

LINEAR INTEGRATED CIRCUITS

DESCRIPTION

The LM107/207/307 is a general purpose internally compensated operational amplifier. Advanced processing techniques provide input currents which are an order of magnitude lower than the $\mu A709$. Standard pin out allows plug in replacement for the $\mu A709$, LM101, LM101A, and the $\mu A741$.

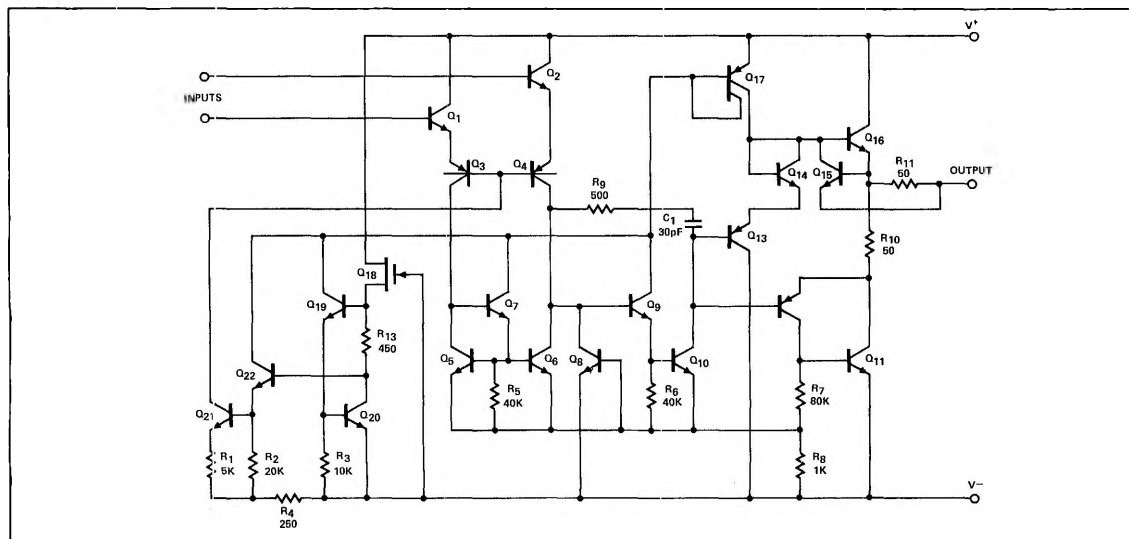
FEATURES

- 3mV MAX OFFSET VOLTAGE OVER TEMP
- 100 nA MAX INPUT CURRENT OVER TEMP
- 20 nA MAX INPUT OFFSET CURRENT OVER TEMP
- OFFSETS GUARANTEED OVER COMMON MODE RANGE
- INPUT/OUTPUT SHORT CIRCUIT PROTECTED

ABSOLUTE MAXIMUM RATINGS

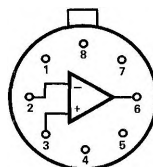
Supply Voltage	LM107	$\pm 22V$
	LM307	$\pm 18V$
Power Dissipation (Note 1)		500 mW
Differential Input Voltage		$\pm 30V$
Input Voltage (Note 2)		$\pm 15V$
Output Short-Circuit Duration (Note 3)		Indefinite
Operating Temperature Range	LM107	$-55^{\circ}C$ to $125^{\circ}C$
	LM207	$-25^{\circ}C$ to $85^{\circ}C$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

INTERNAL SCHEMATIC



PIN CONFIGURATIONS

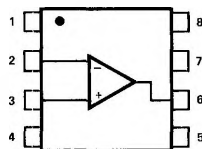
T PACKAGE (Top View)



1. NC
2. Inverting Input
3. Noninverting Input
4. V^-
5. NC
6. Output
7. V^+
8. NC

ORDER PART NOS.
LM107H/LM207H/LM307H

V PACKAGE



1. NC
2. Inverting Input
3. Noninverting Input
4. V^-
5. NC
6. Output
7. V^+
8. NC

ORDER PART NO.
LM107N/LM207N/LM307N

ELECTRICAL CHARACTERISTICS

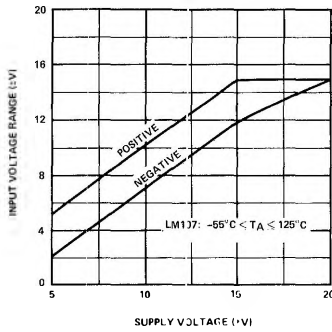
PARAMETER	CONDITIONS	LM101/207			LM307			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$T_A = 25^\circ\text{C}, R_S \leq 10\text{K}\Omega$	—	0.7	2.0	—	—	—	mV
	$T_A = 25^\circ\text{C}, R_S \leq 50\text{K}\Omega$	—	—	—	—	2.0	7.5	—
Input Offset Current	$T_A = 25^\circ\text{C}$	—	1.5	10	—	3	50	nA
Input Bias Current	$T_A = 25^\circ\text{C}$	—	30	75	—	70	250	nA
Input Resistance	$T_A = 25^\circ\text{C}$	1.5	4	—	0.5	2	—	$\text{M}\Omega$
Supply Current	$T_A = 25^\circ\text{C}, V_S = \pm 20\text{V}$	—	1.8	3.0	—	—	—	mA
	$T_A = 25^\circ\text{C}, V_S = \pm 15\text{V}$	—	—	—	—	1.8	3.0	mA
Large Signal Voltage Gain	$T_A = 25^\circ\text{C}, V_S = \pm 15\text{V}$ $V_{\text{OUT}} = \pm 10\text{V}, R_L \geq 2\text{K}\Omega$	50	160	—	25	160	—	V/mV
Input Offset Voltage	$R_S \leq 10\text{K}\Omega$	—	—	3.0	—	—	—	mV
	$R_S \leq 50\text{K}\Omega$	—	—	—	—	—	10	mV
Average Temperature Coefficient of Input Offset Voltage			3.0	15	—	6.0	30	$\mu\text{V}/^\circ\text{C}$
Input Offset Current		—	—	20	—	—	70	nA
Average Temperature Coefficient of Input Offset Current	$25^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$	—	0.01	0.1	—	—	—	$\text{nA}/^\circ\text{C}$
	$-55^\circ\text{C} \leq T_A \leq 25^\circ\text{C}$	—	0.02	0.2	—	—	—	$\text{nA}/^\circ\text{C}$
Average Temperature Coefficient of Input Offset Current	$25^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$	—	—	—	—	0.01	0.3	$\text{nA}/^\circ\text{C}$
	$0^\circ\text{C} \leq T_A \leq 25^\circ\text{C}$	—	—	—	—	0.02	0.6	$\text{nA}/^\circ\text{C}$
Input Bias Current		—	—	100	—	—	300	nA
Supply Current	$T_A = +125^\circ\text{C}, V_S = \pm 20\text{V}$	—	1.2	2.5	—	—	—	mA
Large Signal Voltage Gain	$V_S = \pm 15\text{V}, V_{\text{OUT}} = \pm 10\text{V}, R_L \geq 2\text{K}\Omega$	25	—	—	15	—	—	V/mV
Output Voltage Swing	$V_S = \pm 15\text{V}, R_L = 10\text{K}\Omega$	± 12	± 14	—	± 12	± 14	—	V
	$R_L = 2\text{K}\Omega$	± 10	± 13	—	± 10	± 13	—	V
Input Voltage Range	$V_S = \pm 20\text{V}$	± 15	—	—	—	—	—	V
	$V_S = \pm 15\text{V}$	—	—	—	± 12	—	—	V
Common Mode Rejection Ratio	$R_S \leq 10\text{K}\Omega$	80	96	—	—	—	—	dB
	$R_S \leq 50\text{K}\Omega$	—	—	—	70	90	—	dB
Supply Voltage Rejection Ratio	$R_S \leq 10\text{K}\Omega$	80	96	—	—	—	—	dB
	$R_S \leq 50\text{K}\Omega$	—	—	—	70	96	—	dB

NOTES:

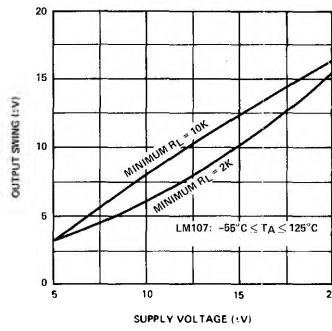
- For operating at elevated temperatures, the device must be derated based on a 150°C maximum junction temperature and a thermal resistance of $150^\circ\text{C}/\text{W}$ junction to ambient or $45^\circ\text{C}/\text{W}$ junction to case (for T Package).
- For supply voltages less than $\pm 15\text{V}$, the absolute maximum input voltage is equal to the supply voltage.
- Continuous short circuit is allowed for case temperatures to 70°C and ambient temperatures to 55°C .
- The specifications apply for -55°C to 125°C for LM107 and 0°C to 70°C for LM307 unless otherwise specified.
- $\pm 5\text{V} \leq V_S \leq \pm 15\text{V}$ unless otherwise specified.

LM107/207

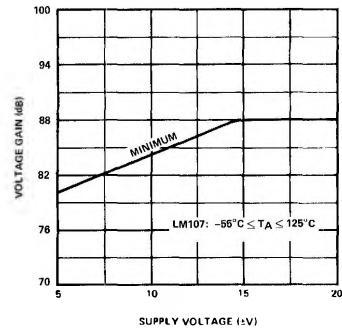
INPUT VOLTAGE RANGE



OUTPUT SWING

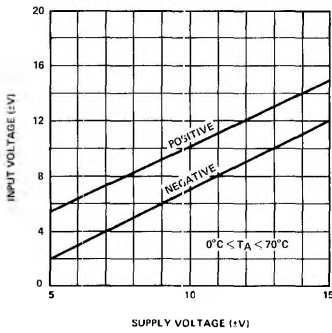


VOLTAGE GAIN

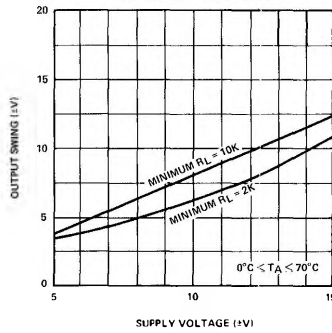


LM307

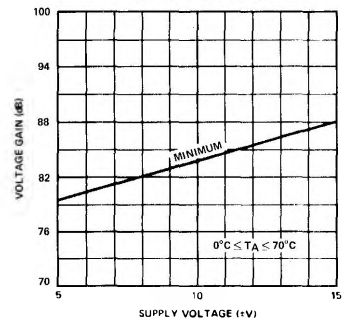
INPUT VOLTAGE RANGE



OUTPUT SWING

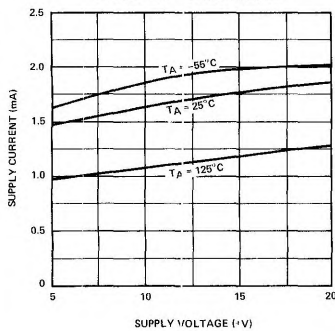


VOLTAGE GAIN

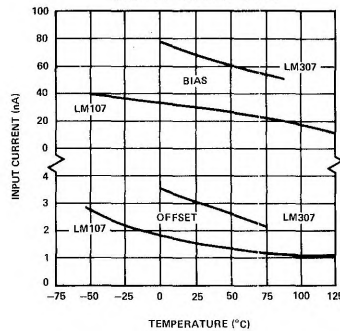


TYPICAL PERFORMANCE CURVES

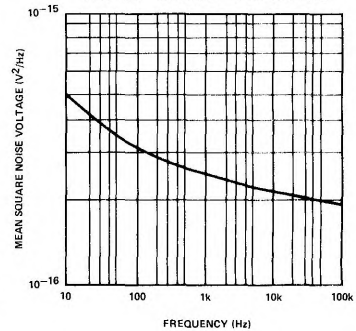
SUPPLY CURRENT



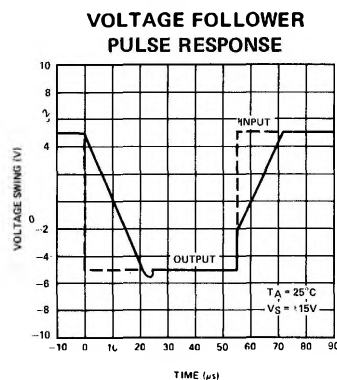
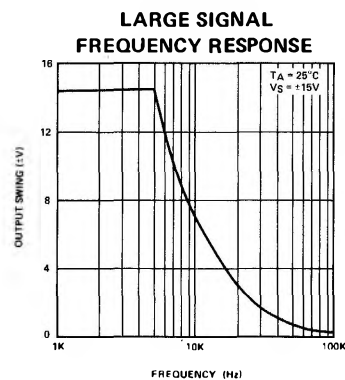
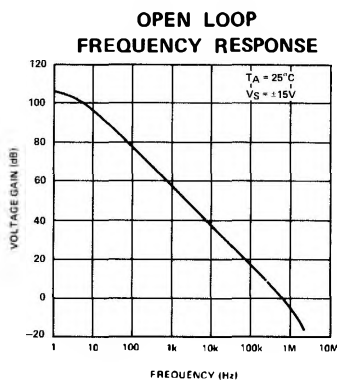
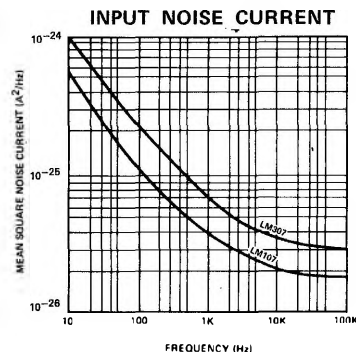
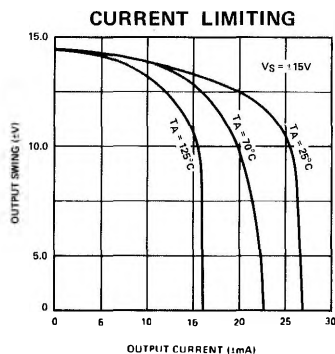
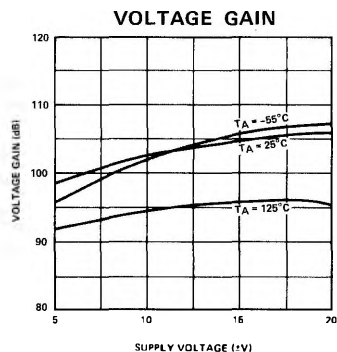
INPUT CURRENT



INPUT NOISE VOLTAGE



TYPICAL PERFORMANCE CURVES (cont'd)



APPLICATIONS

