

74AUP2G126

Low-power dual buffer/line driver; 3-state

Rev. 10 — 28 October 2016

Product data sheet

1. General description

The 74AUP2G126 provides the dual non-inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input (nOE). A LOW level at pin nOE 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 nOE 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 JESD78 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 $-40 \text{ }^\circ\text{C}$ to $+85 \text{ }^\circ\text{C}$ and $-40 \text{ }^\circ\text{C}$ to $+125 \text{ }^\circ\text{C}$

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3. Ordering information

Table 1. Ordering information

| Type number | Package | | | Version |
|-----------------------------|-------------------|--------|---|----------|
| | Temperature range | Name | Description | |
| 74AUP2G126DC | -40 °C to +125 °C | VSSOP8 | plastic very thin shrink small outline package; 8 leads; body width 2.3 mm | SOT765-1 |
| 74AUP2G126GT | -40 °C to +125 °C | XSON8 | plastic extremely thin small outline package; no leads; 8 terminals; body 1 × 1.95 × 0.5 mm | SOT833-1 |
| 74AUP2G126GF | -40 °C to +125 °C | XSON8 | extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1 × 0.5 mm | SOT1089 |
| 74AUP2G126GD | -40 °C to +125 °C | XSON8 | plastic extremely thin small outline package; no leads; 8 terminals; body 3 × 2 × 0.5 mm | SOT996-2 |
| 74AUP2G126GM | -40 °C to +125 °C | XQFN8 | plastic, extremely thin quad flat package; no leads; 8 terminals; body 1.6 × 1.6 × 0.5 mm | SOT902-2 |
| 74AUP2G126GN | -40 °C to +125 °C | XSON8 | extremely thin small outline package; no leads; 8 terminals; body 1.2 × 1.0 × 0.35 mm | SOT1116 |
| 74AUP2G126GS | -40 °C to +125 °C | XSON8 | extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.0 × 0.35 mm | SOT1203 |
| 74AUP2G126GX ^[1] | -40 °C to +125 °C | X2SON8 | plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 × 0.8 × 0.35 mm | SOT1233 |

[1] Type number 74AUP2G126GX is in development.

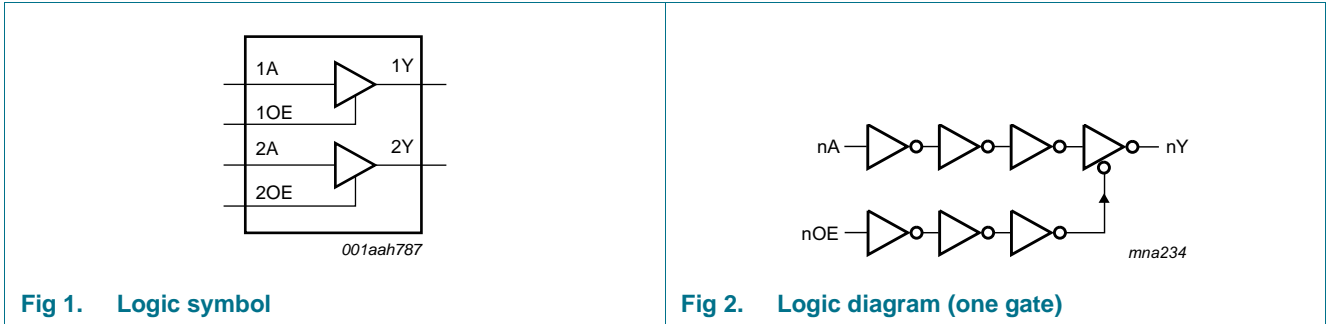
4. Marking

Table 2. Marking codes

| Type number | Marking code ^[1] |
|--------------|-----------------------------|
| 74AUP2G126DC | p26 |
| 74AUP2G126GT | p26 |
| 74AUP2G126GF | pN |
| 74AUP2G126GD | p26 |
| 74AUP2G126GM | p26 |
| 74AUP2G126GN | pN |
| 74AUP2G126GS | pN |
| 74AUP2G126GX | pN |

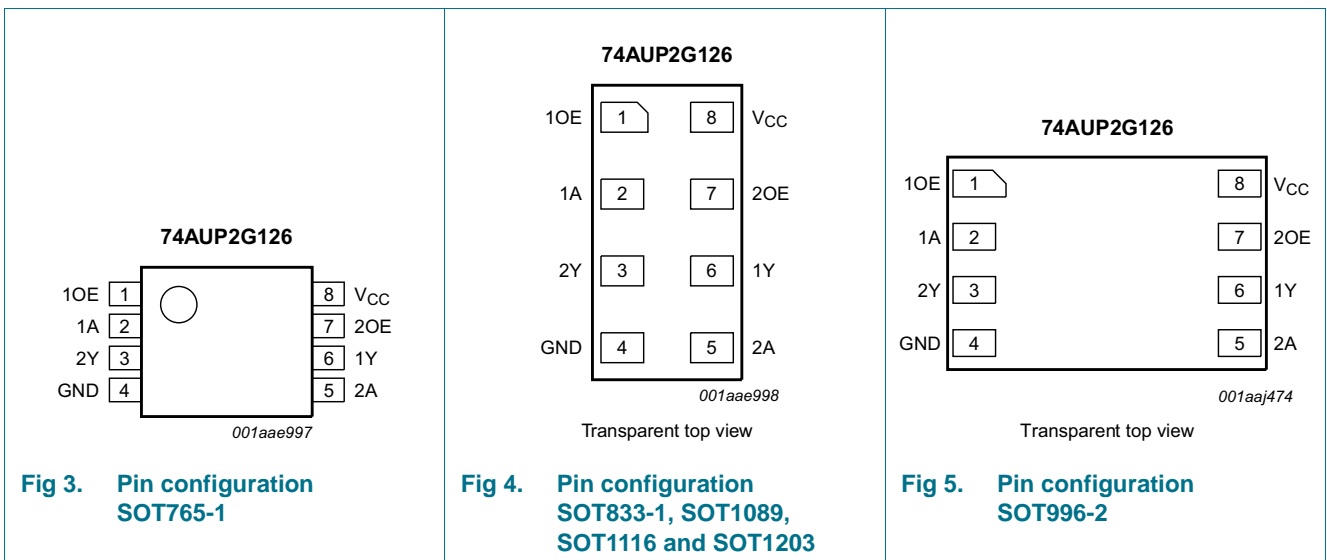
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

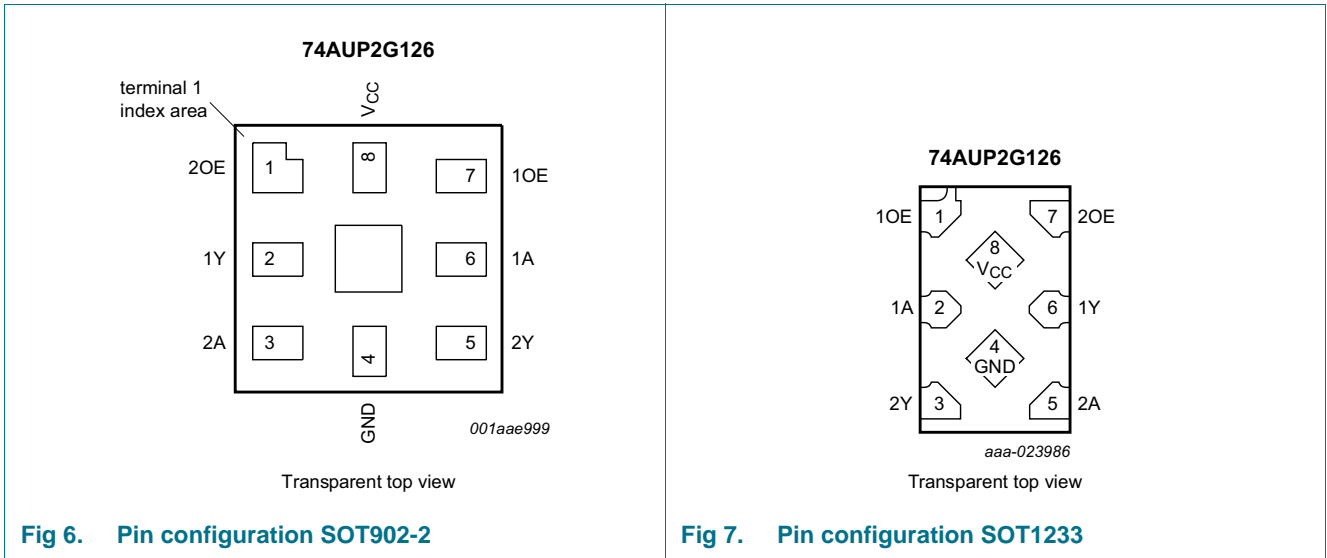
5. Functional diagram



6. Pinning information

6.1 Pinning





6.2 Pin description

Table 3. Pin description

| Symbol | Pin | | Description |
|-----------------|---|----------|-----------------------------------|
| | SOT765-1, SOT833-1, SOT1089, SOT996-2, SOT1116, SOT1203 and SOT1233 | SOT902-2 | |
| 1OE, 2OE | 1, 7 | 7, 1 | output enable input (active HIGH) |
| 1A, 2A | 2, 5 | 6, 3 | data input |
| 1Y, 2Y | 6, 3 | 2, 5 | data output |
| GND | 4 | 4 | ground (0 V) |
| V _{CC} | 8 | 8 | supply voltage |

7. Functional description

Table 4. Function table^[1]

| Input | | Output |
|-------|----|--------|
| nOE | nA | nY |
| H | L | L |
| H | H | H |
| L | X | Z |

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

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 and Power-down mode | [1] -0.5 | +4.6 | V |
| I_O | output current | $V_O = 0$ V to V_{CC} | - | ± 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 minimum input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For VSSOP8 packages: above 110 °C the value of P_{tot} derates linearly with 8.0 mW/K.
 For XSON8 and XQFN8 packages: above 118 °C the value of P_{tot} derates linearly with 7.8 mW/K.
 For X2SON8 package: above 118 °C the value of P_{tot} derates linearly with 7.7 mW/K.

9. Recommended operating conditions

Table 6. 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 |
|--|--------------------------------------|--|------------------------|-----|------------------------|------|
| T_{amb} = 25 °C | | | | | | |
| V _{IH} | HIGH-level input voltage | V _{CC} = 0.8 V | 0.70 × V _{CC} | - | - | V |
| | | V _{CC} = 0.9 V to 1.95 V | 0.65 × V _{CC} | - | - | V |
| | | V _{CC} = 2.3 V to 2.7 V | 1.6 | - | - | V |
| | | V _{CC} = 3.0 V to 3.6 V | 2.0 | - | - | V |
| V _{IL} | LOW-level input voltage | V _{CC} = 0.8 V | - | - | 0.30 × V _{CC} | V |
| | | V _{CC} = 0.9 V to 1.95 V | - | - | 0.35 × V _{CC} | V |
| | | V _{CC} = 2.3 V to 2.7 V | - | - | 0.7 | V |
| | | V _{CC} = 3.0 V to 3.6 V | - | - | 0.9 | V |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} | | | | |
| | | I _O = -20 μA; V _{CC} = 0.8 V to 3.6 V | V _{CC} - 0.1 | - | - | V |
| | | I _O = -1.1 mA; V _{CC} = 1.1 V | 0.75 × V _{CC} | - | - | V |
| | | I _O = -1.7 mA; V _{CC} = 1.4 V | 1.11 | - | - | V |
| | | I _O = -1.9 mA; V _{CC} = 1.65 V | 1.32 | - | - | V |
| | | I _O = -2.3 mA; V _{CC} = 2.3 V | 2.05 | - | - | V |
| | | I _O = -3.1 mA; V _{CC} = 2.3 V | 1.9 | - | - | V |
| | | I _O = -2.7 mA; V _{CC} = 3.0 V | 2.72 | - | - | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} | | | | |
| | | I _O = 20 μA; V _{CC} = 0.8 V to 3.6 V | - | - | 0.1 | V |
| | | I _O = 1.1 mA; V _{CC} = 1.1 V | - | - | 0.3 × V _{CC} | V |
| | | I _O = 1.7 mA; V _{CC} = 1.4 V | - | - | 0.31 | V |
| | | I _O = 1.9 mA; V _{CC} = 1.65 V | - | - | 0.31 | V |
| | | I _O = 2.3 mA; V _{CC} = 2.3 V | - | - | 0.31 | V |
| | | I _O = 3.1 mA; V _{CC} = 2.3 V | - | - | 0.44 | V |
| | | I _O = 2.7 mA; V _{CC} = 3.0 V | - | - | 0.31 | V |
| I _O = 4.0 mA; V _{CC} = 3.0 V | - | - | 0.44 | V | | |
| I _I | input leakage current | V _I = GND to 3.6 V; V _{CC} = 0 V to 3.6 V | - | - | ±0.1 | μA |
| I _{OZ} | OFF-state output current | V _I = V _{IH} or V _{IL} ; V _O = 0 V to 3.6 V; V _{CC} = 0 V to 3.6 V | - | - | ±0.1 | μA |
| I _{OFF} | power-off leakage current | V _I or V _O = 0 V to 3.6 V; V _{CC} = 0 V | - | - | ±0.2 | μA |
| ΔI _{OFF} | additional power-off leakage current | V _I or V _O = 0 V to 3.6 V; V _{CC} = 0 V to 0.2 V | - | - | ±0.2 | μA |
| I _{CC} | supply current | V _I = GND or V _{CC} ; I _O = 0 A; V _{CC} = 0.8 V to 3.6 V | - | - | 0.5 | μA |

Table 7. Static characteristics ...continued

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---------------------------|---|----------------------|-----|----------------------|---------|
| ΔI_{CC} | additional supply current | data input; $V_I = V_{CC} - 0.6$ V; $I_O = 0$ A; [1] $V_{CC} = 3.3$ V | - | - | 40 | μ A |
| | | nOE input; $V_I = V_{CC} - 0.6$ V; $I_O = 0$ A; [1] $V_{CC} = 3.3$ V | - | - | 110 | μ A |
| | | all inputs; $V_I =$ GND to 3.6 V; nOE = GND; $V_{CC} = 0.8$ V to 3.6 V [2] | - | - | 1 | μ A |
| C_I | input capacitance | $V_I =$ GND or V_{CC} ; $V_{CC} = 0$ V to 3.6 V | - | 0.9 | - | pF |
| C_O | output capacitance | output enabled; $V_O =$ GND; $V_{CC} = 0$ V | - | 1.7 | - | pF |
| | | output disabled; $V_O =$ GND or V_{CC} ; $V_{CC} = 0$ V to 3.6 V | - | 1.5 | - | pF |
| $T_{amb} = -40$ °C to $+85$ °C | | | | | | |
| V_{IH} | HIGH-level input voltage | $V_{CC} = 0.8$ V | $0.70 \times V_{CC}$ | - | - | V |
| | | $V_{CC} = 0.9$ V to 1.95 V | $0.65 \times V_{CC}$ | - | - | V |
| | | $V_{CC} = 2.3$ V to 2.7 V | 1.6 | - | - | V |
| | | $V_{CC} = 3.0$ V to 3.6 V | 2.0 | - | - | V |
| V_{IL} | LOW-level input voltage | $V_{CC} = 0.8$ V | - | - | $0.30 \times V_{CC}$ | V |
| | | $V_{CC} = 0.9$ V to 1.95 V | - | - | $0.35 \times V_{CC}$ | V |
| | | $V_{CC} = 2.3$ V to 2.7 V | - | - | 0.7 | V |
| | | $V_{CC} = 3.0$ V to 3.6 V | - | - | 0.9 | V |
| V_{OH} | HIGH-level output voltage | $V_I = V_{IH}$ or V_{IL} | | | | |
| | | $I_O = -20$ μ A; $V_{CC} = 0.8$ V to 3.6 V | $V_{CC} - 0.1$ | - | - | V |
| | | $I_O = -1.1$ mA; $V_{CC} = 1.1$ V | $0.7 \times V_{CC}$ | - | - | V |
| | | $I_O = -1.7$ mA; $V_{CC} = 1.4$ V | 1.03 | - | - | V |
| | | $I_O = -1.9$ mA; $V_{CC} = 1.65$ V | 1.30 | - | - | V |
| | | $I_O = -2.3$ mA; $V_{CC} = 2.3$ V | 1.97 | - | - | V |
| | | $I_O = -3.1$ mA; $V_{CC} = 2.3$ V | 1.85 | - | - | V |
| | | $I_O = -2.7$ mA; $V_{CC} = 3.0$ V | 2.67 | - | - | V |
| V_{OL} | LOW-level output voltage | $V_I = V_{IH}$ or V_{IL} | | | | |
| | | $I_O = 20$ μ A; $V_{CC} = 0.8$ V to 3.6 V | - | - | 0.1 | V |
| | | $I_O = 1.1$ mA; $V_{CC} = 1.1$ V | - | - | $0.3 \times V_{CC}$ | V |
| | | $I_O = 1.7$ mA; $V_{CC} = 1.4$ V | - | - | 0.37 | V |
| | | $I_O = 1.9$ mA; $V_{CC} = 1.65$ V | - | - | 0.35 | V |
| | | $I_O = 2.3$ mA; $V_{CC} = 2.3$ V | - | - | 0.33 | V |
| | | $I_O = 3.1$ mA; $V_{CC} = 2.3$ V | - | - | 0.45 | V |
| | | $I_O = 2.7$ mA; $V_{CC} = 3.0$ V | - | - | 0.33 | V |
| I_I | input leakage current | $V_I =$ GND to 3.6 V; $V_{CC} = 0$ V to 3.6 V | - | - | ± 0.5 | μ A |
| | | $V_I = V_{IH}$ or V_{IL} ; $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V to 3.6 V | - | - | ± 0.5 | μ A |
| I_{OFF} | power-off leakage current | V_I or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V | - | - | ± 0.5 | μ A |

Table 7. Static characteristics ...continued

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|--------------------------------------|--|----------------------|-----|----------------------|---------|
| ΔI_{OFF} | additional power-off leakage current | V_I or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V to 0.2 V | - | - | ± 0.6 | μ A |
| I_{CC} | supply current | $V_I = \text{GND}$ or V_{CC} ; $I_O = 0$ A; $V_{CC} = 0.8$ V to 3.6 V | - | - | 0.9 | μ A |
| ΔI_{CC} | additional supply current | data input; $V_I = V_{CC} - 0.6$ V; $I_O = 0$ A; [1] $V_{CC} = 3.3$ V | - | - | 50 | μ A |
| | | nOE input; $V_I = V_{CC} - 0.6$ V; $I_O = 0$ A; [1] $V_{CC} = 3.3$ V | - | - | 120 | μ A |
| | | all inputs; $V_I = \text{GND}$ to 3.6 V; nOE = GND; $V_{CC} = 0.8$ V to 3.6 V [2] | - | - | 1 | μ A |
| $T_{amb} = -40$ °C to $+125$ °C | | | | | | |
| V_{IH} | HIGH-level input voltage | $V_{CC} = 0.8$ V | $0.75 \times V_{CC}$ | - | - | V |
| | | $V_{CC} = 0.9$ V to 1.95 V | $0.70 \times V_{CC}$ | - | - | V |
| | | $V_{CC} = 2.3$ V to 2.7 V | 1.6 | - | - | V |
| | | $V_{CC} = 3.0$ V to 3.6 V | 2.0 | - | - | V |
| V_{IL} | LOW-level input voltage | $V_{CC} = 0.8$ V | - | - | $0.25 \times V_{CC}$ | V |
| | | $V_{CC} = 0.9$ V to 1.95 V | - | - | $0.30 \times V_{CC}$ | V |
| | | $V_{CC} = 2.3$ V to 2.7 V | - | - | 0.7 | V |
| | | $V_{CC} = 3.0$ V to 3.6 V | - | - | 0.9 | V |
| V_{OH} | HIGH-level output voltage | $V_I = V_{IH}$ or V_{IL} | | | | |
| | | $I_O = -20$ μ A; $V_{CC} = 0.8$ V to 3.6 V | $V_{CC} - 0.11$ | - | - | V |
| | | $I_O = -1.1$ mA; $V_{CC} = 1.1$ V | $0.6 \times V_{CC}$ | - | - | V |
| | | $I_O = -1.7$ mA; $V_{CC} = 1.4$ V | 0.93 | - | - | V |
| | | $I_O = -1.9$ mA; $V_{CC} = 1.65$ V | 1.17 | - | - | V |
| | | $I_O = -2.3$ mA; $V_{CC} = 2.3$ V | 1.77 | - | - | V |
| | | $I_O = -3.1$ mA; $V_{CC} = 2.3$ V | 1.67 | - | - | V |
| | | $I_O = -2.7$ mA; $V_{CC} = 3.0$ V | 2.40 | - | - | V |
| V_{OL} | LOW-level output voltage | $V_I = V_{IH}$ or V_{IL} | | | | |
| | | $I_O = 20$ μ A; $V_{CC} = 0.8$ V to 3.6 V | - | - | 0.11 | V |
| | | $I_O = 1.1$ mA; $V_{CC} = 1.1$ V | - | - | $0.33 \times V_{CC}$ | V |
| | | $I_O = 1.7$ mA; $V_{CC} = 1.4$ V | - | - | 0.41 | V |
| | | $I_O = 1.9$ mA; $V_{CC} = 1.65$ V | - | - | 0.39 | V |
| | | $I_O = 2.3$ mA; $V_{CC} = 2.3$ V | - | - | 0.36 | V |
| | | $I_O = 3.1$ mA; $V_{CC} = 2.3$ V | - | - | 0.50 | V |
| | | $I_O = 2.7$ mA; $V_{CC} = 3.0$ V | - | - | 0.36 | V |
| I_I | input leakage current | $V_I = \text{GND}$ to 3.6 V; $V_{CC} = 0$ V to 3.6 V | - | - | ± 0.75 | μ A |
| | | $V_I = V_{IH}$ or V_{IL} ; $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V to 3.6 V | - | - | ± 0.75 | μ A |
| I_{OFF} | power-off leakage current | V_I or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V | - | - | ± 0.75 | μ A |

Table 7. Static characteristics ...continued

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|--------------------------------------|---|-----|-----|------------|---------|
| ΔI_{OFF} | additional power-off leakage current | V_I or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V to 0.2 V | - | - | ± 0.75 | μ A |
| I_{CC} | supply current | $V_I = GND$ or V_{CC} ; $I_O = 0$ A; $V_{CC} = 0.8$ V to 3.6 V | - | - | 1.4 | μ A |
| ΔI_{CC} | additional supply current | data input; $V_I = V_{CC} - 0.6$ V; $I_O = 0$ A; [1] $V_{CC} = 3.3$ V | - | - | 75 | μ A |
| | | nOE input; $V_I = V_{CC} - 0.6$ V; $I_O = 0$ A; [1] $V_{CC} = 3.3$ V | - | - | 180 | μ A |
| | | all inputs; $V_I = GND$ to 3.6 V; nOE = GND; $V_{CC} = 0.8$ V to 3.6 V [2] | - | - | 1 | μ A |

[1] One input at $V_{CC} - 0.6$ V, other input at V_{CC} or GND.[2] To show I_{CC} remains very low when the input-disable feature is enabled.

11. Dynamic characteristics

Table 8. Dynamic characteristicsVoltages are referenced to GND (ground = 0 V); for test circuit see [Figure 10](#).

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +125 °C | | | Unit |
|--------------------------------|-------------------|---|-------|--------------------|------|-------------------|-------------|--------------|------|
| | | | Min | Typ ^[1] | Max | Min | Max (85 °C) | Max (125 °C) | |
| $C_L = 5$ pF | | | | | | | | | |
| t_{pd} | propagation delay | nA to nY; see Figure 8 [2] | | | | | | | |
| | | $V_{CC} = 0.8$ V | - | 20.6 | - | - | - | - | ns |
| | | $V_{CC} = 1.1$ V to 1.3 V | 2.8 | 5.5 | 10.5 | 2.5 | 11.7 | 12.9 | ns |
| | | $V_{CC} = 1.4$ V to 1.6 V | 2.2 | 3.9 | 6.1 | 2.0 | 7.3 | 8.1 | ns |
| | | $V_{CC} = 1.65$ V to 1.95 V | 1.9 | 3.2 | 4.1 | 1.7 | 6.1 | 6.7 | ns |
| | | $V_{CC} = 2.3$ V to 2.7 V | 1.6 | 2.6 | 3.6 | 1.4 | 4.3 | 4.9 | ns |
| | | $V_{CC} = 3.0$ V to 3.6 V | 1.4 | 2.4 | 3.1 | 1.2 | 3.9 | 4.4 | ns |
| t_{en} | enable time | nOE to nY; see Figure 9 [3] | | | | | | | |
| | | $V_{CC} = 0.8$ V | - | 71.6 | - | - | - | - | ns |
| | | $V_{CC} = 1.1$ V to 1.3 V | 2.8 | 6.2 | 12.4 | 2.6 | 13.6 | 13.6 | ns |
| | | $V_{CC} = 1.4$ V to 1.6 V | 2.3 | 4.2 | 6.9 | 2.2 | 7.4 | 7.7 | ns |
| | | $V_{CC} = 1.65$ V to 1.95 V | 1.9 | 3.3 | 5.3 | 1.7 | 5.9 | 6.2 | ns |
| | | $V_{CC} = 2.3$ V to 2.7 V | 1.5 | 2.4 | 3.6 | 1.4 | 3.8 | 4.1 | ns |
| | | $V_{CC} = 3.0$ V to 3.6 V | 1.3 | 2.0 | 2.9 | 1.2 | 3.2 | 3.4 | ns |
| t_{dis} | disable time | nOE to nY; see Figure 9 [4] | | | | | | | |
| | | $V_{CC} = 0.8$ V | - | 10.3 | - | - | - | - | ns |
| | | $V_{CC} = 1.1$ V to 1.3 V | 2.6 | 4.2 | 6.2 | 2.9 | 6.4 | 6.5 | ns |
| | | $V_{CC} = 1.4$ V to 1.6 V | 2.1 | 3.2 | 4.4 | 2.2 | 4.6 | 4.7 | ns |
| | | $V_{CC} = 1.65$ V to 1.95 V | 2.1 | 3.1 | 4.4 | 1.7 | 4.6 | 4.8 | ns |
| | | $V_{CC} = 2.3$ V to 2.7 V | 1.7 | 2.4 | 3.2 | 1.4 | 3.4 | 3.6 | ns |
| | | $V_{CC} = 3.0$ V to 3.6 V | 2.1 | 2.8 | 3.6 | 1.2 | 3.7 | 3.8 | ns |

Table 8. Dynamic characteristics ...continuedVoltages are referenced to GND (ground = 0 V); for test circuit see [Figure 10](#).

| Symbol | Parameter | Conditions | 25 °C | | | –40 °C to +125 °C | | | Unit |
|------------------------------|-------------------|--|-------|--------------------|------|-------------------|-------------|--------------|------|
| | | | Min | Typ ^[1] | Max | Min | Max (85 °C) | Max (125 °C) | |
| C_L = 10 pF | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Figure 8 ^[2] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 24.0 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 3.2 | 6.4 | 12.3 | 3.0 | 13.8 | 15.2 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 2.1 | 4.5 | 7.3 | 1.9 | 8.5 | 9.4 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 1.9 | 3.8 | 5.5 | 1.7 | 6.8 | 7.6 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.1 | 3.2 | 4.2 | 1.6 | 5.3 | 5.9 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 1.8 | 3.0 | 3.8 | 1.6 | 4.6 | 5.2 | ns |
| t _{en} | enable time | nOE to nY; see Figure 9 ^[3] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 75.3 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 3.2 | 7.1 | 14.1 | 3.0 | 15.4 | 15.4 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 2.2 | 4.8 | 8.0 | 2.1 | 8.3 | 8.6 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 1.8 | 3.9 | 5.9 | 1.7 | 6.5 | 6.8 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 1.5 | 2.9 | 4.2 | 1.4 | 4.5 | 4.8 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 1.4 | 2.6 | 3.6 | 1.3 | 3.8 | 4.0 | ns |
| t _{dis} | disable time | nOE to nY; see Figure 9 ^[4] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 12.2 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 3.5 | 5.3 | 7.6 | 3.3 | 7.9 | 7.9 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 2.2 | 4.1 | 5.6 | 2.1 | 5.7 | 5.9 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.4 | 4.2 | 5.7 | 1.7 | 5.8 | 6.0 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 1.9 | 3.2 | 4.1 | 1.4 | 4.3 | 4.5 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 2.4 | 4.1 | 5.0 | 1.3 | 5.2 | 5.3 | ns |
| C_L = 15 pF | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Figure 8 ^[2] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 27.4 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 3.6 | 7.2 | 14.1 | 3.3 | 15.8 | 17.5 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 3.0 | 5.1 | 8.1 | 2.5 | 9.8 | 10.9 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.2 | 4.3 | 6.3 | 2.0 | 7.9 | 8.8 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.0 | 3.7 | 4.9 | 1.8 | 6.0 | 6.7 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 2.0 | 3.5 | 4.4 | 1.8 | 5.4 | 6.1 | ns |
| t _{en} | enable time | nOE to nY; see Figure 9 ^[3] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 79.2 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 3.6 | 7.8 | 15.8 | 3.3 | 17.1 | 17.1 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 3.0 | 5.4 | 8.8 | 2.9 | 9.4 | 9.7 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.1 | 4.3 | 6.7 | 2.0 | 7.3 | 7.7 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 1.8 | 3.4 | 4.8 | 1.7 | 5.2 | 5.6 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 1.6 | 3.1 | 4.1 | 1.5 | 4.5 | 4.7 | ns |

Table 8. Dynamic characteristics ...continuedVoltages are referenced to GND (ground = 0 V); for test circuit see [Figure 10](#).

| Symbol | Parameter | Conditions | 25 °C | | | –40 °C to +125 °C | | | Unit |
|------------------------------|-------------------|--|-------|--------------------|------|-------------------|-------------|--------------|------|
| | | | Min | Typ ^[1] | Max | Min | Max (85 °C) | Max (125 °C) | |
| t _{dis} | disable time | nOE to nY; see Figure 9 ^[4] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 14.9 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 4.3 | 6.4 | 8.5 | 3.7 | 9.3 | 9.4 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 3.0 | 5.0 | 6.6 | 2.5 | 6.9 | 7.0 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 3.1 | 5.4 | 6.6 | 2.0 | 7.4 | 7.5 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.4 | 4.0 | 5.0 | 1.7 | 5.1 | 5.5 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 3.2 | 5.3 | 6.2 | 1.5 | 6.7 | 6.9 | ns |
| C_L = 30 pF | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Figure 8 ^[2] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 37.4 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 4.8 | 9.5 | 18.7 | 4.4 | 21.4 | 24.0 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 4.0 | 6.7 | 10.8 | 3.0 | 13.0 | 14.5 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.9 | 5.6 | 8.4 | 2.6 | 10.3 | 11.5 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.7 | 4.8 | 6.3 | 2.5 | 7.8 | 8.7 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 2.7 | 4.6 | 5.8 | 2.5 | 7.0 | 8.3 | ns |
| t _{en} | enable time | nOE to nY; see Figure 9 ^[3] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 90.6 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 4.7 | 10.0 | 20.4 | 4.3 | 22.0 | 22.0 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 3.0 | 6.9 | 11.3 | 3.7 | 12.0 | 12.5 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.6 | 5.6 | 8.6 | 3.2 | 9.5 | 10.1 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.3 | 4.5 | 6.3 | 2.9 | 6.8 | 7.3 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 2.2 | 4.2 | 5.8 | 2.7 | 6.4 | 6.7 | ns |
| t _{dis} | disable time | nOE to nY; see Figure 9 ^[4] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 51.6 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 6.0 | 9.8 | 13.6 | 4.7 | 14.3 | 14.4 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 4.5 | 7.7 | 10.5 | 3.0 | 10.7 | 11.0 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 5.2 | 8.8 | 11.4 | 2.6 | 11.5 | 11.6 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 3.9 | 6.4 | 7.4 | 2.3 | 9.0 | 10.2 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 5.5 | 9.0 | 10.7 | 2.2 | 10.8 | 12.0 | ns |

Table 8. Dynamic characteristics ...continued

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

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +125 °C | | | Unit |
|---|-------------------------------|--|-------|--------------------|-----|-------------------|-------------|--------------|------|
| | | | Min | Typ ^[1] | Max | Min | Max (85 °C) | Max (125 °C) | |
| C_L = 5 pF, 10 pF, 15 pF and 30 pF | | | | | | | | | |
| C _{PD} | power dissipation capacitance | output enabled; f _i = 1 MHz; V _I = GND to V _{CC} ^[5] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 2.7 | - | - | - | - | pF |
| | | V _{CC} = 1.1 V to 1.3 V | - | 2.8 | - | - | - | - | pF |
| | | V _{CC} = 1.4 V to 1.6 V | - | 2.9 | - | - | - | - | pF |
| | | V _{CC} = 1.65 V to 1.95 V | - | 3.0 | - | - | - | - | pF |
| | | V _{CC} = 2.3 V to 2.7 V | - | 3.6 | - | - | - | - | pF |
| | | V _{CC} = 3.0 V to 3.6 V | - | 4.2 | - | - | - | pF | |

- [1] All typical values are measured at nominal V_{CC}.
- [2] t_{pd} is the same as t_{PLH} and t_{PHL}.
- [3] t_{en} is the same as t_{PZH} and t_{PZL}.
- [4] t_{dis} is the same as t_{PHZ} and t_{PLZ}.
- [5] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ where:
 f_i = input frequency in MHz;
 f_o = output frequency in MHz;
 C_L = output load capacitance in pF;
 V_{CC} = supply voltage in V;
 N = number of inputs switching;
 Σ(C_L × V_{CC}² × f_o) = sum of the outputs.

12. Waveforms

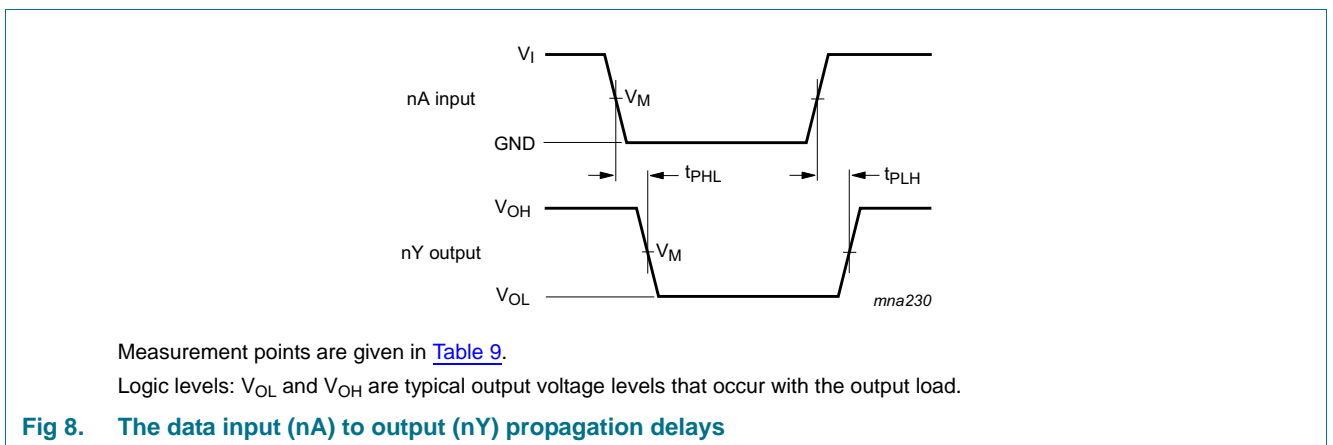
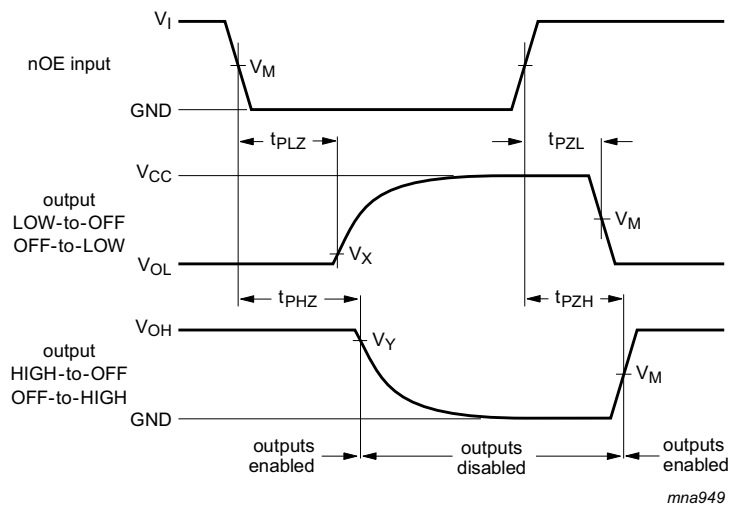


Table 9. Measurement points

| 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 × V _{CC} | 0.5 × V _{CC} | V _{CC} | ≤ 3.0 ns |



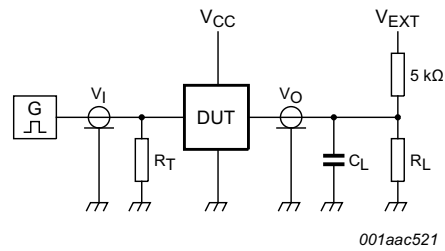
Measurement points are given in [Table 10](#).

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

Fig 9. Enable and disable times

Table 10. 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 11](#).

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.

Fig 10. Test circuit for measuring switching times

Table 11. 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, set-up and hold times and pulse width $R_L = 1 \text{ M}\Omega$.

13. Package outline

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm

SOT765-1

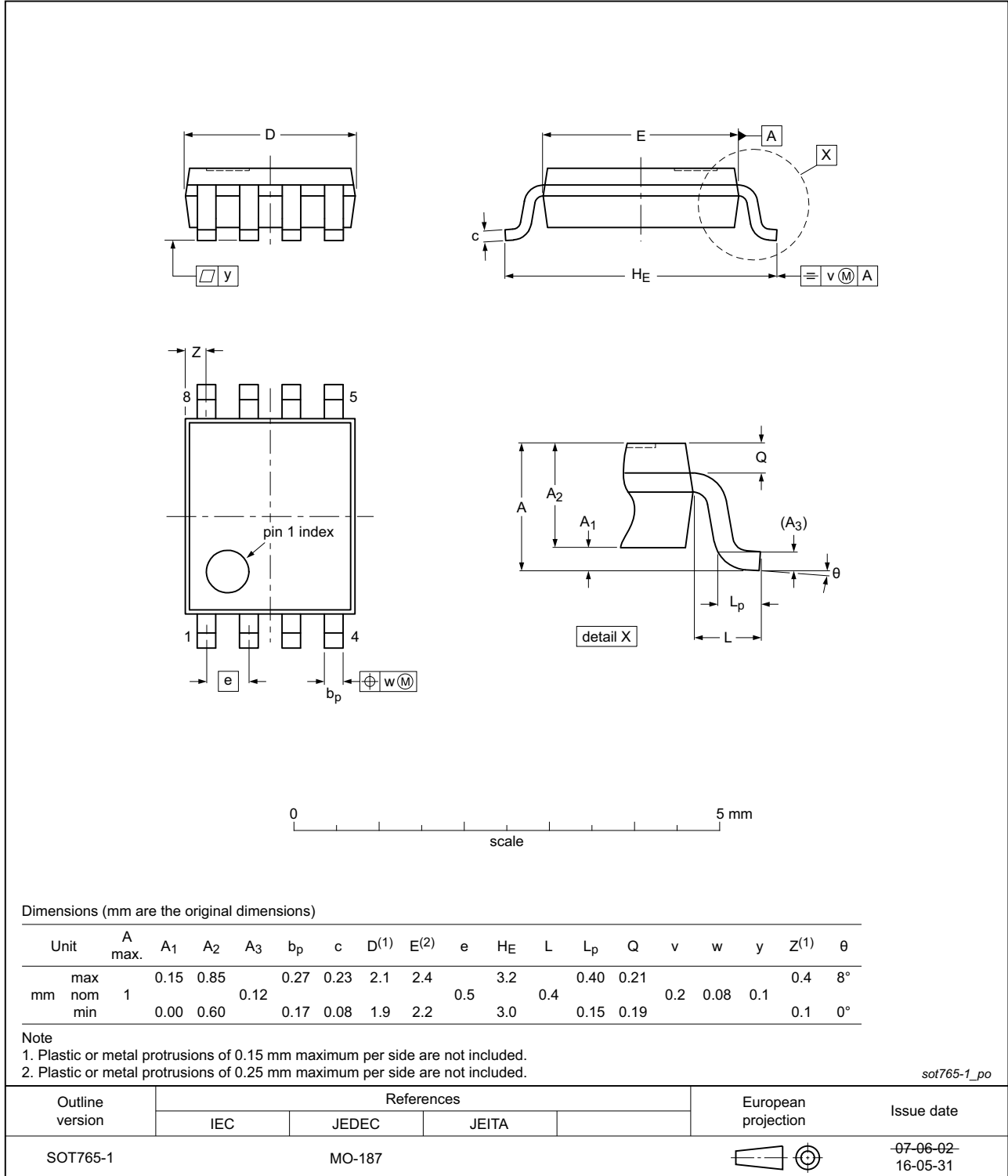


Fig 11. Package outline SOT765-1 (VSSOP8)

XSON8: plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm

SOT833-1

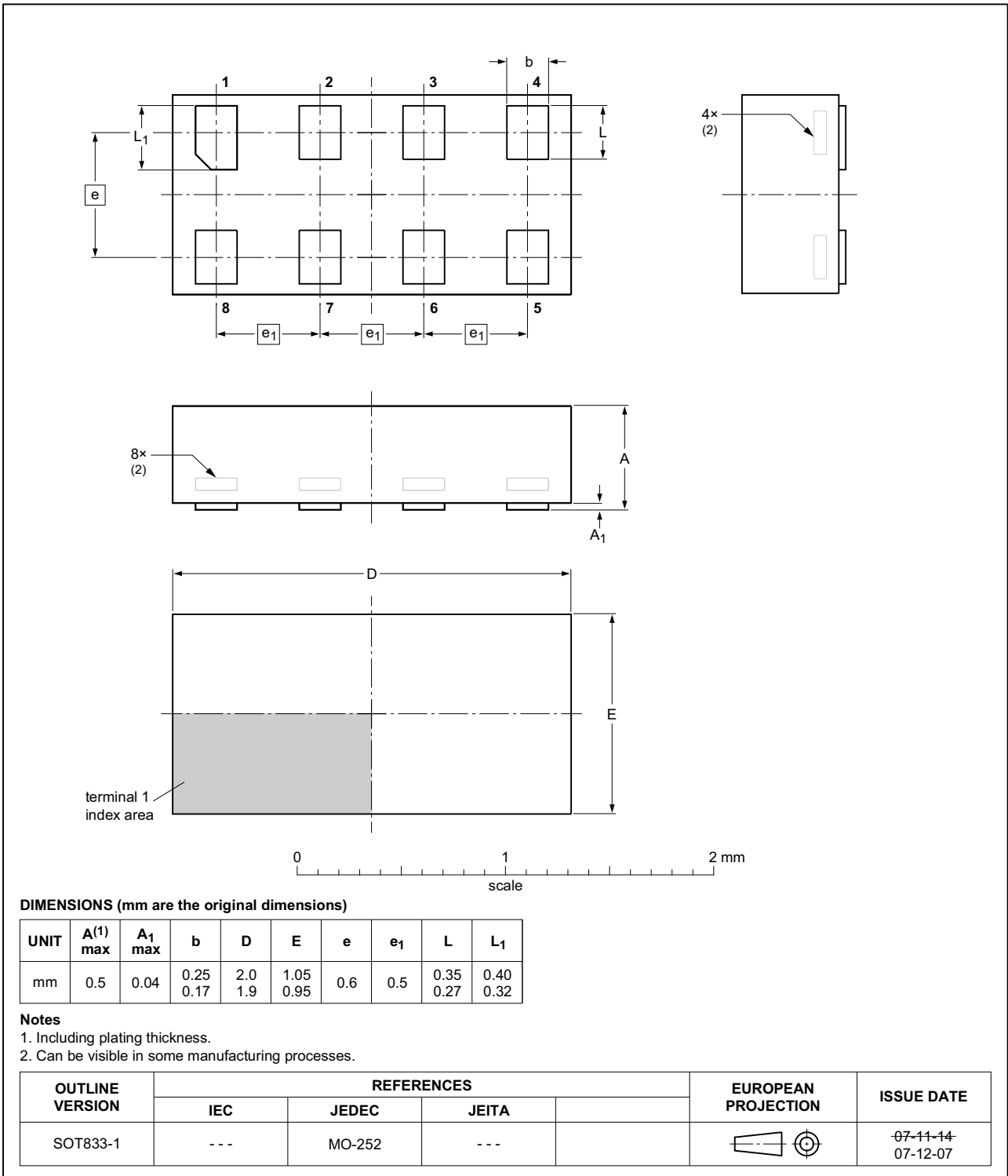


Fig 12. Package outline SOT833-1 (XSON8)

**XSON8: extremely thin small outline package; no leads;
8 terminals; body 1.35 x 1 x 0.5 mm**

SOT1089

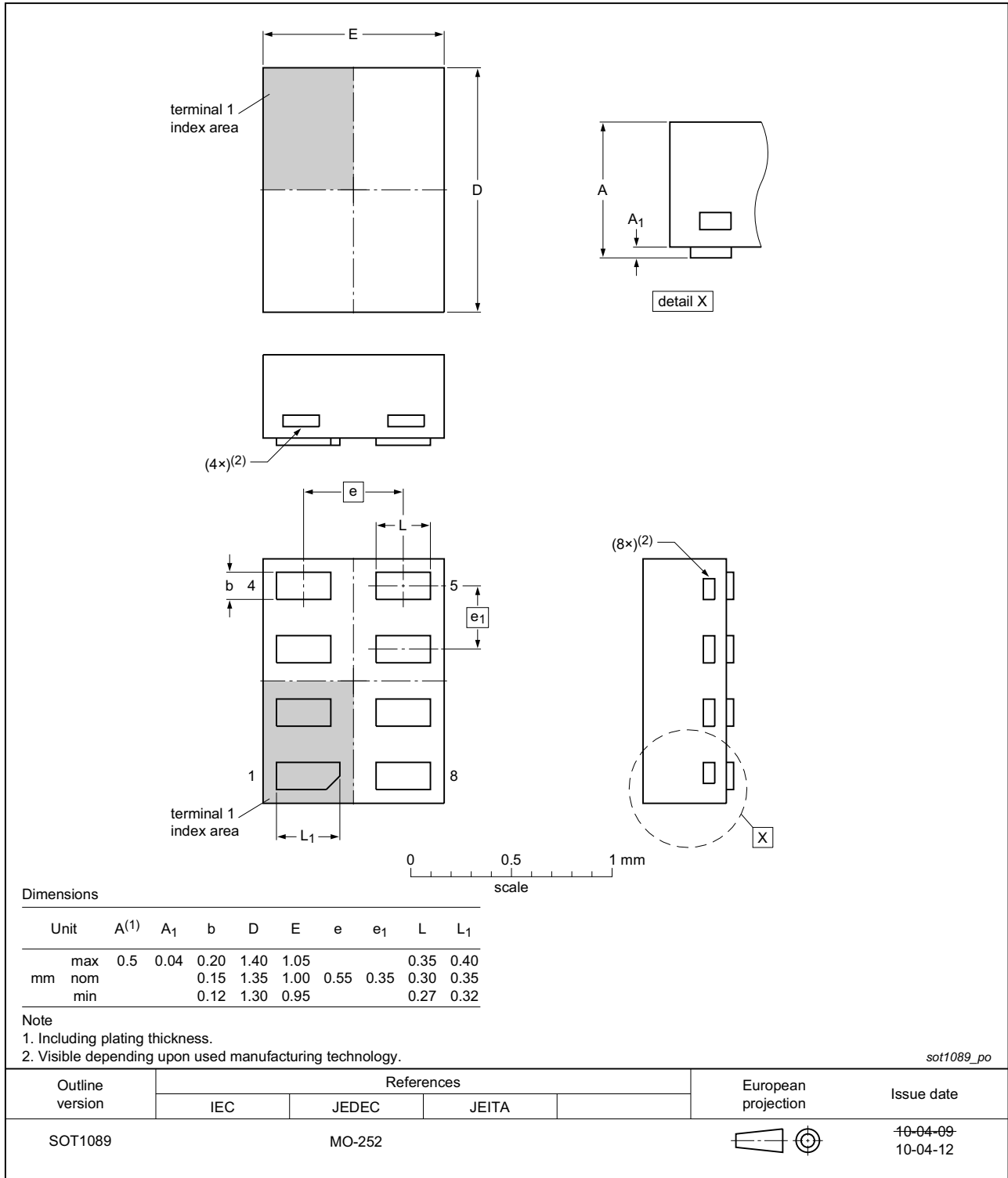


Fig 13. Package outline SOT1089 (XSON8)

XSON8: plastic extremely thin small outline package; no leads;
8 terminals; body 3 x 2 x 0.5 mm

SOT996-2

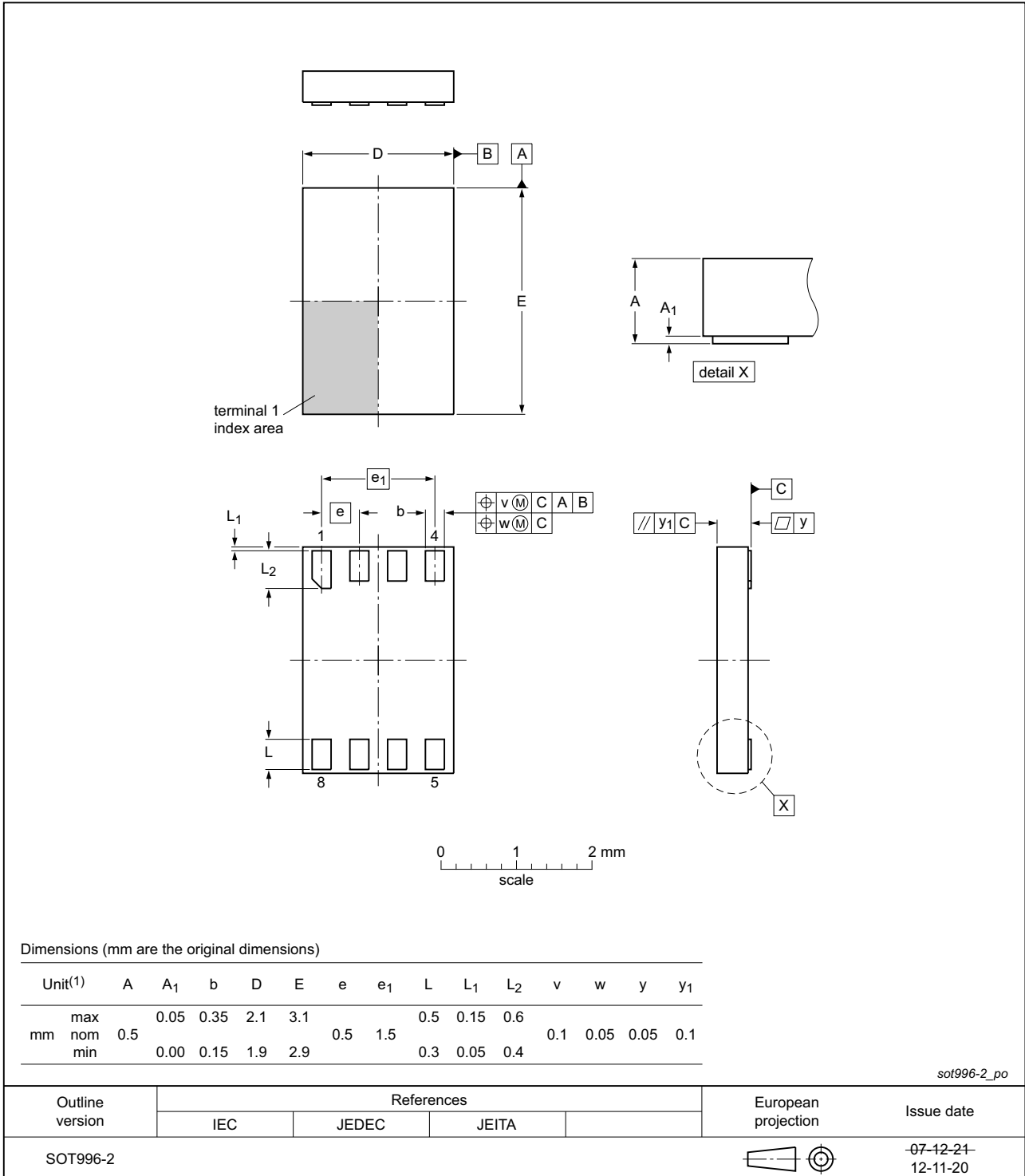


Fig 14. Package outline SOT996-2 (XSON8)

XQFN8: plastic, extremely thin quad flat package; no leads;
8 terminals; body 1.6 x 1.6 x 0.5 mm

SOT902-2

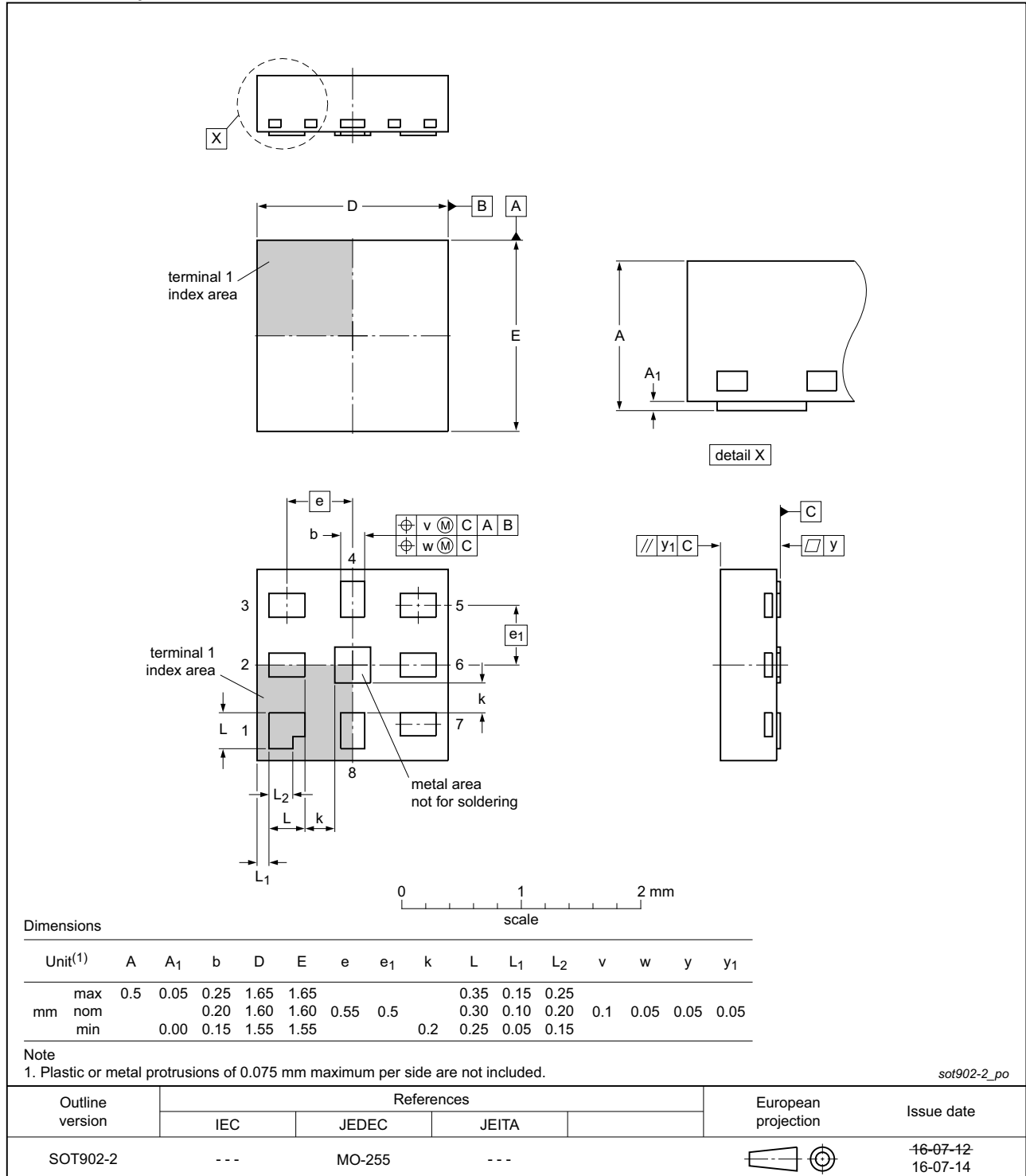


Fig 15. Package outline SOT902-2 (XQFN8)

**XSON8: extremely thin small outline package; no leads;
8 terminals; body 1.2 x 1.0 x 0.35 mm**

SOT1116

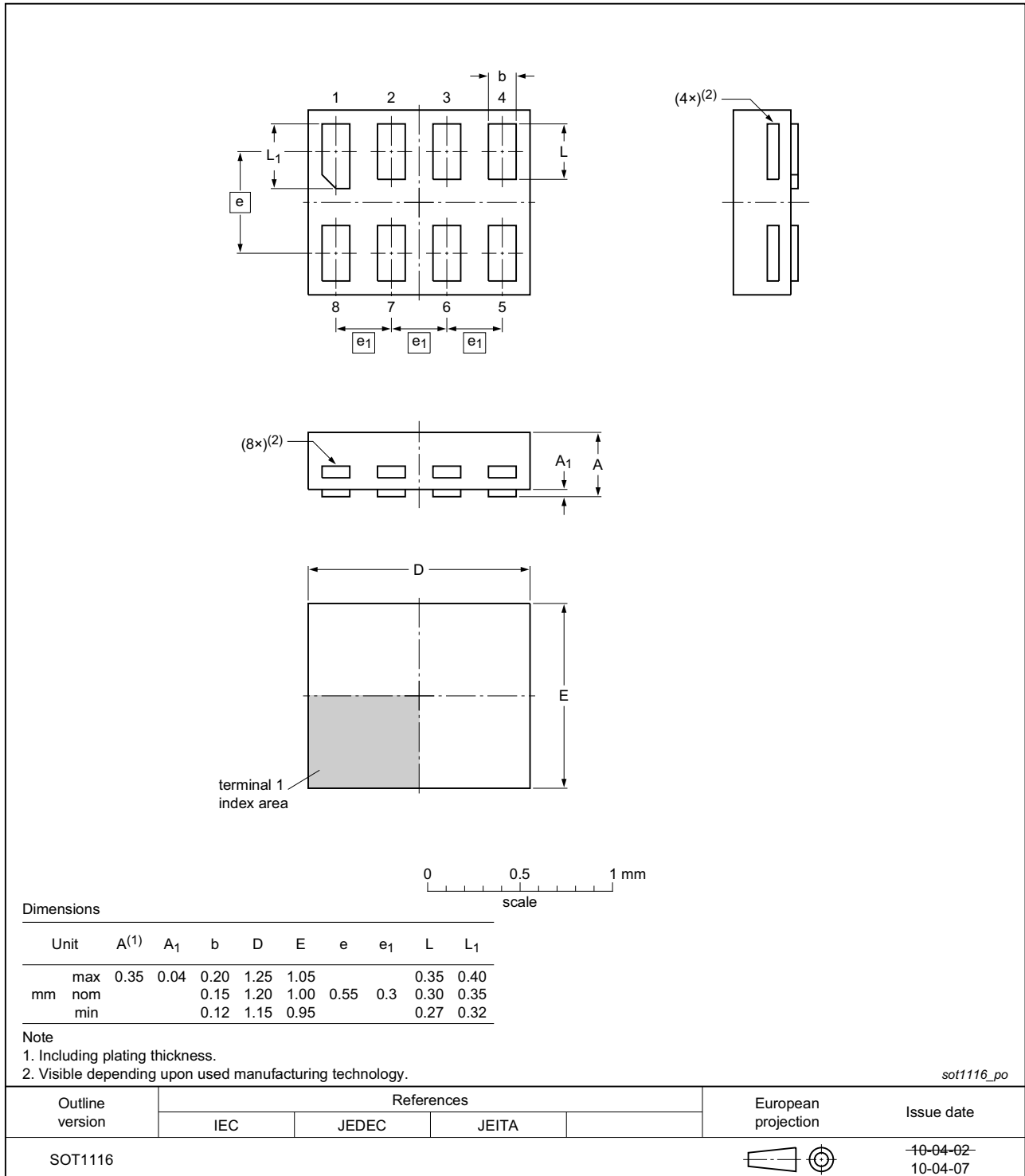


Fig 16. Package outline SOT1116 (XSON8)

**XSON8: extremely thin small outline package; no leads;
8 terminals; body 1.35 x 1.0 x 0.35 mm**

SOT1203

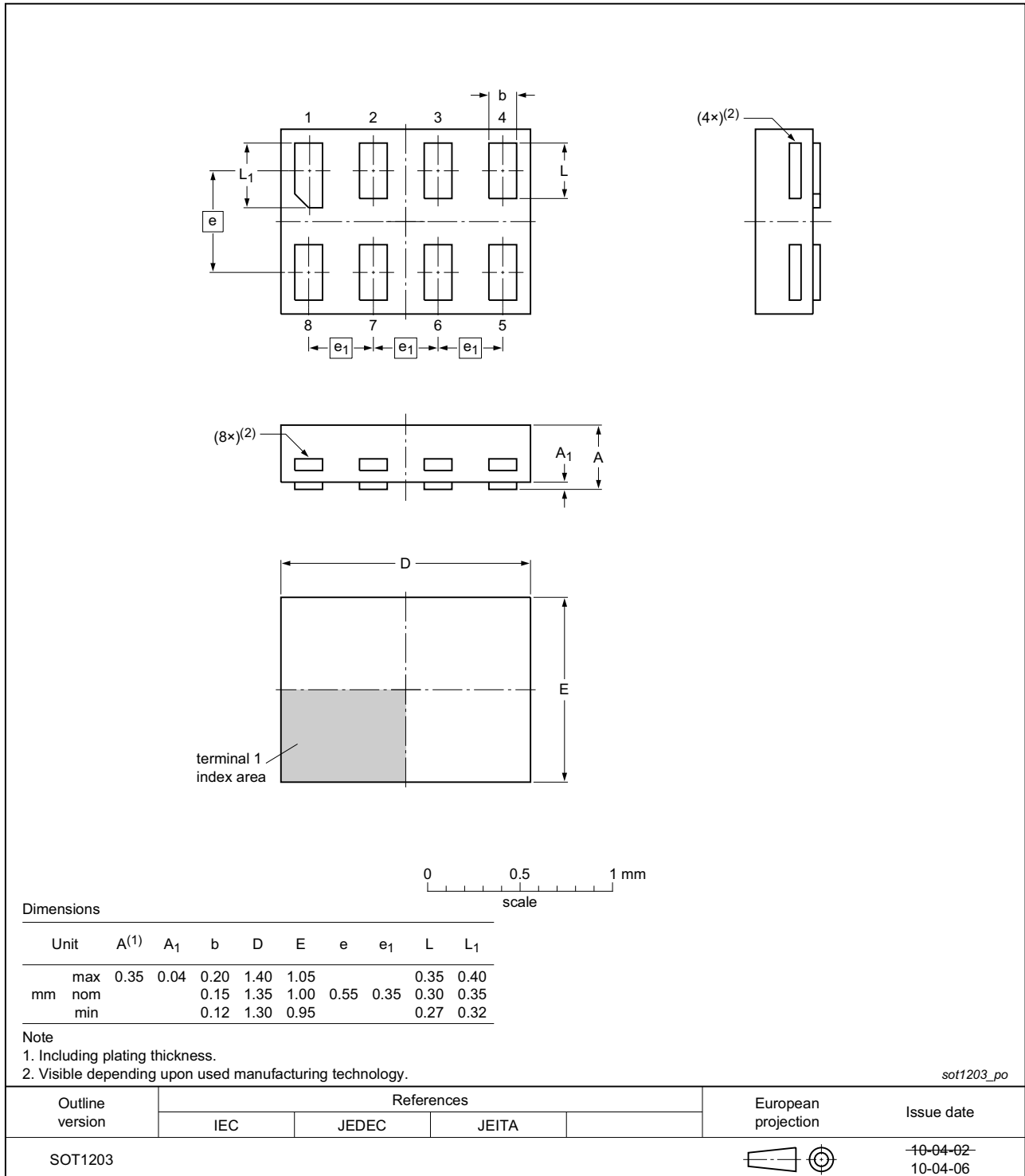


Fig 17. Package outline SOT1203 (XSON8)

X2SON8: plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 x 0.8 x 0.35 mm

SOT1233

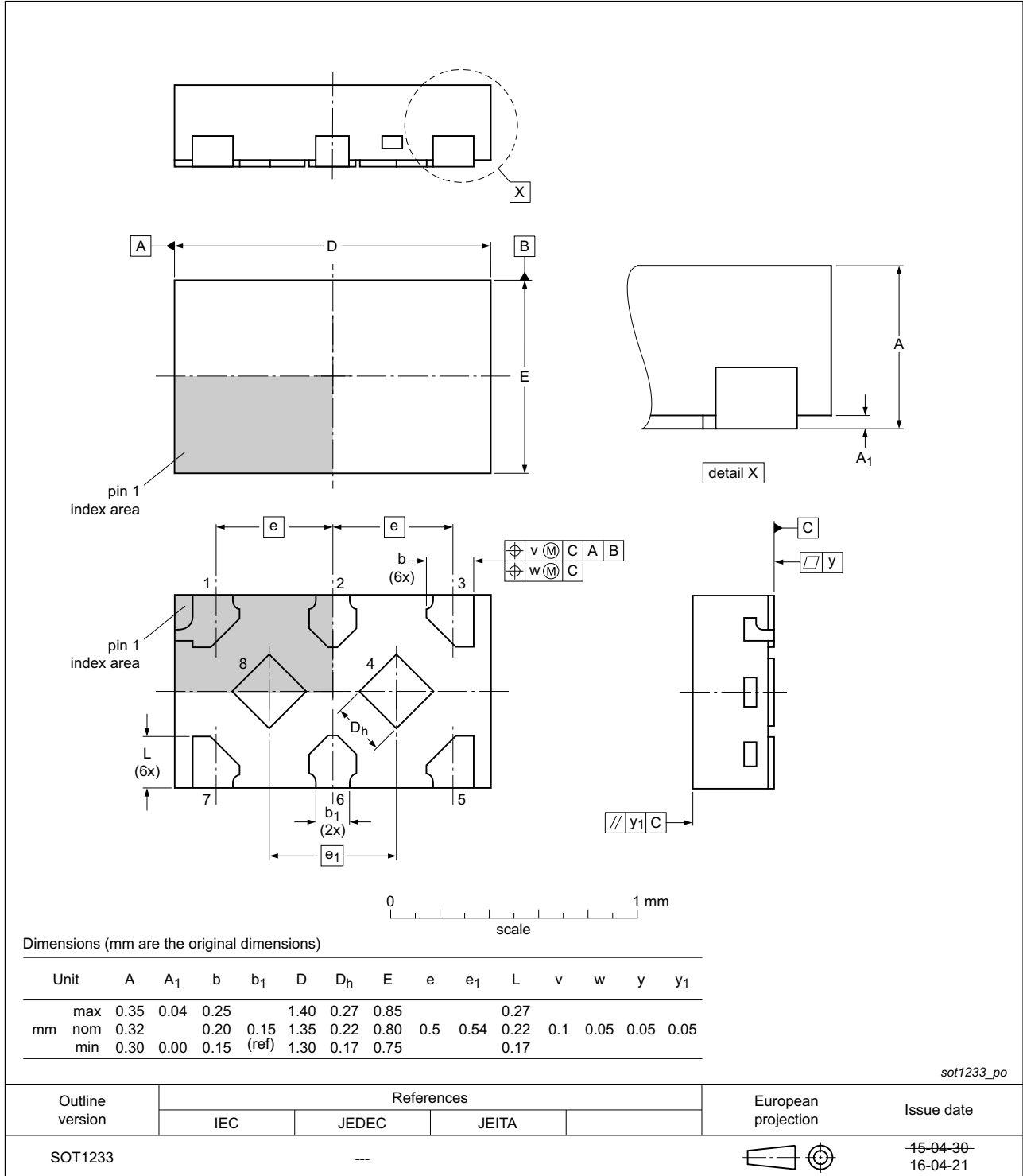


Fig 18. Package outline SOT1233 (X2SON8)

14. Abbreviations

Table 12. Abbreviations

| Acronym | Description |
|---------|---|
| CDM | Charged Device Model |
| CMOS | Complementary Metal-Oxide Semiconductor |
| DUT | Device Under Test |
| ESD | ElectroStatic Discharge |
| HBM | Human Body Model |
| MM | Machine Model |
| TTL | Transistor-Transistor Logic |

15. Revision history

Table 13. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-----------------|---|--------------------|---------------|----------------|
| 74AUP2G126 v.10 | 20161028 | Product data sheet | - | 74AUP2G126 v.9 |
| Modifications: | <ul style="list-style-type: none"> Added type number 74AUP2G126GX (SOT1233/X2SON8) | | | |
| 74AUP2G126 v.9 | 20130211 | Product data sheet | - | 74AUP2G126 v.8 |
| Modifications: | <ul style="list-style-type: none"> For type number 74AUP2G126GD XSON8U has changed to XSON8. | | | |
| 74AUP2G126 v.8 | 20120606 | Product data sheet | - | 74AUP2G126 v.7 |
| 74AUP2G126 v.7 | 20111201 | Product data sheet | - | 74AUP2G126 v.6 |
| 74AUP2G126 v.6 | 20100621 | Product data sheet | - | 74AUP2G126 v.5 |
| 74AUP2G126 v.5 | 20090202 | Product data sheet | - | 74AUP2G126 v.4 |
| 74AUP2G126 v.4 | 20090114 | Product data sheet | - | 74AUP2G126 v.3 |
| 74AUP2G126 v.3 | 20080409 | Product data sheet | - | 74AUP2G126 v.2 |
| 74AUP2G126 v.2 | 20070515 | Product data sheet | - | 74AUP2G126 v.1 |
| 74AUP2G126 v.1 | 20061009 | Product data sheet | - | - |

16. Legal information

16.1 Data sheet status

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

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

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

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

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