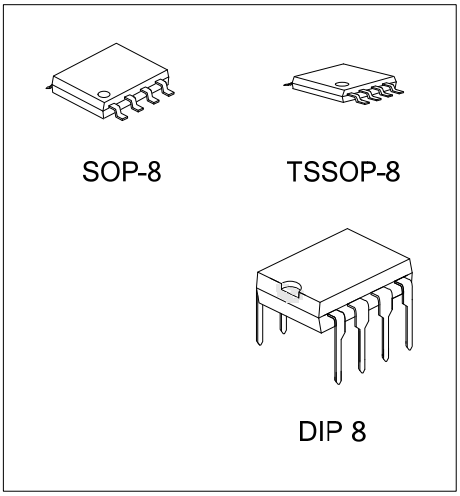
# DUAL OPERATIONAL AMPLIFIER




## ■ DESCRIPTION

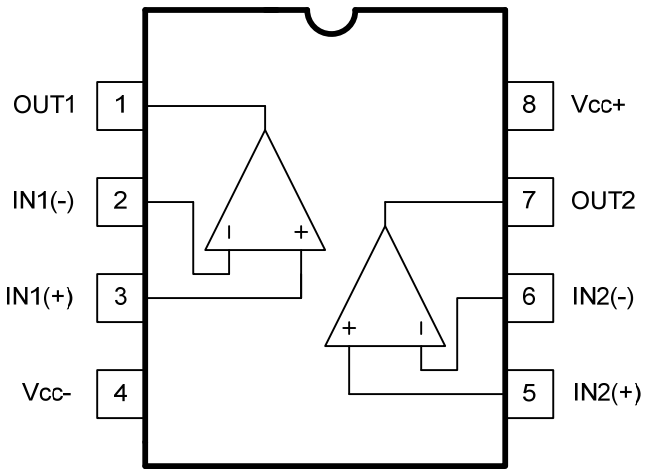
The HG 4558 is a monolithic integrated circuit designed for dual operational amplifier.

## ■ 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

## ■ PIN CONFIGURATIONS

SOP-8/DIP-8/TSSOP-8



## ■ ABSOLUTE MAXIMUM RATINGS

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

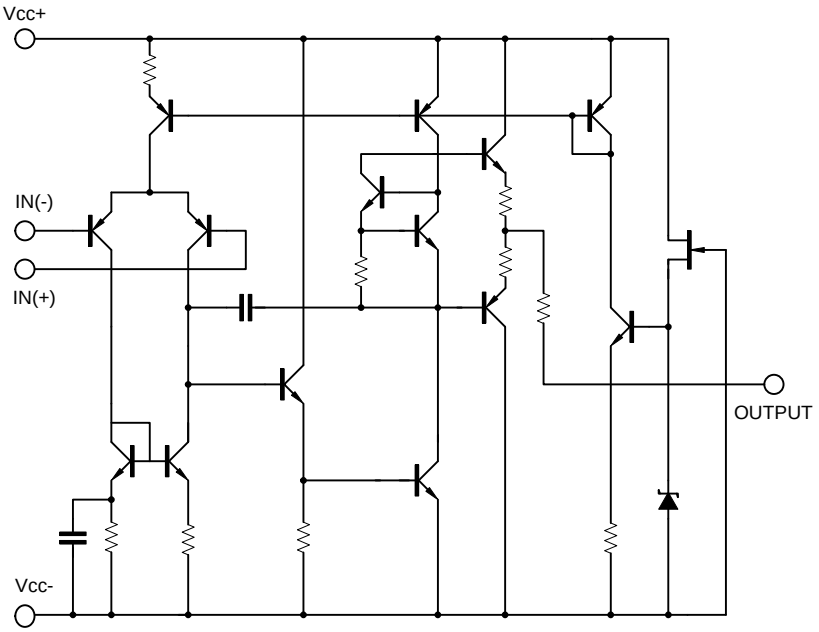
Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

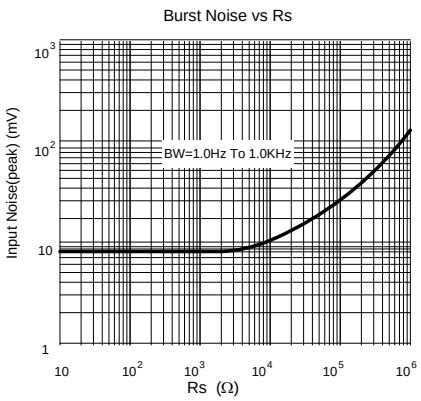
## ■ ELECTRICAL CHARACTERISTICS (Ta=25°C, $V_{CC}$=15V, Vee=-15V)

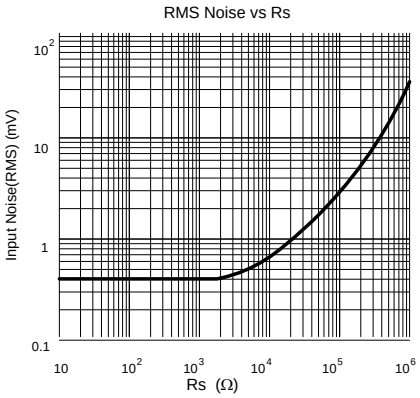
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Supply Current, all Amp, no load | $I_{CC}$ | | | 2.3 | 4.5 | mA |
| Input offset voltage | $V_{I(OFF)}$ | $R_S$<10kΩ | | 2 | 6 | mV |
| Input offset current | $I_{I(OFF)}$ | | | 5 | 200 | nA |
| Input bias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

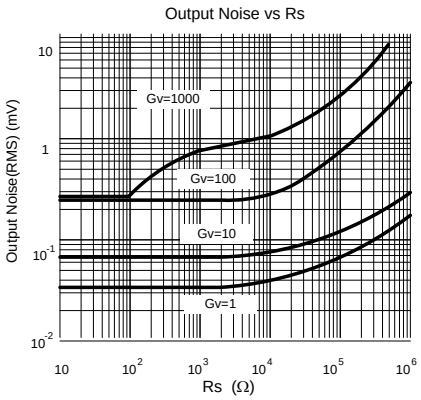
## ■ BLOCK DIAGRAM

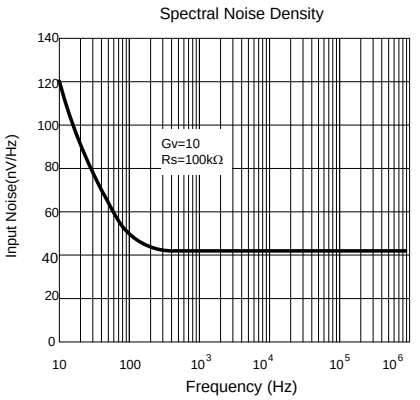



## ■ TYPICAL CHARACTERISTICS

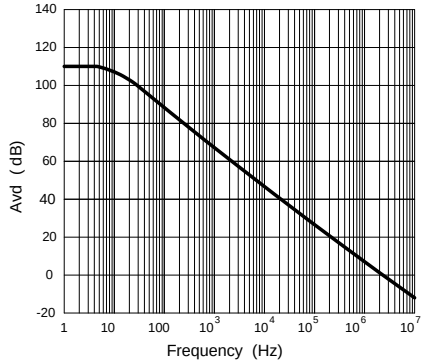


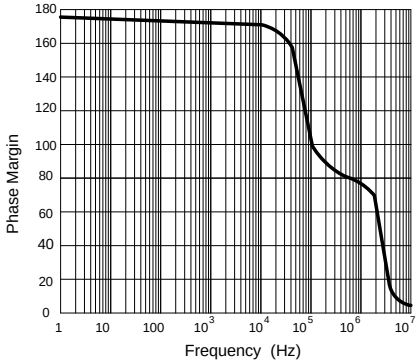



Open loop frequency response

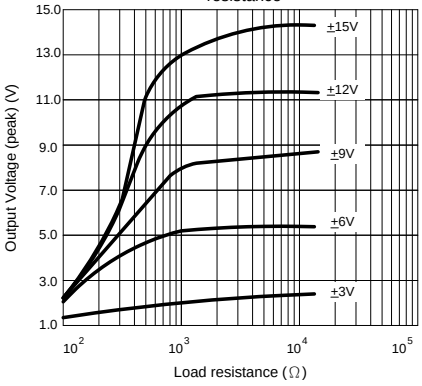



Phase Margin vs Frequency

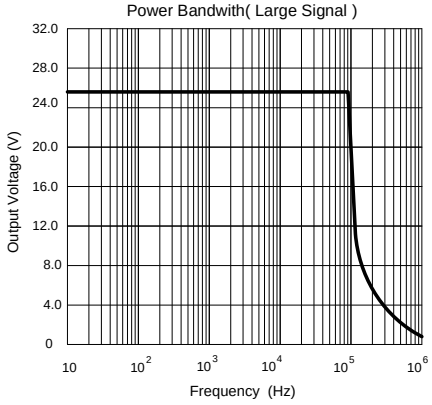



## ■ TYPICAL CHARACTERISTICS(Cont.)

Positive output voltage swing vs Load resistance




Power Bandwith( Large Signal )




Negative output voltage swing vs Load resistance