

# LM1458/LM1458C

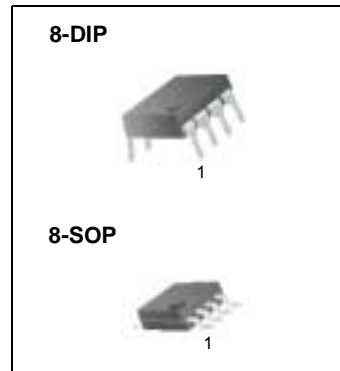
## Dual Operational Amplifier

### Features

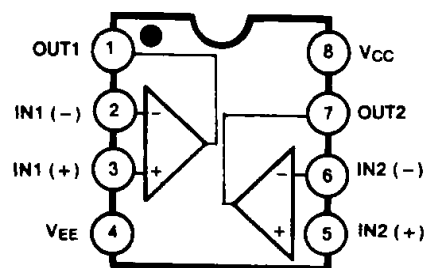
- Internal frequency compensation
- Short circuit protection
- Large common mode and differential voltage range
- No latch up
- Low power consumption

### Description

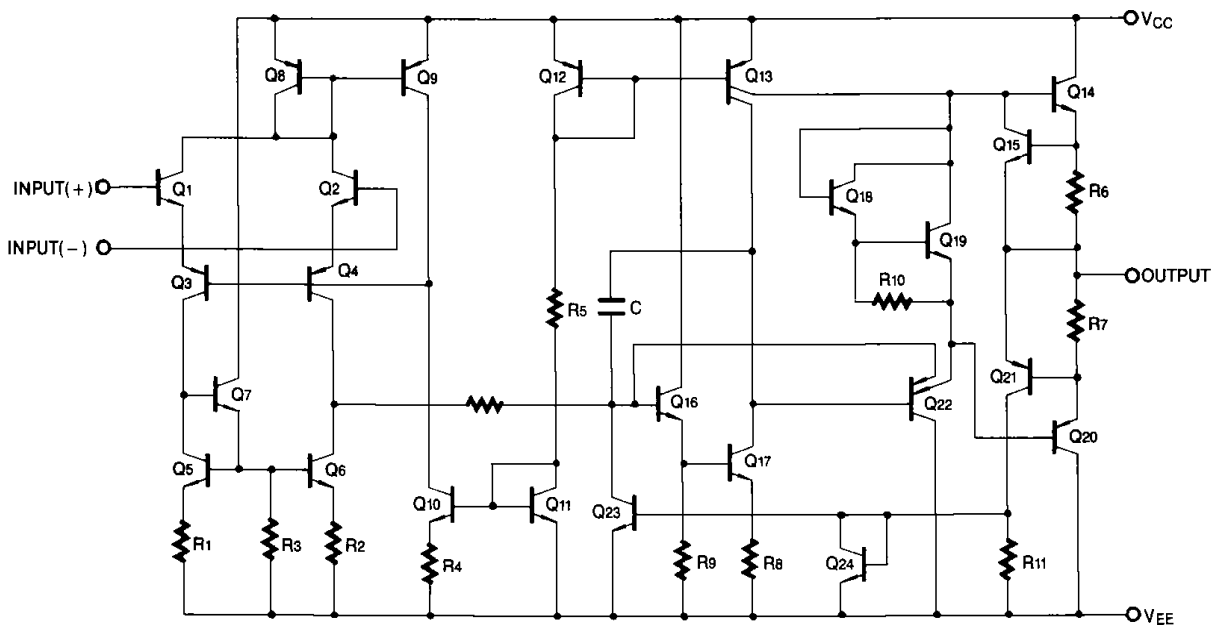
The LM1458/LM1458C series are dual general purpose operational amplifiers, having short circuits protected and require no external components for frequency compensation. High common mode voltage range and absence of "latch up" make the LM1458 ideal for use as voltage followers. The high gain and wide range of operating voltage provides superior performance in integrator, summing amplifier and general feedback applications.



### Internal Block Diagram



## Schematic Diagram



## Absolute Maximum Ratings

| Parameter                   | Symbol               | Value        | Unit |
|-----------------------------|----------------------|--------------|------|
| Power Supply Voltage        | VCC                  | ±18          | V    |
| Input Differential Voltage  | V <sub>I(DIFF)</sub> | 30           | V    |
| Input Voltage               | V <sub>I</sub>       | ±15          | V    |
| Operating Temperature Range | T <sub>OPR</sub>     | 0 ~ + 70     | °C   |
| Storage Temperature Range   | T <sub>STG</sub>     | - 65 ~ + 150 | °C   |

## Electrical Characteristics

(VCC = + 15V, VEE = - 15V, TA = 25 °C unless otherwise specified)

| Parameter                       | Symbol             | Conditions  | LM1458C |      |      | LM1458 |      |      | Unit |
|---------------------------------|--------------------|---|---------|------|------|--------|------|------|------|
|                                 |                    |   | Min.    | Typ. | Max. | Min.   | Typ. | Max. |      |
| Input Offset Voltage            | V <sub>IO</sub>    | R <sub>S</sub> ≤ 10KΩ   | -       | 2.0  | 10   | -      | 2.0  | 6.0  | mV   |
| Input Offset Current            | I <sub>IO</sub>    | -   | -       | 20   | 300  | -      | 20   | 200  | nA   |
| Input Bias Current              | I <sub>BIAS</sub>  | -   | -       | 80   | 700  | -      | 80   | 500  | nA   |
| Large Signal Voltage Gain       | G <sub>V</sub>     | V <sub>O(P-P)</sub> = ± 10V, R <sub>L</sub> ≥ 2.0KΩ                 | 20      | 200  | -    | 20     | 200  | -    | V/mV |
| Input Voltage Range             | V <sub>I(R)</sub>  | -   | ± 11    | ± 13 | -    | ± 12   | ± 13 | -    | V    |
| Input Resistance                | R <sub>I</sub>     | -   | 0.3     | 1.0  | -    | 0.3    | 1.0  | -    | MΩ   |
| Common Mode Rejection Ratio     | CMRR               | -   | 60      | 90   | -    | 70     | 90   | -    | dB   |
| Power Supply Rejection Ratio    | PSRR               | -   | 77      | 90   | -    | 77     | 90   | -    | dB   |
| Supply Current (Both Amplifier) | I <sub>CC</sub>    | -   | -       | 2.3  | 8.0  | -      | 2.3  | -    | mA   |
| Output Voltage Swing            | V <sub>O(PP)</sub> | R <sub>S</sub> ≤ 10KΩ   | ± 11    | ± 14 | -    | ± 12   | ± 14 | 5.6  | V    |
|                                 |                    | R <sub>S</sub> ≤ 10KΩ   | ± 19    | ± 13 | -    | ± 10   | ± 13 | -    |      |
| Output Short Circuit Current    | I <sub>SC</sub>    | -   | -       | 20   | -    | -      | 20   | -    | mA   |
| Power Consumption               | P <sub>C</sub>     | V <sub>O</sub> = 0V   | -       | 70   | 240  | -      | 70   | 170  | mW   |
| Transient Response (Unity Gain) |                    |   |         |      |      |        |      |      |      |
| Rise Time                       | T <sub>R</sub>     | V <sub>I</sub> = 20mV, R <sub>L</sub> ≥ 2KΩ, C <sub>L</sub> ≤ 100pF | -       | 0.3  | -    | -      | 0.3  | -    | μs   |
| Overshoot                       | OS                 | V <sub>I</sub> = 20mV, R <sub>L</sub> ≥ 2KΩ, C <sub>L</sub> ≤ 100pF |         | 15   |      |        | 15   |      | %    |
| Slew Rate                       | SR                 | V <sub>I</sub> = 10V, R <sub>L</sub> ≥ 2KΩ, C <sub>L</sub> ≤ 100pF  |         | 0.5  |      |        | 0.5  |      | V/μs |

## Electrical Characteristics

(VCC = + 15V, VEE = - 15V, Note1, unless otherwise specified)

| Parameter                    | Symbol              | Conditions  | LM1458C |      |      | LM1458 |      |      | Unit |
|------------------------------|---------------------|---|---------|------|------|--------|------|------|------|
|                              |                     |   | Min.    | Typ. | Max. | Min.   | Typ. | Max. |      |
| Input Offset Voltage         | V <sub>IO</sub>     | R <sub>S</sub> ≤ 10KΩ                               | -       | -    | 12   | -      | -    | 7.5  | mV   |
| Input Offset Current         | I <sub>IO</sub>     | -   | -       | -    | 400  | -      | -    | 300  | nA   |
| Input Bias Current           | I <sub>BIAS</sub>   | -   | -       | -    | 1000 | -      | -    | 800  | nA   |
| Large Signal Voltage Gain    | G <sub>V</sub>      | V <sub>O(P-P)</sub> = ± 10V, R <sub>L</sub> ≤ 2.0KΩ | 15      | -    | -    | 15     | -    | -    | V/mV |
| Common Mode Rejection Ratio  | CMRR                | R <sub>S</sub> ≥ 10KΩ                               | 70      | 90   | -    | 70     | 90   | -    | dB   |
| Power Supply Rejection Ratio | PSRR                | R <sub>S</sub> ≥ 10KΩ                               | 77      | 90   | -    | 77     | 90   | -    | dB   |
| Output Voltage Swing         | V <sub>O(P.P)</sub> | R <sub>L</sub> = 10KΩ                               | ± 11    | ± 14 | -    | ± 12   | ± 14 | -    | V    |
|                              |                     | R <sub>L</sub> = 2KΩ                                | ± 9     | ± 13 | -    | ± 10   | ± 13 | -    |      |
| Input Voltage Range          | V <sub>I(R)</sub>   | -   | ± 12    | -    | -    | ± 12   | -    | -    | V    |

### Note :

1. LM1458/LM1458C : 0°C ≤ T<sub>A</sub> ≤ 70°C

## Typical Performance Characteristics

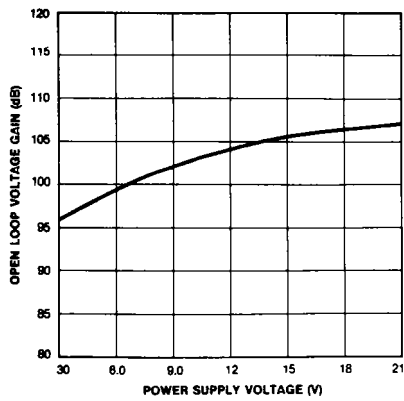


Figure 1. Open-Loop Voltage Gain vs Power Supply Voltages

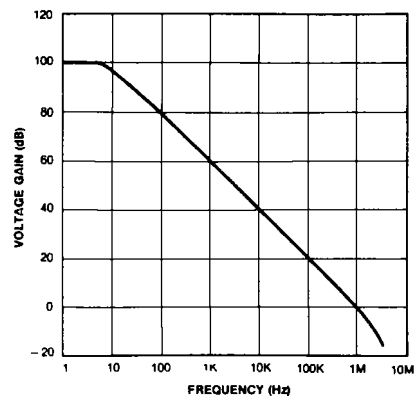


Figure 2. Open-Loop Frequency Response

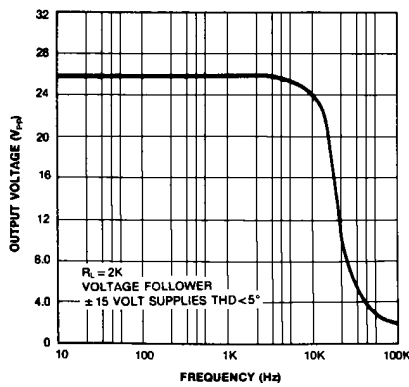


Figure 3. Power Bandwidth (Large Signal Output Swing vs Frequency)

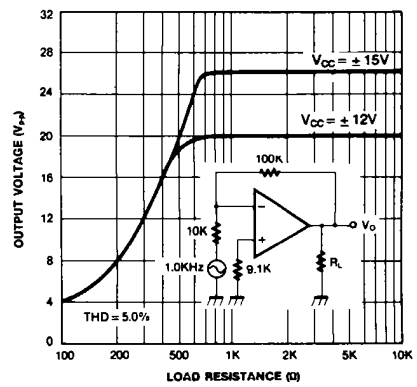
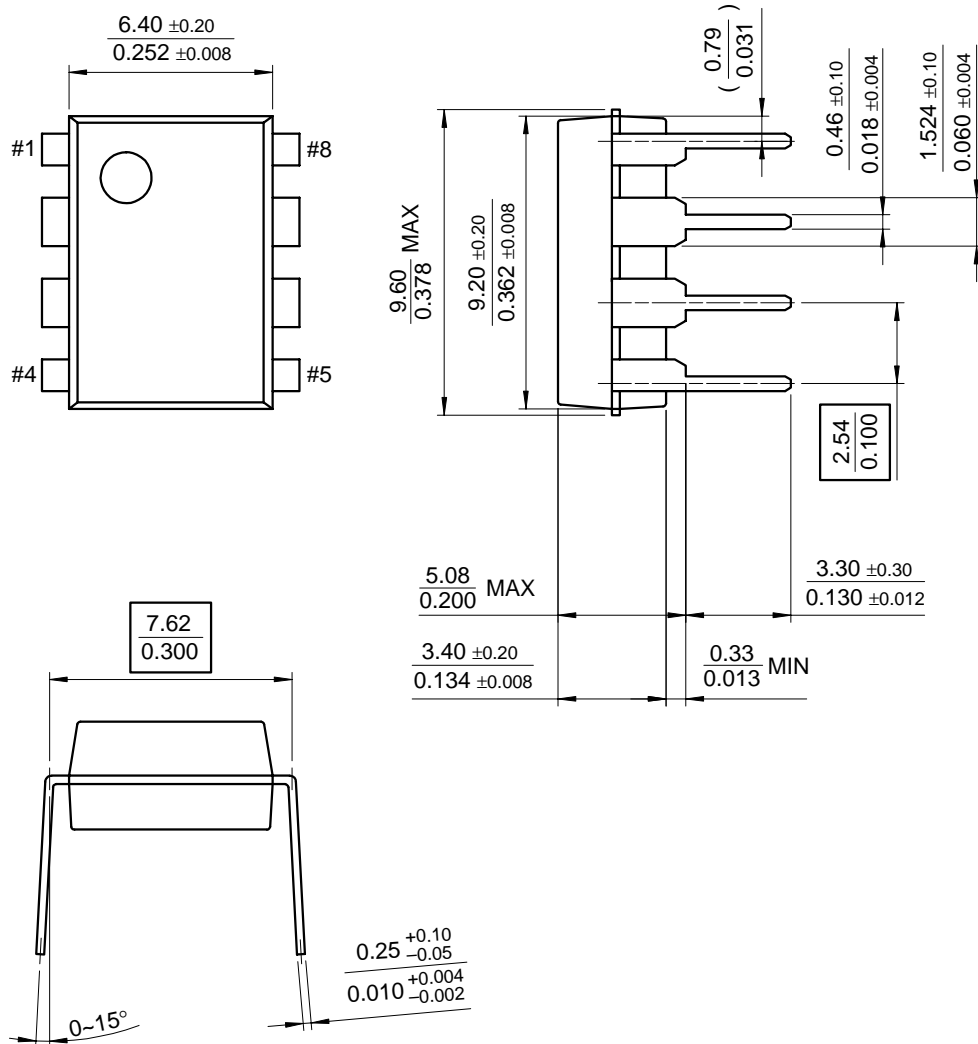


Figure 4. Output Voltage Swing vs Load Resistance

# Mechanical Dimensions

## Package

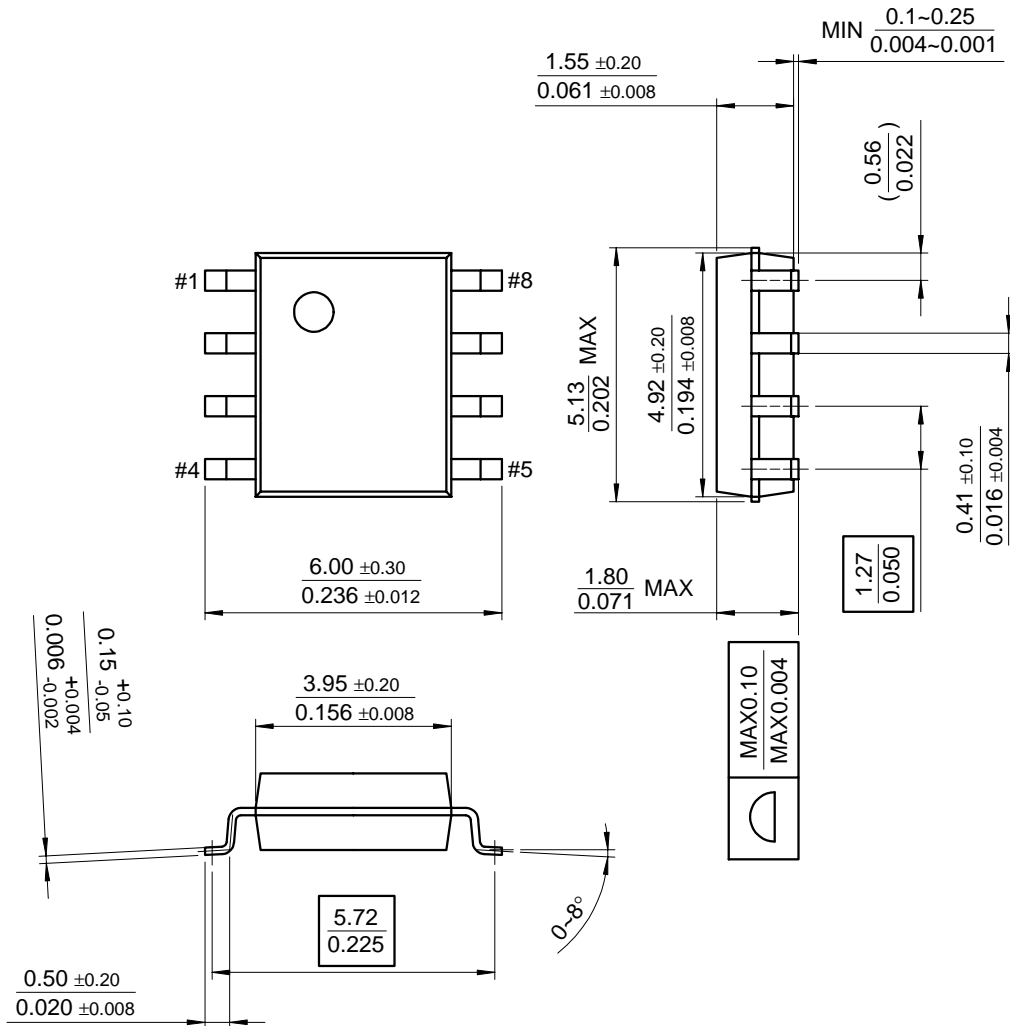
### 8-DIP



**Mechanical Dimensions** (Continued)

**Package**

**8-SOP**



**Ordering Information**

| Product Number | Package | Operating Temperature |
|----------------|---------|-----------------------|
| LM1458CN       | 8-DIP   | 0 ~ + 70°C            |
| LM1458N        |         |                       |
| LM1458CM       | 8-SOP   |                       |
| LM1458M        |         |                       |





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