

# 74HC153; 74HCT153

## Dual 4-input multiplexer

Rev. 8 — 13 August 2019

Product data sheet

## 1. General description

The 74HC153; 74HCT153 is a dual 4-input multiplexer. The device features independent enable inputs ( $\overline{nE}$ ) and common data select inputs (S0 and S1). For each multiplexer, the select inputs select one of the four binary inputs and routes it to the multiplexer output ( $nY$ ). A HIGH on  $\overline{E}$  forces the corresponding multiplexer outputs LOW. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

## 2. Features and benefits

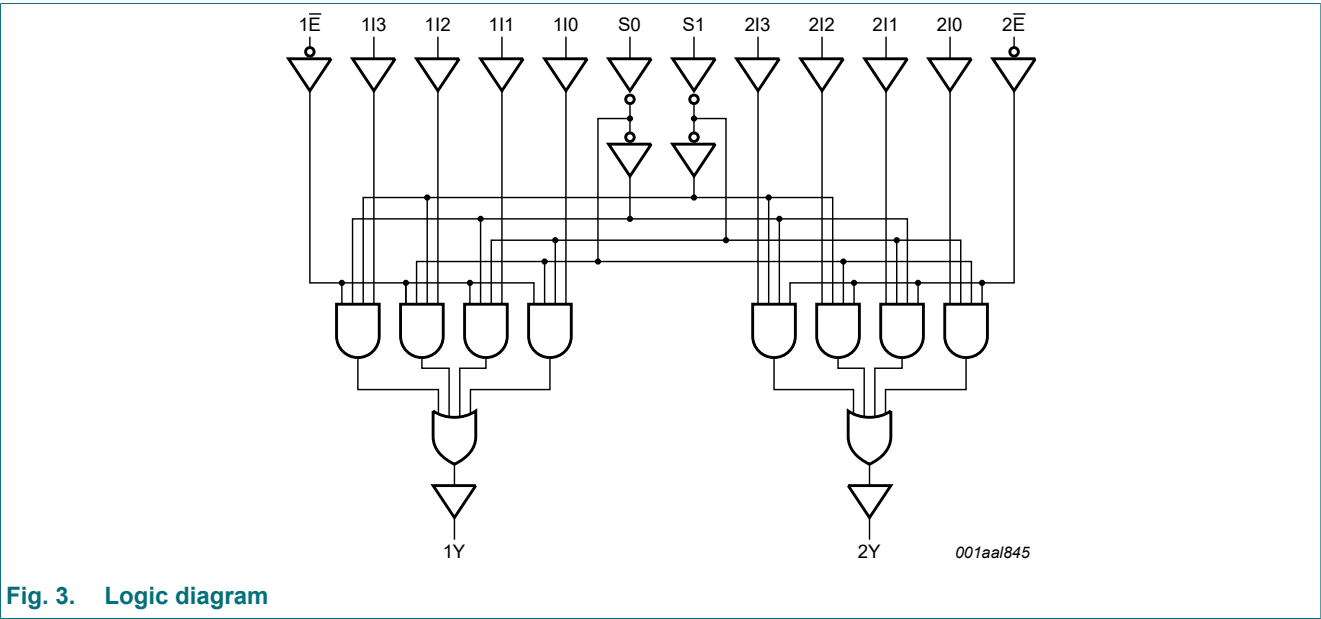
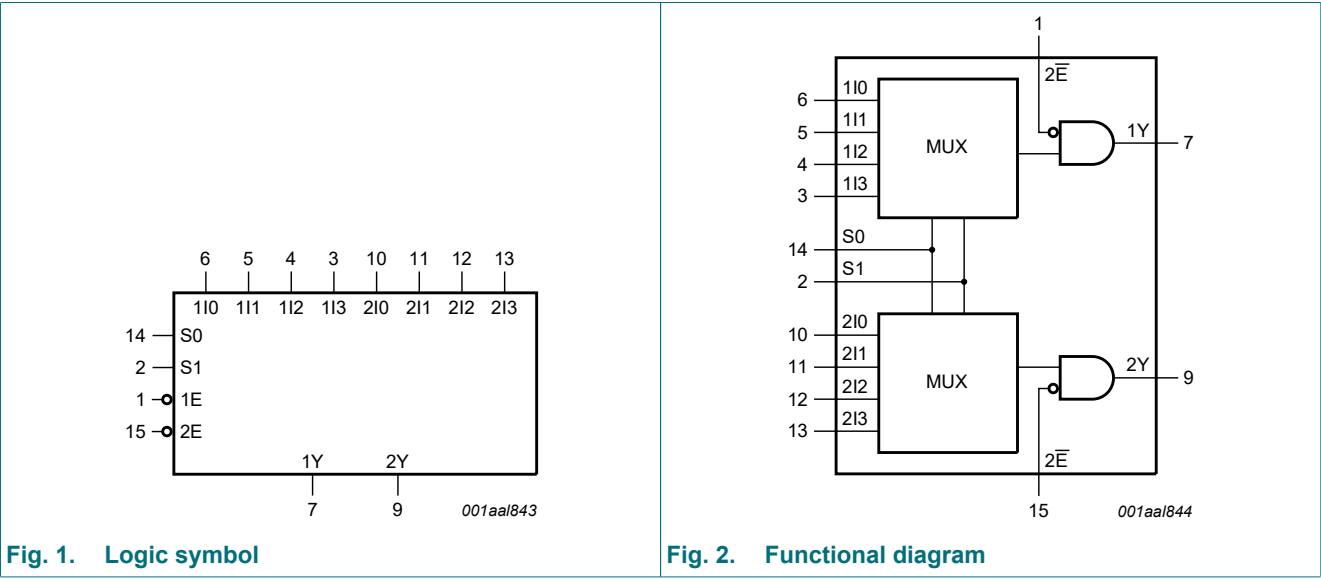
- Input levels:
  - For 74HC153: CMOS level
  - For 74HCT153: TTL level
- Non-inverting outputs
- Separate enable input for each output
- Common select inputs
- Complies with JEDEC standard no. 7A
- Permits multiplexing from n lines to 1 line
- Enable line provided for cascading (n lines to 1 line)
- 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 -40 °C to +125 °C.

## 3. Ordering information

Table 1. Ordering information

| Type number | Package           |         |                                                                           |          |
|-------------|-------------------|---------|---------------------------------------------------------------------------|----------|
|             | Temperature range | Name    | Description                                                               | Version  |
| 74HC153D    | -40 °C to +125 °C | SO16    | plastic small outline package; 16 leads;<br>body width 3.9 mm             | SOT109-1 |
| 74HCT153D   |                   |         |                                                                           |          |
| 74HC153DB   | -40 °C to +125 °C | SSOP16  | plastic shrink small outline package; 16 leads;<br>body width 5.3 mm      | SOT338-1 |
| 74HCT153DB  |                   |         |                                                                           |          |
| 74HC153PW   | -40 °C to +125 °C | TSSOP16 | plastic thin shrink small outline package;<br>16 leads; body width 4.4 mm | SOT403-1 |
| 74HCT153PW  |                   |         |                                                                           |          |

4. Functional diagram



5. Pinning information

5.1. Pinning

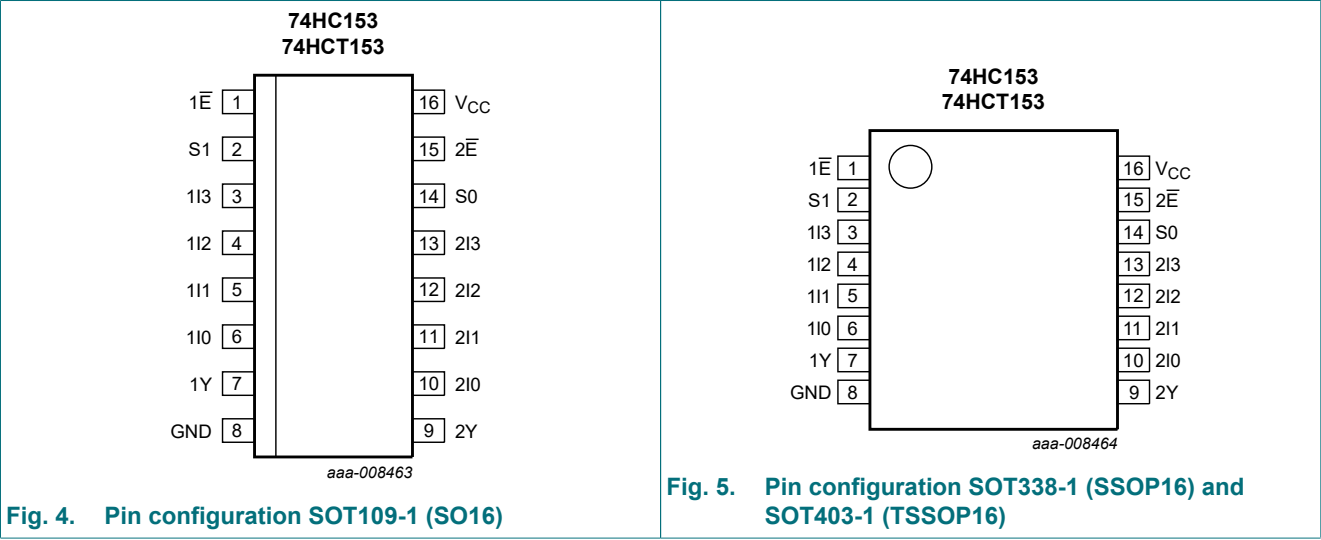


Fig. 4. Pin configuration SOT109-1 (SO16)

Fig. 5. Pin configuration SOT338-1 (SSOP16) and SOT403-1 (TSSOP16)

5.2. Pin description

Table 2. Pin description

| Symbol             | Pin            | Description                       |
|--------------------|----------------|-----------------------------------|
| 1E, 2E             | 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              |
| VCC                | 16             | supply voltage                    |

## 6. Functional description

**Table 3. Function table**

*H = HIGH voltage level; L = LOW voltage level; X = don't care.*

| select inputs |    | data inputs |     |     |     | output enable | output |
|---------------|----|-------------|-----|-----|-----|---------------|--------|
| S0            | S1 | nl0         | nl1 | nl2 | nl3 | n $\bar{E}$   | nY     |
| X             | X  | X           | X   | X   | X   | H             | L      |
| 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      |

## 7. 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   | 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 [1] | -    | ±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 [1] | -    | ±20  | mA   |
| I <sub>O</sub>   | output current          | -0.5 V < V <sub>O</sub> < V <sub>CC</sub> + 0.5 V                       | -    | ±25  | mA   |
| I <sub>CC</sub>  | supply current          |                                                                         | -    | 50   | mA   |
| I <sub>GND</sub> | ground current          |                                                                         | -50  | -    | mA   |
| T <sub>stg</sub> | storage temperature     |                                                                         | -65  | +150 | °C   |
| P <sub>tot</sub> | total power dissipation | [2]                                                                     | -    | 500  | mW   |

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

[2] For SOT109-1 (SO16) packages: P<sub>tot</sub> derates linearly with 12.4 mW/K above 110 °C.

For SOT338-1 (SSOP16) packages: P<sub>tot</sub> derates linearly with 8.5 mW/K above 91 °C.

For SOT403-1 (TSSOP16) packages: P<sub>tot</sub> derates linearly with 8.5 mW/K above 91 °C.

## 8. Recommended operating conditions

**Table 5. Recommended operating conditions**

Voltages are referenced to GND (ground = 0 V)

| Symbol           | Parameter                           | Conditions              | 74HC153 |      |                 | 74HCT153 |      |                 | 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   |
| 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 |

## 9. 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  |      |
| 74HC153         |                           |                                                                                        |       |      |      |                  |      |                   |      |      |
| 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    |
| 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> = -4.0 mA; V <sub>CC</sub> = 4.5 V                                      | 3.98  | 4.32 | -    | 3.84             | -    | 3.7               | -    | V    |
| V <sub>OL</sub> | LOW-level output voltage  | I <sub>O</sub> = -5.2 mA; V <sub>CC</sub> = 6.0 V                                      | 5.48  | 5.81 | -    | 5.34             | -    | 5.2               | -    | V    |
|                 |                           | 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> = 4.0 mA; V <sub>CC</sub> = 4.5 V                                       | -     | 0.15 | 0.26 | -                | 0.33 | -                 | 0.4  | V    |
| I <sub>I</sub>  | input leakage current     | I <sub>O</sub> = 5.2 mA; V <sub>CC</sub> = 6.0 V                                       | -     | 0.16 | 0.26 | -                | 0.33 | -                 | 0.4  | V    |
|                 |                           | V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V                       | -     | -    | ±0.1 | -                | ±1   | -                 | ±1   | 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   |

| Symbol           | Parameter                 | Conditions                                                                                                                                              | 25 °C |      |      | -40 °C to +85 °C |      | -40 °C to +125 °C |     | Unit |
|------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|------|------------------|------|-------------------|-----|------|
|                  |                           |                                                                                                                                                         | Min   | Typ  | Max  | Min              | Max  | Min               | Max |      |
| 74HCT153         |                           |                                                                                                                                                         |       |      |      |                  |      |                   |     |      |
| 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> = -4.0 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; V <sub>CC</sub> = 4.5 V                                                                                                         | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1 | V    |
|                  |                           | I <sub>O</sub> = 5.2 mA; V <sub>CC</sub> = 6.0 V                                                                                                        | -     | 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   | -                 | ±1  | 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    | -                | 80   | -                 | 160 | µA   |
| ΔI <sub>CC</sub> | additional supply current | per input pin; V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; I <sub>O</sub> = 0 A; other inputs at V <sub>CC</sub> or GND; V <sub>CC</sub> = 4.5 V to 5.5 V |       |      |      |                  |      |                   |     |      |
|                  |                           | 1In, 2In                                                                                                                                                | -     | 45   | 162  | -                | 203  | -                 | 221 | µA   |
|                  |                           | n $\overline{E}$                                                                                                                                        | -     | 60   | 216  | -                | 270  | -                 | 294 | µA   |
|                  |                           | Sn                                                                                                                                                      | -     | 135  | 486  | -                | 608  | -                 | 662 | µA   |
| C <sub>I</sub>   | input capacitance         |                                                                                                                                                         | -     | 3.5  | -    | -                | -    | -                 | -   | pF   |

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

$GND = 0\text{ V}$ ;  $t_r = t_f = 6\text{ ns}$ ;  $C_L = 50\text{ pF}$ ; for test circuit, see [Fig. 8](#); unless otherwise specified

| Symbol          | Parameter                     | Conditions                                               | 25 °C |     |     | -40 °C to +85 °C |     | -40 °C to +125 °C |     | Unit |
|-----------------|-------------------------------|----------------------------------------------------------|-------|-----|-----|------------------|-----|-------------------|-----|------|
|                 |                               |                                                          | Min   | Typ | Max | Min              | Max | Min               | Max |      |
| 74HC153         |                               |                                                          |       |     |     |                  |     |                   |     |      |
| t <sub>pd</sub> | propagation delay             | 1In to nY, 2In to nY; see Fig. 6 [1]                     |       |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | -     | 47  | 145 | -                | 180 | -                 | 220 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | -     | 17  | 29  | -                | 36  | -                 | 44  | ns   |
|                 |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF          | -     | 14  | -   | -                | -   | -                 | -   | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | -     | 14  | 25  | -                | 31  | -                 | 38  | ns   |
|                 |                               | Sn to nY; see Fig. 7                                     |       |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | -     | 50  | 150 | -                | 190 | -                 | 225 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | -     | 18  | 30  | -                | 38  | -                 | 45  | ns   |
|                 |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF          | -     | 15  | -   | -                | -   | -                 | -   | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | -     | 14  | 26  | -                | 33  | -                 | 38  | ns   |
|                 |                               | nE to nY; see Fig. 7                                     |       |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | -     | 33  | 100 | -                | 125 | -                 | 150 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | -     | 12  | 20  | -                | 25  | -                 | 30  | ns   |
|                 |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF          | -     | 10  | -   | -                | -   | -                 | -   | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | -     | 10  | 17  | -                | 21  | -                 | 26  | ns   |
| t <sub>t</sub>  | transition time               | see Fig. 6 [2]                                           |       |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | -     | 19  | 75  | -                | 95  | -                 | 110 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | -     | 7   | 15  | -                | 19  | -                 | 22  | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | -     | 6   | 13  | -                | 16  | -                 | 19  | ns   |
| C <sub>PD</sub> | power dissipation capacitance | per package; V <sub>I</sub> = GND to V <sub>CC</sub> [3] | -     | 30  | -   | -                | -   | -                 | -   | pF   |

| Symbol           | Parameter                     | Conditions                                                       | 25 °C |     |     | -40 °C to +85 °C |     | -40 °C to +125 °C |     | Unit |
|------------------|-------------------------------|------------------------------------------------------------------|-------|-----|-----|------------------|-----|-------------------|-----|------|
|                  |                               |                                                                  | Min   | Typ | Max | Min              | Max | Min               | Max |      |
| 74HCT153         |                               |                                                                  |       |     |     |                  |     |                   |     |      |
| t <sub>PHL</sub> | HIGH to LOW propagation delay | 1In to nY, 2In to nY; see <a href="#">Fig. 6</a> [1]             |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V                                          | -     | 19  | 34  | -                | 43  | -                 | 51  | ns   |
|                  |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF                  | -     | 16  | -   | -                | -   | -                 | -   | ns   |
| t <sub>PLH</sub> | LOW to HIGH propagation delay | 1In to nY, 2In to nY; see <a href="#">Fig. 6</a> [1]             |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V                                          | -     | 13  | 24  | -                | 30  | -                 | 36  | ns   |
|                  |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF                  | -     | 16  | -   | -                | -   | -                 | -   | ns   |
| t <sub>pd</sub>  | propagation delay             | Sn to nY; see <a href="#">Fig. 7</a> [1]                         |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V                                          | -     | 20  | 34  | -                | 43  | -                 | 51  | ns   |
|                  |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF                  | -     | 17  | -   | -                | -   | -                 | -   | ns   |
|                  |                               | nE to nY; see <a href="#">Fig. 7</a> [1]                         |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V                                          | -     | 14  | 27  | -                | 34  | -                 | 41  | ns   |
|                  |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF                  | -     | 11  | -   | -                | -   | -                 | -   | ns   |
| t <sub>t</sub>   | transition time               | see <a href="#">Fig. 6</a> [2]                                   |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V                                          | -     | 7   | 15  | -                | 19  | -                 | 22  | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | per package; V <sub>I</sub> = GND to V <sub>CC</sub> - 1.5 V [3] | -     | 30  | -   | -                | -   | -                 | -   | pF   |

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

[2] t<sub>t</sub> is the same as t<sub>THL</sub> and t<sub>TLH</sub>.

[3] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in  $\mu$ W):

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

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

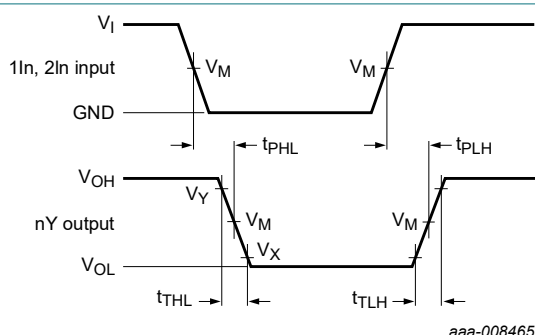
f<sub>o</sub> = output frequency in MHz;

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

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

N = number of inputs switching;

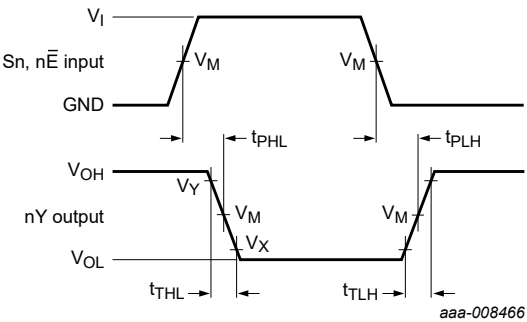
$\sum (C_L \times V_{CC}^2 \times f_o)$  = sum of outputs.



Measurement points are given in Table 8.

V<sub>OL</sub> and V<sub>OH</sub> are typical voltage output levels that occur with the output load.

**Fig. 6.** Waveforms showing the input (1In, 2In) to output (1Y, 2Y) propagation delays and output transition times

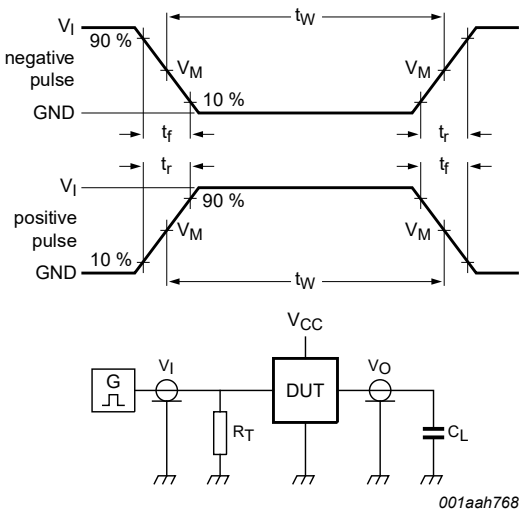


Measurement points are given in [Table 8](#).  
 $V_{OL}$  and  $V_{OH}$  are typical voltage output levels that occur with the output load.

**Fig. 7. Waveforms showing the input (Sn, nE) to output (nY) propagation delays**

**Table 8. Measurement points**

| Type     | Input       | Output      |             |             |
|----------|-------------|-------------|-------------|-------------|
|          | $V_M$       | $V_M$       | $V_X$       | $V_Y$       |
| 74HC153  | $0.5V_{CC}$ | $0.5V_{CC}$ | $0.1V_{CC}$ | $0.9V_{CC}$ |
| 74HCT153 | 1.3 V       | 1.3 V       | $0.1V_{CC}$ | $0.9V_{CC}$ |



Test data is given in [Table 9](#).  
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.

**Fig. 8. Test circuit for measuring switching times**

**Table 9. Test data**

| Type     | Input    |            | Load         | Test               |
|----------|----------|------------|--------------|--------------------|
|          | $V_I$    | $t_r, t_f$ | $C_L$        |                    |
| 74HC153  | $V_{CC}$ | 6.0 ns     | 15 pF, 50 pF | $t_{PLH}, t_{PHL}$ |
| 74HCT153 | 3.0 V    | 6.0 ns     | 15 pF, 50 pF | $t_{PLH}, t_{PHL}$ |

11. Package outline

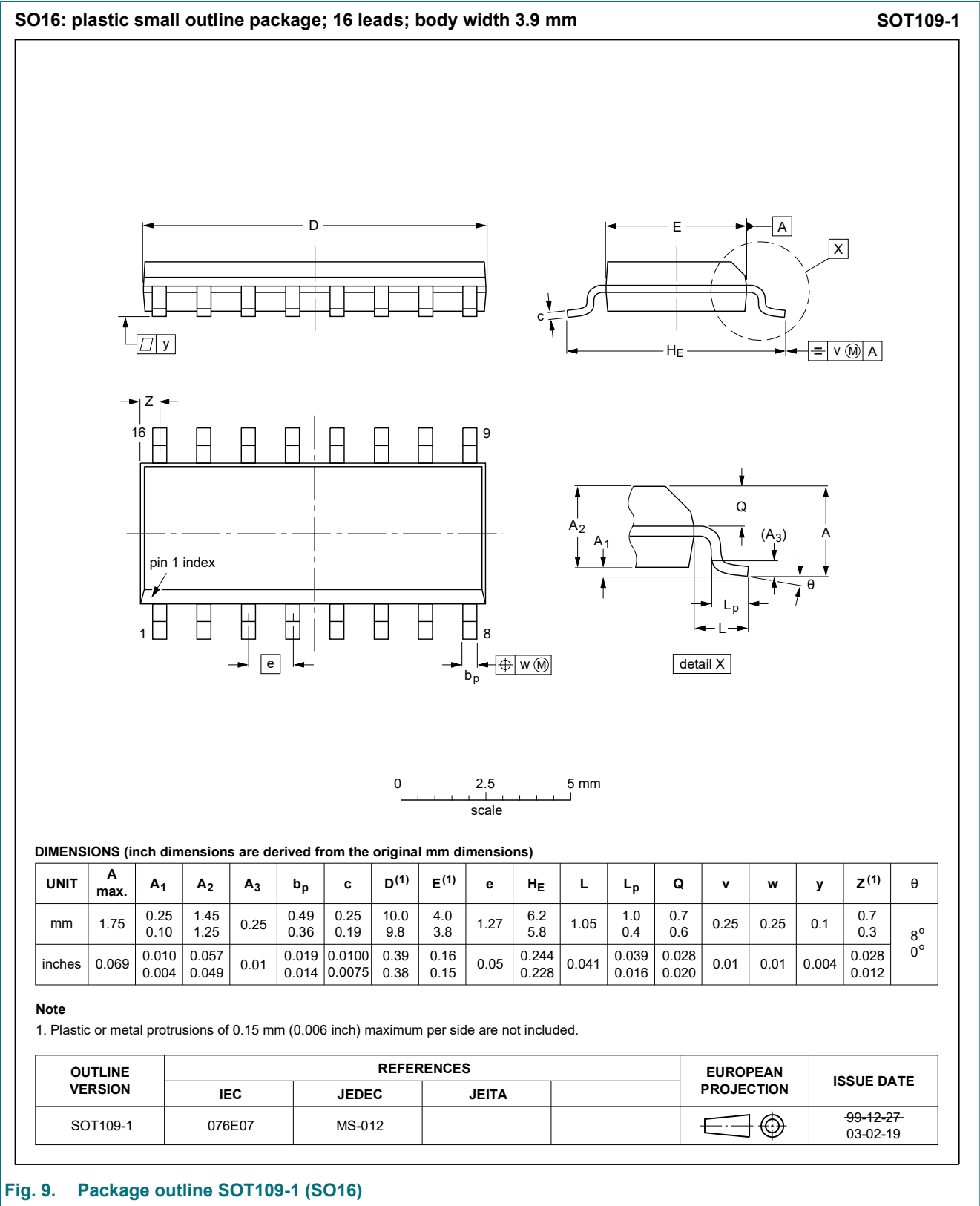


Fig. 9. Package outline SOT109-1 (SO16)

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

SOT338-1

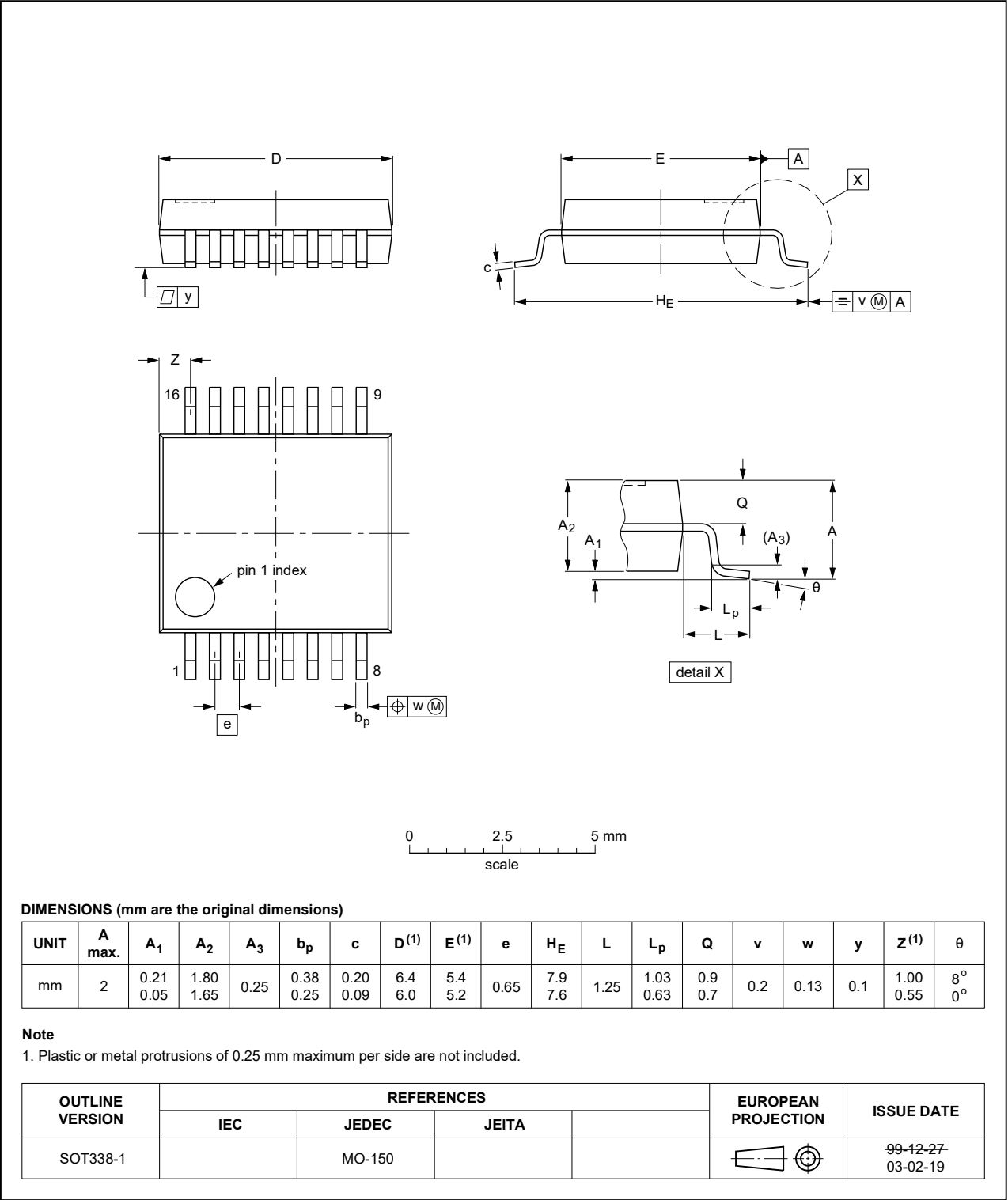
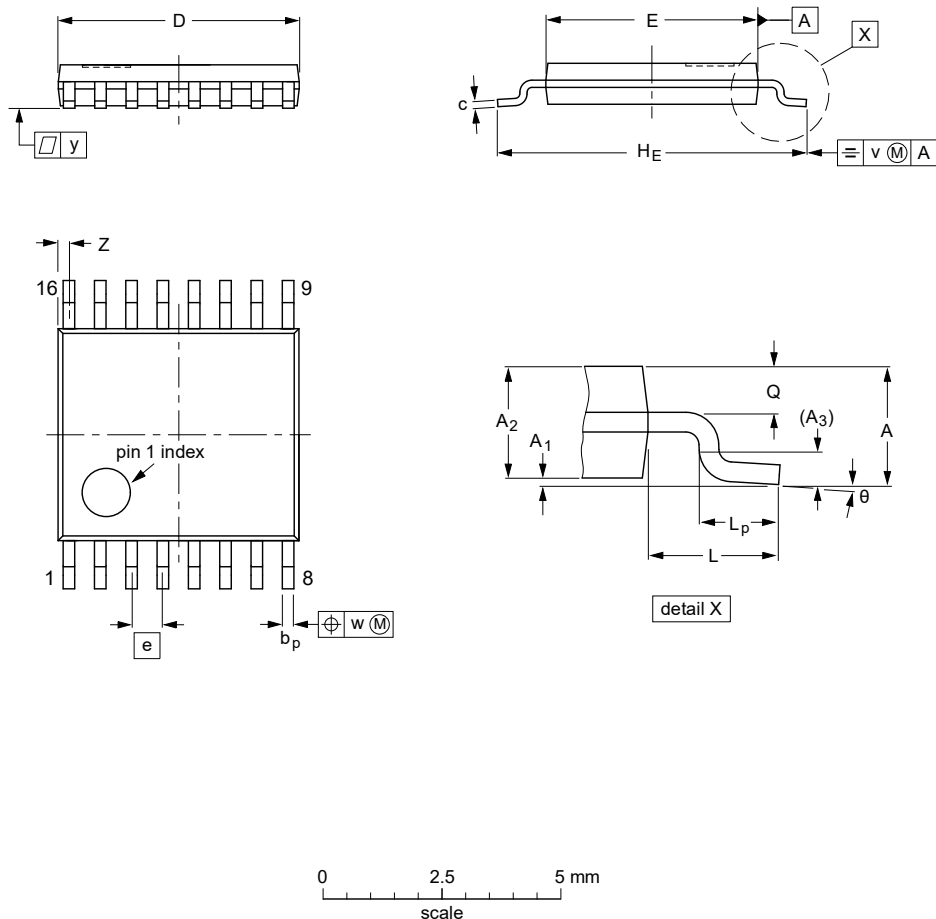


Fig. 10. Package outline SOT338-1 (SSOP16)

TSSOP16: plastic thin shrink small outline package; 16 leads; body width 4.4 mm

SOT403-1



DIMENSIONS (mm are the original dimensions)

| UNIT | A <sub>max.</sub> | A <sub>1</sub> | A <sub>2</sub> | A <sub>3</sub> | b <sub>p</sub> | c          | D <sup>(1)</sup> | E <sup>(2)</sup> | e    | H <sub>E</sub> | L | L <sub>p</sub> | Q          | v   | w    | y   | Z <sup>(1)</sup> | θ        |
|------|-------------------|----------------|----------------|----------------|----------------|------------|------------------|------------------|------|----------------|---|----------------|------------|-----|------|-----|------------------|----------|
| mm   | 1.1               | 0.15<br>0.05   | 0.95<br>0.80   | 0.25           | 0.30<br>0.19   | 0.2<br>0.1 | 5.1<br>4.9       | 4.5<br>4.3       | 0.65 | 6.6<br>6.2     | 1 | 0.75<br>0.50   | 0.4<br>0.3 | 0.2 | 0.13 | 0.1 | 0.40<br>0.06     | 8°<br>0° |

Notes

- 1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
- 2. Plastic interlead protrusions of 0.25 mm maximum per side are not included.

| OUTLINE<br>VERSION | REFERENCES |        |       |  | EUROPEAN<br>PROJECTION                                                                | ISSUE DATE           |
|--------------------|------------|--------|-------|--|---------------------------------------------------------------------------------------|----------------------|
|                    | IEC        | JEDEC  | JEITA |  |                                                                                       |                      |
| SOT403-1           |            | MO-153 |       |  |  | 99-12-27<br>03-02-18 |

Fig. 11. Package outline SOT403-1 (TSSOP16)

## 12. 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             |

## 13. Revision history

Table 11. Revision history

| Document ID         | Release date                                                                                                                                                                                                                                                                                                        | Data sheet status     | Change notice | Supersedes          |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|---------------------|
| 74HC_HCT153 v.8     | 20190813                                                                                                                                                                                                                                                                                                            | Product data sheet    | -             | 74HC_HCT153 v.7     |
| Modifications:      | <ul style="list-style-type: none"> <li>Type numbers 74HC153DB and 74HCT153DB (SOT338-1/SSOP16) added.</li> <li><a href="#">Table 4</a>: Derating values for <math>P_{tot}</math> total power dissipation updated.</li> </ul>                                                                                        |                       |               |                     |
| 74HC_HCT153 v.7     | 20181010                                                                                                                                                                                                                                                                                                            | Product data sheet    | -             | 74HC_HCT153 v.6     |
| 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> <li>Type numbers 74HC153DB and 74HCT153DB (SOT338-1/SSOP16) removed.</li> </ul> |                       |               |                     |
| 74HC_HCT153 v.6     | 20160511                                                                                                                                                                                                                                                                                                            | Product data sheet    | -             | 74HC_HCT153 v.5     |
| Modifications:      | <ul style="list-style-type: none"> <li>Type numbers 74HC153N and 74HCT153N (SOT38-4) removed.</li> </ul>                                                                                                                                                                                                            |                       |               |                     |
| 74HC_HCT153 v.5     | 20140123                                                                                                                                                                                                                                                                                                            | Product data sheet    | -             | 74HC_HCT153 v.4     |
| Modifications:      | <ul style="list-style-type: none"> <li><a href="#">Table 1</a> and <a href="#">Section 11</a>: all references to 14 pin packages removed.</li> </ul>                                                                                                                                                                |                       |               |                     |
| 74HC_HCT153 v.4     | 20131128                                                                                                                                                                                                                                                                                                            | Product data sheet    | -             | 74HC_HCT153 v.3     |
| 74HC_HCT153 v.3     | 20130722                                                                                                                                                                                                                                                                                                            | Product data sheet    | -             | 74HC_HCT153_CNV v.2 |
| 74HC_HCT153_CNV v.2 | 19970827                                                                                                                                                                                                                                                                                                            | Product specification | -             | -                   |

## 14. Legal information

### Data sheet status

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

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

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