

# 74LVC1G04

Single inverter

Rev. 15 — 8 June 2018

Product data sheet

## 1 General description

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The 74LVC1G04 provides one inverting buffer.

Input can be driven from either 3.3 V or 5 V devices. These features allow the use of these devices in a mixed 3.3 V and 5 V environment.

Schmitt-trigger action at all 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)
  - JESD8-B/JESD36 (2.7 V to 3.6 V)
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 Class 2 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
- Inputs accept voltages up to 5 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   |
| 74LVC1G04GW  | -40 °C to +125 °C | TSSOP5 | plastic thin shrink small outline package; 5 leads; body width 1.25 mm                                         | SOT353-1  |
| 74LVC1G04GV  | -40 °C to +125 °C | SC-74A | plastic surface-mounted package; 5 leads                                                                       | SOT753    |
| 74LVC1G04GM  | -40 °C to +125 °C | XSON6  | plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm                    | SOT886    |
| 74LVC1G04GF  | -40 °C to +125 °C | XSON6  | plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1 x 0.5 mm                       | SOT891    |
| 74LVC1G04GN  | -40 °C to +125 °C | XSON6  | extremely thin small outline package; no leads; 6 terminals; body 0.9 x 1.0 x 0.35 mm                          | SOT1115   |
| 74LVC1G04GS  | -40 °C to +125 °C | XSON6  | extremely thin small outline package; no leads; 6 terminals; body 1.0 x 1.0 x 0.35 mm                          | SOT1202   |
| 74LVC1G04GX  | -40 °C to +125 °C | X2SON5 | plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 x 0.8 x 0.35 mm | SOT1226   |
| 74LVC1G04GX4 | -40 °C to +125 °C | X2SON4 | plastic thermal enhanced extremely thin small outline package; no leads; 4 terminals; body 0.6 x 0.6 x 0.32 mm | SOT1269-2 |

4 Marking

Table 2. Marking

| Type number  | Marking code <sup>[1]</sup> |
|--------------|-----------------------------|
| 74LVC1G04GW  | VC                          |
| 74LVC1G04GV  | V04                         |
| 74LVC1G04GM  | VC                          |
| 74LVC1G04GF  | VC                          |
| 74LVC1G04GN  | VC                          |
| 74LVC1G04GS  | VC                          |
| 74LVC1G04GX  | VC                          |
| 74LVC1G04GX4 | VC                          |

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

5 Functional diagram

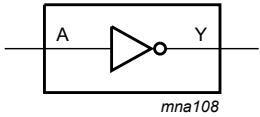


Figure 1. Logic symbol

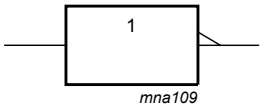


Figure 2. IEC logic symbol

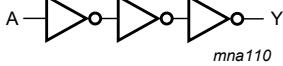
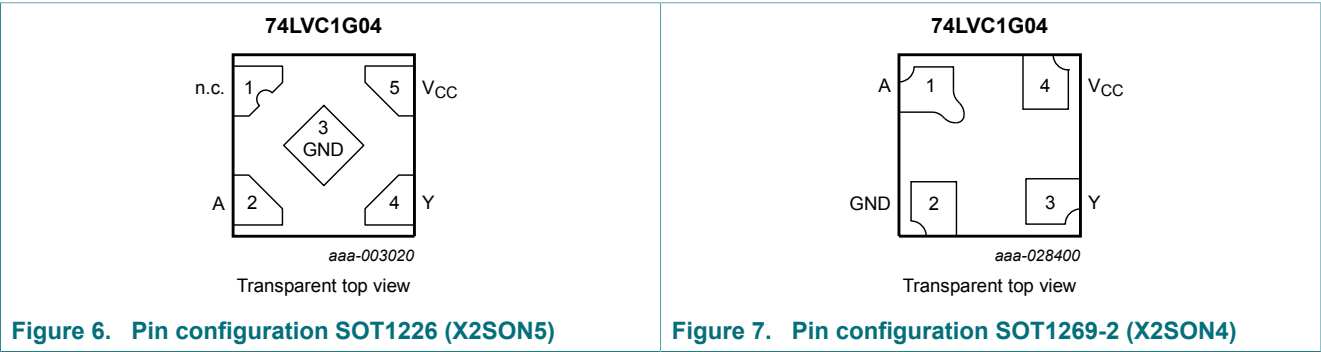
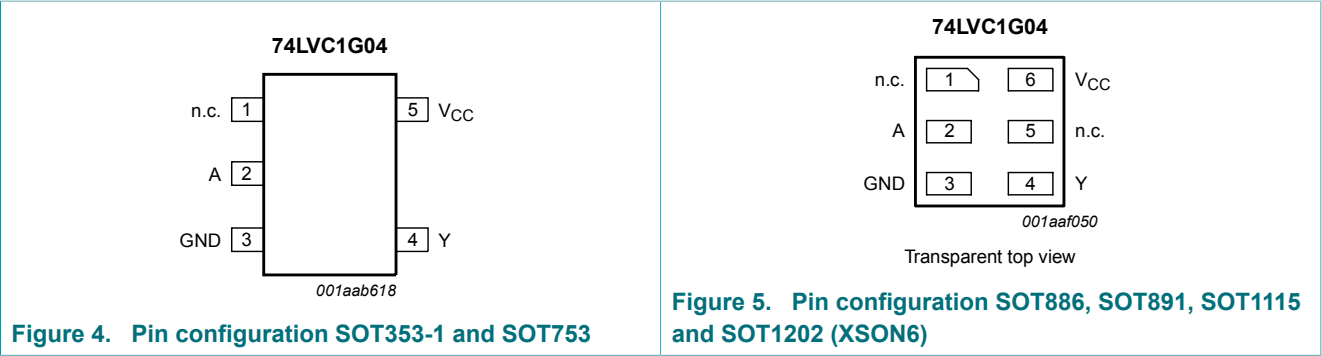


Figure 3. Logic diagram

6 Pinning information

6.1 Pinning



6.2 Pin description

Table 3. Pin description

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

## 7 Functional description

**Table 4. Function table**

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

| Input    | Output   |
|----------|----------|
| <b>A</b> | <b>Y</b> |
| L        | H        |
| H        | L        |

## 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                | -    | $\pm 50$       | 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          | $V_O = 0$ to $V_{CC}$                        | -    | $\pm 50$       | mA   |
| $I_{CC}$  | supply current          |                                              | -    | 100            | mA   |
| $I_{GND}$ | ground current          |                                              | -100 | -              | mA   |
| $T_{stg}$ | storage temperature     |                                              | -65  | +150           | °C   |
| $P_{tot}$ | total power dissipation | $T_{amb} = -40$ °C to $+125$ °C              |      |                |      |
|           |                         | TSSOP5, SC-74A, XSON6 and X2SON5 package [2] | -    | 250            | mW   |
|           |                         | X2SON4 package [3]                           | -    | 150            | mW   |

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

[2] For TSSOP5 and SC-74A packages: above 87.5 °C the value of  $P_{tot}$  derates linearly with 4.0 mW/K.

For XSON6 and X2SON5 package: above 118 °C the value of  $P_{tot}$  derates linearly with 7.8 mW/K.

[3] For X2SON4 packages: above 57 °C the value of  $P_{tot}$  derates linearly with 1.7 mW/K.

## 9 Recommended operating conditions

**Table 6. Recommended operating conditions**

| Symbol              | Parameter                           | Conditions                      | Min  | 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    | -   | $V_{CC}$ | $V_O$ |
|                     |                                     | Power-down mode; $V_{CC} = 0$ V | 0    | -   | 5.5      | $V_O$ |
| $T_{amb}$           | ambient temperature                 |                                 | -40  | -   | +125     | °C    |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC} = 1.65$ V to 2.7 V      | -    | -   | 20       | ns/V  |
|                     |                                     | $V_{CC} = 2.7$ V to 5.5 V       | -    | -   | 10       | ns/V  |

## 10 Static characteristics

**Table 7. Static characteristics**

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

| Symbol                                    | Parameter                 | Conditions                                                                                                   | Min                    | Typ <sup>[1]</sup> | Max                    | Unit |
|-------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------|------------------------|--------------------|------------------------|------|
| <b>T<sub>amb</sub> = -40 °C to +85 °C</b> |                           |                                                                                                              |                        |                    |                        |      |
| V <sub>IH</sub>                           | HIGH-level input voltage  | V <sub>CC</sub> = 1.65 V to 1.95 V                                                                           | 0.65 × V <sub>CC</sub> | -                  | -                      | V    |
|                                           |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                             | 1.7                    | -                  | -                      | V    |
|                                           |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | 2.0                    | -                  | -                      | V    |
|                                           |                           | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                             | 0.7 × V <sub>CC</sub>  | -                  | -                      | V    |
| V <sub>IL</sub>                           | LOW-level input voltage   | V <sub>CC</sub> = 1.65 V to 1.95 V                                                                           | -                      | -                  | 0.35 × V <sub>CC</sub> | V    |
|                                           |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                             | -                      | -                  | 0.7                    | V    |
|                                           |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | -                      | -                  | 0.8                    | V    |
|                                           |                           | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                             | -                      | -                  | 0.3 × V <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; 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>IH</sub> or V <sub>IL</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>CC</sub> = 0 V to 5.5 V; V <sub>I</sub> = 5.5 V or GND                                                | -                      | ±0.1               | ±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                     | 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 | 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                    | µA   |
| C <sub>I</sub>                            | input capacitance         | V <sub>CC</sub> = 3.3 V; V <sub>I</sub> = GND to V <sub>CC</sub>                                             | -                      | 5                  | -                      | pF   |

| Symbol                                     | Parameter                 | Conditions                                                                                                   | Min                    | Typ <sup>[1]</sup> | Max                    | Unit |
|--------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------|------------------------|--------------------|------------------------|------|
| <b>T<sub>amb</sub> = -40 °C to +125 °C</b> |                           |                                                                                                              |                        |                    |                        |      |
| V <sub>IH</sub>                            | HIGH-level input voltage  | V <sub>CC</sub> = 1.65 V to 1.95 V                                                                           | 0.65 × V <sub>CC</sub> | -                  | -                      | V    |
|                                            |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                             | 1.7                    | -                  | -                      | V    |
|                                            |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | 2.0                    | -                  | -                      | V    |
|                                            |                           | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                             | 0.7 × V <sub>CC</sub>  | -                  | -                      | V    |
| V <sub>IL</sub>                            | LOW-level input voltage   | V <sub>CC</sub> = 1.65 V to 1.95 V                                                                           | -                      | -                  | 0.35 × V <sub>CC</sub> | V    |
|                                            |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                             | -                      | -                  | 0.7                    | V    |
|                                            |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | -                      | -                  | 0.8                    | V    |
|                                            |                           | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                             | -                      | -                  | 0.3 × V <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; 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>IH</sub> or V <sub>IL</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                                                              | -                      | -                  | 0.70                   | 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                                                              | -                      | -                  | 0.60                   | V    |
|                                            |                           | I <sub>O</sub> = 24 mA; V <sub>CC</sub> = 3.0 V                                                              | -                      | -                  | 0.80                   | V    |
|                                            |                           | I <sub>O</sub> = 32 mA; V <sub>CC</sub> = 4.5 V                                                              | -                      | -                  | 0.80                   | V    |
| I <sub>I</sub>                             | input leakage current     | V <sub>CC</sub> = 0 V to 5.5 V; V <sub>I</sub> = 5.5 V or GND                                                | -                      | -                  | ±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                                              | -                      | -                  | ±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                    | -                      | -                  | 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 | -                      | -                  | 500                    | µA   |

[1] All typical values are measured at V<sub>CC</sub> = 3.3 V and 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 Figure 9.

| Symbol          | Parameter                     | Conditions                                                                       | -40 °C to +85 °C |                    |     | -40 °C to +125 °C |     | Unit |
|-----------------|-------------------------------|----------------------------------------------------------------------------------|------------------|--------------------|-----|-------------------|-----|------|
|                 |                               |                                                                                  | Min              | Typ <sup>[1]</sup> | Max | Min               | Max |      |
| t <sub>pd</sub> | propagation delay             | A to Y; see Figure 8 <sup>[2]</sup>                                              |                  |                    |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                               | 1.0              | 3.0                | 7.5 | 1.0               | 9.5 | ns   |
|                 |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                                 | 0.5              | 2.0                | 5.0 | 0.5               | 6.5 | ns   |
|                 |                               | V <sub>CC</sub> = 2.7 V                                                          | 0.5              | 2.3                | 5.2 | 0.5               | 7.0 | ns   |
|                 |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                                 | 0.5              | 2.0                | 4.2 | 0.5               | 5.5 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                                 | 0.5              | 1.6                | 3.7 | 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 <sup>[3]</sup> | -                | 14                 | -   | -                 | -   | 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).

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

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

11.1 Waveform and test circuit

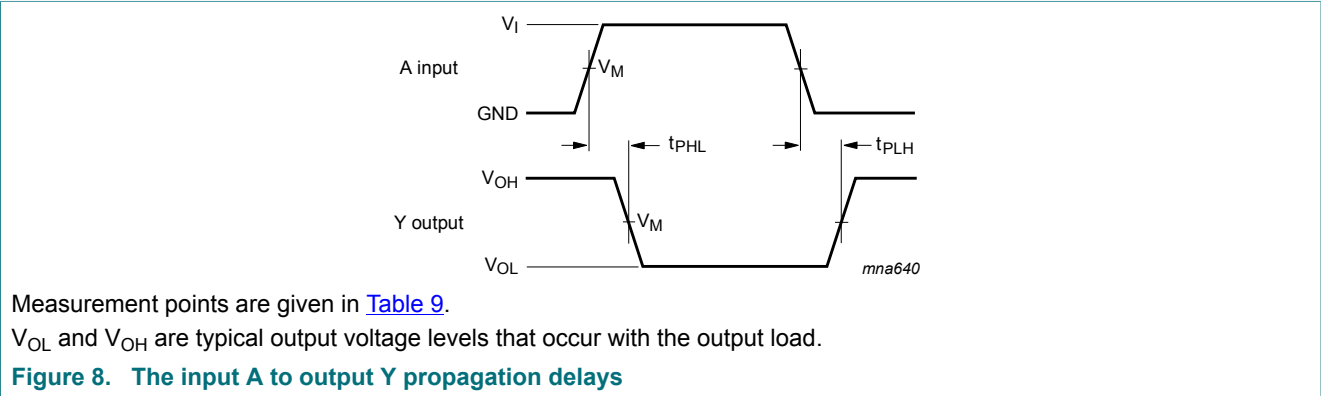
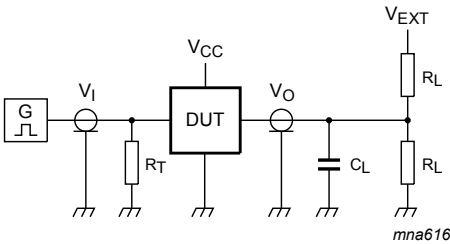


Table 9. Measurement points

| 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 x V <sub>CC</sub> | 0.5 x V <sub>CC</sub> |
| 2.3 V to 2.7 V   | 0.5 x V <sub>CC</sub> | 0.5 x 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 x V <sub>CC</sub> | 0.5 x V <sub>CC</sub> |



Test data is given in [Table 10](#).  
Definitions for test circuit:  
 $R_L$  = Load resistance.  
 $C_L$  = Load capacitance including jig and probe capacitance.  
 $R_T$  = Termination resistance should be equal to the output impedance  $Z_o$  of the pulse generator.  
 $V_{EXT}$  = External voltage for measuring switching times.

Figure 9. Test circuit for measuring switching times

Table 10. Test data

| Supply voltage   | Input           | Load                            |                |                | V <sub>EXT</sub>                    |
|------------------|-----------------|---------------------------------|----------------|----------------|-------------------------------------|
| V <sub>CC</sub>  | V <sub>I</sub>  | t <sub>r</sub> = t <sub>f</sub> | C <sub>L</sub> | R <sub>L</sub> | t <sub>PLH</sub> , t <sub>PHL</sub> |
| 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                                |

12 Package outline

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm SOT353-1



DIMENSIONS (mm are the original dimensions)

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

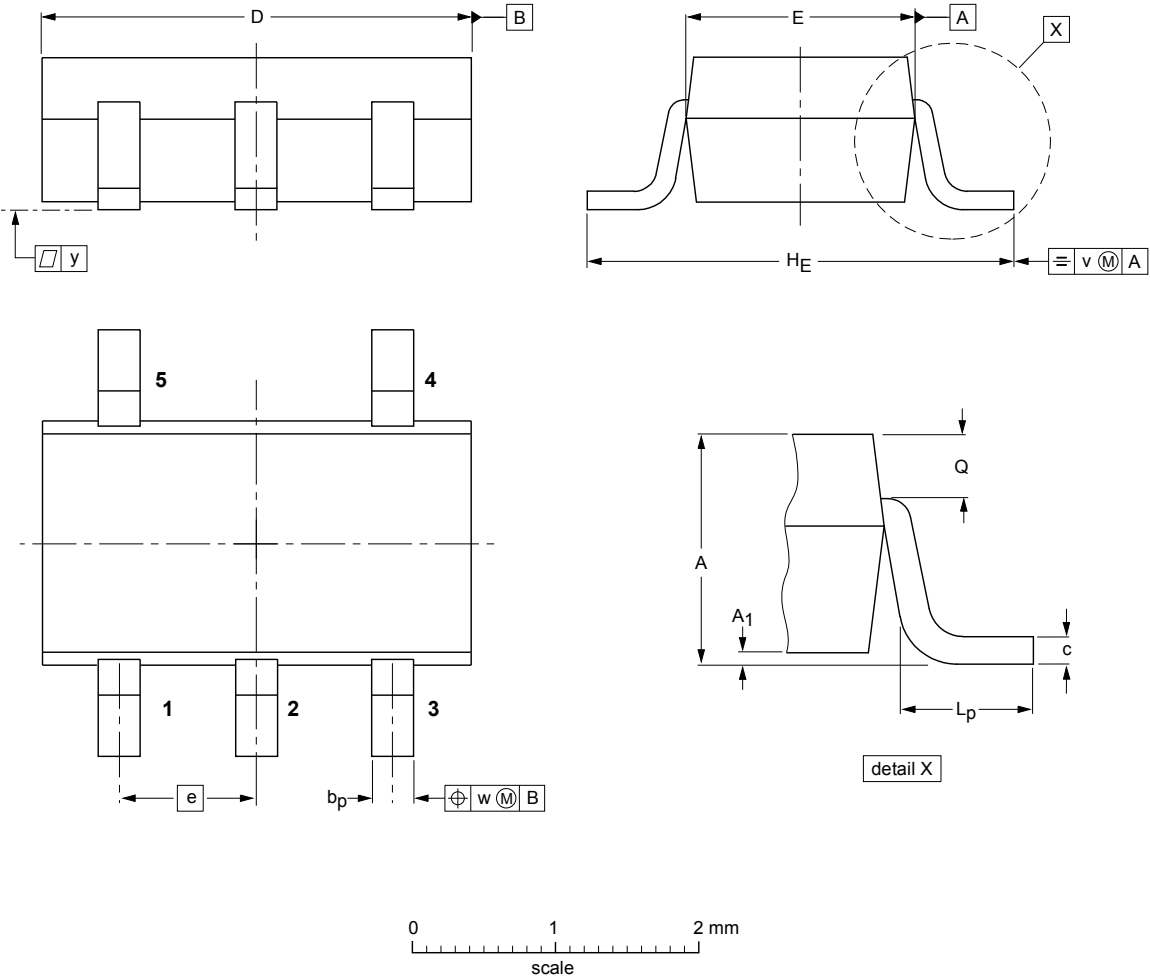
**Note**  
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

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

Figure 10. Package outline SOT353-1 (TSSOP5)

Plastic surface-mounted package; 5 leads

SOT753



DIMENSIONS (mm are the original dimensions)

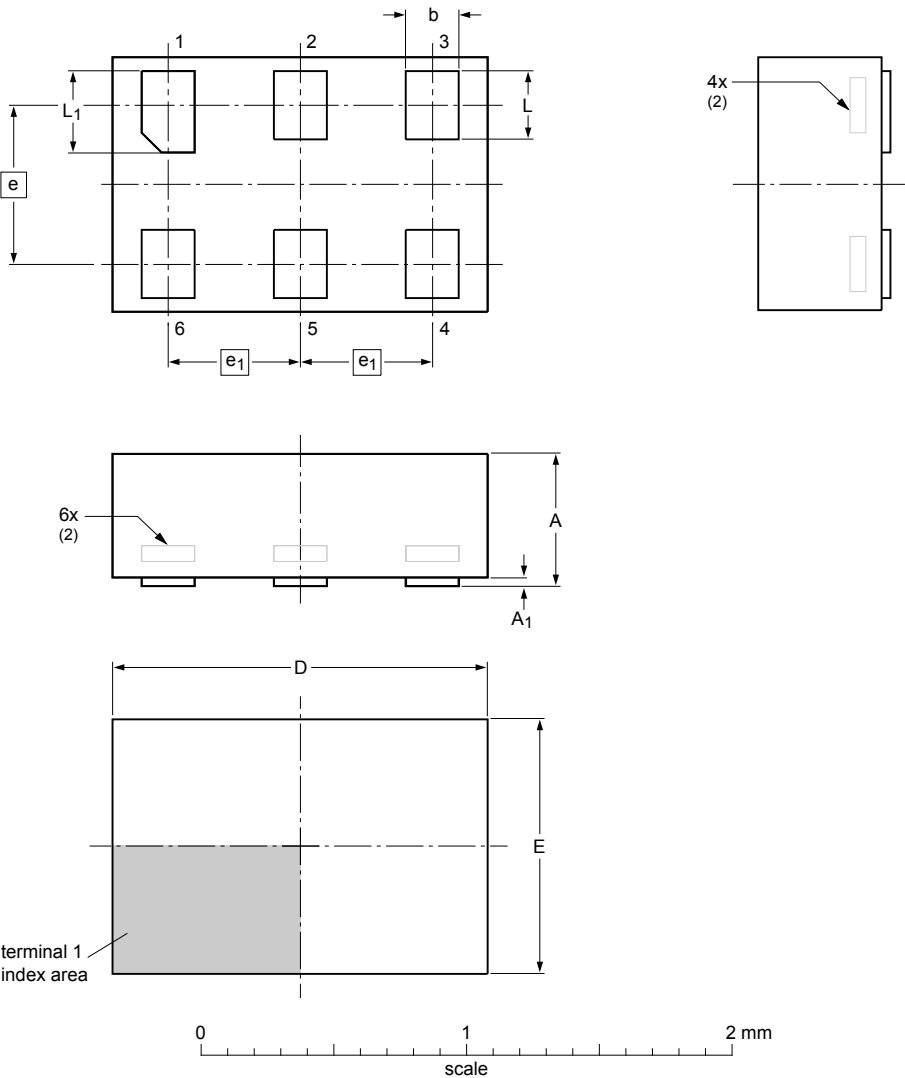
| UNIT | A          | A <sub>1</sub> | b <sub>p</sub> | c            | D          | E          | e    | H <sub>E</sub> | L <sub>p</sub> | Q            | v   | w   | y   |
|------|------------|----------------|----------------|--------------|------------|------------|------|----------------|----------------|--------------|-----|-----|-----|
| mm   | 1.1<br>0.9 | 0.100<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  |  |                                                                                       |                       |
| SOT753             |            |       | SC-74A |  |  | -02-04-16<br>06-03-16 |

Figure 11. Package outline SOT753 (SC-74A)

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

SOT886



Dimensions (mm are the original dimensions)

| Unit | A <sup>(1)</sup> | A <sub>1</sub> | b    | D    | E    | e    | e <sub>1</sub> | L    | L <sub>1</sub> |
|------|------------------|----------------|------|------|------|------|----------------|------|----------------|
| mm   | max              | 0.5            | 0.04 | 0.25 | 1.50 | 1.05 |                | 0.35 | 0.40           |
|      | nom              |                |      | 0.20 | 1.45 | 1.00 | 0.6            | 0.30 | 0.35           |
|      | min              |                |      | 0.17 | 1.40 | 0.95 |                | 0.27 | 0.32           |

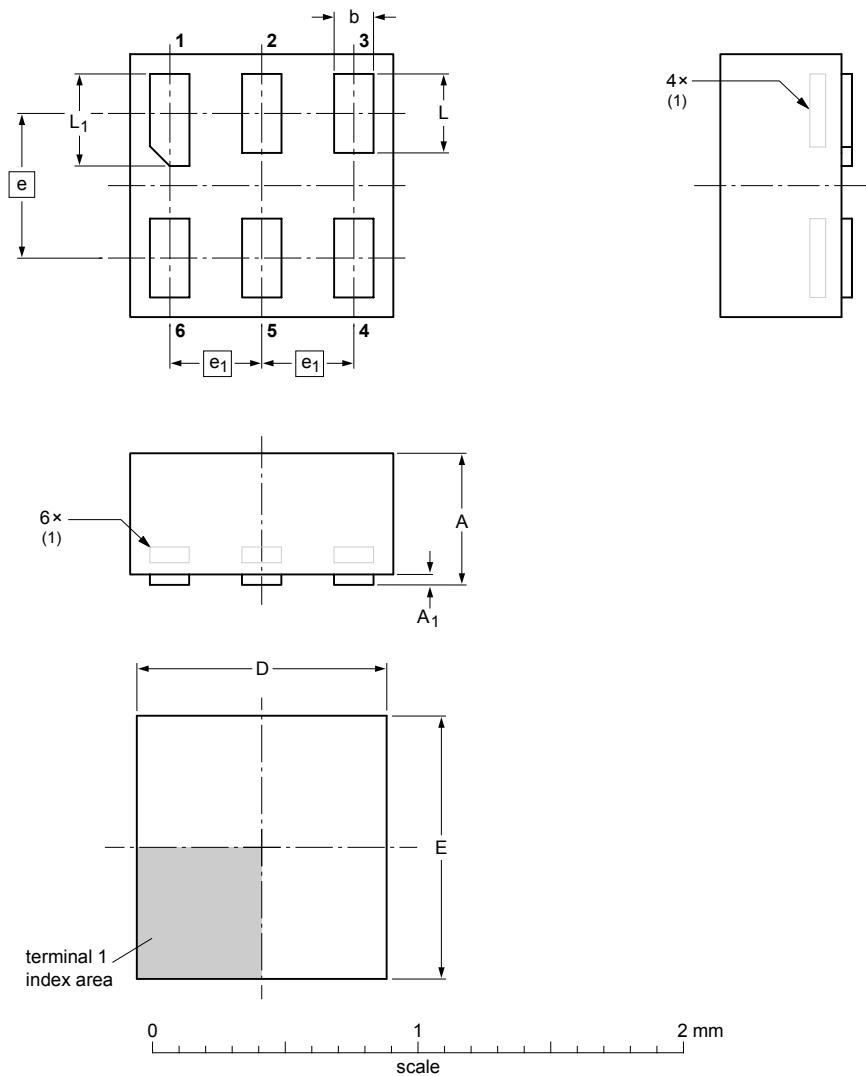
- Notes
- 1. Including plating thickness.
  - 2. Can be visible in some manufacturing processes.

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

Figure 12. 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 | A <sub>1</sub><br>max | b            | D            | E            | e    | e <sub>1</sub> | L            | L <sub>1</sub> |
|------|----------|-----------------------|--------------|--------------|--------------|------|----------------|--------------|----------------|
| mm   | 0.5      | 0.04                  | 0.20<br>0.12 | 1.05<br>0.95 | 1.05<br>0.95 | 0.55 | 0.35           | 0.35<br>0.27 | 0.40<br>0.32   |

Note  
1. Can be visible in some manufacturing processes.

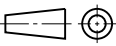
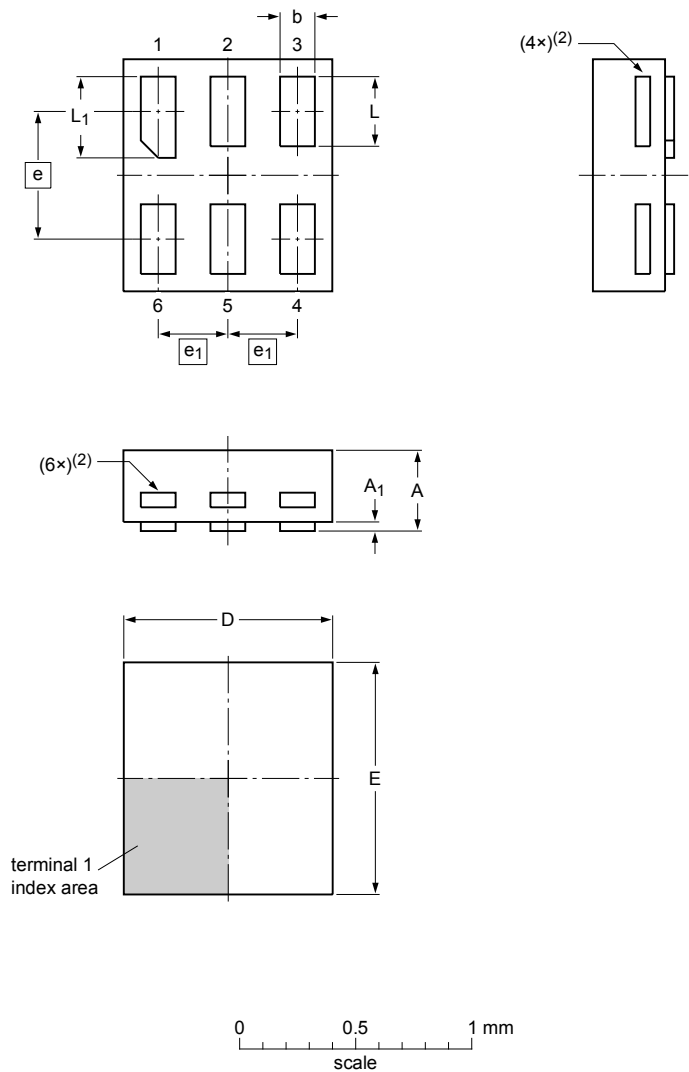
| OUTLINE<br>VERSION | REFERENCES |       |       |  | EUROPEAN<br>PROJECTION                                                                | ISSUE DATE            |
|--------------------|------------|-------|-------|--|---------------------------------------------------------------------------------------|-----------------------|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

Figure 13. Package outline SOT891 (XSON6)

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

SOT1115



Dimensions

| Unit | A <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 | 0.95 | 1.05 |                | 0.35 | 0.40           |
|      | nom              |                |      | 0.15 | 0.90 | 1.00 | 0.55           | 0.30 | 0.35           |
|      | min              |                |      | 0.12 | 0.85 | 0.95 |                | 0.27 | 0.32           |

Note

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

sot1115\_po

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

Figure 14. 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         |            |       |       |  |  | 10-04-02<br>10-04-06 |

Figure 15. Package outline SOT1202 (XSON6)

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

SOT1226

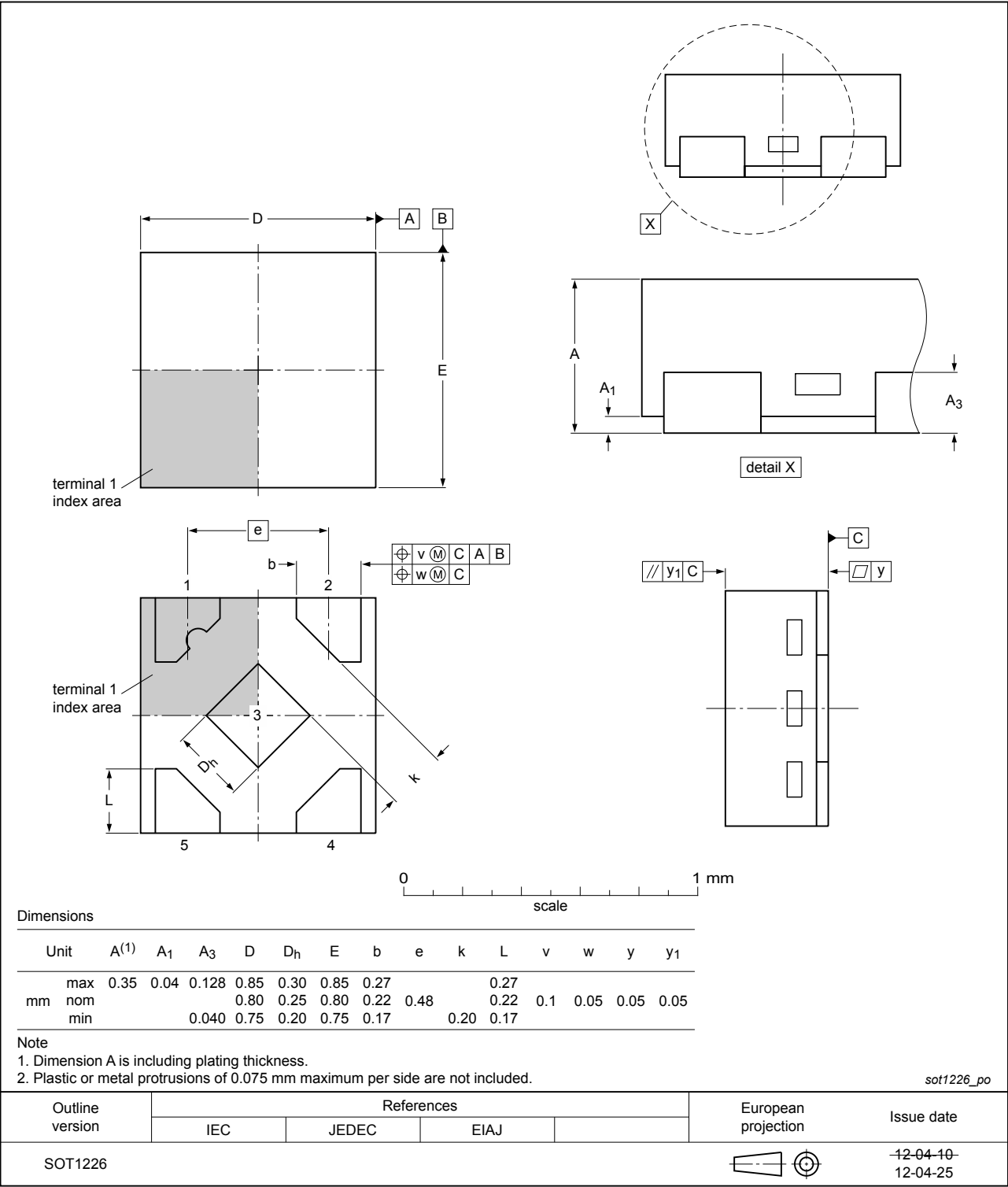


Figure 16. Package outline SOT1226 (X2SON5)

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

SOT1269-2

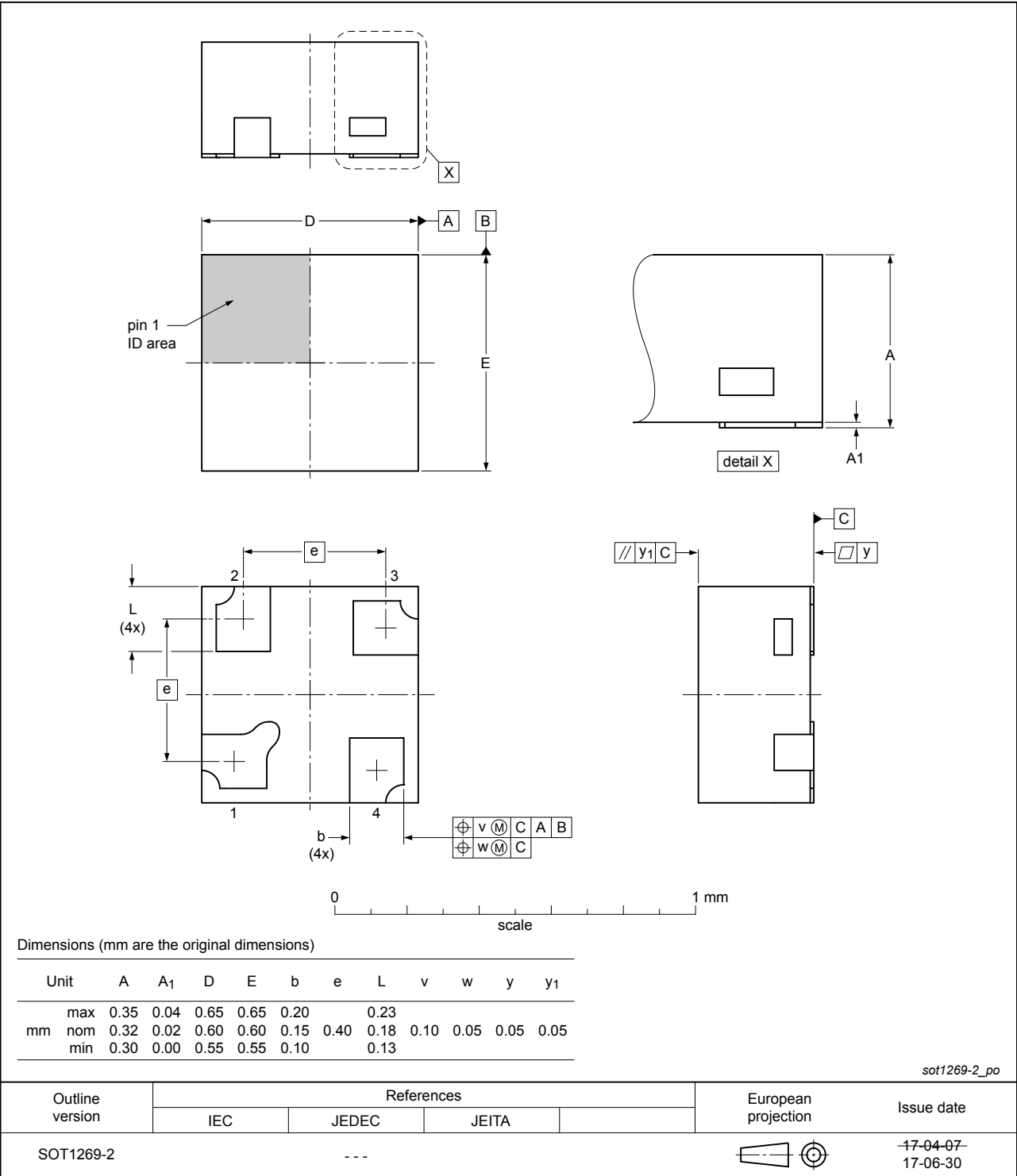


Figure 17. Package outline SOT1269-2 (X2SON4)

## 13 Abbreviations

Table 11. Abbreviations

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

## 14 Revision history

Table 12. Revision history

| Document ID    | Release date                                                                                                                                                                                                                              | Data sheet status     | Change notice | Supersedes     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|----------------|
| 74LVC1G04 v.15 | 20180608                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.14 |
| Modifications: | <ul style="list-style-type: none"> <li>Added type number 74LVC1G04GX4 (SOT1269-2)</li> </ul>                                                                                                                                              |                       |               |                |
| 74LVC1G04 v.14 | 20171101                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.13 |
| 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> |                       |               |                |
| 74LVC1G04 v.13 | 20161128                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.12 |
| 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>                                                                                        |                       |               |                |
| 74LVC1G04 v.12 | 20120806                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.11 |
| Modifications: | <ul style="list-style-type: none"> <li>Package outline drawing of SOT1226 (<a href="#">Figure 16</a>) modified.</li> </ul>                                                                                                                |                       |               |                |
| 74LVC1G04 v.11 | 20120412                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.10 |
| Modifications: | <ul style="list-style-type: none"> <li>Added type number 74LVC1G04GX (SOT1226)</li> <li>Package outline drawing of SOT886 (<a href="#">Figure 12</a>) modified.</li> </ul>                                                                |                       |               |                |
| 74LVC1G04 v.10 | 20111207                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.9  |
| Modifications: | <ul style="list-style-type: none"> <li>Legal pages updated.</li> </ul>                                                                                                                                                                    |                       |               |                |
| 74LVC1G04 v.9  | 20101026                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.8  |
| 74LVC1G04 v.8  | 20090427                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.7  |
| 74LVC1G04 v.7  | 20070827                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.6  |
| 74LVC1G04 v.6  | 20070202                                                                                                                                                                                                                                  | Product data sheet    | -             | 74LVC1G04 v.5  |
| 74LVC1G04 v.5  | 20040907                                                                                                                                                                                                                                  | Product specification | -             | 74LVC1G04 v.4  |
| 74LVC1G04 v.4  | 20021002                                                                                                                                                                                                                                  | Product specification | -             | 74LVC1G04 v.3  |
| 74LVC1G04 v.3  | 20020513                                                                                                                                                                                                                                  | Product specification | -             | 74LVC1G04 v.2  |
| 74LVC1G04 v.2  | 20010119                                                                                                                                                                                                                                  | Product specification | -             | 74LVC1G04 v.1  |
| 74LVC1G04 v.1  | 20011121                                                                                                                                                                                                                                  | Product specification | -             | -              |

## 15 Legal information

### 15.1 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".

[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 URL <http://www.nexperia.com>.

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