

GD54/74LS151

DATA SELECTOR/MULTIPLEXER

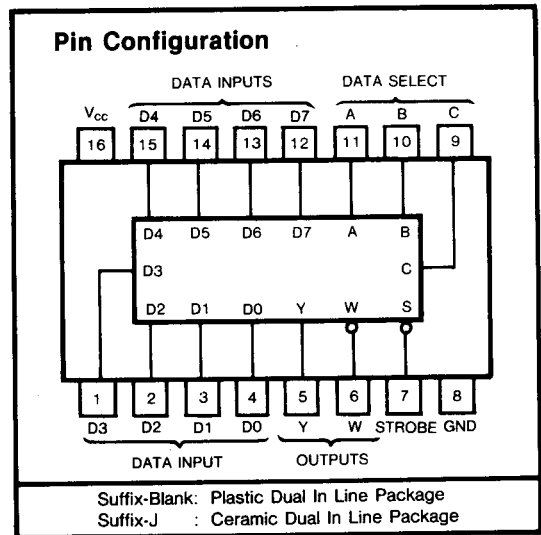
Features

- Select one-of-eight data lines
- Performs parallel-to-serial conversion
- Permits multiplexing from N lines to one line
- Also for use Boolean function generator

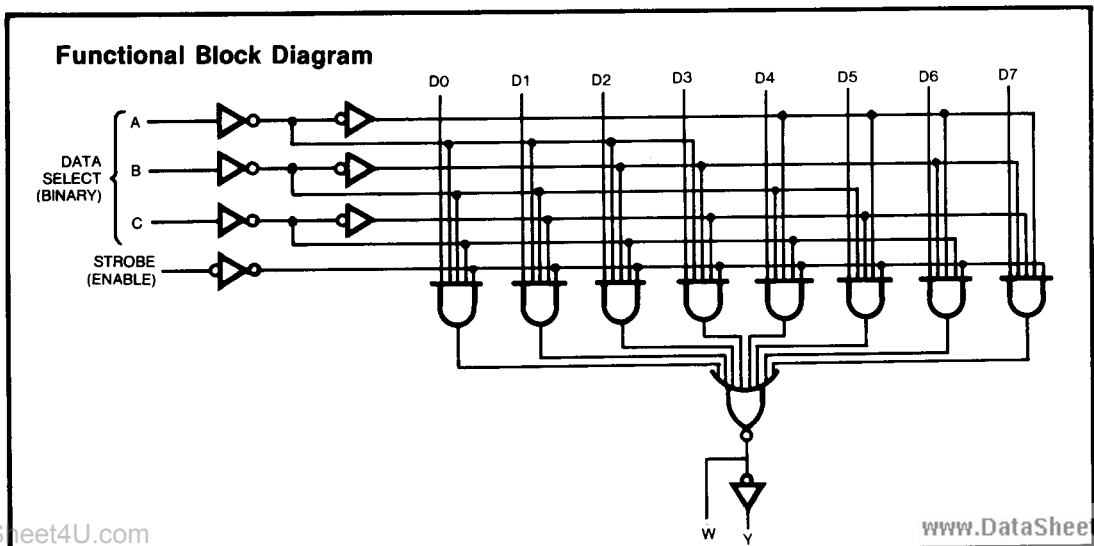
Description

This data selector/multiplexer contains full on-chip decoding to select the desired data source. The LS151 selects one-of-eight data sources. The LS151 has a strobe input which must be at a low logic level to enable these devices. A high level at the strobe forces the W output high, and the Y output low.

The LS151 features complementary W and Y outputs.



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Function Table

Inputs			Outputs		
Select			Strobe S	Y	W
C	B	A			
X	X	X	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

H=High Level, L=Low Level, Irrelevant
D0,D1...D7=the level of the respective D input

Absolute Maximum Ratings

- Supply voltage, V_{CC} 7V
- Input voltage 7V
- Operating free-air temperature range 54LS -55°C to 125°C
74LS 0°C to 70°C
- Storage temperature range -65°C to 150°C

Recommended Operating Conditions

SYMBOL	PARAMETER		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	54	4.5	5	5.5	V
		74	4.75	5	5.25	
I_{OH}	High-level output current	54,74			-400	μA
I_{OL}	Low-level output current	54			4	mA
		74			8	
T_A	Operating free-air temperature	54	-55		125	$^{\circ}\text{C}$
		74	0		70	

Electrical Characteristics over recommended operating free-air temperature range (unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS		MIN	TYP (Note 1)	MAX	UNIT
V_{IH}	High-level input voltage			2			V
V_{IL}	Low-level input voltage			54	0.7		V
				74	0.8		
V_{IK}	Input clamp voltage	$V_{CC} = \text{Min}, I_I = -18\text{mA}$		-1.5			V
V_{OH}	High-level output voltage	$V_{CC} = \text{Min}, V_{IL} = \text{Max}$ $I_{OH} = \text{Max}, V_{IH} = \text{Min}$	54	2.5	3.4	V	
			74	2.7	3.4		
V_{OL}	Low-level output voltage	$V_{CC} = \text{Min}$ $V_{IL} = \text{Max}$ $V_{IH} = \text{Min}$	$I_{OL} = 4\text{mA}$	54,74	0.25	0.4	V
			$I_{OL} = 8\text{mA}$	74	0.35	0.5	
I_I	Input current at maximum input voltage	$V_{CC} = \text{Max}, V_I = 7\text{V}$		0.1			mA
I_{IH}	High-level input current	$V_{CC} = \text{Max}, V_I = 2.7\text{V}$		20			μA
I_{IL}	Low-level input current	$V_{CC} = \text{Max}, V_I = 0.4\text{V}$		-0.4			mA
I_{OS}	Short-circuit output current	$V_{CC} = \text{Max}$ (Note 2)		-20	-100		mA
I_{CC}	Supply current	$V_{CC} = \text{Max}$ (Note 3)		6	10		mA

Note 1: All typical values are at $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$.

Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Note 3: I_{CC} is measured with all outputs open, strobe and data select inputs at 4.5V, and all other inputs open.

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Switching Characteristics, $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITION #	MIN	TYP	MAX	UNIT
t_{PLH}	A,B or C(4 levels)	Y	$C_L = 15\text{pF}$ $R_L = 2\text{K}\Omega$	27	43	ns	
t_{PHL}				18	30		
t_{PLH}	A,B or C(3 levels)	W		14	23	ns	
t_{PHL}				20	32		
t_{PLH}	Any D	Y		20	32	ns	
t_{PHL}				16	26		
t_{PLH}	Any D	W		13	21	ns	
t_{PHL}				12	20		
t_{PLH}	Strobe	Y		26	42	ns	
t_{PHL}				20	32		
t_{PLH}	Strobe	W	15	24	ns		
t_{PHL}			18	30			

* t_{PLH} = propagation delay time, low-to-high-level output

* t_{PHL} = propagation delay time, high-to-low-level output

* For load circuit and voltage waveforms, see page 3-11.