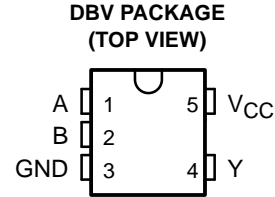


- Operating Range 2-V to 5.5-V V_{CC}
- **EPIC™** (Enhanced-Performance Implanted CMOS) Process
- Operation From Very Slow Input Transitions
- Temperature-Compensated Threshold Levels
- High Noise Immunity
- Same Pinout as SN74AHC1G00
- Packaged in Plastic Small-Outline Transistor Package



description

The SN74AHC1G132 is a single NAND gate, but because of the Schmitt action, it has different input threshold levels for positive- and negative-going signals. This device performs the Boolean function $Y = \overline{A} \cdot \overline{B}$ or $Y = \overline{A + B}$ in positive logic.

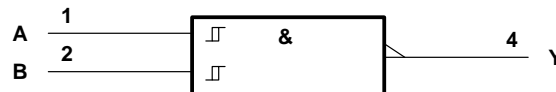
These circuits are temperature compensated and can be triggered from the slowest of input ramps and still give clean jitter-free output signals.

The SN74AHC1G132 is characterized for operation from -40°C to 85°C .

FUNCTION TABLE

| 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.



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TEXAS
INSTRUMENTS

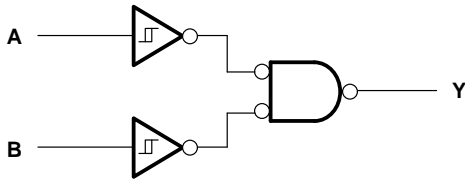
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PRODUCT PREVIEW

SN74AHC1G132
SINGLE POSITIVE-NAND GATE
WITH SCHMITT-TRIGGER INPUTS
 SCLS355A – MAY 1997 – REVISED JUNE 1997

logic diagram (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

| | |
|--|----------------------------|
| Supply voltage range, V_{CC} | –0.5 V to 7 V |
| Input voltage range, V_I (see Note 1) | –0.5 V to 7 V |
| Output voltage range, V_O (see Note 1) | –0.5 V to $V_{CC} + 0.5$ V |
| Input clamp current, I_{IK} ($V_I < 0$) | –20 mA |
| Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$) | ±20 mA |
| Continuous output current, I_O ($V_O = 0$ to V_{CC}) | ±25 mA |
| Continuous current through V_{CC} or GND | ±50 mA |
| Package thermal impedance, θ_{JA} (see Note 2) | 347°C/W |
| 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 may affect device reliability.

- NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 2. The package thermal impedance is calculated in accordance with JESD 51.

recommended operating conditions (see Note 3)

| | | | MIN | MAX | UNIT |
|-----------------|--------------------------------|---------------------------------|-----|-----------------|------|
| V _{CC} | Supply voltage | | 2 | 5.5 | V |
| V _I | Input voltage | | 0 | 5.5 | V |
| V _O | Output voltage | | 0 | V _{CC} | V |
| I _{OH} | High-level output current | V _{CC} = 2 V | −50 | | μA |
| | | V _{CC} = 3.3 V ± 0.3 V | −4 | | mA |
| | | V _{CC} = 5 V ± 0.5 V | −8 | | |
| I _{OL} | Low-level output current | V _{CC} = 2 V | 50 | | μA |
| | | V _{CC} = 3.3 V ± 0.3 V | 4 | | mA |
| | | V _{CC} = 5 V ± 0.5 V | 8 | | |
| T _A | Operating free-air temperature | | −40 | 85 | °C |

NOTE 3: Unused inputs must be held high or low to prevent them from floating.

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | V _{CC} | T _A = 25°C | | | MIN | MAX | UNIT |
|--|---|-----------------|-----------------------|------|------|------|------|------|
| | | | MIN | TYP | MAX | | | |
| V _{T+} Positive-going input threshold voltage | | 3 V | | 2.2 | | 2.2 | | V |
| | | 4.5 V | | 3.15 | | 3.15 | | |
| | | 5.5 V | | 3.85 | | 3.85 | | |
| V _{T-} Negative-going input threshold voltage | | 3 V | 0.9 | | | 0.9 | | V |
| | | 4.5 V | 1.35 | | | 1.35 | | |
| | | 5.5 V | 1.65 | | | 1.65 | | |
| ΔV _T Hysteresis (V _{T+} – V _{T-}) | | 3 V | 0.3 | | 1.2 | 0.3 | 1.2 | V |
| | | 4.5 V | 0.4 | | 1.4 | 0.4 | 1.4 | |
| | | 5.5 V | 0.5 | | 1.6 | 0.5 | 1.6 | |
| V _{OH} | I _{OH} = –50 μA | 2 V | 1.9 | 2 | | 1.9 | | V |
| | | 3 V | 2.9 | 3 | | 2.9 | | |
| | | 4.5 V | 4.4 | 4.5 | | 4.4 | | |
| | I _{OH} = –4 mA | 3 V | 2.58 | | | 2.48 | | |
| | I _{OH} = –8 mA | 4.5 V | 3.94 | | | 3.8 | | |
| V _{OL} | I _{OL} = 50 μA | 2 V | | | 0.1 | | 0.1 | V |
| | | 3 V | | | 0.1 | | 0.1 | |
| | | 4.5 V | | | 0.1 | | 0.1 | |
| | I _{OL} = 4 mA | 3 V | | | 0.36 | | 0.44 | |
| | I _{OL} = 8 mA | 4.5 V | | | 0.36 | | 0.44 | |
| I _I | V _I = V _{CC} or GND | 5.5 V | | | ±0.1 | | ±1 | μA |
| I _{CC} | V _I = V _{CC} or GND, I _O = 0 | 5.5 V | | | 1 | | 10 | μA |
| C _i | V _I = V _{CC} or GND | 5 V | | 2 | 10 | | 10 | pF |

**switching characteristics over recommended operating free-air temperature range,
 V_{CC} = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)**

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | LOAD CAPACITANCE | T _A = 25°C | | | MIN | MAX | UNIT |
|------------------|-----------------|----------------|------------------------|-----------------------|-----|------|-----|-----|------|
| | | | | MIN | TYP | MAX | | | |
| t _{PLH} | A or B | Y | C _L = 15 pF | | 5.5 | 7.9 | 1 | 9.5 | ns |
| t _{PHL} | | | | | 5.5 | 7.9 | 1 | 9.5 | |
| t _{PLH} | A or B | Y | C _L = 50 pF | | 8 | 11.4 | 1 | 13 | ns |
| t _{PHL} | | | | | 8 | 11.4 | 1 | 13 | |

**switching characteristics over recommended operating free-air temperature range,
 V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)**

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | LOAD CAPACITANCE | T _A = 25°C | | | MIN | MAX | UNIT |
|------------------|-----------------|----------------|------------------------|-----------------------|-----|-----|-----|-----|------|
| | | | | MIN | TYP | MAX | | | |
| t _{PLH} | A or B | Y | C _L = 15 pF | | 3.7 | 5.5 | 1 | 6.5 | ns |
| t _{PHL} | | | | | 3.7 | 5.5 | 1 | 6.5 | |
| t _{PLH} | A or B | Y | C _L = 50 pF | | 5.2 | 7.5 | 1 | 8.5 | ns |
| t _{PHL} | | | | | 5.2 | 7.5 | 1 | 8.5 | |

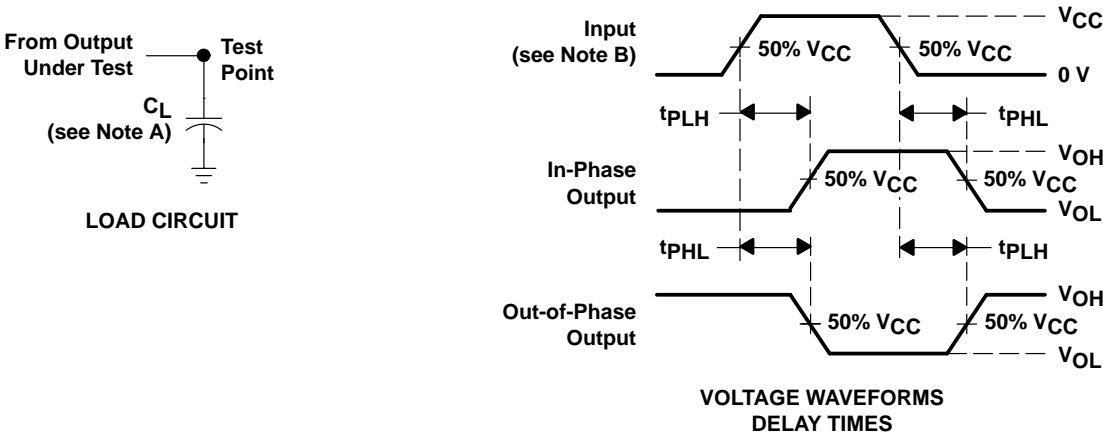
PRODUCT PREVIEW

SN74AHC1G132
SINGLE POSITIVE-NAND GATE
WITH SCHMITT-TRIGGER INPUTS
SCLS355A – MAY 1997 – REVISED JUNE 1997

operating characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

| PARAMETER | TEST CONDITIONS | TYP | UNIT |
|--|-----------------------------|-----|------|
| C_{pd} Power dissipation capacitance | No load, $f = 1\text{ MHz}$ | | pF |

PARAMETER MEASUREMENT INFORMATION



- NOTES: A. C_L includes probe and jig capacitance.
B. Input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r = 3\text{ ns}$, $t_f = 3\text{ ns}$.
C. The output is measured with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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