

# 74HC541; 74HCT541

Octal buffer/line driver; 3-state

Rev. 3 — 15 April 2014

Product data sheet

## 1. General description

The 74HC541; 74HCT541 is an octal non-inverting buffer/line driver with 3-state outputs. The device features two output enables ( $\overline{OE}1$  and  $\overline{OE}2$ ). A HIGH on  $\overline{OE}n$  causes the outputs to assume a high-impedance OFF-state. Inputs include clamp diodes that enable the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

## 2. Features and benefits

- Non-Inverting outputs
- Complies with JEDEC standard no. 7A
- Input levels:
  - ◆ For 74HC541: CMOS level
  - ◆ For 74HCT541: TTL level
- ESD protection:
  - ◆ HBM JESD22-A114F 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 from  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$

## 3. Ordering information

Table 1. Ordering information

| Type number | Package   |         |   |          |
|-------------|---|---------|---|----------|
|             | Temperature range   | Name    | Description   | Version  |
| 74HC541N    | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | DIP20   | plastic dual in-line package; 20 leads (300 mil)                          | SOT146-1 |
| 74HCT541N   |   |         |   |          |
| 74HC541D    | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | SO20    | plastic small outline package; 20 leads;<br>body width 7.5 mm             | SOT163-1 |
| 74HCT541D   |   |         |   |          |
| 74HC541DB   | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | SSOP20  | plastic shrink small outline package; 20 leads;<br>body width 5.3 mm      | SOT339-1 |
| 74HCT541DB  |   |         |   |          |
| 74HC541PW   | $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ | TSSOP20 | plastic thin shrink small outline package; 20 leads;<br>body width 4.4 mm | SOT360-1 |
| 74HCT541PW  |   |         |   |          |



## 4. Functional diagram

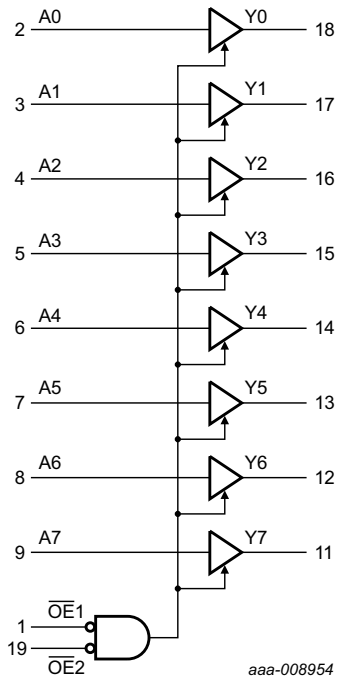


Fig 1. Logic symbol

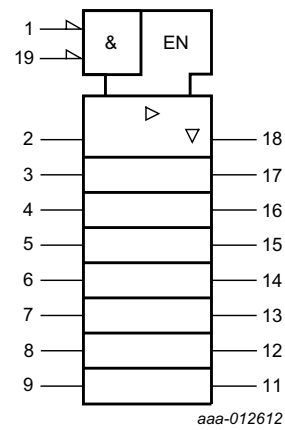


Fig 2. IEC logic symbol

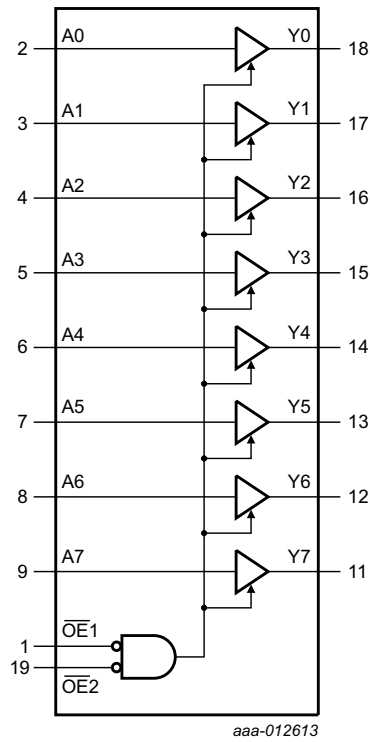


Fig 3. Functional diagram

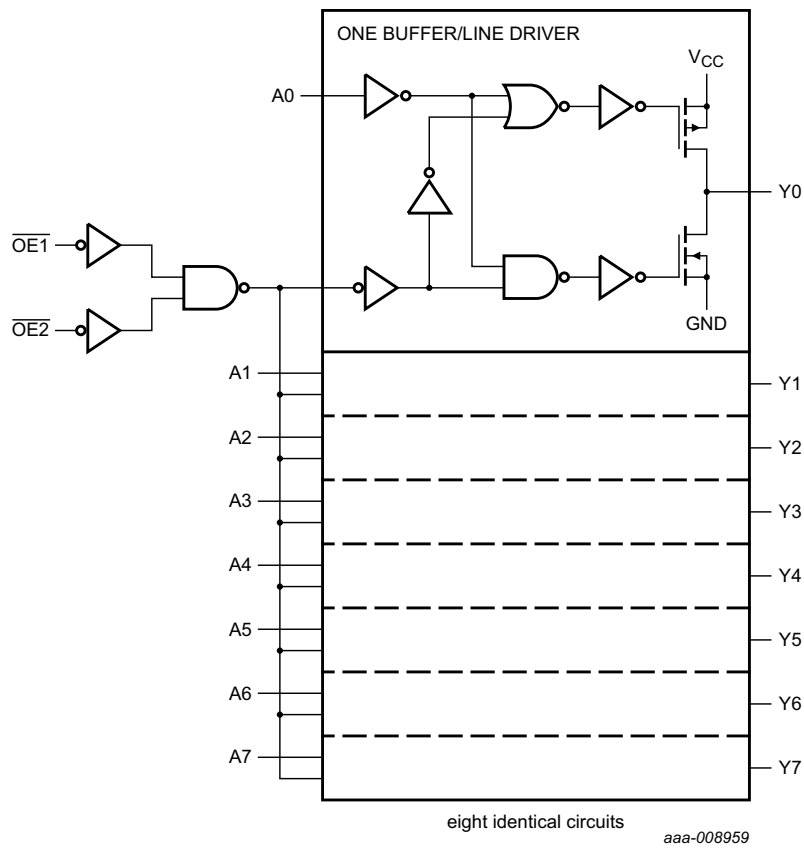
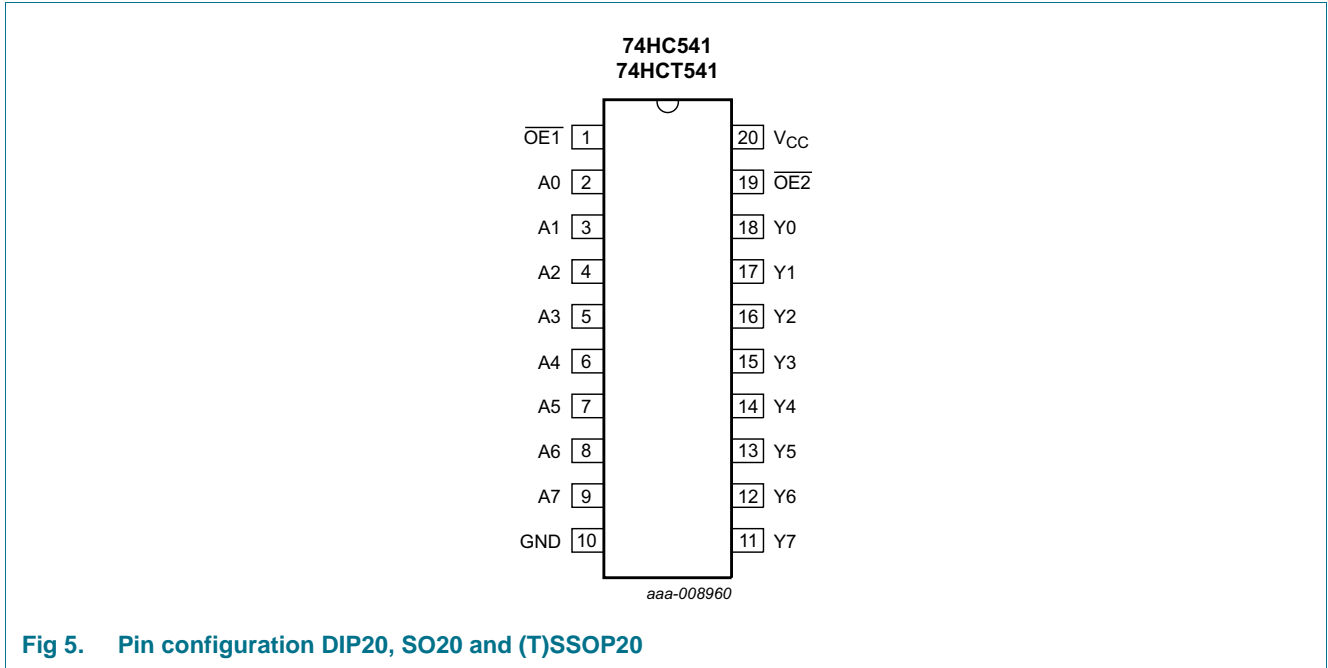


Fig 4. Logic diagram

## 5. Pinning information

### 5.1 Pinning



### 5.2 Pin description

**Table 2. Pin description**

| Symbol          | Pin                            | Description                      |
|-----------------|--------------------------------|----------------------------------|
| OE1             | 1                              | output enable input (active LOW) |
| A0 to A7        | 2, 3, 4, 5, 6, 7, 8, 9         | data input                       |
| GND             | 10                             | ground (0 V)                     |
| Y0 to Y7        | 18, 17, 16, 15, 14, 13, 12, 11 | data output                      |
| OE2             | 19                             | output enable input (active LOW) |
| V <sub>CC</sub> | 20                             | supply voltage                   |

## 6. Functional description

**Table 3. Functional table<sup>[1]</sup>**

| Control |     | Input          | Output         |
|---------|-----|----------------|----------------|
| OE1     | OE2 | A <sub>n</sub> | Y <sub>n</sub> |
| L       | L   | L              | L              |
| L       | L   | H              | H              |
| X       | H   | X              | Z              |
| H       | X   | X              | Z              |

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

## 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 |
|-----------|-------------------------|--|------|------|------|
| $V_{CC}$  | supply voltage          |  | -0.5 | +7   | V    |
| $I_{IK}$  | input clamping current  | $V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$ | [1]  | ±20  | mA   |
| $I_{OK}$  | output clamping current | $V_O < -0.5\text{ V}$ or $V_O > V_{CC} + 0.5\text{ V}$ | [1]  | ±20  | mA   |
| $I_O$     | output current          | $-0.5\text{ V} < V_O < V_{CC} + 0.5\text{ V}$          | -    | ±35  | mA   |
| $I_{CC}$  | supply current          |  | -    | 70   | mA   |
| $I_{GND}$ | ground current          |  | -70  | -    | mA   |
| $T_{stg}$ | storage temperature     |  | -65  | +150 | °C   |
| $P_{tot}$ | total power dissipation |  | [2]  |      |      |
|           | DIP20                   |  | -    | 750  | mW   |
|           | SO20, SSOP20, TSSOP20   |  | -    | 500  | mW   |

- [1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
- [2] For DIP20 packages: above 70 °C the value of  $P_{tot}$  derates linearly with 12 mW/K.  
 For SO20 packages: above 70 °C the value of  $P_{tot}$  derates linearly with 8 mW/K.  
 For (T)SSOP20 packages: above 60 °C the value of  $P_{tot}$  derates linearly with 5.5 mW/K.

## 8. Recommended operating conditions

**Table 5. Recommended operating conditions**

Voltages are referenced to GND (ground = 0 V)

| Symbol              | Parameter                           | Conditions              | 74HC541 |      |          | 74HCT541 |      |          | Unit |
|---------------------|-------------------------------------|-------------------------|---------|------|----------|----------|------|----------|------|
|                     |                                     |                         | Min     | Typ  | Max      | Min      | Typ  | Max      |      |
| $V_{CC}$            | supply voltage                      |                         | 2.0     | 5.0  | 6.0      | 4.5      | 5.0  | 5.5      | V    |
| $V_I$               | input voltage                       |                         | 0       | -    | $V_{CC}$ | 0        | -    | $V_{CC}$ | V    |
| $V_O$               | output voltage                      |                         | 0       | -    | $V_{CC}$ | 0        | -    | $V_{CC}$ | V    |
| $T_{amb}$           | ambient temperature                 |                         | -40     | +25  | +125     | -40      | +25  | +125     | °C   |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC} = 2.0\text{ V}$ | -       | -    | 625      | -        | -    | -        | ns/V |
|                     |                                     | $V_{CC} = 4.5\text{ V}$ | -       | 1.67 | 139      | -        | 1.67 | 139      | ns/V |
|                     |                                     | $V_{CC} = 6.0\text{ V}$ | -       | -    | 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   | T <sub>amb</sub> = 25 °C |   |      | T <sub>amb</sub> = -40 °C to +85 °C |      | T <sub>amb</sub> = -40 °C to +125 °C |      | Unit |
|-----------------|---------------------------|--|--------------------------|---|------|-------------------------------------|------|--------------------------------------|------|------|
|                 |                           |  | Min                      | Typ   | Max  | Min                                 | Max  | Min                                  | Max  |      |
| <b>74HC541</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    |
| 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    |
| 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>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 | per input pin; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = V <sub>CC</sub> or GND; other inputs at V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V; I <sub>O</sub> = 0 A | -    | -                                   | ±0.5 | -                                    | ±5.0 | -    |
| 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>74HCT541</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> = -6.0 mA   | 3.98                     | 4.32  | -    | 3.84                                | -    | 3.7                                  | -    | V    |

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

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

| Symbol           | Parameter                 | Conditions  | T <sub>amb</sub> = 25 °C |      |      | T <sub>amb</sub> = -40 °C to +85 °C |      | T <sub>amb</sub> = -40 °C to +125 °C |      | Unit |
|------------------|---------------------------|---|--------------------------|------|------|-------------------------------------|------|--------------------------------------|------|------|
|                  |                           |   | Min                      | Typ  | Max  | Min                                 | Max  | Min                                  | Max  |      |
| 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;  | -                        | 0.16 | 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> = 5.5 V  | -                        | -    | ±0.1 | -                                   | ±1.0 | -                                    | ±1.0 | μA   |
| I <sub>OZ</sub>  | OFF-state output current  | per input pin; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = V <sub>CC</sub> or GND; other inputs at V <sub>CC</sub> or GND; V <sub>CC</sub> = 5.5 V; 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   |
| ΔI <sub>CC</sub> | additional supply current | per input pin; I <sub>O</sub> = 0 A; V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; other inputs at V <sub>CC</sub> or GND; V <sub>CC</sub> = 4.5 V to 5.5 V   |                          |      |      |                                     |      |                                      |      |      |
|                  |                           | An input  | -                        | 70   | 252  | -                                   | 315  | -                                    | 343  | μA   |
|                  |                           | $\overline{\text{OE}}1$ input   | -                        | 150  | 540  | -                                   | 675  | -                                    | 735  | μA   |
|                  |                           | $\overline{\text{OE}}2$ input   | -                        | 100  | 360  | -                                   | 450  | -                                    | 490  | μA   |
| C <sub>I</sub>   | input capacitance         |   | -                        | 3.5  | -    | -                                   | -    | -                                    | -    | pF   |

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

GND = 0 V; C<sub>L</sub> = 50 pF; for test circuit, see [Figure 8](#).

| Symbol           | Parameter         | Conditions  | T <sub>amb</sub> = 25 °C |     |     | T <sub>amb</sub> = -40 °C to +125 °C |              | Unit |
|------------------|-------------------|---|--------------------------|-----|-----|--------------------------------------|--------------|------|
|                  |                   |   | Min                      | Typ | Max | Max (85 °C)                          | Max (125 °C) |      |
| <b>74HC541</b>   |                   |   |                          |     |     |                                      |              |      |
| t <sub>pd</sub>  | propagation delay | An to Y <sub>n</sub> ; see <a href="#">Figure 6</a> <sup>[1]</sup>                      |                          |     |     |                                      |              |      |
|                  |                   | V <sub>CC</sub> = 2.0 V   | -                        | 33  | 115 | 145                                  | 175          | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V   | -                        | 12  | 23  | 29                                   | 35           | ns   |
|                  |                   | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF   | -                        | 10  | -   | -                                    | -            | ns   |
|                  |                   | V <sub>CC</sub> = 6.0 V   | -                        | 10  | 20  | 25                                   | 30           | ns   |
| t <sub>en</sub>  | enable time       | $\overline{\text{OE}}n$ to Y <sub>n</sub> ; see <a href="#">Figure 7</a> <sup>[1]</sup> |                          |     |     |                                      |              |      |
|                  |                   | V <sub>CC</sub> = 2.0 V   | -                        | 55  | 160 | 200                                  | 240          | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V   | -                        | 20  | 32  | 40                                   | 48           | ns   |
|                  |                   | V <sub>CC</sub> = 6.0 V   | -                        | 16  | 27  | 34                                   | 41           | ns   |
| t <sub>dis</sub> | disable time      | $\overline{\text{OE}}n$ to Y <sub>n</sub> ; see <a href="#">Figure 7</a> <sup>[1]</sup> |                          |     |     |                                      |              |      |
|                  |                   | V <sub>CC</sub> = 2.0 V   | -                        | 61  | 160 | 200                                  | 240          | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V   | -                        | 22  | 32  | 40                                   | 48           | ns   |
|                  |                   | V <sub>CC</sub> = 6.0 V   | -                        | 18  | 27  | 34                                   | 41           | ns   |

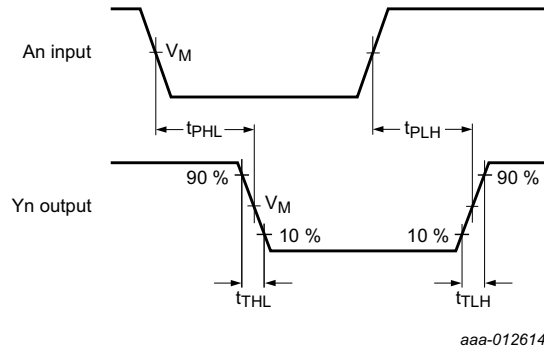


**Table 7. Dynamic characteristics**  
*GND = 0 V; C<sub>L</sub> = 50 pF; for test circuit, see Figure 8.*

| Symbol           | Parameter                     | Conditions   | T <sub>amb</sub> = 25 °C |     |     | T <sub>amb</sub> = -40 °C to +125 °C |              | Unit |
|------------------|-------------------------------|--|--------------------------|-----|-----|--------------------------------------|--------------|------|
|                  |                               |  | Min                      | Typ | Max | Max (85 °C)                          | Max (125 °C) |      |
| t <sub>t</sub>   | transition time               | see Figure 6 [2]   |                          |     |     |                                      |              |      |
|                  |                               | V <sub>CC</sub> = 2.0 V  | -                        | 14  | 60  | 75                                   | 90           | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -                        | 5   | 12  | 15                                   | 18           | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V  | -                        | 4   | 10  | 13                                   | 15           | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | per package; V <sub>I</sub> = GND to V <sub>CC</sub> [3]         | -                        | 37  | -   | -                                    | -            | pF   |
| <b>74HCT541</b>  |                               |  |                          |     |     |                                      |              |      |
| t <sub>pd</sub>  | propagation delay             | An to Yn; see Figure 6 [1]                                       |                          |     |     |                                      |              |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -                        | 15  | 28  | 35                                   | 42           | ns   |
|                  |                               | V <sub>CC</sub> = 5.0 V; C <sub>L</sub> = 15 pF                  | -                        | 12  | -   | -                                    | -            | ns   |
| t <sub>en</sub>  | enable time                   | O <sub>En</sub> to Yn; see Figure 7 [1]                          |                          |     |     |                                      |              |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -                        | 21  | 35  | 44                                   | 53           | ns   |
| t <sub>dis</sub> | disable time                  | O <sub>En</sub> to Yn; see Figure 7 [1]                          |                          |     |     |                                      |              |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -                        | 21  | 35  | 44                                   | 53           | ns   |
| t <sub>t</sub>   | transition time               | V <sub>CC</sub> = 4.5 V; see Figure 6 [2]                        | -                        | 5   | 12  | 15                                   | 18           | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | per package; V <sub>I</sub> = GND to V <sub>CC</sub> - 1.5 V [3] | -                        | 39  | -   | -                                    | -            | pF   |

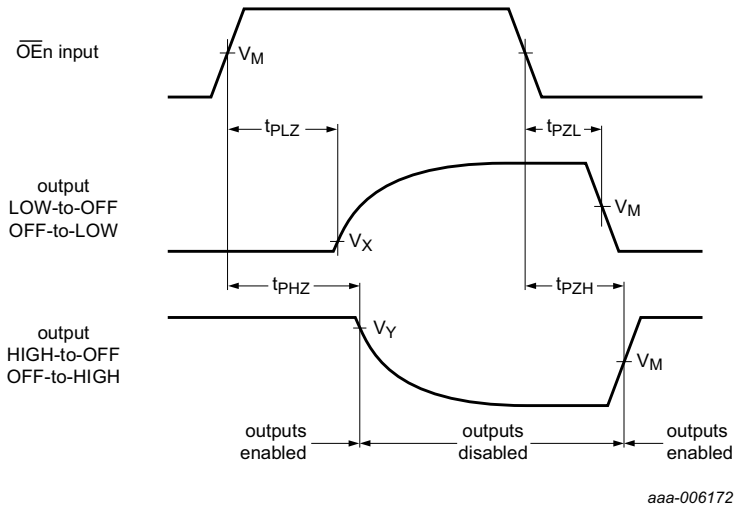
- [1] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.  
t<sub>en</sub> is the same as t<sub>PZL</sub> and t<sub>PZH</sub>.  
t<sub>dis</sub> is the same as t<sub>PLZ</sub> and t<sub>PHZ</sub>.
- [2] t<sub>t</sub> is the same as t<sub>THL</sub> and t<sub>TLH</sub>.
- [3] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW):  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum (C_L \times V_{CC}^2 \times f_o)$  where:  
f<sub>i</sub> = input frequency in MHz;  
f<sub>o</sub> = output frequency in MHz;  
C<sub>L</sub> = output load capacitance in pF;  
V<sub>CC</sub> = supply voltage in V;  
N = number of inputs switching;  
 $\sum (C_L \times V_{CC}^2 \times f_o)$  = sum of outputs.

11. 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. Input to output propagation delays



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 enable and disable times

Table 8. Measurement points

| Type     | Input       | Output      |             |             |
|----------|-------------|-------------|-------------|-------------|
|          | $V_M$       | $V_M$       | $V_X$       | $V_Y$       |
| 74HC541  | $0.5V_{CC}$ | $0.5V_{CC}$ | $0.1V_{CC}$ | $0.9V_{CC}$ |
| 74HCT541 | 1.3 V       | 1.3 V       | $0.1V_{CC}$ | $0.9V_{CC}$ |

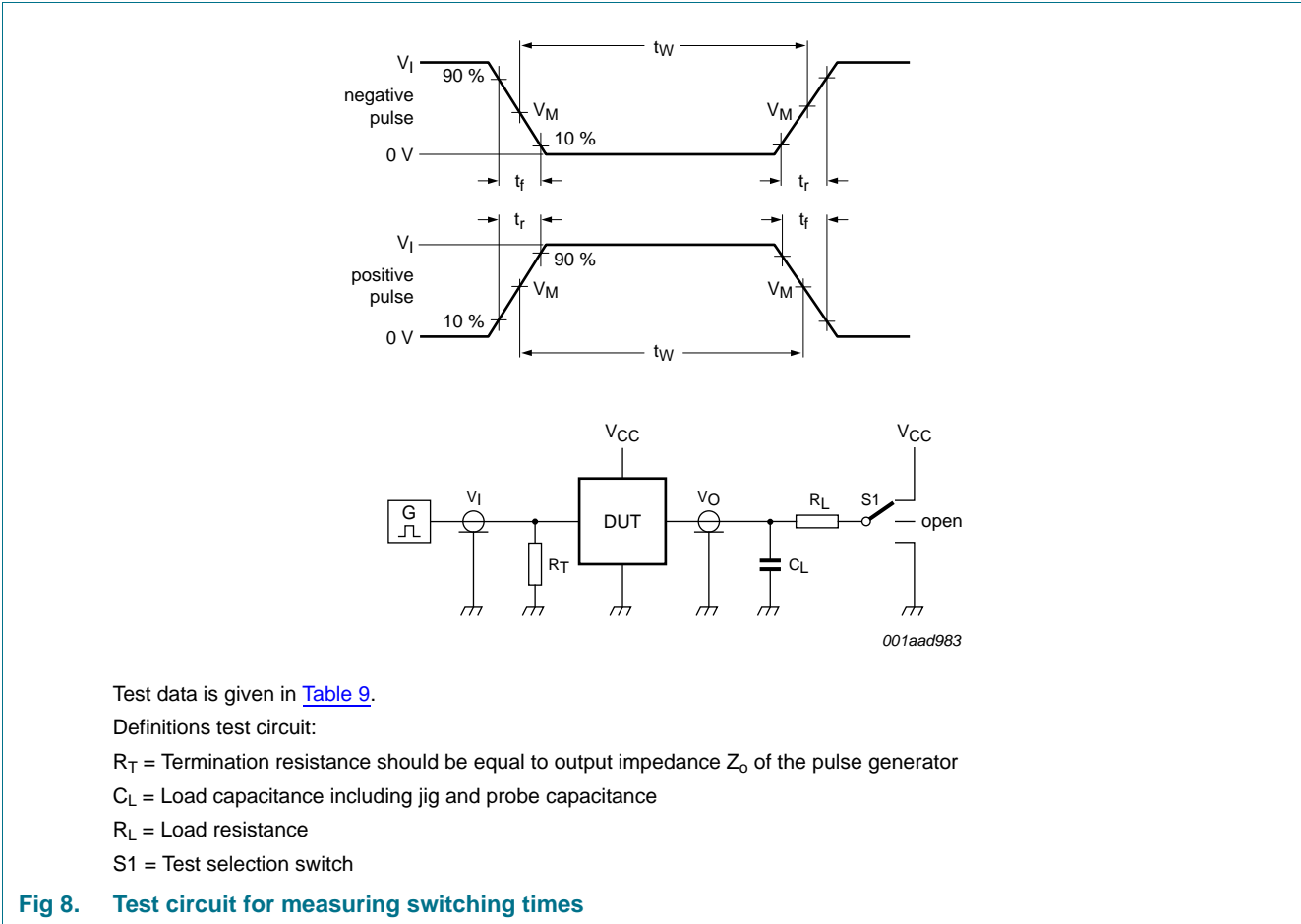


Table 9. Test data

| Type     | Input    |            | Load         |              | S1 position        |                    |                    |
|----------|----------|------------|--------------|--------------|--------------------|--------------------|--------------------|
|          | $V_I$    | $t_r, t_f$ | $C_L$        | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74HC541  | $V_{CC}$ | 6 ns       | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74HCT541 | 3 V      | 6 ns       | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |

12. Package outline

DIP20: plastic dual in-line package; 20 leads (300 mil)

SOT146-1

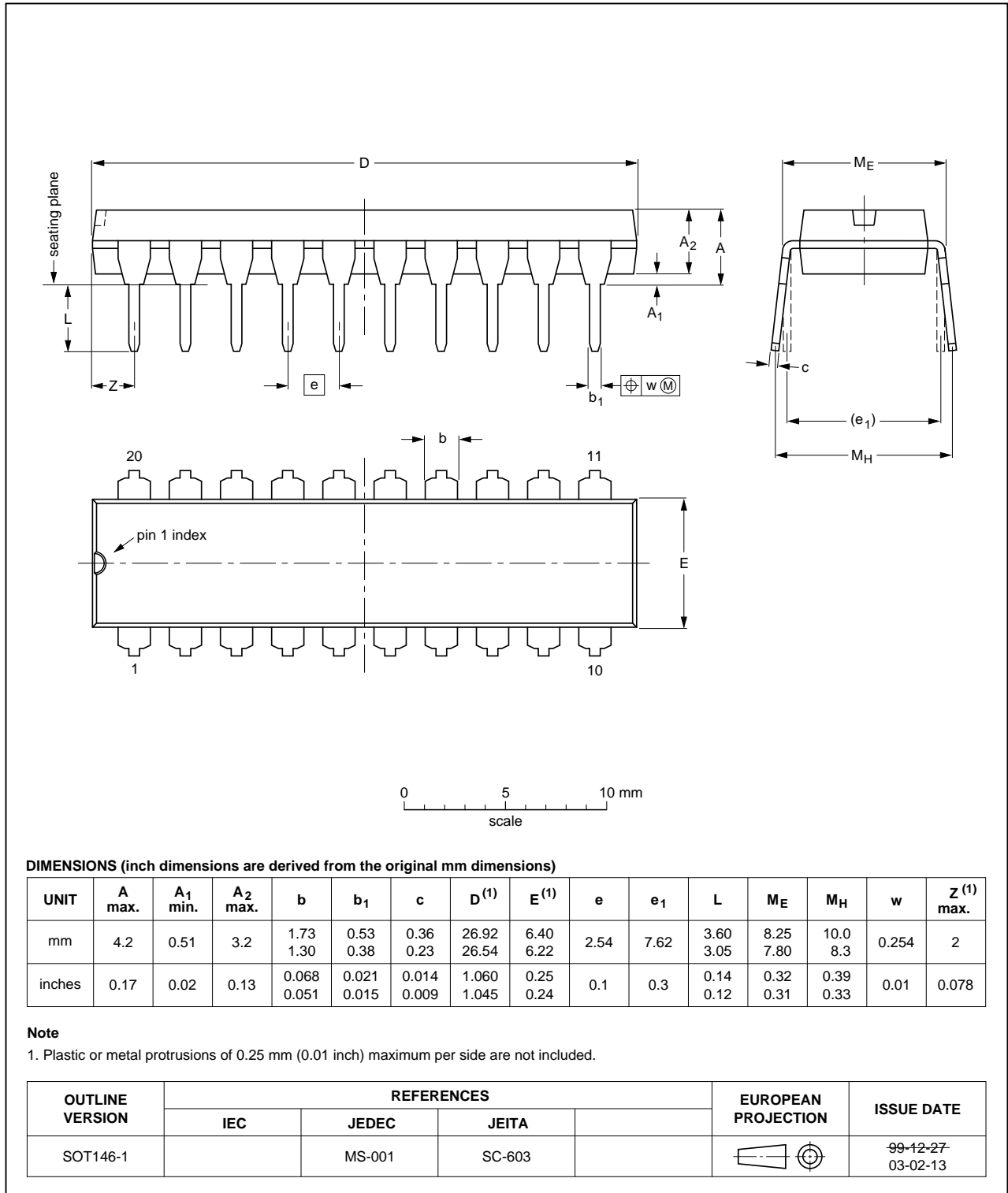


Fig 9. Package outline SOT146-1 (DIP20)

SO20: plastic small outline package; 20 leads; body width 7.5 mm

SOT163-1

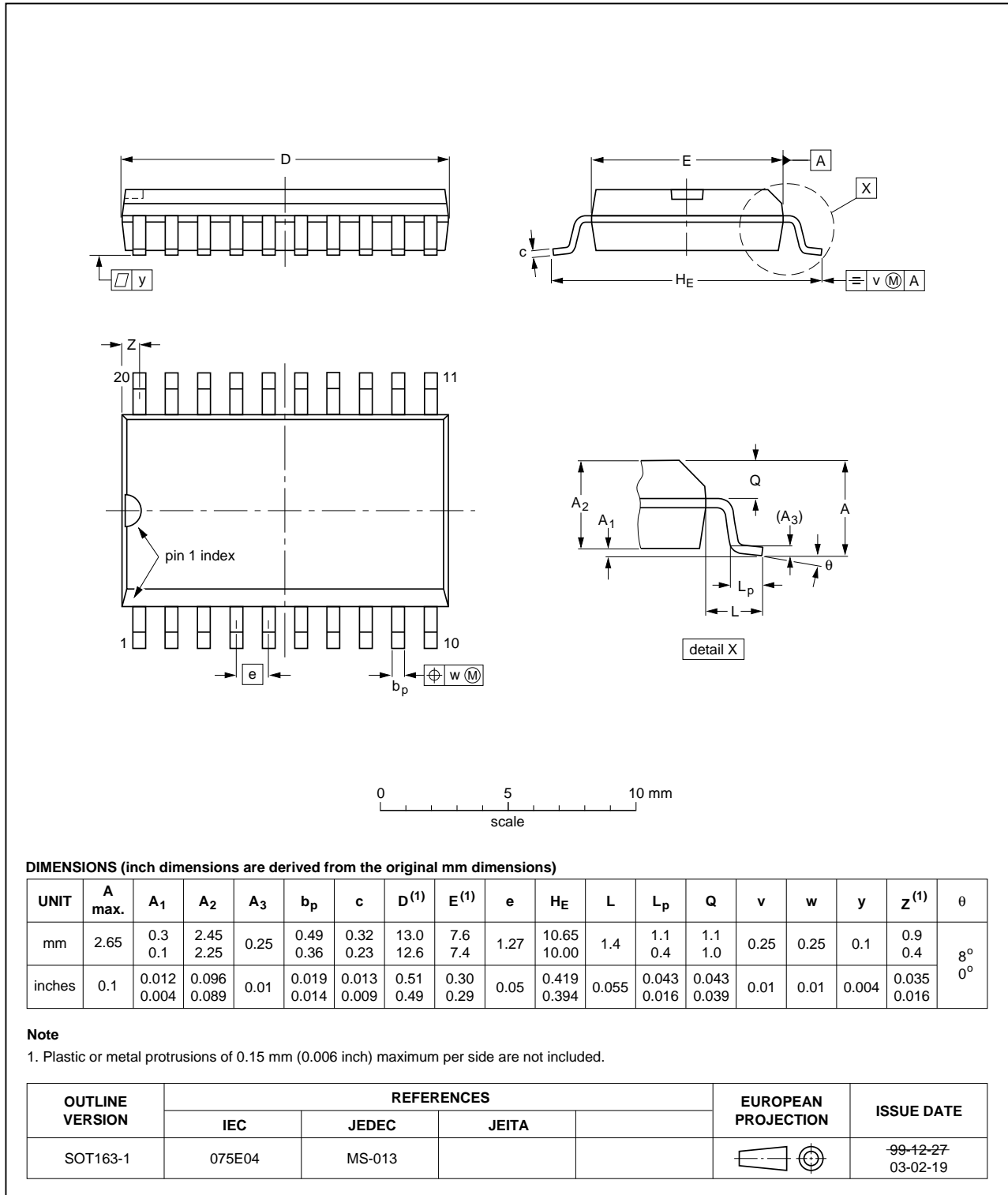


Fig 10. Package outline SOT163-1 (SO20)

SSOP20: plastic shrink small outline package; 20 leads; body width 5.3 mm

SOT339-1

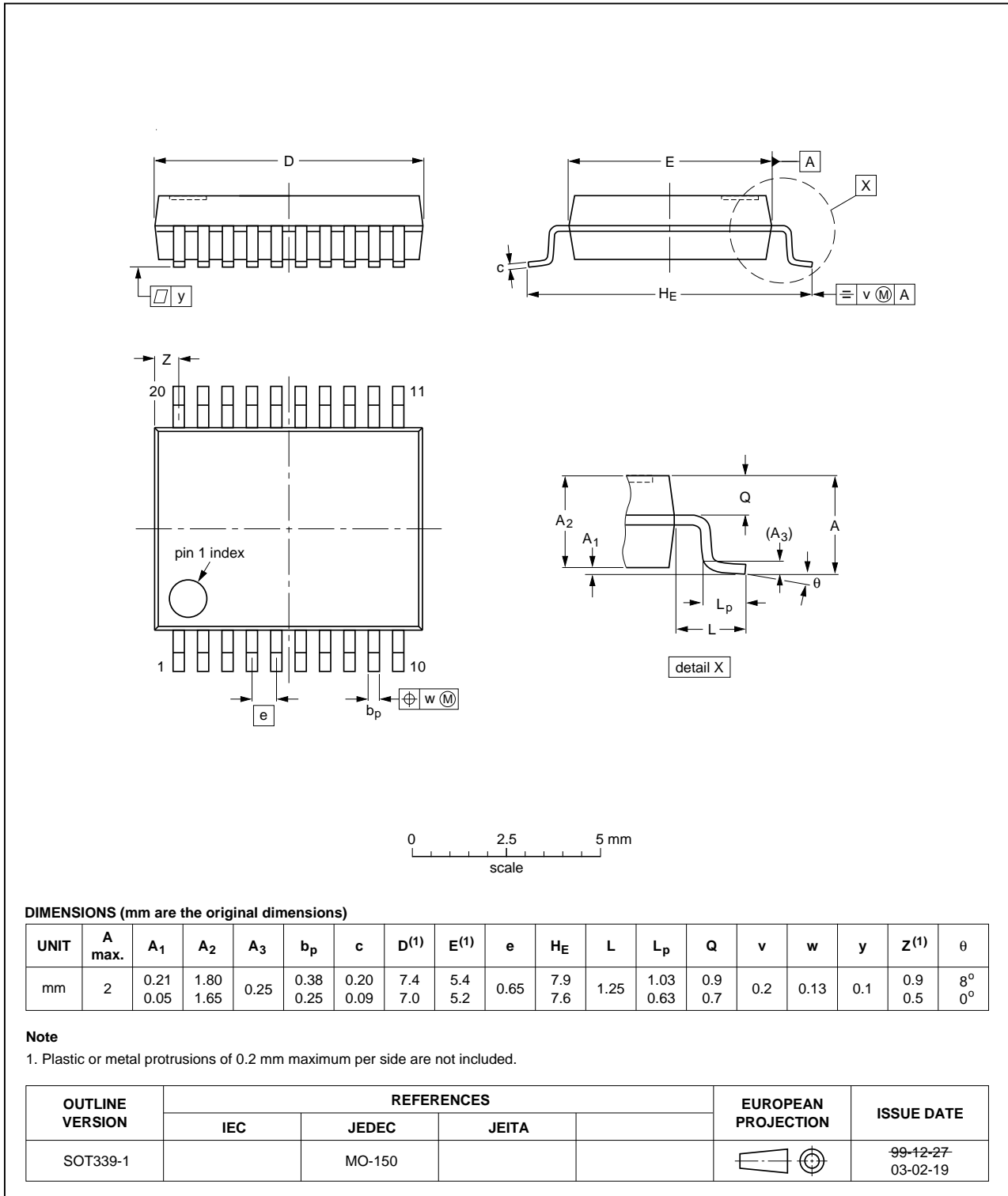


Fig 11. Package outline SOT339-1 (SSOP20)

TSSOP20: plastic thin shrink small outline package; 20 leads; body width 4.4 mm

SOT360-1

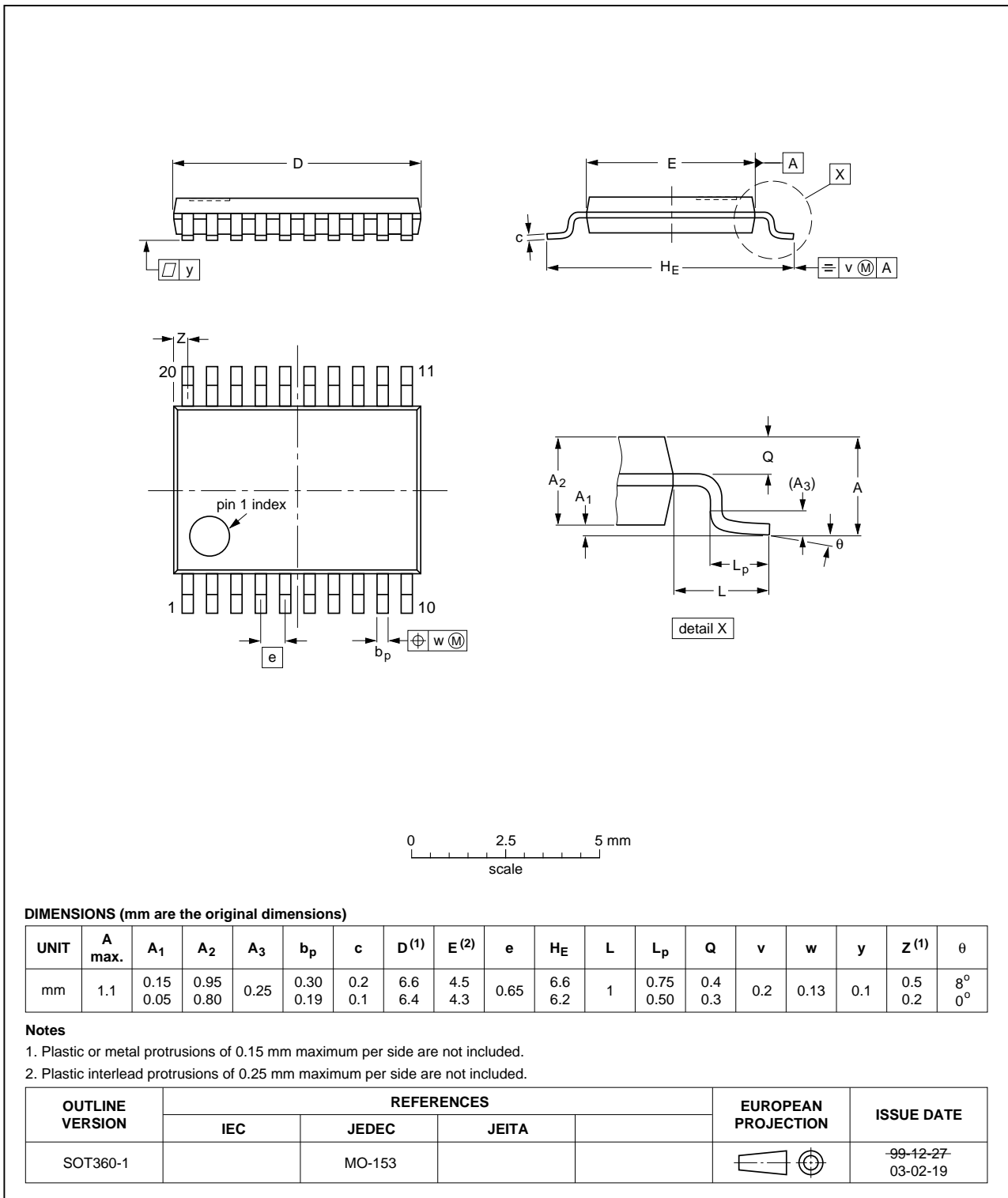


Fig 12. Package outline SOT360-1 (TSSOP20)

## 13. Abbreviations

Table 10. Abbreviations

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

## 14. Revision history

Table 11. Revision history

| Document ID         | Release date  | Data sheet status     | Change notice | Supersedes          |
|---------------------|---|-----------------------|---------------|---------------------|
| 74HC_HCT541 v.3     | 20140415  | Product data sheet    | -             | 74HC_HCT541_CNV v.2 |
| 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> </ul> |                       |               |                     |
| 74HC_HCT541_CNV v.2 | 19901201  | Product specification | -             | -                   |



## 15. Legal information

### 15.1 Data sheet status

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

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

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

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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