LM307

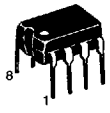
Internally Compensated Monolithic Operational Amplifier

OPERATIONAL AMPLIFIER

SEMICONDUCTOR TECHNICAL DATA

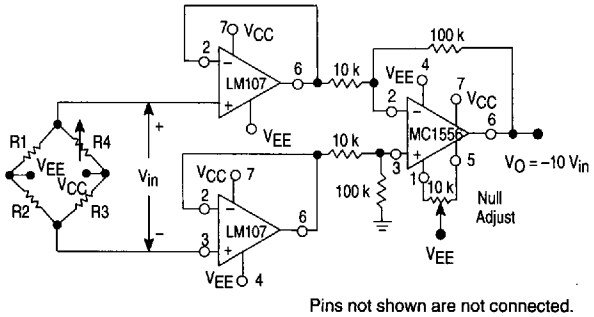
A general purpose operational amplifier well suited for applications requiring lower input currents than are available with the popular MC1741. These improved input characteristics permit greater accuracy in sample and hold circuits and long interval integrators.

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



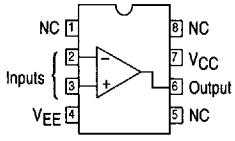
N SUFFIX
PLASTIC PACKAGE
CASE 626

Simplified Application
High Impedance Bridge Amplifier



Pins not shown are not connected.

PIN CONNECTIONS

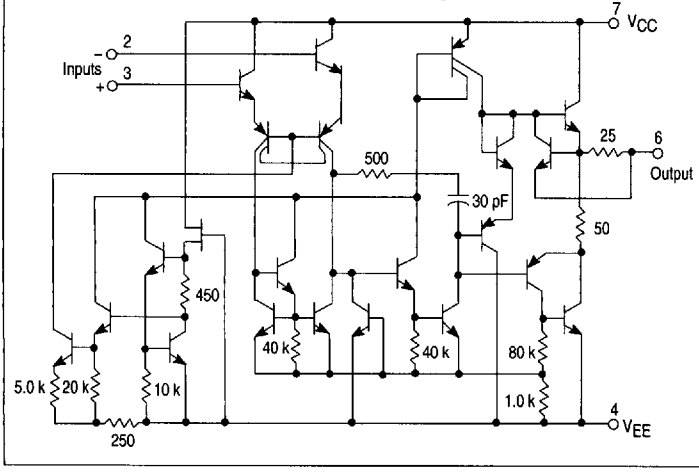


(Top View)

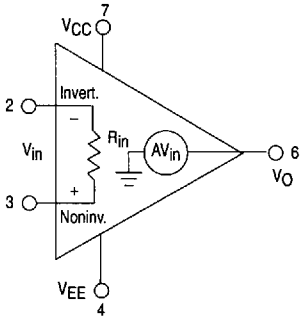
ORDERING INFORMATION

Device	Operating Temperature Range	Package
LM307N	T_A = 0° to +70°C	Plastic DIP

Representative Schematic Diagram



Equivalent Circuit



Pins 1, 5, and 8 no connection.

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MAXIMUM RATINGS (T_A = +25°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	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

ELECTRICAL CHARACTERISTICS (T_A = +25°C, unless otherwise noted, see Note 3.)

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

NOTES: 1. For supply voltages less than ±15 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: ±5.0 V ≤ V_{CC}/V_{EE} ≤ ±15 V, T_{low} = 0°C, T_{high} = +70°C.

Figure 1. Minimum Input Voltage Range

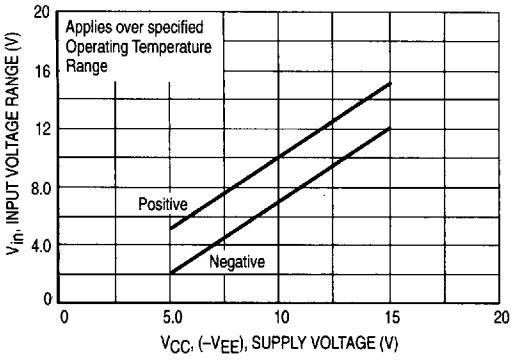

Figure 2. Minimum Output Voltage Swing

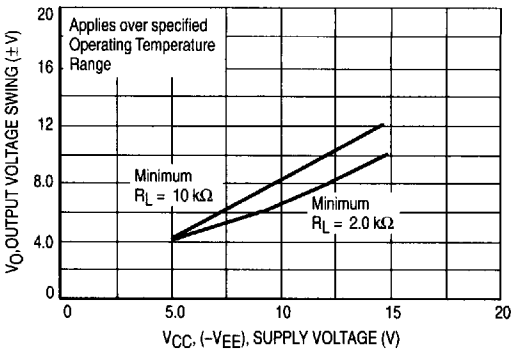

Figure 3. Minimum Voltage Gain

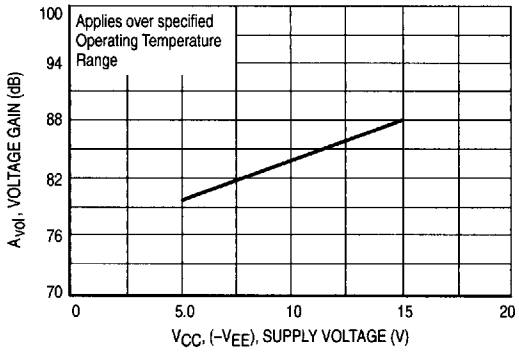

Figure 4. Typical Supply Currents

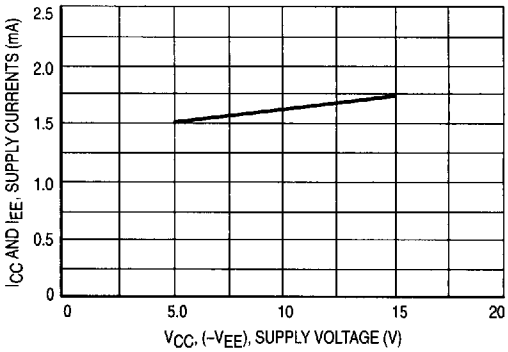

Figure 5. Open Loop Frequency Response

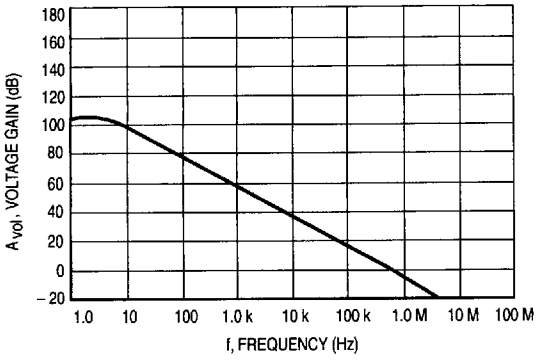

Figure 6. Large Signal Frequency Response

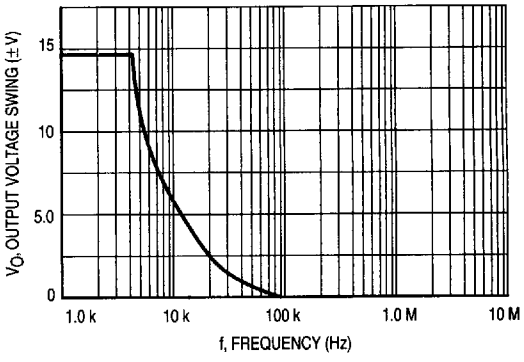

Figure 7. Voltage Follower Pulse Response