

# 74AHC573; 74AHCT573

Octal D-type transparent latch; 3-state

Rev. 8 — 13 July 2020

Product data sheet

## 1. General description

The 74AHC573; 74AHCT573 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 are overvoltage tolerant. This feature allows the use of these devices as translators in mixed voltage environments.

## 2. Features and benefits

- Wide supply voltage range from 2.0 V to 5.5 V
- Balanced propagation delays
- All inputs have Schmitt-trigger action
- Overvoltage tolerant inputs to 5.5 V
- High noise immunity
- CMOS low power dissipation
- Common 3-state output enable input
- Functionally identical to the 74AHC373; 74AHCT373
- Input levels:
  - For 74AHC573: CMOS input level
  - For 74AHCT573: TTL input level
- ESD protection:
  - HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101E exceeds 1000 V
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level A
- Multiple package options
- Specified from -40 °C to +85 °C and from -40 °C to +125 °C

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3. Ordering information

Table 1. Ordering information

| Type number | Package           |          |                                                                                                                                      |          |
|-------------|-------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------|----------|
|             | Temperature range | Name     | Description                                                                                                                          | Version  |
| 74AHC573D   | -40 °C to +125 °C | SO20     | plastic small outline package; 20 leads;<br>body width 7.5 mm                                                                        | SOT163-1 |
| 74AHCT573D  |                   |          |                                                                                                                                      |          |
| 74AHC573PW  | -40 °C to +125 °C | TSSOP20  | plastic thin shrink small outline package; 20 leads;<br>body width 4.4 mm                                                            | SOT360-1 |
| 74AHCT573PW |                   |          |                                                                                                                                      |          |
| 74AHC573BQ  | -40 °C to +125 °C | DHVQFN20 | plastic dual in-line compatible thermal enhanced<br>very thin quad flat package; no leads; 20 terminals;<br>body 2.5 × 4.5 × 0.85 mm | SOT764-1 |
| 74AHCT573BQ |                   |          |                                                                                                                                      |          |

4. Functional diagram

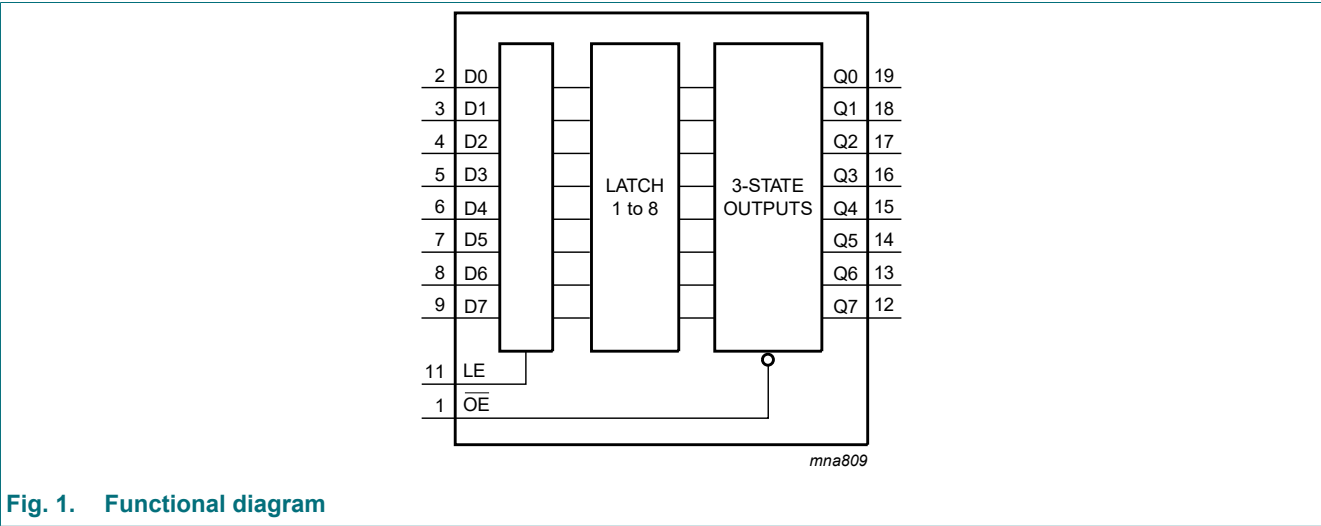


Fig. 1. Functional diagram

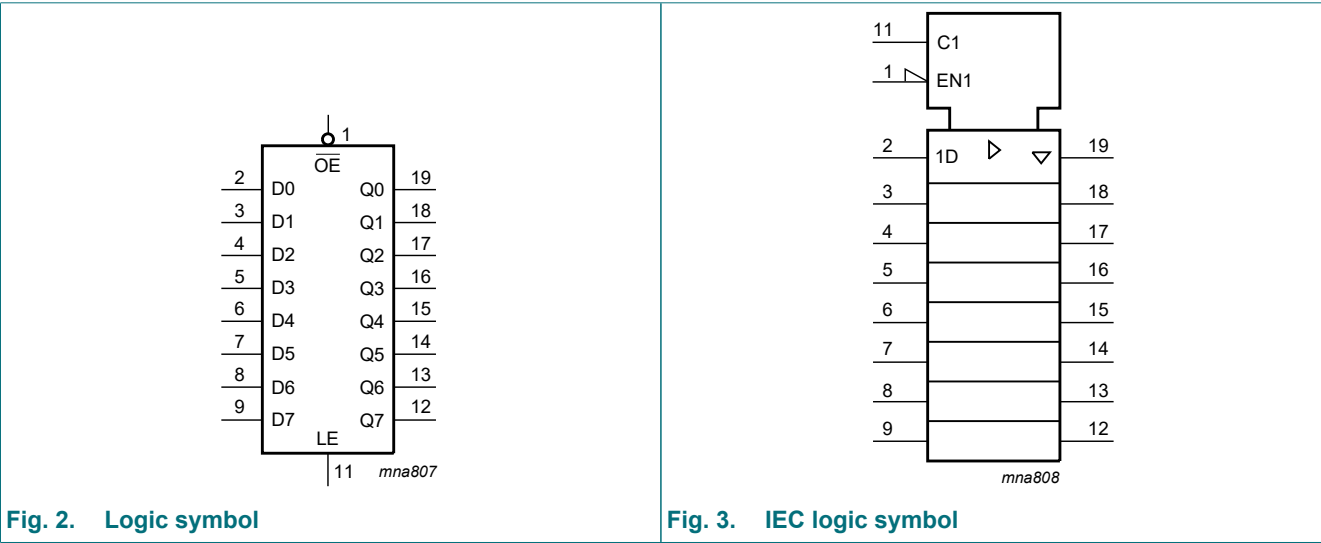
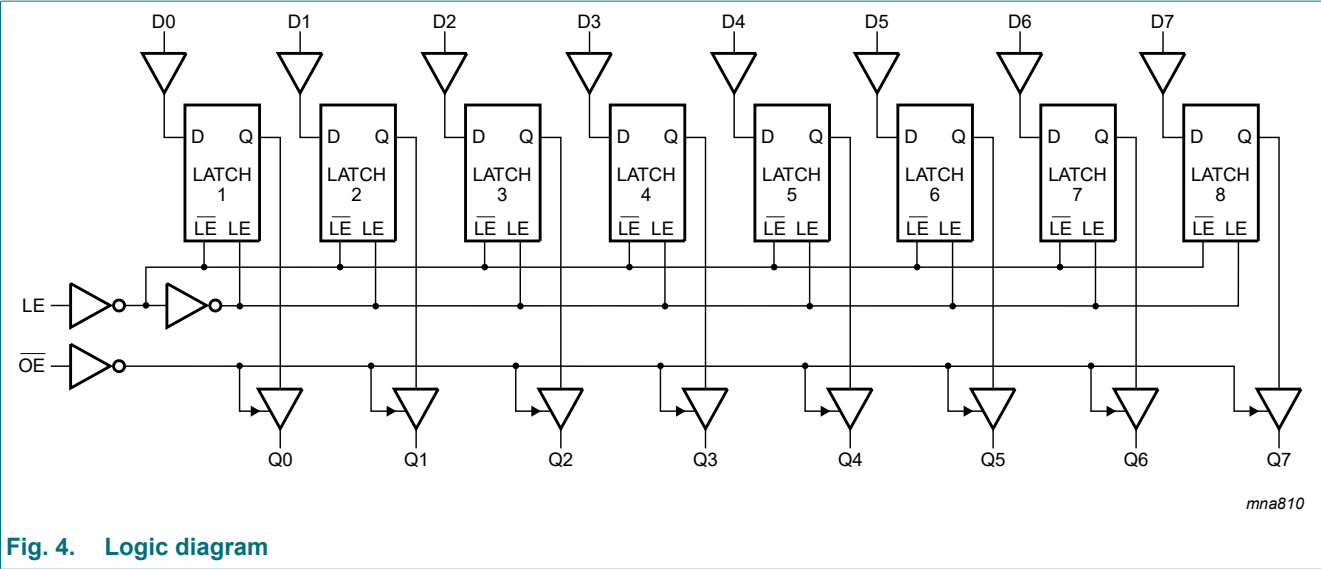


Fig. 2. Logic symbol

Fig. 3. IEC logic symbol



5. Pinning information

5.1. Pinning

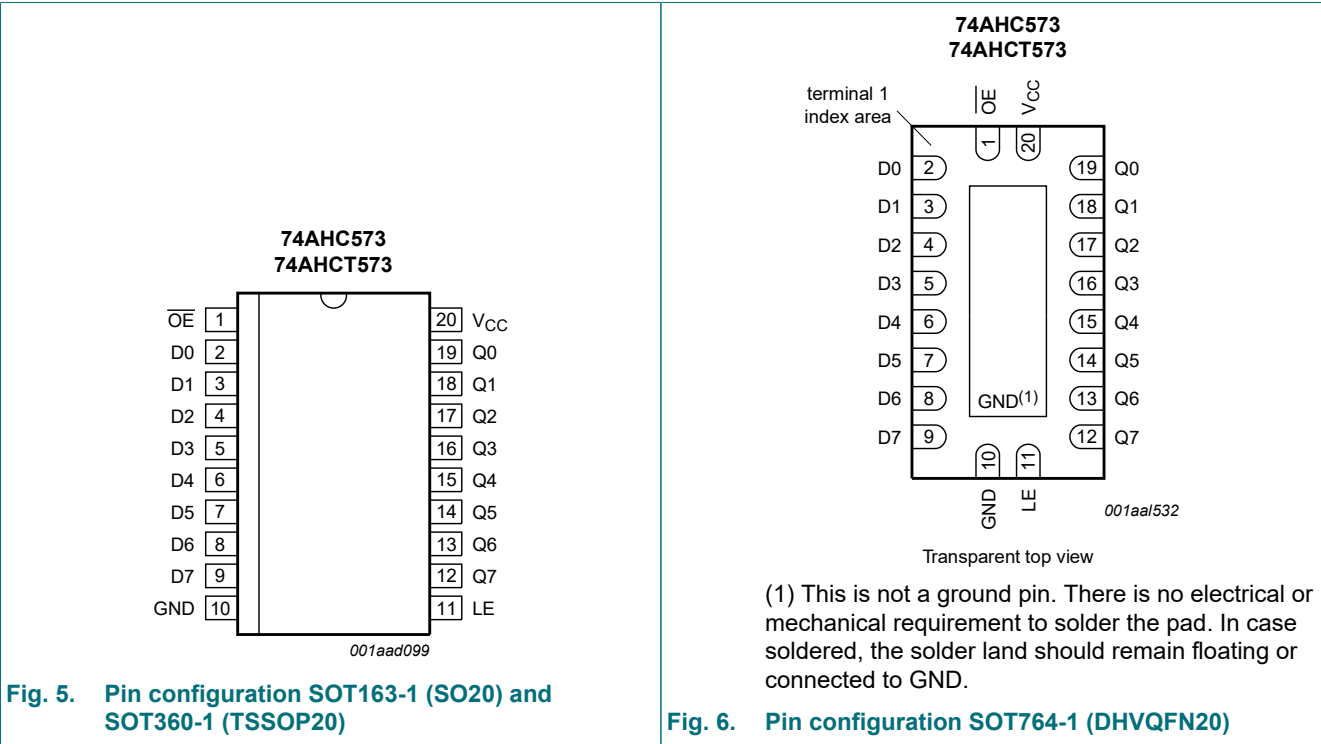


Fig. 5. Pin configuration SOT163-1 (SO20) and SOT360-1 (TSSOP20)

Fig. 6. Pin configuration SOT764-1 (DHVQFN20)

## 5.2. Pin description

Table 2. Pin description

| Symbol          | Pin                            | Description                      |
|-----------------|--------------------------------|----------------------------------|
| OE              | 1                              | output enable input (active LOW) |
| D0 to D7        | 2, 3, 4, 5, 6, 7, 8, 9         | data input                       |
| GND             | 10                             | ground (0 V)                     |
| LE              | 11                             | latch enable (active HIGH)       |
| Q0 to Q7        | 19, 18, 17, 16, 15, 14, 13, 12 | data output                      |
| V <sub>CC</sub> | 20                             | supply voltage                   |

## 6. Functional description

Table 3. Function table

*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.*

| Operating mode                              | Input |    |    | Internal latch | Output<br>Qn |
|---------------------------------------------|-------|----|----|----------------|--------------|
|                                             | OE    | LE | Dn |                |              |
| 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            |

## 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 | +7.0 | V    |
| V <sub>I</sub>   | input voltage           |                                                                         | -0.5 | +7.0 | V    |
| I <sub>IK</sub>  | input clamping current  | V <sub>I</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  | +20  | mA   |
| I <sub>O</sub>   | output current          | V <sub>O</sub> = -0.5 V to (V <sub>CC</sub> + 0.5 V)                    | -25  | +25  | mA   |
| I <sub>CC</sub>  | supply current          |                                                                         | -    | +75  | mA   |
| I <sub>GND</sub> | ground current          |                                                                         | -75  | -    | mA   |
| T <sub>stg</sub> | storage temperature     |                                                                         | -65  | +150 | °C   |
| P <sub>tot</sub> | total power dissipation | T <sub>amb</sub> = -40 °C to +125 °C [2]                                | -    | 500  | mW   |

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

[2] For SOT163-1 (SO20) package: P<sub>tot</sub> derates linearly with 12.3 mW/K above 109 °C.  
For SOT360-1 (TSSOP20) package: P<sub>tot</sub> derates linearly with 10.0 mW/K above 100 °C.  
For SOT764-1 (DHVQFN20) package: P<sub>tot</sub> derates linearly with 12.9 mW/K above 111 °C.

## 8. Recommended operating conditions

**Table 5. Recommended operating conditions**

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

| Symbol           | Parameter                           | Conditions                      | 74AHC573 |     |                 | 74AHCT573 |     |                 | Unit |
|------------------|-------------------------------------|---------------------------------|----------|-----|-----------------|-----------|-----|-----------------|------|
|                  |                                     |                                 | Min      | Typ | Max             | Min       | Typ | Max             |      |
| V <sub>CC</sub>  | supply voltage                      |                                 | 2.0      | 5.0 | 5.5             | 4.5       | 5.0 | 5.5             | V    |
| V <sub>I</sub>   | input voltage                       |                                 | 0        | -   | 5.5             | 0         | -   | 5.5             | 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> = 3.3 V ± 0.3 V | -        | -   | 100             | -         | -   | -               | ns/V |
|                  |                                     | V <sub>CC</sub> = 5.0 V ± 0.5 V | -        | -   | 20              | -         | -   | 20              | 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               | Typ | Max   |      |
| 74AHC573        |                           |                                                                                                                        |       |     |       |                  |      |                   |     |       |      |
| V <sub>IH</sub> | HIGH-level input voltage  | V <sub>CC</sub> = 2.0 V                                                                                                | 1.5   | -   | -     | 1.5              | -    | 1.5               | -   | -     | V    |
|                 |                           | V <sub>CC</sub> = 3.0 V                                                                                                | 2.1   | -   | -     | 2.1              | -    | 2.1               | -   | -     | V    |
|                 |                           | V <sub>CC</sub> = 5.5 V                                                                                                | 3.85  | -   | -     | 3.85             | -    | 3.85              | -   | -     | V    |
| V <sub>IL</sub> | LOW-level input voltage   | V <sub>CC</sub> = 2.0 V                                                                                                | -     | -   | 0.5   | -                | 0.5  | -                 | -   | 0.5   | V    |
|                 |                           | V <sub>CC</sub> = 3.0 V                                                                                                | -     | -   | 0.9   | -                | 0.9  | -                 | -   | 0.9   | V    |
|                 |                           | V <sub>CC</sub> = 5.5 V                                                                                                | -     | -   | 1.65  | -                | 1.65 | -                 | -   | 1.65  | 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> = -50 μA; V <sub>CC</sub> = 2.0 V                                                                       | 1.9   | 2.0 | -     | 1.9              | -    | 1.9               | -   | -     | V    |
|                 |                           | I <sub>O</sub> = -50 μA; V <sub>CC</sub> = 3.0 V                                                                       | 2.9   | 3.0 | -     | 2.9              | -    | 2.9               | -   | -     | V    |
|                 |                           | I <sub>O</sub> = -50 μA; V <sub>CC</sub> = 4.5 V                                                                       | 4.4   | 4.5 | -     | 4.4              | -    | 4.4               | -   | -     | V    |
|                 |                           | I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V                                                                      | 2.58  | -   | -     | 2.48             | -    | 2.40              | -   | -     | V    |
| V <sub>OL</sub> | LOW-level output voltage  | I <sub>O</sub> = -8.0 mA; V <sub>CC</sub> = 4.5 V                                                                      | 3.94  | -   | -     | 3.80             | -    | 3.70              | -   | -     | V    |
|                 |                           | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                    |       |     |       |                  |      |                   |     |       |      |
|                 |                           | I <sub>O</sub> = 50 μA; V <sub>CC</sub> = 2.0 V                                                                        | -     | 0   | 0.1   | -                | 0.1  | -                 | -   | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 50 μA; V <sub>CC</sub> = 3.0 V                                                                        | -     | 0   | 0.1   | -                | 0.1  | -                 | -   | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 50 μA; V <sub>CC</sub> = 4.5 V                                                                        | -     | 0   | 0.1   | -                | 0.1  | -                 | -   | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V                                                                       | -     | -   | 0.36  | -                | 0.44 | -                 | -   | 0.55  | V    |
| I <sub>OZ</sub> | OFF-state output current  | I <sub>O</sub> = 8.0 mA; V <sub>CC</sub> = 4.5 V                                                                       | -     | -   | 0.36  | -                | 0.44 | -                 | -   | 0.55  | V    |
|                 |                           | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 5.5 V | -     | -   | ±0.25 | -                | ±2.5 | -                 | -   | ±10.0 | μA   |
| I <sub>I</sub>  | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 0 V to 5.5 V                                                | -     | -   | 0.1   | -                | 1.0  | -                 | -   | 2.0   | μA   |
| I <sub>CC</sub> | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 5.5 V                                 | -     | -   | 4.0   | -                | 40   | -                 | -   | 80    | μA   |

| Symbol           | Parameter                 | Conditions                                                                                                                                                     | 25 °C |     |       | -40 °C to +85 °C |      | -40 °C to +125 °C |     |       | Unit |
|------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|-------|------------------|------|-------------------|-----|-------|------|
|                  |                           |                                                                                                                                                                | Min   | Typ | Max   | Min              | Max  | Min               | Typ | Max   |      |
| C <sub>I</sub>   | input capacitance         | V <sub>I</sub> = V <sub>CC</sub> or GND                                                                                                                        | -     | 3   | 10    | -                | 10   | -                 | -   | 10    | pF   |
| C <sub>O</sub>   | output capacitance        |                                                                                                                                                                | -     | 4   | -     | -                | -    | -                 | -   | 10    | pF   |
| <b>74AHCT573</b> |                           |                                                                                                                                                                |       |     |       |                  |      |                   |     |       |      |
| V <sub>IH</sub>  | HIGH-level input voltage  | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                                                                               | 2.0   | -   | -     | 2.0              | -    | 2.0               | -   | -     | V    |
| V <sub>IL</sub>  | LOW-level input voltage   | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                                                                               | -     | -   | 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> = -50 µA                                                                                                                                        | 4.4   | 4.5 | -     | 4.4              | -    | 4.4               | -   | -     | V    |
|                  |                           | I <sub>O</sub> = -8.0 mA                                                                                                                                       | 3.94  | -   | -     | 3.80             | -    | 3.70              | -   | -     | 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> = 50 µA                                                                                                                                         | -     | 0   | 0.1   | -                | 0.1  | -                 | -   | 0.1   | V    |
|                  |                           | I <sub>O</sub> = 8.0 mA                                                                                                                                        | -     | -   | 0.36  | -                | 0.44 | -                 | -   | 0.55  | V    |
| I <sub>OZ</sub>  | OFF-state output current  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ;<br>V <sub>O</sub> = V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 5.5 V                                   | -     | -   | ±0.25 | -                | ±2.5 | -                 | -   | ±10.0 | µA   |
| I <sub>I</sub>   | input leakage current     | V <sub>I</sub> = 5.5 V or GND;<br>V <sub>CC</sub> = 0 V to 5.5 V                                                                                               | -     | -   | 0.1   | -                | 1.0  | -                 | -   | 2.0   | µA   |
| I <sub>CC</sub>  | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 5.5 V                                                                      | -     | -   | 4.0   | -                | 40   | -                 | -   | 80    | µA   |
| ΔI <sub>CC</sub> | additional supply current | per input pin;<br>V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; I <sub>O</sub> = 0 A;<br>other pins at V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 4.5 V to 5.5 V | -     | -   | 1.35  | -                | 1.5  | -                 | -   | 1.5   | mA   |
| C <sub>I</sub>   | input capacitance         | V <sub>I</sub> = V <sub>CC</sub> or GND                                                                                                                        | -     | 3   | 10    | -                | 10   | -                 | -   | 10    | pF   |
| C <sub>O</sub>   | output capacitance        |                                                                                                                                                                | -     | 4   | -     | -                | -    | -                 | -   | 10    | pF   |

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 11.

| Symbol           | Parameter         | Conditions                       | 25 °C |        |      | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|------------------|-------------------|----------------------------------|-------|--------|------|------------------|------|-------------------|------|------|
|                  |                   |                                  | Min   | Typ[1] | Max  | Min              | Max  | Min               | Max  |      |
| 74AHC573         |                   |                                  |       |        |      |                  |      |                   |      |      |
| t <sub>pd</sub>  | propagation delay | Dn to Qn; see Fig. 7 [2]         |       |        |      |                  |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V |       |        |      |                  |      |                   |      |      |
|                  |                   | C <sub>L</sub> = 15 pF           | -     | 5.5    | 11.0 | 1.0              | 13.0 | 1.0               | 14.0 | ns   |
|                  |                   | C <sub>L</sub> = 50 pF           | -     | 7.8    | 14.5 | 1.0              | 16.5 | 1.0               | 18.5 | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V to 5.5 V |       |        |      |                  |      |                   |      |      |
|                  |                   | C <sub>L</sub> = 15 pF           | -     | 3.9    | 6.8  | 1.0              | 8.0  | 1.0               | 8.5  | ns   |
|                  |                   | C <sub>L</sub> = 50 pF           | -     | 5.5    | 8.8  | 1.0              | 10.0 | 1.0               | 11.0 | ns   |
|                  |                   | LE to Qn; see Fig. 8 [2]         |       |        |      |                  |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V |       |        |      |                  |      |                   |      |      |
|                  |                   | C <sub>L</sub> = 15 pF           | -     | 5.8    | 11.9 | 1.0              | 14.0 | 1.0               | 15.0 | ns   |
|                  |                   | C <sub>L</sub> = 50 pF           | -     | 8.3    | 15.4 | 1.0              | 17.5 | 1.0               | 19.5 | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V to 5.5 V |       |        |      |                  |      |                   |      |      |
|                  |                   | C <sub>L</sub> = 15 pF           | -     | 4.2    | 7.7  | 1.0              | 9.0  | 1.0               | 10.0 | ns   |
|                  |                   | C <sub>L</sub> = 50 pF           | -     | 5.9    | 9.7  | 1.0              | 11.0 | 1.0               | 12.5 | ns   |
| t <sub>en</sub>  | enable time       | OE to Qn; see Fig. 9 [3]         |       |        |      |                  |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V |       |        |      |                  |      |                   |      |      |
|                  |                   | C <sub>L</sub> = 15 pF           | -     | 5.8    | 11.5 | 1.0              | 13.5 | 1.0               | 14.5 | ns   |
|                  |                   | C <sub>L</sub> = 50 pF           | -     | 8.3    | 15.0 | 1.0              | 17.0 | 1.0               | 19.0 | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V to 5.5 V |       |        |      |                  |      |                   |      |      |
|                  |                   | C <sub>L</sub> = 15 pF           | -     | 4.4    | 7.7  | 1.0              | 9.0  | 1.0               | 10.0 | ns   |
| t <sub>dis</sub> | disable time      | OE to Qn; see Fig. 9 [4]         |       |        |      |                  |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V |       |        |      |                  |      |                   |      |      |
|                  |                   | C <sub>L</sub> = 15 pF           | -     | 6.8    | 11.0 | 1.0              | 13.0 | 1.0               | 14.0 | ns   |
|                  |                   | C <sub>L</sub> = 50 pF           | -     | 9.7    | 14.5 | 1.0              | 16.5 | 1.0               | 18.5 | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V to 5.5 V |       |        |      |                  |      |                   |      |      |
|                  |                   | C <sub>L</sub> = 15 pF           | -     | 4.6    | 7.7  | 1.0              | 9.0  | 1.0               | 10.0 | ns   |
| t <sub>w</sub>   | pulse width       | C <sub>L</sub> = 50 pF           | -     | 7.4    | 9.7  | 1.0              | 11.0 | 1.0               | 12.5 | ns   |
|                  |                   | LE HIGH; see Fig. 8              |       |        |      |                  |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V | 5.0   | -      | -    | 5.0              | -    | 5.0               | -    | ns   |
| t <sub>su</sub>  | set-up time       | V <sub>CC</sub> = 4.5 V to 5.5 V | 5.0   | -      | -    | 5.0              | -    | 5.0               | -    | ns   |
|                  |                   | Dn to LE; see Fig. 10            |       |        |      |                  |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V | 3.5   | -      | -    | 3.5              | -    | 3.5               | -    | ns   |
| t <sub>h</sub>   | hold time         | V <sub>CC</sub> = 4.5 V to 5.5 V | 3.5   | -      | -    | 3.5              | -    | 3.5               | -    | ns   |
|                  |                   | Dn to LE; see Fig. 10            |       |        |      |                  |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V | 1.5   | -      | -    | 1.5              | -    | 1.5               | -    | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V to 5.5 V | 1.5   | -      | -    | 1.5              | -    | 1.5               | -    | ns   |

| Symbol                                            | Parameter                     | Conditions                                                             | 25 °C |        |     | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|---------------------------------------------------|-------------------------------|------------------------------------------------------------------------|-------|--------|-----|------------------|------|-------------------|------|------|
|                                                   |                               |                                                                        | Min   | Typ[1] | Max | Min              | Max  | Min               | Max  |      |
| C <sub>PD</sub>                                   | power dissipation capacitance | f <sub>i</sub> = 1 MHz;<br>V <sub>I</sub> = GND to V <sub>CC</sub> [5] | -     | 12     | -   | -                | -    | -                 | -    | pF   |
| <b>74AHCT573; V<sub>CC</sub> = 4.5 V to 5.5 V</b> |                               |                                                                        |       |        |     |                  |      |                   |      |      |
| t <sub>pd</sub>                                   | propagation delay             | Dn to Qn; see Fig. 7 [2]                                               |       |        |     |                  |      |                   |      |      |
|                                                   |                               | C <sub>L</sub> = 15 pF                                                 | -     | 3.5    | 5.5 | 1                | 6.5  | 1                 | 7.0  | ns   |
|                                                   |                               | C <sub>L</sub> = 50 pF                                                 | -     | 4.9    | 7.5 | 1                | 8.5  | 1                 | 9.5  | ns   |
|                                                   |                               | LE to Qn; see Fig. 8 [2]                                               |       |        |     |                  |      |                   |      |      |
|                                                   |                               | C <sub>L</sub> = 15 pF                                                 | -     | 3.9    | 6.0 | 1                | 7.0  | 1                 | 7.5  | ns   |
| t <sub>en</sub>                                   | enable time                   | OE to Qn; see Fig. 9 [3]                                               |       |        |     |                  |      |                   |      |      |
|                                                   |                               | C <sub>L</sub> = 15 pF                                                 | -     | 4.1    | 6.5 | 1                | 7.5  | 1                 | 8.5  | ns   |
|                                                   |                               | C <sub>L</sub> = 50 pF                                                 | -     | 5.9    | 8.5 | 1                | 10.0 | 1                 | 11.0 | ns   |
| t <sub>dis</sub>                                  | disable time                  | OE to Qn; see Fig. 9 [4]                                               |       |        |     |                  |      |                   |      |      |
|                                                   |                               | C <sub>L</sub> = 15 pF                                                 | -     | 4.5    | 6.5 | 1                | 7.5  | 1                 | 8.5  | ns   |
|                                                   |                               | C <sub>L</sub> = 50 pF                                                 | -     | 6.4    | 9.0 | 1                | 10.0 | 1                 | 11.5 | ns   |
| t <sub>W</sub>                                    | pulse width                   | LE HIGH; see Fig. 8                                                    | 5.0   | -      | -   | 5.0              | -    | 5.0               | -    | ns   |
| t <sub>su</sub>                                   | set-up time                   | Dn to LE; see Fig. 10                                                  | 3.5   | -      | -   | 3.5              | -    | 3.5               | -    | ns   |
| t <sub>h</sub>                                    | hold time                     | Dn to LE; see Fig. 10                                                  | 1.5   | -      | -   | 1.5              | -    | 1.5               | -    | ns   |
| C <sub>PD</sub>                                   | power dissipation capacitance | f <sub>i</sub> = 1 MHz;<br>V <sub>I</sub> = GND to V <sub>CC</sub> [5] | -     | 18     | -   | -                | -    | -                 | -    | pF   |

[1] Typical values are measured at nominal supply voltage (V<sub>CC</sub> = 3.3 V and V<sub>CC</sub> = 5.0 V).

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

[3] t<sub>en</sub> is the same as t<sub>PZH</sub> and t<sub>PZL</sub>.

[4] t<sub>dis</sub> is the same as t<sub>PHZ</sub> and t<sub>PLZ</sub>.

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

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

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

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

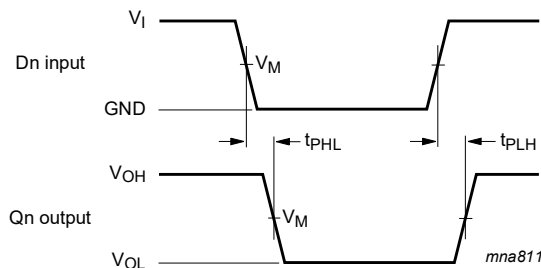
C<sub>L</sub> = output load capacitance in pF;

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

N = number of inputs switching;

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

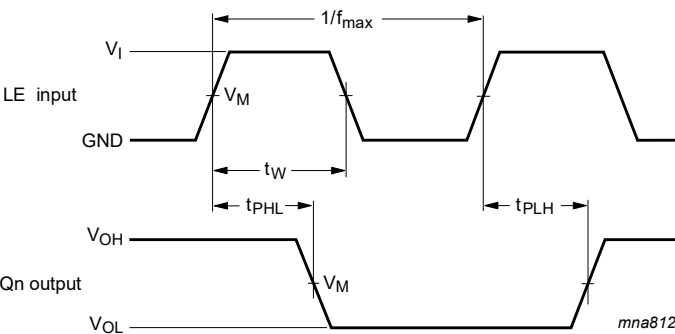
## 10.1. Waveforms and test circuit



Measurement points are given in Table 8.

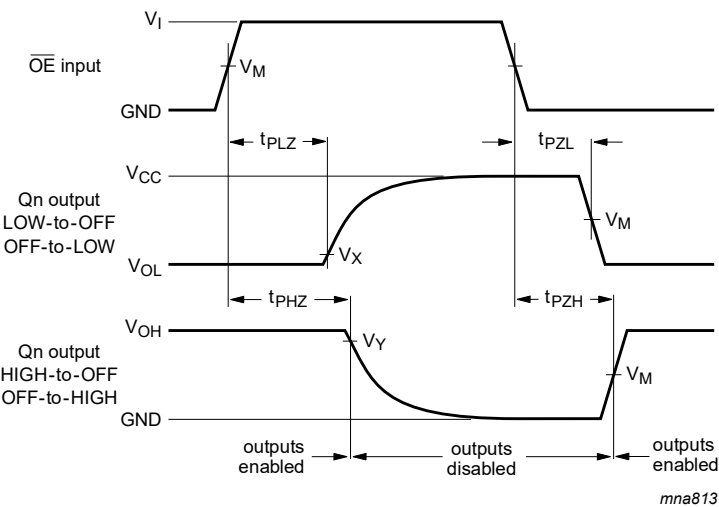
V<sub>OL</sub> and V<sub>OH</sub> are typical voltage output levels that occur with the output load.

**Fig. 7. Data input to output propagation delays**



Measurement points are given in [Table 8](#).  
VOL and VOH are typical voltage output levels that occur with the output load.

**Fig. 8. Latch enable input to output propagation delays**



Measurement points are given in [Table 8](#).  
VOL and VOH are typical voltage output levels that occur with the output load.

**Fig. 9. Enable and disable times**

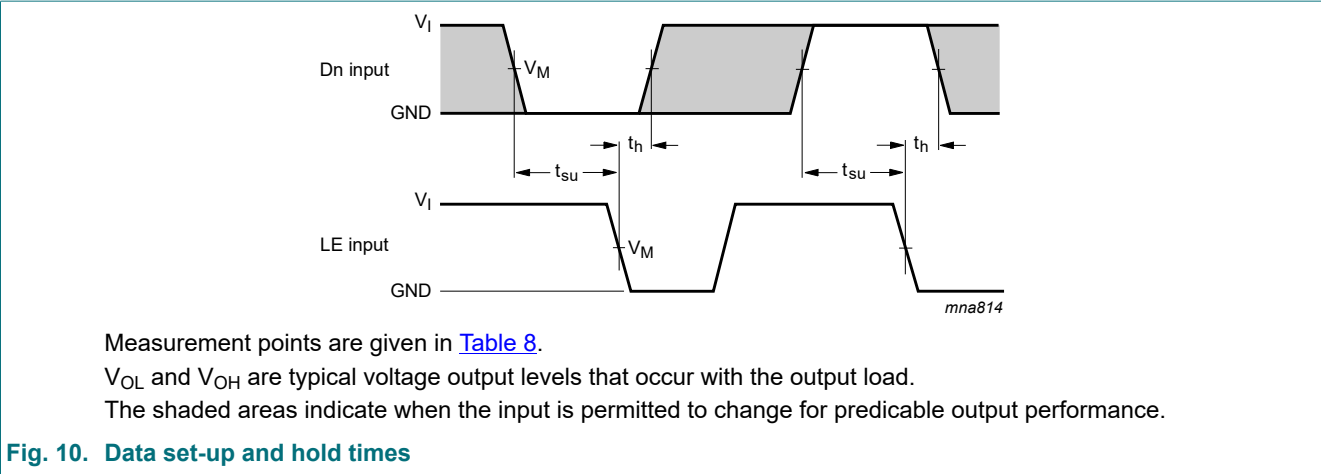


Table 8. Measurement points

| Type      | Input               |                     | Output                   |                          |
|-----------|---------------------|---------------------|--------------------------|--------------------------|
|           | $V_M$               | $V_M$               | $V_X$                    | $V_Y$                    |
| 74AHC573  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.3 \text{ V}$ | $V_{OH} - 0.3 \text{ V}$ |
| 74AHCT573 | 1.5 V               | $0.5 \times V_{CC}$ | $V_{OL} + 0.3 \text{ V}$ | $V_{OH} - 0.3 \text{ V}$ |

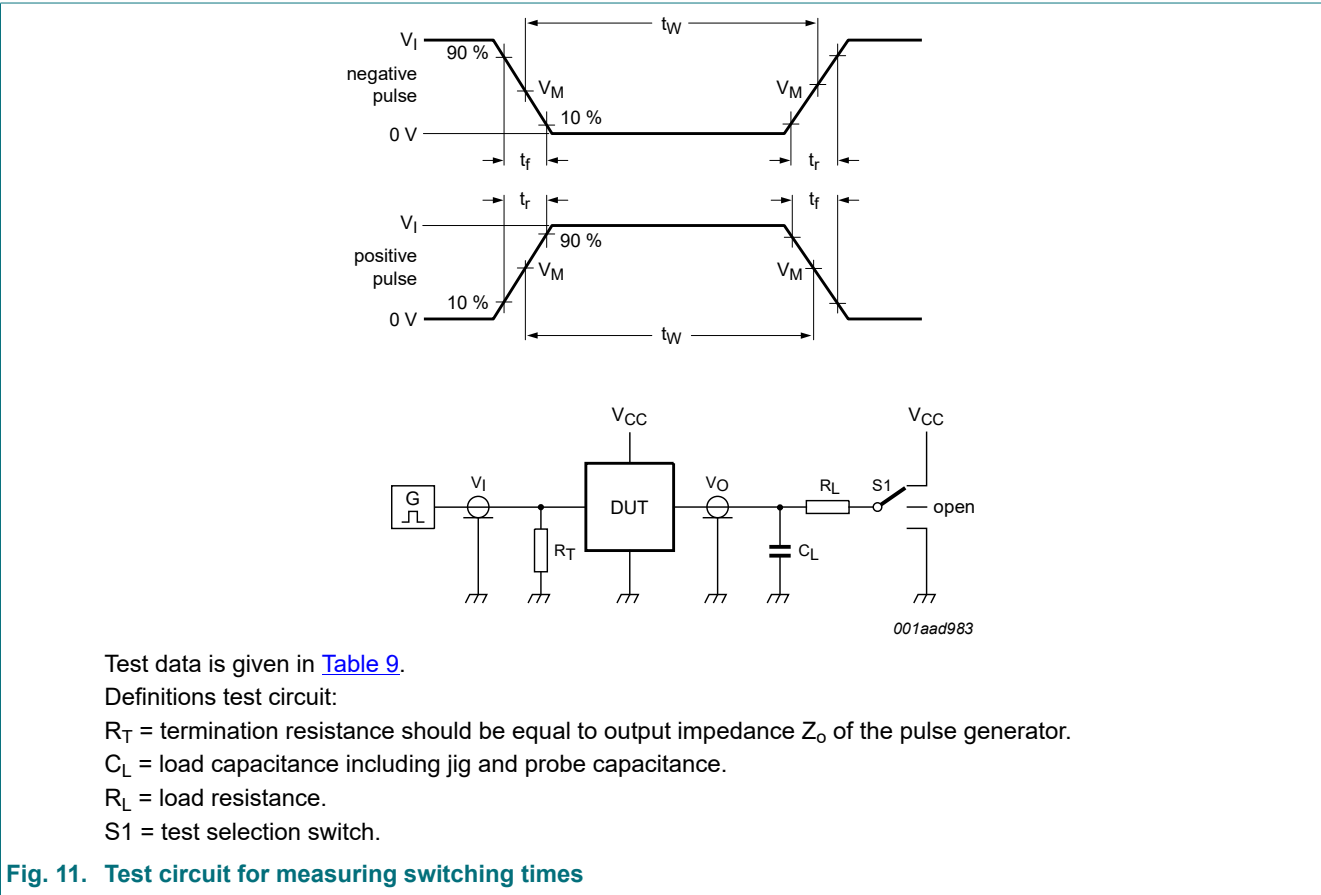


Table 9. Test data

| Type      | Input    |                       | Load         |              | S1 position        |                    |                    |
|-----------|----------|-----------------------|--------------|--------------|--------------------|--------------------|--------------------|
|           | $V_I$    | $t_r, t_f$            | $C_L$        | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74AHC573  | $V_{CC}$ | $\leq 3.0 \text{ ns}$ | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74AHCT573 | 3.0 V    | $\leq 3.0 \text{ ns}$ | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |

11. Package outline

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

SOT163-1

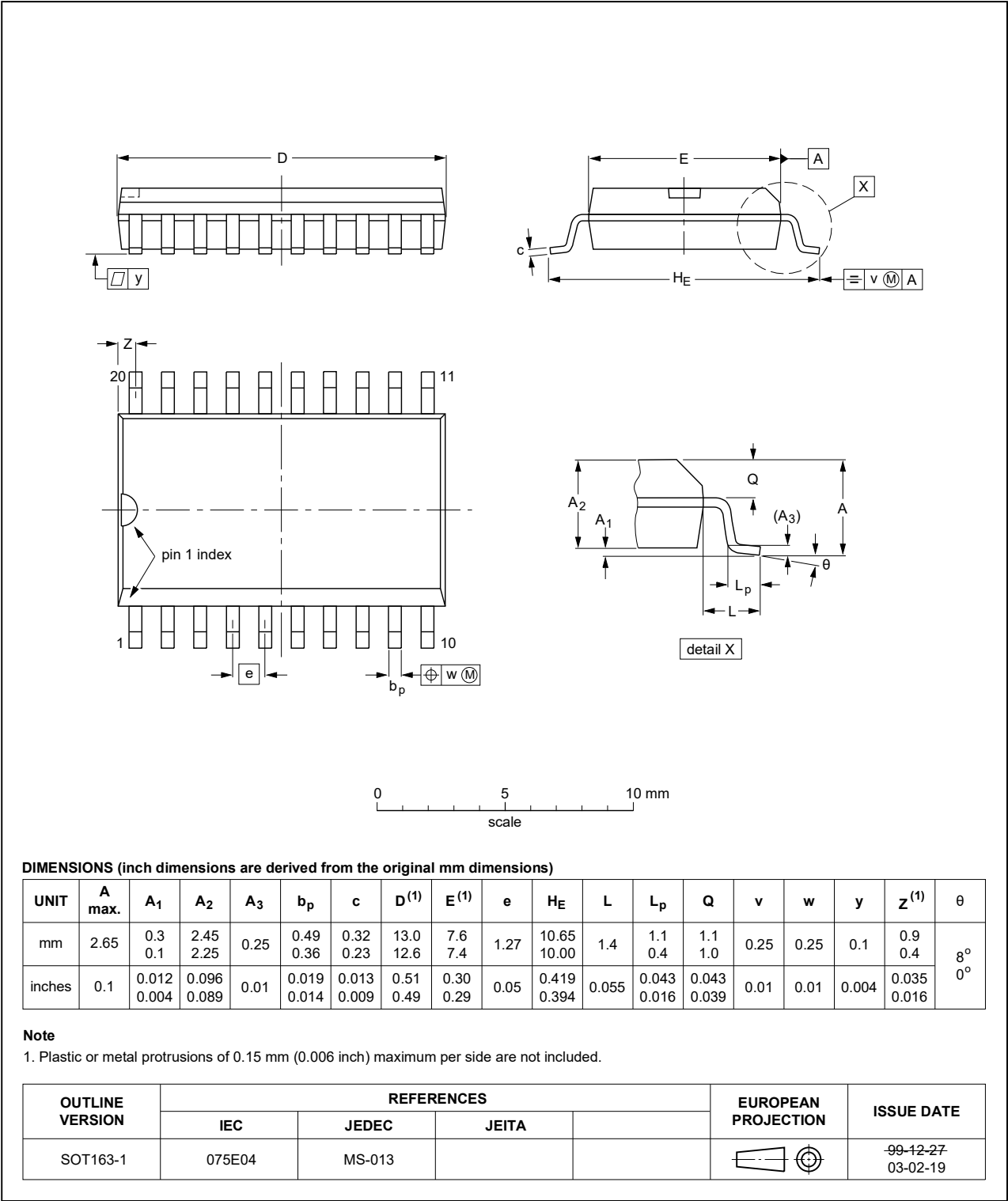


Fig. 12. Package outline SOT163-1 (SO20)

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

SOT360-1

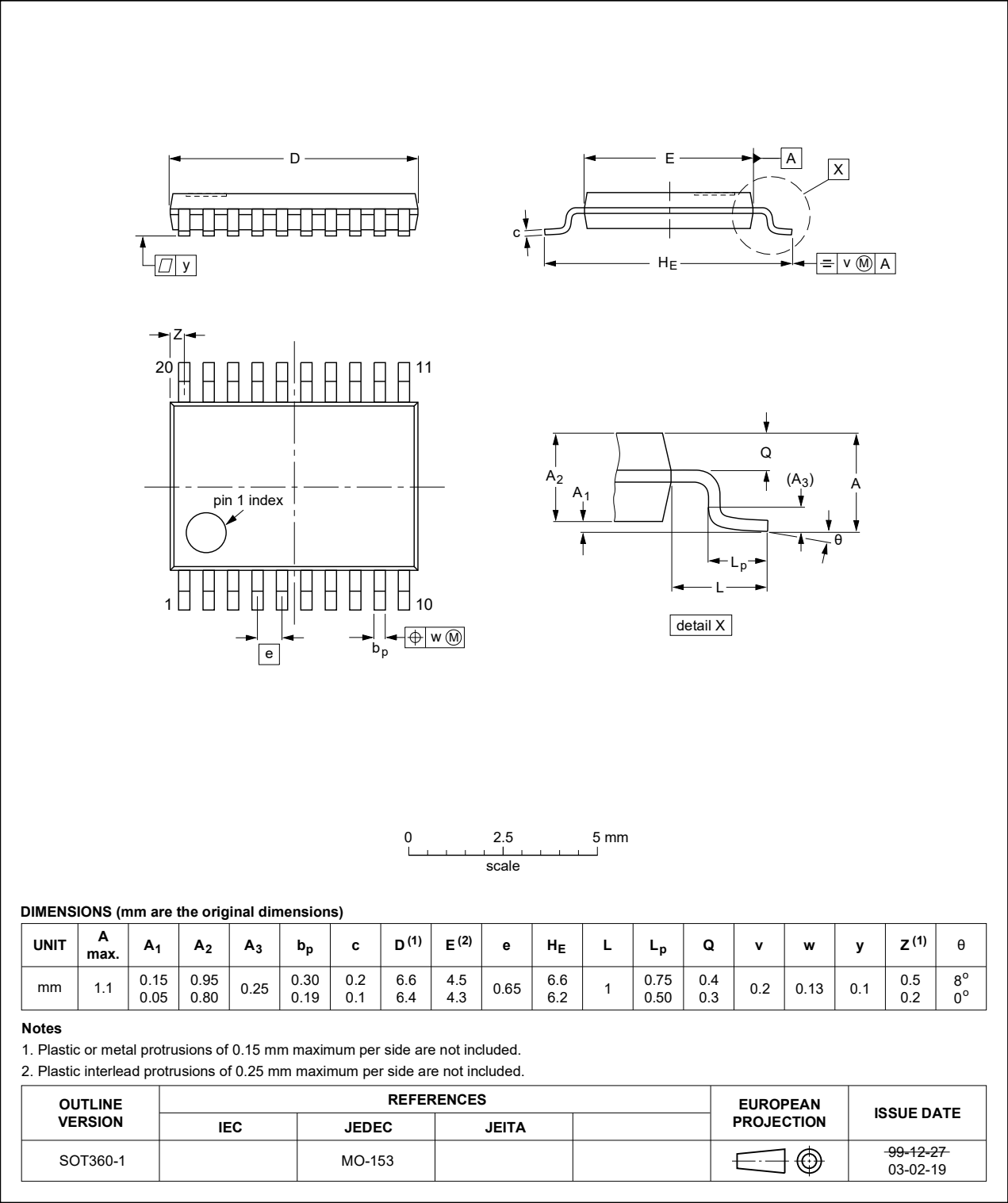


Fig. 13. Package outline SOT360-1 (TSSOP20)

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

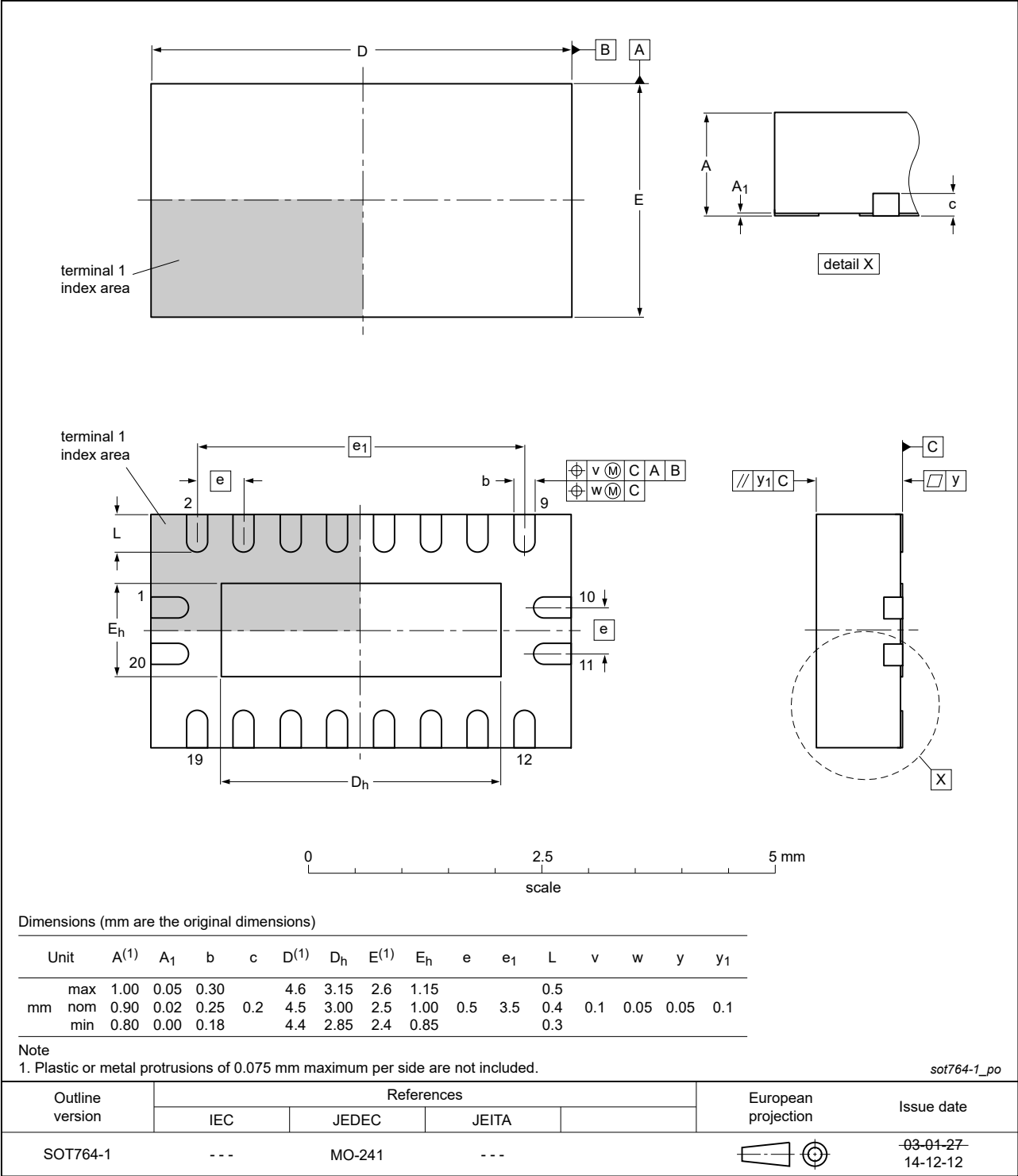


Fig. 14. Package outline SOT764-1 (DHVQFN20)

## 12. Abbreviations

Table 10. Abbreviations

| Acronym | Description                             |
|---------|-----------------------------------------|
| CDM     | Charged Device Model                    |
| CMOS    | Complementary Metal-Oxide Semiconductor |
| 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        |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------------|
| 74AHC_AHCT573 v.8 | 20200713                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Product data sheet    | -             | 74AHC_AHCT573 v.7 |
| 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><a href="#">Section 1</a> and <a href="#">Section 2</a> updated.</li> <li><a href="#">Table 4</a>: Derating values for <math>P_{tot}</math> total power dissipation have been updated.</li> <li><a href="#">Table 6</a>: Conditions for <math>I_{OZ}</math> corrected.</li> <li>Package outline drawing of SOT764-1 (<a href="#">Fig. 14</a>) updated.</li> </ul> |                       |               |                   |
| 74AHC_AHCT573 v.7 | 20111108                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Product data sheet    | -             | 74AHC_AHCT573 v.6 |
| Modifications:    | <ul style="list-style-type: none"> <li>Legal pages updated.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |               |                   |
| 74AHC_AHCT573 v.6 | 20101125                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Product data sheet    | -             | 74AHC_AHCT573 v.5 |
| 74AHC_AHCT573 v.5 | 20100325                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Product data sheet    | -             | 74AHC_AHCT573 v.4 |
| 74AHC_AHCT573 v.4 | 20100303                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Product data sheet    | -             | 74AHC_AHCT573 v.3 |
| 74AHC_AHCT573 v.3 | 20080424                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Product data sheet    | -             | 74AHC_AHCT573 v.2 |
| 74AHC_AHCT573 v.2 | 20031208                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Product specification | -             | 74AHC_AHCT573 v.1 |
| 74AHC_AHCT573 v.1 | 19990927                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 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".
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