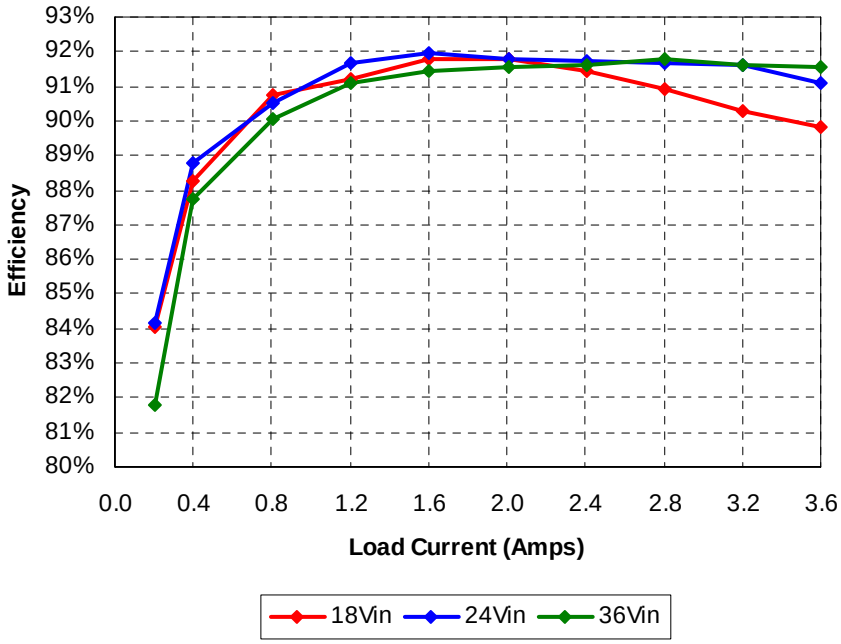
1 Photo

The photograph below shows the top view of the PMP6943 Rev A demo board. The circuit is built on a PMP4963 Rev C PWB.

2 Efficiency

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



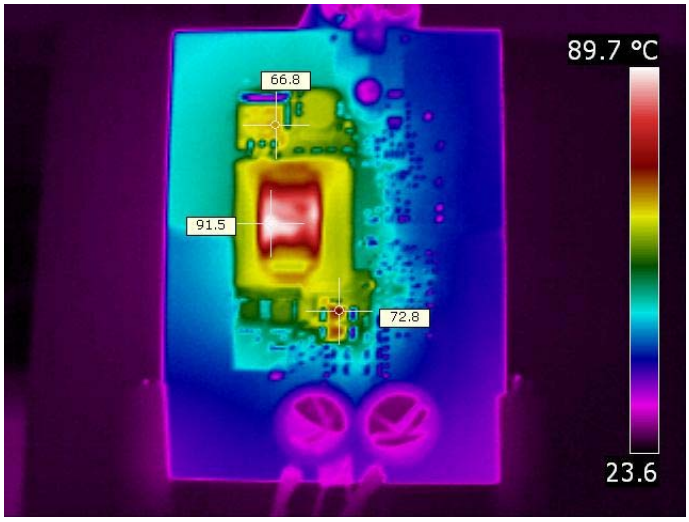
Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.000	27.19	18.0	0.018	0.00	0.324	0.0%
0.203	27.23	18.0	0.366	5.53	1.049	84.0%
0.402	27.23	18.0	0.689	10.95	1.456	88.3%
0.803	27.23	18.0	1.339	21.87	2.236	90.7%
1.202	27.23	18.0	1.993	32.73	3.144	91.2%
1.601	27.23	18.0	2.638	43.60	3.889	91.8%
2.004	27.23	18.0	3.302	54.57	4.867	91.8%
2.403	27.23	18.0	3.975	65.43	6.116	91.5%
2.803	27.24	18.0	4.665	76.35	7.616	90.9%
3.203	27.24	18.0	5.369	87.25	9.392	90.3%
3.603	27.25	18.0	6.074	98.18	11.150	89.8%
Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.000	27.21	24.0	0.017	0.00	0.408	0.0%
0.203	27.26	24.0	0.274	5.53	1.042	84.2%
0.402	27.25	24.0	0.514	10.95	1.382	88.8%
0.803	27.25	24.0	1.007	21.88	2.286	90.5%
1.202	27.25	24.0	1.489	32.75	2.982	91.7%
1.601	27.25	24.0	1.977	43.63	3.821	91.9%
2.004	27.25	24.0	2.479	54.61	4.887	91.8%
2.403	27.25	24.0	2.975	65.48	5.918	91.7%
2.803	27.25	24.0	3.471	76.38	6.922	91.7%
3.203	27.25	24.0	3.970	87.28	7.998	91.6%
3.603	27.26	24.0	4.492	98.22	9.590	91.1%
Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.000	27.21	36.0	0.014	0.00	0.504	0.0%
0.203	27.26	36.0	0.188	5.53	1.234	81.8%
0.402	27.26	36.0	0.347	10.96	1.533	87.7%
0.803	27.26	36.0	0.675	21.89	2.410	90.1%
1.202	27.25	36.0	0.999	32.75	3.210	91.1%
1.601	27.25	36.0	1.325	43.63	4.073	91.5%
2.004	27.25	36.0	1.657	54.61	5.043	91.5%
2.403	27.25	36.0	1.985	65.48	5.978	91.6%
2.803	27.25	36.0	2.311	76.38	6.814	91.8%
3.203	27.25	36.0	2.646	87.28	7.974	91.6%
3.603	27.26	36.0	2.979	98.22	9.026	91.6%

3 Thermal Images

The thermal images below show a top view of the board, with an ambient temperature of 25C, with no forced air flow. The output was loaded with 2.5A. Sustained loads over 2.5A require forced air cooling.

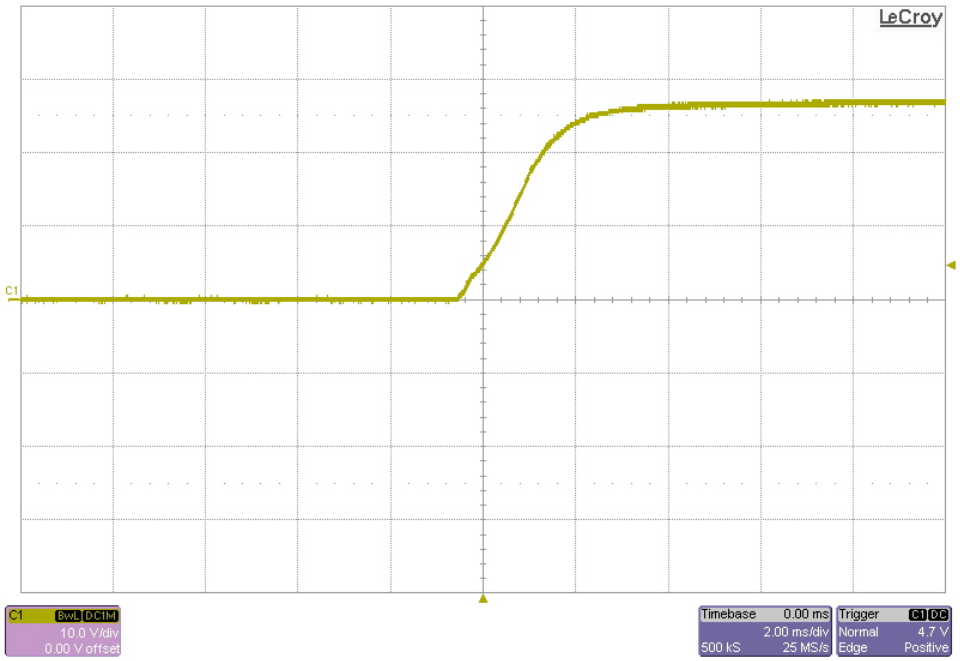
3.1 18V Input

3.2 36V Input

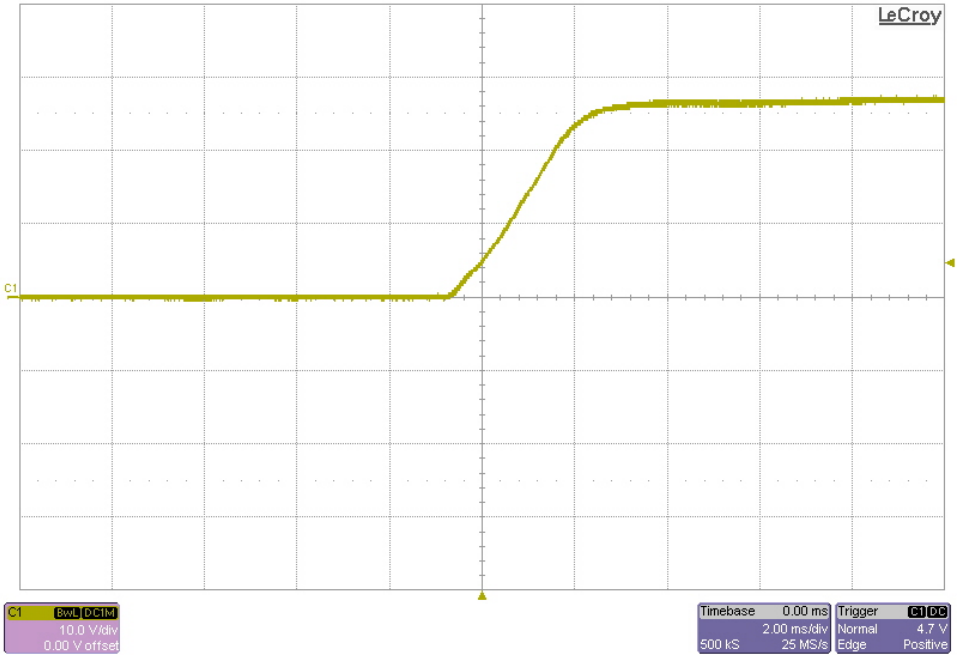


4 Startup

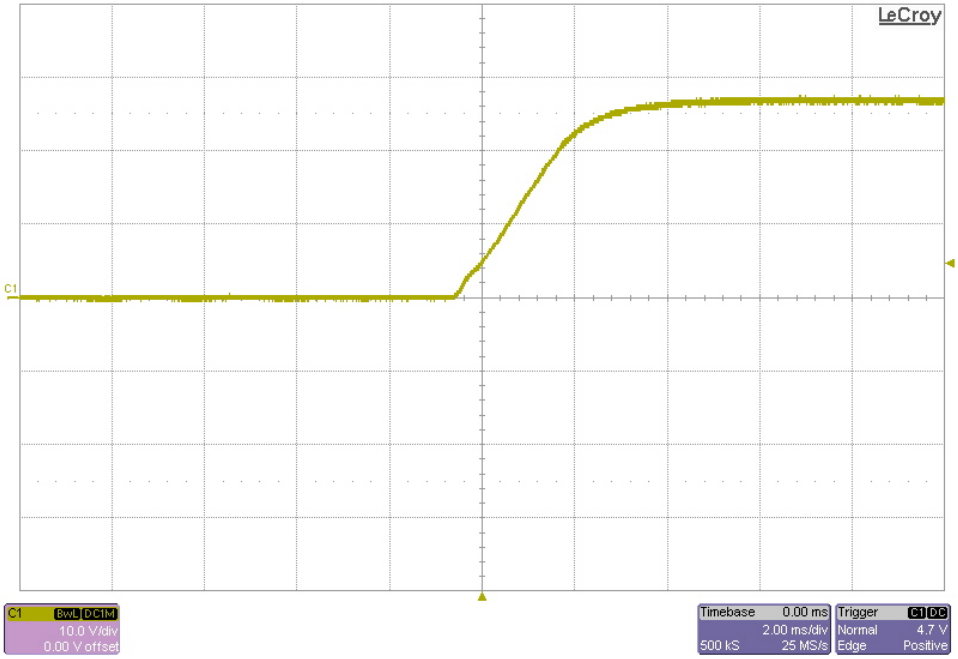
4.1 18V Input – No Load



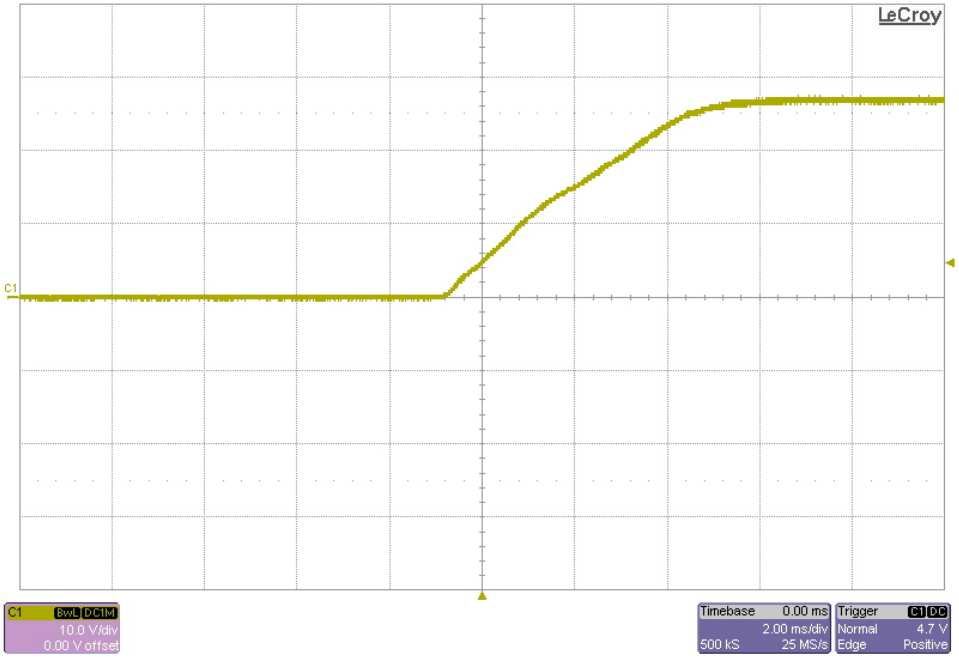
4.2 36V Input – No Load



4.3 18V Input – 3.6A Load



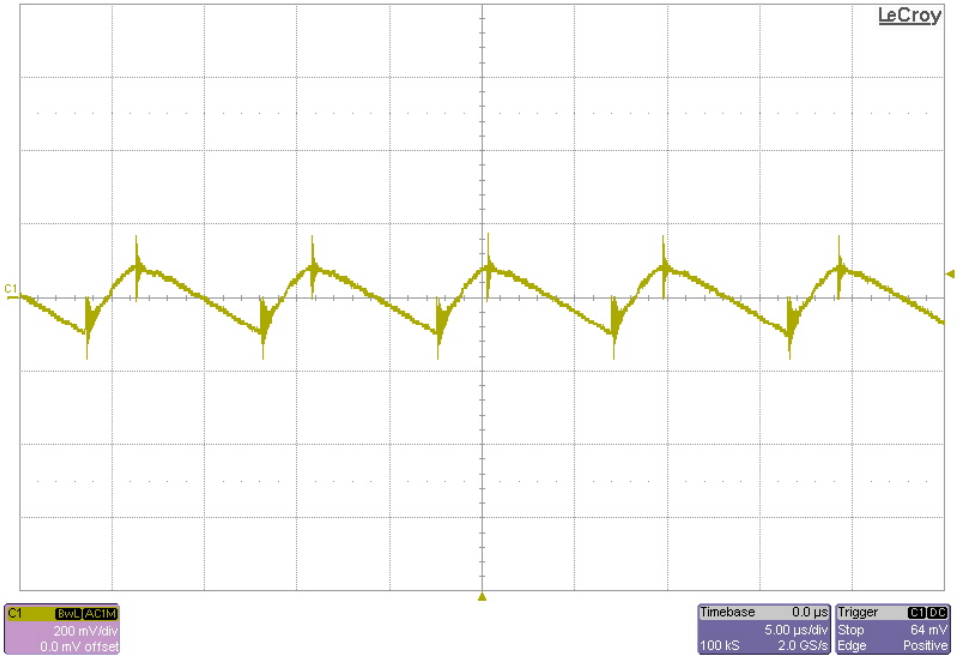
4.4 36V Input – 3.6A Load



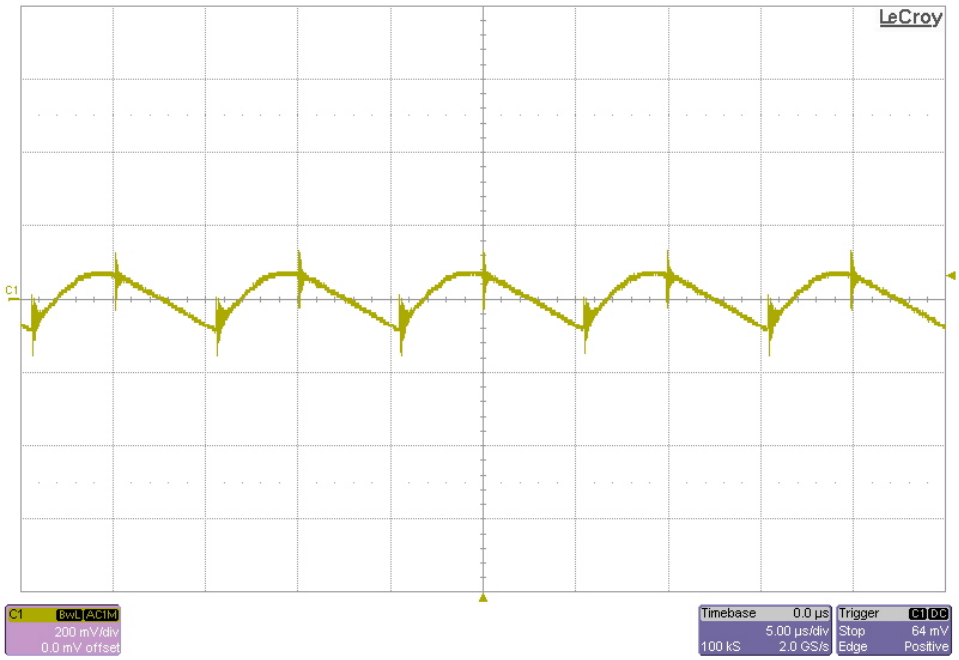
5 Output Ripple Voltage

The output ripple voltage is shown in the plots below. The output was loaded with 3.6A.

5.1 18V Input

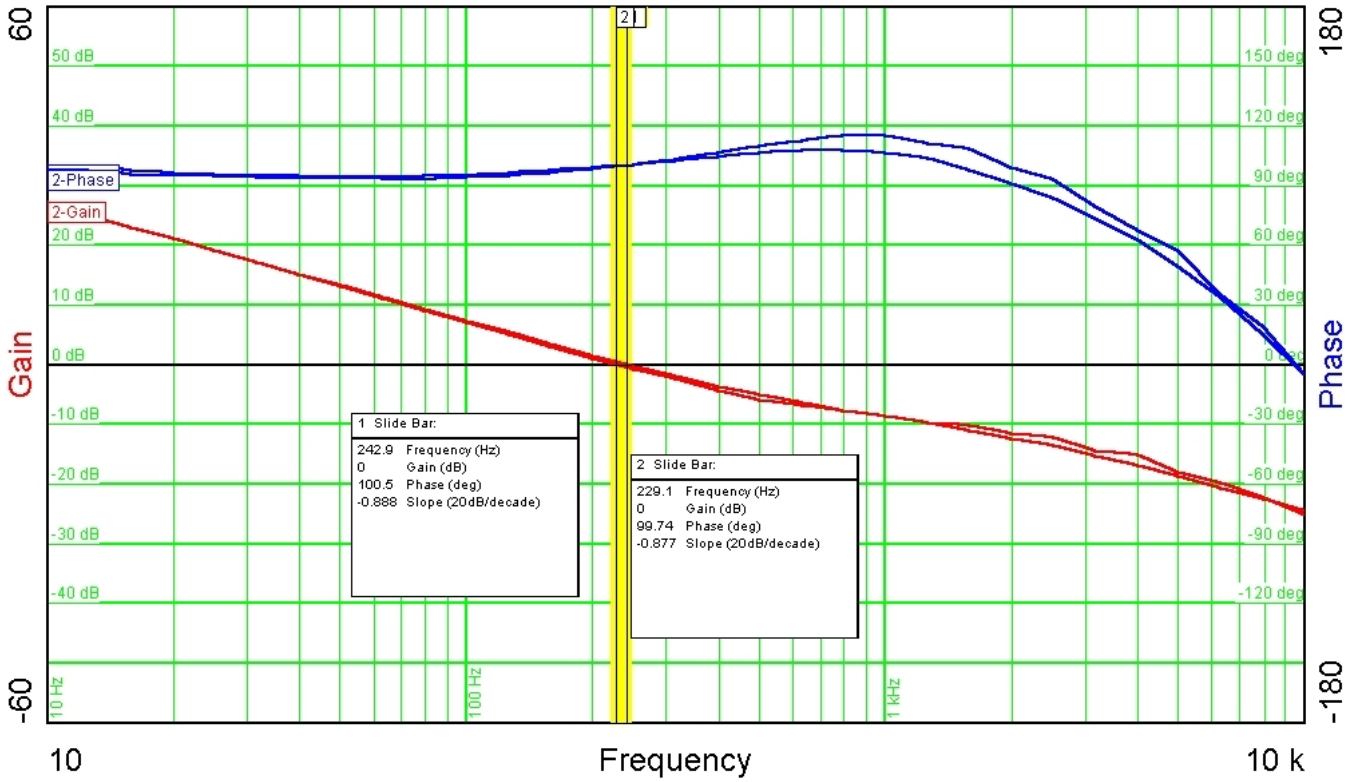


5.2 36V Input



6 Frequency Response

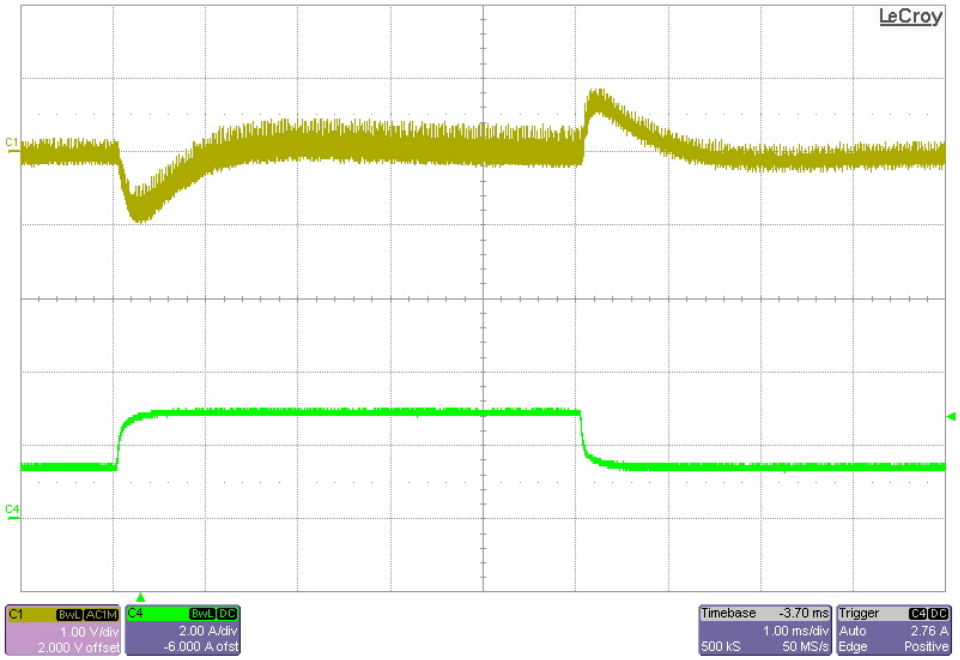
The frequency response of the feedback loop is shown below. For the gain/phase plot #1, the input was set to 18V. For the gain/phase plot #2, the input was set to 36V. The output was loaded with 3.6A.



7 Load Transients

The response to a load step from 1.5A to 3A is shown in the images below. Channel 1: Vout (ac coupled); Channel 4: Iout.

7.1 18V Input



7.2 24V Input

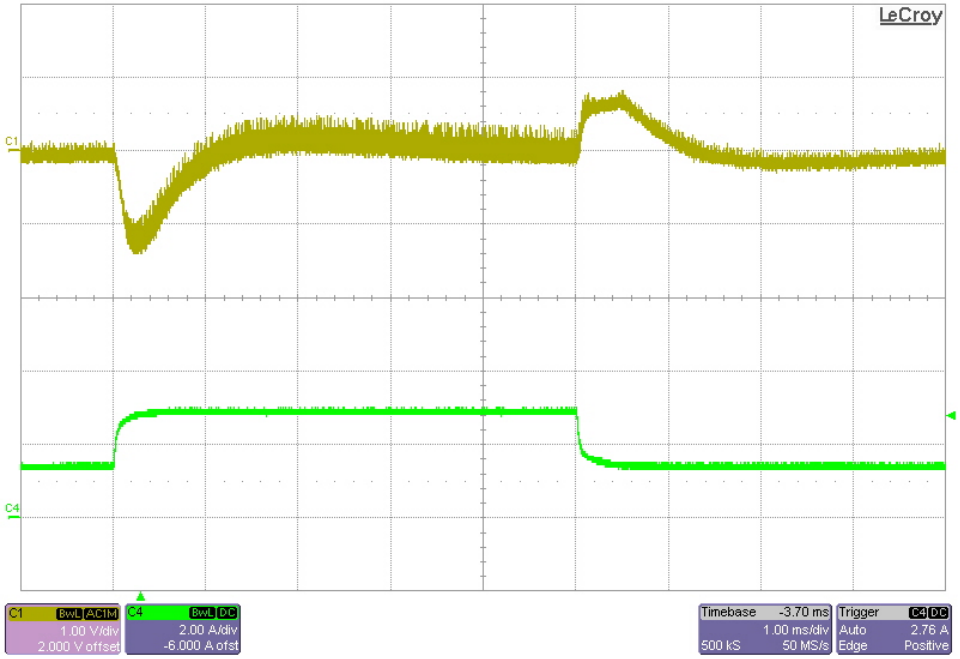
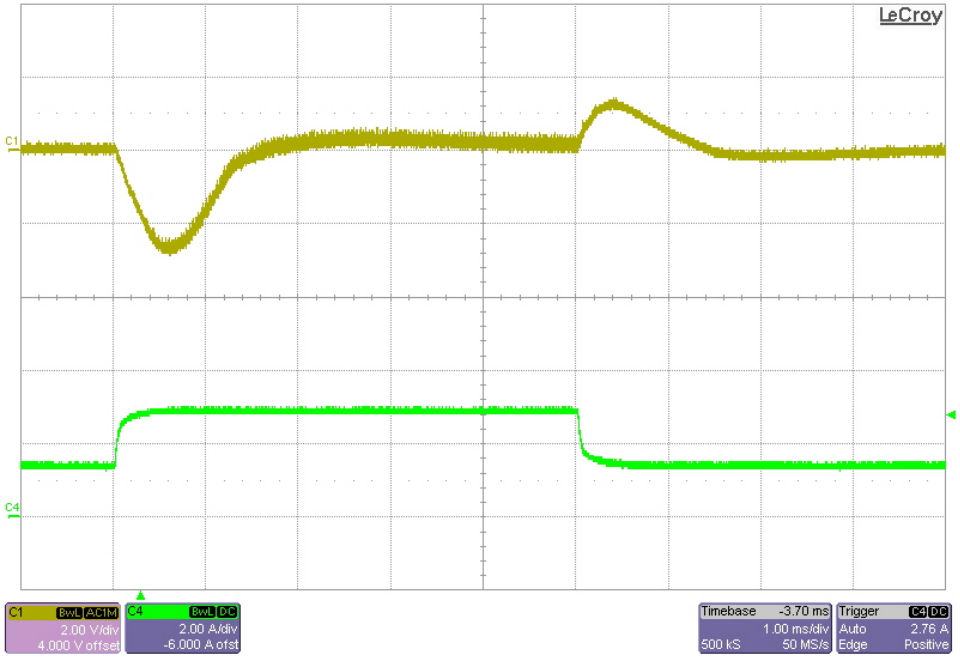


Figure 1

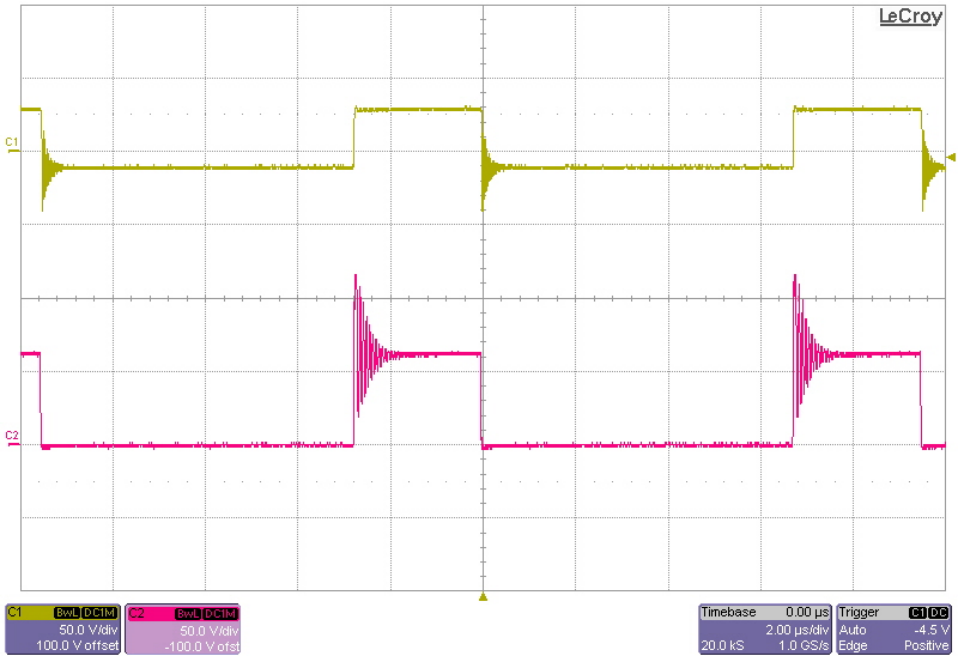
7.3 36V Input



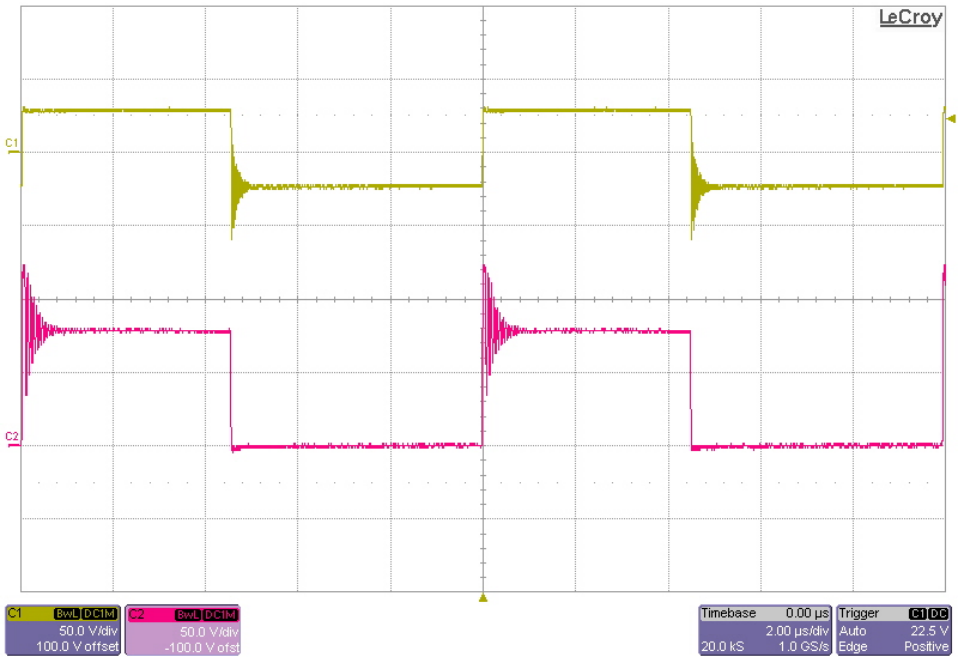
8 Switching Waveforms

The images below show the drain-to-source voltage waveforms on the switching MOSFETs. The output was loaded with 3.6A. Channel 1: D3 anode; Channel 2: Q1 & Q2 Vds.

8.1 18V Input



8.2 36V Input


LeCroy
C1
C2
C1 BwL DC1M
50.0 V/div
100.0 V offset
C2 BwL DC1M
50.0 V/div
-100.0 V ofst
Timebase 0.00 µs
2.00 µs/div
20.0 kS 1.0 GS/s
Trigger C1 DC
Auto 22.5 V
Edge Positive

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