



ON Semiconductor®

<http://onsemi.com>

# LA6500

## Monolithic Linear IC Power Operational Amplifier

### Overview

The LA6500 is a power operational amplifier.

### Features

- High output current ( $I_O$  max = 1.0A)
- High gain
- With current limiter
- Capable of being operated from single supply

### Specifications

**Maximum Ratings** at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC}/V_{EE}$		$\pm 18$	V
Differential input voltage	$V_{ID}$		30	V
Common-mode input voltage	$V_{IN}$		$\pm 15$	V
Output current	$I_O$ max		1.0	A
Allowable power dissipation	$P_d$ max1	With infinity large heat sink	20	W
	$P_d$ max2	Independent IC	1.75	W
Operating temperature	$T_{opr}$		-20 to +75	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

# LA6500

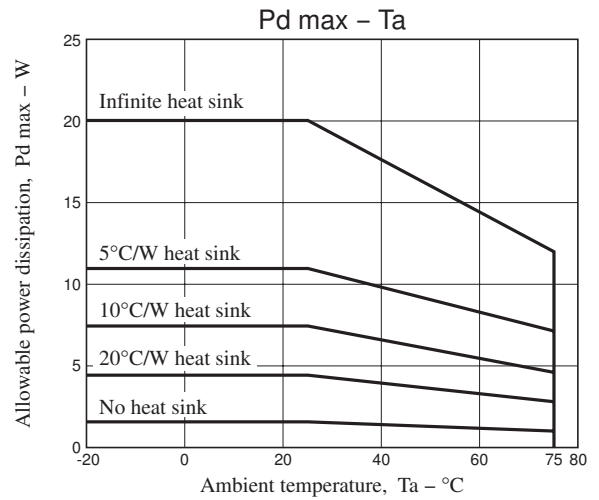
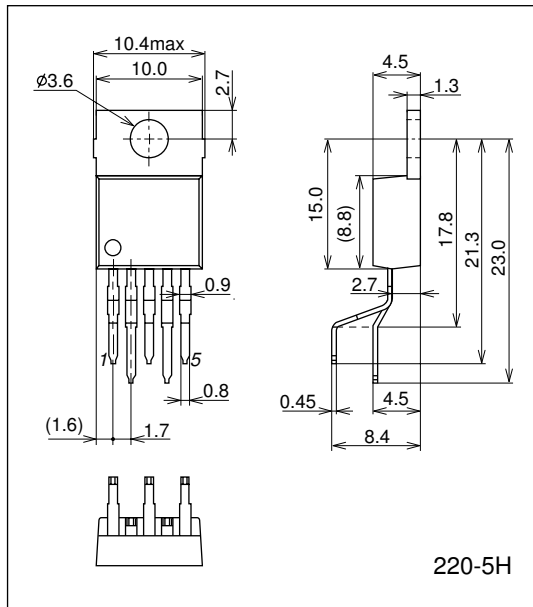
**Electrical Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{CC}/V_{EE} = \pm 15\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current dissipation	$I_{CCO}$			6.0	12.0	mA
Input offset voltage	$V_{IO}$			2	6	mV
Input offset current	$I_{IO}$			10	200	nA
Input bias current	$I_B$			100	700	nA
Common-mode input voltage range	$V_{ICM}$		-15		+13	V
Common-mode rejection	CMR		70	80		dB
Maximum output voltage	$V_O$	$R_L = 33\Omega$	$\pm 12$	$\pm 13$		V
Voltage gain	$V_{GO}$			100		dB
Slew rate	SR	$G_V = 0, R_L = 33\Omega, R = 2.2\Omega, L = 0.1\mu\text{F}$		0.15		V/ $\mu\text{s}$
Equivalent input noise voltage	$V_{NI}$	$R_g = 1\text{k}\Omega, \text{DIN AUDIO}$		2		$\mu\text{V}$
Supply voltage rejection	SVR			30	150	$\mu\text{V}/\text{V}$
Limiting current	$I_{SC}$			1.0		A

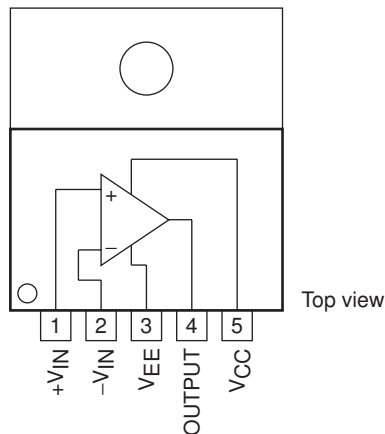
## Package Dimensions

unit : mm (typ)

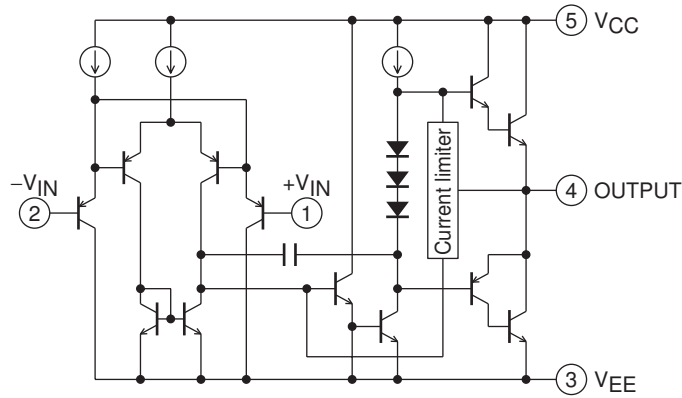
3079C



## Pin Assignment

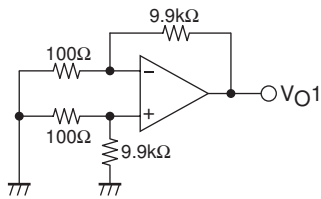


Equivalent Circuit



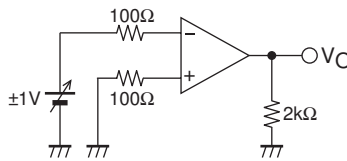
Test Circuit

(1)  $V_{IO}$ , SVRR



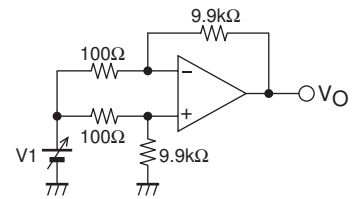
$\cdot V_{IO}$  is  $V_{CC}/V_{EE} = \pm 15V$   
 $\cdot SVRR$  is  $\begin{cases} V_{CC} = 15, 5V \\ V_{EE} = -5, -15V \end{cases}$

(2)  $V_O$



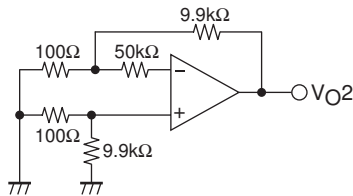
$\cdot V_{IO} = V_O / 100$   
 $SVR(+)$  and  $SVR(-)$  are calculated as  $\left| \frac{\Delta V_{O1}}{100 \times 10V} \right|$

(3) CMMR,  $V_{ICM}$



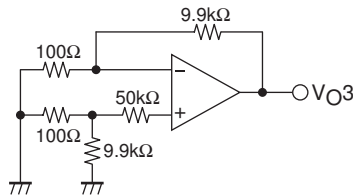
$\cdot CMMR$   $V_1 = \pm 7.5V$   
 $\cdot CMMR = 20 \log \frac{15 \times 100}{|\Delta V_O|}$

(3)  $I_B(+)$



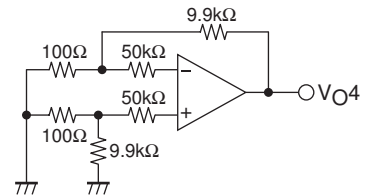
$\cdot I_B(+)$  is calculated as  $\frac{|V_{O2} - V_{O1}|}{50k\Omega \times 100}$

(4)  $I_B(-)$



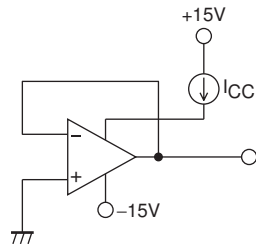
$\cdot I_B(-)$  is calculated as  $\frac{|V_{O3} - V_{O1}|}{50k\Omega \times 100}$

(5)  $I_{IO}$

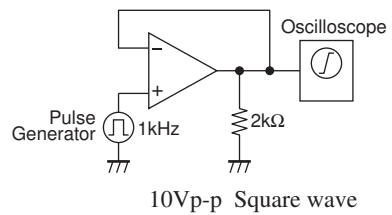


$\cdot I_{IO}$  is calculated as  $\frac{|V_{O4} - V_{O1}|}{50k\Omega \times 100}$

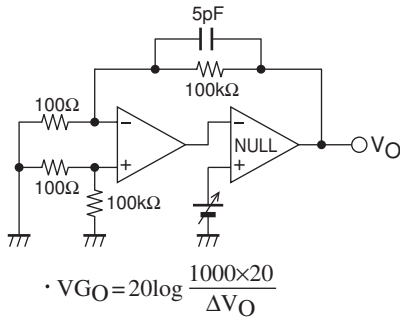
(7)  $I_{CC}$



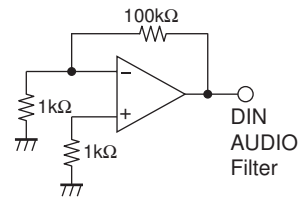
(8) SR



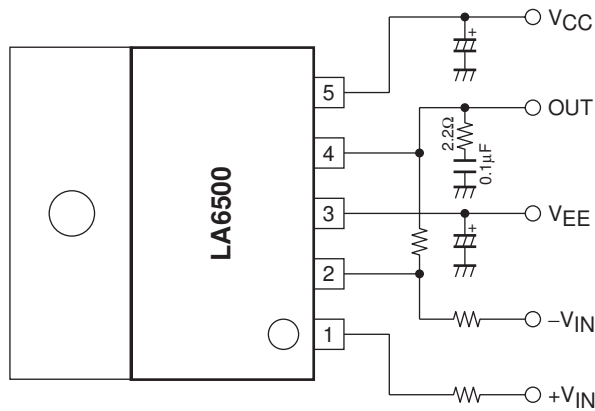
(9)  $V_{GO}$



(10)  $V_{NI}$



**Application Circuit Example**



ON Semiconductor and the ON logo are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.