

74ACT11153 DUAL 1 OF 4 DATA SELECTOR/MULTIPLEXER

SCAS118A – D3583, JUNE 1990 – REVISED APRIL 1993

- Inputs Are TTL-Voltage Compatible
- Permits Multiplexing From N Lines to One Line
- Performs Parallel-to-Serial Conversion
- Strobe (Enable) Line Provided for Cascading (N Lines to N Lines)
- Flow-Through Architecture Optimizes PCB Layout
- Center-Pin V_{CC} and GND Configurations Minimize High-Speed Switching Noise
- EPIC™ (Enhanced-Performance Implanted CMOS) 1- μ m Process
- 500-mA Typical Latch-Up Immunity at 125°C
- Package Options Include Plastic Small-Outline Packages and Standard Plastic 300-mil DIPs

description

This data selector/multiplexer contains inverters and drivers to supply full binary decoding data selection to the AND-OR gates. Separate strobe inputs (\bar{G}) are provided for each of the two four-line sections.

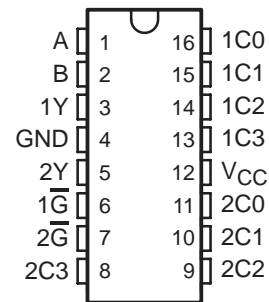
The 74ACT11153 is characterized for operation from – 40°C to 85°C.

FUNCTION TABLE

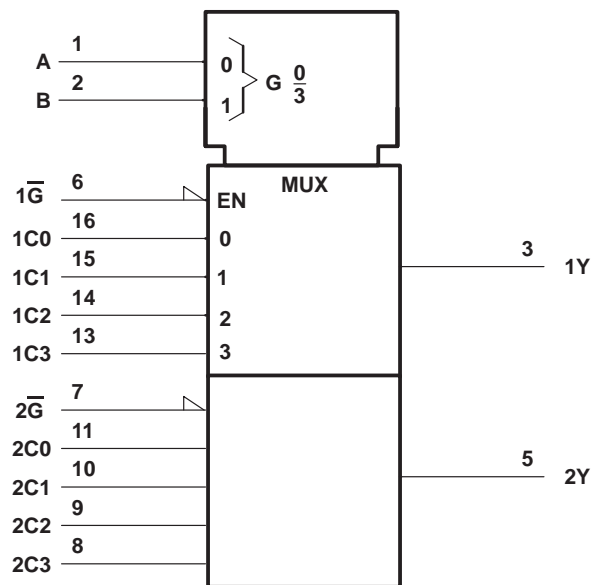
SELECT INPUTS		DATA INPUTS				STROBE \bar{G}	OUTPUT Y
		C0	C1	C2	C3		
B	A	C0	C1	C2	C3		
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

H = high level, L = low level, X = irrelevant

D OR N PACKAGE
(TOP VIEW)



logic symbol†



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

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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



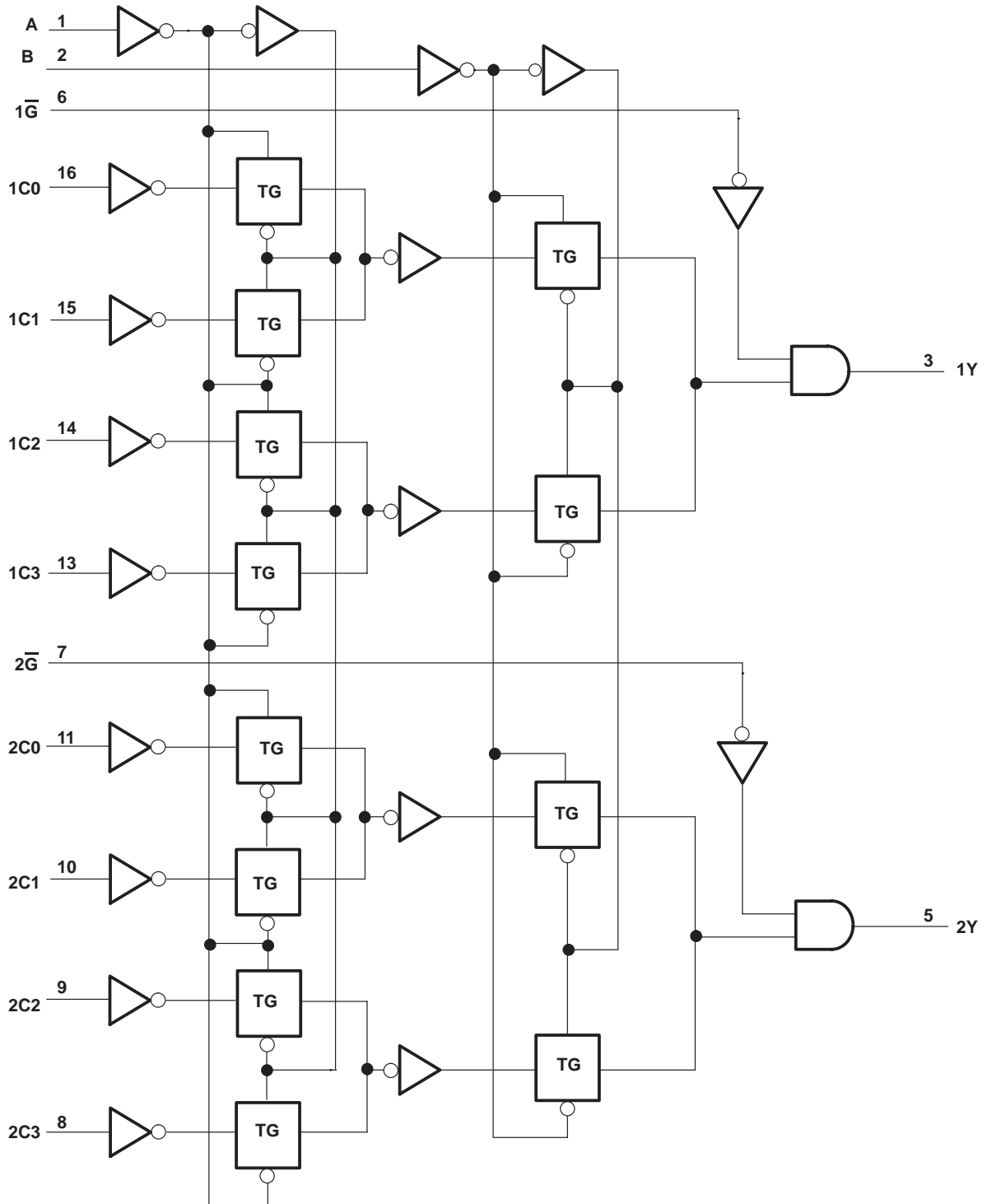
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logic diagram (positive logic)



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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}	$T_A = 25^\circ\text{C}$			MIN	MAX	UNIT
			MIN	TYP	MAX			
V_{OH}	$I_{OH} = -50 \mu\text{A}$	4.5 V	4.4		4.4		V	
		5.5 V	5.4		5.4			
	$I_{OH} = -24 \text{ mA}$	4.5 V	3.94		3.8			
		5.5 V	4.94		4.8			
	$I_{OH} = -75 \text{ mA}^\dagger$	5.5 V			3.85			
V_{OL}	$I_{OL} = 50 \mu\text{A}$	4.5 V		0.1		0.1	V	
		5.5 V		0.1		0.1		
	$I_{OL} = 24 \text{ mA}$	4.5 V		0.36		0.44		
		5.5 V		0.36		0.44		
	$I_{OL} = 75 \text{ mA}^\dagger$	5.5 V				1.65		
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}^\ddagger	One input at 3.4 V, Other inputs at GND or V_{CC}	5.5 V		0.9		1	mA	
C_i	$V_I = V_{CC}$ or GND	5 V		3.5			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 or V_{CC} .



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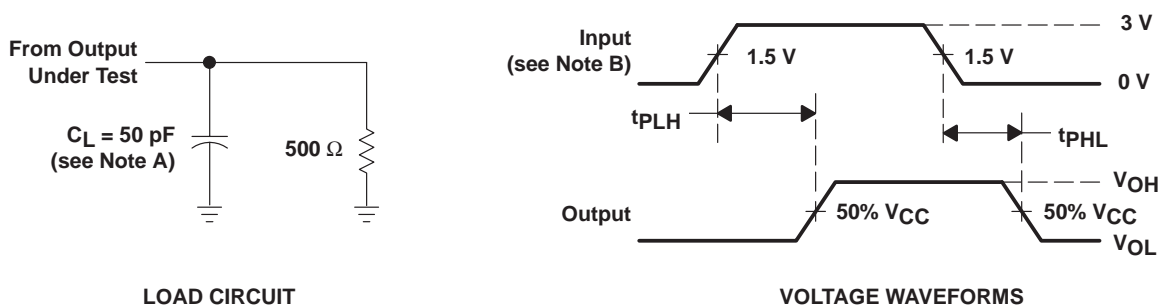
switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t _{PLH}	A or B	Y	2.8	6.4	9.8	2.8	10.9	ns
t _{PHL}			3.1	6.8	10	3.1	11	
t _{PLH}	Data (Any C)	Y	2.8	5.4	7.5	2.8	8.3	ns
t _{PHL}			3	6.4	8.8	3	9.8	
t _{PLH}	\bar{G}	Y	2.2	5.5	8.6	2.2	9.3	ns
t _{PHL}			2.9	5.6	6.6	2.9	7.6	

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

PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd} Power dissipation capacitance	C _L = 50 pF, f = 1 MHz	34	pF

PARAMETER MEASUREMENT INFORMATION



- NOTES: A. C_L includes probe and jig capacitance.
 B. Input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r = 3 ns, t_f = 3 ns.
 C. 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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