

August 1986 Revised May 2000

DM74S00 Quad 2-Input NAND Gate

General Description

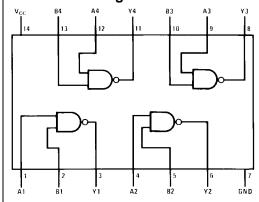
This device contains four independent gates each of which performs the logic NAND function.

Ordering Code:

Order Number	Package Number	Package Description				
DM74S00M	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow				
DM74S00N	N14A	14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide				

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagram



Function Table

Inputs		Output
Α	В	Y
L	L	Н
L	Н	Н
Н	L	Н
Н	Н	L

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

H = HIGH Logic Level L = LOW Logic Level

Absolute Maximum Ratings(Note 1)

Supply Voltage \$7V\$ Input Voltage \$5.5V\$ Operating Free Air Temperature Range $$0^{\circ}C$$ to +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 tables 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	Min	Nom	Max	Units
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	mA
I _{OL}	LOW Level Output Current			20	mA
T _A	Free Air Operating Temperature	0		70	°C

-65°C to +150°C

Electrical Characteristics

Storage Temperature Range

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

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
VI	Input Clamp Voltage	V _{CC} = Min, I _I = -18 mA			-1.2	V
V _{OH}	HIGH Level Output Voltage	V _{CC} = Min, I _{OH} = Max V _{IL} = Max	2.7	3.4		V
V _{OL}	LOW Level Output Voltage	$V_{CC} = Min, I_{OL} = Max$ $V_{IH} = Min$			0.5	V
I _I	Input Current @ Max Input Voltage	$V_{CC} = Max, V_I = 5.5V$			1	mA
I _{IH}	HIGH Level Input Current	$V_{CC} = Max, V_I = 2.7V$			50	μΑ
I _{IL}	LOW Level Input Current	$V_{CC} = Max, V_I = 0.5V$			-2	mA
Ios	Short Circuit Output Current	V _{CC} = Max (Note 3)	-40		-100	mA
I _{CCH}	Supply Current with Outputs HIGH	V _{CC} = Max		10	16	mA
I _{CCL}	Supply Current with Outputs LOW	V _{CC} = Max		20	36	mA

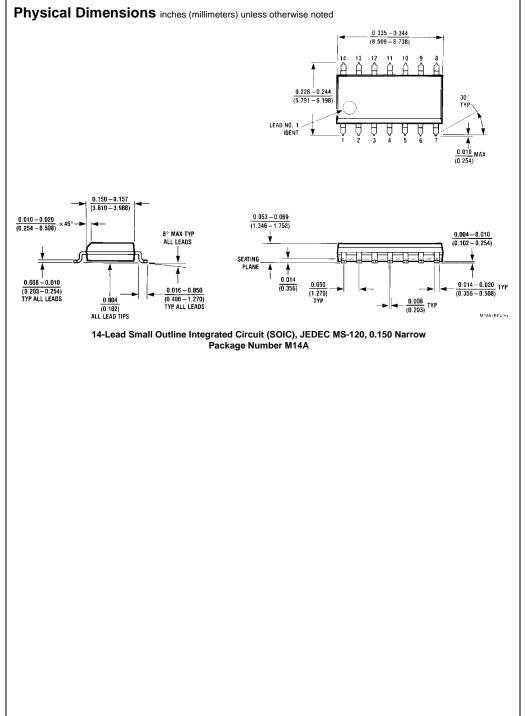
Switching Characteristics

at $\rm V_{CC} = 5V$ and $\rm T_A = 25^{\circ}C$ (See Section 1 for Test Waveforms and Output Load)

		$R_L = 280\Omega$				
Symbol	Parameter	C _L = 15 pF		C _L = 50 pF		Units
		Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time	2	4.5	2	7	ns
	LOW-to-HIGH Level Output	2	4.5	2	,	115
t _{PHL}	Propagation Delay Time	2	5	2	8	ns
	HIGH-to-LOW Level Output		3	2	o	115

Note 2: All typicals are at $V_{CC} = 5V$, $T_A = 25$ °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 (Continued) $\frac{0.740 - 0.770}{(18.80 - 19.56)}$ 0.090 (2.286) 14 13 12 11 10 9 14 13 12 0.250 ± 0.010 (6.350 ± 0.254 PIN NO. 1 1 2 3 4 5 6 7 1 2 3 $\frac{0.092}{(2.337)}$ DIA $\frac{0.030}{(0.762)}$ MAX OPTION 1 OPTION 02 0.135 ± 0.005 $\frac{0.300 - 0.320}{(7.620 - 8.128)}$ (3.429 ± 0.127) 0.065 (1.651) (3.683 - 5.080)0.020 0.008 - 0.016 (0.203 - 0.406) TYP 95°±5 $\frac{0.125 - 0.150}{(3.175 - 3.810)}$ 0.075 ±0.015 (1.905 ±0.381) 0.280 (7.112)-MIN $\frac{0.014 - 0.023}{(0.356 - 0.584)}$ TYP $\frac{0.100 \pm 0.010}{(2.540 \pm 0.254)} \text{ TYP}$

14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N14A

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 $\frac{0.325 + 0.040 \\
-0.015}{(8.255 + 1.016) \\
-0.381}$

N14A (REV F)

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