

## Logic

Order code	Manufacturer code	Description
83-0548	SN74LS14N	74LS14 HEX SCHMITT TRIGGER INVERTER DIL

Logic	Page 1 of 7
The enclosed information is believed to be correct, Information may change 'without notice' due to product improvement. Users should ensure that the product is suitable for their use. E. & O. E.	Revision A 04/07/2003

## DM74LS14

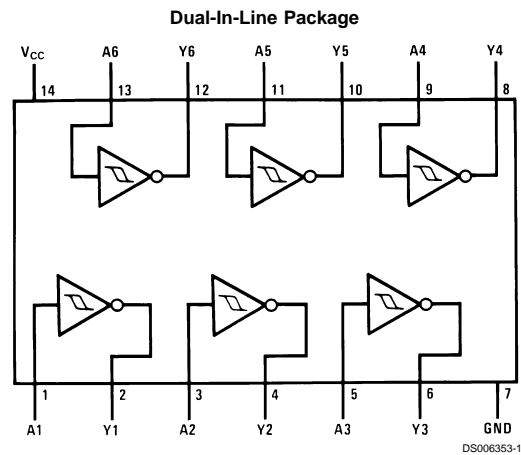
### Hex Inverters with Schmitt Trigger Inputs

#### General Description

This device contains six independent gates each of which performs the logic INVERT function. Each input has hys-

teresis which increases the noise immunity and transforms a slowly changing input signal to a fast changing, jitter free output.

#### Connection Diagram



Order Number 54LS14DMQB, 54LS14FMQB,  
54LS14LMQB, DM74LS14M or DM74LS14N  
See Package Number E20A, J14A, M14A, N14A or W14B

#### Function Table

$$Y = \overline{A}$$

Input	Output
A	Y
L	H
H	L

H = High Logic Level  
L = Low Logic Level

**Absolute Maximum Ratings** (Note 1)

Supply Voltage

Input Voltage

Operating Free Air Temperature Range

7V

7V

54LS

DM74LS

Storage Temperature Range

–55°C to +125°C

0°C to +70°C

–65°C to +150°C

**Recommended Operating Conditions**

Symbol	Parameter	54LS14			DM74LS14			Units
		Min	Nom	Max	Min	Nom	Max	
V <sub>CC</sub>	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V <sub>T+</sub>	Positive-Going Input Threshold Voltage (Note 2)	1.5	1.6	2.0	1.4	1.6	1.9	V
V <sub>T–</sub>	Negative-Going Input Threshold Voltage (Note 2)	0.6	0.8	1.1	0.5	0.8	1	V
HYS	Input Hysteresis (Note 2)	0.4	0.8		0.4	0.8		V
I <sub>OH</sub>	High Level Output Current			–0.4			–0.4	mA
I <sub>OL</sub>	Low Level Output Current			4			8	mA
T <sub>A</sub>	Free Air Operating Temperature	–55		125	0		70	°C

**Note 1:** The “Absolute Maximum Ratings” are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the “Electrical Characteristics” table are not guaranteed at the absolute maximum ratings. The “Recommended Operating Conditions” table will define the conditions for actual device operation.

**Electrical Characteristics**

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

Symbol	Parameter	Conditions	Min	Typ (Note 3)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = –18 mA			–1.5	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OH</sub> = Max V <sub>IL</sub> = Max	54LS DM74	2.5 2.7	3.4 3.4	V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max V <sub>IH</sub> = Min V <sub>CC</sub> = Min, I <sub>OL</sub> = 4 mA	54LS DM74 DM74	0.25 0.35 0.25	0.4 0.5 0.4	V
I <sub>T+</sub>	Input Current at Positive-Going Threshold	V <sub>CC</sub> = 5V, V <sub>I</sub> = V <sub>T+</sub>	DM74		–0.14	mA
I <sub>T–</sub>	Input Current at Negative-Going Threshold	V <sub>CC</sub> = 5V, V <sub>I</sub> = V <sub>T–</sub>	DM74		–0.18	mA
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 7V V <sub>CC</sub> = Max, V <sub>I</sub> = 10.0V	DM74 54LS		0.1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.7V			20	µA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V			–0.4	mA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 4)	54LS DM74	–20 –20	–100 –100	mA
I <sub>CCH</sub>	Supply Current with Outputs High	V <sub>CC</sub> = Max		8.6	16	mA
I <sub>CCL</sub>	Supply Current with Outputs Low	V <sub>CC</sub> = Max		12	21	mA

**Note 2:** V<sub>CC</sub> = 5V.

**Note 3:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

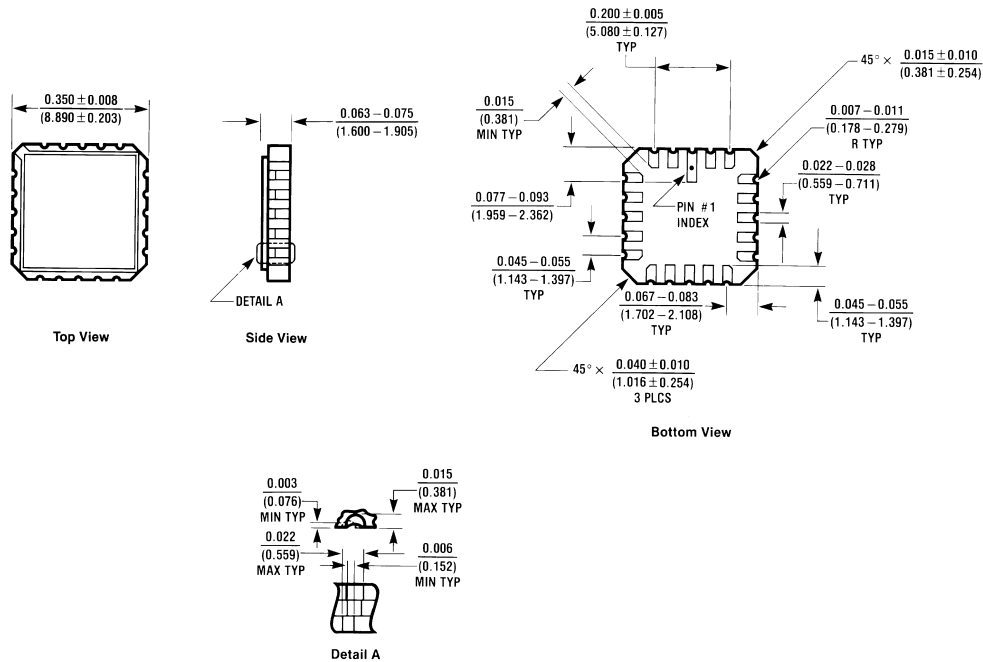
**Note 4:** Not more than one output should be shorted at a time, and the duration should not exceed one second.

## Switching Characteristics

at  $V_{CC} = 5V$  and  $T_A = 25^\circ C$  (See for Test Waveforms and Output Load)

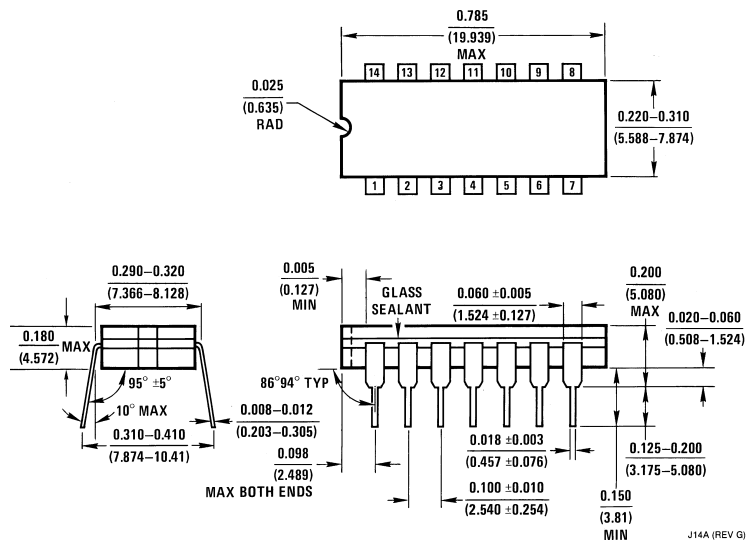
Symbol	Parameter	R <sub>L</sub> = 2 kΩ				Units
		C <sub>L</sub> = 15 pF		C <sub>L</sub> = 50 pF		
		Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay Time Low to High Level Output	5	22	8	25	ns
t <sub>PHL</sub>	Propagation Delay Time High to Low Level Output	5	22	10	33	ns

## Physical Dimensions inches (millimeters) unless otherwise noted



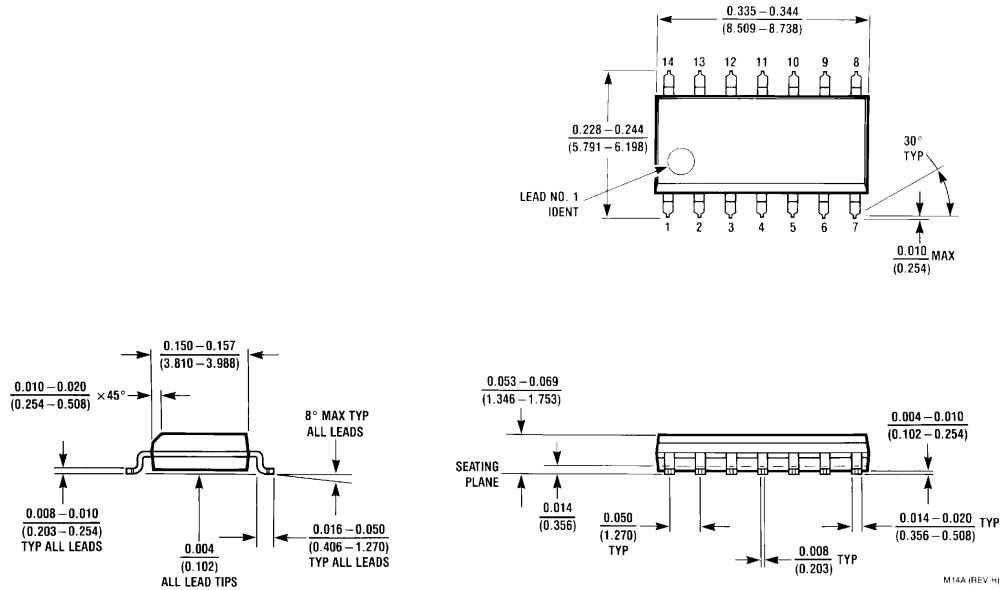
E20A (REV D)

**Ceramic Leadless Chip Carrier (E)**  
Order Number 54LS14LMQB  
Package Number E20A

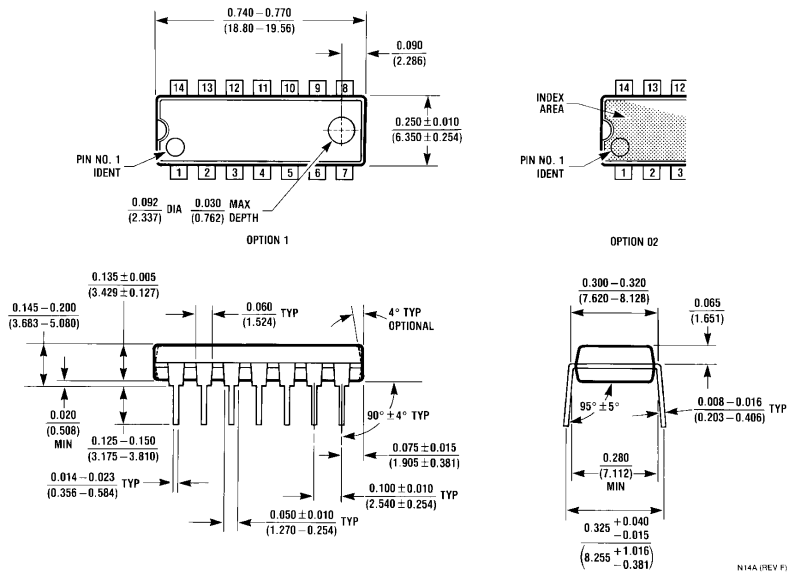


**14-Lead Ceramic Dual-In-Line Package (J)**  
Order Number 54LS14DMQB  
Package Number J14A

**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



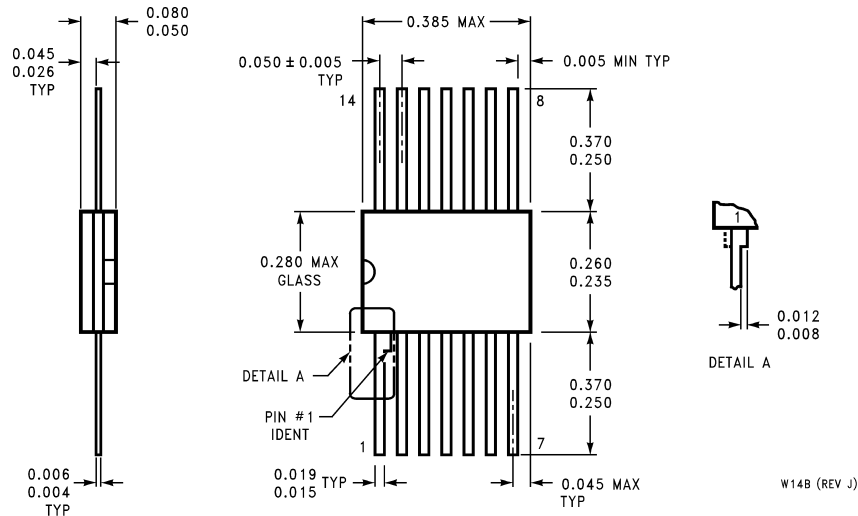
**14-Lead Small Outline Molded Package (M)**  
Order Number DM74LS14M  
Package Number M14A



**14-Lead Molded Dual-In-Line Package (N)**  
Order Number DM74LS14N  
Package Number N14A

# DM74LS14 Hex Inverters with Schmitt Trigger Inputs

## Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



**14-Lead Ceramic Flat Package (W)**  
**Order Number 54LS14MQB**  
**Package Number W14B**

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