

SN74LS365A, SN74LS367A, SN74LS368A



ON Semiconductor™

<http://onsemi.com>

3-State Hex Buffers

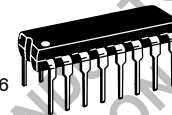
These devices are high speed hex buffers with 3-state outputs. They are organized as single 6-bit or 2-bit/4-bit, with inverting or non-inverting data (D) paths. The outputs are designed to drive 15 TTL Unit Loads or 60 Low Power Schottky loads when the Enable (E) is LOW.

When the Output Enable (E) is HIGH, the outputs are forced to a high impedance "off" state. If the outputs of the 3-state devices are tied together, all but one device must be in the high impedance state to avoid high currents that would exceed the maximum ratings. Designers should ensure that Output Enable signals to 3-state devices whose outputs are tied together are designed so there is no overlap.

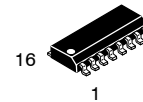
LOW
POWER
SCHOTTKY

GUARANTEED OPERATING RANGES

| Symbol | Parameter | Min | Typ | Max | Unit |
|-----------------|-------------------------------------|------|-----|------|------|
| V _{CC} | Supply Voltage | 4.75 | 5.0 | 5.25 | V |
| T _A | Operating Ambient Temperature Range | 0 | 25 | 70 | °C |
| I _{OH} | Output Current - High | | | -2.6 | mA |
| I _{OL} | Output Current - Low | | | 24 | mA |



PLASTIC
DIP SUFFIX
CASE 648



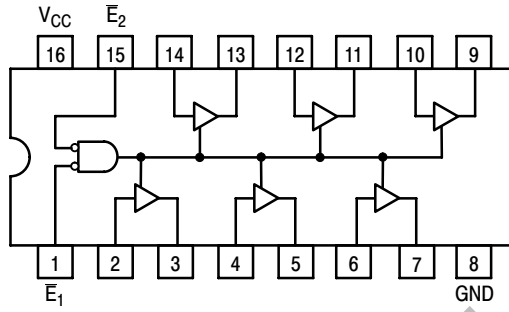
SOIC
D SUFFIX
CASE 751B

ORDERING INFORMATION

| Device | Package | Shipping |
|---------------|------------|------------------|
| SN74LS365AN | 16 Pin DIP | 2000 Units/Box |
| SN74LS365AD | SOIC-16 | 38 Units/Rail |
| SN74LS365ADR2 | SOIC-16 | 2500/Tape & Reel |
| SN74LS367AN | 16 Pin DIP | 2000 Units/Box |
| SN74LS367AD | SOIC-16 | 38 Units/Rail |
| SN74LS367ADR2 | SOIC-16 | 2500/Tape & Reel |
| SN74LS368AN | 16 Pin DIP | 2000 Units/Box |
| SN74LS368AD | SOIC-16 | 38 Units/Rail |
| SN74LS368ADR2 | SOIC-16 | 2500/Tape & Reel |

SN74LS365A, SN74LS367A, SN74LS368A

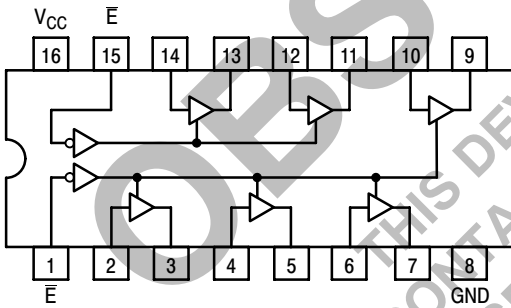
SN74LS365A
HEX 3-STATE BUFFER WITH
COMMON 2-INPUT NOR ENABLE



TRUTH TABLE

| INPUTS | | | OUTPUT |
|-------------|-------------|---|--------|
| \bar{E}_1 | \bar{E}_2 | D | |
| L | L | L | L |
| L | L | H | H |
| L | X | X | (Z) |
| H | X | X | (Z) |

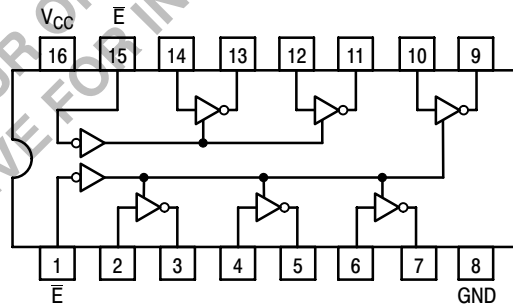
SN74LS367A
HEX 3-STATE BUFFER
SEPARATE 2-BIT AND 4-BIT SECTIONS



TRUTH TABLE

| INPUTS | | OUTPUT |
|-----------|---|--------|
| \bar{E} | D | |
| L | L | L |
| L | H | H |
| L | X | (Z) |
| H | X | (Z) |

SN74LS368A
HEX 3-STATE INVERTER BUFFER
SEPARATE 2-BIT AND 4-BIT SECTIONS



TRUTH TABLE

| INPUTS | | OUTPUT |
|-----------|---|--------|
| \bar{E} | D | |
| L | L | H |
| L | H | L |
| L | X | (Z) |
| H | X | (Z) |

SN74LS365A, SN74LS367A, SN74LS368A

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

| Symbol | Parameter | Limits | | | Unit | Test Conditions | |
|------------------|--------------------------------------|--------|-------|------|------|--|---|
| | | Min | Typ | Max | | | |
| V _{IH} | Input HIGH Voltage | 2.0 | | | V | Guaranteed Input HIGH Voltage for All Inputs | |
| V _{IL} | Input LOW Voltage | | | 0.8 | V | Guaranteed Input LOW Voltage for All Inputs | |
| V _{IK} | Input Clamp Diode Voltage | | -0.65 | -1.5 | V | V _{CC} = MIN, I _{IN} = -18 mA | |
| V _{OH} | Output HIGH Voltage | 2.4 | 3.1 | | V | V _{CC} = MIN, I _{OH} = MAX, V _{IN} = V _{IH} or V _{IL} per Truth Table | |
| V _{OL} | Output LOW Voltage | | 0.25 | 0.4 | V | I _{OL} = 12 mA I _{OL} = 24 mA | V _{CC} = V _{CC} MIN, V _{IN} = V _{IL} or V _{IH} per Truth Table |
| | | | 0.35 | 0.5 | V | | |
| I _{OZH} | Output Off Current HIGH | | | 20 | μA | V _{CC} = MAX, V _{OUT} = 2.7 V | |
| I _{OZL} | Output Off Current LOW | | | -20 | μA | V _{CC} = MAX, V _{OUT} = 0.4 V | |
| I _{IH} | Input HIGH Current | | | 20 | μA | V _{CC} = MAX, V _{IN} = 2.7 V | |
| | | | | 0.1 | mA | V _{CC} = MAX, V _{IN} = 7.0 V | |
| I _{IL} | Input LOW Current E Inputs | | | -0.4 | mA | V _{CC} = MAX, V _{IN} = 0.4 V | |
| | D Inputs | | | -20 | μA | V _{CC} = MAX, V _{IN} = 0.5 V Either E Input at 2.0 V | |
| | | | | -0.4 | mA | V _{CC} = MAX, V _{IN} = 0.4 V Both E Inputs at 0.4 V | |
| I _{OS} | Short Circuit Current (Note 1) | -40 | | -225 | mA | V _{CC} = MAX | |
| I _{CC} | Power Supply Current LS365A, 367A | | | 24 | mA | V _{CC} = MAX | |
| | LS368A | | | 21 | mA | | |

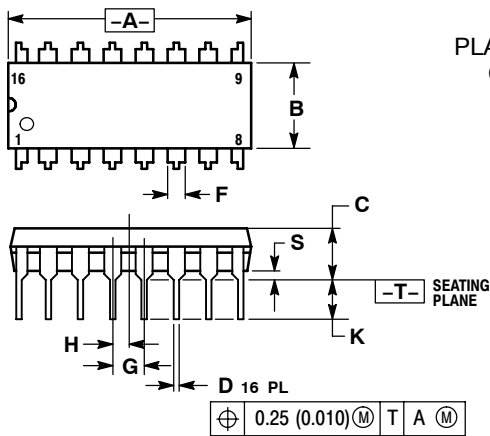
Note 1: Not more than one output should be shorted at a time, nor for more than 1 second.

AC CHARACTERISTICS (T_A = 25°C, V_{CC} = 5.0 V)

| Symbol | Parameter | Limits | | | | | | Unit | Test Conditions |
|--------------------------------------|---------------------|---------------|-----------|----------|---------------|-----------|----------|------|---|
| | | LS365A/LS367A | | | LS366A/LS368A | | | | |
| | | Min | Typ | Max | Min | Typ | Max | | |
| t _{PLH} t _{PHL} | Propagation Delay | | 10 9.0 | 16 22 | | 7.0 12 | 15 18 | ns | C _L = 45 pF, R _L = 667 Ω |
| t _{PZH} t _{PZL} | Output Enable Time | | 19 24 | 35 40 | | 18 28 | 35 45 | ns | |
| t _{PHZ} t _{PLZ} | Output Disable Time | | | 30 35 | | | 32 35 | ns | C _L = 5.0 pF |

SN74LS365A, SN74LS367A, SN74LS368A

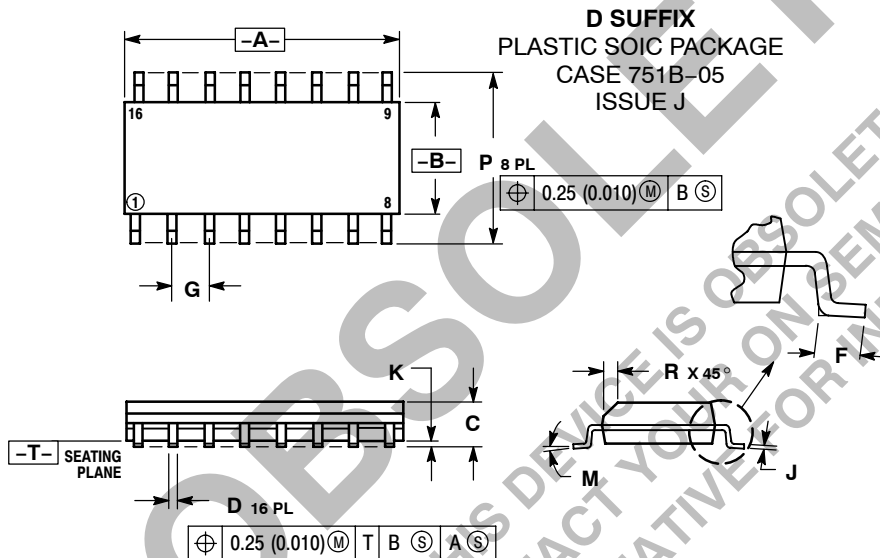
PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.740 | 0.770 | 18.80 | 19.55 |
| B | 0.250 | 0.270 | 6.35 | 6.85 |
| C | 0.145 | 0.175 | 3.69 | 4.44 |
| D | 0.015 | 0.021 | 0.39 | 0.53 |
| F | 0.040 | 0.70 | 1.02 | 1.77 |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.050 BSC | | 1.27 BSC | |
| J | 0.008 | 0.015 | 0.21 | 0.38 |
| K | 0.110 | 0.130 | 2.80 | 3.30 |
| L | 0.295 | 0.305 | 7.50 | 7.74 |
| M | 0° | 10° | 0° | 10° |
| S | 0.020 | 0.040 | 0.51 | 1.01 |



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 9.80 | 10.00 | 0.386 | 0.393 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.054 | 0.068 |
| D | 0.35 | 0.49 | 0.014 | 0.019 |
| F | 0.40 | 1.25 | 0.016 | 0.049 |
| G | 1.27 BSC | | 0.050 BSC | |
| J | 0.19 | 0.25 | 0.008 | 0.009 |
| K | 0.10 | 0.25 | 0.004 | 0.009 |
| M | 0° | 7° | 0° | 7° |
| P | 5.80 | 6.20 | 0.229 | 0.244 |
| R | 0.25 | 0.50 | 0.010 | 0.019 |

ON Semiconductor and **ON** are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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. "Typical" parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC 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:

Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative