



ELECTRONICS, INC.

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## NTE941M & NTE941SM Integrated Circuit Operational Amplifier

### **Description:**

The NTE941M and NTE941SM (Surface Mount) are general purpose operational amplifiers in 8-Lead DIP type packages and offer many features which make their 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, $V_S$	±18V
Differential Input Voltage, $V_{ID}$	±30V
Common Mode Input Voltage (Note 2), $V_{ICM}$	±15V
Power Dissipation (Note 1), $P_D$	500mW
Output Short-Circuit Duration, $t_S$	Continuous
Operating Temperature Range, $T_{opr}$	0° to +70°C
Storage Temperature Range, $T_{stg}$	-65° to +150°C
Junction Temperature, $T_J$	+100°C
Lead Temperature (During Soldering, 10sec), $T_L$	+260°C
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$	
NTE941M	+100°C/W
NTE941SM	+195°C/W

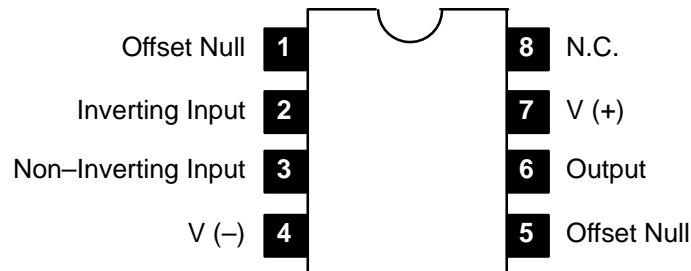
Note 1. For operation at elevated temperatures, these devices must be derated based on thermal resistance, and  $T_J$  Max ( $T_J = T_A + (R_{thJA} P_D)$ ).

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

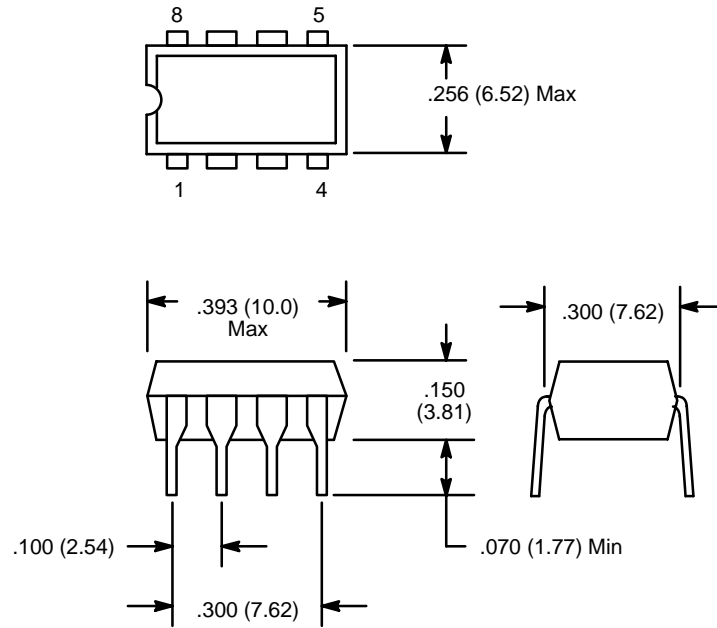
**Electrical Characteristics:** ( $V_S = \pm 15V$ ,  $0^\circ \leq T_A \leq +70^\circ C$  unless otherwise specified)

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	

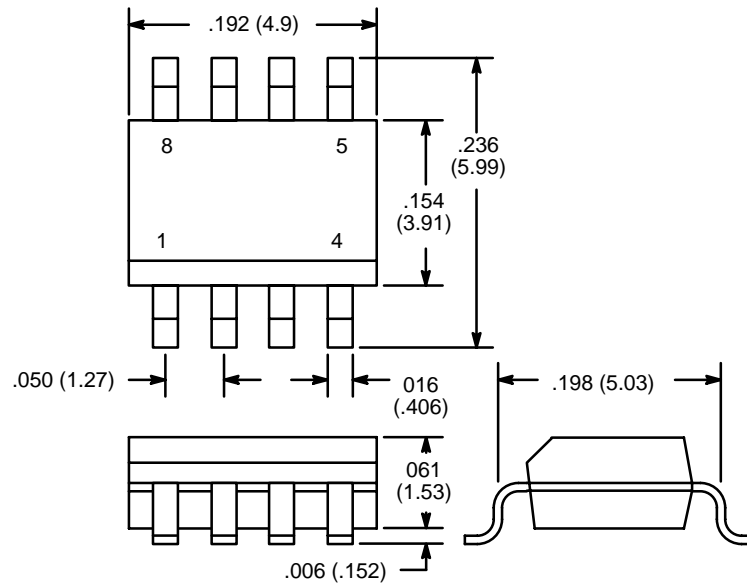
**Pin Connection Diagram**



### NTE941M



### NTE941SM



NOTE: Pin1 on Beveled Edge

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