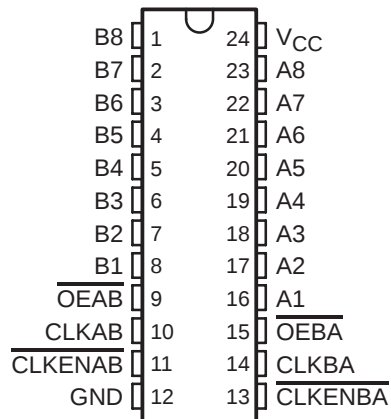


SN74BCT2953 OCTAL BUS TRANSCEIVER AND REGISTER WITH 3-STATE OUTPUTS

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- State-of-the-Art BiCMOS Design Significantly Reduces I_{CCZ}
- ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015
- Two 8-Bit, Back-to-Back Registers Store Data Flowing in Both Directions
- A Port Sinks 24 mA and Sources 3 mA
- B Port Sinks 64 mA and Sources 15 mA
- Inverting Outputs
- Package Options Include Plastic Small-Outline (DW) Packages and Standard Plastic 300-mil DIPs (NT)

DW OR NT PACKAGE
(TOP VIEW)



description

The SN74BCT2953 octal bus transceiver contains two 8-bit back-to-back registers that store data flowing in both directions between two bidirectional buses. Data on the A or B bus is stored in the registers on the low-to-high transition of the clock (CLKAB or CLKBA) input provided that the clock-enable (CLKENAB or CLKENBA) input is low. Taking the output-enable (OEAB or OEBA) input low allows access of the data on the output port (B port or A port).

The SN74BCT2953 is characterized for operation from 0°C to 70°C.

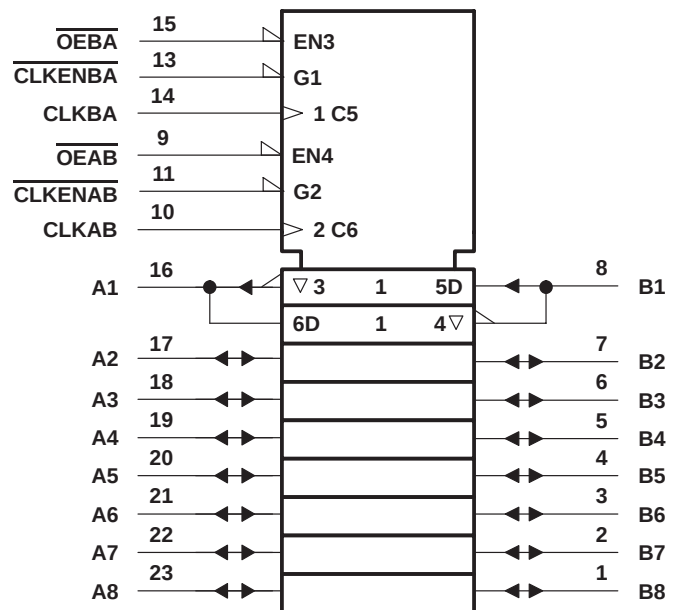
FUNCTION TABLE[†]

INPUTS				OUTPUT B
CLKENAB	CLKAB	OEAB	A	
H	X	L	X	$B_0^{\ddagger}$
X	H or L	L	X	$B_0^{\ddagger}$
L	↑	L	L	H
L	↑	L	H	L
X	X	H	X	Z

[†] A-to-B data flow is shown; B-to-A data flow is similar but uses CLKENBA, CLKBA, and OEBA.

[‡] Level of B before the indicated steady-state input conditions were established.

logic symbol[§]



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

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Supply voltage range, V_{CC}	-0.5 V to 7 V
Input voltage range (see Note 1)	-0.5 V to 7 V
Voltage range applied to any output in the disabled or power-off state	-0.5 V to 5.5 V
Voltage range applied to any output in the high state	-0.5 V to V_{CC}
Input clamp current, I_{IK} ($V_I < 0$)	-30 mA
Current into any output in the low state	128 mA
Operating free-air temperature range	0°C to 70°C
Storage temperature range	-65°C to 150°C

NOTE 1: The input negative-voltage rating may be exceeded if the input clamp-current rating is observed.

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OCTAL BUS TRANSCEIVER AND REGISTER WITH 3-STATE OUTPUTS

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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
I_{IK}	Input clamp current			-18	mA
I_{OH}	High-level output current	A ports		-3	mA
		B ports		-15	
I_{OL}	Low-level output current	A ports		24	mA
		B ports		64	
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}		$V_{CC} = 4.5\text{ V}$,	$I_I = -18\text{ mA}$			-1.2	V
V_{OH}	A port	$V_{CC} = 4.5\text{ V}$	$I_{OH} = -1\text{ mA}$	2.5	3.4		V
			$I_{OH} = -3\text{ mA}$	2.4	3.3		
	B port	$V_{CC} = 4.5\text{ V}$	$I_{OH} = -3\text{ mA}$	2.4	3.3		
			$I_{OH} = -12\text{ mA}$		3.2		
			$I_{OH} = -15\text{ mA}$	2	3.1		
V_{OL}	A port	$V_{CC} = 4.5\text{ V}$	$I_{OL} = 24\text{ mA}$		0.35	0.5	V
	B port		$I_{OL} = 64\text{ mA}$		0.42	0.55	
$I_I^{\ddagger}$	Control inputs	$V_{CC} = 5.5\text{ V}$,	$V_I = 5.5\text{ V}$			1	mA
	A or B ports					0.1	
$I_{IH}^{\ddagger}$	Control inputs	$V_{CC} = 5.5\text{ V}$,	$V_I = 2.7\text{ V}$			70	μA
	A or B ports					20	
$I_{IL}^{\ddagger}$	Control inputs	$V_{CC} = 5.5\text{ V}$,	$V_I = 0.5\text{ V}$			-70	μA
	A or B ports					-20	
$I_{OS}^{\S}$	Any A	$V_{CC} = 5.5\text{ V}$,	$V_O = 0$	-60		-150	mA
	Any B			-100		-250	
$I_{CCH}^{\parallel}$		$V_{CC} = 5.5\text{ V}$			2	5	mA
$I_{CCL}^{\parallel}$		$V_{CC} = 5.5\text{ V}$			38	55	mA
I_{CCZ}		$V_{CC} = 5.5\text{ V}$			2	5	mA
C_i	Control inputs	$V_{CC} = 5\text{ V}$,	$V_I = 2.5\text{ V}$ or 0.5 V		6		pF
C_{io}	A or B ports	$V_{CC} = 5\text{ V}$,	$V_O = 2.5\text{ V}$ or 0.5 V		12.5		pF

[†] 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-shoot output current.

[§] Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

^{||} I_{CCH} and I_{CCL} are measured in the A-to-B mode.



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OCTAL BUS TRANSCEIVER AND REGISTER WITH 3-STATE OUTPUTS

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timing requirements over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

			$V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$		MIN	MAX	UNIT
			MIN	MAX			
f_{clock}	Clock frequency		0	110	0	110	MHz
t_w	Pulse duration	CLK high	4.5		4.5		ns
		CLK low	4.5		4.5		
t_{su}	Setup time before CLK $\uparrow$	A or B	2.5		2.5		ns
		$\overline{\text{CLKENAB}}$ or $\overline{\text{CLKENBA}}$	2		2		
t_h	Hold time after CLK $\uparrow$	A or B	1.5		1.5		ns
		$\overline{\text{CLKENAB}}$ or $\overline{\text{CLKENBA}}$	2		2		

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$			MIN	MAX	UNIT
			MIN	TYP	MAX			
f_{max}			110			110		MHz
t_{PLH}	CLKBA or CLKAB	A or B	2.5	6.3	8	2.5	9.5	ns
t_{PHL}			4.3	7.8	9.4	4.3	10.2	
t_{PZH}	$\overline{\text{OEBA}}$ or $\overline{\text{OEAB}}$	A or B	2.1	5.8	7.3	2.1	8.8	ns
t_{PZL}			5.2	10.3	12.1	5.2	14	
t_{PHZ}	$\overline{\text{OEBA}}$ or $\overline{\text{OEAB}}$	A or B	2.3	5.5	7.6	2.3	9.1	ns
t_{PLZ}			1.8	5.5	7.1	1.8	7.6	

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⁾
SN74BCT2953DW	OBSOLETE	SOIC	DW	24		TBD	Call TI	Call TI
SN74BCT2953DWR	OBSOLETE	SOIC	DW	0		TBD	Call TI	Call TI
SN74BCT2953NT	OBSOLETE	PDIP	NT	24		TBD	Call TI	Call TI

⁽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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