

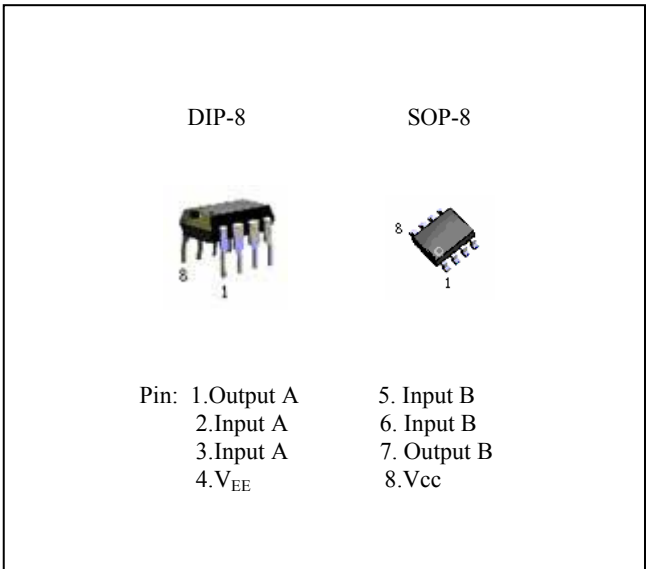
Dual Wide Bandwidth Operational Amplifiers

**FEATURES**

- 2.5MHz Unity Gain Bandwidth Guaranteed(PJ4558)
- Internally Compensated
- Short Circuit Protection
- Gain and Phase Match between Amplifiers
- Low Power Consumption

**ORDERING INFORMATION**

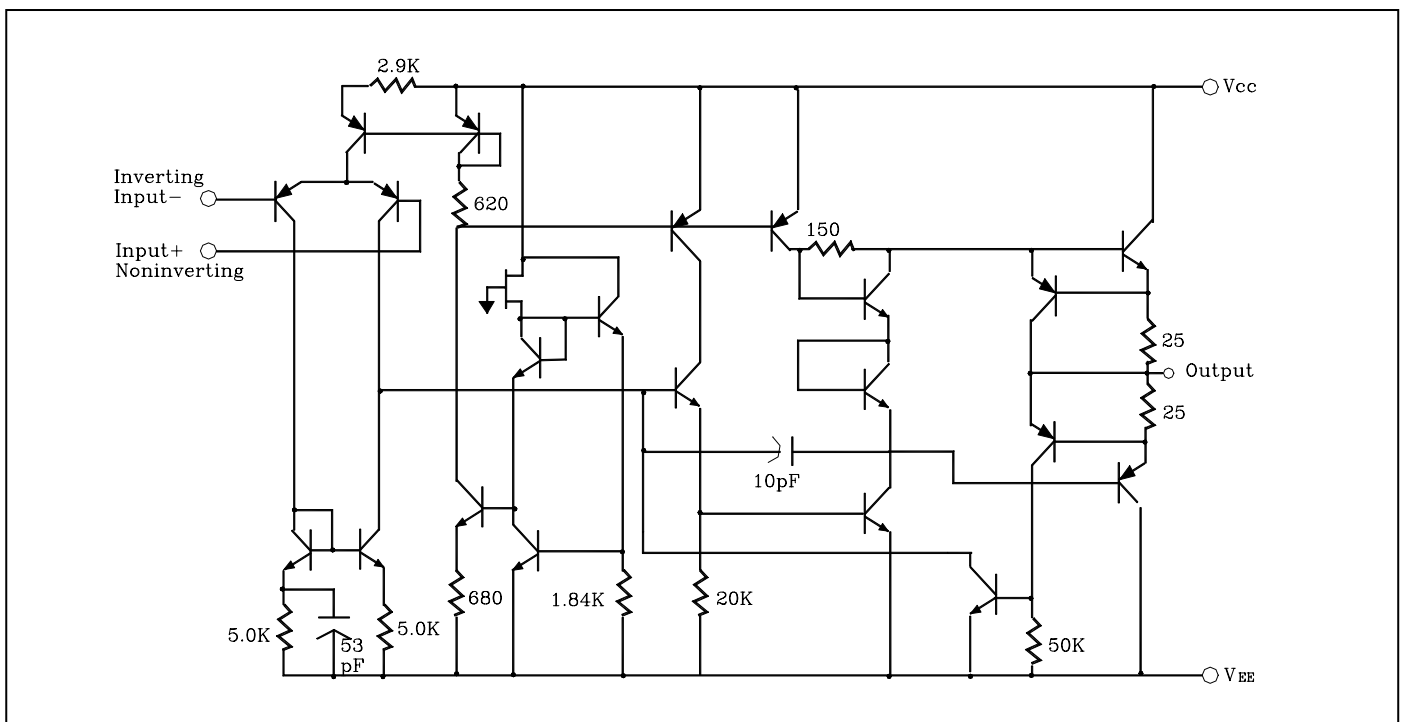
Device	Operating Temperature	Package
PJ4558CS	-20°C ~ +85°C	SOP-8
PJ4558CD		DIP-8



**MAXIMUM RATINGS**(T<sub>A</sub>=25°C, unless otherwise noted)

Rating	Symbol	PJ4558	Unit
Power Supply Voltage	V <sub>cc</sub> V <sub>EE</sub>	+22 -22	Vdc
Input Differential Voltage	V <sub>ID</sub>	±30	V
Input Common Mode Voltage (Note 1)	V <sub>ICM</sub>	±15	V
Output Short Circuit Duration (Note 2)	tsc	Continuous	--
Ambient Temperature Range	T <sub>A</sub>	-20 to 85	°C
Storage Temperature Range	T <sub>stg</sub>	5 to 125	°C
Junction Temperature	T <sub>J</sub>	150	°C

**BLOCK DIAGRAM**



Dual Wide Bandwidth Operational Amplifiers

**ELECTRICAL CHARACTERISTICS**( $V_{CC}=+15V, V_{EE}=-15V, T_A=25^{\circ}C$ , unless otherwise noted)

Input Offset Voltage( $R_s \leq 10K \Omega$ )	$V_{IO}$	--	1.0	5.0	mV
Input Offset Current	$I_{IO}$	--	20	200	nA
Input Bias Current(Note 1)	$I_{IB}$	--	80	500	nA
Input Resistance	$r_j$	0.3	2.0	--	$M \Omega$
Input Capacitance	$C_j$	--	1.4	--	pF
Common Mode Input Voltage Range	$V_{ICR}$	$\pm 12$	$\pm 13$	--	V
Large Signal Voltage Gain ( $V_o = \pm 10V, R_L = 2.0K \Omega$ )	$A_{VOL}$	50	200	--	V/mV
Output Resistance	$r_o$	--	75	--	$\Omega$
Common Mode Rejection( $R_s \leq 10K \Omega$ )	CMR	70	90	--	dB
Supply Voltage Rejection Ratio( $R_s \leq 10K \Omega$ )	PSRR	--	30	150	$\mu V/V$
Output Voltage Swing ( $R_L \geq 10K \Omega$ ) ( $R_L \geq 2.0K \Omega$ )	$V_o$	$\pm 12$ $\pm 10$	$\pm 14$ $\pm 13$	-- --	V
Output Short Circuit Current	$I_{sc}$	10	20	40	mA
Supply Currents(Both Amplifiers)	$I_D$	--	2.3	5.0	mA
Power Consumption(Both Amplifiers)	$P_c$	--	70	150	mW
Transient Reponse(Unity Gain) ( $V_i = 20mV, R_L \geq 2.0K \Omega, C_L \geq 100pF$ )Rise Time	$t_{TLH}$	--	0.3	--	$\mu s$
( $V_i = 20mV, R_L \geq 2.0K \Omega, C_L \geq 100pF$ )Overshoot	$OS$	--	15	--	%
( $V_i = 10V, R_L \geq 2.0K \Omega, C_L \geq 100pF$ )Slew Rate	SR	1.5	1.6	--	$V/\mu s$

**ELECTRICAL CHARACTERISTICS**( $V_{CC}=+15V, V_{EE}=-15V, T_A=Thigh$  to  $T_{low}$ , unless otherwise noted)

Input Offset Voltage( $R_s \leq 10K \Omega$ )	$V_{IO}$	-	1.0	6.0	mV
Input Offset Current ( $T_A=Thigh$ ) ( $T_A=Tlow$ ) ( $T_A=0^{\circ}C$ to $70^{\circ}C$ )	$I_{IO}$	-- -- --	7.0 85 --	200 500 --	nA
Input Bias Current ( $T_A=Thigh$ ) ( $T_A=Tlow$ ) ( $T_A=0^{\circ}C$ to $70^{\circ}C$ )	$I_{IB}$	-- -- --	30 300 --	500 1500 --	nA
Common Mode Input Voltage Range	$V_{ICR}$	$\pm 12$	$\pm 13$	--	V
Large Signal Voltage Gain( $V_o = \pm 10V, R_L = 2.0 K \Omega$ )	$A_{VOL}$	26	--	--	V/mV
Common Mode Rejection( $R_s \leq 10K \Omega$ )	CMR	70	90	--	dB
Supply Voltage Rejection Ratio( $R_s \leq 10K \Omega$ )	PSRR	--	30	150	$\mu V/V$
Output Voltage Swing ( $R_L \geq 10K \Omega$ ) ( $R_L \geq 2.0K \Omega$ )	$V_o$	$\pm 12$ $\pm 10$	$\pm 14$ $\pm 13$	-- --	V
Supply currents(Both Amplifiers) ( $T_A=Thigh$ ) ( $T_A=Tlow$ )	$I_D$	-- --	-- --	4.5 6.0	mA
Power Consumption(Both Amplifiers) ( $T_A=Thigh$ ) ( $T_A=Tlow$ )	$P_c$	-- --	-- --	135 180	mW

Notes:1.  $I_{IB}$  is out of amplifier due to PNP input transistors. 2.  $T_{high}=70^{\circ}C, T_{low}=0^{\circ}C$ .

Dual Wide Bandwidth Operational Amplifiers

Figure 1. Burst Noise versus Source Resistance

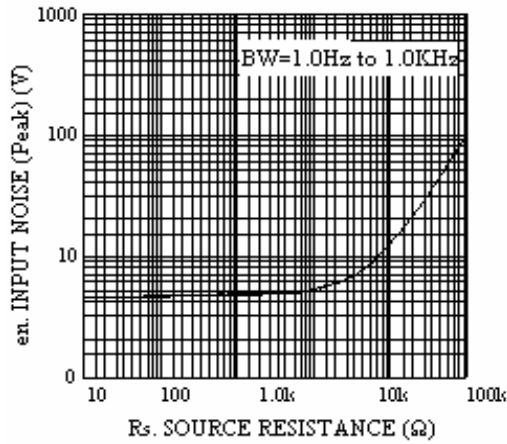


Figure 2. RMS Noise versus Source Resistance

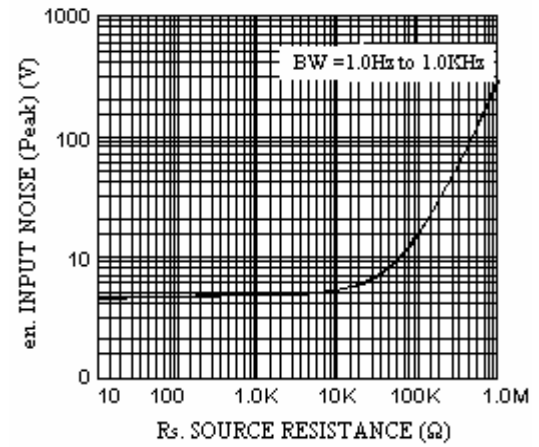


Figure 3. Output Noise Versus Source Resistance

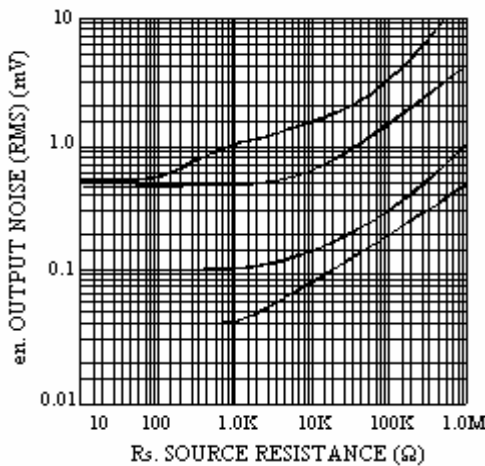


Figure 4. Spectrial Noise Density

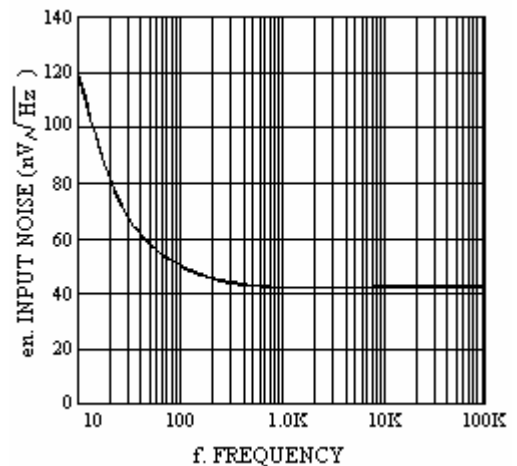
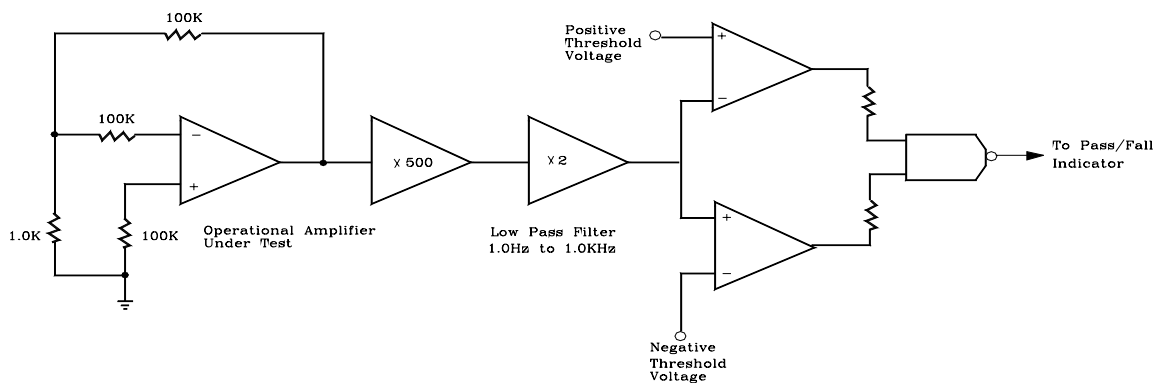


Figure 5. Burse Noise Test Circuit



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  $20 \mu V_{peak}$  limit refers to the operational amplifier input thus eliminating errors in the closed loop gain factor of the operational amplifier.

Figure 6. Open Loop Frequency Response

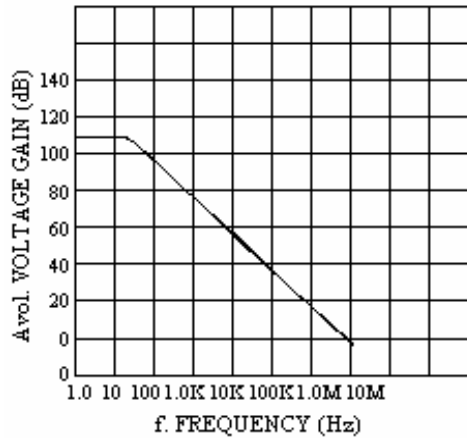


Figure 7. Phase Margin versus Frequency

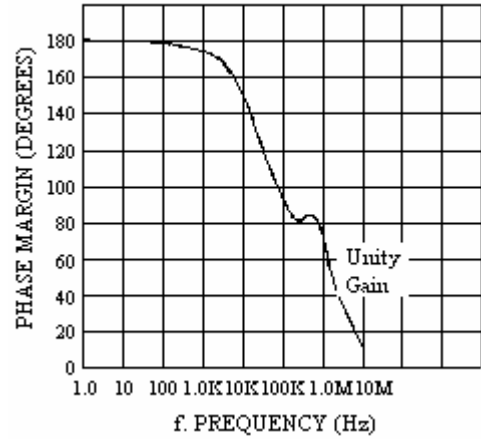


Figure 8. Positive Output Voltage Swing versus Load Resistance

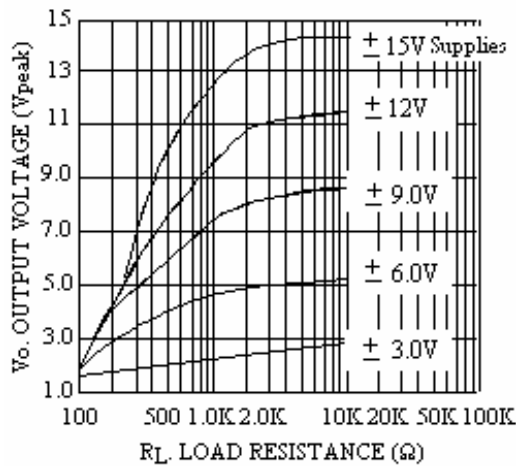


Figure 9. Negative Output Voltage Swing versus Load Resistance

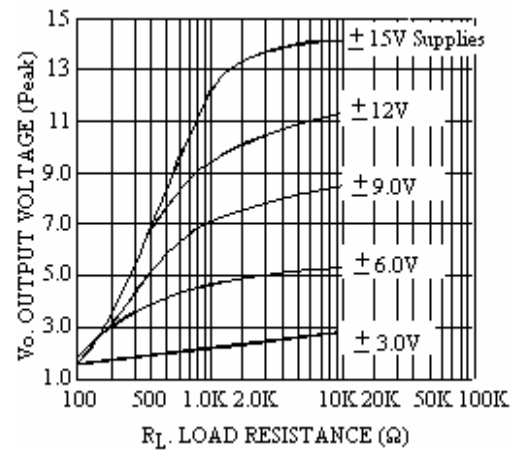


Figure 10. Power Bandwidth (Large Signal Swing versus Frequency)

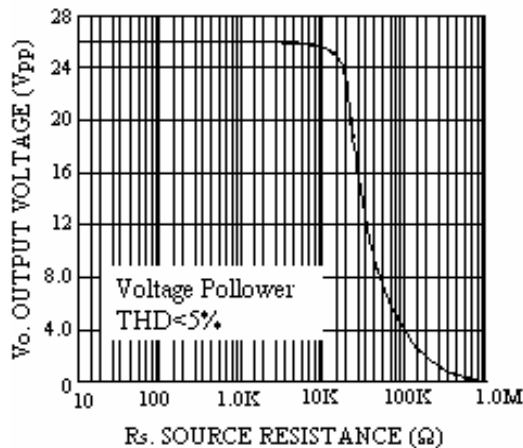
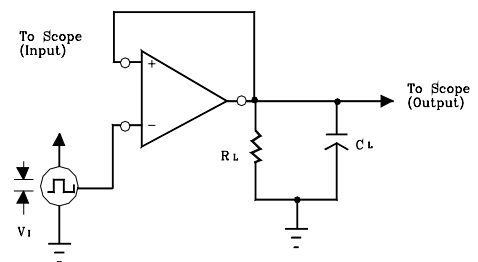
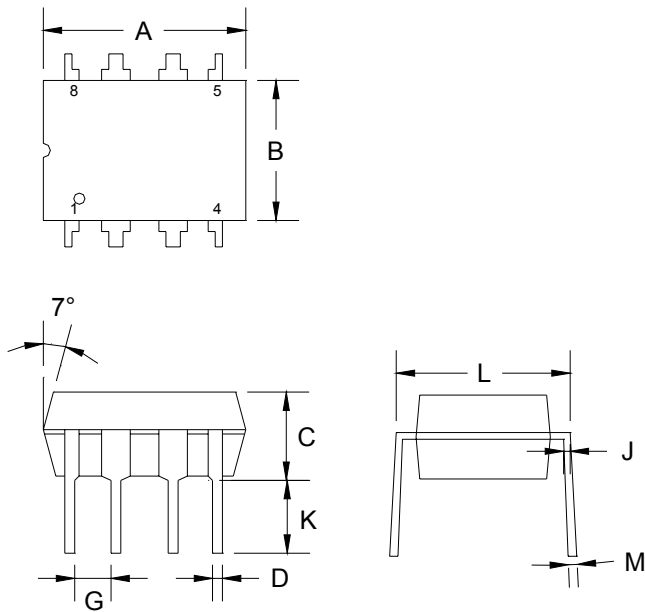


Figure 11. Transient Response Test Circuit

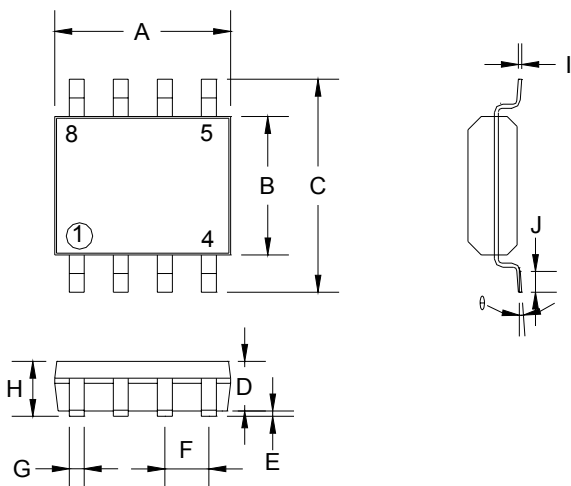


DIP-8 Unit : mm



DIP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.070	9.320	0.357	0.367
B	6.220	6.480	0.245	0.255
C	3.180	4.430	0.125	0.174
D	0.350	0.550	0.019	0.022
G	2.54BSC		0.10BSC	
J	0.150	0.290	0.006	0.011
K	3.250	3.350	0.128	0.132
L	7.750	8.000	0.305	0.315
M	-	10°	-	10°

SOP-8 Unit : mm



SOP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.800	5.000	0.189	0.197
B	3.800	4.000	0.150	0.157
C	5.800	6.200	0.228	0.244
D	1.400	1.500	0.055	0.059
E	-	0.100	-	0.004
F	1.27BSC		0.05BSC	
G	0.330	0.510	0.013	0.020
H	1.450	1.550	0.057	0.061
I	0.190	0.250	0.007	0.010
J	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°