TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TS4558

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.

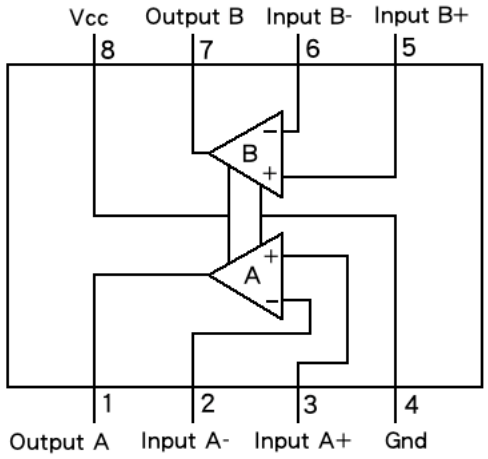
Features

- 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

Applications

- DVD player
- Audio application

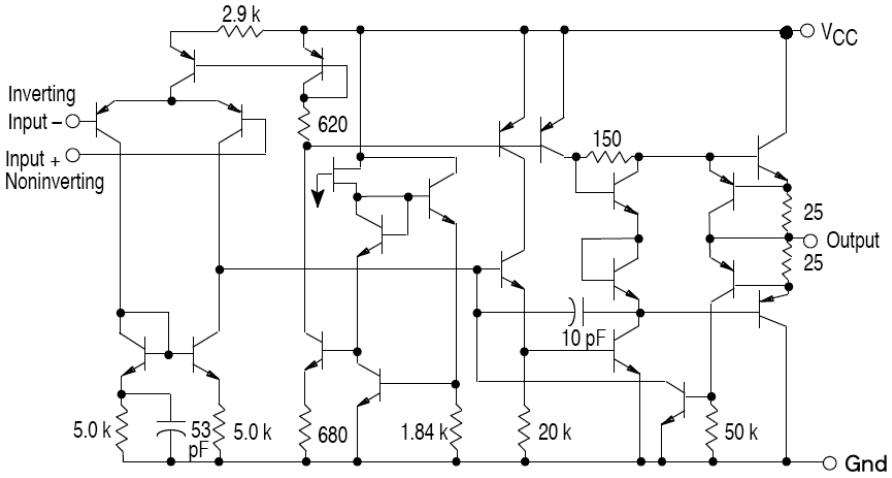
Block Diagram



Ordering Information

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

Schematic (each amplifier)



TS4558

Dual General Purpose Operational Amplifier

Absolute Maximum Rating

Parameter		Symbol	Value	Unit
Supply Voltage		Vcc +	18	V
Supply Voltage		Vcc -	-18	V
Differential Input Voltage		VIDR	±30	V
Input Voltage		Vin	30	V
Package Thermal Impedance	DIP-8	θja	97	°C/W
	SOP-8		85	
Operating Junction Temperature Range		TJ	0 ~ +70	°C
Storage Temperature Range		TSTG	-65 ~ +150	°C
Lead Temperature 1.6mm(1/16") from case for 10Sec.		TLEAD	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

Parameter	Symbol	Value	Unit
Supply Voltage	Vcc +	15	V
Supply Voltage	Vcc -	-15	V

Electrical Specifications (V_{CC} = ±15V, Ta =25°C; unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Offset Current	Iio		--	20	±200	nA
Input Bias Current	Iib		--	150	500	nA
Input Resistance	Ri		0.3	5	--	MΩ
Unity Gain Bandwidth	B1		--	3	--	MHz
Large-Signal Voltage Gain	Av	RL ≥ 2kΩ, Vc = ±10V	20	300	--	V/mV
Output Voltage Swing	Vom	RL ≥ 10kΩ	±12	±14	--	V
		RL ≥ 2kΩ	±10	±14	--	
Input Common-Mode Voltage Range	Vicr		±12	±13	--	V
Common-Mode Rejection Ratio	CMRR	Rs ≤ 10kΩ	70	90	--	dB
Supply Voltage Rejection Ratio	PSRR	Rs ≤ 10kΩ	--	30	150	uV/V
Slew Rate	SR	RL = 2kΩ, Vin=10V, L=100pF	0.8	1.6	--	V/uS
Supply Current	I+, I -		--	2.5	5.6	mA
Power Consumption	Pc	RL = ∞	--	75	170	mV
Input Noise Voltage	Vn	Rs = 1kΩ, f = 30Hz~30KHz	--	--	3.5	uVrms
Source Current	Isource		-20	--	--	mA
Sink Current	Isink		20	--	--	mA

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

Electrical Characteristics Curve

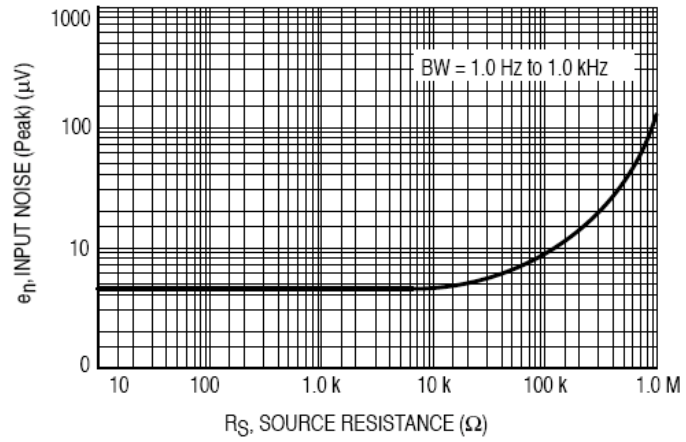


Figure 1. Burst Noise vs. Source Resistance

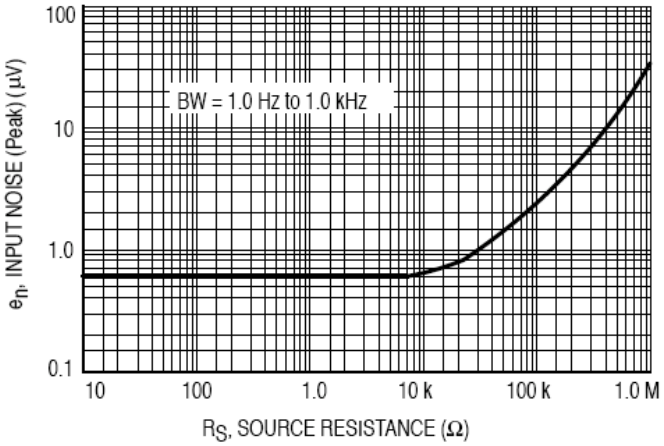


Figure 2. RMS Noise vs. Source Resistance

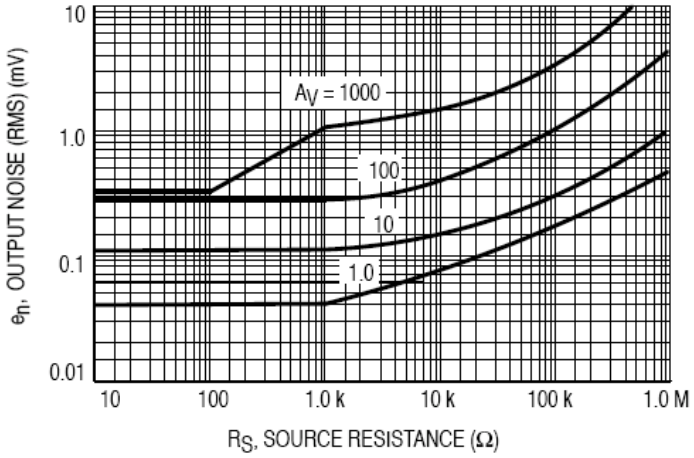


Figure 3. Output Noise vs. Source Resistance

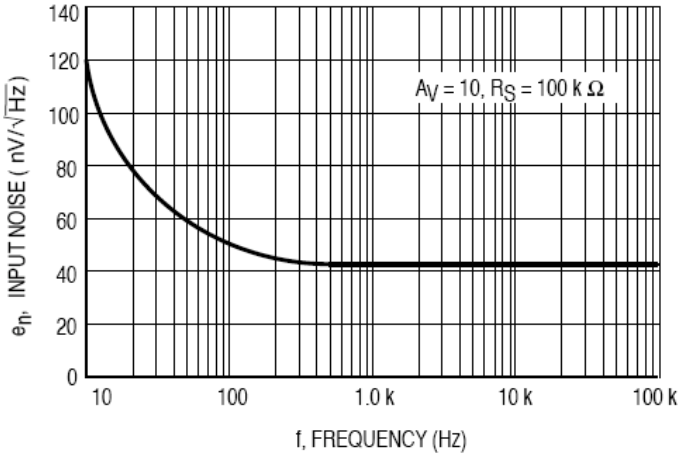
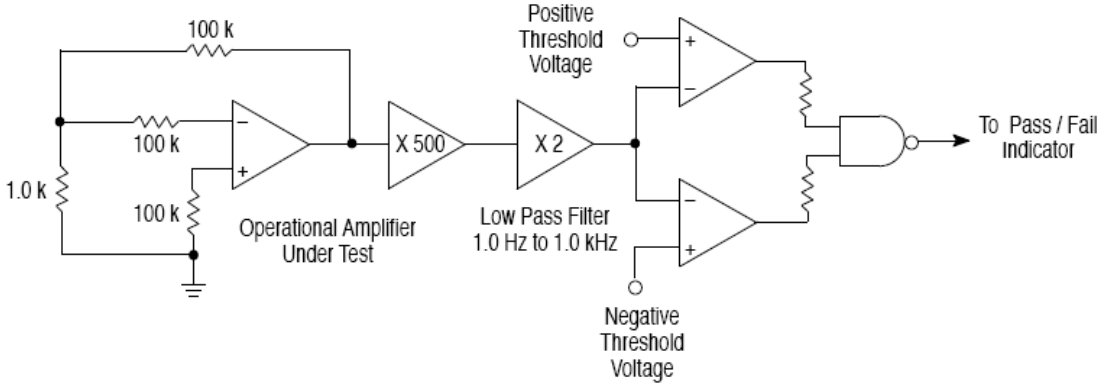


Figure 4. Spectral Noise Density



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 Citcuit

Electrical Characteristics Curve

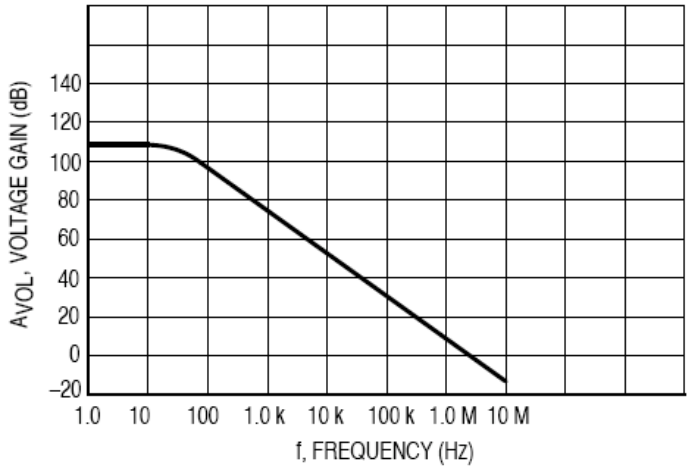


Figure 6. Open Loop Frequency Response

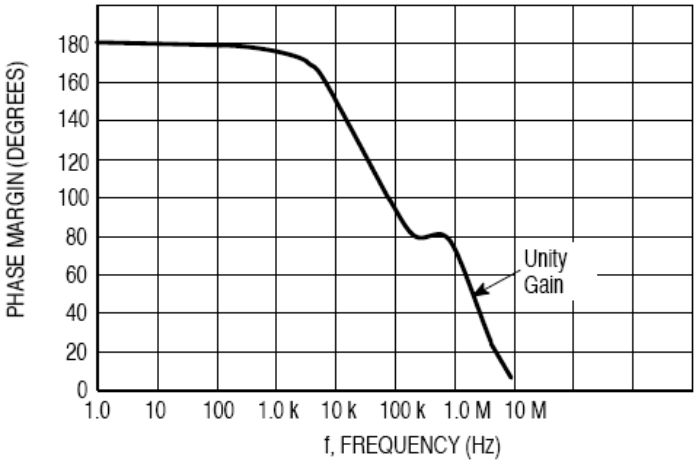


Figure 7. Phase Margin vs. Frequency

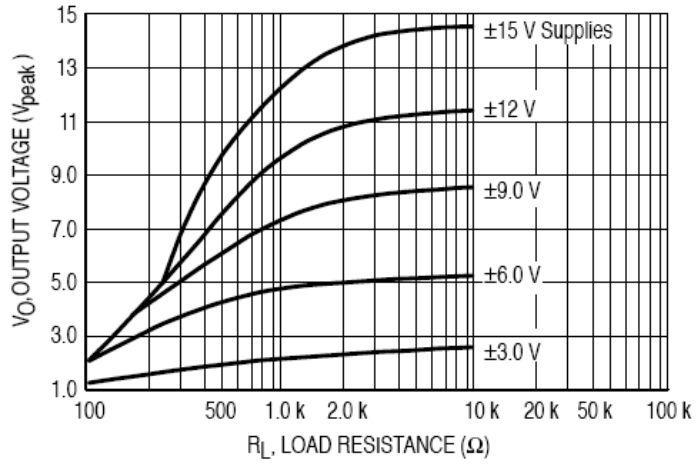


Figure 8. Positive Vout Swing vs. Load Resistance

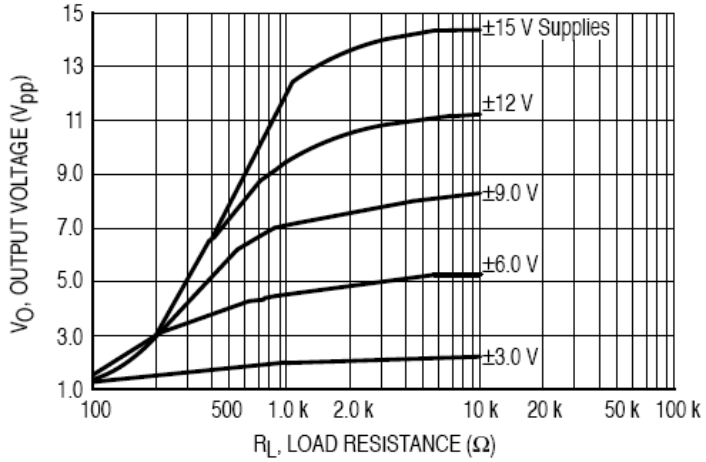


Figure 9. Negative Vout Swing vs. Load Resistance

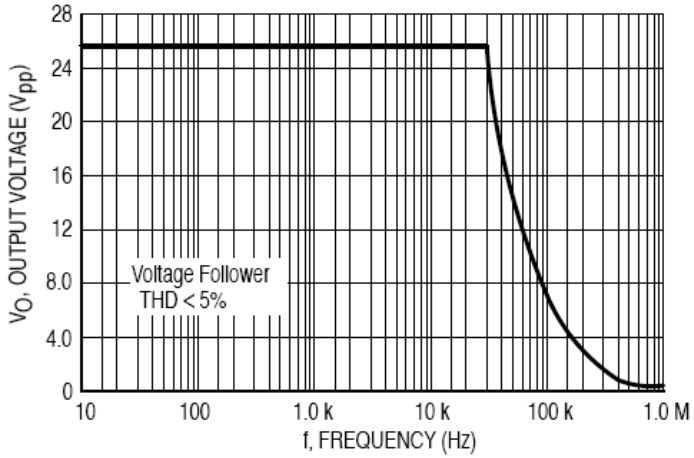


Figure 10. Power Bandwidth (Large Signal Swing vs. Frequency)

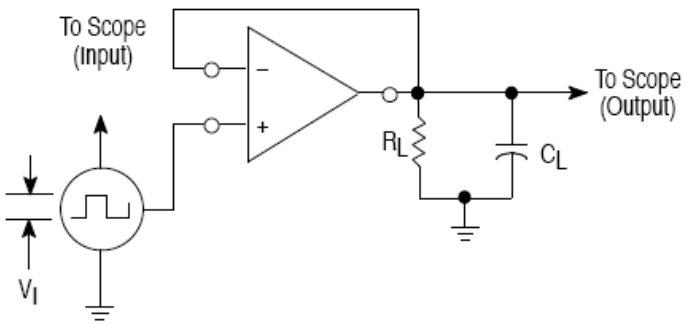
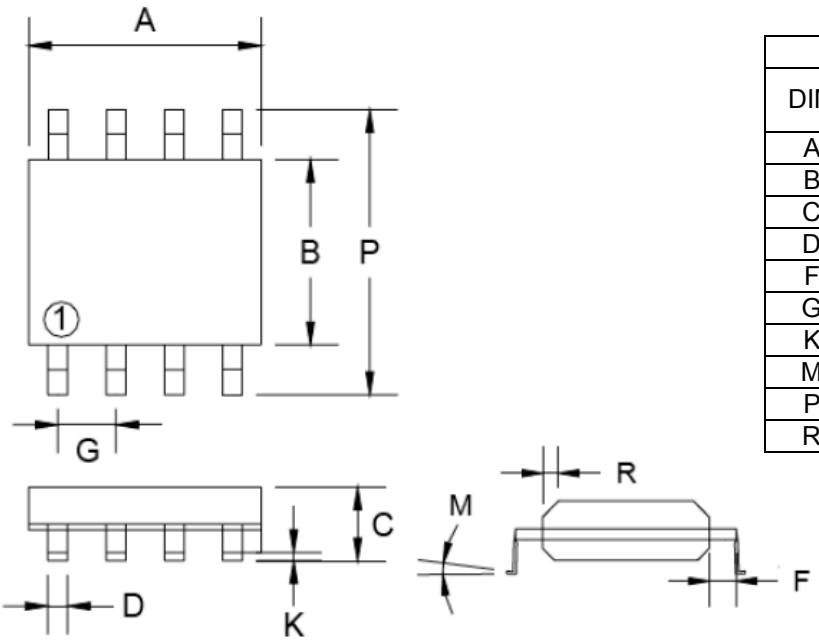


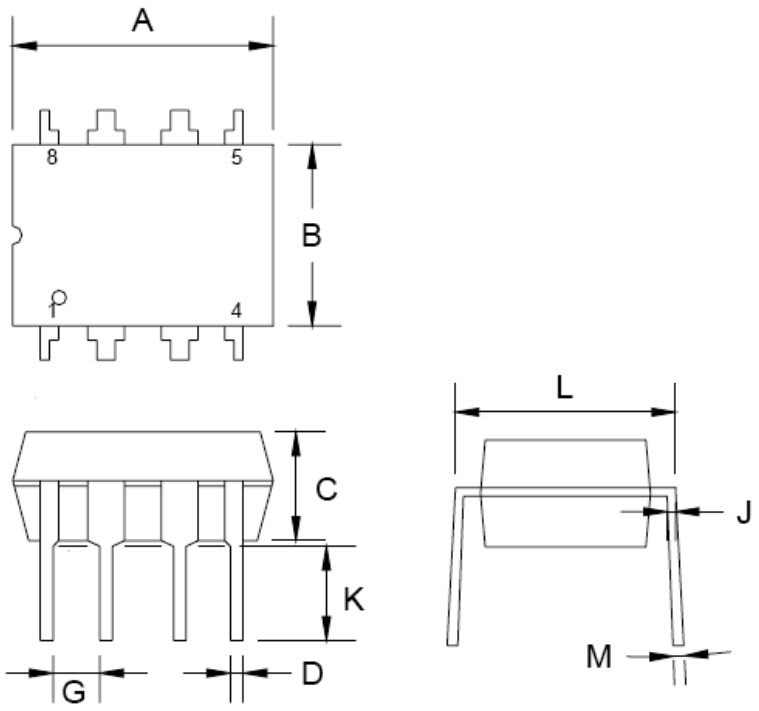
Figure 11. Transient Response Test Circuit

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

DIP-8 Mechanical Drawing



DIP-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^{o}	-	10^{o}

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