Ordering number : EN1103F

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 Ta = 25°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	Pd max	Independent IC	300	mW
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

Operating Ranges at Ta = 25°C

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

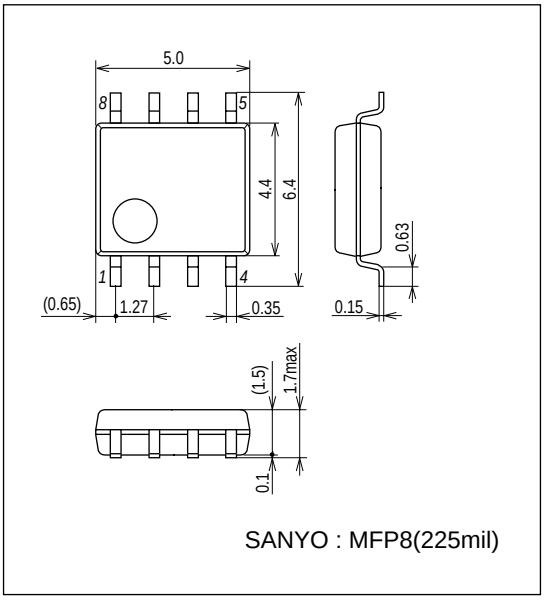
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V

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 = 15kΩ	5		200		V/mV
Response time	SR	V_{RL} = 5 V, R_L = 5.1kΩ	6		1.3		μs
Output sink current	I_{SINK}	V_{IN}– = 1V, V_{IN}+ = 0V, $V_O \leq$ 1.5V	7	6	16		mA
Output saturation voltage	V_{OL}	V_{IN}– = 1V, V_{IN}+ = 0V, $I_{SINK} \leq$ 3mA	8		0.2	0.4	V
Output leakage current	I_{LEAK}	V_{IN}– = 0V, V_{IN}+ = 1V, V_O = 5V	9		0.1		nA

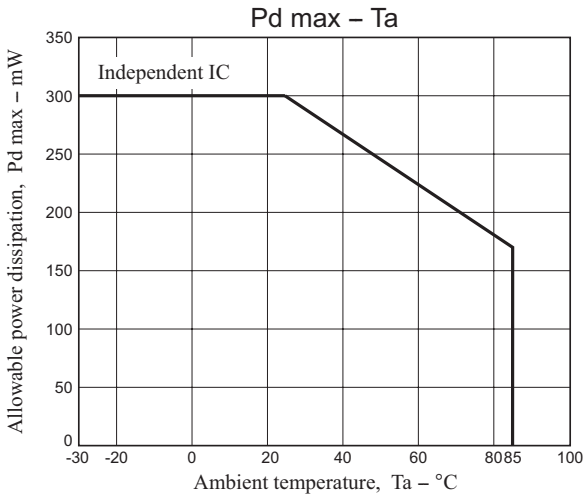
Package Dimensions

unit : mm (typ)

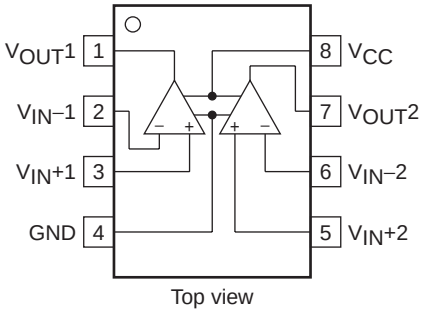
3032D



SANYO : MFP8(225mil)

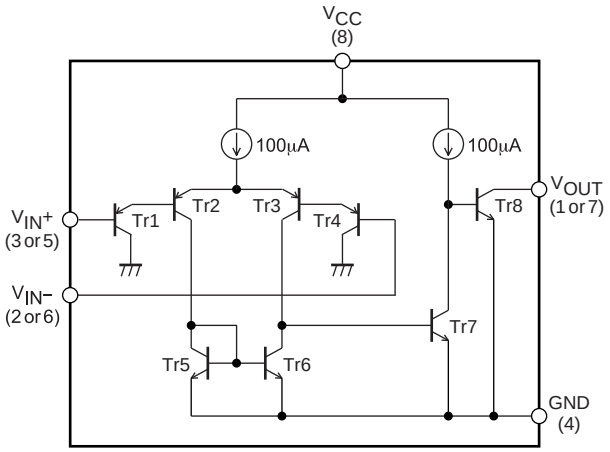


Pin Assignment



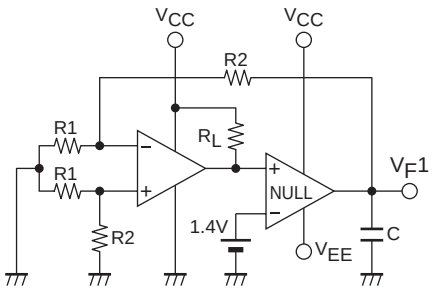
Top view

Equivalent Circuit



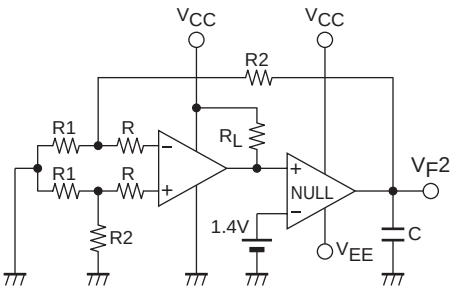
Test Circuit

1. Input offset voltage



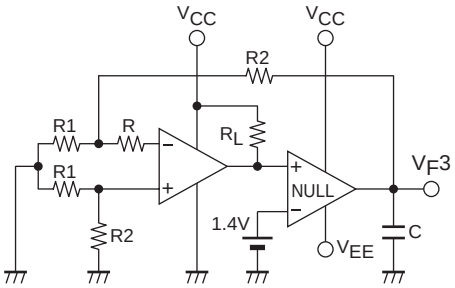
$$\cdot V_{IO} = \frac{V_F1}{1+R2/R1}$$

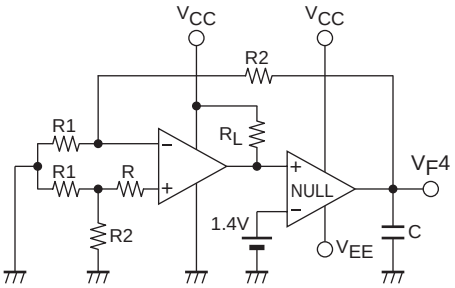
2. Input offset current



$$\cdot I_{IO} = \frac{V_F2-V_F1}{R(1+R2/R1)}$$

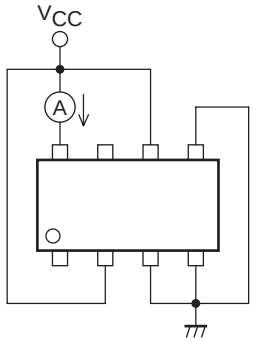
3. Input bias current



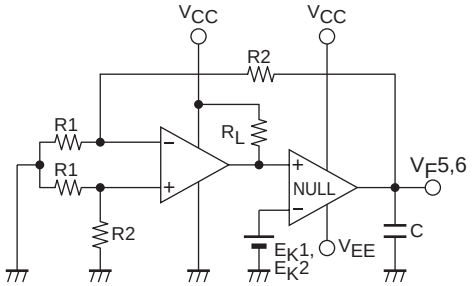


$$\bullet I_B = \frac{|V_F3-V_F4|}{2R(1+R2/R1)}$$

4. Current drain

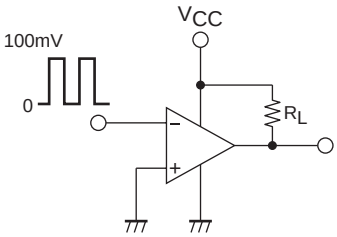


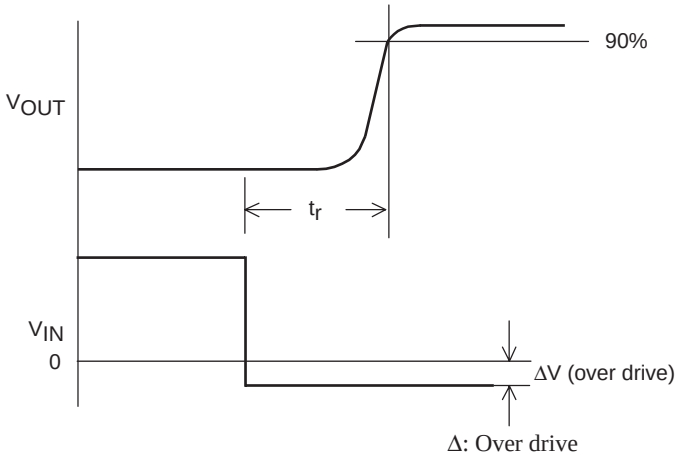
5. Voltage gain



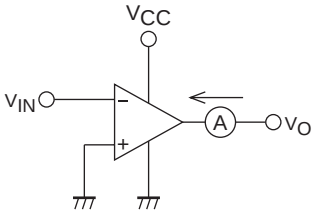
$$\cdot VG = \frac{(E_K1 - E_K2)(1+R2/R1)}{(V_F6 - V_F5)}$$

4. response time

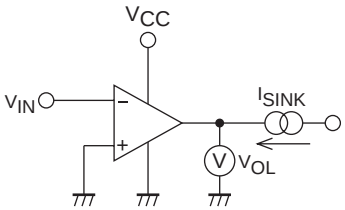




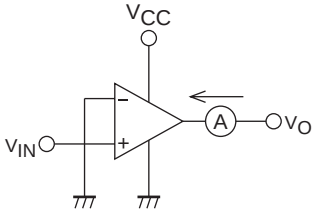
7. Output sink current

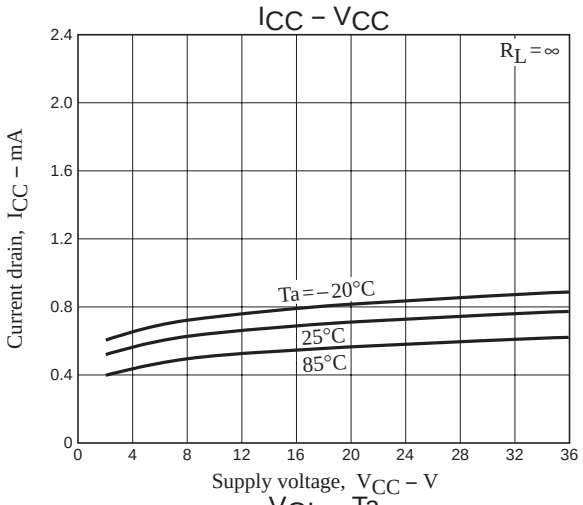


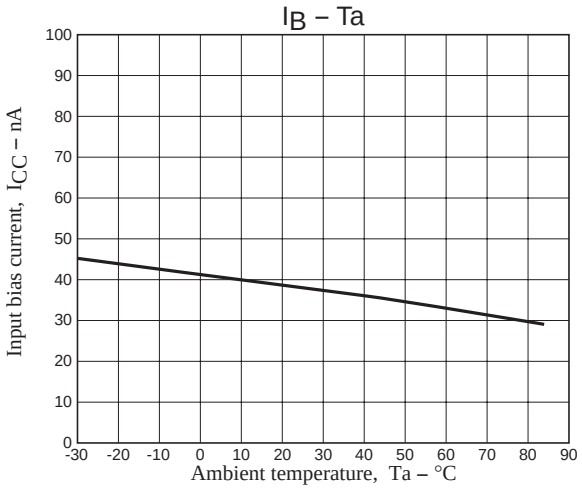
8. Output saturation voltage

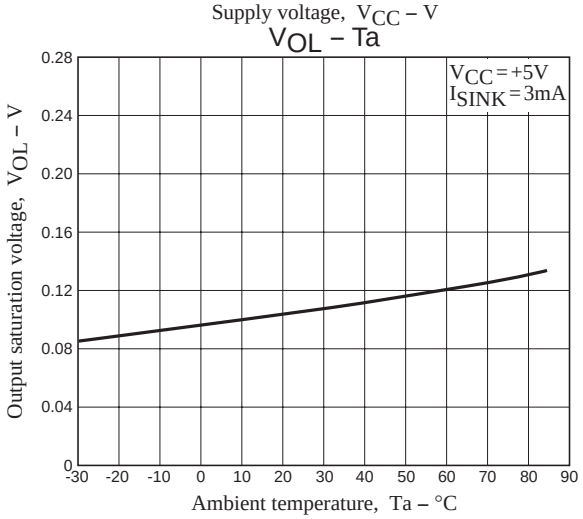


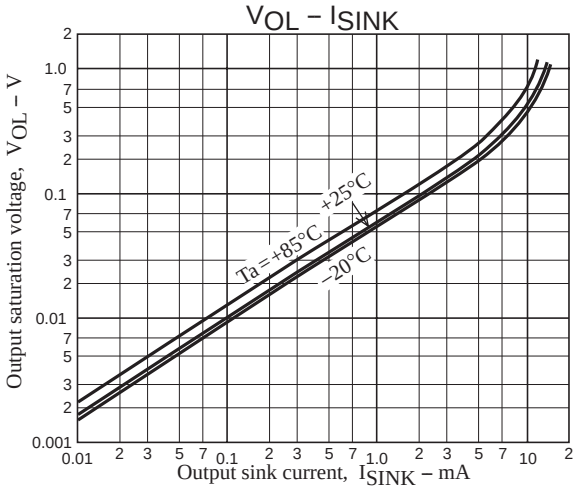
9. Output leakage current

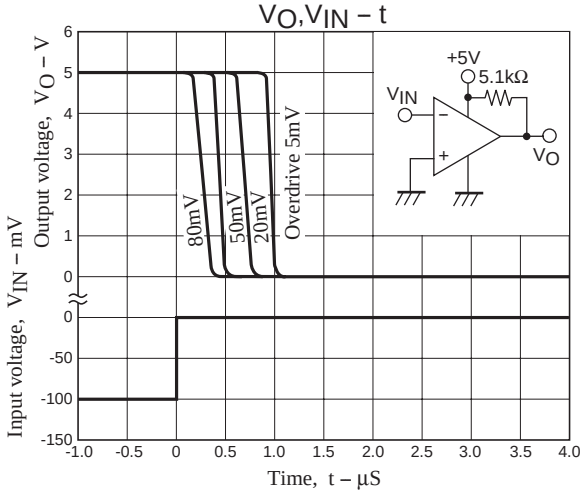


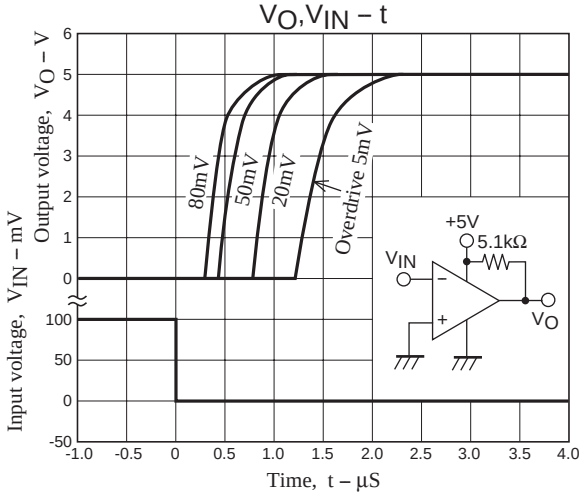

ICC – VCC
RL = ∞
Ta = –20°C
25°C
85°C
Current drain, ICC – mA
Supply voltage, VCC – V


IB – Ta
Input bias current, ICC – nA
Ambient temperature, Ta – °C

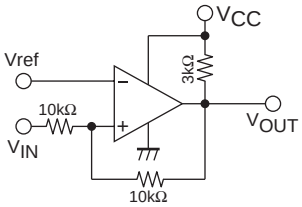

VOL – Ta
VCC = +5V
ISINK = 3mA
Output saturation voltage, VOL – V
Ambient temperature, Ta – °C


VOL – ISINK
Ta = +85°C
+25°C
–20°C
Output saturation voltage, VOL – V
Output sink current, ISINK – mA

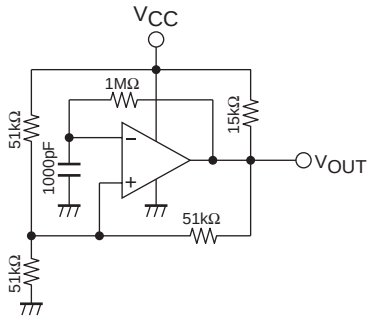

VO,VIN – t
+5V
5.1kΩ
VIN
VO
80mV
50mV
20mV
Overdrive 5mV
Output voltage, VO – V
Input voltage, VIN – mV
Time, t – µS


VO,VIN – t
80mV
50mV
20mV
Overdrive 5mV
+5V
5.1kΩ
VIN
VO
Output voltage, VO – V
Input voltage, VIN – mV
Time, t – µS

Application Circuit Example



Voltage comparator
(with hysteresis)



Square wave generator