

# 74LVC1G157

## Single 2-input multiplexer

Rev. 12 — 15 August 2023

Product data sheet

## 1. General description

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The 74LVC1G157 is a single 2-input multiplexer. Inputs can be driven from either 3.3 V or 5 V devices. This feature allows the use of these devices as translators in mixed 3.3 V and 5 V environments.

Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times.

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

## 2. Features and benefits

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- Wide supply voltage range from 1.65 V to 5.5 V
- High noise immunity
- $\pm 24$  mA output drive ( $V_{CC} = 3.0$  V)
- CMOS low power dissipation
- Direct interface with TTL levels
- Overvoltage tolerant inputs to 5.5 V
- $I_{OFF}$  circuitry provides partial Power-down mode operation
- Latch-up performance exceeds 250 mA
- Complies with JEDEC standard:
  - JESD8-7 (1.65 V to 1.95 V)
  - JESD8-5 (2.3 V to 2.7 V)
  - JESD8C (2.7 V to 3.6 V)
  - JESD36 (4.5 V to 5.5 V)
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- 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                  |
| <a href="#">74LVC1G157GW</a> | -40 °C to +125 °C | TSSOP6       | plastic thin shrink small outline package; 6 leads; body width 1.25 mm                      | <a href="#">SOT363-2</a> |
| <a href="#">74LVC1G157GV</a> | -40 °C to +125 °C | SC-74; TSOP6 | plastic surface-mounted package; 6 leads                                                    | <a href="#">SOT457</a>   |
| <a href="#">74LVC1G157GM</a> | -40 °C to +125 °C | XSON6        | plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm | <a href="#">SOT886</a>   |
| <a href="#">74LVC1G157GN</a> | -40 °C to +125 °C | XSON6        | extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm       | <a href="#">SOT1115</a>  |
| <a href="#">74LVC1G157GS</a> | -40 °C to +125 °C | XSON6        | extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm       | <a href="#">SOT1202</a>  |

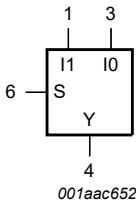
4. Marking

Table 2. Marking

| Type number  | Marking code[1] |
|--------------|-----------------|
| 74LVC1G157GW | YP              |
| 74LVC1G157GV | YP              |
| 74LVC1G157GM | YP              |
| 74LVC1G157GN | YP              |
| 74LVC1G157GS | YP              |

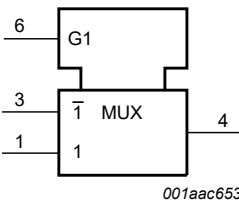
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram



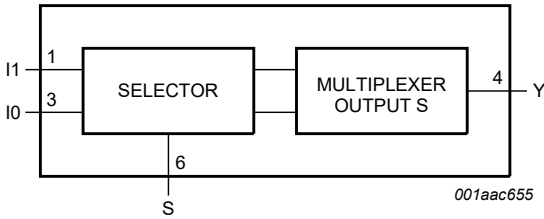
001aac652

**Fig. 1. Logic symbol**



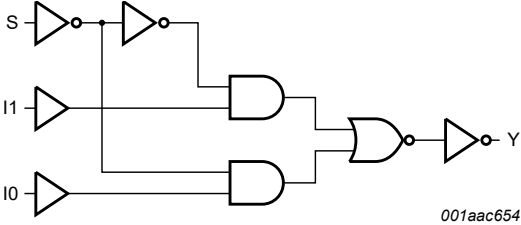
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**Fig. 2. IEC logic symbol**



001aac655

**Fig. 3. Functional diagram**

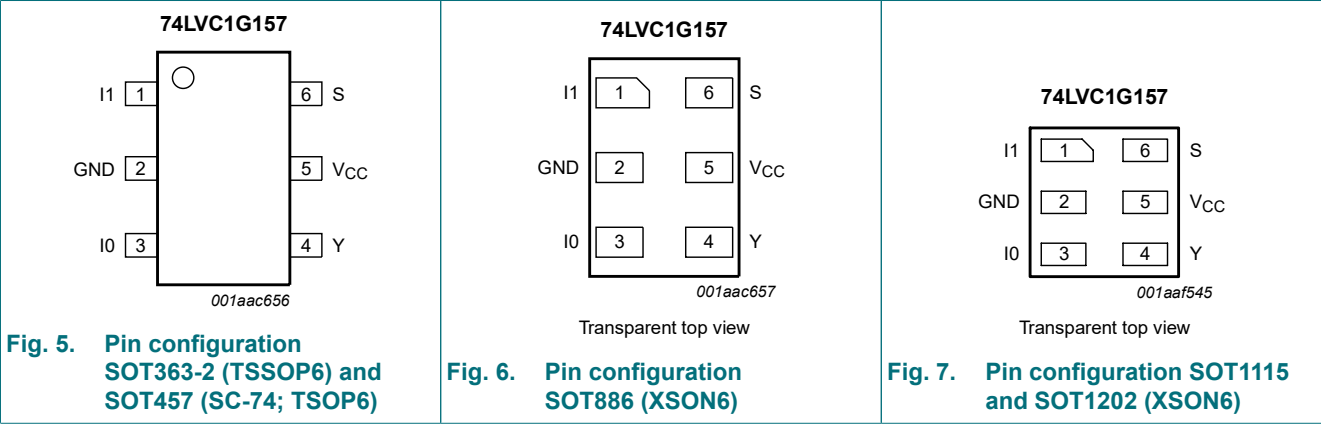


001aac654

**Fig. 4. Logic diagram**

6. Pinning information

6.1. Pinning



6.2. Pin description

Table 3. Pin description

| Symbol          | Pin | Description              |
|-----------------|-----|--------------------------|
| I1              | 1   | data input from source 1 |
| GND             | 2   | ground (0 V)             |
| I0              | 3   | data input from source 0 |
| Y               | 4   | multiplexer output       |
| V <sub>CC</sub> | 5   | supply voltage           |
| S               | 6   | common data select input |

7. Functional description

Table 4. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care.

| Inputs |    |    | Output |
|--------|----|----|--------|
| S      | I1 | I0 | Y      |
| L      | X  | L  | L      |
| L      | X  | H  | H      |
| H      | L  | X  | L      |
| H      | H  | X  | 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 | +6.5           | V    |
| $I_{IK}$  | input clamping current  | $V_I < 0$ V                         | -50  | -              | mA   |
| $V_I$     | input voltage           | [1]                                 | -0.5 | +6.5           | V    |
| $I_{OK}$  | output clamping current | $V_O > V_{CC}$ or $V_O < 0$ V       | -    | ±50            | mA   |
| $V_O$     | output voltage          | Active mode [1]                     | -0.5 | $V_{CC} + 0.5$ | V    |
|           |                         | Power-down mode; $V_{CC} = 0$ V [1] | -0.5 | +6.5           | V    |
| $I_O$     | output current          | $V_O = 0$ V to $V_{CC}$             | -    | ±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 [2] | -    | 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] For SOT363-2 (TSSOP6) package:  $P_{tot}$  derates linearly with 3.7 mW/K above 83 °C.

For SOT457 (SC-74; TSOP6) package:  $P_{tot}$  derates linearly with 4.1 mW/K above 89 °C.

For SOT886 (XSON6) package:  $P_{tot}$  derates linearly with 3.3 mW/K above 74 °C.

For SOT1115 (XSON6) package:  $P_{tot}$  derates linearly with 3.2 mW/K above 71 °C.

For SOT1202 (XSON6) package:  $P_{tot}$  derates linearly with 3.3 mW/K above 74 °C.

## 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                     | -    | -   | $V_{CC}$ | V    |
|                     |                                     | Power-down mode; $V_{CC} = 0$ V | -    | -   | 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                                                                                                   | -40 °C to +85 °C     |         |                     | -40 °C to +125 °C    |                     | Unit |
|------------------|---------------------------|--------------------------------------------------------------------------------------------------------------|----------------------|---------|---------------------|----------------------|---------------------|------|
|                  |                           |                                                                                                              | Min                  | Typ [1] | Max                 | Min                  | Max                 |      |
| V <sub>IH</sub>  | HIGH-level input voltage  | V <sub>CC</sub> = 1.65 V to 1.95 V                                                                           | 0.65V <sub>CC</sub>  | -       | -                   | 0.65V <sub>CC</sub>  | -                   | V    |
|                  |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                             | 1.7                  | -       | -                   | 1.7                  | -                   | V    |
|                  |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | 2.0                  | -       | -                   | 2.0                  | -                   | V    |
|                  |                           | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                             | 0.7V <sub>CC</sub>   | -       | -                   | 0.7V <sub>CC</sub>   | -                   | V    |
| V <sub>IL</sub>  | LOW-level input voltage   | V <sub>CC</sub> = 1.65 V to 1.95 V                                                                           | -                    | -       | 0.35V <sub>CC</sub> | -                    | 0.35V <sub>CC</sub> | V    |
|                  |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                             | -                    | -       | 0.7                 | -                    | 0.7                 | V    |
|                  |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | -                    | -       | 0.8                 | -                    | 0.8                 | V    |
|                  |                           | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                             | -                    | -       | 0.3V <sub>CC</sub>  | -                    | 0.3V <sub>CC</sub>  | V    |
| V <sub>OH</sub>  | HIGH-level output voltage | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                          |                      |         |                     |                      |                     |      |
|                  |                           | I <sub>O</sub> = -100 µA;<br>V <sub>CC</sub> = 1.65 V to 5.5 V                                               | V <sub>CC</sub> -0.1 | -       | -                   | V <sub>CC</sub> -0.1 | -                   | V    |
|                  |                           | I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 1.65 V                                                             | 1.2                  | 1.54    | -                   | 0.95                 | -                   | V    |
|                  |                           | I <sub>O</sub> = -8 mA; V <sub>CC</sub> = 2.3 V                                                              | 1.9                  | 2.15    | -                   | 1.7                  | -                   | V    |
|                  |                           | I <sub>O</sub> = -12 mA; V <sub>CC</sub> = 2.7 V                                                             | 2.2                  | 2.50    | -                   | 1.9                  | -                   | V    |
|                  |                           | I <sub>O</sub> = -24 mA; V <sub>CC</sub> = 3.0 V                                                             | 2.3                  | 2.62    | -                   | 2.0                  | -                   | V    |
|                  |                           | I <sub>O</sub> = -32 mA; V <sub>CC</sub> = 4.5 V                                                             | 3.8                  | 4.11    | -                   | 3.4                  | -                   | V    |
| V <sub>OL</sub>  | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                          |                      |         |                     |                      |                     |      |
|                  |                           | I <sub>O</sub> = 100 µA;<br>V <sub>CC</sub> = 1.65 V to 5.5 V                                                | -                    | -       | 0.10                | -                    | 0.10                | V    |
|                  |                           | I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V                                                              | -                    | 0.07    | 0.45                | -                    | 0.70                | V    |
|                  |                           | I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V                                                               | -                    | 0.12    | 0.30                | -                    | 0.45                | V    |
|                  |                           | I <sub>O</sub> = 12 mA; V <sub>CC</sub> = 2.7 V                                                              | -                    | 0.17    | 0.40                | -                    | 0.60                | V    |
|                  |                           | I <sub>O</sub> = 24 mA; V <sub>CC</sub> = 3.0 V                                                              | -                    | 0.33    | 0.55                | -                    | 0.80                | V    |
|                  |                           | I <sub>O</sub> = 32 mA; V <sub>CC</sub> = 4.5 V                                                              | -                    | 0.39    | 0.55                | -                    | 0.80                | V    |
| I <sub>I</sub>   | input leakage current     | V <sub>I</sub> = 5.5 V or GND;<br>V <sub>CC</sub> = 0 V to 5.5 V                                             | -                    | ±0.1    | ±1                  | -                    | ±1                  | µA   |
| I <sub>OFF</sub> | power-off leakage current | V <sub>CC</sub> = 0 V; V <sub>I</sub> or V <sub>O</sub> = 5.5 V                                              | -                    | ±0.1    | ±2                  | -                    | ±2                  | µA   |
| I <sub>CC</sub>  | supply current            | V <sub>I</sub> = 5.5 V or GND; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 1.65 V to 5.5 V                    | -                    | 0.1     | 4                   | -                    | 4                   | µA   |
| ΔI <sub>CC</sub> | additional supply current | per pin; V <sub>CC</sub> = 2.3 V to 5.5 V;<br>V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A | -                    | 5       | 500                 | -                    | 500                 | µA   |
| C <sub>I</sub>   | input capacitance         | V <sub>CC</sub> = 3.3 V; V <sub>I</sub> = GND to V <sub>CC</sub>                                             | -                    | 2.5     | -                   | -                    | -                   | pF   |

[1] All typical values are measured at T<sub>amb</sub> = 25 °C.

## 11. Dynamic characteristics

**Table 8. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 9.

| Symbol          | Parameter                     | Conditions                                                            | -40 °C to +85 °C |        |      | -40 °C to +125 °C |      | Unit |
|-----------------|-------------------------------|-----------------------------------------------------------------------|------------------|--------|------|-------------------|------|------|
|                 |                               |                                                                       | Min              | Typ[1] | Max  | Min               | Max  |      |
| t <sub>pd</sub> | propagation delay             | I <sub>0</sub> , I <sub>1</sub> to Y; see Fig. 8 [2]                  |                  |        |      |                   |      |      |
|                 |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                    | 1.5              | 4.3    | 11.0 | 1.5               | 13.0 | ns   |
|                 |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                      | 1.0              | 2.9    | 6.1  | 1.0               | 7.6  | ns   |
|                 |                               | V <sub>CC</sub> = 2.7 V                                               | 1.0              | 3.1    | 5.6  | 1.0               | 7.0  | ns   |
|                 |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                      | 1.0              | 2.7    | 5.0  | 1.0               | 6.3  | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                      | 0.5              | 2.2    | 4.0  | 0.5               | 5.0  | ns   |
|                 |                               | S to Y; see Fig. 8 [2]                                                |                  |        |      |                   |      |      |
|                 |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                    | 1.5              | 4.3    | 11.0 | 1.5               | 13.0 | ns   |
|                 |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                      | 1.0              | 2.9    | 6.9  | 1.0               | 8.6  | ns   |
|                 |                               | V <sub>CC</sub> = 2.7 V                                               | 1.0              | 3.3    | 5.9  | 1.0               | 7.4  | ns   |
|                 |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                      | 1.0              | 2.9    | 5.0  | 1.0               | 6.3  | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                      | 0.5              | 2.3    | 4.0  | 0.5               | 5.0  | ns   |
| C <sub>PD</sub> | power dissipation capacitance | V <sub>I</sub> = GND to V <sub>CC</sub> ; V <sub>CC</sub> = 3.3 V [3] | -                | 18     | -    | -                 | -    | 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] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).

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

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 Volts;

N = number of inputs switching;

Σ(C<sub>L</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>) = sum of the outputs.

11.1. Waveforms and test circuit

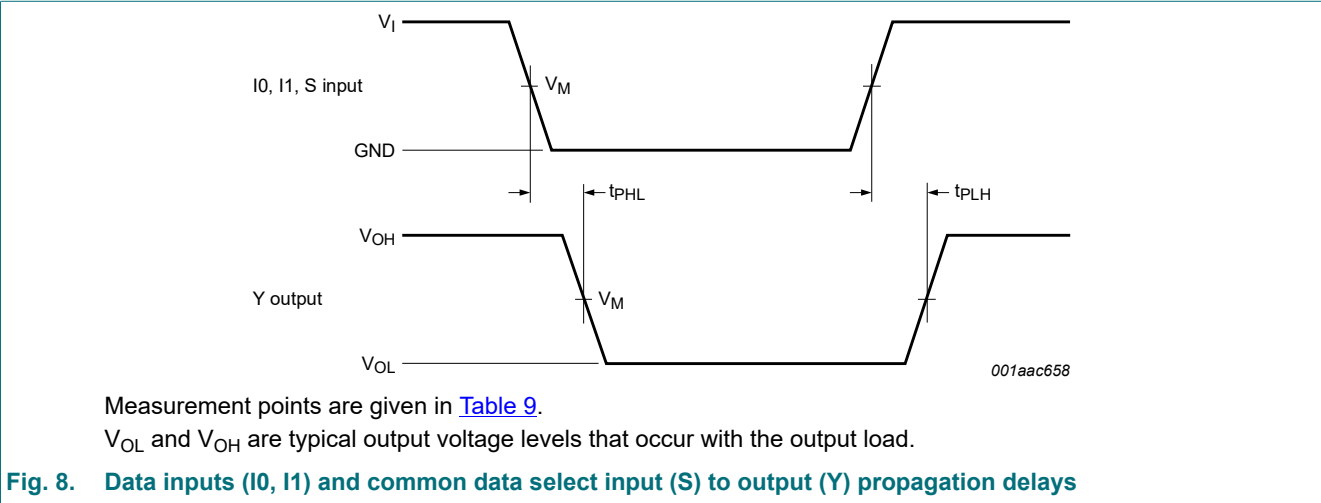


Table 9. Measurement points

| Supply voltage   | Input               | Output              |
|------------------|---------------------|---------------------|
| $V_{CC}$         | $V_M$               | $V_M$               |
| 1.65 V to 1.95 V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |
| 2.3 V to 2.7 V   | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |
| 2.7 V            | 1.5 V               | 1.5 V               |
| 3.0 V to 3.6 V   | 1.5 V               | 1.5 V               |
| 4.5 V to 5.5 V   | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |

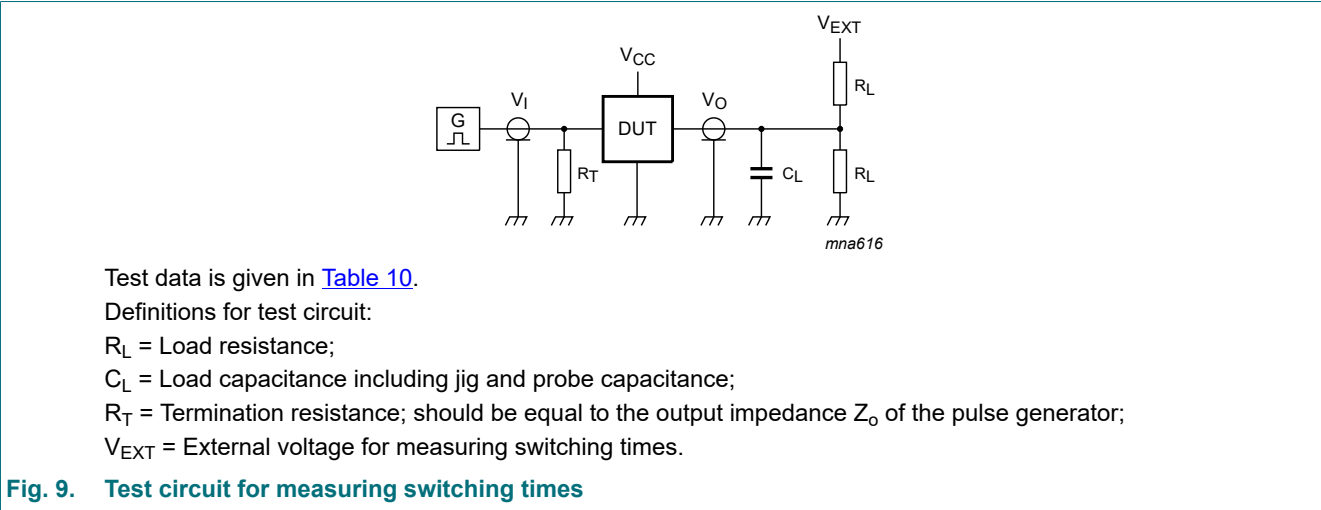


Table 10. Test data

| Supply voltage   | Input    |               | Load  |              | $V_{EXT}$          |
|------------------|----------|---------------|-------|--------------|--------------------|
| $V_{CC}$         | $V_I$    | $t_r = t_f$   | $C_L$ | $R_L$        | $t_{PLH}, t_{PHL}$ |
| 1.65 V to 1.95 V | $V_{CC}$ | $\leq 2.0$ ns | 30 pF | 1 k $\Omega$ | open               |
| 2.3 V to 2.7 V   | $V_{CC}$ | $\leq 2.0$ ns | 30 pF | 500 $\Omega$ | open               |
| 2.7 V            | 2.7 V    | $\leq 2.5$ ns | 50 pF | 500 $\Omega$ | open               |
| 3.0 V to 3.6 V   | 2.7 V    | $\leq 2.5$ ns | 50 pF | 500 $\Omega$ | open               |
| 4.5 V to 5.5 V   | $V_{CC}$ | $\leq 2.5$ ns | 50 pF | 500 $\Omega$ | open               |

12. Package outline

TSSOP6: plastic thin shrink small outline package; 6 leads; body width 1.25 mmSOT363-2

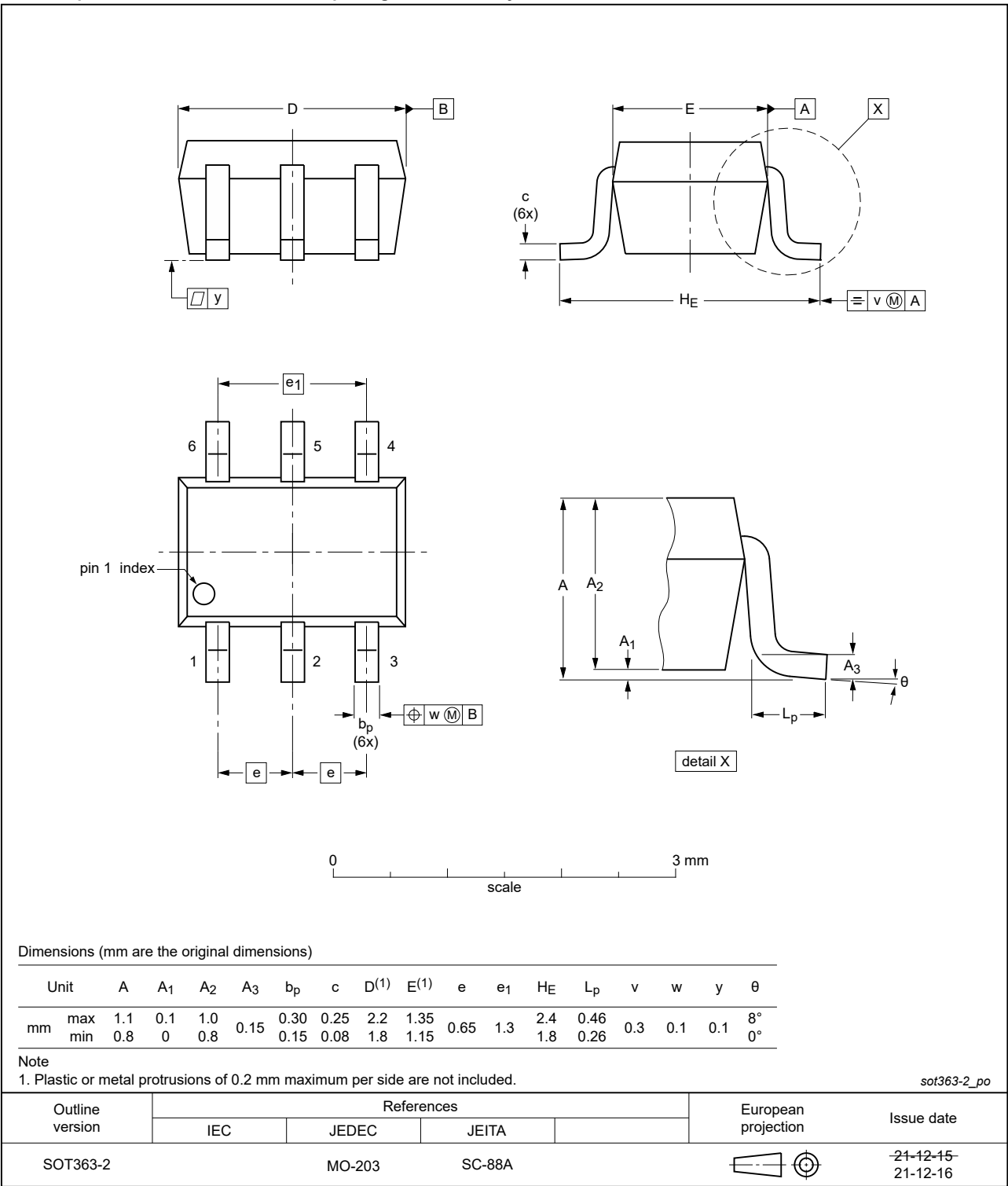


Fig. 10. Package outline SOT363-2 (TSSOP6)

Plastic, surface-mounted package (SC-74; TSOP6); 6 leads

SOT457

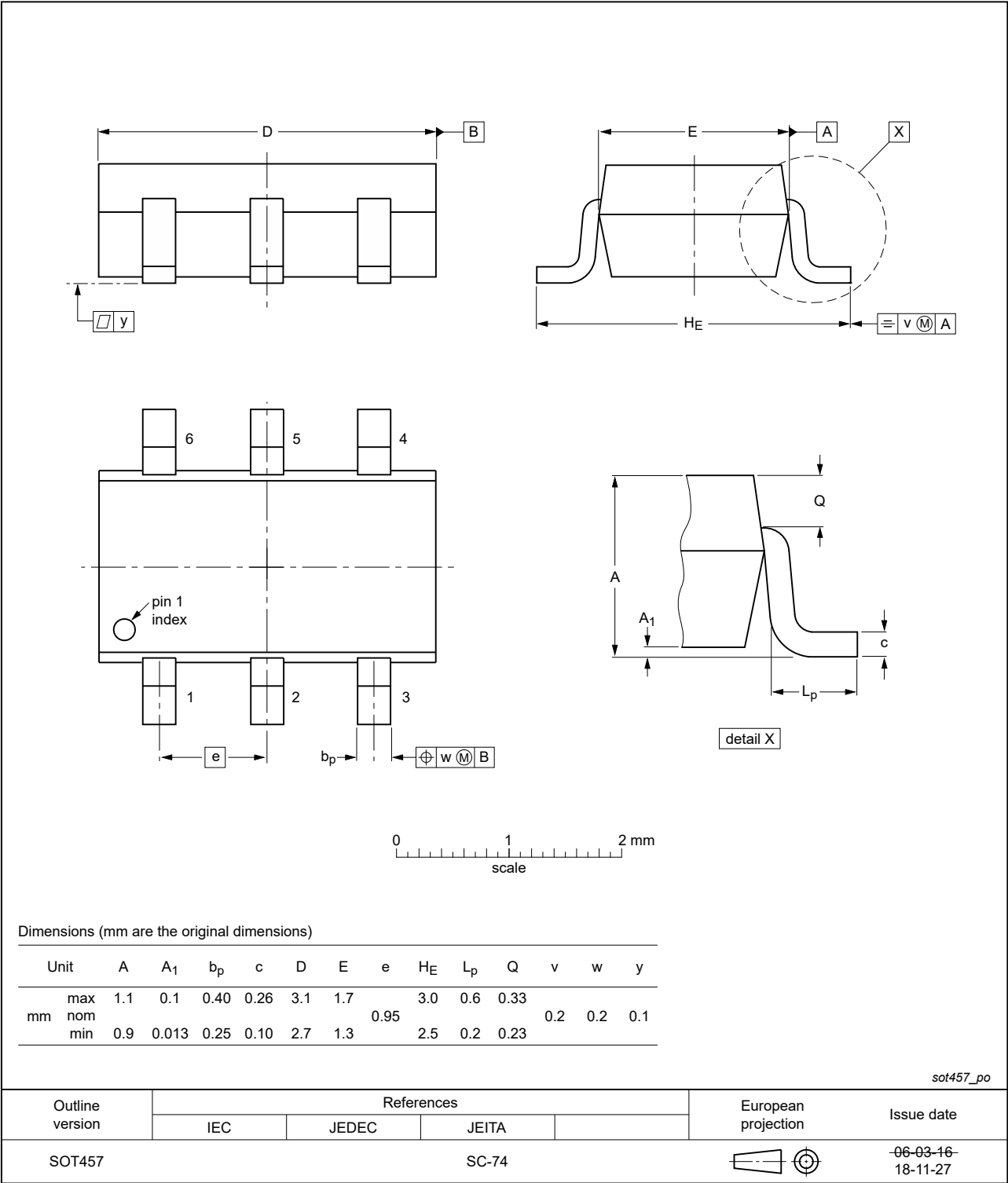


Fig. 11. Package outline SOT457 (SC-74; TSOP6)

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

SOT886

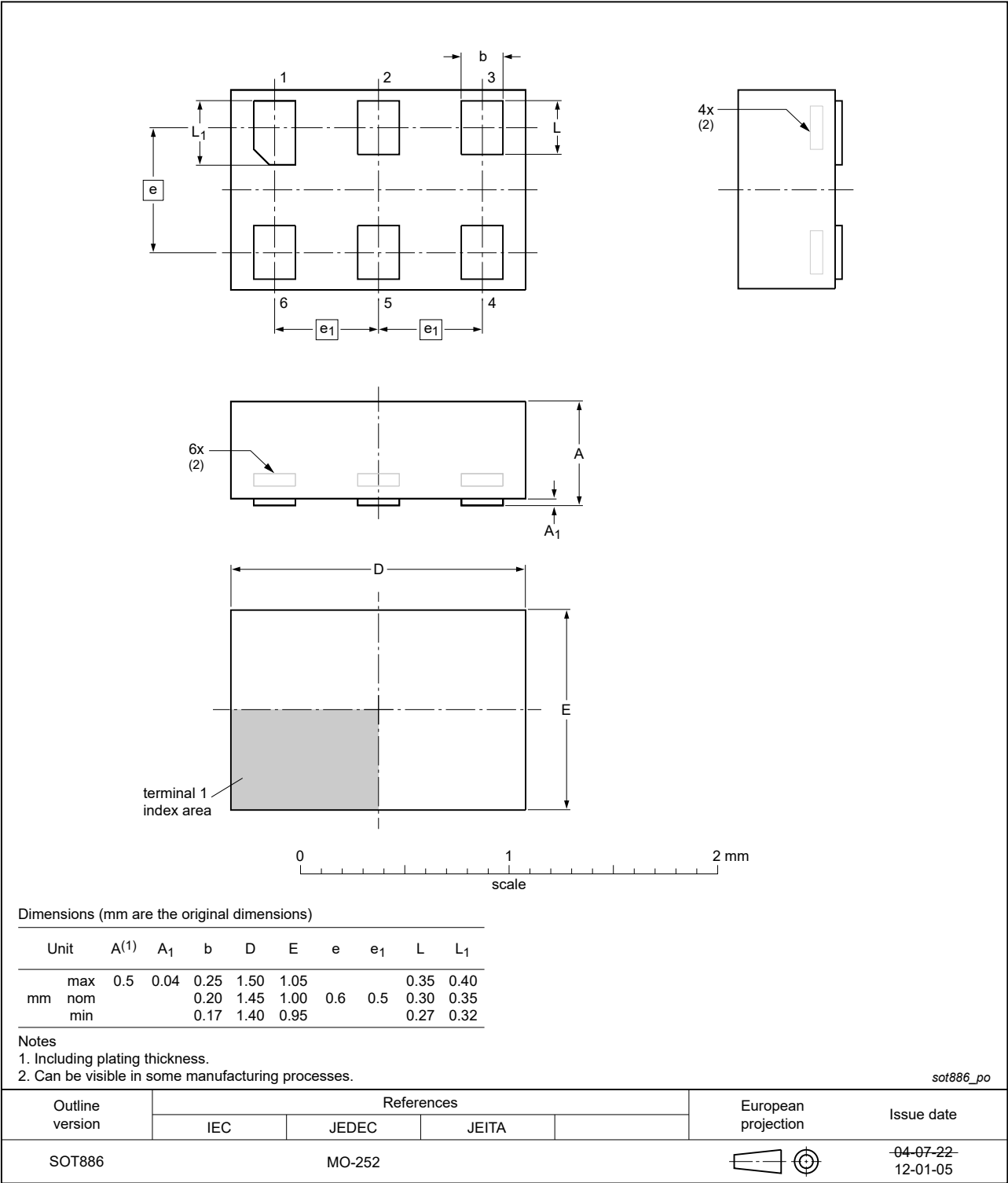


Fig. 12. Package outline SOT886 (XSON6)

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

SOT1115

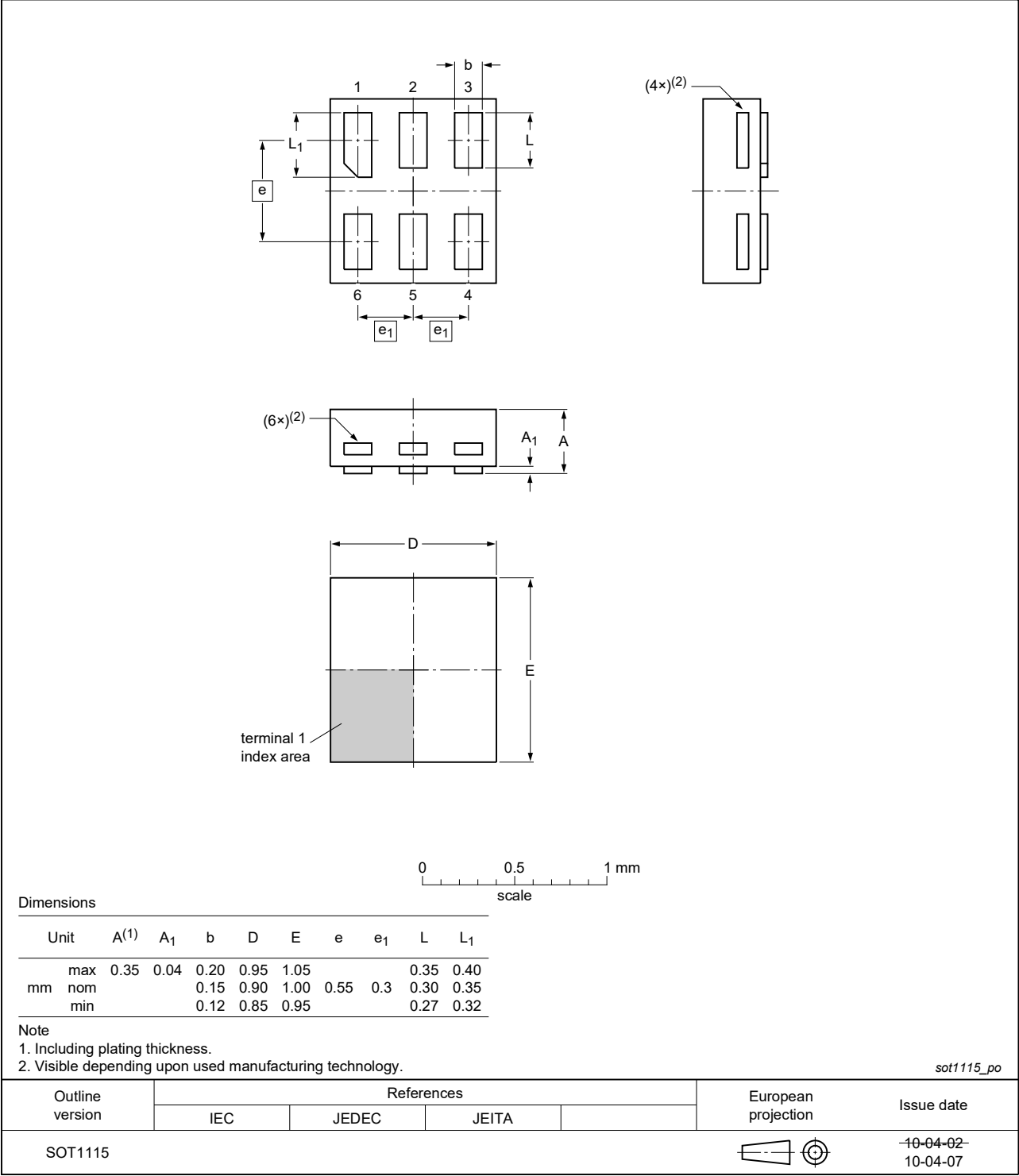


Fig. 13. Package outline SOT1115 (XSON6)

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

SOT1202

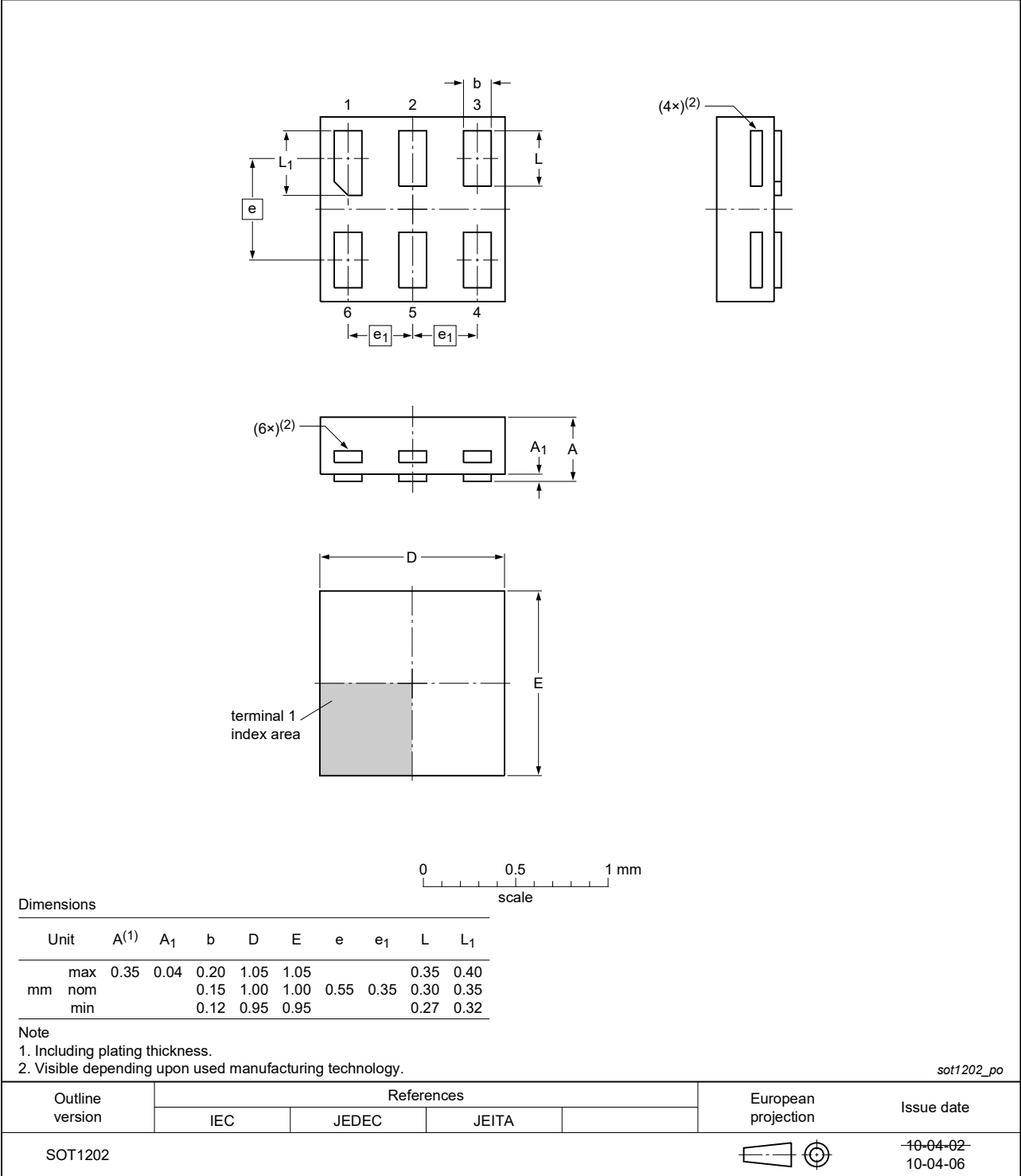


Fig. 14. Package outline SOT1202 (XSON6)

13. Abbreviations

Table 11. Abbreviations

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

14. Revision history

Table 12. Revision history

| Document ID     | Release date                                                                                                                                                                                                                           | Data sheet status  | Change notice | Supersedes      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|-----------------|
| 74LVC1G157 v.12 | 20230815                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.11 |
| Modifications:  | <ul style="list-style-type: none"><li><a href="#">Section 2</a>: ESD specification updated according to the latest JEDEC standard.</li></ul>                                                                                           |                    |               |                 |
| 74LVC1G157 v.11 | 20220127                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.10 |
| Modifications:  | <ul style="list-style-type: none"><li>Package SOT363 (SC-88) changed to SOT363-2 (TSSOP6).</li></ul>                                                                                                                                   |                    |               |                 |
| 74LVC1G157 v.10 | 20210610                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.9  |
| Modifications:  | <ul style="list-style-type: none"><li><a href="#">Section 1</a> updated.</li><li>Type number 74LVC1G157GF (SOT891 / XSON6) removed.</li></ul>                                                                                          |                    |               |                 |
| 74LVC1G157 v.9  | 20191008                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.8  |
| Modifications:  | <ul style="list-style-type: none"><li><a href="#">Table 5</a>: Derating values for P<sub>tot</sub> total power dissipation updated.</li><li>Package outline drawing <a href="#">SOT457</a> (SC-74) updated</li></ul>                   |                    |               |                 |
| 74LVC1G157 v.8  | 20171031                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.7  |
| Modifications:  | <ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li></ul> |                    |               |                 |
| 74LVC1G157 v.7  | 20161202                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.6  |
| 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>                                                                                       |                    |               |                 |
| 74LVC1G157 v.6  | 20121231                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.5  |
| Modifications:  | <ul style="list-style-type: none"><li>Package outline drawing of SOT886 (<a href="#">Fig. 12</a>) modified.</li></ul>                                                                                                                  |                    |               |                 |
| 74LVC1G157 v.5  | 20111206                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.4  |
| Modifications:  | <ul style="list-style-type: none"><li>Legal pages updated.</li></ul>                                                                                                                                                                   |                    |               |                 |
| 74LVC1G157 v.4  | 20101028                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.3  |
| 74LVC1G157 v.3  | 20070712                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.2  |
| 74LVC1G157 v.2  | 20061011                                                                                                                                                                                                                               | Product data sheet | -             | 74LVC1G157 v.1  |
| 74LVC1G157 v.1  | 20050425                                                                                                                                                                                                                               | Product data sheet | -             | -               |

## 15. Legal information

### Data sheet status

| 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.                                     |

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