National Semiconductor

DM54LS451/DM74LS451 Dual 8:1 Multiplexer

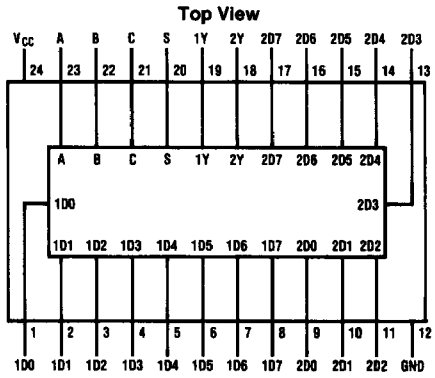
General Description

The Dual 8:1 Mux selects one of eight inputs, D0 through D7, specified by three binary select inputs, A, B, and C. The true data is output on Y when strobed by S. Propagation delays are the same for inputs, addresses and strobes 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
- Twice the density of 74LS151
- Low current PNP inputs reduce loading

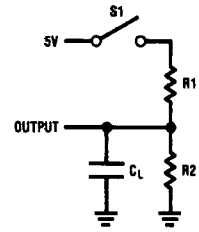
Connection Diagram



TL/L/8337-1

Order Number DM54LS451J, DM74LS451J, DM74LS451N or DM74LS451V
See NS Package Number J24F, N24C or V28A

Standard Test Load



TL/L/8337-2

Function Table

Inputs				Outputs
Select			Strobe	Y
C	B	A	S	
X	X	X	H	H
L	L	L	L	D0
L	L	H	L	D1
L	H	L	L	D2
L	H	H	L	D3
H	L	L	L	D4
H	L	H	L	D5
H	H	L	L	D6
H	H	H	L	D7

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°C 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 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	C_L = 50 pF, R_1 = 560Ω, R_2 = 1.1Ω		25	45		25	40	ns

Logic Diagram

