## MC74LCX573

# Low-Voltage CMOS Octal Transparent Latch Flow Through Pinout 

## With 5 V-Tolerant Inputs and Outputs (3-State, Non-Inverting)

The MC74LCX573 is a high performance, non-inverting octal transparent latch operating from a 2.3 to 3.6 V supply. High impedance TTL compatible inputs significantly reduce current loading to input drivers while TTL compatible outputs offer improved switching noise performance. $\mathrm{A} \mathrm{V}_{\mathrm{I}}$ specification of 5.5 V allows MC74LCX573 inputs to be safely driven from 5.0 V devices.

The MC74LCX573 contains 8 D-type latches with 3-state standard outputs. When the Latch Enable (LE) input is HIGH, data on the Dn 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 standard outputs are controlled by the Output Enable ( $\overline{\mathrm{OE}}$ ) input. When $\overline{\mathrm{OE}}$ is LOW, the standard outputs are enabled. When $\overline{\mathrm{OE}}$ is HIGH, the standard outputs are in the high impedance state, but this does not interfere with new data entering into the latches. The LCX573 flow through design facilitates easy PC board layout.

## Features

- Designed for 2.3 to $3.6 \mathrm{~V} \mathrm{~V}_{\mathrm{CC}}$ Operation
- 5.0 V Tolerant - Interface Capability With 5.0 V TTL Logic
- Supports Live Insertion and Withdrawal
- $\mathrm{I}_{\mathrm{OFF}}$ Specification Guarantees High Impedance When $\mathrm{V}_{\mathrm{CC}}=0 \mathrm{~V}$
- LVTTL Compatible
- LVCMOS Compatible
- 24 mA Balanced Output Sink and Source Capability
- Near Zero Static Supply Current in All Three Logic States (10 $\mu \mathrm{A}$ ) Substantially Reduces System Power Requirements
- Latchup Performance Exceeds 500 mA
- ESD Performance:
- Human Body Model > 2000 V
- Machine Model >200 V
- NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are $\mathrm{Pb}-$ Free, Halogen Free/BFR Free and are RoHS Compliant


## ON Semiconductor ${ }^{\circledR}$

http://onsemi.com


ORDERING INFORMATION
See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.


Figure 1. Pinout (Top View)

PIN NAMES

| Pins | Function |
| :---: | :---: |
| $\overline{O E}$ | Output Enable Input |
| LE | Latch Enable Input |
| D0-D7 | Data Inputs |
| O0-O7 | 3-State Latch Outputs |



Figure 2. Logic Diagram

## TRUTH TABLE

| Inputs |  |  | Outputs | Operating Mode |
| :---: | :---: | :---: | :---: | :---: |
| OE | LE | Dn | On |  |
| L | H | H | H | Latched (Latch Enabled) Read Latch |
| L | H | L | L |  |
| L | L | h | H | Hold; Disabled Outputs |
| L | L | I | L | Transparent (Latch Disabled); Disabled Outputs |
| L | L | X | NC | Latched (Latch Enabled); Disabled Outputs |
| H | L | X | Z |  |
| H | H | H | Z |  |
| H | H | L | Z |  |
| H | L | h | Z |  |

[^0]
## MC74LCX573

MAXIMUM RATINGS

| Symbol | Parameter | Value | Condition | Units |
| :---: | :--- | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | DC Supply Voltage | -0.5 to +7.0 |  | V |
| $\mathrm{~V}_{\mathrm{I}}$ | DC Input Voltage | $-0.5 \leq \mathrm{V}_{\mathrm{I}} \leq+7.0$ |  | V |
| $\mathrm{~V}_{\mathrm{O}}$ | DC Output Voltage | $-0.5 \leq \mathrm{V}_{\mathrm{O}} \leq+7.0$ | Output in 3-State | V |
|  |  | $-0.5 \leq \mathrm{V}_{\mathrm{O}} \leq \mathrm{V}_{\mathrm{CC}}+0.5$ | Output in HIGH or LOW State (Note 1$)$ | V |
| $\mathrm{I}_{\mathrm{IK}}$ | DC Input Diode Current | -50 | $\mathrm{~V}_{\mathrm{l}}<\mathrm{GND}$ | mA |
| $\mathrm{I}_{\mathrm{OK}}$ | DC Output Diode Current | -50 | $\mathrm{~V}_{\mathrm{O}}<\mathrm{GND}$ | mA |
|  |  | +50 | $\mathrm{~V}_{\mathrm{O}}>\mathrm{V}_{\mathrm{CC}}$ | mA |
| $\mathrm{I}_{\mathrm{O}}$ | DC Output Source/Sink Current | $\pm 50$ | mA |  |
| $\mathrm{I}_{\mathrm{CC}}$ | DC Supply Current Per Supply Pin | $\pm 100$ | mA |  |
| $\mathrm{I}_{\mathrm{GND}}$ | DC Ground Current Per Ground Pin | $\pm 100$ |  | mA |
| $\mathrm{~T}_{\mathrm{STG}}$ | Storage Temperature Range | -65 to +150 |  | ${ }^{\circ} \mathrm{C}$ |
| MSL | Moisture Sensitivity |  | Level 1 |  |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. $I_{0}$ absolute maximum rating must be observed.

## RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Min | Typ | Max | Units |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | Supply Voltage Operating Data Retention Only | $\begin{aligned} & 2.0 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 2.5,3.3 \\ & 2.5,3.3 \end{aligned}$ | $\begin{aligned} & 3.6 \\ & 3.6 \end{aligned}$ | V |
| $\mathrm{V}_{1}$ | Input Voltage | 0 |  | 5.5 | V |
| $\mathrm{V}_{\mathrm{O}}$ | Output Voltage (HIGH or LOW State) (3-State) | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ |  | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}} \\ & 5.5 \end{aligned}$ | V |
| IOH | HIGH Level Output Current $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}-3.6 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.7 \mathrm{~V}-3.0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.3 \mathrm{~V}-2.7 \mathrm{~V} \end{aligned}$ |  |  | $\begin{gathered} -24 \\ -12 \\ -8 \end{gathered}$ | mA |
| ${ }_{\text {IOL }}$ | LOW Level Output Current $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}-3.6 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.7 \mathrm{~V}-3.0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.3 \mathrm{~V}-2.7 \mathrm{~V} \end{aligned}$ |  |  | $\begin{gathered} +24 \\ +12 \\ +8 \end{gathered}$ | mA |
| $\mathrm{T}_{\text {A }}$ | Operating Free-Air Temperature | -55 |  | +125 | ${ }^{\circ} \mathrm{C}$ |
| $\Delta t / \Delta \mathrm{V}$ | Input Transition Rise or Fall Rate, $\mathrm{V}_{\text {IN }}$ from 0.8 V to $2.0 \mathrm{~V}, \mathrm{~V}_{\mathrm{CC}}=3.0 \mathrm{~V}$ | 0 |  | 10 | ns/V |

ORDERING INFORMATION

| Device | Package | Shipping $^{\dagger}$ |
| :--- | :---: | :---: |
| MC74LCX573DWG | SOIC-20 <br> (Pb-Free) | 38 Units / Rail |
| MC74LCX573DWR2G | SOIC-20 <br> (Pb-Free) | 1000 Tape \& Reel |
| MC74LCX573DTG | TSSOP-20 <br> (Pb-Free) | 75 Units / Rail |
| MC74LCX573DTR2G | TSSOP-20 <br> (Pb-Free) | 2500 Tape \& Reel |
| NLV74LCX573DTR2G* | TSSOP-20 <br> (Pb-Free) | 2500 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.
*NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable.

DC ELECTRICAL CHARACTERISTICS

| Symbol | Characteristic | Condition | $\mathrm{T}_{\mathrm{A}}=-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ |  | $\mathrm{T}_{\mathrm{A}}=-55^{\circ} \mathrm{C}$ to $+125^{\circ} \mathrm{C}$ |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Min | Max | Min | Max |  |
| $\mathrm{V}_{\mathrm{IH}}$ | HIGH Level Input Voltage (Note 2) | $2.3 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 2.7 \mathrm{~V}$ | 1.7 |  | 1.7 |  | V |
|  |  | $2.7 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V}$ | 2.0 |  | 2.0 |  |  |
| $\mathrm{V}_{\mathrm{IL}}$ | LOW Level Input Voltage (Note 2) | $2.3 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 2.7 \mathrm{~V}$ |  | 0.7 |  | 0.7 | V |
|  |  | $2.7 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V}$ |  | 0.8 |  | 0.8 |  |
| $\mathrm{V}_{\mathrm{OH}}$ | HIGH Level Output Voltage | $2.3 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V}$; $\mathrm{I}_{\mathrm{OL}}=100 \mu \mathrm{~A}$ | $\mathrm{V}_{\mathrm{CC}}-0.2$ |  | $\mathrm{V}_{\mathrm{Cc}}-0.2$ |  | V |
|  |  | $\mathrm{V}_{\mathrm{CC}}=2.3 \mathrm{~V} ; \mathrm{I}_{\mathrm{OH}}=-8 \mathrm{~mA}$ | 1.8 |  | 1.8 |  |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=2.7 \mathrm{~V}$; $\mathrm{I}_{\mathrm{OH}}=-12 \mathrm{~mA}$ | 2.2 |  | 2.2 |  |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}$; $\mathrm{I}_{\mathrm{OH}}=-18 \mathrm{~mA}$ | 2.4 |  | 2.4 |  |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V} ; \mathrm{I}_{\mathrm{OH}}=-24 \mathrm{~mA}$ | 2.2 |  | 2.2 |  |  |
| $\mathrm{V}_{\mathrm{OL}}$ | LOW Level Output Voltage | $2.3 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V}$; $\mathrm{I}_{\text {OL }}=100 \mu \mathrm{~A}$ |  | 0.2 |  | 0.2 | V |
|  |  | $\mathrm{V}_{\mathrm{CC}}=2.3 \mathrm{~V} ; \mathrm{I}_{\mathrm{OL}}=8 \mathrm{~mA}$ |  | 0.6 |  | 0.6 |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=2.7 \mathrm{~V} ; \mathrm{I}_{\mathrm{OL}}=12 \mathrm{~mA}$ |  | 0.4 |  | 0.4 |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}$; $\mathrm{IOL}=16 \mathrm{~mA}$ |  | 0.4 |  | 0.4 |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}$; $\mathrm{IOL}=24 \mathrm{~mA}$ |  | 0.55 |  | 0.60 |  |
| $\mathrm{I}_{\text {Oz }}$ | 3-State Output Current | $\begin{gathered} \hline \mathrm{V}_{\mathrm{CC}}=3.6 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{IH}} \text { or } \mathrm{V}_{\mathrm{IL}}, \\ \mathrm{~V}_{\mathrm{OUT}}=0 \text { to } 5.5 \mathrm{~V} \end{gathered}$ |  | $\pm 5$ |  | $\pm 5$ | $\mu \mathrm{A}$ |
| IofF | Power Off Leakage Current | $\mathrm{V}_{\mathrm{CC}}=0, \mathrm{~V}_{\text {IN }}=5.5 \mathrm{~V}$ or $\mathrm{V}_{\text {OUT }}=5.5 \mathrm{~V}$ |  | 10 |  | 10 | $\mu \mathrm{A}$ |
| In | Input Leakage Current | $\mathrm{V}_{\mathrm{CC}}=3.6 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=5.5 \mathrm{~V}$ or GND |  | $\pm 5$ |  | $\pm 5$ | $\mu \mathrm{A}$ |
| $I_{\text {cc }}$ | Quiescent Supply Current | $\mathrm{V}_{\mathrm{CC}}=3.6 \mathrm{~V}, \mathrm{~V}_{\text {IN }}=5.5 \mathrm{~V}$ or GND |  | 10 |  | 10 | $\mu \mathrm{A}$ |
| $\Delta_{\text {l }}$ | Increase in ICC per Input | $2.3 \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V} ; \mathrm{V}_{\mathrm{IH}}=\mathrm{V}_{\mathrm{CC}}-0.6 \mathrm{~V}$ |  | 500 |  | 500 | $\mu \mathrm{A}$ |

2. These values of $\mathrm{V}_{\mathrm{l}}$ are used to test DC electrical characteristics only.

AC CHARACTERISTICS $\mathrm{t}_{\mathrm{R}}=\mathrm{t}_{\mathrm{F}}=2.5 \mathrm{~ns} ; \mathrm{R}_{\mathrm{L}}=500 \Omega$

| Symbol | Parameter | Waveform | Limits |  |  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\mathrm{T}_{\mathrm{A}}=-55^{\circ} \mathrm{C}$ to $+125^{\circ} \mathrm{C}$ |  |  |  |  |  |  |
|  |  |  | $\mathrm{V}_{\mathrm{Cc}}=3.3 \mathrm{~V} \pm 0.3 \mathrm{~V}$ |  | $\mathrm{V}_{\mathrm{CC}}=2.7 \mathrm{~V}$ |  | $\mathrm{V}_{\mathrm{CC}}=2.5 \mathrm{~V} \pm 0.2 \mathrm{~V}$ |  |  |
|  |  |  | $\mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ |  | $\mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ |  | $\mathrm{C}_{\mathrm{L}}=30 \mathrm{pF}$ |  |  |
|  |  |  | Min | Max | Min | Max | Min | Max |  |
| $\begin{aligned} & \hline t_{\text {PLH }} \\ & t_{\text {PHL }} \end{aligned}$ | Propagation Delay $\mathrm{D}_{\mathrm{n}} \text { to } \mathrm{O}_{\mathrm{n}}$ | 1 | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & \hline 8.0 \\ & 8.0 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & \hline 9.0 \\ & 9.0 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 9.6 \\ & 9.6 \end{aligned}$ | ns |
| $\begin{aligned} & \hline \mathrm{tPLH}^{t_{\text {PHL }}} \end{aligned}$ | Propagation Delay LE to $\mathrm{O}_{\mathrm{n}}$ | 3 | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 8.5 \\ & 8.5 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & \hline 9.5 \\ & 9.5 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 10.5 \\ & 10.5 \end{aligned}$ | ns |
| $\overline{t_{\text {PZH }}}$ | Output Enable Time to HIGH and LOW Level | 2 | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & \hline 8.5 \\ & 8.5 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & \hline 9.5 \\ & 9.5 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & \hline 10.5 \\ & 10.5 \end{aligned}$ | ns |
| $\begin{aligned} & \mathrm{t}_{\mathrm{t} H Z} \\ & \mathrm{t}_{\mathrm{PLLZ}} \end{aligned}$ | Output Disable Time From High and Low Level | 2 | $\begin{aligned} & \hline 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 6.5 \\ & 6.5 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 7.0 \\ & 7.0 \end{aligned}$ | $\begin{aligned} & \hline 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 7.8 \\ & 7.8 \end{aligned}$ | ns |
| $\mathrm{t}_{\mathrm{s}}$ | Setup TIme, HIGH or LOW $\mathrm{D}_{\mathrm{n}}$ to LE | 3 | 2.5 |  | 2.5 |  | 4.0 |  |  |
| $t_{\text {h }}$ | Hold TIme, HIGH or LOW $D_{n}$ to LE | 3 | 1.5 |  | 1.5 |  | 2.0 |  |  |
| $\mathrm{t}_{\text {w }}$ | LE Pulse Width, HIGH | 3 | 3.3 |  | 3.3 |  | 4.0 |  |  |
| toshl tosth | Output-to-Output Skew (Note 3) |  |  | $\begin{aligned} & 1.0 \\ & 1.0 \end{aligned}$ |  |  |  |  | ns |

3. Skew is defined as the absolute value of the difference between the actual propagation delay for any two separate outputs of the same device. The specification applies to any outputs switching in the same direction, either HIGH-to-LOW (tOSHL) or LOW-to-HIGH (tosLH); parameter guaranteed by design.

DYNAMIC SWITCHING CHARACTERISTICS

| Symbol | Characteristic | Condition | $\mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C}$ |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Min | Typ | Max |  |
| $V_{\text {OLP }}$ | Dynamic LOW Peak Voltage (Note 4) | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}, \mathrm{~V}_{\mathrm{IH}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{IL}}=0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.5 \mathrm{~V}, \mathrm{C}_{\mathrm{L}}=30 \mathrm{pF}, \mathrm{~V}_{\mathrm{IH}}=2.5 \mathrm{~V}, \mathrm{~V}_{\mathrm{IL}}=0 \mathrm{~V} \end{aligned}$ |  | $\begin{aligned} & 0.8 \\ & 0.6 \end{aligned}$ |  | V |
| $\mathrm{V}_{\text {OLV }}$ | Dynamic LOW Valley Voltage (Note 4) | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}, \mathrm{~V}_{\mathrm{IH}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{IL}}=0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.5 \mathrm{~V}, \mathrm{C}_{\mathrm{L}}=30 \mathrm{pF}, \mathrm{~V}_{\mathrm{IH}}=2.5 \mathrm{~V}, \mathrm{~V}_{\mathrm{IL}}=0 \mathrm{~V} \end{aligned}$ |  | $\begin{aligned} & \hline-0.8 \\ & -0.6 \end{aligned}$ |  | V |

4. Number of outputs defined as " $n$ ". Measured with " $n-1$ " outputs switching from HIGH-to-LOW or LOW-to-HIGH. The remaining output is measured in the LOW state.

## CAPACITIVE CHARACTERISTICS

| Symbol | Parameter | Condition | Typical | Units |
| :---: | :--- | :---: | :---: | :---: |
| $\mathrm{C}_{I \mathrm{~N}}$ | Input Capacitance | $\mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{I}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 7 | pF |
| $\mathrm{C}_{\mathrm{I} / \mathrm{O}}$ | Input/Output Capacitance | $\mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{I}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 8 | pF |
| $\mathrm{C}_{\mathrm{PD}}$ | Power Dissipation Capacitance | $10 \mathrm{MHz}, \mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{I}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 25 | pF |



WAVEFORM 1 - PROPAGATION DELAYS
$t_{R}=t_{F}=2.5 \mathrm{~ns}, 10 \%$ to $90 \% ; f=1 \mathrm{MHz} ; \mathrm{t}_{\mathrm{w}}=500 \mathrm{~ns}$


WAVEFORM 2 - OUTPUT ENABLE AND DISABLE TIMES $t_{R}=t_{F}=2.5 \mathrm{~ns}, 10 \%$ to $90 \% ; f=1 \mathrm{MHz} ; \mathrm{t}_{\mathrm{W}}=500 \mathrm{~ns}$


|  | $\mathbf{V}_{\mathbf{C c}}$ |  |  |
| :---: | :---: | :---: | :---: |
| Symbol | $\mathbf{3 . 3} \mathbf{V} \pm \mathbf{0 . 3} \mathbf{V}$ | $\mathbf{2 . 7} \mathbf{V}$ | $\mathbf{2 . 5} \mathbf{V} \pm \mathbf{0 . 2} \mathbf{~ V}$ |
| Vmi | 1.5 V | 1.5 V | $\mathrm{~V}_{\mathrm{CC}} / 2$ |
| $\mathrm{Vmo}_{\mathrm{my}}$ | 1.5 V | 1.5 V | $\mathrm{~V}_{\mathrm{CC}} / 2$ |
| $\mathrm{~V}_{\mathrm{HZ}}$ | $\mathrm{V}_{\mathrm{OL}}+0.3 \mathrm{~V}$ | $\mathrm{~V}_{\mathrm{OL}}+0.3 \mathrm{~V}$ | $\mathrm{~V}_{\mathrm{OL}}+0.15 \mathrm{~V}$ |
| $\mathrm{~V}_{\mathrm{LZ}}$ | $\mathrm{V}_{\mathrm{OL}}-0.3 \mathrm{~V}$ | $\mathrm{~V}_{\mathrm{OL}}-0.3 \mathrm{~V}$ | $\mathrm{~V}_{\mathrm{OL}}-0.15 \mathrm{~V}$ |

## WAVEFORM 3 - LE to On PROPAGATION DELAYS, LE MINIMUM

PULSE WIDTH, Dn to LE SETUP AND HOLD TIMES
$t_{R}=t_{F}=2.5 \mathrm{~ns}, 10 \%$ to $90 \% ; f=1 \mathrm{MHz} ; \mathrm{t}_{\mathrm{W}}=500 \mathrm{~ns}$ except when noted
Figure 3. AC Waveforms


| Test | Switch |
| :---: | :---: |
| $\mathrm{t}_{\text {PLH }}, \mathrm{t}_{\text {PHL }}$ | Open |
| $\mathrm{t}_{\text {PZL }}, \mathrm{t}_{\text {PLZ }}$ | 6 V at $\mathrm{V}_{\mathrm{CC}}=3.3 \pm 0.3 \mathrm{~V}$ |
|  | 6 V at $\mathrm{V}_{\mathrm{CC}}=2.5 \pm 0.2 \mathrm{~V}$ |
| Open Collector/Drain $\mathrm{t}_{\text {PLH }}$ and $\mathrm{t}_{\text {PHL }}$ | 6 V |
| $\mathrm{t}_{\text {PZH, }}, \mathrm{t}_{\text {PHZ }}$ | GND |

$\mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ at $\mathrm{V}_{\mathrm{CC}}=3.3 \pm 0.3 \mathrm{~V}$ or equivalent (includes jig and probe capacitance)
$\mathrm{C}_{\mathrm{L}}=30 \mathrm{pF}$ at $\mathrm{V}_{\mathrm{CC}}=2.5 \pm 0.2 \mathrm{~V}$ or equivalent (includes jig and probe capacitance)
$R_{L}=R_{1}=500 \Omega$ or equivalent
$\mathrm{R}_{\mathrm{T}}=\mathrm{Z}_{\mathrm{OUT}}$ of pulse generator (typically $50 \Omega$ )

Figure 4. Test Circuit


SCALE 1：1


| Q | 0.25 （M） | T | A（S） | B（S） |
| :--- | :--- | :--- | :--- | :--- |



RECOMMENDED SOLDERING FOOTPRINT＊

＊For additional information on our Pb －Free strategy and soldering details，please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual，SOLDERRM／D．


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 PROTRUSIO
SHALL BE 0.13 TOTAL IN EXCESS OF B
SHALL BE 0．13 TOTAL IN EXCESS OF B
DIMENSION AT MAXIMUM MATERIAL
DIMENSION AT MAXIMUM MATERIAL
CONDITION．

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

## GENERIC <br> MARKING DIAGRAM＊ <br> 20日月日日月日日月日 <br> 

XXXXX＝Specific Device Code
A＝Assembly Location
WL＝Wafer Lot
YY＝Year
WW＝Work Week
$\mathrm{G} \quad=\mathrm{Pb}-$ Free Package
＊This information is generic．Please refer to device data sheet for actual part marking． $\mathrm{Pb}-$ Free indicator，＂ G ＂or microdot＂$\stackrel{ }{ }$＂， may or may not be present．

| DOCUMENT NUMBER： | 98ASB42343B | Electronic versions are uncontrolled except when accessed directly from the Document Repository． <br> Printed versions are uncontroled except when stamped＂CONTROLLED COPY＂in red． |
| ---: | :--- | :--- | :--- |
| DESCRIPTION： | SOIC－20 WB | PAGE 1 OF 1 |

[^1]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.
MOLD FLASH OR GATE BURRS SHALL NOT 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

| DIM | MILLIMETERS |  | INCHES |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 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 | 0.3 | 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 | $0^{\circ}$ | $8^{\circ}$ | $0^{\circ}$ | $8^{\circ}$ |

GENERIC MARKING DIAGRAM*




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 " $\quad$ ", may or may not be present.

| DOCUMENT NUMBER: | 98ASH70169A | Electronic versions are uncontrolled except when accessed directly from the Document Repository. <br> Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| ---: | :--- | :--- | :--- |
| DESCRIPTION: | TSSOP-20 WB | PAGE 1 OF 1 |

[^2]onsemi, OnSemi., and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by onsemi. "Typical" parameters which may be provided in onsemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. onsemi does not convey any license under any of its intellectual property rights nor the rights of others. onsemi products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use onsemi products for any such unintended or unauthorized application, Buyer shall indemnify and hold onsemi and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that onsemi was negligent regarding the design or manufacture of the part. onsemi is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

## LITERATURE FULFILLMENT:

Email Requests to: orderlit@onsemi.com
onsemi Website: www.onsemi.com

TECHNICAL SUPPORT
North American Technical Support:
Voice Mail: 1800-282-9855 Toll Free USA/Canada
Phone: 011421337902910

Europe, Middle East and Africa Technical Support:
Phone: 00421337902910
For additional information, please contact your local Sales Representative

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components
Click to view similar products for Latches category:
Click to view products by ON Semiconductor manufacturer:

Other Similar products are found below :
ML4875CS-5 401639B 716165RB 74F373DW 74LVC373ADTR2G 74LVC573ADTR2G NL17SG373DFT2G NLV14044BDG 59628863901RA 5962-88639012A NLV14042BDR2G M22W-1333-21/3/45-90-02 (NI 2.L18.001-21 2.T18.001-21 2.T18.002-18 2.T18.006-18 CQ/AA-KEY CQ/A-M22X1,5-45-28 CQ/A-M22X1,5-45-32 M22-2-D5-2-21-01-P CY74FCT2373CTSOC 421283 MM74HC373WM MM74HC573WM 74LCX373MTC 74LVT16373MTDX 74VHC373MX KLD5.001-02 Z-0233-827-15 MIC58P01YV 74AHCT573D. 112 74LCX16373MTDX CQ/A-M22X1,5-45-16 CQ/A-M22X1,5-45-18 CQ/A-M22X1,5-45-20 CQ/A-M22X1,5-45-24 CQ/A-M22X1,5-45-30 CQT/A-32-18 AE-V0 CQT/A-32 20-AE-V0 CQT/A-32 32-AE-V0 CY54FCT841ATDMB TPIC6B273DWRG4 Z-2106-25001-22 2.904.005 2.904.006 2.904.008 TC74HC573APF 74HC373DB.112 HEF4043BT.652 2.KLB-D5.001PA-07


[^0]:    H = High Voltage Level;
    $h=$ High Voltage Level One Setup Time Prior to the Latch Enable High-to-Low Transition
    L = Low Voltage Level
    I = Low Voltage Level One Setup Time Prior to the Latch Enable High-to-Low Transition
    NC = No Change, State Prior to the Latch Enable High-to-Low Transition
    X = High or Low Voltage Level or Transitions are Acceptable
    Z = High Impedance State
    For ICC Reasons DO NOT FLOAT Inputs

[^1]:    ON Semiconductor and（ON）are trademarks of Semiconductor Components Industries，LLC dba ON Semiconductor or its subsidiaries in the United States and／or other countries． ON Semiconductor reserves the right to make changes without further notice to any products herein．ON Semiconductor makes no warranty，representation or guarantee regarding the suitability of its products for any particular purpose，nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit，and specifically disclaims any and all liability，including without limitation special，consequential or incidental damages．ON Semiconductor does not convey any license under its patent rights nor the rights of others．

[^2]:    ON Semiconductor and (UN) are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

