



# THE DATASHEET OF 74HC2G66GD,125



# 74HC2G66; 74HCT2G66

Dual single-pole single-throw analog switch

Rev. 12 — 21 November 2023

Product data sheet

## 1. General description

The 74HC2G66; 74HCT2G66 is a dual single pole, single-throw analog switch. Each switch has two input/output terminals (nY and nZ) and a digital enable input (nE). When nE is LOW, the analog switch is turned off. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

## 2. Features and benefits

- Wide supply voltage range from 2.0 V to 10.0 V for 74HC2G66
- Very low ON resistance:
  - 41  $\Omega$  (typ.) at  $V_{CC} = 4.5$  V
  - 30  $\Omega$  (typ.) at  $V_{CC} = 6.0$  V
  - 21  $\Omega$  (typ.) at  $V_{CC} = 9.0$  V
- CMOS low power dissipation
- High noise immunity
- 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
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

## 3. Ordering information

Table 1. Ordering information

| Type number                                               | Package           |        |                                                                                                |                          |
|-----------------------------------------------------------|-------------------|--------|------------------------------------------------------------------------------------------------|--------------------------|
|                                                           | Temperature range | Name   | Description                                                                                    | Version                  |
| <a href="#">74HC2G66DP</a><br><a href="#">74HCT2G66DP</a> | -40 °C to +125 °C | TSSOP8 | plastic thin shrink small outline package;<br>8 leads; body width 3 mm; lead length 0.5 mm     | <a href="#">SOT505-2</a> |
| <a href="#">74HC2G66DC</a><br><a href="#">74HCT2G66DC</a> | -40 °C to +125 °C | VSSOP8 | plastic very thin shrink small outline package;<br>8 leads; body width 2.3 mm                  | <a href="#">SOT765-1</a> |
| <a href="#">74HC2G66GT</a><br><a href="#">74HCT2G66GT</a> | -40 °C to +125 °C | XSON8  | plastic extremely thin small outline package;<br>no leads; 8 terminals; body 1 × 1.95 × 0.5 mm | <a href="#">SOT833-1</a> |

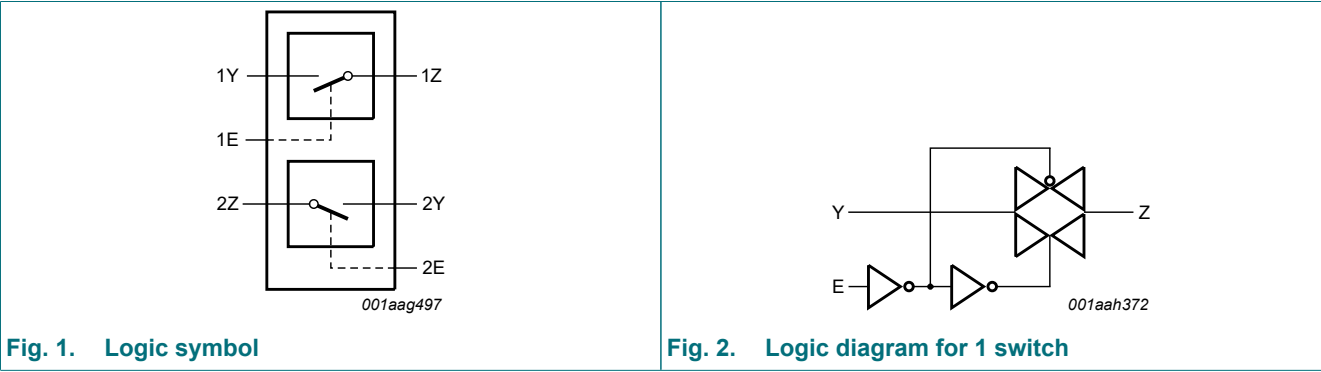
4. Marking

Table 2. Marking codes

| Type number | Marking [1] |
|-------------|-------------|
| 74HC2G66DP  | H66         |
| 74HCT2G66DP | T66         |
| 74HC2G66DC  | H66         |
| 74HCT2G66DC | T66         |
| 74HC2G66GT  | H66         |
| 74HCT2G66GT | T66         |

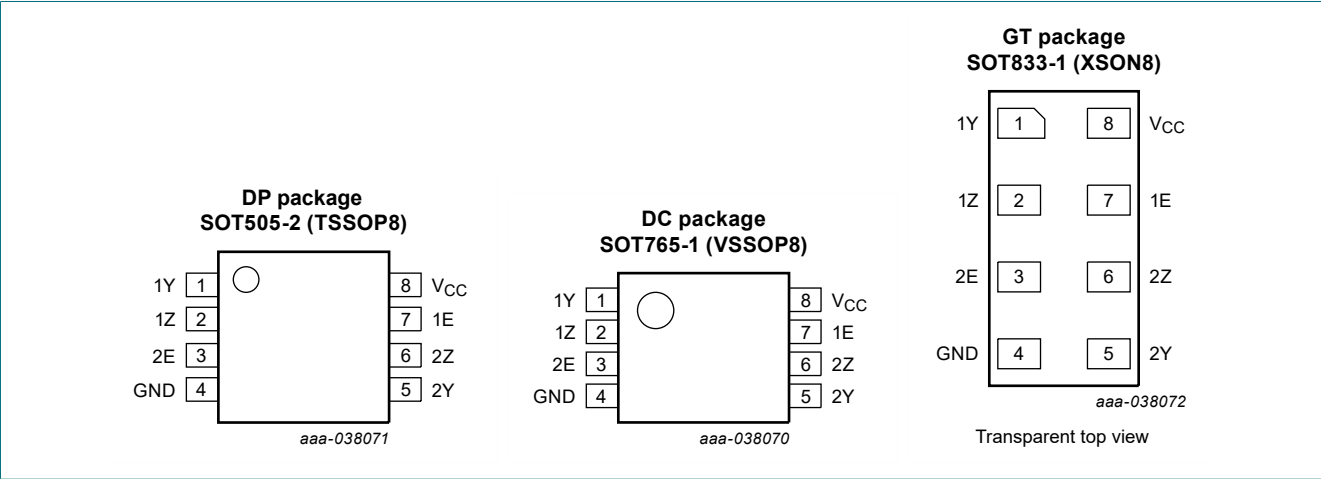
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram



6. Pinning information

6.1. Pinning



6.2. Pin description

Table 3. Pin description

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

7. Functional description

Table 4. Function table

H = HIGH voltage level; L = LOW voltage level.

| Input nE | Switch |
|----------|--------|
| L        | OFF    |
| H        | ON     |

8. Limiting values

Table 5. 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 | +11.0 | 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 [1] | -    | ±20   | mA   |
| I <sub>SK</sub>  | switch clamping current | V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V [1] | -    | ±20   | mA   |
| I <sub>SW</sub>  | switch current          | V <sub>SW</sub> > -0.5 V or V <sub>SW</sub> < V <sub>CC</sub> + 0.5 V   | -    | ±20   | mA   |
| I <sub>CC</sub>  | supply current          |                                                                         | -    | 30    | mA   |
| I <sub>GND</sub> | ground current          |                                                                         | -30  | -     | 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                                    |      |       |      |
|                  |                         | per package [2]                                                         | -    | 250   | mW   |
|                  |                         | per switch [2]                                                          | -    | 100   | mW   |

- [1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
- [2] For SOT505-2 (TSSOP8) package: P<sub>tot</sub> derates linearly with 4.6 mW/K above 96 °C.  
For SOT765-1 (VSSOP8) package: P<sub>tot</sub> derates linearly with 4.9 mW/K above 99 °C.  
For SOT833-1 (XSON8) package: P<sub>tot</sub> derates linearly with 3.1 mW/K above 68 °C.

## 9. Recommended operating conditions

**Table 6. Recommended operating conditions**

Voltages are referenced to GND (ground = 0 V).

| Symbol              | Parameter                           | Conditions               | 74HC2G66 |      |          | 74HCT2G66 |      |          | Unit |
|---------------------|-------------------------------------|--------------------------|----------|------|----------|-----------|------|----------|------|
|                     |                                     |                          | Min      | Typ  | Max      | Min       | Typ  | Max      |      |
| $V_{CC}$            | supply voltage                      |                          | 2.0      | 5.0  | 10.0     | 4.5       | 5.0  | 5.5      | V    |
| $V_I$               | input voltage                       |                          | 0        | -    | $V_{CC}$ | 0         | -    | $V_{CC}$ | V    |
| $V_O$               | output voltage                      |                          | 0        | -    | $V_{CC}$ | 0         | -    | $V_{CC}$ | V    |
| $V_{SW}$            | switch voltage                      | [1]                      | 0        | -    | $V_{CC}$ | 0         | -    | $V_{CC}$ | V    |
| $T_{amb}$           | ambient temperature                 |                          | -40      | +25  | +125     | -40       | +25  | +125     | °C   |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC} = 2.0\text{ V}$  | -        | -    | 625      | -         | -    | -        | ns/V |
|                     |                                     | $V_{CC} = 4.5\text{ V}$  | -        | 1.67 | 139      | -         | 1.67 | 139      | ns/V |
|                     |                                     | $V_{CC} = 6.0\text{ V}$  | -        | -    | 83       | -         | -    | -        | ns/V |
|                     |                                     | $V_{CC} = 10.0\text{ V}$ | -        | -    | 35       | -         | -    | -        | ns/V |

- [1] To avoid drawing  $V_{CC}$  current out of pin nZ, when switch current flows in pin nY, the voltage drop across the bidirectional switch must not exceed 0.4 V. If the switch current flows into pin nZ, no  $V_{CC}$  current will flow out of terminal nY. In this case there is no limit for the voltage drop across the switch, but the voltage at pins nY and nZ may not exceed  $V_{CC}$  or GND.

## 10. Static characteristics

**Table 7. Static characteristics**

Voltages are referenced to GND (ground = 0 V).

| Symbol              | Parameter                 | Conditions                                    | -40 °C to +85 °C |         |      | -40 °C to +125 °C |      | Unit |
|---------------------|---------------------------|-----------------------------------------------|------------------|---------|------|-------------------|------|------|
|                     |                           |                                               | Min              | Typ [1] | Max  | Min               | Max  |      |
| 74HC2G66            |                           |                                               |                  |         |      |                   |      |      |
| V <sub>IH</sub>     | HIGH-level input voltage  | V <sub>CC</sub> = 2.0 V                       | 1.5              | 1.2     | -    | 1.5               | -    | V    |
|                     |                           | V <sub>CC</sub> = 4.5 V                       | 3.15             | 2.4     | -    | 3.15              | -    | V    |
|                     |                           | V <sub>CC</sub> = 6.0 V                       | 4.2              | 3.2     | -    | 4.2               | -    | V    |
|                     |                           | V <sub>CC</sub> = 9.0 V                       | 6.3              | 4.7     | -    | 6.3               | -    | V    |
| V <sub>IL</sub>     | LOW-level input voltage   | V <sub>CC</sub> = 2.0 V                       | -                | 0.8     | 0.5  | -                 | 0.5  | V    |
|                     |                           | V <sub>CC</sub> = 4.5 V                       | -                | 2.1     | 1.35 | -                 | 1.35 | V    |
|                     |                           | V <sub>CC</sub> = 6.0 V                       | -                | 2.8     | 1.8  | -                 | 1.8  | V    |
|                     |                           | V <sub>CC</sub> = 9.0 V                       | -                | 4.3     | 2.7  | -                 | 2.7  | V    |
| I <sub>I</sub>      | input leakage current     | nE; V <sub>I</sub> = V <sub>CC</sub> or GND   |                  |         |      |                   |      |      |
|                     |                           | V <sub>CC</sub> = 6.0 V                       | -                | -       | ±0.1 | -                 | ±0.1 | µA   |
|                     |                           | V <sub>CC</sub> = 9.0 V                       | -                | -       | ±0.2 | -                 | ±0.2 | µA   |
| I <sub>S(OFF)</sub> | OFF-state leakage current | nY or nZ; V <sub>CC</sub> = 9.0 V; see Fig. 3 | -                | 0.1     | 1.0  | -                 | 1.0  | µA   |
| I <sub>S(ON)</sub>  | ON-state leakage current  | nY or nZ; V <sub>CC</sub> = 9.0 V; see Fig. 4 | -                | 0.1     | 1.0  | -                 | 1.0  | µA   |
| I <sub>CC</sub>     | supply current            | nE, nY and nZ = V <sub>CC</sub> or GND        |                  |         |      |                   |      |      |
|                     |                           | V <sub>CC</sub> = 6.0 V                       | -                | -       | 10   | -                 | 20   | µA   |
|                     |                           | V <sub>CC</sub> = 9.0 V                       | -                | -       | 20   | -                 | 40   | µA   |

| Symbol              | Parameter                     | Conditions                                                                            | -40 °C to +85 °C |         |      | -40 °C to +125 °C |      | Unit |
|---------------------|-------------------------------|---------------------------------------------------------------------------------------|------------------|---------|------|-------------------|------|------|
|                     |                               |                                                                                       | Min              | Typ [1] | Max  | Min               | Max  |      |
| C <sub>I</sub>      | input capacitance             |                                                                                       | -                | 3.5     | -    | -                 | -    | pF   |
| C <sub>PD</sub>     | power dissipation capacitance |                                                                                       | -                | 9       | -    | -                 | -    | pF   |
| C <sub>S(ON)</sub>  | ON-state capacitance          |                                                                                       | -                | 8       | -    | -                 | -    | pF   |
| <b>74HCT2G66</b>    |                               |                                                                                       |                  |         |      |                   |      |      |
| 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               | -    | 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  | V    |
| I <sub>I</sub>      | input leakage current         | nE; V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 5.5 V                  | -                | -       | ±1.0 | -                 | ±1.0 | µA   |
| I <sub>S(OFF)</sub> | OFF-state leakage current     | nY or nZ; V <sub>CC</sub> = 5.5 V; see Fig. 3                                         | -                | 0.1     | 1.0  | -                 | 1.0  | µA   |
| I <sub>S(ON)</sub>  | ON-state leakage current      | nY or nZ; V <sub>CC</sub> = 5.5 V; see Fig. 4                                         | -                | 0.1     | 1.0  | -                 | 1.0  | µA   |
| I <sub>CC</sub>     | supply current                | nE, nY and nZ = V <sub>CC</sub> or GND; V <sub>CC</sub> = 4.5 V to 5.5 V              | -                | -       | 10   | -                 | 20   | µA   |
| ΔI <sub>CC</sub>    | additional supply current     | nE = V <sub>CC</sub> - 2.1 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 4.5 V to 5.5 V; | -                | -       | 375  | -                 | 410  | µA   |
| C <sub>I</sub>      | input capacitance             |                                                                                       | -                | 3.5     | -    | -                 | -    | pF   |
| C <sub>PD</sub>     | power dissipation capacitance |                                                                                       | -                | 9       | -    | -                 | -    | pF   |
| C <sub>S(ON)</sub>  | ON-state capacitance          |                                                                                       | -                | 8       | -    | -                 | -    | pF   |

[1] Typical values are measured at T<sub>amb</sub> = 25 °C.

10.1. Test circuits

$V_I = V_{CC}$  or GND and  $V_O =$  GND or  $V_{CC}$ .

**Fig. 3. Test circuit for measuring OFF-state leakage current**

$V_I = V_{CC}$  or GND and  $V_O =$  open circuit.

**Fig. 4. Test circuit for measuring ON-state leakage current**

## 10.2. ON resistance

Table 8. ON resistance for 74HC2G66 and 74HCT2G66

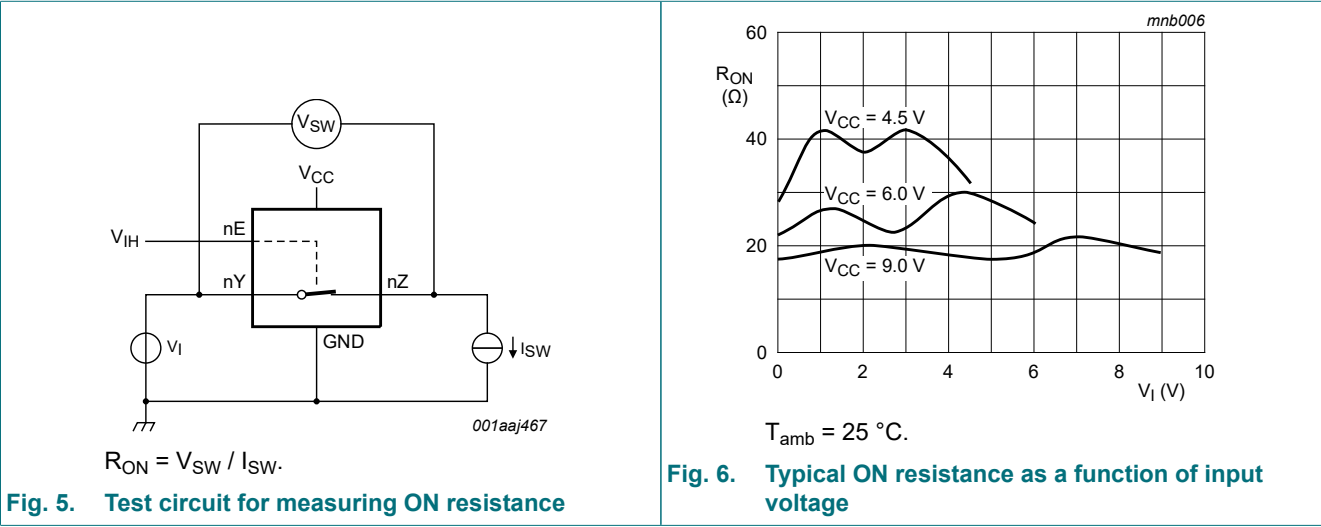
At recommended operating conditions; voltages are referenced to GND (ground 0 V); for graph see Fig. 6.

| Symbol                | Parameter                               | Conditions                                                      | -40 °C to +85 °C |         |     | -40 °C to +125 °C |     | Unit |
|-----------------------|-----------------------------------------|-----------------------------------------------------------------|------------------|---------|-----|-------------------|-----|------|
|                       |                                         |                                                                 | Min              | Typ [1] | Max | Min               | Max |      |
| 74HC2G66 [2]          |                                         |                                                                 |                  |         |     |                   |     |      |
| R <sub>ON(peak)</sub> | ON resistance (peak)                    | V <sub>I</sub> = GND to V <sub>CC</sub> ; see Fig. 5 and Fig. 6 |                  |         |     |                   |     |      |
|                       |                                         | I <sub>SW</sub> = 0.1 mA; V <sub>CC</sub> = 2.0 V               | -                | 250     | -   | -                 | -   | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 4.5 V               | -                | 41      | 118 | -                 | 142 | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 6.0 V               | -                | 30      | 105 | -                 | 126 | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 9.0 V               | -                | 21      | 88  | -                 | 105 | Ω    |
| R <sub>ON(rail)</sub> | ON resistance (rail)                    | V <sub>I</sub> = GND; see Fig. 5 and Fig. 6                     |                  |         |     |                   |     |      |
|                       |                                         | I <sub>SW</sub> = 0.1 mA; V <sub>CC</sub> = 2.0 V               | -                | 65      | -   | -                 | -   | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 4.5 V               | -                | 28      | 95  | -                 | 115 | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 6.0 V               | -                | 22      | 82  | -                 | 100 | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 9.0 V               | -                | 18      | 70  | -                 | 80  | Ω    |
|                       |                                         | V <sub>I</sub> = V <sub>CC</sub> ; see Fig. 5 and Fig. 6        |                  |         |     |                   |     |      |
|                       |                                         | I <sub>SW</sub> = 0.1 mA; V <sub>CC</sub> = 2.0 V               | -                | 65      | -   | -                 | -   | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 4.5 V               | -                | 31      | 106 | -                 | 128 | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 6.0 V               | -                | 23      | 94  | -                 | 113 | Ω    |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 9.0 V               | -                | 19      | 78  | -                 | 95  | Ω    |
| ΔR <sub>ON</sub>      | ON resistance mismatch between channels | V <sub>I</sub> = V <sub>CC</sub> to GND; see Fig. 5 and Fig. 6  |                  |         |     |                   |     |      |
|                       |                                         | V <sub>CC</sub> = 4.5 V                                         | -                | 5       | -   | -                 | -   | Ω    |
|                       |                                         | V <sub>CC</sub> = 6.0 V                                         | -                | 4       | -   | -                 | -   | Ω    |
|                       |                                         | V <sub>CC</sub> = 9.0 V                                         | -                | 3       | -   | -                 | -   | Ω    |
| 74HCT2G66             |                                         |                                                                 |                  |         |     |                   |     |      |
| R <sub>ON(peak)</sub> | ON resistance (peak)                    | V <sub>I</sub> = GND to V <sub>CC</sub> ; see Fig. 5 and Fig. 6 |                  |         |     |                   |     |      |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 4.5 V               | -                | 41      | 118 | -                 | 142 | Ω    |
| R <sub>ON(rail)</sub> | ON resistance (rail)                    | V <sub>I</sub> = GND; see Fig. 5 and Fig. 6                     |                  |         |     |                   |     |      |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 4.5 V               | -                | 28      | 95  | -                 | 115 | Ω    |
|                       |                                         | V <sub>I</sub> = V <sub>CC</sub> ; see Fig. 5 and Fig. 6        |                  |         |     |                   |     |      |
|                       |                                         | I <sub>SW</sub> = 1.0 mA; V <sub>CC</sub> = 4.5 V               | -                | 31      | 106 | -                 | 128 | Ω    |
| ΔR <sub>ON</sub>      | ON resistance mismatch between channels | V <sub>I</sub> = V <sub>CC</sub> to GND; see Fig. 5 and Fig. 6  |                  |         |     |                   |     |      |
|                       |                                         | V <sub>CC</sub> = 4.5 V                                         | -                | 5       | -   | -                 | -   | Ω    |

[1] Typical values are measured at T<sub>amb</sub> = 25 °C.

[2] At supply voltages approaching 2 V, the ON resistance becomes extremely non-linear. Therefore it is recommended that these devices be used to transmit digital signals only, when using this supply voltage.

10.3. ON resistance test circuit and graphs



## 11. Dynamic characteristics

**Table 9. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); For test circuit see Fig. 9.

| Symbol           | Parameter                     | Conditions                                                                          | -40 °C to +85 °C |         |     | -40 °C to +125 °C |     | Unit |
|------------------|-------------------------------|-------------------------------------------------------------------------------------|------------------|---------|-----|-------------------|-----|------|
|                  |                               |                                                                                     | Min              | Typ [1] | Max | Min               | Max |      |
| 74HC2G66         |                               |                                                                                     |                  |         |     |                   |     |      |
| t <sub>pd</sub>  | propagation delay             | nY to nZ or nZ to nY; R <sub>L</sub> = ∞ Ω; see Fig. 7 [2]                          |                  |         |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V                                                             | -                | 6.5     | 65  | -                 | 80  | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V                                                             | -                | 2       | 13  | -                 | 15  | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V                                                             | -                | 1.5     | 11  | -                 | 14  | ns   |
|                  |                               | V <sub>CC</sub> = 9.0 V                                                             | -                | 1.2     | 10  | -                 | 12  | ns   |
| t <sub>en</sub>  | enable time                   | nE to nY or nZ; see Fig. 8 [2]                                                      |                  |         |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V                                                             | -                | 40      | 125 | -                 | 150 | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V                                                             | -                | 12      | 29  | -                 | 30  | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V                                                             | -                | 10      | 21  | -                 | 26  | ns   |
|                  |                               | V <sub>CC</sub> = 9.0 V                                                             | -                | 7       | 16  | -                 | 20  | ns   |
| t <sub>dis</sub> | disable time                  | nE to nY or nZ; see Fig. 8 [2]                                                      |                  |         |     |                   |     |      |
|                  |                               | V <sub>CC</sub> = 2.0 V                                                             | -                | 21      | 145 | -                 | 175 | ns   |
|                  |                               | V <sub>CC</sub> = 4.5 V                                                             | -                | 12      | 29  | -                 | 35  | ns   |
|                  |                               | V <sub>CC</sub> = 6.0 V                                                             | -                | 11      | 28  | -                 | 33  | ns   |
|                  |                               | V <sub>CC</sub> = 9.0 V                                                             | -                | 10      | 23  | -                 | 27  | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | V <sub>I</sub> = GND to V <sub>CC</sub> [3]                                         | -                | 9       | -   | -                 | -   | pF   |
| 74HCT2G66        |                               |                                                                                     |                  |         |     |                   |     |      |
| t <sub>pd</sub>  | propagation delay             | nY to nZ or nZ to nY; R <sub>L</sub> = ∞ Ω; V <sub>CC</sub> = 4.5 V; see Fig. 7 [2] | -                | 2       | 15  | -                 | 18  | ns   |
| t <sub>en</sub>  | enable time                   | nE to nY or nZ; V <sub>CC</sub> = 4.5; see Fig. 8 [2]                               | -                | 13      | 30  | -                 | 36  | ns   |
| t <sub>dis</sub> | disable time                  | nE to nY or nZ; V <sub>CC</sub> = 4.5 V; see Fig. 8 [2]                             | -                | 13      | 44  | -                 | 53  | ns   |
| C <sub>PD</sub>  | power dissipation capacitance | V <sub>I</sub> = GND to V <sub>CC</sub> - 1.5 V [3]                                 | -                | 9       | -   | -                 | -   | pF   |

[1] All typical values are measured at  $T_{amb} = 25 \text{ °C}$ .

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

$t_{en}$  is the same as  $t_{PZL}$  and  $t_{PZH}$ .

$t_{dis}$  is the same as  $t_{PLZ}$  and  $t_{PHZ}$ .

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

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

$f_i$  = input frequency in MHz;

$f_o$  = output frequency in MHz;

$C_L$  = output load capacitance in pF;

$C_{SW}$  = maximum switch capacitance in pF (see Table 7);

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

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

11.1. Waveforms and test circuit

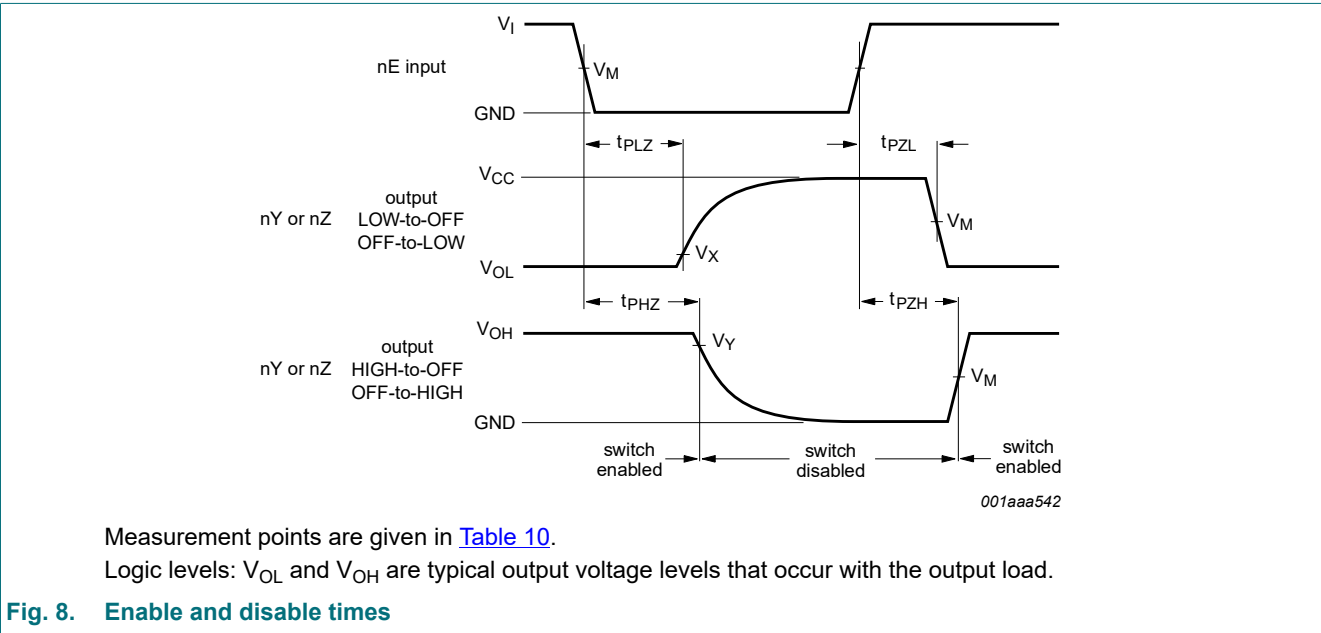
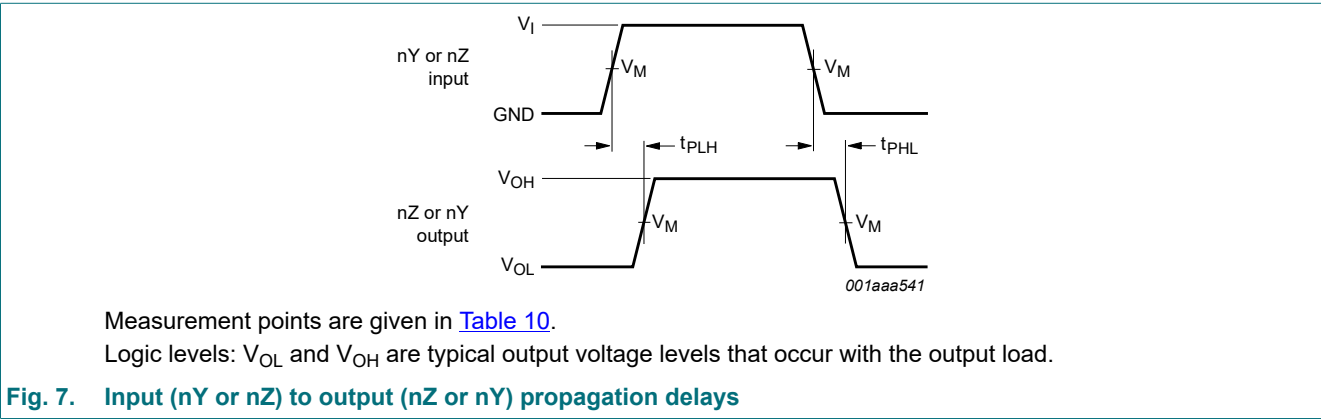


Table 10. Measurement points

| Type      | Input       | Output      |                 |                 |
|-----------|-------------|-------------|-----------------|-----------------|
|           | $V_M$       | $V_M$       | $V_X$           | $V_Y$           |
| 74HC2G66  | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 10\%$ | $V_{OH} - 10\%$ |
| 74HCT2G66 | 1.3 V       | 1.3 V       | $V_{OL} + 10\%$ | $V_{OH} - 10\%$ |

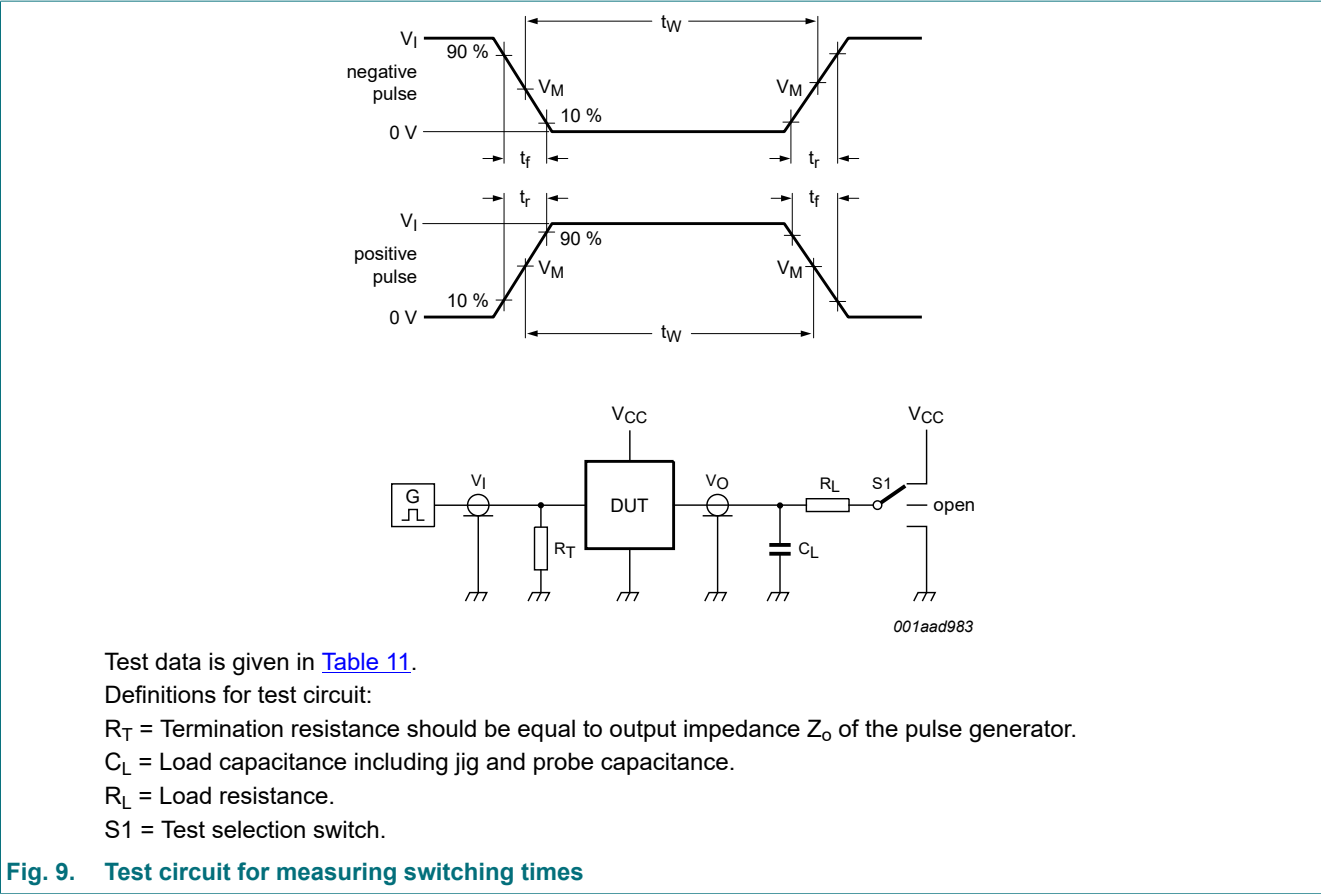


Table 11. Test data

| Type      | Input           |                | Load  |              | S1 position        |                    |                    |
|-----------|-----------------|----------------|-------|--------------|--------------------|--------------------|--------------------|
|           | $V_I$           | $t_r, t_f$ [1] | $C_L$ | $R_L$        | $t_{PHL}, t_{PLH}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 74HC2G66  | GND to $V_{CC}$ | 6 ns           | 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |
| 74HCT2G66 | GND to 3 V      | 6 ns           | 50 pF | 1 k $\Omega$ | open               | GND                | $V_{CC}$           |

[1] There is no constraint on  $t_r, t_f$  with a 50 % duty factor when measuring  $f_{max}$ .

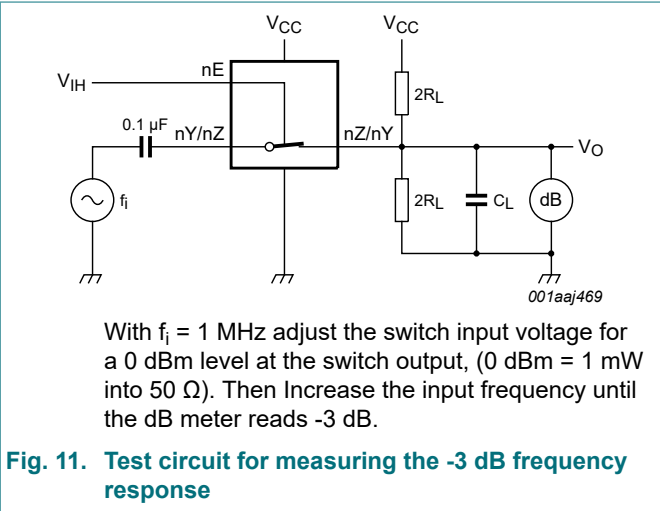
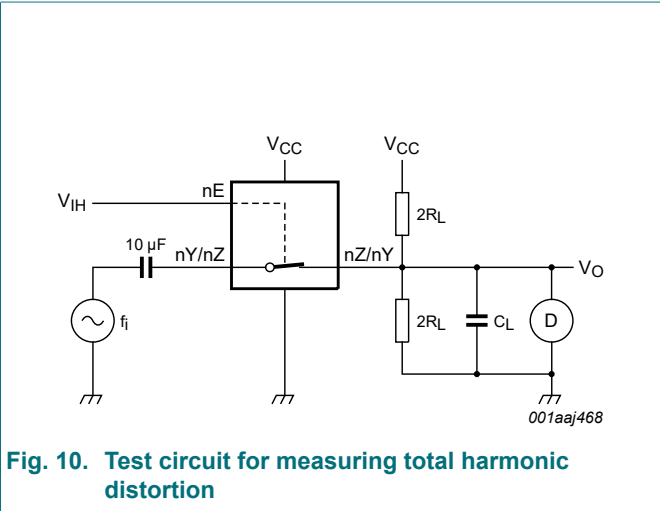
11.2. Additional dynamic characteristics

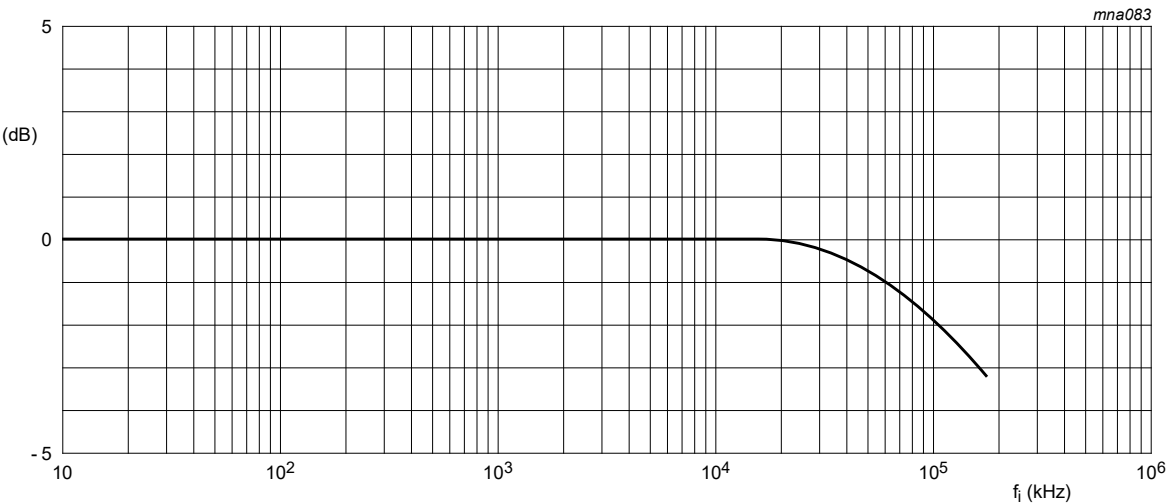
Table 12. Additional dynamic characteristics for 74HC2G66 and 74HCT2G66

$GND = 0\text{ V}$ ;  $t_r = t_f = 6.0\text{ ns}$ ;  $C_L = 50\text{ pF}$ ; unless otherwise specified. All typical values are measured at  $T_{amb} = 25\text{ }^{\circ}\text{C}$ .

| Symbol              | Parameter                 | Conditions                                                                                                            | Min | Typ  | Max | Unit |
|---------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------|-----|------|-----|------|
| THD                 | total harmonic distortion | $f_i = 1\text{ kHz}$ ; $R_L = 10\text{ k}\Omega$ ; see Fig. 10                                                        |     |      |     |      |
|                     |                           | $V_{CC} = 4.5\text{ V}$ ; $V_I = 4.0\text{ V (p-p)}$                                                                  | -   | 0.04 | -   | %    |
|                     |                           | $V_{CC} = 9.0\text{ V}$ ; $V_I = 8.0\text{ V (p-p)}$                                                                  | -   | 0.02 | -   | %    |
|                     |                           | $f_i = 10\text{ kHz}$ ; $R_L = 10\text{ k}\Omega$ ; see Fig. 10                                                       |     |      |     |      |
|                     |                           | $V_{CC} = 4.5\text{ V}$ ; $V_I = 4.0\text{ V (p-p)}$                                                                  | -   | 0.12 | -   | %    |
|                     |                           | $V_{CC} = 9.0\text{ V}$ ; $V_I = 8.0\text{ V (p-p)}$                                                                  | -   | 0.06 | -   | %    |
| $f_{(-3\text{dB})}$ | -3 dB frequency response  | $R_L = 50\text{ }\Omega$ ; $C_L = 10\text{ pF}$ ; see Fig. 11 and Fig. 12                                             |     |      |     |      |
|                     |                           | $V_{CC} = 4.5\text{ V}$                                                                                               | -   | 180  | -   | MHz  |
|                     |                           | $V_{CC} = 9.0\text{ V}$                                                                                               | -   | 200  | -   | MHz  |
| $\alpha_{iso}$      | isolation (OFF-state)     | $R_L = 600\text{ }\Omega$ ; $f_i = 1\text{ MHz}$ ; see Fig. 13 and Fig. 14                                            |     |      |     |      |
|                     |                           | $V_{CC} = 4.5\text{ V}$                                                                                               | -   | -50  | -   | dB   |
|                     |                           | $V_{CC} = 9.0\text{ V}$                                                                                               | -   | -50  | -   | dB   |
| $V_{ct}$            | crosstalk voltage         | between digital input and switch (peak to peak value); $R_L = 600\text{ }\Omega$ ; $f_i = 1\text{ MHz}$ ; see Fig. 15 |     |      |     |      |
|                     |                           | $V_{CC} = 4.5\text{ V}$                                                                                               | -   | 110  | -   | mV   |
|                     |                           | $V_{CC} = 9.0\text{ V}$                                                                                               | -   | 220  | -   | mV   |
| Xtalk               | crosstalk                 | between switches; $R_L = 600\text{ }\Omega$ ; $f_i = 1\text{ MHz}$ ; see Fig. 16                                      |     |      |     |      |
|                     |                           | $V_{CC} = 4.5\text{ V}$                                                                                               | -   | -60  | -   | dB   |
|                     |                           | $V_{CC} = 9.0\text{ V}$                                                                                               | -   | -60  | -   | dB   |

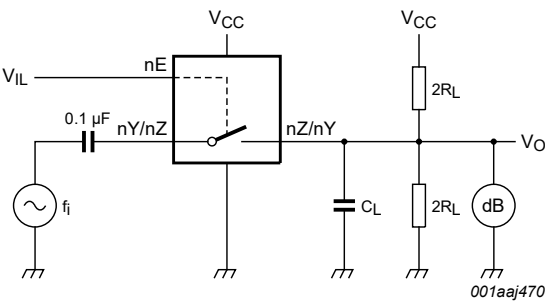
11.3. Test circuits and graphs





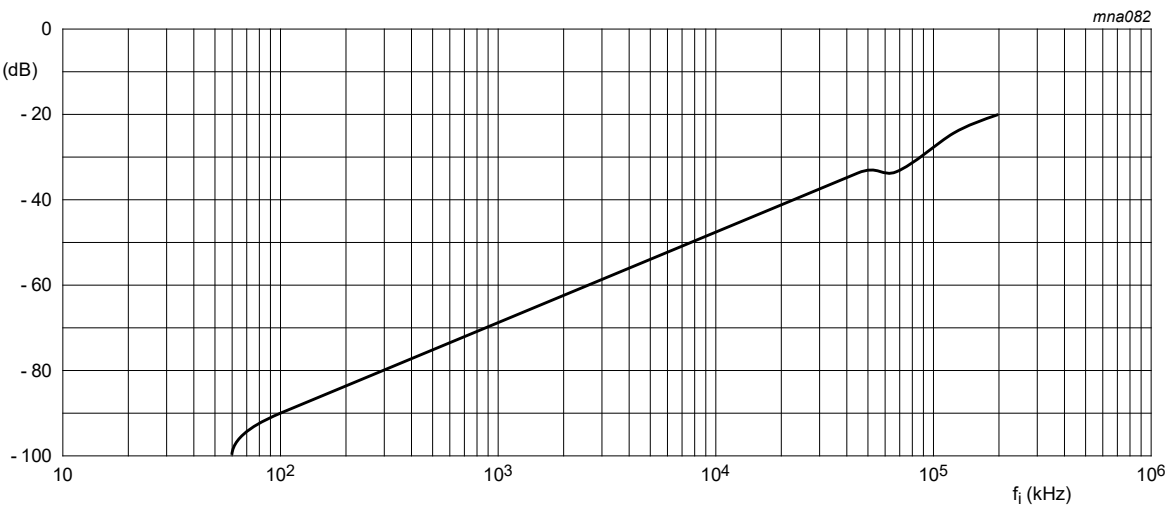
Test conditions:  $V_{CC} = 4.5\text{ V}$ ;  $GND = 0\text{ V}$ ;  $R_L = 50\text{ }\Omega$ ;  $R_{SOURCE} = 1\text{ k}\Omega$ .

Fig. 12. Typical -3 dB frequency response



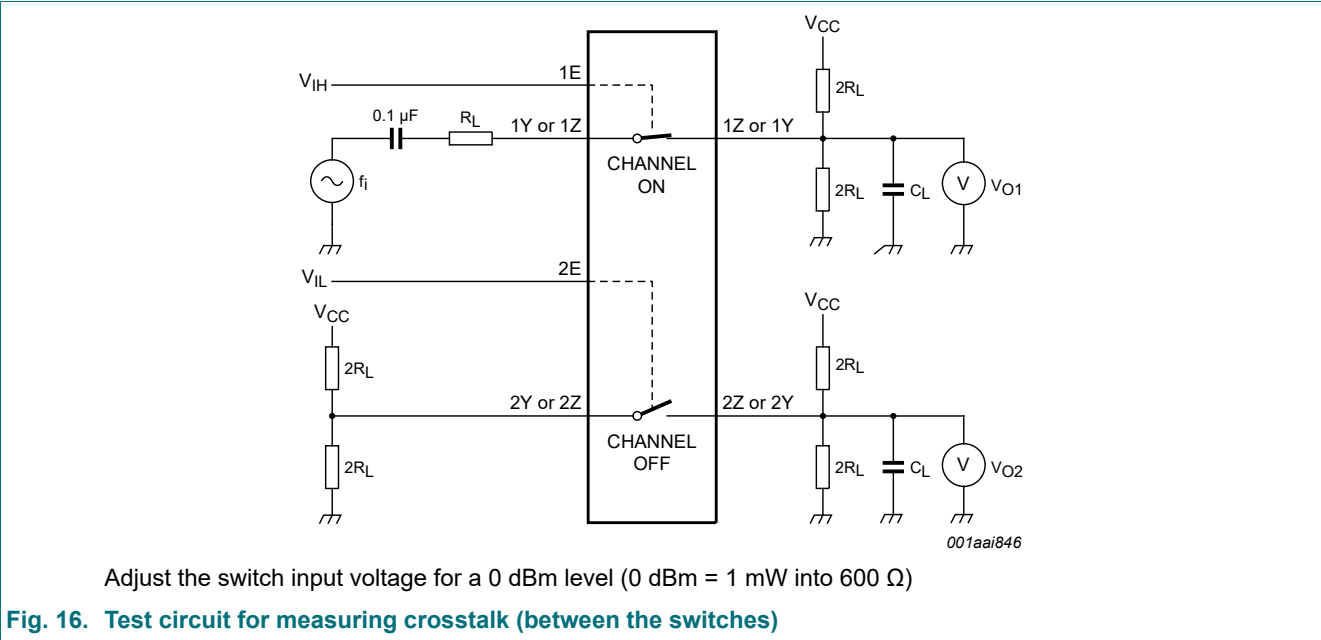
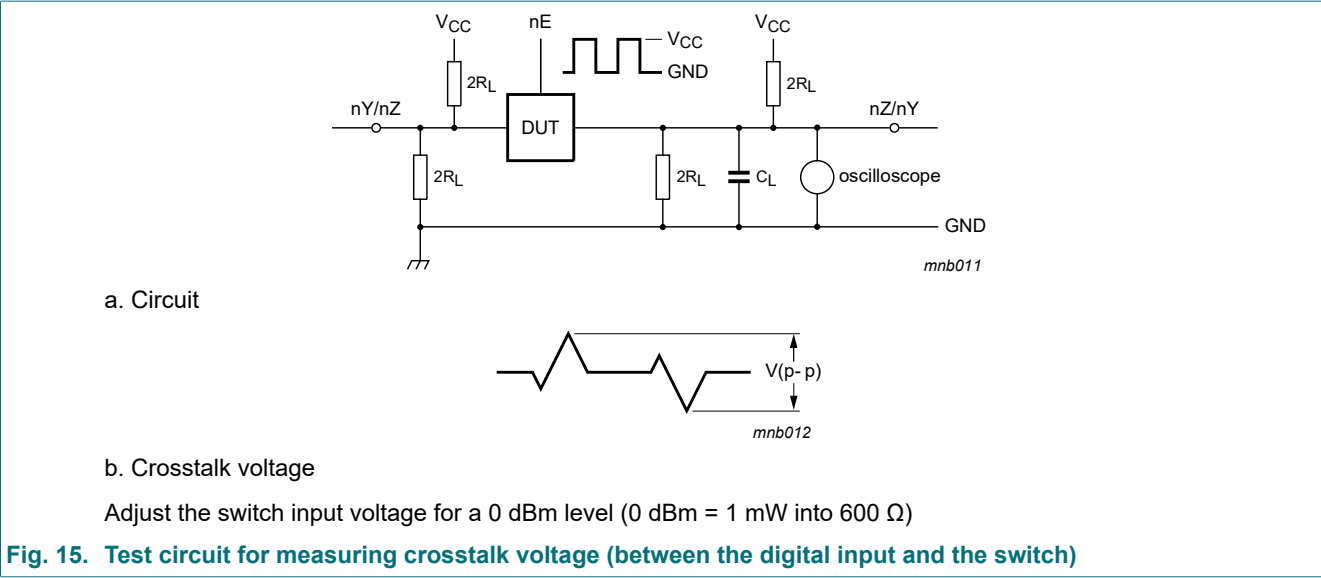
Adjust the switch input voltage for a 0 dBm level (0 dBm = 1 mW into 600  $\Omega$ )

Fig. 13. Test circuit for measuring isolation (OFF-state)



Test conditions:  $V_{CC} = 4.5\text{ V}$ ;  $GND = 0\text{ V}$ ;  $R_L = 50\text{ }\Omega$ ;  $R_{SOURCE} = 1\text{ k}\Omega$ .

Fig. 14. Typical isolation (OFF-state) as a function of frequency



12. Package outline

TSSOP8: plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm SOT505-2

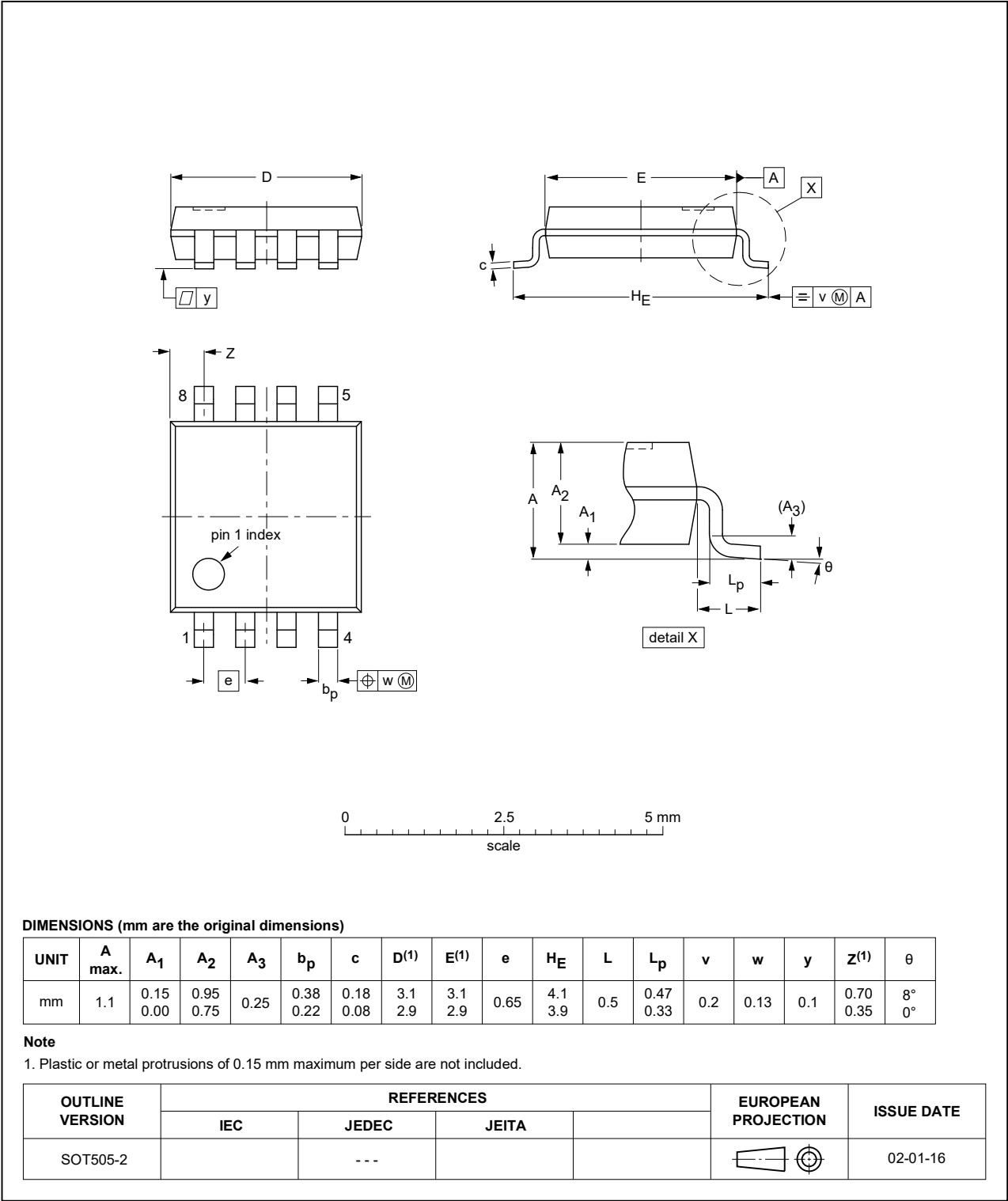


Fig. 17. Package outline SOT505-2 (TSSOP8)

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm

SOT765-1

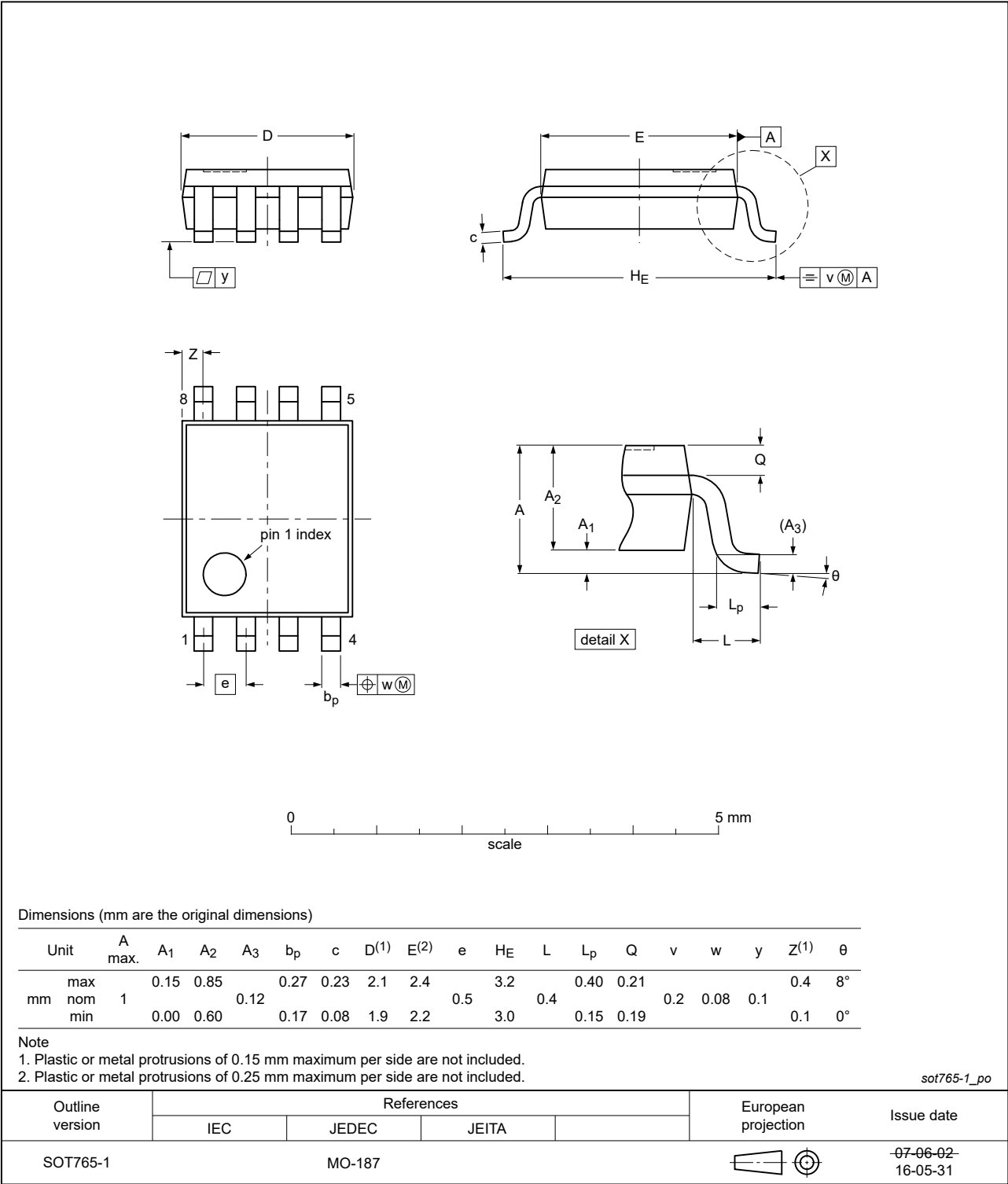


Fig. 18. Package outline SOT765-1 (VSSOP8)

XSON8: plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm

SOT833-1

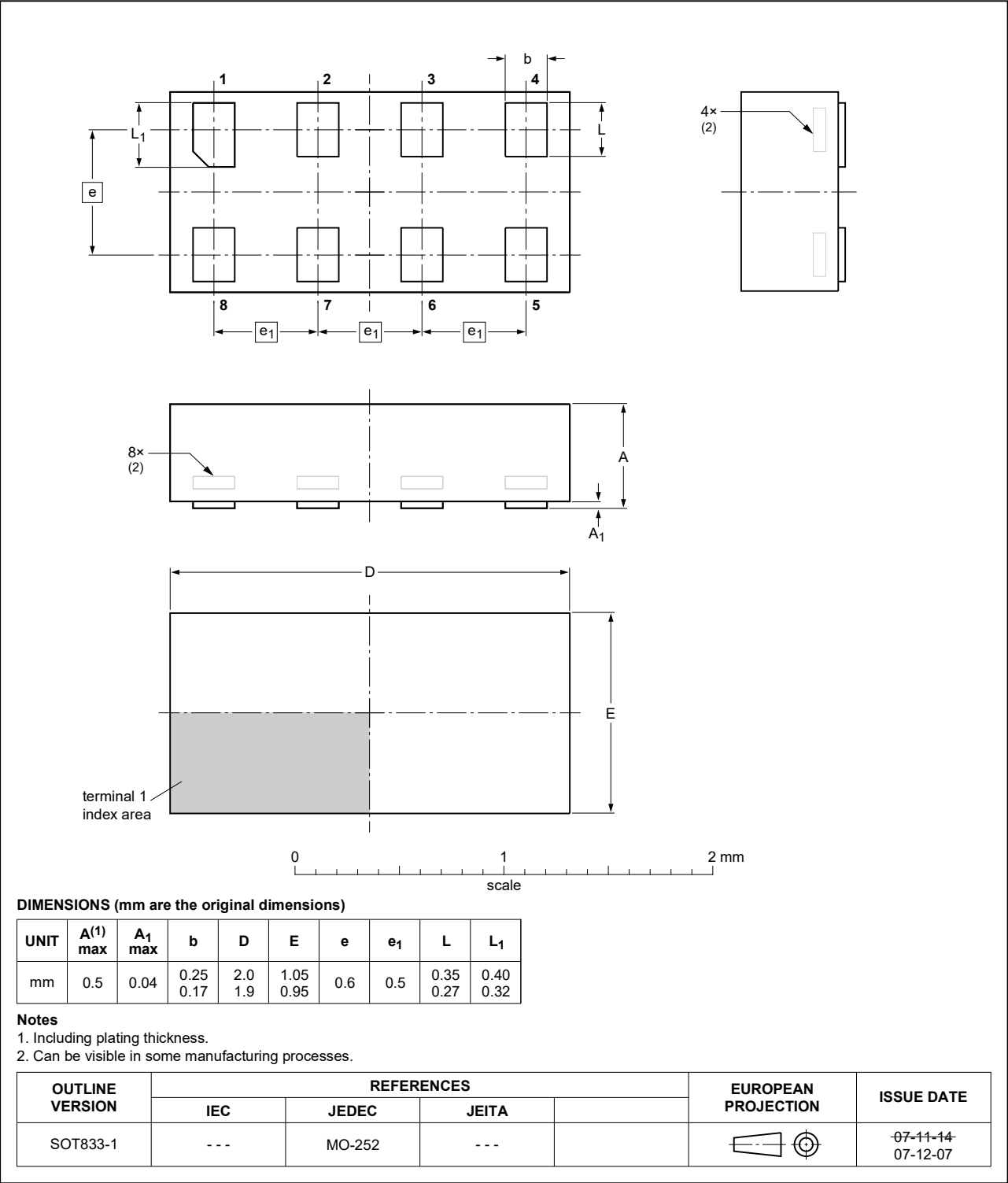


Fig. 19. Package outline SOT833-1 (XSON8)

13. Abbreviations

Table 13. Abbreviations

| Acronym | Description             |
|---------|-------------------------|
| CDM     | Charged Device Model    |
| DUT     | Device Under Test       |
| ESD     | ElectroStatic Discharge |
| HBM     | Human Body Model        |

14. Revision history

Table 14. Revision history

| Document ID       | Release date                                                                                                                                                                                                                                                                                                                                                                                                                   | Data sheet status     | Change notice | Supersedes        |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------------|
| 74HC_HCT2G66 v.12 | 20231121                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74HC_HCT2G66 v.11 |
| Modifications:    | <ul style="list-style-type: none"><li>• <a href="#">Section 2</a> updated.</li><li>• <a href="#">Section 2</a>: ESD specification updated according to the latest JEDEC standard.</li><li>• <a href="#">Section 8</a>: P<sub>tot</sub> and derating values for P<sub>tot</sub> total power dissipation updated.</li></ul>                                                                                                      |                       |               |                   |
| 74HC_HCT2G66 v.11 | 20181106                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74HC_HCT2G66 v.10 |
| 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>• Type numbers 74HC2G66GD and 74HCT2G66GD (SOT996-2) removed.</li><li>• Corrected <a href="#">Fig. 2</a></li><li>• Package outline drawing <a href="#">SOT765-1</a> updated</li></ul> |                       |               |                   |
| 74HC_HCT2G66 v.10 | 20131003                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74HC_HCT2G66 v.9  |
| Modifications:    | <ul style="list-style-type: none"><li>• For type numbers 74HC2G66GD and 74HCT2G66GD XSON8U has changed to XSON8.</li></ul>                                                                                                                                                                                                                                                                                                     |                       |               |                   |
| 74HC_HCT2G66 v.9  | 20111213                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74HC_HCT2G66 v.8  |
| 74HC_HCT2G66 v.8  | 20100923                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74HC_HCT2G66 v.7  |
| 74HC_HCT2G66 v.7  | 20100914                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74HC_HCT2G66 v.6  |
| 74HC_HCT2G66 v.6  | 20100402                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74HC_HCT2G66 v.5  |
| 74HC_HCT2G66 v.5  | 20090126                                                                                                                                                                                                                                                                                                                                                                                                                       | Product data sheet    | -             | 74HC_HCT2G66 v.4  |
| 74HC_HCT2G66 v.4  | 20040519                                                                                                                                                                                                                                                                                                                                                                                                                       | Product specification | -             | 74HC_HCT2G66 v.3  |
| 74HC_HCT2G66 v.3  | 20031126                                                                                                                                                                                                                                                                                                                                                                                                                       | Product specification | -             | 74HC_HCT2G66 v.2  |
| 74HC_HCT2G66 v.2  | 20030808                                                                                                                                                                                                                                                                                                                                                                                                                       | Product specification | -             | 74HC_HCT2G66 v.1  |
| 74HC_HCT2G66 v.1  | 20030625                                                                                                                                                                                                                                                                                                                                                                                                                       | Product specification | -             | -                 |

15. 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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