

## LH0002/LH0002C Current Amplifier

### General Description

The LH0002/LH0002C is a general purpose current amplifier.

### Features

- High input impedance 400 k $\Omega$
- Low output impedance 6 $\Omega$
- High power efficiency
- Low harmonic distortion
- DC to 30 MHz bandwidth
- Output voltage swing that approaches supply voltage
- 400 mA pulsed output current
- Slew rate is typically 200 V/ $\mu$ s
- Operation from  $\pm 5$ V to  $\pm 20$ V

These features make it ideal to integrate with an operational amplifier inside a closed loop configuration to increase current output. The symmetrical output portion of the cir-

cuit also provides a low output impedance for both the positive and negative slopes of output pulses.

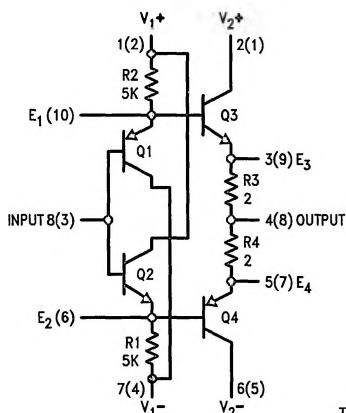
The LH0002 is available in an 8-lead low-profile TO-5 header and a 20-pin leadless chip carrier; the LH0002C is also available in an 8-lead TO-5, and a 10-pin molded dual-in-line package.

The LH0002 is specified for operation over the  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  military temperature range. The LH0002C is specified for operation over the  $0^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  temperature range.

### Applications

- Line driver
- 30 MHz buffer
- High speed D/A conversion
- Instrumentation buffer
- Precision current source

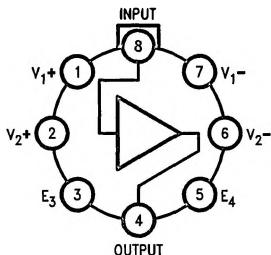
### Schematic and Connection Diagrams



Pin numbers in parentheses denote pin connections for dual-in-line package.

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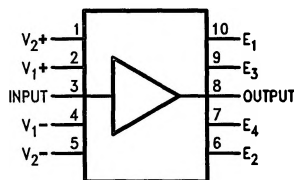
#### Metal Can Package



TL/H/5560-3

**Order Number LH0002H or LH0002CH**  
**See NS Package Number H08D**

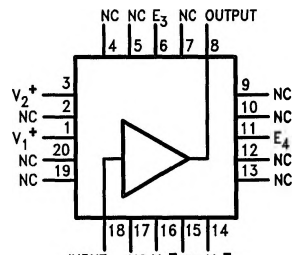
#### Dual-In-Line Package



TL/H/5560-2

**Order Number LH0002CN**  
**See NS Package Number N10A**

#### Leadless Chip Carrier



TL/H/5560-6

**Order Number LH0002E**  
**See NS Package Number E20A**

## Absolute Maximum Ratings

If Military/Aerospace specified devices are required, contact the National Semiconductor Sales Office/Distributors for availability and specifications. (Note 2)

Supply Voltage	±22V
Power Dissipation Ambient	600 mW
Input Voltage	(Equal to Power Supply Voltage)
Storage Temperature Range	−65°C to +150°C
Operating Temperature Range	
LH0002	−55°C to +125°C
LH0002C	0°C to +85°C

Steady State Output Current	±100 mA
Pulsed Output Current (50 ms On/1 sec. Off)	±400 mA
Lead Temperature Soldering (10 seconds)	
Metal Can	300°C
Plastic	260°C
ESD rating to be determined.	

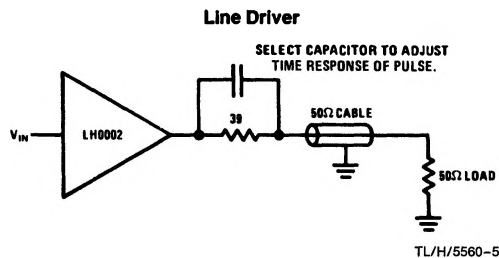
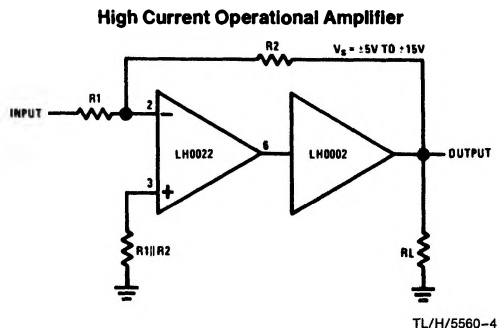
## Electrical Characteristics (Note 1)

Parameter	Conditions	Min	Typ	Max	Units
Voltage Gain	$R_S = 10\text{ k}\Omega$ , $R_L = 1.0\text{ k}\Omega$ , $V_{IN} = \pm 10\text{V}$	0.95	0.97		
AC Current Gain	$V_{IN} = 1.0\text{ V}_{rms}$ , $f = 1.0\text{ kHz}$		40		A/mA
Input Impedance	$R_S = 200\text{ k}\Omega$ , $V_{IN} = \pm 1.0\text{V}$ , $R_L = 1.0\text{ k}\Omega$	180	400		k $\Omega$
Output Impedance	$V_{IN} = \pm 1.0\text{V}$ , $R_L = 50\Omega$ , $R_S = 10\text{ k}\Omega$		6.0	10	$\Omega$
Output Voltage Swing	$R_L = 1.0\text{ k}\Omega$ , $V_{IN} = \pm 12\text{V}$	±10	±11		V
Output Voltage Swing	$V_S = \pm 15\text{V}$ , $V_{IN} = \pm 12\text{V}$ , $R_S = 50\Omega$ , $R_L = 100\Omega$ , $T_A = 25^\circ\text{C}$	±10			V
DC Output Offset Voltage	$R_S = 300\Omega$ , $R_L = 1.0\text{ k}\Omega$		±10	±30	mV
DC Input Offset Current	$R_S = 10\text{ k}\Omega$ , $R_L = 1.0\text{ k}\Omega$		±6.0	±10	$\mu\text{A}$
Harmonic Distortion	$V_{IN} = 5.0\text{ V}_{rms}$ , $f = 1.0\text{ kHz}$		0.1		%
Rise Time	$R_L = 50\Omega$ , $\Delta V_{IN} = 100\text{ mV}$		7.0	12	ns
Positive Supply Current	$R_S = 10\text{ k}\Omega$ , $R_L = 1.0\text{ k}\Omega$		+6.0	+10	mA
Negative Supply Current	$R_S = 10\text{ k}\Omega$ , $R_L = 1.0\text{ k}\Omega$		−6.0	−10	mA

Note 1: Specification applies for  $T_A = 25^\circ\text{C}$  with +12V on Pins 1 and 2; −12V on Pins 6 and 7 for the metal can package and +12V on Pins 1 and 2; −12V on Pins 4 and 5 for the dual-in-line package unless otherwise specified. The parameter guarantees for LH0002C apply over the temperature range of 0°C to +85°C, while parameters for the LH0002 are guaranteed over the temperature range −55°C to +125°C unless otherwise specified.

Note 2: Refer to RETS0002X for LH0002 military specifications.

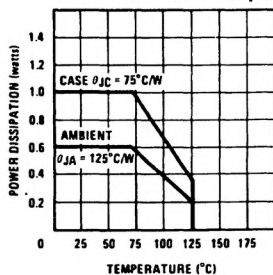
## Typical Applications



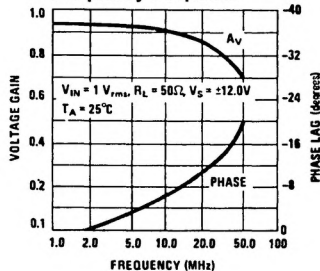
\*Previously called NH0002/NH0002C

# Typical Performance Characteristics

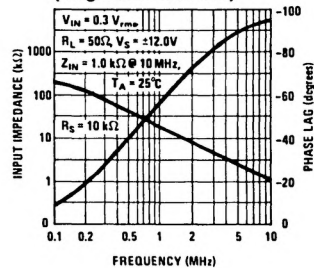
## Maximum Power Dissipation



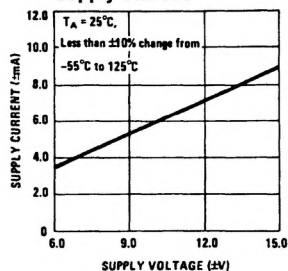
## Frequency Response



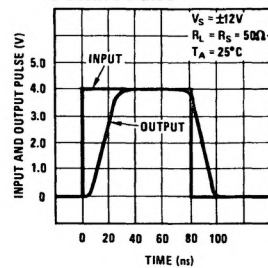
## Input Impedance (Magnitude & Phase)



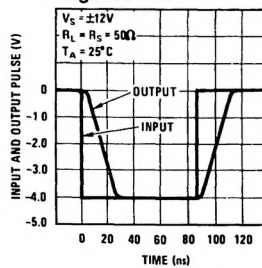
## Supply Current



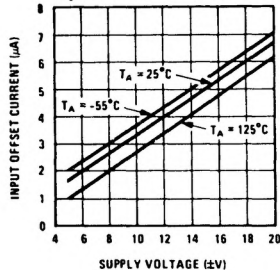
## Positive Pulse



## Negative Pulse



## Input Offset Current



TL/H/5560-7