

LM307

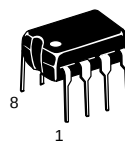
Internally Compensated Monolithic Operational Amplifier

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

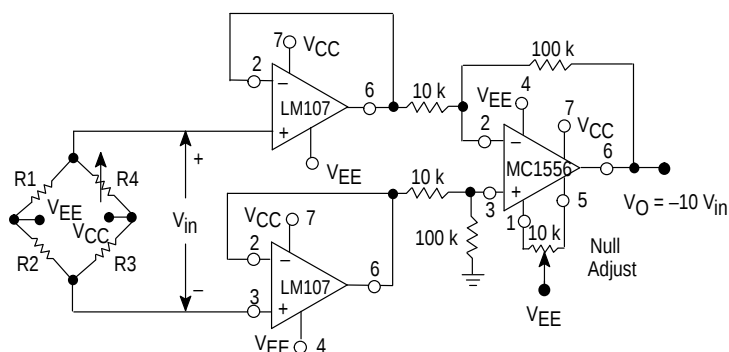
OPERATIONAL AMPLIFIER

SEMICONDUCTOR TECHNICAL DATA



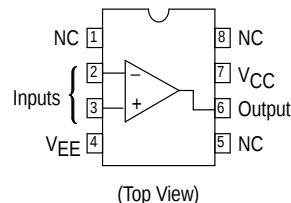
N SUFFIX
PLASTIC PACKAGE
CASE 626

Simplified Application High Impedance Bridge Amplifier



Pins not shown are not connected.

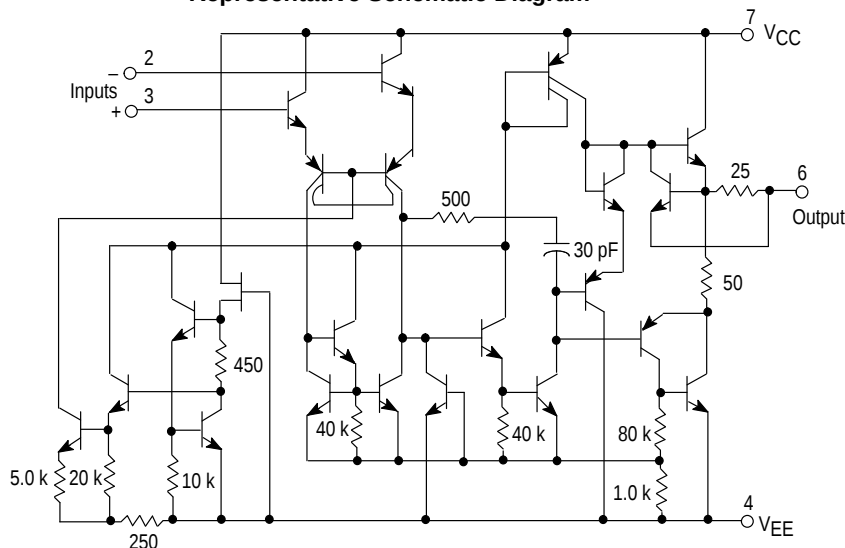
PIN CONNECTIONS



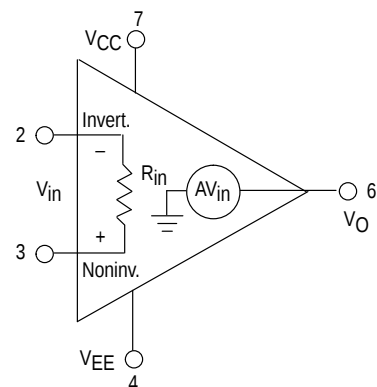
ORDERING INFORMATION

Device	Operating Temperature Range	Package
LM307N	$T_A = 0^\circ \text{ to } +70^\circ\text{C}$	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 ≤ 50 kΩ, T _A = +25°C R _S ≤ 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} ≤ T _A ≤ T _{high}	TCV _{IO}	–	6.0	30	μV/°C
Average Temperature Coefficient of Input Offset Current +25°C ≤ T _A ≤ T _{high} T _{low} ≤ 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 ≤ 50 kΩ	CMR	70	90	–	dB
Supply Voltage Rejection (T _A = T _{low} to T _{high}) R _S ≤ 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

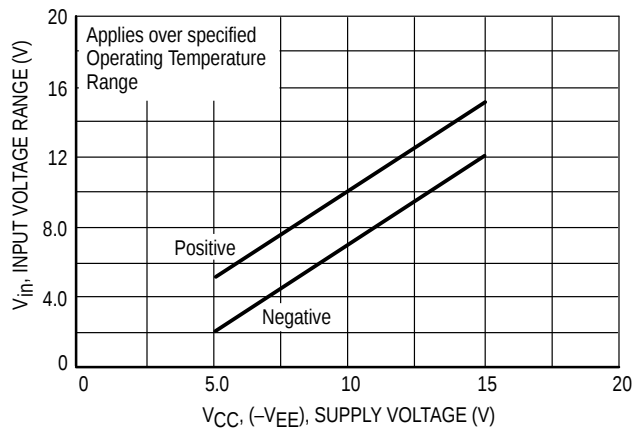


Figure 2. Minimum Output Voltage Swing

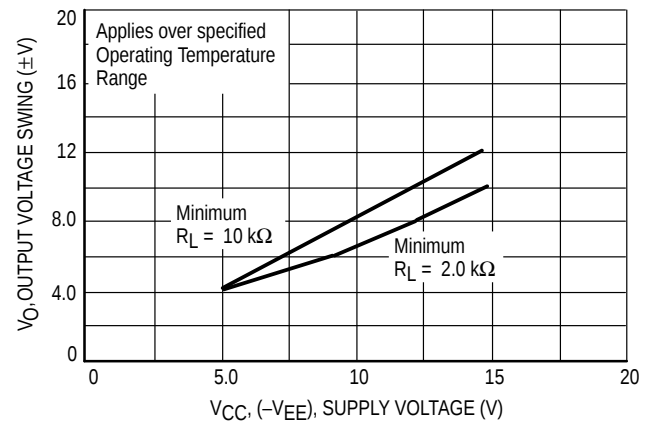


Figure 3. Minimum Voltage Gain

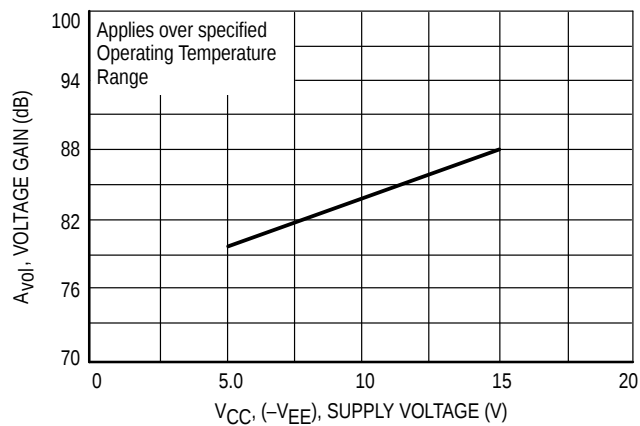


Figure 4. Typical Supply Currents

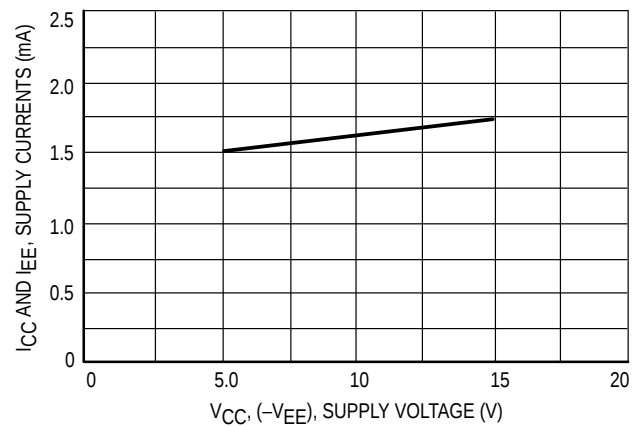


Figure 5. Open Loop Frequency Response

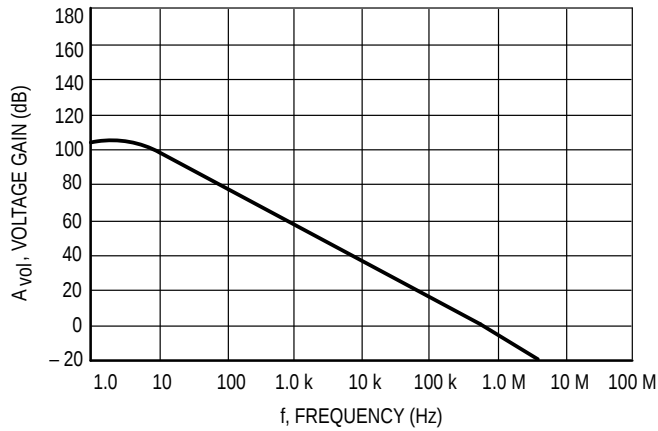


Figure 6. Large Signal Frequency Response

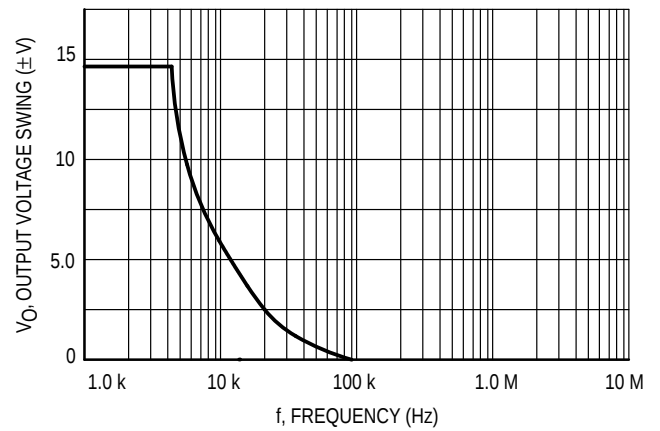
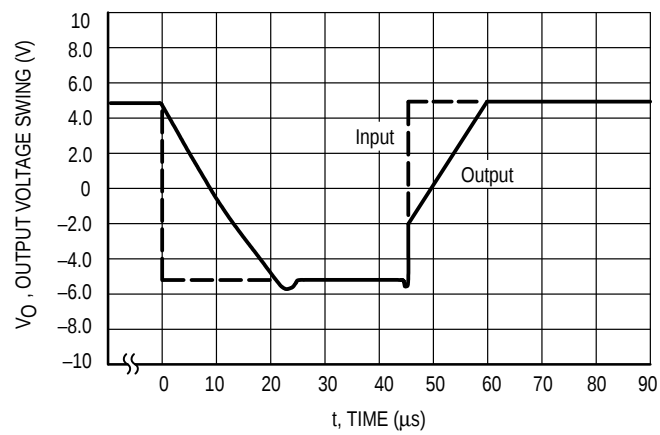


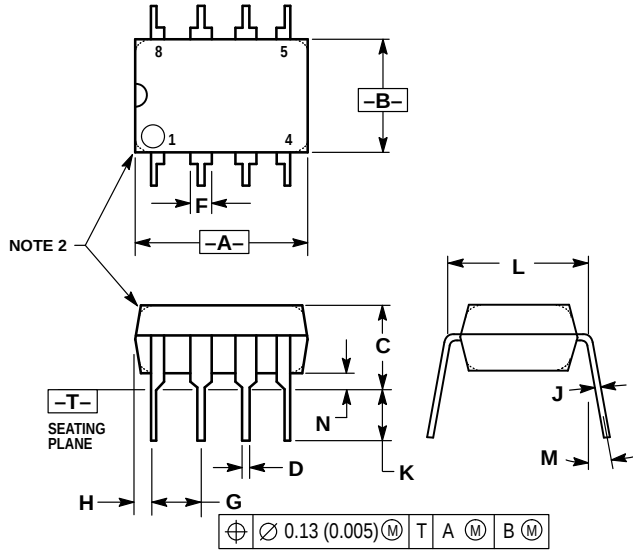
Figure 7. Voltage Follower Pulse Response



LM307

OUTLINE DIMENSIONS

N SUFFIX
PLASTIC PACKAGE
CASE 626-05
ISSUE K



NOTES:

1. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
2. PACKAGE CONTOUR OPTIONAL (ROUND OR SQUARE CORNERS).
3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.40	10.16	0.370	0.400
B	6.10	6.60	0.240	0.260
C	3.94	4.45	0.155	0.175
D	0.38	0.51	0.015	0.020
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
H	0.76	1.27	0.030	0.050
J	0.20	0.30	0.008	0.012
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	10°		10°	
N	0.76	1.01	0.030	0.040

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How to reach us:

USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



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LM307/D

