Ordering number : EN1156C

SANYO Semiconductors
DATA SHEET

# LA6339M — Monolithic Linear IC
# High-Performance Quad Comparator

## Overview

The LA6339M is a high-performance quad 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 multisignal parallel comparator circuits that require high-density assembly.

## Features

- Wide supply voltage range (Single supply : 2.0 to 36.0V, dual supplies : ±1.0 to ±18.0V).
- Wide common-mode input voltage range (0 to $V_{CC}$-1.5V).
- Open collector output enabling wired OR.
- Small current drain (0.8mA/ $V_{CC}$ = 5V, $R_L$ = ∞) and low power.
- Mini flat package enabling compactness of sets.

## Specifications

### Absolute Maximum Ratings at Ta = 25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Maximum supply voltage | $V_{CC}$ max | | 36 | V |
| Differential input voltage | $V_{ID}$ | | 36 | V |
| Common-mode input voltage range | $V_{ICM}$ | | –0.3 to +36 | V |
| Allowable power dissipation | Pd max | | 330 | mW |
| Operating temperature | Topr | | –30 to +85 | °C |
| Storage temperature | Tstg | | –55 to +125 | °C |



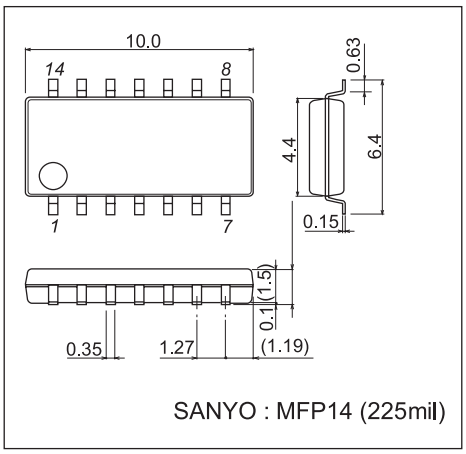

SANYO Semiconductor Co., Ltd.
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

**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 | | ±2 | ±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 | | $V_{CC}$–1.5 | V |
| Current drain | $I_{CC}$ | $R_L = \infty$ | 4 | | 0.8 | 2 | mA |
| Voltage gain | VG | $R_L$ = 15kΩ | 5 | | 200 | | V/ mV |
| Response time | | $V_{RL}$ = 5V, $R_L$ = 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 |

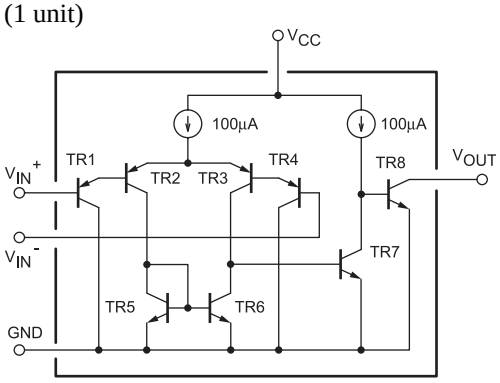
## Package Dimensions

unit : mm (typ)
3034B

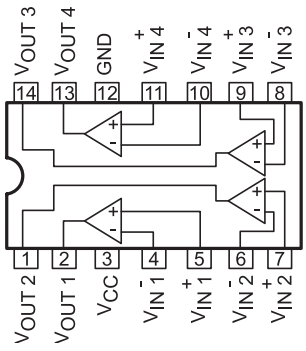



## Equivalent Circuit

(1 unit)

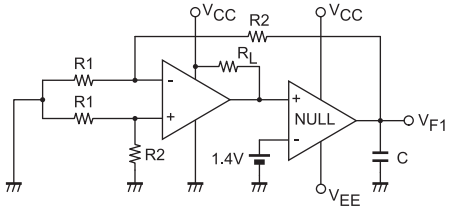



## Pin Assignment



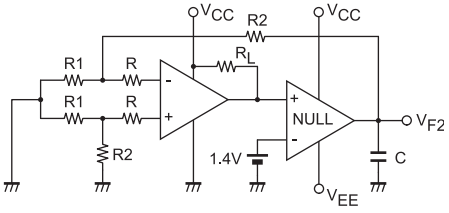
## Test Circuits

1. Input Offset Voltage



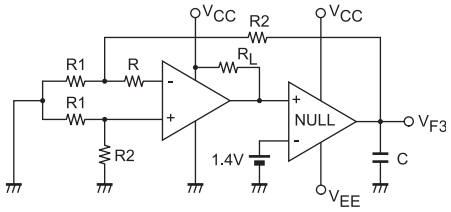

$$V_{IO} = \frac{V_{F1}}{1+R2/R1}$$

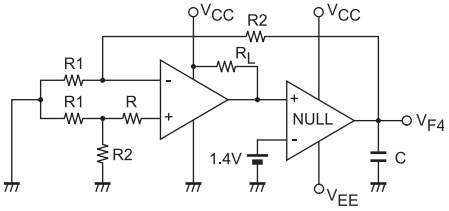
2. Input Offset Current




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

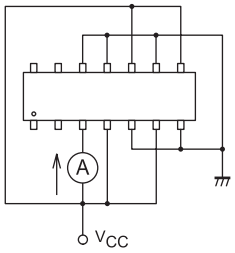
3. Input Bias Current



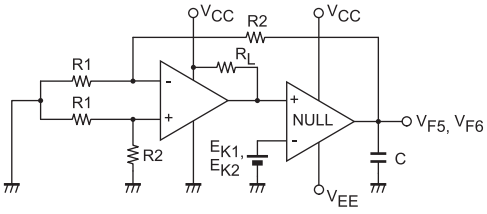




$$I_B = \frac{|V_{F3}-V_{F4}|}{2R(1+R2/R1)}$$

4. Current Drain

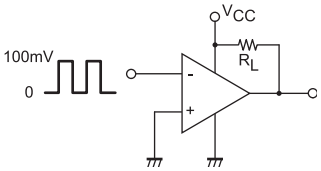


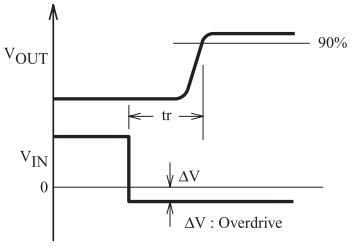

5. Voltage Gain



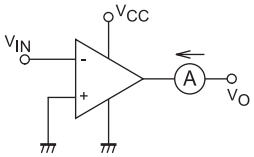

$$VG = \frac{(E_{K1}-E_{K2})(1+R2/R1)}{V_{F6}-V_{F5}}$$

6. Response Time

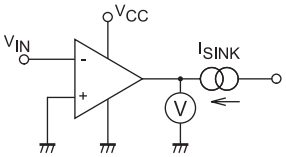


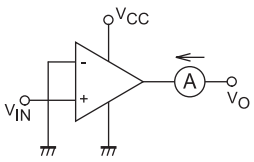

7. Output Sink Current

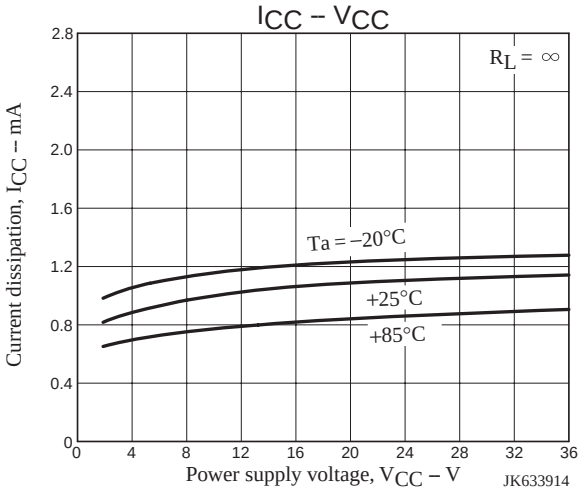


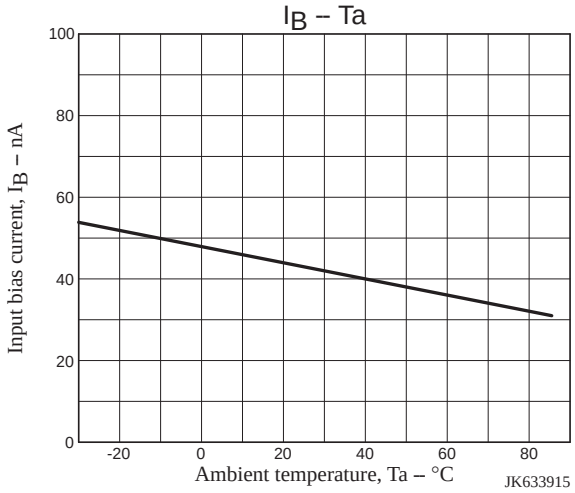

8. Output Saturation Voltage

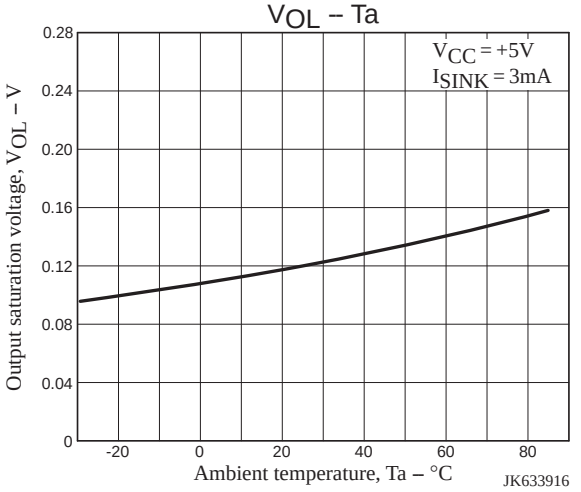


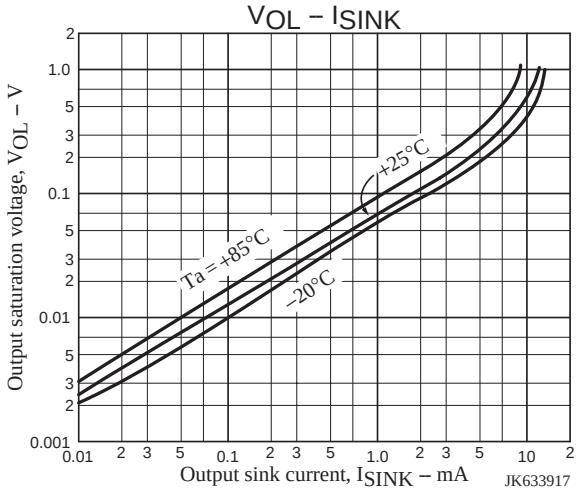

9. Output Leakage Current

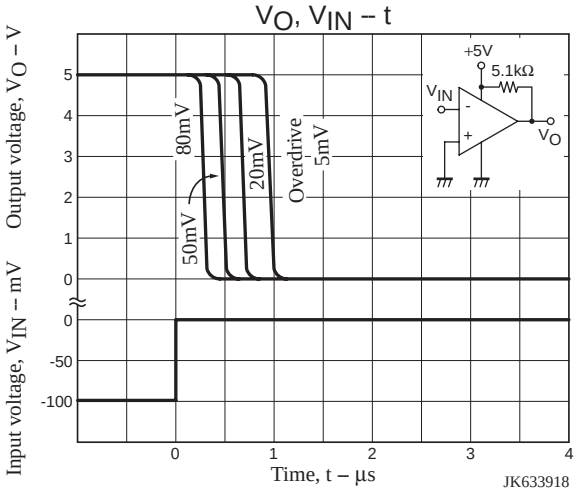


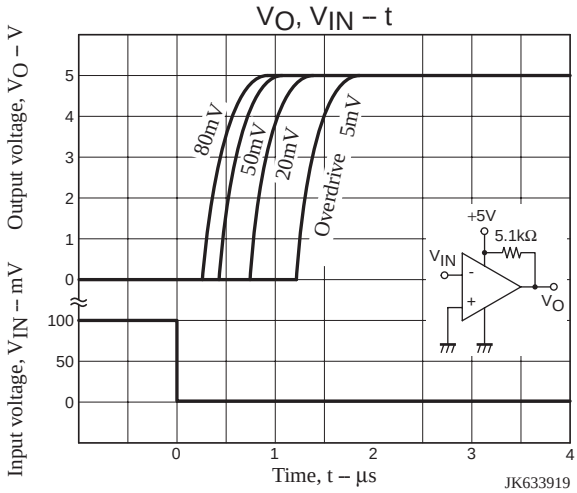

ICC – VCC
RL = ∞
Ta = –20°C
+25°C
+85°C
Current dissipation, ICC – mA
Power supply voltage, VCC – V
JK633914


IB – Ta
Input bias current, IB – nA
Ambient temperature, Ta – °C
JK633915

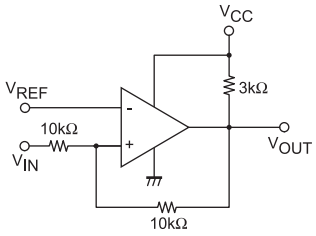

VOL – Ta
VCC = +5V
ISINK = 3mA
Output saturation voltage, VOL – V
Ambient temperature, Ta – °C
JK633916


VOL – ISINK
+25°C
Ta = +85°C
–20°C
Output saturation voltage, VOL – V
Output sink current, ISINK – mA
JK633917

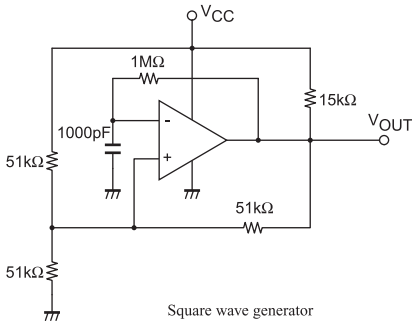

VO, VIN – t
+5V
5.1kΩ
VIN
VO
80mV
50mV
20mV
Overdrive 5mV
Output voltage, VO – V
Input voltage, VIN – mV
Time, t – µs
JK633918


VO, VIN – t
80mV
50mV
20mV
Overdrive 5mV
+5V
5.1kΩ
VIN
VO
Output voltage, VO – V
Input voltage, VIN – mV
Time, t – µs
JK633919

## Sample Application Circuits




Voltage comparator
(with hysteresis)




Square wave generator