



# LA6512, 6513

## High-Voltage Dual Power Operational Amplifiers

### Overview

LA6512 (SIP10F) and LA6513 (SIP10) are power operational amplifier ICs capable of withstanding high voltages of  $\pm 30$  V/1 A and are best suited for such voltage division devices as LCD drivers and general-purpose power operational amplifiers.

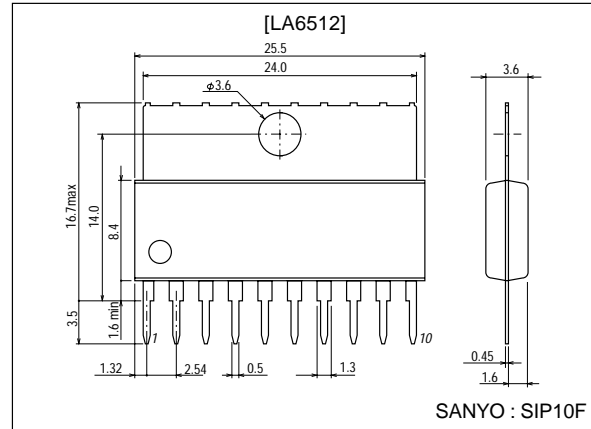
### Features

- High output current ( $I_O$  max=1.0A).
- High gain.
- Equipped with current limiter pin (Adjustable by external settings).
- Supports single power source operation.
- Withstands high voltages ( $\pm 30$ V).

### Package Dimensions

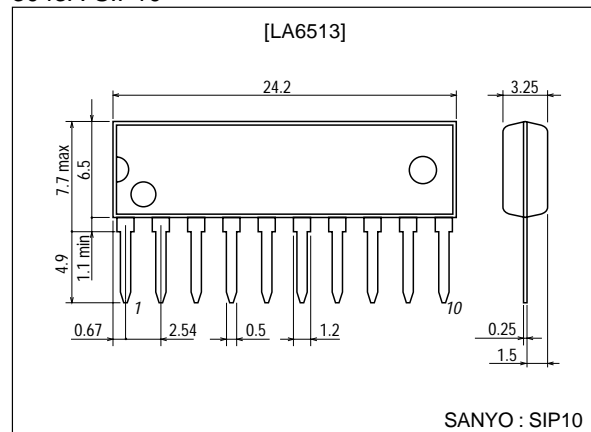
unit:mm

3046B-SIP10F



unit:mm

3043A-SIP10



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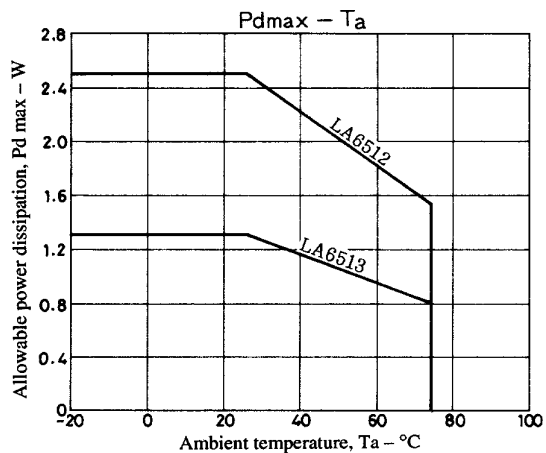
## Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC}/V_{EE\text{ max}}$		$\pm 30$	V
Differential input voltage	$V_{IDIF}$		56	V
Common-mode input voltage	$V_{ICOM}$		$\pm 28$	V
Maximum output current	$I_{O\text{ max}}$		1.0	A
Allowable power dissipation	Pd max	LA6512	2.5	W
		LA6513	1.3	W
Operating temperature	$T_{opr}$		-20 to +75	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

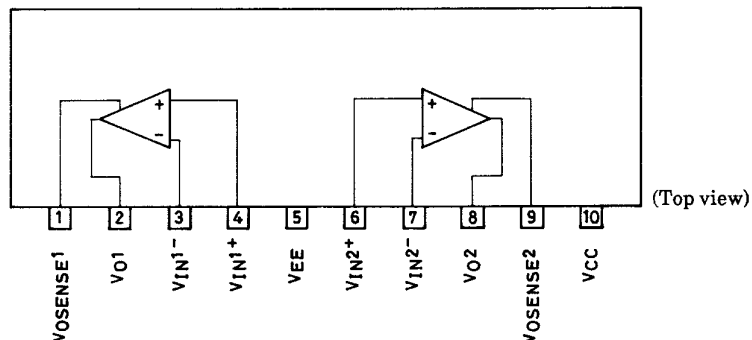
Operating Characteristics at  $T_a = 25^\circ\text{C}$ ,  $V_{CC}/V_{EE} = \pm 15$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
No load current drain	$I_{CCO}$		6	12	20	mA
Input offset voltage	$V_{IO}$	$R_S \leq 10\text{k}\Omega$		2	6	mV
Input offset current	$I_{IO}$			10	200	nA
Input bias current	$I_B$			100	700	nA
Common-mode input voltage range	$V_{ICM}$		-14		+13	V
Common-mode single rejection ratio	CMRR		70	80		dB
Maximum output voltage	$V_{O\text{ max}}$		$\pm 12$	$\pm 13$		V
Voltage gain	$V_{GO}$			100		dB
Slew rate	SR	$GV=0, R_L=33\Omega, R=2.2\Omega, C=0.1\mu\text{F}$		0.15		V/ $\mu\text{s}$
Supply voltage rejection ratio	SVRR			30	150	$\mu\text{V/V}$
Limiting current	$I_{SC}$	$R_{SC}=2.2\Omega$		0.35		A



## Pin Assignment

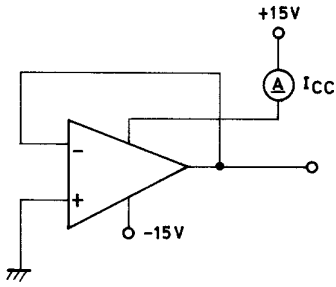
(LA6512, 6513 common)



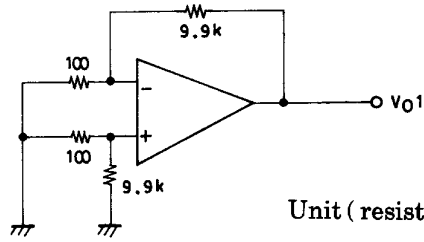
# LA6512, 6513

## Test Circuits

$I_{CC}$



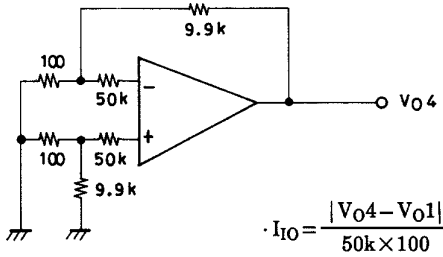
$V_{IO}, SVRR$



Unit (resistance:Ω)

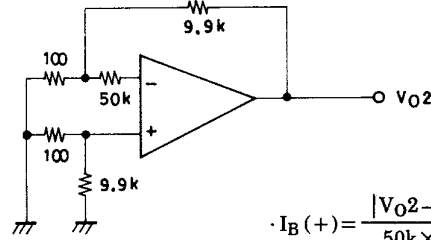
- $V_{IO}$  is with  $V_{CC}/V_{EE} = \pm 15V$
- $SVRR$  is with  $\left[ \begin{matrix} V_{CC} = 15.5V \\ V_{EE} = -5, -15V \end{matrix} \right]$
- $V_{IO} = V_{O1}/100$
- $SVR (+) = \frac{\Delta V_{O1}}{100 \times 10V}$
- $SVR (-) = \frac{\Delta V_{O1}}{100 \times 10V}$

$I_{IO}$



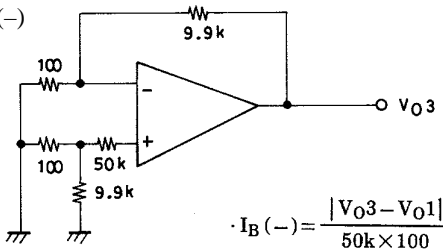
$$\cdot I_{IO} = \frac{|V_{O4} - V_{O1}|}{50k \times 100}$$

$I_B (+)$



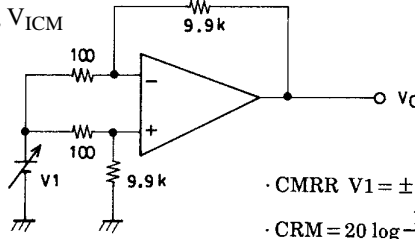
$$\cdot I_B (+) = \frac{|V_{O2} - V_{O1}|}{50k \times 100}$$

$I_B (-)$



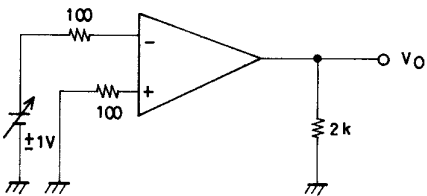
$$\cdot I_B (-) = \frac{|V_{O3} - V_{O1}|}{50k \times 100}$$

CMRR,  $V_{ICM}$

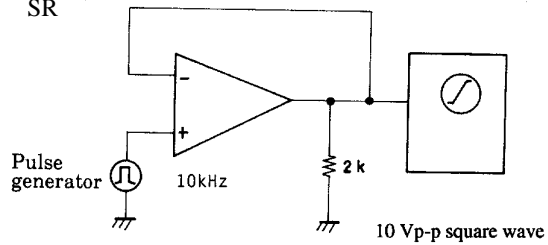


- CMRR  $V_1 = \pm 7.5V$
- $CRM = 20 \log \frac{15 \times 100}{|\Delta V_0|}$

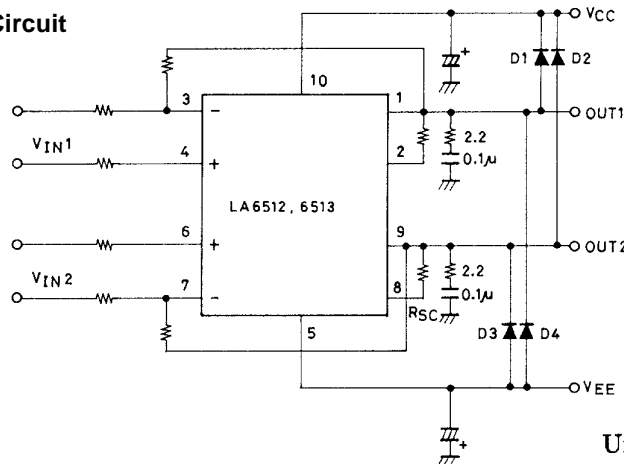
$V_O$



SR

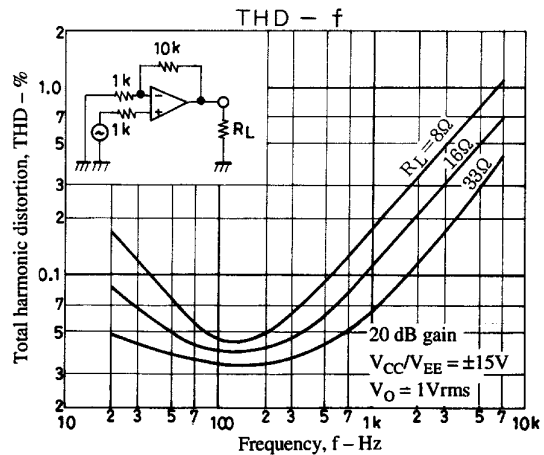
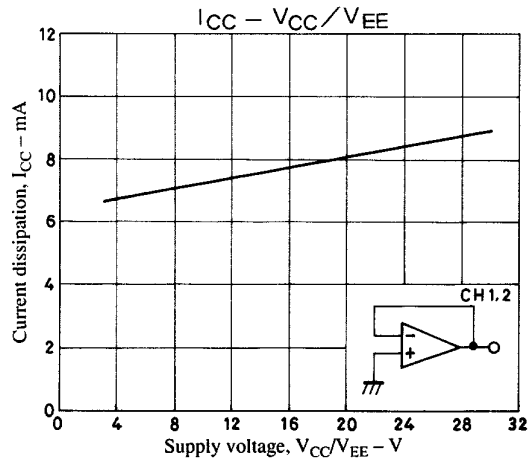


## Sample Application Circuit



Unit (resistance:Ω capacitance:F)

Note : When driving an inductive load, a D1 to D4 protective diode should be installed.



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