

# 74AVC4T774-Q100

## 4-bit dual supply translating transceiver; 3-state

Rev. 3 — 25 June 2024

Product data sheet

## 1. General description

The 74AVC4T774-Q100 is a 4-bit, dual supply transceiver that enables bidirectional level translation. It features eight 1-bit input-output ports ( $A_n$  and  $B_n$ ), four direction control inputs (DIR1, DIR2, DIR3 and DIR4), an output enable input ( $\overline{OE}$ ) and dual supply pins ( $V_{CC(A)}$  and  $V_{CC(B)}$ ). Both  $V_{CC(A)}$  and  $V_{CC(B)}$  can be supplied at any voltage between 0.8 V and 3.6 V making the device suitable for translating between any of the low voltage nodes (0.8 V, 1.2 V, 1.5 V, 1.8 V, 2.5 V and 3.3 V). Pins  $A_n$ ,  $\overline{OE}$  and DIRn are referenced to  $V_{CC(A)}$  and pins  $B_n$  are referenced to  $V_{CC(B)}$ . A HIGH on DIRn allows transmission from  $A_n$  to  $B_n$  and a LOW on DIRn allows transmission from  $B_n$  to  $A_n$ . 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  $A_n$  and  $B_n$  are in the high-impedance OFF-state.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

## 2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- 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 1500 V

3. Ordering information

Table 1. Ordering information

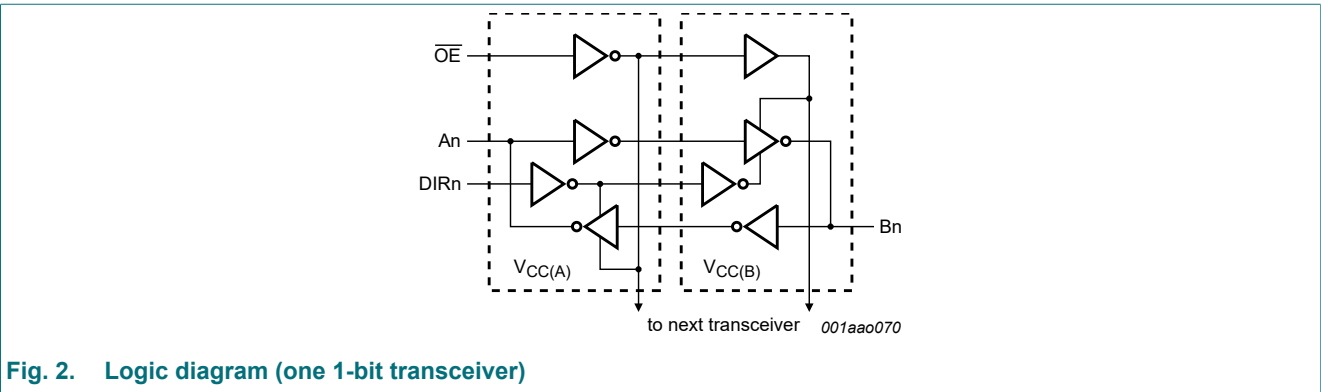
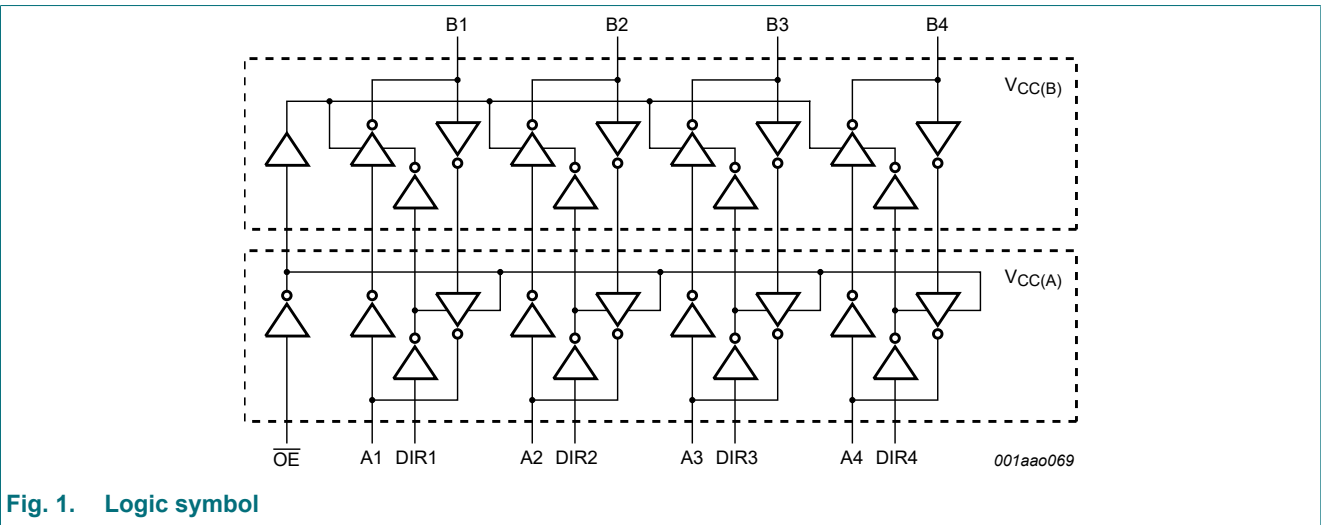
| Type number                       | Package           |          |                                                                                                                                |                           |
|-----------------------------------|-------------------|----------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                   | Temperature range | Name     | Description                                                                                                                    | Version                   |
| <a href="#">74AVC4T774BQ-Q100</a> | -40 °C to +125 °C | DHVQFN16 | plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 16 terminals; body 2.5 × 3.5 × 0.85 mm | <a href="#">SOT763-1</a>  |
| <a href="#">74AVC4T774GU-Q100</a> | -40 °C to +125 °C | XQFN16   | plastic, extremely thin quad flat package; no leads; 16 terminals; body 1.80 × 2.60 × 0.50 mm                                  | <a href="#">SOT1161-1</a> |

4. Marking

Table 2. Marking codes

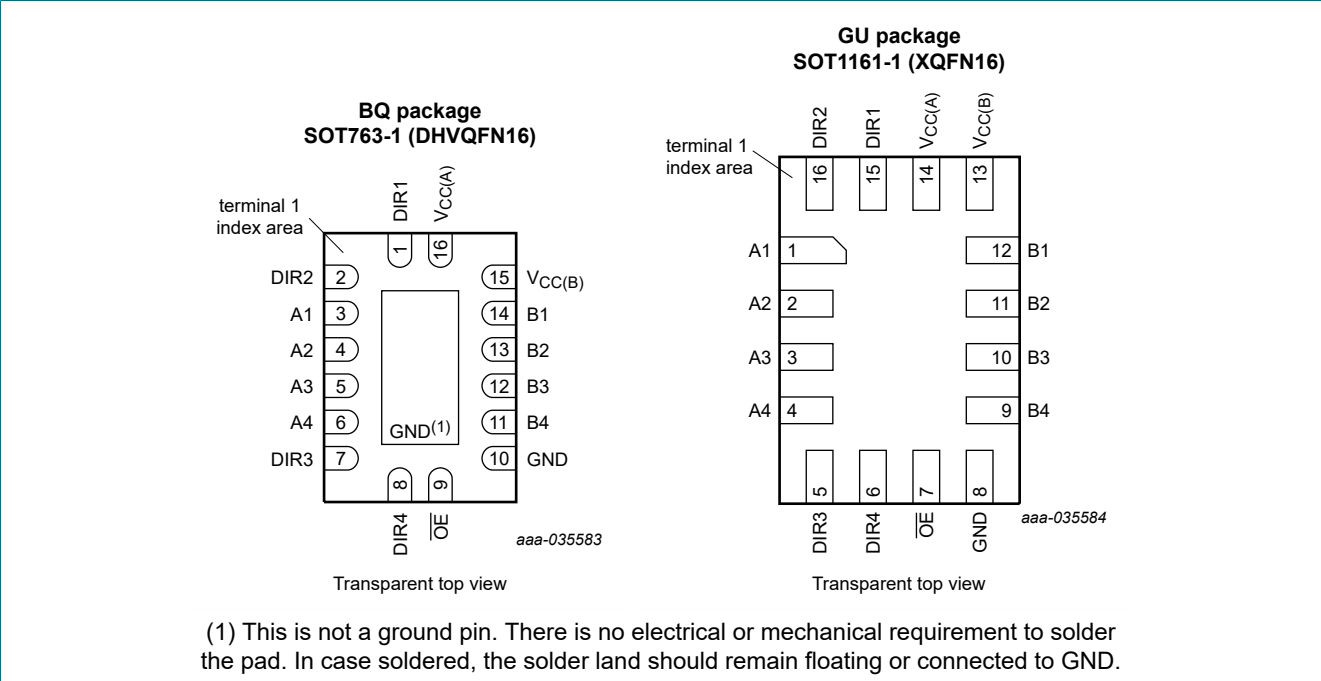
| Type number       | Marking code |
|-------------------|--------------|
| 74AVC4T774BQ-Q100 | C4T774       |
| 74AVC4T774GU-Q100 | B77          |

5. Functional diagram



6. Pinning information

6.1. Pinning



6.2. Pin description

Table 3. Pin description

| Symbol                 | Pin            |               | Description                                                                                         |
|------------------------|----------------|---------------|-----------------------------------------------------------------------------------------------------|
|                        | SOT763-1       | SOT1161-1     |                                                                                                     |
| V <sub>CC(A)</sub>     | 16             | 14            | supply voltage A (An, $\overline{\text{OE}}$ and DIRn inputs are referenced to V <sub>CC(A)</sub> ) |
| DIR1, DIR2, DIR3, DIR4 | 1, 2, 7, 8     | 15, 16, 5, 6  | direction control input                                                                             |
| A1, A2, A3, A4         | 3, 4, 5, 6     | 1, 2, 3, 4    | data input or output                                                                                |
| GND                    | 10             | 8             | ground (0 V)                                                                                        |
| B1, B2, B3, B4         | 14, 13, 12, 11 | 12, 11, 10, 9 | data input or output                                                                                |
| $\overline{\text{OE}}$ | 9              | 7             | output enable input (active LOW)                                                                    |
| V <sub>CC(B)</sub>     | 15             | 13            | supply voltage B (Bn pins are referenced to V <sub>CC(B)</sub> )                                    |

7. Functional description

Table 4. Function table

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

The An, DIRn and OE input circuit is referenced to VCC(A); The Bn input circuit is referenced to VCC(B).

| Supply voltage | Input |      |      |      |      | Input/output |          |
|----------------|-------|------|------|------|------|--------------|----------|
| VCC(A), VCC(B) | OE    | DIR1 | DIR2 | DIR3 | DIR4 | An           | Bn       |
| 0.8 V to 3.6 V | L     | L    | X    | X    | X    | A1 = B1      | input B1 |
| 0.8 V to 3.6 V | L     | H    | X    | X    | X    | input A1     | B1 = A1  |
| 0.8 V to 3.6 V | L     | X    | L    | X    | X    | A2 = B2      | input B2 |
| 0.8 V to 3.6 V | L     | X    | H    | X    | X    | input A2     | B2 = A2  |
| 0.8 V to 3.6 V | L     | X    | X    | L    | X    | A3 = B3      | input B3 |
| 0.8 V to 3.6 V | L     | X    | X    | H    | X    | input A3     | B3 = A3  |
| 0.8 V to 3.6 V | L     | X    | X    | X    | L    | A4 = B4      | input B4 |
| 0.8 V to 3.6 V | L     | X    | X    | X    | H    | input A4     | B4 = A4  |
| 0.8 V to 3.6 V | H     | X    | X    | X    | X    | Z            | Z        |
| GND [1]        | X     | X    | X    | X    | X    | Z            | Z        |

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

8. Limiting values

Table 5. Limiting values

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

| Symbol | Parameter               | Conditions               | Min  | Max        | Unit |
|--------|-------------------------|--------------------------|------|------------|------|
| VCC(A) | supply voltage A        |                          | -0.5 | +4.6       | V    |
| VCC(B) | supply voltage B        |                          | -0.5 | +4.6       | V    |
| IIK    | input clamping current  | VI < 0 V                 | -50  | -          | mA   |
| VI     | input voltage           |                          | -0.5 | +4.6       | V    |
| IOK    | output clamping current | VO < 0 V                 | -50  | -          | mA   |
| VO     | output voltage          | Active mode              | -0.5 | VCCO + 0.5 | V    |
|        |                         | Suspend or 3-state mode  | -0.5 | +4.6       | V    |
| IO     | output current          | VO = 0 V to VCCO         | -    | ±50        | mA   |
| ICC    | supply current          | ICC(A) or ICC(B)         | -    | 100        | mA   |
| IGND   | ground current          |                          | -100 | -          | mA   |
| Tstg   | storage temperature     |                          | -65  | +150       | °C   |
| Ptot   | total power dissipation | Tamb = -40 °C to +125 °C |      |            |      |
|        |                         | SOT763-1 (DHVQFN16)      | -    | 500        | mW   |
|        |                         | SOT1161-1 (XQFN16)       | -    | 250        | mW   |

[1] The minimum input voltage ratings and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] VCCO is the supply voltage associated with the output port.

[3] VCCO + 0.5 V should not exceed 4.6 V.

[4] For SOT763-1 (DHVQFN16) package: Ptot derates linearly with 11.2 mW/K above 106 °C.

9. Recommended operating conditions

Table 6. 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] | -   | 10               | 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.

10. Static characteristics

Table 7. Typical static characteristics at T<sub>amb</sub> = 25 °C

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

| 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><br>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><br>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     | DIRn, $\overline{\text{OE}}$ 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> ; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.6 V [1]                      | -   | ±0.5   | ±2.5  | 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 [1]         | -   | ±0.5   | ±2.5  | 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 [1]         | -   | ±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; 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; 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         | DIRn, $\overline{\text{OE}}$ input; V <sub>I</sub> = 0 V or 3.3 V; 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; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.3 V                                     | -   | 4.0    | -     | pF   |

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

Table 8. Static characteristics

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

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

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

| Symbol   | Parameter                 | Conditions                                                                                 | -40 °C to +85 °C |                 | -40 °C to +125 °C |                 | Unit |
|----------|---------------------------|--------------------------------------------------------------------------------------------|------------------|-----------------|-------------------|-----------------|------|
|          |                           |                                                                                            | Min              | Max             | Min               | Max             |      |
| $V_{IH}$ | HIGH-level input voltage  | data input                                                                                 |                  |                 |                   |                 |      |
|          |                           | $V_{CCI} = 0.8\text{ V}$                                                                   | $0.70V_{CCI}$    | -               | $0.70V_{CCI}$     | -               | 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    |
|          |                           | DIRn, $\overline{OE}$ 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    |
|          |                           | DIRn, $\overline{OE}$ 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    |

| 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     | DIRn, $\overline{\text{OE}}$ 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 | -                | ±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; 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; V <sub>CC(A)</sub> = 0.8 V to 3.6 V      | -                | ±5   | -                 | ±30  | µA   |

| 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   |
| ΔI <sub>CC</sub> | additional supply current | V <sub>I</sub> = 3.0 V; V <sub>CC(A)</sub> = V <sub>CC(B)</sub> = 3.6 V                                                                                                                                      | -                | 500 | -                 | 650 | µA   |

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

Table 9. 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   |

11. Dynamic characteristics

Table 10. 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   | 0.2   | 0.3   | 0.4   | pF   |
|          |                               | A port: (direction An to Bn); output disabled | 0.2                     | 0.2   | 0.2   | 0.2   | 0.3   | 0.4   | pF   |
|          |                               | A port: (direction Bn to An); output enabled  | 9.5                     | 9.7   | 9.8   | 9.9   | 10.7  | 11.9  | pF   |
|          |                               | A port: (direction Bn to An); output disabled | 0.6                     | 0.6   | 0.6   | 0.6   | 0.7   | 0.7   | pF   |
|          |                               | B port: (direction An to Bn); output enabled  | 9.5                     | 9.7   | 9.8   | 9.9   | 10.7  | 11.9  | pF   |
|          |                               | B port: (direction An to Bn); output disabled | 0.6                     | 0.6   | 0.6   | 0.6   | 0.7   | 0.7   | pF   |
|          |                               | B port: (direction Bn to An); output enabled  | 0.2                     | 0.2   | 0.2   | 0.2   | 0.3   | 0.4   | pF   |
|          |                               | B port: (direction Bn to An); 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 11. 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 waveforms 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 | An to Bn              | 14.5        | 7.3   | 6.5   | 6.2   | 5.9   | 6.0   | ns   |
|           |                   | Bn to An              | 14.5        | 12.7  | 12.4  | 12.3  | 12.1  | 12.0  | ns   |
| $t_{dis}$ | disable time      | $\overline{OE}$ to An | 14.3        | 14.3  | 14.3  | 14.3  | 14.3  | 14.3  | ns   |
|           |                   | $\overline{OE}$ to Bn | 17.0        | 9.9   | 9.0   | 9.4   | 9.0   | 9.7   | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 18.2        | 18.2  | 18.2  | 18.2  | 18.2  | 18.2  | ns   |
|           |                   | $\overline{OE}$ to Bn | 19.2        | 10.7  | 9.8   | 9.6   | 9.7   | 10.2  | ns   |

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

Table 12. Typical dynamic characteristics at  $V_{CC(B)} = 0.8\text{ V}$  and  $T_{amb} = 25\text{ }^{\circ}\text{C}$

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 5; for waveforms 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 | An to Bn              | 14.5        | 12.7  | 12.4  | 12.3  | 12.1  | 12.0  | ns   |
|           |                   | Bn to An              | 14.5        | 7.3   | 6.5   | 6.2   | 5.9   | 6.0   | ns   |
| $t_{dis}$ | disable time      | $\overline{OE}$ to An | 14.3        | 5.5   | 4.1   | 4.0   | 3.0   | 3.5   | ns   |
|           |                   | $\overline{OE}$ to Bn | 17.0        | 13.8  | 13.4  | 13.1  | 12.9  | 12.7  | ns   |
| $t_{en}$  | enable time       | $\overline{OE}$ to An | 18.2        | 5.6   | 4.0   | 3.2   | 2.4   | 2.2   | ns   |
|           |                   | $\overline{OE}$ to Bn | 19.2        | 14.6  | 14.1  | 13.9  | 13.7  | 13.6  | 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 13. 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 waveforms 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 | An to Bn   | 2.0                | 10.5 | 1.3           | 7.8  | 1.2            | 6.9  | 1.0           | 5.9  | 0.8           | 5.7  | ns   |
|                                       |                   | Bn to An   | 2.0                | 10.5 | 1.5           | 9.9  | 1.5            | 9.7  | 1.4           | 9.4  | 1.4           | 9.3  | ns   |
| t <sub>dis</sub>                      | disable time      | OE to An   | 2.0                | 10.0 | 2.0           | 10.0 | 2.0            | 10.0 | 2.0           | 10.0 | 2.0           | 10.0 | ns   |
|                                       |                   | OE to Bn   | 2.0                | 11.1 | 2.0           | 8.6  | 1.0            | 8.0  | 0.7           | 7.0  | 1.0           | 8.0  | ns   |
| t <sub>en</sub>                       | enable time       | OE to An   | 2.0                | 13.5 | 2.0           | 13.5 | 2.0            | 13.5 | 2.0           | 13.5 | 2.0           | 13.5 | ns   |
|                                       |                   | OE to Bn   | 2.0                | 15.0 | 2.0           | 11.0 | 2.0            | 9.4  | 1.0           | 7.8  | 1.0           | 7.4  | ns   |
| V <sub>CC(A)</sub> = 1.4 V to 1.6 V   |                   |            |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | An to Bn   | 1.5                | 9.9  | 1.0           | 7.1  | 1.0            | 6.0  | 0.5           | 4.8  | 0.5           | 4.3  | ns   |
|                                       |                   | Bn to An   | 1.3                | 7.8  | 1.0           | 7.1  | 0.9            | 6.9  | 0.8           | 6.6  | 0.6           | 6.5  | ns   |
| t <sub>dis</sub>                      | disable time      | OE to An   | 1.0                | 6.0  | 1.0           | 6.0  | 1.0            | 6.0  | 1.0           | 6.0  | 1.0           | 6.0  | ns   |
|                                       |                   | OE to Bn   | 2.0                | 10.2 | 1.5           | 7.5  | 0.9            | 7.2  | 0.4           | 6.2  | 0.4           | 6.1  | ns   |
| t <sub>en</sub>                       | enable time       | OE to An   | 1.0                | 7.5  | 1.0           | 7.5  | 1.0            | 7.5  | 1.0           | 7.5  | 1.0           | 7.5  | ns   |
|                                       |                   | OE to Bn   | 2.0                | 14.4 | 1.4           | 7.9  | 1.3            | 7.7  | 1.1           | 6.4  | 1.1           | 5.6  | ns   |
| V <sub>CC(A)</sub> = 1.65 V to 1.95 V |                   |            |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | An to Bn   | 1.5                | 9.7  | 0.9           | 6.9  | 0.8            | 5.7  | 0.5           | 4.5  | 0.3           | 4.0  | ns   |
|                                       |                   | Bn to An   | 1.2                | 6.9  | 1.0           | 6.0  | 0.8            | 5.7  | 0.5           | 5.5  | 0.5           | 5.3  | ns   |
| t <sub>dis</sub>                      | disable time      | OE to An   | 0.5                | 5.7  | 0.5           | 5.7  | 0.5            | 5.7  | 0.5           | 5.7  | 0.5           | 5.7  | ns   |
|                                       |                   | OE to Bn   | 2.0                | 9.9  | 1.5           | 7.0  | 0.8            | 6.9  | 0.2           | 5.8  | 0.2           | 5.9  | ns   |
| t <sub>en</sub>                       | enable time       | OE to An   | 1.0                | 6.7  | 1.0           | 6.7  | 1.0            | 6.7  | 1.0           | 6.7  | 1.0           | 6.7  | ns   |
|                                       |                   | OE to Bn   | 1.5                | 13.9 | 1.2           | 7.2  | 1.2            | 6.9  | 0.8           | 5.4  | 0.6           | 5.0  | ns   |
| V <sub>CC(A)</sub> = 2.3 V to 2.7 V   |                   |            |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | An to Bn   | 1.4                | 9.4  | 0.8           | 6.6  | 0.5            | 5.5  | 0.4           | 4.2  | 0.2           | 3.7  | ns   |
|                                       |                   | Bn to An   | 1.0                | 5.9  | 0.5           | 4.8  | 0.5            | 4.5  | 0.4           | 4.2  | 0.3           | 3.9  | ns   |
| t <sub>dis</sub>                      | disable time      | OE to An   | 0.2                | 4.0  | 0.2           | 4.0  | 0.2            | 4.0  | 0.2           | 4.0  | 0.2           | 4.0  | ns   |
|                                       |                   | OE to Bn   | 2.0                | 9.3  | 1.5           | 6.7  | 0.7            | 6.3  | 0.2           | 5.0  | 0.2           | 5.7  | ns   |
| t <sub>en</sub>                       | enable time       | OE to An   | 0.6                | 4.5  | 0.6           | 4.5  | 0.6            | 4.5  | 0.6           | 4.5  | 0.6           | 4.5  | ns   |
|                                       |                   | OE to Bn   | 1.5                | 13.6 | 1.0           | 6.8  | 1.0            | 6.0  | 0.8           | 4.6  | 0.6           | 4.2  | ns   |
| V <sub>CC(A)</sub> = 3.0 V to 3.6 V   |                   |            |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | An to Bn   | 1.4                | 9.3  | 0.6           | 6.5  | 0.5            | 5.3  | 0.3           | 3.9  | 0.2           | 3.5  | ns   |
|                                       |                   | Bn to An   | 0.8                | 5.7  | 0.5           | 4.3  | 0.3            | 4.0  | 0.2           | 3.7  | 0.2           | 3.5  | ns   |
| t <sub>dis</sub>                      | disable time      | OE to An   | 0.2                | 4.5  | 0.2           | 4.5  | 0.2            | 4.5  | 0.2           | 4.5  | 0.2           | 4.5  | ns   |
|                                       |                   | OE to Bn   | 2.0                | 9.0  | 1.5           | 6.4  | 0.7            | 6.1  | 0.2           | 4.8  | 0.2           | 5.6  | ns   |
| t <sub>en</sub>                       | enable time       | OE to An   | 0.5                | 4.0  | 0.5           | 4.0  | 0.5            | 4.0  | 0.5           | 4.0  | 0.5           | 4.0  | ns   |
|                                       |                   | OE to Bn   | 1.5                | 13.4 | 1.0           | 6.7  | 1.0            | 5.9  | 0.7           | 4.4  | 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>.

Table 14. 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 waveforms 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 | An to Bn              | 2.0                | 12.1 | 1.3           | 9.0  | 1.2            | 8.0  | 1.0           | 6.8  | 0.8           | 6.6  | ns   |
|                                       |                   | Bn to An              | 2.0                | 12.1 | 1.5           | 11.4 | 1.5            | 11.2 | 1.4           | 10.9 | 1.4           | 10.7 | ns   |
| t <sub>dis</sub>                      | disable time      | $\overline{OE}$ to An | 2.0                | 11.5 | 2.0           | 11.5 | 2.0            | 11.5 | 2.0           | 11.5 | 2.0           | 11.5 | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 2.0                | 12.8 | 2.0           | 9.9  | 1.0            | 9.2  | 0.7           | 8.1  | 1.0           | 9.2  | ns   |
| t <sub>en</sub>                       | enable time       | $\overline{OE}$ to An | 2.0                | 15.6 | 2.0           | 15.6 | 2.0            | 15.6 | 2.0           | 15.6 | 2.0           | 15.6 | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 2.0                | 17.3 | 2.0           | 12.7 | 2.0            | 10.9 | 1.0           | 9.0  | 1.0           | 8.6  | ns   |
| V <sub>CC(A)</sub> = 1.4 V to 1.6 V   |                   |                       |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | An to Bn              | 1.5                | 11.4 | 1.0           | 8.2  | 1.0            | 6.9  | 0.5           | 5.6  | 0.5           | 5.0  | ns   |
|                                       |                   | Bn to An              | 1.3                | 9.0  | 1.0           | 8.2  | 0.9            | 8.0  | 0.8           | 7.6  | 0.6           | 7.5  | ns   |
| t <sub>dis</sub>                      | disable time      | $\overline{OE}$ to An | 1.0                | 6.9  | 1.0           | 6.9  | 1.0            | 6.9  | 1.0           | 6.9  | 1.0           | 6.9  | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 2.0                | 11.8 | 1.5           | 8.7  | 0.9            | 8.3  | 0.4           | 7.2  | 0.4           | 7.1  | ns   |
| t <sub>en</sub>                       | enable time       | $\overline{OE}$ to An | 1.0                | 8.7  | 1.0           | 8.7  | 1.0            | 8.7  | 1.0           | 8.7  | 1.0           | 8.7  | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 2.0                | 16.6 | 1.4           | 9.1  | 1.3            | 8.9  | 1.1           | 7.4  | 1.1           | 6.5  | ns   |
| V <sub>CC(A)</sub> = 1.65 V to 1.95 V |                   |                       |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | An to Bn              | 1.5                | 11.2 | 0.9           | 8.0  | 0.8            | 6.6  | 0.5           | 5.2  | 0.3           | 4.6  | ns   |
|                                       |                   | Bn to An              | 1.2                | 8.0  | 1.0           | 6.9  | 0.8            | 6.6  | 0.5           | 6.4  | 0.5           | 6.1  | ns   |
| t <sub>dis</sub>                      | disable time      | $\overline{OE}$ to An | 0.5                | 6.6  | 0.5           | 6.6  | 0.5            | 6.6  | 0.5           | 6.6  | 0.5           | 6.6  | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 2.0                | 11.4 | 1.5           | 8.1  | 0.8            | 8.0  | 0.2           | 6.7  | 0.2           | 6.8  | ns   |
| t <sub>en</sub>                       | enable time       | $\overline{OE}$ to An | 1.0                | 7.8  | 1.0           | 7.8  | 1.0            | 7.8  | 1.0           | 7.8  | 1.0           | 7.8  | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 1.5                | 16.0 | 1.2           | 8.3  | 1.2            | 8.0  | 0.8           | 6.3  | 0.6           | 5.8  | ns   |
| V <sub>CC(A)</sub> = 2.3 V to 2.7 V   |                   |                       |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | An to Bn              | 1.4                | 10.9 | 0.8           | 7.6  | 0.5            | 6.4  | 0.4           | 4.9  | 0.2           | 4.3  | ns   |
|                                       |                   | Bn to An              | 1.0                | 6.8  | 0.5           | 5.6  | 0.5            | 5.2  | 0.4           | 4.9  | 0.3           | 4.5  | ns   |
| t <sub>dis</sub>                      | disable time      | $\overline{OE}$ to An | 0.2                | 4.6  | 0.2           | 4.6  | 0.2            | 4.6  | 0.2           | 4.6  | 0.2           | 4.6  | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 2.0                | 10.7 | 1.5           | 7.8  | 0.7            | 7.3  | 0.2           | 5.8  | 0.2           | 6.6  | ns   |
| t <sub>en</sub>                       | enable time       | $\overline{OE}$ to An | 0.6                | 5.2  | 0.6           | 5.2  | 0.6            | 5.2  | 0.6           | 5.2  | 0.6           | 5.2  | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 1.5                | 15.7 | 1.0           | 7.9  | 1.0            | 6.9  | 0.8           | 5.3  | 0.6           | 4.9  | ns   |
| V <sub>CC(A)</sub> = 3.0 V to 3.6 V   |                   |                       |                    |      |               |      |                |      |               |      |               |      |      |
| t <sub>pd</sub>                       | propagation delay | An to Bn              | 1.4                | 10.7 | 0.6           | 7.5  | 0.5            | 6.1  | 0.3           | 4.5  | 0.2           | 4.1  | ns   |
|                                       |                   | Bn to An              | 0.8                | 6.6  | 0.5           | 5.0  | 0.3            | 4.6  | 0.2           | 4.3  | 0.2           | 4.1  | ns   |
| t <sub>dis</sub>                      | disable time      | $\overline{OE}$ to An | 0.2                | 5.2  | 0.2           | 5.2  | 0.2            | 5.2  | 0.2           | 5.2  | 0.2           | 5.2  | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 2.0                | 10.4 | 1.5           | 7.4  | 0.7            | 7.1  | 0.2           | 5.6  | 0.2           | 6.5  | ns   |
| t <sub>en</sub>                       | enable time       | $\overline{OE}$ to An | 0.5                | 4.6  | 0.5           | 4.6  | 0.5            | 4.6  | 0.5           | 4.6  | 0.5           | 4.6  | ns   |
|                                       |                   | $\overline{OE}$ to Bn | 1.5                | 15.5 | 1.0           | 7.8  | 1.0            | 6.8  | 0.7           | 5.1  | 0.5           | 4.6  | 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>.

11.1. Waveforms and test circuit

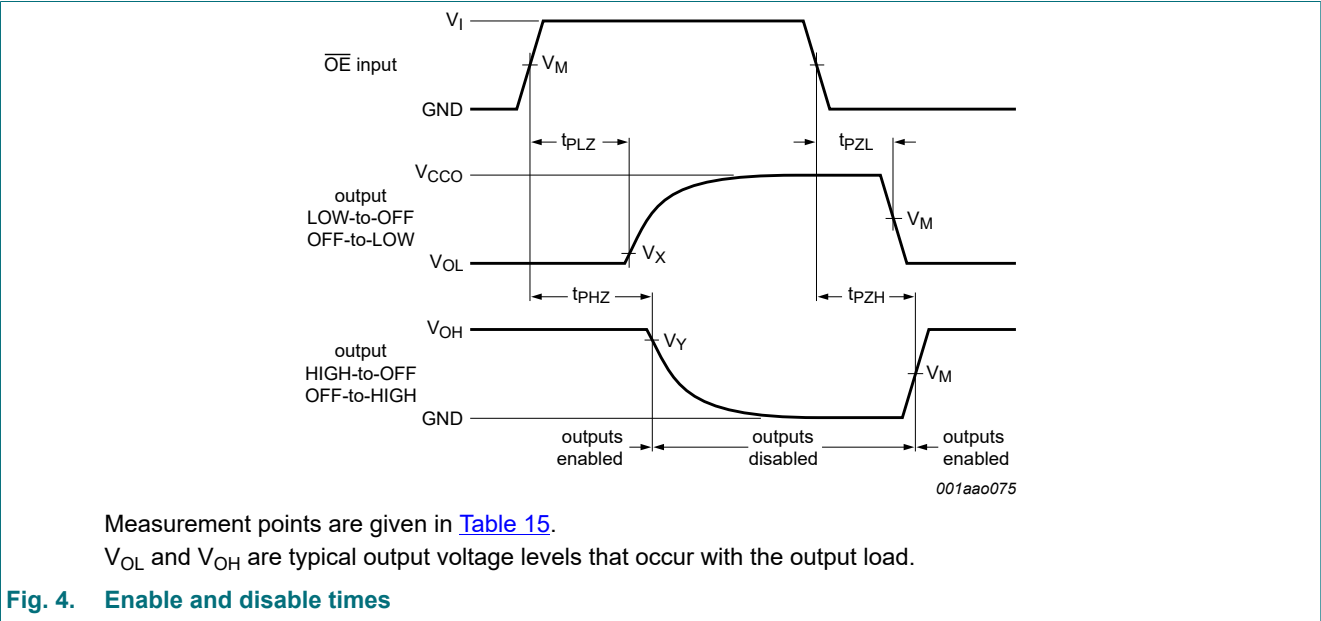
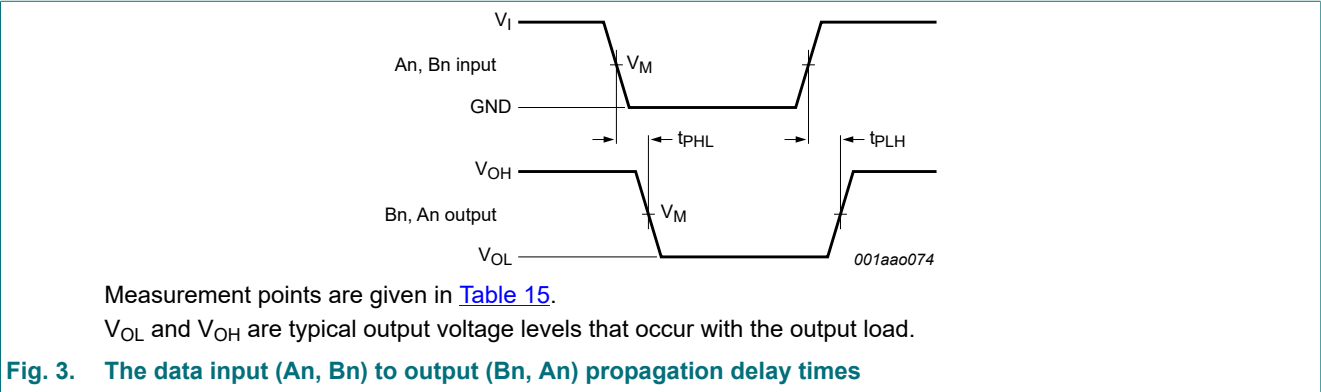


Table 15. Measurement points

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

[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.

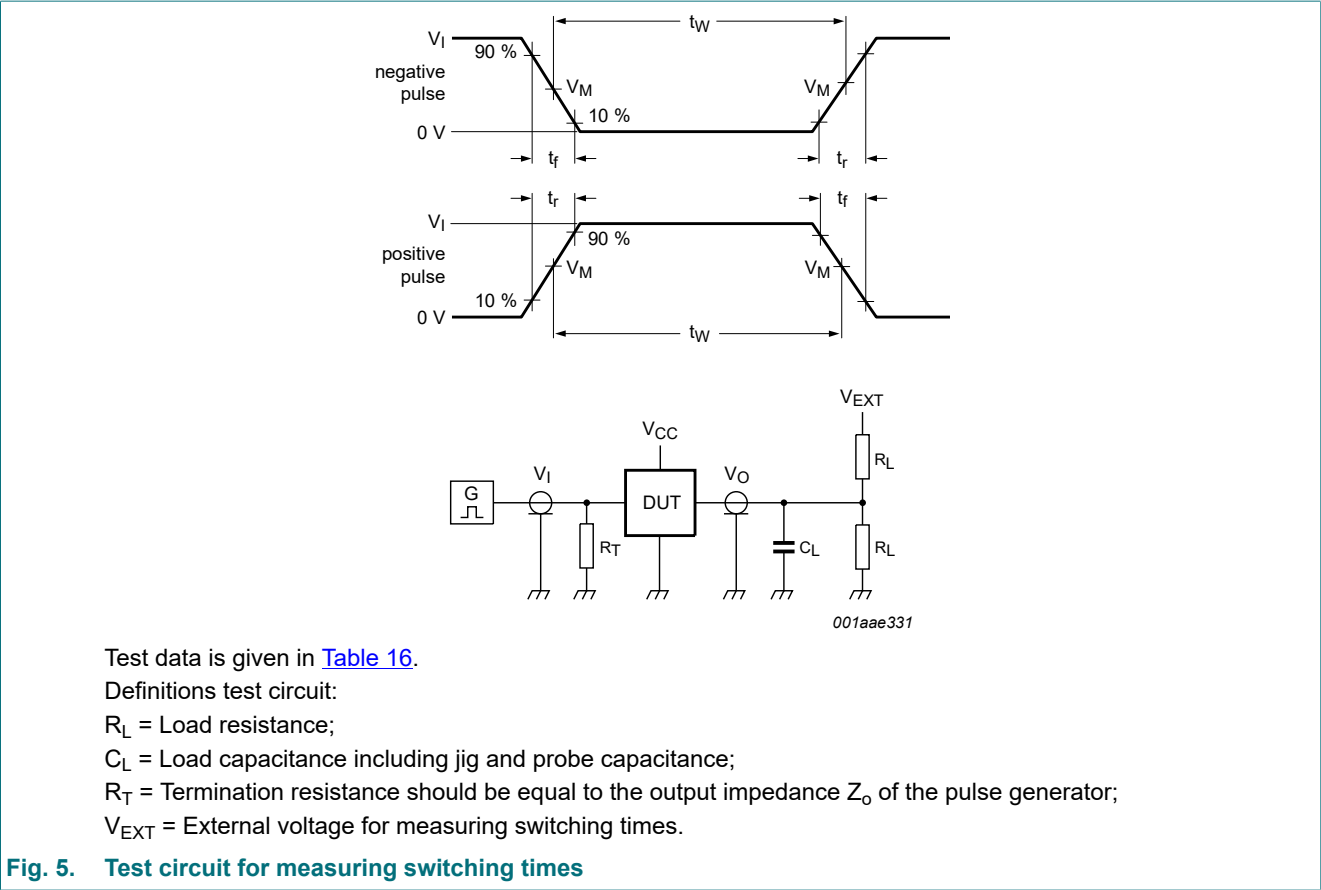


Table 16. Test data

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

[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.

11.2. Typical propagation delay characteristics

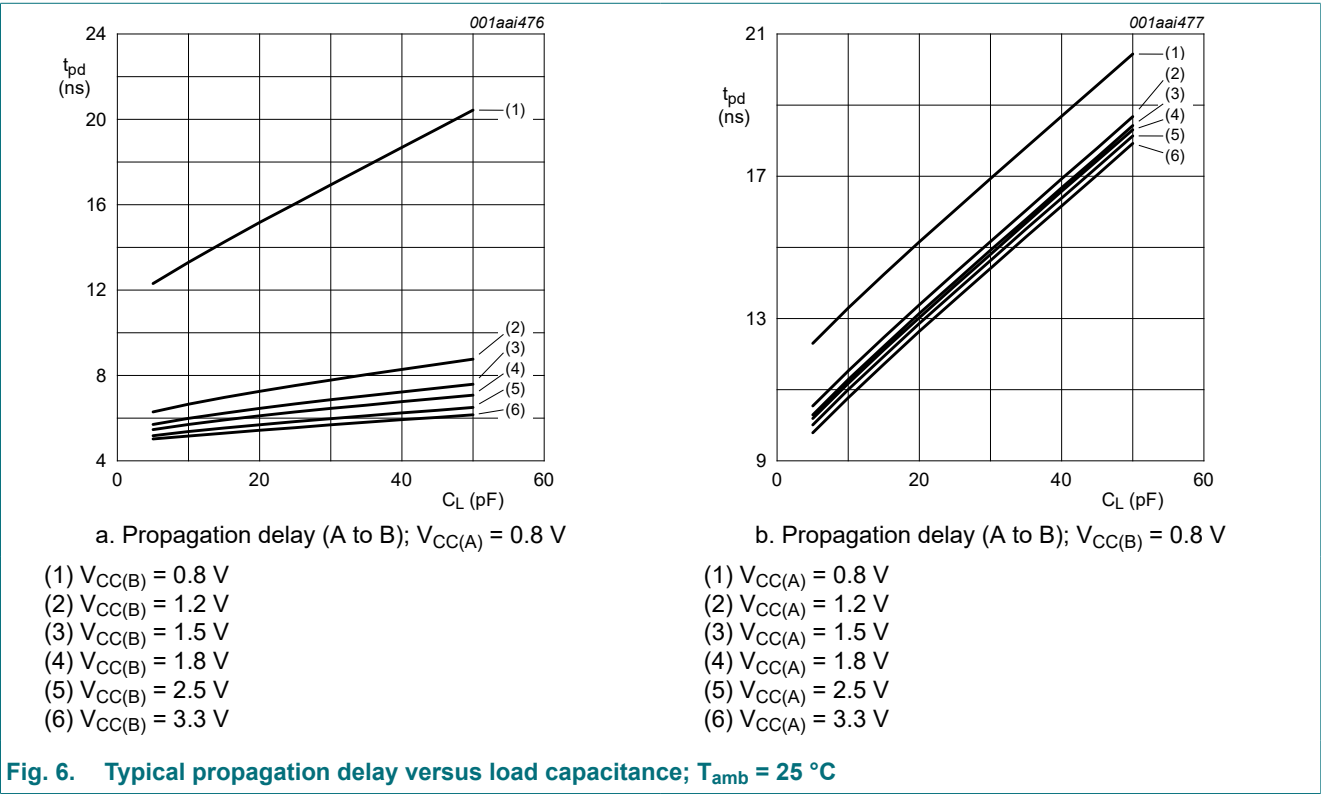
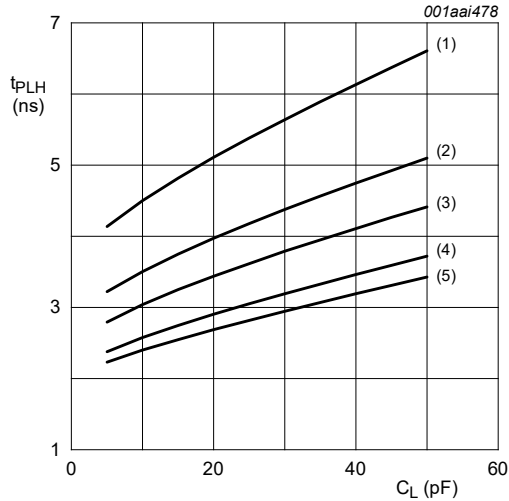
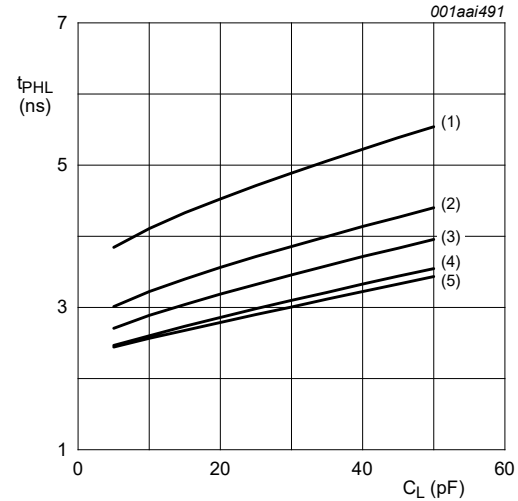
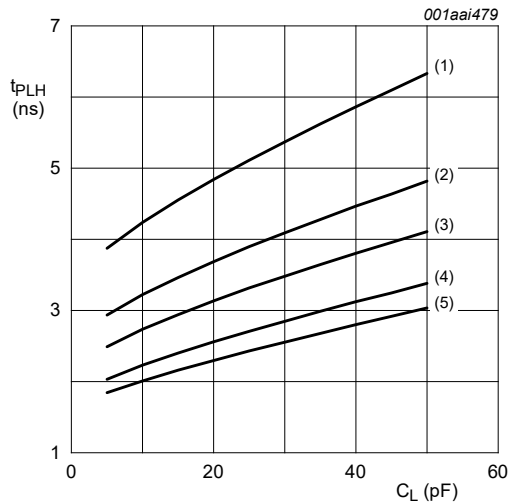
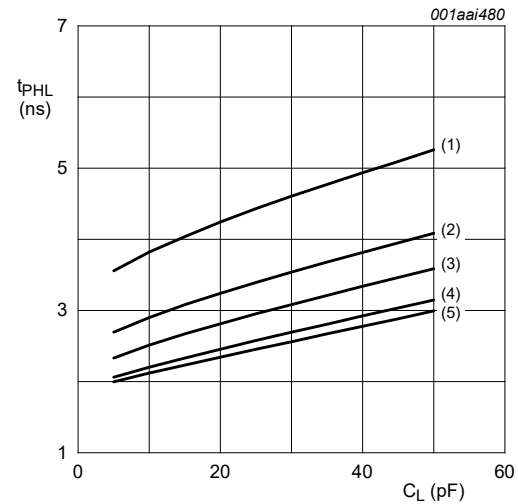
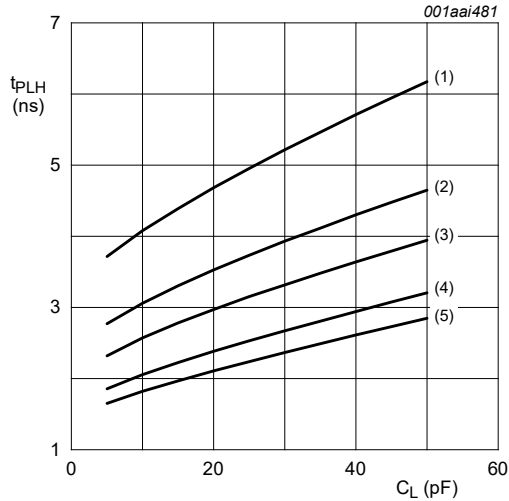
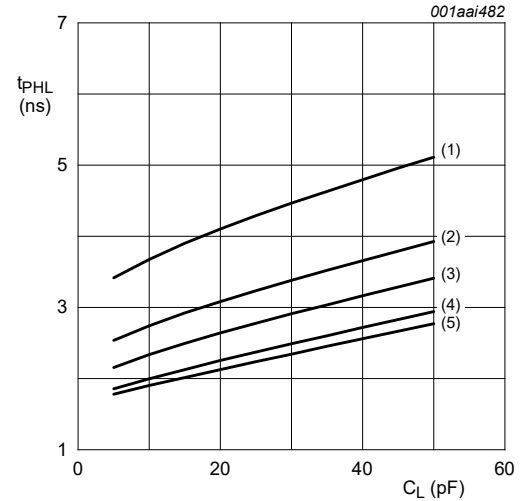
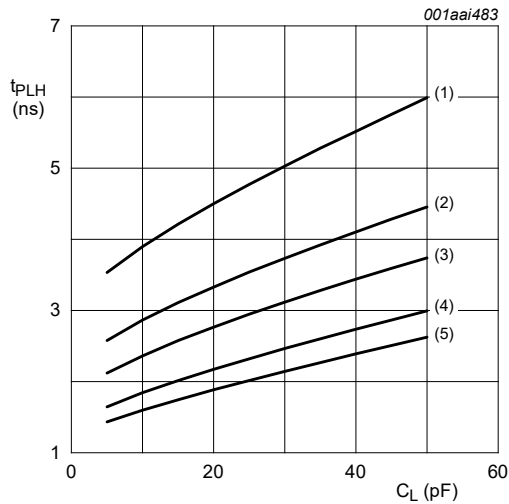
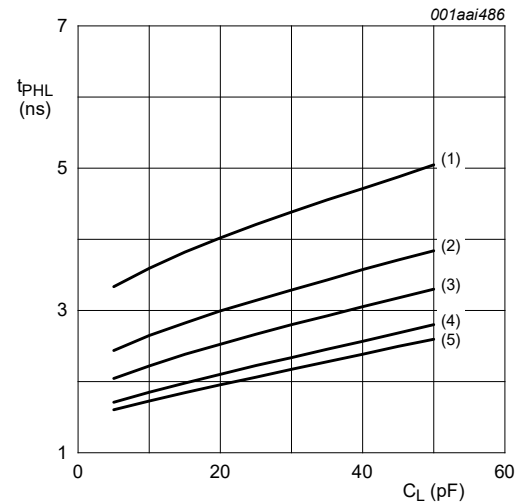


Fig. 6. Typical propagation delay versus load capacitance;  $T_{amb} = 25\text{ }^{\circ}\text{C}$

a. LOW to HIGH propagation delay (A to B);  $V_{CC(A)} = 1.2$  Vb. HIGH to LOW propagation delay (A to B);  $V_{CC(A)} = 1.2$  Vc. LOW to HIGH propagation delay (A to B);  $V_{CC(A)} = 1.5$  Vd. HIGH to LOW propagation delay (A to B);  $V_{CC(A)} = 1.5$  V

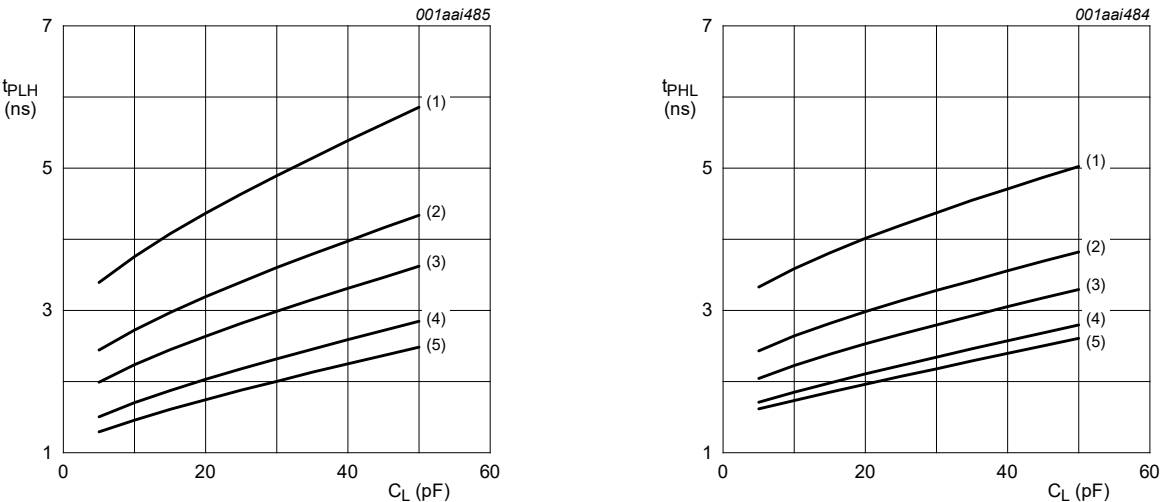
- (1)  $V_{CC(B)} = 1.2$  V
- (2)  $V_{CC(B)} = 1.5$  V
- (3)  $V_{CC(B)} = 1.8$  V
- (4)  $V_{CC(B)} = 2.5$  V
- (5)  $V_{CC(B)} = 3.3$  V

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

a. LOW to HIGH propagation delay (A to B);  $V_{CC(A)} = 1.8$  Vb. HIGH to LOW propagation delay (A to B);  $V_{CC(A)} = 1.8$  Vc. LOW to HIGH propagation delay (A to B);  $V_{CC(A)} = 2.5$  Vd. HIGH to LOW propagation delay (A to B);  $V_{CC(A)} = 2.5$  V

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

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



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

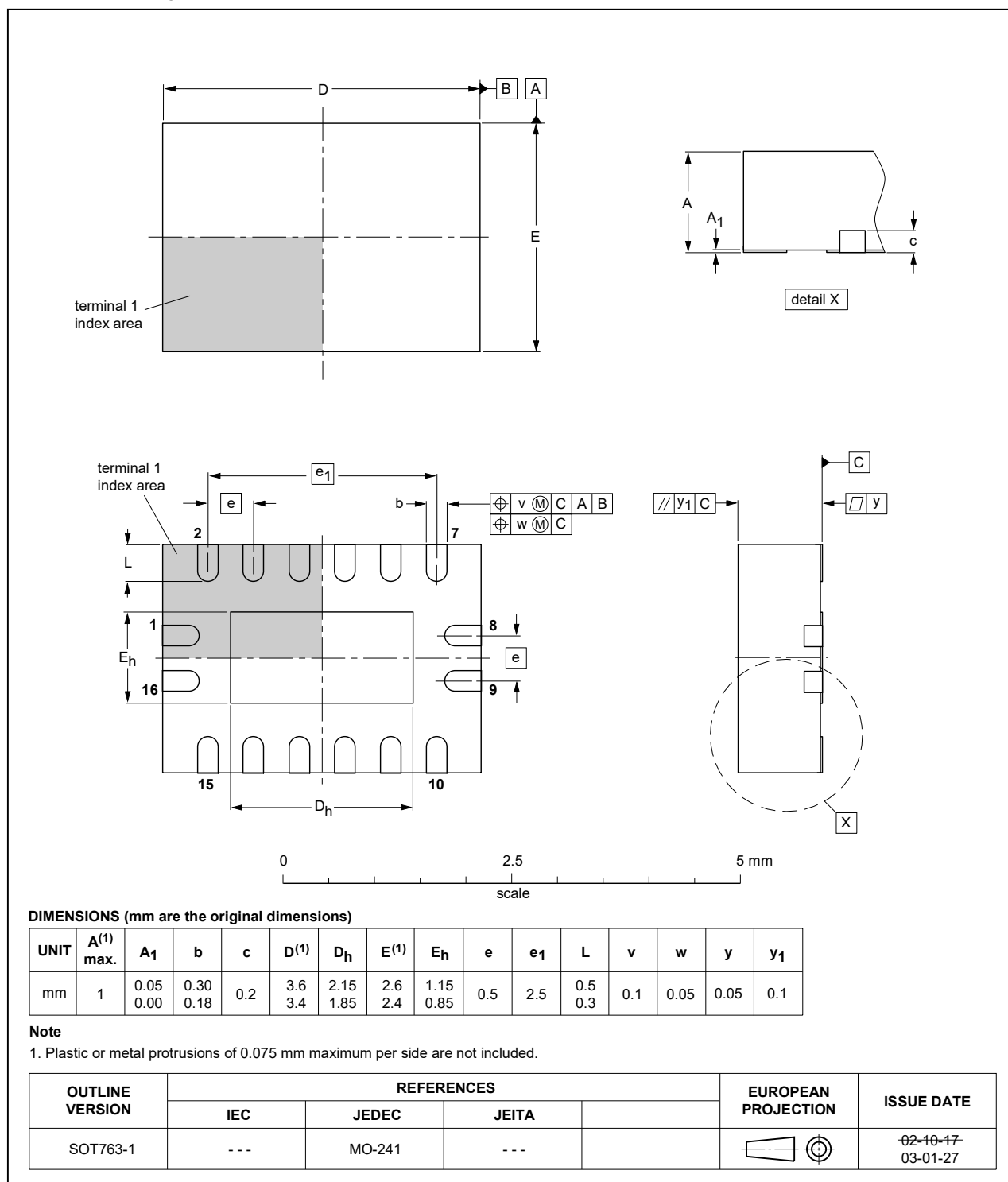
(1)  $V_{CC(B)} = 1.2\text{ V}$   
(2)  $V_{CC(B)} = 1.5\text{ V}$   
(3)  $V_{CC(B)} = 1.8\text{ V}$   
(4)  $V_{CC(B)} = 2.5\text{ V}$   
(5)  $V_{CC(B)} = 3.3\text{ V}$

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

## 12. Package outline

**DHVQFN16: plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 16 terminals; body 2.5 x 3.5 x 0.85 mm**

**SOT763-1**



**Fig. 10. Package outline SOT763-1 (DHVQFN16)**

XQFN16: plastic, extremely thin quad flat package; no leads;  
16 terminals; body 1.80 x 2.60 x 0.50 mm

SOT1161-1

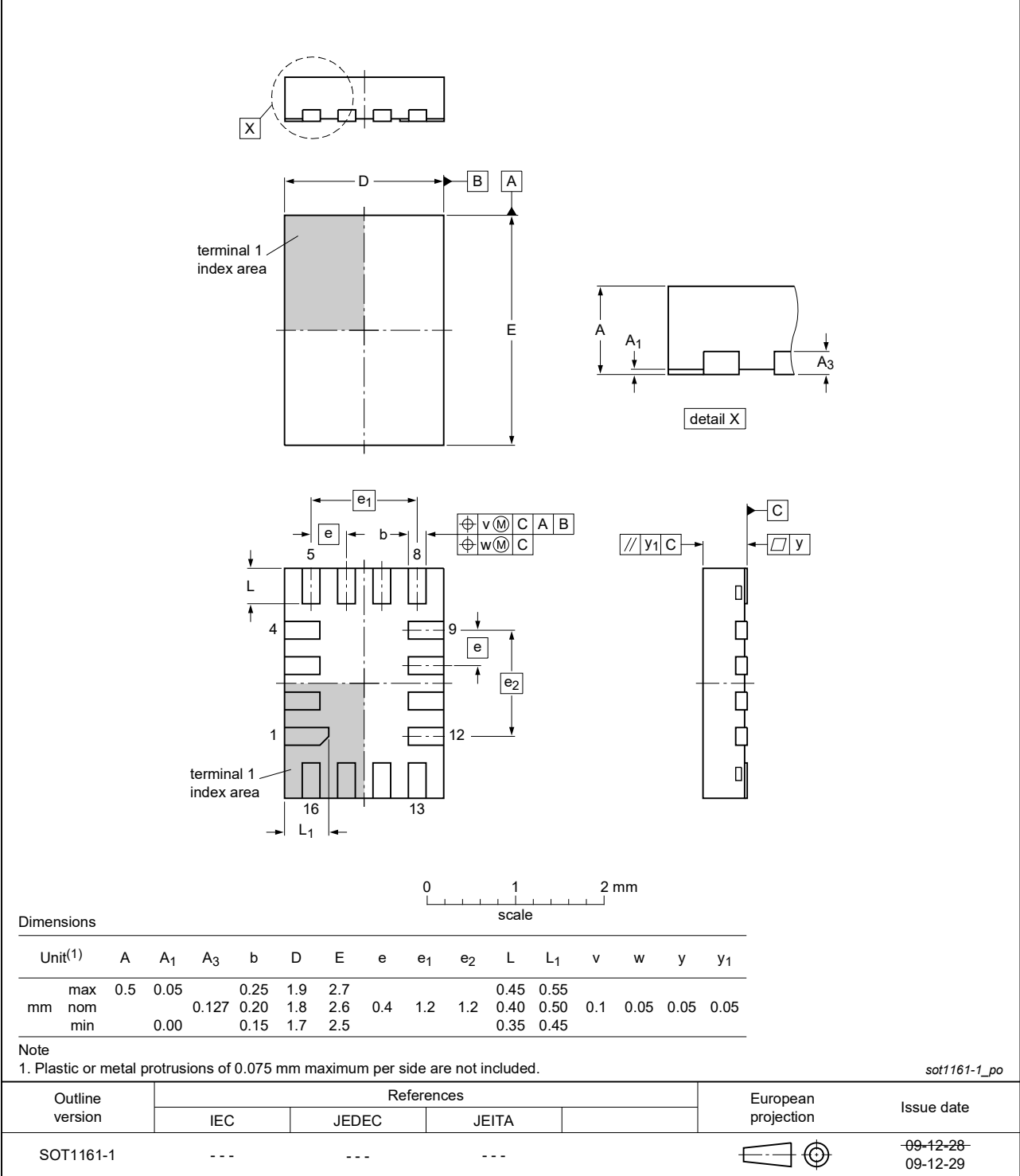


Fig. 11. Package outline SOT1161-1 (XQFN16)

13. Abbreviations

Table 17. 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 18. Revision history

| Document ID         | Release date                                                                                    | Data sheet status  | Change notice | Supersedes          |
|---------------------|-------------------------------------------------------------------------------------------------|--------------------|---------------|---------------------|
| 74AVC4T774_Q100 v.3 | 20240625                                                                                        | Product data sheet | -             | 74AVC4T774_Q100 v.2 |
| Modifications:      | • <a href="#">Section 2</a> : ESD specification updated according to the latest JEDEC standard. |                    |               |                     |
| 74AVC4T774_Q100 v.2 | 20230102                                                                                        | Product data sheet | -             | 74AVC4T774_Q100 v.1 |
| Modifications:      | • <a href="#">Section 2</a> updated.                                                            |                    |               |                     |
| 74AVC4T774_Q100 v.1 | 20220511                                                                                        | Product data sheet | -             | -                   |

## 15. Legal information

### Data sheet status

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

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

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