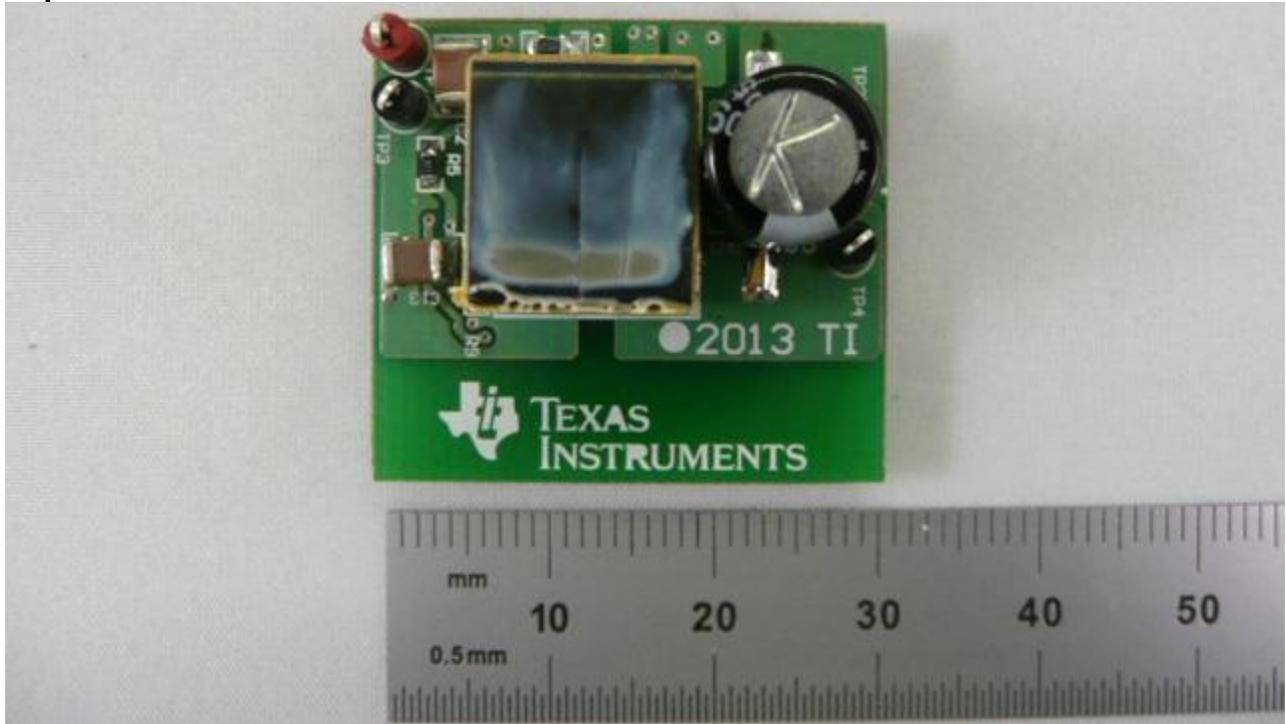


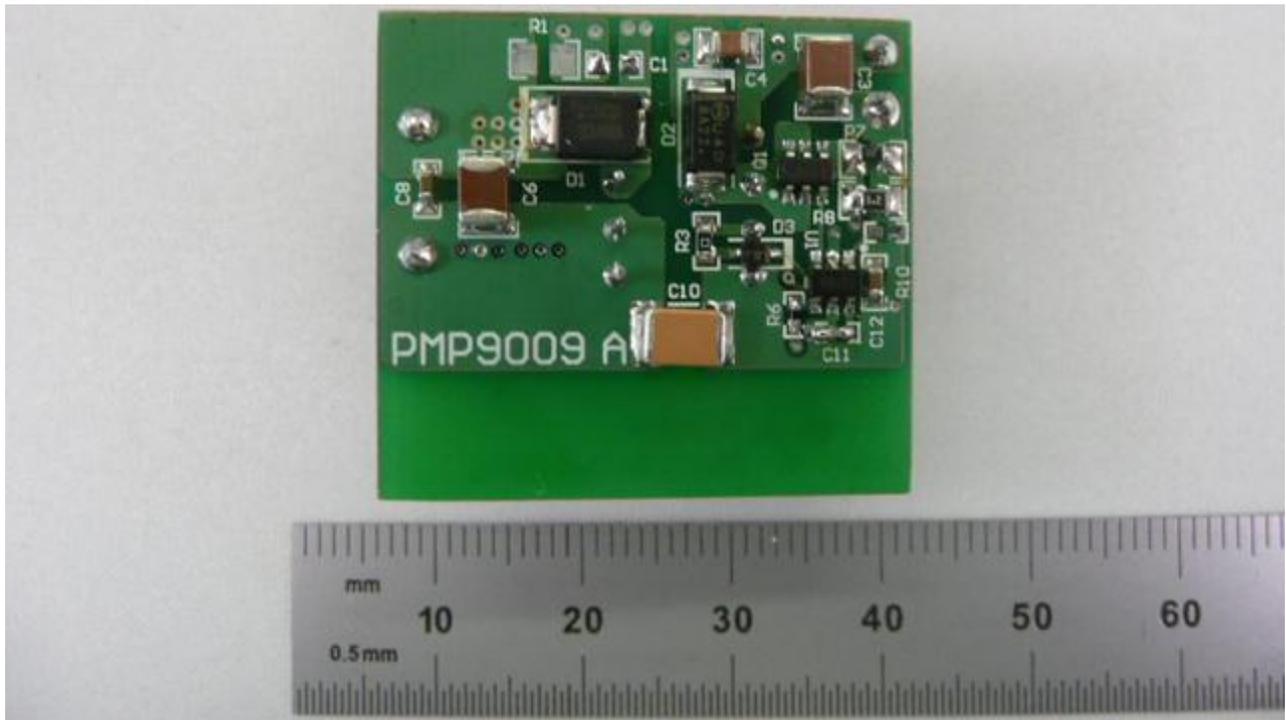
1 Photo

The photographs below show the PMP9009 Rev A assembly. This circuit was built on a PMP9009 Rev A PCB.

Top side

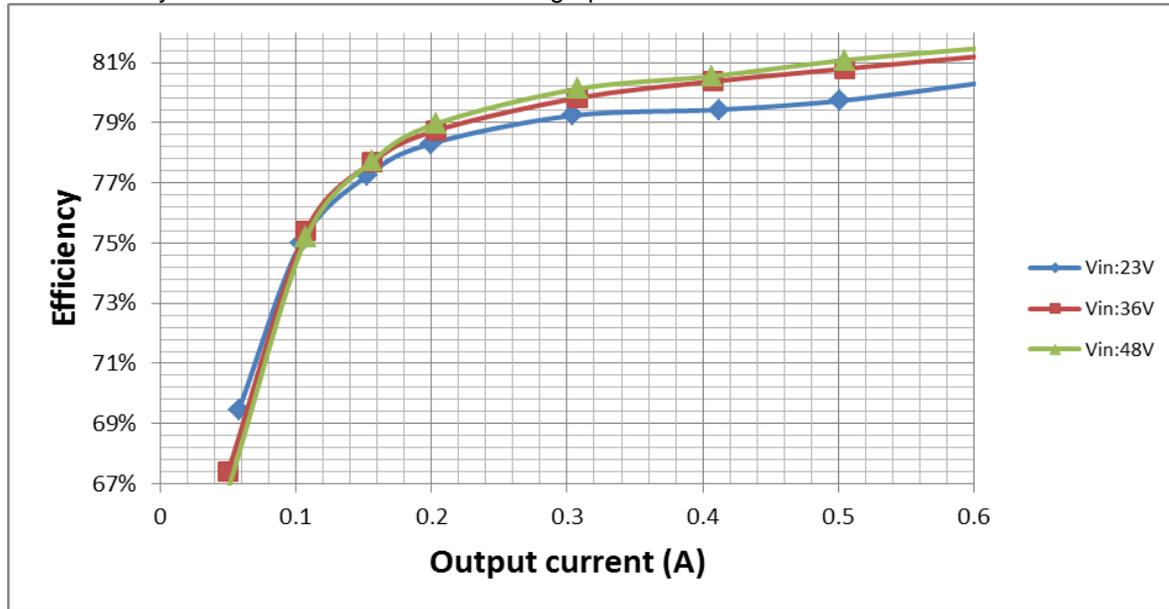


Bottom side



2 Converter Efficiency

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



V_{in}=23V_{DC}

Vin(V)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses(W)	Efficiency (%)
23.02	0.1612	3.710824	4.95	0.602	2.9799	0.730924	80.30%
23.08	0.1345	3.10426	4.94	0.501	2.47494	0.62932	79.73%
23.12	0.1106	2.557072	4.93	0.412	2.03116	0.525912	79.43%
23.18	0.0816	1.891488	4.93	0.304	1.49872	0.392768	79.23%
23.23	0.0541	1.256743	4.93	0.1996	0.984028	0.272715	78.30%
23.26	0.0419	0.974594	4.93	0.1527	0.752811	0.221783	77.24%
23.28	0.02931	0.682337	4.93	0.1038	0.511734	0.1706028	75.00%
23.3	0.01777	0.414041	4.96	0.05799	0.28763	0.1264106	69.47%

V_{in}=36V_{DC}

Vin(V)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses(W)	Efficiency (%)
36	0.1026	3.6936	4.95	0.606	2.9997	0.6939	81.21%
36.03	0.0857	3.087771	4.94	0.505	2.4947	0.593071	80.79%
36.06	0.0694	2.502564	4.93	0.408	2.01144	0.491124	80.38%
36.09	0.0526	1.898334	4.92	0.308	1.51536	0.382974	79.83%
36.13	0.03521	1.272137	4.92	0.2036	1.001712	0.2704253	78.74%
36.14	0.02744	0.991682	4.92	0.1566	0.770472	0.2212096	77.69%
36.16	0.01944	0.70295	4.93	0.1075	0.529975	0.1729754	75.39%
36.18	0.01018	0.368312	4.96	0.05005	0.248248	0.1200644	67.40%

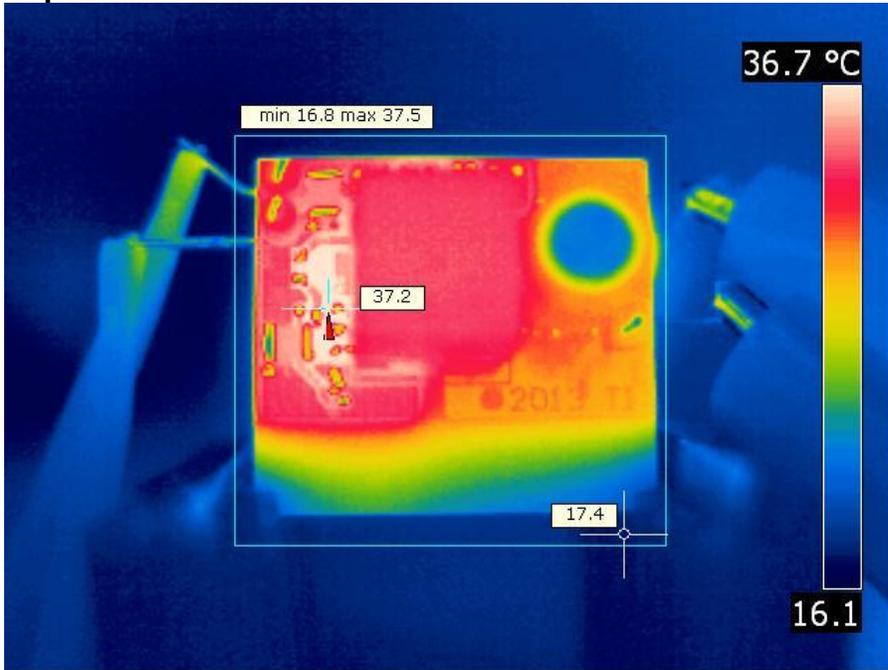
V_{in}=48V_{DC}

Vin(V)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses(W)	Efficiency (%)
48	0.0767	3.6816	4.95	0.606	2.9997	0.6819	81.48%
48	0.0641	3.0768	4.94	0.505	2.4947	0.5821	81.08%
48	0.0519	2.4912	4.93	0.407	2.00651	0.48469	80.54%
48	0.0394	1.8912	4.92	0.308	1.51536	0.37584	80.13%
48	0.02644	1.26912	4.92	0.2037	1.002204	0.266916	78.97%
48.1	0.02062	0.991822	4.92	0.1567	0.770964	0.220858	77.73%
48.1	0.01465	0.704665	4.92	0.1077	0.529884	0.174781	75.20%
48.1	0.00773	0.371813	4.95	0.0502	0.24849	0.123323	66.83%

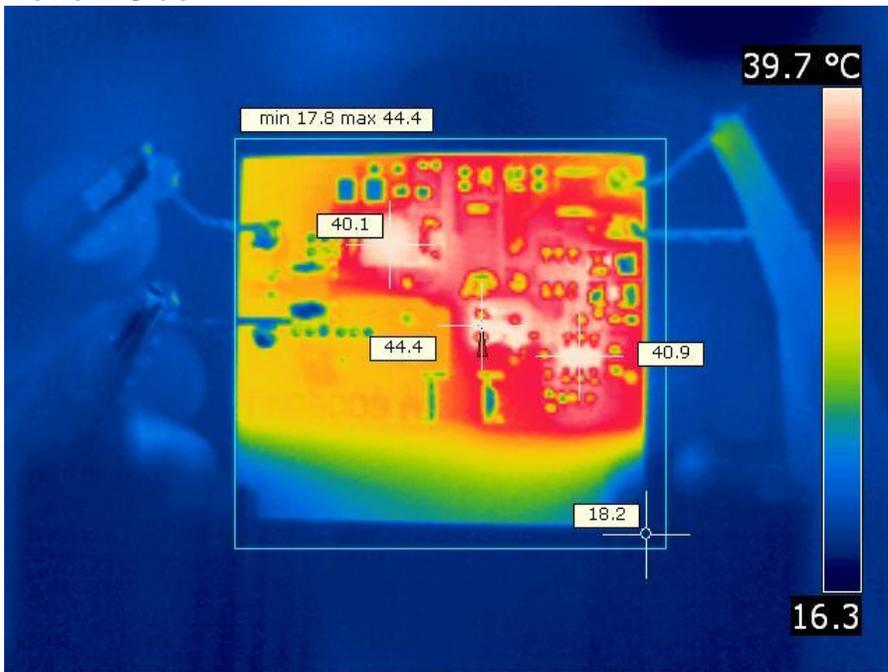
3 Thermal Images

The thermal images below show a top view and bottom view of the board with 23V_{DC} input. The ambient temperature was 20°C with no forced air flow. The output was at full load: 5V/0.6A.

Top Side



Bottom Side



4 Startup

The output voltage at 23V_{in} and full load (5V/0.6A) startup is shown in the image below.



5 Turn off

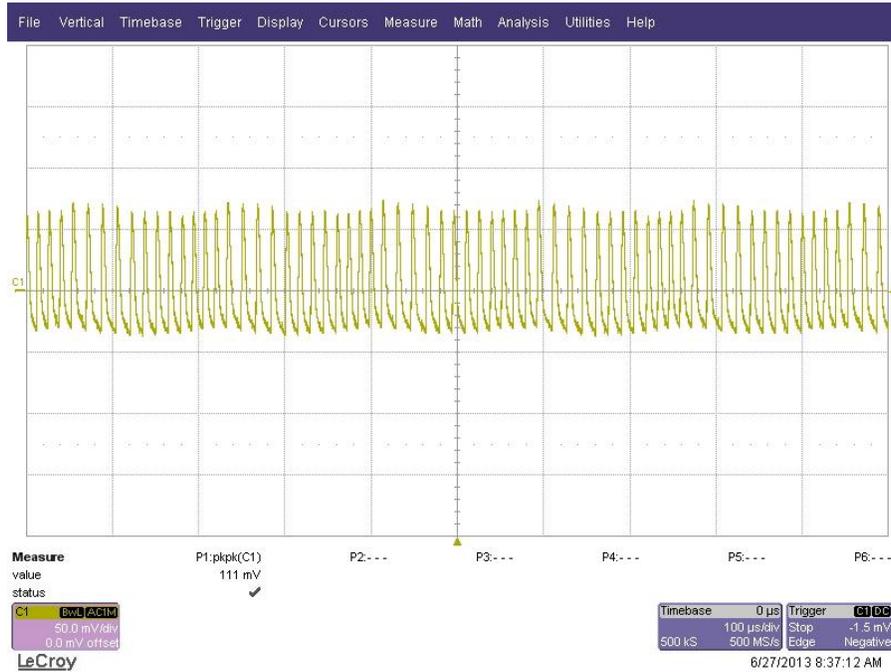
The output voltage at 23V_{in} and full load (5V/0.6A) turn off transient is shown in the image below.



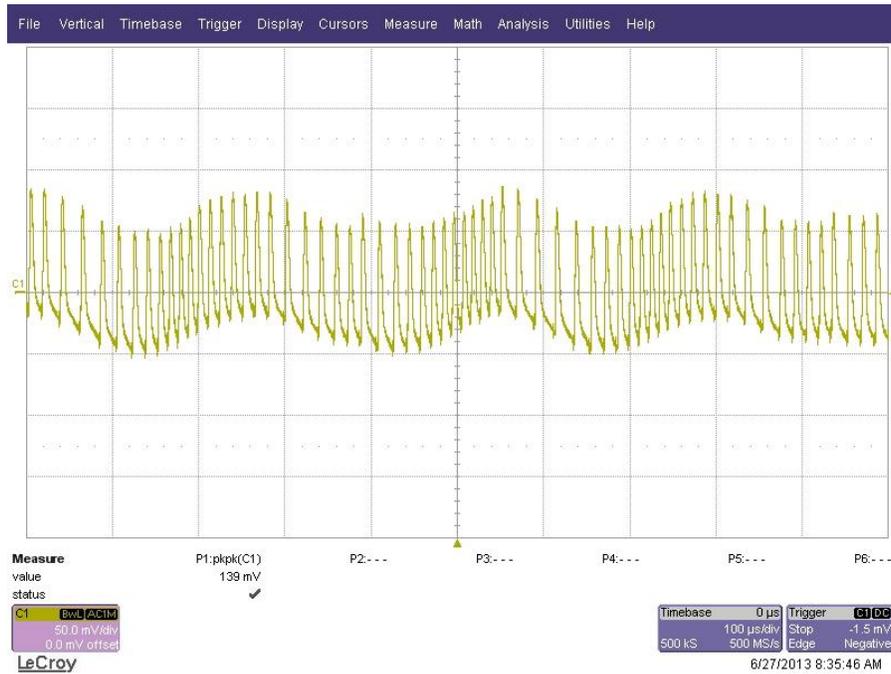
6 Output Ripple Voltages - Full Load

The output ripple voltages are shown in the plots below.

6.1 $V_{in}=23V_{DC}$: 5V/0.6A.

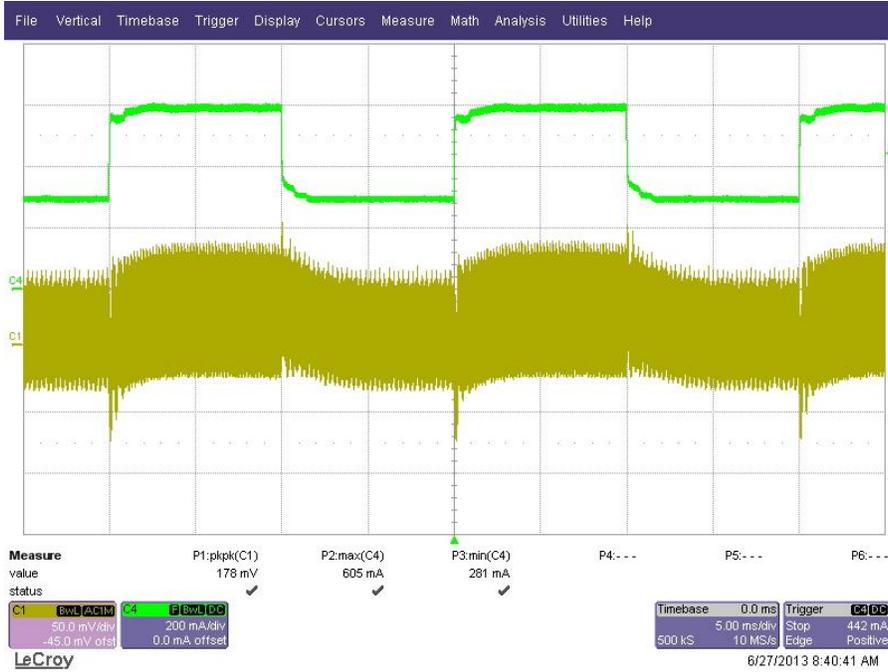


6.2 $V_{in}=56V_{DC}$: 5V/0.6A.



7 Load Transient

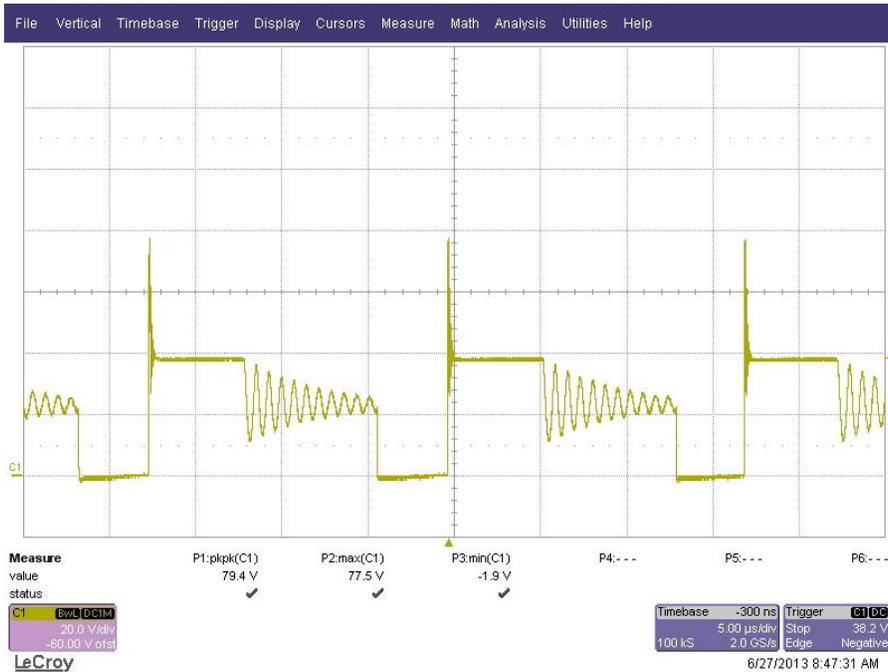
The image below shows $5V_{out}$ voltage response to a **0.3A** to **0.6A** load transient at $23V_{in}$.



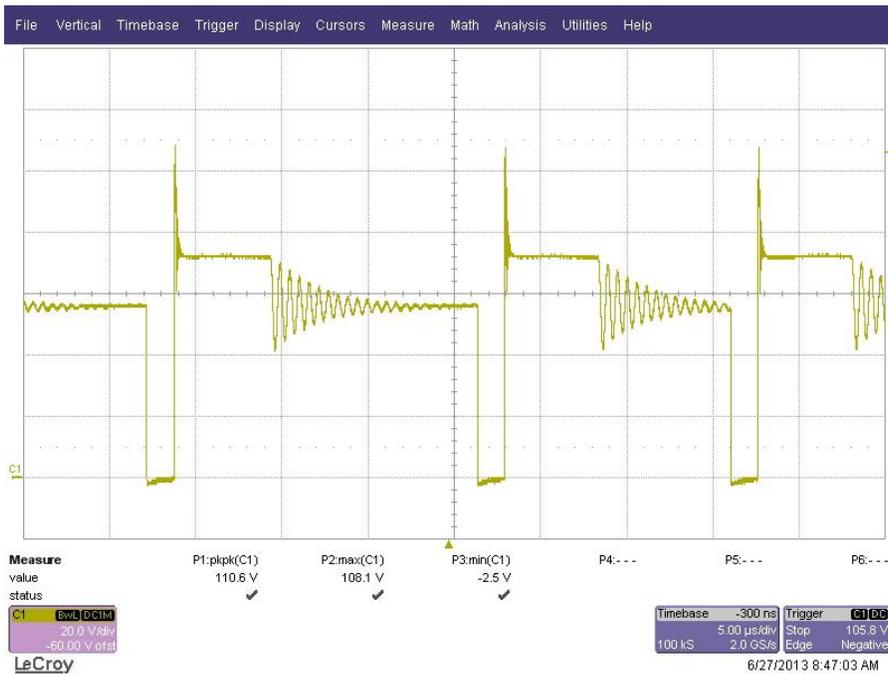
8 Switching Waveforms

The image below shows key switching waveforms of PMP9009RevA. The waveforms are measured with 0.6A output current.

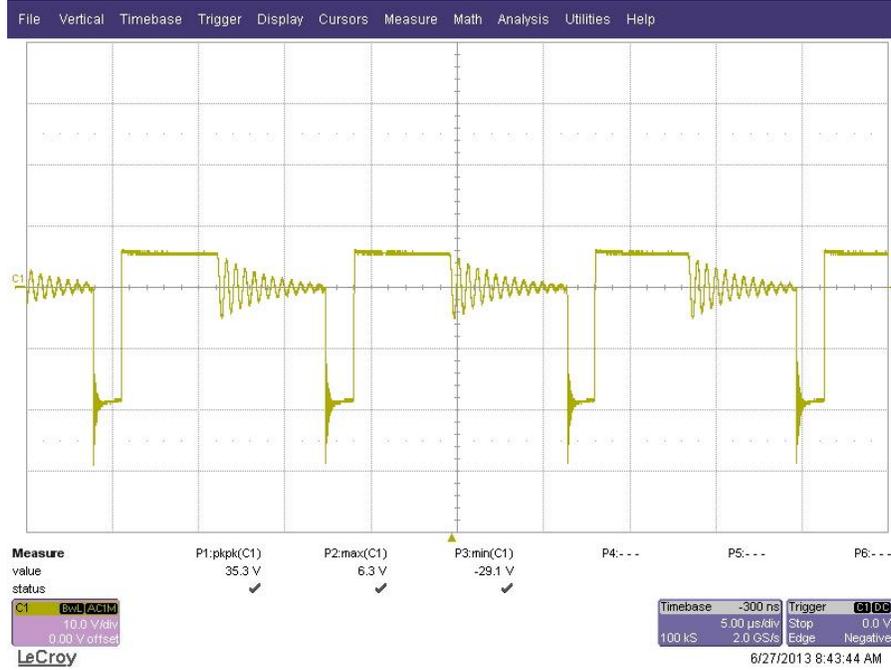
8.1 Primary MOSFET Q1 @ 23V_{in}



8.2 Primary MOSFET Q1 @ 56V_{in}



8.3 Secondary Diode D1 @ 56V_{in} (AC level)



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