

# 74LVC2G14

Dual inverting Schmitt trigger with 5 V tolerant input

Rev. 10 — 15 December 2016

Product data sheet

## 1. General description

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The 74LVC2G14 provides two inverting buffers with Schmitt-trigger input. It is capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

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

## 2. Features and benefits

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- Wide supply voltage range from 1.65 V to 5.5 V
- 5 V tolerant inputs for interfacing with 5 V logic
- 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)
  - ◆ JESD8B/JESD36 (2.7 V to 3.6 V)
- ESD protection:
  - ◆ HBM JESD22-A114F exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V
- $\pm 24$  mA output drive ( $V_{CC} = 3.0$  V)
- CMOS low power consumption
- Latch-up performance exceeds 250 mA
- Direct interface with TTL levels
- Unlimited rise and fall times
- Input accepts voltages up to 5 V
- Multiple package options
- Specified from  $-40$  °C to  $+85$  °C and  $-40$  °C to  $+125$  °C.

## 3. Applications

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- Wave and pulse shaper
- Astable multivibrator
- Monostable multivibrator

4. Ordering information

Table 1. Ordering information

| Type number | Package           |       |                                                                                             |         |
|-------------|-------------------|-------|---------------------------------------------------------------------------------------------|---------|
|             | Temperature range | Name  | Description                                                                                 | Version |
| 74LVC2G14GW | −40 °C to +125 °C | SC-88 | plastic surface-mounted package; 6 leads                                                    | SOT363  |
| 74LVC2G14GV | −40 °C to +125 °C | TSOP6 | plastic surface-mounted package (TSOP6); 6 leads                                            | SOT457  |
| 74LVC2G14GM | −40 °C to +125 °C | XSON6 | plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm | SOT886  |
| 74LVC2G14GF | −40 °C to +125 °C | XSON6 | plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm    | SOT891  |
| 74LVC2G14GN | −40 °C to +125 °C | XSON6 | extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm       | SOT1115 |
| 74LVC2G14GS | −40 °C to +125 °C | XSON6 | extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm       | SOT1202 |

5. Marking

Table 2. Marking codes

| Type number | Marking code <sup>[1]</sup> |
|-------------|-----------------------------|
| 74LVC2G14GW | VK                          |
| 74LVC2G14GV | V14                         |
| 74LVC2G14GM | VK                          |
| 74LVC2G14GF | VK                          |
| 74LVC2G14GN | VK                          |
| 74LVC2G14GS | VK                          |

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

6. Functional diagram

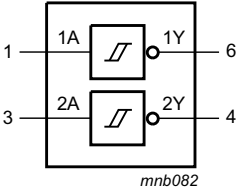


Fig 1. Logic symbol

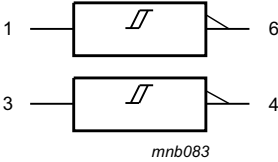


Fig 2. IEC logic symbol

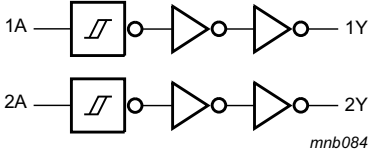
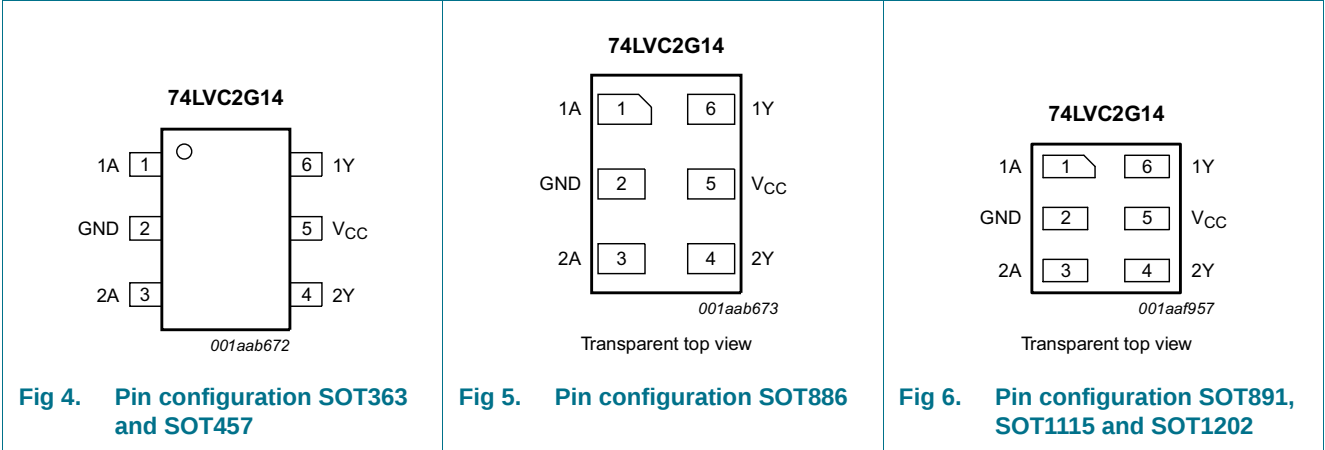


Fig 3. Logic diagram

7. Pinning information

7.1 Pinning



7.2 Pin description

Table 3. Pin description

| Symbol          | Pin | Description    |
|-----------------|-----|----------------|
| 1A              | 1   | data input     |
| GND             | 2   | ground (0 V)   |
| 2A              | 3   | data input     |
| 2Y              | 4   | data output    |
| V <sub>CC</sub> | 5   | supply voltage |
| 1Y              | 6   | data input     |

8. Functional description

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

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

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

## 9. 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 SC-88 and TSOP6 packages: above 87.5 °C the value of  $P_{tot}$  derates linearly with 4.0 mW/K.  
For XSON6 packages: above 118 °C the value of  $P_{tot}$  derates linearly with 7.8 mW/K.

## 10. 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    |
|           |                     | Power-down mode; $V_{CC} = 0$ V | 0    | -   | 5.5      | V    |
| $T_{amb}$ | ambient temperature |                                 | -40  | -   | +125     | °C   |

## 11. 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 |
|--------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|--------------------|------|------|
| <b>T<sub>amb</sub> = –40 °C to +85 °C</b>  |                           |                                                                                                     |                       |                    |      |      |
| V <sub>OH</sub>                            | HIGH-level output voltage | V <sub>I</sub> = V <sub>T+</sub> or V <sub>T–</sub>                                                 |                       |                    |      |      |
|                                            |                           | I <sub>O</sub> = –100 µA; V <sub>CC</sub> = 1.65 V to 5.5 V                                         | V <sub>CC</sub> – 0.1 | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –4 mA; V <sub>CC</sub> = 1.65 V                                                    | 1.2                   | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –8 mA; V <sub>CC</sub> = 2.3 V                                                     | 1.9                   | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –12 mA; V <sub>CC</sub> = 2.7 V                                                    | 2.2                   | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –24 mA; V <sub>CC</sub> = 3.0 V                                                    | 2.3                   | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –32 mA; V <sub>CC</sub> = 4.5 V                                                    | 3.8                   | -                  | -    | V    |
| V <sub>OL</sub>                            | LOW-level output voltage  | V <sub>I</sub> = V <sub>T+</sub> or V <sub>T–</sub>                                                 |                       |                    |      |      |
|                                            |                           | I <sub>O</sub> = 100 µA; V <sub>CC</sub> = 1.65 V to 5.5 V                                          | -                     | -                  | 0.1  | V    |
|                                            |                           | I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V                                                     | -                     | -                  | 0.45 | V    |
|                                            |                           | I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V                                                      | -                     | -                  | 0.3  | V    |
|                                            |                           | I <sub>O</sub> = 12 mA; V <sub>CC</sub> = 2.7 V                                                     | -                     | -                  | 0.4  | V    |
|                                            |                           | I <sub>O</sub> = 24 mA; V <sub>CC</sub> = 3.0 V                                                     | -                     | -                  | 0.55 | V    |
|                                            |                           | I <sub>O</sub> = 32 mA; V <sub>CC</sub> = 4.5 V                                                     | -                     | -                  | 0.55 | V    |
| I <sub>I</sub>                             | input leakage current     | V <sub>I</sub> = 5.5 V or GND; V <sub>CC</sub> = 0 V to 5.5 V                                       | -                     | ±0.1               | ±1   | µA   |
| I <sub>OFF</sub>                           | power-off leakage current | V <sub>I</sub> or V <sub>O</sub> = 5.5 V; V <sub>CC</sub> = 0 V                                     | -                     | ±0.1               | ±2   | µA   |
| I <sub>CC</sub>                            | supply current            | V <sub>I</sub> = 5.5 V or GND;<br>V <sub>CC</sub> = 1.65 V to 5.5 V; I <sub>O</sub> = 0 A           | -                     | 0.1                | 4    | µA   |
| ΔI <sub>CC</sub>                           | additional supply current | V <sub>I</sub> = V <sub>CC</sub> – 0.6 V; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 2.3 V to 5.5 V | -                     | 5                  | 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>                                    | -                     | 3.5                | -    | pF   |
| <b>T<sub>amb</sub> = –40 °C to +125 °C</b> |                           |                                                                                                     |                       |                    |      |      |
| V <sub>OH</sub>                            | HIGH-level output voltage | V <sub>I</sub> = V <sub>T+</sub> or V <sub>T–</sub>                                                 |                       |                    |      |      |
|                                            |                           | I <sub>O</sub> = –100 µA; V <sub>CC</sub> = 1.65 V to 5.5 V                                         | V <sub>CC</sub> – 0.1 | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –4 mA; V <sub>CC</sub> = 1.65 V                                                    | 0.95                  | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –8 mA; V <sub>CC</sub> = 2.3 V                                                     | 1.7                   | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –12 mA; V <sub>CC</sub> = 2.7 V                                                    | 1.9                   | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –24 mA; V <sub>CC</sub> = 3.0 V                                                    | 2.0                   | -                  | -    | V    |
|                                            |                           | I <sub>O</sub> = –32 mA; V <sub>CC</sub> = 4.5 V                                                    | 3.4                   | -                  | -    | V    |
| V <sub>OL</sub>                            | LOW-level output voltage  | V <sub>I</sub> = V <sub>T+</sub> or V <sub>T–</sub>                                                 |                       |                    |      |      |
|                                            |                           | I <sub>O</sub> = 100 µA; V <sub>CC</sub> = 1.65 V to 5.5 V                                          | -                     | -                  | 0.1  | V    |
|                                            |                           | I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V                                                     | -                     | -                  | 0.7  | V    |
|                                            |                           | I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V                                                      | -                     | -                  | 0.45 | V    |
|                                            |                           | I <sub>O</sub> = 12 mA; V <sub>CC</sub> = 2.7 V                                                     | -                     | -                  | 0.6  | V    |
|                                            |                           | I <sub>O</sub> = 24 mA; V <sub>CC</sub> = 3.0 V                                                     | -                     | -                  | 0.8  | V    |
|                                            |                           | I <sub>O</sub> = 32 mA; V <sub>CC</sub> = 4.5 V                                                     | -                     | -                  | 0.8  | V    |

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

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

| Symbol          | Parameter                 | Conditions                                                                                            | Min | Typ [1] | Max     | Unit          |
|-----------------|---------------------------|-------------------------------------------------------------------------------------------------------|-----|---------|---------|---------------|
| $I_I$           | input leakage current     | $V_I = 5.5 \text{ V}$ or GND; $V_{CC} = 0 \text{ V}$ to $5.5 \text{ V}$                               | -   | -       | $\pm 1$ | $\mu\text{A}$ |
| $I_{OFF}$       | power-off leakage current | $V_I$ or $V_O = 5.5 \text{ V}$ ; $V_{CC} = 0 \text{ V}$                                               | -   | -       | $\pm 2$ | $\mu\text{A}$ |
| $I_{CC}$        | 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 | $V_I = V_{CC} - 0.6 \text{ V}$ ; $I_O = 0 \text{ A}$ ;<br>$V_{CC} = 2.3 \text{ V}$ to $5.5 \text{ V}$ | -   | -       | 500     | $\mu\text{A}$ |

[1] All typical values are measured at maximum  $V_{CC}$  and  $T_{amb} = 25^\circ\text{C}$ .**Table 8.** Transfer characteristicsVoltages are referenced to GND (ground = 0 V; for test circuit see [Figure 8](#))

| Symbol   | Parameter                        | Conditions                                                                                                      | -40 °C to +85 °C |         |      | -40 °C to +125 °C |      | Unit |
|----------|----------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------|---------|------|-------------------|------|------|
|          |                                  |                                                                                                                 | Min              | Typ [1] | Max  | Min               | Max  |      |
| $V_{T+}$ | positive-going threshold voltage | see <a href="#">Figure 9</a> and <a href="#">Figure 10</a>                                                      |                  |         |      |                   |      |      |
|          |                                  | $V_{CC} = 1.8 \text{ V}$                                                                                        | 0.70             | 1.10    | 1.50 | 0.70              | 1.70 | V    |
|          |                                  | $V_{CC} = 2.3 \text{ V}$                                                                                        | 1.00             | 1.40    | 1.80 | 1.00              | 2.00 | V    |
|          |                                  | $V_{CC} = 3.0 \text{ V}$                                                                                        | 1.30             | 1.76    | 2.20 | 1.30              | 2.40 | V    |
|          |                                  | $V_{CC} = 4.5 \text{ V}$                                                                                        | 1.90             | 2.47    | 3.10 | 1.90              | 3.30 | V    |
|          |                                  | $V_{CC} = 5.5 \text{ V}$                                                                                        | 2.20             | 2.91    | 3.60 | 2.20              | 3.80 | V    |
| $V_{T-}$ | negative-going threshold voltage | see <a href="#">Figure 9</a> and <a href="#">Figure 10</a>                                                      |                  |         |      |                   |      |      |
|          |                                  | $V_{CC} = 1.8 \text{ V}$                                                                                        | 0.25             | 0.61    | 0.90 | 0.25              | 1.10 | V    |
|          |                                  | $V_{CC} = 2.3 \text{ V}$                                                                                        | 0.40             | 0.80    | 1.15 | 0.40              | 1.35 | V    |
|          |                                  | $V_{CC} = 3.0 \text{ V}$                                                                                        | 0.60             | 1.04    | 1.50 | 0.60              | 1.70 | V    |
|          |                                  | $V_{CC} = 4.5 \text{ V}$                                                                                        | 1.00             | 1.55    | 2.00 | 1.00              | 2.20 | V    |
|          |                                  | $V_{CC} = 5.5 \text{ V}$                                                                                        | 1.20             | 1.86    | 2.30 | 1.20              | 2.50 | V    |
| $V_H$    | hysteresis voltage               | $(V_{T+} - V_{T-})$ ; see <a href="#">Figure 9</a> ,<br><a href="#">Figure 10</a> and <a href="#">Figure 11</a> |                  |         |      |                   |      |      |
|          |                                  | $V_{CC} = 1.8 \text{ V}$                                                                                        | 0.15             | 0.49    | 1.00 | 0.15              | 1.20 | V    |
|          |                                  | $V_{CC} = 2.3 \text{ V}$                                                                                        | 0.25             | 0.60    | 1.10 | 0.25              | 1.30 | V    |
|          |                                  | $V_{CC} = 3.0 \text{ V}$                                                                                        | 0.40             | 0.73    | 1.20 | 0.40              | 1.40 | V    |
|          |                                  | $V_{CC} = 4.5 \text{ V}$                                                                                        | 0.60             | 0.92    | 1.50 | 0.60              | 1.70 | V    |
|          |                                  | $V_{CC} = 5.5 \text{ V}$                                                                                        | 0.70             | 1.02    | 1.70 | 0.70              | 1.90 | V    |

[1] All typical values are measured at  $T_{amb} = 25^\circ\text{C}$

12. Dynamic characteristics

Table 9. Dynamic characteristics  
Voltages are referenced to GND (ground = 0 V). For test circuit see Figure 8.

| 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             | nA to nY; see Figure 7 <sup>[2]</sup>                                            |                  |                    |      |                   |      |      |
|                 |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                               | 1.0              | 5.6                | 11.0 | 1.0               | 12.0 | ns   |
|                 |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                                 | 0.5              | 3.7                | 6.5  | 0.5               | 7.2  | ns   |
|                 |                               | V <sub>CC</sub> = 2.7 V                                                          | 0.5              | 4.1                | 7.0  | 0.5               | 7.7  | ns   |
|                 |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                                 | 0.5              | 3.9                | 6.0  | 0.5               | 6.7  | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                                 | 0.5              | 2.7                | 4.3  | 0.5               | 4.7  | 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 <sup>[3]</sup> | -                | 18.1               | -    | -                 | -    | 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).  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$  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.

13. Waveforms

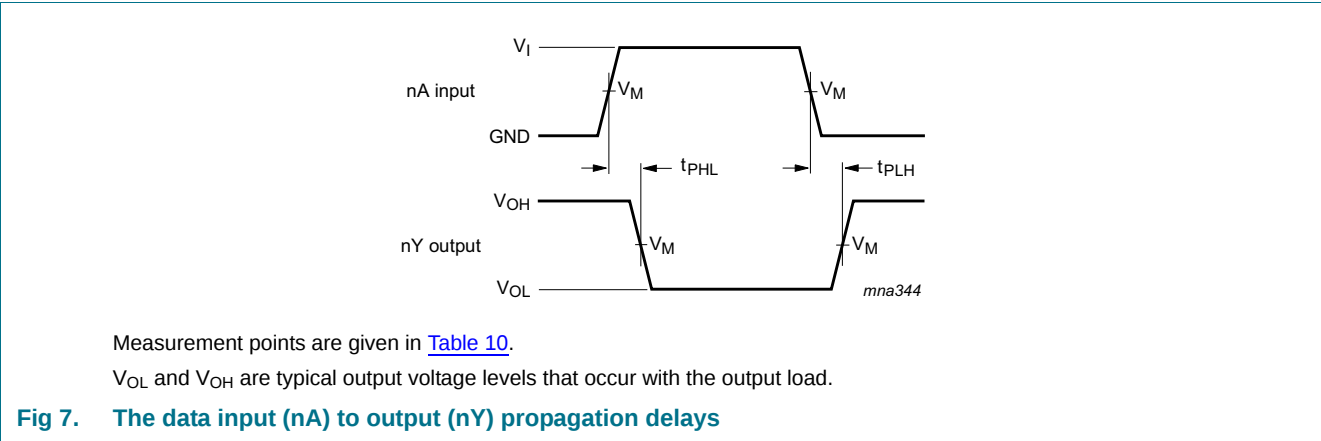
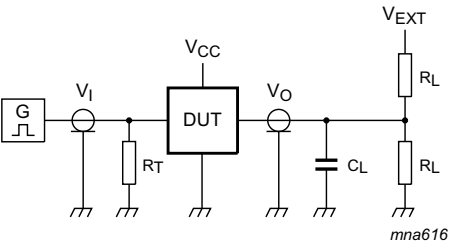


Table 10. Measurement points

| Supply voltage   | Input                 | Output                |
|------------------|-----------------------|-----------------------|
| V <sub>CC</sub>  | V <sub>M</sub>        | V <sub>M</sub>        |
| 1.65 V to 1.95 V | 0.5 × V <sub>CC</sub> | 0.5 × V <sub>CC</sub> |
| 2.3 V to 2.7 V   | 0.5 × V <sub>CC</sub> | 0.5 × V <sub>CC</sub> |
| 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 × V <sub>CC</sub> | 0.5 × V <sub>CC</sub> |



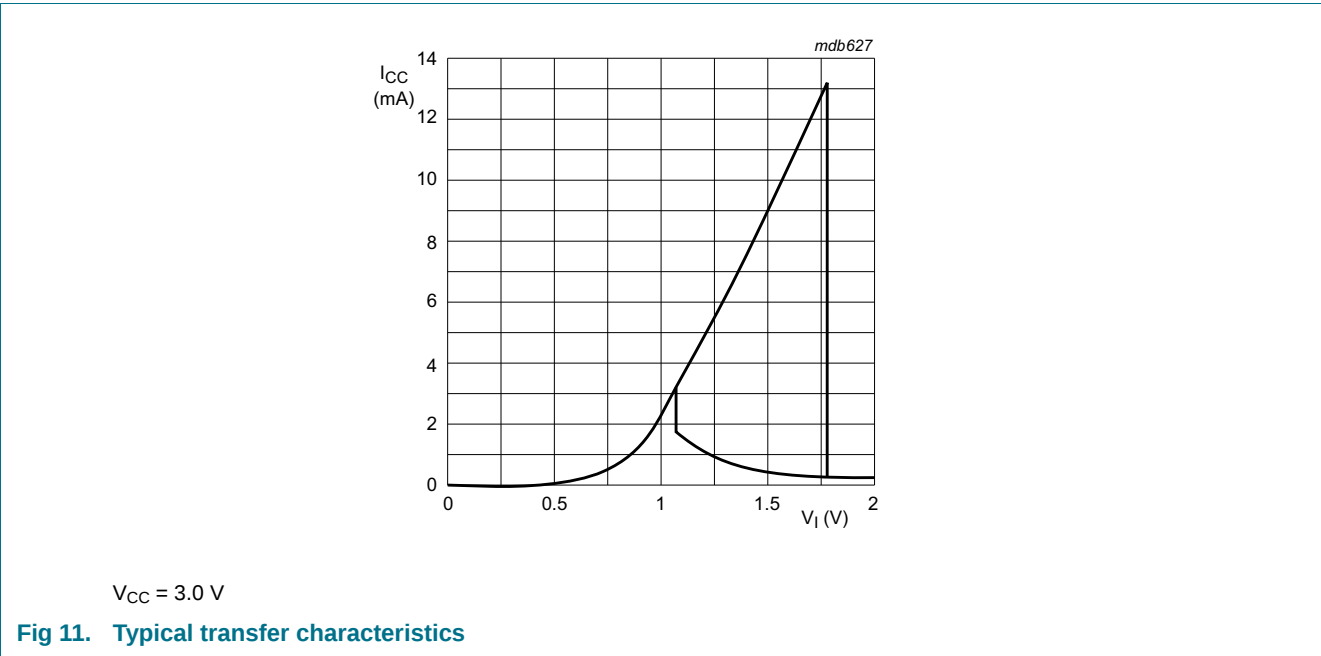
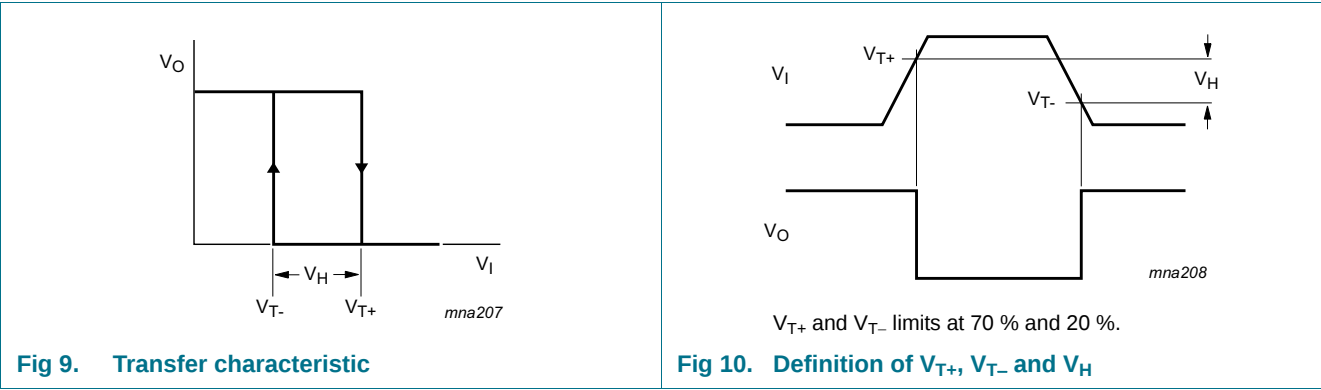
Test data is given in [Table 11](#).  
Definitions for test circuit:  
R<sub>L</sub> = Load resistance.  
C<sub>L</sub> = Load capacitance including jig and probe capacitance.  
R<sub>T</sub> = Termination resistance should be equal to the output impedance Z<sub>o</sub> of the pulse generator.  
V<sub>EXT</sub> = External voltage for measuring switching times.

Fig 8. Test circuit for measuring switching times

Table 11. 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> |
| 1.65 V to 1.95 V | V <sub>CC</sub> | ≤ 2.0 ns                        | 30 pF          | 1 kΩ           | open                                |
| 2.3 V to 2.7 V   | V <sub>CC</sub> | ≤ 2.0 ns                        | 30 pF          | 500 Ω          | open                                |
| 2.7 V            | 2.7 V           | ≤ 2.5 ns                        | 50 pF          | 500 Ω          | open                                |
| 3.0 V to 3.6 V   | 2.7 V           | ≤ 2.5 ns                        | 50 pF          | 500 Ω          | open                                |
| 4.5 V to 5.5 V   | V <sub>CC</sub> | ≤ 2.5 ns                        | 50 pF          | 500 Ω          | open                                |

14. Waveforms transfer characteristics



## 15. Application information

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

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

$P_{\text{add}}$  = additional power dissipation ( $\mu\text{W}$ );

$f_i$  = input frequency (MHz);

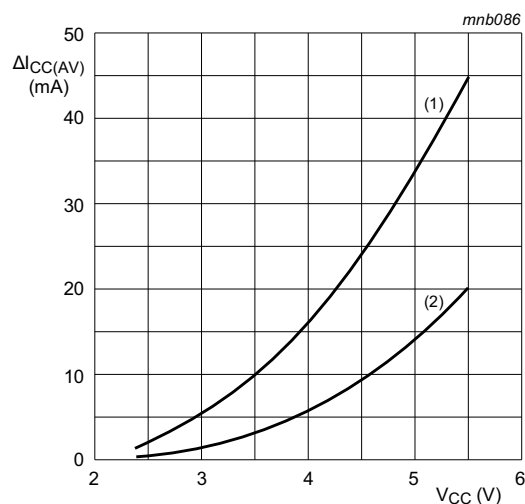
$t_r$  = input rise time (ns); 10 % to 90 %;

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

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

$\Delta I_{\text{CC(AV)}}$  differs with positive or negative input transitions, as shown in [Figure 12](#).

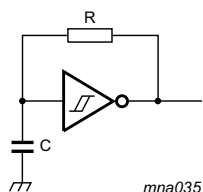
An example of a relaxation circuit using the 74LVC2G14 is shown in [Figure 13](#).



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

- (1) Positive-going edge.
- (2) Negative-going edge.

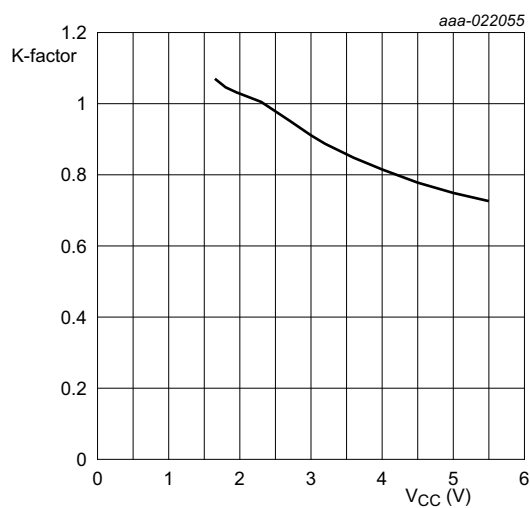
**Fig 12. Average  $I_{\text{CC}}$  as a function of  $V_{\text{CC}}$**



$$f = \frac{1}{T} \approx \frac{1}{K \times RC}$$

For K-factor, see [Figure 14](#)

**Fig 13. Relaxation oscillator**



**Fig 14. Typical K-factor for relaxation oscillator**

16. Package outline

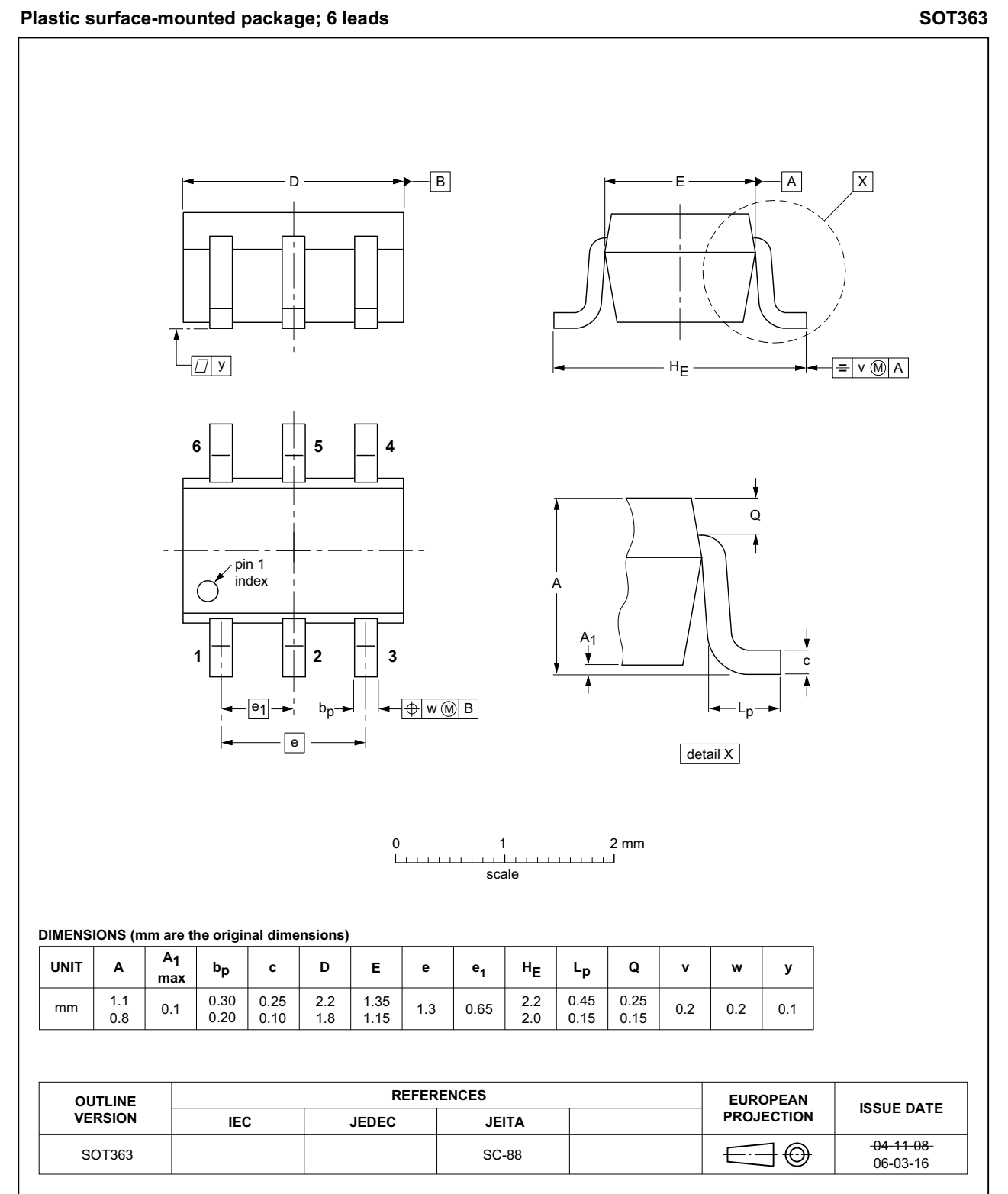


Fig 15. Package outline SOT363 (SC-88)

Plastic surface-mounted package (TSOP6); 6 leads

SOT457

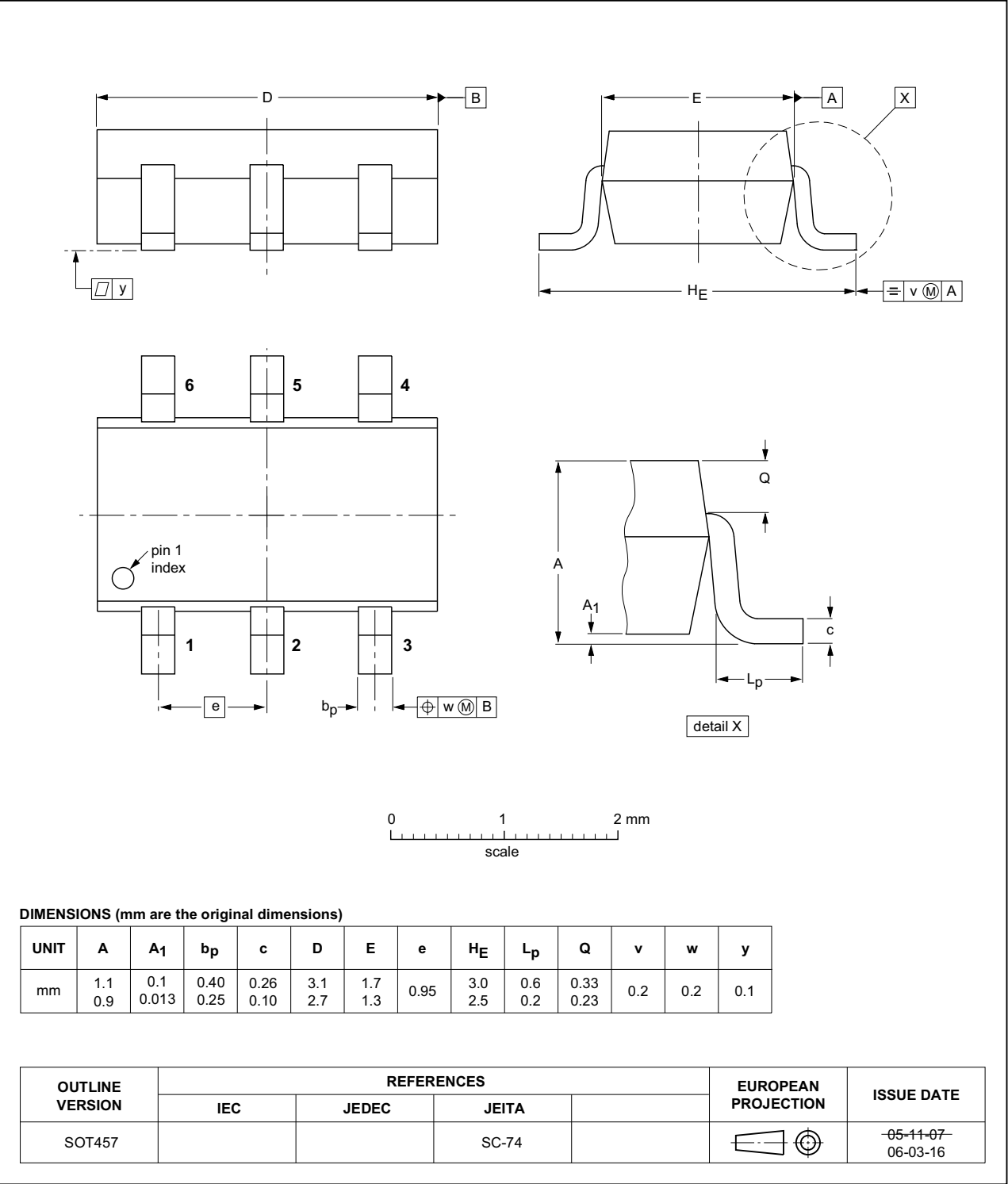


Fig 16. Package outline SOT457 (SC-74)

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

SOT886

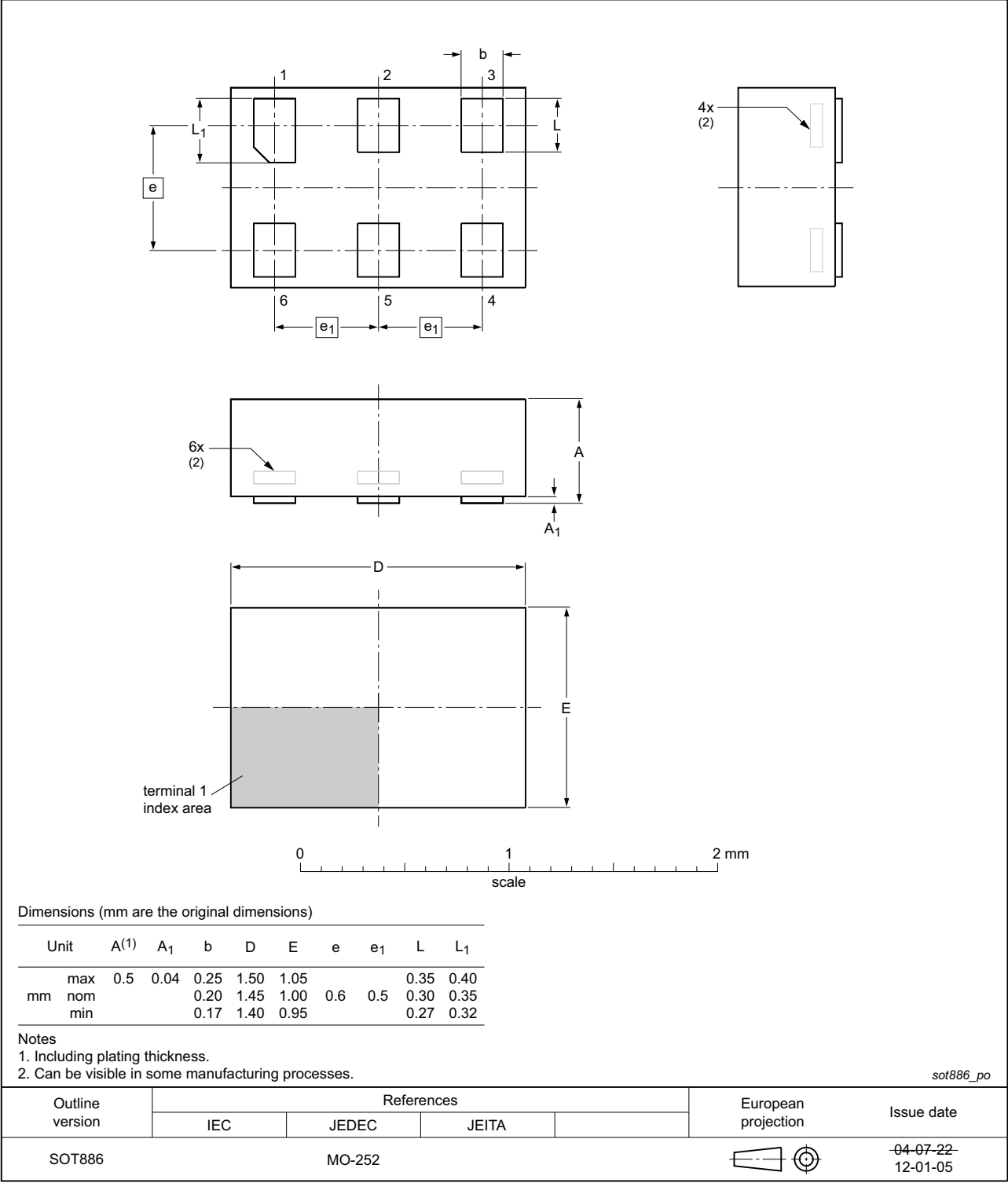


Fig 17. Package outline SOT886 (XSON6)

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

SOT891

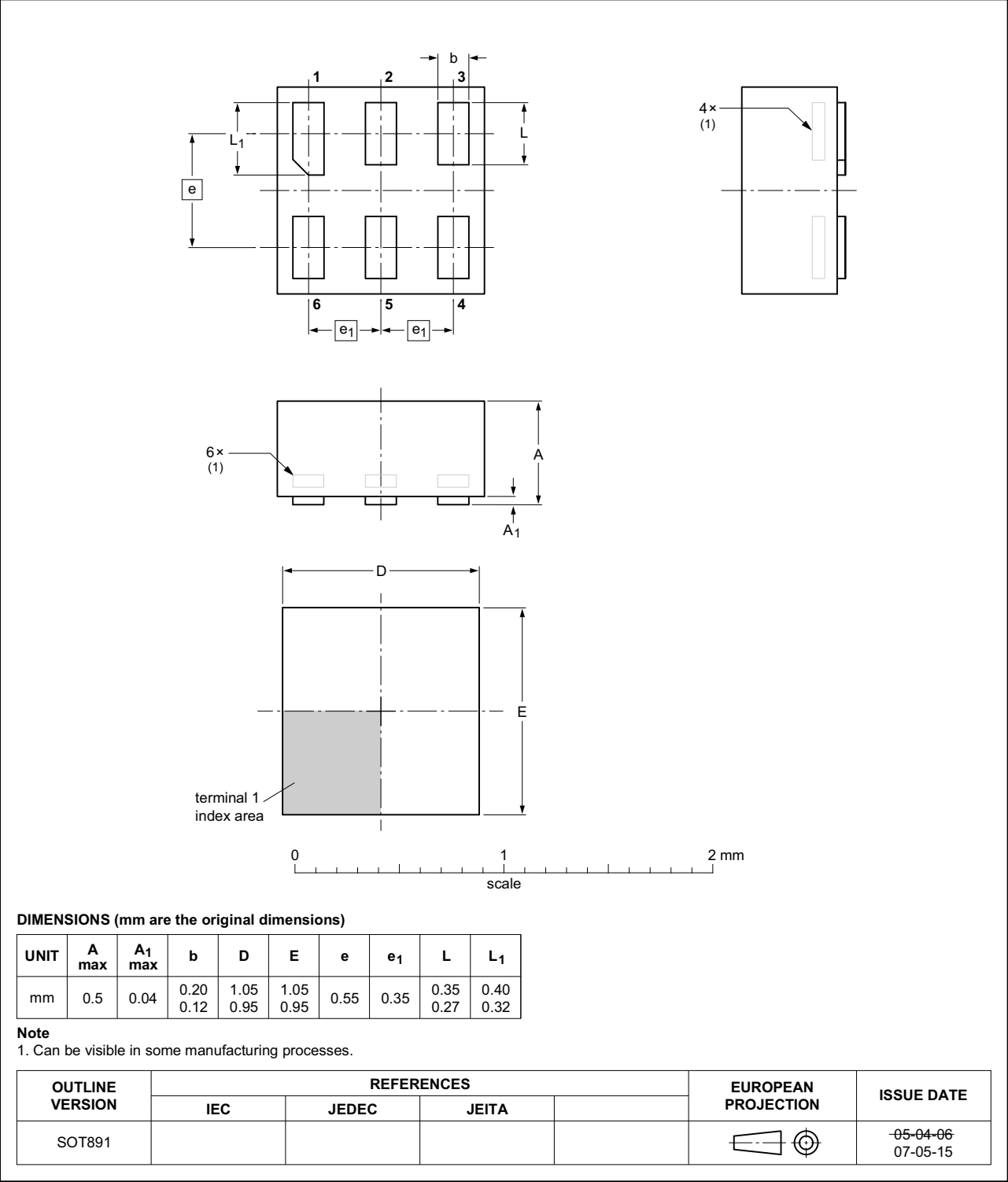


Fig 18. Package outline SOT891 (XSON6)

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

SOT1115

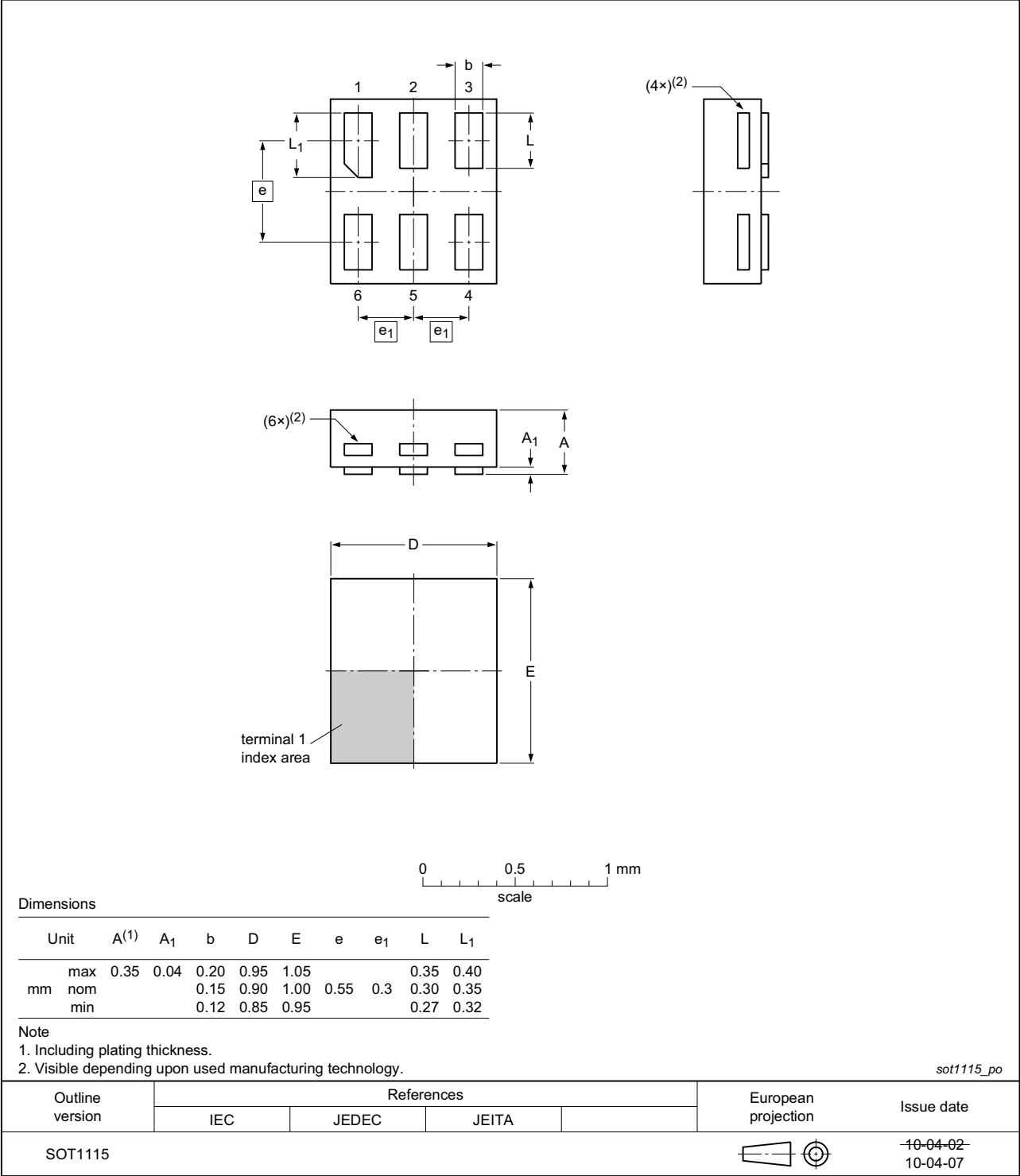
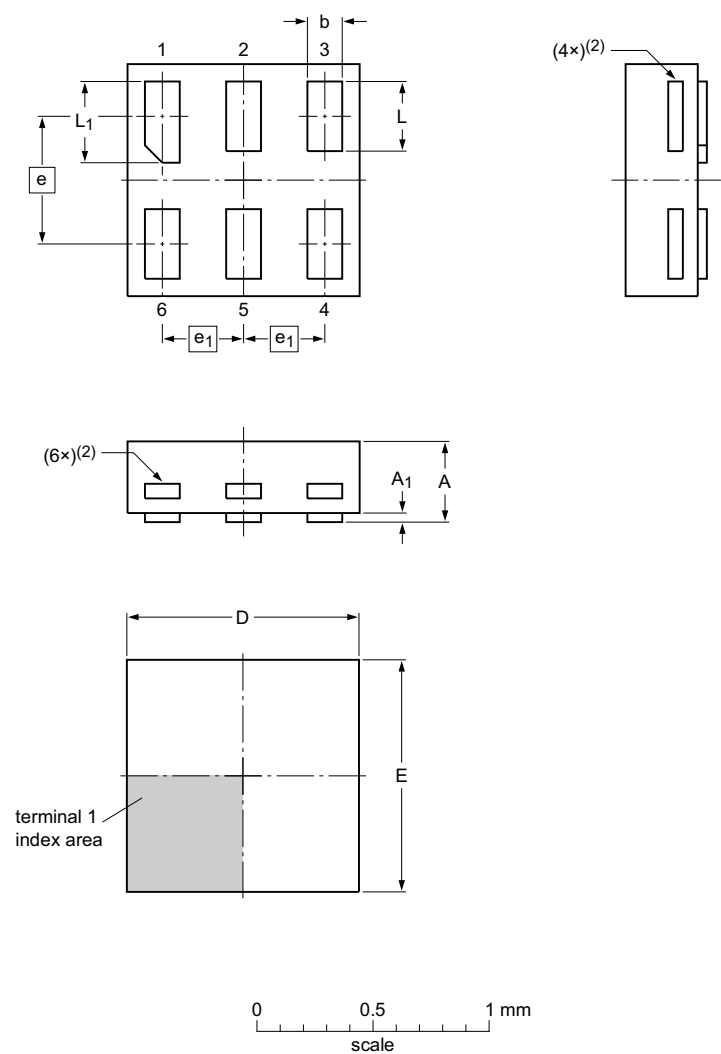


Fig 19. Package outline SOT1115 (XSON6)

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

SOT1202



Dimensions

| Unit | A <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

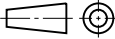
| Outline version | References |       |       |  | European projection                                                                   | Issue date                      |
|-----------------|------------|-------|-------|--|---------------------------------------------------------------------------------------|---------------------------------|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

Fig 20. Package outline SOT1202 (XSON6)

## 17. Abbreviations

Table 12. 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             |

## 18. Revision history

Table 13. Revision history

| Document ID    | Release date                                                                                                                                       | Data sheet status     | Change notice | Supersedes    |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|---------------|
| 74LVC2G14 v.10 | 20161215                                                                                                                                           | Product data sheet    | -             | 74LVC2G14 v.9 |
| 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> |                       |               |               |
| 74LVC2G14 v.9  | 20160315                                                                                                                                           | Product data sheet    | -             | 74LVC2G14 v.8 |
| Modifications: | <ul style="list-style-type: none"> <li><a href="#">Figure 14</a> added (typical K-factor for relaxation oscillator).</li> </ul>                    |                       |               |               |
| 74LVC2G14 v.8  | 20140910                                                                                                                                           | Product data sheet    |               | 74LVC2G14 v.7 |
| Modifications: | <ul style="list-style-type: none"> <li>Package outline drawing of SOT886 (<a href="#">Figure 17</a>) modified.</li> </ul>                          |                       |               |               |
| 74LVC2G14 v.7  | 20111130                                                                                                                                           | Product data sheet    |               | 74LVC2G14 v.6 |
| 74LVC2G14 v.6  | 20110923                                                                                                                                           | Product data sheet    |               | 74LVC2G14 v.5 |
| 74LVC2G14 v.5  | 20101029                                                                                                                                           | Product data sheet    |               | 74LVC2G14 v.4 |
| 74LVC2G14 v.4  | 20070904                                                                                                                                           | Product data sheet    |               | 74LVC2G14 v.3 |
| 74LVC2G14 v.3  | 20070220                                                                                                                                           | Product data sheet    |               | 74LVC2G14 v.2 |
| 74LVC2G14 v.2  | 20040908                                                                                                                                           | Product specification | -             | 74LVC2G14 v.1 |
| 74LVC2G14 v.1  | 20030731                                                                                                                                           | Product specification |               | -             |

## 19. Legal information

### 19.1 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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