

LINEAR INTEGRATED CIRCUITS

DESCRIPTION

The LM107/307 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

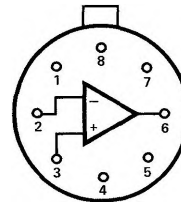
ABSOLUTE MAXIMUM RATINGS

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 $125^{\circ}C$
	LM307	$0^{\circ}C$ to $70^{\circ}C$
Storage Temperature Range		$-65^{\circ}C$ to $150^{\circ}C$
Lead Temperature (Soldering, 60 sec)		$300^{\circ}C$

PIN CONFIGURATIONS

T PACKAGE

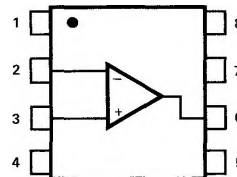
(Top View)



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

ORDER PART NOS.
LM107H/LM307H

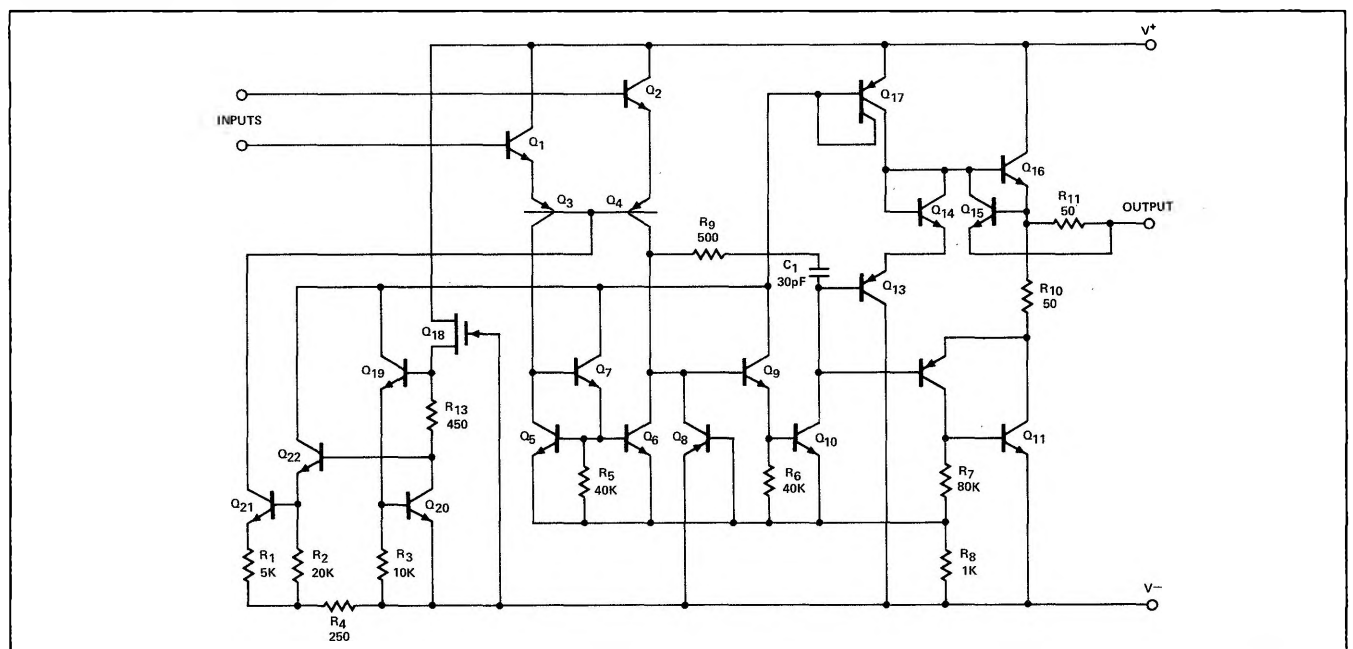
V PACKAGE



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

ORDER PART NO. LM307N

EQUIVALENT SCHEMATIC



SIGNETICS ■ LM107/307 – GENERAL PURPOSE OPERATIONAL AMPLIFIER
ELECTRICAL CHARACTERISTICS

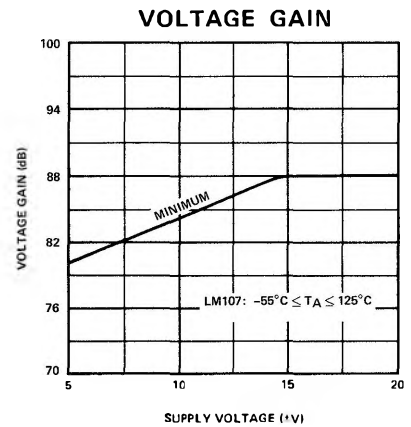
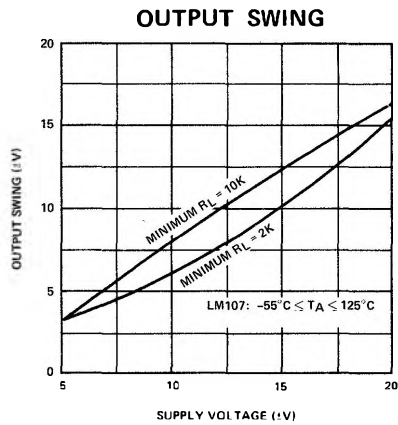
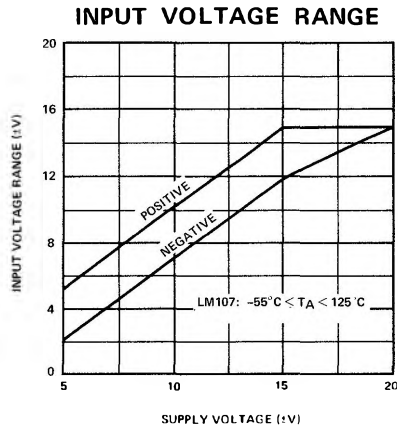
PARAMETER	CONDITIONS	LM107			LM307			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$T_A = 25^\circ\text{C}, R_S \leq 10\text{K}\Omega$	—	0.7	2.0	—	—	—	mV
	$T_A = 25^\circ\text{C}, R_S \leq 50\text{K}\Omega$	—	—	—	—	2.0	7.5	—
Input Offset Current	$T_A = 25^\circ\text{C}$	—	1.5	10	—	3	50	nA
Input 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	—	M Ω
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	—			nA/ $^\circ\text{C}$
	$-55^\circ\text{C} \leq T_A \leq 25^\circ\text{C}$	—	0.02	0.2	—			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	nA/ $^\circ\text{C}$
	$0^\circ\text{C} \leq T_A \leq 25^\circ\text{C}$	—	—	—	—	0.02	0.6	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:

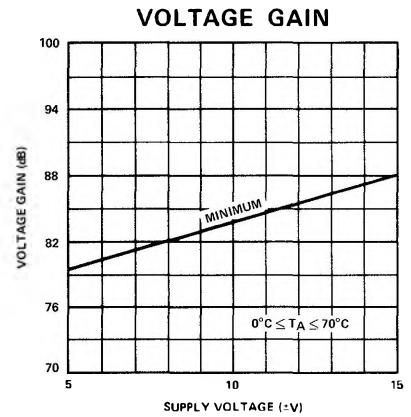
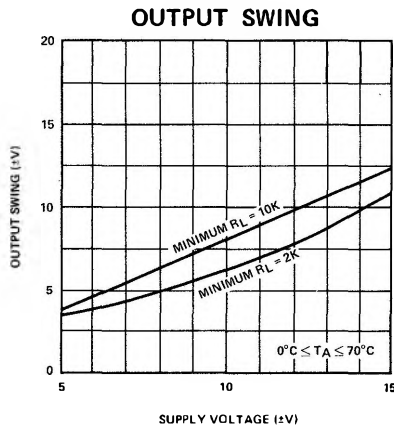
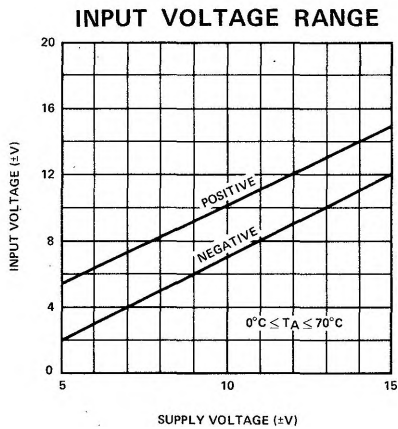
- For operating at elevated temperatures, the device must be derated based on a 150°C maximum junction temperature and a thermal resistance of $150^\circ\text{C}/\text{W}$ junction to ambient or $45^\circ\text{C}/\text{W}$ junction to case (for T Package).
- For supply voltages less than $\pm 15\text{V}$, 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.

GUARANTEED PERFORMANCE CURVES

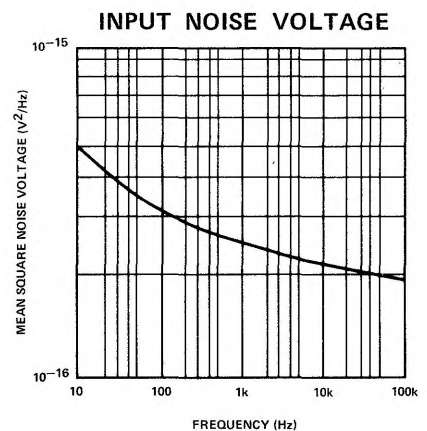
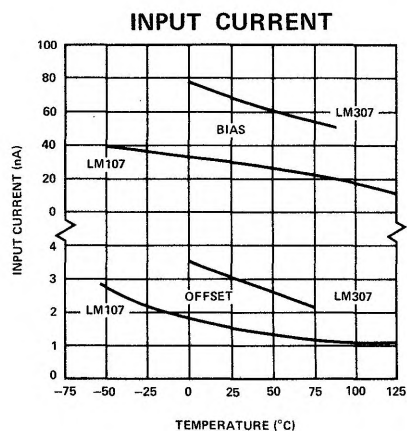
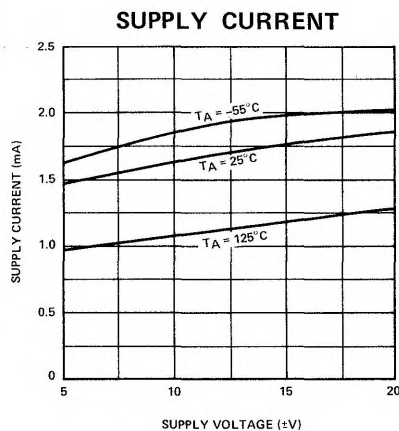
LM107



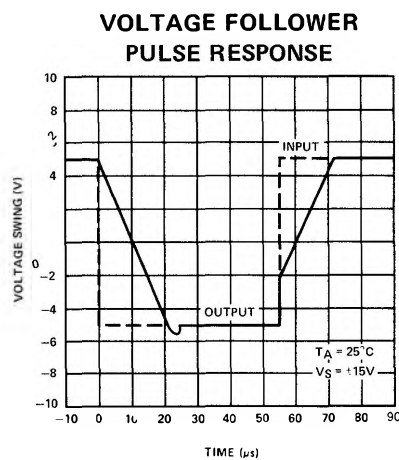
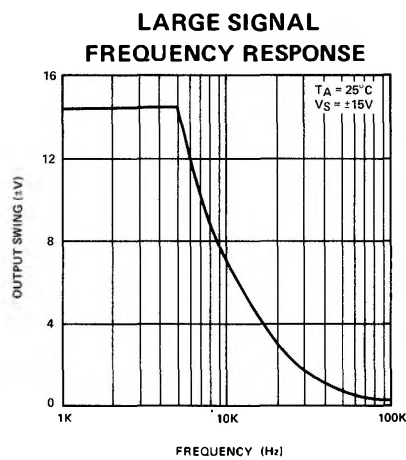
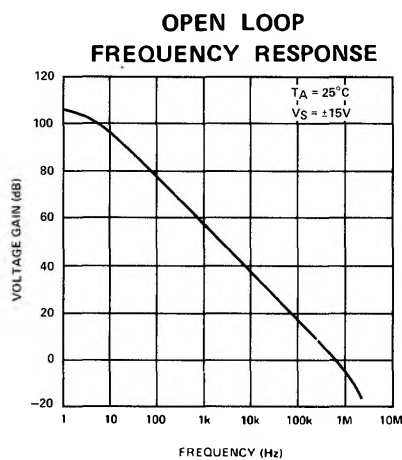
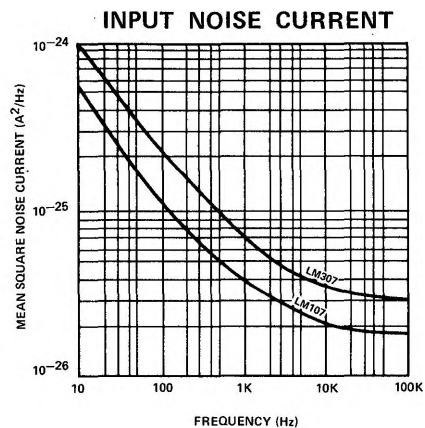
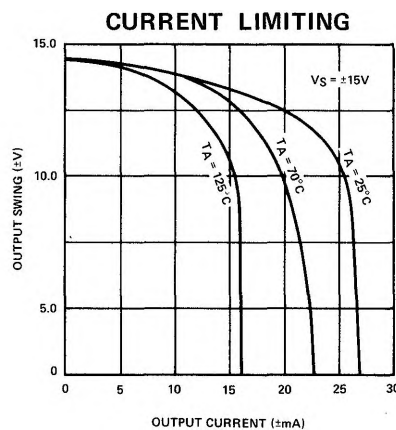
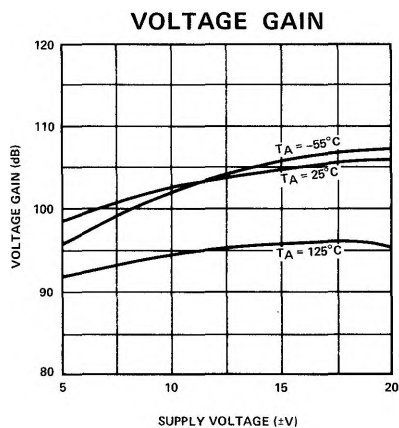
LM307



TYPICAL PERFORMANCE CURVES

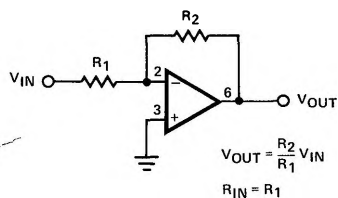


TYPICAL PERFORMANCE CURVES (cont'd)

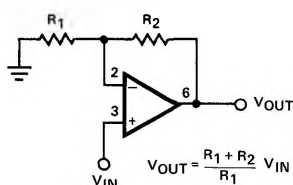


TYPICAL APPLICATIONS

INVERTING AMPLIFIER



NON-INVERTING AMPLIFIER



NON-INVERTING AC AMPLIFIER

