- **Inputs Are TTL-Voltage Compatible**
- **Flow-Through Architecture Optimizes PCB Layout**
- **Center-Pin V_{CC} and GND Configurations Minimize High-Speed Switching Noise**
- **EPIC™ (Enhanced-Performance Implanted CMOS) 1-μm Process**
- **500-mA Typical Latch-Up Immunity at 125°C**
- **Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs**

54ACT11030 . . . J PACKAGE
74ACT11030 . . . D OR N PACKAGE
(TOP VIEW)

```
        ┌───∪───┐
    C  │ 1   14 │  D
    B  │ 2   13 │  E
    A  │ 3   12 │  F
  GND  │ 4   11 │  V_CC
    Y  │ 5   10 │  NC
   NC  │ 6    9 │  G
   NC  │ 7    8 │  H
        └───────┘
```

54ACT11030 . . . FK PACKAGE
(TOP VIEW)

```
          E  F  NC V_CC NC
          3  2  1  20  19
      D  │ 4            18 │  G
     NC  │ 5            17 │  NC
      C  │ 6            16 │  H
     NC  │ 7            15 │  NC
      B  │ 8            14 │  NC
          9  10 11 12 13
          A  GND NC Y  NC
```

NC – No internal connection

description

These devices contain a single 8-input NAND gate and perform the following Boolean functions in positive logic:

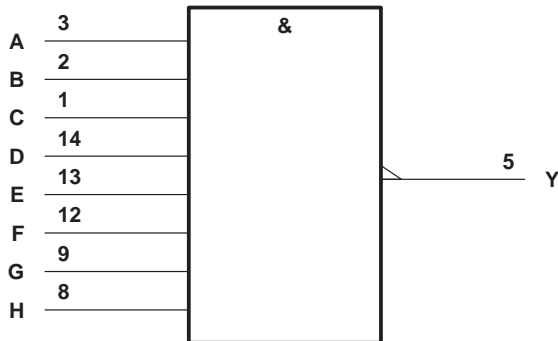$$Y = \overline{A \bullet B \bullet C \bullet D \bullet E \bullet F \bullet G \bullet H} \text{ or}$$
$$Y = \overline{A} + \overline{B} + \overline{C} + \overline{D} + \overline{E} + \overline{F} + \overline{G} + \overline{H}$$

The 54ACT11030 is characterized for operation over the full military temperature range of −55°C to 125°C. The 74ACT11030 is characterized for operation from −40°C to 85°C.

FUNCTION TABLE

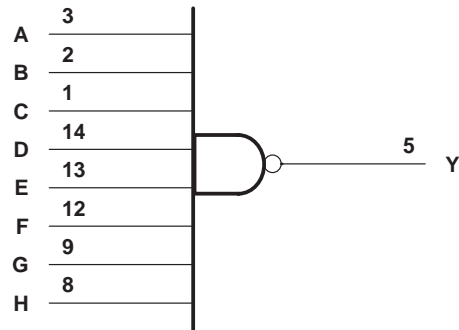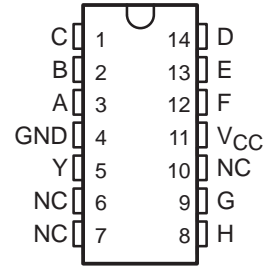| INPUTS A THRU H	OUTPUT Y
All inputs H	L
One or more inputs L	H

logic symbol†

logic diagram (positive logic)

† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
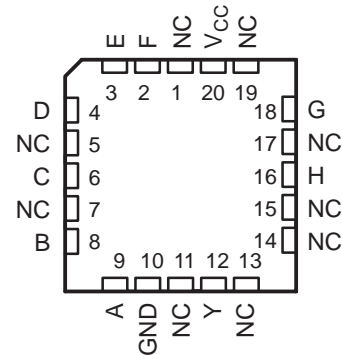Pin numbers shown are for the D, J, and N packages.

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TEXAS INSTRUMENTS

54ACT11030, 74ACT11030
8-INPUT POSITIVE-NAND GATES

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

Supply voltage range, V_{CC} .... −0.5 V to 6 V
Input voltage range, V_I (see Note 1) .... −0.5 V to V_{CC} + 0.5 V
Output voltage range, V_O (see Note 1) .... −0.5 V to V_{CC} + 0.5 V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$) .... ±20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$) .... ±50 mA
Continuous output current, I_O (V_O = 0 to V_{CC}) .... ±50 mA
Continuous current through V_{CC} or GND .... ±100 mA
Storage temperature range .... −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.
NOTE 1: The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

recommended operating conditions

		54ACT11030		74ACT11030		UNIT
		MIN	MAX	MIN	MAX	
V_{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V_{IH}	High-level input voltage	2		2		V
V_{IL}	Low-level input voltage		0.8		0.8	V
V_I	Input voltage	0	V_{CC}	0	V_{CC}	V
V_O	Output voltage	0	V_{CC}	0	V_{CC}	V
I_{OH}	High-level output current		−24		−24	mA
I_{OL}	Low-level output current		24		24	mA
$\Delta t/\Delta v$	Input transition rise or fall rate	0	10	0	10	ns/V
T_A	Operating free-air temperature	−55	125	−40	85	°C

TEXAS
INSTRUMENTS

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

PARAMETER	TEST CONDITIONS		V_{CC}	$T_A = 25°C$			54ACT11030		74ACT11030		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}	$I_{OH} = -50\ \mu A$		4.5 V	4.4			4.4		4.4		V
			5.5 V	5.4			5.4		5.4		
	$I_{OH} = -24\ mA$		4.5 V	3.94			3.7		3.8		
			5.5 V	4.94			4.7		4.8		
	$I_{OH} = -50\ mA$†		5.5 V				3.85				
	$I_{OH} = -75\ mA$†		5.5 V						3.85		
V_{OL}	$I_{OL} = 50\ \mu A$		4.5 V			0.1		0.1		0.1	V
			5.5 V			0.1		0.1		0.1	
	$I_{OL} = 24\ mA$		4.5 V			0.36		0.5		0.44	
			5.5 V			0.36		0.5		0.44	
	$I_{OL} = 50\ mA$†		5.5 V					1.65			
	$I_{OL} = 75\ mA$†		5.5 V							1.65	
I_I	$V_I = V_{CC}$ or GND		5.5 V			±0.1		±1		±1	μA
I_{CC}	$V_I = V_{CC}$ or GND,	$I_O = 0$	5.5 V			4		80		40	μA
ΔI_{CC}‡	One input at 3.4 V, Other inputs at V_{CC} or GND		5.5 V			0.9		1		1	mA
C_i	$V_I = V_{CC}$ or GND		5 V		3.5						pF

† Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.
‡ This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0 V or V_{CC}.

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)	$T_A = 25°C$			54ACT11030		74ACT11030		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A thru H	Y	1.5	5.4	8.1	1.5	8.8	1.5	8.5	ns
t_{PHL}			1.5	5.9	7.8	1.5	9.3	1.5	8.7	

operating characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS		TYP	UNIT
C_{pd}	Power dissipation capacitance per gate	C_L = 50 pF,	f = 1 MHz	41	pF

TEXAS
INSTRUMENTS

PARAMETER MEASUREMENT INFORMATION

LOAD CIRCUIT

From Output
Under Test

C_L = 50 pF
(see Note A)

500 Ω

VOLTAGE WAVEFORMS

Input
(see Note B)

3 V

1.5 V   1.5 V

0 V

t_{PHL} t_{PLH}

Output
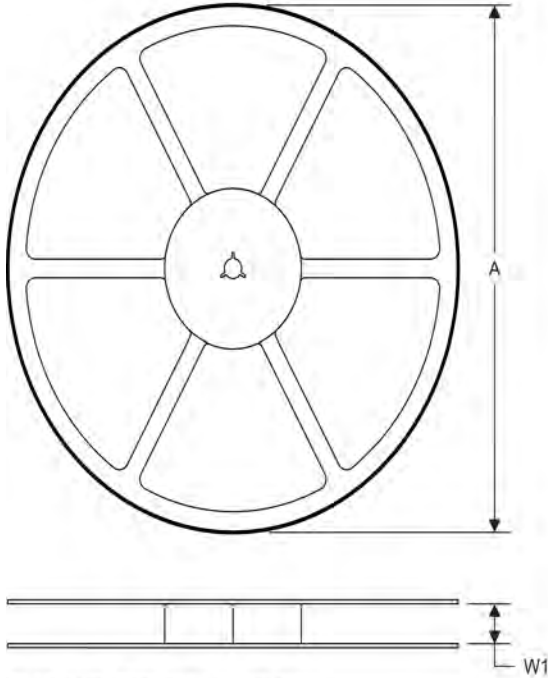
V_{OH}

50% V_{CC} 50% V_{CC}

V_{OL}
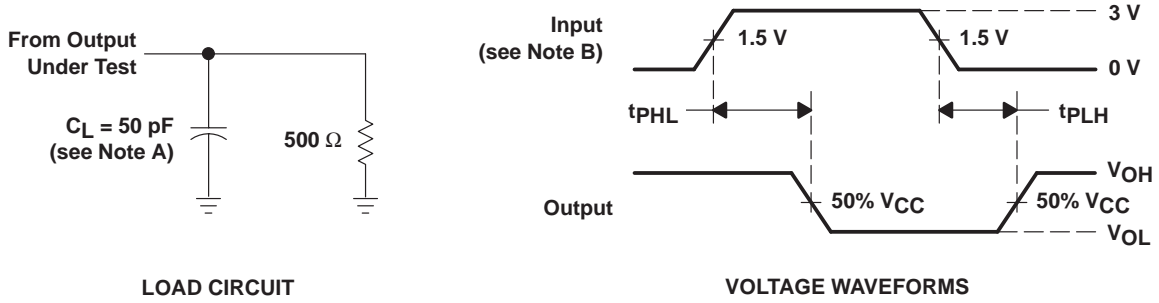
NOTES: A. C_L includes probe and jig capacitance.
B. Input pulses are supplied by generators having the following characteristics: PRR $\leq$ 10 MHz, Z_O = 50 Ω, t_r = 3 ns, t_f = 3 ns.
C. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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INSTRUMENTS

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PACKAGE MATERIALS INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS

TAPE DIMENSIONS
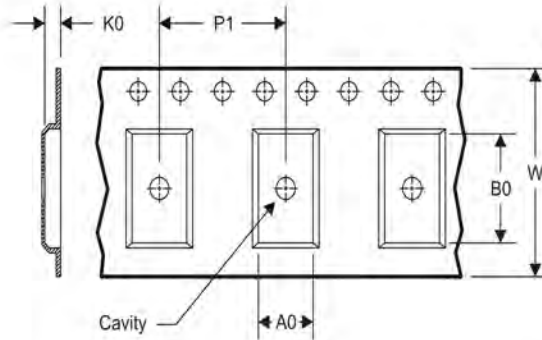
A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

TAPE AND REEL INFORMATION

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
74ACT11030DR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1

TAPE AND REEL BOX DIMENSIONS

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
74ACT11030DR	SOIC	D	14	2500	367.0	367.0	38.0

IMPORTANT NOTICE

Products		Applications	
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