National Semiconductor

PRELIMINARY
July 1989

DM54LS450/DM74LS450 16:1 Multiplexer

General Description

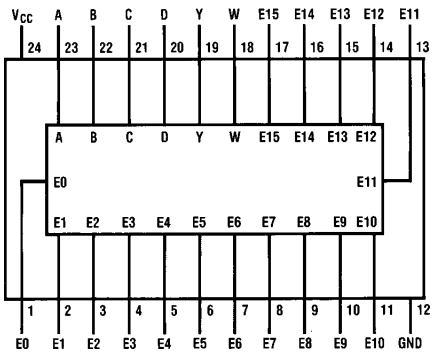
The 16:1 Mux selects one of sixteen inputs, E0 through E15, specified by four binary select inputs, A, B, C, and D. The true data is output on Y and the inverted data on W. Propagation delays are the same for both inputs and addresses and are specified for 50 pF loading. Outputs conform to the standard 8 mA LS totem pole drive standard.

Features/Benefits

- 24-pin SKINNYDIP saves space
- Similar to 74150 (Fat DIP)
- Low current PNP inputs reduce loading

Connection Diagram

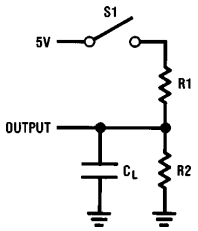
Top View



TL/L/8338–1

Order Number DM54LS450J, DM74LS450J, DM74LS450N or DM74LS450V
See NS Package Number J24F, N24C or V28A

Standard Test Load



TL/L/8338–2

Function Table

Input Select				Output	
D	C	B	A	W	Y
L	L	L	L	$\overline{E0}$	E0
L	L	L	H	$\overline{E1}$	E1
L	L	H	L	$\overline{E2}$	E2
L	L	H	H	$\overline{E3}$	E3
L	H	L	L	$\overline{E4}$	E4
L	H	L	H	$\overline{E5}$	E5
L	H	H	L	$\overline{E6}$	E6
L	H	H	H	$\overline{E7}$	E7
H	L	L	L	$\overline{E8}$	E8
H	L	L	H	$\overline{E9}$	E9
H	L	H	L	$\overline{E10}$	E10
H	L	H	H	$\overline{E11}$	E11
H	H	L	L	$\overline{E12}$	E12
H	H	L	H	$\overline{E13}$	E13
H	H	H	L	$\overline{E14}$	E14
H	H	H	H	$\overline{E15}$	E15

  RRD-B30M115/Printed in U. S. A.

Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage V_{CC}	7V
Input Voltage	5.5V
Off-State Output Voltage	5.5V
Storage Temperature	−65° to +150°C

Operating Conditions

Symbol	Parameter	Military			Commercial			Units
		Min	Nom	Max	Min	Nom	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
T_A	Operating Free-Air Temperature	−55		125*	0		75	°C

*Case temperature

Electrical Characteristics Over Operating Conditions

Symbol	Parameter	Test Conditions			Min	Typ†	Max	Units
V_{IL}	Low-Level Input Voltage						0.8	V
V_{IH}	High-Level Input Voltage				2			V
V_{IC}	Input Clamp Voltage	V_{CC} = MIN		I_I = −18 mA			−1.5	V
I_{IL}	Low-Level Input Current	V_{CC} = MAX		V_I = 0.4V			−0.25	mA
I_{IH}	High-Level Input Current	V_{CC} = MAX		V_I = 2.4V			25	μA
I_I	Maximum Input Current	V_{CC} = MAX		V_I = 5.5V			1	mA
V_{OL}	Low-Level Output Voltage	V_{CC} = MIN V_{IL} = 0.8V V_{IH} = 2V		I_{OL} = 8 mA			0.5	V
V_{OH}	High-Level Output Voltage	V_{CC} = MIN V_{IL} = 0.8V V_{IH} = 2V	MIL	I_{OH} = −2 mA	2.4			V
			COM	I_{OH} = −3.2 mA				
I_{OS}	Output Short-Circuit Current*	V_{CC} = 5.0V		V_O = 0V	−30		−130	mA
I_{CC}	Supply Current	V_{CC} = MAX				60	100	mA

*No more than one output should be shorted at a time and duration of the short-circuit should not exceed one second.

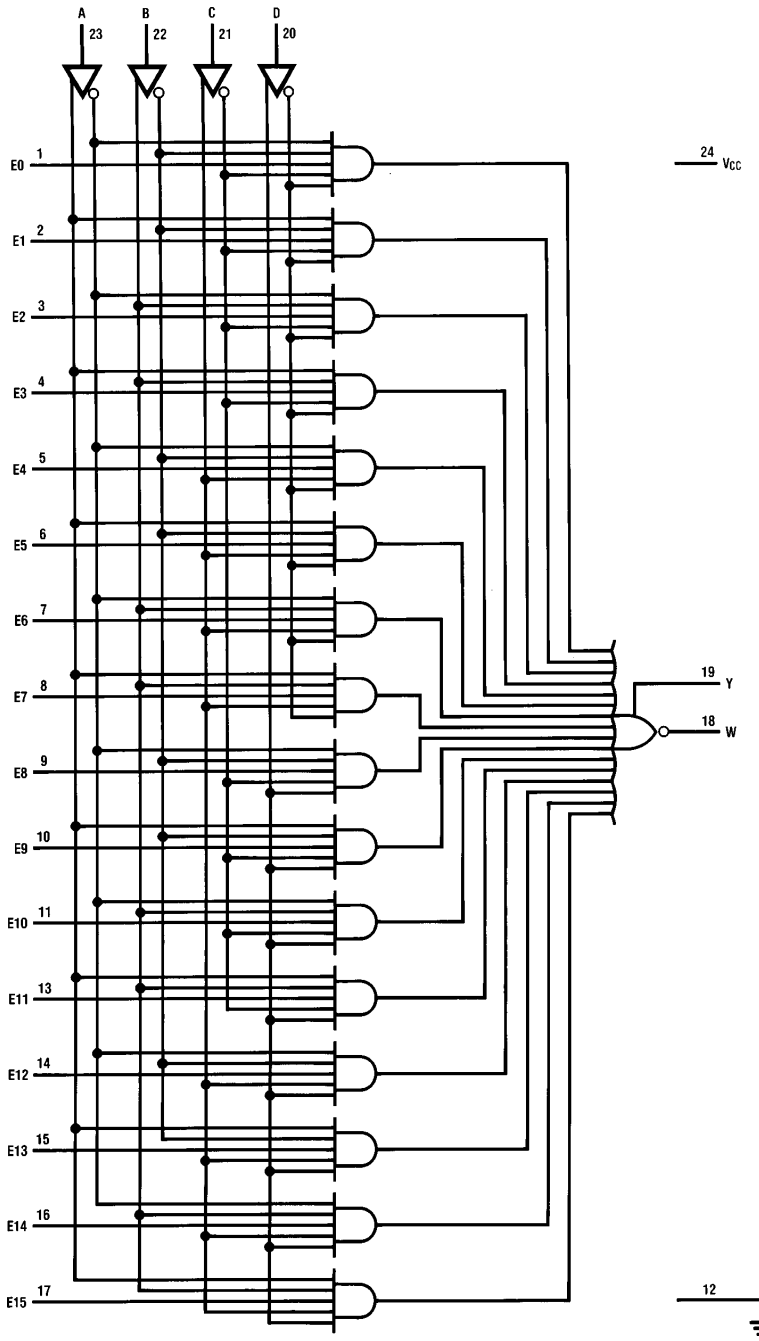
†All typical values are at V_{CC} = 5V, T_A = 25°C.

Switching Characteristics Over Operating Conditions

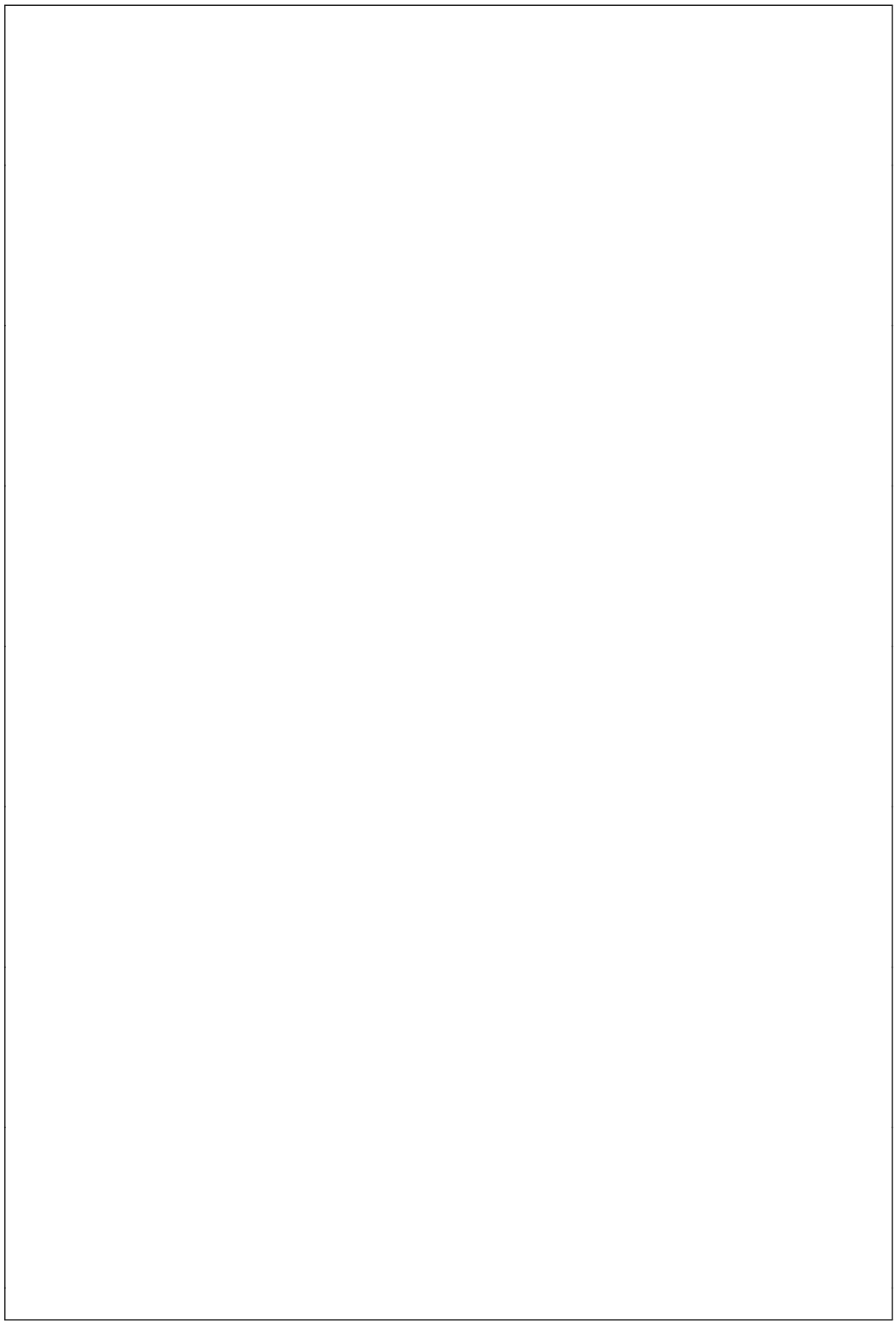
Symbol	Parameter	Test Conditions (See Test Load)	Military			Commercial			Units
			Min	Typ	Max	Min	Typ	Max	
t_{PD}	Any Input to Y or W	C_L = 50 pF R_1 = 560Ω R_2 = 1.1kΩ		25	45		25	40	ns

Logic Diagram

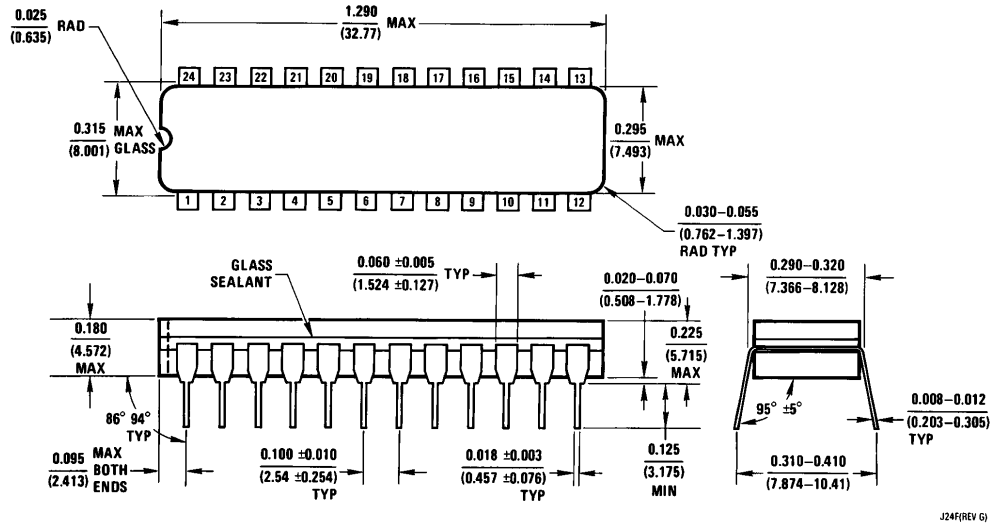
16:1 Mux



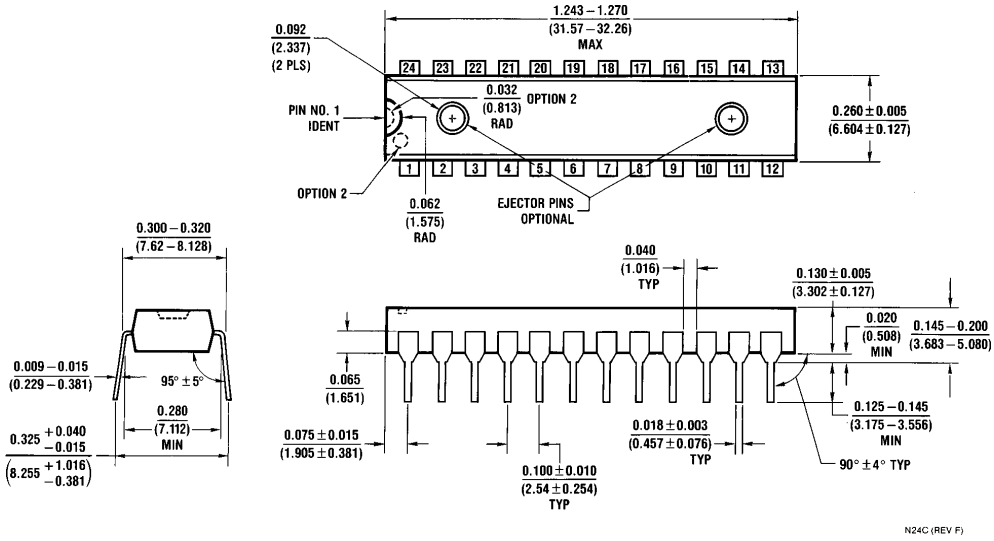
TL/L/8338–3



Physical Dimensions inches (millimeters)

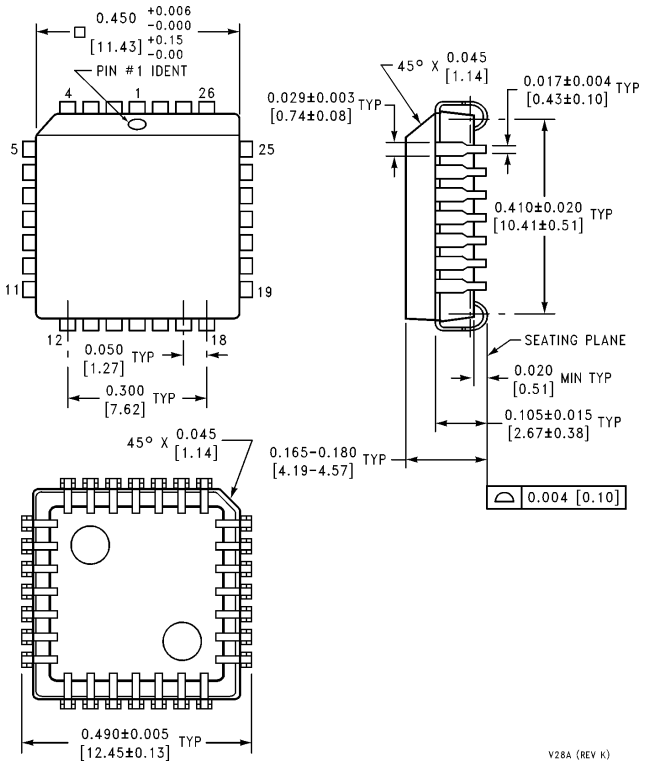


24-Pin Narrow Ceramic Dual-In-Line Package (J)
Order Number DM54LS450J or DM74LS450J
NS Package Number J24F



24-Pin Narrow Plastic Dual-In-Line Package (N)
Order Number DM74LS450N
NS Package Number N24C

Physical Dimensions inches (millimeters) (Continued)



28-Lead Plastic Chip Carrier (V)
Order Number DM74LS450V
NS Package Number V28A

LIFE SUPPORT POLICY

NATIONAL'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 NATIONAL 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 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 is 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.

National Semiconductor Corporation
1111 West Bardin Road
Arlington, TX 76017
Tel: 1(800) 272-9959
Fax: 1(800) 737-7018

National Semiconductor Europe
Fax: (+49) 0-180-530 85 86
Email: cnjwge@tevm2.nsc.com
Deutsch Tel: (+49) 0-180-530 85 85
English Tel: (+49) 0-180-532 78 32
Français Tel: (+49) 0-180-532 93 58
Italiano Tel: (+49) 0-180-534 16 80

National Semiconductor Hong Kong Ltd.
13th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: (852) 2737-1600
Fax: (852) 2736-9960

National Semiconductor Japan Ltd.
Tel: 81-043-299-2309
Fax: 81-043-299-2408