

# 74LVC374A

Octal D-type flip-flop; 5 V tolerant inputs/outputs;  
positive-edge trigger; 3-state

Rev. 6 — 1 September 2023

Product data sheet

## 1. General description

The 74LVC374A is an octal 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 can be driven from either 3.3 V or 5 V devices. This feature allows the use of these devices as translators in mixed 3.3 V and 5 V environments.

Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times.

This device is fully specified for partial power down applications using  $I_{OFF}$ . The  $I_{OFF}$  circuitry disables the output, preventing the potentially damaging backflow current through the device when it is powered down.

## 2. Features and benefits

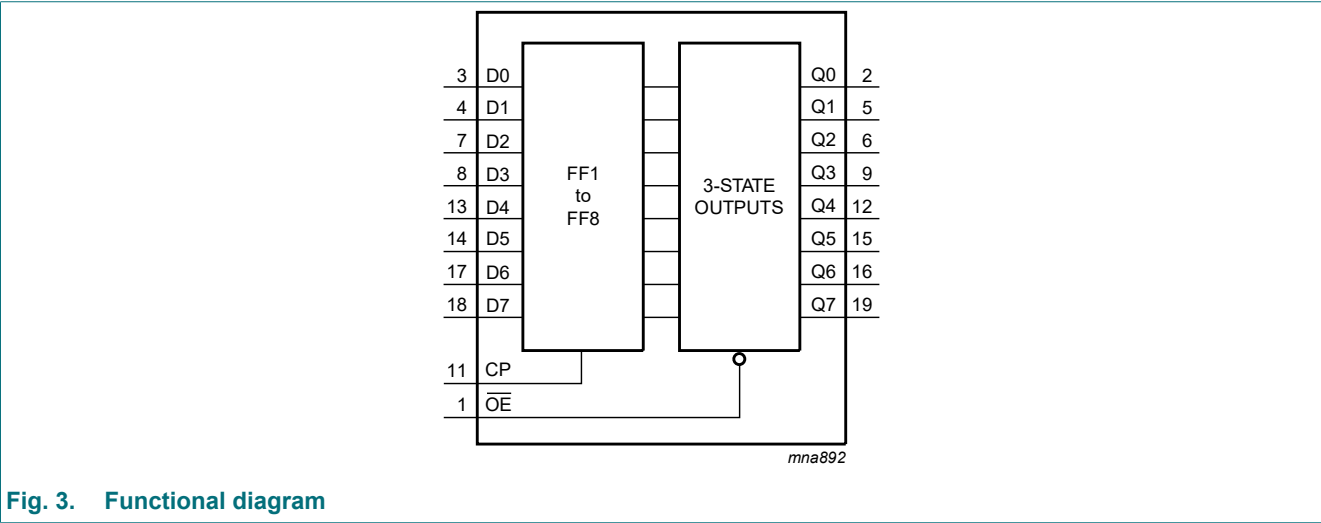
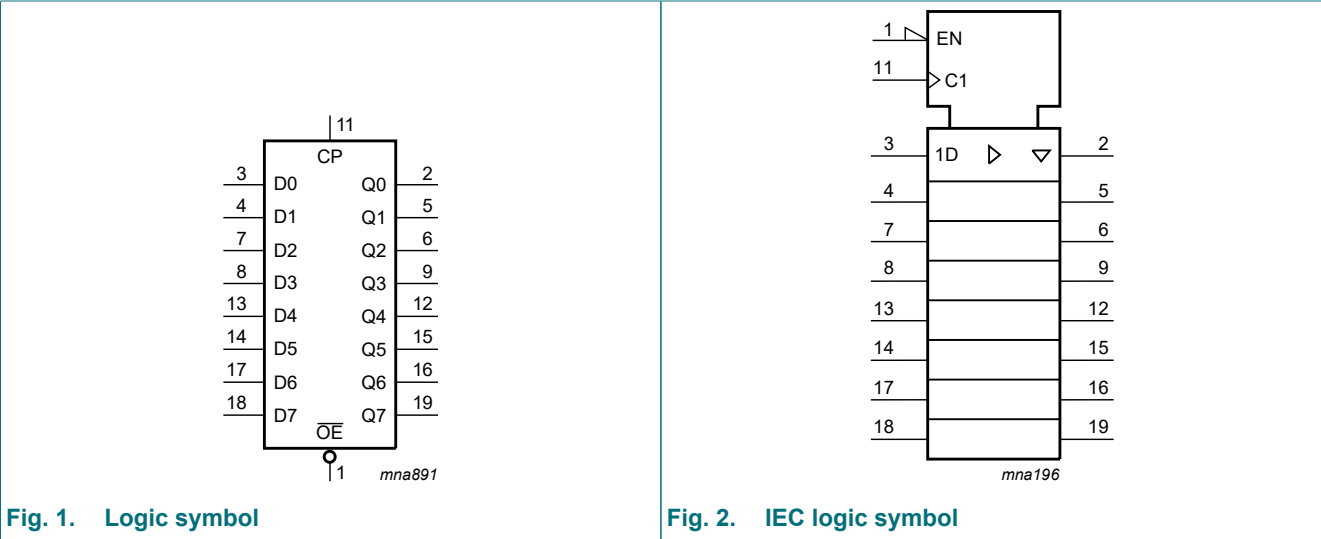
- Wide supply voltage range from 1.2 V to 3.6 V
- Overvoltage tolerant inputs to 5.5 V
- CMOS low power dissipation
- Direct interface with TTL levels
- $I_{OFF}$  circuitry provides partial Power-down mode operation
- 8-bit positive edge-triggered register
- Independent register and 3-state buffer operation
- Complies with JEDEC standard:
  - JESD8-7A (1.65 V to 1.95 V)
  - JESD8-5A (2.3 V to 2.7 V)
  - JESD8-C/JESD36 (2.7 V to 3.6 V)
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

3. Ordering information

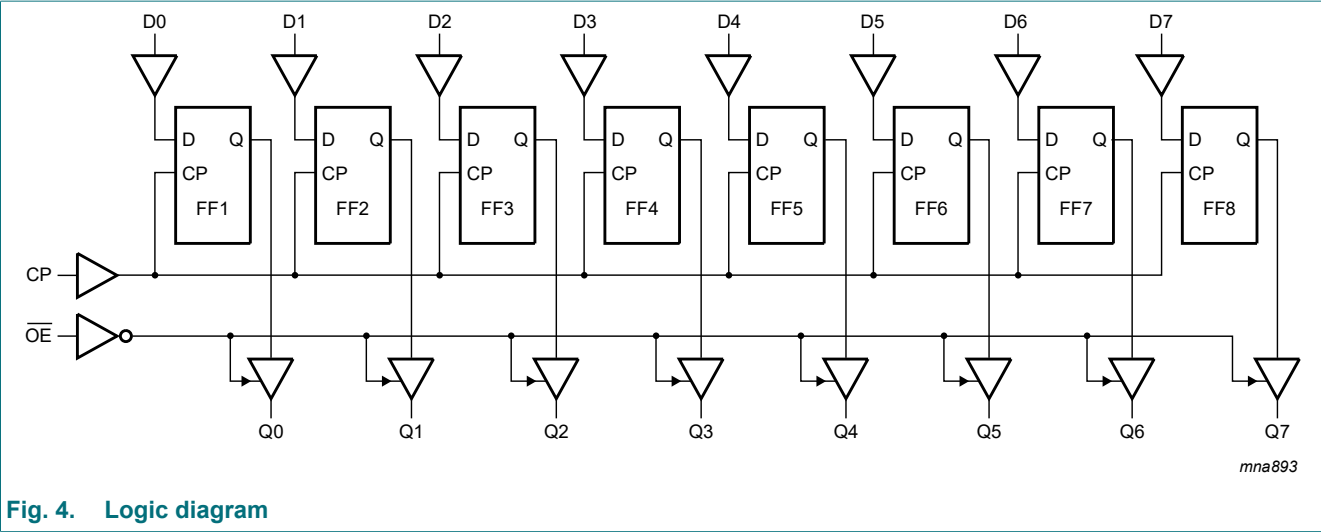
Table 1. Ordering information

| Type number                 | Package           |          |                                                                                                                                      |                          |
|-----------------------------|-------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|                             | Temperature range | Name     | Description                                                                                                                          | Version                  |
| <a href="#">74LVC374AD</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="#">74LVC374APW</a> | -40 °C to +125 °C | TSSOP20  | plastic thin shrink small outline package; 20 leads;<br>body width 4.4 mm                                                            | <a href="#">SOT360-1</a> |
| <a href="#">74LVC374ABQ</a> | -40 °C to +125 °C | DHVQFN20 | plastic dual in-line compatible thermal enhanced<br>very thin quad flat package; no leads; 20 terminals;<br>body 2.5 × 4.5 × 0.85 mm | <a href="#">SOT764-1</a> |

4. Functional diagram

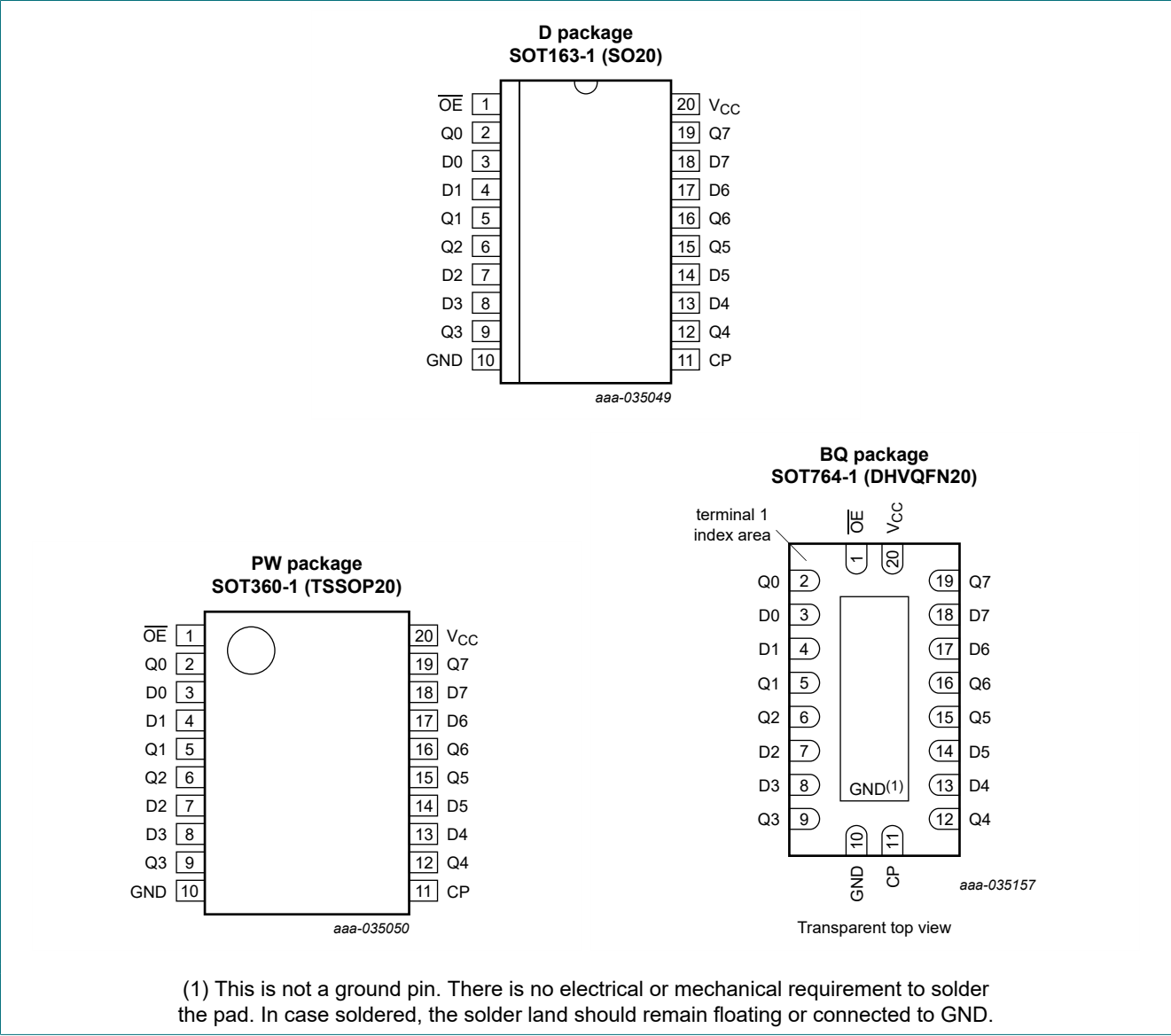


Octal D-type flip-flop; 5 V tolerant inputs/outputs; positive-edge trigger; 3-state



5. Pinning information

5.1. Pinning



5.2. Pin description

Table 2. Pin description

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

6. Functional description

Table 3. Function table

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

| Operating mode                    | Input |    |    | Internal flip-flop | Output |
|-----------------------------------|-------|----|----|--------------------|--------|
|                                   | OE    | CP | Dn |                    | Qn     |
| 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      |

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 | +6.5                  | V    |
| I <sub>IK</sub>  | input clamping current  | V <sub>I</sub> < 0 V                                     | -50  | -                     | mA   |
| V <sub>I</sub>   | input voltage           | [1]                                                      | -0.5 | +6.5                  | V    |
| I <sub>OK</sub>  | output clamping current | V <sub>O</sub> > V <sub>CC</sub> or V <sub>O</sub> < 0 V | -    | ±50                   | mA   |
| V <sub>O</sub>   | output voltage          | output HIGH or LOW state [2]                             | -0.5 | V <sub>CC</sub> + 0.5 | V    |
|                  |                         | output 3-state [2]                                       | -0.5 | +6.5                  | 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 +125 °C [3]                 | -    | 500                   | mW   |

[1] The minimum input voltage ratings may be exceeded if the input current ratings are observed.  
[2] The output voltage ratings may be exceeded if the output current ratings are observed.  
[3] 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

| Symbol           | Parameter                           | Conditions                        | Min  | Typ | Max             | Unit |
|------------------|-------------------------------------|-----------------------------------|------|-----|-----------------|------|
| V <sub>CC</sub>  | supply voltage                      |                                   | 1.65 | -   | 3.6             | V    |
|                  |                                     | functional                        | 1.2  | -   | -               | V    |
| V <sub>I</sub>   | input voltage                       |                                   | 0    | -   | 5.5             | V    |
| V <sub>O</sub>   | output voltage                      | output HIGH or LOW state          | 0    | -   | V <sub>CC</sub> | V    |
|                  |                                     | output 3-state                    | 0    | -   | 5.5             | V    |
| T <sub>amb</sub> | ambient temperature                 | in free air                       | -40  | -   | +125            | °C   |
| Δt/ΔV            | input transition rise and fall rate | V <sub>CC</sub> = 1.65 V to 2.7 V | 0    | -   | 20              | ns/V |
|                  |                                     | V <sub>CC</sub> = 2.7 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                                                                                                    | -40 °C to +85 °C      |        |                     | -40 °C to +125 °C     |                     | Unit |
|-----------------|---------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|--------|---------------------|-----------------------|---------------------|------|
|                 |                           |                                                                                                               | Min                   | Typ[1] | Max                 | Min                   | Max                 |      |
| V <sub>IH</sub> | HIGH-level input voltage  | V <sub>CC</sub> = 1.2 V                                                                                       | 1.08                  | -      | -                   | 1.08                  | -                   | V    |
|                 |                           | V <sub>CC</sub> = 1.65 V to 1.95 V                                                                            | 0.65V <sub>CC</sub>   | -      | -                   | 0.65V <sub>CC</sub>   | -                   | V    |
|                 |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                              | 1.7                   | -      | -                   | 1.7                   | -                   | V    |
|                 |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                              | 2.0                   | -      | -                   | 2.0                   | -                   | V    |
| V <sub>IL</sub> | LOW-level input voltage   | V <sub>CC</sub> = 1.2 V                                                                                       | -                     | -      | 0.12                | -                     | 0.12                | V    |
|                 |                           | V <sub>CC</sub> = 1.65 V to 1.95 V                                                                            | -                     | -      | 0.35V <sub>CC</sub> | -                     | 0.35V <sub>CC</sub> | V    |
|                 |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                              | -                     | -      | 0.7                 | -                     | 0.7                 | V    |
|                 |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                              | -                     | -      | 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> = -100 μA; V <sub>CC</sub> = 1.65 V to 3.6 V                                                   | V <sub>CC</sub> - 0.2 | -      | -                   | V <sub>CC</sub> - 0.3 | -                   | V    |
|                 |                           | I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 1.65 V                                                              | 1.2                   | -      | -                   | 1.05                  | -                   | V    |
|                 |                           | I <sub>O</sub> = -8 mA; V <sub>CC</sub> = 2.3 V                                                               | 1.8                   | -      | -                   | 1.65                  | -                   | V    |
|                 |                           | I <sub>O</sub> = -12 mA; V <sub>CC</sub> = 2.7 V                                                              | 2.2                   | -      | -                   | 2.05                  | -                   | V    |
|                 |                           | I <sub>O</sub> = -18 mA; V <sub>CC</sub> = 3.0 V                                                              | 2.4                   | -      | -                   | 2.25                  | -                   | V    |
|                 |                           | I <sub>O</sub> = -24 mA; V <sub>CC</sub> = 3.0 V                                                              | 2.2                   | -      | -                   | 2.0                   | -                   | 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> = 100 μA; V <sub>CC</sub> = 1.65 V to 3.6 V                                                    | -                     | -      | 0.2                 | -                     | 0.3                 | V    |
|                 |                           | I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V                                                               | -                     | -      | 0.45                | -                     | 0.65                | V    |
|                 |                           | I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V                                                                | -                     | -      | 0.6                 | -                     | 0.8                 | V    |
|                 |                           | I <sub>O</sub> = 12 mA; V <sub>CC</sub> = 2.7 V                                                               | -                     | -      | 0.4                 | -                     | 0.6                 | V    |
|                 |                           | I <sub>O</sub> = 24 mA; V <sub>CC</sub> = 3.0 V                                                               | -                     | -      | 0.55                | -                     | 0.8                 | V    |
| I <sub>I</sub>  | input leakage current     | V <sub>CC</sub> = 3.6 V; V <sub>I</sub> = 5.5 V or GND                                                        | -                     | ±0.1   | ±5                  | -                     | ±20                 | 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> = 3.6 V; V <sub>O</sub> = 5.5 V or GND; | -                     | ±0.1   | ±5                  | -                     | ±20                 | μA   |

## Octal D-type flip-flop; 5 V tolerant inputs/outputs; positive-edge trigger; 3-state

| Symbol           | Parameter                 | Conditions                                                                                                      | -40 °C to +85 °C |        |     | -40 °C to +125 °C |      | Unit |
|------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------|------------------|--------|-----|-------------------|------|------|
|                  |                           |                                                                                                                 | Min              | Typ[1] | Max | Min               | Max  |      |
| I <sub>OFF</sub> | power-off leakage current | V <sub>CC</sub> = 0 V; V <sub>I</sub> or V <sub>O</sub> = 5.5 V                                                 | -                | ±0.1   | ±10 | -                 | ±20  | µA   |
| I <sub>CC</sub>  | supply current            | V <sub>CC</sub> = 3.6 V; V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A                          | -                | 0.1    | 10  | -                 | 40   | µA   |
| ΔI <sub>CC</sub> | additional supply current | per input pin; V <sub>CC</sub> = 2.7 V to 3.6 V; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A | -                | 5      | 500 | -                 | 5000 | µA   |
| C <sub>I</sub>   | input capacitance         | V <sub>CC</sub> = 0 V to 3.6 V; V <sub>I</sub> = GND to V <sub>CC</sub>                                         | -                | 4.0    | -   | -                 | -    | pF   |

[1] All typical values are measured at V<sub>CC</sub> = 3.3 V (unless stated otherwise) and T<sub>amb</sub> = 25 °C.

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

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

| Symbol           | Parameter         | Conditions                         | -40 °C to +85 °C |        |      | -40 °C to +125 °C |      | Unit |
|------------------|-------------------|------------------------------------|------------------|--------|------|-------------------|------|------|
|                  |                   |                                    | Min              | Typ[1] | Max  | Min               | Max  |      |
| t <sub>pd</sub>  | propagation delay | CP to Qn; see Fig. 5 [2]           |                  |        |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 1.2 V            | -                | 16     | -    | -                 | -    | ns   |
|                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V | 2.2              | 7.4    | 16.3 | 2.2               | 18.8 | ns   |
|                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V   | 1.5              | 3.9    | 8.4  | 1.5               | 9.7  | ns   |
|                  |                   | V <sub>CC</sub> = 2.7 V            | 1.5              | 3.5    | 8.0  | 1.5               | 10.0 | ns   |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V   | 1.5              | 3.3    | 7.0  | 1.5               | 9.0  | ns   |
| t <sub>en</sub>  | enable time       | OE to Qn; see Fig. 6 [2]           |                  |        |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 1.2 V            | -                | 19     | -    | -                 | -    | ns   |
|                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V | 1.5              | 6.6    | 16.7 | 1.5               | 19.3 | ns   |
|                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V   | 1.5              | 3.7    | 9.3  | 1.5               | 10.8 | ns   |
|                  |                   | V <sub>CC</sub> = 2.7 V            | 1.5              | 3.8    | 8.5  | 1.5               | 11.0 | ns   |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V   | 1.5              | 3.0    | 7.5  | 1.5               | 9.5  | ns   |
| t <sub>dis</sub> | disable time      | OE to Qn; see Fig. 6 [2]           |                  |        |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 1.2 V            | -                | 8.0    | -    | -                 | -    | ns   |
|                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V | 2.3              | 4.0    | 10.1 | 2.3               | 11.7 | ns   |
|                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V   | 1.0              | 2.2    | 5.7  | 1.0               | 6.7  | ns   |
|                  |                   | V <sub>CC</sub> = 2.7 V            | 1.5              | 3.1    | 6.5  | 1.5               | 9.0  | ns   |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V   | 1.5              | 2.9    | 6.0  | 1.5               | 7.5  | ns   |
| t <sub>w</sub>   | pulse width       | CP HIGH or LOW; see Fig. 5         |                  |        |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V | 5.0              | -      | -    | 5.0               | -    | ns   |
|                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V   | 4.0              | -      | -    | 4.0               | -    | ns   |
|                  |                   | V <sub>CC</sub> = 2.7 V            | 3.0              | -      | -    | 4.5               | -    | ns   |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V   | 3.0              | 1.5    | -    | 4.5               | -    | ns   |
| t <sub>su</sub>  | set-up time       | Dn to CP; see Fig. 7               |                  |        |      |                   |      |      |
|                  |                   | V <sub>CC</sub> = 1.65 V to 1.95 V | 4.0              | -      | -    | 4.0               | -    | ns   |
|                  |                   | V <sub>CC</sub> = 2.3 V to 2.7 V   | 3.0              | -      | -    | 3.0               | -    | ns   |
|                  |                   | V <sub>CC</sub> = 2.7 V            | 2.0              | -      | -    | 2.0               | -    | ns   |
|                  |                   | V <sub>CC</sub> = 3.0 V to 3.6 V   | 2.0              | 0      | -    | 2.0               | -    | ns   |

## Octal D-type flip-flop; 5 V tolerant inputs/outputs; positive-edge trigger; 3-state

| Symbol      | Parameter                     | Conditions                                       | -40 °C to +85 °C |        |     | -40 °C to +125 °C |     | Unit |
|-------------|-------------------------------|--------------------------------------------------|------------------|--------|-----|-------------------|-----|------|
|             |                               |                                                  | Min              | Typ[1] | Max | Min               | Max |      |
| $t_h$       | hold time                     | Dn to CP; see Fig. 7                             |                  |        |     |                   |     |      |
|             |                               | $V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$     | 3.0              | -      | -   | 3.0               | -   | ns   |
|             |                               | $V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$       | 2.0              | -      | -   | 2.0               | -   | ns   |
|             |                               | $V_{CC} = 2.7 \text{ V}$                         | 1.5              | -      | -   | 1.5               | -   | ns   |
|             |                               | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$       | 1.5              | 0.6    | -   | 1.5               | -   | ns   |
| $f_{max}$   | maximum frequency             | see Fig. 5                                       |                  |        |     |                   |     |      |
|             |                               | $V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$     | 100              | -      | -   | 64                | -   | MHz  |
|             |                               | $V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$       | 125              | -      | -   | 100               | -   | MHz  |
|             |                               | $V_{CC} = 2.7 \text{ V}$                         | 150              | -      | -   | 120               | -   | MHz  |
|             |                               | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$       | 150              | -      | -   | 120               | -   | MHz  |
| $t_{sk(o)}$ | output skew time              | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ [3]   | -                | -      | 1.0 | -                 | 1.5 | ns   |
| $C_{PD}$    | power dissipation capacitance | per flip-flop; $V_I = \text{GND to } V_{CC}$ [4] |                  |        |     |                   |     |      |
|             |                               | $V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$     | -                | 11.6   | -   | -                 | -   | pF   |
|             |                               | $V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$       | -                | 13.6   | -   | -                 | -   | pF   |
|             |                               | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$       | -                | 15.4   | -   | -                 | -   | pF   |

[1] Typical values are measured at  $T_{amb} = 25 \text{ °C}$  and  $V_{CC} = 1.2 \text{ V}, 1.8 \text{ V}, 2.5 \text{ V}, 2.7 \text{ V}$  and  $3.3 \text{ V}$  respectively.

[2]  $t_{pd}$  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  $t_{PHZ}$ .

[3] Skew between any two outputs of the same package switching in the same direction. This parameter is guaranteed by design.

[4]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ ).

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

$f_i$  = input frequency in MHz;  $f_o$  = output frequency in MHz

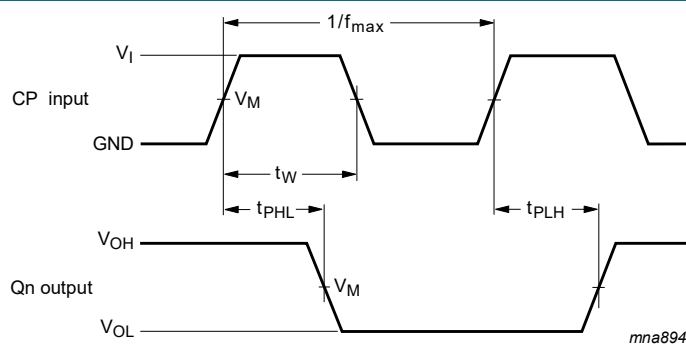
$C_L$  = output load capacitance in pF

$V_{CC}$  = supply voltage in Volt

$N$  = number of inputs switching

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

## 10.1. Waveforms and test circuit



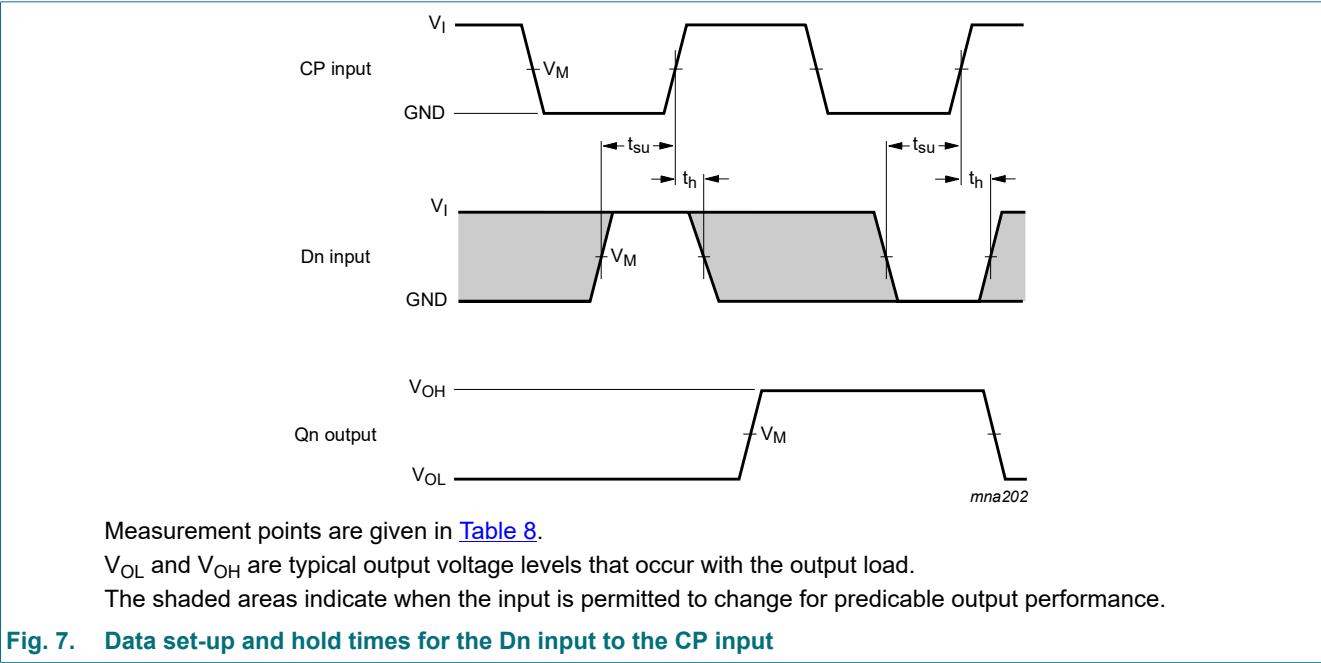
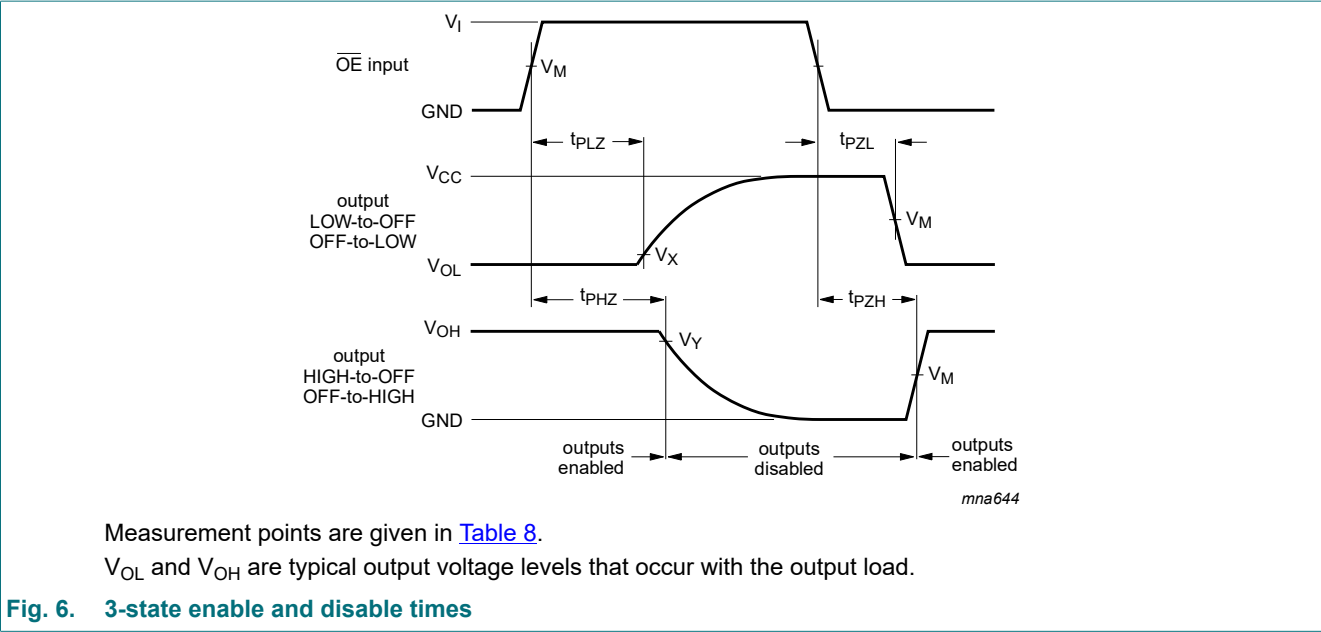
Measurement points are given in Table 8.

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

**Fig. 5. Clock (CP) to output (Qn) propagation delays, the clock pulse width, output transition times, and the maximum frequency**



Octal D-type flip-flop; 5 V tolerant inputs/outputs; positive-edge trigger; 3-state



| Table 8. Measurement points |          |                     |                     |                           |                           |
|-----------------------------|----------|---------------------|---------------------|---------------------------|---------------------------|
| Supply voltage              | Input    |                     | Output              |                           |                           |
| $V_{CC}$                    | $V_I$    | $V_M$               | $V_M$               | $V_X$                     | $V_Y$                     |
| 1.2 V                       | $V_{CC}$ | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.15 \text{ V}$ | $V_{OH} - 0.15 \text{ V}$ |
| 1.65 V to 1.95 V            | $V_{CC}$ | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.15 \text{ V}$ | $V_{OH} - 0.15 \text{ V}$ |
| 2.3 V to 2.7 V              | $V_{CC}$ | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.15 \text{ V}$ | $V_{OH} - 0.15 \text{ V}$ |
| 2.7 V                       | 2.7 V    | 1.5 V               | 1.5 V               | $V_{OL} + 0.3 \text{ V}$  | $V_{OH} - 0.3 \text{ V}$  |
| 3.0 V to 3.6 V              | 2.7 V    | 1.5 V               | 1.5 V               | $V_{OL} + 0.3 \text{ V}$  | $V_{OH} - 0.3 \text{ V}$  |

Octal D-type flip-flop; 5 V tolerant inputs/outputs; positive-edge trigger; 3-state

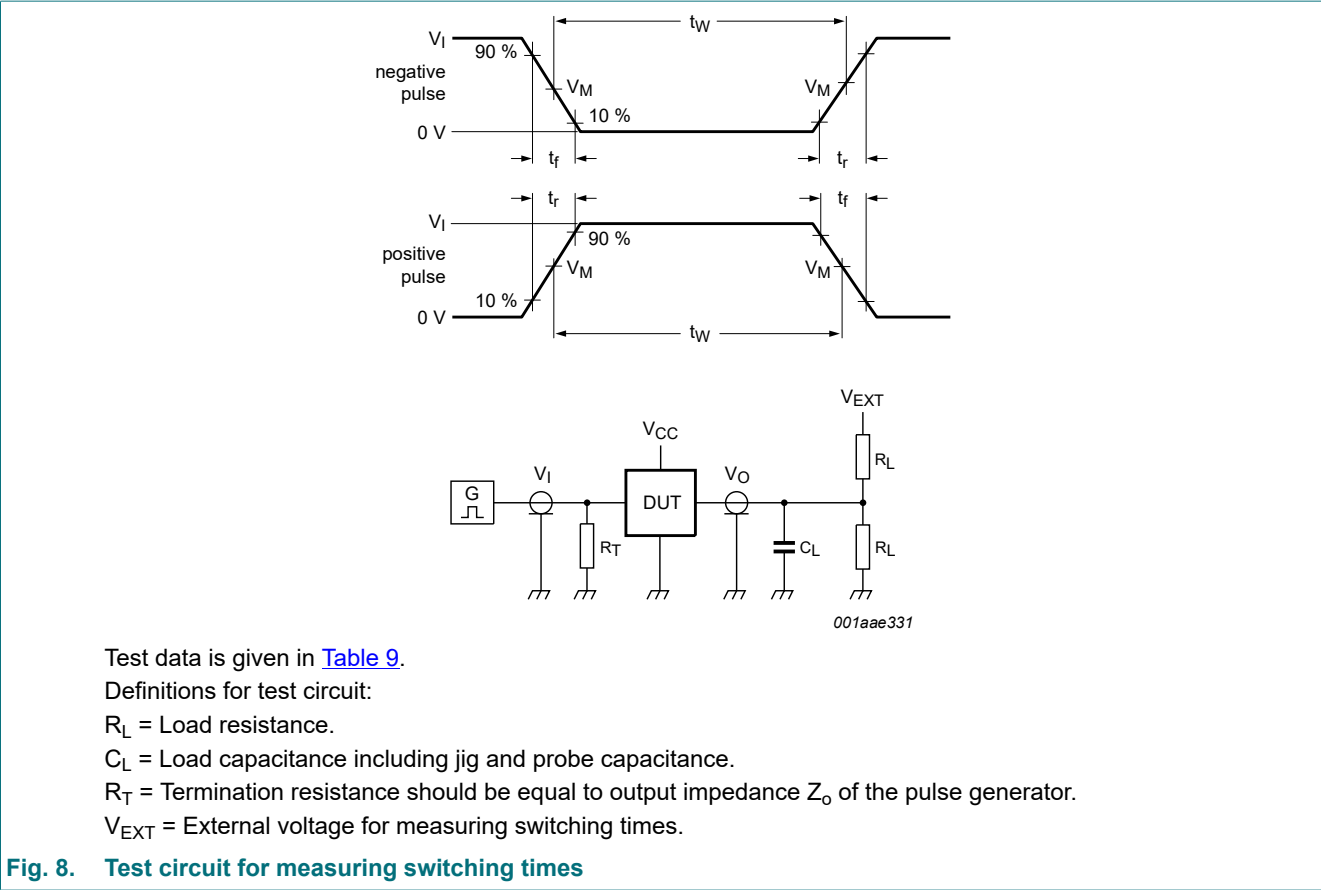


Table 9. Test data

| Supply voltage   | Input    |               | Load  |              | $V_{EXT}$          |                    |                    |
|------------------|----------|---------------|-------|--------------|--------------------|--------------------|--------------------|
| $V_{CC}$         | $V_I$    | $t_r, t_f$    | $C_L$ | $R_L$        | $t_{PLH}, t_{PHL}$ | $t_{PLZ}, t_{PZL}$ | $t_{PHZ}, t_{PZH}$ |
| 1.2 V            | $V_{CC}$ | $\leq 2$ ns   | 30 pF | 1 k $\Omega$ | open               | 2 x $V_{CC}$       | GND                |
| 1.65 V to 1.95 V | $V_{CC}$ | $\leq 2$ ns   | 30 pF | 1 k $\Omega$ | open               | 2 x $V_{CC}$       | GND                |
| 2.3 V to 2.7 V   | $V_{CC}$ | $\leq 2$ ns   | 30 pF | 500 $\Omega$ | open               | 2 x $V_{CC}$       | GND                |
| 2.7 V            | 2.7 V    | $\leq 2.5$ ns | 50 pF | 500 $\Omega$ | open               | 2 x $V_{CC}$       | GND                |
| 3.0 V to 3.6 V   | 2.7 V    | $\leq 2.5$ ns | 50 pF | 500 $\Omega$ | open               | 2 x $V_{CC}$       | GND                |

11. Package outline

SO20: plastic small outline package; 20 leads; body width 7.5 mm

SOT163-1

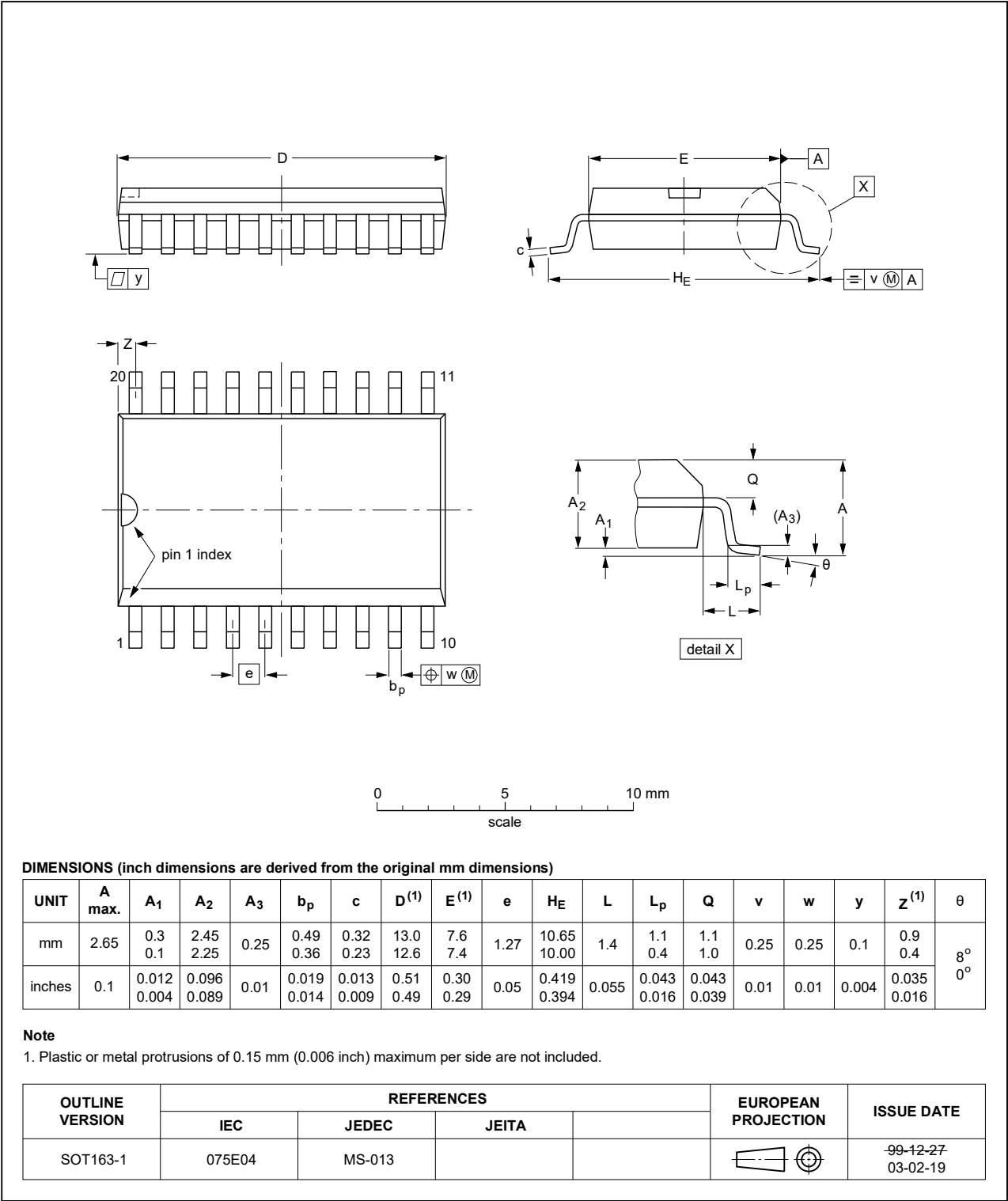


Fig. 9. Package outline SOT163-1 (SO20)

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

SOT360-1

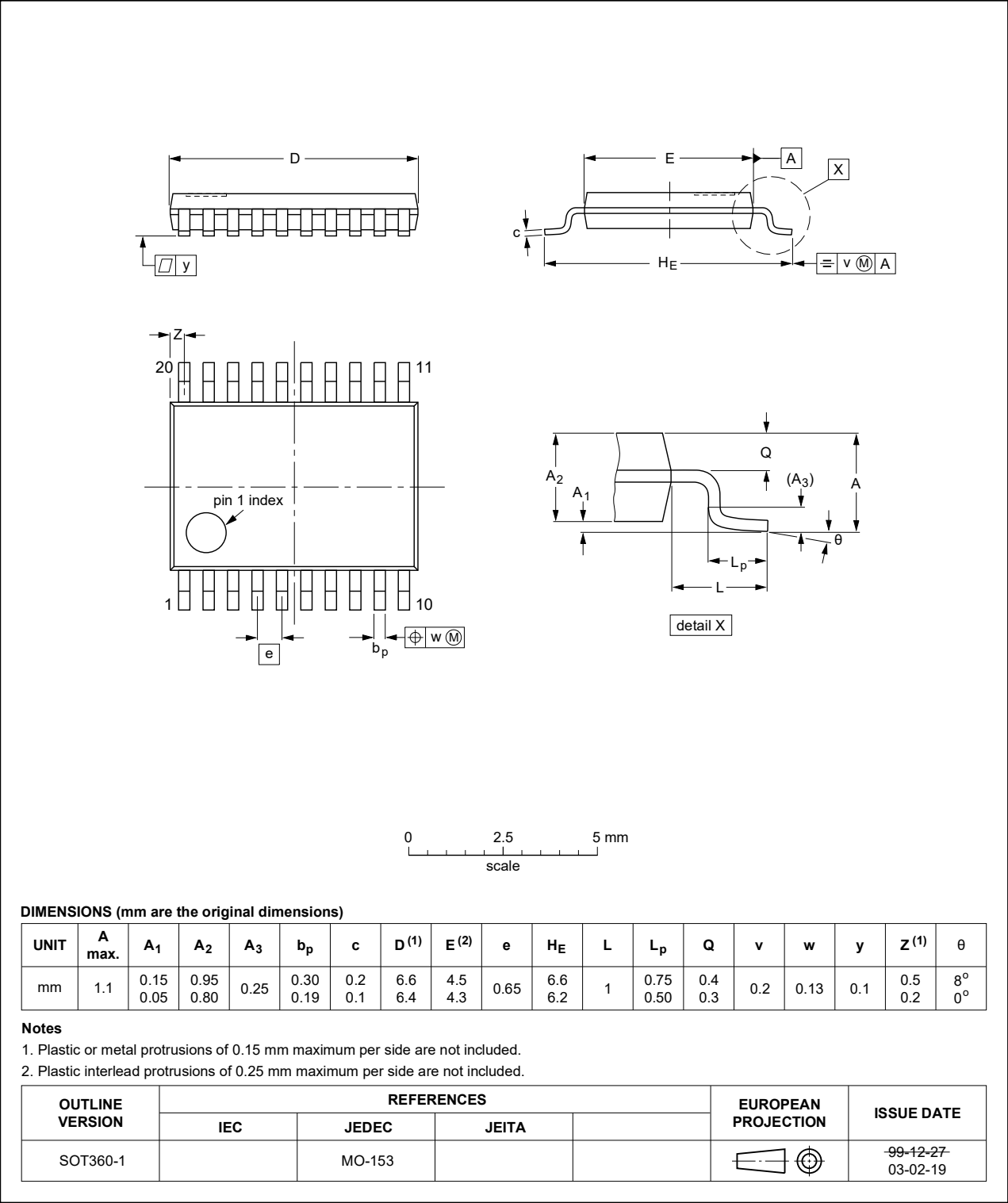


Fig. 10. Package outline SOT360-1 (TSSOP20)

Octal D-type flip-flop; 5 V tolerant inputs/outputs; positive-edge trigger; 3-state

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

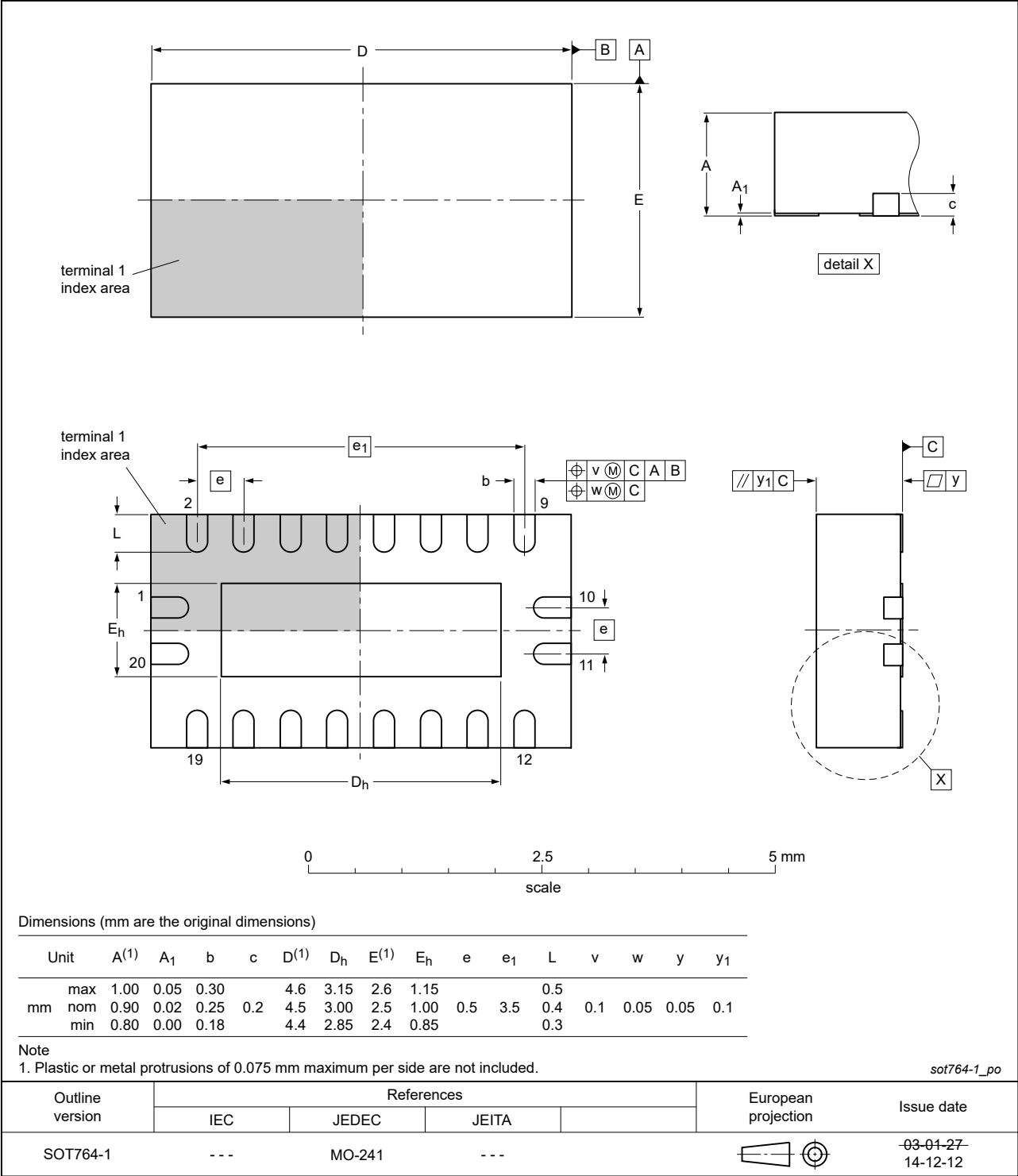


Fig. 11. Package outline SOT764-1 (DHVQFN20)

12. Abbreviations

Table 10. Abbreviations

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

13. Revision history

Table 11. Revision history

| Document ID    | Release date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data sheet status     | Change notice | Supersedes    |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|---------------|
| 74LVC374A v.6  | 20230901                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74LVC374A v.5 |
| Modifications: | <ul style="list-style-type: none"><li><a href="#">Section 2</a>: ESD specification updated according to the latest JEDEC standard.</li></ul>                                                                                                                                                                                                                                                                                                                                                                   |                       |               |               |
| 74LVC374A v.5  | 20210827                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74LVC374A v.4 |
| Modifications: | <ul style="list-style-type: none"><li>Type number 74LVC374ADB (SOT339-1/SSOP20) removed.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                             |                       |               |               |
| 74LVC374A v.4  | 20200824                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74LVC374A v.3 |
| 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 have been updated.</li><li>Package outline drawing of SOT764-1 (<a href="#">Fig. 11</a>) updated.</li></ul> |                       |               |               |
| 74LVC374A v.3  | 20121206                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74LVC374A v.2 |
| Modifications: | <ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>Legal texts have been adapted to the new company name where appropriate.</li><li><a href="#">Table 4</a>, <a href="#">Table 5</a>, <a href="#">Table 6</a>, <a href="#">Table 7</a>, <a href="#">Table 8</a> and <a href="#">Table 9</a>: values added for lower voltage ranges.</li></ul>                                                   |                       |               |               |
| 74LVC374A v.2  | 20030514                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product specification | -             | 74LVC374A v.1 |
| 74LVC374A v.1  | 19980729                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Product specification | -             | -             |

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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