FAIRCHILD SEMICONDUCTOR™

February 1998

DM74ALS37A
Quadruple 2-Input NAND Buffer

General Description

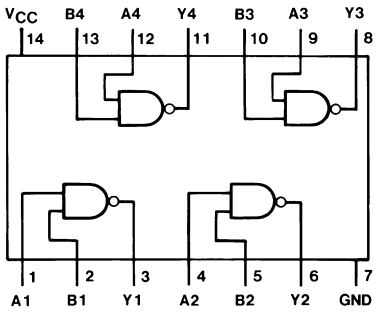
This device contains four independent gates, each of which performs the logic NAND function.

Features

- Switching specifications at 50 pF
- Switching specifications guaranteed over full temperature and V_{CC} range
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Functionally and pin for pin compatible with LS TTL counterpart
- Improved AC performance over LS37
- Improved line receiving characteristics

Connection Diagram

Dual-In-Line Package



Order Number DM74ALS37AM or DM74ALS37AN
See Package Number M14A or N14A

Function Table

$$Y = \overline{AB}$$

Inputs		Output
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	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	
DM74ALS	0˚C to +70˚C
Storage Temperature Range	−65˚C to +150˚C
Typical θ_{JA}	
N Package	83.0˚C/W
M Package	114.0˚C/W

Recommended Operating Conditions

Symbol	Parameter	DM74ALS37A			Units
		Min	Nom	Max	
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

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. All typical values are measured at V_{CC} = 5V, T_A = 25˚C.

Symbol	Parameter	Conditions		Min	Typ	Max	Units
V_{IK}	Input Clamp Voltage	V_{CC} = 4.5V, I_I = −18 mA				−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = 4.5V, V_{IL} = Max	I_{OH} = −2.6 mA	2.4	3.3		V
		I_{OH} = −400 µA		V_{CC} − 2			V
V_{OL}	Low Level Output Voltage	V_{CC} = 4.5V, V_{IH} = 2V	I_{OL} = 12 mA		0.25	0.4	V
			I_{OL} = 24 mA		0.35	0.5	V
I_I	Input Current @ Max. 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	µA
I_{IL}	Low Level Input Current	V_{CC} = 5.5V, V_{IL} = 0.4V				−0.1	mA
I_O	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			4.0	7.8	mA

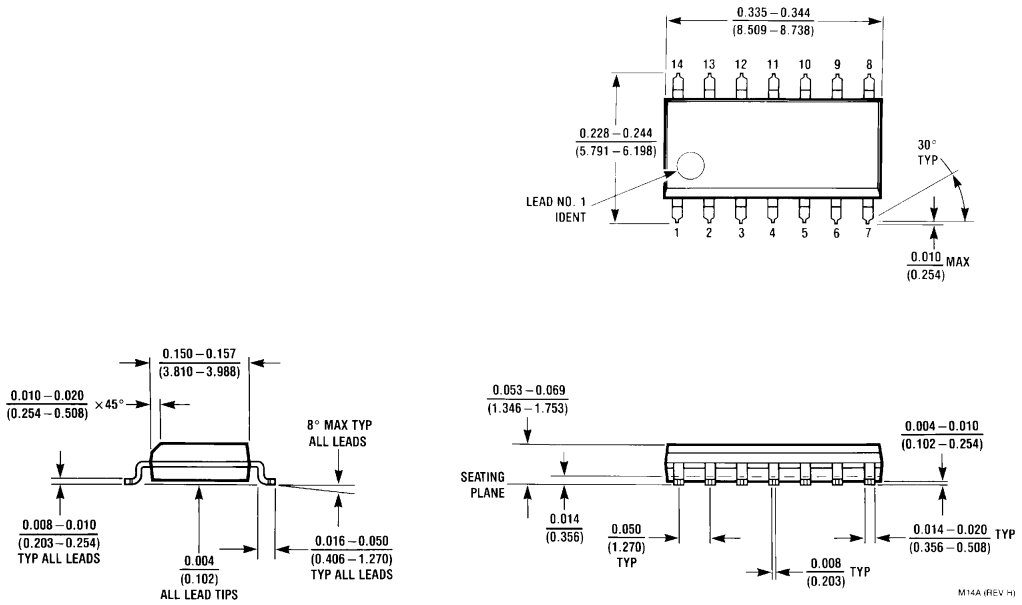
Switching Characteristics

over recommended operating free air temperature range (Note 2)

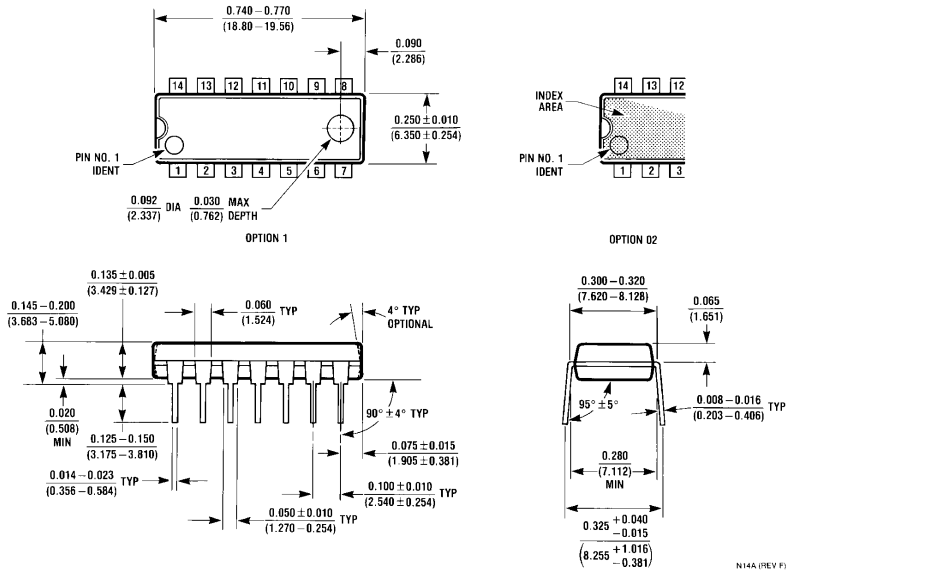
Symbol	Parameter	Conditions	DM74ALS37A		Units
			Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output	V_{CC} = 4.5V to 5.5V, R_L = 500Ω, C_L = 50 pF	2	8	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		2	7	ns

Note 2: See Section 1 for test waveforms and output load.

Physical Dimensions inches (millimeters) unless otherwise noted



S.O. Package (M)
Order Number DM74ALS37AM
Package Number M14A



Molded Dual-In-Line Package (N)
Order Number DM74ALS37AN
Package Number N14A

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