

SN54F242, SN74F242 QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDFS062A – D2932, MARCH 1987 – REVISED OCTOBER 1993

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

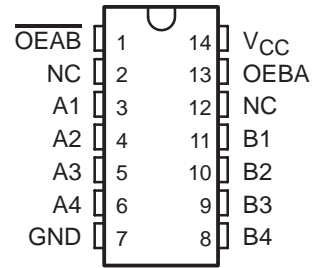
description

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 $\overline{\text{OEAB}}$) inputs. The output-enable inputs can be used to disable the device so that the buses are effectively isolated.

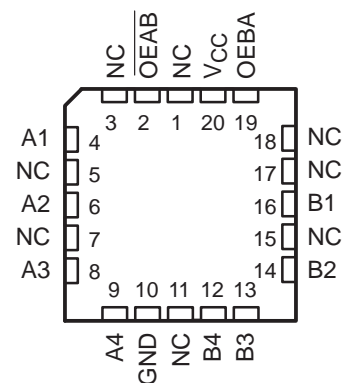
The dual-enable configuration gives the quadruple bus transceivers the capability to store data by simultaneous enabling of OEBA and $\overline{\text{OEAB}}$. Each output reinforces its input in this transceiver configuration. Thus, when both control inputs are enabled and all other data sources to the 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 complementary for the 'F242.

The SN54F242 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74F242 is characterized for operation from 0°C to 70°C .

SN54F242 . . . J PACKAGE
SN74F242 . . . D OR N PACKAGE
(TOP VIEW)



SN54F242 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

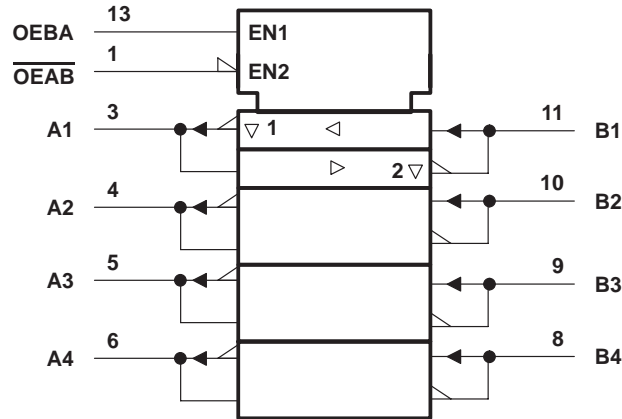
FUNCTION TABLE

INPUTS		FUNCTION
$\overline{\text{OEAB}}$	OEBA	
L	L	$\overline{\text{A}}$ to B
H	H	$\overline{\text{B}}$ to A
H	L	Isolation
L	H	Latch A and B (A = $\overline{\text{B}}$)

SN54F242, SN74F242 QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

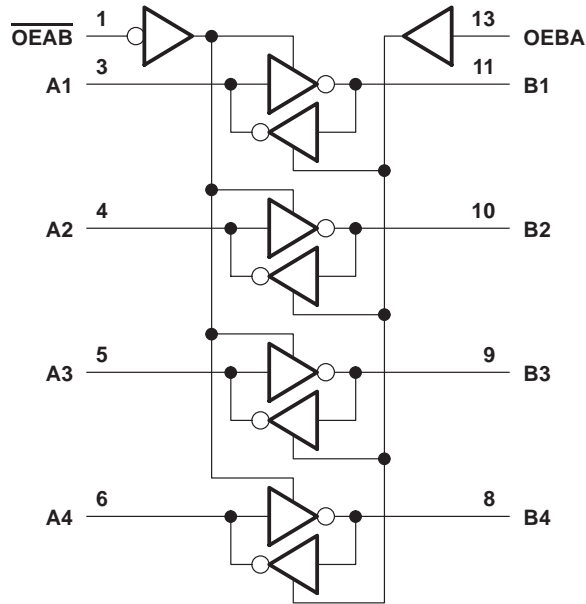
SDFS062A – D2932, MARCH 1987 – REVISED OCTOBER 1993

logic symbol†



† 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.

SN54F242, SN74F242 QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDFS062A – D2932, MARCH 1987 – REVISED OCTOBER 1993

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)	–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_{CC}
Current into any output in the low state: SN54F242	96 mA
SN74F242	128 mA
Operating free-air temperature range: SN54F242	–55°C to 125°C
SN74F242	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 voltage ratings may be exceeded provided the input current ratings are observed.

recommended operating conditions

		SN54F242			SN74F242			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			–12			–15	mA
I_{OL}	Low-level output current			48			64	mA
T_A	Operating free-air temperature	–55		125	0		70	°C



SN54F242, SN74F242 QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDFS062A – D2932, MARCH 1987 – REVISED OCTOBER 1993

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

PARAMETER	TEST CONDITIONS		SN54F242			SN74F242			UNIT	
			MIN	TYP†	MAX	MIN	TYP†	MAX		
V_{IK}	$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$		-1.2			-1.2			V	
V_{OH}	$V_{CC} = 4.5\text{ V}$	$I_{OH} = -3\text{ mA}$	2.4	3.3		2.4	3.3		V	
		$I_{OH} = -12\text{ mA}$	2	3.2						
		$I_{OH} = -15\text{ mA}$				2	3.1			
	$V_{CC} = 4.75\text{ V}$	$I_{OH} = -3\text{ mA}$				2.7				
V_{OL}	$V_{CC} = 4.5\text{ V}$	$I_{OL} = 48\text{ mA}$	0.38		0.55				V	
		$I_{OL} = 64\text{ mA}$					0.42	0.55		
I_I	A or B port	$V_{CC} = 5.5\text{ V}$	$V_I = 5.5\text{ V}$		1		1		mA	
	Control inputs		$V_I = 7\text{ V}$		0.1		0.1			
I_{IH}	A or B port‡	$V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$			70		70		μA	
	Control inputs				20		20			
$I_{IL}‡$		$V_{CC} = 5.5\text{ V}$, $V_I = 0.5\text{ V}$			-1		-1		mA	
$I_{OS}§$		$V_{CC} = 5.5\text{ V}$, $V_O = 0$	-100		-225		-100		-225	mA
I_{CC}	$V_{CC} = 5.5\text{ V}$, See Note 2	Outputs high	30		46		30		46	mA
		Outputs low	46		69		46		69	
		Outputs disabled	42		63		42		63	

† 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-state 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.

NOTE 2: I_{CC} is measured either with all transceivers enabled in only one direction or all transceivers disabled.

switching characteristics (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5\text{ V}$, $C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, $T_A = 25^\circ\text{C}$			$V_{CC} = 4.5\text{ V to }5.5\text{ V}$, $C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, $T_A = \text{MIN to MAX}^\ddagger$				UNIT
			'F242			SN54F242		SN74F242		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	2.2	4.1	6.5	2.2	9	2.2	7.5	ns
t_{PHL}			1	2.6	4.5	0.5	5	1	4.5	
t_{PZL}	Enable	A or B	2.7	5.6	7.5	2.2	10	2.7	8.5	ns
t_{PZH}			2.7	6.1	9	2.2	12	2.7	10.5	
t_{PHZ}	Disable	A or B	1.8	6.6	9	1.8	11	1.8	9.5	ns
t_{PLZ}			2.7	5.6	9.5	2.3	13.5	2.7	11	

†† 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.



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
RFID	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