

# 74HC253; 74HCT253

Dual 4-input multiplexer; 3-state

Rev. 5 — 21 January 2015

Product data sheet

## 1. General description

The 74HC253; 74HCT253 are high-speed Si-gate CMOS devices and are pin compatible with Low-power Schottky TTL (LSTTL).

The 74HC253; 74HCT253 provides a dual 4-input multiplexer with 3-state outputs which selects 2 bits of data from up to four sources selected by common data select inputs (S0, S1). The two 4-input multiplexer circuits have individual active LOW output enable inputs (1OE, 2OE).

The 74HC253 and 74HCT253 are the logic implementation of a 2-pole, 4-position switch, where the position of the switch is determined by the logic levels applied to S0 and S1. The outputs are forced to a high-impedance OFF-state when nOE is HIGH.

The logic equations for the outputs are:

$$1Y = 1\overline{OE} \cdot (110 \cdot \overline{S1} \cdot \overline{S0} + 111 \cdot \overline{S1} \cdot S0 + 112 \cdot S1 \cdot \overline{S0} + 113 \cdot S1 \cdot S0)$$

$$2Y = 2\overline{OE} \cdot (210 \cdot \overline{S1} \cdot \overline{S0} + 211 \cdot \overline{S1} \cdot S0 + 212 \cdot S1 \cdot \overline{S0} + 213 \cdot S1 \cdot S0)$$

## 2. Features and benefits

- Non-inverting data path
- 3-state outputs interface directly with system bus
- Complies with JEDEC standard no. 7A
- Common select inputs
- Separate output enable inputs
- Input levels:
  - ◆ For 74HC253: CMOS level
  - ◆ For 74HCT253: TTL level
- ESD protection:
  - ◆ HBM JESD22-A114F exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V
- Multiple package options
- Specified from -40 °C to +85 °C and from -40 °C to +125 °C



## 3. Applications

- Data selectors
- Data multiplexers

## 4. Ordering information

Table 1. Ordering information

| Type number | Package           |        |   |          |
|-------------|-------------------|--------|---|----------|
|             | Temperature range | Name   | Description   | Version  |
| 74HC253N    | -40 °C to +125 °C | DIP16  | plastic dual in-line package; 16 leads (300 mil)                  | SOT38-4  |
| 74HCT253N   |                   |        |   |          |
| 74HC253D    | -40 °C to +125 °C | SO16   | plastic small outline package; 16 leads; body width 3.9 mm        | SOT109-1 |
| 74HCT253D   |                   |        |   |          |
| 74HC253DB   | -40 °C to +125 °C | SSOP16 | plastic shrink small outline package; 16 leads; body width 5.3 mm | SOT338-1 |
| 74HCT253DB  |                   |        |   |          |

## 5. Functional diagram

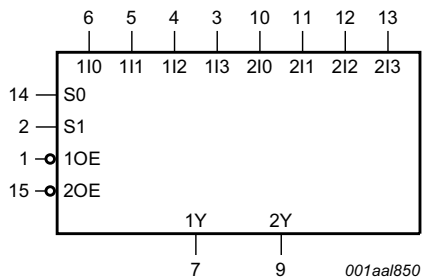


Fig 1. Logic symbol

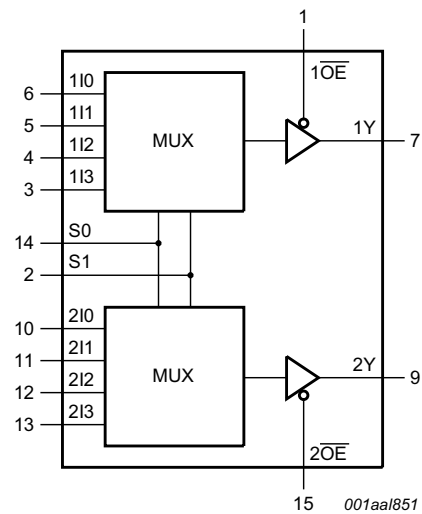


Fig 2. Functional diagram

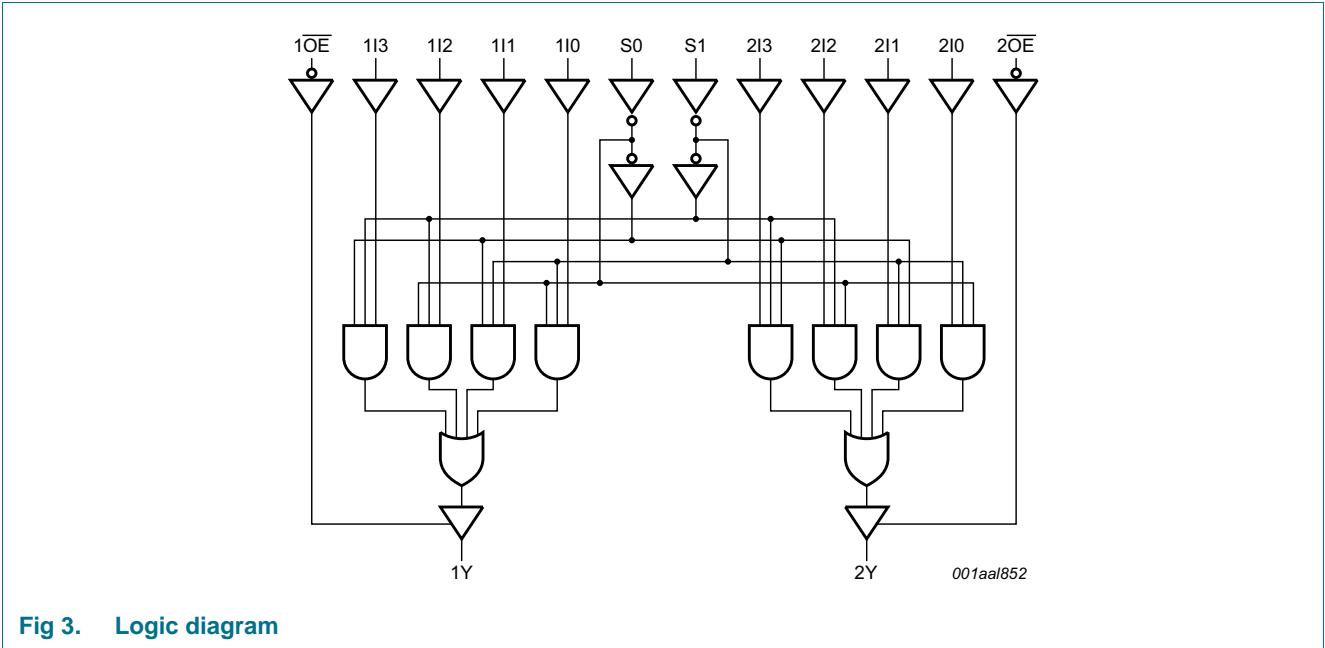


Fig 3. Logic diagram

## 6. Pinning information

### 6.1 Pinning

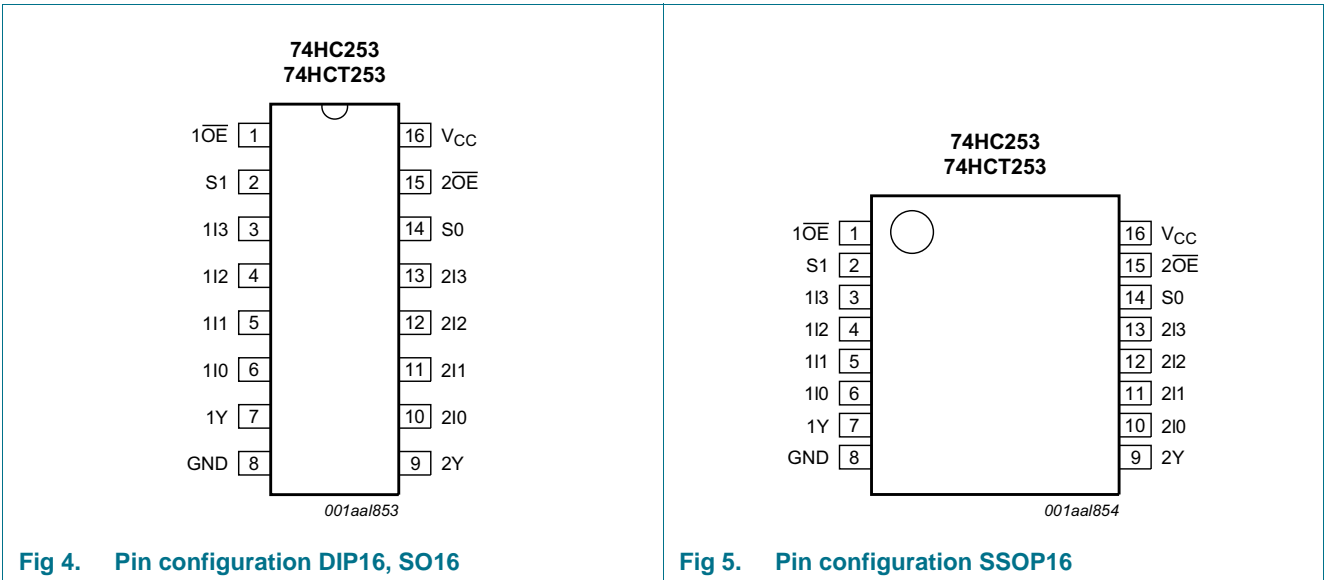


Fig 4. Pin configuration DIP16, SO16

Fig 5. Pin configuration SSOP16

## 6.2 Pin description

Table 2. Pin description

| Symbol                              | Pin            | Description                       |
|-------------------------------------|----------------|-----------------------------------|
| $1\overline{OE}$ , $2\overline{OE}$ | 1, 15          | output enable inputs (active LOW) |
| S0, S1                              | 14, 2          | data select inputs                |
| 1I0, 1I1, 1I2, 1I3                  | 6, 5, 4, 3     | data inputs source 1              |
| 1Y                                  | 7              | multiplexer output source 1       |
| GND                                 | 8              | ground (0 V)                      |
| 2Y                                  | 9              | multiplexer output source 2       |
| 2I0, 2I1, 2I2, 2I3                  | 10, 11, 12, 13 | data inputs source 2              |
| V <sub>CC</sub>                     | 16             | supply voltage                    |

## 7. Functional description

Table 3. Function table<sup>[1]</sup>

| select inputs |    | data inputs |     |     |     | output enable     | output |
|---------------|----|-------------|-----|-----|-----|-------------------|--------|
| S0            | S1 | nI0         | nI1 | nI2 | nI3 | n $\overline{OE}$ | nY     |
| X             | X  | X           | X   | X   | X   | H                 | Z      |
| L             | L  | L           | X   | X   | X   | L                 | L      |
| L             | L  | H           | X   | X   | X   | L                 | H      |
| H             | L  | X           | L   | X   | X   | L                 | L      |
| H             | L  | X           | H   | X   | X   | L                 | H      |
| L             | H  | X           | X   | L   | X   | L                 | L      |
| L             | H  | X           | X   | H   | X   | L                 | H      |
| H             | H  | X           | X   | X   | L   | L                 | L      |
| H             | H  | X           | X   | X   | H   | L                 | H      |

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

## 8. Limiting values

Table 4. 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  | $V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$ | [1]  | ±20  | mA   |
| I <sub>OK</sub>  | output clamping current | $V_O < -0.5\text{ V}$ or $V_O > V_{CC} + 0.5\text{ V}$ | [1]  | ±50  | mA   |
| I <sub>O</sub>   | output current          | $-0.5\text{ V} < V_O < V_{CC} + 0.5\text{ V}$          | -    | ±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   |

**Table 4. Limiting values ...continued**

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

| Symbol           | Parameter               | Conditions                           | Min | Max | Unit |    |
|------------------|-------------------------|--------------------------------------|-----|-----|------|----|
| P <sub>tot</sub> | total power dissipation | T <sub>amb</sub> = -40 °C to +125 °C |     |     |      |    |
|                  |                         | DIP16 package                        | [2] | -   | 750  | mW |
|                  |                         | SO16 package                         | [3] | -   | 500  | mW |
|                  |                         | SSOP16 package                       | [4] | -   | 500  | mW |

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

[2] P<sub>tot</sub> derates linearly with 12 mW/K above 70 °C.

[3] P<sub>tot</sub> derates linearly with 8 mW/K above 70 °C.

[4] P<sub>tot</sub> derates linearly with 5.5 mW/K above 60 °C.

## 9. Recommended operating conditions

**Table 5. Recommended operating conditions**

Voltages are referenced to GND (ground = 0 V)

| Symbol           | Parameter                           | Conditions              | 74HC253 |      |                 | 74HCT253 |      |                 | 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     | -    | +125            | -40      | -    | +125            | °C   |
| Δt/ΔV            | 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 6. Static characteristics**

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

| Symbol          | Parameter                | Conditions              | 25 °C |     |      | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|-----------------|--------------------------|-------------------------|-------|-----|------|------------------|------|-------------------|------|------|
|                 |                          |                         | Min   | Typ | Max  | Min              | Max  | Min               | Max  |      |
| <b>74HC253</b>  |                          |                         |       |     |      |                  |      |                   |      |      |
| V <sub>IH</sub> | HIGH-level input voltage | V <sub>CC</sub> = 2.0 V | 1.5   | 1.2 | -    | 1.5              | -    | 1.5               | -    | V    |
|                 |                          | V <sub>CC</sub> = 4.5 V | 3.15  | 2.4 | -    | 3.15             | -    | 3.15              | -    | V    |
|                 |                          | V <sub>CC</sub> = 6.0 V | 4.2   | 3.2 | -    | 4.2              | -    | 4.2               | -    | V    |
| V <sub>IL</sub> | LOW-level input voltage  | V <sub>CC</sub> = 2.0 V | -     | 0.8 | 0.5  | -                | 0.5  | -                 | 0.5  | V    |
|                 |                          | V <sub>CC</sub> = 4.5 V | -     | 2.1 | 1.35 | -                | 1.35 | -                 | 1.35 | V    |
|                 |                          | V <sub>CC</sub> = 6.0 V | -     | 2.8 | 1.8  | -                | 1.8  | -                 | 1.8  | V    |

**Table 6. Static characteristics ...continued**

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

| Symbol          | Parameter                 | Conditions   | 25 °C |      |      | -40 °C to +85 °C |      | -40 °C to +125 °C |       | Unit |
|-----------------|---------------------------|--|-------|------|------|------------------|------|-------------------|-------|------|
|                 |                           |  | Min   | Typ  | Max  | Min              | Max  | Min               | Max   |      |
| 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              | -    | 1.9               | -     | V    |
|                 |                           | I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 4.5 V   | 4.4   | 4.5  | -    | 4.4              | -    | 4.4               | -     | V    |
|                 |                           | I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 6.0 V   | 5.9   | 6.0  | -    | 5.9              | -    | 5.9               | -     | V    |
|                 |                           | I <sub>O</sub> = -6.0 mA; V <sub>CC</sub> = 4.5 V  | 3.98  | 4.32 | -    | 3.84             | -    | 3.7               | -     | V    |
|                 |                           | I <sub>O</sub> = -7.8 mA; V <sub>CC</sub> = 6.0 V  | 5.48  | 5.81 | -    | 5.34             | -    | 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  | -                 | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V  | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V  | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 6.0 mA; V <sub>CC</sub> = 4.5 V   | -     | 0.15 | 0.26 | -                | 0.33 | -                 | 0.4   | V    |
|                 |                           | I <sub>O</sub> = 7.8 mA; V <sub>CC</sub> = 6.0 V   | -     | 0.16 | 0.26 | -                | 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   | -     | -    | ±0.1 | -                | ±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> ; V <sub>O</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V   | -     | -    | ±0.5 | -                | ±5.0 | -                 | ±10.0 | μA   |
| I <sub>CC</sub> | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 6.0 V   | -     | -    | 8.0  | -                | 80   | -                 | 160   | μA   |
| C <sub>I</sub>  | input capacitance         |  | -     | 3.5  | -    |                  |      |                   |       | pF   |
| <b>74HCT253</b> |                           |  |       |      |      |                  |      |                   |       |      |
| V <sub>IH</sub> | HIGH-level input voltage  | V <sub>CC</sub> = 4.5 V to 5.5 V   | 2.0   | 1.6  | -    | 2.0              | -    | 2.0               | -     | V    |
| V <sub>IL</sub> | LOW-level input voltage   | V <sub>CC</sub> = 4.5 V to 5.5 V   | -     | 1.2  | 0.8  | -                | 0.8  | -                 | 0.8   | V    |
| V <sub>OH</sub> | HIGH-level output voltage | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 4.5 V  |       |      |      |                  |      |                   |       |      |
|                 |                           | I <sub>O</sub> = -20 μA  | 4.4   | 4.5  | -    | 4.4              | -    | 4.4               | -     | V    |
|                 |                           | I <sub>O</sub> = -6 mA   | 3.98  | 4.32 | -    | 3.84             | -    | 3.7               | -     | V    |
| V <sub>OL</sub> | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 4.5 V  |       |      |      |                  |      |                   |       |      |
|                 |                           | I <sub>O</sub> = 20 μA   | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 6.0 mA  | -     | 0.15 | 0.26 | -                | 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> = 5.5 V   | -     | -    | ±0.1 | -                | ±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> ; V <sub>CC</sub> = 5.5 V; V <sub>O</sub> = V <sub>CC</sub> or GND per input pin; other inputs at V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A | -     | -    | ±0.5 | -                | ±5.0 | -                 | ±10   | μA   |
| I <sub>CC</sub> | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 5.5 V   | -     | -    | 8.0  | -                | 80   | -                 | 160   | μA   |

**Table 6. Static characteristics ...continued**

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

| Symbol          | Parameter                 | Conditions   | 25 °C |     |     | -40 °C to +85 °C |     | -40 °C to +125 °C |     | Unit          |
|-----------------|---------------------------|--|-------|-----|-----|------------------|-----|-------------------|-----|---------------|
|                 |                           |  | Min   | Typ | Max | Min              | Max | Min               | Max |               |
| $\Delta I_{CC}$ | additional supply current | $V_I = V_{CC} - 2.1\text{ V}$ ;<br>other inputs at $V_{CC}$ or GND;<br>$V_{CC} = 4.5\text{ V}$ to $5.5\text{ V}$ ;<br>$I_O = 0\text{ A}$ |       |     |     |                  |     |                   |     |               |
|                 |                           | per input pin; 1In, 2In inputs   | -     | 40  | 144 | -                | 180 | -                 | 196 | $\mu\text{A}$ |
|                 |                           | per input pin; $\overline{nOE}$ input  | -     | 110 | 396 | -                | 495 | -                 | 539 | $\mu\text{A}$ |
|                 |                           | per input pin; Sn input  | -     | 110 | 396 | -                | 495 | -                 | 539 | $\mu\text{A}$ |
| $C_I$           | input capacitance         |  | -     | 3.5 | -   |                  |     |                   |     | pF            |

## 11. Dynamic characteristics

**Table 7. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); For test circuit see [Figure 8](#).

| Symbol         | Parameter         | Conditions   | 25 °C |     | -40 °C to +85 °C | -40 °C to +125 °C | Unit |
|----------------|-------------------|--|-------|-----|------------------|-------------------|------|
|                |                   |  | Typ   | Max | Max              | Max               |      |
| <b>74HC253</b> |                   |  |       |     |                  |                   |      |
| $t_{pd}$       | propagation delay | 1In to 1Y or 2In to 2Y; see <a href="#">Figure 6</a> <a href="#">[1]</a> |       |     |                  |                   |      |
|                |                   | $V_{CC} = 2.0\text{ V}$  | 55    | 175 | 220              | 265               | ns   |
|                |                   | $V_{CC} = 4.5\text{ V}$  | 20    | 35  | 44               | 53                | ns   |
|                |                   | $V_{CC} = 5.0\text{ V}$ ; $C_L = 15\text{ pF}$                           | 17    | -   | -                | -                 | ns   |
|                |                   | $V_{CC} = 6.0\text{ V}$  | 16    | 30  | 37               | 45                | ns   |
|                |                   | Sn to nY; see <a href="#">Figure 6</a>                                   |       |     |                  |                   |      |
|                |                   | $V_{CC} = 2.0\text{ V}$  | 58    | 175 | 220              | 265               | ns   |
|                |                   | $V_{CC} = 4.5\text{ V}$  | 21    | 35  | 44               | 53                | ns   |
| $t_{en}$       | enable time       | $\overline{nOE}$ to nY; see <a href="#">Figure 7</a> <a href="#">[2]</a> |       |     |                  |                   |      |
|                |                   | $V_{CC} = 2.0\text{ V}$  | 30    | 100 | 125              | 150               | ns   |
|                |                   | $V_{CC} = 4.5\text{ V}$  | 11    | 20  | 25               | 30                | ns   |
|                |                   | $V_{CC} = 6.0\text{ V}$  | 9     | 17  | 21               | 26                | ns   |
| $t_{dis}$      | disable time      | $\overline{nOE}$ to nY; see <a href="#">Figure 7</a> <a href="#">[3]</a> |       |     |                  |                   |      |
|                |                   | $V_{CC} = 2.0\text{ V}$  | 41    | 150 | 190              | 225               | ns   |
|                |                   | $V_{CC} = 4.5\text{ V}$  | 15    | 30  | 38               | 45                | ns   |
|                |                   | $V_{CC} = 6.0\text{ V}$  | 12    | 26  | 33               | 38                | ns   |
| $t_t$          | transition time   | see <a href="#">Figure 6</a> <a href="#">[4]</a>                         |       |     |                  |                   |      |
|                |                   | $V_{CC} = 2.0\text{ V}$  | 14    | 60  | 75               | 90                | ns   |
|                |                   | $V_{CC} = 4.5\text{ V}$  | 5     | 12  | 15               | 18                | ns   |
|                |                   | $V_{CC} = 6.0\text{ V}$  | 4     | 10  | 13               | 15                | ns   |

**Table 7. Dynamic characteristics ...continued**

Voltages are referenced to GND (ground = 0 V); For test circuit see [Figure 8](#).

| Symbol           | Parameter                     | Conditions  | 25 °C |     | -40 °C to +85 °C | -40 °C to +125 °C | Unit |
|------------------|-------------------------------|---|-------|-----|------------------|-------------------|------|
|                  |                               |   | Typ   | Max | Max              | Max               |      |
| C <sub>PD</sub>  | power dissipation capacitance | per multiplexer; V <sub>I</sub> = GND to V <sub>CC</sub> [5]                              | 55    | -   |                  |                   | pF   |
| <b>74HCT253</b>  |                               |   |       |     |                  |                   |      |
| t <sub>pd</sub>  | propagation delay             | 1In to 1Y or 2In to 2Y; see <a href="#">Figure 6</a> [1]                                  |       |     |                  |                   |      |
|                  |                               | V <sub>CC</sub> = 4.5 V   | 20    | 38  | 48               | 57                | ns   |
|                  |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF   | 17    | -   | -                |                   | ns   |
|                  |                               | Sn to nY; see <a href="#">Figure 6</a>  |       |     |                  |                   |      |
|                  |                               | V <sub>CC</sub> = 4.5 V   | 22    | 40  | 50               | 60                | ns   |
|                  |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF   | 19    | -   |                  |                   | ns   |
| t <sub>en</sub>  | enable time                   | n $\overline{\text{OE}}$ to nY; V <sub>CC</sub> = 4.5 V; see <a href="#">Figure 7</a> [2] | 14    | 30  | 38               | 45                | ns   |
| t <sub>dis</sub> | disable time                  | n $\overline{\text{OE}}$ to nY; V <sub>CC</sub> = 4.5 V; see <a href="#">Figure 7</a> [3] | 13    | 30  | 38               | 45                | ns   |
| t <sub>t</sub>   | transition time               | V <sub>CC</sub> = 4.5 V; see <a href="#">Figure 6</a>                                     | 5     | 12  | 15               | 18                | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | per multiplexer; V <sub>I</sub> = GND to V <sub>CC</sub> - 1.5 V [5]                      | 55    | -   |                  |                   | pF   |

[1] t<sub>pd</sub> is the same as t<sub>PHL</sub>, t<sub>PLH</sub>.

[2] t<sub>en</sub> is the same as t<sub>PZH</sub>, t<sub>PZL</sub>.

[3] t<sub>dis</sub> is the same as t<sub>PHZ</sub>, t<sub>PLZ</sub>.

[4] t<sub>t</sub> is the same as t<sub>THL</sub>, t<sub>TLH</sub>.

[5] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).

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

f<sub>i</sub> = input frequency in MHz;

f<sub>o</sub> = output frequency in MHz;

C<sub>L</sub> = output load capacitance in pF;

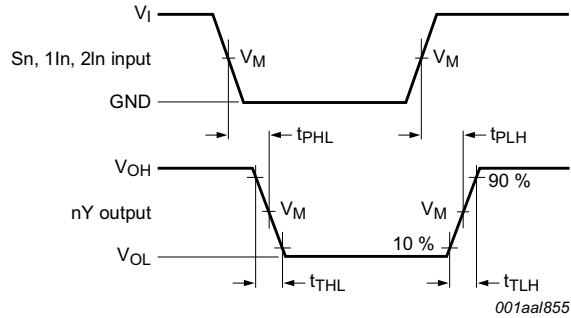
V<sub>CC</sub> = supply voltage in V;

N = number of inputs switching;

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

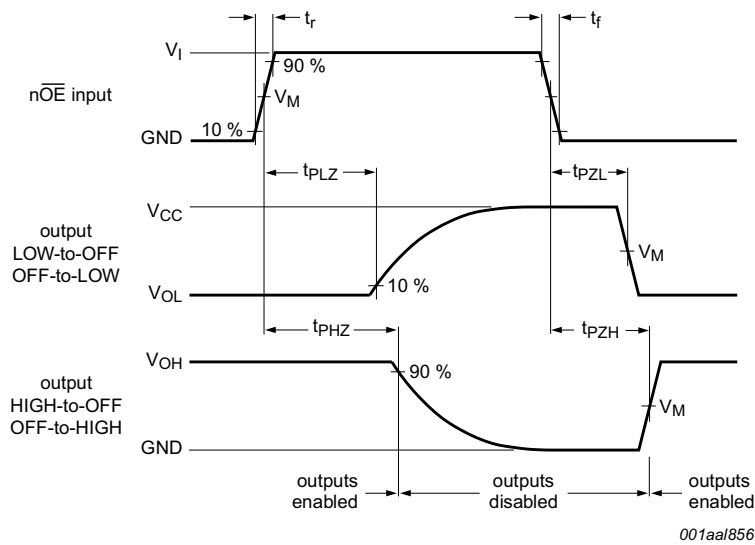


12. Waveforms



Measurement points are given in [Table 8](#).  
 $V_{OL}$  and  $V_{OH}$  are typical voltage output levels that occur with the output load.

Fig 6. Propagation delays input (Sn, 1In, 2In) to output (nY) and output (nY) transition times



Measurement points are given in [Table 8](#).  
 $V_{OL}$  and  $V_{OH}$  are typical voltage output levels that occur with the output load.

Fig 7. 3-state output enable and disable times

Table 8. Measurement points

| Type     | Input       | Output      |
|----------|-------------|-------------|
|          | $V_M$       | $V_M$       |
| 74HC253  | $0.5V_{CC}$ | $0.5V_{CC}$ |
| 74HCT253 | 1.3 V       | 1.3 V       |

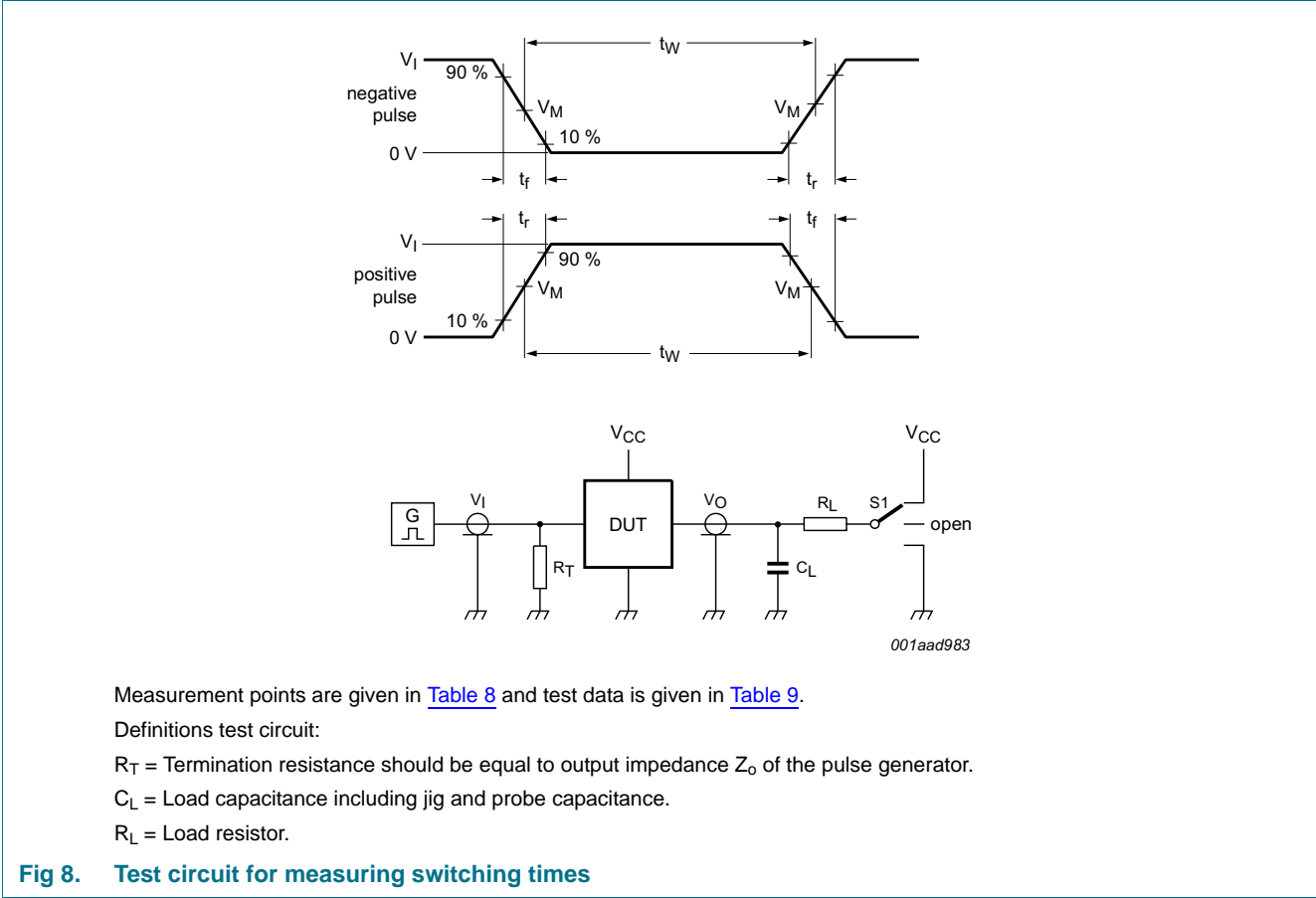


Table 9. Test data

| Type     | Input    |            | Load  |              | Switch position    |                    |                    |
|----------|----------|------------|-------|--------------|--------------------|--------------------|--------------------|
|          | $V_I$    | $t_r, t_f$ | $C_L$ | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74HC253  | $V_{CC}$ | 6 ns       | 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74HCT253 | 3 V      | 6 ns       | 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |

13. Package outline

DIP16: plastic dual in-line package; 16 leads (300 mil)

SOT38-4

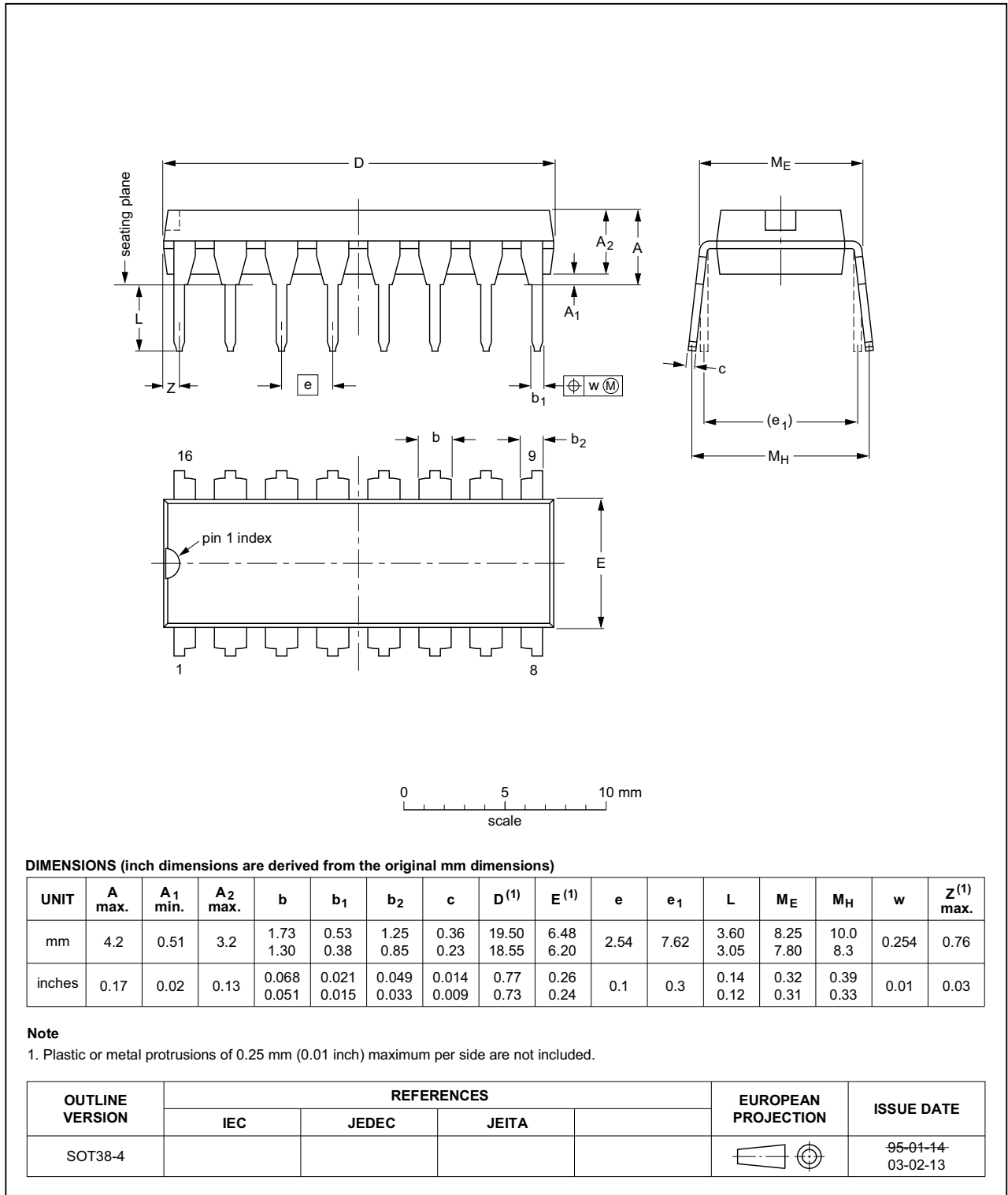


Fig 9. Package outline SOT38-4 (DIP16)

SO16: plastic small outline package; 16 leads; body width 3.9 mm

SOT109-1

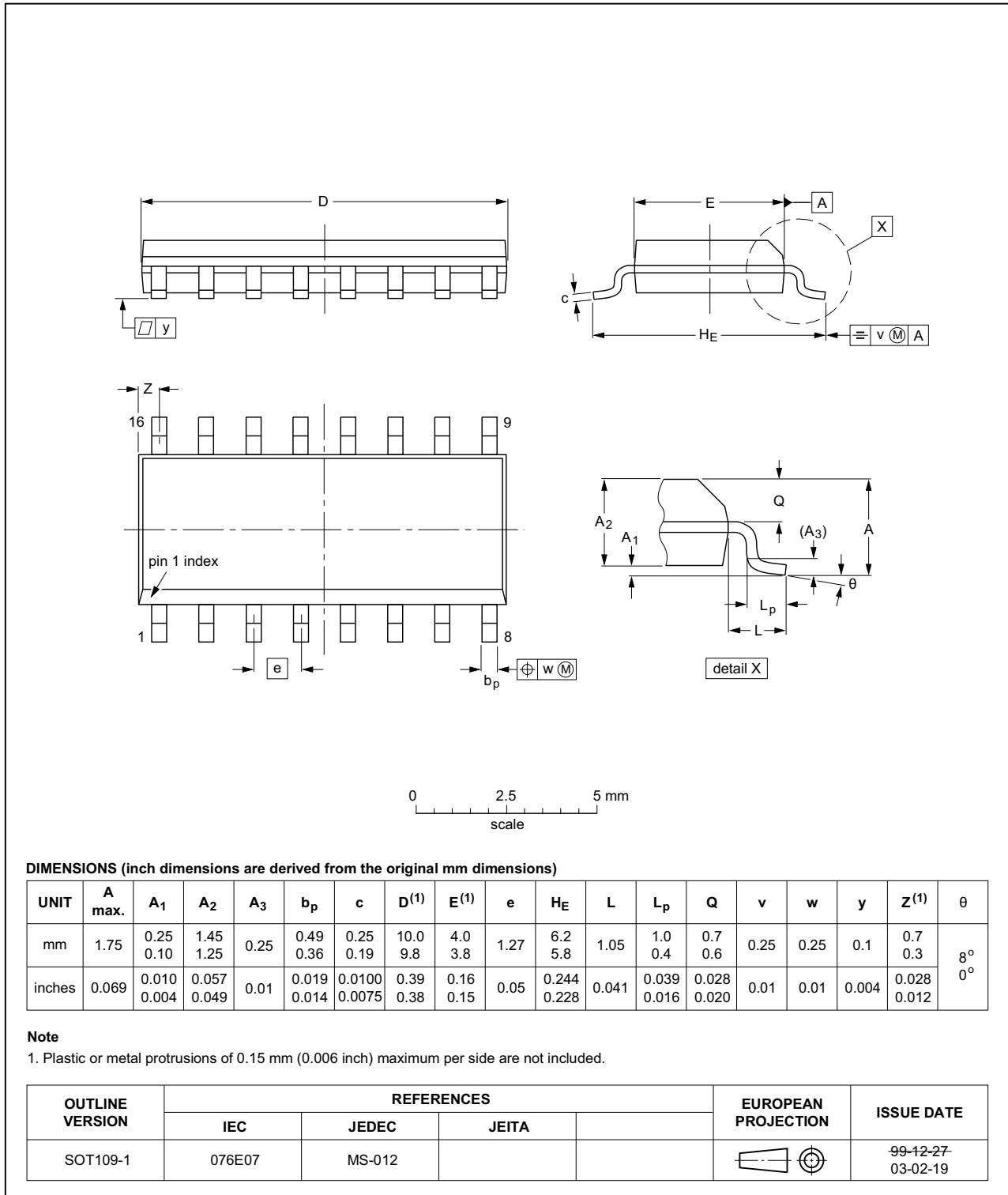


Fig 10. Package outline SOT109-1 (SO16)

SSOP16: plastic shrink small outline package; 16 leads; body width 5.3 mm

SOT338-1

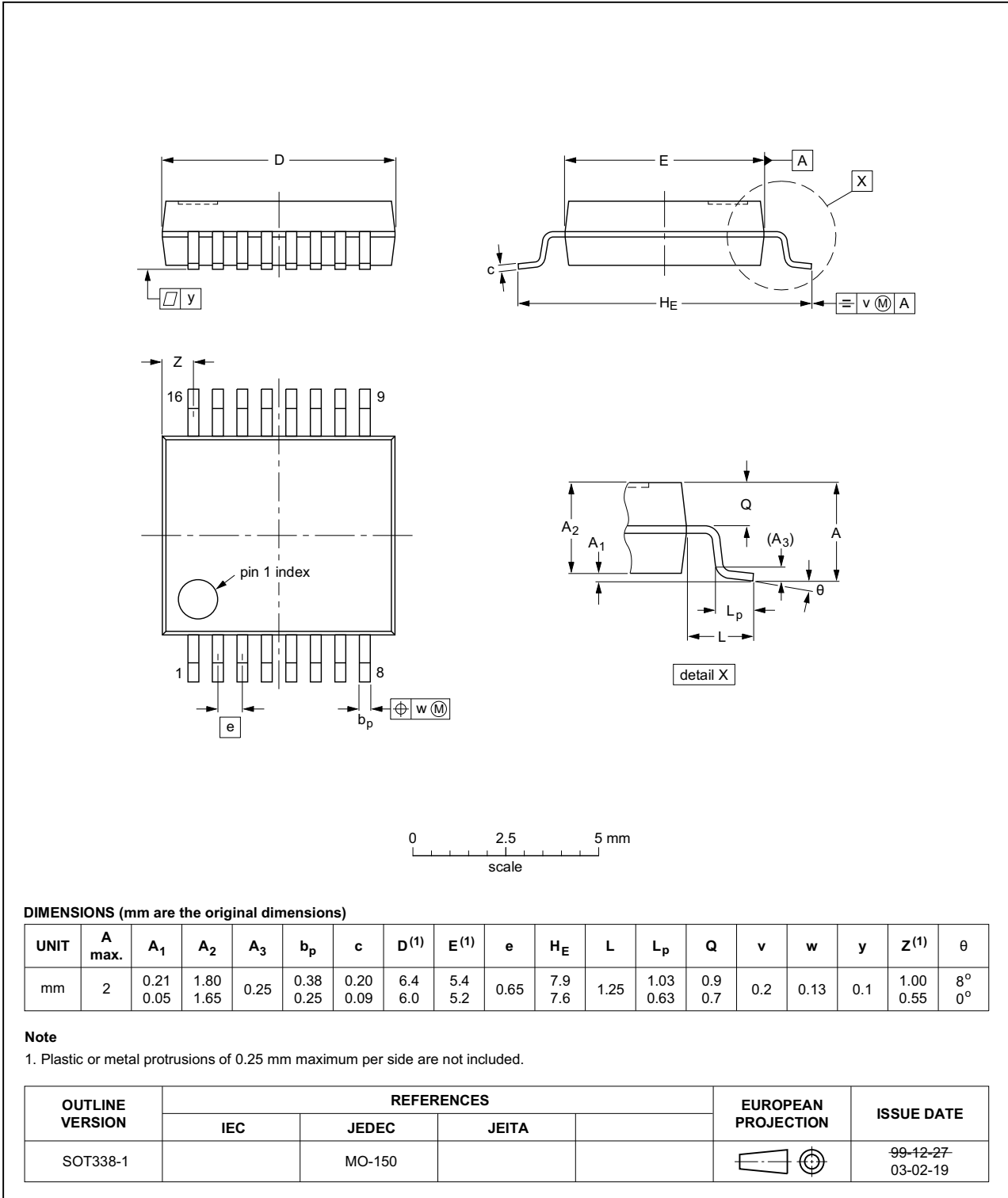


Fig 11. Package outline SOT338-1 (SSOP16)

## 14. Abbreviations

Table 10. 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             |

## 15. Revision history

Table 11. Revision history

| Document ID         | Release date  | Data sheet status     | Change notice | Supersedes          |
|---------------------|---|-----------------------|---------------|---------------------|
| 74HC_HCT253 v.5     | 20150121  | Product data sheet    | -             | 74HC_HCT253 v.4     |
| Modifications:      | <ul style="list-style-type: none"> <li><a href="#">Table 7</a>: Power dissipation capacitance condition for 74HCT253 is corrected.</li> </ul> |                       |               |                     |
| 74HC_HCT253 v.4     | 20111212  | Product data sheet    | -             | 74HC_HCT253 v.3     |
| Modifications:      | <ul style="list-style-type: none"> <li>Legal pages updated.</li> </ul>  |                       |               |                     |
| 74HC_HCT253 v.3     | 20100422  | Product data sheet    | -             | 74HC_HCT253_CNV v.2 |
| 74HC_HCT253_CNV v.2 | 970828  | 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".

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