# 74HC574-Q100; 74HCT574-Q100

## Octal D-type flip-flop; positive edge-trigger; 3-state

Rev. 6 — 5 August 2024 Product data sheet

## 1. General description

The 74HC574-Q100; 74HCT574-Q100 is an 8-bit positive-edge triggered D-type flip-flop with 3-state outputs. The device features a clock (CP) and output enable ($\overline{OE}$) inputs. The flip-flops will store the state of their individual D-inputs that meet the set-up and hold time requirements on the LOW-to-HIGH clock (CP) transition. 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 flip-flops. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of $V_{CC}$.

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 6.0 V
- CMOS low power dissipation
- High noise immunity
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- Complies with JEDEC standards:
  - JESD8C (2.7 V to 3.6 V)
  - JESD7A (2.0 V to 6.0 V)
- Input levels:
  - For 74HC574-Q100: CMOS level
  - For 74HCT574-Q100: TTL level
- 3-state non-inverting outputs for bus oriented applications
- 8-bit positive, edge-triggered register
- Common 3-state output enable input
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- DHVQFN package with Side-Wettable Flanks enabling Automated 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 |
| 74HC574D-Q100<br>74HCT574D-Q100 | -40 °C to +125 °C | SO20 | plastic small outline package; 20 leads; body width 7.5 mm | SOT163-1 |
| 74HC574PW-Q100<br>74HCT574PW-Q100 | -40 °C to +125 °C | TSSOP20 | plastic thin shrink small outline package; 20 leads; body width 4.4 mm | SOT360-1 |
| 74HC574BQ-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

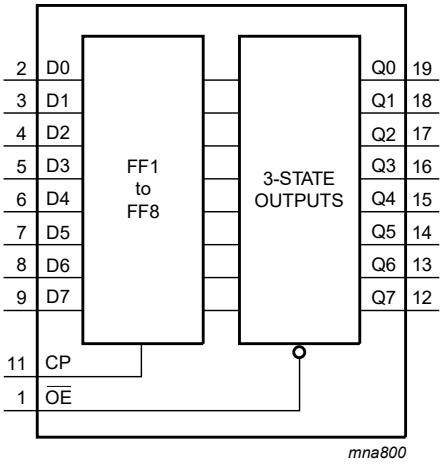



**Fig. 1. Functional diagram**

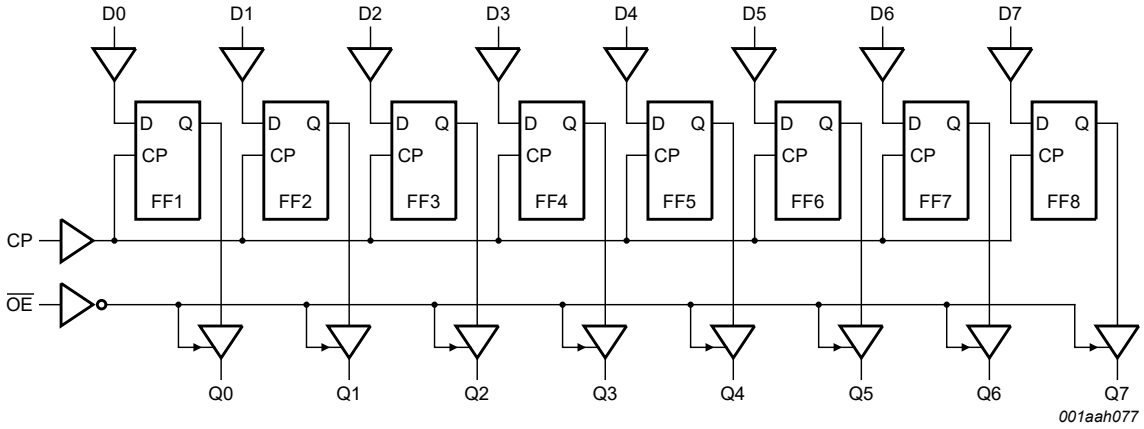



**Fig. 2. Logic diagram**

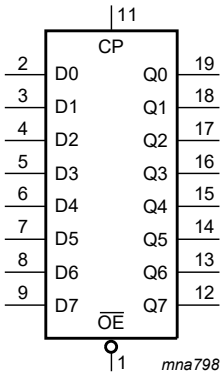



**Fig. 3. Logic symbol**

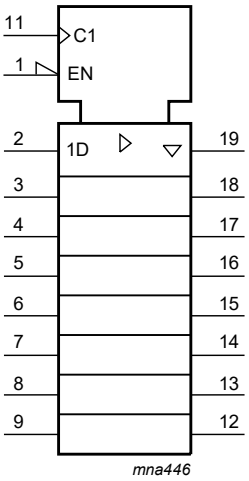
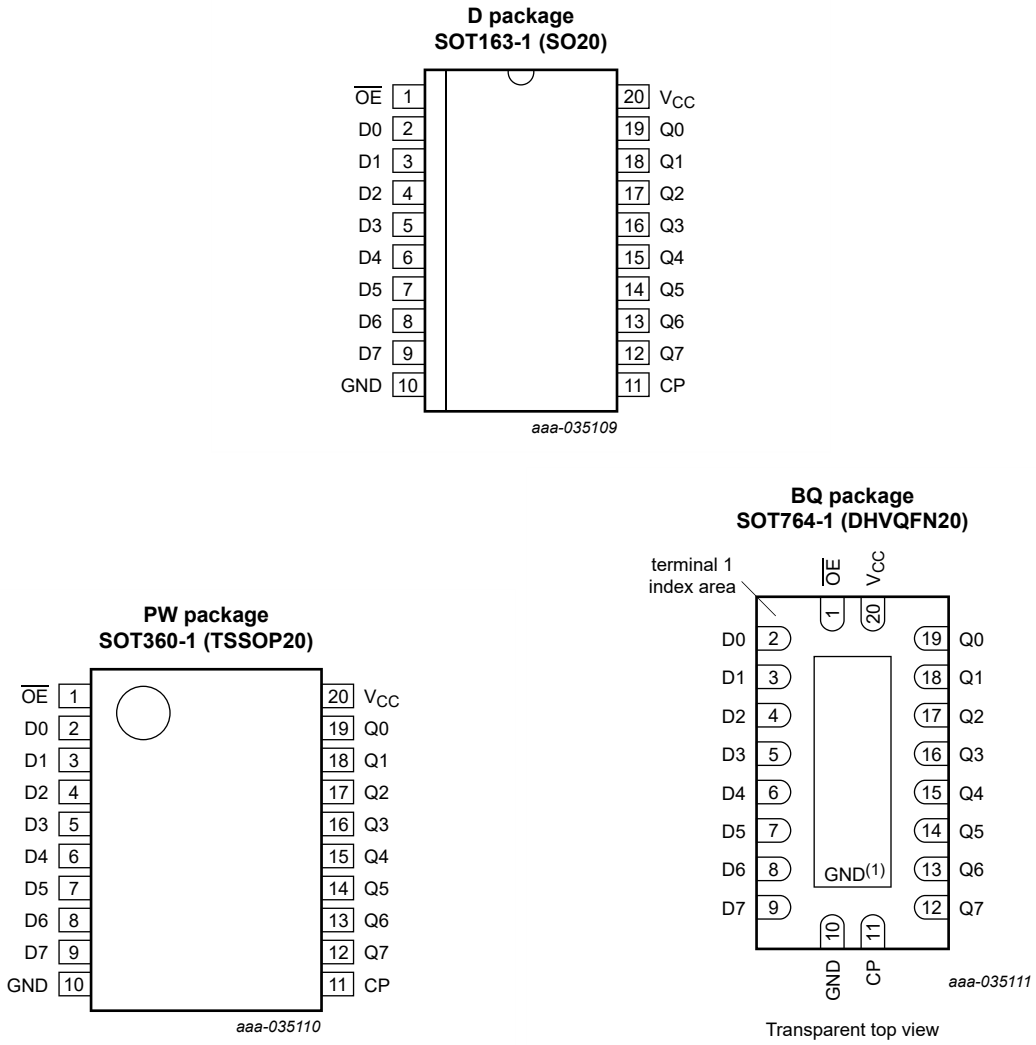



**Fig. 4. IEC logic symbol**

# 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 |
|---|---|---|
| $\overline{OE}$ | 1 | 3-state output enable input (active LOW) |
| D0, D1, D2, D3, D4, D5, D6, D7 | 2, 3, 4, 5, 6, 7, 8, 9 | data inputs |
| GND | 10 | ground (0 V) |
| CP | 11 | clock input (LOW-to-HIGH, edge triggered) |
| Q0, Q1, Q2, Q3, Q4, Q5, Q6, Q7 | 19, 18, 17, 16, 15, 14, 13, 12 | 3-state flip-flop outputs |
| $V_{CC}$ | 20 | supply voltage |

# 6. Functional description

**Table 3. Function table**

*H = HIGH voltage level; h = HIGH voltage level one setup time prior to the HIGH-to-LOW CP transition;*
*L = LOW voltage level; l = LOW voltage level one setup time prior to the HIGH-to-LOW CP transition;*
*Z = high-impedance OFF-state; ↑ = LOW-to-HIGH clock transition.*

| Operating mode | Input | | | Internal flip-flop | Output |
|---|---|---|---|---|---|
| | $\overline{OE}$ | CP | Dn | | Qn |
| Load and read register | L | ↑ | l | L | L |
| | L | ↑ | h | H | H |
| Load register and disable output | H | ↑ | l | L | Z |
| | H | ↑ | 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 |
|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | | -0.5 | +7 | V |
| $I_{IK}$ | input clamping current | $V_I < -0.5$ V or $V_I > V_{CC} + 0.5$ V | - | ±20 | mA |
| $I_{OK}$ | output clamping current | $V_O < -0.5$ V or $V_O > V_{CC} + 0.5$ V | - | ±20 | mA |
| $I_O$ | output current | $V_O = -0.5$ V to $(V_{CC} + 0.5$ V) | - | ±35 | mA |
| $I_{CC}$ | supply current | | - | +70 | mA |
| $I_{GND}$ | ground current | | - | -70 | mA |
| $T_{stg}$ | storage temperature | | -65 | +150 | °C |
| $P_{tot}$ | total power dissipation | [1] | - | 500 | mW |

[1] 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 | 74HC574-Q100 | | | 74HCT574-Q100 | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Typ | Max | |
| $V_{CC}$ | supply voltage | | 2.0 | 5.0 | 6.0 | 4.5 | 5.0 | 5.5 | V |
| $V_I$ | input voltage | | 0 | - | $V_{CC}$ | 0 | - | $V_{CC}$ | V |
| $V_O$ | output voltage | | 0 | - | $V_{CC}$ | 0 | - | $V_{CC}$ | V |
| $T_{amb}$ | ambient temperature | | -40 | +25 | +125 | -40 | +25 | +125 | °C |
| Δt/ΔV | input transition rise and fall rate | $V_{CC} = 2.0$ V | - | - | 625 | - | - | - | ns/V |
| | | $V_{CC} = 4.5$ V | - | 1.67 | 139 | - | 1.67 | 139 | ns/V |
| | | $V_{CC} = 6.0$ V | - | - | 83 | - | - | - | ns/V |

# 9. Static characteristics

**Table 6. Static characteristics**

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

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| **74HC574-Q100** | | | | | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 2.0 V | 1.5 | 1.2 | - | 1.5 | - | 1.5 | - | V |
| | | $V_{CC}$ = 4.5 V | 3.15 | 2.4 | - | 3.15 | - | 3.15 | - | V |
| | | $V_{CC}$ = 6.0 V | 4.2 | 3.2 | - | 4.2 | - | 4.2 | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 2.0 V | - | 0.8 | 0.5 | - | 0.5 | - | 0.5 | V |
| | | $V_{CC}$ = 4.5 V | - | 2.1 | 1.35 | - | 1.35 | - | 1.35 | V |
| | | $V_{CC}$ = 6.0 V | - | 2.8 | 1.8 | - | 1.8 | - | 1.8 | V |
| $V_{OH}$ | HIGH-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | | | | | |
| | | $I_O$ = -20 µA; $V_{CC}$ = 2.0 V | 1.9 | 2.0 | - | 1.9 | - | 1.9 | - | V |
| | | $I_O$ = -20 µA; $V_{CC}$ = 4.5 V | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | V |
| | | $I_O$ = -20 µA; $V_{CC}$ = 6.0 V | 5.9 | 6.0 | - | 5.9 | - | 5.9 | - | V |
| | | $I_O$ = -6.0 mA; $V_{CC}$ = 4.5 V | 3.98 | 4.32 | - | 3.84 | - | 3.7 | - | V |
| | | $I_O$ = -7.8 mA; $V_{CC}$ = 6.0 V | 5.48 | 5.81 | - | 5.34 | - | 5.2 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | | | | | |
| | | $I_O$ = 20 µA; $V_{CC}$ = 2.0 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 20 µA; $V_{CC}$ = 4.5 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 20 µA; $V_{CC}$ = 6.0 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 6.0 mA; $V_{CC}$ = 4.5 V | - | 0.15 | 0.26 | - | 0.33 | - | 0.4 | V |
| | | $I_O$ = 7.8 mA; $V_{CC}$ = 6.0 V | - | 0.16 | 0.26 | - | 0.33 | - | 0.4 | V |
| $I_I$ | input leakage current | $V_I$ = $V_{CC}$ or GND; $V_{CC}$ = 6.0 V | - | - | ±0.1 | - | ±1.0 | - | ±1.0 | µA |
| $I_{OZ}$ | OFF-state output current | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_{CC}$ = 6.0 V; $V_O$ = $V_{CC}$ or GND | - | - | ±0.5 | - | ±5.0 | - | ±10.0 | µA |
| $I_{CC}$ | supply current | $V_I$ = $V_{CC}$ or GND; $I_O$ = 0 A; $V_{CC}$ = 6.0 V | - | - | 8.0 | - | 80 | - | 160 | µA |
| $C_I$ | input capacitance | | - | 3.5 | - | - | - | - | - | pF |

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| **74HCT574-Q100** | | | | | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | 2.0 | 1.6 | - | 2.0 | - | 2.0 | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | - | 1.2 | 0.8 | - | 0.8 | - | 0.8 | V |
| $V_{OH}$ | HIGH-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_{CC}$ = 4.5 V | | | | | | | | |
| | | $I_O$ = -20 µA | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | V |
| | | $I_O$ = -6 mA | 3.98 | 4.32 | - | 3.84 | - | 3.7 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_{CC}$ = 4.5 V | | | | | | | | |
| | | $I_O$ = 20 µA | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 6.0 mA | - | 0.16 | 0.26 | - | 0.33 | - | 0.4 | V |
| $I_I$ | input leakage current | $V_I$ = $V_{CC}$ or GND; $V_{CC}$ = 5.5 V | - | - | ±0.1 | - | ±1.0 | - | ±1.0 | µA |
| $I_{OZ}$ | OFF-state output current | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_{CC}$ = 5.5 V; $V_O$ = $V_{CC}$ or GND | - | - | ±0.5 | - | ±5.0 | - | ±10 | µA |
| $I_{CC}$ | supply current | $V_I$ = $V_{CC}$ or GND; $I_O$ = 0 A; $V_{CC}$ = 5.5 V | - | - | 8.0 | - | 80 | - | 160 | µA |
| $\Delta I_{CC}$ | additional supply current | $V_I$ = $V_{CC}$ - 2.1 V; other inputs at $V_{CC}$ or GND; $V_{CC}$ = 4.5 V to 5.5 V; $I_O$ = 0 A | | | | | | | | |
| | | per input pin; Dn inputs | - | 50 | 180 | - | 225 | - | 245 | µA |
| | | per input pin; $\overline{OE}$ input | - | 125 | 450 | - | 563 | - | 613 | µA |
| | | per input pin; CP input | - | 150 | 540 | - | 675 | - | 735 | µA |
| $C_I$ | input capacitance | | - | 3.5 | - | - | - | - | - | pF |

# 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

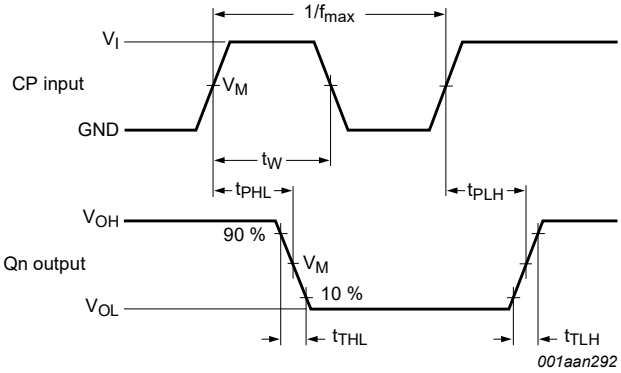
*Voltages are referenced to GND (ground = 0 V); $C_L$ = 50 pF unless otherwise specified; for test circuit see Fig. 8.*

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| **74HC574-Q100** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | CP to Qn; see Fig. 5 [1] | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | - | 47 | 150 | - | 190 | - | 225 | ns |
| | | $V_{CC}$ = 4.5 V | - | 17 | 30 | - | 35 | - | 45 | ns |
| | | $V_{CC}$ = 5 V; $C_L$ = 15 pF | - | 14 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 6.0 V | - | 14 | 26 | - | 33 | - | 38 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to Qn; see Fig. 7 [2] | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | - | 44 | 140 | - | 175 | - | 210 | ns |
| | | $V_{CC}$ = 4.5 V | - | 16 | 28 | - | 35 | - | 42 | ns |
| | | $V_{CC}$ = 6.0 V | - | 13 | 24 | - | 30 | - | 36 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to Qn; see Fig. 7 [3] | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | - | 39 | 125 | - | 155 | - | 190 | ns |
| | | $V_{CC}$ = 4.5 V | - | 14 | 25 | - | 31 | - | 38 | ns |
| | | $V_{CC}$ = 6.0 V | - | 11 | 21 | - | 26 | - | 32 | ns |
| $t_t$ | transition time | Qn; see Fig. 5 [4] | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | - | 14 | 60 | - | 75 | - | 90 | ns |
| | | $V_{CC}$ = 4.5 V | - | 5 | 12 | - | 15 | - | 18 | ns |
| | | $V_{CC}$ = 6.0 V | - | 4 | 10 | - | 13 | - | 15 | ns |
| $t_W$ | pulse width | CP HIGH or LOW; see Fig. 6 | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | 80 | 14 | - | 100 | - | 120 | - | ns |
| | | $V_{CC}$ = 4.5 V | 16 | 5 | - | 20 | - | 24 | - | ns |
| | | $V_{CC}$ = 6.0 V | 14 | 4 | - | 17 | - | 20 | - | ns |
| $t_{su}$ | set-up time | Dn to CP; see Fig. 6 | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | 60 | 6 | - | 75 | - | 90 | - | ns |
| | | $V_{CC}$ = 4.5 V | 12 | 2 | - | 15 | - | 18 | - | ns |
| | | $V_{CC}$ = 6.0 V | 10 | 2 | - | 13 | - | 15 | - | ns |
| $t_h$ | hold time | Dn to CP; see Fig. 6 | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | 5 | 0 | - | 5 | - | 5 | - | ns |
| | | $V_{CC}$ = 4.5 V | 5 | 0 | - | 5 | - | 5 | - | ns |
| | | $V_{CC}$ = 6.0 V | 5 | 0 | - | 5 | - | 5 | - | ns |
| $f_{max}$ | maximum frequency | CP; see Fig. 5 | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | 6.0 | 37 | - | 4.8 | - | 4.0 | - | MHz |
| | | $V_{CC}$ = 4.5 V | 30 | 112 | - | 24 | - | 20 | - | MHz |
| | | $V_{CC}$ = 5 V; $C_L$ = 15 pF | - | 123 | - | - | - | - | - | MHz |
| | | $V_{CC}$ = 6.0 V | 35 | 133 | - | 28 | - | 24 | - | MHz |
| $C_{PD}$ | power dissipation capacitance | $C_L$ = 50 pF; f = 1 MHz; $V_I$ = GND to $V_{CC}$ [5] | - | 22 | - | - | - | - | - | pF |

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| **74HCT574-Q100** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | CP to Qn; see Fig. 5 [1] | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | - | 18 | 33 | - | 41 | - | 50 | ns |
| | | $V_{CC}$ = 5 V; $C_L$ = 15 pF | - | 15 | - | - | - | - | - | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to Qn; see Fig. 7 [2] | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | - | 19 | 33 | - | 41 | - | 50 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to Qn; see Fig. 7 [3] | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | - | 16 | 28 | - | 35 | - | 42 | ns |
| $t_t$ | transition time | Qn; see Fig. 5 [4] | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | - | 5 | 12 | - | 15 | - | 18 | ns |
| $t_W$ | pulse width | CP HIGH or LOW; see Fig. 6 | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | 16 | 7 | - | 20 | - | 24 | - | ns |
| $t_{su}$ | set-up time | Dn to CP; see Fig. 6 | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | 12 | 3 | - | 15 | - | 18 | - | ns |
| $t_h$ | hold time | Dn to CP; see Fig. 6 | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | 5 | -1 | - | 5 | - | 5 | - | ns |
| $f_{max}$ | maximum frequency | CP; see Fig. 5 | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | 30 | 69 | - | 24 | - | 20 | - | MHz |
| | | $V_{CC}$ = 5 V; $C_L$ = 15 pF | - | 76 | - | - | - | - | - | MHz |
| $C_{PD}$ | power dissipation capacitance | $C_L$ = 50 pF; f = 1 MHz; $V_I$ = GND to $V_{CC}$ - 1.5 V [5] | - | 25 | - | - | - | - | - | pF |

[1] $t_{pd}$ is the same as $t_{PLH}$ and $t_{PHL}$.
[2] $t_{en}$ is the same as $t_{PZH}$ and $t_{PZL}$.
[3] $t_{dis}$ is the same as $t_{PLZ}$ and $t_{PHZ}$.
[4] $t_t$ is the same as $t_{THL}$ and $t_{TLH}$.
[5] $C_{PD}$ is used to determine the dynamic power dissipation ($P_D$ in 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 outputs.

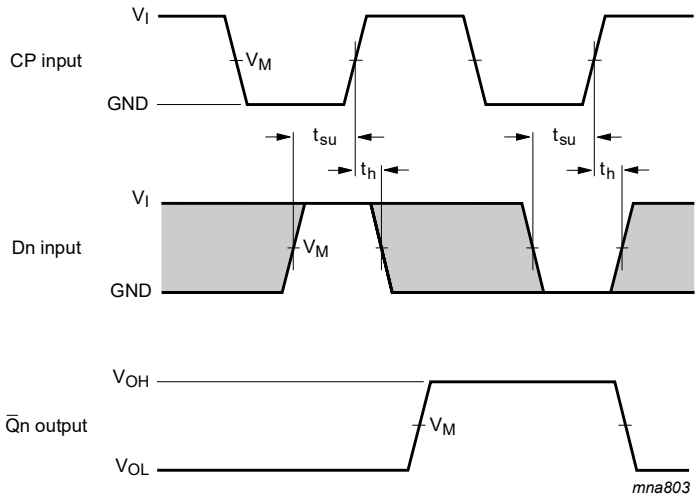
## 10.1. Waveforms and test circuit




Measurement points are given in Table 8.

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

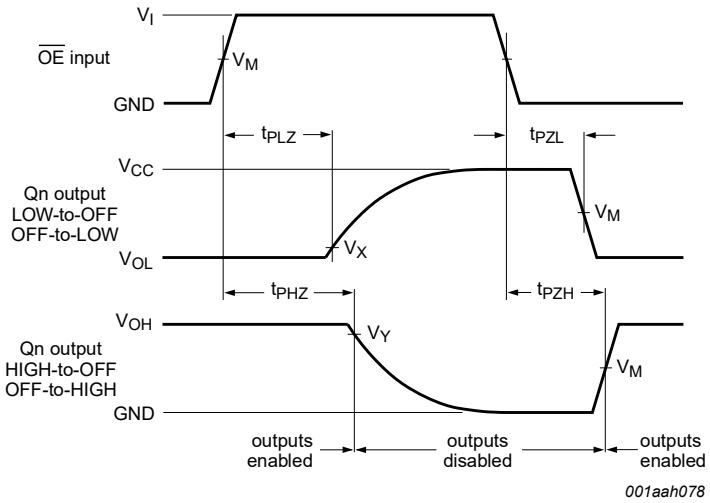
**Fig. 5. Propagation delay input (CP) to output (Qn), output transition time, clock input (CP) pulse width and the maximum frequency (CP)**




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. The data input (D) to clock input (CP) set-up times and clock input (CP) to data input (D) hold times**



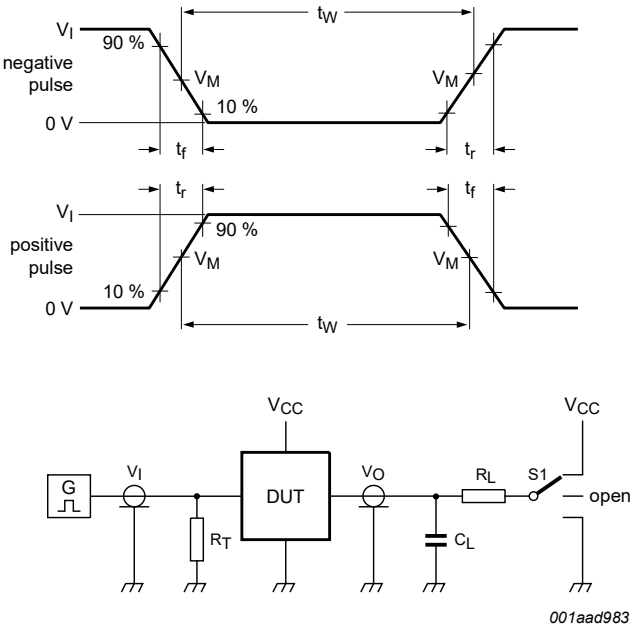

Measurement points are given in Table 8.

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

**Fig. 7. Enable and disable times**

**Table 8. Measurement points**

| Type | Input | Output | | |
|---|---|---|---|---|
| | $V_M$ | $V_M$ | $V_X$ | $V_Y$ |
| 74HC574-Q100 | 0.5 × $V_{CC}$ | 0.5 × $V_{CC}$ | 0.1 × $V_{CC}$ | 0.9 × $V_{CC}$ |
| 74HCT574-Q100 | 1.3 V | 1.3 V | 0.1 × $V_{CC}$ | 0.9 × $V_{CC}$ |




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;

$R_L$ = Load resistance;

S1 = Test selection switch.

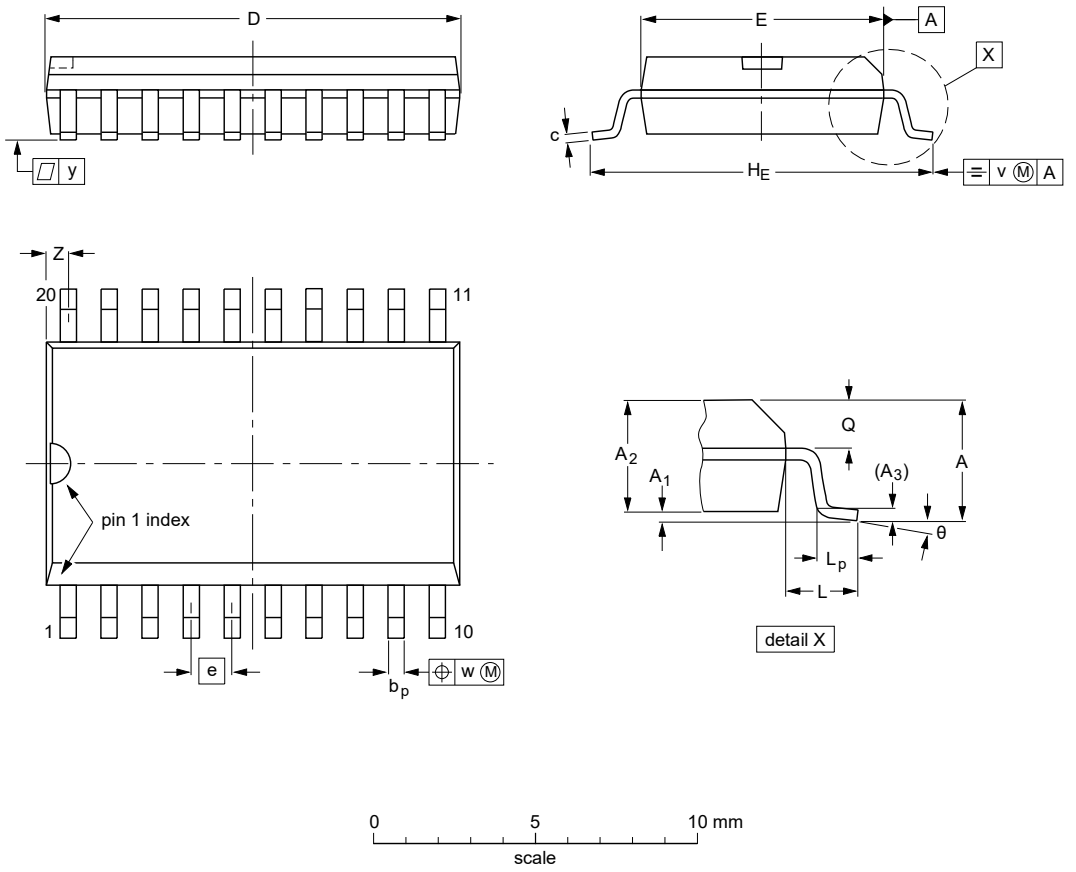
**Fig. 8. Test circuit for measuring switching times**

**Table 9. Test data**

| Type | Input | | Load | | S1 position | | |
|---|---|---|---|---|---|---|---|
| | $V_I$ | $t_r$, $t_f$ | $C_L$ | $R_L$ | $t_{PHL}$, $t_{PLH}$ | $t_{PZH}$, $t_{PHZ}$ | $t_{PZL}$, $t_{PLZ}$ |
| 74HC574-Q100 | $V_{CC}$ | 6 ns | 15 pF, 50 pF | 1 kΩ | open | GND | $V_{CC}$ |
| 74HCT574-Q100 | 3 V | 6 ns | 15 pF, 50 pF | 1 kΩ | open | GND | $V_{CC}$ |

# 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 | |

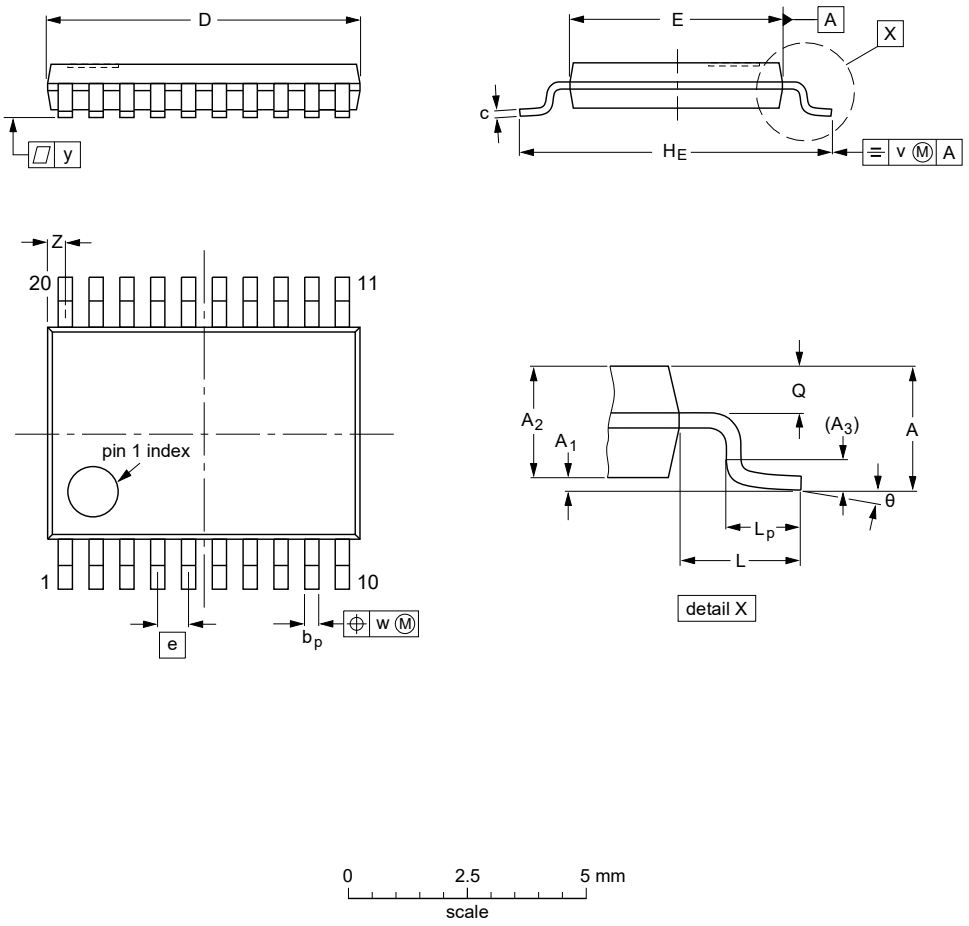
**Note**

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° |

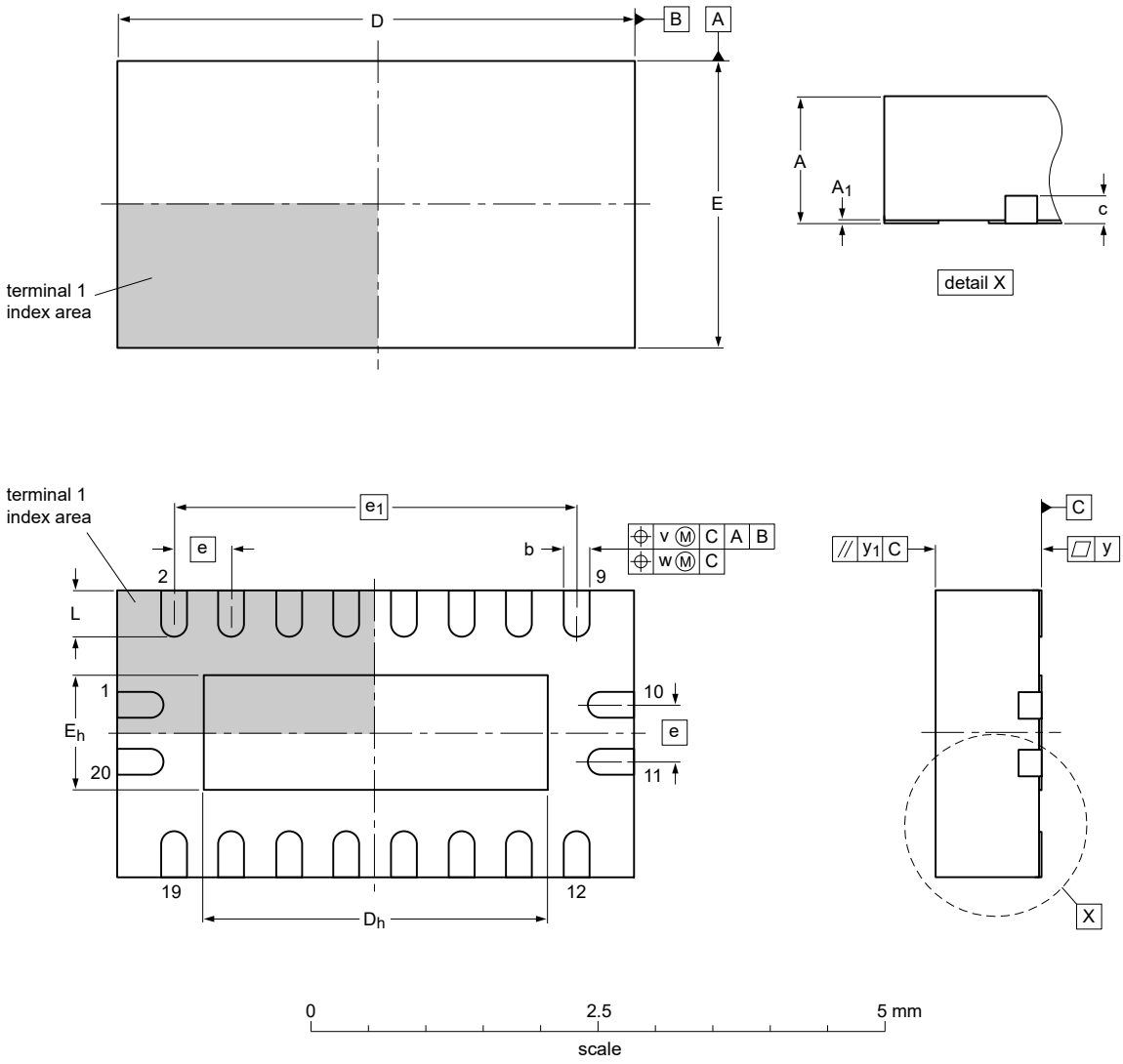
**Notes**

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 |
|---|---|
| ANSI | American National Standards Institute |
| CDM | Charged Device Model |
| CMOS | Complementary Metal Oxide Semiconductor |
| DUT | Device Under Test |
| ESD | ElectroStatic Discharge |
| ESDA | ElectroStatic Discharge Association |
| HBM | Human Body Model |
| JEDEC | Joint Electron Device Engineering Council |
| TTL | Transistor-Transistor Logic |

## 13. Revision history

**Table 11. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74HC_HCT574_Q100 v.6 | 20240805 | Product data sheet | - | 74HC_HCT574_Q100 v.5 |
| Modifications: | • Section 2: ESD specification updated according to the latest JEDEC standard. | | | |
| 74HC_HCT574_Q100 v.5 | 20221020 | Product data sheet | - | 74HC_HCT574_Q100 v.4 |
| Modifications: | • Section 5.1 updated. | | | |
| 74HC_HCT574_Q100 v.4 | 20220713 | Product data sheet | - | 74HC_HCT574_Q100 v.3 |
| Modifications: | • Type number 74HC574BQ-Q100 (SOT764-1/DHVQFN20) added. | | | |
| 74HC_HCT574_Q100 v.3 | 20210730 | Product data sheet | - | 74HC_HCT574_Q100 v.2 |
| 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 1 and Section 2 updated.<br>• Section 7: Derating values for $P_{tot}$ total power dissipation updated. | | | |
| 74HC_HCT574_Q100 v.2 | 20150126 | Product data sheet | - | 74HC_HCT574_Q100 v.1 |
| Modifications: | • Table 7: Power dissipation capacitance condition for 74HCT574-Q100 is corrected. | | | |
| 74HC_HCT574_Q100 v.1 | 20120802 | 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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