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NTE927 Integrated Circuit Differential Video Amplifier

Description:

The NTE927 is a two-stage, differential input, differential output, wide-band video amplifier. 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 | – – – | k Ω |
| Input Capacitance | Gain 2 | – | 2.0 | – | pF |
| Input Offset Current | | – | 0.4 | 5.0 | μA |
| Input Bias Current | | – | 9.0 | 30 | μA |
| Input Noise Voltage | BW = 1kHz to 10MHz | – | 12 | – | μV_{rms} |
| Input Voltage Range | | ± 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 | – | Ω |
| 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 | μA |
| Input Bias Current | | – | – | 40 | μA |
| Input Voltage Range | | ± 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_{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.



