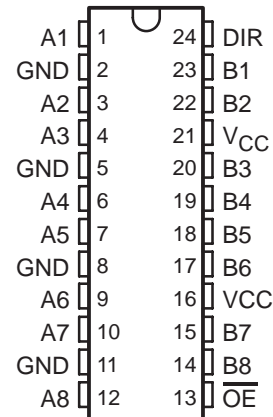


- **State-of-the-Art BiCMOS Design Significantly Reduces I_{CCZ}**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015; Exceeds 200 V Using Machine Model ($C = 200$ pF, $R = 0$)**
- **Designed to Facilitate Incident-Wave Switching for Line Impedances of 25 Ω or Greater**
- **Distributed V_{CC} and GND Pins Minimize Noise Generated by the Simultaneous Switching of Outputs**
- **The A Port Features Open-Collector Outputs That Provide 188-mA I_{OL} to Allow for Heavy DC Loading on Open-Collector Outputs**
- **Eliminates Need for 3-State Overlap Protection on A Ports**
- **Package Options Include Plastic Small-Outline (DW) Packages and Standard Plastic 300-mil DIPs (NT)**

**DW OR NT PACKAGE
(TOP VIEW)**



description

This 25-Ω octal bus transceiver is designed for asynchronous communication between data buses. The device transmits data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the direction-control (DIR) input. The output-enable (\overline{OE}) input can be used to disable the device so the buses are effectively isolated.

The SN74BCT25642 is capable of sinking 188-mA I_{OL} (A port), which facilitates switching 25-Ω transmission lines on the incident wave. It is designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented transceivers. The distributed V_{CC} and GND pins minimize the noise generated by the simultaneous switching of the outputs.

The SN74BCT25642 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE

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

recommended operating conditions (see Note 2)

		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
V _{OH}	High-level output voltage			5.5	V
I _{IK}	Input clamp current			-18	mA
I _{OH}	High-level output current			-3	mA
I _{OL}	Low-level output current			188	mA
				24	
T _A	Operating free-air temperature	0		70	°C

NOTE 2: Unused or floating pins (input or I/O) must be held high or low.

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 V,	I _I = -18 mA			-1.2	V
V _{OH}	Any B	V _{CC} = 4.75 V,	I _{OH} = -1 mA	2.7			V
		V _{CC} = 4.5 V,	I _{OH} = -3 mA	2.4	3.3		
V _{OL}	Any A	V _{CC} = 4.5 V	I _{OL} = 94 mA		0.42	0.55	V
			I _{OL} = 188 mA			0.7	
	Any B	V _{CC} = 4.5 V,	I _{OL} = 24 mA		0.35	0.5	
I _{OH}	Any A	V _{CC} = 4.5 V,	V _{OH} = 5.5 V			0.1	mA
I _I	A and B	V _{CC} = 5.5 V,	V _I = 5.5 V			0.25	mA
	DIR and \overline{OE}					0.1	
I _{IH} ‡	A and B	V _{CC} = 5.5 V,	V _I = 2.7 V			70	μA
	DIR and \overline{OE}					20	
I _{IL} ‡	A and B	V _{CC} = 5.5 V,	V _I = 0.5 V			-0.6	mA
	DIR and \overline{OE}					-0.6	
I _{OS} §	Any B	V _{CC} = 5.5 V,	V _O = 0	-60		-150	mA
I _{CCL}	A to B	V _{CC} = 5.5 V			40	64	mA
	B to A				78	125	
I _{CCH}	A to B	V _{CC} = 5.5 V			25	40	mA
	B to A				34	55	
I _{CCZ}	A to B	V _{CC} = 5.5 V			7.6	13	mA
C _i	Control inputs	V _{CC} = 5 V,	V _O = 2.5 V or 0.5 V			8	pF
C _{io}	A port	V _{CC} = 5 V,	V _I = 2.5 V or 0.5 V			15	pF
	B port					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 shorted at a time, and the duration of the short-circuit should not exceed 10 ms.



SN74BCT25642

25-Ω OCTAL BUS TRANSCEIVER

SCBS047C – DECEMBER 1989 – REVISED NOVEMBER 1993

switching characteristics over recommended ranges of supply voltage and operating free-air temperature, $C_L = 50$ pF (unless otherwise noted) (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5$ V, $T_A = 25^\circ\text{C}$			$R1 = 500 \Omega^\dagger$, $R2 = 500 \Omega$		UNIT
			MIN	TYP	MAX	MIN	MAX	
t_{PLH}	A	B	0.8	3.2	6	0.8	6.2	ns
t_{PHL}			0.5	2	3.9	0.5	4	
t_{PLH}	B	A	1.5	3.2	5.7	1.5	6.3	ns
t_{PHL}			1.7	4.5	4.8	1.7	5.9	
t_{PLH}	\overline{OE}	A	2.8	5.5	10.4	2.8	11.6	ns
t_{PHL}			4.6	8.6	11.3	4.6	11.3	
t_{PZH}	\overline{OE}	B	3.3	5.7	8.1	3.3	9.1	ns
t_{PZL}			3.8	6.6	8.8	3.8	9.8	
t_{PHZ}	\overline{OE}	B	1.8	4.6	7	1.8	7.3	ns
t_{PLZ}			1.4	4.3	6.7	1.4	7.3	

† For A port, $R1 = 100 \Omega$.

NOTE 3: 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	MSL Peak Temp ⁽³⁾
SN74BCT25642DW	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT25642DWE4	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT25642DWG4	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT25642DWR	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT25642DWRE4	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT25642DWRG4	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT25642NT	ACTIVE	PDIP	NT	24	15	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74BCT25642NTE4	ACTIVE	PDIP	NT	24	15	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type

⁽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.

OBSOLETE: 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.

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TAPE AND REEL INFORMATION



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74BCT25642DWR	SOIC	DW	24	2000	330.0	24.4	10.75	15.7	2.7	12.0	24.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

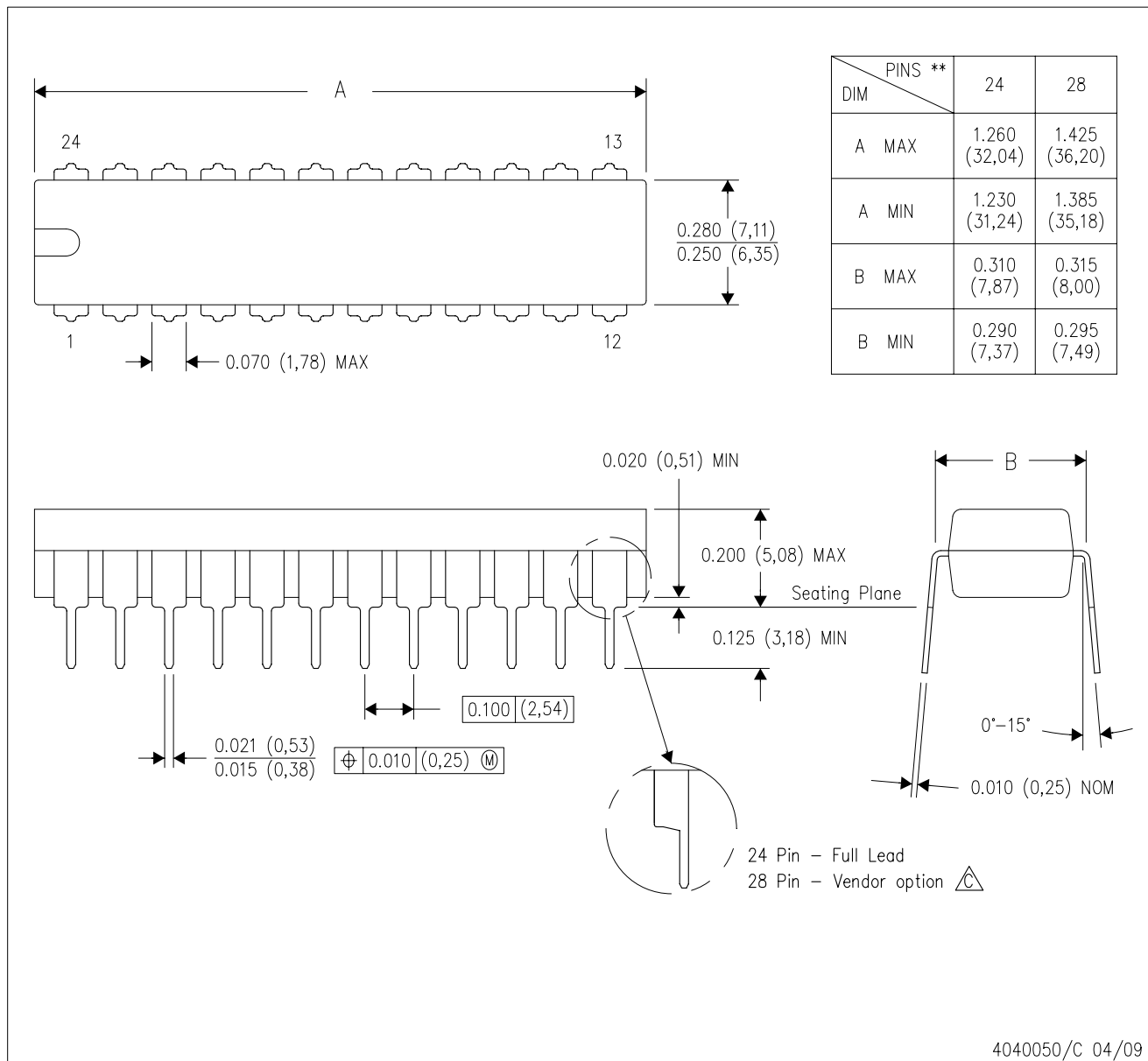
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74BCT25642DWR	SOIC	DW	24	2000	346.0	346.0	41.0


MECHANICAL DATA

NT (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

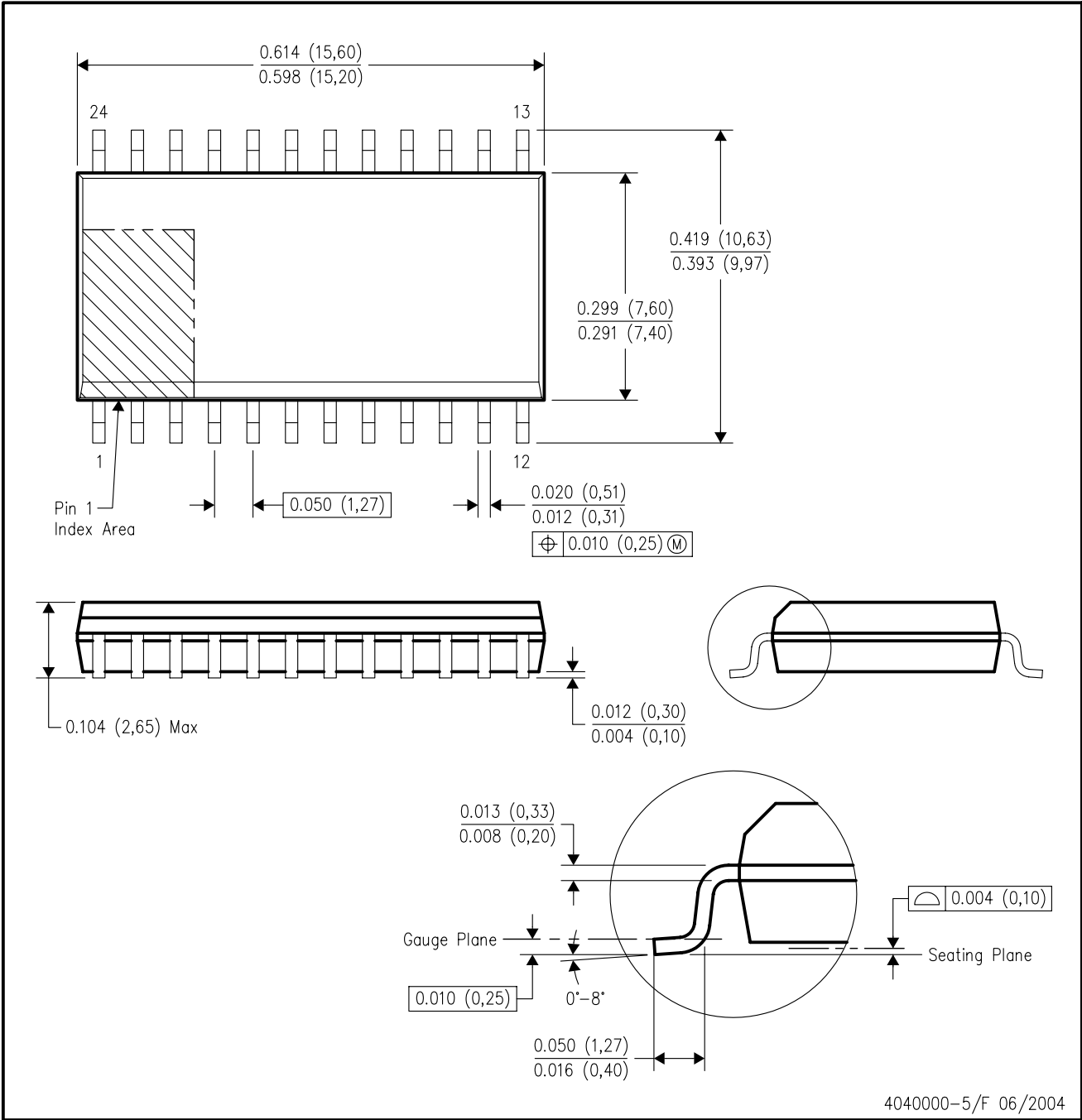
24 PINS SHOWN



- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 -  The 28 pin end lead shoulder width is a vendor option, either half or full width.

DW (R-PDSO-G24)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - 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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