

September 1986 Revised February 2000

DM74ALS1000A Quadruple 2-Input NAND Buffer

General Description

These devices contain four independent 2-input buffer/drivers, each of which performs the logic NAND function. The DM74ALS1000A is a buffer/driver version of the DM74ALS00A.

Features

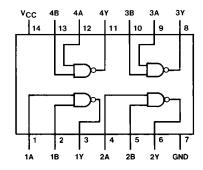
- Switching specifications at 50 pF
- \blacksquare Switching specifications guaranteed over full temperature and V_{CC} range
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Improved line receiving characteristics

Ordering Code:

Order Number	Package Number	Package Description
DM74ALS1000AM	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow
DM74ALS1000AN	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

$$Y = \overline{AB}$$

Inp	Output			
Α	В	Υ		
L	L	Н		
L	Н	Н		
Н	L	Н		
Н	Н	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 0 $^{\circ}$ C to +70 $^{\circ}$ C

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

Typical θ_{JA}

N Package 83.0°C/W

M Package 114.0°C/W

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	4.5	5	5.5	V
V _{IH}	HIGH Level Input Voltage	2			V
V _{IL}	LOW Level Input Voltage			0.8	V
I _{OH}	HIGH Level Output Current			-2.6	mA
I _{OL}	LOW Level Output Current			24	mA
T _A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

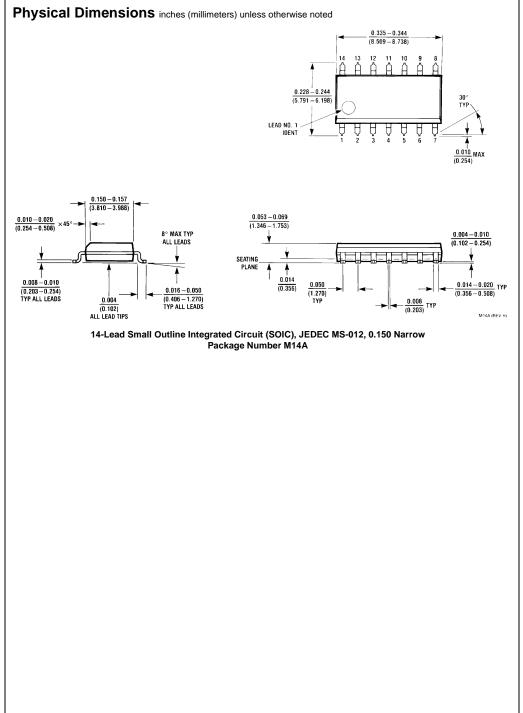
 $over \ recommended \ operating \ free \ air \ temperature \ range. \ All \ typical \ values \ are \ measured \ at \ V_{CC} = 5V, \ T_A = 25^{\circ}C.$

Symbol	Parameter	Conditions		Min	Тур	Max	Units
V _{IK}	Input Clamp Voltage	$V_{CC} = 4.5V$, $I_I = -18 \text{ mA}$				-1.5	V
V _{OH}	HIGH Level	V _{CC} = 4.5V	I _{OH} = Max	2.4	3.2		V
	Output Voltage	$V_{IL} = V_{IL} Max$	IOH INGX		0.2		
		$V_{CC} = 4.5V \text{ to } 5.5V$	$I_{OH} = -400 \mu A$	V _{CC} – 2			V
V _{OL}	LOW Level	V _{CC} = 4.5V	$I_{OL} = 12 \text{ mA}$		0.25	0.4	V
	Output Voltage	$V_{IH} = 2V$	$I_{OL} = 24 \text{ mA}$		0.35	0.5	V
II	Input Current at Maximum Input Voltage	$V_{CC} = 5.5V, V_{IH} = 7V$	-			0.1	mA
I _{IH}	HIGH Level Input Current	$V_{CC} = 5.5V, V_{IH} = 2.7V$				20	μΑ
I _{IL}	LOW Level Input Current	$V_{CC} = 5.5V, V_{IL} = 0.4V$				-0.1	mA
Io	Output Drive Current	$V_{CC} = 5.5V, V_{O} = 2.25V$		-30		-112	mA
I _{CCH}	Supply Current with Outputs HIGH	$V_{CC} = 5.5V, V_{I} = 0V$			0.86	1.6	mA
I _{CCL}	Supply Current with Outputs LOW	$V_{CC} = 5.5V, V_{I} = 4.5V$			4.8	7.8	mA

Switching Characteristics

over recommended operating free air temperature range

Symbol	Parameter	Conditions	Min	Max	Units
t _{PLH}	Propagation Delay Time	V _{CC} = 4.5V to 5.5V	2	8	ns
	LOW-to-HIGH Level Output	$R_L = 500\Omega$		0	115
t _{PHL}	Propagation Delay Time	C _L = 50 pF	2	7	
	HIGH-to-LOW Level Output		2	,	ns



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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) $\frac{0.008 - 0.016}{(0.203 - 0.406)} \text{ TYP}$ 95°±5 0.020 $\frac{0.125 - 0.150}{(3.175 - 3.810)}$ 0.075 ±0.015 (1.905 ±0.381) 0.280 (7.112)-MIN $\frac{0.014 - 0.023}{(0.356 - 0.584)}$ TYP $\frac{0.100 \pm 0.010}{(2.540 \pm 0.254)} \text{ TYP}$ 1.270 ± 0.010 (1.270 − 0.254) $0.325 ^{\,+\,0.040}_{\,-\,0.015}$ $8.255 + 1.016 \\ -0.381$

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

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N14A (REV F)