ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089

# NTE918
# NTE918M
# NTE918SM
# Integrated Circuit
# High Speed Operational Amplifier

**Description:**

The NTE918, NTE918M, and the NTE918SM are precision high speed operational amplifier designed for applications requiring wide bandwidth and high slew rate. These devices have internal unity gain frequency compensation. This considerably simplifies its application since no external components are necessary for operation. However, unlike most internally compensated amplifiers, external frequency compensation may be added for optimum performance. For inverting applications, feedforward compensation will boost the slew rate to over 150V/μs and almost double the bandwidth. Overcompensation can be used with the amplifier for greater stability when maximum bandwidth is not needed. Further, a single capacitor can be added to reduce the 0.1% setting time to under 1μs.

The high speed and fast setting time of these OP amps make them useful in A/D converters, oscillators, active filters, sample and hold circuits, or general purpose amplifiers. These devices are easy to apply and offer an order of magnitude better AC performance than industry standards such as the NTE909 and NTE909D.

**Features:**

- 15MHz Small Signal Bandwidth
- Guaranteed 50V/μs Slew Rate
- Maximum Bias Current of 250nA
- Operates from Supplies of ±5V to ±20V
- Internal Frequency Compensation
- Input and Output Overload Protected
- Pin Compatible with General Purpose OP Amps
- Available in 3 Different Case Styles:
  - 8–Lead Metal Can: NTE918
  - 8–Lead Mini DIP: NTE918M
  - 8–Lead SOIC (Surface Mount): NTE918SM

**Absolute Maximum Ratings:**

Power Supply Voltage, $V_S$ . . . . . ±20V
Power Dissipation (Note 1), $P_D$ . . . . . 500mW
Differential Input Current (Note 2), $I_{ID}$ . . . . . ±10mA
Input Voltage (Note 3), $V_I$ . . . . . ±15V
Output Short–Circuit Duration, $t_S$ . . . . . Indefinite
Operating Temperature Range, $T_{opr}$ . . . . . 0° to +70°C
Storage Temperature Range, $T_{stg}$ . . . . . –65° to +150°C
Lead Temperature (During Soldering, 10sec), $T_L$
NTE918 (Metal Can) . . . . . +300°C
NTE918M (Plastic DIP) . . . . . +260°C
NTE918SM (Surface Mount)
Vapor Phase (60sec) . . . . . +215°C
Infrared (15sec) . . . . . +220°C

Note 1. The maximum junction temperature of these devices is +110°C. For operating at elevated temperatures, the NTE918 must be derated based on a thermal resistance of +150°C/W, junctio to ambient, or +45°C/W, junction to case. The thermal resistance of the NTE918M and the NTE918SM is +100°C/W, junction to ambient.

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:** ($\pm5V \le V_S \le \pm20V$, $0° \le T_A \le +70°C$, Note 4 unless otherwise specified)

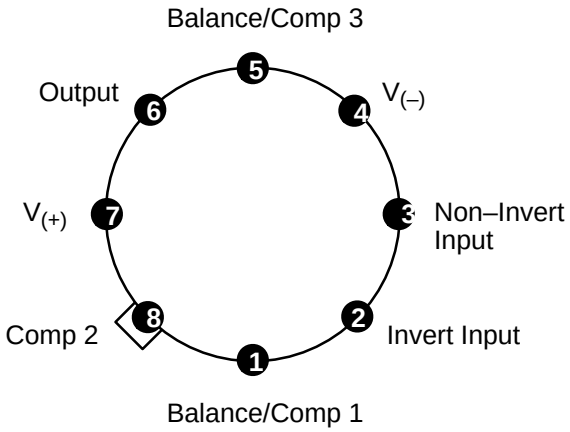
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Input Offset Voltage | $V_{IO}$ | | – | – | 15 | V |
| | | $T_A = +25°C$ | – | 4 | 10 | V |
| Input Offset Current | $I_{IO}$ | | – | – | 300 | nA |
| | | $T_A = +25°C$ | – | 30 | 200 | nA |
| Input Bias Current | $I_{IB}$ | | – | – | 750 | nA |
| | | $T_A = +25°C$ | – | 150 | 500 | nA |
| Input Resistance | $r_i$ | $T_A = +25°C$ | 0.5 | 3.0 | – | MΩ |
| Supply Current | $I_{CC}$, $I_{EE}$ | $T_A = +25°C$ | – | 5 | 10 | mA |
| Large Signal Voltage Gain | $A_V$ | $V_S = \pm15V$, $V_{OUT} = \pm10V$, $R_L \ge 2k\Omega$ | 20 | – | – | V/mV |
| | | $V_S = \pm15V$, $V_{OUT} = \pm10V$, $R_L \ge 2k\Omega$, $T_A = +25°C$ | 25 | 200 | – | V/mV |
| Slew Rate | SR | $V_S = \pm15V$, $A_V = 1$, $T_A = +25°C$, Note 5 | 50 | 70 | – | V/µs |
| Small Signal Bandwidth | BW | $V_S = \pm15V$, $T_A = +25°C$ | – | 15 | – | MHz |
| Output Voltage Swing | $V_O$ | $V_S = \pm15V$, $R_L = 2k\Omega$ | ±12 | ±13 | – | V |
| Input Voltage Range | $V_I$ | $V_S = \pm15V$ | ±11.5 | – | – | V |
| Common–Mode Rejection Ratio | CMRR | | 100 | – | – | dB |
| Supply Voltage Rejection Ratio | PSRR | | 65 | 80 | – | dB |

Note 4. Power supplies must be bypassed with 0.1µF disc capacitors.

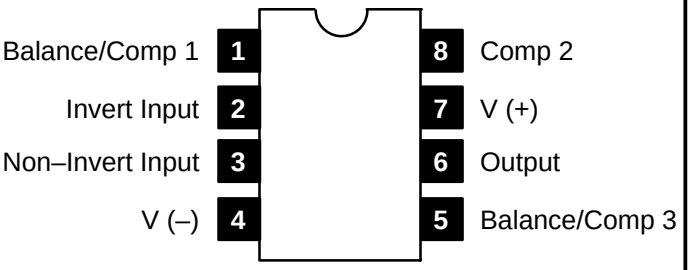
Note 5. Slew rate is tested with $V_S = \pm15V$. These devices are in a unity–gain non–inverting configuration. $V_{IN}$ is stepped from –7.5V to +7.5V and vice versa. The slew rates between –5V and +5V and vice versa are tested and guaranteed to exceed 50V/µs.

## Pin Connection Diagram

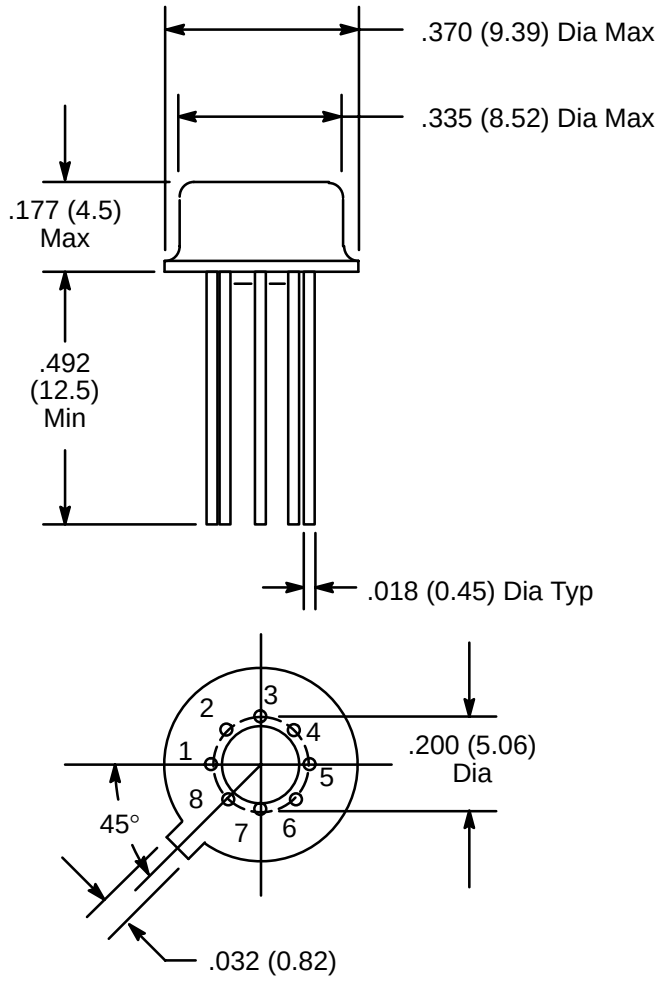
**NTE918**
(Top View)



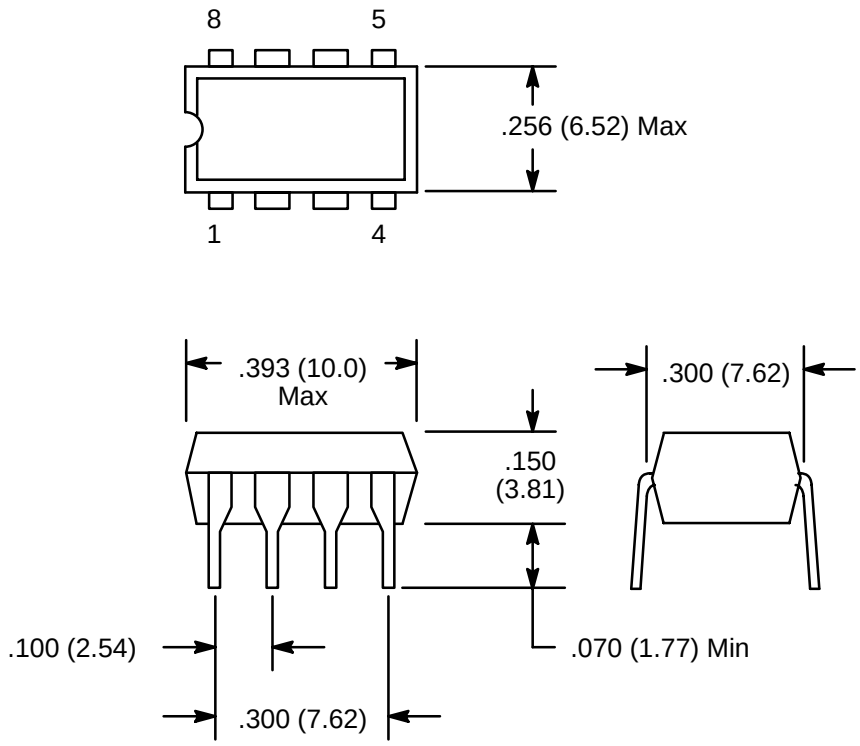

**NTE918M**
**NTE918SM**



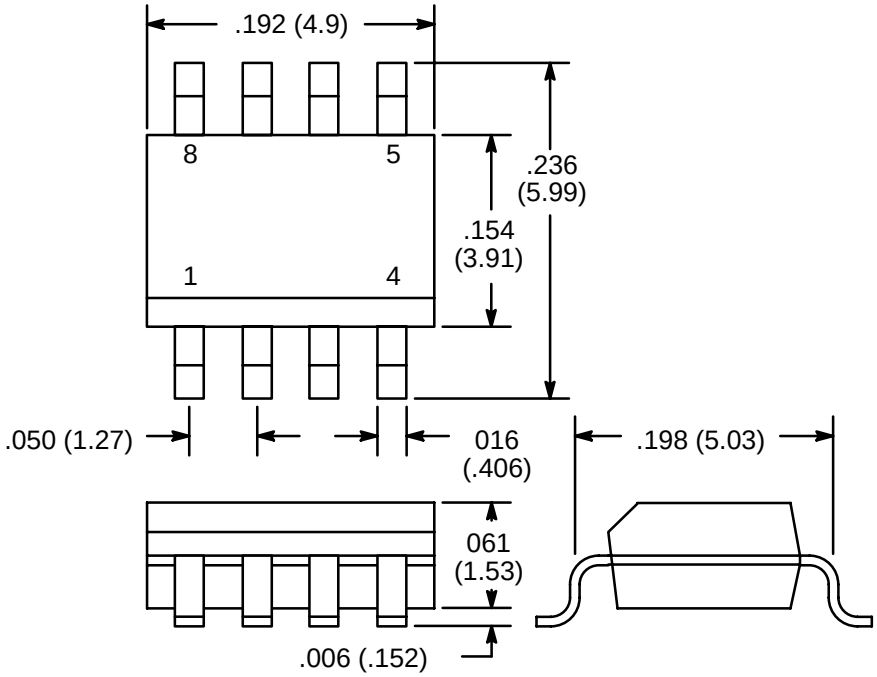

**NTE918**



**NTE918M**




**NTE918SM**




NOTE: Pin1 on Beveled Edge