



SANYO Semiconductors

# DATA SHEET

## LA6393AT — Monolithic Linear IC For Parallel Comparator Circuits High-Performance Dual Comparator

### Overview

The LA6393AT is a high-performance dual comparator that features the flexible operating characteristics of a wide supply voltage range (2 to 24V for single voltage operation) and a wide operating temperature range (−40 to +125°C). It also features superlative input characteristics and low power, making it optimal for a wide range of applications including automotive and industrial applications.

### Functions

- Wide operating supply voltage range: 2.0 to 24.0V (single voltage supply), ±1.0 to 12.0V (dual voltage supply)
- Wide common-mode input voltage range: 0 to  $V_{CC} - 1.8\text{ V}$
- Open collector outputs allow the use of wired OR circuits
- Low current drain for low-power operation (0.6mA)
- Miniature flat package supports product miniaturization

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max}}$		36	V
Maximum differential input voltage	$V_{ID\text{ max}}$		36	V
Maximum common-mode input voltage range	$V_{ICM\text{ max}}$		-0.3 to +36	V
Allowable power dissipation	$P_d\text{ max}$		160	mW
Operating temperature	$T_{opr}$		-40 to +125	°C
Storage temperature	$T_{stg}$		-55 to +150	°C

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**SANYO Semiconductor Co., Ltd.**

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# LA6393AT

## Allowable Operating Ranges at $T_a = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply voltage	$V_{CC}$		2		24	V

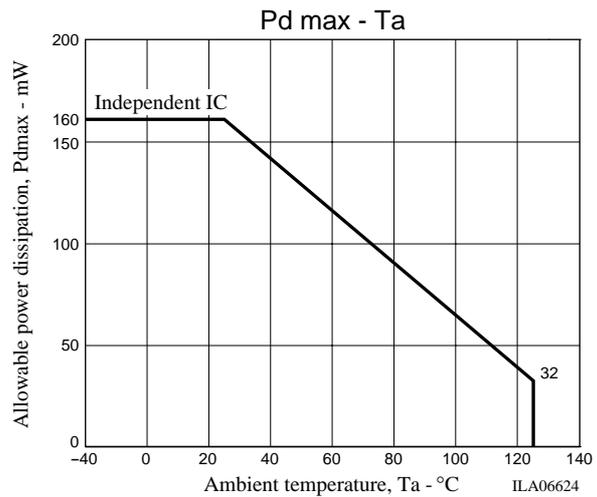
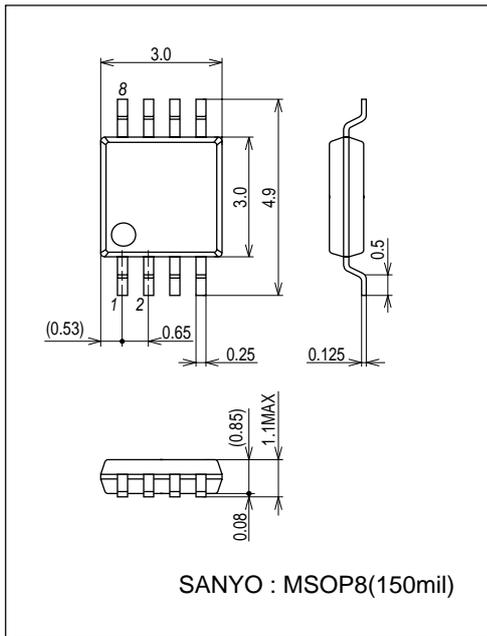
## Electrical Characteristics at $T_a = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ , $V_{CC} = 5\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input offset voltage	$V_{IO}$			$\pm 1$	$\pm 5$	mV
Input offset current	$I_{IO}$			$\pm 5$	$\pm 50$	nA
Input bias current	$I_B$			25	250	nA
Common-mode input voltage range	$V_{ICM}$		0		$V_{CC}-1.8$	V
Current drain	$I_{CC}$	$R_L = \infty$		0.6	1	mA
Voltage gain	VG	$R_L = 15\text{k}\Omega$		200		V/mV
Response time	SR	$R_L = 5.1\text{k}\Omega$ , $V_{RL} = 5\text{V}$		1.3		$\mu\text{s}$
Output sink current	$I_{SINK}$	$V_{IN-} = 0.5\text{V}$ , $V_{IN+} = 0\text{V}$ , $V_O \leq 1.5\text{V}$	6	16		mA
Output saturation voltage	$V_{OL}$	$V_{IN-} = 0.5\text{V}$ , $V_{IN+} = 0\text{V}$ , $I_{SINK} \leq 3\text{mA}$		0.2	0.4	V
Output leakage current	$I_{LEAK}$	$V_{IN-} = 0\text{V}$ , $V_{IN+} = 0.5\text{V}$ , $V_O = 5\text{V}$		0.1		nA

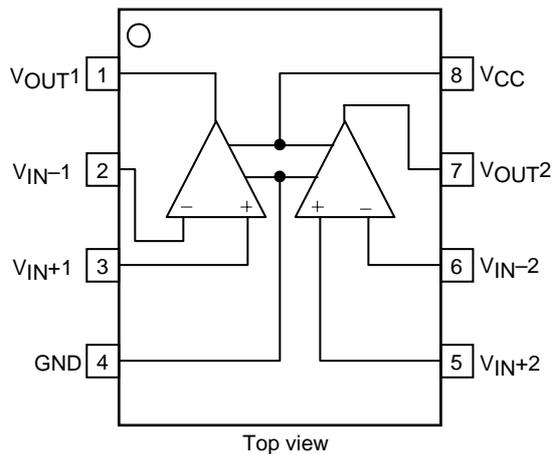
## Package Dimensions

unit : mm (typ)

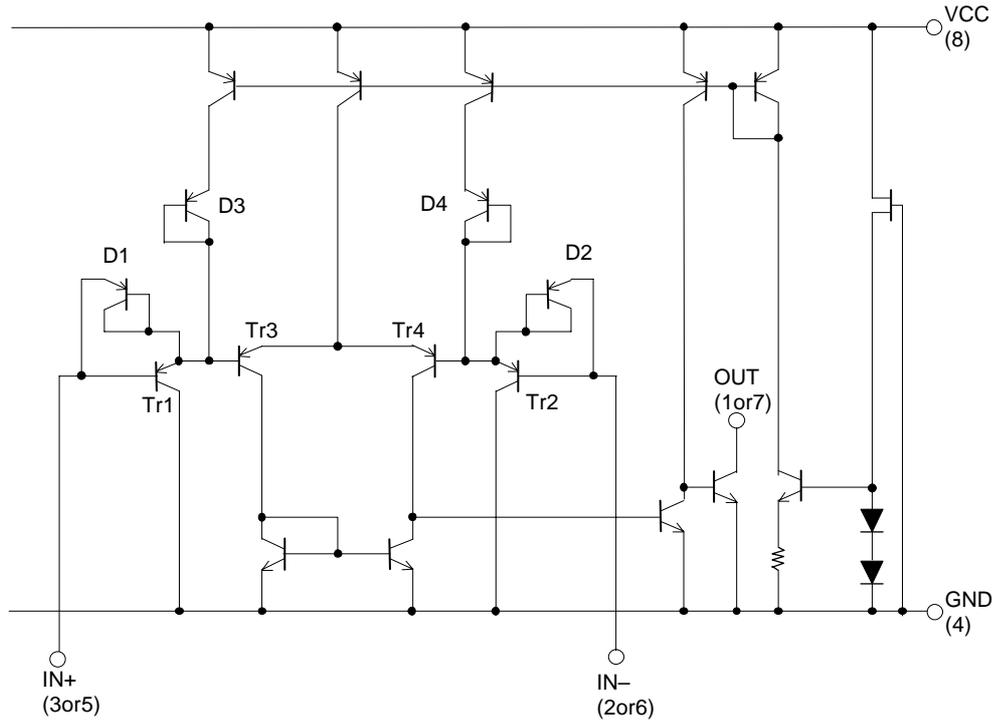
3245B



## Pin Assignment

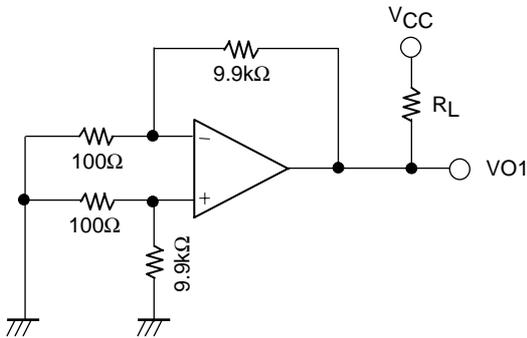


Equivalent Circuit Block Diagram



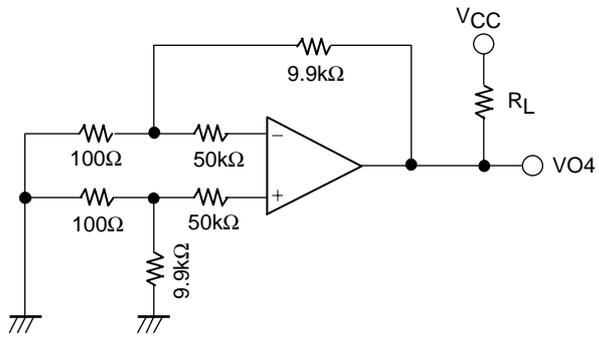
Test Circuits

1. Input offset voltage



$V_{IO} \quad V_{CC}/V_{EE} = \pm 15V$   
 $V_{IO} = VO1/100$

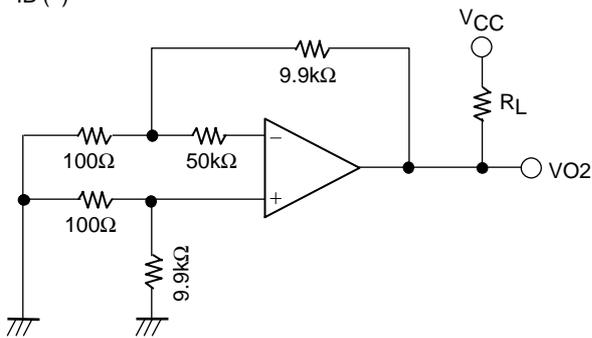
2. Input offset current



$$I_{IO} = \frac{|VO4 - VO1|}{50k\Omega \times 100}$$

3. Input bias current

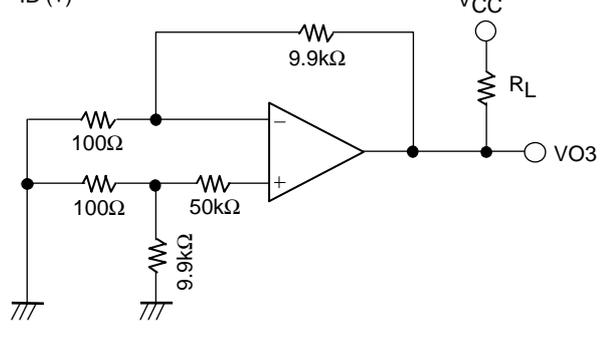
IB (-)



$$I_{B(-)} = \frac{|VO2 - VO1|}{50k\Omega \times 100}$$

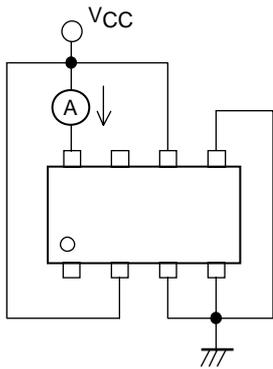
Input bias current

IB (+)

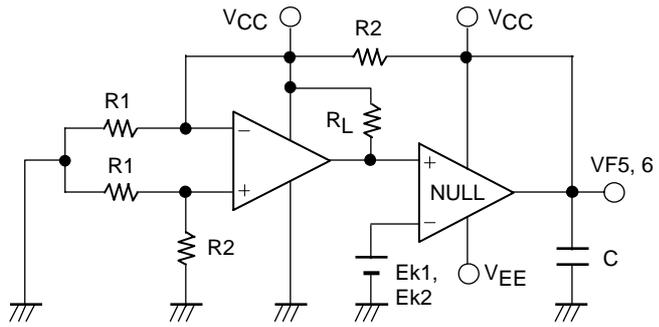


$$I_{B(+)} = \frac{|VO3 - VO1|}{50k\Omega \times 100}$$

4. Current drain

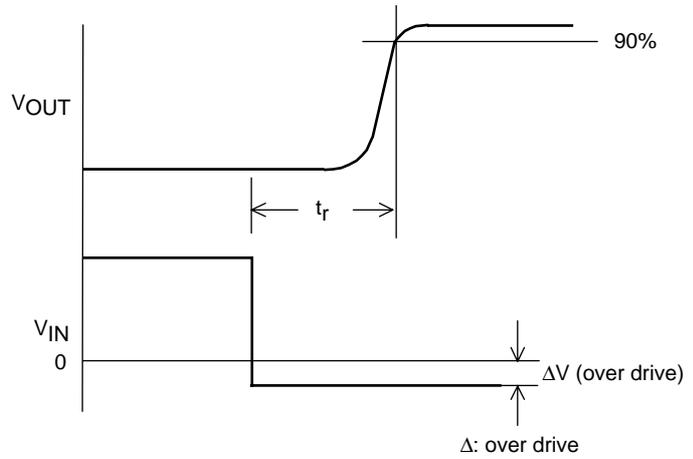
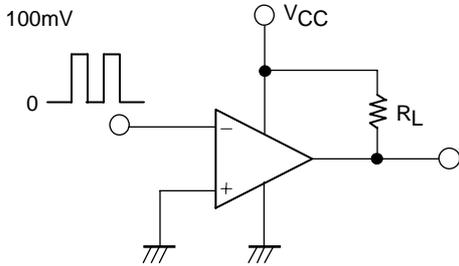


5. Voltage gain

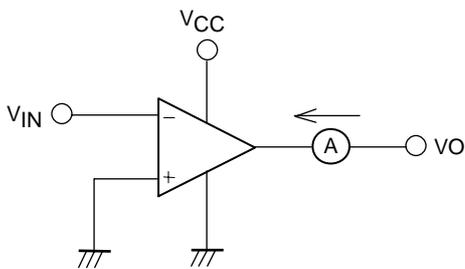


$$VG = \frac{(EK1 - EK2) (1 + R2/R1)}{(VF6 - VF5)}$$

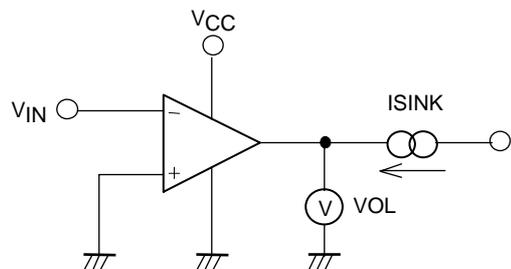
6. Response time



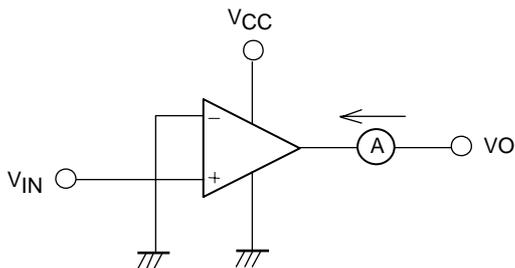
7. Output sink current



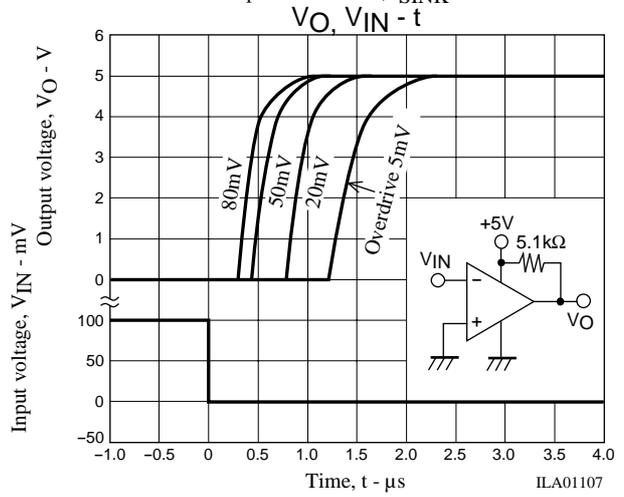
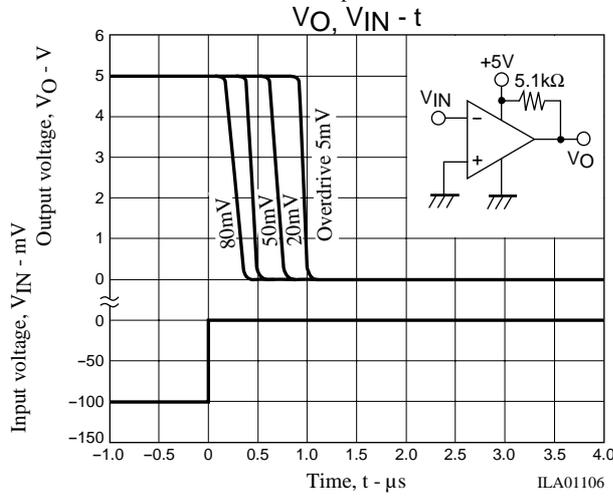
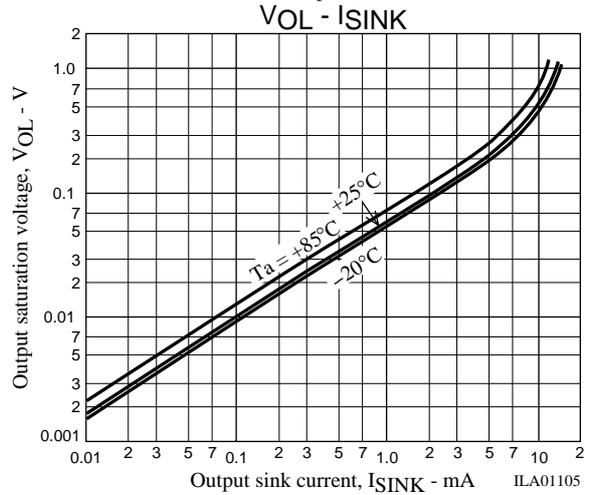
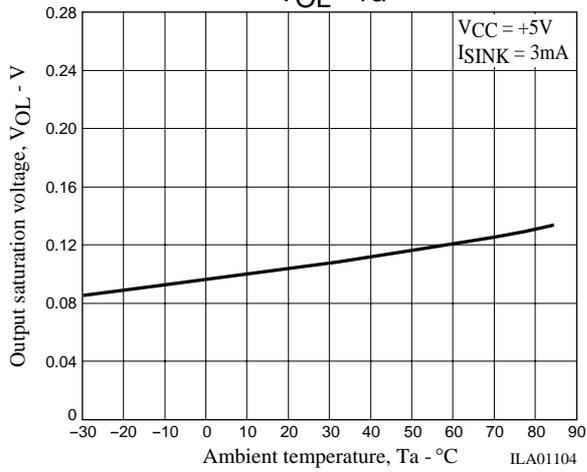
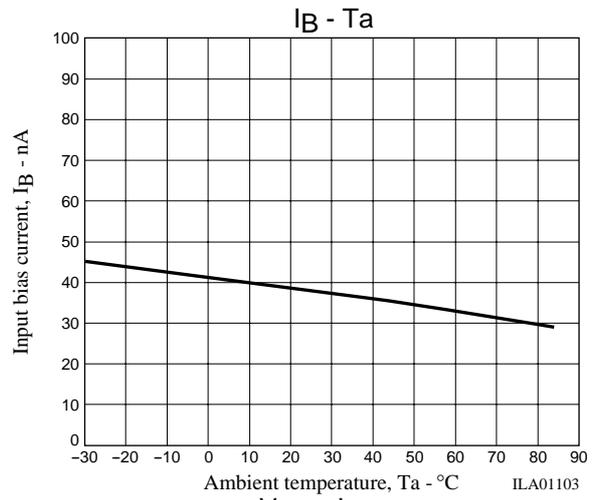
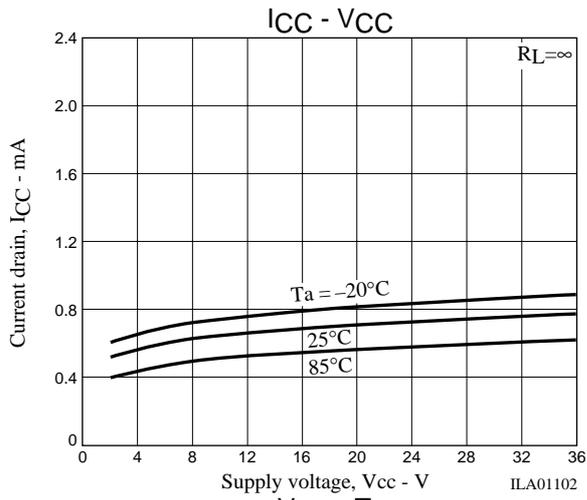
8. Output saturation voltage



9. Output leakage current



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