



## Descriptions

Consisted of high voltage J-FET and bipolar transistors, the TL062IDR is a high speed J-FET dual- channel operational amplifier, featured with high slew rate, low input offset and bias current and low offset voltage temperature rate. The TL062IDR provides SOP-8(SOIC-8) package forms.

## Feature

- Lower Power Consumption
- Wide Common-Mode And Differential Voltage Ranges
- Low Input Bias And Offset Currents
- Output Short-Circuit Protection
- High Input Impedance
- High Slew Rate
- High Gain-Bandwidth up to 4MHz

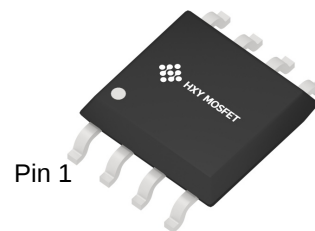
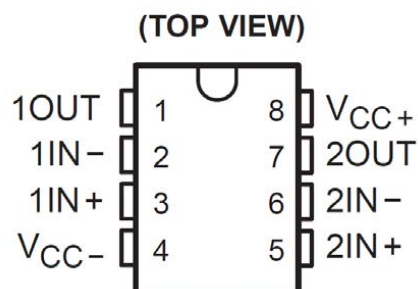
## Applications

- Battery test equipment
- Pro audio mixers
- Single phase online UPS
- Solar energy: string and central inverter
- Three phase UPS
- Motor drives: AC and servo drive control and power stage modules

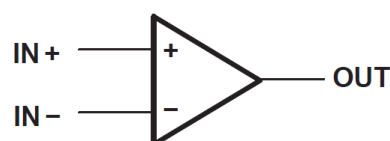
## Ordering Information

| Product Model | Package Type  | Packing | Packing Qty  |
|---------------|---------------|---------|--------------|
| TL062IDR      | SOP-8(SOIC-8) | Tape    | 4000Pcs/Reel |

## Pins Diagram

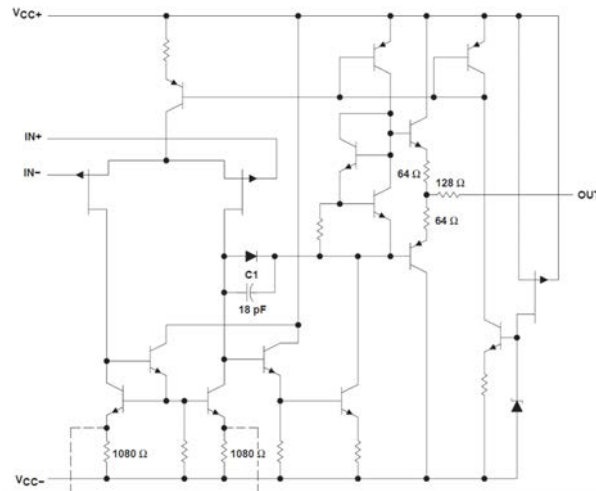


## Symbol





## Internal Diagram



## Absolute Maximum Ratings

| Symbol     | Description                 | Parameter | Unit |
|------------|-----------------------------|-----------|------|
| $V_{CC}$   | Supply Voltage              | $\pm 18$  | V    |
| $V_i$      | Input Voltage               | $\pm 14$  | V    |
| $V_{id}$   | Differential Input Voltage  | $\pm 28$  | V    |
| $T_{oper}$ | Operating Temperature Range | 0~70      | °C   |
| $T_{stg}$  | Storage Temperature Range   | -65~+150  | °C   |

## Electrical Parameter Characteristics

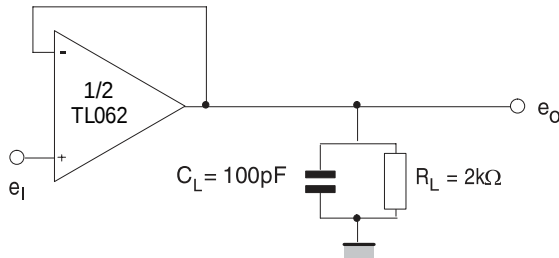
(  $V_{CC}=\pm 15$ ,  $T_{amp}=25^{\circ}\text{C}$  Unless otherwise specified )

| Symbol    | Parameter Name                                  | Test Conditions                                                  | Parameter            |                          |      | Unit |
|-----------|-------------------------------------------------|------------------------------------------------------------------|----------------------|--------------------------|------|------|
|           |                                                 |                                                                  | Min.                 | Typ.                     | Max. |      |
| $V_{IO}$  | Input Offset Voltage                            | $V_o=0\text{V}$                                                  |                      | 3                        | 15   | mV   |
| $I_{IO}$  | Input Offset Current                            | $V_o=0\text{V}$                                                  |                      |                          | 1.5  | pA   |
| $I_{ib}$  | Input Bias Current                              | $V_o=0\text{V}$                                                  |                      |                          | 2.5  | nA   |
| $V_{icr}$ | Input Common Mode Voltage Range                 |                                                                  | -12                  | $\pm 11$                 | 15   | V    |
| $V_{OM}$  | Maximum Peak Output Voltage Swing               | $R_L = 10\text{ k}\Omega$<br>$R_L \geq 2\text{ k}\Omega$         | $\pm 12$<br>$\pm 10$ | $\pm 13.5$<br>$\pm 12.5$ |      | V    |
| $A_{VD}$  | Large-signal differential voltage amplification | $R_L \geq 2\text{ k}\Omega$ , $V_o = \pm 10\text{ V}$            | 80                   | 95                       |      | dB   |
| GB        | Gain Bandwidth                                  |                                                                  |                      | 3                        |      | MHz  |
| CMRR      | Common Mode Rejection Ratio                     |                                                                  | 70                   | 85                       |      | dB   |
| kSVR      | Supply Voltage Rejection Ratio                  | $V_{CC} = \pm 15\text{ V}$ to $\pm 9\text{ V}$ , $V_o=0\text{V}$ | 70                   | 86                       |      | dB   |
| $I_{CC}$  | Static Supply Current (each amplifier)          |                                                                  |                      | 1.4                      | 2.8  | mA   |
| SR        | Slew Rate                                       | $V_i = 10\text{ V}$                                              | 8                    | 13                       |      | V/us |
| $t_R$     | Rise time                                       |                                                                  |                      | 0.05                     |      | us   |

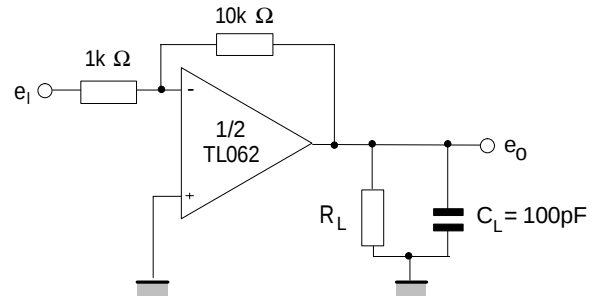


## Typical Application ( Including One Amplifier )

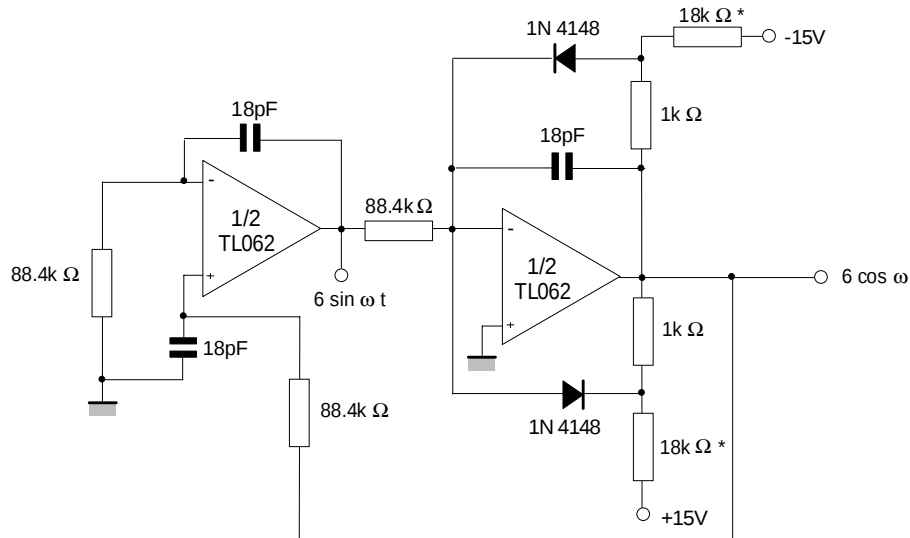
### Typical lines



Voltage follower

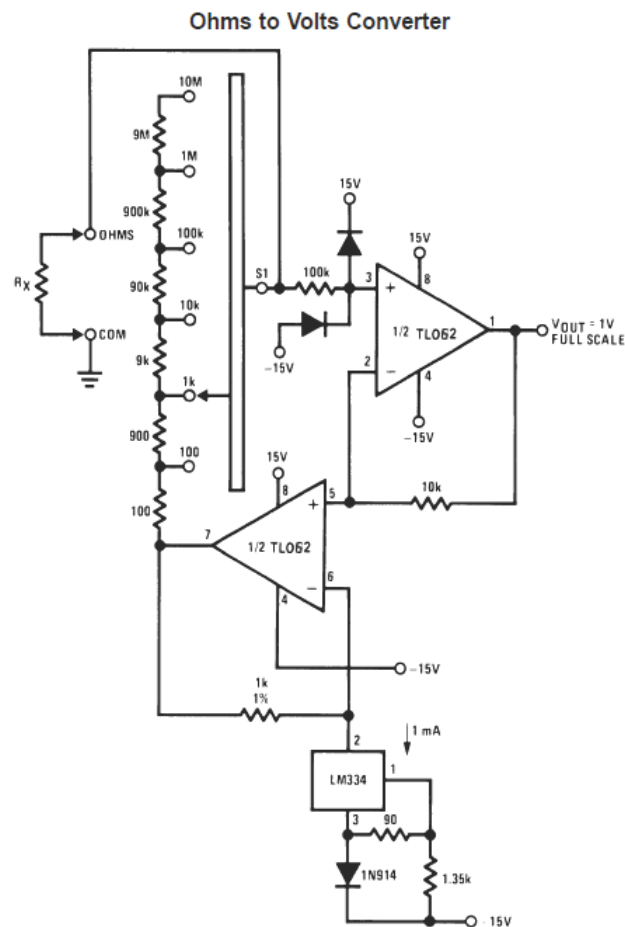


Gain-of-10 inverting amplifier



\* These resistor values may be adjusted for a symmetrical output

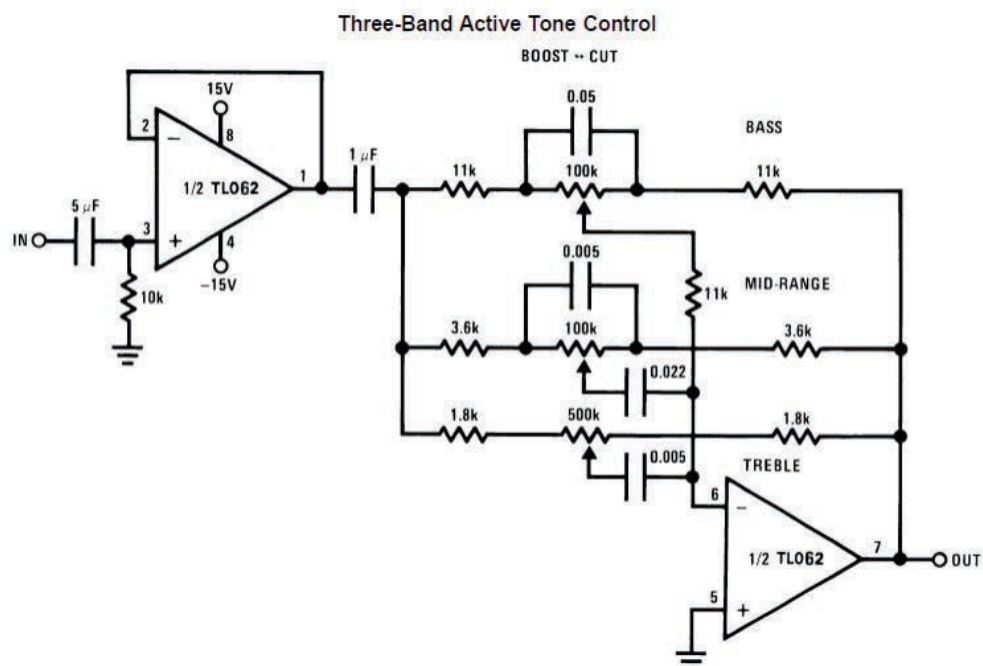
100kHz quadruple oscillator



$$V_O = \frac{1V}{R_{LADDER}} \times R_X$$

Where  $R_{LADDER}$  is the resistance from switch S1 pole to pin 7 of the TL062CN

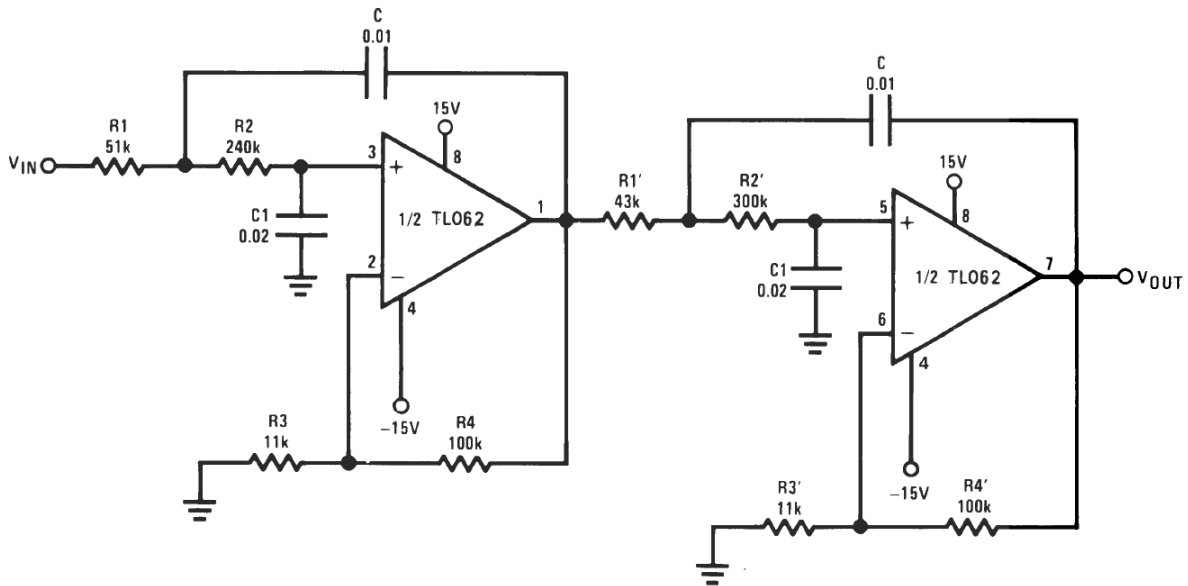
### Resistance-to-Voltage Conversion



### Three-Band Active Tone Control

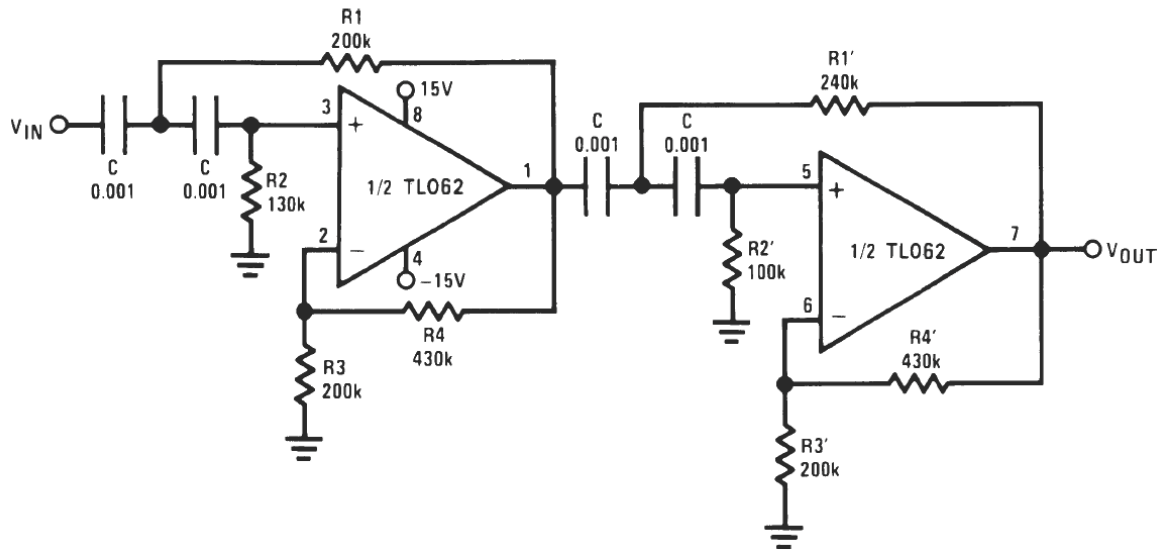


#### Fourth Order Low Pass Butterworth Filter



#### Fourth-order Low Pass Butterworth Filter

#### Fourth Order High Pass Butterworth Filter



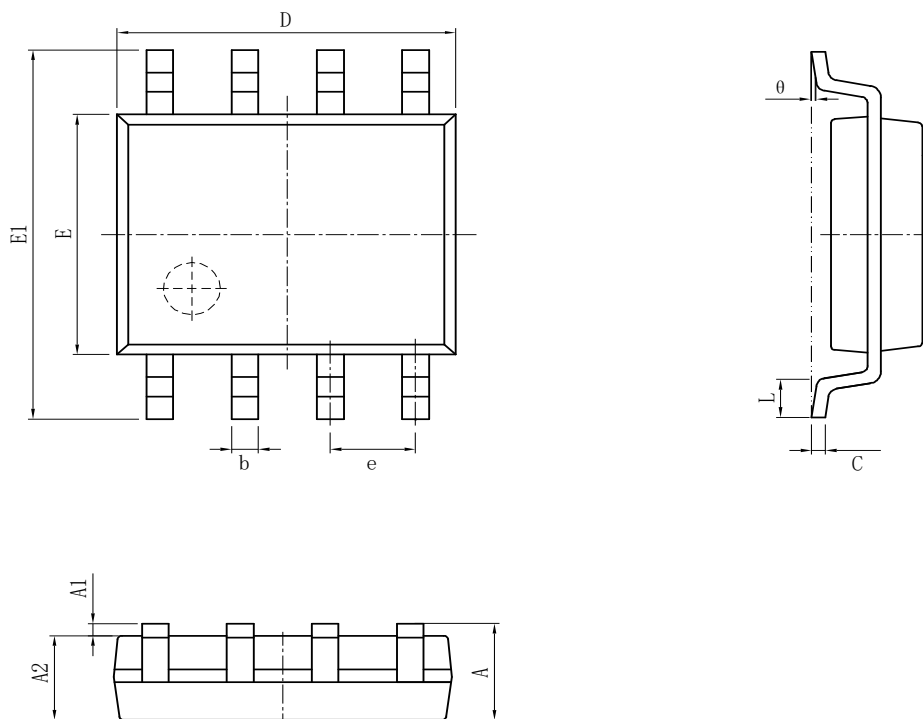
- Corner frequency ( $f_c$ ) =  $\sqrt{\frac{1}{R_1 R_2 C^2}} \cdot \frac{1}{2\pi} = \sqrt{\frac{1}{R_1' R_2' C^2}} \cdot \frac{1}{2\pi}$
- Passband gain ( $H_0$ ) =  $(1 + R_4/R_3) (1 + R_4'/R_3')$
- First stage  $Q = 1.31$
- Second stage  $Q = 0.541$
- Circuit shown uses closest 5% tolerance resistor values for a filter with a corner frequency of 1 kHz and a passband gain of 10

#### Fourth Order High Pass Butterworth Filter



## Package Information

### SOP-8(SOIC-8)



| Symbol | Size | Dimensions In Millimeters |         | Symbol | Size | Dimensions In Inches |         |
|--------|------|---------------------------|---------|--------|------|----------------------|---------|
|        |      | Min(mm)                   | Max(mm) |        |      | Min(in)              | Max(in) |
| A      |      | 1.350                     | 1.750   | A      |      | 0.053                | 0.069   |
| A1     |      | 0.100                     | 0.250   | A1     |      | 0.004                | 0.010   |
| A2     |      | 1.350                     | 1.550   | A2     |      | 0.053                | 0.061   |
| b      |      | 0.330                     | 0.510   | b      |      | 0.013                | 0.020   |
| c      |      | 0.170                     | 0.250   | c      |      | 0.006                | 0.010   |
| D      |      | 4.700                     | 5.100   | D      |      | 0.185                | 0.200   |
| E      |      | 3.800                     | 4.000   | E      |      | 0.150                | 0.157   |
| E1     |      | 5.800                     | 6.200   | E1     |      | 0.228                | 0.224   |
| e      |      | 1.270(BSC)                |         | e      |      | 0.050(BSC)           |         |
| L      |      | 0.400                     | 1.270   | L      |      | 0.016                | 0.050   |
| theta  |      | 0°                        | 8°      | theta  |      | 0°                   | 8°      |



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