

# MC74AC573, MC74ACT573

## Octal Buffer/Line Driver with 3-State Outputs

The MC74AC573/74ACT573 is a high-speed octal latch with buffered common Latch Enable (LE) and buffered common Output Enable ( $\overline{OE}$ ) inputs.

The MC74AC573/74ACT573 is functionally identical to the MC74AC373/74ACT373 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 MC74AC373/74ACT373
- 3-State Outputs for Bus Interfacing
- Outputs Source/Sink 24 mA
- 'ACT573 Has TTL Compatible Inputs

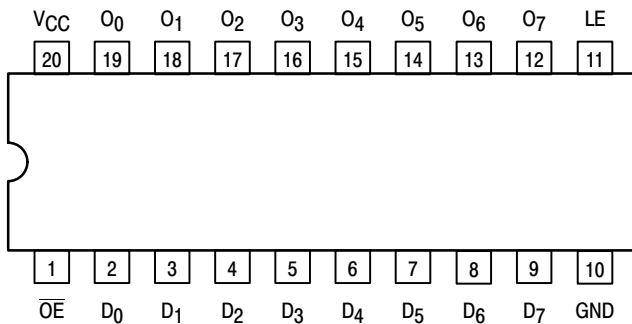


Figure 1. Pinout 20-Lead Packages Conductors (Top View)

### PIN ASSIGNMENT

PIN	FUNCTION
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

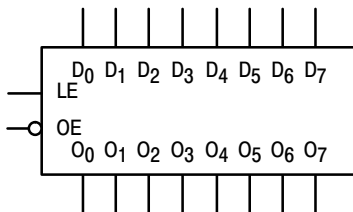
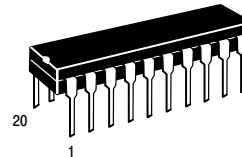


Figure 2. Logic Symbol

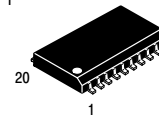


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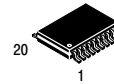
<http://onsemi.com>



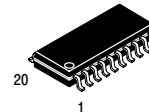
PDIP-20  
N SUFFIX  
CASE 738



SO-20  
DW SUFFIX  
CASE 751



TSSOP-20  
DT SUFFIX  
CASE 948E



EIAJ-20  
M SUFFIX  
CASE 967

### ORDERING INFORMATION

Device	Package	Shipping
MC74AC573N	PDIP-20	18 Units/Rail
MC74ACT573N	PDIP-20	18 Units/Rail
MC74AC573DW	SOIC-20	38 Units/Rail
MC74AC573DWR2	SOIC-20	1000 Tape & Reel
MC74ACT573DW	SOIC-20	38 Units/Rail
MC74ACT573DWR2	SOIC-20	1000 Tape & Reel
MC74AC573DT	TSSOP-20	75 Units/Rail
MC74AC573DTR2	TSSOP-20	2500 Tape & Reel
MC74ACT573DT	TSSOP-20	75 Units/Rail
MC74ACT573DTR2	TSSOP-20	2500 Tape & Reel
MC74AC573M	EIAJ-20	40 Units/Rail
MC74AC573MEL	EIAJ-20	2000 Tape & Reel
MC74ACT573M	EIAJ-20	40 Units/Rail
MC74ACT573MEL	EIAJ-20	2000 Tape & Reel

### DEVICE MARKING INFORMATION

See general marking information in the device marking section on page 231 of this data sheet.

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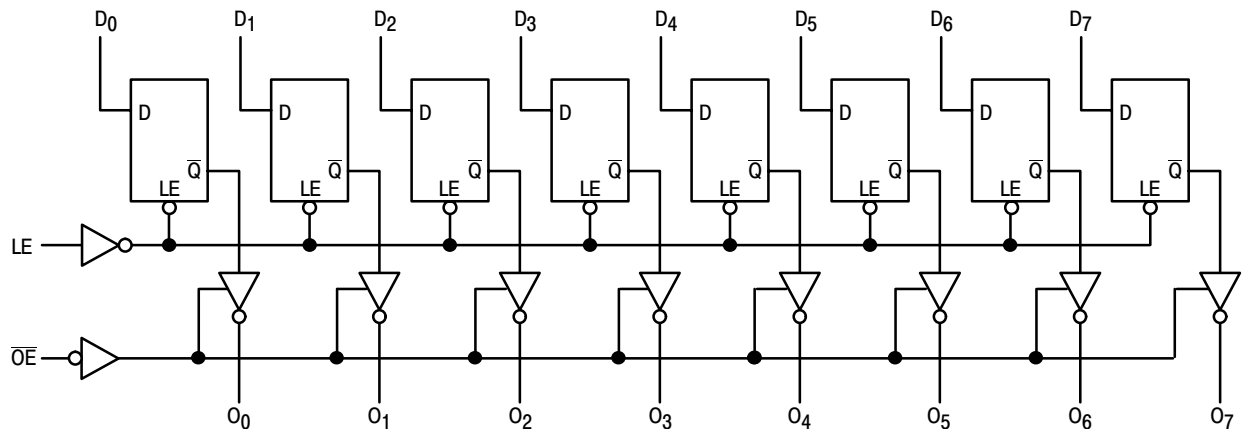
## TRUTH TABLE

Inputs			Outputs
$\overline{OE}$	LE	$D_n$	$O_n$
L	H	H	H
L	H	L	H
L	L	X	$O_0$
H	X	X	Z

H = HIGH Voltage Level  
 L = LOW Voltage Level  
 Z = High Impedance  
 X = Immaterial  
 $O_0$  = Previous  $O_0$  before LOW-to-HIGH Transition of Clock

## FUNCTIONAL DESCRIPTION

The MC74AC573/74ACT574 contains eight D-type latches with 3-state output buffers. When the Latch Enable (LE) input is HIGH, data on the  $D_n$  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.



NOTE: That this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

Figure 3. Logic Diagram

## MAXIMUM RATINGS\*

Symbol	Parameter	Value	Unit
$V_{CC}$	DC Supply Voltage (Referenced to GND)	-0.5 to +7.0	V
$V_{IN}$	DC Input Voltage (Referenced to GND)	-0.5 to $V_{CC} + 0.5$	V
$V_{OUT}$	DC Output Voltage (Referenced to GND)	-0.5 to $V_{CC} + 0.5$	V
$I_{IN}$	DC Input Current, per Pin	$\pm 20$	mA
$I_{OUT}$	DC Output Sink/Source Current, per Pin	$\pm 50$	mA
$I_{CC}$	DC $V_{CC}$ or GND Current per Output Pin	$\pm 50$	mA
$T_{stg}$	Storage Temperature	-65 to +150	$^{\circ}C$

\*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

## MC74AC573, MC74ACT573

### RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit	
V <sub>CC</sub>	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
V <sub>IN</sub> , V <sub>OUT</sub>	DC Input Voltage, Output Voltage (Ref. to GND)	0	–	V <sub>CC</sub>	V	
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs	V <sub>CC</sub> @ 3.0 V	–	150	–	ns/V
		V <sub>CC</sub> @ 4.5 V	–	40	–	
		V <sub>CC</sub> @ 5.5 V	–	25	–	
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time (Note 2) 'ACT Devices except Schmitt Inputs	V <sub>CC</sub> @ 4.5 V	–	10	–	ns/V
		V <sub>CC</sub> @ 5.5 V	–	8.0	–	
T <sub>J</sub>	Junction Temperature (PDIP)	–	–	140	°C	
T <sub>A</sub>	Operating Ambient Temperature Range	–40	25	85	°C	
I <sub>OH</sub>	Output Current – High	–	–	–24	mA	
I <sub>OL</sub>	Output Current – Low	–	–	24	mA	

1. V<sub>IN</sub> from 30% to 70% V<sub>CC</sub>; see individual Data Sheets for devices that differ from the typical input rise and fall times.
2. V<sub>IN</sub> from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

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## DC CHARACTERISTICS

Symbol	Parameter	V <sub>CC</sub> (V)	74AC		74AC	Unit	Conditions
			T <sub>A</sub> = +25°C		T <sub>A</sub> = -40°C to +85°C		
			Typ	Guaranteed Limits			
V <sub>IH</sub>	Minimum High Level Input Voltage	3.0	1.5	2.1	2.1	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
		4.5	2.25	3.15	3.15		
		5.5	2.75	3.85	3.85		
V <sub>IL</sub>	Maximum Low Level Input Voltage	3.0	1.5	0.9	0.9	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
		4.5	2.25	1.35	1.35		
		5.5	2.75	1.65	1.65		
V <sub>OH</sub>	Minimum High Level Output Voltage	3.0	2.99	2.9	2.9	V	I <sub>OUT</sub> = -50 μA
		4.5	4.49	4.4	4.4		
		5.5	5.49	5.4	5.4		
		3.0	-	2.56	2.46	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> -12 mA I <sub>OH</sub> -24 mA -24 mA
		4.5	-	3.86	3.76		
5.5	-	4.86	4.76				
V <sub>OL</sub>	Maximum Low Level Output Voltage	3.0	0.002	0.1	0.1	V	I <sub>OUT</sub> = 50 μA
		4.5	0.001	0.1	0.1		
		5.5	0.001	0.1	0.1		
		3.0	-	0.36	0.44	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> 12 mA I <sub>OL</sub> 24 mA 24 mA
		4.5	-	0.36	0.44		
5.5	-	0.36	0.44				
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μA	V <sub>I</sub> = V <sub>CC</sub> , GND
I <sub>OZ</sub>	Maximum 3-State Current	5.5	-	±0.5	±5.0	μA	V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub> V <sub>I</sub> = V <sub>CC</sub> , GND V <sub>O</sub> = V <sub>CC</sub> , GND
I <sub>OLD</sub>	†Minimum Dynamic Output Current	5.5	-	-	75	mA	V <sub>OLD</sub> = 1.65 V Max
I <sub>OHD</sub>		5.5	-	-	-75	mA	V <sub>OHD</sub> = 3.85 V Min
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	-	8.0	80	μA	V <sub>IN</sub> = V <sub>CC</sub> or GND

\*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

NOTE: I<sub>IN</sub> and I<sub>CC</sub> @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V<sub>CC</sub>.

# MC74AC573, MC74ACT573

## AC CHARACTERISTICS (For Figures and Waveforms – See Section 3)

Symbol	Parameter	V <sub>CC</sub> * (V)	74AC			74AC		Unit	Fig. No.
			T <sub>A</sub> = +25°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		
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to O <sub>n</sub>	3.3	2.5	–	13.0	2.0	15.0	ns	3–5
		5.0	2.5	–	10.0	2.0	11.5		
t <sub>PHL</sub>	Propagation Delay D <sub>n</sub> to O <sub>n</sub>	3.3	2.5	–	12.0	2.0	14.0	ns	3–5
		5.0	2.5	–	9.5	2.0	11.0		
t <sub>PLH</sub>	Propagation Delay LE to O <sub>n</sub>	3.3	2.5	–	13.0	2.0	15.0	ns	3–6
		5.0	2.5	–	9.5	2.0	11.0		
t <sub>PHL</sub>	Propagation Delay LE to O <sub>n</sub>	3.3	2.5	–	12.0	2.0	14.0	ns	3–6
		5.0	2.5	–	8.5	2.0	10.0		
t <sub>PZH</sub>	Output Enable Time	3.3	2.5	–	11.0	2.0	12.0	ns	3–7
		5.0	2.5	–	9.0	2.0	10.0		
t <sub>PZL</sub>	Output Enable Time	3.3	2.5	–	11.0	2.0	12.5	ns	3–8
		5.0	2.5	–	8.5	2.0	9.5		
t <sub>PHZ</sub>	Output Disable Time	3.3	2.5	–	12.5	2.0	13.5	ns	3–7
		5.0	2.5	–	11.0	2.0	12.0		
t <sub>PLZ</sub>	Output Disable Time	3.3	2.5	–	9.5	2.0	10.5	ns	3–8
		5.0	2.5	–	8.0	2.0	9.0		

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

## AC OPERATING REQUIREMENTS

Symbol	Parameter	V <sub>CC</sub> * (V)	74AC		74AC		Unit	Fig. No.
			T <sub>A</sub> = +25°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	3.3	–	3.5	4.0	ns	3–9	
		5.0	–	3.0	3.5			
t <sub>h</sub>	Hold Time, HIGH or LOW D <sub>n</sub> to LE	3.3	–	2.0	2.0	ns	3–9	
		5.0	–	2.0	2.0			
t <sub>w</sub>	LE Pulse Width, HIGH	3.3	–	6.0	7.0	ns	3–6	
		5.0	–	4.0	5.0			

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

# MC74AC573, MC74ACT573

## DC CHARACTERISTICS

Symbol	Parameter	V <sub>CC</sub> (V)	74ACT		74ACT		Unit	Conditions
			T <sub>A</sub> = +25°C		T <sub>A</sub> = -40°C to +85°C			
			Typ	Guaranteed Limits				
V <sub>IH</sub>	Minimum High Level Input Voltage	4.5	1.5	2.0	2.0	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V	
		5.5	1.5	2.0	2.0			
V <sub>IL</sub>	Maximum Low Level Input Voltage	4.5	1.5	0.8	0.8	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V	
		5.5	1.5	0.8	0.8			
V <sub>OH</sub>	Minimum High Level Output Voltage	4.5	4.49	4.4	4.4	V	I <sub>OUT</sub> = -50 μA	
		5.5	5.49	5.4	5.4			
		4.5	-	3.86	3.76	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OH</sub> = -24 mA	
		5.5	-	4.86	4.76			
V <sub>OL</sub>	Maximum Low Level Output Voltage	4.5	0.001	0.1	0.1	V	I <sub>OUT</sub> = 50 μA	
		5.5	0.001	0.1	0.1			
		4.5	-	0.36	0.44	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OL</sub> = 24 mA	
		5.5	-	0.36	0.44			
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μA	V <sub>I</sub> = V <sub>CC</sub> , GND	
ΔI <sub>CCT</sub>	Additional Max. I <sub>CC</sub> /Input	5.5	0.6	-	1.5	mA	V <sub>I</sub> = V <sub>CC</sub> - 2.1 V	
I <sub>OZ</sub>	Maximum 3-State Current	5.5	-	±0.5	±5.0	μA	V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub> V <sub>I</sub> = V <sub>CC</sub> , GND V <sub>O</sub> = V <sub>CC</sub> , GND	
I <sub>OLD</sub>	†Minimum Dynamic Output Current	5.5	-	-	75	mA	V <sub>OLD</sub> = 1.65 V Max	
I <sub>OHD</sub>		5.5	-	-	-75	mA	V <sub>OHD</sub> = 3.85 V Min	
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	-	8.0	80	μA	V <sub>IN</sub> = V <sub>CC</sub> or GND	

\*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

## AC CHARACTERISTICS (For Figures and Waveforms – See Section 3)

Symbol	Parameter	V <sub>CC</sub> * (V)	74ACT			74ACT		Unit	Fig. No.
			T <sub>A</sub> = +25°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		
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to O <sub>n</sub>	5.0	2.5	-	10.5	2.0	12	ns	3-5
t <sub>PHL</sub>	Propagation Delay D <sub>n</sub> to O <sub>n</sub>	5.0	2.5	-	10.5	2.0	12	ns	3-5
t <sub>PLH</sub>	Propagation Delay LE to O <sub>n</sub>	5.0	3.0	-	10.5	2.5	12	ns	3-6
t <sub>PHL</sub>	Propagation Delay LE to O <sub>n</sub>	5.0	2.5	-	9.5	2.0	10.5	ns	3-6
t <sub>PZH</sub>	Output Enable Time	5.0	2.0	-	10	1.5	11	ns	3-7
t <sub>PZL</sub>	Output Enable Time	5.0	1.5	-	9.5	1.5	10.5	ns	3-8
t <sub>PHZ</sub>	Output Disable Time	5.0	2.5	-	11	1.5	12.5	ns	3-7
t <sub>PLZ</sub>	Output Disable Time	5.0	1.5	-	8.5	1.0	9.5	ns	3-8

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.

# MC74AC573, MC74ACT573

## AC OPERATING REQUIREMENTS

Symbol	Parameter	V <sub>CC</sub> * (V)	74ACT		74ACT		Unit	Fig. No.
			T <sub>A</sub> = +25°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	–	3.0	3.5	ns	3–9	
t <sub>h</sub>	Hold Time, HIGH or LOW D <sub>n</sub> to LE	5.0	–	0	0	ns	3–9	
t <sub>w</sub>	LE Pulse Width, HIGH	5.0	–	3.5	4.0	ns	3–6	

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.

## CAPACITANCE

Symbol	Parameter	Value Typ	Unit	Test Conditions
C <sub>IN</sub>	Input Capacitance	5.0	pF	V <sub>CC</sub> = 5.0 V
C <sub>PD</sub>	Power Dissipation Capacitance	25	pF	V <sub>CC</sub> = 5.0 V

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## MARKING DIAGRAMS

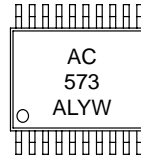
PDIP-20



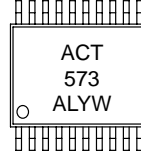
SO-20



TSSOP-20



EIAJ-20



A = Assembly Location  
WL, L = Wafer Lot  
YY, Y = Year  
WW, W = Work Week