

Dual 8:1 Mux

SN54/74LS451

Features/Benefits

- 24-pin SKINNYDIP® saves space
- Twice the density of SN5/741S151
- Low-current PNP inputs reduce loading

Ordering Information

PART NUMBER	PACKAGE	TEMPERATURE
SN54LS451	JS, W	Mil
SN74LS451	NS, JS	Com

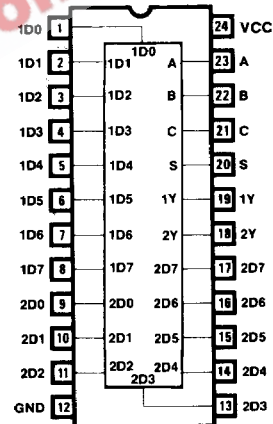
Description

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.

Function Table

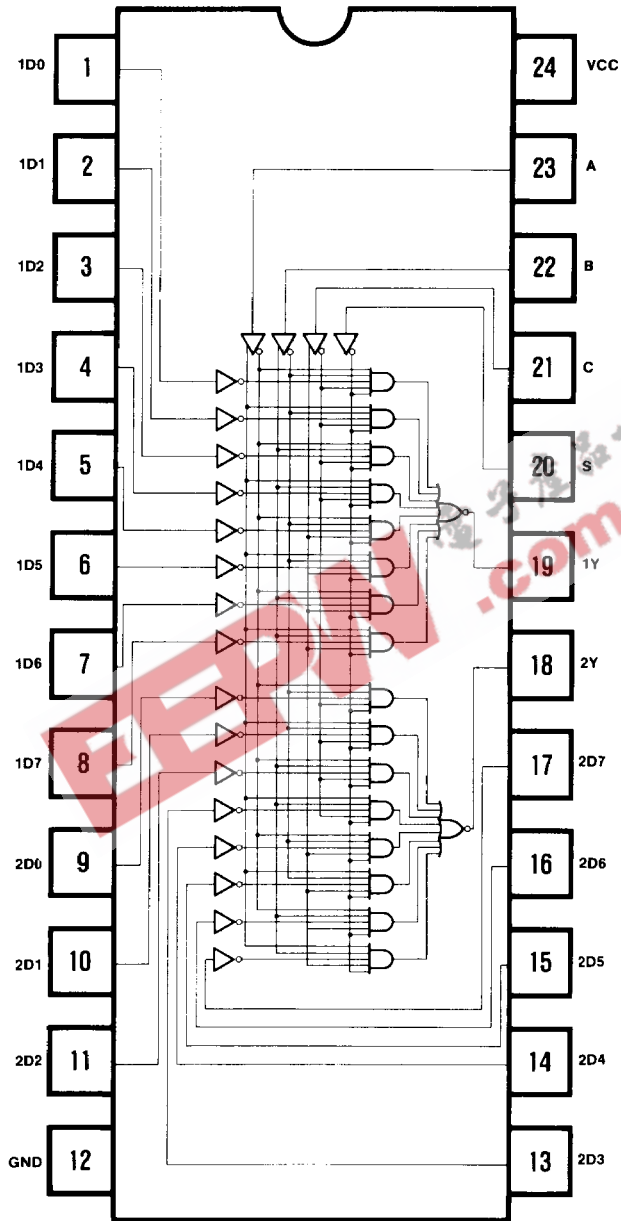
INPUTS				OUTPUTS
SELECT			STROBE	Y
C	B	A	S	
X	X	X	H	H
L	L	L	L	D0
L	L	H	L	D1
L	H	L	L	D2
L	H	H	L	D3
H	L	L	L	D4
H	L	H	L	D5
H	H	L	L	D6
H	H	H	L	D7

Logic Symbol



Logic Diagram

Dual 8:1 Mux



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Absolute Maximum Ratings

Supply voltage V_{CC}	7.0 V
Input voltage	5.5 V
Off-state output voltage	5.5 V
Storage temperature	-65° to +150° C

Operating Conditions

SYMBOL	PARAMETER	MILITARY			COMMERCIAL			UNIT
		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	UNIT
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.

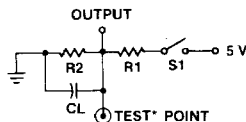
† All typical values are at $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$.

Switching Characteristics Over Operating Conditions

SYMBOL	PARAMETER	TEST CONDITIONS (See Test Load)	MILITARY			COMMERCIAL			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{PD}	Any input to Y	$C_L = 50\text{pF}$ $R_1 = 560\Omega$ $R_2 = 1.1\text{k}\Omega$		25	45		25	40	ns

Test Load

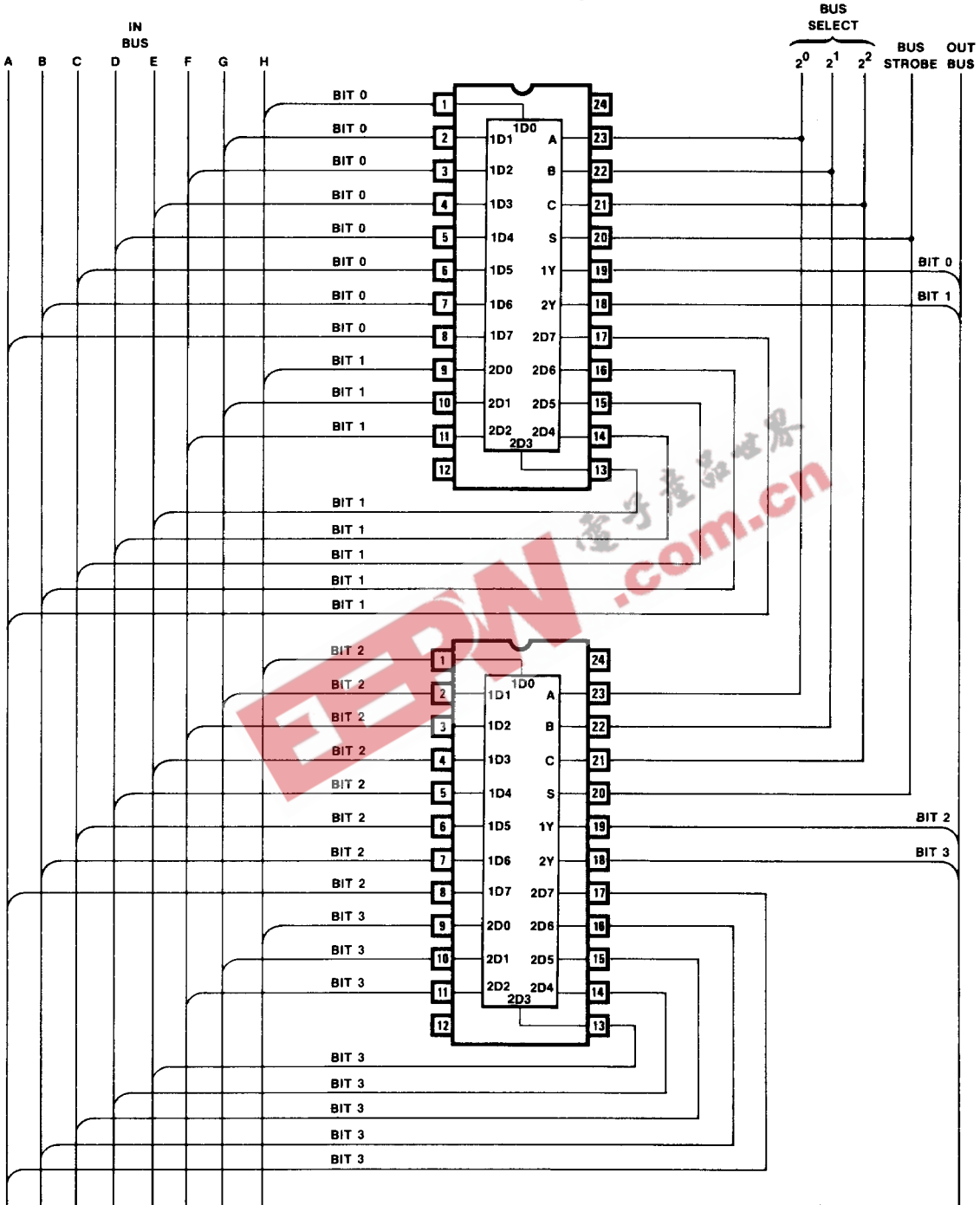
* The "Test Point" is driven by the outputs under test, and observed by instrumentation



- Notes:
- t_{PD} is tested with switch S_1 closed, $C_L = 50\text{pF}$ and measured at 1.5 V output level.
 - t_{PXZ} is measured at the 1.5 V output level with $C_L = 50\text{pF}$, S_1 is open for high impedance to "1" test, and closed for high impedance to "0" test.
 - t_{PXZ} is tested with $C_L = 5\text{pF}$, S_1 is open for "1" to high impedance test, measured at $V_{OH} - 0.5\text{V}$ output level; S_1 is closed for "0" to high impedance test measured at $V_{OL} + 0.5\text{V}$ output level.

Application

4-Bit Wide 8:1 Bus Multiplexer



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