# GSC4558

**DUAL OPERATIONAL AMPLIFIER**

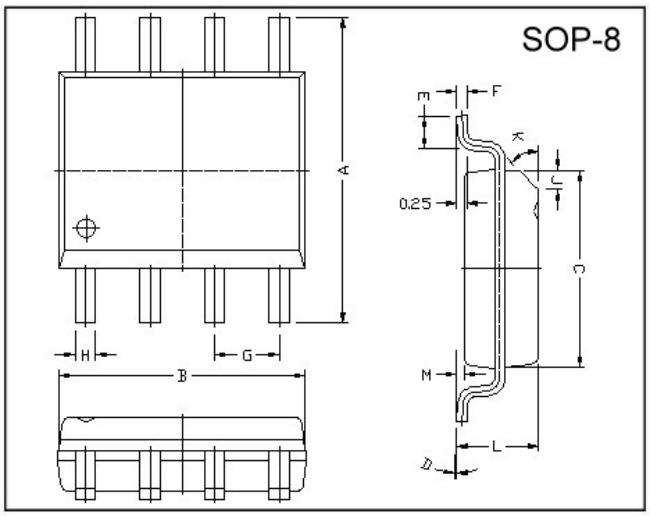
## Description

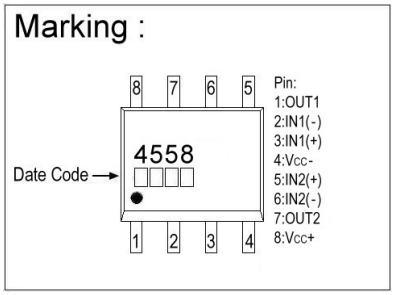
The GSC4558 is a monolithic integrated circuit designed for dual operational amplifier.

## Features

- No frequency compensated 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

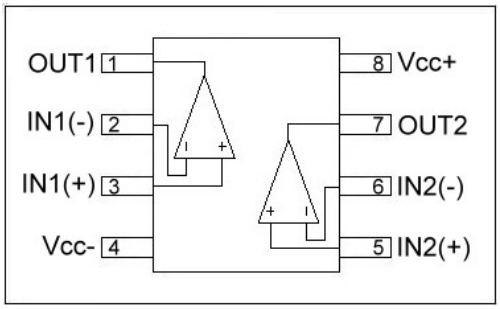
## Package Dimensions



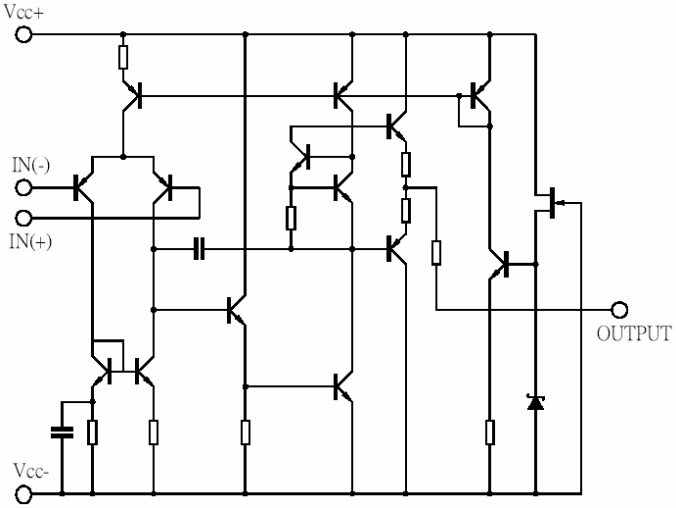




| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 5.80 | 6.20 | M | 0.10 | 0.25 |
| B | 4.80 | 5.00 | H | 0.35 | 0.49 |
| C | 3.80 | 4.00 | L | 1.35 | 1.75 |
| D | 0° | 8° | J | 0.375 REF. | |
| E | 0.40 | 0.90 | K | 45° | |
| F | 0.19 | 0.25 | G | 1.27 TYP. | |

## Pin Configurations




## Block Diagram



## Absolute Maximum Ratings at Ta = 25℃

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Supply Voltage | $V_{CC}$ | ±22 | V |
| Differential Input Voltage | $V_{I(DIFF)}$ | ±18 | V |
| Input Voltage | $V_I$ | ±15 | V |
| Power Dissipation | $P_D$ | 400 | mW |
| Operating Temperature Range | $T_{OPR}$ | 0 ~ +70 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -65 ~ +150 | ℃ |

## Electrical Characteristics ($V_{CC}$=15V Vee=-15V, $T_A$=25℃)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Supply Current, all Amp, no load | $I_{CC}$ | | - | 2.3 | 4.5 | mA |
| Input Offset Voltage | $V_{IO}$ | $R_S$<10kΩ | - | 2 | 6 | mV |
| Input Offset Current | $I_{IO}$ | | - | 5 | 200 | nA |
| Input Bias Current | $I_{BIAS}$ | | - | 30 | 500 | nA |
| Common Mode Input Voltage | $V_{I(R)}$ | | ±12 | ±13 | | V |
| Large Signal Voltage Gain | $G_V$ | $V_{O(P-P)}$=±10V, $R_L$≧2kΩ | 20 | 200 | - | V/mV |
| Output Voltage Swing | $V_{O(P-P)}$ | $R_L$≧10kΩ | - | ±12 | ±14 | V |
| Common Mode Rejection Ratio | CMRR | $R_S$≦10kΩ | 70 | 90 | - | dB |
| Supply Voltage Rejection Ratio | PSRR | $R_S$≦10kΩ | 76 | 90 | - | dB |
| Power Consumption | $P_C$ | | - | 70 | 170 | mV |
| Slew Rate | SR | Vi=±10V, $R_L$≧2kΩ, $C_L$≦100pF | 1.2 | 2.2 | - | V/μs |
| Rise Time | $T_{RIS}$ | Vi=±20mV, $R_L$≧2kΩ, $C_L$≦100pF | - | 0.3 | - | μs |
| Overshoot | OS | Vi=±20mV, $R_L$≧2kΩ, $C_L$≦100pF | - | 15 | - | % |
| Input Resistance | $R_i$ | | 0.3 | 2 | - | MΩ |
| Output Resistance | $R_O$ | | - | 75 | - | Ω |
| Total Harmonic Distortion | THD | f=1kHz, $A_V$=20dB, $R_L$=2kΩ, $V_O$= $2V_{PP}$, $C_L$=100pF | - | 0.008 | - | % |
| Channel Separation | $V_{O1}/V_{O2}$ | | - | 120 | - | dB |

## Frequency Characteristics ($V_{CC}$=15V Vee=-15V, $T_A$=25℃)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Unity Gain Bandwidth | BW | | 2.0 | 2.8 | - | MHz |

## Typical Performance Characteristics

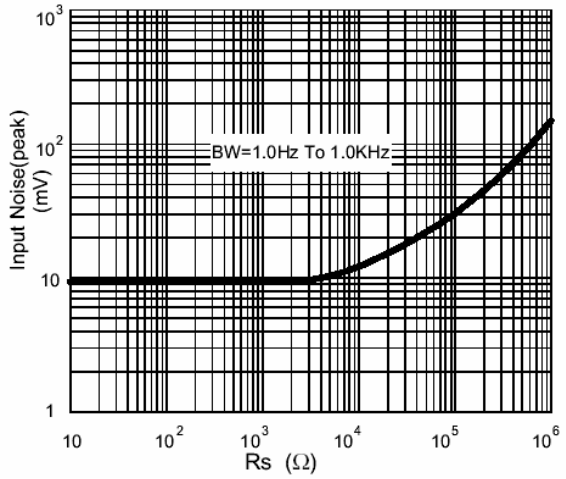



**Fig 1. Burst Noise vs. Rs**

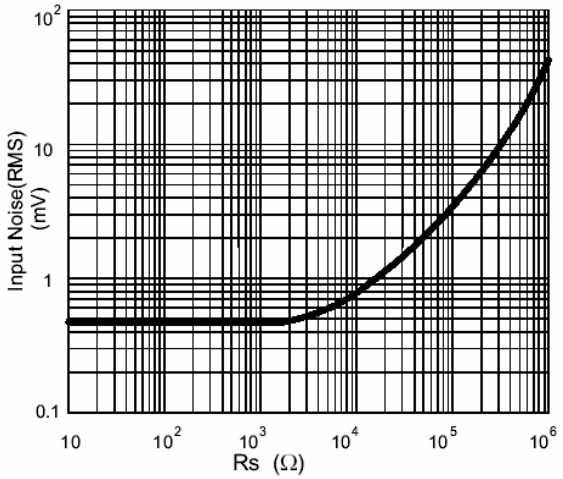



**Fig 2. RMS Noise vs. Rs**

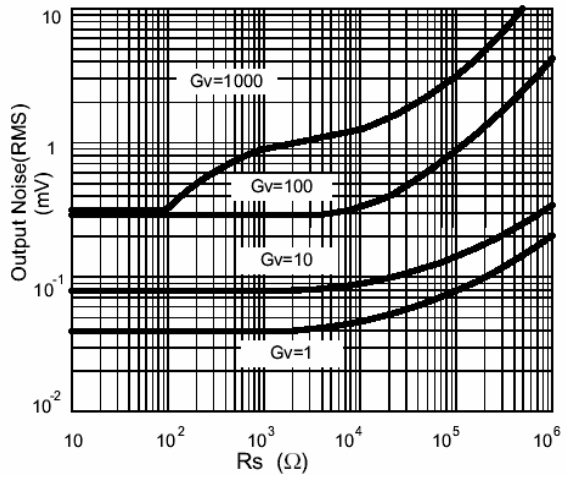



**Fig 3. Output Noise vs. Rs**

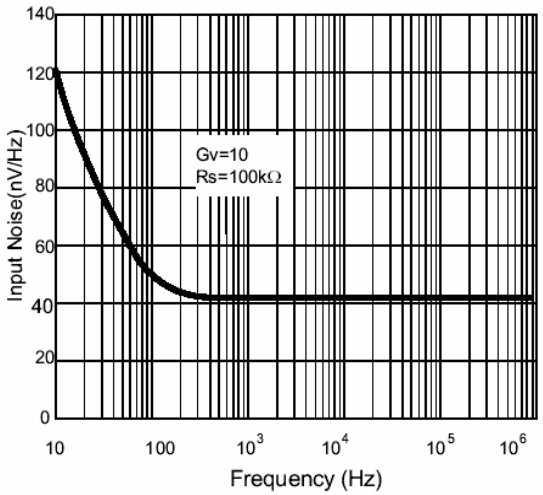



**Fig 4. Spectral Noise vs. Density**

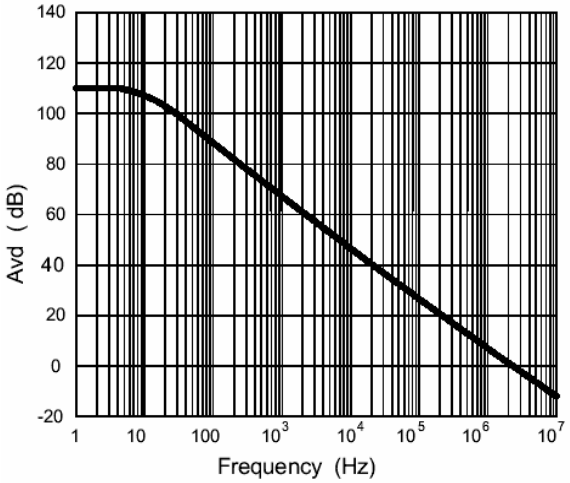



**Fig 5. Open Loop Frequency Response**

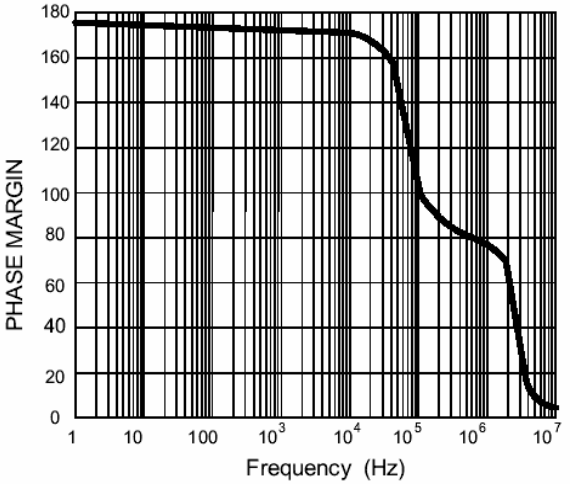



**Fig 6. Phase Margin vs. Frequency**

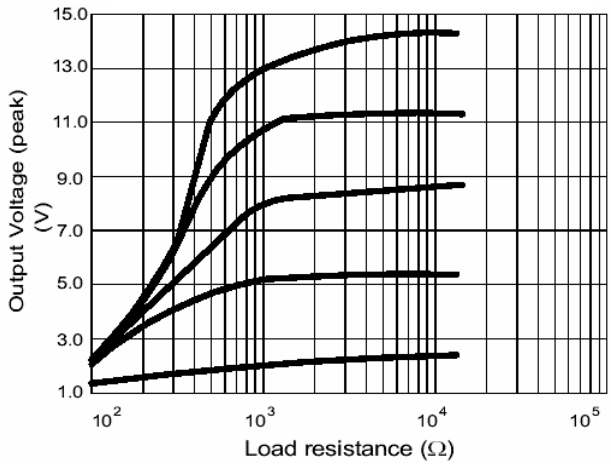



**Fig 7. Positive Output Voltage Swing vs. Load Resistance**

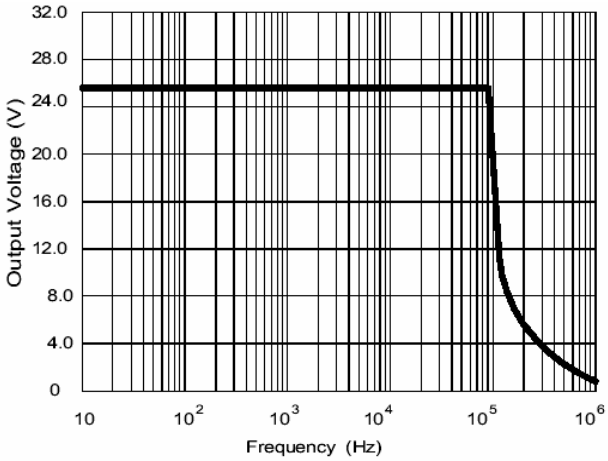



**Fig 8. Power Bandwidth (Large Signal)**



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