



# 74AVC16T245

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

Rev. 9 — 25 June 2024

Product data sheet

## 1. General description

The 74AVC16T245 is a 16-bit transceiver with bidirectional level voltage translation and 3-state outputs. The device can be used as two 8-bit transceivers or as a 16-bit transceiver. It has dual supplies ( $V_{CC(A)}$  and  $V_{CC(B)}$ ) for voltage translation and four 8-bit input-output ports (nAn and nBn) each with its own output enable (nOE) and send/receive (nDIR) input for direction control.  $V_{CC(A)}$  and  $V_{CC(B)}$  can be independently supplied at any voltage between 0.8 V and 3.6 V making the device suitable for low voltage translation between any of the following voltages: 0.8 V, 1.2 V, 1.5 V, 1.8 V, 2.5 V and 3.3 V. A HIGH on nDIR selects transmission from nAn to nBn while a LOW on nDIR selects transmission from nBn to nAn. A HIGH on nOE causes the outputs to assume a high-impedance OFF-state

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 nAn and nBn 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)
- Maximum data rates:
  - 380 Mbit/s ( $\geq 1.8$  V to 3.3 V translation)
  - 200 Mbit/s ( $\geq 1.1$  V to 3.3 V translation)
  - 200 Mbit/s ( $\geq 1.1$  V to 2.5 V translation)
  - 200 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
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 3B exceeds 8000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- 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                  |
| <a href="#">74AVC16T245DGG</a> | -40 °C to +125 °C | TSSOP48 | plastic thin shrink small outline package; 48 leads; body width 6.1 mm                    | <a href="#">SOT362-1</a> |
| <a href="#">74AVC16T245DGV</a> | -40 °C to +125 °C | TVSOP48 | plastic thin shrink small outline package; 48 leads; body width 4.4 mm; lead pitch 0.4 mm | <a href="#">SOT480-1</a> |

4. Functional diagram

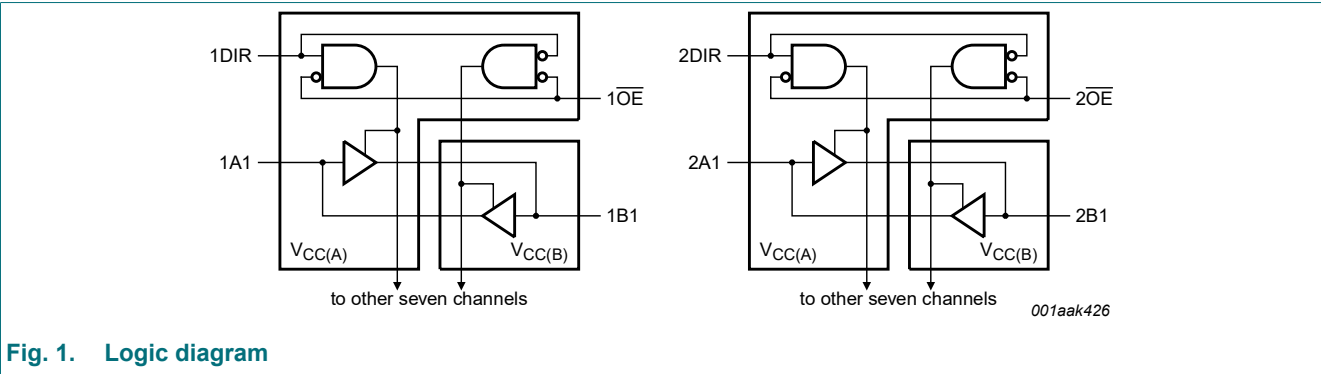
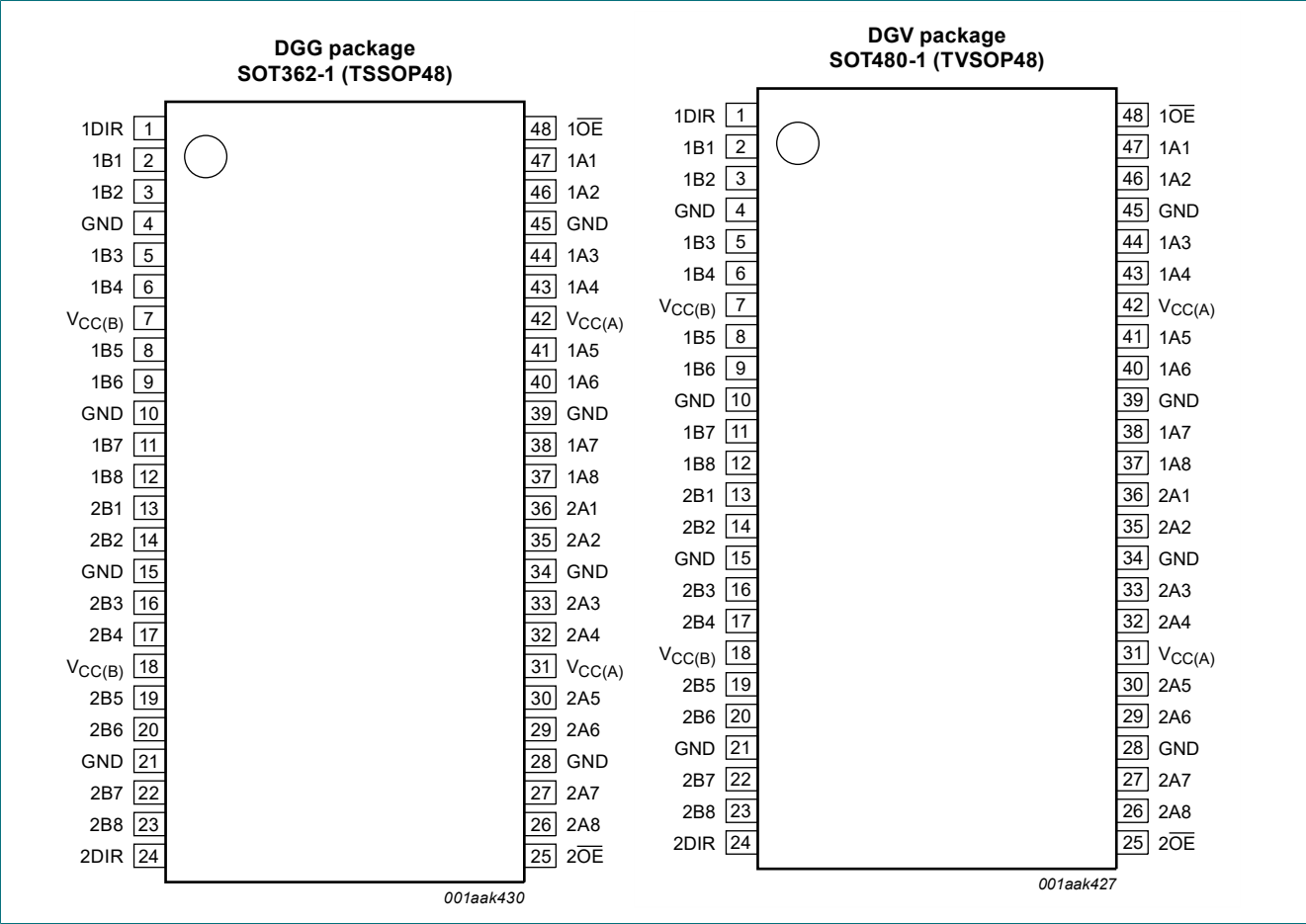


**Fig. 2. Logic symbol**

5. Pinning information

5.1. Pinning



5.2. Pin description

Table 2. Pin description

| Symbol                                 | Pin                            | Description                                                                       |
|----------------------------------------|--------------------------------|-----------------------------------------------------------------------------------|
| 1DIR, 2DIR                             | 1, 24                          | direction control                                                                 |
| 1B1, 1B2, 1B3, 1B4, 1B5, 1B6, 1B7, 1B8 | 2, 3, 5, 6, 8, 9, 11, 12       | data input or output                                                              |
| 2B1, 2B2, 2B3, 2B4, 2B5, 2B6, 2B7, 2B8 | 13, 14, 16, 17, 19, 20, 22, 23 | data input or output                                                              |
| GND [1]                                | 4, 10, 15, 21, 28, 34, 39, 45  | ground (0 V)                                                                      |
| V <sub>CC(B)</sub>                     | 7, 18                          | supply voltage B (nBn inputs are referenced to V <sub>CC(B)</sub> )               |
| 1OE, 2OE                               | 48, 25                         | output enable input (active LOW)                                                  |
| 1A1, 1A2, 1A3, 1A4, 1A5, 1A6, 1A7, 1A8 | 47, 46, 44, 43, 41, 40, 38, 37 | data input or output                                                              |
| 2A1, 2A2, 2A3, 2A4, 2A5, 2A6, 2A7, 2A8 | 36, 35, 33, 32, 30, 29, 27, 26 | data input or output                                                              |
| V <sub>CC(A)</sub>                     | 31, 42                         | supply voltage A (nAn, nOE and nDIR inputs are referenced to V <sub>CC(A)</sub> ) |

[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 <sub>CC(A)</sub> , V <sub>CC(B)</sub> | nOE [2] | nDIR [2] | nAn [2]          | nBn [2]   |
| 0.8 V to 3.6 V                          | L       | L        | nAn = nBn        | input     |
| 0.8 V to 3.6 V                          | L       | H        | input            | nBn = nAn |
| 0.8 V to 3.6 V                          | H       | X        | Z                | Z         |
| GND [1]                                 | X       | X        | Z                | Z         |

- [1] If at least one of V<sub>CC(A)</sub> or V<sub>CC(B)</sub> is at GND level, the device goes into suspend mode.  
[2] The nAn, nDIR and nOE input circuit is referenced to V<sub>CC(A)</sub>; The nBn input circuit is referenced to V<sub>CC(B)</sub>.

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 <sub>CC(A)</sub> | supply voltage A        |                                                  | -0.5 | +4.6                   | V    |
| V <sub>CC(B)</sub> | supply voltage B        |                                                  | -0.5 | +4.6                   | V    |
| I <sub>IK</sub>    | input clamping current  | V <sub>I</sub> < 0 V                             | -50  | -                      | mA   |
| V <sub>I</sub>     | input voltage           | [1]                                              | -0.5 | +4.6                   | V    |
| I <sub>OK</sub>    | output clamping current | V <sub>O</sub> < 0 V                             | -50  | -                      | mA   |
| V <sub>O</sub>     | output voltage          | Active mode [1] [2] [3]                          | -0.5 | V <sub>CCO</sub> + 0.5 | V    |
|                    |                         | Suspend or 3-state mode [1]                      | -0.5 | +4.6                   | V    |
| I <sub>O</sub>     | output current          | V <sub>O</sub> = 0 V to V <sub>CCO</sub> [2]     | -    | ±50                    | mA   |
| I <sub>CC</sub>    | supply current          | per V <sub>CC(A)</sub> or V <sub>CC(B)</sub> pin | -    | 100                    | mA   |
| I <sub>GND</sub>   | ground current          | per GND pin                                      | -100 | -                      | mA   |
| T <sub>stg</sub>   | storage temperature     |                                                  | -65  | +150                   | °C   |
| P <sub>tot</sub>   | total power dissipation | T <sub>amb</sub> = -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<sub>CCO</sub> is the supply voltage associated with the output port.  
[3] V<sub>CCO</sub> + 0.5 V should not exceed 4.6 V.  
[4] For SOT362-1 (TSSOP48) packages: P<sub>tot</sub> derates linearly with 12.2 mW/K above 109 °C.  
For SOT480-1 (TVSOP48) packages: P<sub>tot</sub> derates linearly with 5.5 mW/K above 60 °C.

8. Recommended operating conditions

Table 5. Recommended operating conditions

| Symbol             | Parameter                           | Conditions                            | Min | Max              | Unit |
|--------------------|-------------------------------------|---------------------------------------|-----|------------------|------|
| V <sub>CC(A)</sub> | supply voltage A                    |                                       | 0.8 | 3.6              | V    |
| V <sub>CC(B)</sub> | supply voltage B                    |                                       | 0.8 | 3.6              | V    |
| V <sub>I</sub>     | input voltage                       |                                       | 0   | 3.6              | V    |
| V <sub>O</sub>     | output voltage                      | Active mode [1]                       | 0   | V <sub>CCO</sub> | V    |
|                    |                                     | Suspend or 3-state mode               | 0   | 3.6              | V    |
| T <sub>amb</sub>   | ambient temperature                 |                                       | -40 | +125             | °C   |
| Δt/ΔV              | input transition rise and fall rate | V <sub>CCI</sub> = 0.8 V to 3.6 V [2] | -   | 5                | ns/V |

[1] V<sub>CCO</sub> is the supply voltage associated with the output port.  
[2] V<sub>CCI</sub> is the supply voltage associated with the input port.

9. Static characteristics

Table 6. Typical static characteristics at T<sub>amb</sub> = 25 °C

At recommended operating conditions; voltages are referenced to GND (ground = 0 V). [1]

| Symbol           | Parameter                 | Conditions                                                                                                                       | Min | Typ    | Max   | Unit |
|------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----|--------|-------|------|
| V <sub>OH</sub>  | HIGH-level output voltage | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                              |     |        |       |      |
|                  |                           | I <sub>O</sub> = -1.5 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 0.8 V                                                        | -   | 0.69   | -     | V    |
| 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> = 1.5 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 0.8 V                                                         | -   | 0.07   | -     | V    |
| I <sub>I</sub>   | input leakage current     | nDIR, n $\overline{\text{OE}}$ 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 | -   | ±0.025 | ±0.25 | 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 [2]                   | -   | ±0.5   | ±2.5  | μA   |
|                  |                           | suspend mode A port; V <sub>O</sub> = 0 V or V <sub>CCO</sub> ;<br>V <sub>CC(A)</sub> = 3.6 V; V <sub>CC(B)</sub> = 0 V [2]      | -   | ±0.5   | ±2.5  | μA   |
|                  |                           | suspend mode B port; V <sub>O</sub> = 0 V or V <sub>CCO</sub> ;<br>V <sub>CC(A)</sub> = 0 V; V <sub>CC(B)</sub> = 3.6 V [2]      | -   | ±0.5   | ±2.5  | 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; V <sub>CC(B)</sub> = 0.8 V to 3.6 V        | -   | ±0.1   | ±1    | 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; V <sub>CC(A)</sub> = 0.8 V to 3.6 V        | -   | ±0.1   | ±1    | μA   |
| C <sub>I</sub>   | input capacitance         | nDIR, n $\overline{\text{OE}}$ input; V <sub>I</sub> = 0 V or 3.3 V;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.3 V          | -   | 2.0    | -     | pF   |
| C <sub>I/O</sub> | input/output capacitance  | A and B port; V <sub>O</sub> = 3.3 V or 0 V;<br>V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.3 V                                  | -   | 4.5    | -     | pF   |

[1] V<sub>CCO</sub> is the supply voltage associated with the output port.  
[2] For I/O ports, the parameter I<sub>OZ</sub> includes the input leakage current.

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Table 7. Static characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V). [1]

| Symbol          | Parameter                 | Conditions                                                                            | -40 °C to +85 °C       |                        | -40 °C to +125 °C      |                        | Unit |
|-----------------|---------------------------|---------------------------------------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|------|
|                 |                           |                                                                                       | Min                    | Max                    | Min                    | Max                    |      |
| V <sub>IH</sub> | HIGH-level input voltage  | data input                                                                            |                        |                        |                        |                        |      |
|                 |                           | V <sub>CCI</sub> = 0.8 V                                                              | 0.70V <sub>CCI</sub>   | -                      | 0.70V <sub>CCI</sub>   | -                      | V    |
|                 |                           | V <sub>CCI</sub> = 1.1 V to 1.95 V                                                    | 0.65V <sub>CCI</sub>   | -                      | 0.65V <sub>CCI</sub>   | -                      | V    |
|                 |                           | V <sub>CCI</sub> = 2.3 V to 2.7 V                                                     | 1.6                    | -                      | 1.6                    | -                      | V    |
|                 |                           | V <sub>CCI</sub> = 3.0 V to 3.6 V                                                     | 2                      | -                      | 2                      | -                      | V    |
|                 |                           | nDIR, nOE input                                                                       |                        |                        |                        |                        |      |
|                 |                           | V <sub>CC(A)</sub> = 0.8 V                                                            | 0.70V <sub>CC(A)</sub> | -                      | 0.70V <sub>CC(A)</sub> | -                      | V    |
|                 |                           | V <sub>CC(A)</sub> = 1.1 V to 1.95 V                                                  | 0.65V <sub>CC(A)</sub> | -                      | 0.65V <sub>CC(A)</sub> | -                      | V    |
|                 |                           | V <sub>CC(A)</sub> = 2.3 V to 2.7 V                                                   | 1.6                    | -                      | 1.6                    | -                      | V    |
|                 |                           | V <sub>CC(A)</sub> = 3.0 V to 3.6 V                                                   | 2                      | -                      | 2                      | -                      | V    |
| V <sub>IL</sub> | LOW-level input voltage   | data input                                                                            |                        |                        |                        |                        |      |
|                 |                           | V <sub>CCI</sub> = 0.8 V                                                              | -                      | 0.30V <sub>CCI</sub>   | -                      | 0.30V <sub>CCI</sub>   | V    |
|                 |                           | V <sub>CCI</sub> = 1.1 V to 1.95 V                                                    | -                      | 0.35V <sub>CCI</sub>   | -                      | 0.35V <sub>CCI</sub>   | V    |
|                 |                           | V <sub>CCI</sub> = 2.3 V to 2.7 V                                                     | -                      | 0.7                    | -                      | 0.7                    | V    |
|                 |                           | V <sub>CCI</sub> = 3.0 V to 3.6 V                                                     | -                      | 0.8                    | -                      | 0.8                    | V    |
|                 |                           | nDIR, nOE input                                                                       |                        |                        |                        |                        |      |
|                 |                           | V <sub>CC(A)</sub> = 0.8 V                                                            | -                      | 0.30V <sub>CC(A)</sub> | -                      | 0.30V <sub>CC(A)</sub> | V    |
|                 |                           | V <sub>CC(A)</sub> = 1.1 V to 1.95 V                                                  | -                      | 0.35V <sub>CC(A)</sub> | -                      | 0.35V <sub>CC(A)</sub> | V    |
|                 |                           | V <sub>CC(A)</sub> = 2.3 V to 2.7 V                                                   | -                      | 0.7                    | -                      | 0.7                    | V    |
|                 |                           | V <sub>CC(A)</sub> = 3.0 V to 3.6 V                                                   | -                      | 0.8                    | -                      | 0.8                    | V    |
| V <sub>OH</sub> | HIGH-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 | V <sub>CCO</sub> - 0.1 | -                      | V <sub>CCO</sub> - 0.1 | -                      | V    |
|                 |                           | I <sub>O</sub> = -3 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.1 V               | 0.85                   | -                      | 0.85                   | -                      | V    |
|                 |                           | I <sub>O</sub> = -6 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.4 V               | 1.05                   | -                      | 1.05                   | -                      | V    |
|                 |                           | I <sub>O</sub> = -8 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.65 V              | 1.2                    | -                      | 1.2                    | -                      | V    |
|                 |                           | I <sub>O</sub> = -9 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 2.3 V               | 1.75                   | -                      | 1.75                   | -                      | V    |
|                 |                           | I <sub>O</sub> = -12 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.0 V              | 2.3                    | -                      | 2.3                    | -                      | V    |
| 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; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.1 V                | -                      | 0.25                   | -                      | 0.25                   | V    |
|                 |                           | I <sub>O</sub> = 6 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.4 V                | -                      | 0.35                   | -                      | 0.35                   | V    |
|                 |                           | I <sub>O</sub> = 8 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 1.65 V               | -                      | 0.45                   | -                      | 0.45                   | V    |
|                 |                           | I <sub>O</sub> = 9 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 2.3 V                | -                      | 0.55                   | -                      | 0.55                   | V    |
|                 |                           | I <sub>O</sub> = 12 mA; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.0 V               | -                      | 0.7                    | -                      | 0.7                    | V    |

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| Symbol           | Parameter                 | Conditions                                                                                                                                                                                          | -40 °C to +85 °C |     | -40 °C to +125 °C |     | Unit |
|------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----|-------------------|-----|------|
|                  |                           |                                                                                                                                                                                                     | Min              | Max | Min               | Max |      |
| I <sub>I</sub>   | input leakage current     | nDIR, n $\overline{\text{OE}}$ input; V <sub>I</sub> = 0 V or 3.6 V; 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> ; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.6 V [2]                                                                                         | -                | ±5  | -                 | ±30 | µA   |
|                  |                           | suspend mode A port; V <sub>O</sub> = 0 V or V <sub>CCO</sub> ; V <sub>CC(A)</sub> = 3.6 V; V <sub>CC(B)</sub> = 0 V [2]                                                                            | -                | ±5  | -                 | ±30 | µA   |
|                  |                           | suspend mode B port; V <sub>O</sub> = 0 V or V <sub>CCO</sub> ; V <sub>CC(A)</sub> = 0 V; V <sub>CC(B)</sub> = 3.6 V [2]                                                                            | -                | ±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; V <sub>CC(A)</sub> = 0 V; 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; V <sub>CC(B)</sub> = 0 V; V <sub>CC(A)</sub> = 0.8 V to 3.6 V                                                                              | -                | ±5  | -                 | ±30 | µA   |
| 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; V <sub>CC(B)</sub> = 0.8 V to 3.6 V                                                                                                                            | -                | 30  | -                 | 125 | µA   |
|                  |                           | V <sub>CC(A)</sub> = 1.1 V to 3.6 V; V <sub>CC(B)</sub> = 1.1 V to 3.6 V                                                                                                                            | -                | 25  | -                 | 100 | µA   |
|                  |                           | V <sub>CC(A)</sub> = 3.6 V; V <sub>CC(B)</sub> = 0 V                                                                                                                                                | -                | 25  | -                 | 100 | µA   |
|                  |                           | V <sub>CC(A)</sub> = 0 V; V <sub>CC(B)</sub> = 3.6 V                                                                                                                                                | -5               | -   | -20               | -   | 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; V <sub>CC(B)</sub> = 0.8 V to 3.6 V                                                                                                                            | -                | 30  | -                 | 125 | µA   |
|                  |                           | V <sub>CC(A)</sub> = 1.1 V to 3.6 V; V <sub>CC(B)</sub> = 1.1 V to 3.6 V                                                                                                                            | -                | 25  | -                 | 100 | µA   |
|                  |                           | V <sub>CC(A)</sub> = 3.6 V; V <sub>CC(B)</sub> = 0 V                                                                                                                                                | -5               | -   | -20               | -   | µA   |
|                  |                           | V <sub>CC(A)</sub> = 0 V; V <sub>CC(B)</sub> = 3.6 V                                                                                                                                                | -                | 25  | -                 | 100 | µA   |
|                  |                           | A plus B port (I <sub>CC(A)</sub> + I <sub>CC(B)</sub> ); I <sub>O</sub> = 0 A; V <sub>I</sub> = 0 V or V <sub>CCI</sub> ; V <sub>CC(A)</sub> = 0.8 V to 3.6 V; V <sub>CC(B)</sub> = 0.8 V to 3.6 V | -                | 55  | -                 | 185 | µA   |
|                  |                           | A plus B port (I <sub>CC(A)</sub> + I <sub>CC(B)</sub> ); I <sub>O</sub> = 0 A; V <sub>I</sub> = 0 V or V <sub>CCI</sub> ; V <sub>CC(A)</sub> = 1.1 V to 3.6 V; V <sub>CC(B)</sub> = 1.1 V to 3.6 V | -                | 45  | -                 | 150 | µA   |

[1] V<sub>CCI</sub> is the supply voltage associated with the data input port; V<sub>CCO</sub> is the supply voltage associated with the output port.  
[2] 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 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 nAn to nBn); output enabled  | 0.2                     | 0.2   | 0.2   | 0.2   | 0.3   | 0.4   | pF   |
|          |                               | A port: (direction nAn to nBn); output disabled | 0.2                     | 0.2   | 0.2   | 0.2   | 0.3   | 0.4   | pF   |
|          |                               | A port: (direction nBn to nAn); output enabled  | 9                       | 9.7   | 9.8   | 10.3  | 11.7  | 13.7  | pF   |
|          |                               | A port: (direction nBn to nAn); output disabled | 0.6                     | 0.6   | 0.6   | 0.7   | 0.7   | 0.7   | pF   |
|          |                               | B port: (direction nAn to nBn); output enabled  | 9                       | 9.7   | 9.8   | 10.3  | 11.7  | 13.7  | pF   |
|          |                               | B port: (direction nAn to nBn); output disabled | 0.6                     | 0.6   | 0.6   | 0.7   | 0.7   | 0.7   | pF   |
|          |                               | B port: (direction nBn to nAn); output enabled  | 0.2                     | 0.2   | 0.2   | 0.2   | 0.3   | 0.4   | pF   |
|          |                               | B port: (direction nBn to nAn); output disabled | 0.2                     | 0.2   | 0.2   | 0.2   | 0.3   | 0.4   | pF   |

[1]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ ).  $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$  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]  $f_i = 10\text{ MHz}$ ;  $V_i = \text{GND to } V_{CC}$ ;  $t_r = t_f = 1\text{ ns}$ ;  $C_L = 0\text{ pF}$ ;  $R_L = \infty\text{ }\Omega$ .

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

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 5; for wave forms see Fig. 3 and Fig. 4. [1]

| 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 | nAn to nBn | 14.4        | 7.0   | 6.2   | 6.0   | 5.9   | 6.0   | ns   |
|           |                   | nBn to nAn | 14.4        | 12.4  | 12.1  | 11.9  | 11.8  | 11.8  | ns   |
| $t_{dis}$ | disable time      | nOE to nAn | 16.2        | 16.2  | 16.2  | 16.2  | 16.2  | 16.2  | ns   |
|           |                   | nOE to nBn | 17.6        | 10.0  | 9.0   | 9.1   | 8.7   | 9.3   | ns   |
| $t_{en}$  | enable time       | nOE to nAn | 21.9        | 21.9  | 21.9  | 21.9  | 21.9  | 21.9  | ns   |
|           |                   | nOE to nBn | 22.2        | 11.1  | 9.8   | 9.4   | 9.4   | 9.6   | 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 11. Typical dynamic characteristics at  $V_{CC(B)} = 0.8\text{ V}$  and  $T_{amb} = 25\text{ }^{\circ}\text{C}$**

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 5; for wave forms see Fig. 3 and Fig. 4. [1]

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

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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. 5; for wave forms see Fig. 3 and Fig. 4. [1]

| Symbol                                | Parameter         | Conditions                      | V <sub>CC(B)</sub> |      |               |      |                |      |               |      |               |      | 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 <sub>CC(A)</sub> = 1.1 V to 1.3 V   |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 9.2  | 0.5           | 6.9  | 0.5            | 6.0  | 0.5           | 5.1  | 0.5           | 4.9  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 9.2  | 0.5           | 8.7  | 0.5            | 8.5  | 0.5           | 8.2  | 0.5           | 8.0  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 1.5                | 11.6 | 1.5           | 11.6 | 1.5            | 11.6 | 1.5           | 11.6 | 1.5           | 11.6 | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.5                | 12.5 | 1.5           | 9.7  | 1.5            | 9.5  | 1.0           | 8.1  | 1.0           | 8.9  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 1.0                | 14.5 | 1.0           | 14.5 | 1.0            | 14.5 | 1.0           | 14.5 | 1.0           | 14.5 | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.1                | 14.9 | 1.1           | 11.0 | 1.1            | 9.6  | 1.0           | 8.1  | 1.0           | 7.7  | ns   |
| V <sub>CC(A)</sub> = 1.4 V to 1.6 V   |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 8.7  | 0.5           | 6.2  | 0.5            | 5.2  | 0.5           | 4.1  | 0.5           | 3.7  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 6.9  | 0.5           | 6.2  | 0.5            | 5.9  | 0.5           | 5.6  | 0.5           | 5.5  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 1.5                | 9.1  | 1.5           | 9.1  | 1.5            | 9.1  | 1.5           | 9.1  | 1.5           | 9.1  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.5                | 11.4 | 1.5           | 8.7  | 1.5            | 7.5  | 1.0           | 6.5  | 1.0           | 6.3  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 1.0                | 10.1 | 1.0           | 10.1 | 1.0            | 10.1 | 1.0           | 10.1 | 1.0           | 10.1 | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.0                | 13.5 | 1.0           | 10.1 | 0.5            | 8.1  | 0.5           | 5.9  | 0.5           | 5.2  | ns   |
| V <sub>CC(A)</sub> = 1.65 V to 1.95 V |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 8.5  | 0.5           | 5.9  | 0.5            | 4.8  | 0.5           | 3.7  | 0.5           | 3.3  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 6.0  | 0.5           | 5.2  | 0.5            | 4.8  | 0.5           | 4.5  | 0.5           | 4.4  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 1.5                | 7.7  | 1.5           | 7.7  | 1.5            | 7.7  | 1.5           | 7.7  | 1.5           | 7.7  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.5                | 11.1 | 1.5           | 8.4  | 1.5            | 7.1  | 1.0           | 5.9  | 1.0           | 5.7  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 1.0                | 7.8  | 1.0           | 7.8  | 1.0            | 7.8  | 1.0           | 7.8  | 1.0           | 7.8  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.0                | 13.0 | 1.0           | 9.2  | 0.5            | 7.4  | 0.5           | 5.3  | 0.5           | 4.5  | ns   |
| V <sub>CC(A)</sub> = 2.3 V to 2.7 V   |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 8.2  | 0.5           | 5.6  | 0.5            | 4.6  | 0.5           | 3.3  | 0.5           | 2.8  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 5.1  | 0.5           | 4.1  | 0.5            | 3.7  | 0.5           | 3.4  | 0.5           | 3.2  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 1.0                | 6.1  | 1.0           | 6.1  | 1.0            | 6.1  | 1.0           | 6.1  | 1.0           | 6.1  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.0                | 10.6 | 1.0           | 7.9  | 1.0            | 6.6  | 1.0           | 6.1  | 1.0           | 5.2  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 0.5                | 5.3  | 0.5           | 5.3  | 0.5            | 5.3  | 0.5           | 5.3  | 0.5           | 5.3  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 0.5                | 12.5 | 0.5           | 9.4  | 0.5            | 7.3  | 0.5           | 5.1  | 0.5           | 4.5  | ns   |
| V <sub>CC(A)</sub> = 3.0 V to 3.6 V   |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 8.0  | 0.5           | 5.5  | 0.5            | 4.4  | 0.5           | 3.2  | 0.5           | 2.7  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 4.9  | 0.5           | 3.7  | 0.5            | 3.3  | 0.5           | 2.9  | 0.5           | 2.7  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 0.5                | 5.0  | 0.5           | 5.0  | 0.5            | 5.0  | 0.5           | 5.0  | 0.5           | 5.0  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.0                | 10.3 | 1.0           | 7.7  | 1.0            | 6.5  | 1.0           | 5.2  | 0.5           | 5.0  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 0.5                | 4.3  | 0.5           | 4.3  | 0.5            | 4.2  | 0.5           | 4.1  | 0.5           | 4.0  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 0.5                | 12.4 | 0.5           | 9.3  | 0.5            | 7.2  | 0.5           | 4.9  | 0.5           | 4.0  | ns   |

[1] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>;  
t<sub>dis</sub> is the same as t<sub>PLZ</sub> and t<sub>PHZ</sub>;  
t<sub>en</sub> is the same as t<sub>PZL</sub> and t<sub>PZH</sub>.

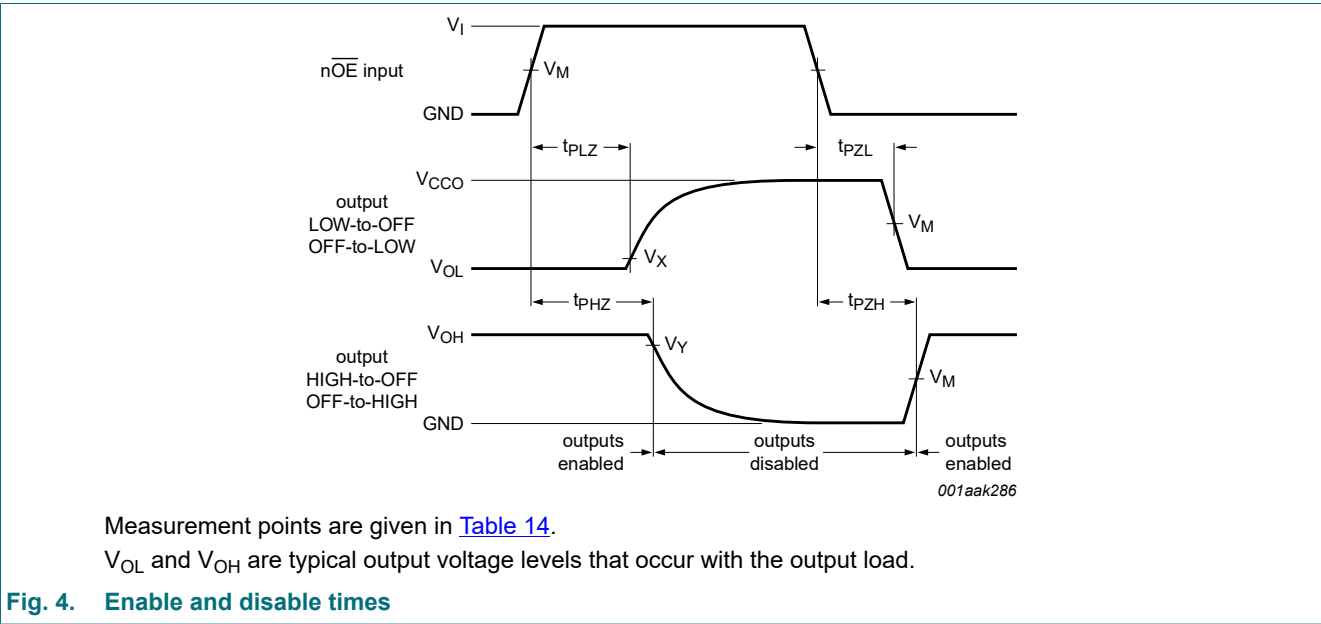
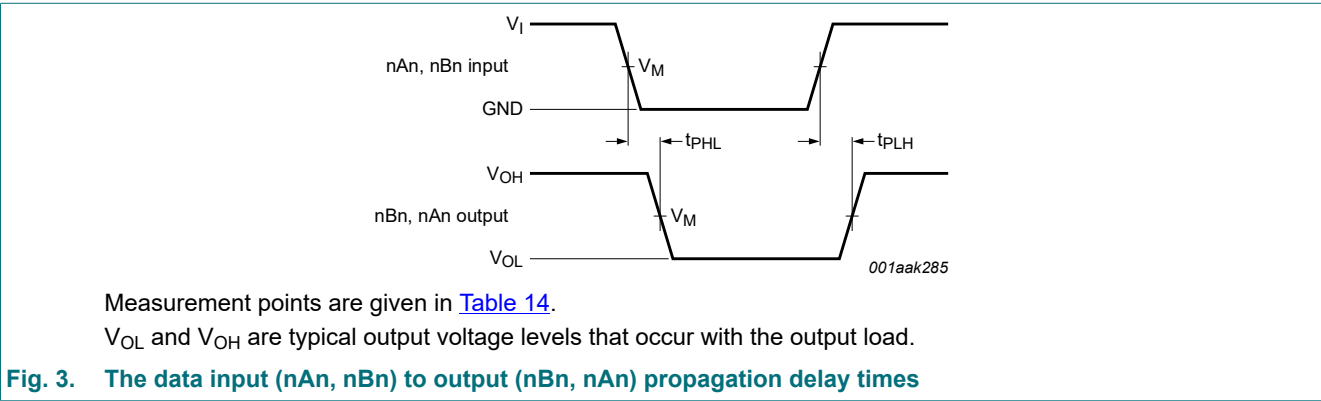
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Table 13. Dynamic characteristics for temperature range -40 °C to +125 °C  
Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 5; for wave forms see Fig. 3 and Fig. 4. [1]

| Symbol                                | Parameter         | Conditions                      | V <sub>CC(B)</sub> |      |               |      |                |      |               |      |               |      | 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 <sub>CC(A)</sub> = 1.1 V to 1.3 V   |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 10.2 | 0.5           | 7.6  | 0.5            | 6.6  | 0.5           | 5.7  | 0.5           | 5.4  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 10.2 | 0.5           | 9.6  | 0.5            | 9.4  | 0.5           | 9.1  | 0.5           | 8.8  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 1.5                | 12.8 | 1.5           | 12.8 | 1.5            | 12.8 | 1.5           | 12.8 | 1.5           | 12.8 | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.5                | 13.8 | 1.5           | 10.7 | 1.5            | 10.5 | 1.0           | 9.0  | 1.5           | 9.8  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 1.0                | 16.0 | 1.0           | 16.0 | 1.0            | 16.0 | 1.0           | 16.0 | 1.0           | 16.0 | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.1                | 16.4 | 1.1           | 12.1 | 1.1            | 10.6 | 1.0           | 9.0  | 1.0           | 8.5  | ns   |
| V <sub>CC(A)</sub> = 1.4 V to 1.6 V   |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 9.6  | 0.5           | 6.9  | 0.5            | 5.8  | 0.5           | 4.6  | 0.5           | 4.1  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 7.6  | 0.5           | 6.9  | 0.5            | 6.5  | 0.5           | 6.2  | 0.5           | 6.1  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 1.5                | 10.1 | 1.5           | 10.1 | 1.5            | 10.1 | 1.5           | 10.1 | 1.5           | 10.1 | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.5                | 12.6 | 1.5           | 9.6  | 1.5            | 8.3  | 1.0           | 7.2  | 1.0           | 7.0  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 1.0                | 11.2 | 1.0           | 11.2 | 1.0            | 11.2 | 1.0           | 11.2 | 1.0           | 11.2 | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.0                | 14.9 | 1.0           | 11.2 | 0.5            | 9.0  | 0.5           | 6.5  | 0.5           | 5.8  | ns   |
| V <sub>CC(A)</sub> = 1.65 V to 1.95 V |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 9.4  | 0.5           | 6.5  | 0.5            | 5.3  | 0.5           | 4.1  | 0.5           | 3.7  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 6.6  | 0.5           | 5.8  | 0.5            | 5.3  | 0.5           | 5.0  | 0.5           | 4.9  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 1.5                | 8.5  | 1.5           | 8.5  | 1.5            | 8.5  | 1.5           | 8.5  | 1.5           | 8.5  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.5                | 12.3 | 1.5           | 9.3  | 1.5            | 7.9  | 1.0           | 6.5  | 1.0           | 6.3  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 1.0                | 8.6  | 1.0           | 8.6  | 1.0            | 8.6  | 1.0           | 8.6  | 1.0           | 8.6  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.0                | 14.3 | 1.0           | 10.2 | 0.5            | 8.2  | 0.5           | 5.9  | 0.5           | 5.0  | ns   |
| V <sub>CC(A)</sub> = 2.3 V to 2.7 V   |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 9.1  | 0.5           | 6.2  | 0.5            | 5.1  | 0.5           | 3.7  | 0.5           | 3.1  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 5.7  | 0.5           | 4.6  | 0.5            | 4.1  | 0.5           | 3.8  | 0.5           | 3.6  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 1.0                | 6.8  | 1.0           | 6.8  | 1.0            | 6.8  | 1.0           | 6.8  | 1.0           | 6.8  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.0                | 11.7 | 1.0           | 8.7  | 1.0            | 7.3  | 1.0           | 6.8  | 1.0           | 5.8  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 0.5                | 5.9  | 0.5           | 5.9  | 0.5            | 5.9  | 0.5           | 5.9  | 0.5           | 5.9  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 0.5                | 13.8 | 0.5           | 10.4 | 0.5            | 8.1  | 0.5           | 5.7  | 0.5           | 5.0  | ns   |
| V <sub>CC(A)</sub> = 3.0 V to 3.6 V   |                   |                                 |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | nAn to nBn                      | 0.5                | 8.8  | 0.5           | 6.1  | 0.5            | 4.9  | 0.5           | 3.6  | 0.5           | 3.0  | ns   |
|                                       |                   | nBn to nAn                      | 0.5                | 5.4  | 0.5           | 4.1  | 0.5            | 3.7  | 0.5           | 3.2  | 0.5           | 3.0  | ns   |
| t <sub>dis</sub>                      | disable time      | n $\overline{\text{OE}}$ to nAn | 0.5                | 5.5  | 0.5           | 5.5  | 0.5            | 5.5  | 0.5           | 5.5  | 0.5           | 5.5  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 1.0                | 11.4 | 1.0           | 8.5  | 1.0            | 7.2  | 1.0           | 5.8  | 0.5           | 5.5  | ns   |
| t <sub>en</sub>                       | enable time       | n $\overline{\text{OE}}$ to nAn | 0.5                | 4.8  | 0.5           | 4.8  | 0.5            | 4.7  | 0.5           | 4.6  | 0.5           | 4.4  | ns   |
|                                       |                   | n $\overline{\text{OE}}$ to nBn | 0.5                | 13.7 | 0.5           | 10.3 | 0.5            | 8.0  | 0.5           | 5.4  | 0.5           | 4.4  | ns   |

[1] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>;  
t<sub>dis</sub> is the same as t<sub>PLZ</sub> and t<sub>PHZ</sub>;  
t<sub>en</sub> is the same as t<sub>PZL</sub> and t<sub>PZH</sub>.

10.1. Waveforms and test circuit



| Table 14. 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               | $0.5V_{CCI}$ | $0.5V_{CCO}$ | $V_{OL} + 0.1\text{ V}$  | $V_{OH} - 0.1\text{ V}$  |
| 1.65 V to 2.7 V              | $0.5V_{CCI}$ | $0.5V_{CCO}$ | $V_{OL} + 0.15\text{ V}$ | $V_{OH} - 0.15\text{ V}$ |
| 3.0 V to 3.6 V               | $0.5V_{CCI}$ | $0.5V_{CCO}$ | $V_{OL} + 0.3\text{ V}$  | $V_{OH} - 0.3\text{ V}$  |

[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.

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

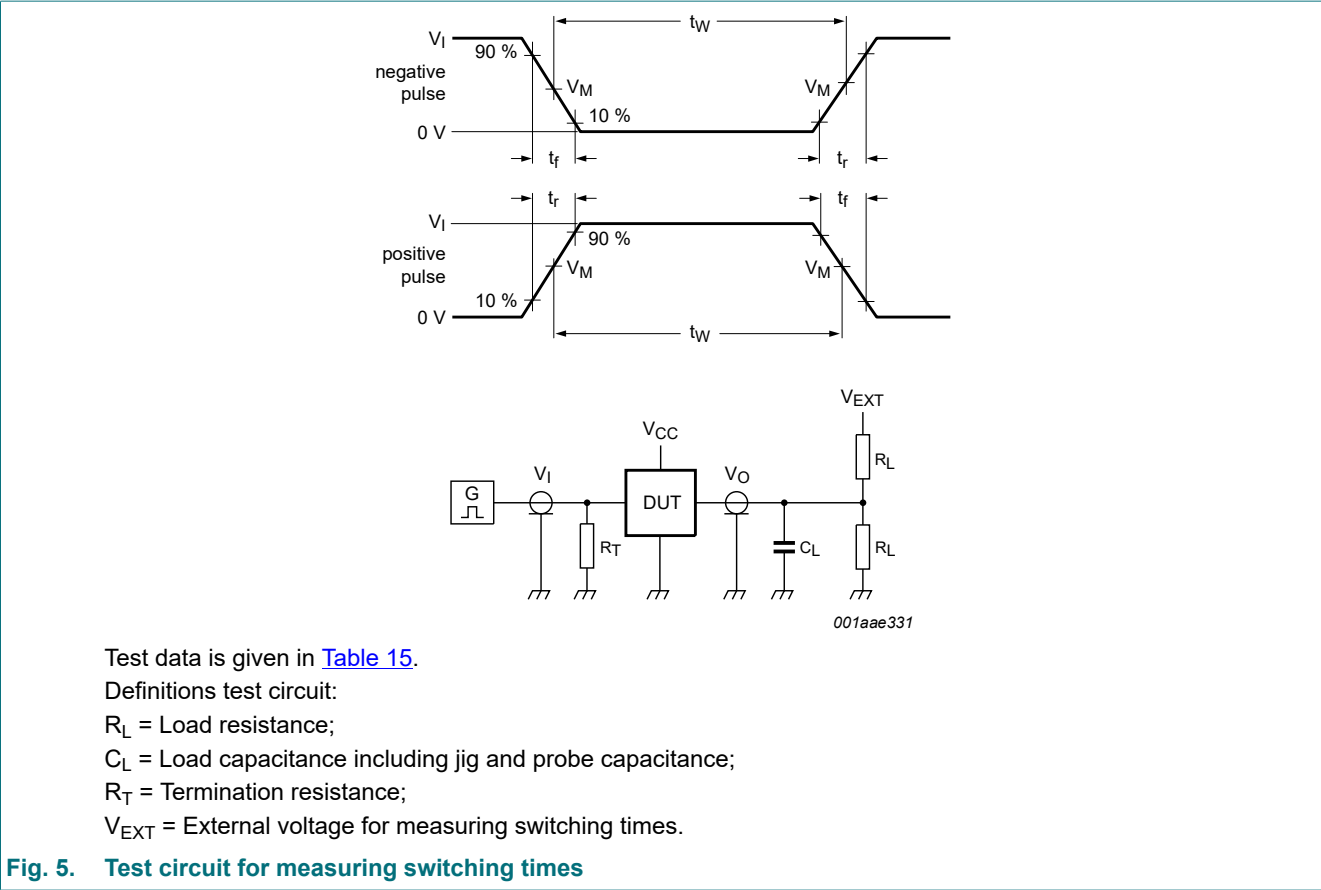


Table 15. Test data

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

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

11. Typical propagation delay characteristics

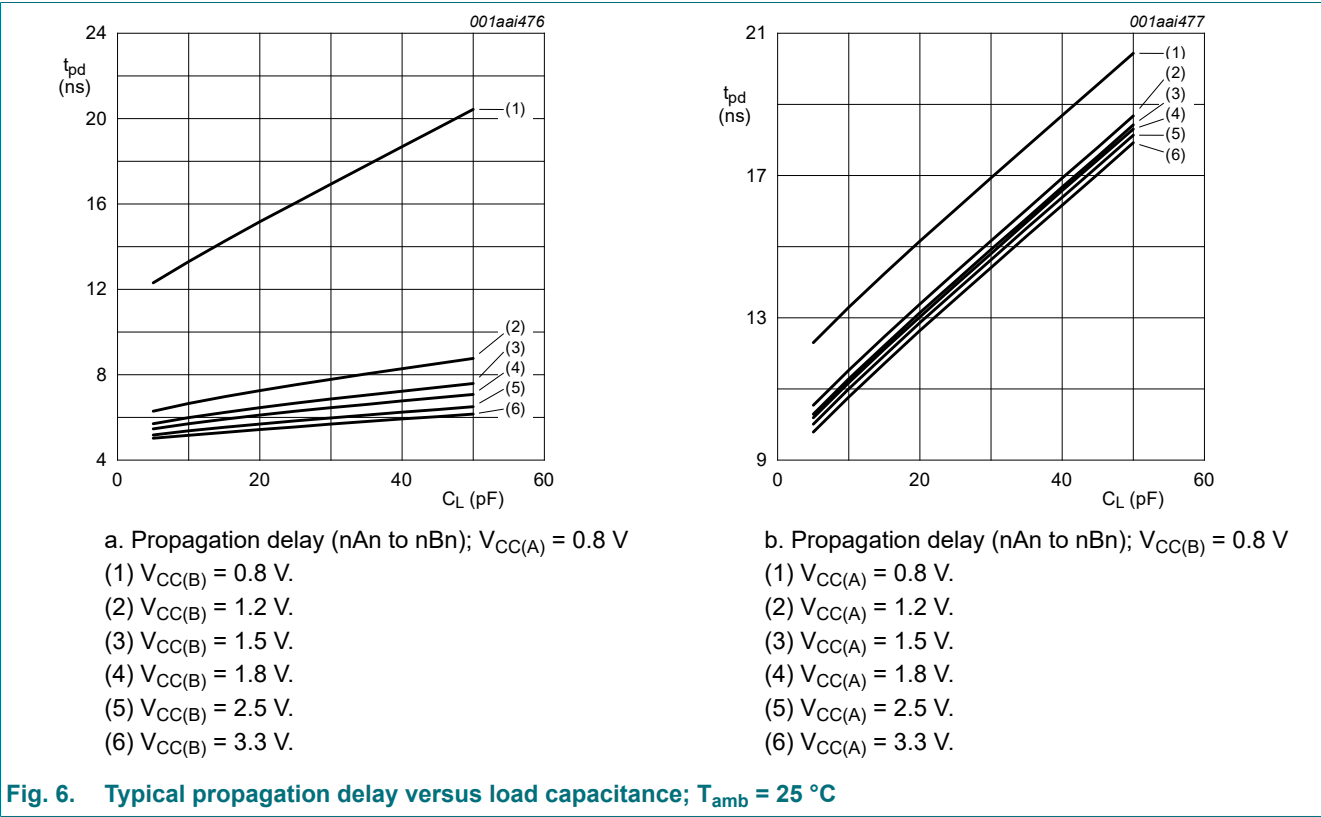
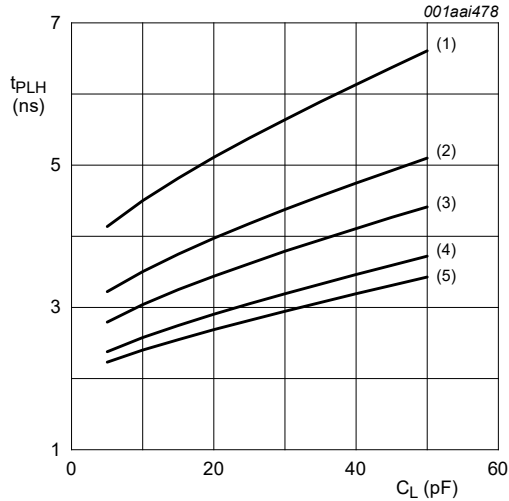
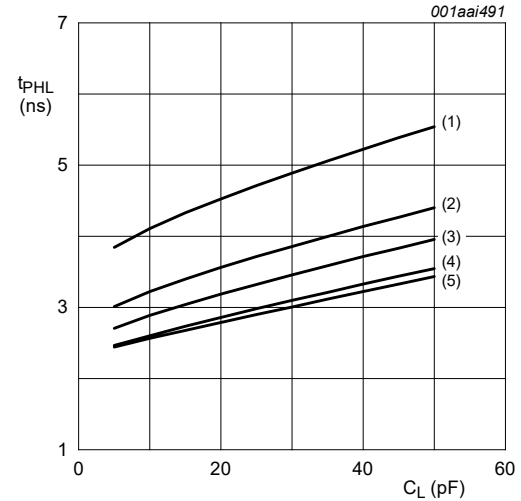


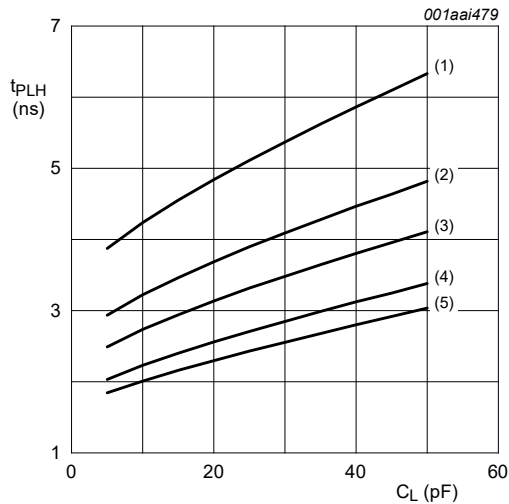
Fig. 6. Typical propagation delay versus load capacitance;  $T_{amb} = 25\text{ }^{\circ}\text{C}$



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

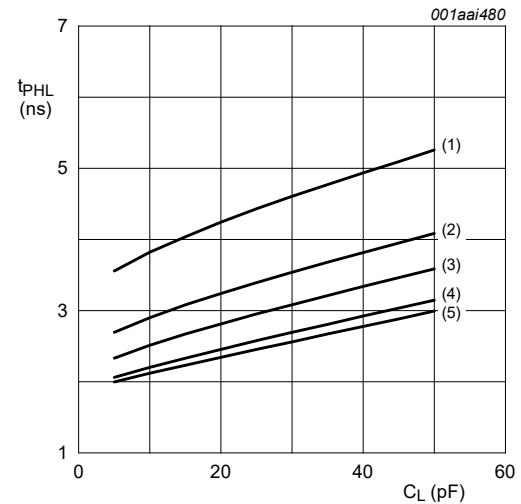


b. HIGH to LOW propagation delay (nAn to nBn);  
 $V_{CC(A)} = 1.2 \text{ V}$



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

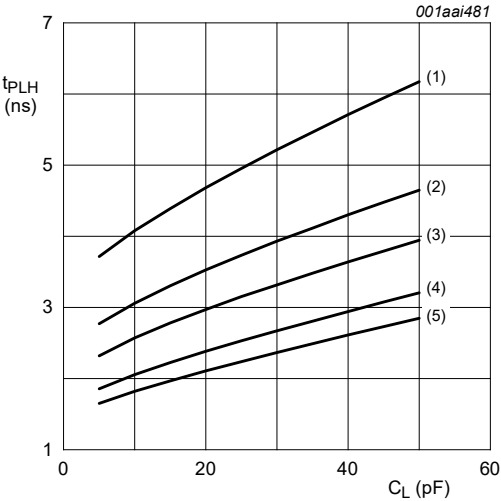
- (1)  $V_{CC(B)} = 1.2 \text{ V}$ .
- (2)  $V_{CC(B)} = 1.5 \text{ V}$ .
- (3)  $V_{CC(B)} = 1.8 \text{ V}$ .
- (4)  $V_{CC(B)} = 2.5 \text{ V}$ .
- (5)  $V_{CC(B)} = 3.3 \text{ V}$ .



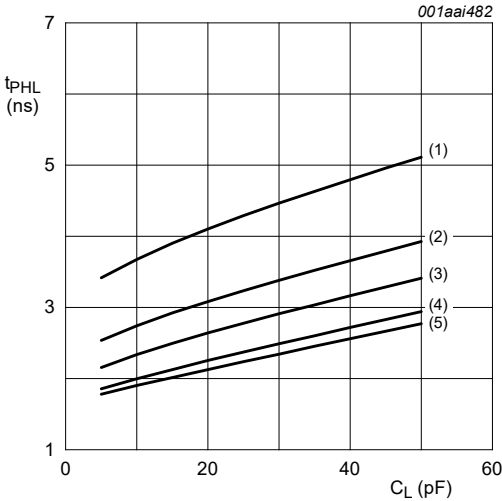
d. HIGH to LOW propagation delay (nAn to nBn);  
 $V_{CC(A)} = 1.5 \text{ V}$

**Fig. 7. Typical propagation delay versus load capacitance;  $T_{amb} = 25^\circ\text{C}$**

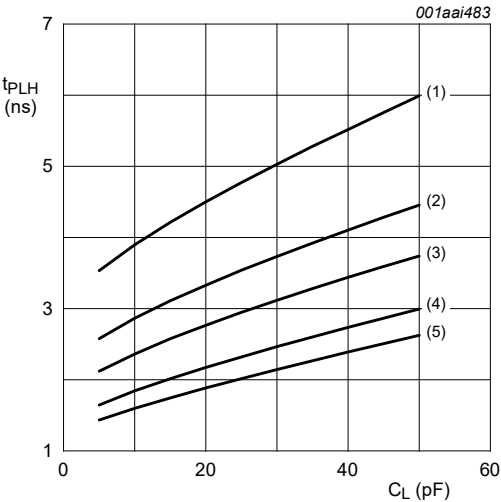
16-bit dual supply translating transceiver with configurable voltage translation; 3-state



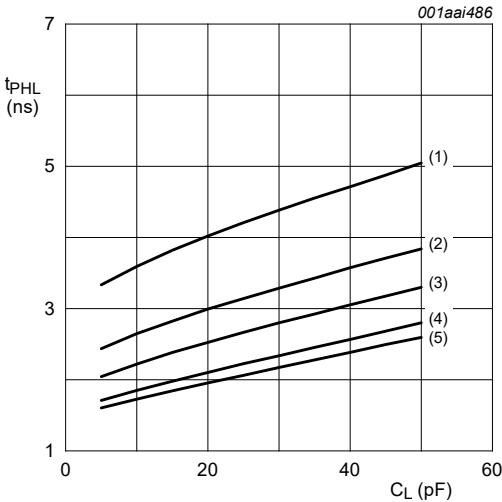
a. LOW to HIGH propagation delay (nAn to nBn);  
 $V_{CC(A)} = 1.8\text{ V}$



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



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

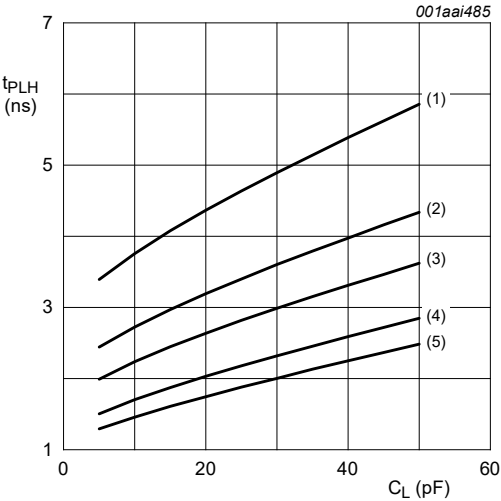


d. HIGH to LOW propagation delay (nAn to nBn);  
 $V_{CC(A)} = 2.5\text{ V}$

- (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)  $V_{CC(B)} = 3.3\text{ V}$ .

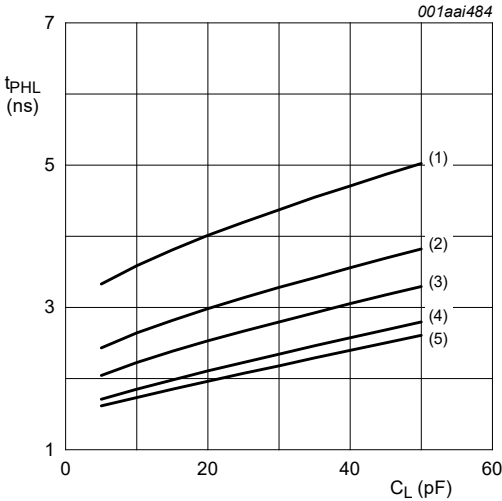
Fig. 8. Typical propagation delay versus load capacitance;  $T_{amb} = 25\text{ }^{\circ}\text{C}$

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



a. LOW to HIGH propagation delay (nAn to nBn);  
 $V_{CC(A)} = 3.3\text{ V}$

- (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)  $V_{CC(B)} = 3.3\text{ V}$ .



b. HIGH to LOW propagation delay (nAn to nBn);  
 $V_{CC(A)} = 3.3\text{ V}$

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

12. Package outline

TSSOP48: plastic thin shrink small outline package; 48 leads; body width 6.1 mm

SOT362-1

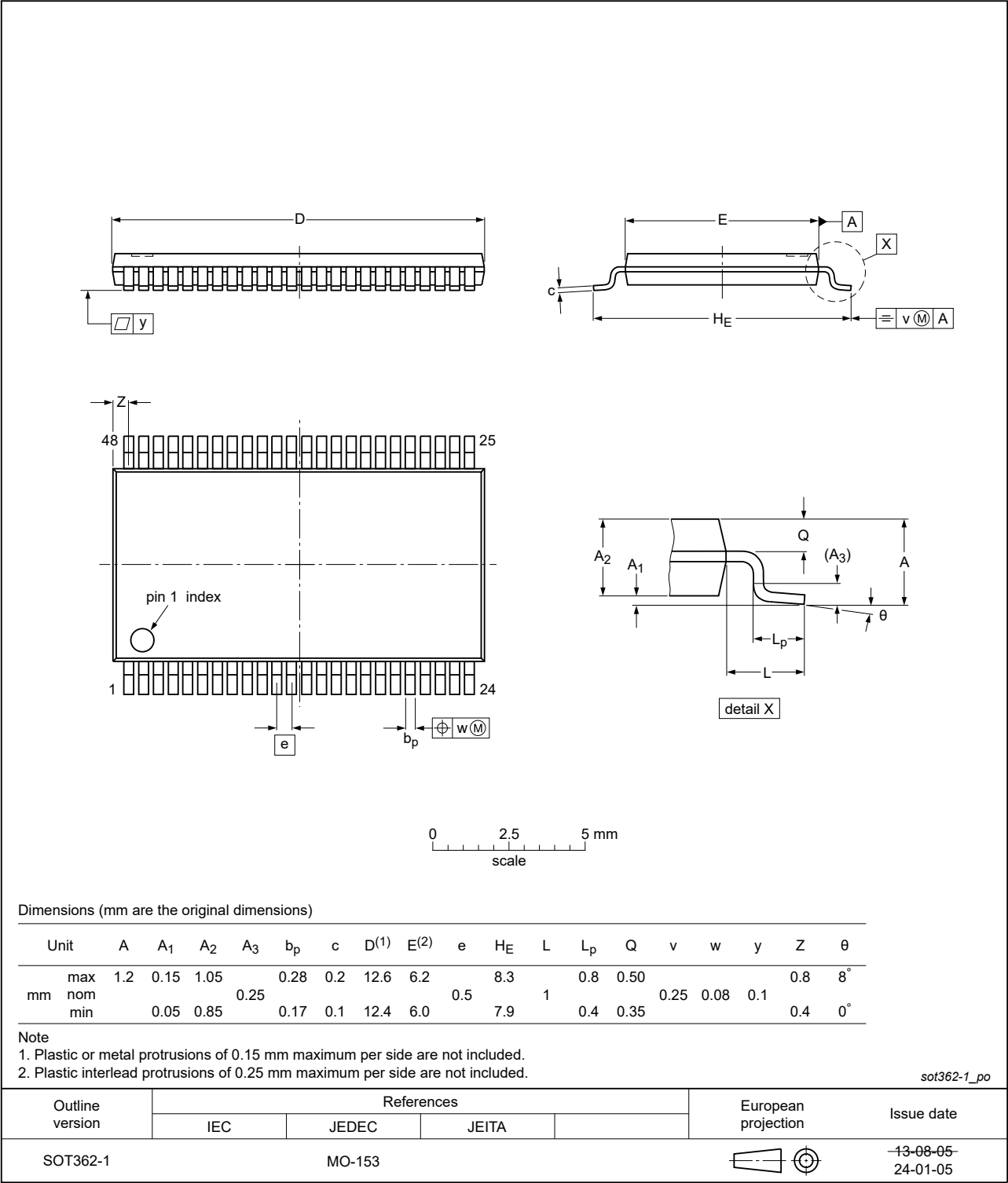


Fig. 10. Package outline SOT362-1 (TSSOP48)

TVSOP48: plastic thin shrink small outline package; 48 leads;  
body width 4.4 mm; lead pitch 0.4 mm

SOT480-1

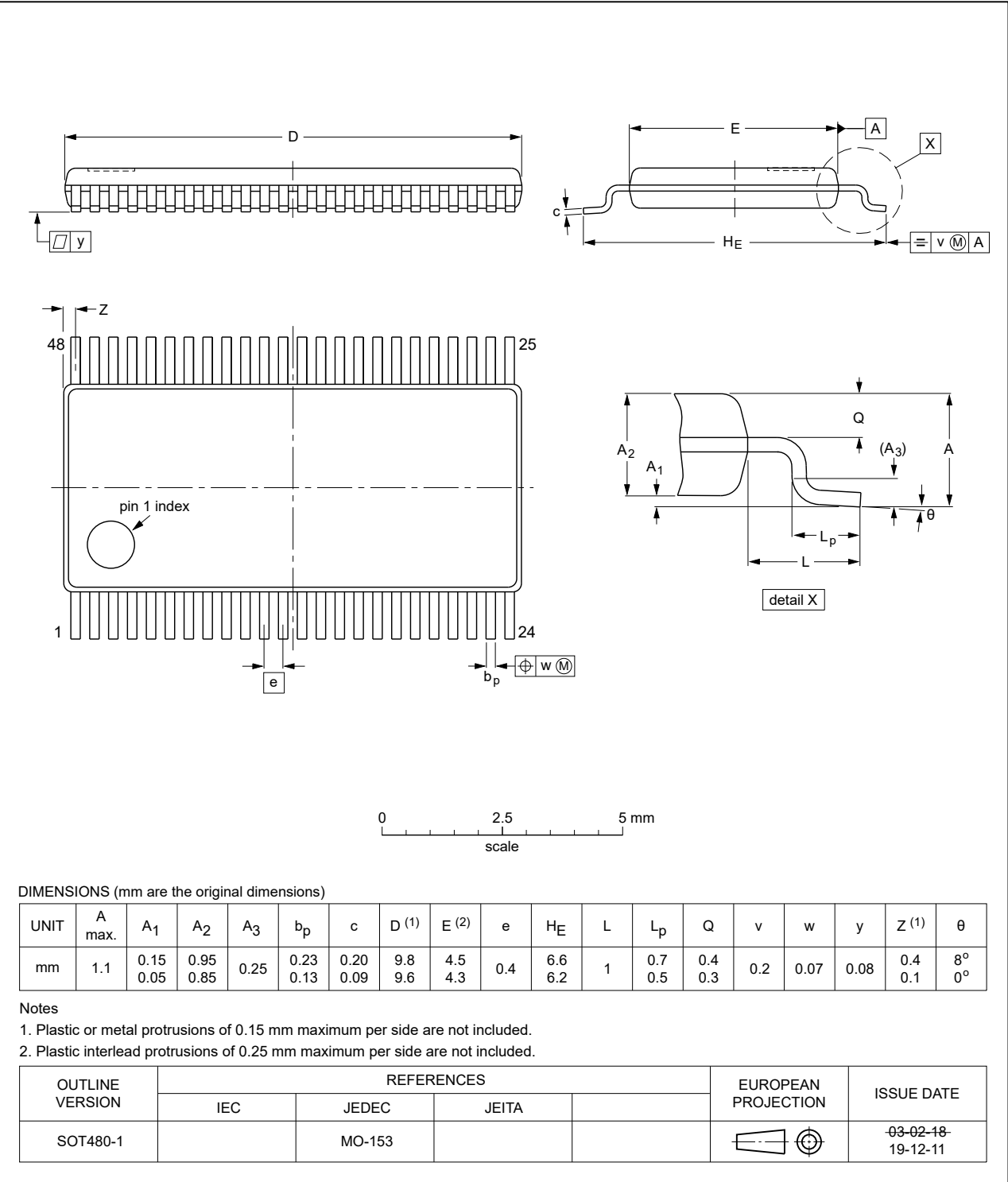


Fig. 11. Package outline SOT480-1 (TVSOP48)

13. Abbreviations

Table 16. Abbreviations

| Acronym | Description                               |
|---------|-------------------------------------------|
| ANSI    | American National Standards Institute     |
| CDM     | Charged Device Model                      |
| DUT     | Device Under Test                         |
| ESD     | ElectroStatic Discharge                   |
| ESDA    | ElectroStatic Discharge Association       |
| HBM     | Human Body Model                          |
| JEDEC   | Joint Electron Device Engineering Council |

14. Revision history

Table 17. Revision history

| Document ID     | Release date                                                                                                                                                                                                                                                                                                                | Data sheet status  | Change notice | Supersedes      |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|-----------------|
| 74AVC16T245 v.9 | 20240625                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | 74AVC16T245 v.8 |
| Modifications:  | <ul style="list-style-type: none"><li><a href="#">Section 2</a>: ESD specification updated according to the latest JEDEC standard.</li></ul>                                                                                                                                                                                |                    |               |                 |
| 74AVC16T245 v.8 | 20240425                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | 74AVC16T245 v.7 |
| Modifications:  | <ul style="list-style-type: none"><li><a href="#">Section 7</a>: Derating values for P<sub>tot</sub> total power dissipation updated.</li><li><a href="#">Fig. 10</a>: Updated package outline drawing SOT362-1 (TSSOP48).</li><li><a href="#">Fig. 11</a>: Updated package outline drawing SOT480-1 (TVSOP48).</li></ul>   |                    |               |                 |
| 74AVC16T245 v.7 | 20190114                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | 74AVC16T245 v.6 |
| 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>Type numbers 74AVC16T245EV (SOT702-1) and 74AVC16T245BX (SOT1134-2) removed.</li></ul> |                    |               |                 |
| 74AVC16T245 v.6 | 20130909                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | 74AVC16T245 v.5 |
| Modifications:  | <ul style="list-style-type: none"><li><a href="#">Section 7</a>: conditions I<sub>CC</sub> and I<sub>GND</sub> changed (errata).</li></ul>                                                                                                                                                                                  |                    |               |                 |
| 74AVC16T245 v.5 | 20120309                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | 74AVC16T245 v.4 |
| Modifications:  | <ul style="list-style-type: none"><li>For type number 74AVC16T245BX the sot code has changed to SOT1134-2.</li></ul>                                                                                                                                                                                                        |                    |               |                 |
| 74AVC16T245 v.4 | 20111208                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | 74AVC16T245 v.3 |
| Modifications:  | <ul style="list-style-type: none"><li>Legal pages updated.</li></ul>                                                                                                                                                                                                                                                        |                    |               |                 |
| 74AVC16T245 v.3 | 20110609                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | 74AVC16T245 v.2 |
| 74AVC16T245 v.2 | 20100330                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | 74AVC16T245 v.1 |
| 74AVC16T245 v.1 | 20091001                                                                                                                                                                                                                                                                                                                    | Product data sheet | -             | -               |

## 15. 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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