

# 74HC373-Q100; 74HCT373-Q100

Octal D-type transparent latch; 3-state

Rev. 3 — 5 August 2024

Product data sheet

## 1. General description

The 74HC373-Q100; 74HCT373-Q100 is an octal D-type transparent latch with 3-state outputs. The device features latch enable (LE) and output enable ( $\overline{OE}$ ) inputs. When LE is HIGH, data at the inputs enter the latches. In this condition the latches are transparent, a latch output will change each time its corresponding D-input changes. When LE is LOW the latches store the information that was present at the inputs a set-up time preceding the HIGH-to-LOW transition of LE. A HIGH on  $\overline{OE}$  causes the outputs to assume a high-impedance OFF-state. Operation of the  $\overline{OE}$  input does not affect the state of the latches. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

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

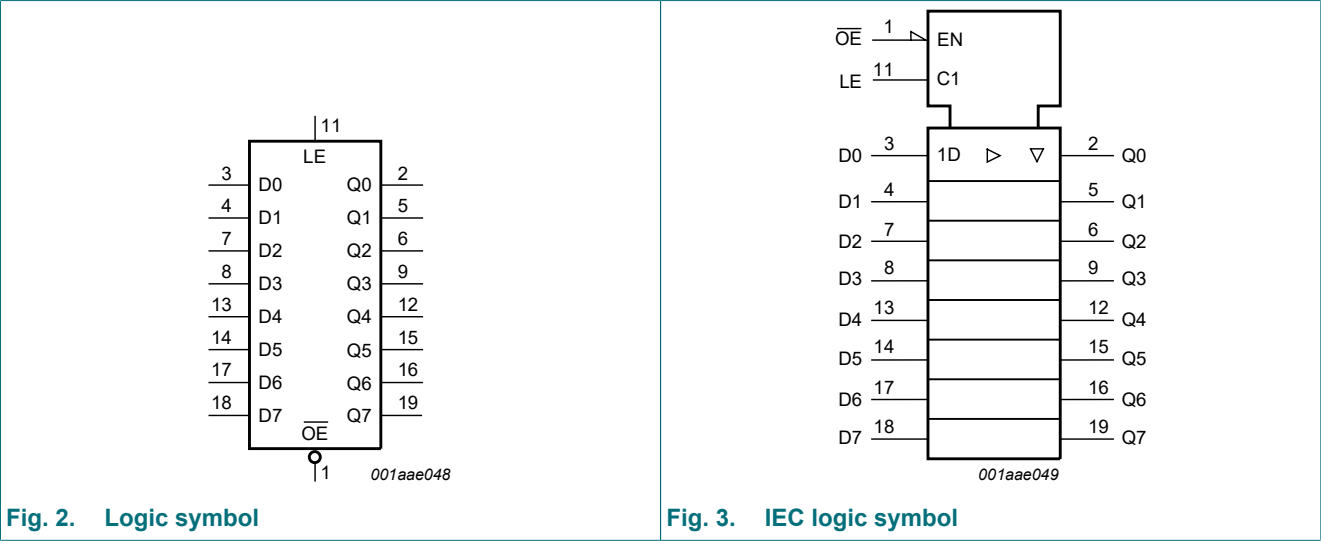
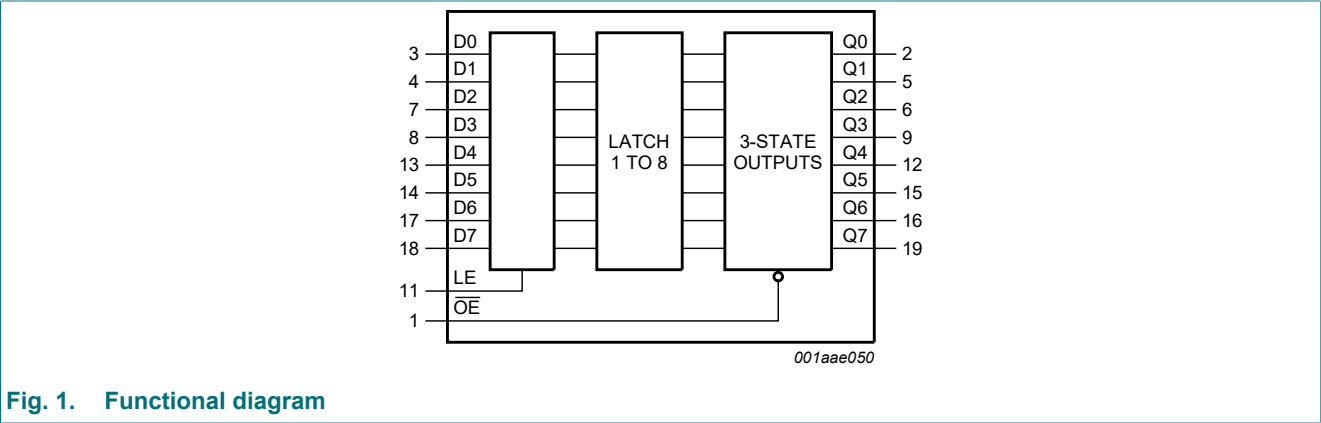
- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- Wide supply voltage range from 2.0 V to 6.0 V
- CMOS low power dissipation
- High noise immunity
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- Complies with JEDEC standards:
  - JESD8C (2.7 V to 3.6 V)
  - JESD7A (2.0 V to 6.0 V)
- Input levels:
  - For 74HC373-Q100: CMOS level
  - For 74HCT373-Q100: TTL level
- 3-state non-inverting outputs for bus-oriented applications
- 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
- Multiple package options
- DHVQFN package with Side-Wettable Flanks enabling Automated Optical Inspection (AOI) of solder joints

3. Ordering information

Table 1. Ordering information

| Type number                                                       | Package           |          |                                                                                                                                      |                          |
|-------------------------------------------------------------------|-------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|                                                                   | Temperature range | Name     | Description                                                                                                                          | Version                  |
| <a href="#">74HC373D-Q100</a><br><a href="#">74HCT373D-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="#">74HC373PW-Q100</a><br><a href="#">74HCT373PW-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="#">74HC373BQ-Q100</a><br><a href="#">74HCT373BQ-Q100</a> | -40 °C to +125 °C | DHVQFN20 | plastic dual in-line compatible thermal<br>enhanced very thin quad flat package; no leads;<br>20 terminals; body 2.5 × 4.5 × 0.85 mm | <a href="#">SOT764-1</a> |

4. Functional diagram



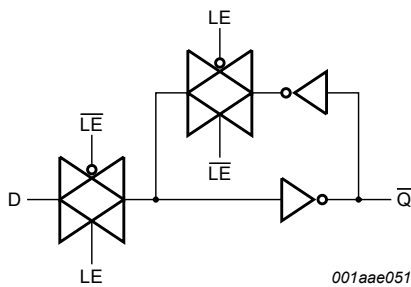


Fig. 4. Logic diagram (one latch)

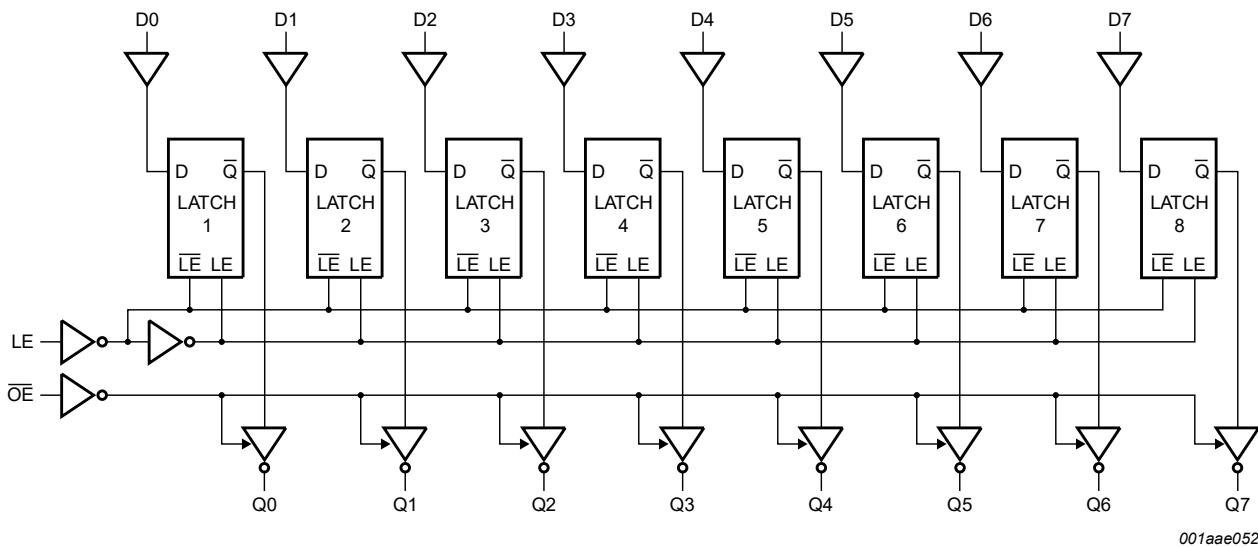
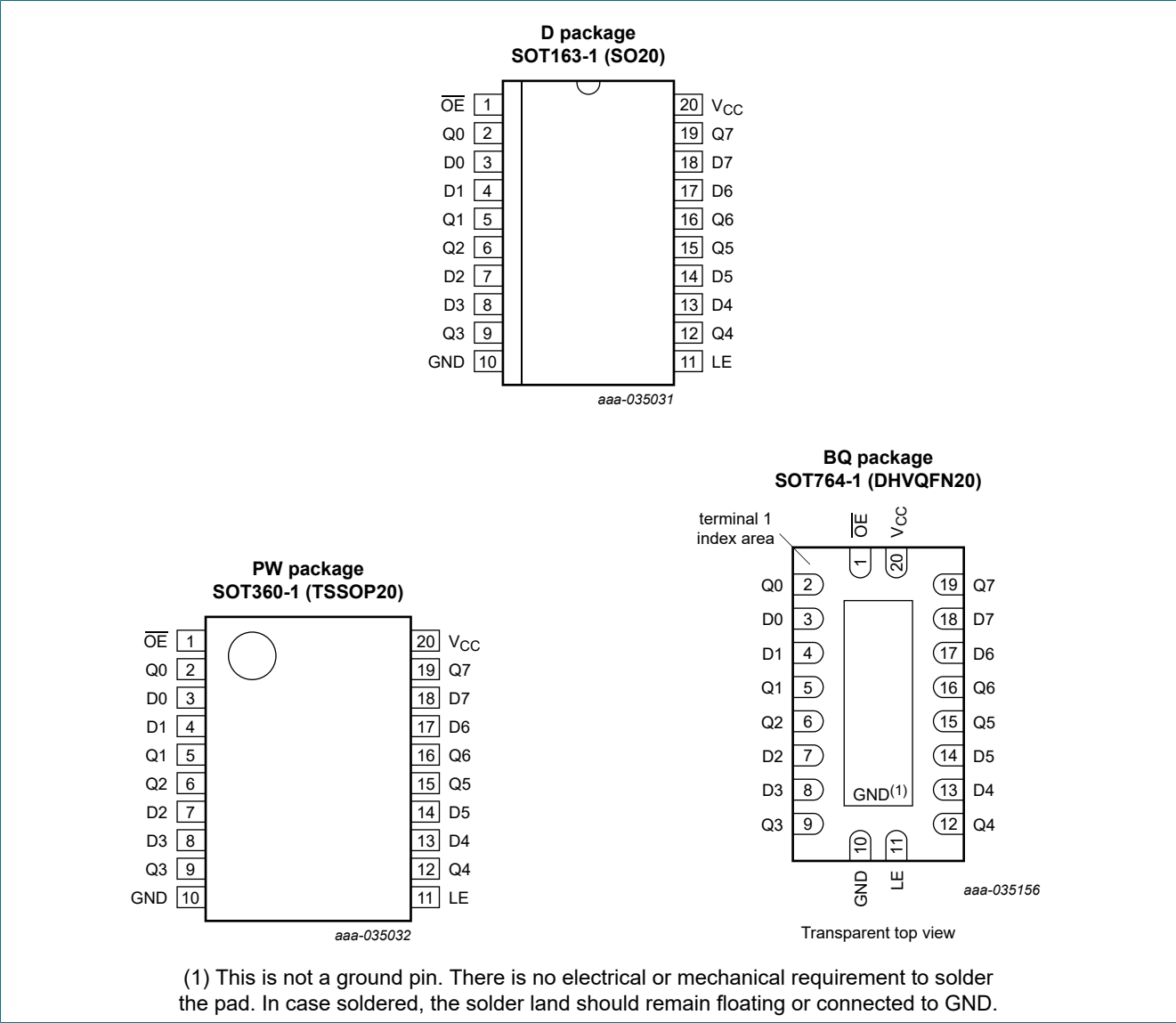


Fig. 5. Logic diagram

5. Pinning information

5.1. Pinning



5.2. Pin description

Table 2. Pin description

| Symbol                         | Pin                        | Description                              |
|--------------------------------|----------------------------|------------------------------------------|
| OE                             | 1                          | 3-state output enable input (active LOW) |
| Q0, Q1, Q2, Q3, Q4, Q5, Q6, Q7 | 2, 5, 6, 9, 12, 15, 16, 19 | 3-state latch output                     |
| D0, D1, D2, D3, D4, D5, D6, D7 | 3, 4, 7, 8, 13, 14, 17, 18 | data input                               |
| GND                            | 10                         | ground (0 V)                             |
| LE                             | 11                         | latch enable input (active HIGH)         |
| V <sub>CC</sub>                | 20                         | supply voltage                           |

6. Functional description

Table 3. Functional description

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;  
X = don't care; Z = high-impedance OFF-state.

| Operating mode                                 | Control |    | Input | Internal latches | Output |
|------------------------------------------------|---------|----|-------|------------------|--------|
|                                                | OE      | LE | Dn    |                  | Qn     |
| Enable and read register<br>(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<br>outputs          | H       | X  | X     | X                | 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   | V    |
| I <sub>IK</sub>  | input clamping current  | V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V | -    | ±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 | -    | ±20  | mA   |
| I <sub>O</sub>   | output current          | V <sub>O</sub> = -0.5 V to (V <sub>CC</sub> + 0.5 V)                | -    | ±35  | mA   |
| I <sub>CC</sub>  | supply current          |                                                                     | -    | +70  | mA   |
| I <sub>GND</sub> | ground current          |                                                                     | -    | -70  | mA   |
| T <sub>stg</sub> | storage temperature     |                                                                     | -65  | +150 | °C   |
| P <sub>tot</sub> | total power dissipation | [1]                                                                 | -    | 500  | mW   |

- [1] 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              | 74HC373-Q100 |      |                 | 74HCT373-Q100 |      |                 | Unit |
|------------------|-------------------------------------|-------------------------|--------------|------|-----------------|---------------|------|-----------------|------|
|                  |                                     |                         | Min          | Typ  | Max             | Min           | Typ  | Max             |      |
| V <sub>CC</sub>  | supply voltage                      |                         | 2.0          | 5.0  | 6.0             | 4.5           | 5.0  | 5.5             | V    |
| V <sub>I</sub>   | input voltage                       |                         | 0            | -    | V <sub>CC</sub> | 0             | -    | V <sub>CC</sub> | V    |
| V <sub>O</sub>   | output voltage                      |                         | 0            | -    | V <sub>CC</sub> | 0             | -    | V <sub>CC</sub> | V    |
| T <sub>amb</sub> | ambient temperature                 |                         | -40          | +25  | +125            | -40           | +25  | +125            | °C   |
| Δt/ΔV            | input transition rise and fall rate | V <sub>CC</sub> = 2.0 V | -            | -    | 625             | -             | -    | -               | ns/V |
|                  |                                     | V <sub>CC</sub> = 4.5 V | -            | 1.67 | 139             | -             | 1.67 | 139             | ns/V |
|                  |                                     | V <sub>CC</sub> = 6.0 V | -            | -    | 83              | -             | -    | -               | ns/V |

9. Static characteristics

Table 6. Static characteristics

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

| Symbol          | Parameter                 | Conditions                                                                                                             | T <sub>amb</sub> = 25 °C |      |      | T <sub>amb</sub> = -40 °C to 85 °C |      | T <sub>amb</sub> = -40 °C to 125 °C |       | Unit |
|-----------------|---------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------|------|------|------------------------------------|------|-------------------------------------|-------|------|
|                 |                           |                                                                                                                        | Min                      | Typ  | Max  | Min                                | Max  | Min                                 | Max   |      |
| 74HC373-Q100    |                           |                                                                                                                        |                          |      |      |                                    |      |                                     |       |      |
| V <sub>IH</sub> | HIGH-level input voltage  | V <sub>CC</sub> = 2.0 V                                                                                                | 1.5                      | 1.2  | -    | 1.5                                | -    | 1.5                                 | -     | V    |
|                 |                           | V <sub>CC</sub> = 4.5 V                                                                                                | 3.15                     | 2.4  | -    | 3.15                               | -    | 3.15                                | -     | V    |
|                 |                           | V <sub>CC</sub> = 6.0 V                                                                                                | 4.2                      | 3.2  | -    | 4.2                                | -    | 4.2                                 | -     | V    |
| V <sub>IL</sub> | LOW-level input voltage   | V <sub>CC</sub> = 2.0 V                                                                                                | -                        | 0.8  | 0.5  | -                                  | 0.5  | -                                   | 0.5   | V    |
|                 |                           | V <sub>CC</sub> = 4.5 V                                                                                                | -                        | 2.1  | 1.35 | -                                  | 1.35 | -                                   | 1.35  | V    |
|                 |                           | V <sub>CC</sub> = 6.0 V                                                                                                | -                        | 2.8  | 1.8  | -                                  | 1.8  | -                                   | 1.8   | V    |
| V <sub>OH</sub> | HIGH-level output voltage | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                    | -                        | -    | -    |                                    |      |                                     |       |      |
|                 |                           | I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 2.0 V                                                                       | 1.9                      | 2.0  | -    | 1.9                                | -    | 1.9                                 | -     | V    |
|                 |                           | I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 4.5 V                                                                       | 4.4                      | 4.5  | -    | 4.4                                | -    | 4.4                                 | -     | V    |
|                 |                           | I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 6.0 V                                                                       | 5.9                      | 6.0  | -    | 5.9                                | -    | 5.9                                 | -     | V    |
|                 |                           | I <sub>O</sub> = -6.0 mA; V <sub>CC</sub> = 4.5 V                                                                      | 3.98                     | 4.32 | -    | 3.84                               | -    | 3.7                                 | -     | V    |
|                 |                           | I <sub>O</sub> = -7.8 mA; V <sub>CC</sub> = 6.0 V                                                                      | 5.48                     | 5.81 | -    | 5.34                               | -    | 5.2                                 | -     | V    |
| V <sub>OL</sub> | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                    |                          |      |      |                                    |      |                                     |       |      |
|                 |                           | I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 2.0 V                                                                        | -                        | 0    | 0.1  | -                                  | 0.1  | -                                   | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 4.5 V                                                                        | -                        | 0    | 0.1  | -                                  | 0.1  | -                                   | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 6.0 V                                                                        | -                        | 0    | 0.1  | -                                  | 0.1  | -                                   | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 6.0 mA; V <sub>CC</sub> = 4.5 V                                                                       | -                        | 0.15 | 0.26 | -                                  | 0.33 | -                                   | 0.4   | V    |
|                 |                           | I <sub>O</sub> = 7.8 mA; V <sub>CC</sub> = 6.0 V                                                                       | -                        | 0.16 | 0.26 | -                                  | 0.33 | -                                   | 0.4   | V    |
| I <sub>I</sub>  | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V                                                       | -                        | -    | ±0.1 | -                                  | ±1.0 | -                                   | ±1.0  | µA   |
| I <sub>OZ</sub> | OFF-state output current  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 6.0 V; V <sub>O</sub> = V <sub>CC</sub> or GND | -                        | -    | ±0.5 | -                                  | ±5.0 | -                                   | ±10.0 | µA   |
| I <sub>CC</sub> | supply current            | V <sub>CC</sub> = 6.0 V; I <sub>O</sub> = 0 A; V <sub>I</sub> = V <sub>CC</sub> or GND                                 | -                        | -    | 8.0  | -                                  | 80   | -                                   | 160   | µA   |
| C <sub>I</sub>  | input capacitance         |                                                                                                                        | -                        | 3.5  | -    | -                                  | -    | -                                   | -     | pF   |
| 74HCT373-Q100   |                           |                                                                                                                        |                          |      |      |                                    |      |                                     |       |      |
| V <sub>IH</sub> | HIGH-level input voltage  | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                                       | 2.0                      | 1.6  | -    | 2.0                                | -    | 2.0                                 | -     | V    |
| V <sub>IL</sub> | LOW-level input voltage   | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                                       | -                        | 1.2  | 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>                                                                    |                          |      |      |                                    |      |                                     |       |      |
|                 |                           | I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 4.5 V                                                                       | 4.4                      | 4.5  | -    | 4.4                                | -    | 4.4                                 | -     | V    |
|                 |                           | I <sub>O</sub> = -6.0 mA; V <sub>CC</sub> = 4.5 V                                                                      | 3.98                     | 4.32 | -    | 3.84                               | -    | 3.7                                 | -     | V    |
| V <sub>OL</sub> | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                    |                          |      |      |                                    |      |                                     |       |      |
|                 |                           | I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 4.5 V                                                                        | -                        | 0.0  | 0.1  | -                                  | 0.1  | -                                   | 0.1   | V    |
|                 |                           | I <sub>O</sub> = 6.0 mA; V <sub>CC</sub> = 4.5 V                                                                       | -                        | 0.16 | 0.26 | -                                  | 0.33 | -                                   | 0.4   | V    |
| I <sub>I</sub>  | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 5.5 V                                                       | -                        | -    | ±0.1 | -                                  | ±1.0 | -                                   | ±1.0  | µA   |

| Symbol           | Parameter                 | Conditions                                                                                                                               | T <sub>amb</sub> = 25 °C |     |      | T <sub>amb</sub> = -40 °C to 85 °C |      | T <sub>amb</sub> = -40 °C to 125 °C |     | Unit |
|------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----|------|------------------------------------|------|-------------------------------------|-----|------|
|                  |                           |                                                                                                                                          | Min                      | Typ | Max  | Min                                | Max  | Min                                 | Max |      |
| I <sub>OZ</sub>  | OFF-state output current  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 5.5 V; V <sub>O</sub> = V <sub>CC</sub> or GND                   | -                        | -   | ±0.5 | -                                  | ±5.0 | -                                   | ±10 | µA   |
| I <sub>CC</sub>  | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 5.5 V                                                   | -                        | -   | 8.0  | -                                  | 80   | -                                   | 160 | µA   |
| ΔI <sub>CC</sub> | additional supply current | V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; other inputs at V <sub>CC</sub> or GND; V <sub>CC</sub> = 4.5 V to 5.5 V; I <sub>O</sub> = 0 A |                          |     |      |                                    |      |                                     |     |      |
|                  |                           | Dn                                                                                                                                       | -                        | 30  | 108  | -                                  | 135  | -                                   | 147 | µA   |
|                  |                           | LE                                                                                                                                       | -                        | 150 | 540  | -                                  | 675  | -                                   | 735 | µA   |
|                  |                           | OE                                                                                                                                       | -                        | 100 | 360  | -                                  | 450  | -                                   | 490 | µA   |
| C <sub>I</sub>   | input capacitance         |                                                                                                                                          | -                        | 3.5 | -    | -                                  | -    | -                                   | -   | pF   |

10. Dynamic characteristics

Table 7. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); C<sub>L</sub> = 50 pF unless otherwise specified; for test circuit see Fig. 10.

| Symbol           | Parameter         | Conditions                                                    | T <sub>amb</sub> = 25 °C |     |     | T <sub>amb</sub> = -40 °C to +85 °C |     | T <sub>amb</sub> = -40 °C to +125 °C |     | Unit |
|------------------|-------------------|---------------------------------------------------------------|--------------------------|-----|-----|-------------------------------------|-----|--------------------------------------|-----|------|
|                  |                   |                                                               | Min                      | Typ | Max | Min                                 | Max | Min                                  | Max |      |
| 74HC373-Q100     |                   |                                                               |                          |     |     |                                     |     |                                      |     |      |
| t <sub>pd</sub>  | propagation delay | Dn to Qn; see <a href="#">Fig. 6</a> [1]                      |                          |     |     |                                     |     |                                      |     |      |
|                  |                   | V <sub>CC</sub> = 2.0 V                                       | -                        | 41  | 150 | -                                   | 190 | -                                    | 225 | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V                                       | -                        | 15  | 30  | -                                   | 38  | -                                    | 45  | ns   |
|                  |                   | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF                 | -                        | 12  | -   | -                                   | -   | -                                    | -   | ns   |
|                  |                   | V <sub>CC</sub> = 6.0 V                                       | -                        | 12  | 26  | -                                   | 33  | -                                    | 38  | ns   |
|                  |                   | LE to Qn; see <a href="#">Fig. 7</a>                          |                          |     |     |                                     |     |                                      |     |      |
|                  |                   | V <sub>CC</sub> = 2.0 V                                       | -                        | 50  | 175 | -                                   | 220 | -                                    | 265 | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V                                       | -                        | 18  | 35  | -                                   | 44  | -                                    | 53  | ns   |
|                  |                   | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF                 | -                        | 15  | -   | -                                   | -   | -                                    | -   | ns   |
|                  |                   | V <sub>CC</sub> = 6.0 V                                       | -                        | 14  | 30  | -                                   | 37  | -                                    | 45  | ns   |
| t <sub>en</sub>  | enable time       | $\overline{\text{OE}}$ to Qn; see <a href="#">Fig. 8</a> [2]  |                          |     |     |                                     |     |                                      |     |      |
|                  |                   | V <sub>CC</sub> = 2.0 V                                       | -                        | 44  | 150 | -                                   | 190 | -                                    | 225 | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V                                       | -                        | 16  | 30  | -                                   | 38  | -                                    | 45  | ns   |
|                  |                   | V <sub>CC</sub> = 6.0 V                                       | -                        | 13  | 26  | -                                   | 33  | -                                    | 38  | ns   |
| t <sub>dis</sub> | disable time      | $\overline{\text{OE}}$ to Qn; see <a href="#">Fig. 8</a> [3]  |                          |     |     |                                     |     |                                      |     |      |
|                  |                   | V <sub>CC</sub> = 2.0 V                                       | -                        | 47  | 150 | -                                   | 190 | -                                    | 225 | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V                                       | -                        | 17  | 30  | -                                   | 38  | -                                    | 45  | ns   |
|                  |                   | V <sub>CC</sub> = 6.0 V                                       | -                        | 14  | 26  | -                                   | 33  | -                                    | 38  | ns   |
| t <sub>t</sub>   | transition time   | Qn; see <a href="#">Fig. 6</a> and <a href="#">Fig. 7</a> [4] |                          |     |     |                                     |     |                                      |     |      |
|                  |                   | V <sub>CC</sub> = 2.0 V                                       | -                        | 14  | 60  | -                                   | 75  | -                                    | 90  | ns   |
|                  |                   | V <sub>CC</sub> = 4.5 V                                       | -                        | 5   | 12  | -                                   | 15  | -                                    | 18  | ns   |
|                  |                   | V <sub>CC</sub> = 6.0 V                                       | -                        | 4   | 10  | -                                   | 13  | -                                    | 15  | ns   |

| Symbol               | Parameter                     | Conditions                                                       | T <sub>amb</sub> = 25 °C |     |     | T <sub>amb</sub> = -40 °C<br>to +85 °C |     | T <sub>amb</sub> = -40 °C<br>to +125 °C |     | Unit |
|----------------------|-------------------------------|------------------------------------------------------------------|--------------------------|-----|-----|----------------------------------------|-----|-----------------------------------------|-----|------|
|                      |                               |                                                                  | Min                      | Typ | Max | Min                                    | Max | Min                                     | Max |      |
| t <sub>W</sub>       | pulse width                   | LE HIGH; see Fig. 7                                              |                          |     |     |                                        |     |                                         |     |      |
|                      |                               | V <sub>CC</sub> = 2.0 V                                          | 80                       | 17  | -   | 100                                    | -   | 120                                     | -   | ns   |
|                      |                               | V <sub>CC</sub> = 4.5 V                                          | 16                       | 6   | -   | 20                                     | -   | 24                                      | -   | ns   |
|                      |                               | V <sub>CC</sub> = 6.0 V                                          | 14                       | 5   | -   | 17                                     | -   | 20                                      | -   | ns   |
| t <sub>su</sub>      | set-up time                   | Dn to LE; see Fig. 9                                             |                          |     |     |                                        |     |                                         |     |      |
|                      |                               | V <sub>CC</sub> = 2.0 V                                          | 50                       | 14  | -   | 65                                     | -   | 75                                      | -   | ns   |
|                      |                               | V <sub>CC</sub> = 4.5 V                                          | 10                       | 5   | -   | 13                                     | -   | 15                                      | -   | ns   |
|                      |                               | V <sub>CC</sub> = 6.0 V                                          | 9                        | 4   | -   | 11                                     | -   | 13                                      | -   | ns   |
| t <sub>h</sub>       | hold time                     | Dn to LE; see Fig. 9                                             |                          |     |     |                                        |     |                                         |     |      |
|                      |                               | V <sub>CC</sub> = 2.0 V                                          | +5                       | -8  | -   | 5                                      | -   | 5                                       | -   | ns   |
|                      |                               | V <sub>CC</sub> = 4.5 V                                          | +5                       | -3  | -   | 5                                      | -   | 5                                       | -   | ns   |
|                      |                               | V <sub>CC</sub> = 6.0 V                                          | +5                       | -2  | -   | 5                                      | -   | 5                                       | -   | ns   |
| C <sub>PD</sub>      | power dissipation capacitance | per latch; V <sub>I</sub> = GND to V <sub>CC</sub> [5]           | -                        | 45  | -   | -                                      | -   | -                                       | -   | pF   |
| <b>74HCT373-Q100</b> |                               |                                                                  |                          |     |     |                                        |     |                                         |     |      |
| t <sub>pd</sub>      | propagation delay             | Dn to Qn; see Fig. 6 [1]                                         |                          |     |     |                                        |     |                                         |     |      |
|                      |                               | V <sub>CC</sub> = 4.5 V                                          | -                        | 17  | 30  | -                                      | 38  | -                                       | 45  | ns   |
|                      |                               | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF                    | -                        | 14  | -   | -                                      | -   | -                                       | -   | ns   |
|                      |                               | LE to Qn; see Fig. 7                                             |                          |     |     |                                        |     |                                         |     |      |
|                      |                               | V <sub>CC</sub> = 4.5 V                                          | -                        | 16  | 32  | -                                      | 40  | -                                       | 48  | ns   |
|                      |                               | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF                    | -                        | 13  | -   | -                                      | -   | -                                       | -   | ns   |
| t <sub>en</sub>      | enable time                   | OE to Qn; V <sub>CC</sub> = 4.5 V; see Fig. 8 [2]                | -                        | 19  | 32  | -                                      | 40  | -                                       | 48  | ns   |
| t <sub>dis</sub>     | disable time                  | OE to Qn; V <sub>CC</sub> = 4.5 V; see Fig. 8 [3]                | -                        | 18  | 30  | -                                      | 38  | -                                       | 45  | ns   |
| t <sub>t</sub>       | transition time               | Qn; V <sub>CC</sub> = 4.5 V; see Fig. 6 and Fig. 7 [4]           | -                        | 5   | 12  | -                                      | 15  | -                                       | 18  | ns   |
| t <sub>W</sub>       | pulse width                   | LE HIGH; V <sub>CC</sub> = 4.5 V; see Fig. 7                     | 16                       | 4   | -   | 20                                     | -   | 24                                      | -   | ns   |
| t <sub>su</sub>      | set-up time                   | Dn to LE; V <sub>CC</sub> = 4.5 V; see Fig. 9                    | 12                       | 6   | -   | 15                                     | -   | 18                                      | -   | ns   |
| t <sub>h</sub>       | hold time                     | Dn to LE; V <sub>CC</sub> = 4.5 V; see Fig. 9                    | 4                        | -1  | -   | 4                                      | -   | 4                                       | -   | ns   |
| C <sub>PD</sub>      | power dissipation capacitance | per latch; V <sub>I</sub> = GND to (V <sub>CC</sub> - 1.5 V) [5] | -                        | 41  | -   | -                                      | -   | -                                       | -   | pF   |

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

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

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

[4] t<sub>t</sub> is the same as t<sub>THL</sub> and t<sub>TLH</sub>.

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

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

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

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

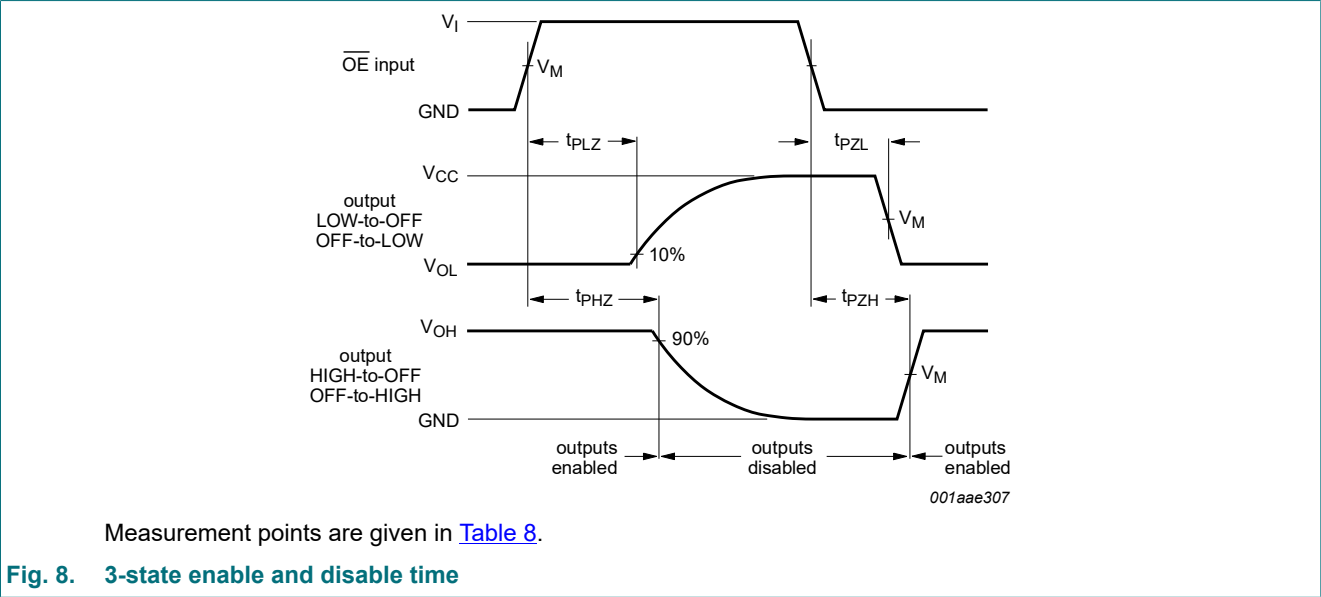
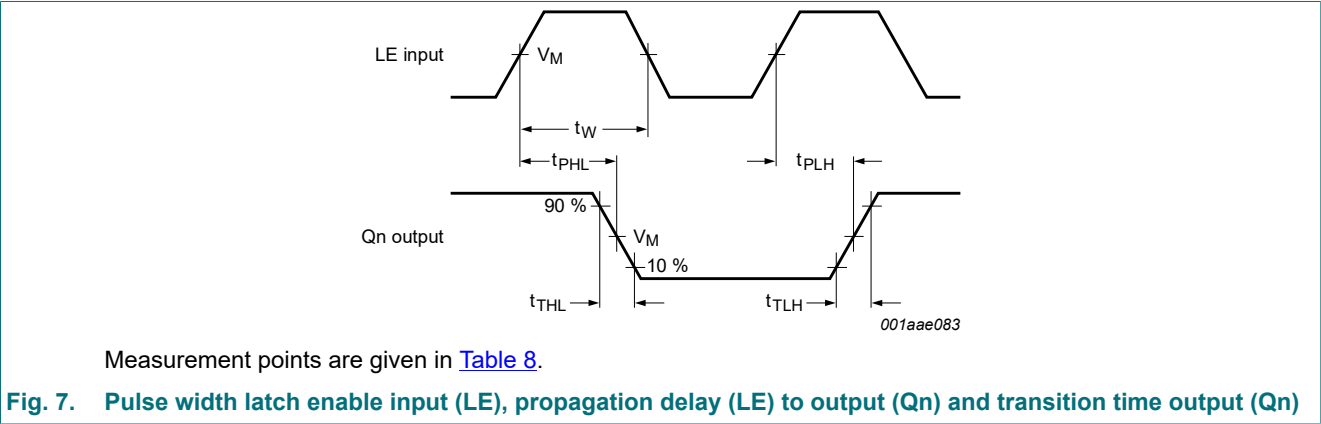
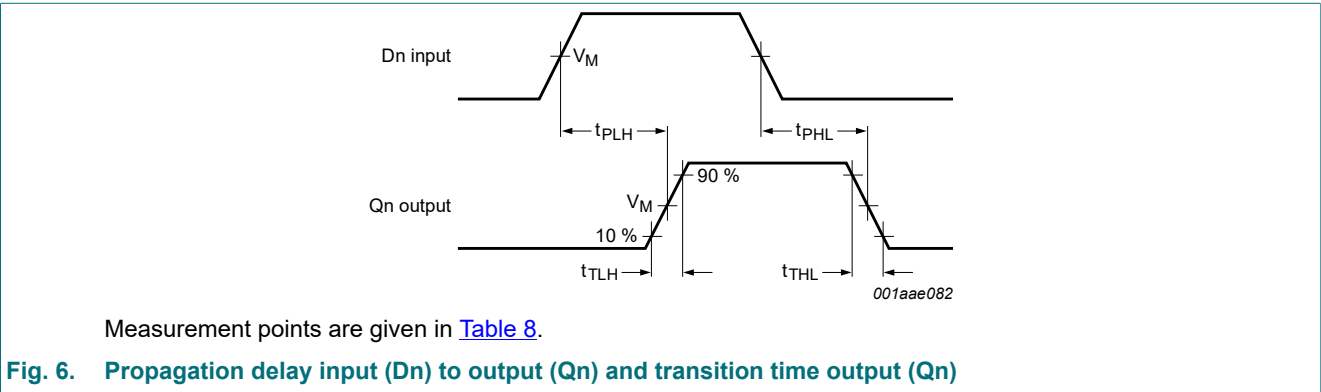
C<sub>L</sub> = output load capacitance in pF;

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

N = number of inputs switching;

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

10.1. Waveforms and test circuit



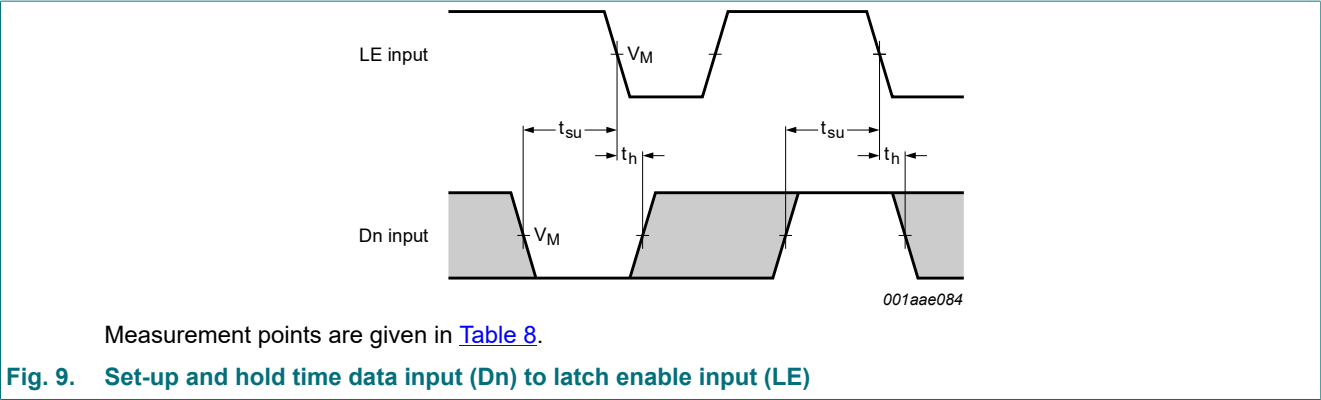


Table 8. Measurement points

| Type          | Input               | Output              |
|---------------|---------------------|---------------------|
|               | $V_M$               | $V_M$               |
| 74HC373-Q100  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |
| 74HCT373-Q100 | 1.3 V               | 1.3 V               |

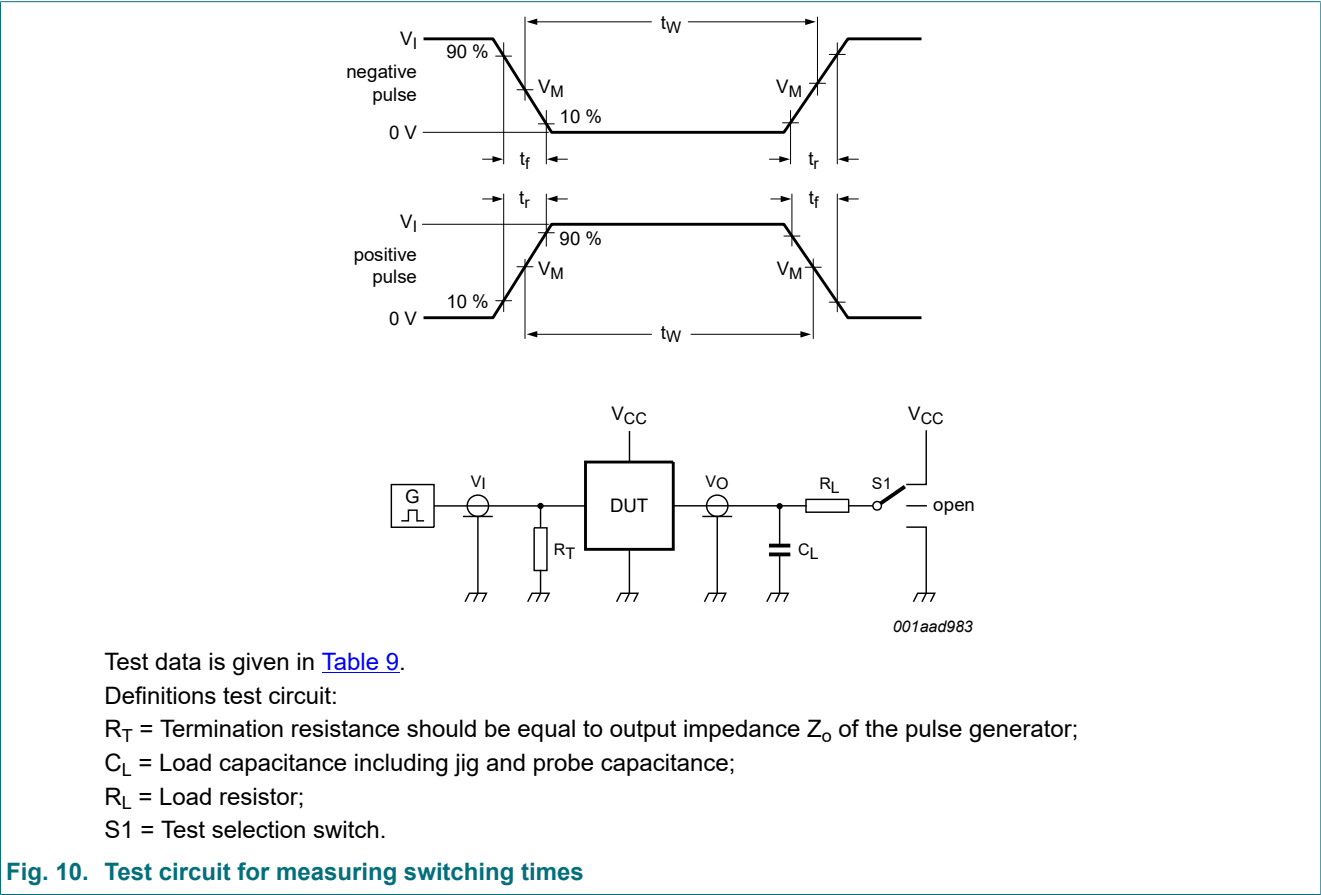


Table 9. Test data

| Type          | Input    |            | Load         |              | S1 position        |                    |                    |
|---------------|----------|------------|--------------|--------------|--------------------|--------------------|--------------------|
|               | $V_I$    | $t_r, t_f$ | $C_L$        | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74HC373-Q100  | $V_{CC}$ | 6 ns       | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74HCT373-Q100 | 3 V      | 6 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. 11. Package outline SOT163-1 (SO20)

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

SOT360-1



Fig. 12. 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

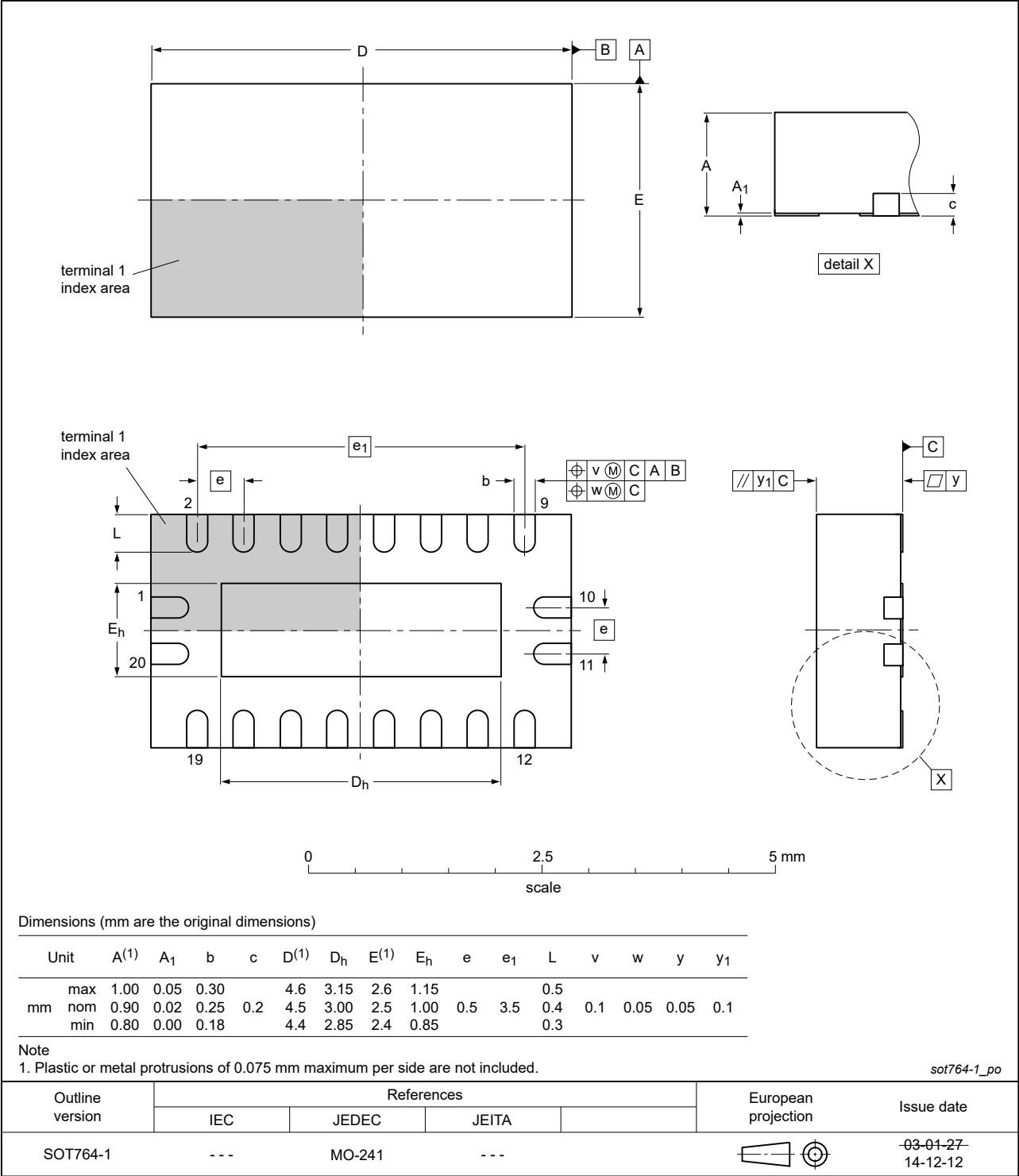


Fig. 13. Package outline SOT764-1 (DHVQFN20)

12. Abbreviations

Table 10. Abbreviations

| Acronym | Description                               |
|---------|-------------------------------------------|
| ANSI    | American National Standards Institute     |
| CDM     | Charged Device Model                      |
| CMOS    | Complementary Metal Oxide Semiconductor   |
| 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_HCT373_Q100 v.3 | 20240805                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Product data sheet | -             | 74HC_HCT373_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>                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |               |                      |
| 74HC_HCT373_Q100 v.2 | 20200722                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Product data sheet | -             | 74HC_HCT373_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 P<sub>tot</sub> total power dissipation updated.</li><li><a href="#">Table 6</a>: Conditions I<sub>OZ</sub> updated.</li><li><a href="#">Fig. 13</a>: Package outline drawing SOT764-1 (DHVQFN20) updated.</li></ul> |                    |               |                      |
| 74HC_HCT373_Q100 v.1 | 20120810                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 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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Contents

|                                          |    |
|------------------------------------------|----|
| 1. General description.....              | 1  |
| 2. Features and benefits.....            | 1  |
| 3. Ordering information.....             | 2  |
| 4. Functional diagram.....               | 2  |
| 5. Pinning information.....              | 4  |
| 5.1. Pinning.....                        | 4  |
| 5.2. Pin description.....                | 4  |
| 6. Functional description.....           | 5  |
| 7. Limiting values.....                  | 5  |
| 8. Recommended operating conditions..... | 5  |
| 9. Static characteristics.....           | 6  |
| 10. Dynamic characteristics.....         | 7  |
| 10.1. Waveforms and test circuit.....    | 9  |
| 11. Package outline.....                 | 11 |
| 12. Abbreviations.....                   | 14 |
| 13. Revision history.....                | 14 |
| 14. Legal information.....               | 15 |

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