



**THE DATASHEET OF
SN74AS8003PSRE4**

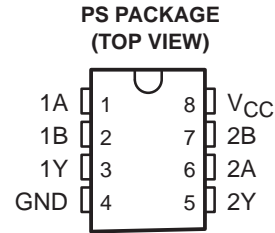


- Packaged in Plastic Small-Outline Package

description

The SN74AS8003 device contains two independent 2-input positive-NAND gates. It performs the Boolean functions $Y = \overline{A \cdot B}$ or $Y = \overline{A} + \overline{B}$ in positive logic.

The SN74AS8003 is characterized for operation from 0°C to 70°C.



**FUNCTION TABLE
(each gate)**

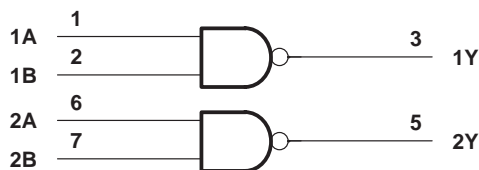
| INPUTS | | OUTPUT |
|--------|---|--------|
| A | B | Y |
| H | H | L |
| L | X | H |
| X | L | H |

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



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SN74AS8003

DUAL 2-INPUT POSITIVE-NAND GATE

SDAS305 – OCTOBER 1999

absolute maximum ratings over operating free-air temperature†

| | |
|--------------------------------------|----------------|
| Supply voltage range, V_{CC} | –0.5 V to 7 V |
| Input voltage range, V_I | –0.5 V to 7 V |
| Storage temperature range, T_{stg} | –65°C to 150°C |

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods can affect device reliability.

recommended operating conditions (see Note 1)

| | MIN | NOM | MAX | UNIT |
|--------------------------------------|-----|-----|-----|------|
| V_{CC} Supply voltage | 4.5 | 5 | 5.5 | V |
| V_{IH} High-level input voltage | 2 | | | V |
| V_{IL} Low-level input voltage | | | 0.8 | V |
| I_{OH} High-level output current | | | –2 | mA |
| I_{OL} Low-level output current | | | 20 | mA |
| T_A Operating free-air temperature | 0 | | 70 | °C |

NOTE 1: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

electrical characteristics over recommended operating conditions (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | MIN | TYP‡ | MAX | UNIT |
|-----------|----------------------------|------------------|------------|------|------|------|
| V_{IK} | $V_{CC} = 4.5$ V, | $I_I = -18$ mA | | | –1.2 | V |
| V_{OH} | $V_{CC} = 4.5$ V to 5.5 V, | $I_{OH} = -2$ mA | $V_{CC}-2$ | | | V |
| V_{OL} | $V_{CC} = 4.5$ V, | $I_{OL} = 20$ mA | | 0.35 | 0.5 | V |
| I_I | $V_{CC} = 5.5$ V, | $V_I = 7$ V | | | 0.1 | mA |
| I_{IH} | $V_{CC} = 5.5$ V, | $V_I = 2.7$ V | | | 20 | µA |
| I_{IL} | $V_{CC} = 5.5$ V, | $V_I = 0.4$ V | | | –0.5 | mA |
| $I_{O§}$ | $V_{CC} = 5.5$ V, | $V_O = 2.25$ V | –30 | | –112 | mA |
| I_{CCH} | $V_{CC} = 5.5$ V, | $V_I = 0$ V | | 1 | 1.6 | mA |
| I_{CCL} | $V_{CC} = 5.5$ V, | $V_I = 4.5$ V | | 3.5 | 8.7 | mA |

‡ All typical values are at $V_{CC} = 5$ V, $T_A = 25$ °C.

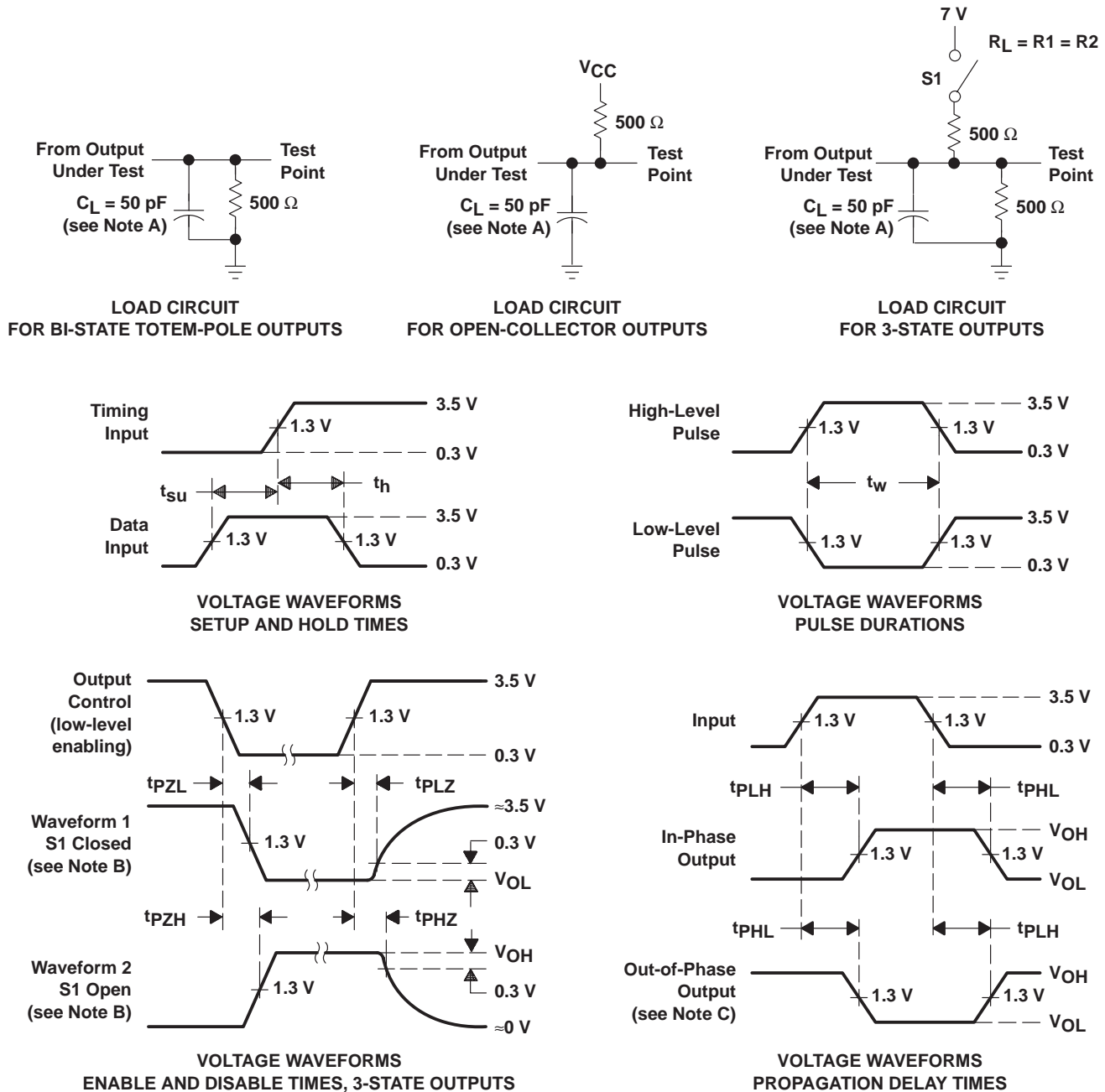
§ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

switching characteristics over recommended operating conditions (unless otherwise noted) (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | MIN | MAX | UNIT |
|-----------|--------------|-------------|-----|-----|------|
| t_{PLH} | A or B | Y | 1 | 4.5 | ns |
| t_{PHL} | | | 1 | 4 | |



PARAMETER MEASUREMENT INFORMATION



- NOTES:
- A. C_L includes probe and jig capacitance.
 - B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 - C. When measuring propagation delay of 3-state outputs, switch S1 is open.
 - D. All input pulses have the following characteristics: $PRR \leq 1$ MHz, $t_r = t_f = 2$ ns, duty cycle = 50%.
 - E. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms

PACKAGING INFORMATION

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| SN74AS8003PSRE4 | ACTIVE | SO | PS | 8 | | TBD | Call TI | Call TI |
| SN74AS8003PSRG4 | ACTIVE | SO | PS | 8 | | TBD | Call TI | Call TI |

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBsolete: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

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⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

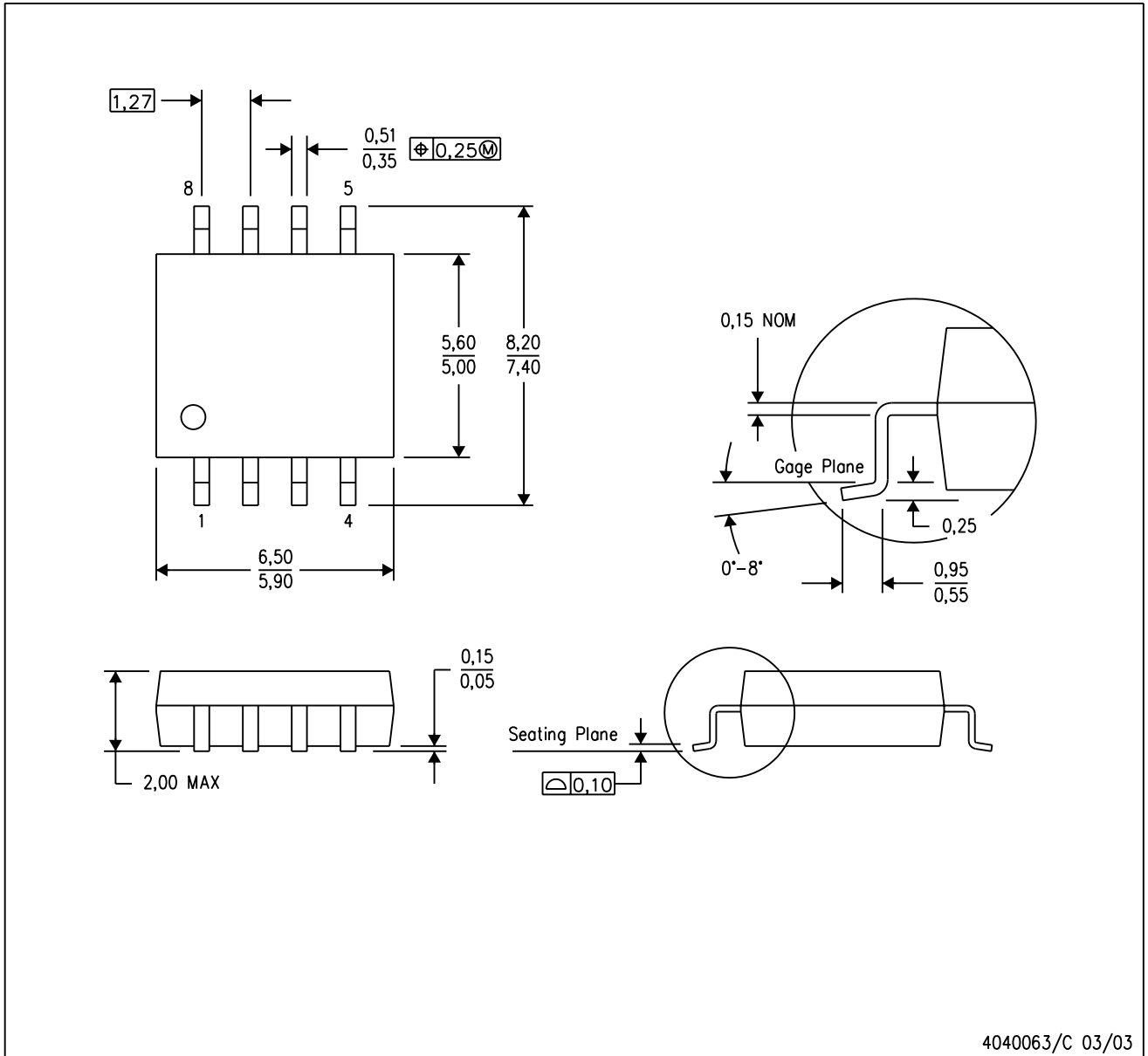
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MECHANICAL DATA

PS (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

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