

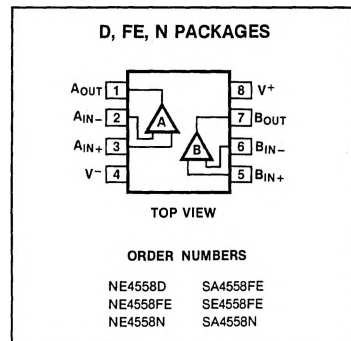
DUAL GENERAL-PURPOSE OPERATIONAL AMPLIFIER**SA/SE/NE4558****DESCRIPTION**

The 4558 is a dual operational amplifier internally compensated. The use of planar epitaxial process for silicon chip construction gives the IC unique performance characteristics.

Excellent channel separation allows the use of a dual device in a single amp application, providing the highest packaging density. The SA/SE/NE4558 is a pin for pin replacement for the RC/RM/RV4558.

FEATURES

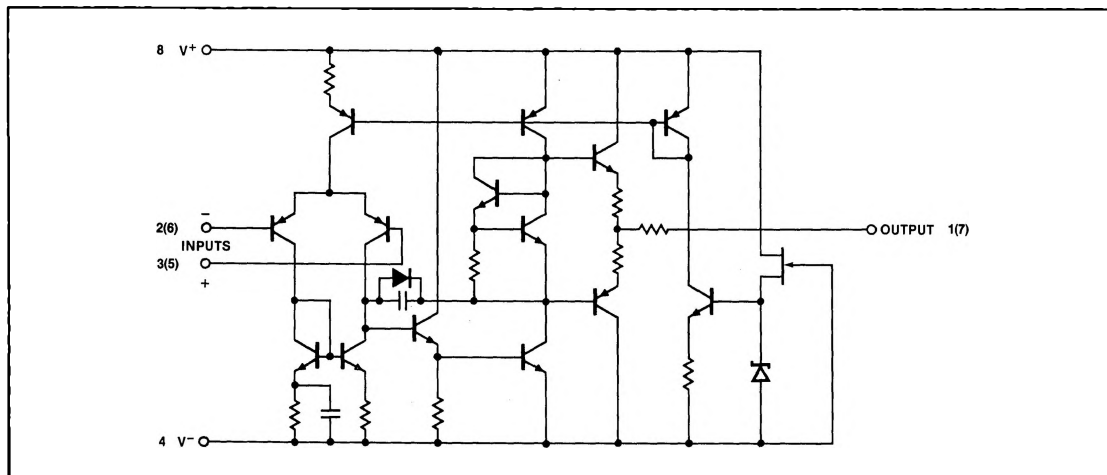
- 2MHz unity gain bandwidth guaranteed
- Supply voltage $\pm 22V$ for SE4558 and $\pm 18V$ for NE4558
- Short circuit protection
- No frequency compensation required
- No latch-up
- Large common mode and differential voltage ranges
- Low power consumption

PIN CONFIGURATION**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	RATING	UNIT
Supply voltage		
SE4558:	± 22	V
NE4558, SA4558:	± 18	V
Internal power dissipation (Note 1)	500	mW
Differential input voltage	± 30	V
Input voltage (Note 2)	± 15	V
Storage temperature range	- 65 to + 150	°C
Operating temperature range		
SE4558:	- 55 to + 125	°C
SA4558:	- 40 to + 85	°C
NE4558:	0 to + 70	°C
Lead temperature (soldering, 60s)	300	°C
Output short circuit duration (Note 3)	Indefinite	

NOTES

1. Rating applies for case temperatures to + 125°C; derate linearly at 5.6 mW/°C for ambient temperatures above + 75°C for SE4558.
2. For supply voltages less than $\pm 15V$, the absolute maximum input voltage is equal to the supply voltage.
3. Short circuit may be to ground on one amp only. Rating applies to + 125°C case temperature or + 75°C ambient temperature for NE4558 and to + 85°C ambient temperature for SA4558.

EQUIVALENT SCHEMATIC

DUAL GENERAL-PURPOSE OPERATIONAL AMPLIFIER

SA/SE/NE4558

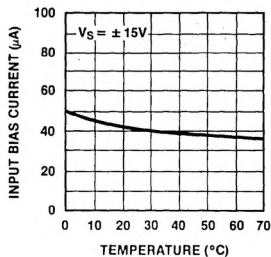
ELECTRICAL CHARACTERISTICS $V_{CC} = \pm 15V$, $T_A = 25^\circ C$ unless otherwise specified.

PARAMETER	TEST CONDITIONS	SE4558			SA/NE4558			UNIT
		Min	Typ	Max	Min	Typ	Max	
Input offset voltage	$R_S \leq 10k\Omega$		1.0	5.0		2.0	6.0	mV
$\Delta V_{OS}/\Delta T$	Over temp.		4			4		$\mu V/^\circ C$
Input offset current			50	200		30	200	nA
$\Delta I_{OS}/\Delta T$	Over temp.		20			20		$pA/^\circ C$
Input bias current			40	500		200	500	nA
$\Delta I_B/\Delta T$	Over temp.		40			40		$pA/^\circ C$
Input resistance		0.3	1.0		0.3	1.0		M Ω
Large signal voltage gain	$R_L \geq 2K\Omega$ $V_{OUT} = \pm 10V$	50,000	300,000		20,000	300,000		V/V
Output voltage swing	$R_L \geq 10k\Omega$ $R_L \geq 2k\Omega$	± 12 ± 10	± 14 ± 13		± 12 ± 10	± 14 ± 13		V
Input voltage range		± 12	± 13		± 12	± 13	V	
Common mode rejection ratio	$R_S \leq 10k\Omega$	70	100		70	100		dB
Supply voltage rejection ratio	$R_S \leq 10k\Omega$		10	150		10	150	$\mu V/V$
Power consumption (all amplifiers)	$R_L = \infty$		100	170		100	170	mW
Transient response (unity gain)	$V_{IN} = 20mV$ $R_L = 2K\Omega$ $C_L \leq 100pF$							
Risetime			100			100		ns
Overshoot			15.0			15.0		%
Slew rate (unity gain)	$R_L \geq 2k\Omega$		1.0			1.0		V/ μs
Channel separation (gain = 100)	$f = 10kHz$ $R_S = 1k\Omega$		90			90		dB
Unity gain bandwidth (gain = 1)		2.5	3.0		2.0	3.0		MHz
θ_M phase margin	$T_A = 25^\circ C$		45			45		Degree
Input noise voltage	$f = 1kc$		25			25		$nV/\sqrt{Hz}$
I_{SC} short circuit	$T_A = 25^\circ C$	5	25	50	5	25	50	mA
The following specifications apply for $-55^\circ C \leq T_A \leq +125^\circ C$ for SE4558; $0^\circ C \leq T_A \leq +70^\circ C$ for NE4558; $-40^\circ C \leq T_A \leq +85^\circ C$ for SA4558								
Input offset voltage	$R_S \leq 10k\Omega$			6.0			7.5	mV
Input offset current				500			300/500*	nA
Input bias current				1500			800/1500*	nA
Large signal voltage gain	$R_L \geq 2k\Omega$ $V_{OUT} = \pm 10$	25,000			15,000			
Output voltage swing	$R_L \geq 2k\Omega$	± 10			± 10			V
Power consumption	$V_S = \pm 15V$ $T_A = HIGH$ $T_A = LOW$		90 120	150 200		90 120	150 200	mW

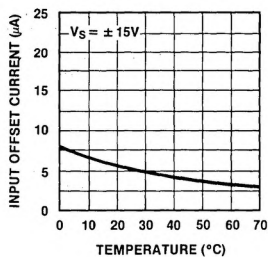
*SA4558

TYPICAL PERFORMANCE CURVES

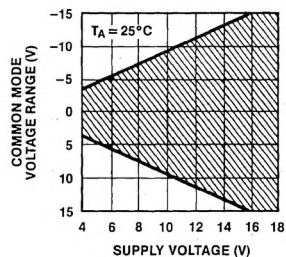
INPUT BIAS CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



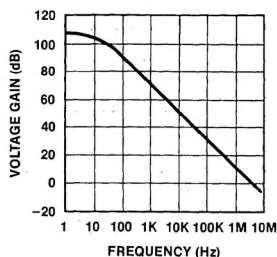
INPUT OFFSET CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



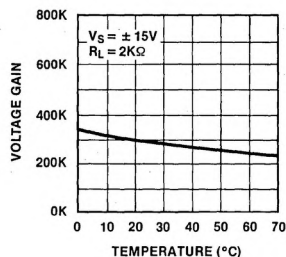
COMMON MODE RANGE AS A FUNCTION OF SUPPLY VOLTAGE



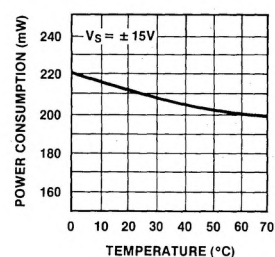
OPEN LOOP VOLTAGE GAIN AS A FUNCTION OF FREQUENCY



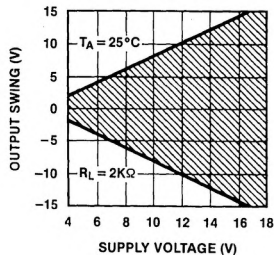
OPEN LOOP GAIN AS A FUNCTION OF TEMPERATURE



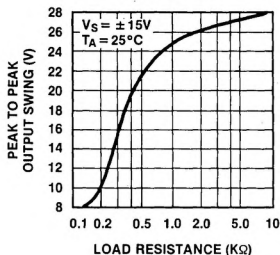
POWER CONSUMPTION AS A FUNCTION OF AMBIENT TEMPERATURE



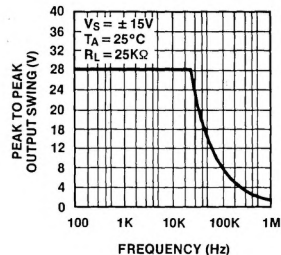
TYPICAL OUTPUT VOLTAGE AS A FUNCTION OF SUPPLY VOLTAGE



OUTPUT VOLTAGE SWING AS A FUNCTION OF LOAD RESISTANCE

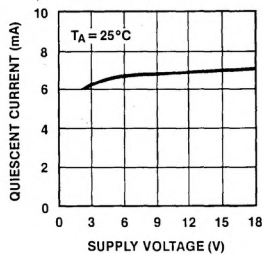


OUTPUT VOLTAGE SWING AS A FUNCTION OF FREQUENCY

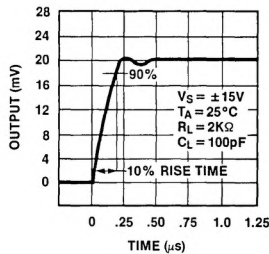


TYPICAL PERFORMANCE CURVES (Continued)

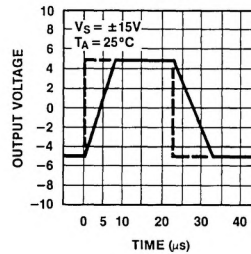
QUIESCENT CURRENT AS A FUNCTION OF SUPPLY VOLTAGE



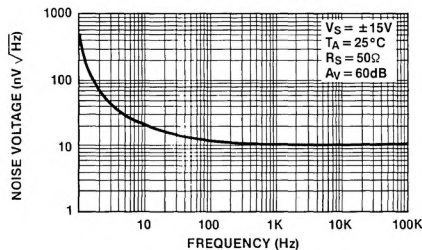
TRANSIENT RESPONSE



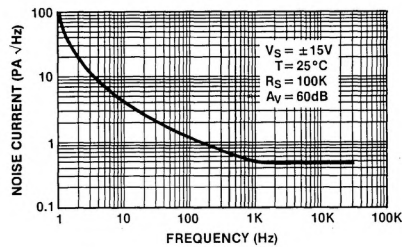
VOLTAGE FOLLOWER LARGE-SIGNAL PULSE RESPONSE



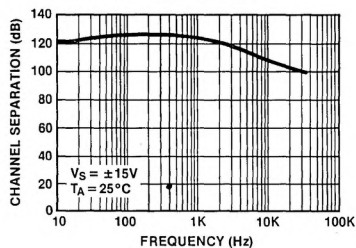
INPUT NOISE VOLTAGE AS A FUNCTION OF FREQUENCY



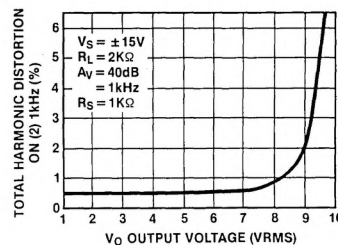
INPUT NOISE CURRENT AS A FUNCTION OF FREQUENCY



CHANNEL SEPARATION



TOTAL HARMONIC DISTORTION vs OUTPUT VOLTAGE



DISTORTION vs FREQUENCY
 $V_O = 1\text{vrms}$

