

# AN1393 (AN6914), AN1393S (AN6914S)

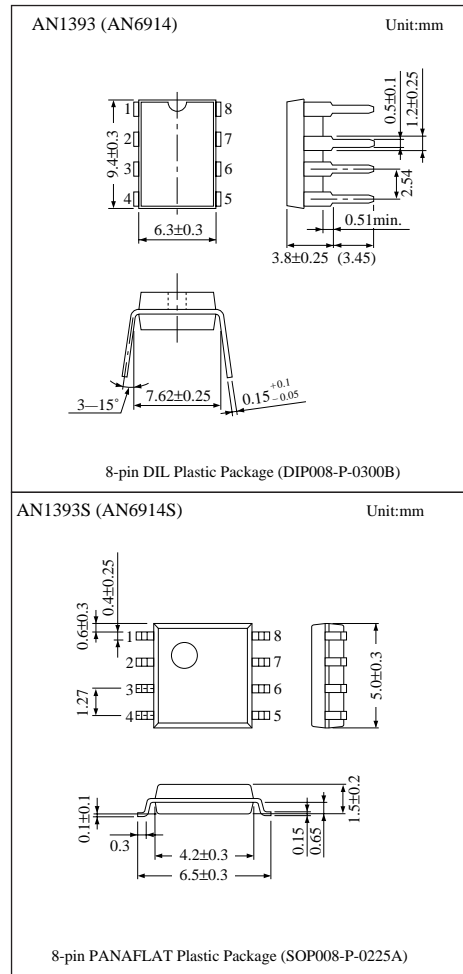
## Dual Comparators

### ■ Overview

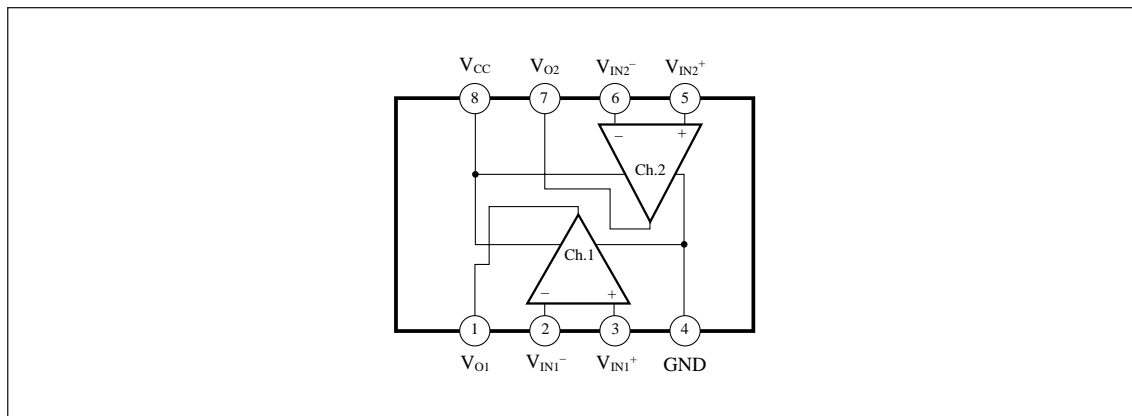
The AN1393 (AN6914) and the AN1393S (AN6914S) are dual (voltage) comparators with wide range of operating supply voltage.

### ■ Features

- Wide range of operating voltages  
Single supply: 2 to 36V  
Dual supply:  $\pm 1$  to  $\pm 18$ V
- Low circuit current: 0.6mA typ.
- Wide range of common-mode input voltages  
: 0V to  $V_{CC}-1.5$ V (single supply)
- Open collector output



### ■ Block Diagram



## ■ Pin Descriptions

| Pin No. | Pin name                 |
|---------|--------------------------|
| 1       | Ch.1 output              |
| 2       | Ch.1 inverting input     |
| 3       | Ch.1 non inverting input |
| 4       | GND                      |
| 5       | Ch.2 non inverting input |
| 6       | Ch.2 inverting input     |
| 7       | Ch.2 output              |
| 8       | V <sub>CC</sub>          |

## ■ Absolute Maximum Ratings (Ta=25°C)

| Parameter                     |                            | Symbol                          | Rating       | Unit |
|-------------------------------|----------------------------|---------------------------------|--------------|------|
| Voltage                       | Supply voltage             | V <sub>CC</sub>                 | 36           | V    |
|                               | Common-mode input voltage  | V <sub>ICM</sub> *1             | − 0.3 to 36  | V    |
|                               | Differential input voltage | V <sub>ID</sub> *2              | 36           | V    |
|                               | Output applied voltage     | V <sub>I</sub> , V <sub>7</sub> | 24           | V    |
| Power dissipation             | AN1393 (AN6914)            | P <sub>D</sub>                  | 500          | mW   |
|                               | AN1393S(AN6914S)           |                                 | 360          |      |
| Operating ambient temperature |                            | T <sub>opr</sub>                | − 30 to +85  | °C   |
| Storage temperature           | AN1393(AN6914)             | T <sub>stg</sub>                | − 55 to +150 | °C   |
|                               | AN1393S(AN6914S)           |                                 | − 55 to +125 |      |

\*1 The common mode input voltage is a voltage applied to the non-inverting input pin and inverting input pin simultaneously.

\*2 Differential input is equivalent to the potential difference between the non-inverting input pin and inverting input pin.

## ■ Recommended Operating Range (Ta=25°C)

| Parameter                      | Symbol          | Range                           |
|--------------------------------|-----------------|---------------------------------|
| Operating supply voltage range | V <sub>CC</sub> | Single power supply 2V to 36V   |
|                                |                 | Double power supply ±1V to ±18V |

## ■ Electrical Characteristics (V<sub>CC</sub>=5V, Ta=25°C)

| Parameter                       | Symbol                 | Condition   | min | typ | max                  | Unit |
|---------------------------------|------------------------|---|-----|-----|----------------------|------|
| Input offset voltage            | V <sub>I(offset)</sub> |   | —   | 1   | 5                    | mV   |
| Input offset current            | I <sub>IO</sub>        |   | —   | —   | 50                   | nA   |
| Input bias current              | I <sub>Bias</sub>      |   | —   | —   | 250                  | nA   |
| Voltage gain                    | G <sub>V</sub>         | R <sub>L</sub> =15kΩ  | —   | 200 | —                    | V/mV |
| Common-mode input voltage range | V <sub>CM</sub>        |   | 0   | —   | V <sub>CC</sub> −1.5 | V    |
| Supply current                  | I <sub>CC</sub>        | R <sub>L</sub> = ∞  | —   | 0.6 | 1.5                  | mA   |
| Response time                   | t <sub>r</sub>         | R <sub>L</sub> =5.1kΩ, V <sub>RL</sub> =5V                        | —   | 1.3 | —                    | μs   |
| Output sink current             | I <sub>SINK</sub>      | V <sub>REF</sub> =0V, V <sub>IN</sub> =1V, V <sub>O</sub> ≤1.5V   | 10  | —   | —                    | mA   |
| Low level output voltage        | V <sub>OL</sub>        | V <sub>REF</sub> =0V, V <sub>IN</sub> =1V, I <sub>SINK</sub> =3mA | —   | 0.2 | 0.4                  | V    |
| Output terminal leakage current | I <sub>O (Leak)</sub>  | V <sub>IN</sub> =0V, V <sub>REF</sub> =1V, V <sub>O</sub> =5V     | —   | 0.1 | —                    | nA   |

## ■ Characteristics Curve

