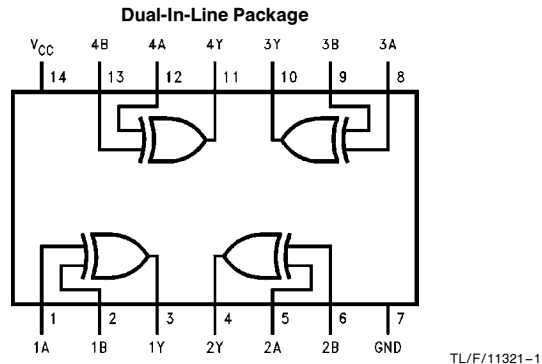


## DM74LS386 Quad 2-Input Exclusive-OR Gates

### General Description

This device contains four independent gates each of which performs the logic exclusive-OR function.

### Connection Diagram



**Order Number DM74LS386N**  
See NS Package Number N14A

### Function Table

$$Y = A \oplus B = \bar{A}B + A\bar{B}$$

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

H = High Logic Level  
L = Low Logic Level

## Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	7V
Storage Temperature Range	-65°C to +150°C

Note: The "Absolute Maximum Ratings" are those values beyond which the safety of the device can not 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	DM74LS386			Units
		Min	Nom	Max	
V <sub>CC</sub>	Supply Voltage	4.75	5	5.25	V
V <sub>IH</sub>	High Level Input Voltage	2			V
V <sub>IL</sub>	Low Level Input Voltage			0.8	V
I <sub>OH</sub>	High Level Output Current			-0.4	mA
I <sub>OL</sub>	Low Level Output Current			8	mA
T <sub>A</sub>	Free Air Operating Temperature	0		70	°C

## Electrical Characteristics over recommended operating free air temperature unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ (Note 1)	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, V <sub>IH</sub> = Min	2.7	3.4		V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max, V <sub>IL</sub> = Max, V <sub>IH</sub> = Min		0.35	0.5	V
		I <sub>IL</sub> = 4 mA, V <sub>CC</sub> = Min		0.25	0.4	
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 7V			0.2	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.7V			40	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V			-0.8	mA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 2)	-20		-100	mA
I <sub>CC</sub>	Supply Current with Outputs Low	V <sub>CC</sub> = Max, (Note 3)			10	mA

**Note 1:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

**Note 2:** Not more than one output should be shorted at a time, and the duration should not exceed one second.

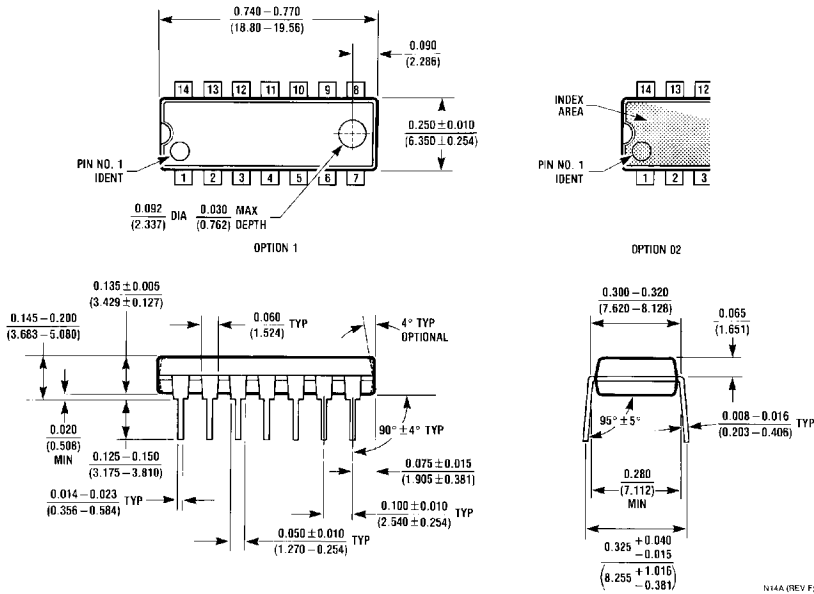
**Note 3:** I<sub>CC</sub> is measured with all outputs open, and all inputs grounded.

## Switching Characteristics

at  $V_{CC} = 5V$  and  $T_A = 25^\circ C$

Symbol	Parameter	Conditions	$R_L = 2\text{ k}\Omega$		Units
			$C_L = 50\text{ pF}$		
			Min	Max	
$t_{PLH}$	Propagation Delay Time Low to High Level Output	Other Input Low		23	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output			17	ns
$t_{PLH}$	Propagation Delay Time Low to High Level Output	Other Input High		30	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output			22	

**Physical Dimensions** inches (millimeters)



**Order Number DM74LS386N**  
**NSC Package Number N14A**

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