

SN54ALS243A, SN74ALS243A QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDAS069B – DECEMBER 1982 – REVISED DECEMBER 1994

- Two-Way Asynchronous Communication Between Data Buses
- pnp Inputs Reduce dc Loading
- Package Options Include Plastic Small-Outline (D) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

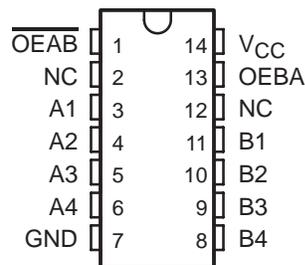
description

These quadruple bus transceivers are designed for asynchronous two-way communication 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.

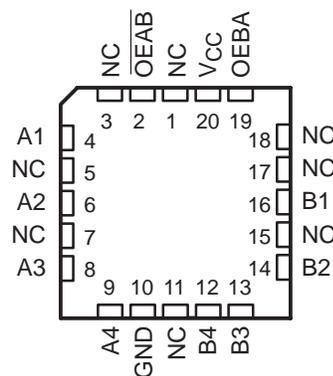
The dual-enable configuration gives the quadruple bus transceivers the capability to store data by simultaneously enabling OEBA and $\overline{\text{OEAB}}$. Each output reinforces its input in this transceiver configuration. When both control inputs are enabled and all other data sources to the two sets of bus lines are at high impedance, both sets of bus lines (eight in all) retain their states. The 4-bit codes appearing on the two sets of buses are identical.

The SN54ALS243A is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS243A is characterized for operation from 0°C to 70°C .

SN54ALS243A . . . J PACKAGE
SN74ALS243A . . . D OR N PACKAGE
(TOP VIEW)



SN54ALS243A . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

FUNCTION TABLE

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

SN54ALS243A, SN74ALS243A QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDAS069B – DECEMBER 1982 – REVISED DECEMBER 1994

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

PARAMETER	TEST CONDITIONS	SN54ALS243A		SN74ALS243A		UNIT	
		MIN	TYP†	MAX	MIN		TYP†
V_{IK}	$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$			-1.2		-1.2	V
V_{OH}	$V_{CC} = 4.5\text{ V to }5.5\text{ V}$, $I_{OH} = -0.4\text{ mA}$	$V_{CC} - 2$		$V_{CC} - 2$		V	
	$V_{CC} = 4.5\text{ V}$, $I_{OH} = -3\text{ mA}$	2.4	3.2	2.4	3.2		
	$V_{CC} = 4.5\text{ V}$, $I_{OH} = -12\text{ mA}$ $I_{OH} = -15\text{ mA}$	2		2			
V_{OL}	$V_{CC} = 4.5\text{ V}$, $I_{OL} = 12\text{ mA}$	0.25 0.4		0.25 0.4		V	
	$V_{CC} = 4.5\text{ V}$, $I_{OL} = 24\text{ mA}$			0.35 0.5			
I_I	Control inputs A or B ports	$V_{CC} = 5.5\text{ V}$		$V_I = 7\text{ V}$	0.1 0.1		mA
				$V_I = 5.5\text{ V}$	0.1 0.1		
I_{IH}	Control inputs A or B ports‡	$V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$		20 20		μA	
				20 20			
I_{IL}	Control inputs A or B ports‡	$V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$		-0.1 -0.1		mA	
				-0.1 -0.1			
I_O §	$V_{CC} = 5.5\text{ V}$, $V_O = 2.25\text{ V}$	-20	-112	-30	-112	mA	
I_{CC}	$V_{CC} = 5.5\text{ V}$	Outputs high		15 30	15 25		mA
		Outputs low		20 35	20 30		
		Outputs disabled		21 37	21 32		

† 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.

§ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5\text{ V to }5.5\text{ V}$, $C_L = 50\text{ pF}$, $R_1 = 500\ \Omega$, $R_2 = 500\ \Omega$, $T_A = \text{MIN to MAX}\ddagger$				UNIT
			SN54ALS243A		SN74ALS243A		
			MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	4	15	4	11	ns
t_{PHL}			4	15	4	11	
t_{PZH}	$\overline{\text{OEAB}}$	B	7	25	7	20	ns
t_{PZL}			7	25	7	20	
t_{PHZ}	$\overline{\text{OEAB}}$	B	2	16	2	14	ns
t_{PLZ}			3	27	3	22	
t_{PZH}	OEBA	A	7	25	7	20	ns
t_{PZL}			7	25	7	20	
t_{PHZ}	OEBA	A	2	16	2	14	ns
t_{PLZ}			3	27	3	22	

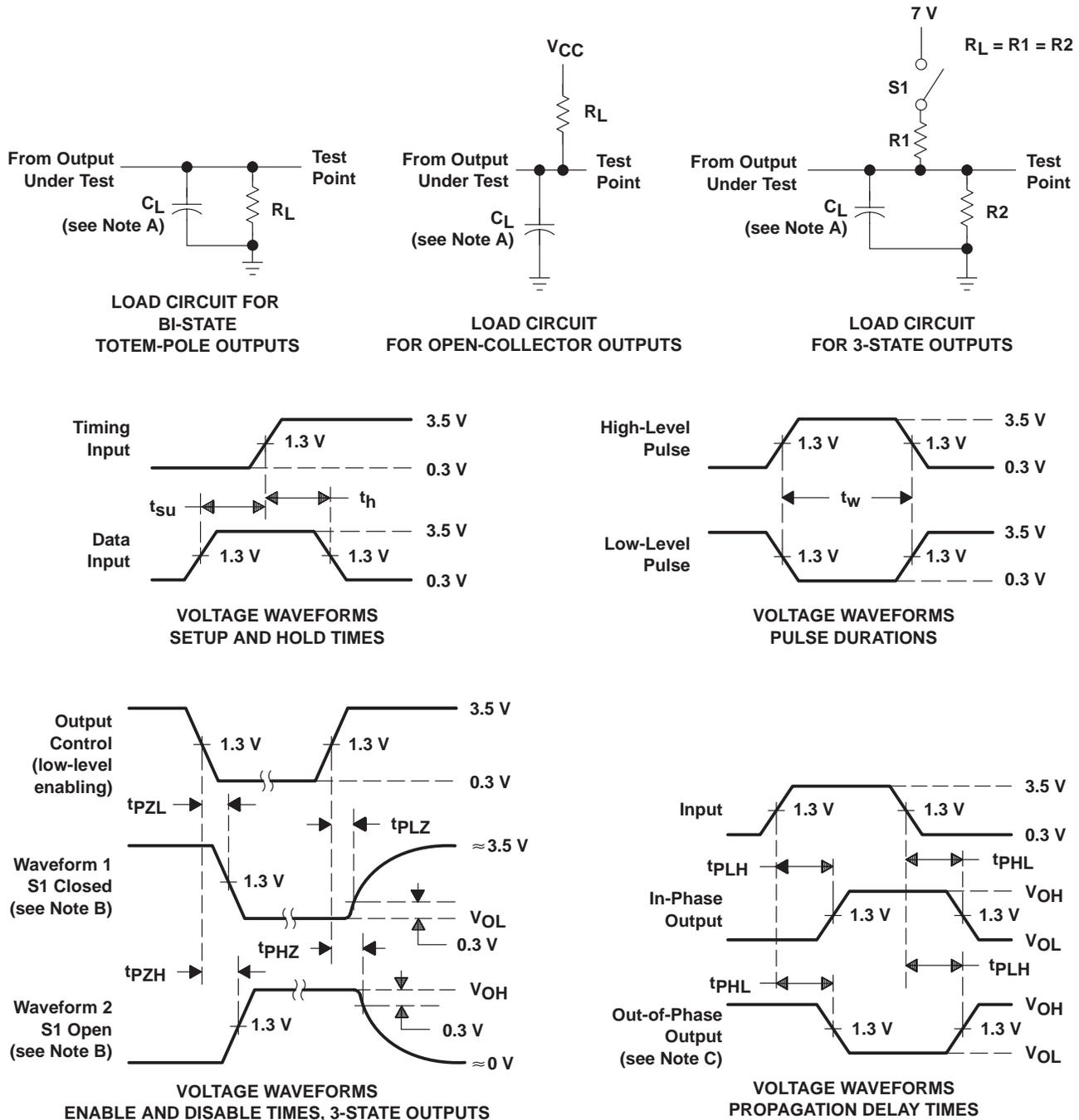
†† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.



SN54ALS243A, SN74ALS243A QUADRUPLE BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDAS069B – DECEMBER 1982 – REVISED DECEMBER 1994

PARAMETER MEASUREMENT INFORMATION SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



- NOTES: A. C_L includes probe and jig capacitance.
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 C. When measuring propagation delay items of 3-state outputs, switch S1 is open.
 D. All input pulses have the following characteristics: $PRR \leq 1$ MHz, $t_r = t_f = 2$ ns, duty cycle = 50%.
 E. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms



PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
84013022A	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	84013022A SNJ54ALS 243AFK	
SNJ54ALS243AFK	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	84013022A SNJ54ALS 243AFK	

(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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

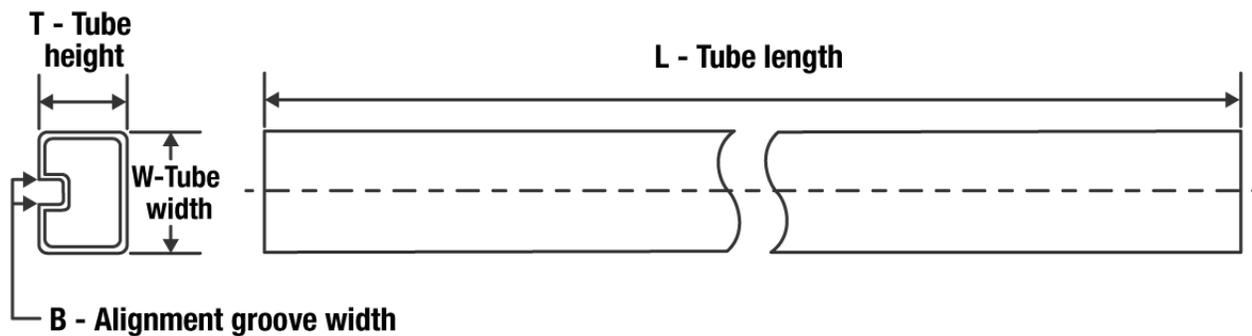
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "-" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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.

TUBE


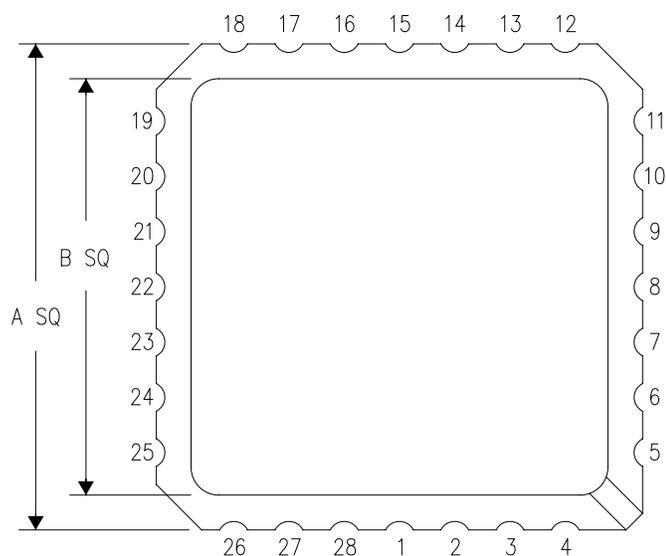
*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
84013022A	FK	LCCC	20	1	506.98	12.06	2030	NA
SNJ54ALS243AFK	FK	LCCC	20	1	506.98	12.06	2030	NA

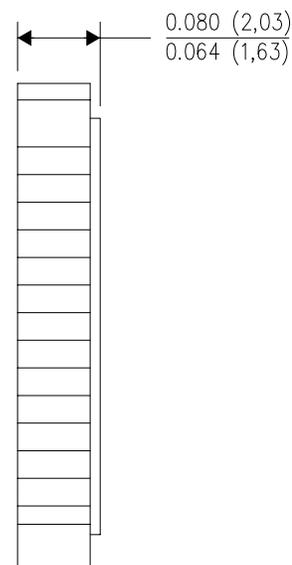
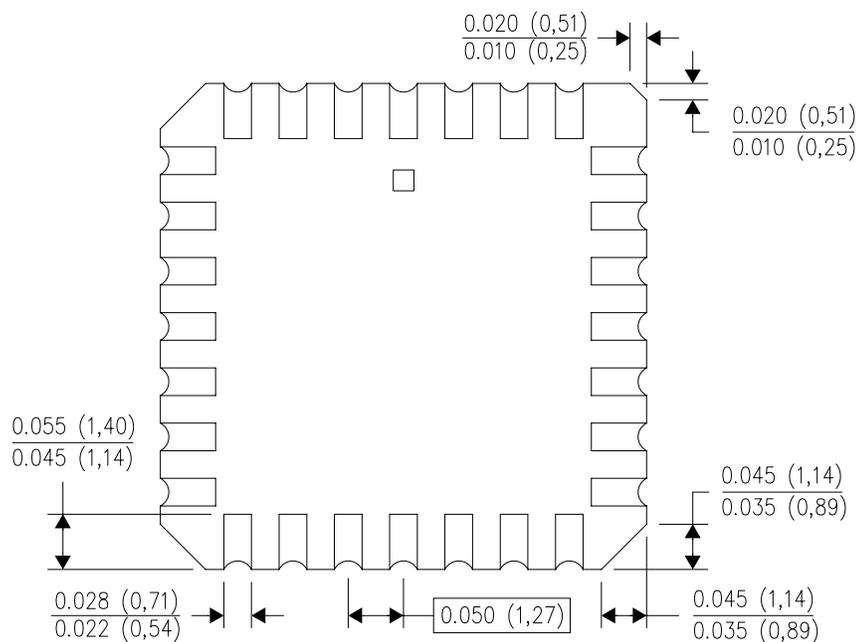
FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



NO. OF TERMINALS **	A		B	
	MIN	MAX	MIN	MAX
20	0.342 (8,69)	0.358 (9,09)	0.307 (7,80)	0.358 (9,09)
28	0.442 (11,23)	0.458 (11,63)	0.406 (10,31)	0.458 (11,63)
44	0.640 (16,26)	0.660 (16,76)	0.495 (12,58)	0.560 (14,22)
52	0.740 (18,78)	0.761 (19,32)	0.495 (12,58)	0.560 (14,22)
68	0.938 (23,83)	0.962 (24,43)	0.850 (21,6)	0.858 (21,8)
84	1.141 (28,99)	1.165 (29,59)	1.047 (26,6)	1.063 (27,0)



4040140/D 01/11

- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - This package can be hermetically sealed with a metal lid.
 - Falls within JEDEC MS-004

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2022, Texas Instruments Incorporated