

# LOW-VOLTAGE OPERATION TINY SINGLE C-MOS COMPARATOR

## ■ GENERAL DESCRIPTION

The NJU7141 is a low voltage single-power-supply operation single C-MOS comparator with open drain output.

The NJU7141 operated from 1 to 5.5V supply and interface with most of TTL and C-MOS type standard logic ICs.

The NJU7141 is in MTP-5 package, and it is suitable for battery use items and other portable system.

## ■ PACKAGE OUTLINE

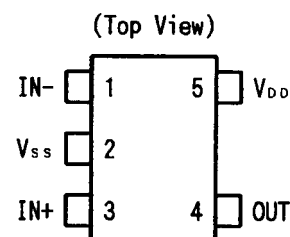


NJU7141F

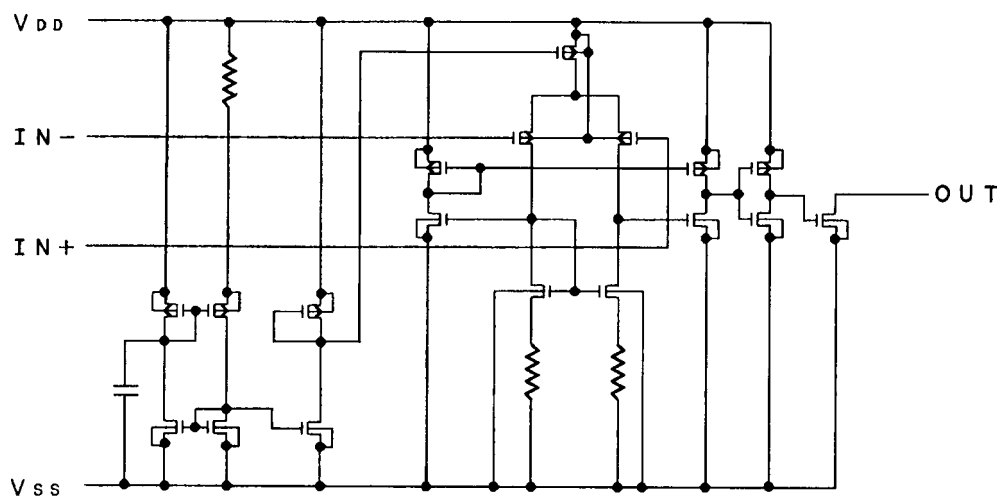
## ■ FEATURES

- Single-Power-Supply ( $V_{DD}=1\sim 5.5V$ )
- Input Offset Voltage ( $V_{IO}=10mV$  max.@ 3.0V)
- Low Operating Current ( $I_{DD}=5\mu A$  typ.)
- Low Input Bias Current ( $I_B=1pA$  typ.)
- Open Drain Output
- Output Signal Falling Time (30ns typ.)
- C-MOS Technology
- Package Outline MTP5

## ■ PIN CONFIGURATION



## ■ EQUIVALENT CIRCUIT



## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25°C )

| PARAMETER                   | SYMBOL    | RATINGS           | UNIT |
|-----------------------------|-----------|-------------------|------|
| Supply Voltage              | $V_{IN}$  | 7                 | V    |
| Differential Input Voltage  | $V_{ID}$  | $\pm 7$ ( note1 ) | V    |
| Common Mode Input Voltage   | $V_{IC}$  | -0.3~7            | V    |
| Power Dissipation           | $P_D$     | 200               | mW   |
| Operating Temperature Range | $T_{opr}$ | -40~+85           | °C   |
| Storage Temperature Range   | $T_{stg}$ | -55~+125          | °C   |

( note1 ) If the supply voltage (  $V_{DD}$  ) is less than 7V, the input voltage must not over the  $V_{DD}$  level though 7V is limit specified.

( note2 ) Decoupling capacitor should be connected between  $V_{DD}$  and  $V_{SS}$  due to the stabilized operation for the circuit.

## ■ ELECTRICAL CHARACTERISTICS

( Ta=25°C,  $V_{DD}$ =3.0V,  $R_L$ = $\infty$  )

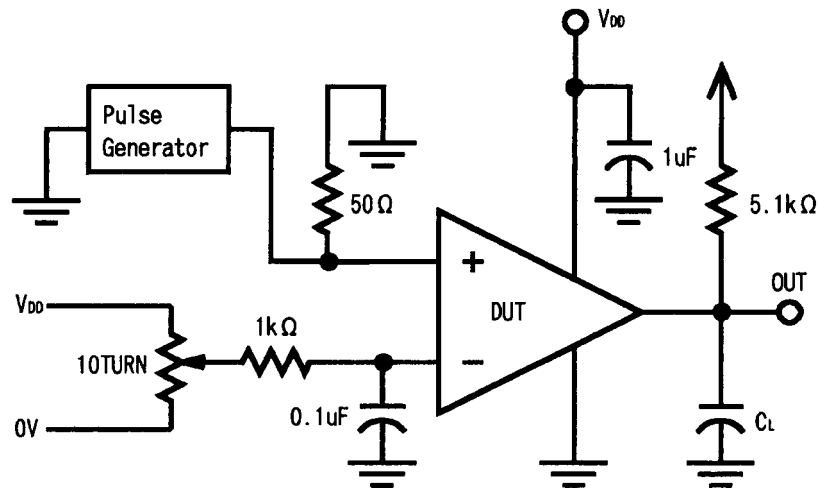
| PARAMETER                       | SYMBOL    | TEST CONDITION     | MIN.  | TYP. | MAX. | UNIT    |
|---------------------------------|-----------|--------------------|-------|------|------|---------|
| Operating Voltage               | $V_{DD}$  |                    | 1.0   | -    | 5.5  | V       |
| Input Offset Voltage            | $V_{IO}$  | $V_{IN}=1/2V_{DD}$ | -     | -    | 10   | mV      |
| Input Offset Current            | $I_{IO}$  |                    | -     | 1    | -    | pA      |
| Input Bias Current              | $I_{IB}$  |                    | -     | 1    | -    | pA      |
| Input Common Mode Voltage Range | $V_{ICM}$ |                    | 0~2.5 | -    | -    | V       |
| Output Leakage Current          | $I_{OFF}$ | $V_{OH}=V_{DD}$    | -     | -    | 1    | $\mu$ A |
| Low Level Output Voltage        | $V_{OL}$  | $I_{OL}=2mA$       | -     | -    | 0.3  | V       |
| Common Mode Rejection Ratio     | CMR       | $V_{IC}=1/2V_{DD}$ | 55    | -    | -    | dB      |
| Supply Voltage Rejection Ratio  | SVR       | $V_{DD}=3\sim 5V$  | 60    | -    | -    | dB      |
| Operating Current               | $I_{DD}$  | No Load, $V_O=0V$  | -     | 5    | 12   | $\mu$ A |

## ■ SWITCHING CHARACTERISTICS

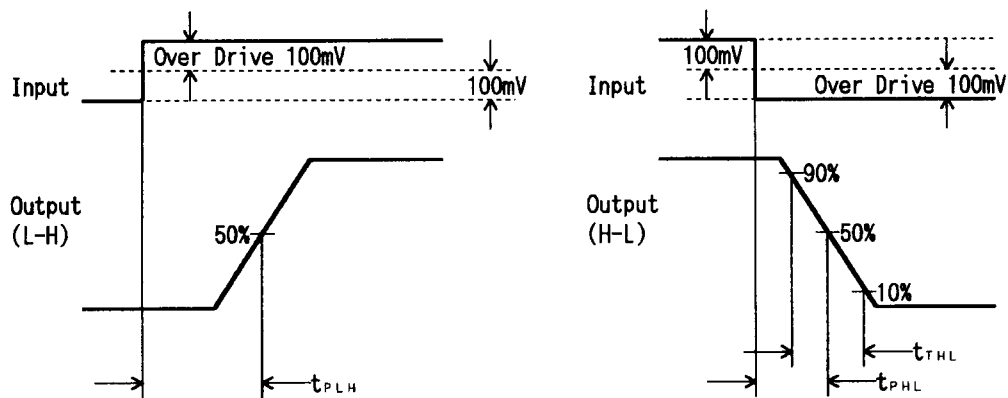
( Ta=25°C,  $V_{DD}$ =3.0V,  $f$ =10kHz,  $C_L$ =15pF )

| PARAMETER                        | SYMBOL    | CONDITIONS       |             | MIN. | TYP. | MAX. | UNIT    |
|----------------------------------|-----------|------------------|-------------|------|------|------|---------|
| Propagation Delay<br>High to Low | $t_{PHL}$ | Over Drive=100mV | $V_{IC}=0V$ | -    | 0.35 | -    | $\mu$ s |
|                                  |           | TTL Level Step   |             | -    | 0.10 | -    |         |
| Propagation Delay<br>Low to High | $t_{PLH}$ | Over Drive=100mV | $V_{IC}=0V$ | -    | 0.90 | -    | $\mu$ s |
|                                  |           | TTL Level Step   |             | -    | 0.60 | -    |         |
| Output Signal<br>Falling Time    | $t_{THL}$ | Over Drive=100mV |             | -    | 30   | -    | ns      |

## ■ SWITCHING CHARACTERISTICS MEASUREMENT CIRCUIT



## ■ TIMING WAVEFORM



### [CAUTION]

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