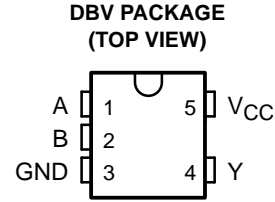


- Inputs Are TTL-Voltage Compatible
- **EPIC™** (Enhanced-Performance Implanted CMOS) Process
- Operation From Very Slow Input Transitions
- Temperature-Compensated Threshold Levels
- High Noise Immunity
- Same Pinout as SN74AHCT1G00
- Packaged in Plastic Small-Outline Transistor Package



## description

The SN74AHCT1G132 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.

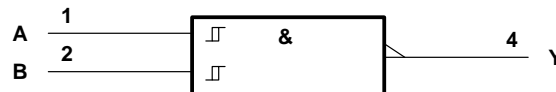
These circuits are temperature compensated and can be triggered from the slowest of input ramps and still give clean jitter-free output signals.

The SN74AHCT1G132 is characterized for operation from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .

**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**

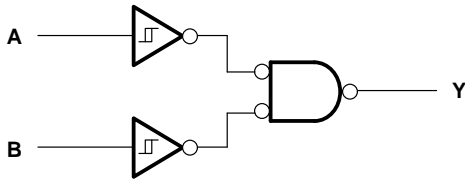
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**PRODUCT PREVIEW**

**SN74AHCT1G132**  
**SINGLE POSITIVE-NAND GATE**  
**WITH SCHMITT-TRIGGER INPUTS**  
 SCLS356A – MAY 1997 – REVISED JUNE 1997

**logic diagram (positive logic)**



**absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>**

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, $\theta_{JA}$ (see Note 2)	347°C/W
Storage temperature range, $T_{stg}$	–65°C to 150°C

<sup>†</sup> 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	4.5	5.5	V
$V_{IH}$ High-level input voltage	2		V
$V_{IL}$ Low-level input voltage		0.8	V
$V_I$ Input voltage	0	5.5	V
$V_O$ Output voltage	0	$V_{CC}$	V
$I_{OH}$ High-level output current		–8	mA
$I_{OL}$ Low-level output current		8	mA
$T_A$ 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 <sub>CC</sub>	T <sub>A</sub> = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
V <sub>T+</sub> Positive-going input threshold voltage		4.5 V	1.9			1.9		V
		5.5 V	2.1			2.1		
V <sub>T−</sub> Negative-going input threshold voltage		4.5 V	0.5			0.5		V
		5.5 V	0.6			0.6		
ΔV <sub>T</sub> Hysteresis (V <sub>T+</sub> − V <sub>T−</sub> )		4.5 V	0.4			0.4	1.4	V
		5.5 V	0.4			0.4	1.5	
V <sub>OH</sub>	I <sub>OH</sub> = −50 μA	4.5 V	4.4	4.5		4.4		V
	I <sub>OH</sub> = −8 mA	4.5 V	3.94			3.8		
V <sub>OL</sub>	I <sub>OL</sub> = 50 μA	4.5 V	0.1			0.1		V
	I <sub>OL</sub> = 8 mA	4.5 V	0.36			0.44		
I <sub>I</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5.5 V	±0.1			±1		μA
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V	1			10		μA
ΔI <sub>CC</sub> <sup>†</sup>	One input at 3.4 V, Other inputs at V <sub>CC</sub> or GND	5.5 V	1.35			1.5		mA
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5 V	2		10	10		pF

<sup>†</sup> This is the increase in supply current for each input at one of the specified TTL voltage levels rather than 0 V or V<sub>CC</sub>.

**switching characteristics over recommended operating free-air temperature range,  
V<sub>CC</sub> = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T <sub>A</sub> = 25°C			MIN	MAX	UNIT
				MIN	TYP	MAX			
t <sub>PLH</sub>	A or B	Y	C <sub>L</sub> = 15 pF	5			1	8	ns
t <sub>PHL</sub>				5			1	8	
t <sub>PLH</sub>	A or B	Y	C <sub>L</sub> = 50 pF	5.5			1	9	ns
t <sub>PHL</sub>				5.5			1	9	

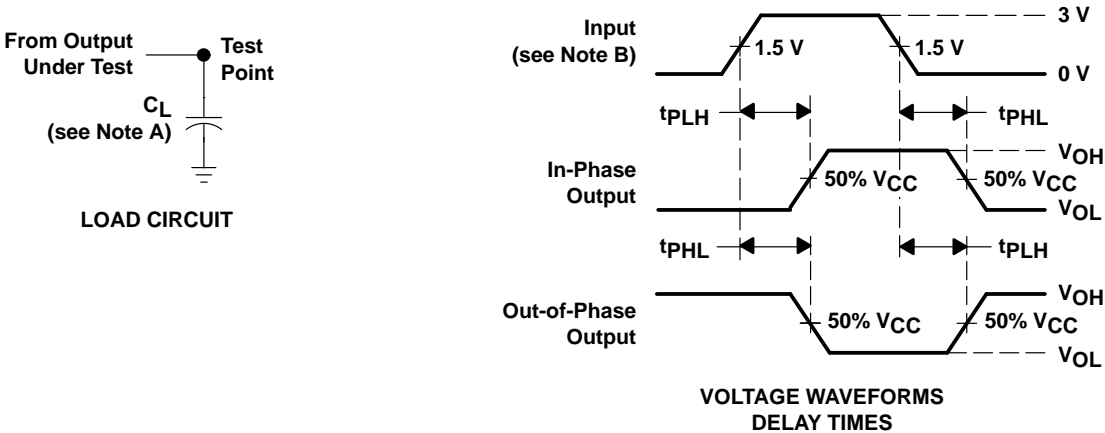
**operating characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C**

PARAMETER	TEST CONDITIONS	TYP	UNIT
C <sub>pd</sub> Power dissipation capacitance	No load, f = 1 MHz		pF

**PRODUCT PREVIEW**

SN74AHCT1G132  
SINGLE POSITIVE-NAND GATE  
WITH SCHMITT-TRIGGER INPUTS  
SCLS356A – MAY 1997 – REVISED JUNE 1997

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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