

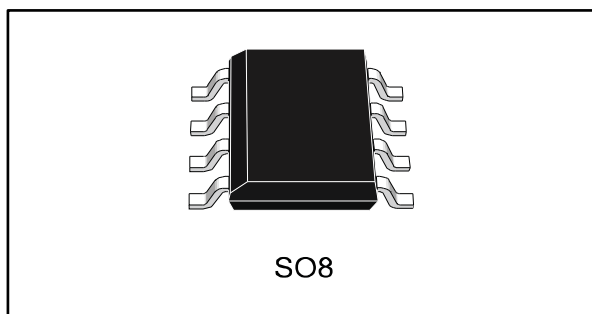


**THE DATASHEET OF
MC1458N**



High-performance, dual operational amplifier

Datasheet - production data



Features

- Low power consumption
- Large input voltage range
- No latch-up
- High gain
- Short-circuit protection
- No frequency compensation required

Applications

- Summing amplifier
- Voltage follower
- Integrator
- Active filtering
- Function generator

Description

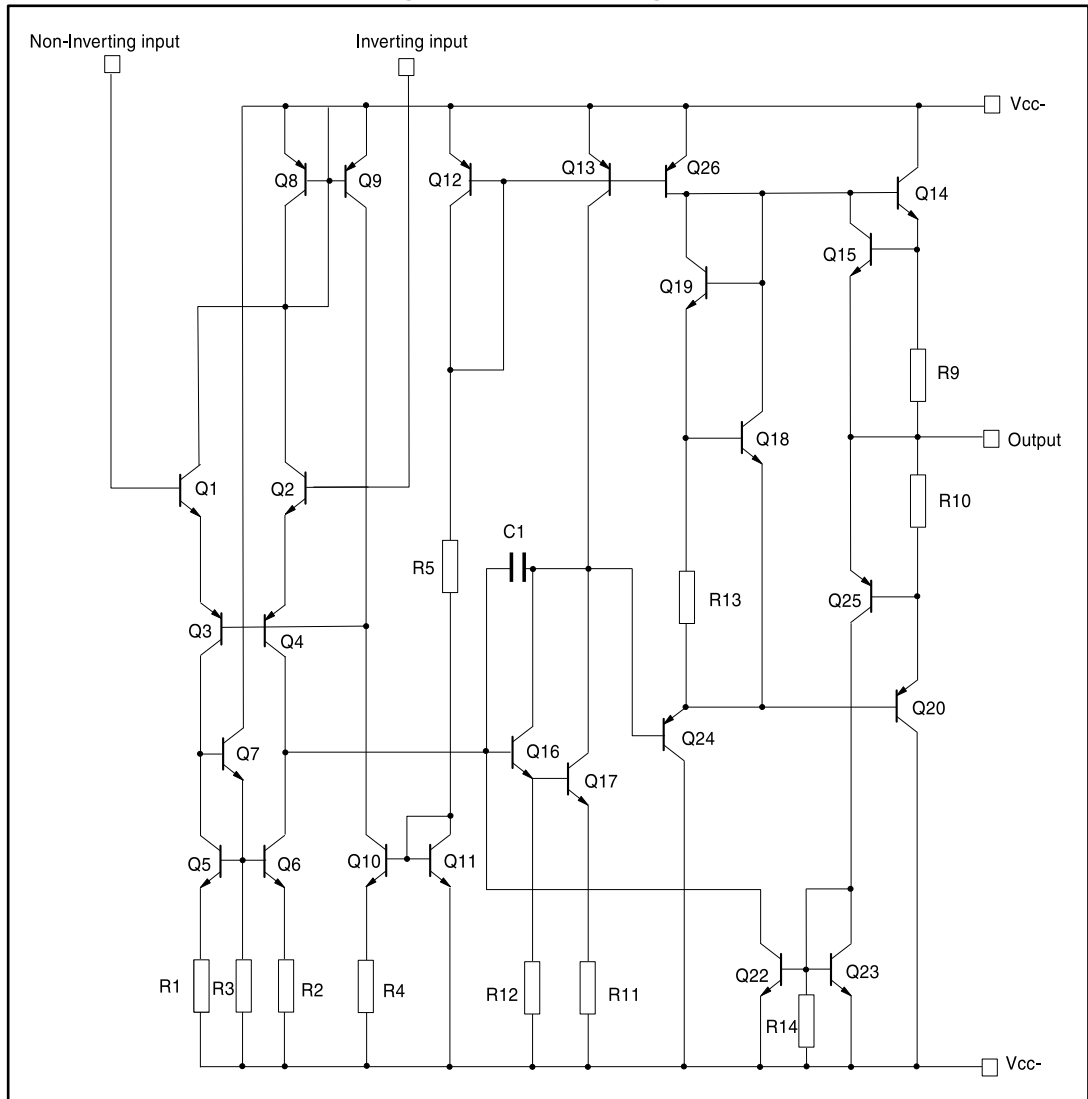
The MC1458 is a high-performance, monolithic, dual operational amplifier intended for a wide range of analog applications. The high gain and wide range of operating voltages provide superior performance in integrator, summing amplifiers, and general feedback applications.

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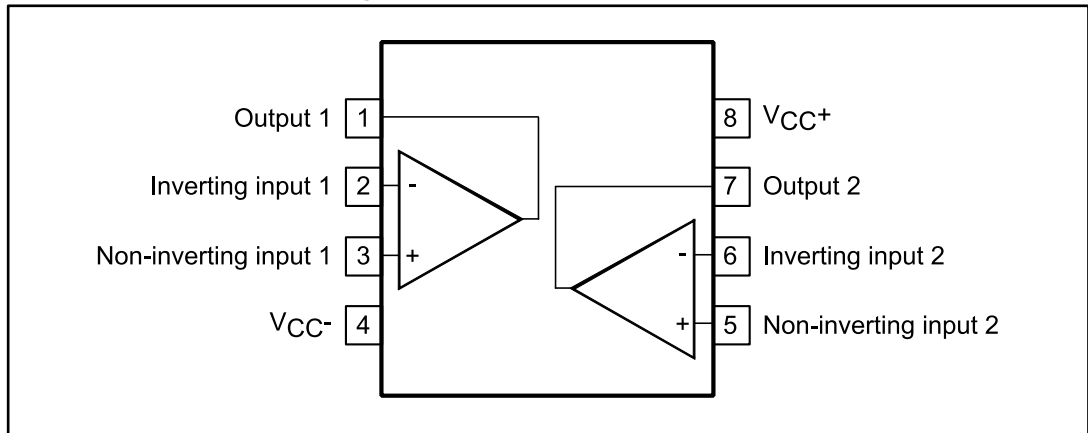
1 Schematic diagram

Figure 1: Schematic diagram



2 Package pin connections

Figure 2: Pin connections (top view)



3 Absolute maximum ratings

Table 1: Absolute maximum ratings

| Symbol | Parameter | MC1458DT | MC1458IDT | Unit |
|-------------------|--------------------------------------|------------|------------|------|
| V _{cc} | Supply voltage | ±22 | | V |
| V _i | Input voltage | ±15 | | |
| V _{id} | Differential input voltage | ±30 | | |
| | Output short-circuit duration | Infinite | | |
| P _{tot} | Power dissipation | 300 | | mW |
| T _{oper} | Operating free-air temperature range | 0 to 70 | -40 to 105 | °C |
| T _{stg} | Storage temperature range | -65 to 150 | | |

4 Electrical characteristics

Table 2: Electrical characteristics for $V_{CC} = \pm 15\text{ V}$, $T_{amb} = 25\text{ }^{\circ}\text{C}$ (unless otherwise specified)

| Symbol | Parameter | Min. | Typ. | Max. | Unit | |
|---------------|--|---|----------|------|------|------------------|
| V_{io} | Input offset voltage, $R_s \leq 10\text{ k}\Omega$ | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 1 | 5 | mV | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$ | | 6 | | |
| I_{io} | Input offset current | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 2 | 200 | nA | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$ | | 300 | | |
| I_{ib} | Input bias current | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 30 | 500 | | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$ | | 800 | | |
| A_{vd} | Large signal voltage gain, $V_o = \pm 10\text{ V}$, $R_L = 2\text{ k}\Omega$ | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 50 | 200 | V/mV | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$ | 25 | | | |
| SVR | Supply voltage rejection ratio, $R_s \leq 10\text{ k}\Omega$ | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 77 | 90 | dB | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$ | 77 | | | |
| I_{cc} | Supply current, all amp, no load | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 2.3 | 5 | mA | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$ | | 6 | | |
| V_{icm} | Input common-mode voltage range | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | ± 12 | | V | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$ | ± 12 | | | |
| CMR | Common-mode rejection ratio, $R_s \leq 10\text{ k}\Omega$ | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 70 | 90 | dB | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$ | 70 | | | |
| I_{os} | Output short-circuit source | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 10 | 20 | 35 | mA |
| $\pm V_{opp}$ | Output voltage swing | $T_{amb} = 25\text{ }^{\circ}\text{C}$, $R_L \leq 10\text{ k}\Omega$ | 12 | 14 | V | |
| | | $T_{amb} = 25\text{ }^{\circ}\text{C}$, $R_L \leq 2\text{ k}\Omega$ | 10 | 13 | | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$, $R_L \leq 10\text{ k}\Omega$ | 12 | | | |
| | | $T_{min} \leq T_{amb} \leq T_{max}$, $R_L \leq 2\text{ k}\Omega$ | 10 | | | |
| SR | Slew rate | $V_i = \pm 10\text{ V}$, $R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$, unity gain | 0.2 | 0.8 | | V/ μs |
| t_r | Rise time | $V_i = \pm 20\text{ mV}$, $R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$, unity gain | | 0.3 | | μs |
| K_{ov} | Overshoot | $V_i = \pm 20\text{ mV}$, $R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$, unity gain | | 5 | | % |
| R_i | Input resistance | | 0.3 | 2 | | M Ω |
| Z_{ic} | Common-mode input impedance | | | 200 | | |
| C_i | Input capacitance | | | 1.4 | | pF |
| R_o | Output resistance | | | 75 | | Ω |
| FPB | Full power bandwidth | $R_L = 2\text{ k}\Omega$, $V_o \geq \pm 10\text{ V}$, $A_{VD} = 1$, THD $\leq 5\%$ | | 14 | | kHz |
| B | Unity gain bandwidth | $V_i = 10\text{ mV}$, $R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$ | | 1 | | MHz |
| GBP | Gain bandwidth product | $V_i = 10\text{ mV}$, $R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$, $f = 100\text{ kHz}$ | 0.4 | 1 | | |
| THD | Total harmonic distortion | $f = 1\text{ kHz}$, $A_v = 20\text{ dB}$, $R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$, $V_o = 2\text{ V}_{pp}$ | | 0.02 | | % |

| Symbol | Parameter | | Min. | Typ. | Max. | Unit |
|-----------------|--------------------------------|---------------------------------------|------|------|------|------------------------|
| e_n | Equivalent input noise voltage | $f = 1 \text{ kHz}, R_s = 100 \Omega$ | | 45 | | nV/ $\sqrt{\text{Hz}}$ |
| ϕ_m | Phase margin | | | 65 | | Degrees |
| A_m | Gain margin | | | 11 | | dB |
| V_{o1}/V_{o2} | Channel separation | | | 120 | | |

5 Package information

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5.1 SO8 package information

Figure 3: SO8 package outline

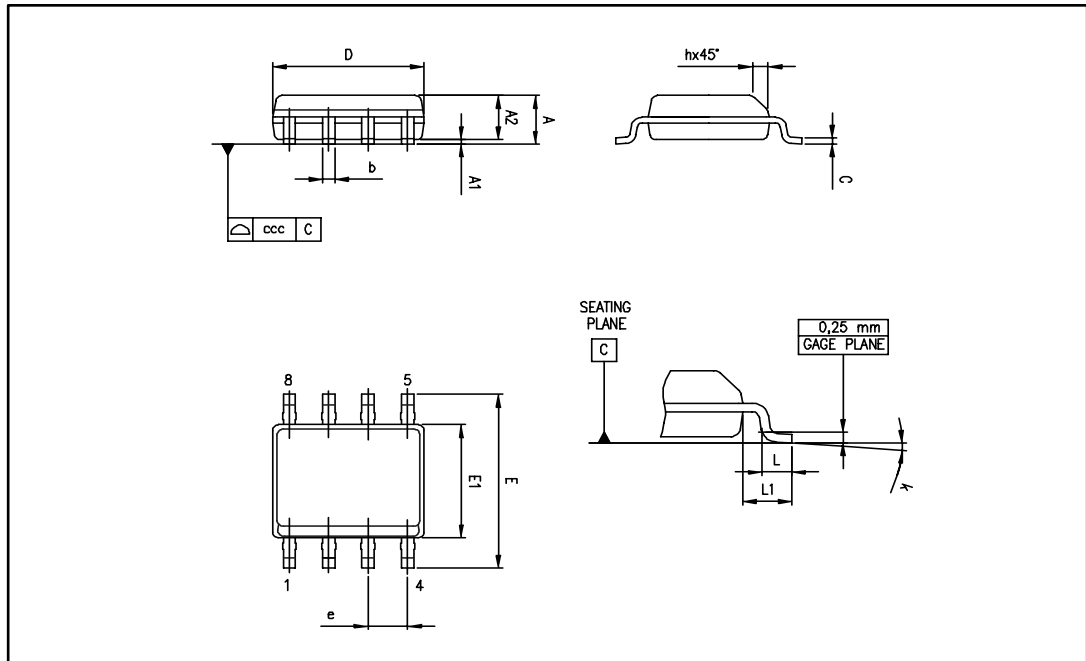


Table 3: SO8 mechanical data

| Ref. | Dimensions | | | | | |
|------|-------------|------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max |
| A | | | 1.75 | | | 0.069 |
| A1 | 0.10 | | 0.25 | 0.004 | | 0.010 |
| A2 | 1.25 | | | 0.049 | | |
| b | 0.28 | | 0.48 | 0.011 | | 0.019 |
| c | 0.17 | | 0.23 | 0.007 | | 0.010 |
| D | 4.80 | 4.90 | 5.00 | 0.189 | 0.193 | 0.197 |
| E | 5.80 | 6.00 | 6.20 | 0.228 | 0.236 | 0.244 |
| E1 | 3.80 | 3.90 | 4.00 | 0.150 | 0.154 | 0.157 |
| e | | 1.27 | | | 0.050 | |
| h | 0.25 | | 0.50 | 0.010 | | 0.020 |
| L | 0.40 | | 1.27 | 0.016 | | 0.050 |
| L1 | | 1.04 | | | 0.040 | |
| k | 0° | | 8° | 0° | | 8° |
| ccc | | | 0.10 | | | 0.004 |

6 Ordering information

Table 4: Order codes

| Order code | Temperature range | Package | Packaging | Marking |
|------------|-------------------|---------|---------------|---------|
| MC1458DT | 0 °C to 70 °C | SO8 | Tape and reel | 1458 |
| MC1458IDT | -40 °C to 105 °C | | | 1458I |

7 Revision history

Table 5: Document revision history

| Date | Revision | Changes |
|-------------|----------|--|
| 21-Sep-2016 | 4 | Moved part number MC1558 to a separate datasheet. Removed DIP8 package Deleted "Device summary table", created Table 4: "Order codes" in its place, and added the latter to Section 6: "Ordering information" . Updated Section 5.1: "SO8 package information" Updated document layout |

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