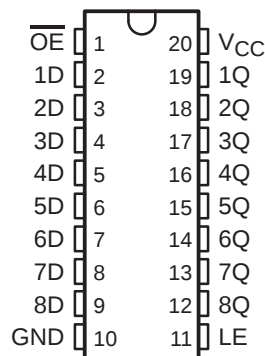


SN54AHC573, SN74AHC573 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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- **EPIC™** (Enhanced-Performance Implanted CMOS) Process
- Operating Range 2-V to 5.5-V V_{CC}
- 3-State Outputs Directly Drive Bus Lines
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB), Thin Very Small-Outline (DGV), Thin Shrink Small-Outline (PW), and Ceramic Flat (W) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) DIPs

SN54AHC573 . . . J OR W PACKAGE
SN74AHC573 . . . DB, DGV, DW, N, OR PW PACKAGE
(TOP VIEW)



description

The 'AHC573 devices are octal transparent D-type latches designed for 2-V to 5.5-V V_{CC} operation.

When the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is low, the Q outputs are latched at the logic levels of the D inputs.

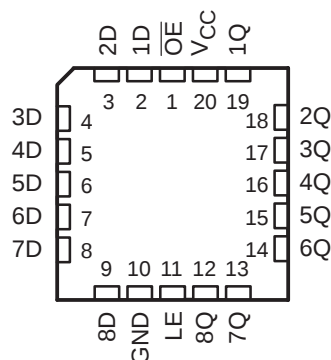
A buffered output-enable ($\overline{OE}$) input can be used to place the eight outputs in either a normal logic state (high or low) or the high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and increased drive provide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

$\overline{OE}$ 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.

The SN54AHC573 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74AHC573 is characterized for operation from -40°C to 85°C .

SN54AHC573 . . . FK PACKAGE
(TOP VIEW)



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**TEXAS
INSTRUMENTS**

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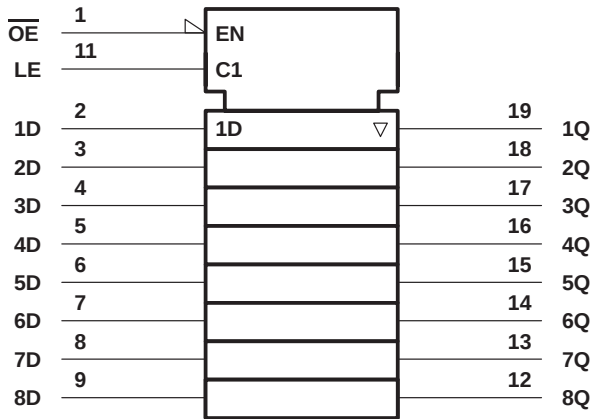
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OCTAL TRANSPARENT D-TYPE LATCHES
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FUNCTION TABLE
(each latch)

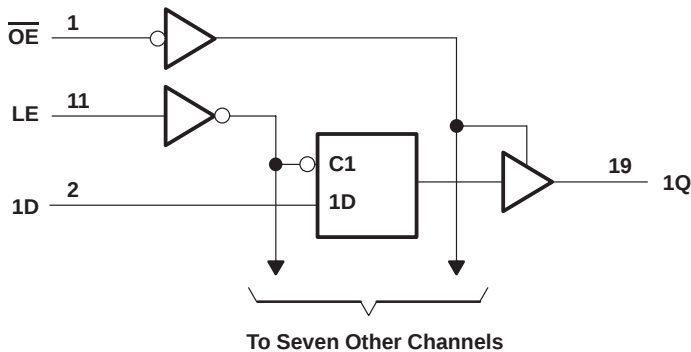
INPUTS			OUTPUT Q
$\overline{\text{OE}}$	LE	D	
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



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Supply voltage range, V_{CC}	−0.5 V to 7 V
Input voltage range, V_I (see Note 1)	−0.5 V to 7 V
Output voltage range, V_O (see Note 1)	−0.5 V to $V_{CC} + 0.5$ V
Input clamp current, I_{IK} ($V_I < 0$)	−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})	±25 mA
Continuous current through V_{CC} or GND	±75 mA
Package thermal impedance, θ_{JA} (see Note 2):	
DB package	70°C/W
DGV package	92°C/W
DW package	58°C/W
N package	69°C/W
PW package	83°C/W
Storage temperature range, T_{sta}	−65°C to 150°C

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 JEDEC 51.

			SN54AHC573		SN74AHC573		UNIT
			MIN	MAX	MIN	MAX	
V _{CC}	Supply voltage		2	5.5	2	5.5	V
V _{IH}	High-level input voltage	V _{CC} = 2 V	1.5		1.5		V
		V _{CC} = 3 V	2.1		2.1		
		V _{CC} = 5.5 V	3.85		3.85		
V _{IL}	Low-level input voltage	V _{CC} = 2 V		0.5		0.5	V
		V _{CC} = 3 V		0.9		0.9	
		V _{CC} = 5.5 V		1.65		1.65	
V _I	Input voltage		0	5.5	0	5.5	V
V _O	Output voltage		0	V _{CC}	0	V _{CC}	V
I _{OH}	High-level output current	V _{CC} = 2 V		−50		−50	μA
		V _{CC} = 3.3 V ± 0.3 V		−4		−4	mA
		V _{CC} = 5 V ± 0.5 V		−8		−8	
I _{OL}	Low-level output current	V _{CC} = 2 V		50		50	μA
		V _{CC} = 3.3 V ± 0.3 V		4		4	mA
		V _{CC} = 5 V ± 0.5 V		8		8	
Δt/Δv	Input transition rise or fall rate	V _{CC} = 3.3 V ± 0.3 V		100		100	ns/V
		V _{CC} = 5 V ± 0.5 V		20		20	
T _A	Operating free-air temperature		−55	125	−40	85	°C



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

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			SN54AHC573		SN74AHC573		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V _{OH}	I _{OH} = –50 µA	2 V	1.9	2		1.9		1.9		V
		3 V	2.9	3		2.9		2.9		
		4.5 V	4.4	4.5		4.4		4.4		
	I _{OH} = –4 mA	3 V	2.58			2.48		2.48		
	I _{OH} = –8 mA	4.5 V	3.94			3.8		3.8		
V _{OL}	I _{OL} = 50 µA	2 V			0.1		0.1		0.1	V
		3 V			0.1		0.1		0.1	
		4.5 V			0.1		0.1		0.1	
	I _{OL} = 4 mA	3 V			0.36		0.5		0.44	
	I _{OL} = 8 mA	4.5 V			0.36		0.5		0.44	
I _I	V _I = V _{CC} or GND	0 V to 5.5 V			±0.1		±1*		±1	µA
I _{OZ}	V _I = V _{IL} or V _{IH} , V _O = V _{CC} or GND	5.5 V			±0.25		±2.5		±2.5	µA
I _{CC}	V _I = V _{CC} or GND, I _O = 0	5.5 V			4		40		40	µA
C _i	V _I = V _{CC} or GND	5 V		2.5	10				10	pF
C ₀	V _O = V _{CC} or GND	5 V		3.5						pF

* On products compliant to MIL-PRF-38535, this parameter is not production tested at V_{CC} = 0 V.

**timing requirements over recommended operating free-air temperature range,
V_{CC} = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)**

		T _A = 25°C		SN54AHC573		SN74AHC573		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	
t _w	Pulse duration, LE high	5		5		5		ns
t _{su}	Setup time, data before LE↓	3.5		3.5		3.5		ns
t _h	Hold time, data after LE↓	1.5		1.5		1.5		ns

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

		T _A = 25°C		SN54AHC573		SN74AHC573		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	
t _w	Pulse duration, LE high	5		5		5		ns
t _{su}	Setup time, data before LE↓	3.5		3.5		3.5		ns
t _h	Hold time, data after LE↓	1.5		1.5		1.5		ns



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switching characteristics over recommended operating free-air temperature range,
 $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T _A = 25°C			SN54AHC573		SN74AHC573		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	D	Q	C _L = 15 pF	7*	11*	1*	13*	1	13	ns	
t _{PHL}				7*	11*	1*	13*	1	13		
t _{PLH}	LE	Q	C _L = 15 pF	7.6*	11.9*	1*	14*	1	14	ns	
t _{PHL}				7.6*	11.9*	1*	14*	1	14		
t _{PZH}	$\overline{OE}$	Q	C _L = 15 pF	7.3*	11.5*	1*	13.5*	1	13.5	ns	
t _{PZL}				7.3*	11.5*	1*	13.5*	1	13.5		
t _{PHZ}	$\overline{OE}$	Q	C _L = 15 pF	8.3*	11*	1*	13*	1	13	ns	
t _{PLZ}				8.3*	11*	1*	13*	1	13		
t _{PLH}	D	Q	C _L = 50 pF	9.5	14.5	1	16.5	1	16.5	ns	
t _{PHL}				9.5	14.5	1	16.5	1	16.5		
t _{PLH}	LE	Q	C _L = 50 pF	10.1	15.4	1	17.5	1	17.5	ns	
t _{PHL}				10.1	15.4	1	17.5	1	17.5		
t _{PZH}	$\overline{OE}$	Q	C _L = 50 pF	9.8	15	1	17	1	17	ns	
t _{PZL}				9.8	15	1	17	1	17		
t _{PHZ}	$\overline{OE}$	Q	C _L = 50 pF	10.7	14.5	1	16.5	1	16.5	ns	
t _{PLZ}				10.7	14.5	1	16.5	1	16.5		
t _{sk(o)}			C _L = 50 pF	1.5**				1.5		ns	

* On products compliant to MIL-PRF-38535, this parameter is not production tested.

** On products compliant to MIL-PRF-38535, this parameter does not apply.

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T _A = 25°C			SN54AHC573		SN74AHC573		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	D	Q	C _L = 15 pF	4.5*	6.8*	1	8*	1	8	ns	
t _{PHL}				4.5*	6.8*	1	8*	1	8		
t _{PLH}	LE	Q	C _L = 15 pF	5*	7.7*	1	9*	1	9	ns	
t _{PHL}				5*	7.7*	1	9*	1	9		
t _{PZH}	$\overline{OE}$	Q	C _L = 15 pF	5.2*	7.7*	1	9*	1	9	ns	
t _{PZL}				5.2*	7.7*	1	9*	1	9		
t _{PHZ}	$\overline{OE}$	Q	C _L = 15 pF	5.2*	7.7*	1	9*	1	9	ns	
t _{PLZ}				5.2*	7.7*	1	9*	1	9		
t _{PLH}	D	Q	C _L = 50 pF	6	8.8	1	10	1	10	ns	
t _{PHL}				6	8.8	1	10	1	10		
t _{PLH}	LE	Q	C _L = 50 pF	6.5	9.7	1	11	1	11	ns	
t _{PHL}				6.5	9.7	1	11	1	11		
t _{PZH}	$\overline{OE}$	Q	C _L = 50 pF	6.7	9.7	1	11	1	11	ns	
t _{PZL}				6.7	9.7	1	11	1	11		
t _{PHZ}	$\overline{OE}$	Q	C _L = 50 pF	6.7	9.7	1	11	1	11	ns	
t _{PLZ}				6.7	9.7	1	11	1	11		
t _{sk(0)}			C _L = 50 pF	1**				1		ns	

* On products compliant to MIL-PRF-38535, this parameter is not production tested.

** On products compliant to MIL-PRF-38535, this parameter does not apply.



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noise characteristics, $V_{CC} = 5\text{ V}$, $C_L = 50\text{ pF}$, $T_A = 25^\circ\text{C}$ (see Note 4)

PARAMETER	SN74AHC573		UNIT
	MIN	MAX	
$V_{OL(P)}$ Quiet output, maximum dynamic V_{OL}		1	V
$V_{OL(V)}$ Quiet output, minimum dynamic V_{OL}		-0.8	V
$V_{OH(V)}$ Quiet output, minimum dynamic V_{OH}	4		V
$V_{IH(D)}$ High-level dynamic input voltage	3.5		V
$V_{IL(D)}$ Low-level dynamic input voltage		1.5	V

NOTE 4: Characteristics are for surface-mount packages only.

operating characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	TYP	UNIT
C_{pd} Power dissipation capacitance	No load, $f = 1\text{ MHz}$	16	pF

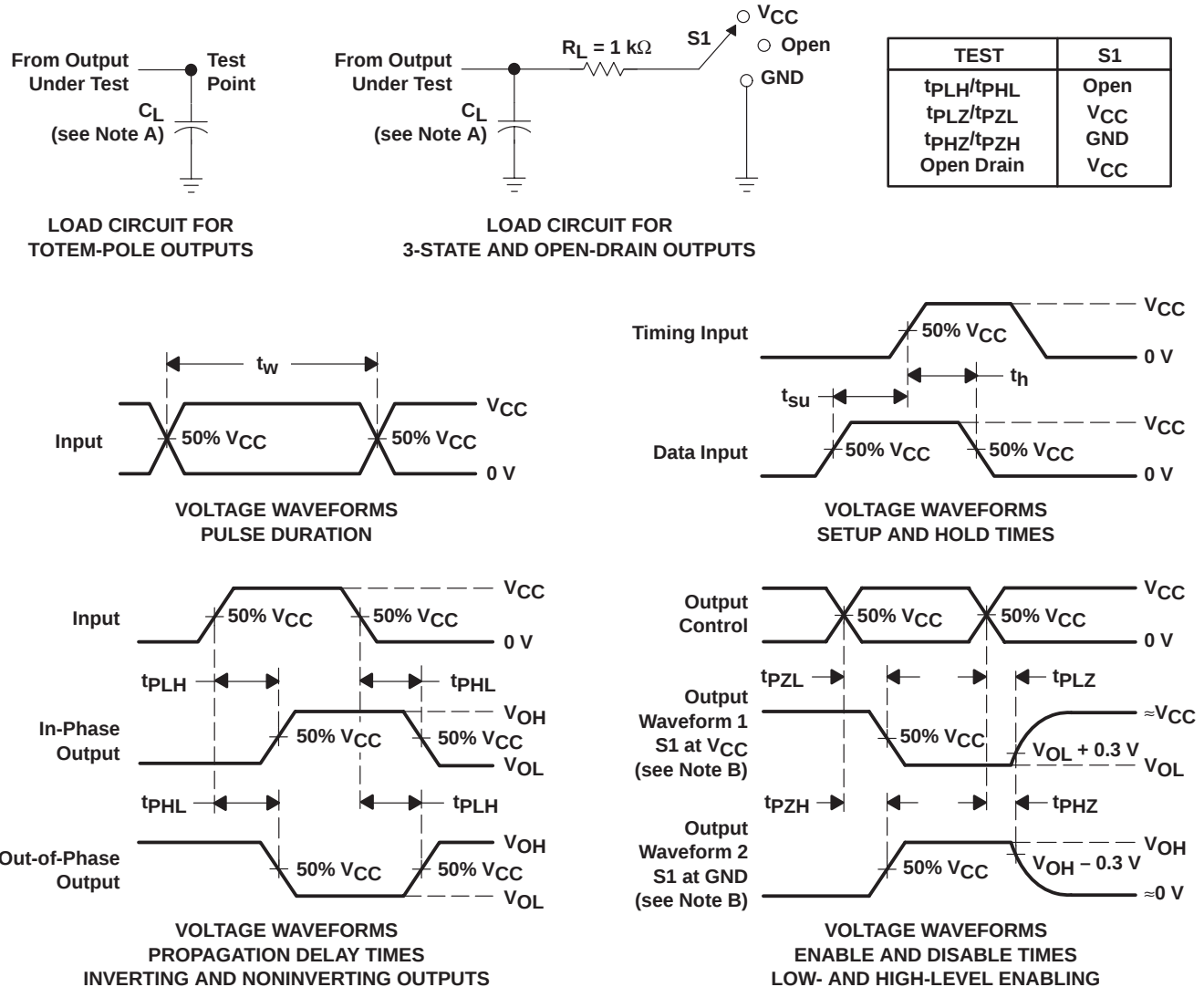


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PARAMETER MEASUREMENT INFORMATION



- 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: $PRR \leq 1\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r \leq 3\text{ ns}$, $t_f \leq 3\text{ ns}$.
- D. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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