

SN74AS353B DUAL 1-OF-4 DATA SELECTOR/MULTIPLEXER WITH 3-STATE OUTPUTS

SDAS222A – APRIL 1982 – REVISED DECEMBER 1994

- Inverting Version of 'AS253
- Permits Multiplexing From n Lines to One Line
- Performs Parallel-to-Serial Conversion
- Package Options Include Plastic Small-Outline (D) Packages and Standard Plastic (N) 300-mil DIPs

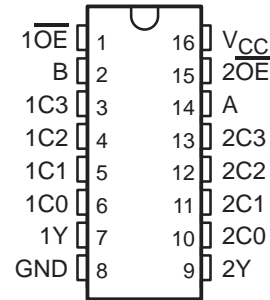
description

This data selector/multiplexer contains inverters and drivers to supply full binary decoding data selection to the AND-OR-invert gates. Separate output-enable (\overline{OE}) inputs are provided for each of the two 4-line sections.

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 the high-impedance state), the low impedance of the single enabled output drives the bus line to a high or low logic level. Each section has its own output enable. The output is disabled when \overline{OE} is high.

The SN74ALS353B is characterized for operation from 0°C to 70°C.

D OR N PACKAGE
(TOP VIEW)



FUNCTION TABLE

INPUTS							OUTPUT Y
SELECT		DATA				\overline{OE}	
B	A	C0	C1	C2	C3		
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	H
L	L	H	X	X	X	L	L
L	H	X	L	X	X	L	H
L	H	X	H	X	X	L	L
H	L	X	X	L	X	L	H
H	L	X	X	H	X	L	L
H	H	X	X	X	L	L	H
H	H	X	X	X	H	L	L

Select inputs A and B are common to both sections.

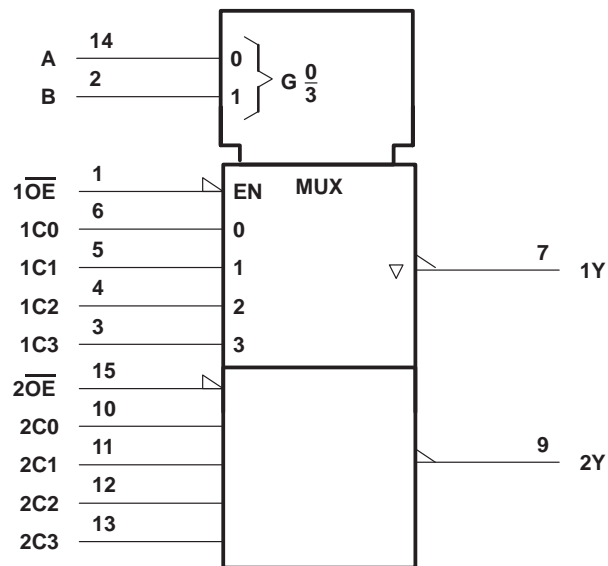
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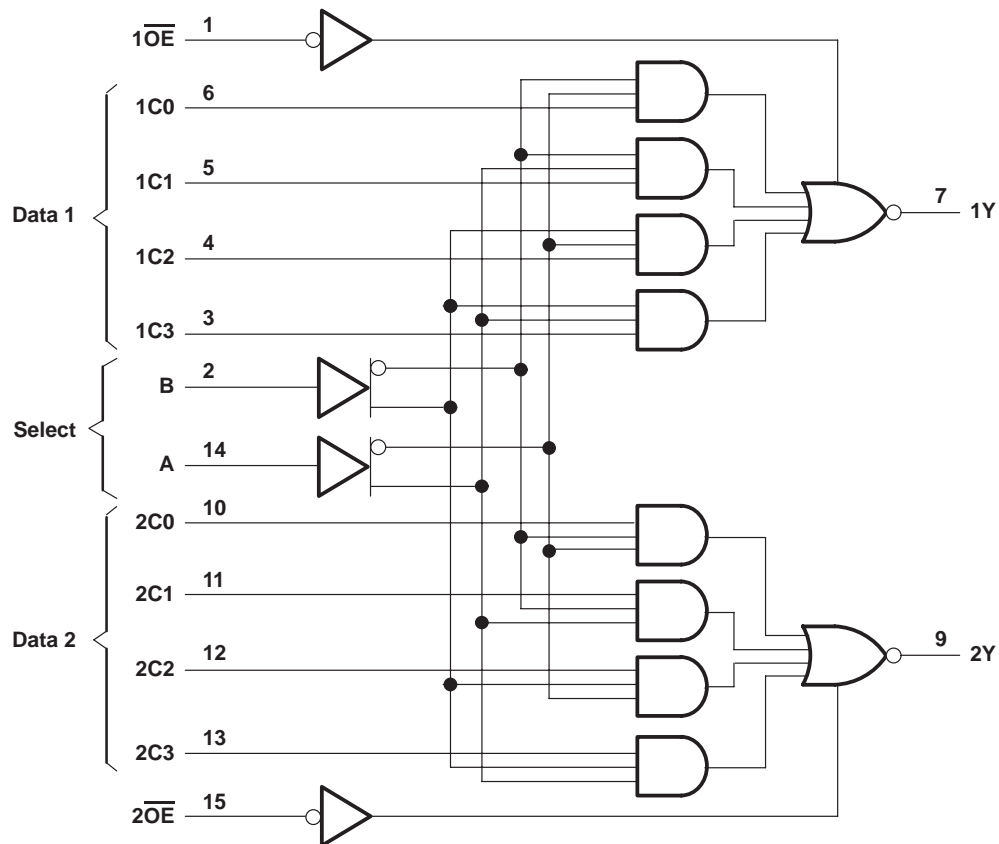
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logic symbol†



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

logic diagram (positive logic)



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

Supply voltage, V_{CC}	7 V
Input voltage, V_I	7 V
Voltage applied to a disabled 3-state output	5.5 V
Operating free-air temperature range, T_A	0°C to 70°C
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.

recommended operating conditions

	MIN	NOM	MAX	UNIT
V_{CC} Supply voltage	4.5	5	5.5	V
V_{IH} High-level input voltage	2			V
V_{IL} Low-level input voltage			0.8	V
I_{OH} High-level output current			–15	mA
I_{OL} Low-level output current			48	mA
T_A Operating free-air temperature	0		70	°C

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

PARAMETER		TEST CONDITIONS	MIN	TYP‡	MAX	UNIT
V_{IK}		$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$			–1.2	V
V_{OH}		$V_{CC} = 4.5\text{ V to } 5.5\text{ V}$, $I_{OH} = -2\text{ mA}$	$V_{CC} - 2$			V
		$V_{CC} = 4.5\text{ V}$, $I_{OH} = -15\text{ mA}$	2.4	3.3		
V_{OL}		$V_{CC} = 4.5\text{ V}$, $I_{OL} = 48\text{ mA}$		0.35	0.5	V
I_{OZH}		$V_{CC} = 5.5\text{ V}$, $V_O = 2.7\text{ V}$			50	µA
I_{OZL}		$V_{CC} = 5.5\text{ V}$, $V_O = 0.4\text{ V}$			–50	µA
I_I	A, B	$V_{CC} = 5.5\text{ V}$, $V_I = 7\text{ V}$			0.2	mA
	All others				0.1	
I_{IH}	A, B	$V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$			40	µA
	All others				20	
I_{IL}	A, B	$V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$			–1	mA
	All others				–0.5	
$I_{O§}$		$V_{CC} = 5.5\text{ V}$, $V_O = 2.25\text{ V}$	–30		–112	mA
I_{CC}		$V_{CC} = 5.5\text{ V}$			15	mA
					24	
					19	
		Outputs disabled			18	30

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

§ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

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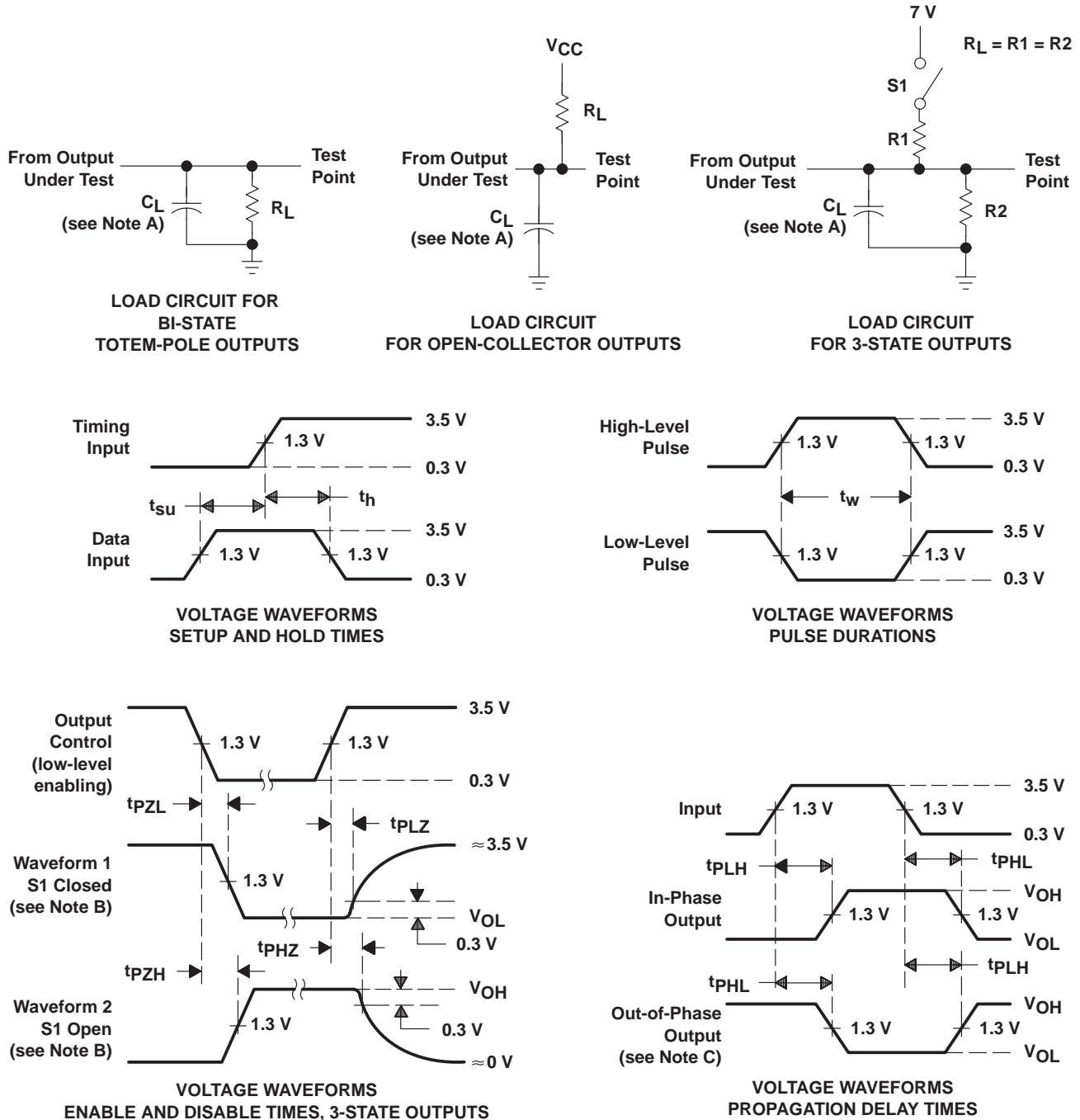
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switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T _A = MIN to MAX†		UNIT
			MIN	MAX	
t _{PLH}	A or B	Y	3	10	ns
t _{PHL}			2.5	9	
t _{PLH}	Data (any C)	Y	2	7	ns
t _{PHL}			1	6	
t _{PZH}	$\overline{\text{OE}}$	Y	1	5	ns
t _{PZL}			2	9	
t _{PHZ}	$\overline{\text{OE}}$	Y	1	6	ns
t _{PLZ}			1	5	

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

PARAMETER MEASUREMENT INFORMATION SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



- 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. When measuring propagation delay items of 3-state outputs, switch S1 is open.
 D. All input pulses have the following characteristics: $PRR \leq 1$ MHz, $t_r = t_f = 2$ ns, duty cycle = 50%.
 E. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms

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