



LA6393AT

High-Performance Dual Comparator for Parallel Comparator Circuits

Overview

The LA6393AT is a high-performance dual comparator that features the flexible operating characteristics of a wide supply voltage range (2 to 24 V 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.

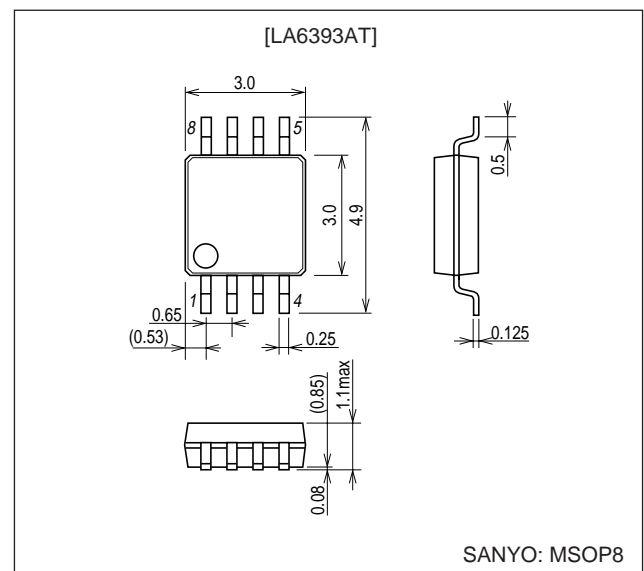
Functions and Features

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

Package Dimensions

unit: mm

3245A-MSOP8



Specifications

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

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

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

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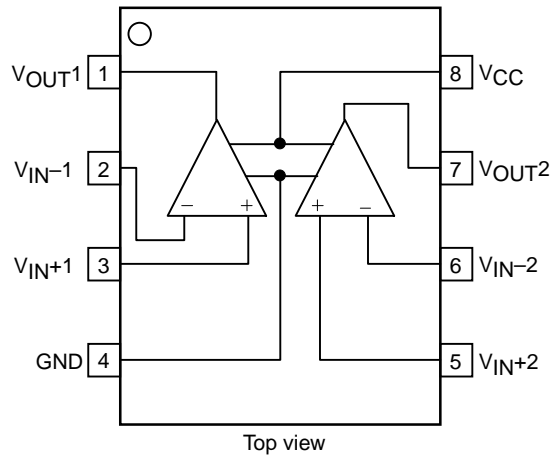
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

LA6393AT

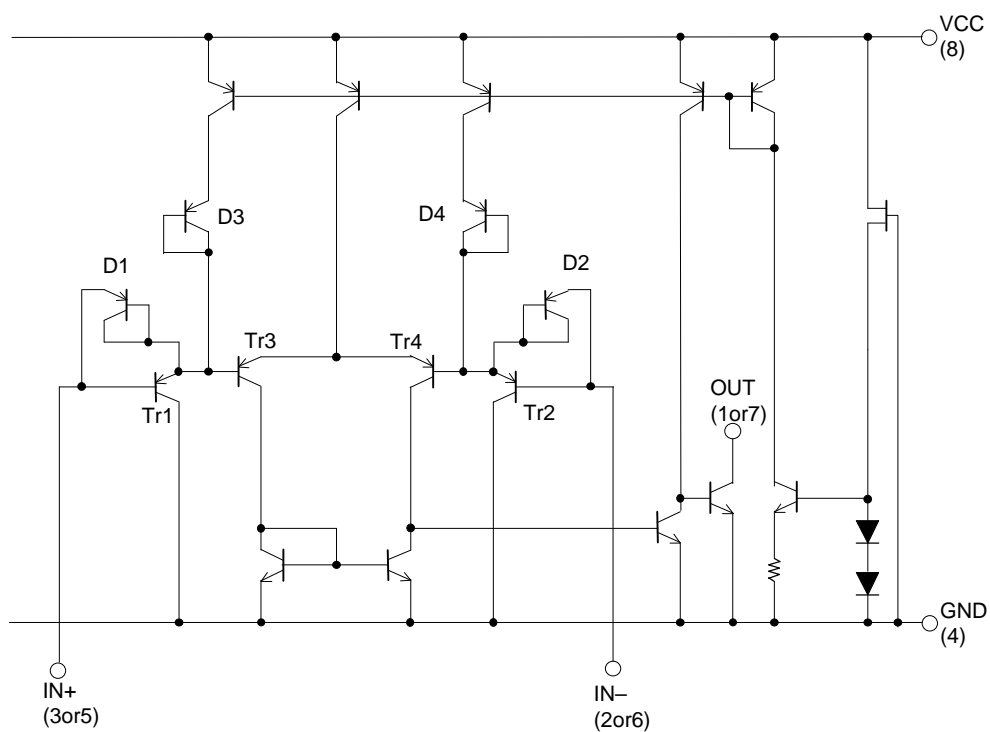
Electrical Characteristics at $T_a = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $V_{CC} = 5\text{ V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input offset voltage	V_{IO}			± 1	± 5	mV
Input offset current	I_{IO}			± 5	± 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	$V_{RL} = 5\text{ V}, R_L = 5.1\text{ k}\Omega$		1.3		μs
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

Pin Assignment

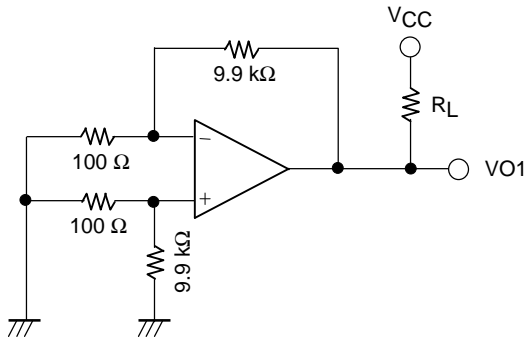


Equivalent Circuit Block Diagram



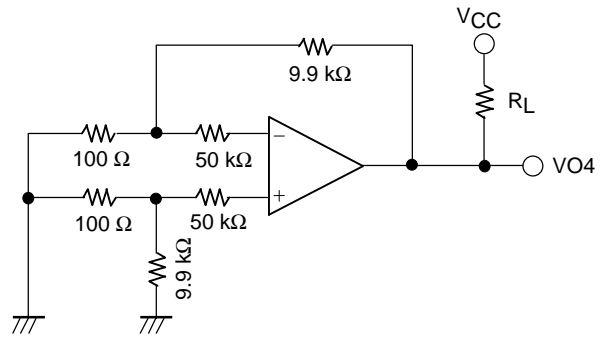
Test Circuits

1. Input offset voltage



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

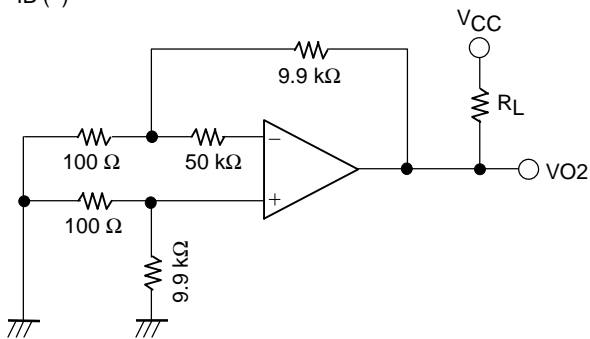
2. Input offset current



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

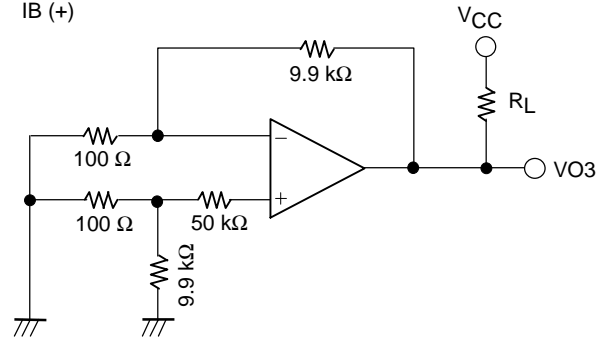
3. Input bias current

IB (-)



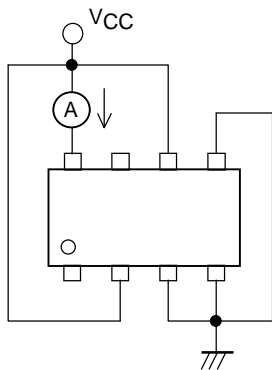
$$IB (-) = \frac{|VO2 - VO1|}{50 \text{ k}\Omega \times 100}$$

IB (+)

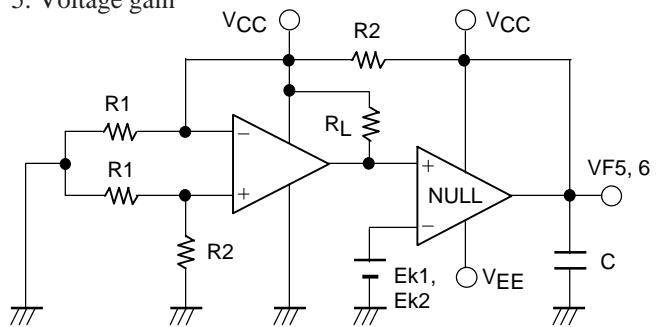


$$IB (+) = \frac{|VO3 - VO1|}{50 \text{ k}\Omega \times 100}$$

4. Current drain

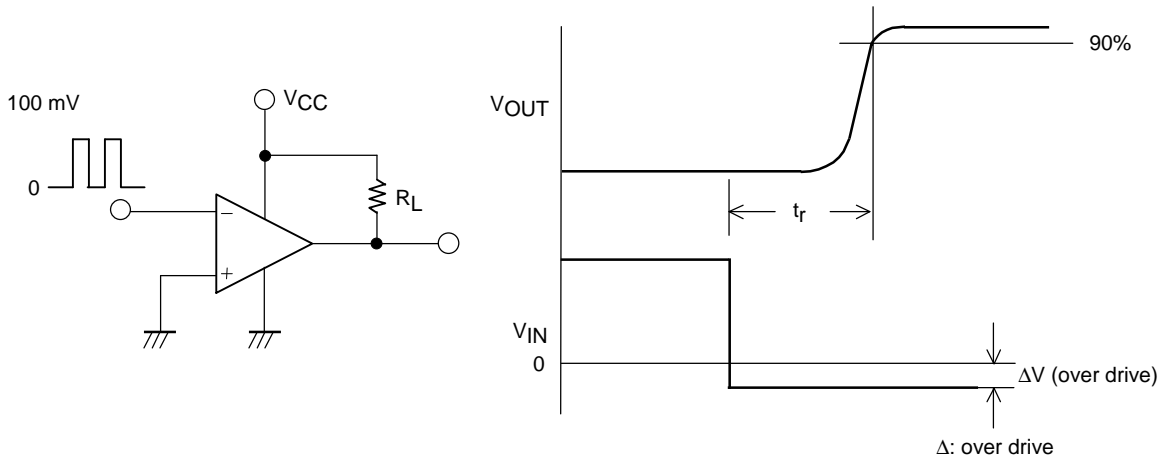


5. Voltage gain

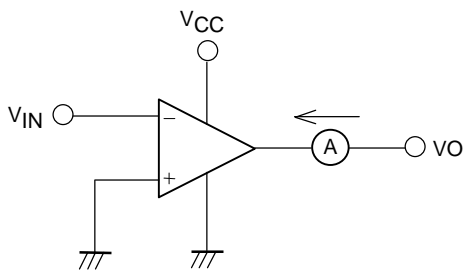


$$VG = \frac{(EK1 - EK2) (1 + R2/R1)}{(VF6 - VF5)}$$

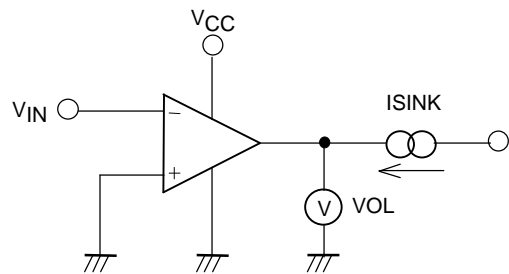
6. Response time



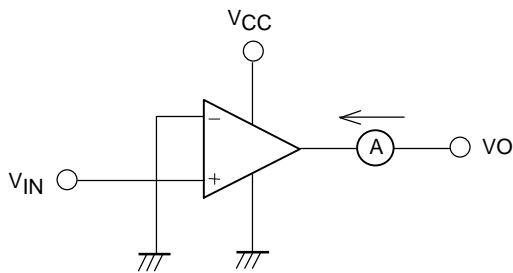
7. Output sink current

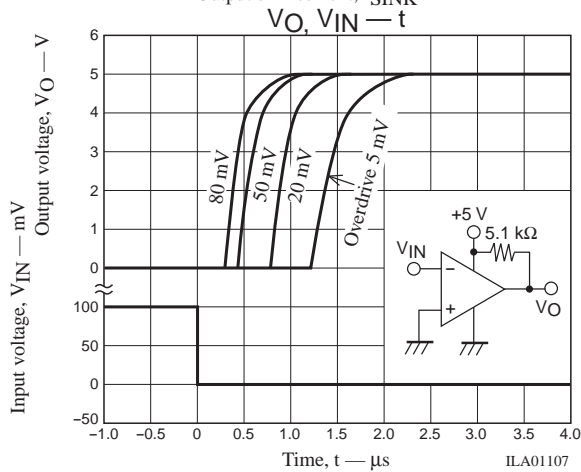
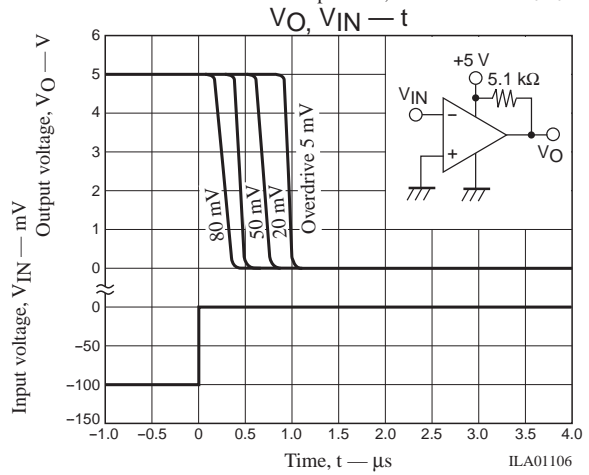
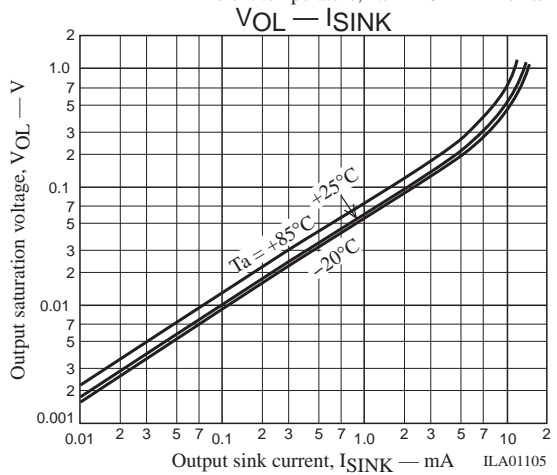
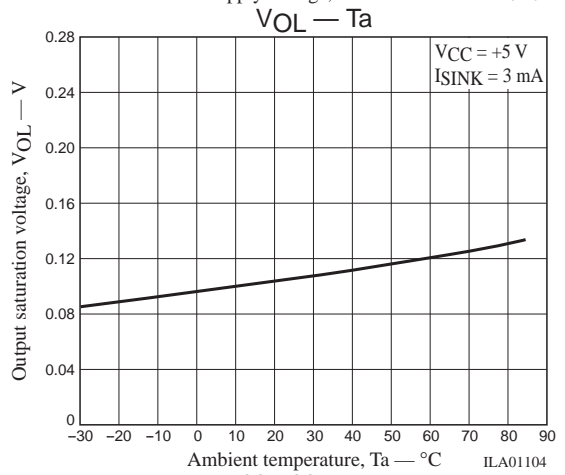
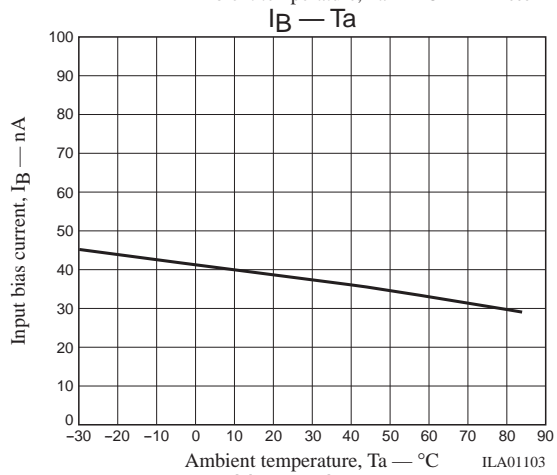
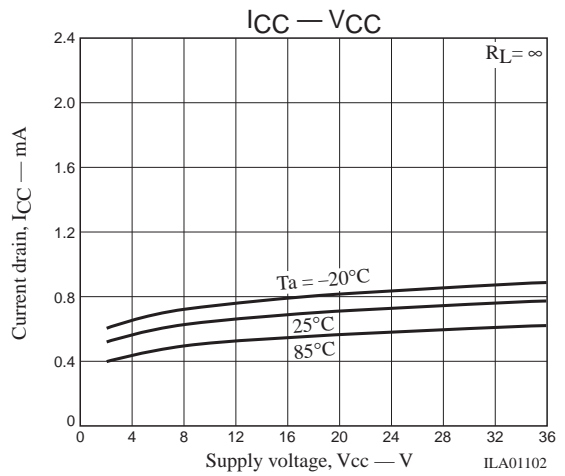
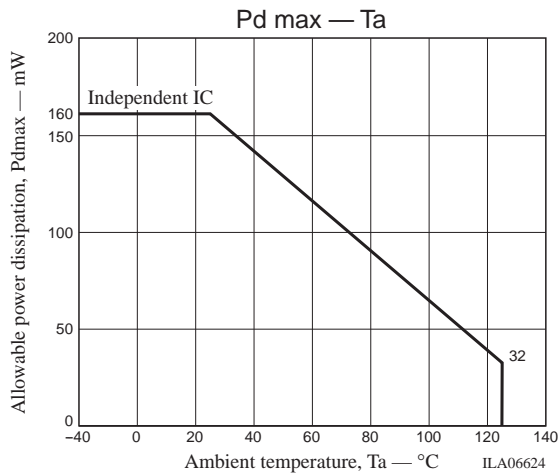


8. Output saturation voltage



9. Output leakage current





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