National Semiconductor

LM124/LM224/LM324/LM2902 Low Power Quad Operational Amplifiers

General Description

The LM124 series consists of four independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage.

Application areas include transducer amplifiers, DC gain blocks and all the conventional op amp circuits which now can be more easily implemented in single power supply systems. For example, the LM124 series can be directly operated off of the standard +5V power supply voltage which is used in digital systems and will easily provide the required interface electronics without requiring the additional ±15V power supplies.

Unique Characteristics

- In the linear mode the input common-mode voltage range includes ground and the output voltage can also swing to ground, even though operated from only a single power supply voltage
- The unity gain cross frequency is temperature compensated
- The input bias current is also temperature compensated

Advantages

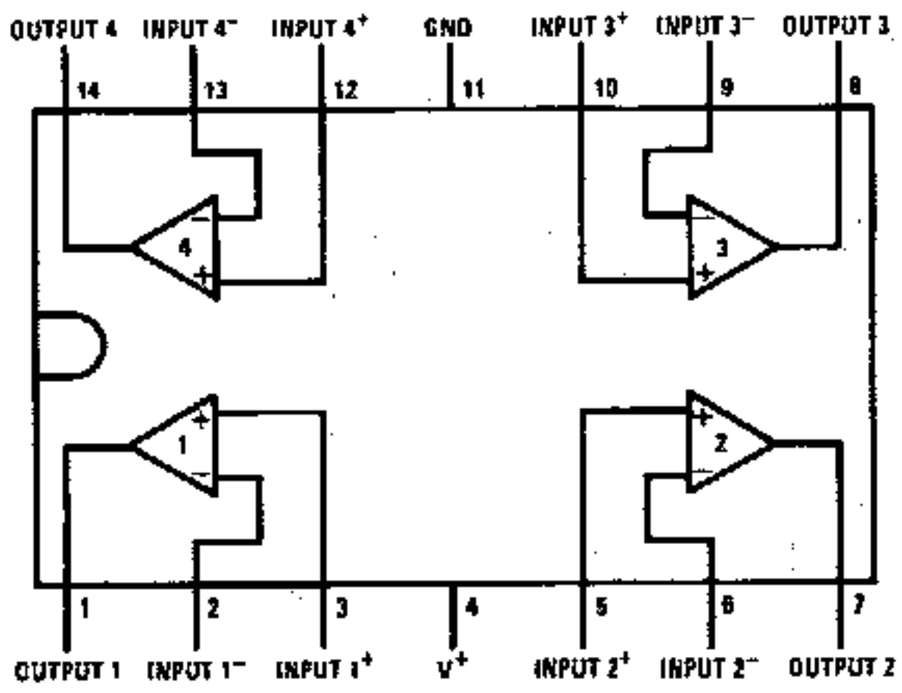
- Eliminates need for dual supplies
- Four internally compensated op amps in a single package
- Allows directly sensing near GND and V_{OUT} also goes to GND
- Compatible with all forms of logic
- Power drain suitable for battery operation

Features

- Internally frequency compensated for unity gain
- Large DC voltage gain 100 dB
- Wide bandwidth (unity gain) (temperature compensated) 1 MHz
- Wide power supply range:
  - Single supply 3V to 32V
  - or dual supplies ±1.5V to ±16V
- Very low supply current drain (700 μA)—essentially independent of supply voltage
- Low input biasing current (temperature compensated) 45 nA
- Low input offset voltage 2 mV
- and offset current 5 nA
- Input common-mode voltage range includes ground
- Differential input voltage range equal to the power supply voltage
- Large output voltage swing 0V to V+ − 1.5V

Connection Diagram

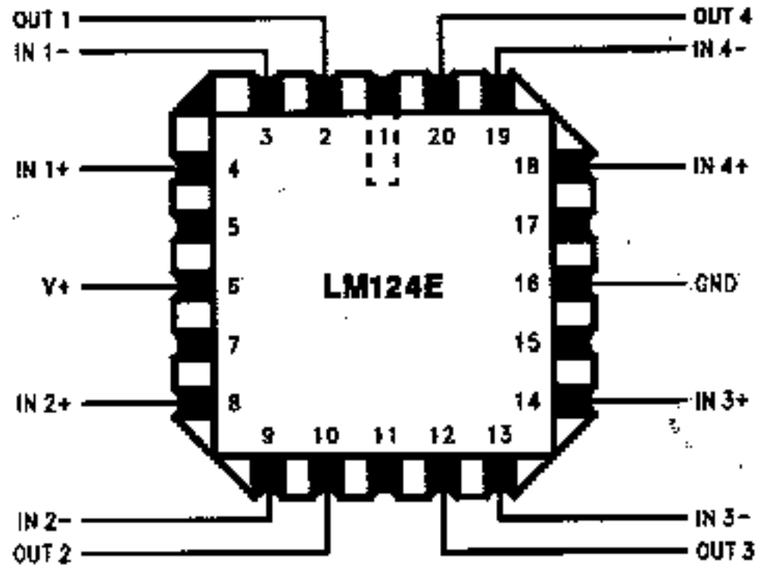
Dual-In-Line Package



TL/H/9299–1

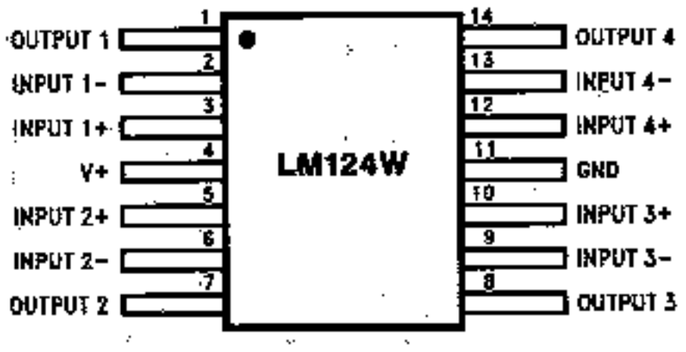
Top View

Order Number LM124J, LM124AJ, LM124J/883, LM124AJ/883*, LM224J, LM224AJ, LM324J, LM324M, LM324AM, LM2902M, LM324N, LM324AN or LM2902N**
See NS Package Number J14A, M14A or N14A



TL/H/9299–32

Order Number LM124AE/883 or LM124E/883
See NS Package Number E20A



TL/H/9299–33

Order Number LM124AW/883 or LM124W/883
See NS Package Number W14B

*LM124A available per JM38510/11006
**LM124 available per JM38510/11005

1