

# 74AHC573-Q100; 74AHCT573-Q100

Octal D-type transparent latch; 3-state

Rev. 3.1 — 11 October 2023

Product data sheet

## 1. General description

The 74AHC573-Q100; 74AHCT573-Q100 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.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

## 2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- 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
- Input levels:
  - For 74AHC573-Q100: CMOS input level
  - For 74AHCT573-Q100: TTL input level
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level A
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- Multiple package options
- DHVQFN package with Side-Wettable Flanks enabling Automatic Optical Inspection (AOI) of solder joints

3. Ordering information

Table 1. Ordering information

| Type number                                                         | Package           |          |                                                                                                                                         |                          |
|---------------------------------------------------------------------|-------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|                                                                     | Temperature range | Name     | Description                                                                                                                             | Version                  |
| <a href="#">74AHC573D-Q100</a><br><a href="#">74AHCT573D-Q100</a>   | -40 °C to +125 °C | SO20     | plastic small outline package; 20 leads;<br>body width 7.5 mm                                                                           | <a href="#">SOT163-1</a> |
| <a href="#">74AHC573PW-Q100</a><br><a href="#">74AHCT573PW-Q100</a> | -40 °C to +125 °C | TSSOP20  | plastic thin shrink small outline package;<br>20 leads; body width 4.4 mm                                                               | <a href="#">SOT360-1</a> |
| <a href="#">74AHC573BQ-Q100</a><br><a href="#">74AHCT573BQ-Q100</a> | -40 °C to +125 °C | DHVQFN20 | plastic dual in-line compatible<br>thermal enhanced very thin quad<br>flat package; no leads; 20 terminals;<br>body 2.5 × 4.5 × 0.85 mm | <a href="#">SOT764-1</a> |

4. Functional diagram

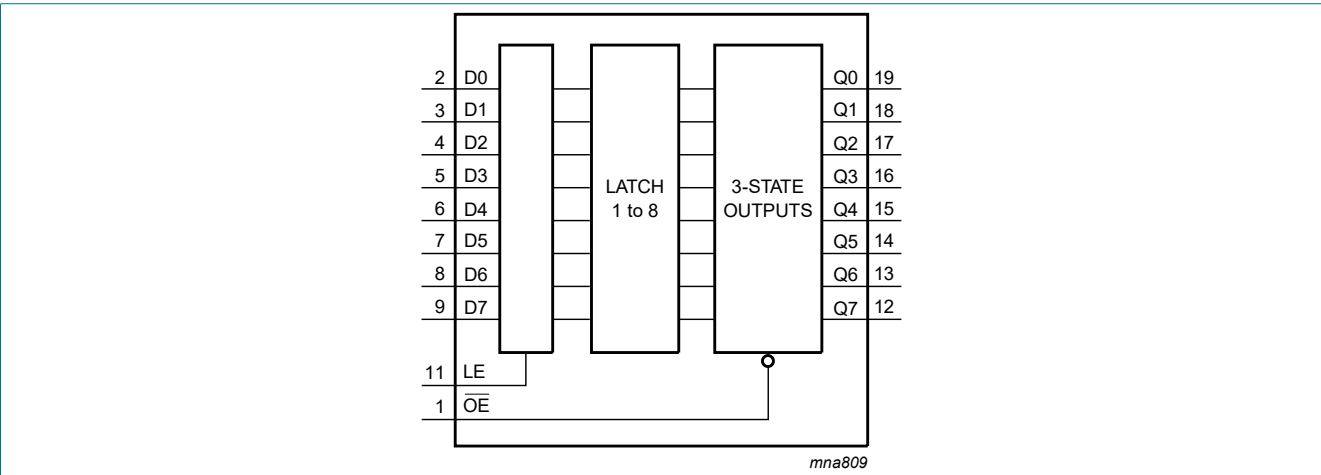


Fig. 1. Functional diagram

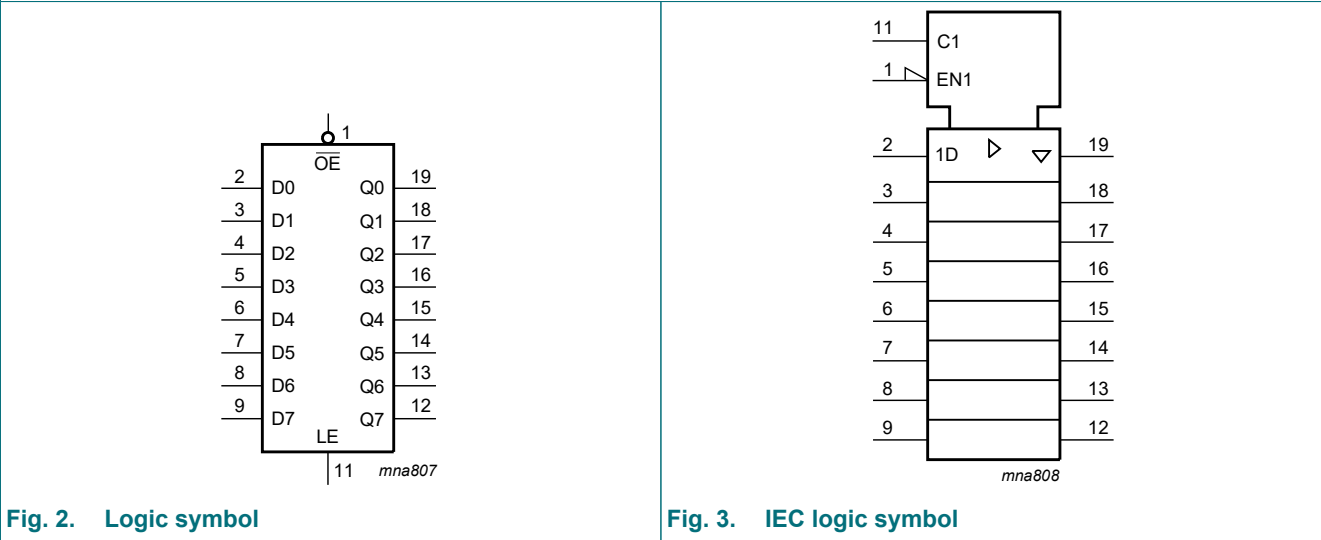


Fig. 2. Logic symbol

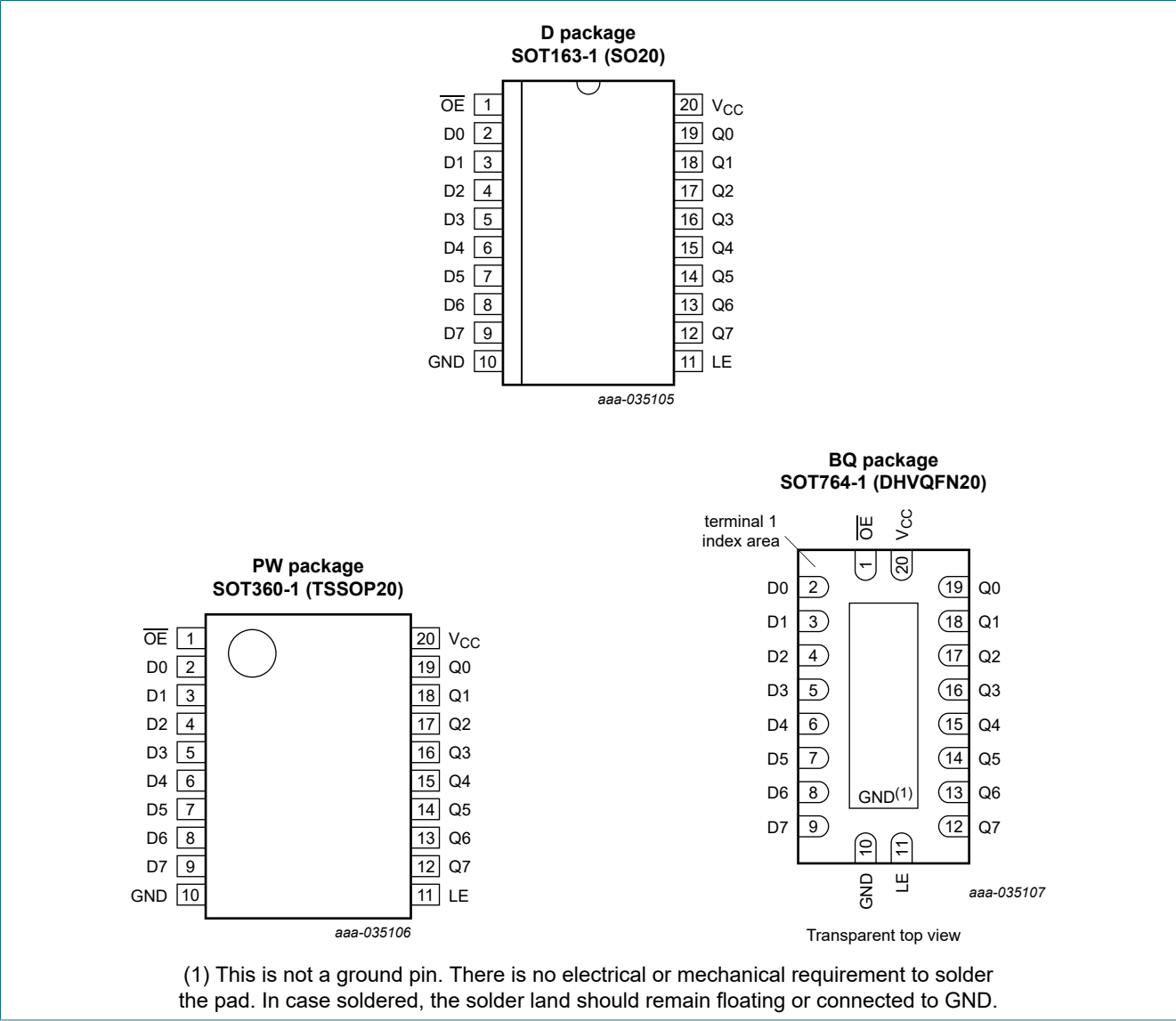
Fig. 3. IEC logic symbol



**Fig. 4. Logic diagram**

5. Pinning information

5.1. Pinning



5.2. Pin description

Table 2. Pin description

| Symbol                         | Pin                            | Description                      |
|--------------------------------|--------------------------------|----------------------------------|
| OE                             | 1                              | output enable input (active LOW) |
| D0, D1, D2, D3, D4, D5, D6, D7 | 2, 3, 4, 5, 6, 7, 8, 9         | data input                       |
| GND                            | 10                             | ground (0 V)                     |
| LE                             | 11                             | latch enable (active HIGH)       |
| Q0, Q1, Q2, Q3, Q4, Q5, Q6, Q7 | 19, 18, 17, 16, 15, 14, 13, 12 | data output                      |
| VCC                            |                                | 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-Q100 |     |                 | 74AHCT573-Q100 |     |                 | 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-Q100   |                           |                                                                                                                              |       |     |       |                  |      |                   |     |       |      |
| 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    |
|                 |                           | I <sub>O</sub> = -8.0 mA; V <sub>CC</sub> = 4.5 V                                                                            | 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>                                                                          |       |     |       |                  |      |                   |     |       |      |
|                 |                           | 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>O</sub> = 8.0 mA; V <sub>CC</sub> = 4.5 V                                                                             | -     | -   | 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> = V <sub>CC</sub> 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   |
| 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   |

| Symbol           | Parameter                 | Conditions                                                                                                                                                     | 25 °C |     |       | -40 °C to +85 °C |      | -40 °C to +125 °C |     |       | Unit |
|------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|-------|------------------|------|-------------------|-----|-------|------|
|                  |                           |                                                                                                                                                                | Min   | Typ | Max   | Min              | Max  | Min               | Typ | Max   |      |
| 74AHCT573-Q100   |                           |                                                                                                                                                                |       |     |       |                  |      |                   |     |       |      |
| 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. 9.

| 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-Q100                    |                                  |                                  |                      |        |      |                  |      |                   |      |      |
| t <sub>pd</sub>                  | propagation delay                | Dn to Qn; see Fig. 5 [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. 6 [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. 7 [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                     | C <sub>L</sub> = 50 pF           | -                    | 6.3    | 9.7  | 1.0              | 11.0 | 1.0               | 12.5 | ns   |
|                                  |                                  | OE to Qn; see Fig. 7 [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 |                      |        |      |                  |      |                   |      |      |
| t <sub>w</sub>                   | pulse width                      | C <sub>L</sub> = 15 pF           | -                    | 4.6    | 7.7  | 1.0              | 9.0  | 1.0               | 10.0 | ns   |
|                                  |                                  | C <sub>L</sub> = 50 pF           | -                    | 7.4    | 9.7  | 1.0              | 11.0 | 1.0               | 12.5 | ns   |
|                                  |                                  | LE HIGH; see Fig. 6              |                      |        |      |                  |      |                   |      |      |
| V <sub>CC</sub> = 3.0 V to 3.6 V | 5.0                              | -                                | -                    | 5.0    | -    | 5.0              | -    | ns                |      |      |
|                                  | V <sub>CC</sub> = 4.5 V to 5.5 V | 5.0                              | -                    | -      | 5.0  | -                | 5.0  | -                 | ns   |      |
|                                  | t <sub>su</sub>                  | set-up time                      | Dn to LE; see Fig. 8 |        |      |                  |      |                   |      |      |
| V <sub>CC</sub> = 3.0 V to 3.6 V |                                  |                                  | 3.5                  | -      | -    | 3.5              | -    | 3.5               | -    | ns   |
| V <sub>CC</sub> = 4.5 V to 5.5 V |                                  |                                  | 3.5                  | -      | -    | 3.5              | -    | 3.5               | -    | ns   |
| t <sub>h</sub>                   | hold time                        | Dn to LE; see Fig. 8             |                      |        |      |                  |      |                   |      |      |
|                                  |                                  | 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-Q100; V<sub>CC</sub> = 4.5 V to 5.5 V</b> |                               |                                                                        |       |        |     |                  |      |                   |      |      |
| t <sub>pd</sub>                                        | propagation delay             | Dn to Qn; see Fig. 5 [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. 6 [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. 7 [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. 7 [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. 6                                                    | 5.0   | -      | -   | 5.0              | -    | 5.0               | -    | ns   |
| t <sub>su</sub>                                        | set-up time                   | Dn to LE; see Fig. 8                                                   | 3.5   | -      | -   | 3.5              | -    | 3.5               | -    | ns   |
| t <sub>h</sub>                                         | hold time                     | Dn to LE; see Fig. 8                                                   | 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).

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

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

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

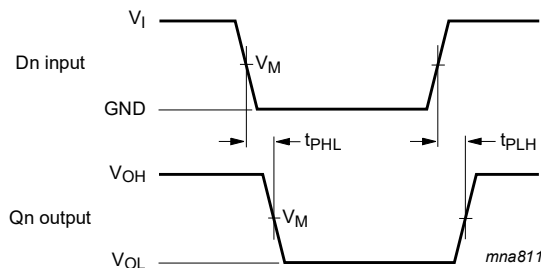
C<sub>L</sub> = output load capacitance in pF;

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

N = number of inputs switching;

Σ(C<sub>L</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>) = sum of the outputs.

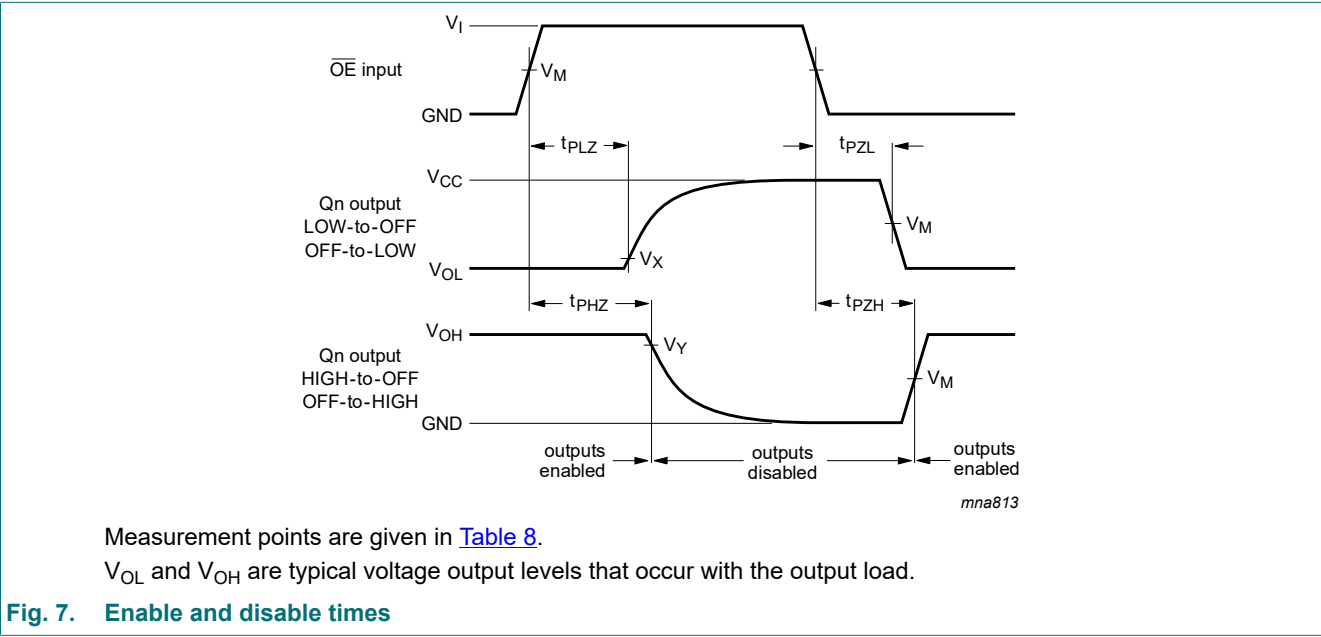
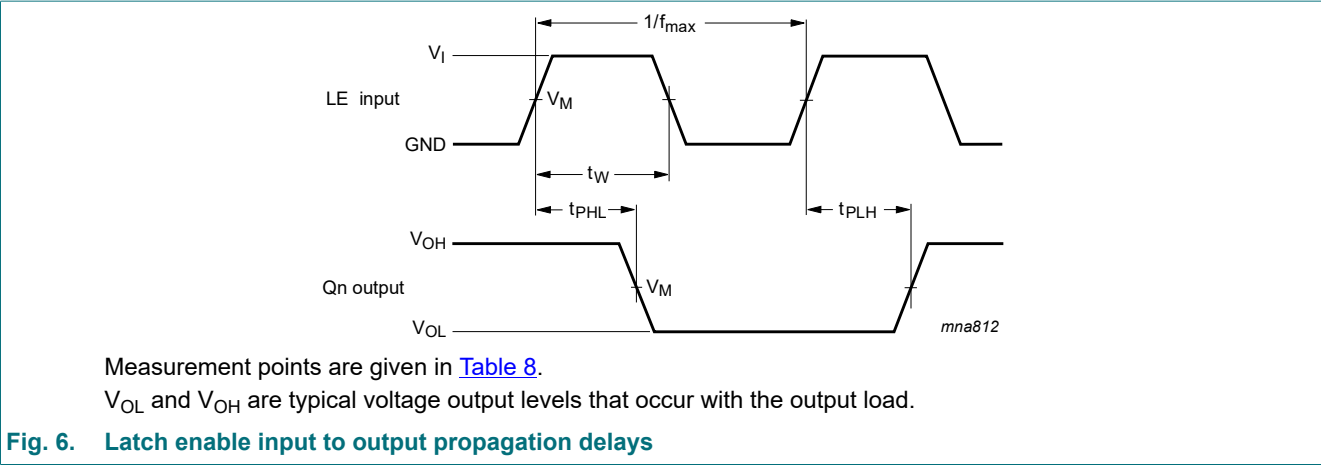
## 10.1. Waveforms and test circuit



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. 5. Data input to output propagation delays**



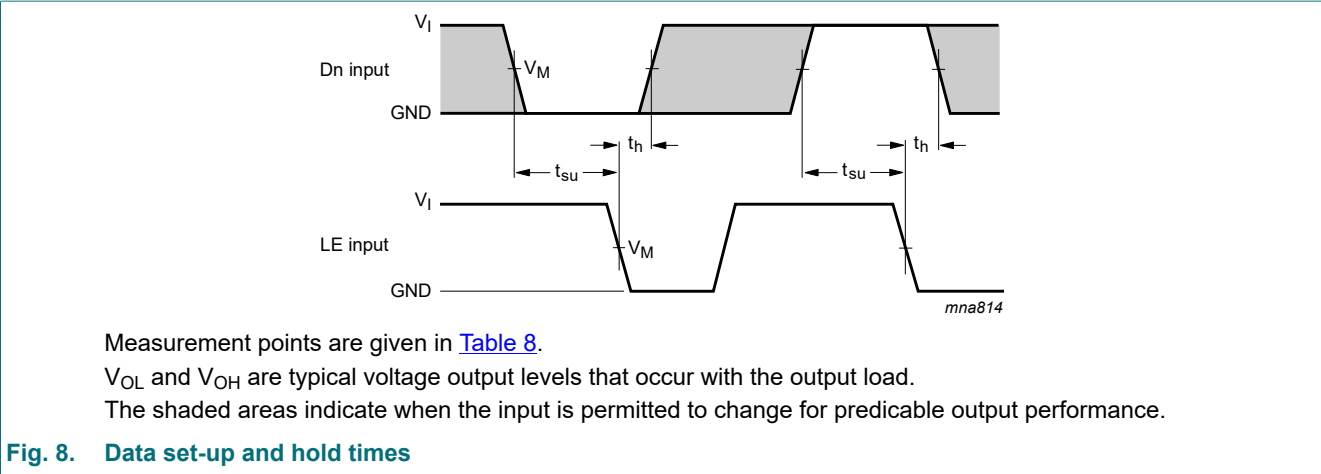


Table 8. Measurement points

| Type           | Input               |                     | Output                  |                         |
|----------------|---------------------|---------------------|-------------------------|-------------------------|
|                | $V_M$               | $V_M$               | $V_X$                   | $V_Y$                   |
| 74AHC573-Q100  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.3\text{ V}$ | $V_{OH} - 0.3\text{ V}$ |
| 74AHCT573-Q100 | 1.5 V               | $0.5 \times V_{CC}$ | $V_{OL} + 0.3\text{ V}$ | $V_{OH} - 0.3\text{ V}$ |

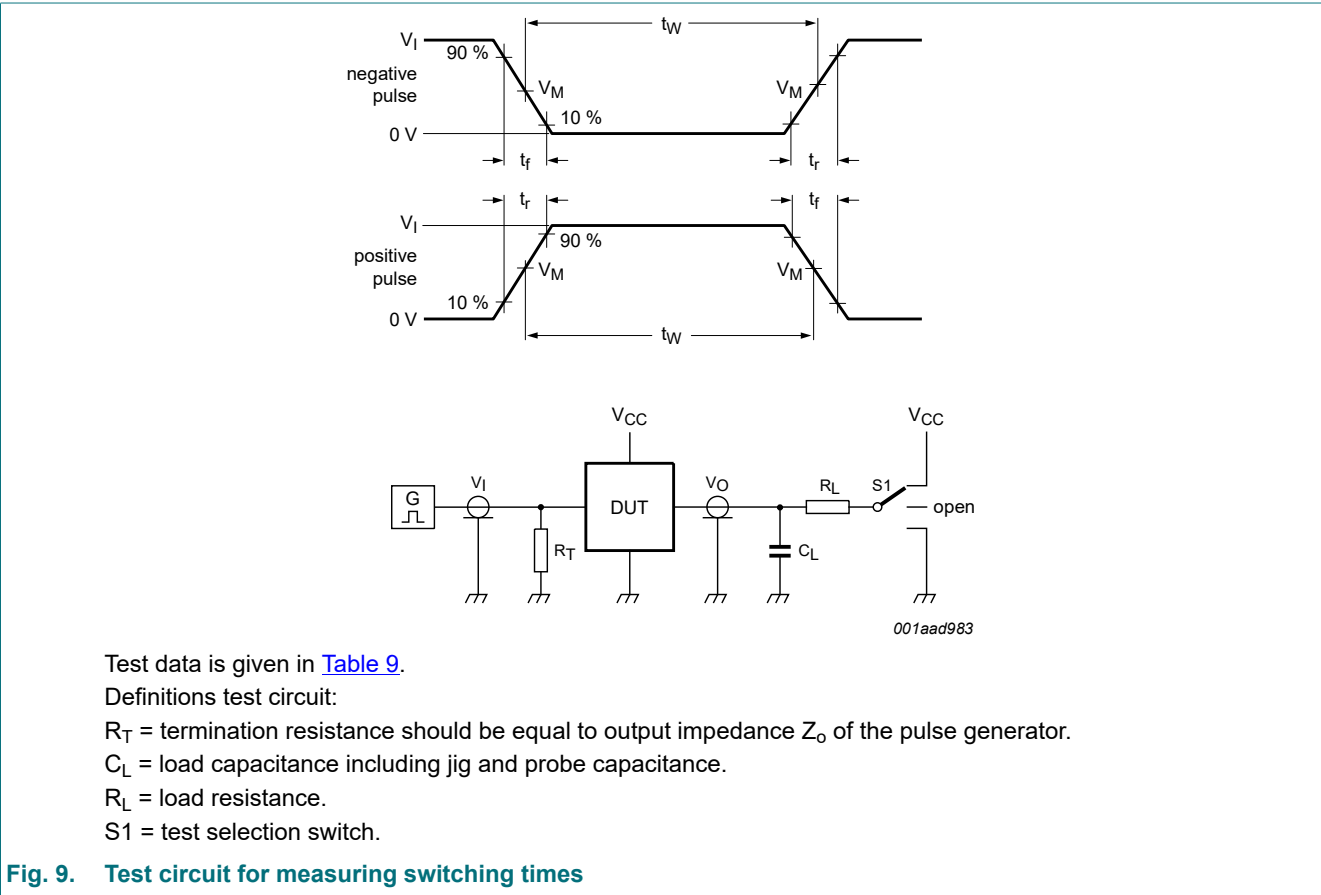


Table 9. Test data

| 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-Q100  | $V_{CC}$ | $\leq 3.0\text{ ns}$ | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74AHCT573-Q100 | 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

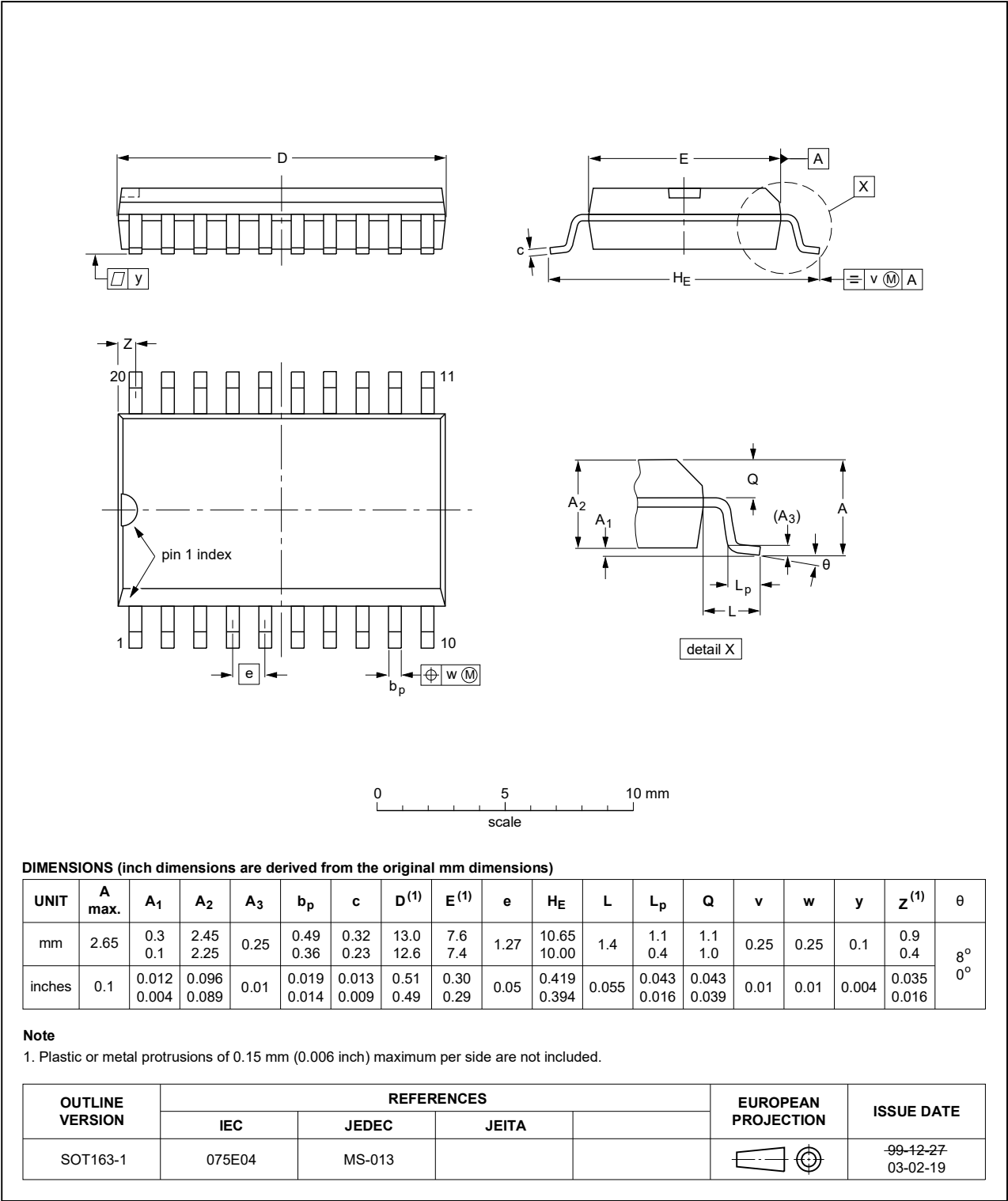


Fig. 10. Package outline SOT163-1 (SO20)

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

SOT360-1

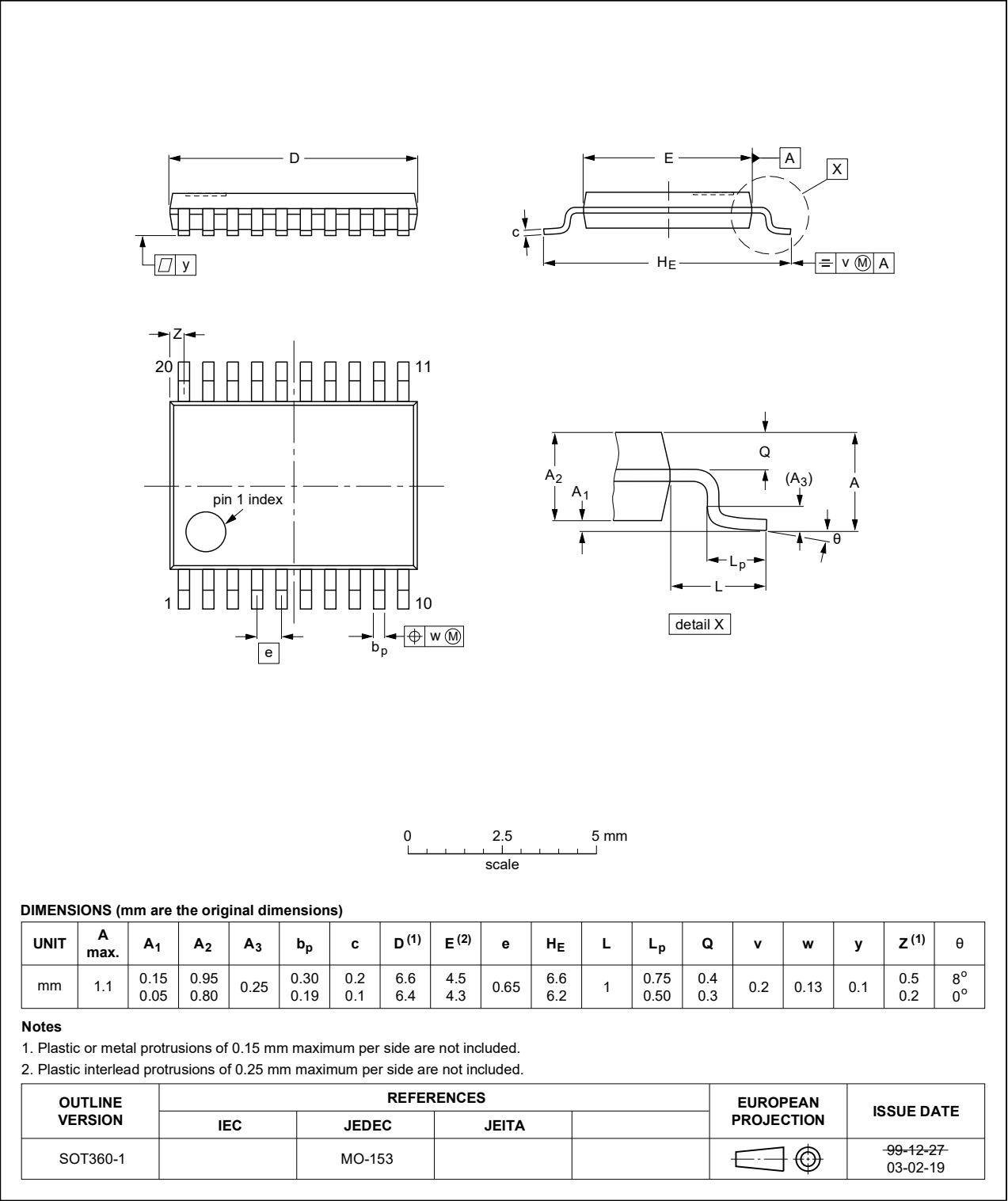


Fig. 11. Package outline SOT360-1 (TSSOP20)

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

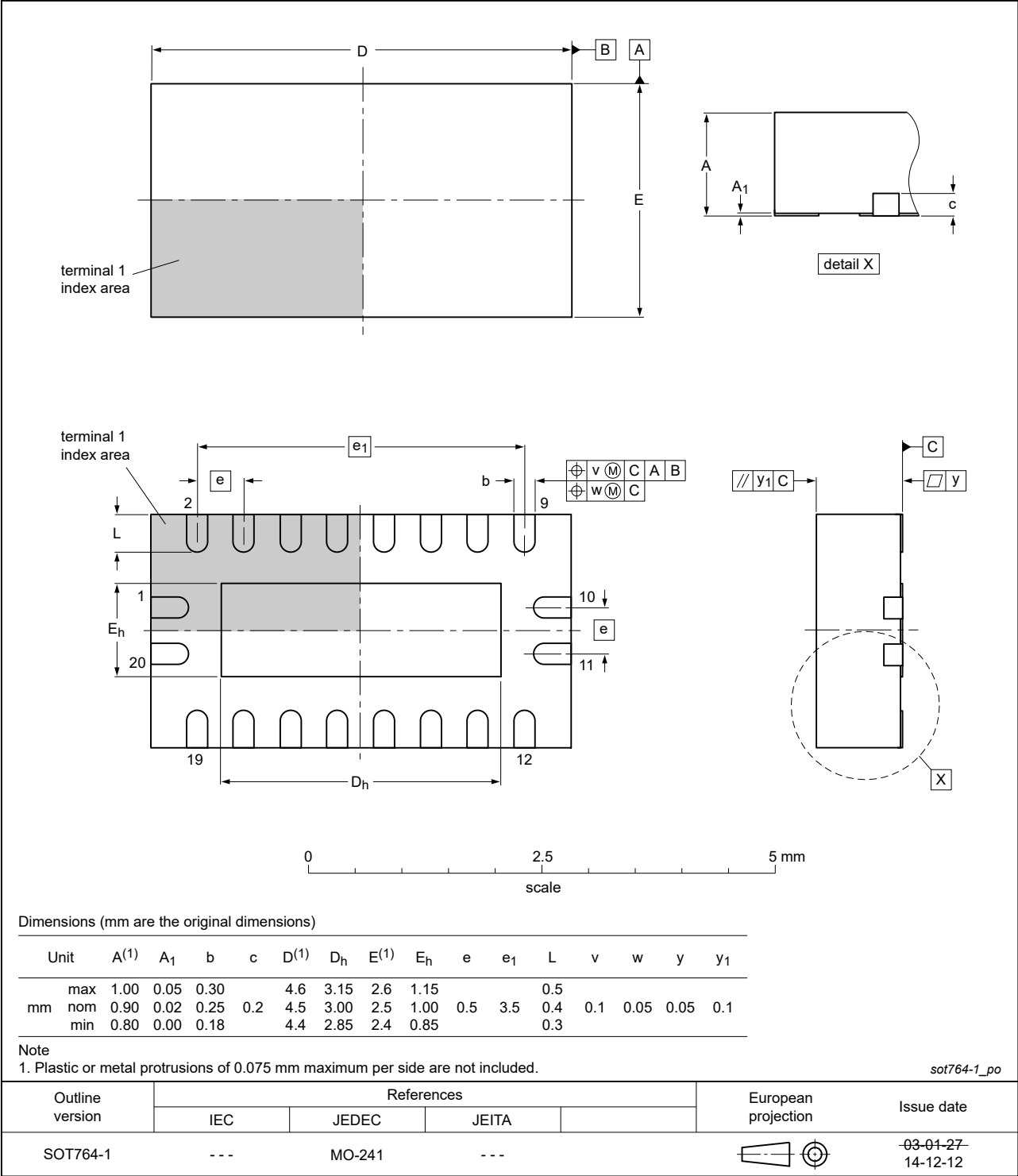


Fig. 12. Package outline SOT764-1 (DHVQFN20)

## 12. Abbreviations

**Table 10. Abbreviations**

| Acronym | Description                             |
|---------|-----------------------------------------|
| CDM     | Charged Device Model                    |
| CMOS    | Complementary Metal-Oxide Semiconductor |
| ESD     | ElectroStatic Discharge                 |
| HBM     | Human Body Model                        |
| TTL     | Transistor-Transistor Logic             |

## 13. Revision history

**Table 11. Revision history**

| Document ID              | Release date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data sheet status  | Change notice | Supersedes             |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|------------------------|
| 74AHC_AHCT573_Q100 v.3.1 | 20231011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet | -             | 74AHC_AHCT573_Q100 v.2 |
| Modifications:           | <ul style="list-style-type: none"><li>• <a href="#">Section 2</a>: ESD specification updated according to the latest JEDEC standard.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |               |                        |
| 74AHC_AHCT573_Q100 v.2   | 20200713                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet | -             | 74AHC_AHCT573_Q100 v.1 |
| 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. 12</a>) updated.</li></ul> |                    |               |                        |
| 74AHC_AHCT573_Q100 v.1   | 20130610                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet | -             | -                      |

## 14. Legal information

### Data sheet status

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

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

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