

TYPES SN54150, SN54151A, SN54152A, SN54LS151, SN54LS152, SN54S151, SN74150, SN74151A, SN74LS151, SN74S151 DATA SELECTORS/MULTIPLEXERS

REVISED OCTOBER 1976

logic

'150
FUNCTION TABLE

INPUTS					OUTPUT W
SELECT				STROBE	
D	C	B	A	S	
X	X	X	X	H	H
L	L	L	L	L	$\overline{E0}$
L	L	L	H	L	$\overline{E1}$
L	L	H	L	L	$\overline{E2}$
L	L	H	H	L	$\overline{E3}$
L	H	L	L	L	$\overline{E4}$
L	H	L	H	L	$\overline{E5}$
L	H	H	L	L	$\overline{E6}$
L	H	H	H	L	$\overline{E7}$
H	L	L	L	L	$\overline{E8}$
H	L	L	H	L	$\overline{E9}$
H	L	H	L	L	$\overline{E10}$
H	L	H	H	L	$\overline{E11}$
H	H	L	L	L	$\overline{E12}$
H	H	L	H	L	$\overline{E13}$
H	H	H	L	L	$\overline{E14}$
H	H	H	H	L	$\overline{E15}$

'151A, 'LS151, 'S151
FUNCTION TABLE

INPUTS				OUTPUTS	
SELECT C B A	STROBE S			Y	W
X X X	H				L
L L L	L				$\overline{D0}$
L L H	L				$\overline{D1}$
L H L	L				$\overline{D2}$
L H H	L				$\overline{D3}$
H L L	L				$\overline{D4}$
H L H	L				$\overline{D5}$
H H L	L				$\overline{D6}$
H H H	L				$\overline{D7}$

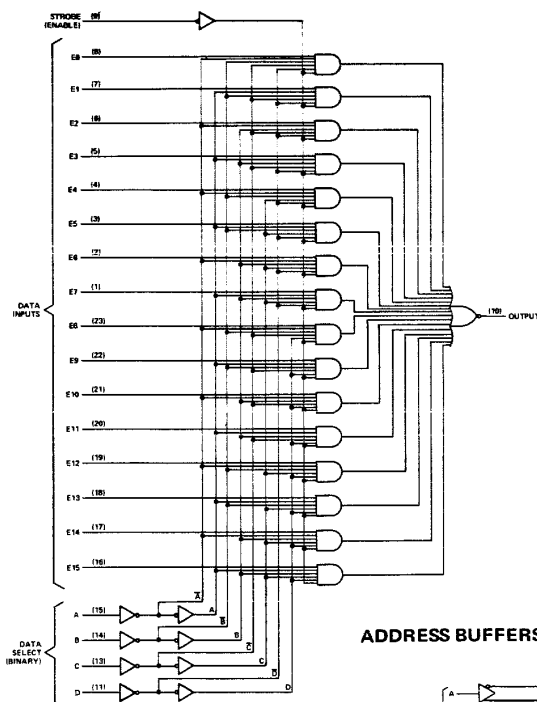
'152A, 'LS152
FUNCTION TABLE

SELECT INPUTS C B A	OUTPUT W
L L L	$\overline{D0}$
L L H	$\overline{D1}$
L H L	$\overline{D2}$
L H H	$\overline{D3}$
H L L	$\overline{D4}$
H L H	$\overline{D5}$
H H L	$\overline{D6}$
H H H	$\overline{D7}$

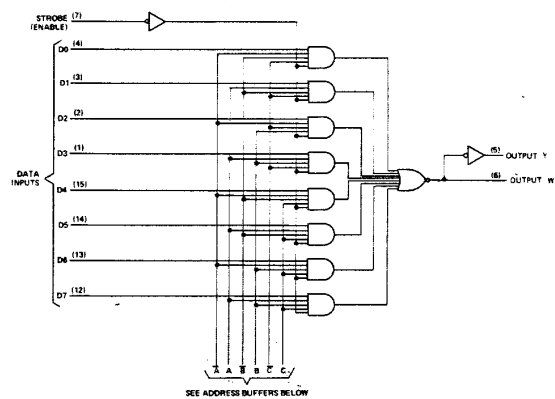
H = high level, L = low level, X = irrelevant
 $\overline{E0}, \overline{E1} \dots \overline{E15}$ = the complement of the level of the respective E input
 $\overline{D0}, \overline{D1} \dots \overline{D7}$ = the level of the D respective input

functional block diagrams

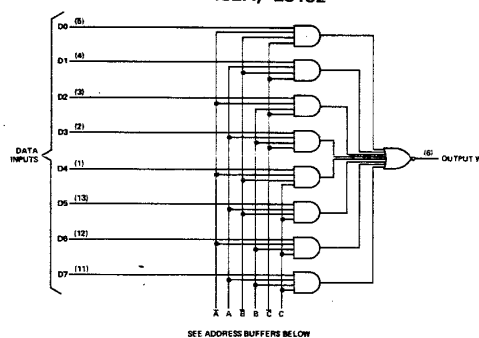
'150



'151A, 'LS151, 'S151

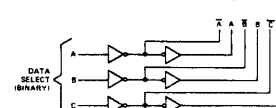
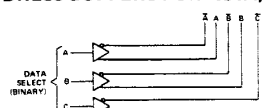


'152A, 'LS152



ADDRESS BUFFERS FOR '151A, '152A

ADDRESS BUFFERS FOR 'LS151, 'S151, 'LS152



TYPES SN54150, SN54151A, SN54152A, SN74150, SN74151A DATA SELECTORS/MULTIPLEXERS

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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage (see Note 2)	5.5 V
Operating free-air temperature range: SN54' Circuits	−55°C to 125°C
SN74' Circuits	0°C to 70°C
Storage temperature range:	−65°C to 150°C

NOTES: 1. Voltage values are with respect to network ground terminal.

2. For the '150, input voltages must be zero or positive with respect to network ground terminal.

recommended operating conditions

	SN54'			SN74'			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			−800			−800	μA
Low-level output current, I_{OL}			16			16	mA
Operating free-air temperature, T_A	−55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	'150			'151A, '152A			UNIT
		MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IH} High-level input voltage		2			2			V
V_{IL} Low-level input voltage				0.8			0.8	V
V_{IK} Input clamp voltage	$V_{CC} = \text{MIN}, I_I = -8 \text{ mA}$						−1.5	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OH} = -800 \mu\text{A}$	2.4	3.4		2.4	3.4		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OL} = 16 \text{ mA}$		0.2	0.4		0.2	0.4	V
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$			1			1	mA
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.4 \text{ V}$			40			40	μA
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$			−1.6			−1.6	mA
I_{OS} Short-circuit output current§	$V_{CC} = \text{MAX}$	SN54'	−20	−55	−20	−55		mA
		SN74'	−18	−55	−18	−55		
I_{CC} Supply current	$V_{CC} = \text{MAX},$ See Note 3	'150	40	68				mA
		'151A			29	48		
		'152A			26	43		

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

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

§Not more than one output of the '151A should be shorted at a time.

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

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TYPES SN54150, SN54151A, SN54152A, SN74150, SN74151A
DATA SELECTORS/MULTIPLEXERS

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

PARAMETER†	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	'150			'151A, '152A			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
tPLH	A, B, or C (4 levels)	Y	CL = 15 pF, RL = 400 Ω, See Note 4				25	38	ns	
tPHL							25	38		
tPLH	A, B, C, or D (3 levels)	W		23	35	17	26	ns		
tPHL				22	33	19	30			
tPLH	Strobe	Y				21	33	ns		
tPHL						22	33			
tPLH	Strobe	W		15.5	24	14	21	ns		
tPHL				21	30	15	23			
tPLH	D0 thru D7	Y				13	20	ns		
tPHL						18	27			
tPLH	E0 thru E15, or D0 thru D7	W		13	20	8	14	ns		
tPHL				8.5	14	8	14			

†t_{PLH} ≡ propagation delay time, low-to-high-level output

t_{PLH} \equiv propagation delay time, low-to-high-level output
 t_{PHL} \equiv propagation delay time, high-to-low-level output

NOTE 4: Load circuit and voltage waveforms are shown on page 3-10.

schematics of inputs and outputs

