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L272 / L272A

Dual Power Operational Amplifier

Features

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

Applications

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

Description

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



Ordering Information

| Part Number | Operating Temperature Range | Top Mark | Package | Packing Method |
|-------------|-----------------------------|----------|---------|----------------|
| L272M | -40 to +85°C | L272M | MDIP 8L | Rail |
| L272AM | | L272AM | MDIP 8L | Rail |

Block Diagram

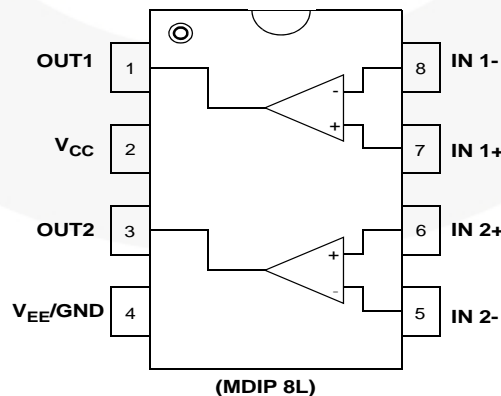


Figure 1. Block Diagram

Pin Descriptions

| Pin Number | Name | Description |
|------------|---------|-------------------------------|
| 1 | OUTPUT1 | Amplifier Output 1 |
| 2 | VCC | Positive Supply Voltage |
| 3 | OUTPUT2 | Amplifier Output 2 |
| 4 | VEE/GND | Negative Supply Voltage (GND) |
| 5 | INPUT-2 | Amplifier Negative Input 2 |
| 6 | INPUT+2 | Amplifier Positive Input 2 |
| 7 | INPUT+1 | Amplifier Positive Input 1 |
| 8 | INPUT-1 | Amplifier Negative Input 1 |

Absolute Maximum Ratings⁽¹⁾

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|----------------|--|------------|------------------|
| V_{CC} | Supply Voltage | 40 | V |
| V_I | Input Voltage | V_S | V |
| $V_{I(DIFF)}$ | Differential Input Voltage | $\pm V_S$ | V |
| I_O | DC Output Current | 0.7 | A |
| I_P | Peak Output Current (Non-Repetitive) | 1 | A |
| T_{OP} | Operating Temperature Range | -40 to 85 | $^\circ\text{C}$ |
| T_{STG}, T_J | Storage and Junction Temperature Range | -40 to 150 | $^\circ\text{C}$ |

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.

Thermal Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|-----------------|--|-------|--------------------|
| P_D | Total Power Dissipation ($T_A = 50^\circ\text{C}$) | 1 | W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 100 | $^\circ\text{C/W}$ |

Electrical Characteristics (L272)

$V_{CC} = +12\text{ V}$, $V_{EE} = -12\text{ V}$; Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------|---|--|------|------|------|------------------|
| V_S | Supply Voltage ($V_{CC} - V_{EE}$) | | 4 | | 28 | V |
| I_S | Supply Current | $V_O = V_{CC}/2$, $V_{CC} = 24\text{ V}$, $V_{EE} = 0\text{ V}$ | | 8.0 | 12.0 | mA |
| | | $V_O = V_{CC}/2$, $V_{CC} = 12\text{ V}$, $V_{EE} = 0\text{ V}$ | | 7.5 | 11.0 | |
| I_{BIAS} | Input Bias Current | | | 0.3 | 2.5 | μA |
| V_{IO} | Input Offset Voltage | | | 15 | 60 | mV |
| I_{IO} | Input Offset Current | | | 50 | 250 | nA |
| SR | Slew Rate | $V_{IN} = 1V_{PP}$, Unit Gain | | 1 | | V/ μs |
| GBW | Gain-Bandwidth Product | | | 350 | | kHz |
| R_I | Input Resistance | | 500 | | | k Ω |
| G_V | Large-Signal Voltage Gain | $V_{O(pp)} = \pm 10\text{ V}$ | 65 | 75 | | dB |
| e_N | Input Noise Voltage | $B = 20\text{ kHz}$ | | 10 | | μV |
| I_N | Input Noise Current | $B = 20\text{ kHz}$ | | 200 | | pA |
| CMRR | Common Mode Rejection Ratio | | 60 | 75 | | dB |
| PSRR | Supply Voltage Rejection Ratio | $V_{CC} = +15\text{ V}$, $V_{EE} = -15\text{ V}$ $V_{CC} = +5\text{ V}$, $V_{EE} = -5\text{ V}$ | 54 | 62 | | dB |
| V_O | Output Voltage Swing | $V_{CC} = 24\text{ V}$, $V_{EE} = 0\text{ V}$, $I_P = 0.1\text{ A}$ | 21.0 | 23.0 | | V |
| | | $V_{CC} = 24\text{ V}$, $V_{EE} = 0\text{ V}$, $I_P = 0.5\text{ A}$ | 21.0 | 22.5 | | |
| C_S | Channel Separation | $f = 1\text{ kHz}$, $R_L = 10\ \Omega$, $G_V = 30\text{ dB}$ | | 60 | | dB |
| THD | Total Harmonic Distortion | $f = 1\text{ kHz}$, $G_V = 1\text{ dB}$, $R_L = \infty$ | | 0.5 | | % |
| TSD | Thermal Shutdown Temperature ⁽²⁾ | | | 160 | | $^\circ\text{C}$ |

Note:

2. Guaranteed by design; not 100% tested in production.

Electrical Characteristics (L272A)

$V_{CC} = +12\text{ V}$, $V_{EE} = -12\text{ V}$; Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------|---|--|------|------|------|------------------|
| V_S | Supply Voltage ($V_{CC} - V_{EE}$) | | 4 | | 28 | V |
| I_S | Supply Current | $V_O = V_{CC}/2$ $V_{CC} = 24\text{ V}$, $V_{EE} = 0\text{ V}$ | | 8.0 | 12.0 | mA |
| | | $V_O = V_{CC}/2$, $V_{CC} = 12\text{ V}$, $V_{EE} = 0\text{ V}$ | | 7.5 | 11.0 | mA |
| I_{BIAS} | Input Bias Current | | | 0.1 | 1.0 | μA |
| V_{IO} | Input Offset Voltage | | | 7 | 30 | mV |
| I_{IO} | Input Offset Current | | | 20 | 100 | nA |
| SR | Slew Rate | $V_{IN} = 1V_{PP}$, Unit Gain | | 1 | | V/ μs |
| GBW | Gain-Bandwidth Product | | | 350 | | kHz |
| R_I | Input Resistance | | 500 | | | k Ω |
| G_V | Large-Signal Voltage Gain | $V_{O(pp)} = \pm 10\text{ V}$ | 65 | 75 | | dB |
| e_N | Input Noise Voltage | $B = 20\text{ kHz}$ | | 10 | | μV |
| I_N | Input Noise Current | $B = 20\text{ kHz}$ | | 200 | | pA |
| CMRR | Common Mode Rejection Ratio | | 60 | 75 | | dB |
| PSRR | Supply Voltage Rejection Ratio | $V_{CC} = +15\text{ V}$, $V_{EE} = -15\text{ V}$ $V_{CC} = +5\text{ V}$, $V_{EE} = -5\text{ V}$ | 54 | 62 | | dB |
| V_O | Output Voltage Swing | $V_{CC} = 24\text{ V}$, $V_{EE} = 0\text{ V}$, $I_p = 0.1\text{ A}$ | 21.0 | 23.0 | | V |
| | | $V_{CC} = 24\text{ V}$, $V_{EE} = 0\text{ V}$, $I_p = 0.5\text{ A}$ | 21.0 | 22.5 | | V |
| C_S | Channel Separation | $f = 1\text{ kHz}$, $R_L = 10\ \Omega$, $G_V = 30\text{ dB}$ | | 60 | | dB |
| THD | Total Harmonic Distortion | $f = 1\text{ kHz}$, $G_V = 1\text{ dB}$, $R_L = \infty$ | | 0.5 | | % |
| TSD | Thermal Shutdown Temperature ⁽³⁾ | | | 160 | | $^\circ\text{C}$ |

Note:

3. Guaranteed by design; not 100% tested in production.

Typical Performance Characteristics

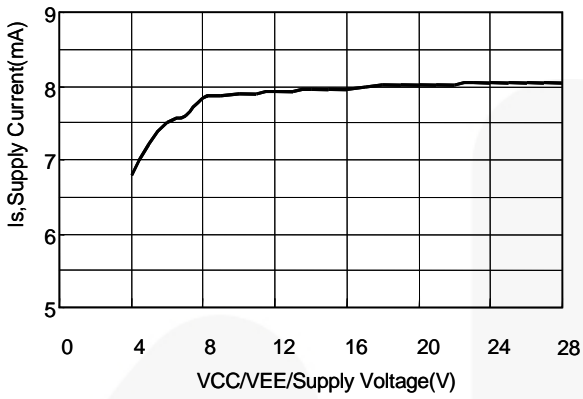


Figure 2. Supply Voltage vs. Supply Current with No Load



Figure 3. Open-Loop Voltage Gain

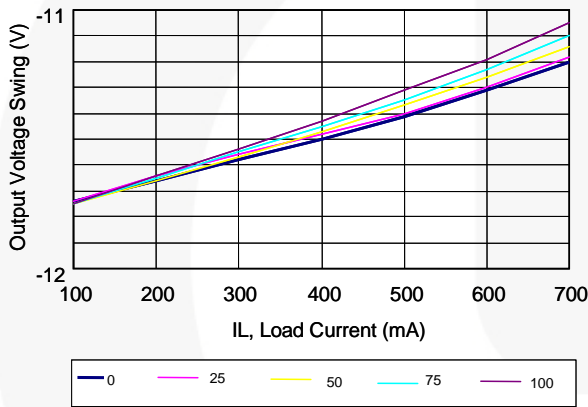


Figure 4. Output Voltage Swing vs. Load Current

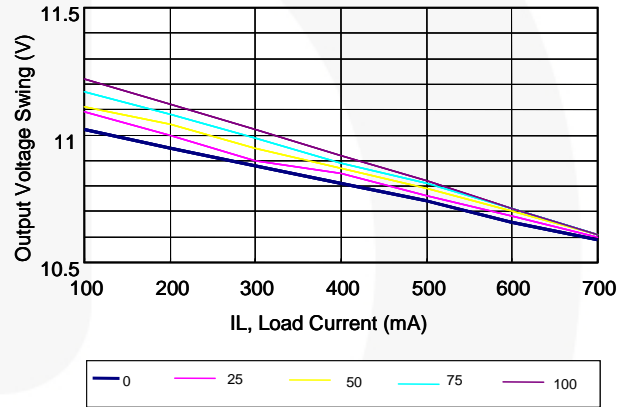


Figure 5. Output Voltage Swing vs. Load Current

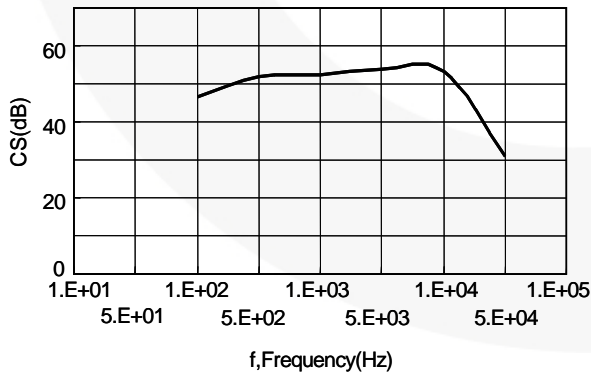


Figure 6. Channel Separation vs. Frequency

Applications

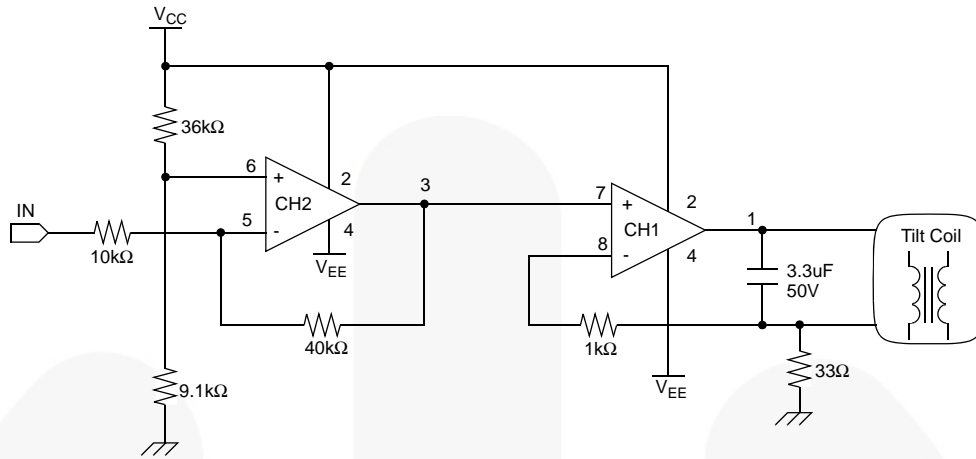
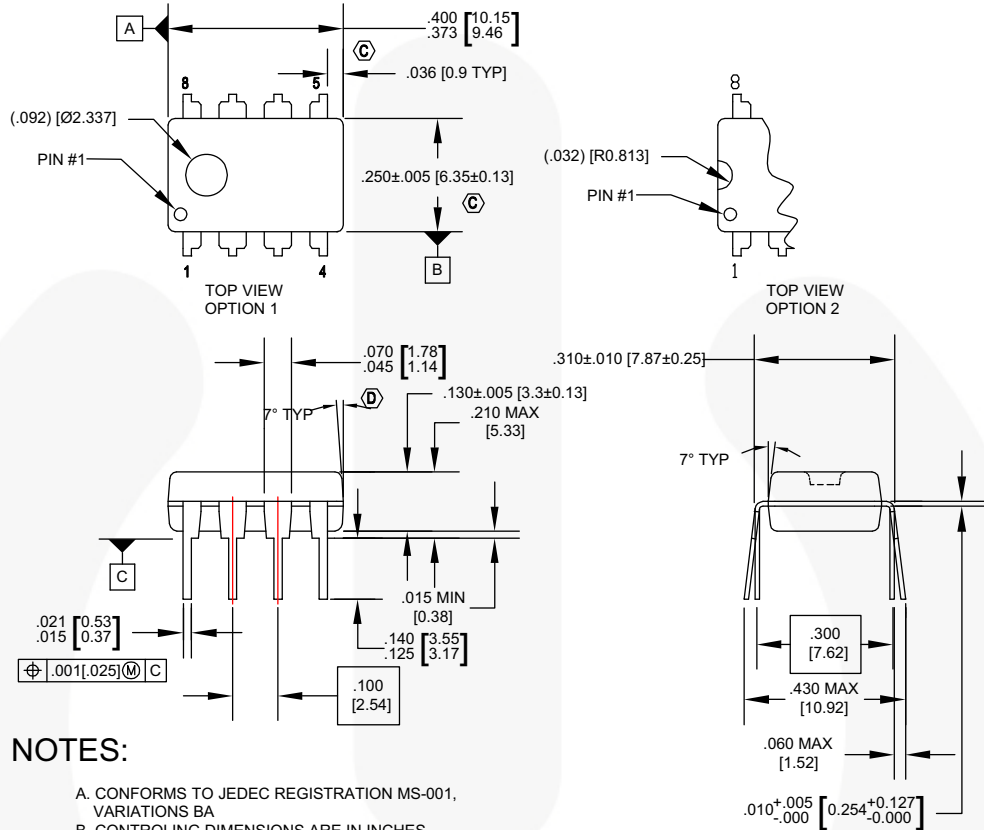


Figure 7. Tilt Coil, Current-Control Circuit in Monitor



Physical Dimensions

MDIP 8L



NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MS-001, VARIATIONS BA
- B. CONTROLLING DIMENSIONS ARE IN INCHES
REFERENCE DIMENSIONS ARE IN MILLIMETERS
- C. DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
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- D. DOES NOT INCLUDE DAMBAR PROTRUSIONS.
DAMBAR PROTRUSIONS SHALL NOT EXCEED .010 INCHES OR 0.25MM.
- E. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.

N08EREVG

Figure 8. 8-LEAD, MDIP, JEDEC MS-001, .300-INCH WIDE

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