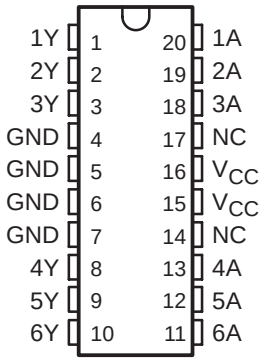
- **Inputs Are TTL-Voltage Compatible**
- **Flow-Through Architecture Optimizes PCB Layout**
- **Center-Pin V_{CC} and GND Configurations Minimize High-Speed Switching Noise**
- ***EPIC*™ (Enhanced-Performance Implanted CMOS) 1-μm Process**
- **500-mA Typical Latch-Up Immunity at 125°C**
- **Package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

DW OR N PACKAGE
(TOP VIEW)



description

The 74ACT11014 contains six independent inverters. The device performs the Boolean function $Y = \overline{A}$. Because of the Schmitt action, the device has different input threshold levels for positive-going (V_{T+}) and negative-going (V_{T-}) signals.

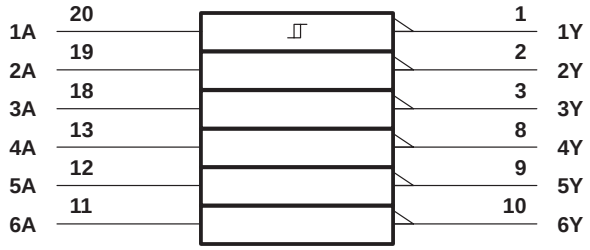
The 74ACT11014 is temperature compensated and can be triggered from the slowest of input ramps and still give clean, jitter-free output signals. It also has a greater noise margin than conventional inverters.

The 74ACT11014 is characterized for operation from −40°C to 85°C.

FUNCTION TABLE
(each inverter)

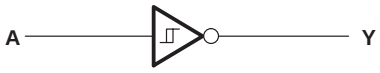
INPUT A	OUTPUT Y
H	L
L	H

logic symbol†



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

logic diagram, each inverter (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
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.

NOTE 1: The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

recommended operating conditions (see Note 2)

		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
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
T_A	Operating free-air temperature	−40		85	°C

NOTE 2: 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 threshold		4.5 V			2		2	V
		5.5 V			2		2	
V_{T-} Negative-going threshold		4.5 V			0.8		0.8	V
		5.5 V			0.8		0.8	
ΔV_T Hysteresis ($V_{T+} - V_{T-}$		4.5 V	0.4		1.2	0.4	1.2	V
		5.5 V	0.4		1.2	0.4	1.2	
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 V_{CC} or GND	5.5 V			0.9		1	mA
C_i	$V_I = V_{CC}$ or GND	5 V		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}.

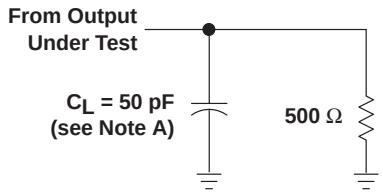
switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t_{PLH}	A	Y	2.3	5.6	8.4	2.3	9.2	ns
t_{PHL}			3.3	6.4	8.3	3.3	9.5	

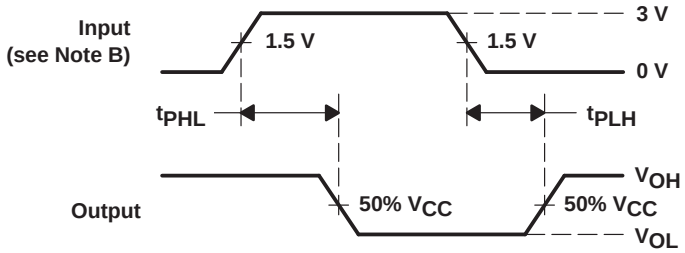
operating characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance	No Load, f = 1 MHz	30	pF

PARAMETER MEASUREMENT INFORMATION



LOAD CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. C_L includes probe and jig capacitance.
B. Input pulses are supplied by generators having the following characteristics: PRR ≤ 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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