National Semiconductor

PRELIMINARY
July 1989

DM54LS450/DM74LS450 16:1 Multiplexer

General Description

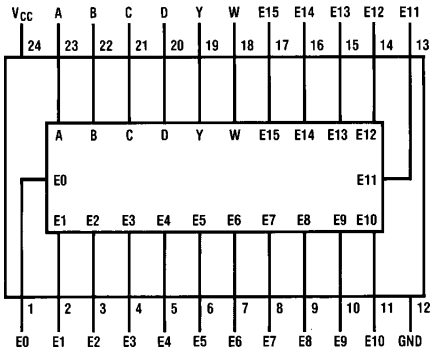
The 16:1 Mux selects one of sixteen inputs, E0 through E15, specified by four binary select inputs, A, B, C, and D. The true data is output on Y and the inverted data on W. Propagation delays are the same for both inputs and addresses and are specified for 50 pF loading. Outputs conform to the standard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

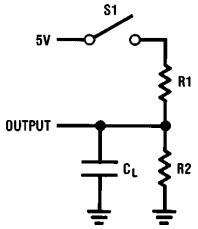
Top View



TL/L/8338–1

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

Standard Test Load



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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.

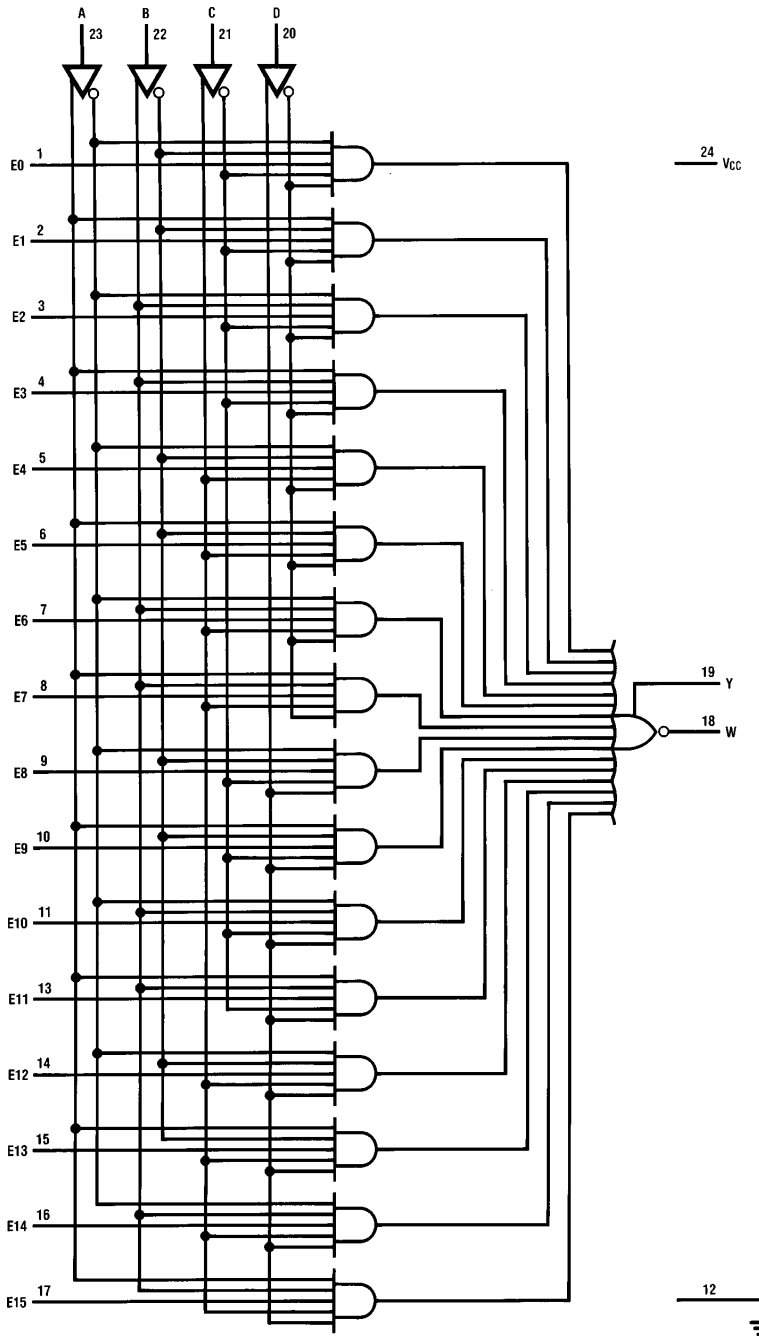
†All typical values are at V_{CC} = 5V, T_A = 25°C.

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



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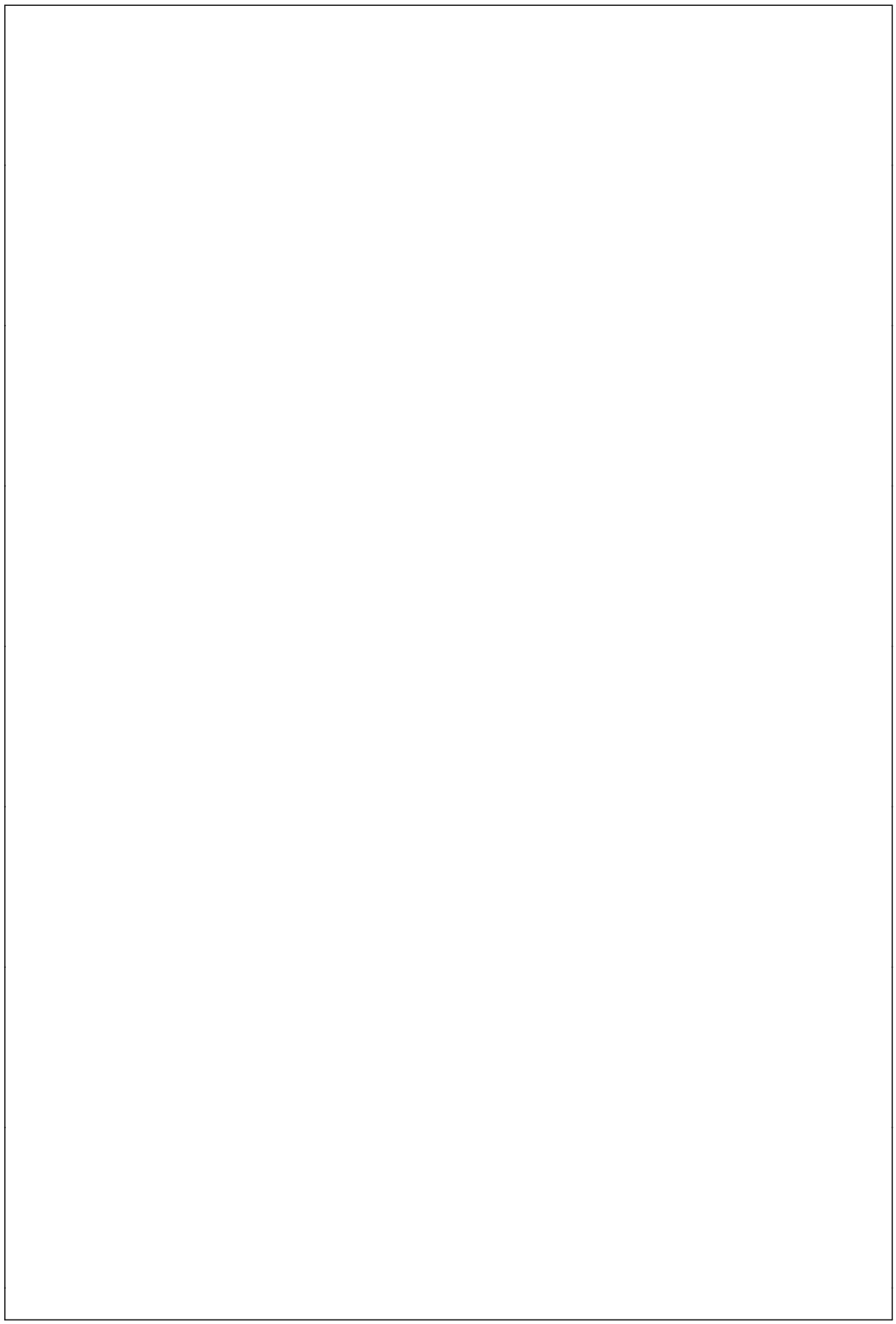
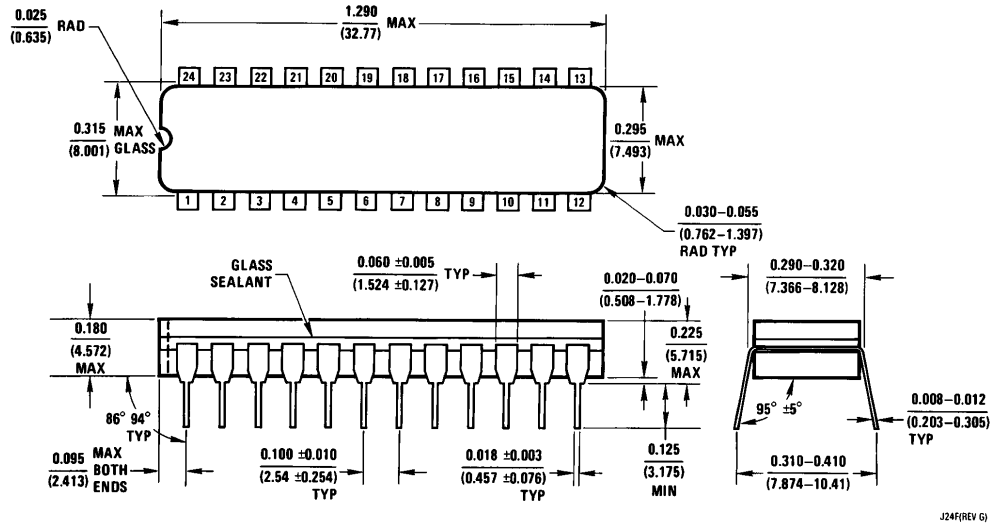
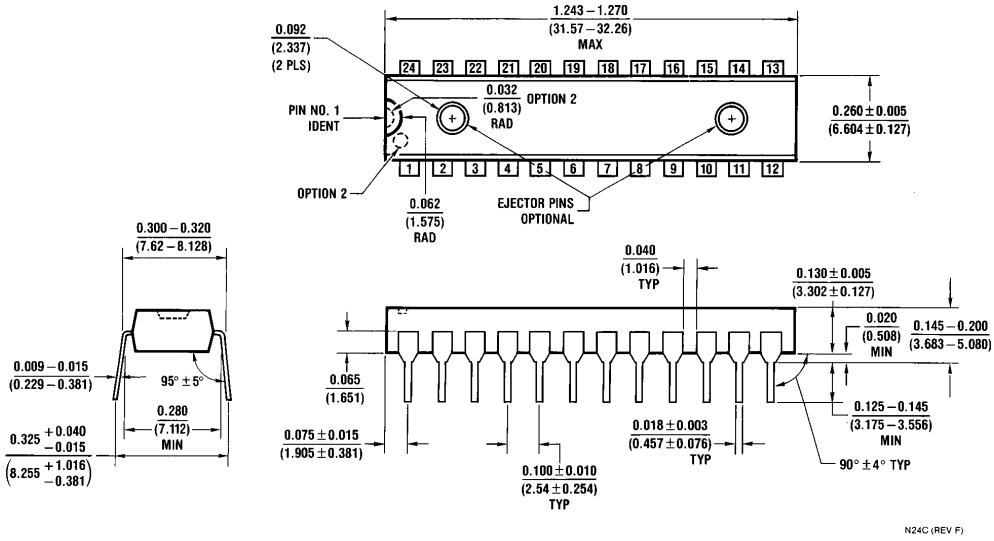


Physical Dimensions inches (millimeters)

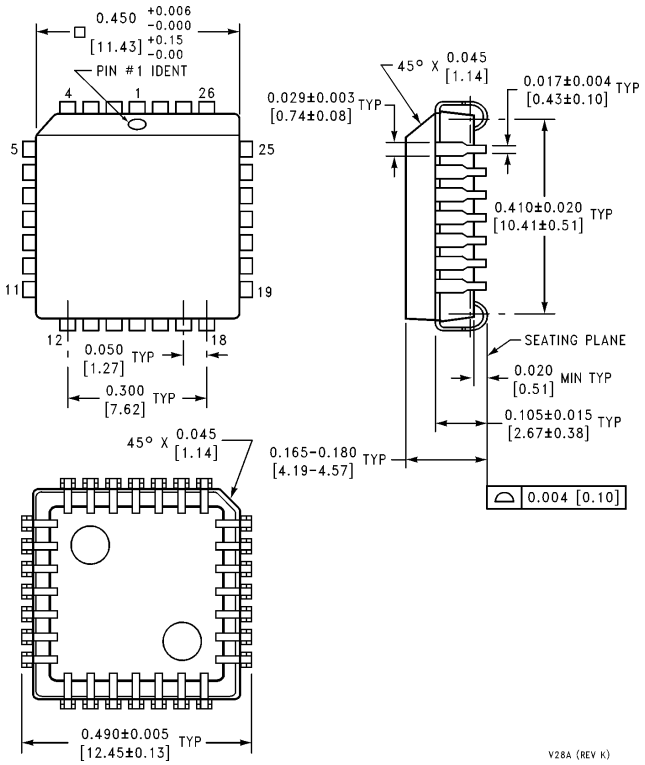


24-Pin Narrow Ceramic Dual-In-Line Package (J)
Order Number DM54LS450J or DM74LS450J
NS Package Number J24F



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

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