



QNHCHIP

QN339

# Product Specification

QN339

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Quad Differential Comparators



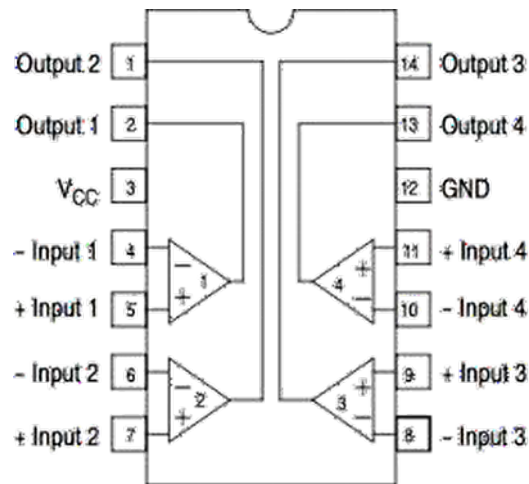
## Description

The QN339 consists of four independent voltage comparators designed specifically to operate from a single power supply over a wide voltage range.

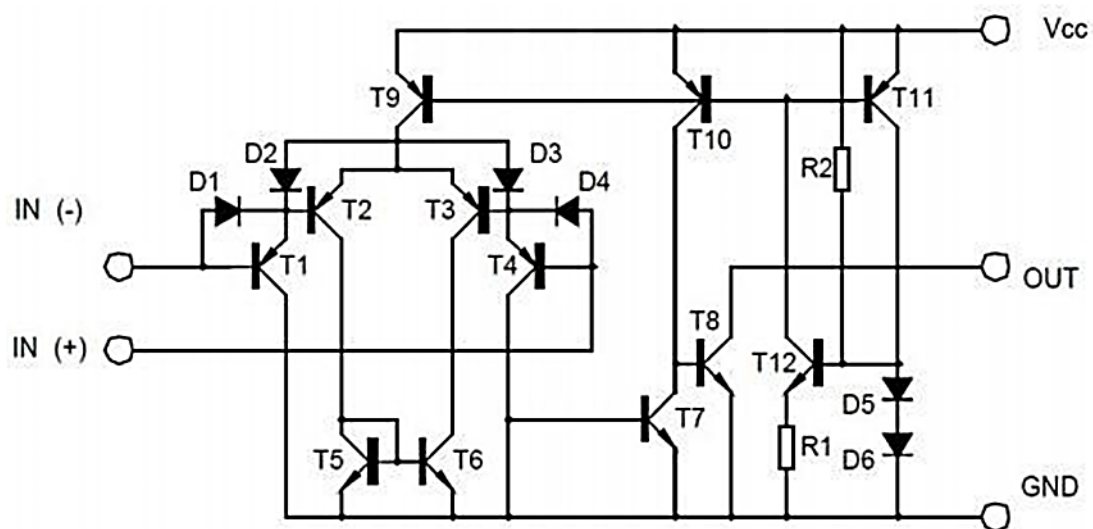
## Features

- Single or dual supply operation
- Wide operating supply range: ( $V_{CC}=3V\sim 36V$  or  $\pm 1.5$  to  $\pm 18V$ )
- Input common-mode voltage includes ground
- Low supply current drain:  $I_{CC}=0.8$  mA(Typical)
- Low input bias current  $I_{bias}=25$  nA( Typical)
- Output compatible with TTL,DTL,and CMOS logic System

## Pin Configuration



## Block Diagram



**Absolute Maximum Ratings(Ta=25°C )**

| Characteristic             | Symbol                 | Value             | Unit |
|----------------------------|------------------------|-------------------|------|
| Supply Voltage             | $V_{CC}$               | $\pm 15$ or $+36$ | V    |
| Differential input voltage | $V_{i \text{ (diff)}}$ | 36                | V    |
| Input Voltage              | $V_I$                  | -0.3~36V          | V    |
| Power Dissipation          | $P_d$                  | 570               | V    |
| Operating Temperature      | $T_{opr}$              | 0 to +70          | °C   |
| Storage Temperature        | $T_{stg}$              | -65 to 150        | °C   |

**Electrical Characteristics**

(Vcc=5.0V, Ta=25°C, All voltage referenced to GND unless otherwise specified)

| Characteristic                  | Symbol                 | Test Condition                                                    | Min | Typ       | Max          | Unit |
|---------------------------------|------------------------|-------------------------------------------------------------------|-----|-----------|--------------|------|
| Input offset voltage            | $V_{IO}$               | $V_{CM}=0$ to $V_{CC}-1.5$ ,<br>$V_{O(P)}=1.4V, R_S=0$            |     | $\pm 4.0$ | $\pm 7.0$    | mV   |
| Input offset current            | $I_{IO}$               |                                                                   |     | $\pm 5$   | $\pm 50$     | nA   |
| Input Bias current              | $I_b$                  |                                                                   |     | 65        | 250          | nA   |
| Input Commom-mode voltage range | $V_{I(R)}$             |                                                                   | 0   |           | $V_{CC}-1.5$ | V    |
| Differential Input Voltage      | $V_{I \text{ (diff)}}$ |                                                                   |     |           | 30           | V    |
| Supply Current                  | $I_{CC}$               | $R_L=\infty$                                                      |     | 0.6       | 1.0          | mA   |
|                                 |                        | $R_L=\infty, V_{CC}=30V$                                          |     | 0.8       | 2.5          | mA   |
| Large signal Voltage Gain       | $G_V$                  | $V_{CC}=15V, R_L > 15K\Omega$                                     | 50  | 200       |              | V/mV |
| Large signal response time      | $t_{res}$              | $V_i=TTL$ logic wing<br>$V_{ref}=1.4V, V_{RL}=5V, R_L=5.1k\Omega$ |     | 350       |              | ns   |
| Response time                   | $t_{res}$              | $V_{RL}=5V, R_L=5.1K\Omega$                                       |     | 1400      |              | ns   |
| Output sink current             | $I_{sink}$             | $V_{i(-)} > 1V, V_{i(+)}=0V, V_{O(P)} < 1.5V$                     | 6   | 18        |              | mA   |
| Output saturation voltage       | $V_{sat}$              | $V_{i(-)} > 1V, V_{i(+)}=0V, I_{sink}=4mA$                        | 160 | 400       |              | mV   |
| Output leakage current          | $I_{leakage}$          | $V_{i(+)}=1V, V_{i(-)}=0, V_{O(P)}=5V$                            | 0.1 |           |              | nA   |



## Typical Characteristics Performance

Fig.1 supply current

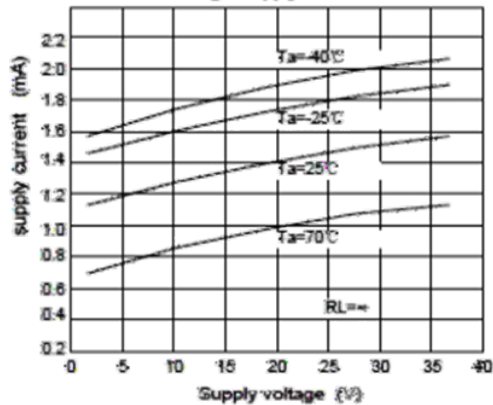


Fig.2 Input current

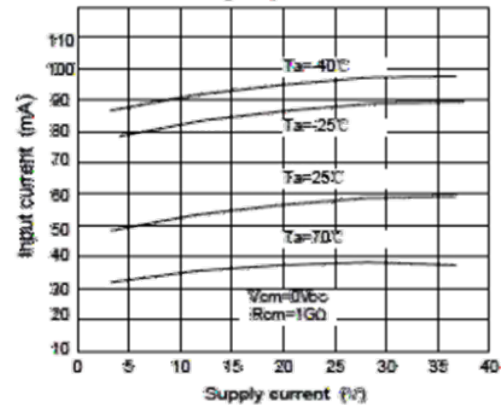


Fig.3 Output saturation voltage

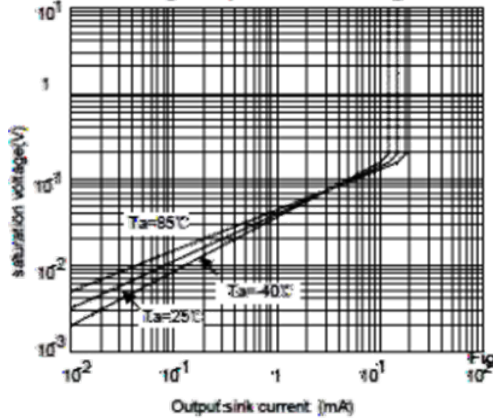


Fig.4 Reponse time for various input overdrive negative transition

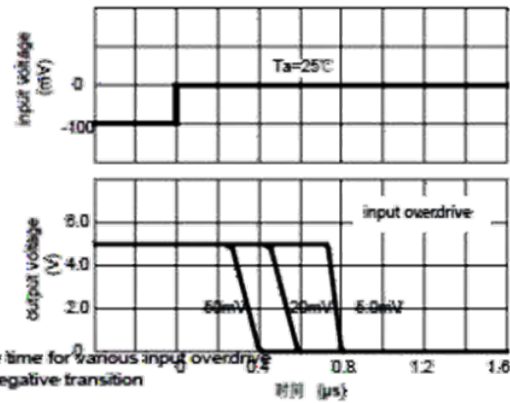


Fig.4 Reponse time for various input overdrive positive transition

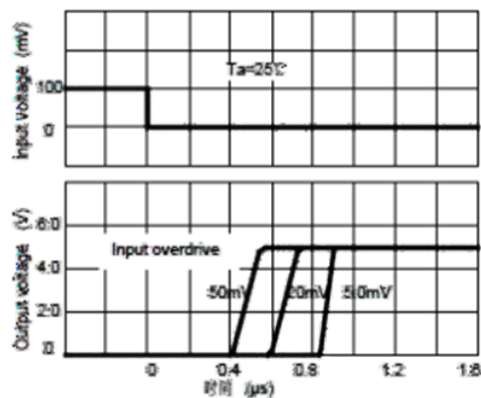




Fig.7

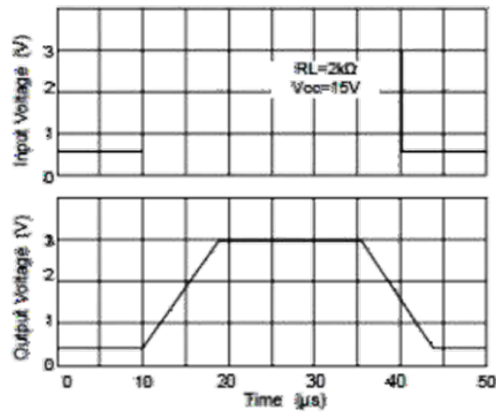
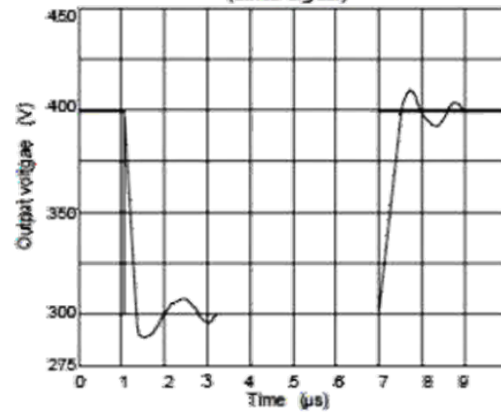
Fig.8 voltage Follower pulse response  
(small signal)

Fig.9 Large signal Frequency Response

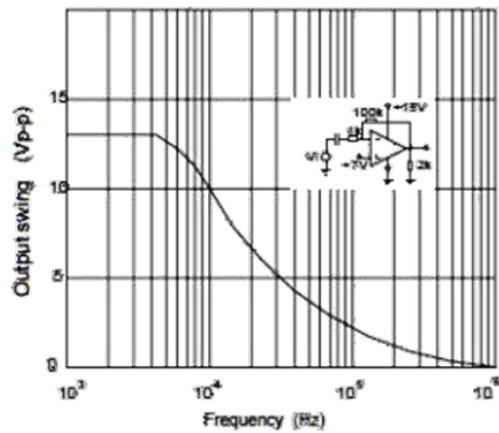
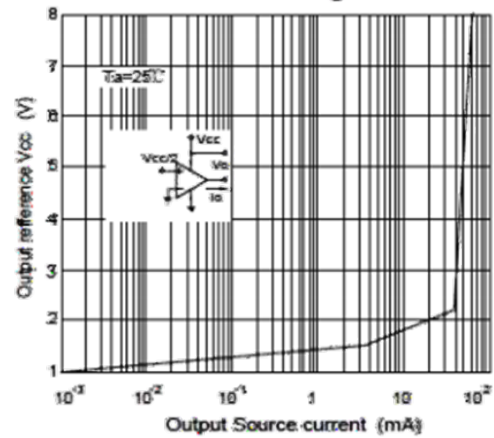
Fig.10 Output Characteristics  
current sourcing

Fig.11 Output Characteristics Current sinking

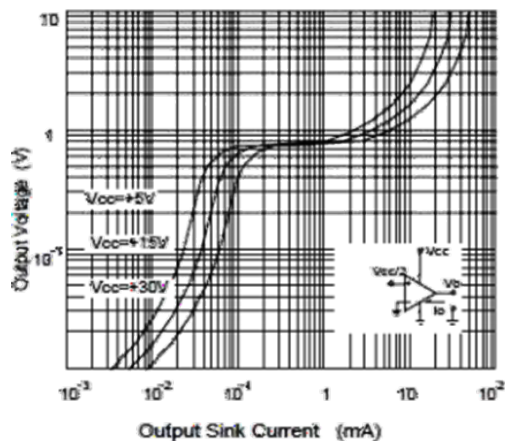
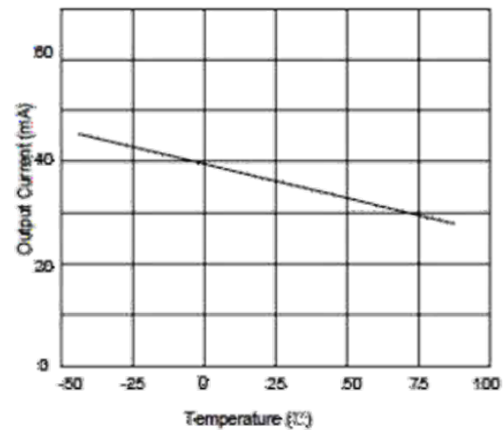


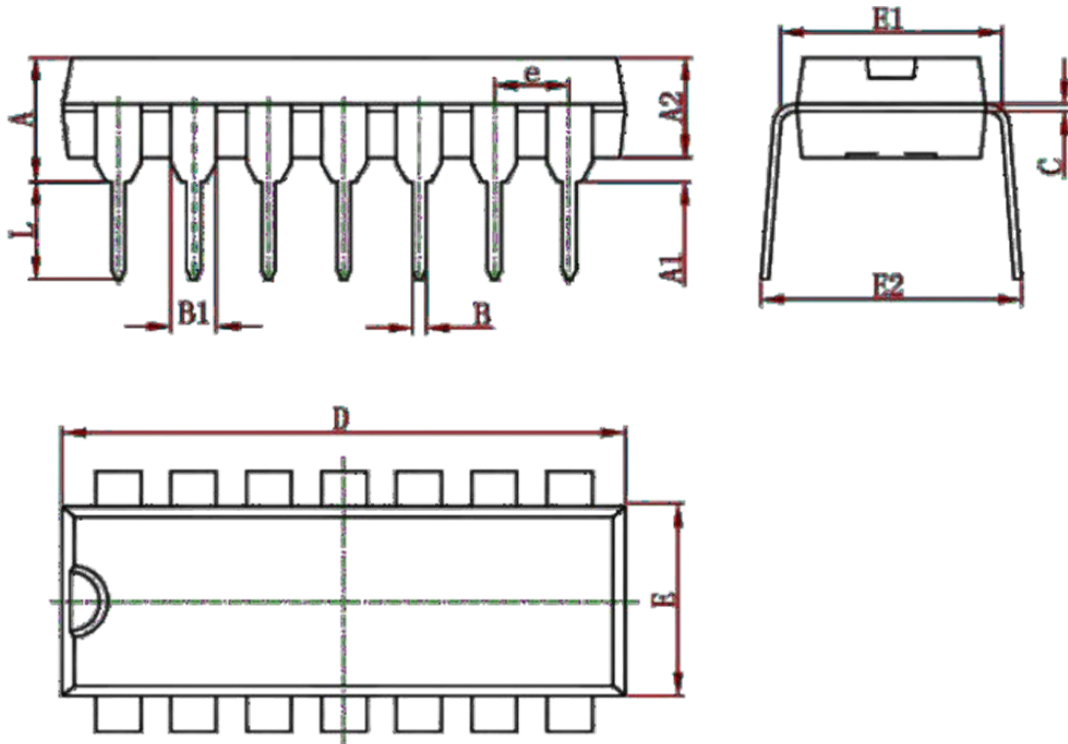
Fig.12 Current Limiting





## Outline Dimensions

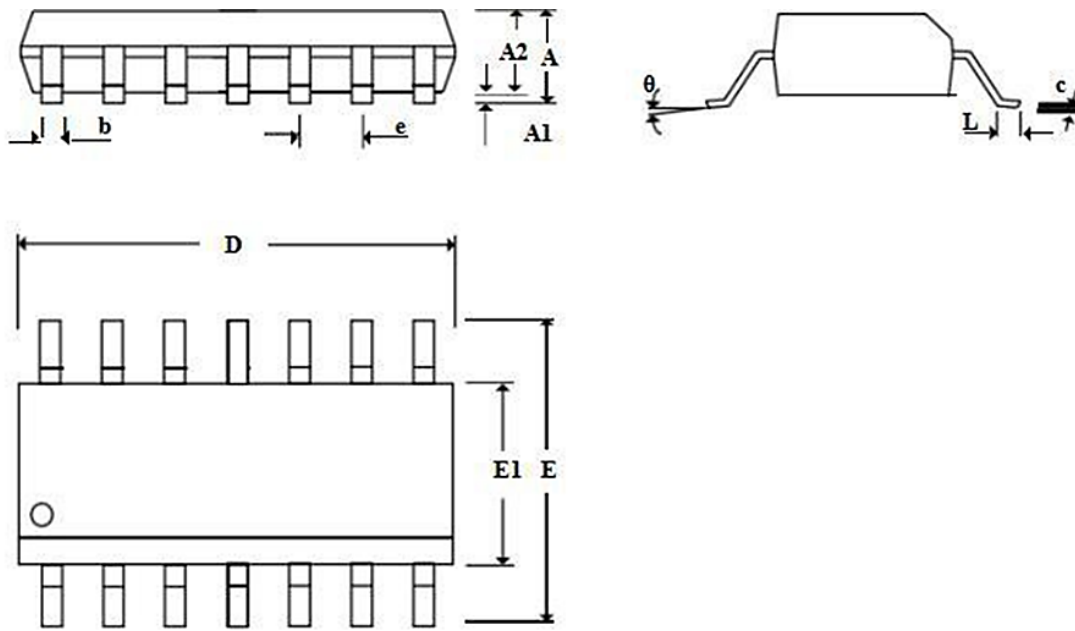
DIP14



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 3.710                     | 4.310  | 0.146                | 0.170 |
| A1     | 0.510                     |        | 0.020                |       |
| A2     | 3.200                     | 3.600  | 0.126                | 0.142 |
| B      | 0.380                     | 0.570  | 0.015                | 0.022 |
| B1     | 1.524 (BSC)               |        | 0.060 (BSC)          |       |
| C      | 0.204                     | 0.360  | 0.008                | 0.014 |
| D      | 18.800                    | 19.200 | 0.740                | 0.756 |
| E      | 6.200                     | 6.600  | 0.244                | 0.260 |
| E1     | 7.320                     | 7.920  | 0.288                | 0.312 |
| e      | 2.540 (BSC)               |        | 0.100 (BSC)          |       |
| L      | 3.000                     | 3.600  | 0.118                | 0.142 |
| E2     | 8.400                     | 9.000  | 0.331                | 0.354 |



## SOP14



| 符号 | 尺寸(mm) |       | 符号 | 尺寸(mm)      |       |
|----|--------|-------|----|-------------|-------|
|    | 最小值    | 最大值   |    | 最小值         | 最大值   |
| A  |        | 1.750 | D  | 8.450       | 8.850 |
| A1 | 0.100  | 0.250 | e  | 1.270 (BSC) |       |
| A2 | 1.250  |       | E  | 5.800       | 6.200 |
| b  | 0.310  | 0.510 | E1 | 3.800       | 4.000 |
| c  | 0.100  | 0.250 | L  | 0.400       | 1.270 |
|    |        |       | θ  | 0°          | 8°    |

## Ordering information

| Part Number | Package Type | Minimum Packing QTY | Belivery Mode |
|-------------|--------------|---------------------|---------------|
| QN339NG     | DIP14        | 4000                | Tape & Reel   |
| QN339DRG    | SOP14        |                     |               |