

NH0002/NH0002C current amplifier

general description

The NH0002/NH0002C is a general purpose thick film hybrid current amplifier that is built on a single substrate. The circuit features:

- High Input Impedance 400 k Ω
- Low Output Impedance 6 Ω
- 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 200V/ μ s
- Operation from ± 5 V to ± 20 V

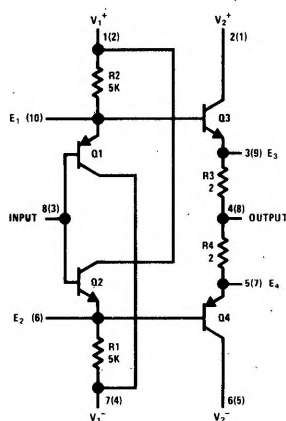
These features make it ideal to integrate with an operational amplifier inside a closed loop configuration to increase current output. The symmetrical output portion of the circuit also provides a low output impedance for both the positive and negative slopes of output pulses.

The NH0002 is available in an 8-lead low-profile TO-5 header; the NH0002C is also available in an 8-lead TO-5, and a 10-pin molded dual-in-line package.

applications

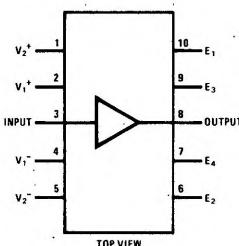
- Line driver
- 30 MHz buffer
- High speed D/A conversion
- Instrumentation buffer
- Precision current source

schematic and connection diagrams

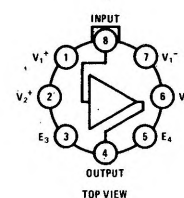


Pin numbers in parentheses denote pin connections for dual in-line package.

Dual-In-Line Package

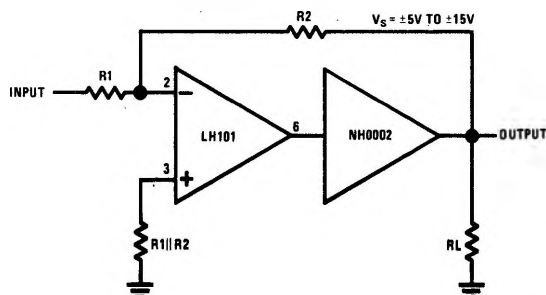


Metal Can Package

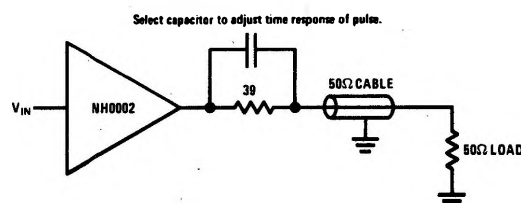


typical applications

High Current Operational Amplifier



Line Driver



absolute maximum ratings

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	NH0002 –55°C to +125°C
	NH0002C 0°C to +85°C
Steady State Output Current	±100 mA
Pulsed Output Current (50 ms On/1 sec Off)	±400 mA

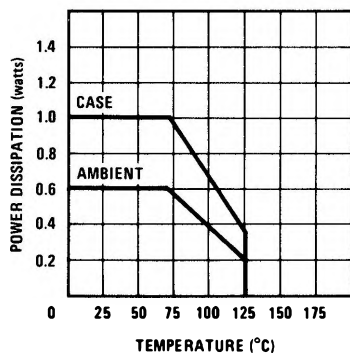
electrical characteristics (Note 1)

PARAMETERS	CONDITIONS	MIN	TYP	MAX	UNITS
Voltage Gain	$R_S = 10\text{ k}\Omega$, $R_L = 1.0\text{ k}\Omega$ $V_{IN} = 3.0\text{ V}_{PP}$, $f = 1.0\text{ kHz}$ $T_A = -55^\circ\text{C}$ to 125°C	.95	.97		
AC Current Gain	$V_{IN} = 1.0\text{ V}_{rms}$ $f = 1.0\text{ kHz}$		40		A/mA
Input Impedance	$R_S = 200\text{ k}\Omega$, $V_{IN} = 1.0\text{ V}_{rms}$, $f = 1.0\text{ kHz}$, $R_L = 1.0\text{ k}\Omega$	180	400	—	k Ω
Output Impedance	$V_{IN} = 1.0\text{ V}_{rms}$, $f = 1.0\text{ kHz}$ $R_L = 50\Omega$, $R_S = 10\text{ k}\Omega$	—	6	10	Ω
Output Voltage Swing	$R_L = 1.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$	±10	±11	—	V
DC Output Offset Voltage	$R_S = 300\Omega$, $R_L = 1.0\text{ k}\Omega$ $T_A = -55^\circ\text{C}$ to 125°C	—	±10	±30	mV
DC Input Offset Current	$R_S = 10\text{ k}\Omega$, $R_L = 1.0\text{ k}\Omega$ $T_A = -55^\circ\text{C}$ to 125°C	—	±6.0	±10	μA
Harmonic Distortion	$V_{IN} = 5.0\text{ V}_{rms}$, $f = 1.0\text{ kHz}$	—	0.1	—	%
Bandwidth	$V_{IN} = 1.0\text{ V}_{rms}$, $R_L = 50\Omega$, $f = 1\text{ MHz}$	30	50	—	MHz
Positive Supply Current	$R_S = 10\text{ k}\Omega$, $R_L = 1\text{ k}\Omega$	—	+6.0	+10.0	mA
Negative Supply Current	$R_S = 10\text{ k}\Omega$, $R_L = 1\text{ k}\Omega$	—	–6.0	–10.0	mA

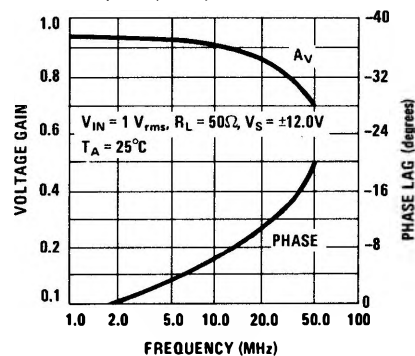
Note 1: Specification applies for $T_A = 25^\circ\text{C}$ with +12V on Pins 1 and 2; –12V on Pins 6 and 7 for the metal can package and +12V on Pins 1 and 2; –12V on Pins 4 and 5 for the dual-in-line package unless otherwise specified. The parameter guarantees for NH0002C apply over the temperature range of 0°C to $+85^\circ\text{C}$, while parameters for the NH0002 are guaranteed over the temperature range -55°C to 125°C .

typical performance

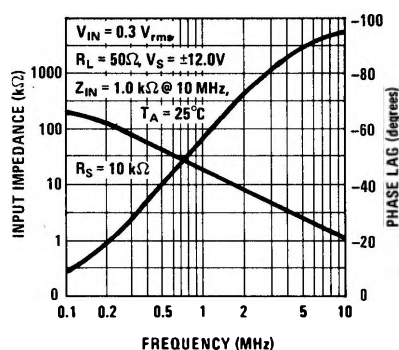
Maximum Power Dissipation



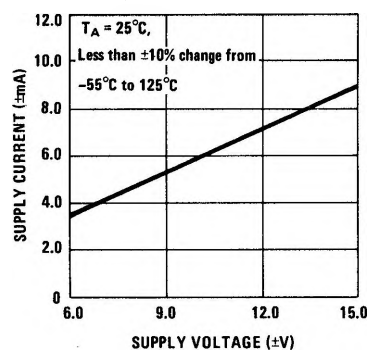
Frequency Response



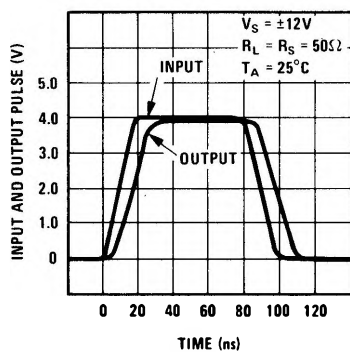
Input Impedance (Magnitude & Phase)



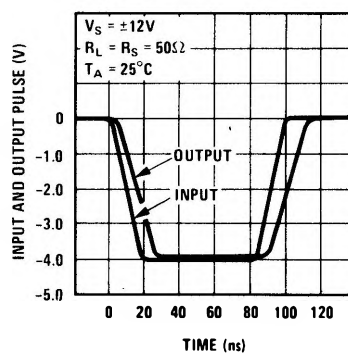
Supply Current



Positive Pulse



Negative Pulse



Input Offset Current

