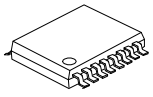
# U74AVC4TD245

**CMOS IC**

# 4-BIT DUAL SUPPLY TRANSLATING TRANSCEIVER WITH CONFIGURABLE VOLTAGE TRANSLATION; 3-STATE



TSSOP-16


QFN-16(3.5×2.5)


X1QFN-16(1.8×2.6)

## ■ DESCRIPTION

**U74AVC4TD245** is a 4-bit, dual supply transceiver that enables bidirectional level translation. It features eight 1-bit input-output ports, four direction control inputs, an output enable input and dual supply pins.

The device is fully specified for partial power-down applications using $I_{OFF}$. The $I_{OFF}$ circuitry disables the output, preventing any damaging backflow current through the device when it is powered down.

## ■ FEATURES

* Wide supply voltage range from 0.8V to 3.6V
* Suspend mode
* Inputs accept voltages up to 3.6 V
* $I_{OFF}$ supports live insertion, partial-power-down mode

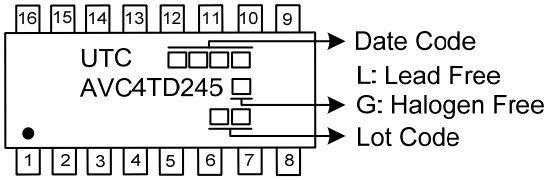
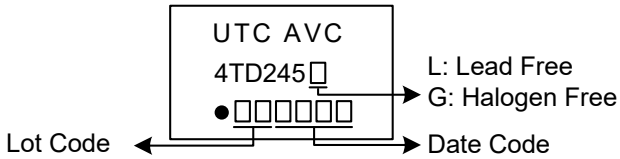
## ■ ORDERING INFORMATION

| Ordering Number | | Package | Packing |
|---|---|---|---|
| Lead Free | Halogen Free | | |
| U74AVC4TD245L-P16-R | U74AVC4TD245G-P16-R | TSSOP-16 | Tape Reel |
| U74AVC4TD245L-QAE-R | U74AVC4TD245G-QAE-R | X1QFN-16(1.8×2.6) | Tape Reel |
| U74AVC4TD245L-QAH-R | U74AVC4TD245G-QAH-R | QFN-16(3.5×2.5) | Tape Reel |

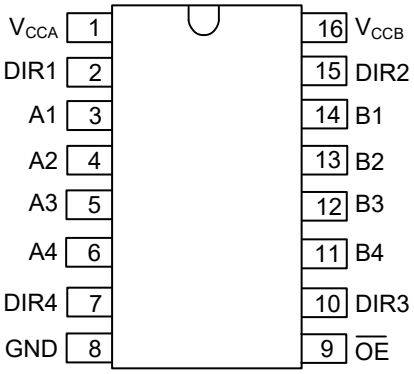
U74AVC4TD245G-P16-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) P16: TSSOP-16, QAE: X1QFN-16(1.8×2.6)
QAH: QFN-16(3.5×2.5)
(3) G: Halogen Free and Lead Free, L: Lead Free

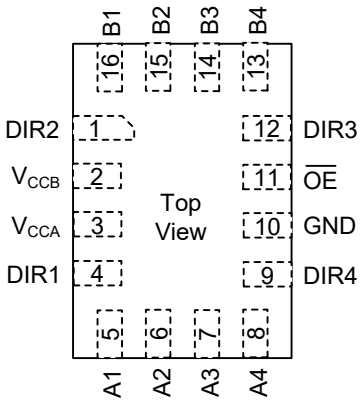
## ■ MARKING

| PACKAGE | MARKING |
|---|---|
| TSSOP-16 |  |
| X1QFN-16(1.8×2.6) |  |
| QFN-16(3.5×2.5) |  |

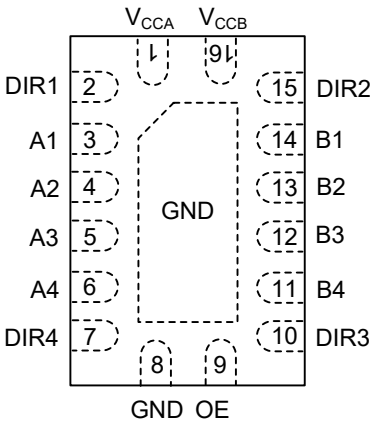
## ■ PIN CONFIGURATION




TSSOP-16




X1QFN-16(1.8×2.6)



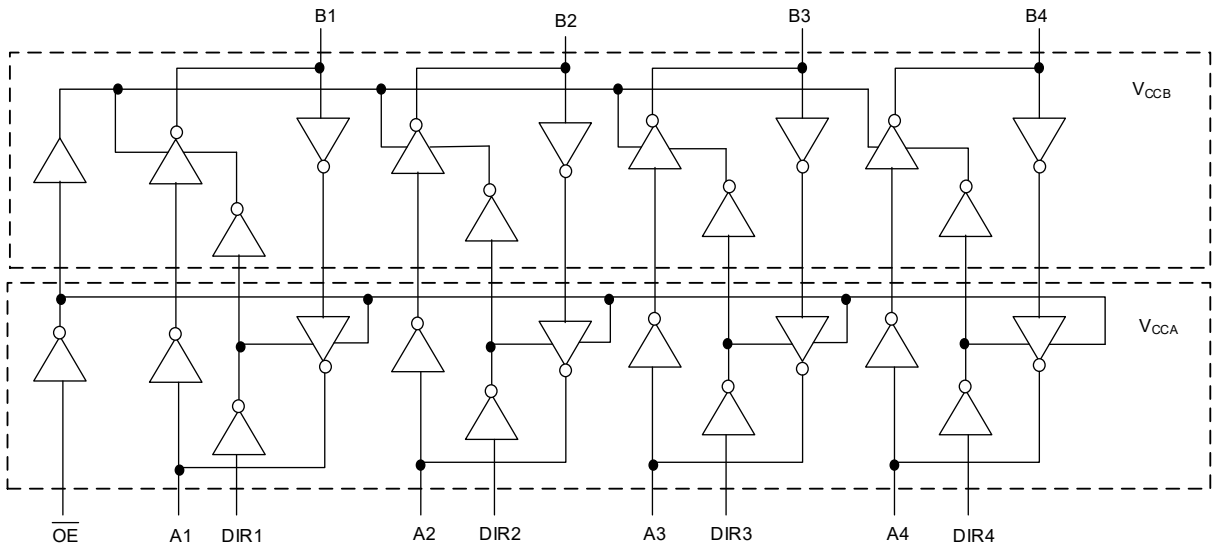

QFN-16(3.5×2.5)
(TOP VIEW)

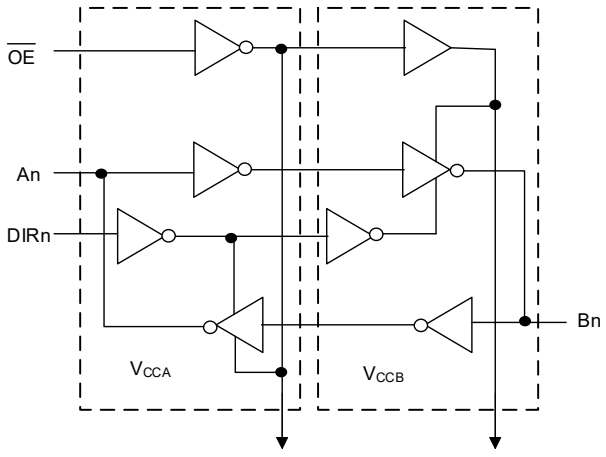
## ■ FUNCTION TABLE

| INPUT | | | | | OUTPUT | |
|---|---|---|---|---|---|---|
| $\overline{OE}$ | DIR1 | DIR2 | DIR3 | DIR4 | An | Bn |
| L | L | X | X | X | A1=B1 | Input B1 |
| L | H | X | X | X | Input A1 | B1=A1 |
| L | X | L | X | X | A2=B2 | Input B2 |
| L | X | H | X | X | Input A2 | B2=A2 |
| L | X | X | L | X | A3=B3 | Input B3 |
| L | X | X | H | X | Input A3 | B3=A3 |
| L | X | X | X | L | A4=B4 | Input B4 |
| L | X | X | X | H | Input A4 | B4=A4 |
| H | X | X | X | X | Z | Z |
| X | X | X | X | X | Z | Z |

Note: H: HIGH voltage level, L: LOW voltage level, X = Don't care, Z = HIGH-Impedance OFF-State

## ■ LOGIC DIAGRAM



## ■ ABSOLUTE MAXIMUM RATING ($T_A$=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | CONDITIONS | RATINGS | UNIT |
|---|---|---|---|---|
| Supply Voltage A | $V_{CCA}$ | | -0.5 ~ +4.6 | V |
| Supply Voltage B | $V_{CCB}$ | | -0.5 ~ +4.6 | V |
| Input Voltage | $V_{IN}$ | | -0.5 ~ +4.6 | V |
| Output Voltage | $V_{OUT}$ | Active mode | -0.5 ~ $V_{CCO}$+0.5 | V |
| | | Suspend or 3-state mode | -0.5 ~ +4.6 | V |
| Input Clamp Current | $I_{IK}$ | $V_{IN}$<0 | -50 | mA |
| Output Clamp Current | $I_{OK}$ | $V_{OUT}$<0V | -50 | mA |
| Continuous $V_{CC}$ or GND Current | $I_{CC}$ | | ±100 | mA |
| Continuous Output Current | $I_{OUT}$ | $V_{OUT}$=0V to $V_{CCO}$ | ±50 | mA |
| Storage Temperature | $T_{STG}$ | | -65 ~ +150 | °C |

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
3. $V_{CCO}$ is the $V_{CC}$ associated with the output port.
4. $V_{CCO}$ + 0.5V should not exceed 4.6V.

## ■ THERMAL DATA

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Junction to Ambient | TSSOP-16 | $\theta_{JA}$ | 110 | °C/W |
| | X1QFN-16(1.8×2.6) | | 160 | °C/W |
| | QFN-16(3.5×2.5) | | 90 | °C/W |

## ■ RECOMMENDED OPERATING COMDITIONS

| PARAMETER | SYMBOL | CONDITIONS | MIN | TPY | MAX | UNIT |
|---|---|---|---|---|---|---|
| Supply Voltage A | $V_{CCA}$ | | 0.8 | | 3.6 | V |
| Supply Voltage B | $V_{CCB}$ | | 0.8 | | 3.6 | V |
| Input Voltage | $V_{IN}$ | | 0 | | 3.6 | V |
| Output Voltage | $V_{OUT}$ | Active mode | 0 | | $V_{CCO}$ | V |
| | | Suspend or 3-state mode | 0 | | 3.6 | V |
| Input-Pulse Rise and Fall Time | $t_r$ / $t_f$ | $V_{CCI}$ =0.8V to 3.6V | | | 10 | ns |

Notes: 1. $V_{CCI}$ is the $V_{CC}$ associated with the input port.
2. $V_{CCO}$ is the $V_{CC}$ associated with the output port.

## ■ ELECTRICAL CHARACTERISTICS (Note 1, 2, 3)

| PARAMETER | | SYMBOL | TEST CONDITIONS | $T_A$=25°C | | | $T_A$=-40°C~+125°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| High-level input voltage | Data Inputs | $V_{IH}$ | $V_{CCI}$ =0.8V | 0.7× $V_{CCI}$ | | | 0.7× $V_{CCI}$ | | | V |
| | | | $V_{CCI}$ =1.1V~1.95V | 0.65× $V_{CCI}$ | | | 0.65× $V_{CCI}$ | | | V |
| | | | $V_{CCI}$ =2.3V~2.7V | 1.6 | | | 1.6 | | | |
| | | | $V_{CCI}$ =3V~3.6V | 2 | | | 2 | | | V |
| | DIR, $\overline{OE}$ Input | | $V_{CCA}$=0.8V | 0.7× $V_{CCA}$ | | | 0.7× $V_{CCA}$ | | | V |
| | | | $V_{CCA}$=1.1V~1.95V | 0.65× $V_{CCA}$ | | | 0.65× $V_{CCA}$ | | | V |
| | | | $V_{CCA}$=2.3V~2.7V | 1.6 | | | 1.6 | | | |
| | | | $V_{CCA}$=3V~3.6V | 2 | | | 2 | | | V |
| Low-level input voltage | Data Inputs | $V_{IL}$ | $V_{CCI}$ =0.8V | | | 0.3× $V_{CCI}$ | | | 0.3× $V_{CCI}$ | V |
| | | | $V_{CCI}$ =1.1V~1.95V | | | 0.35× $V_{CCI}$ | | | 0.35× $V_{CCI}$ | V |
| | | | $V_{CCI}$ =2.3V~2.7V | | | 0.7 | | | 0.7 | |
| | | | $V_{CCI}$ =3V~3.6V | | | 0.8 | | | 0.8 | V |
| | DIR, $\overline{OE}$ Input | | $V_{CCA}$=0.8V | | | 0.3× $V_{CCA}$ | | | 0.3× $V_{CCA}$ | V |
| | | | $V_{CCA}$=1.1V~1.95V | | | 0.35× $V_{CCA}$ | | | 0.35× $V_{CCA}$ | V |
| | | | $V_{CCA}$=2.3V~2.7V | | | 0.7 | | | 0.7 | |
| | | | $V_{CCA}$=3V~3.6V | | | 0.8 | | | 0.8 | V |
| High-Level Output Voltage | | $V_{OH}$ | $V_{CCA}$= $V_{CCB}$=0.8V~3.6V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OH}$=-100μA | $V_{CCO}$-0.1 | | | $V_{CCO}$-0.1 | | | V |
| | | | $V_{CCA}$= $V_{CCB}$=1.1V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OH}$=-3mA | 0.85 | | | 0.55 | | | V |
| | | | $V_{CCA}$= $V_{CCB}$=1.4V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OH}$=-6mA | 1.05 | | | 0.75 | | | V |
| | | | $V_{CCA}$= $V_{CCB}$=1.65V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OH}$=-8mA | 1.2 | | | 0.9 | | | V |
| | | | $V_{CCA}$= $V_{CCB}$=2.3V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OH}$=-9mA | 1.75 | | | 1.45 | | | V |
| | | | $V_{CCA}$= $V_{CCB}$=3V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OH}$=-12mA | 2.3 | | | 2.0 | | | V |
| Low-Level Output Voltage | | $V_{OL}$ | $V_{CCA}$= $V_{CCB}$=0.8V~3.6V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OL}$=100μA | | | 0.1 | | | 0.1 | V |
| | | | $V_{CCA}$= $V_{CCB}$=1.1V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OL}$=3mA | | | 0.25 | | | 0.5 | V |
| | | | $V_{CCA}$= $V_{CCB}$=1.4V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OL}$=6mA | | | 0.35 | | | 0.6 | V |
| | | | $V_{CCA}$= $V_{CCB}$=1.65V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OL}$=8mA | | | 0.45 | | | 0.7 | V |
| | | | $V_{CCA}$= $V_{CCB}$=2.3V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OL}$=9mA | | | 0.55 | | | 0.8 | V |
| | | | $V_{CCA}$= $V_{CCB}$=3V, $V_{IN}$=$V_{IH}$ or $V_{IL}$, $I_{OL}$=12mA | | | 0.7 | | | 0.95 | V |

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

| PARAMETER | | SYMBOL | TEST CONDITIONS | $T_A$=25°C | | | $T_A$=-40°C~+125°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Input Leakage Current | DIR, $\overline{OE}$ input | $I_{I(LEAK)}$ | $V_{CCA}$=$V_{CCB}$=0.8V~3.6V<br>$V_{IN}$=0V or 3.6V | | | ±1 | | | ±5 | μA |
| Power OFF Leakage Current | A Port | $I_{OFF}$ | $V_{CCA}$=0V, $V_{CCB}$=0.8V~3.6V<br>$V_{IN}$ or $V_{OUT}$=0V~3.6V | | | ±5 | | | ±30 | μA |
| | B Port | | $V_{CCB}$=0V, $V_{CCA}$=0.8V~3.6V<br>$V_{IN}$ or $V_{OUT}$=0V~3.6V | | | ±5 | | | ±30 | μA |
| Output OFF-State Current | A or B Port (Note 3) | $I_{OZ}$ | $V_{CCA}$=$V_{CCB}$=3.6V<br>$V_{OUT}$=0V or $V_{CCO}$ | | | ±5 | | | ±30 | μA |
| | Suspend Mode A Port (Note 3) | | $V_{CCA}$=3.6V, $V_{CCB}$=0V<br>$V_{OUT}$=0V or $V_{CCO}$ | | | ±5 | | | ±30 | μA |
| | Suspend Mode B Port (Note 3) | | $V_{CCA}$=0V, $V_{CCB}$=3.6V<br>$V_{OUT}$=0V or $V_{CCO}$ | | | ±5 | | | ±30 | μA |
| Quiescent Supply Current | A Port | $I_{CCA}$ | $V_{CCA}$=$V_{CCB}$=0.8V~3.6V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | | | 10 | | | 55 | μA |
| | | | $V_{CCA}$=$V_{CCB}$=1.1V~3.6V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | | | 8 | | | 50 | μA |
| | | | $V_{CCA}$=3.6V, $V_{CCB}$=0V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | | | 8 | | | 50 | μA |
| | | | $V_{CCA}$=0V, $V_{CCB}$=3.6V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | -2 | | | -12 | | | μA |
| Quiescent Supply Current | B Port | $I_{CCB}$ | $V_{CCA}$=$V_{CCB}$=0.8V~3.6V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | | | 10 | | | 55 | μA |
| | | | $V_{CCA}$=$V_{CCB}$=1.1V~3.6V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | | | 8 | | | 50 | μA |
| | | | $V_{CCA}$=3.6V, $V_{CCB}$=0V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | -2 | | | -12 | | | μA |
| | | | $V_{CCA}$=0V, $V_{CCB}$=3.6V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | | | 8 | | | 50 | μA |
| Quiescent Supply Current & Quiescent Supply Current | | $I_{CCA}$+$I_{CCB}$ | $V_{CCA}$=$V_{CCB}$=0.8V~3.6V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | | | 20 | | | 70 | μA |
| | | | $V_{CCA}$=$V_{CCB}$=1.1V~3.6V<br>$V_{IN}$=0V or $V_{CCI}$, $I_O$=0A | | | 16 | | | 65 | μA |
| Additional Quiescent Supply Current Per Input Pin | | $\Delta I_{CC}$ | $V_{CCA}$= $V_{CCB}$ =3.6V, $V_{IN}$=3V | | | 500 | | | 650 | μA |

Notes: 1. $V_{CCI}$ is the $V_{CC}$ associated with the input port.
2. $V_{CCO}$ is the $V_{CC}$ associated with the output port.
3. For I/O ports, the parameter $I_{OZ}$ includes the input leakage current.

## ■ SWITCHING CHARACTERISTICS

(Over recommended operating free-air temperature range, $V_{CCA}$=0.8V, $T_A$=25°C unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Propagation Delay From Input (A) to Output (B) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=0.8V | | 65 | | ns |
| | | $V_{CCB}$=1.2V | | 60 | | ns |
| | | $V_{CCB}$=1.5V±0.1V | | 56 | | ns |
| | | $V_{CCB}$=1.8V±0.15V | | 52 | | ns |
| | | $V_{CCB}$=2.5V±0.2V | | 44 | | ns |
| | | $V_{CCB}$=3.3V±0.3V | | 35 | | ns |
| Propagation Delay From Input (B) to Output (A) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=0.8V | | 65 | | ns |
| | | $V_{CCB}$=1.2V | | 61 | | ns |
| | | $V_{CCB}$=1.5V±0.1V | | 58 | | ns |
| | | $V_{CCB}$=1.8V±0.15V | | 55 | | ns |
| | | $V_{CCB}$=2.5V±0.2V | | 48 | | ns |
| | | $V_{CCB}$=3.3V±0.3V | | 40 | | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=0.8V | | 60 | | ns |
| | | $V_{CCB}$=1.2V | | 60 | | ns |
| | | $V_{CCB}$=1.5V±0.1V | | 60 | | ns |
| | | $V_{CCB}$=1.8V±0.15V | | 60 | | ns |
| | | $V_{CCB}$=2.5V±0.2V | | 60 | | ns |
| | | $V_{CCB}$=3.3V±0.3V | | 60 | | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=0.8V | | 70 | | ns |
| | | $V_{CCB}$=1.2V | | 66 | | ns |
| | | $V_{CCB}$=1.5V±0.1V | | 63 | | ns |
| | | $V_{CCB}$=1.8V±0.15V | | 60 | | ns |
| | | $V_{CCB}$=2.5V±0.2V | | 53 | | ns |
| | | $V_{CCB}$=3.3V±0.3V | | 45 | | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=0.8V | | 70 | | ns |
| | | $V_{CCB}$=1.2V | | 70 | | ns |
| | | $V_{CCB}$=1.5V±0.1V | | 70 | | ns |
| | | $V_{CCB}$=1.8V±0.15V | | 70 | | ns |
| | | $V_{CCB}$=2.5V±0.2V | | 70 | | ns |
| | | $V_{CCB}$=3.3V±0.3V | | 70 | | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=0.8V | | 75 | | ns |
| | | $V_{CCB}$=1.2V | | 68 | | ns |
| | | $V_{CCB}$=1.5V±0.1V | | 63 | | ns |
| | | $V_{CCB}$=1.8V±0.15V | | 58 | | ns |
| | | $V_{CCB}$=2.5V±0.2V | | 47 | | ns |
| | | $V_{CCB}$=3.3V±0.3V | | 35 | | ns |

## ■ SWITCHING CHARACTERISTICS (Cont.)

(Over recommended operating free-air temperature range, $V_{CCB}$=0.8V, $T_A$=25°C unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Propagation Delay From Input (A) to Output (B) | $t_{PLH}$ $t_{PHL}$ | $V_{CCA}$=0.8V | | 65 | | ns |
| | | $V_{CCA}$=1.2V | | 62 | | ns |
| | | $V_{CCA}$=1.5V±0.1V | | 59 | | ns |
| | | $V_{CCA}$=1.8V±0.15V | | 56 | | ns |
| | | $V_{CCA}$=2.5V±0.2V | | 49 | | ns |
| | | $V_{CCA}$=3.3V±0.3V | | 45 | | ns |
| Propagation Delay From Input (B) to Output (A) | $t_{PLH}$ $t_{PHL}$ | $V_{CCA}$=0.8V | | 65 | | ns |
| | | $V_{CCA}$=1.2V | | 58 | | ns |
| | | $V_{CCA}$=1.5V±0.1V | | 53 | | ns |
| | | $V_{CCA}$=1.8V±0.15V | | 48 | | ns |
| | | $V_{CCA}$=2.5V±0.2V | | 37 | | ns |
| | | $V_{CCA}$=3.3V±0.3V | | 25 | | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCA}$=0.8V | | 60 | | ns |
| | | $V_{CCA}$=1.2V | | 50 | | ns |
| | | $V_{CCA}$=1.5V±0.1V | | 43 | | ns |
| | | $V_{CCA}$=1.8V±0.15V | | 36 | | ns |
| | | $V_{CCA}$=2.5V±0.2V | | 20 | | ns |
| | | $V_{CCA}$=3.3V±0.3V | | 6 | | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCA}$=0.8V | | 70 | | ns |
| | | $V_{CCA}$=1.2V | | 63 | | ns |
| | | $V_{CCA}$=1.5V±0.1V | | 58 | | ns |
| | | $V_{CCA}$=1.8V±0.15V | | 53 | | ns |
| | | $V_{CCA}$=2.5V±0.2V | | 41 | | ns |
| | | $V_{CCA}$=3.3V±0.3V | | 30 | | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PZH}$ $t_{PZL}$ | $V_{CCA}$=0.8V | | 70 | | ns |
| | | $V_{CCA}$=1.2V | | 60 | | ns |
| | | $V_{CCA}$=1.5V±0.1V | | 52 | | ns |
| | | $V_{CCA}$=1.8V±0.15V | | 44 | | ns |
| | | $V_{CCA}$=2.5V±0.2V | | 26 | | ns |
| | | $V_{CCA}$=3.3V±0.3V | | 5 | | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PZH}$ $t_{PZL}$ | $V_{CCA}$=0.8V | | 75 | | ns |
| | | $V_{CCA}$=1.2V | | 71 | | ns |
| | | $V_{CCA}$=1.5V±0.1V | | 66 | | ns |
| | | $V_{CCA}$=1.8V±0.15V | | 61 | | ns |
| | | $V_{CCA}$=2.5V±0.2V | | 52 | | ns |
| | | $V_{CCA}$=3.3V±0.3V | | 45 | | ns |

## ■ SWITCHING CHARACTERISTICS (Cont.)

(Over recommended operating free-air temperature range, $V_{CCA}$=1.2V±0.1V, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | $T_A$=25°C | | | $T_A$=-40°C~+125°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Propagation Delay From Input (A) to Output (B) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 20.1 | 1 | | 22.1 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 16 | 1 | | 18 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 13 | 1 | | 15 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 12.8 | 1 | | 14.8 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 11.6 | 1 | | 13.6 | ns |
| Propagation Delay From Input (B) to Output (A) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 20.1 | 1 | | 24.1 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 17.4 | 1 | | 21.4 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 15.2 | 1 | | 19.2 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 13.9 | 1 | | 16.9 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 12.7 | 1 | | 14.7 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 19.5 | 1 | | 21.5 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 19.5 | 1 | | 21.5 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 19.5 | 1 | | 21.5 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 19.5 | 1 | | 21.5 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 19.5 | 1 | | 21.5 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 18.8 | 1 | | 20.8 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 15.9 | 1 | | 17.9 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 15.2 | 1 | | 17.2 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 14.1 | 1 | | 16.1 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 15.2 | 1 | | 17.2 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 22.6 | 1 | | 24.6 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 22.6 | 1 | | 24.6 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 22.6 | 1 | | 24.6 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 22.6 | 1 | | 24.6 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 22.6 | 1 | | 24.6 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 22.3 | 1 | | 24.3 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 17.7 | 1 | | 19.7 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 15.9 | 1 | | 17.9 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 14 | 1 | | 16 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 13.6 | 1 | | 15.6 | ns |

## ■ SWITCHING CHARACTERISTICS (Cont.)

(Over recommended operating free-air temperature range, $V_{CCA}$=1.5V±0.1V, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | $T_A$=25°C | | | $T_A$=-40°C~+125°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Propagation Delay From Input (A) to Output (B) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 18.4 | 1 | | 20.4 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 13.2 | 1 | | 15.2 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 11.9 | 1 | | 13.9 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 9.6 | 1 | | 11.6 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 8 | 1 | | 11 | ns |
| Propagation Delay From Input (B) to Output (A) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 16 | 1 | | 18 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 13.2 | 1 | | 15.2 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 11 | 1 | | 13 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 9.6 | 1 | | 11.6 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 9.5 | 1 | | 11.5 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 12.9 | 1 | | 14.9 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 12.9 | 1 | | 14.9 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 12.9 | 1 | | 14.9 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 12.9 | 1 | | 14.9 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 12.9 | 1 | | 14.9 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 16.8 | 1 | | 18.8 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 13.7 | 1 | | 15.7 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 13.3 | 1 | | 15.3 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 12.2 | 1 | | 14.2 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 12.1 | 1 | | 14.1 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 14.7 | 1 | | 16.7 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 14.7 | 1 | | 16.7 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 14.7 | 1 | | 16.7 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 14.7 | 1 | | 16.7 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 14.7 | 1 | | 16.7 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 20.6 | 1 | | 22.6 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 13.1 | 1 | | 17.1 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 12.9 | 1 | | 16.9 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 11.4 | 1 | | 15.4 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 10.5 | 1 | | 14.5 | ns |

## ■ SWITCHING CHARACTERISTICS (Cont.)

(Over recommended operating free-air temperature range, $V_{CCA}$=1.8V±0.15V, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | $T_A$=25°C | | | $T_A$=-40°C~+125°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Propagation Delay From Input (A) to Output (B) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 17.2 | 1 | | 19.2 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 12 | 1 | | 14 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 10.6 | 1 | | 12.6 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 8.2 | 1 | | 10.2 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 6.6 | 1 | | 8.6 | ns |
| Propagation Delay From Input (B) to Output (A) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 14 | 1 | | 16 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 10.9 | 1 | | 12.9 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 8.6 | 1 | | 10.6 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 8.4 | 1 | | 10.4 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 7.1 | 1 | | 9.1 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 10.6 | 1 | | 12.6 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 10.6 | 1 | | 12.6 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 10.6 | 1 | | 12.6 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 10.6 | 1 | | 12.6 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 10.6 | 1 | | 12.6 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 15.4 | 1 | | 17.4 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 12.1 | 1 | | 14.1 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 12 | 1 | | 14 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 10.7 | 1 | | 12.7 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 10.8 | 1 | | 12.8 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 11.8 | 1 | | 13.8 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 11.8 | 1 | | 13.8 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 11.8 | 1 | | 13.8 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 11.8 | 1 | | 13.8 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 11.8 | 1 | | 13.8 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 19 | 1 | | 22 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 11.3 | 1 | | 13.3 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 11 | 1 | | 13 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 9.3 | 1 | | 11.3 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 8.8 | 1 | | 10.8 | ns |

## ■ SWITCHING CHARACTERISTICS (Cont.)

(Over recommended operating free-air temperature range, $V_{CCA}$=2.5V±0.2V, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | $T_A$=25°C | | | $T_A$=-40°C~+125°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Propagation Delay From Input (A) to Output (B) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 15.9 | 1 | | 17.9 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 10.6 | 1 | | 12.6 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 9.4 | 1 | | 11.4 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 6.9 | 1 | | 8.9 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 5.3 | 1 | | 7.3 | ns |
| Propagation Delay From Input (B) to Output (A) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 11.8 | 1 | | 13.8 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 8.6 | 1 | | 10.6 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 6.2 | 1 | | 8.2 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 5.9 | 1 | | 8.9 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 5.5 | 1 | | 8.5 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 6.6 | 1 | | 8.6 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 13.7 | 1 | | 15.7 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 10.8 | 1 | | 12.8 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 10.3 | 1 | | 12.3 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 8.8 | 1 | | 10.8 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 9.6 | 1 | | 11.6 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 7.2 | 1 | | 9.2 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 7.2 | 1 | | 9.2 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 7.2 | 1 | | 9.2 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 7.2 | 1 | | 9.2 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 7.2 | 1 | | 9.2 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 17.7 | 1 | | 19.7 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 9.9 | 1 | | 11.9 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 8.9 | 1 | | 10.9 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 7.3 | 1 | | 9.3 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 6.9 | 1 | | 8.9 | ns |

## ■ SWITCHING CHARACTERISTICS (Cont.)

(Over recommended operating free-air temperature range, $V_{CCA}$=3.3V±0.3V, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | $T_A$=25°C | | | $T_A$=-40°C~+125°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Propagation Delay From Input (A) to Output (B) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 15.7 | 1 | | 17.7 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 11.5 | 1 | | 13.5 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 9.1 | 1 | | 11.1 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 6.5 | 1 | | 8.5 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 5.1 | 1 | | 7.1 | ns |
| Propagation Delay From Input (B) to Output (A) | $t_{PLH}$ $t_{PHL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 10.6 | 1 | | 12.6 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 8 | 1 | | 10 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 5.3 | 1 | | 9.3 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 5.1 | 1 | | 9.1 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 7.2 | 1 | | 9.2 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 7.2 | 1 | | 9.2 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 7.2 | 1 | | 9.2 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 7.2 | 1 | | 9.2 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 7.2 | 1 | | 9.2 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PHZ}$ $t_{PLZ}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 13.4 | 1 | | 15.4 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 10.4 | 1 | | 12.4 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 10.1 | 1 | | 12.1 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 8.6 | 1 | | 10.6 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 9.5 | 1 | | 11.5 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (A) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 6.6 | 1 | | 8.6 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 6.6 | 1 | | 8.6 | ns |
| Propagation Delay From Input ( $\overline{OE}$ ) to Output (B) | $t_{PZH}$ $t_{PZL}$ | $V_{CCB}$=1.2V±0.1V | 1 | | 16.5 | 1 | | 18.5 | ns |
| | | $V_{CCB}$=1.5V±0.1V | 1 | | 8.8 | 1 | | 10.8 | ns |
| | | $V_{CCB}$=1.8V±0.15V | 1 | | 7.8 | 1 | | 9.8 | ns |
| | | $V_{CCB}$=2.5V±0.2V | 1 | | 6.1 | 1 | | 8.1 | ns |
| | | $V_{CCB}$=3.3V±0.3V | 1 | | 5.6 | 1 | | 7.6 | ns |

■ OPERATING CHARACTERISTIC ($C_L$=0, f=10MHz, $t_r$=$t_f$=1ns, $T_A$=25°C, unless otherwise specified)

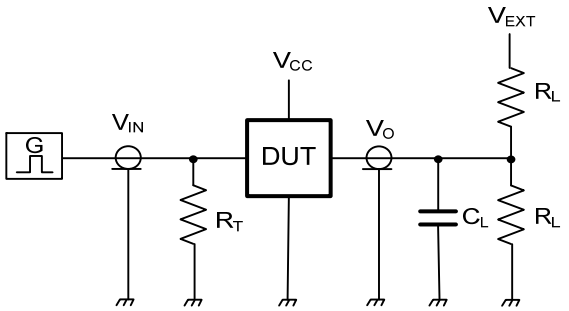
| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Power Dissipation Capacitance (A to B) | Outputs enabled | $C_{PDA}$ | $V_{CCA}$=$V_{CCB}$=0.8V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.2V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.5V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.8V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=2.5V | | 0.3 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=3.3V | | 0.4 | | pF |
| | Outputs disabled | | $V_{CCA}$=$V_{CCB}$=0.8V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.2V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.5V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.8V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=2.5V | | 0.3 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=3.3V | | 0.4 | | pF |
| Power Dissipation Capacitance (B to A) | Outputs enabled | | $V_{CCA}$=$V_{CCB}$=0.8V | | 9.5 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.2V | | 9.7 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.5V | | 9.8 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.8V | | 9.9 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=2.5V | | 10.7 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=3.3V | | 11.9 | | pF |
| | Outputs disabled | | $V_{CCA}$=$V_{CCB}$=0.8V | | 0.6 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.2V | | 0.6 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.5V | | 0.6 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.8V | | 0.6 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=2.5V | | 0.7 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=3.3V | | 0.7 | | pF |
| Power Dissipation Capacitance (A to B) | Outputs enabled | $C_{PDB}$ | $V_{CCA}$=$V_{CCB}$=0.8V | | 9.5 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.2V | | 9.7 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.5V | | 9.8 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.8V | | 9.9 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=2.5V | | 10.7 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=3.3V | | 11.9 | | pF |
| | Outputs disabled | | $V_{CCA}$=$V_{CCB}$=0.8V | | 0.6 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.2V | | 0.6 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.5V | | 0.6 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.8V | | 0.6 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=2.5V | | 0.7 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=3.3V | | 0.7 | | pF |
| Power Dissipation Capacitance (B to A) | Outputs enabled | | $V_{CCA}$=$V_{CCB}$=0.8V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.2V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.5V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.8V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=2.5V | | 0.3 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=3.3V | | 0.4 | | pF |
| | Outputs disabled | | $V_{CCA}$=$V_{CCB}$=0.8V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.2V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.5V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=1.8V | | 0.2 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=2.5V | | 0.3 | | pF |
| | | | $V_{CCA}$=$V_{CCB}$=3.3V | | 0.4 | | pF |

Note: Power dissipation capacitance per transceiver.

■ OPERATING CHARACTERISTICS (f=10MHz, $T_A$=25°C, unless otherwise specified)

| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Input Capacitance | DIR, $\overline{OE}$ input | $C_{IN}$ | $V_{CCA}$=$V_{CCB}$=3.3V, $V_{IN}$=0V or 3.3V | | 2.0 | | pF |
| Input / Output Capacitance | A or B port | $C_{IO}$ | $V_{CCA}$=$V_{CCB}$=3.3V, $V_{OUT}$=3.3V or 0V | | 4.0 | | pF |

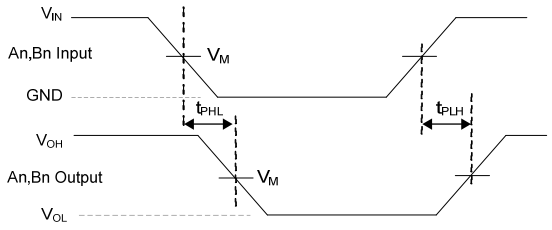
## ■ TEST CIRCUIT AND WAVEFORMS



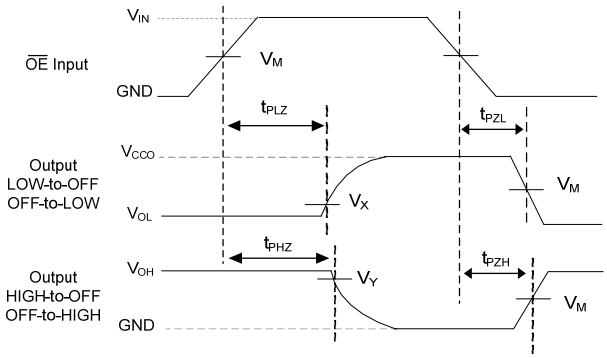

| TEST | $V_{EXT}$ |
|---|---|
| $t_{PLH}/t_{PHL}$ | OPEN |
| $t_{PZH}/t_{PHZ}$ | GND |
| $t_{PZL}/t_{PLZ}$ | 2×$V_{CCO}$ |

**TEST CIRCUIT**

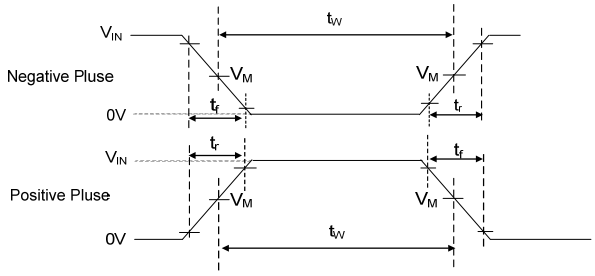
| Supply voltage | Inputs | | $V_M$ | $C_L$ | $R_L$ | $V_X$ | $V_Y$ |
|---|---|---|---|---|---|---|---|
| $V_{CCA}$ , $V_{CCB}$ | $V_{IN}$ | $t_r$, $t_f$ | | | | | |
| 0.8V~1.6V | $V_{CCI}$ | 20 ns | $V_{CCI(O)}/2$ | 15pF | 2KΩ | $V_{OL}$+0.1V | $V_{OH}$-0.1V |
| 1.65V~2.7V | $V_{CCI}$ | 20ns | $V_{CCI(O)}/2$ | 15pF | 2KΩ | $V_{OL}$+0.15V | $V_{OH}$-0.15V |
| 3V~3.6V | $V_{CCI}$ | 20ns | $V_{CCI(O)}/2$ | 15pF | 2KΩ | $V_{OL}$+0.3V | $V_{OH}$-0.3V |




**PROPAGATION DELAY TIMES**




**ENABLE AND DISABLE TIMES**




**MEASURING SWITCHING TIMES**

Notes: 1. $C_L$ includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics: PRR ≤1MHz, $Z_O$ = 50Ω.
3. $V_{CCI}$ is the $V_{CC}$ associated with the input port.
4. $V_{CCO}$ is the $V_{CC}$ associated with the output port.