LINEAR INTEGRATED CIRCUITS

LS107
LS207
LS307

FREQUENCY COMPENSATED OPERATIONAL AMPLIFIERS

- LOW OFFSET CURRENT AND VOLTAGE
- LOW INPUT CURRENT
- GUARANTEED DRIFT CHARACTERISTICS

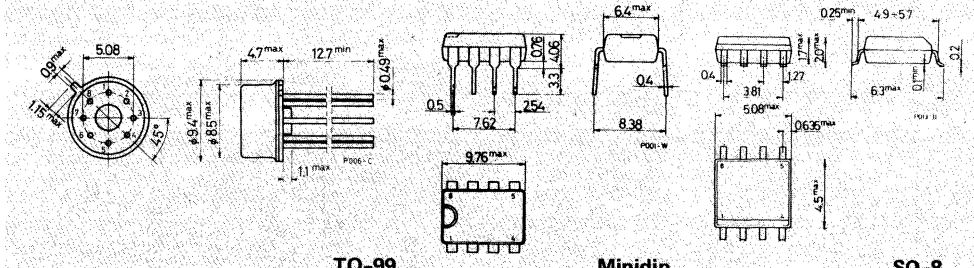
The LS 107 series consists of general purpose operational amplifiers, with the frequency compensation built into the chip. They replace pin-to-pin the LS 709, LS 101, LS 141 and LS 148.
The LS 107 series offers features similar to the LS 101A, providing better accuracy and lower noise in high impedance circuits. The low input currents allow the device to be used in slow charge applications, such as long interval integrators, slow ramps, sample and hold circuits.
The LS 107 series is available with hermetic gold chip (8000 series), particularly suitable for professional and telecom applications, wherever very high MTBF are required.

ABSOLUTE MAXIMUM RATINGS		TO-99	Minidip	μpackage
V_s	Supply voltage for **LS 107** and **LS 207**		± 22V	
	for **LS 307**		± 18V	
V_i (1)	Input voltage		± 15V	
ΔV_i	Differential input voltage		± 30V	
T_{op}	Operating temperature for **LS 107**		-55 to 125 °C	
	for **LS 207**		-25 to 85 °C	
	for **LS 307**		0 to 70 °C	
	Output short circuit duration (2)		indefinite	
P_{tot}	Power dissipation at T_{amb} = 70°C	520 mW	665 mW	400 mW
T_{stg}	Storage temperature	-65 to 150 °C	-55 to 150 °C	-55 to 150 °C
	Lead soldering temperature	300 °C (10s)	260 °C (12s)	260 °C (5s) 235 °C (11s)

1) For supply voltages less than ±15V, input voltage is equal to the supply voltage
2) The short circuit duration is limited by thermal dissipation

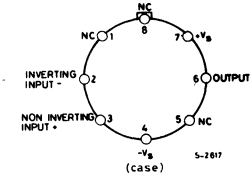
MECHANICAL DATA

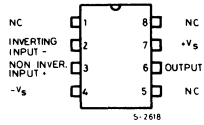
Dimensions in mm

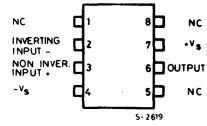


LS107
LS207
LS307

CONNECTION DIAGRAMS AND ORDERING NUMBERS
(top views)

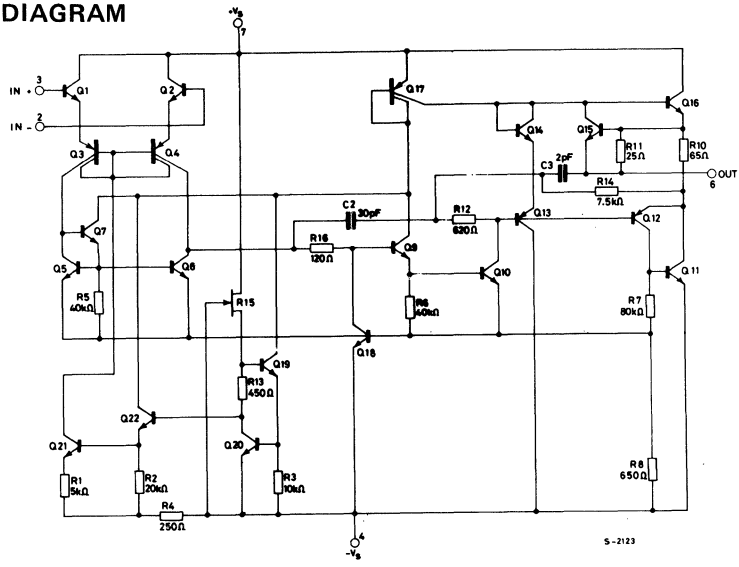






Type	TO-99	Minidip	SO-8
LS 107	LS 107T	–	–
LS 207	LS 207T	–	–
LS 307	LS 307T	LS 307B	LS 307M
LS 8107	–	–	LS 8107M
LS 8207	–	–	LS 8207M
LS 8307	–	–	LS 8307M

SCHEMATIC DIAGRAM



THERMAL DATA

			TO-99	Minidip	SO-8
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	155 °C/W	120 °C/W	200* °C/W

* Measured with the device mounted on a ceramic substrate (25x16x0.6 mm)

ELECTRICAL CHARACTERISTICS (see note)

Parameter		Test conditions	LS 107/LS 207			LS 307			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
V_{os}	Input offset voltage	$R_g \leqslant 10\ k\Omega$			3			10	mV
		$R_g \leqslant 10\ k\Omega$ $T_{amb}= 25°C$		0.7	2		2	7.5	mV
$\frac{\Delta V_{os}}{\Delta T}$	Average temperature coefficient of input offset voltage			3	15		6	30	$\mu V/°C$
I_{os}	Input offset current				20			70	nA
		$T_{amb}= 25°C$		1.5	10		3	50	nA
$\frac{\Delta I_{os}}{\Delta T}$	Average temperature coefficient of input offset current	$T_{amb}= 25°C$ to T_{max}		0.01	0.1		0.01	0.3	nA/°C
		$T_{amb}= T_{min}$ to 25°C		0.02	0.2		0.02	0.6	nA/°C
I_b	Input bias current				100			300	nA
		$T_{amb}= 25°C$		30	75		70	250	nA
R_i	Input resistance	$T_{amb}= 25°C$	1.5	4		0.5	2		MΩ
G_v	Large signal voltage gain	$V_s= \pm 15V$ $V_o= \pm 10V$ $R_L \geqslant 2\ k\Omega$	88			84			dB
		$V_s= \pm 15V$ $V_o= \pm 10V$ $R_L \geqslant 2\ k\Omega$ $T_{amb}= 25°C$	94	104		88	104		dB
V_i	Input voltage range	$V_s= \pm 20V$	±15						V
		$V_s= \pm 15V$				±12			V
V_o	Output voltage swing	$V_s= \pm 15V$ $R_L= 10\ k\Omega$	±12	±14		±12	±14		V
		$V_s= \pm 15V$ $R_L= 2\ k\Omega$	±10	±13		±10	±13		V
CMR	Common mode rejection	$R_g \leqslant 10\ k\Omega$	80	96		70	90		dB
SVR	Supply voltage rejection	$R_g \leqslant 10\ k\Omega$	80	96		70	96		dB
I_s	Supply current	$V_s= \pm 20V$							
		$T_{amb}= 25°C$		1.8	3				mA
		$T_{amb}= 125°C$		1.2	2.5				mA
		$V_s= \pm 15V$ $T_{amb}= 25°C$					1.8	3	mA

Note: These specifications, unless otherwise specified, apply for $V_s= \pm 5V$ to $\pm 20V$ and $T_{amb}= -55$ to 125°C for LS 107; $V_s= \pm 5V$ to $\pm 20V$ and $T_{amb}= -25$ to 85°C for LS 207; $V_s= \pm 5V$ to $\pm 15V$ and $T_{amb}= 0$ to 70°C for LS 307.

LS107 LS207 LS307

Fig. 1 - Supply current vs. supply voltage

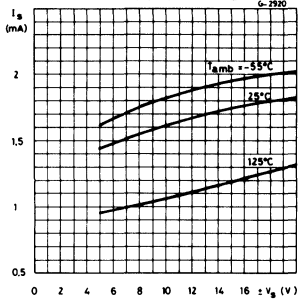


Fig. 2 - Voltage gain vs. supply voltage

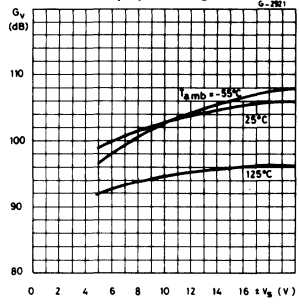


Fig. 3 - Input current vs. ambient temp.

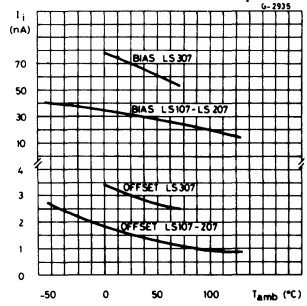


Fig. 4 - Current limiting vs. output current

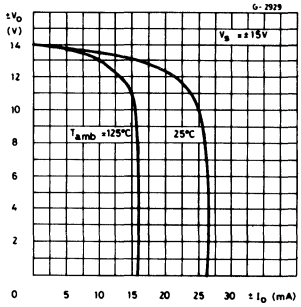


Fig. 5 - Input noise voltage vs. frequency

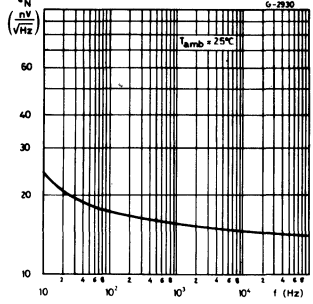


Fig. 6 - Input noise current vs. frequency

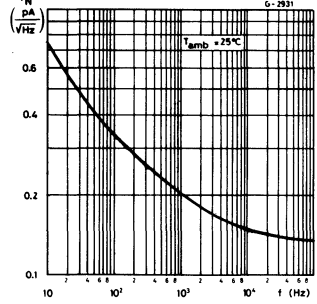


Fig. 7 - Open loop frequency response

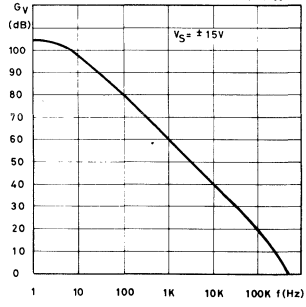


Fig. 8 - Large signal frequency response

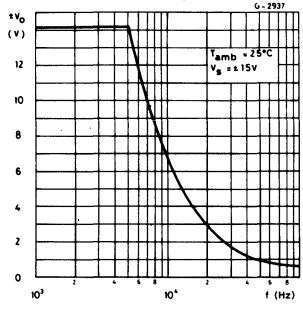
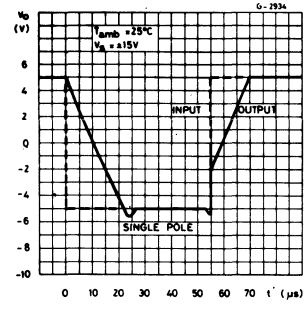


Fig. 9 - Voltage follower pulse response



Guaranteed performance characteristics (LS 107/LS 207)

Fig. 10 - Input voltage range vs. supply voltage

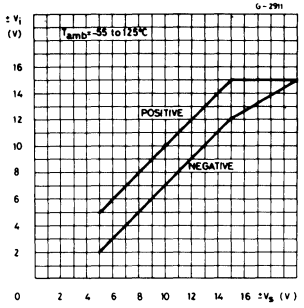


Fig. 11 - Output voltage swing vs. supply voltage

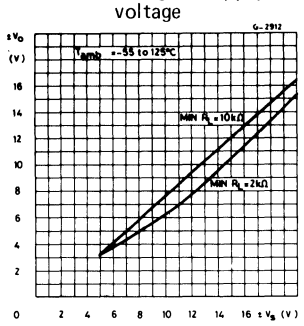
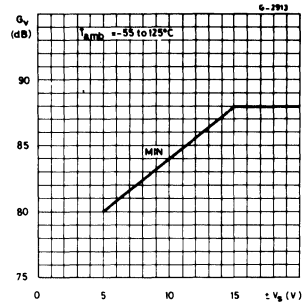


Fig. 12 - Voltage gain vs. supply voltage



Guaranteed performance characteristics (LS 307)

Fig. 13 - Input voltage range vs. supply voltage

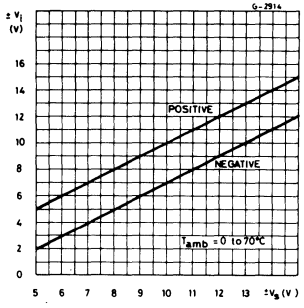


Fig. 14 - Output voltage swing vs. supply voltage

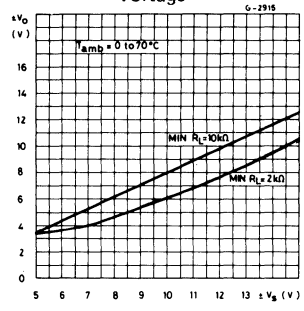
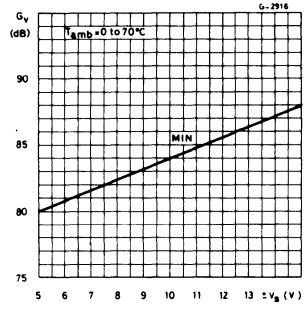


Fig. 15 - Voltage gain vs. supply voltage



TYPICAL APPLICATIONS

Fig. 16 - Inverting amplifier

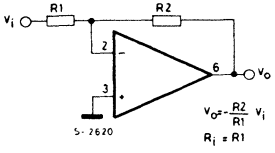


Fig. 17 - Non-inverting AC amplifier

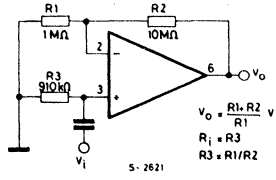


Fig. 18 - Non-inverting amplifier