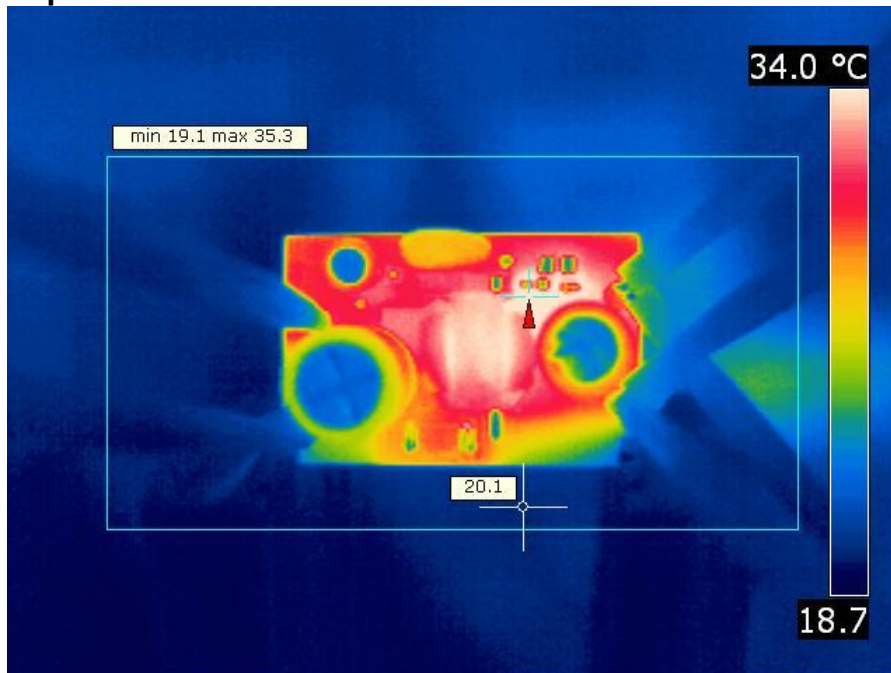


Bottom Side

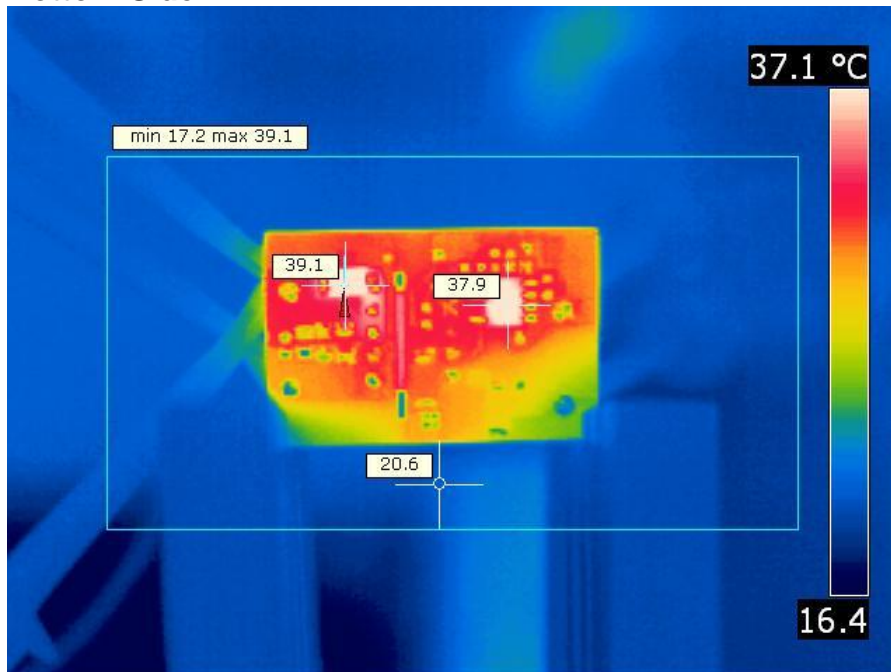


$V_{in}=230V_{AC}/50Hz$

Top Side



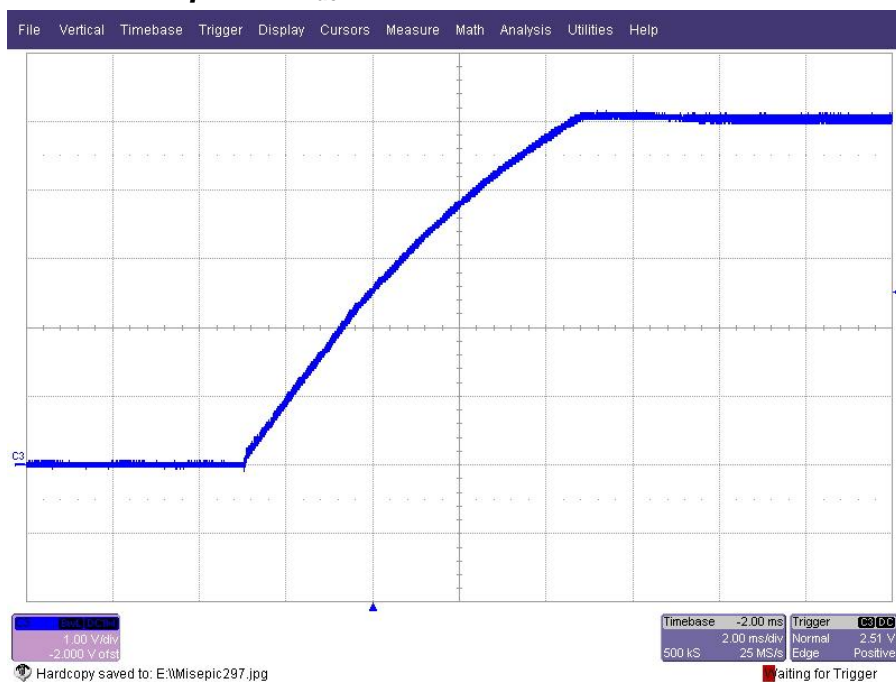
Bottom Side



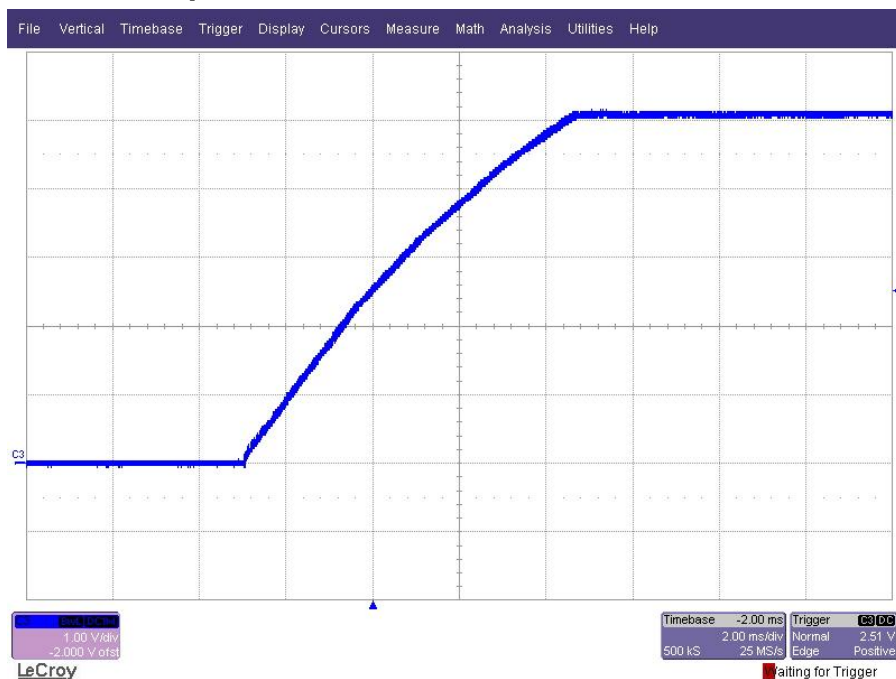
4 Startup

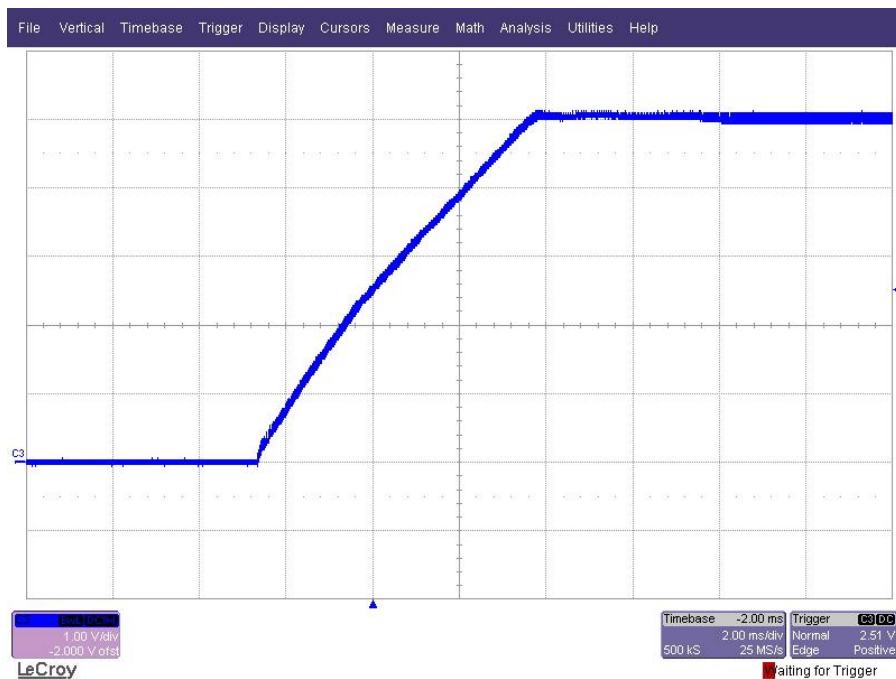
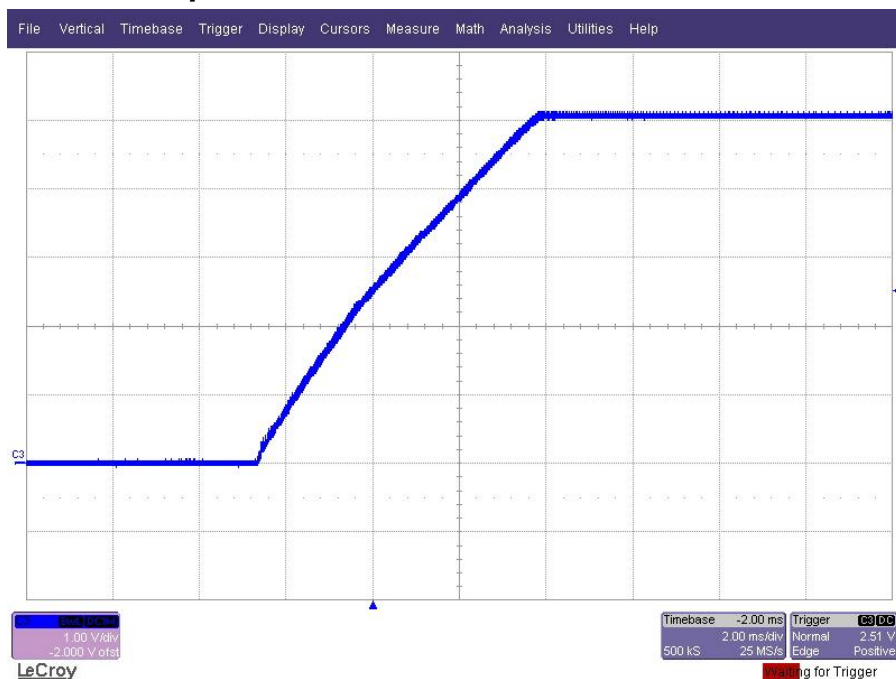
The output voltages at startup are shown in the images below with single phase input voltage.

4.1 Start Up @ 85V_{ac}/60Hz: 5V/0.3A.



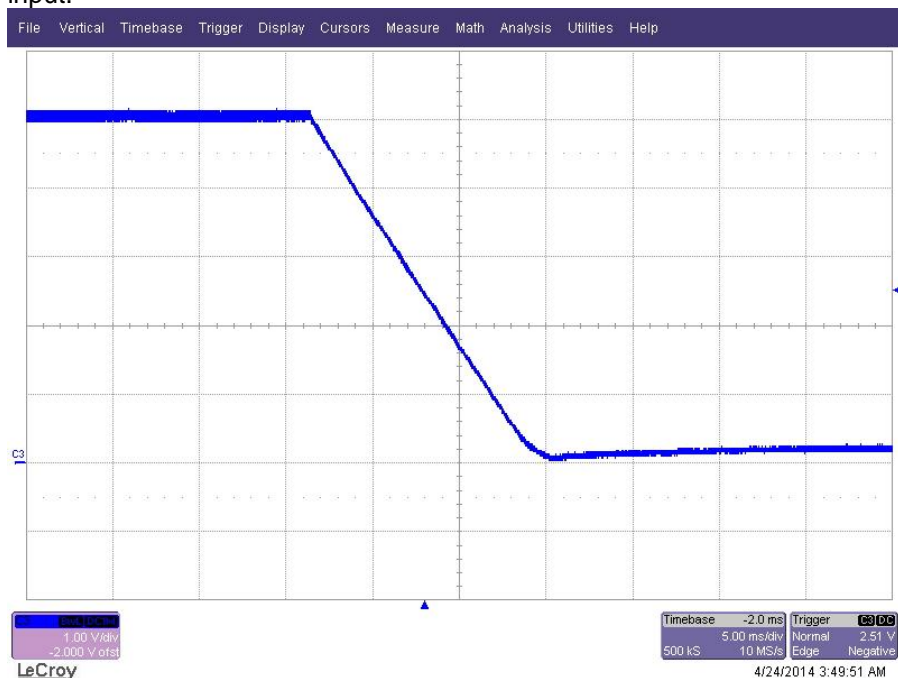
4.2 Start Up @ 85V_{ac}/60Hz: no load.



4.3 Start Up @ 230V_{ac}/50Hz: 5V/0.3A.**4.4 Start Up @ 230V_{ac}/50Hz: no load.**

5 Turn off

The output voltage at turn off transient is shown in the image below at full load (5V/0.3A) and a 85V_{ac}/60Hz input.



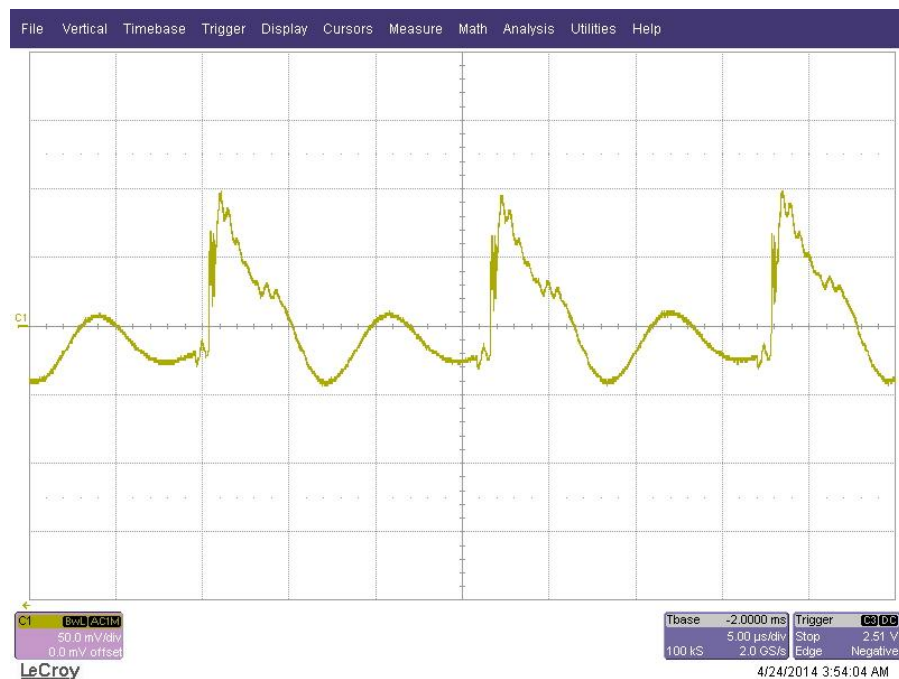
6 Output Ripple Voltages

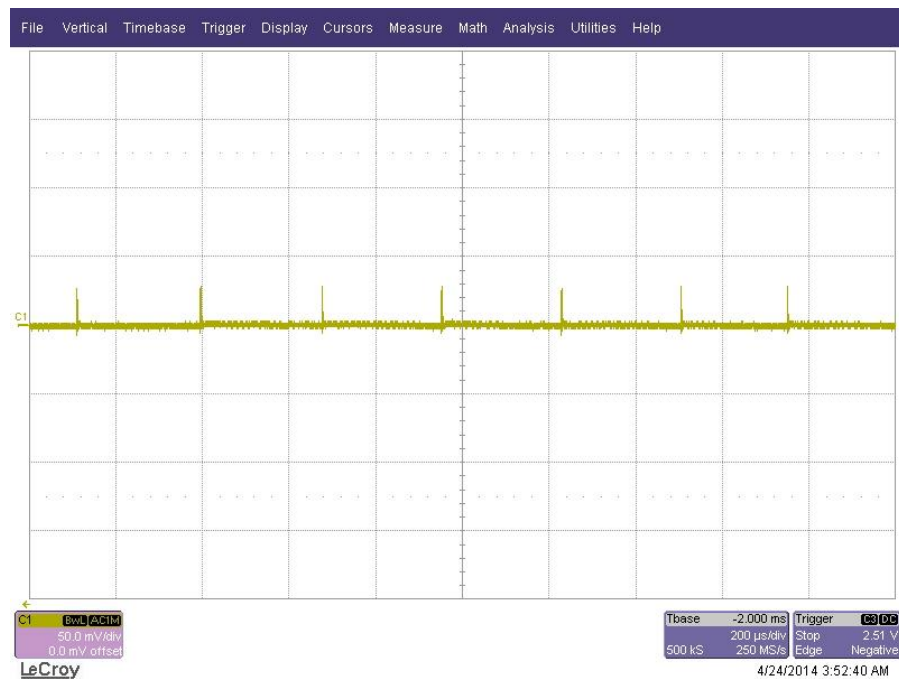
The output ripple voltages are shown in the plots below.

6.1 120V/60Hz – 5V/0.3A



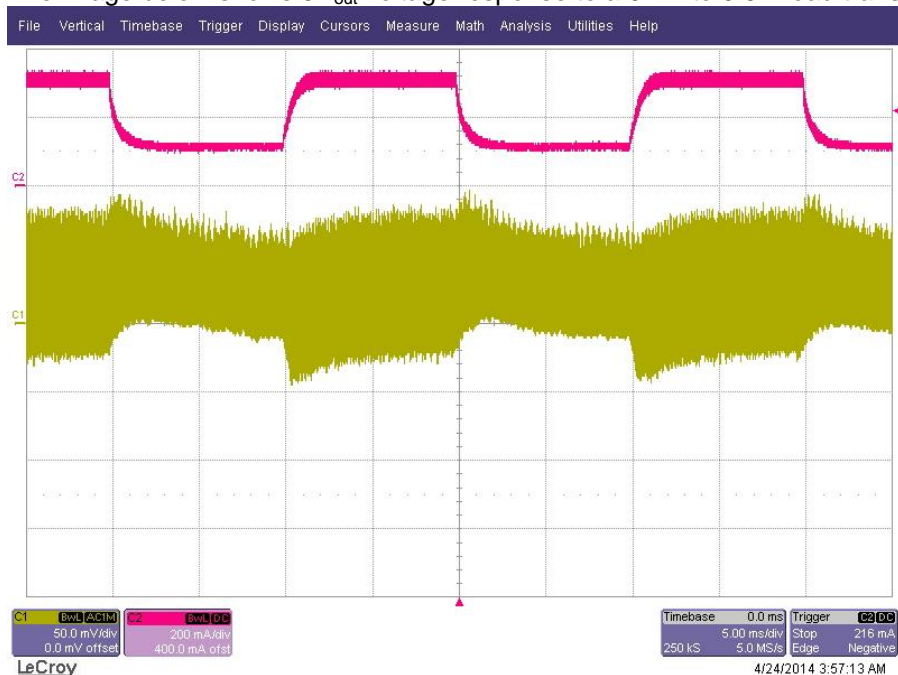
6.2 230V/50Hz – 5V/0.3A



6.3 120V/60Hz – 5V/0A**6.4 230V/50Hz – 5V/0A**

7 Load Transient

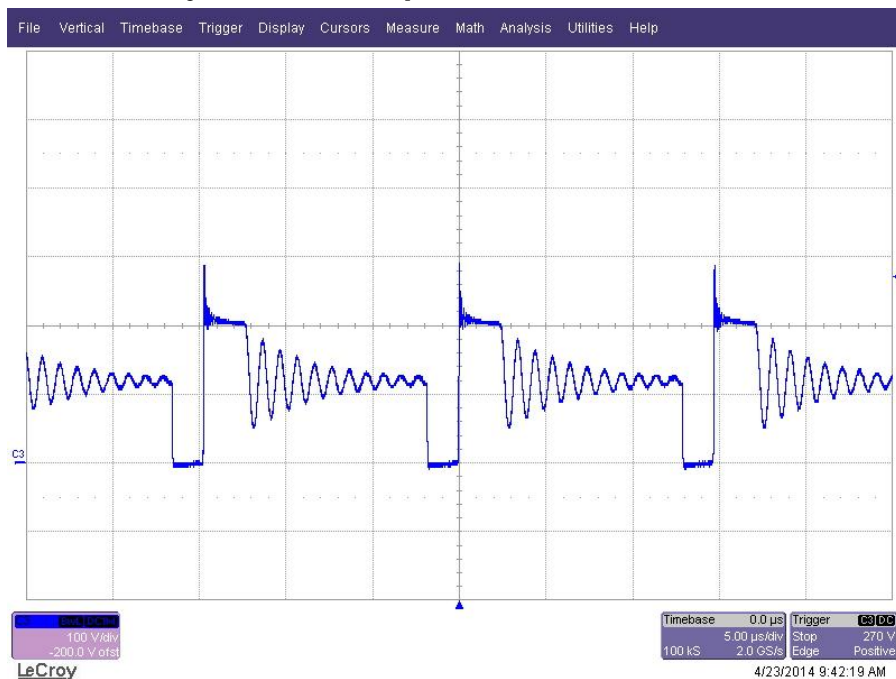
The image below shows $5V_{out}$ voltage response to a **0.1A** to **0.3A** load transient at a $120V_{ac}/60\text{Hz}$ input.



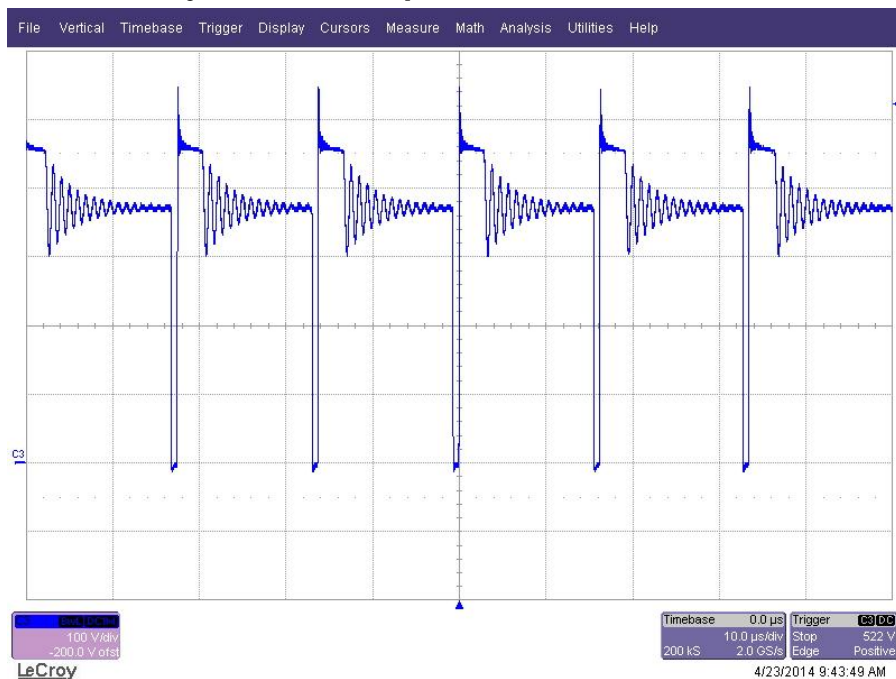
8 Switching Waveforms

The images below show key switching waveforms of PMP9689RevA. The waveforms are measured with 0.3A full load.

8.1 Primary MOSFET U1 pin8 @ 85V_{ac}/60Hz



8.2 Primary MOSFET U1 pin8 @ 265V_{ac}/50Hz



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