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Kind regards,

Team Nexperia

# 74LVC1G125

Bus buffer/line driver; 3-state

Rev. 12 — 2 December 2016

Product data sheet

## 1. General description

The 74LVC1G125 provides one non-inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input ( $\overline{\text{OE}}$ ). A HIGH-level at pin  $\overline{\text{OE}}$  causes the output to assume a high-impedance OFF-state.

The input can be driven from either 3.3 V or 5 V devices. This feature allows the use of this device in a mixed 3.3 V and 5 V environment.

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

## 2. Features and benefits

- Wide supply voltage range from 1.65 V to 5.5 V
- High noise immunity
- Complies with JEDEC standard:
  - ◆ JESD8-7 (1.65 V to 1.95 V)
  - ◆ JESD8-5 (2.3 V to 2.7 V)
  - ◆ JESD8-B/JESD36 (2.7 V to 3.6 V)
- $\pm 24$  mA output drive ( $V_{\text{CC}} = 3.0$  V)
- ESD protection:
  - ◆ HBM JESD22-A114F exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V
- CMOS low power consumption
- Inputs accept voltages up to 5 V
- Latch-up performance exceeds 250 mA
- Direct interface with TTL levels
- Multiple package options
- Specified from  $-40$  °C to  $+85$  °C and  $-40$  °C to  $+125$  °C



### 3. Ordering information

Table 1. Ordering information

| Type number  | Package           |        |                                                                                                                        |          |
|--------------|-------------------|--------|------------------------------------------------------------------------------------------------------------------------|----------|
|              | Temperature range | Name   | Description                                                                                                            | Version  |
| 74LVC1G125GW | −40 °C to +125 °C | TSSOP5 | plastic thin shrink small outline package; 5 leads; body width 1.25 mm                                                 | SOT353-1 |
| 74LVC1G125GV | −40 °C to +125 °C | SC-74A | plastic surface-mounted package; 5 leads                                                                               | SOT753   |
| 74LVC1G125GM | −40 °C to +125 °C | XSON6  | plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm                            | SOT886   |
| 74LVC1G125GF | −40 °C to +125 °C | XSON6  | plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm                               | SOT891   |
| 74LVC1G125GN | −40 °C to +125 °C | XSON6  | extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm                                  | SOT1115  |
| 74LVC1G125GS | −40 °C to +125 °C | XSON6  | extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm                                  | SOT1202  |
| 74LVC1G125GX | −40 °C to +125 °C | X2SON5 | X2SON5: plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 × 0.8 × 0.35 mm | SOT1226  |

### 4. Marking

Table 2. Marking

| Type number  | Marking code <sup>[1]</sup> |
|--------------|-----------------------------|
| 74LVC1G125GW | VM                          |
| 74LVC1G125GV | V25                         |
| 74LVC1G125GM | VM                          |
| 74LVC1G125GF | VM                          |
| 74LVC1G125GN | VM                          |
| 74LVC1G125GS | VM                          |
| 74LVC1G125GX | VM                          |

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

### 5. Functional diagram

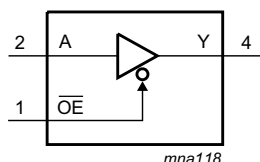


Fig 1. Logic symbol

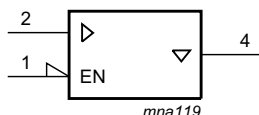


Fig 2. IEC logic symbol

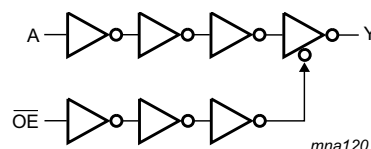
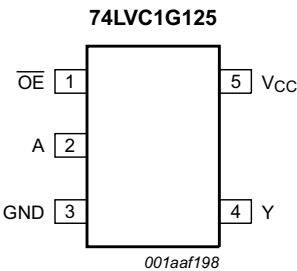


Fig 3. Logic diagram

6. Pinning information

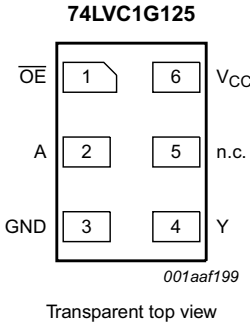
6.1 Pinning



74LVC1G125

Pin 1:  $\overline{OE}$ , Pin 2: A, Pin 3: GND, Pin 4: Y, Pin 5:  $V_{CC}$

001aaf198

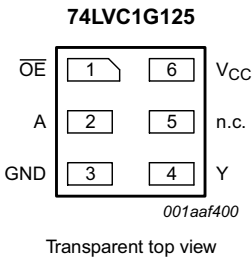


74LVC1G125

Pin 1:  $\overline{OE}$ , Pin 2: A, Pin 3: GND, Pin 4: Y, Pin 5: n.c., Pin 6:  $V_{CC}$

001aaf199

Transparent top view

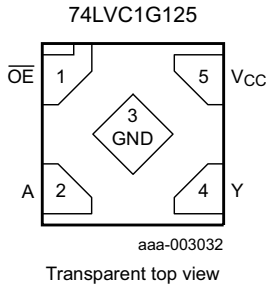


74LVC1G125

Pin 1:  $\overline{OE}$ , Pin 2: A, Pin 3: GND, Pin 4: Y, Pin 5: n.c., Pin 6:  $V_{CC}$

001aaf400

Transparent top view



74LVC1G125

Pin 1:  $\overline{OE}$ , Pin 2: A, Pin 3: GND, Pin 4: Y, Pin 5:  $V_{CC}$

aaa-003032

Transparent top view

Fig 4. Pin configuration SOT353-1 and SOT753

Fig 5. Pin configuration SOT886

Fig 6. Pin configuration SOT891, SOT1115 and SOT1202

Fig 7. Pin configuration SOT1226 (X2SON5)

6.2 Pin description

Table 3. Pin description

| Symbol          | Pin               |       | Description         |
|-----------------|-------------------|-------|---------------------|
|                 | TSSOP5 and X2SON5 | XSON6 |                     |
| $\overline{OE}$ | 1                 | 1     | output enable input |
| A               | 2                 | 2     | data input          |
| GND             | 3                 | 3     | ground (0 V)        |
| Y               | 4                 | 4     | data output         |
| n.c.            | -                 | 5     | not connected       |
| $V_{CC}$        | 5                 | 6     | supply voltage      |

## 7. Functional description

Table 4. Function table<sup>[1]</sup>

| Input |   | Output |
|-------|---|--------|
| OE    | A | Y      |
| L     | L | L      |
| L     | H | H      |
| H     | 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 | +6.5           | V    |
| $I_{IK}$  | input clamping current  | $V_I < 0$ V                   | -50  | -              | mA   |
| $V_I$     | input voltage           |                               | -0.5 | +6.5           | V    |
| $I_{OK}$  | output clamping current | $V_O > V_{CC}$ or $V_O < 0$ V | -    | $\pm 50$       | mA   |
| $V_O$     | output voltage          | Active mode                   | -0.5 | $V_{CC} + 0.5$ | V    |
|           |                         | Power-down mode               | -0.5 | +6.5           | V    |
| $I_O$     | output current          | $V_O = 0$ V to $V_{CC}$       | -    | $\pm 50$       | mA   |
| $I_{CC}$  | supply current          |                               | -    | 100            | mA   |
| $I_{GND}$ | ground current          |                               | -100 | -              | mA   |
| $P_{tot}$ | total power dissipation | $T_{amb} = -40$ °C to +125 °C | -    | 250            | mW   |
| $T_{stg}$ | storage temperature     |                               | -65  | +150           | °C   |

- [1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.  
 [2] When  $V_{CC} = 0$  V (Power-down mode), the output voltage can be 5.5 V in normal operation.  
 [3] 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 package: 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  | Typ | Max      | Unit |
|---------------------|-------------------------------------|---------------------------------|------|-----|----------|------|
| $V_{CC}$            | supply voltage                      |                                 | 1.65 | -   | 5.5      | V    |
| $V_I$               | input voltage                       |                                 | 0    | -   | 5.5      | V    |
| $V_O$               | output voltage                      | Active mode                     | 0    | -   | $V_{CC}$ | V    |
|                     |                                     | $V_{CC} = 0$ V; Power-down mode | 0    | -   | 5.5      | V    |
| $T_{amb}$           | ambient temperature                 |                                 | -40  | -   | +125     | °C   |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC} = 1.65$ V to 2.7 V      | -    | -   | 20       | ns/V |
|                     |                                     | $V_{CC} = 2.7$ V to 5.5 V       | -    | -   | 10       | 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 <sup>[1]</sup> | Max                  | Unit    |
|------------------------------|---------------------------|---------------------------------------------------------------------|----------------------|--------------------|----------------------|---------|
| $T_{amb} = -40$ °C to +85 °C |                           |                                                                     |                      |                    |                      |         |
| $V_{IH}$                     | HIGH-level input voltage  | $V_{CC} = 1.65$ V to 1.95 V                                         | $0.65 \times V_{CC}$ | -                  | -                    | V       |
|                              |                           | $V_{CC} = 2.3$ V to 2.7 V                                           | 1.7                  | -                  | -                    | V       |
|                              |                           | $V_{CC} = 2.7$ V to 3.6 V                                           | 2.0                  | -                  | -                    | V       |
|                              |                           | $V_{CC} = 4.5$ V to 5.5 V                                           | $0.7 \times V_{CC}$  | -                  | -                    | V       |
| $V_{IL}$                     | LOW-level input voltage   | $V_{CC} = 1.65$ V to 1.95 V                                         | -                    | -                  | $0.35 \times V_{CC}$ | V       |
|                              |                           | $V_{CC} = 2.3$ V to 2.7 V                                           | -                    | -                  | 0.7                  | V       |
|                              |                           | $V_{CC} = 2.7$ V to 3.6 V                                           | -                    | -                  | 0.8                  | V       |
|                              |                           | $V_{CC} = 4.5$ V to 5.5 V                                           | -                    | -                  | $0.3 \times V_{CC}$  | V       |
| $V_{OL}$                     | LOW-level output voltage  | $V_I = V_{IH}$ or $V_{IL}$                                          |                      |                    |                      |         |
|                              |                           | $V_{CC} = 1.65$ V to 5.5 V; $I_O = 100$ $\mu$ A                     | -                    | -                  | 0.1                  | V       |
|                              |                           | $V_{CC} = 1.65$ V; $I_O = 4$ mA                                     | -                    | -                  | 0.45                 | V       |
|                              |                           | $V_{CC} = 2.3$ V; $I_O = 8$ mA                                      | -                    | -                  | 0.3                  | V       |
|                              |                           | $V_{CC} = 2.7$ V; $I_O = 12$ mA                                     | -                    | -                  | 0.4                  | V       |
|                              |                           | $V_{CC} = 3.0$ V; $I_O = 24$ mA                                     | -                    | -                  | 0.55                 | V       |
|                              |                           | $V_{CC} = 4.5$ V; $I_O = 32$ mA                                     | -                    | -                  | 0.55                 | V       |
| $V_{OH}$                     | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$                                          |                      |                    |                      |         |
|                              |                           | $V_{CC} = 1.65$ V to 5.5 V; $I_O = -100$ $\mu$ A                    | $V_{CC} - 0.1$       | -                  | -                    | V       |
|                              |                           | $V_{CC} = 1.65$ V; $I_O = -4$ mA                                    | 1.2                  | -                  | -                    | V       |
|                              |                           | $V_{CC} = 2.3$ V; $I_O = -8$ mA                                     | 1.9                  | -                  | -                    | V       |
|                              |                           | $V_{CC} = 2.7$ V; $I_O = -12$ mA                                    | 2.2                  | -                  | -                    | V       |
|                              |                           | $V_{CC} = 3.0$ V; $I_O = -24$ mA                                    | 2.3                  | -                  | -                    | V       |
|                              |                           | $V_{CC} = 4.5$ V; $I_O = -32$ mA                                    | 3.8                  | -                  | -                    | V       |
| $I_I$                        | input leakage current     | $V_{CC} = 0$ V to 5.5 V; $V_I = 5.5$ V or GND                       | -                    | $\pm 0.1$          | $\pm 1$              | $\mu$ A |
| $I_{OZ}$                     | OFF-state output current  | $V_{CC} = 3.6$ V; $V_I = V_{IH}$ or $V_{IL}$ ; $V_O = 5.5$ V or GND | -                    | $\pm 0.1$          | $\pm 2$              | $\mu$ A |

**Table 7.** Static characteristics ...continued

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

| Symbol                                                                                                 | Parameter                 | Conditions                                                                                                 | Min                  | Typ <sup>[1]</sup> | Max                  | Unit          |
|--------------------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|---------------|
| $I_{OFF}$                                                                                              | power-off leakage current | $V_{CC} = 0\text{ V}$ ; $V_I$ or $V_O = 5.5\text{ V}$                                                      | -                    | $\pm 0.1$          | $\pm 2$              | $\mu\text{A}$ |
| $I_{CC}$                                                                                               | supply current            | $V_I = 5.5\text{ V}$ or GND;<br>$V_{CC} = 1.65\text{ V}$ to $5.5\text{ V}$ ; $I_O = 0\text{ A}$            | -                    | 0.1                | 4                    | $\mu\text{A}$ |
| $\Delta I_{CC}$                                                                                        | additional supply current | per pin; $V_{CC} = 2.3\text{ V}$ to $5.5\text{ V}$ ;<br>$V_I = V_{CC} - 0.6\text{ V}$ ; $I_O = 0\text{ A}$ | -                    | 5                  | 500                  | $\mu\text{A}$ |
| $C_I$                                                                                                  | input capacitance         |                                                                                                            | -                    | 5                  | -                    | pF            |
| <b><math>T_{amb} = -40\text{ }^{\circ}\text{C}</math> to <math>+125\text{ }^{\circ}\text{C}</math></b> |                           |                                                                                                            |                      |                    |                      |               |
| $V_{IH}$                                                                                               | HIGH-level input voltage  | $V_{CC} = 1.65\text{ V}$ to $1.95\text{ V}$                                                                | $0.65 \times V_{CC}$ | -                  | -                    | V             |
|                                                                                                        |                           | $V_{CC} = 2.3\text{ V}$ to $2.7\text{ V}$                                                                  | 1.7                  | -                  | -                    | V             |
|                                                                                                        |                           | $V_{CC} = 2.7\text{ V}$ to $3.6\text{ V}$                                                                  | 2.0                  | -                  | -                    | V             |
|                                                                                                        |                           | $V_{CC} = 4.5\text{ V}$ to $5.5\text{ V}$                                                                  | $0.7 \times V_{CC}$  | -                  | -                    | V             |
| $V_{IL}$                                                                                               | LOW-level input voltage   | $V_{CC} = 1.65\text{ V}$ to $1.95\text{ V}$                                                                | -                    | -                  | $0.35 \times V_{CC}$ | V             |
|                                                                                                        |                           | $V_{CC} = 2.3\text{ V}$ to $2.7\text{ V}$                                                                  | -                    | -                  | 0.7                  | V             |
|                                                                                                        |                           | $V_{CC} = 2.7\text{ V}$ to $3.6\text{ V}$                                                                  | -                    | -                  | 0.8                  | V             |
|                                                                                                        |                           | $V_{CC} = 4.5\text{ V}$ to $5.5\text{ V}$                                                                  | -                    | -                  | $0.3 \times V_{CC}$  | V             |
| $V_{OL}$                                                                                               | LOW-level output voltage  | $V_I = V_{IH}$ or $V_{IL}$                                                                                 |                      |                    |                      |               |
|                                                                                                        |                           | $V_{CC} = 1.65\text{ V}$ to $5.5\text{ V}$ ; $I_O = 100\text{ }\mu\text{A}$                                | -                    | -                  | 0.1                  | V             |
|                                                                                                        |                           | $V_{CC} = 1.65\text{ V}$ ; $I_O = 4\text{ mA}$                                                             | -                    | -                  | 0.70                 | V             |
|                                                                                                        |                           | $V_{CC} = 2.3\text{ V}$ ; $I_O = 8\text{ mA}$                                                              | -                    | -                  | 0.45                 | V             |
|                                                                                                        |                           | $V_{CC} = 2.7\text{ V}$ ; $I_O = 12\text{ mA}$                                                             | -                    | -                  | 0.60                 | V             |
|                                                                                                        |                           | $V_{CC} = 3.0\text{ V}$ ; $I_O = 24\text{ mA}$                                                             | -                    | -                  | 0.80                 | V             |
|                                                                                                        |                           | $V_{CC} = 4.5\text{ V}$ ; $I_O = 32\text{ mA}$                                                             | -                    | -                  | 0.80                 | V             |
| $V_{OH}$                                                                                               | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$                                                                                 |                      |                    |                      |               |
|                                                                                                        |                           | $V_{CC} = 1.65\text{ V}$ to $5.5\text{ V}$ ; $I_O = -100\text{ }\mu\text{A}$                               | $V_{CC} - 0.1$       | -                  | -                    | V             |
|                                                                                                        |                           | $V_{CC} = 1.65\text{ V}$ ; $I_O = -4\text{ mA}$                                                            | 0.95                 | -                  | -                    | V             |
|                                                                                                        |                           | $V_{CC} = 2.3\text{ V}$ ; $I_O = -8\text{ mA}$                                                             | 1.7                  | -                  | -                    | V             |
|                                                                                                        |                           | $V_{CC} = 2.7\text{ V}$ ; $I_O = -12\text{ mA}$                                                            | 1.9                  | -                  | -                    | V             |
|                                                                                                        |                           | $V_{CC} = 3.0\text{ V}$ ; $I_O = -24\text{ mA}$                                                            | 2.0                  | -                  | -                    | V             |
|                                                                                                        |                           | $V_{CC} = 4.5\text{ V}$ ; $I_O = -32\text{ mA}$                                                            | 3.4                  | -                  | -                    | V             |
| $I_I$                                                                                                  | input leakage current     | $V_{CC} = 0\text{ V}$ to $5.5\text{ V}$ ; $V_I = 5.5\text{ V}$ or GND                                      | -                    | -                  | $\pm 1$              | $\mu\text{A}$ |
| $I_{OZ}$                                                                                               | OFF-state output current  | $V_{CC} = 3.6\text{ V}$ ; $V_I = V_{IH}$ or $V_{IL}$ ;<br>$V_O = 5.5\text{ V}$ or GND                      | -                    | -                  | $\pm 2$              | $\mu\text{A}$ |
| $I_{OFF}$                                                                                              | power-off leakage current | $V_{CC} = 0\text{ V}$ ; $V_I$ or $V_O = 5.5\text{ V}$                                                      | -                    | -                  | $\pm 2$              | $\mu\text{A}$ |
| $I_{CC}$                                                                                               | supply current            | $V_I = 5.5\text{ V}$ or GND;<br>$V_{CC} = 1.65\text{ V}$ to $5.5\text{ V}$ ; $I_O = 0\text{ A}$            | -                    | -                  | 4                    | $\mu\text{A}$ |
| $\Delta I_{CC}$                                                                                        | additional supply current | per pin; $V_{CC} = 2.3\text{ V}$ to $5.5\text{ V}$ ;<br>$V_I = V_{CC} - 0.6\text{ V}$ ; $I_O = 0\text{ A}$ | -                    | -                  | 500                  | $\mu\text{A}$ |

[1] All typical values are measured at  $V_{CC} = 3.3\text{ V}$  and  $T_{amb} = 25\text{ }^{\circ}\text{C}$ .

## 11. Dynamic characteristics

**Table 8. Dynamic characteristics**

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

| Symbol           | Parameter                     | Conditions                                                         | –40 °C to +85 °C |                    |     | –40 °C to +125 °C |      | Unit |
|------------------|-------------------------------|--------------------------------------------------------------------|------------------|--------------------|-----|-------------------|------|------|
|                  |                               |                                                                    | Min              | Typ <sup>[1]</sup> | Max | Min               | Max  |      |
| t <sub>pd</sub>  | propagation delay             | A to Y; see <a href="#">Figure 8</a> <sup>[2]</sup>                |                  |                    |     |                   |      |      |
|                  |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                 | 1.0              | 3.3                | 8.0 | 1.0               | 10.5 | ns   |
|                  |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                   | 0.5              | 2.2                | 5.5 | 0.5               | 7    | ns   |
|                  |                               | V <sub>CC</sub> = 2.7 V                                            | 0.5              | 2.5                | 5.5 | 0.5               | 7    | ns   |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                   | 0.5              | 2.1                | 4.5 | 0.5               | 6    | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                   | 0.5              | 1.7                | 4.0 | 0.5               | 5.5  | ns   |
| t <sub>en</sub>  | enable time                   | OE to Y; see <a href="#">Figure 9</a> <sup>[3]</sup>               |                  |                    |     |                   |      |      |
|                  |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                 | 1.0              | 4.1                | 9.4 | 1.0               | 12   | ns   |
|                  |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                   | 0.5              | 2.8                | 6.6 | 0.5               | 8.5  | ns   |
|                  |                               | V <sub>CC</sub> = 2.7 V                                            | 0.5              | 3.3                | 6.6 | 0.5               | 8.5  | ns   |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                   | 0.5              | 2.4                | 5.3 | 0.5               | 7    | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                   | 0.5              | 2.1                | 5.0 | 0.5               | 6.5  | ns   |
| t <sub>dis</sub> | disable time                  | OE to Y; see <a href="#">Figure 9</a> <sup>[4]</sup>               |                  |                    |     |                   |      |      |
|                  |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                 | 1.0              | 4.3                | 9.2 | 1.0               | 12   | ns   |
|                  |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                   | 0.5              | 2.7                | 5.0 | 0.5               | 6.5  | ns   |
|                  |                               | V <sub>CC</sub> = 2.7 V                                            | 0.5              | 3.0                | 5.0 | 0.5               | 6.5  | ns   |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                   | 0.5              | 3.1                | 5.0 | 0.5               | 6.5  | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                   | 0.5              | 2.2                | 4.2 | 0.5               | 5.5  | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | per buffer; V <sub>I</sub> = GND to V <sub>CC</sub> <sup>[5]</sup> |                  |                    |     |                   |      |      |
|                  |                               | output enabled                                                     | -                | 25                 | -   | -                 | -    | pF   |
|                  |                               | output disabled                                                    | -                | 6                  | -   | -                 | -    | pF   |

[1] Typical values are measured at T<sub>amb</sub> = 25 °C and V<sub>CC</sub> = 1.8 V, 2.5 V, 2.7 V, 3.3 V and 5.0 V respectively.

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

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

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

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

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

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

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

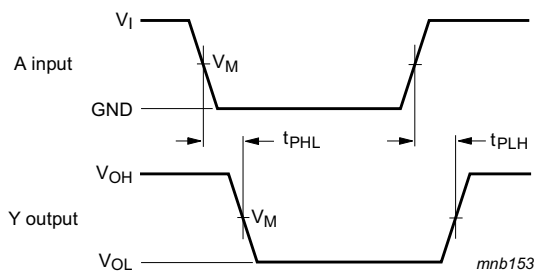
C<sub>L</sub> = output load capacitance in pF;

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

N = number of inputs switching;

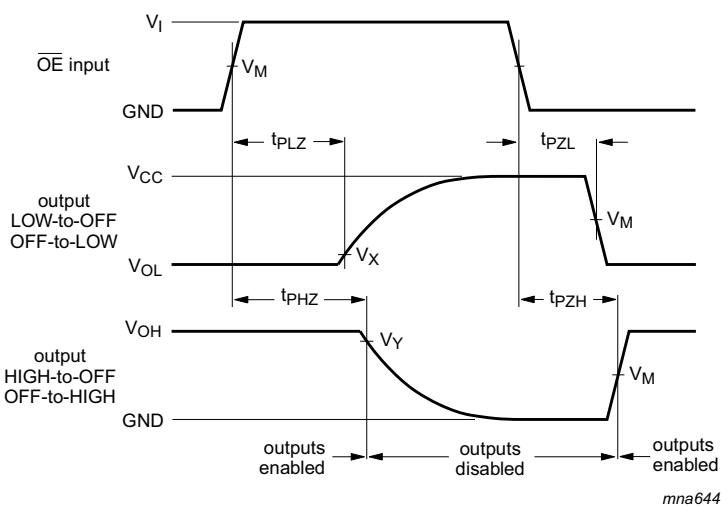
$\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of outputs.

12. Waveforms



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

**Fig 8. Input A to output Y propagation delay times**

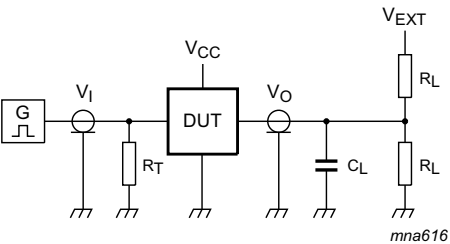


Measurement points are given in [Table 9](#).  
 $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

**Fig 9. 3-state enable and disable times**

**Table 9. Measurement points**

| Supply voltage   | Input       | Output      |                          |                          |
|------------------|-------------|-------------|--------------------------|--------------------------|
| $V_{CC}$         | $V_M$       | $V_M$       | $V_X$                    | $V_Y$                    |
| 1.65 V to 1.95 V | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.15\text{ V}$ | $V_{OH} - 0.15\text{ V}$ |
| 2.3 V to 2.7 V   | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.15\text{ V}$ | $V_{OH} - 0.15\text{ V}$ |
| 2.7 V            | 1.5 V       | 1.5 V       | $V_{OL} + 0.3\text{ V}$  | $V_{OH} - 0.3\text{ V}$  |
| 3.0 V to 3.6 V   | 1.5 V       | 1.5 V       | $V_{OL} + 0.3\text{ V}$  | $V_{OH} - 0.3\text{ V}$  |
| 4.5 V to 5.5 V   | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.3\text{ V}$  | $V_{OH} - 0.3\text{ V}$  |



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 10. Test circuit for measuring switching times

Table 10. Test data

| Supply voltage   | Input           |                                 | Load           |                | V <sub>EXT</sub>                    |                                     |                                     |
|------------------|-----------------|---------------------------------|----------------|----------------|-------------------------------------|-------------------------------------|-------------------------------------|
| V <sub>CC</sub>  | V <sub>I</sub>  | t <sub>r</sub> , t <sub>f</sub> | C <sub>L</sub> | R <sub>L</sub> | t <sub>PLH</sub> , t <sub>PHL</sub> | t <sub>PZH</sub> , t <sub>PHZ</sub> | t <sub>PZL</sub> , t <sub>PLZ</sub> |
| 1.65 V to 1.95 V | V <sub>CC</sub> | ≤ 2.0 ns                        | 30 pF          | 1 kΩ           | open                                | GND                                 | 2V <sub>CC</sub>                    |
| 2.3 V to 2.7 V   | V <sub>CC</sub> | ≤ 2.0 ns                        | 30 pF          | 500 Ω          | open                                | GND                                 | 2V <sub>CC</sub>                    |
| 2.7 V            | 2.7 V           | ≤ 2.5 ns                        | 50 pF          | 500 Ω          | open                                | GND                                 | 6 V                                 |
| 3.0 V to 3.6 V   | 2.7 V           | ≤ 2.5 ns                        | 50 pF          | 500 Ω          | open                                | GND                                 | 6 V                                 |
| 4.5 V to 5.5 V   | V <sub>CC</sub> | ≤ 2.5 ns                        | 50 pF          | 500 Ω          | open                                | GND                                 | 2V <sub>CC</sub>                    |

13. Package outline

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

SOT353-1

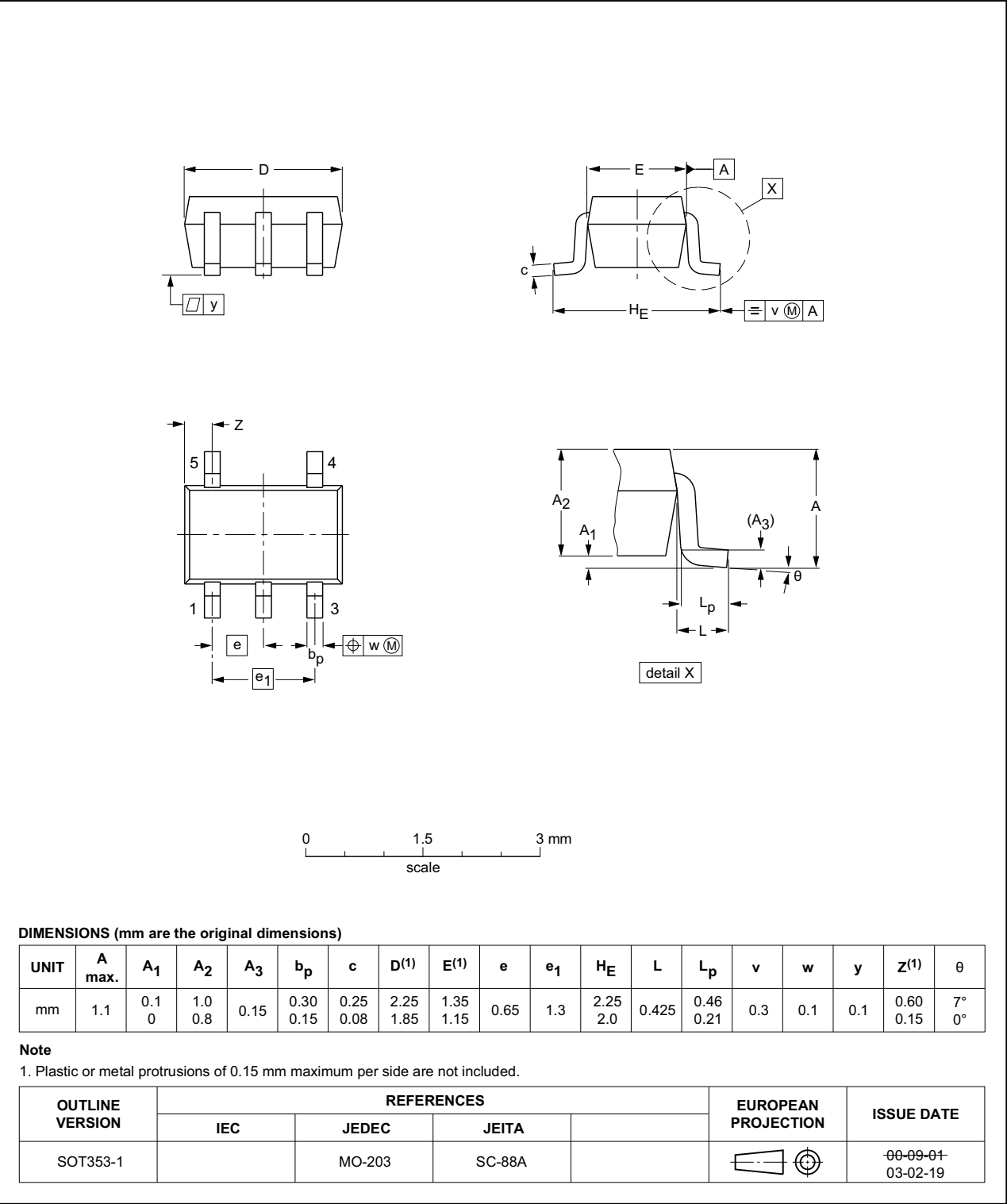


Fig 11. Package outline SOT353-1 (TSSOP5)

Plastic surface-mounted package; 5 leads

SOT753

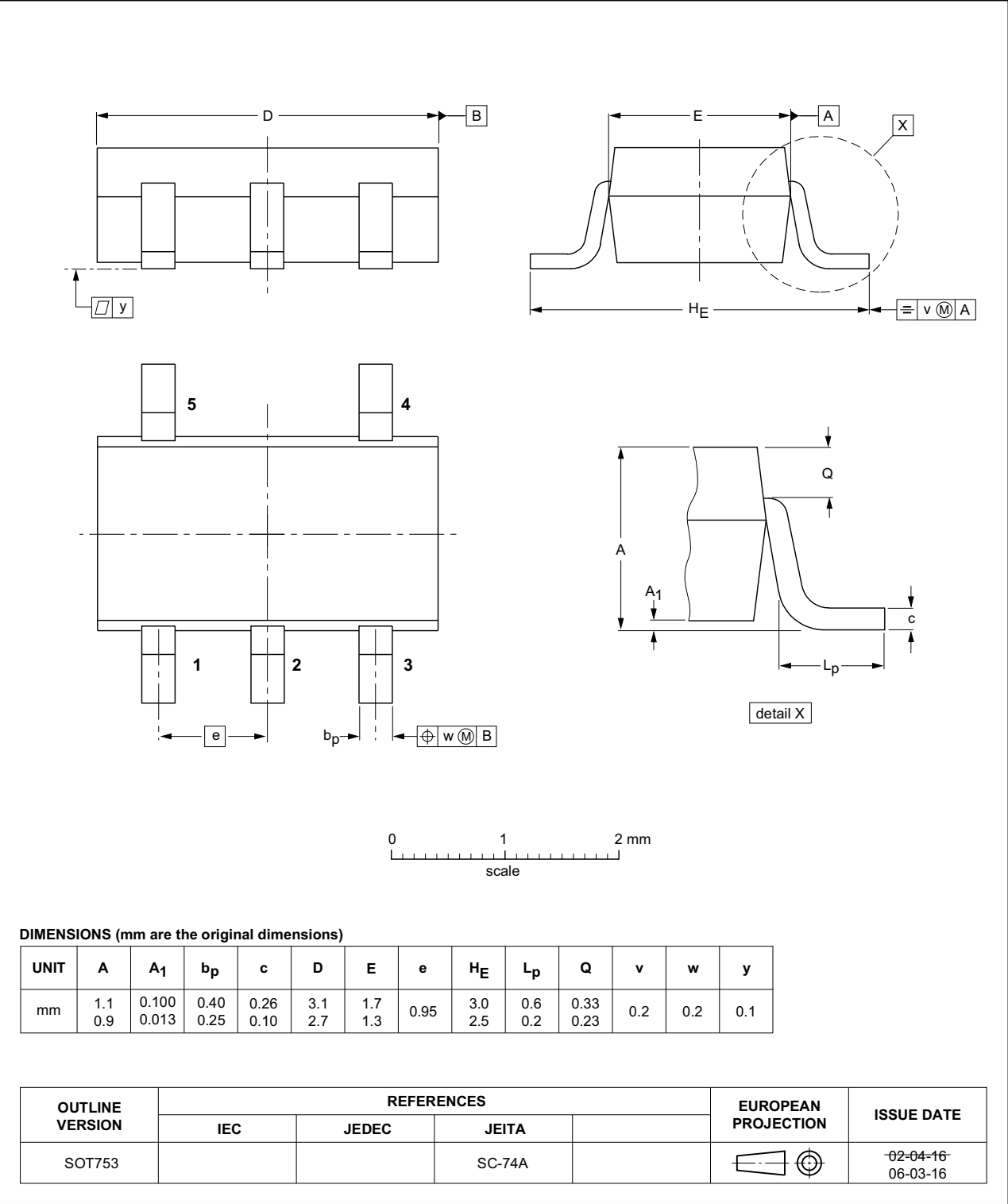


Fig 12. Package outline SOT753

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

SOT886

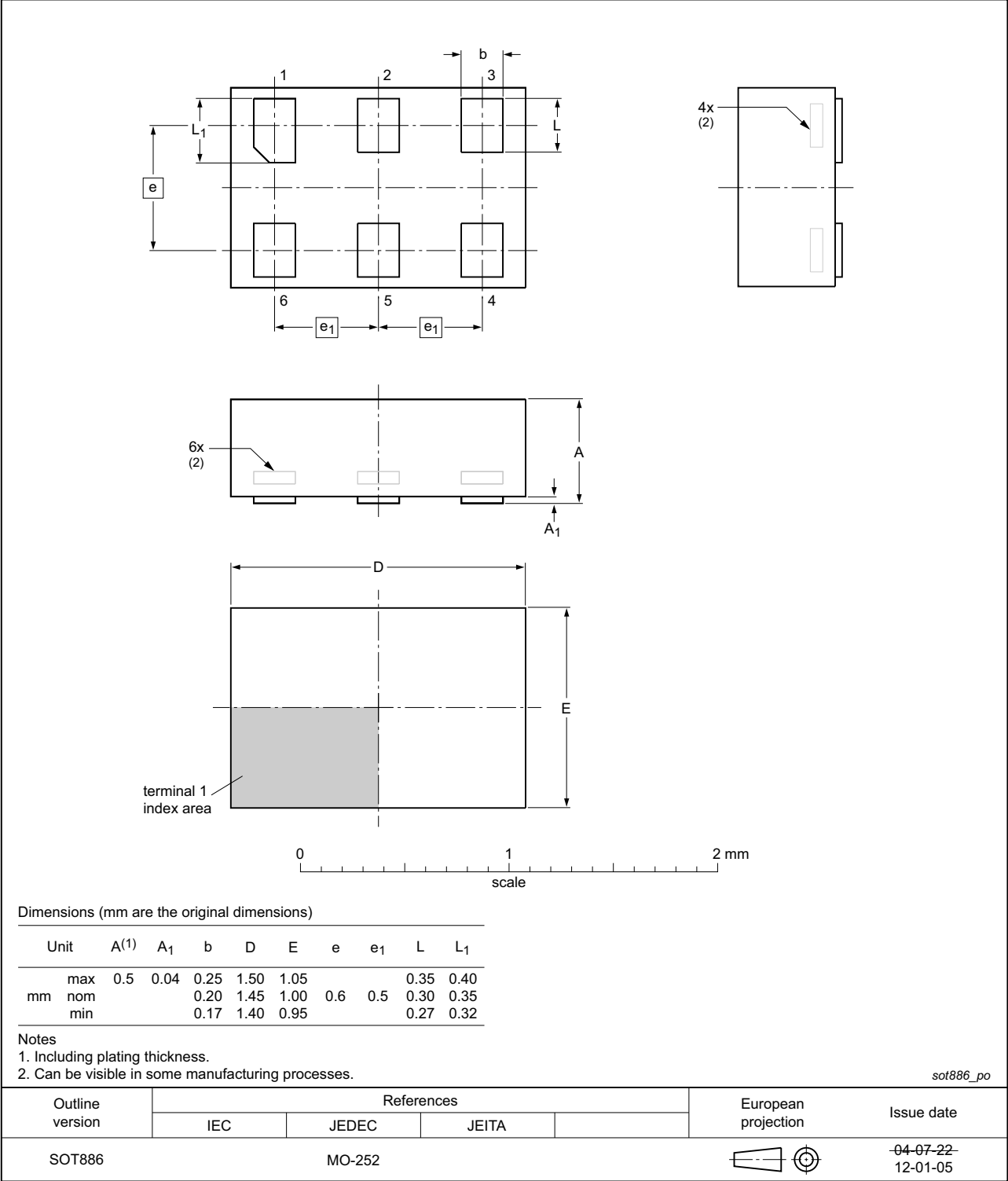
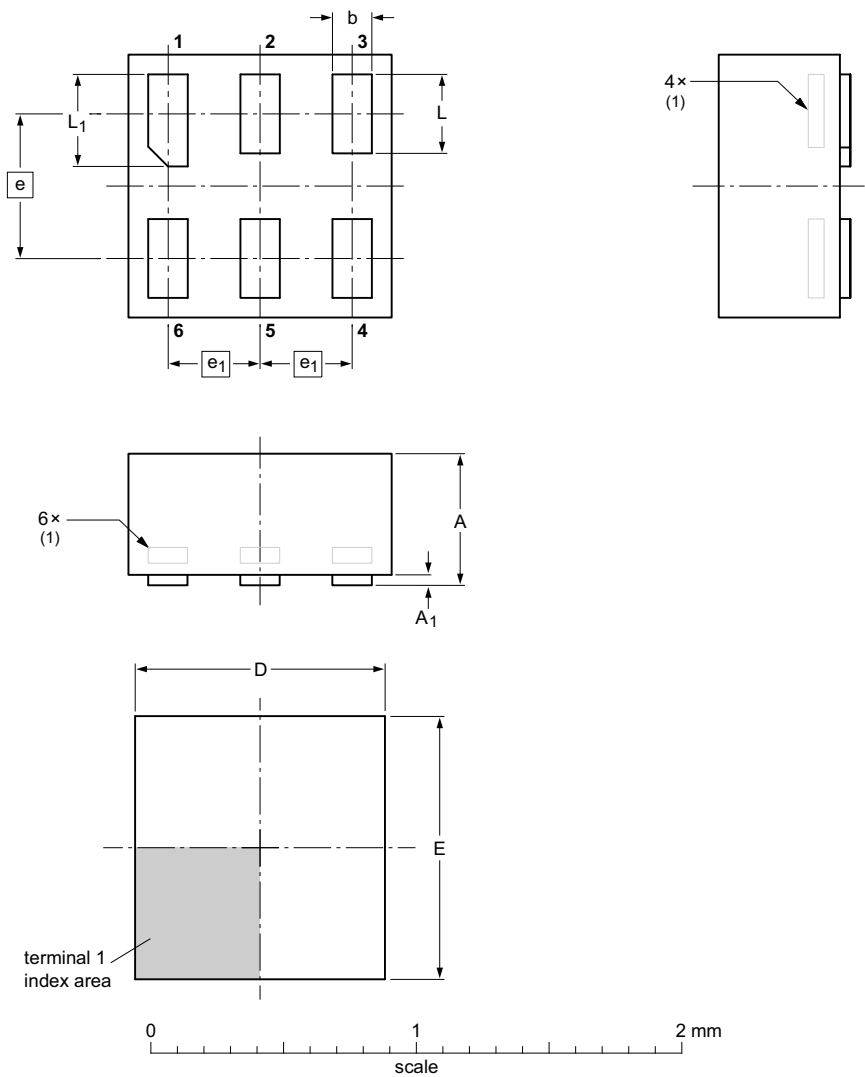


Fig 13. Package outline SOT886 (XSON6)

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

Note  
1. Can be visible in some manufacturing processes.

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

Fig 14. 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

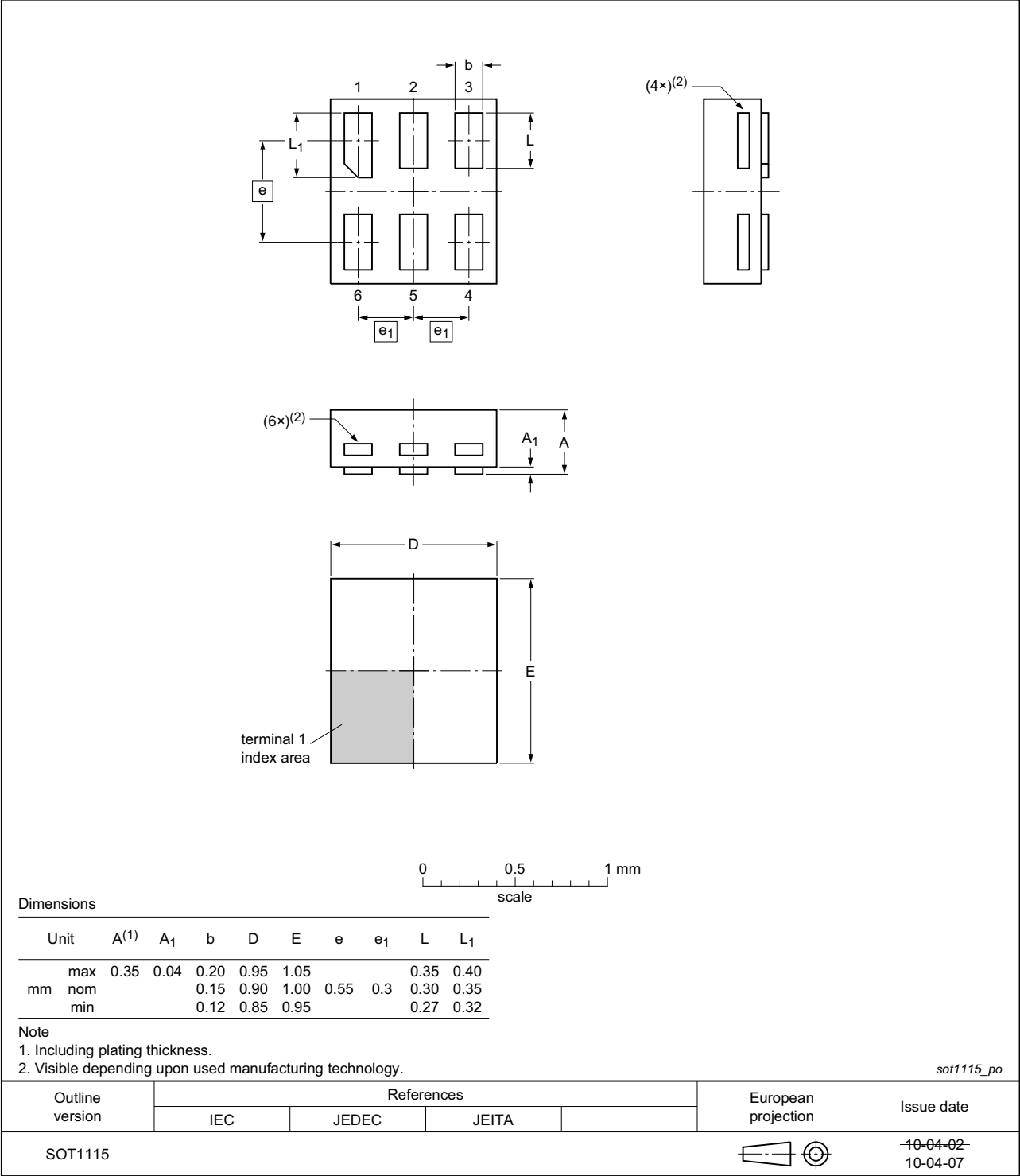
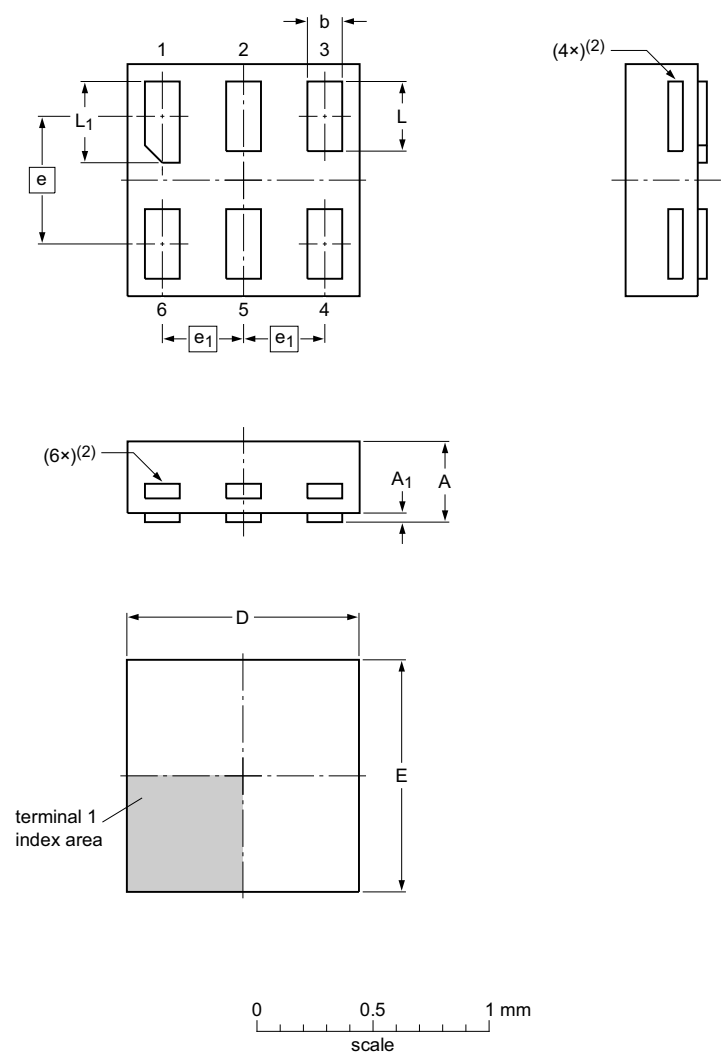


Fig 15. Package outline SOT1115 (XSON6)

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

SOT1202



Dimensions

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

Note

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

sot1202\_po

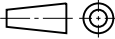
| Outline version | References |       |       |  | European projection                                                                   | Issue date                      |
|-----------------|------------|-------|-------|--|---------------------------------------------------------------------------------------|---------------------------------|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

Fig 16. 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

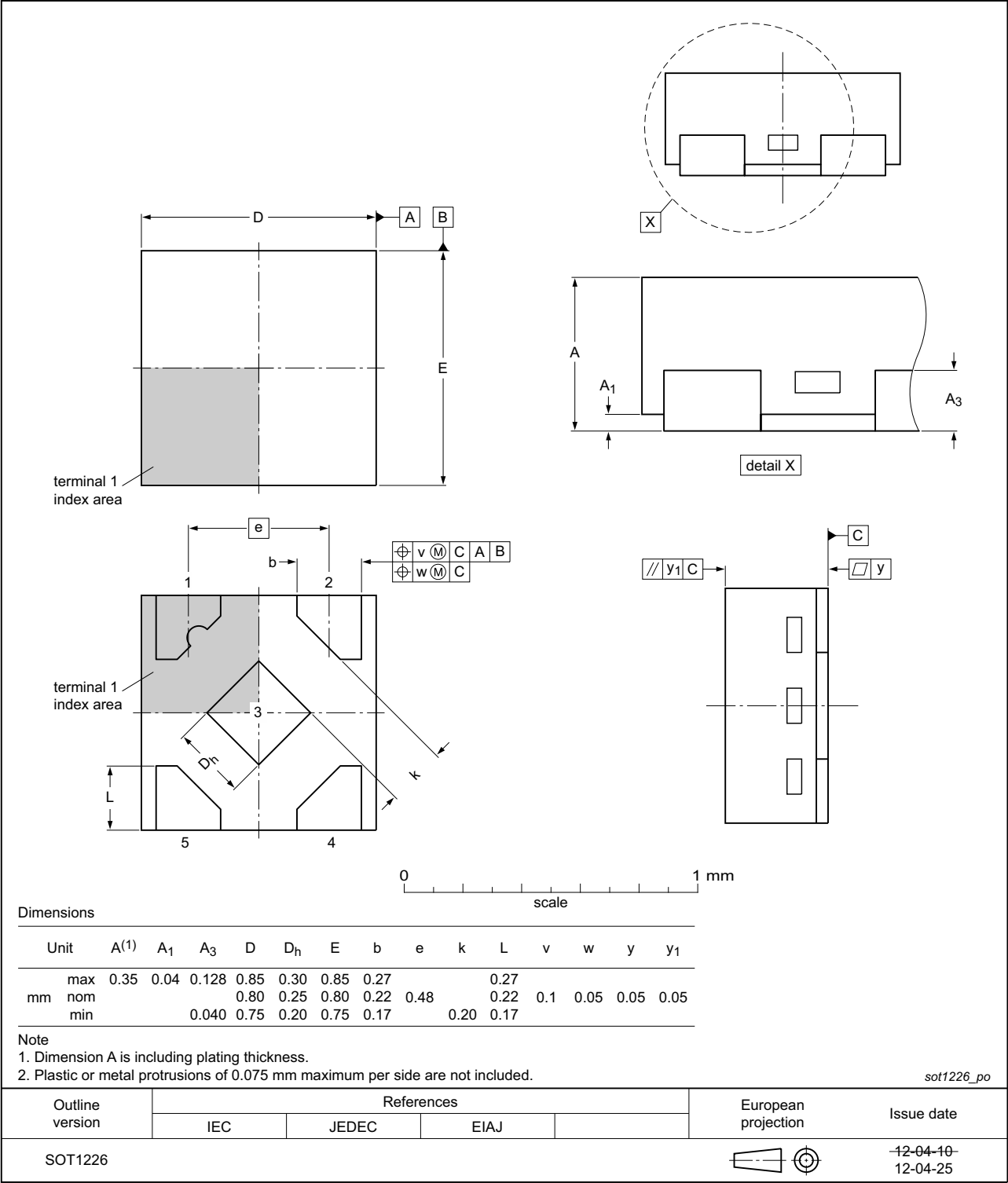


Fig 17. Package outline SOT1226 (X2SON5)

## 14. Abbreviations

Table 11. Abbreviations

| Acronym | Description                             |
|---------|-----------------------------------------|
| 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 12. Revision history

| Document ID     | Release date                                                                                                                                                                | Data sheet status     | Change notice | Supersedes      |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-----------------|
| 74LVC1G125 v.12 | 20161202                                                                                                                                                                    | Product data sheet    | -             | 74LVC1G125 v.11 |
| Modifications:  | <ul style="list-style-type: none"> <li><a href="#">Table 7</a>: The maximum limits for leakage current and supply current have changed.</li> </ul>                          |                       |               |                 |
| 74LVC1G125 v.11 | 20120702                                                                                                                                                                    | Product data sheet    | -             | 74LVC1G125 v.10 |
| Modifications:  | <ul style="list-style-type: none"> <li>Added type number 74LVC1G125GX (SOT1226)</li> <li>Package outline drawing of SOT886 (<a href="#">Figure 13</a>) modified.</li> </ul> |                       |               |                 |
| 74LVC1G125 v.10 | 20111207                                                                                                                                                                    | Product data sheet    | -             | 74LVC1G125 v.9  |
| Modifications:  | <ul style="list-style-type: none"> <li>Legal pages updated.</li> </ul>                                                                                                      |                       |               |                 |
| 74LVC1G125 v.9  | 20101229                                                                                                                                                                    | Product data sheet    | -             | 74LVC1G125 v.8  |
| 74LVC1G125 v.8  | 20100824                                                                                                                                                                    | Product data sheet    | -             | 74LVC1G125 v.7  |
| 74LVC1G125 v.7  | 20070830                                                                                                                                                                    | Product data sheet    | -             | 74LVC1G125 v.6  |
| 74LVC1G125 v.6  | 20060912                                                                                                                                                                    | Product data sheet    | -             | 74LVC1G125 v.5  |
| 74LVC1G125 v.5  | 20040915                                                                                                                                                                    | Product specification | -             | 74LVC1G125 v.4  |
| 74LVC1G125 v.4  | 20021118                                                                                                                                                                    | Product specification | -             | 74LVC1G125 v.3  |
| 74LVC1G125 v.3  | 20020528                                                                                                                                                                    | Product specification | -             | 74LVC1G125 v.2  |
| 74LVC1G125 v.2  | 20010406                                                                                                                                                                    | Product specification | -             | 74LVC1G125 v.1  |
| 74LVC1G125 v.1  | 20001222                                                                                                                                                                    | Product specification | -             | -               |

## 16. Legal information

### 16.1 Data sheet status

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

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

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

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