## 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（ $\overline{\mathrm{OE}}$ ）inputs．

The MC74AC573／74ACT573 is functionally identical to the MC74AC373／74ACT373 but has inputs and outputs on opposite sides．

## Features

－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
－These are $\mathrm{Pb}-$ Free Devices


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

PIN ASSIGNMENT

| PIN | FUNCTION |
| :--- | :--- |
| $D_{0}-D_{7}$ | Data Inputs |
| LE | Latch Enable Input |
| $\overline{\mathrm{OE}}$ | 3－State Output Enable Input |
| $\mathrm{O}_{0}-\mathrm{O}_{7}$ | 3－State Latch Outputs |



Figure 2．Logic Symbol

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SO－20 DW SUFFIX CASE 751D

TSSOP－20
DT SUFFIX
CASE 948E
MARKING
ABA日月日明
xxx573
AWLYYWWG
昭昭昭

| xxx <br> 573 <br> ALYW • <br> $0 \quad$ ！ |
| :---: |
|  |  |

xxx＝AC or ACT
A＝Assembly Location
WL，L＝Wafer Lot
$Y Y, Y=$ Year
WW，W＝Work Week
G or •＝Pb－Free Package
（Note：Microdot may be in either location）

## ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 8 of this data sheet．

TRUTH TABLE

| Inputs |  |  | Outputs |
| :---: | :---: | :---: | :---: |
| OE | LE | $\mathbf{D}_{\boldsymbol{n}}$ | $\mathbf{O}_{\boldsymbol{n}}$ |
| L | $H$ | $H$ | $H$ |
| L | $H$ | L | L |
| L | L | X | $\mathrm{O}_{0}$ |
| $H$ | X | X | Z |

$\mathrm{H}=\mathrm{HIGH}$ Voltage Level
L = LOW Voltage Level
$\mathrm{Z}=$ High Impedance
$X=$ Immaterial
$\mathrm{O}_{0}=$ Previous $\mathrm{O}_{0}$ 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 $\mathrm{D}_{\mathrm{n}}$ 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 $(\overline{\mathrm{OE}})$ input. When $\overline{\mathrm{OE}}$ is LOW, the buffers are enabled. When $\overline{\mathrm{OE}}$ is HIGH the buffers are in the high impedance mode but this does not interfere with entering new data into the latches.


Figure 3. Logic Diagram

MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
| :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\text {CC }}$ | DC Supply Voltage (Referenced to GND) | -0.5 to +7.0 | V |
| $\mathrm{V}_{\text {IN }}$ | DC Input Voltage (Referenced to GND) | -0.5 to $\mathrm{V}_{\mathrm{CC}}+0.5$ | V |
| $\mathrm{V}_{\text {OUT }}$ | DC Output Voltage (Referenced to GND) (Note 1) | -0.5 to $\mathrm{V}_{\mathrm{CC}}+0.5$ | V |
| IK | DC Input Diode Current | $\pm 20$ | mA |
| $\mathrm{l}_{\text {OK }}$ | DC Output Diode Current | $\pm 50$ | mA |
| Iout | DC Output Sink/Source Current | $\pm 50$ | mA |
| ICC | DC Supply Current, per Output Pin | $\pm 50$ | mA |
| $\mathrm{I}_{\text {GND }}$ | DC Ground Current, per Output Pin | $\pm 100$ | mA |
| TSTG | Storage Temperature Range | -65 to +150 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{L}}$ | Lead temperature, 1 mm from Case for 10 Seconds | 260 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{J}}$ | Junction Temperature Under Bias | 140 | ${ }^{\circ} \mathrm{C}$ |
| $\theta_{\text {JA }}$ | $\begin{array}{lr}\text { Thermal Resistance (Note 2) } & \text { SOIC } \\ & \text { TSSOP }\end{array}$ | $\begin{gathered} 65.8 \\ 110.7 \end{gathered}$ | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| MSL | Moisture Sensitivity | Level 1 |  |
| $\mathrm{F}_{\mathrm{R}}$ | Flammability Rating Oxygen Index: 30\% - 35\% | UL 94 V-0 @ 0.125 in |  |
| $\mathrm{V}_{\text {ESD }}$ | ESD Withstand VoltageHuman Body Model (Note 3) <br> Machine Model (Note 4) <br> Charged Device Model (Note 5) | $\begin{aligned} & >2000 \\ & >200 \\ & >1000 \end{aligned}$ | V |
| ILatchup | Latchup Performance Above $\mathrm{V}_{\mathrm{CC}}$ and Below GND at $85^{\circ} \mathrm{C}$ (Note 6) | $\pm 100$ | mA |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. IOUT absolute maximum rating must be observed.
2. The package thermal impedance is calculated in accordance with JESD 51-7.
3. Tested to EIA/JESD22-A114-A.
4. Tested to EIA/JESD22-A115-A.
5. Tested to JESD22-C101-A.
6. Tested to EIA/JESD78.

RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter |  | Min | Typ | Max | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | Supply Voltage | 'AC | 2.0 | 5.0 | 6.0 | V |
|  |  | 'ACT | 4.5 | 5.0 | 5.5 |  |
| $\mathrm{V}_{\text {IN }}, \mathrm{V}_{\text {OUT }}$ | DC Input Voltage, Output Voltage (Ref. to GND) |  | 0 | - | $\mathrm{V}_{\text {CC }}$ | V |
| $\mathrm{tr}_{\mathrm{r}} \mathrm{tf}_{\mathrm{f}}$ | Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs | $\mathrm{V}_{\mathrm{Cc}} @ 3.0 \mathrm{~V}$ | - | 150 | - | $\mathrm{ns} / \mathrm{V}$ |
|  |  | $\mathrm{V}_{\text {CC }} @ 4.5 \mathrm{~V}$ | - | 40 | - |  |
|  |  | $\mathrm{V}_{\mathrm{Cc}}$ @ 5.5 V | - | 25 | - |  |
| $\mathrm{tr}_{\text {r }} \mathrm{tf}_{\text {f }}$ | Input Rise and Fall Time (Note 2) 'ACT Devices except Schmitt Inputs | $\mathrm{V}_{\mathrm{CC}}$ @ 4.5 V | - | 10 | - | $\mathrm{ns} / \mathrm{V}$ |
|  |  | $\mathrm{V}_{\mathrm{Cc}} @ 5.5 \mathrm{~V}$ | - | 8.0 | - |  |
| $\mathrm{T}_{\mathrm{A}}$ | Operating Ambient Temperature Range |  | -40 | 25 | 85 | ${ }^{\circ} \mathrm{C}$ |
| IOH | Output Current - High |  | - | - | -24 | mA |
| loL | Output Current - Low |  | - | - | 24 | mA |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

1. $\mathrm{V}_{\text {IN }}$ from $30 \%$ to $70 \% \mathrm{~V}_{\mathrm{CC}}$; see individual Data Sheets for devices that differ from the typical input rise and fall times.
2. $\mathrm{V}_{\text {IN }}$ from 0.8 V to 2.0 V ; see individual Data Sheets for devices that differ from the typical input rise and fall times.

DC CHARACTERISTICS

| Symbol | Parameter | $\begin{aligned} & V_{\mathrm{Cc}} \\ & \text { (V) } \end{aligned}$ |  |  | 74AC | Unit | Conditions |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C}$ |  | $\begin{gathered} \mathrm{T}_{\mathrm{A}}= \\ -40^{\circ} \mathrm{C} \text { to } \\ +85^{\circ} \mathrm{C} \end{gathered}$ |  |  |
|  |  |  | Typ | Guaranteed Limits |  |  |  |
| $\mathrm{V}_{\mathrm{IH}}$ | Minimum High Level Input Voltage | $\begin{aligned} & 3.0 \\ & 4.5 \\ & 5.5 \end{aligned}$ | $\begin{gathered} 1.5 \\ 2.25 \\ 2.75 \end{gathered}$ | $\begin{gathered} \hline 2.1 \\ 3.15 \\ 3.85 \end{gathered}$ | $\begin{gathered} \hline 2.1 \\ 3.15 \\ 3.85 \end{gathered}$ | V | $\begin{aligned} & \mathrm{V}_{\text {OUT }}=0.1 \mathrm{~V} \\ & \text { or } \mathrm{V}_{\mathrm{CC}}-0.1 \mathrm{~V} \end{aligned}$ |
| VIL | Maximum Low Level Input Voltage | $\begin{aligned} & 3.0 \\ & 4.5 \\ & 5.5 \end{aligned}$ | $\begin{gathered} 1.5 \\ 2.25 \\ 2.75 \end{gathered}$ | $\begin{gathered} \hline 0.9 \\ 1.35 \\ 1.65 \end{gathered}$ | $\begin{gathered} 0.9 \\ 1.35 \\ 1.65 \end{gathered}$ | V | $\begin{aligned} & \mathrm{V}_{\mathrm{OUT}}=0.1 \mathrm{~V} \\ & \text { or } \mathrm{V}_{\mathrm{CC}}-0.1 \mathrm{~V} \end{aligned}$ |
| $\mathrm{V}_{\mathrm{OH}}$ | Minimum High Level Output Voltage | $\begin{aligned} & 3.0 \\ & 4.5 \\ & 5.5 \end{aligned}$ | $\begin{aligned} & 2.99 \\ & 4.49 \\ & 5.49 \end{aligned}$ | $\begin{aligned} & 2.9 \\ & 4.4 \\ & 5.4 \end{aligned}$ | $\begin{aligned} & 2.9 \\ & 4.4 \\ & 5.4 \end{aligned}$ | V | lout $=-50 \mu \mathrm{~A}$ |
|  |  | $\begin{aligned} & 3.0 \\ & 4.5 \\ & 5.5 \end{aligned}$ | - | $\begin{aligned} & 2.56 \\ & 3.86 \\ & 4.86 \end{aligned}$ | $\begin{aligned} & 2.46 \\ & 3.76 \\ & 4.76 \end{aligned}$ | V | $\begin{gathered} { }^{*} \mathrm{~V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{IL}} \text { or } \mathrm{V}_{\mathrm{IH}} \\ \\ \\ -12 \mathrm{~mA} \\ \mathrm{I}_{\mathrm{OH}} \quad \\ \\ \\ \\ \\ -24 \mathrm{~mA} \\ -24 \mathrm{~mA} \end{gathered}$ |
| $\mathrm{V}_{\text {OL }}$ | Maximum Low Level Output Voltage | $\begin{aligned} & 3.0 \\ & 4.5 \\ & 5.5 \end{aligned}$ | $\begin{aligned} & 0.002 \\ & 0.001 \\ & 0.001 \end{aligned}$ | $\begin{aligned} & \hline 0.1 \\ & 0.1 \\ & 0.1 \end{aligned}$ | $\begin{aligned} & 0.1 \\ & 0.1 \\ & 0.1 \end{aligned}$ | V | $\mathrm{l}_{\text {OUT }}=50 \mu \mathrm{~A}$ |
|  |  | $\begin{aligned} & 3.0 \\ & 4.5 \\ & 5.5 \end{aligned}$ | - | $\begin{aligned} & 0.36 \\ & 0.36 \\ & 0.36 \end{aligned}$ | $\begin{aligned} & 0.44 \\ & 0.44 \\ & 0.44 \end{aligned}$ | V |  |
| $\mathrm{IIN}^{\text {N }}$ | Maximum Input Leakage Current | 5.5 | - | $\pm 0.1$ | $\pm 1.0$ | $\mu \mathrm{A}$ | $\mathrm{V}_{\mathrm{I}}=\mathrm{V}_{\mathrm{CC}}, \mathrm{GND}$ |
| loz | Maximum <br> 3-State <br> Current | 5.5 | - | $\pm 0.5$ | $\pm 5.0$ | $\mu \mathrm{A}$ | $\begin{aligned} & \mathrm{V}_{\mathrm{I}}(\mathrm{OE})=\mathrm{V}_{\mathrm{IL}}, \mathrm{~V}_{\mathrm{IH}} \\ & \mathrm{~V}_{\mathrm{I}}=\mathrm{V}_{\mathrm{CC}}, G N D \\ & \mathrm{~V}_{\mathrm{O}}=\mathrm{V}_{\mathrm{CC}}, \mathrm{GND} \end{aligned}$ |
| Iold | $\dagger$ Minimum Dynamic Output Current | 5.5 | - | - | 75 | mA | $\mathrm{V}_{\text {OLD }}=1.65 \mathrm{~V} \mathrm{Max}$ |
| IOHD |  | 5.5 | - | - | -75 | mA | $\mathrm{V}_{\mathrm{OHD}}=3.85 \mathrm{~V}$ Min |
| ICC | Maximum Quiescent Supply Current | 5.5 | - | 8.0 | 80 | $\mu \mathrm{A}$ | $\mathrm{V}_{\text {IN }}=\mathrm{V}_{\text {CC }}$ or GND |

NOTE: $\mathrm{I}_{\mathrm{IN}}$ and $\mathrm{I}_{\mathrm{CC}} @ 3.0 \mathrm{~V}$ are guaranteed to be less than or equal to the respective limit @ $5.5 \mathrm{~V} \mathrm{~V}_{\mathrm{CC}}$.
*All outputs loaded; thresholds on input associated with output under test.
$\dagger$ Maximum test duration 2.0 ms , one output loaded at a time.

AC CHARACTERISTICS (For Figures and Waveforms - See Section 3)

| Symbol | Parameter | $\begin{gathered} \mathrm{V}_{\mathrm{cc}}{ }^{*} \\ (\mathrm{~V}) \end{gathered}$ | 74AC |  |  | 74AC |  | Unit | Fig. No. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\begin{aligned} & \mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C} \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{aligned}$ |  |  | $\begin{gathered} \mathrm{T}_{\mathrm{A}}=-40^{\circ} \mathrm{C} \\ \text { to }+85^{\circ} \mathrm{C} \\ \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{gathered}$ |  |  |  |
|  |  |  | Min | Typ | Max | Min | Max |  |  |
| tpLH | Propagation Delay $\mathrm{D}_{\mathrm{n}} \text { to } \mathrm{O}_{\mathrm{n}}$ | $\begin{aligned} & 3.3 \\ & 5.0 \end{aligned}$ | $\begin{aligned} & 2.5 \\ & 2.5 \end{aligned}$ |  | $\begin{aligned} & 13.0 \\ & 10.0 \end{aligned}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | $\begin{aligned} & 15.0 \\ & 11.5 \end{aligned}$ | ns | 3-5 |
| $\mathrm{t}_{\text {PHL }}$ | Propagation Delay $\mathrm{D}_{\mathrm{n}} \text { to } \mathrm{O}_{\mathrm{n}}$ | $\begin{aligned} & 3.3 \\ & 5.0 \end{aligned}$ | $\begin{aligned} & 2.5 \\ & 2.5 \end{aligned}$ |  | $\begin{gathered} 12.0 \\ 9.5 \end{gathered}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | $\begin{aligned} & 14.0 \\ & 11.0 \end{aligned}$ | ns | 3-5 |
| tpli | Propagation Delay LE to $\mathrm{O}_{\mathrm{n}}$ | $\begin{aligned} & 3.3 \\ & 5.0 \end{aligned}$ | $\begin{aligned} & 2.5 \\ & 2.5 \end{aligned}$ |  | $\begin{gathered} 13.0 \\ 9.5 \end{gathered}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | $\begin{aligned} & 15.0 \\ & 11.0 \end{aligned}$ | ns | 3-6 |
| tPHL | Propagation Delay LE to $\mathrm{O}_{\mathrm{n}}$ | $\begin{aligned} & 3.3 \\ & 5.0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 2.5 \\ & 2.5 \end{aligned}$ |  | $\begin{gathered} 12.0 \\ 8.5 \\ \hline \end{gathered}$ | $\begin{aligned} & 2.0 \\ & 2.0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 14.0 \\ & 10.0 \\ & \hline \end{aligned}$ | ns | 3-6 |
| tpzH | Output Enable Time | $\begin{aligned} & 3.3 \\ & 5.0 \end{aligned}$ | $\begin{aligned} & 2.5 \\ & 2.5 \end{aligned}$ |  | $\begin{gathered} 11.0 \\ 9.0 \end{gathered}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | $\begin{aligned} & 12.0 \\ & 10.0 \end{aligned}$ | ns | 3-7 |
| tpzL | Output Enable Time | $\begin{aligned} & 3.3 \\ & 5.0 \end{aligned}$ | $\begin{aligned} & 2.5 \\ & 2.5 \end{aligned}$ | - | $\begin{gathered} 11.0 \\ 8.5 \end{gathered}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | $\begin{gathered} 12.5 \\ 9.5 \end{gathered}$ | ns | 3-8 |
| tphz | Output Disable Time | $\begin{aligned} & 3.3 \\ & 5.0 \end{aligned}$ | $\begin{aligned} & 2.5 \\ & 2.5 \end{aligned}$ | - | $\begin{aligned} & 12.5 \\ & 11.0 \end{aligned}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | $\begin{aligned} & 13.5 \\ & 12.0 \end{aligned}$ | ns | 3-7 |
| tpLz | Output Disable Time | $\begin{aligned} & 3.3 \\ & 5.0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 2.5 \\ & 2.5 \end{aligned}$ | - | $\begin{aligned} & 9.5 \\ & 8.0 \end{aligned}$ | $\begin{aligned} & 2.0 \\ & 2.0 \\ & \hline \end{aligned}$ | $\begin{gathered} 10.5 \\ 9.0 \\ \hline \end{gathered}$ | ns | 3-8 |

*Voltage Range 3.3 V is $3.3 \mathrm{~V} \pm 0.3 \mathrm{~V}$.
Voltage Range 5.0 V is $5.0 \mathrm{~V} \pm 0.5 \mathrm{~V}$.

## AC OPERATING REQUIREMENTS

| Symbol | Parameter | $\begin{gathered} \mathrm{V}_{\mathrm{Cc}}{ }^{*} \\ (\mathrm{~V}) \end{gathered}$ |  |  | 74AC | Unit | Fig. No. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\begin{aligned} & \mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C} \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{aligned}$ |  | $\begin{gathered} \mathrm{T}_{\mathrm{A}}=-40^{\circ} \mathrm{C} \\ \text { to }+85^{\circ} \mathrm{C} \\ \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{gathered}$ |  |  |
|  |  |  | Typ | Guaranteed Minimum |  |  |  |
| $\mathrm{t}_{\text {s }}$ | Setup Time, HIGH or LOW $\mathrm{D}_{\mathrm{n}}$ to LE | $\begin{aligned} & 3.3 \\ & 5.0 \end{aligned}$ | - | $\begin{aligned} & 3.5 \\ & 3.0 \end{aligned}$ | $\begin{aligned} & 4.0 \\ & 3.5 \end{aligned}$ | ns | 3-9 |
| $t_{h}$ | Hold Time, HIGH or LOW $\mathrm{D}_{\mathrm{n}} \text { to } \mathrm{LE}$ | $\begin{aligned} & 3.3 \\ & 5.0 \\ & \hline \end{aligned}$ | - | $\begin{aligned} & 2.0 \\ & 2.0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | ns | 3-9 |
| $\mathrm{t}_{\text {w }}$ | LE Pulse Width, HIGH | $\begin{aligned} & 3.3 \\ & 5.0 \end{aligned}$ | - | $\begin{aligned} & 6.0 \\ & 4.0 \end{aligned}$ | $\begin{aligned} & 7.0 \\ & 5.0 \end{aligned}$ | ns | 3-6 |

*Voltage Range 3.3 V is $3.3 \mathrm{~V} \pm 0.3 \mathrm{~V}$.
Voltage Range 5.0 V is $5.0 \mathrm{~V} \pm 0.5 \mathrm{~V}$.

DC CHARACTERISTICS

| Symbol | Parameter | $\mathrm{V}_{\mathrm{cc}}$ <br> (V) |  |  | 74ACT | Unit | Conditions |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C}$ |  | $\begin{gathered} \mathrm{T}_{\mathrm{A}}= \\ -40^{\circ} \mathrm{C} \text { to } \\ +85^{\circ} \mathrm{C} \end{gathered}$ |  |  |
|  |  |  | Typ | Guaranteed Limits |  |  |  |
| $\mathrm{V}_{\mathrm{IH}}$ | Minimum High Level Input Voltage | $\begin{aligned} & 4.5 \\ & 5.5 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | $\begin{aligned} & 2.0 \\ & 2.0 \end{aligned}$ | V | $\begin{aligned} & \mathrm{V}_{\text {OUT }}=0.1 \mathrm{~V} \\ & \text { or } \mathrm{V}_{\mathrm{CC}}-0.1 \mathrm{~V} \end{aligned}$ |
| VIL | Maximum Low Level Input Voltage | $\begin{aligned} & 4.5 \\ & 5.5 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 0.8 \\ & 0.8 \end{aligned}$ | $\begin{aligned} & 0.8 \\ & 0.8 \end{aligned}$ | V | $\begin{aligned} & \mathrm{V}_{\text {OUT }}=0.1 \mathrm{~V} \\ & \text { or } \mathrm{V}_{\mathrm{CC}}-0.1 \mathrm{~V} \end{aligned}$ |
| $\mathrm{V}_{\mathrm{OH}}$ | Minimum High Level Output Voltage | $\begin{aligned} & \hline 4.5 \\ & 5.5 \end{aligned}$ | $\begin{aligned} & \hline 4.49 \\ & 5.49 \end{aligned}$ | $\begin{aligned} & 4.4 \\ & 5.4 \end{aligned}$ | $\begin{aligned} & 4.4 \\ & 5.4 \end{aligned}$ | V | IOUT $=-50 \mu \mathrm{~A}$ |
|  |  | $\begin{aligned} & 4.5 \\ & 5.5 \end{aligned}$ | - | $\begin{aligned} & 3.86 \\ & 4.86 \end{aligned}$ | $\begin{aligned} & 3.76 \\ & 4.76 \end{aligned}$ | V | $\begin{aligned} & { }^{*} \mathrm{~V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{IL}} \text { or } \mathrm{V}_{\mathrm{HH}} \\ & \mathrm{I}_{\mathrm{OH}} \quad-24 \mathrm{~mA} \\ & -24 \mathrm{~mA} \end{aligned}$ |
| $\mathrm{V}_{\text {OL }}$ | Maximum Low Level Output Voltage | $\begin{aligned} & 4.5 \\ & 5.5 \end{aligned}$ | $\begin{aligned} & 0.001 \\ & 0.001 \end{aligned}$ | $\begin{aligned} & 0.1 \\ & 0.1 \end{aligned}$ | $\begin{aligned} & 0.1 \\ & 0.1 \end{aligned}$ | V | Iout $=50 \mu \mathrm{~A}$ |
|  |  | $\begin{aligned} & 4.5 \\ & 5.5 \end{aligned}$ | - | $\begin{aligned} & 0.36 \\ & 0.36 \end{aligned}$ | $\begin{aligned} & 0.44 \\ & 0.44 \end{aligned}$ | V | $\begin{array}{ll} { }^{{ }^{V_{\mathrm{IN}}}=\mathrm{V}_{\mathrm{IL}} \text { or } \mathrm{V}_{\mathrm{IH}}} \begin{array}{c} 24 \mathrm{~mA} \\ \mathrm{IOL}^{24} \\ 24 \mathrm{~mA} \end{array} \end{array}$ |
| $\mathrm{I}_{\mathrm{IN}}$ | Maximum Input Leakage Current | 5.5 | - | $\pm 0.1$ | $\pm 1.0$ | $\mu \mathrm{A}$ | $\mathrm{V}_{\mathrm{I}}=\mathrm{V}_{\mathrm{CC}}, \mathrm{GND}$ |
| $\Delta \mathrm{l}_{\text {CCT }}$ | Additional Max. ICC/Input | 5.5 | 0.6 | - | 1.5 | mA | $\mathrm{V}_{\mathrm{I}}=\mathrm{V}_{C C}-2.1 \mathrm{~V}$ |
| loz | Maximum 3-State Current | 5.5 | - | $\pm 0.5$ | $\pm 5.0$ | $\mu \mathrm{A}$ | $\begin{aligned} & \mathrm{V}_{\mathrm{I}}(\mathrm{OE})=\mathrm{V}_{\mathrm{IL}}, \mathrm{~V}_{\mathrm{IH}} \\ & \mathrm{~V}_{\mathrm{I}}=\mathrm{V}_{\mathrm{CC}}, \mathrm{GND} \\ & \mathrm{~V}_{\mathrm{O}}=\mathrm{V}_{\mathrm{CC}}, \mathrm{GND} \\ & \hline \end{aligned}$ |
| Iold | $\dagger$ Minimum Dynamic Output Current | 5.5 | - | - | 75 | mA | $\mathrm{V}_{\text {OLD }}=1.65 \mathrm{~V}$ Max |
| IOHD |  | 5.5 | - | - | -75 | mA | $\mathrm{V}_{\text {OHD }}=3.85 \mathrm{~V}$ Min |
| Icc | Maximum Quiescent Supply Current | 5.5 | - | 8.0 | 80 | $\mu \mathrm{A}$ | $\mathrm{V}_{\mathrm{IN}}=\mathrm{V}_{\text {CC }}$ or GND |

*All outputs loaded; thresholds on input associated with output under test.
$\dagger$ Maximum test duration 2.0 ms , one output loaded at a time.
AC CHARACTERISTICS (For Figures and Waveforms - See Section 3)

| Symbol | Parameter | $\mathrm{V}_{\mathrm{cc}}{ }^{*}$ <br> (V) | 74ACT |  |  | 74ACT |  | Unit | Fig. No. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\begin{aligned} & \mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C} \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{aligned}$ |  |  | $\begin{gathered} \mathrm{T}_{\mathrm{A}}=-40^{\circ} \mathrm{C} \\ \text { to }+85^{\circ} \mathrm{C} \\ \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{gathered}$ |  |  |  |
|  |  |  | Min | Typ | Max | Min | Max |  |  |
| tpli | Propagation Delay $D_{n} \text { to } O_{n}$ | 5.0 | 2.5 | - | 10.5 | 2.0 | 12 | ns | 3-5 |
| $t_{\text {PHL }}$ | Propagation Delay $D_{n} \text { to } O_{n}$ | 5.0 | 2.5 | - | 10.5 | 2.0 | 12 | ns | 3-5 |
| tpli | Propagation Delay LE to $\mathrm{O}_{\mathrm{n}}$ | 5.0 | 3.0 | - | 10.5 | 2.5 | 12 | ns | 3-6 |
| ${ }_{\text {tPHL }}$ | Propagation Delay LE to $\mathrm{O}_{\mathrm{n}}$ | 5.0 | 2.5 | - | 9.5 | 2.0 | 10.5 | ns | 3-6 |
| tpzH | Output Enable Time | 5.0 | 2.0 | - | 10 | 1.5 | 11 | ns | 3-7 |
| tPZL | Output Enable Time | 5.0 | 1.5 | - | 9.5 | 1.5 | 10.5 | ns | 3-8 |
| tPHZ | Output Disable Time | 5.0 | 2.5 | - | 11 | 1.5 | 12.5 | ns | 3-7 |
| tpLz | Output Disable Time | 5.0 | 1.5 | - | 8.5 | 1.0 | 9.5 | ns | 3-8 |

*Voltage Range 5.0 V is $5.0 \mathrm{~V} \pm 0.5 \mathrm{~V}$.

AC OPERATING REQUIREMENTS

| Symbol | Parameter | $\mathrm{V}_{\mathrm{cc}}{ }^{*}$ <br> (V) |  | CT | 74ACT | Unit | Fig. No. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\begin{aligned} & \mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C} \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{aligned}$ |  | $\begin{gathered} \mathrm{T}_{\mathrm{A}}=-40^{\circ} \mathrm{C} \\ \text { to }+85^{\circ} \mathrm{C} \\ \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{gathered}$ |  |  |
|  |  |  | Typ | Guaranteed Minimum |  |  |  |
| $\mathrm{t}_{\text {s }}$ | Setup Time, HIGH or LOW $\mathrm{D}_{\mathrm{n}} \text { to LE }$ | 5.0 | - | 3.0 | 3.5 | ns | 3-9 |
| $t_{h}$ | Hold Time, HIGH or LOW $D_{n}$ to LE | 5.0 | - | 0 | 0 | ns | 3-9 |
| $\mathrm{t}_{\mathrm{w}}$ | LE Pulse Width, HIGH | 5.0 | - | 3.5 | 4.0 | ns | 3-6 |

*Voltage Range 5.0 V is $5.0 \mathrm{~V} \pm 0.5 \mathrm{~V}$.
CAPACITANCE

| Symbol | Parameter | Value <br> Typ | Unit | Test Conditions |
| :--- | :--- | :---: | :---: | :---: |
| $\mathrm{C}_{\mathrm{IN}}$ | Input Capacitance | 5.0 | pF | $\mathrm{V}_{\mathrm{CC}}=5.0 \mathrm{~V}$ |
| $\mathrm{C}_{\mathrm{PD}}$ | Power Dissipation Capacitance | 25 | pF | $\mathrm{V}_{\mathrm{CC}}=5.0 \mathrm{~V}$ |

## MC74AC573, MC74ACT573

ORDERING INFORMATION

| Device | Package | Shipping ${ }^{\dagger}$ |
| :--- | :---: | :---: |
| MC74AC573DWG | SOIC-20 <br> (Pb-Free) | 38 Units / Rail |
| MC74AC573DWR2G | SOIC-20 <br> (Pb-Free) | 1000 Units / Tape \& Reel |
| MC74AC573DTR2G | TSSOP-20 <br> (Pb-Free) | 2500 Units / Tape \& Reel |
| MC74ACT573DWG | SOIC-20 <br> (Pb-Free) | 38 Units / Rail |
| MC74ACT573DWR2G | SOIC-20 <br> (Pb-Free) | 1000 Units / Tape \& Reel |
| MC74ACT573DTR2G | TSSOP-20 <br> (Pb-Free) | 2500 Units / Tape \& Reel |

$\dagger$ For information on tape and reel specifications,including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.


SCALE 1:1


NOTES:

1. DIMENSIONS ARE IN MILLIMETERS.
2. INTERPRET DIMENSIONS AND TOLERANCES

PER ASME Y14.5M, 1994
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE
5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE PROTRUSION PROTRUSION. ALLOWABLE PROTRUSION
SHALL BE 0.13 TOTAL IN EXCESS OF B SHALL BE 0.13 TOTAL IN EXCESS OF B DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS |  |
| :---: | ---: | ---: |
|  | MIN | MAX |
| A | 2.35 | 2.65 |
| A1 | 0.10 | 0.25 |
| b | 0.35 | 0.49 |
| $\mathbf{c}$ | 0.23 | 0.32 |
| D | 12.65 | 12.95 |
| E | 7.40 | 7.60 |
| e | 1.27 BSC |  |
| H | 10.05 | 10.55 |
| $\mathbf{h}$ | 0.25 | 0.75 |
| L | 0.50 | 0.90 |
| $\boldsymbol{\theta}$ | $0^{\circ}$ | $7^{\circ}$ |

GENERIC
MARKING DIAGRAM*


| XXXXX | $=$ Specific Device Code |
| :--- | :--- |
| A | $=$ Assembly Location |
| WL | $=$ Wafer Lot |
| YY | $=$ Year |
| WW | $=$ Work Week |
| G | $=$ Pb-Free Package |

*This information is generic. Please refer to device data sheet for actual part marking. $\mathrm{Pb}-$ Free indicator, " G " or microdot " $\mathrm{\nabla}$ ", may or may not be present.

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| ---: | :--- | :--- | :--- |
| DESCRIPTION: | SOIC-20 WB | PAGE 1 OF 1 |

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TSSOP-20 WB
CASE 948E
ISSUE D
DATE 17 FEB 2016

SCALE 2:1


1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982
CONTROLLING DIMENSION: MILLIMETER
2. DIMENSION A DOES NOT INCLUDE MOLD

FLASH, PROTRUSIONS OR GATE BURRS.
FLASH, PROTRUSIONS OR GATE BURRS.
MOLD FLASH OR GATE BURRS SHALL NO
EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE

INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION. SHALL NOT EXCEED $0.25(0.010)$ PER SIDE
5. DIMENSION K DOES NOT INCLUDE

DAMBAR PROTRUSION. ALLOWABLE
DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE K DIMENSION AT MAXIMUM MATERIAL CONDITION
6. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY
7. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-

|  | MILLIMETERS |  | INCHES |  |
| :---: | :---: | :---: | :---: | :---: |
| DIM | MIN | MAX | MIN | MAX |
| A | 6.40 | 6.60 | 0.252 | 0.260 |
| B | 4.30 | 4.50 | 0.169 | 0.177 |
| C | --- | 1.20 | --- | 0.047 |
| D | 0.05 | 0.15 | 0.002 | 0.006 |
| F | 0.50 | 0.75 | 0.020 | 0.030 |
| G | 0.65 BSC |  | 0.026 BSC |  |
| H | 0.27 | 0.37 | 0.011 | 0.015 |
| J | 0.09 | 0.20 | 0.004 | 0.008 |
| J1 | 0.09 | 0.16 | 0.004 | 0.006 |
| K | 0.19 | 0.30 | 0.007 | 0.012 |
| K1 | 0.19 | 0.25 | 0.007 | 0.010 |
| L | 6.40 | BSC | 0.252 BSC |  |
| M | 0 | $0^{\circ}$ | $8^{\circ}$ | 0 |

GENERIC MARKING DIAGRAM* НРННННННН

|  | XXXX |
| :---: | :---: |
|  | XXXX |
|  | ALYW. |
| $\bigcirc$ | - |

A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week

- = Pb-Free Package
(Note: Microdot may be in either location)
*This information is generic. Please refer to device data sheet for actual part marking. $\mathrm{Pb}-$ Free indicator, " G " or microdot " $\mathrm{\nabla}$ ", may or may not be present.
DIMENSIONS: MILLIMETERS

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| ---: | :--- | :--- | :--- |
| DESCRIPTION: | TSSOP-20 WB | PAGE 1 OF 1 |

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