

KA301A

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

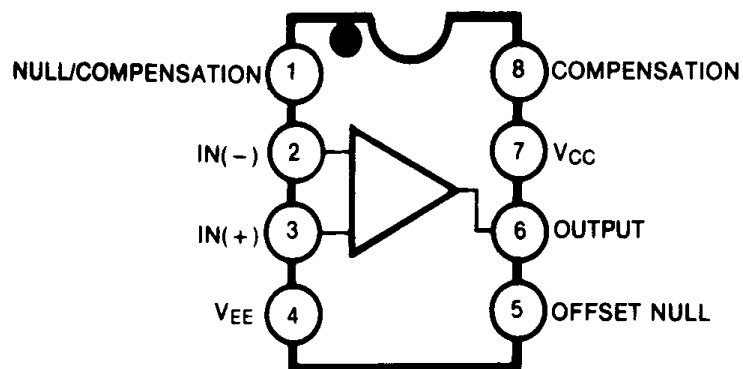
Description

The KA301A is a general purpose operational amplifier which is 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.

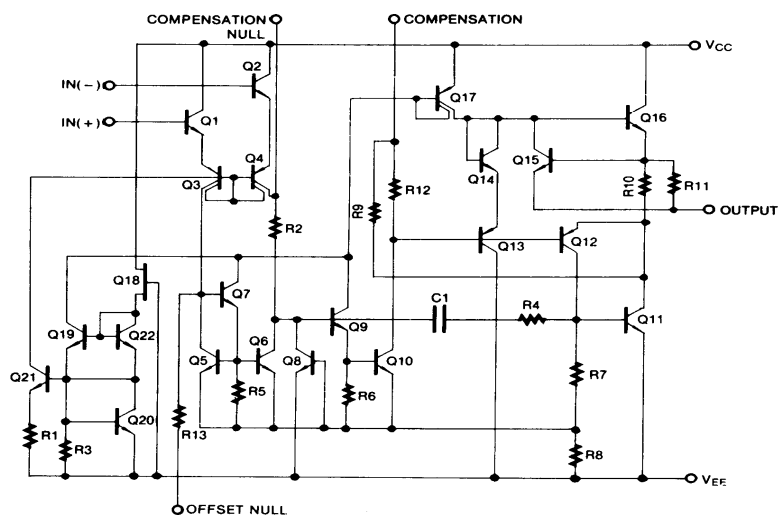
8-DIP



Internal Block Diagram



Schematic Diagram



Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|-------------------------------|----------------------|--------------|------|
| Supply Voltage | V _{CC} | ±18 | V |
| Differential Input Voltage | V _{I(DIFF)} | 30 | V |
| Input Voltage | V _I | ±15 | V |
| Output short Circuit Duration | - | Continuous | - |
| Power Dissipation | P _D | 500 | mW |
| Operating Temperature Range | T _{OPR} | 0 ~ +70 | °C |
| Storage Temperature Range | T _{STG} | - 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 | | KA301A | | | Unit |
|---|--------------------------|---|---------------------------|----------|----------|------|--------------------------------|
| | | | | Min. | Typ. | Max. | |
| Input Offset Voltage | V_{IO} | $R_S \leq 50\text{K}\Omega$ | | - | 2.0 | 7.5 | mV |
| | | | Note 1 | - | - | 10 | mV |
| Input Offset Current | I_{IO} | | | - | 4.5 | 50 | nA |
| | | | Note 1 | - | - | 70 | nA |
| Input Bias Current | I_{BIAS} | | | - | 60 | 250 | nA |
| | | | Note 1 | - | - | 300 | nA |
| Supply Current | I_{CC} | $V_{CC} = \pm 20\text{V}$ | | - | - | - | mA |
| | | $V_{CC} = \pm 15\text{V}$ | | - | 2.0 | 3.0 | mA |
| | | $V_{CC} = \pm 20\text{V}$, $T_A = T_A(\text{MAX})$ | | - | - | - | mA |
| Large Signal Voltage Gain | G_V | $V_{CC} = \pm 15\text{V}$, $R_L \geq 2\text{K}\Omega$, $V_{O(P-P)} = \pm 10\text{V}$ | | 25 | 160 | - | V/mV |
| | | | Note 1 | 15 | - | - | V/mV |
| Average Temperature Coefficient of Input Offset Voltage (NOTE2) | $\Delta V_{IO}/\Delta T$ | Note 1 | | - | 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 | 0.3 | nA/ $^{\circ}\text{C}$ |
| | | $T_A(\text{MIN}) \leq T_A \leq 25^{\circ}\text{C}$ | | - | 0.02 | 0.6 | nA/ $^{\circ}\text{C}$ |
| Input Voltage Range | $V_{I(R)}$ | $V_{CC} = \pm 20\text{V}$ | Note 1 | - | - | - | 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 | 70 | 95 | - | dB |
| Power Supply Rejection Ratio | PSRR | $R_S \leq 50\text{K}\Omega$ | Note 1 | 70 | 100 | - | dB |
| Output Voltage Swing | $V_{O(P,P)}$ | $V_{CC} = \pm 15\text{V}$ | $R_L = 10\text{K}\Omega$ | ± 12 | ± 14 | - | V |
| | | | $R_L = 2.0\text{K}\Omega$ | ± 10 | ± 13 | - | V |
| Input Resistance (NOTE2) | R_I | - | | 0.5 | 2.0 | - | M Ω |

Note:

- KA301A: $0 \leq T_A \leq +70^{\circ}\text{C}$
- Guaranteed by design.

Typical Performance Characteristics

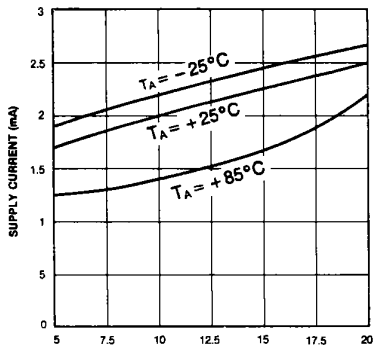


Figure 1. Supply Current

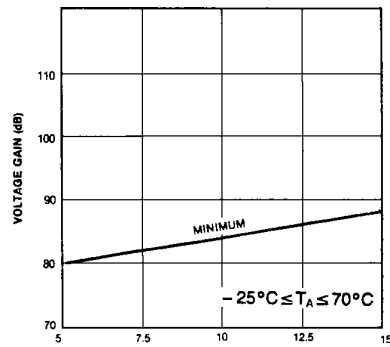


Figure 2. Voltage Gain

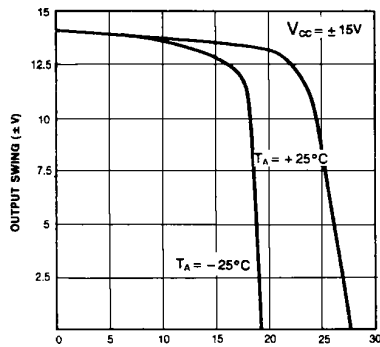


Figure 3. Current Limiting

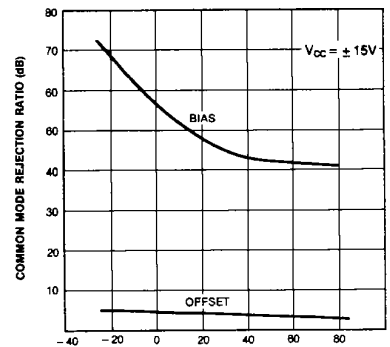


Figure 4. Input Current

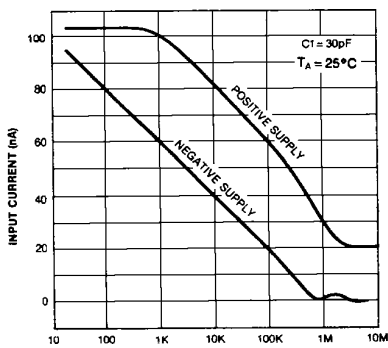


Figure 5. Power Supply Rejection

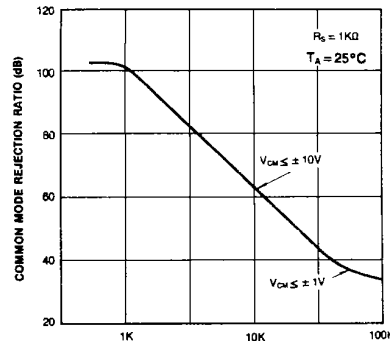


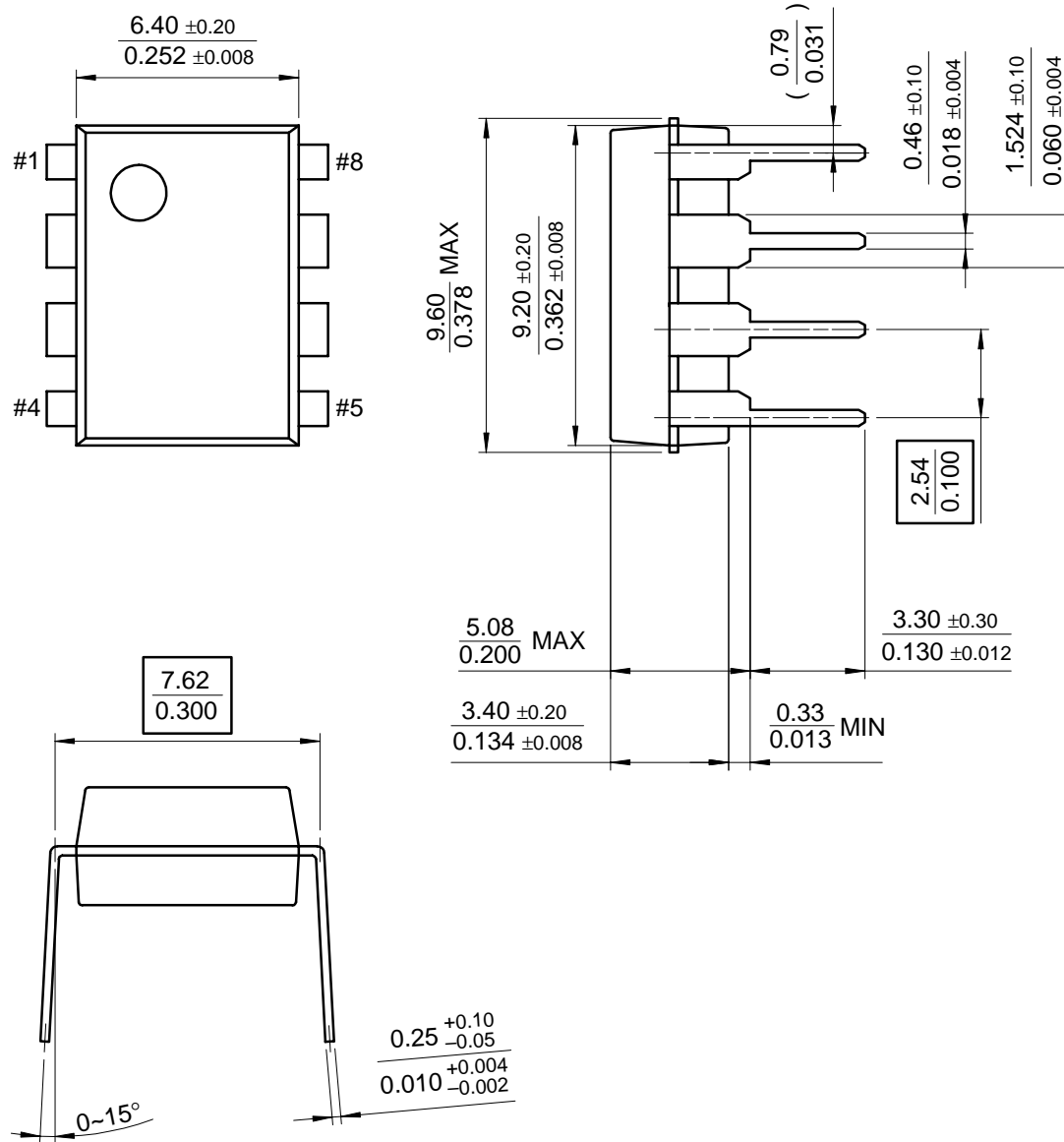
Figure 6. Common Mode Rejection

Mechanical Dimensions

Package

Dimensions in millimeters

8-DIP



Ordering Information

| Product Number | Package | Operating Temperature |
|----------------|---------|-----------------------|
| KA301A | 8-DIP | 0 ~ + 70 °C |

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
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.