

# 74CBTLV3253-Q100

## Dual 1-of-4 multiplexer/demultiplexer

Rev. 2 — 10 November 2016

Product data sheet

## 1. General description

The 74CBTLV3253-Q100 provides a dual 1-of-4 high-speed multiplexer/demultiplexer with two common select inputs (S0, S1) and two output enable inputs ( $\overline{1OE}$ ,  $\overline{2OE}$ ). The low ON resistance of the switch allows inputs to be connected to outputs without adding propagation delay or generating additional ground bounce noise. When pin  $\overline{nOE}$  = LOW, one of the four switches is selected (low-impedance ON-state) with pins S0 and S1. When pin  $\overline{nOE}$  = HIGH, all switches are in the high-impedance OFF-state, independent of pins S0 and S1. To ensure the high-impedance OFF-state during power-up or power-down,  $\overline{nOE}$  should be tied to the  $V_{CC}$  through a pull-up resistor. The current-sinking capability of the driver determines the minimum value of the resistor.

Schmitt trigger action at control input makes the circuit tolerant to slower input rise and fall times across the entire  $V_{CC}$  range from 2.3 V to 3.6 V.

This device is fully specified for partial power-down applications using  $I_{OFF}$ .

The  $I_{OFF}$  circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

## 2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - ◆ Specified from  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$  and from  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$
- Supply voltage range from 2.3 V to 3.6 V
- High noise immunity
- Complies with JEDEC standard:
  - ◆ JESD8-5 (2.3 V to 2.7 V)
  - ◆ JESD8-B/JESD36 (2.7 V to 3.6 V)
- ESD protection:
  - ◆ MIL-STD-883, method 3015 exceeds 2000 V
  - ◆ HBM JESD22-A114F exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V ( $C = 200\text{ pF}$ ,  $R = 0\text{ }\Omega$ )
- $5\text{ }\Omega$  switch connection between two ports
- Rail to rail switching on data I/O ports
- CMOS low power consumption
- Latch-up performance exceeds 250 mA per JESD78B Class I level A
- $I_{OFF}$  circuitry provides partial Power-down mode operation
- Multiple package options

3. Ordering information

Table 1. Ordering information

| Type number        | Package           |          |                                                                                                                                |          |
|--------------------|-------------------|----------|--------------------------------------------------------------------------------------------------------------------------------|----------|
|                    | Temperature range | Name     | Description                                                                                                                    | Version  |
| 74CBTLV3253D-Q100  | −40 °C to +125 °C | SO16     | plastic small outline package; 16 leads; body width 3.9 mm                                                                     | SOT109-1 |
| 74CBTLV3253PW-Q100 | −40 °C to +125 °C | TSSOP16  | plastic thin shrink small outline package; 16 leads; body width 4.4 mm                                                         | SOT403-1 |
| 74CBTLV3253BQ-Q100 | −40 °C to +125 °C | DHVQFN16 | plastic dual-in-line compatible thermal enhanced very thin quad flat package; no leads; 16 terminals; body 2.5 × 3.5 × 0.85 mm | SOT763-1 |

4. Functional diagram

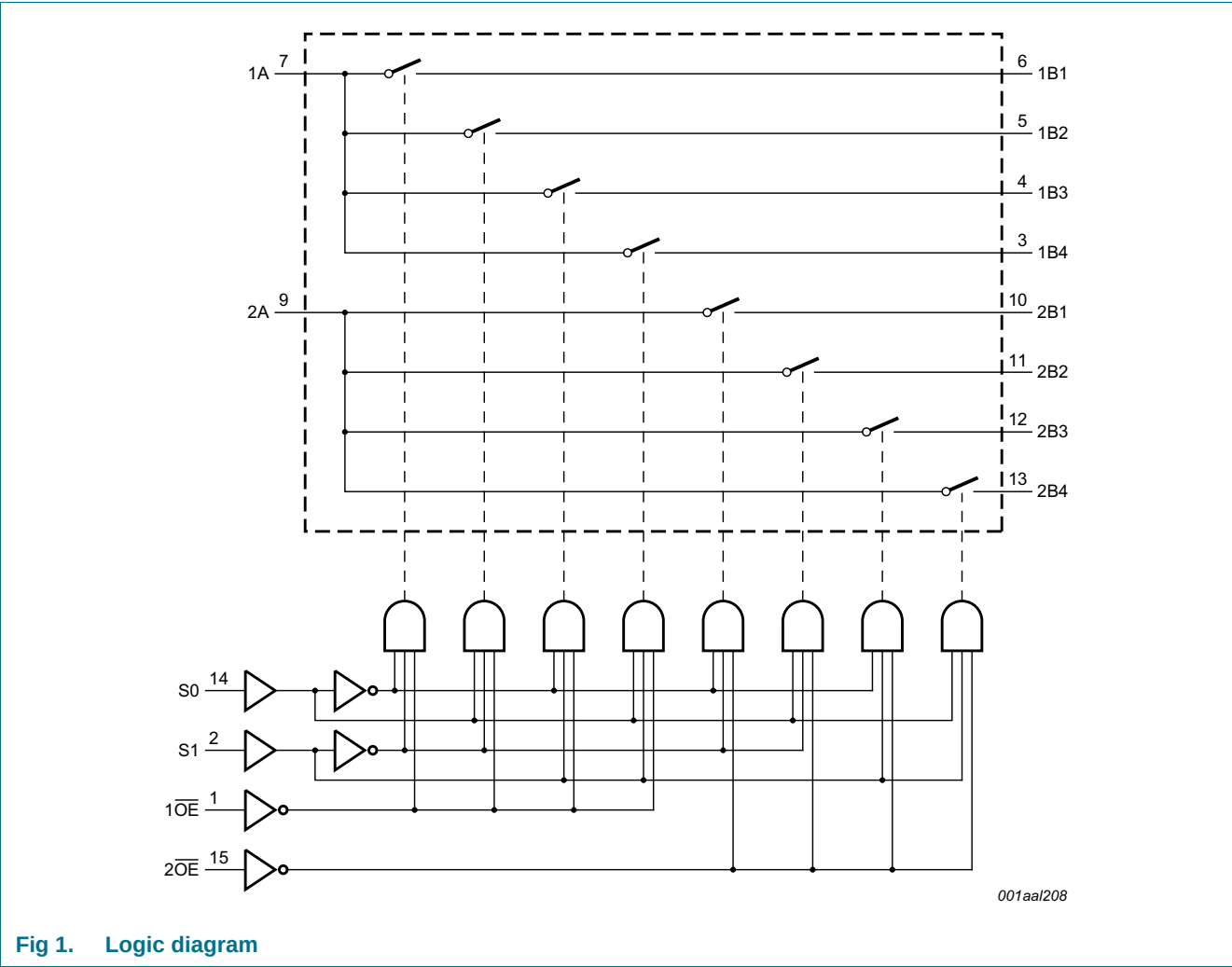


Fig 1. Logic diagram

5. Pinning information

5.1 Pinning

**Fig 2. Pin configuration SOT109-1 (SO16)**

**Fig 3. Pin configuration SOT403-1 (TSSOP16)**

**Fig 4. Pin configuration SOT763-1 (DHVQFN16)**

(1) This is not a supply pin. The substrate is attached to this pad using conductive die attach material. There is no electrical or mechanical requirement to solder this pad. However, if it is soldered, the solder land should remain floating or be connected to GND.

5.2 Pin description

Table 2. Pin description

| Symbol          | Pin            | Description                      |
|-----------------|----------------|----------------------------------|
| 1OE, 2OE        | 1, 15          | output enable input (active LOW) |
| S0, S1          | 14, 2          | select input                     |
| 1B1 to 1B4      | 6, 5, 4, 3     | B input/output                   |
| 2B1 to 2B4      | 10, 11, 12, 13 | B input/output                   |
| GND             | 8              | ground (0 V)                     |
| 1A, 2A          | 7, 9           | A input/output                   |
| V <sub>CC</sub> | 16             | supply voltage                   |

## 6. Functional description

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

| Inputs |     |    |    | Function switch         |
|--------|-----|----|----|-------------------------|
| 1OE    | 2OE | S1 | S0 |                         |
| X      | H   | X  | X  | disconnect 2A and 2Bn   |
| H      | X   | X  | X  | disconnect 1A and 1Bn   |
| L      | L   | L  | L  | 1A to 1B1 and 2A to 2B1 |
| L      | L   | L  | H  | 1A to 1B2 and 2A to 2B2 |
| L      | L   | H  | L  | 1A to 1B3 and 2A to 2B3 |
| L      | L   | H  | H  | 1A to 1B4 and 2A to 2B4 |

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

## 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 | +4.6                  | V    |
| V <sub>I</sub>   | input voltage           | control inputs <sup>[1]</sup>                       | −0.5 | +4.6                  | V    |
| V <sub>SW</sub>  | switch voltage          | enable and disable mode <sup>[2]</sup>              | −0.5 | V <sub>CC</sub> + 0.5 | V    |
| I <sub>IK</sub>  | input clamping current  | V <sub>I</sub> < −0.5 V                             | −50  | -                     | mA   |
| I <sub>SK</sub>  | switch clamping current | V <sub>I</sub> < −0.5 V                             | −50  | -                     | mA   |
| I <sub>SW</sub>  | switch current          | V <sub>SW</sub> = 0 V to V <sub>CC</sub>            | -    | ±128                  | mA   |
| I <sub>CC</sub>  | supply current          |                                                     | -    | +100                  | mA   |
| I <sub>GND</sub> | ground current          |                                                     | −100 | -                     | mA   |
| T <sub>stg</sub> | storage temperature     |                                                     | −65  | +150                  | °C   |
| P <sub>tot</sub> | total power dissipation | T <sub>amb</sub> = −40 °C to +125 °C <sup>[3]</sup> | -    | 500                   | mW   |

[1] The minimum input voltage rating may be exceeded if the input clamping current ratings are observed.

[2] The switch voltage ratings may be exceeded if switch clamping current ratings are observed

[3] For TSSOP16 packages: P<sub>tot</sub> derates linearly with 5.5 mW/K above 60 °C.  
For DHVQFN16 packages: P<sub>tot</sub> derates linearly with 4.5 mW/K above 60 °C.

## 8. Recommended operating conditions

Table 5. Recommended operating conditions

| Symbol           | Parameter                           | Conditions                                      | Min | Max             | Unit |
|------------------|-------------------------------------|-------------------------------------------------|-----|-----------------|------|
| V <sub>CC</sub>  | supply voltage                      |                                                 | 2.3 | 3.6             | V    |
| V <sub>I</sub>   | input voltage                       |                                                 | 0   | 3.6             | V    |
| V <sub>SW</sub>  | switch voltage                      | enable and disable mode                         | 0   | V <sub>CC</sub> | V    |
| T <sub>amb</sub> | ambient temperature                 |                                                 | −40 | +125            | °C   |
| Δt/ΔV            | input transition rise and fall rate | V <sub>CC</sub> = 2.3 V to 3.6 V <sup>[1]</sup> | 0   | 200             | ns/V |

[1] Applies to control signal levels.

## 9. Static characteristics

**Table 6. Static characteristics**

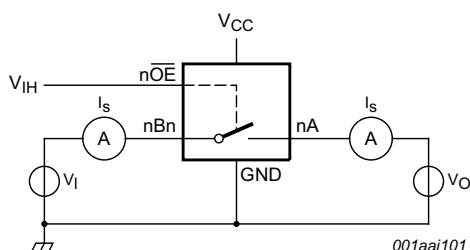
At recommended operating conditions voltages are referenced to GND (ground = 0 V).

| Symbol              | Parameter                 | Conditions                                                                                                                           | T <sub>amb</sub> = –40 °C to +85 °C |                    |     | T <sub>amb</sub> = –40 °C to +125 °C |      | Unit |
|---------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------|-----|--------------------------------------|------|------|
|                     |                           |                                                                                                                                      | Min                                 | Typ <sup>[1]</sup> | Max | Min                                  | Max  |      |
| V <sub>IH</sub>     | HIGH-level input voltage  | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                                                     | 1.7                                 | -                  | -   | 1.7                                  | -    | V    |
|                     |                           | V <sub>CC</sub> = 3.0 V to 3.6 V                                                                                                     | 2.0                                 | -                  | -   | 2.0                                  | -    | V    |
| V <sub>IL</sub>     | LOW-level input voltage   | V <sub>CC</sub> = 2.3 V to 2.7 V                                                                                                     | -                                   | -                  | 0.7 | -                                    | 0.7  | V    |
|                     |                           | V <sub>CC</sub> = 3.0 V to 3.6 V                                                                                                     | -                                   | -                  | 0.9 | -                                    | 0.9  | V    |
| I <sub>I</sub>      | input leakage current     | pin nOE; V <sub>I</sub> = GND to V <sub>CC</sub> ; V <sub>CC</sub> = 3.6 V                                                           | -                                   | -                  | ±1  | -                                    | ±20  | μA   |
| I <sub>S(OFF)</sub> | OFF-state leakage current | V <sub>CC</sub> = 3.6 V; see <a href="#">Figure 5</a>                                                                                | -                                   | -                  | ±1  | -                                    | ±20  | μA   |
| I <sub>S(ON)</sub>  | ON-state leakage current  | V <sub>CC</sub> = 3.6 V; see <a href="#">Figure 6</a>                                                                                | -                                   | -                  | ±1  | -                                    | ±20  | μA   |
| I <sub>OFF</sub>    | power-off leakage current | V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V                                                               | -                                   | -                  | ±10 | -                                    | ±50  | μA   |
| I <sub>CC</sub>     | supply current            | V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>SW</sub> = GND or V <sub>CC</sub> ; V <sub>CC</sub> = 3.6 V   | -                                   | -                  | 10  | -                                    | 50   | μA   |
| ΔI <sub>CC</sub>    | additional supply current | pin nOE; V <sub>I</sub> = V <sub>CC</sub> – 0.6 V; V <sub>SW</sub> = GND or V <sub>CC</sub> ; V <sub>CC</sub> = 3.6 V <sup>[2]</sup> | -                                   | -                  | 300 | -                                    | 2000 | μA   |
| C <sub>I</sub>      | input capacitance         | pin nOE; V <sub>CC</sub> = 3.3 V; V <sub>I</sub> = 0 V to 3.3 V                                                                      | -                                   | 0.9                | -   | -                                    | -    | pF   |
| C <sub>S(OFF)</sub> | OFF-state capacitance     | V <sub>CC</sub> = 3.3 V; V <sub>I</sub> = 0 V to 3.3 V                                                                               | -                                   | 5.2                | -   | -                                    | -    | pF   |
| C <sub>S(ON)</sub>  | ON-state capacitance      | V <sub>CC</sub> = 3.3 V; V <sub>I</sub> = 0 V to 3.3 V                                                                               | -                                   | 20.0               | -   | -                                    | -    | pF   |

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

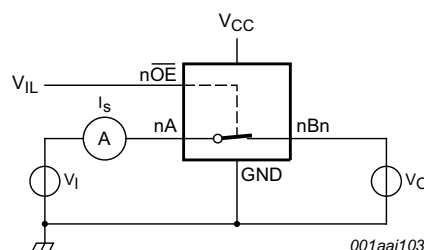
[2] One input at 3 V, other inputs at V<sub>CC</sub> or GND.

### 9.1 Test circuits



V<sub>I</sub> = V<sub>CC</sub> or GND and V<sub>O</sub> = GND or V<sub>CC</sub>.

**Fig 5. Test circuit for measuring OFF-state leakage current (one switch)**



V<sub>I</sub> = V<sub>CC</sub> or GND and V<sub>O</sub> = open circuit.

**Fig 6. Test circuit for measuring ON-state leakage current (one switch)**

9.2 ON resistance

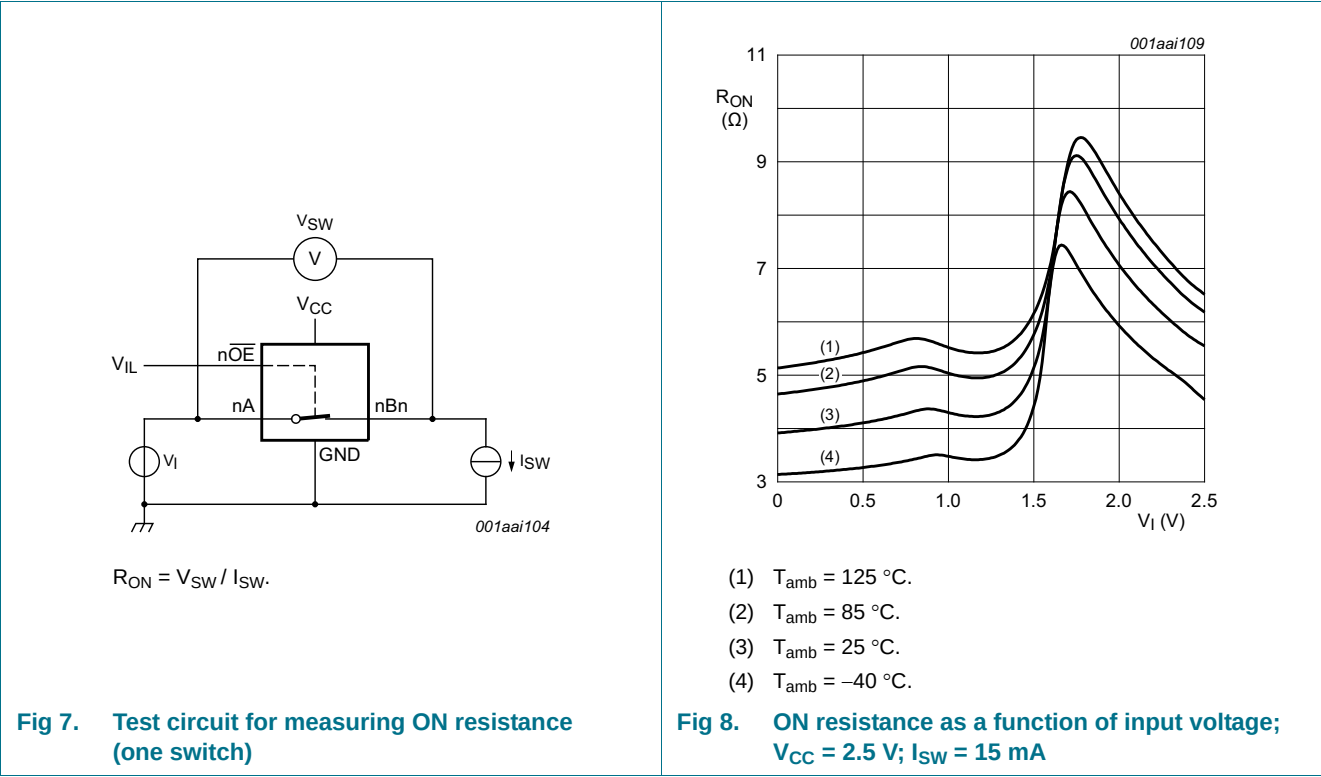
Table 7. Resistance R<sub>ON</sub>

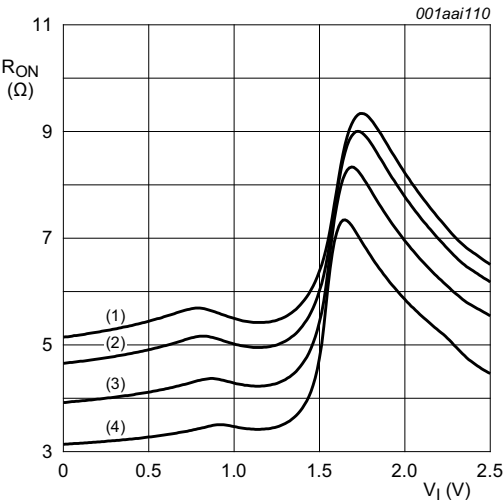
At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see Figure 7.

| Symbol          | Parameter     | Conditions                                                                 | T <sub>amb</sub> = −40 °C to +85 °C |                    |      | T <sub>amb</sub> = −40 °C to +125 °C |      | Unit |
|-----------------|---------------|----------------------------------------------------------------------------|-------------------------------------|--------------------|------|--------------------------------------|------|------|
|                 |               |                                                                            | Min                                 | Typ <sup>[1]</sup> | Max  | Min                                  | Max  |      |
| R <sub>ON</sub> | ON resistance | V <sub>CC</sub> = 2.3 V to 2.7 V; see Figure 8 to Figure 10 <sup>[2]</sup> |                                     |                    |      |                                      |      |      |
|                 |               | I <sub>SW</sub> = 64 mA; V <sub>I</sub> = 0 V                              | -                                   | 4.2                | 8.0  | -                                    | 15.0 | Ω    |
|                 |               | I <sub>SW</sub> = 24 mA; V <sub>I</sub> = 0 V                              | -                                   | 4.2                | 8.0  | -                                    | 15.0 | Ω    |
|                 |               | I <sub>SW</sub> = 15 mA; V <sub>I</sub> = 1.7 V                            | -                                   | 8.4                | 40.0 | -                                    | 60.0 | Ω    |
|                 |               | V <sub>CC</sub> = 3.0 V to 3.6 V; see Figure 11 to Figure 13               |                                     |                    |      |                                      |      |      |
|                 |               | I <sub>SW</sub> = 64 mA; V <sub>I</sub> = 0 V                              | -                                   | 4.0                | 7.0  | -                                    | 11.0 | Ω    |
|                 |               | I <sub>SW</sub> = 24 mA; V <sub>I</sub> = 0 V                              | -                                   | 4.0                | 7.0  | -                                    | 11.0 | Ω    |
|                 |               | I <sub>SW</sub> = 15 mA; V <sub>I</sub> = 2.4 V                            | -                                   | 6.2                | 15.0 | -                                    | 25.5 | Ω    |

- [1] Typical values are measured at T<sub>amb</sub> = 25 °C and nominal V<sub>CC</sub>.
- [2] Measured by the voltage drop between the A and B terminals at the indicated current through the switch. ON-state resistance is determined by the lower of the voltages of the two (A or B) terminals.

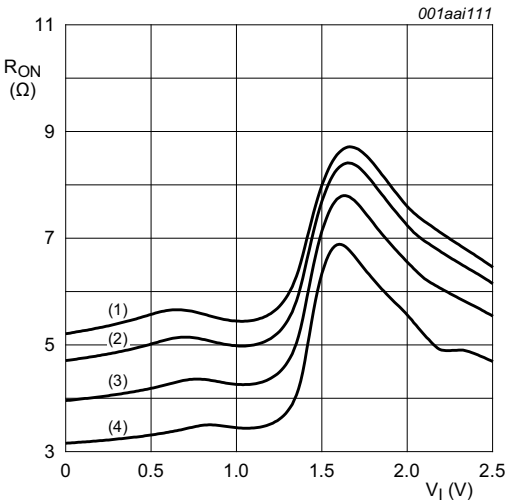
9.3 ON resistance test circuit and graphs





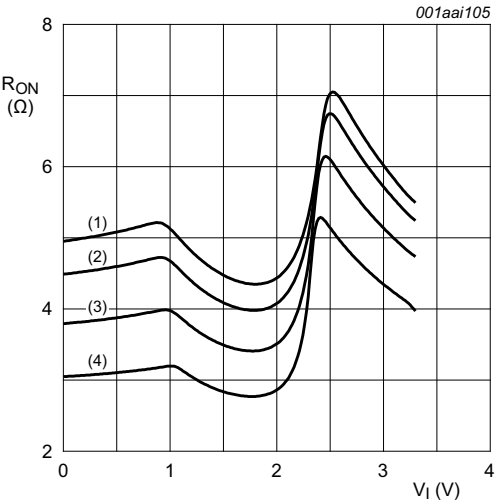
- (1)  $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2)  $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4)  $T_{amb} = -40\text{ }^{\circ}\text{C}.$

Fig 9. ON resistance as a function of input voltage;  
 $V_{CC} = 2.5\text{ V}; I_{SW} = 24\text{ mA}$



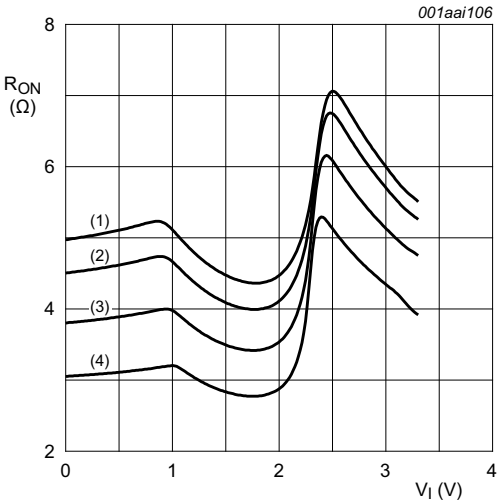
- (1)  $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2)  $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4)  $T_{amb} = -40\text{ }^{\circ}\text{C}.$

Fig 10. ON resistance as a function of input voltage;  
 $V_{CC} = 2.5\text{ V}; I_{SW} = 64\text{ mA}$



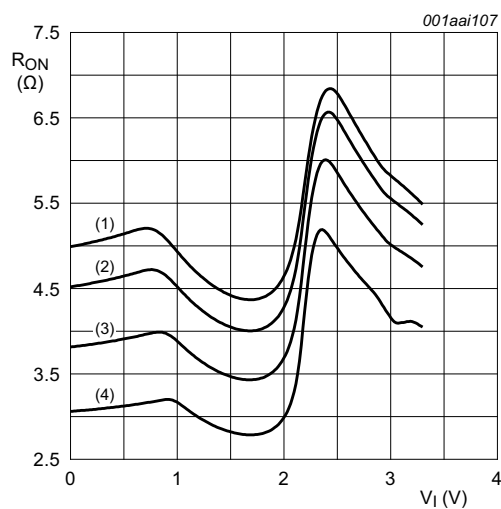
- (1)  $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2)  $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4)  $T_{amb} = -40\text{ }^{\circ}\text{C}.$

Fig 11. ON resistance as a function of input voltage;  
 $V_{CC} = 3.3\text{ V}; I_{SW} = 15\text{ mA}$



- (1)  $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2)  $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4)  $T_{amb} = -40\text{ }^{\circ}\text{C}.$

Fig 12. ON resistance as a function of input voltage;  
 $V_{CC} = 3.3\text{ V}; I_{SW} = 24\text{ mA}$



- (1)  $T_{amb} = 125^\circ\text{C}$ .
- (2)  $T_{amb} = 85^\circ\text{C}$ .
- (3)  $T_{amb} = 25^\circ\text{C}$ .
- (4)  $T_{amb} = -40^\circ\text{C}$ .

Fig 13. ON resistance as a function of input voltage;  $V_{CC} = 3.3\text{ V}$ ;  $I_{SW} = 64\text{ mA}$



## 10. Dynamic characteristics

**Table 8. Dynamic characteristics**

$GND = 0\text{ V}$ ; for test circuit see [Figure 16](#)

| Symbol           | Parameter         | Conditions                                                                         | $T_{\text{amb}} = -40\text{ °C to }+85\text{ °C}$ |                    |      | $T_{\text{amb}} = -40\text{ °C to }+125\text{ °C}$ |      | Unit |
|------------------|-------------------|------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|------|----------------------------------------------------|------|------|
|                  |                   |                                                                                    | Min                                               | Typ <sup>[1]</sup> | Max  | Min                                                | Max  |      |
| $t_{\text{pd}}$  | propagation delay | nA to nBn or nBn to nA; see <a href="#">Figure 14</a> <sup>[2][3]</sup>            |                                                   |                    |      |                                                    |      |      |
|                  |                   | $V_{\text{CC}} = 2.3\text{ V to }2.7\text{ V}$                                     | -                                                 | -                  | 0.15 | -                                                  | 0.25 | ns   |
|                  |                   | $V_{\text{CC}} = 3.0\text{ V to }3.6\text{ V}$                                     | -                                                 | -                  | 0.15 | -                                                  | 0.25 | ns   |
|                  |                   | Sn to nA; see <a href="#">Figure 14</a> <sup>[3]</sup>                             |                                                   |                    |      |                                                    |      |      |
|                  |                   | $V_{\text{CC}} = 2.3\text{ V to }2.7\text{ V}$                                     | 1.0                                               | 2.2                | 6.8  | 1.0                                                | 7.5  | ns   |
|                  |                   | $V_{\text{CC}} = 3.0\text{ V to }3.6\text{ V}$                                     | 1.0                                               | 2.0                | 5.5  | 1.0                                                | 6.1  | ns   |
| $t_{\text{en}}$  | enable time       | $\overline{\text{nOE}}$ to nA or nBn; see <a href="#">Figure 15</a> <sup>[4]</sup> |                                                   |                    |      |                                                    |      |      |
|                  |                   | $V_{\text{CC}} = 2.3\text{ V to }2.7\text{ V}$                                     | 1.0                                               | 2.1                | 5.0  | 1.0                                                | 5.5  | ns   |
|                  |                   | $V_{\text{CC}} = 3.0\text{ V to }3.6\text{ V}$                                     | 1.0                                               | 1.9                | 4.8  | 1.0                                                | 5.3  | ns   |
|                  |                   | Sn to nBn; see <a href="#">Figure 15</a> <sup>[4]</sup>                            |                                                   |                    |      |                                                    |      |      |
|                  |                   | $V_{\text{CC}} = 2.3\text{ V to }2.7\text{ V}$                                     | 1.0                                               | 2.1                | 4.3  | 1.0                                                | 4.7  | ns   |
|                  |                   | $V_{\text{CC}} = 3.0\text{ V to }3.6\text{ V}$                                     | 1.0                                               | 1.9                | 4.0  | 1.0                                                | 4.4  | ns   |
| $t_{\text{dis}}$ | disable time      | $\overline{\text{nOE}}$ to nA or nBn; see <a href="#">Figure 15</a> <sup>[5]</sup> |                                                   |                    |      |                                                    |      |      |
|                  |                   | $V_{\text{CC}} = 2.3\text{ V to }2.7\text{ V}$                                     | 1.0                                               | 2.6                | 5.5  | 1.0                                                | 6.1  | ns   |
|                  |                   | $V_{\text{CC}} = 3.0\text{ V to }3.6\text{ V}$                                     | 1.0                                               | 3.2                | 5.4  | 1.0                                                | 5.9  | ns   |
|                  |                   | Sn to nBn; see <a href="#">Figure 15</a> <sup>[5]</sup>                            |                                                   |                    |      |                                                    |      |      |
|                  |                   | $V_{\text{CC}} = 2.3\text{ V to }2.7\text{ V}$                                     | 0.8                                               | 2.0                | 4.8  | 0.8                                                | 5.3  | ns   |
|                  |                   | $V_{\text{CC}} = 3.0\text{ V to }3.6\text{ V}$                                     | 1.0                                               | 2.0                | 4.5  | 1.0                                                | 5.0  | ns   |

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

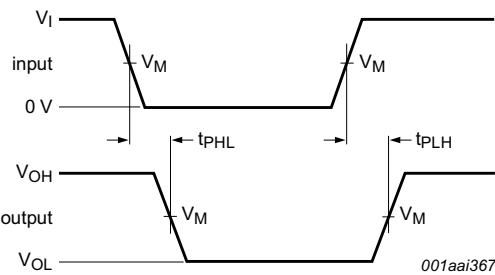
[2] The propagation delay is the calculated RC time constant of the typical on-state resistance of the switch and the load capacitance, when driven by an ideal voltage source (zero output impedance).

[3]  $t_{\text{pd}}$  is the same as  $t_{\text{PLH}}$  and  $t_{\text{PHL}}$ .

[4]  $t_{\text{en}}$  is the same as  $t_{\text{PZH}}$  and  $t_{\text{PZL}}$ .

[5]  $t_{\text{dis}}$  is the same as  $t_{\text{PHZ}}$  and  $t_{\text{PLZ}}$ .

11. Waveforms

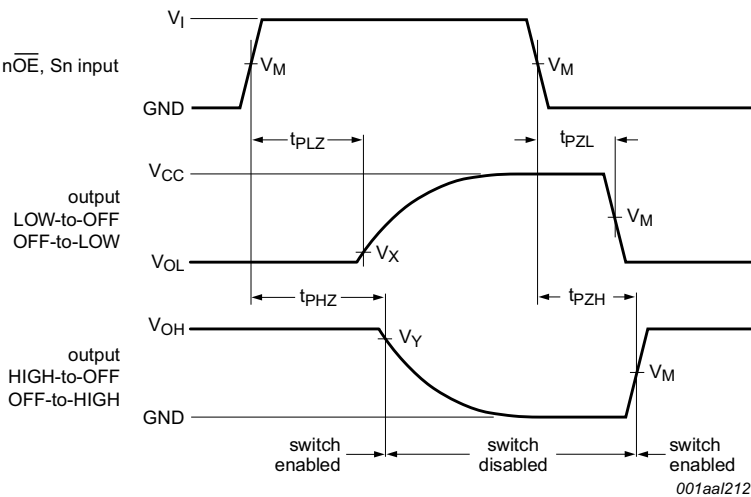


Measurement points are given in [Table 9](#).  
Logic levels:  $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

Fig 14. The data input (nA or nBn) to output (nBn or nA) propagation delays

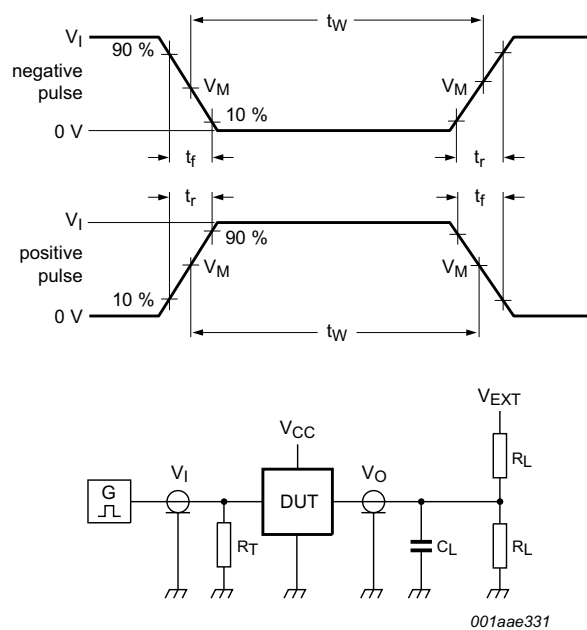
Table 9. Measurement points

| Supply voltage | Input       |          |               | Output      |                   |                   |
|----------------|-------------|----------|---------------|-------------|-------------------|-------------------|
| $V_{CC}$       | $V_M$       | $V_I$    | $t_r = t_f$   | $V_M$       | $V_X$             | $V_Y$             |
| 2.3 V to 2.7 V | $0.5V_{CC}$ | $V_{CC}$ | $\leq 2.0$ ns | $0.5V_{CC}$ | $V_{OL} + 0.15$ V | $V_{OH} - 0.15$ V |
| 3.0 V to 3.6 V | $0.5V_{CC}$ | $V_{CC}$ | $\leq 2.0$ ns | $0.5V_{CC}$ | $V_{OL} + 0.3$ V  | $V_{OH} - 0.3$ V  |



Measurement points are given in [Table 9](#).  
Logic levels:  $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

Fig 15. Enable and disable times



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

Fig 16. Test circuit for measuring switching times

Table 10. Test data

| Supply voltage | Load  |              | $V_{EXT}$          |                    |                    |
|----------------|-------|--------------|--------------------|--------------------|--------------------|
| $V_{CC}$       | $C_L$ | $R_L$        | $t_{PLH}, t_{PHL}$ | $t_{PZH}, t_{PHZ}$ | $t_{PZL}, t_{PLZ}$ |
| 2.3 V to 2.7 V | 30 pF | 500 $\Omega$ | open               | GND                | $2V_{CC}$          |
| 3.0 V to 3.6 V | 50 pF | 500 $\Omega$ | open               | GND                | $2V_{CC}$          |

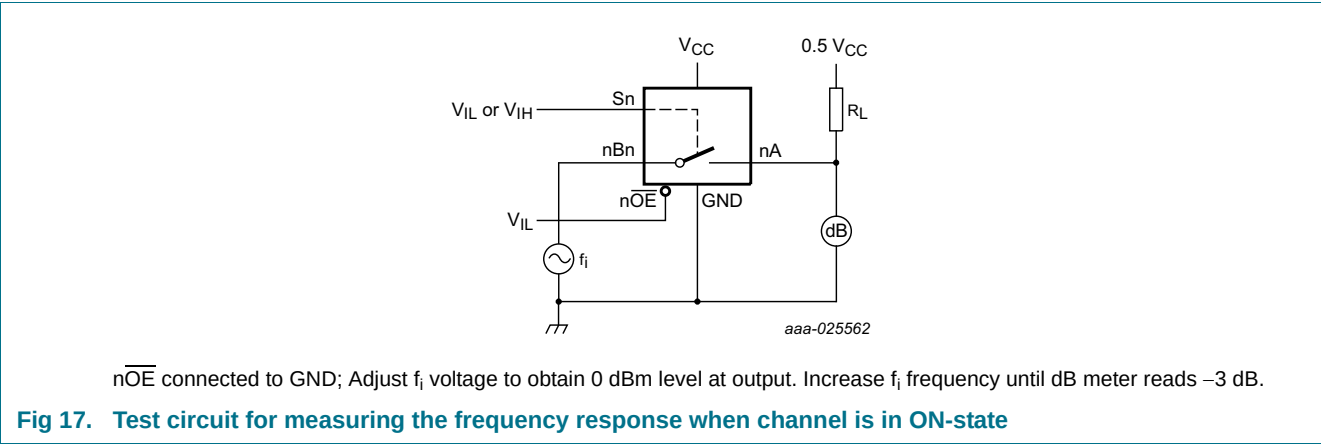
11.1 Additional dynamic characteristics

**Table 11. Additional dynamic characteristics**  
At recommended operating conditions; voltages are referenced to GND (ground = 0 V);  $V_I = \text{GND}$  or  $V_{CC}$  (unless otherwise specified);  $t_r = t_f \leq 2.5 \text{ ns}$ .

| Symbol              | Parameter                | Conditions                                                                                        | T <sub>amb</sub> = 25 °C |     |     | Unit |
|---------------------|--------------------------|---------------------------------------------------------------------------------------------------|--------------------------|-----|-----|------|
|                     |                          |                                                                                                   | Min                      | Typ | Max |      |
| f <sub>(-3dB)</sub> | -3 dB frequency response | V <sub>CC</sub> = 3.3 V; R <sub>L</sub> = 50 Ω; see <a href="#">Figure 17</a> <a href="#">[1]</a> | -                        | 302 | -   | MHz  |

[1] f<sub>i</sub> is biased at 0.5V<sub>CC</sub>.

11.2 Test circuits



12. Package outline

SO16: plastic small outline package; 16 leads; body width 3.9 mm

SOT109-1

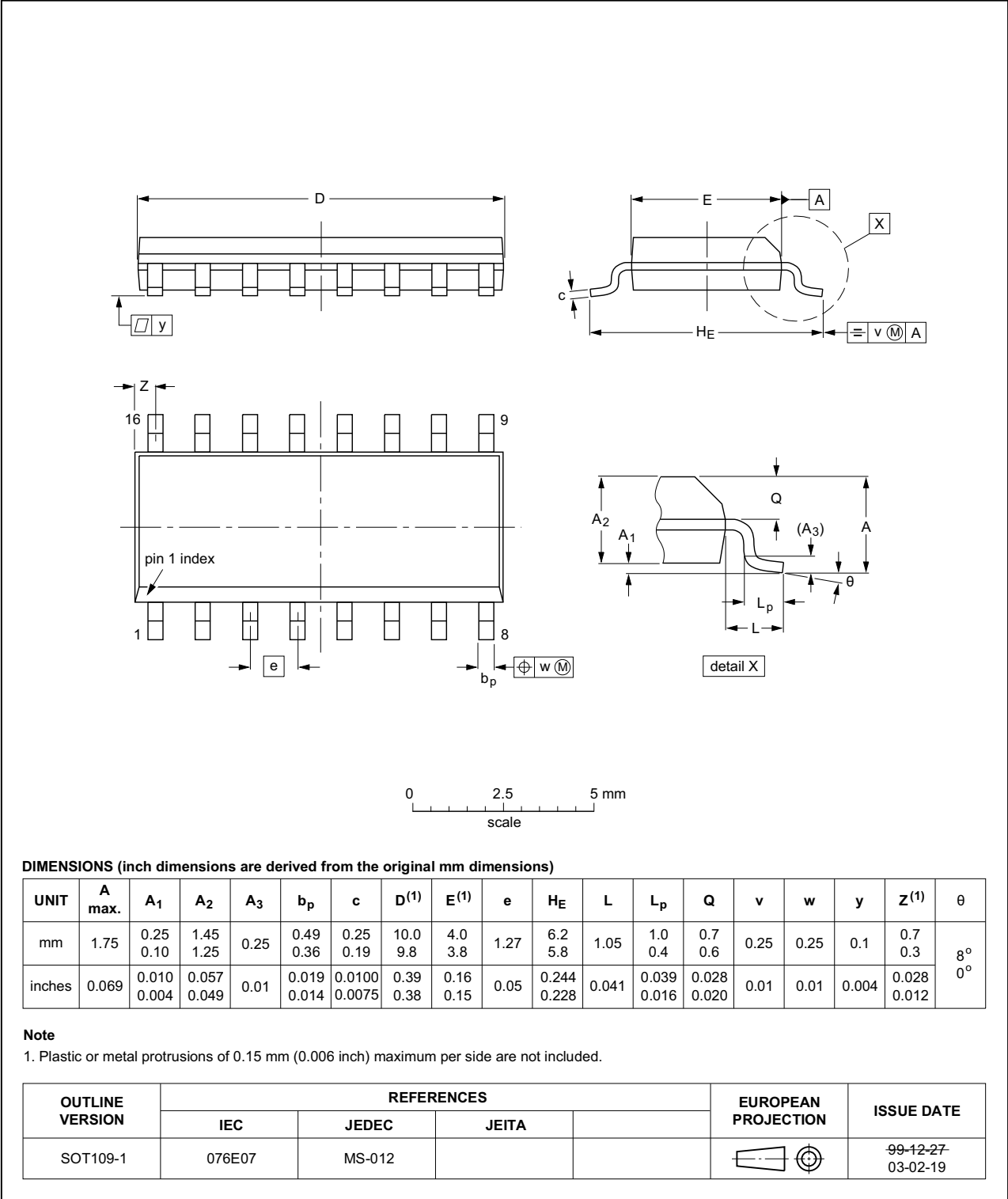


Fig 18. Package outline SOT109-1 (SO16)

TSSOP16: plastic thin shrink small outline package; 16 leads; body width 4.4 mm

SOT403-1

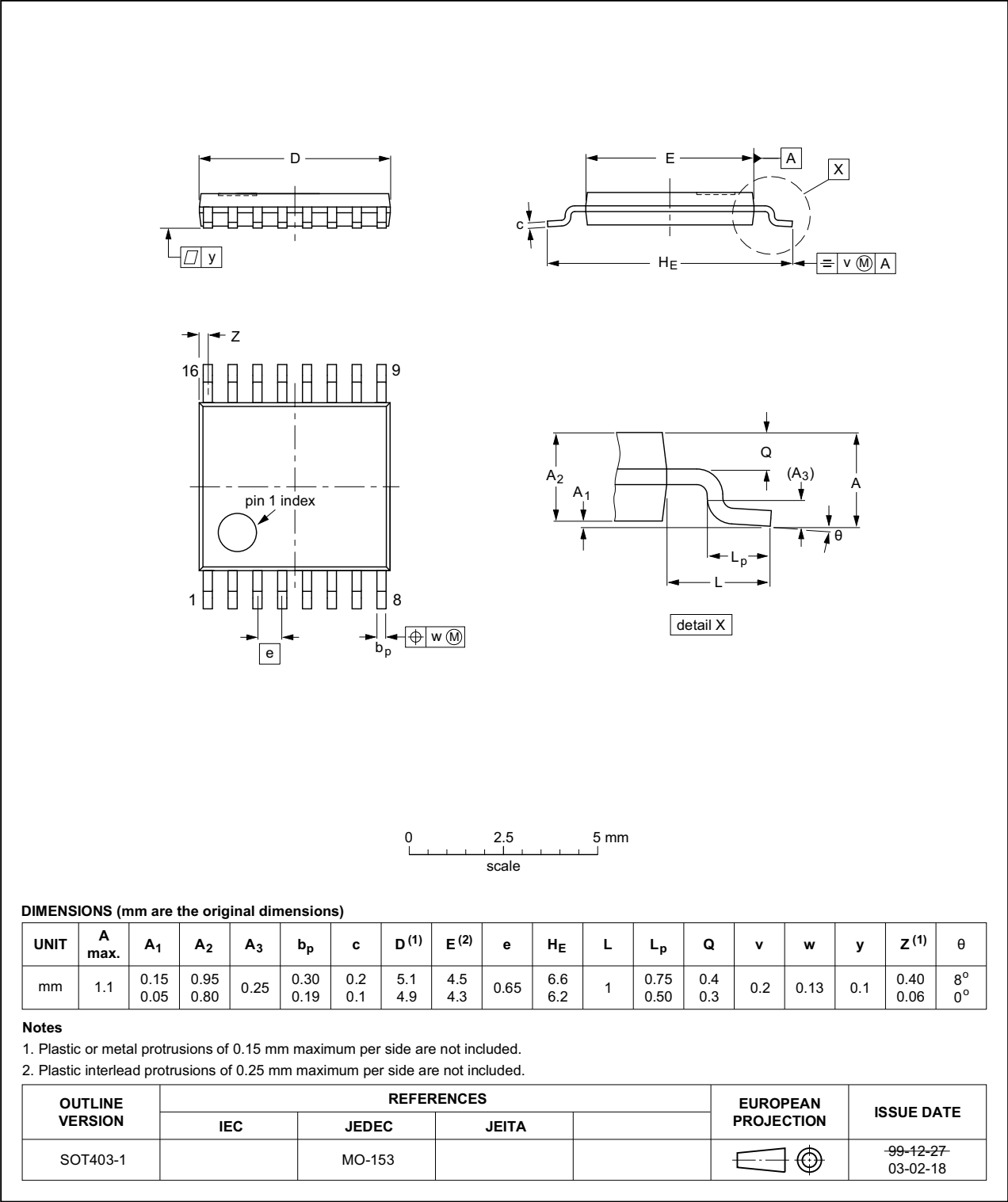


Fig 19. Package outline SOT403-1 (TSSOP16)

DHVQFN16: plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 16 terminals; body 2.5 x 3.5 x 0.85 mm SOT763-1

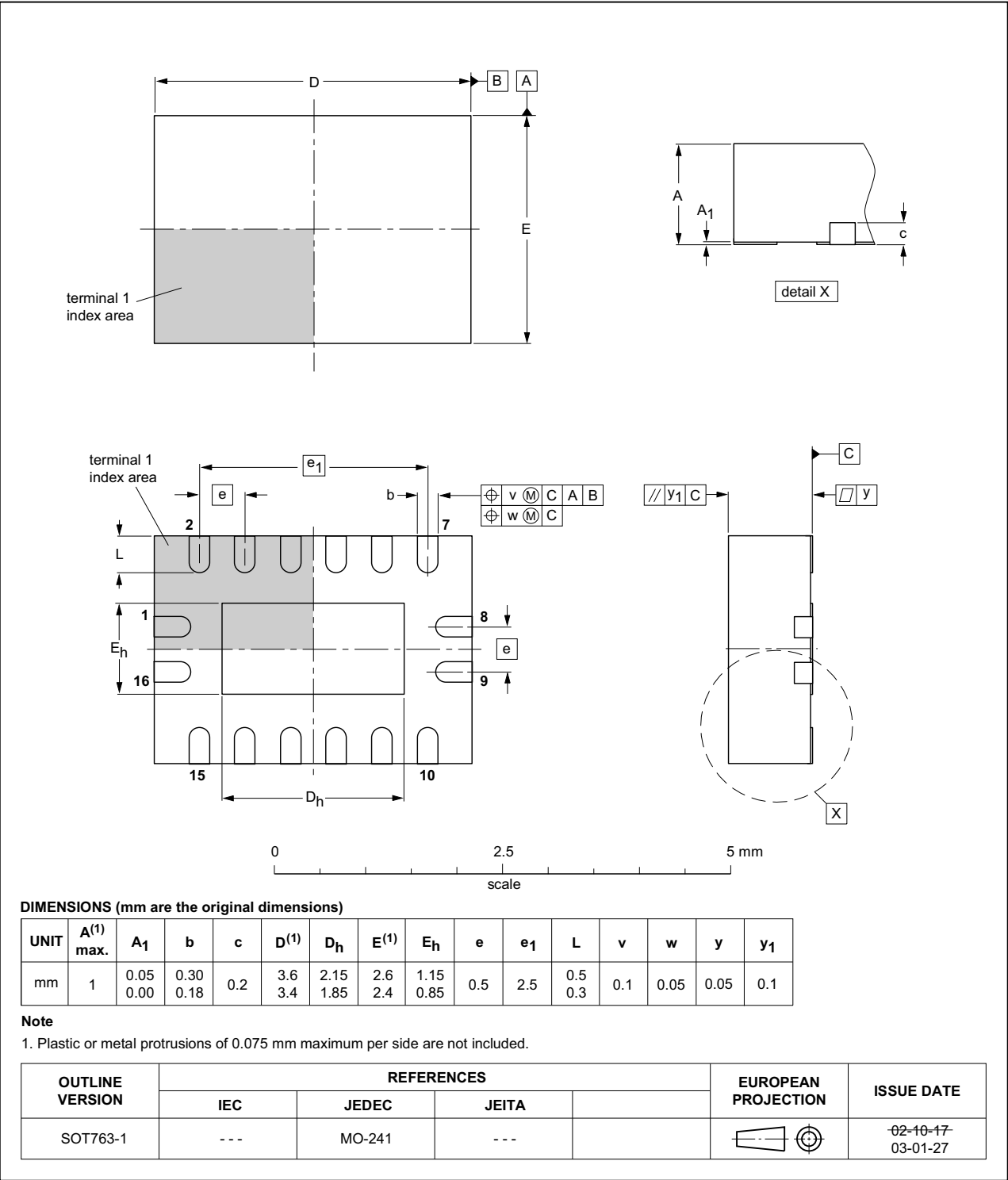


Fig 20. Package outline SOT763-1 (DHVQFN16)

## 13. 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                        |
| MIL     | Military                                |
| MM      | Machine Model                           |

## 14. Revision history

Table 13. Revision history

| Document ID          | Release date                                                           | Data sheet status  | Change notice | Supersedes           |
|----------------------|------------------------------------------------------------------------|--------------------|---------------|----------------------|
| 74CBTLV3253_Q100 v.2 | 20161110                                                               | Product data sheet | -             | 74CBTLV3253_Q100 v.1 |
| Modifications:       | • <a href="#">Section 11.1</a> and <a href="#">Section 11.2</a> added. |                    |               |                      |
| 74CBTLV3253_Q100 v.1 | 20130403                                                               | Product data sheet | -             | -                    |



## 15. Legal information

### 15.1 Data sheet status

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

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

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

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nexperia.com>.

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