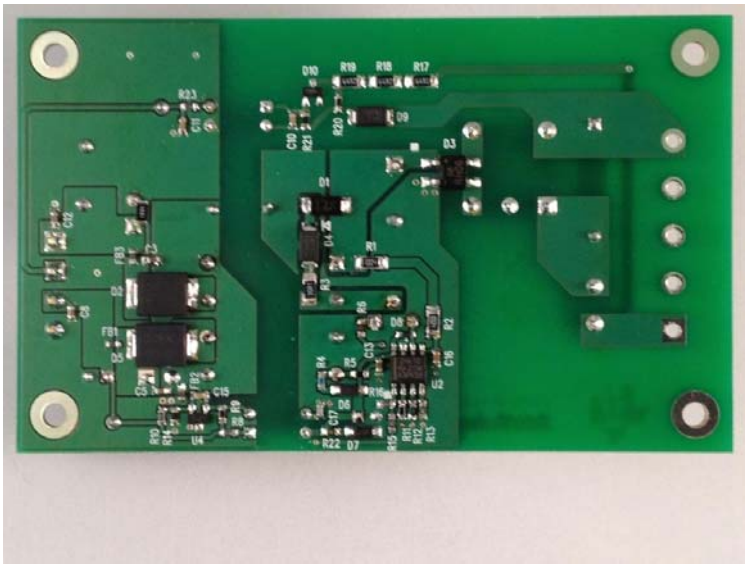
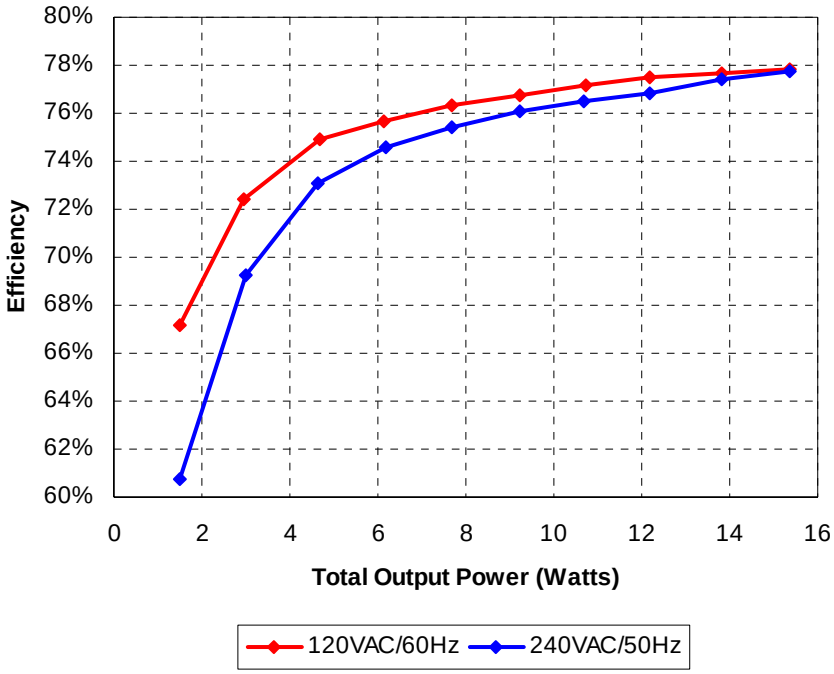
1 Photo

The photographs below show the PMP8362 assembly. This circuit was built on a PMP8259 Rev A PCB.



2 Efficiency



120VAC/60Hz

7.5V		12V								
Iout	Vout	Iout	Vout	Vin	Iin (A)	Pin	PF	Pout	Losses	Efficiency
0.000	7.52	0.000	11.85	120.0	0.01	0.32	0.29	0.00	0.32	0.0%
0.129	7.52	0.042	13.03	120.0	0.05	2.26	0.39	1.52	0.74	67.1%
0.257	7.52	0.079	13.13	120.0	0.08	4.10	0.43	2.97	1.13	72.4%
0.392	7.53	0.130	13.15	120.0	0.11	6.22	0.46	4.66	1.56	74.9%
0.518	7.53	0.171	13.16	120.0	0.14	8.13	0.49	6.15	1.98	75.7%
0.652	7.53	0.211	13.18	120.0	0.17	10.07	0.51	7.69	2.38	76.4%
0.781	7.53	0.252	13.19	120.0	0.19	11.99	0.52	9.20	2.79	76.8%
0.913	7.53	0.291	13.20	120.0	0.22	13.89	0.54	10.72	3.17	77.1%
1.040	7.54	0.330	13.20	120.0	0.24	15.74	0.55	12.20	3.54	77.5%
1.170	7.54	0.379	13.19	120.0	0.27	17.79	0.56	13.82	3.97	77.7%
1.302	7.54	0.421	13.19	120.0	0.29	19.74	0.57	15.37	4.37	77.9%

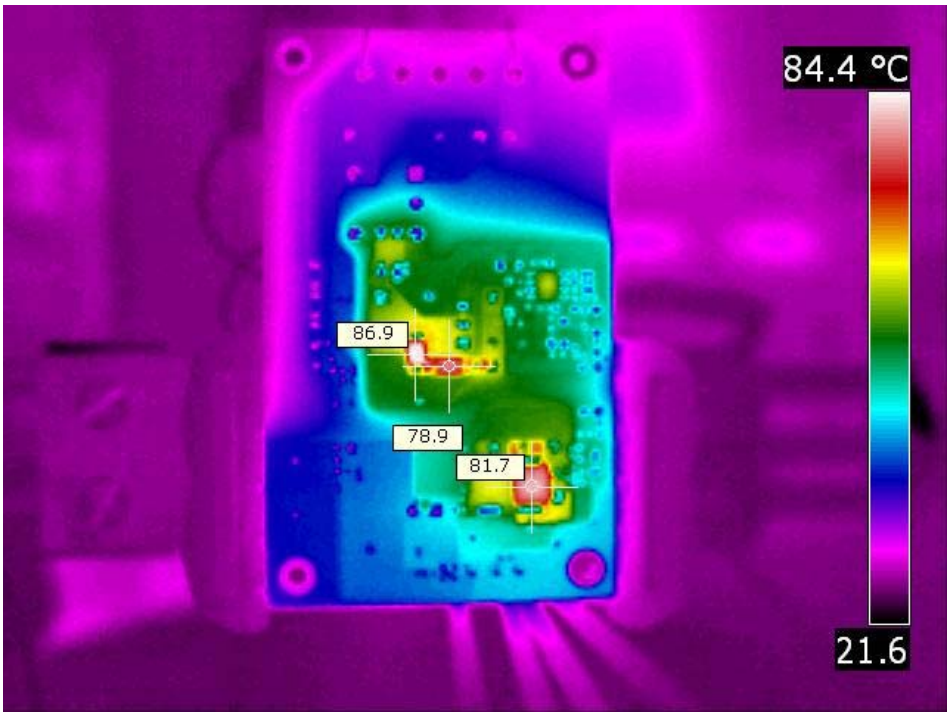
240VAC/50Hz

7.5V		12V								
Iout	Vout	Iout	Vout	Vin	Iin (A)	Pin	PF	Pout	Losses	Efficiency
0.000	7.53	0.000	11.92	240.0	0.01	0.62	0.24	0.00	0.62	0.0%
0.129	7.53	0.042	13.04	240.0	0.03	2.50	0.31	1.52	0.98	60.8%
0.261	7.53	0.079	13.15	240.0	0.05	4.34	0.33	3.00	1.34	69.2%
0.391	7.53	0.130	13.16	240.0	0.07	6.37	0.36	4.66	1.71	73.1%
0.520	7.53	0.172	13.18	240.0	0.09	8.29	0.37	6.18	2.11	74.6%
0.652	7.53	0.211	13.19	240.0	0.11	10.20	0.39	7.69	2.51	75.4%
0.782	7.53	0.252	13.19	240.0	0.13	12.11	0.40	9.21	2.90	76.1%
0.910	7.53	0.291	13.20	240.0	0.14	13.98	0.41	10.69	3.29	76.5%
1.040	7.53	0.330	13.20	239.9	0.16	15.86	0.42	12.19	3.67	76.8%
1.171	7.54	0.379	13.20	240.0	0.17	17.87	0.44	13.83	4.04	77.4%
1.302	7.54	0.421	13.20	240.0	0.19	19.78	0.44	15.37	4.41	77.7%

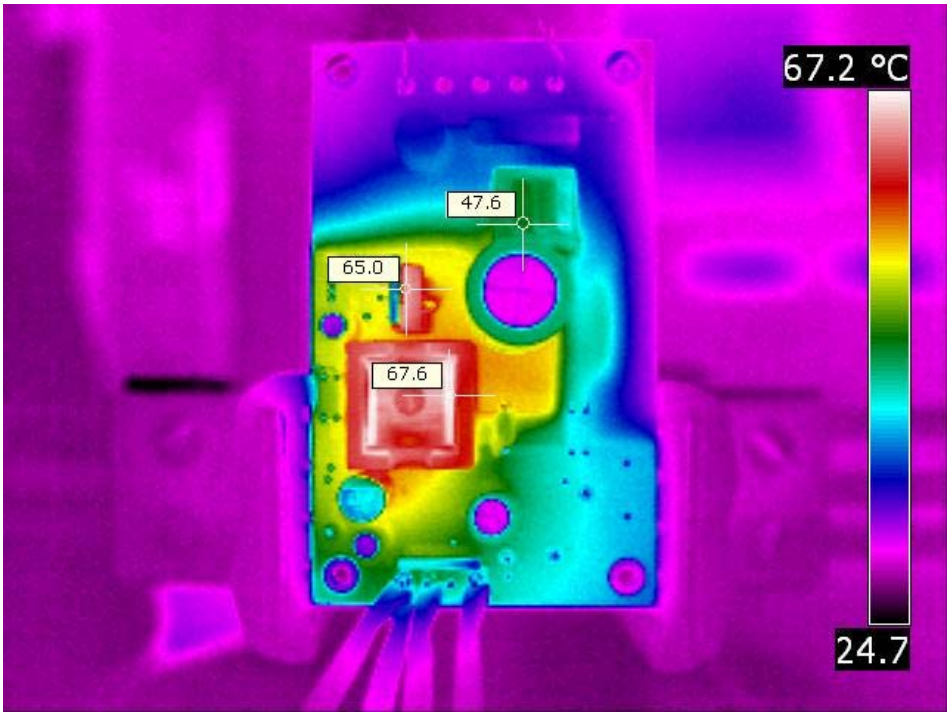
3 Thermal Images

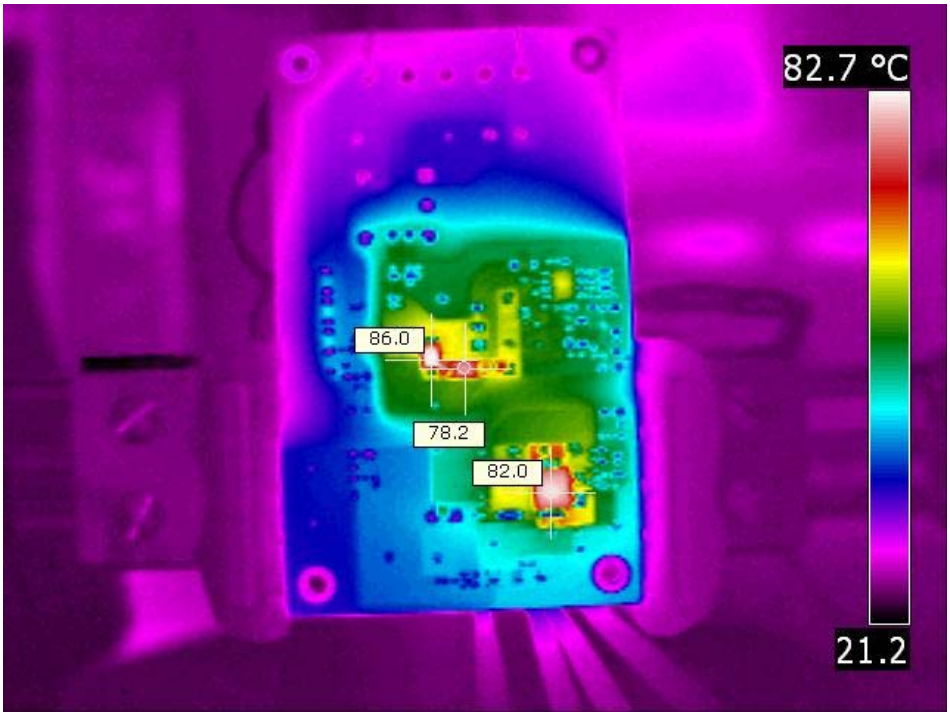
The ambient temperature was 25ºC with no forced air flow. The outputs were loaded with 7.5V/1.3A and 12V/0.42A.

3.1 120VAC/60Hz Input



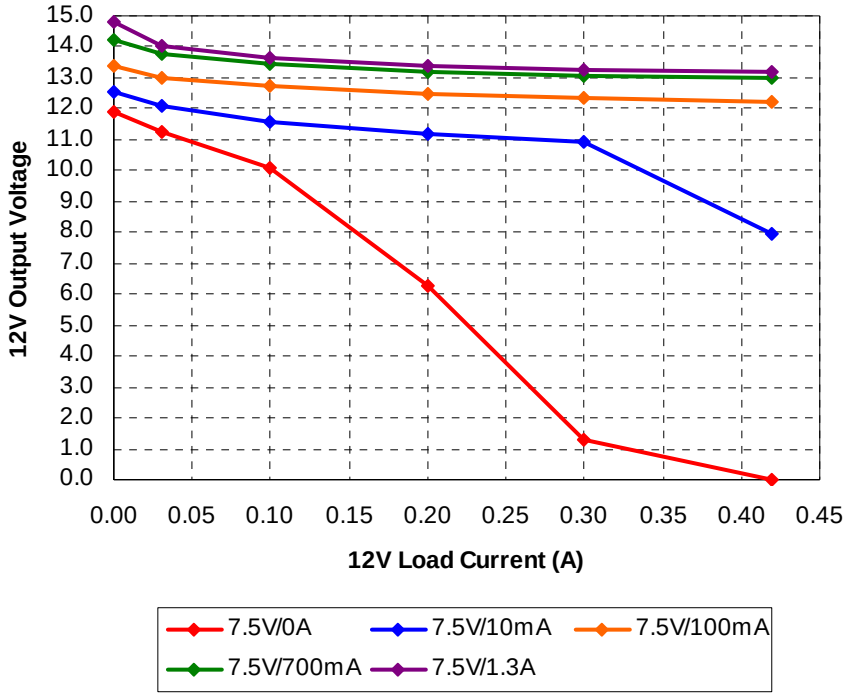
3.2 240VAC/50Hz Input





4 Cross-Regulation

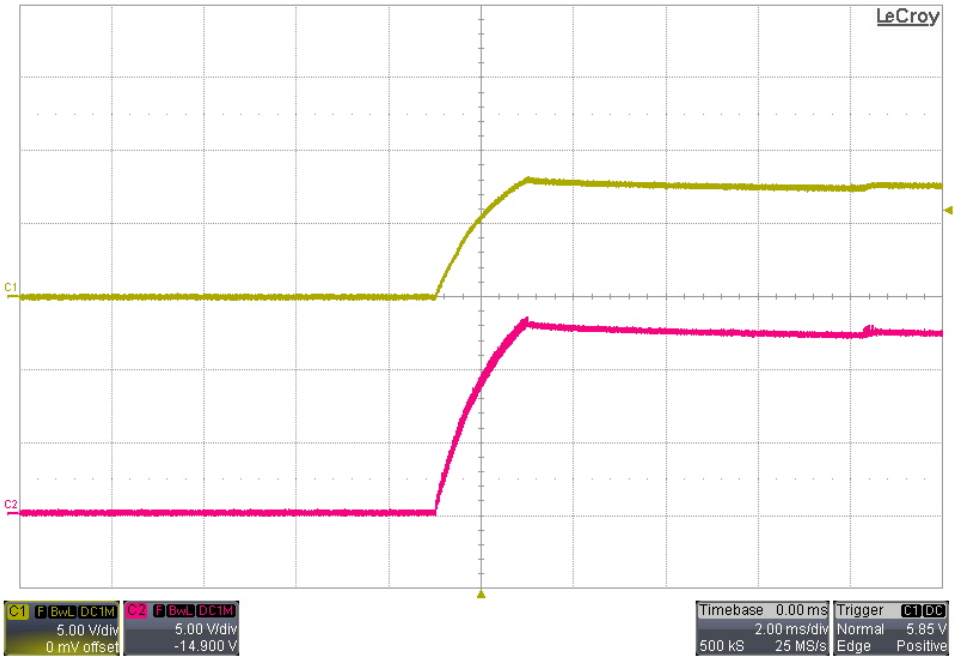
The chart below shows the 12V output voltage versus 12V load current for different loading conditions on the 7.5V output. The input was 120VAC/60Hz.



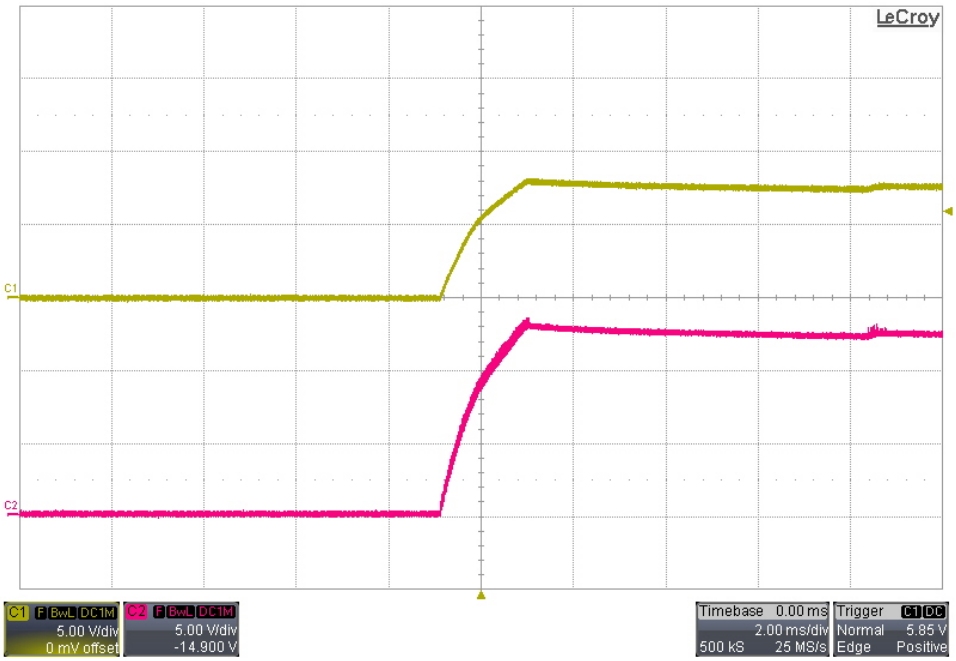
5 Startup

The output voltages at startup are shown in the images below. The input was 120VAC/60Hz.

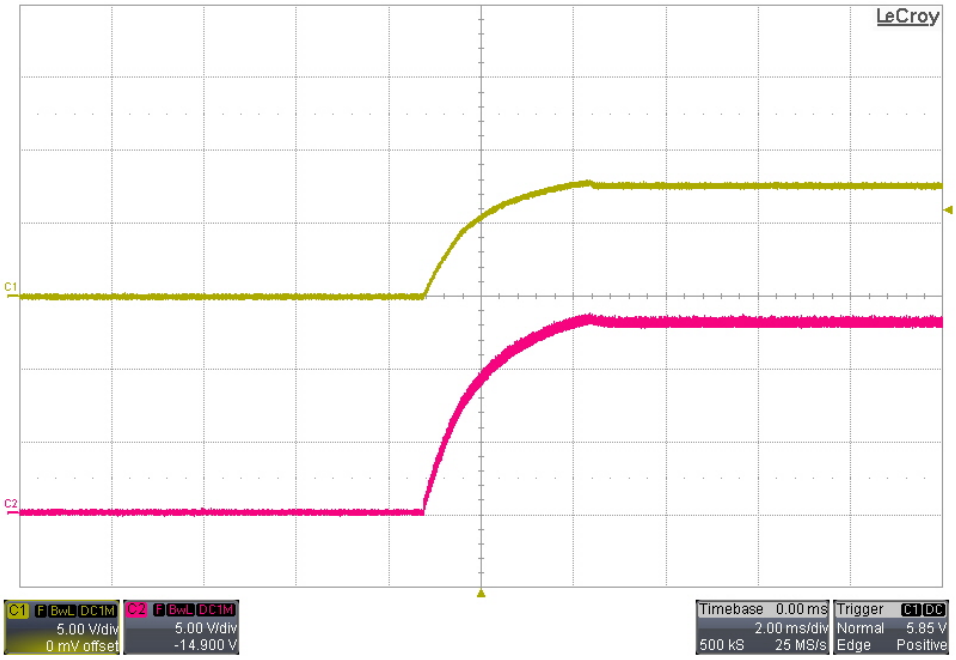
5.1 120VAC/60Hz Input; No Load



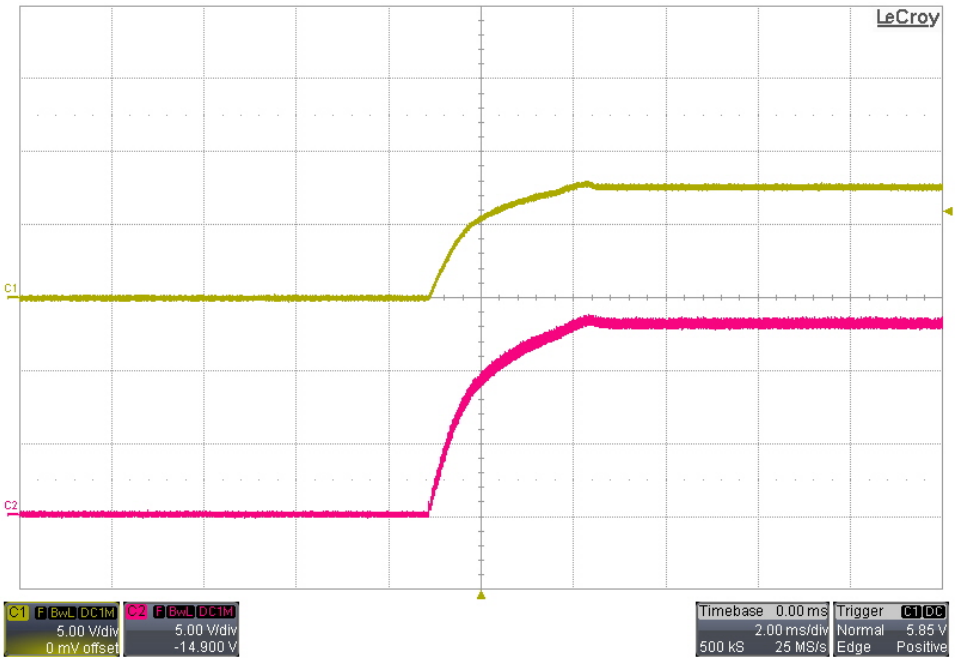
5.2 240VAC/50Hz Input; No Load



5.3 120VAC/60Hz Input; 7.5V/6Ω, 12V/28Ω



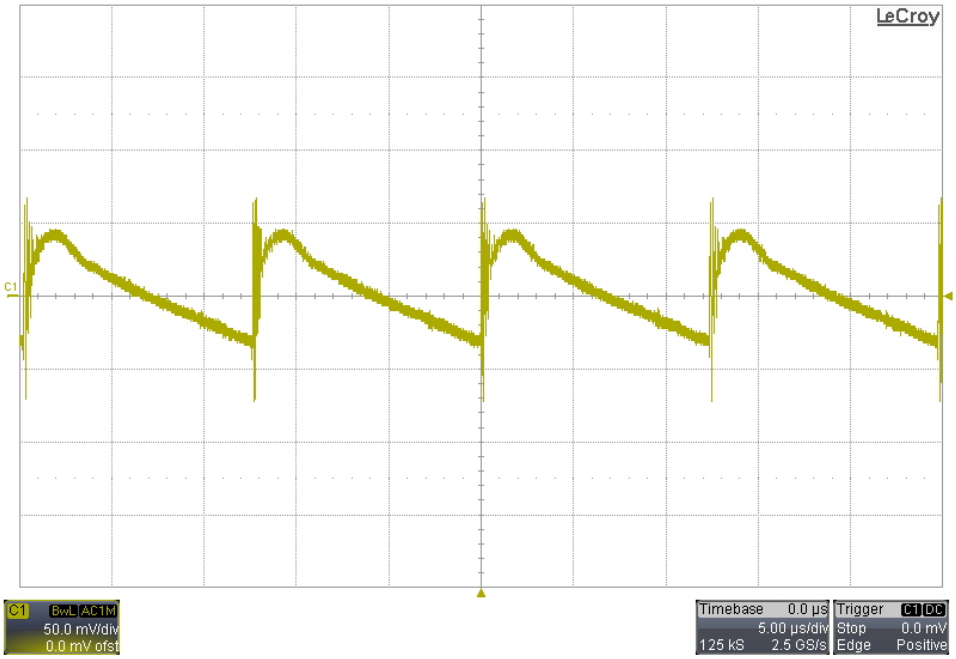
5.4 240VAC/50Hz Input; 7.5V/6Ω, 12V/28Ω



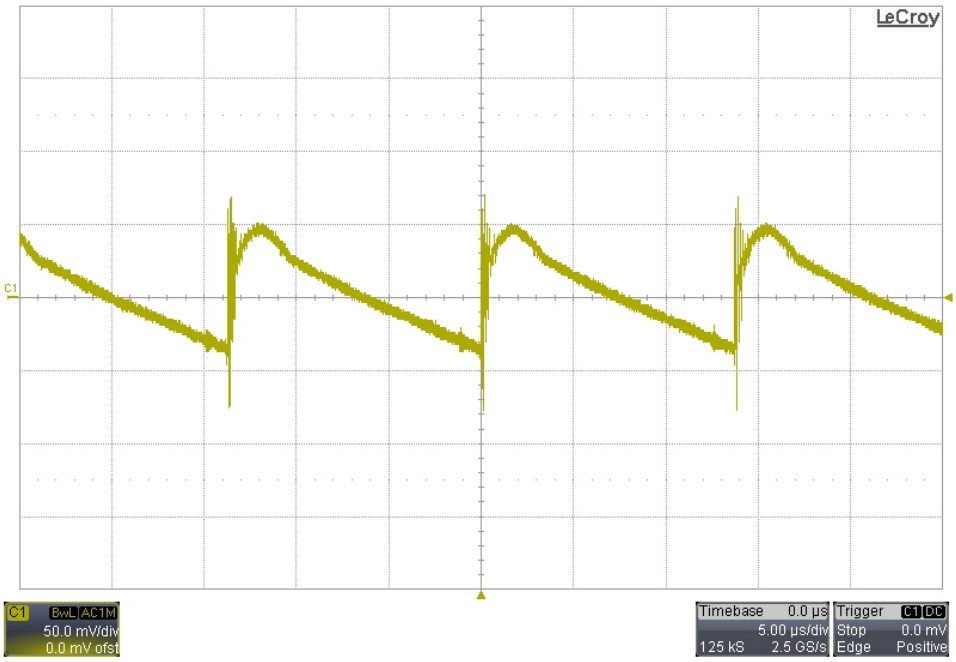
6 7.5V Output Ripple Voltage

The output ripple voltage on the 7.5V output is shown in the plots below. The outputs were loaded with 7.5V/1.3A and 12V/0.42A.

6.1 120VAC/60Hz Input



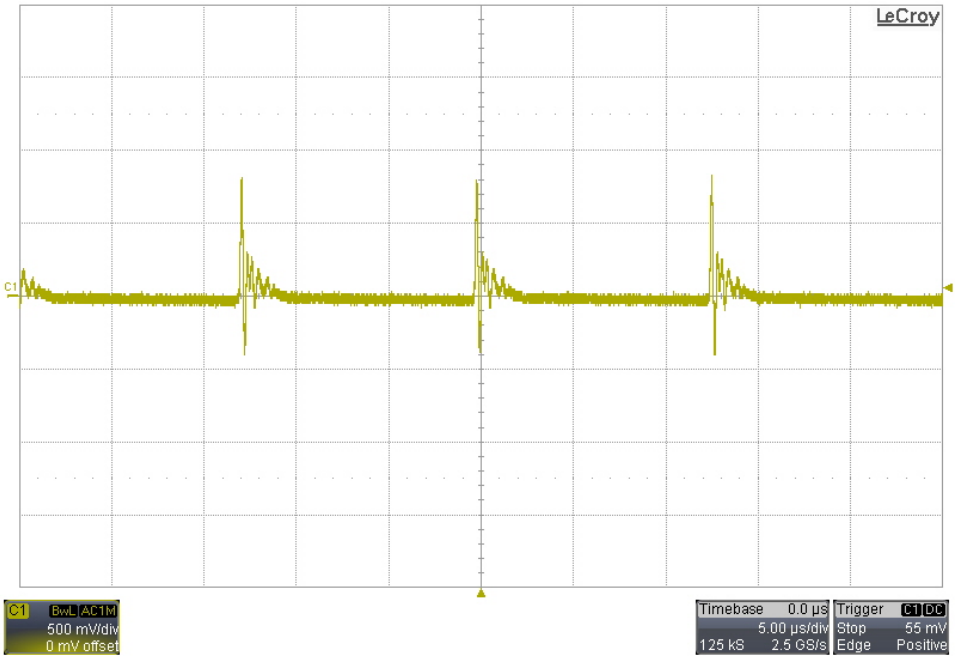
6.2 240VAC/50Hz Input



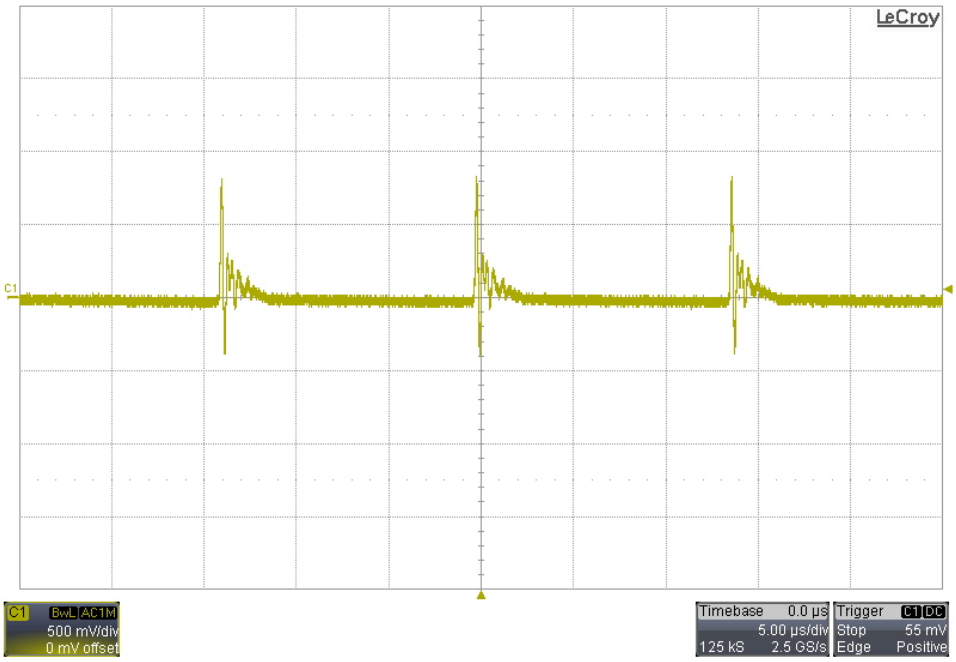
7 12V Output Ripple Voltage

The output ripple voltage on the 12V output is shown in the plots below. The outputs were loaded with 7.5V/1.3A and 12V/0.42A.

7.1 120VAC/60Hz Input

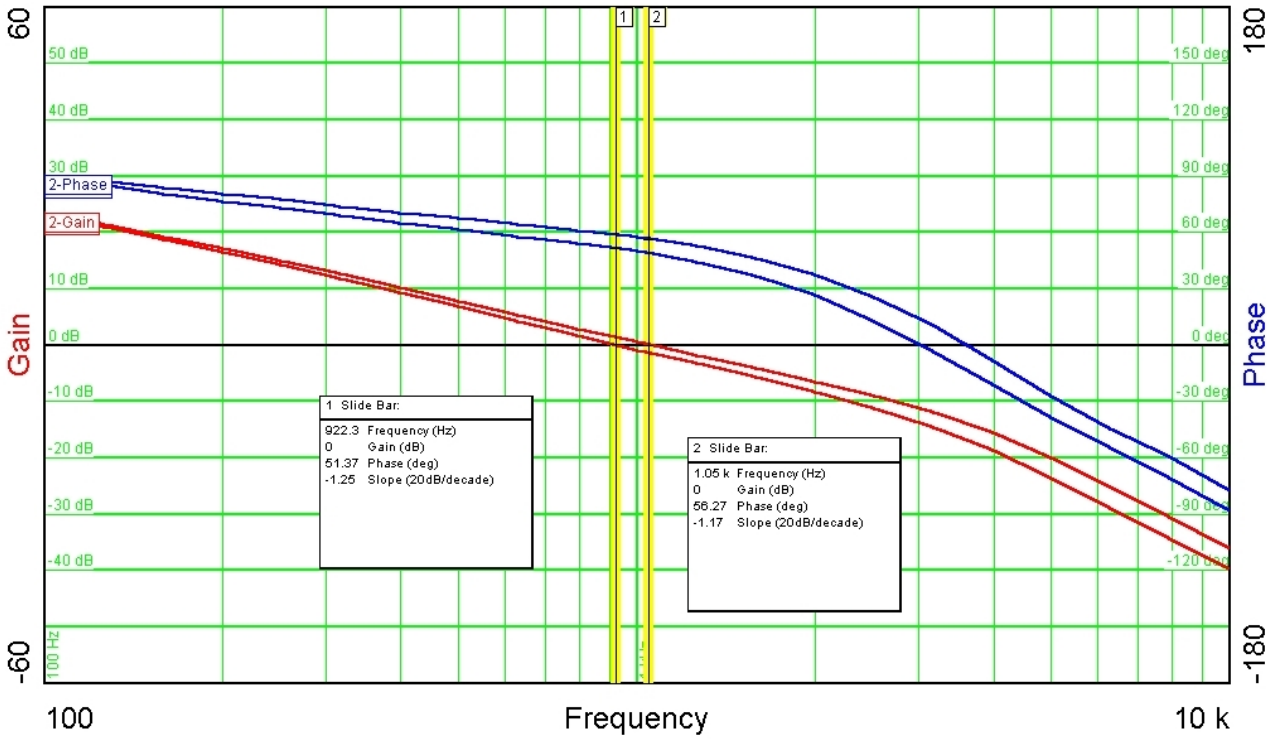


7.2 240VAC/50Hz Input



8 Loop Response

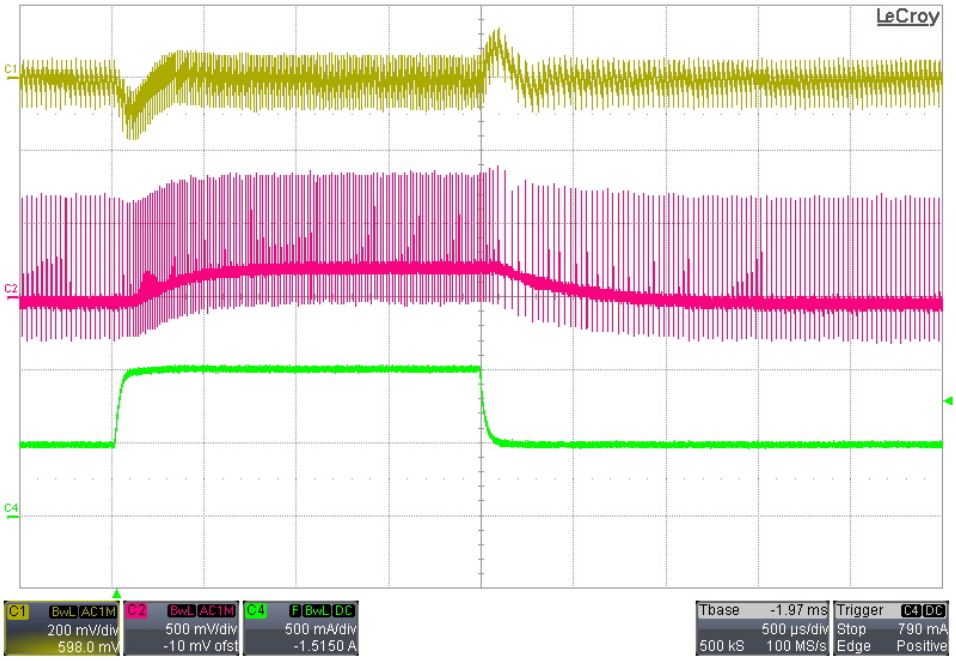
The frequency response of the feedback loop is shown in the image below. The outputs were loaded with 7.5V/1.3A and 12V/0.42A. For gain/phase plot #1, the input was 120VAC/60Hz. For gain/phase plot #2, the input was 240VAC/50Hz.



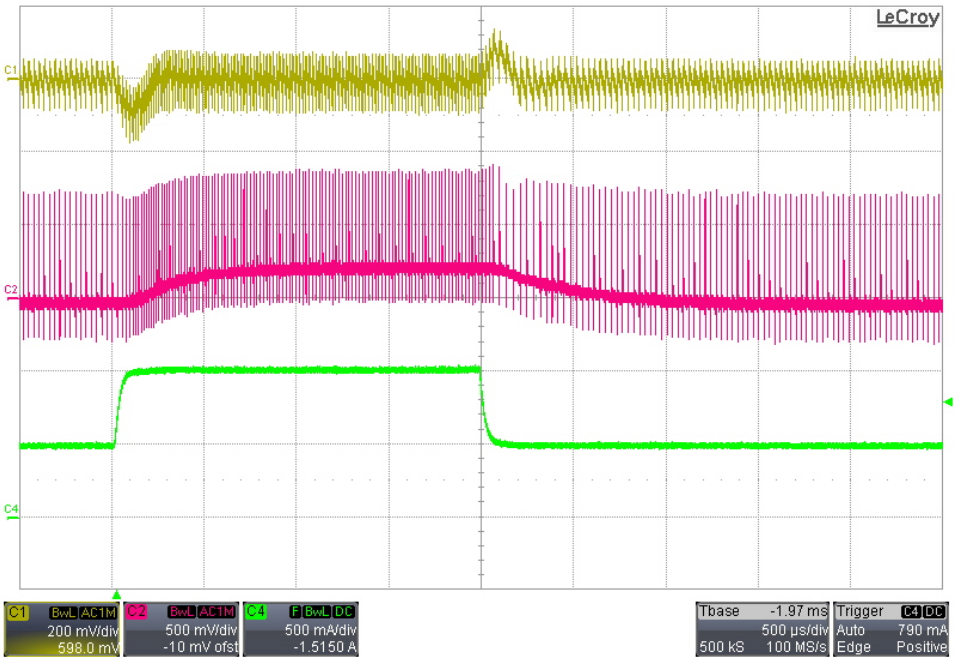
9 7.5V Load Transients

The images below show the response to a 0.5A to 1A load transient on the 7.5V output. The 12V output was loaded with 50Ω. Channel 1 shows the 7.5V output voltage (ac coupled). Channel 2 shows the 12V output voltage (ac coupled). Channel 4 shows the 7.5V load current.

9.1 120VAC/60Hz Input



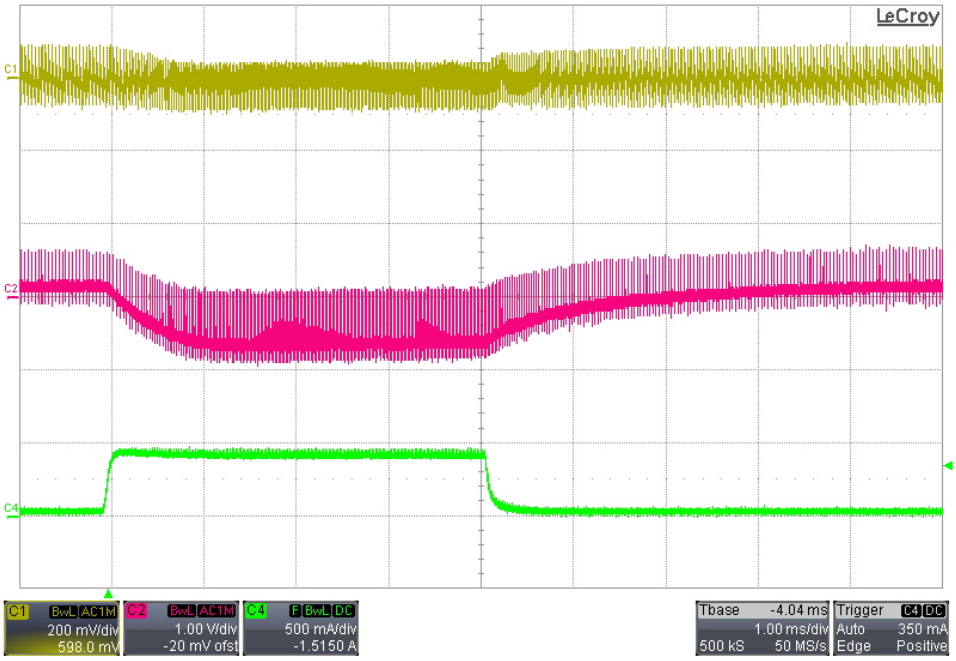
9.2 240VAC/50Hz Input



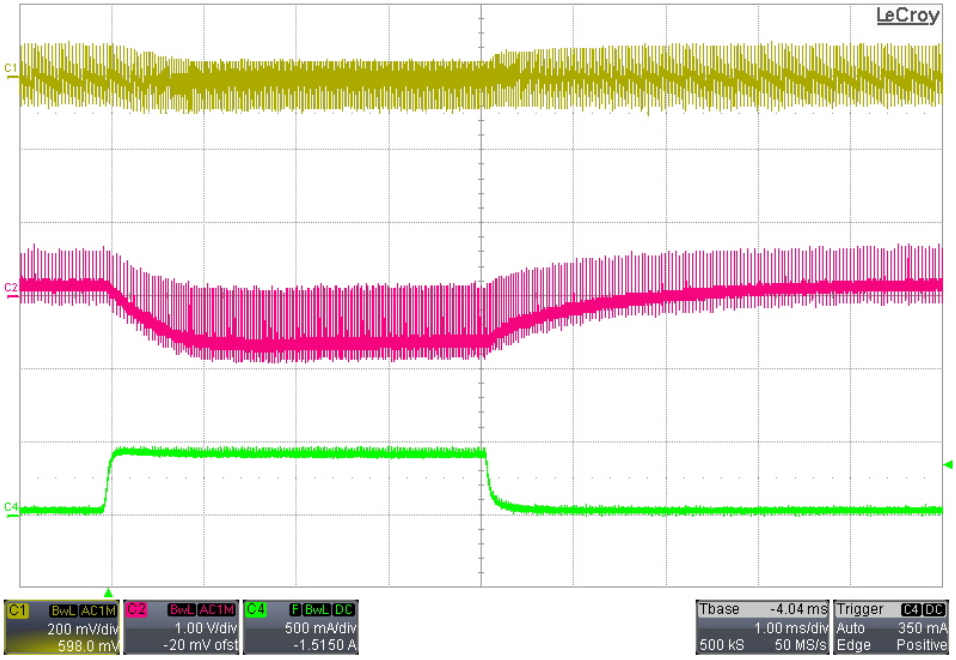
10 12V Load Transients

The images below show the response to a 0A to 0.42A load transient on the 12V output. The 7.5V output was loaded with 10Ω. Channel 1 shows the 7.5V output voltage (ac coupled). Channel 2 shows the 12V output voltage (ac coupled). Channel 4 shows the 12V load current.

10.1 120VAC/60Hz Input



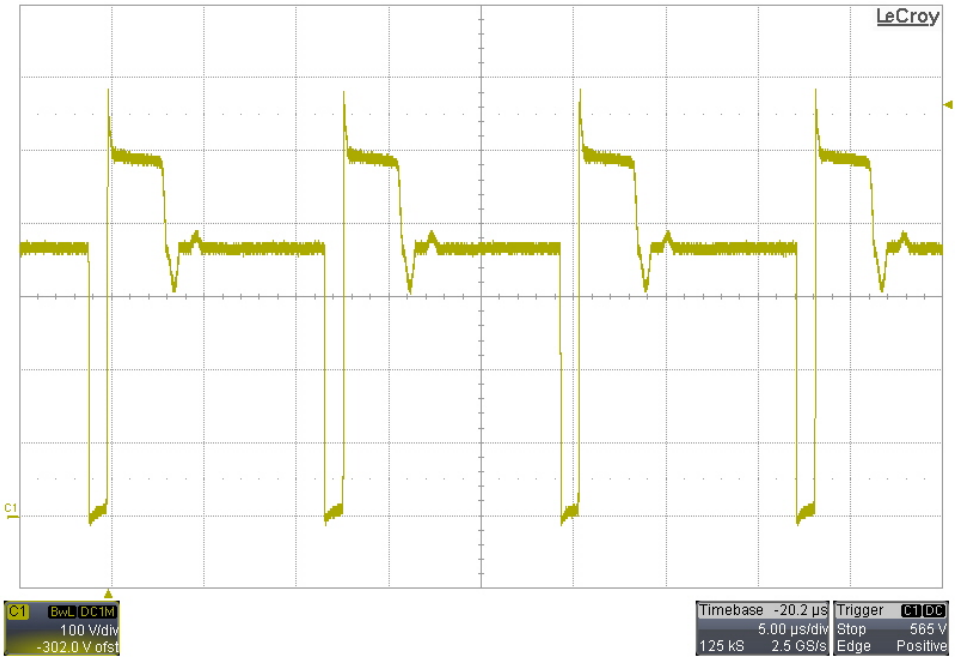
10.2 240VAC/50Hz Input



11 Switching Waveforms

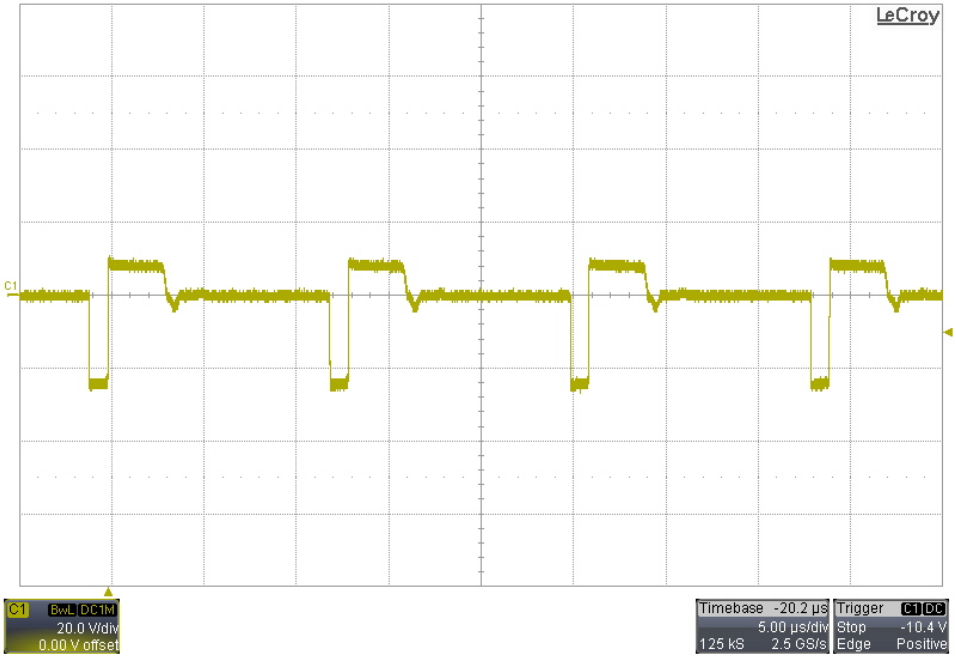
11.1 Primary FET

The image below shows the drain-to-source voltage on the primary MOSFET (Q1). The outputs were loaded with 7.5V/1.3A and 12V/0.42A. The input was set to 264VAC/50Hz.



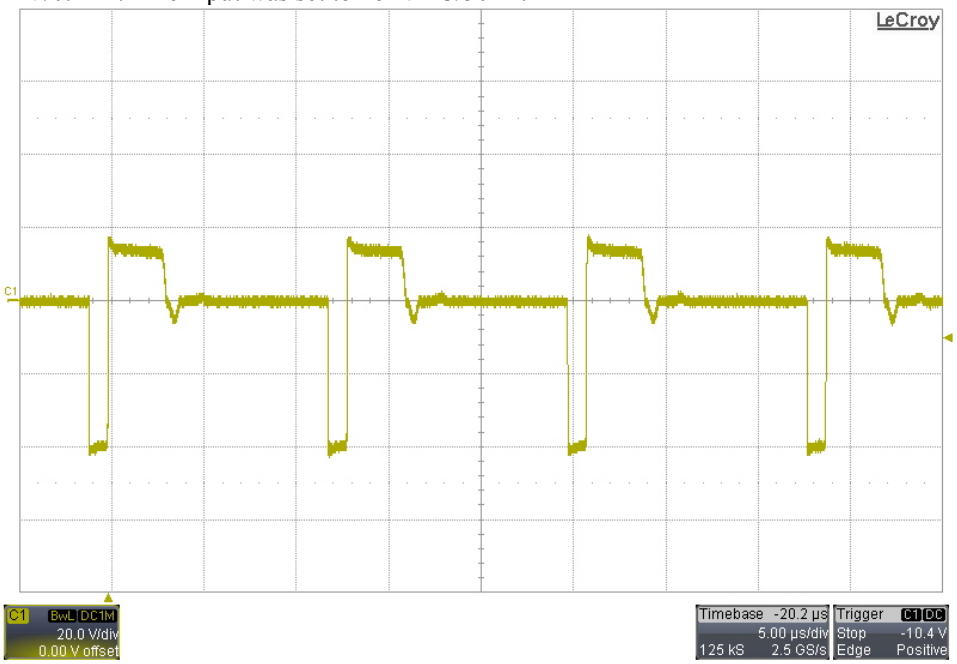
11.2 7.5V Diode

The image below shows the voltage on the anode of the 7.5V output diode (D5). The outputs were loaded with 7.5V/1.3A and 12V/0.42A. The input was set to 264VAC/50Hz.



11.3 12V Diode

The image below shows the voltage on the anode of the 12V output diode (D2). The outputs were loaded with 7.5V/1.3A and 12V/0.42A. The input was set to 264VAC/50Hz.



IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale (https:www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265