

# ON Semiconductor

## Is Now

# onsemi™

To learn more about onsemi™, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

**onsemi** and **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** product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://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. Other names and brands may be claimed as the property of others.

# MC74VHC373

## Octal D-Type Latch with 3-State Output

The MC74VHC373 is an advanced high speed CMOS octal latch with 3-state output fabricated with silicon gate CMOS technology. It achieves high speed operation similar to equivalent Bipolar Schottky TTL while maintaining CMOS low power dissipation.

This 8-bit D-type latch is controlled by a latch enable input and an output enable input. When the output enable input is high, the eight outputs are in a high impedance state.

The internal circuit is composed of three stages, including a buffer output which provides high noise immunity and stable output. The inputs tolerate voltages up to 7.0 V, allowing the interface of 5.0 V systems to 3.0 V systems.

### Features

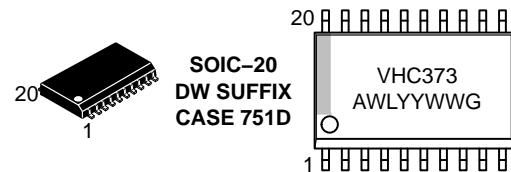
- High Speed:  $t_{PD} = 5.0$  ns (Typ) at  $V_{CC} = 5.0$  V
- Low Power Dissipation:  $I_{CC} = 4.0$   $\mu$ A (Max) at  $T_A = 25^\circ$ C
- High Noise Immunity:  $V_{NIH} = V_{NIL} = 28\%$   $V_{CC}$
- Power Down Protection Provided on Inputs
- Balanced Propagation Delays
- Designed for 2.0 V to 5.5 V Operating Range
- Low Noise:  $V_{OLP} = 0.9$  V (Max)
- Pin and Function Compatible with Other Standard Logic Families
- Latchup Performance Exceeds 300 mA
- ESD Performance: HBM > 2000 V; Machine Model > 200 V
- Chip Complexity: 186 FETs or 46.5 Equivalent Gates
- These Devices are Pb-Free and are RoHS Compliant



ON Semiconductor®

<http://onsemi.com>

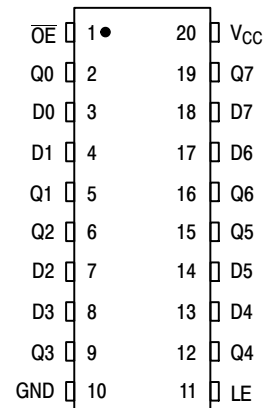
### MARKING DIAGRAM



VHC373 = Specific Device Code  
A = Assembly Location  
WL, L = Wafer Lot  
Y = Year  
WW, W = Work Week  
G or ■ = Pb-Free Package

(Note: Microdot may be in either location)

### PIN ASSIGNMENT



### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

# MC74VHC373

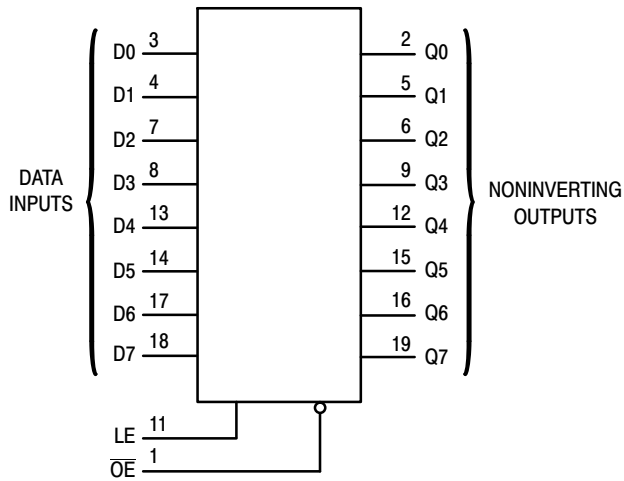


Figure 1. Logic Diagram

## FUNCTION TABLE

| INPUTS          |    |   | OUTPUT    |
|-----------------|----|---|-----------|
| $\overline{OE}$ | LE | D | Q         |
| L               | H  | H | H         |
| L               | H  | L | L         |
| L               | L  | X | No Change |
| H               | X  | X | Z         |

## MAXIMUM RATINGS

| Symbol    | Parameter                                     | Value                   | Unit |
|-----------|---|-------------------------|------|
| $V_{CC}$  | DC Supply Voltage                             | - 0.5 to + 7.0          | V    |
| $V_{in}$  | DC Input Voltage                              | - 0.5 to + 7.0          | V    |
| $V_{out}$ | DC Output Voltage                             | - 0.5 to $V_{CC} + 0.5$ | V    |
| $I_{IK}$  | Input Diode Current                           | - 20                    | mA   |
| $I_{OK}$  | Output Diode Current                          | $\pm 20$                | mA   |
| $I_{out}$ | DC Output Current, per Pin                    | $\pm 25$                | mA   |
| $I_{CC}$  | DC Supply Current, $V_{CC}$ and GND Pins      | $\pm 75$                | mA   |
| $P_D$     | Power Dissipation in Still Air, SOIC Package† | 500                     | mW   |
| $T_{stg}$ | Storage Temperature                           | - 65 to + 150           | °C   |

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit. For proper operation,  $V_{in}$  and  $V_{out}$  should be constrained to the range  $GND \leq (V_{in} \text{ or } V_{out}) \leq V_{CC}$ . Unused inputs must always be tied to an appropriate logic voltage level (e.g., either GND or  $V_{CC}$ ). Unused outputs must be left open.

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.

†Derating — SOIC Package: - 7 mW/°C from 65° to 125°C

## RECOMMENDED OPERATING CONDITIONS

| Symbol     | Parameter                | Min                           | Max      | Unit |
|------------|--------------------------|-------------------------------|----------|------|
| $V_{CC}$   | DC Supply Voltage        | 2.0                           | 5.5      | V    |
| $V_{in}$   | DC Input Voltage         | 0                             | 5.5      | V    |
| $V_{out}$  | DC Output Voltage        | 0                             | $V_{CC}$ | V    |
| $T_A$      | Operating Temperature    | - 40                          | + 85     | °C   |
| $t_r, t_f$ | Input Rise and Fall Time | $V_{CC} = 3.3 \text{ V}$<br>0 | 100      | ns/V |
|            |                          | $V_{CC} = 5.0 \text{ V}$<br>0 | 20       |      |

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.

# MC74VHC373

## DC ELECTRICAL CHARACTERISTICS

| Symbol          | Parameter                           | Test Conditions  | V <sub>CC</sub><br>V | T <sub>A</sub> = 25°C         |                   |                               | T <sub>A</sub> = - 40 to 85°C |                               | Unit |
|-----------------|-------------------------------------|--|----------------------|-------------------------------|-------------------|-------------------------------|-------------------------------|-------------------------------|------|
|                 |                                     |  |                      | Min                           | Typ               | Max                           | Min                           | Max                           |      |
| V <sub>IH</sub> | Minimum High-Level Input Voltage    |  | 2.0<br>3.0 to<br>5.5 | 1.50<br>V <sub>CC</sub> x 0.7 |                   |                               | 1.50<br>V <sub>CC</sub> x 0.7 |                               | V    |
| V <sub>IL</sub> | Maximum Low-Level Input Voltage     |  | 2.0<br>3.0 to<br>5.5 |                               |                   | 0.50<br>V <sub>CC</sub> x 0.3 |                               | 0.50<br>V <sub>CC</sub> x 0.3 | V    |
| V <sub>OH</sub> | Minimum High-Level Output Voltage   | V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub><br>I <sub>OH</sub> = - 50 μA                            | 2.0<br>3.0<br>4.5    | 1.9<br>2.9<br>4.4             | 2.0<br>3.0<br>4.5 |                               | 1.9<br>2.9<br>4.4             |                               | V    |
|                 |                                     | V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub><br>I <sub>OH</sub> = - 4 mA<br>I <sub>OH</sub> = - 8 mA | 3.0<br>4.5           | 2.58<br>3.94                  |                   |                               | 2.48<br>3.80                  |                               |      |
| V <sub>OL</sub> | Maximum Low-Level Output Voltage    | V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub><br>I <sub>OL</sub> = 50 μA                              | 2.0<br>3.0<br>4.5    |                               | 0.0<br>0.0<br>0.0 | 0.1<br>0.1<br>0.1             |                               | 0.1<br>0.1<br>0.1             | V    |
|                 |                                     | V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub><br>I <sub>OL</sub> = 4 mA<br>I <sub>OL</sub> = 8 mA     | 3.0<br>4.5           |                               |                   | 0.36<br>0.36                  |                               | 0.44<br>0.44                  |      |
| I <sub>in</sub> | Maximum Input Leakage Current       | V <sub>in</sub> = 5.5 V or GND   | 0 to 5.5             |                               |                   | ± 0.1                         |                               | ± 1.0                         | μA   |
| I <sub>oz</sub> | Maximum Three-State Leakage Current | V <sub>in</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>V <sub>out</sub> = V <sub>CC</sub> or GND            | 5.5                  |                               |                   | ± 0.25                        |                               | ± 2.5                         | μA   |
| I <sub>CC</sub> | Maximum Quiescent Supply Current    | V <sub>in</sub> = V <sub>CC</sub> or GND   | 5.5                  |                               |                   | 4.0                           |                               | 40.0                          | μA   |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## AC ELECTRICAL CHARACTERISTICS (Input t<sub>r</sub> = t<sub>f</sub> = 3.0ns)

| Symbol                                   | Parameter                             | Test Conditions  | T <sub>A</sub> = 25°C |            |              | T <sub>A</sub> = - 40 to 85°C |              | Unit |
|--|---------------------------------------|--|-----------------------|------------|--------------|-------------------------------|--------------|------|
|  |                                       |  | Min                   | Typ        | Max          | Min                           | Max          |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub>   | Maximum Propagation Delay,<br>D to Q  | V <sub>CC</sub> = 3.3 ± 0.3 V C <sub>L</sub> = 15 pF<br>C <sub>L</sub> = 50 pF                       |                       | 7.3<br>9.8 | 11.4<br>14.9 | 1.0<br>1.0                    | 13.5<br>17.0 | ns   |
|  |                                       | V <sub>CC</sub> = 5.0 ± 0.5 V C <sub>L</sub> = 15 pF<br>C <sub>L</sub> = 50 pF                       |                       | 4.9<br>6.4 | 7.2<br>9.2   | 1.0<br>1.0                    | 8.5<br>10.5  |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub>   | Maximum Propagation Delay,<br>LE to Q | V <sub>CC</sub> = 3.3 ± 0.3 V C <sub>L</sub> = 15 pF<br>C <sub>L</sub> = 50 pF                       |                       | 7.0<br>9.5 | 11.0<br>14.5 | 1.0<br>1.0                    | 13.0<br>16.5 | ns   |
|  |                                       | V <sub>CC</sub> = 5.0 ± 0.5 V C <sub>L</sub> = 15 pF<br>C <sub>L</sub> = 50 pF                       |                       | 5.0<br>6.5 | 7.2<br>9.2   | 1.0<br>1.0                    | 8.5<br>10.5  |      |
| t <sub>PZL</sub> ,<br>t <sub>PZH</sub>   | Output Enable Time,<br>OE to Q        | V <sub>CC</sub> = 3.3 ± 0.3 V C <sub>L</sub> = 15 pF<br>R <sub>L</sub> = 1 kΩ C <sub>L</sub> = 50 pF |                       | 7.3<br>9.8 | 11.4<br>14.9 | 1.0<br>1.0                    | 13.5<br>17.0 | ns   |
|  |                                       | V <sub>CC</sub> = 5.0 ± 0.5 V C <sub>L</sub> = 15 pF<br>R <sub>L</sub> = 1 kΩ C <sub>L</sub> = 50 pF |                       | 5.5<br>7.0 | 8.1<br>10.1  | 1.0<br>1.0                    | 9.5<br>11.5  |      |
| t <sub>PLZ</sub> ,<br>t <sub>PHZ</sub>   | Output Disable Time,<br>OE to Q       | V <sub>CC</sub> = 3.3 ± 0.3 V C <sub>L</sub> = 50 pF<br>R <sub>L</sub> = 1 kΩ                        |                       | 9.5        | 13.2         | 1.0                           | 15.0         | ns   |
|  |                                       | V <sub>CC</sub> = 5.0 ± 0.5 V C <sub>L</sub> = 50 pF<br>R <sub>L</sub> = 1 kΩ                        |                       | 6.5        | 9.2          | 1.0                           | 10.5         |      |
| t <sub>OSLH</sub> ,<br>t <sub>OSHL</sub> | Output to Output Skew                 | V <sub>CC</sub> = 3.3 ± 0.3 V C <sub>L</sub> = 50 pF<br>(Note 1)                                     |                       |            | 1.5          |                               | 1.5          | ns   |
|  |                                       | V <sub>CC</sub> = 5.5 ± 0.5 V C <sub>L</sub> = 50 pF<br>(Note 1)                                     |                       |            | 1.0          |                               | 1.0          | ns   |

# MC74VHC373

## AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0\text{ns}$ )

| Symbol    | Parameter   | Test Conditions                                       | $T_A = 25^\circ\text{C}$ |     |     | $T_A = -40 \text{ to } 85^\circ\text{C}$ |     | Unit |
|-----------|---|---|--------------------------|-----|-----|--|-----|------|
|           |   |   | Min                      | Typ | Max | Min                                      | Max |      |
| $C_{in}$  | Maximum Input Capacitance   |   |                          | 4   | 10  |  | 10  | pF   |
| $C_{out}$ | Maximum Three-State Output Capacitance (Output in High-Impedance State) |   |                          | 6   |     |  |     | pF   |
| $C_{PD}$  | Power Dissipation Capacitance (Note 2)                                  | Typical @ $25^\circ\text{C}$ , $V_{CC} = 5.0\text{V}$ |                          |     |     |  | pF  |      |
|           |   | 27  |                          |     |     |  |     |      |

- Parameter guaranteed by design.  $t_{OSLH} = |t_{PLHm} - t_{PLHn}|$ ,  $t_{OSHL} = |t_{PHLm} - t_{PHLn}|$ .
- $C_{PD}$  is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation:  $I_{CC(OPR)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}/8$  (per latch).  $C_{PD}$  is used to determine the no-load dynamic power consumption;  $P_D = C_{PD} \cdot V_{CC}^2 \cdot f_{in} + I_{CC} \cdot V_{CC}$ .

## NOISE CHARACTERISTICS (Input $t_r = t_f = 3.0\text{ns}$ , $C_L = 50\text{pF}$ , $V_{CC} = 5.0\text{V}$ )

| Symbol    | Parameter                                | $T_A = 25^\circ\text{C}$ |      | Unit |
|-----------|--|--------------------------|------|------|
|           |  | Typ                      | Max  |      |
| $V_{OLP}$ | Quiet Output Maximum Dynamic $V_{OL}$    | 0.6                      | 0.9  | V    |
| $V_{OLV}$ | Quiet Output Minimum Dynamic $V_{OL}$    | -0.6                     | -0.9 | V    |
| $V_{IHD}$ | Minimum High Level Dynamic Input Voltage |                          | 3.5  | V    |
| $V_{ILD}$ | Maximum Low Level Dynamic Input Voltage  |                          | 1.5  | V    |

## TIMING REQUIREMENTS (Input $t_r = t_f = 3.0\text{ns}$ )

| Symbol     | Parameter                   | Test Conditions  | $T_A = 25^\circ\text{C}$ |            | $T_A = -40 \text{ to } 85^\circ\text{C}$ | Unit |
|------------|-----------------------------|--|--------------------------|------------|--|------|
|            |                             |  | Typ                      | Limit      | Limit                                    |      |
| $t_{w(h)}$ | Minimum Pulse Width, LE     | $V_{CC} = 3.3 \pm 0.3\text{V}$<br>$V_{CC} = 5.0 \pm 0.5\text{V}$ |                          | 5.0<br>5.0 | 5.0<br>5.0                               | ns   |
| $t_{su}$   | Minimum Setup Time, D to LE | $V_{CC} = 3.3 \pm 0.3\text{V}$<br>$V_{CC} = 5.0 \pm 0.5\text{V}$ |                          | 4.0<br>4.0 | 4.0<br>4.0                               | ns   |
| $t_h$      | Minimum Hold Time, D to LE  | $V_{CC} = 3.3 \pm 0.3\text{V}$<br>$V_{CC} = 5.0 \pm 0.5\text{V}$ |                          | 1.0<br>1.0 | 1.0<br>1.0                               | ns   |

## ORDERING INFORMATION

| Device          | Package              | Shipping†          |
|-----------------|----------------------|--------------------|
| MC74VHC373DWR2G | SOIC-20<br>(Pb-Free) | 1000 / Tape & Reel |

†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.

# MC74VHC373

## SWITCHING WAVEFORMS

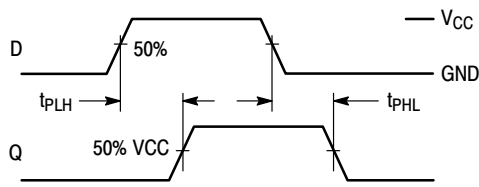


Figure 2.

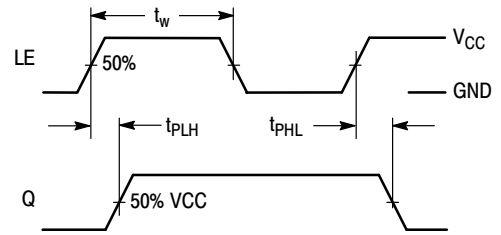


Figure 3.

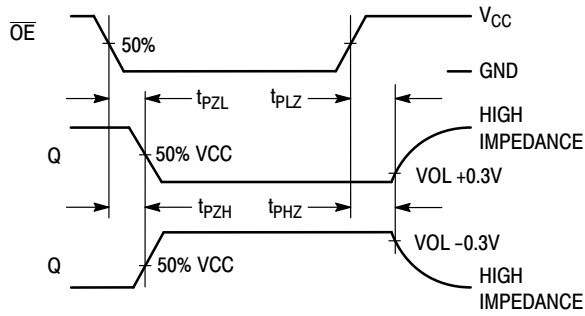


Figure 4.

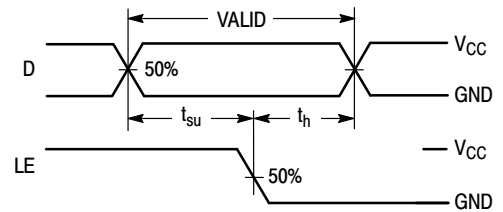
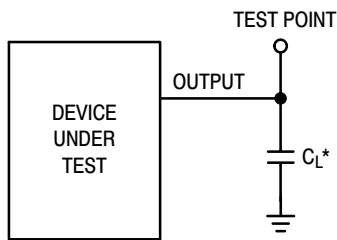


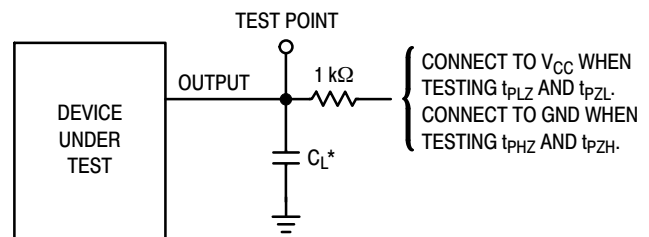
Figure 5.

## TEST CIRCUITS



\*Includes all probe and jig capacitance

Figure 6.



\*Includes all probe and jig capacitance

Figure 7.

# MC74VHC373

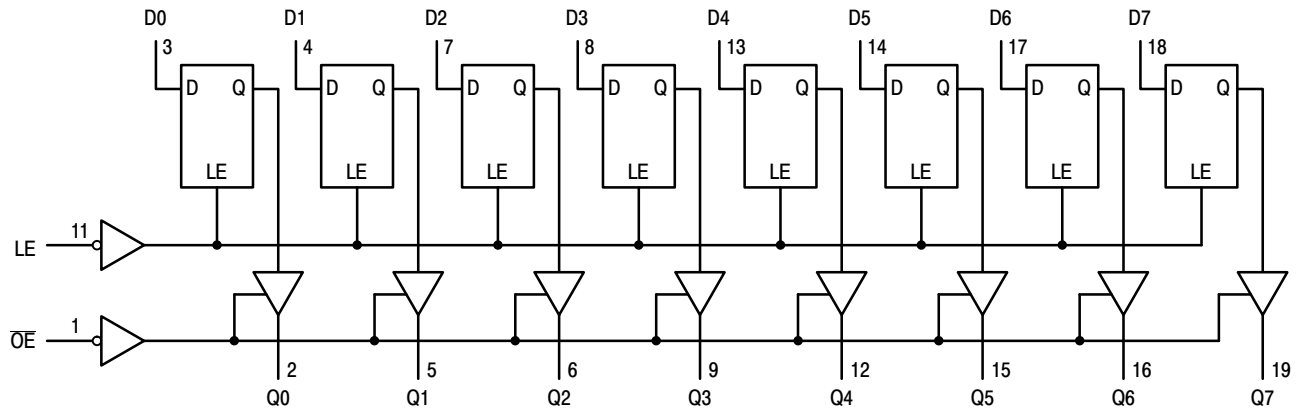


Figure 8. EXPANDED LOGIC DIAGRAM

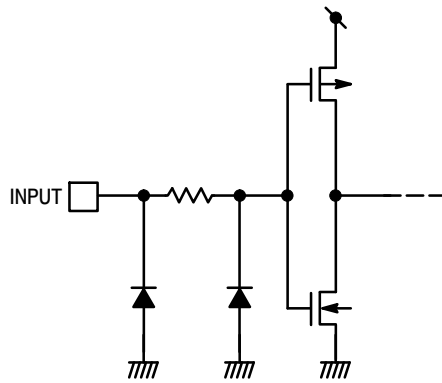


Figure 9. INPUT EQUIVALENT CIRCUIT

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



SCALE 1:1

SOIC-20 WB  
CASE 751D-05  
ISSUE H

DATE 22 APR 2015

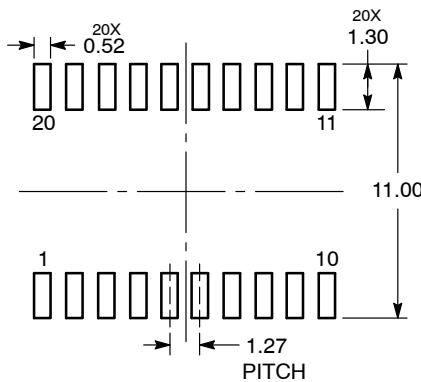


NOTES:

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 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  |
| 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  |
| θ   | 0°          | 7°    |

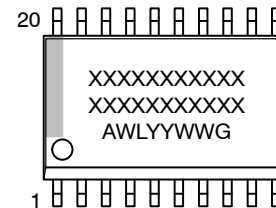
RECOMMENDED  
SOLDERING FOOTPRINT\*



DIMENSIONS: MILLIMETERS

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

GENERIC  
MARKING DIAGRAM\*



XXXXXX = 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. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

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



ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). 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. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor 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 ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor 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 ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor 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](mailto:orderlit@onsemi.com)

ON Semiconductor Website: [www.onsemi.com](http://www.onsemi.com)

### TECHNICAL SUPPORT

North American Technical Support:  
Voice Mail: 1 800-282-9855 Toll Free USA/Canada  
Phone: 011 421 33 790 2910

### Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative

