

## 54AC/74AC573 • 54ACT/74ACT573

### Octal D-Type Latch With 3-State Outputs

#### Description

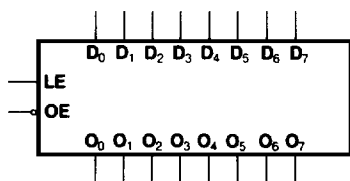
The 'AC'/ACT573 is a high-speed octal latch with buffered common Latch Enable (LE) and buffered common Output Enable ( $\overline{OE}$ ) inputs.

The 'AC'/ACT573 is functionally identical to the 'AC'/ACT373 but has inputs and outputs on opposite sides.

- Inputs and Outputs on Opposite Sides of Package Allowing Easy Interface with Microprocessors
- Useful as Input or Output Port for Microprocessors
- Functionally Identical to 'AC'/ACT373
- 3-State Outputs for Bus Interfacing
- Outputs Source/Sink 24 mA
- 'ACT573 has TTL-Compatible Inputs

**Ordering Code:** See Section 6

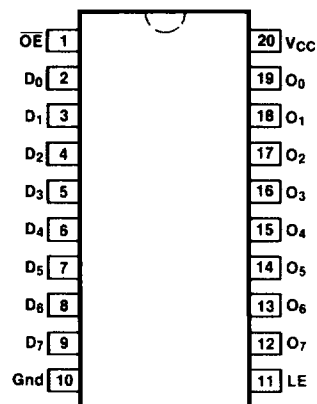
#### Logic Symbol



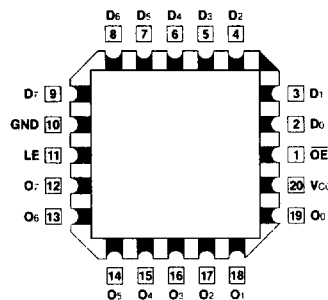
#### Pin Names

- D<sub>0</sub> - D<sub>7</sub> Data Inputs
- LE Latch Enable Input
- $\overline{OE}$  3-State Output Enable Input
- O<sub>0</sub> - O<sub>7</sub> 3-State Latch Outputs

#### Connection Diagrams



**Pin Assignment  
for DIP, Flatpak and SOIC**



**Pin Assignment  
for LCC**

**Functional Description**

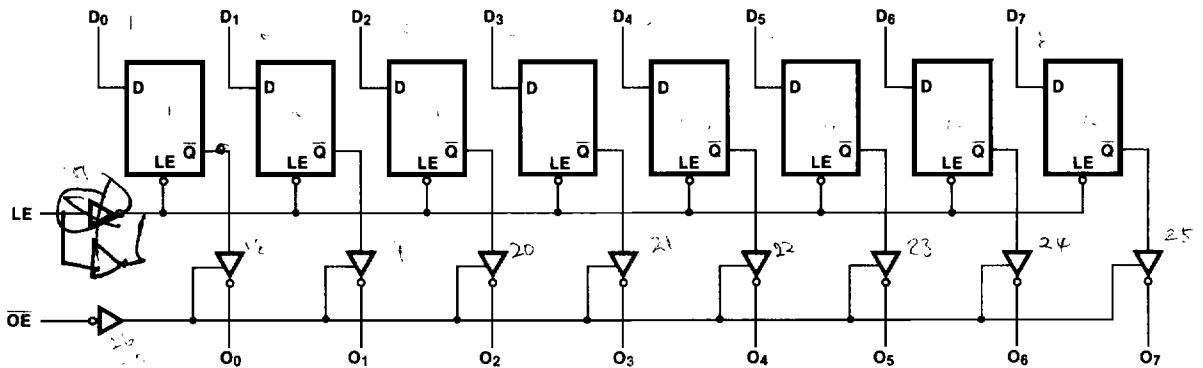
The 'AC/ACT573 contains eight D-type latches with 3-state output buffers. When the Latch Enable (LE) input is HIGH, data on the D<sub>n</sub> inputs enters the latches. In this condition the latches are transparent, i.e., a latch output will change state each time its D input changes. When LE is LOW the latches store the information that was present on the D inputs a setup time preceding the HIGH-to-LOW transition of LE. The 3-state buffers are controlled by the Output Enable ( $\overline{OE}$ ) input. When  $\overline{OE}$  is LOW, the buffers are enabled. When  $\overline{OE}$  is HIGH the buffers are in the high impedance mode but this does not interfere with entering new data into the latches.

**Truth Table**

Inputs			Outputs
$\overline{OE}$	LE	D	O <sub>n</sub>
L	H	H	H
L	H	L	H
L	L	X	O <sub>0</sub>
H	X	X	Z

H = HIGH Voltage  
 L = LOW Voltage  
 Z = High Impedance  
 X = Immaterial  
 O<sub>0</sub> = Previous O<sub>0</sub> before LOW-to-HIGH Transition of Clock

**Logic Diagram**



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

# AC573 • ACT573

## DC Characteristics (unless otherwise specified)

Symbol	Parameter	54AC/ACT	74AC/ACT	Units	Conditions
I <sub>CC</sub>	Maximum Quiescent Supply Current	160	80	μA	V <sub>IN</sub> = V <sub>CC</sub> or Ground, V <sub>CC</sub> = 5.5 V, T <sub>A</sub> = Worst Case
I <sub>CC</sub>	Maximum Quiescent Supply Current	8.0	8.0	μA	V <sub>IN</sub> = V <sub>CC</sub> or Ground, V <sub>CC</sub> = 5.5 V, T <sub>A</sub> = 25°C
I <sub>CC(T)</sub>	Maximum Additional I <sub>CC</sub> /Input ('ACT573)	1.6	1.5	mA	V <sub>IN</sub> = V <sub>CC</sub> - 2.1 V V <sub>CC</sub> = 5.5 V, T <sub>A</sub> = Worst Case

## AC Characteristics

Symbol	Parameter	V <sub>CC</sub> * (V)	74AC			54AC		74AC		Units	Fig. No.
			T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF			T <sub>A</sub> = -55°C to +125°C C <sub>L</sub> = 50 pF		T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF			
			Min	Typ	Max	Min	Max	Min	Max		
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to O <sub>n</sub>	3.3 5.0	9.0 6.0						ns	3-5	
t <sub>PHL</sub>	Propagation Delay D <sub>n</sub> to O <sub>n</sub>	3.3 5.0	9.0 6.0						ns	3-5	
t <sub>PLH</sub>	Propagation Delay LE to O <sub>n</sub>	3.3 5.0	9.0 6.0						ns	3-6	
t <sub>PHL</sub>	Propagation Delay LE to O <sub>n</sub>	3.3 5.0	8.0 5.5						ns	3-6	
t <sub>PZH</sub>	Output Enable Time	3.3 5.0	7.0 5.5						ns	3-7	
t <sub>PZL</sub>	Output Enable Time	3.3 5.0	7.5 5.5						ns	3-8	
t <sub>PHZ</sub>	Output Disable Time	3.3 5.0	8.5 6.5						ns	3-7	
t <sub>P LZ</sub>	Output Disable Time	3.3 5.0	6.5 5.0						ns	3-8	

\*Voltage Range 3.3 is 3.3 V ± 0.3 V

Voltage Range 5.0 is 5.0 V ± 0.5 V

Military parameters given herein are for general references only. For current military specifications and subgroup testing information please request Fairchild's Table I data sheet from your Fairchild sales engineer or account representative.

AC Operating Requirements

Symbol	Parameter	Vcc* (V)	74AC		54AC		74AC		Units	Fig. No.
			TA = +25°C CL = 50 pF		TA = -55°C to +125°C CL = 50 pF		TA = -40°C to +85°C CL = 50 pF			
			Typ	Guaranteed Minimum						
ts	Setup Time, HIGH or LOW Dn to LE	3.3 5.0	2.0 1.0						ns	3-9
th	Hold Time, HIGH or LOW Dn to LE	3.3 5.0	0 0						ns	3-9
tw	LE Pulse Width, HIGH	3.3 5.0	4.0 2.5						ns	3-6

\*Voltage Range 3.3 is 3.3 V ± 0.3 V  
Voltage Range 5.0 is 5.0 V ± 0.5 V

AC Characteristics

5

Symbol	Parameter	Vcc* (V)	74ACT			54ACT		74ACT		Units	Fig. No.
			TA = +25°C CL = 50 pF			TA = -55°C to +125°C CL = 50 pF		TA = -40°C to +85°C CL = 50 pF			
			Min	Typ	Max	Min	Max	Min	Max		
tPLH	Propagation Delay Dn to On	5.0	1.0	6.0	10.5	1.0	13.5	1.0	12.0	ns	3-5
tPHL	Propagation Delay Dn to On	5.0	1.0	6.0	10.5	1.0	13.5	1.0	12.0	ns	3-5
tPLH	Propagation Delay LE to On	5.0	1.0	6.0	10.5	1.0	13.0	1.0	12.0	ns	3-6
tPHL	Propagation Delay LE to On	5.0	1.0	5.5	9.5	1.0	12.0	1.0	10.5	ns	3-6
tPZH	Output Enable Time	5.0	1.0	5.5	10.0	1.0	11.5	1.0	11.0	ns	3-7
tPZL	Output Enable Time	5.0	1.0	5.5	9.5	1.0	11.0	1.0	10.5	ns	3-8
tPHZ	Output Disable Time	5.0	1.0	6.5	11.0	1.0	13.5	1.0	12.5	ns	3-7
tPLZ	Output Disable Time	5.0	1.0	5.0	8.5	1.0	10.5	1.0	9.5	ns	3-8

\*Voltage Range 5.0 is 5.0 V ± 0.5 V

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# AC573 • ACT573

## AC Operating Requirements

Symbol	Parameter	V <sub>CC</sub> * (V)	74ACT		54ACT	74ACT	Units	Fig. No.
			T <sub>A</sub> = + 25°C C <sub>L</sub> = 50 pF		T <sub>A</sub> = - 55°C to + 125°C C <sub>L</sub> = 50 pF	T <sub>A</sub> = - 40°C to + 85°C C <sub>L</sub> = 50 pF		
			Typ	Guaranteed Minimum				
t <sub>s</sub>	Setup Time, HIGH or LOW D <sub>n</sub> to LE	5.0	1.5	3.0	3.5	3.5	ns	3-9
t <sub>h</sub>	Hold Time, HIGH or LOW D <sub>n</sub> to LE	5.0	- 1.5	0	0.5	0	ns	3-9
t <sub>w</sub>	LE Pulse Width, HIGH	5.0	2.0	3.5	5.0	4.0	ns	3-6

\*Voltage Range 5.0 is 5.0 V ± 0.5 V

Military parameters given herein are for general references only. For current military specifications and subgroup testing information please request Fairchild's Table I data sheet from your Fairchild sales engineer or account representative.

## Capacitance

Symbol	Parameter	54/74AC/ACT	Units	Conditions
		Typ		
C <sub>IN</sub>	Input Capacitance	5.0	pF	V <sub>CC</sub> = 5.5 V
C <sub>PD</sub>	Power Dissipation Capacitance	25.0	pF	V <sub>CC</sub> = 5.5 V