



SANYO Semiconductors

# DATA SHEET

## LA6393T — Monolithic Linear IC High-Performance Dual Comparator

### Overview

The LA6393T is a high-performance dual comparator that features the flexible operating characteristics of a wide supply voltage range (2.0 to 36.0V for single voltage operation) and a wide operating temperature range (–20 to +85°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 36.0V (single voltage supply), ±1.0 to 18.0V (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 (0.6mA)
- Miniature flat package supports product miniaturization

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	$V_{CC}$		36	V
Differential input voltage	$V_{ID}$		36	V
Maximum input voltage	$V_{IN\ max}$		-0.3 to +36	V
Allowable power dissipation	$P_d\ max$	$T_a \leq 25^\circ\text{C}$	160	mW
Operating temperature	$T_{opr}$		-20 to +85	°C
Storage temperature	$T_{stg}$		-55 to +125	°C

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**SANYO Semiconductor Co., Ltd.**

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# LA6393T

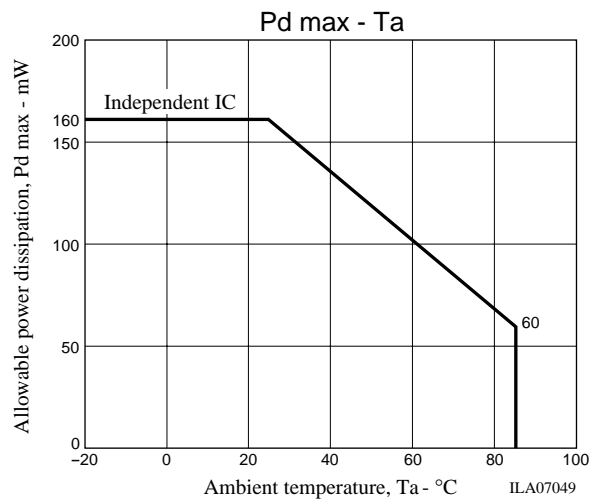
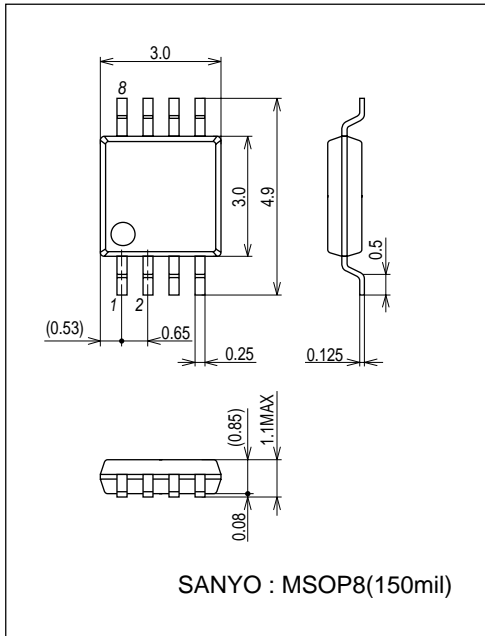
Electrical Characteristics at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 5\text{V}$

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

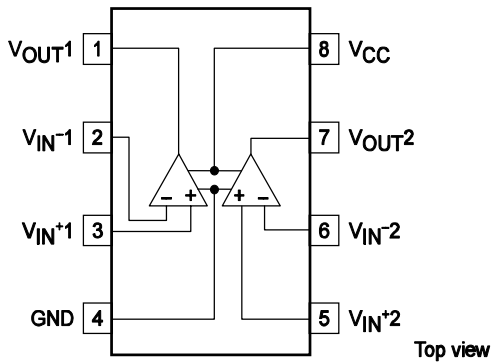
## Package Dimensions

unit : mm (typ)

3245B

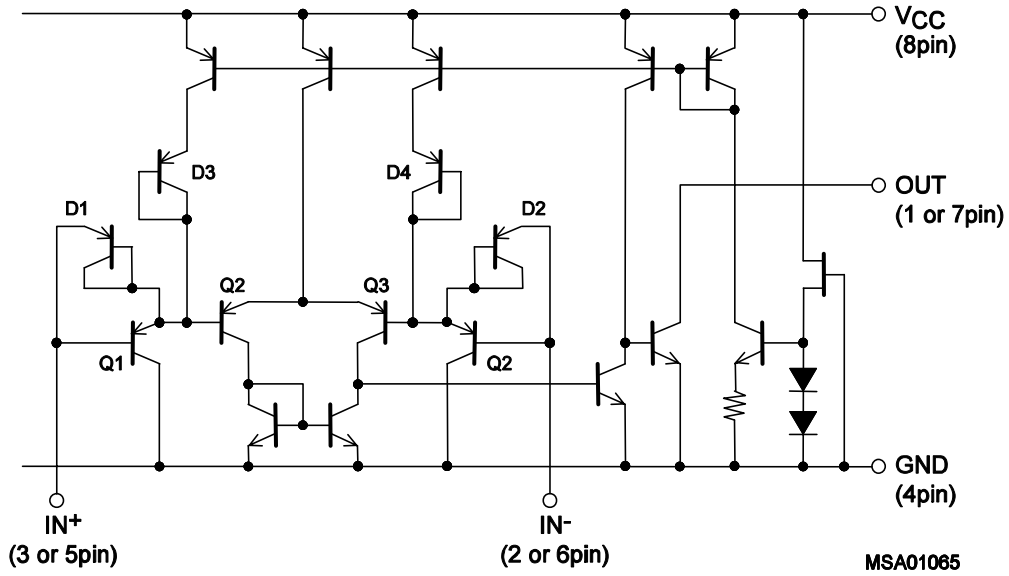


## Pin Assignment



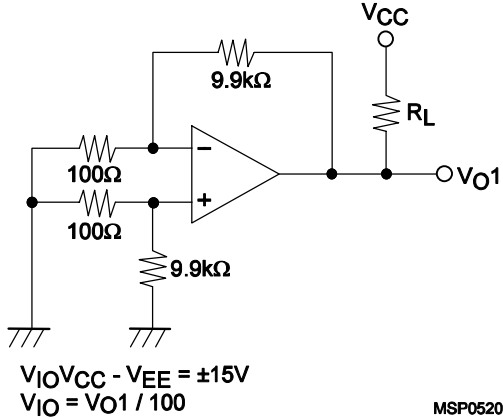
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Equivalent Circuit

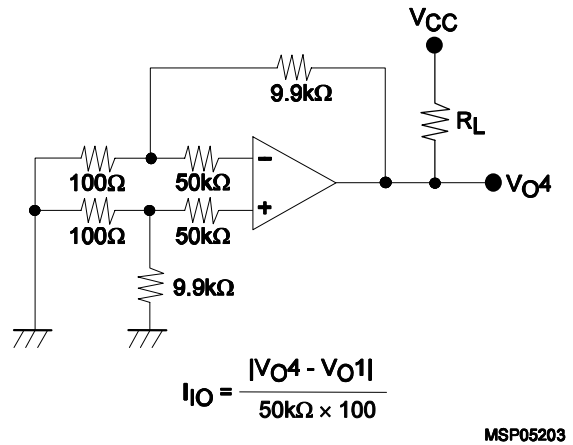


Test Circuits

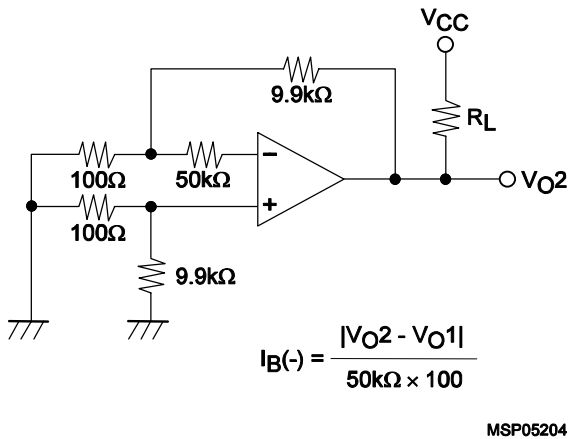
1. Input offset voltage  $V_{IO}$



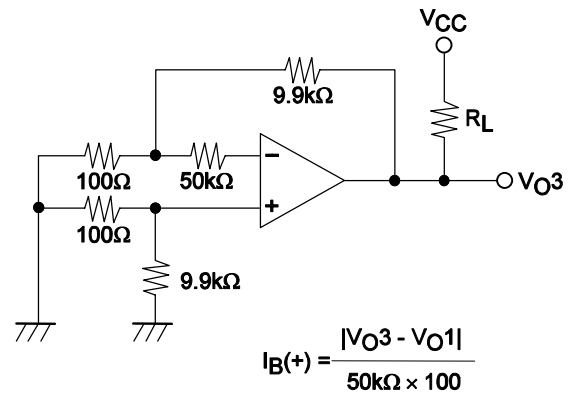
2. Input offset current  $I_{IO}$



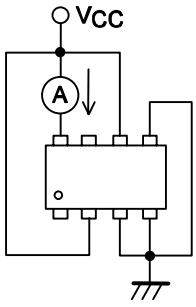
3. Input bias current  $I_B (-)$



Input bias current  $I_B (+)$

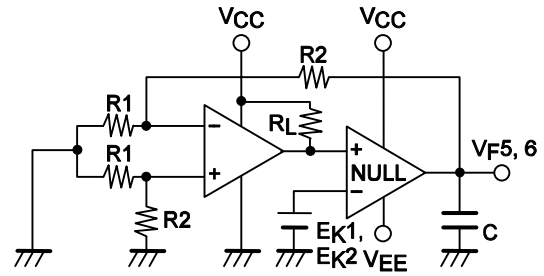


4. Current drain  $I_{CC}$



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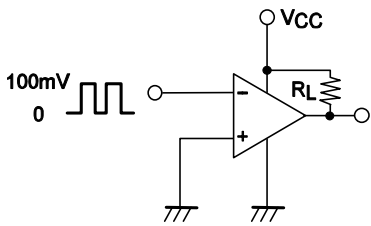
5. Voltage gain  $V_G$



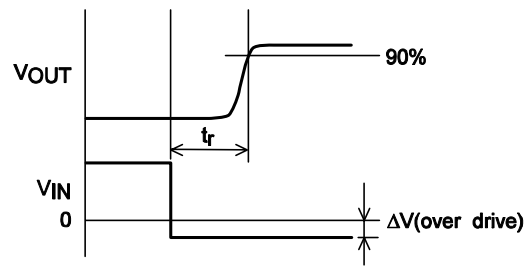
$$V_G = \frac{(E_{K1} - E_{K2})(1 + R_2 / R_1)}{V_{F6} - V_{F5}}$$

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6. Response time  $R_T$

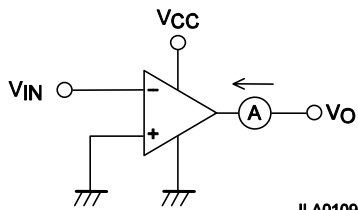


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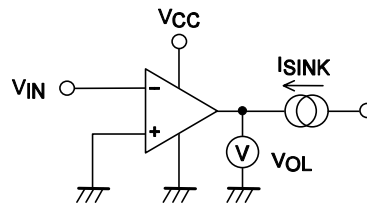
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7. Output sink current  $I_{SINK}$



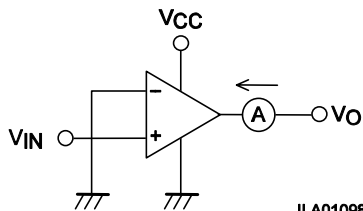
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8. Output saturation voltage  $V_{OL}$



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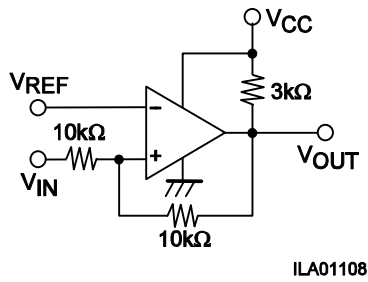
9. Output leakage current  $I_{LEAK}$



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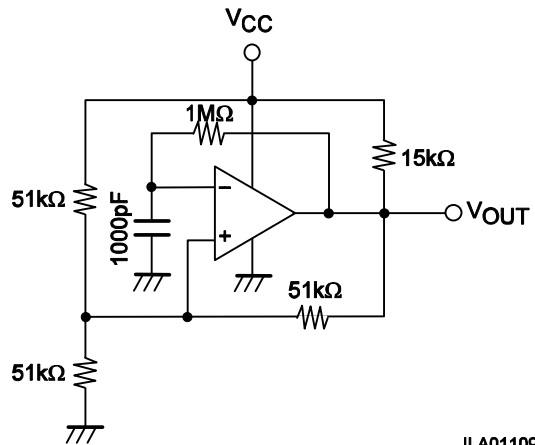
Application Circuit Examples

Voltage comparator  
(with hysteresis)



ILA01108

Square wave generator



ILA01109

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