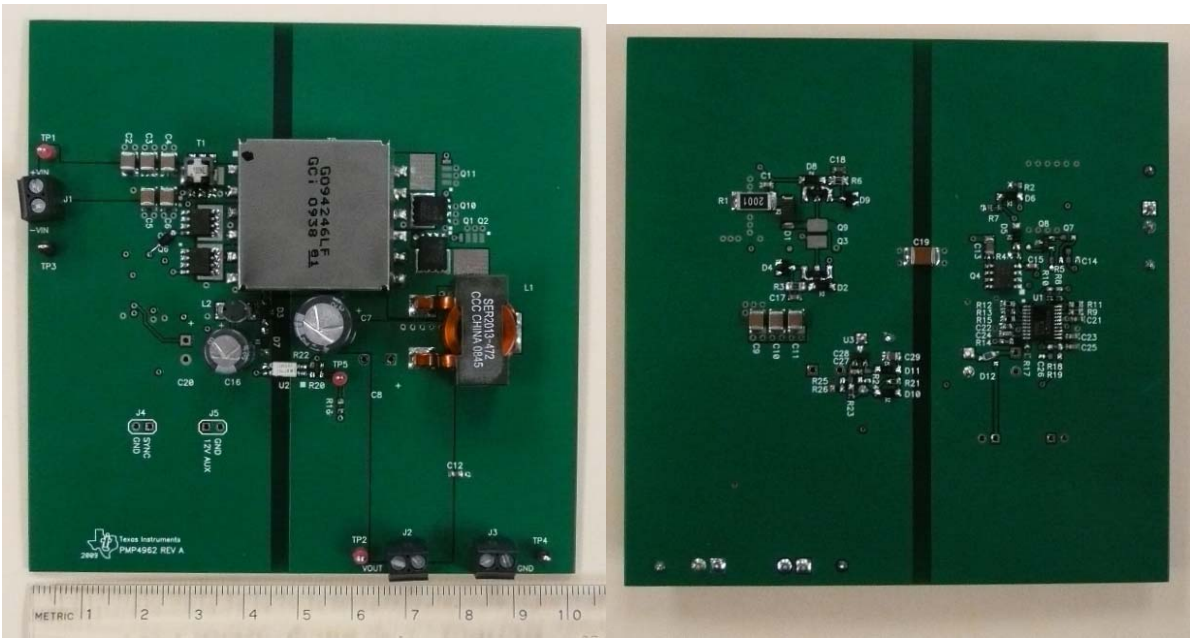
PMP5117 Rev B Test Results

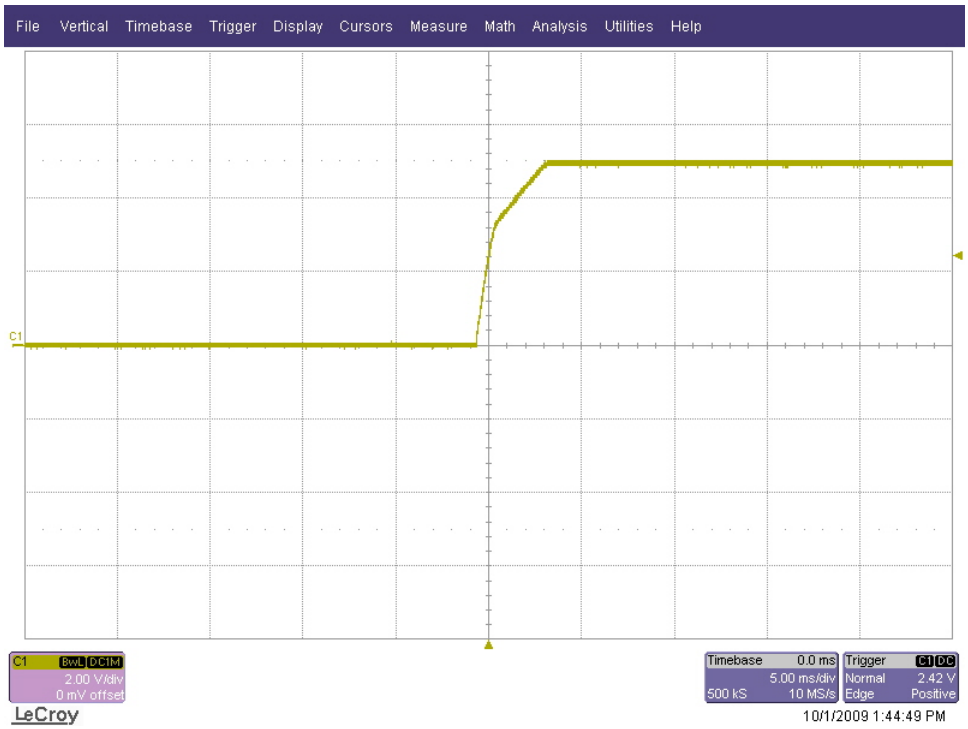
1 Photo

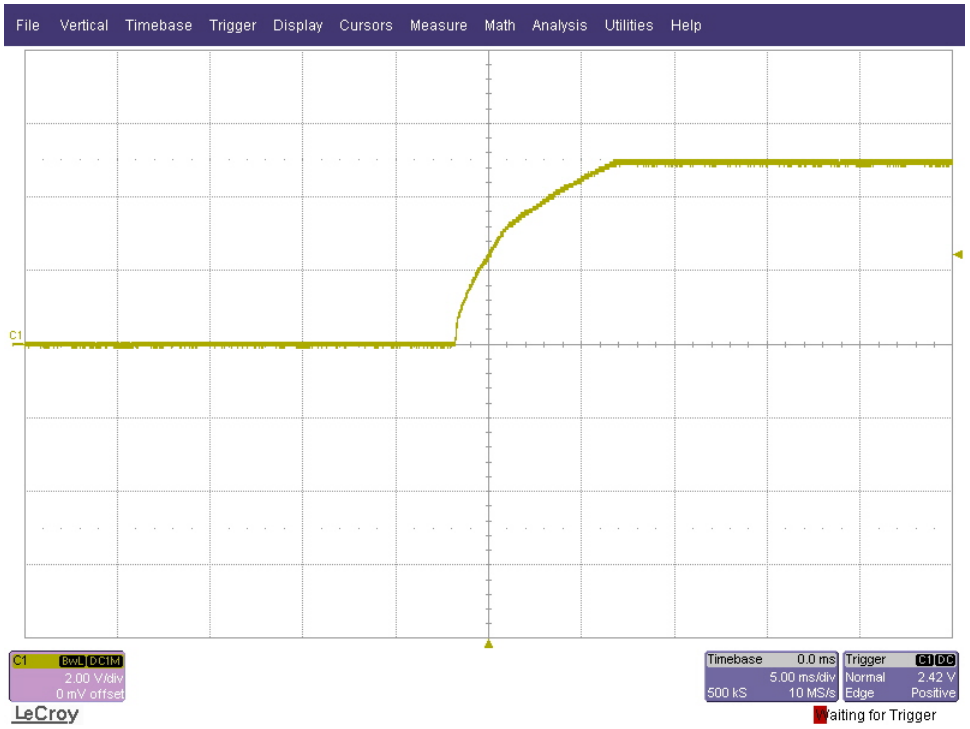
The photographs below show a top and bottom view of the PMP5117 Rev B demo board. The circuit is built on a PMP4962 Rev A PWB.



2 Startup

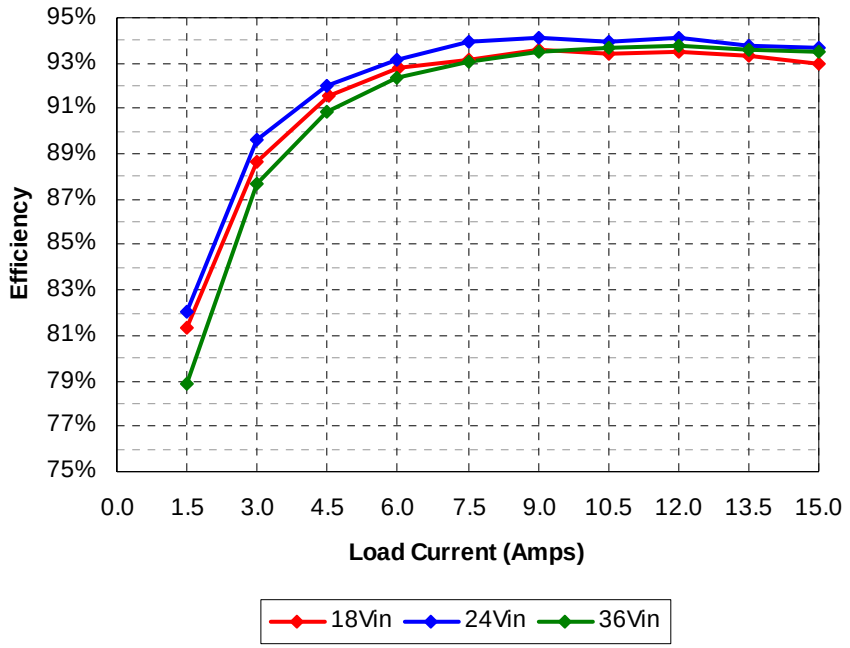
The output voltage at startup is shown in the images below. The input was 24VDC. For the top image the output was unloaded. For the bottom image, the output was loaded with 15A.





3 Efficiency

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



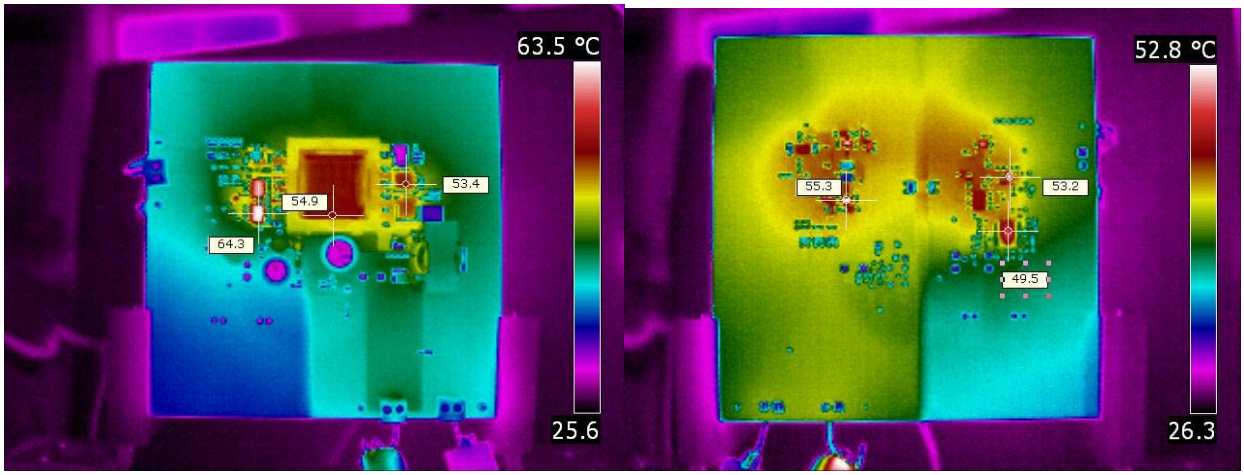
Vin	Iin	Iout	Vout	Pout	Losses	Efficiency
18.0	0.100	0.000	5.00	0.00	1.800	0.0%
18.0	0.515	1.508	5.00	7.54	1.730	81.3%
18.0	0.941	3.004	5.00	15.02	1.918	88.7%
18.0	1.371	4.518	5.00	22.59	2.088	91.5%
18.0	1.801	6.014	5.00	30.07	2.348	92.8%
18.0	2.237	7.50	5.00	37.50	2.766	93.1%
18.0	2.671	9.00	5.00	45.00	3.078	93.6%
18.0	3.123	10.50	5.00	52.50	3.714	93.4%
18.0	3.563	11.99	5.00	59.95	4.184	93.5%
18.0	4.016	13.49	5.00	67.45	4.838	93.3%
18.0	4.48	15.00	5.00	75.00	5.640	93.0%

Vin	Iin	Iout	Vout	Pout	Losses	Efficiency
24.0	0.069	0.000	5.00	0.00	1.656	0.0%
24.0	0.380	1.496	5.00	7.48	1.640	82.0%
24.0	0.698	3.003	5.00	15.02	1.737	89.6%
24.0	1.019	4.499	5.00	22.50	1.961	92.0%
24.0	1.343	6.004	5.00	30.02	2.212	93.1%
24.0	1.665	7.51	5.00	37.55	2.410	94.0%
24.0	1.993	9.00	5.00	45.00	2.832	94.1%
24.0	2.328	10.50	5.00	52.50	3.372	94.0%
24.0	2.656	12.00	5.00	60.00	3.744	94.1%
24.0	2.996	13.49	5.00	67.45	4.454	93.8%
24.0	3.333	14.99	5.00	74.95	5.042	93.7%

Vin	Iin	Iout	Vout	Pout	Losses	Efficiency
36.0	0.056	0.000	5.01	0.00	2.016	0.0%
36.0	0.264	1.499	5.00	7.50	2.009	78.9%
36.0	0.475	2.999	5.00	15.00	2.105	87.7%
36.0	0.688	4.502	5.00	22.51	2.258	90.9%
36.0	0.903	6.003	5.00	30.02	2.493	92.3%
36.0	1.119	7.50	5.00	37.50	2.784	93.1%
36.0	1.337	9.00	5.00	45.00	3.132	93.5%
36.0	1.557	10.50	5.00	52.50	3.552	93.7%
36.0	1.778	12.00	5.00	60.00	4.008	93.7%
36.0	2.002	13.49	5.00	67.45	4.622	93.6%
36.0	2.228	15.00	5.00	75.00	5.208	93.5%

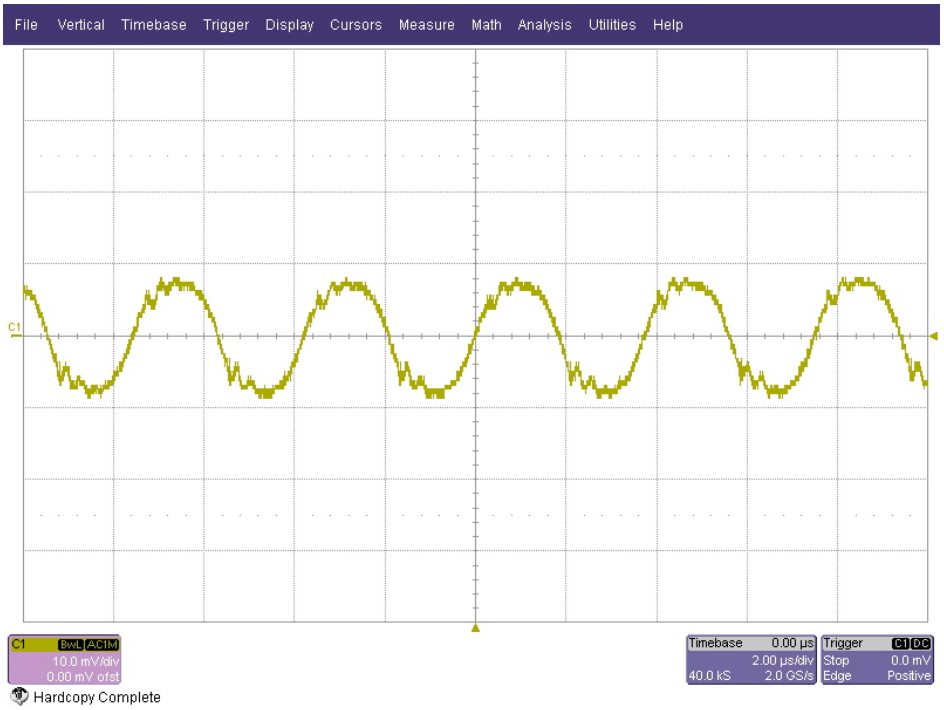
4 Thermal Images

The thermal images below show a top view (left) and bottom view (right) of the board. The ambient temperature was 26ºC with no forced air flow. The output was load with 15A. The input was 24V.



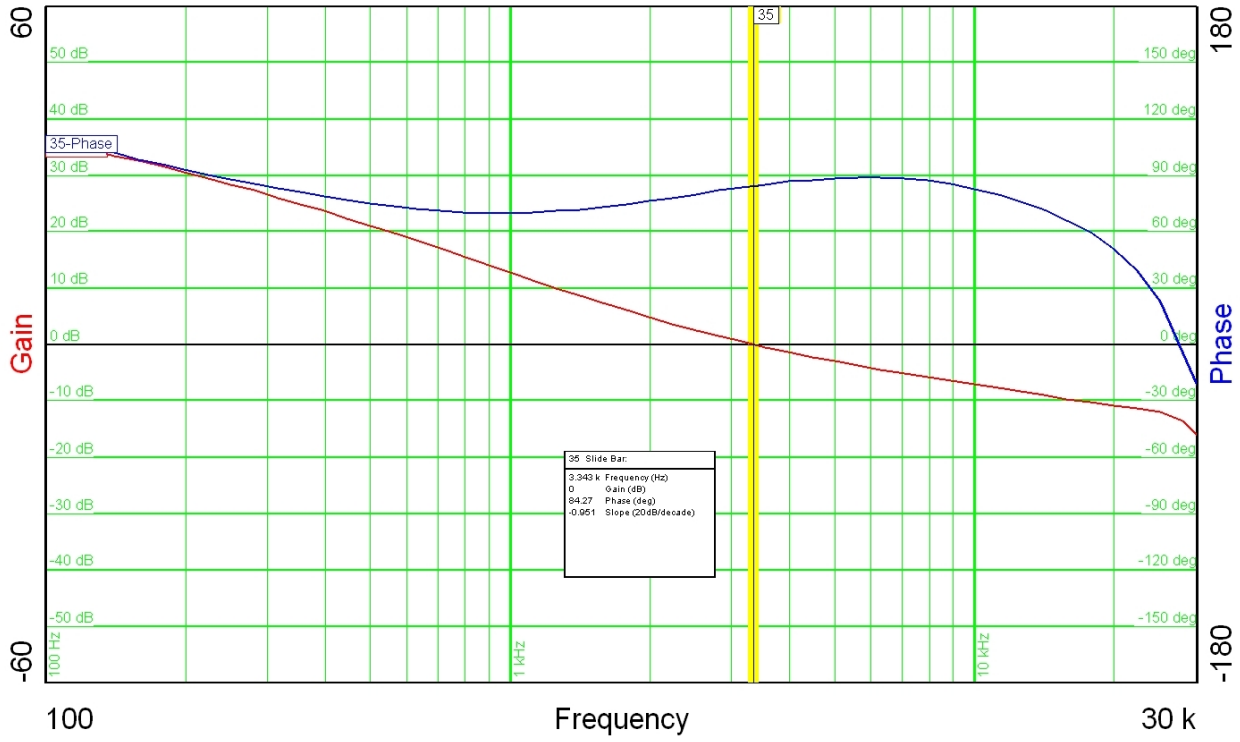
5 Output Ripple Voltage

The output ripple voltage is shown in the plot below. The input was set to 24VDC and the output was loaded with 15A.



6 Frequency Response

The frequency response of the feedback loop is shown below. The input was set to 24V and the output was loaded with 15A.



7 Load Transients

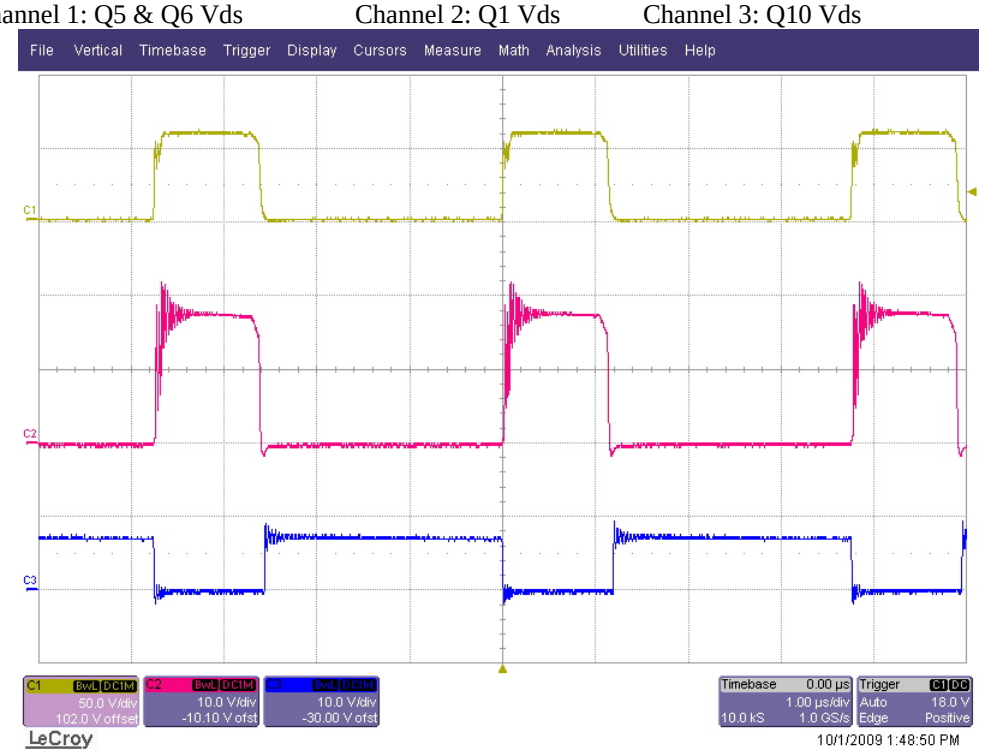
The response to a load step from 5A to 10A is shown in the image below. The input was set to 24V.

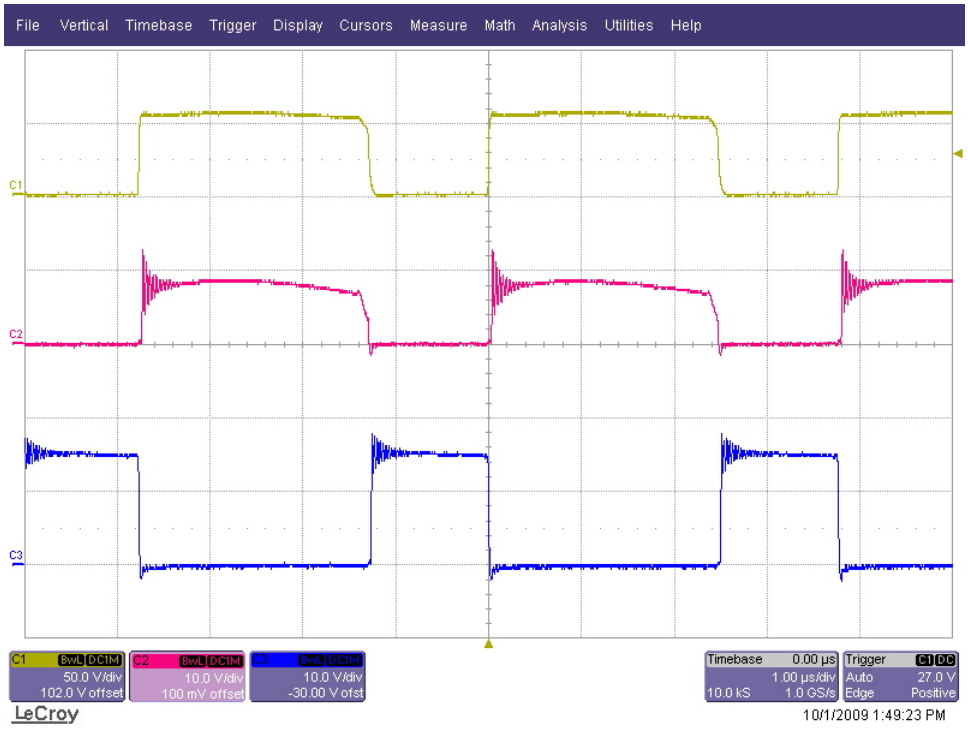
Channel 1: Vout 200mV/div (ac coupled) Channel 4: Iout 5A/div

8 Switching Waveforms

The images below show the drain-to-source voltage waveforms on the switching MOSFETs. The output was loaded with 15A. For the top image, the input was 18V. For the bottom image, the input was 36V.

Channel 1: Q5 & Q6 Vds Channel 2: Q1 Vds Channel 3: Q10 Vds




File Vertical Timebase Trigger Display Cursors Measure Math Analysis Utilities Help
C1
C2
C3
C1 BwL DC1M
50.0 V/div
102.0 V offset
C2 BwL DC1M
10.0 V/div
100 mV offset
C3 BwL DC1M
10.0 V/div
-30.00 V ofst
Timebase 0.00 µs
1.00 µs/div
10.0 kS 1.0 GS/s
Trigger C1 DC
Auto 27.0 V
Edge Positive
LeCroy
10/1/2009 1:49:23 PM

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