SDFS086 - MARCH 1987 - REVISED OCTOBER 1993

- Asynchronous Communication Between Data Buses
- Local Bus-Latch Capability
- True Logic
- Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs

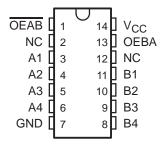
#### description

These quadruple bus transceivers are designed for asynchronous communications between data buses. The control function implementation allows for maximum flexibility in timing. These devices allow data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic levels at the output-enable (OEBA and OEAB) inputs. The output-enable inputs can be used to disable the device so that the buses are effectively isolated.

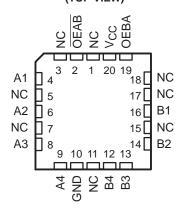
The dual-enable configuration gives the quadruple bus transceivers the capability to store data by simultaneous enabling of OEBA and OEAB. Each output reinforces its input in this transceiver configuration. Thus, when both control inputs are enabled and all other data sources to the two sets of bus lines are at high impedance, both sets of bus lines (eight in all) remain at their states. The 4-bit codes appearing on the two sets of buses will be identical for the 'F243.

The SN54F243 is characterized for operation over the full military temperature range of  $-55^{\circ}$ C to 125°C. The SN74F243 is characterized for operation from 0°C to 70°C.

#### SN54F243 . . . J PACKAGE SN74F243 . . . D OR N PACKAGE (TOP VIEW)



# SN54F243 . . . FK PACKAGE (TOP VIEW)



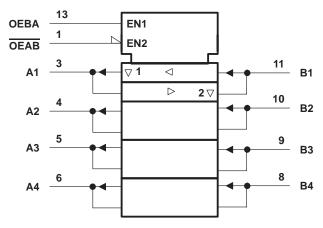
NC - No internal connection

#### **FUNCTION TABLE**

INP	UTS	FUNCTION
OEAB	OEBA	FUNCTION
L	L	A to B
Н	Н	B to A
Н	L	Isolation
L	Н	Latch A and B (A = B)

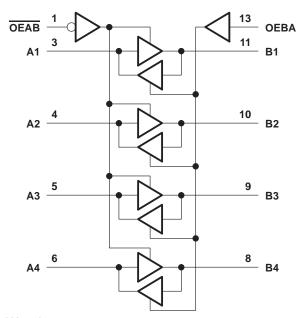
SDFS086 - MARCH 1987 - REVISED OCTOBER 1993

### logic symbol†



<sup>&</sup>lt;sup>†</sup> This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

## logic diagram (positive logic)



Pin numbers shown are for the D, J, and N packages.

# SN54F243, SN74F243 QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDFS086 - MARCH 1987 - REVISED OCTOBER 1993

### absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V <sub>CC</sub>		–0.5 V to 7 V
Input voltage range, V <sub>I</sub> (see Note 1) .		–1.2 V to 7 V
Input current range		–30 mA to 5 mA
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 <sub>CC</sub>
Current into any output in the low state	: SN54F243	96 mA
	SN74F243	128 mA
Operating free-air temperature range:	SN54F243	–55°C to 125°C
	SN74F243	0°C to 70°C
Storage temperature range		–65°C to 150°C

<sup>†</sup> 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 voltage ratings may be exceeded provided the input current ratings are observed.

#### recommended operating conditions

		SN54F243			SN74F243			
		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
VIL	Low-level input voltage			8.0			0.8	V
liK	Input clamp current			-18			-18	mA
IOH	High-level output current			- 12			- 15	mA
lOL	Low-level output current			48			64	mA
TA	Operating free-air temperature	-55		125	0		70	°C

## SN54F243, SN74F243 QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDFS086 - MARCH 1987 - REVISED OCTOBER 1993

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

PARAMETER		TEST CONDITIONS		S	SN54F243			SN74F243			
				MIN	TYP†	MAX	MIN	TYP†	MAX	UNIT	
٧ıK		$V_{CC} = 4.5 \text{ V},$	I <sub>I</sub> = –18 mA			-1.2			-1.2	V	
			$I_{OH} = -3 \text{ mA}$	2.4	3.3		2.4	3.3			
		V <sub>CC</sub> = 4.5 V	$I_{OH} = -12 \text{ mA}$	2	3.2						
VOН			$I_{OH} = -15 \text{ mA}$				2	3.1		V	
		$V_{CC} = 4.75 \text{ V},$	$I_{OH} = -3 \text{ mA}$				2.7			İ	
.,		V <sub>CC</sub> = 4.5 V	$I_{OL} = 48 \text{ mA}$		0.38	0.55				V	
VOL			$I_{OL} = 64 \text{ mA}$					0.42	0.55		
	A or B port	.,	V <sub>I</sub> = 5.5 V			1			1		
1	Control inputs VC	V <sub>CC</sub> = 5.5 V	V <sub>I</sub> = 7 V			0.1			0.1	mA	
	A or B port‡					70			70		
lн	Control inputs	$V_{CC} = 5.5 \text{ V},$	$V_1 = 2.7 \text{ V}$			20			20	μΑ	
I <sub>IL</sub> ‡		V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 0.5 V			- 1			- 1.6	mA	
los§		V <sub>CC</sub> = 5.5 V,	VO = 0	-100		-225	-100		-225	mA	
		V <sub>CC</sub> = 5.5 V, See Note 2		Outputs high		64	80		64	80	
Icc			Outputs low		64	90		64	90	mA	
		OCC NOTE 2	Outputs disabled		71	90		71	90	]	

 $<sup>\</sup>overline{\dagger}$  All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

#### switching characteristics (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	C <sub>I</sub> R <sub>I</sub>	CC = 5 V = 50 pl = 500 s = 25°C 'F243	F, Ω,	C <sub>L</sub> R <sub>L</sub>	= 50 pF = 500 Ω = MIN to	,		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
<sup>t</sup> PLH	A or B	D on A	1.7	3.6	5.2	1.2	6.5	1.2	6.2	
<sup>t</sup> PHL		B or A	1.7	3.6	5.2	1.2	8.5	1.2	6.5	ns
<sup>t</sup> PZH	Enable		1.2	3.9	5.7	1.2	8	1.2	6.7	
t <sub>PZL</sub>		A or B	1.2	5.4	7.5	1.2	10.5	1.2	8.5	ns
t <sub>PHZ</sub>	Disable	e A or B	1.2	4.1	6	1	7.5	1	7	20
t <sub>PLZ</sub>	Disable		2	4.5	6	2	8.5	2	7	ns

<sup>¶</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions. NOTE 3: Load circuits and waveforms are shown in Section 1.



For I/O ports, the parameters I<sub>IH</sub> and I<sub>IL</sub> include the off-state output current.

<sup>§</sup> Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

NOTE 2: ICC is measured either with all transceivers enabled in only one direction or all transceivers disabled.

#### **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 TI 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. Information of third parties may be subject to additional restrictions

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.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

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

#### **Products Amplifiers** amplifier.ti.com Data Converters dataconverter.ti.com DSP dsp.ti.com Clocks and Timers www.ti.com/clocks Interface interface.ti.com Logic logic.ti.com Power Mgmt power.ti.com Microcontrollers microcontroller.ti.com www.ti-rfid.com RF/IF and ZigBee® Solutions www.ti.com/lprf

Applications	
Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Broadband	www.ti.com/broadband
Digital Control	www.ti.com/digitalcontrol
Medical	www.ti.com/medical
Military	www.ti.com/military
Optical Networking	www.ti.com/opticalnetwork
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 © 2008, Texas Instruments Incorporated