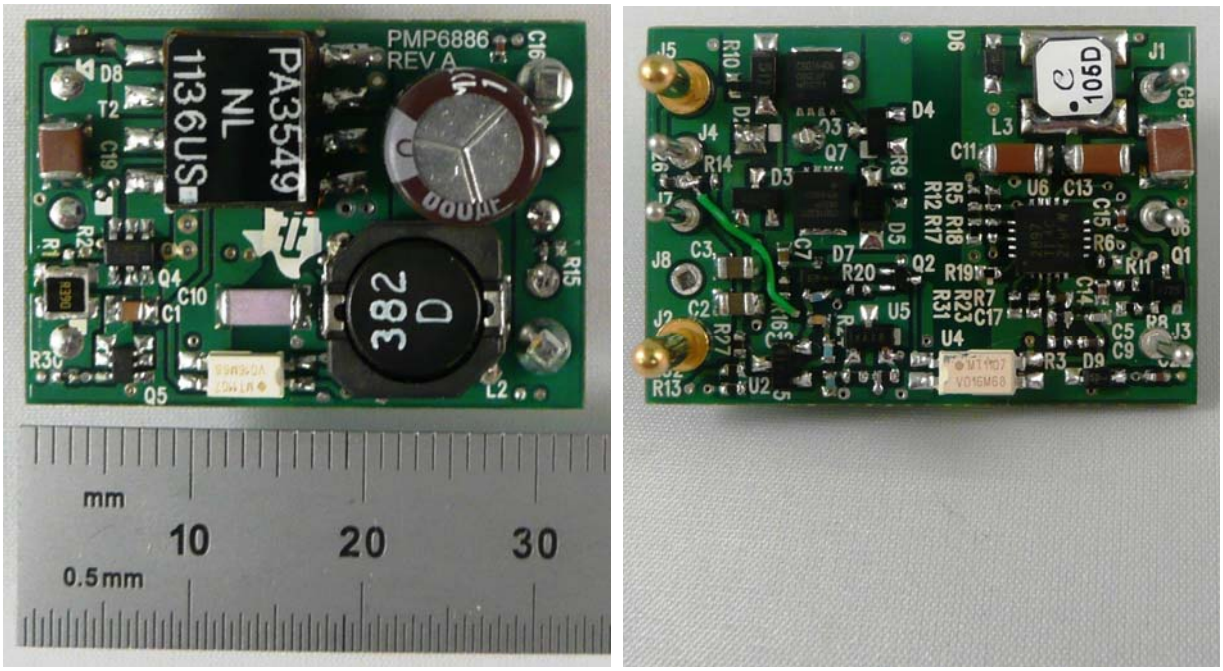
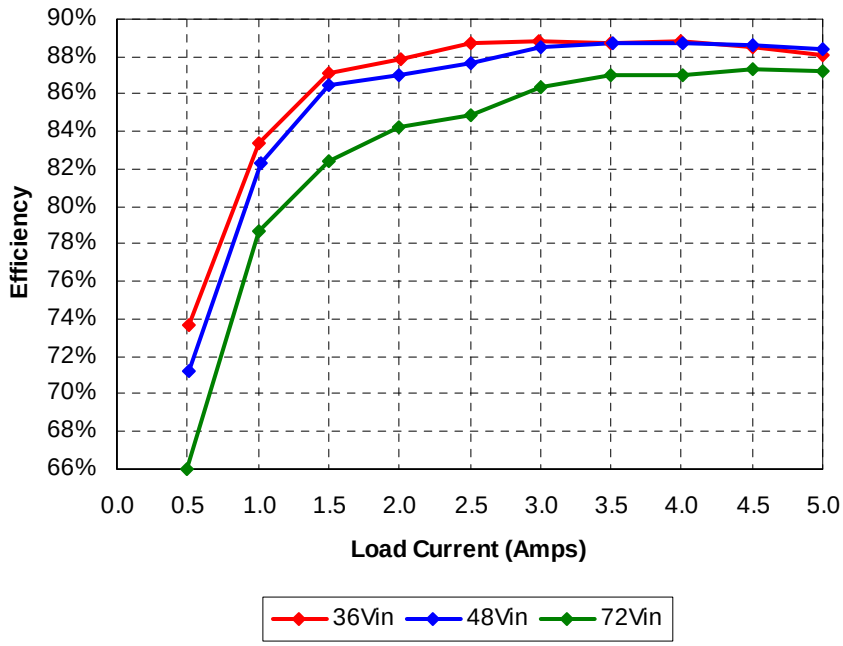
1 Photo

The photographs below show the top and bottom views of the PMP6886 Rev B demo board. The circuit is built on a PMP6886 Rev A PWB.



2 Efficiency

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



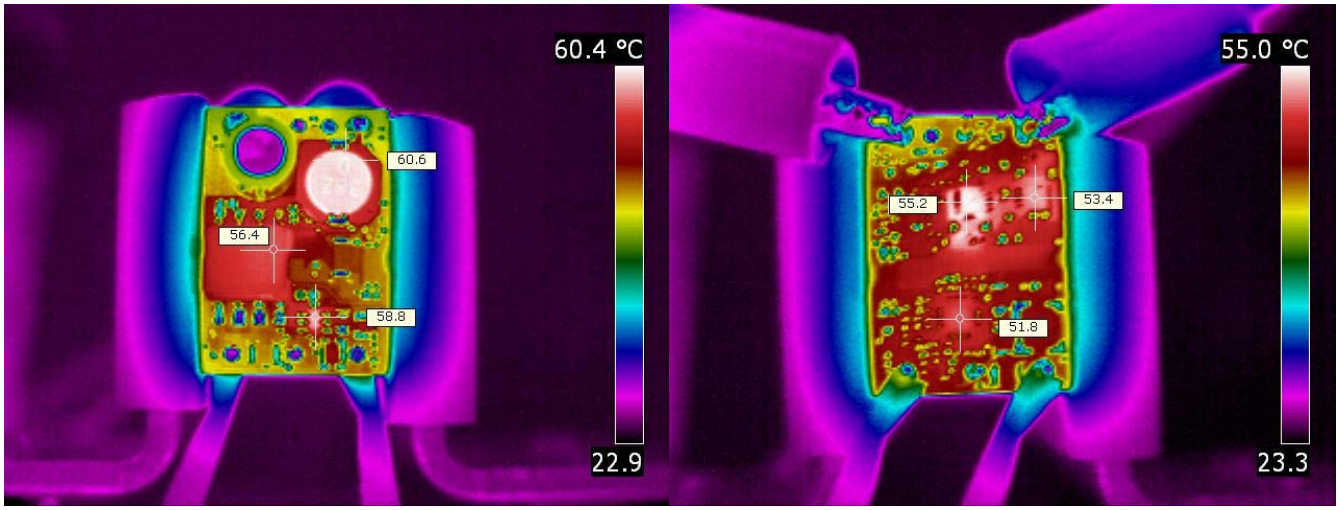
Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.000	2.490	36.0	0.012	0.00	0.432	0.0%
0.511	2.490	36.0	0.048	1.27	0.456	73.6%
1.001	2.489	36.0	0.083	2.49	0.497	83.4%
1.499	2.489	36.0	0.119	3.73	0.553	87.1%
2.007	2.489	36.0	0.158	5.00	0.693	87.8%
2.502	2.488	36.0	0.195	6.22	0.795	88.7%
2.995	2.488	36.0	0.233	7.45	0.936	88.8%
3.504	2.488	36.0	0.273	8.72	1.110	88.7%
3.998	2.488	36.0	0.311	9.95	1.249	88.8%
4.498	2.487	36.0	0.351	11.19	1.449	88.5%
4.997	2.487	36.0	0.392	12.43	1.684	88.1%

Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.000	2.490	48.0	0.011	0.00	0.528	0.0%
0.508	2.490	48.0	0.037	1.26	0.511	71.2%
1.016	2.489	48.0	0.064	2.53	0.543	82.3%
1.501	2.489	48.0	0.090	3.74	0.584	86.5%
1.998	2.489	48.0	0.119	4.97	0.739	87.1%
2.503	2.488	48.0	0.148	6.23	0.877	87.7%
3.004	2.488	48.0	0.176	7.47	0.974	88.5%
3.510	2.488	48.0	0.205	8.73	1.107	88.7%
4.005	2.488	48.0	0.234	9.96	1.268	88.7%
4.500	2.487	48.0	0.263	11.19	1.433	88.7%
5.002	2.487	48.0	0.293	12.44	1.624	88.5%

Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.000	2.491	72.0	0.009	0.00	0.648	0.0%
0.496	2.490	72.0	0.026	1.24	0.637	66.0%
1.001	2.490	72.0	0.044	2.49	0.676	78.7%
1.501	2.490	72.0	0.063	3.74	0.799	82.4%
1.999	2.489	72.0	0.082	4.98	0.928	84.3%
2.505	2.489	72.0	0.102	6.23	1.109	84.9%
2.998	2.488	72.0	0.120	7.46	1.181	86.3%
3.502	2.488	72.0	0.139	8.71	1.295	87.1%
4.005	2.488	72.0	0.159	9.96	1.484	87.0%
4.502	2.487	72.0	0.178	11.20	1.620	87.4%
4.999	2.487	72.0	0.198	12.43	1.823	87.2%

3 Thermal Images

The thermal images below show a top view (left) and bottom view (right) of the board. The ambient temperature was 25C with no forced air flow. The input was 48VDC, and the output was loaded with 5A.

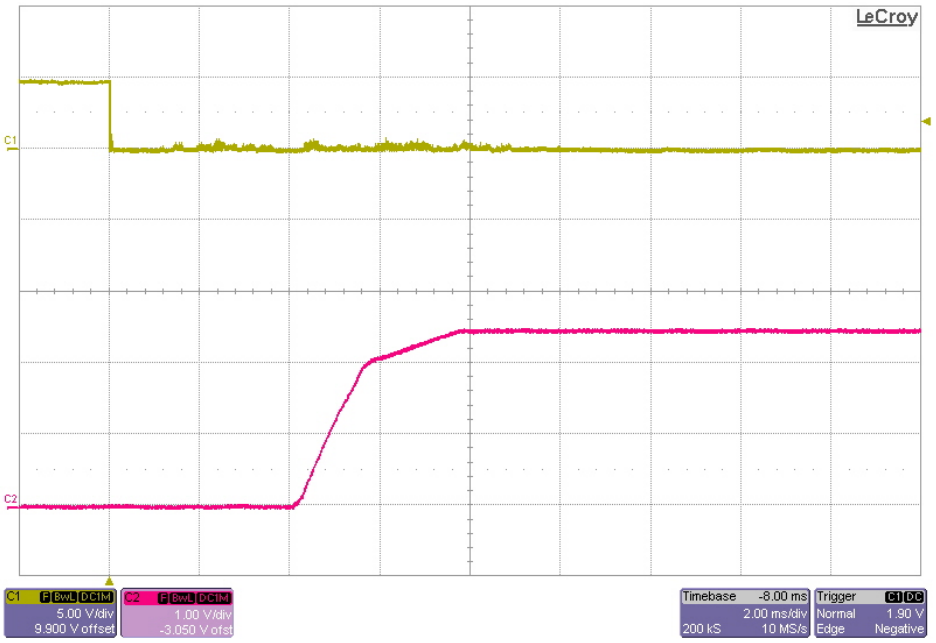


4 Startup

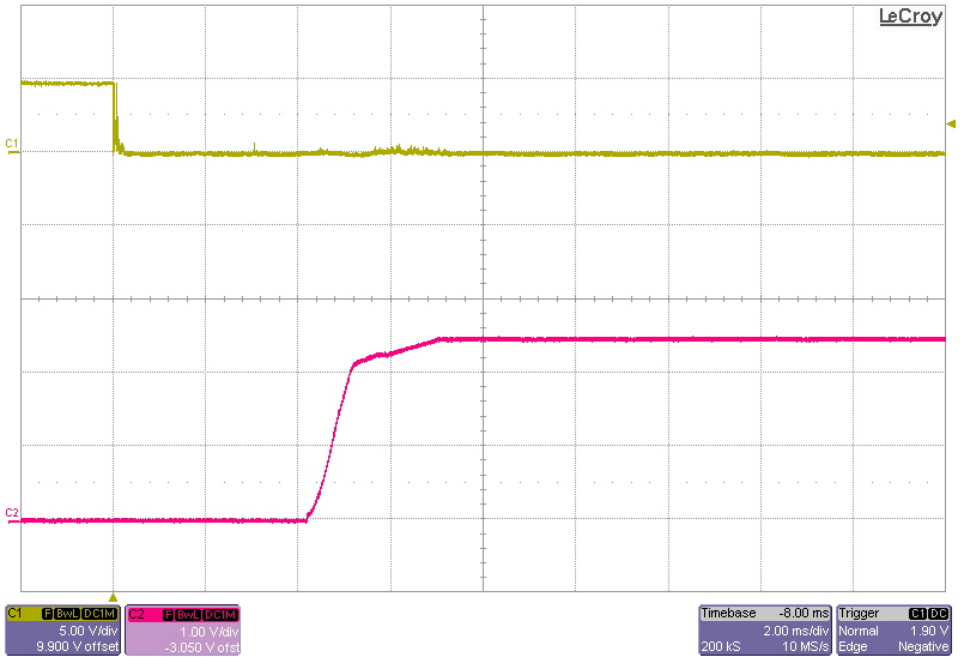
The output voltage at startup is shown in the images below. Channel 1 shows the Enable signal voltage. Channel 2 shows the output voltage.

4.1 No External Capacitance

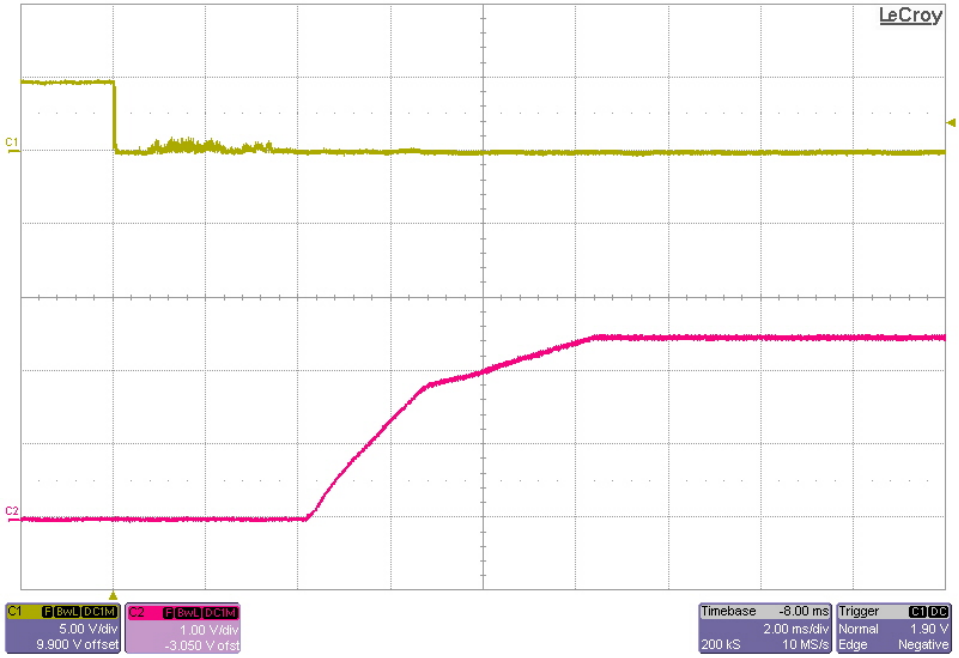
4.1.1 36V Input – No Load



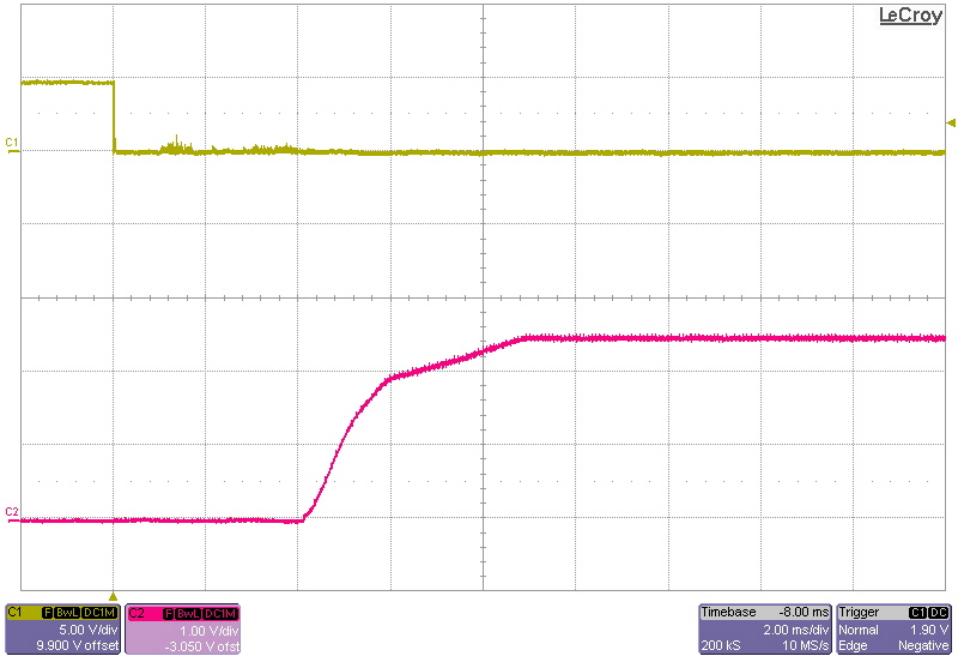
4.1.2 72V Input – No Load



4.1.3 36V Input – 5A Load

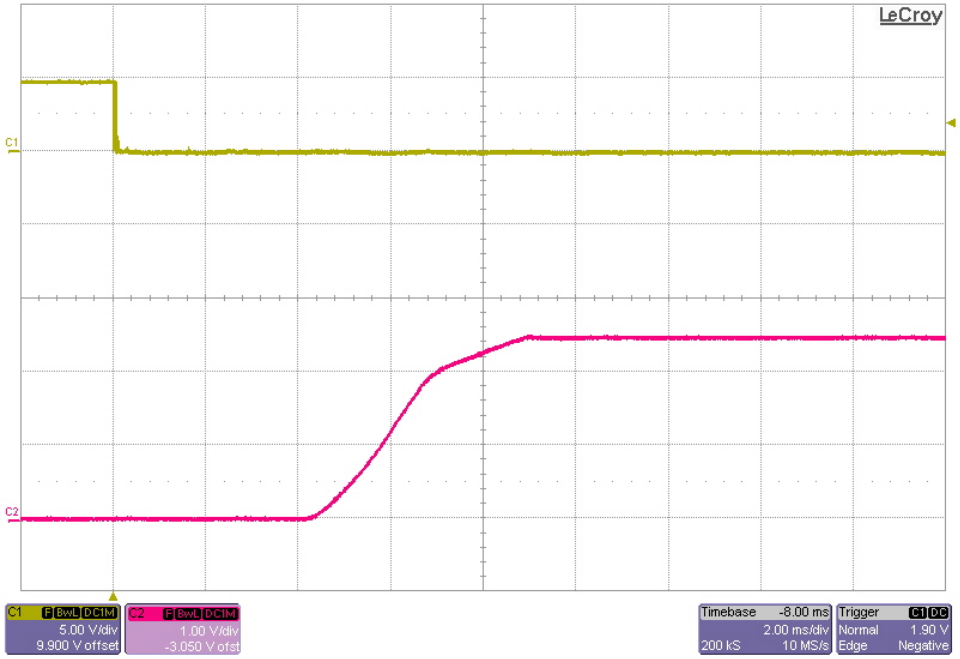


4.1.4 72V Input – 5A Load

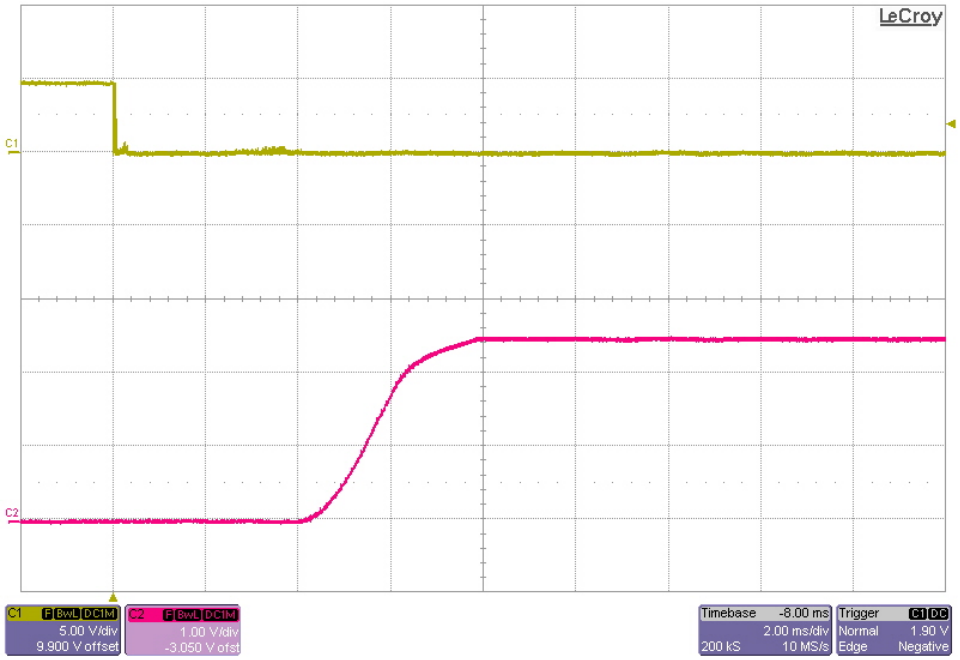


4.2 2700uF External Capacitance

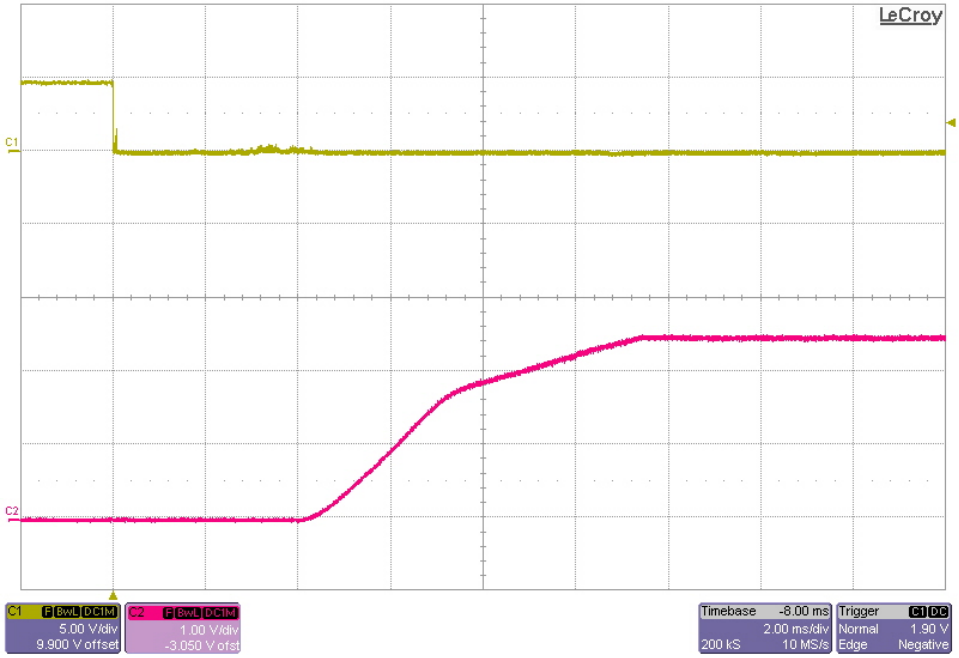
4.2.1 36V Input – 270uF External Capacitance – No Load



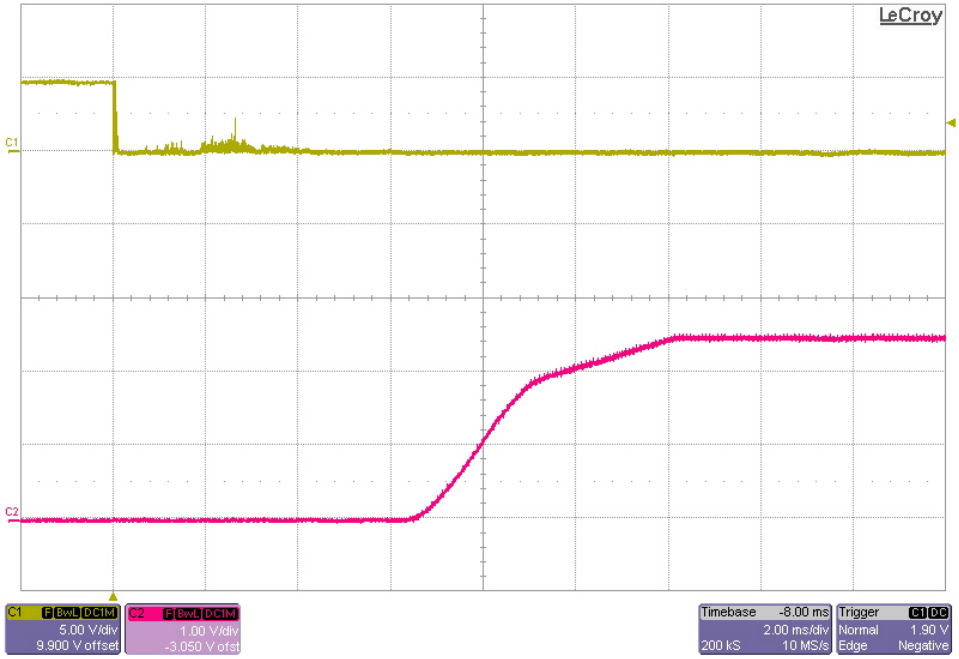
4.2.2 72V Input – 270uF External Capacitance – No Load



4.2.3 36V Input – 2700uF External Capacitance – 5A Load



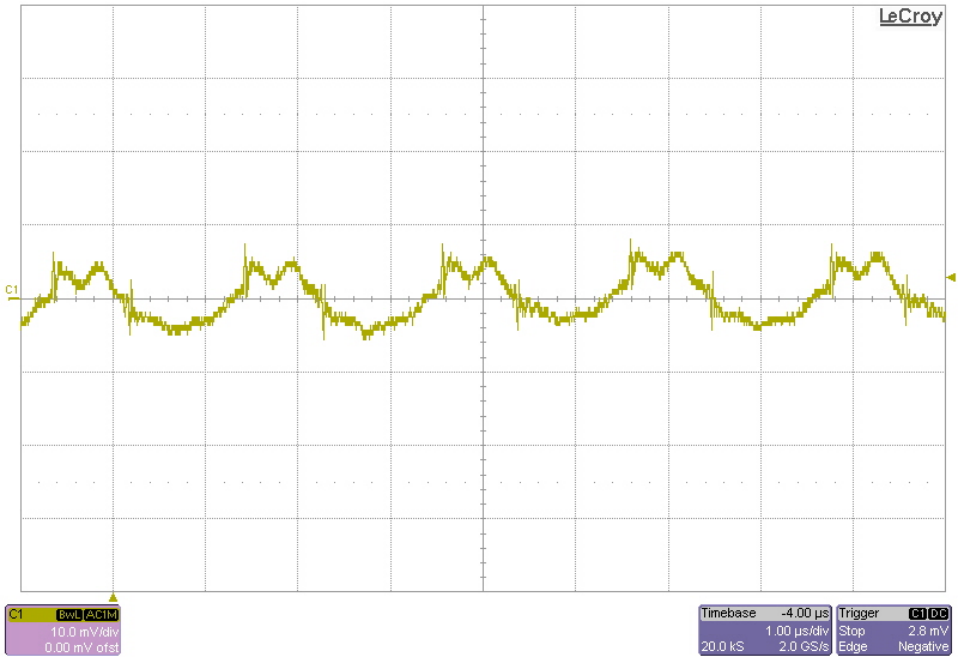
4.2.4 72V Input – 2700uF External Capacitance – 5A Load



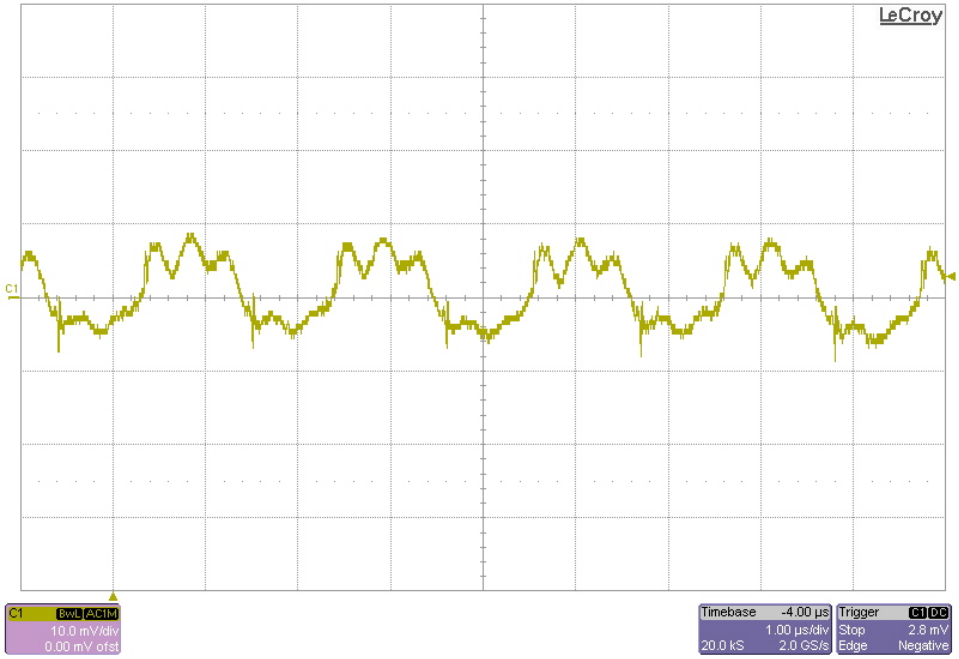
5 Output Ripple Voltage

The output ripple voltage is shown in the plots below. The output was loaded with 5.

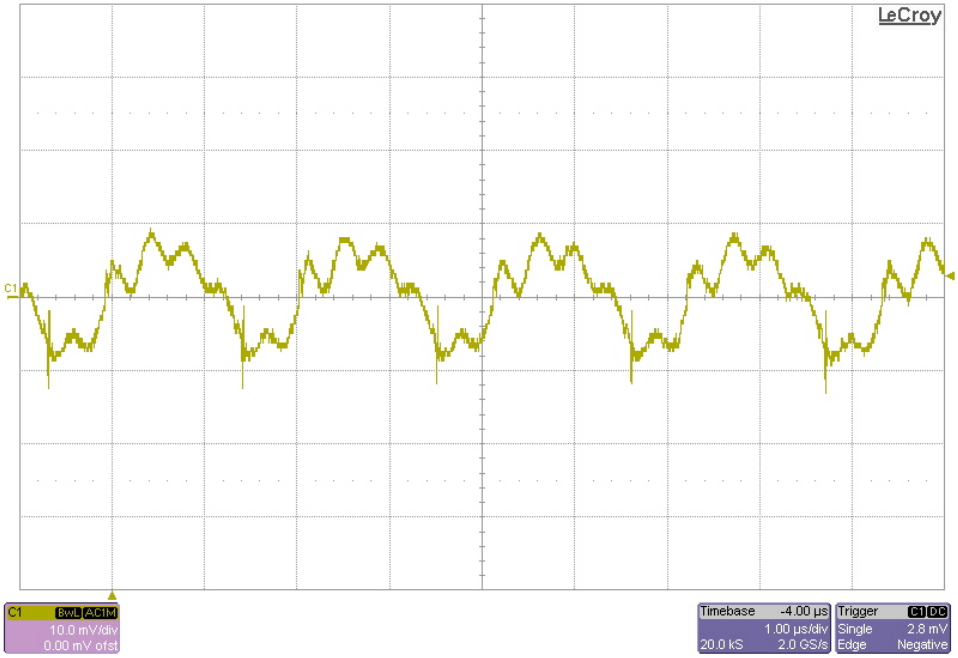
5.1 36V Input



5.2 48V Input



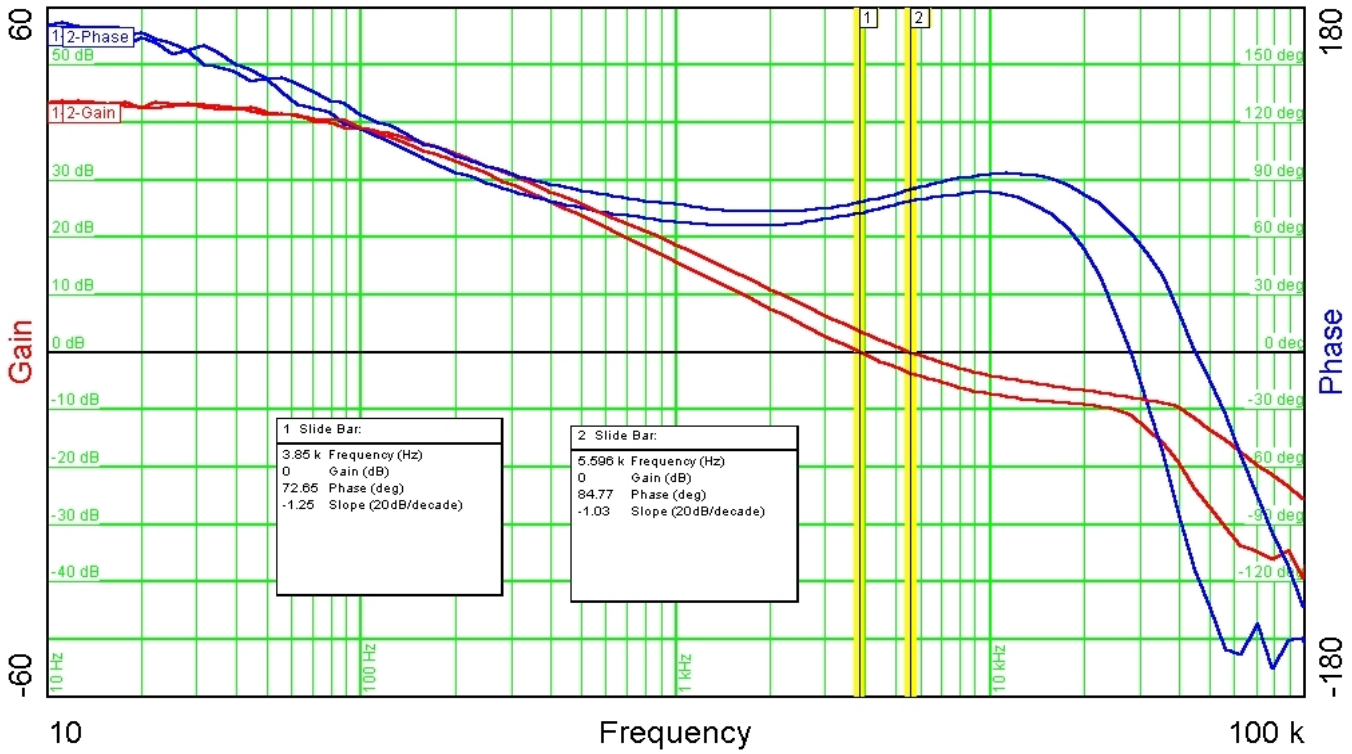
5.3 72V Input



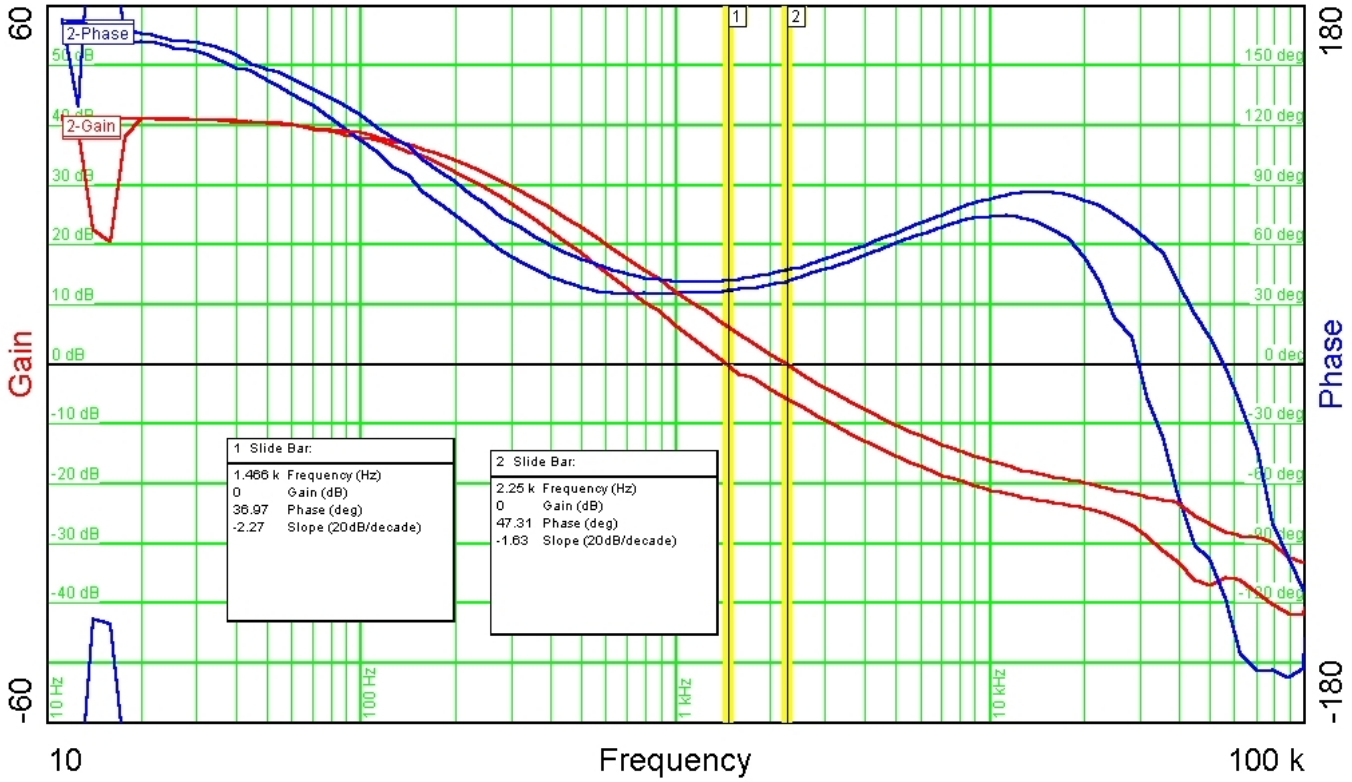
6 Frequency Response

The frequency response of the feedback loop is shown below. For the upper gain and phase plot, the input was set to 72V. For the lower gain and phase plot, the input was set to 36V. The output was loaded with 5A.

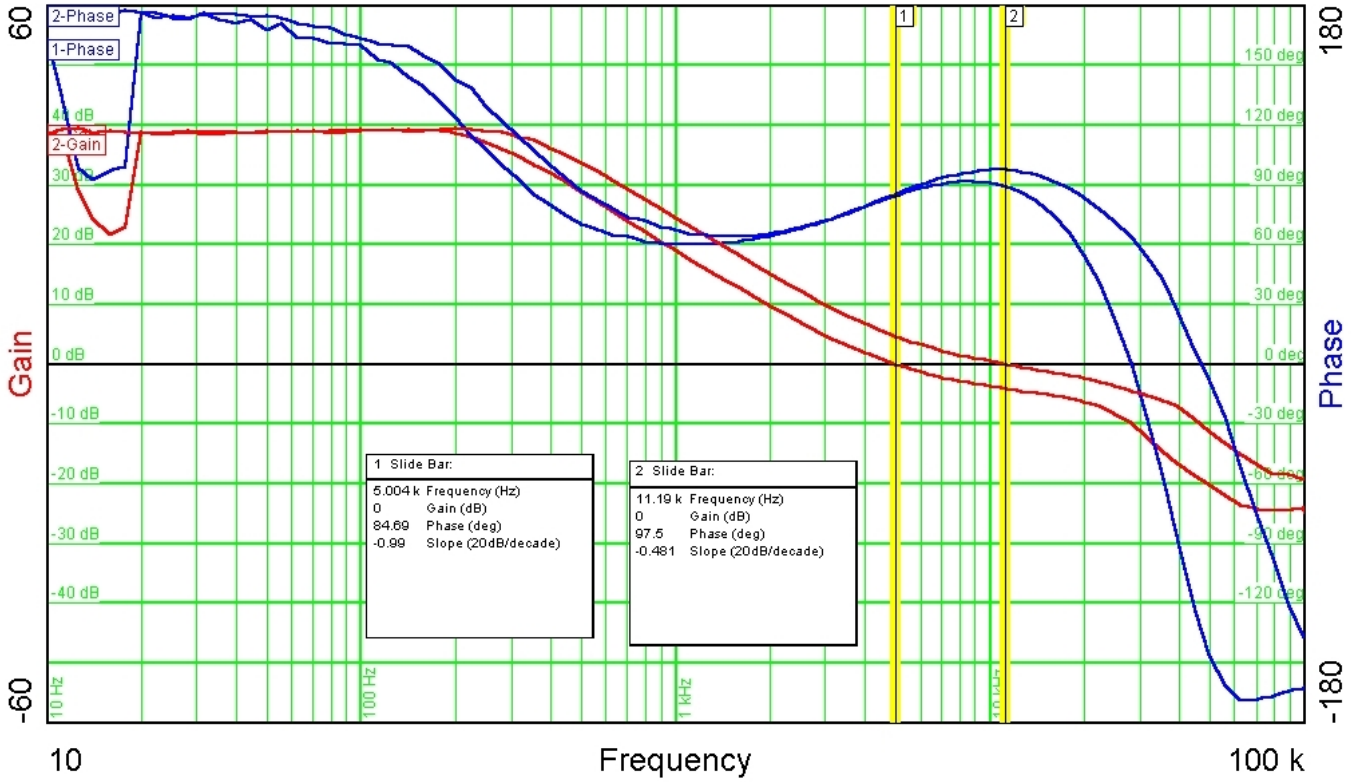
6.1 No External Capacitance, Loop Broken At R14



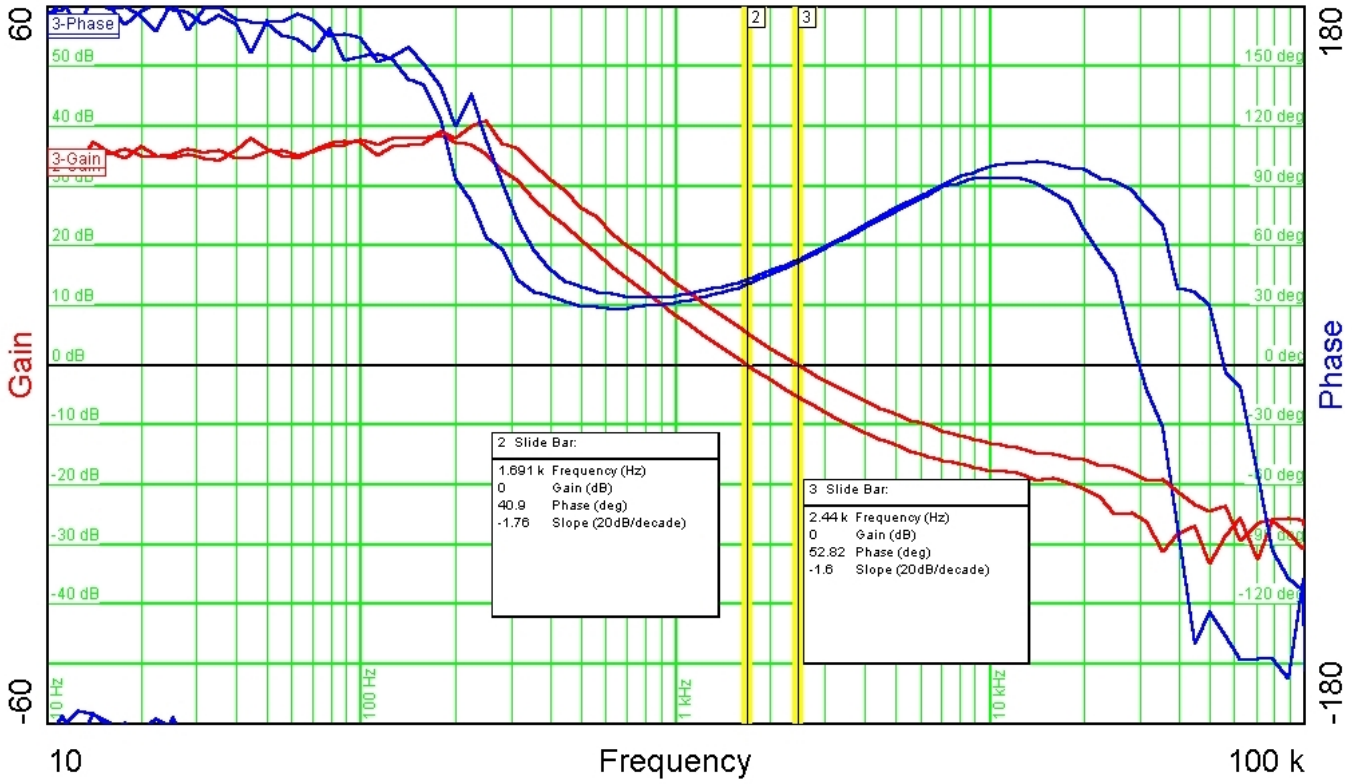
6.2 2700uF External Capacitance, Loop Broken At R14



6.3 No External Capacitance, Loop Broken At R26



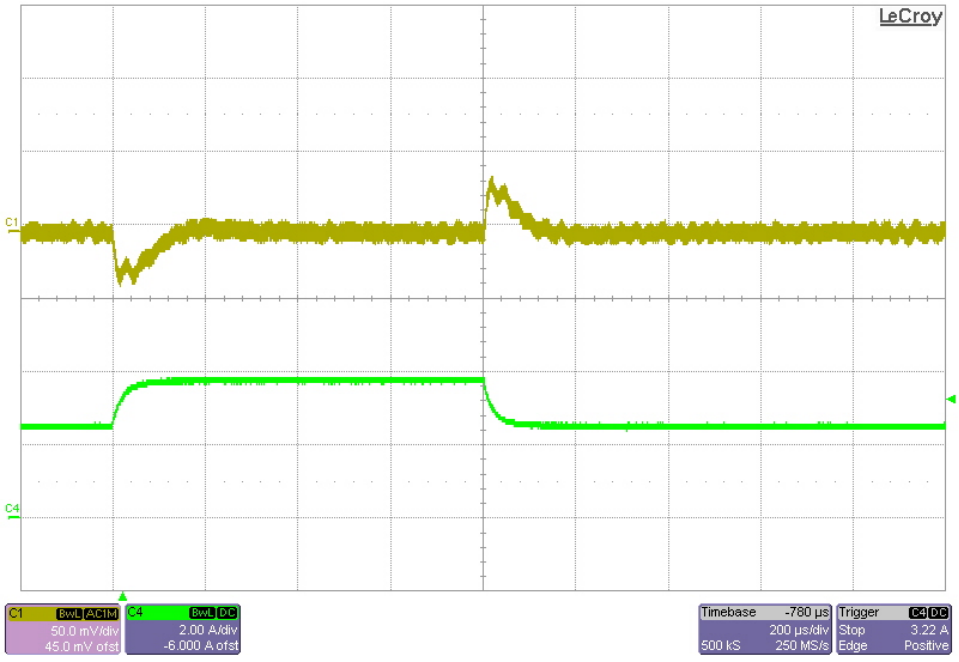
6.4 2700uF External Capacitance, Loop Broken At R26



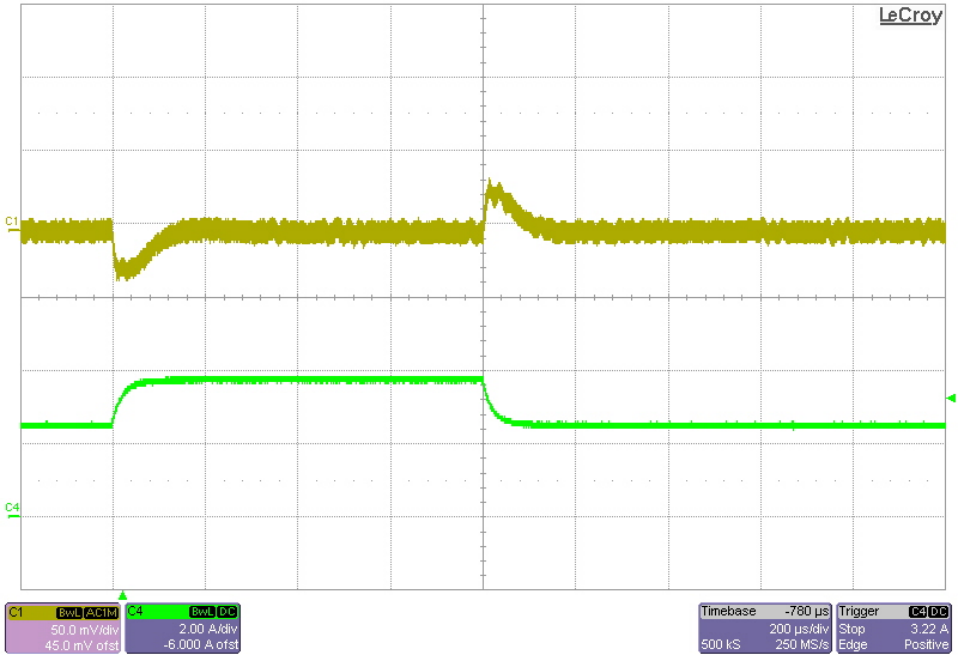
7 Load Transients

The response to a load step from 2.5A to 3.8A is shown in the images below. Channel 1: Vout 50mV/div (ac coupled); Channel 4: Iout 2A/div

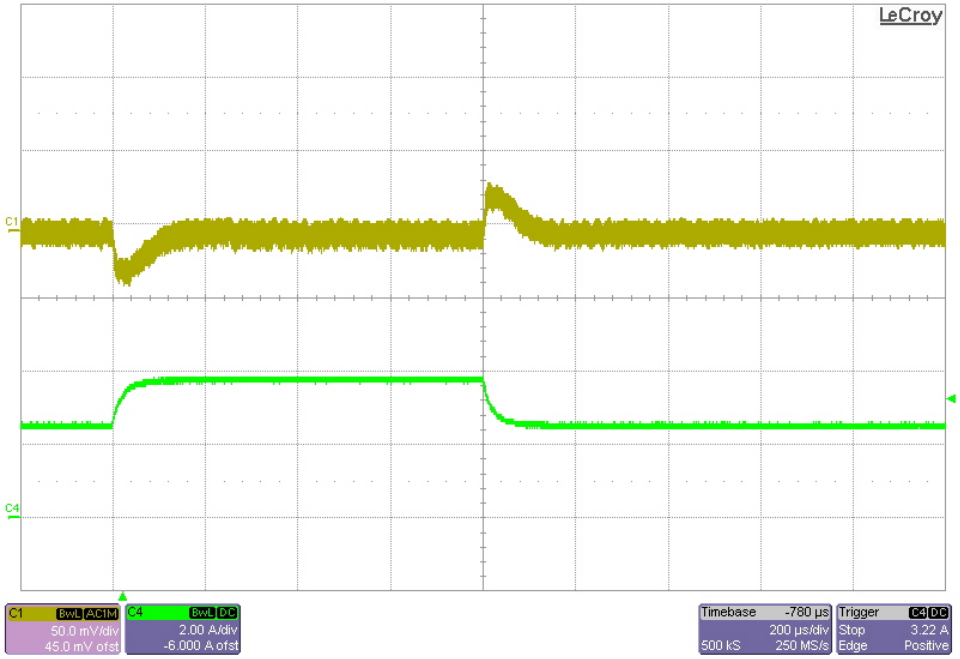
7.1 36V Input – No External Capacitance



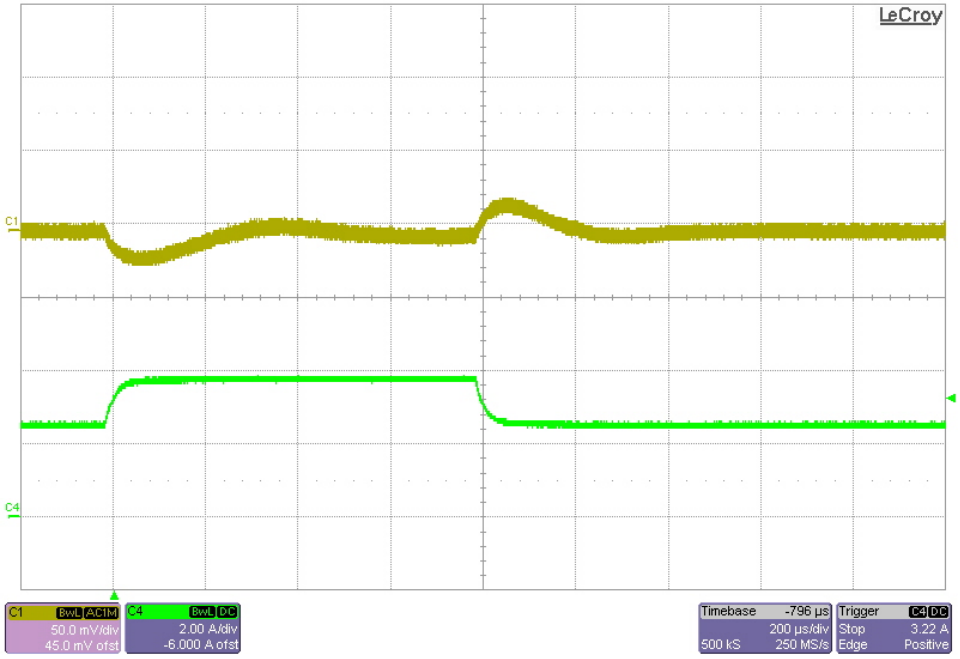
7.2 48V Input – No External Capacitance



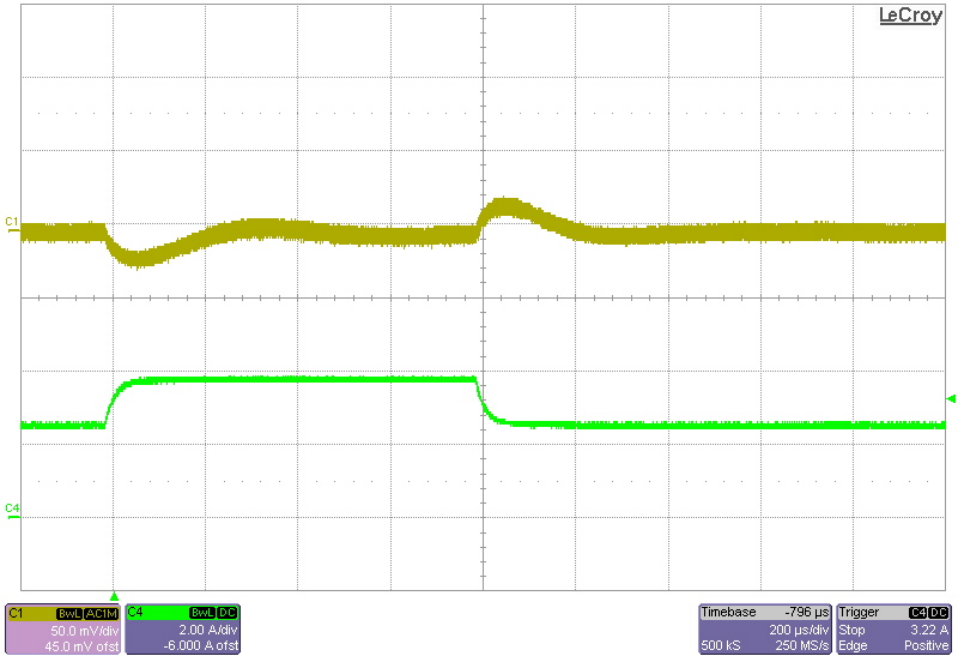
7.3 72V Input – No External Capacitance



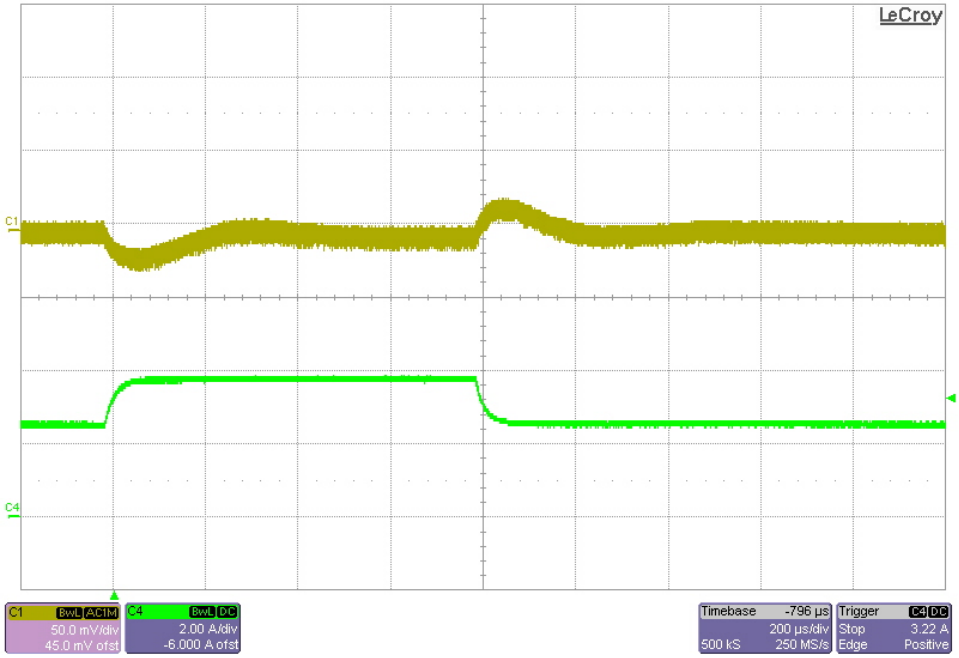
7.4 36V Input – 2700uF External Capacitance



7.5 48V Input – 2700uF External Capacitance



7.6 72V Input – 2700uF External Capacitance



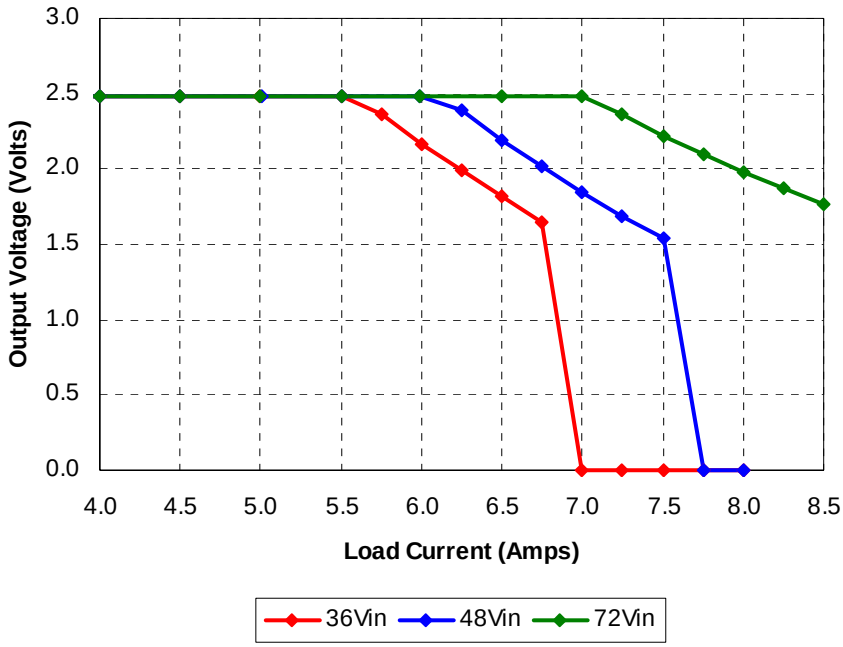
8 Input Under-Voltage Lock-Out

The turn-on and turn-off input voltages were measured and recorded below.

Turn-On	35.0 V
Turn-Off	33.4 V

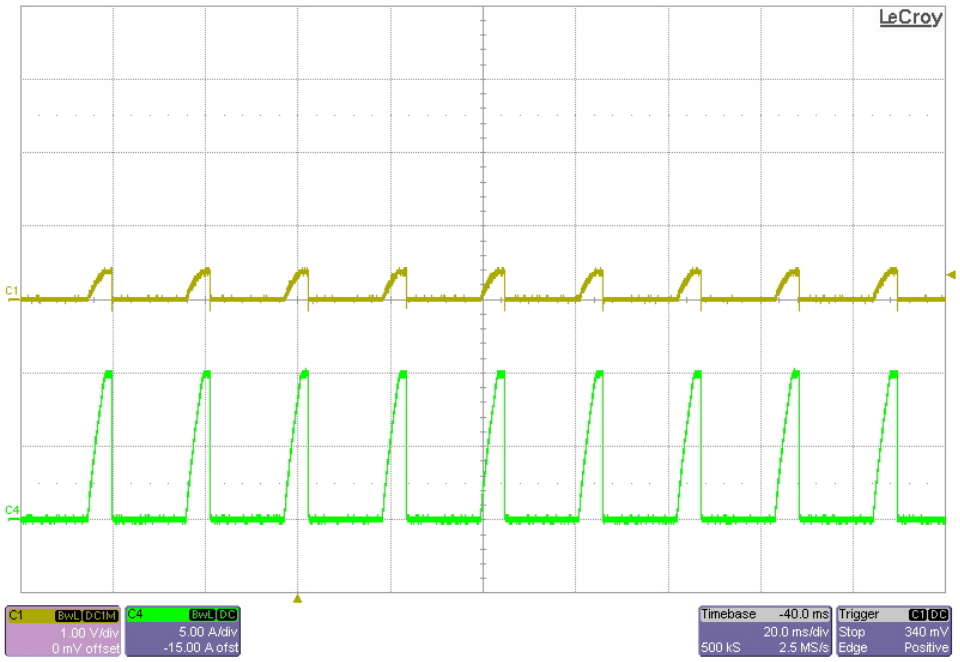
9 Current Limit

The output voltage versus load current in overload conditions is shown below.



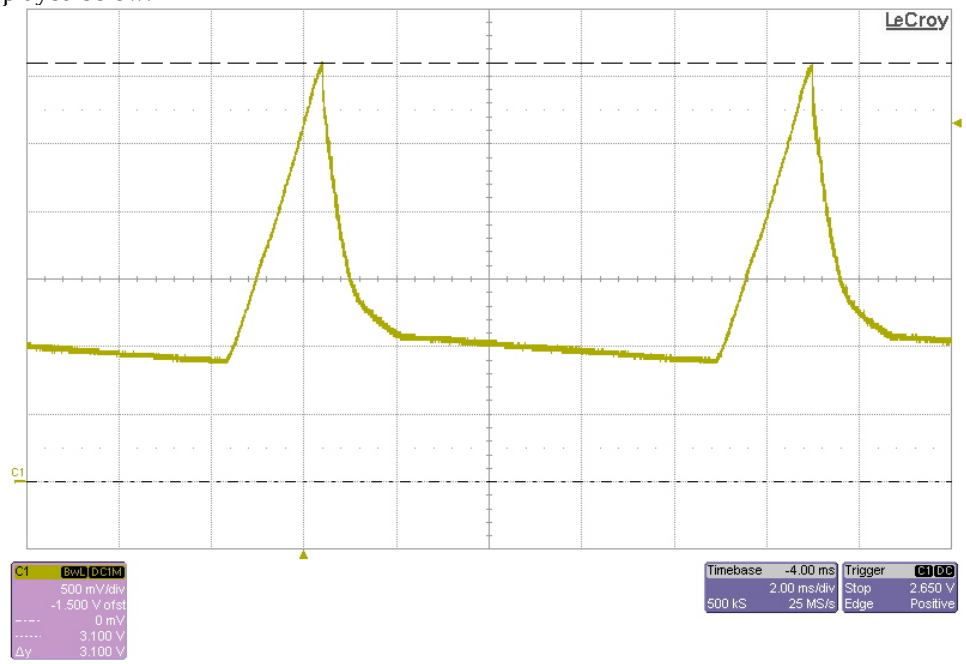
10 Output Short-Circuit

A short was applied to the output of the converter and the output voltage and input current waveforms were captured and displayed below.



11 Output Over-Voltage

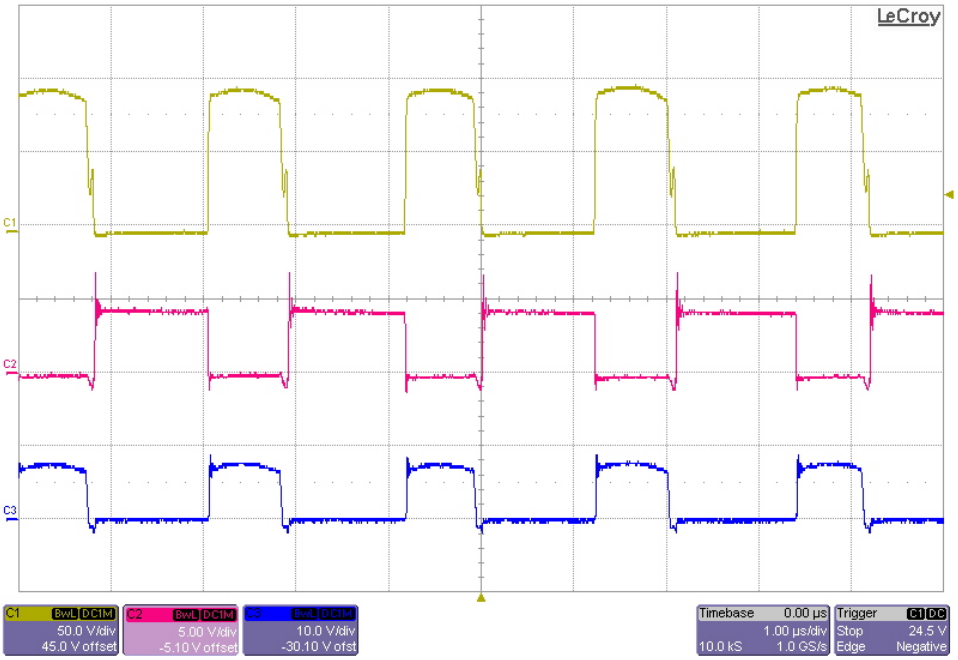
An output over-voltage was induced by shorting the +Remote Sense pin (J4) to ground. The output voltage waveform was captured and is displayed below.



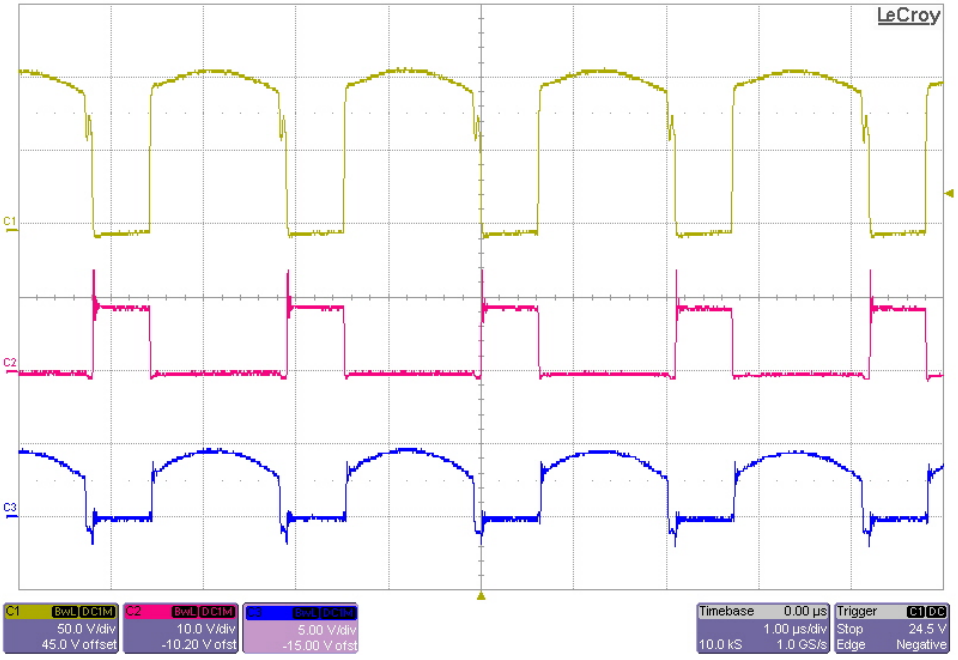
12 Switching Waveforms

The images below show the drain-to-source voltage waveforms on the switching MOSFETs. The output was loaded with 5A. Channel 1: Q4 Vds; Channel 2: Q7 Vds; Channel 3: Q3 Vds.

12.1 36V Input



12.2 72V Input



IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		**Applications**	
Audio	www.ti.com/audio	Communications and Telecom	www.ti.com/communications
Amplifiers	amplifier.ti.com	Computers and Peripherals	www.ti.com/computers
Data Converters	dataconverter.ti.com	Consumer Electronics	www.ti.com/consumer-apps
DLP® Products	www.dlp.com	Energy and Lighting	www.ti.com/energy
DSP	dsp.ti.com	Industrial	www.ti.com/industrial
Clocks and Timers	www.ti.com/clocks	Medical	www.ti.com/medical
Interface	interface.ti.com	Security	www.ti.com/security
Logic	logic.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Power Mgmt	power.ti.com	Transportation and Automotive	www.ti.com/automotive
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Mobile Processors	www.ti.com/omap		
Wireless Connectivity	www.ti.com/wirelessconnectivity		
	TI E2E Community Home Page		e2e.ti.com

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