

## L272 • L272A Dual Power Operational Amplifier

### General Description

The L272 and L272A are high-power dual operational amplifier provided as a 8-DIP and 16-SOP package. The operational amplifier is designed for low impedance loads and will deliver output current up to 0.7A. The L272A offers tighter specifications for input bias current, input offset voltage and input offset currents. The L272 and L272A can be used in a wide range of applications including power supply, VCR, monitor, servo amplifier, compact disc, etc.

### Features

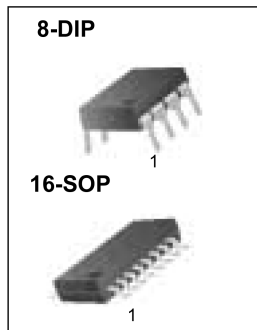
- Output Current up to 0.7A
- Operates at Low Voltage ( $V_{S(MIN)} = 4V$ )
- Low Saturation Voltage ( $I_p = 0.5A, V_O = 1.5V$ )
- Thermal Shutdown (TSD = 160°C) Ground Compatible Inputs
- Ground Compatible Inputs
- Large Common Mode & Differential Mode Range

### Applications

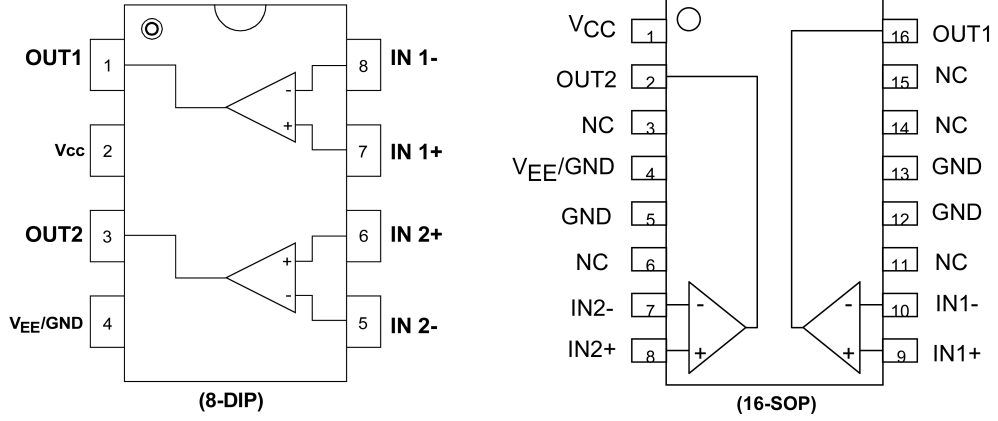
- Servo Amplifier
- Power Supply
- Compact Disc
- VCR
- Monitor

### Ordering Code:

| Product Number | Package | Packing       | Operating Temperature |
|----------------|---------|---------------|-----------------------|
| L272M          | 8-DIP   | Tube          | -25°C to +85°C        |
| L272D2         | 16-SOP  | Tube          |                       |
| L272D2TF       | 16-SOP  | Tape and Reel |                       |
| L272AM         | 8-DIP   | Tube          |                       |
| L272AD2        | 16-SOP  | Tube          |                       |
| L272AD2TF      | 16-SOP  | Tape and Reel |                       |



**Internal Block Diagram**



**Pin Definitions**

| Pin Number |           | Pin Name             | Pin Function Description      |
|------------|-----------|----------------------|-------------------------------|
| 8-DIP      | 16-SOP    |                      |                               |
| 1          | 16        | OUTPUT1              | Amp Output 1                  |
| 2          | 1         | V <sub>CC</sub>      | Positive Supply Voltage       |
| 3          | 2         | OUTPUT2              | Amp Output 2                  |
| 4          | 4/5/12/13 | V <sub>EE</sub> /GND | Negative Supply Voltage (GND) |
| 5          | 7         | INPUT-2              | Amp Negative Input 2          |
| 6          | 8         | INPUT+2              | Amp Positive Input 2          |
| 7          | 9         | INPUT+1              | Amp Positive Input 1          |
| 8          | 10        | INPUT-1              | Amp Negative Input 1          |

| Absolute Maximum Ratings <sup>(Note 1)</sup>       |                |            |                  |
|--|----------------|------------|------------------|
| Parameter  | Symbol         | Value      | Units            |
| Supply Voltage                                     | $V_{CC}$       | 40         | V                |
| Input Voltage                                      | $V_I$          | $V_S$      | V                |
| Differential Input Voltage                         | $V_{I(DIFF)}$  | $\pm V_S$  | V                |
| DC Output Current                                  | $I_O$          | 0.7        | A                |
| Peak Output Current (Non Repetitive)               | $I_P$          | 1          | A                |
| Power Dissipation At: $T_{amb} = 50^\circ\text{C}$ | $P_{tot}$      | 1          | W                |
| Operating Temperature Range                        | $T_{op}$       | -25 to 85  | $^\circ\text{C}$ |
| Storage and Junction Temperature                   | $T_{stg}, T_j$ | -40 to 150 | $^\circ\text{C}$ |

| Thermal Data                                |                |       |                           |
|---|----------------|-------|---------------------------|
| Parameter                                   | Symbol         | Value | Unit                      |
| Thermal Resistance Junction-Ambient Maximum | $R\theta_{ja}$ | 100   | $^\circ\text{C}/\text{W}$ |
| 8-DIP                                       |                |       |                           |
| 16-SOP                                      |                |       |                           |

**Note 1:** The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings.

### Electrical Characteristics (L272)

( $V_{CC} = +12\text{V}$ ,  $V_{EE} = -12\text{V}$ ,  $T_A = 25^\circ\text{C}$  unless otherwise specified)

| Parameter                             | Symbol     | Conditions   | Min          | Typ          | Max          | Units            |
|---------------------------------------|------------|--|--------------|--------------|--------------|------------------|
| Supply Voltage ( $V_{CC} - V_{EE}$ )  | $V_S$      |  | 4.0          |              | 28.0         | V                |
| Supply Current                        | $I_S$      | $V_O = V_{CC}/2$<br>$V_{CC} = 24\text{V}, V_{EE} = 0\text{V}$<br>$V_{CC} = 12\text{V}, V_{EE} = 0\text{V}$ |              | 8.0<br>7.5   | 12.0<br>11.0 | mA<br>mA         |
| Input Bias Current                    | $I_{BIAS}$ |  |              | 0.3          | 2.5          | $\mu\text{A}$    |
| Input Offset Voltage                  | $V_{IO}$   |  |              | 15.0         | 60.0         | mV               |
| Input Offset Current                  | $I_{IO}$   |  |              | 50.0         | 250          | nA               |
| Slew Rate                             | SR         | $V_{IN} = 1V_{pp}$ , Unit Gain   |              | 1.0          |              | V/ $\mu\text{s}$ |
| Gain-Bandwidth Product                | GBW        |  |              | 350          |              | kHz              |
| Input Resistance                      | $R_I$      |  | 500          |              |              | k $\Omega$       |
| Large Signal                          | $G_V$      | $V_{O(pp)} = \pm 10\text{V}$   | 65.0         | 75.0         |              | dB               |
| Input Noise Voltage                   | $e_N$      | $B = 20\text{ kHz}$  |              | 10.0         |              | $\mu\text{V}$    |
| Input Noise Current                   | $I_N$      | $B = 20\text{ kHz}$  |              | 200          |              | pA               |
| Common Mode Rejection Ratio           | CMRR       |  | 60.0         | 75.0         |              | dB               |
| Supply Voltage Rejection Ratio        | PSRR       | $V_{CC} = +15\text{V}, V_{EE} = -15\text{V}$<br>$V_{CC} = +5\text{V}, V_{EE} = -5\text{V}$                 | 54.0         | 62.0         |              | dB               |
| Output Voltage Swing                  | $V_O$      | $V_{CC} = 24\text{V}, V_{EE} = 0\text{V}$<br>$I_P = 0.1\text{A}$<br>$I_P = 0.5\text{A}$                    | 21.0<br>21.0 | 23.0<br>22.5 |              | V<br>V           |
| Channel Separation                    | $C_S$      | $f = 1\text{ kHz}; R_L = 10\Omega, G_V = 30\text{ dB}$   |              | 60.0         |              | dB               |
| Total Harmonic Distortion             | THD        | $f = 1\text{ kHz}; G_V = 1\text{ dB}, R_L = \bullet$   |              | 0.5          |              | %                |
| Thermal Shutdown Temperature (Note 2) | TSD        |  |              | 160          |              | $^\circ\text{C}$ |

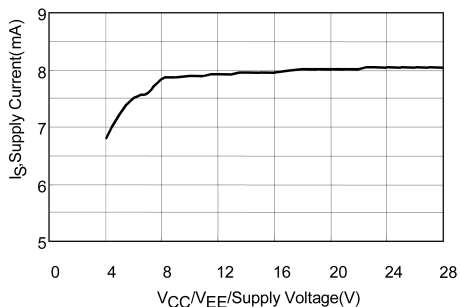
**Note 2:** Guaranteed by design. Not 100% tested in production.

**Electrical Characteristics (L272A)**(V<sub>CC</sub> = +12V, V<sub>EE</sub> = -12V, T<sub>A</sub> = 25°C unless otherwise specified)

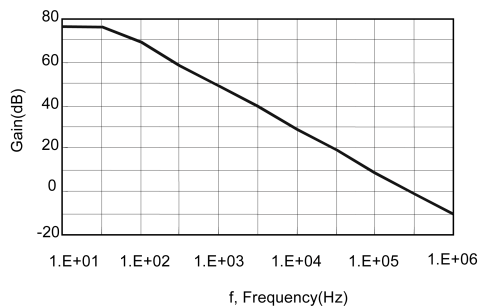
| Parameter   | Symbol            | Conditions  | Min          | Typ          | Max          | Units    |
|---|-------------------|---|--------------|--------------|--------------|----------|
| Supply Voltage (V <sub>CC</sub> - V <sub>EE</sub> ) | V <sub>S</sub>    |   | 4.0          |              | 28.0         | V        |
| Supply Current                                      | I <sub>S</sub>    | V <sub>O</sub> = V <sub>CC</sub> /2<br>V <sub>CC</sub> = 24V, V <sub>EE</sub> = 0V<br>V <sub>CC</sub> = 12V, V <sub>EE</sub> = 0V |              | 8.0<br>7.5   | 12.0<br>11.0 | mA<br>mA |
| Input Bias Current                                  | I <sub>BIAS</sub> |   |              | 0.1          | 1.0          | μA       |
| Input Offset Voltage                                | V <sub>IO</sub>   |   |              | 7.0          | 30.0         | mV       |
| Input Offset Current                                | I <sub>IO</sub>   |   |              | 20.0         | 100          | nA       |
| Slew Rate   | SR                | V <sub>IN</sub> = 1V <sub>PP</sub> , Unit Gain  |              | 1.0          |              | V/μs     |
| Gain-Bandwidth Product                              | GBW               |   |              | 350          |              | kHz      |
| Input Resistance                                    | R <sub>I</sub>    |   | 500          |              |              | kΩ       |
| Large Signal  | G <sub>V</sub>    | V <sub>O(pp)</sub> = ± 10V  | 65.0         | 75.0         |              | dB       |
| Input Noise Voltage                                 | e <sub>N</sub>    | B = 20 kHz  |              | 10.0         |              | μV       |
| Input Noise Current                                 | I <sub>N</sub>    | B = 20 kHz  |              | 200          |              | pA       |
| Common Mode Rejection Ratio                         | CMRR              |   | 60.0         | 75.0         |              | dB       |
| Supply Voltage Rejection Ratio                      | PSRR              | V <sub>CC</sub> = +15V, V <sub>EE</sub> = -15V<br>V <sub>CC</sub> = +5V, V <sub>EE</sub> = -5V                                    | 54.0         | 62.0         |              | dB       |
| Output Voltage Swing                                | V <sub>O</sub>    | V <sub>CC</sub> = 24V, V <sub>EE</sub> = 0V<br>I <sub>P</sub> = 0.1A<br>I <sub>P</sub> = 0.5A                                     | 21.0<br>21.0 | 23.0<br>22.5 |              | V<br>V   |
| Channel Separation                                  | C <sub>S</sub>    | f = 1 kHz; R <sub>L</sub> = 10Ω, G <sub>V</sub> = 30 dB   |              | 60.0         |              | dB       |
| Total Harmonic Distortion                           | THD               | f = 1 kHz; G <sub>V</sub> = 1dB, R <sub>L</sub> = •   |              | 0.5          |              | %        |
| Thermal Shutdown Temperature (Note 2)               | TSD               |   |              | 160          |              | °C       |

**Note 3:** Guaranteed by design. Not 100% tested in production.

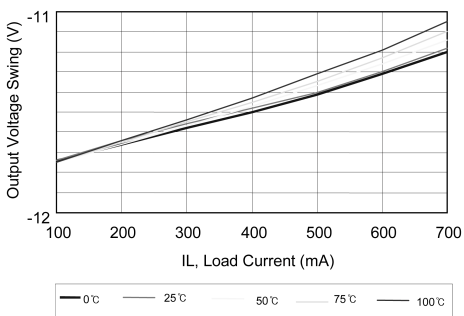
**Typical Performance Characteristics**



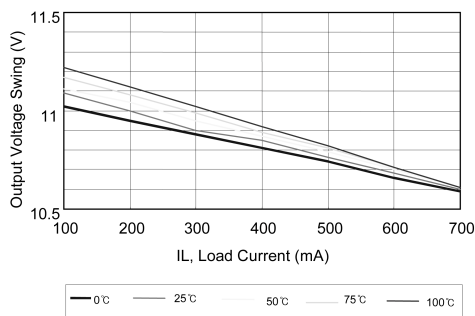
**FIGURE 1. Supply Voltage vs. Supply Current with No Load**



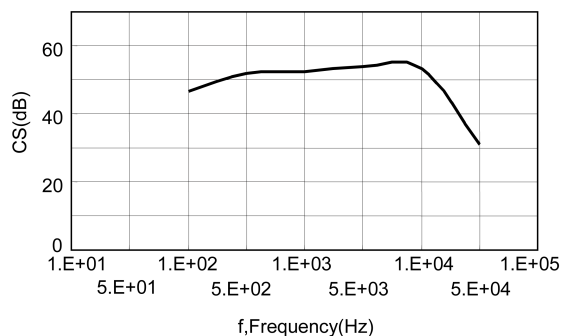
**FIGURE 2. Open Loop Voltage Gain**



**FIGURE 3. Output voltage Swing vs. Load Current**

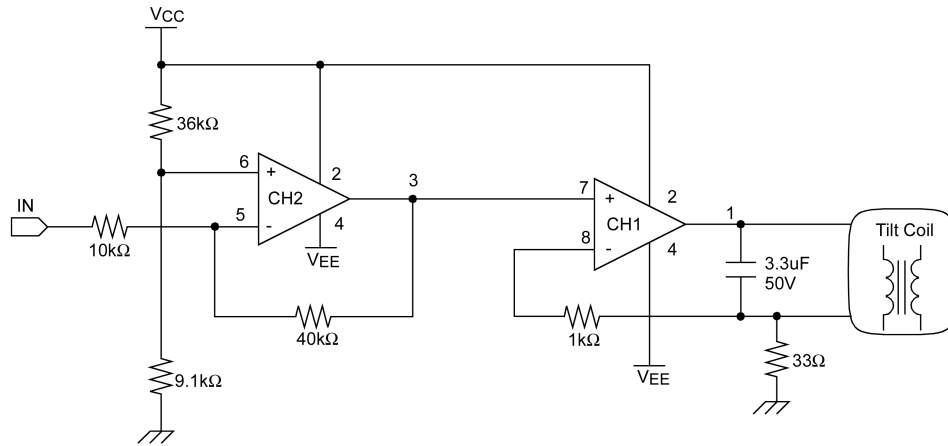


**FIGURE 4. Output Voltage Swing vs. Load Current**



**FIGURE 5. Channel Separation vs. Frequency**

**Application**



<Tilt Coil Current Circuit in Monitor, 8-DIP Package>

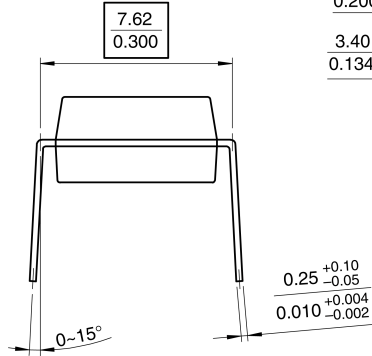
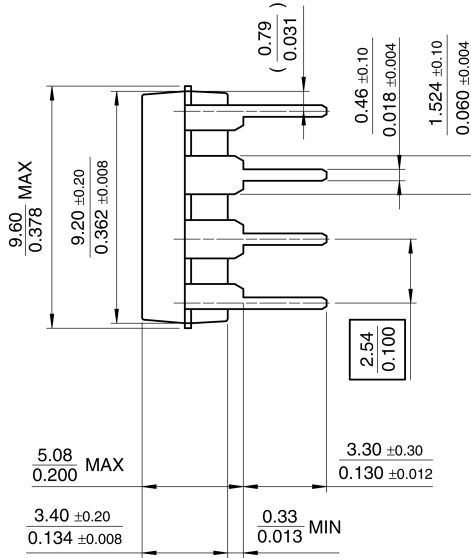
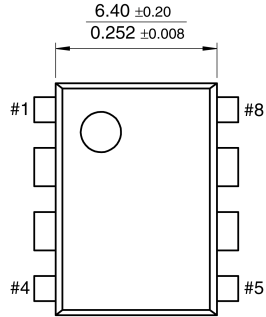
**Physical Dimensions** inches (millimeters) unless otherwise noted

L272 • L272A

Package

Dimensions in millimeters

**8-DIP**

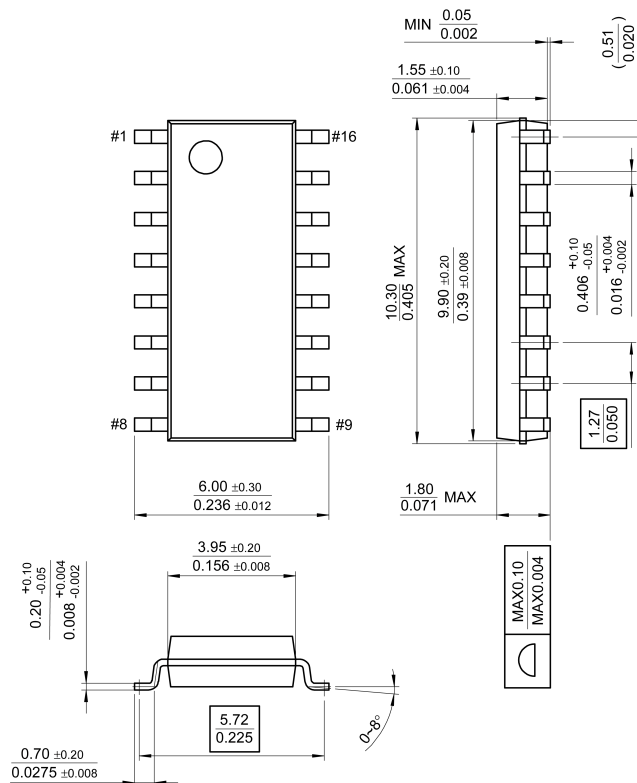


**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)

Package

Dimensions in millimeters

**16-SOP**



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