

# 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<sub>CC</sub>-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 Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max		36	V
Differential input voltage	VID		36	V
Common-mode input voltage range	VICM		-0.6 to +36	V
Allowable power dissipation	Pd max	Independent IC	300	mW
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

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# **LA6393M**

# Operating Ranges at Ta = 25°C

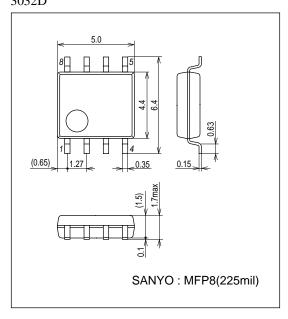
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub> op	Single voltage supply	2 to 18	V
range		Dual voltage supply	±1 to ±18	V

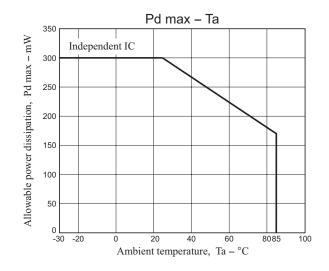
# **Electrical Characteristics** at Ta = 25°C, $V_{CC} = 5V$

Parameter	Symbol	Conditions	Test	Ratings			11.2
			circuit	min	typ	max	Unit
Input offset voltage	V <sub>IO</sub>		1		±1	±5	mV
Input offset current	I <sub>IO</sub>		2		±5	±50	nA
Input bias current	IB		3		25	250	nA
Common-mode input voltage range	VICM			0		V <sub>CC</sub> -1.8	V
Current drain	Icc	R <sub>L</sub> = ∞	4		0.6	1	mA
Voltage gain	V <sub>G</sub>	$R_L = 15k\Omega$	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	ISINK	$V_{IN}$ = 1V, $V_{IN}$ + = 0V, $V_{O} \le 1.5$ V	7	6	16		mA
Output saturation voltage	V <sub>OL</sub>	$V_{IN}- = 1V, V_{IN}+ = 0V, I_{SINK} \le 3mA$	8		0.2	0.4	V
Output leakage current	I <sub>LEAK</sub>	$V_{IN}$ -= 0V, $V_{IN}$ += 1V, $V_{O}$ = 5V	9		0.1		nA

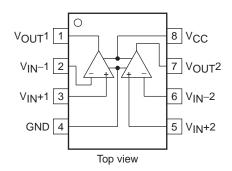
# **Package Dimensions**

unit : mm (typ) 3032D

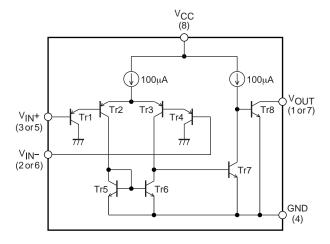




# **Pin Assignment**

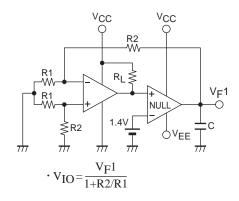


# **Equivalent Circuit**

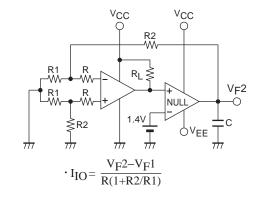


# **Test Circuit**

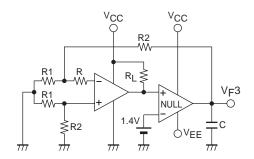
# 1. Input offset voltage

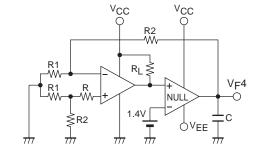


# 2. Input offset current



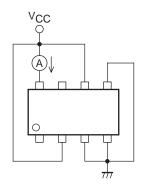
# 3. Input bias current



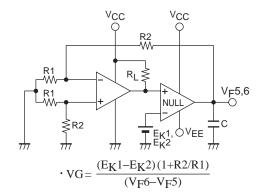


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$$I_B = \frac{|V_F 3 - V_F 4|}{2R(1 + R2/R1)}$$

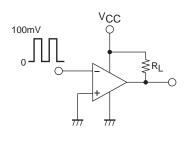
#### 4. Current drain

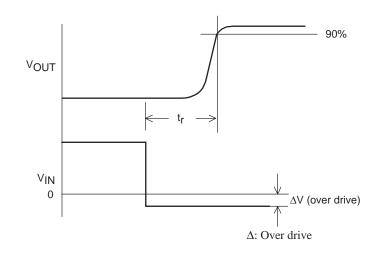


# 5. Voltage gain

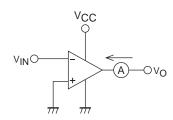


### 4. response time

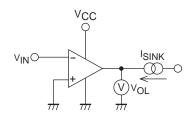




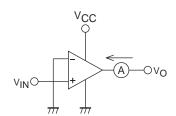
# 7. Output sink current

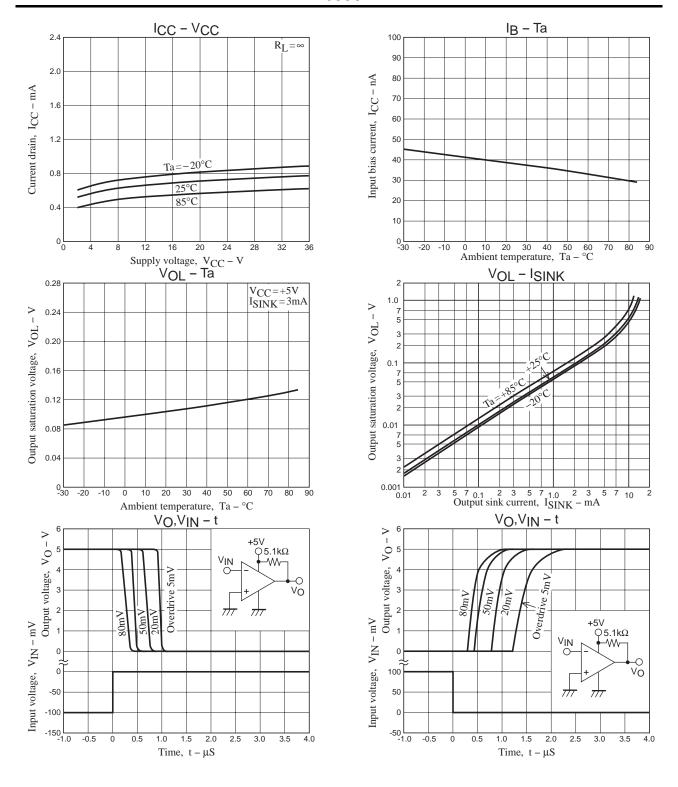


# 8. Output saturation voltage

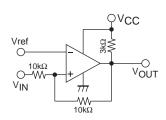


#### 9. Output leakage current

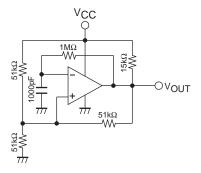




## **Application Circuit Example**



Voltage comparator (with hysteresis)



Square wave generator

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