

74AUP1G17

Low-power Schmitt trigger

Rev. 11 — 8 June 2018

Product data sheet

1 General description

The 74AUP1G17 provides the single Schmitt trigger buffer. 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: ANSI/ESDA/JEDEC JS-001 Class 3A exceeds 5000 V
 - CDM: ANSI/ESDA/JEDEC JS-002 Class C3 exceeds 1000 V
 - MM: JESD22-A115-A exceeds 200 V
- Low static power consumption; $I_{CC} = 0.9 \mu A$ (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 $+125\text{ }^{\circ}\text{C}$

3 Ordering information

Table 1. Ordering information

| Type number | Package | | | |
|-------------|---|--------|--|----------|
| | Temperature range | Name | Description | Version |
| 74AUP1G17GW | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | TSSOP5 | plastic thin shrink small outline package; 5 leads; body width 1.25 mm | SOT353-1 |
| 74AUP1G17GV | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | SC-74A | plastic surface-mounted package; 5 leads | SOT753 |

| Type number | Package | | | |
|--------------|-------------------|--------|--|-----------|
| | Temperature range | Name | Description | Version |
| 74AUP1G17GM | -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 |
| 74AUP1G17GF | -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 |
| 74AUP1G17GN | -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 |
| 74AUP1G17GS | -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 |
| 74AUP1G17GX | -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 |
| 74AUP1G17GX4 | -40 °C to +125 °C | X2SON4 | plastic thermal enhanced extremely thin small outline package; no leads; 4 terminals; body 0.6 x 0.6 x 0.32 mm | SOT1269-2 |

4 Marking

Table 2. Marking

| Type number | Marking code ^[1] |
|--------------|-----------------------------|
| 74AUP1G17GW | pJ |
| 74AUP1G17GV | pJ |
| 74AUP1G17GM | pJ |
| 74AUP1G17GF | pJ |
| 74AUP1G17GN | pJ |
| 74AUP1G17GS | pJ |
| 74AUP1G17GX | pJ |
| 74AUP1G17GX4 | pJ |

[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

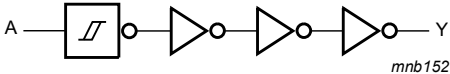
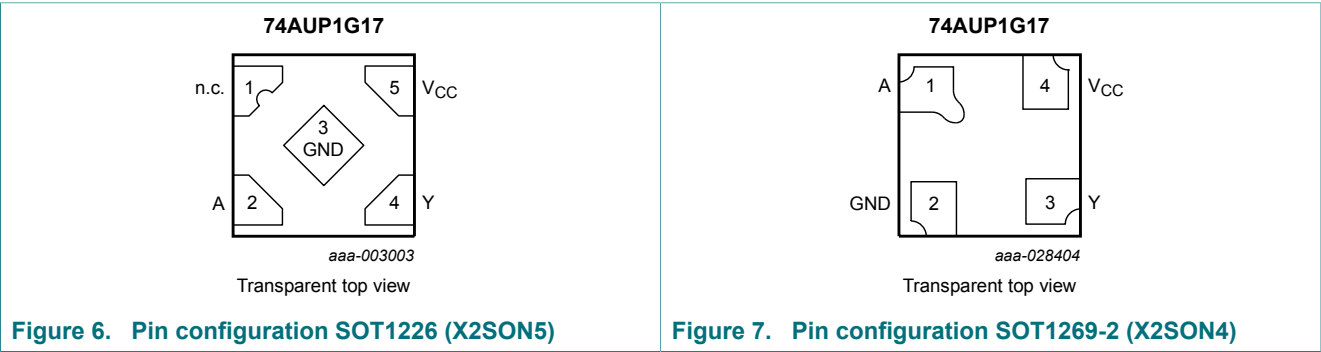
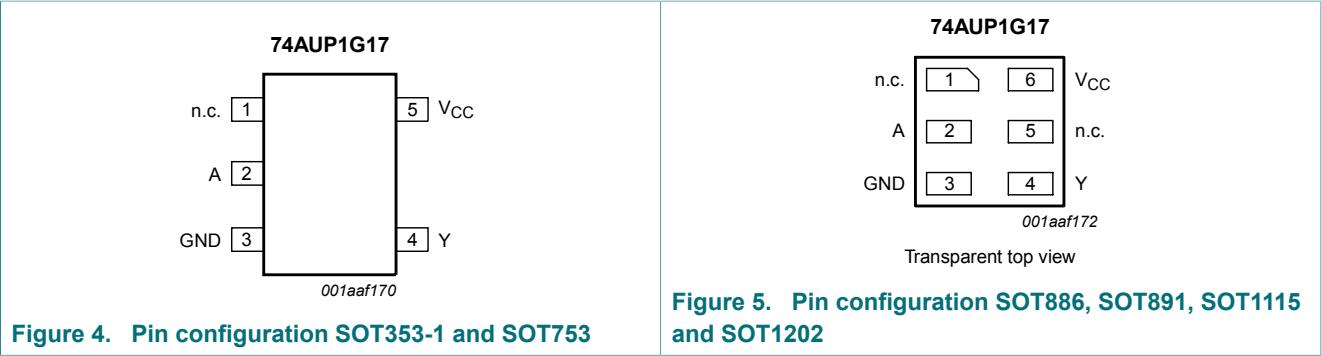


Figure 3. Logic diagram

6 Pinning information

6.1 Pinning



6.2 Pin description

Table 3. Pin description

| Symbol | Pin | | | Description |
|-----------------|---------------------------|-------|--------|----------------|
| | TSSOP5, SC-74A and X2SON5 | XSON6 | X2SON4 | |
| n.c. | 1 | 1, 5 | - | not connected |
| A | 2 | 2 | 1 | data input |
| GND | 3 | 3 | 2 | ground (0 V) |
| Y | 4 | 4 | 3 | data output |
| V _{CC} | 5 | 6 | 4 | supply voltage |

7 Functional description

Table 4. Function table

H = HIGH voltage level; L = LOW voltage level.

| Input | Output |
|-------|--------|
| A | Y |
| L | L |
| H | H |

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 | | | |
| | | TSSOP5, SC-74A, XSON6 and X2SON5 package [2] | - | 250 | mW |
| | | X2SON4 package [3] | - | 150 | mW |

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

[2] For TSSOP5 and SC-74A 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.

[3] For X2SON4 packages: above 57 °C the value of P_{tot} derates linearly with 1.7 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 °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} - 0.1 | - | - | 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 |
| | | I _O = -4.0 mA; V _{CC} = 3.0 V | 2.6 | - | - | 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 | - | - | 0.1 | 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 _{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 |
| ΔI _{CC} | additional supply current | V _I = V _{CC} - 0.6 V; I _O = 0 A; V _{CC} = 3.3 V | - | - | 40 | µA |
| C _I | input capacitance | V _I = GND or V _{CC} ; V _{CC} = 0 V to 3.6 V | - | 1.1 | - | pF |
| C _O | output capacitance | V _O = GND; V _{CC} = 0 V | - | 1.7 | - | pF |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--------------------------------------|---|-----------------------|-----|-----------------------|------|
| T_{amb} = -40 °C to +85 °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} - 0.1 | - | - | V |
| | | I _O = -1.1 mA; V _{CC} = 1.1 V | 0.7 × 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 |
| | | I _O = -4.0 mA; V _{CC} = 3.0 V | 2.55 | - | - | 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 | - | - | 0.1 | 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 |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|--------------------------------------|---|------------------------|-----|------------------------|------|
| 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 |
| 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 | µA |
| 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 | µA |
| ΔI _{CC} | additional supply current | V _I = V _{CC} - 0.6 V; I _O = 0 A; V _{CC} = 3.3 V | - | - | 75 | µA |

11 Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 9](#)

| 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 | A to Y; see Figure 8 ^[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 | A to Y; see Figure 8 ^[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 |
| C _L = 15 pF | | | | | | | | | |
| t _{pd} | propagation delay | A to Y; see Figure 8 ^[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 |

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +125 °C | | | Unit |
|---|-------------------------------|---|-------|--------------------|------|-------------------|----------------|-----------------|------|
| | | | Min | Typ ^[1] | Max | Min | Max (85 °C) | Max (125 °C) | |
| C _L = 30 pF | | | | | | | | | |
| t _{pd} | propagation delay | A to Y; see Figure 8 ^[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 = 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).

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

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

11.1 Waveform and test circuit

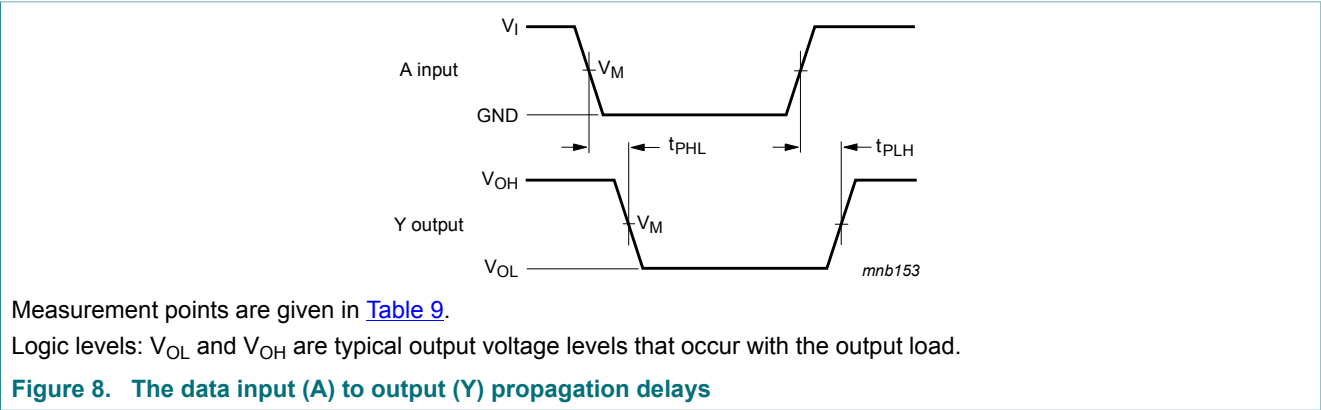


Table 9. Measurement points

| 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} | $\leq 3.0 \text{ ns}$ |

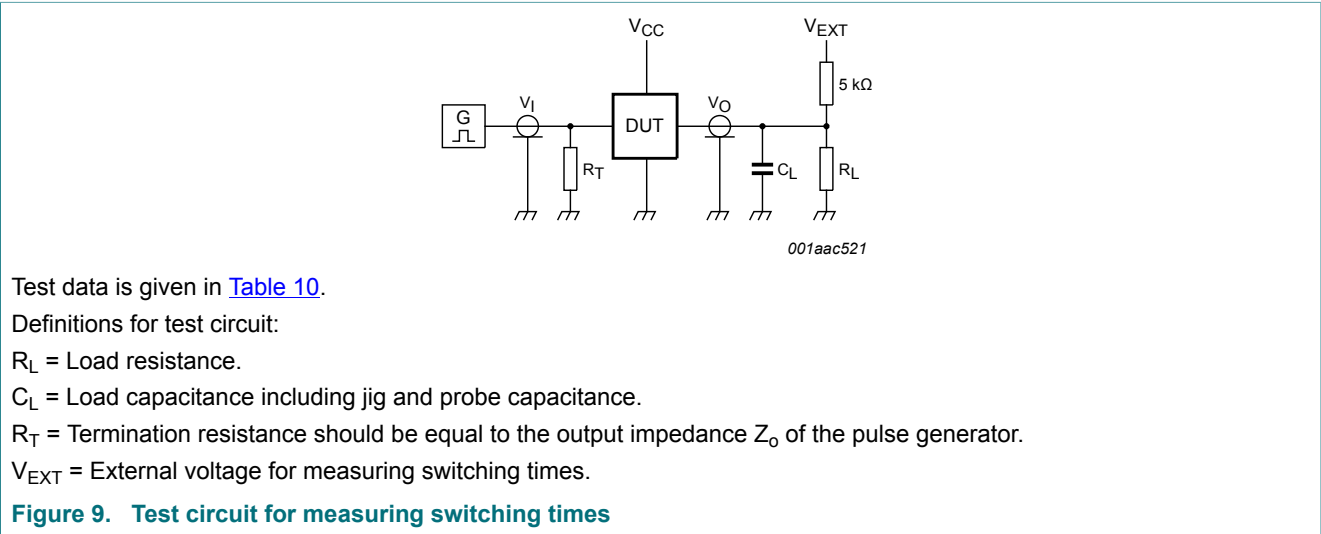


Table 10. Test data

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

12 Transfer characteristics

Table 11. Transfer characteristics

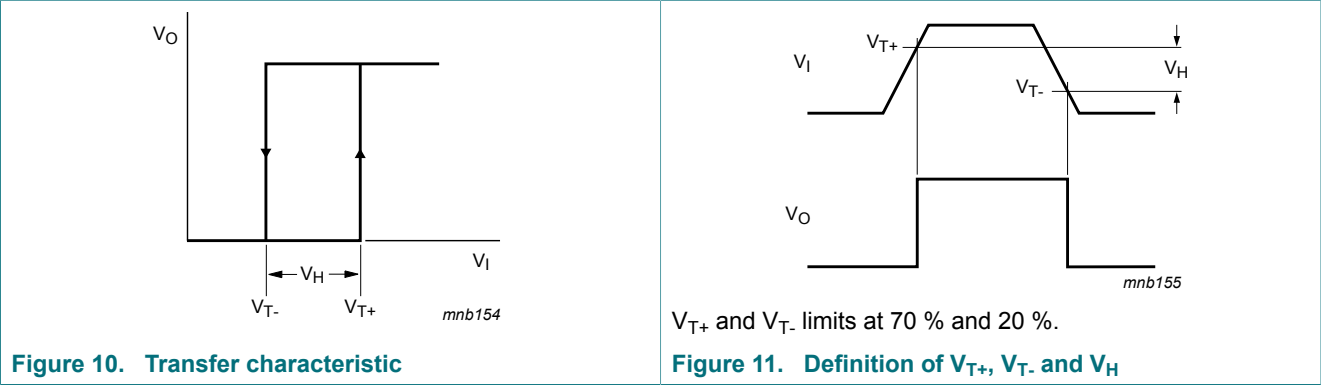
Voltages are referenced to GND (ground = 0 V).

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------------------------------|----------------------------------|---|------|-----|------|------|
| T_{amb} = 25 °C | | | | | | |
| V _{T+} | positive-going threshold voltage | see Figure 10 and Figure 11 | | | | |
| | | V _{CC} = 0.8 V | 0.30 | - | 0.60 | V |
| | | V _{CC} = 1.1 V | 0.53 | - | 0.90 | V |
| | | V _{CC} = 1.4 V | 0.74 | - | 1.11 | V |
| | | V _{CC} = 1.65 V | 0.91 | - | 1.29 | V |
| | | V _{CC} = 2.3 V | 1.37 | - | 1.77 | V |
| | | V _{CC} = 3.0 V | 1.88 | - | 2.29 | V |
| V _{T-} | negative-going threshold voltage | see Figure 10 and Figure 11 | | | | |
| | | V _{CC} = 0.8 V | 0.10 | - | 0.60 | V |
| | | V _{CC} = 1.1 V | 0.26 | - | 0.65 | V |
| | | V _{CC} = 1.4 V | 0.39 | - | 0.75 | V |
| | | V _{CC} = 1.65 V | 0.47 | - | 0.84 | V |
| | | V _{CC} = 2.3 V | 0.69 | - | 1.04 | V |
| | | V _{CC} = 3.0 V | 0.88 | - | 1.24 | V |
| V _H | hysteresis voltage | see Figure 10 , Figure 11 , Figure 12 and Figure 13 | | | | |
| | | V _{CC} = 0.8 V | 0.07 | - | 0.50 | V |
| | | V _{CC} = 1.1 V | 0.08 | - | 0.46 | V |
| | | V _{CC} = 1.4 V | 0.18 | - | 0.56 | V |
| | | V _{CC} = 1.65 V | 0.27 | - | 0.66 | V |
| | | V _{CC} = 2.3 V | 0.53 | - | 0.92 | V |
| | | V _{CC} = 3.0 V | 0.79 | - | 1.31 | V |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|----------------------------------|---|------|-----|------|------|
| T_{amb} = -40 °C to +85 °C | | | | | | |
| V _{T+} | positive-going threshold voltage | see Figure 10 and Figure 11 | | | | |
| | | V _{CC} = 0.8 V | 0.30 | - | 0.60 | V |
| | | V _{CC} = 1.1 V | 0.53 | - | 0.90 | V |
| | | V _{CC} = 1.4 V | 0.74 | - | 1.11 | V |
| | | V _{CC} = 1.65 V | 0.91 | - | 1.29 | V |
| | | V _{CC} = 2.3 V | 1.37 | - | 1.77 | V |
| | | V _{CC} = 3.0 V | 1.88 | - | 2.29 | V |
| V _{T-} | negative-going threshold voltage | see Figure 10 and Figure 11 | | | | |
| | | V _{CC} = 0.8 V | 0.10 | - | 0.60 | V |
| | | V _{CC} = 1.1 V | 0.26 | - | 0.65 | V |
| | | V _{CC} = 1.4 V | 0.39 | - | 0.75 | V |
| | | V _{CC} = 1.65 V | 0.47 | - | 0.84 | V |
| | | V _{CC} = 2.3 V | 0.69 | - | 1.04 | V |
| | | V _{CC} = 3.0 V | 0.88 | - | 1.24 | V |
| V _H | hysteresis voltage | see Figure 10 , Figure 11 , Figure 12 and Figure 13 | | | | |
| | | V _{CC} = 0.8 V | 0.07 | - | 0.50 | V |
| | | V _{CC} = 1.1 V | 0.08 | - | 0.46 | V |
| | | V _{CC} = 1.4 V | 0.18 | - | 0.56 | V |
| | | V _{CC} = 1.65 V | 0.27 | - | 0.66 | V |
| | | V _{CC} = 2.3 V | 0.53 | - | 0.92 | V |
| | | V _{CC} = 3.0 V | 0.79 | - | 1.31 | V |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|----------------------------------|---|------|-----|------|------|
| T_{amb} = -40 °C to +125 °C | | | | | | |
| V _{T+} | positive-going threshold voltage | see Figure 10 and Figure 11 | | | | |
| | | V _{CC} = 0.8 V | 0.30 | - | 0.62 | V |
| | | V _{CC} = 1.1 V | 0.53 | - | 0.92 | V |
| | | V _{CC} = 1.4 V | 0.74 | - | 1.13 | V |
| | | V _{CC} = 1.65 V | 0.91 | - | 1.31 | V |
| | | V _{CC} = 2.3 V | 1.37 | - | 1.80 | V |
| | | V _{CC} = 3.0 V | 1.88 | - | 2.32 | V |
| V _{T-} | negative-going threshold voltage | see Figure 10 and Figure 11 | | | | |
| | | V _{CC} = 0.8 V | 0.10 | - | 0.60 | V |
| | | V _{CC} = 1.1 V | 0.26 | - | 0.65 | V |
| | | V _{CC} = 1.4 V | 0.39 | - | 0.75 | V |
| | | V _{CC} = 1.65 V | 0.47 | - | 0.84 | V |
| | | V _{CC} = 2.3 V | 0.69 | - | 1.04 | V |
| | | V _{CC} = 3.0 V | 0.88 | - | 1.24 | V |
| V _H | hysteresis voltage | see Figure 10 , Figure 11 , Figure 12 and Figure 13 | | | | |
| | | V _{CC} = 0.8 V | 0.07 | - | 0.50 | V |
| | | V _{CC} = 1.1 V | 0.08 | - | 0.46 | V |
| | | V _{CC} = 1.4 V | 0.18 | - | 0.56 | V |
| | | V _{CC} = 1.65 V | 0.27 | - | 0.66 | V |
| | | V _{CC} = 2.3 V | 0.53 | - | 0.92 | V |
| | | V _{CC} = 3.0 V | 0.79 | - | 1.31 | V |

12.1 Waveforms transfer characteristics



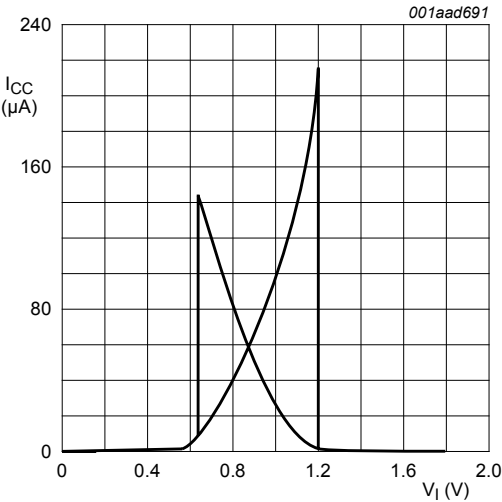


Figure 12. Typical transfer characteristics; $V_{CC} = 1.8\text{ V}$

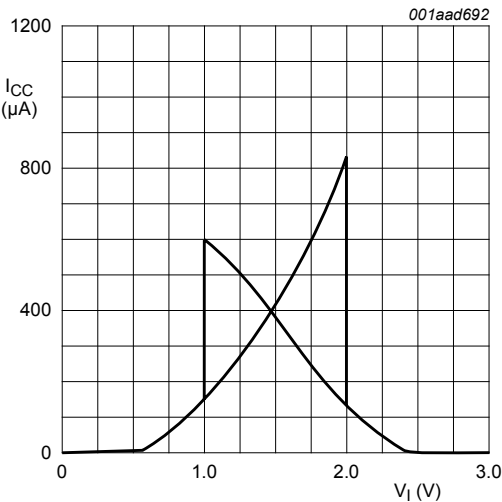


Figure 13. Typical transfer characteristics; $V_{CC} = 3.0\text{ V}$

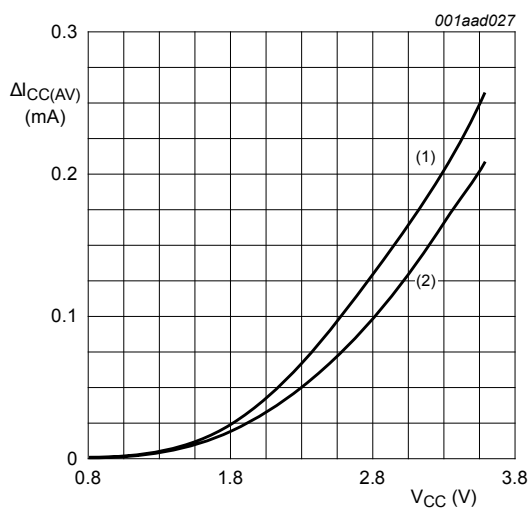
13 Application information

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

$$P_{ad} = f_i \times (t_r \times I_{CC(AV)} + t_f \times I_{CC(AV)}) \times V_{CC} \text{ where:}$$

- P_{ad} = 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 %;
- $I_{CC(AV)}$ = average additional supply current (μA).

Average I_{CC} differs with positive or negative input transitions, as shown in [Figure 14](#).



(1) Positive-going edge.

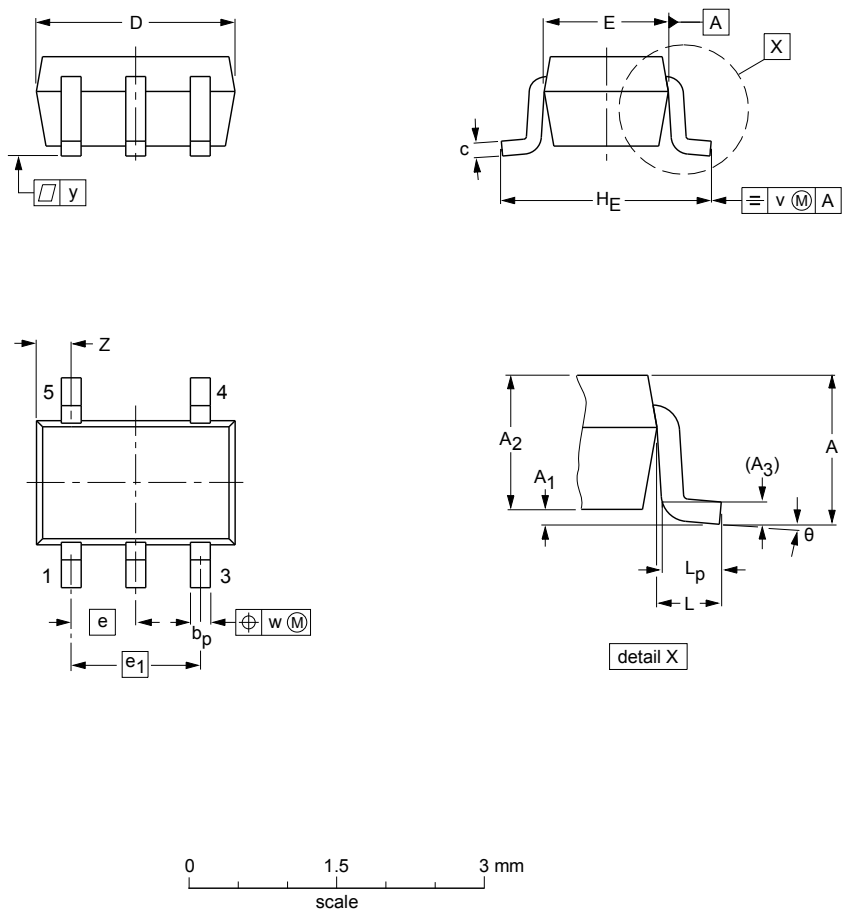
(2) Negative-going edge.

Linear change of V_I between 0.8 V and 2.0 V. All values given are typical, unless otherwise specified.

Figure 14. Average I_{CC} as a function of V_{CC}

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

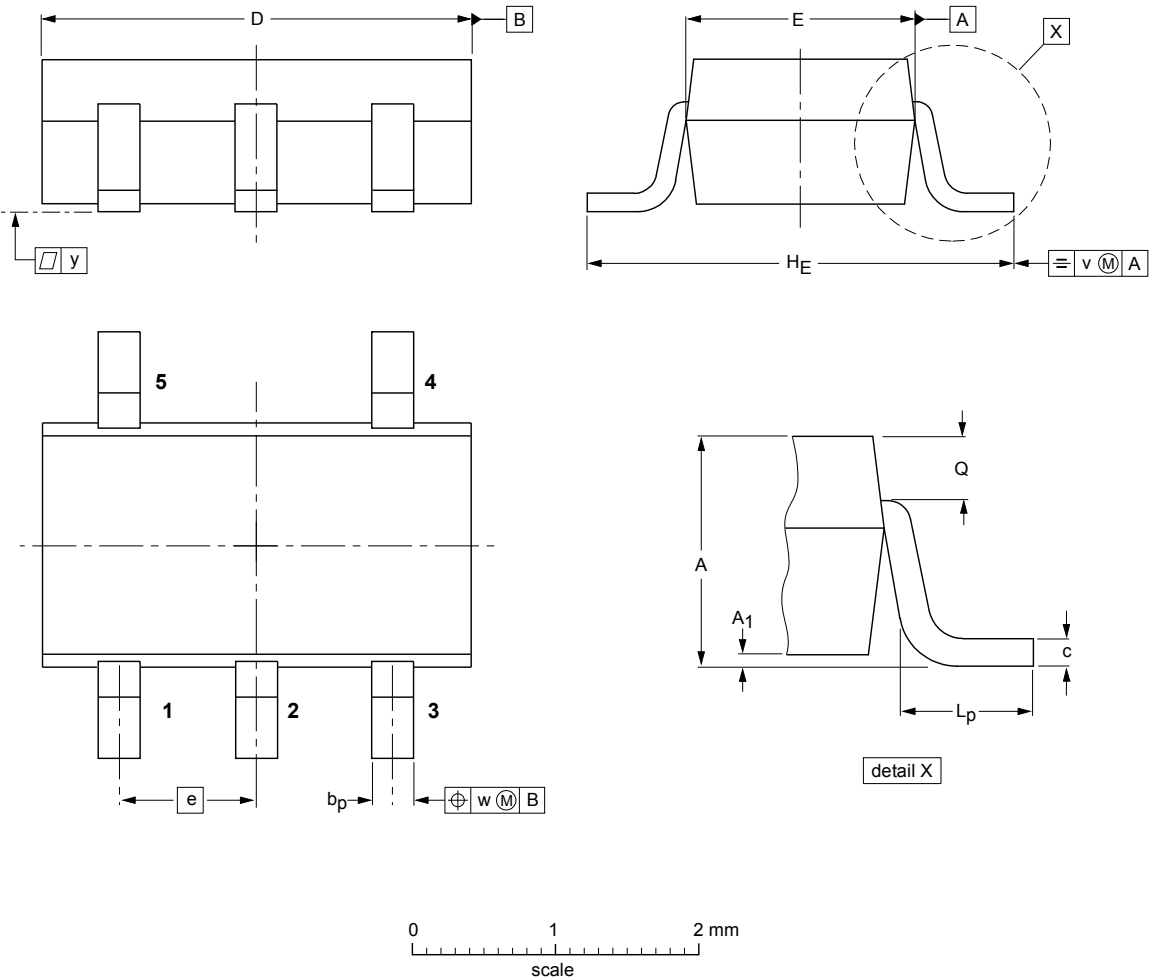
Note
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

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

Figure 15. Package outline SOT353-1 (TSSOP5)

Plastic surface-mounted package; 5 leads

SOT753



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₁ | b _p | c | D | E | e | H _E | L _p | Q | v | w | y |
|------|------------|----------------|----------------|--------------|------------|------------|------|----------------|----------------|--------------|-----|-----|-----|
| mm | 1.1 0.9 | 0.100 0.013 | 0.40 0.25 | 0.26 0.10 | 3.1 2.7 | 1.7 1.3 | 0.95 | 3.0 2.5 | 0.6 0.2 | 0.33 0.23 | 0.2 | 0.2 | 0.1 |

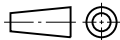
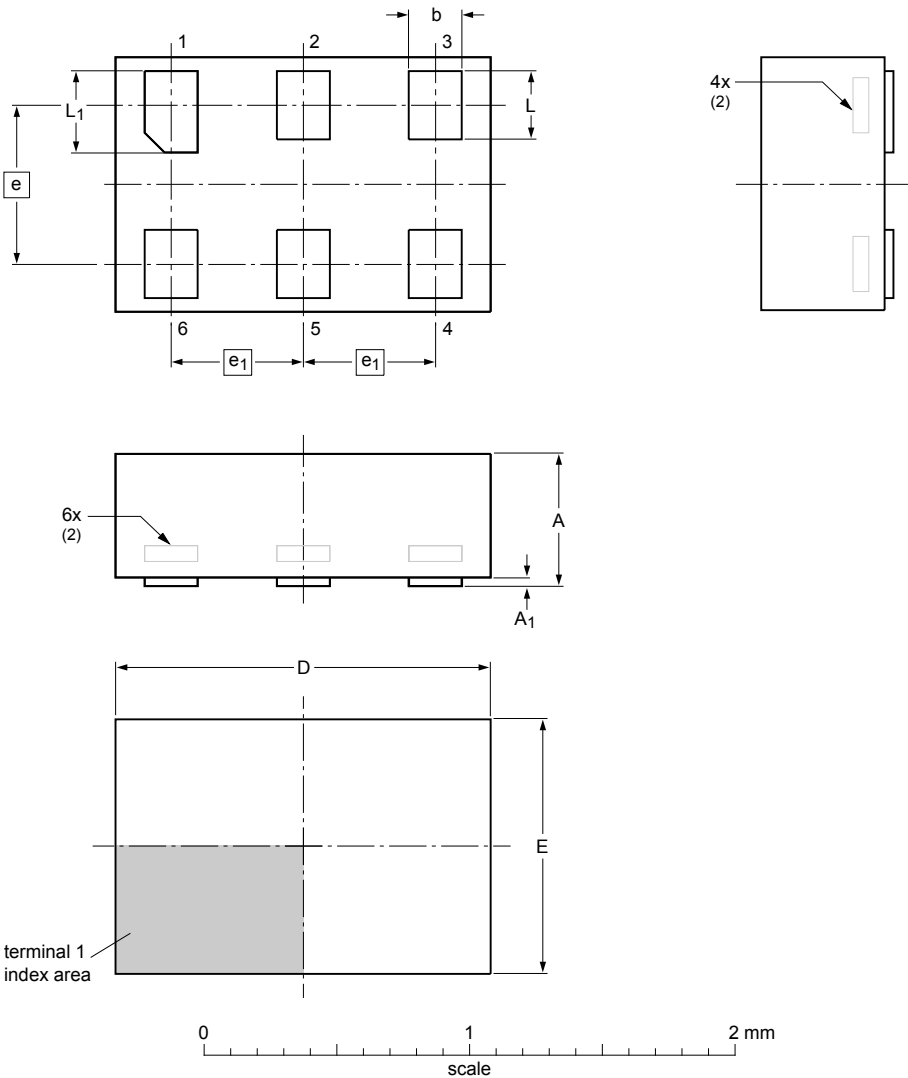
| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|--------|--|---|-----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT753 | | | SC-74A | |  | -02-04-16 06-03-16 |

Figure 16. Package outline SOT753 (SC-74A)

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 ⁽¹⁾ | A ₁ | b | D | E | e | e ₁ | L | L ₁ |
|------|------------------|----------------|------|------|------|------|----------------|------|----------------|
| 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 |

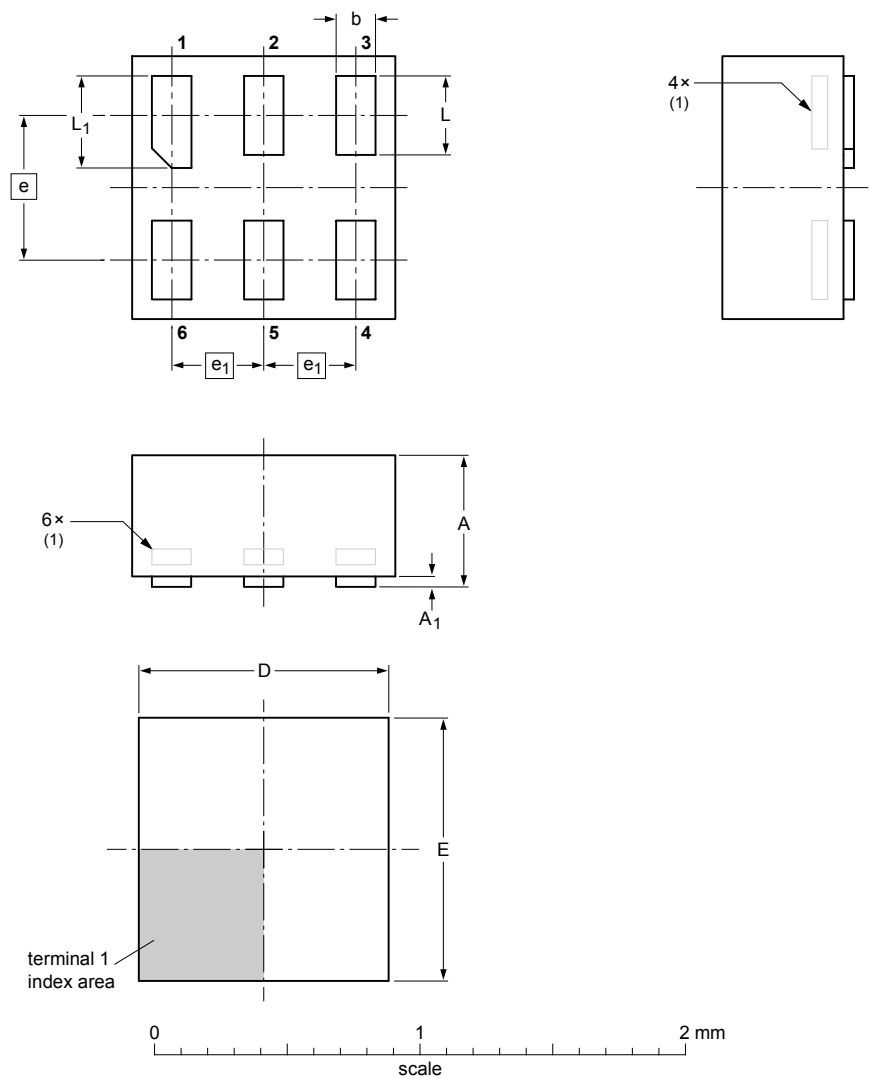
- Notes
- 1. Including plating thickness.
 - 2. Can be visible in some manufacturing processes.

| | | | | | | |
|-----------------|------------|-------|-------|--|---------------------|--|
| Outline version | References | | | | European projection | Issue date |
| | IEC | JEDEC | JEITA | | | |
| SOT886 | MO-252 | | | | | <div>sot886_po</div> <div>04-07-22</div> <div>12-01-05</div> |

Figure 17. 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 max | A ₁ max | b | D | E | e | e ₁ | L | L ₁ |
|------|----------|-----------------------|--------------|--------------|--------------|------|----------------|--------------|----------------|
| mm | 0.5 | 0.04 | 0.20 0.12 | 1.05 0.95 | 1.05 0.95 | 0.55 | 0.35 | 0.35 0.27 | 0.40 0.32 |

Note
1. Can be visible in some manufacturing processes.


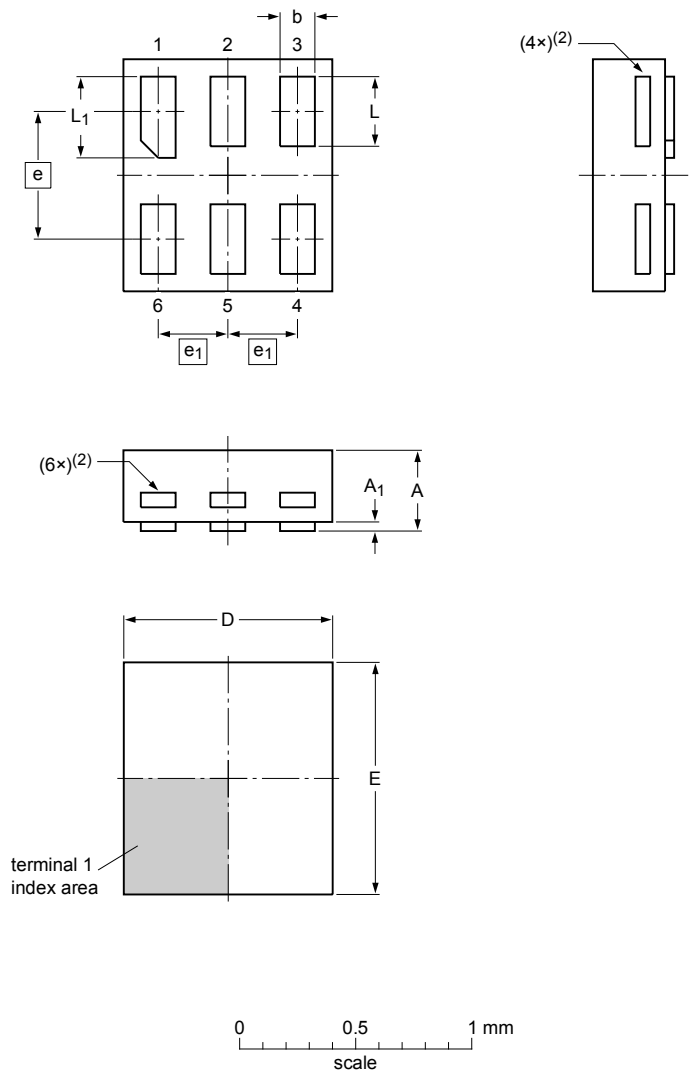
| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|--|---|----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT891 | | | | |  | 05-04-06 07-05-15 |

Figure 18. 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 ⁽¹⁾ | A ₁ | b | D | E | e | e ₁ | L | L ₁ |
|------|------------------|----------------|------|------|------|------|----------------|------|----------------|
| 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

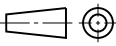
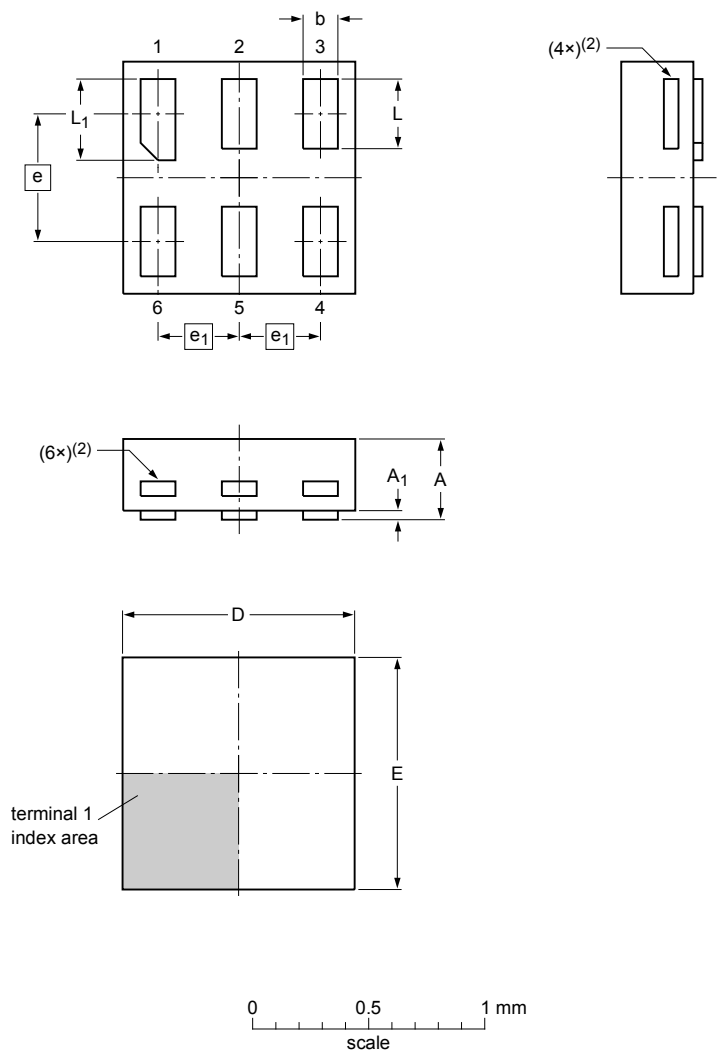
| Outline version | References | | | | European projection | Issue date |
|-----------------|------------|-------|-------|--|---|-----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT1115 | | | | |  | 10-04-02- 10-04-07 |

Figure 19. 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 ⁽¹⁾ | A ₁ | b | D | E | e | e ₁ | L | L ₁ |
|------|------------------|----------------|------|------|------|------|----------------|------|----------------|
| 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

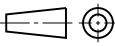
| Outline version | References | | | | European projection | Issue date |
|-----------------|------------|-------|-------|--|---|----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT1202 | | | | |  | 10-04-02 10-04-06 |

Figure 20. Package outline SOT1202 (XSON6)

X2SON5: plastic thermal enhanced extremely thin small outline package; no leads;
5 terminals; body 0.8 x 0.8 x 0.35 mm

SOT1226

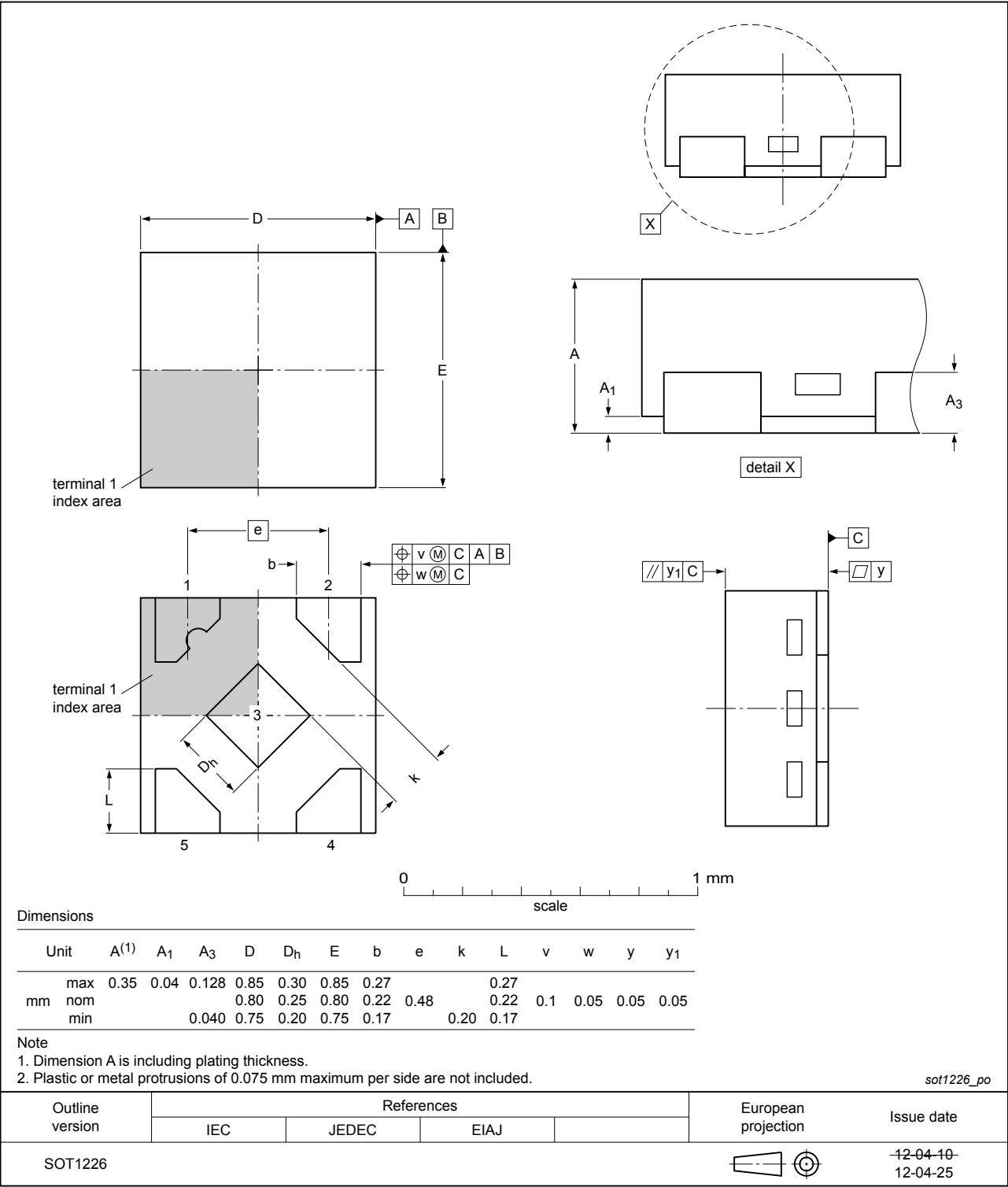


Figure 21. Package outline SOT1226 (X2SON5)

X2SON4: plastic thermal enhanced extremely thin small outline package; no leads;
4 terminals; body 0.6 x 0.6 x 0.32 mm

SOT1269-2

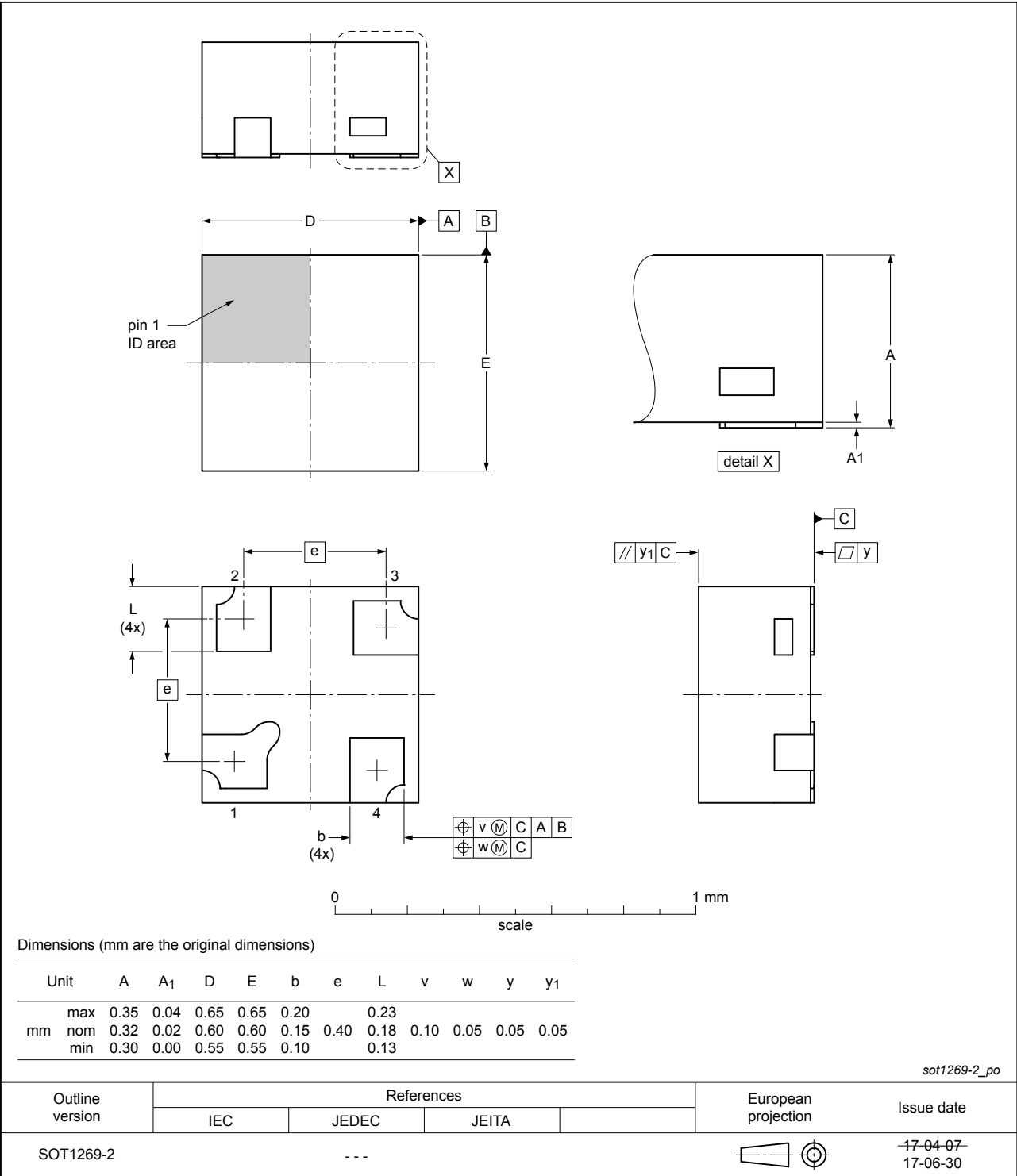


Figure 22. Package outline SOT1269-2 (X2SON4)

15 Abbreviations

Table 12. Abbreviations

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

16 Revision history

Table 13. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|---|--------------------|---------------|----------------|
| 74AUP1G17 v.11 | 20180608 | Product data sheet | - | 74AUP1G17 v.10 |
| Modifications: | <ul style="list-style-type: none"> Added type number 74AUP1G17GX4 (SOT1269-2) | | | |
| 74AUP1G17 v.10 | 20170519 | Product data sheet | - | 74AUP1G17 v.9 |
| Modifications: | <ul style="list-style-type: none"> The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. Legal texts have been adapted to the new company name where appropriate. | | | |
| 74AUP1G17 v.9 | 20161104 | Product data sheet | - | 74AUP1G17 v.8 |
| Modifications: | <ul style="list-style-type: none"> Added type number 74AUP1G17GV (SOT753) | | | |
| 74AUP1G17 v.8 | 20150115 | Product data sheet | - | 74AUP1G17 v.7 |
| Modifications: | <ul style="list-style-type: none"> Marking code Table 2: typo corrected in type number 74AUP1G17GX. | | | |
| 74AUP1G17 v.7 | 20120716 | Product data sheet | - | 74AUP1G17 v.6 |
| Modifications: | <ul style="list-style-type: none"> Package outline drawing of SOT1226 (Figure 21) modified. | | | |
| 74AUP1G17 v.6 | 20120412 | Product data sheet | - | 74AUP1G17 v.5 |
| Modifications: | <ul style="list-style-type: none"> Added type number 74AUP1G17GX (SOT1226) Package outline drawing of SOT886 (Figure 17) modified. | | | |
| 74AUP1G17 v.5 | 20111124 | Product data sheet | - | 74AUP1G17 v.4 |
| Modifications: | <ul style="list-style-type: none"> Legal pages updated. | | | |
| 74AUP1G17 v.4 | 20100715 | Product data sheet | - | 74AUP1G17 v.3 |
| 74AUP1G17 v.3 | 20090710 | Product data sheet | - | 74AUP1G17 v.2 |
| 74AUP1G17 v.2 | 20060727 | Product data sheet | - | 74AUP1G17 v.1 |
| 74AUP1G17 v.1 | 20050726 | Product data sheet | - | - |

17 Legal information

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

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

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

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Contents

| | | |
|------|--|----|
| 1 | General description | 1 |
| 2 | Features and benefits | 1 |
| 3 | Ordering information | 1 |
| 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 | 8 |
| 11.1 | Waveform and test circuit | 10 |
| 12 | Transfer characteristics | 11 |
| 12.1 | Waveforms transfer characteristics | 13 |
| 13 | Application information | 15 |
| 14 | Package outline | 16 |
| 15 | Abbreviations | 24 |
| 16 | Revision history | 24 |
| 17 | Legal information | 25 |

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Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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