Test Data
For PMP20814 Flybuck
4/11/2017

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1. Design Specifications

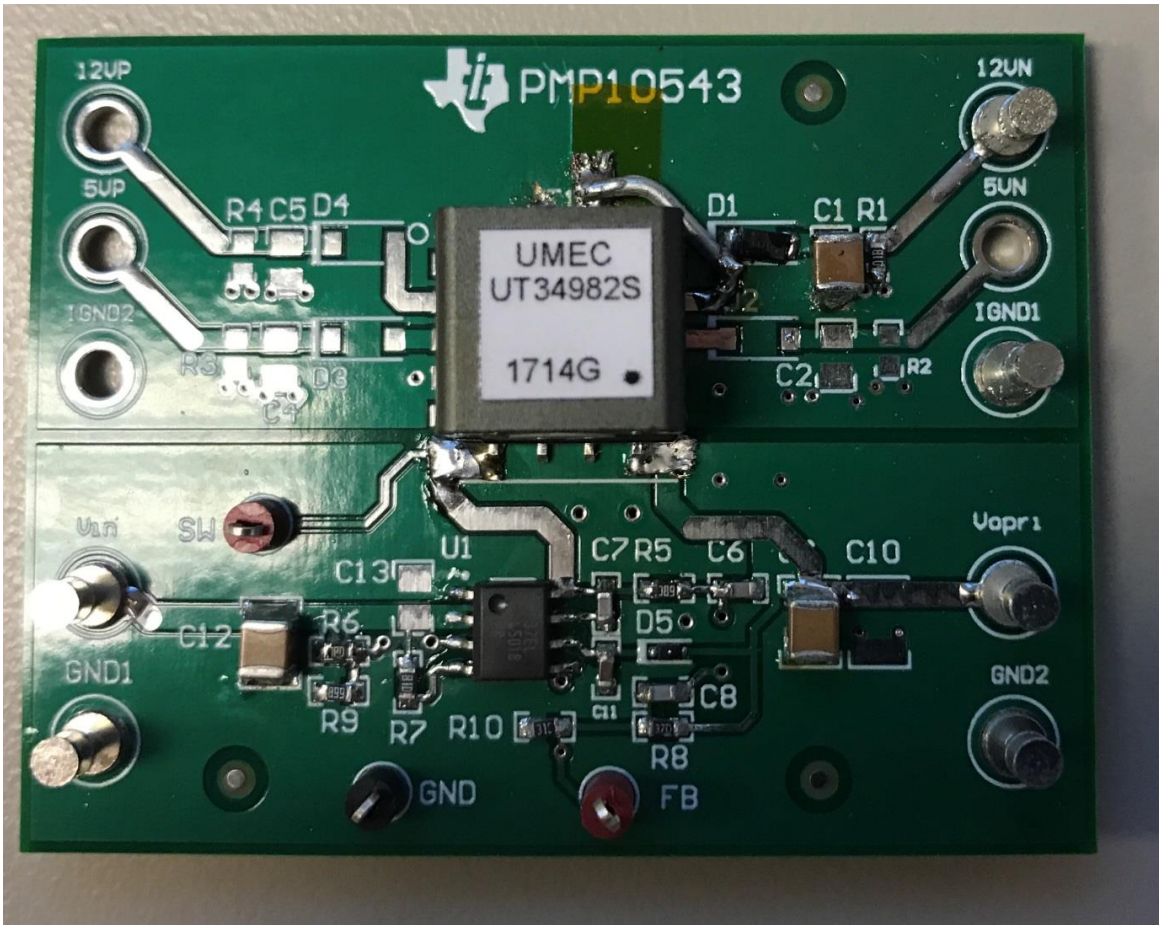
Vin Minimum	**43VDC**
Vin Maximum	**53VDC**
Vout	**+15VDC @ 0.25A**
Nominal Switching Frequency	**≈ 250KHz**

2. Circuit Description

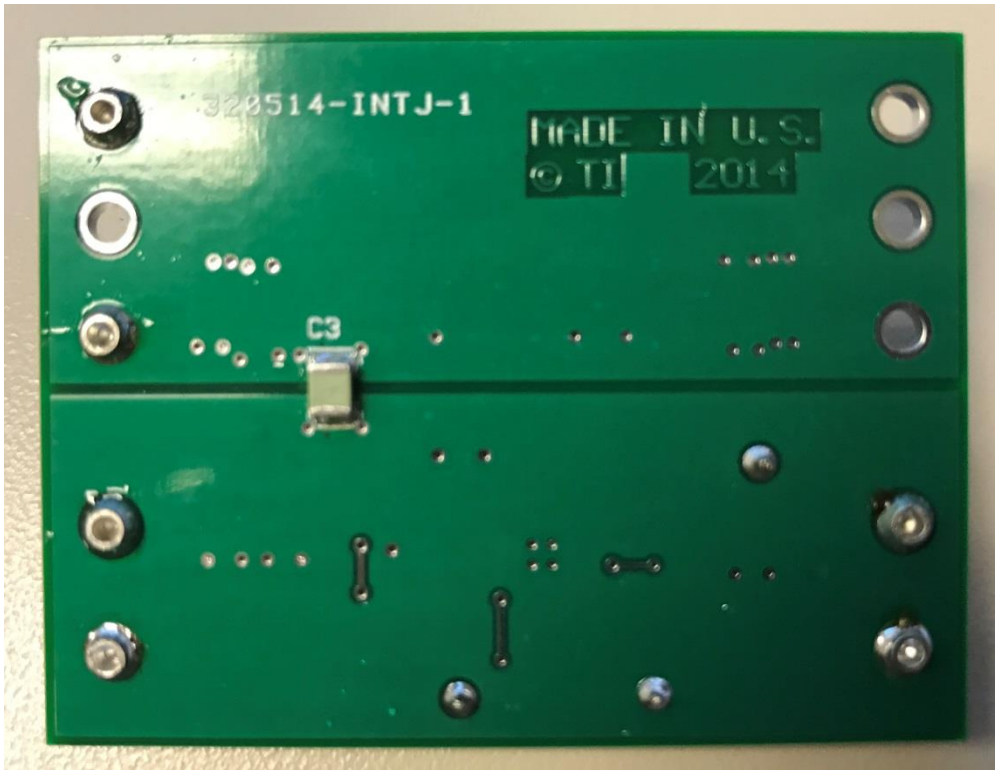
PMP20814 is an isolated Flybuck converter utilizing the LM5018 for industrial applications. This design has a minimum operating input voltage of 43V and a maximum input voltage of 53V. The design has a primary output of 7.35V and a secondary output capable of sourcing 0.25A continuous current at 15Vout. Switching frequency is set to 250kHz. A custom transformer is used. PMP10543's PCB was used to build the design.

3. PMP20814 Board Photos

Board Dimensions: 56mm x 43mm



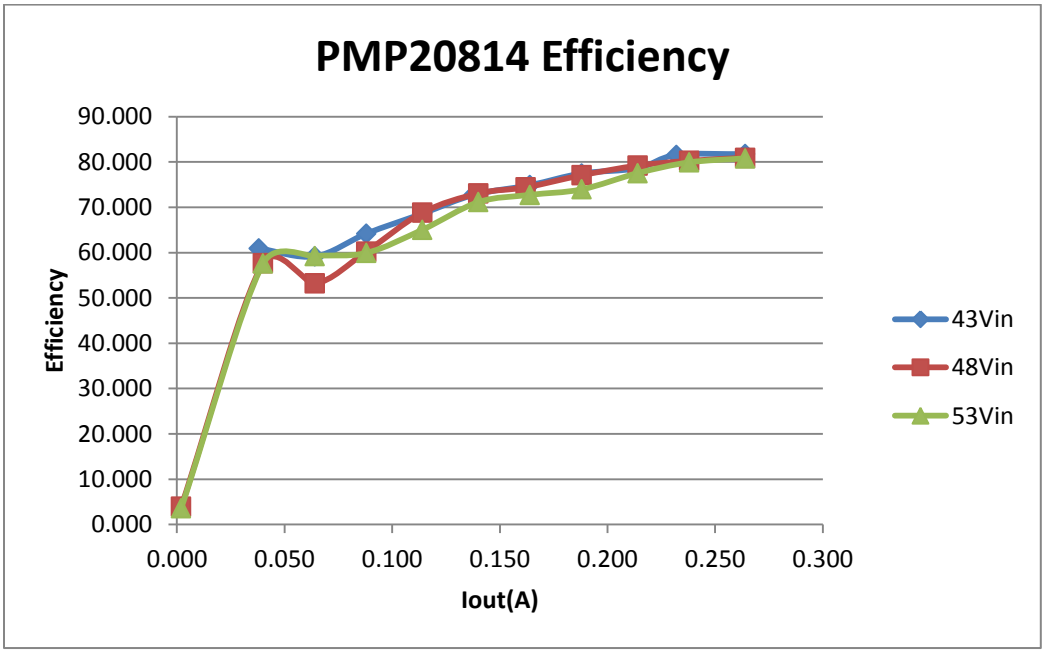
Board Photo (Top)



Board Photo (Bottom)

4 Efficiency

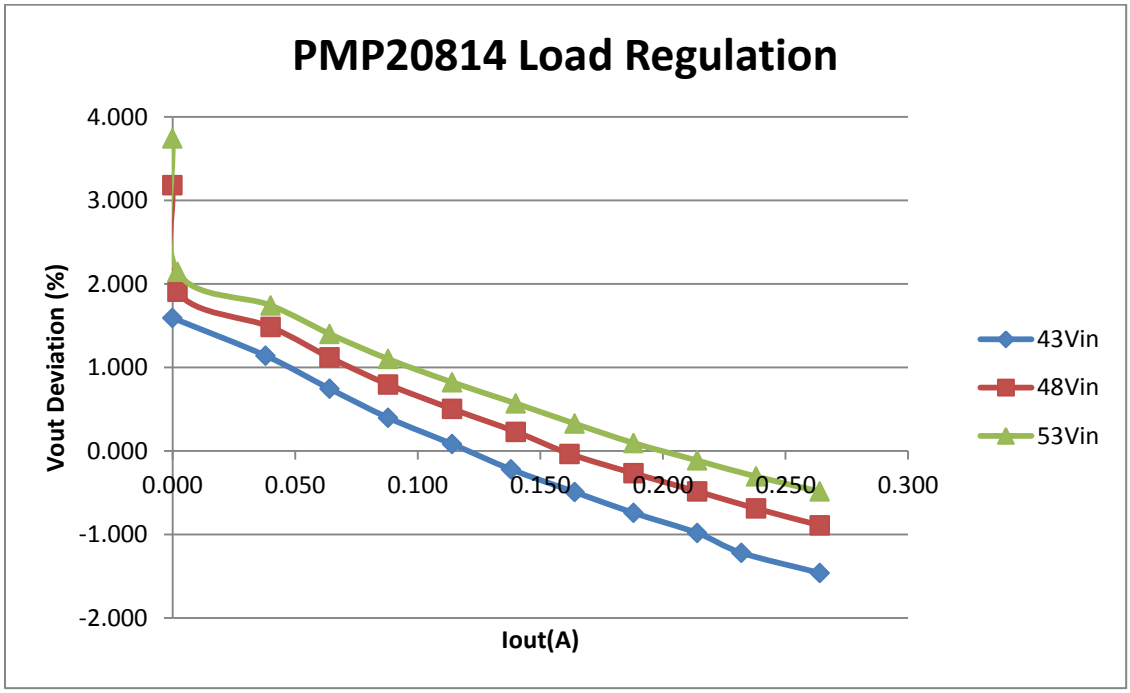
4.1 Efficiency Chart



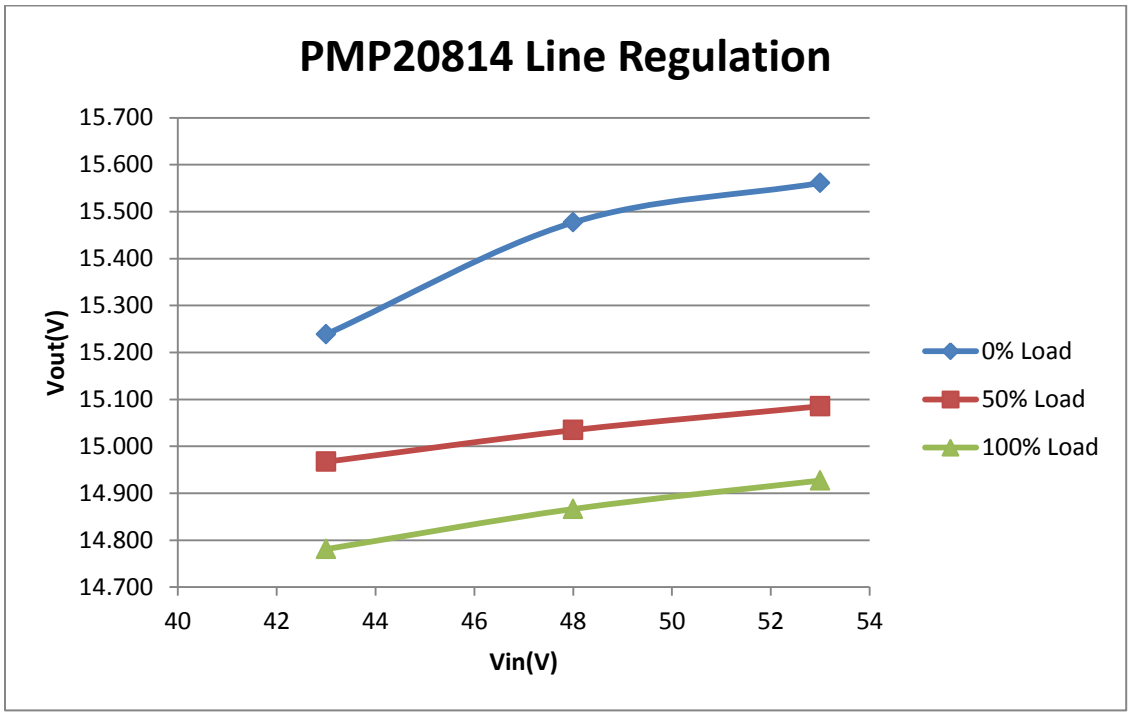
4.2 Efficiency Data

Vin(V)	Iin(A)	Vout(V)	Iout(A)	Pin(W)	Pout(W)	Ploss(W)	Efficiency
43.014	0.016	15.239	0.000	0.688	0.000	0.688	0.000
43.014	0.022	15.171	0.038	0.946	0.576	0.370	60.921
43.014	0.038	15.112	0.064	1.635	0.967	0.667	59.171
43.014	0.048	15.060	0.088	2.065	1.325	0.739	64.187
43.014	0.058	15.013	0.114	2.495	1.711	0.783	68.600
43.014	0.066	14.967	0.138	2.839	2.065	0.773	72.756
43.013	0.076	14.926	0.164	3.269	2.448	0.821	74.882
43.014	0.084	14.889	0.188	3.613	2.799	0.814	77.471
43.013	0.094	14.853	0.214	4.043	3.179	0.865	78.613
43.013	0.098	14.817	0.232	4.215	3.438	0.778	81.551
43.013	0.111	14.781	0.264	4.774	3.902	0.872	81.730
48.018	0.010	15.477	0.000	0.480	0.000	0.635	0.000
48.018	0.016	15.286	0.002	0.768	0.031	0.738	3.979
48.018	0.022	15.223	0.040	1.056	0.609	0.448	57.639
48.018	0.038	15.168	0.064	1.825	0.971	0.854	53.201
48.018	0.046	15.119	0.088	2.209	1.330	0.878	60.235
48.018	0.052	15.076	0.114	2.497	1.719	0.778	68.829
48.018	0.060	15.034	0.140	2.881	2.105	0.776	73.056
48.018	0.068	14.995	0.162	3.265	2.429	0.836	74.395
48.018	0.076	14.960	0.188	3.649	2.812	0.837	77.067
48.018	0.084	14.928	0.214	4.034	3.194	0.839	79.199
48.018	0.092	14.897	0.238	4.418	3.545	0.872	80.256
48.018	0.101	14.867	0.264	4.850	3.925	0.925	80.927
53.016	0.012	15.561	0.000	0.636	0.000	0.792	0.000
53.016	0.016	15.322	0.002	0.848	0.031	0.818	3.612
53.016	0.020	15.261	0.040	1.060	0.610	0.450	57.573
53.016	0.031	15.210	0.064	1.644	0.973	0.670	59.230
53.016	0.042	15.165	0.088	2.227	1.335	0.892	59.933
53.016	0.050	15.123	0.114	2.651	1.724	0.927	65.040
53.016	0.056	15.085	0.140	2.969	2.112	0.857	71.136
53.016	0.064	15.049	0.164	3.393	2.468	0.925	72.739
53.016	0.072	15.014	0.188	3.817	2.823	0.994	73.948
53.016	0.078	14.983	0.214	4.135	3.206	0.929	77.537
53.015	0.084	14.954	0.238	4.453	3.559	0.894	79.921
53.016	0.092	14.927	0.264	4.877	3.941	0.937	80.796

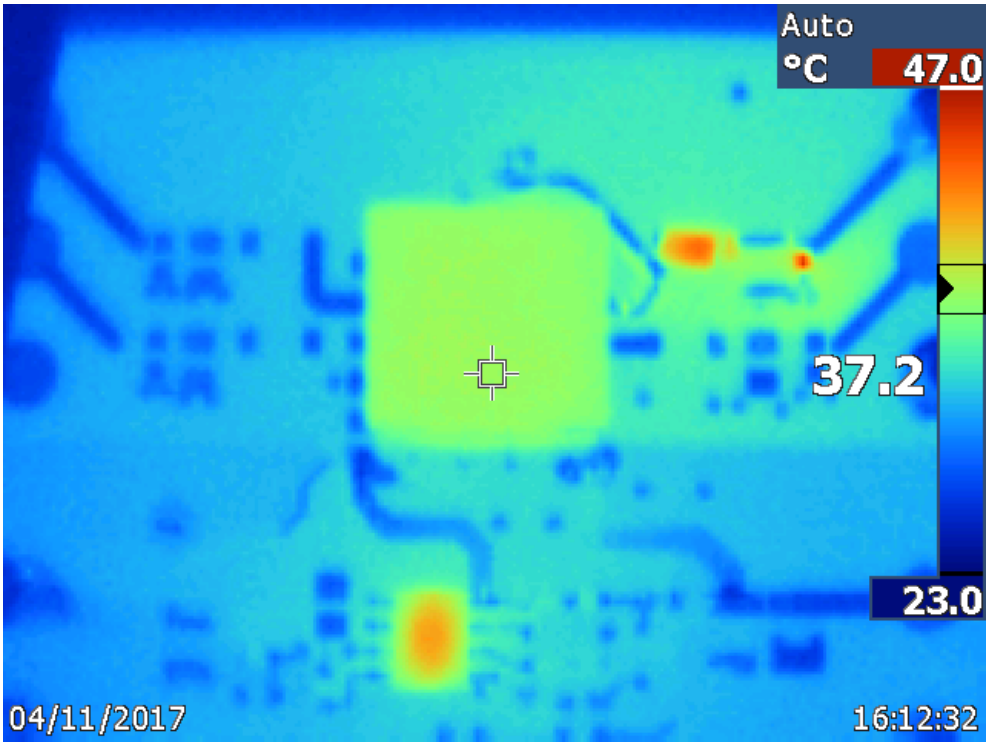
4.3 Load Regulation



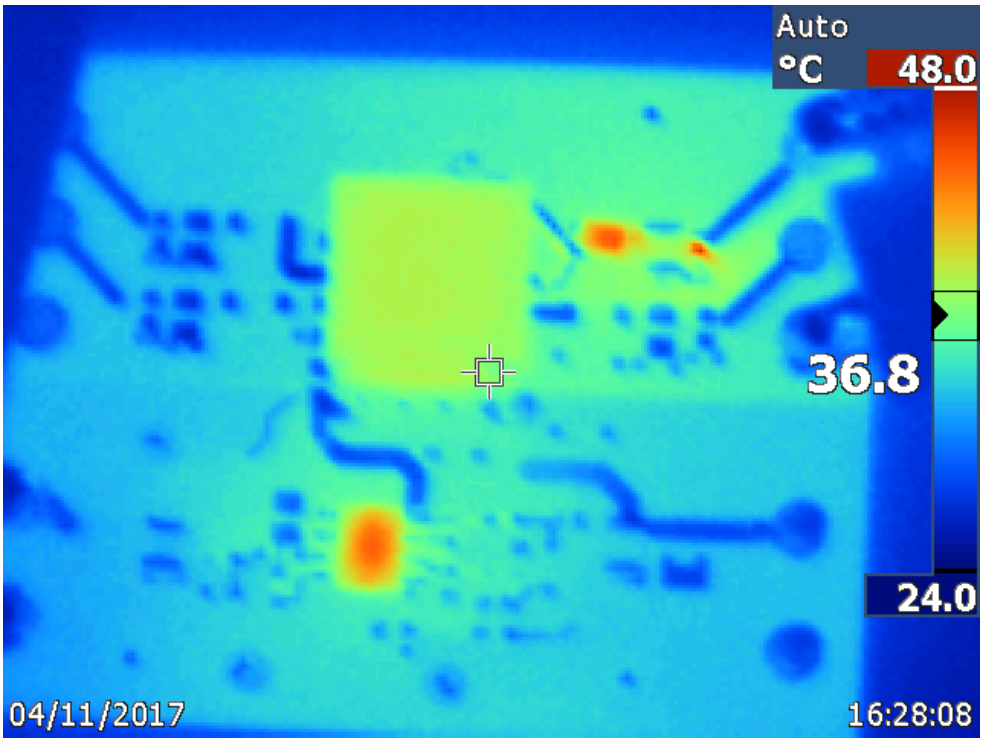
4.4 Line Regulation



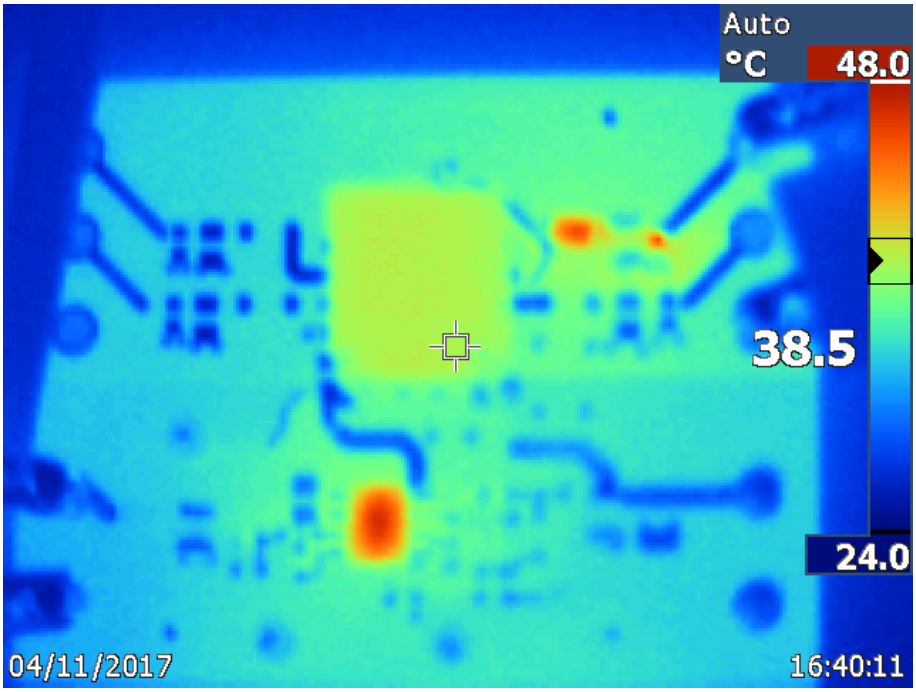
5 Thermal



Thermal equilibrium was taken at 43Vin, full load on 15Vout. No air flow.



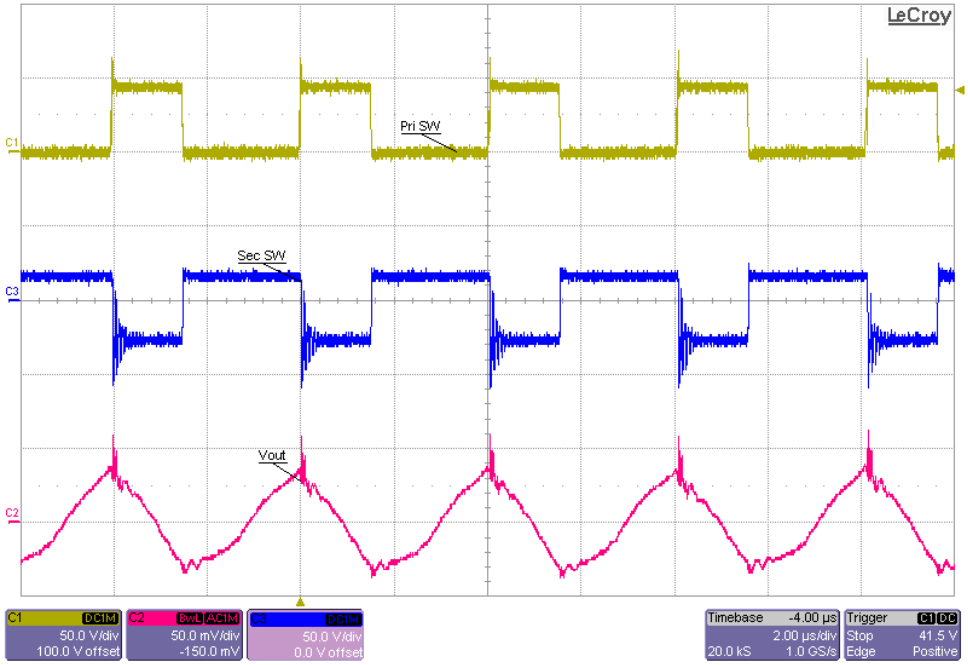
Thermal equilibrium was taken at 48Vin, full load on 15Vout. No air flow.



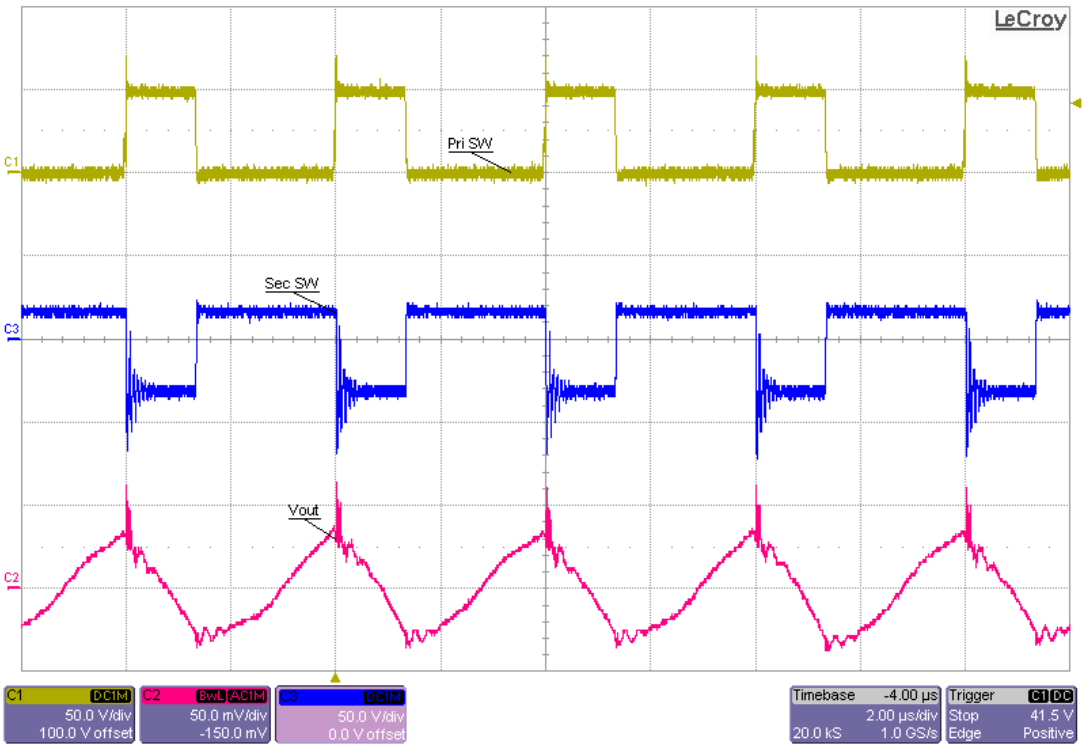
Thermal equilibrium was taken at 53Vin, full load on 15Vout. No air flow.

6 Waveform

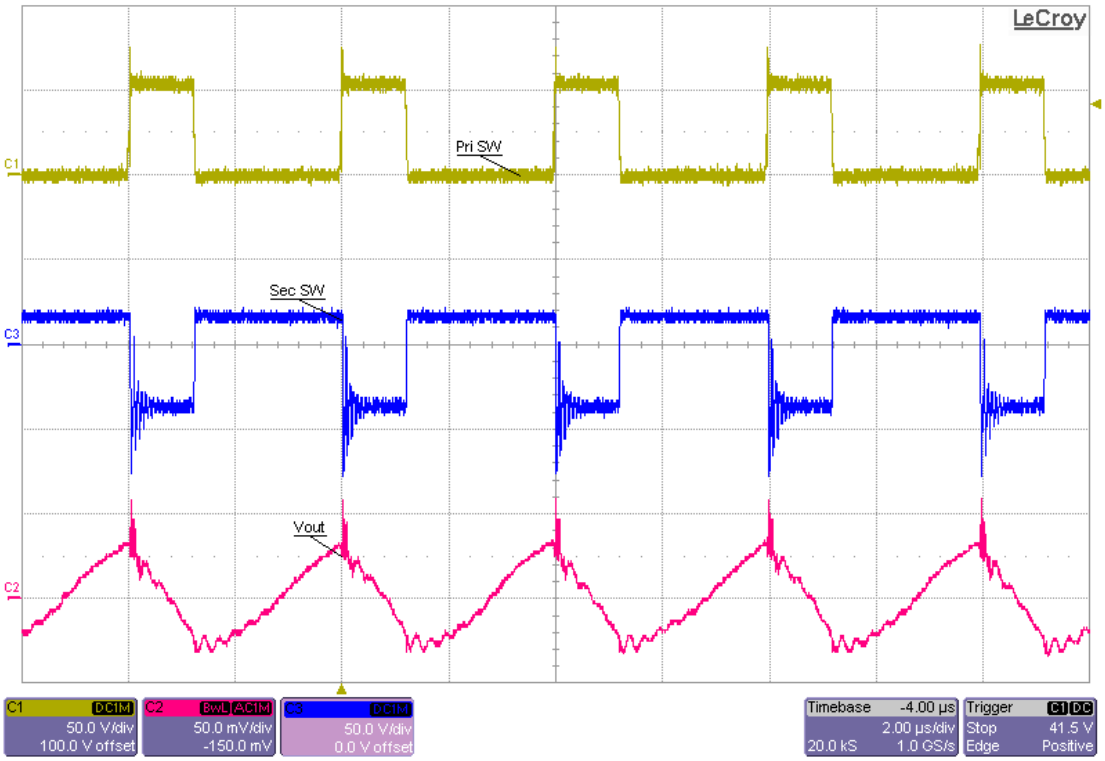
6.1 Switching Waveform and Output Ripple



43Vin, full load. Ch1 measures primary switch, Ch3 measures secondary switch, Ch2 measures Vout.

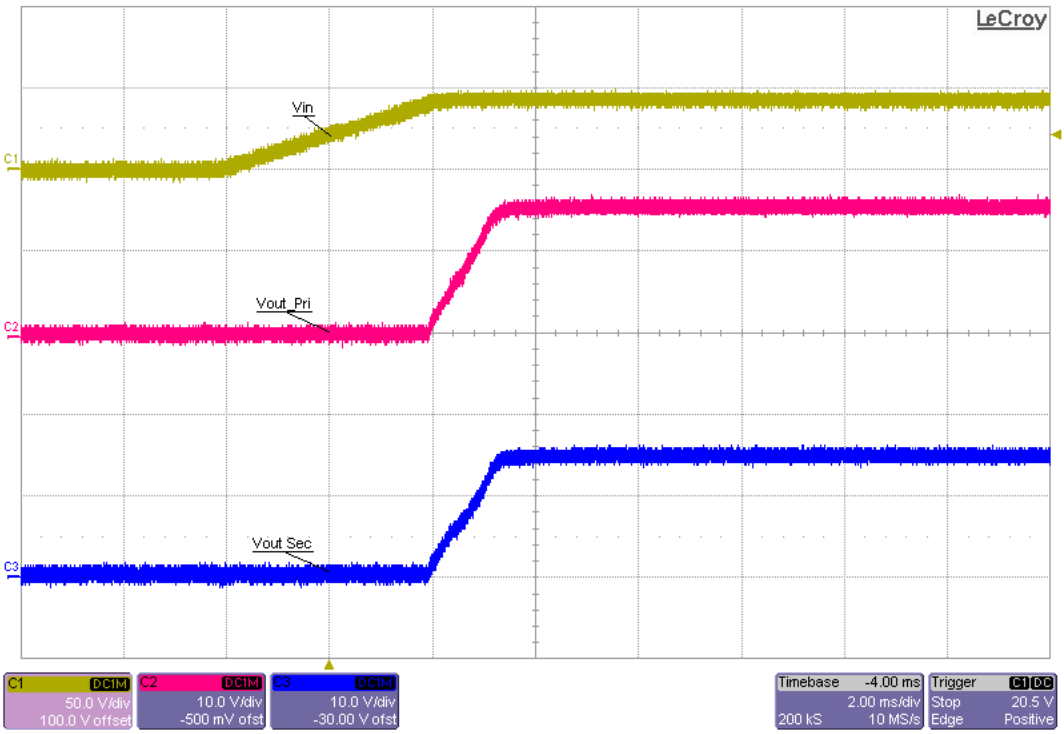


48Vin, full load. Ch1 measures primary switch, Ch3 measures secondary switch, Ch2 measures Vout.

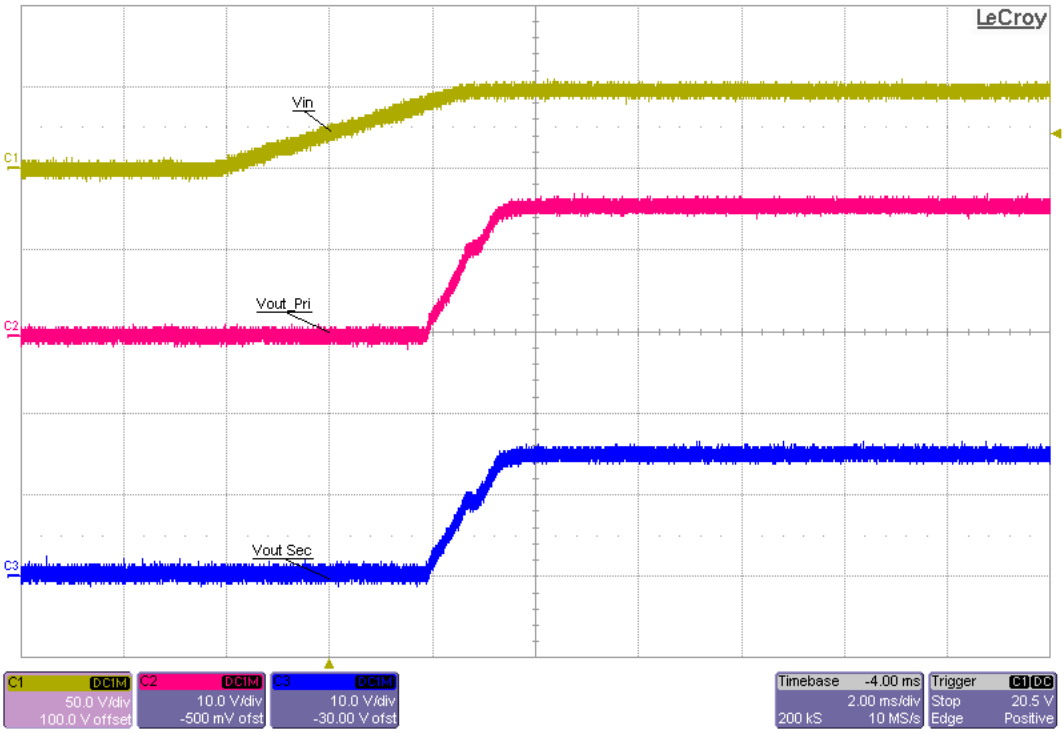


53Vin, full load. Ch1 measures primary switch, Ch3 measures secondary switch, Ch2 measures Vout.

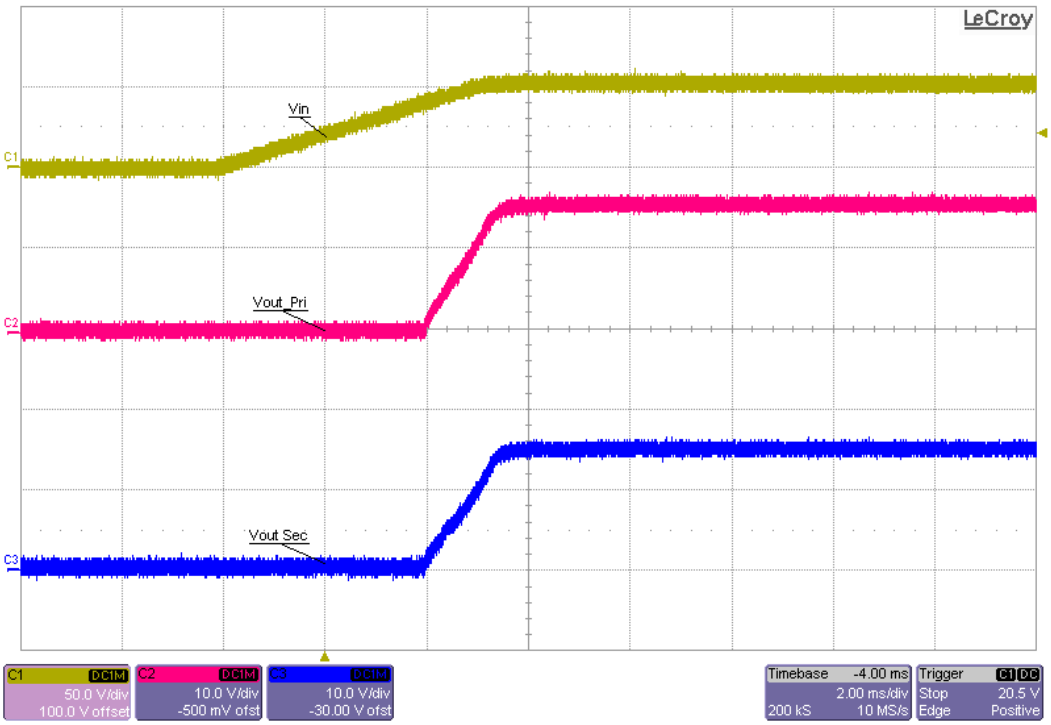
6.2 Start Up



43Vin, full load start up from Vin. Ch1 measures Vin, Ch2 measures Vpri, and Ch3 measures Vsec.

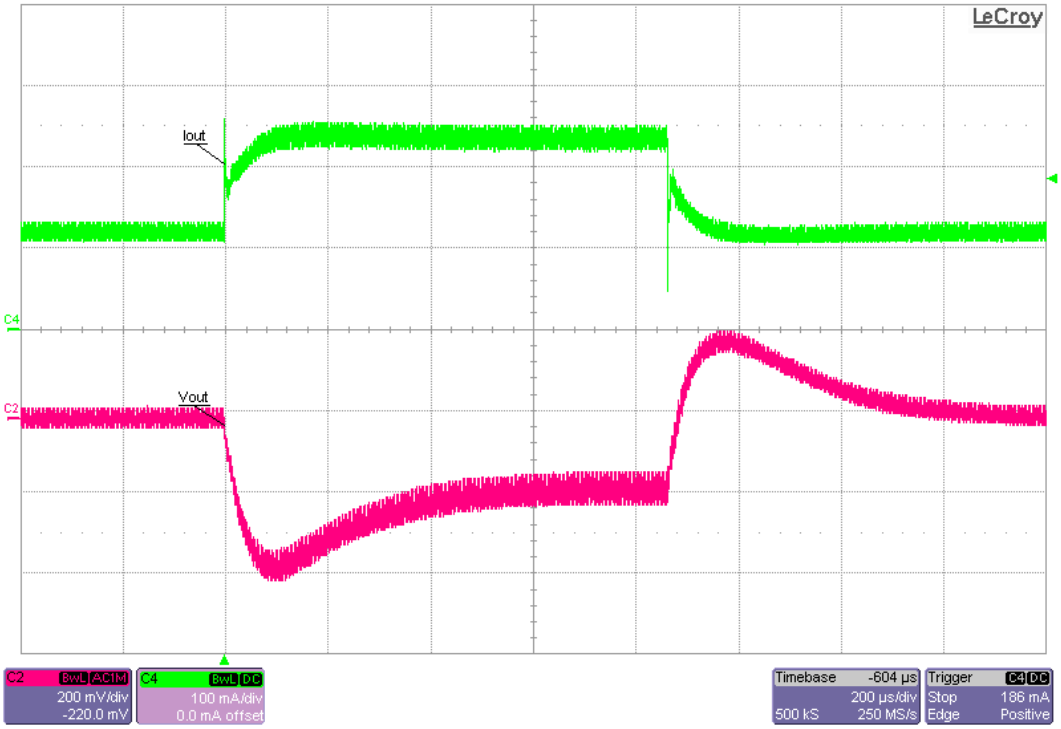


48Vin, full load start up from Vin. Ch1 measures Vin, Ch2 measures Vpri, and Ch3 measures Vsec.

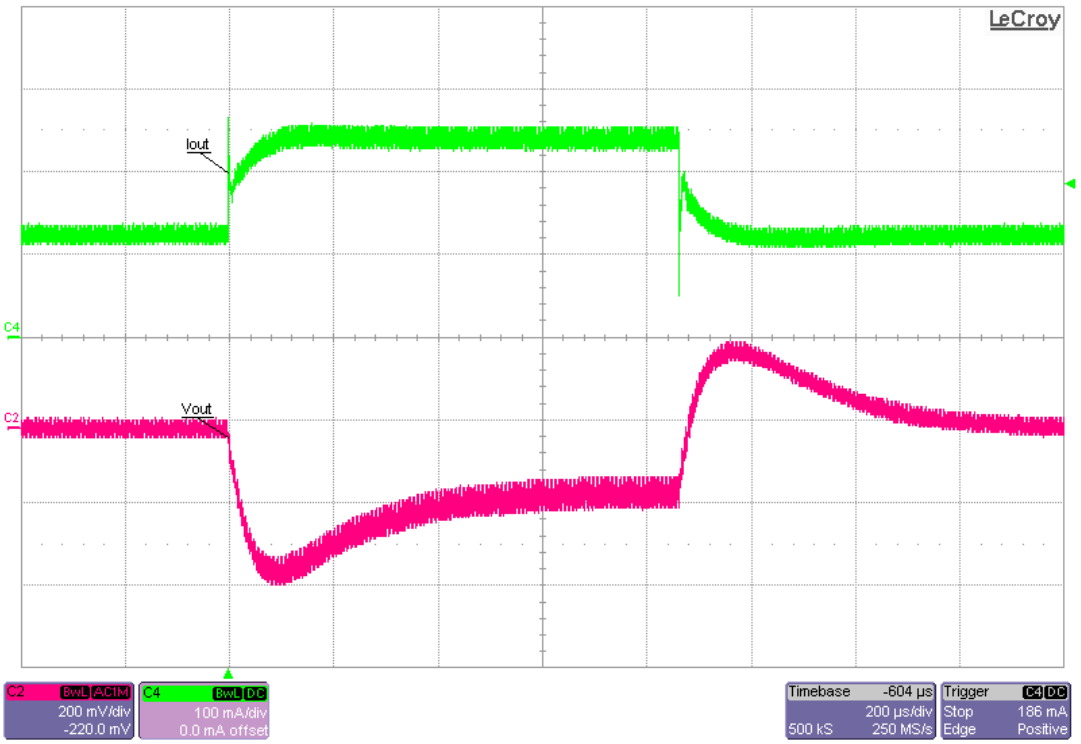


53Vin, full load start up from Vin. Ch1 measures Vin, Ch2 measures Vpri, and Ch3 measures Vsec.

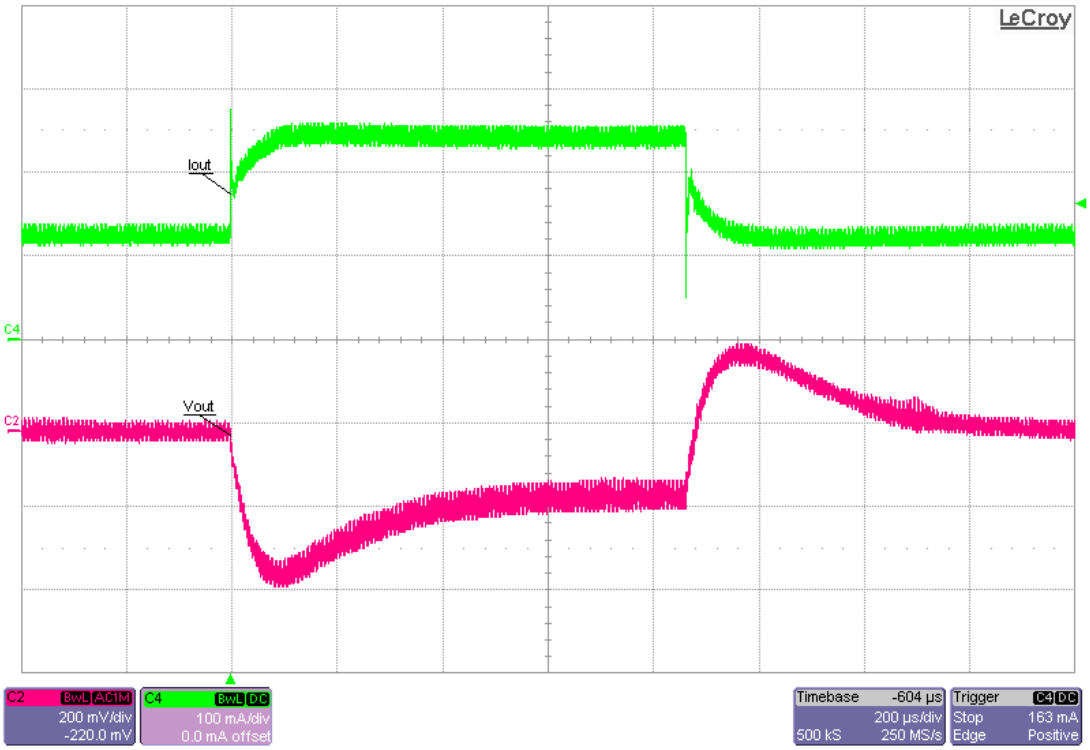
6.3 Transient Response



43Vin, 15Vout 0.125A to 0.25A load transient. Ch4 measures Iout, and Ch2 measures Vsec.



43Vin, 15Vout 0.125A to 0.25A load transient. Ch4 measures Iout, and Ch2 measures Vsec.



53Vin, 15Vout 0.125A to 0.25A load transient. Ch4 measures Iout, and Ch2 measures Vsec.

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