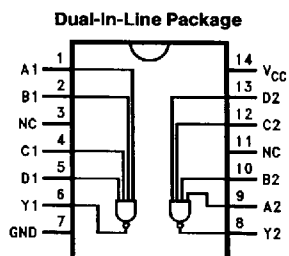


DM74LS40 Dual 4-Input NAND Buffer

General Description

This device contains two independent gates each of which perform the logic NAND function.

Connection Diagrams



TL/F/10171-1

Order Number DM74LS40M or DM74LS40N
See NS Package Number M14A or N14A

Function Table

(Each Gate)

Inputs				Outputs
A	B	C	D	Y
H	H	H	H	L
L	X	X	X	H
X	L	X	X	H
X	X	L	X	H
X	X	X	L	H

Logic Diagram (Each Gate)



TL/F/10171-2

Positive Logic

$$Y = \overline{A \cdot B \cdot C \cdot D} \quad \text{or} \quad Y = \overline{A} + \overline{B} + \overline{C} + \overline{D}$$

Absolute Maximum Ratings (Note)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range DM74LS	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

Note: 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	DM74LS40			Units
		Min	Nom	Max	
V_{CC}	Supply Voltage	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			V
V_{IL}	Low Level Input Voltage			0.8	V
I_{OH}	High Level Output Current			−1.2	mA
I_{OL}	Low Level Output Current			24	mA
T_A	Free Air Operating Temperature	0		70	°C

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

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V_I	Input Clamp Voltage	$V_{CC} = \text{Min}, I_I = -18 \text{ mA}$			−1.5	V
V_{OH}	High Level Output Voltage	$V_{CC} = \text{Min}, I_{OH} = \text{Max}, V_{IL} = \text{Max}$	2.7			V
V_{OL}	Low Level Output Voltage	$V_{CC} = \text{Min}, I_{OL} = \text{Max}, V_{IH} = \text{Min}$			0.5	V
		$I_{OL} = 12 \text{ mA}, V_{CC} = \text{Min}$			0.4	
I_I	Input Current @ Max Input Voltage	$V_{CC} = \text{Max}, V_I = 7 \text{ V}$			0.1	mA
I_{IH}	High Level Input Current	$V_{CC} = \text{Max}, V_I = 2.7 \text{ V}$			20	μA
I_{IL}	Low Level Input Current	$V_{CC} = \text{Max}, V_I = 0.4 \text{ V}$			−0.4	mA
I_{OS}	Short Circuit Output Current	$V_{CC} = \text{Max}$ (Note 2)	−30		−130	mA
I_{CCH}	Supply Current with Outputs High	$V_{CC} = \text{Max}, V_{IN} = \text{GND}$			1.0	mA
I_{CCL}	Supply Current with Outputs Low	$V_{CC} = \text{Max}, V_{IN} = \text{OPEN}$			6.0	mA

Note 1: All typicals are at $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$.

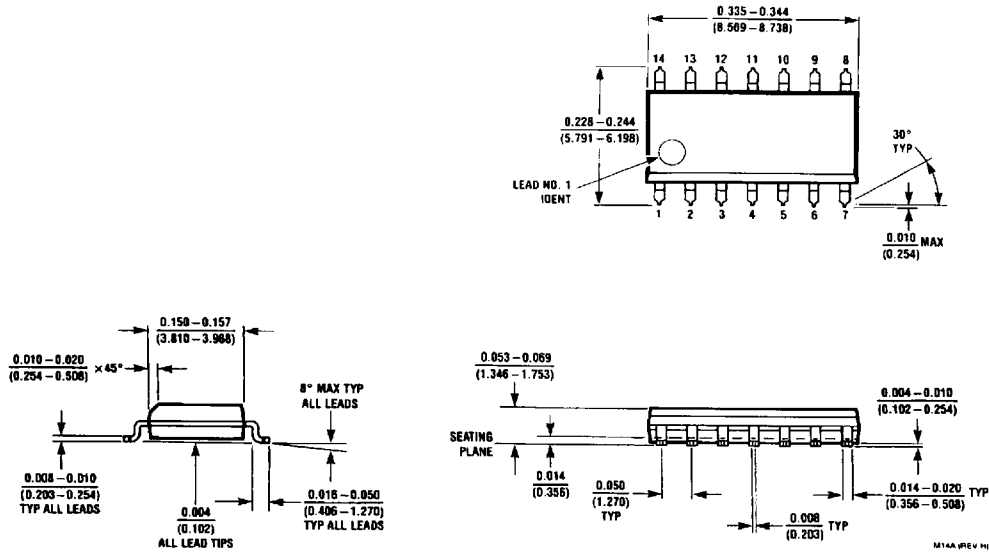
Note 2: Note more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics

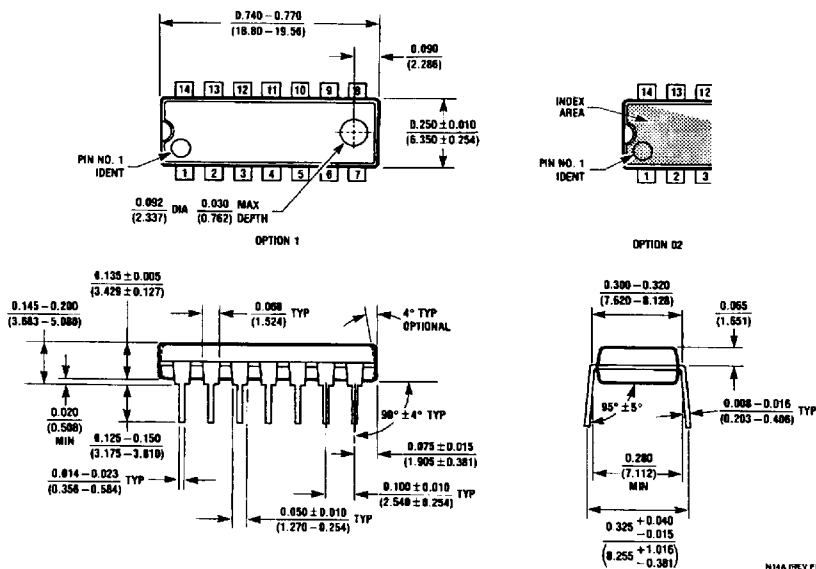
$V_{CC} = +5.0V$, $T_A = +25^\circ C$

Symbol	Parameter	$R_L = 2 k\Omega$ $C_L = 15 pF$		Units
		Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output		24	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		24	ns

Physical Dimensions inches (millimeters)



14-Lead Small Outline Molded Package (M)
Order Number DM74LS40M
NS Package Number M14A

Physical Dimensions inches (millimeters) (Continued)**LIFE SUPPORT POLICY**

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National Semiconductor Corporation
 1111 West Bardin Road
 Arlington, TX 76017
 Tel: 1(800) 272-9959
 Fax: 1(800) 737-7018

National Semiconductor Europe
 Fax: (+49) 0-180-530 85 86
 Email: cnlwg@tevm2.nsc.com
 Deutsch Tel: (+49) 0-180-530 85 85
 English Tel: (+49) 0-180-532 78 32
 Français Tel: (+49) 0-180-532 93 58
 Italiano Tel: (+49) 0-180-534 16 80

National Semiconductor Hong Kong Ltd.
 13th Floor, Straight Block,
 Ocean Centre, 5 Canton Rd.
 Tsimshatsui, Kowloon
 Hong Kong
 Tel: (852) 2737-1600
 Fax: (852) 2736-9960

National Semiconductor Japan Ltd.
 Tel: 81-043-299-2309
 Fax: 81-043-299-2408

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