

GENERAL DESCRIPTION

The LM107, LM207, and LM307 high-gain, general purpose operational amplifiers are monolithically constructed and internally compensated. The addition of a 30pF MOS capacitor guarantees unconditional stability eliminating the need for external frequency compensation. Input currents are a factor of ten lower than an industry standard device such as the 709, LM101, and 741.

This series offers all the best features of the LM101. In addition, the devices provide better accuracy and lower noise in high impedance circuitry.

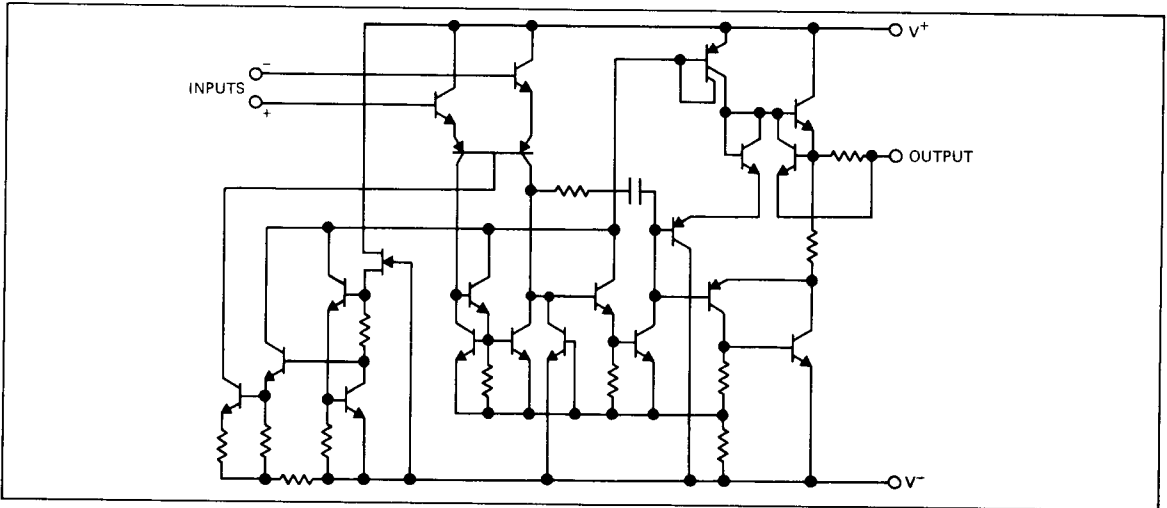
The LM107 operates over a temperature range of -55°C to $+125^{\circ}\text{C}$. The LM307 operates from 0°C to $+70^{\circ}\text{C}$.

The LM207 is the same as the LM107 except its performance is guaranteed from -25°C to $+85^{\circ}\text{C}$.

DESIGN FEATURES

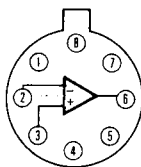
- Offset Voltage 3mV Maximum Over Temperature
- Input Current 100nA Maximum Over Temperature
- Offset Current 20nA Maximum Over Temperature
- Offsets Guaranteed Over Entire Common-Mode Range and Supply Voltage Range
- Internal Frequency Compensation
- Supply Voltage $\pm 5\text{V}$ to $\pm 20\text{V}$

SCHEMATIC DIAGRAM



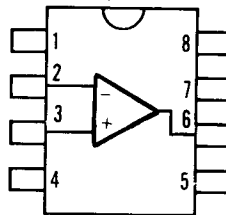
CONNECTION INFORMATION

TE
Metal Can Package
(Top View)



Order Part No.:
LM107H, LM207H, LM307H

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



Order Part No.:
LM107DE, LM207DE,
LM307DE, LM307N

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

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	107A, 207A: $\pm 22V$ 307A: $\pm 18V$	Operating Temperature Range	LM107: $-55^{\circ}C$ to $+125^{\circ}C$ LM207: $-25^{\circ}C$ to $+85^{\circ}C$ LM307: $0^{\circ}C$ to $+70^{\circ}C$
Power Dissipation (Note 1)	500mW	Storage Temperature Range	$-65^{\circ}C$ to $+150^{\circ}C$
Differential Input Voltage	$\pm 30V$	Lead Temperature (Soldering, 60s)	$300^{\circ}C$
Input Voltage (Note 2)	$\pm 15V$		
Output Short-Circuit Duration (Note 3)	Indefinite		

ELECTRICAL CHARACTERISTICS LM107A, LM207A: $\pm 5V \leq V_S \leq \pm 20V$; LM307A: $\pm 5 \leq V_S \leq \pm 15V$ (Note 4)

PARAMETER	CONDITIONS	LM107/207			LM307			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$T_A = 25^{\circ}C, R_S \leq 50 k\Omega$		0.7	2.0		2.0	7.5	mV
Input Offset Current	$T_A = 25^{\circ}C$		1.5	10		3	50	nA
Input Bias Current	$T_A = 25^{\circ}C$		30	75		70	250	nA
Input Resistance	$T_A = 25^{\circ}C$	1.5	4		0.5	2		M Ω
Supply Current	$T_A = 25^{\circ}C, V_S = \pm 20V$		1.8	3.0		1.8	3.0	mA
Large Signal Voltage Gain	$T_A = 25^{\circ}C, V_S = \pm 15V$ $V_{OUT} = \pm 10V, R_L \geq 2 k\Omega$	50	160		25	160		V/mV
Input Offset Voltage	$R_S \leq 50 k\Omega$			3.0			10	mV
Average Temperature Coefficient of Input Offset Voltage			3.0	15		6.0	30	$\mu V/^{\circ}C$
Input Offset Current				20			70	nA
Average Temperature Coefficient of Input Offset Current	$25^{\circ}C \leq T_A \leq 125^{\circ}C$ $25^{\circ}C \leq T_A \leq 70^{\circ}C$ $-55^{\circ}C \leq T_A \leq 25^{\circ}C$ $0^{\circ}C \leq T_A \leq 25^{\circ}C$		0.01	0.1		0.01	0.3	nA/ $^{\circ}C$
Input Bias Current				100			300	nA
Supply Current	$T_A = +125^{\circ}C, V_S = \pm 20V$		1.2	2.5				mA
Large Signal Voltage Gain	$V_S = \pm 15V, V_{OUT} = \pm 10V$ $R_L \geq 2 k\Omega$	25			15			V/mV
Output Voltage Swing	$V_S = \pm 15V, R_L = 10 k\Omega$ $R_L = 2 k\Omega$	± 12 ± 10	± 14 ± 13		± 12 ± 10	± 14 ± 13		V V
Input Voltage Range	$V_S = \pm 20V$	± 15			± 12			V
Common Mode Rejection Ratio	$R_S \leq 10 k\Omega$	80	96		70	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 10 k\Omega$	80	96		70	96		dB

NOTES:

- For operating at elevated temperatures, the device must be derated based on $+150^{\circ}C$ for LM107 or $100^{\circ}C$ for LM207 and LM307, 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.
- Continuous short-circuit is allowed for case temperatures to $+125^{\circ}C$ and ambient temperatures to $+75^{\circ}C$ for LM107, case temperatures to $+70^{\circ}C$ and ambient temperatures to $+55^{\circ}C$ for LM307.
- These specifications apply for $-55^{\circ}C < T_A < +125^{\circ}C$ LM107, $-25^{\circ}C$ to $+85^{\circ}C$ LM207, and $0^{\circ}C < T_A < +70^{\circ}C$ LM307, unless otherwise specified.