SCBS025C - SEPTEMBER 1988 - REVISED APRIL 1994

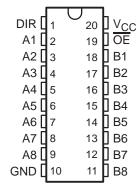
- State-of-the-Art BiCMOS Design Substantially Reduces Standby Current
- Outputs Have Undershoot-Protection Circuitry
- Power-Up High-Impedance State
- Buffered Control Inputs to Reduce DC Loading Effects
- ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015
- Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK) and Flatpacks (W), and Plastic and Ceramic 300-mil DIPs (J, N)

description

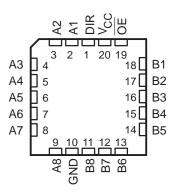
The 'BCT640 bus transceiver is designed for asynchronous communication between data buses. These devices transmit data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the direction-control (DIR) input. The output-enable (\overline{OE}) input can be used to disable the device so that the buses are effectively isolated.

The SN54BCT640 is characterized for operation over the full military temperature range of -55° C to 125°C. The SN74BCT640 is characterized for operation from 0°C to 70°C.

SN54BCT640 . . . J OR W PACKAGE SN74BCT640 . . . DW OR N PACKAGE (TOP VIEW)



SN54BCT640 . . . FK PACKAGE (TOP VIEW)

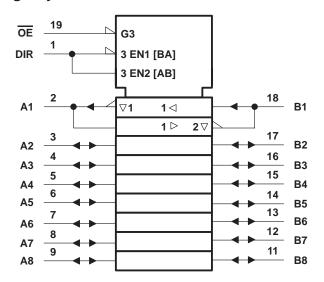


FUNCTION TABLE

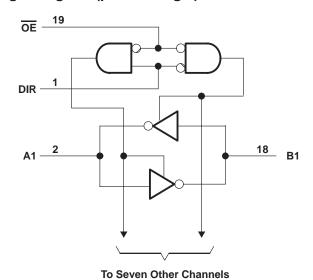
INP	UTS	OPERATION
ŌĒ	DIR	OPERATION
L	L	B data to A bus
L	Н	A data to B bus
Н	Χ	Isolation

SCBS025C - SEPTEMBER 1988 - REVISED APRIL 1994

logic symbol†



logic diagram (positive logic)



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: Control inputs (se	ee Note 1)	– 0.5 V to 7 V
I/O ports (see No	te 1)	– 0.5 V to 5.5 V
Voltage range applied to any output in	the disabled or power-off state, VO	$\dots \dots -0.5 \text{ V to } 5.5 \text{ V}$
Voltage range applied to any output in	the high state, V _O	– 0.5 V to V _{CC}
Input clamp current, I _{IK}		
Current into any output in the low state	e: SN54BCT640	96 mA
	SN74BCT640	128 mA
Operating free-air temperature range:	SN54BCT640	– 55°C to 125°C
	SN74BCT640	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 voltage ratings may be exceeded if the input and output current ratings are observed.

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

recommended operating conditions

				SN54BCT640			SN74BCT640		
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT
Vcc	Supply voltage	4.5	5	5.5	4.5	5	5.5	V	
VIH	High-level input voltage	2			2			V	
V _{IL}	Low-level input voltage			0.8			0.8	V	
ΙK	Input clamp current				-18			-18	mA
lau	High-level output current	A port			-3			-3	mA
IOH	riigh-ievel output current	B port	-12		-15		-15	'''^	
IOI Low-level output current		A port			20			24	mA
IOL	Low-level output current	B port			48			64	IIIA
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		SN	SN54BCT640			SN74BCT640			
PA	RAMEIER	TEST CONDITIONS		MIN	TYP†	MAX	MIN	TYP [†]	MAX	UNIT	
VIK		$V_{CC} = 4.5 \text{ V},$	$I_{I} = -18 \text{ mA}$			-1.2			-1.2	V	
	A port	V _{CC} = 4.5 V	I _{OH} = -1 mA	2.5	3.4		2.5	3.4			
	A port	VCC = 4.5 V	$I_{OH} = -3 \text{ mA}$	2.4	3.3		2.4	3.3			
Vон			$I_{OH} = -3 \text{ mA}$	2.4	3.3		2.4	3.3		V	
	B port	V _{CC} = 4.5 V	$I_{OH} = -12 \text{ mA}$	2	3.2						
			$I_{OH} = -15 \text{ mA}$				2	3.1			
	A port	V _{CC} = 4.5 V	$I_{OL} = 20 \text{ mA}$		0.3	0.5					
\/0.	A port	vCC = 4.5 v	$I_{OL} = 24 \text{ mA}$					0.35	0.5	V	
VOL	VOL B port	V _{CC} = 4.5 V	I _{OL} = 48 mA		0.38	0.55					
	Вроп		$I_{OL} = 64 \text{ mA}$					0.42	0.55		
	A or B port	V _{CC} = 5.5 V,	V _I = 5.5 V			1			1	mA	
I _I	Control inputs	v CC = 5.5 v,	V = 3.5 V			0.1			0.1		
. +	A or B port	V _{CC} = 5.5 V,	V _I = 2.7 V			70			70	μΑ	
¹ıн‡	Control inputs	vCC = 5.5 v,	V = 2.7 V			20			20	μΑ	
. +	A or B port	V _{CC} = 5.5 V,	V _I = 0.5 V			-0.6			-0.6	mA	
1 _{1L} ‡	Control inputs	v CC = 5.5 v,	V = 0.5 V			-0.65			-0.65	IIIA	
	A port	V00 - 5 5 V	\\o0	-60		-150	-60		-150	m /\	
los§	B port	V _{CC} = 5.5 V,	VO = 0	-100		-225	-100		-225	mA	
ICCL	A to B	V _{CC} = 5.5 V			53	84		53	94	mA	
ICCH	A to B	V _{CC} = 5.5 V			23	37		23	41	mA	
ICCZ		V _{CC} = 5.5 V			4	10		4	11	mA	

[†] 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.

SN54BCT640, SN74BCT640 OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SCBS025C - SEPTEMBER 1988 - REVISED APRIL 1994

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
			′BCT640			SN54BCT640		SN74BCT640		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A or B	B or A	0.5	3.6	5.6	0.5	7	0.5	6.5	ns
t _{PHL}	AOIB		0.5	1.9	3.4	0.5	3.8	0.5	3.7	115
^t PZH	ŌĒ	A or B	3.1	6.4	8.9	2.6	10.5	2.6	10.2	ns
t _{PZL}	OE	AOIB	4.1	6.9	9.5	3.5	12.3	3.5	10.7	115
^t PHZ	ŌĒ	A or B	1.9	5	7.9	1.4	12.2	1.4	10.2	ns
t _{PLZ}	ŬL.		1.8	4.3	6.8	1.5	8.3	1.5	7.8	115

[†] 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.



PACKAGE OPTION ADDENDUM





PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp (3)
5962-9075201M2A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
5962-9075201MRA	ACTIVE	CDIP	J	20	1	TBD	Call TI	Level-NC-NC-NC
5962-9075201MSA	ACTIVE	CFP	W	20	1	TBD	Call TI	Level-NC-NC-NC
SN74BCT640DW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT640DWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT640DWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT640DWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT640N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74BCT640NE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74BCT640NSR	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74BCT640NSRE4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SNJ54BCT640FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54BCT640J	ACTIVE	CDIP	J	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54BCT640W	ACTIVE	CFP	W	20	1	TBD	Call TI	Level-NC-NC-NC

⁽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) 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.

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.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

14 LEADS SHOWN



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package is hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
- E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F20)

CERAMIC DUAL FLATPACK



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within Mil-Std 1835 GDFP2-F20



FK (S-CQCC-N**)

28 TERMINAL SHOWN

LEADLESS CERAMIC CHIP CARRIER



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

- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a metal lid.
- D. The terminals are gold plated.
- E. Falls within JEDEC MS-004



N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
- The 20 pin end lead shoulder width is a vendor option, either half or full width.



DW (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE



- 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 AC.



MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
		Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments

Post Office Box 655303 Dallas, Texas 75265

Copyright © 2005, Texas Instruments Incorporated

Copyright © Each Manufacturing Company.

All Datasheets cannot be modified without permission.

This datasheet has been download from:

www.AllDataSheet.com

100% Free DataSheet Search Site.

Free Download.

No Register.

Fast Search System.

www.AllDataSheet.com