# 74AHC273-Q100; 74AHCT273-Q100

## Octal D-type flip-flop with reset; positive-edge trigger

Rev. 3 — 21 September 2023 Product data sheet

## 1. General description

The 74AHC273-Q100; 74AHCT273-Q100 is an octal positive-edge triggered D-type flip-flop. The device features clock (CP) and master reset ($\overline{MR}$) inputs. The outputs Qn will assume the state of their corresponding D inputs that meet the set-up and hold time requirements on the LOW-to-HIGH clock (CP) transition. A LOW on $\overline{MR}$ forces the outputs LOW independently of clock and data inputs. 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 to 5.5 V
- Overvoltage tolerant inputs to 5.5 V
- High noise immunity
- CMOS low power dissipation
- Balanced propagation delays
- All inputs have Schmitt-trigger actions
- Ideal buffer for MOS microcontroller or memory
- Common clock and master reset
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level A
- Input levels:
  - For 74AHC273-Q100: CMOS level
  - For 74AHCT273-Q100: TTL level
- 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

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# 3. Ordering information

**Table 1. Ordering information**

| Type number | Package | | | |
|---|---|---|---|---|
| | Temperature range | Name | Description | Version |
| 74AHC273D-Q100<br>74AHCT273D-Q100 | -40 °C to +125 °C | SO20 | plastic small outline package; 20 leads; body width 7.5 mm | SOT163-1 |
| 74AHC273PW-Q100<br>74AHCT273PW-Q100 | -40 °C to +125 °C | TSSOP20 | plastic thin shrink small outline package; 20 leads; body width 4.4 mm | SOT360-1 |
| 74AHC273BQ-Q100<br>74AHCT273BQ-Q100 | -40 °C to +125 °C | DHVQFN20 | plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 20 terminals; body 2.5 × 4.5 × 0.85 mm | SOT764-1 |

# 4. Functional diagram

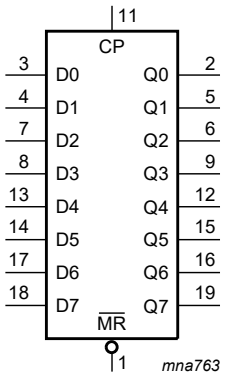



**Fig. 1. Logic symbol**

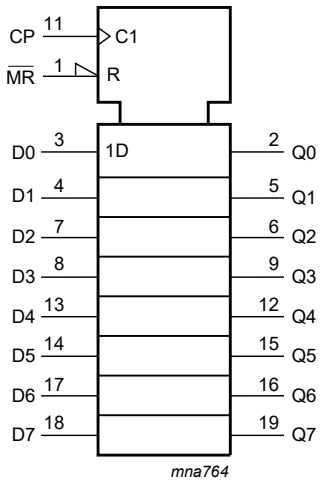



**Fig. 2. IEC logic symbol**

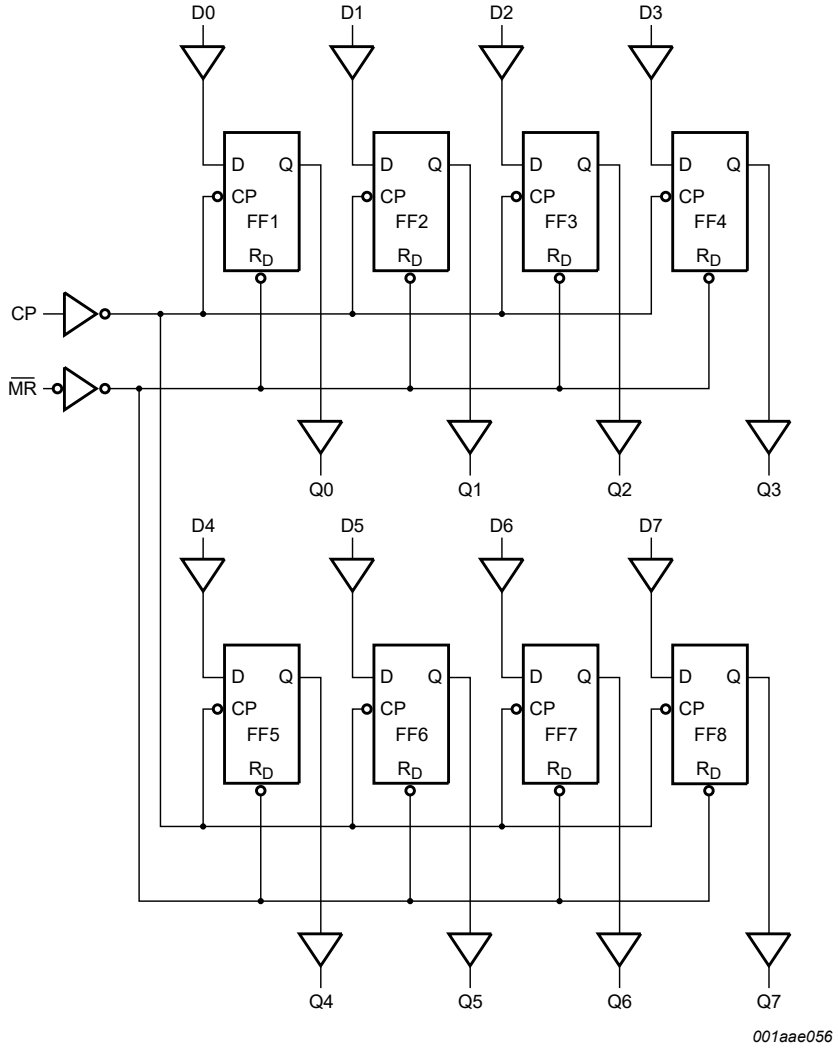



**Fig. 3. Logic diagram**

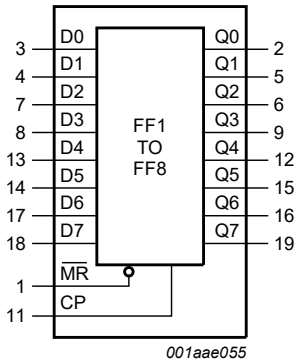
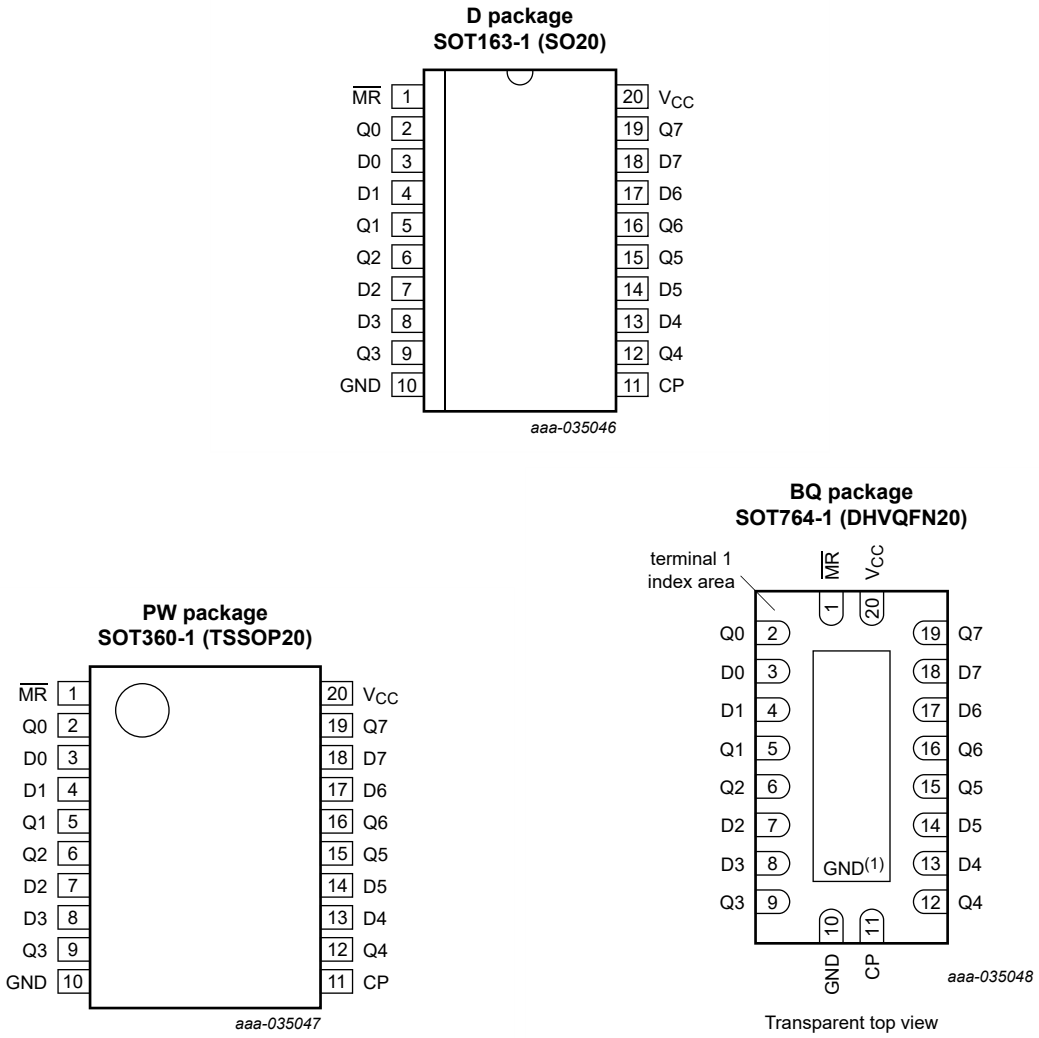



**Fig. 4. Functional diagram**

# 5. Pinning information

## 5.1. Pinning




(1) This is not a ground pin. There is no electrical or mechanical requirement to solder the pad. In case soldered, the solder land should remain floating or connected to GND.

## 5.2. Pin description

**Table 2. Pin description**

| Symbol | Pin | Description |
|---|---|---|
| $\overline{MR}$ | 1 | master reset input (active LOW) |
| Q0, Q1, Q2, Q3, Q4, Q5, Q6, Q7 | 2, 5, 6, 9, 12, 15, 16, 19 | flip-flop output |
| D0, D1, D2, D3, D4, D5, D6, D7 | 3, 4, 7, 8, 13, 14, 17, 18 | data input |
| GND | 10 | ground (0 V) |
| CP | 11 | clock input (LOW-to-HIGH edge-triggered) |
| $V_{CC}$ | 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 LOW-to-HIGH CP transition;*
*L = LOW voltage level; l = LOW voltage level one set-up time prior to the LOW-to-HIGH CP transition;*
*↑ = LOW-to-HIGH; X = don't care.*

| Operating mode | Control | | Input | Output |
|---|---|---|---|---|
| | $\overline{MR}$ | CP | Dn | Qn |
| Reset (clear) | L | X | X | L |
| Load '1' | H | ↑ | h | H |
| Load '0' | H | ↑ | l | L |

# 7. Limiting values

**Table 4. Limiting values**

*In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | | Min | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | | | -0.5 | +7.0 | V |
| $V_I$ | input voltage | | | -0.5 | +7.0 | V |
| $I_{IK}$ | input clamping current | $V_I$ < -0.5 V | [1] | -20 | - | mA |
| $I_{OK}$ | output clamping current | $V_O$ < -0.5 V or $V_O$ > $V_{CC}$ + 0.5 V | [1] | -20 | +20 | mA |
| $I_O$ | output current | $V_O$ = -0.5 V to ($V_{CC}$ + 0.5 V) | | -25 | +25 | mA |
| $I_{CC}$ | supply current | | | - | +75 | mA |
| $I_{GND}$ | ground current | | | -75 | - | mA |
| $T_{stg}$ | storage temperature | | | -65 | +150 | °C |
| $P_{tot}$ | total power dissipation | $T_{amb}$ = -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: $P_{tot}$ derates linearly with 12.3 mW/K above 109 °C.
For SOT360-1 (TSSOP20) package: $P_{tot}$ derates linearly with 10.0 mW/K above 100 °C.
For SOT764-1 (DHVQFN20) package: $P_{tot}$ 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 | 74AHC273-Q100 | | | 74AHCT273-Q100 | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Typ | Max | |
| $V_{CC}$ | supply voltage | | 2.0 | 5.0 | 5.5 | 4.5 | 5.0 | 5.5 | V |
| $V_I$ | input voltage | | 0 | - | 5.5 | 0 | - | 5.5 | V |
| $V_O$ | output voltage | | 0 | - | $V_{CC}$ | 0 | - | $V_{CC}$ | V |
| $T_{amb}$ | ambient temperature | | -40 | +25 | +125 | -40 | +25 | +125 | °C |
| Δt/ΔV | input transition rise and fall rate | $V_{CC}$ = 3.3 V ± 0.3 V | - | - | 100 | - | - | - | ns/V |
| | | $V_{CC}$ = 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 | Max | |
| **74AHC273-Q100** | | | | | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 2.0 V | 1.5 | - | - | 1.5 | - | 1.5 | - | V |
| | | $V_{CC}$ = 3.0 V | 2.1 | - | - | 2.1 | - | 2.1 | - | V |
| | | $V_{CC}$ = 5.5 V | 3.85 | - | - | 3.85 | - | 3.85 | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 2.0 V | - | - | 0.5 | - | 0.5 | - | 0.5 | V |
| | | $V_{CC}$ = 3.0 V | - | - | 0.9 | - | 0.9 | - | 0.9 | V |
| | | $V_{CC}$ = 5.5 V | - | - | 1.65 | - | 1.65 | - | 1.65 | V |
| $V_{OH}$ | HIGH-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | | | | | |
| | | $I_O$ = -50 µA; $V_{CC}$ = 2.0 V | 1.9 | 2.0 | - | 1.9 | - | 1.9 | - | V |
| | | $I_O$ = -50 µA; $V_{CC}$ = 3.0 V | 2.9 | 3.0 | - | 2.9 | - | 2.9 | - | V |
| | | $I_O$ = -50 µA; $V_{CC}$ = 4.5 V | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | V |
| | | $I_O$ = -4.0 mA; $V_{CC}$ = 3.0 V | 2.58 | - | - | 2.48 | - | 2.40 | - | V |
| | | $I_O$ = -8.0 mA; $V_{CC}$ = 4.5 V | 3.94 | - | - | 3.80 | - | 3.70 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | | | | | |
| | | $I_O$ = 50 µA; $V_{CC}$ = 2.0 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 50 µA; $V_{CC}$ = 3.0 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 50 µA; $V_{CC}$ = 4.5 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 4.0 mA; $V_{CC}$ = 3.0 V | - | - | 0.36 | - | 0.44 | - | 0.55 | V |
| | | $I_O$ = 8.0 mA; $V_{CC}$ = 4.5 V | - | - | 0.36 | - | 0.44 | - | 0.55 | V |
| $I_I$ | input leakage current | $V_I$ = 5.5 V or GND; $V_{CC}$ = 0 V to 5.5 V | - | - | 0.1 | - | 1.0 | - | 2.0 | µA |
| $I_{CC}$ | supply current | $V_I$ = $V_{CC}$ or GND; $I_O$ = 0 A; $V_{CC}$ = 5.5 V | - | - | 4.0 | - | 40 | - | 80 | µA |
| $C_I$ | input capacitance | | - | 3 | 10 | - | 10 | - | 10 | pF |
| $C_O$ | output capacitance | | - | 4 | - | - | - | - | - | pF |

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| **74AHCT273-Q100** | | | | | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | 2.0 | - | - | 2.0 | - | 2.0 | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | - | - | 0.8 | - | 0.8 | - | 0.8 | V |
| $V_{OH}$ | HIGH-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_{CC}$ = 4.5 V | | | | | | | | |
| | | $I_O$ = -50 µA | 4.4 | - | - | 4.4 | - | 4.4 | - | V |
| | | $I_O$ = -8.0 mA | 3.94 | - | - | 3.80 | - | 3.70 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_{CC}$ = 4.5 V | | | | | | | | |
| | | $I_O$ = 50 µA | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 8.0 mA | - | - | 0.36 | - | 0.44 | - | 0.55 | V |
| $I_I$ | input leakage current | $V_I$ = 5.5 V or GND; $V_{CC}$ = 0 V to 5.5 V | - | - | 0.1 | - | 1.0 | - | 2.0 | µA |
| $I_{CC}$ | supply current | $V_I$ = $V_{CC}$ or GND; $I_O$ = 0 A; $V_{CC}$ = 5.5 V | - | - | 4.0 | - | 40 | - | 80 | µA |
| $\Delta I_{CC}$ | additional supply current | per input pin; $V_I$ = $V_{CC}$ - 2.1 V; other pins at $V_{CC}$ or GND; $I_O$ = 0 A; $V_{CC}$ = 4.5 V to 5.5 V | - | - | 1.35 | - | 1.5 | - | 1.5 | mA |
| $C_I$ | input capacitance | | - | 3 | 10 | - | 10 | - | 10 | pF |
| $C_O$ | output capacitance | | - | 4 | - | - | - | - | - | pF |

# 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

*Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 8.*

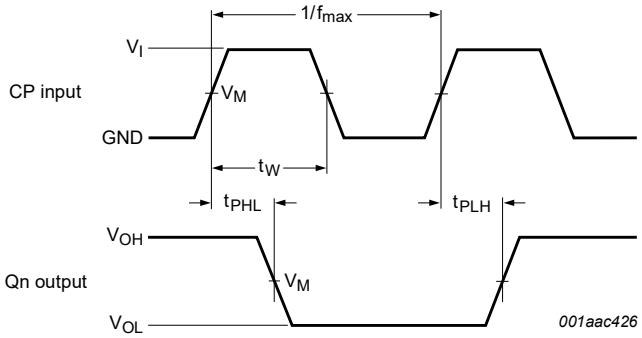
| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ[1] | Max | Min | Max | Min | Max | |
| **74AHC273-Q100** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | CP to Qn; see Fig. 5 [2] | | | | | | | | |
| | | $V_{CC}$ = 3.0 V to 3.6 V | | | | | | | | |
| | | $C_L$ = 15 pF | - | 6.0 | 13.6 | 1.0 | 16.0 | 1.0 | 17.0 | ns |
| | | $C_L$ = 50 pF | - | 8.6 | 17.1 | 1.0 | 19.5 | 1.0 | 21.5 | ns |
| | | $V_{CC}$ = 4.5 V to 5.5 V | | | | | | | | |
| | | $C_L$ = 15 pF | - | 4.2 | 9 | 1.0 | 10.5 | 1.0 | 11.5 | ns |
| | | $C_L$ = 50 pF | - | 6.0 | 11.0 | 1.0 | 12.5 | 1.0 | 14.0 | ns |
| | | $\overline{MR}$ to Qn; see Fig. 6 [3] | | | | | | | | |
| | | $V_{CC}$ = 3.0 V to 3.6 V | | | | | | | | |
| | | $C_L$ = 15 pF | - | 5.1 | 13.6 | 1.0 | 16.0 | 1.0 | 17.0 | ns |
| | | $C_L$ = 50 pF | - | 7.3 | 17.1 | 1.0 | 19.5 | 1.0 | 21.5 | ns |
| | | $V_{CC}$ = 4.5 V to 5.5 V | | | | | | | | |
| | | $C_L$ = 15 pF | - | 3.7 | 8.5 | 1.0 | 10.0 | 1.0 | 11.0 | ns |
| | | $C_L$ = 50 pF | - | 5.3 | 10.5 | 1.0 | 12.0 | 1.0 | 13.5 | 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 | |
| $f_{max}$ | maximum frequency | see Fig. 5 | | | | | | | | |
| | | $V_{CC}$ = 3.0 V to 3.6 V | | | | | | | | |
| | | $C_L$ = 15 pF | 75 | 120 | - | 65 | - | 65 | - | MHz |
| | | $C_L$ = 50 pF | 50 | 75 | - | 45 | - | 45 | - | MHz |
| | | $V_{CC}$ = 4.5 V to 5.5 V | | | | | | | | |
| | | $C_L$ = 15 pF | 120 | 165 | - | 100 | - | 100 | - | MHz |
| | | $C_L$ = 50 pF | 80 | 110 | - | 70 | - | 70 | - | MHz |
| $t_W$ | pulse width | CP HIGH or LOW; see Fig. 5 | | | | | | | | |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 5.0 | - | - | 6.5 | - | 6.5 | - | ns |
| | | $V_{CC}$ = 4.5 V to 5.5 V | 5.0 | - | - | 5.0 | - | 5.0 | - | ns |
| | | $\overline{MR}$ LOW; see Fig. 6 | | | | | | | | |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 5.0 | - | - | 6.0 | - | 6.0 | - | ns |
| | | $V_{CC}$ = 4.5 V to 5.5 V | 5.0 | - | - | 5.0 | - | 5.0 | - | ns |
| $t_{su}$ | set-up time | Dn to CP; see Fig. 7 | | | | | | | | |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 3.0 | - | - | 3.0 | - | 3.0 | - | ns |
| | | $V_{CC}$ = 4.5 V to 5.5 V | 3.0 | - | - | 3.0 | - | 3.0 | - | ns |
| $t_h$ | hold time | Dn to CP; see Fig. 7 | | | | | | | | |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 1.0 | - | - | 1.0 | - | 1.0 | - | ns |
| | | $V_{CC}$ = 4.5 V to 5.5 V | 1.0 | - | - | 1.0 | - | 1.0 | - | ns |
| $t_{rec}$ | recovery time | $\overline{MR}$ to CP; see Fig. 6 | | | | | | | | |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 2.5 | - | - | 2.5 | - | 2.5 | - | ns |
| | | $V_{CC}$ = 4.5 V to 5.5 V | 2.0 | - | - | 2.0 | - | 2.0 | - | ns |
| $C_{PD}$ | power dissipation capacitance | $f_i$ = 1 MHz; $V_I$ = GND to $V_{CC}$ [4] | - | 14 | - | - | - | - | - | pF |

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ[1] | Max | Min | Max | Min | Max | |
| **74AHCT273-Q100; $V_{CC}$ = 4.5 V to 5.5 V** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | CP to Qn; see Fig. 5 [2] | | | | | | | | |
| | | $C_L$ = 15 pF | - | 4.0 | 7.5 | 1.0 | 8.8 | 1.0 | 9.5 | ns |
| | | $C_L$ = 50 pF | - | 5.8 | 9.2 | 1.0 | 10.5 | 1.0 | 11.5 | ns |
| | | $\overline{MR}$ to Qn; see Fig. 6 [3] | | | | | | | | |
| | | $C_L$ = 15 pF | - | 3.9 | 10.0 | 1.0 | 11.6 | 1.0 | 12.5 | ns |
| | | $C_L$ = 50 pF | - | 5.6 | 11.0 | 1.0 | 12.6 | 1.0 | 14.0 | ns |
| $f_{max}$ | maximum frequency | see Fig. 5 | | | | | | | | |
| | | $C_L$ = 15 pF | 75 | 120 | - | 65 | - | 65 | - | MHz |
| | | $C_L$ = 50 pF | 50 | 75 | - | 45 | - | 45 | - | MHz |
| $t_W$ | pulse width | CP HIGH or LOW; see Fig. 5 | 5.0 | - | - | 6.5 | - | 6.5 | - | ns |
| | | $\overline{MR}$ LOW; see Fig. 6 | 5.0 | - | - | 6.0 | - | 6.0 | - | ns |
| $t_{su}$ | set-up time | Dn to CP; see Fig. 7 | 3.0 | - | - | 3.0 | - | 3.0 | - | ns |
| $t_h$ | hold time | Dn to CP; see Fig. 7 | 1.0 | - | - | 1.0 | - | 1.0 | - | ns |
| $t_{rec}$ | recovery time | $\overline{MR}$ to CP; see Fig. 6 | 2.5 | - | - | 2.5 | - | 2.5 | - | ns |
| $C_{PD}$ | power dissipation capacitance | $f_i$ = 1 MHz; $V_I$ = GND to $V_{CC}$ [4] | - | 18 | - | - | - | - | - | pF |

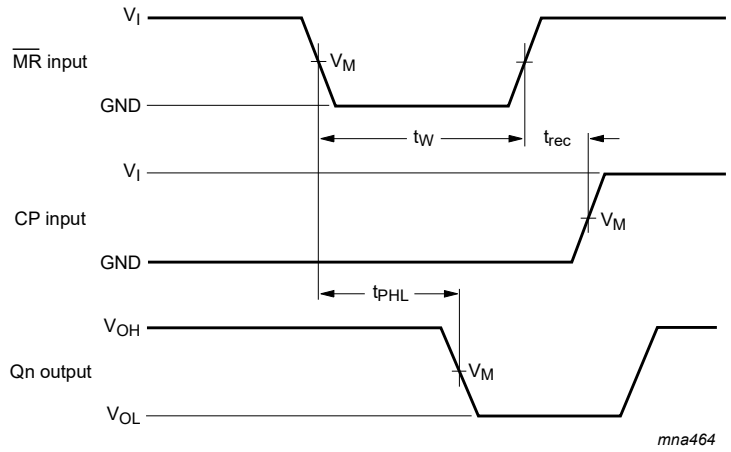
[1] Typical values are measured at nominal supply voltage ($V_{CC}$ = 3.3 V and $V_{CC}$ = 5.0 V).
[2] $t_{pd}$ is the same as $t_{PLH}$ and $t_{PHL}$.
[3] $t_{pd}$ is the same as $t_{PHL}$ only.
[4] $C_{PD}$ is used to determine the dynamic power dissipation ($P_D$ in µW).
$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ where:
$f_i$ = input frequency in MHz;
$f_o$ = output frequency in MHz;
$C_L$ = output load capacitance in pF;
$V_{CC}$ = supply voltage in V;
N = number of inputs switching;
$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of the outputs.

## 10.1. Waveforms and test circuit




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

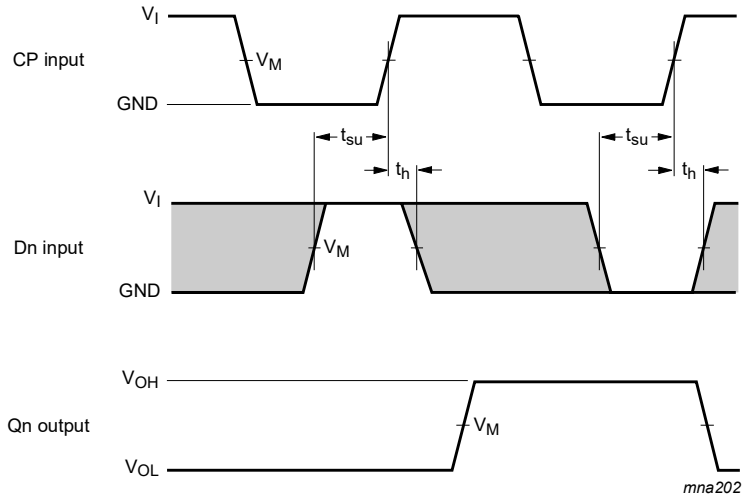
**Fig. 5. Clock pulse width, maximum frequency and input to output propagation delays**




Measurement points are given in Table 8.

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

**Fig. 6. Master reset pulse width, recovery time and propagation delay**




Measurement points are given in Table 8.

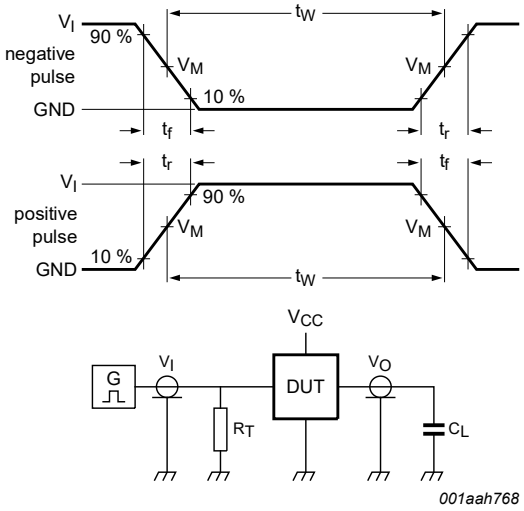
The shaded areas indicate when the input is permitted to change for predictable output performance.

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

**Fig. 7. Data set-up and hold times**

**Table 8. Measurement points**

| Type | Input | Output |
|---|---|---|
| | $V_M$ | $V_M$ |
| 74AHC273-Q100 | 0.5 × $V_{CC}$ | 0.5 × $V_{CC}$ |
| 74AHCT273-Q100 | 1.5 V | 0.5 × $V_{CC}$ |




Test data is given in Table 9.

Definitions test circuit:

$R_T$ = termination resistance should be equal to output impedance $Z_o$ of the pulse generator.

$C_L$ = load capacitance including jig and probe capacitance.

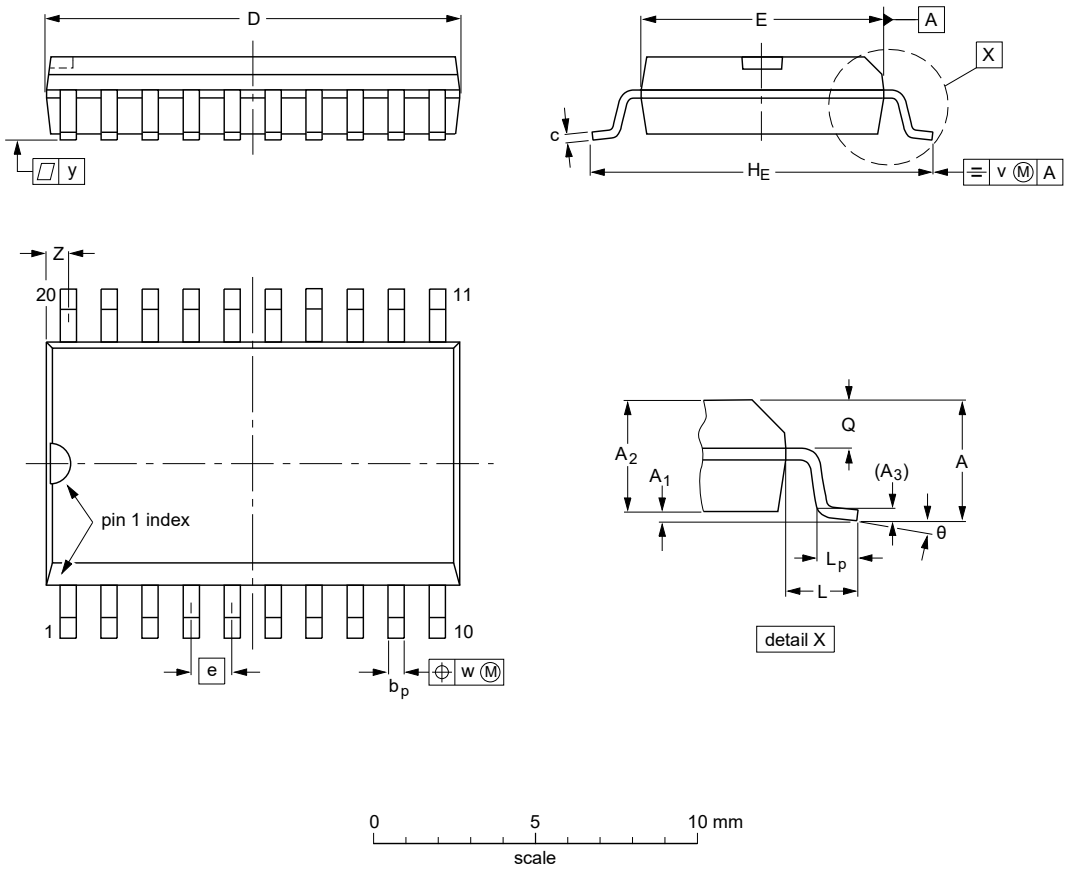
**Fig. 8. Test circuit for measuring switching times**

**Table 9. Test data**

| Type | Input | | Load | Test |
|---|---|---|---|---|
| | $V_I$ | $t_r$, $t_f$ | $C_L$ | |
| 74AHC273-Q100 | $V_{CC}$ | ≤ 3.0 ns | 15 pF, 50 pF | $t_{PLH}$, $t_{PHL}$ |
| 74AHCT273-Q100 | 3.0 V | ≤ 3.0 ns | 15 pF, 50 pF | $t_{PLH}$, $t_{PHL}$ |

# 11. Package outline

**SO20: plastic small outline package; 20 leads; body width 7.5 mm** **SOT163-1**




**DIMENSIONS (inch dimensions are derived from the original mm dimensions)**

| UNIT | A max. | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | $D^{(1)}$ | $E^{(1)}$ | e | $H_E$ | L | $L_p$ | Q | v | w | y | $Z^{(1)}$ | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 2.65 | 0.3<br>0.1 | 2.45<br>2.25 | 0.25 | 0.49<br>0.36 | 0.32<br>0.23 | 13.0<br>12.6 | 7.6<br>7.4 | 1.27 | 10.65<br>10.00 | 1.4 | 1.1<br>0.4 | 1.1<br>1.0 | 0.25 | 0.25 | 0.1 | 0.9<br>0.4 | $8^o$<br>$0^o$ |
| inches | 0.1 | 0.012<br>0.004 | 0.096<br>0.089 | 0.01 | 0.019<br>0.014 | 0.013<br>0.009 | 0.51<br>0.49 | 0.30<br>0.29 | 0.05 | 0.419<br>0.394 | 0.055 | 0.043<br>0.016 | 0.043<br>0.039 | 0.01 | 0.01 | 0.004 | 0.035<br>0.016 | |

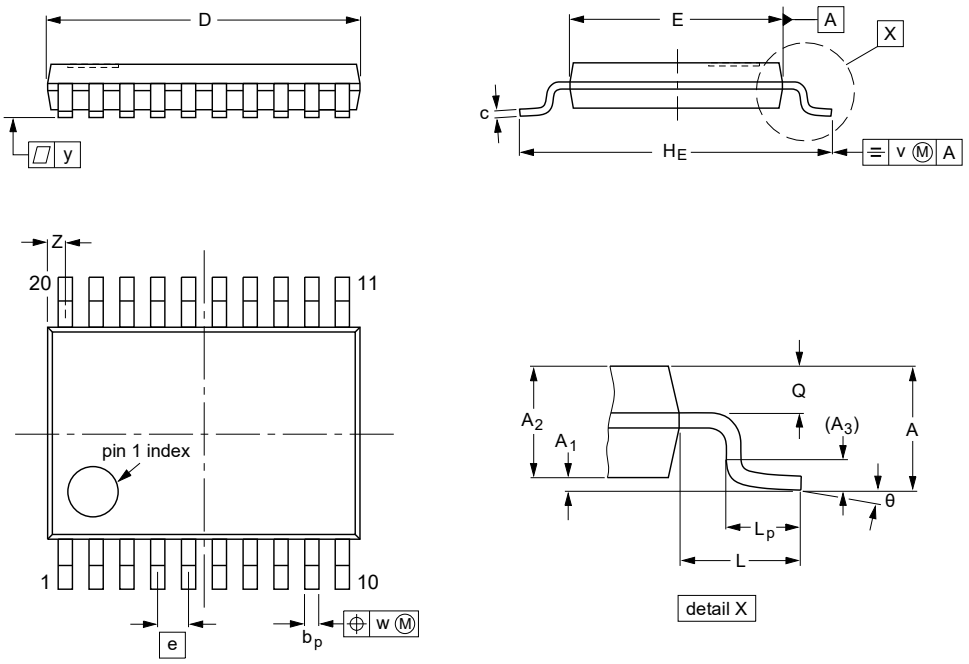
**Note**

1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT163-1 | 075E04 | MS-013 | | | | ~~99-12-27~~<br>03-02-19 |

**Fig. 9. Package outline SOT163-1 (SO20)**

**TSSOP20: plastic thin shrink small outline package; 20 leads; body width 4.4 mm** **SOT360-1**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max. | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | D (1) | E (2) | e | $H_E$ | L | $L_p$ | Q | v | w | y | Z (1) | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1 | 0.15<br>0.05 | 0.95<br>0.80 | 0.25 | 0.30<br>0.19 | 0.2<br>0.1 | 6.6<br>6.4 | 4.5<br>4.3 | 0.65 | 6.6<br>6.2 | 1 | 0.75<br>0.50 | 0.4<br>0.3 | 0.2 | 0.13 | 0.1 | 0.5<br>0.2 | 8°<br>0° |

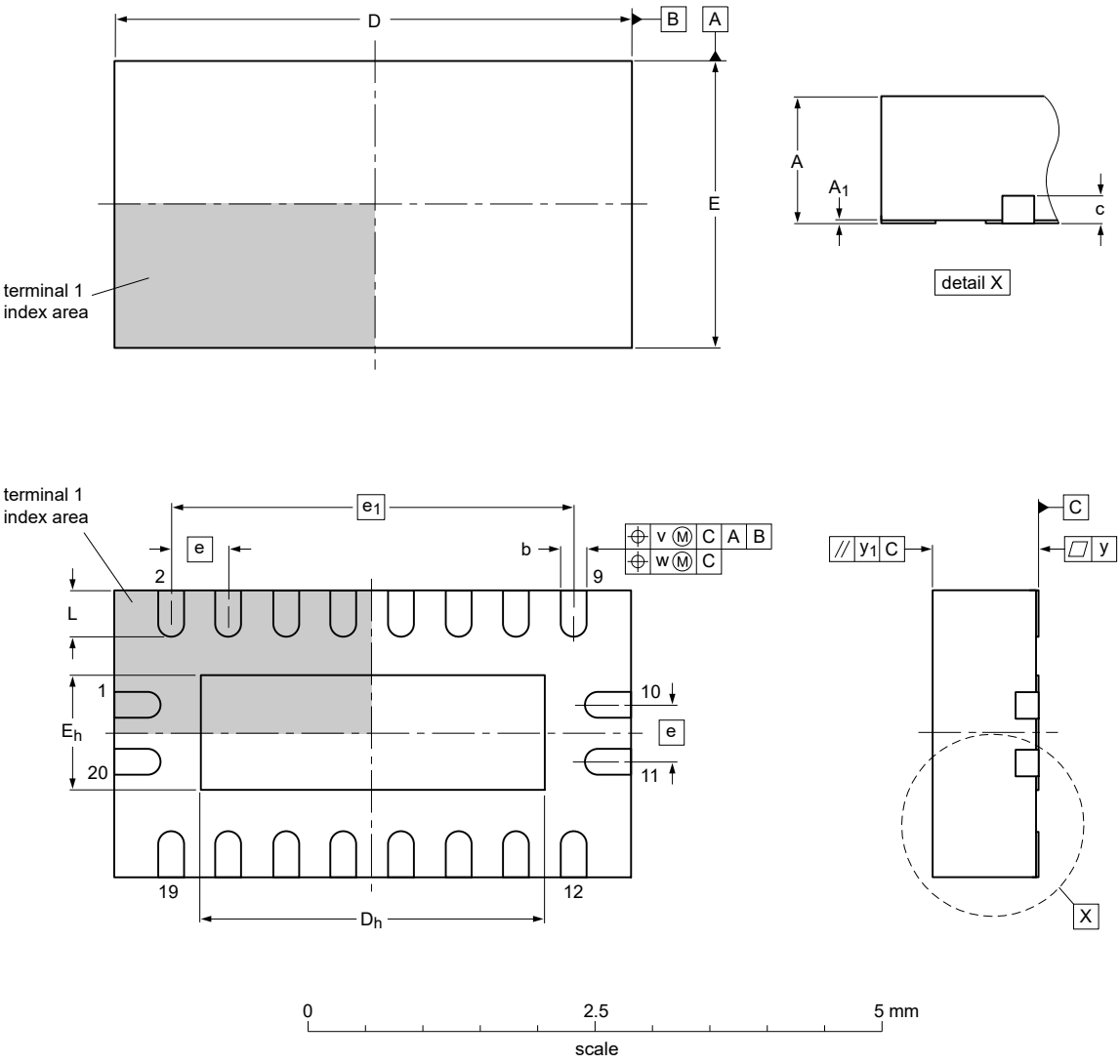
**Notes**

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

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT360-1 | | MO-153 | | | | ~~99-12-27~~<br>03-02-19 |

**Fig. 10. 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**




Dimensions (mm are the original dimensions)

| Unit | | $A^{(1)}$ | $A_1$ | b | c | $D^{(1)}$ | $D_h$ | $E^{(1)}$ | $E_h$ | e | $e_1$ | L | v | w | y | $y_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | max | 1.00 | 0.05 | 0.30 | | 4.6 | 3.15 | 2.6 | 1.15 | | | 0.5 | | | | |
| mm | nom | 0.90 | 0.02 | 0.25 | 0.2 | 4.5 | 3.00 | 2.5 | 1.00 | 0.5 | 3.5 | 0.4 | 0.1 | 0.05 | 0.05 | 0.1 |
| | min | 0.80 | 0.00 | 0.18 | | 4.4 | 2.85 | 2.4 | 0.85 | | | 0.3 | | | | |

Note
1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

*sot764-1_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT764-1 | - - - | MO-241 | - - - | | | ~~03-01-27~~ 14-12-12 |

**Fig. 11. Package outline SOT764-1 (DHVQFN20)**

# 12. Abbreviations

**Table 10. Abbreviations**

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

# 13. Revision history

**Table 11. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74AHC_AHCT273_Q100 v.3 | 20230921 | Product data sheet | - | 74AHC_AHCT273_Q100 v.2 |
| Modifications: | • Section 1 updated.<br>• Section 2: ESD specification updated according to the latest JEDEC standard. | | | |
| 74AHC_AHCT273_Q100 v.2 | 20200923 | Product data sheet | - | 74AHC_AHCT273_Q100 v.1 |
| Modifications: | • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.<br>• Legal texts have been adapted to the new company name where appropriate.<br>• Section 2 updated.<br>• Table 4: Derating values for $P_{tot}$ total power dissipation have been updated.<br>• Package outline drawing of SOT764-1 (Fig. 11) updated. | | | |
| 74AHC_AHCT273_Q100 v.1 | 20130327 | 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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**Date of release: 21 September 2023**