FAIRCHILD SEMICONDUCTOR™

March 1998

DM74LS30
8-Input NAND Gate

General Description

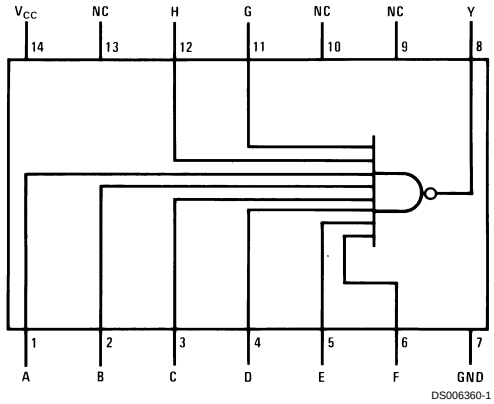
This device contains a single gate which performs the logic NAND function.

Features

- Alternate Military/Aerospace device (54LS30) is available. Contact a Fairchild Semiconductor Sales Office/Distributor for specifications.

Connection Diagram

Dual-In-Line Package



Order Number 54LS30DMQB, 54LS30FMQB, 54LS30LMQB, DM54LS30J, DM54LS530W, DM74LS30M or DM74LS30N
See Package Number E20A, J14A, M14A, N14A or W14B

Function Table

$$Y = \overline{ABCDEFGH}$$

Inputs	Output
A thru H	**Y**
All Inputs H	L
One or More Input L	H

H = High Logic Level
L = Low Logic Level

Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	
DM54LS and 54LS	−55˚C to +125˚C
DM74LS	0˚C to +70˚C
Storage Temperature Range	−65˚C to +150˚C

Recommended Operating Conditions

Symbol	Parameter	DM54LS30			DM74LS30			Units
		Min	Nom	Max	Min	Nom	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			2			V
V_{IL}	Low Level Input Voltage			0.7			0.8	V
I_{OH}	High Level Output Current			−0.4			−0.4	mA
I_{OL}	Low Level Output Current			4			8	mA
T_A	Free Air Operating Temperature	−55		125	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 (unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ (Note 2)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −18 mA				−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max, V_{IL} = Max	DM54	2.5	3.4		V
			DM74	2.7	3.4		
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max, V_{IH} = Min	DM54		0.25	0.4	V
			DM74		0.35	0.5	
		I_{OL} = 4 mA, V_{CC} = Min	DM74		0.25	0.4	
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 7V				0.1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.7V				20	µA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V				−0.4	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 3)	DM54	−20		−100	mA
			DM74	−20		−100	
I_{CCH}	Supply Current with Outputs High	V_{CC} = Max			0.35	0.5	mA
I_{CCL}	Supply Current with Outputs Low	V_{CC} = Max			0.6	1.1	mA

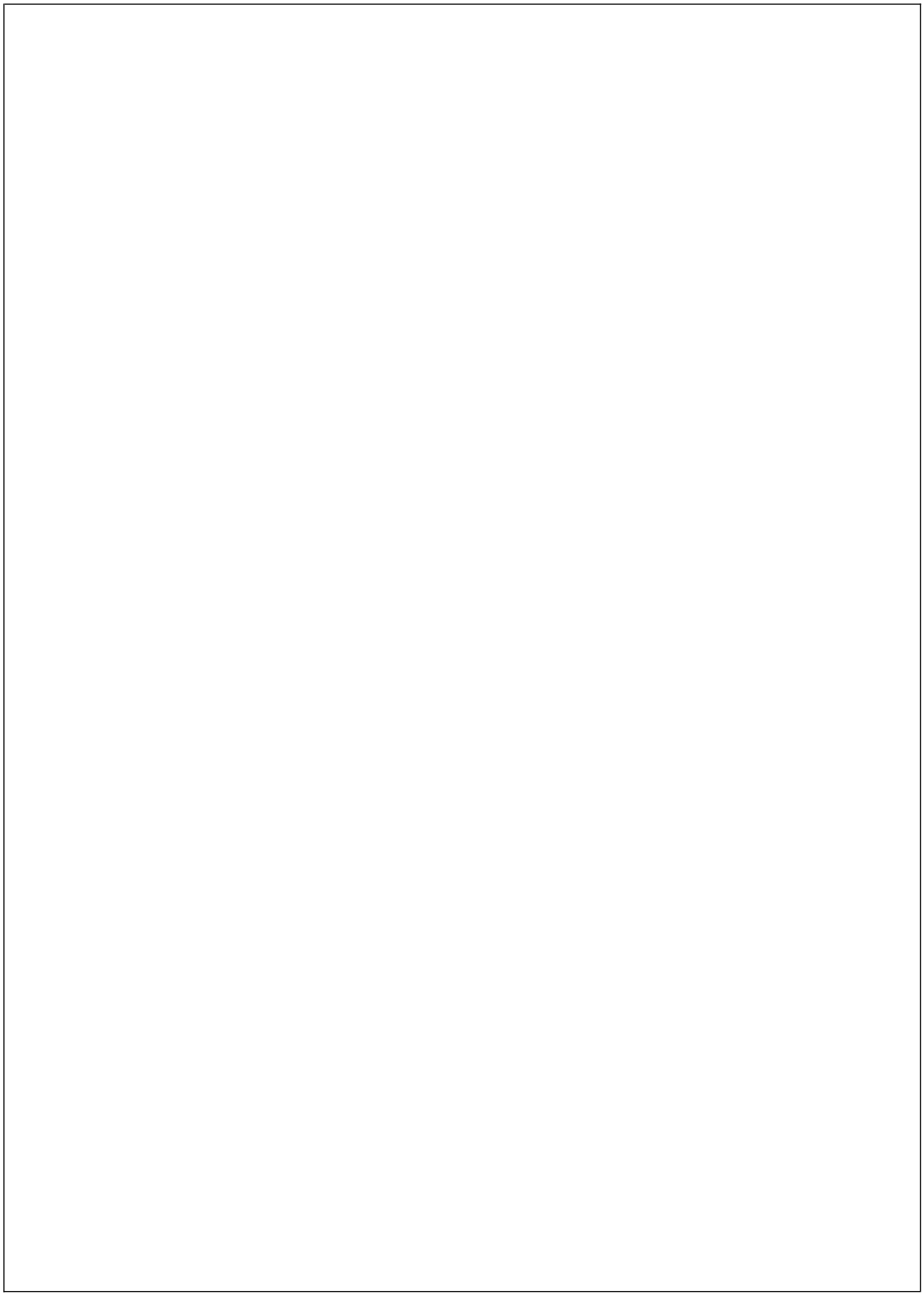
Switching Characteristics

at V_{CC} = 5V and T_A = 25˚C (See Section 1 for Test Waveforms and Output Load)

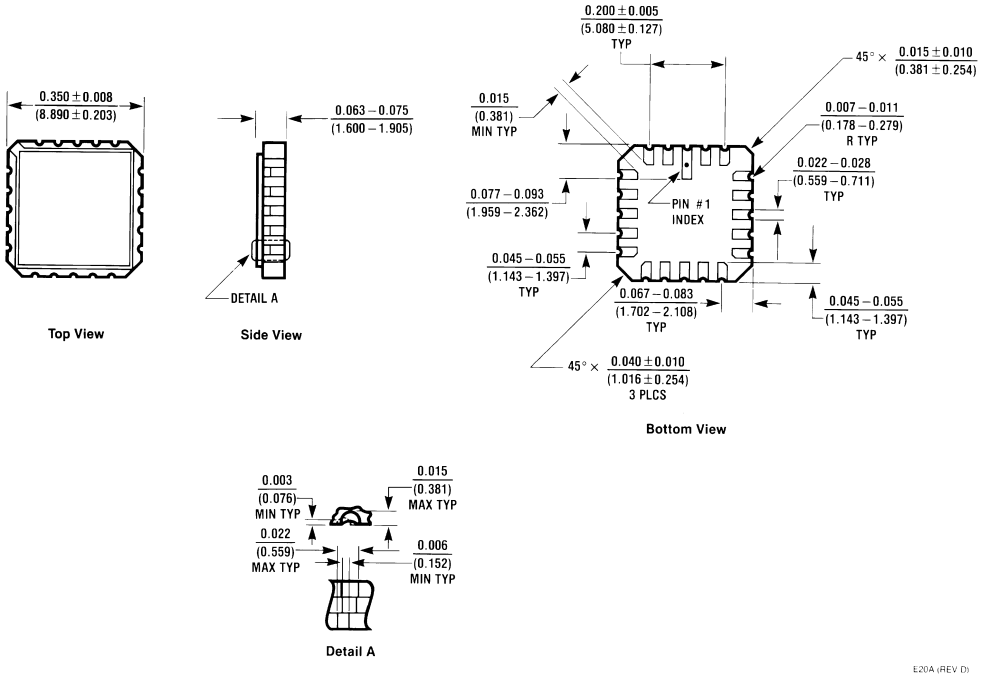
Symbol	Parameter	R_L = 2 kΩ				Units
		C_L = 15 pF		C_L = 50 pF		
		Min	Max	Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output	4	12	5	18	ns
t_{PHL}	Propagation Delay Time High to Low Level Output	4	15	5	20	ns

Note 2: All typicals are at V_{CC} = 5V, T_A = 25˚C.

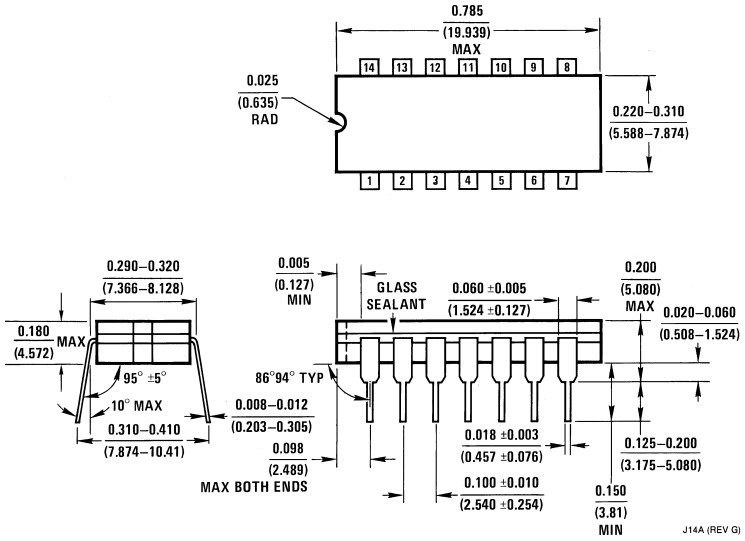
Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.



Physical Dimensions inches (millimeters) unless otherwise noted

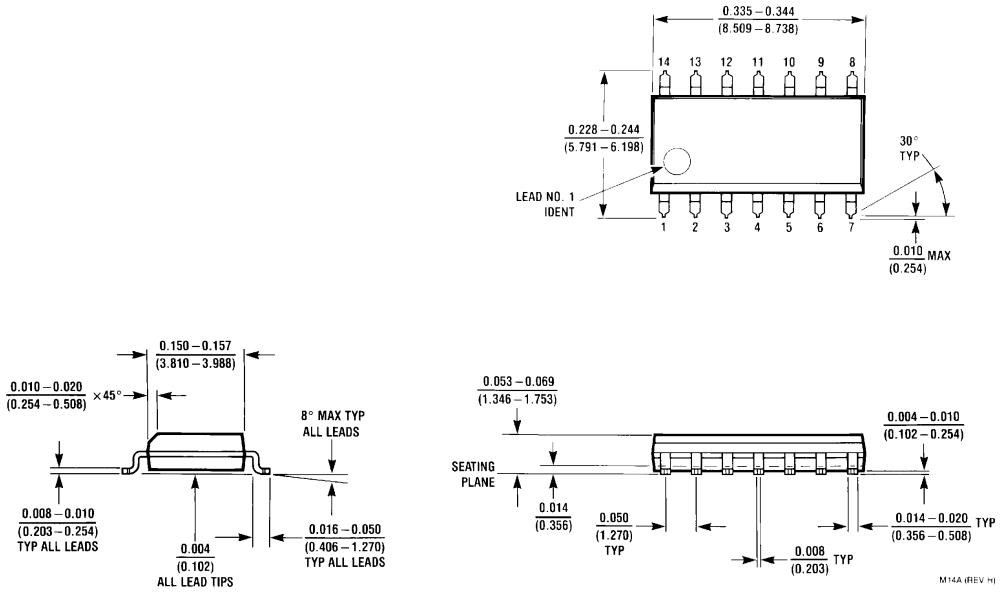


Ceramic Leadless Chip Carrier Package (E)
Order Number 54LS30LMQB
Package Number E20A

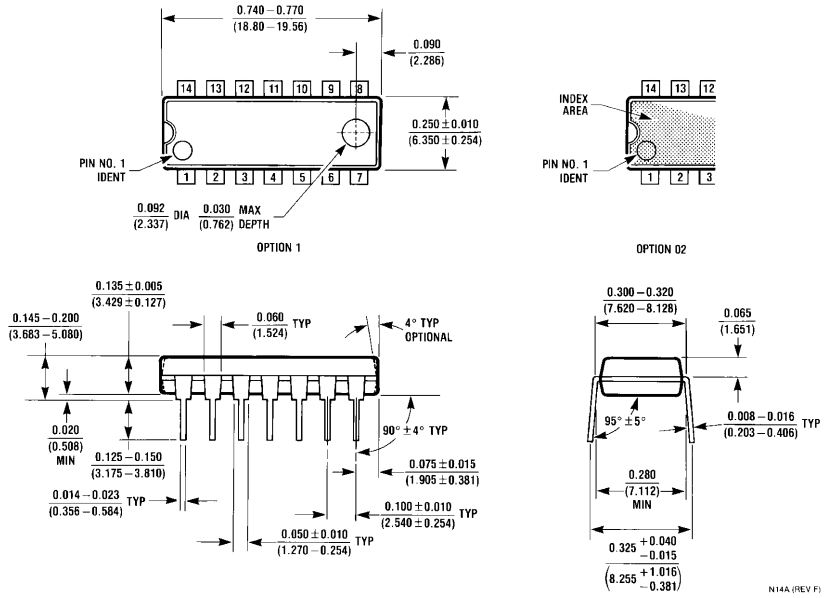


14-Lead Ceramic Dual-In-Line Package (J)
Order Number 54LS30DMQB or DM54LS30J
Package Number J14A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

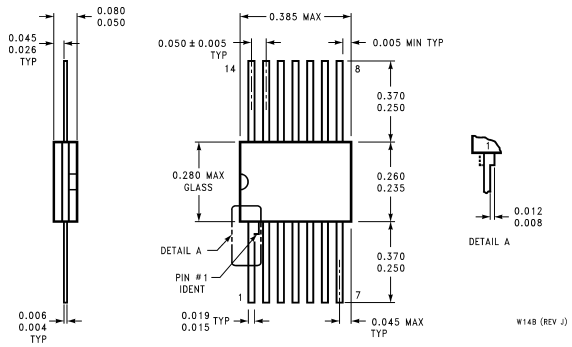


14-Lead Small Outline Molded Package (M)
Order Number DM74LS30M
Package Number M14A



14-Lead Molded Dual-In-Line Package (N)
Order Number DM74LS30N
Package Number N14A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



14-Lead Ceramic Flat Package (W)
Order Number 54LS30FMQB or DM54LS30W
Package Number W14B

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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