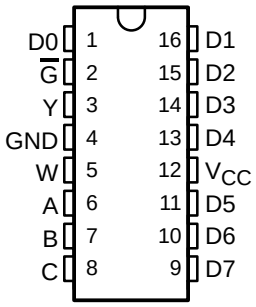
74ACT11251
1 OF 8 DATA SELECTOR/MULTIPLEXER WITH 3–STATE OUTPUTS

SCAS076 – OCTOBER 1989 – REVISED APRIL 1993

- **Inputs Are TTL-Voltage Compatible**
- **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 signal enabled 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 74ACT11251 is characterized for operation from – 40°C to 85°C.

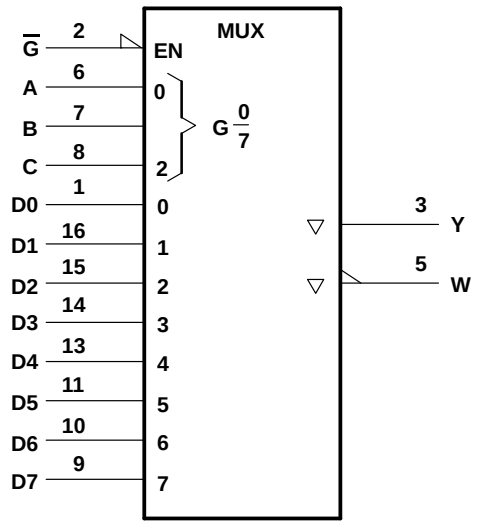
EPIC is a trademark of Texas Instruments Incorporated.

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	$\overline{D7}$

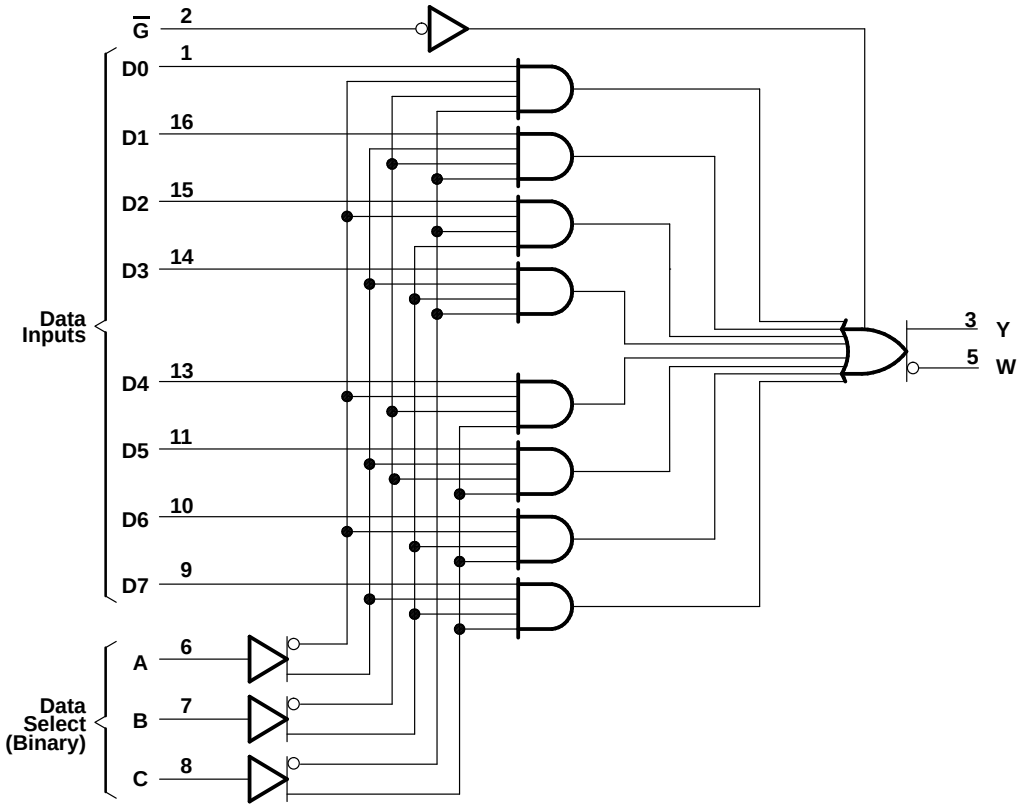
H = high level, L = low level, X = irrelevant.
D0, D1,...D7 = the level of the respective D input

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 . . . . . ±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	MAX	UNIT
V_{CC}	Supply voltage	4.5	5.5	V
V_{IH}	High-level input voltage	2		V
V_{IL}	Low-level input voltage		0.8	V
V_I	Input voltage	0	V_{CC}	V
V_O	Output voltage	0	V_{CC}	V
I_{OH}	High-level output current		–24	mA
I_{OL}	Low-level output current		24	mA
$\Delta t/\Delta v$	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	4.5 V	4.4			4.4		V
		5.5 V	5.4			5.4		
	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	4.5 V			0.1		0.1	V
		5.5 V			0.1		0.1	
	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
ΔI_{CC}‡	One input at 3.4 V, Other inputs at V_{CC} or GND	5.5 V			0.9		1	mA
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.
‡ This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0 V to V_{CC}.

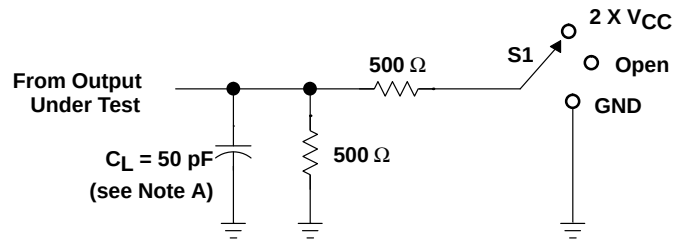
switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t_{PLH}	A, B, or C	Y	3.2	6.8	10.2	3.2	11.4	ns
t_{PHL}			2.7	6.7	9.5	2.7	10.5	
t_{PLH}	A, B, or C	W	2.5	6.3	8.8	2.5	9.8	ns
t_{PHL}			2.8	6.3	9.7	2.8	10.8	
t_{PLH}	Any D	Y	3	5.7	7.8	3	8.7	ns
t_{PHL}			2	5.2	7.9	2	8.6	
t_{PLH}	Any D	W	1.7	4.7	7.1	1.7	7.8	ns
t_{PHL}			2.7	5.1	7.2	2.7	8	
t_{PZH}	$\overline{G}$	Y	1.3	3.7	6.2	1.3	6.8	ns
t_{PZL}			1.3	4	6	1.3	6.8	
t_{PZH}	$\overline{G}$	W	1	4.4	6.4	1	7	ns
t_{PZL}			1.3	4.1	5.8	1.3	6.4	
t_{PHZ}	$\overline{G}$	Y	4.1	5.7	7.6	4.1	8.1	ns
t_{PLZ}			3.1	4	6.6	3.1	6.9	
t_{PHZ}	$\overline{G}$	W	4.1	5.7	7.7	4.1	8.2	ns
t_{PLZ}			3.2	4.1	6.6	3.2	6.9	

operating characteristics, V_{CC} = 5 V, T_A = 25°C

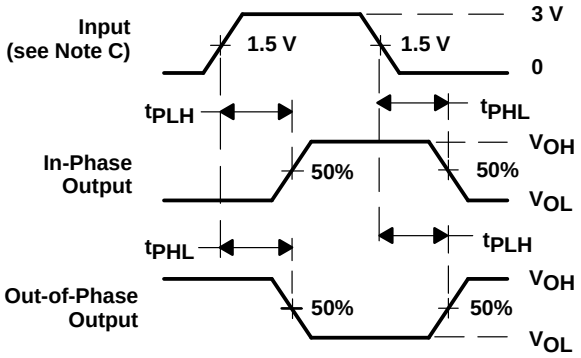
PARAMETER			TEST CONDITIONS		TYP	UNIT
C_{pd}	Power dissipation capacitance	Outputs enabled	C_L = 50 pF,	f = 1 MHz	60	pF
		Outputs disabled			16	

PARAMETER MEASUREMENT INFORMATION

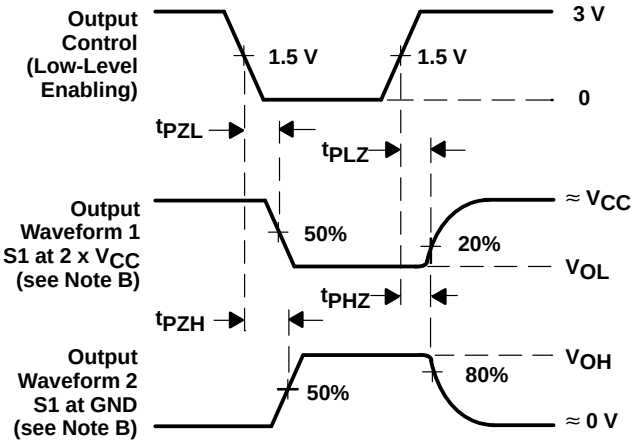


TEST	S1
t_{PLH}/t_{PHL}	OPEN
t_{PLZ}/t_{PZL}	2 x V_{CC}
t_{PHZ}/t_{PZH}	GND

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

IMPORTANT NOTICE

Texas Instruments (TI) reserves the right to make changes to its products or to discontinue any semiconductor product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

TI warrants performance of its semiconductor products and related software to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Certain applications using semiconductor products may involve potential risks of death, personal injury, or severe property or environmental damage ("Critical Applications").

TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, INTENDED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT APPLICATIONS, DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS.

Inclusion of TI products in such applications is understood to be fully at the risk of the customer. Use of TI products in such applications requires the written approval of an appropriate TI officer. Questions concerning potential risk applications should be directed to TI through a local SC sales office.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards should be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein. Nor does TI warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used.