

## NTE941S Integrated Circuit Operational Amplifier

### **Description:**

The NTE941S is a general purpose operational amplifier in a 7-Lead SIP type package and offers many features which make its application nearly foolproof: overload protection on the input and output, no latch-up when the common mode range is exceeded, as well as freedom from oscillators.

### **Absolute Maximum Ratings:**

Supply Voltage, $V_S$ .....	$\pm 18V$
Differential Input Voltage, $V_{ID}$ .....	$\pm 30V$
Common Mode Input Voltage (Note 2), $V_{ICM}$ .....	$\pm 15V$
Power Dissipation (Note 1), $P_D$ .....	500mW
Output Short-Circuit Duration, $t_S$ .....	Continuous
Operating Temperature Range, $T_{opr}$ .....	$0^\circ$ to $+70^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ C$
Junction Temperature, $T_J$ .....	$+100^\circ C$
Lead Temperature (During Soldering, 10sec), $T_L$ .....	$+260^\circ C$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	$+100^\circ C/W$

Note 1. For operation at elevated temperatures, these devices must be derated based on thermal resistance, and  $T_J \text{ Max}$  ( $T_J = T_A + (R_{thJA} P_D)$ ).

Note 2. For supply voltage less than  $\pm 15V$ , the absolute maximum input voltage is equal to the supply voltage.

**Electrical Characteristics:** ( $V_S = \pm 15V$ ,  $0^\circ \leq T_A \leq +70^\circ C$  unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Input Offset Voltage	$V_{IO}$	$R_S \leq 10k\Omega$	$T_A = +25^\circ C$	–	2.0	6.0	mV
				–	–	7.5	mV
Input Offset Voltage Adjustment Range	$V_{IOR}$	$V_S = \pm 20V$ , $T_A = +25^\circ C$		–	$\pm 15$	–	V
Input Offset Current	$I_{IO}$	$T_A = +25^\circ C$		–	20	200	nA
				–	–	300	nA
Input Bias Current	$I_{IB}$	$T_A = +25^\circ C$		–	80	500	nA
				–	–	0.8	$\mu A$
Input Resistance	$r_i$	$V_S = \pm 20V$ , $T_A = +25^\circ C$		0.3	2.0	–	$M\Omega$
Common Mode Input Voltage Range	$V_{ICR}$	$T_A = +25^\circ C$		–	$\pm 12$	$\pm 13$	V
Large Signal Voltage Gain	$A_V$	$V_O = \pm 10V$ , $R_L \geq 2k\Omega$	$T_A = +25^\circ C$	20	200	–	V/mV
				15	–	–	V/mV
Output Voltage Swing	$V_O$	$R_L \geq 10k\Omega$		$\pm 12$	$\pm 14$	–	V
		$R_L \geq 2k\Omega$		$\pm 10$	$\pm 13$	–	V
Output Short-Circuit Current	$I_{OS}$	$T_A = +25^\circ C$		–	25	–	mA
Common-Mode Rejection Ratio	CMRR	$R_S \leq 10k\Omega$ , $V_{CM} = \pm 12V$		70	90	–	dB
Supply Voltage Rejection Ratio	PSRR	$V_S = \pm 20V$ to $\pm 5V$ , $R_S \leq 10k\Omega$		77	96	–	dB
Transient Response Rise Time	$t_{TLH}$	$T_A = +25^\circ C$ , Unity Gain		–	0.3	–	$\mu s$
Transient Response Overshoot	os			–	5	–	%
Transient Response Slew Rate	SR			–	0.5	–	V/ $\mu s$
Supply Current	$I_D$	$T_A = +25^\circ C$		–	1.7	2.8	mA
Power Consumption	$P_C$	$T_A = +25^\circ C$		–	50	85	mW

**Pin Connection Diagram**  
(Front View)



