

# 74LV4066

## Quad bilateral switches

Rev. 6 — 8 April 2024

Product data sheet

### 1. General description

The 74LV4066 is a quad single pole, single throw analog switch. Each switch features two input/output terminals (nY and nZ) and an active HIGH enable input (nE). When nE is LOW, the analog switch is turned off. Digital inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess  $V_{CC}$ .

### 2. Features and benefits

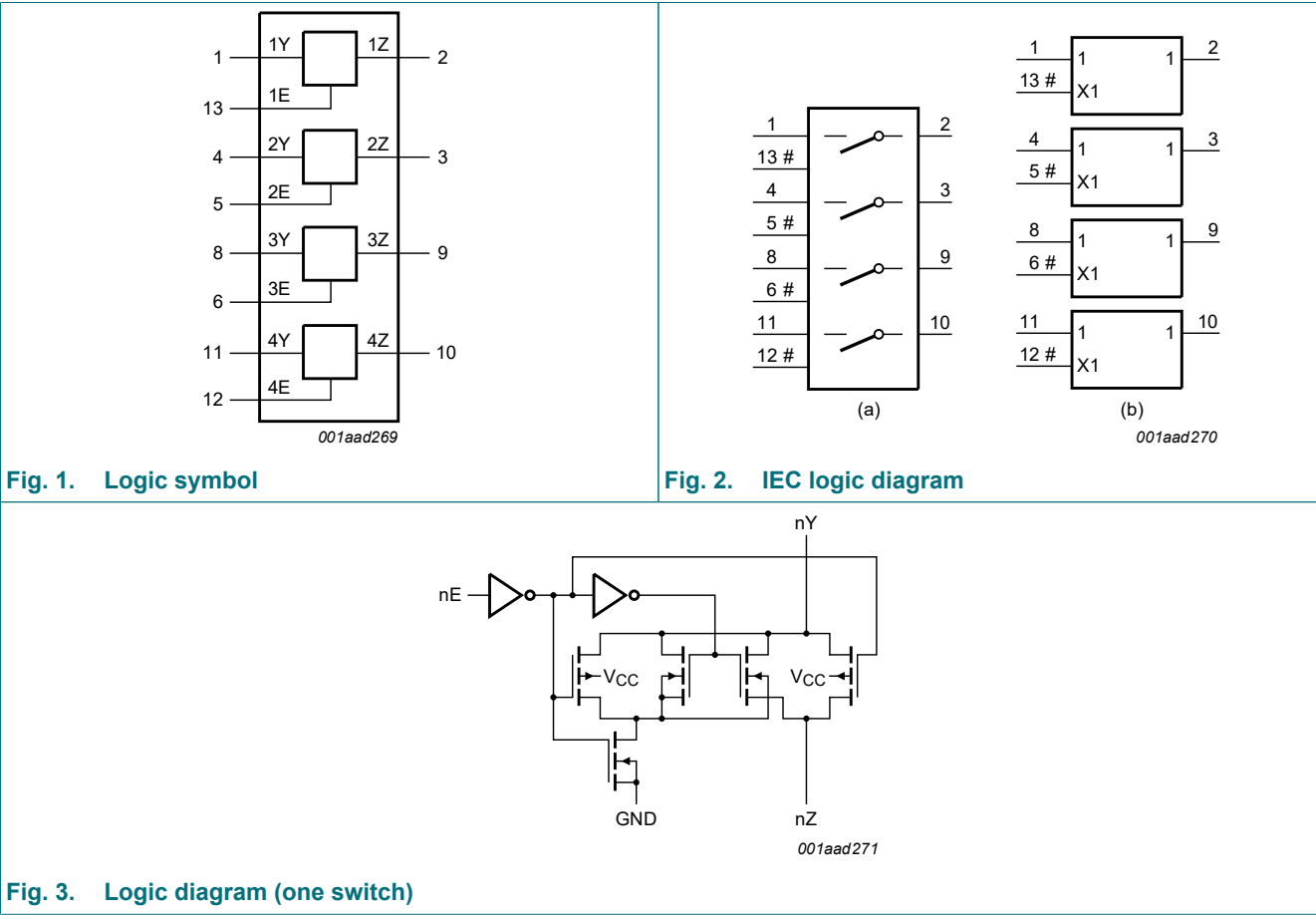
- Wide supply voltage range from 1.0 to 6.0 V
- CMOS low power dissipation
- Direct interface with TTL levels
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- Complies with JEDEC standards:
  - JESD8-7 (1.65 V to 1.95 V)
  - JESD8-5 (2.3 V to 2.7 V)
  - JESD8C (2.7 V to 3.6 V)
  - JESD36 (4.5 V to 5.5 V)
- Typical  $V_{OLP}$  (output ground bounce): < 0.8 V at  $V_{CC} = 3.3$  V and  $T_{amb} = 25$  °C
- Very low ON-resistance:
  - 60  $\Omega$  (typical) at  $V_{CC} = 2.0$  V
  - 35  $\Omega$  (typical) at  $V_{CC} = 3.0$  V
  - 25  $\Omega$  (typical) at  $V_{CC} = 4.5$  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 +80 °C and from -40 °C to +125 °C

### 3. Ordering information

Table 1. Ordering information

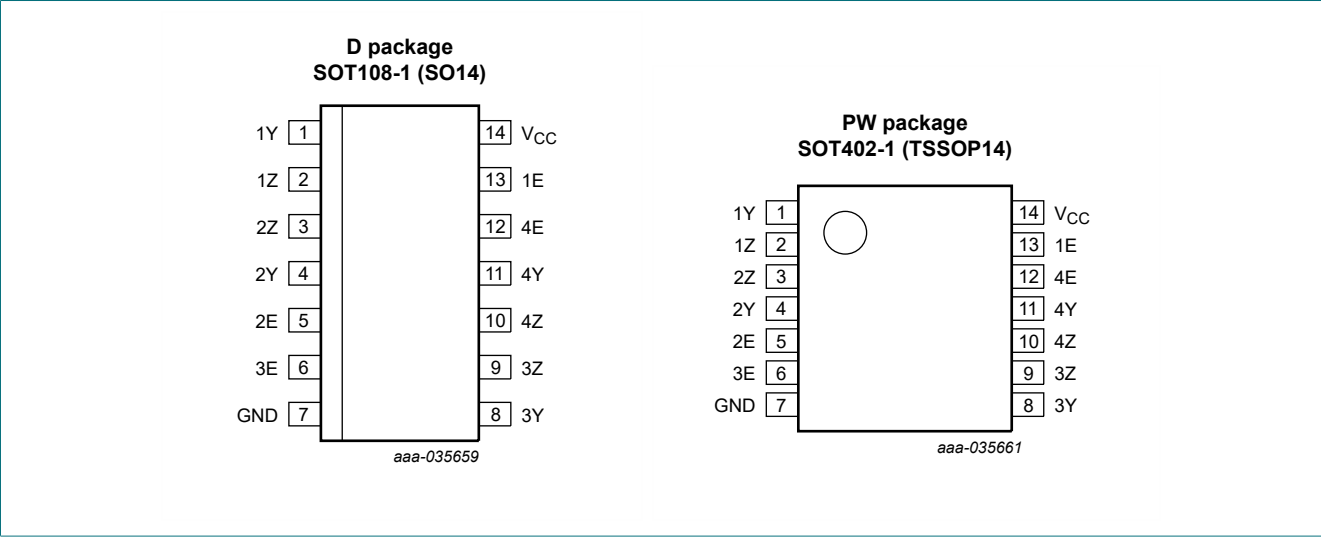
| Type number                | Package           |         |                                                                           |                          |
|----------------------------|-------------------|---------|---------------------------------------------------------------------------|--------------------------|
|                            | Temperature range | Name    | Description                                                               | Version                  |
| <a href="#">74LV4066D</a>  | -40 °C to +125 °C | SO14    | plastic small outline package; 14 leads;<br>body width 3.9 mm             | <a href="#">SOT108-1</a> |
| <a href="#">74LV4066PW</a> | -40 °C to +125 °C | TSSOP14 | plastic thin shrink small outline package; 14 leads;<br>body width 4.4 mm | <a href="#">SOT402-1</a> |

4. Functional diagram



5. Pinning information

5.1. Pinning



5.2. Pin description

Table 2. Pin description

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

6. Functional description

Table 3. Function table

| Input nE | Switch |
|----------|--------|
| LOW      | off    |
| HIGH     | on     |

7. Limiting values

Table 4. Limiting values

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

| Symbol           | Parameter               | Conditions                                                          | Min  | Max  | Unit |
|------------------|-------------------------|---------------------------------------------------------------------|------|------|------|
| V <sub>CC</sub>  | supply voltage          |                                                                     | -0.5 | +7.0 | V    |
| I <sub>IK</sub>  | input clamping current  | V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V | -    | ±20  | mA   |
| I <sub>OK</sub>  | output clamping current | V <sub>O</sub> < -0.5 V or V <sub>O</sub> > V <sub>CC</sub> + 0.5 V | -    | ±50  | mA   |
| I <sub>SW</sub>  | switch current          | V <sub>O</sub> = -0.5 V to (V <sub>CC</sub> + 0.5 V) [1]            | -    | ±25  | 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 [2]                            | -    | 500  | mW   |

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

[2] For SOT108-1 (SO14) package: P<sub>tot</sub> derates linearly with 10.1 mW/K above 100 °C.  
For SOT402-1 (TSSOP14) package: P<sub>tot</sub> derates linearly with 7.3 mW/K above 81 °C.

8. Recommended operating conditions

Table 5. Recommended operating conditions

| Symbol           | Parameter                           | Conditions                       | Min | Typ | Max             | Unit |
|------------------|-------------------------------------|----------------------------------|-----|-----|-----------------|------|
| V <sub>CC</sub>  | supply voltage                      | [1]                              | 1.0 | 3.3 | 6.0             | V    |
| V <sub>I</sub>   | input voltage                       |                                  | 0   | -   | V <sub>CC</sub> | 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> = 1.0 V to 2.0 V | -   | -   | 500             | ns/V |
|                  |                                     | V <sub>CC</sub> = 2.0 V to 2.7 V | -   | -   | 200             | ns/V |
|                  |                                     | V <sub>CC</sub> = 2.7 V to 3.6 V | -   | -   | 100             | ns/V |
|                  |                                     | V <sub>CC</sub> = 3.6 V to 5.5 V | -   | -   | 50              | ns/V |

[1] The static characteristics are guaranteed from V<sub>CC</sub> = 1.2 V to V<sub>CC</sub> = 5.5 V, but LV devices are guaranteed to function down to V<sub>CC</sub> = 1.0 V (with input levels GND or V<sub>CC</sub>).

9. Static characteristics

Table 6. Static characteristics

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

| Symbol                                    | Parameter                 | Conditions                                                                               | Min  | Typ | Max  | Unit |
|-------------------------------------------|---------------------------|------------------------------------------------------------------------------------------|------|-----|------|------|
| <b>T<sub>amb</sub> = -40 °C to +85 °C</b> |                           |                                                                                          |      |     |      |      |
| V <sub>IH</sub>                           | HIGH-level input voltage  | V <sub>CC</sub> = 1.2 V                                                                  | 0.90 | -   | -    | V    |
|                                           |                           | V <sub>CC</sub> = 2.0 V                                                                  | 1.40 | -   | -    | V    |
|                                           |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                         | 2.00 | -   | -    | V    |
|                                           |                           | V <sub>CC</sub> = 4.5 V                                                                  | 3.15 | -   | -    | V    |
|                                           |                           | V <sub>CC</sub> = 6.0 V                                                                  | 4.20 | -   | -    | V    |
| V <sub>IL</sub>                           | LOW-level input voltage   | V <sub>CC</sub> = 1.2 V                                                                  | -    | -   | 0.30 | V    |
|                                           |                           | V <sub>CC</sub> = 2.0 V                                                                  | -    | -   | 0.60 | V    |
|                                           |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                         | -    | -   | 0.80 | V    |
|                                           |                           | V <sub>CC</sub> = 4.5 V                                                                  | -    | -   | 1.35 | V    |
|                                           |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 1.80 | V    |
| I <sub>I</sub>                            | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND                                                  |      |     |      |      |
|                                           |                           | V <sub>CC</sub> = 3.6 V                                                                  | -    | -   | 1.0  | μA   |
|                                           |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 2.0  | μA   |
| I <sub>S(OFF)</sub>                       | OFF-state leakage current | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; see Fig. 4                         |      |     |      |      |
|                                           |                           | V <sub>CC</sub> = 3.6 V                                                                  | -    | -   | 1.0  | μA   |
|                                           |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 2.0  | μA   |
| I <sub>S(ON)</sub>                        | ON-state leakage current  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; see Fig. 5                         |      |     |      |      |
|                                           |                           | V <sub>CC</sub> = 3.6 V                                                                  | -    | -   | 1.0  | μA   |
|                                           |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 2.0  | 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> = 3.6 V                                                                  | -    | -   | 20   | μA   |
|                                           |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 40   | μA   |
| ΔI <sub>CC</sub>                          | additional supply current | per input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V;<br>V <sub>CC</sub> = 2.7 V to 3.6 V | -    | -   | 500  | μA   |
| C <sub>I</sub>                            | input capacitance         |                                                                                          | -    | 3.5 | -    | pF   |

| Symbol                                     | Parameter                 | Conditions                                                                               | Min  | Typ | Max  | Unit |
|--------------------------------------------|---------------------------|------------------------------------------------------------------------------------------|------|-----|------|------|
| <b>T<sub>amb</sub> = -40 °C to +125 °C</b> |                           |                                                                                          |      |     |      |      |
| V <sub>IH</sub>                            | HIGH-level input voltage  | V <sub>CC</sub> = 1.2 V                                                                  | 0.90 | -   | -    | V    |
|                                            |                           | V <sub>CC</sub> = 2.0 V                                                                  | 1.40 | -   | -    | V    |
|                                            |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                         | 2.00 | -   | -    | V    |
|                                            |                           | V <sub>CC</sub> = 4.5 V                                                                  | 3.15 | -   | -    | V    |
|                                            |                           | V <sub>CC</sub> = 6.0 V                                                                  | 4.20 |     |      | V    |
| V <sub>IL</sub>                            | LOW-level input voltage   | V <sub>CC</sub> = 1.2 V                                                                  | -    | -   | 0.30 | V    |
|                                            |                           | V <sub>CC</sub> = 2.0 V                                                                  | -    | -   | 0.60 | V    |
|                                            |                           | V <sub>CC</sub> = 2.7 V to 3.6 V                                                         | -    | -   | 0.80 | V    |
|                                            |                           | V <sub>CC</sub> = 4.5 V                                                                  | -    | -   | 1.35 | V    |
|                                            |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 1.80 | V    |
| I <sub>I</sub>                             | input leakage current     | V <sub>I</sub> = V <sub>CC</sub> or GND                                                  |      |     |      |      |
|                                            |                           | V <sub>CC</sub> = 3.6 V                                                                  | -    | -   | 1.0  | µA   |
|                                            |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 2.0  | µA   |
| I <sub>S(OFF)</sub>                        | OFF-state leakage current | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; see Fig. 4                         |      |     |      |      |
|                                            |                           | V <sub>CC</sub> = 3.6 V                                                                  | -    | -   | 1.0  | µA   |
|                                            |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 2.0  | µA   |
| I <sub>S(ON)</sub>                         | ON-state leakage current  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; see Fig. 5                         |      |     |      |      |
|                                            |                           | V <sub>CC</sub> = 3.6 V                                                                  | -    | -   | 1.0  | µA   |
|                                            |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 2.0  | 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> = 3.6 V                                                                  | -    | -   | 40   | µA   |
|                                            |                           | V <sub>CC</sub> = 6.0 V                                                                  | -    | -   | 80   | µA   |
| ΔI <sub>CC</sub>                           | additional supply current | per input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V;<br>V <sub>CC</sub> = 2.7 V to 3.6 V | -    | -   | 850  | µA   |

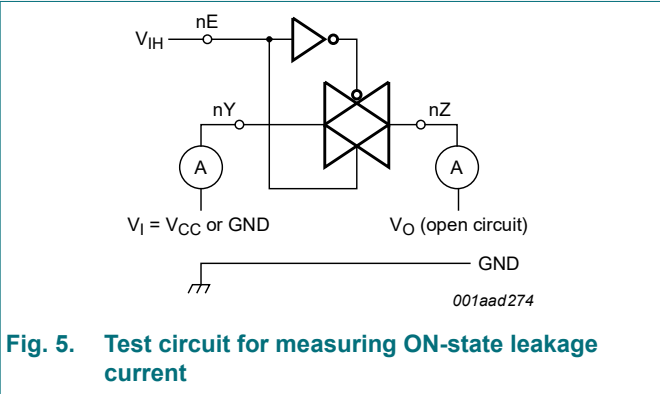
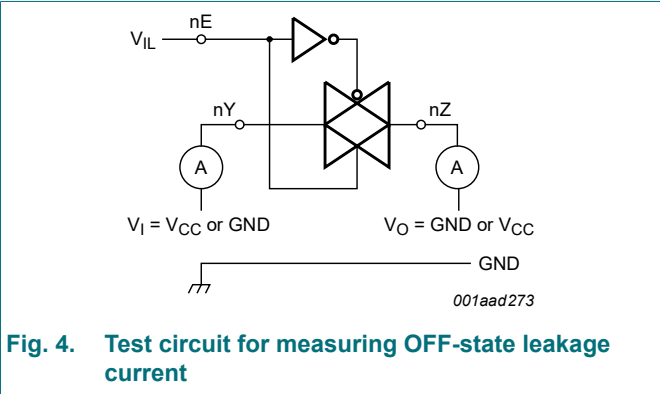


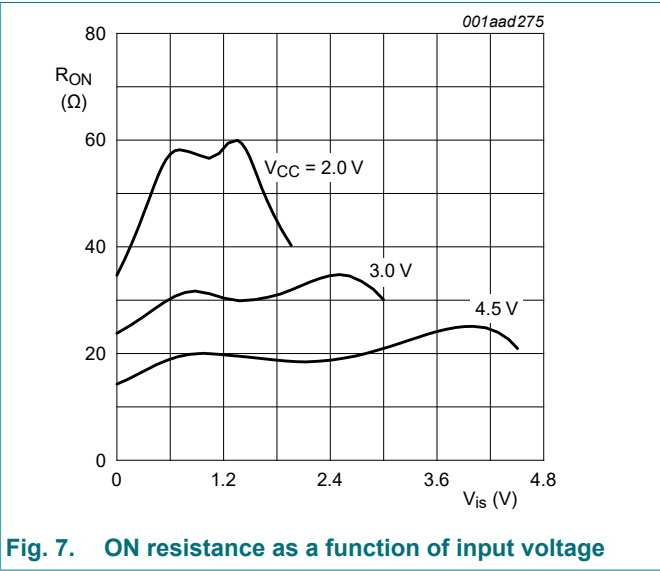
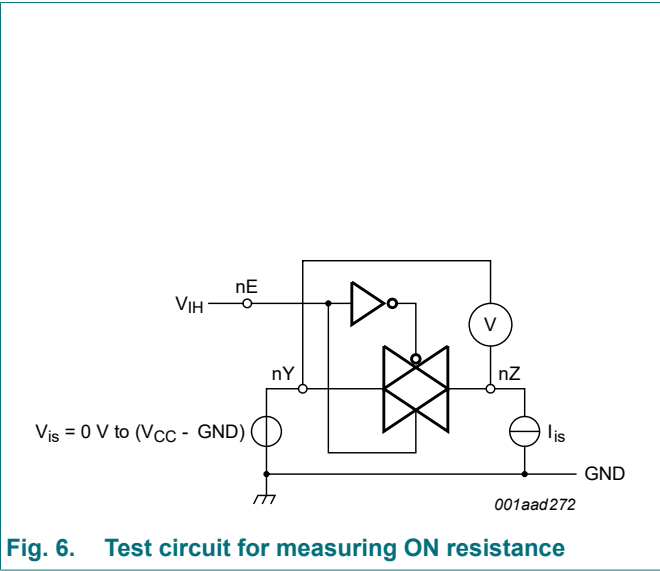
Table 7. ON-resistance

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 6.

| Symbol                                          | Parameter                | Conditions                                                                              | Min | Typ[1] | Max | Unit |
|-------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------|-----|--------|-----|------|
| T <sub>amb</sub> = -40 °C to +85 °C; see Fig. 7 |                          |                                                                                         |     |        |     |      |
| R <sub>ON(peak)</sub>                           | ON resistance (peak)     | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                     |     |        |     |      |
|                                                 |                          | V <sub>CC</sub> = 1.2 V [2]                                                             | -   | 300    | -   | Ω    |
|                                                 |                          | V <sub>CC</sub> = 2.0 V                                                                 | -   | 60     | 130 | Ω    |
|                                                 |                          | V <sub>CC</sub> = 2.7 V                                                                 | -   | 41     | 60  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 3.0 V to 3.6 V                                                        | -   | 37     | 72  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 4.5 V                                                                 | -   | 25     | 52  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 6.0 V                                                                 | -   | 23     | 47  | Ω    |
| R <sub>ON(rail)</sub>                           | ON resistance (rail)     | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>is</sub> = GND             |     |        |     |      |
|                                                 |                          | V <sub>CC</sub> = 1.2 V [2]                                                             | -   | 75     | -   | Ω    |
|                                                 |                          | V <sub>CC</sub> = 2.0 V                                                                 | -   | 35     | 98  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 2.7 V                                                                 | -   | 26     | 60  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 3.0 V to 3.6 V                                                        | -   | 24     | 52  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 4.5 V                                                                 | -   | 15     | 40  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 6.0 V                                                                 | -   | 13     | 35  | Ω    |
|                                                 |                          | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>is</sub> = V <sub>CC</sub> |     |        |     |      |
|                                                 |                          | V <sub>CC</sub> = 1.2 V [2]                                                             | -   | 75     | -   | Ω    |
|                                                 |                          | V <sub>CC</sub> = 2.0 V                                                                 | -   | 40     | 110 | Ω    |
|                                                 |                          | V <sub>CC</sub> = 2.7 V                                                                 | -   | 35     | 72  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 3.0 V to 3.6 V                                                        | -   | 30     | 65  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 4.5 V                                                                 | -   | 22     | 47  | Ω    |
|                                                 |                          | V <sub>CC</sub> = 6.0 V                                                                 | -   | 20     | 40  | Ω    |
| R <sub>ON(flat)</sub>                           | ON resistance (flatness) | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>is</sub> = V <sub>CC</sub> |     |        |     |      |
|                                                 |                          | V <sub>CC</sub> = 2.0 V                                                                 | -   | 5      | -   | Ω    |
|                                                 |                          | V <sub>CC</sub> = 2.7 V                                                                 | -   | 4      | -   | Ω    |
|                                                 |                          | V <sub>CC</sub> = 3.0 V to 3.6 V                                                        | -   | 4      | -   | Ω    |
|                                                 |                          | V <sub>CC</sub> = 4.5 V                                                                 | -   | 3      | -   | Ω    |
|                                                 |                          | V <sub>CC</sub> = 6.0 V                                                                 | -   | 2      | -   | Ω    |

| Symbol                                     | Parameter            | Conditions                                                                              | Min | Typ[1] | Max | Unit |
|--------------------------------------------|----------------------|-----------------------------------------------------------------------------------------|-----|--------|-----|------|
| <b>T<sub>amb</sub> = -40 °C to +125 °C</b> |                      |                                                                                         |     |        |     |      |
| R <sub>ON(peak)</sub>                      | ON resistance (peak) | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                     |     |        |     |      |
|                                            |                      | V <sub>CC</sub> = 2.0 V                                                                 | -   | -      | 150 | Ω    |
|                                            |                      | V <sub>CC</sub> = 2.7 V                                                                 | -   | -      | 90  | Ω    |
|                                            |                      | V <sub>CC</sub> = 3.0 V to 3.6 V                                                        | -   | -      | 83  | Ω    |
|                                            |                      | V <sub>CC</sub> = 4.5 V                                                                 | -   | -      | 60  | Ω    |
|                                            |                      | V <sub>CC</sub> = 6.0 V                                                                 | -   | -      | 54  | Ω    |
| R <sub>ON(rail)</sub>                      | ON resistance (rail) | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>is</sub> = GND             |     |        |     |      |
|                                            |                      | V <sub>CC</sub> = 2.0 V                                                                 | -   | -      | 115 | Ω    |
|                                            |                      | V <sub>CC</sub> = 2.7 V                                                                 | -   | -      | 68  | Ω    |
|                                            |                      | V <sub>CC</sub> = 3.0 V to 3.6 V                                                        | -   | -      | 60  | Ω    |
|                                            |                      | V <sub>CC</sub> = 4.5 V                                                                 | -   | -      | 45  | Ω    |
|                                            |                      | V <sub>CC</sub> = 6.0 V                                                                 | -   | -      | 40  | Ω    |
|                                            |                      | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>is</sub> = V <sub>CC</sub> |     |        |     |      |
|                                            |                      | V <sub>CC</sub> = 2.0 V                                                                 | -   | -      | 130 | Ω    |
|                                            |                      | V <sub>CC</sub> = 2.7 V                                                                 | -   | -      | 85  | Ω    |
|                                            |                      | V <sub>CC</sub> = 3.0 V to 3.6 V                                                        | -   | -      | 75  | Ω    |
|                                            |                      | V <sub>CC</sub> = 4.5 V                                                                 | -   | -      | 55  | Ω    |
|                                            |                      | V <sub>CC</sub> = 6.0 V                                                                 | -   | -      | 47  | Ω    |

- [1] All typical values are measured at T<sub>amb</sub> = 25 °C.
- [2] At supply voltage approaching 1.2 V, the analog switch ON-resistance becomes extremely non-linear. Therefore it is recommended that these devices be used to transmit digital signals only, when using these supply voltages.



10. Dynamic characteristics

Table 8. Dynamic characteristics

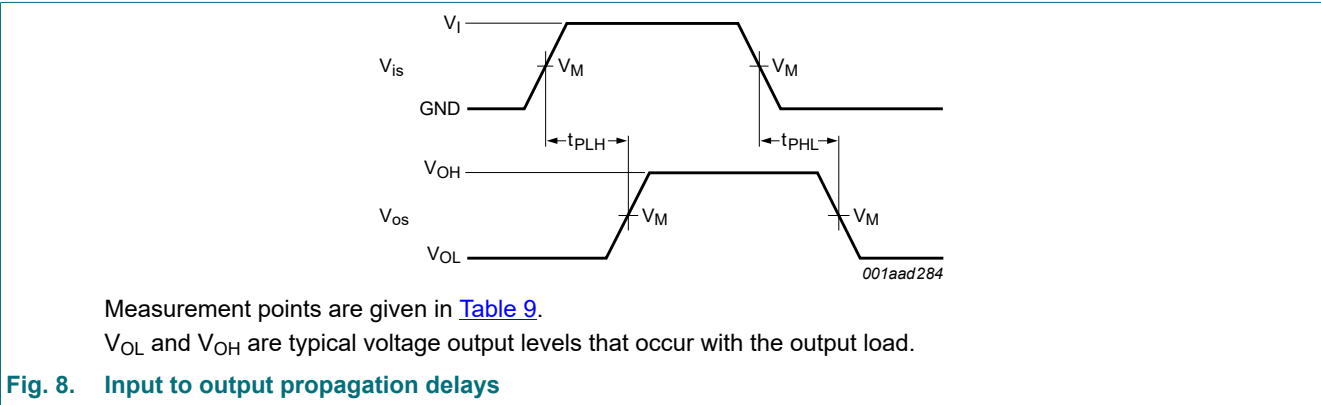
Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 10.

| Symbol                              | Parameter                     | Conditions                                                                                                   | Min | Typ[1] | Max | Unit |
|-------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------|-----|--------|-----|------|
| T <sub>amb</sub> = -40 °C to +85 °C |                               |                                                                                                              |     |        |     |      |
| t <sub>pd</sub>                     | propagation delay             | V <sub>is</sub> to V <sub>os</sub> ; see Fig. 8 [2]                                                          |     |        |     |      |
|                                     |                               | V <sub>CC</sub> = 1.2 V                                                                                      | -   | 8      | -   | ns   |
|                                     |                               | V <sub>CC</sub> = 2.0 V                                                                                      | -   | 5      | 26  | ns   |
|                                     |                               | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | -   | 3      | 15  | ns   |
|                                     |                               | V <sub>CC</sub> = 4.5 V                                                                                      | -   | 2      | 13  | ns   |
|                                     |                               | V <sub>CC</sub> = 6.0 V                                                                                      | -   | 2      | 10  | ns   |
| t <sub>on</sub>                     | turn-on time                  | nE to V <sub>os</sub> ; see Fig. 9 [3]                                                                       |     |        |     |      |
|                                     |                               | V <sub>CC</sub> = 1.2 V                                                                                      | -   | 40     | -   | ns   |
|                                     |                               | V <sub>CC</sub> = 2.0 V                                                                                      | -   | 22     | 43  | ns   |
|                                     |                               | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | -   | 12     | 25  | ns   |
|                                     |                               | V <sub>CC</sub> = 3.3 V; C <sub>L</sub> = 15 pF                                                              | -   | 10     | -   | ns   |
|                                     |                               | V <sub>CC</sub> = 4.5 V                                                                                      | -   | 10     | 21  | ns   |
|                                     |                               | V <sub>CC</sub> = 6.0 V                                                                                      | -   | 8      | 16  | ns   |
| t <sub>off</sub>                    | turn-off time                 | nE to V <sub>os</sub> ; see Fig. 9 [4]                                                                       |     |        |     |      |
|                                     |                               | V <sub>CC</sub> = 1.2 V                                                                                      | -   | 50     | -   | ns   |
|                                     |                               | V <sub>CC</sub> = 2.0 V                                                                                      | -   | 27     | 65  | ns   |
|                                     |                               | V <sub>CC</sub> = 2.7 V to 3.6 V                                                                             | -   | 15     | 38  | ns   |
|                                     |                               | V <sub>CC</sub> = 3.3 V; C <sub>L</sub> = 15 pF                                                              | -   | 13     | -   | ns   |
|                                     |                               | V <sub>CC</sub> = 4.5 V                                                                                      | -   | 13     | 32  | ns   |
|                                     |                               | V <sub>CC</sub> = 6.0 V                                                                                      | -   | 12     | 28  | ns   |
| C <sub>PD</sub>                     | power dissipation capacitance | per switch; V <sub>CC</sub> = 3.3 V;<br>V <sub>I</sub> = GND to V <sub>CC</sub> ; C <sub>L</sub> = 15 pF [5] | -   | 11     | -   | pF   |

| Symbol                                     | Parameter         | Conditions                                          | Min | Typ[1] | Max | Unit |
|--------------------------------------------|-------------------|-----------------------------------------------------|-----|--------|-----|------|
| <b>T<sub>amb</sub> = -40 °C to +125 °C</b> |                   |                                                     |     |        |     |      |
| t <sub>pd</sub>                            | propagation delay | V <sub>is</sub> to V <sub>os</sub> ; see Fig. 8 [2] |     |        |     |      |
|                                            |                   | V <sub>CC</sub> = 2.0 V                             | -   | -      | 31  | ns   |
|                                            |                   | V <sub>CC</sub> = 2.7 V to 3.6 V                    | -   | -      | 18  | ns   |
|                                            |                   | V <sub>CC</sub> = 4.5 V                             | -   | -      | 15  | ns   |
|                                            |                   | V <sub>CC</sub> = 6.0 V                             | -   | -      | 12  | ns   |
| t <sub>on</sub>                            | turn-on time      | nE to V <sub>os</sub> ; see Fig. 9 [3]              |     |        |     |      |
|                                            |                   | V <sub>CC</sub> = 2.0 V                             | -   | -      | 51  | ns   |
|                                            |                   | V <sub>CC</sub> = 2.7 V to 3.6 V                    | -   | -      | 30  | ns   |
|                                            |                   | V <sub>CC</sub> = 4.5 V                             | -   | -      | 26  | ns   |
|                                            |                   | V <sub>CC</sub> = 6.0 V                             | -   | -      | 20  | ns   |
| t <sub>off</sub>                           | turn-off time     | nE to V <sub>os</sub> ; see Fig. 9 [4]              |     |        |     |      |
|                                            |                   | V <sub>CC</sub> = 2.0 V                             | -   | -      | 81  | ns   |
|                                            |                   | V <sub>CC</sub> = 2.7 V to 3.6 V                    | -   | -      | 47  | ns   |
|                                            |                   | V <sub>CC</sub> = 4.5 V                             | -   | -      | 40  | ns   |
|                                            |                   | V <sub>CC</sub> = 6.0 V                             | -   | -      | 34  | ns   |

- [1] Typical values are measured at nominal V<sub>CC</sub> and T<sub>amb</sub> = 25 °C.
- [2] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.
- [3] t<sub>on</sub> is the same as t<sub>PZH</sub> and t<sub>PZL</sub>.
- [4] t<sub>off</sub> is the same as t<sub>PHZ</sub> and t<sub>PLZ</sub>.
- [5] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).
- $$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma[(C_L + C_S) \times V_{CC}^2 \times f_o]$$
 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;
  - C<sub>S</sub> = maximum switch capacitance in pF;
  - V<sub>CC</sub> = supply voltage in V;
  - N = number of inputs switching;
  - Σ[(C<sub>L</sub> + C<sub>S</sub>) × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>] = sum of the outputs.

10.1. Waveforms and test circuit



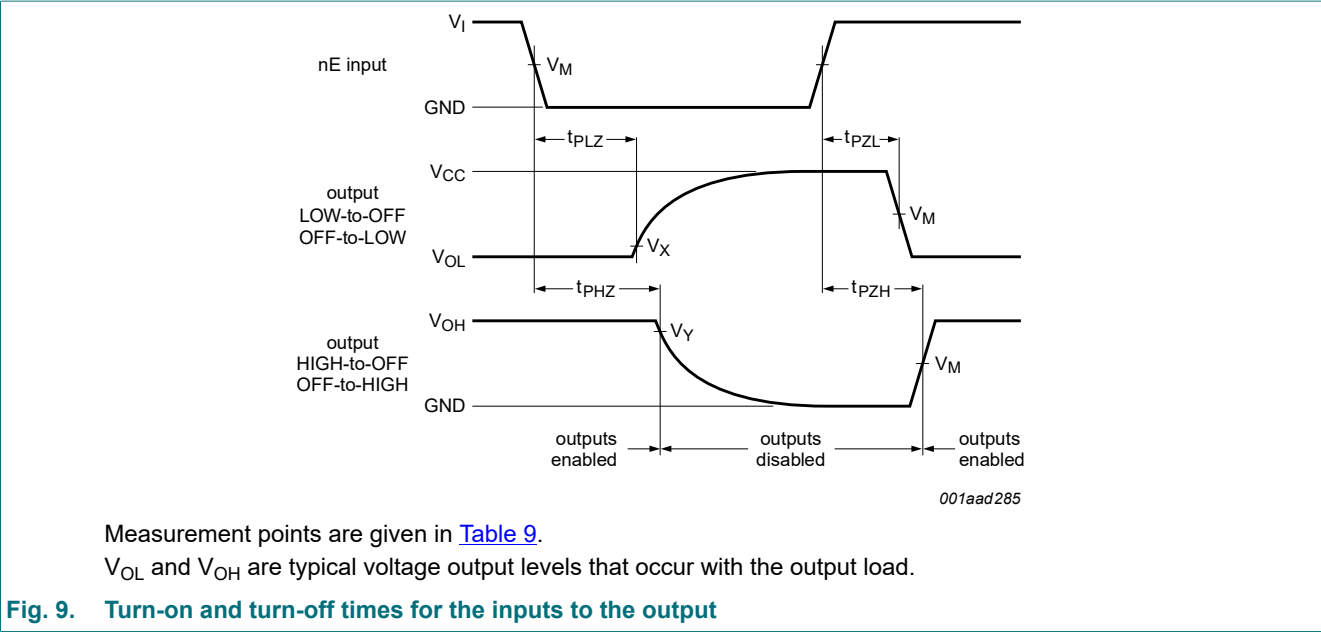
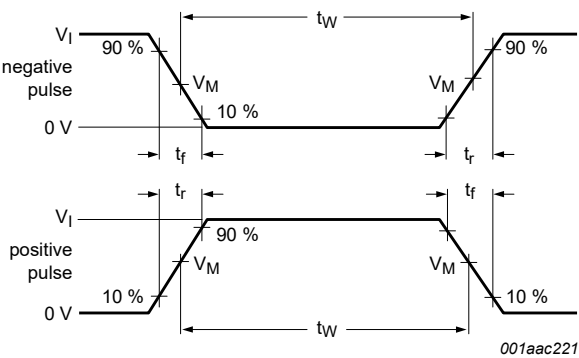
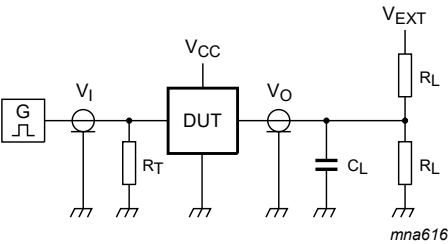


Table 9. Measurement points

| Supply voltage       | Input               | Output              |                 |                           |
|----------------------|---------------------|---------------------|-----------------|---------------------------|
| $V_{CC}$             | $V_M$               | $V_M$               | $V_X$           | $V_Y$                     |
| < 2.7 V              | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.15$ | $V_{OH} - 0.15 \text{ V}$ |
| $\geq 2.7 \text{ V}$ | 1.5 V               | 1.5 V               | $V_{OL} + 0.3$  | $V_{OH} - 0.3 \text{ V}$  |



a. Input pulse definition



Test data is given in [Table 10](#).  
Definitions test circuit:  
 $R_L$  = Load resistance;  
 $C_L$  = Load capacitance includes jig and probe capacitance;  
 $R_T$  = Termination resistance should be equal to  $Z_o$  of the pulse generator;  
 $V_{EXT}$  = Test voltage for switching times.  
Test circuit

Fig. 10. Test circuit for measuring switching times

Table 10. Test data

| Supply voltage | Input    |               | Load  |              | $V_{EXT}$          |                    |                    |
|----------------|----------|---------------|-------|--------------|--------------------|--------------------|--------------------|
| $V_{CC}$       | $V_I$    | $t_r, t_f$    | $C_L$ | $R_L$ [1]    | $t_{PHZ}, t_{PZH}$ | $t_{PLZ}, t_{PZL}$ | $t_{PLH}, t_{PHL}$ |
| < 2.7 V        | $V_{CC}$ | $\leq 2.5$ ns | 50 pF | 1 k $\Omega$ | GND                | 2 x $V_{CC}$       | open               |
| 2.7 V to 3.6 V | 2.7 V    | $\leq 2.5$ ns | 50 pF | 1 k $\Omega$ | GND                | 2 x $V_{CC}$       | open               |
| $\geq 4.5$ V   | $V_{CC}$ | $\leq 2.5$ ns | 50 pF | 1 k $\Omega$ | GND                | 2 x $V_{CC}$       | open               |

[1]  $R_L = \infty \Omega$  for measuring the propagation delays  $t_{PLH}$  and  $t_{PHL}$ .

10.2. Additional dynamic characteristics

Table 11. Additional dynamic characteristics

Voltages are referenced to GND (ground = 0 V);  
 $V_{is}$  is the input voltage at pin nY or nZ, whichever is assigned as an input;  
 $V_{os}$  is the output voltage at pin nY or nZ, whichever is assigned as an output.

| Symbol                   | Parameter                                                                 | Conditions                                                                                           | Min | Typ  | Max | Unit |
|--------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----|------|-----|------|
| $d_{sin}$                | sine-wave distortion                                                      | $R_L = 10\text{ k}\Omega$ ; $f = 1\text{ kHz}$ ; $C_L = 50\text{ pF}$ ; see Fig. 11                  |     |      |     |      |
|                          |                                                                           | $V_{CC} = 3.0\text{ V}$ ; $V_{is} = 2.75\text{ V (p-p)}$                                             | -   | 0.04 | -   | %    |
|                          |                                                                           | $V_{CC} = 6.0\text{ V}$ ; $V_{is} = 5.50\text{ V (p-p)}$                                             | -   | 0.02 | -   | %    |
|                          |                                                                           | $R_L = 10\text{ k}\Omega$ ; $f = 10\text{ kHz}$ ; $C_L = 50\text{ pF}$ ; see Fig. 11                 |     |      |     |      |
|                          |                                                                           | $V_{CC} = 3.0\text{ V}$ ; $V_{is} = 2.75\text{ V (p-p)}$                                             | -   | 0.12 | -   | %    |
|                          |                                                                           | $V_{CC} = 6.0\text{ V}$ ; $V_{is} = 5.50\text{ V (p-p)}$                                             | -   | 0.06 | -   | %    |
| $\alpha_{OFF(feedthru)}$ | switch OFF-state signal feed-through attenuation                          | $R_L = 600\text{ k}\Omega$ ; $f = 1\text{ MHz}$ ; $C_L = 50\text{ pF}$ ; see Fig. 12 and Fig. 13 [1] |     |      |     |      |
|                          |                                                                           | $V_{CC} = 3.0\text{ V}$                                                                              | -   | -50  | -   | dB   |
|                          |                                                                           | $V_{CC} = 6.0\text{ V}$                                                                              | -   | -50  | -   | dB   |
| $\alpha_{ct(S)}$         | crosstalk between switches                                                | $R_L = 600\text{ k}\Omega$ ; $f = 1\text{ MHz}$ ; $C_L = 50\text{ pF}$ ; see Fig. 14 [1]             |     |      |     |      |
|                          |                                                                           | $V_{CC} = 3.0\text{ V}$                                                                              | -   | -60  | -   | dB   |
|                          |                                                                           | $V_{CC} = 6.0\text{ V}$                                                                              | -   | -60  | -   | dB   |
| $V_{ct(pp)}$             | crosstalk voltage between enable input to any switch (peak-to-peak value) | $R_L = 600\text{ k}\Omega$ ; $f = 1\text{ MHz}$ ; $C_L = 50\text{ pF}$ ; see Fig. 15 and Fig. 16 [2] |     |      |     |      |
|                          |                                                                           | $V_{CC} = 3.0\text{ V}$                                                                              | -   | 110  | -   | mV   |
|                          |                                                                           | $V_{CC} = 6.0\text{ V}$                                                                              | -   | 220  | -   | mV   |
| $f_{max}$                | minimum frequency response (-3 dB)                                        | $R_L = 50\text{ k}\Omega$ ; $C_L = 50\text{ pF}$ ; see Fig. 17 and Fig. 18 [3]                       |     |      |     |      |
|                          |                                                                           | $V_{CC} = 3.0\text{ V}$                                                                              | -   | 180  | -   | MHz  |
|                          |                                                                           | $V_{CC} = 6.0\text{ V}$                                                                              | -   | 200  | -   | MHz  |
| $C_S$                    | maximum switch capacitance                                                |                                                                                                      | -   | 8    | -   | pF   |

- [1] Adjust input voltage  $V_{is}$  is 0 dBm level (0 dBm = 1 mW into 600  $\Omega$ ).  
[2] Pin nE: square wave between  $V_{CC}$  and GND,  $t_r = t_f = 6\text{ ns}$ .  
[3] Adjust input voltage  $V_{is}$  is 0 dBm level at  $V_{os}$  for 1 MHz (0 dBm = 1 mW into 50  $\Omega$ ).

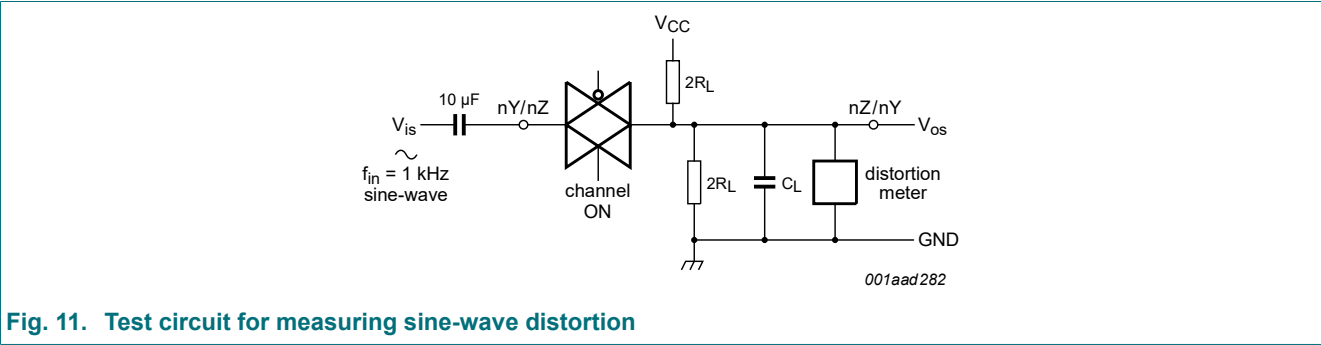


Fig. 11. Test circuit for measuring sine-wave distortion

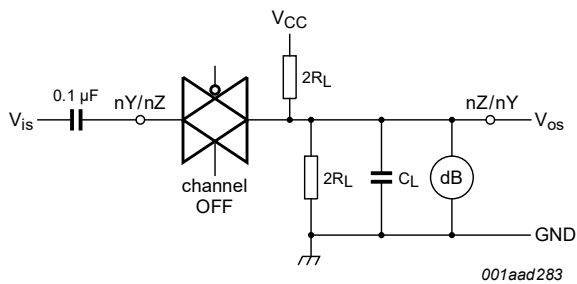


Fig. 12. Test circuit for measuring switch OFF-state signal feed-through

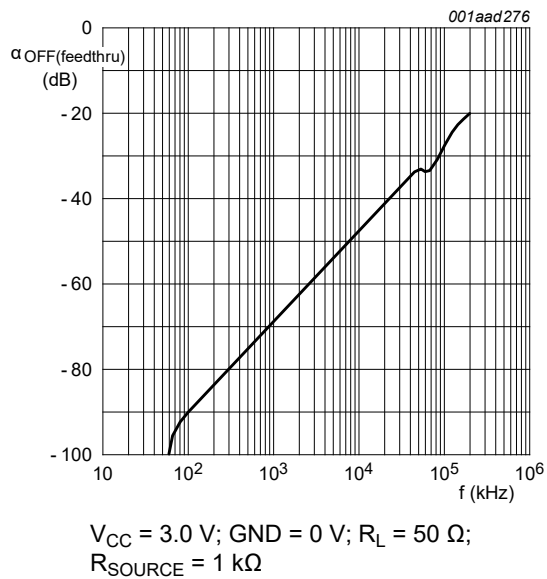
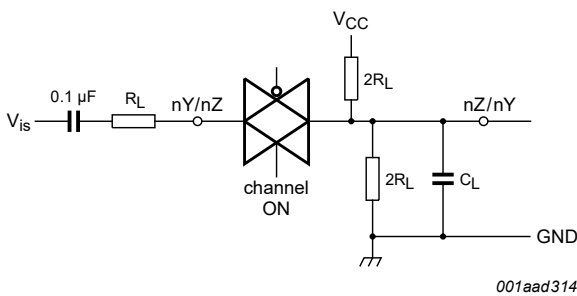
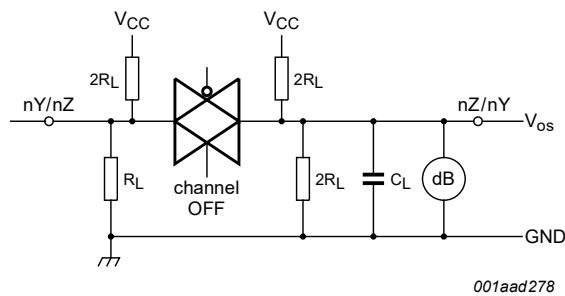


Fig. 13. Switch OFF-state signal feed-through as a function of frequency



a. Channel ON condition



b. Channel OFF condition

Fig. 14. Test circuit for measuring crosstalk between switches

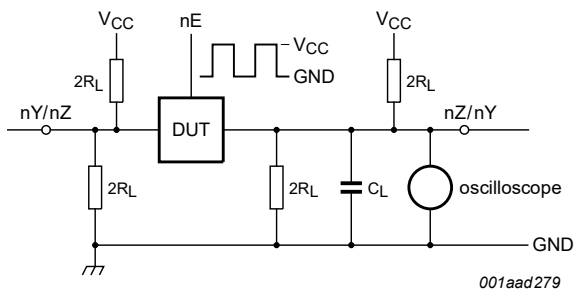


Fig. 15. Test circuit for measuring crosstalk between enable and any switch

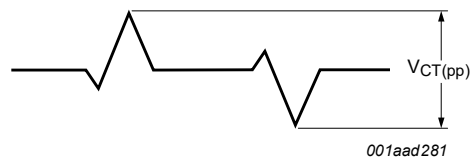
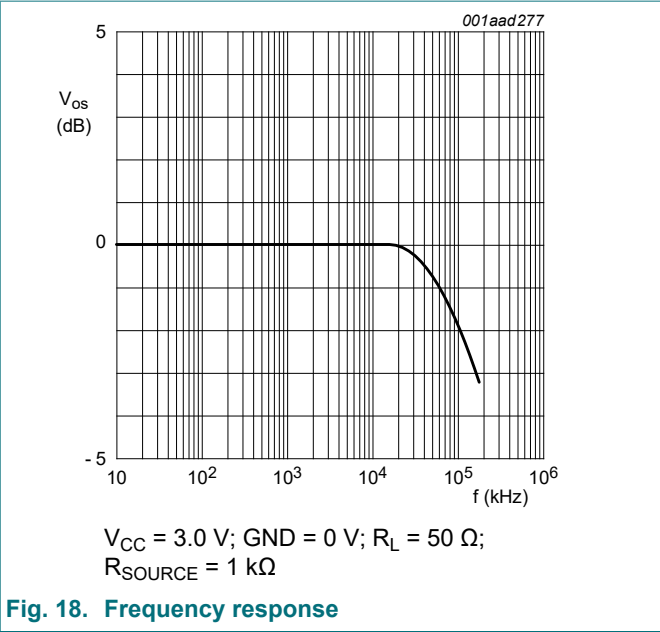
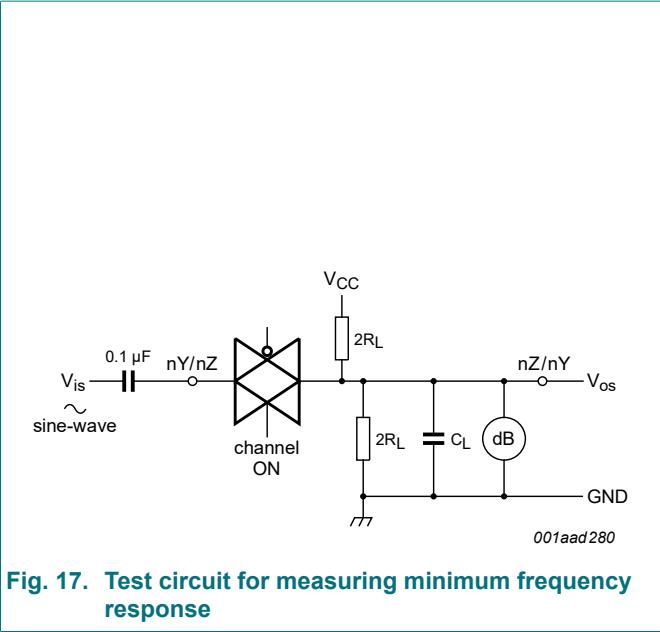


Fig. 16. Crosstalk definition (oscilloscope output)



11. Package outline

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

SOT108-1

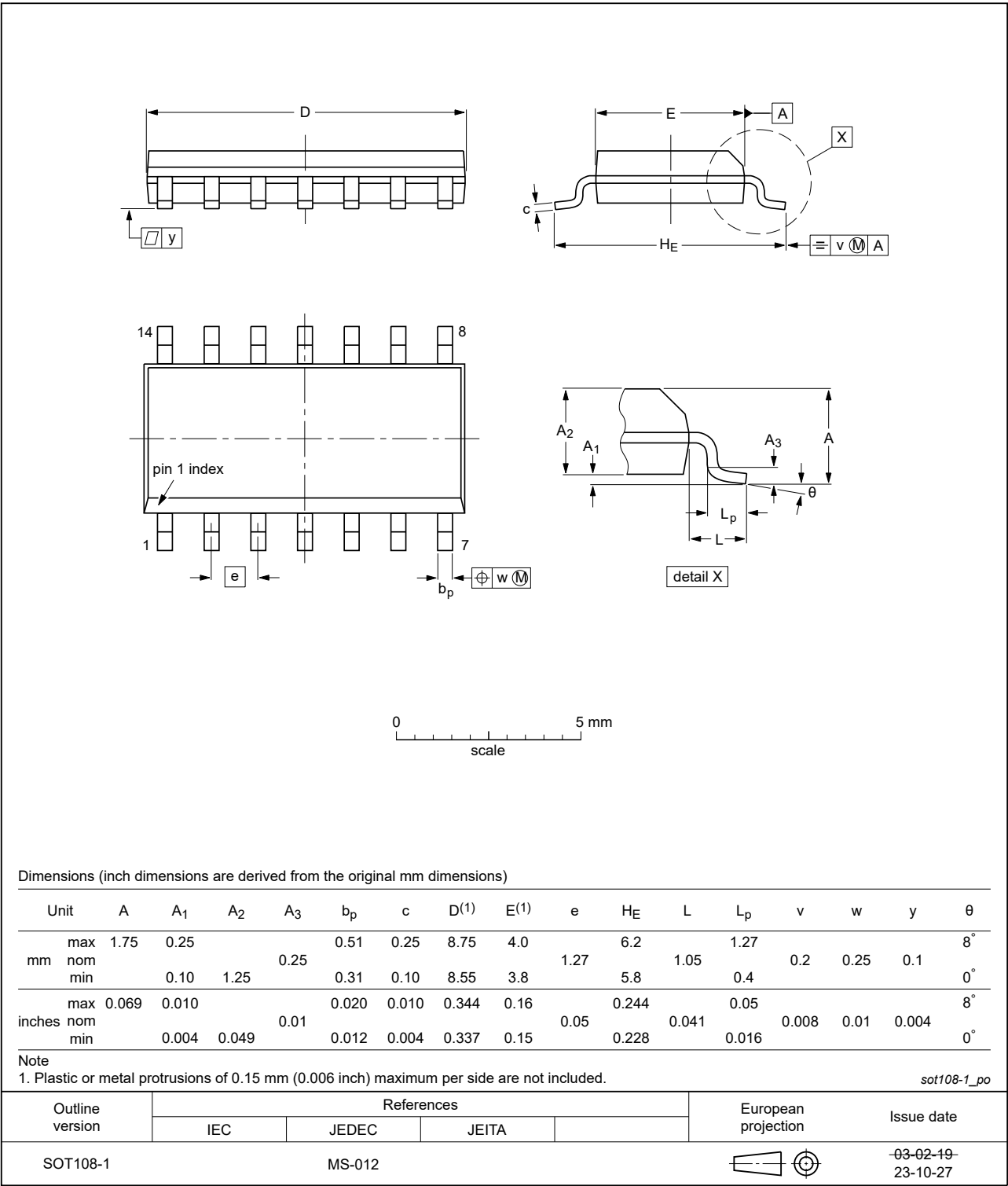


Fig. 19. Package outline SOT108-1 (SO14)

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

SOT402-1

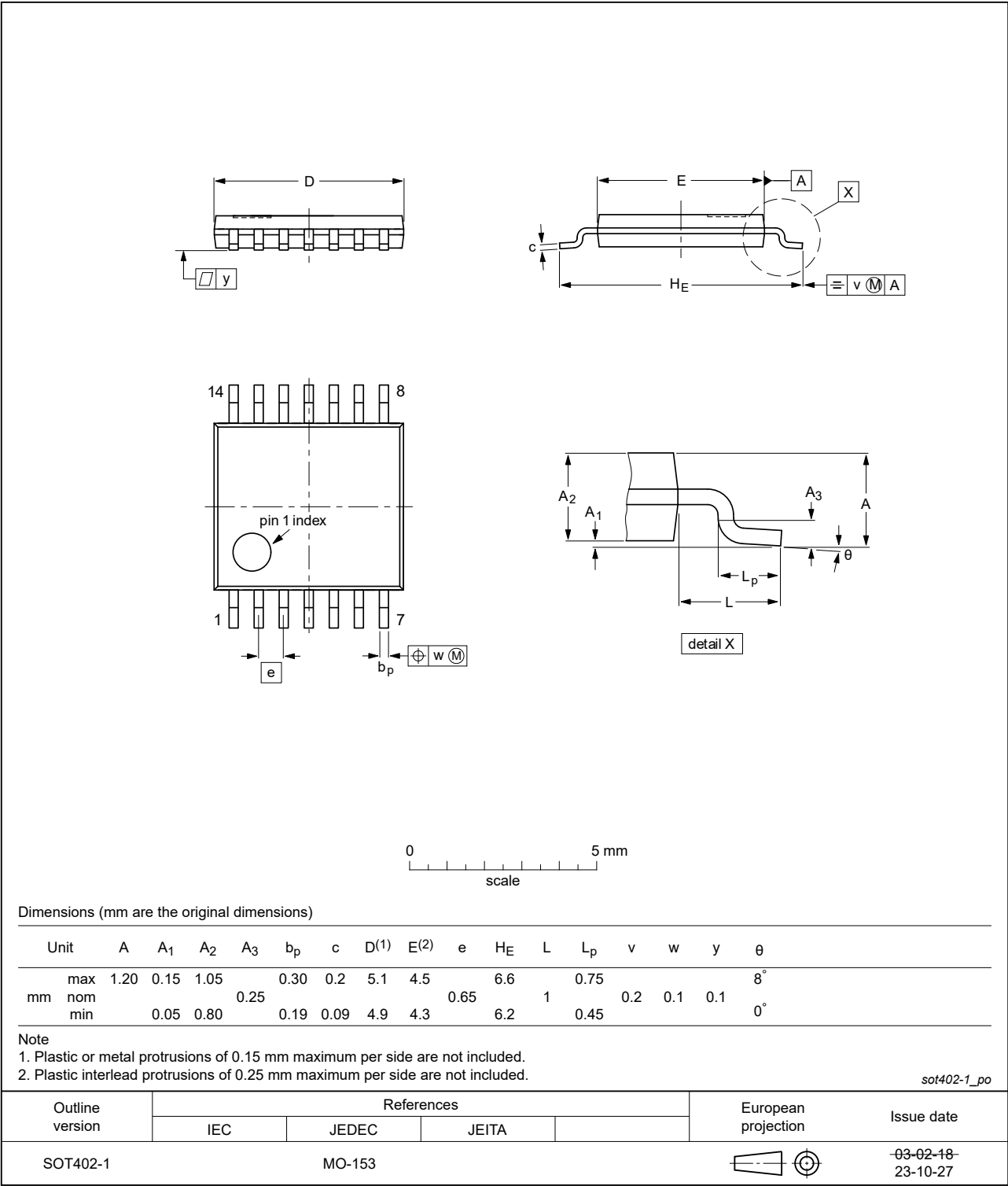


Fig. 20. Package outline SOT402-1 (TSSOP14)

12. Abbreviations

Table 12. Abbreviations

| Acronym | Description                             |
|---------|-----------------------------------------|
| CDM     | Charged Device Model                    |
| CMOS    | Complementary Metal Oxide Semiconductor |
| DUT     | Device Under Test                       |
| ESD     | ElectroStatic Discharge                 |
| HBM     | Human Body Model                        |
| TTL     | Transistor-Transistor Logic             |

13. Revision history

Table 13. Revision history

| Document ID    | Release date                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Data sheet status     | Change notice | Supersedes     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|----------------|
| 74LV4066 v.6   | 20240408                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Product data sheet    | -             | 74LV4066 v.5   |
| Modifications: | <ul style="list-style-type: none"><li><a href="#">Fig. 19</a>, <a href="#">Fig. 20</a>: Aligned SO and TSSOP package outline drawings to JEDEC MS-012 and MO-153.</li><li><a href="#">Section 2</a>: ESD specification updated according to the latest JEDEC standard.</li><li>Type number 74LV4066DB (SOT337-1/SSOP14) removed.</li></ul>                                                                                                                           |                       |               |                |
| 74LV4066 v.5   | 20221024                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Product data sheet    | -             | 74LV4066 v.4   |
| 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><li><a href="#">Section 1</a> and <a href="#">Section 2</a> updated.</li><li><a href="#">Section 5.1</a> updated.</li><li><a href="#">Section 7</a>: Derating values for P<sub>tot</sub> total power dissipation updated.</li></ul> |                       |               |                |
| 74LV4066 v.4   | 20151209                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Product data sheet    | -             | 74LV4066 v.3   |
| Modifications: | <ul style="list-style-type: none"><li>Type number 74LV4066N (SOT27-1) removed.</li></ul>                                                                                                                                                                                                                                                                                                                                                                             |                       |               | Modifications: |
| 74LV4066 v.3   | 20050704                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Product data sheet    | -             | 74LV4066 v.2   |
| Modifications: | <ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors.</li><li><a href="#">Table 1</a>: corrected package names.</li></ul>                                                                                                                                                                                                                  |                       |               |                |
| 74LV4066 v.2   | 19980623                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Product specification | -             | -              |

## 14. Legal information

### Data sheet status

| Document status [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".
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