

## DESCRIPTION

The TL072CDR-CN is a high speed JFET input dual operational amplifiers incorporating Well matched, high-voltage JFET and bipolar transistors in a monolithic integrated circuit.

The device features high slew rates, low input bias and offset current, and low offset voltage temperature coefficients.

The TL072CDR-CN is available in a SOP8 package.

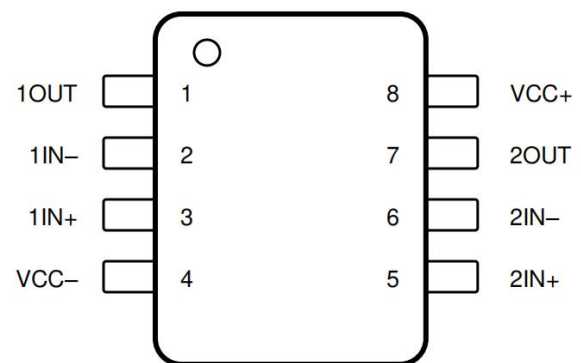
## FEATURES

- Low Supply Current: 1.4mA per Amp
- Low Input Bias Current: 200pA (Typ)
- Low Input Offset Current: 50pA (Typ)
- High slew rate: 13V/ $\mu$ s (Typ)
- Wide Gain Bandwidth: 3.0 MHz

## APPLICATIONS

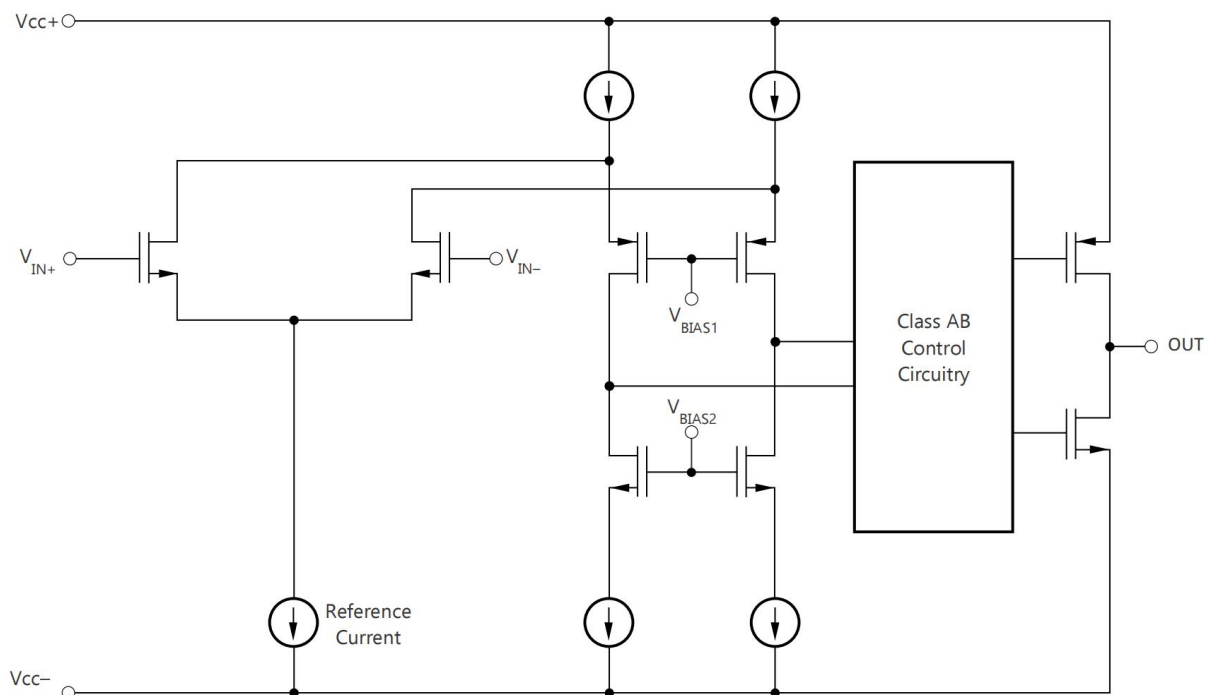
- Motor drives
- Pro audio mixers
- Battery test equipment
- Mobile electronics

## Pin Configuration



SOP8

## Simplified Schematic (Each Amplifier)



## Absolute Maximum Ratings

Over operating free-air temperature range (unless otherwise noted)

| PARAMETER                          | MIN | MAX  | UNIT |
|------------------------------------|-----|------|------|
| Supply Voltage                     |     | ±18  | V    |
| Input voltage                      |     | ±15  | V    |
| Differential input voltage         |     | ±30  | V    |
| Maximum Junction Temperature       |     | +150 | °C   |
| Storage Temperature Range          | -65 | +150 | °C   |
| Lead Temperature(soldering, 10sec) |     | +260 | °C   |

## Recommended Operating Conditions

Over operating free-air temperature range (unless otherwise noted)

| PARAMETER                   | MIN             | TYP | MAX             | UNIT |
|-----------------------------|-----------------|-----|-----------------|------|
| Supply Voltage              | $V_{CC+}$       | +5  | +15             | V    |
|                             | $V_{CC-}$       | -5  | -15             | V    |
| Common-mode voltage         | $(V_{CC-}) + 4$ |     | $(V_{CC+}) - 4$ | V    |
| Operating Temperature Range | -20             | +25 | +85             | °C   |

## Electrical Characteristics

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

| PARAMETER                       | SYMBOL    | CONDITIONS                                       | MIN | TYP       | MAX | UNIT |
|---------------------------------|-----------|--------------------------------------------------|-----|-----------|-----|------|
| Supply Current (Each Amplifier) | $I_{CC}$  | $V_O=0\text{V}$ , $R_L=\infty$                   |     | 1.4       | 2.8 | mA   |
| Input Offset Voltage            | $V_{IO}$  | $V_O=0\text{V}$                                  |     | ±2        | ±6  | mV   |
| Input Offset Current            | $I_{IO}$  | $V_O=0\text{V}$                                  |     | ±50       | -   | pA   |
| Input Bias Current              | $I_B$     | $V_O=0\text{V}$                                  |     | ±200      |     | pA   |
| Common Mode Input Voltage Range | $V_{ICM}$ |                                                  | ±11 |           |     | V    |
| Output Voltage Swing            | $V_{OM}$  | $R_L=10\text{k}\Omega$                           | ±12 | ±13.5     |     | V    |
|                                 |           | $R_L=2\text{k}\Omega$                            | ±10 | ±12       |     |      |
| Output short-circuit current    | $I_{SC}$  | $V_O = 0\text{V}$                                | ±40 | ±60       | ±80 | mA   |
| Large signal voltage gain       | $A_{OL}$  | $V_O = \pm 10\text{V}$ , $R_L < 2\text{k}\Omega$ |     | 100       |     | V/mV |
| Common mode rejection ratio     | CMRR      |                                                  |     | 95        |     | dB   |
| Supply Voltage Rejection Ratio  | PSRR      |                                                  |     | 100       |     | dB   |
| Unity Gain Bandwidth            | GBWP      |                                                  |     | 3         |     | MHz  |
| Slew Rate                       | SR        |                                                  | 8   | 13        |     | V/μs |
| Input Resistance                | $R_i$     |                                                  |     | $10^{12}$ |     | Ω    |

## Typical Characteristic

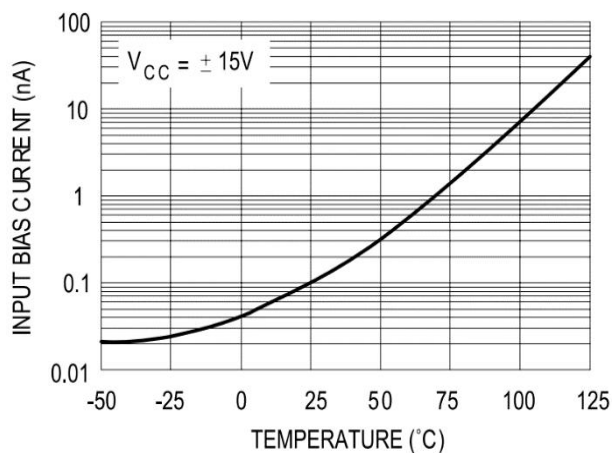


Figure 1. Input Bias Current vs Temperature

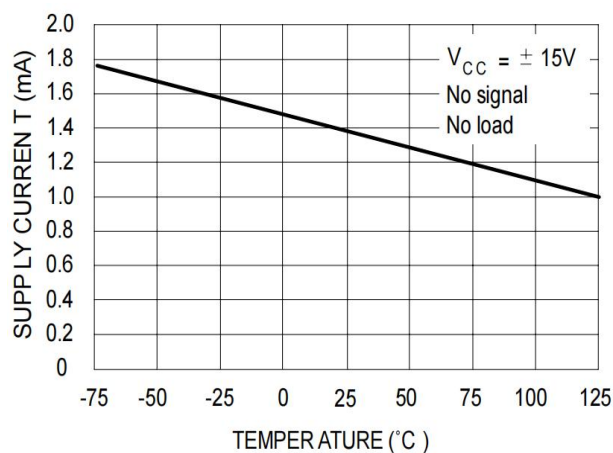


Figure 2. Supply Current vs Temperature(Each Amplifier)

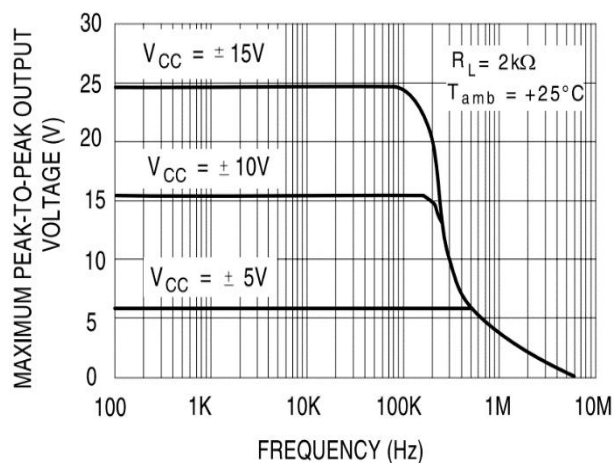


Figure 3. Maximum Peak Output Voltage vs Frequency ( $R_L=2K$ )

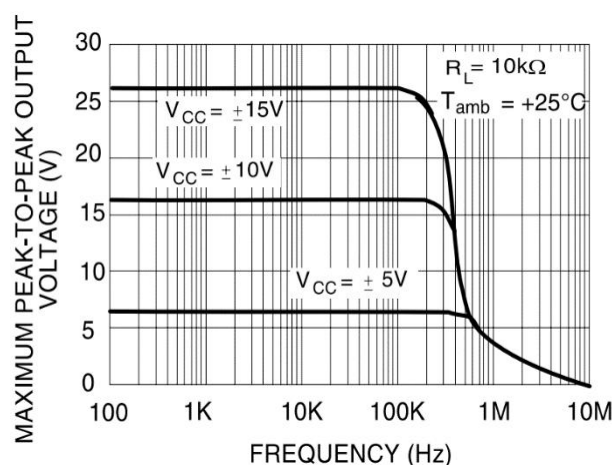


Figure 4. Maximum Peak Output Voltage vs Frequency ( $R_L=10K$ )

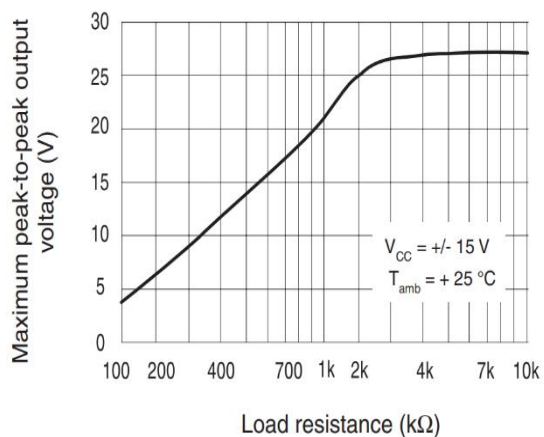


Figure 5. Maximum Peak Output Voltage vs Load Resistance

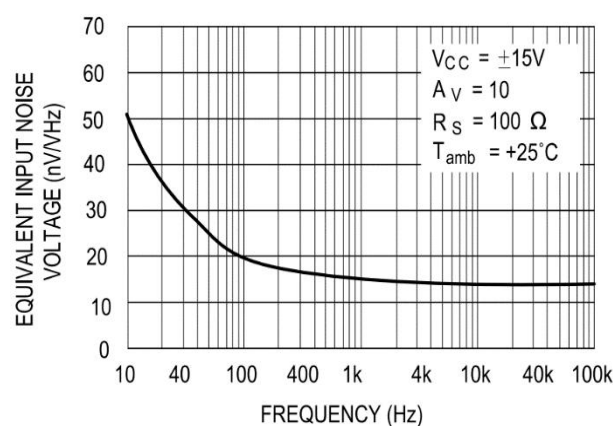


Figure 6. Equivalent Input Noise Voltage vs Frequency

## Typical Application

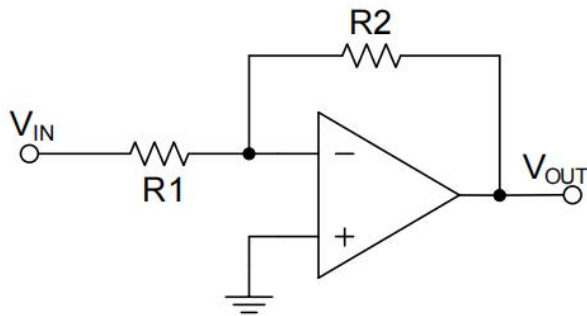


Figure 7. Inverting Amplifier

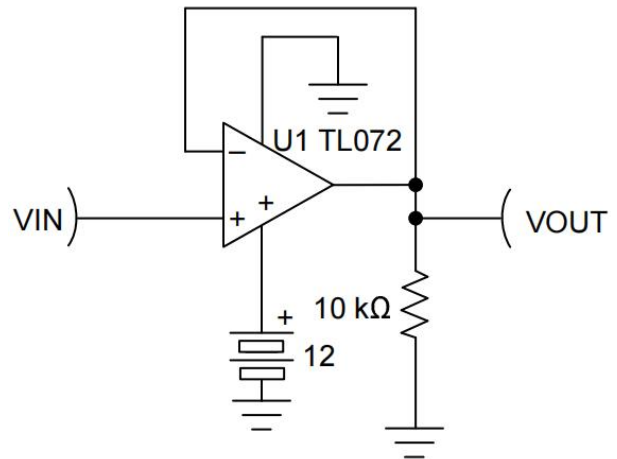


Figure 8. Single-Supply Unity Gain Amplifier

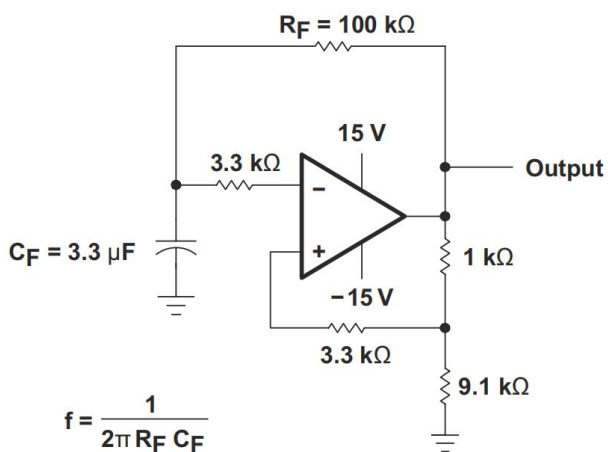


Figure 9. 0.5Hz Square wave Oscillator

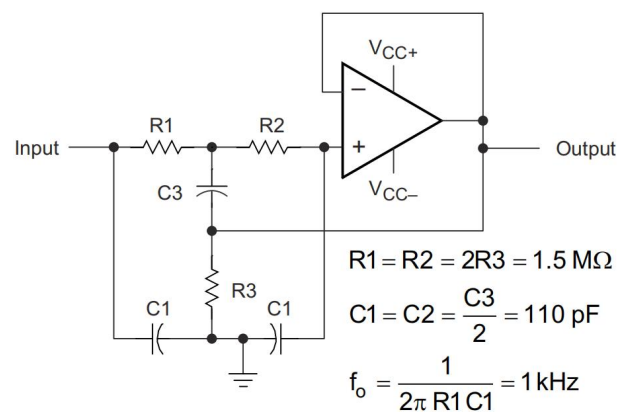


Figure 10. High Q Notch Filter

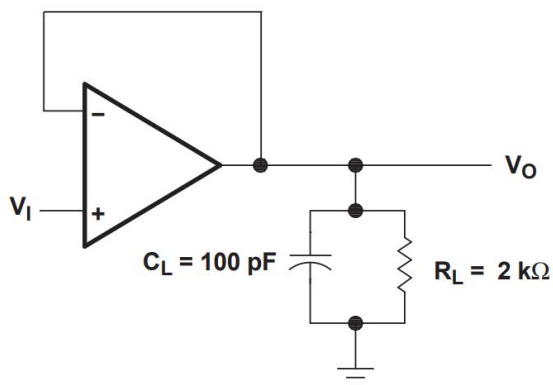


Figure 11. Unity-Gain Amplifier

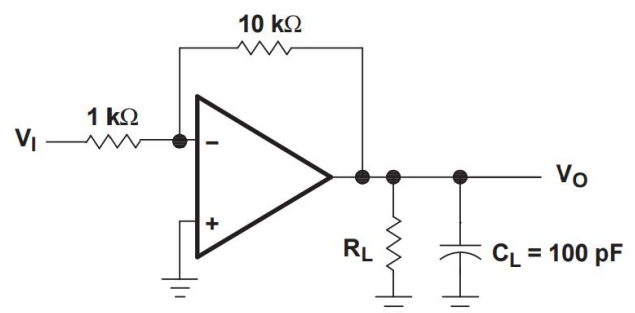
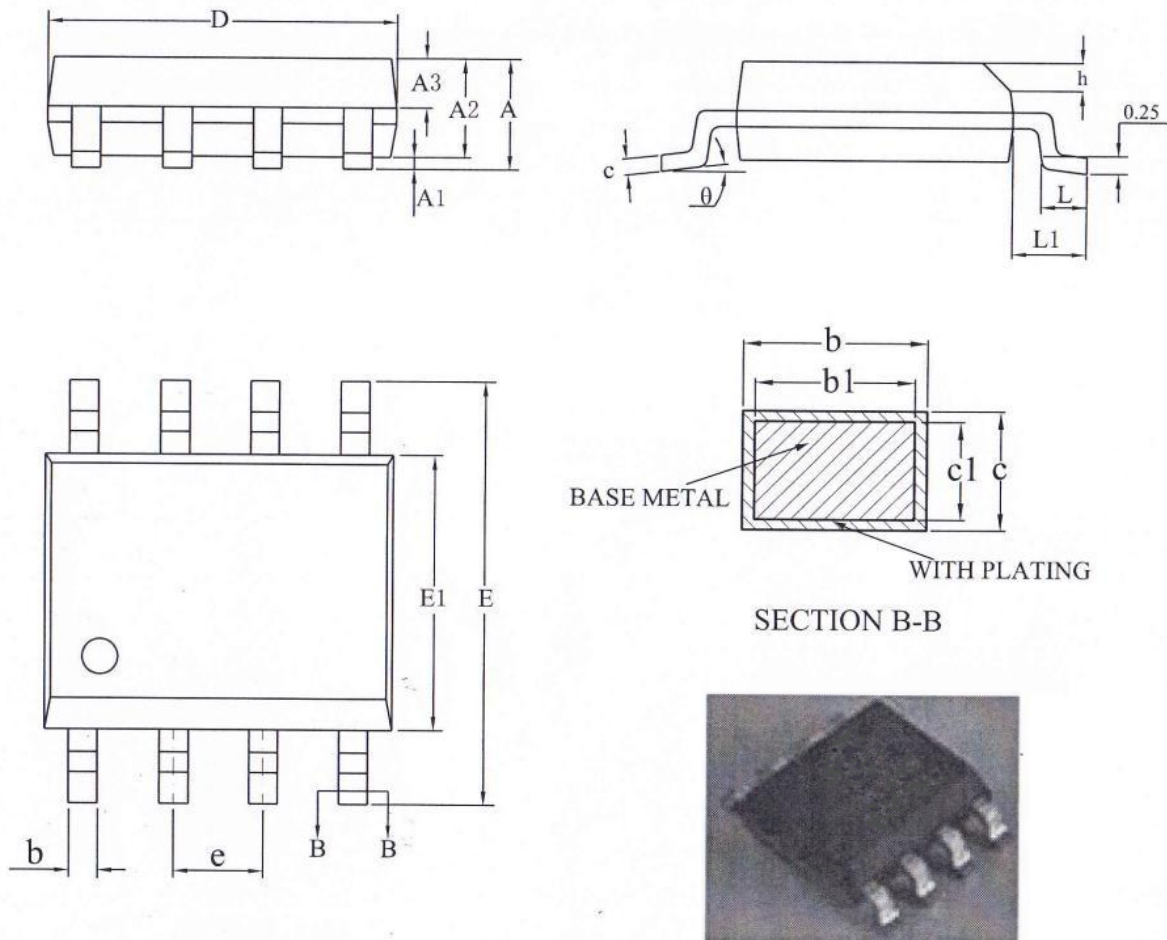


Figure 12. Gain-of-10 Inverting Amplifier

**PACKAGE OUTLINE DIMENSIONS**
**SOP8**


| SYMBOL | MILLIMETER |      |       | SYMBOL | MILLIMETER |      |      |
|--------|------------|------|-------|--------|------------|------|------|
|        | MIN        | NOM  | MAX   |        | MIN        | NOM  | MAX  |
| A      | -          | -    | 1.75  | D      | 4.80       | 4.90 | 5.00 |
| A1     | 0.10       | -    | 0.225 | E      | 5.80       | 6.00 | 6.20 |
| A2     | 1.30       | 1.40 | 1.50  | E1     | 3.80       | 3.90 | 4.00 |
| A3     | 0.60       | 0.65 | 0.70  | e      | 1.27 BSC   |      |      |
| b      | 0.39       | -    | 0.47  | h      | 0.25       | -    | 0.50 |
| b1     | 0.38       | 0.41 | 0.44  | L      | 0.50       | -    | 0.80 |
| c      | 0.20       | -    | 0.24  | L1     | 1.05REF    |      |      |
| c1     | 0.19       | 0.20 | 0.21  | θ      | 0°         | -    | 8°   |

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