LH0003,LH0003C

LH0003 LH0003C Wide Bandwidth Operational Amplifier

TEXAS INSTRUMENTS

Literature Number: SNOS492A

National *Semiconductor*

LH0003
Wide Bandwidth Operational Amplifier

General Description

The LH0003/LH0003C is a general purpose operational amplifier which features: slewing rate up to 70 V/μs, a gain bandwidth of up to 30 MHz, and high output currents. Other features are:

Features

■ Very low offset voltage — Typically 0.4 mV
■ Large output swing — $> \pm 10$V into 100Ω load
■ High CMRR — Typically $>$ 90 dB
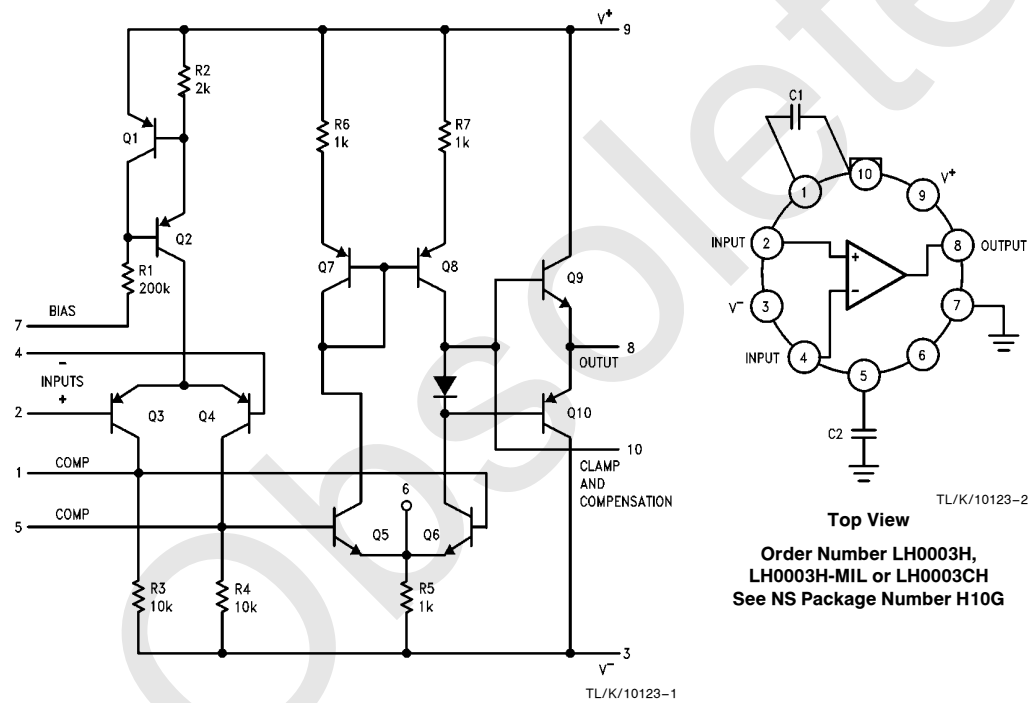■ Good large signal frequency response — 50 kHz to 400 kHz depending on compensation

The LH0003 is specified for operation over the $-55°$C to $+125°$C military temperature range. The LH0003C is specified for operation over the 0°C to $+85°$C temperature range.

Schematic and Connection Diagrams

TL/K/10123–1

TL/K/10123–2

Top View

**Order Number LH0003H,
LH0003H-MIL or LH0003CH
See NS Package Number H10G**

Absolute Maximum Ratings

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

Supply Voltage	± 20V
Power Dissipation	See curve
Differential Input Voltage	± 7V

Input Voltage	Equal to supply
Load Current	120 mA
Operating Temperature Range LH0003	$-55°C$ to $+125°C$
LH0003C	$0°C$ to $+85°C$
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	$R_S < 100\Omega$		0.4	3.0	mV
Input Offset Current			0.02	0.2	μA
Input Bias Current			0.4	2.0	μA
Supply Current	$V_S = \pm 20$V		1.2	3	mA
Voltage Gain	$R_L = 100$k, $V_S = \pm 15$V, $V_{OUT} = \pm 10$V	20	70		V/mV
Voltage Gain	$R_L = 2$k, $V_S = \pm 15$V, $V_{OUT} = \pm 10$V	15	40		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	$R_S < 100\Omega$		4		μV/°C
Average Temperature Coefficient of Bias Current			8		nA/°C
CMRR	$R_S < 100\Omega$, $V_S = \pm 15$V, $V_{IN} = \pm 10$V	70	90		dB
PSRR	$R_S < 100\Omega$, $V_S = \pm 15$V, $\Delta V = $ 5V to 20V	70	90		dB
Equivalent Input Noise Voltage	$R_S = 100\Omega$, f = 10 kHz to 100 kHz $V_S = \pm 15$V		1.8		μVrms

Note 1: These specifications apply for Pin 7 grounded, for ± 5V $< V_S < \pm 20$V, 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.
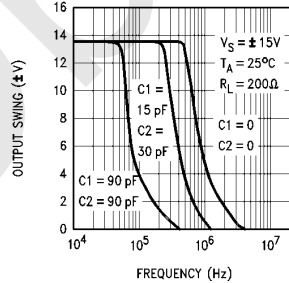
Note 3: See #RETS0003X for the LM0003H military specifications.

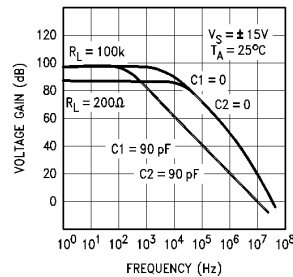## Typical Performance Characteristics

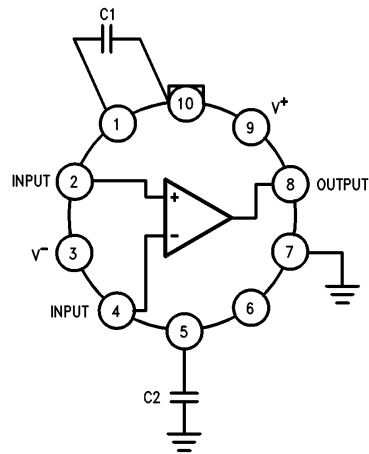Maximum Power Dissipation
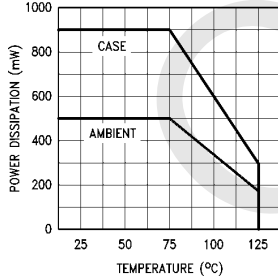
Large Signal Frequency Response

Open Loop Frequency Response

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Typical Applications
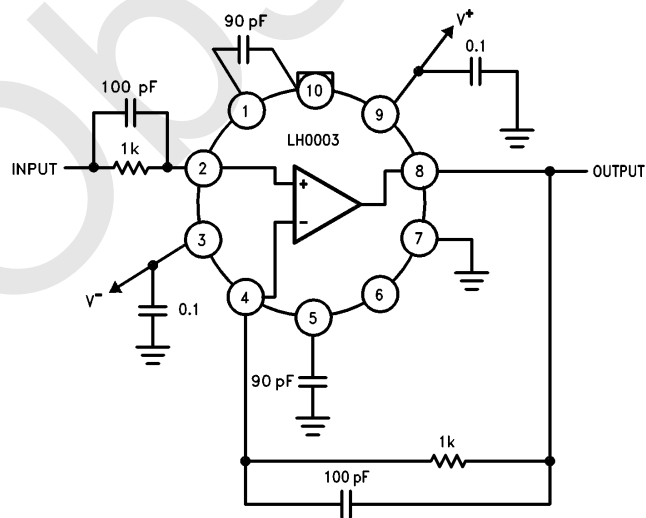
High Slew Rate Unity Gain Inverting Amplifier

TL/K/10123–2

Typical Compensation

Circuit Gain	C_1 pF	C_2 pF	Slew Rate $R_L > 200\Omega$, V/μs	Full Output Frequency $R_L = 200\Omega$ $V_{OUT} = \pm 10V$
≥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

Unity Gain Follower

TL/K/10123–4

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Physical Dimensions inches (millimeters)
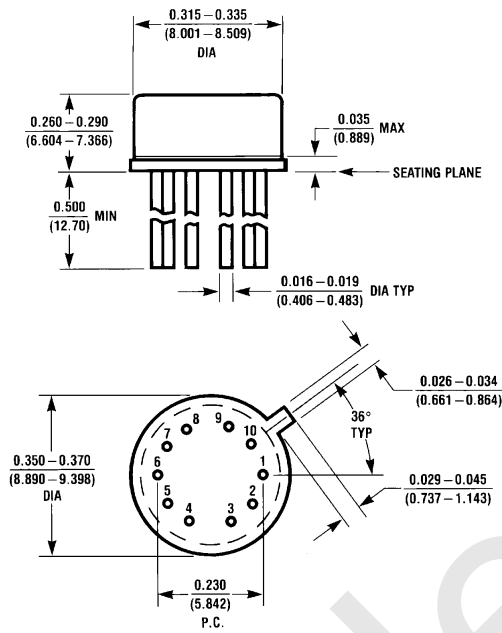
10 Lead .230 Dia P.C. Metal Can Package (H)
Order Number LH0003H, LH0003H-MIL or LH0003CH
NS Package Number H10G

LIFE SUPPORT POLICY

IMPORTANT NOTICE