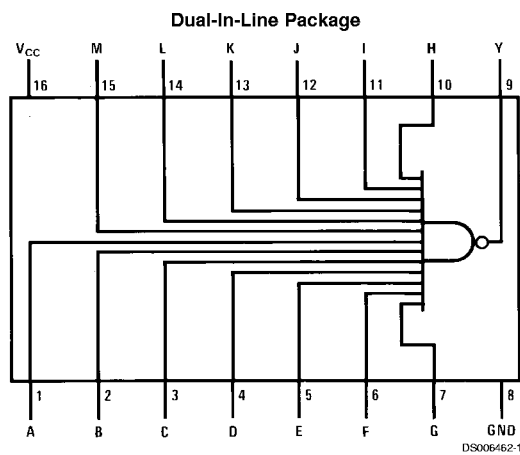


DM74S133 13-Input NAND Gate

General Description

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

Connection Diagram



Order Number DM54S133J, DM74S133M or DM74S133N
See Package Number J16A, M16A or N16E

Function Table

$$Y = \overline{ABCDEFGHIJKLM}$$

Inputs	Output
A thru M	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

Input Voltage

Operating Free Air Temperature Range

7V

5.5V

DM54S

DM74S

Storage Temperature Range

–55°C to +125°C

0°C to +70°C

–65°C to +150°C

Recommended Operating Conditions

Symbol	Parameter	DM54S133			DM74S133			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			0.8			0.8	V
I _{OH}	High Level Output Current			–1			–1	mA
I _{OL}	Low Level Output Current			20			20	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			–1.2	V
V _{OH}	High Level Output Voltage	V _{CC} = Min, I _{OH} = Max	DM54	2.5	3.4	V
		V _{IL} = Max	DM74	2.7	3.4	
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	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.5V			–2	mA
I _{OS}	Short Circuit Output Current	V _{CC} = Max	DM54	–40	–100	mA
		(Note 3)	DM74	–40	–100	
I _{CCCH}	Supply Current with Outputs High	V _{CC} = Max		3	5	mA
I _{CCCL}	Supply Current with Outputs Low	V _{CC} = Max		5.5	10	mA

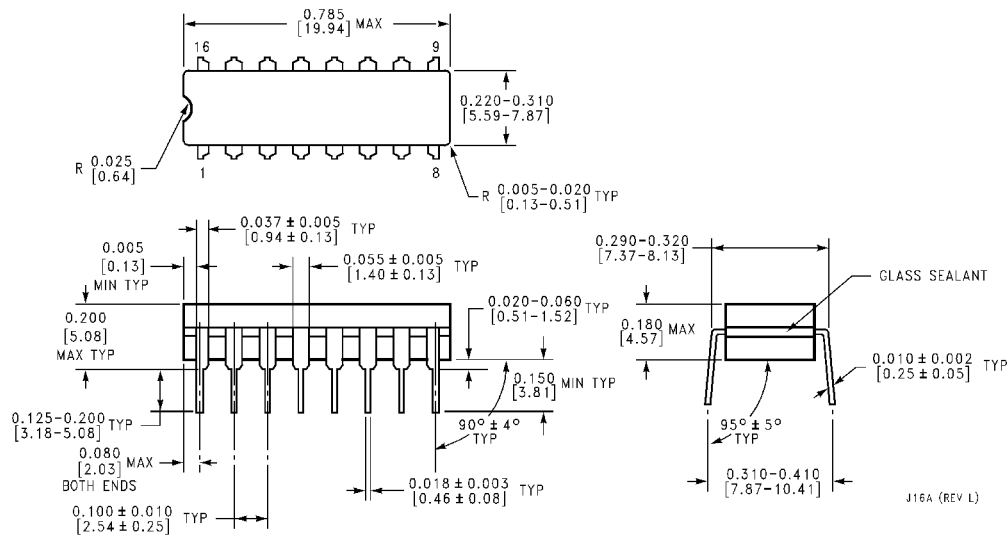
Switching Characteristicsat V_{CC} = 5V and T_A = 25°C

Symbol	Parameter	R _L = 280Ω				Units
		C _L = 15 pF		C _L = 50 pF		
		Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time Low to High Level Output	2	6	2	8	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	2	7	3	10	ns

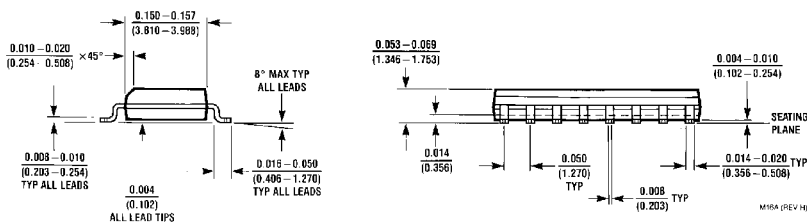
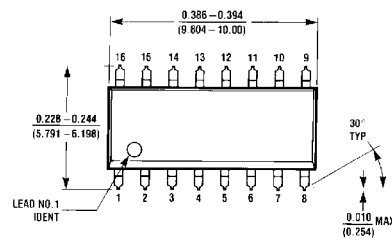
Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

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

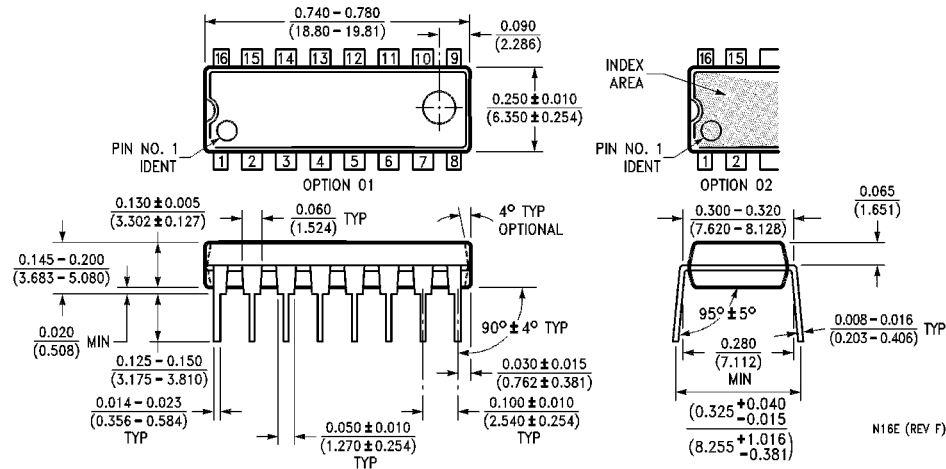


16-Lead Ceramic Dual-In-Line Package (J)
Order Number DM54S133J
Package Number J16A



16-Lead Small Outline Molded Package (M)
Order Number DM74S133M
Package Number M16A

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



16-Lead Molded Dual-In-Line Package (N)
Order Number DM74S133N
Package Number N16E

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
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.

Fairchild Semiconductor
Corporation
Americas
Customer Response Center
Tel: 1-888-522-5372

Fairchild Semiconductor
Europe
Fax: +49 (0) 1 80-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 8 141-35-0
English Tel: +44 (0) 1 793-85-68-56
Italy Tel: +39 (0) 2 57 5631

Fairchild Semiconductor
Hong Kong Ltd.
13th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: +852 2737-7200
Fax: +852 2314-0061

National Semiconductor
Japan Ltd.
Tel: 81-3-5620-6175
Fax: 81-3-5620-6179

www.fairchildsemi.com