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## **NTE927D & NTE927SM Integrated Circuit Differential Video Amplifier**

### **Description:**

The NTE927D and NTE927SM are two-stage, differential input, differential output, wide-band video amplifiers. The use of internal series-shunt feedback gives wide band bandwidth with low phase distortion and high gain stability. Emitter-follower outputs provide a high current drive, low impedance capability. Its 120MHz bandwidth and selectable gains of 10, 100, and 400, without need for frequency compensation, make it a very useful circuit for memory element drivers, pulse amplifiers, and wide band gain stages.

### **Features:**

- 120MHz Bandwidth
- 250kΩ Input Resistance
- No Frequency Compensation Required
- Selectable Gains of 10, 100 and 400
- High Common Mode Rejection Ratio at High Frequencies

### **Applications:**

- Magnetic Tape Systems
- Disk File Memories
- Thin and Thick Film Memories
- Woven and Plated Wire Memories
- Wide Band Video Amplifiers

### **Absolute Maximum Ratings:**

Differential Input Voltage	±5V
Common Mode Input Voltage	±6V
Supply Voltage, $V_{CC}$	±8V
Output Current, $I_O$	10mA
Power Dissipation (Note 1), $P_D$	500mW
Junction Temperature, $T_J$	+100°C
Storage Temperature Range, $T_{stg}$	-65° to +150°C
Operating Temperature Range, $T_{opr}$	0° to +70°C
Lead Temperature (Soldering, 10sec), $T_L$	+260°C

Note 1. For operation at elevated temperatures, derate device based on a thermal resistance of +150°C/W junction to ambient or +45°C/W junction to case.

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ , unless otherwise specified,  $V_S = \pm 6\text{V}$ )

Parameter	Test Conditions	Min	Typ	Max	Unit
Differential Voltage Gain Gain 1 (Note 2) Gain 2 (Note 3) Gain 3 (Note 4)	$R_L = 2\text{k}\Omega$ , $V_{\text{OUT}} = 3V_{\text{p-p}}$	250 80 8.0	400 100 10	600 120 12	
Bandwidth Gain 1 Gain 2 Gain 3		– – –	40 90 120	– – –	MHz
Rise Time Gain 1 Gain 2 Gain 3		– – –	10.5 4.5 2.5	– – –	ns
Propagation Delay Gain 1 Gain 2 Gain 3	$V_{\text{OUT}} = 1V_{\text{p-p}}$	– – –	7.5 6.0 3.6	– 10 –	ns
Input Resistance Gain 1 Gain 2 Gain 3		– 10 –	4.0 30 250	– – –	$\text{k}\Omega$
Input Capacitance	Gain 2	–	2.0	–	pF
Input Offset Current		–	0.4	5.0	$\mu\text{A}$
Input Bias Current		–	9.0	30	$\mu\text{A}$
Input Noise Voltage	BW = 1kHz to 10MHz	–	12	–	$\mu\text{V}_{\text{rms}}$
Input Voltage Range		$\pm 1.0$	–	–	V
Common Mode Rejection Ratio Gain 2 Gain 2	$V_{\text{CM}} = \pm 1\text{V}$ , $f \leq 100\text{kHz}$ $V_{\text{CM}} = \pm 1\text{V}$ , $f = 5\text{MHz}$	60 –	86 60	– –	dB
Supply Voltage Rejection Ratio Gain 2	$\Delta V_S = \pm 0.5\text{V}$	50	70	–	dB
Output Offset Voltage Gain 1 Gain 2 and 3	$R_L = \infty$	– –	0.6 0.35	1.5 1.5	V
Output Common Mode Voltage	$R_L = \infty$	2.4	2.9	3.4	V
Output Voltage Swing	$R_L = 2\text{k}$	3.0	4.0	–	
Output Sink Current		2.5	3.6	–	mA
Output Resistance		–	20	–	$\Omega$
Power Supply Current	$R_L = \infty$	–	18	24	mA

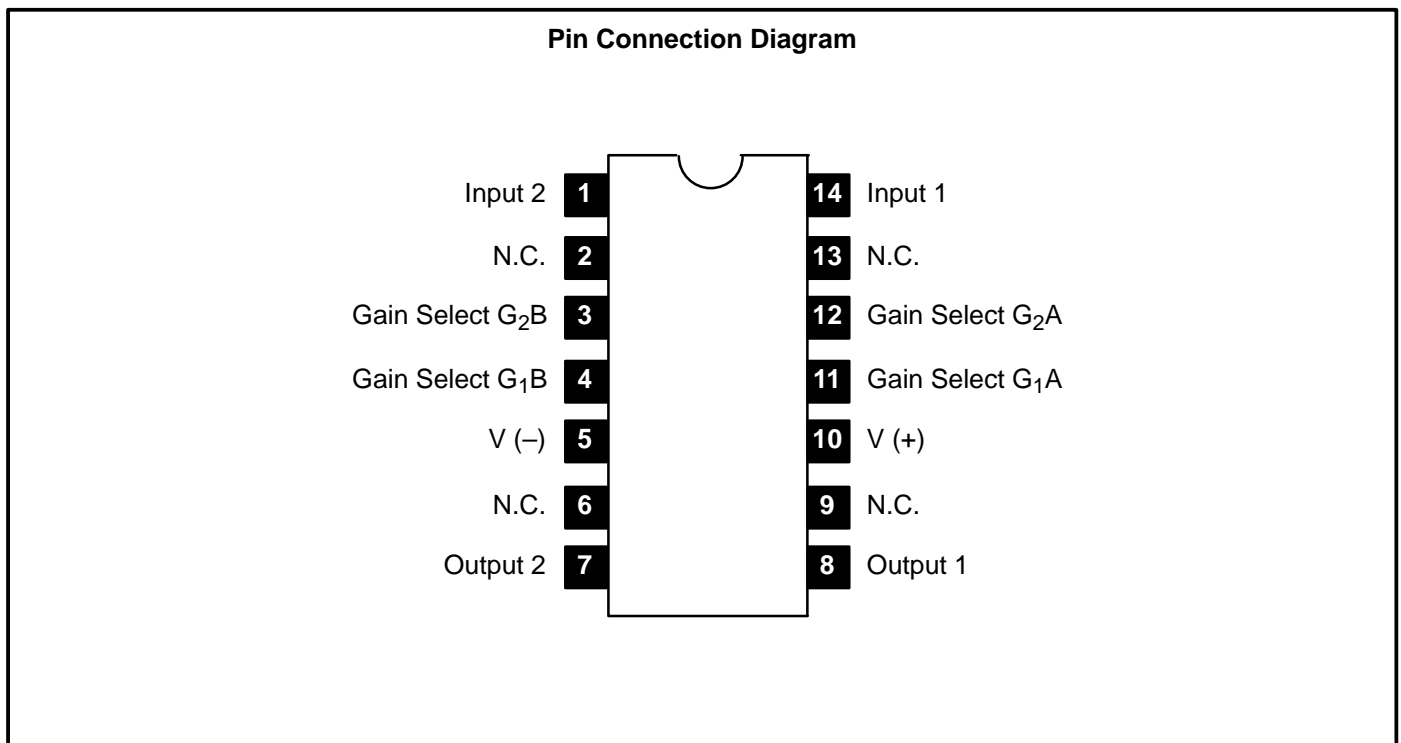
**Electrical Characteristics:** (The following specifications apply for  $0^\circ < T_A < +70^\circ\text{C}$ ,  $V_S = \pm 6\text{V}$ )

Parameter	Test Conditions	Min	Typ	Max	Unit
Differential Voltage Gain Gain 1 Gain 2 Gain 3	$R_L = 2\text{k}\Omega$ , $V_{\text{OUT}} = 3V_{\text{p-p}}$	250 80 8.0	– – –	600 120 12.0	
Input Resistance	Gain 2	8	–	–	$\text{k}\Omega$
Input Offset Current		–	–	6	$\mu\text{A}$
Input Bias Current		–	–	40	$\mu\text{A}$
Input Voltage Range		$\pm 1.0$	–	–	V
Common Mode Rejection Ratio Gain 2	$V_{\text{CM}} = \pm 1\text{V}$ , $f \leq 100\text{kHz}$	50	–	–	dB
Supply Voltage Rejection Ratio Gain 2	$\Delta V_S = \pm 0.5\text{V}$	50	–	–	dB
Output Offset Voltage Gain 1 Gain 2 and 3	$R_L = \infty$	– –	– –	1.5 1.5	V
Output Voltage Swing	$R_L = 2\text{k}$	2.8	–	–	$V_{\text{pp}}$
Output Sink Current		2.5	–	–	mA
Power Supply Current	$R_L = \infty$	–	–	27	mA

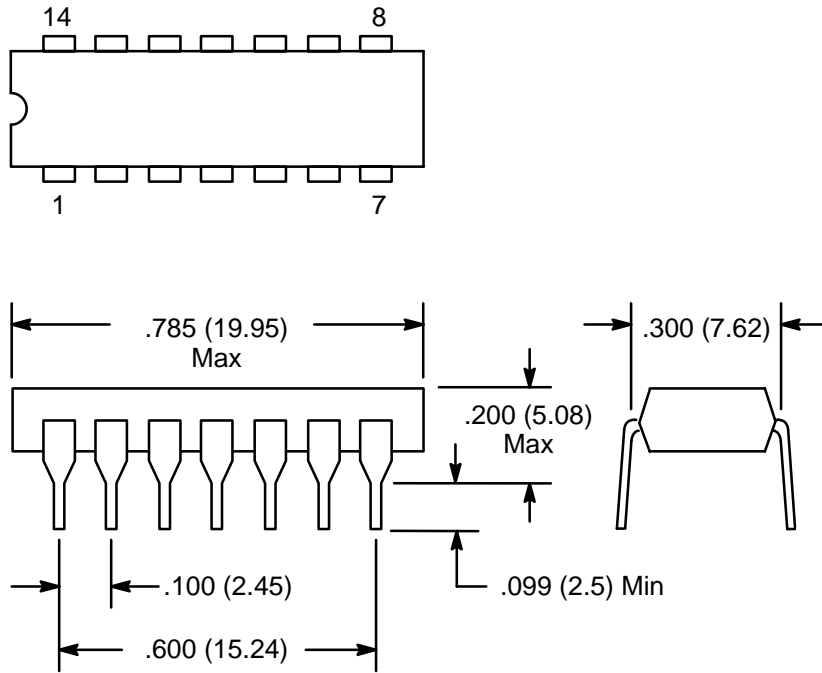
Note 2. Pins G1A and G1B connected together.

Note 3. Pins G2A and G2B connected together.

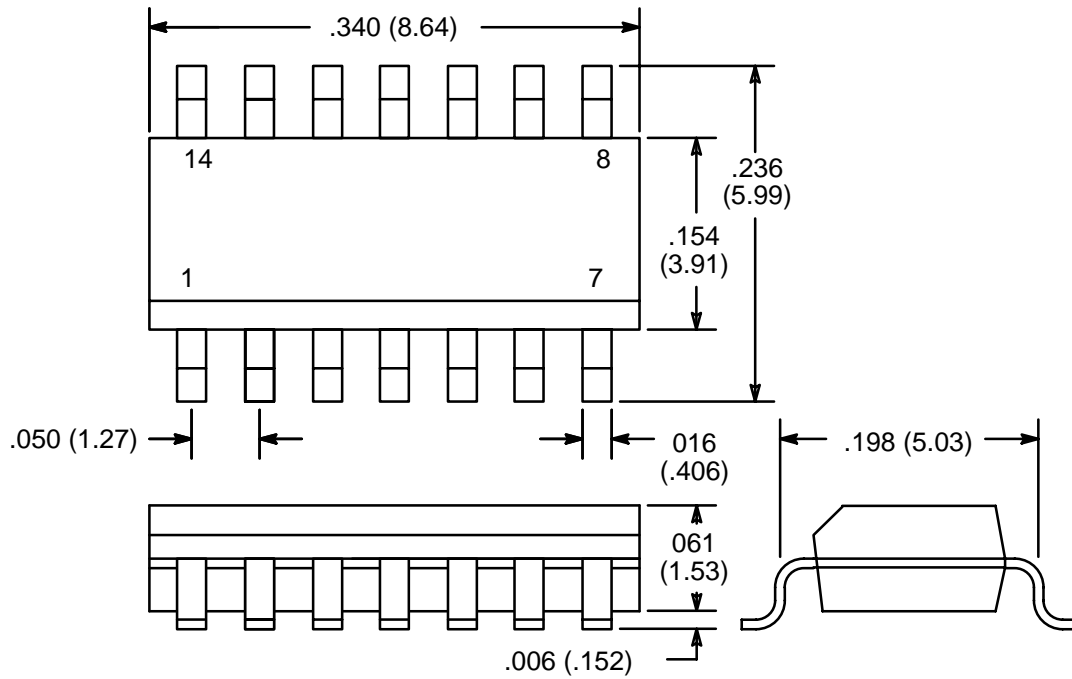
Note 4. Gain select pins open.



### NTE927D



### NTE927SM



NOTE: Pin1 on Beveled Edge