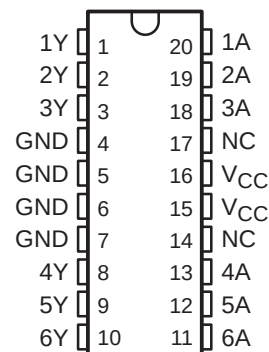


74ACT11004 HEX INVERTER

SCAS215B – JANUARY 1988 – REVISED JUNE 1997

- 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- μ m Process
- 500-mA Typical Latch-Up Immunity at 125°C
- Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB), and Thin Shrink Small-Outline (PW) Packages and Standard Plastic (N) 300-mil DIPs

DB, DW, N, OR PW PACKAGE
(TOP VIEW)



NC – No internal connection

description

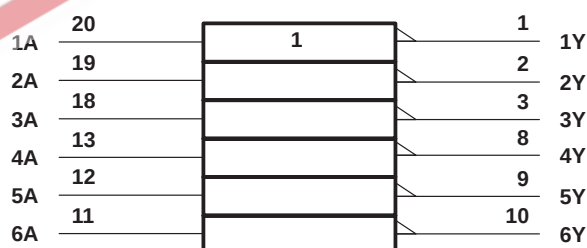
This device contains six independent inverters. It performs the Boolean function $Y = \bar{A}$.

The 74ACT11004 is characterized for operation from -40°C to 85°C .

FUNCTION TABLE
(each inverter)

INPUT A	OUTPUT Y
H	L
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**

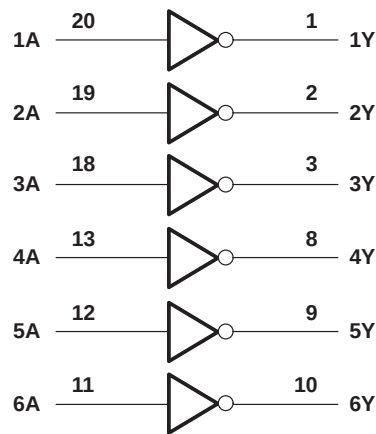
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74ACT11004
HEX INVERTER

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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 $V_{CC} + 0.5$ 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	±150 mA
Package thermal impedance, θ_{JA} (see Note 2):	
DB package	115°C/W
DW package	97°C/W
N package	67°C/W
PW package	128°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 JEDEC 51, except for through-hole packages, which use a trace length of zero.

recommended operating conditions

	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	V_{CC}	V
V_O Output voltage	0	V_{CC}	V
I_{OH} High-level output current		–24	mA
I_{OL} Low-level output current		24	mA
$\Delta t/\Delta v$ Input transition rise or fall rate	0	10	ns/V
T_A Operating free-air temperature	–40	85	°C

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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			MIN	MAX	UNIT
			MIN	TYP	MAX			
V _{OH}	I _{OH} = -50 µA	4.5 V	4.4			4.4		V
		5.5 V	5.4			5.4		
	I _{OH} = -24 mA	4.5 V	3.94			3.8		
		5.5 V	4.94			4.8		
	I _{OH} = -75 mA [†]	5.5 V				3.85		
V _{OL}	I _{OL} = 50 µA	4.5 V			0.1		0.1	V
		5.5 V			0.1		0.1	
	I _{OL} = 24 mA	4.5 V			0.36		0.44	
		5.5 V			0.36		0.44	
	I _{OL} = 75 mA [†]	5.5 V					1.65	
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			4		40	µA
ΔI _{CC} [‡]	One input at 3.4 V, Other inputs at GND or V _{CC}	5.5 V			0.9		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 ns.

[‡] 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 ranges of supply voltage and free-air temperature (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t _{PLH}	A	Y	1.5	5.3	9	1.5	9.7	ns
t _{PHL}			1.5	6.4	8.7	1.5	9.6	

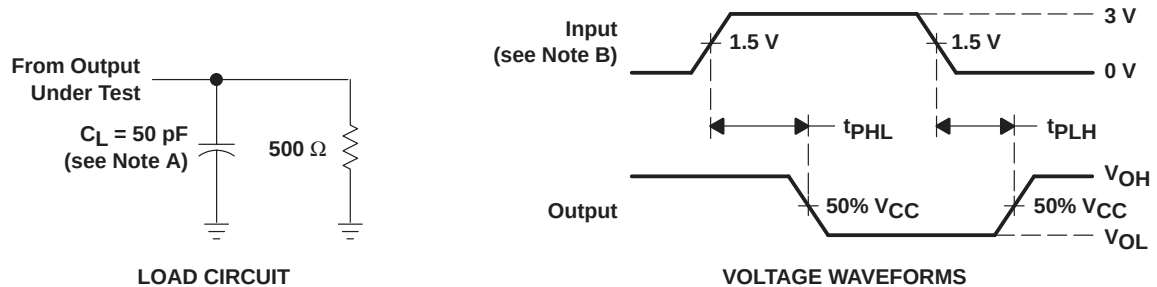
operating characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd} Power dissipation capacitance per inverter	C _L = 50 pF, f = 1 MHz	32	pF

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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 outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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