



# 74HC4514; 74HCT4514

4-to-16 line decoder/demultiplexer with input latches

Rev. 6.1 — 12 August 2024

Product data sheet

## 1. General description

The 74HC4514; 74HCT4514 is a 4-to-16 line decoder/demultiplexer having four binary weighted address inputs (A0 to A3), with latches, a latch enable input (LE), an enable input ( $\bar{E}$ ) and 16 outputs (Q0 to Q15). When LE is HIGH, the selected output is determined by the data on An. When LE goes LOW, the last data present at An are stored in the latches and the outputs remain stable. When  $\bar{E}$  is LOW, the selected output, determined by the contents of the latch, is HIGH. At  $\bar{E}$  HIGH, all outputs are LOW. The enable input  $\bar{E}$  does not affect the state of the latch. When the device is used as a demultiplexer,  $\bar{E}$  is the data input and A0 to A3 are the address inputs. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

The 74HCT4514 features reduced input threshold levels to allow interfacing to TTL logic levels.

## 2. Features and benefits

- Wide supply voltage range from 2.0 V to 6.0 V
- CMOS low power dissipation
- High noise immunity
- Input levels:
  - For 74HC4514: CMOS level
  - For 74HCT4514: TTL level
- 16-line demultiplexing capability
- Decodes 4 binary-coded inputs into 16 mutually-exclusive outputs
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- Complies with JEDEC standards
  - JESD8C (2.7 V to 3.6 V)
  - JESD7A (2.0 V to 6.0 V)
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

## 3. Applications

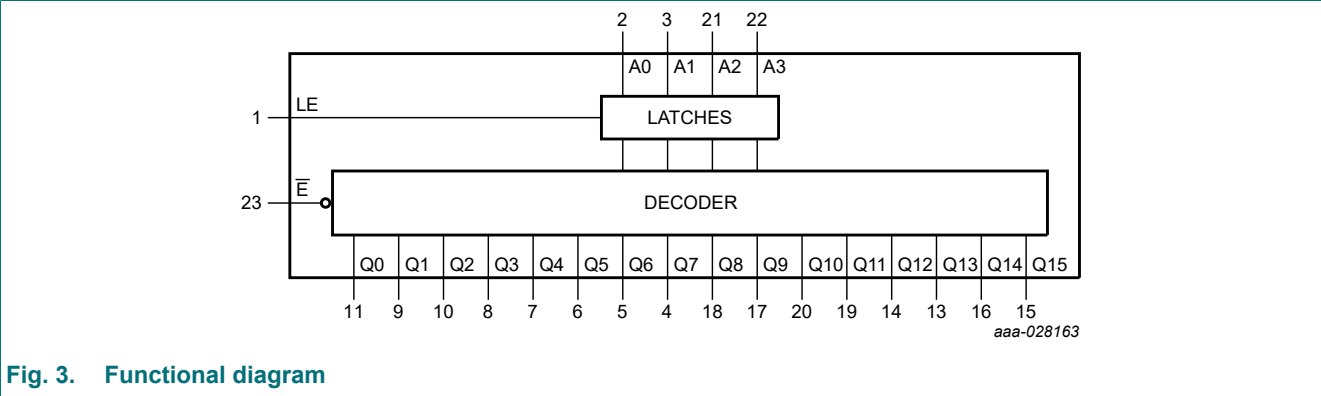
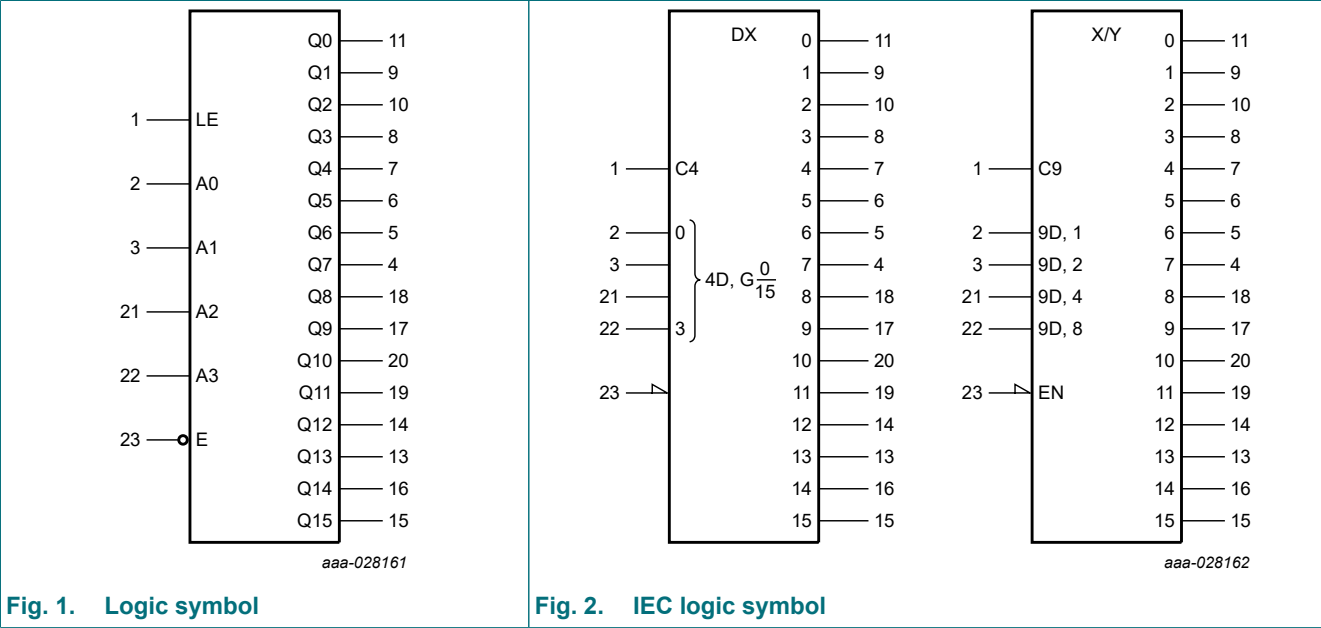
- Digital multiplexing
- Address decoding
- Hexadecimal/BCD decoding

## 4. Ordering information

Table 1. Ordering information

| Type number                                               | Package           |         |                                                                           |                          |
|-----------------------------------------------------------|-------------------|---------|---------------------------------------------------------------------------|--------------------------|
|                                                           | Temperature range | Name    | Description                                                               | Version                  |
| <a href="#">74HC4514PW</a><br><a href="#">74HCT4514PW</a> | -40 °C to +125 °C | TSSOP24 | plastic thin shrink small outline package; 24 leads;<br>body width 4.4 mm | <a href="#">SOT355-1</a> |

5. Functional diagram



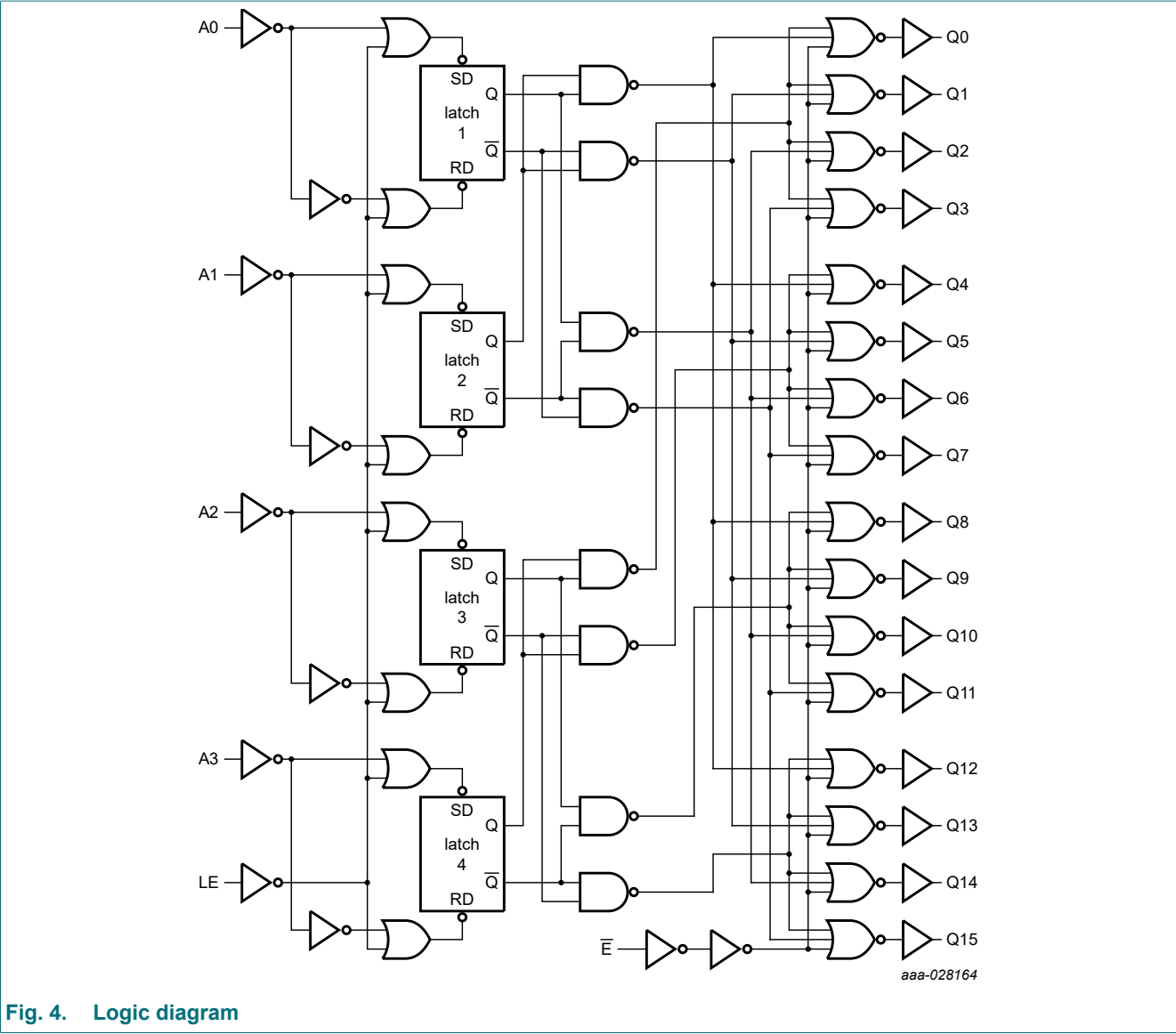
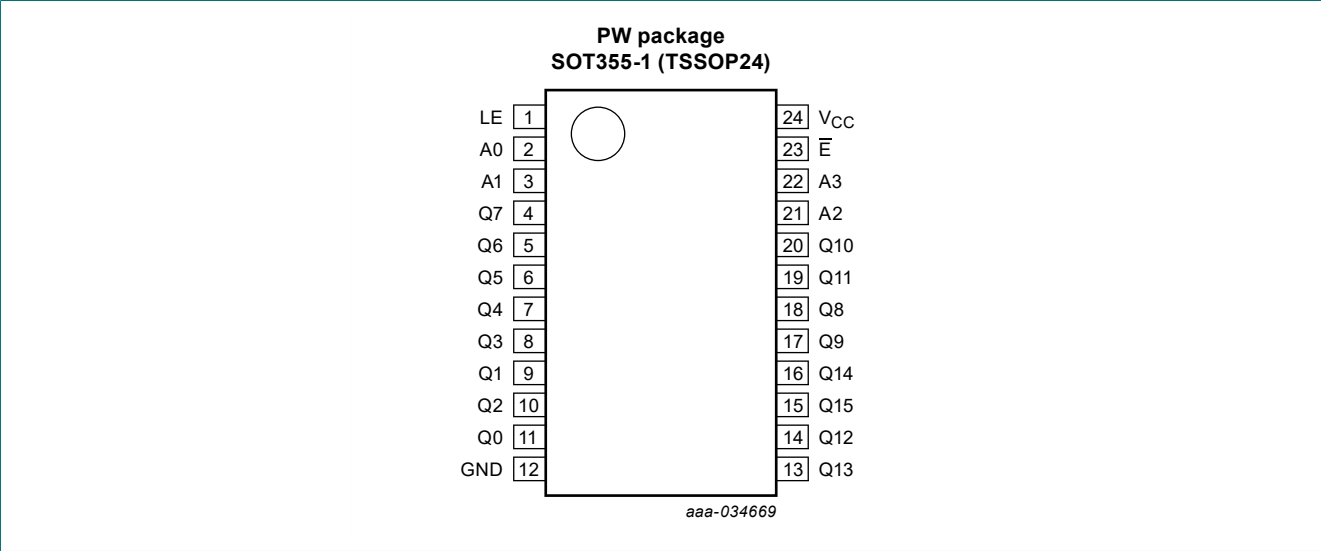


Fig. 4. Logic diagram

6. Pinning information

6.1. Pinning



6.2. Pin description

Table 2. Pin description

| Symbol                                                               | Pin                                                      | Description                       |
|----------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------|
| LE                                                                   | 1                                                        | latch enable input (active HIGH)  |
| $\overline{E}$                                                       | 23                                                       | enable input (active LOW)         |
| Q0, Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15 | 11, 9, 10, 8, 7, 6, 5, 4, 18, 17, 20, 19, 14, 13, 16, 15 | multiplexer outputs (active HIGH) |
| A0, A1, A2, A3                                                       | 2, 3, 21, 22                                             | address inputs                    |
| GND                                                                  | 12                                                       | ground (0 V)                      |
| V <sub>CC</sub>                                                      | 24                                                       | supply voltage                    |

7. Functional description

Table 3. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care.  
Input LE = HIGH.

| Inputs         |    |    |    |    | Outputs |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |
|----------------|----|----|----|----|---------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| $\overline{E}$ | A0 | A1 | A2 | A3 | Q0      | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
| H              | X  | X  | X  | X  | L       | L  | L  | L  | L  | L  | L  | L  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | L  | L  | L  | L  | H       | L  | L  | L  | L  | L  | L  | L  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | H  | L  | L  | L  | L       | H  | L  | L  | L  | L  | L  | L  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | L  | H  | L  | L  | L       | L  | H  | L  | L  | L  | L  | L  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | H  | H  | L  | L  | L       | L  | L  | H  | L  | L  | L  | L  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | L  | L  | H  | L  | L       | L  | L  | L  | H  | L  | L  | L  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | H  | L  | H  | L  | L       | L  | L  | L  | L  | H  | L  | L  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | L  | H  | H  | L  | L       | L  | L  | L  | L  | L  | H  | L  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | H  | H  | H  | L  | L       | L  | L  | L  | L  | L  | L  | H  | L  | L  | L   | L   | L   | L   | L   | L   |
| L              | L  | L  | L  | H  | L       | L  | L  | L  | L  | L  | L  | L  | H  | L  | L   | L   | L   | L   | L   | L   |
| L              | H  | L  | L  | H  | L       | L  | L  | L  | L  | L  | L  | L  | L  | H  | L   | L   | L   | L   | L   | L   |
| L              | L  | H  | L  | H  | L       | L  | L  | L  | L  | L  | L  | L  | L  | L  | L   | H   | L   | L   | L   | L   |
| L              | H  | H  | L  | H  | L       | L  | L  | L  | L  | L  | L  | L  | L  | L  | L   | H   | L   | L   | L   | L   |
| L              | L  | L  | H  | H  | L       | L  | L  | L  | L  | L  | L  | L  | L  | L  | L   | L   | H   | L   | L   | L   |
| L              | H  | L  | H  | H  | L       | L  | L  | L  | L  | L  | L  | L  | L  | L  | L   | L   | L   | H   | L   | L   |
| L              | L  | H  | H  | H  | L       | L  | L  | L  | L  | L  | L  | L  | L  | L  | L   | L   | L   | L   | H   | L   |
| L              | H  | H  | H  | H  | L       | L  | L  | L  | L  | L  | L  | L  | L  | L  | L   | L   | L   | L   | L   | H   |

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 $V_I > V_{CC} + 0.5\text{ V}$ | -    | $\pm 20$ | mA   |
| $I_{OK}$  | output clamping current | $V_O < -0.5\text{ V}$ or $V_O > V_{CC} + 0.5\text{ V}$ | -    | $\pm 20$ | mA   |
| $I_O$     | output current          | $-0.5\text{ V} < V_O < V_{CC} + 0.5\text{ V}$          | -    | $\pm 25$ | 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 | [1]                                                    | -    | 500      | mW   |

[1] For SOT355-1 (TSSOP24) package:  $P_{tot}$  derates linearly with 12.4 mW/K above 110 °C.

9. Recommended operating conditions

Table 5. Recommended operating conditions

| Symbol           | Parameter                           | Conditions              | 74HC4514 |      |                 | 74HCT4514 |      |                 | Unit |
|------------------|-------------------------------------|-------------------------|----------|------|-----------------|-----------|------|-----------------|------|
|                  |                                     |                         | Min      | Typ  | Max             | Min       | Typ  | Max             |      |
| V <sub>CC</sub>  | supply voltage                      |                         | 2.0      | 5.0  | 6.0             | 4.5       | 5.0  | 5.5             | V    |
| V <sub>I</sub>   | input voltage                       |                         | 0        | -    | V <sub>CC</sub> | 0         | -    | V <sub>CC</sub> | V    |
| V <sub>O</sub>   | output voltage                      |                         | 0        | -    | V <sub>CC</sub> | 0         | -    | V <sub>CC</sub> | V    |
| Δt/ΔV            | input transition rise and fall rate | V <sub>CC</sub> = 2.0 V | -        | -    | 625             | -         | -    | -               | ns/V |
|                  |                                     | V <sub>CC</sub> = 4.5 V | -        | 1.67 | 139             | -         | 1.67 | 139             | ns/V |
|                  |                                     | V <sub>CC</sub> = 6.0 V | -        | -    | 83              | -         | -    | -               | ns/V |
| T <sub>amb</sub> | ambient temperature                 |                         | -40      | -    | +125            | -40       | -    | +125            | °C   |

10. 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  |      |
| 74HC4514        |                           |                                                                                        |        |      |      |                  |      |                   |      |      |
| V <sub>IH</sub> | HIGH-level input voltage  | V <sub>CC</sub> = 2.0 V                                                                | 1.5    | 1.2  | -    | 1.5              | -    | 1.5               | -    | V    |
|                 |                           | V <sub>CC</sub> = 4.5 V                                                                | 3.15   | 2.4  | -    | 3.15             | -    | 3.15              | -    | V    |
|                 |                           | V <sub>CC</sub> = 6.0 V                                                                | 4.2    | 3.2  | -    | 4.2              | -    | 4.2               | -    | V    |
| V <sub>IL</sub> | LOW-level input voltage   | V <sub>CC</sub> = 2.0 V                                                                | -      | 0.8  | 0.5  | -                | 0.5  | -                 | 0.5  | V    |
|                 |                           | V <sub>CC</sub> = 4.5 V                                                                | -      | 2.1  | 1.35 | -                | 1.35 | -                 | 1.35 | V    |
|                 |                           | V <sub>CC</sub> = 6.0 V                                                                | -      | 2.8  | 1.8  | -                | 1.8  | -                 | 1.8  | 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> = -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>IH</sub> or V <sub>IL</sub>                                    |        |      |      |                  |      |                   |      |      |
|                 |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 2.0 V                                        | -      | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                 |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V                                        | -      | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                 |                           | I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V                                        | -      | 0    | 0.1  | -                | 0.1  | -                 | 0.1  | V    |
|                 |                           | I <sub>O</sub> = 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 | -      | -    | 8.0  | -                | 80   | -                 | 160  | μA   |
| C <sub>I</sub>  | input capacitance         |                                                                                        | -      | 3.5  | -    | -                | -    | -                 | -    | pF   |

| Symbol           | Parameter                 | Conditions                                                                                                                                              | +25 °C |      |      | −40 °C to +85 °C |       | −40 °C to +125 °C |       | Unit |
|------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|------|------------------|-------|-------------------|-------|------|
|                  |                           |                                                                                                                                                         | Min    | Typ  | Max  | Min              | Max   | Min               | Max   |      |
| 74HCT4514        |                           |                                                                                                                                                         |        |      |      |                  |       |                   |       |      |
| V <sub>IH</sub>  | HIGH-level input voltage  | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                                                                        | 2.0    | 1.6  | -    | 2.0              | -     | 2.0               | -     | V    |
| V <sub>IL</sub>  | LOW-level input voltage   | V <sub>CC</sub> = 4.5 V to 5.5 V                                                                                                                        | -      | 1.2  | 0.8  | -                | 0.8   | -                 | 0.8   | V    |
| V <sub>OH</sub>  | HIGH-level output voltage | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 4.5 V                                                                           |        |      |      |                  |       |                   |       |      |
|                  |                           | I <sub>O</sub> = -20 μA                                                                                                                                 | 4.4    | 4.5  | -    | 4.4              | -     | 4.4               | -     | V    |
|                  |                           | I <sub>O</sub> = -4 mA                                                                                                                                  | 3.98   | 4.32 | -    | 3.84             | -     | 3.7               | -     | V    |
| V <sub>OL</sub>  | LOW-level output voltage  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 4.5 V                                                                           |        |      |      |                  |       |                   |       |      |
|                  |                           | I <sub>O</sub> = 20 μA                                                                                                                                  | -      | 0    | 0.1  | -                | 0.1   | -                 | 0.1   | V    |
|                  |                           | I <sub>O</sub> = 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; V <sub>CC</sub> = 5.5 V; I <sub>O</sub> = 0 A                                                                  | -      | -    | 8.0  | -                | 80    | -                 | 160   | μA   |
| ΔI <sub>CC</sub> | additional supply current | per input pin; V <sub>CC</sub> = 4.5 V to 5.5 V; V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; other inputs at V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A |        |      |      |                  |       |                   |       |      |
|                  |                           | An                                                                                                                                                      | -      | 65   | 234  | -                | 292.5 | -                 | 318.5 | μA   |
|                  |                           | LE                                                                                                                                                      | -      | 140  | 504  | -                | 630   | -                 | 686   | μA   |
|                  |                           | $\overline{\text{E}}$                                                                                                                                   | -      | 100  | 360  | -                | 450   | -                 | 490   | μA   |
| C <sub>I</sub>   | input capacitance         |                                                                                                                                                         | -      | 3.5  | -    | -                | -     | -                 | -     | pF   |

11. Dynamic characteristics

Table 7. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); C<sub>L</sub> = 50 pF unless otherwise specified; for test circuit, see Fig. 7.

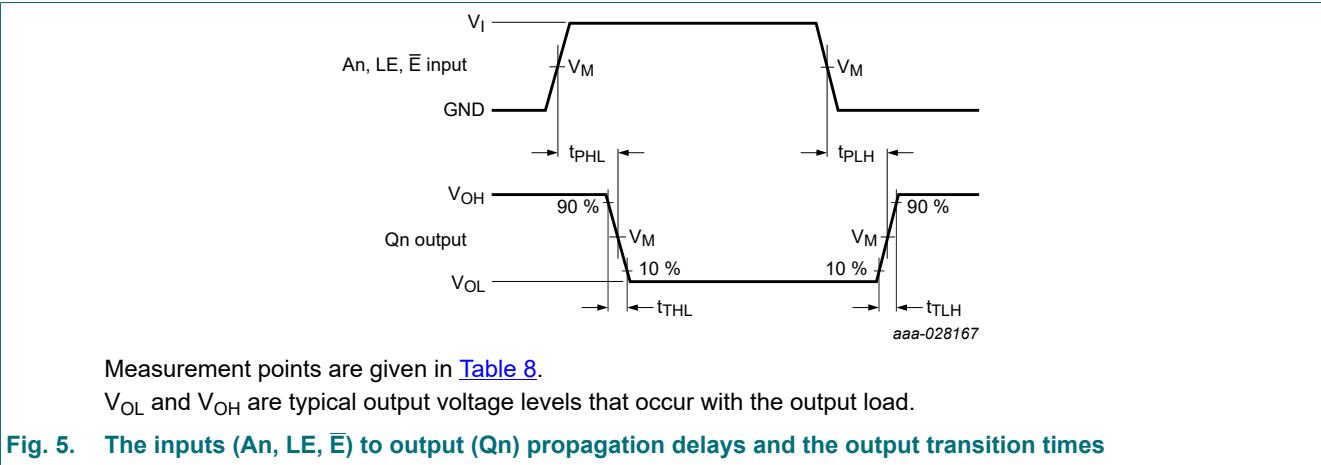
| Symbol          | Parameter                     | Conditions                                               | +25 °C |     |     | −40 °C to +85 °C |     | −40 °C to +125 °C |     | Unit |
|-----------------|-------------------------------|----------------------------------------------------------|--------|-----|-----|------------------|-----|-------------------|-----|------|
|                 |                               |                                                          | Min    | Typ | Max | Min              | Max | Min               | Max |      |
| 74HC4514        |                               |                                                          |        |     |     |                  |     |                   |     |      |
| t <sub>pd</sub> | propagation delay             | An to Qn; see <a href="#">Fig. 5</a> [1]                 |        |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | -      | 74  | 230 | -                | 290 | -                 | 345 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | -      | 27  | 46  | -                | 58  | -                 | 69  | ns   |
|                 |                               | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF            | -      | 23  | -   | -                | -   | -                 | -   | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | -      | 22  | 39  | -                | 49  | -                 | 59  | ns   |
|                 |                               | LE to Qn; see <a href="#">Fig. 5</a>                     |        |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | -      | 74  | 230 | -                | 290 | -                 | 345 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | -      | 27  | 46  | -                | 58  | -                 | 69  | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | -      | 22  | 39  | -                | 49  | -                 | 59  | ns   |
|                 |                               | E to Qn; see <a href="#">Fig. 5</a>                      |        |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | -      | 41  | 175 | -                | 220 | -                 | 265 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | -      | 15  | 35  | -                | 44  | -                 | 53  | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | -      | 12  | 30  | -                | 37  | -                 | 45  | ns   |
| t <sub>t</sub>  | transition time               | Qn; see <a href="#">Fig. 5</a> [2]                       |        |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | -      | 19  | 75  | -                | 95  | -                 | 110 | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | -      | 7   | 15  | -                | 19  | -                 | 22  | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | -      | 6   | 13  | -                | 16  | -                 | 19  | ns   |
| t <sub>w</sub>  | pulse width                   | LE HIGH; see <a href="#">Fig. 6</a>                      |        |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | 80     | 14  | -   | 100              | -   | 120               | -   | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | 16     | 5   | -   | 20               | -   | 24                | -   | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | 14     | 4   | -   | 17               | -   | 20                | -   | ns   |
| t <sub>su</sub> | set-up time                   | An to LE; see <a href="#">Fig. 6</a>                     |        |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | 90     | 25  | -   | 115              | -   | 135               | -   | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | 18     | 9   | -   | 23               | -   | 27                | -   | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | 15     | 7   | -   | 20               | -   | 23                | -   | ns   |
| t <sub>h</sub>  | hold time                     | An to LE; see <a href="#">Fig. 6</a>                     |        |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 2.0 V                                  | 1      | −11 | -   | 1                | -   | 1                 | -   | ns   |
|                 |                               | V <sub>CC</sub> = 4.5 V                                  | 1      | −4  | -   | 1                | -   | 1                 | -   | ns   |
|                 |                               | V <sub>CC</sub> = 6.0 V                                  | 1      | −3  | -   | 1                | -   | 1                 | -   | ns   |
| C <sub>PD</sub> | power dissipation capacitance | per package; V <sub>I</sub> = GND to V <sub>CC</sub> [3] | -      | 44  | -   | -                | -   | -                 | -   | pF   |



| Symbol          | Parameter                     | Conditions                                                       | +25 °C |     |     | −40 °C to +85 °C |     | −40 °C to +125 °C |     | Unit |
|-----------------|-------------------------------|------------------------------------------------------------------|--------|-----|-----|------------------|-----|-------------------|-----|------|
|                 |                               |                                                                  | Min    | Typ | Max | Min              | Max | Min               | Max |      |
| 74HCT4514       |                               |                                                                  |        |     |     |                  |     |                   |     |      |
| t <sub>pd</sub> | propagation delay             | An to Qn; see Fig. 5 [1]                                         |        |     |     |                  |     |                   |     |      |
|                 |                               | V <sub>CC</sub> = 4.5 V                                          | -      | 30  | 55  | -                | 69  | -                 | 83  | ns   |
|                 |                               | V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF                    | -      | 26  | -   | -                | -   | -                 | -   | ns   |
|                 |                               | LE to Qn; V <sub>CC</sub> = 4.5 V; see Fig. 5                    | -      | 29  | 50  | -                | 63  | -                 | 75  | ns   |
|                 |                               | E to Qn; V <sub>CC</sub> = 4.5 V; see Fig. 5                     | -      | 17  | 40  | -                | 50  | -                 | 60  | ns   |
| t <sub>t</sub>  | transition time               | Qn; V <sub>CC</sub> = 4.5 V; see Fig. 5 [2]                      | -      | 7   | 15  | -                | 19  | -                 | 22  | ns   |
| t <sub>W</sub>  | pulse width                   | LE HIGH; V <sub>CC</sub> = 4.5 V; see Fig. 6                     | 16     | 4   | -   | 20               | -   | 24                | -   | ns   |
| t <sub>su</sub> | set-up time                   | An to LE; V <sub>CC</sub> = 4.5 V; see Fig. 6                    | 18     | 9   | -   | 23               | -   | 27                | -   | ns   |
| t <sub>h</sub>  | hold time                     | An to LE; V <sub>CC</sub> = 4.5 V; see Fig. 6                    | 3      | −3  | -   | 3                | -   | 3                 | -   | ns   |
| C <sub>PD</sub> | power dissipation capacitance | per package; V <sub>I</sub> = GND to V <sub>CC</sub> - 1.5 V [3] | -      | 45  | -   | -                | -   | -                 | -   | pF   |

- [1] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>
- [2] t<sub>t</sub> is the same as t<sub>TLH</sub> and t<sub>THL</sub>
- [3] 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 load switching outputs;  
 $\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of the outputs.

11.1. Waveforms and test circuit



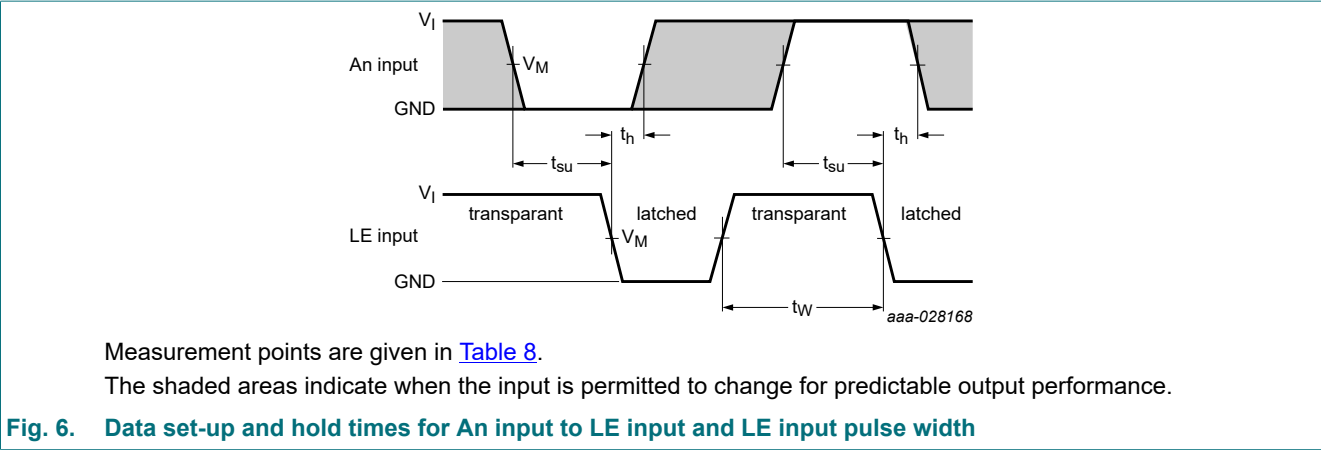


Table 8. Measurement points

| Type      | Input                  |                    | Output             |
|-----------|------------------------|--------------------|--------------------|
|           | V <sub>I</sub>         | V <sub>M</sub>     | V <sub>M</sub>     |
| 74HC4514  | GND to V <sub>CC</sub> | 0.5V <sub>CC</sub> | 0.5V <sub>CC</sub> |
| 74HCT4514 | GND to 3 V             | 1.3 V              | 1.3 V              |

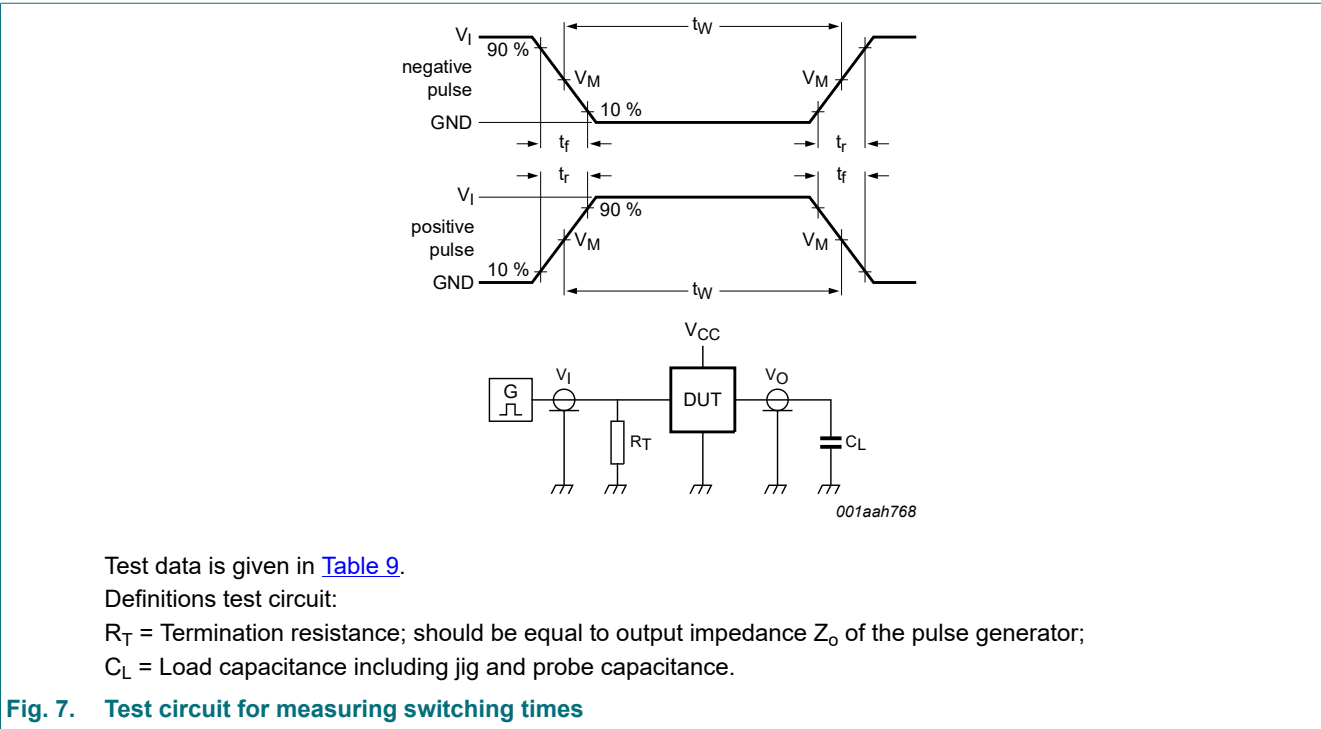
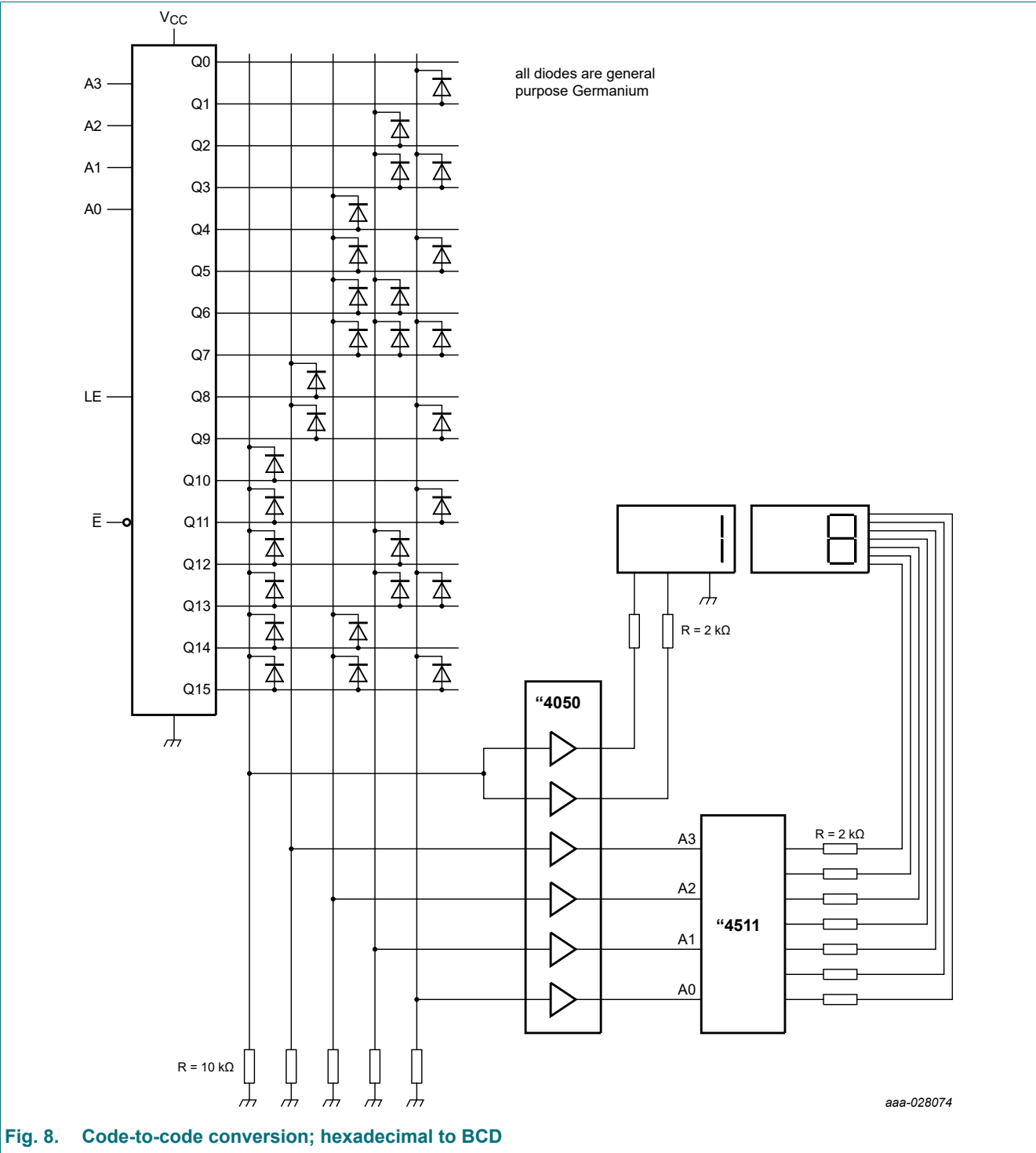


Table 9. Test data

| Type      | Input                  |                                 | Load           |
|-----------|------------------------|---------------------------------|----------------|
|           | V <sub>I</sub>         | t <sub>r</sub> , t <sub>f</sub> | C <sub>L</sub> |
| 74HC4514  | GND to V <sub>CC</sub> | 6 ns                            | 15 pF, 50 pF   |
| 74HCT4514 | GND to 3 V             | 6 ns                            | 15 pF, 50 pF   |

12. Application information



13. Package outline

TSSOP24: plastic thin shrink small outline package; 24 leads; body width 4.4 mm

SOT355-1

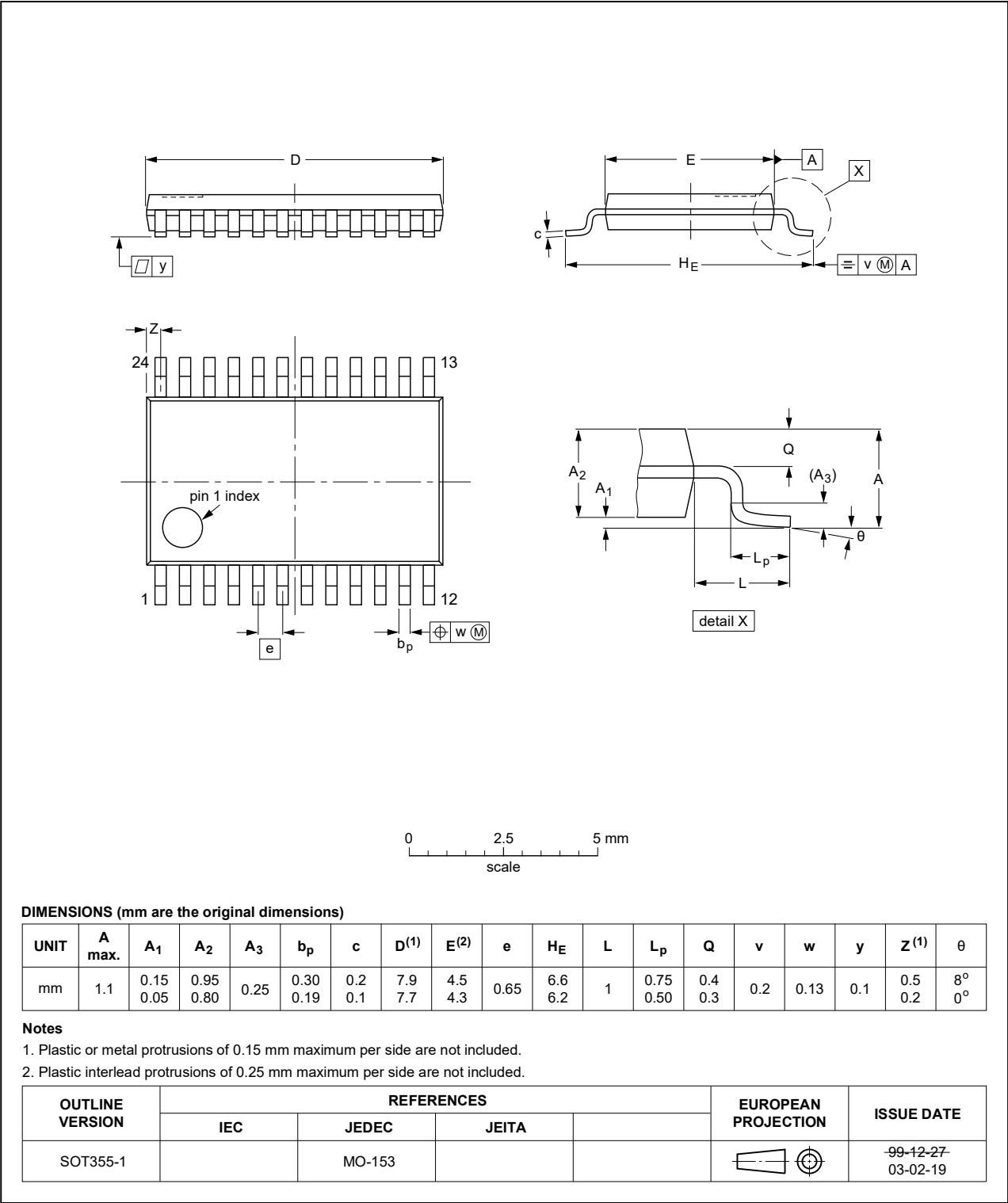


Fig. 9. Package outline SOT355-1 (TSSOP24)

14. Abbreviations

Table 10. Abbreviations

| Acronym | Description                               |
|---------|-------------------------------------------|
| ANSI    | American National Standards Institute     |
| CDM     | Charged Device Model                      |
| CMOS    | Complementary Metal-Oxide Semiconductor   |
| DUT     | Device Under Test                         |
| ESD     | ElectroStatic Discharge                   |
| ESDA    | ElectroStatic Discharge Association       |
| HBM     | Human Body Model                          |
| JEDEC   | Joint Electron Device Engineering Council |
| TTL     | Transistor-Transistor Logic               |

15. Revision history

Table 11. Revision history

| Document ID        | Release date                                                                                                                                                                                                                           | Data sheet status     | Change notice | Supersedes       |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|------------------|
| 74HC_HCT4514 v.6.1 | 20240812                                                                                                                                                                                                                               | Product data sheet    | -             | 74HC_HCT4514 v.6 |
| 74HC_HCT4514 v.6   | 20240805                                                                                                                                                                                                                               | Product data sheet    | -             | 74HC_HCT4514 v.5 |
| Modifications:     | <ul style="list-style-type: none"><li>Section 2: ESD specification updated according to the latest JEDEC standard.</li><li>Type number 74HC4514D (SOT137-1/SO24) removed.</li></ul>                                                    |                       |               |                  |
| 74HC_HCT4514 v.5   | 20240507                                                                                                                                                                                                                               | Product data sheet    | -             | 74HC_HCT4514 v.4 |
| Modifications:     | <ul style="list-style-type: none"><li>Type number 74HCT4514D (SOT137-1/SO24) removed.</li></ul>                                                                                                                                        |                       |               |                  |
| 74HC_HCT4514 v.4   | 20210715                                                                                                                                                                                                                               | Product data sheet    | -             | 74HC_HCT4514 v.3 |
| Modifications:     | <ul style="list-style-type: none"><li>Type number 74HC4514DB (SOT340-1/SSOP24) removed.</li><li>Section 2 updated.</li><li>Section 8: Derating values for P<sub>tot</sub> total power dissipation updated.</li></ul>                   |                       |               |                  |
| 74HC_HCT4514 v.3   | 20180220                                                                                                                                                                                                                               | Product data sheet    | -             | 74HC_HCT4514 v.2 |
| Modifications:     | <ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li></ul> |                       |               |                  |
| 74HC_HCT4514 v.2   | 19930901                                                                                                                                                                                                                               | Product specification | -             | 74HC_HCT4514 v.1 |

## 16. Legal information

### Data sheet status

| Document status<br>[1][2]      | Product status [3] | 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 <https://www.nexperia.com>.

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