

## DM74LS02 Quad 2-Input NOR Gates

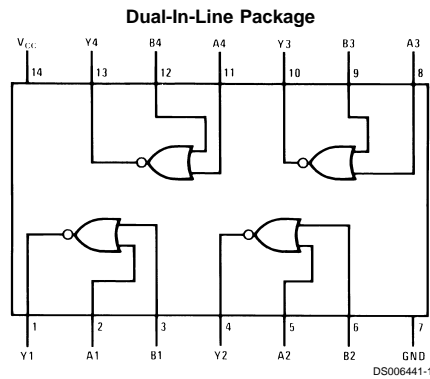
### General Description

This device contains four independent gates each of which performs the logic NOR function.

### Features

- Alternate Military/Aerospace device (54LS02) is available. Contact a Fairchild Semiconductor Sales Office/Distributor for specifications

### Connection Diagram



Order Number 54LS02DMQB, 54LS02FMQB, 54LS02LMQB, DM54LS02J, DM54LS02W,  
DM74LS02M or DM74LS02N  
See Package Number E20A, J14A, M14A, N14A or W14B

### Function Table

$$Y = \overline{A + B}$$

Inputs		Output
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

H = High Logic Level  
L = Low Logic Level

## Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	
DM54LS and 54LS	-55°C to +125°C
DM74LS	0°C to +70°C

Storage Temperature Range -65°C to +150°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.

## Recommended Operating Conditions

Symbol	Parameter	DM54LS02			DM74LS02			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>IH</sub>	High Level Input Voltage	2			2			V
V <sub>IL</sub>	Low Level Input Voltage			0.7			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

## Electrical Characteristics

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

Symbol	Parameter	Conditions	Min	Typ (Note 2)	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	DM54	2.5	3.4	V
			DM74	2.7	3.4	
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max, V <sub>IH</sub> = Min	DM54	0.25	0.4	V
			DM74	0.35	0.5	
		I <sub>OL</sub> = 4 mA, V <sub>CC</sub> = Min	DM74	0.25	0.4	
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 7V			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			-0.40	mA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 3)	DM54	-20	-100	mA
			DM74	-20	-100	
I <sub>CCH</sub>	Supply Current with Outputs High	V <sub>CC</sub> = Max		1.6	3.2	mA
I <sub>CCL</sub>	Supply Current with Outputs Low	V <sub>CC</sub> = Max		2.8	5.4	mA

## Switching Characteristics

at V<sub>CC</sub> = 5V and T<sub>A</sub> = 25°C (See Section 1 for Test Waveforms and Output Load)

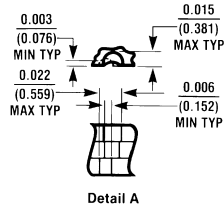
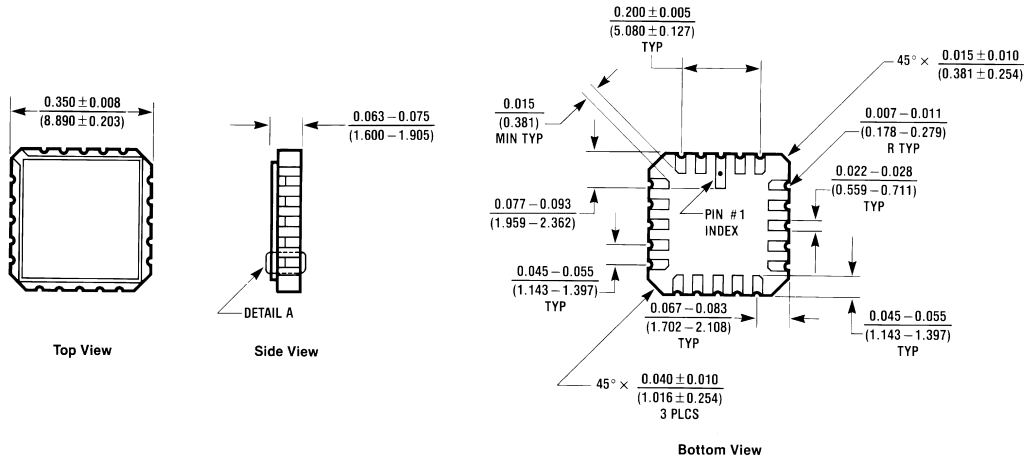
Symbol	Parameter	R <sub>L</sub> = 2 kΩ				Units
		C <sub>L</sub> = 15 pF		C <sub>L</sub> = 50 pF		
		Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay Time Low to High Level Output		13		18	ns
t <sub>PHL</sub>	Propagation Delay Time High to Low Level Output		10		15	ns

**Note 2:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

**Note 3:** Not more than one output should be shorted at a time, and the duration should not exceed one second.

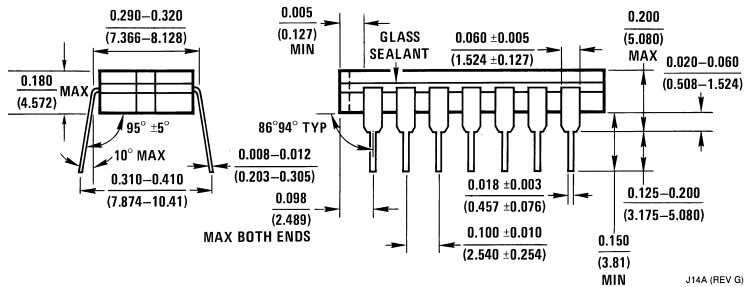
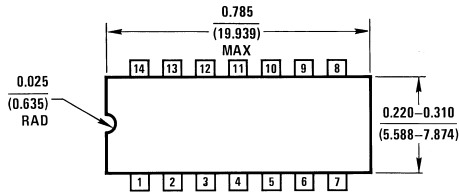


**Physical Dimensions** inches (millimeters) unless otherwise noted



**Ceramic Leadless Chip Carrier Package (E)**  
**Order Number 54LS02LMQB**  
**Package Number E20A**

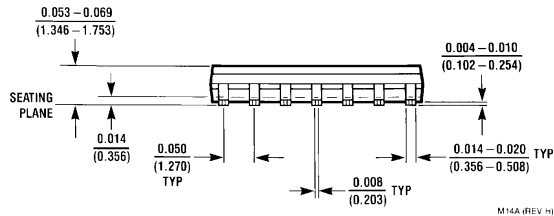
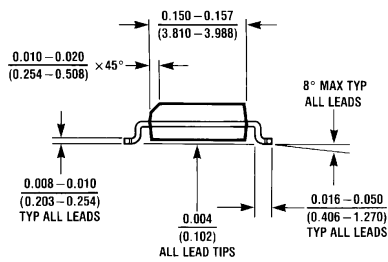
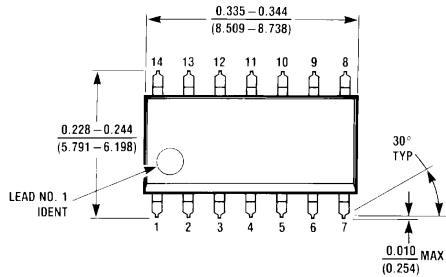
E20A (REV D)



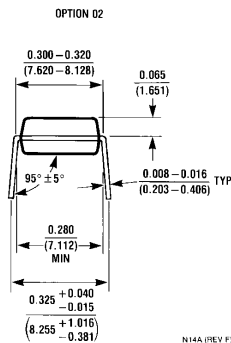
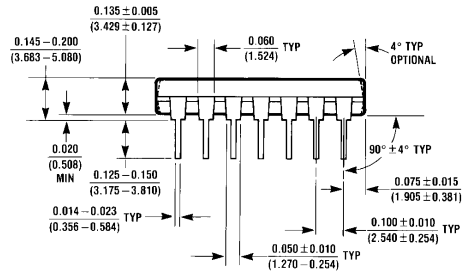
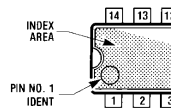
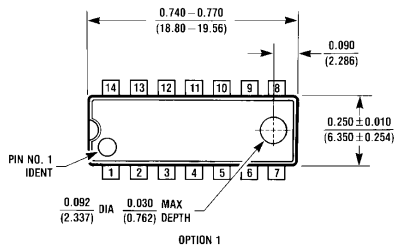
**14-Lead Ceramic Dual-In-Line Package (J)**  
**Order Number 54LS02DMQB or DM54LS02J**  
**Package Number J14A**

J14A (REV G)

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

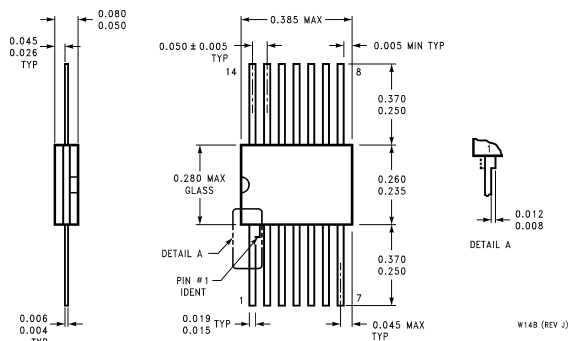


**14-Lead Small Outline Molded Package (M)**  
**Order Number DM74LS02M**  
**Package Number M14A**



**14-Lead Molded Dual-In-Line Package (N)**  
**Order Number DM74LS02N**  
**Package Number N14A**

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



**14-Lead Ceramic Flat Package (W)**  
**Order Number 54LS02FMQB or DM54LS02W**  
**Package Number W14B**

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