

# LM2879

*LM2879 Dual 8W Audio Amplifier*



Literature Number: SNAS528

## LM2879 Dual 8W Audio Amplifier

### General Description

The LM2879 is a monolithic dual power amplifier which offers high quality performance for stereo phonographs, tape players, recorders, AM-FM stereo receivers, etc.

The LM2879 will deliver 8W/channel to an 8Ω load. The amplifier is designed to operate with a minimum of external components and contains an internal bias regulator to bias each amplifier. Device overload protection consists of both internal current limit and thermal shutdown.

### Features

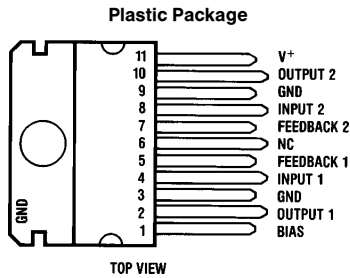
- $A_{VO}$  typical 90 dB
- 9W per channel (typical)
- 60 dB ripple rejection
- 70 dB channel separation

- Self-centering biasing
- 4 MΩ input impedance
- Internal current limiting
- Internal thermal protection

### Applications

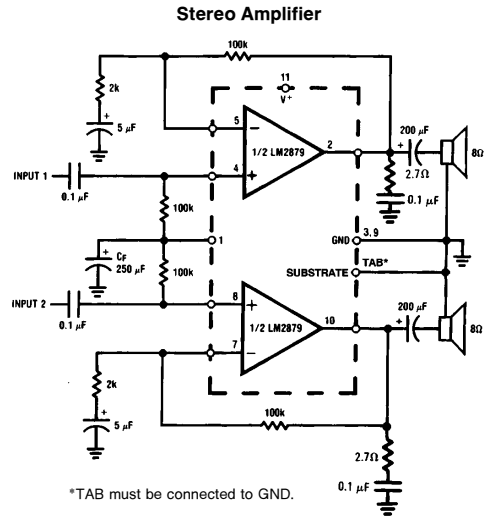
- Multi-channel audio systems
- Tape recorders and players
- Movie projectors
- Automotive systems
- Stereo phonographs
- Bridge output stages
- AM-FM radio receivers
- Intercoms
- Servo amplifiers
- Instrument systems

## Connection Diagram and Typical Application



TL/H/5291-1

Order Number LM2879T  
See NS Package Number TA11B



TL/H/5291-2

FIGURE 1

## Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	35V
Input Voltage (Note 1)	±0.7V
Operating Temperature (Note 2)	0°C to +70°C

Storage Temperature	-65°C to +150°C
Junction Temperature	150°C
Lead Temp. (Soldering, 10 seconds)	260°C
ESD rating to be determined.	
Thermal Resistance	
$\theta_{JC}$	1°C/W
$\theta_{JA}$	43°C/W

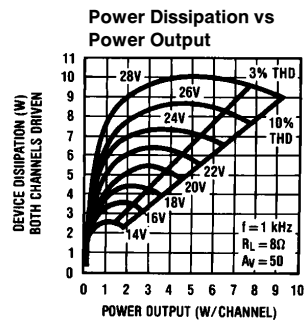
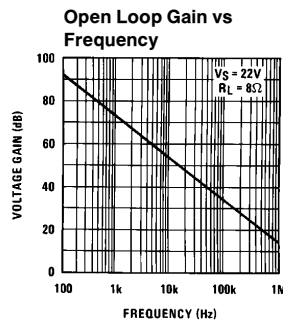
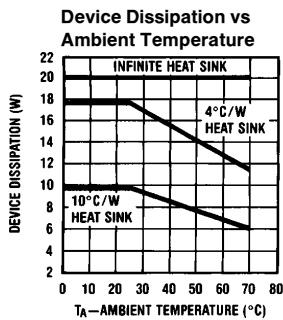
## Electrical Characteristics $V_S = 28V$ , $T_{TAB} = 25^\circ C$ , $R_L = 8\Omega$ , $A_V = 50$ (34 dB), unless otherwise specified.

Parameter	Conditions	Min	Typ	Max	Units
Total Supply Current	$P_O = 0W$		12	65	mA
Operating Supply Voltage		6		32	V
Output Power/Channel	$f = 1 \text{ kHz}$ , THD = 10%, $T_{TAB} = 25^\circ C$	6	8		W
Distortion	$f = 1 \text{ kHz}$ , $R_L = 8\Omega$ $P_O = 1 \text{ W/Channel}$		0.05	1	%
Output Swing	$R_L = 8\Omega$		$V_S - 6V$		Vp-p
Channel Separation	$C_{BYPASS} = 50 \mu F$ , $C_{IN} = 0.1 \mu F$ $f = 1 \text{ kHz}$ , Output Referred $V_O = 4 \text{ Vrms}$	-50	-70		dB
PSRR Positive Supply	$C_{BYPASS} = 50 \mu F$ , $C_{IN} = 0.1 \mu F$ $f = 120 \text{ Hz}$ , Output Referred $V_{ripple} = 1 \text{ Vrms}$	-50	-60		dB
PSRR Negative Supply	Measured at DC, Input Referred		-60		dB
Common-Mode Range	Split Supplies ±15V, Pin 1 Tied to Pin 11		±13.5		V
Input Offset Voltage			10		mV
Noise	Equivalent Input Noise $R_S = 0$ , $C_{IN} = 0.1 \mu F$ BW = 20 - 20 kHz CCIR*ARM Output Noise Wideband $R_S = 0$ , $C_{IN} = 0.1 \mu F$ , $A_V = 200$		2.5 3.0 0.8		$\mu V$ $\mu V$ mV
Open Loop Gain	$R_S = 51\Omega$ , $f = 1 \text{ kHz}$ , $R_L = 8\Omega$		70		dB
Input Bias Current			100		nA
Input Impedance	Open Loop		4		M $\Omega$
DC Output Voltage	$V_S = 28V$		14		V
Slew Rate			2		V/ $\mu s$
Power Bandwidth	3 dB Bandwidth at 2.5W		65		kHz
Current Limit			1.5		A

**Note 1:** The input voltage range is normally limited to ±0.7V with respect to pin 1. This range may be extended by shorting pin 1 to the positive supply.

**Note 2:** For operation at ambient temperature greater than 25°C, the LM2879 must be derated based on a maximum 150°C junction temperature. Thermal resistance, junction to case, is 3°C/W. Thermal resistance, case to ambient, is 40°C/W.

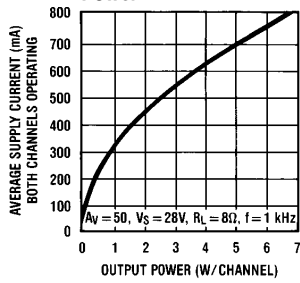
## Typical Performance Characteristics



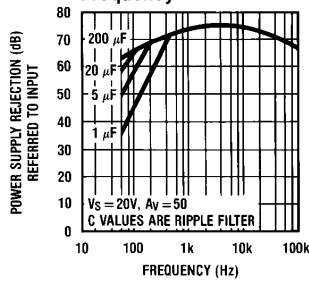
TL/H/5291-3

## Typical Performance Characteristics (Continued)

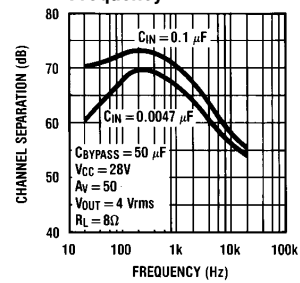
**Supply Current vs Output Power**



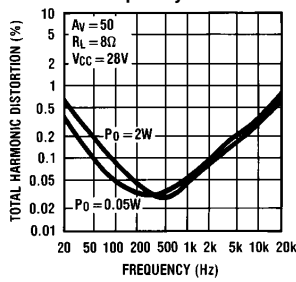
**Supply Rejection vs Frequency**



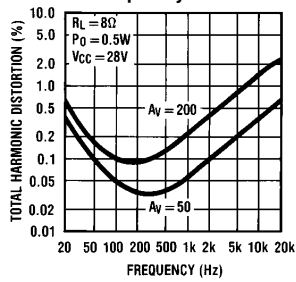
**Channel Separation (Referred to the Output) vs Frequency**



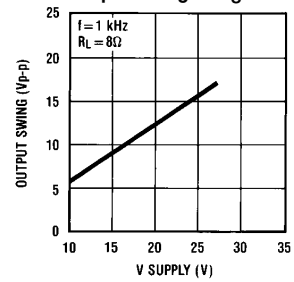
**Total Harmonic Distortion vs Frequency**



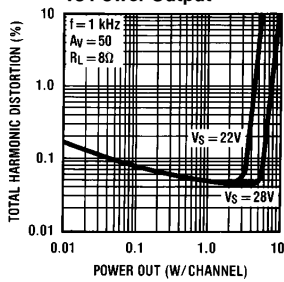
**Total Harmonic Distortion vs Frequency**



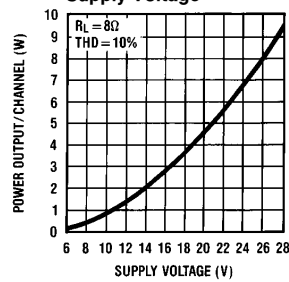
**Output Swing vs  $V_s$**



**Total Harmonic Distortion vs Power Output**



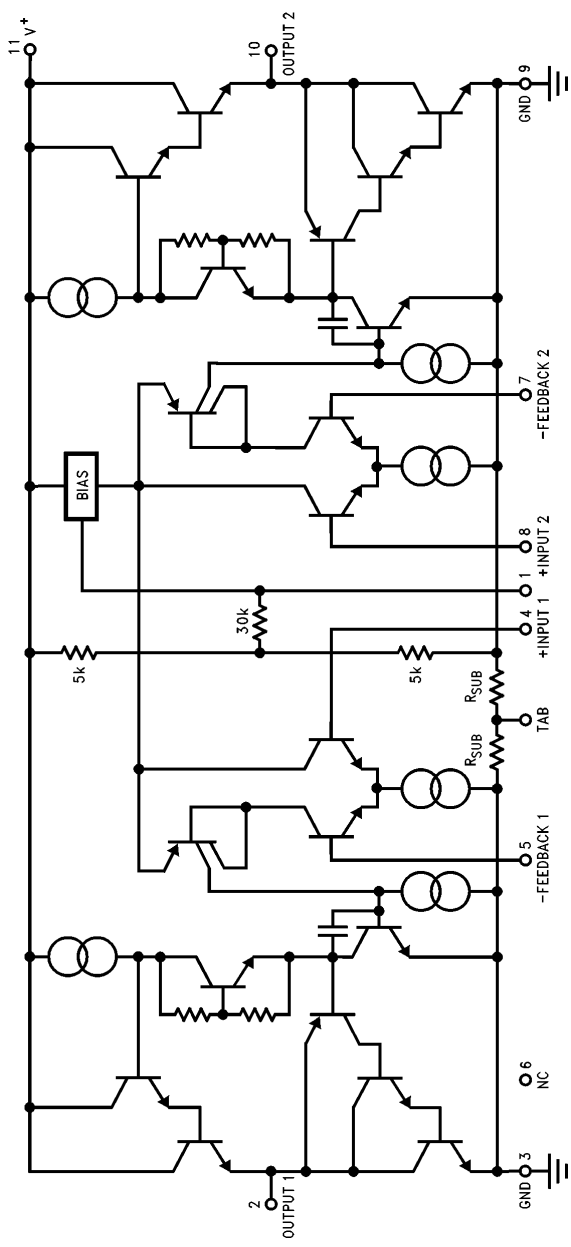
**Power Output/Channel vs Supply Voltage**



TL/H/5291-4

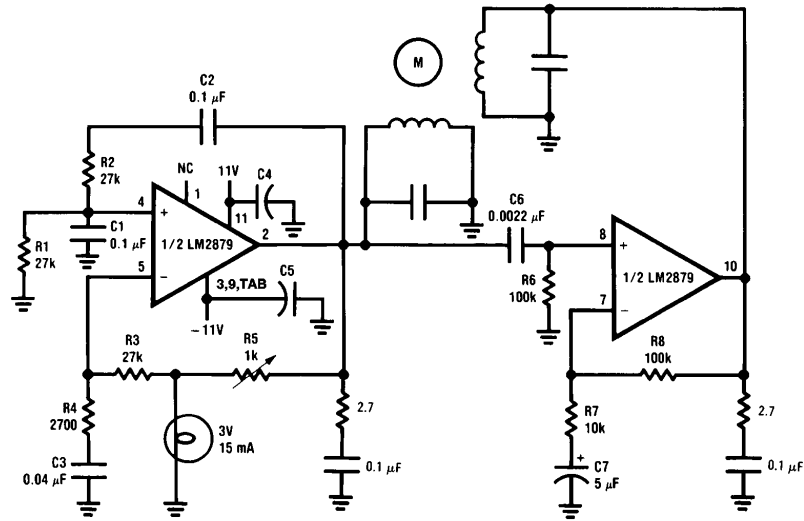
# Equivalent Schematic Diagram

TL/H/5291-5



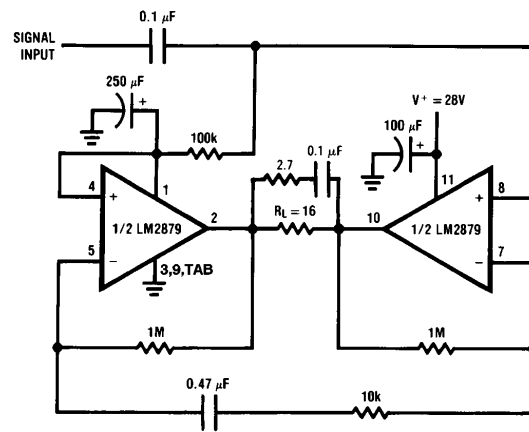
## Typical Applications

### Two-Phase Motor Drive



TL/H/5291-6

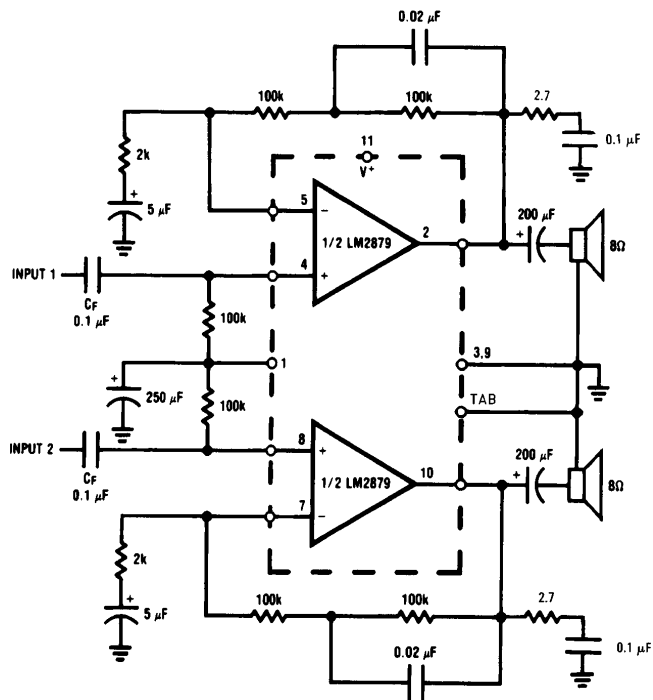
### 12W Bridge Amplifier



TL/H/5291-7

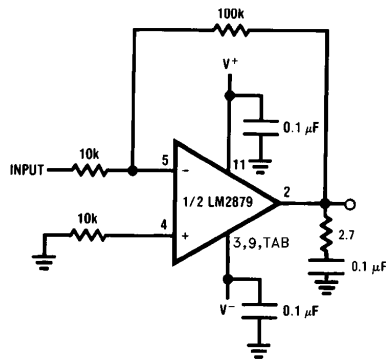
**Typical Applications** (Continued)

**Simple Stereo Amplifier with Bass Boost**



TL/H/5291-8

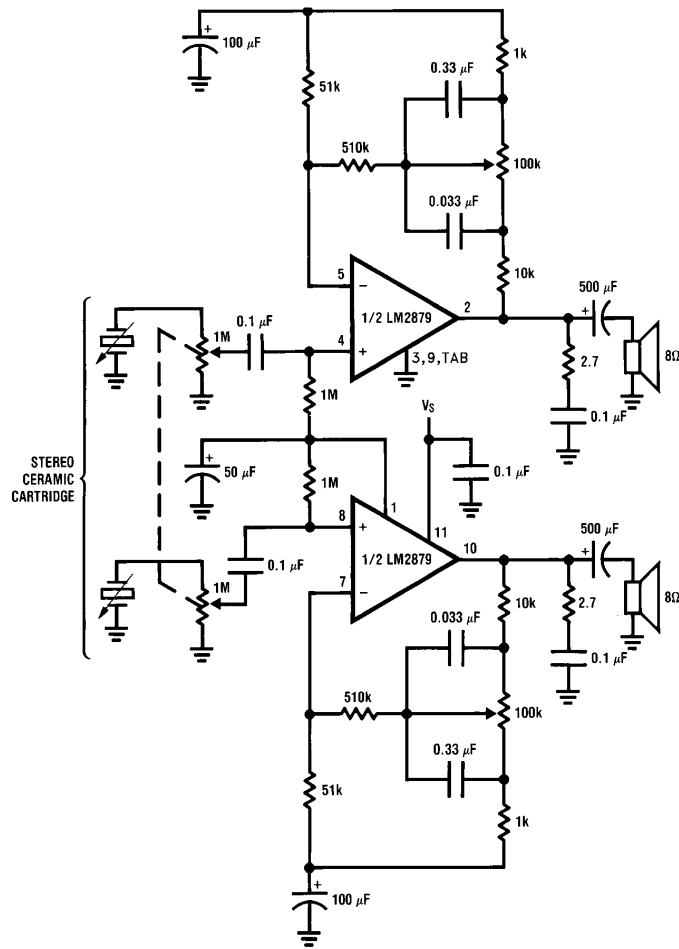
**Power Op Amp (Using Split Supplies)**



TL/H/5291-9

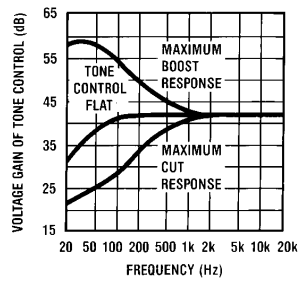
## Typical Applications (Continued)

### Stereo Phonograph Amplifier with Bass Tone Control



TL/H/5291-10

**Frequency Response of Bass Tone Control**

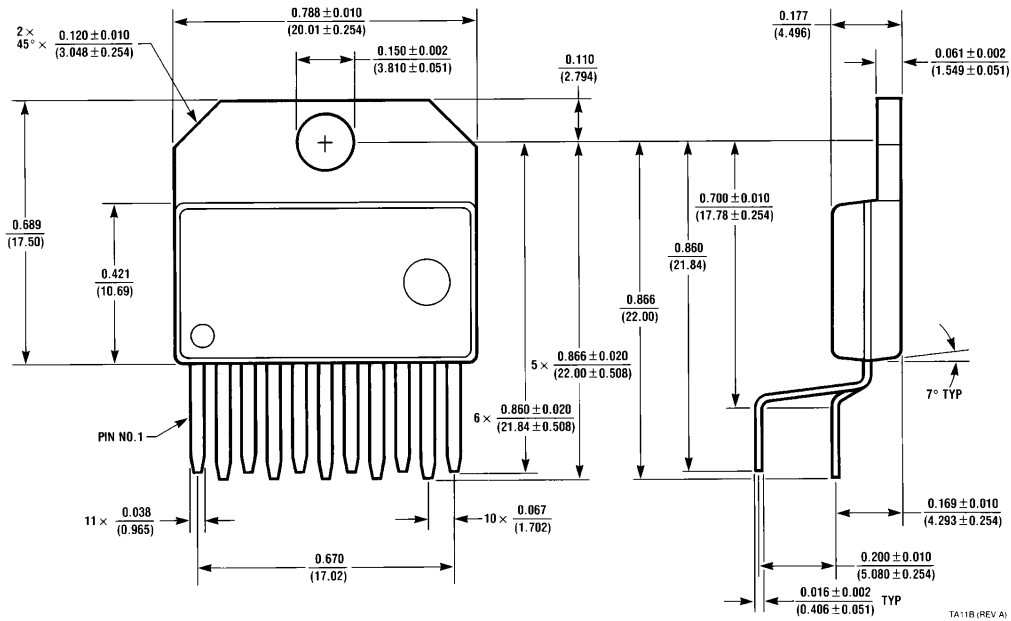


TL/H/5291-11



**LM2879 Dual 8W Audio Amplifier**

**Physical Dimensions** inches (millimeters)



**11-Lead TO-220 Power Package (T)**  
**Order Number LM2879T**  
**NS Package Number TA11B**

TA11B (REV A)

**LIFE SUPPORT POLICY**

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.



**National Semiconductor Corporation**  
 1111 West Bardin Road  
 Arlington, TX 76017  
 Tel: 1(800) 272-9959  
 Fax: 1(800) 737-7018

**National Semiconductor Europe**  
 Fax: (+49) 0-180-530 85 86  
 Email: cnjwge@tevm2.nsc.com  
 Deutsch Tel: (+49) 0-180-530 85 85  
 English Tel: (+49) 0-180-532 78 32  
 Français Tel: (+49) 0-180-532 93 58  
 Italiano Tel: (+49) 0-180-534 16 80

**National Semiconductor Hong Kong Ltd.**  
 19th Floor, Straight Block,  
 Ocean Centre, 5 Canton Rd.  
 Tsimshatsui, Kowloon  
 Hong Kong  
 Tel: (852) 2737-1600  
 Fax: (852) 2736-9960

**National Semiconductor Japan Ltd.**  
 Tel: 81-043-299-2309  
 Fax: 81-043-299-2408

National does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and National reserves the right at any time without notice to change said circuitry and specifications.

## 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

Audio	<a href="http://www.ti.com/audio">www.ti.com/audio</a>
Amplifiers	<a href="http://amplifier.ti.com">amplifier.ti.com</a>
Data Converters	<a href="http://dataconverter.ti.com">dataconverter.ti.com</a>
DLP® Products	<a href="http://www.dlp.com">www.dlp.com</a>
DSP	<a href="http://dsp.ti.com">dsp.ti.com</a>
Clocks and Timers	<a href="http://www.ti.com/clocks">www.ti.com/clocks</a>
Interface	<a href="http://interface.ti.com">interface.ti.com</a>
Logic	<a href="http://logic.ti.com">logic.ti.com</a>
Power Mgmt	<a href="http://power.ti.com">power.ti.com</a>
Microcontrollers	<a href="http://microcontroller.ti.com">microcontroller.ti.com</a>
RFID	<a href="http://www.ti-rfid.com">www.ti-rfid.com</a>
OMAP Mobile Processors	<a href="http://www.ti.com/omap">www.ti.com/omap</a>
Wireless Connectivity	<a href="http://www.ti.com/wirelessconnectivity">www.ti.com/wirelessconnectivity</a>

### Applications

Communications and Telecom	<a href="http://www.ti.com/communications">www.ti.com/communications</a>
Computers and Peripherals	<a href="http://www.ti.com/computers">www.ti.com/computers</a>
Consumer Electronics	<a href="http://www.ti.com/consumer-apps">www.ti.com/consumer-apps</a>
Energy and Lighting	<a href="http://www.ti.com/energy">www.ti.com/energy</a>
Industrial	<a href="http://www.ti.com/industrial">www.ti.com/industrial</a>
Medical	<a href="http://www.ti.com/medical">www.ti.com/medical</a>
Security	<a href="http://www.ti.com/security">www.ti.com/security</a>
Space, Avionics and Defense	<a href="http://www.ti.com/space-avionics-defense">www.ti.com/space-avionics-defense</a>
Transportation and Automotive	<a href="http://www.ti.com/automotive">www.ti.com/automotive</a>
Video and Imaging	<a href="http://www.ti.com/video">www.ti.com/video</a>

TI E2E Community Home Page

[e2e.ti.com](http://e2e.ti.com)

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
Copyright © 2011, Texas Instruments Incorporated