Operational Amplifiers

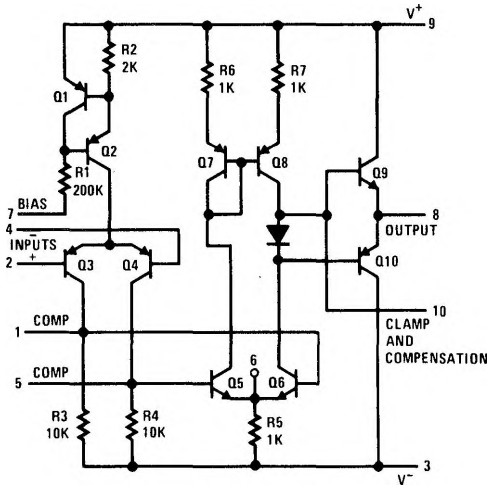
NH0003/NH0003C wide bandwidth operational amplifier

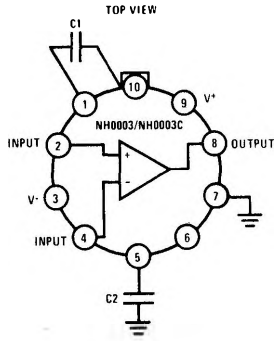
general description

The NH0003/NH0003C is a general purpose operational amplifier which features: slewing rate up to 70 volts/μsec, a gain bandwidth of up to 300 MHz, and high output currents. Other features are:

- Very low offset voltage — Typically 0.4 mV
- Large output swing — $>\pm10$V into 100Ω load
- High CMRR — Typically >90 dB
- Good large signal frequency response — 50 kHz to 400 kHz depending on compensation

schematic and connection diagrams



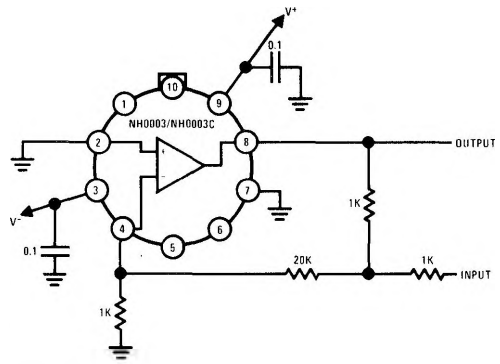


Circuit Gain	C_1 pF	C_2 pF	Slew Rate $R_L > 200\Omega$, V/μsec	Full Output Frequency R_L 200Ω V_{OUT} 10 V
≥ 40	0	0	70	400
≥ 10	5	30	30	350
≥ 5	15	30	15	250 kHz
≥ 2	50	50	5	100
≥ 1	90	90	2	50

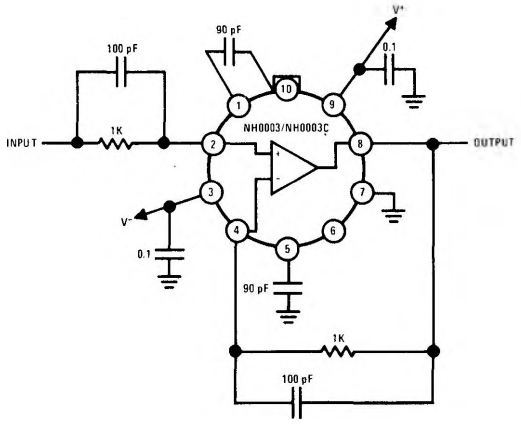
Typical Compensation

typical applications

High Slew Rate Unity Gain Inverting Amplifier



Unity Gain Follower



absolute maximum ratings

Supply Voltage		±20V
Power Dissipation		See curve
Differential Input Voltage		±7V
Input Voltage		Equal to supply
Load Current		120 mA
Operating Temperature Range	NH0003	−55°C to +125°C
	NH0003C	0°C to +70°C
Storage Temperature Range		−65°C to +150°C
Lead Temperature (Soldering, 10 sec)		300°C

electrical characteristics (Notes 1 & 2)

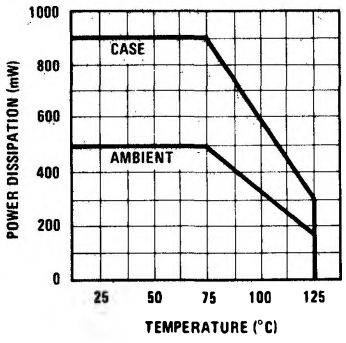
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	$R_S < 1k$		0.4	3.0	mV
Input Offset Current			0.02	0.2	μA
Input Bias Current			0.4	2.0	μA
Supply Current	$V_S = \pm 20V$		1.2	3	mA
Voltage Gain	$R_L = 100k$, $V_S = \pm 15V$, $V_{OUT} = \pm 10V$	20	70		V/mV
Voltage Gain	$R_L = 2k$, $V_S = \pm 15V$, $V_{OUT} = \pm 10V$	15	40		V/mV
Voltage Gain	$R_L = 200\Omega$, $V_S = \pm 15V$, $V_{OUT} = \pm 10V$	5	15		V/mV
Output Voltage Swing	$V_S = \pm 15$, $R_L = 100\Omega$	±10	±12		V
Input Resistance			100		kΩ
Average Temperature Coefficient of Offset Voltage	$R_S < 5k$		4		μV/°C
Average Temperature Coefficient of Bias Current			8		nA/°C
CMRR	$R_S < 1k$, $V_S = \pm V$, $V_{IN} = \pm 10V$	70	90		dB
PSRR	$R_S < 1k$, $V_S = \pm 15V$, $\Delta V = 5V$ to 20V	70	90		dB
Equivalent Input Noise Voltage	$R_S = 1K$, f = 10 kHz to 100 kHz, $V_S = \pm 15V$ dc		1.8		μVrms

Note 1. These specifications apply for Pin 7 grounded, for $\pm 5V < V_S < \pm 20V$, with capacitor $C_1 = 90$ pF from Pin 1 to Pin 10 and $C_2 = 90$ pF from Pin 5 to ground, over the specified operating temperature range, unless otherwise specified.

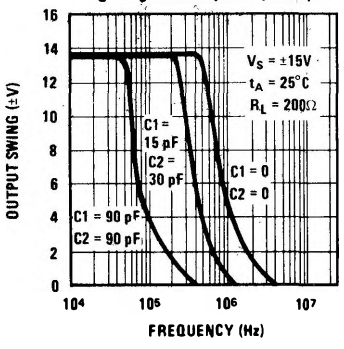
Note 2. Typical values are for $t_{AMBIENT} = 25°C$ unless otherwise specified.

typical performance

Maximum Power Dissipation



Large Signal Frequency Response



Open Loop Frequency Response