

LM201A/LM301A

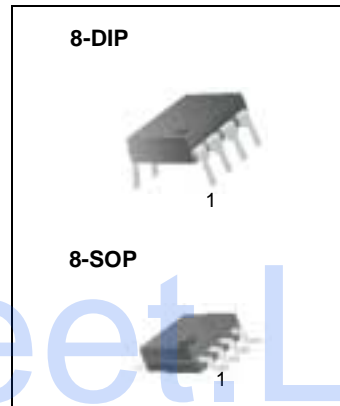
Single Operational Amplifier

Features

- Short circuit protection and latch free operation
- Slew rate of 10V/μs as a summing amplifier
- Class AB output provides excellent linearity
- Low bias current

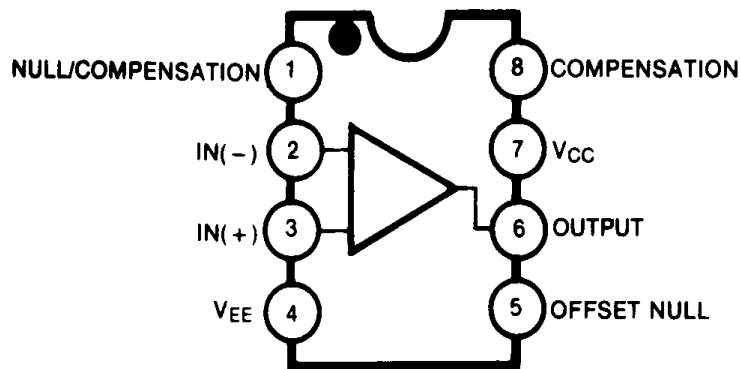
Description

The LM201A and LM301A are general purpose operational amplifiers which are externally phase compensated, permit a choice of operation for optimum high frequency performance at a selected gain: unity gain compensation can be obtained with a single capacitor.

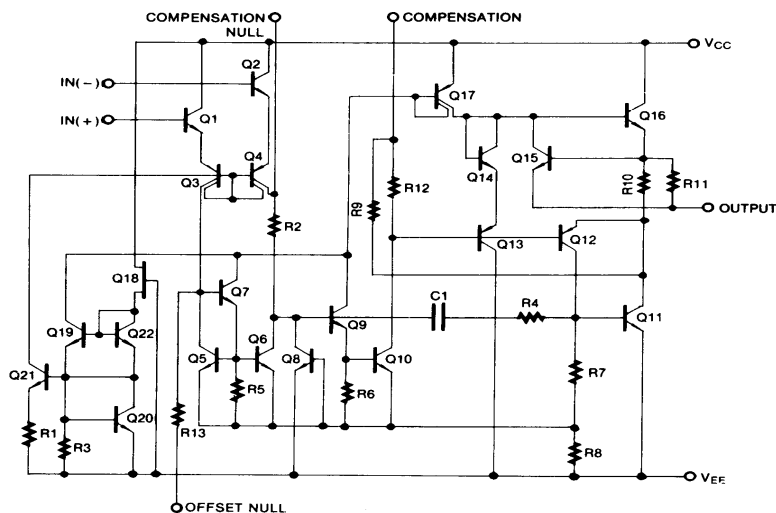


DatasheetLive

Internal Block Diagram



Schematic Diagram



Absolute Maximum Ratings

| Parameter | Symbol | LM201A | LM301A | Unit |
|-------------------------------|----------|------------|--------------|------|
| Supply Voltage | VCC | ±22 | ±18 | V |
| Differential Input Voltage | VI(DIFF) | 30 | 30 | V |
| Input Voltage | VI | ±15 | ±15 | V |
| Output short Circuit Duration | - | Continuous | Continuous | - |
| Power Dissipation | PD | 500 | 500 | mW |
| Operating Temperature Range | TOPR | -25 ~ +85 | 0 ~ +70 | °C |
| Storage Temperature Range | TSTG | -65 ~ +150 | - 65 ~ + 150 | °C |

Electrical Characteristics

($T_A = +25^\circ\text{C}$, $V_{CC} = +15\text{V}$, $V_{EE} = -15\text{V}$, unless otherwise specified)

| Parameter | Symbol | Conditions | LM201A | | | LM301A | | | Unit | |
|---|--------------------------|--|---------------------------|----------|----------|----------|----------|----------|------------------------------|---|
| | | | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| Input Offset Voltage | V_{IO} | $R_S \leq 50\text{K}\Omega$ Note 1 | - | 0.5 | 2.0 | - | 2.0 | 7.5 | mV | |
| | | | - | - | 3 | - | - | 10 | mV | |
| Input Offset Current | I_{IO} | Note 1 | - | 1.5 | 10 | - | 4.5 | 50 | nA | |
| | | | - | - | 20 | - | - | 70 | nA | |
| Input Bias Current | I_{BIAS} | Note 1 | - | 40 | 75 | - | 60 | 250 | nA | |
| | | | - | - | 100 | - | - | 300 | nA | |
| Supply Current | I_{CC} | $V_{CC} = \pm 20\text{V}$ | - | 2.0 | 3.0 | - | - | - | mA | |
| | | $V_{CC} = \pm 15\text{V}$ | - | - | - | - | 2.0 | 3.0 | mA | |
| | | $V_{CC} = \pm 20\text{V}$, $T_A = T_{A(\text{MAX})}$ | - | 1.7 | 2.5 | - | - | - | mA | |
| Large Signal Voltage Gain | G_V | $V_{CC} = \pm 15\text{V}$, $R_L \geq 2\text{K}\Omega$, $V_{O(\text{P-P})} = \pm 10\text{V}$ | 50 | 160 | - | 25 | 160 | - | V/mV | |
| | | Note 1 | 25 | - | - | 15 | - | - | V/mV | |
| Average Temperature Coefficient of Input Offset Voltage (NOTE2) | $\Delta V_{IO}/\Delta T$ | Note 1 | - | 3.0 | 15 | - | 6.0 | 30 | $\mu\text{V}/^\circ\text{C}$ | |
| Average Temperature Coefficient of Input Offset Current (NOTE2) | $\Delta I_{IO}/\Delta T$ | $25^\circ\text{C} \leq T_A \leq T_{A(\text{MAX})}$ | - | 0.01 | 0.1 | - | 0.01 | 0.3 | nA/ $^\circ\text{C}$ | |
| | | $T_{A(\text{MIN})} \leq T_A \leq 25^\circ\text{C}$ | - | 0.02 | 0.2 | - | 0.02 | 0.6 | nA/ $^\circ\text{C}$ | |
| Input Voltage Range | $V_{I(\text{R})}$ | $V_{CC} = \pm 20\text{V}$ Note 1 | ± 15 | - | - | - | - | - | V | |
| | | $V_{CC} = \pm 15\text{V}$ Note 1 | - | - | - | ± 12 | - | - | V | |
| Common-Mode Rejection Ratio | CMRR | $R_S \leq 50\text{K}\Omega$ Note 1 | 80 | 100 | - | 70 | 95 | - | dB | |
| Power Supply Rejection Ratio | PSRR | $R_S \leq 50\text{K}\Omega$ Note 1 | 80 | 100 | - | 70 | 100 | - | dB | |
| Output Voltage Swing | $V_{O(\text{P-P})}$ | $V_{CC} = \pm 15\text{V}$ | $R_L = 10\text{K}\Omega$ | ± 12 | ± 14 | - | ± 12 | ± 14 | - | V |
| | | | $R_L = 2.0\text{K}\Omega$ | ± 10 | ± 13 | - | ± 10 | ± 13 | - | V |
| Input Resistance (NOTE2) | R_I | - | 1.5 | 4.0 | - | 0.5 | 2.0 | - | M Ω | |

Note:

- LM201A: $-25 \leq T_A \leq +85^\circ\text{C}$, LM301A: $0 \leq T_A \leq +70^\circ\text{C}$
- Guaranteed by design.

Typical Performance Characteristics

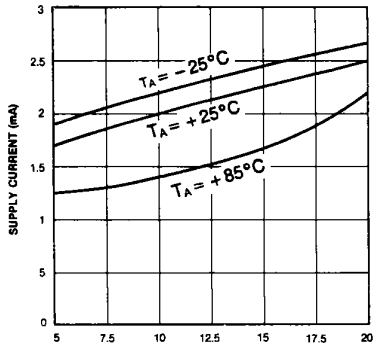


Figure 1. Supply Current

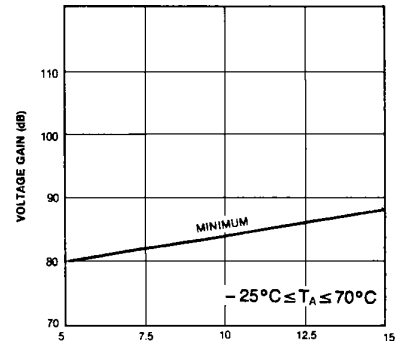


Figure 2. Voltage Gain

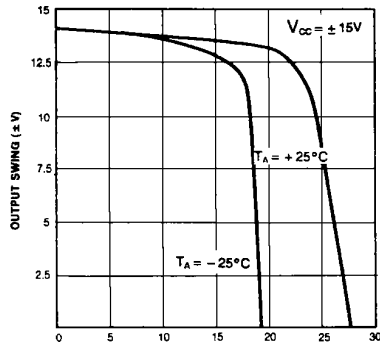


Figure 3. Current Limiting

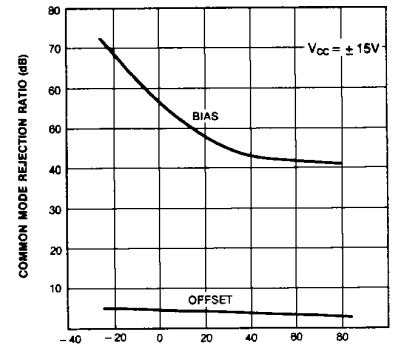


Figure 4. Input Current

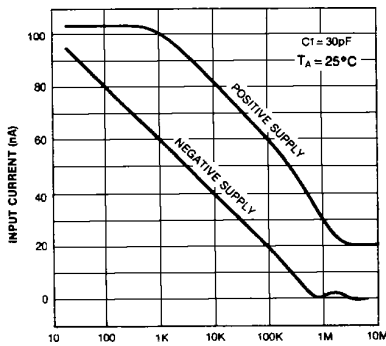


Figure 5. Power Supply Rejection

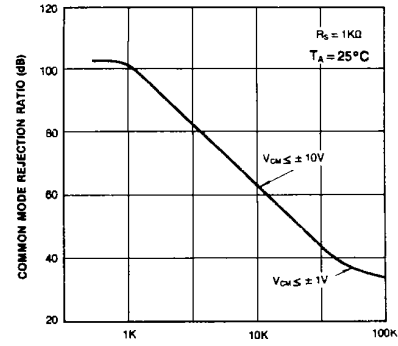


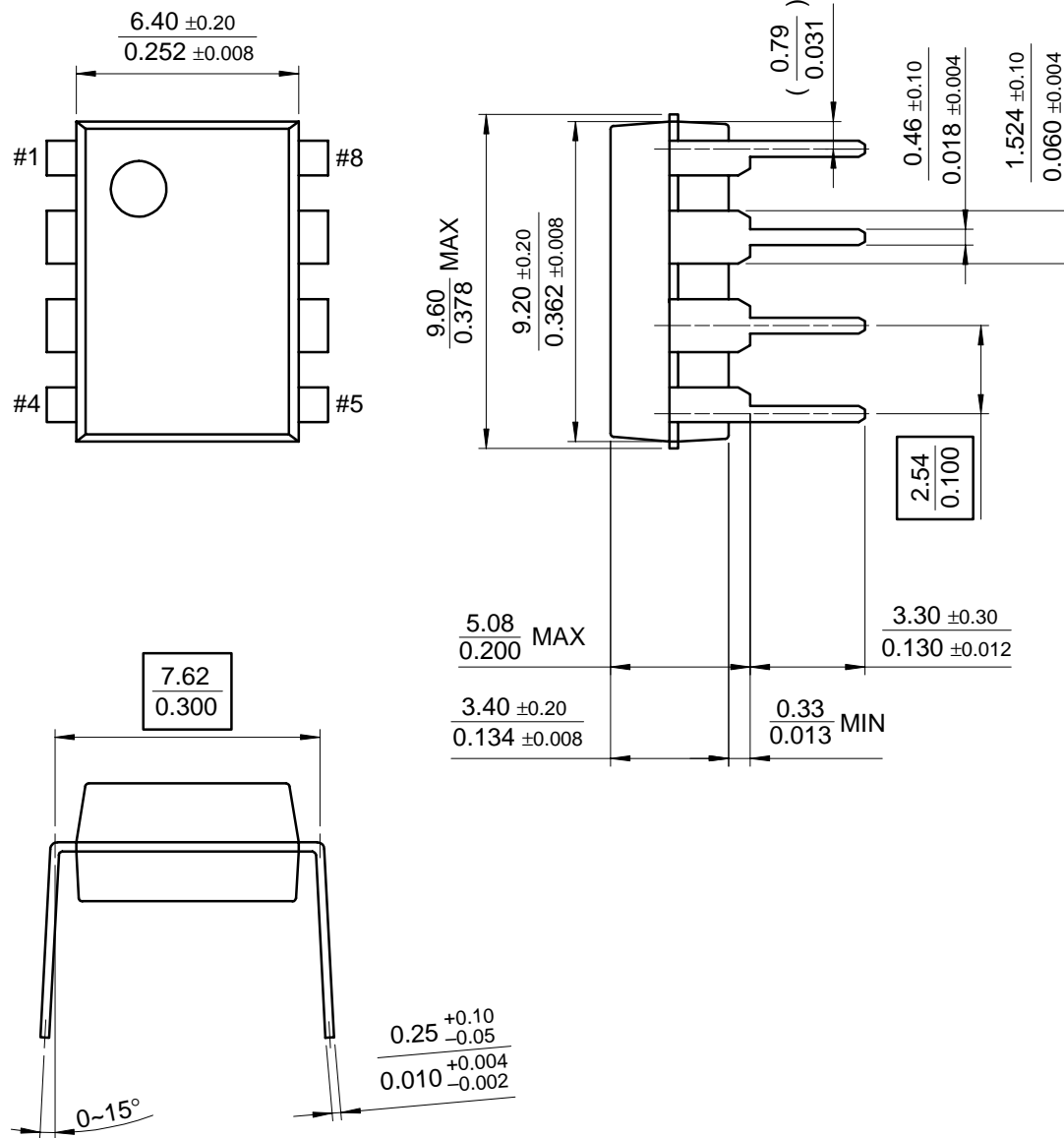
Figure 6. Common Mode Rejection

Mechanical Dimensions

Package

Dimensions in millimeters

8-DIP

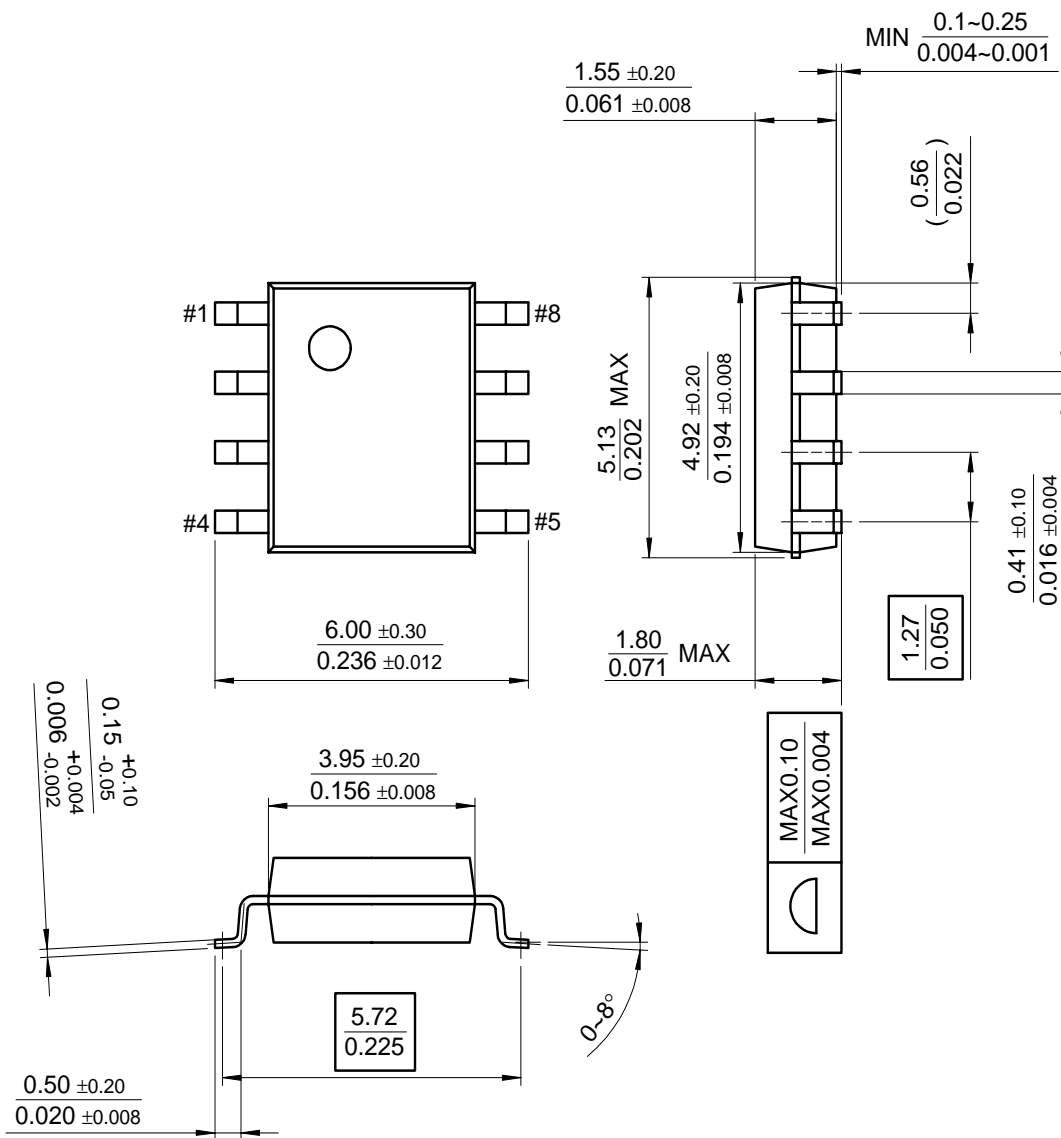


Mechanical Dimensions (Continued)

Package

Dimensions in millimeters

8-SOP



Ordering Information

| Product Number | Package | Operating Temperature |
|----------------|---------|-----------------------|
| LM201AN | 8-DIP | -25 ~ +85 °C |
| LM201AM | 8-SOP | |
| LM301AN | 8-DIP | 0 ~ +70 °C |

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.