

# 74AVC8T245

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

Rev. 6 — 31 March 2020

Product data sheet

### 1. General description

The 74AVC8T245 is an 8-bit, dual supply transceiver that enables bidirectional level translation. It features two 8-bit input-output ports (An and Bn), a direction control input (DIR), a 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 DIR are referenced to  $V_{CC(A)}$  and pins Bn are referenced to  $V_{CC(B)}$ . A HIGH on DIR allows transmission from An to Bn and a LOW on DIR 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
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101C exceeds 1000 V
- Maximum data rates:
  - 380 Mbit/s ( $\geq 1.8$  V to 3.3 V translation)
  - 260 Mbit/s ( $\geq 1.1$  V to 3.3 V translation)
  - 260 Mbit/s ( $\geq 1.1$  V to 2.5 V translation)
  - 210 Mbit/s ( $\geq 1.1$  V to 1.8 V translation)
  - 150 Mbit/s ( $\geq 1.1$  V to 1.5 V translation)
  - 100 Mbit/s ( $\geq 1.1$  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
- $I_{OFF}$  circuitry provides partial Power-down mode operation
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

### 3. Ordering information

Table 1. Ordering information

| Type number  | Package           |          |  | Version  |
|--------------|-------------------|----------|--|----------|
|              | Temperature range | Name     | Description  |          |
| 74AVC8T245PW | -40 °C to +125 °C | TSSOP24  | plastic thin shrink small outline package; 24 leads; body width 4.4 mm   | SOT355-1 |
| 74AVC8T245BQ | -40 °C to +125 °C | DHVQFN24 | plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 24 terminals; body 3.5 x 5.5 x 0.85 mm | SOT815-1 |

### 4. Functional diagram

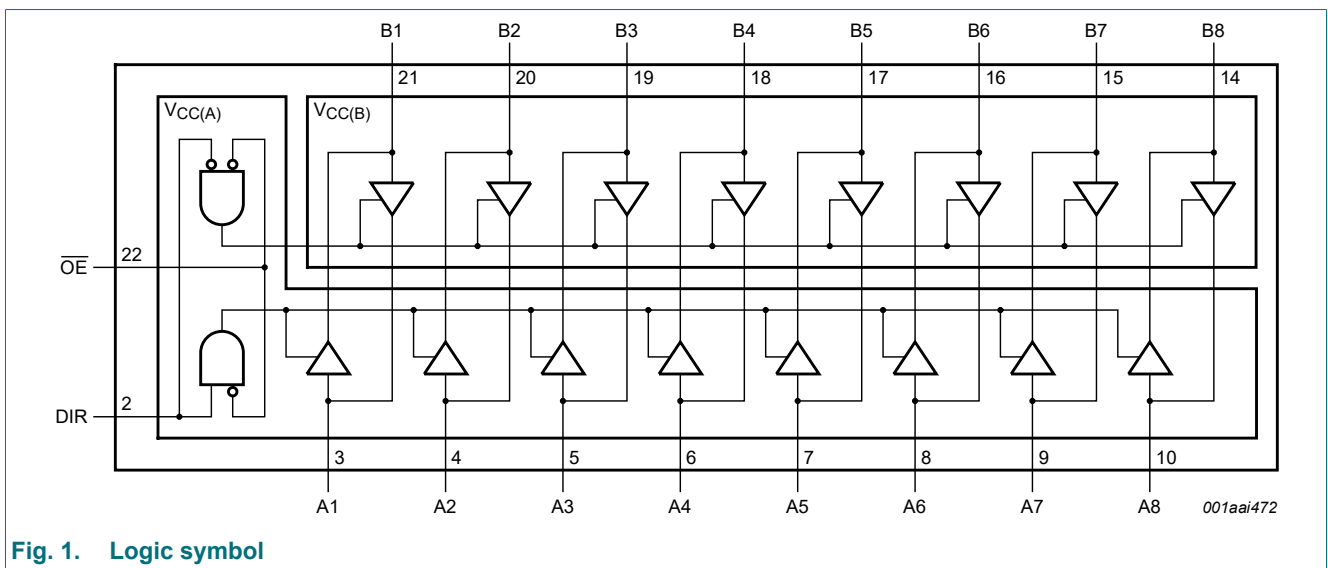


Fig. 1. Logic symbol

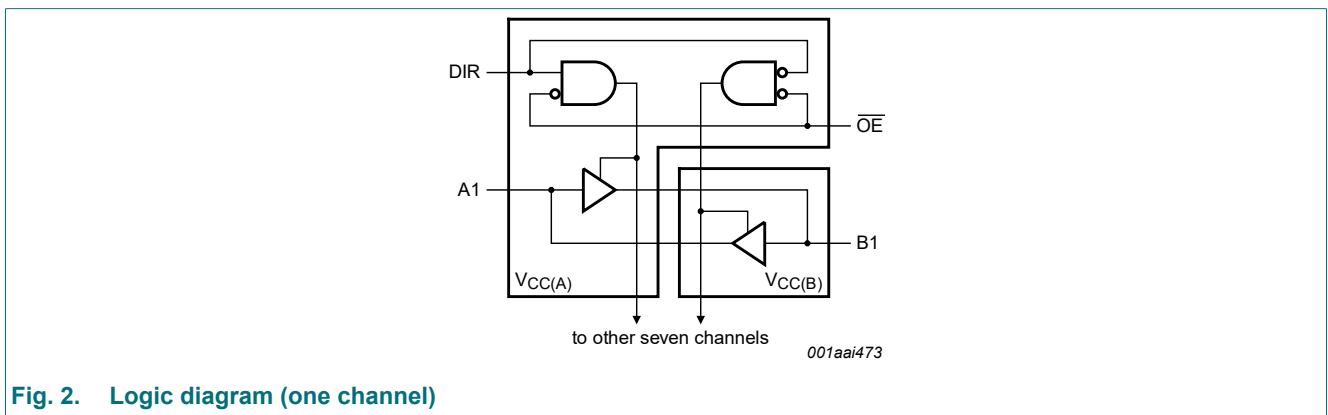


Fig. 2. Logic diagram (one channel)

## 5. Pinning information

### 5.1. Pinning

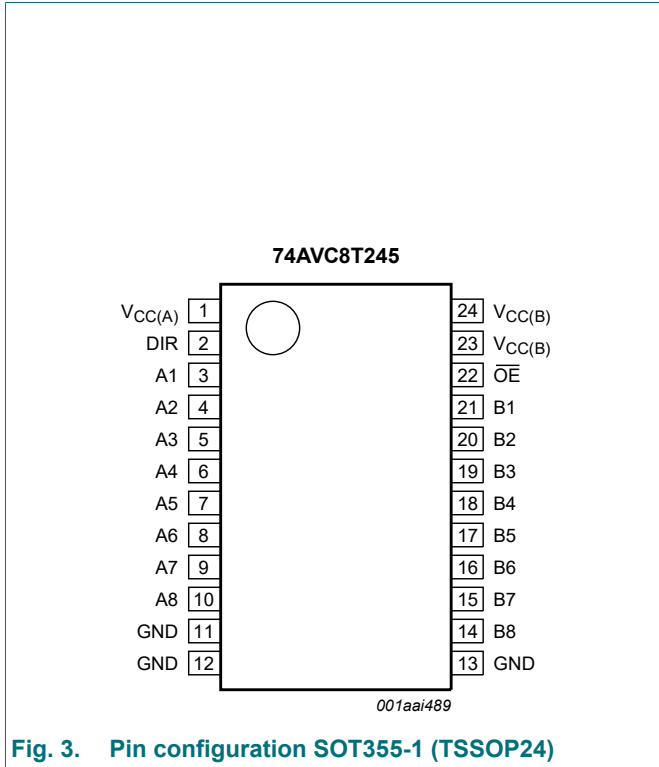


Fig. 3. Pin configuration SOT355-1 (TSSOP24)

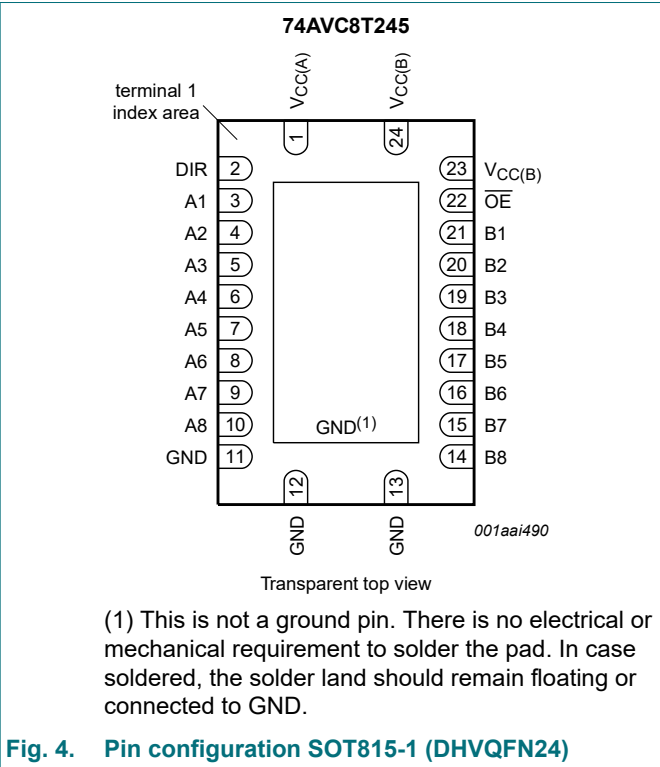


Fig. 4. Pin configuration SOT815-1 (DHFQFN24)

### 5.2. Pin description

Table 2. Pin description

| Symbol                         | Pin                            | Description  |
|--------------------------------|--------------------------------|--|
| $V_{CC(A)}$                    | 1                              | supply voltage A (An, $\overline{OE}$ and DIR inputs are referenced to $V_{CC(A)}$ ) |
| DIR                            | 2                              | direction control  |
| A1, A2, A3, A4, A5, A6, A7, A8 | 3, 4, 5, 6, 7, 8, 9, 10        | data input or output   |
| GND [1]                        | 11, 12, 13                     | ground (0 V)   |
| B1, B2, B3, B4, B5, B6, B7, B8 | 21, 20, 19, 18, 17, 16, 15, 14 | data input or output   |
| $\overline{OE}$                | 22                             | output enable input (active LOW)   |
| $V_{CC(B)}$                    | 23, 24                         | supply voltage B (Bn inputs are referenced to $V_{CC(B)}$ )                          |

[1] All GND pins must be connected to ground (0 V).

## 6. Functional description

**Table 3. Function table**

H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.

| Supply voltage            | Input  |         | Input/output [1] |         |
|---------------------------|--------|---------|------------------|---------|
| $V_{CC(A)}$ , $V_{CC(B)}$ | OE [2] | DIR [2] | An [2]           | Bn      |
| 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 [1]                   | X      | X       | Z                | Z       |

[1] If at least one of  $V_{CC(A)}$  or  $V_{CC(B)}$  is at GND level, the device goes into suspend mode.

[2] The An, DIR and OE input circuit is referenced to  $V_{CC(A)}$ ; The Bn input circuit is referenced to  $V_{CC(B)}$ .

## 7. Limiting values

**Table 4. 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 $V_{CC}$            | -    | $\pm 50$        | mA   |
| $I_{CC}$    | supply current          | per $V_{CC(A)}$ or $V_{CC(B)}$ pin | -    | 100             | mA   |
| $I_{GND}$   | ground current          | per GND pin                        | -100 | -               | mA   |
| $T_{stg}$   | storage temperature     |                                    | -65  | +150            | °C   |
| $P_{tot}$   | total power dissipation | $T_{amb} = -40$ °C to +125 °C [4]  | -    | 500             | 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.

[4] For SOT355-1 (TSSOP24) package:  $P_{tot}$  derates linearly with 12.4 mW/K above 110 °C.  
For SOT815-1 (DHVQFN24) package:  $P_{tot}$  derates linearly with 15.0 mW/K above 117 °C.

## 8. Recommended operating conditions

Table 5. Recommended operating conditions

| 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 | $V_{CCI} = 0.8 \text{ V to } 3.6 \text{ V}$ [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.

## 9. Static characteristics

Table 6. Typical static characteristics at  $T_{amb} = 25 \text{ °C}$

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

$V_{CCI}$  is the supply voltage associated with the data input port;  $V_{CCO}$  is the supply voltage associated with the output port.

| Symbol    | Parameter                 | Conditions  | Min | Typ         | Max        | Unit          |
|-----------|---------------------------|---|-----|-------------|------------|---------------|
| $V_{OH}$  | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ ; $I_O = -1.5 \text{ mA}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 0.8 \text{ V}$                                     | -   | 0.69        | -          | V             |
| $V_{OL}$  | LOW-level output voltage  | $V_I = V_{IH}$ or $V_{IL}$ ; $I_O = 1.5 \text{ mA}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 0.8 \text{ V}$                                      | -   | 0.07        | -          | V             |
| $I_I$     | input leakage current     | DIR, $\overline{OE}$ input; $V_I = 0 \text{ V}$ or $3.6 \text{ V}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 0.8 \text{ V to } 3.6 \text{ V}$     | -   | $\pm 0.025$ | $\pm 0.25$ | $\mu\text{A}$ |
| $I_{OZ}$  | OFF-state output current  | A or B port; $V_O = 0 \text{ V}$ or $V_{CCO}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 3.6 \text{ V}$ [1]  | -   | $\pm 0.5$   | $\pm 2.5$  | $\mu\text{A}$ |
|           |                           | suspend mode A port; $V_O = 0 \text{ V}$ or $V_{CCO}$ ;<br>$V_{CC(A)} = 3.6 \text{ V}$ ; $V_{CC(B)} = 0 \text{ V}$ [1]                | -   | $\pm 0.5$   | $\pm 2.5$  | $\mu\text{A}$ |
|           |                           | suspend mode B port; $V_O = 0 \text{ V}$ or $V_{CCO}$ ;<br>$V_{CC(A)} = 0 \text{ V}$ ; $V_{CC(B)} = 3.6 \text{ V}$ [1]                | -   | $\pm 0.5$   | $\pm 2.5$  | $\mu\text{A}$ |
| $I_{OFF}$ | power-off leakage current | A port; $V_I$ or $V_O = 0 \text{ V to } 3.6 \text{ V}$ ; $V_{CC(A)} = 0 \text{ V}$ ;<br>$V_{CC(B)} = 0.8 \text{ V to } 3.6 \text{ V}$ | -   | $\pm 0.1$   | $\pm 1$    | $\mu\text{A}$ |
|           |                           | B port; $V_I$ or $V_O = 0 \text{ V to } 3.6 \text{ V}$ ; $V_{CC(B)} = 0 \text{ V}$ ;<br>$V_{CC(A)} = 0.8 \text{ V to } 3.6 \text{ V}$ | -   | $\pm 0.1$   | $\pm 1$    | $\mu\text{A}$ |
| $C_I$     | input capacitance         | DIR, $\overline{OE}$ input; $V_I = 0 \text{ V}$ or $3.3 \text{ V}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 3.3 \text{ V}$                       | -   | 1.5         | -          | pF            |
| $C_{I/O}$ | input/output capacitance  | A and B port; $V_O = 3.3 \text{ V}$ or $0 \text{ V}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 3.3 \text{ V}$                                     | -   | 4.3         | -          | pF            |

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

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

Table 7. Static characteristics

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

$V_{CCI}$  is the supply voltage associated with the data input port;  $V_{CCO}$  is the supply voltage associated with the output port.

| 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  |                  |                 |                   |                 |      |
|  |                           | $V_{CCI} = 0.8\text{ V}$  | $0.70V_{CCI}$    | -               | $0.70V_{CCI}$     | -               | V    |
|  |                           | $V_{CCI} = 1.1\text{ V to }1.95\text{ V}$   | $0.65V_{CCI}$    | -               | $0.65V_{CCI}$     | -               | V    |
|  |                           | $V_{CCI} = 2.3\text{ V to }2.7\text{ V}$  | 1.6              | -               | 1.6               | -               | V    |
|  |                           | $V_{CCI} = 3.0\text{ V to }3.6\text{ V}$  | 2                | -               | 2                 | -               | V    |
|  |                           | DIR, $\overline{OE}$ input  |                  |                 |                   |                 |      |
|  |                           | $V_{CC(A)} = 0.8\text{ V}$  | $0.70V_{CC(A)}$  | -               | $0.70V_{CC(A)}$   | -               | V    |
|  |                           | $V_{CC(A)} = 1.1\text{ V to }1.95\text{ V}$   | $0.65V_{CC(A)}$  | -               | $0.65V_{CC(A)}$   | -               | V    |
|  |                           | $V_{CC(A)} = 2.3\text{ V to }2.7\text{ V}$  | 1.6              | -               | 1.6               | -               | V    |
| $V_{CC(A)} = 3.0\text{ V to }3.6\text{ V}$ | 2                         | -   | 2                | -               | V                 |                 |      |
| $V_{IL}$                                   | LOW-level input voltage   | data input  |                  |                 |                   |                 |      |
|  |                           | $V_{CCI} = 0.8\text{ V}$  | -                | $0.30V_{CCI}$   | -                 | $0.30V_{CCI}$   | V    |
|  |                           | $V_{CCI} = 1.1\text{ V to }1.95\text{ V}$   | -                | $0.35V_{CCI}$   | -                 | $0.35V_{CCI}$   | V    |
|  |                           | $V_{CCI} = 2.3\text{ V to }2.7\text{ V}$  | -                | 0.7             | -                 | 0.7             | V    |
|  |                           | $V_{CCI} = 3.0\text{ V to }3.6\text{ V}$  | -                | 0.8             | -                 | 0.8             | V    |
|  |                           | DIR, $\overline{OE}$ input  |                  |                 |                   |                 |      |
|  |                           | $V_{CC(A)} = 0.8\text{ V}$  | -                | $0.30V_{CC(A)}$ | -                 | $0.30V_{CC(A)}$ | V    |
|  |                           | $V_{CC(A)} = 1.1\text{ V to }1.95\text{ V}$   | -                | $0.35V_{CC(A)}$ | -                 | $0.35V_{CC(A)}$ | V    |
|  |                           | $V_{CC(A)} = 2.3\text{ V to }2.7\text{ V}$  | -                | 0.7             | -                 | 0.7             | V    |
| $V_{CC(A)} = 3.0\text{ V to }3.6\text{ V}$ | -                         | 0.8   | -                | 0.8             | V                 |                 |      |
| $V_{OH}$                                   | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$  |                  |                 |                   |                 |      |
|  |                           | $I_O = -100\text{ }\mu\text{A}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 0.8\text{ V to }3.6\text{ V}$ | $V_{CCO} - 0.1$  | -               | $V_{CCO} - 0.1$   | -               | V    |
|  |                           | $I_O = -3\text{ mA}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 1.1\text{ V}$                            | 0.85             | -               | 0.85              | -               | V    |
|  |                           | $I_O = -6\text{ mA}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 1.4\text{ V}$                            | 1.05             | -               | 1.05              | -               | V    |
|  |                           | $I_O = -8\text{ mA}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 1.65\text{ V}$                           | 1.2              | -               | 1.2               | -               | V    |
|  |                           | $I_O = -9\text{ mA}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 2.3\text{ V}$                            | 1.75             | -               | 1.75              | -               | V    |
|  |                           | $I_O = -12\text{ mA}$ ;<br>$V_{CC(A)} = V_{CC(B)} = 3.0\text{ V}$                           | 2.3              | -               | 2.3               | -               | V    |

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

| Symbol           | Parameter                 | Conditions   | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|------------------|---------------------------|--|------------------|------|-------------------|------|------|
|                  |                           |  | Min              | Max  | Min               | Max  |      |
| V <sub>OL</sub>  | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>  |                  |      |                   |      |      |
|                  |                           | I <sub>O</sub> = 100 μA;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 0.8 V to 3.6 V   | -                | 0.1  | -                 | 0.1  | V    |
|                  |                           | I <sub>O</sub> = 3 mA;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.1 V  | -                | 0.25 | -                 | 0.25 | V    |
|                  |                           | I <sub>O</sub> = 6 mA;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.4 V  | -                | 0.35 | -                 | 0.35 | V    |
|                  |                           | I <sub>O</sub> = 8 mA;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.65 V   | -                | 0.45 | -                 | 0.45 | V    |
|                  |                           | I <sub>O</sub> = 9 mA;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 2.3 V  | -                | 0.55 | -                 | 0.55 | V    |
|                  |                           | I <sub>O</sub> = 12 mA;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.0 V   | -                | 0.7  | -                 | 0.7  | V    |
| I <sub>I</sub>   | input leakage current     | DIR, $\overline{OE}$ input; V <sub>I</sub> = 0 V or 3.6 V;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 0.8 V to 3.6 V         | -                | ±1   | -                 | ±5   | μA   |
| I <sub>OZ</sub>  | OFF-state output current  | A or B port; V <sub>O</sub> = 0 V or V <sub>CCO</sub> ;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.6 V [1]                 | -                | ±5   | -                 | ±30  | μA   |
|                  |                           | suspend mode A port;<br>V <sub>O</sub> = 0 V or V <sub>CCO</sub> ; V <sub>CC(A)</sub> = 3.6 V;<br>V <sub>CC(B)</sub> = 0 V [1] | -                | ±5   | -                 | ±30  | μA   |
|                  |                           | suspend mode B port;<br>V <sub>O</sub> = 0 V or V <sub>CCO</sub> ; V <sub>CC(A)</sub> = 0 V;<br>V <sub>CC(B)</sub> = 3.6 V [1] | -                | ±5   | -                 | ±30  | μA   |
| I <sub>OFF</sub> | power-off leakage current | A port; V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V;<br>V <sub>CC(A)</sub> = 0 V;<br>V <sub>CC(B)</sub> = 0.8 V to 3.6 V   | -                | ±5   | -                 | ±30  | μA   |
|                  |                           | B port; V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V;<br>V <sub>CC(B)</sub> = 0 V;<br>V <sub>CC(A)</sub> = 0.8 V to 3.6 V   | -                | ±5   | -                 | ±30  | μA   |

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

| Symbol          | Parameter      | Conditions   | -40 °C to +85 °C |     | -40 °C to +125 °C |     | Unit |
|-----------------|----------------|--|------------------|-----|-------------------|-----|------|
|                 |                |  | Min              | Max | Min               | Max |      |
| I <sub>CC</sub> | supply current | A port; V <sub>I</sub> = 0 V or V <sub>CCI</sub> ; I <sub>O</sub> = 0 A  |                  |     |                   |     |      |
|                 |                | V <sub>CC(A)</sub> = 0.8 V to 3.6 V;<br>V <sub>CC(B)</sub> = 0.8 V to 3.6 V  | -                | 10  | -                 | 55  | μA   |
|                 |                | V <sub>CC(A)</sub> = 1.1 V to 3.6 V;<br>V <sub>CC(B)</sub> = 1.1 V to 3.6 V  | -                | 8   | -                 | 50  | μA   |
|                 |                | V <sub>CC(A)</sub> = 3.6 V; V <sub>CC(B)</sub> = 0 V   | -                | 8   | -                 | 50  | μA   |
|                 |                | V <sub>CC(A)</sub> = 0 V; V <sub>CC(B)</sub> = 3.6 V   | -2               | -   | -12               | -   | μA   |
|                 |                | B port; V <sub>I</sub> = 0 V or V <sub>CCI</sub> ; I <sub>O</sub> = 0 A  |                  |     |                   |     |      |
|                 |                | V <sub>CC(A)</sub> = 0.8 V to 3.6 V;<br>V <sub>CC(B)</sub> = 0.8 V to 3.6 V  | -                | 10  | -                 | 55  | μA   |
|                 |                | V <sub>CC(A)</sub> = 1.1 V to 3.6 V;<br>V <sub>CC(B)</sub> = 1.1 V to 3.6 V  | -                | 8   | -                 | 50  | μA   |
|                 |                | V <sub>CC(A)</sub> = 3.6 V; V <sub>CC(B)</sub> = 0 V   | -2               | -   | -12               | -   | μA   |
|                 |                | V <sub>CC(A)</sub> = 0 V; V <sub>CC(B)</sub> = 3.6 V   | -                | 8   | -                 | 50  | μA   |
|                 |                | A plus B port (I <sub>CC(A)</sub> + I <sub>CC(B)</sub> );<br>I <sub>O</sub> = 0 A; V <sub>I</sub> = 0 V or V <sub>CCI</sub> ;<br>V <sub>CC(A)</sub> = 0.8 V to 3.6 V;<br>V <sub>CC(B)</sub> = 0.8 V to 3.6 V | -                | 20  | -                 | 70  | μA   |
|                 |                | A plus B port (I <sub>CC(A)</sub> + I <sub>CC(B)</sub> );<br>I <sub>O</sub> = 0 A; V <sub>I</sub> = 0 V or V <sub>CCI</sub> ;<br>V <sub>CC(A)</sub> = 1.1 V to 3.6 V;<br>V <sub>CC(B)</sub> = 1.1 V to 3.6 V | -                | 16  | -                 | 65  | μA   |

[1] For I/O ports, the parameter I<sub>OZ</sub> includes the input leakage current.

Table 8. Typical total supply current (I<sub>CC(A)</sub> + I<sub>CC(B)</sub>)

| V <sub>CC(A)</sub> | V <sub>CC(B)</sub> |       |       |       |       |       |       | 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   |



## 10. Dynamic characteristics

**Table 9. Typical dynamic characteristics at  $V_{CC(A)} = 0.8\text{ V}$  and  $T_{amb} = 25\text{ °C}$**

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 7; for wave forms see Fig. 5 and Fig. 6.

$t_{pd}$  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  $t_{PZH}$ .

| 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              | 14.4        | 7.0   | 6.2   | 6.0   | 5.9   | 6.0   | ns   |
|           |                   | Bn to An              | 14.4        | 12.4  | 12.1  | 11.9  | 11.8  | 11.8  | ns   |
| $t_{dis}$ | disable time      | $\overline{OE}$ to An | 16.2        | 16.2  | 16.2  | 16.2  | 16.2  | 16.2  | ns   |
|           |                   | $\overline{OE}$ to Bn | 17.6        | 10.0  | 9.0   | 9.1   | 8.7   | 9.3   | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 21.9        | 21.9  | 21.9  | 21.9  | 21.9  | 21.9  | ns   |
|           |                   | $\overline{OE}$ to Bn | 22.2        | 11.1  | 9.8   | 9.4   | 9.4   | 9.6   | ns   |

**Table 10. Typical dynamic characteristics at  $V_{CC(B)} = 0.8\text{ V}$  and  $T_{amb} = 25\text{ °C}$**

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 7; for wave forms see Fig. 5 and Fig. 6.

$t_{pd}$  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  $t_{PZH}$ .

| 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              | 14.4        | 12.4  | 12.1  | 11.9  | 11.8  | 11.8  | ns   |
|           |                   | Bn to An              | 14.4        | 7.0   | 6.2   | 6.0   | 5.9   | 6.0   | ns   |
| $t_{dis}$ | disable time      | $\overline{OE}$ to An | 16.2        | 5.9   | 4.4   | 4.2   | 3.1   | 3.5   | ns   |
|           |                   | $\overline{OE}$ to Bn | 17.6        | 14.2  | 13.7  | 13.6  | 13.3  | 13.1  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 21.9        | 6.4   | 4.4   | 3.5   | 2.6   | 2.3   | ns   |
|           |                   | $\overline{OE}$ to Bn | 22.2        | 17.7  | 17.2  | 17.0  | 16.8  | 16.7  | ns   |

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

Table 11. Typical power dissipation capacitance at  $V_{CC(A)} = V_{CC(B)}$  and  $T_{amb} = 25\text{ }^{\circ}\text{C}$ 

Voltages are referenced to GND (ground = 0 V). [1] [2]

| 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   | 0.3   | 0.4   | 0.5   | pF   |
|          |                               | A port: (direction An to Bn); output disabled | 0.2                     | 0.2   | 0.2   | 0.3   | 0.4   | 0.5   | pF   |
|          |                               | A port: (direction Bn to An); output enabled  | 9                       | 9     | 10    | 10    | 11    | 13    | pF   |
|          |                               | A port: (direction Bn to An); output disabled | 0.6                     | 0.6   | 0.6   | 0.7   | 0.7   | 0.8   | pF   |
|          |                               | B port: (direction An to Bn); output enabled  | 9                       | 9     | 10    | 10    | 11    | 13    | pF   |
|          |                               | B port: (direction An to Bn); output disabled | 0.6                     | 0.6   | 0.6   | 0.7   | 0.7   | 0.8   | pF   |
|          |                               | B port: (direction Bn to An); output enabled  | 0.2                     | 0.2   | 0.2   | 0.3   | 0.4   | 0.5   | pF   |
|          |                               | B port: (direction Bn to An); output disabled | 0.2                     | 0.2   | 0.2   | 0.3   | 0.4   | 0.5   | pF   |

[1]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ ).

$$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

 $f_i$  = 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]  $f_i = 10\text{ MHz}$ ;  $V_i = \text{GND to } V_{CC}$ ;  $t_r = t_f = 1\text{ ns}$ ;  $C_L = 0\text{ pF}$ ;  $R_L = \infty\ \Omega$ .

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

Table 12. Dynamic characteristics for temperature range -40 °C to +85 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 7; for wave forms see Fig. 5 and Fig. 6.

$t_{pd}$  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  $t_{PZH}$ .

| 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  |      |
| <b><math>V_{CC(A)} = 1.1 \text{ V to } 1.3 \text{ V}</math></b>   |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 9.0  | 0.5           | 6.7  | 0.5            | 5.8  | 0.5           | 4.9  | 0.5           | 4.8  | ns   |
|   |                   | Bn to An              | 0.5           | 9.0  | 0.5           | 8.5  | 0.5            | 8.3  | 0.5           | 8.0  | 0.5           | 7.8  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 11.8 | 0.5           | 11.8 | 0.5            | 11.8 | 0.5           | 11.8 | 0.5           | 11.8 | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 12.3 | 0.5           | 9.5  | 0.5            | 9.4  | 0.5           | 8.0  | 0.5           | 8.9  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 1.1           | 14.4 | 1.1           | 14.4 | 1.1            | 14.4 | 1.1           | 14.4 | 1.1           | 14.4 | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 14.2 | 1.1           | 10.4 | 1.1            | 9.0  | 1.0           | 7.7  | 1.0           | 7.3  | ns   |
| <b><math>V_{CC(A)} = 1.4 \text{ V to } 1.6 \text{ V}</math></b>   |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 8.5  | 0.5           | 5.6  | 0.5            | 4.7  | 0.5           | 4.4  | 0.5           | 4.1  | ns   |
|   |                   | Bn to An              | 0.5           | 6.7  | 0.5           | 5.6  | 0.5            | 5.3  | 0.5           | 5.2  | 0.5           | 5.0  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 8.6  | 0.5           | 8.6  | 0.5            | 8.6  | 0.5           | 8.6  | 0.5           | 8.6  | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 11.2 | 0.5           | 8.4  | 0.5            | 7.6  | 0.5           | 7.2  | 0.5           | 7.8  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 1.1           | 8.7  | 1.1           | 8.7  | 1.1            | 8.7  | 1.1           | 8.7  | 1.1           | 8.7  | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 12.8 | 1.1           | 8.1  | 1.1            | 7.1  | 1.0           | 5.6  | 1.0           | 5.2  | ns   |
| <b><math>V_{CC(A)} = 1.65 \text{ V to } 1.95 \text{ V}</math></b> |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 8.3  | 0.5           | 5.3  | 0.5            | 4.5  | 0.5           | 3.8  | 0.5           | 3.5  | ns   |
|   |                   | Bn to An              | 0.5           | 5.8  | 0.5           | 4.7  | 0.5            | 4.5  | 0.5           | 4.3  | 0.5           | 4.1  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 7.1  | 0.5           | 7.1  | 0.5            | 7.1  | 0.5           | 7.1  | 0.5           | 7.1  | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 10.9 | 0.5           | 7.8  | 0.5            | 6.9  | 0.5           | 6.0  | 0.5           | 5.8  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 1.0           | 6.8  | 1.0           | 6.8  | 1.0            | 6.8  | 1.0           | 6.8  | 1.0           | 6.8  | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 12.4 | 1.1           | 8.2  | 1.0            | 6.7  | 0.5           | 5.1  | 0.5           | 4.5  | ns   |
| <b><math>V_{CC(A)} = 2.3 \text{ V to } 2.7 \text{ V}</math></b>   |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 8.0  | 0.5           | 5.2  | 0.5            | 4.3  | 0.5           | 3.3  | 0.5           | 2.9  | ns   |
|   |                   | Bn to An              | 0.5           | 4.9  | 0.5           | 4.4  | 0.5            | 3.8  | 0.5           | 3.3  | 0.5           | 3.1  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 5.1  | 0.5           | 5.1  | 0.5            | 5.1  | 0.5           | 5.1  | 0.5           | 5.1  | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 10.4 | 0.5           | 7.1  | 0.5            | 6.3  | 0.5           | 5.1  | 0.5           | 5.2  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 0.5           | 4.8  | 0.5           | 4.8  | 0.5            | 4.8  | 0.5           | 4.8  | 0.5           | 4.8  | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 11.9 | 1.1           | 7.9  | 0.5            | 6.4  | 0.5           | 4.6  | 0.5           | 4.0  | ns   |
| <b><math>V_{CC(A)} = 3.0 \text{ V to } 3.6 \text{ V}</math></b>   |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 7.8  | 0.5           | 5.0  | 0.5            | 4.1  | 0.5           | 3.1  | 0.5           | 2.7  | ns   |
|   |                   | Bn to An              | 0.5           | 4.8  | 0.5           | 4.1  | 0.5            | 3.5  | 0.5           | 2.9  | 0.5           | 2.7  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 4.9  | 0.5           | 4.9  | 0.5            | 4.9  | 0.5           | 4.9  | 0.5           | 4.9  | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 10.1 | 0.5           | 6.9  | 0.5            | 6.0  | 0.5           | 4.8  | 0.5           | 5.0  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 0.5           | 4.0  | 0.5           | 4.0  | 0.5            | 4.0  | 0.5           | 4.0  | 0.5           | 4.0  | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 11.7 | 1.1           | 7.8  | 0.5            | 6.2  | 0.5           | 4.5  | 0.5           | 3.9  | ns   |

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

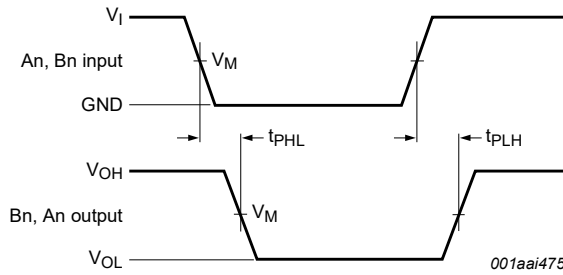
Table 13. Dynamic characteristics for temperature range -40 °C to +125 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 7; for wave forms see Fig. 5 and Fig. 6

$t_{pd}$  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  $t_{PZH}$ .

| 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  |      |
| <b><math>V_{CC(A)} = 1.1 \text{ V to } 1.3 \text{ V}</math></b>   |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 9.9  | 0.5           | 7.4  | 0.5            | 6.4  | 0.5           | 5.4  | 0.5           | 5.3  | ns   |
|   |                   | Bn to An              | 0.5           | 9.9  | 0.5           | 9.4  | 0.5            | 9.2  | 0.5           | 8.8  | 0.5           | 8.6  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 13.0 | 0.5           | 13.0 | 0.5            | 13.0 | 0.5           | 13.0 | 0.5           | 13.0 | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 13.6 | 0.5           | 10.5 | 0.5            | 10.4 | 0.5           | 8.8  | 0.5           | 9.8  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 1.1           | 15.9 | 1.1           | 15.9 | 1.1            | 15.9 | 1.1           | 15.9 | 1.1           | 15.9 | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 15.7 | 1.1           | 11.5 | 1.1            | 9.9  | 1.0           | 8.5  | 1.0           | 8.1  | ns   |
| <b><math>V_{CC(A)} = 1.4 \text{ V to } 1.6 \text{ V}</math></b>   |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 9.4  | 0.5           | 6.2  | 0.5            | 5.2  | 0.5           | 4.9  | 0.5           | 4.6  | ns   |
|   |                   | Bn to An              | 0.5           | 7.4  | 0.5           | 6.2  | 0.5            | 5.9  | 0.5           | 5.8  | 0.5           | 5.5  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 9.5  | 0.5           | 9.5  | 0.5            | 9.5  | 0.5           | 9.5  | 0.5           | 9.5  | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 12.4 | 0.5           | 9.3  | 0.5            | 8.4  | 0.5           | 8.0  | 0.5           | 8.6  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 1.1           | 9.6  | 1.1           | 9.6  | 1.1            | 9.6  | 1.1           | 9.6  | 1.1           | 9.6  | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 14.1 | 1.1           | 9.0  | 1.1            | 7.9  | 1.0           | 6.2  | 1.0           | 5.8  | ns   |
| <b><math>V_{CC(A)} = 1.65 \text{ V to } 1.95 \text{ V}</math></b> |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 9.2  | 0.5           | 5.9  | 0.5            | 5.0  | 0.5           | 4.2  | 0.5           | 3.9  | ns   |
|   |                   | Bn to An              | 0.5           | 6.4  | 0.5           | 5.2  | 0.5            | 5.0  | 0.5           | 4.8  | 0.5           | 4.6  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 7.9  | 0.5           | 7.9  | 0.5            | 7.9  | 0.5           | 7.9  | 0.5           | 7.9  | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 12.0 | 0.5           | 8.6  | 0.5            | 7.6  | 0.5           | 6.6  | 0.5           | 6.4  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 1.0           | 7.5  | 1.0           | 7.5  | 1.0            | 7.5  | 1.0           | 7.5  | 1.0           | 7.5  | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 13.7 | 1.1           | 9.1  | 1.0            | 7.4  | 0.5           | 5.7  | 0.5           | 5.0  | ns   |
| <b><math>V_{CC(A)} = 2.3 \text{ V to } 2.7 \text{ V}</math></b>   |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 8.8  | 0.5           | 5.8  | 0.5            | 4.8  | 0.5           | 3.7  | 0.5           | 3.2  | ns   |
|   |                   | Bn to An              | 0.5           | 5.4  | 0.5           | 4.9  | 0.5            | 4.2  | 0.5           | 3.7  | 0.5           | 3.5  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 5.7  | 0.5           | 5.7  | 0.5            | 5.7  | 0.5           | 5.7  | 0.5           | 5.7  | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 11.5 | 0.5           | 7.9  | 0.5            | 7.0  | 0.5           | 5.7  | 0.5           | 5.8  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 0.5           | 5.3  | 0.5           | 5.3  | 0.5            | 5.3  | 0.5           | 5.3  | 0.5           | 5.3  | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 13.1 | 1.1           | 8.7  | 0.5            | 7.1  | 0.5           | 5.1  | 0.5           | 4.4  | ns   |
| <b><math>V_{CC(A)} = 3.0 \text{ V to } 3.6 \text{ V}</math></b>   |                   |                       |               |      |               |      |                |      |               |      |               |      |      |
| $t_{pd}$  | propagation delay | An to Bn              | 0.5           | 8.6  | 0.5           | 5.5  | 0.5            | 4.6  | 0.5           | 3.5  | 0.5           | 3.0  | ns   |
|   |                   | Bn to An              | 0.5           | 5.3  | 0.5           | 4.6  | 0.5            | 3.9  | 0.5           | 3.2  | 0.5           | 3.0  | ns   |
| $t_{dis}$   | disable time      | $\overline{OE}$ to An | 0.5           | 5.4  | 0.5           | 5.4  | 0.5            | 5.4  | 0.5           | 5.4  | 0.5           | 5.4  | ns   |
|   |                   | $\overline{OE}$ to Bn | 0.5           | 11.2 | 0.5           | 7.6  | 0.5            | 6.6  | 0.5           | 5.3  | 0.5           | 5.5  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 0.5           | 4.4  | 0.5           | 4.4  | 0.5            | 4.4  | 0.5           | 4.4  | 0.5           | 4.4  | ns   |
|   |                   | $\overline{OE}$ to Bn | 1.1           | 12.9 | 1.1           | 8.6  | 0.5            | 6.9  | 0.5           | 5.0  | 0.5           | 4.3  | ns   |

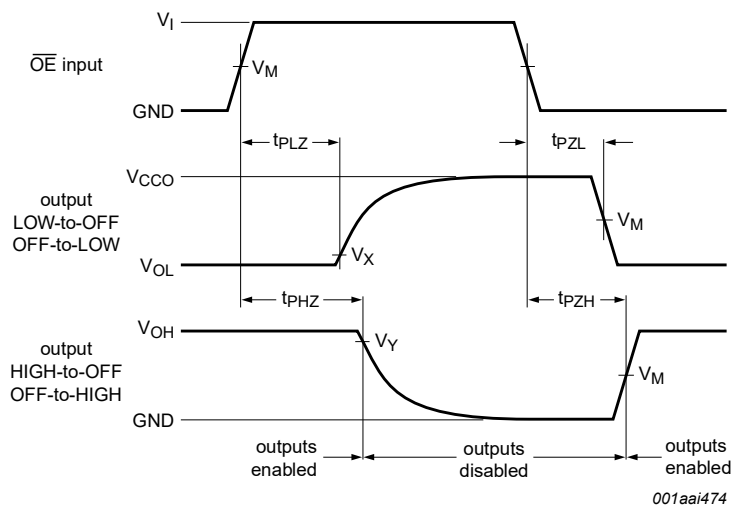
10.1. Waveforms and test circuit



Measurement points are given in Table 14.

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

Fig. 5. The data input (An, Bn) to output (Bn, An) propagation delay times



Measurement points are given in Table 14.

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

Fig. 6. Enable and disable times

Table 14. Measurement points

| Supply voltage  | Input [1]    | Output [2]   |                   |                   |
|-----------------|--------------|--------------|-------------------|-------------------|
|                 | $V_M$        | $V_M$        | $V_X$             | $V_Y$             |
| 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.

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

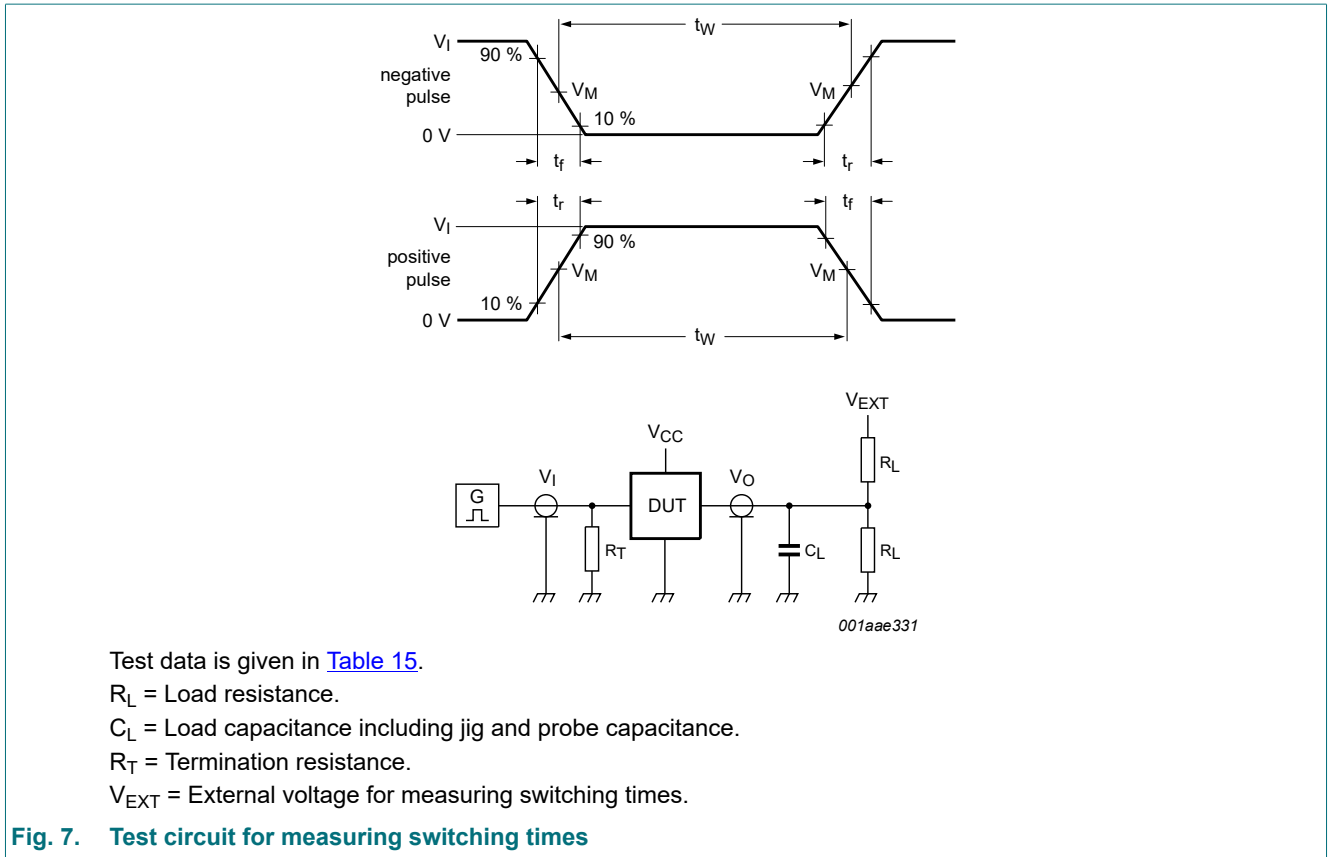
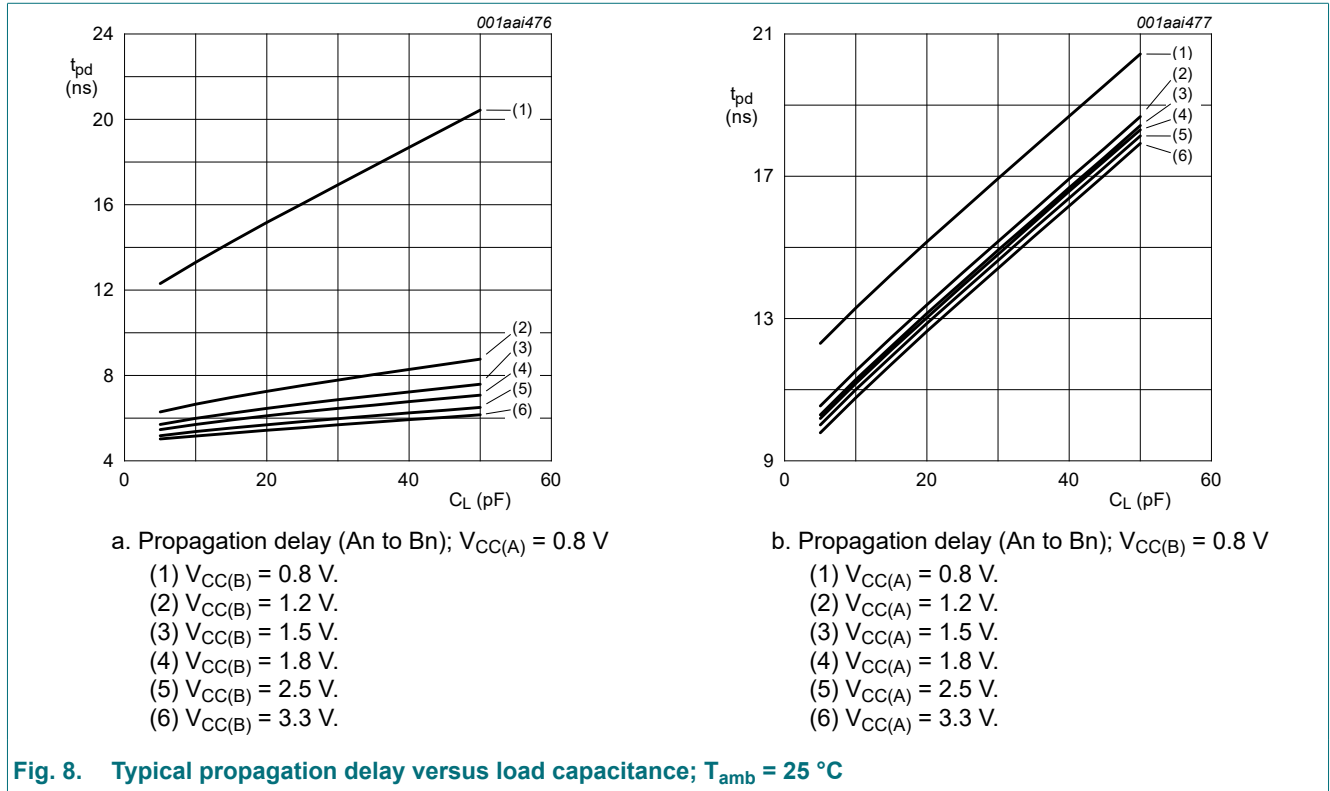


Table 15. Test data

| 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         | $V_{CCI}$ | $\leq 1.0$ ns/V         | 15 pF | 2 k $\Omega$ | open               | GND                | $2V_{CCO}$             |
| 1.65 V to 2.7 V        | $V_{CCI}$ | $\leq 1.0$ ns/V         | 15 pF | 2 k $\Omega$ | open               | GND                | $2V_{CCO}$             |
| 3.0 V to 3.6 V         | $V_{CCI}$ | $\leq 1.0$ ns/V         | 15 pF | 2 k $\Omega$ | open               | GND                | $2V_{CCO}$             |

[1]  $V_{CCI}$  is the supply voltage associated with the data input port.  
 [2]  $dV/dt \geq 1.0$  V/ns  
 [3]  $V_{CCO}$  is the supply voltage associated with the output port.

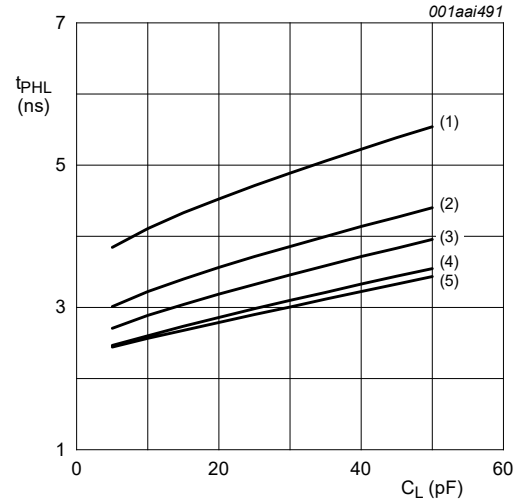
10.2. Typical propagation delay characteristics



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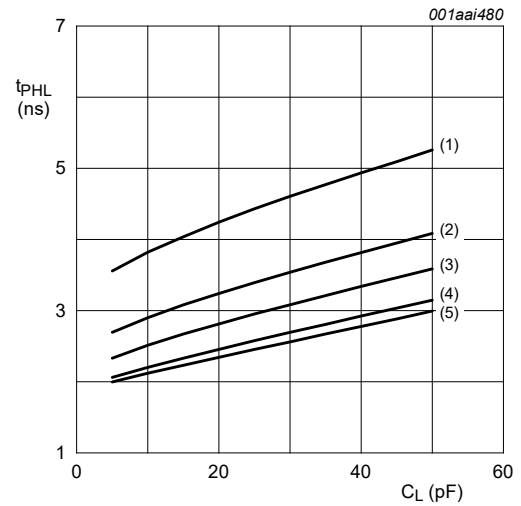
a. LOW to HIGH propagation delay (An to Bn);  $V_{CC(A)} = 1.2\text{ V}$



b. HIGH to LOW propagation delay (An to Bn);  $V_{CC(A)} = 1.2\text{ V}$



c. LOW to HIGH propagation delay (An to Bn);  $V_{CC(A)} = 1.5\text{ V}$



d. HIGH to LOW propagation delay (An to Bn);  $V_{CC(A)} = 1.5\text{ V}$

- (1)  $V_{CC(B)} = 1.2\text{ V}$ .
- (2)  $V_{CC(B)} = 1.5\text{ V}$ .
- (3)  $V_{CC(B)} = 1.8\text{ V}$ .
- (4)  $V_{CC(B)} = 2.5\text{ V}$ .
- (5)  $V_{CC(B)} = 3.3\text{ V}$ .

Fig. 9. Typical propagation delay versus load capacitance;  $T_{amb} = 25\text{ }^\circ\text{C}$



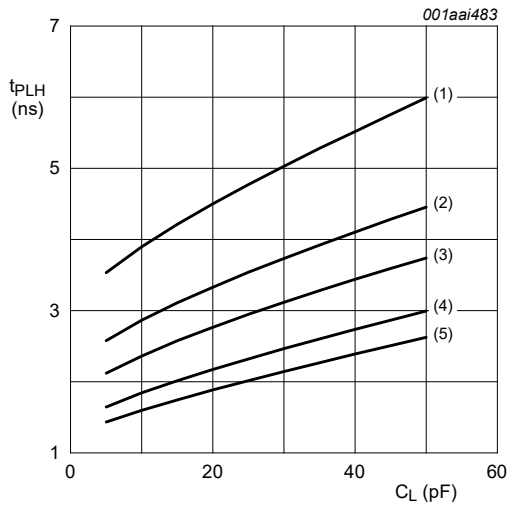
8-bit dual supply translating transceiver with configurable voltage translation; 3-state



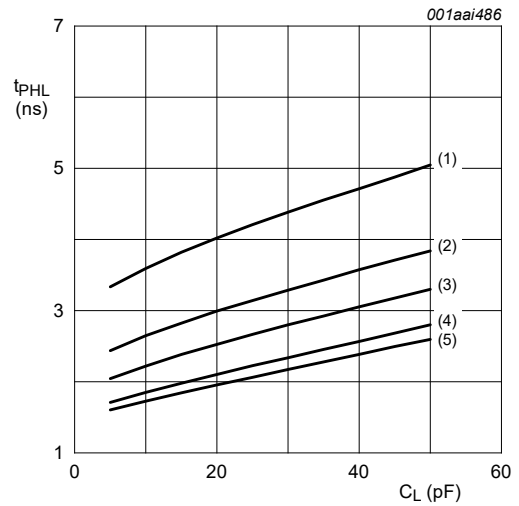
a. LOW to HIGH propagation delay (An to Bn);  $V_{CC(A)} = 1.8\text{ V}$



b. HIGH to LOW propagation delay (An to Bn);  $V_{CC(A)} = 1.8\text{ V}$



c. LOW to HIGH propagation delay (An to Bn);  $V_{CC(A)} = 2.5\text{ V}$

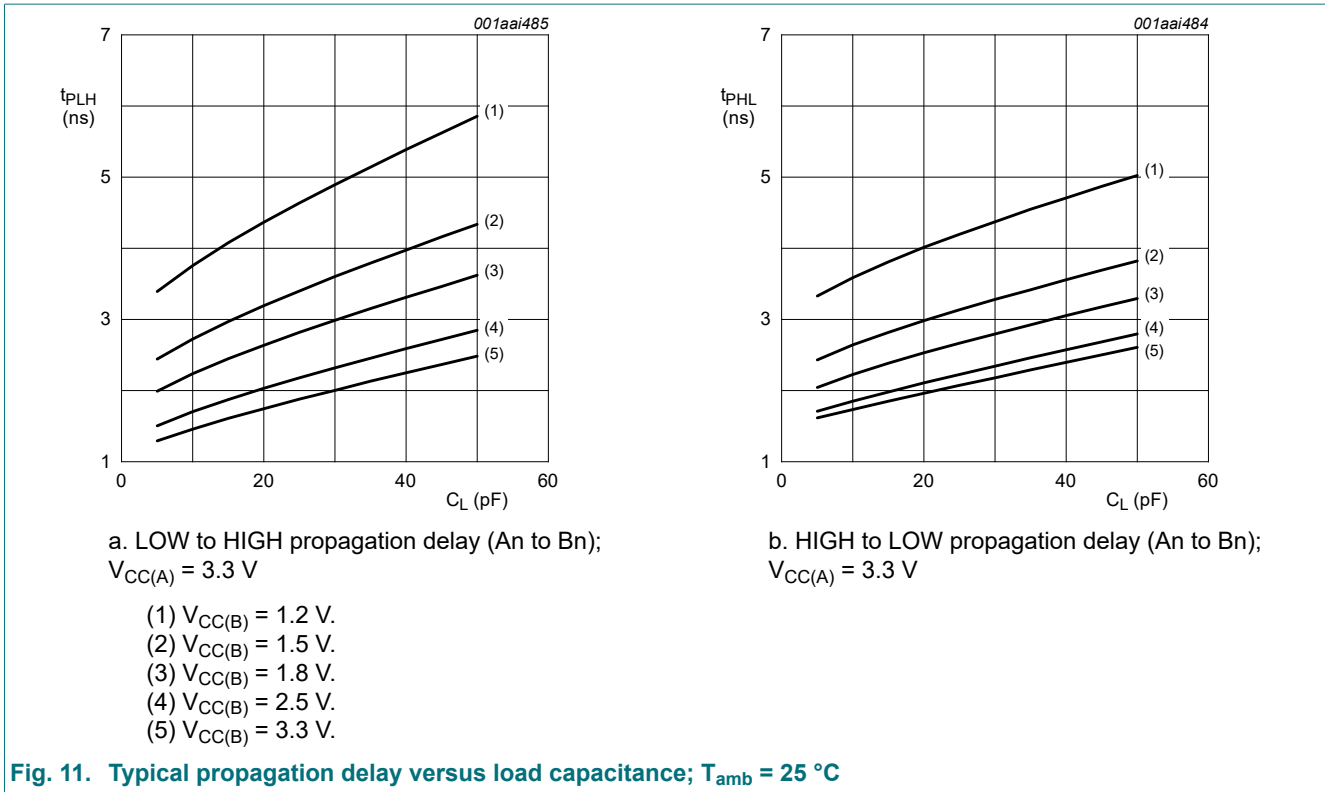


d. HIGH to LOW propagation delay (An to Bn);  $V_{CC(A)} = 2.5\text{ V}$

- (1)  $V_{CC(B)} = 1.2\text{ V}$ .
- (2)  $V_{CC(B)} = 1.5\text{ V}$ .
- (3)  $V_{CC(B)} = 1.8\text{ V}$ .
- (4)  $V_{CC(B)} = 2.5\text{ V}$ .
- (5)  $V_{CC(B)} = 3.3\text{ V}$ .

Fig. 10. Typical propagation delay versus load capacitance;  $T_{amb} = 25\text{ }^{\circ}\text{C}$

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



### 11. Package outline

TSSOP24: plastic thin shrink small outline package; 24 leads; body width 4.4 mm

SOT355-1

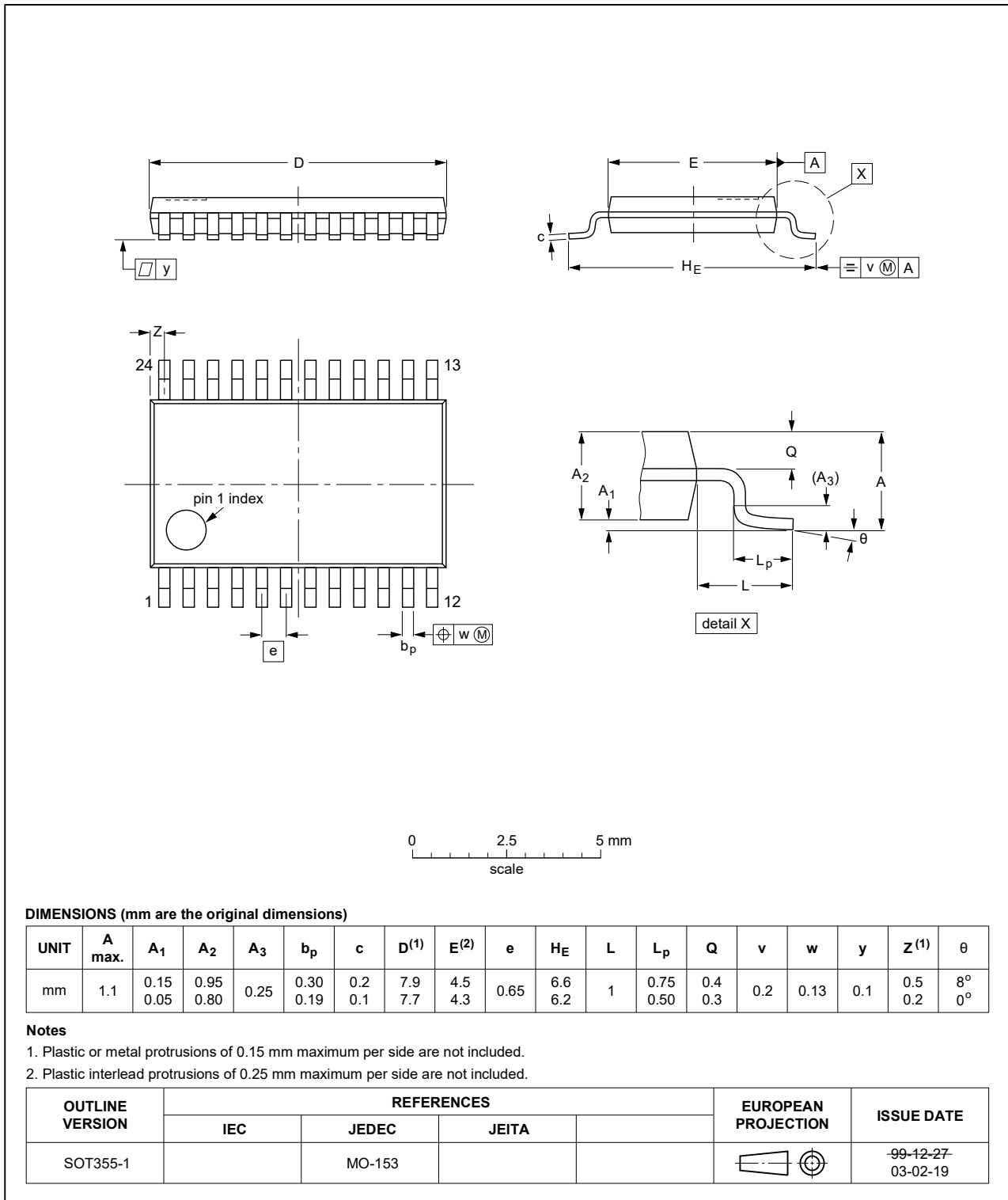


Fig. 12. Package outline SOT355-1 (TSSOP24)

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

DHVQFN24: plastic dual in-line compatible thermal enhanced very thin quad flat package;  
no leads; 24 terminals; body 3.5 x 5.5 x 0.85 mm

SOT815-1



Fig. 13. Package outline SOT815-1 (DHVQFN24)

## 12. Abbreviations

Table 16. Abbreviations

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

## 13. Revision history

Table 17. Revision history

| Document ID    | Release date  | Data sheet status  | Change notice | Supersedes     |
|----------------|---|--------------------|---------------|----------------|
| 74AVC8T245 v.6 | 20200331  | Product data sheet | -             | 74AVC8T245 v.5 |
| Modifications: | <ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li><a href="#">Table 4</a>: Derating values for <math>P_{tot}</math> total power dissipation updated.</li> </ul> |                    |               |                |
| 74AVC8T245 v.5 | 20121227  | Product data sheet | -             | 74AVC8T245 v.4 |
| Modifications: | <ul style="list-style-type: none"> <li><a href="#">Table 4</a>: conditions <math>I_{CC}</math> and <math>I_{GND}</math> changed (errata).</li> </ul>  |                    |               |                |
| 74AVC8T245 v.4 | 20111208  | Product data sheet | -             | 74AVC8T245 v.3 |
| Modifications: | <ul style="list-style-type: none"> <li>Legal pages updated.</li> </ul>  |                    |               |                |
| 74AVC8T245 v.3 | 20110928  | Product data sheet | -             | 74AVC8T245 v.2 |
| 74AVC8T245 v.2 | 20090428  | Product data sheet | -             | 74AVC8T245 v.1 |
| 74AVC8T245 v.1 | 20080711  | Product data sheet | -             | -              |

## 14. Legal information

### 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".
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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А