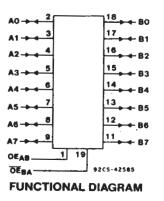
Advance Information

TEXAS INSTRUMENTS Data sheet acquired from Harris Semiconductor SCHS286A - October 2003



Octal-Bus Transceiver, 3-State, Non-Inverting

Type Features:

Buffered inputs

Typical propagation delay:

4.5 ns @ Vcc = 5 V, TA = 25° C, CL = 50 pF

The RCA CD54/74AC623 and CD54/74ACT623 octal-bus transceivers use the RCA ADVANCED CMOS technology. They are non-inverting, 3-state, bidirectional transceiver-buffers that allow for two-way transmission from "A" bus to "B" bus or "B" bus to "A" bus, depending on the logic levels of the Output Enable (OE_{AB} , \overline{OE}_{BA}) inputs.

The dual Output Enable provision gives these devices the capability to store data by simultaneously enabling OE_{AB} and \overline{OE}_{BA} . Each output reinforces its input under these conditions, and when all other data sources to the bus lines are at high-impedance, both sets of bus lines will remain in their last states.

The CD74AC623 is supplied in 20-lead dual-in-line plastic packages (E suffix) and in 20-lead small-outline packages (M, M96, and NSR suffixes). The CD74ACT623 is supplied in 20-lead small-outline packages (M96 suffix). Both package types are operable over the following temperature ranges: Commercial (0 to 70° C); Industrial (-40 to +85°C); and Extended Industrial/Military (-55 to +125°C).

The CD54AC623 and CD54ACT623, available in chip form (H suffix), are operable over the -55 to +125°C temperature range.

Family Features:

- Exceeds 2-kV ESD Protection MIL-STD-883, Method 3015
- SCR-Latchup-resistant CMOS process and circuit design
- Speed of bipolar FAST*/AS/S with significantly reduced power consumption
- Balanced propagation delays
- AC types feature 1.5-V to 5.5-V operation and balanced noise immunity at 30% of the supply
- ± 24-mA output drive current - Fanout to 15 FAST* ICs
 - Drives 50-ohm transmission lines

*FAST is a Registered Trademark of Fairchild Semiconductor Corp.

OUTPUT EN	ABLE INPUTS	0050471044					
OEBA	OEAB	OPERATION					
L	L	B DATA TO A BUS					
Н	н	A DATA TO B BUS					
н	L	ISOLATION					
L	н	B DATA TO A BUS, A DATA TO B BUS					

TRUTH TABLE

H = High level, L = Low level

Note: To prevent excess currents in the High-Z (isolation) modes, all I/O terminals should be terminated with 10 k Ω to 1 M Ω resistors.

This data sheet is applicable to the CD74AC623 and CD54/74ACT623. The CD54AC623 was not acquired from Harris Semiconductor.

MAXIMUM RATINGS, Absolute-Maximum Values:

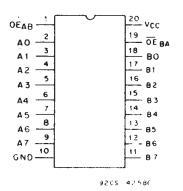
DC Vcc or GROUND CURRENT (Icc or IGND)
For $T_A = -55$ to +100°C (PACKAGE TYPE E)
For $T_A = -55$ to $+70^{\circ}$ C (PACKAGE TYPE M)
OPERATING-TEMPERATURE RANGE (T _A)
LEAD TEMPERATURE (DURING SOLDERING): At distance 1/16 ± 1/32 in. (1.59 ± 0.79 mm) from case for 10 s maximum

RECOMMENDED OPERATING CONDITIONS:

For maximum reliability, normal operating conditions should be selected so that operation is always within the following ranges:

CHARACTERISTIC	LIN	LIMITS				
CHARACTERISTIC	MIN.	MAX.	UNITS			
Supply-Voltage Range, V_{cc}^* : (For $T_A = Full Package-Temperature Range)$			1			
AC Types ACT Types	1.5 4.5	5.5 5.5	V V			
DC Input or Output Voltage, Vi, Vo	0	Vcc	v			
Operating Temperature, T _A	-55	+125	°C			
Input Rise and Fall Slew Rate, dt/dv at 1.5 V to 3 V (AC Types) at 3.6 V to 5.5 V (AC Types) at 4.5 V to 5.5 V (ACT Types)	0 0 0	50 20 10	ns/V ns/V ns/V			

*Unless otherwise specified, all voltages are referenced to ground.





295

STATIC ELECTRICAL CHARACTERISTICS: AC Series

					<u> </u>	AMBIEN	TEMPE	RATURE	(T _A) - ° (<u> </u>	4.
CHARACTERISTI	CS	TEST CO	V _{cc}	+:	+25		o +85	-55 to +125		UNITS	
		V, (V)	l _o (mA)	(Ÿ)	MIN.	MAX.	MIN.	MAX.	MIN.	MAX	
High-Level Input	· .			1.5	1.2		1.2	<u> </u>	1.2	<u> </u>	1
Voltage	ViH			3	2.1		2.1		2.1		v
• *				5.5	3.85		3.85	· · _ ·	3.85		· · ·
Low-Level Input				1.5		0.3	-	0.3	<u> </u>	0.3	1 ¹⁰ 1
Voltage	Vic			3	—	0.9	-	0.9		0.9	V
				5.5		1.65	·	1.65	-	1.65	· · · · ·
High-Level Output			-0.05	1.5	1.4	-	1.4	—	1.4		
Voltage	V _{он}	VIH	-0.05	3	2.9	—	2.9	—	2.9	-	
		or	-0.05	4.5	4.4	<u> </u>	4.4	—	4.4	—	
		VIL	-4	3	2.58	—	2.48		2.4	-] V .
			-24	4.5	3.94	-	3.8		3.7	-]
		1	-75	5.5		_	3.85	-	-	÷]
		#, * {	-50	5.5	_	- 1		_	3.85	- 1	
Low-Level Output	<u> </u>		0.05	1.5		0.1	_	0.1	—	0.1	
Voltage	Vol	VIH	0.05	3	_	0.1		0.1	-	0.1	1
		or	0.05	4.5		0.1	_	0:1	_	0.1	1
		ViL	12	3	-	0.36	-	0.44	- 1	0.5	1 v
			24	4.5		0.36	-	0.44		0.5	1
		1	75	5.5			- 1	1.65	-	<u> </u>	1
		#, * {	50	5.5	_		1	- 1		1.65	1
Input Leakage Current	·	V _{cc} or GND		5.5	·	±0.1		±1	-	±1	μΑ
3-State Leakage Current	loz	V _{IH} or V _{IL} V ₀ =		5.5		±0.5		±5	_	±10	μΑ
	V _{cc} or GND										
Quiescent Supply Current, MSI	lcc	V _{cc} or GND	0	5.5	-	8	-	80	_	160	μA

#Test one output at a time for a 1-second maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation. * Test verifies a minimum 50-ohm transmission-line-drive capability at +85°C, 75 ohms at +125°C.

STATIC ELECTRICAL CHARACTERISTICS: ACT Series

			tin an the			AMBIENT TEMPERATURE (TA) - °C					
CHARACTERISTIC	S .	TEST CO	NDITIONS	V _{cc}	+25		-40 to +85		-55 to +125		UNITS
	_	V, (V)	l _o (mA)	(V)	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.] .r
High-Level Input Voltage	ViH			4.5 to 5.5	2	-	2	_	2	-	v
Low-Level Input Voltage	ViL	-		4.5 to 5.5	_	0.8	-	0.8	-	0.8	v,
High-Level Output		ViH	-0.05	4.5	4.4		4.4		4.4		
Voltage	Voltage V _{OH}	or	-24	4.5	3.94	·	3.8	<u> </u>	3.7		l v
		Vil (-75	5.5	-	_	3.85	-	<u> </u>	-	
		#, * {	-50	5.5	<u>—</u>		_		3.85		1
Low-Level Output		VIH	0.05	4.5		0.1		0.1	-	0.1	1
Voltage	Val	or	24	4.5		0.36		0.44		0.5	1 v 1
		Vic	75	5.5	-		- 1	1.65		-	1
		#, * {	50	5.5	—	-	_	<u> </u>	-	1.65	1
Input Leakage Current	h	V ₀₀ or GND		5.5		±0.1		±1	_	±1	μA
3-State Leakage Current	loz	V _{IH} or V ₈ V ₀ = V ₀ or GND		5.5	_	±0.5	—	±5	·	±10	μΑ
Quiescent Supply Current, MSI	lœ	V _{cc} or GND	0	5.5	_	8	<u> </u>	80	_	160	μA
Additional Quiescent Su Current per Input Pin ITL Inputs High I Unit Load	pply ∆l _œ	V _{cc} -2.1		4.5 to 5.5		2.4		2.8	_	3	mA

9

#Test one output at a time for a 1-second maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation. *Test verifies a minimum 50-ohm transmission-line-drive capability at +85°C, 75 ohms at +125°C.

INPUT	UNIT LOAD*
An, Bn	0.83
ÖE BA	0.64
OEAB	0.15

ACT INPUT LOADING TABLE

*Unit load is ∆I_{cc} limit specified in Static Characteristics Chart, e.g., 2.4 mA max. @ 25°C.

5. A. F.

SWITCHING CHARACTERISTICS: AC Series; L, L = 3 ns, CL = 50 pF

· · · · · · · · · · · · · · · · · · ·	· · ·		AMBI				
CHARACTERISTICS	SYMBOL	V _{cc}	-40 t	o +85	-55 to	UNITS	
		(V)	MIN.	MAX.	MIN.	MAX.	
Propagation Delays: Data to Output	терн тенг	1.5 3.3* 5†	 3.5 2.5	108 12.2 8.7	3.4 2.4	120 13.4 9.6	ns
Output Disable to Output	telz tenz	1.5 3.3 5	 4.8 3.5	153 17.1 12.2		168 18.8 13.4	ns
Output Enable to Output	tpzL tpzн	1.5 3.3 5	 4.8 3.5	153 17.1 12.2		168 18.8 13.4	ns
Power Dissipation Capacitance	CPD§	_	66	66 Тур. 66 Тур.			pF
Min. (Valley) Vон During Switching of Other Outputs (Output Under Test Not Switching)	V _{онv} See Fig. 1	5		4 Тур. @ 25°С			
Max. (Peak) Vo⊾ During Switching of Other Outputs (Output Under Test Not Switching)	Volp See Fig. 1	5		1 Тур. @ 25°С			v
Input Capacitance	Cı	<u> </u>		10		10	pF
3-State Output Capacitance	Co		_	15	-	15	pF

SWITCHING CHARACTERISTICS: ACT Series; t, t = 3 ns, C = 50 pF

			AMB	ENT TEMPE	RATURE (T		
CHARACTERISTICS	SYMBOL	V _{cc} (V)	-40	lo +85	-55 to		
		(•)	MIN.	MAX.	MIN.	MAX.	
Propagation Delays: Data to Output	трін трні	5†	2.7	9.6	2.7	10.6	ns
Output Disable to Output	tpuz tpuz	5	3.7	13.1	3.6	14.4	ns
Output Enable to Output	tezh tezh	5	3.7	13.1	3.6	14.4	ns
Power Dissipation Capacitance	CPD§		66	Тур.	66	pF	
Min. (Valley) VoH During Switching of Other Outputs (Output Under Test Not Switching)	V _{онv} See Fig. 1	5		4 Typ. @ 25°C			
Max. (Peak) Voc During Switching of Other Outputs (Output Under Test Not Switching)	Volp See Fig. 1	5	1 Typ. @ 25°C			v	
Input Capacitance	Cı	—		10		10	pF
3-State Output Capacitance	Co	•		15		15	pF

*3.3 V: min. is @ 3.6 V

max. is @ 3 V

†5 V: min. is @ 5.5 V max. is @ 4.5 V

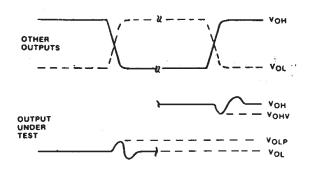
§CPD is used to determine the dynamic power consumption, per channel.

For AC series: $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$ For ACT series: $P_D = V_{CC}^2 f_i (C_{PD} + C_L) + V_{CC}\Delta I_{CC}$ where f_i = input frequency

 C_L = output load capacitance

Vcc = supply voltage.

PARAMETER MEASUREMENT INFORMATION



NOTES:

- 1. VOHV AND VOLP ARE MEASURED WITH RESPECT TO A GROUND REFERENCE NEAR THE OUTPUT UNDER TEST.
- 2. INPUT PULSES HAVE THE FOLLOWING CHARACTERISTICS:
- $\label{eq:rescaled} \begin{array}{l} PRR \leqq 1 \mbox{ MHz}, t_r : 3 \mbox{ ns}, t_f : 3 \mbox{ ns}, SKEW 1 \mbox{ ns}, \\ 3. \mbox{ R.F. FIXTURE WITH 700-MHz DESIGN RULES REQUIRED}, \\ IC SHOULD BE SOLDERED INTO TEST BOARD AND BYPASSED \\ WITH 0.1 \mbox{ } \mu F CAPACITOR, SCOPE AND PROBES REQUIRE } \\ 700-MHz BANDWIDTH. \end{array}$

9205-42406

Fig. 1 - Simultaneous switching transient waveforms.

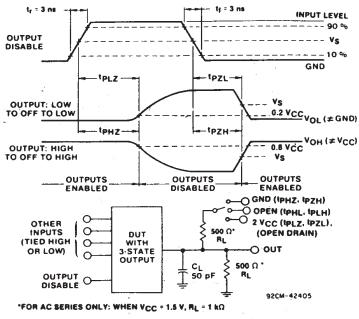


Fig. 2 - Three-state propagation delay times and test circuit.

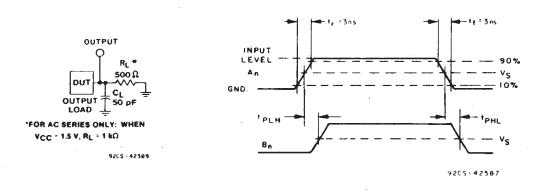


Fig. 3 - Propagation delay times and test circuit.

	CD54/74AC	CD54/74ACT
Input Level	Vcc	3 V
Input Switching Voltage, Vs	0.5 V _{cc}	1.5 V
Output Switching Voltage, Vs	0.5 V _{cc}	0.5 V _{cc}

.



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
CD54ACT623F3A	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	CD54ACT623F3A	Samples
CD74AC623E	ACTIVE	PDIP	Ν	20	20	RoHS & Green	NIPDAU	N / A for Pkg Type	-55 to 125	CD74AC623E	Samples
CD74AC623M	ACTIVE	SOIC	DW	20	25	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC623M	Samples
CD74ACT623M96	ACTIVE	SOIC	DW	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-55 to 125	ACT623M	Samples

⁽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 (CI) 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



www.ti.com

PACKAGE OPTION ADDENDUM

4-Feb-2021

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.

OTHER QUALIFIED VERSIONS OF CD54ACT623, CD74ACT623 :

• Catalog: CD74ACT623

• Military: CD54ACT623

NOTE: Qualified Version Definitions:

- Catalog TI's standard catalog product
- Military QML certified for Military and Defense Applications

PACKAGE MATERIALS INFORMATION

Texas Instruments

www.ti.com

TAPE AND REEL INFORMATION





QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal	

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CD74ACT623M96	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1



www.ti.com

PACKAGE MATERIALS INFORMATION

5-Jan-2022



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CD74ACT623M96	SOIC	DW	20	2000	367.0	367.0	45.0



www.ti.com

5-Jan-2022

TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	Τ (μm)	B (mm)
CD74AC623E	N	PDIP	20	20	506	13.97	11230	4.32
CD74AC623M	DW	SOIC	20	25	507	12.83	5080	6.6

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



NOTES:

- 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).
- \triangle The 20 pin end lead shoulder width is a vendor option, either half or full width.



DW0020A



PACKAGE OUTLINE

SOIC - 2.65 mm max height

SOIC



NOTES:

- 1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M. 2. This drawing is subject to change without notice. 3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not
- exceed 0.15 mm per side.
- 4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm per side.
- 5. Reference JEDEC registration MS-013.



DW0020A

EXAMPLE BOARD LAYOUT

SOIC - 2.65 mm max height

SOIC



NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



DW0020A

EXAMPLE STENCIL DESIGN

SOIC - 2.65 mm max height

SOIC



NOTES: (continued)

- 8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
- 9. Board assembly site may have different recommendations for stencil design.



J (R-GDIP-T**) 14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



NOTES: 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.

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