

# 74HC14-Q100; 74HCT14-Q100

Hex inverting Schmitt trigger

Rev. 4 — 19 April 2013

Product data sheet

## 1. General description

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The 74HC14-Q100; 74HCT14-Q100 is a high-speed Si-gate CMOS device and is pin compatible with Low-power Schottky TTL (LSTTL). It is specified in compliance with JEDEC standard No. 7A.

The 74HC14-Q100; 74HCT14-Q100 provides six inverting buffers with Schmitt-trigger action. They are capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

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  $+125\text{ }^{\circ}\text{C}$
- Low-power dissipation
- ESD protection:
  - ◆ MIL-STD-883, method 3015 exceeds 2000 V
  - ◆ HBM JESD22-A114F exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V ( $C = 200\text{ pF}$ ,  $R = 0\text{ }\Omega$ )
- Multiple package options

## 3. Applications

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- Wave and pulse shapers
- Astable multivibrators
- Monostable multivibrators

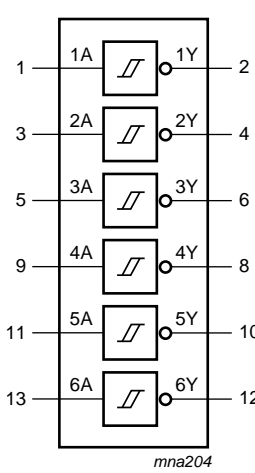


4. Ordering information

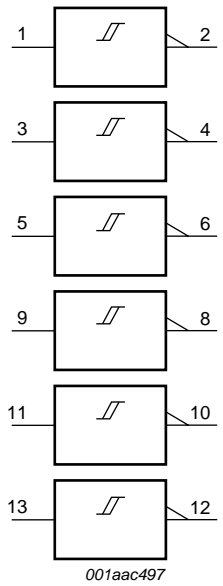
Table 1. Ordering information

| Type number    | Package           |          |  | Version  |
|----------------|-------------------|----------|--|----------|
|                | Temperature range | Name     | Description  |          |
| 74HC14N-Q100   | -40 °C to +125 °C | DIP14    | plastic dual in-line package; 14 leads (300 mil)   | SOT27-1  |
| 74HC14D-Q100   | -40 °C to +125 °C | SO14     | plastic small outline package; 14 leads; body width 3.9 mm   | SOT108-1 |
| 74HCT14D-Q100  |                   |          |  |          |
| 74HC14PW-Q100  | -40 °C to +125 °C | TSSOP14  | plastic thin shrink small outline package; 14 leads; body width 4.4 mm   | SOT402-1 |
| 74HCT14PW-Q100 |                   |          |  |          |
| 74HC14BQ-Q100  | -40 °C to +125 °C | DHVQFN14 | plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 14 terminals; body 2.5 × 3 × 0.85 mm | SOT762-1 |
| 74HCT14BQ-Q100 |                   |          |  |          |

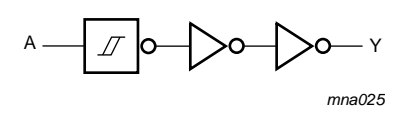
5. Functional diagram



**Fig 1. Logic symbol**



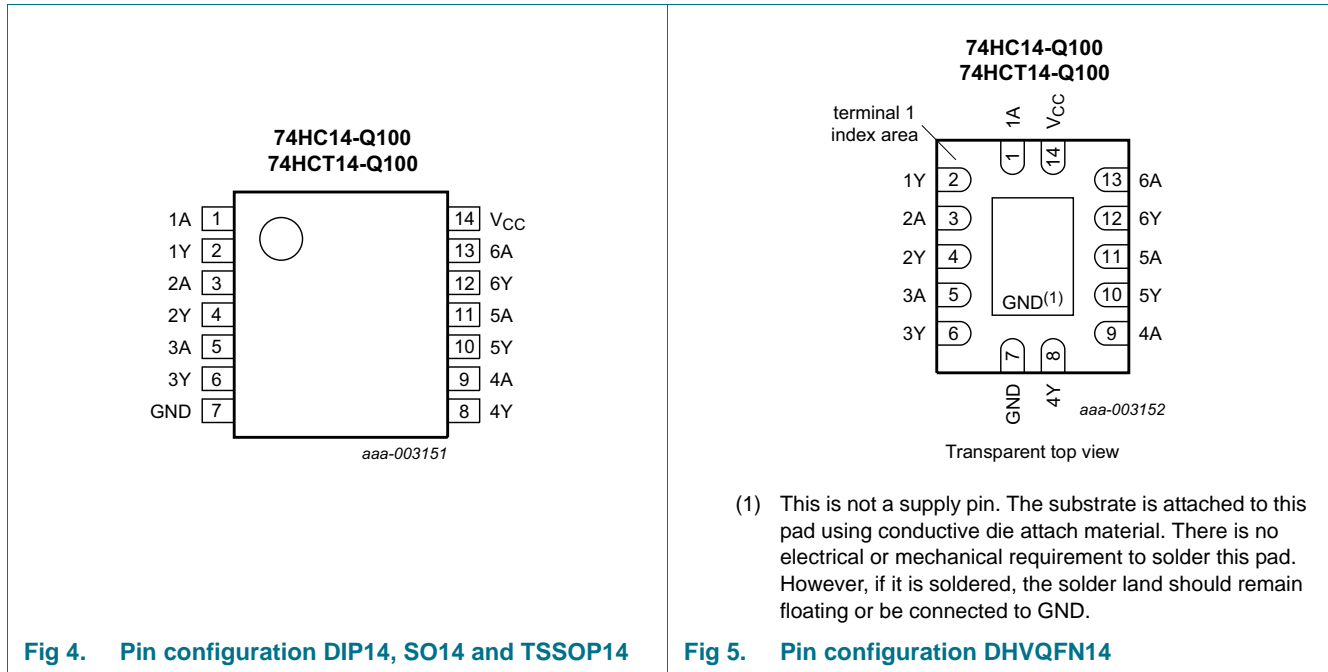
**Fig 2. IEC logic symbol**



**Fig 3. Logic diagram (one Schmitt-trigger)**

## 6. Pinning information

### 6.1 Pinning



### 6.2 Pin description

Table 2. Pin description

| Symbol          | Pin                | Description    |
|-----------------|--------------------|----------------|
| 1A to 6A        | 1, 3, 5, 9, 11, 13 | data input 1   |
| 1Y to 6Y        | 2, 4, 6, 8, 10, 12 | data output 1  |
| GND             | 7                  | ground (0 V)   |
| V <sub>CC</sub> | 14                 | supply voltage |

## 7. Functional description

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

| Input | Output |
|-------|--------|
| nA    | nY     |
| L     | H      |
| H     | L      |

[1] H = HIGH voltage level;  
L = LOW voltage level.

## 8. 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   | V    |
| $I_{IK}$  | input clamping current              | $V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$ | [1] - | ±20  | mA   |
| $I_{OK}$  | output clamping current             | $V_O < -0.5\text{ V}$ or $V_O > V_{CC} + 0.5\text{ V}$ | [1] - | ±20  | mA   |
| $I_O$     | output current                      | $-0.5\text{ V} < V_O < V_{CC} + 0.5\text{ V}$          | -     | ±25  | mA   |
| $I_{CC}$  | supply current                      |  | -     | 50   | mA   |
| $I_{GND}$ | ground current                      |  | -50   | -    | mA   |
| $T_{stg}$ | storage temperature                 |  | -65   | +150 | °C   |
| $P_{tot}$ | total power dissipation             |  | [2]   |      |      |
|           | DIP14 package                       |  | -     | 750  | mW   |
|           | SO14, TSSOP14 and DHVQFN14 packages |  | -     | 500  | mW   |

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

[2] For DIP14 package:  $P_{tot}$  derates linearly with 12 mW/K above 70 °C.  
 For SO14 package:  $P_{tot}$  derates linearly with 8 mW/K above 70 °C.  
 For TSSOP14 packages:  $P_{tot}$  derates linearly with 5.5 mW/K above 60 °C.  
 For DHVQFN14 packages:  $P_{tot}$  derates linearly with 4.5 mW/K above 60 °C.

## 9. Recommended operating conditions

**Table 5. Recommended operating conditions**

Voltages are referenced to GND (ground = 0 V)

| Symbol    | Parameter           | Conditions | 74HC14-Q100 |     |          | 74HCT14-Q100 |     |          | Unit |
|-----------|---------------------|------------|-------------|-----|----------|--------------|-----|----------|------|
|           |                     |            | Min         | Typ | Max      | Min          | Typ | Max      |      |
| $V_{CC}$  | supply voltage      |            | 2.0         | 5.0 | 6.0      | 4.5          | 5.0 | 5.5      | V    |
| $V_I$     | input voltage       |            | 0           | -   | $V_{CC}$ | 0            | -   | $V_{CC}$ | V    |
| $V_O$     | output voltage      |            | 0           | -   | $V_{CC}$ | 0            | -   | $V_{CC}$ | V    |
| $T_{amb}$ | ambient temperature |            | -40         | +25 | +125     | -40          | +25 | +125     | °C   |

## 10. Static characteristics

**Table 6. Static characteristics**

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

| Symbol              | Parameter                 | Conditions  | T <sub>amb</sub> = 25 °C |      |      | T <sub>amb</sub> = -40 °C to +85 °C |      | T <sub>amb</sub> = -40 °C to +125 °C |      | Unit |
|---------------------|---------------------------|---|--------------------------|------|------|-------------------------------------|------|--------------------------------------|------|------|
|                     |                           |   | Min                      | Typ  | Max  | Min                                 | Max  | Min                                  | Max  |      |
| <b>74HC14-Q100</b>  |                           |   |                          |      |      |                                     |      |                                      |      |      |
| V <sub>OH</sub>     | HIGH-level output voltage | V <sub>I</sub> = V <sub>T+</sub> or V <sub>T-</sub>   |                          |      |      |                                     |      |                                      |      |      |
|                     |                           | I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 2.0 V  | 1.9                      | 2.0  | -    | 1.9                                 | -    | 1.9                                  | -    | V    |
|                     |                           | I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 4.5 V  | 4.4                      | 4.5  | -    | 4.4                                 | -    | 4.4                                  | -    | V    |
|                     |                           | I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 6.0 V  | 5.9                      | 6.0  | -    | 5.9                                 | -    | 5.9                                  | -    | V    |
|                     |                           | I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 4.5 V   | 3.98                     | 4.32 | -    | 3.84                                | -    | 3.7                                  | -    | V    |
|                     |                           | I <sub>O</sub> = -5.2 mA; V <sub>CC</sub> = 6.0 V   | 5.48                     | 5.81 | -    | 5.34                                | -    | 5.2                                  | -    | V    |
| V <sub>OL</sub>     | LOW-level output voltage  | V <sub>I</sub> = V <sub>T+</sub> or V <sub>T-</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> = 4.0 mA; V <sub>CC</sub> = 4.5 V  | -                        | 0.15 | 0.26 | -                                   | 0.33 | -                                    | 0.4  | V    |
|                     |                           | I <sub>O</sub> = 5.2 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; V <sub>CC</sub> = 6.0 V  | -                        | -    | ±0.1 | -                                   | ±1.0 | -                                    | ±1.0 | μA   |
| I <sub>CC</sub>     | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 6.0 V  | -                        | -    | 2.0  | -                                   | 20   | -                                    | 40   | μA   |
| C <sub>I</sub>      | input capacitance         |   | -                        | 3.5  | -    | -                                   | -    | -                                    | -    | pF   |
| <b>74HCT14-Q100</b> |                           |   |                          |      |      |                                     |      |                                      |      |      |
| V <sub>OH</sub>     | HIGH-level output voltage | V <sub>I</sub> = V <sub>T+</sub> or V <sub>T-</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> = -4.0 mA  | 3.98                     | 4.32 | -    | 3.84                                | -    | 3.7                                  | -    | V    |
| V <sub>OL</sub>     | LOW-level output voltage  | V <sub>I</sub> = V <sub>T+</sub> or V <sub>T-</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> = 4.0 mA;  | -                        | 0.15 | 0.26 | -                                   | 0.33 | -                                    | 0.4  | V    |
| I <sub>I</sub>      | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 5.5 V  | -                        | -    | ±0.1 | -                                   | ±1.0 | -                                    | ±1.0 | μA   |
| I <sub>CC</sub>     | supply current            | V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 5.5 V  | -                        | -    | 2.0  | -                                   | 20   | -                                    | 40   | μA   |
| ΔI <sub>CC</sub>    | additional supply current | per input pin; V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; other pins at V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 4.5 V to 5.5 V | -                        | 30   | 108  | -                                   | 135  | -                                    | 147  | μA   |
| C <sub>I</sub>      | input capacitance         |   | -                        | 3.5  | -    | -                                   | -    | -                                    | -    | pF   |

## 11. Dynamic characteristics

**Table 7. Dynamic characteristics**

$GND = 0\text{ V}$ ;  $C_L = 50\text{ pF}$ ; for load circuit see [Figure 7](#).

| Symbol              | Parameter                     | Conditions  | $T_{amb} = 25\text{ °C}$ |     |     | $T_{amb} = -40\text{ °C to }+125\text{ °C}$ |              | Unit |
|---------------------|-------------------------------|---|--------------------------|-----|-----|---|--------------|------|
|                     |                               |   | Min                      | Typ | Max | Max (85 °C)                                 | Max (125 °C) |      |
| <b>74HC14-Q100</b>  |                               |   |                          |     |     |   |              |      |
| $t_{pd}$            | propagation delay             | nA to nY; see <a href="#">Figure 6</a> <span style="float:right">[1]</span>                   |                          |     |     |   |              |      |
|                     |                               | $V_{CC} = 2.0\text{ V}$   | -                        | 41  | 125 | 155   | 190          | ns   |
|                     |                               | $V_{CC} = 4.5\text{ V}$   | -                        | 15  | 25  | 31  | 38           | ns   |
|                     |                               | $V_{CC} = 5.0\text{ V}$ ; $C_L = 15\text{ pF}$  | -                        | 12  | -   | -   | -            | ns   |
|                     |                               | $V_{CC} = 6.0\text{ V}$   | -                        | 12  | 21  | 26  | 32           | ns   |
| $t_t$               | transition time               | see <a href="#">Figure 6</a> <span style="float:right">[2]</span>                             |                          |     |     |   |              |      |
|                     |                               | $V_{CC} = 2.0\text{ V}$   | -                        | 19  | 75  | 95  | 110          | ns   |
|                     |                               | $V_{CC} = 4.5\text{ V}$   | -                        | 7   | 15  | 19  | 22           | ns   |
|                     |                               | $V_{CC} = 6.0\text{ V}$   | -                        | 6   | 13  | 15  | 19           | ns   |
| $C_{PD}$            | power dissipation capacitance | per package; $V_I = GND\text{ to }V_{CC}$ <span style="float:right">[3]</span>                | -                        | 7   | -   | -   | -            | pF   |
| <b>74HCT14-Q100</b> |                               |   |                          |     |     |   |              |      |
| $t_{pd}$            | propagation delay             | nA to nY; see <a href="#">Figure 6</a> <span style="float:right">[1]</span>                   |                          |     |     |   |              |      |
|                     |                               | $V_{CC} = 4.5\text{ V}$   | -                        | 20  | 34  | 43  | 51           | ns   |
|                     |                               | $V_{CC} = 5.0\text{ V}$ ; $C_L = 15\text{ pF}$  | -                        | 17  | -   | -   | -            | ns   |
| $t_t$               | transition time               | $V_{CC} = 4.5\text{ V}$ ; see <a href="#">Figure 6</a> <span style="float:right">[2]</span>   | -                        | 7   | 15  | 19  | 22           | ns   |
| $C_{PD}$            | power dissipation capacitance | per package; $V_I = GND\text{ to }V_{CC} - 1.5\text{ V}$ <span style="float:right">[3]</span> | -                        | 8   | -   | -   | -            | pF   |

[1]  $t_{pd}$  is the same as  $t_{PHL}$  and  $t_{PLH}$ .

[2]  $t_t$  is the same as  $t_{THL}$  and  $t_{TLH}$ .

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

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

$f_i$  = input frequency in MHz;

$f_o$  = output frequency in MHz;

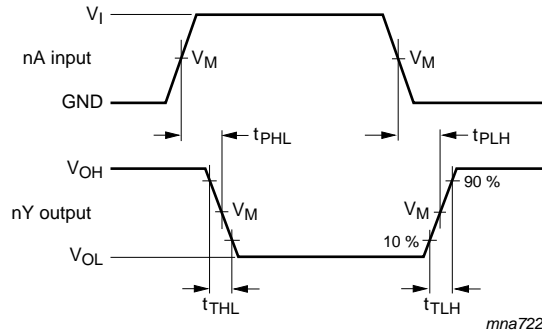
$C_L$  = output load capacitance in pF;

$V_{CC}$  = supply voltage in V;

$N$  = number of inputs switching;

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

12. Waveforms

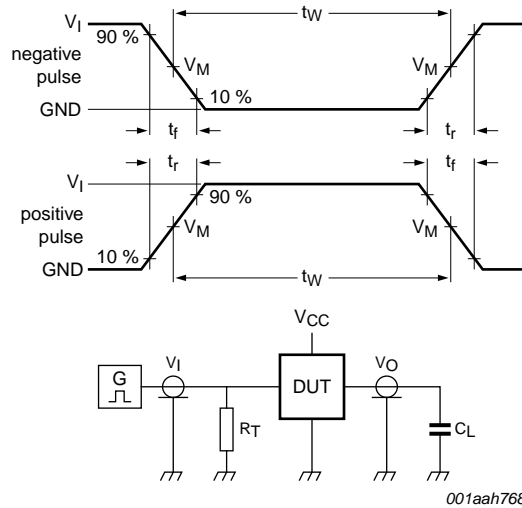


Measurement points are given in [Table 8](#).  
 $V_{OL}$  and  $V_{OH}$  are typical voltage output levels that occur with the output load.

Fig 6. Input to output propagation delays

Table 8. Measurement points

| Type         | Input       | Output      |             |             |
|--------------|-------------|-------------|-------------|-------------|
|              | $V_M$       | $V_M$       | $V_X$       | $V_Y$       |
| 74HC14-Q100  | $0.5V_{CC}$ | $0.5V_{CC}$ | $0.1V_{CC}$ | $0.9V_{CC}$ |
| 74HCT14-Q100 | 1.3 V       | 1.3 V       | $0.1V_{CC}$ | $0.9V_{CC}$ |



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.

Fig 7. Test circuit for measuring switching times

**Table 9. Test data**

| Type         | Input    |            | Load         | Test               |
|--------------|----------|------------|--------------|--------------------|
|              | $V_I$    | $t_r, t_f$ | $C_L$        |                    |
| 74HC14-Q100  | $V_{CC}$ | 6.0 ns     | 15 pF, 50 pF | $t_{PLH}, t_{PHL}$ |
| 74HCT14-Q100 | 3.0 V    | 6.0 ns     | 15 pF, 50 pF | $t_{PLH}, t_{PHL}$ |

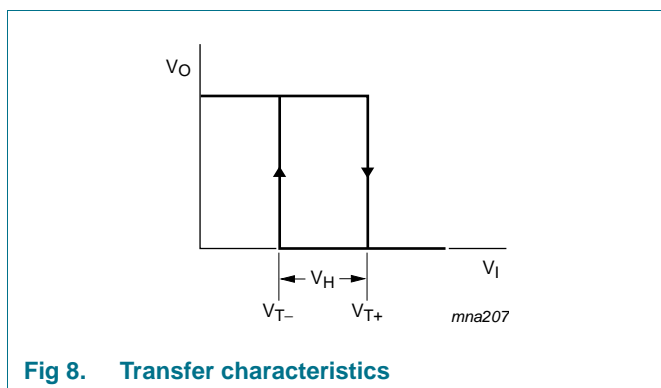
## 13. Transfer characteristics

**Table 10. Transfer characteristics**

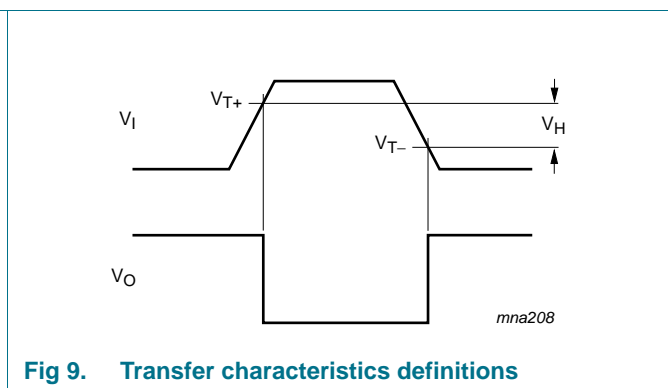
At recommended operating conditions; voltages are referenced to GND (ground = 0 V); see [Figure 8](#) and [Figure 9](#).

| Symbol              | Parameter                        | Conditions              | $T_{amb} = 25\text{ }^\circ\text{C}$ |      |      | $T_{amb} = -40\text{ }^\circ\text{C}$<br>to $+85\text{ }^\circ\text{C}$ |      | $T_{amb} = -40\text{ }^\circ\text{C}$<br>to $+125\text{ }^\circ\text{C}$ |      | Unit |
|---------------------|----------------------------------|-------------------------|--------------------------------------|------|------|---|------|--|------|------|
|                     |                                  |                         | Min                                  | Typ  | Max  | Min   | Max  | Min  | Max  |      |
| <b>74HC14-Q100</b>  |                                  |                         |                                      |      |      |   |      |  |      |      |
| $V_{T+}$            | positive-going threshold voltage | $V_{CC} = 2.0\text{ V}$ | 0.7                                  | 1.18 | 1.5  | 0.7   | 1.5  | 0.7  | 1.5  | V    |
|                     |                                  | $V_{CC} = 4.5\text{ V}$ | 1.7                                  | 2.38 | 3.15 | 1.7   | 3.15 | 1.7  | 3.15 | V    |
|                     |                                  | $V_{CC} = 6.0\text{ V}$ | 2.1                                  | 3.14 | 4.2  | 2.1   | 4.2  | 2.1  | 4.2  | V    |
| $V_{T-}$            | negative-going threshold voltage | $V_{CC} = 2.0\text{ V}$ | 0.3                                  | 0.52 | 0.9  | 0.3   | 0.9  | 0.3  | 0.9  | V    |
|                     |                                  | $V_{CC} = 4.5\text{ V}$ | 0.9                                  | 1.4  | 2.0  | 0.9   | 2.0  | 0.9  | 2.0  | V    |
|                     |                                  | $V_{CC} = 6.0\text{ V}$ | 1.2                                  | 1.89 | 2.6  | 1.2   | 2.6  | 1.2  | 2.6  | V    |
| $V_H$               | hysteresis voltage               | $V_{CC} = 2.0\text{ V}$ | 0.2                                  | 0.66 | 1.0  | 0.2   | 1.0  | 0.2  | 1.0  | V    |
|                     |                                  | $V_{CC} = 4.5\text{ V}$ | 0.4                                  | 0.98 | 1.4  | 0.4   | 1.4  | 0.4  | 1.4  | V    |
|                     |                                  | $V_{CC} = 6.0\text{ V}$ | 0.6                                  | 1.25 | 1.6  | 0.6   | 1.6  | 0.6  | 1.6  | V    |
| <b>74HCT14-Q100</b> |                                  |                         |                                      |      |      |   |      |  |      |      |
| $V_{T+}$            | positive-going threshold voltage | $V_{CC} = 4.5\text{ V}$ | 1.2                                  | 1.41 | 1.9  | 1.2   | 1.9  | 1.2  | 1.9  | V    |
|                     |                                  | $V_{CC} = 5.5\text{ V}$ | 1.4                                  | 1.59 | 2.1  | 1.4   | 2.1  | 1.4  | 2.1  | V    |
| $V_{T-}$            | negative-going threshold voltage | $V_{CC} = 4.5\text{ V}$ | 0.5                                  | 0.85 | 1.2  | 0.5   | 1.2  | 0.5  | 1.2  | V    |
|                     |                                  | $V_{CC} = 5.5\text{ V}$ | 0.6                                  | 0.99 | 1.4  | 0.6   | 1.4  | 0.6  | 1.4  | V    |
| $V_H$               | hysteresis voltage               | $V_{CC} = 4.5\text{ V}$ | 0.4                                  | 0.56 | -    | 0.4   | -    | 0.4  | -    | V    |
|                     |                                  | $V_{CC} = 5.5\text{ V}$ | 0.4                                  | 0.6  | -    | 0.4   | -    | 0.4  | -    | V    |

## 14. Transfer characteristics waveforms

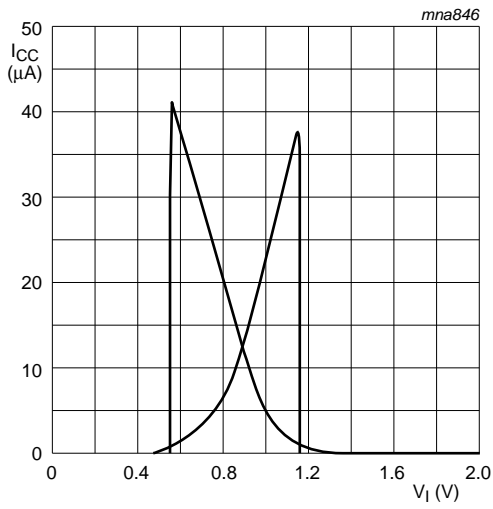


**Fig 8. Transfer characteristics**

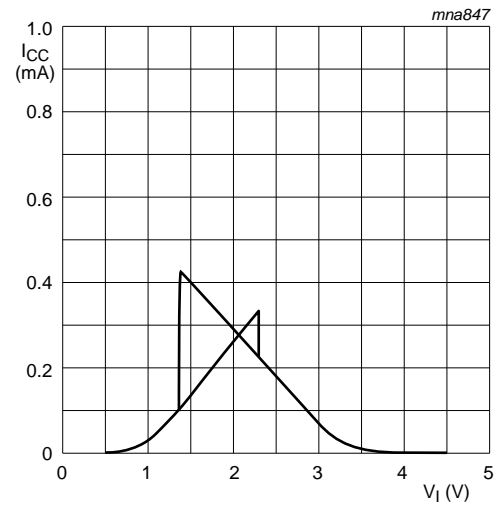


**Fig 9. Transfer characteristics definitions**

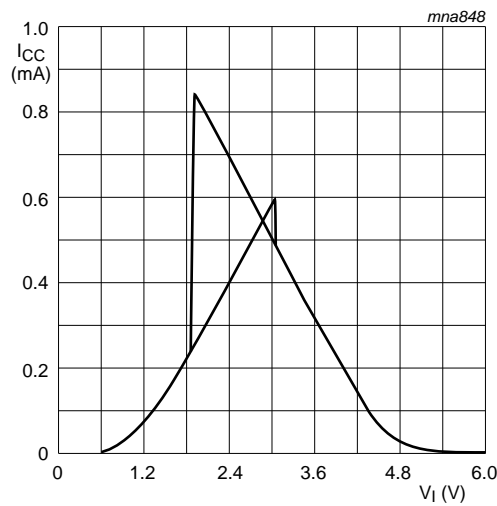




a.  $V_{CC} = 2.0\text{ V}$

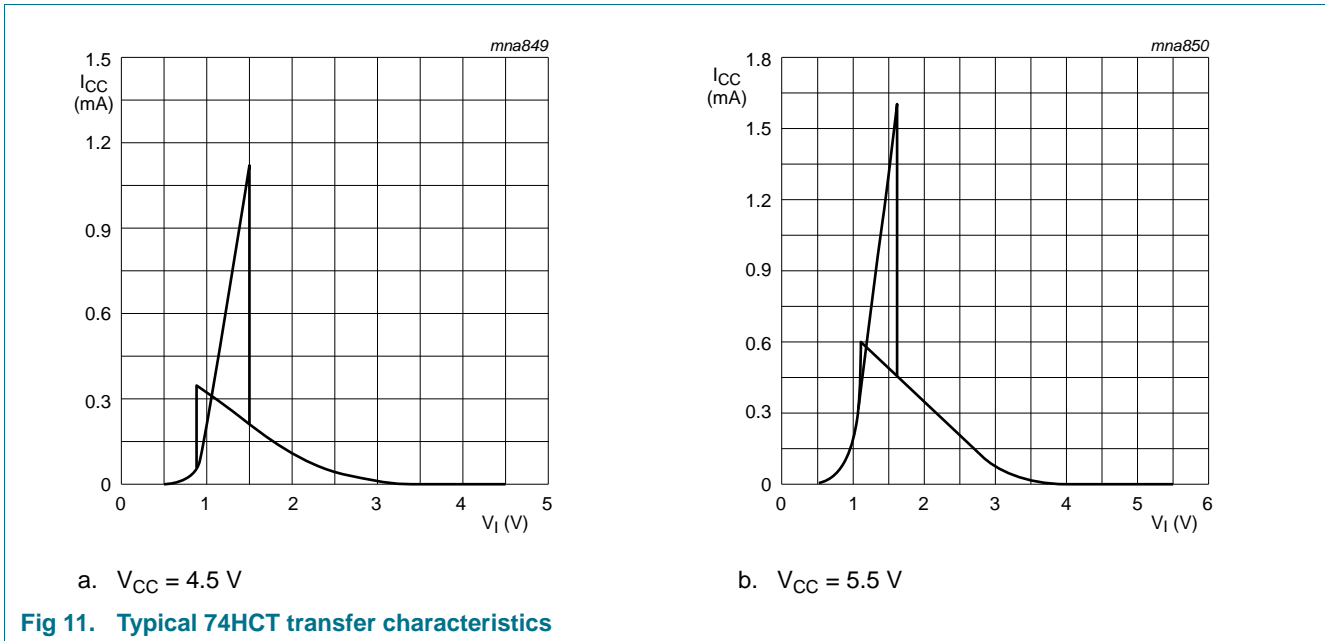


b.  $V_{CC} = 4.5\text{ V}$



c.  $V_{CC} = 6.0\text{ V}$

**Fig 10. Typical 74HC transfer characteristics**



## 15. Application information

The slow input rise and fall times cause additional power dissipation, this can be calculated using the following formula:

$$P_{add} = f_i \times (t_r \times \Delta I_{CC(AV)} + t_f \times \Delta I_{CC(AV)}) \times V_{CC} \text{ where:}$$

$P_{add}$  = additional power dissipation ( $\mu$ W);

$f_i$  = input frequency (MHz);

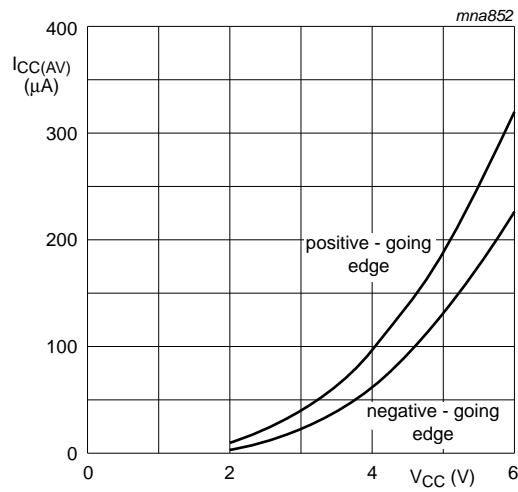
$t_r$  = rise time (ns); 10 % to 90 %;

$t_f$  = fall time (ns); 90 % to 10 %;

$\Delta I_{CC(AV)}$  = average additional supply current ( $\mu$ A).

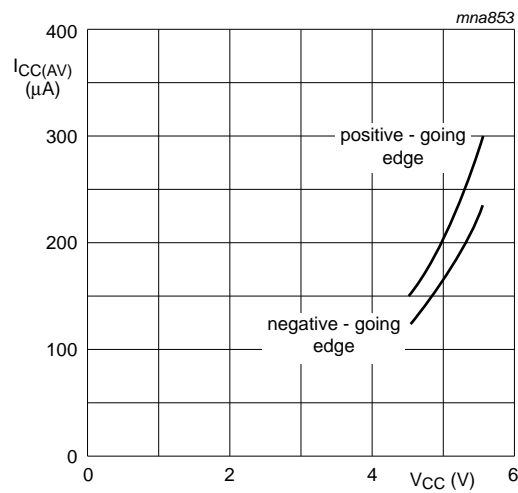
Average  $\Delta I_{CC(AV)}$  differs with positive or negative input transitions, as shown in [Figure 12](#) and [Figure 13](#).

An example of a relaxation circuit using the 74HC14-Q100; 74HCT14-Q100 is shown in [Figure 14](#).



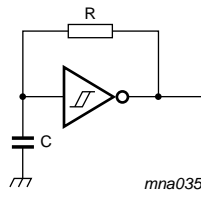
- (1) Positive-going edge.
- (2) Negative-going edge.

**Fig 12. Average additional supply current as a function of V<sub>CC</sub> for 74HC14-Q100; linear change of V<sub>I</sub> between 0.1V<sub>CC</sub> to 0.9V<sub>CC</sub>.**



- (1) Positive-going edge.
- (2) Negative-going edge.

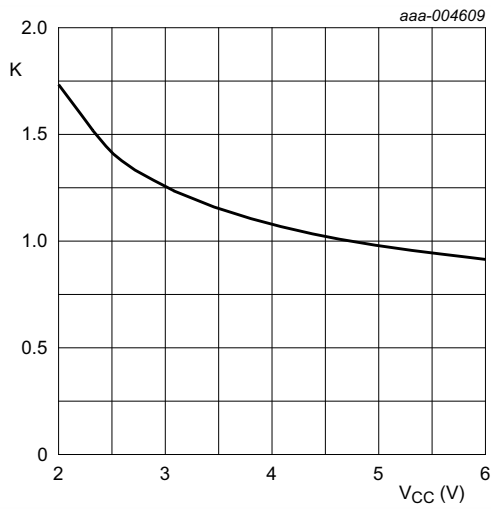
**Fig 13. Average additional supply current as a function of V<sub>CC</sub> for 74HCT14-Q100; linear change of V<sub>I</sub> between 0.1V<sub>CC</sub> to 0.9V<sub>CC</sub>.**



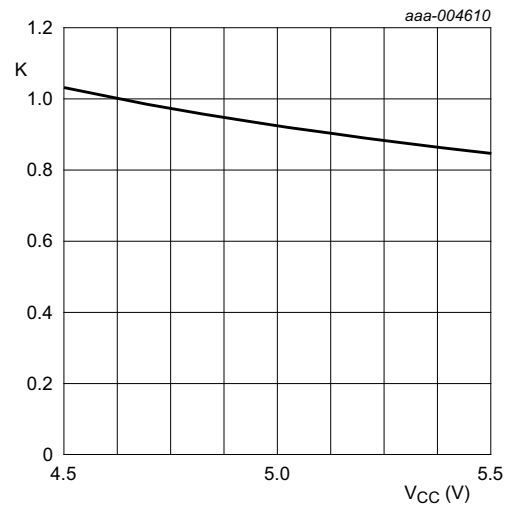
For 74HC14-Q100 and 74HCT14-Q100:  $f = \frac{1}{T} \approx \frac{1}{K \times RC}$

For K-factor see [Figure 15](#)

**Fig 14. Relaxation oscillator**



K-factor for 74HC14-Q100



K-factor for 74HCT14-Q100

**Fig 15. Typical K-factor for relaxation oscillator**

16. Package outline

DIP14: plastic dual in-line package; 14 leads (300 mil)

SOT27-1

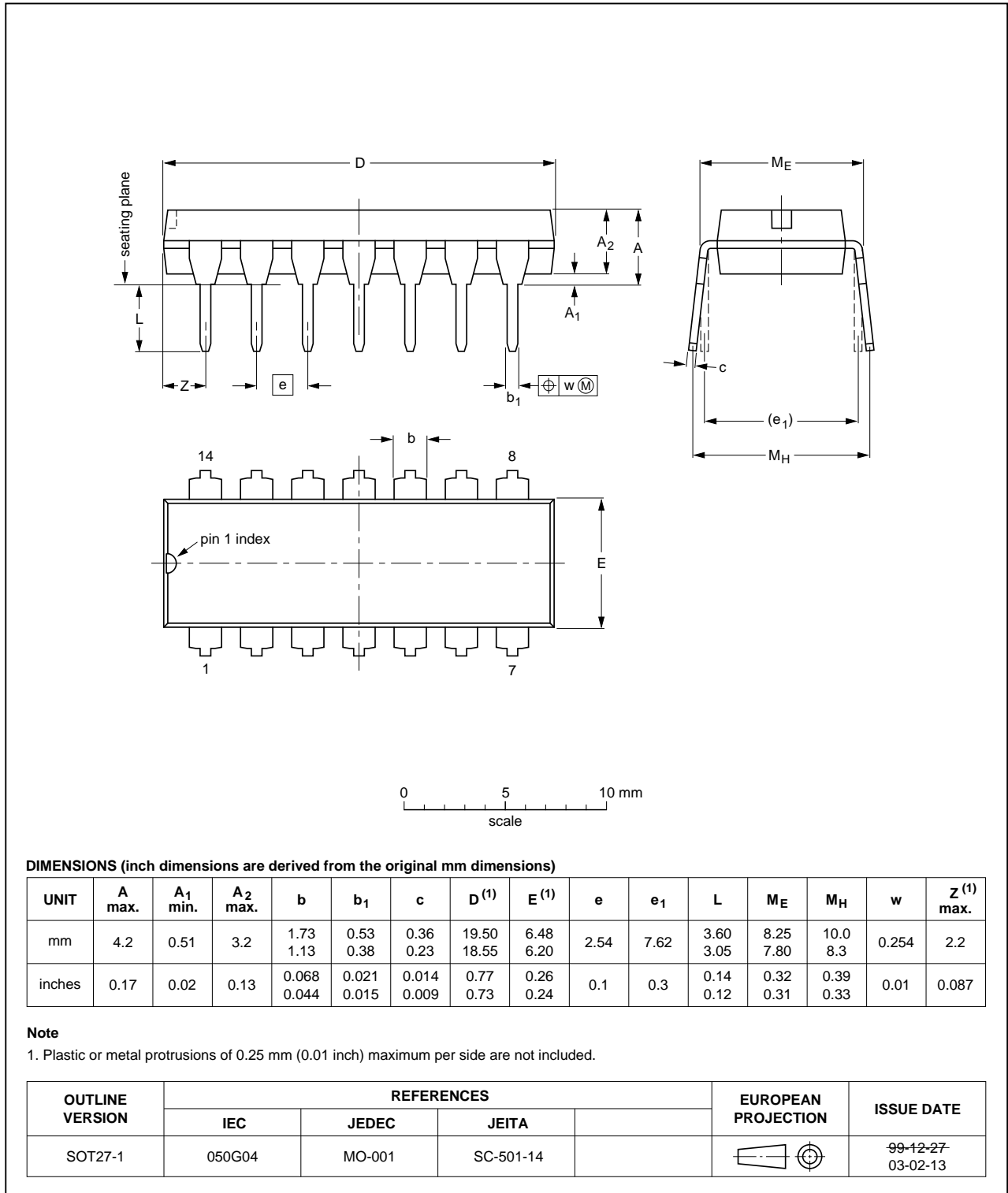


Fig 16. Package outline SOT27-1 (DIP14)

SO14: plastic small outline package; 14 leads; body width 3.9 mm

SOT108-1

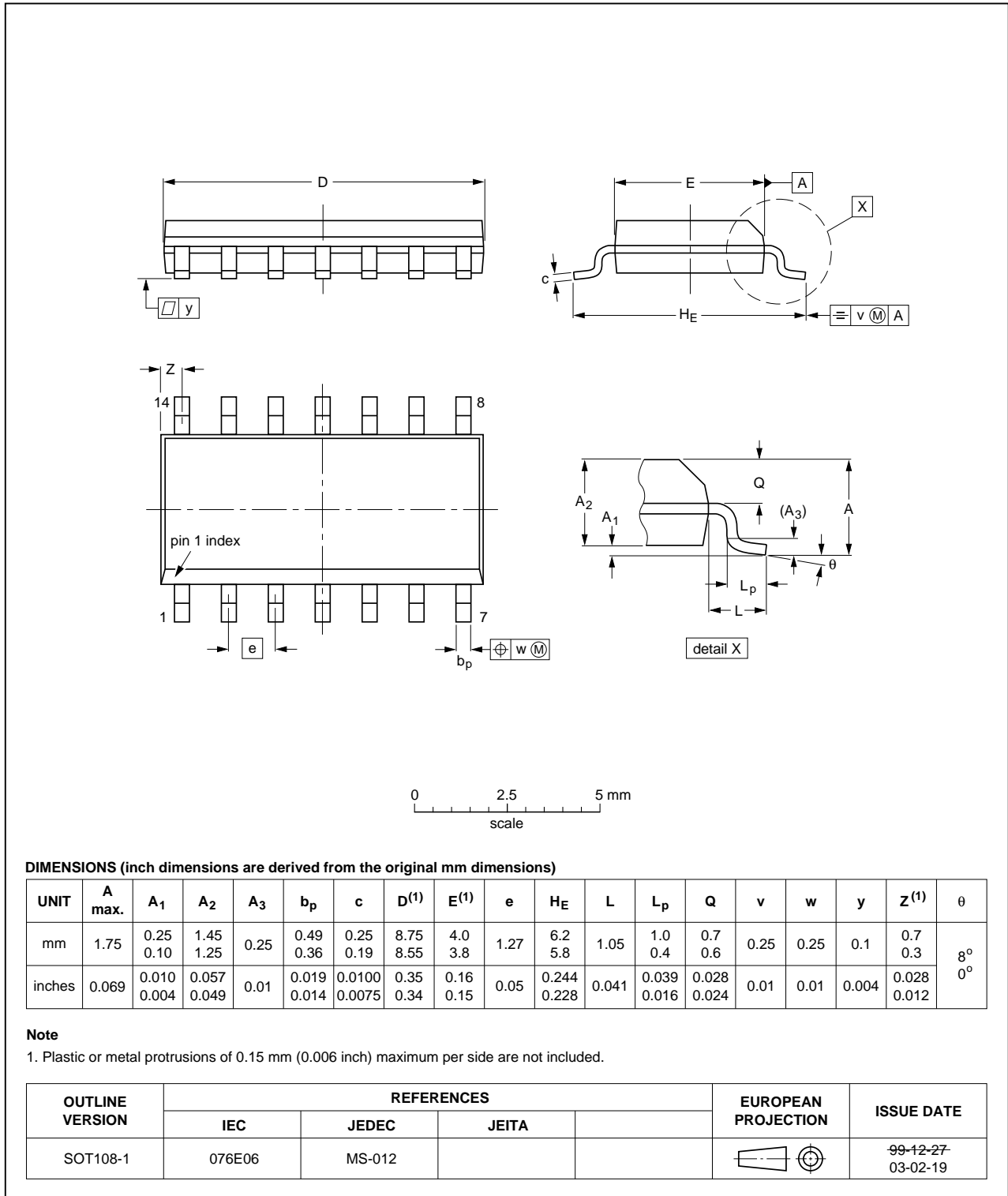


Fig 17. Package outline SOT108-1 (SO14)

TSSOP14: plastic thin shrink small outline package; 14 leads; body width 4.4 mm

SOT402-1

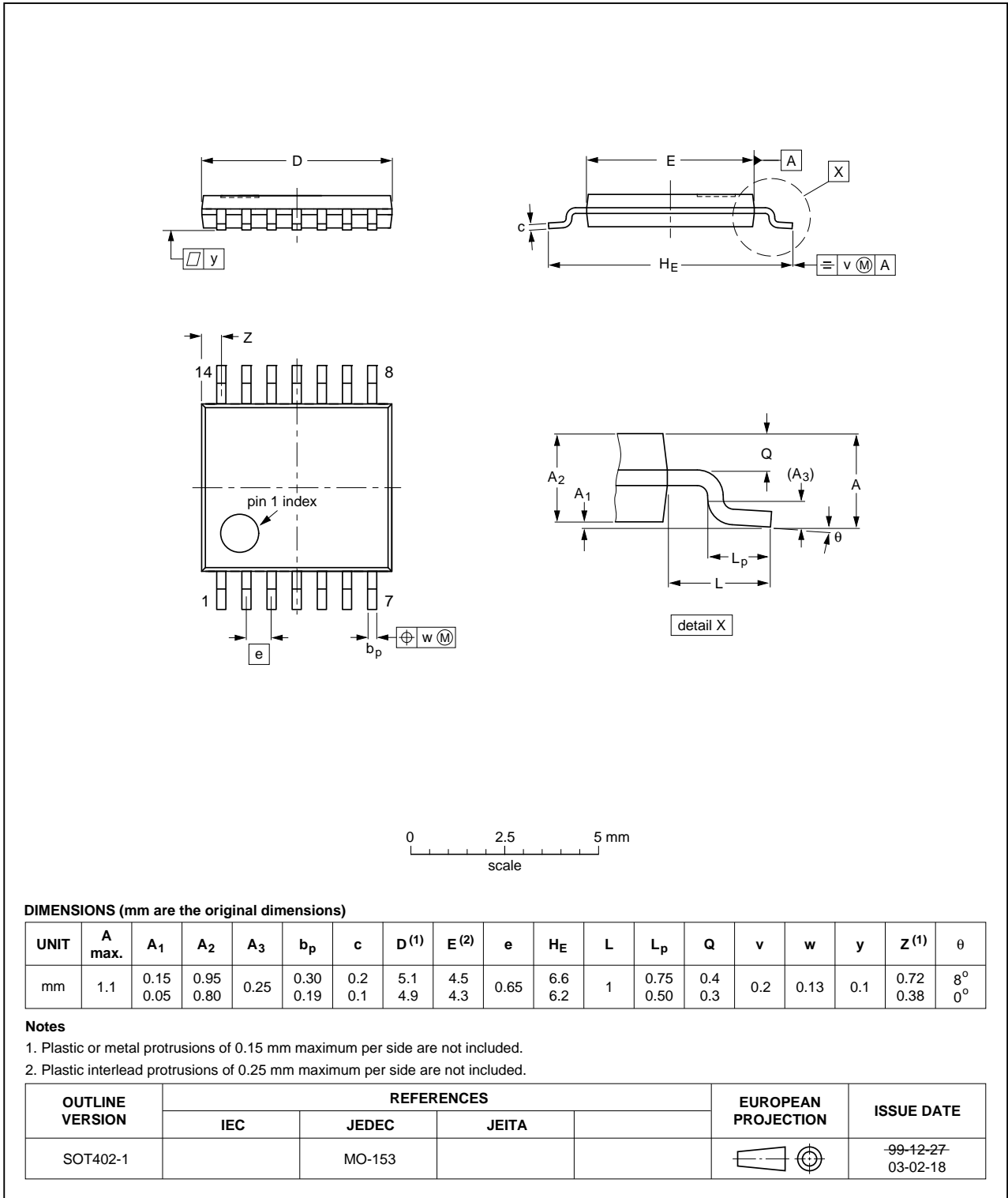


Fig 18. Package outline SOT402-1 (TSSOP14)

DHVQFN14: plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 14 terminals; body 2.5 x 3 x 0.85 mm

SOT762-1

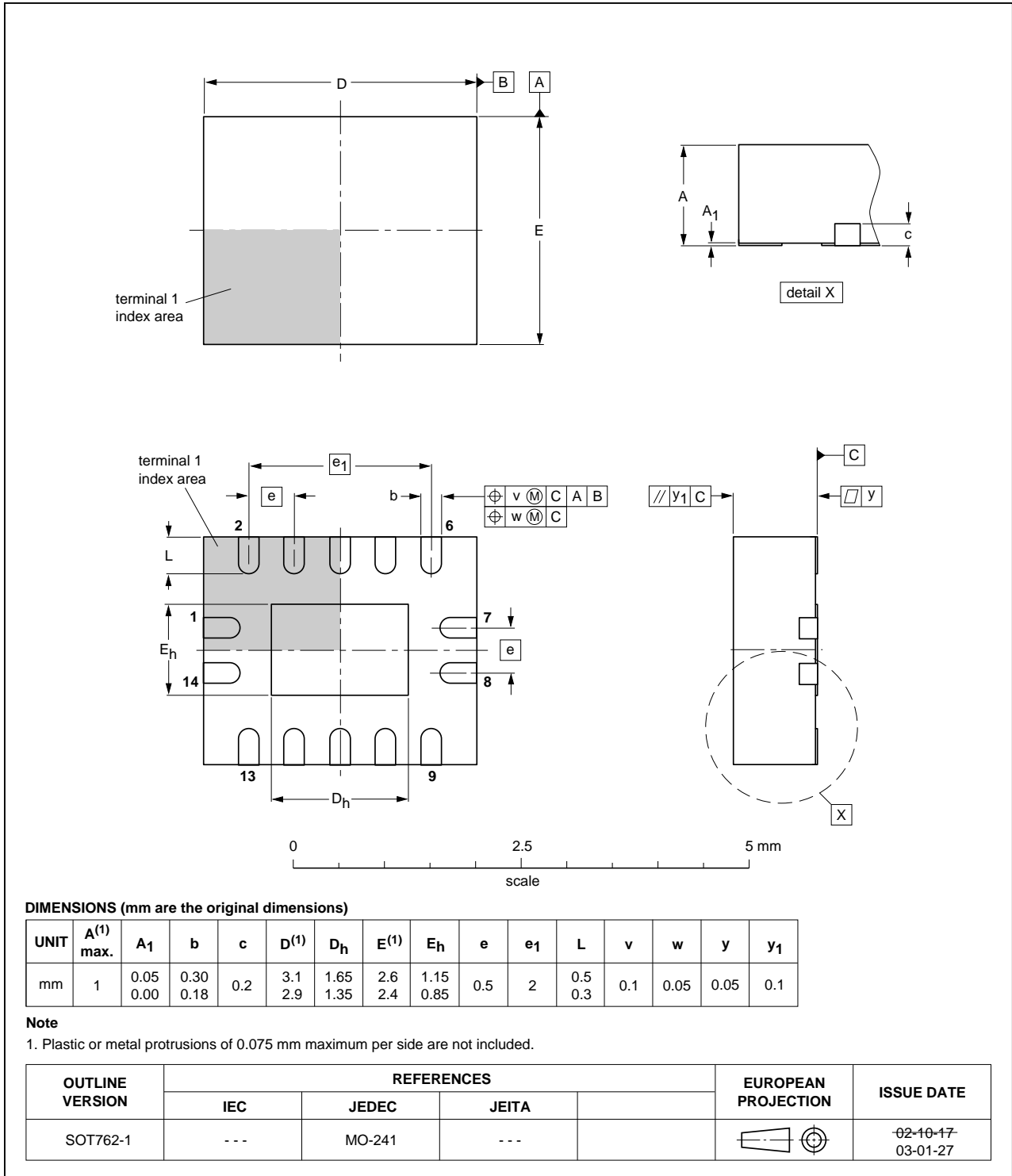


Fig 19. Package outline SOT762-1 (DHVQFN14)



## 17. Abbreviations

Table 11. Abbreviations

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

## 18. Revision history

Table 12. Revision history

| Document ID         | Release date  | Data sheet status  | Change notice | Supersedes          |
|---------------------|---|--------------------|---------------|---------------------|
| 74HC_HCT14_Q100 v.4 | 20130419  | Product data sheet | -             | 74HC_HCT14_Q100 v.3 |
| Modifications:      | <ul style="list-style-type: none"> <li>74HCT14N-Q100 removed.</li> </ul>  |                    |               |                     |
| 74HC_HCT14_Q100 v.3 | 20130410  | Product data sheet | -             | 74HC_HCT14_Q100 v.2 |
| Modifications:      | <ul style="list-style-type: none"> <li>74HC14N-Q100 and 74HCT14N-Q100 added.</li> </ul>   |                    |               |                     |
| 74HC_HCT14_Q100 v.2 | 20120810  | Product data sheet | -             | 74HC_HCT14_Q100 v.1 |
| Modifications:      | <ul style="list-style-type: none"> <li><a href="#">Figure 15</a> added (typical K-factor for relaxation oscillator).</li> </ul> |                    |               |                     |
| 74HC_HCT14_Q100 v.1 | 20120709  | Product data sheet | -             | -                   |

## 19. Legal information

### 19.1 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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