

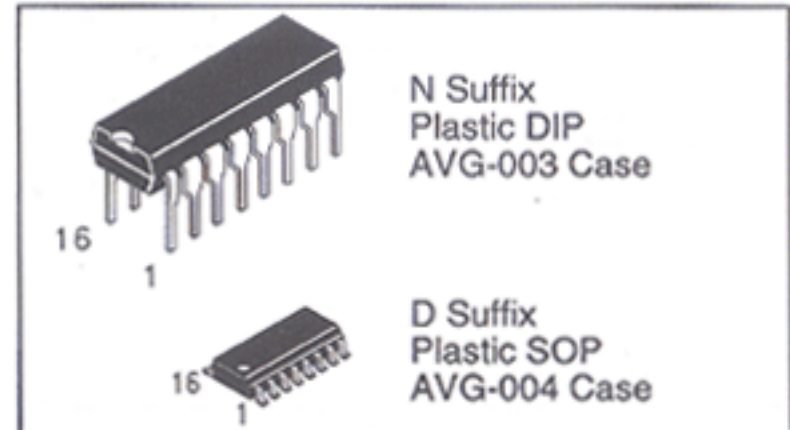
Available Q2, 1995

Hex Tri-State Buffer

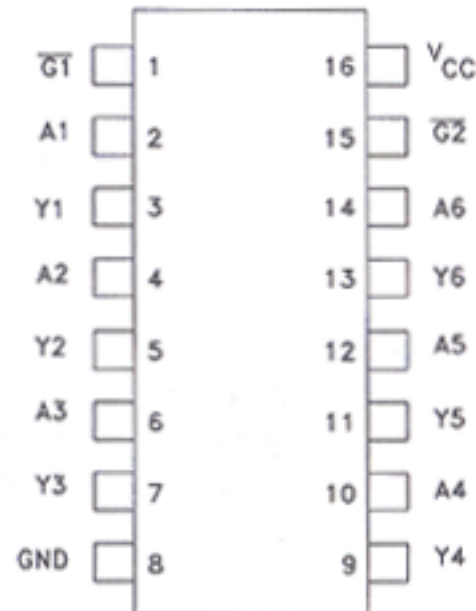
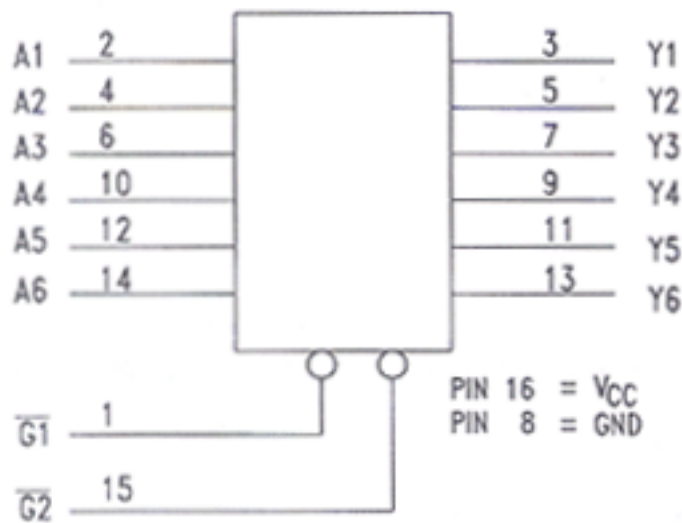
**DV74HC365, DV74HCT365
DV74HC367, DV74HCT367**

These devices are High Speed Non-Inverting Buffers. Both devices have active-low enables. All six gates are controlled in the HC365, 2-Bits and 4-Bits are separately controlled in the HC367.

- Output Drive Capability: 15 LSTTL Loads
- Outputs Directly Interface to CMOS, NMOS, and TTL
- Operating Voltage Range: 2 to 6 V
- Low Input Current: 1 μ A
- DC, AC parameters guaranteed from -55°C to 125°C



365, 367



**DV74HC365
TRUTH TABLE**

| Inputs | | | Outputs |
|-----------------|-----------------|----------------|----------------|
| $\overline{G1}$ | $\overline{G2}$ | A _n | Y _n |
| H | X | X | Z |
| L | H | X | Z |
| H | L | X | Z |
| L | L | D _n | D _n |

H = High Logic Level
L = Low Logic Level
X = Don't Care
Z = High Impedance

**DV74HC367
TRUTH TABLE**

| Inputs | | | | Outputs | |
|-----------------|-----------------|------------------|------------------|------------------|------------------|
| $\overline{G1}$ | $\overline{G2}$ | A ₁₋₄ | A _{5,6} | Y ₁₋₄ | Y _{5,6} |
| H | H | X | X | Z | Z |
| L | H | D ₁₋₄ | X | D ₁₋₄ | Z |
| H | L | X | D _{5,6} | Z | D _{5,6} |
| L | L | D ₁₋₄ | D _{5,6} | D ₁₋₄ | D _{5,6} |

H = High Logic Level
L = Low Logic Level
X = Don't Care
Z = High Impedance
HC 367: $\overline{G1}$ Controls the outputs Y1-Y4
 $\overline{G2}$ Controls the outputs Y5, Y6

ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

| Symbol | Parameter | Value | Unit |
|------------------|--|------------------------------|------|
| V _{CC} | DC Supply Voltage (Referenced to GND) | -0.5 to +7.0 | V |
| V _{IN} | DC Input Voltage (Referenced to GND) | -1.5 to V _{CC} +1.5 | V |
| V _{OUT} | DC Output Voltage (Referenced to GND) | -0.5 to V _{CC} +0.5 | V |
| I _{IN} | DC Input Current, per Pin | ± 20 | mA |
| I _{OUT} | DC Output Current, per Pin | ± 25 | mA |
| I _{CC} | DC Supply Current, V _{CC} and GND Pins | ± 75 | mA |
| P _D | Power Dissipation in Still Air, Plastic DIP SOP Package | 750 500 | mW |
| T _{STG} | Storage Temperature Range | -65 to +150 | °C |
| TL | Lead Temperature, 1mm from Case for 10 Seconds | 260 | °C |

GUARANTEED OPERATING CONDITIONS

| Symbol | Parameter | Min | Max | Unit |
|------------------------------------|--|-------------|--------------------|------|
| V _{CC} | DC Supply Voltage (Referenced to GND) | 2.0 | 6.0 | V |
| V _{IN} , V _{OUT} | DC Input Voltage, Output Voltage (Referenced to GND) | 0 | V _{CC} | V |
| T _A | Ambient Temperature | -55 | +125 | °C |
| t _r , t _f | Input Rise and Fall Time: HC: V _{CC} =2.0V HCT: V _{CC} =5.5V / HC: V _{CC} =4.5V HC: V _{CC} =6.0V | 0 0 0 | 1000 500 400 | ns |

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DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Conditions | V _{CC} V | Guaranteed Limits | | | Unit |
|-----------------|-------------------------------------|---|----------------------|---------------------|-------|--------|------|
| | | | | 25°C to -55°C | ≤85°C | ≤125°C | |
| V _{IH} | Minimum High-Level Input Voltage | V _{OUT} = 0.1 V, I _{OUT} ≤ 20 μA | 2.0 | 1.5 | 1.5 | 1.5 | V |
| | | | 4.5 | 3.15 | 3.15 | 3.15 | |
| | | | 6.0 | 4.2 | 4.2 | 4.2 | |
| V _{IL} | Maximum Low-Level Input Voltage | V _{OUT} = V _{CC} - 0.1V I _{OUT} ≤ 20 μA | 2.0 | 0.5 | 0.5 | 0.5 | V |
| | | | 4.5 | 1.35 | 1.35 | 1.35 | |
| | | | 6.0 | 1.8 | 1.8 | 1.8 | |
| V _{OH} | Minimum High-Level Output Voltage | V _{IN} = V _{IH} or V _{IL} I _{OUT} ≤ 20 μA | 2.0 | 1.9 | 1.9 | 1.9 | V |
| | | | 4.5 | 4.4 | 4.4 | 4.4 | |
| | | 6.0 | 5.9 | 5.9 | 5.9 | | |
| | | V _{IN} = V _{IH} or V _{IL} , I _{OUT} ≤ 6.0mA I _{OUT} ≤ 7.8 mA | 4.5 | 3.98 | 3.84 | 3.7 | |
| 6.0 | 5.48 | | 5.34 | 5.2 | | | |
| V _{OL} | Maximum Low Level Output Voltage | V _{IN} = V _{IH} or V _{IL} I _{OUT} ≤ 20 μA | 2.0 | 0.1 | 0.1 | 0.1 | V |
| | | | 4.5 | 0.1 | 0.1 | 0.1 | |
| | | 6.0 | 0.1 | 0.1 | 0.1 | | |
| | | V _{IN} = V _{IH} or V _{IL} , I _{OUT} ≤ 6.0mA I _{OUT} ≤ 7.8 mA | 4.5 | 0.26 | 0.33 | 0.40 | |
| 6.0 | 0.26 | | 0.33 | 0.40 | | | |
| I _{IN} | Maximum Input Leakage Current | V _{IN} = V _{CC} or GND | 6.0 | ± 0.1 | ± 1.0 | ± 1.0 | μA |
| I _{OZ} | Maximum Three-State Leakage Current | Output in High-Impedance State V _{IN} = V _{IL} or V _{IH} V _{OUT} = V _{CC} or GND | 6.0 | ± 0.5 | ± 5.0 | ± 10.0 | μA |
| I _{CC} | Maximum Quiescent Supply Current | V _{IN} = V _{CC} or GND, I _{OUT} = 0 μA | 6.0 | 8.0 | 80 | 160 | μA |

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AC ELECTRICAL CHARACTERISTICS over full operating conditions ($C_L=50\text{pF}$, Input $t_f=t_r=6\text{ns}$)

| Symbol | Parameter | V _{CC} V | Guaranteed Limit | | | Unit |
|--|--|----------------------|---------------------|-------|--------|------|
| | | | 25°C to -55°C | ≤85°C | ≤125°C | |
| t _{PLH} , t _{PHL} | Maximum Propagation Delay Time, Input to Output | 2.0 | 120 | 150 | 180 | ns |
| | | 4.5 | 24 | 30 | 36 | |
| | | 6.0 | 20 | 26 | 31 | |
| t _{PLZ} , t _{PHZ} | HC367 Maximum Propagation Delay Time, Output Disable to Output | 2.0 | 175 | 220 | 260 | ns |
| | | 4.5 | 45 | 55 | 65 | |
| | | 6.0 | 36 | 45 | 55 | |
| t _{PLZ} ,t _{PHZ} t _{PZL} ,t _{PZH} | HC365 Maximum Propagation Delay Time, Output Disable to Output | 2.0 | 220 | 275 | 330 | ns |
| | | 4.5 | 44 | 55 | 66 | |
| | | 6.0 | 37 | 47 | 56 | |
| t _{PZL} , t _{PZH} | HC367 Maximum Propagation Delay Time, Output Enable to Output | 2.0 | 190 | 240 | 285 | ns |
| | | 4.5 | 38 | 48 | 57 | |
| | | 6.0 | 32 | 41 | 48 | |
| t _{TLH} , t _{THL} | Maximum Output Transition Time Any Output | 2.0 | 60 | 75 | 90 | ns |
| | | 4.5 | 12 | 15 | 18 | |
| | | 6.0 | 10 | 13 | 15 | |
| C _{IN} | Maximum Input Capacitance | — | 10 | 10 | 10 | pF |
| C _{OUT} | Maximum Three-State Output Capacitance (Output in High-Impedance) | — | 15 | 15 | 15 | pF |

| | | | | | |
|-----------------|---|---------------------------------------|--|--|----|
| C _{PD} | Power Dissipation Capacitance (Per Gate) Used to determine the no-load dynamic power consumption, $P_D = C_{PD} V_{CC}^2 f + I_{CC} V_{CC}$ | Typical @ 25°C, V _{CC} = 5 V | | | pF |
| | | 40 | | | |

HCT- 365, 367
DC ELECTRICAL CHARACTERISTICS

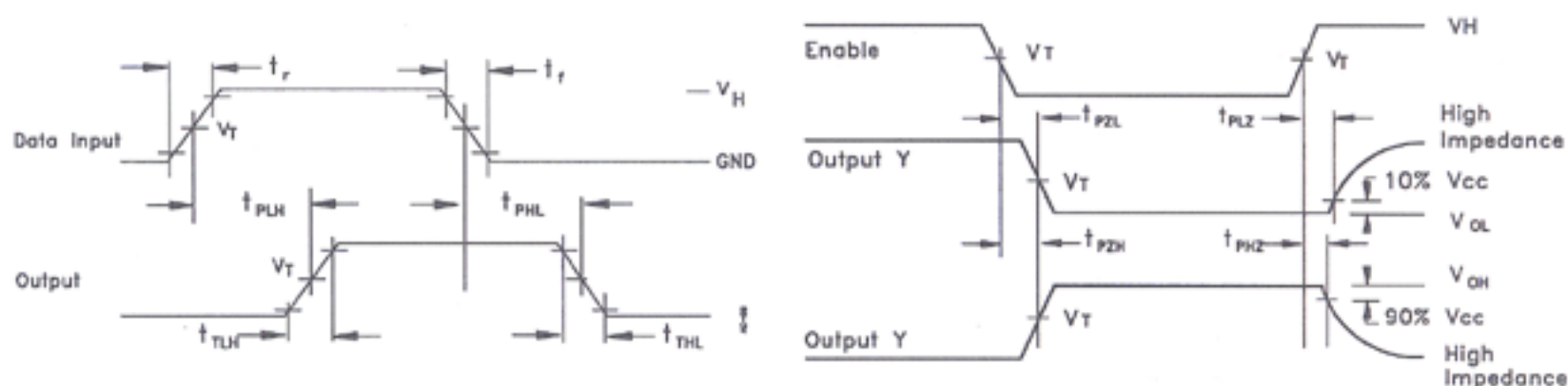
| Symbol | Parameter | Conditions | V _{CC} V | Guaranteed Limits | | | Unit |
|-----------------|--|---|----------------------|---------------------|-------|--------|------|
| | | | | 25°C to -55°C | ≤85°C | ≤125°C | |
| V _{IH} | Minimum High-Level Input Voltage | V _{OUT} = 0.1 V, I _{OUT} = 0 μA or V _{OUT} = V _{CC} - 0.1V | 4.5 | 2.0 | 2.0 | 2.0 | V |
| | | | 5.5 | 2.0 | 2.0 | 2.0 | |
| V _{IL} | Maximum Low- Level Input Voltage | V _{OUT} = 0.1 V, I _{OUT} = 0 μA or V _{OUT} = V _{CC} - 0.1V | 4.5 | 0.8 | 0.8 | 0.8 | V |
| | | | 5.5 | 0.8 | 0.8 | 0.8 | |
| V _{OH} | Minimum High-Level Output Voltage | V _{IN} = V _{IH} or V _{IL} I _{OUT} ≤ 20 μA | 4.5 | 4.4 | 4.4 | 4.4 | V |
| | | V _{IN} = V _{IH} or V _{IL} I _{OUT} < 6.0 mA | 5.5 | 5.4 | 5.4 | 5.4 | |
| V _{OL} | Maximum Low Level Output Voltage | V _{IN} = V _{IH} or V _{IL} I _{OUT} ≤ 20 μA | 4.5 | 0.1 | 0.1 | 0.1 | V |
| | | V _{IN} = V _{IH} or V _{IL} I _{OUT} ≤ 4.0 mA | 5.5 | 0.1 | 0.1 | 0.1 | |
| | | V _{IN} = V _{IH} or V _{IL} , I _{OUT} ≤ 6.0 mA | 4.5 | 0.26 | 0.33 | 0.4 | |
| I _{IN} | Maximum Input Leakage Current | V _{IN} = V _{CC} or GND | 5.5 | ±0.1 | ±1 | ±1 | μA |
| I _{OZ} | Maximum Three-State Leakage Current | Output in High-Impedance State V _{IN} = V _{IL} or V _{IH} V _{OUT} = V _{CC} or GND | 6.0 | ±0.5 | ±5.0 | ±10.0 | μA |
| I _{CC} | Maximum Quiescent Supply Current (Per Package) | V _{IN} = V _{CC} or GND I _{OUT} = 0 μA | 5.5 | 8 | 80 | 160 | μA |

| Symbol | Parameter | Conditions | V _{CC} V | Guaranteed Limits | | | Unit |
|------------------|-------------------------------------|--|----------------------|-------------------|---------------|--------|------|
| | | | | 25°C to -55°C | ≤85°C | ≤125°C | |
| ΔI _{CC} | Additional Quiescent Supply Current | V _{IN} =2.4V, Any One Input V _{IN} =V _{CC} or GND, Other Inputs I _{OUT} =0μA | 5.5 | ≥-55°C | 25°C to 125°C | | mA |
| | | | | 2.9 | 2.4 | | |

AC ELECTRICAL CHARACTERISTICS over full operating conditions

| Symbol | Parameter (C _L =50pF, Input t _f =t _r =6ns) (V _{CC} = 5V ± 10%) | Guaranteed Limit | | | Unit |
|--|---|---------------------------------------|-------|--------|------|
| | | 25°C to -55°C | ≤85°C | ≤125°C | |
| t _{PLH} , t _{PHL} | Maximum Propagation Delay Time, Input to Output | 24 | 30 | 36 | ns |
| t _{PLZ} , t _{PHZ} | Maximum Propagation Delay Time, Output Disable to Output | 45 | 55 | 65 | ns |
| t _{PZL} , t _{PZH} | Maximum Propagation Delay Time, Output Enable to Output | 45 | 55 | 65 | ns |
| t _{TLH} , t _{THL} | Maximum Output Transition Time Any Output | 12 | 15 | 18 | ns |
| C _{IN} | Maximum Input Capacitance | 10 | 10 | 10 | pF |
| C _{OUT} | Maximum Three-State Output Capacitance (Output in High Impedance State) | 15 | 15 | 15 | pF |
| C _{PD} | Power Dissipation Capacitance (Per Gate) Used to determine the no-load dynamic power consumption P _D = C _{PD} V _{CC} ² f + I _{CC} V _{CC} | Typical @ 25°C, V _{CC} = 5 V | | | pF |
| | | 60 | | | |

SWITCHING WAVEFORMS



Input threshold Voltage, V_T = 50% V_{CC} for HC, 1.3V for HCT
V_H = V_{CC} for HC, 3V for HCT