

C-MOS COMPARATOR WITH OPEN DRAIN OUTPUT

■ GENERAL DESCRIPTION

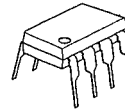
The NJU7112A and 14A dual and quad C-MOS Comparators performing wide operating voltage from 3 to 16V, low operating current and low offset voltage.

The NJU7112A and 14A operated on a single-power-supply can interface with most of TTL and C-MOS type standard logic ICs.

■ FEATURES

- Single-Power-Supply
- Wide Operating Voltage (V<sub>DD</sub>=3~16V)
- Low Operating Current (11 μA / circuit typ.)
- Wide Common Mode Input Voltage (0~3.8V at V<sub>DD</sub>=5V)
- High Input Impedance
- Low Bias Current (I<sub>b</sub>=1pA)
- Low Offset Voltage
- Open Drain Output
- Package Outline  
DIP/DMP 8 (NJU7112A)  
DIP/DMP 14 (NJU7114A)
- C-MOS Technology

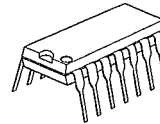
■ PACKAGE OUTLINE



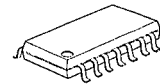
NJU7112AD



NJU7112AM

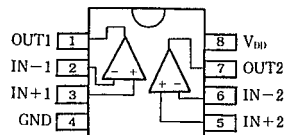


NJU7114AD

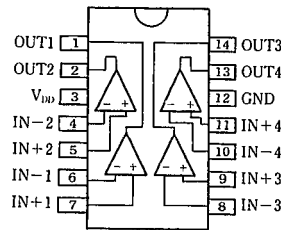


NJU7114AM

■ EQUIVALENT CIRCUIT

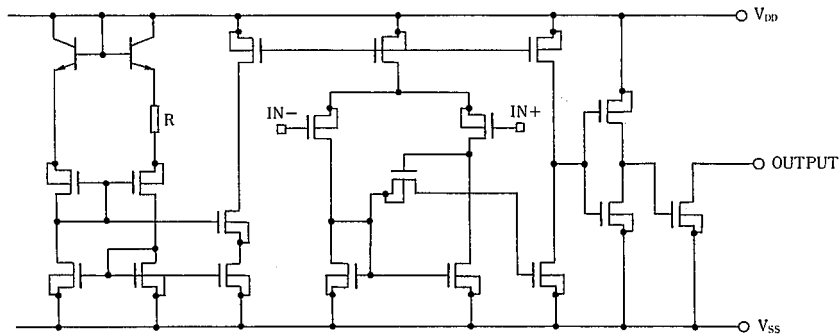


NJU7112AD/AM



NJU7114AD/AM

■ PIN CONFIGURATION



# NJU7112A/14A

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER                  | SYMBOL           | RATINGS  | UNIT |
|----------------------------|------------------|--|------|
| Supply Voltage             | V <sub>DD</sub>  | 18   | V    |
| Differential Input Voltage | V <sub>ID</sub>  | ±18 (Note1)  | V    |
| Input Voltage              | V <sub>I</sub>   | 18   | V    |
| Output Voltage             | V <sub>O</sub>   | 18   | V    |
| Output Current             | I <sub>O</sub>   | 20   | mA   |
| Power Dissipation          | P <sub>D</sub>   | (DIP8) 500<br>(DIP14) 700<br>(DMP8) 300<br>(DMP14) 300 | mW   |
| Operating Temperature      | T <sub>opr</sub> | 0~+70  | °C   |
| Storage Temperature        | T <sub>stg</sub> | -40~+125   | °C   |

(Note1) If the supply voltage (V<sub>DD</sub>) is less than 18V, the input voltage must not over the V<sub>DD</sub> level though 18V is limit specified.

## ■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V<sub>DD</sub>=5V)

| PARAMETER                       | SYMBOL           | CONDITIONS                                  | NJU7112A |      |      | NJU7114A |      |      | UNIT |
|---------------------------------|------------------|---|----------|------|------|----------|------|------|------|
|                                 |                  |   | MIN      | TYP  | MAX  | MIN      | TYP  | MAX  |      |
| Operating Voltage               | V <sub>DD</sub>  |   | 3        | —    | 16   | 3        | —    | 16   | V    |
| Input Offset Voltage            | V <sub>IO</sub>  | V <sub>IC</sub> =V <sub>ICmin</sub> (Note2) | —        | 1.4  | 12   | —        | 1.4  | 12   | mV   |
| Input Offset Current            | I <sub>IO</sub>  |   | —        | 1    | —    | —        | 1    | —    | pA   |
| Input Bias Current              | I <sub>IB</sub>  |   | —        | 1    | —    | —        | 1    | —    | pA   |
| Input Common Mode Voltage Range | V <sub>ICM</sub> |   | 0        | —    | 3.8  | 0        | —    | 3.8  | V    |
| High Level Output Current       | I <sub>OH</sub>  | V <sub>ID</sub> =+1V, V <sub>OH</sub> =+5V  | —        | 2    | 40   | —        | 2    | 40   | nA   |
| Low Level Output Voltage        | V <sub>OL</sub>  | V <sub>ID</sub> =+1V, I <sub>OL</sub> =+6mA | —        | 0.35 | 0.40 | —        | 0.35 | 0.40 | V    |
| Common Mode Rejection Ratio     | CMR              | V <sub>IC</sub> =V <sub>ICmin</sub>         | —        | 71   | —    | —        | 75   | —    | dB   |
| Supply Voltage Rejection Ratio  | SVR              | V <sub>DD</sub> =5~10V                      | —        | 80   | —    | —        | 85   | —    | dB   |
| Operating Current               | I <sub>DD</sub>  | No Load, V <sub>O</sub> =0V                 | —        | 22   | 40   | —        | 44   | 80   | μA   |

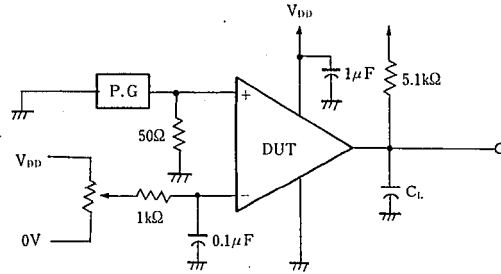
(Note2) This condition is available for operating voltage V<sub>DD</sub>=5~10V and driving voltage is over 4.5V or under 0.3V.

## ■ SWITCHING CHARACTERISTICS

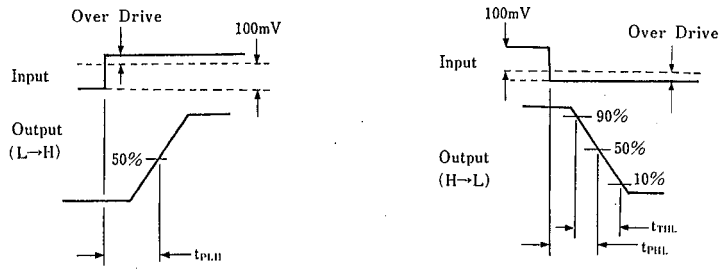
(Ta=25°C, V<sub>DD</sub>=5V f=10kHz, C<sub>L</sub>=15pF)

| PARAMETER                        | SYMBOL           | CONDITIONS          | NJU7112A       |     |      | NJU7114A |     |      | UNIT |    |
|----------------------------------|------------------|---------------------|----------------|-----|------|----------|-----|------|------|----|
|                                  |                  |                     | MIN            | TYP | MAX  | MIN      | TYP | MAX  |      |    |
| Propagation Delay<br>High to Low | t <sub>PHL</sub> | V <sub>IC</sub> =0V | Over Drive=5mV | —   | 2.7  | —        | —   | 2.9  | —    | μs |
|                                  |                  |                     | TTL level step | —   | 0.16 | —        | —   | 0.16 | —    |    |
| Propagation Delay<br>Low to High | t <sub>PLH</sub> | V <sub>IC</sub> =0V | Over Drive=5mV | —   | 1.5  | —        | —   | 1.5  | —    | μs |
|                                  |                  |                     | TTL level step | —   | 0.7  | —        | —   | 0.8  | —    |    |
| Output Signal<br>Falling Time    | t <sub>THL</sub> | Over Drive=50mV     | —              | 20  | —    | —        | 20  | —    | ns   |    |

■ MEASUREMENT CIRCUIT



■ TIMING WAVEFORM



# NJU7112A/14A

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## MEMO

**[CAUTION]**

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