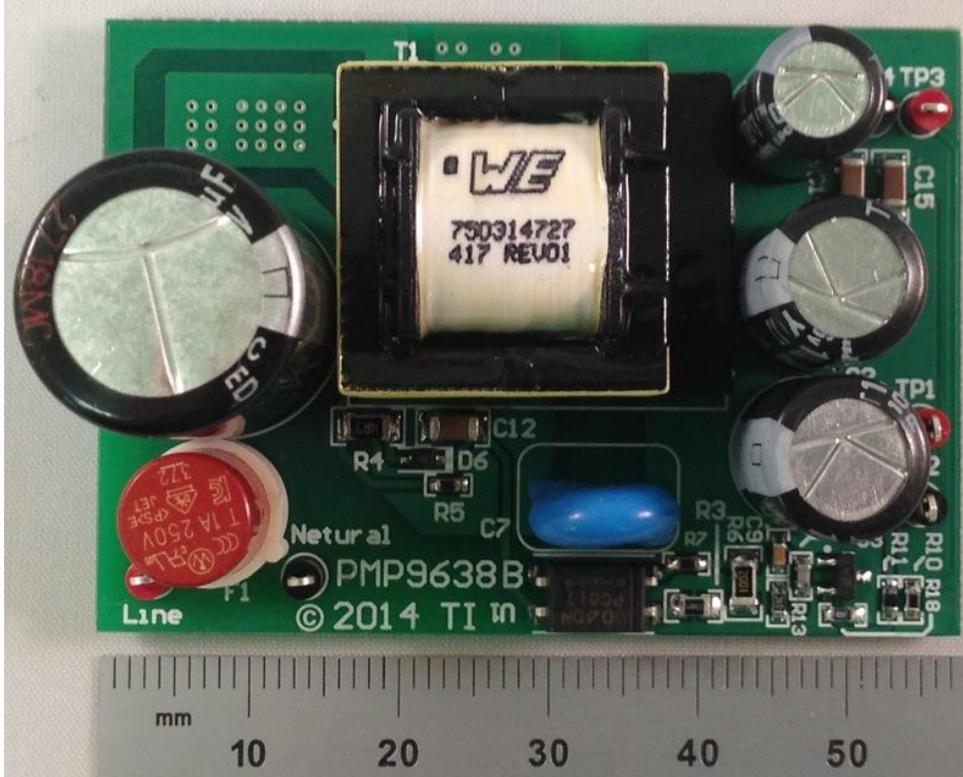


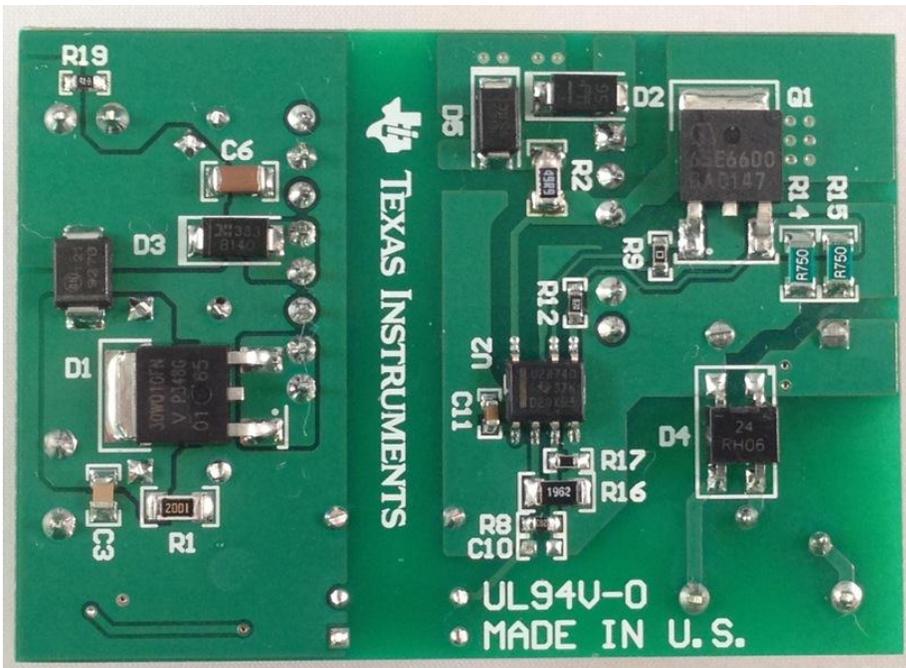
1 Photo

The photographs below show the PMP9638 Rev B assembly. This circuit was built on a PMP9638 Rev B PCB.

Top side

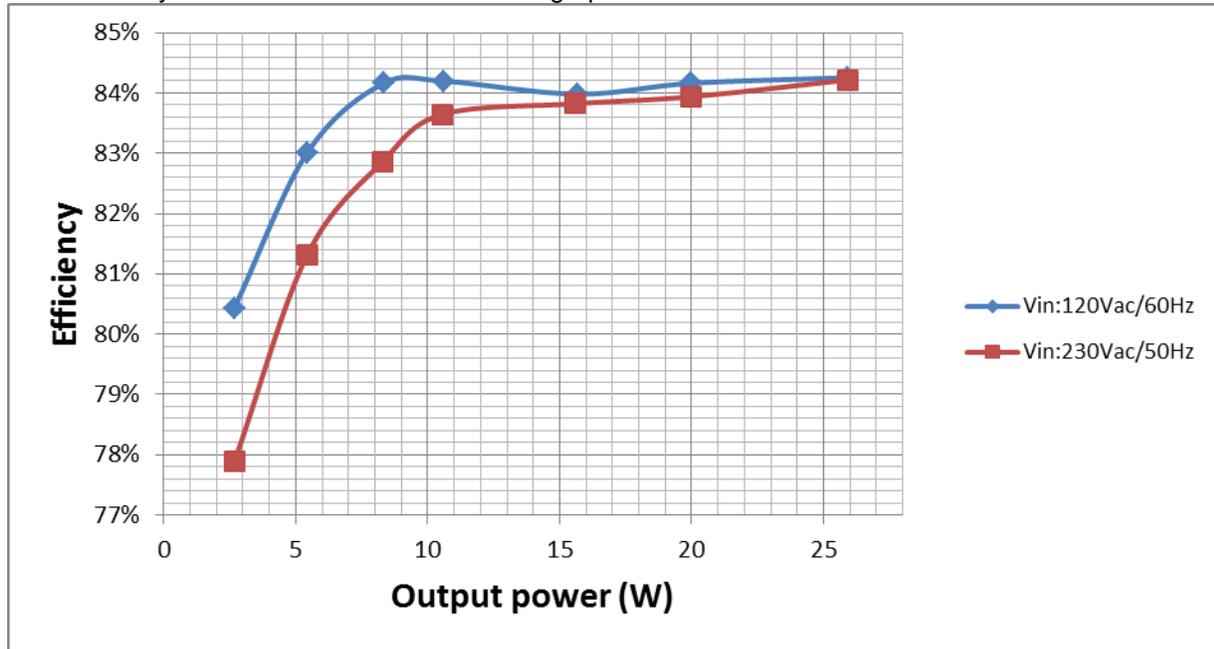


Bottom side



2 Converter Efficiency

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



Vin=120V_{AC}/60Hz

Vin(ac)	Iin(A)	Pin(W)	Vo1(V)	Io1(A)	Vo2(V)	Io2(A)	Pout(W)	Eff. (%)
120.23	0.4866	30.78	12.42	1.956	3.28	0.5	25.93352	84.25%
120.23	0.3949	23.73	12.45	1.499	3.28	0.399	19.97127	84.16%
120.23	0.3263	18.667	12.42	1.183	3.28	0.3	15.67686	83.98%
120.24	0.2388	12.579	12.35	0.805	3.28	0.198	10.59119	84.20%
120.25	0.19705	9.879	12.29	0.637	3.28	0.148	8.31417	84.16%
120.26	0.14206	6.541	12.25	0.417	3.28	0.098	5.42969	83.01%
120.25	0.08154	3.32	12.21	0.205	3.28	0.051	2.67033	80.43%
120.25	0.0056	0.15232	12.5	0	3.28	0	0	0.00%

Vin=230V_{AC}/50Hz

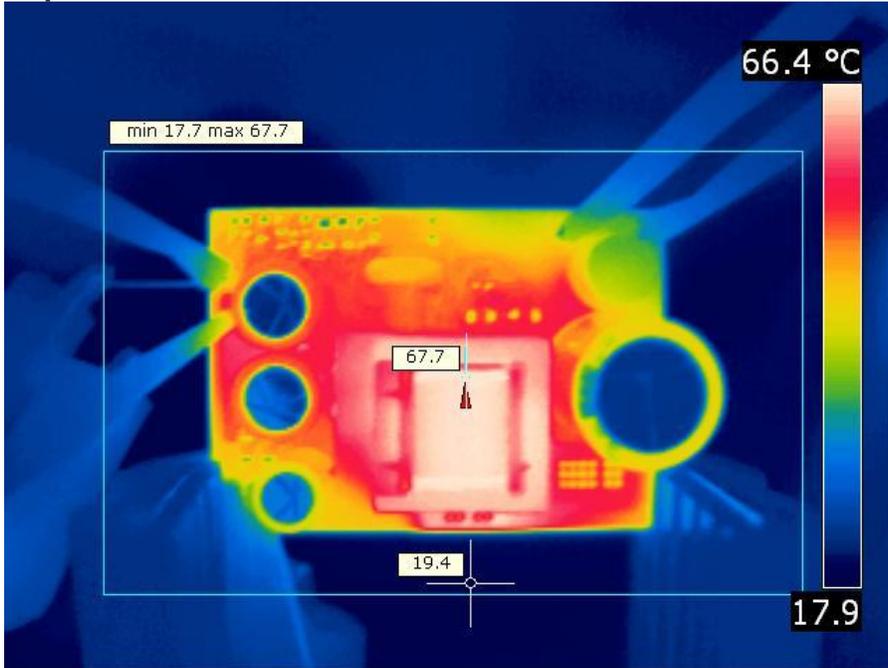
Vin(ac)	Iin(A)	Pin(W)	Vo1(V)	Io1(A)	Vo2(V)	Io2(A)	Pout(W)	Eff. (%)
230.2	0.3371	30.77	12.43	1.952	3.28	0.503	25.9132	84.22%
230.2	0.2779	23.8	12.46	1.498	3.28	0.4	19.97708	83.94%
230.2	0.2313	18.598	12.43	1.175	3.28	0.3	15.58925	83.82%
230.2	0.16994	12.611	12.35	0.801	3.28	0.2	10.54835	83.64%
230.2	0.13912	9.996	12.29	0.634	3.28	0.1496	8.282548	82.86%
230.2	0.09669	6.674	12.25	0.416	3.28	0.1008	5.426624	81.31%
230.2	0.05437	3.434	12.25	0.205	3.28	0.0498	2.674594	77.89%
230.2	0.0047	0.2005	12.54	0	3.28	0	0	0.00%

3 Thermal Images

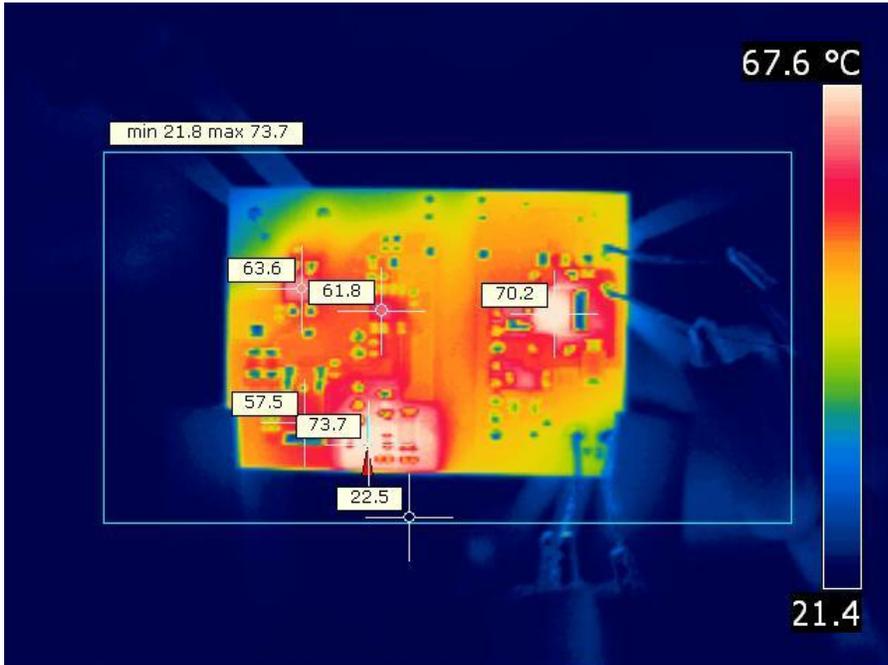
The thermal images below show a top view and bottom view of the board. The ambient temperature was 20°C with no forced air flow. The outputs were at 12V/2A and 3.3V/0.5A loads.

120V_{AC}/60Hz

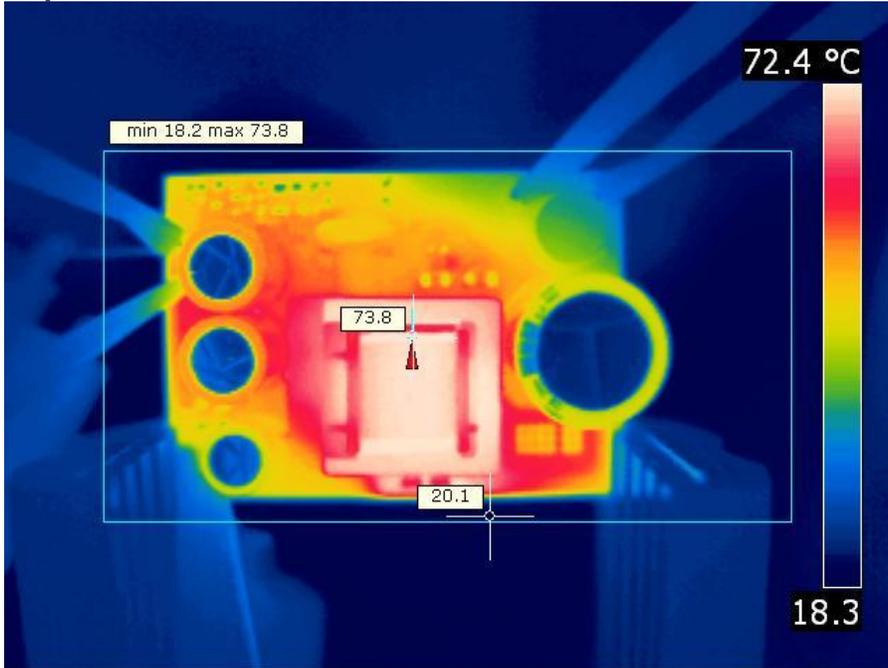
Top Side



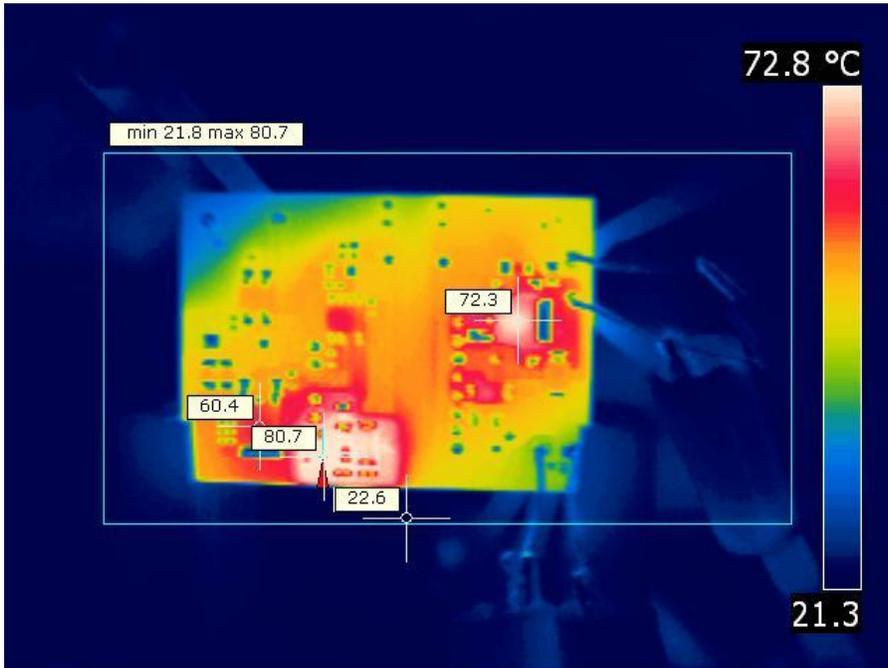
Bottom Side



230V_{AC}/50Hz
Top Side



Bottom Side



4 Startup

The output voltages at startup are shown in the images below.

4.1 Start Up @ 120V_{AC}: 12V/2A, 3.3V/0.5A.



4.2 Start Up @ 120V_{AC}: 12V/2A, 3.3V/0A.



4.3 Start Up @ 120V_{AC}: no load.



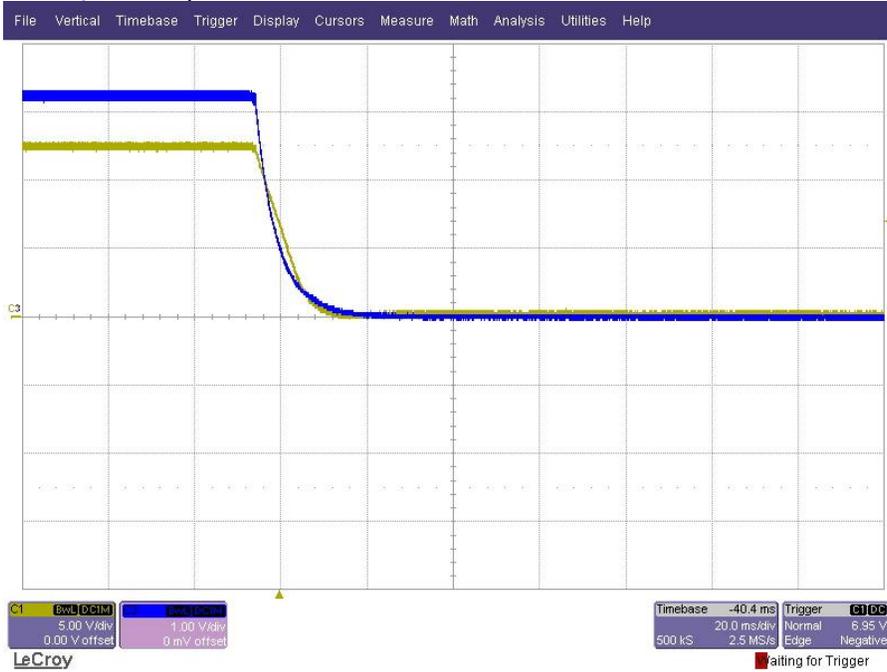
5 Cross regulation

Output voltage cross regulation is tested at 120V_{AC}/60Hz input.

$I_{out_{12V}}$ (A)	$I_{out_{3.3V}}$ (A)	$12V_{measured}$ (V)	$3.3V_{measured}$ (V)
0	0.512	15.82	3.23
2	0.202	12.06	3.28
2	0	11.28	3.29

6 Turn off

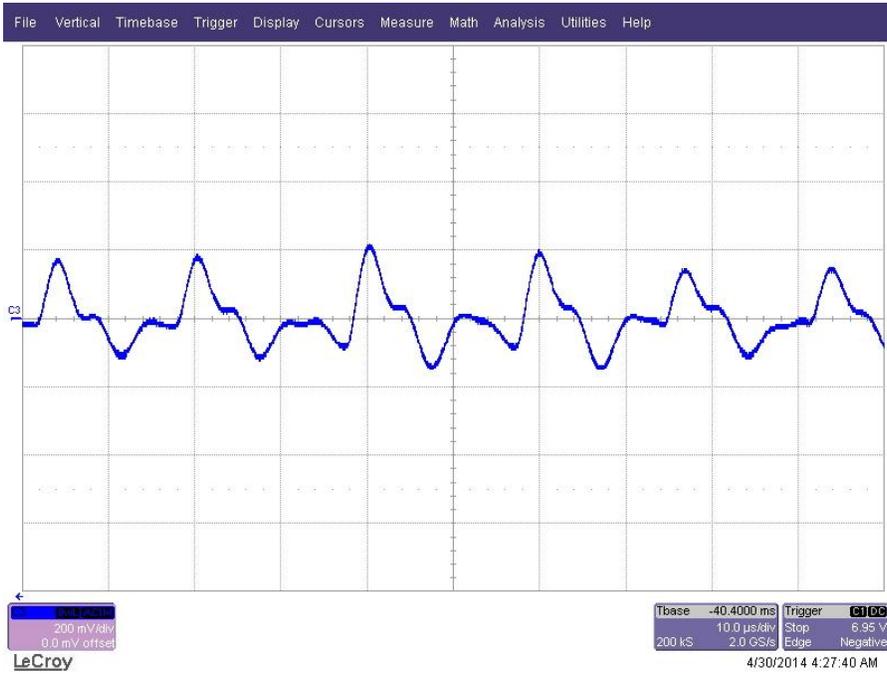
The output voltages at turn off transient is shown in the image below at full load (12V/2A, 3.3V/0.5A) and 120V_{AC}/60Hz input.



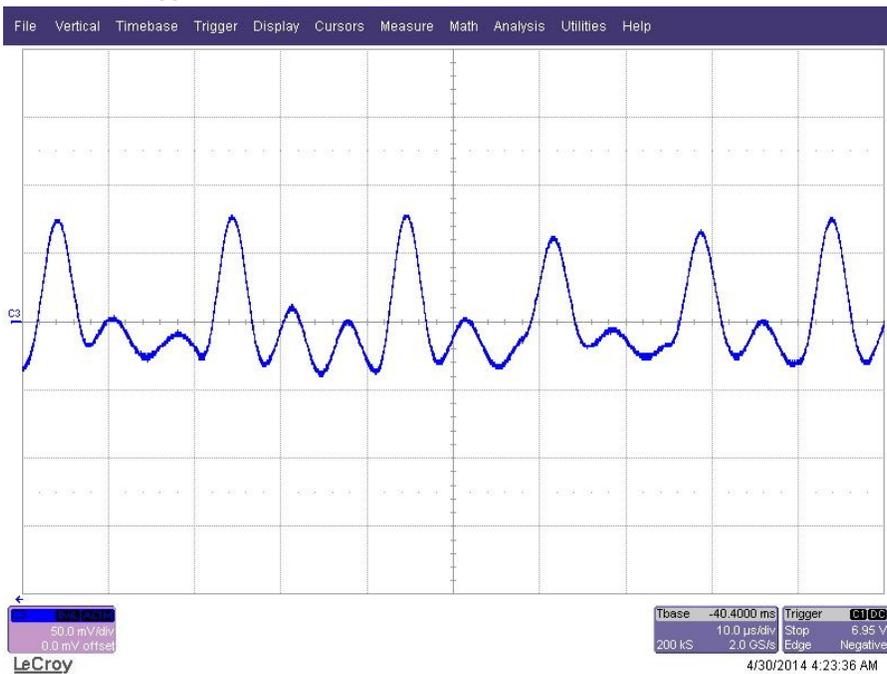
7 Output Ripple Voltages

The output ripple voltages are shown in the plots below at full load (12V/2A and 3.3V/0.5A).

7.1 12V_{ripple} at 120V_{AC}/60Hz



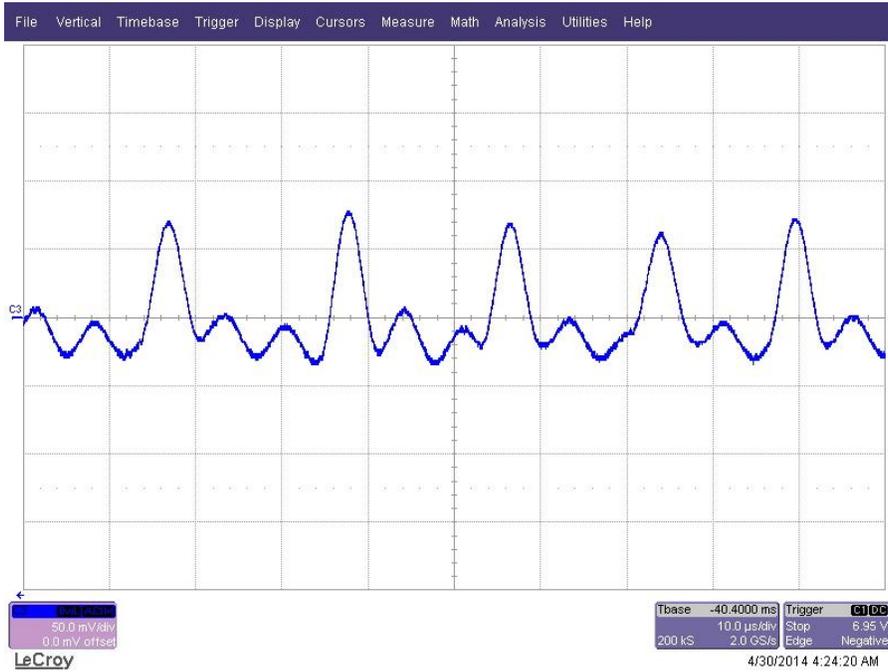
7.2 3.3V_{ripple} at 120V_{AC}/60Hz



7.3 12V_{ripple} at 230V_{AC}/50Hz

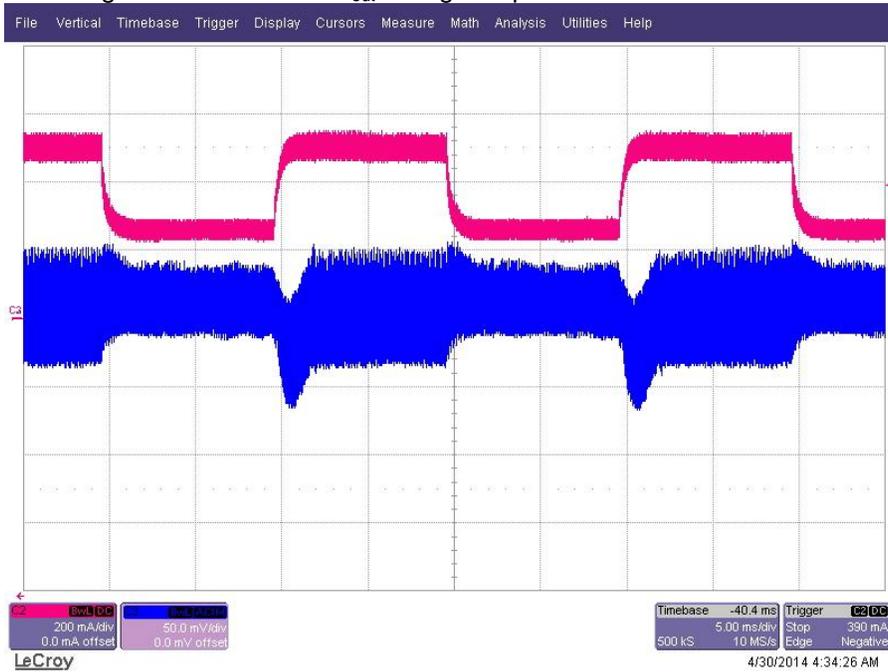


7.4 3.3V_{ripple} at 230V_{AC}/50Hz



8 Load Transient

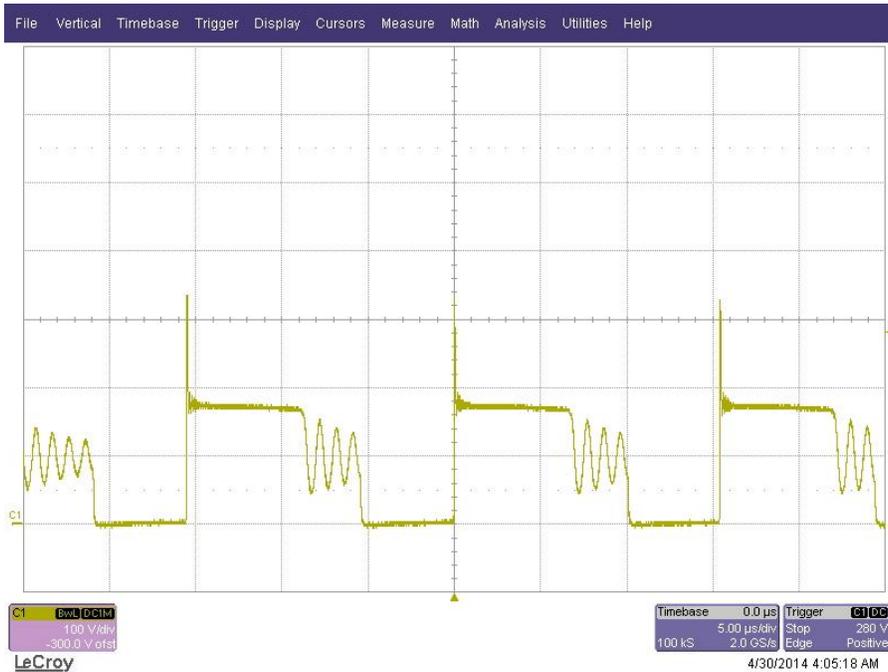
The image below shows $3.3V_{out}$ voltage response to a **0.25A** to **0.5A** load transient with 12V loaded with 2A.



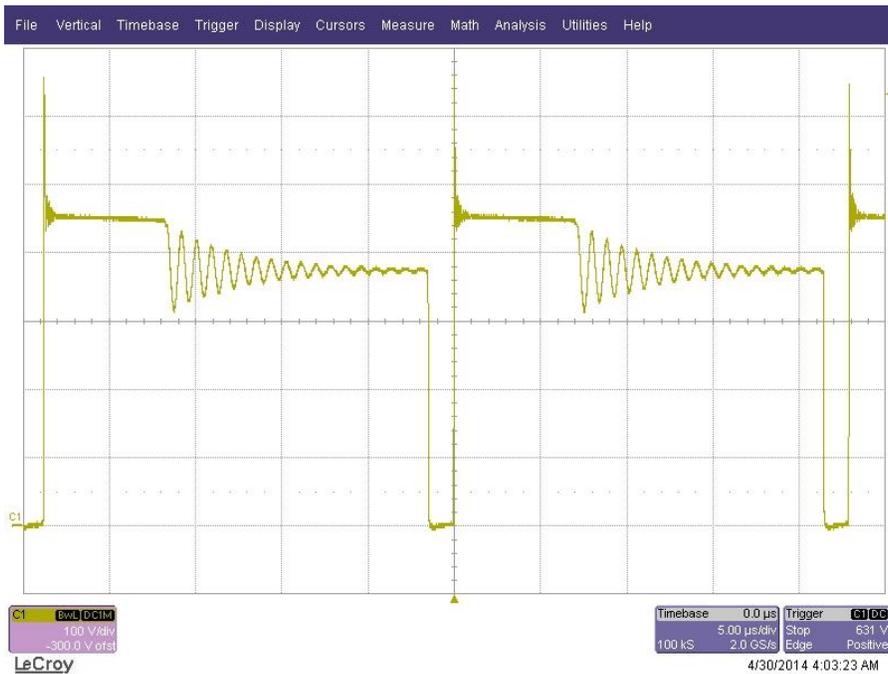
9 Switching Waveforms

The images below show key switching waveforms of PMP9638RevB. The waveforms are measured with 12V/2A and 3.3V/0.5A full load.

9.1 Primary MOSFET Q1 @ 85V_{ac}/60Hz

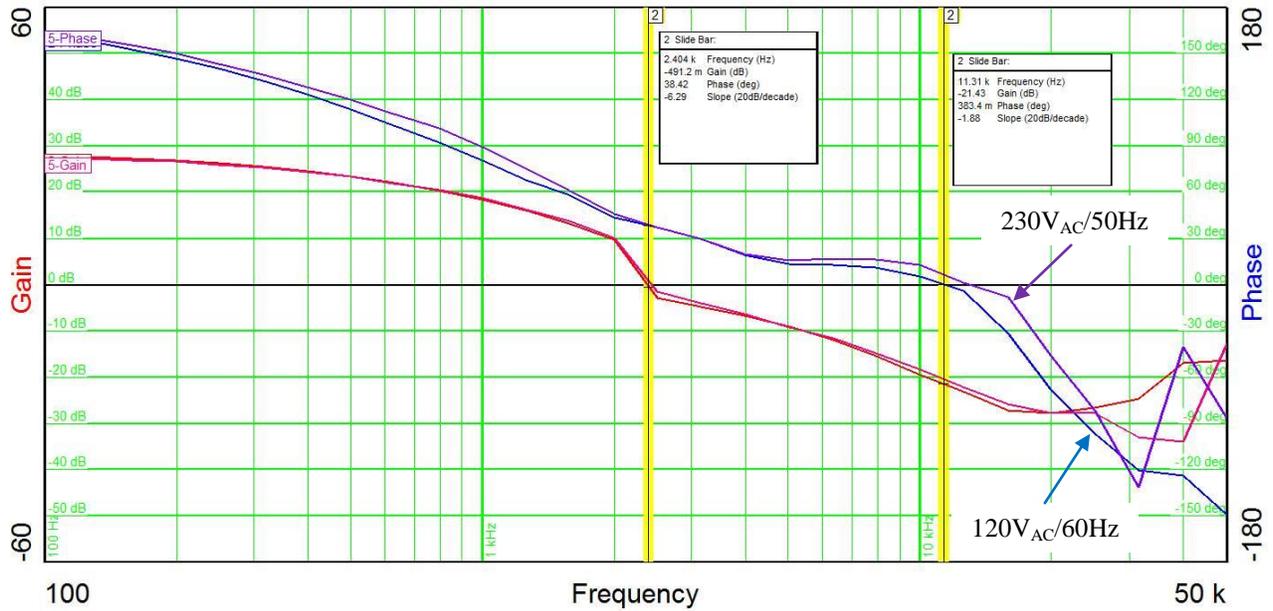


9.2 Primary MOSFET Q1 @ 264V_{ac}/50Hz



10 Frequency Response

The images below show the frequency response of PMP9638RevB with 12V/2A and 3.3V/0.2A loads.



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