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## **NTE891M & NTE891SM**

### **Integrated Circuit**

### **Dual Audio Operational Amplifier**

**Description:**

The NTE891M and NTE891SM are dual general purpose operational amplifiers designed with particular emphasis on performance in audio systems. These devices deliver low noise, high speed and wide bandwidth without increasing external components for all closed loop gains and is therefore optimized for all preamp and high level stages in PCM and HiFi systems.

**Features:**

- Wide Dynamic Range
- Low Input Noise Voltage
- High Slew Rate
- High Gain Bandwidth Product
- Wide Power Bandwidth
- Low Distortion
- Low Offset Voltage
- Large Phase Margin
- Available in 8-Lead Mini DIP (NTE891M) and Surface Mount SOIC-8 (NTE891SM)

**Absolute Maximum Ratings:**

Supply Voltage, $V_{CC} - V_{EE}$ .....	36V
Differential Input Voltage (Note 1), $V_{ID}$ .....	$\pm 30V$
Input Voltage Range (Note 1), $V_{IC}$ .....	$\pm 15V$
Power Dissipation (Note 2), $P_D$ .....	500mW
Operating Temperature Range, $T_{opr}$ .....	$-40^{\circ}$ to $+85^{\circ}C$
Storage Temperature Range, $T_{stg}$ .....	$-60^{\circ}$ to $+150^{\circ}C$
Lead Soldering Temperature (10 seconds), $T_L$ .....	$+260^{\circ}C$

Note 1. If supply voltage is less than  $\pm 15V$ , it is equal to supply voltage.

Note 2. This is a permissible value at  $T_A \leq +85^{\circ}C$ .

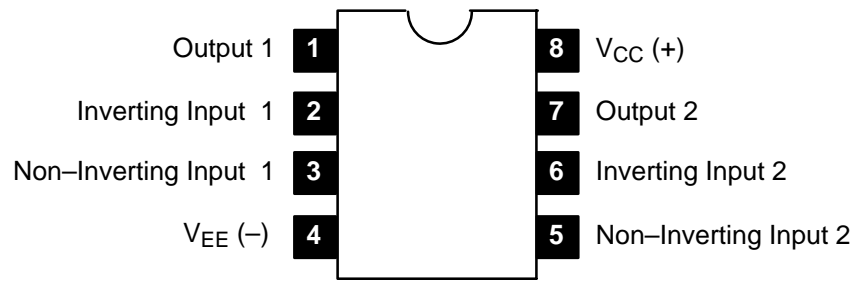
**DC Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_S = \pm 15\text{V}$ , unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Offset Voltage	$V_{OS}$	$R_S = 10\Omega$	–	0.3	5	mV
Input Offset Current	$I_{OS}$		–	10	200	nA
Input Bias Current	$I_B$		–	500	1000	nA
Voltage Gain	$A_V$	$R_L = 2\text{k}\Omega$ , $V_O = \pm 10\text{V}$	90	110	–	dB
Output Voltage Swing	$V_{OM}$	$R_L = 10\text{k}\Omega$	$\pm 12$	$\pm 13.5$	–	V
		$R_L = 2\text{k}\Omega$	$\pm 10$	$\pm 13.4$	–	
Input Common-Mode Range	$V_{CM}$		$\pm 12$	$\pm 14.0$	–	V
Common-Mode Rejection Ratio	CMRR	$V_{IN} = \pm 12\text{V}$	80	100	–	dB
Power Supply Rejection Ratio	PSRR	$V_S = 15\text{V to } 5\text{V}$ , $-15\text{V to } -5\text{V}$	80	100	–	dB
Supply Current	$I_Q$	$V_O = 0\text{V}$ , Both Amps	–	5	8	mA

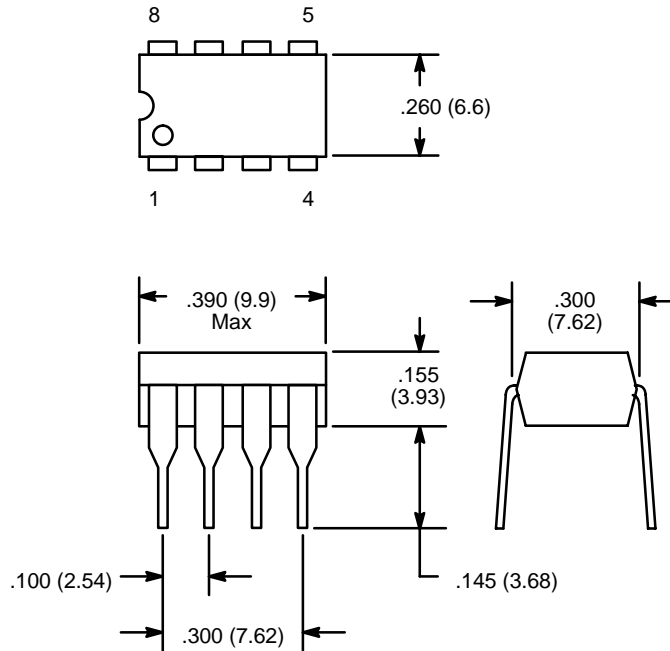
**AC Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_S = \pm 15\text{V}$ ,  $R_L = 2\text{k}\Omega$ , unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Slew Rate	SR	$R_L = 2\text{k}\Omega$	5	7	–	V/ $\mu\text{s}$
Gain Bandwidth Product	GBW	$f = 100\text{kHz}$	10	15	–	MHz
Average Temperature Coefficient of Input Offset Voltage	$\Delta V_{OS}/\Delta T$		–	2	–	$\mu\text{V}/^\circ\text{C}$
Distortion	THD	$R_L = 2\text{k}\Omega$ , $f = 20 \sim 20\text{kHz}$ , $V_{OUT} = 3V_{rms}$ , $A_V = 1$	–	0.002	–	%
Input Referred Noise Voltage	$e_n$	$R_S = 100\Omega$ , $f = 1\text{kHz}$	–	4.5	–	nV/ $\sqrt{\text{Hz}}$
Input Referred Noise Current	$i_n$	$f = 1\text{kHz}$	–	0.7	–	pA/ $\sqrt{\text{Hz}}$
Power Bandwidth	PBW	$V_O = 27V_{pp}$ , $R_L = 2\text{k}\Omega$ , $\text{THD} \leq 1\%$	–	120	–	kHz
Unity Gain Frequency	$f_U$	Open Loop	–	9	–	MHz
Phase Margin	$\phi_M$	Open Loop	–	60	–	deg
Input Referred Cross Talk		$f = 20 \sim 20\text{kHz}$	–	–120	–	dB

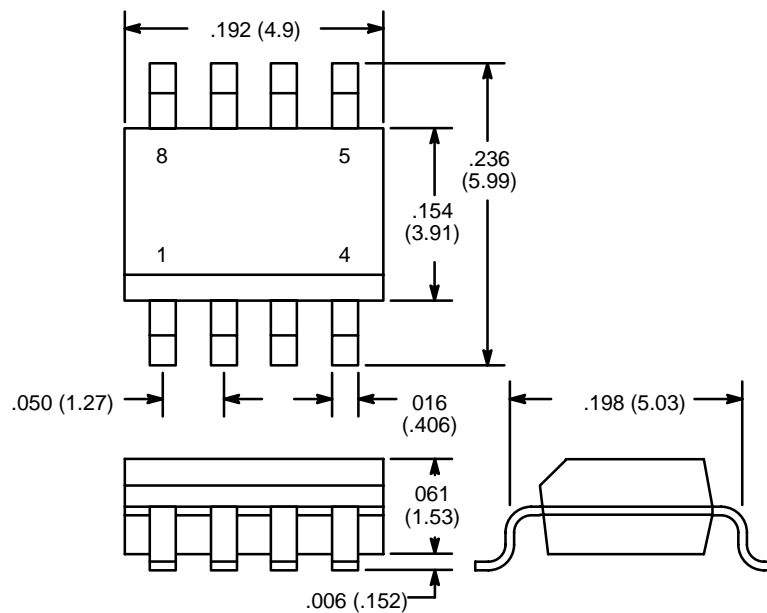
### Pin Connection Diagram



### NTE891M



### NTE891SM



NOTE: Pin1 on Beveled Edge