

**MOTOROLA**

LM307

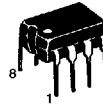
Internally Compensated Monolithic Operational Amplifier

A general purpose operational amplifier well suited for applications requiring lower input currents than are available with the popular MC1741. These improved input characteristics permit greater accuracy in sample and hold circuits and long interval integrators.

- Internally Compensated
- Low Offset Voltage: 7.5 mV Max
- Low Input Offset Current: 50 nA Max
- Low Input Bias Current: 250 nA Max

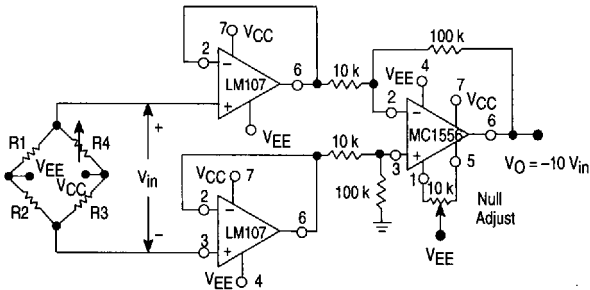
OPERATIONAL AMPLIFIER

SEMICONDUCTOR TECHNICAL DATA



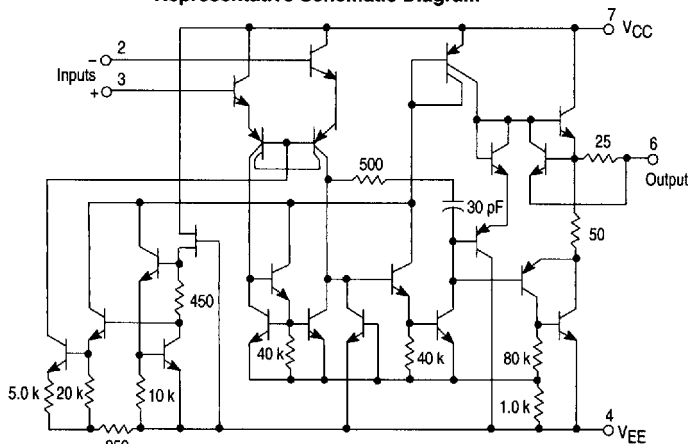
N SUFFIX
PLASTIC PACKAGE
CASE 626

Simplified Application High Impedance Bridge Amplifier

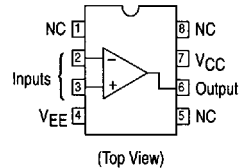


Pins not shown are not connected.

Representative Schematic Diagram



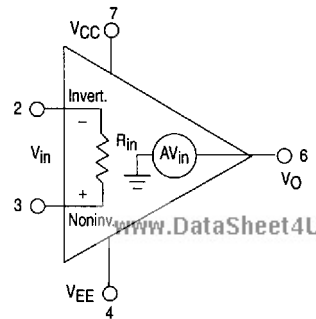
PIN CONNECTIONS



ORDERING INFORMATION

Device	Operating Temperature Range	Package
LM307N	$T_A = 0^\circ \text{ to } +70^\circ \text{C}$	Plastic DIP

Equivalent Circuit



Pins 1, 5, and 8 no connection.

MAXIMUM RATINGS ($T_A = +25^{\circ}\text{C}$, unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Supply Voltage	V_{CC} V_{EE}	+18 -18	Vdc
Differential Input Signal Voltage	V_{ID}	± 30	V
Common Mode Input Swing (Note 1)	V_{ICR}	± 15	V
Output Short Circuit Duration	t_{SC}	Indefinite	
Power Dissipation (Package Limitation) (Note 2)	P_D	500	mW
Operating Temperature Range	T_A	0 to +70	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = +25^{\circ}\text{C}$, unless otherwise noted, see Note 3.)

Characteristic	Symbol	Min	Typ	Max	Unit
Input Offset Voltage $R_S \leq 50\text{ k}\Omega$, $T_A = +25^{\circ}\text{C}$ $R_S \leq 50\text{ k}\Omega$, $T_A = T_{low}$ to T_{high}	V_{IO}	- -	2.0 -	7.5 10	mV
Input Offset Current $T_A = +25^{\circ}\text{C}$ $T_A = T_{low}$ to T_{high}	I_{IO}	- -	3.0 -	50 70	nA
Input Bias Current $T_A = +25^{\circ}\text{C}$ $T_A = T_{low}$ to T_{high}	I_{IB}	- -	70 -	250 300	nA
Input Resistance	r_i	0.5	2.0	-	$\text{M}\Omega$
Supply Current, $V_S = \pm 15\text{ V}$, $T_A = +25^{\circ}\text{C}$	I_D	-	1.8	3.0	mA
Large Signal Voltage Gain $V_S = \pm 15\text{ V}$, $V_O = \pm 10\text{ V}$, $R_L > 2.0\text{ k}\Omega$, $T_A = +25^{\circ}\text{C}$ $V_S = \pm 15\text{ V}$, $V_O = \pm 10\text{ V}$, $R_L > 2.0\text{ k}\Omega$, $T_A = T_{low}$	A_{VOL}	25 15	160 -	- -	V/mV
Average Temperature Coefficient of Input Offset Voltage, $T_{low} \leq T_A \leq T_{high}$	TCV_{IO}	-	6.0	30	$\mu\text{V}/^{\circ}\text{C}$
Average Temperature Coefficient of Input Offset Current $+25^{\circ}\text{C} \leq T_A \leq T_{high}$ $T_{low} \leq T_A \leq +25^{\circ}\text{C}$	TCI_{IO}	- -	0.01 0.02	0.3 0.6	$\text{nA}/^{\circ}\text{C}$
Output Voltage Swing ($T_A = T_{low}$ to T_{high}) $V_S = \pm 15\text{ V}$, $R_L = 10\text{ k}\Omega$ $R_L = 2.0\text{ k}\Omega$	V_O	± 12 ± 10	± 14 ± 13	- -	V
Input Voltage Range ($T_A = T_{low}$ to T_{high}) $V_S = \pm 15\text{ V}$	V_{ICR}	± 12	-	-	V
Common Mode Rejection ($T_A = T_{low}$ to T_{high}) $R_S \leq 50\text{ k}\Omega$	CMR	70	90	-	dB
Supply Voltage Rejection ($T_A = T_{low}$ to T_{high}) $R_S \leq 50\text{ k}\Omega$	PSR	70	96	-	dB

- NOTES:** 1. For supply voltages less than $\pm 15\text{ V}$, the absolute maximum input voltage is equal to the supply voltage.
2. For operating at elevated temperatures, the device must be derated based on a maximum junction temperature of 100°C .
3. Unless otherwise noted, these specifications apply for: $\pm 5.0\text{ V} \leq V_{CC}/V_{EE} \leq \pm 15\text{ V}$, $T_{low} = 0^{\circ}\text{C}$, $T_{high} = +70^{\circ}\text{C}$.

Figure 1. Minimum Input Voltage Range

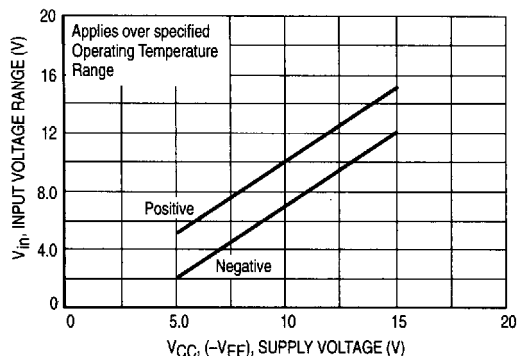


Figure 2. Minimum Output Voltage Swing

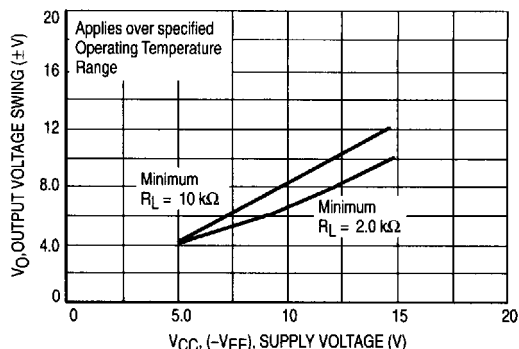


Figure 3. Minimum Voltage Gain

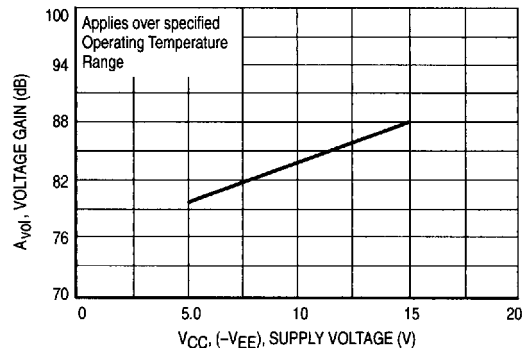


Figure 4. Typical Supply Currents

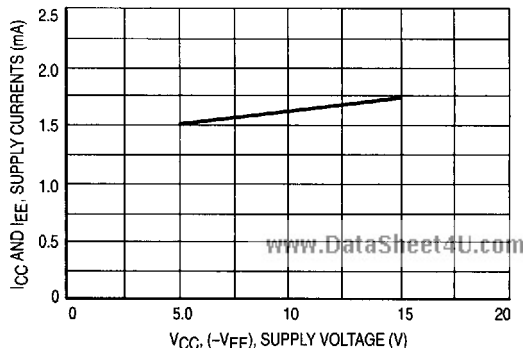


Figure 5. Open Loop Frequency Response

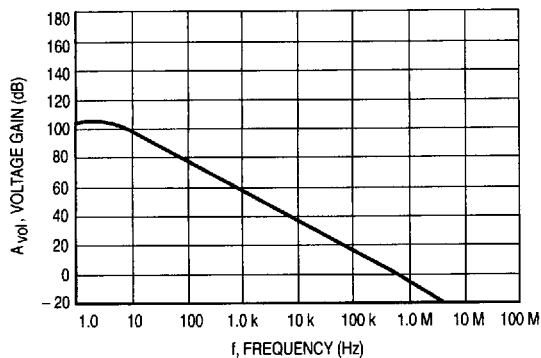


Figure 6. Large Signal Frequency Response

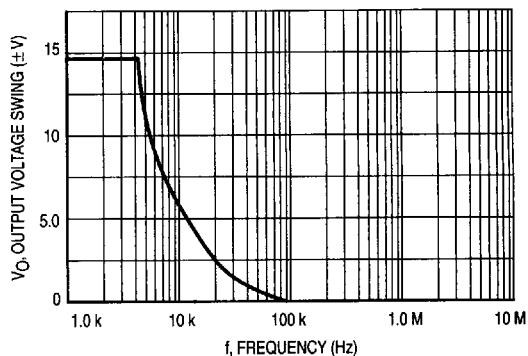


Figure 7. Voltage Follower Pulse Response

