



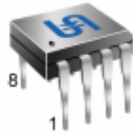
# TS4558

## Dual General Purpose Operational Amplifier

SOP-8



DIP-8



### Pin Assignment

1. Out A
2. Input A (-)
3. Input A (+)
4. Ground
5. Input B (+)
6. Input B (-)
7. Output B
8. Vcc

Supply Voltage Range -18 V to 18V

Unity Gain Bandwidth 3MHz

Dual Channel Amplifier

### General Description

The TS4558 is dual general purpose operational amplifier, and provide the high common-mode input voltage range and the absence of latch-up make these amplifiers ideal for voltage follower application.

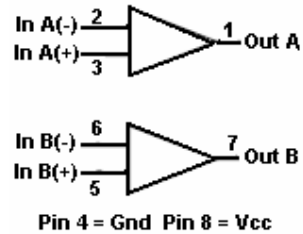
The devices are short circuit protected and the internal frequency compensation ensures stability without external components.

The TS4558 is offered in 8 pin SOP-8 and DIP-8 package.

### Features

- ◇ Short circuit protection
- ◇ Wide common-mode and differential ranges
- ◇ No frequency compensation required
- ◇ Low power consumption
- ◇ No latch-up
- ◇ 3MHz unity gain bandwidth guaranteed
- ◇ Gain and phase match between amplifiers

### Block Diagram



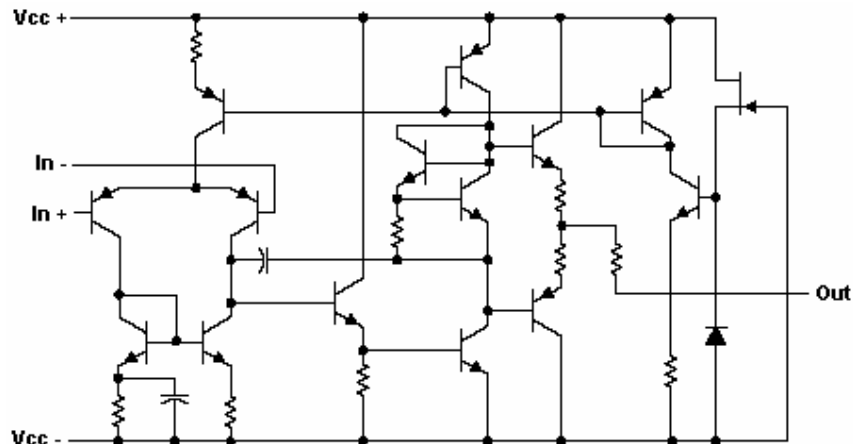
### Applications

- ◇ DVD player
- ◇ Audio application

### Ordering Information

Part No.	Operating Temp.	Package
TS4558CD	0 ~ +70 °C	DIP-8
TS4558CS		SOP-8

### Schematic (each amplifier)





Absolute Maximum Rating				
Supply Voltage		V <sub>CC +</sub>	18	V
Supply Voltage		V <sub>CC -</sub>	- 18	V
Differential Input Voltage		V <sub>IDR</sub>	±30	V
Input Voltage		V <sub>in</sub>	30	V
Package Thermal Impedance	SOP-8	θ <sub>ja</sub>	97	°C/W
	DIP-8		85	
Operating Junction Temperature Range		T <sub>J</sub>	0 ~ +125	°C
Storage Temperature Range		T <sub>STG</sub>	-65 ~ +150	°C
Lead Temperature 1.6mm(1/16") from case for 10Sec.		T <sub>LEAD</sub>	260	°C

Note: Maximum ratings are those values beyond which damage to the device may occur, and functional operation should be restricted to the recommended operating condition.

### Recommended Operating Conditions

Supply Voltage		V <sub>CC +</sub>	15	V
Supply Voltage		V <sub>CC -</sub>	- 15	V

### Electrical Characteristics

(V<sub>CC</sub> = ±15V, T<sub>a</sub> = 25°C; unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Offset Voltage	V <sub>io</sub>	R <sub>s</sub> ≤ 10kΩ		0.5	±6	mV
Input Offset Current	I <sub>io</sub>			20	±200	nA
Input Bias Current	I <sub>ib</sub>			150	500	nA
Input Resistance	R <sub>i</sub>		0.3	5		MΩ
Unity Gain Bandwidth	B <sub>1</sub>			3		MHz
Large-Signal Voltage Gain	A <sub>v</sub>	R <sub>L</sub> ≥ 2kΩ, V <sub>c</sub> = ±10V	20	300		V/mV
Output Voltage Swing	V <sub>om</sub>	R <sub>L</sub> ≥ 10kΩ	±12	±14		V
		R <sub>L</sub> ≥ 2kΩ	±10	±14		
Input Common-Mode Voltage Range	V <sub>icr</sub>		±12	±13		V
Common-Mode Rejection Ratio	CMRR	R <sub>s</sub> ≤ 10kΩ	70	90		dB
Supply Voltage Rejection Ratio	PSRR	R <sub>s</sub> ≤ 10kΩ		30	150	uV/V
Slew Rate	SR	R <sub>L</sub> = 2kΩ, V <sub>in</sub> =10V, L=100pF	0.8	1.6		V/uS
Supply Current	I <sup>+</sup> , I <sup>-</sup>			2.5	5.6	mA
Power Consumption	P <sub>c</sub>	R <sub>L</sub> = ∞		75	170	mV
Input Noise Voltage	V <sub>n</sub>	R <sub>s</sub> = 1kΩ, f = 30Hz~30KHz			3.5	uV <sub>rms</sub>
Source Current	I <sub>source</sub>		- 20			mA
Sink Current	I <sub>sink</sub>		20			mA

Note 1: All characteristics are measured under open-loop conditions with zero common-mode input voltage, unless otherwise specified.

## Electrical Characteristics Curve

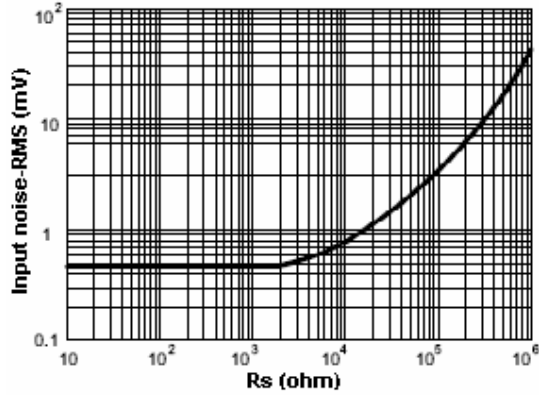


Figure 1. RMS noise vs Rs

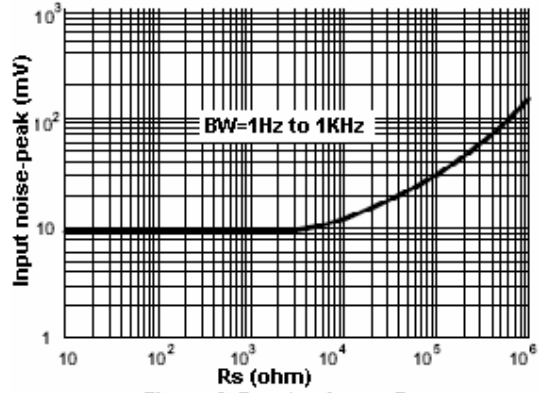


Figure 2. Burst noise vs Rs

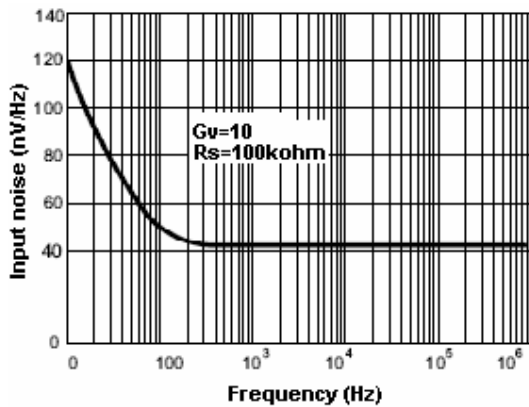


Figure 3. Spectral noise density

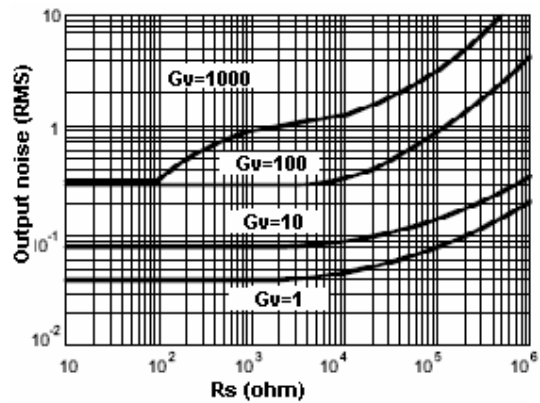


Figure 4. Output noise vs Rs

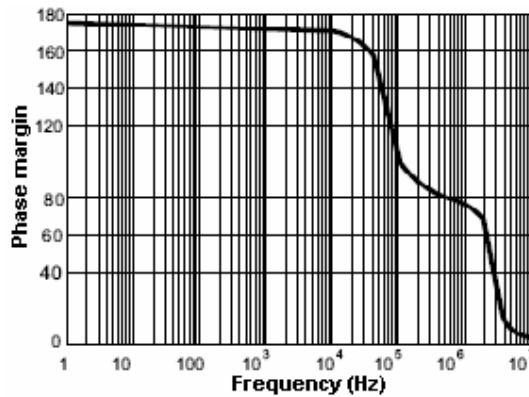


Figure 5. Phase margin vs Frequency

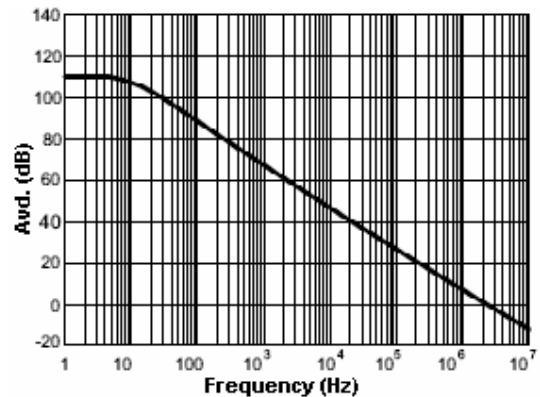
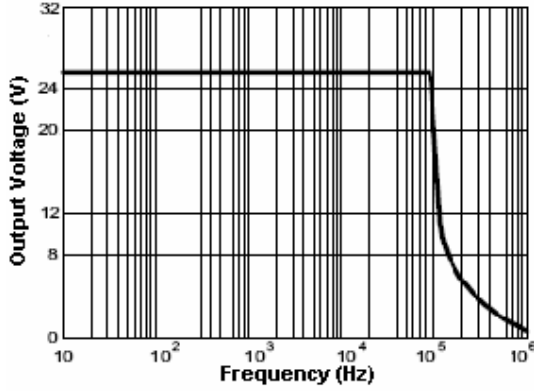
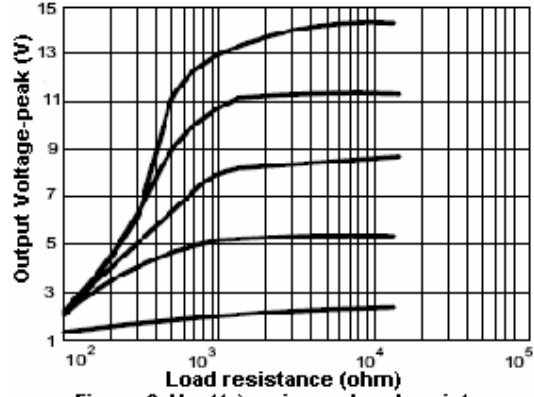


Figure 6. Open loop frequency response

**Electrical Characteristics Curve**

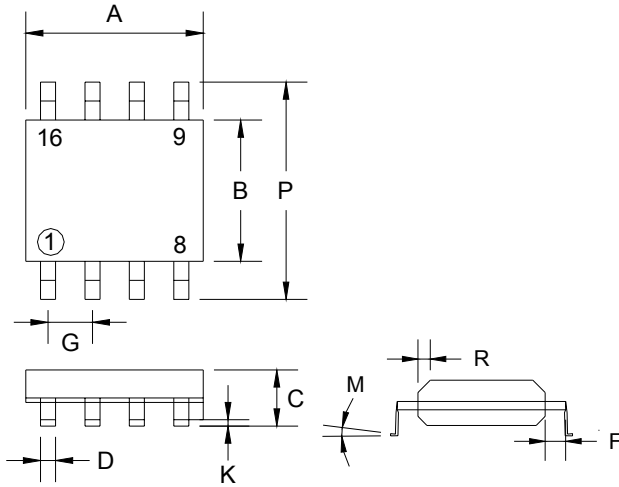


**Figure 7. Power bandwidth (large signal)**



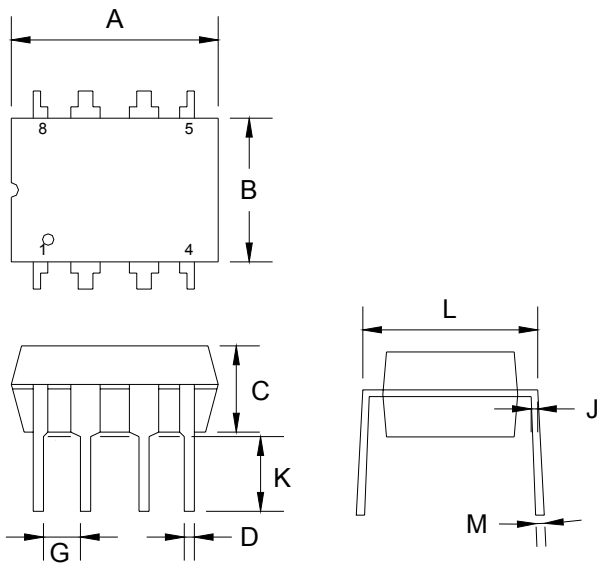
**Figure 8. Vout(+) swing vs Load resistance**

## SOP-8 Mechanical Drawing



SOP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 (typ)		0.05 (typ)	
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

## DIP-8 Mechanical Drawing



SOP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.07	9.32	0.357	0.367
B	6.22	6.48	0.245	0.255
C	3.18	4.45	0.125	0.135
D	0.35	0.55	0.019	0.020
G	2.54 (typ)		0.10 (typ)	
J	0.29	0.31	0.011	0.012
K	3.25	3.35	0.128	0.132
L	7.75	8.00	0.305	0.315
M	-	10°	-	10°