



Operational Amplifiers

LM107/LM207 operational amplifiers

general description

The LM107 and LM207 are complete, general purpose operational amplifiers, with the necessary frequency compensation built into the chip. Advanced processing techniques make the input currents a factor of ten lower than industry standards like the 709. Yet, they are a direct, plug-in replacement for the 709, LM101, LM101A and 741. Specifications which have been improved include:

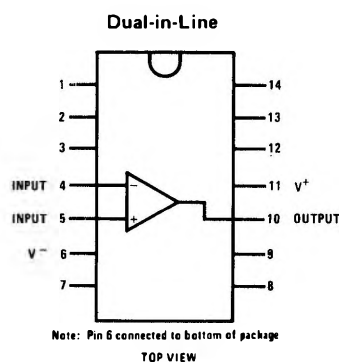
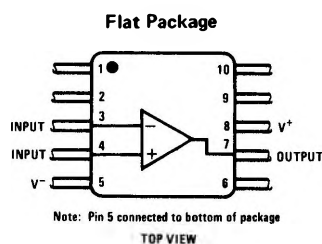
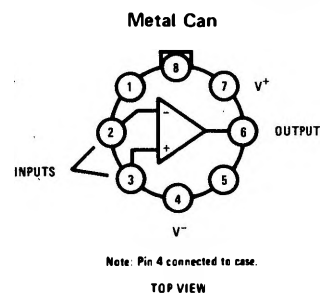
- Offset voltage 3 mV maximum over temperature
- Input current 100 nA maximum over temperature
- Offset current 20 nA maximum over temperature
- Guaranteed drift characteristics

- Offsets guaranteed over entire common mode range

The LM107 series offers the features of the LM101, which makes its application nearly fool-proof. In addition, the device provides better accuracy and lower noise in high impedance circuitry. The low input currents also make it particularly well suited for long interval integrators or timers, sample and hold circuits and low frequency waveform generators. Further, replacing circuits where matched transistor pairs buffer the inputs of conventional IC op amps, it can give lower offset voltage and drift at a lower cost.

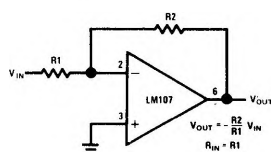
The LM207 is identical to the LM107, except that the LM207 has its performance guaranteed over a -25°C to 85°C temperature range, instead of -55°C to 125°C .

connection diagrams

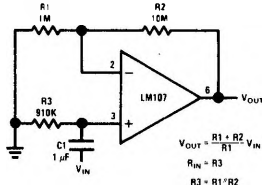


typical applications

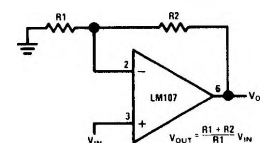
Inverting Amplifier



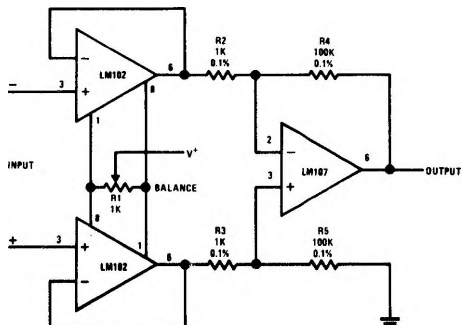
Non-Inverting AC Amplifier



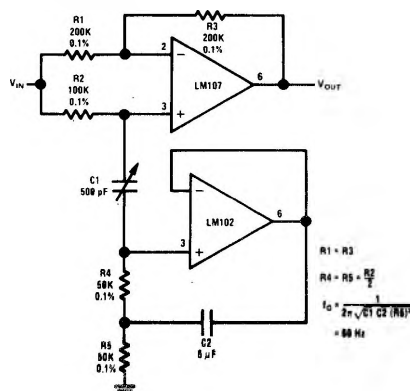
Non-Inverting Amplifier



Differential Input Instrumentation Amplifier



Tunable Notch Filter



absolute maximum ratings

Supply Voltage	±22V
Power Dissipation (Note 1)	500 mW
Differential Input Voltage	±30V
Input Voltage (Note 2)	±15V
Output Short-Circuit Duration	Indefinite
Operating Temperature Range	LM107 -55°C to 125°C
	LM207 -25°C to 85°C
Storage Temperature Range	-65°C to 150°C
Lead Temperature (Soldering, 60 sec)	300°C

electrical characteristics (Note 3)

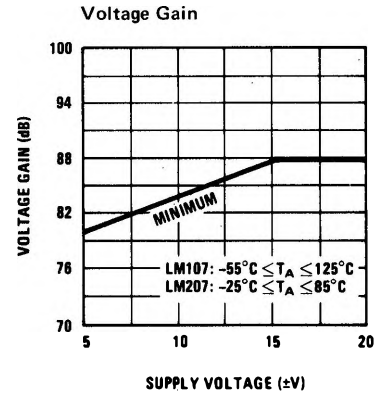
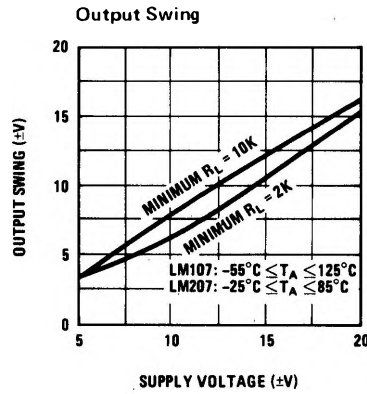
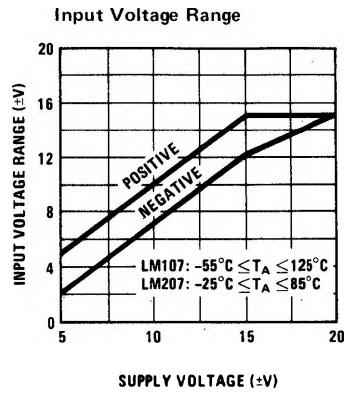
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	$T_A = 25^\circ\text{C}$, $R_S \leq 10\text{ k}\Omega$		0.7	2.0	mV
Input Offset Current	$T_A = 25^\circ\text{C}$		1.5	10	nA
Input Bias Current	$T_A = 25^\circ\text{C}$		30	75	nA
Input Resistance	$T_A = 25^\circ\text{C}$	1.5	4		M Ω
Supply Current	$T_A = 25^\circ\text{C}$, $V_S = \pm 20\text{V}$		1.8	3.0	mA
Large Signal Voltage Gain	$T_A = 25^\circ\text{C}$, $V_S = \pm 15\text{V}$ $V_{OUT} = \pm 10\text{V}$, $R_L \geq 2\text{ k}\Omega$	50	160		V/mV
Input Offset Voltage	$R_S \leq 10\text{ k}\Omega$			3.0	mV
Average Temperature Coefficient of Input Offset Voltage			3.0	15	$\mu\text{V}/^\circ\text{C}$
Input Offset Current				20	nA
Average Temperature Coefficient of Input Offset Current	$25^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$ $-55^\circ\text{C} \leq T_A \leq 25^\circ\text{C}$		0.01 0.02	0.1 0.2	nA/ $^\circ\text{C}$ nA/ $^\circ\text{C}$
Input Bias Current				100	nA
Supply Current	$T_A = +125^\circ\text{C}$, $V_S = \pm 20\text{V}$		1.2	2.5	mA
Large Signal Voltage Gain	$V_S = \pm 15\text{V}$, $V_{OUT} = \pm 10\text{V}$ $R_L \geq 2\text{ k}\Omega$	25			V/mV
Output Voltage Swing	$V_S = \pm 15\text{V}$, $R_L = 10\text{ k}\Omega$ $R_L = 2\text{ k}\Omega$	±12 ±10	±14 ±13		V V
Input Voltage Range	$V_S = \pm 20\text{V}$	±15			V
Common Mode Rejection Ratio	$R_S \leq 10\text{ k}\Omega$	80	96		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\text{ k}\Omega$	80	96		dB

Note 1: The maximum junction temperature of the LM107 is 150°C, while that of the LM207 is 100°C. For operating at elevated temperatures, devices in the TO-5 package must be derated based on a thermal resistance of 150°C/W, junction to ambient, or 45°C/W, junction to case. For the flat package, the derating is based on a thermal resistance of 185°C/W when mounted on a 1/16-inch-thick epoxy glass board with ten, 0.03-inch-wide, 2-ounce copper conductors. The thermal resistance of the dual-in-line package is 100°C/W, junction to ambient.

Note 2: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

Note 3: These specifications apply for $\pm 5\text{V} \leq V_S \leq \pm 20\text{V}$ and $-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$ for the LM107 or $-25^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$ for the LM207, unless otherwise specified.

guaranteed performance



typical performance

