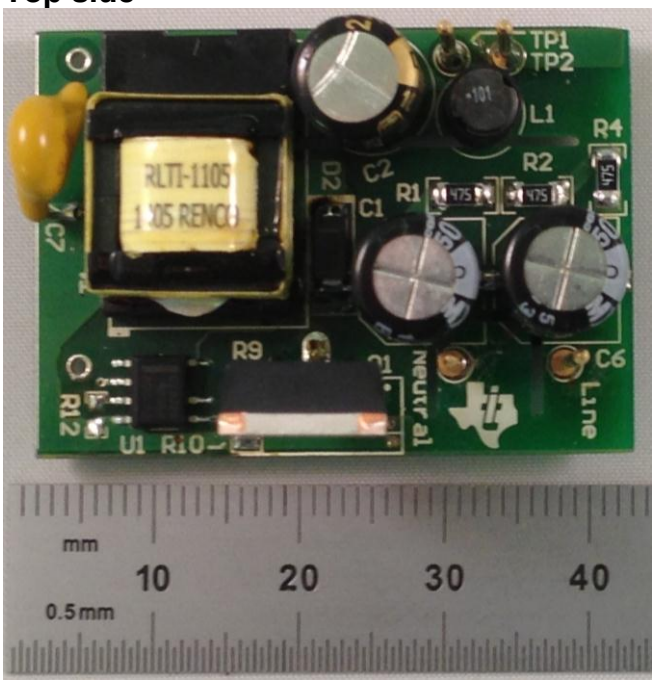
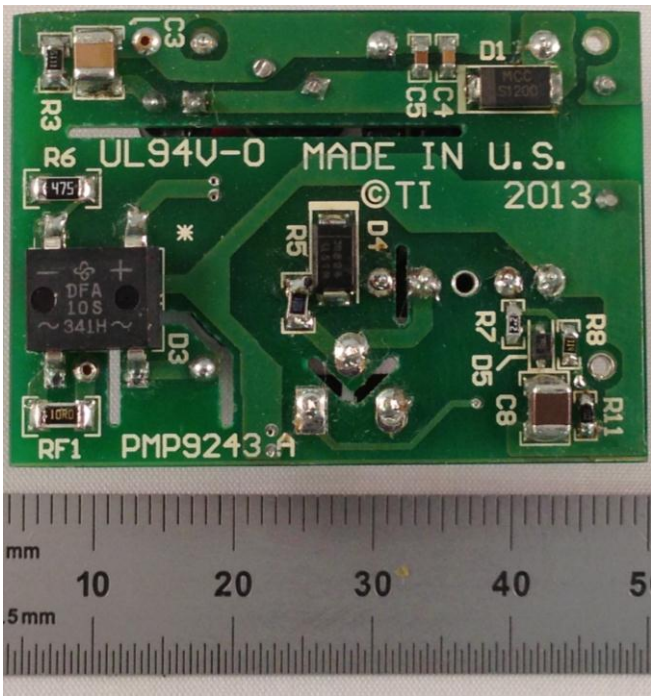
1 Photo

The photographs below show the PMP9243 Rev A assembly. This circuit was built on a PMP9243 Rev A PCB.

Top side

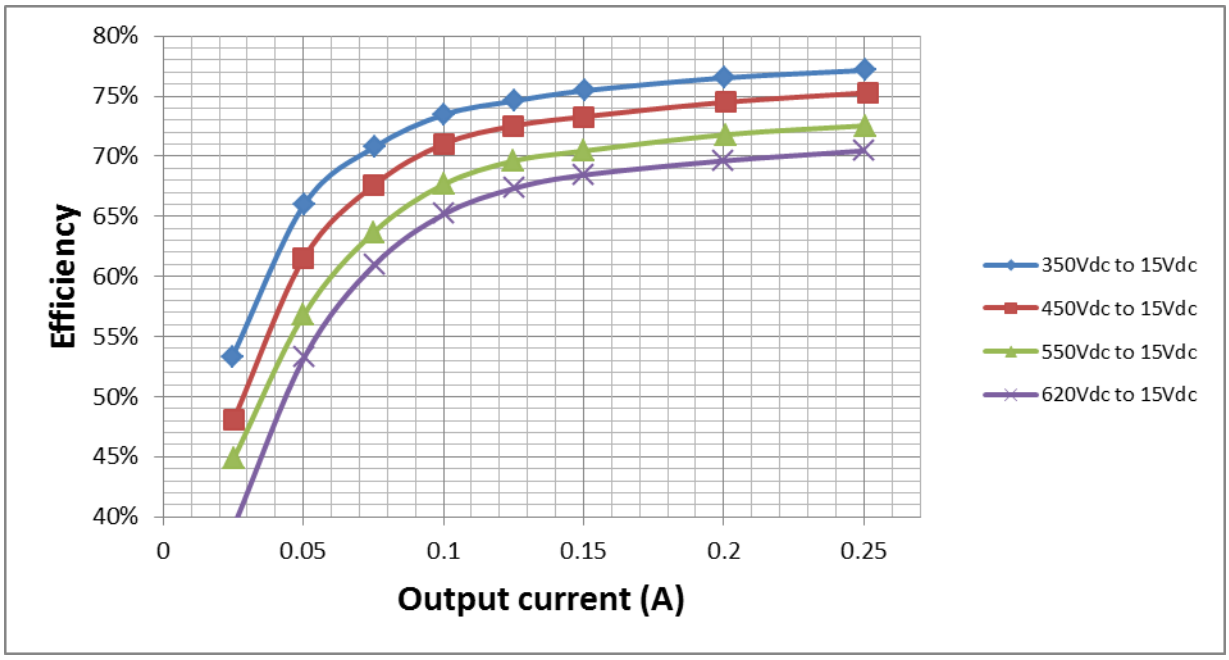


Bottom side



2 Converter Efficiency

The efficiency data is shown in the tables and graph below. DC voltage was injected from test pins Line and Neutral.



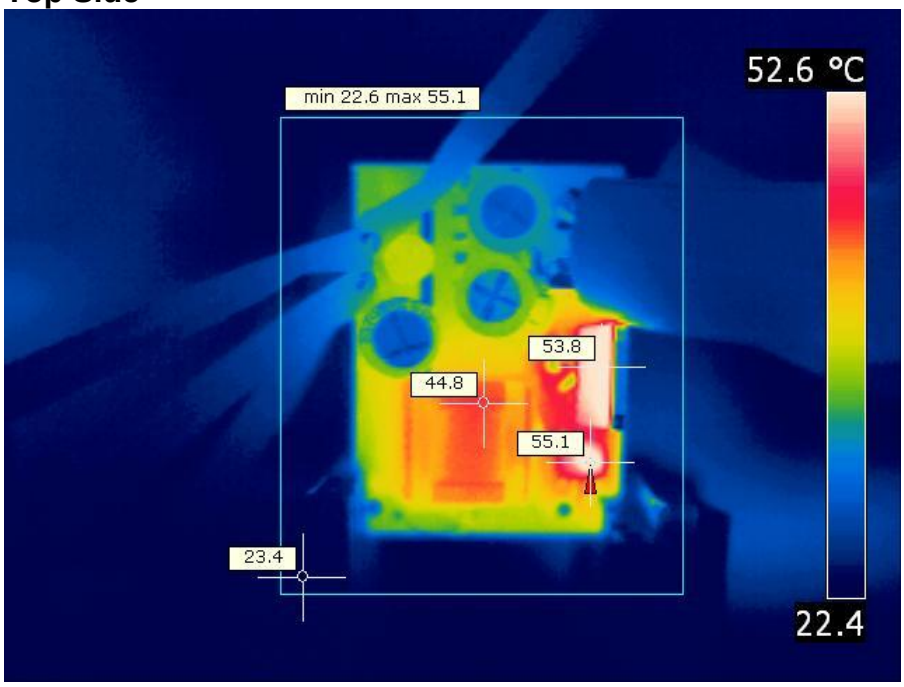
Vin(Vdc)	Iin(mA)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Losses(W)	Efficiency (%)
350	14.04	4.914	15.14	0.2504	3.791056	1.122944	77.15%
350	11.32	3.962	15.15	0.2001	3.031515	0.930485	76.51%
350	8.64	3.024	15.18	0.1503	2.281554	0.742446	75.45%
350	7.29	2.5515	15.19	0.1253	1.903307	0.648193	74.60%
350	5.93	2.0755	15.19	0.1004	1.525076	0.550424	73.48%
350	4.63	1.6205	15.21	0.0754	1.146834	0.473666	70.77%
350	3.32	1.162	15.22	0.0504	0.767088	0.394912	66.01%
350	2.01	0.7035	15.25	0.02458	0.374845	0.328655	53.28%
350	0.32	0.112	15.33	0	0	0.112	0.00%
450	11.24	5.058	15.13	0.2517	3.808221	1.249779	75.29%
450	9.07	4.0815	15.15	0.2007	3.040605	1.040895	74.50%
450	6.9	3.105	15.18	0.1499	2.275482	0.829518	73.28%
450	5.81	2.6145	15.18	0.1249	1.895982	0.718518	72.52%
450	4.75	2.1375	15.18	0.1	1.518	0.6195	71.02%
450	3.75	1.6875	15.2	0.075	1.14	0.5475	67.56%
450	2.75	1.2375	15.21	0.05	0.7605	0.477	61.45%
450	1.77	0.7965	15.25	0.02511	0.382928	0.4135725	48.08%
450	0.32	0.144	15.34	0	0	0.144	0.00%
550	9.5	5.225	15.12	0.2507	3.790584	1.434416	72.55%
550	7.7	4.235	15.15	0.2007	3.040605	1.194395	71.80%
550	5.87	3.2285	15.17	0.1499	2.273983	0.954517	70.43%
550	4.95	2.7225	15.17	0.1249	1.894733	0.827767	69.60%
550	4.08	2.244	15.18	0.1	1.518	0.726	67.65%
550	3.26	1.793	15.2	0.0751	1.14152	0.65148	63.67%
550	2.44	1.342	15.21	0.0501	0.762021	0.579979	56.78%
550	1.57	0.8635	15.4	0.02513	0.387002	0.476498	44.82%
550	0.38	0.209	15.32	0	0	0.209	0.00%
620	8.66	5.3692	15.13	0.25	3.7825	1.5867	70.45%
620	7.02	4.3524	15.15	0.2	3.03	1.3224	69.62%
620	5.37	3.3294	15.17	0.1502	2.278534	1.050866	68.44%
620	4.55	2.821	15.17	0.1252	1.899284	0.921716	67.33%
620	3.77	2.3374	15.18	0.1004	1.524072	0.813328	65.20%
620	3.03	1.8786	15.19	0.0754	1.145326	0.733274	60.97%
620	2.32	1.4384	15.21	0.0504	0.766584	0.671816	53.29%
620	1.59	0.9858	15.24	0.02549	0.388468	0.5973324	39.41%
620	0.42	0.2604	15.29	0	0	0.2604	0.00%

3 Thermal Images

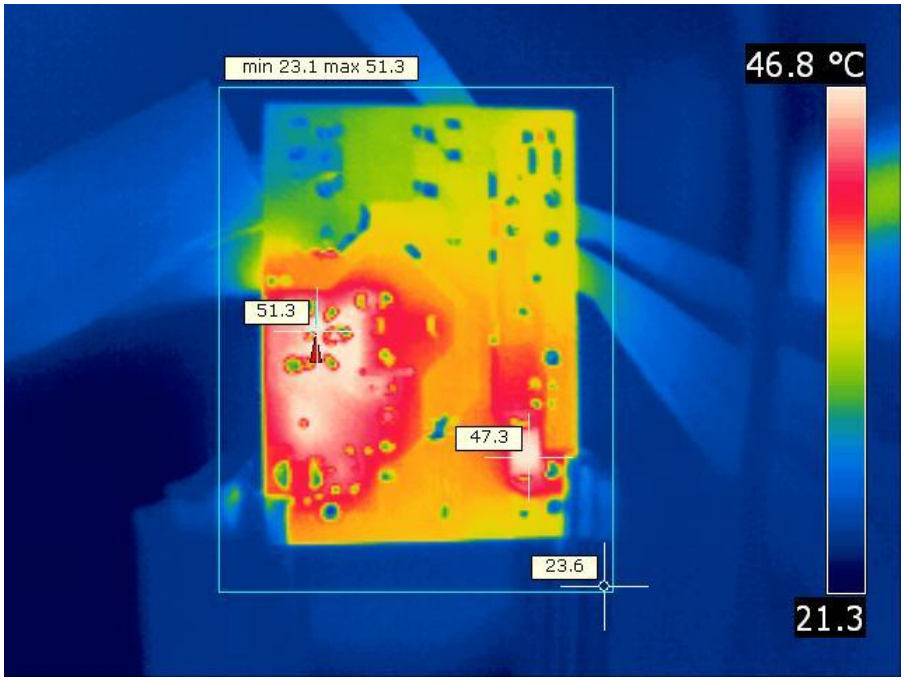
The thermal images below show a top view and bottom view of the board. The ambient temperature was 20ºC with no forced air flow. DC voltage was injected from test pins Line and Neutral. The output was at full load: 15V/0.25A (with a 75ohm resistive load).

V_{in}=450V_{DC}

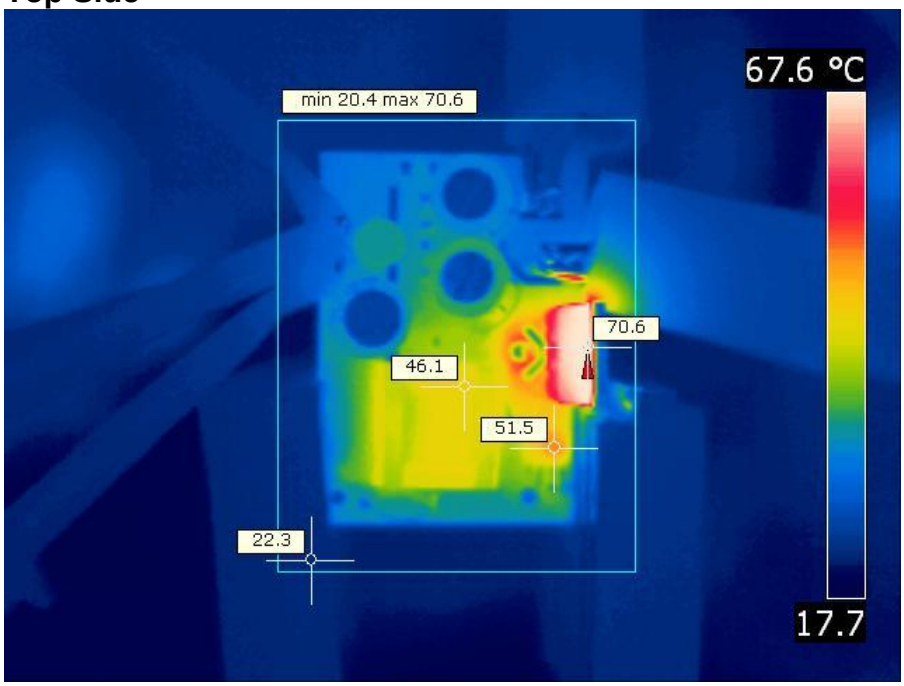
Top Side



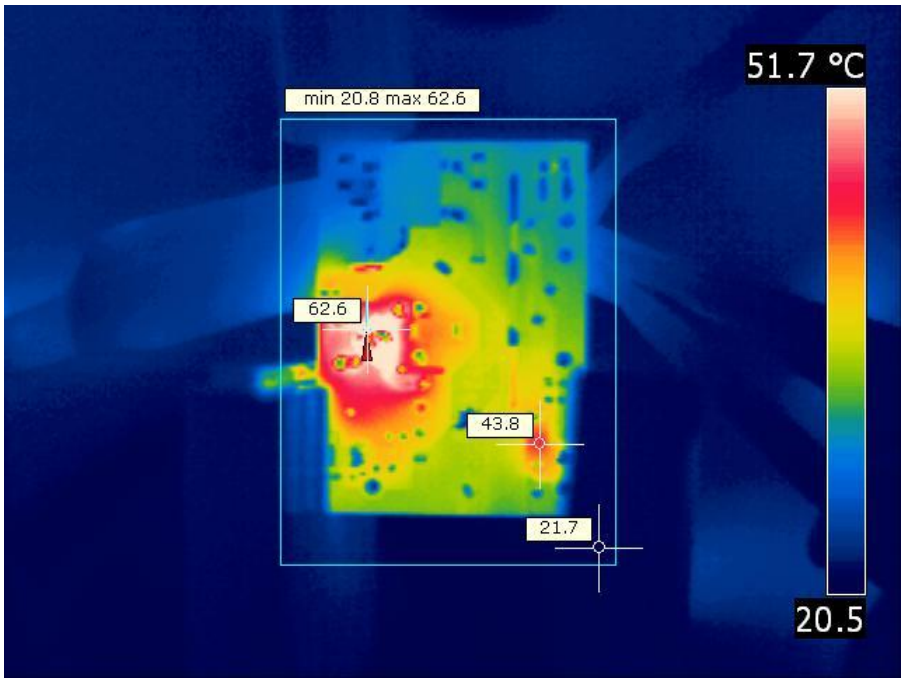
Bottom Side



V_{in}=620V_{DC}
Top Side



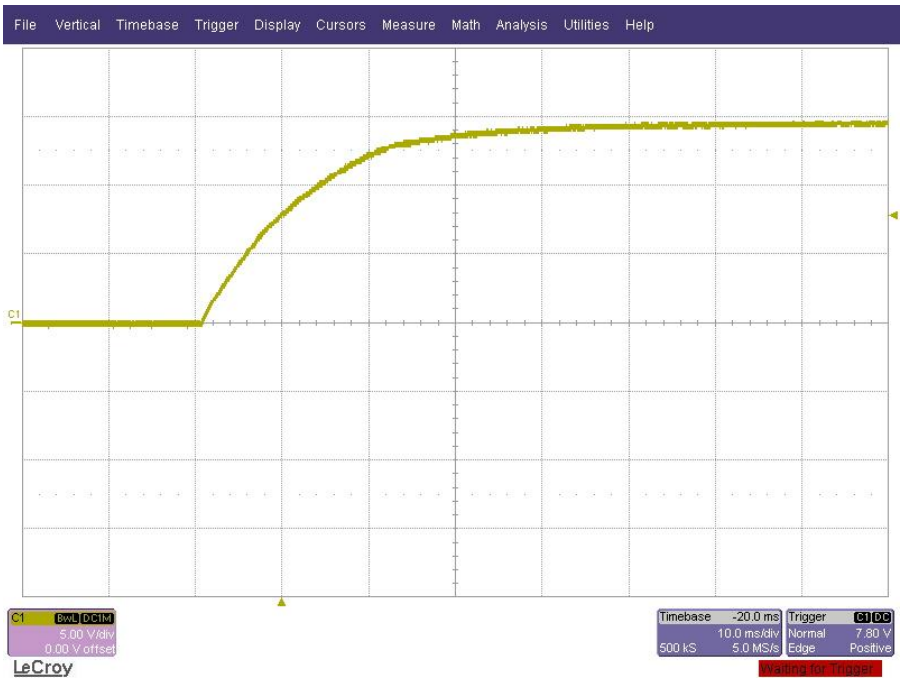
Bottom Side



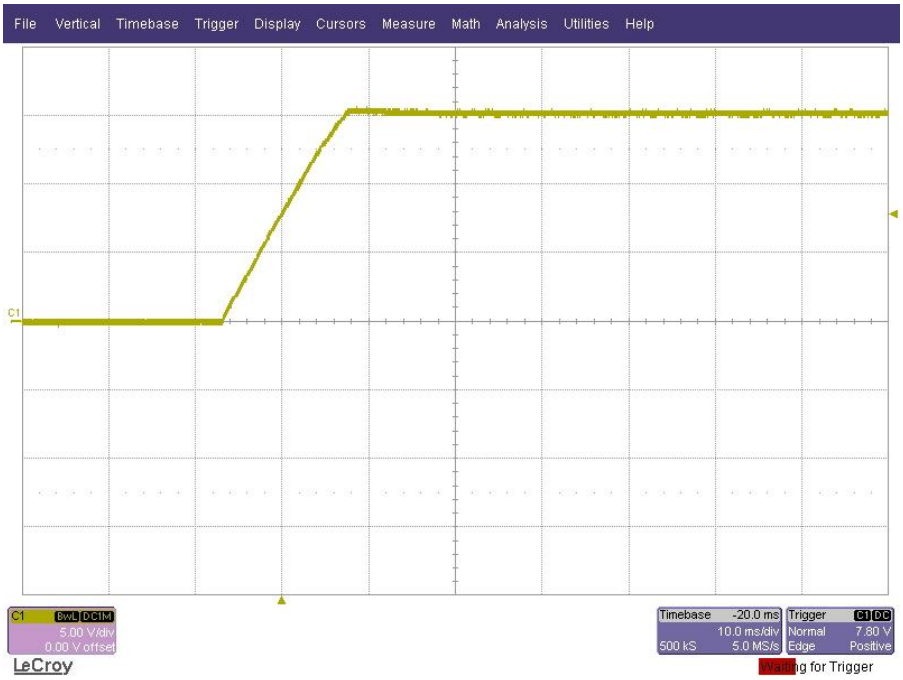
4 Startup

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

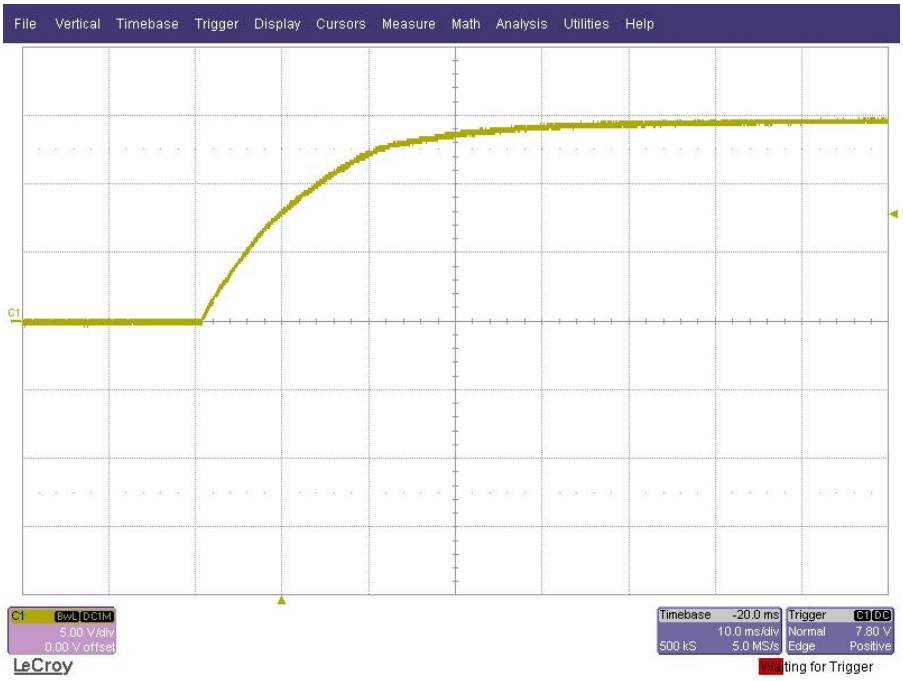
4.1 Start Up @ 450V_{DC} Input: 15V/75ohm.



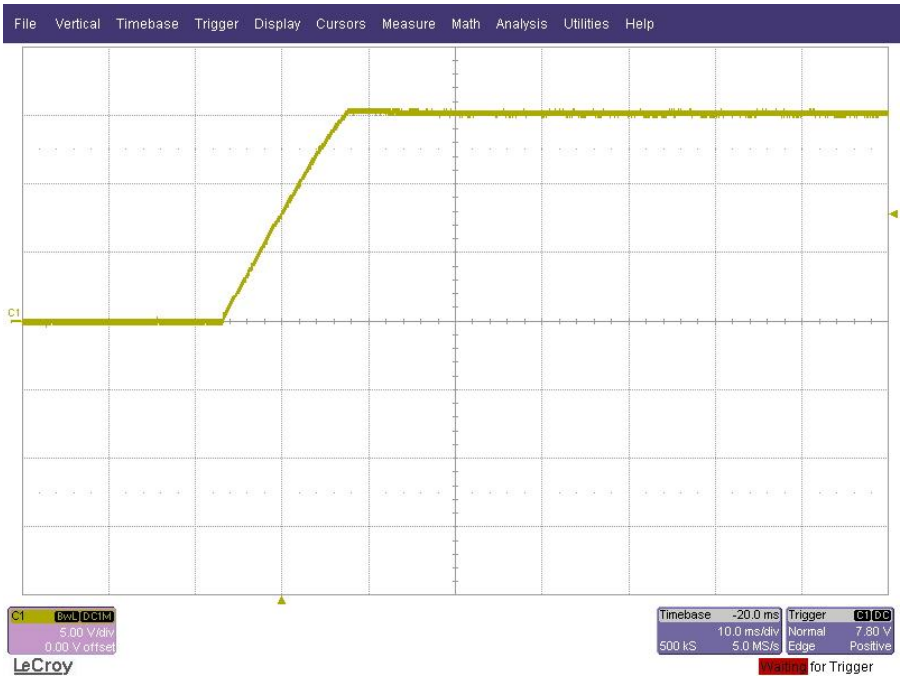
4.2 Start Up @ 450V_{DC} Input: no load.



4.3 Start Up @ 620V_{DC} Input: 15V/75ohm.



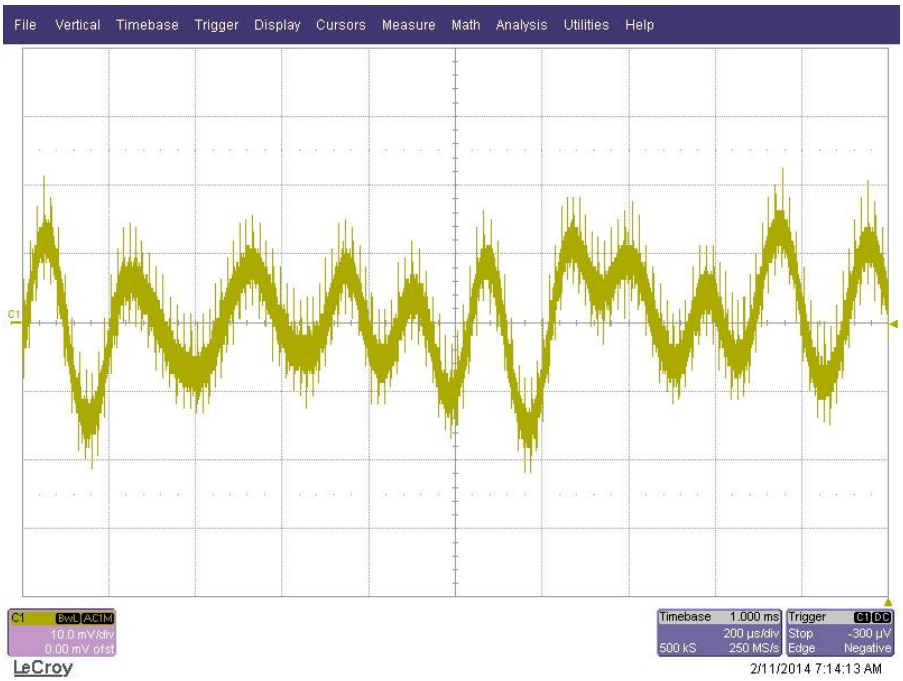
4.4 Start Up @ 620V_{DC} Input: no load.



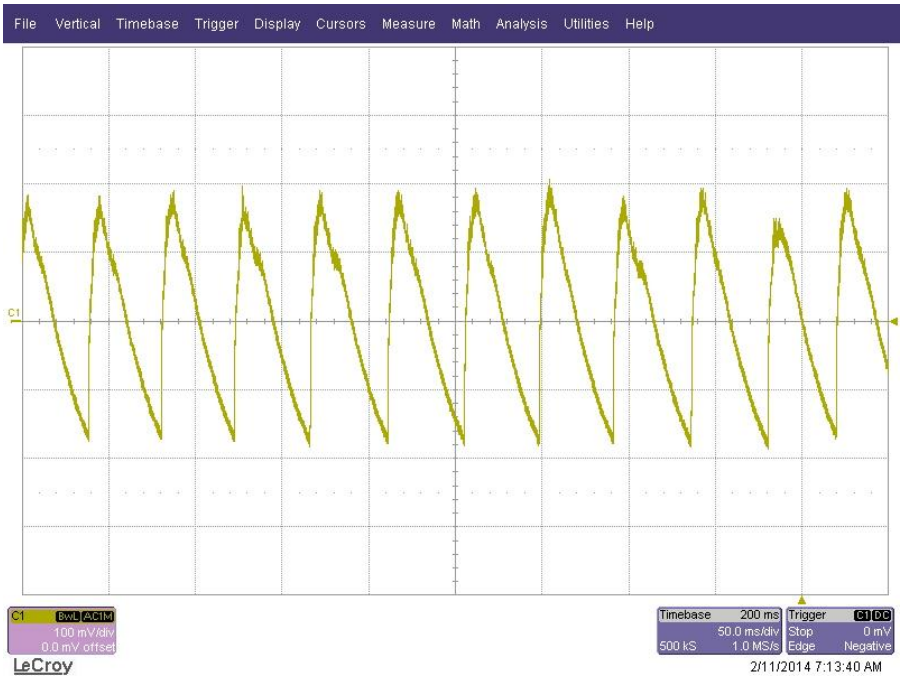
5 Output Ripple Voltages

The output ripple voltages are shown in the plots below.

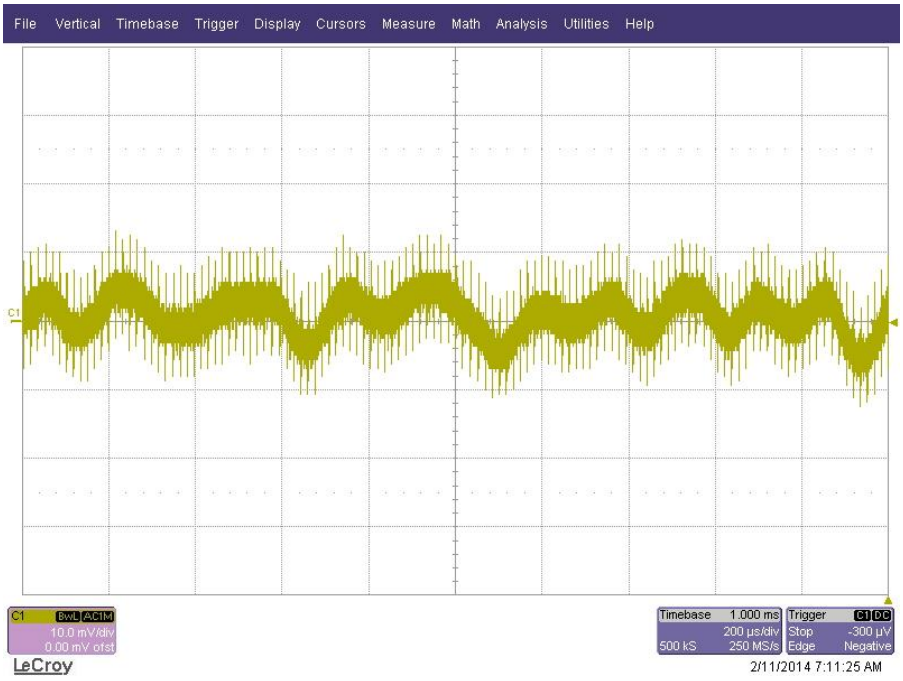
5.1 $450V_{DC}$ Input – 15V/75ohm



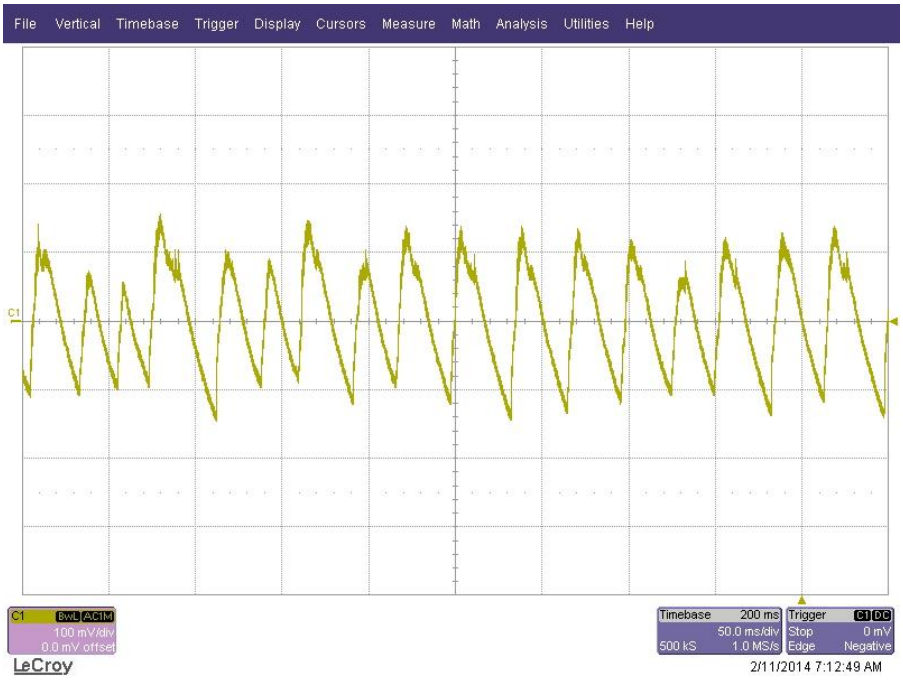
5.2 $450V_{DC}$ Input – 15V/ No load



5.3 620V_{DC} Input – 15V/75ohm

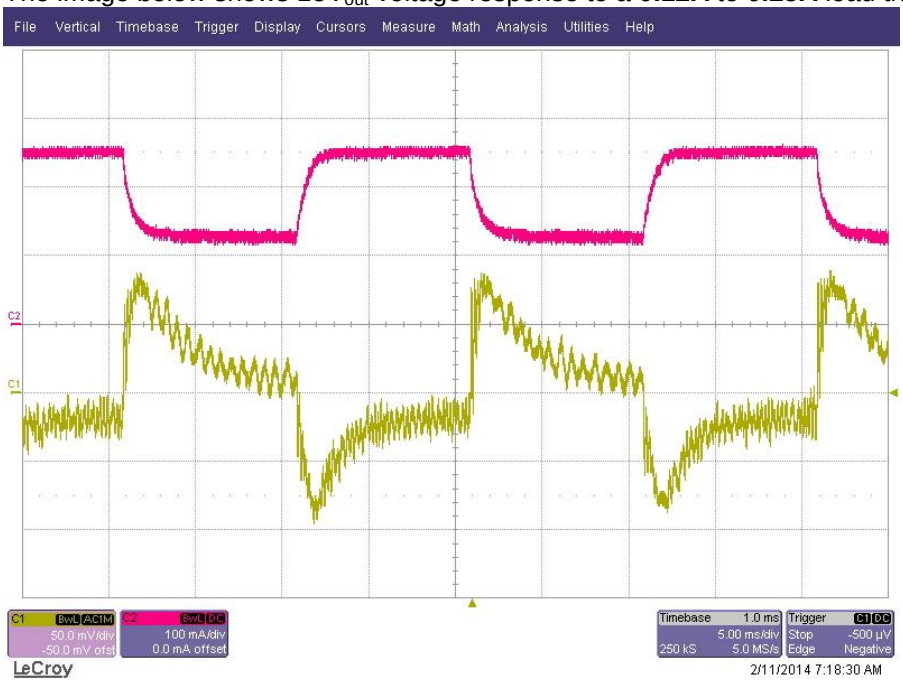


5.4 620V_{DC} Input – 15V/ No load



6 Load Transient

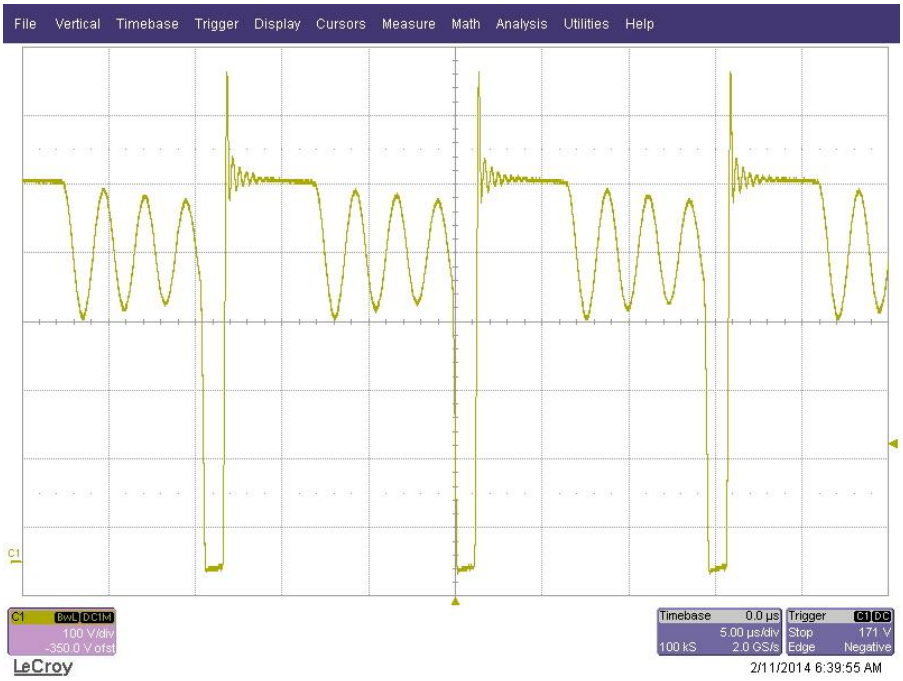
The image below shows 15V_{out} voltage response to a **0.12A** to **0.25A** load transient at a 450V_{DC} input.



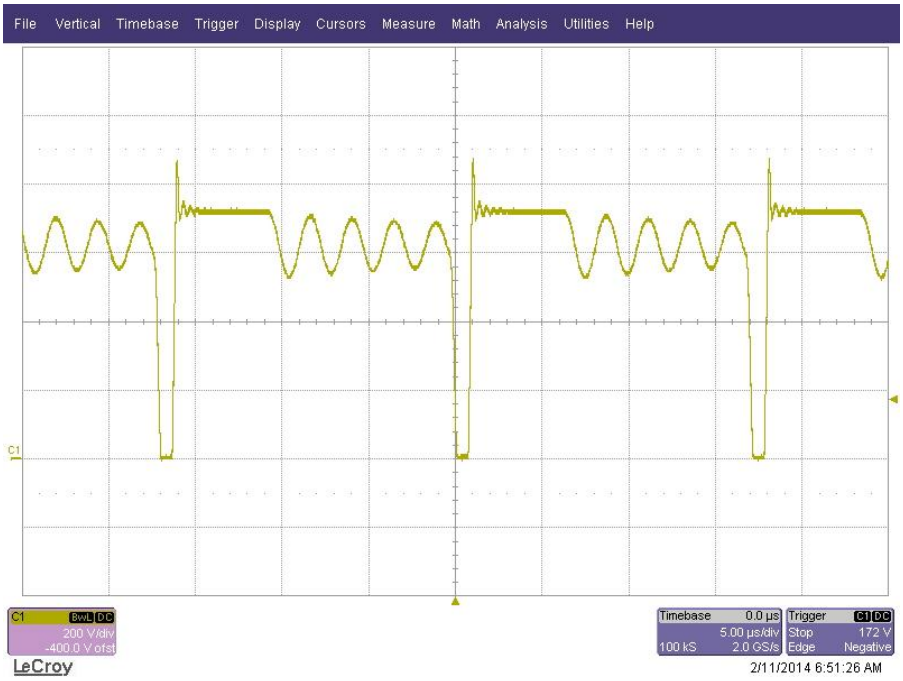
7 Switching Waveforms

The images below show key switching waveforms of PMP9243RevA. The waveforms are measured with 75ohm full load.

7.1 Primary MOSFET U1 pin8 @ 450V_{DC} Input



7.2 Primary MOSFET U1 pin8 @ 620V_{DC} Input



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