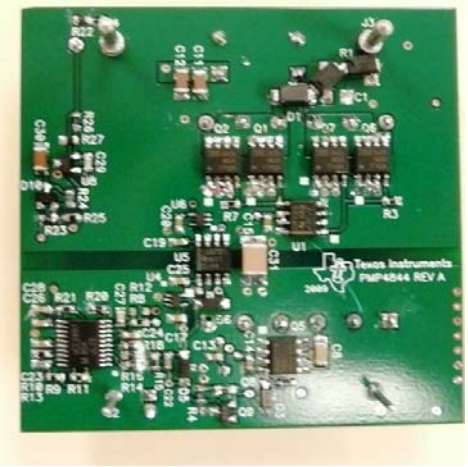
PMP4844 Rev B Test Results

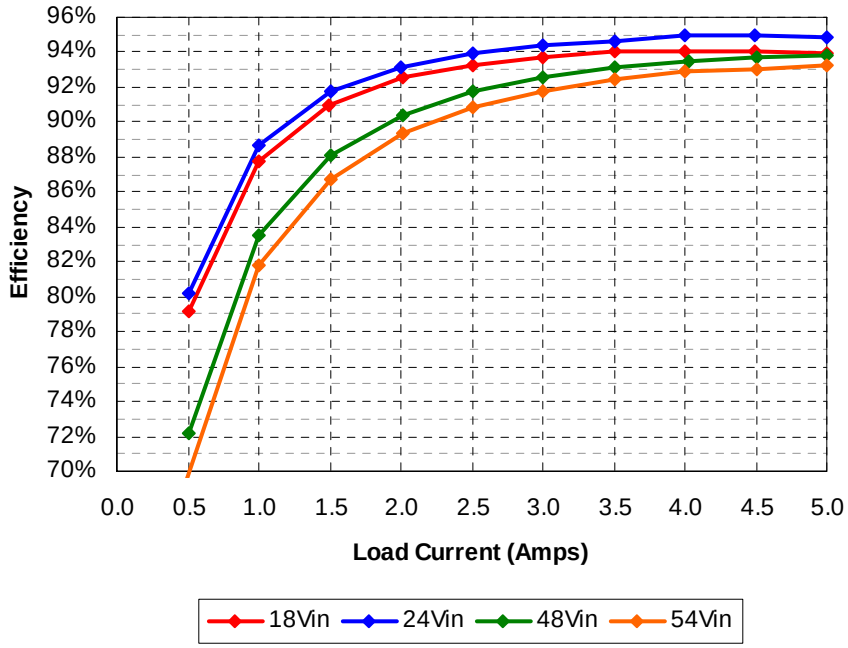
1 Photo

The photographs below show the top and bottom views of the PMP4844 Rev B demo board. The circuit is built on a PMP4844 Rev A PWB.



2 Efficiency

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



Vin	Iin	Iout	Vout	Pout	Losses	Efficiency
18.05	0.180	0.001	24.23	0.02	3.225	0.7%
17.99	0.858	0.504	24.23	12.21	3.224	79.1%
17.98	1.537	1.001	24.24	24.26	3.371	87.8%
17.99	2.221	1.499	24.24	36.34	3.620	90.9%
17.99	2.929	2.011	24.24	48.75	3.946	92.5%
18.00	3.621	2.508	24.24	60.79	4.384	93.3%
17.99	4.32	3.003	24.24	72.79	4.924	93.7%
18.01	5.02	3.507	24.25	85.04	5.365	94.1%
18.01	5.73	4.004	24.25	97.10	6.100	94.1%
18.01	6.44	4.497	24.25	109.05	6.932	94.0%
18.00	7.17	4.999	24.25	121.23	7.834	93.9%

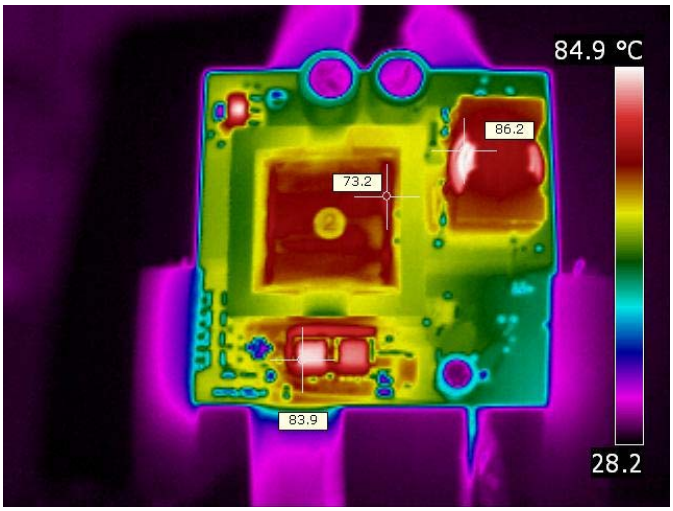
Vin	Iin	Iout	Vout	Pout	Losses	Efficiency
24.00	0.127	0.001	24.24	0.02	3.024	0.8%
24.00	0.632	0.502	24.24	12.17	3.000	80.2%
23.97	1.141	1.000	24.24	24.24	3.110	88.6%
23.99	1.652	1.500	24.24	36.36	3.271	91.7%
23.98	2.163	1.994	24.24	48.33	3.534	93.2%
23.98	2.692	2.502	24.24	60.65	3.906	93.9%
23.98	3.216	3.003	24.25	72.82	4.297	94.4%
24.00	3.740	3.503	24.25	84.95	4.812	94.6%
23.99	4.260	4.001	24.25	97.02	5.173	94.9%
23.97	4.790	4.497	24.25	109.05	5.764	95.0%
23.99	5.330	5.001	24.25	121.27	6.592	94.8%

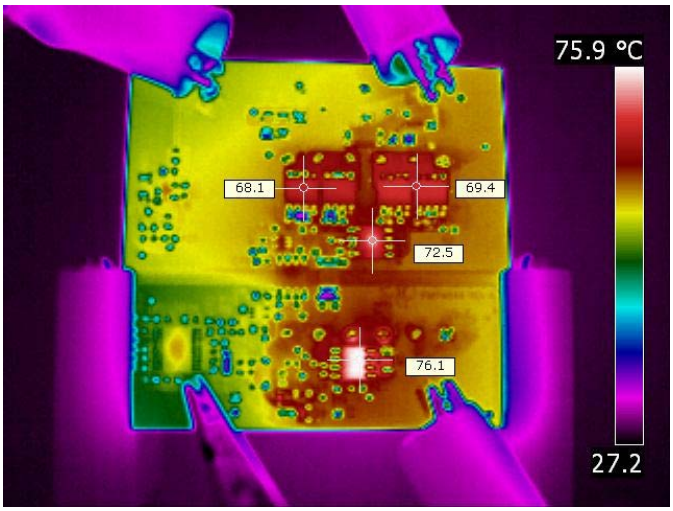
Vin	Iin	Iout	Vout	Pout	Losses	Efficiency
48.0	0.102	0.000	24.25	0.00	4.900	-0.1%
48.0	0.356	0.509	24.25	12.34	4.745	72.2%
48.0	0.607	1.003	24.25	24.32	4.813	83.5%
48.0	0.866	1.510	24.25	36.62	4.951	88.1%
48.0	1.124	2.011	24.25	48.77	5.185	90.4%
48.0	1.379	2.504	24.25	60.72	5.470	91.7%
48.0	1.638	3.000	24.25	72.75	5.874	92.5%
48.0	1.903	3.507	24.25	85.04	6.299	93.1%
48.0	2.182	4.035	24.25	97.85	6.887	93.4%
48.0	2.430	4.504	24.26	109.27	7.373	93.7%
48.0	2.697	5.004	24.26	121.40	8.059	93.8%

Vin	Iin	Iout	Vout	Pout	Losses	Efficiency
54.0	0.098	0.000	24.24	0.00	5.296	-0.1%
54.0	0.322	0.499	24.24	12.10	5.292	69.6%
54.0	0.549	1.000	24.25	24.25	5.396	81.8%
54.0	0.778	1.503	24.25	36.45	5.564	86.8%
54.0	1.011	2.012	24.25	48.79	5.803	89.4%
54.0	1.236	2.500	24.25	60.63	6.119	90.8%
54.0	1.470	3.004	24.25	72.85	6.533	91.8%
54.0	1.702	3.505	24.25	85.00	6.912	92.5%
54.0	1.934	3.999	24.25	96.98	7.460	92.9%
54.0	2.176	4.508	24.25	109.32	8.185	93.0%
54.0	2.409	5.003	24.26	121.37	8.713	93.3%

3 Thermal Image

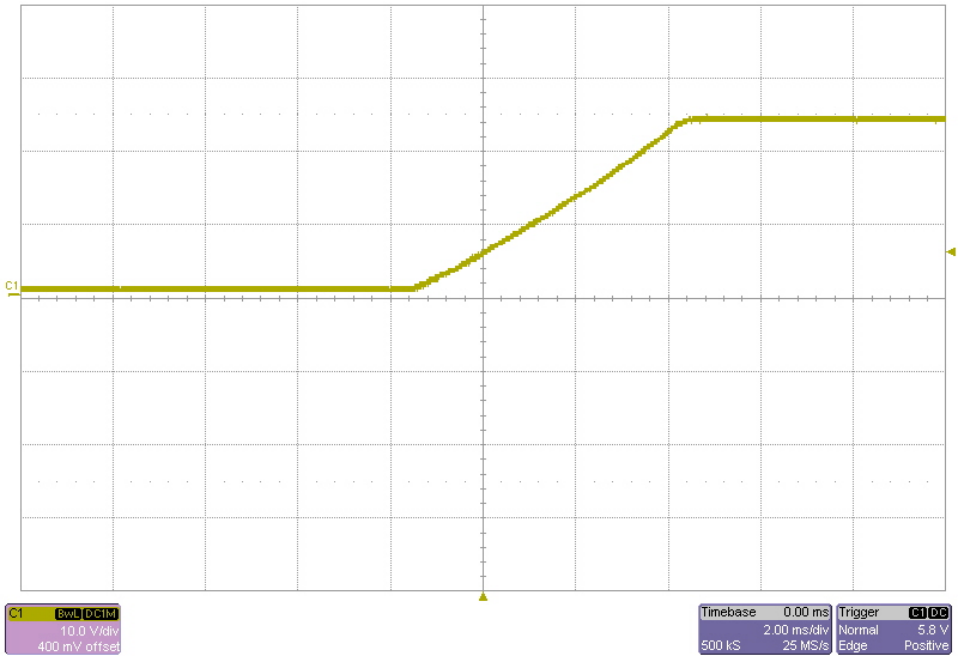
The thermal images below show a top view (left) and bottom view (right) of the board. The ambient temperature was 27.5ºC with no forced air flow. The input was 24VDC, and the output was loaded with 5A. The output inductor was the hottest component on the board and measured 86ºC.

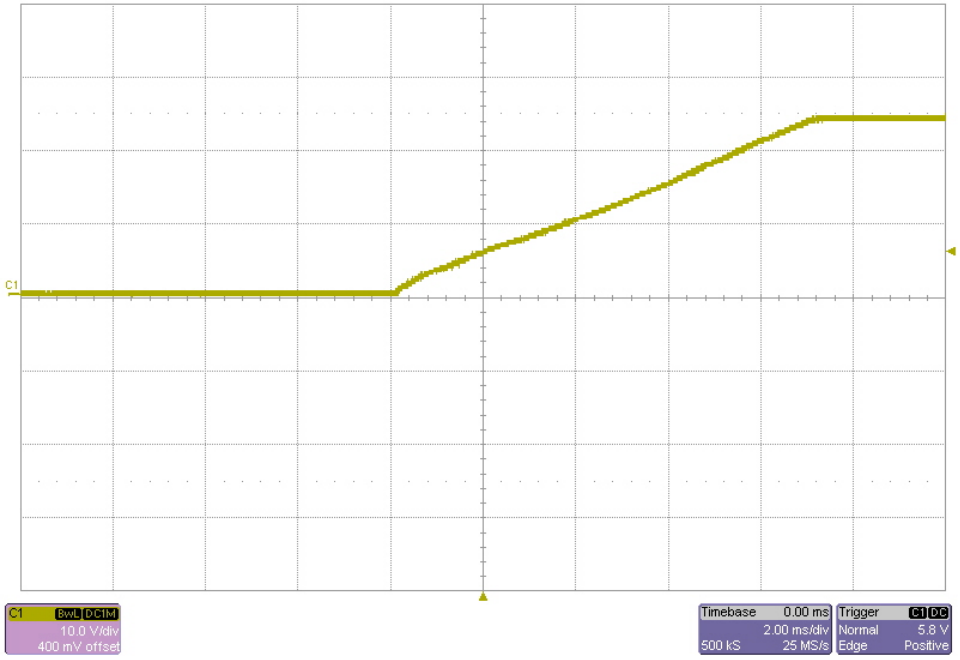




4 Startup

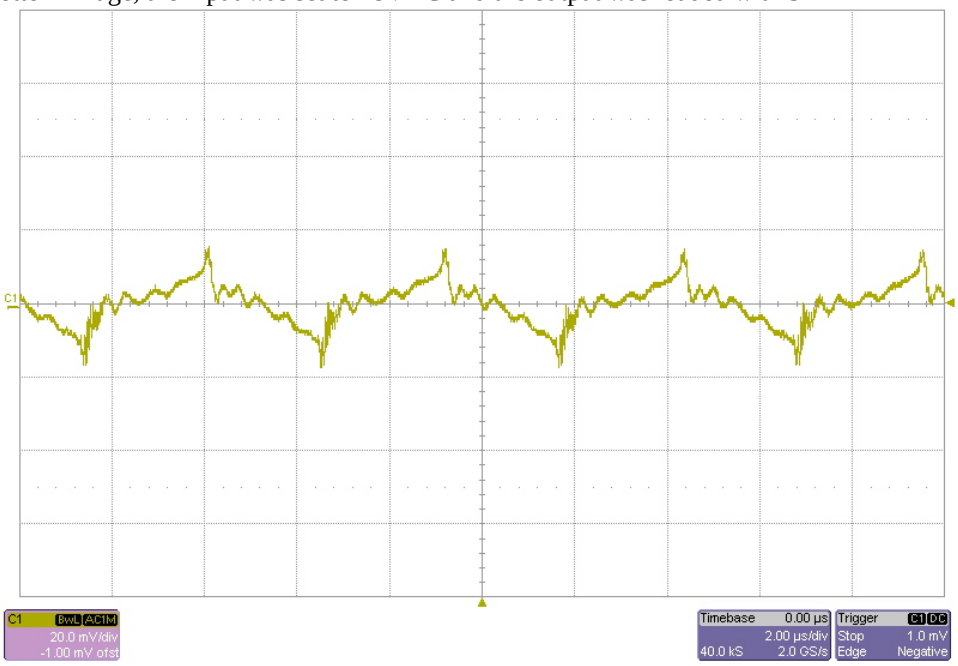
The output voltage at startup is shown in the images below. The input was 24VDC. For the top image, the output was unloaded. For the bottom image, the output was loaded with 5A.

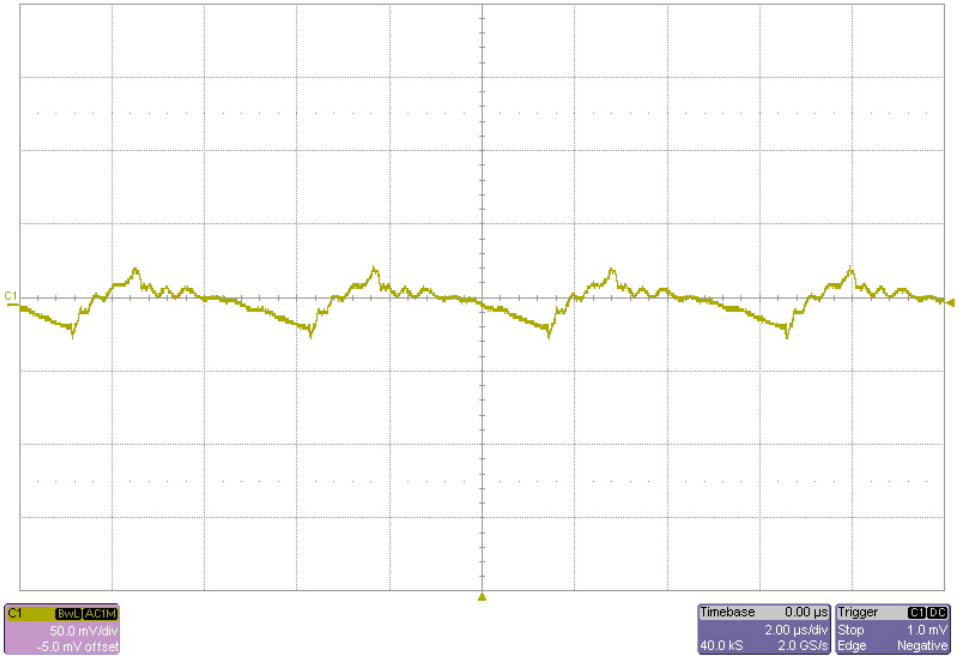




5 Output Ripple Voltage

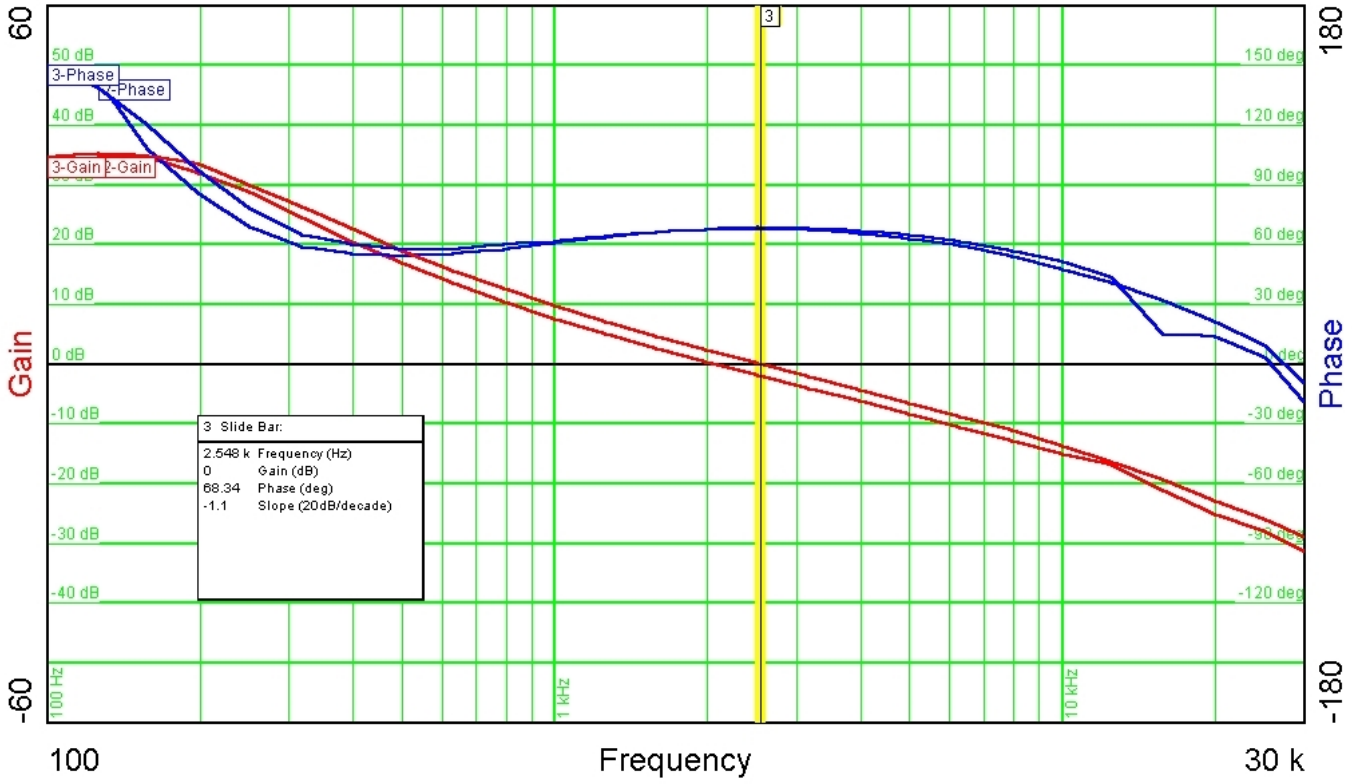
The output ripple voltage is shown in the plot below. For the top image, the input was set to 24VDC and the output was loaded with 5A. For the bottom image, the input was set to 48VDC and the output was loaded with 5A





6 Frequency Response

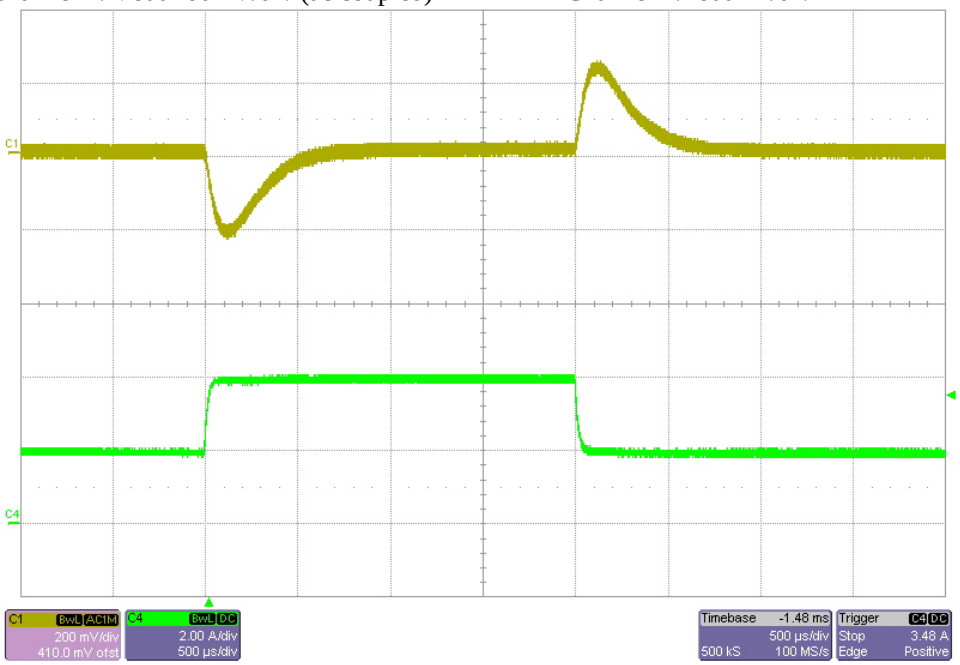
The frequency response of the feedback loop is shown below. For the upper gain and phase plot, the input was set to 54V. For the lower gain and phase plot, the input was set to 18V. The output was loaded with 5A for both sets of plots.



7 Load Transients

The response to a load step from 2A to 4A is shown in the image below. The input was set to 24V.

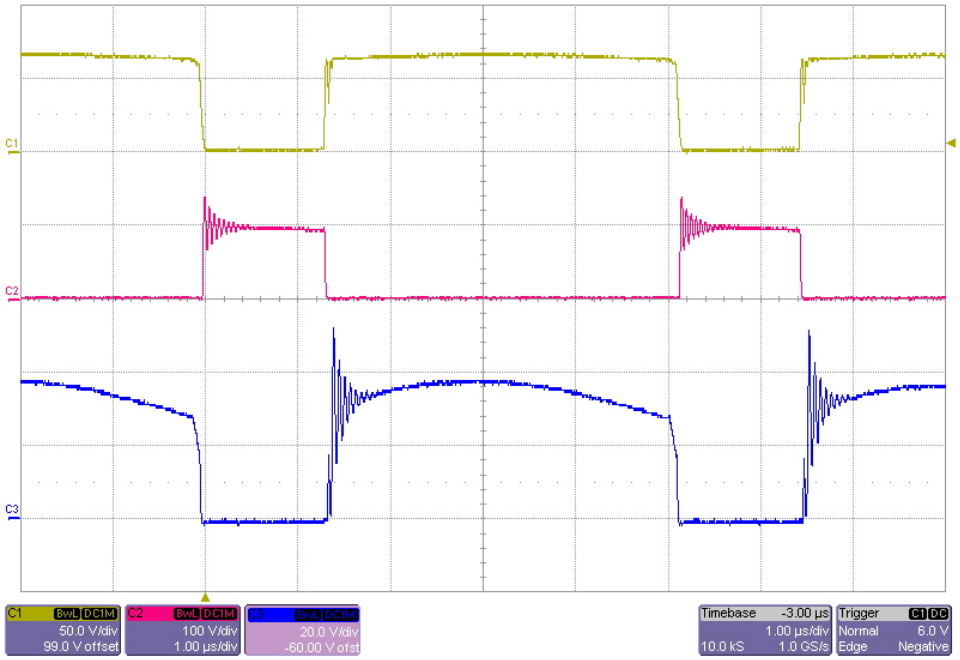
Channel 1: Vout 200mV/div (ac coupled) Channel 4: Iout 2A/div



8 Switching Waveforms

The image below shows the drain-to-source voltage waveforms on the switching MOSFETs. The input was set to 48VDC, and the output was loaded with 5A.

Channel 1: Q3 & Q4 Vds
Channel 2: Q1 & Q2 Vds
Channel 3: Q6 & Q7 Vds



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