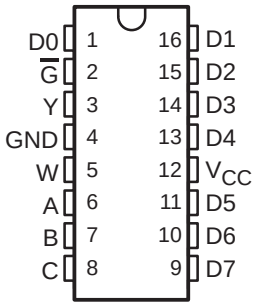
- **3-State Outputs Interface Directly with System Bus**
- **Performs Parallel-to-Serial Conversion**
- **Complementary Outputs Provide True and Inverted Data**
- **New Flow-Through Architecture to Optimize PCB Layout**
- **Center-Pin V_{CC} and GND Configurations to Minimize High-Speed Switching Noise**
- **EPIC™ (Enhanced-Performance Implanted CMOS) 1-μm Process**
- **500-mA Typical Latch-Up Immunity at 125°C**
- **Package Options Include Plastic Small Outline Packages, and Standard Plastic 300-mil DIPs**

D OR N PACKAGE

(TOP VIEW)



description

This data selector/multiplexer contains full binary decoding to select one-of-eight data sources and features strobe-controlled complementary 3-state outputs.

The 3-state outputs can interface with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (at a high-impedance state), the low-impedance of the enable output will drive the bus line to a high or low logic level. Both outputs are controlled by the strobe ($\overline{G}$). The outputs are disabled when $\overline{G}$ is high.

The 74AC11251 is characterized for operation from – 40°C to 85°C.

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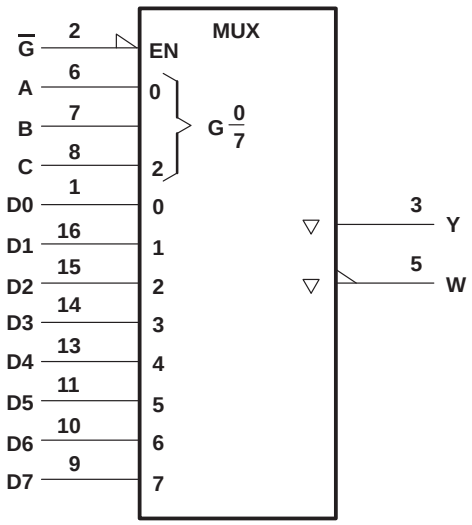
FUNCTION TABLE

INPUTS				OUTPUTS	
SELECT			STROBE	Y	W
C	B	A	$\overline{G}$		
X	X	X	H	Z	Z
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	$\overline{D7}$

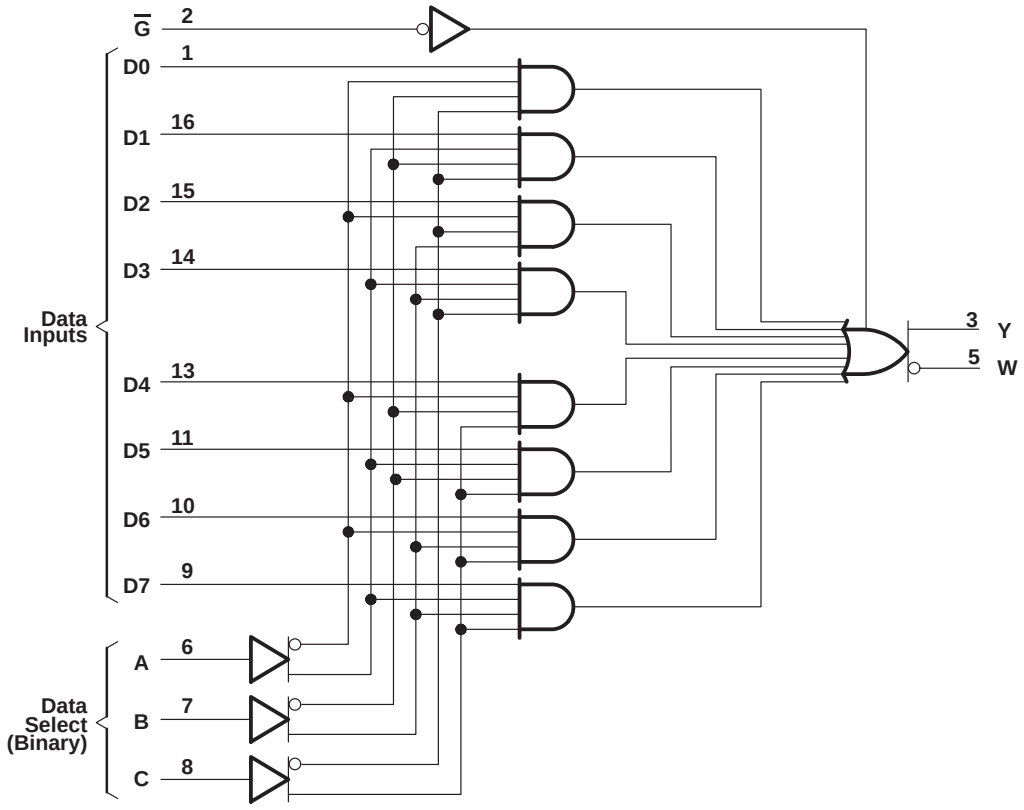
H = high level, L = low level, X = irrelevant.
D0, D1,...D7 = the level of the respective D input

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



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

Supply voltage range, V_{CC} . . . . . –0.5 V to 7 V
Input voltage range, V_I (see Note 1) . . . . . – 0.5 V to V_{CC} + 0.5 V
Output voltage range, V_O (see Note 1) . . . . . –0.5 V to V_{CC} + 0.5 V
Input clamp current, I_{IK} (V_I < 0 or V_I > V_{CC}) . . . . . ± 20 mA
Output clamp current, I_{OK} (V_O < 0 or V_O > V_{CC}) . . . . . ± 50 mA
Continuous output current, I_O (V_O = 0 to V_{CC}) . . . . . ± 50 mA
Continuous current through V_{CC} or GND pins . . . . . ± 100 mA
Storage temperature range . . . . . – 65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

recommended operating conditions

			MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage		3	5	5.5	V
V_{IH}	High-level input voltage	V_{CC} = 3 V	2.1			V
		V_{CC} = 4.5 V	3.15			
		V_{CC} = 5.5 V	3.85			
V_{IL}	Low-level input voltage	V_{CC} = 3 V			0.9	V
		V_{CC} = 4.5 V			1.35	
		V_{CC} = 5.5 V			1.65	
V_I	Input voltage		0		V_{CC}	V
V_O	Output voltage		0		V_{CC}	V
I_{OH}	High-level output current	V_{CC} = 3 V			–4	mA
		V_{CC} = 4.5 V			–24	
		V_{CC} = 5.5 V			–24	
I_{OL}	Low-level output current	V_{CC} = 3 V			12	mA
		V_{CC} = 4.5 V			24	
		V_{CC} = 5.5 V			24	
$\Delta t/\Delta v$	Input transition rise or fall rate		0		10	ns/V
T_A	Operating free-air temperature		–40		85	°C

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

PARAMETER	TEST CONDITIONS	V_{CC}	T_A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
V_{OH}	I_{OH} = – 50 μA	3 V	2.9			2.9		V
		4.5 V	4.4			4.4		
		5.5 V	5.4			5.4		
	I_{OH} = – 4 mA	3 V	2.58			2.48		
	I_{OH} = – 24 mA	4.5 V	3.94			3.8		
		5.5 V	4.94			4.8		
	I_{OH} = – 75 mA†	5.5 V				3.85		
V_{OL}	I_{OL} = 50 μA	3 V			0.1		0.1	V
		4.5 V			0.1		0.1	
		5.5 V			0.1		0.1	
	I_{OL} = 12 mA	3 V			0.36		0.44	
	I_{OL} = 24 mA	4.5 V			0.36		0.44	
		5.5 V			0.36		0.44	
	I_{OL} = 75 mA†	5.5 V					1.65	
I_{OZ}	$V_O = V_{CC}$ or GND	5.5 V			± 0.5		± 5	μA
I_I	$V_I = V_{CC}$ or GND	5.5 V			± 0.1		± 1	μA
I_{CC}	$V_I = V_{CC}$ or GND, I_O = 0	5.5 V			8		80	μA
C_i	$V_I = V_{CC}$ or GND	5 V		3.5				pF
C_O	$V_O = V_{CC}$ or GND	5 V		8				pF

† Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.

switching characteristics over recommended operating free-air temperature range, V_{CC} = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t_{PLH}	A, B, or C	Y	2.6	8.1	10.8	2.6	12.1	ns
t_{PHL}			2.8	8.3	10.8	2.8	11.9	
t_{PLH}	A, B, or C	W	2.6	7.9	10.2	2.6	11.3	ns
t_{PHL}			2.5	8	10.8	2.5	12.1	
t_{PLH}	Any D	Y	2.4	6.3	8.2	2.4	9	ns
t_{PHL}			2.1	6.1	8	2.1	8.8	
t_{PLH}	Any D	W	1.9	5.7	7.5	1.9	8.2	ns
t_{PHL}			2.3	6.3	8.2	2.3	9.1	
t_{PZH}	G	Y	1.3	4.1	5.7	1.3	6.1	ns
t_{PZL}			1.6	4.9	6.6	1.6	7.2	
t_{PZH}	G	W	1.2	4	5.5	1.2	5.9	ns
t_{PZL}			1.6	4.8	6.5	1.6	7.1	
t_{PHZ}	G	Y	3	4.5	5.9	3	6.1	ns
t_{PLZ}			2.8	4.7	6.3	2.8	6.6	
t_{PHZ}	G	W	2.9	4.5	5.9	2.9	6.2	ns
t_{PLZ}			2.9	4.7	6.3	2.9	6.6	

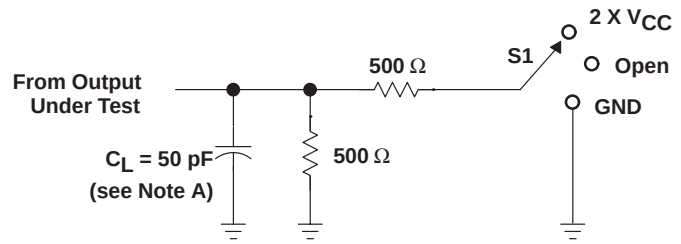
switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t_{PLH}	A, B, or C	Y	2.2	5.3	7.5	2.2	8.3	ns
t_{PHL}			2.4	5	7.5	2.4	8.4	
t_{PLH}	A, B, or C	W	2.1	4.7	7.1	2.1	7.9	ns
t_{PHL}			2.2	5.4	7.5	2.2	8.5	
t_{PLH}	Any D	Y	2	4	5.9	2	6.5	ns
t_{PHL}			1.8	3.8	5.7	1.8	6.3	
t_{PLH}	Any D	W	1.6	3.5	5.4	1.6	5.8	ns
t_{PHL}			1.9	4.1	5.9	1.9	6.6	
t_{PZH}	G	Y	1.1	2.7	4.4	1.1	4.7	ns
t_{PZL}			1.3	3.1	4.8	1.3	5.2	
t_{PZH}	G	W	1	2.6	4.3	1	4.6	ns
t_{PZL}			1.2	3	4.7	1.2	5.1	
t_{PHZ}	G	Y	2.8	4.2	5.6	2.8	5.9	ns
t_{PLZ}			2.7	4.2	5.7	2.7	6	
t_{PHZ}	G	W	2.9	4.3	5.7	2.9	6	ns
t_{PLZ}			2.7	4.2	5.7	2.7	5.9	

operating characteristics

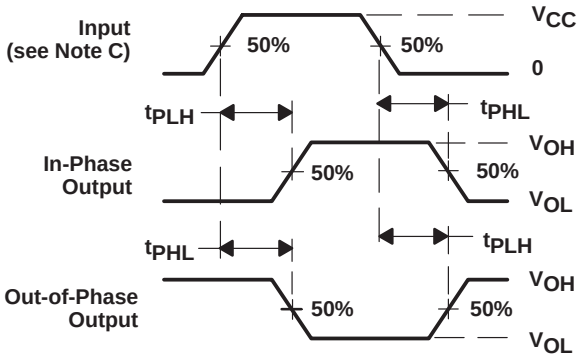
PARAMETER			TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance	Outputs enabled	C_L = 50 pF, f = 1 MHz	55	pF
		Outputs disabled		13	

PARAMETER MEASUREMENT INFORMATION

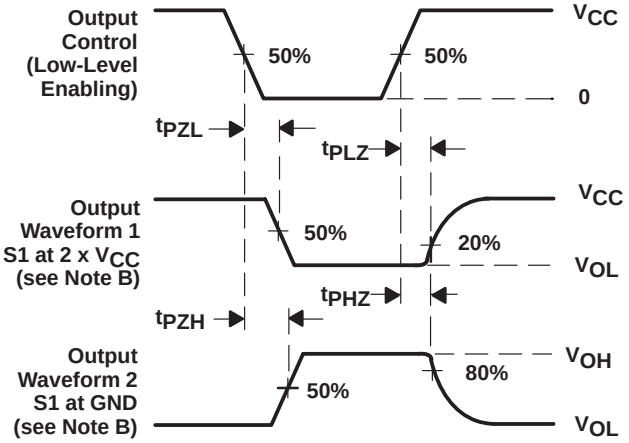


TEST	S1
t_{PLH}/t_{PHL}	OPEN
t_{PLZ}/t_{PZL}	2 x V_{CC}
t_{PHZ}/t_{PZH}	GND

LOAD CIRCUIT



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES

NOTES: A. C_L includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r ≤ 2.5 ns, t_f ≤ 2.5 ns.
D. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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