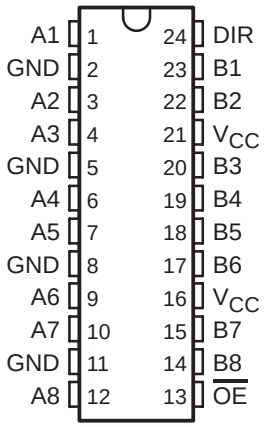
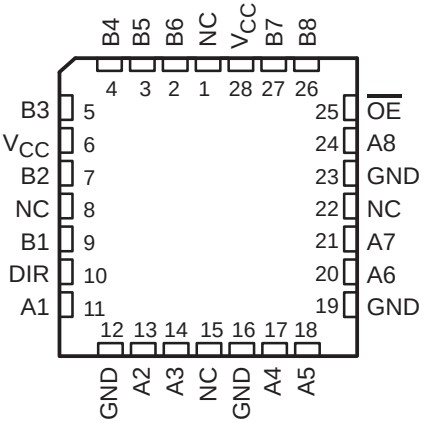
- **State-of-the-Art BiCMOS Design Significantly Reduces I_{CCZ}**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)**
- **Designed to Facilitate Incident-Wave Switching for Line Impedances of 25 Ω or Greater**
- **Distributed V_{CC} and GND Pins Minimize Noise Generated by the Simultaneous Switching of Outputs**
- **Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK) and Flatpacks (W), and Standard Plastic and Ceramic 300-mil DIPs (JT, NT)**

SN54BCT25245 . . . JT OR W PACKAGE
SN74BCT25245 . . . DW OR NT PACKAGE
(TOP VIEW)



SN54BCT25245 . . . FK PACKAGE
(TOP VIEW)



NC − No internal connection

description

The ′BCT25245 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.

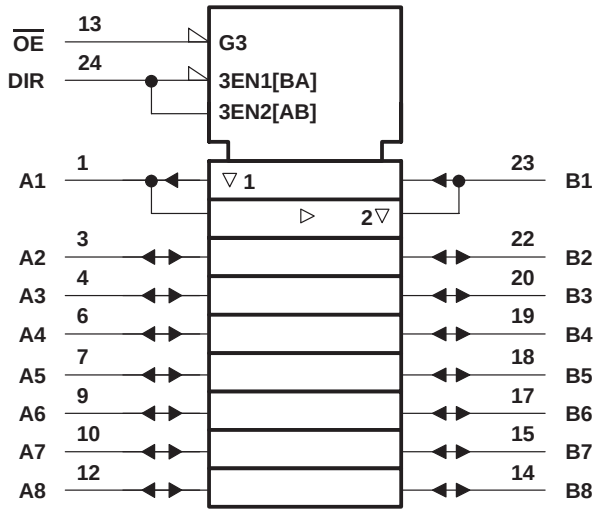
These transceivers are capable of sinking 188-mA I_{OL}, which facilitates switching 25-Ω transmission lines on the incident wave. The distributed V_{CC} and GND pins minimize switching noise for more reliable system operation.

The SN54BCT25245 is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74BCT25245 is characterized for operation from 0°C to 70°C.

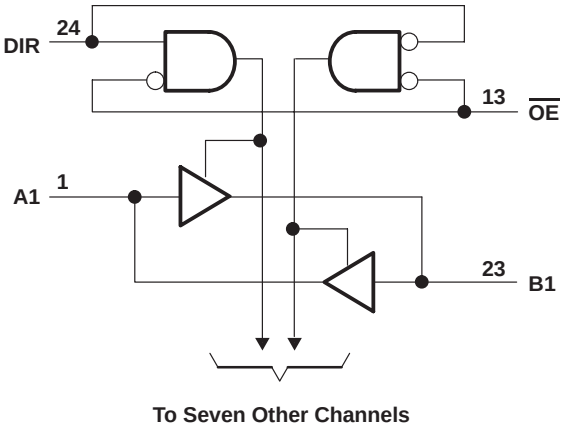
FUNCTION TABLE

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

logic symbol†



logic diagram (positive logic)



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for the DW, JT, NT, and W packages.

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): 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, V_O . . . . . −0.5 V to 5.5 V
Voltage range applied to any output in the high state, V_O (B port) . . . . . −0.5 V to V_{CC}
Input clamp current, I_{IK} . . . . . −30 mA
Current into any output in the low state, I_O: SN54BCT25245 (A port) . . . . . 250 mA
SN54BCT25245 (B port) . . . . . 40 mA
SN74BCT25245 (A port) . . . . . 376 mA
SN74BCT25245 (B port) . . . . . 48 mA
Operating free-air temperature range: SN54BCT25245 . . . . . −55°C to 125°C
SN74BCT25245 . . . . . 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.
NOTE 1: The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

recommended operating conditions

			SN54BCT25245			SN74BCT25245			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage		4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage		2			2			V
V_{IL}	Low-level input voltage				0.8			0.8	V
I_{IK}	Input clamp current				−18			−18	mA
I_{OH}	High-level output current	A port			−53			−80	mA
		B port			−3			−3	
I_{OL}	Low-level output current	A port			125			188	mA
		B port			20			24	
T_A	Operating free-air temperature		−55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS		SN54BCT25245			SN74BCT25245			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
V_{OH}	A port	V_{CC} = 4.5 V	I_{OH} = −53 mA	2						V
			I_{OH} = − 80 mA				2			
		V_{CC} = 4.75 V,	I_{OH} = −3 mA				2.7			
	B port	V_{CC} = 4.5 V,	I_{OH} = −3 mA	2.4	3.3		2.4	3.3		
V_{OL}	A port	V_{CC} = 4.5 V	I_{OL} = 94 mA		0.38	0.55		0.42	0.55	V
			I_{OL} = 125 mA			0.8				
			I_{OL} = 188 mA						0.7	
	B port	V_{CC} = 4.5 V	I_{OL} = 20 mA		0.3	0.5				
			I_{OL} = 24 mA					0.35	0.5	
I_I	A or B port	V_{CC} = 5.5 V,	V_I = 5.5 V			0.25			0.25	mA
	Control input					0.1			0.1	
I_{IH}‡	A or B port	V_{CC} = 5.5 V,	V_I = 2.7 V			70			70	µA
	Control input					20			20	
I_{IL}‡	A or B port	V_{CC} = 5.5 V,	V_I = 0.5 V			−0.6			−0.6	mA
	Control input					−0.6			−0.6	
I_{OS}§	B port only¶	V_{CC} = 5.5 V,	V_O = 0	−60		−150	−60		−150	mA
I_{CCH}	A to B	V_{CC} = 5.5 V			36	46		36	46	mA
	B to A				63	80		63	80	
I_{CCL}	A to B	V_{CC} = 5.5 V			48	60		48	60	mA
	B to A				95	125		95	125	
I_{CCZ}		V_{CC} = 5.5 V			12	16		12	16	mA
C_i	Control input	V_{CC} = 5 V,	V_I = 2.5 V or 0.5 V		8			8		pF
C_{io}	A port	V_{CC} = 5 V,	V_O = 2.5 V or 0.5 V		18			18		pF
	B port				8			8		

† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output 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.

switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	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, T_A = MIN to MAX†				UNIT
			′BCT25245			SN54BCT25245		SN74BCT25245		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	B	1.2	3.3	5.1	1.2	5.8	1.2	5.7	ns
t_{PHL}			1.9	4.3	6.7	1.9	7.6	1.9	7.2	
t_{PLH}	B	A	1.2	3.3	4.8	1.2	5.7	1.2	5.5	ns
t_{PHL}			2.1	4	5.6	2.1	6.4	2.1	6.2	
t_{PZH}	$\overline{OE}$	A	3.7	6.3	8.4	3.7	10.1	3.7	9.6	ns
t_{PZL}			4.5	7.4	9.2	4.5	11.1	4.5	10.3	
t_{PHZ}	$\overline{OE}$	A	1.8	3.7	5.5	1.8	6.4	1.8	6.2	ns
t_{PLZ}			3.3	5.1	7.2	3.3	9.6	3.3	8.3	
t_{PZH}	$\overline{OE}$	B	3.4	5.7	7.9	3.4	9.2	3.4	8.9	ns
t_{PZL}			4.3	6.6	8.7	4.3	10.1	4.3	9.7	
t_{PHZ}	$\overline{OE}$	B	2.7	4.5	6.3	2.7	7.2	2.7	6.9	ns
t_{PLZ}			1.7	4.5	6.8	1.7	8.3	1.7	7.5	

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

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

TEXAS INSTRUMENTS
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77251−1443

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SN74BCT25245DW	Active	Production	SOIC (DW) | 24	25 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	BCT25245
SN74BCT25245DW.A	Active	Production	SOIC (DW) | 24	25 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	BCT25245

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

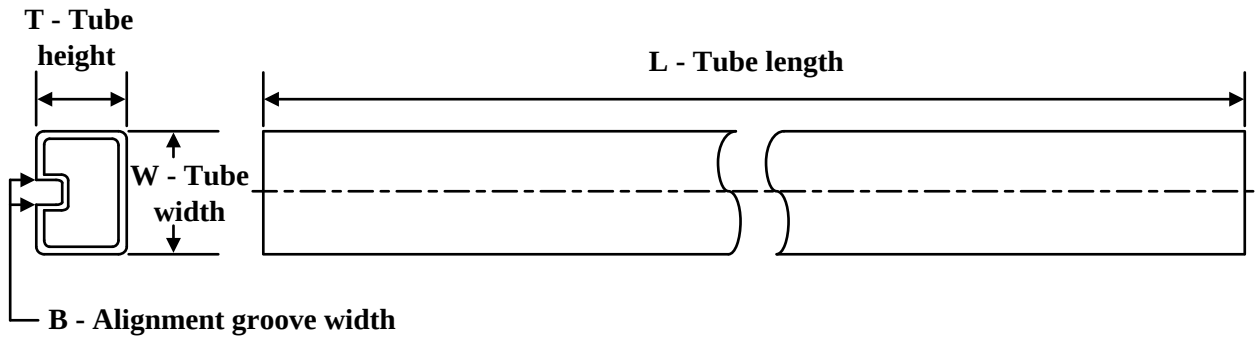
(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

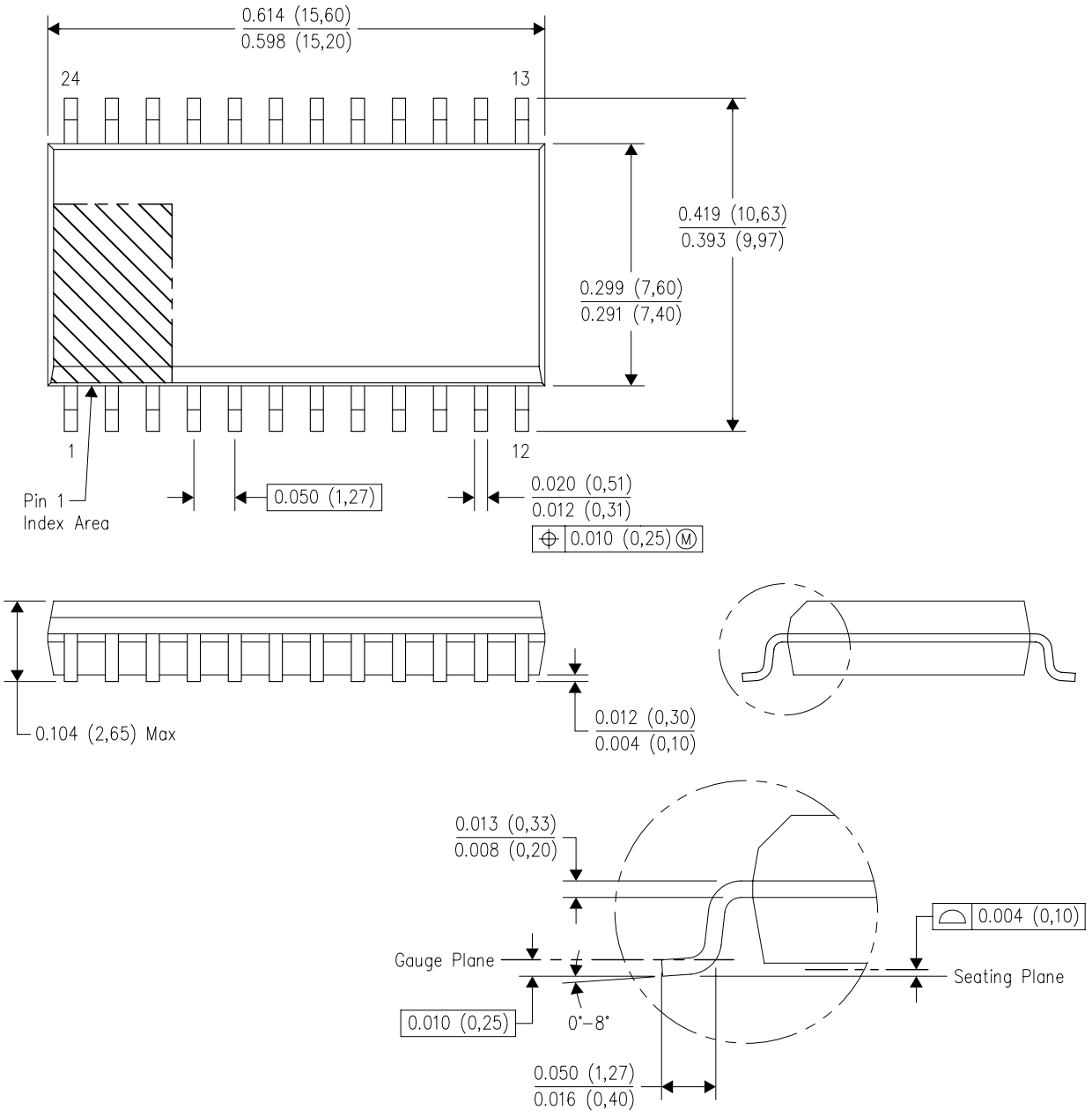
TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
SN74BCT25245DW	DW	SOIC	24	25	506.98	12.7	4826	6.6
SN74BCT25245DW.A	DW	SOIC	24	25	506.98	12.7	4826	6.6

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.

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you fully indemnify TI and its representatives against any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale, TI’s General Quality Guidelines, or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

TI objects to and rejects any additional or different terms you may propose.

Last updated 10/2025