

DM54LS450/DM74LS450 16:1 Multiplexer

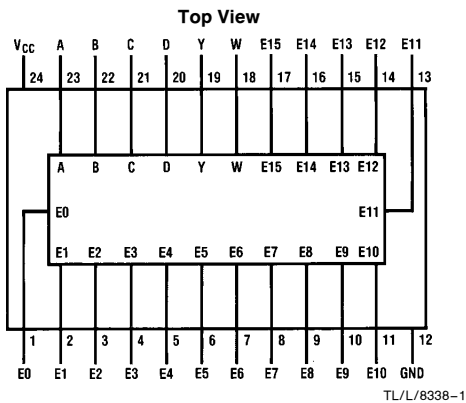
General Description

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

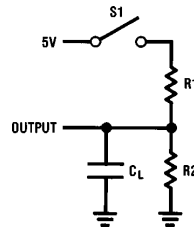
- 24-pin SKINNYDIP saves space
- Similar to 74150 (Fat DIP)
- Low current PNP inputs reduce loading

Connection Diagram



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

Standard Test Load



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

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 $+150^{\circ}$ 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	$^{\circ}$ 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	$V_{CC} = \text{MIN}$ $I_I = -18 \text{ mA}$			-1.5	V	
I_{IL}	Low-Level Input Current	$V_{CC} = \text{MAX}$ $V_I = 0.4 \text{ V}$			-0.25	mA	
I_{IH}	High-Level Input Current	$V_{CC} = \text{MAX}$ $V_I = 2.4 \text{ V}$			25	μA	
I_I	Maximum Input Current	$V_{CC} = \text{MAX}$ $V_I = 5.5 \text{ V}$			1	mA	
V_{OL}	Low-Level Output Voltage	$V_{CC} = \text{MIN}$ $V_{IL} = 0.8 \text{ V}$ $V_{IH} = 2 \text{ V}$	$I_{OL} = 8 \text{ mA}$		0.5	V	
V_{OH}	High-Level Output Voltage	$V_{CC} = \text{MIN}$ $V_{IL} = 0.8 \text{ V}$ $V_{IH} = 2 \text{ V}$	MIL	$I_{OH} = -2 \text{ mA}$	2.4		V
			COM	$I_{OH} = -3.2 \text{ mA}$			
I_{OS}	Output Short-Circuit Current*	$V_{CC} = 5.0 \text{ V}$	$V_O = 0 \text{ V}$		-30	-130	mA
I_{CC}	Supply Current	$V_{CC} = \text{MAX}$		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.

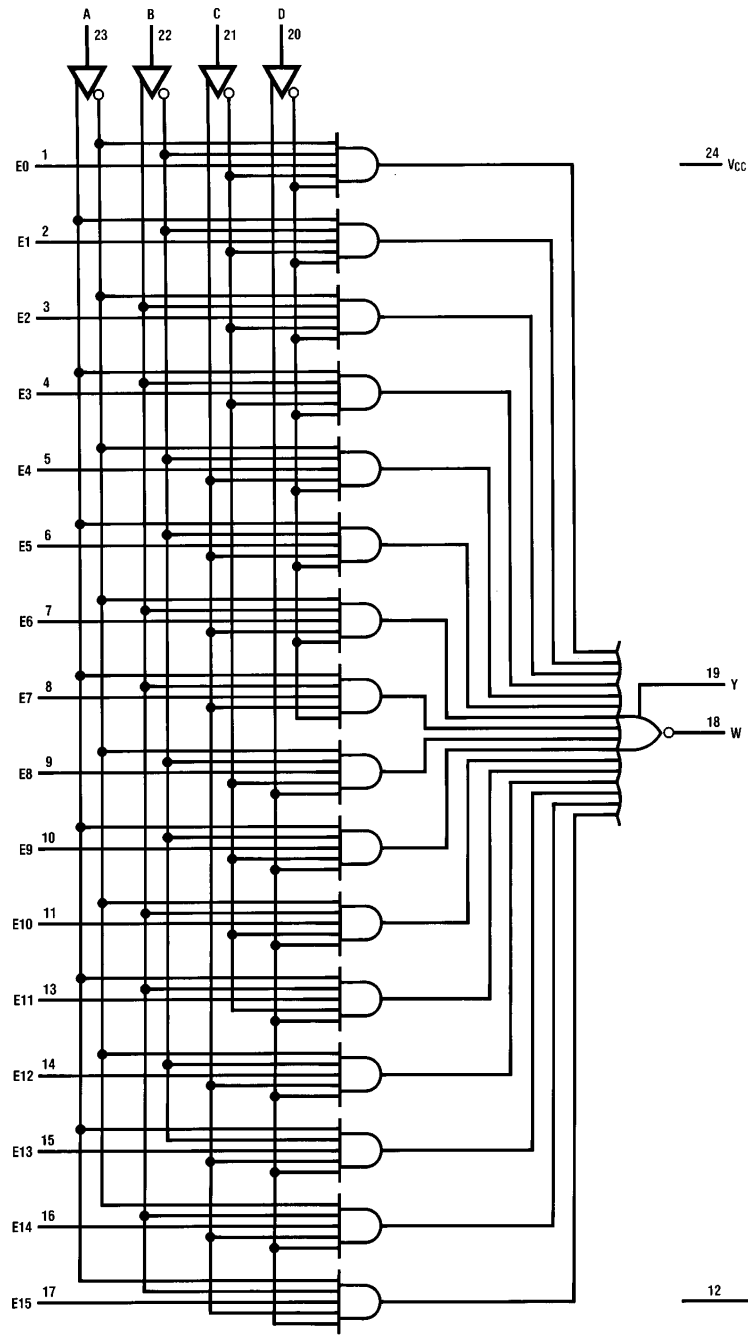
†All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25^{\circ}\text{C}$.

Switching Characteristics Over Operating Conditions

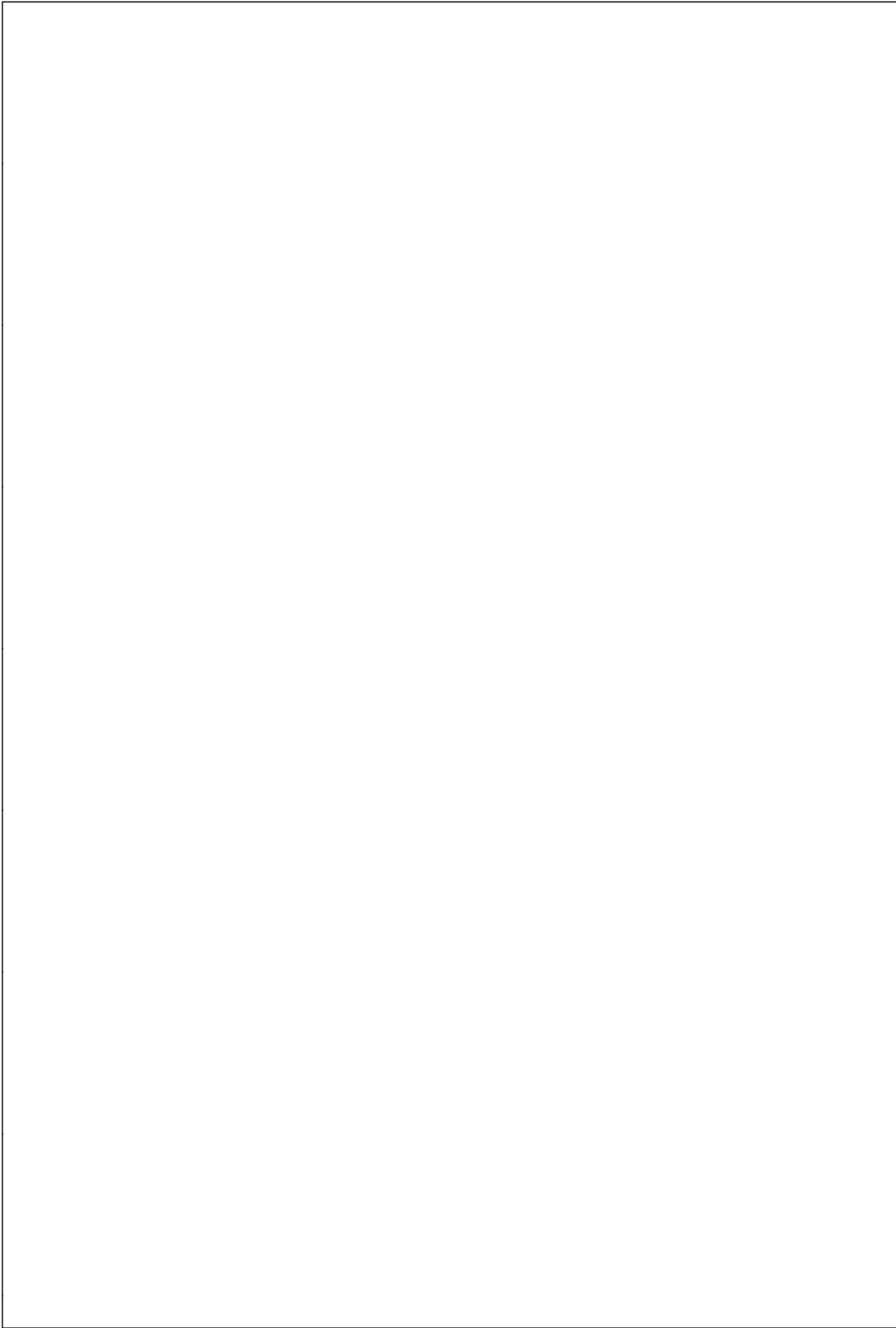
Symbol	Parameter	Test Conditions (See Test Load)	Military			Commercial			Units
			Min	Typ	Max	Min	Typ	Max	
t_{PD}	Any Input to Y or W	$C_L = 50 \text{ pF}$ $R_1 = 560 \Omega$ $R_2 = 1.1 \text{ k}\Omega$		25	45		25	40	ns

Logic Diagram

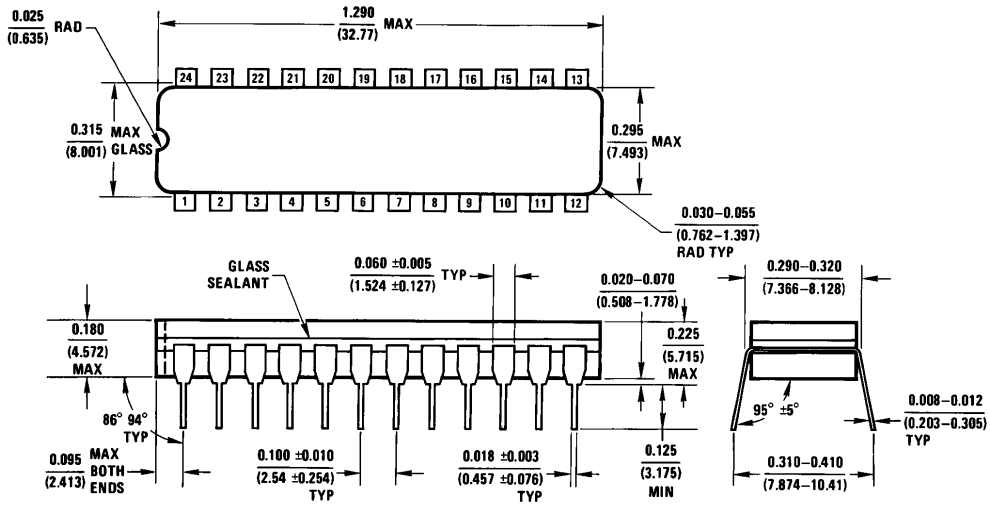
16:1 Mux



TL/L/8338-3

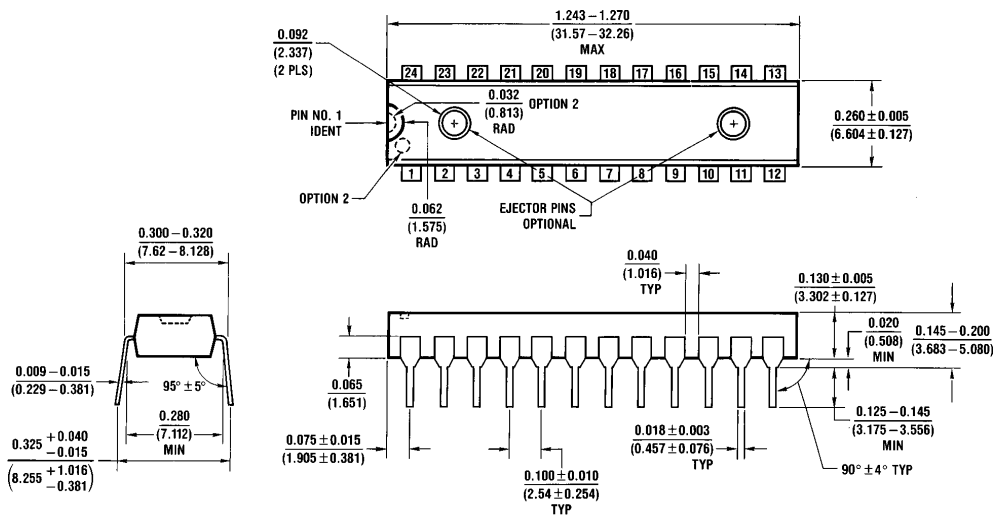


Physical Dimensions inches (millimeters)



J24F (REV 6)

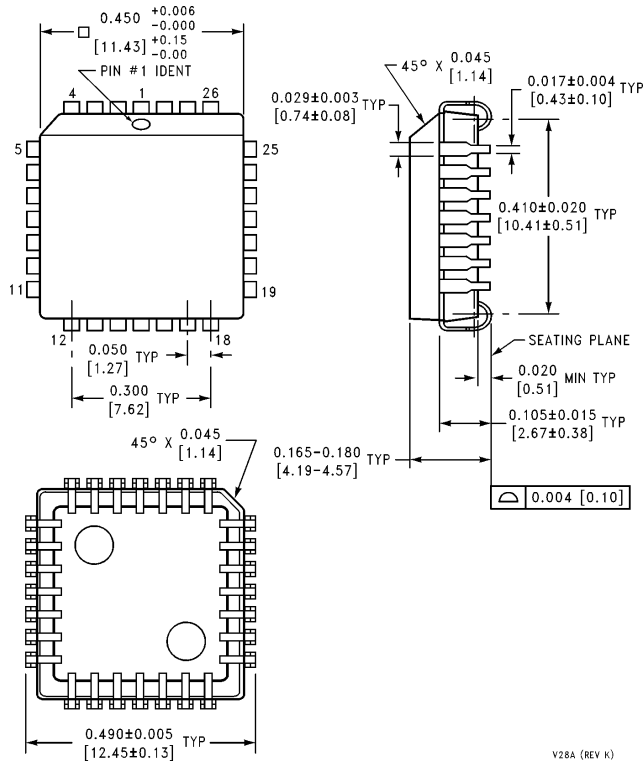
24-Pin Narrow Ceramic Dual-In-Line Package (J)
Order Number DM54LS450J or DM74LS450J
NS Package Number J24F



N24C (REV F)

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

V28A (REV K)

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.
 19th 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

National does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and National reserves the right at any time without notice to change said circuitry and specifications.