

## 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.

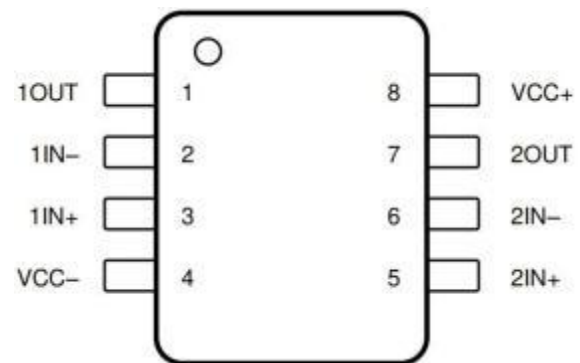
## FEATURES

- 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

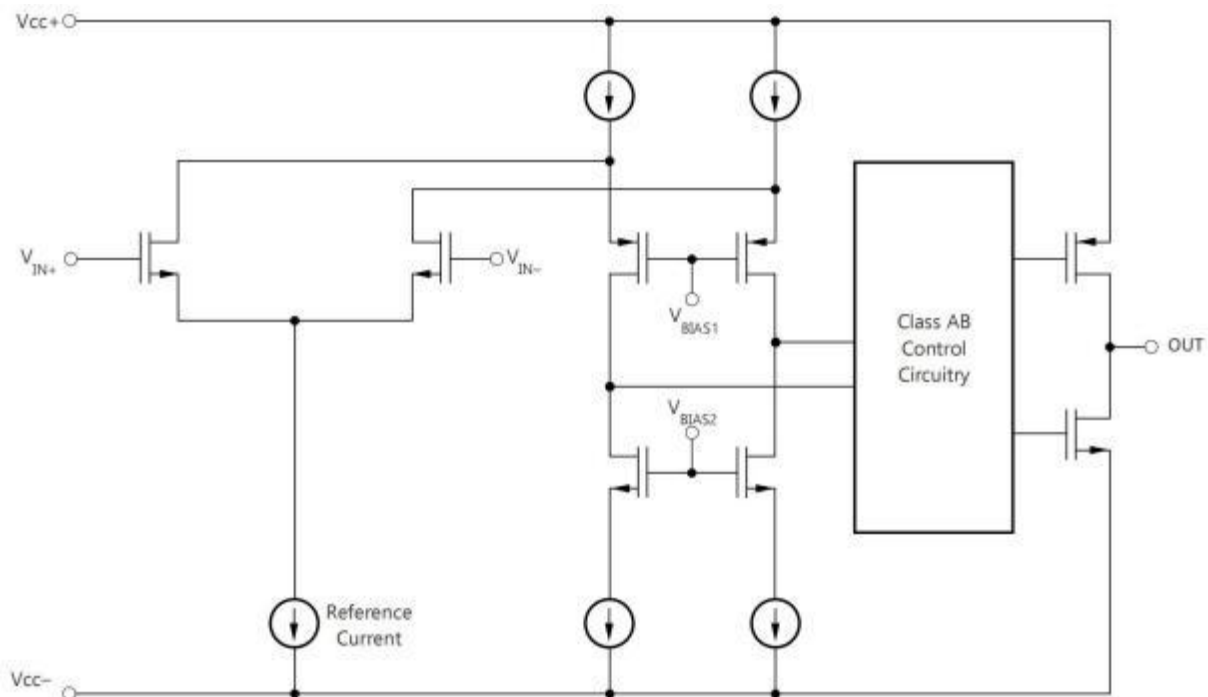
- Motor drives
- Pro audio mixers
- Battery test equipment
- Mobile electronics

## 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 <sub>CC</sub> +       | +5  | +15                     | V    |
|                             | V <sub>CC</sub> -       | -5  | -15                     | V    |
| Common-mode voltage         | (V <sub>CC</sub> -) + 4 |     | (V <sub>CC</sub> +) - 4 | V    |
| Operating Temperature Range | -20                     | +25 | +85                     | °C   |

## Electrical Characteristics

(At T<sub>A</sub>=+25°C, V<sub>CC</sub> +=15V, V<sub>CC</sub> -=-15V, unless otherwise noted.)

| PARAMETER                       | SYMBOL           | CONDITIONS                                | MIN | TYP              | MAX | UNIT |
|---------------------------------|------------------|-------------------------------------------|-----|------------------|-----|------|
| Supply Current (Each Amplifier) | I <sub>CC</sub>  | V <sub>O</sub> =0V, R <sub>L</sub> =∞     |     | 1.4              | 2.8 | mA   |
| Input Offset Voltage            | V <sub>IO</sub>  | V <sub>O</sub> =0V                        |     | ±2               | ±6  | mV   |
| Input Offset Current            | I <sub>IO</sub>  | V <sub>O</sub> =0V                        |     | ±50              | -   | pA   |
| Input Bias Current              | I <sub>B</sub>   | V <sub>O</sub> =0V                        |     | ±200             |     | pA   |
| Common Mode Input Voltage Range | V <sub>ICM</sub> |                                           | ±11 |                  |     | V    |
| Output Voltage Swing            | V <sub>OM</sub>  | R <sub>L</sub> =10kΩ                      | ±12 | ±13.5            |     | V    |
|                                 |                  | R <sub>L</sub> =2kΩ                       | ±10 | ±12              |     |      |
| Output short-circuit current    | I <sub>SC</sub>  | V <sub>O</sub> = 0V                       | ±40 | ±60              | ±80 | mA   |
| Large signal voltage gain       | A <sub>OL</sub>  | V <sub>O</sub> =±10V, R <sub>L</sub> <2kΩ |     | 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 <sub>i</sub>   |                                           |     | 10 <sup>12</sup> |     | Ω    |

## Typical Characteristic

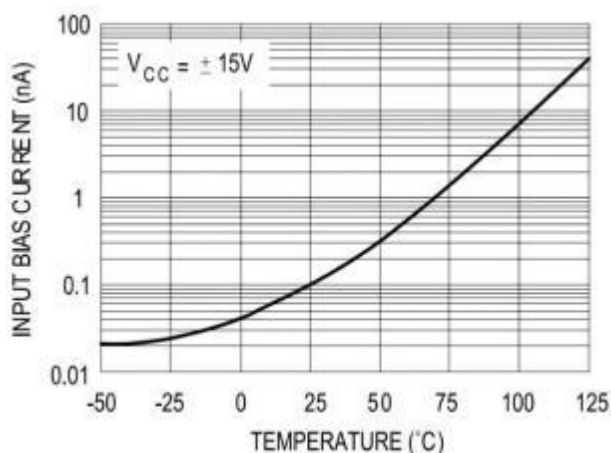


Figure 1. Input Bias Current vs Temperature

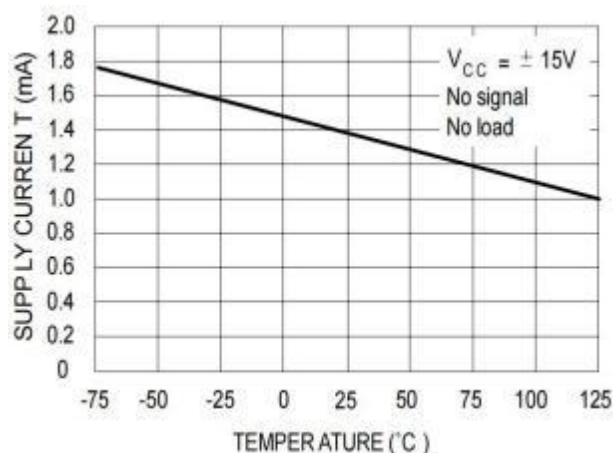


Figure 2. Supply Current vs Temperature(Each Amplifier)

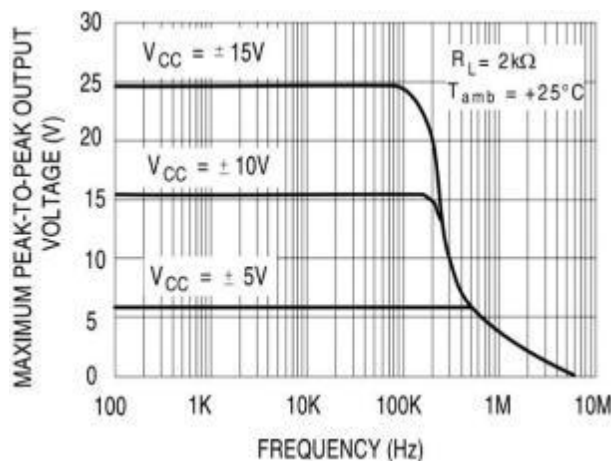


Figure 3. Maximum Peak Output Voltage vs Frequency ( $R_L=2K$ )

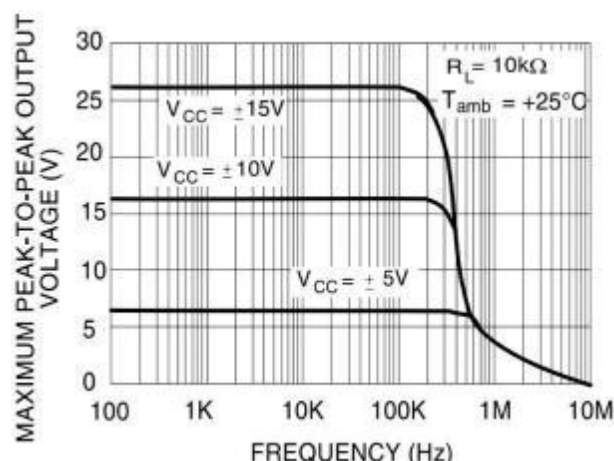


Figure 4. Maximum Peak Output Voltage vs Frequency ( $R_L=10K$ )

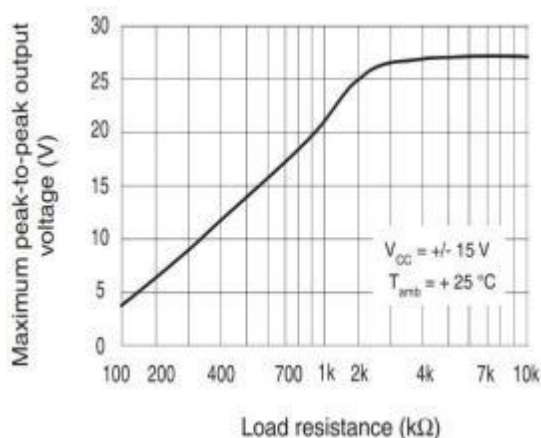


Figure 5. Maximum Peak Output Voltage vs Load Resistance

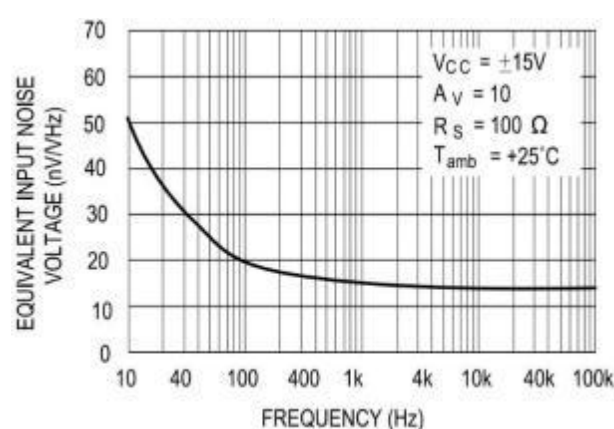


Figure 6. Equivalent Input Noise Voltage vs Frequency

## Typical Application

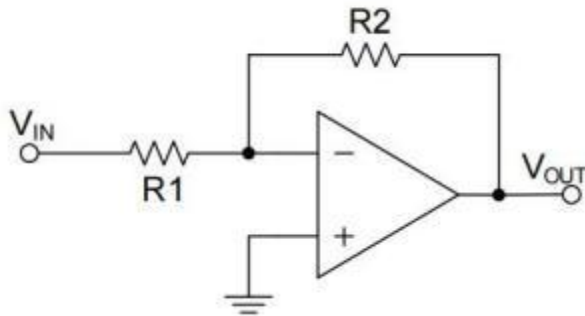


Figure 7. Inverting Amplifier

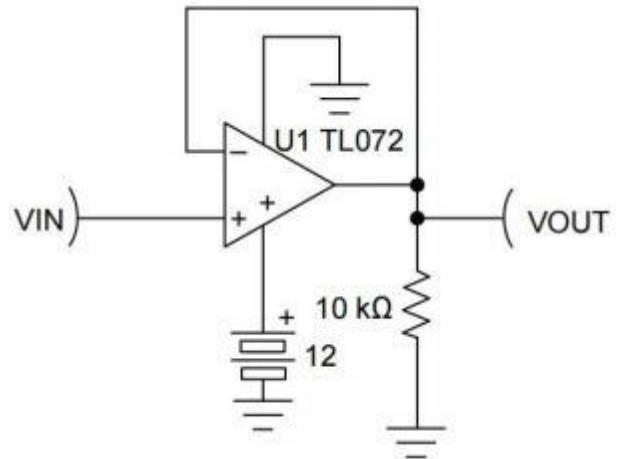


Figure 8. Single-Supply Unity Gain Amplifier

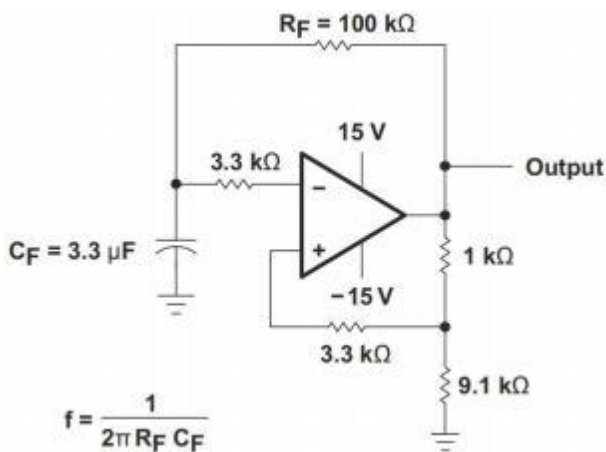


Figure 9. 0.5Hz Square wave Oscillator

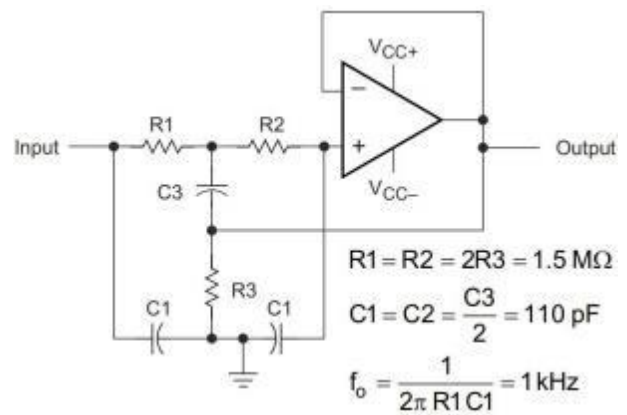


Figure 10. High Q Notch Filter

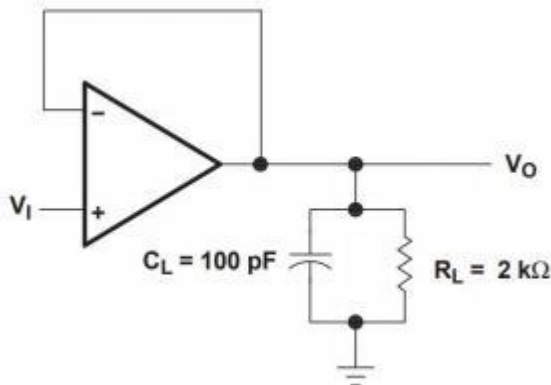


Figure 11. Unity-Gain Amplifier

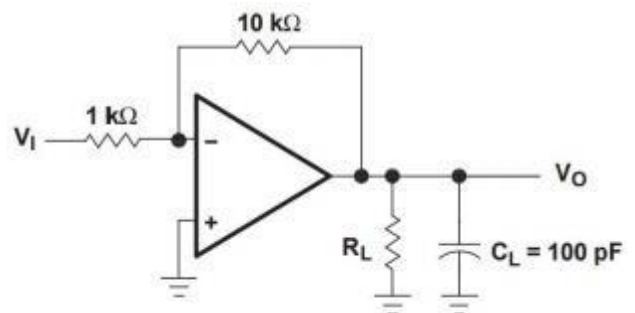
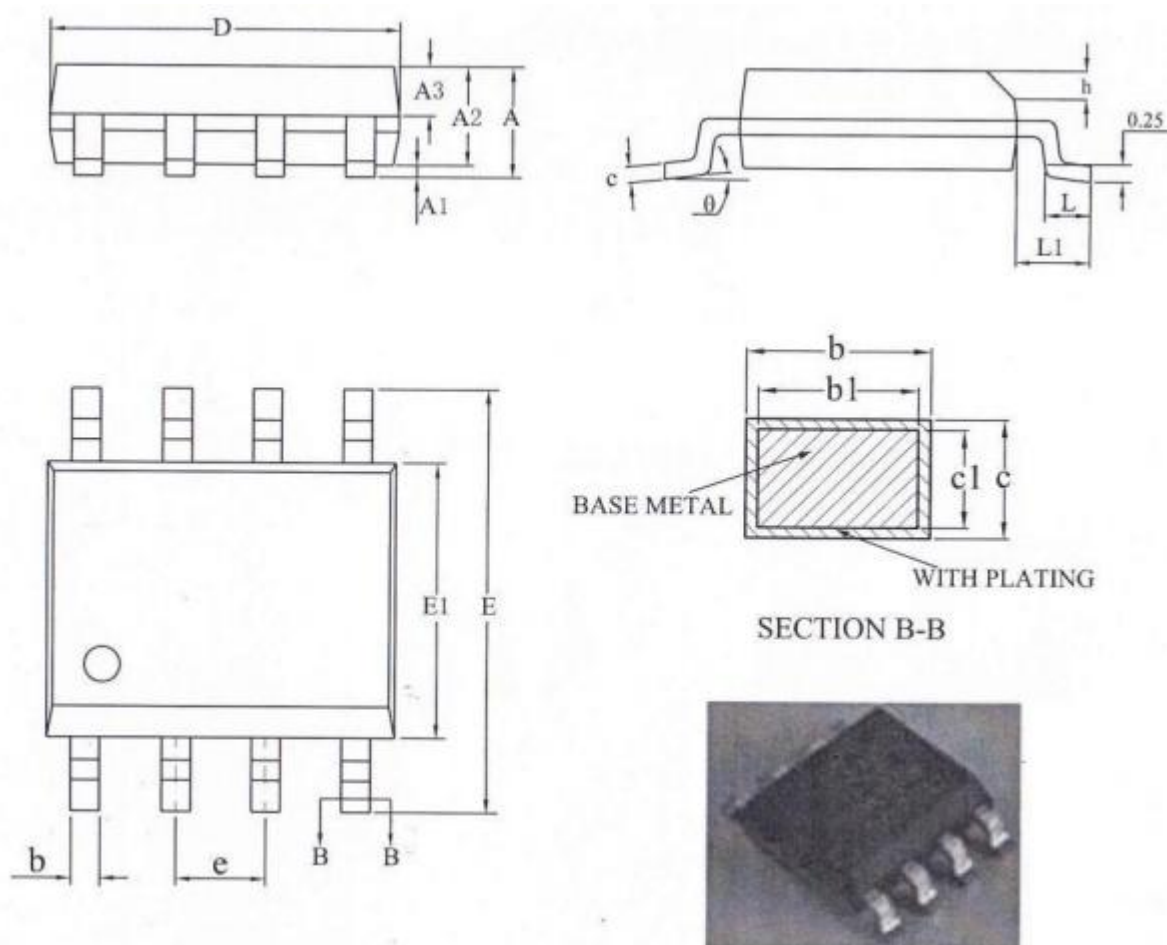


Figure 12. Gain-of-10 Inverting Amplifier

**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°   |

**NOTICE**

The information presented in this document is for reference only. Involving product optimization and productivity improvement, ChipNobo reserves the right to adjust product indicators and upgrade some technical parameters. ChipNobo is entitled to be exempted from liability for any delay or non-delivery of the information disclosure process that occurs.

本文件中提供的信息仅供参考。涉及产品优化和生产效率改善，ChipNobo 有权调整产品指标和部分技术参数的升级，所出现信息披露过程存在延后或者不能送达的情形，ChipNobo 有获免责权。

The product listed herein is designed to be used with residential and commercial equipment, and do not support sensitive items and specialized equipment in areas where sanctions do exist. ChipNobo Co., Ltd or anyone on its behalf, assumes no responsibility or liability for any damages resulting from improper use.

此处列出的产品旨在民用和商业设备上使用，不支持确有制裁地区的敏感项目和特殊设备，ChipNobo 有限公司或其代表，对因不当使用而造成的任何损害不承担任何责任。

For additional information, please visit our website <http://www.chipnobo.com>, or consult your nearest Chipnobo sales office for further assistance.

欲了解更多信息，请访问我们的网站 <http://www.chipnobo.com>，或咨询离您最近的 Chipnobo 销售办事处以获得进一步帮助。