

# 74HC2G125; 74HCT2G125

Dual buffer/line driver; 3-state

Rev. 04 — 4 July 2008

Product data sheet

## 1. General description

The 74HC2G125; 74HCT2G125 is a high-speed, Si-gate CMOS device.

The 74HC2G125; 74HCT2G125 provides two non-inverting buffer/line drivers with 3-state output. The 3-state output is controlled by the output enable input (pin  $\overline{\text{nOE}}$ ). A HIGH level at pin  $\overline{\text{nOE}}$  causes the output to assume a high-impedance OFF-state.

The bus driver output currents are equal compared to the 74HC125 and 74HCT125.

## 2. Features

- Wide supply voltage range from 2.0 V to 6.0 V
- Symmetrical output impedance
- High noise immunity
- Low power consumption
- Balanced propagation delays
- ESD protection:
  - ◆ HBM JESD22-A114E exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V
- Multiple package options
- Specified from  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$  and  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$

## 3. Ordering information

Table 1. Ordering information

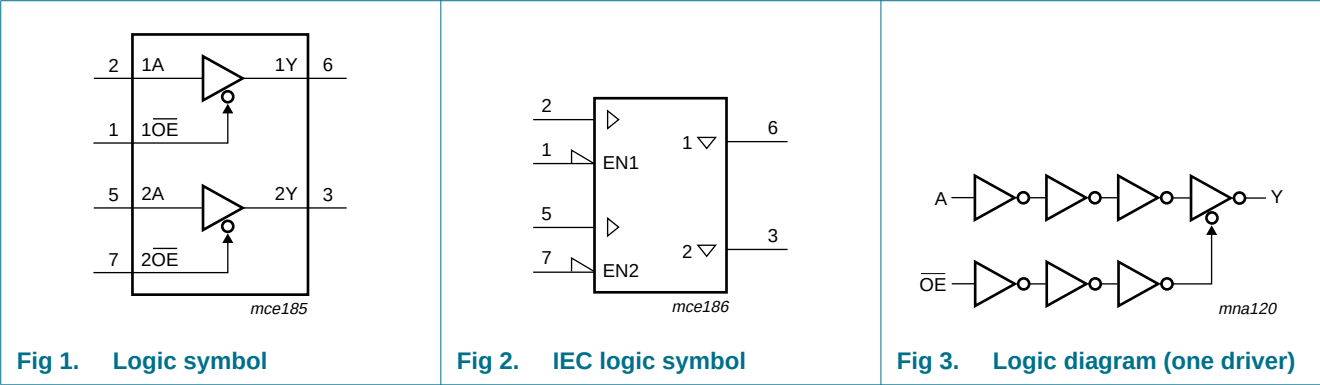
| Type number                 | Package                                                         |        |                                                                                                                         |          |
|-----------------------------|-----------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------|----------|
|                             | Temperature range                                               | Name   | Description                                                                                                             | Version  |
| 74HC2G125DP<br>74HCT2G125DP | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | TSSOP8 | plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm                                 | SOT505-2 |
| 74HC2G125DC<br>74HCT2G125DC | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | VSSOP8 | plastic very thin shrink small outline package; 8 leads; body width 2.3 mm                                              | SOT765-1 |
| 74HC2G125GD<br>74HCT2G125GD | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | XSON8U | plastic extremely thin small outline package; no leads; 8 terminals; UTLP based; body $3 \times 2 \times 0.5\text{ mm}$ | SOT996-2 |

4. Marking

Table 2. Marking

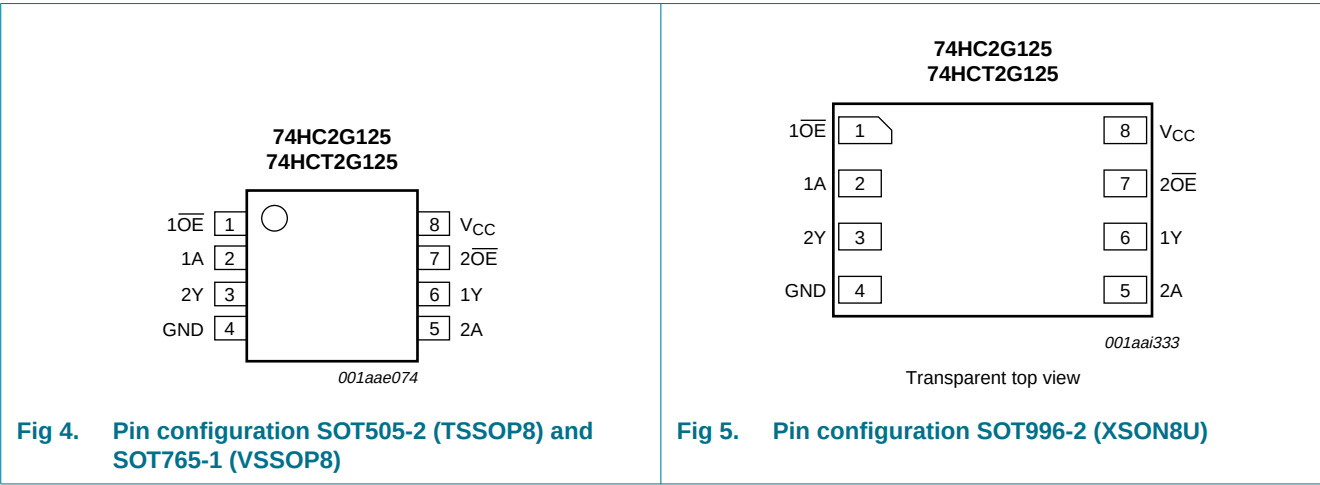
| Type number  | Marking code |
|--------------|--------------|
| 74HC2G125DP  | H25          |
| 74HCT2G125DP | T25          |
| 74HC2G125DC  | H25          |
| 74HCT2G125DC | T25          |
| 74HC2G125GD  | H25          |
| 74HCT2G125GD | T25          |

5. Functional diagram



6. Pinning information

6.1 Pinning



## 6.2 Pin description

**Table 3.** Pin description

| Symbol                                              | Pin  | Description                      |
|-----------------------------------------------------|------|----------------------------------|
| 1 $\overline{\text{OE}}$ , 2 $\overline{\text{OE}}$ | 1, 7 | output enable input (active LOW) |
| 1A, 2A                                              | 2, 5 | data input                       |
| GND                                                 | 4    | ground (0 V)                     |
| 1Y, 2Y                                              | 6, 3 | data output                      |
| V <sub>CC</sub>                                     | 8    | supply voltage                   |

## 7. Functional description

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

| Control                  | Input | Output |
|--------------------------|-------|--------|
| n $\overline{\text{OE}}$ | nA    | nY     |
| L                        | L     | L      |
| L                        | H     | H      |
| H                        | X     | Z      |

[1] H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.

## 8. Limiting values

**Table 5.** Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

| Symbol           | Parameter               | Conditions                                                          | Min              | Max  | Unit |
|------------------|-------------------------|---------------------------------------------------------------------|------------------|------|------|
| V <sub>CC</sub>  | supply voltage          |                                                                     | -0.5             | +7.0 | V    |
| I <sub>IK</sub>  | input clamping current  | V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V | <sup>[1]</sup> - | ±20  | mA   |
| I <sub>OK</sub>  | output clamping current | V <sub>O</sub> < -0.5 V or V <sub>O</sub> > V <sub>CC</sub> + 0.5 V | <sup>[1]</sup> - | ±20  | mA   |
| I <sub>O</sub>   | output current          | V <sub>O</sub> = -0.5 V to (V <sub>CC</sub> + 0.5 V)                | <sup>[1]</sup> - | 35   | mA   |
| I <sub>CC</sub>  | supply current          |                                                                     | -                | 70   | mA   |
| I <sub>GND</sub> | ground current          |                                                                     | -70              | -    | mA   |
| T <sub>stg</sub> | storage temperature     |                                                                     | -65              | +150 | °C   |
| P <sub>tot</sub> | total power dissipation | T <sub>amb</sub> = -40 °C to +125 °C                                | <sup>[2]</sup> - | 300  | mW   |

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

[2] For TSSOP8 package: above 55 °C the value of P<sub>tot</sub> derates linearly with 2.5 mW/K.

For VSSOP8 package: above 110 °C the value of P<sub>tot</sub> derates linearly with 8 mW/K.

For XSON8U package: above 45 °C the value of P<sub>tot</sub> derates linearly with 2.4 mW/K.

## 9. Recommended operating conditions

**Table 6. Recommended operating conditions**

Voltages are referenced to GND (ground = 0 V).

| Symbol              | Parameter                           | Conditions              | 74HC2G125 |      |                 | 74HCT2G125 |      |                 | Unit |
|---------------------|-------------------------------------|-------------------------|-----------|------|-----------------|------------|------|-----------------|------|
|                     |                                     |                         | Min       | Typ  | Max             | Min        | Typ  | Max             |      |
| V <sub>CC</sub>     | supply voltage                      |                         | 2.0       | 5.0  | 6.0             | 4.5        | 5.0  | 5.5             | V    |
| V <sub>I</sub>      | input voltage                       |                         | 0         | -    | V <sub>CC</sub> | 0          | -    | V <sub>CC</sub> | V    |
| V <sub>O</sub>      | output voltage                      |                         | 0         | -    | V <sub>CC</sub> | 0          | -    | V <sub>CC</sub> | V    |
| T <sub>amb</sub>    | ambient temperature                 |                         | -40       | +25  | +125            | -40        | +25  | +125            | °C   |
| $\Delta t/\Delta V$ | input transition rise and fall rate | V <sub>CC</sub> = 2.0 V | -         | -    | 625             | -          | -    | -               | ns/V |
|                     |                                     | V <sub>CC</sub> = 4.5 V | -         | 1.67 | 139             | -          | 1.67 | 139             | ns/V |
|                     |                                     | V <sub>CC</sub> = 6.0 V | -         | -    | 83              | -          | -    | -               | ns/V |

## 10. Static characteristics

**Table 7. Static characteristics**

Voltages are referenced to GND (ground = 0 V). All typical values are measured at T<sub>amb</sub> = 25 °C.

| Symbol          | Parameter                 | Conditions                                                                                                                | T <sub>amb</sub> = −40 °C to +85 °C |      |      | T <sub>amb</sub> = −40 °C to +125 °C |      | Unit |
|-----------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------|------|--------------------------------------|------|------|
|                 |                           |                                                                                                                           | Min                                 | Typ  | Max  | Min                                  | Max  |      |
| 74HC2G125       |                           |                                                                                                                           |                                     |      |      |                                      |      |      |
| V <sub>IH</sub> | HIGH-level input voltage  | V <sub>CC</sub> = 2.0 V                                                                                                   | 1.5                                 | 1.2  | -    | 1.5                                  | -    | V    |
|                 |                           | V <sub>CC</sub> = 4.5 V                                                                                                   | 3.15                                | 2.4  | -    | 3.15                                 | -    | V    |
|                 |                           | V <sub>CC</sub> = 6.0 V                                                                                                   | 4.2                                 | 3.2  | -    | 4.2                                  | -    | V    |
| V <sub>IL</sub> | LOW-level input voltage   | V <sub>CC</sub> = 2.0 V                                                                                                   | -                                   | 0.8  | 0.5  | -                                    | 0.5  | V    |
|                 |                           | V <sub>CC</sub> = 4.5 V                                                                                                   | -                                   | 2.1  | 1.35 | -                                    | 1.35 | V    |
|                 |                           | V <sub>CC</sub> = 6.0 V                                                                                                   | -                                   | 2.8  | 1.8  | -                                    | 1.8  | 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> = −20 μA; V <sub>CC</sub> = 2.0 V                                                                          | 1.9                                 | 2.0  | -    | 1.9                                  | -    | V    |
|                 |                           | I <sub>O</sub> = −20 μA; V <sub>CC</sub> = 4.5 V                                                                          | 4.4                                 | 4.5  | -    | 4.4                                  | -    | V    |
|                 |                           | I <sub>O</sub> = −20 μA; V <sub>CC</sub> = 6.0 V                                                                          | 5.9                                 | 6.0  | -    | 5.9                                  | -    | V    |
|                 |                           | I <sub>O</sub> = −6.0 mA; V <sub>CC</sub> = 4.5 V                                                                         | 3.84                                | 4.32 | -    | 3.7                                  | -    | V    |
|                 |                           | I <sub>O</sub> = −7.8 mA; V <sub>CC</sub> = 6.0 V                                                                         | 5.34                                | 5.81 | -    | 5.2                                  | -    | 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> = 20 μA; V <sub>CC</sub> = 2.0 V                                                                           | -                                   | 0    | 0.1  | -                                    | 0.1  | V    |
|                 |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V                                                                           | -                                   | 0    | 0.1  | -                                    | 0.1  | V    |
|                 |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V                                                                           | -                                   | 0    | 0.1  | -                                    | 0.1  | V    |
|                 |                           | I <sub>O</sub> = 6.0 mA; V <sub>CC</sub> = 4.5 V                                                                          | -                                   | 0.15 | 0.33 | -                                    | 0.4  | V    |
|                 |                           | I <sub>O</sub> = 7.8 mA; V <sub>CC</sub> = 6.0 V                                                                          | -                                   | 0.16 | 0.33 | -                                    | 0.4  | V    |
| I <sub>I</sub>  | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V                                                          | -                                   | -    | ±1.0 | -                                    | ±1.0 | μA   |
| I <sub>OZ</sub> | OFF-state output current  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ;<br>V <sub>O</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V | -                                   | -    | ±5.0 | -                                    | ±10  | μA   |

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

Voltages are referenced to GND (ground = 0 V). All typical values are measured at  $T_{amb} = 25\text{ }^{\circ}\text{C}$ .

| Symbol            | Parameter                 | Conditions                                                                                                  | $T_{amb} = -40\text{ }^{\circ}\text{C to } +85\text{ }^{\circ}\text{C}$ |      |           | $T_{amb} = -40\text{ }^{\circ}\text{C to } +125\text{ }^{\circ}\text{C}$ |           | Unit          |
|-------------------|---------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------|-----------|--------------------------------------------------------------------------|-----------|---------------|
|                   |                           |                                                                                                             | Min                                                                     | Typ  | Max       | Min                                                                      | Max       |               |
| $I_{CC}$          | supply current            | $V_I = V_{CC}$ or GND; $I_O = 0\text{ A}$ ;<br>$V_{CC} = 6.0\text{ V}$                                      | -                                                                       | -    | 10        | -                                                                        | 20        | $\mu\text{A}$ |
| $C_I$             | input capacitance         |                                                                                                             | -                                                                       | 1.0  | -         | -                                                                        | -         | pF            |
| $C_O$             | output capacitance        |                                                                                                             | -                                                                       | 1.5  | -         | -                                                                        | -         | pF            |
| <b>74HCT2G125</b> |                           |                                                                                                             |                                                                         |      |           |                                                                          |           |               |
| $V_{IH}$          | HIGH-level input voltage  | $V_{CC} = 4.5\text{ V to } 5.5\text{ V}$                                                                    | 2.0                                                                     | 1.6  | -         | 2.0                                                                      | -         | V             |
| $V_{IL}$          | LOW-level input voltage   | $V_{CC} = 4.5\text{ V to } 5.5\text{ V}$                                                                    | -                                                                       | 1.2  | 0.8       | -                                                                        | 0.8       | V             |
| $V_{OH}$          | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5\text{ V}$<br>$I_O = -20\text{ }\mu\text{A}$                      | 4.4                                                                     | 4.5  | -         | 4.4                                                                      | -         | V             |
|                   |                           | $I_O = -6.0\text{ mA}$                                                                                      | 3.84                                                                    | 4.32 | -         | 3.7                                                                      | -         | V             |
|                   |                           |                                                                                                             |                                                                         |      |           |                                                                          |           |               |
| $V_{OL}$          | LOW-level output voltage  | $V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5\text{ V}$<br>$I_O = 20\text{ }\mu\text{A}$                       | -                                                                       | 0    | 0.1       | -                                                                        | 0.1       | V             |
|                   |                           | $I_O = 6.0\text{ mA}$                                                                                       | -                                                                       | 0.16 | 0.33      | -                                                                        | 0.4       | V             |
|                   |                           |                                                                                                             |                                                                         |      |           |                                                                          |           |               |
| $I_I$             | input leakage current     | $V_I = V_{CC}$ or GND; $V_{CC} = 5.5\text{ V}$                                                              | -                                                                       | -    | $\pm 1.0$ | -                                                                        | $\pm 1.0$ | $\mu\text{A}$ |
| $I_{OZ}$          | OFF-state output current  | $V_I = V_{IH}$ or $V_{IL}$ ; $V_O = V_{CC}$ or GND; $V_{CC} = 5.5\text{ V}$                                 | -                                                                       | -    | $\pm 5.0$ | -                                                                        | $\pm 10$  |               |
| $I_{CC}$          | supply current            | $V_I = V_{CC}$ or GND; $I_O = 0\text{ A}$ ;<br>$V_{CC} = 5.5\text{ V}$                                      | -                                                                       | -    | 10        | -                                                                        | 20        | $\mu\text{A}$ |
| $\Delta I_{CC}$   | additional supply current | per input; $V_{CC} = 4.5\text{ V to } 5.5\text{ V}$ ;<br>$V_I = V_{CC} - 2.1\text{ V}$ ; $I_O = 0\text{ A}$ | -                                                                       | -    | 375       | -                                                                        | 410       | $\mu\text{A}$ |
| $C_I$             | input capacitance         |                                                                                                             | -                                                                       | 1.0  | -         | -                                                                        | -         | pF            |
| $C_O$             | output capacitance        |                                                                                                             | -                                                                       | 1.5  | -         | -                                                                        | -         | pF            |

## 11. Dynamic characteristics

**Table 8.** Dynamic characteristics

Voltages are referenced to GND (ground = 0 V);  $C_L = 50\text{ pF}$  unless otherwise specified; for test circuit see [Figure 8](#).

| Symbol          | Parameter         | Conditions                                      | T <sub>amb</sub> = −40 °C to +85 °C |                    |     | T <sub>amb</sub> = −40 °C to +125 °C |     | Unit |
|-----------------|-------------------|-------------------------------------------------|-------------------------------------|--------------------|-----|--------------------------------------|-----|------|
|                 |                   |                                                 | Min                                 | Typ <sup>[1]</sup> | Max | Min                                  | Max |      |
| 74HC2G125       |                   |                                                 |                                     |                    |     |                                      |     |      |
| t <sub>pd</sub> | propagation delay | nA to nY; see <a href="#">Figure 6</a>          |                                     |                    |     |                                      |     |      |
|                 |                   | V <sub>CC</sub> = 2.0 V                         | -                                   | 35                 | 115 | -                                    | 135 | ns   |
|                 |                   | V <sub>CC</sub> = 4.5 V                         | -                                   | 11                 | 23  | -                                    | 27  | ns   |
|                 |                   | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF | -                                   | 10                 | -   | -                                    | -   | ns   |
|                 |                   | V <sub>CC</sub> = 6.0 V                         | -                                   | 8                  | 20  | -                                    | 23  | ns   |

**Table 8. Dynamic characteristics ...continued**

Voltages are referenced to GND (ground = 0 V);  $C_L = 50$  pF unless otherwise specified; for test circuit see [Figure 8](#).

| Symbol    | Parameter                     | Conditions                                                          | $T_{amb} = -40\text{ }^{\circ}\text{C to }+85\text{ }^{\circ}\text{C}$ |                    |     | $T_{amb} = -40\text{ }^{\circ}\text{C to }+125\text{ }^{\circ}\text{C}$ |     | Unit |
|-----------|-------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|-----|-------------------------------------------------------------------------|-----|------|
|           |                               |                                                                     | Min                                                                    | Typ <sup>[1]</sup> | Max | Min                                                                     | Max |      |
| $t_{en}$  | enable time                   | $n\overline{OE}$ to nY; see <a href="#">Figure 7</a> <sup>[2]</sup> |                                                                        |                    |     |                                                                         |     |      |
|           |                               | $V_{CC} = 2.0\text{ V}$                                             | -                                                                      | 40                 | 115 | -                                                                       | 135 | ns   |
|           |                               | $V_{CC} = 4.5\text{ V}$                                             | -                                                                      | 11                 | 23  | -                                                                       | 27  | ns   |
|           |                               | $V_{CC} = 6.0\text{ V}$                                             | -                                                                      | 8                  | 20  | -                                                                       | 23  | ns   |
| $t_{dis}$ | disable time                  | $n\overline{OE}$ to nY; see <a href="#">Figure 7</a> <sup>[2]</sup> |                                                                        |                    |     |                                                                         |     |      |
|           |                               | $V_{CC} = 2.0\text{ V}$                                             | -                                                                      | 24                 | 125 | -                                                                       | 150 | ns   |
|           |                               | $V_{CC} = 4.5\text{ V}$                                             | -                                                                      | 12                 | 25  | -                                                                       | 30  | ns   |
|           |                               | $V_{CC} = 6.0\text{ V}$                                             | -                                                                      | 10                 | 21  | -                                                                       | 26  | ns   |
| $t_t$     | transition time               | see <a href="#">Figure 6</a> <sup>[2]</sup>                         |                                                                        |                    |     |                                                                         |     |      |
|           |                               | $V_{CC} = 2.0\text{ V}$                                             | -                                                                      | 18                 | 75  | -                                                                       | 90  | ns   |
|           |                               | $V_{CC} = 4.5\text{ V}$                                             | -                                                                      | 6                  | 15  | -                                                                       | 18  | ns   |
|           |                               | $V_{CC} = 6.0\text{ V}$                                             | -                                                                      | 5                  | 13  | -                                                                       | 15  | ns   |
| $C_{PD}$  | power dissipation capacitance | per buffer; $V_I = \text{GND to } V_{CC}$ <sup>[3]</sup>            |                                                                        |                    |     |                                                                         |     |      |
|           |                               | output enabled                                                      | -                                                                      | 11                 | -   | -                                                                       | -   | pF   |
|           |                               | output disabled                                                     | -                                                                      | 1                  | -   | -                                                                       | -   | pF   |

**74HCT2G125**

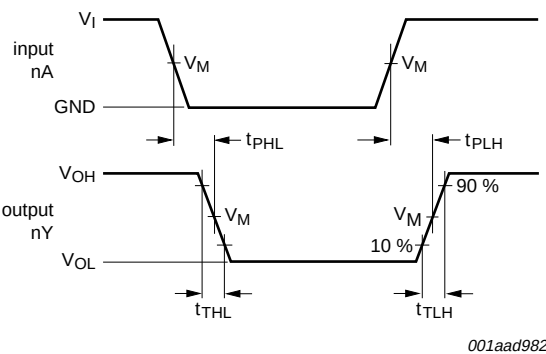
|           |                               |                                                                                               |   |    |    |   |    |    |
|-----------|-------------------------------|-----------------------------------------------------------------------------------------------|---|----|----|---|----|----|
| $t_{pd}$  | propagation delay             | nA to nY; see <a href="#">Figure 6</a> <sup>[2]</sup>                                         |   |    |    |   |    |    |
|           |                               | $V_{CC} = 4.5\text{ V}$                                                                       | - | 15 | 31 | - | 38 | ns |
|           |                               | $V_{CC} = 5.0\text{ V}; C_L = 15\text{ pF}$                                                   | - | 12 | -  | - | -  | ns |
| $t_{en}$  | enable time                   | $n\overline{OE}$ to nY; see <a href="#">Figure 7</a> ; $V_{CC} = 4.5\text{ V}$ <sup>[2]</sup> | - | 15 | 35 | - | 42 | ns |
| $t_{dis}$ | disable time                  | $n\overline{OE}$ to nY; see <a href="#">Figure 7</a> ; $V_{CC} = 4.5\text{ V}$ <sup>[2]</sup> | - | 15 | 31 | - | 38 | ns |
| $t_t$     | transition time               | see <a href="#">Figure 6</a> ; $V_{CC} = 4.5\text{ V}$ <sup>[2]</sup>                         | - | 6  | 15 | - | 18 | ns |
| $C_{PD}$  | power dissipation capacitance | per buffer; $V_I = \text{GND to } V_{CC} - 1.5\text{ V}$ <sup>[3]</sup>                       |   |    |    |   |    |    |
|           |                               | output enabled                                                                                | - | 11 | -  | - | -  | pF |
|           |                               | output disabled                                                                               | - | 1  | -  | - | -  | pF |

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

[2]  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .  
 $t_{en}$  is the same as  $t_{PZL}$  and  $t_{PZH}$ .  
 $t_{dis}$  is the same as  $t_{PLZ}$  and  $t_{PHZ}$ .  
 $t_t$  is the same as  $t_{THL}$  and  $t_{TLH}$ .

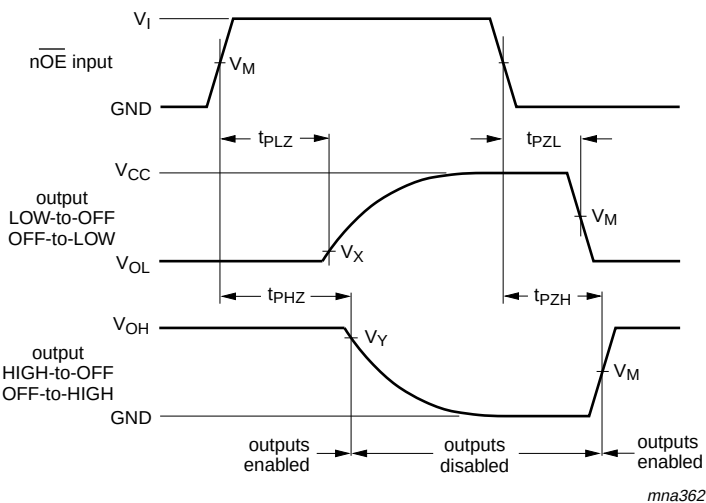
[3]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ ).  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$  where:  
 $f_i$  = input frequency in MHz;  
 $f_o$  = output frequency in MHz;  
 $C_L$  = output load capacitance in pF;  
 $V_{CC}$  = supply voltage in V;  
 $N$  = number of inputs switching;  
 $\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of outputs.

12. Waveforms



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

**Fig 6. Propagation delays data input (nA) to output (nY)**

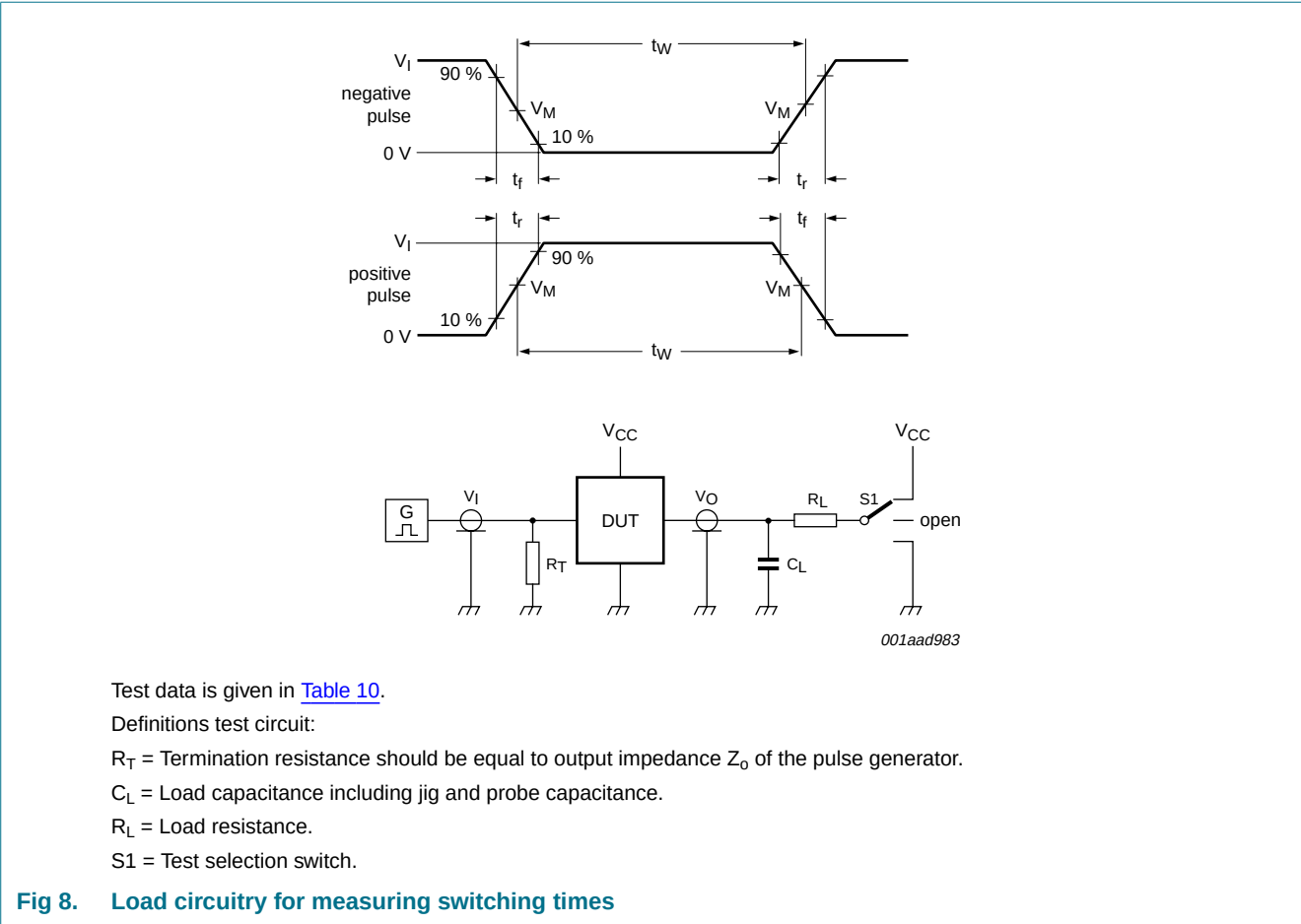


Measurement points are given in [Table 9](#).  
Logic levels:  $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

**Fig 7. Enable and disable times**

**Table 9. Measurement points**

| Type       | Input       | Output      |                         |                         |
|------------|-------------|-------------|-------------------------|-------------------------|
|            | $V_M$       | $V_M$       | $V_X$                   | $V_Y$                   |
| 74HC2G125  | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.3\text{ V}$ | $V_{OH} - 0.3\text{ V}$ |
| 74HCT2G125 | 1.3 V       | 1.3 V       | $V_{OL} + 0.3\text{ V}$ | $V_{OH} - 0.3\text{ V}$ |



Test data is given in [Table 10](#).

Definitions test circuit:

$R_T$  = Termination resistance should be equal to output impedance  $Z_o$  of the pulse generator.

$C_L$  = Load capacitance including jig and probe capacitance.

$R_L$  = Load resistance.

$S1$  = Test selection switch.

**Fig 8. Load circuitry for measuring switching times**

**Table 10. Test data**

| Type       | Input    |                    | Load         |              | S1 position        |                    |                    |
|------------|----------|--------------------|--------------|--------------|--------------------|--------------------|--------------------|
|            | $V_I$    | $t_r, t_f$         | $C_L$        | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74HC2G125  | $V_{CC}$ | $\leq 6\text{ ns}$ | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74HCT2G125 | 3 V      | $\leq 6\text{ ns}$ | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |



13. Package outline

TSSOP8: plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm SOT505-2

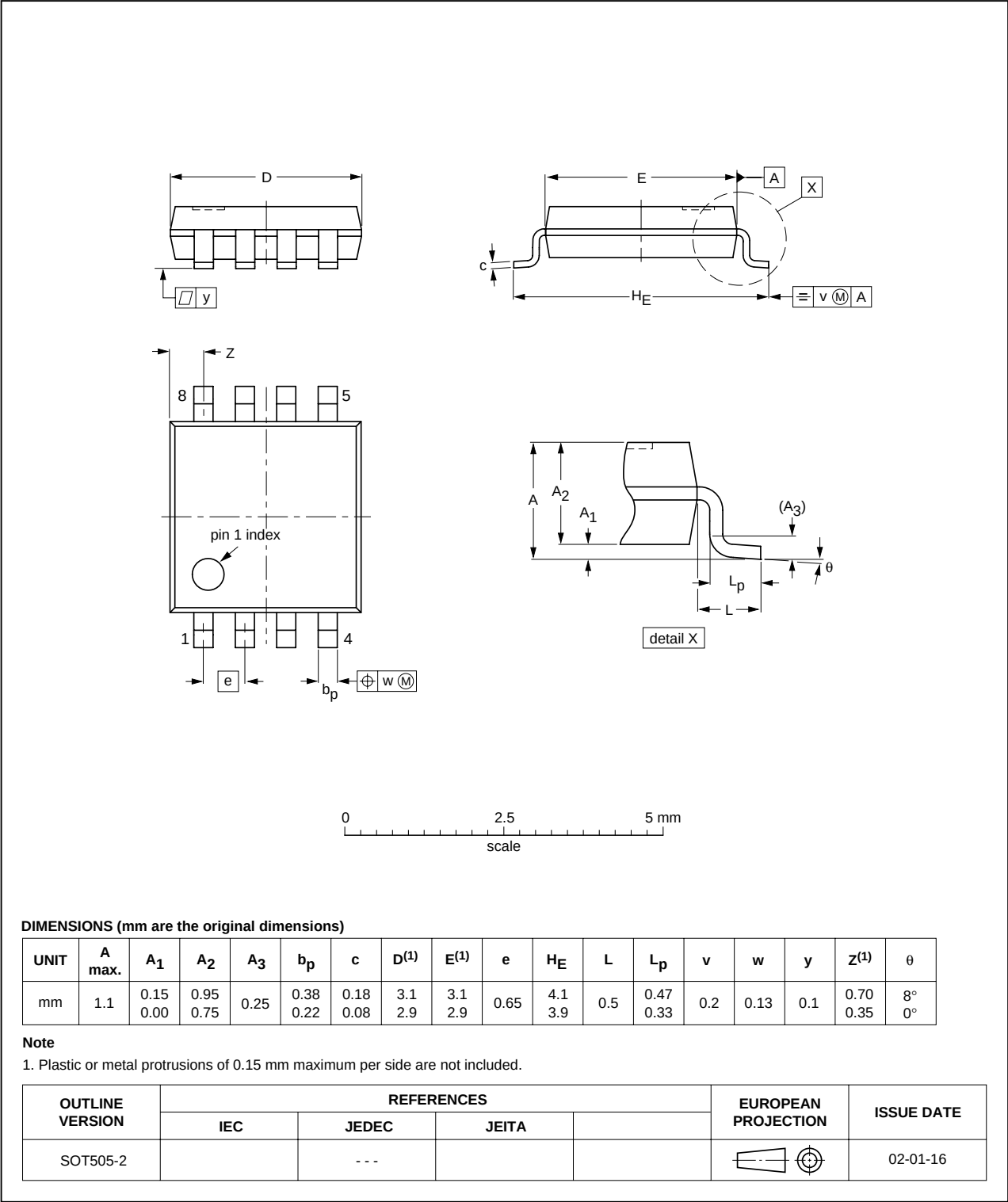


Fig 9. Package outline SOT505-2 (TSSOP8)

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm

SOT765-1

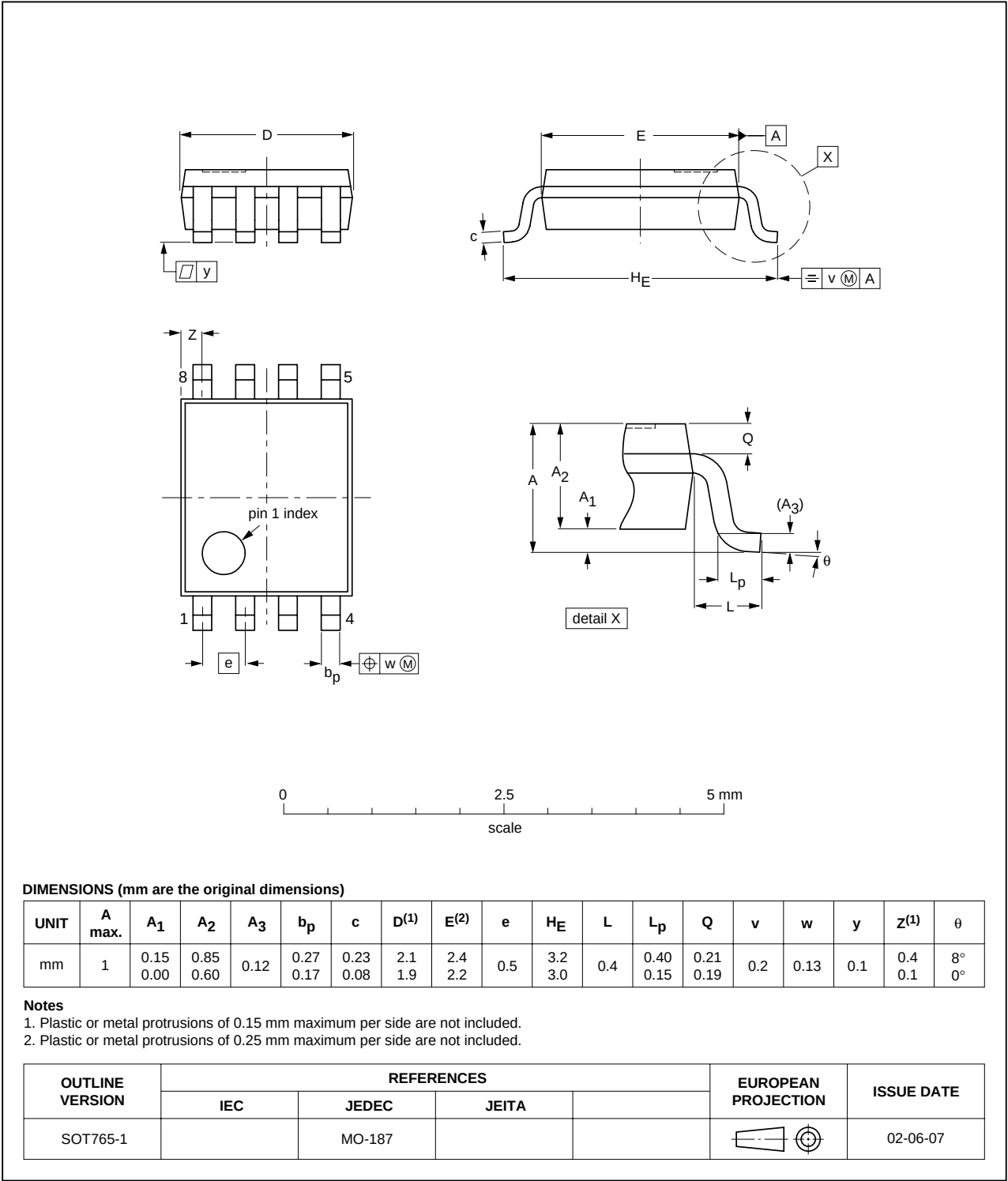


Fig 10. Package outline SOT765-1 (VSSOP8)

XSON8U: plastic extremely thin small outline package; no leads;  
8 terminals; UTLP based; body 3 x 2 x 0.5 mm

SOT996-2

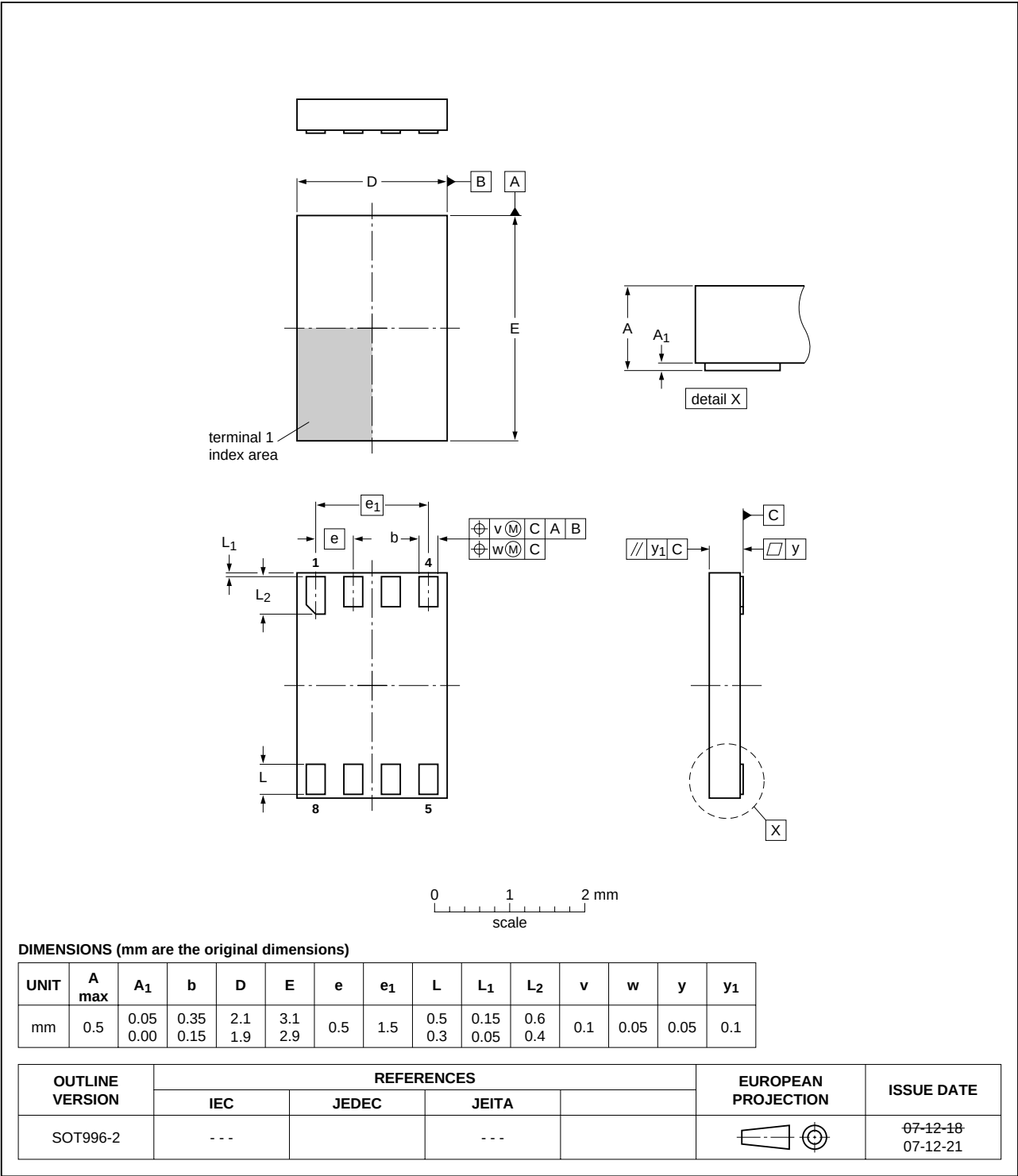


Fig 11. Package outline SOT996-2 (XSON8U)

## 14. Abbreviations

Table 11. Abbreviations

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

## 15. Revision history

Table 12. Revision history

| Document ID     | Release date                                                                                                                                                                                                                                                                                                                                                                                                                         | Data sheet status     | Change notice | Supersedes      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-----------------|
| 74HC_HCT2G125_4 | 20080704                                                                                                                                                                                                                                                                                                                                                                                                                             | Product data sheet    | -             | 74HC_HCT2G125_3 |
| Modifications:  | <ul style="list-style-type: none"><li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li><li>• <a href="#">Section 8</a>: derating factor for TSSOP8, VSSOP8 and XSON8U package added</li><li>• Added type numbers 74HC2G125GD and 74HCT2G125GD (XSON8U package)</li></ul> |                       |               |                 |
| 74HC_HCT2G125_3 | 20060102                                                                                                                                                                                                                                                                                                                                                                                                                             | Product data sheet    | -             | 74HC_HCT2G125_2 |
| 74HC_HCT2G125_2 | 20030303                                                                                                                                                                                                                                                                                                                                                                                                                             | Product specification | -             | 74HC_HCT2G125_1 |
| 74HC_HCT2G125_1 | 20030131                                                                                                                                                                                                                                                                                                                                                                                                                             | Product specification | -             | -               |

## 16. Legal information

### 16.1 Data sheet status

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

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

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

[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.nxp.com>.

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