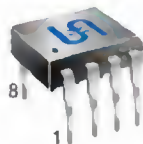


Dual General Purpose Operational Amplifier

SOP-8



DIP-8



Pin Definition:

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

General Description

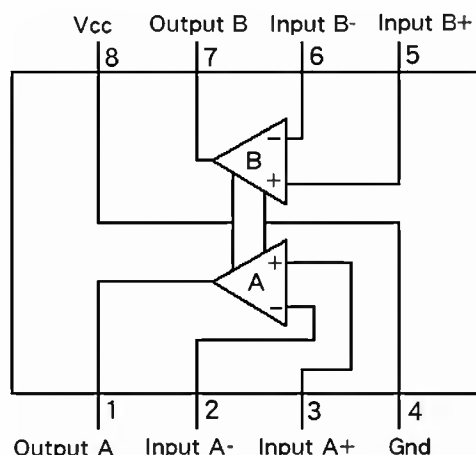
The TS4558 is dual general purpose operational amplifier, and provide the high common-mode input voltage range and the absence of latch-up make these amplifiers ideal for voltage follower application.

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



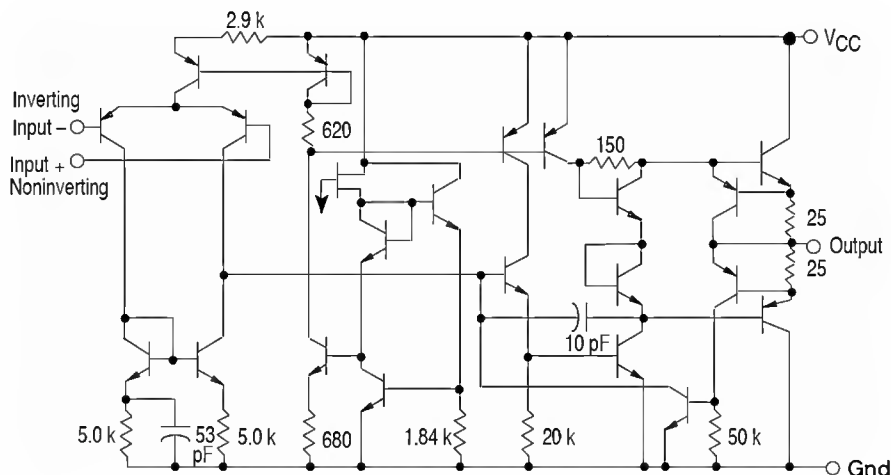
Applications

- DVD player
- Audio application

Ordering Information

Part No.	Package	Packing
TS4558CD C3	DIP-8	50pcs / Tube
TS4558CS RL	SOP-8	2.5Kpcs / 13" Reel

Schematic (each amplifier)



Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC+}	18	V
Supply Voltage	V_{CC-}	-18	V
Differential Input Voltage	V_{IDR}	± 30	V
Input Voltage	V_{IN}	30	V
Package Thermal Impedance	DIP-8	θ_{JA}	$^{\circ}\text{C/W}$
	SOP-8	85	
Ambient Temperature Range	T_A	0 ~ +70	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$
Junction Temperature Range	T_J	+150	$^{\circ}\text{C}$
Lead Temperature 1.6mm(1/16") from case for 10Sec.	T_{LEAD}	260	$^{\circ}\text{C}$

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

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC+}	15	V
Supply Voltage	V_{CC-}	-15	V

Electrical Specifications ($V_{CC} = \pm 15\text{V}$, $T_a = 25^{\circ}\text{C}$; unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Offset Current	I_{IO}		--	20	± 200	nA
Input Bias Current	I_{IB}		--	150	500	nA
Input Resistance	R_i		0.3	5	--	M Ω
Unity Gain Bandwidth	B1		--	3	--	MHz
Large-Signal Voltage Gain	A_v	$R_L \geq 2\text{k}\Omega$, $V_c = \pm 10\text{V}$	20	300	--	V/mV
Output Voltage Swing	V_{om}	$R_L \geq 10\text{k}\Omega$	± 12	± 14	--	V
		$R_L \geq 2\text{k}\Omega$	± 10	± 14	--	
Input Common-Mode Voltage Range	V_{icr}		± 12	± 13	--	V
Common-Mode Rejection Ratio	CMRR	$R_s \leq 10\text{k}\Omega$	70	90	--	dB
Supply Voltage Rejection Ratio	PSRR	$R_s \leq 10\text{k}\Omega$	--	30	150	$\mu\text{V/V}$
Slew Rate	SR	$R_L = 2\text{k}\Omega$, $V_{in} = 10\text{V}$, $L = 100\text{pF}$	0.8	1.6	--	V/ μs
Supply Current	I_+ , I_-		--	2.5	5.6	mA
Power Consumption	P_c	$R_L = \infty$	--	75	170	mW
Input Noise Voltage	V_n	$R_s = 1\text{k}\Omega$, $f = 30\text{Hz} \sim 30\text{kHz}$	--	--	3.5	μV_{rms}
Source Current	I_{source}		-20	--	--	mA
Sink Current	I_{sink}		20	--	--	mA

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

Electrical Characteristics Curve

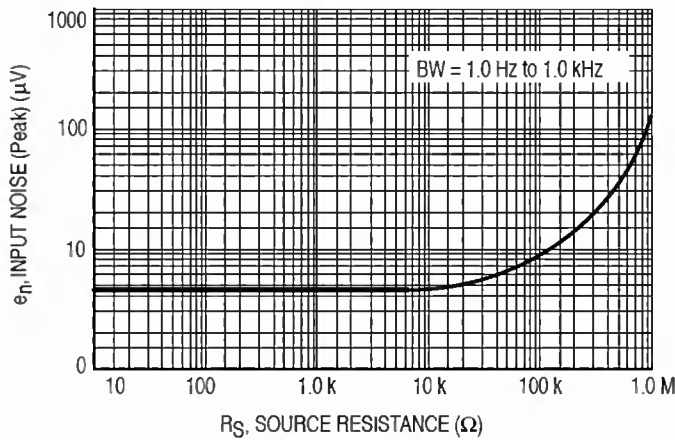


Figure 1. Burst Noise vs. Source Resistance

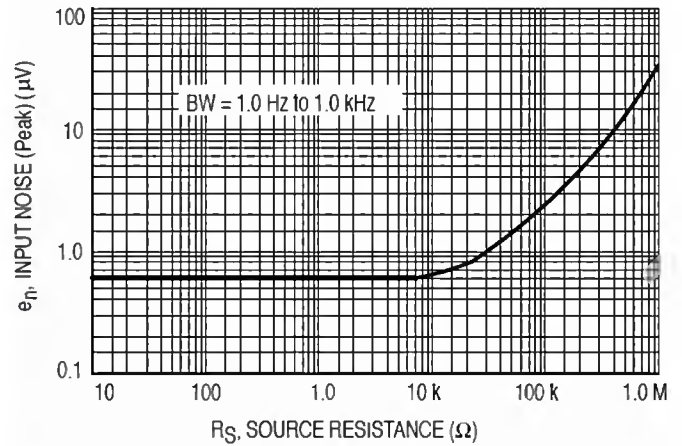


Figure 2. RMS Noise vs. Source Resistance

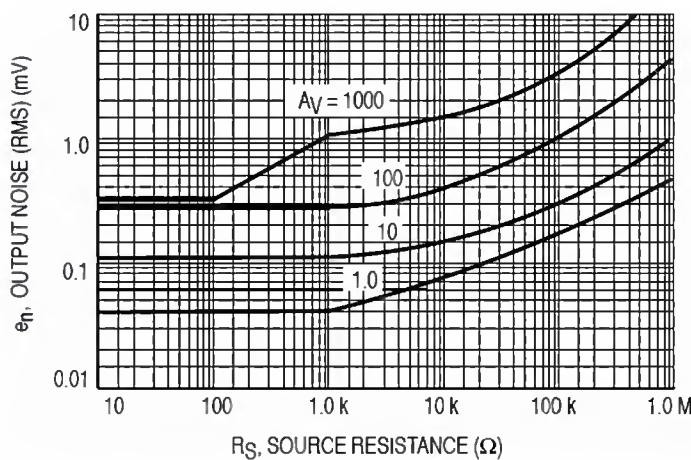


Figure 3. Output Noise vs. Source Resistance

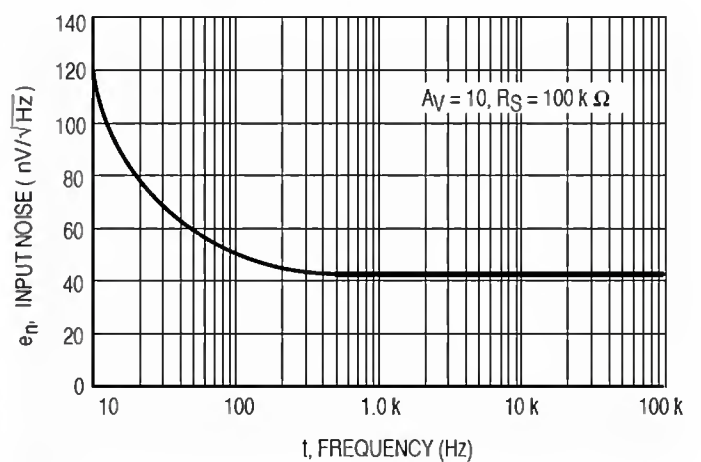
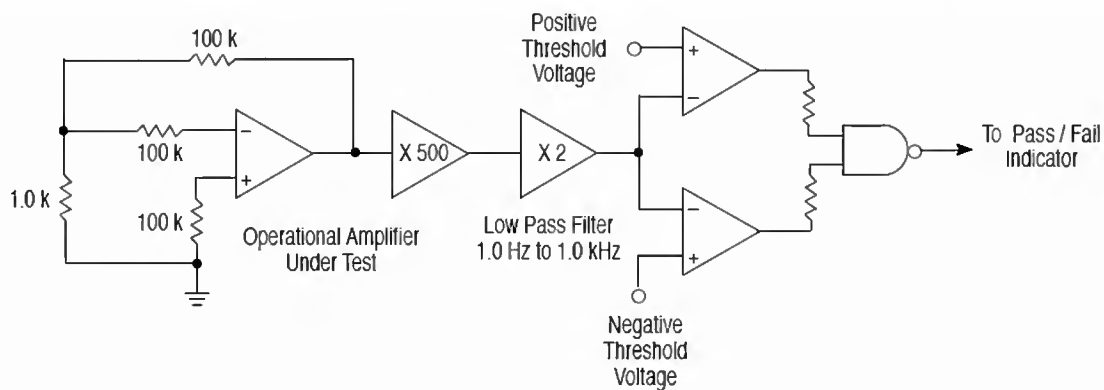


Figure 4. Spectral Noise Density



Unlike conventional peak reading or RMS meters, this system was especially designed to provide the quick response time essential to burst (popcorn) noise testing.

The test time employed is 10 sec and the 20 μV peak limit refers to the operational amplifier input thus eliminating errors in the closed loop gain factor of the operational amplifier.

Figure 5. Burst Noise Test Circuit

Electrical Characteristics Curve

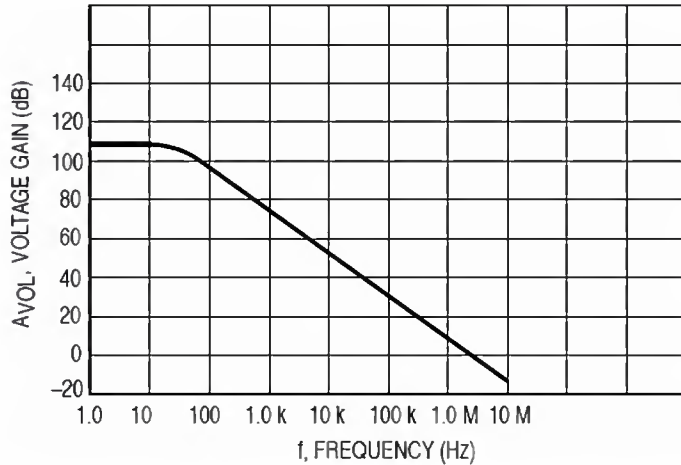


Figure 6. Open Loop Frequency Response

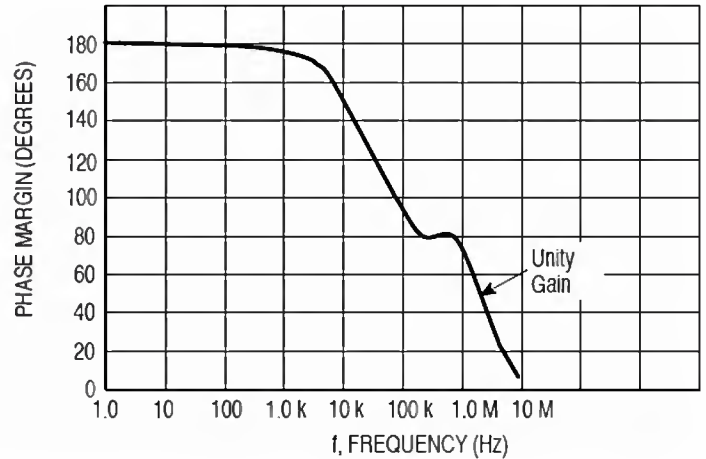


Figure 7. Phase Margin vs. Frequency

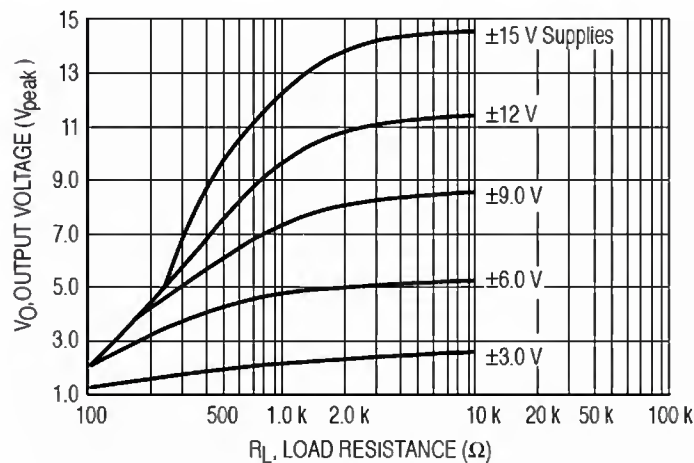


Figure 8. Positive Vout Swing vs. Load Resistance

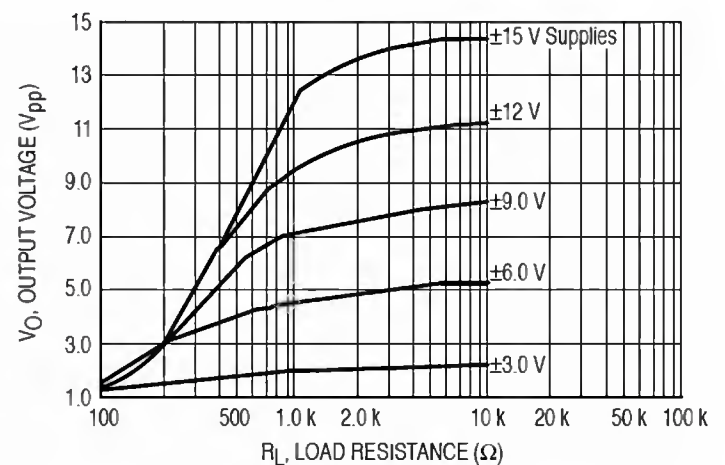
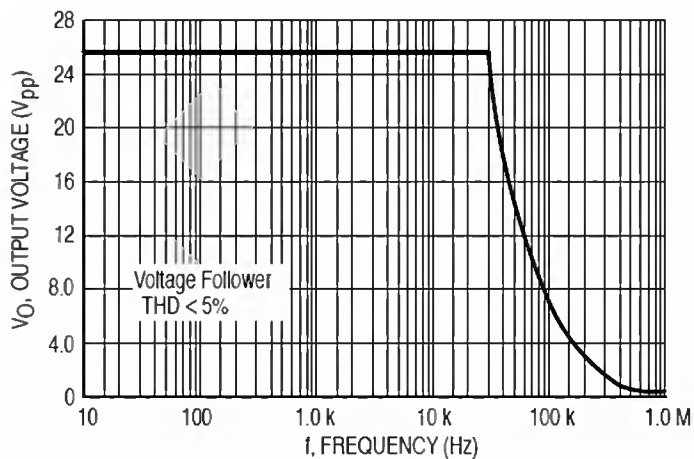


Figure 9. Negative Vout Swing vs. Load Resistance



**Figure 10. Power Bandwidth
(Large Signal Swing vs. Frequency)**

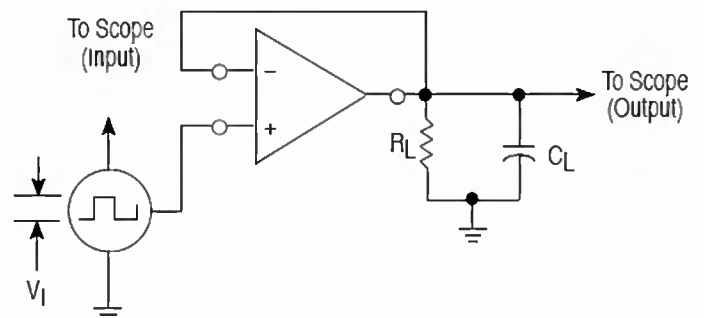
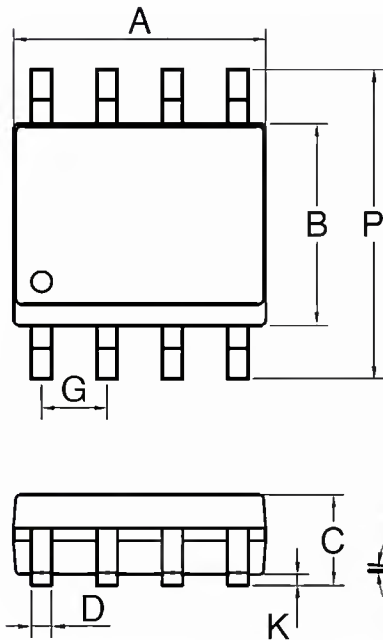


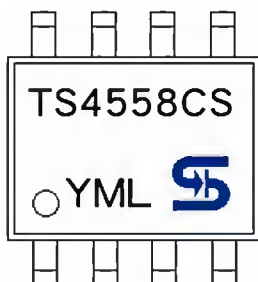
Figure 11. Transient Response Test Circuit

SOP-8 Mechanical Drawing



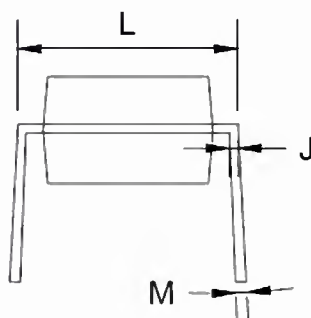
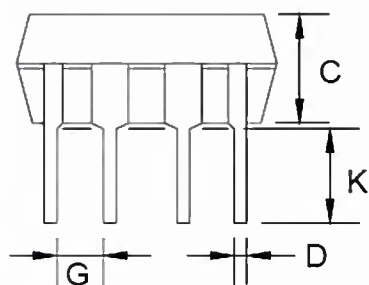
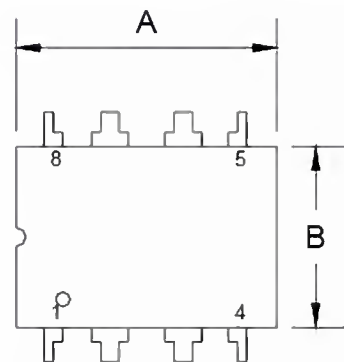
SOP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX.
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27BSC		0.05BSC	
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

Marking Diagram



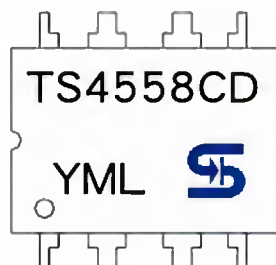
- Y** = Year Code
M = Month Code
 (A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
L = Lot Code

DIP-8 Mechanical Drawing



DIM	DIP-8 DIMENSION			
	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°

Marking Diagram



Y = Year Code
M = Month Code
 (A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
L = Lot Code

TS4558

Dual General Purpose Operational Amplifier

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