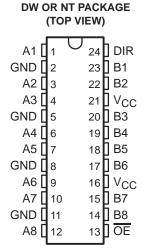
SCBS060A - JUNE 1990 - REVISED DECEMBER 1993

- State-of-the-Art BiCMOS Design Significantly Reduces I<sub>CCZ</sub>
- Designed to Facilitate Incident-Wave Switching for Line Impedances of 25  $\Omega$  or Greater
- Distributed V<sub>CC</sub> and GND Pins Minimize Noise Generated by the Simultaneous Switching of Outputs
- Data Flow-Through Pinout (All Inputs on Opposite Side From Outputs)
- High-Impedance State During Power Up and Power Down
- ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015
- Package Options Include Plastic Small-Outline (DW) Packages and Standard Plastic 300-mil DIPs (NT)



## description

The SN64BCT25245 is a 25- $\Omega$  octal bus transceiver designed for asynchronous communication between data buses. It improves both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented transceivers.

The device allows data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the direction-control (DIR) input. The output-enable  $(\overline{OE})$  input can disable the device so that both buses are effectively isolated.

This transceiver is capable of sinking 188-mA  $I_{OL}$ , which facilitates switching 25- $\Omega$  transmission lines on the incident wave. The distributed  $V_{CC}$  and GND pins minimize switching noise for more reliable system operation.

The outputs are in a high-impedance state during power up and power down while the supply voltage is less than approximately 3 V.

The SN64BCT25245 is characterized for operation from -40°C to 85°C and 0°C to 70°C.

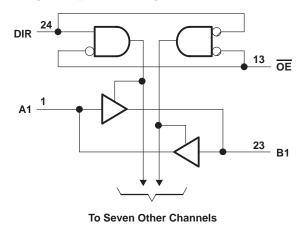
### **FUNCTION TABLE**

INP	UTS	OPERATION					
ŌĒ	DIR	OPERATION					
L	L	B data to A bus					
L	Н	A data to B bus					
Н	Χ	Isolation					

# logic symbol†

#### OE G3 24 DIR 3EN1[BA] 3EN2[AB] 23 **▽ 1 B**1 $\triangleright$ 2♡ 22 **A2 B2** 20 **A3 B3** 6 19 **B4** Α4 18 **B5** Α5 9 17 **B6** A6 10 15 Α7 **B7** 12 14 **A8 B8**

# logic diagram (positive logic)



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

Supply voltage range, V <sub>CC</sub>	0.5 V to 7 V
Input voltage range, V <sub>I</sub> (see Note 1): Control inputs	0.5 V to 7 V
I/O ports	−0.5 V to 5.5 V
Voltage range applied to any output in the disabled or power-off state, VO	
Voltage range applied to any output in the high state, VO (B port)	$\cdot \cdot -0.5 \text{ V to V}_{CC}$
Input clamp current, I <sub>IK</sub>	–30 mA
Current into any output in the low state, IO: A port	376 mA
B port	48 mA
Operating free-air temperature range	−40°C to 85°C
Storage temperature range	. −65°C to 150°C

<sup>‡</sup> 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	
Vcc	Supply voltage	4.5	5	5.5	V	
VIH	IH High-level input voltage					V
$V_{IL}$	Low-level input voltage				0.8	V
liK	Input clamp current				-18	mA
ЮН	High level output ourrant	A port			-80	mA
	High-level output current	B port			-3	IIIA
lOL	Lour lovel outbut outroot	A port	188		mΛ	
	Low-level output current	B port			24	mA
TA	Operating free-air temperature				85	°C



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

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

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

PARAMETER		TEST CONDITIONS				TYP <sup>†</sup>	MAX	UNIT
VIK		V <sub>CC</sub> = 4.5 V,	I <sub>I</sub> = -18 mA				-1.2	V
	A port	V <sub>CC</sub> = 4.75 V,	$I_{OH} = -3 \text{ mA}$		2.7			
VOH A port		V <sub>CC</sub> = 4.5 V,	$I_{OH} = -80 \text{ mA}$					V
	B port	$V_{CC} = 4.5 \text{ V},$	$I_{OH} = -3 \text{ mA}$		2.4	3.3		
	A port	V <sub>CC</sub> = 4.5 V	I <sub>OL</sub> = 94 mA			0.42	0.55	
VOL	A port	VCC = 4.5 V	I <sub>OL</sub> = 188 mA				0.7	V
	B port	$V_{CC} = 4.5 \text{ V},$	$I_{OL} = 24 \text{ mA}$			0.35	0.5	
		V <sub>CC</sub> = 0 to 2.3 V (power up)	V <sub>O</sub> = 2.7 V	OE at 0.8 V			70	μΑ
		VCC = 0 to 2.3 v (power up)	V <sub>O</sub> = 0.5 V	OE at 0.8 V			-0.6	mA
loz		V <sub>CC</sub> = 1.8 V to 0 (power down)	V <sub>O</sub> = 2.7 V	OE at 0.8 V			70	μΑ
		VCC = 1.8 V to 0 (power down)	V <sub>O</sub> = 0.5 V	OE at 0.8 V			-0.6	mA
ļ.,	A and B ports	$V_{CC} = 0 \text{ to } 5.5 \text{ V},$	V <sub>I</sub> = 5.5 V				0.25	mA
l <sub>l</sub>	DIR and OE	vCC = 0 to 5.5 v,	V   = 3.5 V			0.1		
. +	A and B ports	V <sub>CC</sub> = 5.5 V,	V <sub>1</sub> = 2.7 V				70	μΑ
¹IH <sup>‡</sup>	DIR and OE	VCC = 5.5 V,					20	μΑ
I <sub>IL</sub> ‡	A and B ports	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 0.5 V				-0.6	mA
	DIR and OE	VCC = 5.5 V,	V   = 0.5 V			-0.6	IIIA	
IOS§	B port¶	$V_{CC} = 5.5 \text{ V},$	V <sub>O</sub> = 0		-60		-150	mA
looi	A to B port	V <sub>CC</sub> = 5.5 V				48	60	mA
ICCL	B to A port	VCC = 3.3 V			95	125	IIIA	
lasu	A to B port	V <sub>CC</sub> = 5.5 V				36	46	mA
ICCH	B to A port	vCC = 2.2 v			63	80	IIIA	
ICCZ	$V_{CC} = 5.5 \text{ V}$				12	16	mA	
Ci	OE and DIR	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 2.5 V to 0.5 V			8		pF
C.	A port	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	V: = 2.5 V to 0.5 V			18		nE.
C <sub>io</sub>	B port	$V_{CC} = 5.5 \text{ V},$	$V_1 = 2.5 \text{ V to } 0.5 \text{ V}$		8		pF	

<sup>†</sup> All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C. ‡ For I/O ports, the parameters I<sub>IH</sub> and I<sub>IL</sub> include the off-state outputs current. § Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

Testing for this parameter on the A port is not recommended.

SCBS060A - JUNE 1990 - REVISED DECEMBER 1993

# switching characteristics (see Note 2)

PARAMETER	FROM	TO (OUTPUT)	$V_{CC}$ = 5 V, $C_{L}$ = 50 pF, R1 = 500 Ω, R2 = 500 Ω, $T_{A}$ = 25°C		$V_{CC}$ = 4.5 V to 5.5 V, $C_L$ = 50 pF, R1 = 500 Ω, R2 = 500 Ω				UNIT	
	(INPUT)				T <sub>A</sub> = -40°C to 85°C		T <sub>A</sub> = 0°C to 70°C			
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	А	В	1.2	3.3	5.1	1.2	5.7	1.2	5.7	ns
<sup>t</sup> PHL	A	В	1.9	4.3	6.7	1.9	7.3	1.9	7.2	1 118
t <sub>PLH</sub>	В	А	1.2	3.3	4.8	1.2	5.5	1.2	5.5	ns l
<sup>t</sup> PHL	В	A	2.1	4	5.6	2.1	6.3	2.1	6.2	
<sup>t</sup> PZH	  -  -	А	3.7	6.3	8.4	3.7	9.7	3.7	9.6	ns
<sup>t</sup> PZL	ŌĒ	A	4.5	7.4	9.2	4.5	10.6	4.5	10.3	115
t <sub>PHZ</sub>	ŌĒ	А	1.8	3.7	5.5	1.8	6.2	1.8	6.2	ns
tPLZ	OE	A	3.3	5.1	7.2	3.3	8.8	3.3	8.3	115
<sup>t</sup> PZH	ŌĒ	В	3.4	5.7	7.9	3.4	8.9	3.4	8.9	ns
t <sub>PZL</sub>	OE .		4.3	6.6	8.7	4.3	9.9	4.3	9.7	
<sup>t</sup> PHZ	OE	В	2.7	4.5	6.3	2.7	6.9	2.7	6.9	ns
t <sub>PLZ</sub>		В	1.7	4.5	6.8	1.7	7.7	1.7	7.5	119

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

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