

GENERAL DESCRIPTION

The LM108A/LM108, LM208A/LM208 and LM308A/LM308 are Super Beta operational amplifiers fabricated on single silicon chips using the planar epitaxial process.

The LM108A/LM108 offer specifications an order of magnitude better than FET amplifiers over a temperature range -55°C to $+125^{\circ}\text{C}$.

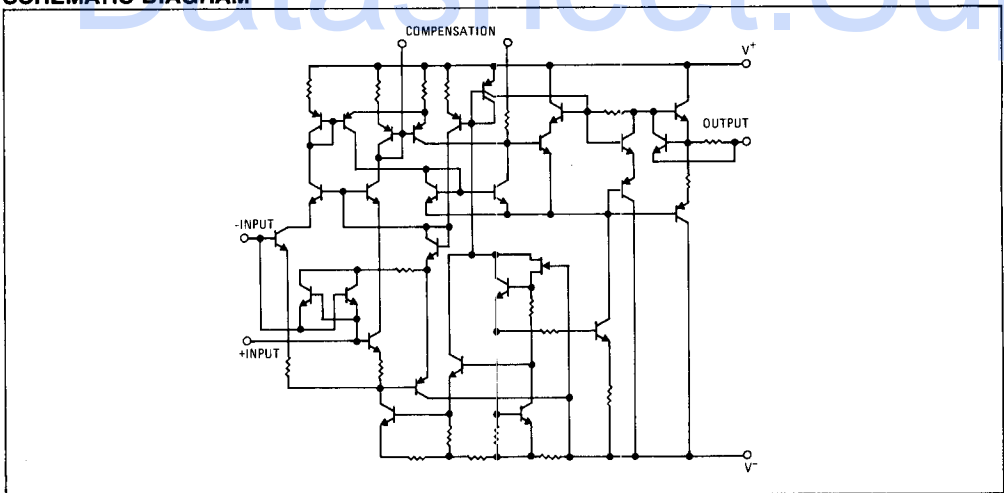
The LM208A/LM208 are identical to the LM108A/LM108 except their performance is guaranteed from -25°C to $+85^{\circ}\text{C}$.

The LM308A/LM308 provide lower input offset voltage of 0.5mV maximum, and drift characteristics of $5.0\mu\text{V}/^{\circ}\text{C}$ maximum. These devices can be compensated by the conventional technique used with the LM101/LM101A series.

DESIGN FEATURES

- Offset Voltage Over Temperature Range 0.5mV Maximum
- Input Current Over Temperature Range 3.0nA Maximum
- Offset Current Over Temperature Range 400pA Maximum
- Supply Current Only 400 μA
- Guaranteed Drift Characteristics $5.0\mu\text{V}/^{\circ}\text{C}$ Maximum
- Supply Voltage $\pm 2\text{V}$ to $\pm 20\text{V}$

SCHEMATIC DIAGRAM



CONNECTION INFORMATION

TE
Metal Can Package
(Top View)

DE and NB
Dual In-line Packages
(Top View)

PIN	FUNCTION
1	COMP
2	-INPUT
3	+INPUT
4	V ⁻
5	NC
6	OUTPUT
7	V ⁺
8	COMP

Order Part Nos.:
LM108AH, LM208AH,
LM308AH, LM108H,
LM208H, LM308H

Order Part Nos.:
LM108ADE, LM208ADE,
LM108DE, LM208DE
LM308DE, LM308ADE
LM308N

NOTE: THE LM108A SERIES IS AVAILABLE ON SPECIAL ORDER IN THE DC (14-PIN) CERAMIC DIP AND CQ (10-PIN) FLATPAK PACKAGES.

Precision Operational Amplifiers

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	LM108A/LM108: $\pm 20V$ LM208A/LM208: $\pm 20V$ LM308A/LM308: $\pm 18V$	Operating Temperature Range	LM108A/LM108: $-55^{\circ}C$ to $+125^{\circ}C$ LM208A/LM208: $-25^{\circ}C$ to $+85^{\circ}C$ LM308A/LM308: $0^{\circ}C$ to $+70^{\circ}C$
Power Dissipation (Note 1)	500mW	Storage Temperature Range	$-65^{\circ}C$ to $+150^{\circ}C$
Differential Input Current (Note 3)	$\pm 10mA$	Lead Temperature (Soldering, 60s)	$300^{\circ}C$
Input Voltage (Note 2)	$\pm 15V$		
Output Short-Circuit Duration	Indefinite		

ELECTRICAL CHARACTERISTICS (Notes 4 and 5)

PARAMETER	CONDITIONS	LM108A/LM208A			LM308A			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$T_A=25^{\circ}C$		0.3	0.5		0.3	0.5	mV
Large Signal Voltage Gain	$T_A=25^{\circ}C$, $V_S=\pm 15V$, $V_{out}=\pm 10V$, $R_L \geq 10k\Omega$	80	300		80	300		V/mV
Input Offset Voltage				1.0			0.73	mV
Average Temperature Coefficient of Input Offset Voltage			1.0	5.0		1.0	5.0	$\mu V/^{\circ}C$
Large Signal Voltage Gain	$V_S=\pm 15V$, $V_{out}=\pm 10V$, $R_L \geq 10k\Omega$	40			60			V/mV
Common Mode Rejection Ratio		96	110		96	110		dB
Supply Voltage Rejection Ratio		96	110		96	110		dB
PARAMETER	CONDITIONS	LM108/LM208			LM308			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$T_A=25^{\circ}C$		0.7	2.0		2.0	7.5	mV
Input Offset Current	$T_A=25^{\circ}C$		0.05	0.2		0.2	1.0	nA
Input Bias Current	$T_A=25^{\circ}C$		0.8	2.0		1.5	7.0	nA
Input Resistance	$T_A=25^{\circ}C$	30	70		10	40		M Ω
Supply Current	$T_A=25^{\circ}C$		0.3	0.6		0.3	0.8	mA
Large Signal Voltage Gain	$T_A=25^{\circ}C$, $V_S=\pm 15V$, $V_{out}=\pm 10V$, $R_L \geq 10k\Omega$	50	300		25	300		V/mV
Input Offset Voltage				3.0			10	mV
Average Temperature Coefficient of Input Offset Voltage			3.0	15		6.0	30	$\mu V/^{\circ}C$
Input Offset Current				0.4			1.5	nA
Average Temperature Coefficient of Offset Current			0.5	2.5		2.0	10	$pA/^{\circ}C$
Input Bias Current				3.0			10	nA
Supply Current	$T_A=+125^{\circ}C$		0.15	0.4				mA
Large Signal Voltage Gain	$V_S=\pm 15V$, $V_{out}=\pm 10V$, $R_L \geq 10k\Omega$	25			15			V/mV
Output Voltage Swing	$V_S=\pm 15V$, $R_L=10k\Omega$	± 13	± 14		± 13	± 14		V
Input Voltage Range	$V_S=\pm 15V$	± 13.5			14			V
Common Mode Rejection Ratio		85	100		80	100		dB
Supply Voltage Rejection Ratio		80	96		80	96		dB

NOTES:

- For operating at elevated temperatures, the device must be derated based on $+150^{\circ}C$ for LM108, $+100^{\circ}C$ for LM308 maximum junction temperature and a thermal resistance of $150^{\circ}C/W$ junction to ambient or $45^{\circ}C/W$ junction to case.
- For supply voltages less than $\pm 15V$, the absolute maximum input voltage is equal to the supply voltage.
- The inputs are shunted with back-to-back diodes for overvoltage protection. Therefore, excessive current will flow if a differential input voltage in excess of $1V$ is applied between the inputs unless some limiting resistance is used.
- These specifications apply for $\pm 5V < V_S < \pm 20V$ and $-55^{\circ}C < T_A < +125^{\circ}C$, LM108A/LM108; $\pm 5V < V_S < \pm 20V$ and $-25^{\circ}C < T_A < +85^{\circ}C$, LM208A/LM208.
- These specifications apply for $\pm 5V < V_S < \pm 15V$ and $0^{\circ}C < T_A < +70^{\circ}C$, LM308A/LM308.

