SCLS600A - NOVEMBER 2004 - REVISED APRIL 2008

 Qualified for Automotive Applications Wide Operating Voltage Range of 2 V to 6 V 	DW OR PW PACKAGE (TOP VIEW)
 High-Current 3-State Outputs Drive Bus Lines Directly or up to 15 LSTTL Loads 	OE [1 20] V _{CC} 1D [2 19] 1Q
 Low Power Consumption, 80-μA Max I_{CC} 	2D 3 18 2Q
 Typical t_{pd} = 21 ns 	3D [4 17] 3Q
• ±6-mA Output Drive at 5 V	4D [] 5 16 [] 4Q
•	5D [] 6 15 [] 5Q
 Low Input Current of 1 μA Max 	6D [] 7 14 [] 6Q
Bus-Structured Pinout	7D 🛮 8 13 🗓 7Q
	8D 🛛 9 12 🗍 8Q
	GND [10 11] LE

description/ordering information

This octal transparent D-type latch features 3-state outputs designed specifically for driving highly capacitive or relatively low-impedance loads. It is particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

While the latch-enable (LE) input is high, the Q outputs respond to the data (D) inputs. When LE is low, the outputs are latched to retain the data that was set up.

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 without interface or pullup components.

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.

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.

ORDERING INFORMATION†

TA	PACK	\GE [‡]	ORDERABLE PART NUMBER	TOP-SIDE MARKING
4000 1- 40500	SOIC - DW	Reel of 2500	SN74HC573AQDWRQ1	HC573AQ
–40°C to 125°C	TSSOP - PW	Reel of 2000	SN74HC573AQPWRQ1	HC573AQ

[†] For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at http://www.ti.com.



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.



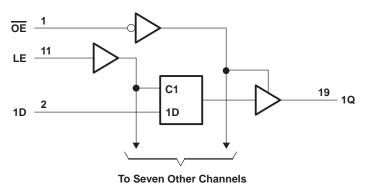
[‡] Package drawings, thermal data, and symbolization are available at http://www.ti.com/packaging.

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FUNCTION TABLE (each latch)

	INPUTS	OUTPUT	
OE	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 clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$) (see Note 1)	±20 mA
Output clamp current, I _{OK} (V _O < 0 or V _O > V _{CC}) (see Note 1)	±20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	±35 mA
Continuous current through V _{CC} or GND	±70 mA
Package thermal impedance, θ_{JA} (see Note 2): DW package	58°C/W
PW package	83°C/W
Storage temperature range, T _{stg}	–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)

			MIN	NOM	MAX	UNIT
Vcc	Supply voltage		2	5	6	V
		V _{CC} = 2 V	1.5			
٧ _{IH}	High-level input voltage	$V_{CC} = 4.5 \text{ V}$	3.15			V
		V _{CC} = 6 V	4.2			
		$V_{CC} = 2 V$			0.5	
VIL	Low-level input voltage	V _{CC} = 4.5 V			1.35	V
		V _{CC} = 6 V			1.8	
٧ _I	Input voltage		0		VCC	V
٧o	Output voltage		0		VCC	V
		V _{CC} = 2 V			1000	
t _t	Input transition (rise and fall) time	$V_{CC} = 4.5 \text{ V}$			500	ns
		V _{CC} = 6 V			400	
T _A	Operating free-air temperature		-40		125	°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)

PARAMETER	TEST CO	VCC	T _A = 25°C			T _A = -40°C TO 125°C		T _A = -40°C TO 85°C		UNIT	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX		
			2 V	1.9	1.998		1.9		1.9		
		$I_{OH} = -20 \mu A$	4.5 V	4.4	4.499		4.4		4.4		
∨он	VI = VIH or VIL		6 V	5.9	5.999		5.9		5.9		V
		$I_{OH} = -6 \text{ mA}$	4.5 V	3.98	4.3		3.7		3.84		
		$I_{OH} = -7.8 \text{ mA}$	6 V	5.48	5.8		5.2		5.34		
			2 V		0.002	0.1		0.1		0.1	
		I _{OL} = 20 μA	4.5 V		0.001	0.1		0.1		0.1	
VOL	VI = VIH or VIL		6 V		0.001	0.1		0.1		0.1	V
		I _{OL} = 6 mA	4.5 V		0.17	0.26		0.4		0.33	
		$I_{OL} = 7.8 \text{ mA}$	6 V		0.15	0.26		0.4		0.33	
lį	$V_I = V_{CC}$ or 0	•	6 V		±0.1	±100		±1000		±1000	nA
loz	$V_O = V_{CC}$ or 0		6 V		±0.01	±0.5		±10		±5	μΑ
Icc	$V_I = V_{CC}$ or 0,	IO = 0	6 V			8		160		80	μΑ
Ci			2 V to 6 V		3	10		10		10	рF

SN74HC573A-Q1 **OCTAL TRANSPARENT D-TYPE LATCH** WITH 3-STATE OUTPUTS SCLS600A - NOVEMBER 2004 - REVISED APRIL 2008

timing requirements over recommended operating free-air temperature range (unless otherwise noted)

		Vcc	T _A = 25°C		T _A = -40°C TO 125°C		T _A = −40°C TO 85°C		UNIT
		30	MIN	MAX	MIN	MAX	MIN	MAX	
t _w Pulse duration, LE high		2 V	80		120		100		
	Pulse duration, LE high	4.5 V	16		24		20		ns
		6 V	14		20		17		
		2 V	50		75		63		ns
t _{su}	Setup time, data before LE↓	4.5 V	10		15		13		
		6 V	9		13		11		
		2 V	20		24		24		
th	Hold time, data after LE↓		5		5		5		ns
		6 V	5		5		5		

switching characteristics over recommended operating free-air temperature range, C_L = 50 pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM	TO (OUTPUT)	VCC	Tø	√ = 25°C	;	T _A = -		T _A = -		UNIT	
	(INPUT)	(OUTPUT)		MIN	TYP	MAX	MIN	MAX	MIN	MAX		
			2 V		77	175		265		220		
	D	Q	4.5 V		26	35		53		44		
			6 V		23	30		45		38		
^t pd			2 V		87	175		265		260	ns	
	LE	Any Q	4.5 V		27	35		53		44		
			6 V		23	30		45		38		
			2 V		68	150		225		190		
t _{en}	ŌĒ	Any Q	4.5 V		24	30		45		38	ns	
			6 V		21	26		38		32		
			2 V		47	150		225		190		
^t dis	ŌĒ	Any Q	4.5 V		23	30		45		38	ns	
			6 V		21	26		38		32		
			2 V		28	60		90		75		
t _t		Any Q	Any Q	4.5 V		8	12		18		15	ns
			6 V		6	10		15		13		

SN74HC573A-Q1 **OCTAL TRANSPARENT D-TYPE LATCH** WITH 3-STATE OUTPUTS SCLS600A - NOVEMBER 2004 - REVISED APRIL 2008

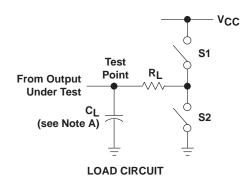
switching characteristics over recommended operating free-air temperature range, C_L = 150 pF (unless otherwise noted) (see Figure 1)

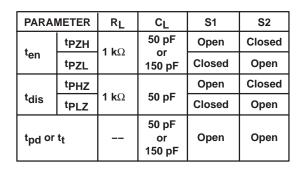
PARAMETER	FROM	TO (OUTPUT)	vcc	T	λ = 25°C	;	T _A = -		T _A = -40°C TO 85°C		UNIT	
	(INPUT)	(OUTPUT)		MIN	TYP	MAX	MIN	MAX	MIN	MAX		
			2 V		95	200		300		250		
	D	Q	4.5 V		33	40		60		50		
			6 V		21	34		51		43		
^t pd	LE		2 V		103	225		335		285	-	
		Any Q	4.5 V		33	45		67		57		
			6 V		29	38		57		48	3	
			2 V		85	200		300		250		
t _{en}	ŌĒ	Any Q	4.5 V		29	40		60		50	ns	
			6 V		26	34		51		43		
			2 V		60	210		315		265		
t _t		Any Q	Any Q	4.5 V		17	42		63		53	ns
			6 V		14	36		53		45		

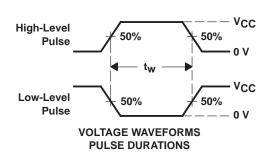
operating characteristics, $T_A = 25^{\circ}C$

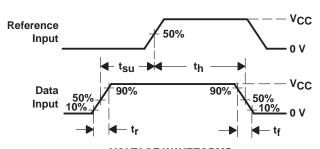
	PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd}	Power dissipation capacitance per latch	No load	50	pF

PARAMETER MEASUREMENT INFORMATION

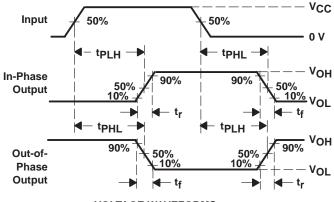


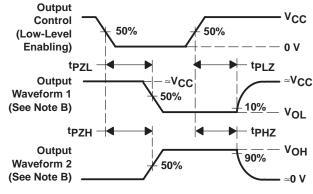






VOLTAGE WAVEFORMS
SETUP AND HOLD AND INPUT RISE AND FALL TIMES





VOLTAGE WAVEFORMS
PROPAGATION DELAY AND OUTPUT TRANSITION TIMES

VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES FOR 3-STATE OUTPUTS

NOTES: A. C_L includes probe and test-fixture 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. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: PRR \leq 1 MHz, $Z_O = 50 \ \Omega$, $t_\Gamma = 6 \ ns$, $t_f = 6 \ ns$.
- D. The outputs are measured one at a time, with one input transition per measurement.
- E. tpl 7 and tpH7 are the same as tdis.
- F. tpzL and tpzH are the same as ten.
- G. tplH and tpHL are the same as tpd.

Figure 1. Load Circuit and Voltage Waveforms







11-Apr-2013

PACKAGING INFORMATION

Orderable Device	Status	Package Type	Package	Pins	Package	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Top-Side Markings	Samples
	(1)		Drawing		Qty	(2)		(3)		(4)	
SN74HC573AQDWRQ1	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	HC573AQ	Samples
SN74HC573AQPWRG4Q1	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	HC573AQ	Samples
SN74HC573AQPWRQ1	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI	-40 to 125	HC573AQ	

(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) Multiple Top-Side Markings will be inside parentheses. Only one Top-Side 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 Top-Side Marking for that device.

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OTHER QUALIFIED VERSIONS OF SN74HC573A-Q1:



PACKAGE OPTION ADDENDUM

11-Apr-2013

• Catalog: SN74HC573A

• Military: SN54HC573A

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

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
SN74HC573AQPWRG4Q 1	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

www.ti.com 14-Mar-2013



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74HC573AQPWRG4Q1	TSSOP	PW	20	2000	367.0	367.0	38.0

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.



DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Refer to IPC7351 for alternate board 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
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



PW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES:

- 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



NOTES:

- A. 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.



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