

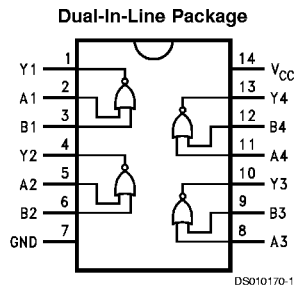
# DM74LS33

## Quad 2-Input NOR Buffer with Open-Collector Outputs

### General Description

This device contains four independent gates each of which perform the logic NOR function. Outputs are open-collector.

### Connection Diagram



Order Number DM54LS33J, DM54LS33W DM74LS33M or DM74LS33N  
See Package Number 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

DM74LS33 Quad 2-Input NOR Buffer with Open-Collector Outputs

## Absolute Maximum Ratings (Note 1)

Supply Voltage	7V	Operating Free Air Temperature Range	54LS	-55°C to +125°C
Input Voltage	7V		DM74LS	0°C to +70°C
Output Voltage	7V	Storage Temperature Range		-65°C to +150°C

## Recommended Operating Conditions

Symbol	Parameter	DM54LS33			DM74LS33			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
V <sub>OH</sub>	High Level Output Voltage			5.5			5.5	V
I <sub>OL</sub>	Low Level Output Current			12			24	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)

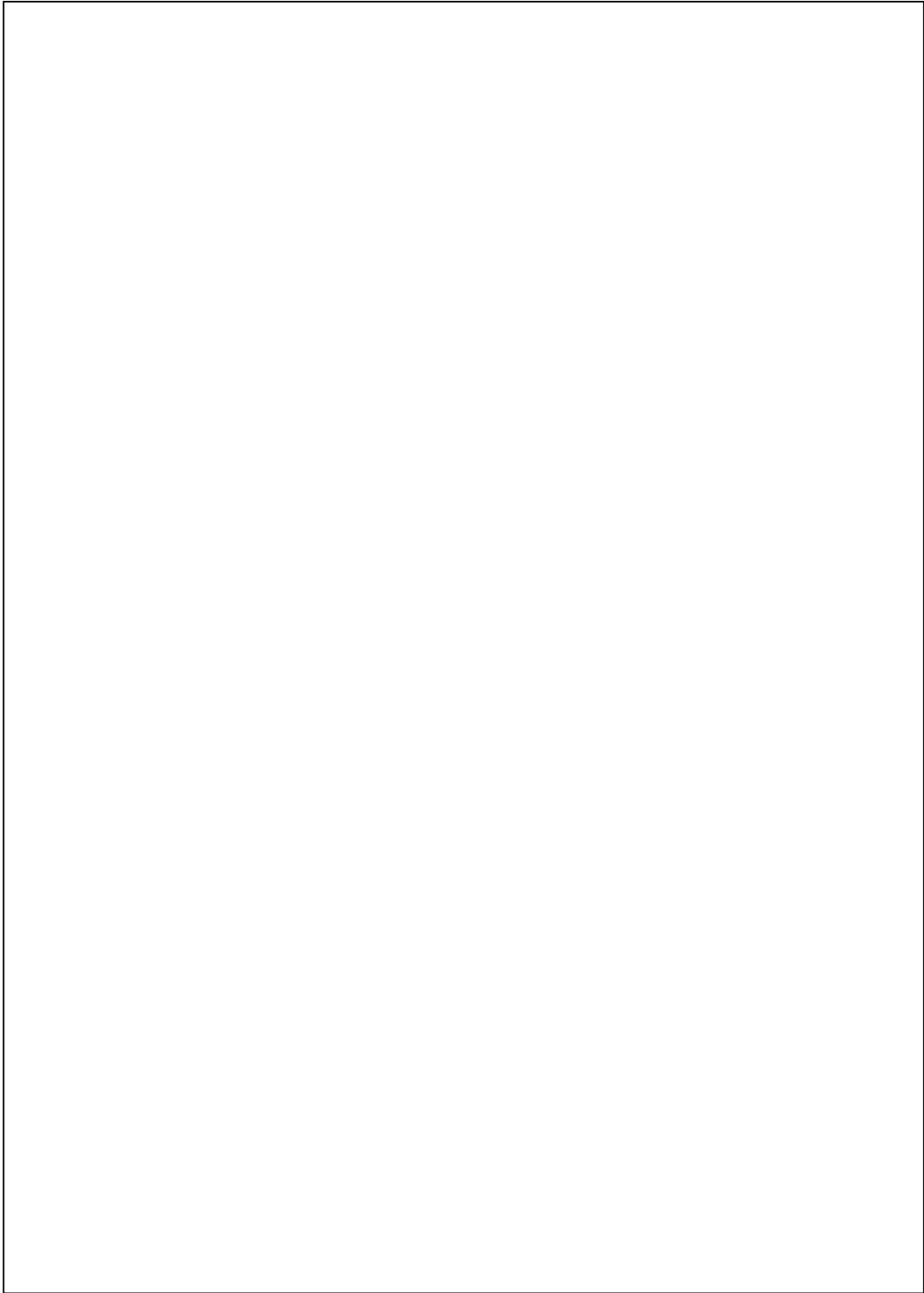
Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -18 mA			-1.5	V
I <sub>CEX</sub>	High Level Output Current	V <sub>CC</sub> = Min, V <sub>O</sub> = 5.5V, V <sub>IL</sub> = Max			100	μA
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max,	DM54		0.4	V
		V <sub>IH</sub> = Min	DM74		0.5	
		I <sub>OL</sub> = 12 mA, V <sub>CC</sub> = Min	DM74		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			-0.4	mA
I <sub>COH</sub>	Supply Current with Outputs High	V <sub>CC</sub> = Max V <sub>IN</sub> = GND			3.6	mA
I <sub>COL</sub>	Supply Current with Outputs Low	V <sub>CC</sub> = Max V <sub>IN</sub> = Open			13.8	mA

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

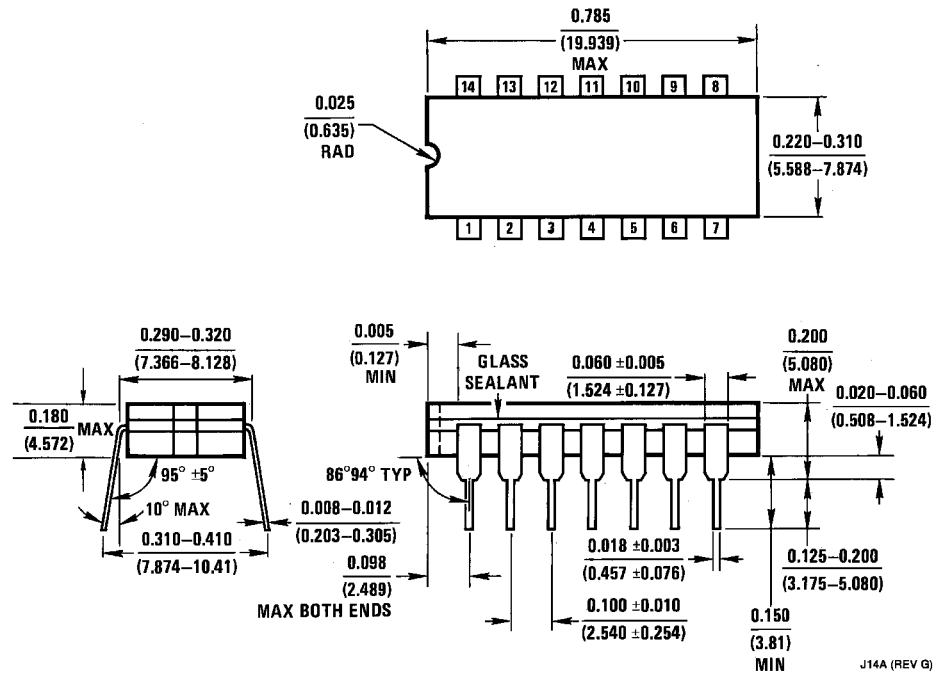
## Switching Characteristics

at V<sub>CC</sub> = 5V and T<sub>A</sub> = 25°C

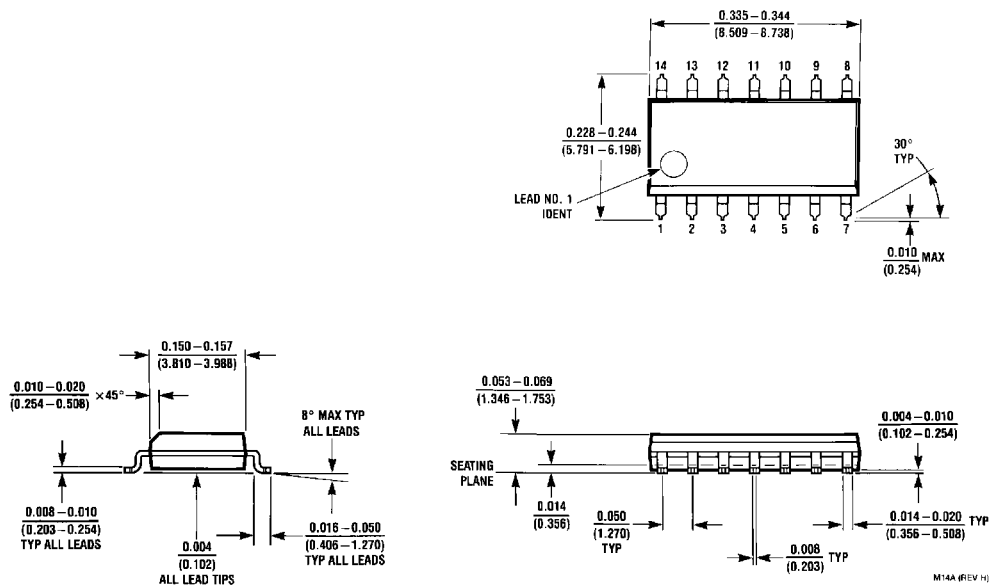
Symbol	Parameter	R <sub>L</sub> = 2 kΩ C <sub>L</sub> = 15 pF		Units
		Min	Max	
t <sub>PLH</sub>	Propagation Delay Time Low to High Level Output		22	ns
t <sub>PHL</sub>	Propagation Delay Time High to Low Level Output		22	ns



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

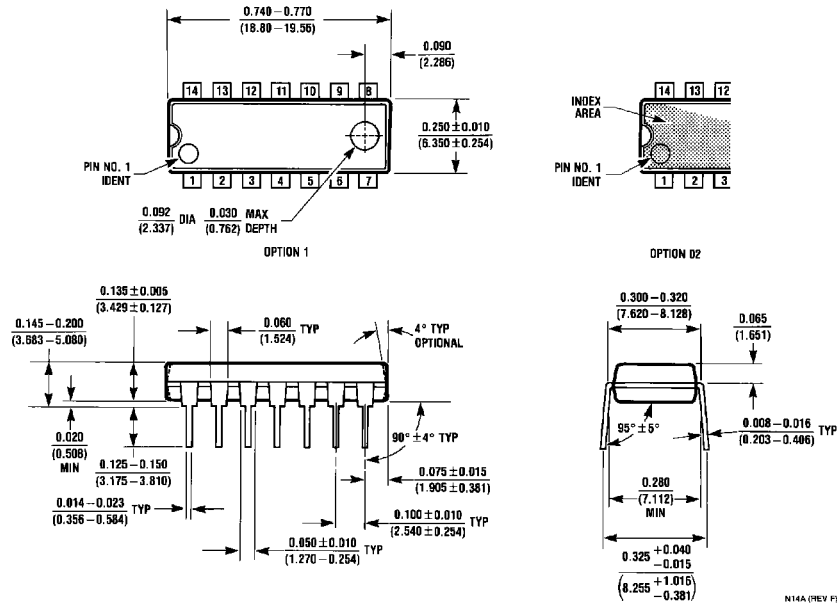


14-Lead Ceramic Dual-In-Line Package (J)  
Order Number DM54LS33J  
Package Number J14A

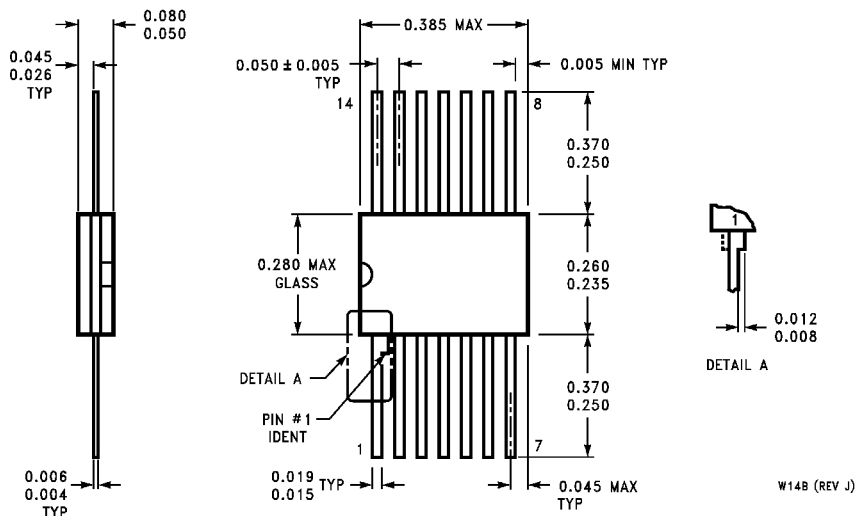


14-Lead Small Outline Molded Package (M)  
Order Number DM74LS33M  
Package Number M14A

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



**14-Lead Molded Dual-In-Line Package (N)**  
**Order Number DM74LS33N**  
**Package Number N14A**



**14-Lead Ceramic Flat Package (W)**  
**Order Number DM54LS33W**  
**Package Number W14B**