

# 74HC244-Q100; 74HCT244-Q100

Octal buffer/line driver; 3-state

Rev. 1 — 7 August 2012

Product data sheet

## 1. General description

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The 74HC244-Q100; 74HCT244-Q100 is an 8-bit buffer/line driver with 3-state outputs. The device can be used as two 4-bit buffers or one 8-bit buffer. The device features two output enables ( $\overline{1OE}$  and  $\overline{2OE}$ ), each controlling four of the 3-state outputs. A HIGH on  $\overline{nOE}$  causes the outputs to assume a high-impedance OFF-state. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

## 2. Features and benefits

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- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - ◆ Specified from  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$  and from  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$
- Input levels:
  - ◆ For 74HC244-Q100: CMOS level
  - ◆ For 74HCT244-Q100: TTL level
- Octal bus interface
- Non-inverting 3-state outputs
- Multiple package options
- Complies with JEDEC standard no. 7 A
- ESD protection:
  - ◆ MIL-STD-883, method 3015 exceeds 2000 V
  - ◆ HBM JESD22-A114F exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V ( $C = 200\text{ pF}$ ,  $R = 0\text{ }\Omega$ )



### 3. Ordering information

Table 1. Ordering information

| Type number                       | Package           |          |                                                                                                                                      | Version  |
|-----------------------------------|-------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------|----------|
|                                   | Temperature range | Name     | Description                                                                                                                          |          |
| 74HC244D-Q100<br>74HCT244D-Q100   | -40 °C to +125 °C | SO20     | plastic small outline package; 20 leads;<br>body width 7.5 mm                                                                        | SOT163-1 |
| 74HC244PW-Q100<br>74HCT244PW-Q100 | -40 °C to +125 °C | TSSOP20  | plastic thin shrink small outline package; 20 leads;<br>body width 4.4 mm                                                            | SOT360-1 |
| 74HC244BQ-Q100<br>74HCT244BQ-Q100 | -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 | SOT764-1 |

### 4. Functional diagram

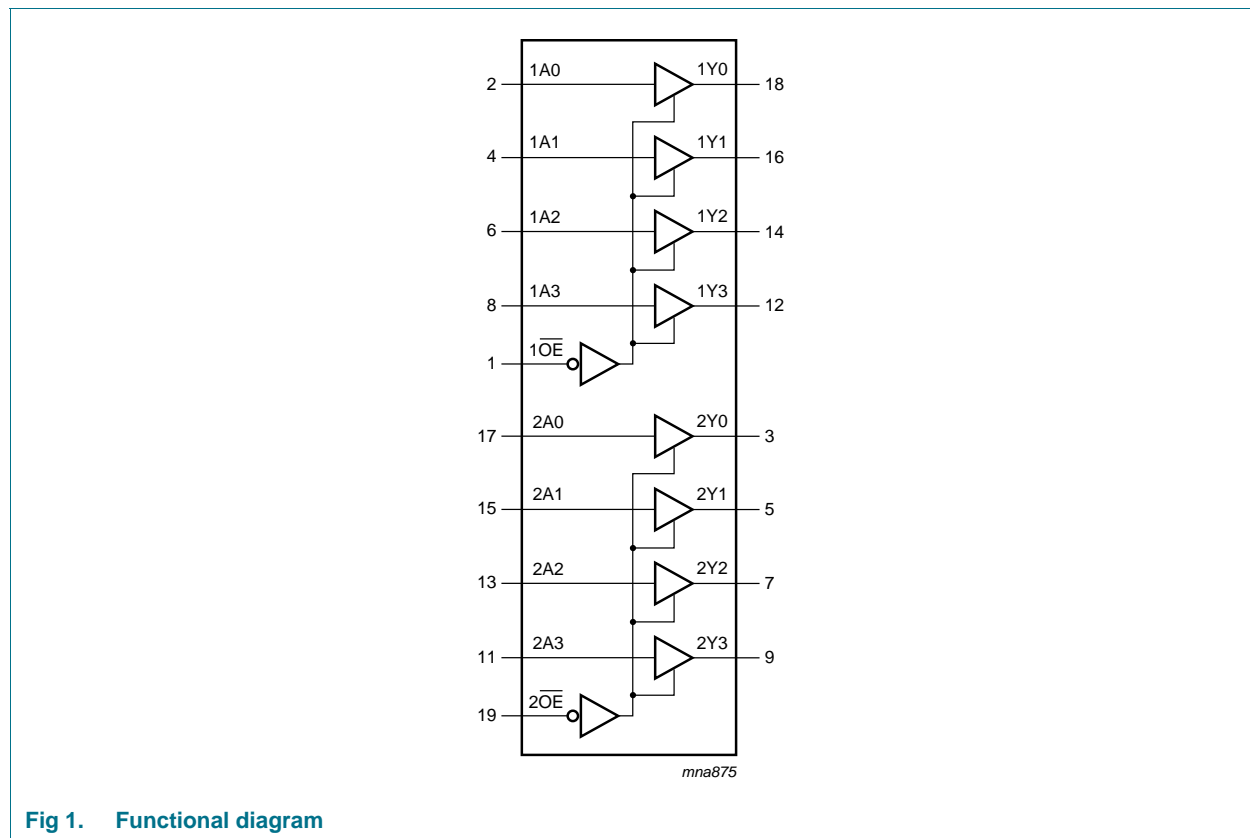


Fig 1. Functional diagram

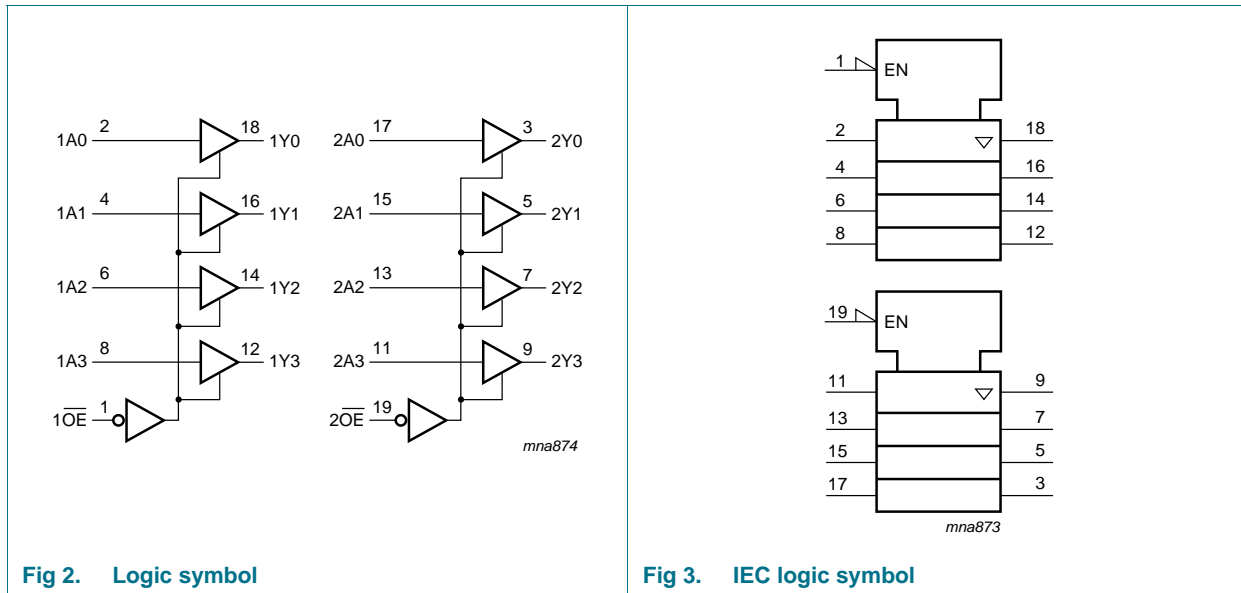


Fig 2. Logic symbol

Fig 3. IEC logic symbol

## 5. Pinning information

### 5.1 Pinning

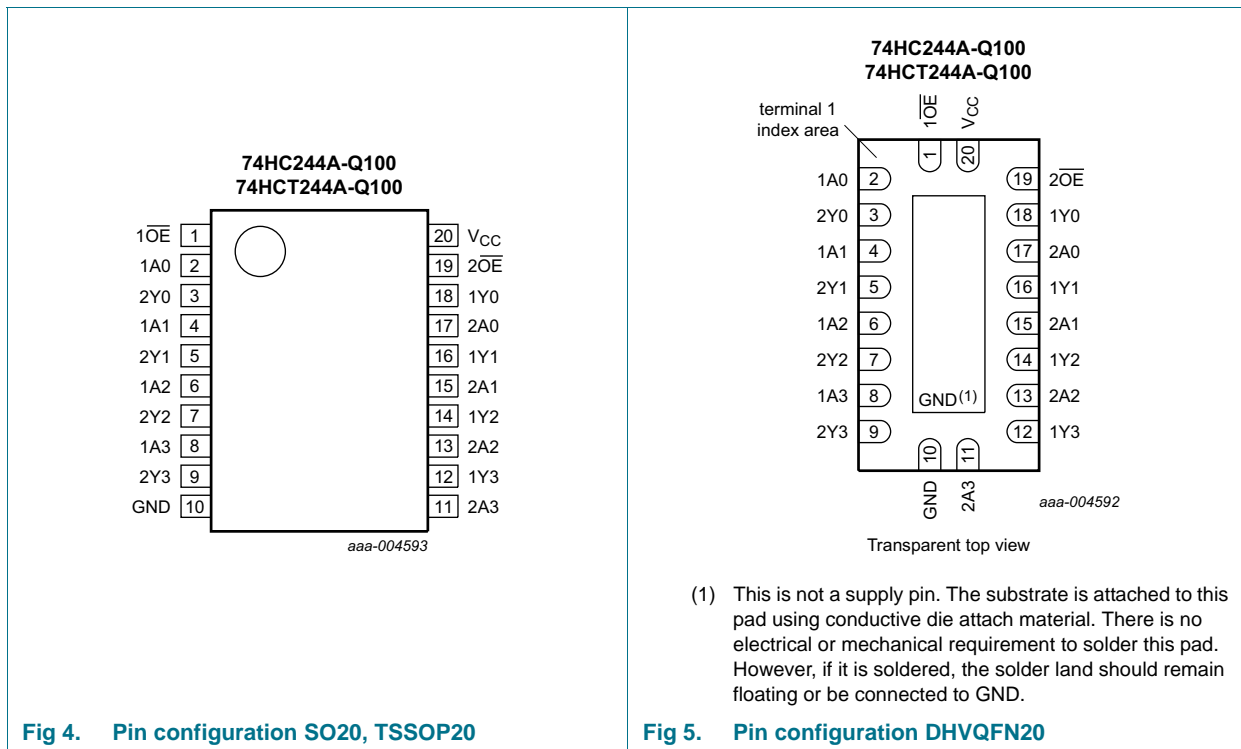


Fig 4. Pin configuration SO20, TSSOP20

Fig 5. Pin configuration DHVQFN20

(1) This is not a supply pin. The substrate is attached to this pad using conductive die attach material. There is no electrical or mechanical requirement to solder this pad. However, if it is soldered, the solder land should remain floating or be connected to GND.

## 5.2 Pin description

Table 2. Pin description

| Symbol                              | Pin            | Description                      |
|-------------------------------------|----------------|----------------------------------|
| $\overline{1OE}$ , $\overline{2OE}$ | 1, 19          | output enable input (active LOW) |
| 1A0, 1A1, 1A2, 1A3                  | 2, 4, 6, 8     | data input                       |
| 2Y0, 2Y1, 2Y2, 2Y3                  | 3, 5, 7, 9     | bus output                       |
| GND                                 | 10             | ground (0 V)                     |
| 2A0, 2A1, 2A2, 2A3                  | 17, 15, 13, 11 | data input                       |
| 1Y0, 1Y1, 1Y2, 1Y3                  | 18, 16, 14, 12 | bus output                       |
| V <sub>CC</sub>                     | 20             | supply voltage                   |

## 6. Functional description

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

| Input            |     | Output |
|------------------|-----|--------|
| $\overline{nOE}$ | nAn | nYn    |
| L                | L   | L      |
| L                | H   | H      |
| H                | X   | Z      |

[1] H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.

## 7. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

| Symbol           | Parameter               | Conditions                                               | Min              | Max  | Unit |
|------------------|-------------------------|----------------------------------------------------------|------------------|------|------|
| V <sub>CC</sub>  | supply voltage          |                                                          | -0.5             | +7   | V    |
| I <sub>IK</sub>  | input clamping current  | $V_I < -0.5 \text{ V}$ or $V_I > V_{CC} + 0.5 \text{ V}$ | -                | ±20  | mA   |
| I <sub>OK</sub>  | output clamping current | $V_O < -0.5 \text{ V}$ or $V_O > V_{CC} + 0.5 \text{ V}$ | -                | ±20  | mA   |
| I <sub>O</sub>   | output current          | $-0.5 \text{ V} < V_O < V_{CC} + 0.5 \text{ V}$          | -                | ±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 |                                                          | <sup>[1]</sup> - | 500  | mW   |

[1] For SO20 packages: above 70 °C, P<sub>tot</sub> derates linearly with 8 mW/K.  
 For TSSOP20 package: above 60 °C, P<sub>tot</sub> derates linearly with 5.5 mW/K.  
 For DHVQFN20 packages: above 60 °C, P<sub>tot</sub> derates linearly with 4.5 mW/K.

## 8. Recommended operating conditions

Table 5. Recommended operating conditions

| Symbol               | Parameter                           | Conditions              | Min | Typ  | Max      | Unit |
|----------------------|-------------------------------------|-------------------------|-----|------|----------|------|
| <b>74HC244-Q100</b>  |                                     |                         |     |      |          |      |
| $V_{CC}$             | supply voltage                      |                         | 2.0 | 5.0  | 6.0      | V    |
| $V_I$                | input voltage                       |                         | 0   | -    | $V_{CC}$ | V    |
| $V_O$                | output voltage                      |                         | 0   | -    | $V_{CC}$ | V    |
| $\Delta t/\Delta V$  | input transition rise and fall rate | $V_{CC} = 2.0\text{ V}$ | -   | -    | 625      | ns/V |
|                      |                                     | $V_{CC} = 4.5\text{ V}$ | -   | 1.67 | 139      | ns/V |
|                      |                                     | $V_{CC} = 6.0\text{ V}$ | -   | -    | 83       | ns/V |
| $T_{amb}$            | ambient temperature                 |                         | -40 | -    | +125     | °C   |
| <b>74HCT244-Q100</b> |                                     |                         |     |      |          |      |
| $V_{CC}$             | supply voltage                      |                         | 4.5 | 5.0  | 5.5      | V    |
| $V_I$                | input voltage                       |                         | 0   | -    | $V_{CC}$ | V    |
| $V_O$                | output voltage                      |                         | 0   | -    | $V_{CC}$ | V    |
| $\Delta t/\Delta V$  | input transition rise and fall rate | $V_{CC} = 4.5\text{ V}$ | -   | 1.67 | 139      | ns/V |
| $T_{amb}$            | ambient temperature                 |                         | -40 | -    | +125     | °C   |

## 9. Static characteristics

Table 6. Static characteristics

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

| Symbol              | Parameter                                        | Conditions                                               | 25 °C |      |      | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|---------------------|--------------------------------------------------|----------------------------------------------------------|-------|------|------|------------------|------|-------------------|------|------|
|                     |                                                  |                                                          | Min   | Typ  | Max  | Min              | Max  | Min               | Max  |      |
| <b>74HC244-Q100</b> |                                                  |                                                          |       |      |      |                  |      |                   |      |      |
| $V_{IH}$            | HIGH-level input voltage                         | $V_{CC} = 2.0\text{ V}$                                  | 1.5   | 1.2  | -    | 1.5              | -    | 1.5               | -    | V    |
|                     |                                                  | $V_{CC} = 4.5\text{ V}$                                  | 3.15  | 2.4  | -    | 3.15             | -    | 3.15              | -    | V    |
|                     |                                                  | $V_{CC} = 6.0\text{ V}$                                  | 4.2   | 3.2  | -    | 4.2              | -    | 4.2               | -    | V    |
| $V_{IL}$            | LOW-level input voltage                          | $V_{CC} = 2.0\text{ V}$                                  | -     | 0.8  | 0.5  | -                | 0.5  | -                 | 0.5  | V    |
|                     |                                                  | $V_{CC} = 4.5\text{ V}$                                  | -     | 2.1  | 1.35 | -                | 1.35 | -                 | 1.35 | V    |
|                     |                                                  | $V_{CC} = 6.0\text{ V}$                                  | -     | 2.8  | 1.8  | -                | 1.8  | -                 | 1.8  | V    |
| $V_{OH}$            | HIGH-level output voltage                        | $V_I = V_{IH}$ or $V_{IL}$                               |       |      |      |                  |      |                   |      |      |
|                     |                                                  | $I_O = -20\text{ }\mu\text{A}$ ; $V_{CC} = 2.0\text{ V}$ | 1.9   | 2.0  | -    | 1.9              | -    | 1.9               | -    | V    |
|                     |                                                  | $I_O = -20\text{ }\mu\text{A}$ ; $V_{CC} = 4.5\text{ V}$ | 4.4   | 4.5  | -    | 4.4              | -    | 4.4               | -    | V    |
|                     |                                                  | $I_O = -20\text{ }\mu\text{A}$ ; $V_{CC} = 6.0\text{ V}$ | 5.9   | 6.0  | -    | 5.9              | -    | 5.9               | -    | V    |
|                     |                                                  | $I_O = -6.0\text{ mA}$ ; $V_{CC} = 4.5\text{ V}$         | 3.98  | 4.32 | -    | 3.84             | -    | 3.7               | -    | V    |
|                     | $I_O = -7.8\text{ mA}$ ; $V_{CC} = 6.0\text{ V}$ | 5.48                                                     | 5.81  | -    | 5.34 | -                | 5.2  | -                 | V    |      |

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

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

| Symbol               | Parameter                 | Conditions                                                                                                                                                                                                   | 25 °C |      |      | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|----------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|------|------------------|------|-------------------|------|------|
|                      |                           |                                                                                                                                                                                                              | Min   | Typ  | Max  | Min              | Max  | Min               | Max  |      |
| V <sub>OL</sub>      | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                                                                                          |       |      |      |                  |      |                   |      |      |
|                      |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 2.0 V                                                                                                                                                              | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                      |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V                                                                                                                                                              | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                      |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V                                                                                                                                                              | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                      |                           | I <sub>O</sub> = 6.0 mA; V <sub>CC</sub> = 4.5 V                                                                                                                                                             | -     | 0.15 | 0.26 | -                | 0.33 | -                 | 0.4  | V    |
|                      |                           | I <sub>O</sub> = 7.8 mA; V <sub>CC</sub> = 6.0 V                                                                                                                                                             | -     | 0.16 | 0.26 | -                | 0.33 | -                 | 0.4  | V    |
| I <sub>I</sub>       | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 6.0 V                                                                                                                                          | -     | -    | ±0.1 | -                | ±1.0 | -                 | ±1.0 | μA   |
| I <sub>OZ</sub>      | OFF-state output current  | per input pin; 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>other inputs at V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 6.0 V; I <sub>O</sub> = 0 A | -     | -    | ±0.5 | -                | ±5.0 | -                 | ±10  | μA   |
| I <sub>CC</sub>      | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A;<br>V <sub>CC</sub> = 6.0 V                                                                                                                    | -     | -    | 8.0  | -                | 80   | -                 | 160  | μA   |
| C <sub>I</sub>       | input capacitance         |                                                                                                                                                                                                              | -     | 3.5  | -    | -                | -    | -                 | -    | pF   |
| <b>74HCT244-Q100</b> |                           |                                                                                                                                                                                                              |       |      |      |                  |      |                   |      |      |
| V <sub>IH</sub>      | HIGH-level input voltage  | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                                                                                                                             | 2.0   | 1.6  | -    | 2.0              | -    | 2.0               | -    | V    |
| V <sub>IL</sub>      | LOW-level input voltage   | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                                                                                                                             | -     | 1.2  | 0.8  | -                | 0.8  | -                 | 0.8  | V    |
| V <sub>OH</sub>      | HIGH-level output voltage | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 4.5 V                                                                                                                                |       |      |      |                  |      |                   |      |      |
|                      |                           | I <sub>O</sub> = -20 μA                                                                                                                                                                                      | 4.4   | 4.5  | -    | 4.4              | -    | 4.4               | -    | V    |
|                      |                           | I <sub>O</sub> = -6 mA                                                                                                                                                                                       | 3.98  | 4.32 | -    | 3.84             | -    | 3.7               | -    | V    |
| V <sub>OL</sub>      | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 4.5 V                                                                                                                                |       |      |      |                  |      |                   |      |      |
|                      |                           | I <sub>O</sub> = 20 μA                                                                                                                                                                                       | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                      |                           | I <sub>O</sub> = 6.0 mA                                                                                                                                                                                      | -     | 0.16 | 0.26 | -                | 0.33 | -                 | 0.4  | V    |
| I <sub>I</sub>       | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 5.5 V                                                                                                                                          | -     | -    | ±0.1 | -                | ±1.0 | -                 | ±1.0 | μA   |
| I <sub>OZ</sub>      | OFF-state output current  | per input pin; 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>other inputs at V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 5.5 V; I <sub>O</sub> = 0 A | -     | -    | ±0.5 | -                | ±5.0 | -                 | ±10  | μA   |
| I <sub>CC</sub>      | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 5.5 V; I <sub>O</sub> = 0 A                                                                                                                    | -     | -    | 8.0  | -                | 80   | -                 | 160  | μA   |
| ΔI <sub>CC</sub>     | additional supply current | per input pin;<br>V <sub>I</sub> = V <sub>CC</sub> - 2.1 V;<br>other inputs at V <sub>CC</sub> or GND;<br>V <sub>CC</sub> = 4.5 V to 5.5 V;<br>I <sub>O</sub> = 0 A                                          | -     | 70   | 252  | -                | 315  | -                 | 343  | μA   |
| C <sub>I</sub>       | input capacitance         |                                                                                                                                                                                                              | -     | 3.5  | -    | -                | -    | -                 | -    | pF   |

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

$GND = 0\text{ V}$ ; for load circuit see [Figure 8](#).

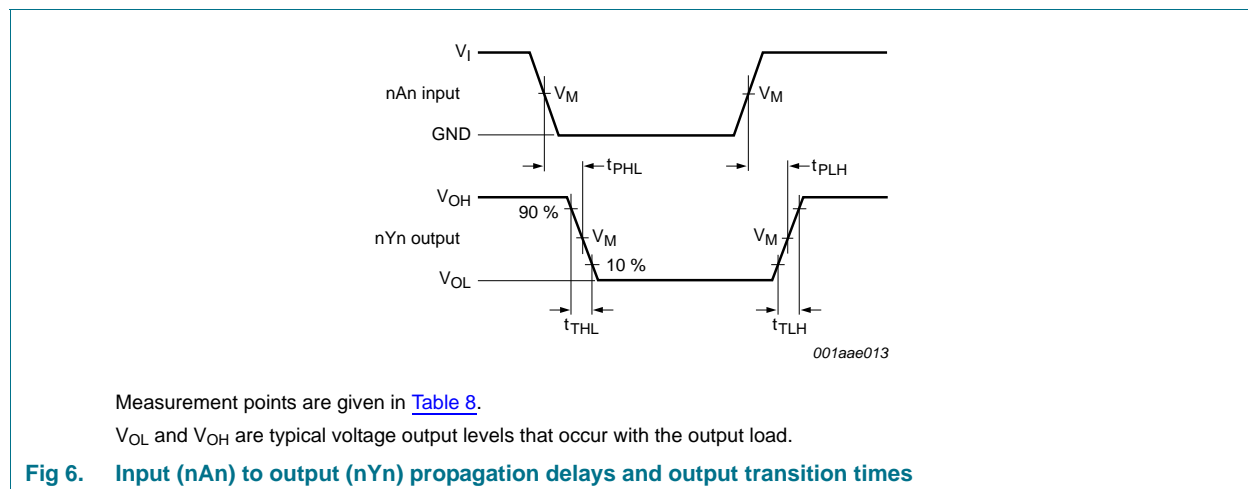
| Symbol              | Parameter                     | Conditions                                              | 25 °C |     |     | -40 °C to +125 °C |              | Unit |    |
|---------------------|-------------------------------|---------------------------------------------------------|-------|-----|-----|-------------------|--------------|------|----|
|                     |                               |                                                         | Min   | Typ | Max | Max (85 °C)       | Max (125 °C) |      |    |
| <b>74HC244-Q100</b> |                               |                                                         |       |     |     |                   |              |      |    |
| $t_{pd}$            | propagation delay             | nAn to nYn; see <a href="#">Figure 6</a>                | [1]   |     |     |                   |              |      |    |
|                     |                               | $V_{CC} = 2.0\text{ V}$                                 | -     | 30  | 110 | 145               | 165          | ns   |    |
|                     |                               | $V_{CC} = 4.5\text{ V}$                                 | -     | 11  | 22  | 28                | 33           | ns   |    |
|                     |                               | $V_{CC} = 5.0\text{ V}$ ; $C_L = 15\text{ pF}$          | -     | 9   | -   | -                 | -            | ns   |    |
| $t_{en}$            | enable time                   | $\overline{nOE}$ to nYn; see <a href="#">Figure 7</a>   | [2]   |     |     |                   |              |      |    |
|                     |                               | $V_{CC} = 2.0\text{ V}$                                 | -     | 36  | 150 | 190               | 225          | ns   |    |
|                     |                               | $V_{CC} = 4.5\text{ V}$                                 | -     | 13  | 30  | 38                | 45           | ns   |    |
|                     |                               | $V_{CC} = 6.0\text{ V}$                                 | -     | 10  | 26  | 33                | 38           | ns   |    |
| $t_{dis}$           | disable time                  | $\overline{nOE}$ to nYn or see <a href="#">Figure 7</a> | [3]   |     |     |                   |              |      |    |
|                     |                               | $V_{CC} = 2.0\text{ V}$                                 | -     | 39  | 150 | 190               | 225          | ns   |    |
|                     |                               | $V_{CC} = 4.5\text{ V}$                                 | -     | 14  | 30  | 38                | 45           | ns   |    |
|                     |                               | $V_{CC} = 6.0\text{ V}$                                 | -     | 11  | 26  | 33                | 38           | ns   |    |
| $t_t$               | transition time               | see <a href="#">Figure 6</a>                            | [4]   |     |     |                   |              |      |    |
|                     |                               | $V_{CC} = 2.0\text{ V}$                                 | -     | 14  | 60  | 75                | 90           | ns   |    |
|                     |                               | $V_{CC} = 4.5\text{ V}$                                 | -     | 5   | 12  | 15                | 18           | ns   |    |
|                     |                               | $V_{CC} = 6.0\text{ V}$                                 | -     | 4   | 10  | 13                | 15           | ns   |    |
| $C_{PD}$            | power dissipation capacitance | per buffer; $V_I = GND$ to $V_{CC}$                     | [5]   | -   | 35  | -                 | -            | -    | pF |

**Table 7. Dynamic characteristics ...continued**  
*GND = 0 V; for load circuit see Figure 8.*

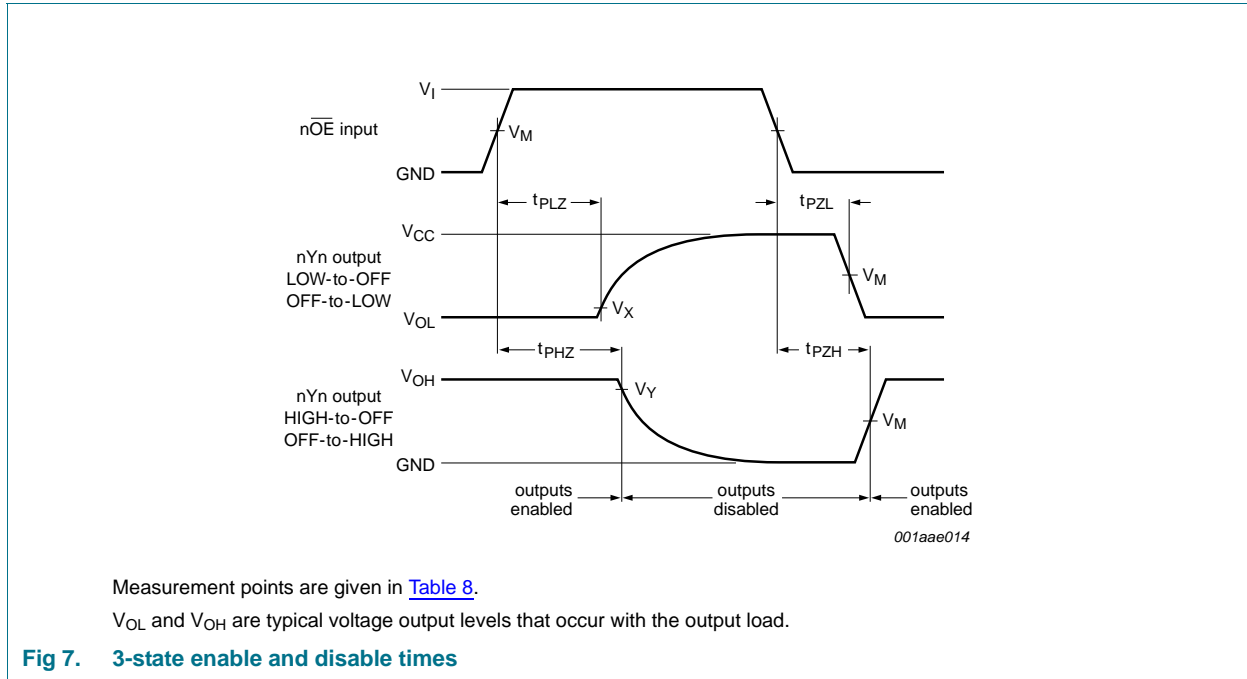
| Symbol               | Parameter                     | Conditions                                                                                                         | 25 °C |     |     | -40 °C to +125 °C |              | Unit |    |
|----------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------|-------|-----|-----|-------------------|--------------|------|----|
|                      |                               |                                                                                                                    | Min   | Typ | Max | Max (85 °C)       | Max (125 °C) |      |    |
| <b>74HCT244-Q100</b> |                               |                                                                                                                    |       |     |     |                   |              |      |    |
| $t_{pd}$             | propagation delay             | nAn to nYn; see <a href="#">Figure 6</a><br>$V_{CC} = 4.5\text{ V}$<br>$V_{CC} = 5.0\text{ V}; C_L = 15\text{ pF}$ | [1]   | -   | 13  | 22                | 28           | 33   | ns |
| $t_{en}$             | enable time                   | $\overline{nOE}$ to nYn; $V_{CC} = 4.5\text{ V}$ ; see <a href="#">Figure 7</a>                                    | [2]   | -   | 15  | 30                | 38           | 45   | ns |
| $t_{dis}$            | disable time                  | $\overline{nOE}$ to nYn; $V_{CC} = 4.5\text{ V}$ ; see <a href="#">Figure 7</a>                                    | [3]   | -   | 15  | 25                | 31           | 38   | ns |
| $t_t$                | transition time               | $V_{CC} = 4.5\text{ V}$ ; see <a href="#">Figure 6</a>                                                             | [4]   | -   | 5   | 12                | 15           | 18   | ns |
| $C_{PD}$             | power dissipation capacitance | per buffer;<br>$V_I = \text{GND to } V_{CC} - 1.5\text{ V}$                                                        | [5]   | -   | 35  | -                 | -            | -    | pF |

- [1]  $t_{pd}$  is the same as  $t_{PHL}$  and  $t_{PLH}$ .
- [2]  $t_{en}$  is the same as  $t_{PZH}$  and  $t_{PZL}$ .
- [3]  $t_{dis}$  is the same as  $t_{PHZ}$  and  $t_{PLZ}$ .
- [4]  $t_t$  is the same as  $t_{THL}$  and  $t_{TLH}$ .
- [5]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ ):  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum (C_L \times V_{CC}^2 \times f_o)$  where:  
 $f_i$  = input frequency in MHz;  
 $f_o$  = output frequency in MHz;  
 $C_L$  = output load capacitance in pF;  
 $V_{CC}$  = supply voltage in V;  
 $N$  = number of inputs switching;  
 $\sum (C_L \times V_{CC}^2 \times f_o)$  = sum of outputs.

## 11. Waveforms

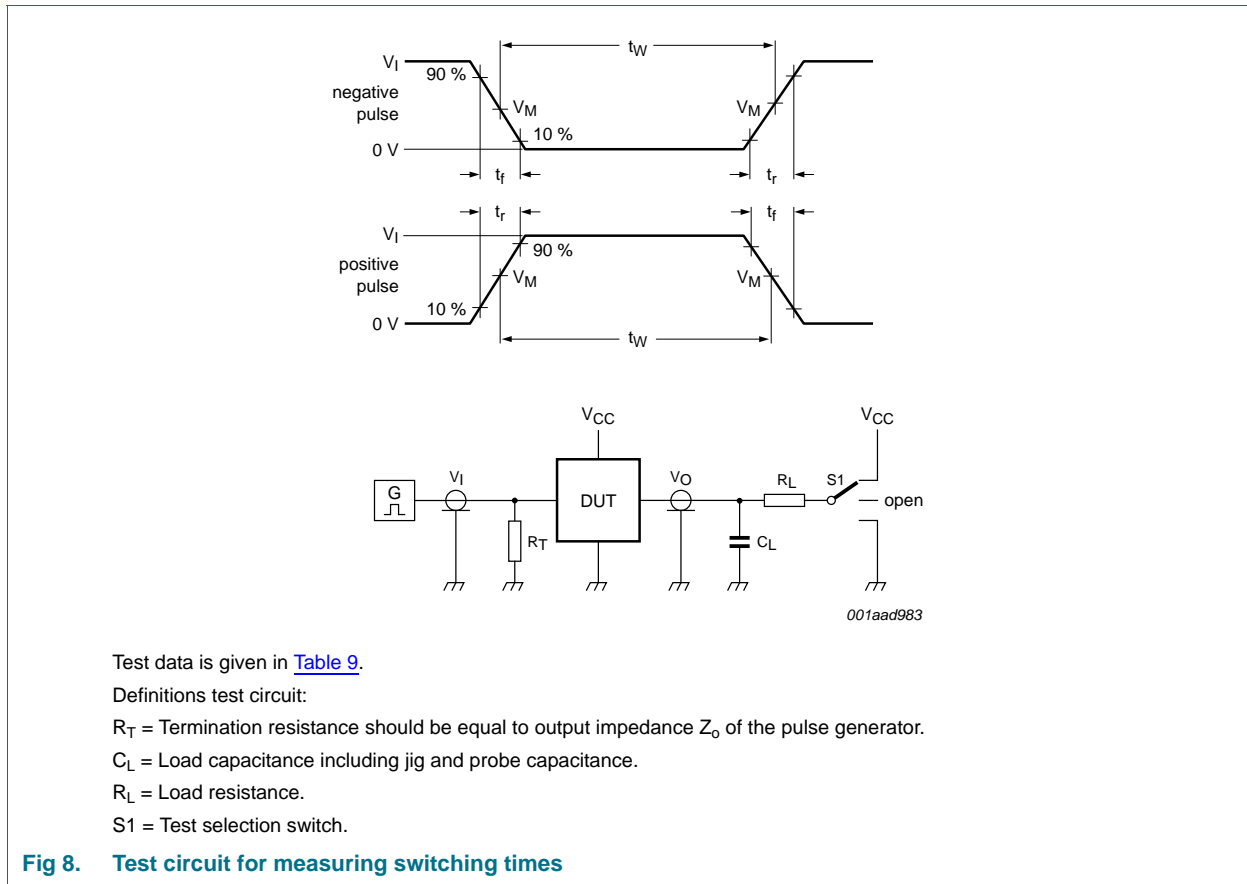






**Table 8. Measurement points**

| Type          | Input               | Output              |                     |                     |
|---------------|---------------------|---------------------|---------------------|---------------------|
|               | $V_M$               | $V_M$               | $V_X$               | $V_Y$               |
| 74HC244-Q100  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $0.1 \times V_{CC}$ | $0.9 \times V_{CC}$ |
| 74HCT244-Q100 | 1.3 V               | 1.3 V               | $0.1 \times V_{CC}$ | $0.9 \times V_{CC}$ |



**Table 9. Test data**

| Type          | Input    |            | Load         |              | S1 position        |                    |                    |
|---------------|----------|------------|--------------|--------------|--------------------|--------------------|--------------------|
|               | $V_I$    | $t_r, t_f$ | $C_L$        | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74HC244-Q100  | $V_{CC}$ | 6 ns       | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74HCT244-Q100 | 3 V      | 6 ns       | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |

## 12. Package outline

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

SOT163-1

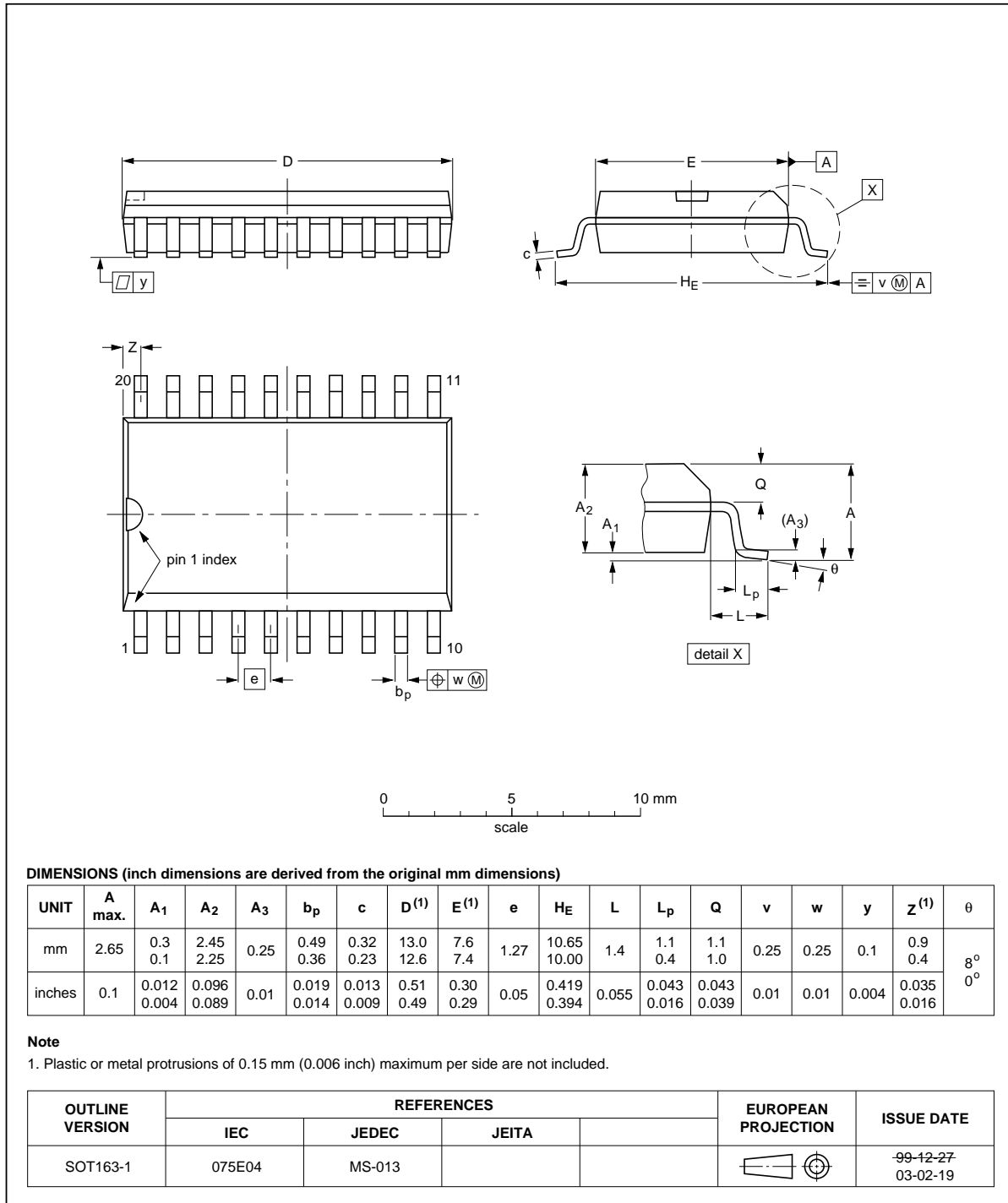


Fig 9. Package outline SOT163-1 (SO20)

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

SOT360-1

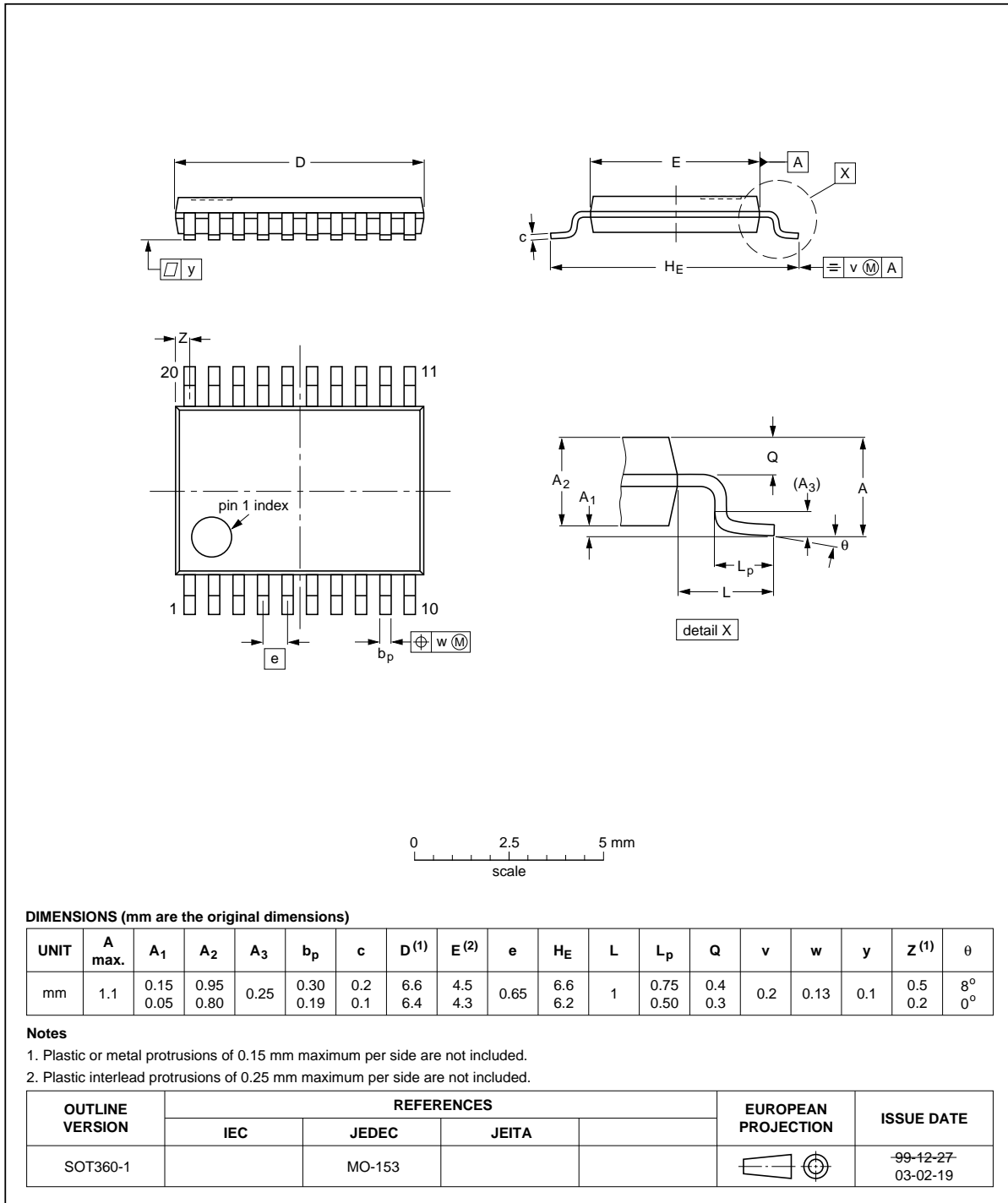
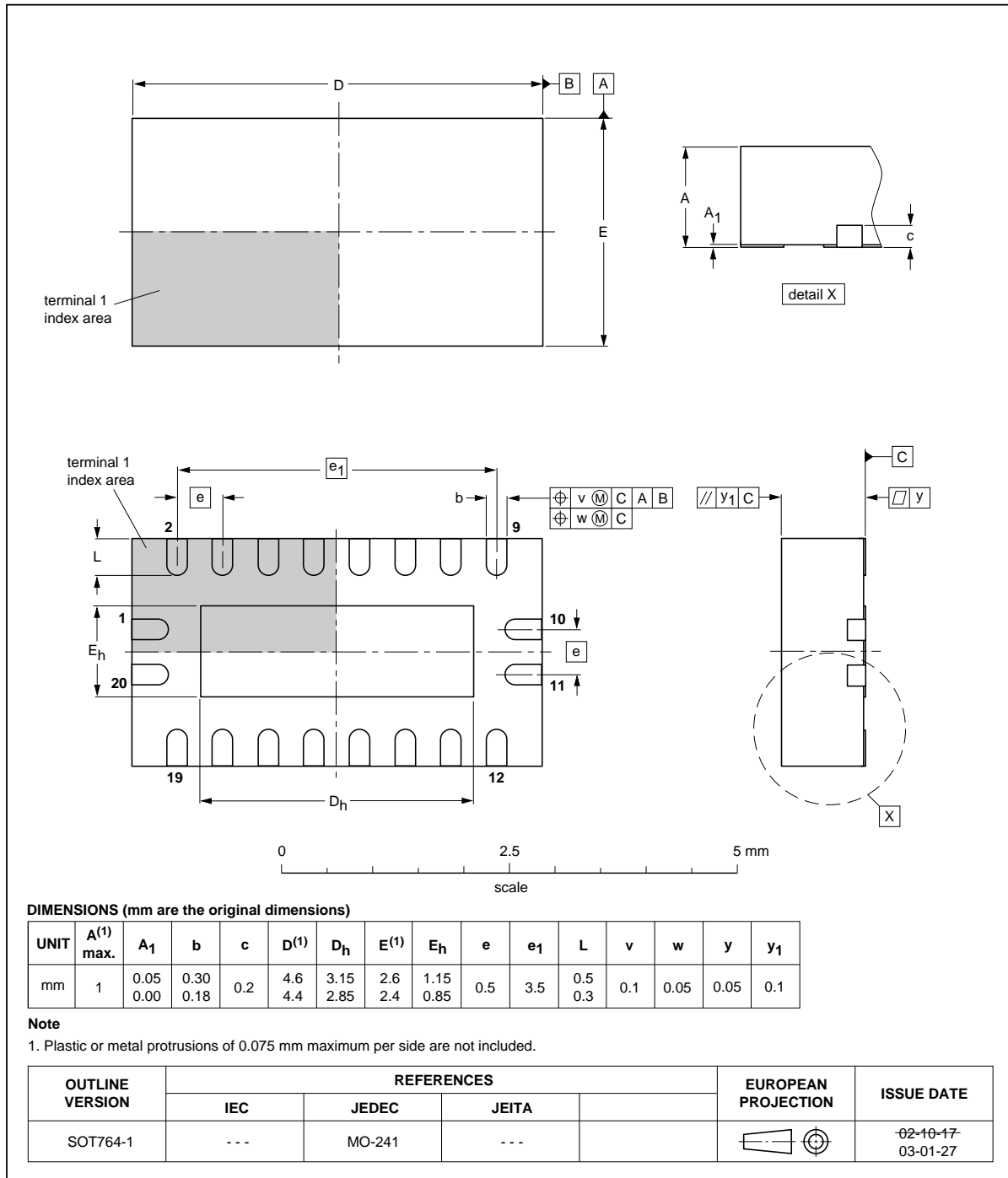


Fig 10. Package outline SOT360-1 (TSSOP20)

**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)**

## 13. Abbreviations

**Table 10. Abbreviations**

| Acronym | Description                             |
|---------|-----------------------------------------|
| CMOS    | Complementary Metal Oxide Semiconductor |
| DUT     | Device Under Test                       |
| ESD     | ElectroStatic Discharge                 |
| HBM     | Human Body Model                        |
| MM      | Machine Model                           |
| TTL     | Transistor-Transistor Logic             |
| MIL     | Military                                |

## 14. Revision history

**Table 11. Revision history**

| Document ID          | Release date | Data sheet status  | Change notice | Supersedes |
|----------------------|--------------|--------------------|---------------|------------|
| 74HC_HCT244_Q100 v.1 | 20120807     | 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".

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Date of release: 7 August 2012

Document identifier: 74HC\_HCT244\_Q100