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NTE945
Integrated Circuit
Operational Amp

Description:

The NTE945 is a precision, high input impedance operational amplifier in an 8–Lead Metal Can type package designed for applications requiring extremely low input current errors. This device uses supergain transistors in a Darlington input stage to get input bias currents that are equal to high–quality FET amplifiers–even in limited temperature range operation.

Unlike most other internally compensated amplifiers, the MOS compensation capacitor is protected to prevent catastrophic failure from overvoltage spikes on the supplies.

The low current error of this amplifier makes possible many designs that were previously impractical with monolithic amplifiers. It will operate from 100mΩ source resistances, introducing less error than general purpose amplifiers with 10kΩ sources, Integrators with worst case drifts less than 10μV/sec and analog time delays in excess of one day can also be made using capacitors no larger than 1μF.

Features:

- Guaranteed Bias Currents as Low as 50pA
- Maximum Offset Currents Down to 15pA
- Operates from Supplies of ±3V to ±20V
- Supply Current Only 300μA at ±20V

Absolute Maximum Ratings:

Supply Voltage . . . . . ±20V
Power Dissipation (Note 1) 500mW
Differential Input Current (Note 2) . . . . . ±10mA
Input Voltage (Note 3) . . . . . ±15V
Output Short–Circuit Duration . . . . . Indefinite
Operating Temperature Range . . . . . 0° to +70°C
Storage Temperature Range . . . . . –65° to +150°C
Lead Temperature (Durin Soldering, 10sec) . . . . . +300°C

Note 1. The maximum junction temperature is +70°C. For operating at elevated temperatures, the NTE945 must be derated based on a thermal resistance of +150°C/W, junction–to–ambient, or +45°C/W, junction–to–case.

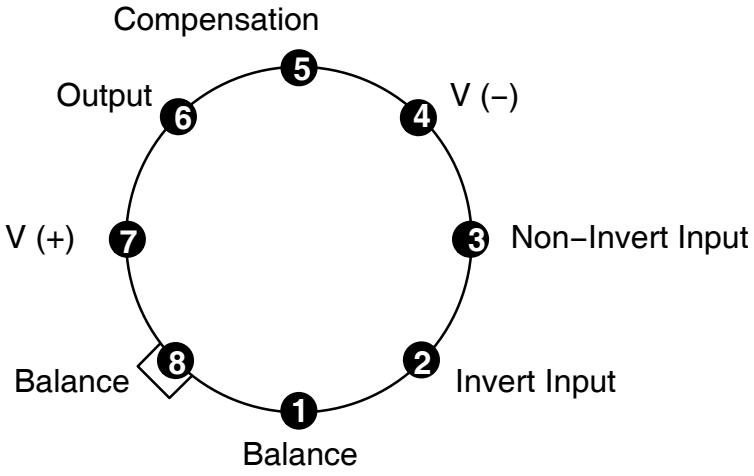
Note 2. The inputs are shunted with back–to–back diodes for overvoltage protection. Therefore, excessive current will flow if a differential input voltage in excess of 1V is applied between the inputs unless some limiting resistance is used.

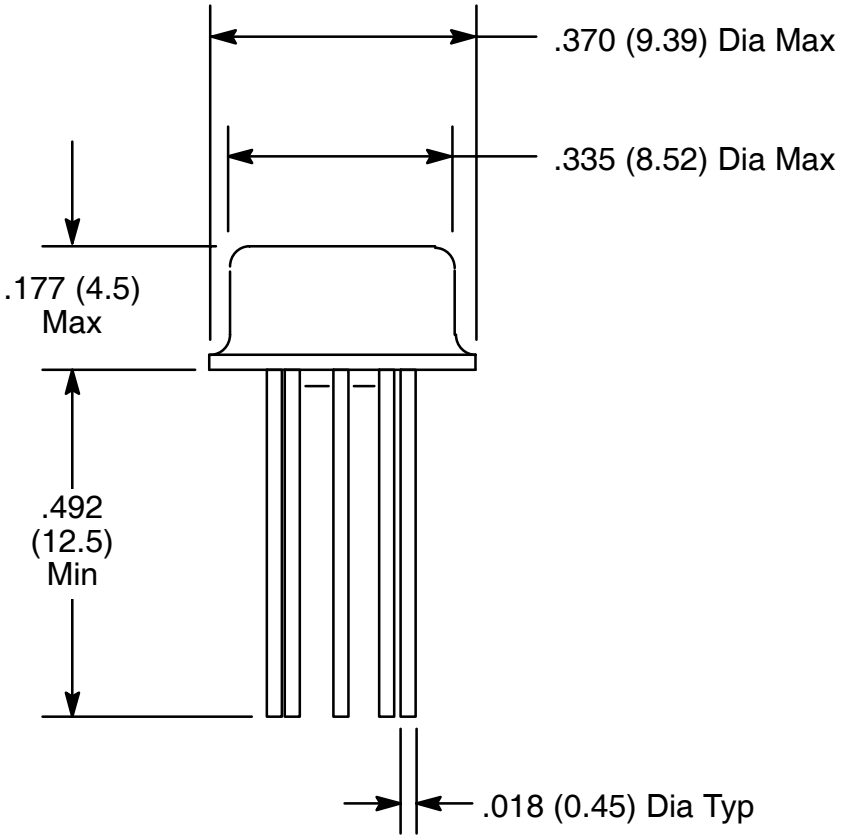
Note 3. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

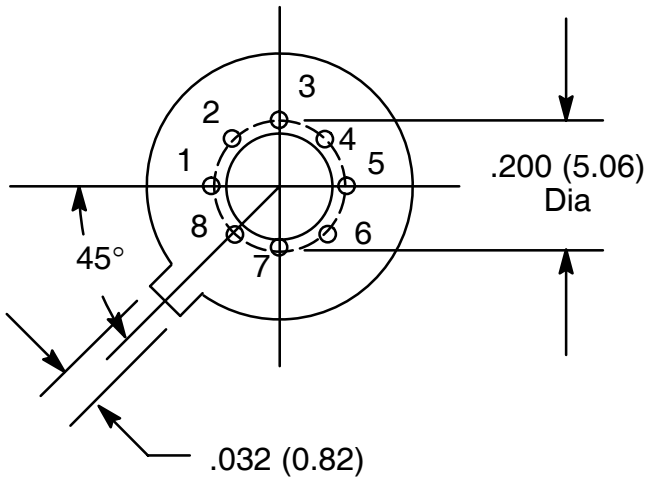
Electrical Characteristics: (T_A = −0° to +55°C, ±5V ≤ V_S ≤ ±20V unless otherwise specified)

Parameter	Test Conditions		Min	Typ	Max	Unit
Input Offset Voltage	T_A = +25°C		–	–	10	mV
			–	–	15	mV
Input Offset Current	T_A = +25°C		–	–	50	pA
			–	–	100	pA
Input Bias Current	T_A = +25°C		–	–	150	pA
			–	–	250	pA
Input Resistance	T_A = +25°C		1	–	–	GΩ
Supply Current	T_A = +25°C		–	–	0.8	mA
Large Signal Voltage Gain	V_S = ±15V, V_{OUT} = ±10V, $R_L \geq 10k\Omega$	T_A = +25°C	20	–	–	V/mV
			15	–	–	V/mV
Output Voltage Swing	V_S = ±15V, R_L = 10kΩ		±13	–	–	V
Input Voltage Range	V_S = ±15V		±13	–	–	V
Common Mode Rejection Ratio			80	–	–	dB
Supply Voltage Rejection Ratio			80	–	–	dB

Pin Connection Diagram
(Top View)




.370 (9.39) Dia Max
.335 (8.52) Dia Max
.177 (4.5)
Max
.492
(12.5)
Min
.018 (0.45) Dia Typ


1
2
3
4
5
6
7
8
.200 (5.06)
Dia
45°
.032 (0.82)