

# 74LV374

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

Rev. 02 — 14 May 2009

Product data sheet

## 1. General description

The 74LV374 is an octal D-type flip-flop featuring separate D-type inputs for each flip-flop and 3-state outputs for bus-oriented applications. A clock input (CP) and an output enable input ( $\overline{OE}$ ) are common to all flip-flops. The 74LV374 is a low-voltage Si-gate CMOS device and is pin and function compatible with 74HC374 and 74HCT374.

The eight flip-flops will store the state of their individual D-inputs that meet the set-up and hold times requirements on the LOW to HIGH CP transition.

When  $\overline{OE}$  is LOW, the contents of the eight flip-flops is available at the outputs. When  $\overline{OE}$  is HIGH, the outputs go to the high-impedance OFF-state. Operation of the  $\overline{OE}$  input does not affect the state of the flip-flops.

## 2. Features

- Wide operating voltage: 1.0 V to 5.5 V
- Optimized for low voltage applications: 1.0 V to 3.6 V
- Accepts TTL input levels between  $V_{CC} = 2.7$  V and  $V_{CC} = 3.6$  V
- Typical output ground bounce < 0.8 V at  $V_{CC} = 3.3$  V and  $T_{amb} = 25$  °C
- Typical HIGH-level output voltage ( $V_{OH}$ ) undershoot: > 2 V at  $V_{CC} = 3.3$  V and  $T_{amb} = 25$  °C
- ESD protection:
  - ◆ HBM JESD22-A114E exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V
- Common 3-state output enable input
- Multiple package options
- Specified from  $-40$  °C to  $+85$  °C and from  $-40$  °C to  $+125$  °C

## 3. Ordering information

Table 1. Ordering information

| Type number | Package               |         |  |          |
|-------------|-----------------------|---------|--|----------|
|             | Temperature range     | Name    | Description  | Version  |
| 74LV374N    | $-40$ °C to $+125$ °C | DIP20   | plastic dual in-line package; 20 leads (300 mil)                       | SOT146-1 |
| 74LV374D    | $-40$ °C to $+125$ °C | SO20    | plastic small outline package; 20 leads; body width 7.5 mm             | SOT163-1 |
| 74LV374DB   | $-40$ °C to $+125$ °C | SSOP20  | plastic shrink small outline package; 20 leads; body width 5.3 mm      | SOT339-1 |
| 74LV374PW   | $-40$ °C to $+125$ °C | TSSOP20 | plastic thin shrink small outline package; 20 leads; body width 4.4 mm | SOT360-1 |

### 4. Functional diagram

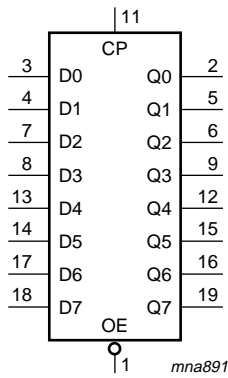


Fig 1. Logic symbol

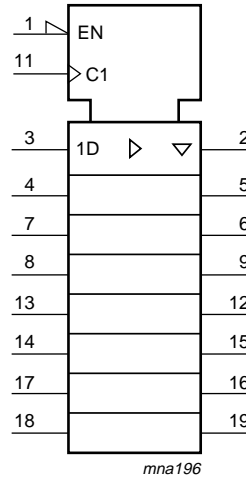


Fig 2. IEC logic symbol

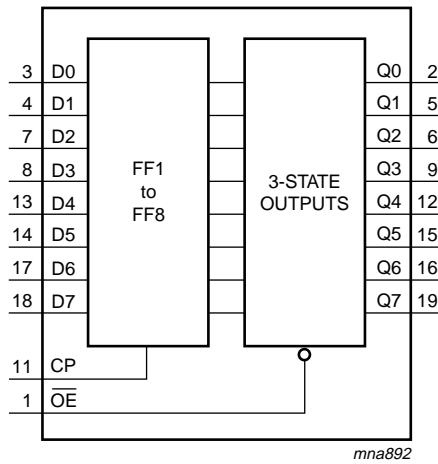


Fig 3. Functional diagram

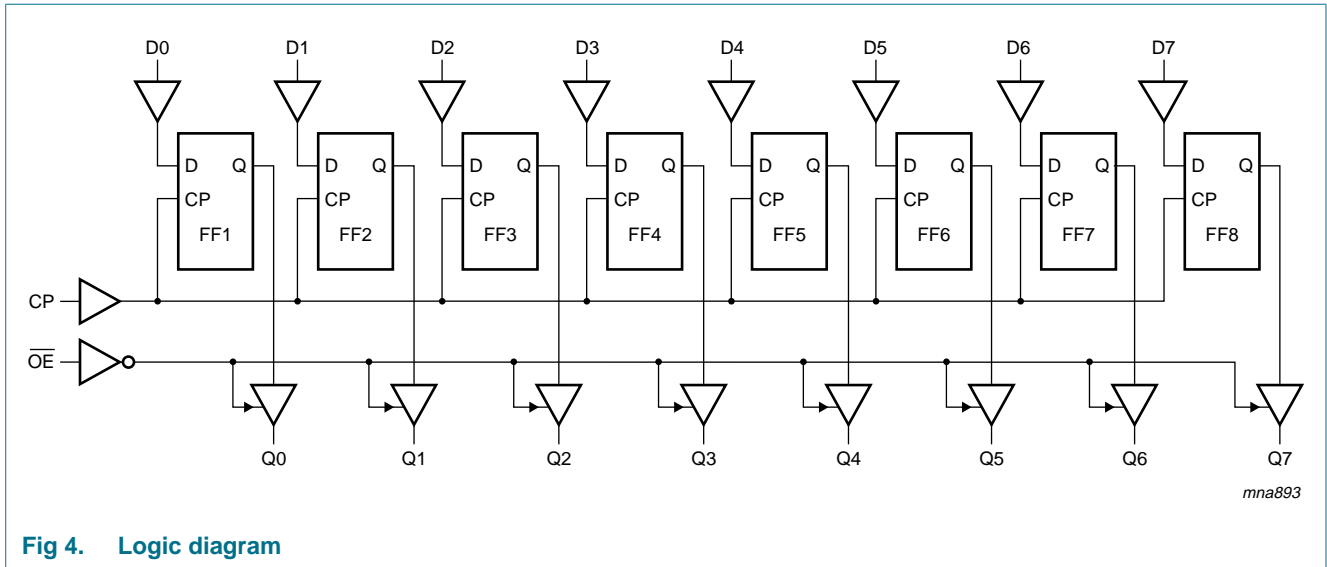


Fig 4. Logic diagram

## 5. Pinning information

### 5.1 Pinning

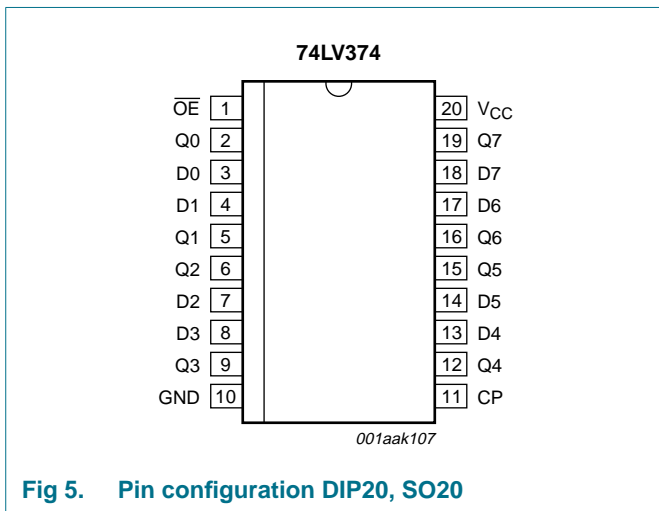


Fig 5. Pin configuration DIP20, SO20

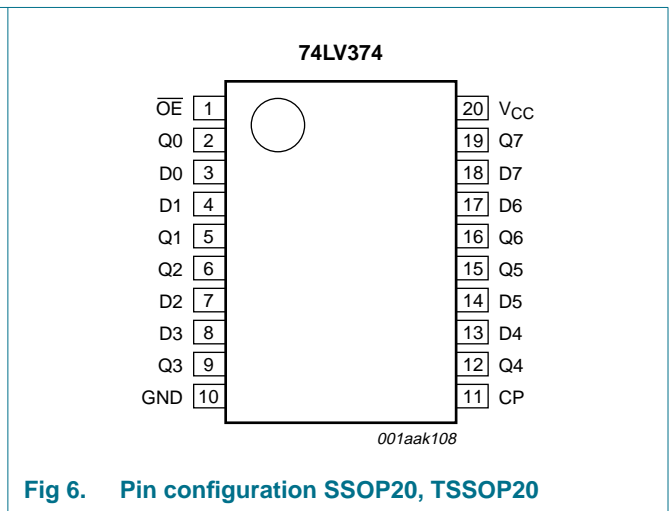


Fig 6. Pin configuration SSOP20, TSSOP20

### 5.2 Pin description

Table 2. Pin description

| Symbol          | Pin                        | Description                               |
|-----------------|----------------------------|---|
| OE              | 1                          | output enable input (active LOW)          |
| Q0 to Q7        | 2, 5, 6, 9, 12, 15, 16, 19 | data output                               |
| D0 to 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<sup>[1]</sup>

| Operating mode                    | Input |    |    | Internal flip-flop | Output<br>Qn |
|-----------------------------------|-------|----|----|--------------------|--------------|
|                                   | OE    | CP | Dn |                    |              |
| 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 clock 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  | +7.0 | 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 | [1] - | ±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 | [1] - | ±50  | 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 | T <sub>amb</sub> = -40 °C to +125 °C                                | [2]   |      |      |
|                  |                         | DIP20   | -     | 750  | mW   |
|                  |                         | SO20, SSOP20 and TSSOP20  | -     | 500  | mW   |

- [1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.  
 [2] For DIP20 packages: above 70 °C the value of P<sub>tot</sub> derates linearly with 12 mW/K.  
 For SO20 packages: above 70 °C the value of P<sub>tot</sub> derates linearly with 8 mW/K.  
 For (T)SSOP20 packages: 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**

Voltages are referenced to GND (ground = 0 V).

| Symbol              | Parameter                           | Conditions                              | Min | Typ | Max      | Unit |
|---------------------|-------------------------------------|---|-----|-----|----------|------|
| $V_{CC}$            | supply voltage <sup>[1]</sup>       |   | 1.0 | 3.3 | 5.5      | V    |
| $V_I$               | input voltage                       |   | 0   | -   | $V_{CC}$ | V    |
| $V_O$               | output voltage                      |   | 0   | -   | $V_{CC}$ | V    |
| $T_{amb}$           | ambient temperature                 |   | -40 | +25 | +125     | °C   |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC} = 1.0\text{ V to }2.0\text{ V}$ | -   | -   | 500      | ns/V |
|                     |                                     | $V_{CC} = 2.0\text{ V to }2.7\text{ V}$ | -   | -   | 200      | ns/V |
|                     |                                     | $V_{CC} = 2.7\text{ V to }3.6\text{ V}$ | -   | -   | 100      | ns/V |
|                     |                                     | $V_{CC} = 3.6\text{ V to }5.5\text{ V}$ | -   | -   | 50       | ns/V |

[1] The static characteristics are guaranteed from  $V_{CC} = 1.2\text{ V}$  to  $V_{CC} = 5.5\text{ V}$ , but LV devices are guaranteed to function down to  $V_{CC} = 1.0\text{ V}$  (with input levels GND or  $V_{CC}$ ).

## 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 <sup>[1]</sup> | Max         | Min               | Max         |      |
| $V_{IH}$                                     | HIGH-level input voltage  | $V_{CC} = 1.2\text{ V}$                          | 0.9              | -                  | -           | 0.9               | -           | V    |
|  |                           | $V_{CC} = 2.0\text{ V}$                          | 1.4              | -                  | -           | 1.4               | -           | V    |
|  |                           | $V_{CC} = 2.7\text{ V to }3.6\text{ V}$          | 2.0              | -                  | -           | 2.0               | -           | V    |
|  |                           | $V_{CC} = 4.5\text{ V to }5.5\text{ V}$          | $0.7V_{CC}$      | -                  | -           | $0.7V_{CC}$       | -           | V    |
| $V_{IL}$                                     | LOW-level input voltage   | $V_{CC} = 1.2\text{ V}$                          | -                | -                  | 0.3         | -                 | 0.3         | V    |
|  |                           | $V_{CC} = 2.0\text{ V}$                          | -                | -                  | 0.6         | -                 | 0.6         | V    |
|  |                           | $V_{CC} = 2.7\text{ V to }3.6\text{ V}$          | -                | -                  | 0.8         | -                 | 0.8         | V    |
|  |                           | $V_{CC} = 4.5\text{ V to }5.5\text{ V}$          | -                | -                  | $0.3V_{CC}$ | -                 | $0.3V_{CC}$ | V    |
| $V_{OH}$                                     | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$                       |                  |                    |             |                   |             |      |
|  |                           | $I_O = -100\ \mu\text{A}; V_{CC} = 1.2\text{ V}$ | -                | 1.2                | -           | -                 | -           | V    |
|  |                           | $I_O = -100\ \mu\text{A}; V_{CC} = 2.0\text{ V}$ | 1.8              | 2.0                | -           | 1.8               | -           | V    |
|  |                           | $I_O = -100\ \mu\text{A}; V_{CC} = 2.7\text{ V}$ | 2.5              | 2.7                | -           | 2.5               | -           | V    |
|  |                           | $I_O = -100\ \mu\text{A}; V_{CC} = 3.0\text{ V}$ | 2.8              | 3.0                | -           | 2.8               | -           | V    |
|  |                           | $I_O = -100\ \mu\text{A}; V_{CC} = 4.5\text{ V}$ | 4.3              | 4.5                | -           | 4.3               | -           | V    |
|  |                           | $I_O = -8\text{ mA}; V_{CC} = 3.0\text{ V}$      | 2.4              | 2.82               | -           | 2.2               | -           | V    |
| $I_O = -16\text{ mA}; V_{CC} = 4.5\text{ V}$ | 3.6                       | 4.2  | -                | 3.5                | -           | V                 |             |      |

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

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 <sup>[1]</sup> | Max  | Min               | Max  |      |
| 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> = 1.2 V   | -                | 0                  | -    | -                 | -    | V    |
|                  |                           | I <sub>O</sub> = 100 μA; V <sub>CC</sub> = 2.0 V   | -                | 0                  | 0.2  | -                 | 0.2  | V    |
|                  |                           | I <sub>O</sub> = 100 μA; V <sub>CC</sub> = 2.7 V   | -                | 0                  | 0.2  | -                 | 0.2  | V    |
|                  |                           | I <sub>O</sub> = 100 μA; V <sub>CC</sub> = 3.0 V   | -                | 0                  | 0.2  | -                 | 0.2  | V    |
|                  |                           | I <sub>O</sub> = 100 μA; V <sub>CC</sub> = 4.5 V   | -                | 0                  | 0.2  | -                 | 0.2  | V    |
|                  |                           | I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 3.0 V   | -                | 0.20               | 0.40 | -                 | 0.50 | V    |
|                  |                           | I <sub>O</sub> = 16 mA; V <sub>CC</sub> = 4.5 V  | -                | 0.35               | 0.55 | -                 | 0.65 | V    |
| I <sub>I</sub>   | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 5.5 V  | -                | -                  | 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> ;<br>V <sub>O</sub> = V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 5.5 V | -                | -                  | 5    | -                 | 10   | μA   |
| I <sub>CC</sub>  | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 5.5 V                                    | -                | -                  | 20   | -                 | 160  | μA   |
| ΔI <sub>CC</sub> | additional supply current | per input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V;<br>V <sub>CC</sub> = 2.7 V to 3.6 V                                     | -                | -                  | 500  | -                 | 850  | μA   |
| C <sub>I</sub>   | input capacitance         |  | -                | 3.5                | -    | -                 | -    | pF   |

[1] Typical values are measured at 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 [Figure 10](#).

| Symbol          | Parameter         | Conditions  | -40 °C to +85 °C |                    |     | -40 °C to +125 °C |     | Unit |
|-----------------|-------------------|---|------------------|--------------------|-----|-------------------|-----|------|
|                 |                   |   | Min              | Typ <sup>[1]</sup> | Max | Min               | Max |      |
| t <sub>pd</sub> | propagation delay | CP to Qn; see <a href="#">Figure 7</a> <sup>[2]</sup>                   |                  |                    |     |                   |     |      |
|                 |                   | V <sub>CC</sub> = 1.2 V   | -                | 90                 | -   | -                 | -   | ns   |
|                 |                   | V <sub>CC</sub> = 2.0 V   | -                | 31                 | 39  | -                 | 49  | ns   |
|                 |                   | V <sub>CC</sub> = 2.7 V   | -                | 23                 | 29  | -                 | 36  | ns   |
|                 |                   | V <sub>CC</sub> = 3.0 V to 3.6 V; C <sub>L</sub> = 15 pF <sup>[3]</sup> | -                | 14                 | -   | -                 | -   | ns   |
|                 |                   | V <sub>CC</sub> = 3.0 V to 3.6 V <sup>[3]</sup>                         | -                | 17                 | 23  | -                 | 29  | ns   |
|                 |                   | V <sub>CC</sub> = 4.5 V to 5.5 V  | -                | -                  | 19  | -                 | 24  | ns   |
| t <sub>en</sub> | enable time       | OE to Qn; see <a href="#">Figure 8</a> <sup>[4]</sup>                   |                  |                    |     |                   |     |      |
|                 |                   | V <sub>CC</sub> = 1.2 V   | -                | 75                 | -   | -                 | -   | ns   |
|                 |                   | V <sub>CC</sub> = 2.0 V   | -                | 26                 | 34  | -                 | 43  | ns   |
|                 |                   | V <sub>CC</sub> = 2.7 V   | -                | 19                 | 25  | -                 | 31  | ns   |
|                 |                   | V <sub>CC</sub> = 3.0 V to 3.6 V <sup>[3]</sup>                         | -                | 14                 | 20  | -                 | 25  | ns   |
|                 |                   | V <sub>CC</sub> = 4.5 V to 5.5 V  | -                | -                  | 17  | -                 | 21  | ns   |

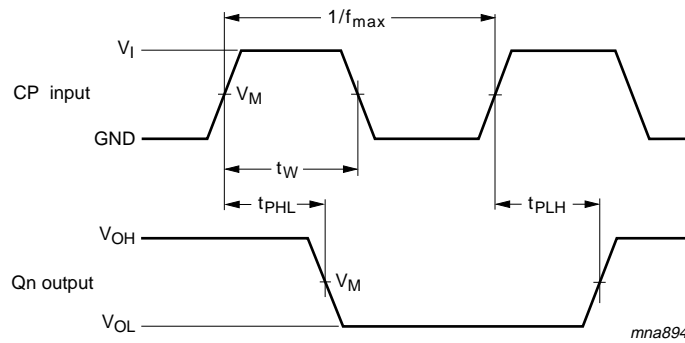
**Table 7. Dynamic characteristics ...continued**

Voltages are referenced to GND (ground = 0 V). For test circuit see [Figure 10](#).

| Symbol           | Parameter                     | Conditions  | -40 °C to +85 °C    |                    |     | -40 °C to +125 °C |     | Unit |     |
|------------------|-------------------------------|---|---------------------|--------------------|-----|-------------------|-----|------|-----|
|                  |                               |   | Min                 | Typ <sup>[1]</sup> | Max | Min               | Max |      |     |
| t <sub>dis</sub> | disable time                  | OE to Qn; <a href="#">Figure 8</a>  |                     |                    |     |                   |     |      |     |
|                  |                               | V <sub>CC</sub> = 1.2 V   | -                   | 80                 | -   | -                 | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 2.0 V   | -                   | 29                 | 39  | -                 | 48  | ns   |     |
|                  |                               | V <sub>CC</sub> = 2.7 V   | -                   | 22                 | 29  | -                 | 36  | ns   |     |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V  | <a href="#">[3]</a> | -                  | 17  | 24                | -   | 29   | ns  |
|                  |                               | V <sub>CC</sub> = 4.5 V to 5.5 V  | <a href="#">[3]</a> | -                  | -   | 20                | -   | 24   | ns  |
| t <sub>W</sub>   | pulse width                   | CP, HIGH or LOW; see <a href="#">Figure 7</a>   |                     |                    |     |                   |     |      |     |
|                  |                               | V <sub>CC</sub> = 2.0 V   | 34                  | 12                 | -   | 41                | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 2.7 V   | 25                  | 9                  | -   | 30                | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V  | <a href="#">[3]</a> | 20                 | 7   | -                 | 24  | -    | ns  |
| t <sub>su</sub>  | set-up time                   | Dn to CP; see <a href="#">Figure 9</a>  |                     |                    |     |                   |     |      |     |
|                  |                               | V <sub>CC</sub> = 1.2 V   | -                   | 25                 | -   | -                 | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 2.0 V   | 22                  | 9                  | -   | 26                | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 2.7 V   | 16                  | 6                  | -   | 19                | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V  | <a href="#">[3]</a> | 13                 | 5   | -                 | 15  | -    | ns  |
| t <sub>h</sub>   | hold time                     | Dn to CP; see <a href="#">Figure 9</a>  |                     |                    |     |                   |     |      |     |
|                  |                               | V <sub>CC</sub> = 1.2 V   | -                   | -10                | -   | -                 | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 2.0 V   | 5                   | -3                 | -   | 5                 | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 2.7 V   | 5                   | -2                 | -   | 5                 | -   | ns   |     |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V  | <a href="#">[3]</a> | 5                  | -2  | -                 | 5   | -    | ns  |
| f <sub>max</sub> | maximum frequency             | see <a href="#">Figure 7</a>  |                     |                    |     |                   |     |      |     |
|                  |                               | V <sub>CC</sub> = 2.0 V   | 15                  | 40                 | -   | 12                | -   | MHz  |     |
|                  |                               | V <sub>CC</sub> = 2.7 V   | 19                  | 58                 | -   | 16                | -   | MHz  |     |
|                  |                               | V <sub>CC</sub> = 3.3 V; C <sub>L</sub> = 15 pF   | -                   | 77                 | -   | -                 | -   | MHz  |     |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V  | <a href="#">[3]</a> | 24                 | 70  | -                 | 20  | -    | MHz |
| C <sub>PD</sub>  | power dissipation capacitance | C <sub>L</sub> = 50 pF; f <sub>i</sub> = 1 MHz; V <sub>i</sub> = GND to V <sub>CC</sub> | <a href="#">[6]</a> | 25                 |     |                   |     | pF   |     |

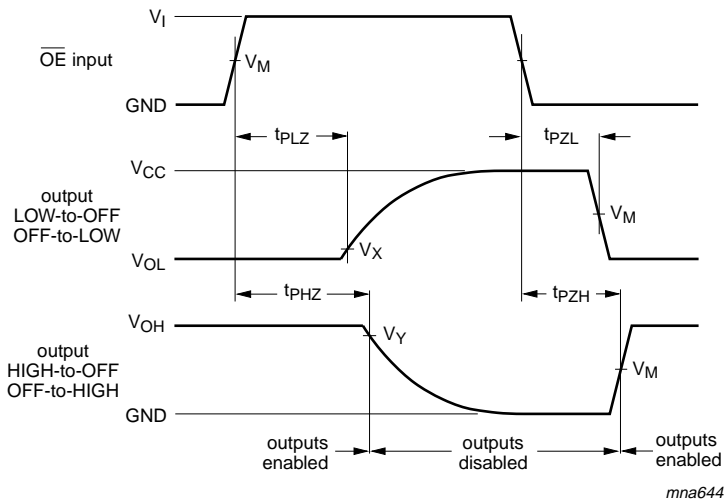
- [1] Typical values are measured at T<sub>amb</sub> = 25 °C.
- [2] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.
- [3] Typical value measured at V<sub>CC</sub> = 3.3 V.
- [4] t<sub>en</sub> is the same as t<sub>PZH</sub> and t<sub>PZL</sub>.
- [5] t<sub>dis</sub> is the same as t<sub>PHZ</sub> and t<sub>PLZ</sub>.
- [6] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum(C_L \times V_{CC}^2 \times f_o)$  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;  
 $\sum(C_L \times V_{CC}^2 \times f_o)$  = sum of outputs.

11. Waveforms



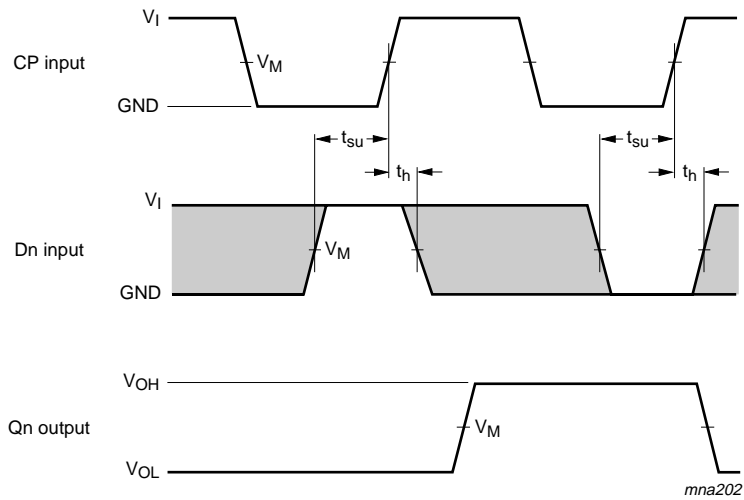
Measurement points are given in [Table 8](#).  
 $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

**Fig 7. The clock (CP) to output (Qn) propagation delays, the clock (CP) pulse width and the maximum clock pulse frequency**



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

**Fig 8. Enable and disable times**

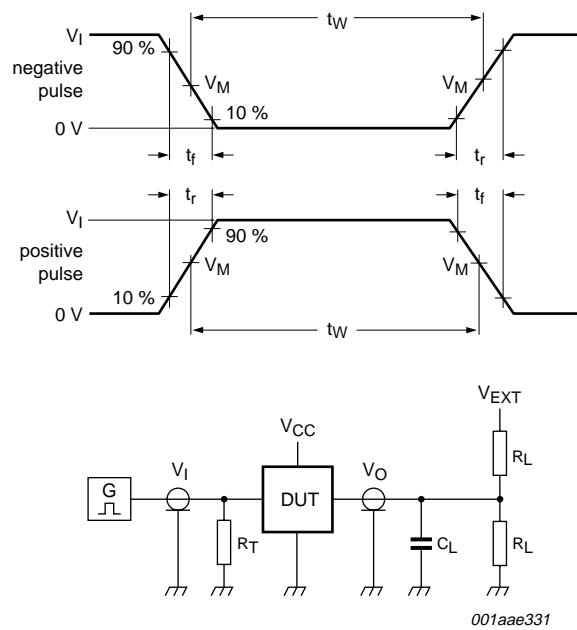


Measurement points are given in [Table 8](#).  
 The shaded areas indicate when the input is permitted to change for predictable output performance.  
 $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

**Fig 9. The data set-up and hold times for the Dn input to the CP input**

**Table 8. Measurement points**

| Supply voltage<br>$V_{CC}$ | Input       | Output      |                  |                  |
|----------------------------|-------------|-------------|------------------|------------------|
|                            | $V_M$       | $V_M$       | $V_x$            | $V_y$            |
| < 2.7 V                    | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.3 V$ | $V_{OH} - 0.3 V$ |
| 2.7 V to 3.6 V             | 1.5 V       | 1.5 V       | $V_{OL} + 0.3 V$ | $V_{OH} - 0.3 V$ |
| $\geq 4.5 V$               | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.3 V$ | $V_{OH} - 0.3 V$ |



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         |              | $V_{EXT}$          |                    |                    |
|----------------|----------|---------------|--------------|--------------|--------------------|--------------------|--------------------|
| $V_{CC}$       | $V_I$    | $t_r, t_f$    | $C_L$        | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| < 2.7 V        | $V_{CC}$ | $\leq 2.5$ ns | 50 pF        | 1 k $\Omega$ | open               | GND                | $2V_{CC}$          |
| 2.7 V to 3.6 V | 2.7 V    | $\leq 2.5$ ns | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $2V_{CC}$          |
| $\geq 4.5$ V   | $V_{CC}$ | $\leq 2.5$ ns | 50 pF        | 1 k $\Omega$ | open               | GND                | $2V_{CC}$          |

12. Package outline

DIP20: plastic dual in-line package; 20 leads (300 mil)

SOT146-1

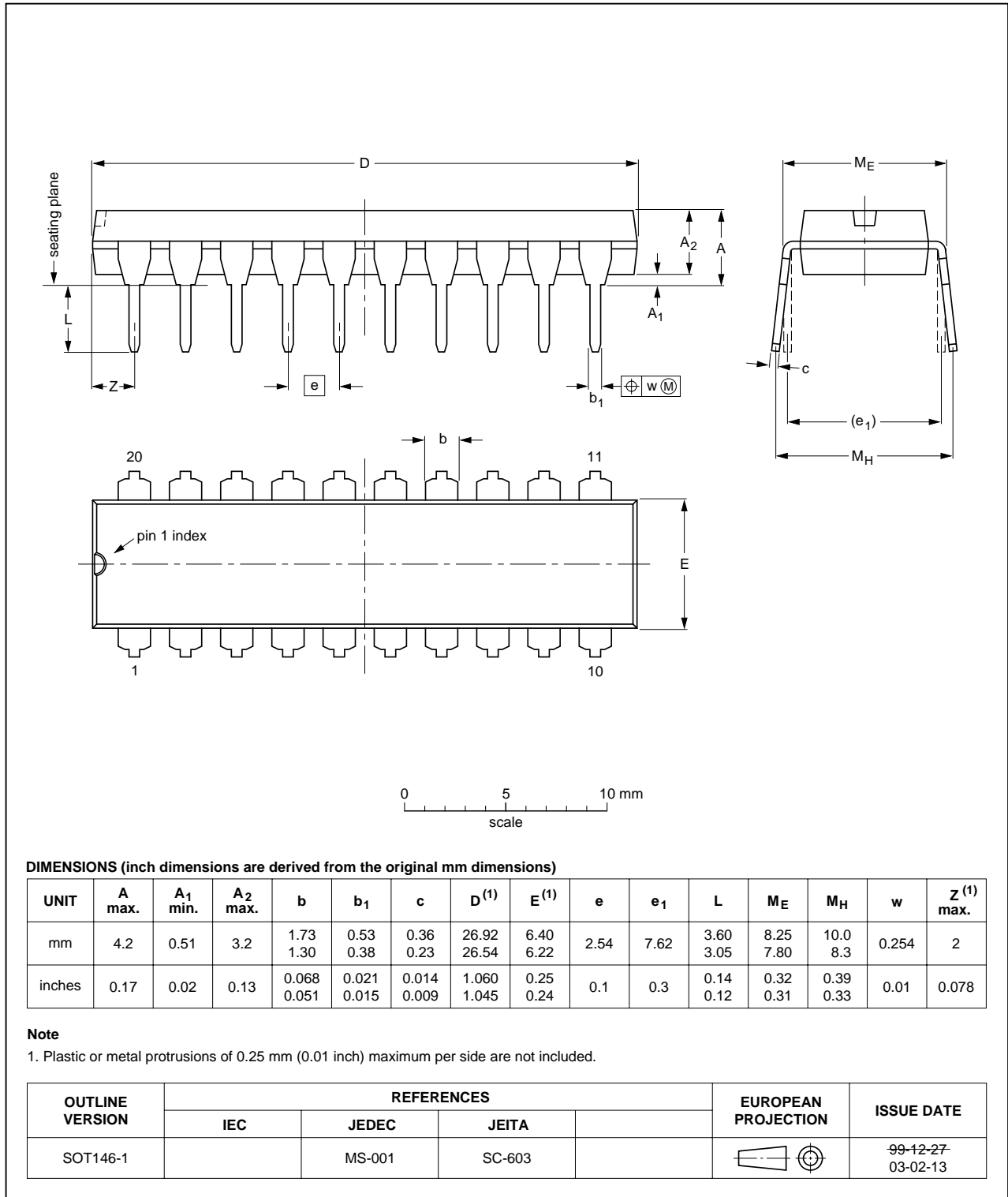


Fig 11. Package outline SOT146-1 (DIP20)

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

SOT163-1

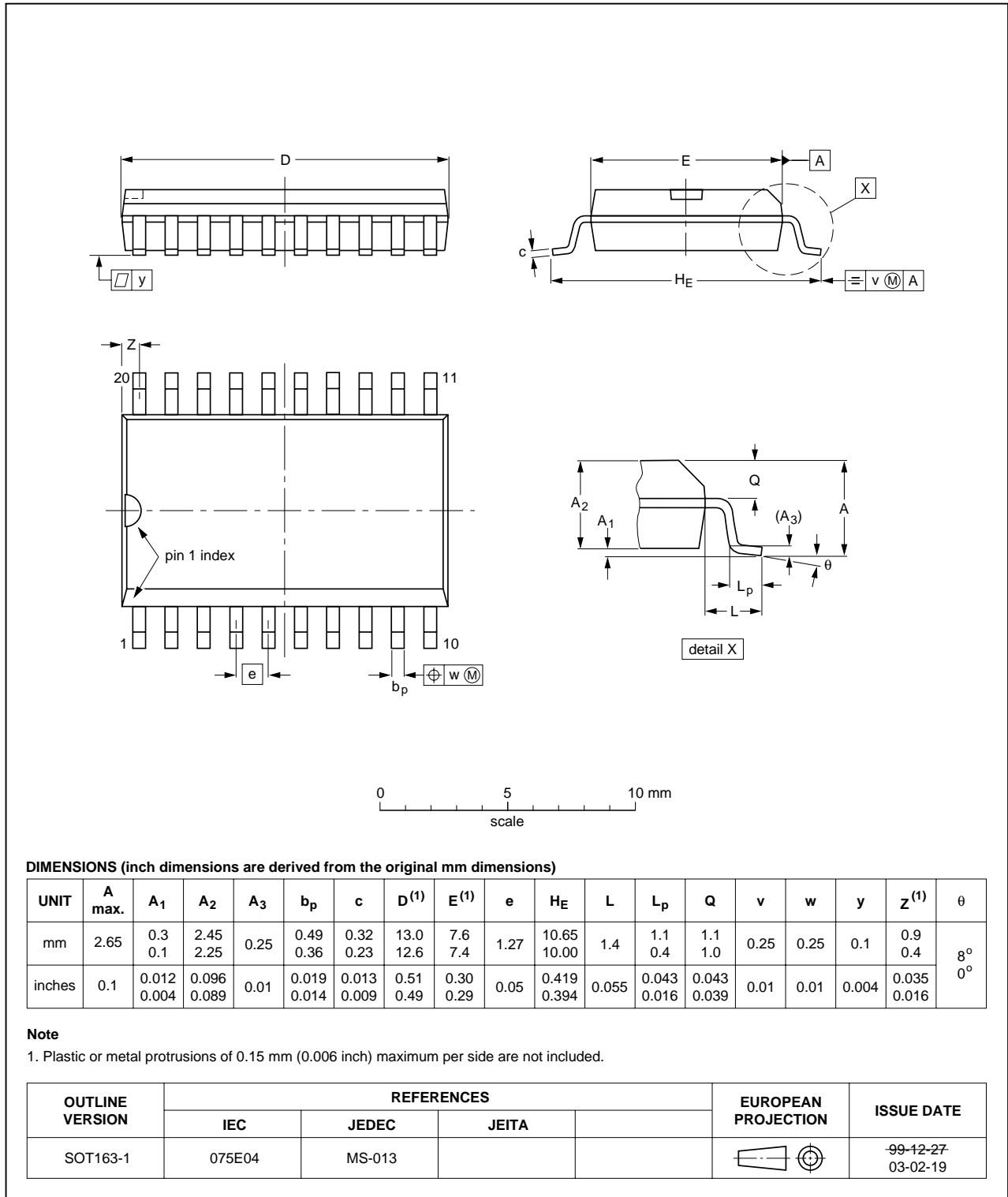


Fig 12. Package outline SOT163-1 (SO20)

SSOP20: plastic shrink small outline package; 20 leads; body width 5.3 mm

SOT339-1

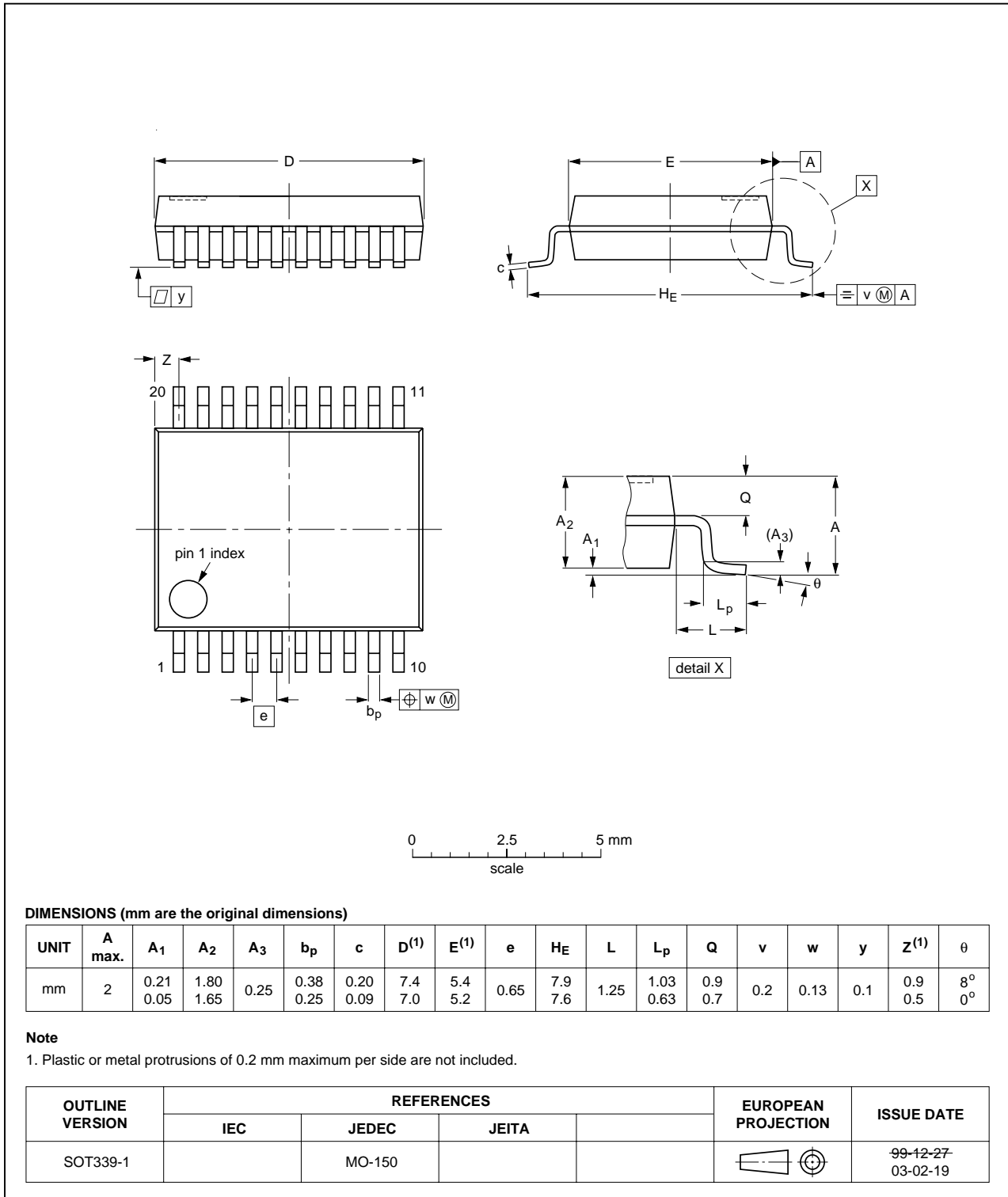


Fig 13. Package outline SOT339-1 (SSOP20)

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

SOT360-1

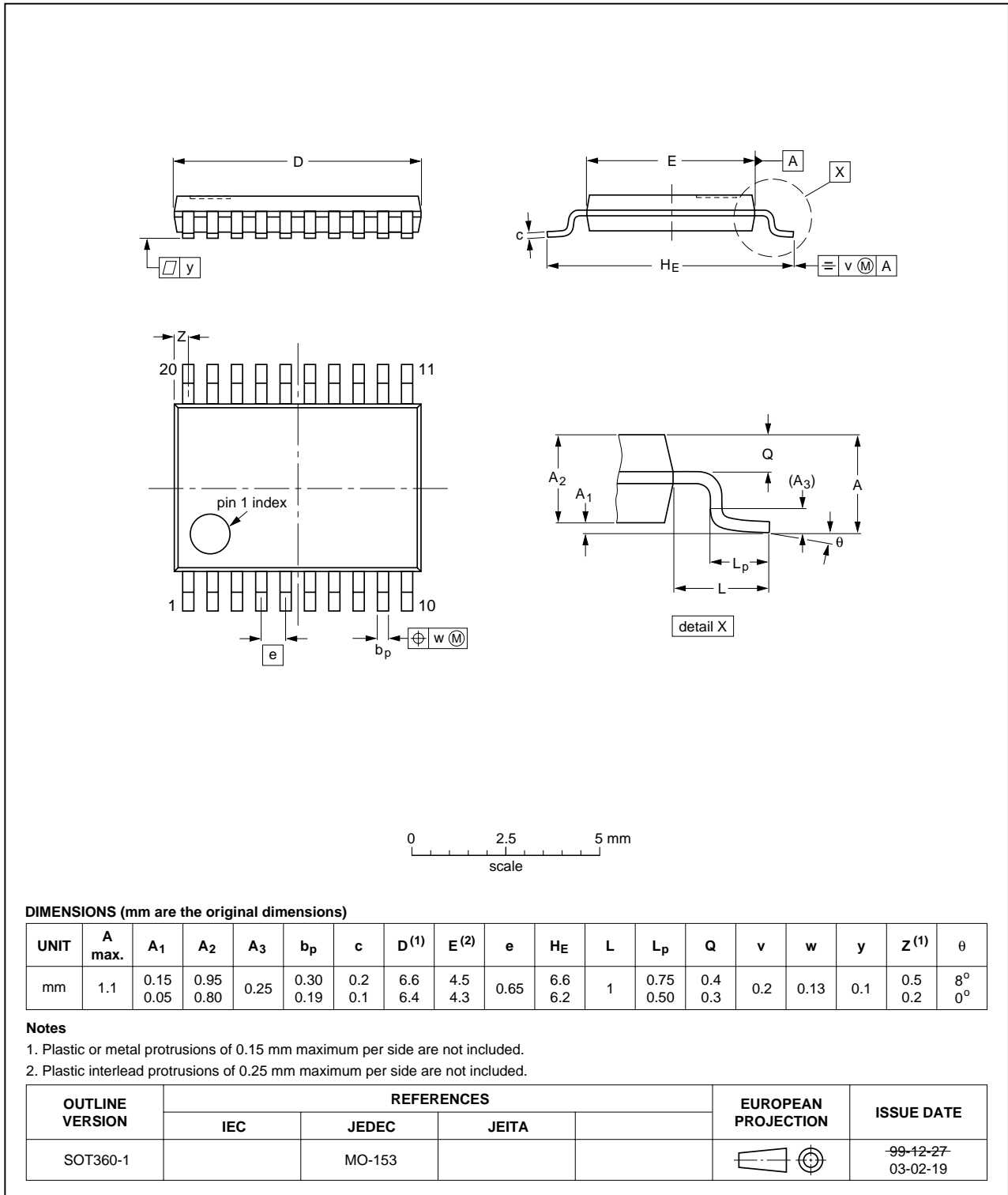


Fig 14. Package outline SOT360-1 (TSSOP20)

## 13. Abbreviations

Table 10. Abbreviations

| Acronym | Description                 |
|---------|-----------------------------|
| DUT     | Device Under Test           |
| ESD     | ElectroStatic Discharge     |
| HBM     | Human Body Model            |
| MM      | Machine Model               |
| TTL     | Transistor-Transistor Logic |

## 14. Revision history

Table 11. Revision history

| Document ID    | Release date   | Data sheet status     | Change notice | Supersedes |
|----------------|--|-----------------------|---------------|------------|
| 74LV374_2      | 20090514   | Product data sheet    | -             | 74LV374_1  |
| 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>• Quick reference data removed</li> <li>• Added type number 74LV374PW (TSSOP20 package)</li> </ul> |                       |               |            |
| 74LV374_1      | 19970320   | Product specification | -             | -          |

## 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.nxp.com>.

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