



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

LA6393M — Monolithic Linear IC For Parallel Comparator Circuits High-Performance Dual Comparator

Overview

The LA6393M is a high-performance dual comparator that is capable of operating from a single power supply over a wide range of 2V to 36V. Because of its excellent input characteristics and low power, it can be very conveniently applied to multi-signal parallel comparator circuits that require high-density assembly.

Features

- 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 $V_{CC}-1.5V$
- 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 $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\ max}$		36	V
Differential input voltage	VID		36	V
Common-mode input voltage range	VICM		-0.6 to +36	V
Allowable power dissipation	$P_d\ max$	Independent IC	300	mW
Operating temperature	T_{opr}		-30 to +85	$^\circ C$
Storage temperature	T_{stg}		-55 to +150	$^\circ C$

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LA6393M

Operating Ranges at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage range	$V_{CC\text{ op}}$	Single voltage supply	2 to 18	V
		Dual voltage supply	± 1 to ± 18	V

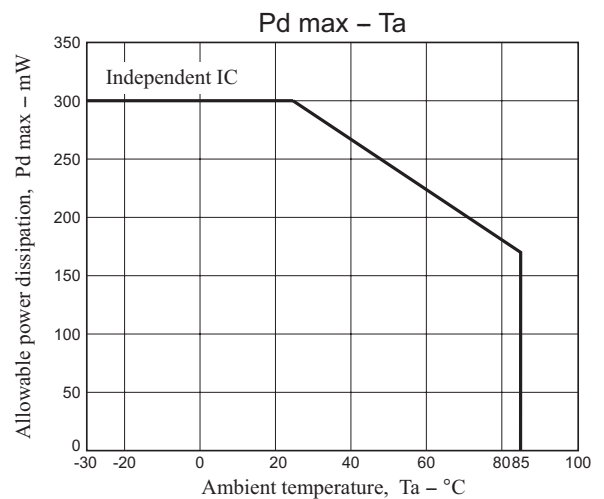
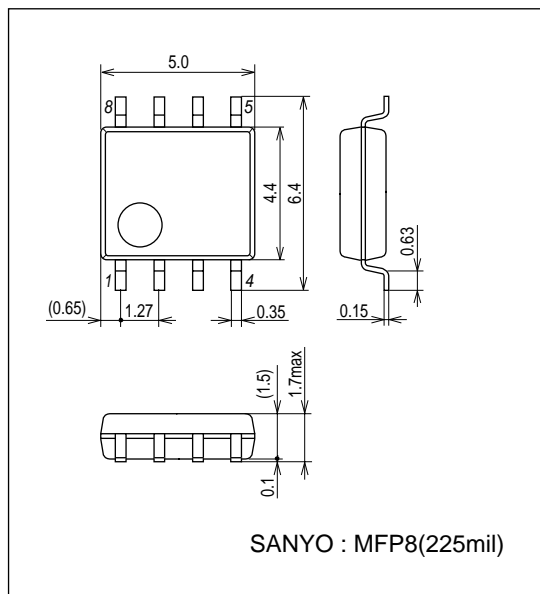
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$

Parameter	Symbol	Conditions	Test circuit	Ratings			Unit
				min	typ	max	
Input offset voltage	V_{IO}		1		± 1	± 5	mV
Input offset current	I_{IO}		2		± 5	± 50	nA
Input bias current	I_B		3		25	250	nA
Common-mode input voltage range	V_{ICM}			0		$V_{CC}-1.8$	V
Current drain	I_{CC}	$R_L = \infty$	4		0.6	1	mA
Voltage gain	V_G	$R_L = 15\text{k}\Omega$	5		200		V/mV
Response time	SR	$V_{RL} = 5\text{V}$, $R_L = 5.1\text{k}\Omega$	6		1.3		μs
Output sink current	I_{SINK}	$V_{IN-} = 1\text{V}$, $V_{IN+} = 0\text{V}$, $V_O \leq 1.5\text{V}$	7	6	16		mA
Output saturation voltage	V_{OL}	$V_{IN-} = 1\text{V}$, $V_{IN+} = 0\text{V}$, $I_{SINK} \leq 3\text{mA}$	8		0.2	0.4	V
Output leakage current	I_{LEAK}	$V_{IN-} = 0\text{V}$, $V_{IN+} = 1\text{V}$, $V_O = 5\text{V}$	9		0.1		nA

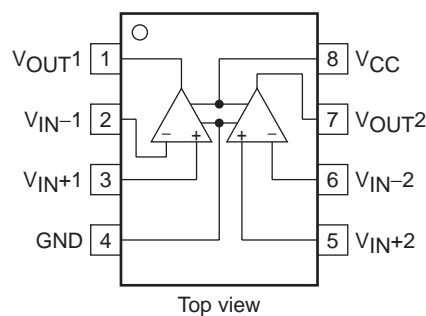
Package Dimensions

unit : mm (typ)

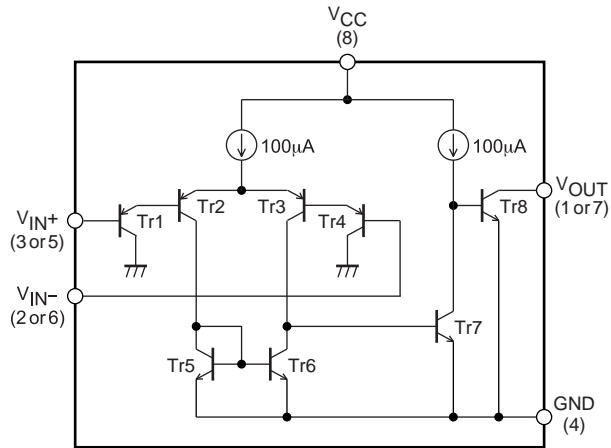
3032D



Pin Assignment

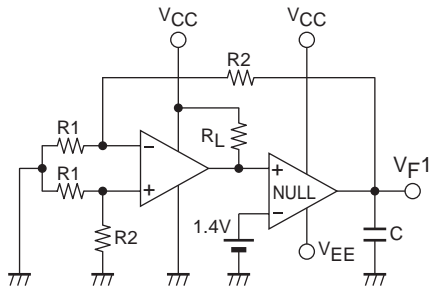


Equivalent Circuit



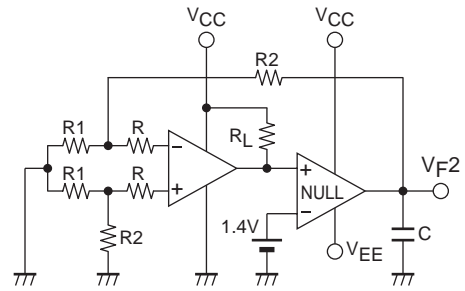
Test Circuit

1. Input offset voltage



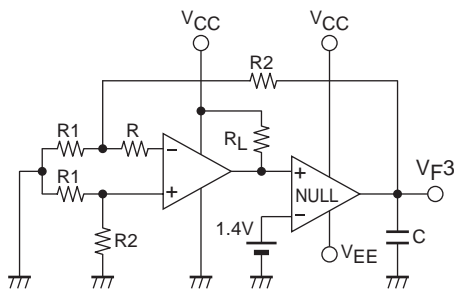
$$\cdot V_{IO} = \frac{V_{F1}}{1 + R2/R1}$$

2. Input offset current



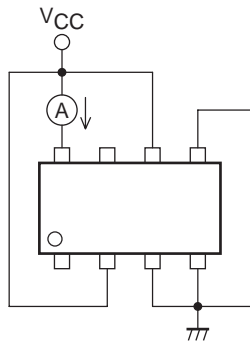
$$\cdot I_{IO} = \frac{V_{F2} - V_{F1}}{R(1 + R2/R1)}$$

3. Input bias current

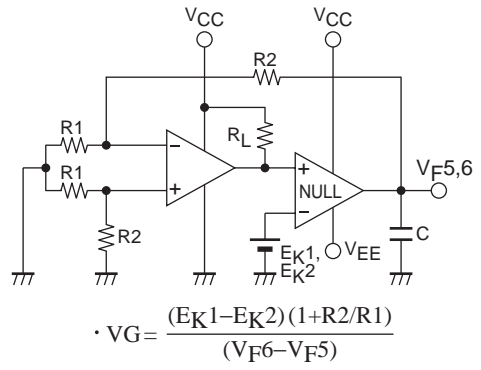


$$\cdot I_B = \frac{|V_{F3} - V_{F4}|}{2R(1 + R2/R1)}$$

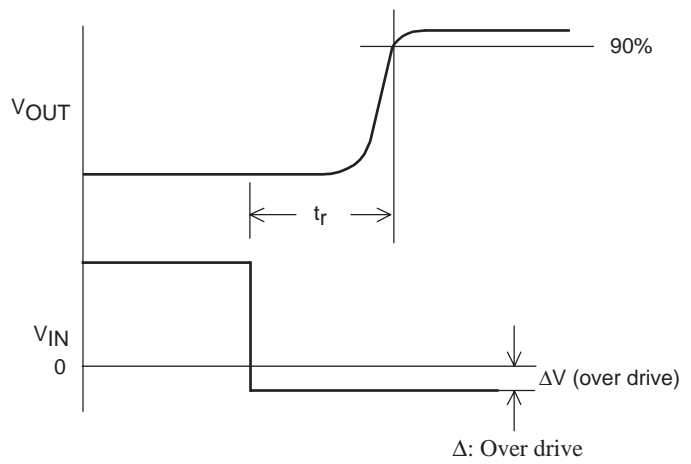
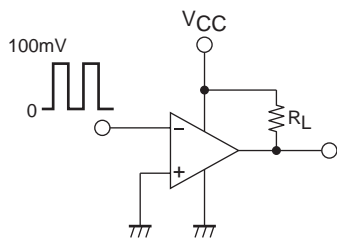
4. Current drain



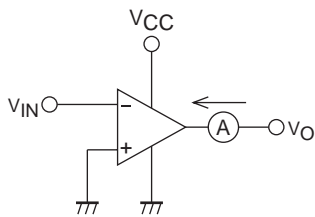
5. Voltage gain



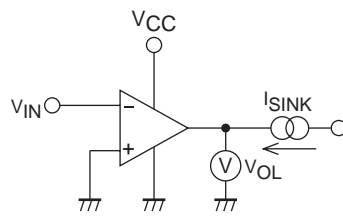
4. response time



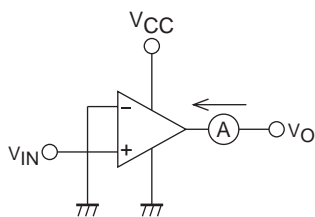
7. Output sink current



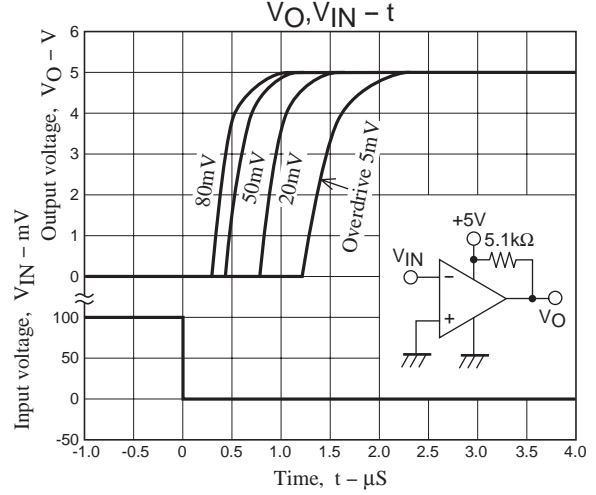
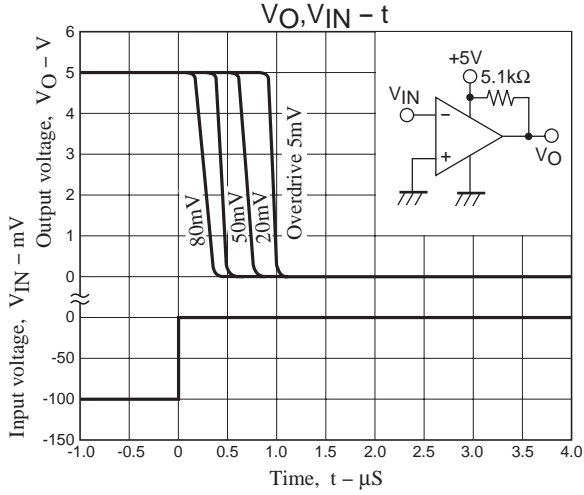
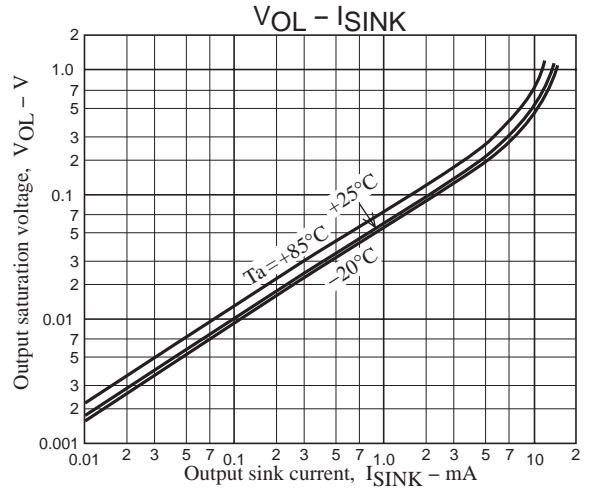
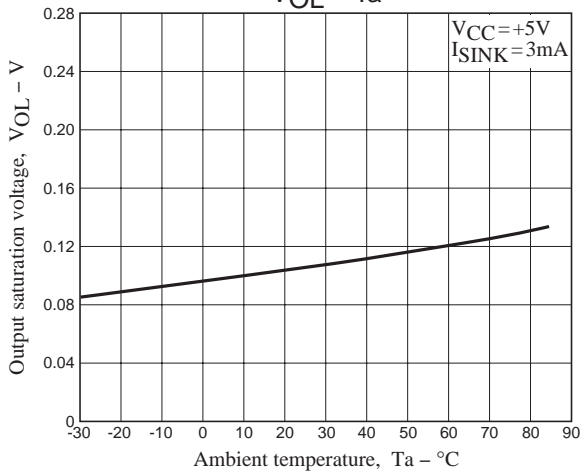
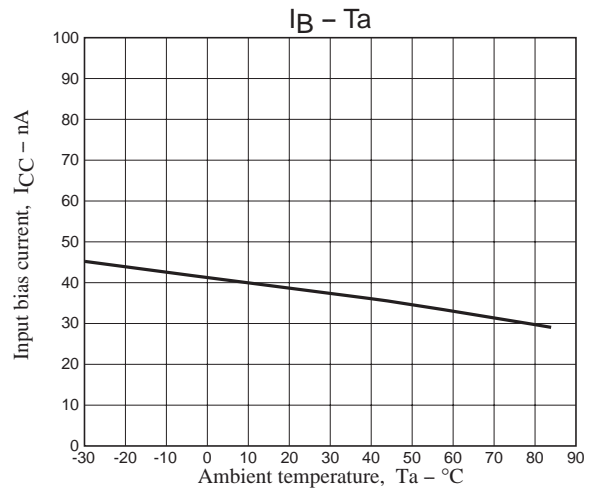
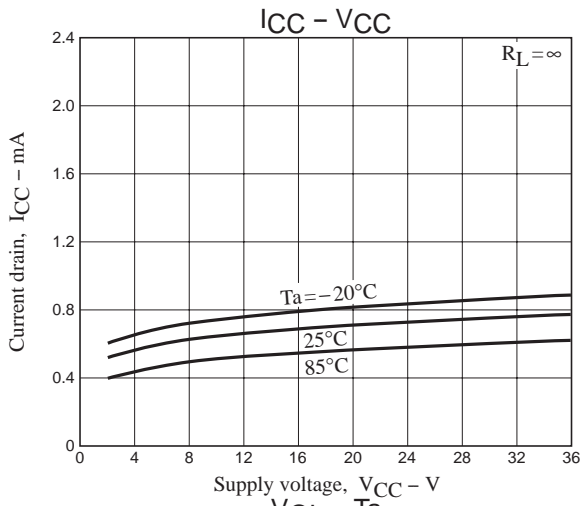
8. Output saturation voltage



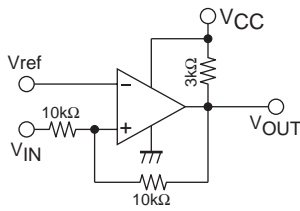
9. Output leakage current



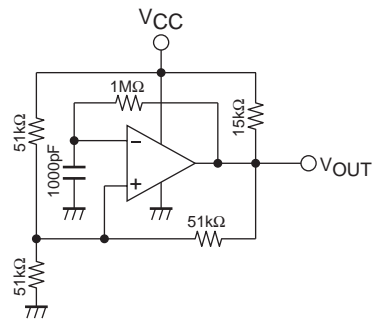
LA6393M



Application Circuit Example



Voltage comparator
(with hysteresis)



Square wave generator

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