

# 74LVC2G14

## Dual inverting Schmitt trigger with 5 V tolerant input

Rev. 11 — 10 August 2018

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 [1] |
|-------------|------------------|
| 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

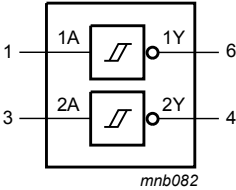


Fig. 1. Logic symbol

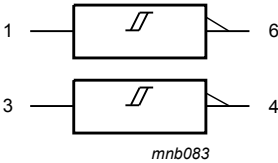


Fig. 2. IEC logic symbol

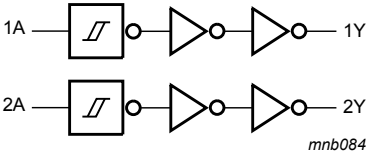


Fig. 3. Logic diagram

7. Pinning information

7.1. Pinning

**Fig. 4. Pin configuration SOT363 (SC-88) and SOT457 (TSOP6)**

**Fig. 5. Pin configuration SOT886 (XSON6)**

**Fig. 6. Pin configuration SOT891, SOT1115 and SOT1202 (XSON6)**

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

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

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

## 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           | [1]                                 | -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 [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 $V_{CC}$             | -    | $\pm 50$       | 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 [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 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 [1] | Max | Unit |
|--------------------------------|---------------------------|--------------------------------------------------|----------------|---------|-----|------|
| $T_{amb} = -40$ °C to $+85$ °C |                           |                                                  |                |         |     |      |
| $V_{OH}$                       | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}$                       |                |         |     |      |
|                                |                           | $I_O = -100$ $\mu$ A; $V_{CC} = 1.65$ V to 5.5 V | $V_{CC} - 0.1$ | -       | -   | V    |
|                                |                           | $I_O = -4$ mA; $V_{CC} = 1.65$ V                 | 1.2            | -       | -   | V    |
|                                |                           | $I_O = -8$ mA; $V_{CC} = 2.3$ V                  | 1.9            | -       | -   | V    |
|                                |                           | $I_O = -12$ mA; $V_{CC} = 2.7$ V                 | 2.2            | -       | -   | V    |
|                                |                           | $I_O = -24$ mA; $V_{CC} = 3.0$ V                 | 2.3            | -       | -   | V    |
|                                |                           | $I_O = -32$ mA; $V_{CC} = 4.5$ V                 | 3.8            | -       | -   | V    |

## Dual inverting Schmitt trigger with 5 V tolerant input

| Symbol                                                                                 | Parameter                 | Conditions                                                                                         | Min            | Typ [1]   | Max     | Unit          |
|----------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------|----------------|-----------|---------|---------------|
| $V_{OL}$                                                                               | LOW-level output voltage  | $V_I = V_{T+}$ or $V_{T-}$                                                                         |                |           |         |               |
|                                                                                        |                           | $I_O = 100\ \mu\text{A}$ ; $V_{CC} = 1.65\ \text{V}$ to $5.5\ \text{V}$                            | -              | -         | 0.1     | V             |
|                                                                                        |                           | $I_O = 4\ \text{mA}$ ; $V_{CC} = 1.65\ \text{V}$                                                   | -              | -         | 0.45    | V             |
|                                                                                        |                           | $I_O = 8\ \text{mA}$ ; $V_{CC} = 2.3\ \text{V}$                                                    | -              | -         | 0.3     | V             |
|                                                                                        |                           | $I_O = 12\ \text{mA}$ ; $V_{CC} = 2.7\ \text{V}$                                                   | -              | -         | 0.4     | V             |
|                                                                                        |                           | $I_O = 24\ \text{mA}$ ; $V_{CC} = 3.0\ \text{V}$                                                   | -              | -         | 0.55    | V             |
|                                                                                        |                           | $I_O = 32\ \text{mA}$ ; $V_{CC} = 4.5\ \text{V}$                                                   | -              | -         | 0.55    | V             |
| $I_I$                                                                                  | input leakage current     | $V_I = 5.5\ \text{V}$ or GND; $V_{CC} = 0\ \text{V}$ to $5.5\ \text{V}$                            | -              | $\pm 0.1$ | $\pm 1$ | $\mu\text{A}$ |
| $I_{OFF}$                                                                              | power-off leakage current | $V_I$ or $V_O = 5.5\ \text{V}$ ; $V_{CC} = 0\ \text{V}$                                            | -              | $\pm 0.1$ | $\pm 2$ | $\mu\text{A}$ |
| $I_{CC}$                                                                               | supply current            | $V_I = 5.5\ \text{V}$ or GND; $V_{CC} = 1.65\ \text{V}$ to $5.5\ \text{V}$ ; $I_O = 0\ \text{A}$   | -              | 0.1       | 4       | $\mu\text{A}$ |
| $\Delta I_{CC}$                                                                        | additional supply current | $V_I = V_{CC} - 0.6\ \text{V}$ ; $I_O = 0\ \text{A}$ ; $V_{CC} = 2.3\ \text{V}$ to $5.5\ \text{V}$ | -              | 5         | 500     | $\mu\text{A}$ |
| $C_I$                                                                                  | input capacitance         | $V_{CC} = 3.3\ \text{V}$ ; $V_I = \text{GND}$ to $V_{CC}$                                          | -              | 3.5       | -       | pF            |
| <b><math>T_{amb} = -40\ ^\circ\text{C}</math> to <math>+125\ ^\circ\text{C}</math></b> |                           |                                                                                                    |                |           |         |               |
| $V_{OH}$                                                                               | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}$                                                                         |                |           |         |               |
|                                                                                        |                           | $I_O = -100\ \mu\text{A}$ ; $V_{CC} = 1.65\ \text{V}$ to $5.5\ \text{V}$                           | $V_{CC} - 0.1$ | -         | -       | V             |
|                                                                                        |                           | $I_O = -4\ \text{mA}$ ; $V_{CC} = 1.65\ \text{V}$                                                  | 0.95           | -         | -       | V             |
|                                                                                        |                           | $I_O = -8\ \text{mA}$ ; $V_{CC} = 2.3\ \text{V}$                                                   | 1.7            | -         | -       | V             |
|                                                                                        |                           | $I_O = -12\ \text{mA}$ ; $V_{CC} = 2.7\ \text{V}$                                                  | 1.9            | -         | -       | V             |
|                                                                                        |                           | $I_O = -24\ \text{mA}$ ; $V_{CC} = 3.0\ \text{V}$                                                  | 2.0            | -         | -       | V             |
|                                                                                        |                           | $I_O = -32\ \text{mA}$ ; $V_{CC} = 4.5\ \text{V}$                                                  | 3.4            | -         | -       | V             |
| $V_{OL}$                                                                               | LOW-level output voltage  | $V_I = V_{T+}$ or $V_{T-}$                                                                         |                |           |         |               |
|                                                                                        |                           | $I_O = 100\ \mu\text{A}$ ; $V_{CC} = 1.65\ \text{V}$ to $5.5\ \text{V}$                            | -              | -         | 0.1     | V             |
|                                                                                        |                           | $I_O = 4\ \text{mA}$ ; $V_{CC} = 1.65\ \text{V}$                                                   | -              | -         | 0.7     | V             |
|                                                                                        |                           | $I_O = 8\ \text{mA}$ ; $V_{CC} = 2.3\ \text{V}$                                                    | -              | -         | 0.45    | V             |
|                                                                                        |                           | $I_O = 12\ \text{mA}$ ; $V_{CC} = 2.7\ \text{V}$                                                   | -              | -         | 0.6     | V             |
|                                                                                        |                           | $I_O = 24\ \text{mA}$ ; $V_{CC} = 3.0\ \text{V}$                                                   | -              | -         | 0.8     | V             |
|                                                                                        |                           | $I_O = 32\ \text{mA}$ ; $V_{CC} = 4.5\ \text{V}$                                                   | -              | -         | 0.8     | V             |
| $I_I$                                                                                  | 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; $V_{CC} = 1.65\ \text{V}$ to $5.5\ \text{V}$ ; $I_O = 0\ \text{A}$   | -              | -         | 4       | $\mu\text{A}$ |
| $\Delta I_{CC}$                                                                        | additional supply current | $V_I = V_{CC} - 0.6\ \text{V}$ ; $I_O = 0\ \text{A}$ ; $V_{CC} = 2.3\ \text{V}$ to $5.5\ \text{V}$ | -              | -         | 500     | $\mu\text{A}$ |

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

12. Transfer characteristics

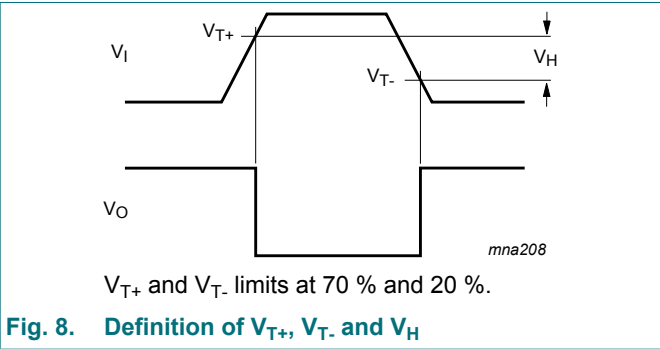
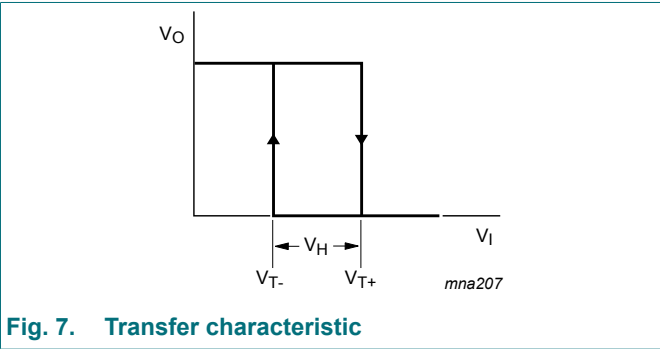
Table 8. Transfer characteristics

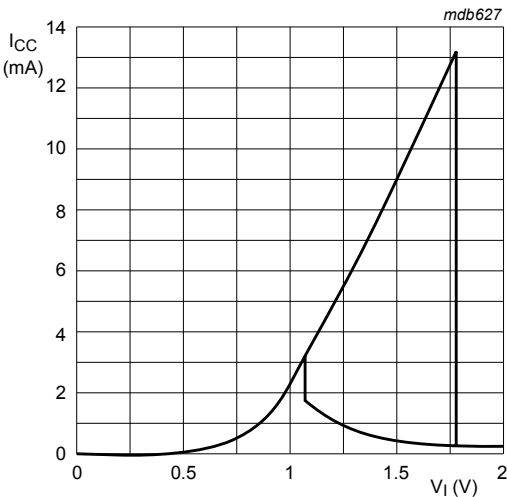
Voltages are referenced to GND (ground = 0 V; for test circuit see Fig. 11

| Symbol          | Parameter                        | Conditions                                                  | -40 °C to +85 °C |         |      | -40 °C to +125 °C |      | Unit |
|-----------------|----------------------------------|-------------------------------------------------------------|------------------|---------|------|-------------------|------|------|
|                 |                                  |                                                             | Min              | Typ [1] | Max  | Min               | Max  |      |
| V <sub>T+</sub> | positive-going threshold voltage | see Fig. 7 and Fig. 8                                       |                  |         |      |                   |      |      |
|                 |                                  | V <sub>CC</sub> = 1.8 V                                     | 0.70             | 1.10    | 1.50 | 0.70              | 1.70 | V    |
|                 |                                  | V <sub>CC</sub> = 2.3 V                                     | 1.00             | 1.40    | 1.80 | 1.00              | 2.00 | V    |
|                 |                                  | V <sub>CC</sub> = 3.0 V; see Fig. 9                         | 1.30             | 1.76    | 2.20 | 1.30              | 2.40 | V    |
|                 |                                  | V <sub>CC</sub> = 4.5 V                                     | 1.90             | 2.47    | 3.10 | 1.90              | 3.30 | V    |
|                 |                                  | V <sub>CC</sub> = 5.5 V                                     | 2.20             | 2.91    | 3.60 | 2.20              | 3.80 | V    |
| V <sub>T-</sub> | negative-going threshold voltage | see Fig. 7 and Fig. 8                                       |                  |         |      |                   |      |      |
|                 |                                  | V <sub>CC</sub> = 1.8 V                                     | 0.25             | 0.61    | 0.90 | 0.25              | 1.10 | V    |
|                 |                                  | V <sub>CC</sub> = 2.3 V                                     | 0.40             | 0.80    | 1.15 | 0.40              | 1.35 | V    |
|                 |                                  | V <sub>CC</sub> = 3.0 V; see Fig. 9                         | 0.60             | 1.04    | 1.50 | 0.60              | 1.70 | V    |
|                 |                                  | V <sub>CC</sub> = 4.5 V                                     | 1.00             | 1.55    | 2.00 | 1.00              | 2.20 | V    |
|                 |                                  | V <sub>CC</sub> = 5.5 V                                     | 1.20             | 1.86    | 2.30 | 1.20              | 2.50 | V    |
| V <sub>H</sub>  | hysteresis voltage               | (V <sub>T+</sub> - V <sub>T-</sub> ); see Fig. 7 and Fig. 8 |                  |         |      |                   |      |      |
|                 |                                  | V <sub>CC</sub> = 1.8 V                                     | 0.15             | 0.49    | 1.00 | 0.15              | 1.20 | V    |
|                 |                                  | V <sub>CC</sub> = 2.3 V                                     | 0.25             | 0.60    | 1.10 | 0.25              | 1.30 | V    |
|                 |                                  | V <sub>CC</sub> = 3.0 V; see Fig. 9                         | 0.40             | 0.73    | 1.20 | 0.40              | 1.40 | V    |
|                 |                                  | V <sub>CC</sub> = 4.5 V                                     | 0.60             | 0.92    | 1.50 | 0.60              | 1.70 | V    |
|                 |                                  | V <sub>CC</sub> = 5.5 V                                     | 0.70             | 1.02    | 1.70 | 0.70              | 1.90 | V    |

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

12.1. Waveforms transfer characteristics





$V_{CC} = 3.0\text{ V}$

Fig. 9. Typical transfer characteristics

13. Dynamic characteristics

Table 9. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V). For test circuit see Fig. 11.

| Symbol   | Parameter                     | Conditions                                              | -40 °C to +85 °C |         |      | -40 °C to +125 °C |      | Unit |
|----------|-------------------------------|---------------------------------------------------------|------------------|---------|------|-------------------|------|------|
|          |                               |                                                         | Min              | Typ [1] | Max  | Min               | Max  |      |
| $t_{pd}$ | propagation delay             | nA to nY; see Fig. 10 [2]                               |                  |         |      |                   |      |      |
|          |                               | $V_{CC} = 1.65\text{ V to }1.95\text{ V}$               | 1.0              | 5.6     | 11.0 | 1.0               | 12.0 | ns   |
|          |                               | $V_{CC} = 2.3\text{ V to }2.7\text{ V}$                 | 0.5              | 3.7     | 6.5  | 0.5               | 7.2  | ns   |
|          |                               | $V_{CC} = 2.7\text{ V}$                                 | 0.5              | 4.1     | 7.0  | 0.5               | 7.7  | ns   |
|          |                               | $V_{CC} = 3.0\text{ V to }3.6\text{ V}$                 | 0.5              | 3.9     | 6.0  | 0.5               | 6.7  | ns   |
|          |                               | $V_{CC} = 4.5\text{ V to }5.5\text{ V}$                 | 0.5              | 2.7     | 4.3  | 0.5               | 4.7  | ns   |
| $C_{PD}$ | power dissipation capacitance | $V_I = \text{GND to }V_{CC}; V_{CC} = 3.3\text{ V}$ [3] | -                | 18.1    | -    | -                 | -    | pF   |

[1] Typical values are measured at  $T_{amb} = 25\text{ °C}$  and  $V_{CC} = 1.8\text{ V}, 2.5\text{ V}, 2.7\text{ V}, 3.3\text{ V}$  and  $5.0\text{ V}$  respectively.

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

[3]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ ).

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

$f_i$  = input frequency in MHz;

$f_o$  = output frequency in MHz;

$C_L$  = output load capacitance in pF;

$V_{CC}$  = supply voltage in V;

$N$  = number of inputs switching;

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

13.1. Waveforms and test circuit

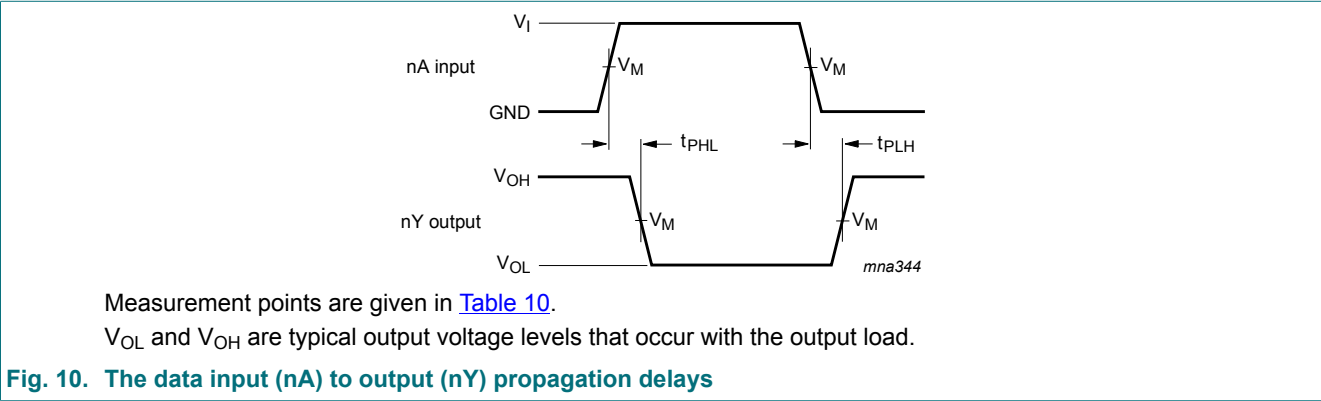


Table 10. Measurement points

| 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   | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |

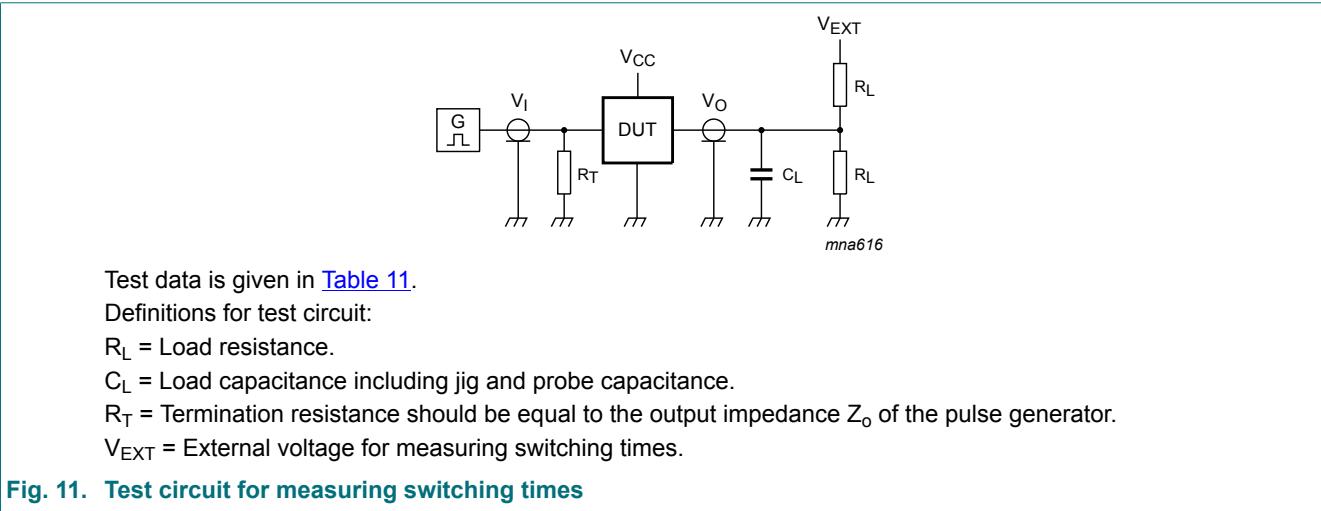


Table 11. Test data

| 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               |

## 14. 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);

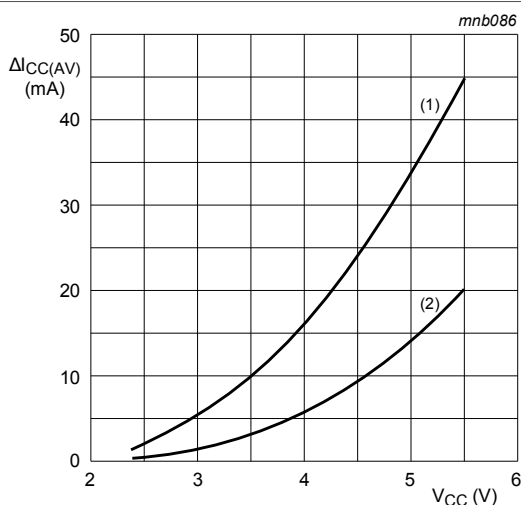
$t_r$  = input rise time (ns); 10 % to 90 %;

$t_f$  = 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 [Fig. 12](#).

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

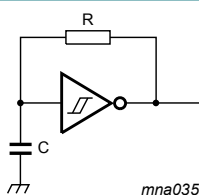


Linear change of  $V_i$  between 0.8 V to 2.0 V. All values given are typical unless otherwise specified.

(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 [Fig. 14](#)

**Fig. 13.** Relaxation oscillator

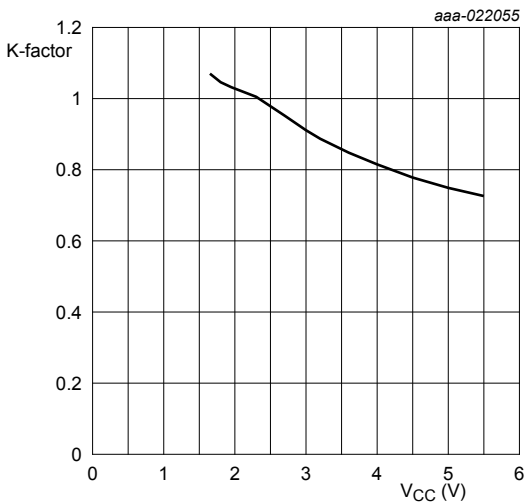


Fig. 14. Typical K-factor for relaxation oscillator

15. Package outline

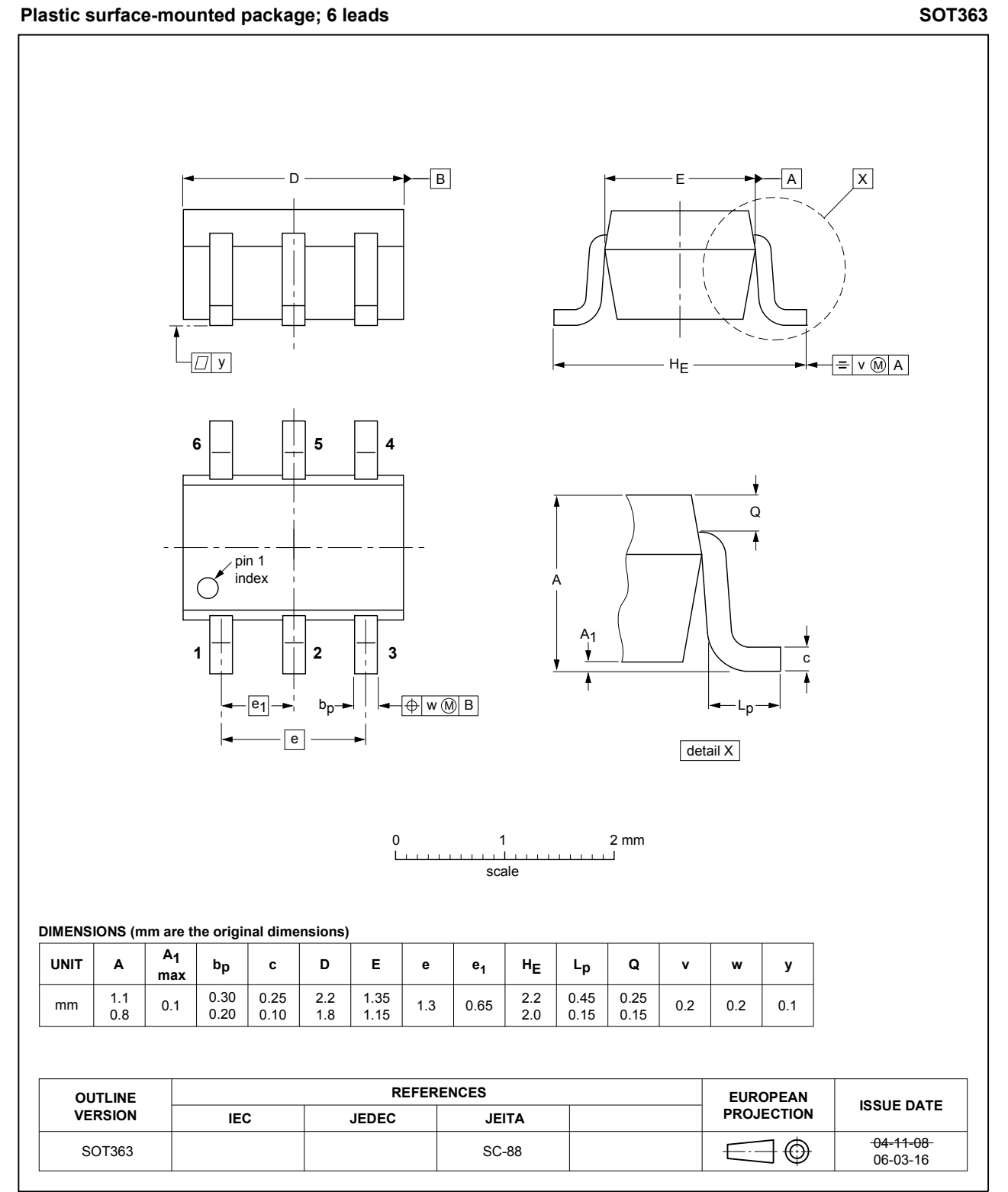
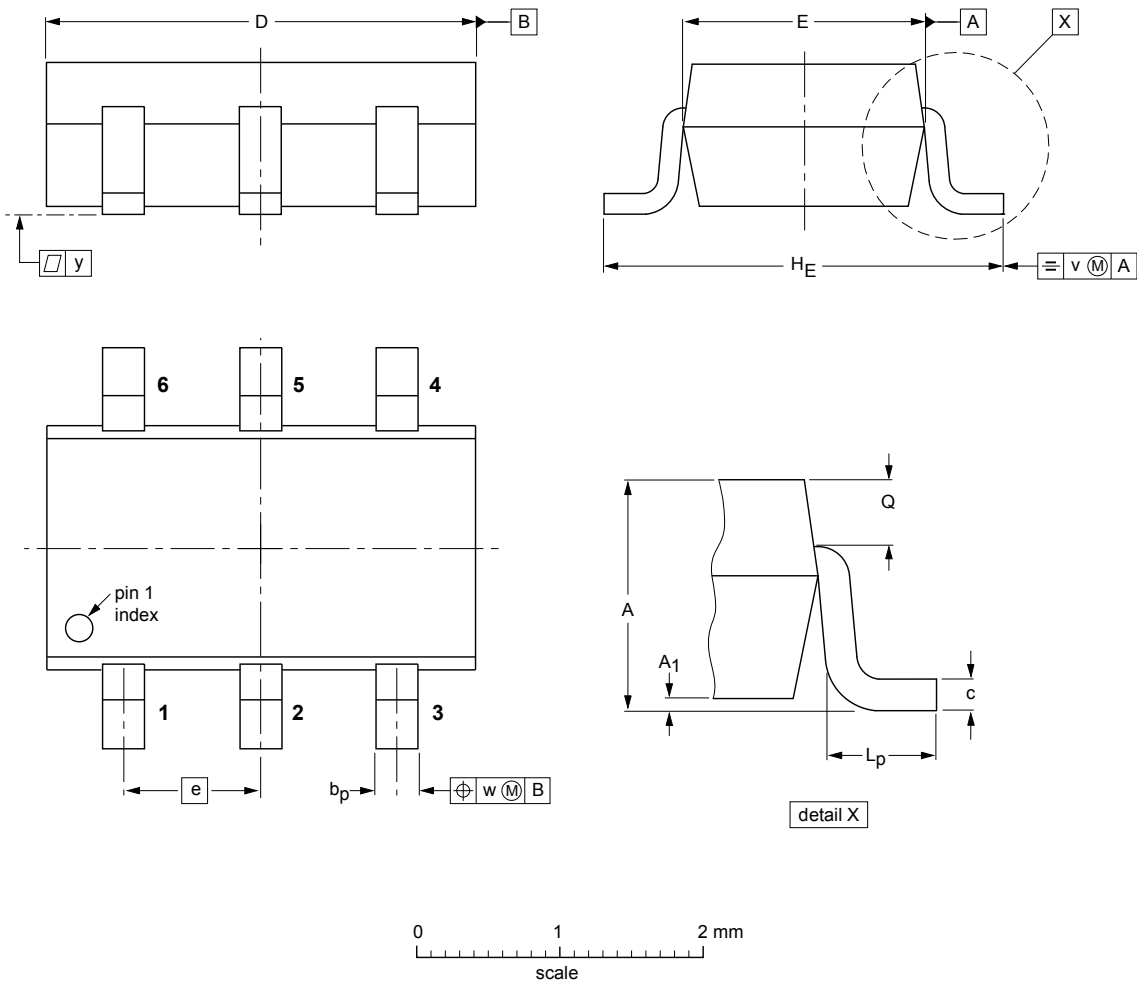


Fig. 15. Package outline SOT363 (SC-88)

Plastic surface-mounted package (TSOP6); 6 leads

SOT457



DIMENSIONS (mm are the original dimensions)

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

| OUTLINE<br>VERSION | REFERENCES |       |       |  | EUROPEAN<br>PROJECTION | ISSUE DATE           |
|--------------------|------------|-------|-------|--|------------------------|----------------------|
|                    | IEC        | JEDEC | JEITA |  |                        |                      |
| SOT457             |            |       | SC-74 |  |                        | 05-11-07<br>06-03-16 |

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

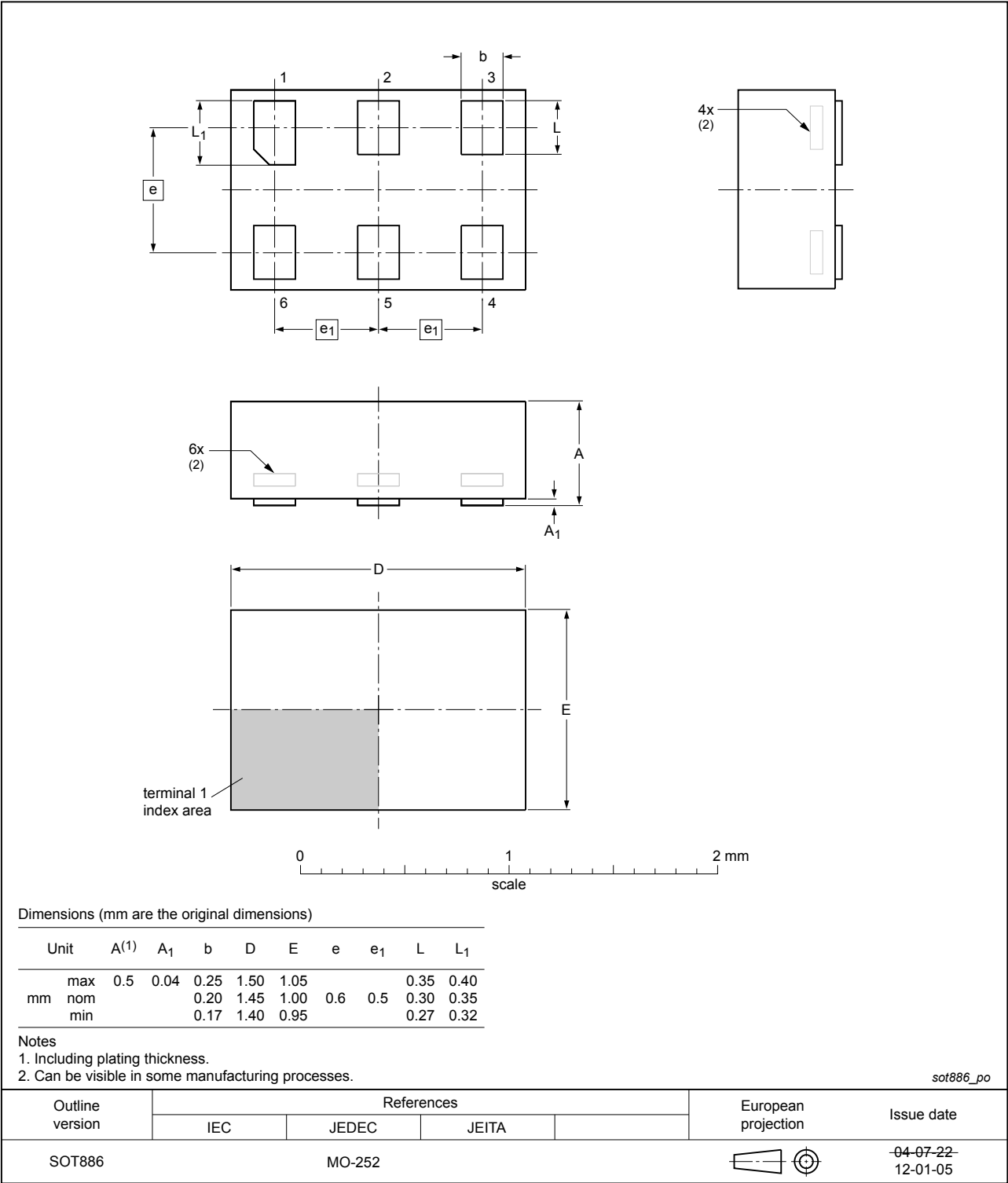
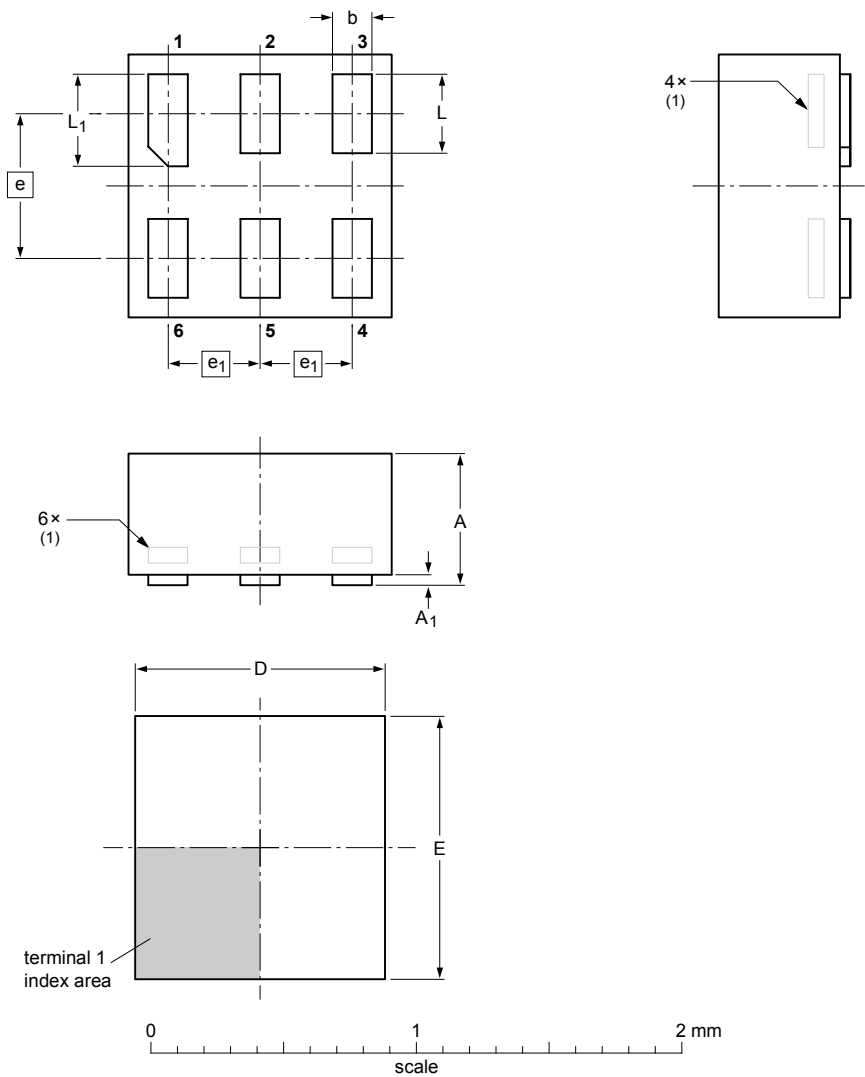


Fig. 17. Package outline SOT886 (XSON6)

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

SOT891



DIMENSIONS (mm are the original dimensions)

| UNIT | A<br>max | A1<br>max | b            | D            | E            | e    | e1   | L            | L1           |
|------|----------|-----------|--------------|--------------|--------------|------|------|--------------|--------------|
| 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. 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

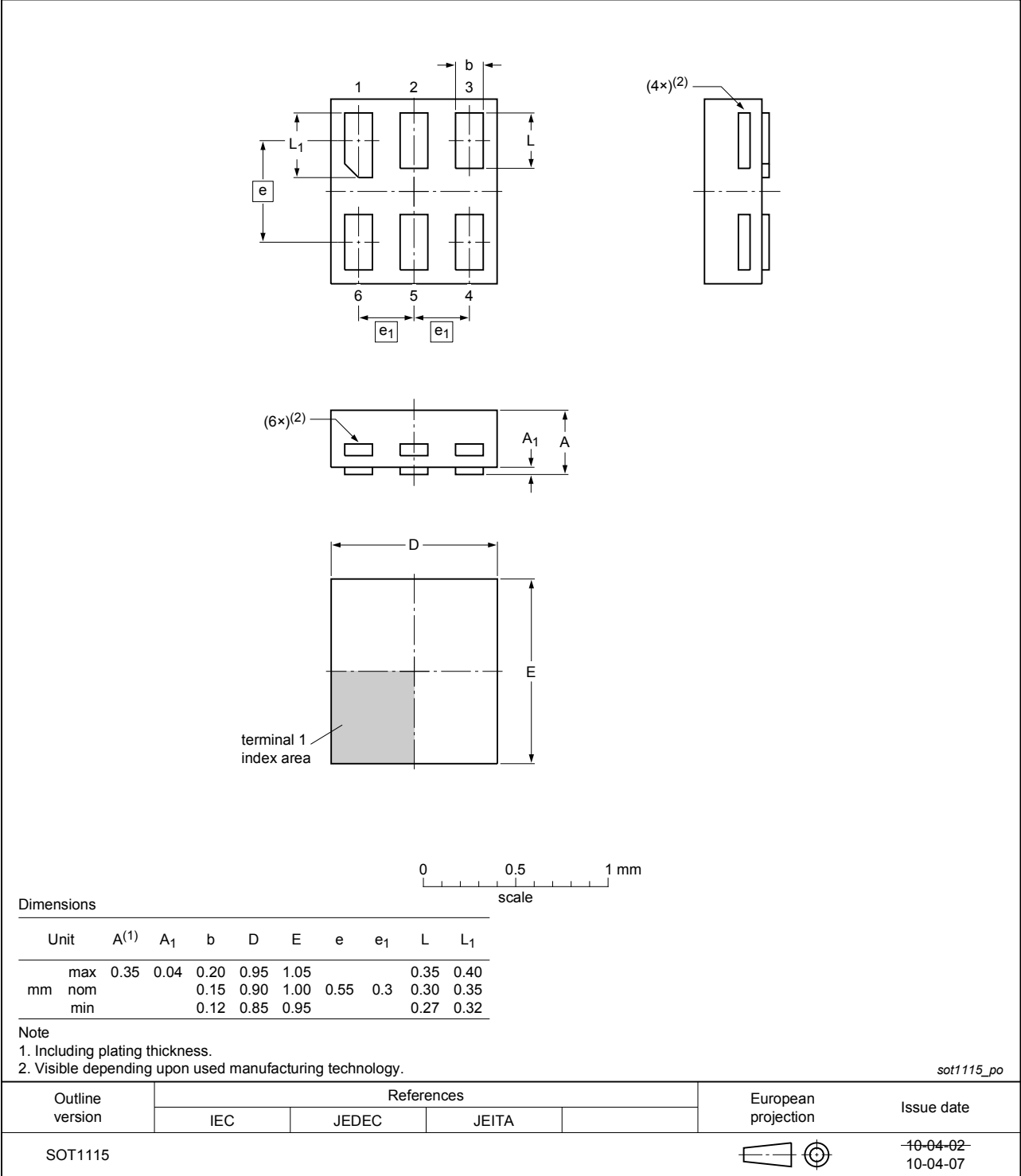
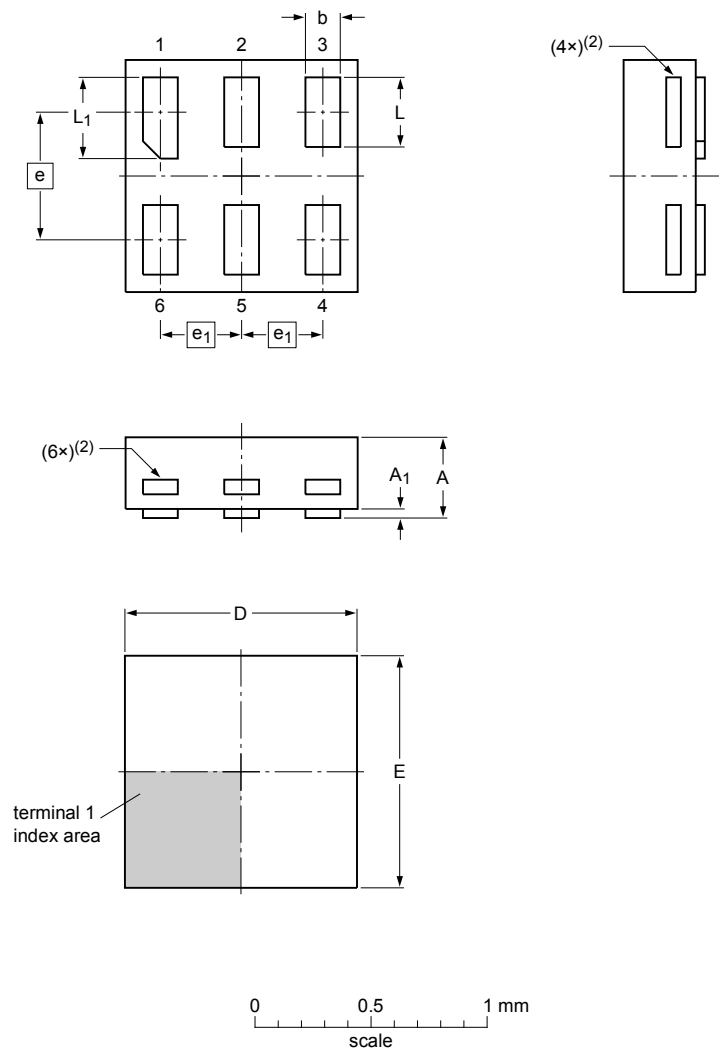


Fig. 19. Package outline SOT1115 (XSON6)

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)

## 16. 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             |

## 17. Revision history

Table 13. Revision history

| Document ID    | Release date                                                                                                                                                                                                                              | Data sheet status     | Change notice | Supersedes     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|----------------|
| 74LVC2G14 v.11 | 20180810                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC2G14 v.10 |
| 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> |                       |               |                |
| 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="#">Fig. 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="#">Fig. 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 | -             | -              |

## 18. Legal information

### Data sheet status

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

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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