- **Low Input Currents**
- **No Frequency Compensation Required**
- **Low Input Offset Parameters**
- **Short-Circuit Protection**
- **No Latch-Up**
- **Wide Common-Mode and Differential Voltage Ranges**

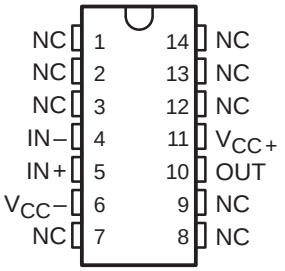
description

The LM107, LM207, and LM307 are high-performance operational amplifiers featuring very low input bias current and input offset voltage and current to improve the accuracy of high-impedance circuits using these devices.

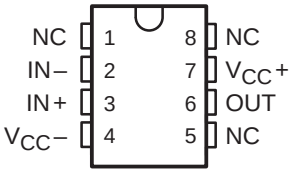
The high common-mode input voltage range and the absence of latch-up make these amplifiers ideal for voltage follower applications. The devices are short-circuit protected and the internal frequency compensation ensures stability without external components.

The LM107 is characterized for operation over the full military temperature range of –55°C to 125°C, the LM207 is characterized for operation from –25°C to 85°C, and the LM307 is characterized for operation from 0°C to 70°C.

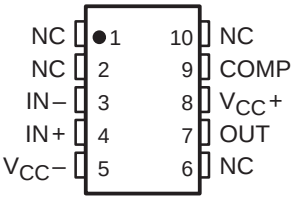
LM107 . . . J OR W PACKAGE
(TOP VIEW)



LM107 . . . JG PACKAGE
LM207, LM307 . . . D OR P PACKAGE
(TOP VIEW)

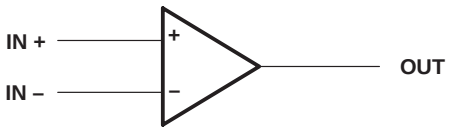


LM107 . . . U FLAT PACKAGE
(TOP VIEW)



NC – No internal connection

symbol



AVAILABLE OPTIONS

T_A	V_{IO} max AT 25°C	PACKAGE					
		SMALL-OUTLINE (D)	CERAMIC (J)	CERAMIC DIP (JG)	PLASTIC DIP (P)	FLAT PACK (U)	FLAT PACK (W)
0°C to 70°C	7.5 mV	LM307D	—	—	LM307P	—	—
–25°C to 85°C	2 mV	LM207D	—	—	LM207P	—	—
–55°C to 125°C	2 mV	—	LM107J	LM107JG	—	LM107U	LM107W

The D package is available taped and reeled. Add the suffix R to the device type, (e.g., LM307DR).

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

	LM107	LM207	LM307	UNIT
Supply voltage, V_{CC+} (see Note 1)	22	22	18	V
Supply voltage, V_{CC-} (see Note 1)	–22	–22	–18	V
Differential input voltage (see Note 2)	±30	±30	±30	V
Input voltage (either input, see Notes 1 and 3)	±15	±15	±15	V
Duration of output short circuit (see Note 4)	unlimited	unlimited	unlimited	
Continuous total dissipation	See Dissipation Rating Table			
Operating free-air temperature range	–55 to 125	–25 to 85	0 to 70	°C
Storage temperature range	–65 to 150	–65 to 150	–65 to 150	°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: J, JG, U, or W package	300			°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: D or P package		260	260	°C

NOTES: 1. All voltage values, unless otherwise noted, are with respect to the midpoint between V_{CC+} and V_{CC-}.
2. Differential voltages are at the noninverting input terminal with respect to the inverting input terminal.
3. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15 V, whichever is less.
4. The output may be shorted to ground or either power supply. For the LM107 only, the unlimited duration of the short circuit applies at (or below) 125°C case temperature or 75°C free-air temperature. For the LM207 only, the unlimited duration of the short circuit applies at (or below) 85°C case temperature or 75°C free air temperature.

DISSIPATION RATING TABLE

PACKAGE	$T_A \le 25^\circ C$ POWER RATING	DERATING FACTOR	DERATE ABOVE T_A	$T_A = 70^\circ C$ POWER RATING	$T_A = 85^\circ C$ POWER RATING	$T_A = 125^\circ C$ POWER RATING
D	500 mW	5.8 mW/°C	64°C	464 mW	377 mW	—
J	500 mW	11.0 mW/°C	105°C	500 mW	500 mW	275 mW
JG	500 mW	8.4 mW/°C	90°C	500 mW	500 mW	210 mW
P	500 mW	N/A	N/A	500 mW	500 mW	—
U	500 mW	5.4 mW/°C	57°C	432 mW	351 mW	135 mW
W	500 mW	8.0 mW/°C	87°C	500 mW	500 mW	200 mW

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC+}	2		18	V
Supply voltage, V_{CC-}	–2		–18	V

electrical characteristics at specified free-air temperature (see Note 5)

PARAMETER		TEST CONDITIONS†		LM107, LM207			LM307			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
V_{IO}	Input offset voltage	V_O = 0	25°C		0.6	2		2	7.5	mV
			Full range			3			10	
α_{VIO}	Average temperature coefficient of input offset voltage	V_O = 0	Full range		3	15		6	30	µV/°C
I_{IO}	Input offset current	V_O = 0	25°C		1.5	10		3	50	nA
			Full range			20			70	
α_{IIO}	Average temperature coefficient of input offset current	T_A = –55°C to 25°C			0.02	0.2				nA/°C
		T_A = 25°C to MAX			0.01	0.1				
		T_A = 0°C to 25°C						0.002	0.6	
		T_A = 25°C to 70°C						0.001	0.3	
I_{IB}	Input bias current		25°C		30	75		70	250	nA
			Full range			100			300	
V_{ICR}	Common-mode input voltage range	See Note 6	Full range	±15			±12			V
$V_{O(PP)}$	Maximum peak-to-peak output voltage swing	$V_{CC\pm}$ = ±15 V, R_L = 10 kΩ	25°C	24	28		24	28		V
			Full range	24			24			
		$V_{CC\pm}$ = ±15 V, R_L = 2 kΩ	25°C	20	26		20	26		
			Full range	20			20			
A_{VD}	Large-signal differential voltage amplification	$V_{CC\pm}$ = ±15 V, V_O = ±10 V, R_L = 2 kΩ	25°C	50	200		25	200		V/mV
			Full range	25			15			
r_I	Input resistance		25°C	1.5	4		0.5	2		MΩ
CMRR	Common-mode rejection ratio	V_{IC} = V_{ICR}min	25°C	80	98		70	90		dB
			Full range	80			70			
k_{SVR}	Supply voltage rejection ratio ($\Delta V_{CC}/\Delta V_{IO}$)		25°C	80	98		70	96		dB
			Full range	80			70			
I_{CC}	Supply current	No load, V_O = 0, See Note 6	25°C		1.8	3		1.8	3	mA
			MAX		1.2	2.5				

† All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified. Full range for LM107 is –55°C to 125°C, for LM207 is –25°C to 85°C, and for LM307 is 0°C to 70°C.

NOTES: 5. Unless otherwise noted $V_{CC\pm}$ = ±5 V to ±20 V for LM107 and LM207, and $V_{CC\pm}$ = ± 5 V to ±15 V for LM307. All typical values are at $V_{CC\pm}$ = ±15 V.

6. For the LM107 and LM207, $V_{CC\pm}$ = ±20 V. For the LM307, $V_{CC\pm}$ = ±15 V.

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