

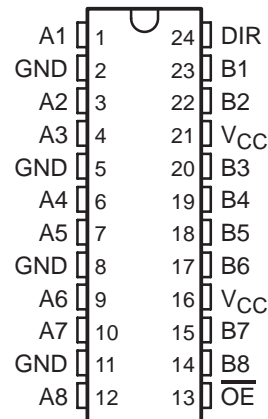


# SN64BCT25245 25-Ω OCTAL BUS TRANSCEIVER

SCBS060A – JUNE 1990 – REVISED DECEMBER 1993

- State-of-the-Art BiCMOS Design Significantly Reduces  $I_{CCZ}$
- Designed to Facilitate Incident-Wave Switching for Line Impedances of 25 Ω or Greater
- Distributed  $V_{CC}$  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)

DW OR NT PACKAGE  
(TOP VIEW)



## description

The SN64BCT25245 is a 25-Ω 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-Ω 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

INPUTS		OPERATION
$\overline{OE}$	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation



**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
$V_{OH}$	A port	$V_{CC} = 4.75\text{ V}$ ,	$I_{OH} = -3\text{ mA}$	2.7			V
		$V_{CC} = 4.5\text{ V}$ ,	$I_{OH} = -80\text{ mA}$	2			
	B port	$V_{CC} = 4.5\text{ V}$ ,	$I_{OH} = -3\text{ mA}$	2.4	3.3		
$V_{OL}$	A port	$V_{CC} = 4.5\text{ V}$	$I_{OL} = 94\text{ mA}$		0.42	0.55	V
			$I_{OL} = 188\text{ mA}$			0.7	
	B port	$V_{CC} = 4.5\text{ V}$ ,	$I_{OL} = 24\text{ mA}$		0.35	0.5	
$I_{OZ}$		$V_{CC} = 0\text{ to }2.3\text{ V}$ (power up)	$V_O = 2.7\text{ V}$	$\overline{OE}$ at 0.8 V		70	$\mu\text{A}$
			$V_O = 0.5\text{ V}$			-0.6	mA
		$V_{CC} = 1.8\text{ V to }0$ (power down)	$V_O = 2.7\text{ V}$	$\overline{OE}$ at 0.8 V		70	$\mu\text{A}$
			$V_O = 0.5\text{ V}$			-0.6	mA
$I_I$	A and B ports	$V_{CC} = 0\text{ to }5.5\text{ V}$ ,	$V_I = 5.5\text{ V}$			0.25	mA
	DIR and $\overline{OE}$					0.1	
$I_{IH}‡$	A and B ports	$V_{CC} = 5.5\text{ V}$ ,	$V_I = 2.7\text{ V}$			70	$\mu\text{A}$
	DIR and $\overline{OE}$					20	
$I_{IL}‡$	A and B ports	$V_{CC} = 5.5\text{ V}$ ,	$V_I = 0.5\text{ V}$			-0.6	mA
	DIR and $\overline{OE}$						
$I_{OS}§$	B port¶	$V_{CC} = 5.5\text{ V}$ ,	$V_O = 0$	-60		-150	mA
$I_{CCL}$	A to B port	$V_{CC} = 5.5\text{ V}$			48	60	mA
	B to A port				95	125	
$I_{CCH}$	A to B port	$V_{CC} = 5.5\text{ V}$			36	46	mA
	B to A port				63	80	
$I_{CCZ}$		$V_{CC} = 5.5\text{ V}$			12	16	mA
$C_i$	$\overline{OE}$ and DIR	$V_{CC} = 5.5\text{ V}$ ,	$V_I = 2.5\text{ V to }0.5\text{ V}$			8	pF
$C_{io}$	A port	$V_{CC} = 5.5\text{ V}$ ,	$V_I = 2.5\text{ V to }0.5\text{ V}$			18	pF
	B port					8	

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

‡ For I/O ports, the parameters  $I_{IH}$  and  $I_{IL}$  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.

# SN64BCT25245

## 25-Ω OCTAL BUS TRANSCEIVER

SCBS060A – JUNE 1990 – REVISED DECEMBER 1993

### switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = 25°C			V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω				UNIT
						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>	A	B	1.2	3.3	5.1	1.2	5.7	1.2	5.7	ns
t <sub>PHL</sub>			1.9	4.3	6.7	1.9	7.3	1.9	7.2	
t <sub>PLH</sub>	B	A	1.2	3.3	4.8	1.2	5.5	1.2	5.5	ns
t <sub>PHL</sub>			2.1	4	5.6	2.1	6.3	2.1	6.2	
t <sub>PZH</sub>	$\overline{OE}$	A	3.7	6.3	8.4	3.7	9.7	3.7	9.6	ns
t <sub>PZL</sub>			4.5	7.4	9.2	4.5	10.6	4.5	10.3	
t <sub>PHZ</sub>	$\overline{OE}$	A	1.8	3.7	5.5	1.8	6.2	1.8	6.2	ns
t <sub>PLZ</sub>			3.3	5.1	7.2	3.3	8.8	3.3	8.3	
t <sub>PZH</sub>	$\overline{OE}$	B	3.4	5.7	7.9	3.4	8.9	3.4	8.9	ns
t <sub>PZL</sub>			4.3	6.6	8.7	4.3	9.9	4.3	9.7	
t <sub>PHZ</sub>	$\overline{OE}$	B	2.7	4.5	6.3	2.7	6.9	2.7	6.9	ns
t <sub>PLZ</sub>			1.7	4.5	6.8	1.7	7.7	1.7	7.5	

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



**PACKAGING INFORMATION**

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN64BCT25245DW	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	6BCT25245	<b>Samples</b>

(1) The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSELETE:** TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "-" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

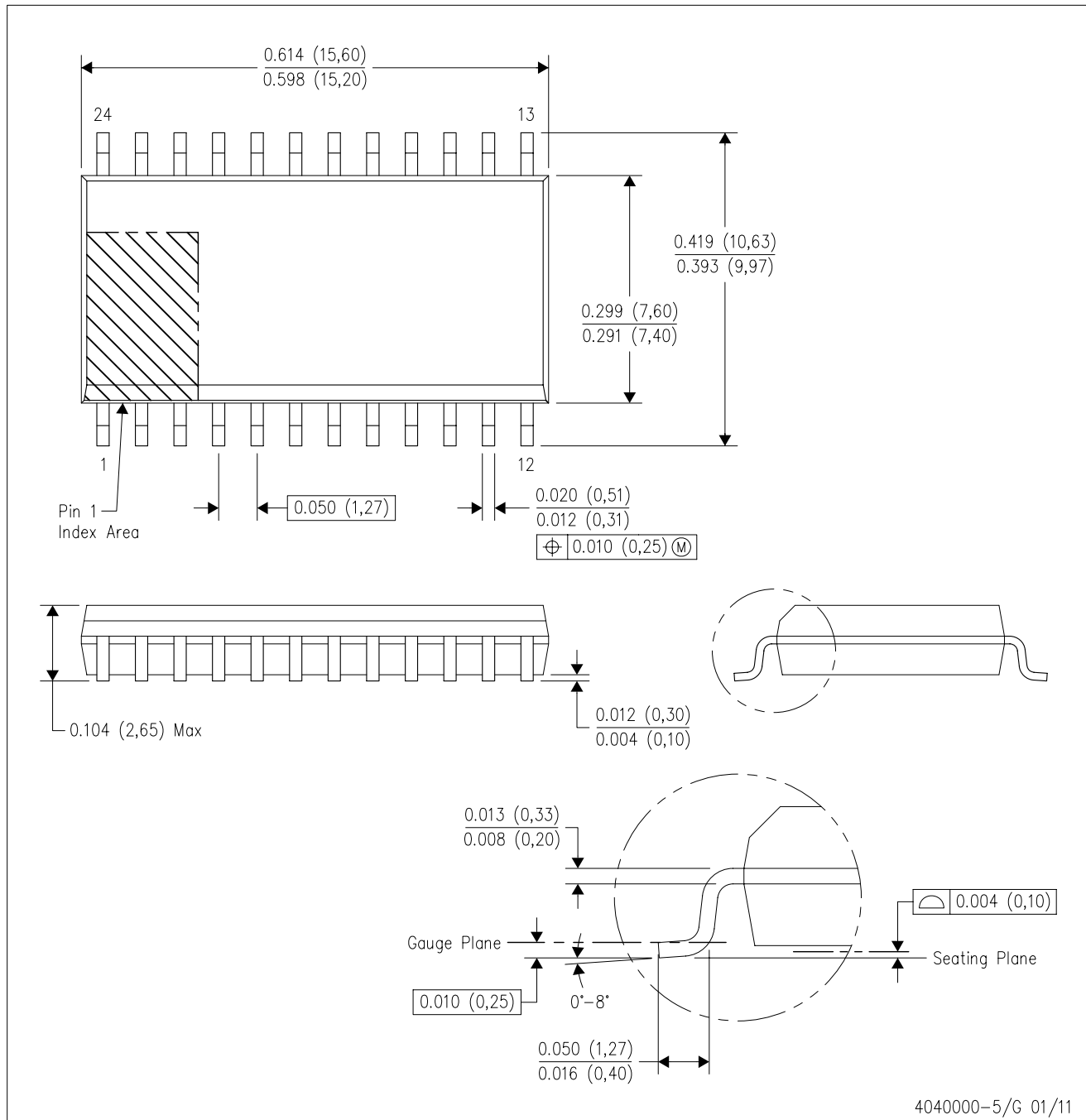
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DW (R-PDSO-G24)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
  - D. Falls within JEDEC MS-013 variation AD.

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