

# 74HC573; 74HCT573

Octal D-type transparent latch; 3-state

Rev. 7 — 4 March 2016

Product data sheet

## 1. General description

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The 74HC573; 74HCT573 is an 8-bit D-type transparent latch with 3-state outputs. The device features latch enable (LE) and output enable ( $\overline{OE}$ ) inputs. When LE is HIGH, data at the inputs enter the latches. In this condition the latches are transparent, a latch output will change each time its corresponding D-input changes. When LE is LOW the latches store the information that was present at the inputs a set-up time preceding the HIGH-to-LOW transition of LE. A HIGH on  $\overline{OE}$  causes the outputs to assume a high-impedance OFF-state. Operation of the  $\overline{OE}$  input does not affect the state of the latches. 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

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- Input levels:
  - ◆ For 74HC573: CMOS level
  - ◆ For 74HCT573: TTL level
- Inputs and outputs on opposite sides of package allowing easy interface with microprocessors
- Useful as input or output port for microprocessors and microcomputers
- 3-state non-inverting outputs for bus-oriented applications
- Common 3-state output enable input
- Multiple package options
- Complies with JEDEC standard no. 7 A
- ESD protection:
  - ◆ HBM JESD22-A114F exceeds 2 000 V
  - ◆ MM JESD22-A115-A exceeds 200 V
- 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  |
| 74HC573D    | -40 °C to +125 °C | SO20     | plastic small outline package; 20 leads;<br>body width 7.5 mm   | SOT163-1 |
| 74HCT573D   |                   |          |   |          |
| 74HC573DB   | -40 °C to +125 °C | SSOP20   | plastic shrink small outline package; 20 leads;<br>body width 5.3 mm  | SOT339-1 |
| 74HCT573DB  |                   |          |   |          |
| 74HC573PW   | -40 °C to +125 °C | TSSOP20  | plastic thin shrink small outline package; 20 leads;<br>body width 4.4 mm   | SOT360-1 |
| 74HCT573PW  |                   |          |   |          |
| 74HC573BQ   | -40 °C to +125 °C | DHVQFN20 | plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 20 terminals;<br>body 2.5 × 4.5 × 0.85 mm | SOT764-1 |
| 74HCT573BQ  |                   |          |   |          |

4. Functional diagram

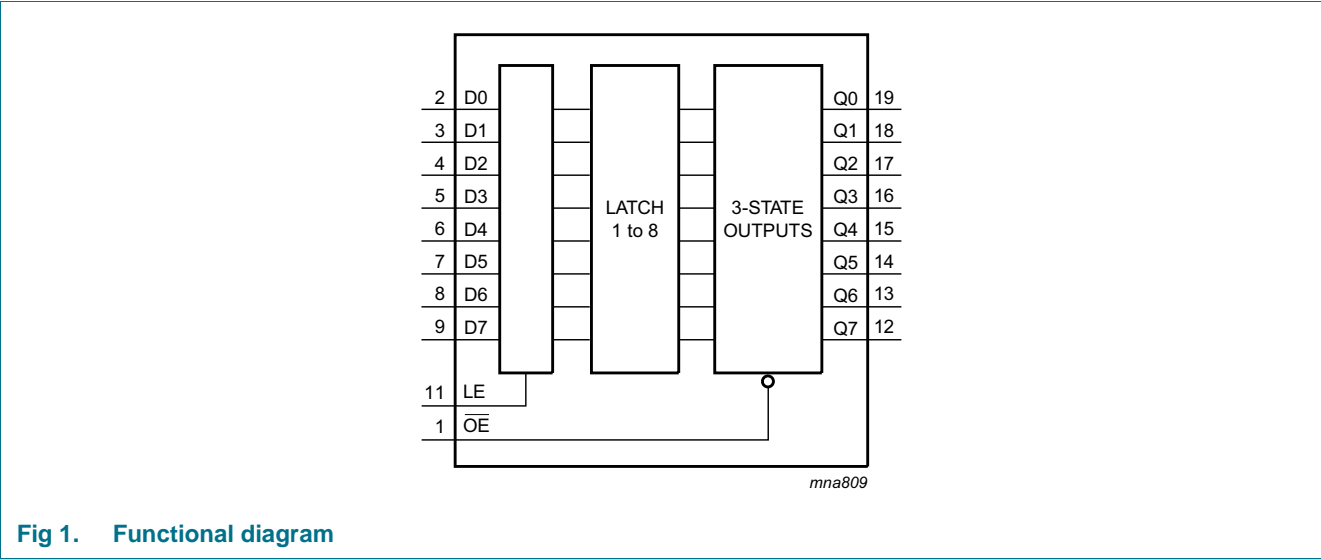


Fig 1. Functional diagram

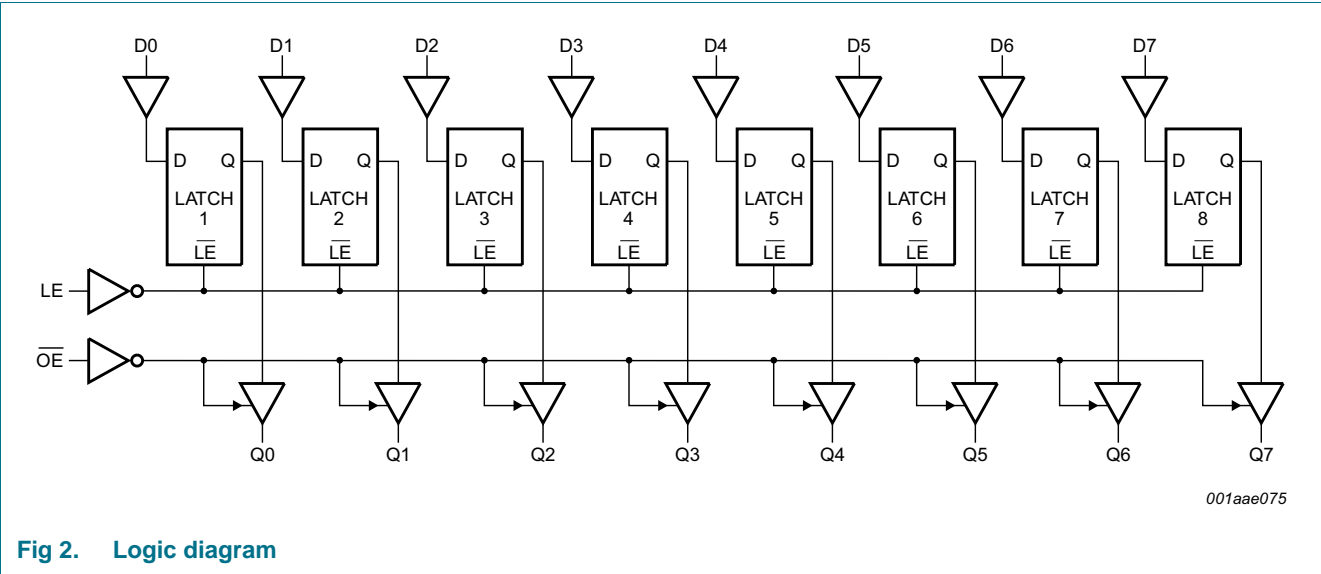


Fig 2. Logic diagram

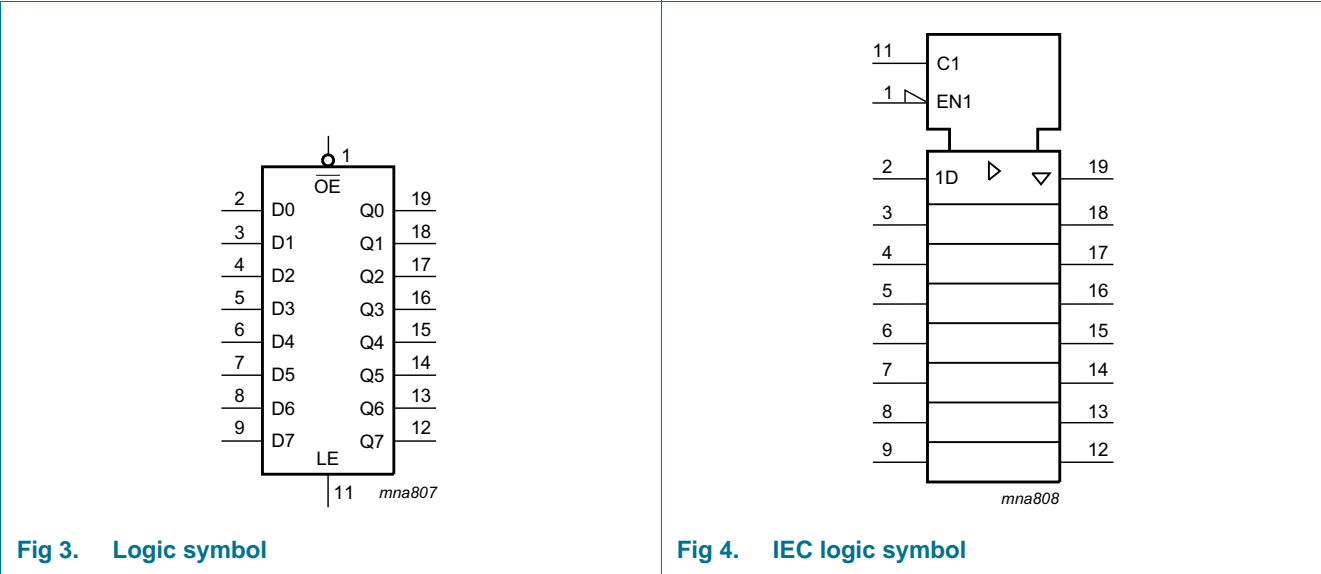


Fig 3. Logic symbol

Fig 4. IEC logic symbol

5. Pinning information

5.1 Pinning

74HC573  
74HCT573

001aae076

74HC573  
74HCT573

terminal 1 index area

001aae077

Transparent top view

(1) This is not a supply pin. The substrate is attached to this pad using conductive die attach material. There is no electrical or mechanical requirement to solder this pad. However, if it is soldered, the solder land should remain floating or be connected to GND.

**Fig 5. Pin configuration SO20, SSOP20 and TSSOP20**

**Fig 6. Pin configuration DHVQFN20**

5.2 Pin description

Table 2. Pin description

| Symbol          | Pin                            | Description                              |
|-----------------|--------------------------------|--|
| $\overline{OE}$ | 1                              | 3-state output enable input (active LOW) |
| D[0:7]          | 2, 3, 4, 5, 6, 7, 8, 9         | data input                               |
| GND             | 10                             | ground (0 V)                             |
| LE              | 11                             | latch enable input (active HIGH)         |
| Q[0:7]          | 19, 18, 17, 16, 15, 14, 13, 12 | 3-state latch output                     |
| V <sub>CC</sub> | 20                             | supply voltage                           |

## 6. Functional description

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

| Operating mode                              | Control                |    | Input | Internal latches | Output |
|---|------------------------|----|-------|------------------|--------|
|   | $\overline{\text{OE}}$ | LE | Dn    |                  | Qn     |
| Enable and read register (transparent mode) | L                      | H  | L     | L                | L      |
|   |                        |    | H     | H                | H      |
| Latch and read register                     | L                      | L  | L     | L                | L      |
|   |                        |    | h     | H                | H      |
| Latch register and disable outputs          | H                      | L  | L     | L                | Z      |
|   |                        |    | h     | H                | Z      |

- [1] H = HIGH voltage level;  
 h = HIGH voltage level one set-up time prior to the HIGH-to-LOW LE transition;  
 L = LOW voltage level;  
 l = LOW voltage level one set-up time prior to the HIGH-to-LOW LE transition;  
 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 $V_I > V_{CC} + 0.5 \text{ V}$   | -    | $\pm 20$ | mA   |
| $I_{OK}$  | output clamping current | $V_O < -0.5 \text{ V}$ or $V_O > V_{CC} + 0.5 \text{ V}$   | -    | $\pm 20$ | mA   |
| $I_O$     | output current          | $V_O = -0.5 \text{ V}$ to $(V_{CC} + 0.5 \text{ V})$       | -    | $\pm 35$ | 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 | SO20, SSOP20, TSSOP20 and DHVQFN20 packages <sup>[1]</sup> | -    | 500      | mW   |

- [1] For SO20:  $P_{tot}$  derates linearly with 8 mW/K above 70 °C.  
 For SSOP20 and TSSOP20 packages:  $P_{tot}$  derates linearly with 5.5 mW/K above 60 °C.  
 For DHVQFN20 package:  $P_{tot}$  derates linearly with 4.5 mW/K above 60 °C.

## 8. Recommended operating conditions

**Table 5. Recommended operating conditions**

Voltages are referenced to GND (ground = 0 V)

| Symbol           | Parameter                           | Conditions              | 74HC573 |      |                 | 74HCT573 |      |                 | 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   |      |
| 74HC573         |                           |  |       |      |      |                  |      |                   |       |      |
| 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    |
|                 |                           | 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>CC</sub> = 6.0 V; V <sub>O</sub> = V <sub>CC</sub> or GND | -     | -    | ±0.5 | -                | ±5.0 | -                 | ±10.0 | 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       |         |
| $I_{CC}$        | supply current            | $V_I = V_{CC}$ or GND; $I_O = 0$ A;<br>$V_{CC} = 6.0$ V  | -     | -    | 8.0       | -                | 80        | -                 | 160       | $\mu$ A |
| $C_I$           | input capacitance         |  | -     | 3.5  | -         |                  |           |                   |           | pF      |
| <b>74HCT573</b> |                           |  |       |      |           |                  |           |                   |           |         |
| $V_{IH}$        | HIGH-level input voltage  | $V_{CC} = 4.5$ V to 5.5 V  | 2.0   | 1.6  | -         | 2.0              | -         | 2.0               | -         | V       |
| $V_{IL}$        | LOW-level input voltage   | $V_{CC} = 4.5$ V to 5.5 V  | -     | 1.2  | 0.8       | -                | 0.8       | -                 | 0.8       | V       |
| $V_{OH}$        | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5$ V  |       |      |           |                  |           |                   |           |         |
|                 |                           | $I_O = -20$ $\mu$ A  | 4.4   | 4.5  | -         | 4.4              | -         | 4.4               | -         | V       |
|                 |                           | $I_O = -6$ mA  | 3.98  | 4.32 | -         | 3.84             | -         | 3.7               | -         | V       |
| $V_{OL}$        | LOW-level output voltage  | $V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5$ V  |       |      |           |                  |           |                   |           |         |
|                 |                           | $I_O = 20$ $\mu$ A   | -     | 0    | 0.1       | -                | 0.1       | -                 | 0.1       | V       |
|                 |                           | $I_O = 6.0$ mA   | -     | 0.16 | 0.26      | -                | 0.33      | -                 | 0.4       | V       |
| $I_I$           | input leakage current     | $V_I = V_{CC}$ or GND;<br>$V_{CC} = 5.5$ V   | -     | -    | $\pm 0.1$ | -                | $\pm 1.0$ | -                 | $\pm 1.0$ | $\mu$ A |
| $I_{OZ}$        | OFF-state output current  | $V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 5.5$ V;<br>$V_O = V_{CC}$ or GND                                  | -     | -    | $\pm 0.5$ | -                | $\pm 5.0$ | -                 | $\pm 10$  | $\mu$ A |
| $I_{CC}$        | supply current            | $V_I = V_{CC}$ or GND; $I_O = 0$ A;<br>$V_{CC} = 5.5$ V  | -     | -    | 8.0       | -                | 80        | -                 | 160       | $\mu$ A |
| $\Delta I_{CC}$ | additional supply current | $V_I = V_{CC} - 2.1$ V;<br>other inputs at $V_{CC}$ or GND;<br>$V_{CC} = 4.5$ V to 5.5 V;<br>$I_O = 0$ A |       |      |           |                  |           |                   |           |         |
|                 |                           | per input pin; Dn inputs   | -     | 35   | 126       | -                | 158       | -                 | 172       | $\mu$ A |
|                 |                           | per input pin; LE input  | -     | 65   | 234       | -                | 293       | -                 | 319       | $\mu$ A |
|                 |                           | per input pin; $\overline{OE}$ input   | -     | 125  | 450       | -                | 563       | -                 | 613       | $\mu$ A |
| $C_I$           | input capacitance         |  | -     | 3.5  | -         | -                | -         | -                 | -         | pF      |

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V);  $C_L = 50$  pF unless otherwise specified; for test circuit see [Figure 11](#).

| Symbol           | Parameter                     | Conditions   | 25 °C |     |     | –40 °C to +85 °C |     | –40 °C to +125 °C |     | Unit |
|------------------|-------------------------------|--|-------|-----|-----|------------------|-----|-------------------|-----|------|
|                  |                               |  | Min   | Typ | Max | Min              | Max | Min               | Max |      |
| 74HC573          |                               |  |       |     |     |                  |     |                   |     |      |
| t <sub>pd</sub>  | propagation delay             | Dn to Qn; see <a href="#">Figure 7</a> <a href="#">[1]</a>                                     |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V  | -     | 47  | 150 | -                | 190 | -                 | 225 | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -     | 17  | 30  | -                | 38  | -                 | 45  | ns   |
|                  |                               | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF  | -     | 14  | -   | -                | -   | -                 | -   | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V  | -     | 14  | 26  | -                | 33  | -                 | 38  | ns   |
| t <sub>pd</sub>  | propagation delay             | LE to Qn; see <a href="#">Figure 8</a> <a href="#">[1]</a>                                     |       |     |     |                  |     |                   |     |      |
|                  |                               | 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 V; C <sub>L</sub> = 15 pF  | -     | 15  | -   | -                | -   | -                 | -   | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V  | -     | 14  | 26  | -                | 33  | -                 | 38  | ns   |
| t <sub>en</sub>  | enable time                   | OE to Qn; see <a href="#">Figure 9</a> <a href="#">[2]</a>                                     |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V  | -     | 44  | 140 | -                | 175 | -                 | 210 | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -     | 16  | 28  | -                | 35  | -                 | 42  | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V  | -     | 13  | 24  | -                | 30  | -                 | 36  | ns   |
| t <sub>dis</sub> | disable time                  | OE to Qn; see <a href="#">Figure 9</a> <a href="#">[3]</a>                                     |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V  | -     | 55  | 150 | -                | 190 | -                 | 225 | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -     | 20  | 30  | -                | 38  | -                 | 45  | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V  | -     | 16  | 26  | -                | 33  | -                 | 38  | ns   |
| t <sub>t</sub>   | transition time               | Qn; see <a href="#">Figure 7</a> <a href="#">[4]</a>   |       |     |     |                  |     |                   |     |      |
|                  |                               | 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   |
| t <sub>W</sub>   | pulse width                   | LE HIGH; see <a href="#">Figure 8</a>  |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V  | 80    | 14  | -   | 100              | -   | 120               | -   | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V  | 16    | 5   | -   | 20               | -   | 24                | -   | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V  | 14    | 4   | -   | 17               | -   | 20                | -   | ns   |
| t <sub>su</sub>  | set-up time                   | Dn to LE; see <a href="#">Figure 10</a>  |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V  | 50    | 11  | -   | 65               | -   | 75                | -   | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V  | 10    | 4   | -   | 13               | -   | 15                | -   | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V  | 9     | 3   | -   | 11               | -   | 13                | -   | ns   |
| t <sub>h</sub>   | hold time                     | Dn to LE; see <a href="#">Figure 10</a>  |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V  | 5     | 3   | -   | 5                | -   | 5                 | -   | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V  | 5     | 1   | -   | 5                | -   | 5                 | -   | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V  | 5     | 1   | -   | 5                | -   | 5                 | -   | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | C <sub>L</sub> = 50 pF; f = 1 MHz; V <sub>I</sub> = GND to V <sub>CC</sub> <a href="#">[5]</a> | -     | 26  | -   | -                | -   | -                 | -   | pF   |



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

Voltages are referenced to GND (ground = 0 V);  $C_L = 50$  pF unless otherwise specified; for test circuit see [Figure 11](#).

| Symbol           | Parameter                     | Conditions   | 25 °C |     |     | –40 °C to +85 °C |     | –40 °C to +125 °C |     | Unit |
|------------------|-------------------------------|--|-------|-----|-----|------------------|-----|-------------------|-----|------|
|                  |                               |  | Min   | Typ | Max | Min              | Max | Min               | Max |      |
| 74HCT573         |                               |  |       |     |     |                  |     |                   |     |      |
| t <sub>pd</sub>  | propagation delay             | Dn to Qn; see <a href="#">Figure 7</a> <a href="#">[1]</a>   |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -     | 20  | 35  | -                | 44  | -                 | 53  | ns   |
|                  |                               | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF  | -     | 17  | -   | -                | -   | -                 | -   | ns   |
| t <sub>pd</sub>  | propagation delay             | LE to Qn; see <a href="#">Figure 8</a> <a href="#">[1]</a>   |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -     | 18  | 35  | -                | 44  | -                 | 53  | ns   |
|                  |                               | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF  | -     | 15  | -   | -                | -   | -                 | -   | ns   |
| t <sub>en</sub>  | enable time                   | $\overline{OE}$ to Qn; see <a href="#">Figure 9</a> <a href="#">[2]</a>                                |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -     | 17  | 30  | -                | 38  | -                 | 45  | ns   |
| t <sub>dis</sub> | disable time                  | $\overline{OE}$ to Qn; see <a href="#">Figure 9</a> <a href="#">[3]</a>                                |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -     | 18  | 30  | -                | 38  | -                 | 45  | ns   |
| t <sub>t</sub>   | transition time               | Qn; see <a href="#">Figure 7</a> <a href="#">[4]</a>   |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | -     | 5   | 12  | -                | 15  | -                 | 18  | ns   |
| t <sub>W</sub>   | pulse width                   | LE HIGH; see <a href="#">Figure 8</a>  |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | 16    | 5   | -   | 20               | -   | 24                | -   | ns   |
| t <sub>su</sub>  | set-up time                   | Dn to LE; see <a href="#">Figure 10</a>  |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | 13    | 7   | -   | 16               | -   | 20                | -   | ns   |
| t <sub>h</sub>   | hold time                     | Dn to LE; see <a href="#">Figure 10</a>  |       |     |     |                  |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 4.5 V  | 9     | 4   | -   | 11               | -   | 15                | -   | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | C <sub>L</sub> = 50 pF; f = 1 MHz; V <sub>I</sub> = GND to V <sub>CC</sub> – 1.5 V <a href="#">[5]</a> | -     | 26  | -   | -                | -   | -                 | -   | pF   |

[1]  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .

[2]  $t_{en}$  is the same as  $t_{PZH}$  and  $t_{PZL}$ .

[3]  $t_{dis}$  is the same as  $t_{PLZ}$  and  $t_{PHZ}$ .

[4]  $t_t$  is the same as  $t_{THL}$  and  $t_{TLH}$ .

[5]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu W$ ).

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

$f_i$  = input frequency in MHz;

$f_o$  = output frequency in MHz;

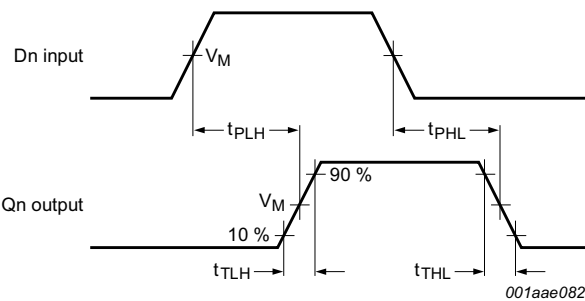
$C_L$  = output load capacitance in pF;

$V_{CC}$  = supply voltage in V;

$N$  = number of inputs switching;

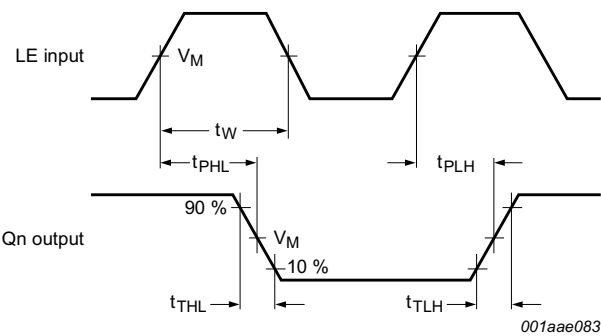
$\sum(C_L \times V_{CC}^2 \times f_o)$  = sum of outputs.

11. Waveforms



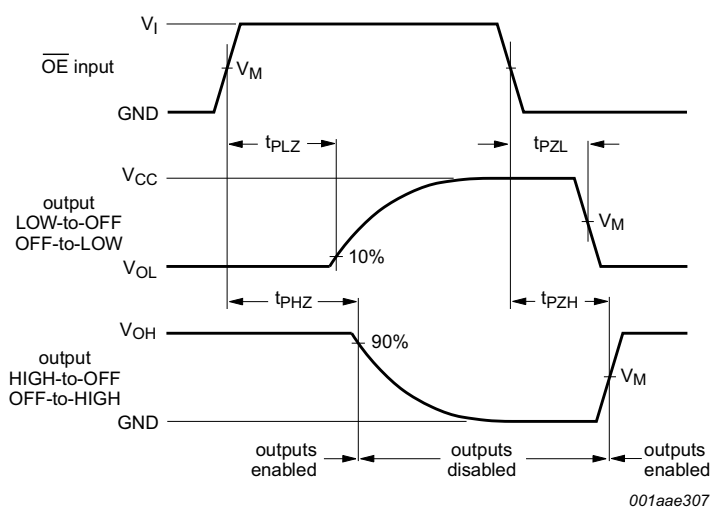
Measurement points are given in [Table 8](#).

Fig 7. Propagation delay data input (Dn) to output (Qn) and output transition time



Measurement points are given in [Table 8](#).

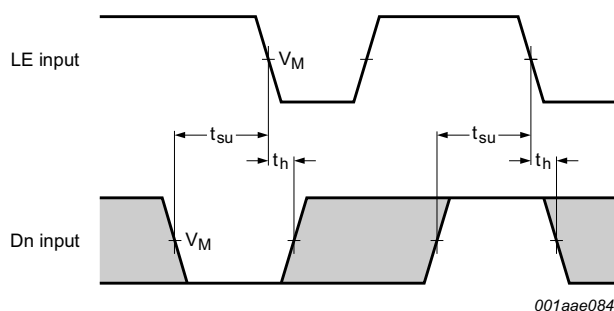
Fig 8. Pulse width latch enable input (LE), propagation delay latch enable input (LE) to output (Qn) and output transition time



Measurement points are given in [Table 8](#).

$V_{OL}$  and  $V_{OH}$  are typical voltage output levels that occur with the output load.

**Fig 9. Enable and disable times**



Measurement points are given in [Table 8](#).

The shaded areas indicate when the input is permitted to change for predictable output performance.

**Fig 10. Set-up and hold times for data input (Dn) to latch input (LE)**

### Table 8. Measurement points

| Type     | Input       | Output      |
|----------|-------------|-------------|
|          | $V_M$       | $V_M$       |
| 74HC573  | $0.5V_{CC}$ | $0.5V_{CC}$ |
| 74HCT573 | 1.3 V       | 1.3 V       |

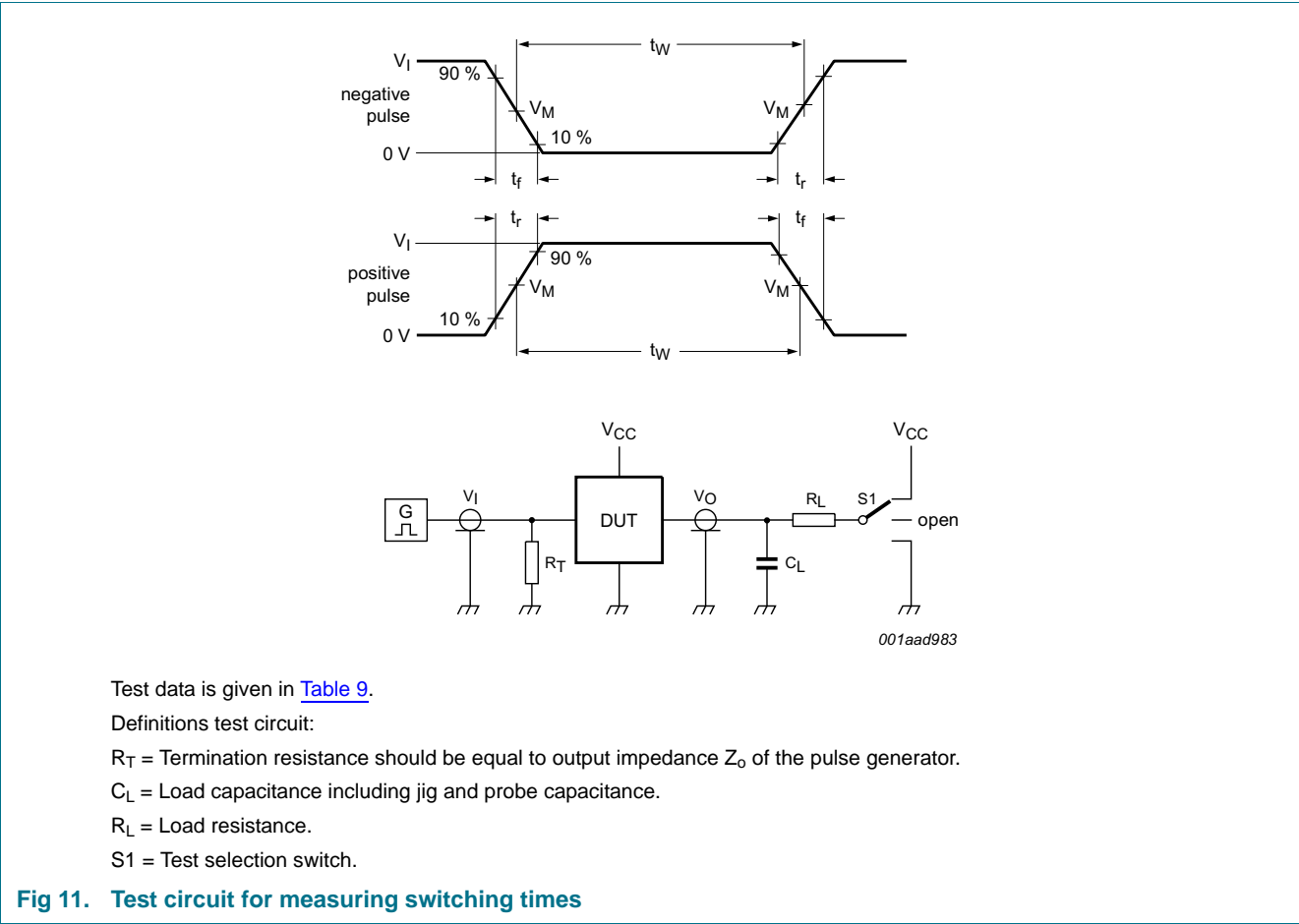


Table 9. Test data

| Type     | Input    |            | Load         |              | S1 position        |                    |                    |
|----------|----------|------------|--------------|--------------|--------------------|--------------------|--------------------|
|          | $V_I$    | $t_r, t_f$ | $C_L$        | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74HC573  | $V_{CC}$ | 6 ns       | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74HCT573 | 3 V      | 6 ns       | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |

12. Package outline

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

SOT163-1

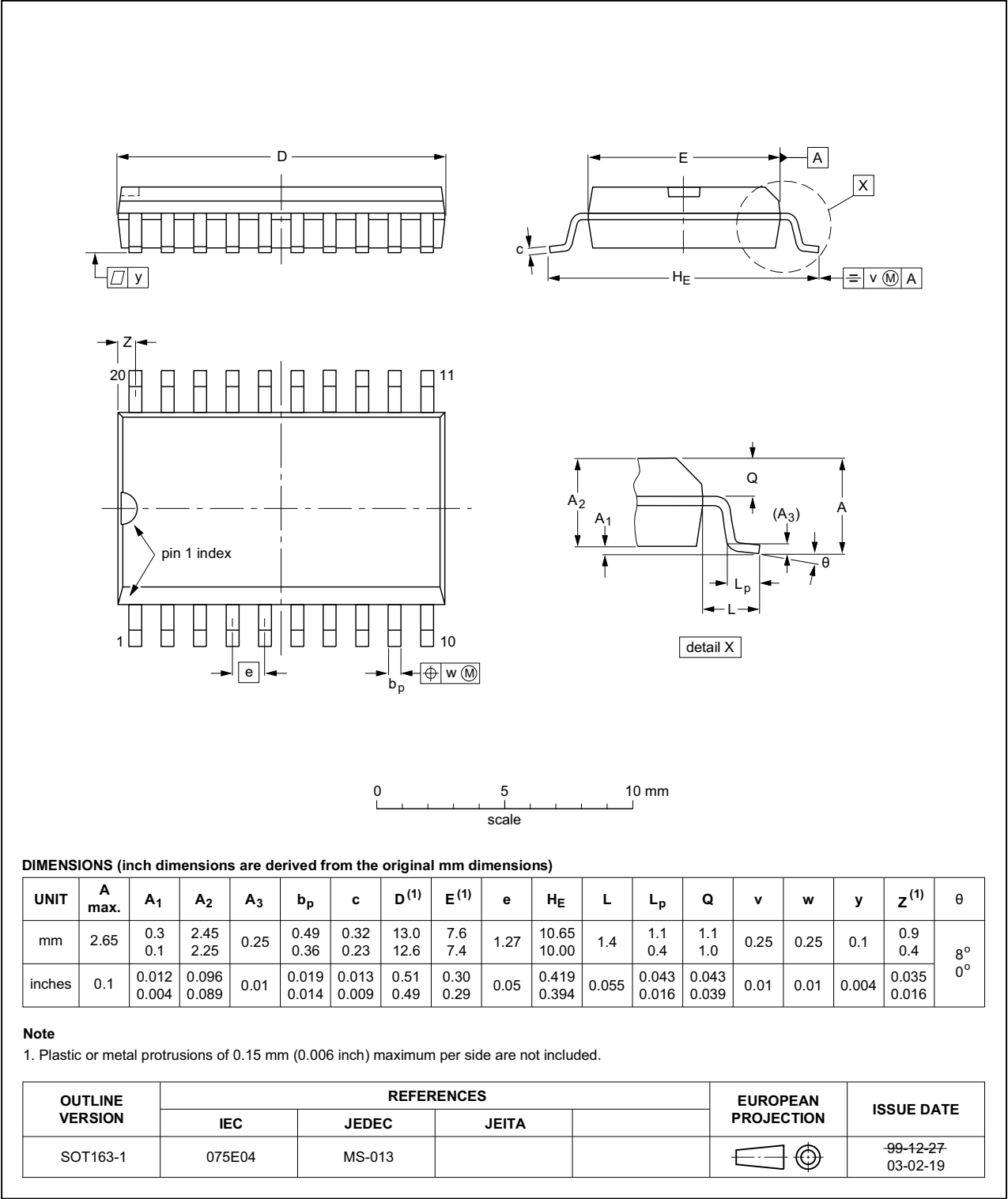


Fig 12. Package outline SOT163-1 (SO20)

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

SOT339-1

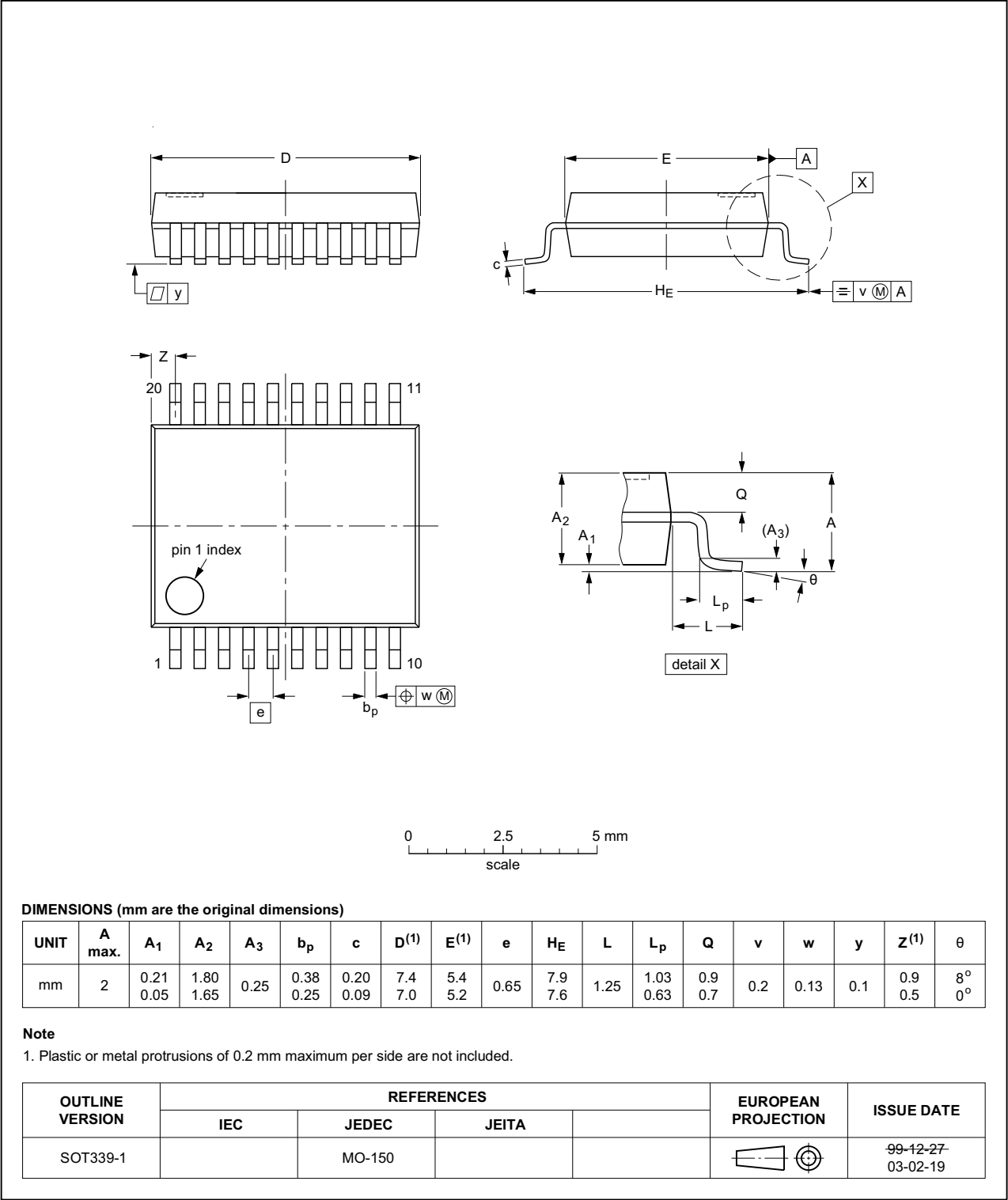


Fig 13. Package outline SOT339-1 (SSOP20)

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

SOT360-1

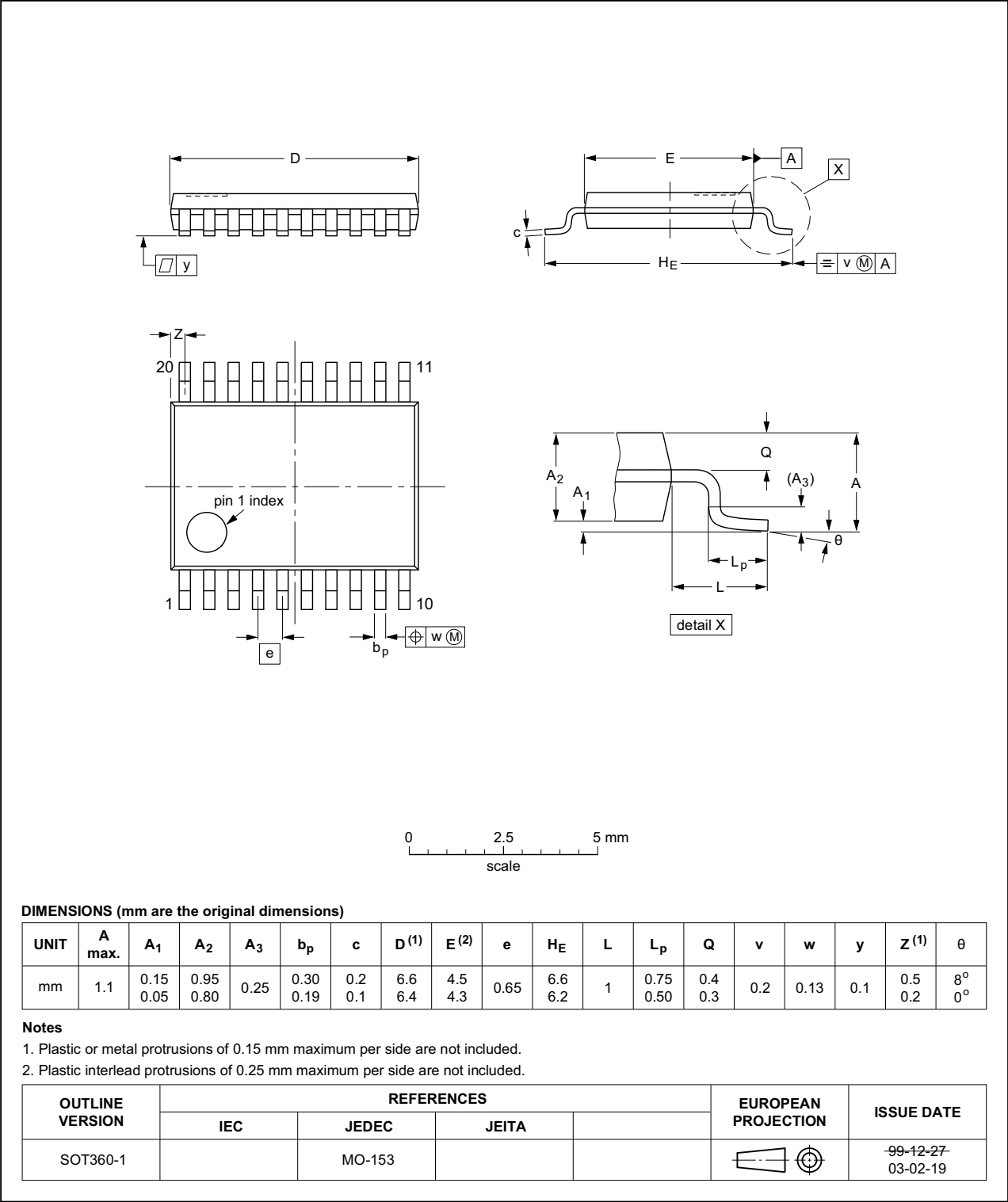


Fig 14. Package outline SOT360-1 (TSSOP20)

DHVQFN20: plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads;  
20 terminals; body 2.5 x 4.5 x 0.85 mm

SOT764-1

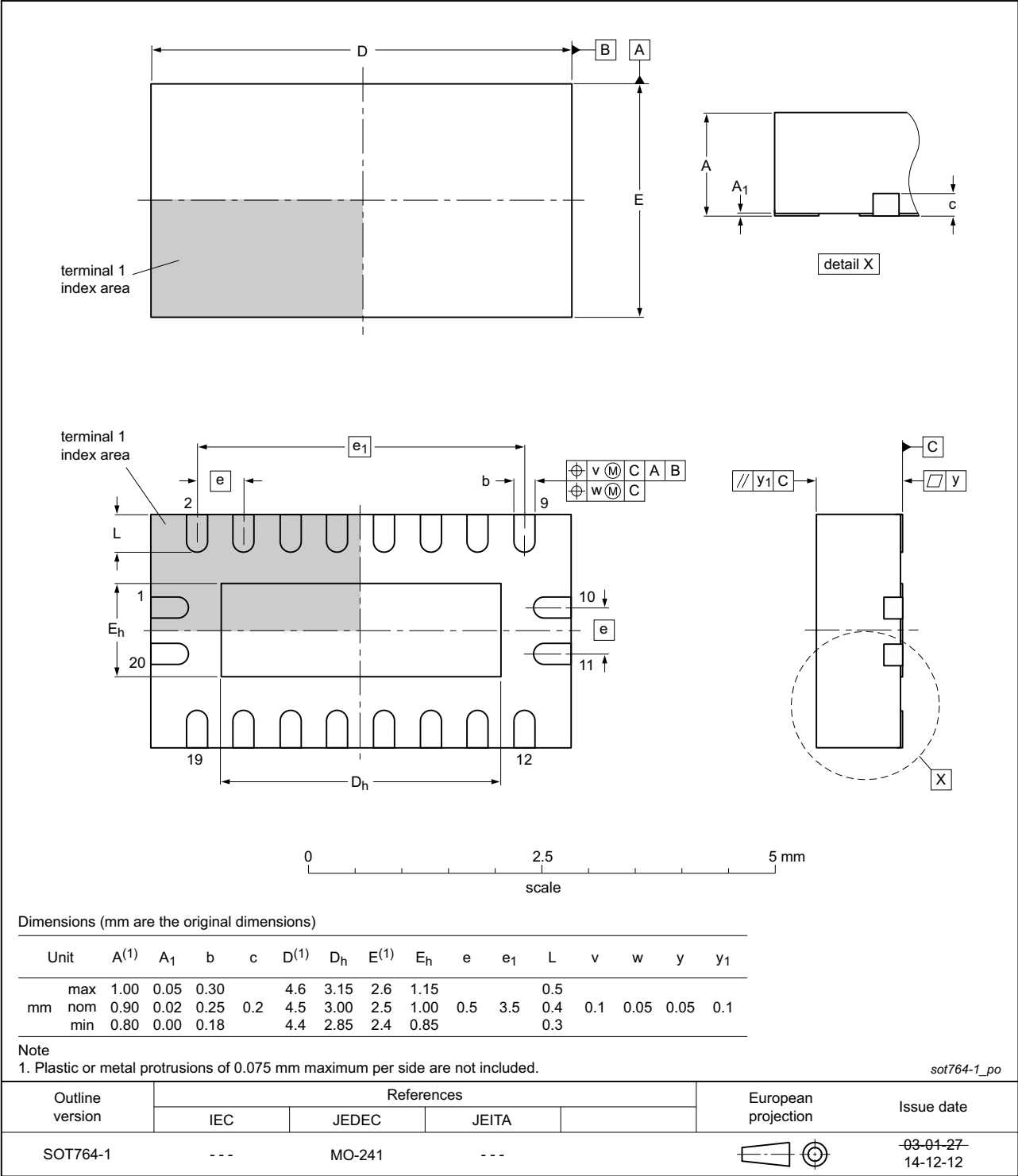


Fig 15. Package outline SOT764-1 (DHVQFN20)



## 13. 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             |

## 14. Revision history

Table 11. Revision history

| Document ID         | Release date  | Data sheet status     | Change notice | Supersedes          |
|---------------------|---|-----------------------|---------------|---------------------|
| 74HC_HCT573 v.7     | 20160304  | Product data sheet    | -             | 74HC_HCT573 v.6     |
| Modifications:      | • Type numbers 74HC573N and 74HCT573N (SOT146-1) removed.   |                       |               |                     |
| 74HC_HCT573 v.6     | 20150126  | Product data sheet    | -             | 74HC_HCT573 v.5     |
| Modifications:      | • <a href="#">Table 7</a> : Power dissipation capacitance condition for 74HCT573 is corrected.  |                       |               |                     |
| 74HC_HCT573 v.5     | 20120815  | Product data sheet    | -             | 74HC_HCT573 v.4     |
| Modifications:      | • Alternative descriptive title corrected (errata).   |                       |               |                     |
| 74HC_HCT573 v.4     | 20120806  | Product data sheet    | -             | 74HC_HCT573 v.3     |
| Modifications:      | • The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.<br>• Legal texts have been adapted to the new company name where appropriate. |                       |               |                     |
| 74HC_HCT573 v.3     | 20060117  | Product data sheet    | -             | 74HC_HCT573_CNV v.2 |
| 74HC_HCT573_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.nexperia.com>.

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