SCAS538D - OCTOBER 1995 - REVISED OCTOBER 2002

- 4.5-V to 5.5-V V_{CC} Operation
- Inputs Accept Voltages to 5.5 V
- Max t_{pd} of 9.5 ns at 5 V
- Inputs Are TTL-Voltage Compatible

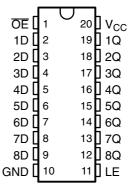
description/ordering information

These 8-bit latches feature 3-state outputs designed specifically for driving highly capacitive or relatively low-impedance loads. The devices are particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

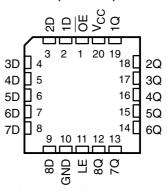
The eight latches are D-type transparent latches. When the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is taken low, the Q outputs are latched at the logic levels set up at the D inputs.

A buffered output-enable (\overline{OE}) input can be used to place the eight outputs in either a normal logic state (high or low logic levels) or the high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and increased drive provide the capability to drive bus lines in a bus-organized system without need for interface or pullup components.

SN54ACT573 . . . J OR W PACKAGE SN74ACT573 . . . DB, DW, N, NS, OR PW PACKAGE (TOP VIEW)



SN54ACT573...FK PACKAGE (TOP VIEW)



OE does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

ORDERING INFORMATION

TA	PACKAGI	<u>=</u> †	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	PDIP – N	Tube	SN74ACT573N	SN74ACT573N
–40°C to 85°C	COIC DW	Tube	SN74ACT573DW	ACTEZO
	SOIC – DW	Tape and reel	SN74ACT573DWR	ACT573
-40°C to 85°C	SOP - NS	Tape and reel	SN74ACT573NSR	ACT573
	SSOP – DB	Tape and reel	SN74ACT573DBR	AD573
	TSSOP – PW	Tape and reel	SN74ACT573PWR	AD573
	CDIP – J	Tube	SNJ54ACT573J	SNJ54ACT573J
-55°C to 125°C	CFP – W	Tube	SNJ54ACT573W	SNJ54ACT573W
	LCCC - FK	Tube	SNJ54ACT573FK	SNJ54ACT573FK

[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

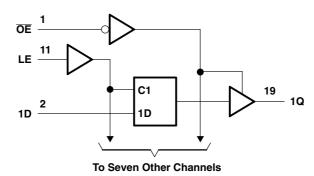


SCAS538D - OCTOBER 1995 - REVISED OCTOBER 2002

FUNCTION TABLE (each latch)

	INPUTS	OUTPUT	
ŌĒ	LE	D	Q
L	Н	Н	Н
L	Н	L	L
L	L	Χ	Q_0
Н	X	Χ	Z

logic diagram (positive logic)



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)		
Output voltage range, V _O (see Note 1)		. -0.5 V to $V_{CC} + 0.5$ V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$)		±20 mA
Output clamp current, I _{OK} (V _O < 0 or V _O > V _{CC}))	±20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})		±50 mA
Continuous current through, V _{CC} or GND		±200 mA
Package thermal impedance, θ _{JA} (see Note 2):	: DB package	70°C/W
-	DW package	58°C/W
	N package	69°C/W
	NS package	60°C/W
	PW package	83°C/W
Storage temperature range, T _{stq}		–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.

- NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 - 2. The package thermal impedance is calculated in accordance with JESD 51-7.



recommended operating conditions (see Note 3)

		SN54A	CT573	SN74A	CT573	LINIT
		MIN	MAX	MIN	MAX	UNIT
V _{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V _{IH}	High-level input voltage	2		2		V
V _{IL}	Low-level input voltage		0.8		0.8	V
VI	Input voltage	0	V_{CC}	0	V_{CC}	V
V _O	Output voltage	0	V_{CC}	0	V_{CC}	V
I _{OH}	High-level output current		-24		-24	mA
I _{OL}	Low-level output current		24		24	mA
Δt/Δν	Input transition rise or fall rate		8		8	ns/V
T _A	Operating free-air temperature	-55	125	-40	85	°C

NOTE 3: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report Implications of Slow or Floating CMOS Inputs, literature number SCBA004.

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

			T,	_A = 25°C	;	SN54A	CT573	SN74A	CT573	
PARAMETER	TEST CONDITIONS	v _{cc}	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
		4.5 V	4.4	4.49		4.4		4.4		
	$I_{OH} = -50 \mu\text{A}$	5.5 V	5.4	5.49		5.4		5.4		
.,		4.5 V	3.86			3.7		3.76		
V _{OH}	$I_{OH} = -24 \text{ mA}$	5.5 V	4.86			4.7		4.76		V
	$I_{OH} = -50 \text{ mA}^{\dagger}$	5.5 V				3.85				
	$I_{OH} = -75 \text{ mA}^{\dagger}$	5.5 V						3.85		
		4.5 V			0.1		0.1		0.1	
	$I_{OL} = 50 \mu A$	5.5 V			0.1		0.1		0.1	
.,		4.5 V			0.36		0.44		0.44	
V _{OL}	I _{OL} = 24 mA	5.5 V			0.36		0.44		0.44	V
	$I_{OL} = 50 \text{ mA}^{\dagger}$	5.5 V					1.65			
	I _{OL} = 75 mA [†]	5.5 V							1.65	
l _{OZ}	V _O = V _{CC} or GND	5.5 V			±0.25		±5		±2.5	μА
I _I	V _I = V _{CC} or GND	5.5 V			±0.1		±1		±1	μА
I _{CC}	$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V			4		80		40	μΑ
Δl _{CC} ‡	One input at 3.4 V, Other inputs at GND or V _{CC}	5.5 V		0.6			1.5		1.5	mA
C _i	V _I = V _{CC} or GND	5 V		5						pF

[†] Not more than one output should be tested at a time, and the duration of the test should not exceed 2 ms.

timing requirements over recommended operating free-air temperature range, V_{CC} = 5 V \pm 0.5 V (unless otherwise noted) (see Figure 1)

		$T_A = 2$	T _A = 25°C		CT573	SN74A		
		MIN	MAX	MIN	MAX	MIN	MAX	UNIT
t _w	Pulse duration, LE high	3.5		5		4		ns
t _{su}	Setup time, data before LE↓	3		4.5		3.5		ns
t _h	Hold time, data after LE↓	0		1		0		ns



[‡] This is the increase in supply current for each input that is at one of the specified TTL voltage levels, rather than 0 V or V_{CC}.

SN54ACT573, SN74ACT573 OCTAL D-TYPE TRANSPARENT LATCHES WITH 3-STATE OUTPUTS SCAS538D - OCTOBER 1995 - REVISED OCTOBER 2002

switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V \pm 0.5 V (unless otherwise noted) (see Figure 1)

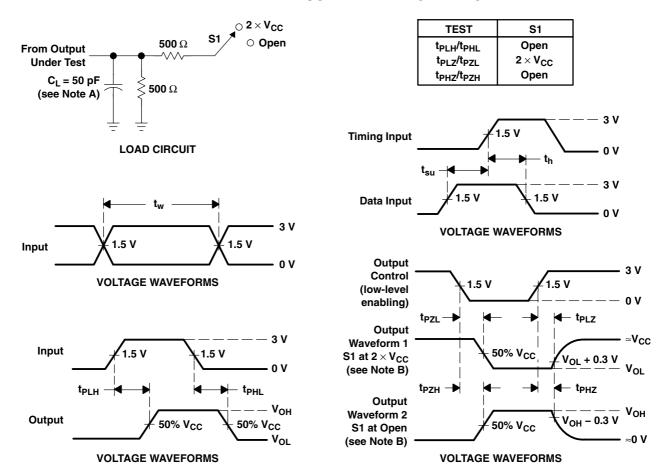
DADAMETED	FROM	то	T,	չ = 25°C	;	SN54A	CT573	SN74A	CT573	
PARAMETER	(INPUT)	(OUTPUT)	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
t _{PLH}	D	0	2.5	6	10.5	1.5	13.5	2	12	
t _{PHL}	U	Q	2.5	6	10.5	1.5	13.5	2	12	ns
t _{PLH}		0	3	6	10.5	1.5	13	2.5	12	
t _{PHL}	LE	Q	2.5	5.5	9.5	1.5	12	2	10.5	ns
t _{PZH}	05	•	2	5.5	10	1.5	11.5	1.5	11	
t _{PZL}	OE	Q	1.5	5.5	9.5	1.5	11	1.5	10.5	ns
t _{PHZ}	ŌĒ	0	2.5	6.5	11	1.5	13.5	1.5	12.5	no
t _{PLZ}	OE	Q	1.5	5	8.5	1.5	10.5	1	9.5	ns

operating characteristics, V_{CC} = 5 V, T_A = 25°C

	PARAMETER	TEST CO	TYP	UNIT	
C _{pd}	Power dissipation capacitance	$C_L = 50 pF$,	f = 1 MHz	25	pF

SCAS538D - OCTOBER 1995 - REVISED OCTOBER 2002

PARAMETER MEASUREMENT INFORMATION



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. All input pulses are supplied by generators having the following characteristics: PRR \leq 1 MHz, $Z_O = 50 \Omega$, $t_f \leq$ 2.5 ns, $t_f \leq$ 2.5 ns.
- D. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms





10-Jun-2014

PACKAGING INFORMATION

Orderable Device	Status	Package Type	Package Drawing	Pins	Package Qty	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Device Marking (4/5)	Samples
5962-87664012A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	5962- 87664012A SNJ54ACT 573FK	Samples
5962-8766401RA	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-8766401RA SNJ54ACT573J	Samples
5962-8766401SA	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-8766401SA SNJ54ACT573W	Samples
SN74ACT573DBLE	OBSOLETE	SSOP	DB	20		TBD	Call TI	Call TI	-40 to 85		
SN74ACT573DBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD573	Samples
SN74ACT573DW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT573	Samples
SN74ACT573DWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT573	Samples
SN74ACT573DWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT573	Samples
SN74ACT573DWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT573	Samples
SN74ACT573N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-40 to 85	SN74ACT573N	Samples
SN74ACT573NE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-40 to 85	SN74ACT573N	Samples
SN74ACT573NSR	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT573	Samples
SN74ACT573NSRE4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT573	Samples
SN74ACT573PW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD573	Samples
SN74ACT573PWG4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD573	Samples
SN74ACT573PWLE	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI	-40 to 85		
SN74ACT573PWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD573	Samples



PACKAGE OPTION ADDENDUM

10-Jun-2014

Orderable Device	Status	Package Type	Package Drawing	Pins	Package Qty	Eco Plan	Lead/Ball Finish (6)	MSL Peak Temp	Op Temp (°C)	Device Marking (4/5)	Samples
SN74ACT573PWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD573	Samples
SNJ54ACT573FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	5962- 87664012A SNJ54ACT 573FK	Samples
SNJ54ACT573J	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-8766401RA SNJ54ACT573J	Samples
SNJ54ACT573W	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-8766401SA SNJ54ACT573W	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) 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.
- (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/Ball Finish Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.



PACKAGE OPTION ADDENDUM

10-Jun-2014

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OTHER QUALIFIED VERSIONS OF SN54ACT573, SN74ACT573:

Catalog: SN74ACT573

Military: SN54ACT573

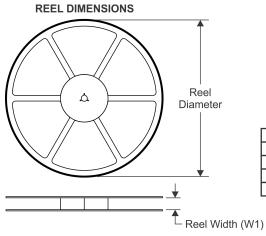
NOTE: Qualified Version Definitions:

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

PACKAGE MATERIALS INFORMATION

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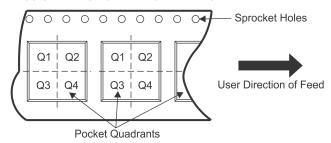
TAPE AND REEL INFORMATION





	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

All ulfrierisions 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
SN74ACT573DBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74ACT573DWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
SN74ACT573NSR	SO	NS	20	2000	330.0	24.4	9.0	13.0	2.4	4.0	24.0	Q1
SN74ACT573PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

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*All dimensions are nominal

7 III dillionorio di o richimal							
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74ACT573DBR	SSOP	DB	20	2000	367.0	367.0	38.0
SN74ACT573DWR	SOIC	DW	20	2000	367.0	367.0	45.0
SN74ACT573NSR	SO	NS	20	2000	367.0	367.0	45.0
SN74ACT573PWR	TSSOP	PW	20	2000	367.0	367.0	38.0

14 LEADS SHOWN



- 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.

W (R-GDFP-F20)

CERAMIC DUAL FLATPACK



- A. All linear dimensions are in inches (millimeters).
- This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.

 D. Index point is provided on cap for terminal identification only.

 E. Falls within Mil—Std 1835 GDFP2—F20



FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



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



N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



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



DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES: A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
- D. Falls within JEDEC MS-013 variation AC.



PW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M—1994.
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
- E. Falls within JEDEC MO-153



PW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



- All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
 C. Publication IPC-7351 is recommended for alternate design.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.

D. Falls within JEDEC MO-150

MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



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