

# 74AUP1G126

Low-power buffer/line driver; 3-state

Rev. 7 — 16 May 2018

Product data sheet

## 1 General description

The 74AUP1G126 provides a single non-inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input (OE). A LOW level at pin OE causes the output to assume a high-impedance OFF-state. This device has the input-disable feature, which allows floating input signals. The inputs are disabled when the output enable input OE is LOW.

Schmitt-trigger action at all inputs makes the circuit tolerant to slower input rise and fall times across the entire  $V_{CC}$  range from 0.8 V to 3.6 V. This device ensures a very low static and dynamic power consumption across the entire  $V_{CC}$  range from 0.8 V to 3.6 V.

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

## 2 Features and benefits

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - JESD8-11 (0.9 V to 1.65 V)
  - JESD8-7 (1.2 V to 1.95 V)
  - JESD8-5 (1.8 V to 2.7 V)
  - JESD8-B (2.7 V to 3.6 V)
- ESD protection:
  - HBM JESD22-A114F Class 3A exceeds 5000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101E exceeds 1000 V
- Low static power consumption;  $I_{CC} = 0.9 \mu\text{A}$  (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V
- Low noise overshoot and undershoot < 10 % of  $V_{CC}$
- Input-disable feature allows floating input conditions
- $I_{OFF}$  circuitry provides partial power-down mode operation
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

3 Ordering information

Table 1. Ordering information

| Type number  | Package           |        |                                                                                                                |          |
|--------------|-------------------|--------|----------------------------------------------------------------------------------------------------------------|----------|
|              | Temperature range | Name   | Description                                                                                                    | Version  |
| 74AUP1G126GW | -40 °C to +125 °C | TSSOP5 | plastic thin shrink small outline package; 5 leads; body width 1.25 mm                                         | SOT353-1 |
| 74AUP1G126GM | -40 °C to +125 °C | XSON6  | plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm                    | SOT886   |
| 74AUP1G126GF | -40 °C to +125 °C | XSON6  | plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1 x 0.5 mm                       | SOT891   |
| 74AUP1G126GN | -40 °C to +125 °C | XSON6  | extremely thin small outline package; no leads; 6 terminals; body 0.9 x 1.0 x 0.35 mm                          | SOT1115  |
| 74AUP1G126GS | -40 °C to +125 °C | XSON6  | extremely thin small outline package; no leads; 6 terminals; body 1.0 x 1.0 x 0.35 mm                          | SOT1202  |
| 74AUP1G126GX | -40 °C to +125 °C | X2SON5 | plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 x 0.8 x 0.35 mm | SOT1226  |

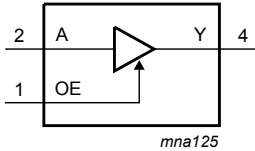
4 Marking

Table 2. Marking

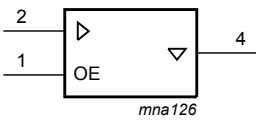
| Type number  | Marking code <sup>[1]</sup> |
|--------------|-----------------------------|
| 74AUP1G126GW | pN                          |
| 74AUP1G126GM | pN                          |
| 74AUP1G126GF | pN                          |
| 74AUP1G126GN | pN                          |
| 74AUP1G126GS | pN                          |
| 74AUP1G126GX | pN                          |

[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

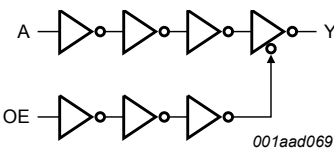
5 Functional diagram



**Figure 1. Logic symbol**



**Figure 2. IEC logic symbol**



**Figure 3. Logic diagram**

6 Pinning information

6.1 Pinning

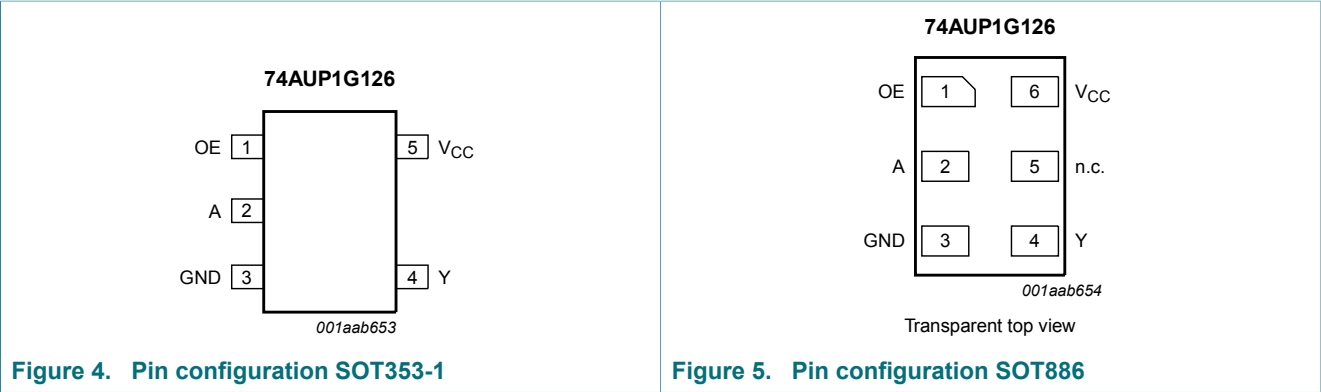


Figure 4. Pin configuration SOT353-1

Figure 5. Pin configuration SOT886

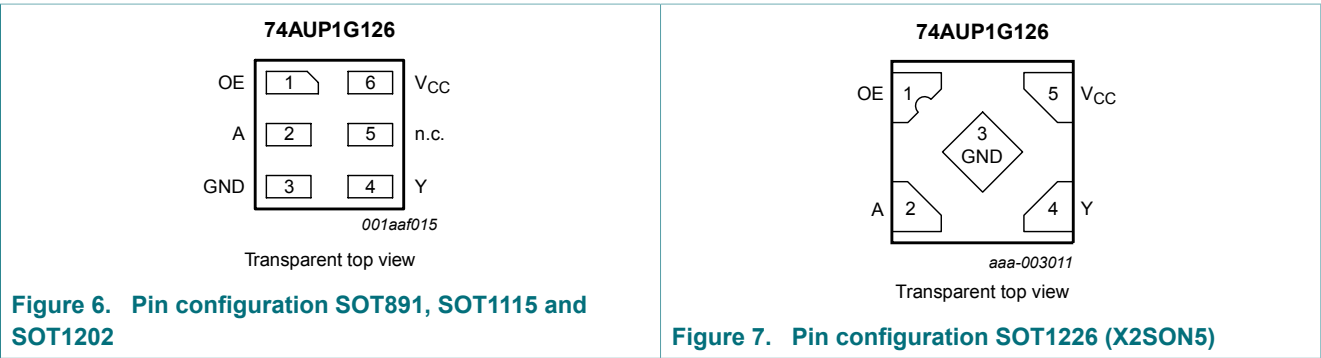


Figure 6. Pin configuration SOT891, SOT1115 and SOT1202

Figure 7. Pin configuration SOT1226 (X2SON5)

6.2 Pin description

Table 3. Pin description

| Symbol          | Pin               |       | Description         |
|-----------------|-------------------|-------|---------------------|
|                 | TSSOP5 and X2SON5 | XSON6 |                     |
| OE              | 1                 | 1     | output enable input |
| A               | 2                 | 2     | data input          |
| GND             | 3                 | 3     | ground (0 V)        |
| Y               | 4                 | 4     | data output         |
| n.c.            | -                 | 5     | not connected       |
| V <sub>CC</sub> | 5                 | 6     | supply voltage      |

## 7 Functional description

**Table 4. Function table**

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

| Input |   | Output |
|-------|---|--------|
| OE    | A | Y      |
| H     | L | L      |
| H     | H | H      |
| L     | X | Z      |

## 8 Limiting values

**Table 5. Limiting values**

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

| Symbol    | Parameter               | Conditions                        | Min  | Max            | Unit |
|-----------|-------------------------|-----------------------------------|------|----------------|------|
| $V_{CC}$  | supply voltage          |                                   | -0.5 | +4.6           | V    |
| $I_{IK}$  | input clamping current  | $V_I < 0$ V                       | -50  | -              | mA   |
| $V_I$     | input voltage           | [1]                               | -0.5 | +4.6           | V    |
| $I_{OK}$  | output clamping current | $V_O < 0$ V                       | -50  | -              | mA   |
| $V_O$     | output voltage          | Active mode [1]                   | -0.5 | $V_{CC} + 0.5$ | V    |
|           |                         | Power-down mode [1]               | -0.5 | +4.6           | V    |
| $I_O$     | output current          | $V_O = 0$ V to $V_{CC}$           | -    | $\pm 20$       | mA   |
| $I_{CC}$  | supply current          |                                   | -    | +50            | mA   |
| $I_{GND}$ | ground current          |                                   | -50  | -              | mA   |
| $T_{stg}$ | storage temperature     |                                   | -65  | +150           | °C   |
| $P_{tot}$ | total power dissipation | $T_{amb} = -40$ °C to +125 °C [2] | -    | 250            | mW   |

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

[2] For TSSOP5 packages: above 87.5 °C the value of  $P_{tot}$  derates linearly with 4.0 mW/K.

For XSON6 and X2SON5 packages: above 118 °C the value of  $P_{tot}$  derates linearly with 7.8 mW/K.

## 9 Recommended operating conditions

**Table 6. Recommended operating conditions**

| Symbol              | Parameter                           | Conditions                      | Min | Max      | Unit |
|---------------------|-------------------------------------|---------------------------------|-----|----------|------|
| $V_{CC}$            | supply voltage                      |                                 | 0.8 | 3.6      | V    |
| $V_I$               | input voltage                       |                                 | 0   | 3.6      | V    |
| $V_O$               | output voltage                      | Active mode                     | 0   | $V_{CC}$ | V    |
|                     |                                     | Power-down mode; $V_{CC} = 0$ V | 0   | 3.6      | V    |
| $T_{amb}$           | ambient temperature                 |                                 | -40 | +125     | °C   |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC} = 0.8$ V to 3.6 V       | 0   | 200      | ns/V |

## 10 Static characteristics

**Table 7. Static characteristics**

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

| Symbol                         | Parameter                            | Conditions                                                                                                             | Min                    | Typ | Max                    | Unit |
|--------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------|-----|------------------------|------|
| <b>T<sub>amb</sub> = 25 °C</b> |                                      |                                                                                                                        |                        |     |                        |      |
| V <sub>IH</sub>                | HIGH-level input voltage             | V <sub>CC</sub> = 0.8 V                                                                                                | 0.70 × V <sub>CC</sub> | -   | -                      | V    |
|                                |                                      | V <sub>CC</sub> = 0.9 V to 1.95 V                                                                                      | 0.65 × V <sub>CC</sub> | -   | -                      | V    |
|                                |                                      | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                                       | 1.6                    | -   | -                      | V    |
|                                |                                      | V <sub>CC</sub> = 3.0 V to 3.6 V                                                                                       | 2.0                    | -   | -                      | V    |
| V <sub>IL</sub>                | LOW-level input voltage              | V <sub>CC</sub> = 0.8 V                                                                                                | -                      | -   | 0.30 × V <sub>CC</sub> | V    |
|                                |                                      | V <sub>CC</sub> = 0.9 V to 1.95 V                                                                                      | -                      | -   | 0.35 × V <sub>CC</sub> | V    |
|                                |                                      | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                                       | -                      | -   | 0.7                    | V    |
|                                |                                      | V <sub>CC</sub> = 3.0 V to 3.6 V                                                                                       | -                      | -   | 0.9                    | 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> = -20 µA; V <sub>CC</sub> = 0.8 V to 3.6 V                                                              | V <sub>CC</sub> - 0.1  | -   | -                      | V    |
|                                |                                      | I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V                                                                      | 0.75 × V <sub>CC</sub> | -   | -                      | V    |
|                                |                                      | I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V                                                                      | 1.11                   | -   | -                      | V    |
|                                |                                      | I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V                                                                     | 1.32                   | -   | -                      | V    |
|                                |                                      | I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V                                                                      | 2.05                   | -   | -                      | V    |
|                                |                                      | I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V                                                                      | 1.9                    | -   | -                      | V    |
|                                |                                      | I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V                                                                      | 2.72                   | -   | -                      | V    |
|                                |                                      | I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V                                                                      | 2.6                    | -   | -                      | 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> = 20 µA; V <sub>CC</sub> = 0.8 V to 3.6 V                                                               | -                      | -   | 0.1                    | V    |
|                                |                                      | I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V                                                                       | -                      | -   | 0.3 × V <sub>CC</sub>  | V    |
|                                |                                      | I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V                                                                       | -                      | -   | 0.31                   | V    |
|                                |                                      | I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V                                                                      | -                      | -   | 0.31                   | V    |
|                                |                                      | I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V                                                                       | -                      | -   | 0.31                   | V    |
|                                |                                      | I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V                                                                       | -                      | -   | 0.44                   | V    |
|                                |                                      | I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V                                                                       | -                      | -   | 0.31                   | V    |
|                                |                                      | I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V                                                                       | -                      | -   | 0.44                   | V    |
| I <sub>I</sub>                 | input leakage current                | V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V                                                          | -                      | -   | ±0.1                   | µA   |
| I <sub>OZ</sub>                | OFF-state output current             | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V;<br>V <sub>CC</sub> = 0 V to 3.6 V | -                      | -   | ±0.1                   | µA   |
| I <sub>OFF</sub>               | power-off leakage current            | V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V                                                 | -                      | -   | ±0.2                   | µA   |
| ΔI <sub>OFF</sub>              | additional power-off leakage current | V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V;<br>V <sub>CC</sub> = 0 V to 0.2 V                                     | -                      | -   | ±0.2                   | µA   |

| Symbol                              | Parameter                 | Conditions                                                                                                            | Min                    | Typ | Max                    | Unit |
|-------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------|-----|------------------------|------|
| I <sub>CC</sub>                     | supply current            | V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 0.8 V to 3.6 V                   | -                      | -   | 0.5                    | μA   |
| ΔI <sub>CC</sub>                    | additional supply current | data input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 3.3 V <sup>[1]</sup> | -                      | -   | 40                     | μA   |
|                                     |                           | OE input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 3.3 V <sup>[1]</sup>   | -                      | -   | 110                    | μA   |
|                                     |                           | all inputs; V <sub>I</sub> = GND to 3.6 V;<br>OE = GND; V <sub>CC</sub> = 0.8 V to 3.6 V <sup>[2]</sup>               | -                      | -   | 1                      | μA   |
| C <sub>I</sub>                      | input capacitance         | V <sub>CC</sub> = 0 V to 3.6 V; V <sub>I</sub> = GND or V <sub>CC</sub>                                               | -                      | 0.9 | -                      | pF   |
| C <sub>O</sub>                      | output capacitance        | output enabled; V <sub>O</sub> = GND; V <sub>CC</sub> = 0 V                                                           | -                      | 1.7 | -                      | pF   |
|                                     |                           | output disabled; V <sub>CC</sub> = 0 V to 3.6 V;<br>V <sub>O</sub> = GND or V <sub>CC</sub>                           | -                      | 1.5 | -                      | pF   |
| T <sub>amb</sub> = -40 °C to +85 °C |                           |                                                                                                                       |                        |     |                        |      |
| V <sub>IH</sub>                     | HIGH-level input voltage  | V <sub>CC</sub> = 0.8 V                                                                                               | 0.70 × V <sub>CC</sub> | -   | -                      | V    |
|                                     |                           | V <sub>CC</sub> = 0.9 V to 1.95 V                                                                                     | 0.65 × V <sub>CC</sub> | -   | -                      | V    |
|                                     |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                                      | 1.6                    | -   | -                      | V    |
|                                     |                           | V <sub>CC</sub> = 3.0 V to 3.6 V                                                                                      | 2.0                    | -   | -                      | V    |
| V <sub>IL</sub>                     | LOW-level input voltage   | V <sub>CC</sub> = 0.8 V                                                                                               | -                      | -   | 0.30 × V <sub>CC</sub> | V    |
|                                     |                           | V <sub>CC</sub> = 0.9 V to 1.95 V                                                                                     | -                      | -   | 0.35 × V <sub>CC</sub> | V    |
|                                     |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                                      | -                      | -   | 0.7                    | V    |
|                                     |                           | V <sub>CC</sub> = 3.0 V to 3.6 V                                                                                      | -                      | -   | 0.9                    | 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> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V                                                             | V <sub>CC</sub> - 0.1  | -   | -                      | V    |
|                                     |                           | I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V                                                                     | 0.7 × V <sub>CC</sub>  | -   | -                      | V    |
|                                     |                           | I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V                                                                     | 1.03                   | -   | -                      | V    |
|                                     |                           | I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V                                                                    | 1.30                   | -   | -                      | V    |
|                                     |                           | I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V                                                                     | 1.97                   | -   | -                      | V    |
|                                     |                           | I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V                                                                     | 1.85                   | -   | -                      | V    |
|                                     |                           | I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V                                                                     | 2.67                   | -   | -                      | V    |
|                                     |                           | I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V                                                                     | 2.55                   | -   | -                      | V    |

| Symbol                               | Parameter                            | Conditions                                                                                                          | Min                    | Typ | Max                    | Unit |
|--------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------|-----|------------------------|------|
| 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> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V                                                            | -                      | -   | 0.1                    | V    |
|                                      |                                      | I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V                                                                    | -                      | -   | 0.3 × V <sub>CC</sub>  | V    |
|                                      |                                      | I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V                                                                    | -                      | -   | 0.37                   | V    |
|                                      |                                      | I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V                                                                   | -                      | -   | 0.35                   | V    |
|                                      |                                      | I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V                                                                    | -                      | -   | 0.33                   | V    |
|                                      |                                      | I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V                                                                    | -                      | -   | 0.45                   | V    |
|                                      |                                      | I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V                                                                    | -                      | -   | 0.33                   | V    |
|                                      |                                      | I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V                                                                    | -                      | -   | 0.45                   | V    |
| I <sub>I</sub>                       | input leakage current                | V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V                                                       | -                      | -   | ±0.5                   | μA   |
| I <sub>OZ</sub>                      | OFF-state output current             | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V | -                      | -   | ±0.5                   | μA   |
| I <sub>OFF</sub>                     | power-off leakage current            | V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V                                              | -                      | -   | ±0.5                   | μA   |
| ΔI <sub>OFF</sub>                    | additional power-off leakage current | V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V                                     | -                      | -   | ±0.6                   | μA   |
| I <sub>CC</sub>                      | supply current                       | V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V                    | -                      | -   | 0.9                    | μA   |
| ΔI <sub>CC</sub>                     | additional supply current            | data input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V <sup>[1]</sup>  | -                      | -   | 50                     | μA   |
|                                      |                                      | OE input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V <sup>[1]</sup>    | -                      | -   | 120                    | μA   |
|                                      |                                      | all inputs; V <sub>I</sub> = GND to 3.6 V; OE = GND; V <sub>CC</sub> = 0.8 V to 3.6 V <sup>[2]</sup>                | -                      | -   | 1                      | μA   |
| T <sub>amb</sub> = -40 °C to +125 °C |                                      |                                                                                                                     |                        |     |                        |      |
| V <sub>IH</sub>                      | HIGH-level input voltage             | V <sub>CC</sub> = 0.8 V                                                                                             | 0.75 × V <sub>CC</sub> | -   | -                      | V    |
|                                      |                                      | V <sub>CC</sub> = 0.9 V to 1.95 V                                                                                   | 0.70 × V <sub>CC</sub> | -   | -                      | V    |
|                                      |                                      | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                                    | 1.6                    | -   | -                      | V    |
|                                      |                                      | V <sub>CC</sub> = 3.0 V to 3.6 V                                                                                    | 2.0                    | -   | -                      | V    |
| V <sub>IL</sub>                      | LOW-level input voltage              | V <sub>CC</sub> = 0.8 V                                                                                             | -                      | -   | 0.25 × V <sub>CC</sub> | V    |
|                                      |                                      | V <sub>CC</sub> = 0.9 V to 1.95 V                                                                                   | -                      | -   | 0.30 × V <sub>CC</sub> | V    |
|                                      |                                      | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                                    | -                      | -   | 0.7                    | V    |
|                                      |                                      | V <sub>CC</sub> = 3.0 V to 3.6 V                                                                                    | -                      | -   | 0.9                    | 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>                                                                    |                        |     |                        |      |
|                   |                                      | I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 0.8 V to 3.6 V                                                              | V <sub>CC</sub> - 0.11 | -   | -                      | V    |
|                   |                                      | I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V                                                                      | 0.6 × V <sub>CC</sub>  | -   | -                      | V    |
|                   |                                      | I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V                                                                      | 0.93                   | -   | -                      | V    |
|                   |                                      | I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V                                                                     | 1.17                   | -   | -                      | V    |
|                   |                                      | I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V                                                                      | 1.77                   | -   | -                      | V    |
|                   |                                      | I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V                                                                      | 1.67                   | -   | -                      | V    |
|                   |                                      | I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V                                                                      | 2.40                   | -   | -                      | V    |
|                   |                                      | I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V                                                                      | 2.30                   | -   | -                      | 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> = 20 µA; V <sub>CC</sub> = 0.8 V to 3.6 V                                                               | -                      | -   | 0.11                   | V    |
|                   |                                      | I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V                                                                       | -                      | -   | 0.33 × V <sub>CC</sub> | V    |
|                   |                                      | I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V                                                                       | -                      | -   | 0.41                   | V    |
|                   |                                      | I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V                                                                      | -                      | -   | 0.39                   | V    |
|                   |                                      | I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V                                                                       | -                      | -   | 0.36                   | V    |
|                   |                                      | I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V                                                                       | -                      | -   | 0.50                   | V    |
|                   |                                      | I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V                                                                       | -                      | -   | 0.36                   | V    |
|                   |                                      | I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V                                                                       | -                      | -   | 0.50                   | V    |
| I <sub>I</sub>    | input leakage current                | V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V                                                          | -                      | -   | ±0.75                  | µA   |
| I <sub>OZ</sub>   | OFF-state output current             | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V;<br>V <sub>CC</sub> = 0 V to 3.6 V | -                      | -   | ±0.75                  | µA   |
| I <sub>OFF</sub>  | power-off leakage current            | V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V                                                 | -                      | -   | ±0.75                  | µA   |
| ΔI <sub>OFF</sub> | additional power-off leakage current | V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V;<br>V <sub>CC</sub> = 0 V to 0.2 V                                     | -                      | -   | ±0.75                  | µA   |
| I <sub>CC</sub>   | supply current                       | V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 0.8 V to 3.6 V                    | -                      | -   | 1.4                    | µA   |
| ΔI <sub>CC</sub>  | additional supply current            | data input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 3.3 V <sup>[1]</sup>  | -                      | -   | 75                     | µA   |
|                   |                                      | OE input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 3.3 V <sup>[1]</sup>    | -                      | -   | 180                    | µA   |
|                   |                                      | all inputs; V <sub>I</sub> = GND to 3.6 V;<br>OE = GND; V <sub>CC</sub> = 0.8 V to 3.6 V <sup>[2]</sup>                | -                      | -   | 1                      | µA   |

[1] One input at V<sub>CC</sub> - 0.6 V, other input at V<sub>CC</sub> or GND.[2] To show I<sub>CC</sub> remains very low when the input-disable feature is enabled.

## 11 Dynamic characteristics

**Table 8. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 10](#)

| Symbol                                           | Parameter         | Conditions                                           | Min | Typ <sup>[1]</sup> | Max  | Unit |
|--------------------------------------------------|-------------------|------------------------------------------------------|-----|--------------------|------|------|
| T <sub>amb</sub> = 25 °C; C <sub>L</sub> = 5 pF  |                   |                                                      |     |                    |      |      |
| t <sub>pd</sub>                                  | propagation delay | A to Y; see <a href="#">Figure 8</a> <sup>[2]</sup>  |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                              | -   | 20.6               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 2.8 | 5.5                | 10.5 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.2 | 3.9                | 6.1  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.9 | 3.2                | 4.8  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.6 | 2.6                | 3.6  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.4 | 2.4                | 3.1  | ns   |
| t <sub>en</sub>                                  | enable time       | OE to Y; see <a href="#">Figure 9</a> <sup>[3]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                              | -   | 71.6               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 2.8 | 6.2                | 12.4 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.3 | 4.2                | 6.9  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.9 | 3.3                | 5.3  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.5 | 2.4                | 3.6  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.3 | 2.0                | 2.9  | ns   |
| t <sub>dis</sub>                                 | disable time      | OE to Y; see <a href="#">Figure 9</a> <sup>[4]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                              | -   | 10.3               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 2.6 | 4.2                | 6.2  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.1 | 3.2                | 4.4  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 2.1 | 3.1                | 4.4  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.7 | 2.4                | 3.2  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 2.1 | 2.8                | 3.6  | ns   |
| T <sub>amb</sub> = 25 °C; C <sub>L</sub> = 10 pF |                   |                                                      |     |                    |      |      |
| t <sub>pd</sub>                                  | propagation delay | see <a href="#">Figure 8</a> <sup>[2]</sup>          |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                              | -   | 24.0               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 3.2 | 6.4                | 12.3 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.1 | 4.5                | 7.3  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.9 | 3.8                | 5.5  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 2.1 | 3.2                | 4.2  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.8 | 3.0                | 3.8  | ns   |

| Symbol                                           | Parameter         | Conditions                                  | Min | Typ <sup>[1]</sup> | Max  | Unit |
|--------------------------------------------------|-------------------|---------------------------------------------|-----|--------------------|------|------|
| t <sub>en</sub>                                  | enable time       | see <a href="#">Figure 9</a> <sup>[3]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                     | -   | 75.3               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V            | 3.2 | 7.1                | 14.1 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V            | 2.2 | 4.8                | 8.0  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V          | 1.8 | 3.9                | 5.9  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V            | 1.5 | 2.9                | 4.2  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V            | 1.4 | 2.6                | 3.6  | ns   |
| t <sub>dis</sub>                                 | disable time      | see <a href="#">Figure 9</a> <sup>[4]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                     | -   | 12.2               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V            | 3.5 | 5.3                | 7.6  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V            | 2.2 | 4.1                | 5.6  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V          | 2.4 | 4.2                | 5.7  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V            | 1.9 | 3.2                | 4.1  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V            | 2.4 | 4.1                | 5.0  | ns   |
| T <sub>amb</sub> = 25 °C; C <sub>L</sub> = 15 pF |                   |                                             |     |                    |      |      |
| t <sub>pd</sub>                                  | propagation delay | see <a href="#">Figure 8</a> <sup>[2]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                     | -   | 27.4               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V            | 3.6 | 7.2                | 14.1 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V            | 3.0 | 5.1                | 8.1  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V          | 2.2 | 4.3                | 6.3  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V            | 2.0 | 3.7                | 4.9  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V            | 2.0 | 3.5                | 4.4  | ns   |
| t <sub>en</sub>                                  | enable time       | see <a href="#">Figure 9</a> <sup>[3]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                     | -   | 79.2               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V            | 3.6 | 7.8                | 15.8 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V            | 3.0 | 5.4                | 8.8  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V          | 2.1 | 4.3                | 6.7  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V            | 1.8 | 3.4                | 4.8  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V            | 1.6 | 3.1                | 4.3  | ns   |

| Symbol                                           | Parameter         | Conditions                                  | Min | Typ <sup>[1]</sup> | Max  | Unit |
|--------------------------------------------------|-------------------|---------------------------------------------|-----|--------------------|------|------|
| t <sub>dis</sub>                                 | disable time      | see <a href="#">Figure 9</a> <sup>[4]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                     | -   | 14.9               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V            | 4.3 | 6.4                | 8.5  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V            | 3.0 | 5.0                | 6.6  | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V          | 3.1 | 5.4                | 6.6  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V            | 2.4 | 4.0                | 5.0  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V            | 3.2 | 5.3                | 6.2  | ns   |
| T <sub>amb</sub> = 25 °C; C <sub>L</sub> = 30 pF |                   |                                             |     |                    |      |      |
| t <sub>pd</sub>                                  | propagation delay | see <a href="#">Figure 8</a> <sup>[2]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                     | -   | 37.4               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V            | 4.8 | 9.5                | 18.7 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V            | 4.0 | 6.7                | 10.8 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V          | 2.9 | 5.6                | 8.4  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V            | 2.7 | 4.8                | 6.3  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V            | 2.7 | 4.6                | 5.8  | ns   |
| t <sub>en</sub>                                  | enable time       | see <a href="#">Figure 9</a> <sup>[3]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                     | -   | 90.6               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V            | 4.7 | 10.0               | 20.4 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V            | 3.0 | 6.9                | 11.3 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V          | 2.6 | 5.6                | 8.6  | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V            | 2.3 | 4.5                | 6.3  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V            | 2.2 | 4.2                | 5.8  | ns   |
| t <sub>dis</sub>                                 | disable time      | see <a href="#">Figure 9</a> <sup>[4]</sup> |     |                    |      |      |
|                                                  |                   | V <sub>CC</sub> = 0.8 V                     | -   | 51.6               | -    | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.1 V to 1.3 V            | 6.0 | 9.8                | 13.6 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.4 V to 1.6 V            | 4.5 | 7.7                | 10.5 | ns   |
|                                                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V          | 5.2 | 8.8                | 11.4 | ns   |
|                                                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V            | 3.9 | 6.4                | 7.4  | ns   |
|                                                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V            | 5.5 | 9.0                | 10.7 | ns   |

| Symbol                         | Parameter                     | Conditions                                                        | Min | Typ <sup>[1]</sup> | Max | Unit |
|--------------------------------|-------------------------------|-------------------------------------------------------------------|-----|--------------------|-----|------|
| <b>T<sub>amb</sub> = 25 °C</b> |                               |                                                                   |     |                    |     |      |
| C <sub>PD</sub>                | power dissipation capacitance | f = 1 MHz; V <sub>I</sub> = GND to V <sub>CC</sub> <sup>[5]</sup> |     |                    |     |      |
|                                |                               | output enabled                                                    |     |                    |     |      |
|                                |                               | V <sub>CC</sub> = 0.8 V                                           | -   | 2.7                | -   | pF   |
|                                |                               | V <sub>CC</sub> = 1.1 V to 1.3 V                                  | -   | 2.8                | -   | pF   |
|                                |                               | V <sub>CC</sub> = 1.4 V to 1.6 V                                  | -   | 2.9                | -   | pF   |
|                                |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                | -   | 3.0                | -   | pF   |
|                                |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                  | -   | 3.6                | -   | pF   |
|                                |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                  | -   | 4.2                | -   | pF   |

[1] All typical values are measured at nominal V<sub>CC</sub>.

[2] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.

[3] t<sub>en</sub> is the same as t<sub>PZH</sub> and t<sub>PZL</sub>.

[4] t<sub>dis</sub> is the same as t<sub>PHZ</sub> and t<sub>PLZ</sub>.

[5] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).

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

f<sub>i</sub> = input frequency in MHz;

f<sub>o</sub> = output frequency in MHz;

C<sub>L</sub> = output load capacitance in pF;

V<sub>CC</sub> = supply voltage in V;

N = number of inputs switching;

$\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of the outputs.

**Table 9. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 10](#)

| Symbol                | Parameter         | Conditions                                           | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|-----------------------|-------------------|------------------------------------------------------|------------------|------|-------------------|------|------|
|                       |                   |                                                      | Min              | Max  | Min               | Max  |      |
| C <sub>L</sub> = 5 pF |                   |                                                      |                  |      |                   |      |      |
| t <sub>pd</sub>       | propagation delay | A to Y; see <a href="#">Figure 8</a> <sup>[1]</sup>  |                  |      |                   |      |      |
|                       |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 2.5              | 11.7 | 2.5               | 12.9 | ns   |
|                       |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.0              | 7.3  | 2.0               | 8.1  | ns   |
|                       |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.7              | 6.1  | 1.7               | 6.7  | ns   |
|                       |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.4              | 4.3  | 1.4               | 4.9  | ns   |
|                       |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.2              | 3.9  | 1.2               | 4.4  | ns   |
| t <sub>en</sub>       | enable time       | OE to Y; see <a href="#">Figure 9</a> <sup>[2]</sup> |                  |      |                   |      |      |
|                       |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 2.6              | 13.6 | 2.6               | 13.6 | ns   |
|                       |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.2              | 7.4  | 2.2               | 7.7  | ns   |
|                       |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.7              | 5.9  | 1.7               | 6.2  | ns   |
|                       |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.4              | 3.8  | 1.4               | 4.1  | ns   |
|                       |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.2              | 3.2  | 1.2               | 3.4  | ns   |

| Symbol                 | Parameter         | Conditions                                           | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|------------------------|-------------------|------------------------------------------------------|------------------|------|-------------------|------|------|
|                        |                   |                                                      | Min              | Max  | Min               | Max  |      |
| t <sub>dis</sub>       | disable time      | OE to Y; see <a href="#">Figure 9</a> <sup>[3]</sup> |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 2.9              | 6.4  | 2.9               | 6.5  | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.2              | 4.6  | 2.2               | 4.7  | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.7              | 4.6  | 1.7               | 4.8  | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.4              | 3.4  | 1.4               | 3.6  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.2              | 3.7  | 1.2               | 3.8  | ns   |
| C <sub>L</sub> = 10 pF |                   |                                                      |                  |      |                   |      |      |
| t <sub>pd</sub>        | propagation delay | A to Y; see <a href="#">Figure 8</a> <sup>[1]</sup>  |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 3.0              | 13.8 | 3.0               | 15.2 | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 1.9              | 8.5  | 1.9               | 9.4  | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.7              | 6.8  | 1.7               | 7.6  | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.6              | 5.3  | 1.6               | 5.9  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.6              | 4.6  | 1.6               | 5.2  | ns   |
| t <sub>en</sub>        | enable time       | OE to Y; see <a href="#">Figure 9</a> <sup>[2]</sup> |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 3.0              | 15.4 | 3.0               | 15.4 | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.1              | 8.3  | 2.1               | 8.6  | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.7              | 6.5  | 1.7               | 6.8  | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.4              | 4.5  | 1.4               | 4.8  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.3              | 3.8  | 1.3               | 4.0  | ns   |
| t <sub>dis</sub>       | disable time      | OE to Y; see <a href="#">Figure 9</a> <sup>[3]</sup> |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 3.3              | 7.9  | 3.3               | 7.9  | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.1              | 5.7  | 2.1               | 5.9  | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 1.7              | 5.8  | 1.7               | 6.0  | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.4              | 4.3  | 1.4               | 4.5  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.3              | 5.2  | 1.3               | 5.3  | ns   |

| Symbol                 | Parameter         | Conditions                                           | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|------------------------|-------------------|------------------------------------------------------|------------------|------|-------------------|------|------|
|                        |                   |                                                      | Min              | Max  | Min               | Max  |      |
| C <sub>L</sub> = 15 pF |                   |                                                      |                  |      |                   |      |      |
| t <sub>pd</sub>        | propagation delay | A to Y; see <a href="#">Figure 8</a> <sup>[1]</sup>  |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 3.3              | 15.8 | 3.3               | 17.5 | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.5              | 9.8  | 2.5               | 10.9 | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 2.0              | 7.9  | 2.0               | 8.8  | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.8              | 6.0  | 1.8               | 6.7  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.8              | 5.4  | 1.8               | 6.1  | ns   |
| t <sub>en</sub>        | enable time       | OE to Y; see <a href="#">Figure 9</a> <sup>[2]</sup> |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 3.3              | 17.1 | 3.3               | 17.1 | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.9              | 9.4  | 2.9               | 9.7  | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 2.0              | 7.3  | 2.0               | 7.7  | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.7              | 5.2  | 1.7               | 5.6  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.5              | 4.5  | 1.5               | 4.7  | ns   |
| t <sub>dis</sub>       | disable time      | OE to Y; see <a href="#">Figure 9</a> <sup>[3]</sup> |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 3.7              | 9.3  | 3.7               | 9.4  | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 2.5              | 6.9  | 2.5               | 7.0  | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 2.0              | 7.4  | 2.0               | 7.5  | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 1.7              | 5.1  | 1.7               | 5.5  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 1.5              | 6.7  | 1.5               | 6.9  | ns   |

| Symbol                 | Parameter         | Conditions                                           | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|------------------------|-------------------|------------------------------------------------------|------------------|------|-------------------|------|------|
|                        |                   |                                                      | Min              | Max  | Min               | Max  |      |
| C <sub>L</sub> = 30 pF |                   |                                                      |                  |      |                   |      |      |
| t <sub>pd</sub>        | propagation delay | A to Y; see <a href="#">Figure 8</a> <sup>[1]</sup>  |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 4.4              | 21.4 | 4.4               | 24.0 | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 3.0              | 13.0 | 3.0               | 14.5 | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 2.6              | 10.3 | 2.6               | 11.5 | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 2.5              | 7.8  | 2.5               | 8.7  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 2.5              | 7.0  | 2.5               | 8.3  | ns   |
| t <sub>en</sub>        | enable time       | OE to Y; see <a href="#">Figure 9</a> <sup>[2]</sup> |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 4.3              | 22.0 | 4.3               | 22.0 | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 3.7              | 12.0 | 3.7               | 12.5 | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 3.2              | 9.5  | 3.2               | 10.1 | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 2.9              | 6.8  | 2.9               | 7.3  | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 2.7              | 6.4  | 2.7               | 6.7  | ns   |
| t <sub>dis</sub>       | disable time      | OE to Y; see <a href="#">Figure 9</a> <sup>[3]</sup> |                  |      |                   |      |      |
|                        |                   | V <sub>CC</sub> = 1.1 V to 1.3 V                     | 4.7              | 14.3 | 4.7               | 14.4 | ns   |
|                        |                   | V <sub>CC</sub> = 1.4 V to 1.6 V                     | 3.0              | 10.7 | 3.0               | 11.0 | ns   |
|                        |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                   | 2.6              | 11.5 | 2.6               | 11.6 | ns   |
|                        |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                     | 2.3              | 9.0  | 2.3               | 10.2 | ns   |
|                        |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                     | 2.2              | 10.8 | 2.2               | 12.0 | ns   |

[1] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.

[2] t<sub>en</sub> is the same as t<sub>pZH</sub> and t<sub>pZL</sub>.

[3] t<sub>dis</sub> is the same as t<sub>pHZ</sub> and t<sub>pLZ</sub>.

11.1 Waveforms and test circuit

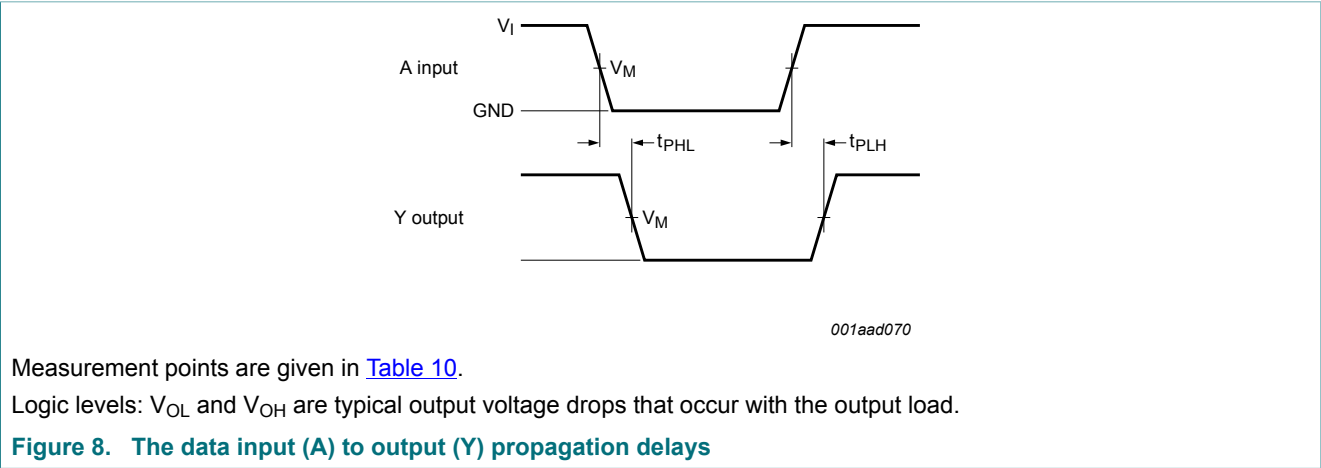


Table 10. Measurement points

| Supply voltage | Output              | Input               |          |                       |
|----------------|---------------------|---------------------|----------|-----------------------|
| $V_{CC}$       | $V_M$               | $V_M$               | $V_I$    | $t_r = t_f$           |
| 0.8 V to 3.6 V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{CC}$ | $\leq 3.0 \text{ ns}$ |

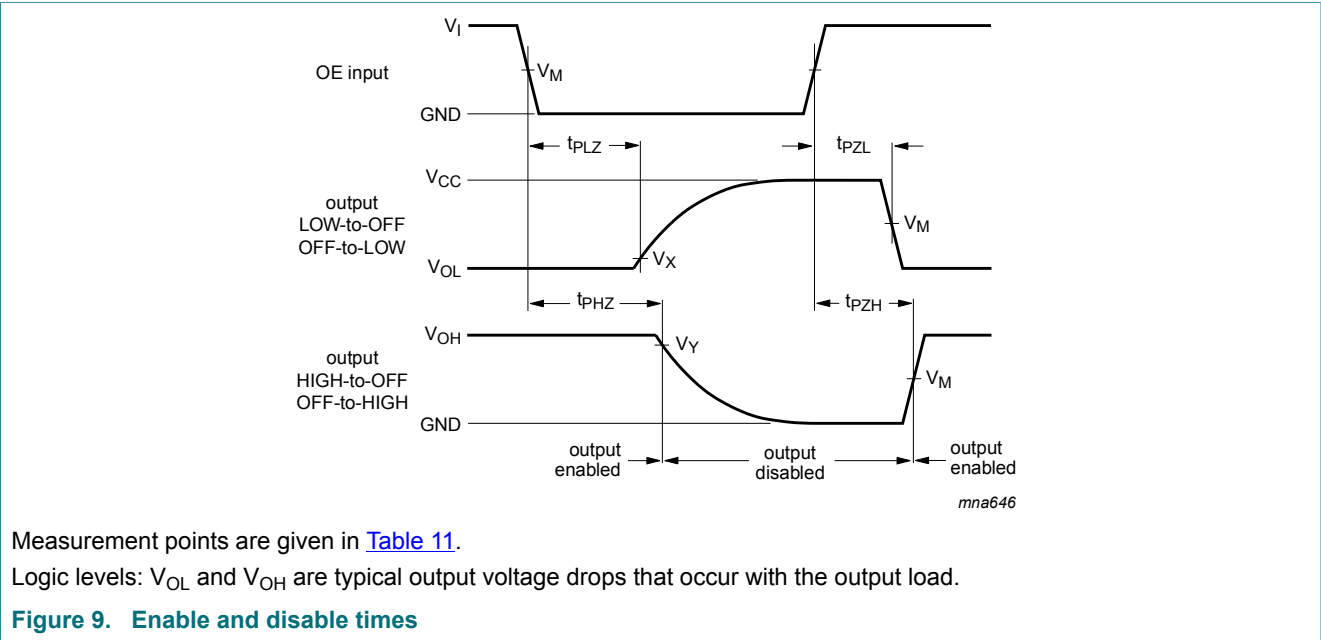
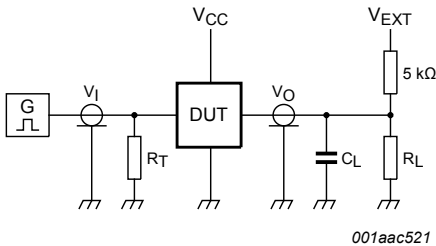


Table 11. Measurement points

| Supply voltage  | Input               | Output              |                           |                           |
|-----------------|---------------------|---------------------|---------------------------|---------------------------|
| $V_{CC}$        | $V_M$               | $V_M$               | $V_X$                     | $V_Y$                     |
| 0.8 V to 1.6 V  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.1 \text{ V}$  | $V_{OH} - 0.1 \text{ V}$  |
| 1.65 V to 2.7 V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.15 \text{ V}$ | $V_{OH} - 0.15 \text{ V}$ |
| 3.0 V to 3.6 V  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.3 \text{ V}$  | $V_{OH} - 0.3 \text{ V}$  |



Test data is given in [Table 12](#).

Definitions for test circuit:

$R_L$  = Load resistance.

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

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

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

**Figure 10. Test circuit for measuring switching times**

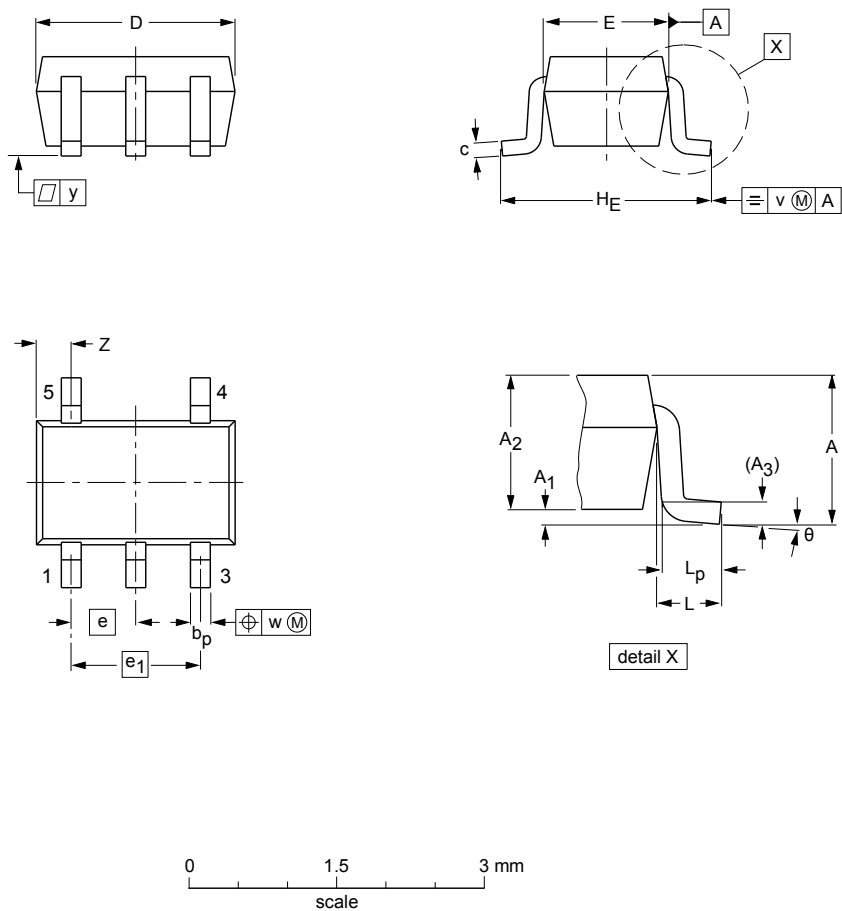
**Table 12. Test data**

| Supply voltage | Load                         |              | $V_{EXT}$             |                       |                       |
|----------------|------------------------------|--------------|-----------------------|-----------------------|-----------------------|
| $V_{CC}$       | $C_L$                        | $R_L$ [1]    | $t_{PLH}$ , $t_{PHL}$ | $t_{PZH}$ , $t_{PHZ}$ | $t_{PZL}$ , $t_{PLZ}$ |
| 0.8 V to 3.6 V | 5 pF, 10 pF, 15 pF and 30 pF | 5 kΩ or 1 MΩ | open                  | GND                   | $2 \times V_{CC}$     |

[1] For measuring enable and disable times  $R_L = 5\text{ k}\Omega$ , for measuring propagation delays, setup and hold times and pulse width  $R_L = 1\text{ M}\Omega$ .

12 Package outline

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm SOT353-1



DIMENSIONS (mm are the original dimensions)

| UNIT | A<br>max. | A <sub>1</sub> | A <sub>2</sub> | A <sub>3</sub> | b <sub>p</sub> | c            | D <sup>(1)</sup> | E <sup>(1)</sup> | e    | e <sub>1</sub> | H <sub>E</sub> | L     | L <sub>p</sub> | v   | w   | y   | Z <sup>(1)</sup> | θ        |
|------|-----------|----------------|----------------|----------------|----------------|--------------|------------------|------------------|------|----------------|----------------|-------|----------------|-----|-----|-----|------------------|----------|
| mm   | 1.1       | 0.1<br>0       | 1.0<br>0.8     | 0.15           | 0.30<br>0.15   | 0.25<br>0.08 | 2.25<br>1.85     | 1.35<br>1.15     | 0.65 | 1.3            | 2.25<br>2.0    | 0.425 | 0.46<br>0.21   | 0.3 | 0.1 | 0.1 | 0.60<br>0.15     | 7°<br>0° |

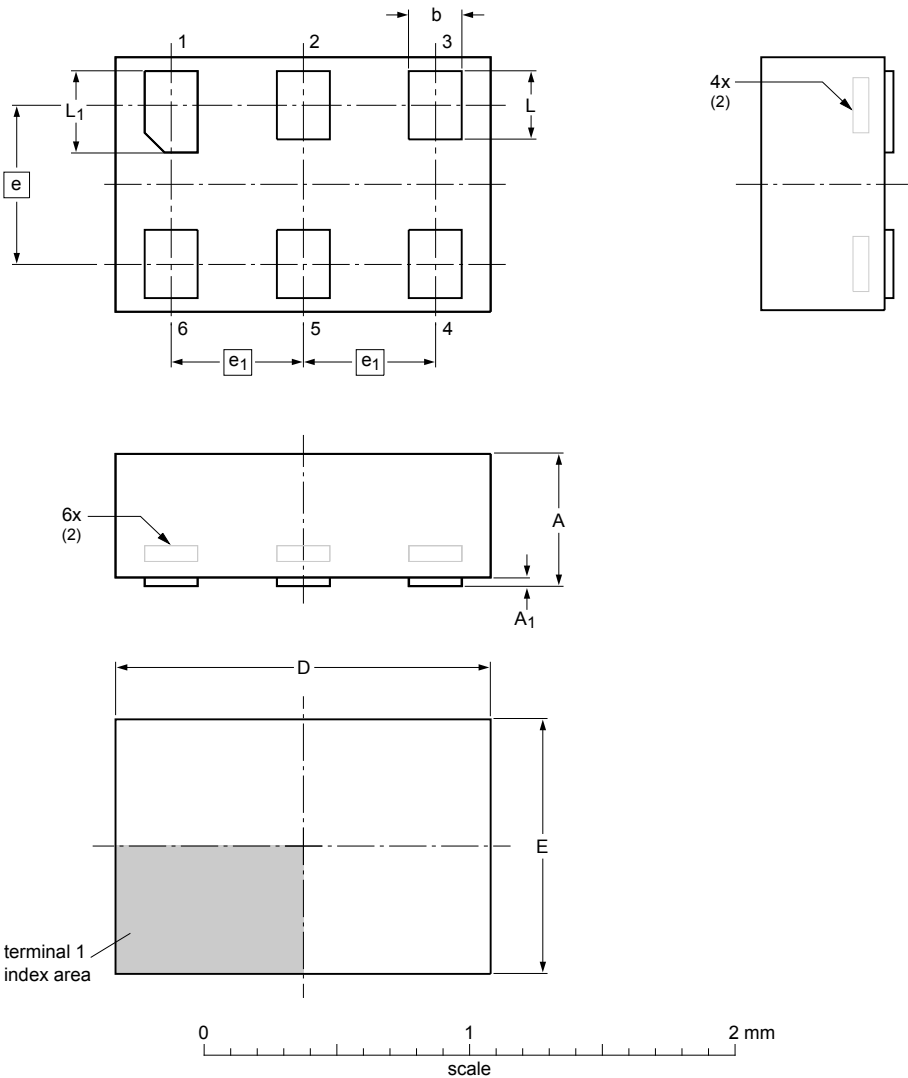
**Note**  
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

| OUTLINE<br>VERSION | REFERENCES |        |        |  | EUROPEAN<br>PROJECTION | ISSUE DATE                      |
|--------------------|------------|--------|--------|--|------------------------|---------------------------------|
|                    | IEC        | JEDEC  | JEITA  |  |                        |                                 |
| SOT353-1           |            | MO-203 | SC-88A |  |                        | <del>00-09-01</del><br>03-02-19 |

Figure 11. Package outline SOT353-1 (TSSOP5)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm

SOT886



Dimensions (mm are the original dimensions)

| Unit | A <sup>(1)</sup> | A <sub>1</sub> | b    | D    | E    | e    | e <sub>1</sub> | L    | L <sub>1</sub> |
|------|------------------|----------------|------|------|------|------|----------------|------|----------------|
| mm   | max              | 0.5            | 0.04 | 0.25 | 1.50 | 1.05 |                | 0.35 | 0.40           |
|      | nom              |                |      | 0.20 | 1.45 | 1.00 | 0.6            | 0.30 | 0.35           |
|      | min              |                |      | 0.17 | 1.40 | 0.95 |                | 0.27 | 0.32           |

- Notes
- 1. Including plating thickness.
  - 2. Can be visible in some manufacturing processes.

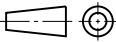
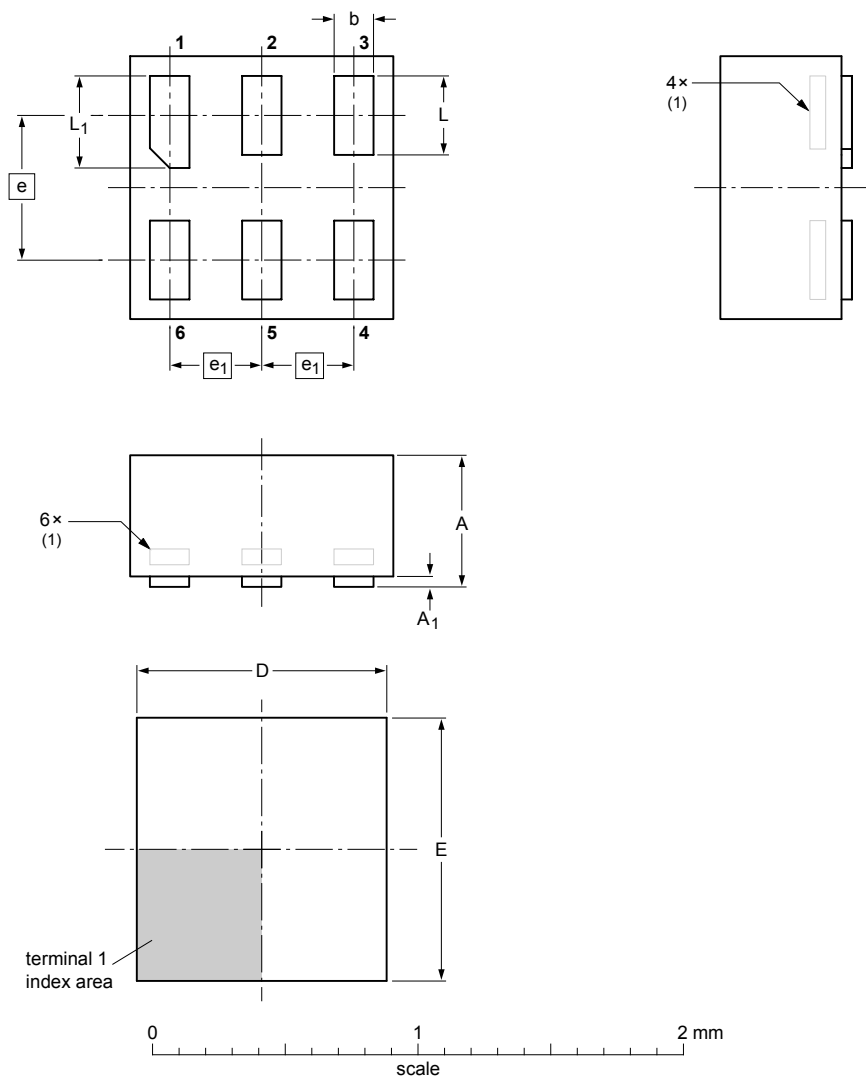
|                 |            |       |       |  |                                                                                       |                      |
|-----------------|------------|-------|-------|--|---------------------------------------------------------------------------------------|----------------------|
| Outline version | References |       |       |  | European projection                                                                   | Issue date           |
|                 | IEC        | JEDEC | JEITA |  |                                                                                       |                      |
| SOT886          | MO-252     |       |       |  |  | 04-07-22<br>12-01-05 |

Figure 12. Package outline SOT886 (XSON6)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1 x 0.5 mm SOT891



DIMENSIONS (mm are the original dimensions)

| UNIT | A<br>max | A <sub>1</sub><br>max | b            | D            | E            | e    | e <sub>1</sub> | L            | L <sub>1</sub> |
|------|----------|-----------------------|--------------|--------------|--------------|------|----------------|--------------|----------------|
| mm   | 0.5      | 0.04                  | 0.20<br>0.12 | 1.05<br>0.95 | 1.05<br>0.95 | 0.55 | 0.35           | 0.35<br>0.27 | 0.40<br>0.32   |

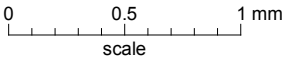
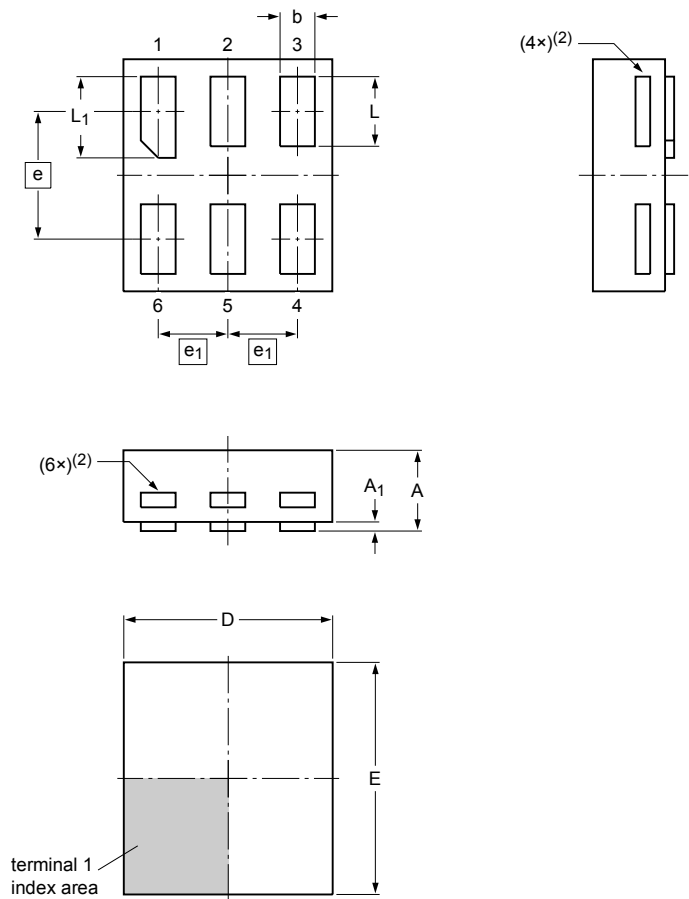
**Note**  
1. Can be visible in some manufacturing processes.

| OUTLINE<br>VERSION | REFERENCES |       |       |  | EUROPEAN<br>PROJECTION | ISSUE DATE            |
|--------------------|------------|-------|-------|--|------------------------|-----------------------|
|                    | IEC        | JEDEC | JEITA |  |                        |                       |
| SOT891             |            |       |       |  |                        | -05-04-06<br>07-05-15 |

Figure 13. Package outline SOT891 (XSON6)

XSON6: extremely thin small outline package; no leads;  
6 terminals; body 0.9 x 1.0 x 0.35 mm

SOT1115



Dimensions

| Unit | A <sup>(1)</sup> | A <sub>1</sub> | b    | D    | E    | e    | e <sub>1</sub> | L    | L <sub>1</sub> |
|------|------------------|----------------|------|------|------|------|----------------|------|----------------|
| mm   | max              | 0.35           | 0.04 | 0.20 | 0.95 | 1.05 |                | 0.35 | 0.40           |
|      | nom              |                |      | 0.15 | 0.90 | 1.00 | 0.55           | 0.30 | 0.35           |
|      | min              |                |      | 0.12 | 0.85 | 0.95 |                | 0.27 | 0.32           |

Note

- 1. Including plating thickness.
- 2. Visible depending upon used manufacturing technology.

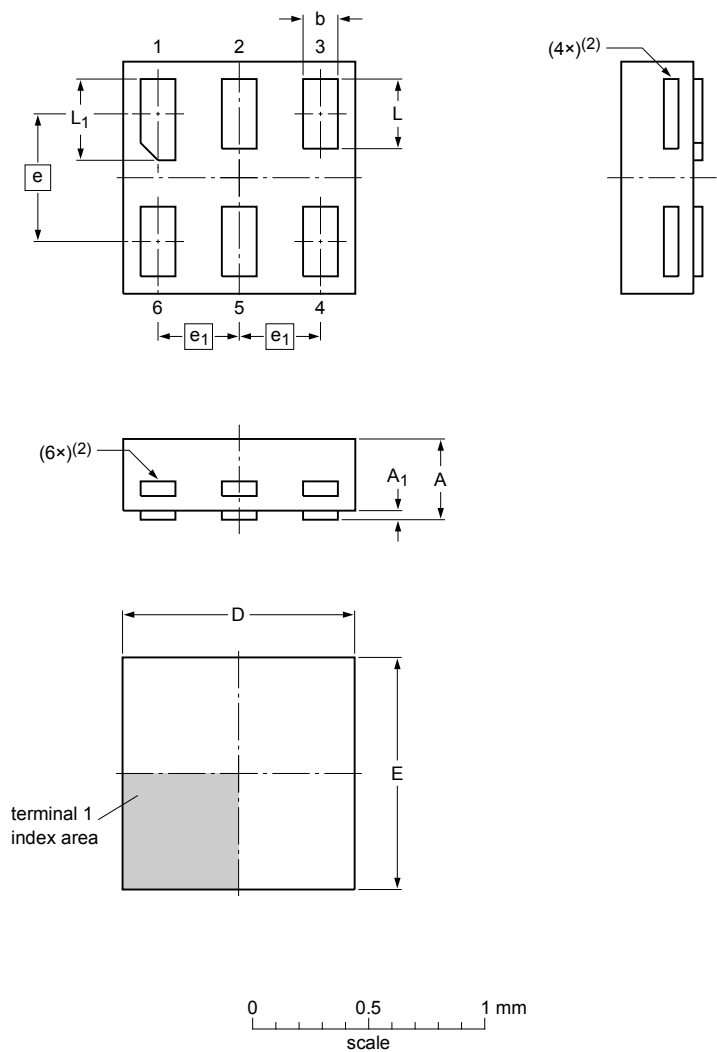
sot1115\_po

| Outline version | References |       |       |  | European projection | Issue date            |
|-----------------|------------|-------|-------|--|---------------------|-----------------------|
|                 | IEC        | JEDEC | JEITA |  |                     |                       |
| SOT1115         |            |       |       |  |                     | 10-04-02-<br>10-04-07 |

Figure 14. Package outline SOT1115 (XSON6)

XSON6: extremely thin small outline package; no leads;  
6 terminals; body 1.0 x 1.0 x 0.35 mm

SOT1202



Dimensions

| Unit | A <sup>(1)</sup> | A <sub>1</sub> | b    | D    | E    | e    | e <sub>1</sub> | L    | L <sub>1</sub> |
|------|------------------|----------------|------|------|------|------|----------------|------|----------------|
| mm   | max              | 0.35           | 0.04 | 0.20 | 1.05 | 1.05 |                | 0.35 | 0.40           |
|      | nom              |                |      | 0.15 | 1.00 | 1.00 | 0.55           | 0.30 | 0.35           |
|      | min              |                |      | 0.12 | 0.95 | 0.95 |                | 0.27 | 0.32           |

Note

- 1. Including plating thickness.
- 2. Visible depending upon used manufacturing technology.

sot1202\_po

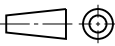
| Outline version | References |       |       |  | European projection                                                                   | Issue date           |
|-----------------|------------|-------|-------|--|---------------------------------------------------------------------------------------|----------------------|
|                 | IEC        | JEDEC | JEITA |  |                                                                                       |                      |
| SOT1202         |            |       |       |  |  | 10-04-02<br>10-04-06 |

Figure 15. Package outline SOT1202 (XSON6)



## 13 Abbreviations

Table 13. Abbreviations

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

## 14 Revision history

Table 14. Revision history

| Document ID    | Release date                                                                                                                                                                                                                              | Data sheet status  | Change notice | Supersedes     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|----------------|
| 74AUP1G126 v.7 | 20180516                                                                                                                                                                                                                                  | Product data sheet | -             | 74AUP1G126 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> </ul> |                    |               |                |
| 74AUP1G126 v.6 | 20151002                                                                                                                                                                                                                                  | Product data sheet | -             | 74AUP1G126 v.5 |
| Modifications: | <ul style="list-style-type: none"> <li>I<sub>OK</sub> minimum changed from -0.5 mA to -50 mA (errata) in <a href="#">Table 5..</a></li> </ul>                                                                                             |                    |               |                |
| 74AUP1G126 v.5 | 20120628                                                                                                                                                                                                                                  | Product data sheet | -             | 74AUP1G126 v.4 |
| Modifications: | <ul style="list-style-type: none"> <li>Added type number 74AUP1G126GX (SOT1226)</li> <li>Package outline drawing of SOT886 (Figure 12) modified.</li> </ul>                                                                               |                    |               |                |
| 74AUP1G126 v.4 | 20111124                                                                                                                                                                                                                                  | Product data sheet | -             | 74AUP1G126 v.3 |
| 74AUP1G126 v.3 | 20100903                                                                                                                                                                                                                                  | Product data sheet | -             | 74AUP1G126 v.2 |
| 74AUP1G126 v.2 | 20060628                                                                                                                                                                                                                                  | Product data sheet | -             | 74AUP1G126 v.1 |
| 74AUP1G126 v.1 | 20050725                                                                                                                                                                                                                                  | Product data sheet | -             | -              |

## 15 Legal information

### 15.1 Data sheet status

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

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nexperia.com>.

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