

## DUAL H BRIDGE DRIVER WITH COMPARATOR

### ■ GENERAL DESCRIPTION

The NJU7382 is a dual H-bridge driver IC especially developed low voltage small stepper motor applications. It consists of a pair of low consumption CMOS H-bridge drivers protected by thermal shutdown circuit.

It is also including a general-purpose comparator suited for detection from photo reflector as rotor position sensor or current limitation.

The NJU7382 adopt a very small FFP package, it is suitable for mobile or portable applications using micro stepper motors.

### ■ Package Outline

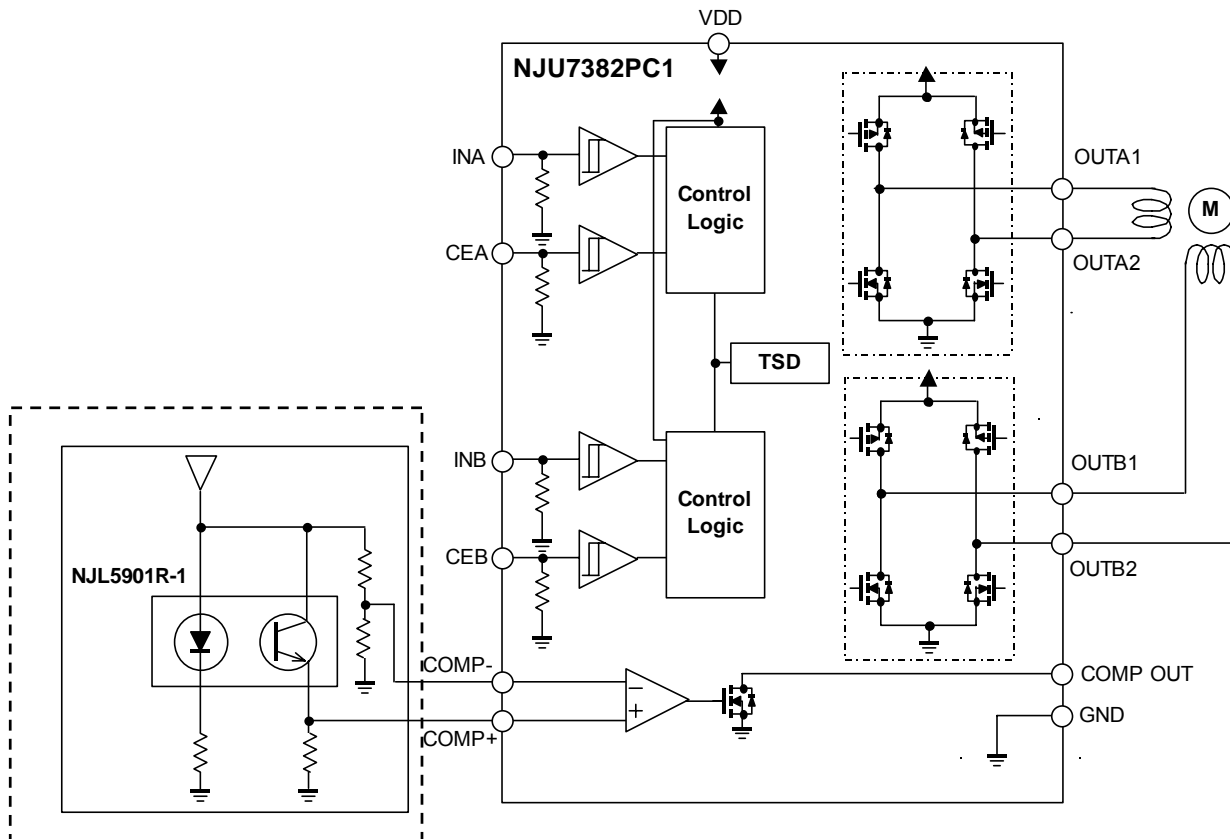


NJU7382PC1

### ■ FEATURES

- Operating Voltage 2.0V to 5.5V
- Two CMOS H-bridge drivers for stepper motor driving
- Motor Output Current 200mA(continuous), 400mA(peak)
- Chip enable function
- General purpose comparator
- Thermal shutdown circuit
- CMOS technology
- Package Outline FFP16 (2.5×2.5×h0.85mm)

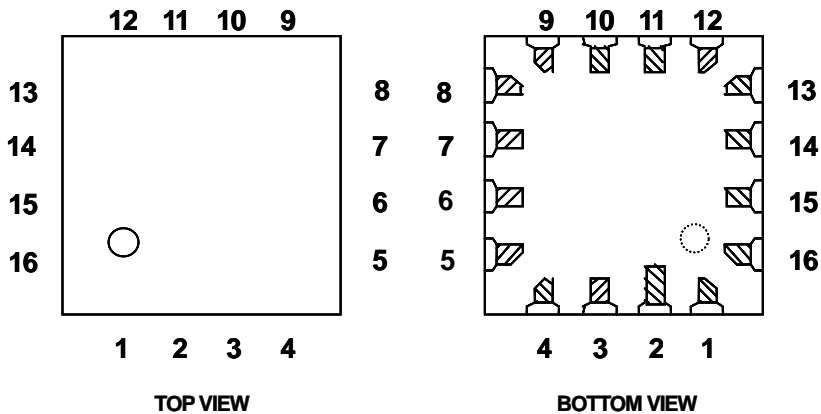
### ■ BLOCK DIAGRAM



# NJU7382

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## ■ PIN CONFIGURATIONS



|    |        |     |          |
|----|--------|-----|----------|
| 1. | CE A   | 9.  | COMP+    |
| 2. | VDD    | 10. | VDD      |
| 3. | CE B   | 11. | NC       |
| 4. | IN B   | 12. | COMP OUT |
| 5. | OUT B2 | 13. | OUT A1   |
| 6. | GND    | 14. | GND      |
| 7. | OUT B1 | 15. | OUT A2   |
| 8. | COMP-  | 16. | IN A     |

(Note)

All VDD and GND pins should be connected the power supply and the ground respectively. Otherwise, the electrical characteristic may not satisfy specifications.

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER                   | RATINGS        | SYMBOL (UNIT)     | REMARKS    |
|-----------------------------|----------------|-------------------|------------|
| Supply Voltage              | +7.0           | $V_{DD}$ (V)      |            |
| Logic Input Voltage         | -0.3~ $V_{DD}$ | $V_{ID}$ (V)      | Note1      |
| Motor Output Current (Peak) | 400            | $I_{OPEAK}$ (mA)  |            |
| Comparator Output Current   | 10             | $I_{COPEAK}$ (mA) |            |
| Comparator Output Voltage   | +7.0           | $V_c$ (V)         |            |
| Operating Temperature       | -40~+85        | $T_{opr}$ (°C)    |            |
| Storage Temperature         | -50~+150       | $T_{stg}$ (°C)    |            |
| Power Dissipation           | 300            | $P_D$ (mW)        | On PCBoard |

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.

■ RECOMMENDED OPERATING CONDITIONS

(Ta=25°C, V<sub>DD</sub>=3.3V)

| PARAMETER            | SYMBOL          | MIN. | TYP. | MAX. | UNIT |
|----------------------|-----------------|------|------|------|------|
| Supply Voltage Range | V <sub>DD</sub> | 2.0  | -    | 5.5  | V    |
| Junction Temperature | T <sub>j</sub>  | -20  | -    | 125  | dg.C |
| Motor Output Current | I <sub>o</sub>  | -    | -    | 200  | mA   |

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V<sub>DD</sub>=3.3V, unless otherwise specified)

| PARAMETER                       | SYMBOL              | CONDITIONS                 | MIN. | TYP. | MAX. | UNIT |
|---------------------------------|---------------------|----------------------------|------|------|------|------|
| <b>■ GENERAL</b>                |                     |                            |      |      |      |      |
| Operating Current 1             | I <sub>DD1</sub>    | IN A=IN B=CE A=CE A=0V     | -    | 100  | 500  | uA   |
| Operating Current 2             | I <sub>DD2</sub>    | IN A=IN B=0V,CE A=CE B=3V  | -    | 100  | -    | uA   |
| Thermal Shutdown                | T <sub>TSD</sub>    | -                          | -    | 180  | -    | °C   |
| Thermal Shutdown Hysteresis     | T <sub>HYS</sub>    | -                          | -    | 30   | -    | °C   |
| <b>■ DRIVERS</b>                |                     |                            |      |      |      |      |
| Logic Input Current             | I <sub>I</sub>      | V <sub>IH</sub> =3V, Note2 | -    | -    | 1    | μA   |
| Logic High Input Voltage        | V <sub>IH</sub>     | Note2                      | 2.4  | -    | -    | V    |
| Logic Low Input Voltage         | V <sub>IL</sub>     | Note2                      | -    | -    | 0.6  | V    |
| High Output Voltage             | V <sub>OH</sub>     | I <sub>o</sub> =+100mA     | -    | 3.1  | -    | V    |
| Low Output Voltage              | V <sub>OL</sub>     | I <sub>o</sub> = -100mA    | -    | 0.2  | -    | V    |
| <b>■ COMPARATOR</b>             |                     |                            |      |      |      |      |
| Input Offset Voltage            | V <sub>IO</sub>     | -                          | -12  | -    | +12  | mV   |
| Input Bias Current              | I <sub>IB</sub>     | -                          | -    | -    | 1    | μA   |
| Common mode Input voltage range | V <sub>ICM</sub>    | -                          | 0    | -    | 2.8  | V    |
| Output Voltage                  | V <sub>sat</sub>    | RL=10kΩ                    | -    | 0.3  | -    | V    |
| Output leak current             | I <sub>COLEAK</sub> | V <sub>CO</sub> =5.5V      | -    | -    | 1    | μA   |

Note2 : Refers to "IN" terminal and "CE" terminal.

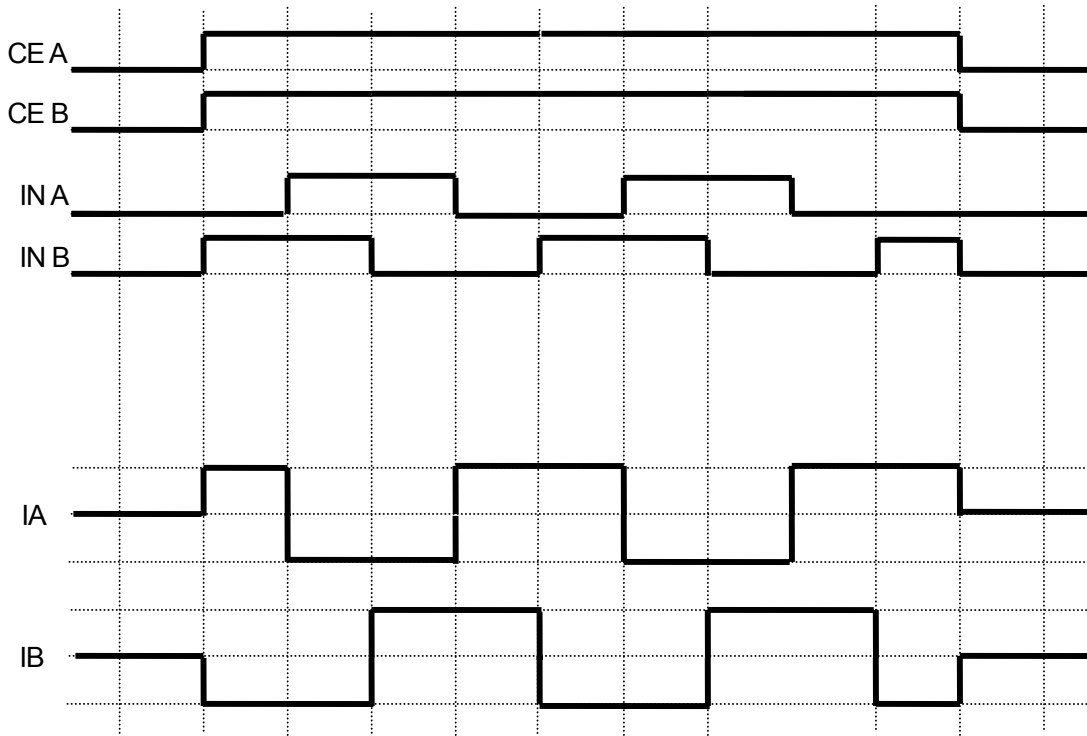
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## ■ TRUTH TABLE

| CE A | IN A | OUT A2 | OUT A1 | CE B | IN B | OUT B2 | OUT B1 |
|------|------|--------|--------|------|------|--------|--------|
| L    | X    | Z      | Z      | L    | X    | Z      | Z      |
| H    | L    | H      | L      | H    | L    | H      | L      |
| H    | H    | L      | H      | H    | H    | L      | H      |

## ■ TIMING CHART



\*IA and IB mean that the current flowing through OUTPUT A1 and OUTPUT A2, OUTPUT B1 and OUTPUT B2.

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