# 74AVC2T245

## 2-bit dual supply translating transceiver with configurable voltage translation; 3-state

Rev. 2 — 6 April 2017 **Product data sheet**

## 1 General description

The 74AVC2T245 is a 2-bit, dual supply transceiver that enables bidirectional level translation. The device can be used as two 1-bit transceivers or as a 2-bit transceiver. It features two 2-bit input-output ports (An and Bn) and direction control inputs (DIRn), an output enable input ($\overline{OE}$) and dual supply pins ($V_{CC(A)}$ and $V_{CC(B)}$). Both $V_{CC(A)}$ and $V_{CC(B)}$ can be supplied at any voltage between 0.8 V and 3.6 V making the device suitable for translating between any of the low voltage nodes (0.8 V, 1.2 V, 1.5 V, 1.8 V, 2.5 V and 3.3 V). Pins An, $\overline{OE}$ and DIRn are referenced to $V_{CC(A)}$ and pins Bn are referenced to $V_{CC(B)}$. A HIGH on DIRn allows transmission from An to Bn and a LOW on DIRn allows transmission from Bn to An. The output enable input ($\overline{OE}$) can be used to disable the outputs so the buses are effectively isolated.

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. In suspend mode when either $V_{CC(A)}$ or $V_{CC(B)}$ are at GND level, both An and Bn are in the high-impedance OFF-state.

## 2 Features and benefits

- Wide supply voltage range:
  - $V_{CC(A)}$: 0.8 V to 3.6 V
  - $V_{CC(B)}$: 0.8 V to 3.6 V
- Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - JESD8-11 (0.9 V to 1.65 V)
  - JESD8-7 (1.2 V to 1.95 V)
  - JESD8-5 (1.8 V to 2.7 V)
  - JESD8-B (2.7 V to 3.6 V)
- ESD protection:
  - HBM JESD22-A114E Class 3B exceeds 8000 V
  - CDM JESD22-C101C exceeds 1000 V
- Maximum data rates:
  - 380 Mbit/s (≥ 1.8 V to 3.3 V translation)
  - 200 Mbit/s (≥ 1.1 V to 3.3 V translation)
  - 200 Mbit/s (≥ 1.1 V to 2.5 V translation)
  - 200 Mbit/s (≥ 1.1 V to 1.8 V translation)
  - 150 Mbit/s (≥ 1.1 V to 1.5 V translation)
  - 100 Mbit/s (≥ 1.1 V to 1.2 V translation)
- Suspend mode
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V

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- $I_{OFF}$ circuitry provides partial Power-down mode operation
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

## 3 Ordering information

**Table 1. Ordering information**

| Type number | Package | | | |
|---|---|---|---|---|
| | Temperature range | Name | Description | Version |
| 74AVC2T245GU | -40 °C to +125 °C | XQFN10 | plastic, extremely thin quad flat package; no leads; 10 terminals; body 1.40 x 1.80 x 0.50 mm | SOT1160-1 |

## 4 Marking

**Table 2. Marking codes**

| Type number | Marking code |
|---|---|
| 74AVC2T245GU | B3 |

## 5 Functional diagram

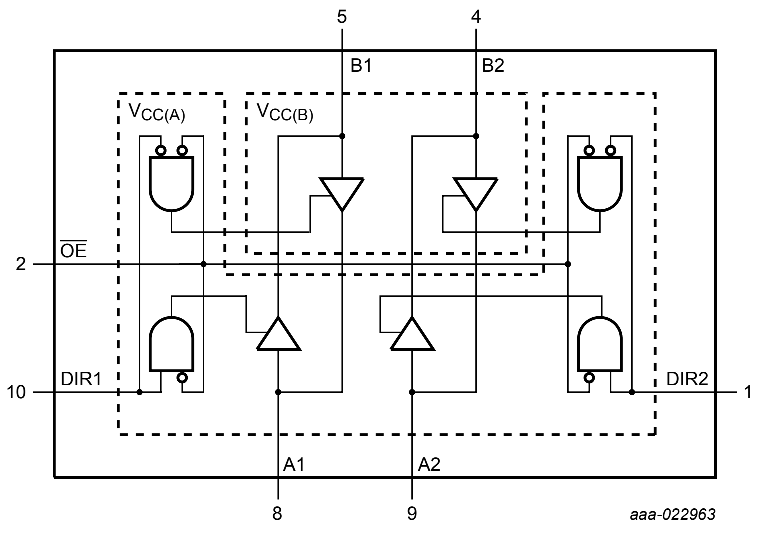



**Figure 1. Logic symbol**

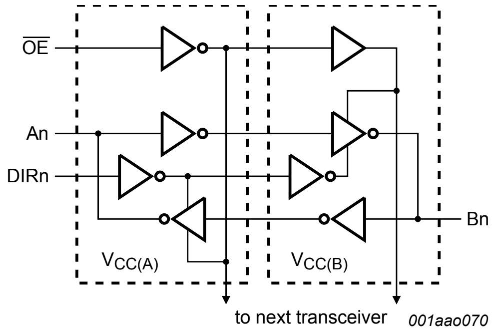



**Figure 2. Logic diagram (one 1-bit transceiver)**

# 6 Pinning information

## 6.1 Pinning

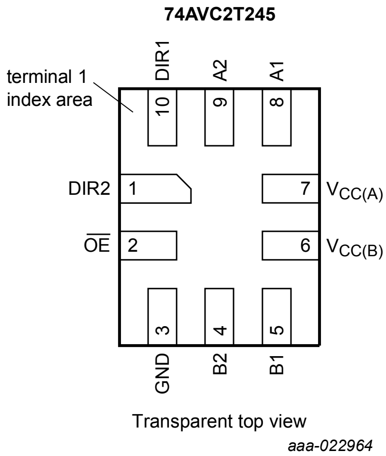



**Figure 3. Pin configuration SOT1160-1 (XQFN10)**

## 6.2 Pin description

**Table 3. Pin description**

| Symbol | Pin | Description |
|---|---|---|
| DIR1, DIR2 | 10, 1 | direction control |
| $\overline{OE}$ | 2 | output enable input (active LOW) |
| $V_{CC(B)}$ | 6 | supply voltage B (Bn inputs are referenced to $V_{CC(B)}$) |
| $V_{CC(A)}$ | 7 | supply voltage A (An, $\overline{OE}$ and DIRn inputs are referenced to $V_{CC(A)}$) |
| A1, A2 | 8, 9 | data input or output |
| B1, B2 | 5, 4 | data input or output |
| GND | 3 | ground (0 V) |

# 7 Functional description

**Table 4. Function table [1]**

| Supply voltage | Input | | Input/output | |
|---|---|---|---|---|
| $V_{CC(A)}$, $V_{CC(B)}$ | $\overline{OE}$ [2] | DIRn [2] | An [2] | Bn [2] |
| 0.8 V to 3.6 V | L | L | An = Bn | input |
| 0.8 V to 3.6 V | L | H | input | Bn = An |
| 0.8 V to 3.6 V | H | X | Z | Z |
| GND [3] | X | X | Z | Z |

[1] H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.
[2] The An, DIRn and $\overline{OE}$ input circuit is referenced to $V_{CC(A)}$; The Bn input circuit is referenced to $V_{CC(B)}$.
[3] If at least one of $V_{CC(A)}$ or $V_{CC(B)}$ is at GND level, the device goes into suspend mode.

# 8 Limiting values

**Table 5. Limiting values**

*In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{CC(A)}$ | supply voltage A | | -0.5 | +4.6 | V |
| $V_{CC(B)}$ | supply voltage B | | -0.5 | +4.6 | V |
| $I_{IK}$ | input clamping current | $V_I < 0$ V | -50 | - | mA |
| $V_I$ | input voltage | [1] | -0.5 | +4.6 | V |
| $I_{OK}$ | output clamping current | $V_O < 0$ V | -50 | - | mA |
| $V_O$ | output voltage | Active mode [1] [2] [3] | -0.5 | $V_{CCO}$ + 0.5 | V |
| | | Suspend or 3-state mode [1] | -0.5 | +4.6 | V |
| $I_O$ | output current | $V_O$ = 0 V to $V_{CCO}$ [2] | - | ±50 | mA |
| $I_{CC}$ | supply current | $I_{CC(A)}$ or $I_{CC(B)}$ | - | 100 | mA |
| $I_{GND}$ | ground current | | -100 | - | mA |
| $T_{stg}$ | storage temperature | | -65 | +150 | °C |
| $P_{tot}$ | total power dissipation | $T_{amb}$ = -40 °C to +125 °C | - | 250 | mW |

[1] The minimum input voltage ratings and output voltage ratings may be exceeded if the input and output current ratings are observed.
[2] $V_{CCO}$ is the supply voltage associated with the output port.
[3] $V_{CCO}$ + 0.5 V should not exceed 4.6 V.

# 9 Recommended operating conditions

**Table 6. Recommended operating conditions**

*Voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{CC(A)}$ | supply voltage A | | 0.8 | 3.6 | V |
| $V_{CC(B)}$ | supply voltage B | | 0.8 | 3.6 | V |
| $V_I$ | input voltage | | 0 | 3.6 | V |
| $V_O$ | output voltage | Active mode [1] | 0 | $V_{CCO}$ | V |
| | | Suspend or 3-state mode | 0 | 3.6 | V |
| $T_{amb}$ | ambient temperature | | -40 | +125 | °C |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CCI}$ =0.8 V to 3.6 V [2] | - | 5 | ns/V |

[1] $V_{CCO}$ is the supply voltage associated with the output port.
[2] $V_{CCI}$ is the supply voltage associated with the input port.

# 10 Static characteristics

**Table 7. Typical static characteristics at $T_{amb}$ = 25 °C [1] [2]**

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ | | | | |
| | | $I_O$ = -1.5 mA; $V_{CC(A)} = V_{CC(B)}$ = 0.8 V | - | 0.69 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ | | | | |
| | | $I_O$ = 1.5 mA; $V_{CC(A)} = V_{CC(B)}$ = 0.8 V | - | 0.07 | - | V |
| $I_I$ | input leakage current | DIRn, $\overline{OE}$ input; $V_I$ = 0 V or 3.6 V; $V_{CC(A)} = V_{CC(B)}$ = 0.8 V to 3.6 V | - | ±0.025 | ±0.25 | μA |
| $I_{OZ}$ | OFF-state output current | A or B port; $V_O$ = 0 V or $V_{CCO}$; $V_{CC(A)} = V_{CC(B)}$ = 3.6 V [3] | - | ±0.5 | ±2.5 | μA |
| | | suspend mode A port; $V_O$ = 0 V or $V_{CCO}$; $V_{CC(A)}$ = 3.6 V; $V_{CC(B)}$ = 0 V [3] | - | ±0.5 | ±2.5 | μA |
| | | suspend mode B port; $V_O$ = 0 V or $V_{CCO}$; $V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 3.6 V [3] | - | ±0.5 | ±2.5 | μA |
| $I_{OFF}$ | power-off leakage current | $V_I$ or $V_O$ = 0 V to 3.6 V | - | ±0.1 | ±1 | μA |
| | | A port; $V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 0.8 V to 3.6 V | - | ±0.1 | ±1 | μA |
| | | B port; $V_{CC(B)}$ = 0 V; $V_{CC(A)}$ = 0.8 V to 3.6 V | - | ±0.1 | ±1 | μA |
| $C_I$ | input capacitance | DIRn, $\overline{OE}$ input; $V_I$ = 0 V or 3.3 V; $V_{CC(A)} = V_{CC(B)}$ = 3.3 V | - | 2.0 | - | pF |
| $C_{I/O}$ | input/output capacitance | A and B port; $V_O$ = 3.3 V or 0 V; $V_{CC(A)} = V_{CC(B)}$ = 3.3 V | - | 4.0 | - | pF |

[1] $V_{CCO}$ is the supply voltage associated with the output port.
[2] $V_{CCI}$ is the supply voltage associated with the data input port.

[3] For I/O ports, the parameter $I_{OZ}$ includes the input leakage current.

**Table 8. Static characteristics [1] [2]**

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | |
| $V_{IH}$ | HIGH-level input voltage | data input | | | | | |
| | | $V_{CCI}$ = 0.8 V | $0.70V_{CCI}$ | - | $0.70V_{CCI}$ | - | V |
| | | $V_{CCI}$ = 1.1 V to 1.95 V | $0.65V_{CCI}$ | - | $0.65V_{CCI}$ | - | V |
| | | $V_{CCI}$ = 2.3 V to 2.7 V | 1.6 | - | 1.6 | - | V |
| | | $V_{CCI}$ = 3.0 V to 3.6 V | 2 | - | 2 | - | V |
| | | DIRn, $\overline{OE}$ input | | | | | |
| | | $V_{CC(A)}$ = 0.8 V | $0.70V_{CC(A)}$ | - | $0.70V_{CC(A)}$ | - | V |
| | | $V_{CC(A)}$ = 1.1 V to 1.95 V | $0.65V_{CC(A)}$ | - | $0.65V_{CC(A)}$ | - | V |
| | | $V_{CC(A)}$ = 2.3 V to 2.7 V | 1.6 | - | 1.6 | - | V |
| | | $V_{CC(A)}$ = 3.0 V to 3.6 V | 2 | - | 2 | - | V |
| $V_{IL}$ | LOW-level input voltage | data input | | | | | |
| | | $V_{CCI}$ = 0.8 V | - | $0.30V_{CCI}$ | - | $0.30V_{CCI}$ | V |
| | | $V_{CCI}$ = 1.1 V to 1.95 V | - | $0.35V_{CCI}$ | - | $0.35V_{CCI}$ | V |
| | | $V_{CCI}$ = 2.3 V to 2.7 V | - | 0.7 | - | 0.7 | V |
| | | $V_{CCI}$ = 3.0 V to 3.6 V | - | 0.8 | - | 0.8 | V |
| | | DIRn, $\overline{OE}$ input | | | | | |
| | | $V_{CC(A)}$ = 0.8 V | - | $0.30V_{CC(A)}$ | - | $0.30V_{CC(A)}$ | V |
| | | $V_{CC(A)}$ = 1.1 V to 1.95 V | - | $0.35V_{CC(A)}$ | - | $0.35V_{CC(A)}$ | V |
| | | $V_{CC(A)}$ = 2.3 V to 2.7 V | - | 0.7 | - | 0.7 | V |
| | | $V_{CC(A)}$ = 3.0 V to 3.6 V | - | 0.8 | - | 0.8 | V |
| $V_{OH}$ | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ | | | | | |
| | | $I_O$ = -100 μA; $V_{CC(A)} = V_{CC(B)}$ = 0.8 V to 3.6 V | $V_{CCO}$ - 0.1 | - | $V_{CCO}$ - 0.1 | - | V |
| | | $I_O$ = -3 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V | 0.85 | - | 0.85 | - | V |
| | | $I_O$ = -6 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.4 V | 1.05 | - | 1.05 | - | V |
| | | $I_O$ = -8 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.65 V | 1.2 | - | 1.2 | - | V |
| | | $I_O$ = -9 mA; $V_{CC(A)} = V_{CC(B)}$ = 2.3 V | 1.75 | - | 1.75 | - | V |
| | | $I_O$ = -12 mA; $V_{CC(A)} = V_{CC(B)}$ = 3.0 V | 2.3 | - | 2.3 | - | V |

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | |
| $V_{OL}$ | LOW-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ | | | | | |
| | | $I_O = 100\ \mu A$; $V_{CC(A)} = V_{CC(B)} = 0.8\ V$ to $3.6\ V$ | - | 0.1 | - | 0.1 | V |
| | | $I_O = 3\ mA$; $V_{CC(A)} = V_{CC(B)} = 1.1\ V$ | - | 0.25 | - | 0.25 | V |
| | | $I_O = 6\ mA$; $V_{CC(A)} = V_{CC(B)} = 1.4\ V$ | - | 0.35 | - | 0.35 | V |
| | | $I_O = 8\ mA$; $V_{CC(A)} = V_{CC(B)} = 1.65\ V$ | - | 0.45 | - | 0.45 | V |
| | | $I_O = 9\ mA$; $V_{CC(A)} = V_{CC(B)} = 2.3\ V$ | - | 0.55 | - | 0.55 | V |
| | | $I_O = 12\ mA$; $V_{CC(A)} = V_{CC(B)} = 3.0\ V$ | - | 0.7 | - | 0.7 | V |
| $I_I$ | input leakage current | DIRn, $\overline{OE}$ input; $V_I = 0\ V$ or $3.6\ V$; $V_{CC(A)} = V_{CC(B)} = 0.8\ V$ to $3.6\ V$ | - | ±1 | - | ±5 | μA |
| $I_{OZ}$ | OFF-state output current | A or B port; $V_O = 0\ V$ or $V_{CCO}$; $V_{CC(A)} = V_{CC(B)} = 3.6\ V$ [3] | - | ±5 | - | ±30 | μA |
| | | suspend mode A port; $V_O = 0\ V$ or $V_{CCO}$; $V_{CC(A)} = 3.6\ V$; $V_{CC(B)} = 0\ V$ [3] | - | ±5 | - | ±30 | μA |
| | | suspend mode B port; $V_O = 0\ V$ or $V_{CCO}$; $V_{CC(A)} = 0\ V$; $V_{CC(B)} = 3.6\ V$ [3] | - | ±5 | - | ±30 | μA |
| $I_{OFF}$ | power-off leakage current | A port; $V_I$ or $V_O = 0\ V$ to $3.6\ V$; $V_{CC(A)} = 0\ V$; $V_{CC(B)} = 0.8\ V$ to $3.6\ V$ | - | ±5 | - | ±30 | μA |
| | | B port; $V_I$ or $V_O = 0\ V$ to $3.6\ V$; $V_{CC(B)} = 0\ V$; $V_{CC(A)} = 0.8\ V$ to $3.6\ V$ | - | ±5 | - | ±30 | μA |
| $I_{CC}$ | supply current | A port; $V_I = 0\ V$ or $V_{CCI}$; $I_O = 0\ A$ | | | | | |
| | | $V_{CC(A)} = 0.8\ V$ to $3.6\ V$; $V_{CC(B)} = 0.8\ V$ to $3.6\ V$ | - | 10 | - | 55 | μA |
| | | $V_{CC(A)} = 1.1\ V$ to $3.6\ V$; $V_{CC(B)} = 1.1\ V$ to $3.6\ V$ | - | 8 | - | 50 | μA |
| | | $V_{CC(A)} = 3.6\ V$; $V_{CC(B)} = 0\ V$ | - | 8 | - | 50 | μA |
| | | $V_{CC(A)} = 0\ V$; $V_{CC(B)} = 3.6\ V$ | -2 | - | -12 | - | μA |
| | | B port; $V_I = 0\ V$ or $V_{CCI}$; $I_O = 0\ A$ | | | | | |
| | | $V_{CC(A)} = 0.8\ V$ to $3.6\ V$; $V_{CC(B)} = 0.8\ V$ to $3.6\ V$ | - | 10 | - | 55 | μA |
| | | $V_{CC(A)} = 1.1\ V$ to $3.6\ V$; $V_{CC(B)} = 1.1\ V$ to $3.6\ V$ | - | 8 | - | 50 | μA |
| | | $V_{CC(A)} = 3.6\ V$; $V_{CC(B)} = 0\ V$ | -2 | - | -12 | - | μA |
| | | $V_{CC(A)} = 0\ V$; $V_{CC(B)} = 3.6\ V$ | - | 8 | - | 50 | μA |

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | |
| | | A plus B port ($I_{CC(A)} + I_{CC(B)}$); $I_O$ = 0 A; $V_I$ = 0 V or $V_{CCI}$; $V_{CC(A)}$ = 0.8 V to 3.6 V; $V_{CC(B)}$ = 0.8 V to 3.6 V | - | 20 | - | 70 | μA |
| | | A plus B port ($I_{CC(A)} + I_{CC(B)}$); $I_O$ = 0 A; $V_I$ = 0 V or $V_{CCI}$; $V_{CC(A)}$ = 1.1 V to 3.6 V; $V_{CC(B)}$ = 1.1 V to 3.6 V | - | 16 | - | 65 | μA |
| $\Delta I_{CC}$ | additional supply current | $V_I$ = 3.0 V; $V_{CC(A)} = V_{CC(B)}$ = 3.6 V | - | 500 | - | 650 | μA |

[1] $V_{CCO}$ is the supply voltage associated with the output port.

[2] $V_{CCI}$ is the supply voltage associated with the data input port.

[3] For I/O ports, the parameter $I_{OZ}$ includes the input leakage current.

**Table 9. Typical total supply current ($I_{CC(A)} + I_{CC(B)}$)**

| $V_{CC(A)}$ | $V_{CC(B)}$ | | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|
| | 0 V | 0.8 V | 1.2 V | 1.5 V | 1.8 V | 2.5 V | 3.3 V | |
| 0 V | 0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | μA |
| 0.8 V | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.3 | 1.6 | μA |
| 1.2 V | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.8 | μA |
| 1.5 V | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.4 | μA |
| 1.8 V | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | μA |
| 2.5 V | 0.1 | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | μA |
| 3.3 V | 0.1 | 1.6 | 0.8 | 0.4 | 0.2 | 0.1 | 0.1 | μA |

## 11 Dynamic characteristics

**Table 10. Typical power dissipation capacitance at $V_{CC(A)} = V_{CC(B)}$ and $T_{amb} = 25$ °C [1] [2]**

*Voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | $V_{CC(A)} = V_{CC(B)}$ | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | 0.8 V | 1.2 V | 1.5 V | 1.8 V | 2.5 V | 3.3 V | |
| $C_{PD}$ | power dissipation capacitance | A port: (direction An to Bn); output enabled | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.6 | pF |
| | | A port: (direction An to Bn); output disabled | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.6 | pF |
| | | A port: (direction Bn to An); output enabled | 9 | 9 | 9 | 10 | 12 | 14 | pF |
| | | A port: (direction Bn to An); output disabled | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 | 0.9 | pF |
| | | B port: (direction An to Bn); output enabled | 9 | 9 | 9 | 10 | 12 | 14 | pF |
| | | B port: (direction An to Bn); output disabled | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 | 0.9 | pF |
| | | B port: (direction Bn to An); output enabled | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.6 | pF |
| | | B port: (direction Bn to An); output disabled | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.6 | pF |

[1] $C_{PD}$ is used to determine the dynamic power dissipation ($P_D$ in μW).
$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ where:
$f_i$ = input frequency in MHz;
$f_o$ = output frequency in MHz;
$C_L$ = load capacitance in pF;
$V_{CC}$ = supply voltage in V;
N = number of inputs switching;
$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of the outputs.

[2] $f_i$ = 10 MHz; $V_I$ = GND to $V_{CC}$; $t_r = t_f$ = 1 ns; $C_L$ = 0 pF; $R_L = \infty$ Ω.

**Table 11. Typical dynamic characteristics at $V_{CC(A)}$ = 0.8 V and $T_{amb} = 25$ °C [1]**

*Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 6; for waveforms see Figure 4 and Figure 5*

| Symbol | Parameter | Conditions | $V_{CC(B)}$ | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | 0.8 V | 1.2 V | 1.5 V | 1.8 V | 2.5 V | 3.3 V | |
| $t_{pd}$ | propagation delay | An to Bn | 17.5 | 8.0 | 7.0 | 6.7 | 6.6 | 6.7 | ns |
| | | Bn to An | 17.6 | 14.8 | 14.4 | 14.2 | 14.0 | 13.8 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | ns |
| | | $\overline{OE}$ to Bn | 19.7 | 10.9 | 9.8 | 10.0 | 9.3 | 9.9 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 30.3 | 30.2 | 30.2 | 30.2 | 30.1 | 30.1 | ns |
| | | $\overline{OE}$ to Bn | 34.3 | 22.7 | 21.5 | 21.0 | 21.1 | 21.5 | ns |

[1] $t_{pd}$ is the same as $t_{PLH}$ and $t_{PHL}$; $t_{dis}$ is the same as $t_{PLZ}$ and $t_{PHZ}$; $t_{en}$ is the same as $t_{PZL}$ and $t_{PZH}$.

**Table 12. Typical dynamic characteristics at $V_{CC(B)}$ = 0.8 V and $T_{amb}$ = 25 °C [1]**

*Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 6; for waveforms see Figure 4 and Figure 5*

| Symbol | Parameter | Conditions | $V_{CC(A)}$ | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | 0.8 V | 1.2 V | 1.5 V | 1.8 V | 2.5 V | 3.3 V | |
| $t_{pd}$ | propagation delay | An to Bn | 17.5 | 14.8 | 14.3 | 14.1 | 13.9 | 13.8 | ns |
| | | Bn to An | 17.6 | 8.0 | 7.1 | 6.8 | 6.6 | 6.7 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 17.0 | 5.8 | 4.1 | 4.0 | 2.9 | 3.4 | ns |
| | | $\overline{OE}$ to Bn | 19.7 | 15.6 | 15.0 | 14.7 | 14.4 | 14.1 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 30.3 | 6.2 | 4.1 | 3.1 | 2.2 | 1.8 | ns |
| | | $\overline{OE}$ to Bn | 34.3 | 18.1 | 17.2 | 16.8 | 16.5 | 16.3 | ns |

[1] $t_{pd}$ is the same as $t_{PLH}$ and $t_{PHL}$; $t_{dis}$ is the same as $t_{PLZ}$ and $t_{PHZ}$; $t_{en}$ is the same as $t_{PZL}$ and $t_{PZH}$.

**Table 13. Dynamic characteristics for temperature range -40 °C to +85 °C [1]**

*Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 6; for waveforms see Figure 4 and Figure 5*

| Symbol | Parameter | Conditions | $V_{CC(B)}$ | | | | | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1.2 V±0.1 V | | 1.5 V±0.1 V | | 1.8 V±0.15 V | | 2.5 V±0.2 V | | 3.3 V±0.3 V | | |
| | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | |
| $V_{CC(A)}$ = 1.1 V to 1.3 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 1.1 | 9.2 | 1.1 | 6.9 | 0.9 | 5.9 | 0.9 | 5.3 | 0.8 | 5.2 | ns |
| | | Bn to An | 1.1 | 9.2 | 1 | 8.5 | 1 | 8.2 | 0.9 | 8.2 | 0.8 | 8 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 2.4 | 10 | 2.4 | 10 | 2.4 | 10 | 2.4 | 10 | 2.4 | 10 | ns |
| | | $\overline{OE}$ to Bn | 2.7 | 10.8 | 2.3 | 8.4 | 2.5 | 8 | 2.1 | 7 | 2.6 | 7.8 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 1.5 | 12.4 | 1.5 | 12.4 | 1.5 | 12.4 | 1.5 | 12.4 | 1.5 | 12.4 | ns |
| | | $\overline{OE}$ to Bn | 1.9 | 12.6 | 1.7 | 9.3 | 1.6 | 8 | 1.5 | 6.9 | 1.4 | 6.7 | ns |
| $V_{CC(A)}$ = 1.4 V to 1.6 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 1 | 8.5 | 1 | 5.5 | 0.9 | 4.7 | 0.9 | 3.8 | 0.8 | 3.5 | ns |
| | | Bn to An | 1.1 | 6.9 | 1 | 5.5 | 1 | 5.3 | 0.9 | 5 | 0.8 | 4.8 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 2 | 6.3 | 2 | 6.3 | 2 | 6.3 | 2 | 6.3 | 2 | 6.3 | ns |
| | | $\overline{OE}$ to Bn | 2.6 | 9.8 | 2.2 | 6.7 | 2.5 | 6.5 | 2 | 5.4 | 2.5 | 6 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 1.2 | 6.8 | 1.2 | 6.8 | 1.2 | 6.8 | 1.2 | 6.8 | 1.2 | 6.8 | ns |
| | | $\overline{OE}$ to Bn | 1.7 | 11 | 1.5 | 6.8 | 1.4 | 5.8 | 1.3 | 4.8 | 1.3 | 4.4 | ns |
| $V_{CC(A)}$ = 1.65 V to 1.95 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 1 | 8.2 | 1 | 5.3 | 0.9 | 4.4 | 0.8 | 3.4 | 0.7 | 3.2 | ns |
| | | Bn to An | 0.9 | 5.9 | 0.9 | 4.7 | 0.9 | 4.4 | 0.8 | 4.1 | 0.7 | 3.9 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 2.1 | 5.9 | 2.1 | 5.9 | 2.1 | 5.9 | 2.1 | 5.9 | 2.1 | 5.9 | ns |
| | | $\overline{OE}$ to Bn | 2.4 | 9.5 | 2.1 | 6.4 | 2.3 | 6.2 | 1.8 | 5 | 2.3 | 5.6 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 1.1 | 5.3 | 1.1 | 5.3 | 1.1 | 5.3 | 1.1 | 5.3 | 1.1 | 5.3 | ns |
| | | $\overline{OE}$ to Bn | 1.6 | 10.5 | 1.4 | 6.3 | 1.3 | 5.3 | 1.2 | 4.3 | 1.1 | 3.9 | ns |

| Symbol | Parameter | Conditions | $V_{CC(B)}$ | | | | | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1.2 V±0.1 V | | 1.5 V±0.1 V | | 1.8 V±0.15 V | | 2.5 V±0.2 V | | 3.3 V±0.3 V | | |
| | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | |
| $V_{CC(A)}$ = 2.3 V to 2.7 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 0.9 | 8.2 | 0.9 | 5 | 0.8 | 4.1 | 0.7 | 3.1 | 0.6 | 2.7 | ns |
| | | Bn to An | 0.9 | 5.3 | 0.9 | 3.8 | 0.8 | 3.4 | 0.7 | 3.1 | 0.6 | 3 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 1.5 | 4.3 | 1.5 | 4.3 | 1.5 | 4.3 | 1.5 | 4.3 | 1.5 | 4.3 | ns |
| | | $\overline{OE}$ to Bn | 2.3 | 9 | 1.9 | 6 | 2.2 | 5.8 | 1.6 | 4.6 | 2.1 | 5.1 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 0.9 | 3.6 | 0.9 | 3.6 | 0.9 | 3.6 | 0.9 | 3.6 | 0.9 | 3.6 | ns |
| | | $\overline{OE}$ to Bn | 1.3 | 10 | 1.3 | 5.8 | 1.2 | 4.8 | 1.1 | 3.7 | 1.1 | 3.3 | ns |
| $V_{CC(A)}$ = 3.0 V to 3.6 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 0.8 | 8 | 0.8 | 4.8 | 0.7 | 3.9 | 0.6 | 3 | 0.5 | 2.6 | ns |
| | | Bn to An | 0.8 | 5.2 | 0.8 | 3.5 | 0.7 | 3.2 | 0.6 | 2.7 | 0.5 | 2.6 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 1.9 | 4.7 | 1.9 | 4.7 | 1.9 | 4.7 | 1.9 | 4.7 | 1.9 | 4.7 | ns |
| | | $\overline{OE}$ to Bn | 2.2 | 8.6 | 1.9 | 5.8 | 2 | 5.6 | 1.5 | 4.4 | 2 | 5 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 0.9 | 2.9 | 0.9 | 2.9 | 0.9 | 2.9 | 0.9 | 2.9 | 0.9 | 2.9 | ns |
| | | $\overline{OE}$ to Bn | 1.5 | 9.8 | 1.4 | 5.6 | 1.2 | 4.6 | 1.1 | 3.5 | 1.1 | 3.1 | ns |

[1] $t_{pd}$ is the same as $t_{PLH}$ and $t_{PHL}$; $t_{dis}$ is the same as $t_{PLZ}$ and $t_{PHZ}$; $t_{en}$ is the same as $t_{PZL}$ and $t_{PZH}$.

**Table 14. Dynamic characteristics for temperature range -40 °C to +125 °C [1]**

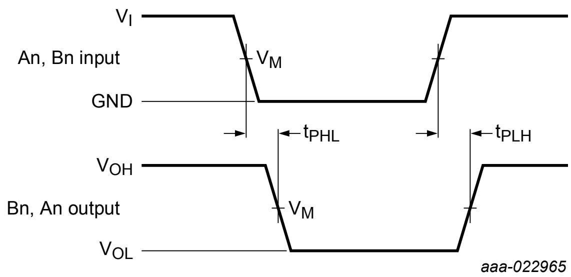
*Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 6; for waveforms see Figure 4 and Figure 5*

| Symbol | Parameter | Conditions | $V_{CC(B)}$ | | | | | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1.2 V±0.1 V | | 1.5 V±0.1 V | | 1.8 V±0.15 V | | 2.5 V±0.2 V | | 3.3 V±0.3 V | | |
| | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | |
| $V_{CC(A)}$ = 1.1 V to 1.3 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 1.1 | 9.7 | 1.1 | 7.3 | 0.9 | 6.3 | 0.9 | 5.6 | 0.8 | 5.5 | ns |
| | | Bn to An | 1.1 | 9.7 | 1 | 8.9 | 1 | 8.6 | 0.9 | 8.6 | 0.8 | 8.4 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 2.4 | 10.5 | 2.4 | 10.5 | 2.4 | 10.5 | 2.4 | 10.5 | 2.4 | 10.5 | ns |
| | | $\overline{OE}$ to Bn | 2.7 | 11.6 | 2.3 | 9.1 | 2.5 | 8.6 | 2.1 | 7.5 | 2.6 | 8.4 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 1.5 | 13 | 1.5 | 13 | 1.5 | 13 | 1.5 | 13 | 1.5 | 13 | ns |
| | | $\overline{OE}$ to Bn | 1.9 | 13 | 1.7 | 9.6 | 1.6 | 8.4 | 1.5 | 7.2 | 1.4 | 7 | ns |
| $V_{CC(A)}$ = 1.4 V to 1.6 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 1 | 8.9 | 1 | 5.7 | 0.9 | 4.9 | 0.9 | 4 | 0.8 | 3.7 | ns |
| | | Bn to An | 1.1 | 7.3 | 1 | 5.7 | 1 | 5.5 | 0.9 | 5.2 | 0.8 | 5.1 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 2 | 6.7 | 2 | 6.7 | 2 | 6.7 | 2 | 6.7 | 2 | 6.7 | ns |
| | | $\overline{OE}$ to Bn | 2.6 | 10.2 | 2.2 | 7.1 | 2.5 | 6.9 | 2 | 5.7 | 2.5 | 6.3 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 1.2 | 7.3 | 1.2 | 7.3 | 1.2 | 7.3 | 1.2 | 7.3 | 1.2 | 7.3 | ns |

| Symbol | Parameter | Conditions | $V_{CC(B)}$ | | | | | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1.2 V±0.1 V | | 1.5 V±0.1 V | | 1.8 V±0.15 V | | 2.5 V±0.2 V | | 3.3 V±0.3 V | | |
| | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | |
| | | $\overline{OE}$ to Bn | 1.7 | 11.4 | 1.5 | 7.1 | 1.4 | 6.1 | 1.3 | 5.1 | 1.3 | 4.7 | ns |
| $V_{CC(A)}$ = 1.65 V to 1.95 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 1 | 8.6 | 1 | 5.5 | 0.9 | 4.6 | 0.8 | 3.6 | 0.7 | 3.4 | ns |
| | | Bn to An | 0.9 | 6.3 | 0.9 | 4.9 | 0.9 | 4.6 | 0.8 | 4.3 | 0.7 | 4.1 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 2.1 | 6.2 | 2.1 | 6.2 | 2.1 | 6.2 | 2.1 | 6.2 | 2.1 | 6.2 | ns |
| | | $\overline{OE}$ to Bn | 2.4 | 10 | 2.1 | 6.8 | 2.3 | 6.6 | 1.8 | 5.3 | 2.3 | 5.9 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 1.1 | 5.7 | 1.1 | 5.7 | 1.1 | 5.7 | 1.1 | 5.7 | 1.1 | 5.7 | ns |
| | | $\overline{OE}$ to Bn | 1.6 | 11 | 1.4 | 6.7 | 1.3 | 5.7 | 1.2 | 4.6 | 1.1 | 4.2 | ns |
| $V_{CC(A)}$ = 2.3 V to 2.7 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 0.9 | 8.6 | 0.9 | 5.2 | 0.8 | 4.3 | 0.7 | 3.3 | 0.6 | 2.9 | ns |
| | | Bn to An | 0.9 | 5.6 | 0.9 | 4 | 0.8 | 3.6 | 0.7 | 3.3 | 0.6 | 3.2 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 1.5 | 4.6 | 1.5 | 4.6 | 1.5 | 4.6 | 1.5 | 4.6 | 1.5 | 4.6 | ns |
| | | $\overline{OE}$ to Bn | 2.3 | 9.5 | 1.9 | 6.4 | 2.2 | 6.1 | 1.6 | 4.9 | 2.1 | 5.4 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 0.9 | 3.9 | 0.9 | 3.9 | 0.9 | 3.9 | 0.9 | 3.9 | 0.9 | 3.9 | ns |
| | | $\overline{OE}$ to Bn | 1.3 | 10.5 | 1.3 | 6.2 | 1.2 | 5.1 | 1.1 | 4 | 1.1 | 3.6 | ns |
| $V_{CC(A)}$ = 3.0 V to 3.6 V | | | | | | | | | | | | | |
| $t_{pd}$ | propagation delay | An to Bn | 0.8 | 8.4 | 0.8 | 5.1 | 0.7 | 4.1 | 0.6 | 3.2 | 0.5 | 2.7 | ns |
| | | Bn to An | 0.8 | 5.5 | 0.8 | 3.7 | 0.7 | 3.4 | 0.6 | 2.9 | 0.5 | 2.7 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to An | 1.9 | 5 | 1.9 | 5 | 1.9 | 5 | 1.9 | 5 | 1.9 | 5 | ns |
| | | $\overline{OE}$ to Bn | 2.2 | 9 | 1.9 | 6.2 | 2 | 5.9 | 1.5 | 4.7 | 2 | 5.2 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to An | 0.9 | 3.1 | 0.9 | 3.1 | 0.9 | 3.1 | 0.9 | 3.1 | 0.9 | 3.1 | ns |
| | | $\overline{OE}$ to Bn | 1.5 | 10.2 | 1.4 | 5.9 | 1.2 | 5 | 1.1 | 3.7 | 1.1 | 3.3 | ns |

[1] $t_{pd}$ is the same as $t_{PLH}$ and $t_{PHL}$; $t_{dis}$ is the same as $t_{PLZ}$ and $t_{PHZ}$; $t_{en}$ is the same as $t_{PZL}$ and $t_{PZH}$.

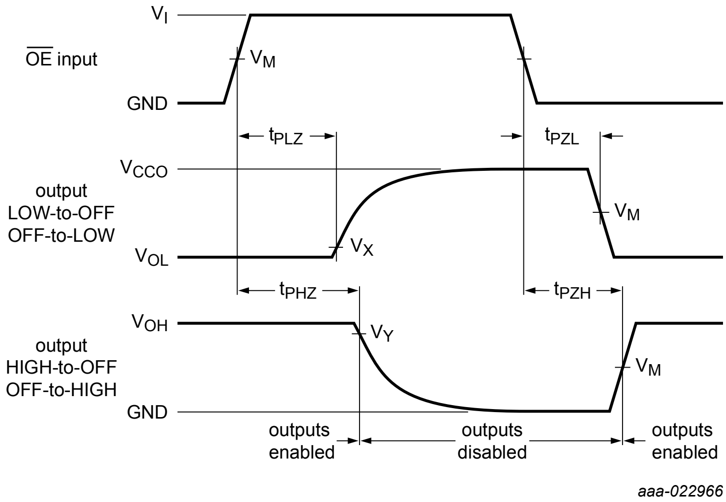
## 11.1 Waveforms and test circuit




Measurement points are given in Table 15.

$V_{OL}$ and $V_{OH}$ are typical output voltage levels that occur with the output load.

**Figure 4. The data input (An, Bn) to output (Bn, An) propagation delay times**




Measurement points are given in Table 15.

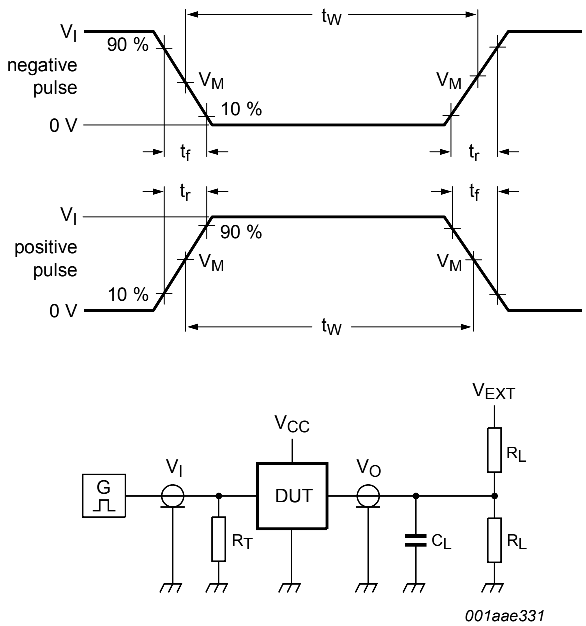
$V_{OL}$ and $V_{OH}$ are typical output voltage levels that occur with the output load.

**Figure 5. Enable and disable times**

**Table 15. Measurement points**

| Supply voltage | Input [1] | Output [2] | | |
|---|---|---|---|---|
| $V_{CC(A)}$, $V_{CC(B)}$ | $V_M$ | $V_M$ | $V_X$ | $V_Y$ |
| 0.8 V to 1.6 V | $0.5V_{CCI}$ | $0.5V_{CCO}$ | $V_{OL}$ + 0.1 V | $V_{OH}$ - 0.1 V |
| 1.65 V to 2.7 V | $0.5V_{CCI}$ | $0.5V_{CCO}$ | $V_{OL}$ + 0.15 V | $V_{OH}$ - 0.15 V |
| 3.0 V to 3.6 V | $0.5V_{CCI}$ | $0.5V_{CCO}$ | $V_{OL}$ + 0.3 V | $V_{OH}$ - 0.3 V |

[1] $V_{CCI}$ is the supply voltage associated with the data input port.
[2] $V_{CCO}$ is the supply voltage associated with the output port.




Test data is given in Table 16.

$R_L$ = Load resistance.

$C_L$ = Load capacitance including jig and probe capacitance.

$R_T$ = termination resistance should be equal to output impedance $Z_o$ of the pulse generator.

$V_{EXT}$ = External voltage for measuring switching times.

**Figure 6. Test circuit for measuring switching times**

**Table 16. Test data**

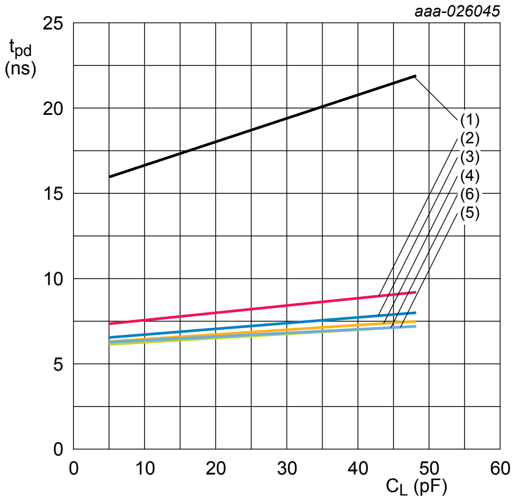
| Supply voltage | Input | | Load | | $V_{EXT}$ | | |
|---|---|---|---|---|---|---|---|
| $V_{CC(A)}$, $V_{CC(B)}$ | $V_I$ [1] | $\Delta t/\Delta V$ [2] | $C_L$ | $R_L$ | $t_{PLH}$, $t_{PHL}$ | $t_{PZH}$, $t_{PHZ}$ | $t_{PZL}$, $t_{PLZ}$ [3] |
| 0.8 V to 1.6 V | $V_{CCI}$ | ≤ 1.0 ns/V | 15 pF | 2 kΩ | open | GND | $2V_{CCO}$ |
| 1.65 V to 2.7 V | $V_{CCI}$ | ≤ 1.0 ns/V | 15 pF | 2 kΩ | open | GND | $2V_{CCO}$ |
| 3.0 V to 3.6 V | $V_{CCI}$ | ≤ 1.0 ns/V | 15 pF | 2 kΩ | open | GND | $2V_{CCO}$ |

[1] $V_{CCI}$ is the supply voltage associated with the data input port.

[2] dV/dt ≥ 1.0 V/ns

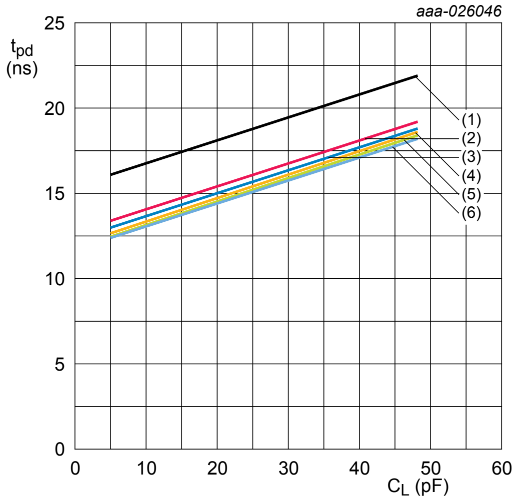
[3] $V_{CCO}$ is the supply voltage associated with the output port.

## 12 Typical propagation delay characteristics




a. Propagation delay (A to B); $V_{CC(A)}$ = 0.8 V

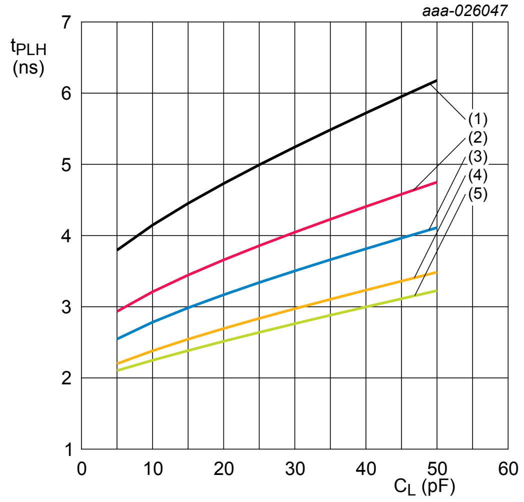
(1) $V_{CC(B)}$ = 0.8 V
(2) $V_{CC(B)}$ = 1.2 V
(3) $V_{CC(B)}$ = 1.5 V
(4) $V_{CC(B)}$ = 1.8 V
(5) $V_{CC(B)}$ = 2.5 V
(6) $V_{CC(B)}$ = 3.3 V



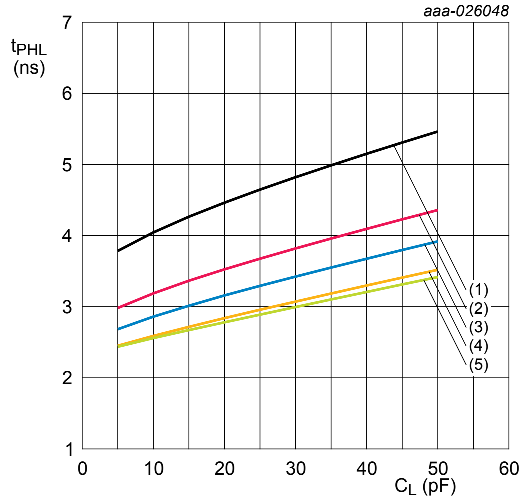

b. Propagation delay (A to B); $V_{CC(B)}$ = 0.8 V

(1) $V_{CC(A)}$ = 0.8 V
(2) $V_{CC(A)}$ = 1.2 V
(3) $V_{CC(A)}$ = 1.5 V
(4) $V_{CC(A)}$ = 1.8 V
(5) $V_{CC(A)}$ = 2.5 V
(6) $V_{CC(A)}$ = 3.3 V

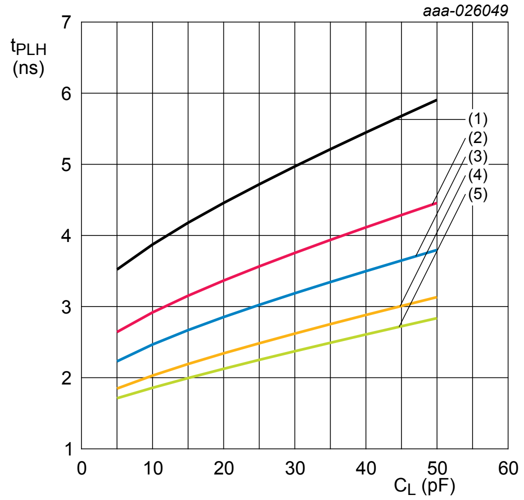
**Figure 7. Typical propagation delay versus load capacitance; $T_{amb}$ = 25 °C**



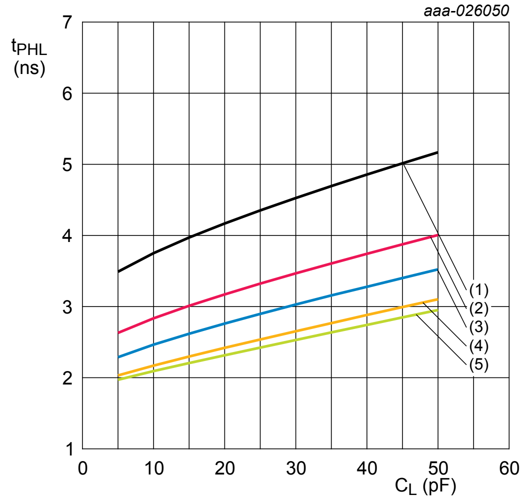

a. LOW to HIGH propagation delay (A to B); $V_{CC(A)}$ = 1.2 V




b. HIGH to LOW propagation delay (A to B); $V_{CC(A)}$ = 1.2 V




c. LOW to HIGH propagation delay (A to B); $V_{CC(A)}$ = 1.5 V




d. HIGH to LOW propagation delay (A to B); $V_{CC(A)}$ = 1.5 V

(1) $V_{CC(B)}$ = 1.2 V

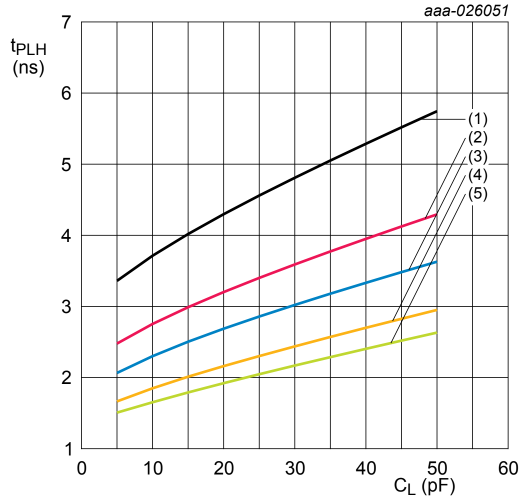
(2) $V_{CC(B)}$ = 1.5 V

(3) $V_{CC(B)}$ = 1.8 V

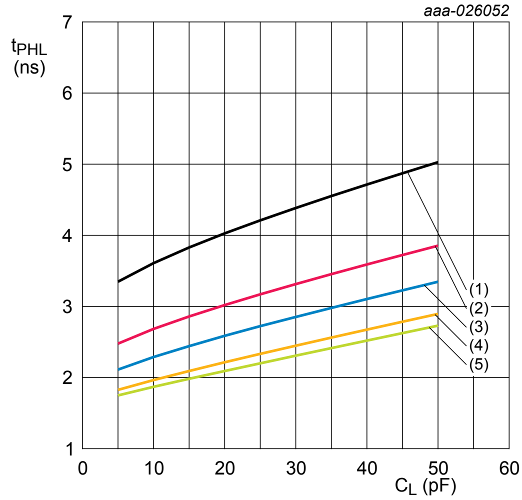
(4) $V_{CC(B)}$ = 2.5 V

(5) $V_{CC(B)}$ = 3.3 V

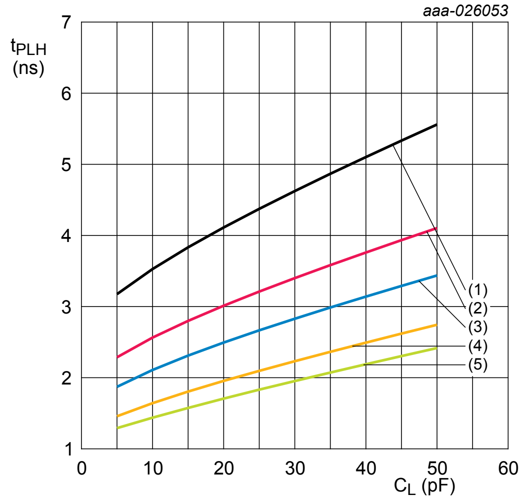
**Figure 8. Typical propagation delay versus load capacitance; $T_{amb}$ = 25 °C**



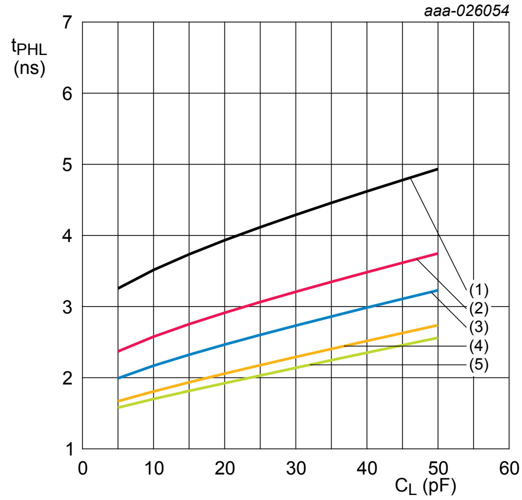

a. LOW to HIGH propagation delay (A to B); $V_{CC(A)}$ = 1.8 V




b. HIGH to LOW propagation delay (A to B); $V_{CC(A)}$ = 1.8 V




c. LOW to HIGH propagation delay (A to B); $V_{CC(A)}$ = 2.5 V




d. HIGH to LOW propagation delay (A to B); $V_{CC(A)}$ = 2.5 V

(1) $V_{CC(B)}$ = 1.2 V

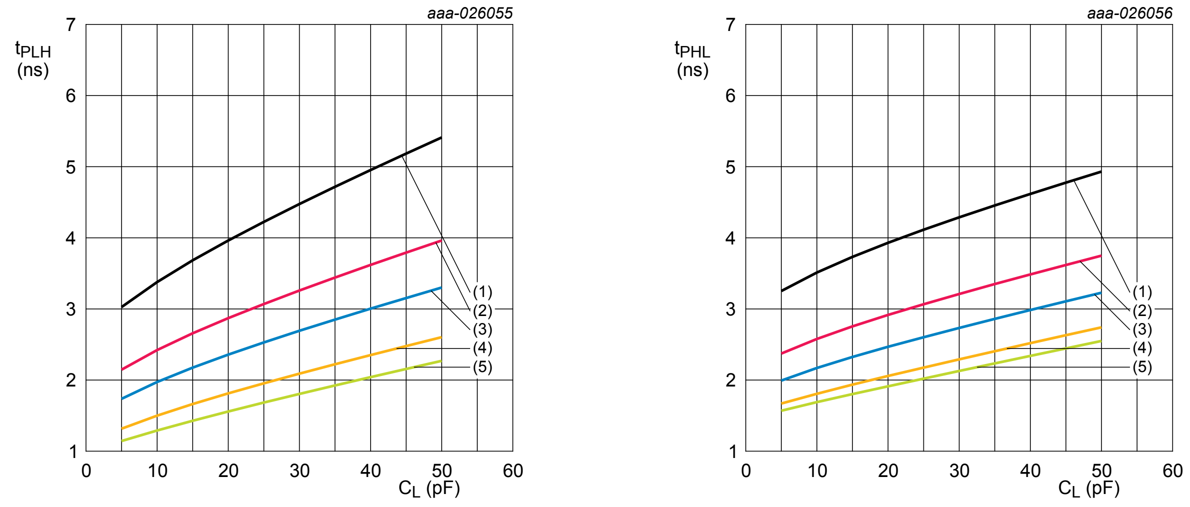
(2) $V_{CC(B)}$ = 1.5 V

(3) $V_{CC(B)}$ = 1.8 V

(4) $V_{CC(B)}$ = 2.5 V

(5) $V_{CC(B)}$ = 3.3 V

**Figure 9. Typical propagation delay versus load capacitance; $T_{amb}$ = 25 °C**




a. LOW to HIGH propagation delay (A to B); $V_{CC(A)}$ = 3.3 V

b. HIGH to LOW propagation delay (A to B); $V_{CC(A)}$ = 3.3 V

(1) $V_{CC(B)}$ = 1.2 V

(2) $V_{CC(B)}$ = 1.5 V

(3) $V_{CC(B)}$ = 1.8 V

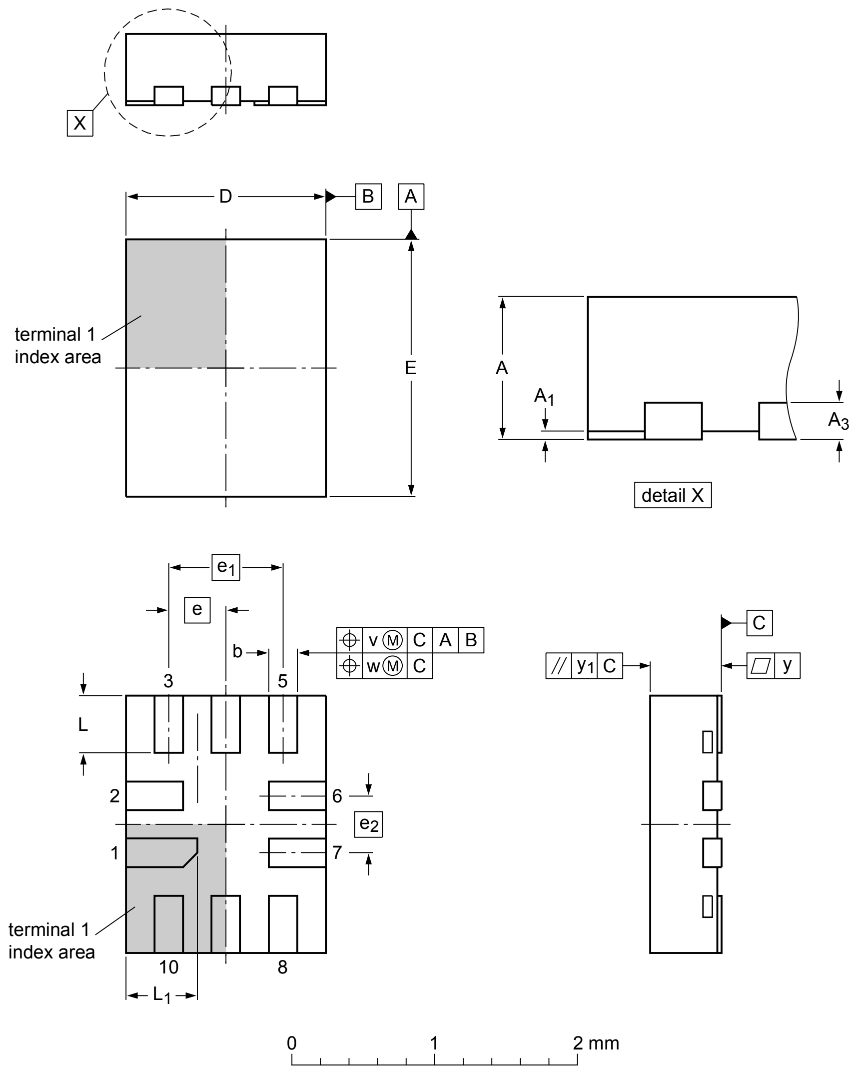
(4) $V_{CC(B)}$ = 2.5 V

(5) $V_{CC(B)}$ = 3.3 V

**Figure 10. Typical propagation delay versus load capacitance; $T_{amb}$ = 25 °C**

# 13 Package outline

**XQFN10: plastic, extremely thin quad flat package; no leads; 10 terminals; body 1.40 x 1.80 x 0.50 mm** **SOT1160-1**




Dimensions

| Unit[(1)] | | A | $A_1$ | $A_3$ | b | D | E | e | $e_1$ | $e_2$ | L | $L_1$ | v | w | y | $y_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 0.5 | 0.05 | | 0.25 | 1.5 | 1.9 | | | | 0.45 | 0.55 | | | | |
| | nom | | | 0.127 | 0.20 | 1.4 | 1.8 | 0.4 | 0.8 | 0.4 | 0.40 | 0.50 | 0.1 | 0.05 | 0.05 | 0.05 |
| | min | | 0.00 | | 0.15 | 1.3 | 1.7 | | | | 0.35 | 0.45 | | | | |

Note

1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

*sot1160-1_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT1160-1 | - - - | - - - | - - - | | | ~~09-12-28~~ 09-12-29 |

Figure 11. Package outline SOT1160-1 (XQFN10)

## 14 Abbreviations

**Table 17. Abbreviations**

| Acronym | Description |
|---|---|
| CDM | Charged Device Model |
| DUT | Device Under Test |
| ESD | ElectroStatic Discharge |
| HBM | Human Body Model |

## 15 Revision history

**Table 18. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74AVC2T245 v.2 | 20170406 | Product data sheet | - | 74AVC2T245 v.1 |
| Modifications: | • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.<br>• Legal texts have been adapted to the new company name where appropriate. | | | |
| 74AVC2T245 v.1 | 20161219 | Product data sheet | - | - |

# 16 Legal information

## 16.1 Data sheet status

| Document status[1][2] | Product status[3] | Definition |
|---|---|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nexperia.com.

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## Contents





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