

## FEATURES

- Very Low Drift — 2 ppm/°C Max Slope
- Pin-Compatible with LT1021-5, REF-02
- Factory-Trimmed to  $5.000V \pm 1mV @ 25^{\circ}C$
- Output Sinks or Sources 10mA
- Excellent Transient Response Suitable for A-to-D Reference Inputs
- Noise Reduction Pin
- Excellent Long Term Stability
- Low Noise

## APPLICATIONS

- A-to-D and D-to-A Conversion
- Digital Voltmeters
- Reference Standard
- Precision Current Source

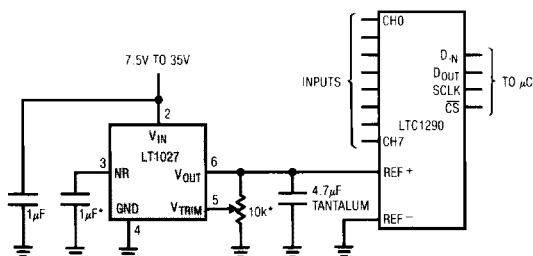
## DESCRIPTION

The LT1027 is a precision reference with extra-low drift, low noise, excellent line and load regulation and low output impedance at high frequency. This device is intended for use in 12- to 16-bit A-to-D and D-to-A systems where demanding accuracy requirements must be met without the use of power-hungry heated-substrate references. The fast-settling output recovers quickly from load transients such as those presented by A-to-D converter reference inputs. The LT1027 represents the next major advance in low-drift, high-accuracy voltage references.

The LT1027 reference is based on LTC's proprietary advanced sub-surface zener bipolar process which eliminates noise and stability problems associated with surface breakdown devices.

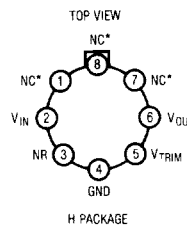
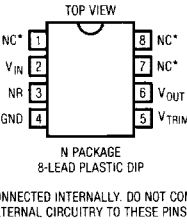
## TYPICAL APPLICATION

Driving a 12-Bit ADC



\*NOISE REDUCTION CAP AND TRIM POTENTIOMETER OPTIONAL.

## PACKAGE/ORDER INFORMATION

 <p>TOP VIEW</p> <p>H PACKAGE 8-LEAD TO-5 METAL CAN</p> <p>*CONNECTED INTERNALLY. DO NOT CONNECT EXTERNAL CIRCUITRY TO THESE PINS.</p>	<b>ORDER PART NUMBER</b>  LT1027BMH LT1027CMH LT1027BCH LT1027CCH
 <p>TOP VIEW</p> <p>N PACKAGE 8-LEAD PLASTIC DIP</p> <p>*CONNECTED INTERNALLY. DO NOT CONNECT EXTERNAL CIRCUITRY TO THESE PINS.</p>	LT1027BCN LT1027CCN

## ABSOLUTE MAXIMUM RATINGS

Input Voltage .....	40V
Input-Output Voltage Differential .....	35V
Output to Ground Voltage .....	7V
Trim to Ground Voltage	
Positive .....	Equal to $V_{OUT}$
Negative .....	-3V
Output Short Circuit Duration	
$V_{IN} = 35V$ .....	10 sec.
$V_{IN} < 20V$ .....	Indefinite

Operating Temperature Range	
LT1027M .....	-55°C to 125°C
LT1027C .....	0°C to 70°C
Storage Temperature Range	
All Devices .....	-65°C to 150°C
Lead Temperature (Soldering, 10 sec.) .....	300°C

## ELECTRICAL CHARACTERISTICS $V_{IN} = 10V$ , $I_{OUT} = 0$ , $T_A = 25^\circ C$ unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage			5.000		V
Output Voltage Accuracy	$T_A = 25^\circ C$		$\pm 0.02$		%
Output Voltage Temperature Coefficient			2		ppm/°C
Settling Time (0.01%)	$I_{OUT} = 10mA$		2		$\mu s$
Line Regulation	$10V < V_{IN} < 40V$		4		ppm/V
Load Regulation (Source)	$0 < I_{OUT} < 10mA$		10		ppm/mA
Load Regulation (Sink)	$0 > I_{OUT} > -10mA$		25		ppm/mA
Supply Current			2		mA
Output Trim Range	$0 > V_{TRIM} > V_{OUT}$		$\pm 50$		mV

## APPLICATIONS INFORMATION

### Transient Response

When a 10mA load step is applied to the LT1027 output, the reference will settle to 0.01% in under 2 $\mu s$ . For faster transient response under no DC load or while sourcing current, a 4.7 $\mu F$  (or greater) tantalum capacitor connected between  $V_{OUT}$  and ground is recommended. This will reduce the settling time to under 500ns. Electrolytic capacitors are not advisable as the series resistance of these type units will degrade the response. If the LT1027 is to be used as a current sink, a bypass cap is not recommended. For driving capacitive-type ADCs, the 4.7 $\mu F$  cap will give optimum performance, although it is not required.

### Trimming Output Voltage

The LT1027 has a trim pin for adjusting output voltage. The impedance of this pin is about 20k $\Omega$  with an open circuit voltage of 2.5V. A  $\pm 50mV$  trim range is obtainable by tying the trim pin to the wiper of a 10k potentiometer connected between  $V_{OUT}$  and ground. Trimming the output voltage will not affect the TC of the device.

### Noise Reduction

A 1 $\mu F$  capacitor between the NR (noise reduction) pin (3) and ground will reduce the noise of the LT1027 from 2.5 $\mu V_{RMS}$  to 1.5 $\mu V_{RMS}$  in a 0.1Hz to 1kHz bandwidth. The pin should be left open if not used. Open circuit voltage on the NR pin is 4.4V. This point goes to the internal amplifier input and is gained up to 5.000V. Do not put any DC load on this pin.