

74AUP3G17

Low-power triple Schmitt trigger

Rev. 2 — 12 October 2016

Product data sheet

1. General description

The 74AUP3G17 provides three Schmitt trigger buffers. It is capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

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 the damaging backflow current through the device when it is powered down.

The inputs switch at different points for positive and negative-going signals. The difference between the positive voltage V_{T+} and the negative voltage V_{T-} is defined as the input hysteresis voltage V_H .

2. Features and benefits

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- 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}
- 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 | |
| 74AUP3G17DC | -40 °C to +125 °C | VSSOP8 | plastic very thin shrink small outline package; 8 leads; body width 2.3 mm | SOT765-1 |
| 74AUP3G17GT | -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 |
| 74AUP3G17GM | -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 |
| 74AUP3G17GN | -40 °C to +125 °C | XSON8 | extremely thin small outline package; no leads; 8 terminals; body 1.2 × 1.0 × 0.35 mm | SOT1116 |
| 74AUP3G17GS | -40 °C to +125 °C | XSON8 | extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.0 × 0.35 mm | SOT1203 |

4. Marking

Table 2. Marking

| Type number | Marking code ^[1] |
|-------------|-----------------------------|
| 74AUP3G17DC | pV |
| 74AUP3G17GT | pV |
| 74AUP3G17GM | pV |
| 74AUP3G17GN | pV |
| 74AUP3G17GS | pV |

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

5. Functional diagram

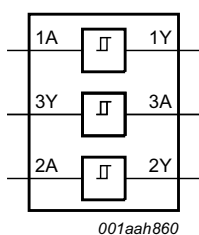


Fig 1. Logic symbol

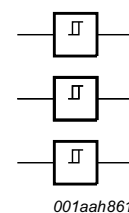


Fig 2. IEC logic symbol

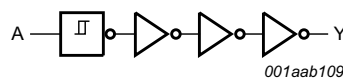
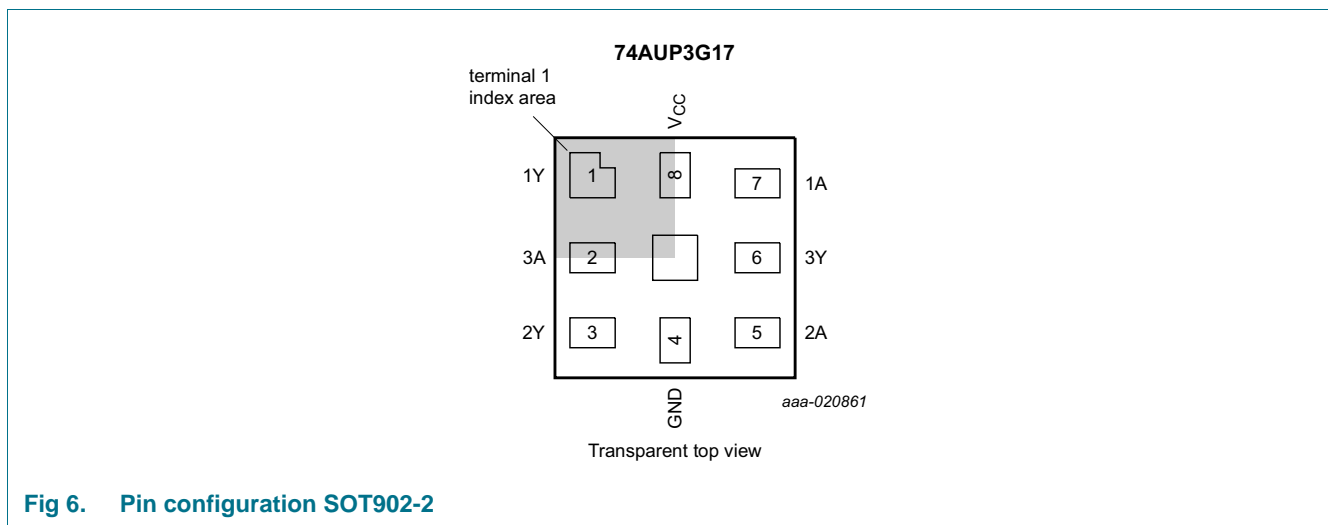
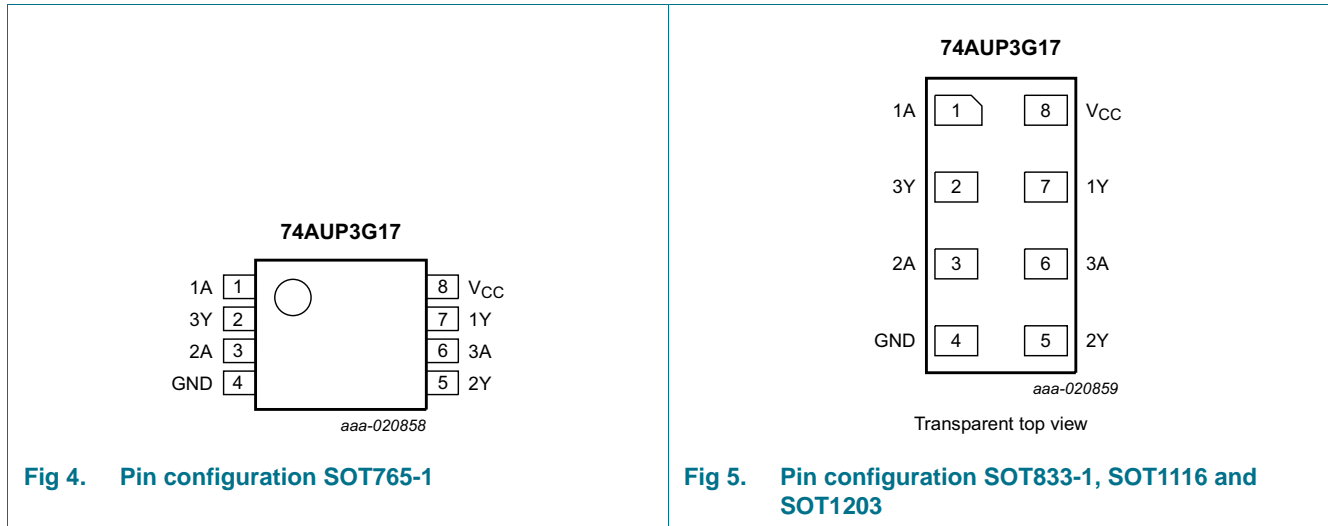


Fig 3. Logic diagram (one gate)

6. Pinning information

6.1 Pinning



6.2 Pin description

Table 3. Pin description

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

7. Functional description

Table 4. Function table^[1]

| Input | Output |
|-------|--------|
| nA | nY |
| L | L |
| H | H |

[1] H = HIGH voltage level; L = LOW voltage level.

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 | | -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 | -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 | - | 250 | mW |

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

[2] For VSSOP8 package: above 110 °C the value of P_{tot} derates linearly with 8 mW/K.
For XSON8 and XQFN8 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 |

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 |
|--|--------------------------------------|--|----------------------|-----|---------------------|---------------|
| $T_{amb} = 25\text{ °C}$ | | | | | | |
| V_{OH} | HIGH-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = -20\text{ }\mu\text{A}$; $V_{CC} = 0.8\text{ V to }3.6\text{ V}$ | $V_{CC} - 0.1$ | - | - | V |
| | | $I_O = -1.1\text{ mA}$; $V_{CC} = 1.1\text{ V}$ | $0.75 \times V_{CC}$ | - | - | V |
| | | $I_O = -1.7\text{ mA}$; $V_{CC} = 1.4\text{ V}$ | 1.11 | - | - | V |
| | | $I_O = -1.9\text{ mA}$; $V_{CC} = 1.65\text{ V}$ | 1.32 | - | - | V |
| | | $I_O = -2.3\text{ mA}$; $V_{CC} = 2.3\text{ V}$ | 2.05 | - | - | V |
| | | $I_O = -3.1\text{ mA}$; $V_{CC} = 2.3\text{ V}$ | 1.9 | - | - | V |
| | | $I_O = -2.7\text{ mA}$; $V_{CC} = 3.0\text{ V}$ | 2.72 | - | - | V |
| | | $I_O = -4.0\text{ mA}$; $V_{CC} = 3.0\text{ V}$ | 2.6 | - | - | V |
| V_{OL} | LOW-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = 20\text{ }\mu\text{A}$; $V_{CC} = 0.8\text{ V to }3.6\text{ V}$ | - | - | 0.1 | V |
| | | $I_O = 1.1\text{ mA}$; $V_{CC} = 1.1\text{ V}$ | - | - | $0.3 \times V_{CC}$ | V |
| | | $I_O = 1.7\text{ mA}$; $V_{CC} = 1.4\text{ V}$ | - | - | 0.31 | V |
| | | $I_O = 1.9\text{ mA}$; $V_{CC} = 1.65\text{ V}$ | - | - | 0.31 | V |
| | | $I_O = 2.3\text{ mA}$; $V_{CC} = 2.3\text{ V}$ | - | - | 0.31 | V |
| | | $I_O = 3.1\text{ mA}$; $V_{CC} = 2.3\text{ V}$ | - | - | 0.44 | V |
| | | $I_O = 2.7\text{ mA}$; $V_{CC} = 3.0\text{ V}$ | - | - | 0.31 | V |
| | | $I_O = 4.0\text{ mA}$; $V_{CC} = 3.0\text{ V}$ | - | - | 0.44 | V |
| I_I | input leakage current | $V_I = \text{GND to }3.6\text{ V}$; $V_{CC} = 0\text{ V to }3.6\text{ V}$ | - | - | ± 0.1 | μA |
| I_{OFF} | power-off leakage current | V_I or $V_O = 0\text{ V to }3.6\text{ V}$; $V_{CC} = 0\text{ V}$ | - | - | ± 0.2 | μA |
| ΔI_{OFF} | additional power-off leakage current | V_I or $V_O = 0\text{ V to }3.6\text{ V}$; $V_{CC} = 0\text{ V to }0.2\text{ V}$ | - | - | ± 0.2 | μA |
| I_{CC} | supply current | $V_I = \text{GND or }V_{CC}$; $I_O = 0\text{ A}$; $V_{CC} = 0.8\text{ V to }3.6\text{ V}$ | - | - | 0.5 | μA |
| ΔI_{CC} | additional supply current | $V_I = V_{CC} - 0.6\text{ V}$; $I_O = 0\text{ A}$; $V_{CC} = 3.3\text{ V}$ | - | - | 40 | μA |
| C_I | input capacitance | $V_I = \text{GND or }V_{CC}$; $V_{CC} = 0\text{ V to }3.6\text{ V}$ | - | 1.1 | - | pF |
| C_O | output capacitance | $V_O = \text{GND}$; $V_{CC} = 0\text{ V}$ | - | 1.7 | - | pF |
| $T_{amb} = -40\text{ °C to }+85\text{ °C}$ | | | | | | |
| V_{OH} | HIGH-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = -20\text{ }\mu\text{A}$; $V_{CC} = 0.8\text{ V to }3.6\text{ V}$ | $V_{CC} - 0.1$ | - | - | V |
| | | $I_O = -1.1\text{ mA}$; $V_{CC} = 1.1\text{ V}$ | $0.7 \times V_{CC}$ | - | - | V |
| | | $I_O = -1.7\text{ mA}$; $V_{CC} = 1.4\text{ V}$ | 1.03 | - | - | V |
| | | $I_O = -1.9\text{ mA}$; $V_{CC} = 1.65\text{ V}$ | 1.30 | - | - | V |
| | | $I_O = -2.3\text{ mA}$; $V_{CC} = 2.3\text{ V}$ | 1.97 | - | - | V |
| | | $I_O = -3.1\text{ mA}$; $V_{CC} = 2.3\text{ V}$ | 1.85 | - | - | V |
| | | $I_O = -2.7\text{ mA}$; $V_{CC} = 3.0\text{ V}$ | 2.67 | - | - | V |
| | | $I_O = -4.0\text{ mA}$; $V_{CC} = 3.0\text{ V}$ | 2.55 | - | - | V |

Table 7. Static characteristics ...continued

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--------------------------------------|---|------------------------|-----|------------------------|------|
| V _{OL} | LOW-level output voltage | V _I = V _{T+} or V _{T-} | | | | |
| | | 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 | - | - | 0.37 | 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 _O = 4.0 mA; V _{CC} = 3.0 V | - | - | 0.45 | V | | |
| I _I | input leakage current | V _I = GND to 3.6 V; V _{CC} = 0 V to 3.6 V | - | - | ±0.5 | μA |
| I _{OFF} | power-off leakage current | V _I or V _O = 0 V to 3.6 V; V _{CC} = 0 V | - | - | ±0.5 | 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 | - | - | ±0.6 | μA |
| I _{CC} | supply current | V _I = GND or V _{CC} ; I _O = 0 A; V _{CC} = 0.8 V to 3.6 V | - | - | 0.9 | μA |
| ΔI _{CC} | additional supply current | V _I = V _{CC} - 0.6 V; I _O = 0 A; V _{CC} = 3.3 V | - | - | 50 | μA |
| T_{amb} = -40 °C to +125 °C | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{T+} or V _{T-} | | | | |
| | | I _O = -20 μA; 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 × 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 |
| I _O = -4.0 mA; V _{CC} = 3.0 V | 2.30 | - | - | V | | |
| V _{OL} | LOW-level output voltage | V _I = V _{T+} or V _{T-} | | | | |
| | | I _O = 20 μA; V _{CC} = 0.8 V to 3.6 V | - | - | 0.11 | V |
| | | I _O = 1.1 mA; V _{CC} = 1.1 V | - | - | 0.33 × 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 _O = 4.0 mA; V _{CC} = 3.0 V | - | - | 0.50 | V | | |
| I _I | input leakage current | V _I = GND to 3.6 V; V _{CC} = 0 V to 3.6 V | - | - | ±0.75 | μA |
| I _{OFF} | power-off leakage current | V _I or V _O = 0 V to 3.6 V; V _{CC} = 0 V | - | - | ±0.75 | 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_{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 | $V_I = V_{CC} - 0.6$ V; $I_O = 0$ A; $V_{CC} = 3.3$ V | - | - | 75 | μ A |

11. Dynamic characteristics

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

| 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 7 ^[2] | | | | | | | |
| | | $V_{CC} = 0.8$ V | - | 19.0 | - | - | - | - | ns |
| | | $V_{CC} = 1.1$ V to 1.3 V | 2.6 | 5.7 | 10.6 | 2.5 | 10.9 | 11.1 | ns |
| | | $V_{CC} = 1.4$ V to 1.6 V | 2.4 | 4.2 | 6.5 | 2.3 | 7.1 | 7.4 | ns |
| | | $V_{CC} = 1.65$ V to 1.95 V | 2.0 | 3.6 | 5.5 | 1.9 | 6.1 | 6.3 | ns |
| | | $V_{CC} = 2.3$ V to 2.7 V | 1.9 | 3.0 | 4.2 | 1.8 | 4.6 | 4.8 | ns |
| | | $V_{CC} = 3.0$ V to 3.6 V | 1.8 | 2.7 | 3.6 | 1.5 | 3.8 | 4.0 | ns |
| $C_L = 10$ pF | | | | | | | | | |
| t_{pd} | propagation delay | nA to nY; see Figure 7 ^[2] | | | | | | | |
| | | $V_{CC} = 0.8$ V | - | 22.5 | - | - | - | - | ns |
| | | $V_{CC} = 1.1$ V to 1.3 V | 2.9 | 6.6 | 12.4 | 2.7 | 12.9 | 13.0 | ns |
| | | $V_{CC} = 1.4$ V to 1.6 V | 2.6 | 4.8 | 7.8 | 2.4 | 8.3 | 8.7 | ns |
| | | $V_{CC} = 1.65$ V to 1.95 V | 2.5 | 4.2 | 6.3 | 2.4 | 6.8 | 7.1 | ns |
| | | $V_{CC} = 2.3$ V to 2.7 V | 2.3 | 3.5 | 4.8 | 2.1 | 5.3 | 5.6 | ns |
| | | $V_{CC} = 3.0$ V to 3.6 V | 2.1 | 3.3 | 4.4 | 2.0 | 4.6 | 4.8 | ns |

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

| Symbol | Parameter | Conditions | 25 °C | | | –40 °C to +125 °C | | | Unit |
|---|-------------------------------|--|-------|--------------------|------|-------------------|-------------|--------------|------|
| | | | Min | Typ ^[1] | Max | Min | Max (85 °C) | Max (125 °C) | |
| C_L = 15 pF | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Figure 7 ^[2] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 26.0 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 3.2 | 7.4 | 14.1 | 3.1 | 14.7 | 14.9 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 3.1 | 5.4 | 8.7 | 2.8 | 9.5 | 9.9 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.7 | 4.7 | 7.1 | 2.7 | 7.8 | 8.2 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.6 | 4.0 | 5.6 | 2.5 | 6.0 | 6.3 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 2.5 | 3.7 | 4.9 | 2.2 | 5.2 | 5.5 | ns |
| C_L = 30 pF | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Figure 7 ^[2] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 36.3 | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 3.9 | 9.7 | 19.0 | 3.7 | 19.8 | 20.1 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 3.5 | 7.0 | 11.2 | 3.6 | 12.4 | 13.0 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 3.5 | 6.0 | 9.2 | 3.4 | 10.1 | 10.7 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 3.4 | 5.1 | 7.0 | 3.2 | 7.5 | 7.9 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 3.3 | 4.8 | 6.2 | 3.1 | 7.1 | 7.5 | ns |
| C_L = 5 pF, 10 pF, 15 pF and 30 pF | | | | | | | | | |
| C _{PD} | power dissipation capacitance | f _i = 1 MHz; V _I = GND to V _{CC} ^[3] | | | | | | | |
| | | V _{CC} = 0.8 V | - | 2.5 | - | - | - | - | pF |
| | | V _{CC} = 1.1 V to 1.3 V | - | 2.7 | - | - | - | - | pF |
| | | V _{CC} = 1.4 V to 1.6 V | - | 2.8 | - | - | - | - | pF |
| | | V _{CC} = 1.65 V to 1.95 V | - | 3.0 | - | - | - | - | pF |
| | | V _{CC} = 2.3 V to 2.7 V | - | 3.5 | - | - | - | - | pF |
| | | V _{CC} = 3.0 V to 3.6 V | - | 4.0 | - | - | - | pF | |

[1] All typical values are measured at nominal V_{CC}.

[2] t_{pd} is the same as t_{PLH} and t_{PHL}

[3] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

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

f_i = input frequency in MHz;

f_o = output frequency in MHz;

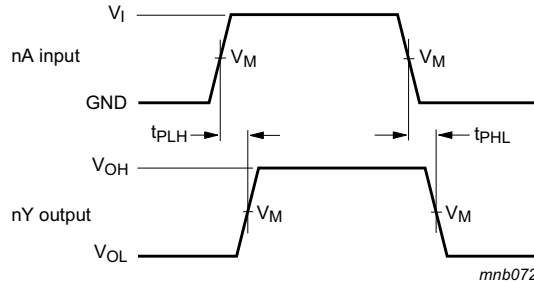
C_L = output load capacitance in pF;

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

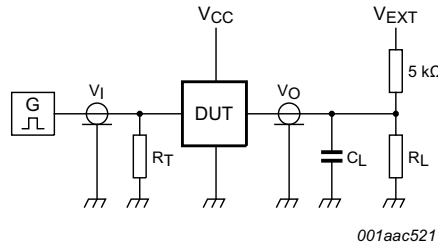


Measurement points are given in [Table 9](#).
 Logic levels: V_{OL} and V_{OH} are typical output voltage drop that occur with the output load.

Fig 7. The data input (nA) to output (nY) propagation delays

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 | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | V_{CC} | ≤ 3.0 ns |



Test data is given in [Table 10](#).
 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 8. Test circuit for measuring switching times

Table 10. 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 $R_L = 5$ kΩ, for measuring propagation delays, setup and hold times and pulse width $R_L = 1$ MΩ.

13. Transfer characteristics

Table 11. Transfer characteristics

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

| Symbol | Parameter | Conditions | 25 °C | | | –40 °C to +125 °C | | | Unit |
|-----------------|----------------------------------|--|-------|-----|------|-------------------|-------------|--------------|------|
| | | | Min | Typ | Max | Min | Max (85 °C) | Max (125 °C) | |
| V _{T+} | positive-going threshold voltage | see Figure 9 and Figure 10 | | | | | | | |
| | | V _{CC} = 0.8 V | 0.30 | - | 0.60 | 0.30 | 0.60 | 0.62 | V |
| | | V _{CC} = 1.1 V | 0.53 | - | 0.90 | 0.53 | 0.90 | 0.92 | V |
| | | V _{CC} = 1.4 V | 0.74 | - | 1.11 | 0.74 | 1.11 | 1.13 | V |
| | | V _{CC} = 1.65 V | 0.91 | - | 1.29 | 0.91 | 1.29 | 1.31 | V |
| | | V _{CC} = 2.3 V | 1.37 | - | 1.77 | 1.37 | 1.77 | 1.80 | V |
| | | V _{CC} = 3.0 V | 1.88 | - | 2.29 | 1.88 | 2.29 | 2.32 | V |
| V _{T-} | negative-going threshold voltage | see Figure 9 and Figure 10 | | | | | | | |
| | | V _{CC} = 0.8 V | 0.10 | - | 0.60 | 0.10 | 0.60 | 0.60 | V |
| | | V _{CC} = 1.1 V | 0.26 | - | 0.65 | 0.26 | 0.65 | 0.65 | V |
| | | V _{CC} = 1.4 V | 0.39 | - | 0.75 | 0.39 | 0.75 | 0.75 | V |
| | | V _{CC} = 1.65 V | 0.47 | - | 0.84 | 0.47 | 0.84 | 0.84 | V |
| | | V _{CC} = 2.3 V | 0.69 | - | 1.04 | 0.69 | 1.04 | 1.04 | V |
| | | V _{CC} = 3.0 V | 0.88 | - | 1.24 | 0.88 | 1.24 | 1.24 | V |
| V _H | hysteresis voltage | (V _{T+} – V _{T-}); see Figure 9 , Figure 10 , Figure 11 and Figure 12 | | | | | | | |
| | | V _{CC} = 0.8 V | 0.07 | - | 0.50 | 0.07 | 0.50 | 0.50 | V |
| | | V _{CC} = 1.1 V | 0.08 | - | 0.46 | 0.08 | 0.46 | 0.46 | V |
| | | V _{CC} = 1.4 V | 0.18 | - | 0.56 | 0.18 | 0.56 | 0.56 | V |
| | | V _{CC} = 1.65 V | 0.27 | - | 0.66 | 0.27 | 0.66 | 0.66 | V |
| | | V _{CC} = 2.3 V | 0.53 | - | 0.92 | 0.53 | 0.92 | 0.92 | V |
| | | V _{CC} = 3.0 V | 0.79 | - | 1.31 | 0.79 | 1.31 | 1.31 | V |

14. Waveforms transfer characteristics

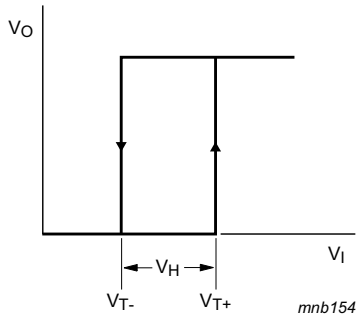
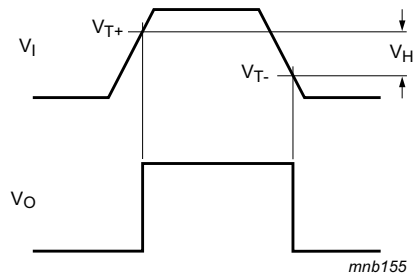


Fig 9. Transfer characteristic



V_{T+} and V_{T-} limits at 70 % and 20 %.

Fig 10. Definition of V_{T+} , V_{T-} and V_H

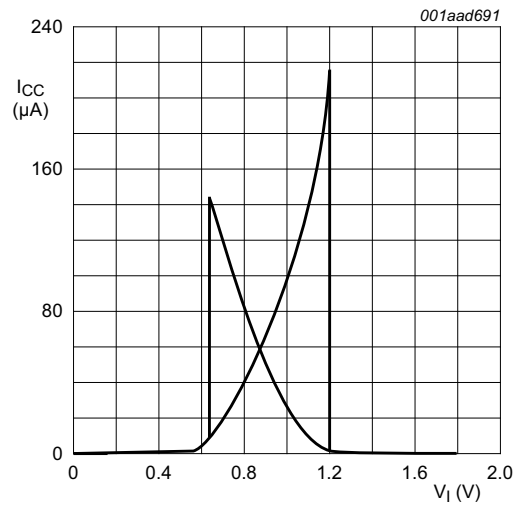


Fig 11. Typical transfer characteristics; $V_{CC} = 1.8\text{ V}$

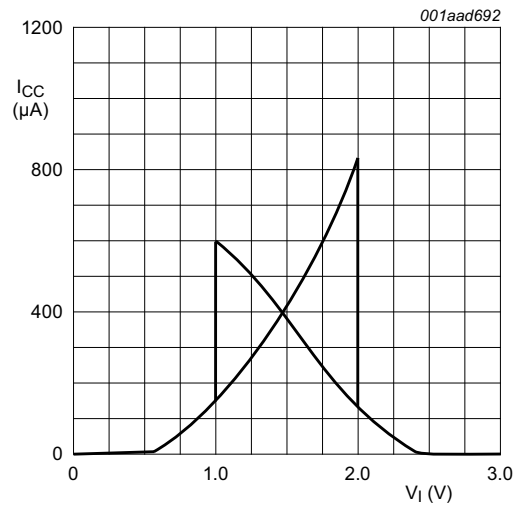


Fig 12. Typical transfer characteristics; $V_{CC} = 3.0\text{ V}$

15. Application information

The slow input rise and fall times cause additional power dissipation, this can be calculated using the following formula:

$$P_{add} = f_i \times (t_r \times \Delta I_{CC(AV)} + t_f \times \Delta I_{CC(AV)}) \times V_{CC}$$

where:

P_{add} = additional power dissipation (μW);

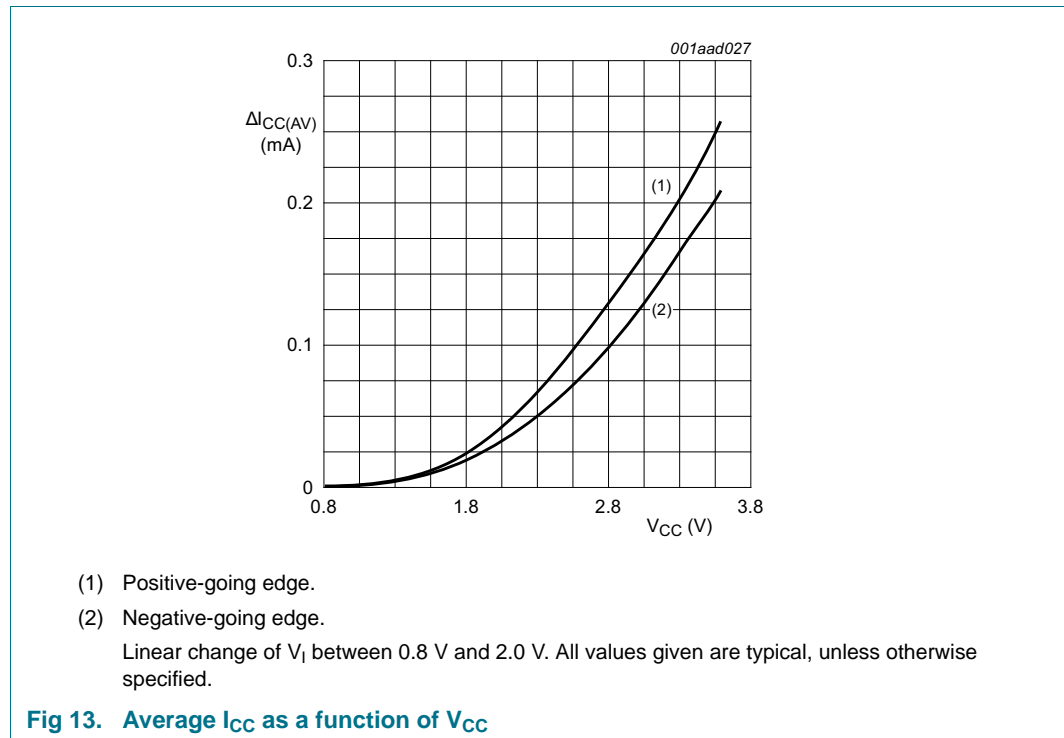
f_i = input frequency (MHz);

t_r = input rise time (ns); 10 % to 90 %;

t_f = input fall time (ns); 90 % to 10 %;

$\Delta I_{CC(AV)}$ = average additional supply current (μA).

Average $\Delta I_{CC(AV)}$ differs with positive or negative input transitions, as shown in [Figure 13](#).



16. Package outline

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

SOT765-1

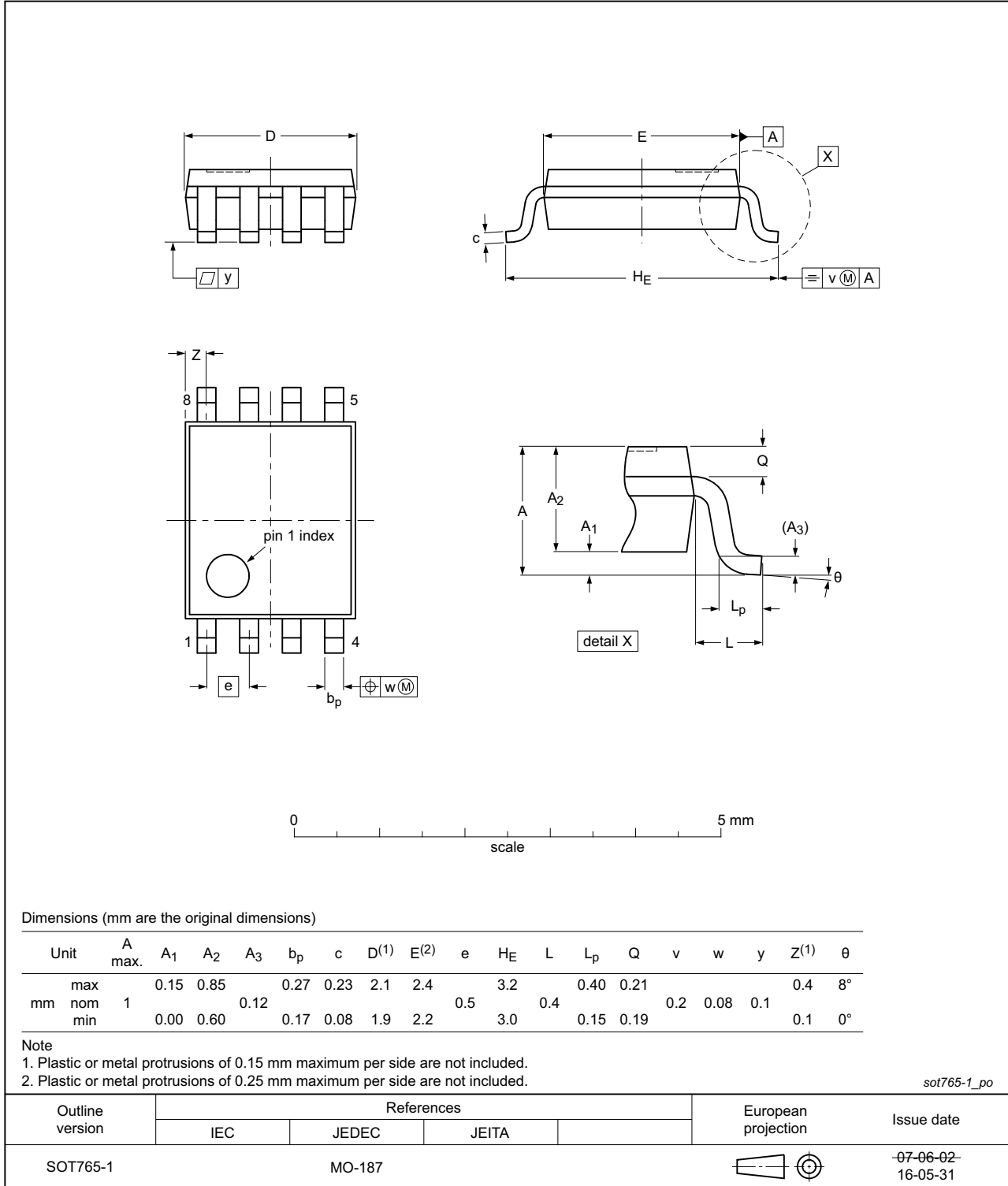


Fig 14. Package outline SOT765-1 (VSSOP8)

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

SOT833-1

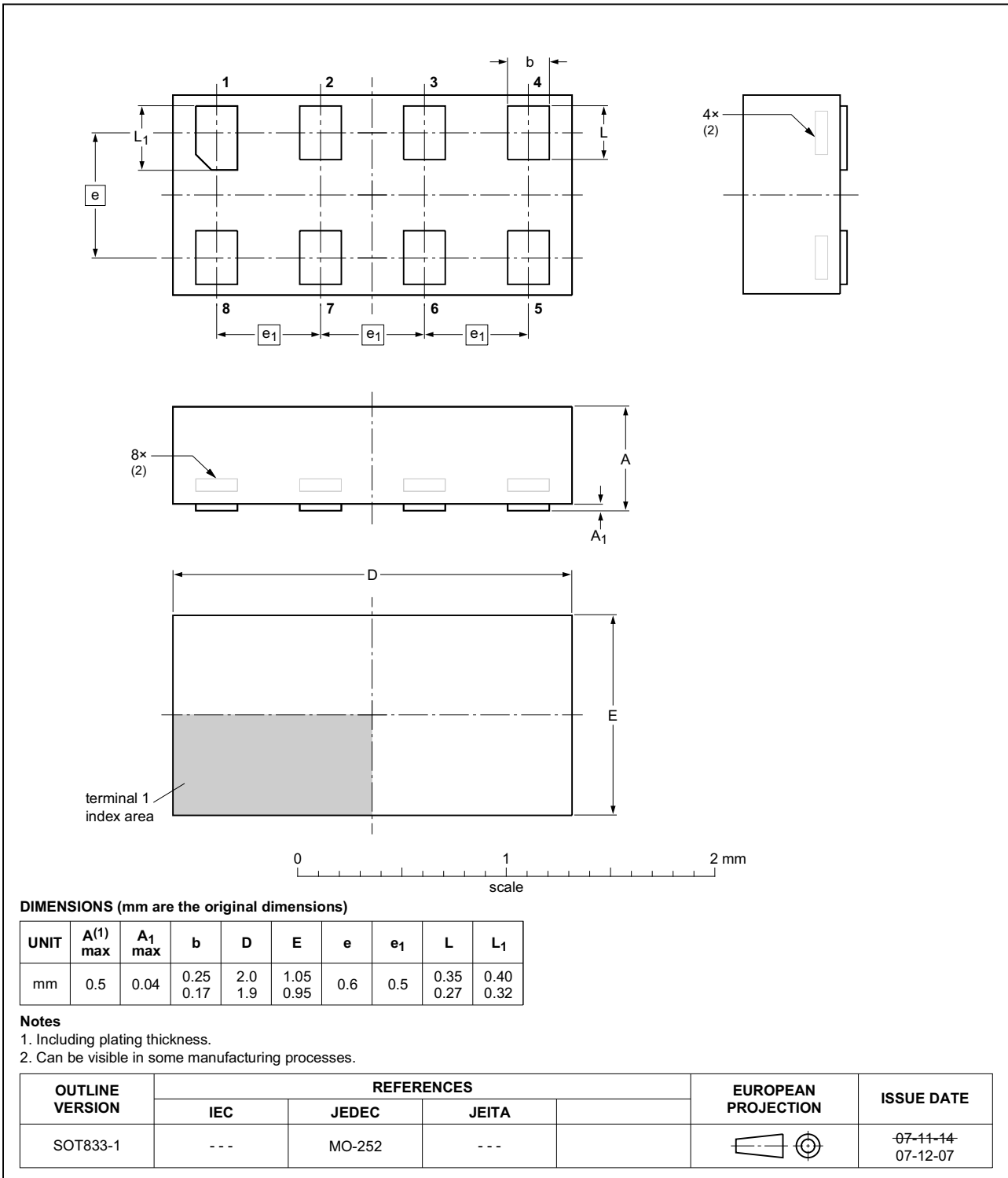


Fig 15. Package outline SOT833-1 (XSON8)

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

SOT902-2

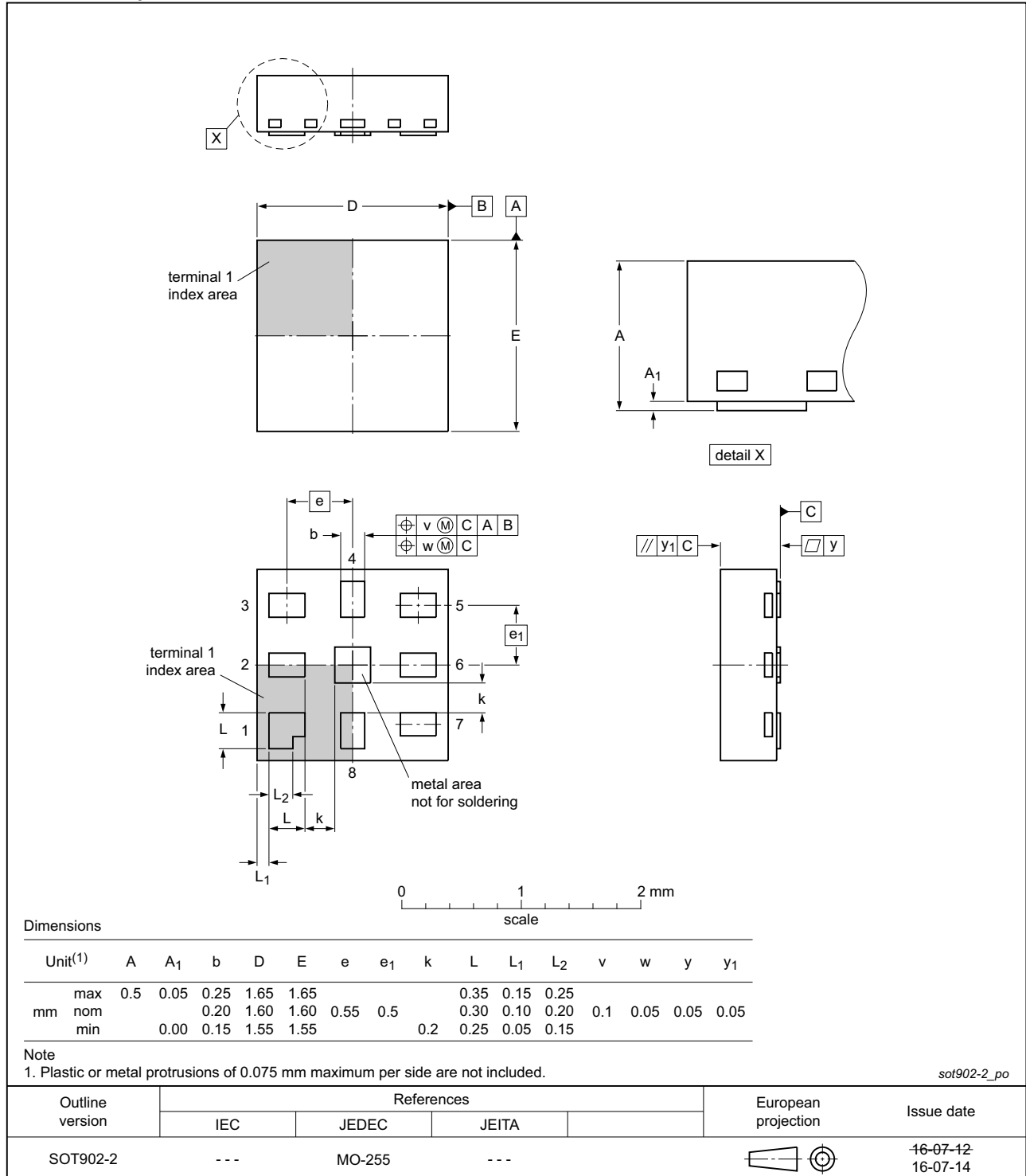


Fig 16. Package outline SOT902-2 (XQFN8)

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

SOT1116

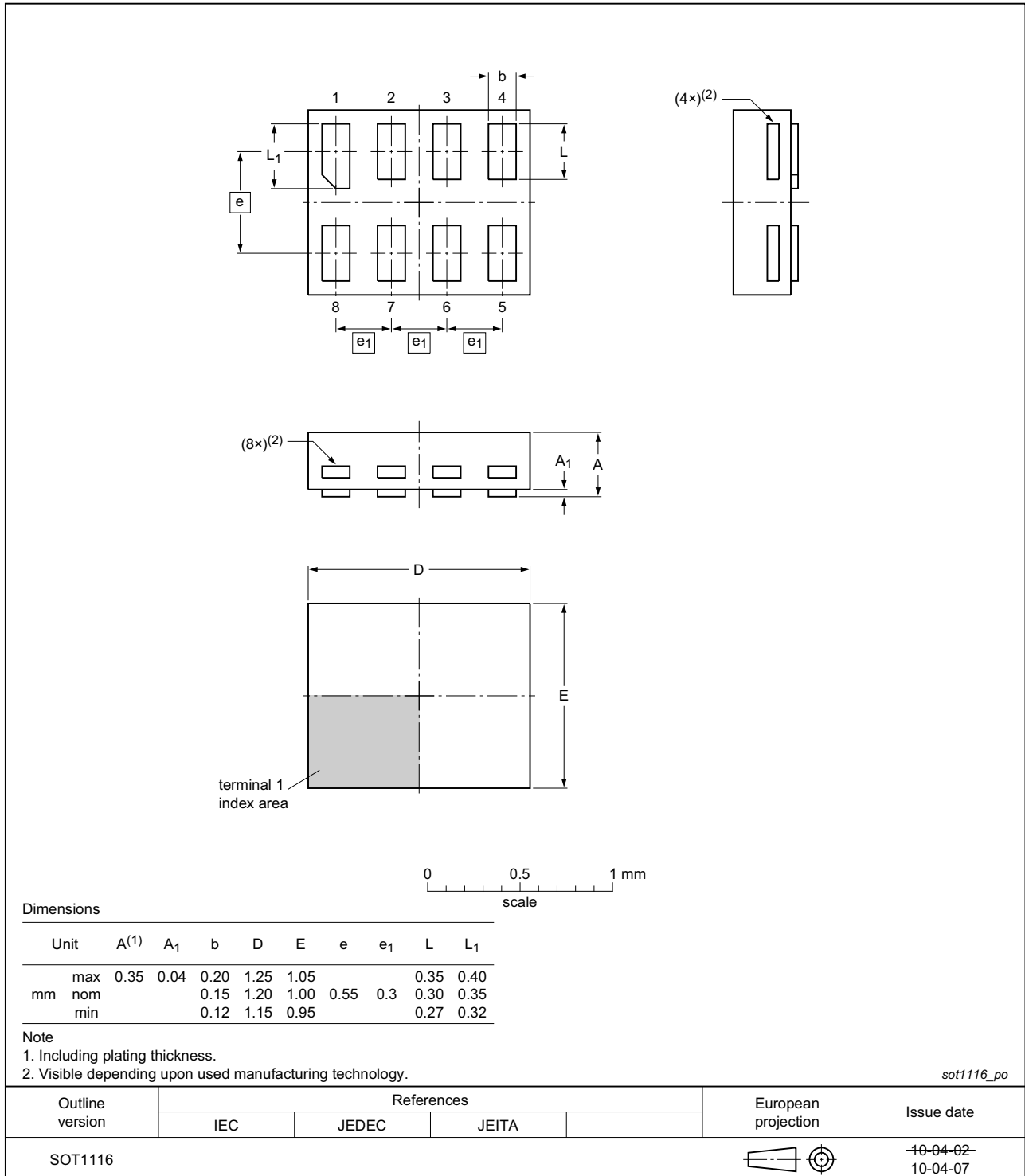


Fig 17. Package outline SOT1116 (XSON8)

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

SOT1203

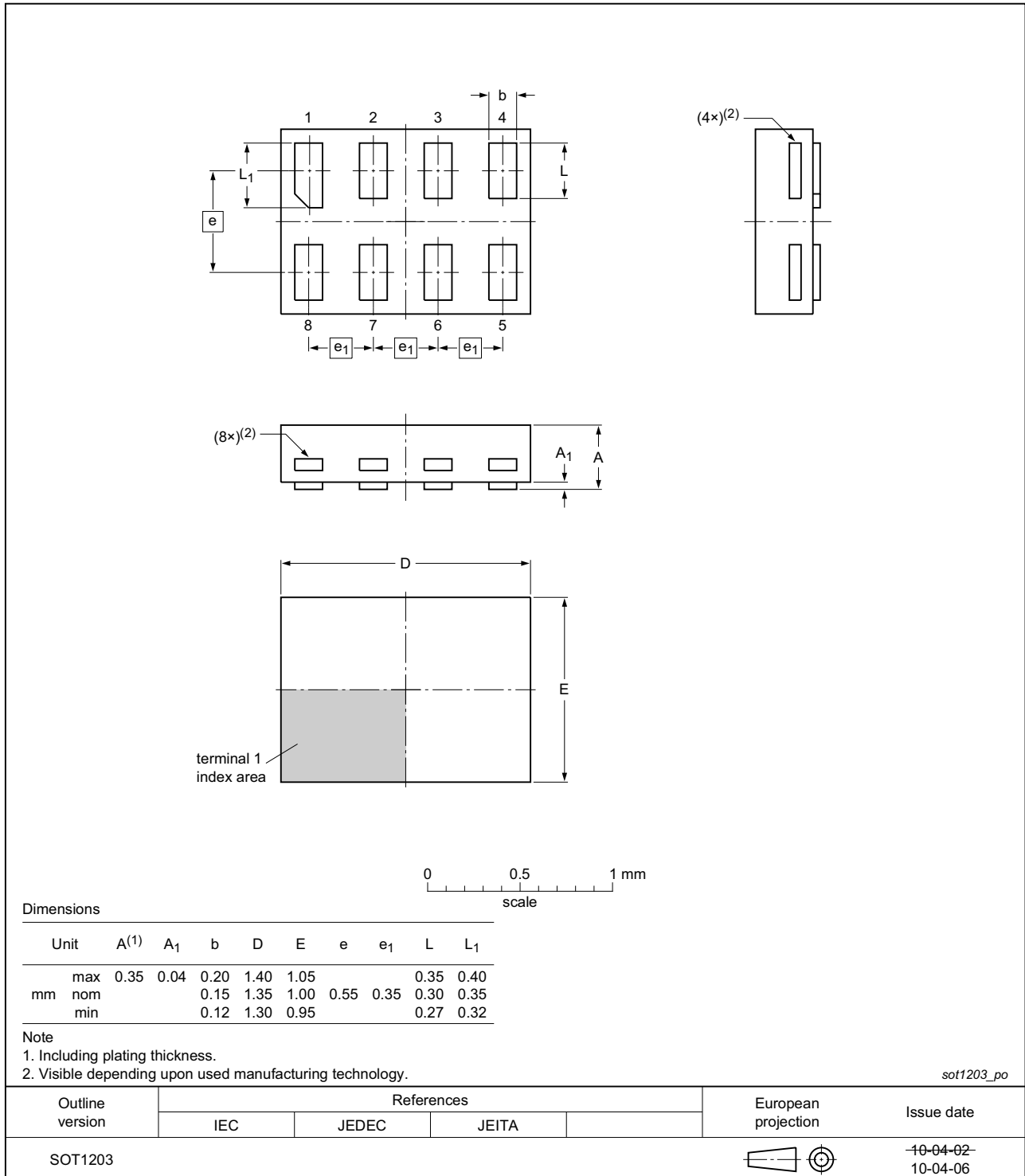


Fig 18. Package outline SOT1203 (XSON8)

17. Abbreviations

Table 12. Abbreviations

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

18. Revision history

Table 13. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--|--------------------|---------------|---------------|
| 74AUP3G17 v.2 | 20161012 | Product data sheet | - | 74AUP3G17 v.1 |
| Modifications: | • Type numbers 74AUP3G17GD, and 74AUP3G17GF removed. | | | |
| 74AUP3G17 v.1 | 20151222 | Product data sheet | - | - |

19. Legal information

19.1 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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21. Contents

| | | |
|-----------|---|-----------|
| 1 | General description | 1 |
| 2 | Features and benefits | 1 |
| 3 | Ordering information | 2 |
| 4 | Marking | 2 |
| 5 | Functional diagram | 2 |
| 6 | Pinning information | 3 |
| 6.1 | Pinning | 3 |
| 6.2 | Pin description | 3 |
| 7 | Functional description | 4 |
| 8 | Limiting values | 4 |
| 9 | Recommended operating conditions | 4 |
| 10 | Static characteristics | 5 |
| 11 | Dynamic characteristics | 7 |
| 12 | Waveforms | 9 |
| 13 | Transfer characteristics | 10 |
| 14 | Waveforms transfer characteristics | 11 |
| 15 | Application information | 13 |
| 16 | Package outline | 14 |
| 17 | Abbreviations | 19 |
| 18 | Revision history | 19 |
| 19 | Legal information | 20 |
| 19.1 | Data sheet status | 20 |
| 19.2 | Definitions | 20 |
| 19.3 | Disclaimers | 20 |
| 19.4 | Trademarks | 21 |
| 20 | Contact information | 21 |
| 21 | Contents | 22 |

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