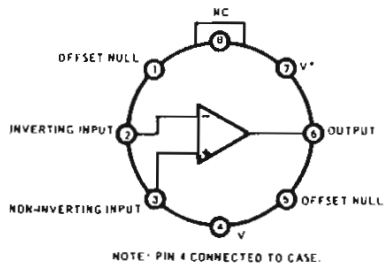
high performance operational amplifier

EXTENDED TEMPERATURE RANGE, - 55°C + 125°C

- No frequency compensation required
- Short-circuit protection
- Offset voltage null capability
- Large common-mode and differential voltage ranges
- Low power consumption
- No latch up

The L 141 is a high performance monolithic operational amplifier constructed on a single silicon chip, using the Planar epitaxial process. It is intended for a wide range of analog applications. High common mode voltage range and absence of "latch-up" tendencies make the L 141 ideal for use as a voltage follower. The high gain and wide range of operating voltages provide superior performance in integrator, summing amplifier, and general feedback applications. The L141 is short-circuit protected, has the same pin configuration as the popular μA709 operational amplifier, but requires no external components for frequency compensation. The internal 6dB/octave roll-off insures stability in closed loop applications.

CONNECTION DIAGRAM
(Top view)



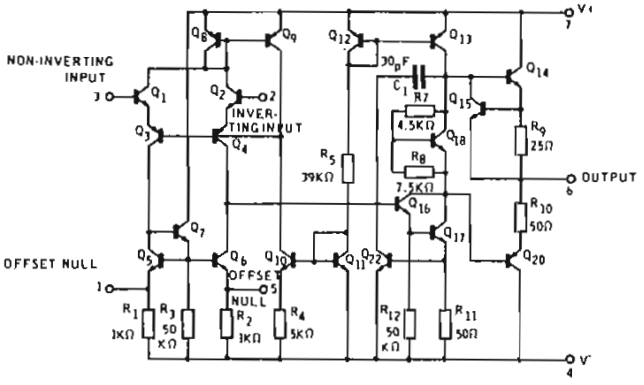
NOTE: PIN 4 CONNECTED TO CASE.

ABSOLUTE MAXIMUM RATINGS
(above which the useful life may be impaired)

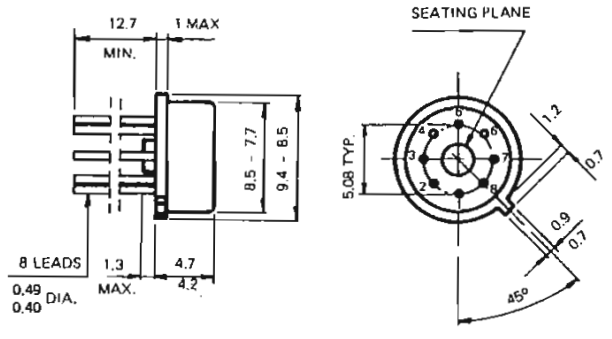
Supply Voltage	± 22 V
Internal Power Dissipation (1)	500 mW
Differential Input Voltage	± 30 V
Input Voltage (2)	± 15 V
Storage Temperature Range	- 65°C to + 150°C
Operating Temperature Range	- 55°C to + 125°C
Lead Temperature (Soldering, 60 sec.)	300°C
Output Short-Circuit Duration (3)	Indefinite

Notes :
1) Rating applies for case temperatures to 125°C; derate linearly at 6.5 mW/°C for ambient temperatures above + 75°C.
2) For supply voltages less than ± 15 V, the absolute maximum input voltage is equal to the supply voltage.
3) Short circuit may be to ground or either supply. Rating applies to + 125°C case temperature or + 75°C ambient temperature.

SCHEMATIC DIAGRAM



PHYSICAL DIMENSIONS
in accordance with
JEDEC TO-99 outline



Notes: All dimensions in mm.

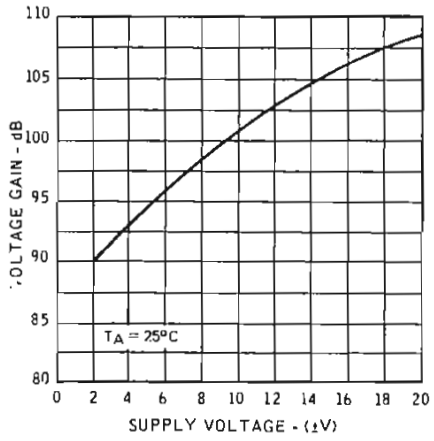
ORDERING NUMBER

L141 T2

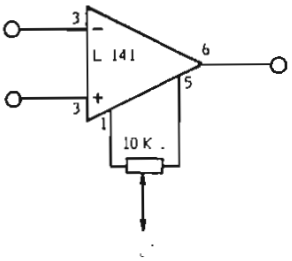
ELECTRICAL CHARACTERISTICS ($V_S = \pm 15V$, $T_A = 25°C$ unless otherwise specified)

PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	$R_S \leq 10\ k\Omega$		1	5	mV
Input Offset Current			30	200	nA
Input Bias Current			200	500	nA
Input Resistance		0.3	1		MΩ
Large-Signal Voltage Gain	$R_L \geq 2\ k\Omega$, $V_{OUT} = \pm 10V$	50.000	200.000		
Output Voltage Swing	$R_L \geq 10\ k\Omega$	± 12	± 14		V
	$R_L \geq 2\ k\Omega$	± 10	± 13		V
Input Voltage Range		± 12	± 13		V
Common Mode Rejection Ratio	$R_S \leq 10\ k\Omega$	70	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\ k\Omega$		30	150	μV/V
Power Consumption			50	85	mW
Transient Response (unity gain)	$V_{in} = 20$ mV, $R_L = 2\ k\Omega$ $C_L \leq 100$ pF				
Risetime			0.3		μs
Overshoot			5		%
Slew Rate (unity gain)	$R_L \geq 2\ k\Omega$		0.5		V/μs
The following specifications apply for $-55°C \leq T_A \leq +125°C$:					
Input Offset Voltage	$R_S \leq 10\ k\Omega$			6	mV
Input Offset Current				500	nA
Input Bias Current				1.5	μA
Large-Signal Voltage Gain	$R_L \geq 2\ k\Omega$ $V_{OUT} = \pm 10V$	25.000			
Output Voltage Swing	$R_L \geq 2\ k\Omega$	± 10			V

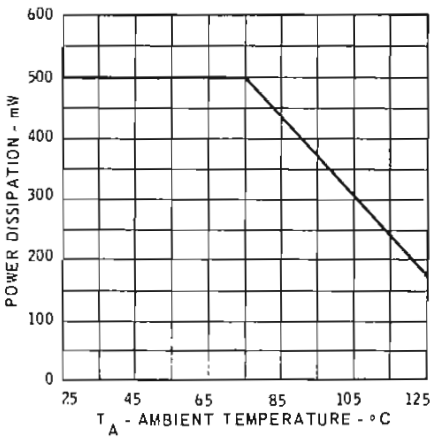
OPEN LOOP VOLTAGE GAIN



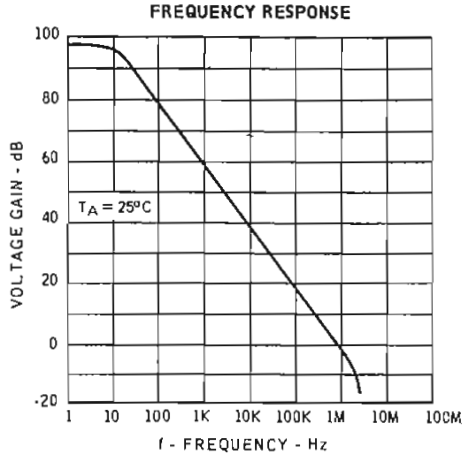
VOLTAGE OFFSET NULL CIRCUIT



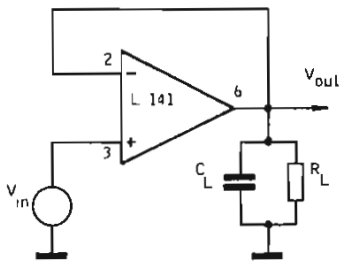
ABSOLUTE MAXIMUM POWER DISSIPATION



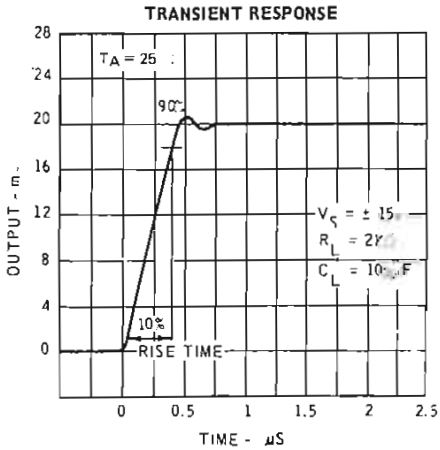
OPEN LOOP FREQUENCY RESPONSE



TRANSIENT RESPONSE TEST CIRCUIT



TRANSIENT RESPONSE



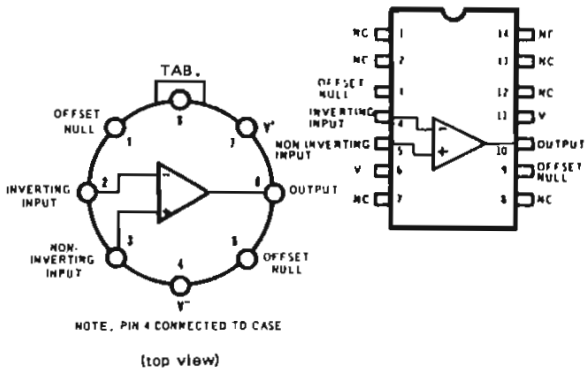
high performance operational amplifier

STANDARD TEMPERATURE RANGE, 0°C + 70°C

- No frequency compensation required
- Short-circuit protection
- Offset voltage null capability
- Large Common-Mode and differential voltage ranges
- Low power consumption
- No latch up

The L 141 is a high performance monolithic operational amplifier constructed on a single silicon chip, using the Planar epitaxial process. It is intended for a wide range of analog applications. High common mode voltage range and absence of "latch-up" tendencies make the L 141 ideal for use as a voltage follower. The high gain and wide range of operating voltages provide superior performance in integrator, summing amplifier, and general feedback applications. The L 141 is short-circuit protected, has the same pin configuration as the popular μA709 operational amplifier, but requires no external components for frequency compensation. The internal 6dB/octave roll-off insures stability in closed loop applications.

CONNECTION DIAGRAM



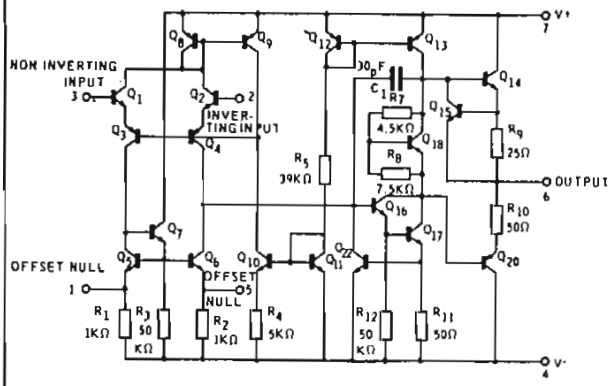
(top view)

ABSOLUTE MAXIMUM RATINGS
(above which the useful life may be impaired)

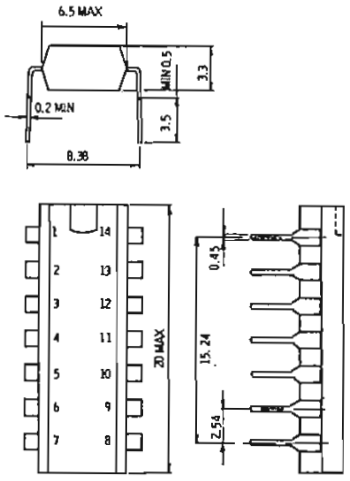
Supply Voltage	± 18 V
Internal Power Dissipation	500 mW
Differential Input Voltage	± 30 V
Input Voltage (1)	± 15 V
Storage Temperature Range	- 65°C to + 150°C
Operating Temperature Range	0°C to + 70°C
Lead Temperature (Soldering, 60 sec)	300°C
Output Short-Circuit Duration (2)	Indefinite

Notes :
1) For supply voltages less than ± 15V, the absolute maximum input voltage is equal to the supply voltage.
2) Short circuit may be to ground or either supply.

SCHEMATIC DIAGRAM

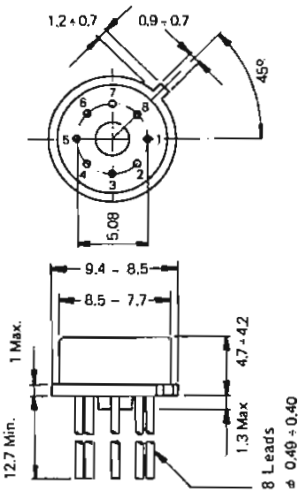


PHYSICAL DIMENSIONS
14-pin plastic DIP



Note : all dimensions in mm.

PHYSICAL DIMENSIONS
similar to
Jedec TO 99 outline



Notes : All dimensions in mm.

ORDERING NUMBER

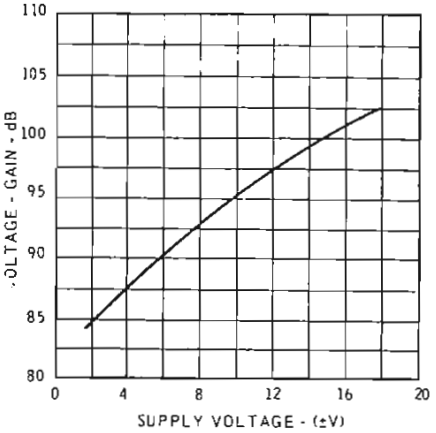
L141 B1 (for TO116 package)
L141 T1 (for TO 99 package)

ELECTRICAL CHARACTERISTICS ($V_S = \pm 15$ V, $T_A = 25°C$ unless otherwise specified)

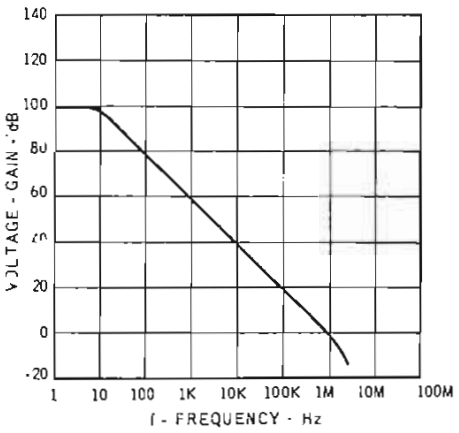
PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	$R_S \leq 10\,k\Omega$		2	6	mV
Input Offset Current			30	200	nA
Input Bias Current			200	500	nA
Input Resistance		0.3	1		MΩ
Large-Signal Voltage Gain	$R_L \geq 2\,k\Omega$, $V_{OUT} = \pm 10$ V	20.000	100.000		
Output Voltage Swing	$R_L \geq 10\,k\Omega$	±12	±14		V
	$R_L \geq 2\,k\Omega$	±10	±13		V
Input Voltage Range		±12	±13		V
Common Mode Rejection Ratio	$R_S \leq 10\,k\Omega$	70	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\,k\Omega$		30	150	μV/V
Power Consumption			50	85	mW
Transient Response (unity gain)	$V_{in} = 20$ mV, $R_L = 2\,k\Omega$ $C_L \leq 100$ pF				
Risetime			0.3		μs
Overshoot			5		%
Slew Rate (unity gain)	$R_L \geq 2\,k\Omega$		0.5		V/μs
The following specifications apply for $0°C \leq T_A \leq +70°C$:					
Input Offset Voltage	$R_S \leq 10\,k\Omega$			7.5	mV
Input Offset Current				300	nA
Input Bias Current				800	nA
Large-Signal Voltage Gain	$R_L \geq 2\,k\Omega$ $V_{OUT} = \pm 10$ V	15.000			
Output Voltage Swing	$R_L \geq 2\,k\Omega$	± 10			V

TYPICAL PERFORMANCE CURVES (25°C free air temperature unless otherwise noted)

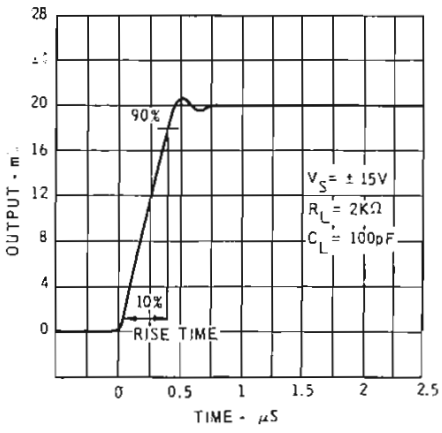
OPEN LOOP VOLTAGE GAIN



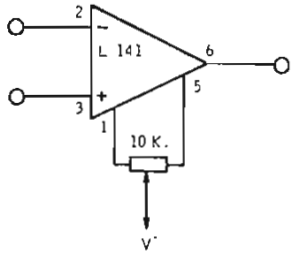
OPEN LOOP FREQUENCY RESPONSE



TRANSIENT RESPONSE



VOLTAGE OFFSET NULL CIRCUIT



TRANSIENT RESPONSE TEST CIRCUIT