

# 74LVC377

Octal D-type flip-flop with data enable; positive-edge trigger

Rev. 6 — 20 November 2012

Product data sheet

## 1. General description

The 74LVC377 has eight edge-triggered D-type flip-flops with individual inputs (D) and outputs (Q). A common clock input (CP) loads all flip-flops simultaneously when data enable input ( $\bar{E}$ ) is LOW. The state of each D input, one set-up time before the LOW to HIGH clock transition, is transferred to the corresponding output (Qn) of the flip-flop. Input  $\bar{E}$  must be stable only one set-up time prior to the LOW to HIGH transition for predictable operation.

## 2. Features and benefits

- Wide supply voltage range from 1.2 V to 3.6 V
- Inputs accept voltages up to 5.5 V
- CMOS low power consumption
- Direct interface with TTL levels
- Output drive capability 50  $\Omega$  transmission lines at 125 °C
- Complies with JEDEC standard:
  - ◆ JESD8-7A (1.65 V to 1.95 V)
  - ◆ JESD8-5A (2.3 V to 2.7 V)
  - ◆ JESD8-C/JESD36 (2.7 V to 3.6 V)
- ESD protection:
  - ◆ HBM JESD22-A114F exceeds 2000 V
  - ◆ MM JESD22-A115-B exceeds 200 V
  - ◆ CDM JESD22-C101E exceeds 1000 V
- Specified from -40 °C to +85 °C and from -40 °C to +125 °C

## 3. Ordering information

Table 1. Ordering information

| Type number | Package           |         |   | Version  |
|-------------|-------------------|---------|---|----------|
|             | Temperature range | Name    | Description   |          |
| 74LVC377D   | -40 °C to +125 °C | SO20    | plastic small outline package; 20 leads;<br>body width 7.5 mm             | SOT163-1 |
| 74LVC377DB  | -40 °C to +125 °C | SSOP20  | plastic shrink small outline package; 20 leads;<br>body width 5.3 mm      | SOT339-1 |
| 74LVC377PW  | -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

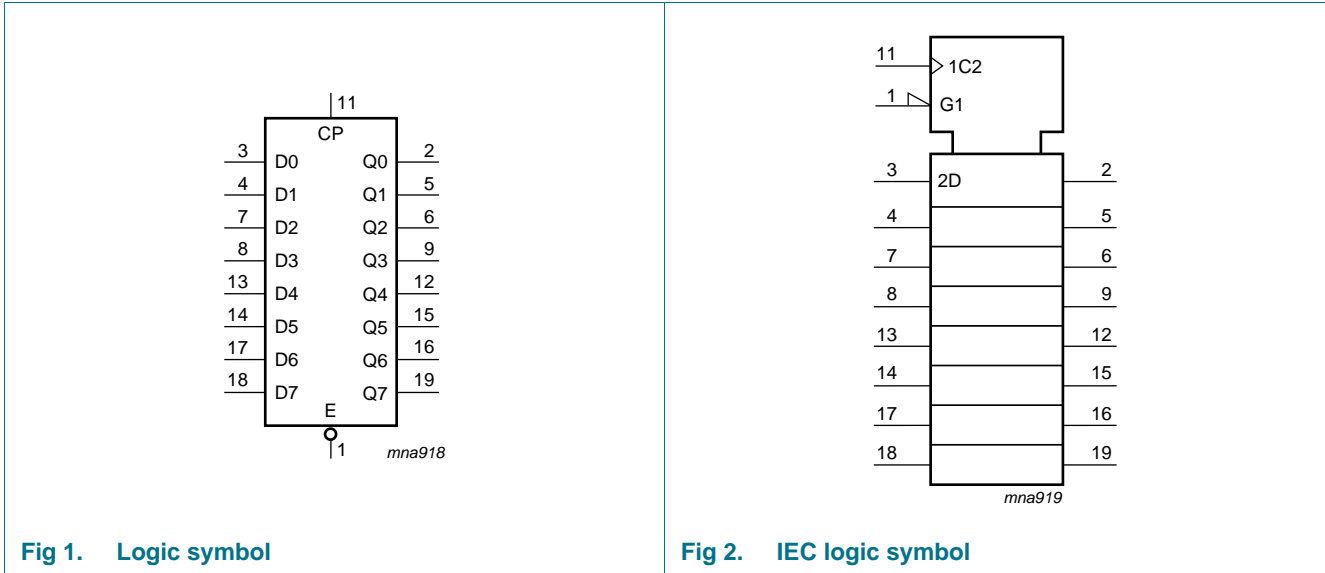


Fig 1. Logic symbol

Fig 2. IEC logic symbol

### 5. Pinning information

#### 5.1 Pinning

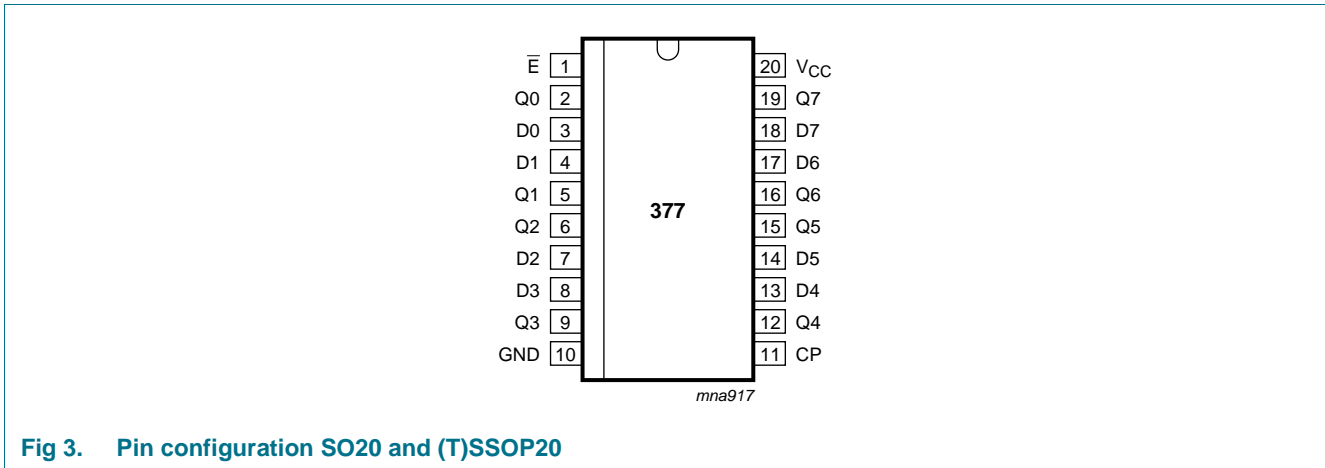


Fig 3. Pin configuration SO20 and (T)SSOP20

#### 5.2 Pin description

Table 2. Pin description

| Symbol    | Pin                        | Description                               |
|-----------|----------------------------|---|
| $\bar{E}$ | 1                          | data enable input (active LOW)            |
| CP        | 11                         | clock input (LOW to HIGH; edge-triggered) |
| D[0:7]    | 3, 4, 7, 8, 13, 14, 17, 18 | data input                                |

Table 2. Pin description *?continued*

| Symbol          | Pin                        | Description      |
|-----------------|----------------------------|------------------|
| Q[0:7]          | 2, 5, 6, 9, 12, 15, 16, 19 | flip-flop output |
| GND             | 10                         | ground (0 V)     |
| V <sub>CC</sub> | 20                         | power supply     |

## 6. Functional description

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

| Operating mode | Control |                | Input | Output |
|----------------|---------|----------------|-------|--------|
|                | CP      | $\overline{E}$ | Dn    | Qn     |
| Load 1         | ↑       | l              | h     | H      |
| Load 0         | ↑       | l              | l     | L      |
| Hold           | ↑       | h              | X     | NC     |
| Do nothing     | X       | H              | X     | NC     |

- [1] H = HIGH voltage level  
h = HIGH voltage level one set-up time prior to the LOW to HIGH CP transition  
L = LOW voltage level  
l = LOW voltage level one set-up time prior to the LOW to HIGH CP transition  
↑ = LOW to HIGH CP transition  
NC = no change  
X = don't care

## 7. Limiting values

Table 4. Limiting values

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

| Symbol           | Parameter               | Conditions   | Min                 | Max                   | Unit |
|------------------|-------------------------|--|---------------------|-----------------------|------|
| V <sub>CC</sub>  | supply voltage          |  | -0.5                | +6.5                  | V    |
| V <sub>I</sub>   | input voltage           |  | <sup>[1]</sup> -0.5 | +5.5                  | V    |
| V <sub>O</sub>   | output voltage          |  | <sup>[2]</sup> -0.5 | V <sub>CC</sub> + 0.5 | V    |
| I <sub>IK</sub>  | input clamping current  | V <sub>I</sub> < 0 V                                     | -50                 | -                     | mA   |
| I <sub>O</sub>   | output current          | V <sub>O</sub> = 0 V to V <sub>CC</sub>                  | -                   | ±50                   | mA   |
| I <sub>OK</sub>  | output clamping current | V <sub>O</sub> > V <sub>CC</sub> or V <sub>O</sub> < 0 V | -                   | ±50                   | mA   |
| I <sub>CC</sub>  | supply current          |  | -                   | 100                   | mA   |
| I <sub>GND</sub> | ground current          |  | -100                | -                     | mA   |
| T <sub>stg</sub> | storage temperature     |  | -65                 | +150                  | °C   |
| P <sub>tot</sub> | total power dissipation | T <sub>amb</sub> = -40 °C to +125 °C                     | <sup>[3]</sup> -    | 500                   | mW   |

- [1] The minimum input voltage ratings may be exceeded if the input current ratings are observed.  
[2] The output voltage ratings may be exceeded if the output current ratings are observed.  
[3] For SO20 packages: above 70 °C derate linearly with 8 mW/K.  
For (T)SSOP20 packages: above 60 °C derate linearly with 5.5 mW/K.

## 8. Recommended operating conditions

**Table 5. Recommended operating conditions**

| Symbol           | Parameter                           | Conditions                        | Min  | Typ | Max             | Unit |
|------------------|-------------------------------------|-----------------------------------|------|-----|-----------------|------|
| V <sub>CC</sub>  | supply voltage                      |                                   | 1.65 | -   | 3.6             | V    |
|                  |                                     | functional                        | 1.2  | -   | -               | V    |
| V <sub>I</sub>   | input voltage                       |                                   | 0    | -   | 5.5             | V    |
| V <sub>O</sub>   | output voltage                      |                                   | 0    | -   | V <sub>CC</sub> | V    |
| T <sub>amb</sub> | ambient temperature                 | in free air                       | -40  | -   | +125            | °C   |
| Δt/ΔV            | input transition rise and fall rate | V <sub>CC</sub> = 1.65 V to 2.7 V | 0    | -   | 20              | ns/V |
|                  |                                     | V <sub>CC</sub> = 2.7 V to 3.6 V  | 0    | -   | 10              | ns/V |

## 9. Static characteristics

**Table 6. Static characteristics**

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

| Symbol          | Parameter                 | Conditions  | -40 °C to +85 °C       |                    |                        | -40 °C to +125 °C      |                        | Unit |
|-----------------|---------------------------|---|------------------------|--------------------|------------------------|------------------------|------------------------|------|
|                 |                           |   | Min                    | Typ <sup>[1]</sup> | Max                    | Min                    | Max                    |      |
| V <sub>IH</sub> | HIGH-level input voltage  | V <sub>CC</sub> = 1.2 V                                     | 1.08                   | -                  | -                      | 1.08                   | -                      | V    |
|                 |                           | V <sub>CC</sub> = 1.65 V to 1.95 V                          | 0.65 × V <sub>CC</sub> | -                  | -                      | 0.65 × V <sub>CC</sub> | -                      | V    |
|                 |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                            | 1.7                    | -                  | -                      | 1.7                    | -                      | V    |
|                 |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                            | 2.0                    | -                  | -                      | 2.0                    | -                      | V    |
| V <sub>IL</sub> | LOW-level input voltage   | V <sub>CC</sub> = 1.2 V                                     | -                      | -                  | 0.12                   | -                      | 0.12                   | V    |
|                 |                           | V <sub>CC</sub> = 1.65 V to 1.95 V                          | -                      | -                  | 0.35 × V <sub>CC</sub> | -                      | 0.35 × V <sub>CC</sub> | V    |
|                 |                           | V <sub>CC</sub> = 2.3 V to 2.7 V                            | -                      | -                  | 0.7                    | -                      | 0.7                    | V    |
|                 |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                            | -                      | -                  | 0.8                    | -                      | 0.8                    | V    |
| V <sub>OH</sub> | HIGH-level output voltage | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>         |                        |                    |                        |                        |                        |      |
|                 |                           | I <sub>O</sub> = -100 μA; V <sub>CC</sub> = 1.65 V to 3.6 V | V <sub>CC</sub> - 0.2  | -                  | -                      | V <sub>CC</sub> - 0.3  | -                      | V    |
|                 |                           | I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 1.65 V            | 1.2                    | -                  | -                      | 1.05                   | -                      | V    |
|                 |                           | I <sub>O</sub> = -8 mA; V <sub>CC</sub> = 2.3 V             | 1.8                    | -                  | -                      | 1.65                   | -                      | V    |
|                 |                           | I <sub>O</sub> = -12 mA; V <sub>CC</sub> = 2.7 V            | 2.2                    | -                  | -                      | 2.05                   | -                      | V    |
|                 |                           | I <sub>O</sub> = -18 mA; V <sub>CC</sub> = 3.0 V            | 2.4                    | -                  | -                      | 2.25                   | -                      | V    |
| V <sub>OL</sub> | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>         |                        |                    |                        |                        |                        |      |
|                 |                           | I <sub>O</sub> = 100 μA; V <sub>CC</sub> = 1.65 V to 3.6 V  | -                      | -                  | 0.2                    | -                      | 0.3                    | V    |
|                 |                           | I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V             | -                      | -                  | 0.45                   | -                      | 0.65                   | V    |
|                 |                           | I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V              | -                      | -                  | 0.6                    | -                      | 0.8                    | V    |
|                 |                           | I <sub>O</sub> = 12 mA; V <sub>CC</sub> = 2.7 V             | -                      | -                  | 0.4                    | -                      | 0.6                    | V    |
| I <sub>I</sub>  | input leakage current     | V <sub>CC</sub> = 3.6 V; V <sub>I</sub> = 5.5 V or GND      | -                      | ±0.1               | ±5                     | -                      | ±20                    | μA   |

**Table 6. Static characteristics** *?ontinued*

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

| Symbol           | Parameter                 | Conditions  | -40 °C to +85 °C |                    |     | -40 °C to +125 °C |      | Unit |
|------------------|---------------------------|---|------------------|--------------------|-----|-------------------|------|------|
|                  |                           |   | Min              | Typ <sup>[1]</sup> | Max | Min               | Max  |      |
| I <sub>CC</sub>  | supply current            | V <sub>CC</sub> = 3.6 V; V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A                          | -                | 0.1                | 10  | -                 | 40   | μA   |
| ΔI <sub>CC</sub> | additional supply current | per input pin; V <sub>CC</sub> = 2.7 V to 3.6 V; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A | -                | 5                  | 500 | -                 | 5000 | μA   |
| C <sub>I</sub>   | input capacitance         | V <sub>CC</sub> = 0 V to 3.6 V; V <sub>I</sub> = GND to V <sub>CC</sub>   | -                | 5.0                | -   | -                 | -    | pF   |

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

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

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

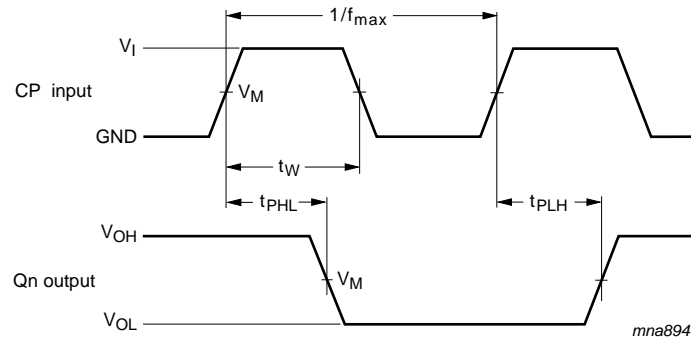
| Symbol          | Parameter         | Conditions  | -40 °C to +85 °C |                    |      | -40 °C to +125 °C |      | Unit |
|-----------------|-------------------|---|------------------|--------------------|------|-------------------|------|------|
|                 |                   |   | Min              | Typ <sup>[1]</sup> | Max  | Min               | Max  |      |
| t <sub>pd</sub> | propagation delay | CP to Qn; see <a href="#">Figure 4</a> <sup>[2]</sup> |                  |                    |      |                   |      |      |
|                 |                   | V <sub>CC</sub> = 1.2 V                               | -                | 15                 | -    | -                 | -    | ns   |
|                 |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                    | 2.5              | 7.4                | 14.5 | 2.5               | 15.5 | ns   |
|                 |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                      | 1.8              | 4.4                | 8.5  | 1.8               | 9.1  | ns   |
|                 |                   | V <sub>CC</sub> = 2.7 V                               | 1.5              | 4.3                | 7.9  | 1.5               | 10.0 | ns   |
|                 |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                      | 1.5              | 4.0                | 7.6  | 1.5               | 9.5  | ns   |
| t <sub>w</sub>  | pulse width       | clock HIGH or LOW; see <a href="#">Figure 4</a>       |                  |                    |      |                   |      |      |
|                 |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                    | 6.0              | -                  | -    | 6.0               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                      | 5.0              | -                  | -    | 5.0               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 2.7 V                               | 5.0              | 1.6                | -    | 5.0               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                      | 4.0              | 1.0                | -    | 4.0               | -    | ns   |
| t <sub>su</sub> | set-up time       | $\bar{E}$ to CP; see <a href="#">Figure 5</a>         |                  |                    |      |                   |      |      |
|                 |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                    | 5.5              | -                  | -    | 5.5               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                      | 4.5              | -                  | -    | 4.5               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 2.7 V                               | 4.0              | 0.6                | -    | 4.0               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                      | 3.0              | 0.2                | -    | 3.0               | -    | ns   |
|                 |                   | Dn to CP; see <a href="#">Figure 5</a>                |                  |                    |      |                   |      |      |
|                 |                   | V <sub>CC</sub> = 1.65 V to 1.95 V                    | 5.5              | -                  | -    | 5.5               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 2.3 V to 2.7 V                      | 4.5              | -                  | -    | 4.5               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 2.7 V                               | 3.0              | 1.0                | -    | 3.0               | -    | ns   |
|                 |                   | V <sub>CC</sub> = 3.0 V to 3.6 V                      | 2.0              | 0.7                | -    | 2.0               | -    | ns   |

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

| Symbol             | Parameter                     | Conditions  | -40 °C to +85 °C |                    |     | -40 °C to +125 °C |     | Unit |
|--------------------|-------------------------------|---|------------------|--------------------|-----|-------------------|-----|------|
|                    |                               |   | Min              | Typ <sup>[1]</sup> | Max | Min               | Max |      |
| t <sub>h</sub>     | hold time                     | $\bar{E}$ to CP; see <a href="#">Figure 5</a>                         |                  |                    |     |                   |     |      |
|                    |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                    | 1.5              | -                  | -   | 1.5               | -   | ns   |
|                    |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                      | 0.5              | -                  | -   | 0.5               | -   | ns   |
|                    |                               | V <sub>CC</sub> = 2.7 V   | 0.0              | -1.0               | -   | 0.0               | -   | ns   |
|                    |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                      | 1.0              | 0                  | -   | 1.0               | -   | ns   |
|                    |                               | Dn to CP; see <a href="#">Figure 5</a>                                |                  |                    |     |                   |     |      |
|                    |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                    | 1.5              | -                  | -   | 1.5               | -   | ns   |
|                    |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                      | 0.5              | -                  | -   | 0.5               | -   | ns   |
| f <sub>max</sub>   | maximum frequency             | see <a href="#">Figure 4</a>  |                  |                    |     |                   |     |      |
|                    |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                    | 80               | -                  | -   | 64                | -   | MHz  |
|                    |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                      | 100              | -                  | -   | 80                | -   | MHz  |
|                    |                               | V <sub>CC</sub> = 2.7 V   | 150              | -                  | -   | 120               | -   | MHz  |
| t <sub>sk(o)</sub> | output skew time              | V <sub>CC</sub> = 3.0 V to 3.6 V <sup>[3]</sup>                       | -                | -                  | 1.0 | -                 | 1.5 | ns   |
|                    |                               |   |                  |                    |     |                   |     |      |
| C <sub>PD</sub>    | power dissipation capacitance | per flip-flop; V <sub>I</sub> = GND to V <sub>CC</sub> <sup>[4]</sup> |                  |                    |     |                   |     |      |
|                    |                               | V <sub>CC</sub> = 1.65 V to 1.95 V                                    | -                | 12.1               | -   | -                 | -   | pF   |
|                    |                               | V <sub>CC</sub> = 2.3 V to 2.7 V                                      | -                | 15.8               | -   | -                 | -   | pF   |
|                    |                               | V <sub>CC</sub> = 3.0 V to 3.6 V                                      | -                | 19.0               | -   | -                 | -   | pF   |

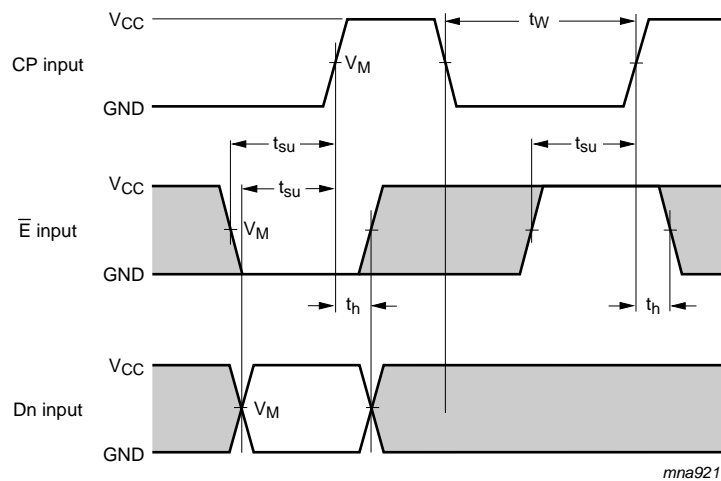
- [1] Typical values are measured at T<sub>amb</sub> = 25 °C and V<sub>CC</sub> = 1.2 V, 1.8 V, 2.5 V, 2.7 V and 3.3 V respectively.
- [2] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.
- [3] Skew between any two outputs of the same package switching in the same direction. This parameter is guaranteed by design.
- [4] 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 Volts  
 N = number of inputs switching  
 Σ(C<sub>L</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>) = sum of the outputs

11. Waveforms



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

**Fig 4. Propagation delay clock (CP) to output (Qn), pulse width clock (CP), and maximum frequency**

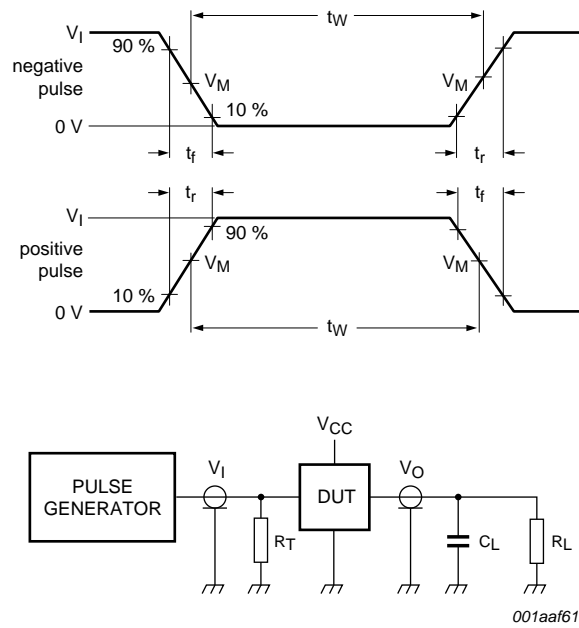


Measurement points are given in [Table 8](#).  
 The shaded areas indicate when the input is permitted to change for predictable output performance.

**Fig 5. Data set-up and hold times of data input (Dn) and enable input ( $\bar{E}$ ) and pulse width of enable input ( $\bar{E}$ )**

**Table 8. Measurement points**

| Supply voltage  | Input               | Output              |
|-----------------|---------------------|---------------------|
| $V_{CC}$        | $V_M$               | $V_M$               |
| 1.2 V           | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |
| 1.65 V to 1.95V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |
| 2.3 V to 2.7 V  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |
| 2.7 V           | 1.5 V               | 1.5 V               |
| 3.0 V to 3.6 V  | 1.5 V               | 1.5 V               |



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

Definitions for test circuit:

$R_L$  = Load resistance.

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

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

**Fig 6. Test circuit for switching times**

**Table 9. Test data**

| Supply voltage   | Input    |               | Load  |              |
|------------------|----------|---------------|-------|--------------|
|                  | $V_I$    | $t_r, t_f$    | $C_L$ | $R_L$        |
| 1.2 V            | $V_{CC}$ | $\leq 2$ ns   | 30 pF | 1 k $\Omega$ |
| 1.65 V to 1.95 V | $V_{CC}$ | $\leq 2$ ns   | 30 pF | 1 k $\Omega$ |
| 2.3 V to 2.7 V   | $V_{CC}$ | $\leq 2$ ns   | 30 pF | 500 $\Omega$ |
| 2.7 V            | 2.7 V    | $\leq 2.5$ ns | 50 pF | 500 $\Omega$ |
| 3.0 V to 3.6 V   | 2.7 V    | $\leq 2.5$ ns | 50 pF | 500 $\Omega$ |



12. Package outline

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

SOT163-1

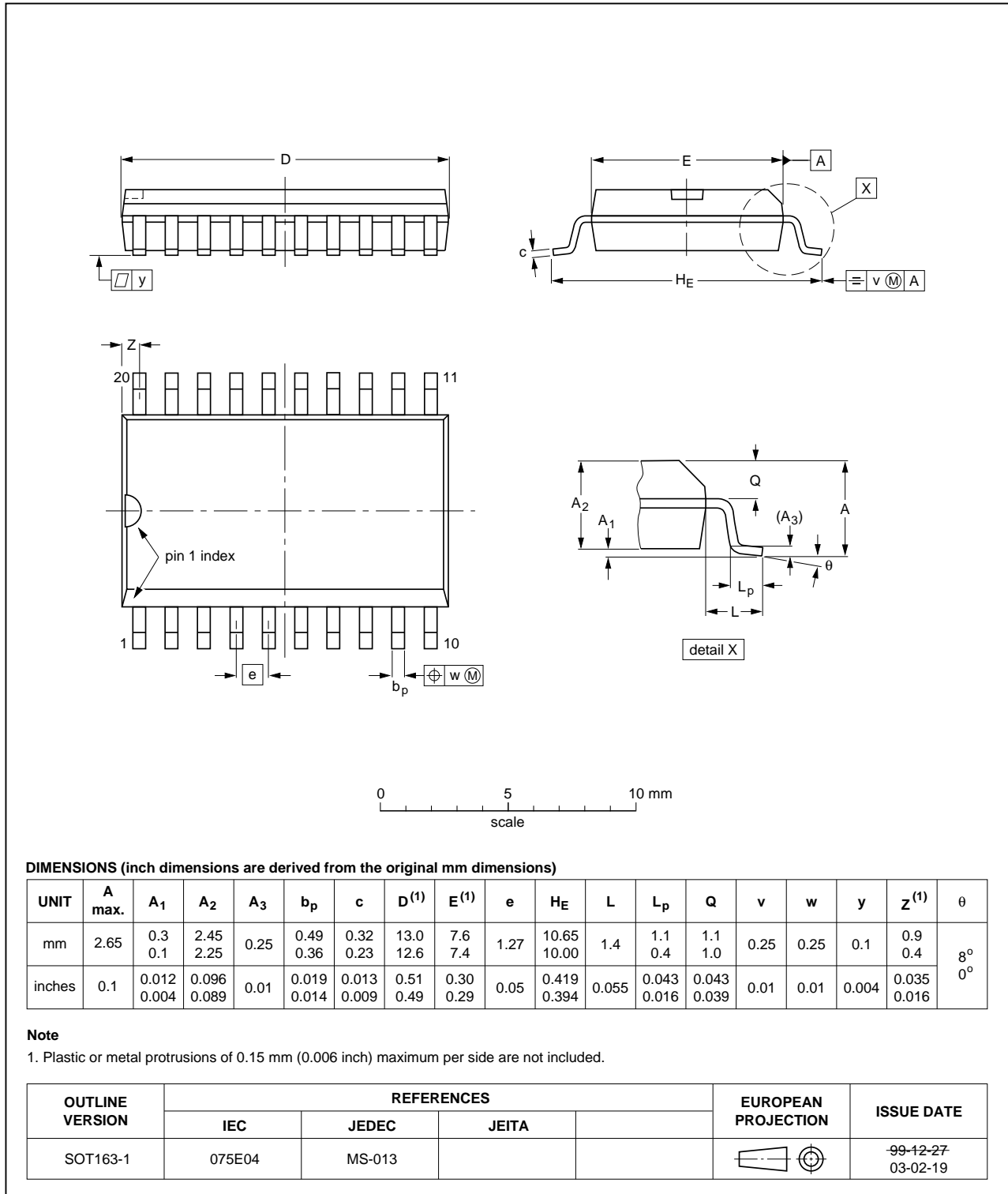


Fig 7. Package outline SOT163-1 (SO20)

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

SOT339-1

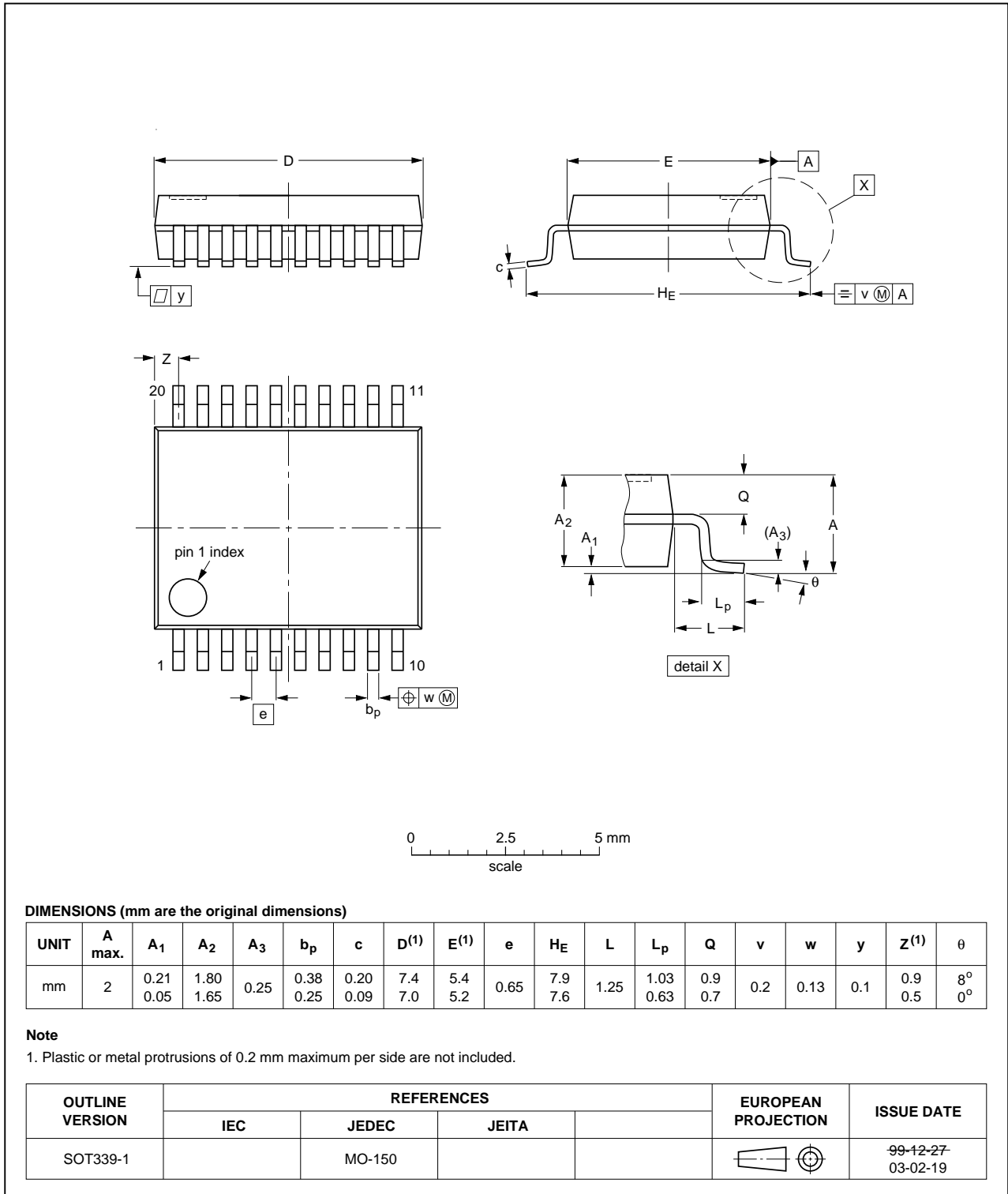


Fig 8. Package outline SOT339-1 (SSOP20)

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

SOT360-1

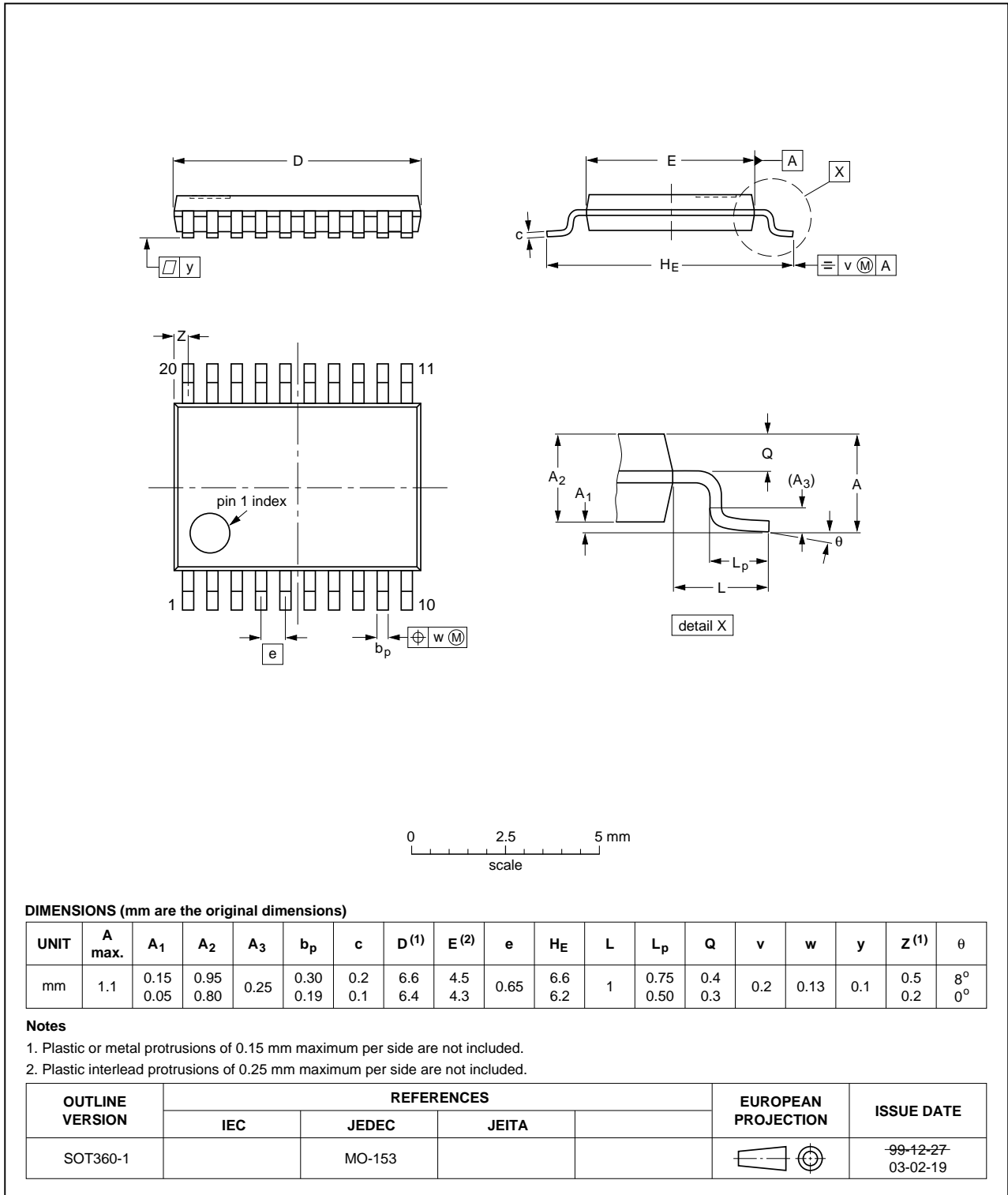


Fig 9. Package outline SOT360-1 (TSSOP20)

## 13. Abbreviations

Table 10. Abbreviations

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

## 14. Revision history

Table 11. Revision history

| Document ID    | Release date  | Data sheet status     | Change notice | Supersedes   |
|----------------|---|-----------------------|---------------|--------------|
| 74LVC377 v.6   | 20121120  | Product data sheet    | -             | 74LVC377 v.5 |
| Modifications: | <ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li><a href="#">Table 4</a>, <a href="#">Table 5</a>, <a href="#">Table 6</a>, <a href="#">Table 7</a>, <a href="#">Table 8</a>, and <a href="#">Table 9</a>: values added for lower voltage ranges.</li> </ul> |                       |               |              |
| 74LVC377 v.5   | 20050221  | Product specification | -             | 74LVC377 v.4 |
| 74LVC377 v.4   | 20040528  | Product specification | -             | 74LVC377 v.3 |
| 74LVC377 v.3   | 20021023  | Product specification | -             | 74LVC377 v.2 |
| 74LVC377 v.2   | 19980729  | Product specification | -             | 74LVC377 v.1 |
| 74LVC377 v.1   | 19990606  | Product specification | -             | -            |

## 15. Legal information

### 15.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | Definition  |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet      | Development                   | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet    | Qualification                 | This document contains data from the preliminary specification.                       |
| Product [short] data sheet        | Production                    | This document contains the product specification.                                     |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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Date of release: 20 November 2012

Document identifier: 74LVC377\_6