

# High Performance Operational Amplifiers

## SG108/208/308 SG108A/208A/308A

## SG1118/2118/3118 SG1118A/2118A/3118A

This series provides input currents and offset voltages which approach performance levels previously associated only with FET or chopper stabilized amplifiers. Superior power supply rejection ratio allows use of unregulated supplies and internal short circuit protection makes application nearly foolproof. Also, these devices feature low power consumption over a wide range of supply voltages. Frequency compensation for the 108 series is accomplished with a single external capacitor.

The SG1118 types are internally compensated versions of the 108 devices. Since a 30pF capacitor is built into the chip, no external components are needed for frequency compensation. In addition, provision is made for paralleling the internal capacitor making it possible to over-compensate to increase stability margin. The "A" versions are high performance selections from the 108 and 1118 types.

- Extremely low input bias currents
- Offset currents less than 1.0nA
- Guaranteed voltage and current drift characteristics
- 300 $\mu$ A power supply current
- Internal compensation on 1118/2118/3118 types

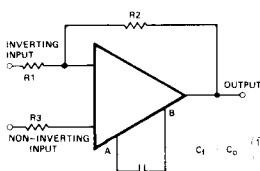
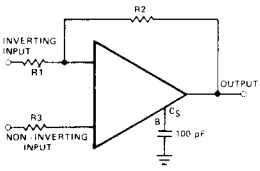
PARAMETERS* <sup>1</sup>	108/1118	208/2118	308/3118	108A/1118A	208A/2118A	308A/3118A	UNITS
Supply Voltage	$\pm 5$ to $\pm 20$		$\pm 5$ to $\pm 15$		$\pm 5$ to $\pm 20$	$\pm 5$ to $\pm 15$	V
Operating Temperature Range	-55 to +125	-25 to +85	0 to +70	-55 to +125	-25 to +85	0 to +70	$^{\circ}$ C
Package Types	J, Y, T, F	J, Y, T, F, M	J, Y, T, F, M	J, Y, T, F	J, Y, T, F, M	J, Y, T, F, M	—
Input Offset Voltage	2.0 (3.0)		7.5 (10)		0.5 (1.0)	0.5 (0.73)	mV
Input Offset Current	0.2 (0.4)		1.0 (1.5)		0.2 (0.4)	1.0 (1.5)	nA
Input Bias Current	2.0 (3.0)		7 (10)		2.0 (3.0)	7 (10)	nA
Temp Coeff Input Offset Voltage	(15)		(30)		(5.0)	(5.0)	$\mu$ V/ $^{\circ}$ C
Temp Coeff Input Offset Current	(2.5)		(10)		(2.5)	(10)	pA/ $^{\circ}$ C
Large Signal Voltage Gain	50 (25)		25 (15)		80 (40)	80 (60)	V/mV
Common Mode Rejection	(85)		(80)		(96)	(96)	dB
Power Supply Rejection	(100)		(100)		(16)	(16)	$\mu$ V/V
Input Common Mode Range	( $\pm 13.5$ )		( $\pm 13.5$ )		( $\pm 13.5$ )	( $\pm 13.5$ )	V
Slew Rate	$A_V = 1$ 0.1		0.1		0.1	0.1	V/ $\mu$ S
	$A_V = 10$ 3 (typ)		3 (typ)		3 (typ)	3 (typ)	
Unity Gain Bandwidth	0.3 (typ)		0.3 (typ)		0.3 (typ)	0.3 (typ)	MHz
Supply Current	0.6		0.8		0.6	0.8	mA
$V_{out}$	$R_L = 10k\Omega$ $\pm 13$		$\pm 13$		$\pm 13$	$\pm 13$	V
Noise							$\mu$ V (rms) (typ)
$R_s = 1k\Omega$ $f = 10\text{Hz to } 10\text{kHz}$	4		4		4	4	
$R_s = 500k\Omega$ $f = 10\text{Hz to } 10\text{kHz}$	20		20		20	20	

\*Parameters apply over supply voltage range and are min./max. limits either at  $T_A = 25^{\circ}\text{C}$  (or over operating temperature range if enclosed in parentheses), unless otherwise indicated.

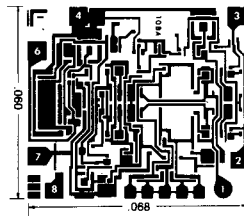
<sup>1</sup>Inputs are shunted with back-to-back diodes for overvoltage protection. Excessive current will flow if a differential input voltage in excess of one volt is applied between the inputs unless some limiting resistance is used.

### CONNECTION DIAGRAMS

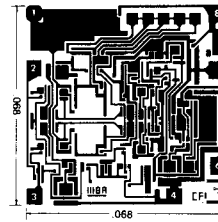
#### Compensation Circuits



Not required for 1118/1118A



SG108/108A Chip (See T-package diagram for pad functions)



SG1118/1118A Chip (See T-package diagram for pad functions)

