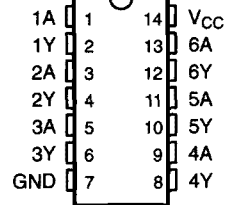


# SN74LVC14 HEX SCHMITT-TRIGGER INVERTER

MARCH 1993

- **Space-Saving Package Option: Shrink Small-Outline Package (DB)**  
Features EIAJ 0.65-mm Lead Pitch
- **EPIC™ (Enhanced-Performance Implanted CMOS) Submicron Process**
- **Designed to Facilitate Incident Wave Switching for Line Impedances of 50 Ω or Greater**
- **Typical  $V_{OLP}$  (Output Ground Bounce)**  
< 0.8 V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- **Typical  $V_{OHV}$  (Output  $V_{OH}$  Undershoot)**  
> 2 V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)**
- **Latch-Up Performance Exceeds 250 mA Per JEDEC Standard JESD-17**
- **Package Options Include Plastic Small-Outline and Thin Shrink Small-Outline Packages**

D, DB, OR PW PACKAGE  
(TOP VIEW)



## description

This hex Schmitt-trigger inverter is designed for 2.7-V to 3.6-V  $V_{CC}$  operation.

The SN74LVC14 contains six independent inverters. The device performs the Boolean function  $Y = \bar{A}$ .

The SN74LVC14 is packaged in TI's shrink small-outline package (DB), which provides the same I/O pin count and functionality of standard small-outline packages in less than half the printed-circuit-board area.

The SN74LVC14 is characterized for operation from  $-40^\circ\text{C}$  to  $85^\circ\text{C}$ .

FUNCTION TABLE  
(each Inverter)

INPUT A	OUTPUT Y
H	L
L	H

PRODUCT PREVIEW

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TEXAS  
INSTRUMENTS

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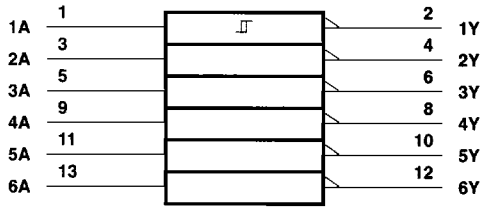
4-29

# SN74LVC14

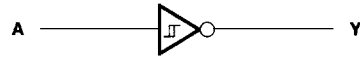
## HEX SCHMITT-TRIGGER INVERTER

MARCH 1993

### logic symbol†



### logic diagram, each inverter (positive logic)



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

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

Supply voltage range, $V_{CC}$	-0.5 V to 4.6 V
Input voltage range, $V_I$ (see Note 1)	-0.5 V to 4.6 V
Output voltage range, $V_O$ (see Notes 1 and 2)	-0.5 V to $V_{CC} + 0.5$ V
Input clamp current, $I_{IK}$ ( $V_I < 0$ )	-50 mA
Output clamp current, $I_{OK}$ ( $V_O < 0$ or $V_O > V_{CC}$ )	$\pm 50$ mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ )	$\pm 50$ mA
Continuous current through $V_{CC}$ or GND pins	$\pm 100$ mA
Maximum power dissipation at $T_A = 55^\circ\text{C}$ (in still air):	
D package	0.7 W
DB package	0.4 W
PW package	0.4 W
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.

NOTES: 1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.  
2. This value is limited to 4.6 V maximum.

### recommended operating conditions (see Note 3)

		MIN	MAX	UNIT
$V_{CC}$	Supply voltage	2.7	3.6	V
$V_{IH}$	High-level input voltage	$V_{CC} = 2.7$ V to 3.6 V		V
$V_{IL}$	Low-level input voltage	$V_{CC} = 2.7$ V to 3.6 V		V
$V_I$	Input voltage	0	$V_{CC}$	V
$V_O$	Output voltage	0	$V_{CC}$	V
$I_{OH}$	High-level output current	$V_{CC} = 2.7$ V	-12	mA
		$V_{CC} = 3$ V	-24§	
$I_{OL}$	Low-level output current	$V_{CC} = 2.7$ V	12	mA
		$V_{CC} = 3$ V	24§	
$\Delta t/\Delta v$	Input transition rise or fall rate	0	10	ns/V
$T_A$	Operating free-air temperature	-40	85	°C

NOTE 3: Unused or floating inputs must be held high or low.

§ Current duty cycle  $\leq 50\%$ ,  $f \geq 1$  kHz

PRODUCT PREVIEW

# SN74LVC14 HEX SCHMITT-TRIGGER INVERTER

MARCH 1993

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

PARAMETER	TEST CONDITIONS	V <sub>CC</sub> <sup>†</sup>	MIN	TYP	MAX	UNIT
V <sub>IK</sub>	I <sub>I</sub> = -18 mA	2.7 V			-1.2	V
V <sub>OH</sub>	I <sub>OH</sub> = -100 μA	MIN to MAX	V <sub>CC</sub> -0.2			V
	I <sub>OH</sub> = -12 mA	2.7 V	2.2			
		3 V	2.4			
	I <sub>OH</sub> = -24 mA	3 V	2			
V <sub>OL</sub>	I <sub>OL</sub> = 100 μA	MIN to MAX			0.2	V
	I <sub>OL</sub> = 12 mA	2.7 V			0.4	
	I <sub>OL</sub> = 24 mA	3 V			0.55	
I <sub>I</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	3.6 V			±5	μA
I <sub>OZ</sub>	V <sub>O</sub> = V <sub>CC</sub> or GND	3.6 V			±10	μA
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	3.6 V			20	μA
ΔI <sub>CC</sub>	V <sub>CC</sub> = 3 V to 3.6 V, One input at V <sub>CC</sub> - 0.6 V, Other inputs at V <sub>CC</sub> or GND				500	μA
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	3.3 V	TBD			pF
C <sub>o</sub>	V <sub>O</sub> = V <sub>CC</sub> or GND	3.3 V	TBD			pF

<sup>†</sup> For conditions shown as MIN or MAX, use the appropriate values under recommended operating conditions.

**PRODUCT PREVIEW**

