

# Precision Chopper Stabilized Operational Amplifier With Internal Capacitors

## FEATURES

- No External Components Required
- Noise Tested and Guaranteed
- Low Aliasing Errors
- Maximum Offset Voltage  $5\mu\text{V}$
- Maximum Offset Voltage Drift  $0.5\mu\text{V}/^\circ\text{C}$
- Low Noise  $1.6\mu\text{V}_{\text{p-p}}$  (0.1Hz to 10Hz)
- Minimum Voltage Gain, 130dB
- Minimum PSRR, 125dB
- Minimum CMRR, 120dB
- Low Supply Current 1mA
- Single Supply Operation 4.75V to 16V
- Input Common Mode Range Includes Ground
- Output Swings to Ground
- Typical Overload Recovery Time 3ms

## APPLICATIONS

- Thermocouple Amplifiers
- Electronic Scales
- Medical Instrumentation
- Strain Gauge Amplifiers
- High Resolution Data Acquisition
- DC Accurate R, C Active Filters

## DESCRIPTION

The LTC1050 is a high performance, low cost chopper stabilized operational amplifier. The unique achievement of the LTC1050 is that it integrates on chip the two sample-and-hold capacitors usually required externally by other chopper amplifiers. Further, the LTC1050 offers better combined overall DC and AC performance than is available from other chopper stabilized amplifiers with or without internal sample/hold capacitors

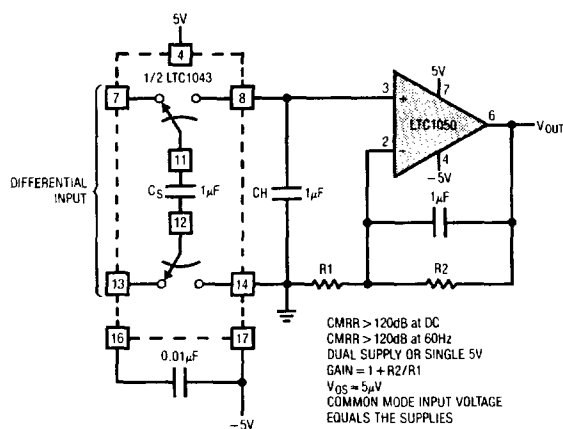
The LTC1050 has an offset voltage of  $0.5\mu\text{V}$ , drift of  $0.01\mu\text{V}/^\circ\text{C}$ , DC to 10Hz, input noise voltage of  $1.6\mu\text{V}_{\text{p-p}}$  and a typical voltage gain of 160dB. The slew rate of  $4\text{V}/\mu\text{s}$  and a gain bandwidth product of 2.5MHz are achieved with only 1mA of supply current.

Overload recovery times from positive and negative saturation conditions are 1.5ms and 3ms respectively, which represents an improvement of about 100 times over chopper amplifiers using external capacitors. Pin 5 is an optional external clock input, useful for synchronization purposes.

The LTC1050 is available in standard 8-pin metal can, plastic and ceramic dual in line packages as well as an 8-pin SO8 package. The LTC1050 can be an improved plug in replacement for most standard op amps.

## TYPICAL APPLICATION

### High Performance Low Cost Instrumentation Amplifier



### Noise Spectrum

