

# 74AHC245; 74AHCT245

Octal bus transceiver; 3-state

Rev. 04 — 25 April 2008

Product data sheet

## 1. General description

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The 74AHC245; 74AHCT245 is a high-speed Si-gate CMOS device.

The 74AHC245; 74AHCT245 is an octal transceiver featuring non-inverting 3-state bus compatible outputs in both send and receive directions.

The 74AHC245; 74AHCT245 features an output enable input ( $\overline{OE}$ ), for easy cascading, and a send and receive direction control input (DIR).

$\overline{OE}$  controls the outputs so that the buses are effectively isolated.

## 2. Features

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- Balanced propagation delays
- All inputs have Schmitt-trigger actions
- Inputs accept voltages higher than  $V_{CC}$
- Input levels:
  - ◆ For 74AHC245: CMOS level
  - ◆ For 74AHCT245: TTL level
- ESD protection:
  - ◆ HBM EIA/JESD22-A114E exceeds 2000 V
  - ◆ MM EIA/JESD22-A115-A exceeds 200 V
  - ◆ CDM EIA/JESD22-C101C exceeds 1000 V
- Multiple package options
- Specified from  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$  and from  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$

### 3. Ordering information

Table 1. Ordering information

| Type number      | Package           |         |   | Version  |
|------------------|-------------------|---------|---|----------|
|                  | Temperature range | Name    | Description   |          |
| <b>74AHC245</b>  |                   |         |   |          |
| 74AHC245D        | -40 °C to +125 °C | SO20    | plastic small outline package; 20 leads;<br>body width 7.5 mm             | SOT163-1 |
| 74AHC245PW       | -40 °C to +125 °C | TSSOP20 | plastic thin shrink small outline package; 20 leads;<br>body width 4.4 mm | SOT360-1 |
| <b>74AHCT245</b> |                   |         |   |          |
| 74AHCT245D       | -40 °C to +125 °C | SO20    | plastic small outline package; 20 leads;<br>body width 7.5 mm             | SOT163-1 |
| 74AHCT245PW      | -40 °C to +125 °C | TSSOP20 | plastic thin shrink small outline package; 20 leads;<br>body width 4.4 mm | SOT360-1 |

### 4. Functional diagram

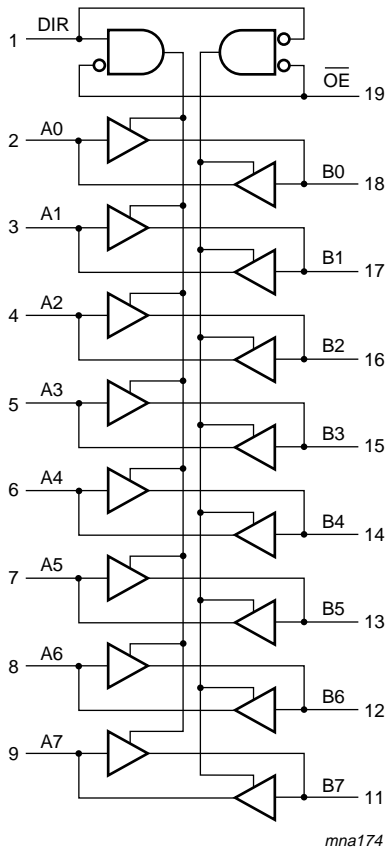


Fig 1. Logic symbol

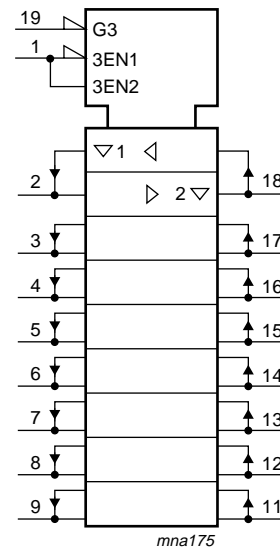


Fig 2. IEC logic symbol

## 5. Pinning information

### 5.1 Pinning

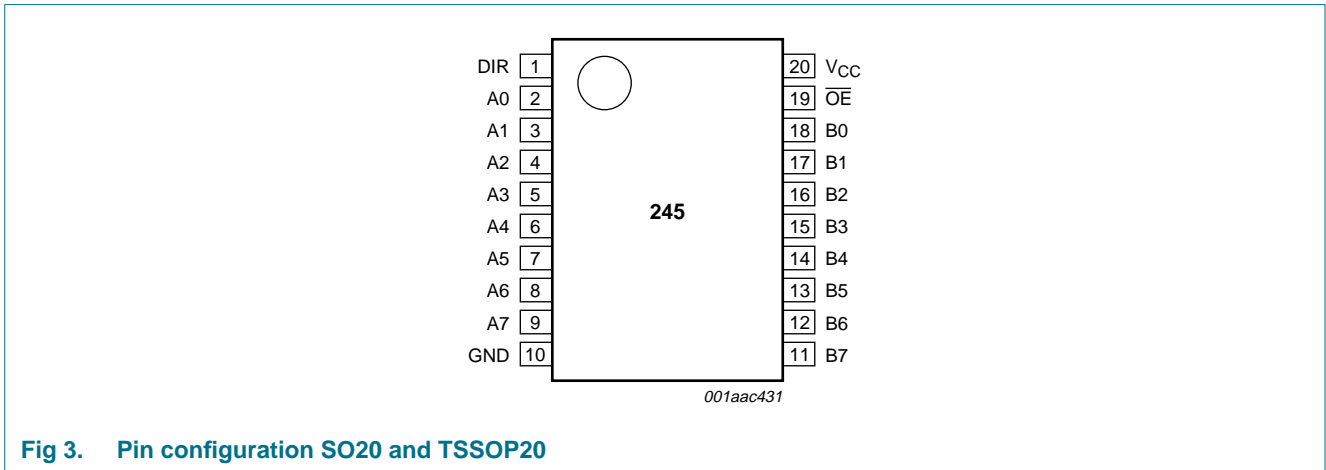


Fig 3. Pin configuration SO20 and TSSOP20

### 5.2 Pin description

Table 2. Pin description

| Symbol          | Pin | Description                      |
|-----------------|-----|----------------------------------|
| DIR             | 1   | direction control input          |
| A0              | 2   | data input/output                |
| A1              | 3   | data input/output                |
| A2              | 4   | data input/output                |
| A3              | 5   | data input/output                |
| A4              | 6   | data input/output                |
| A5              | 7   | data input/output                |
| A6              | 8   | data input/output                |
| A7              | 9   | data input/output                |
| GND             | 10  | ground (0 V)                     |
| B7              | 11  | data input/output                |
| B6              | 12  | data input/output                |
| B5              | 13  | data input/output                |
| B4              | 14  | data input/output                |
| B3              | 15  | data input/output                |
| B2              | 16  | data input/output                |
| B1              | 17  | data input/output                |
| B0              | 18  | data input/output                |
| $\overline{OE}$ | 19  | output enable input (active LOW) |
| V <sub>CC</sub> | 20  | supply voltage                   |

## 6. Functional description

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

| Control                |     | Input/output |  |        |
|------------------------|-----|--------------|--|--------|
| $\overline{\text{OE}}$ | DIR | An           |  | Bn     |
| L                      | L   | A = B        |  | inputs |
| L                      | H   | inputs       |  | B = A  |
| H                      | X   | Z            |  | 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 |
|-----------|-------------------------|--|--------------------|------|------|
| $V_{CC}$  | supply voltage          |  | -0.5               | +7.0 | V    |
| $V_I$     | input voltage           |  | -0.5               | +7.0 | V    |
| $I_{IK}$  | input clamping current  | $V_I < -0.5 \text{ V}$                                   | <sup>[1]</sup> -20 | -    | mA   |
| $I_{OK}$  | output clamping current | $V_O < -0.5 \text{ V}$ or $V_O > V_{CC} + 0.5 \text{ V}$ | <sup>[1]</sup> -20 | +20  | mA   |
| $I_O$     | output current          | $V_O = -0.5 \text{ V}$ to $(V_{CC} + 0.5 \text{ V})$     | -25                | +25  | mA   |
| $I_{CC}$  | supply current          |  | -                  | +75  | mA   |
| $I_{GND}$ | ground current          |  | -75                | -    | mA   |
| $T_{stg}$ | storage temperature     |  | -65                | +150 | °C   |
| $P_{tot}$ | total power dissipation | $T_{amb} = -40 \text{ °C}$ to $+125 \text{ °C}$          | <sup>[2]</sup> -   | 500  | mW   |

- [1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.  
 [2] For SO20 packages: above 70 °C the value of  $P_{tot}$  derates linearly at 8 mW/K.  
 For TSSOP20 packages: above 60 °C the value of  $P_{tot}$  derates linearly at 5.5 mW/K.

## 8. Recommended operating conditions

**Table 5. Operating conditions**

| Symbol           | Parameter                           | Conditions                       | Min | Typ | Max             | Unit |
|------------------|-------------------------------------|----------------------------------|-----|-----|-----------------|------|
| <b>74AHC245</b>  |                                     |                                  |     |     |                 |      |
| V <sub>CC</sub>  | supply voltage                      |                                  | 2.0 | 5.0 | 5.5             | V    |
| V <sub>I</sub>   | input voltage                       |                                  | 0   | -   | 5.5             | V    |
| V <sub>O</sub>   | output voltage                      |                                  | 0   | -   | V <sub>CC</sub> | V    |
| T <sub>amb</sub> | ambient temperature                 |                                  | -40 | +25 | +125            | °C   |
| Δt/ΔV            | input transition rise and fall rate | V <sub>CC</sub> = 3.0 V to 3.6 V | -   | -   | 100             | ns/V |
|                  |                                     | V <sub>CC</sub> = 4.5 V to 5.5 V | -   | -   | 20              | ns/V |
| <b>74AHCT245</b> |                                     |                                  |     |     |                 |      |
| V <sub>CC</sub>  | supply voltage                      |                                  | 4.5 | 5.0 | 5.5             | V    |
| V <sub>I</sub>   | input voltage                       |                                  | 0   | -   | 5.5             | V    |
| V <sub>O</sub>   | output voltage                      |                                  | 0   | -   | V <sub>CC</sub> | V    |
| T <sub>amb</sub> | ambient temperature                 |                                  | -40 | +25 | +125            | °C   |
| Δt/ΔV            | input transition rise and fall rate | V <sub>CC</sub> = 4.5 V to 5.5 V | -   | -   | 20              | ns/V |

## 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>74AHC245</b> |   |   |       |      |      |                  |      |                   |      |      |
| V <sub>IH</sub> | HIGH-level input voltage                          | V <sub>CC</sub> = 2.0 V                             | 1.5   | -    | -    | 1.5              | -    | 1.5               | -    | V    |
|                 |   | V <sub>CC</sub> = 3.0 V                             | 2.1   | -    | -    | 2.1              | -    | 2.1               | -    | V    |
|                 |   | V <sub>CC</sub> = 5.5 V                             | 3.85  | -    | -    | 3.85             | -    | 3.85              | -    | V    |
| V <sub>IL</sub> | LOW-level input voltage                           | V <sub>CC</sub> = 2.0 V                             | -     | -    | 0.5  | -                | 0.5  | -                 | 0.5  | V    |
|                 |   | V <sub>CC</sub> = 3.0 V                             | -     | -    | 0.9  | -                | 0.9  | -                 | 0.9  | V    |
|                 |   | V <sub>CC</sub> = 5.5 V                             | -     | -    | 1.65 | -                | 1.65 | -                 | 1.65 | 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> = -50 μA; V <sub>CC</sub> = 2.0 V    | 1.9   | 2.0  | -    | 1.9              | -    | 1.9               | -    | V    |
|                 |   | I <sub>O</sub> = -50 μA; V <sub>CC</sub> = 3.0 V    | 2.9   | 3.0  | -    | 2.9              | -    | 2.9               | -    | V    |
|                 |   | I <sub>O</sub> = -50 μA; V <sub>CC</sub> = 4.5 V    | 4.4   | 4.5  | -    | 4.4              | -    | 4.4               | -    | V    |
|                 |   | I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V   | 2.58  | -    | -    | 2.48             | -    | 2.40              | -    | V    |
|                 | I <sub>O</sub> = -8.0 mA; V <sub>CC</sub> = 4.5 V | 3.94  | -     | -    | 3.80 | -                | 3.70 | -                 | 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> = 50 μA; V <sub>CC</sub> = 2.0 V     | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                 |   | I <sub>O</sub> = 50 μA; V <sub>CC</sub> = 3.0 V     | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                 |   | I <sub>O</sub> = 50 μA; V <sub>CC</sub> = 4.5 V     | -     | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                 |   | I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V    | -     | -    | 0.36 | -                | 0.44 | -                 | 0.55 | V    |
|                 | I <sub>O</sub> = 8.0 mA; V <sub>CC</sub> = 4.5 V  | -   | -     | 0.36 | -    | 0.44             | -    | 0.55              | 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        |               |
| $I_I$    | input leakage current    | $V_I = 5.5 \text{ V}$ or GND;<br>$V_{CC} = 0 \text{ V}$ to 5.5 V                   | -     | -   | 0.1        | -                | 1.0       | -                 | 2.0        | $\mu\text{A}$ |
| $I_{OZ}$ | OFF-state output current | $V_I = V_{IH}$ or $V_{IL}$ ;<br>$V_O = V_{CC}$ or GND;<br>$V_{CC} = 5.5 \text{ V}$ | -     | -   | $\pm 0.25$ | -                | $\pm 2.5$ | -                 | $\pm 10.0$ | $\mu\text{A}$ |
| $I_{CC}$ | supply current           | $V_I = V_{CC}$ or GND; $I_O = 0 \text{ A}$ ;<br>$V_{CC} = 5.5 \text{ V}$           | -     | -   | 4.0        | -                | 40        | -                 | 80         | $\mu\text{A}$ |
| $C_I$    | input capacitance        | $V_I = V_{CC}$ or GND  | -     | 3   | 10         | -                | 10        | -                 | 10         | pF            |
| $C_O$    | output capacitance       |  | -     | 4   | -          | -                | -         | -                 | -          | pF            |

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|                 |                           |   |      |     |            |      |           |      |            |               |
|-----------------|---------------------------|---|------|-----|------------|------|-----------|------|------------|---------------|
| $V_{IH}$        | HIGH-level input voltage  | $V_{CC} = 4.5 \text{ V}$ to 5.5 V   | 2.0  | -   | -          | 2.0  | -         | 2.0  | -          | V             |
| $V_{IL}$        | LOW-level input voltage   | $V_{CC} = 4.5 \text{ V}$ to 5.5 V   | -    | -   | 0.8        | -    | 0.8       | -    | 0.8        | V             |
| $V_{OH}$        | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5 \text{ V}$<br>$I_O = -50 \mu\text{A}$  | 4.4  | 4.5 | -          | 4.4  | -         | 4.4  | -          | V             |
|                 |                           | $I_O = -8.0 \text{ mA}$   | 3.94 | -   | -          | 3.80 | -         | 3.70 | -          | V             |
|                 |                           |   |      |     |            |      |           |      |            |               |
| $V_{OL}$        | LOW-level output voltage  | $V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5 \text{ V}$<br>$I_O = 50 \mu\text{A}$   | -    | 0   | 0.1        | -    | 0.1       | -    | 0.1        | V             |
|                 |                           | $I_O = 8.0 \text{ mA}$  | -    | -   | 0.36       | -    | 0.44      | -    | 0.55       | V             |
|                 |                           |   |      |     |            |      |           |      |            |               |
| $I_I$           | input leakage current     | $V_I = 5.5 \text{ V}$ or GND;<br>$V_{CC} = 0 \text{ V}$ to 5.5 V  | -    | -   | 0.1        | -    | 1.0       | -    | 2.0        | $\mu\text{A}$ |
| $I_{OZ}$        | OFF-state output current  | $V_I = V_{IH}$ or $V_{IL}$ ;<br>$V_O = V_{CC}$ or GND per input pin; other inputs at $V_{CC}$ or GND; $I_O = 0 \text{ A}$ ;<br>$V_{CC} = 5.5 \text{ V}$ | -    | -   | $\pm 0.25$ | -    | $\pm 2.5$ | -    | $\pm 10.0$ | $\mu\text{A}$ |
| $I_{CC}$        | supply current            | $V_I = V_{CC}$ or GND; $I_O = 0 \text{ A}$ ;<br>$V_{CC} = 5.5 \text{ V}$  | -    | -   | 4.0        | -    | 40        | -    | 80         | $\mu\text{A}$ |
| $\Delta I_{CC}$ | additional supply current | per input pin;<br>$V_I = V_{CC} - 2.1 \text{ V}$ ;<br>other pins at $V_{CC}$ or GND;<br>$I_O = 0 \text{ A}$ ; $V_{CC} = 4.5 \text{ V}$ to 5.5 V         | -    | -   | 1.35       | -    | 1.5       | -    | 1.5        | mA            |
| $C_I$           | input capacitance         | $V_I = V_{CC}$ or GND   | -    | 3   | 10         | -    | 10        | -    | 10         | pF            |
| $C_O$           | output capacitance        |   | -    | 4   | -          | -    | -         | -    | -          | pF            |

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 6](#).

| Symbol           | Parameter                     | Conditions  | 25 °C               |                    |      | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|------------------|-------------------------------|---|---------------------|--------------------|------|------------------|------|-------------------|------|------|
|                  |                               |   | Min                 | Typ <sup>[1]</sup> | Max  | Min              | Max  | Min               | Max  |      |
| <b>74AHC245</b>  |                               |   |                     |                    |      |                  |      |                   |      |      |
| t <sub>pd</sub>  | propagation delay             | An to Bn; Bn to An; see <a href="#">Figure 4</a>                  | <a href="#">[2]</a> |                    |      |                  |      |                   |      |      |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                  |                     |                    |      |                  |      |                   |      |      |
|                  |                               | C <sub>L</sub> = 15 pF  | -                   | 5.0                | 8.4  | 1.0              | 10.0 | 1.0               | 10.5 | ns   |
|                  |                               | C <sub>L</sub> = 50 pF  | -                   | 6.5                | 11.9 | 1.0              | 13.5 | 1.0               | 15.0 | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                  |                     |                    |      |                  |      |                   |      |      |
|                  |                               | C <sub>L</sub> = 15 pF  | -                   | 3.5                | 5.5  | 1.0              | 6.5  | 1.0               | 7.0  | ns   |
| t <sub>en</sub>  | enable time                   | OE to An; OE to Bn; signal name DIR; see <a href="#">Figure 5</a> | <a href="#">[3]</a> |                    |      |                  |      |                   |      |      |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                  |                     |                    |      |                  |      |                   |      |      |
|                  |                               | C <sub>L</sub> = 15 pF  | -                   | 6.5                | 13.2 | 1.0              | 15.5 | 1.0               | 16.5 | ns   |
|                  |                               | C <sub>L</sub> = 50 pF  | -                   | 9.0                | 16.7 | 1.0              | 19.0 | 1.0               | 21.0 | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                  |                     |                    |      |                  |      |                   |      |      |
|                  |                               | C <sub>L</sub> = 15 pF  | -                   | 4.0                | 8.5  | 1.0              | 10.0 | 1.0               | 11.0 | ns   |
| t <sub>dis</sub> | disable time                  | OE to An; OE to Bn; signal name DIR; see <a href="#">Figure 5</a> | <a href="#">[4]</a> |                    |      |                  |      |                   |      |      |
|                  |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                  |                     |                    |      |                  |      |                   |      |      |
|                  |                               | C <sub>L</sub> = 15 pF  | -                   | 7.5                | 12.5 | 1.0              | 15.5 | 1.0               | 16.0 | ns   |
|                  |                               | C <sub>L</sub> = 50 pF  | -                   | 10.0               | 15.8 | 1.0              | 18.0 | 1.0               | 20.0 | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V to 5.5 V                                  |                     |                    |      |                  |      |                   |      |      |
|                  |                               | C <sub>L</sub> = 15 pF  | -                   | 4.5                | 7.8  | 1.0              | 9.2  | 1.0               | 10.0 | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | f <sub>i</sub> = 1 MHz; V <sub>1</sub> = GND to V <sub>CC</sub>   | <a href="#">[5]</a> | -                  | 12   | -                | -    | -                 | -    | pF   |

### 74AHCT245; V<sub>CC</sub> = 4.5 V to 5.5 V

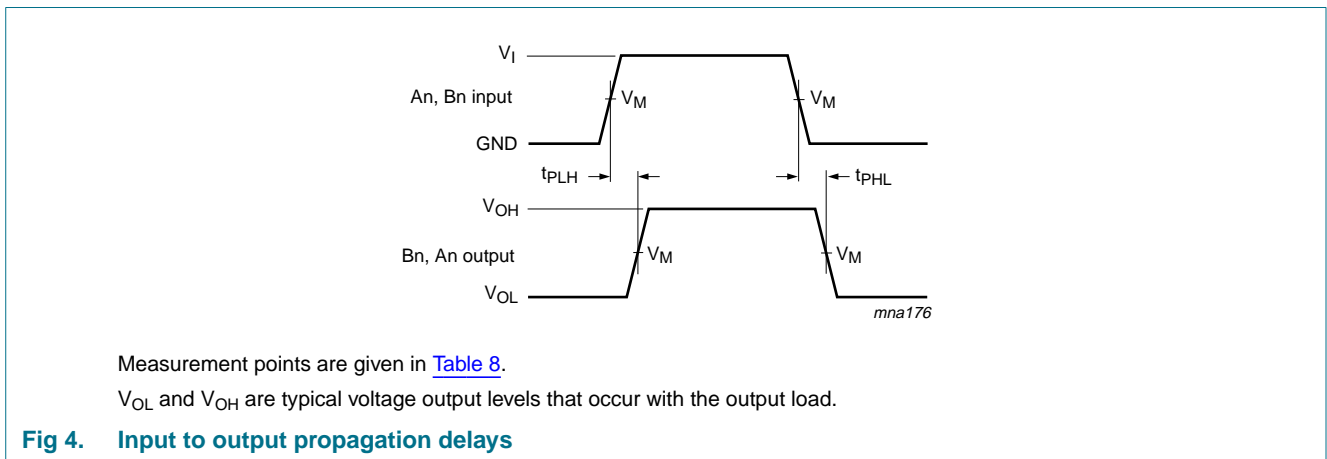
|                 |                   |   |                     |     |      |     |      |     |      |    |
|-----------------|-------------------|---|---------------------|-----|------|-----|------|-----|------|----|
| t <sub>pd</sub> | propagation delay | An to Bn; Bn to An; see <a href="#">Figure 4</a>                  | <a href="#">[2]</a> |     |      |     |      |     |      |    |
|                 |                   | C <sub>L</sub> = 15 pF  | -                   | 3.5 | 7.7  | 1.0 | 8.5  | 1.0 | 10.0 | ns |
|                 |                   | C <sub>L</sub> = 50 pF  | -                   | 4.5 | 8.7  | 1.0 | 9.5  | 1.0 | 11.0 | ns |
| t <sub>en</sub> | enable time       | OE to An; OE to Bn; signal name DIR; see <a href="#">Figure 5</a> | <a href="#">[3]</a> |     |      |     |      |     |      |    |
|                 |                   | C <sub>L</sub> = 15 pF  | -                   | 5.0 | 13.8 | 1.0 | 15.0 | 1.0 | 17.5 | ns |
|                 |                   | C <sub>L</sub> = 50 pF  | -                   | 6.0 | 14.8 | 1.0 | 16.0 | 1.0 | 18.5 | ns |

**Table 7. Dynamic characteristics ...continued**  
 Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 6](#).

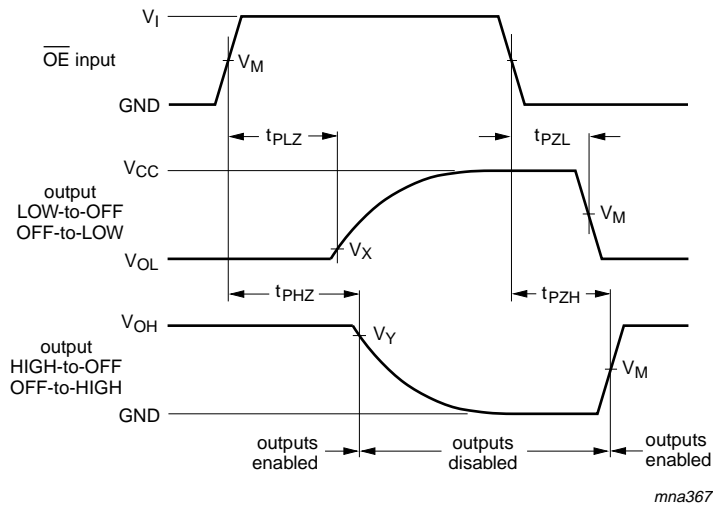
| Symbol           | Parameter                     | Conditions  | 25 °C |                    |      | -40 °C to +85 °C |      | -40 °C to +125 °C |      | Unit |
|------------------|-------------------------------|---|-------|--------------------|------|------------------|------|-------------------|------|------|
|                  |                               |   | Min   | Typ <sup>[1]</sup> | Max  | Min              | Max  | Min               | Max  |      |
| t <sub>dis</sub> | disable time                  | OE to An; OE to Bn;<br>signal name DIR;<br>see <a href="#">Figure 5</a> |       |                    |      |                  |      |                   |      |      |
|                  |                               | C <sub>L</sub> = 15 pF  | -     | 5.0                | 14.4 | 1.0              | 15.5 | 1.0               | 18.0 | ns   |
|                  |                               | C <sub>L</sub> = 50 pF  | -     | 6.0                | 15.4 | 1.0              | 16.5 | 1.0               | 19.5 | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | f <sub>i</sub> = 1 MHz;<br>V <sub>i</sub> = GND to V <sub>CC</sub>      | [5]   | 15                 | -    | -                | -    | -                 | -    | pF   |

- [1] Typical values are measured at nominal supply voltage (V<sub>CC</sub> = 3.3 V and V<sub>CC</sub> = 5.0 V).
- [2] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.
- [3] t<sub>en</sub> is the same as t<sub>PZL</sub> and t<sub>PZH</sub>.
- [4] t<sub>dis</sub> is the same as t<sub>PLZ</sub> and t<sub>PHZ</sub>.
- [5] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$  where:  
 f<sub>i</sub> = input frequency in MHz;  
 f<sub>o</sub> = output frequency in MHz;  
 C<sub>L</sub> = output load capacitance in pF;  
 V<sub>CC</sub> = supply voltage in V;  
 N = number of inputs switching;  
 $\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of the outputs.

### 10.1 Waveforms





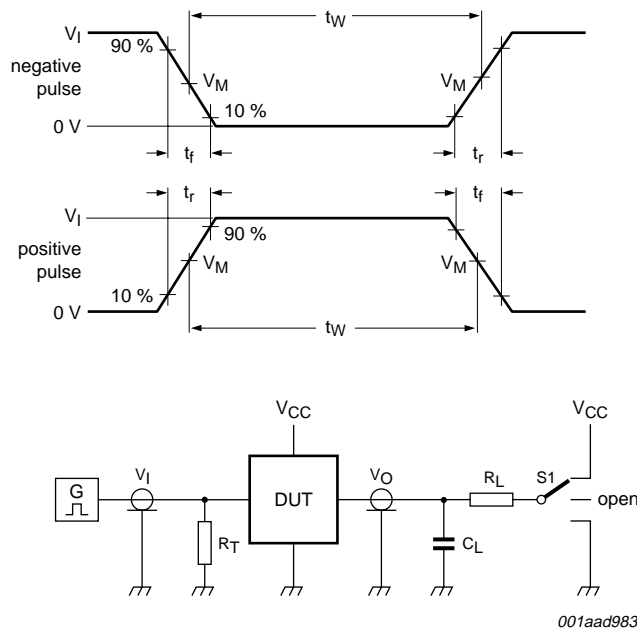


Measurement points are given in [Table 8](#).  
 $V_{OL}$  and  $V_{OH}$  are typical voltage output levels that occur with the output load.

**Fig 5. Enable and disable times**

**Table 8. Measurement points**

| Type      | Input               | Output              |                          |                          |
|-----------|---------------------|---------------------|--------------------------|--------------------------|
|           | $V_M$               | $V_M$               | $V_X$                    | $V_Y$                    |
| 74AHC245  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.3 \text{ V}$ | $V_{OH} - 0.3 \text{ V}$ |
| 74AHCT245 | 1.5 V               | $0.5 \times V_{CC}$ | $V_{OL} + 0.3 \text{ V}$ | $V_{OH} - 0.3 \text{ V}$ |



Test data is given in [Table 9](#).

Definitions test circuit:

$R_T$  = Termination resistance should be equal to output impedance  $Z_o$  of the pulse generator.

$C_L$  = Load capacitance including jig and probe capacitance.

$R_L$  = Load resistance.

$S1$  = Test selection switch.

**Fig 6. Load circuitry for measuring switching times**

**Table 9. Test data**

| Type      | Input    |               | Load         |              | S1 position        |                    |                    |
|-----------|----------|---------------|--------------|--------------|--------------------|--------------------|--------------------|
|           | $V_I$    | $t_r, t_f$    | $C_L$        | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74AHC245  | $V_{CC}$ | $\leq 3.0$ ns | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74AHCT245 | 3.0 V    | $\leq 3.0$ ns | 15 pF, 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |

11. Package outline

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

SOT163-1

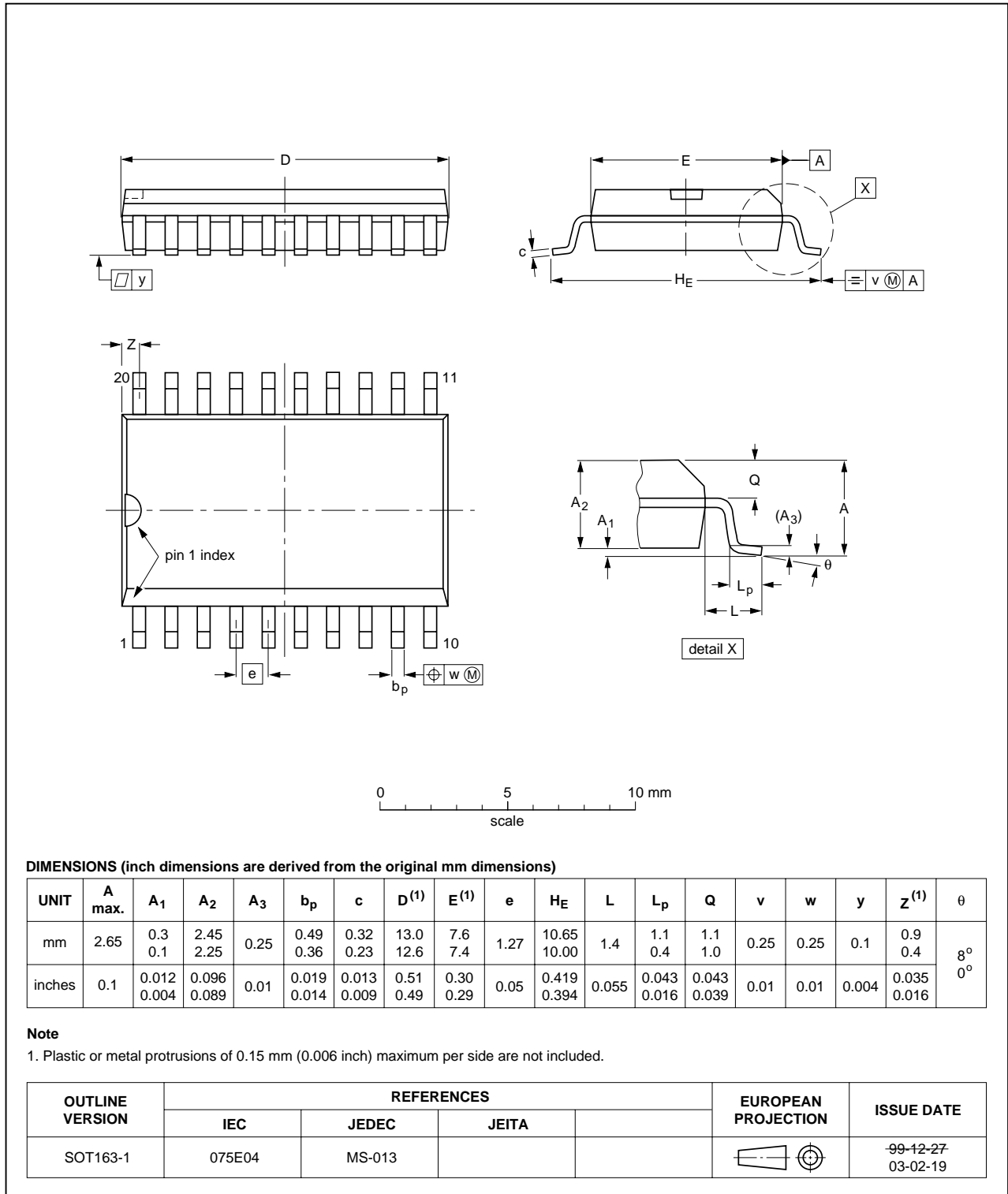


Fig 7. Package outline SOT163-1 (SO20)

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

SOT360-1



Fig 8. Package outline SOT360-1 (TSSOP20)

## 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                        |
| MM      | Machine Model                           |
| TTL     | Transistor-Transistor Logic             |

## 13. Revision history

Table 11. Revision history

| Document ID       | Release date  | Data sheet status     | Change notice | Supersedes        |
|-------------------|---|-----------------------|---------------|-------------------|
| 74AHC_AHCT245_4   | 20080425  | Product data sheet    | -             | 74AHC_AHCT245_N_3 |
| 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 6</a>: the conditions for input leakage current have been changed.</li> </ul> |                       |               |                   |
| 74AHC_AHCT245_N_3 | 20070925  | Product data sheet    | -             | 74AHC_AHCT245_2   |
| 74AHC_AHCT245_2   | 19990928  | Product specification | -             | 74AHC_AHCT245_1   |
| 74AHC_AHCT245_1   | 19980921  | Product specification | -             | -                 |

## 14. Legal information

### 14.1 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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