

# 74AVC16374-Q100

16-bit edge triggered D-type flip-flop; 3.6 V tolerant; 3-state

Rev. 2 — 16 March 2015

Product data sheet

## 1. General description

The 74AVC16374-Q100 is a 16-bit edge triggered flip-flop featuring separate D-type inputs for each flip-flop and 3-state outputs for bus-oriented applications. The 74AVC16374-Q100 consist of 2 sections of 8 edge-triggered flip-flops. A clock input (CP) and an output enable ( $\overline{OE}$ ) are provided per 8-bit section.

The 74AVC16374-Q100 is designed to have an extremely fast propagation delay and a minimum amount of power consumption.

To ensure the high-impedance output state during power-up or power-down,  $\overline{nOE}$  should be tied to VCC through a pull-up resistor (Live Insertion).

A Dynamic Controlled Output (DCO) circuitry is implemented to support termination line drive during transient (see [Figure 5](#) and [Figure 6](#)).

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 3) and is suitable for use in automotive applications.

## 2. Features and benefits

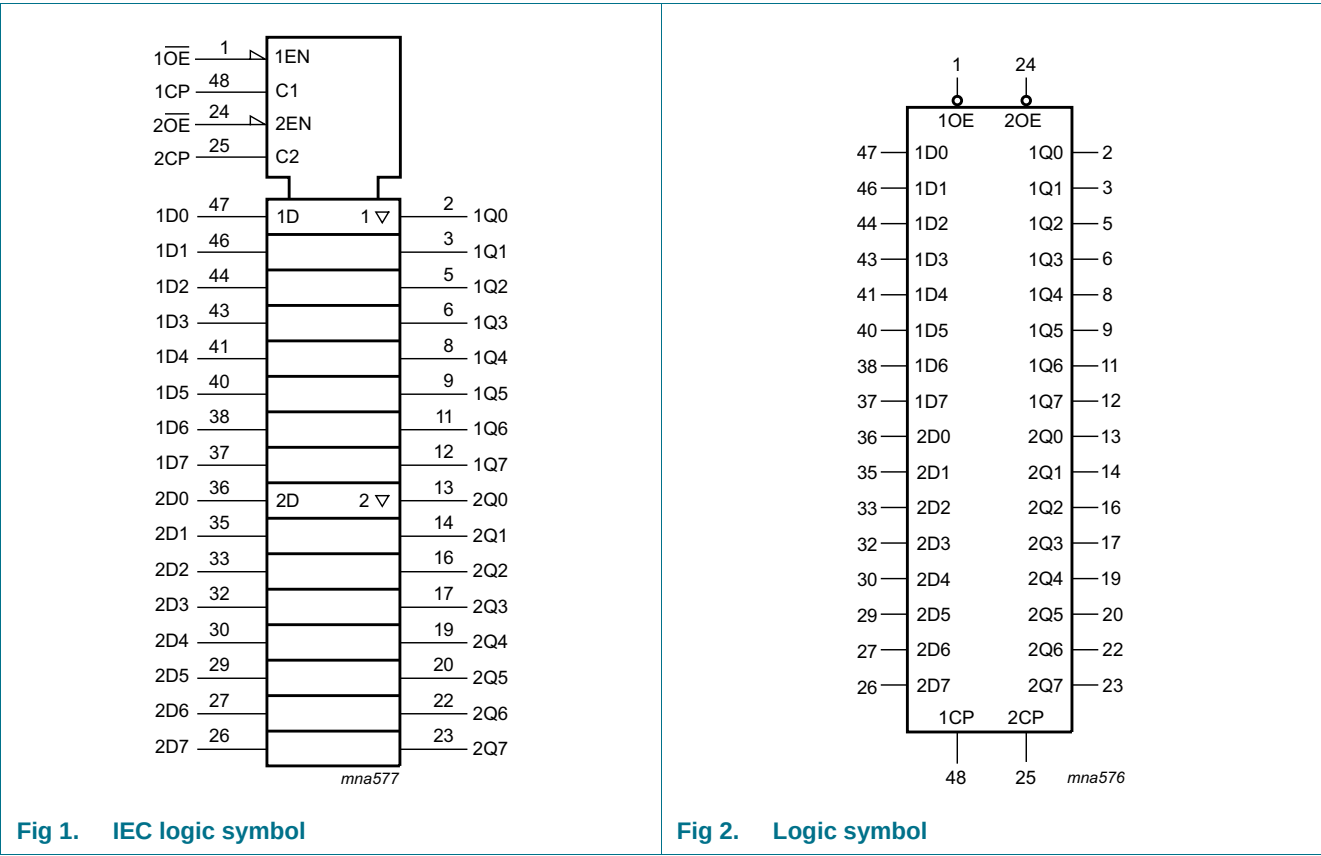
- Automotive product qualification in accordance with AEC-Q100 (Grade 3)
  - ◆ Specified from  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$
- Wide supply voltage range from 1.2 V to 3.6 V
- Complies with JEDEC standards:
  - ◆ JESD8-7 (1.2 V to 1.95 V)
  - ◆ JESD8-5 (1.8 V to 2.7 V)
  - ◆ JESD8-1A (2.7 V to 3.6 V)
- ESD protection:
  - ◆ MIL-STD-883, method 3015 exceeds 1000 V
  - ◆ HBM JESD22-A114F exceeds 1000 V
  - ◆ MM JESD22-A115-A exceeds 200 V ( $C = 200\text{ pF}$ ,  $R = 0\text{ }\Omega$ )
- CMOS low power consumption
- Input/output tolerant up to 3.6 V
- Dynamic Controlled Output (DCO) circuit dynamically changes output impedance, resulting in noise reduction without speed degradation
- Low inductance multiple VCC and GND pins to minimize noise and ground bounce
- Supports Live Insertion

3. Ordering information

Table 1. Ordering information

| Type number        | Package           |         |                                                                           |          |
|--------------------|-------------------|---------|---------------------------------------------------------------------------|----------|
|                    | Temperature range | Name    | Description                                                               | Version  |
| 74AVC16374DGG-Q100 | −40 °C to +85 °C  | TSSOP48 | plastic thin shrink small outline package;<br>48 leads; body width 6.1 mm | SOT362-1 |

4. Functional diagram



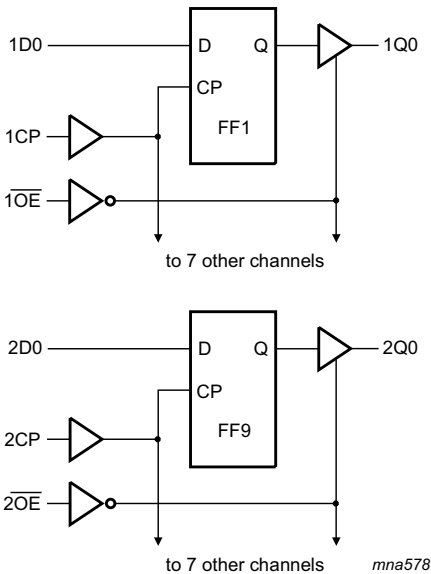


Fig 3. Logic diagram

5. Pinning information

5.1 Pinning

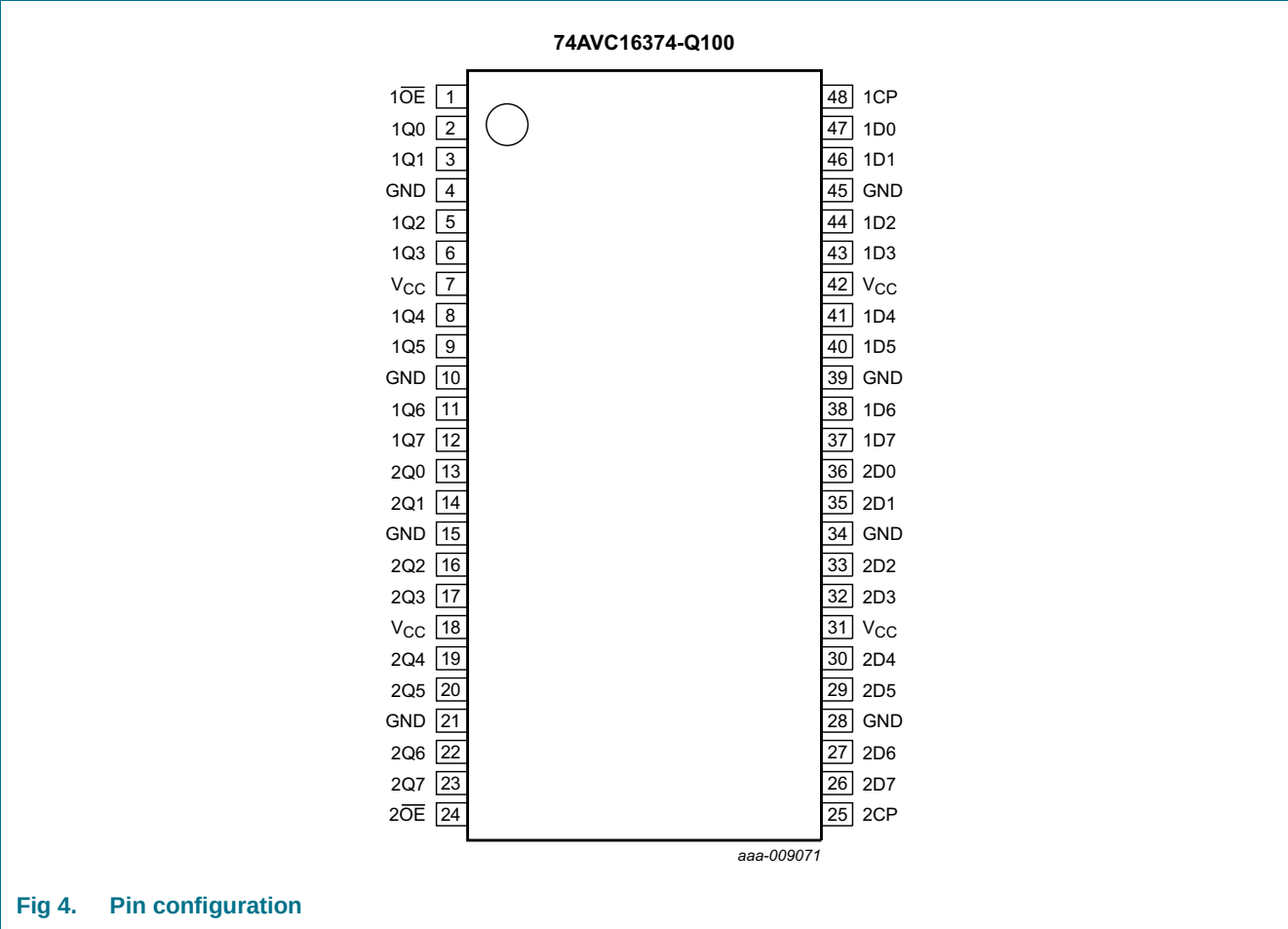


Fig 4. Pin configuration

5.2 Pin description

Table 2. Pin description

| Symbol          | Pin                            | Description                      |
|-----------------|--------------------------------|----------------------------------|
| 1OE             | 1                              | output enable input (active LOW) |
| 1Q0 to 1Q7      | 2, 3, 5, 6, 8, 9, 11, 12       | 3-state flip-flop outputs        |
| GND             | 4, 10, 15, 21, 28, 34, 39, 45  | ground (0 V)                     |
| V <sub>CC</sub> | 7, 18, 31, 42                  | supply voltage                   |
| 2Q0 to 2Q7      | 13, 14, 16, 17, 19, 20, 22, 23 | 3-state flip-flop outputs        |
| 2OE             | 24                             | output enable input (active LOW) |
| 2CP             | 25                             | clock input                      |
| 2D0 to 2D7      | 36, 35, 33, 32, 30, 29, 27, 26 | data input/output                |
| 1D0 to 1D7      | 47, 46, 44, 43, 41, 40, 38, 37 | data input/output                |
| 1CP             | 48                             | clock input                      |

## 6. Functional description

Table 3. Function table<sup>[1]</sup>

| Operating modes                   | Inputs |     |     | Internal flip-flops | Outputs<br>nQn |
|-----------------------------------|--------|-----|-----|---------------------|----------------|
|                                   | nOE    | nCp | nDn |                     |                |
| Load and read register            | L      | ↑   | l   | L                   | L              |
|                                   | L      | ↑   | h   | H                   | H              |
| Load register and disable outputs | H      | ↑   | l   | L                   | Z              |
|                                   | H      | ↑   | h   | H                   | Z              |

- [1] 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  
 Z = high-impedance OFF-state  
 ↑ = LOW-to-HIGH CP transition

## 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                | +4.6                  | V    |
| I <sub>IK</sub>  | input clamping current  | V <sub>I</sub> < 0 V                    | -                   | -50                   | mA   |
| V <sub>I</sub>   | input voltage           |                                         | <sup>[1]</sup> -0.5 | +4.6                  | V    |
| I <sub>OK</sub>  | output clamping current | V <sub>O</sub> < 0 V                    | -50                 | -                     | mA   |
| V <sub>O</sub>   | output voltage          | output HIGH or LOW                      | <sup>[1]</sup> -0.5 | V <sub>CC</sub> + 0.5 | V    |
|                  |                         | output 3-state                          | <sup>[1]</sup> -0.5 | +4.6                  | V    |
| I <sub>O</sub>   | output current          | V <sub>O</sub> = 0 V to V <sub>CC</sub> | -                   | ±50                   | mA   |
| I <sub>CC</sub>  | supply current          |                                         | -                   | +100                  | mA   |
| I <sub>GND</sub> | ground current          |                                         | -100                | -                     | mA   |
| T <sub>stg</sub> | storage temperature     |                                         | -65                 | +150                  | °C   |
| P <sub>tot</sub> | total power dissipation | T <sub>amb</sub> = -40 °C to +85 °C     | <sup>[2]</sup> -    | 500                   | mW   |

- [1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.  
 [2] Above 60 °C, the value of P<sub>tot</sub> derates linearly with 5.5 mW/K.

## 8. Recommended operating conditions

Table 5. Recommended operating conditions

| Symbol           | Parameter                           | Conditions                               | Min  | Typ | Max             | Unit |
|------------------|-------------------------------------|------------------------------------------|------|-----|-----------------|------|
| V <sub>CC</sub>  | supply voltage                      | according to JEDEC Low Voltage Standards | 1.4  | -   | 1.6             | V    |
|                  |                                     |                                          | 1.65 | -   | 1.95            | V    |
|                  |                                     |                                          | 2.3  | -   | 2.7             | V    |
|                  |                                     |                                          | 3.0  | -   | 3.6             | V    |
|                  |                                     | for low-voltage applications             | 1.2  | -   | 3.6             | V    |
| V <sub>I</sub>   | input voltage                       |                                          | 0    | -   | 3.6             | V    |
| V <sub>O</sub>   | output voltage                      | output HIGH or LOW                       | 0    | -   | V <sub>CC</sub> | V    |
|                  |                                     | output 3-state                           | 0    | -   | 3.6             | V    |
| T <sub>amb</sub> | ambient temperature                 | in free air                              | -40  | -   | +85             | °C   |
| Δt/ΔV            | input transition rise and fall rate | V <sub>CC</sub> = 1.4 V to 1.6 V         | 0    | -   | 40              | ns/V |
|                  |                                     | V <sub>CC</sub> = 1.65 V to 2.3 V        | 0    | -   | 30              | ns/V |
|                  |                                     | V <sub>CC</sub> = 2.3 V to 3.0 V         | 0    | -   | 20              | ns/V |
|                  |                                     | V <sub>CC</sub> = 3.0 V to 3.6 V         | 0    | -   | 10              | ns/V |

## 9. Static characteristics

Table 6. Static characteristics

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

| Symbol                              | Parameter                 | Conditions                                                  | Min                    | Typ <sup>[1]</sup>     | Max                    | Unit |
|-------------------------------------|---------------------------|-------------------------------------------------------------|------------------------|------------------------|------------------------|------|
| T <sub>amb</sub> = -40 °C to +85 °C |                           |                                                             |                        |                        |                        |      |
| V <sub>IH</sub>                     | HIGH-level input voltage  | V <sub>CC</sub> = 1.2 V                                     | V <sub>CC</sub>        | -                      | -                      | V    |
|                                     |                           | V <sub>CC</sub> = 1.4 V to 1.6 V                            | 0.65 × V <sub>CC</sub> | 0.9                    | -                      | V    |
|                                     |                           | V <sub>CC</sub> = 1.65 V to 1.95 V                          | 0.65 × V <sub>CC</sub> | 0.9                    | -                      | V    |
|                                     |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                            | 1.7                    | 1.2                    | -                      | V    |
|                                     |                           | V <sub>CC</sub> = 3.0 V to 3.6 V                            | 2.0                    | 1.5                    | -                      | V    |
| V <sub>IL</sub>                     | LOW-level input voltage   | V <sub>CC</sub> = 1.2 V                                     | -                      | -                      | GND                    | V    |
|                                     |                           | V <sub>CC</sub> = 1.4 V to 1.6 V                            | -                      | 0.9                    | 0.35 × V <sub>CC</sub> | V    |
|                                     |                           | V <sub>CC</sub> = 1.65 V to 1.95 V                          | -                      | 0.9                    | 0.35 × V <sub>CC</sub> | V    |
|                                     |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                            | -                      | 1.2                    | 0.7                    | V    |
|                                     |                           | V <sub>CC</sub> = 3.0 V to 3.6 V                            | -                      | 1.5                    | 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> = -100 μA; V <sub>CC</sub> = 1.65 V to 3.6 V | V <sub>CC</sub> - 0.20 | V <sub>CC</sub>        | -                      | V    |
|                                     |                           | I <sub>O</sub> = -3 mA; V <sub>CC</sub> = 1.4 V             | V <sub>CC</sub> - 0.35 | V <sub>CC</sub> - 0.23 | -                      | V    |
|                                     |                           | I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 1.65 V            | V <sub>CC</sub> - 0.45 | V <sub>CC</sub> - 0.25 | -                      | V    |
|                                     |                           | I <sub>O</sub> = -8 mA; V <sub>CC</sub> = 2.3 V             | V <sub>CC</sub> - 0.55 | V <sub>CC</sub> - 0.38 | -                      | V    |
|                                     |                           | I <sub>O</sub> = -12 mA; V <sub>CC</sub> = 3.0 V            | V <sub>CC</sub> - 0.70 | V <sub>CC</sub> - 0.48 | -                      | V    |

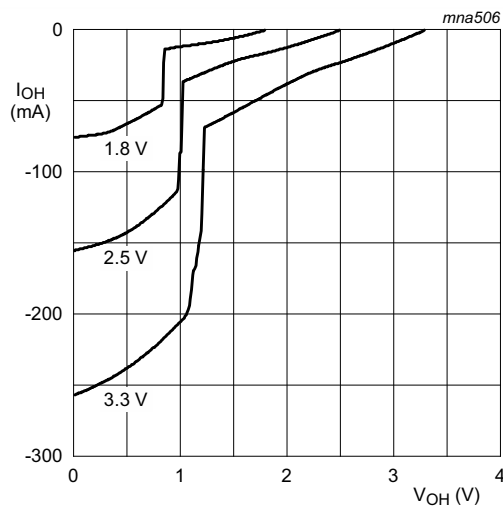
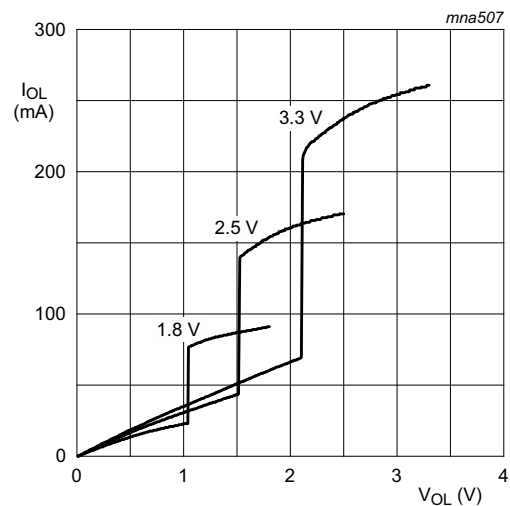
**Table 6.** Static characteristics ...continued

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

| Symbol           | Parameter                 | Conditions                                                                                    | Min | Typ <sup>[1]</sup> | Max  | Unit |
|------------------|---------------------------|-----------------------------------------------------------------------------------------------|-----|--------------------|------|------|
| 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> = 100 µA; V <sub>CC</sub> = 1.65 V to 3.6 V                                    | -   | GND                | 0.20 | V    |
|                  |                           | I <sub>O</sub> = 3 mA; V <sub>CC</sub> = 1.4 V                                                | -   | 0.10               | 0.35 | V    |
|                  |                           | I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V                                               | -   | 0.10               | 0.45 | V    |
|                  |                           | I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V                                                | -   | 0.26               | 0.55 | V    |
|                  |                           | I <sub>O</sub> = 12 mA; V <sub>CC</sub> = 3.0 V                                               | -   | 0.36               | 0.70 | V    |
| I <sub>I</sub>   | input leakage current     | per pin; V <sub>I</sub> = V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 1.4 V to 3.6 V         | -   | 0.1                | 2.5  | µA   |
| I <sub>OFF</sub> | power-off leakage current | V <sub>I</sub> or V <sub>O</sub> = 3.6 V; V <sub>CC</sub> = 0.0 V                             | -   | ±0.1               | ±10  | µA   |
| I <sub>OZ</sub>  | OFF-state output current  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = V <sub>CC</sub> or GND |     |                    |      |      |
|                  |                           | V <sub>CC</sub> = 1.4 V to 2.7 V                                                              | -   | 0.1                | 5    | µA   |
|                  |                           | V <sub>CC</sub> = 3.0 V to 3.6 V                                                              | -   | 0.1                | 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> = 1.4 V to 2.7 V                                                              | -   | 0.1                | 20   | µA   |
|                  |                           | V <sub>CC</sub> = 3.0 V to 3.6 V                                                              | -   | 0.2                | 40   | µA   |
| C <sub>I</sub>   | input capacitance         |                                                                                               | -   | 5                  | -    | pF   |

[1] All typical values are measured at T<sub>amb</sub> = 25 °C.

## 9.1 Graphs

**Fig 5.** Output voltage as a function of the HIGH-level output current.**Fig 6.** Output voltage as a function of the LOW-level output current.

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V).  $t_r = t_f \leq 2$  ns. For test circuit, see [Figure 10](#).

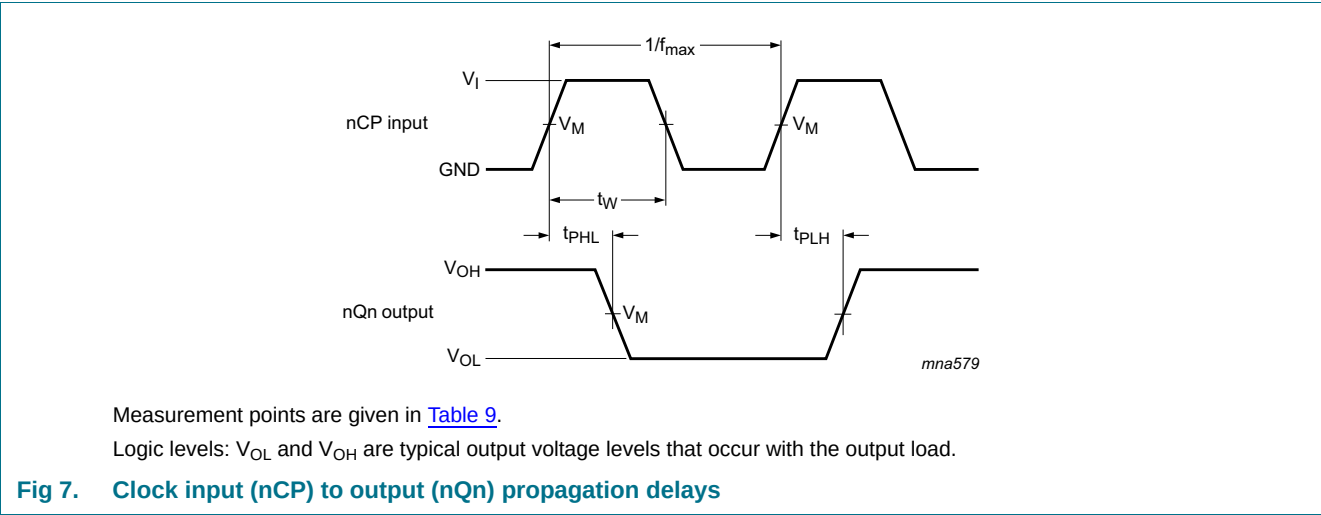
| Symbol    | Parameter         | Conditions                                                   | –40 °C to +85 °C |                    |     | Unit |
|-----------|-------------------|--------------------------------------------------------------|------------------|--------------------|-----|------|
|           |                   |                                                              | Min              | Typ <sup>[2]</sup> | Max |      |
| $t_{pd}$  | propagation delay | nCP to nQn; see <a href="#">Figure 7</a> <sup>[1]</sup>      |                  |                    |     |      |
|           |                   | $V_{CC} = 1.2$ V                                             | -                | 3.1                | -   | ns   |
|           |                   | $V_{CC} = 1.4$ V to 1.6 V                                    | 1.2              | 2.4                | 8.4 | ns   |
|           |                   | $V_{CC} = 1.65$ V to 1.95 V                                  | 1.0              | 2.0                | 6.7 | ns   |
|           |                   | $V_{CC} = 2.3$ V to 2.7 V                                    | 0.8              | 1.5                | 4.1 | ns   |
|           |                   | $V_{CC} = 3.0$ V to 3.6 V                                    | 0.7              | 1.3                | 3.3 | ns   |
| $t_{en}$  | enable time       | nOE to nQn, nBn; see <a href="#">Figure 8</a> <sup>[1]</sup> |                  |                    |     |      |
|           |                   | $V_{CC} = 1.2$ V                                             | -                | 5.4                | -   | ns   |
|           |                   | $V_{CC} = 1.4$ V to 1.6 V                                    | 1.6              | 3.9                | 8.5 | ns   |
|           |                   | $V_{CC} = 1.65$ V to 1.95 V                                  | 2.3              | 3.3                | 6.7 | ns   |
|           |                   | $V_{CC} = 2.3$ V to 2.7 V                                    | 0.9              | 2.3                | 4.3 | ns   |
|           |                   | $V_{CC} = 3.0$ V to 3.6 V                                    | 0.7              | 2.0                | 3.4 | ns   |
| $t_{dis}$ | disable time      | nOE to nQn; see <a href="#">Figure 8</a> <sup>[1]</sup>      |                  |                    |     |      |
|           |                   | $V_{CC} = 1.2$ V                                             | -                | 5.6                | -   | ns   |
|           |                   | $V_{CC} = 1.4$ V to 1.6 V                                    | 2.5              | 4.5                | 9.4 | ns   |
|           |                   | $V_{CC} = 1.65$ V to 1.95 V                                  | 1.8              | 3.3                | 7.8 | ns   |
|           |                   | $V_{CC} = 2.3$ V to 2.7 V                                    | 1.0              | 1.8                | 4.2 | ns   |
|           |                   | $V_{CC} = 3.0$ V to 3.6 V                                    | 1.2              | 2.0                | 3.9 | ns   |
| $t_w$     | pulse width       | HIGH; nCP; see <a href="#">Figure 7</a>                      |                  |                    |     |      |
|           |                   | $V_{CC} = 1.2$ V                                             | -                | 0.8                | -   | ns   |
|           |                   | $V_{CC} = 1.4$ V to 1.6 V                                    | -                | 0.5                | -   | ns   |
|           |                   | $V_{CC} = 1.65$ V to 1.95 V                                  | 3.1              | 0.3                | -   | ns   |
|           |                   | $V_{CC} = 2.3$ V to 2.7 V                                    | 2.5              | 0.2                | -   | ns   |
|           |                   | $V_{CC} = 3.0$ V to 3.6 V                                    | 2.5              | 0.2                | -   | ns   |
| $t_{su}$  | set-up time       | nDn to nCP; see <a href="#">Figure 8</a>                     |                  |                    |     |      |
|           |                   | $V_{CC} = 1.2$ V                                             | -                | –0.6               | -   | ns   |
|           |                   | $V_{CC} = 1.4$ V to 1.6 V                                    | 2.7              | –0.3               | -   | ns   |
|           |                   | $V_{CC} = 1.65$ V to 1.95 V                                  | 1.9              | –0.3               | -   | ns   |
|           |                   | $V_{CC} = 2.3$ V to 2.7 V                                    | 1.4              | –0.2               | -   | ns   |
|           |                   | $V_{CC} = 3.0$ V to 3.6 V                                    | 1.4              | –0.1               | -   | ns   |
| $t_h$     | hold time         | nDn to nCP; see <a href="#">Figure 8</a>                     |                  |                    |     |      |
|           |                   | $V_{CC} = 1.2$ V                                             | -                | 0.8                | -   | ns   |
|           |                   | $V_{CC} = 1.4$ V to 1.6 V                                    | 1.3              | 0.7                | -   | ns   |
|           |                   | $V_{CC} = 1.65$ V to 1.95 V                                  | 1.2              | 0.6                | -   | ns   |
|           |                   | $V_{CC} = 2.3$ V to 2.7 V                                    | 1.1              | 0.5                | -   | ns   |
|           |                   | $V_{CC} = 3.0$ V to 3.6 V                                    | 1.1              | 0.4                | -   | ns   |

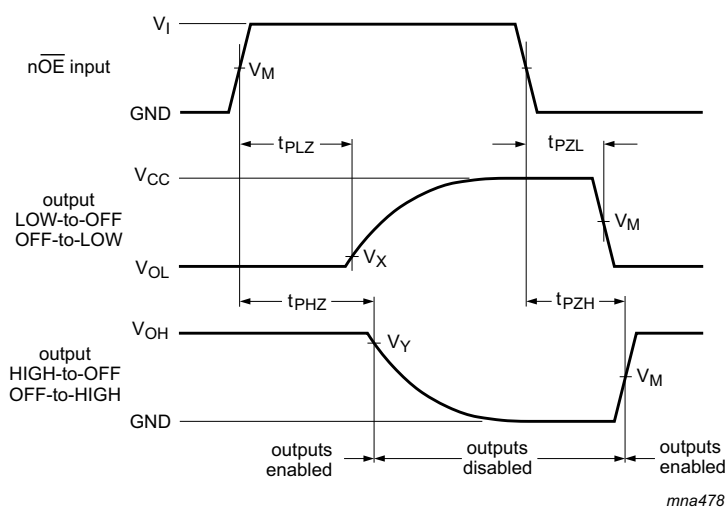
Table 7. Dynamic characteristics ...continued  
Voltages are referenced to GND (ground = 0 V).  $t_r = t_f \leq 2$  ns. For test circuit, see Figure 10.

| Symbol           | Parameter                     | Conditions                                                        | −40 °C to +85 °C |                    |     | Unit |
|------------------|-------------------------------|-------------------------------------------------------------------|------------------|--------------------|-----|------|
|                  |                               |                                                                   | Min              | Typ <sup>[2]</sup> | Max |      |
| f <sub>max</sub> | maximum frequency             | see Figure 8                                                      |                  |                    |     |      |
|                  |                               | V <sub>CC</sub> = 1.2 V                                           | -                | 250                | -   | MHz  |
|                  |                               | V <sub>CC</sub> = 1.4 V to 1.6 V                                  | -                | 300                | -   | MHz  |
|                  |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                | 160              | 320                | -   | MHz  |
|                  |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                  | 200              | 350                | -   | MHz  |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                  | 200              | 350                | -   | MHz  |
| C <sub>PD</sub>  | power dissipation capacitance | per input; V <sub>I</sub> = GND to V <sub>CC</sub> <sup>[3]</sup> |                  |                    |     |      |
|                  |                               | outputs enabled                                                   | -                | 66                 | -   | pF   |
|                  |                               | outputs disabled                                                  | -                | 1                  | -   | pF   |

- [1]  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .  
 $t_{en}$  is the same as  $t_{PZL}$  and  $t_{PZH}$ .  
 $t_{dis}$  is the same as  $t_{PLZ}$  and  $t_{PHZ}$ .
- [2] Typical values are measured at  $T_{amb} = 25$  °C and  $V_{CC} = 1.2$  V, 1.5 V, 1.8 V, 2.5 V and 3.3 V respectively.
- [3]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu$ W).  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$  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 Volts  
 $N$  = number of inputs switching  
 $\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of the outputs.

11. Waveforms

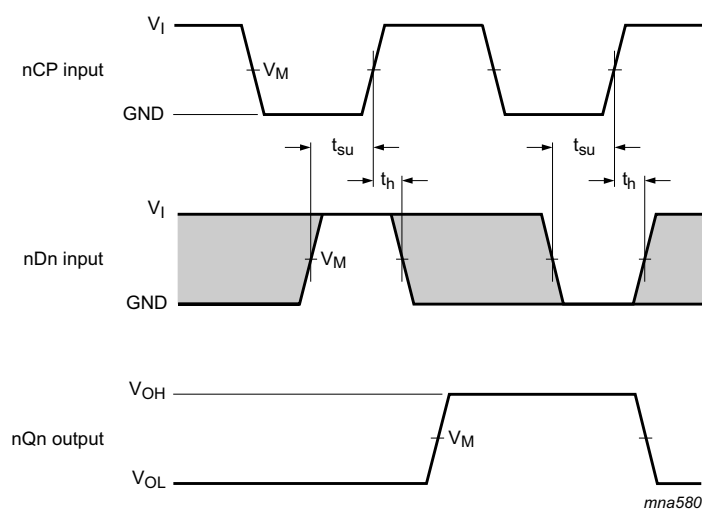




Measurement points are given in [Table 9](#).

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

**Fig 8. 3-state enable and disable times**



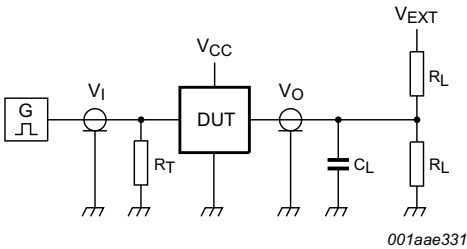
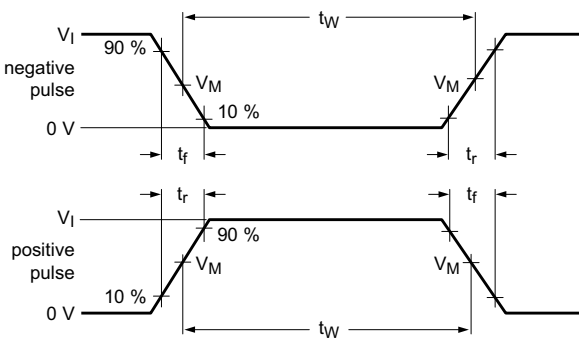
Measurement points are given in [Table 9](#).

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

**Fig 9. Data set-up and hold times for nDn input to nCP input**

Table 8. Measurement points

| Supply voltage   | $V_M$               | Input    |                     |                           |                           |
|------------------|---------------------|----------|---------------------|---------------------------|---------------------------|
| $V_{CC}$         |                     | $V_I$    | $t_r = t_f$         | $V_X$                     | $V_Y$                     |
| 1.2 V            | $0.5 \times V_{CC}$ | $V_{CC}$ | $\leq 2 \text{ ns}$ | $V_{OL} + 0.15 \text{ V}$ | $V_{OH} - 0.15 \text{ V}$ |
| 1.4 V to 1.6 V   | $0.5 \times V_{CC}$ | $V_{CC}$ | $\leq 2 \text{ ns}$ | $V_{OL} + 0.15 \text{ V}$ | $V_{OH} - 0.15 \text{ V}$ |
| 1.65 V to 1.95 V | $0.5 \times V_{CC}$ | $V_{CC}$ | $\leq 2 \text{ ns}$ | $V_{OL} + 0.15 \text{ V}$ | $V_{OH} - 0.15 \text{ V}$ |
| 2.3 V to 2.7 V   | $0.5 \times V_{CC}$ | $V_{CC}$ | $\leq 2 \text{ ns}$ | $V_{OL} + 0.15 \text{ V}$ | $V_{OH} - 0.15 \text{ V}$ |
| 3.0 V to 3.6 V   | $0.5 \times V_{CC}$ | $V_{CC}$ | $\leq 2 \text{ ns}$ | $V_{OL} + 0.3 \text{ V}$  | $V_{OH} - 0.3 \text{ V}$  |



Test data is given in [Table 9](#).  
Definitions for test circuit:  
 $R_L$  = Load resistance.  
 $C_L$  = Load capacitance including jig and probe capacitance.  
 $R_T$  = Termination resistance should be equal to output impedance  $Z_o$  of the pulse generator.  
 $V_{EXT}$  = External voltage for measuring switching times.

Fig 10. Test circuit for measuring switching times

Table 9. Test data

| Supply voltage   | Input    |                     | Load  |              | $V_{EXT}$          |                    |                    |
|------------------|----------|---------------------|-------|--------------|--------------------|--------------------|--------------------|
|                  | $V_I$    | $t_r, t_f$          | $C_L$ | $R_L$        | $t_{PLH}, t_{PHL}$ | $t_{PLZ}, t_{PZL}$ | $t_{PHZ}, t_{PZH}$ |
| 1.2 V            | $V_{CC}$ | $\leq 2 \text{ ns}$ | 15 pF | 2 k $\Omega$ | open               | $2 \times V_{CC}$  | GND                |
| 1.4 V to 1.6 V   | $V_{CC}$ | $\leq 2 \text{ ns}$ | 15 pF | 2 k $\Omega$ | open               | $2 \times V_{CC}$  | GND                |
| 1.65 V to 1.95 V | $V_{CC}$ | $\leq 2 \text{ ns}$ | 30 pF | 1 k $\Omega$ | open               | $2 \times V_{CC}$  | GND                |
| 2.3 V to 2.7 V   | $V_{CC}$ | $\leq 2 \text{ ns}$ | 30 pF | 500 $\Omega$ | open               | $2 \times V_{CC}$  | GND                |
| 3.0 V to 3.6 V   | $V_{CC}$ | $\leq 2 \text{ ns}$ | 30 pF | 500 $\Omega$ | open               | $2 \times V_{CC}$  | GND                |

12. Package outline

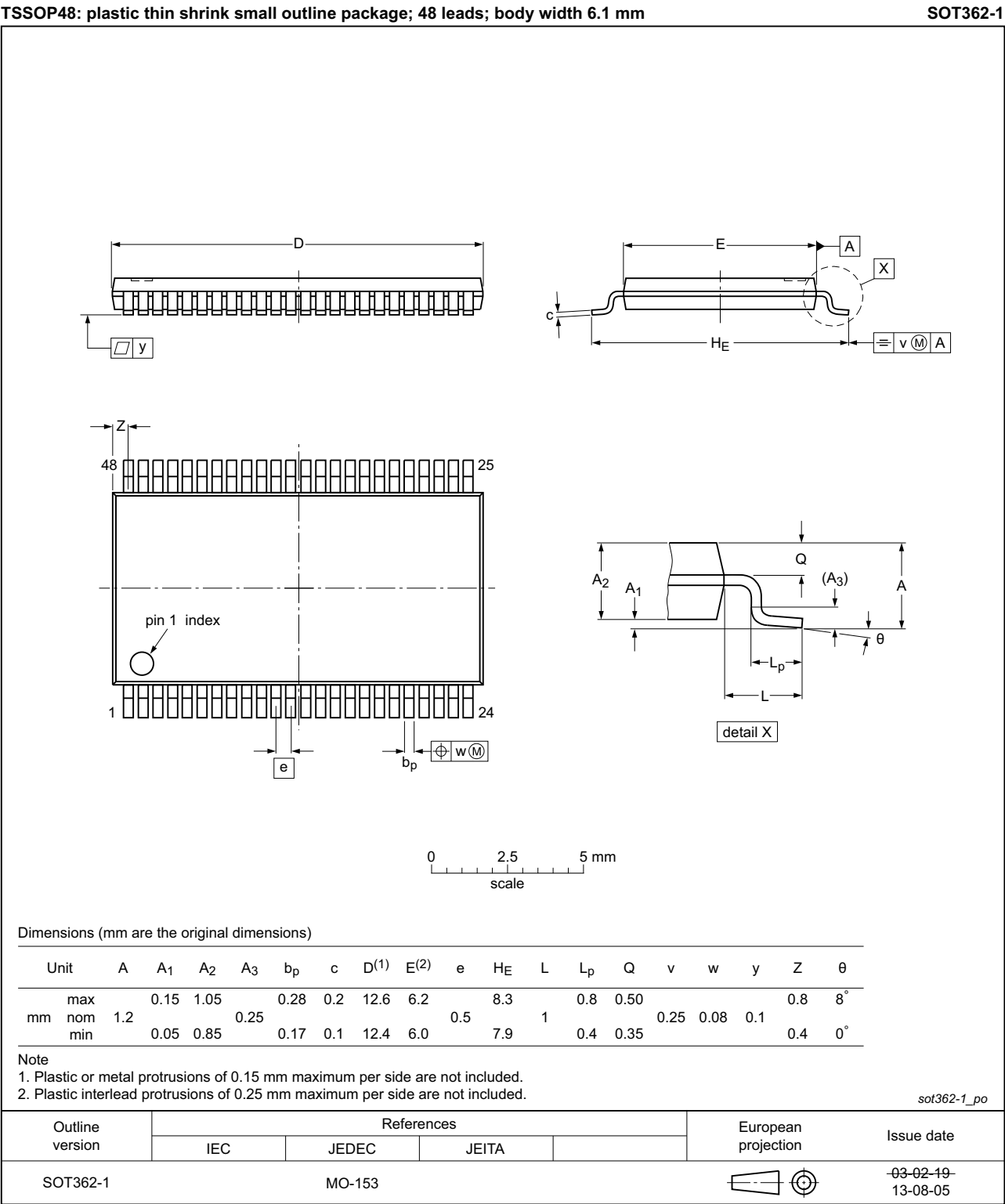


Fig 11. Package outline SOT362-1 (TSSOP48)

## 13. Abbreviations

Table 10. Abbreviations

| Acronym | Description                             |
|---------|-----------------------------------------|
| CMOS    | Complementary Metal-Oxide Semiconductor |
| DUT     | Device Under Test                       |
| MIL     | Military                                |
| TTL     | Transistor-Transistor Logic             |

## 14. Revision history

Table 11. Revision history

| Document ID         | Release date                                                                                                                                                                              | Data sheet status  | Change notice | Supersedes          |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|---------------------|
| 74AVC16374_Q100 v.2 | 20150316                                                                                                                                                                                  | Product data sheet | -             | 74AVC16374_Q100 v.1 |
| Modifications:      | <ul style="list-style-type: none"><li><a href="#">Section 2</a>: ESD protection; for MIL-STD-883 (method 3015) and HBM JESD22-A114F the value is changed from 2000 V to 1000 V.</li></ul> |                    |               |                     |
| 74AVC16374_Q100 v.1 | 20130916                                                                                                                                                                                  | Product data sheet | -             | -                   |

## 15. Legal information

### 15.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | 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 URL <http://www.nexperia.com>.

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