



## MC4558

### LINEAR INTEGRATED CIRCUIT

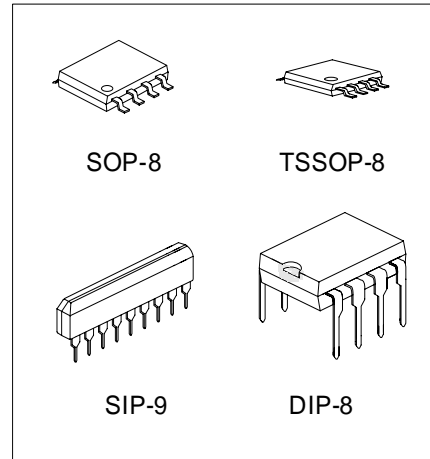
## DUAL OPERATIONAL AMPLIFIER

### DESCRIPTION

The UTC **MC4558** is a monolithic integrated circuit designed for dual operational amplifier.

### FEATURES

- \* No frequency compensation required
- \* No latch-up
- \* Large common mode and differential voltage range
- \* Parameter tracking over temperature range
- \* Gain and phase match between amplifiers
- \* Internally frequency compensated
- \* Low noise input transistors



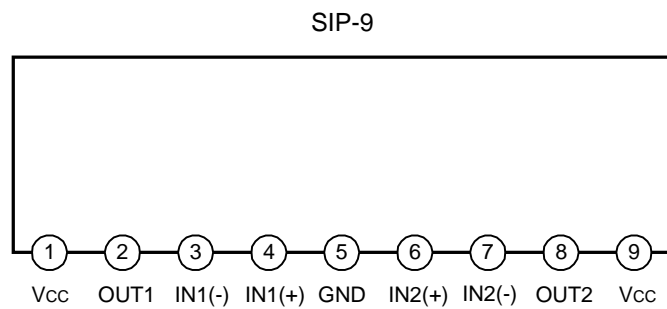
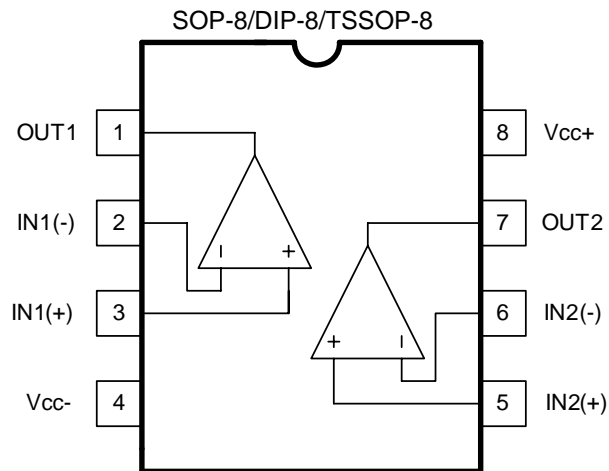
\*Pb-free plating product number: MC4558L

### ORDERING INFORMATION

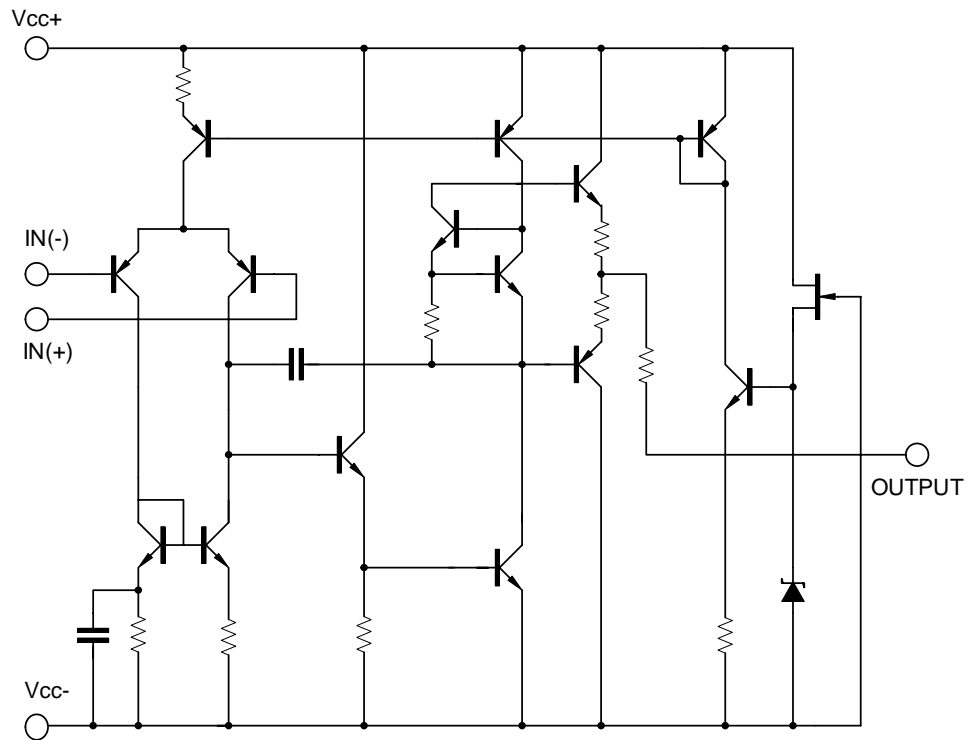
| Order Number |                   | Package | Packing   |
|--------------|-------------------|---------|-----------|
| Normal       | Lead Free Plating |         |           |
| MC4558-D08-T | MC4558L-D08-T     | DIP-8   | Tube      |
| MC4558-P08-R | MC4558L-P08-R     | TSSOP-8 | Tape Reel |
| MC4558-P08-T | MC4558L-P08-T     | TSSOP-8 | Tube      |
| MC4558-S08-R | MC4558L-S08-R     | SOP-8   | Tape Reel |
| MC4558-S08-T | MC4558L-S08-T     | SOP-8   | Tube      |
| MC4558-G09-T | MC4558L-G09-T     | SIP-9   | Tube      |

|  |  |
|--|--|
| <p>MC4558L-D08-R</p> <p>(1) Packing Type<br/>(2) Package Type<br/>(3) Lead Plating</p> | <p>(1) R: Tape Reel, T: Tube<br/>(2) D08: DIP-8, P08: TSSOP-8, S08: SOP-8, G09: SIP-9<br/>(3) L: Lead Free Plating, Blank: Pb/Sn</p> |
|--|--|

### ■ PIN CONFIGURATIONS



### ■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER                  |         | SYMBOL        | RATING     | UNIT |
|----------------------------|---------|---------------|------------|------|
| Supply Voltage             |         | $V_{CC}$      | $\pm 22$   | V    |
| Differential input voltage |         | $V_{I(DIFF)}$ | $\pm 18$   | V    |
| Power Dissipation          | DIP-8   | $P_D$         | 600        | mW   |
|                            | SOP-8   |               | 400        | mW   |
|                            | TSSOP-8 |               | 250        | mW   |
|                            | SIP-9   |               | 500        | mW   |
| Input Voltage              |         | $V_{IN}$      | $\pm 15$   | V    |
| Junction Temperature       |         | $T_J$         | +125       | °C   |
| Operating Temperature      |         | $T_{OPR}$     | -20 ~ +85  | °C   |
| Storage Temperature        |         | $T_{STG}$     | -40 ~ +150 | °C   |

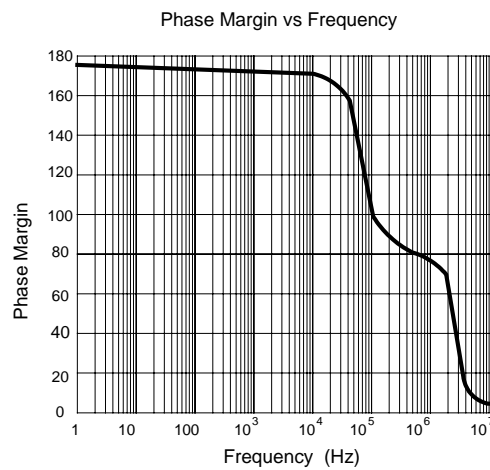
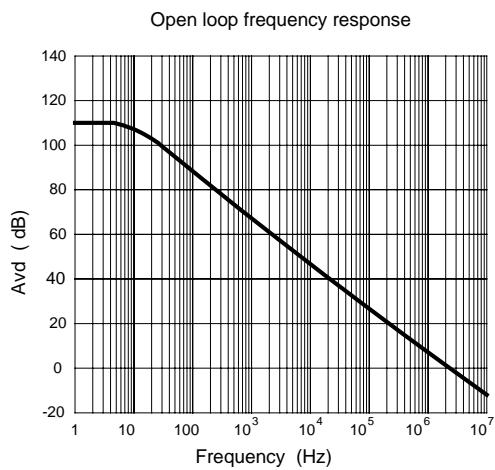
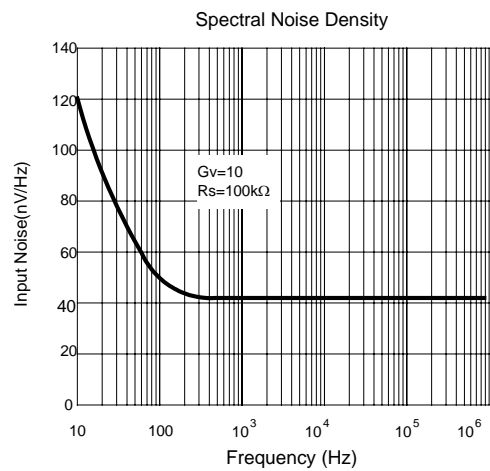
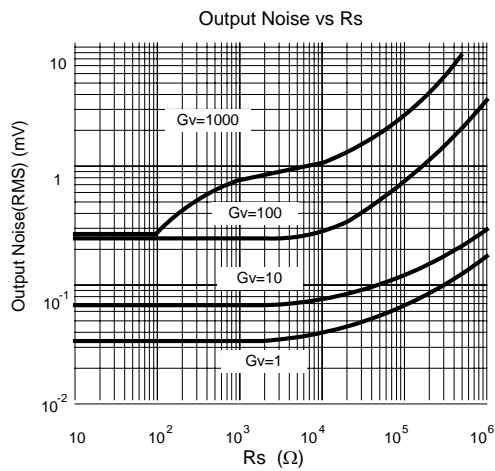
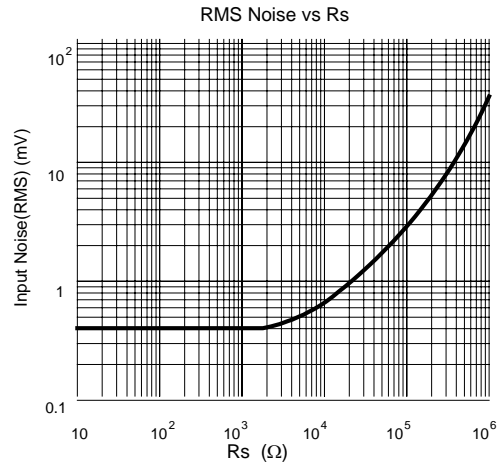
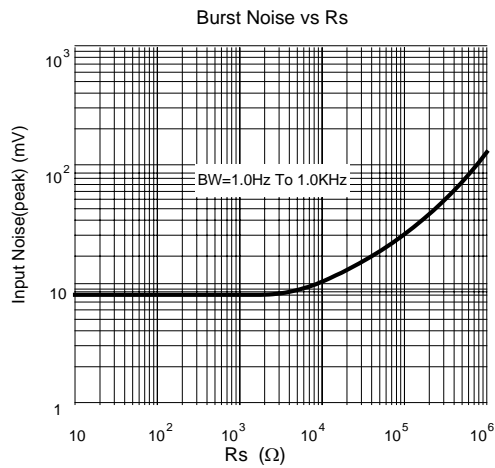
Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The device is guaranteed to meet performance specification within 0 ~ +70 operating temperature range and assured by design from -20 ~ +85 .

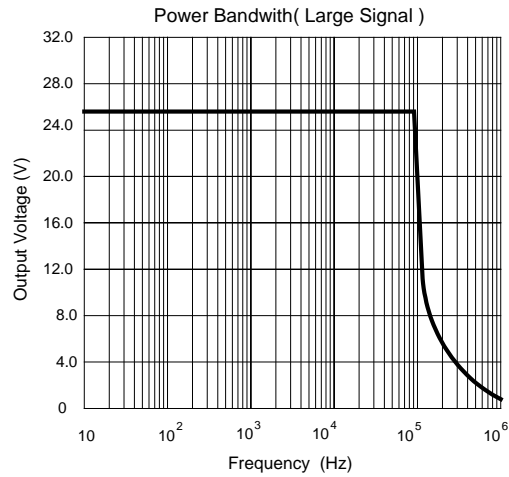
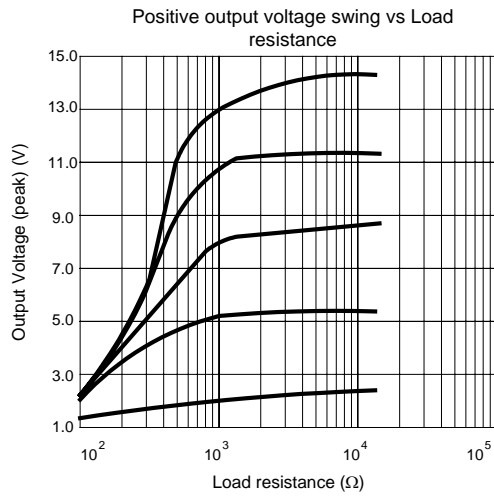
### ■ ELECTRICAL CHARACTERISTICS (Ta=25°C, V<sub>CC</sub>=15V, V<sub>ee</sub>=-15V)

| PARAMETER                        | SYMBOL          | TEST CONDITIONS  | MIN      | TYP      | MAX      | UNIT       |
|----------------------------------|-----------------|--|----------|----------|----------|------------|
| Supply Current, all Amp, no load | $I_{CC}$        |  |          | 2.3      | 4.5      | mA         |
| Input offset voltage             | $V_{I(OFF)}$    | $R_S < 10k\Omega$  |          | 2        | 6        | mV         |
| Input offset current             | $I_{I(OFF)}$    |  |          | 5        | 200      | nA         |
| Input bias current               | $I_{I(BIAS)}$   |  |          | 30       | 500      | nA         |
| Large signal voltage gain        | $G_V$           | $V_{O(p-p)} = \pm 10V, R_L = 2k\Omega$                                 | 20       | 200      |          | V/mV       |
| Common Mode Input Voltage Range  | $V_{I(COM)}$    |  | $\pm 12$ | $\pm 13$ |          | V          |
| Common Mode Rejection Ratio      | $RR_{(COM)}$    | $R_S = 10k\Omega$  | 70       | 90       |          | dB         |
| Supply Voltage Rejection Ratio   | $RR_{(VCC)}$    | $R_S = 10k\Omega$  | 76       | 90       |          | dB         |
| Output Voltage swing             | $V_{O(p-p)}$    | $R_L \geq 10k\Omega$   |          | $\pm 12$ | $\pm 14$ | V          |
| Power Consumption                | $P_C$           |  |          | 70       | 170      | mW         |
| Slew Rate                        | SR              | $V_{IN} = \pm 10V, R_L = 2k\Omega, C_L = 100pF$                        | 1.2      | 2.2      |          | V/ $\mu s$ |
| Rise Time                        | $T_{RIS}$       | $V_{IN} = \pm 20mV, R_L = 2k\Omega, C_L = 100pF$                       |          | 0.3      |          | $\mu s$    |
| Overshoot                        | OS              | $V_{IN} = \pm 20mV, R_L = 2k\Omega, C_L = 100pF$                       |          | 15       |          | %          |
| Input Resistance                 | $R_{IN}$        |  | 0.3      | 2        |          | M $\Omega$ |
| Output Resistance                | $R_{OUT}$       |  |          | 75       |          | $\Omega$   |
| Total Harmonic Distortion        | THD             | $f = 1kHz, A_V = 20dB, R_L = 2k\Omega, V_{OUT} = 2V_{pp}, C_L = 100pF$ |          | 0.008    |          | %          |
| Channel Separation               | $V_{O1}/V_{O2}$ |  |          | 120      |          | dB         |
| <b>FREQUENCY CHARACTERISTIC</b>  |                 |  |          |          |          |            |
| Unity Gain Bandwidth             | BW              |  | 2.0      | 2.8      |          | MHz        |

## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS(Cont.)



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