



**THE DATASHEET OF
74LVC1G66GV-Q100,1**





74LVC1G66-Q100

Bilateral switch

Rev. 6.1 — 3 September 2024

Product data sheet

1. General description

The 74LVC1G66-Q100 is a single-pole, single-throw analog switch with two input/output terminals (nY and nZ) and a digital enable input (nE). When nE is LOW, the analog switch is turned off. Control inputs can be driven from either 3.3 V or 5 V devices. This feature allows the use of these devices as translators in mixed 3.3 V and 5 V environments.

Schmitt-trigger action at control inputs makes the circuit tolerant of slower input rise and fall times.

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 °C to +85 °C and from -40 °C to +125 °C
- Wide supply voltage range from 1.65 V to 5.5 V
- Very low ON resistance:
 - 7.5 Ω (typical) at $V_{CC} = 2.7$ V
 - 6.5 Ω (typical) at $V_{CC} = 3.3$ V
 - 6 Ω (typical) at $V_{CC} = 5$ V
- Switch current capability of 32 mA
- High noise immunity
- CMOS low power consumption
- TTL interface compatibility at 3.3 V
- Overvoltage tolerant control inputs to 5.5 V
- Latch-up performance meets requirements of JESD78 Class I
- 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

3. Ordering information

Table 1. Ordering information

| Type number | Package | | | |
|----------------------------------|-------------------|--------|--|---------------------------|
| | Temperature range | Name | Description | Version |
| 74LVC1G66GW-Q100 | -40 °C to +125 °C | TSSOP5 | plastic thin shrink small outline package; 5 leads; body width 1.25 mm | SOT353-1 |
| 74LVC1G66GV-Q100 | -40 °C to +125 °C | SC-74A | plastic surface-mounted package; 5 leads | SOT753 |
| 74LVC1G66GZ-Q100 | -40 °C to +125 °C | XSON5 | plastic thermal enhanced extremely thin small outline package with side-wettable flanks (SWF); no leads; 5 terminals; body 1.1 × 0.85 × 0.5 mm | SOT8065-1 |

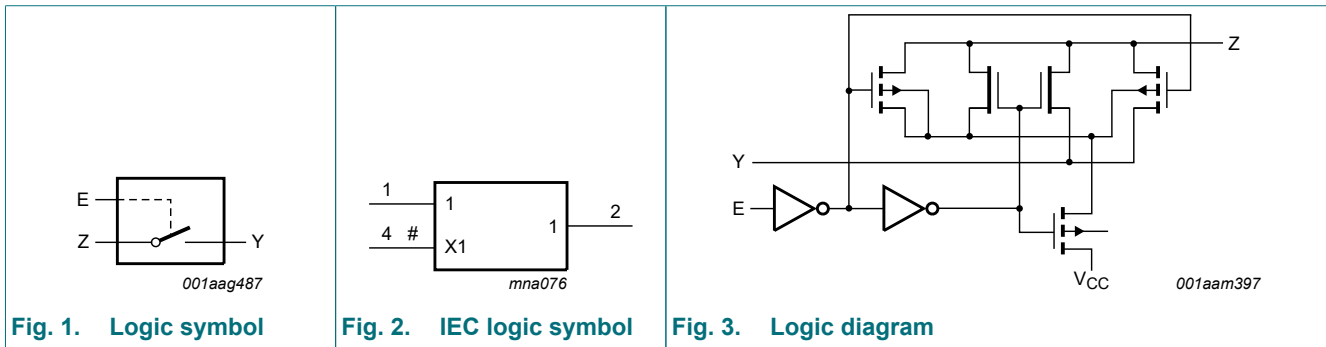
4. Marking

Table 2. Marking

| Type number | Marking code [1] |
|------------------|------------------|
| 74LVC1G66GW-Q100 | VL |
| 74LVC1G66GV-Q100 | V66 |
| 74LVC1G66GZ-Q100 | VL |

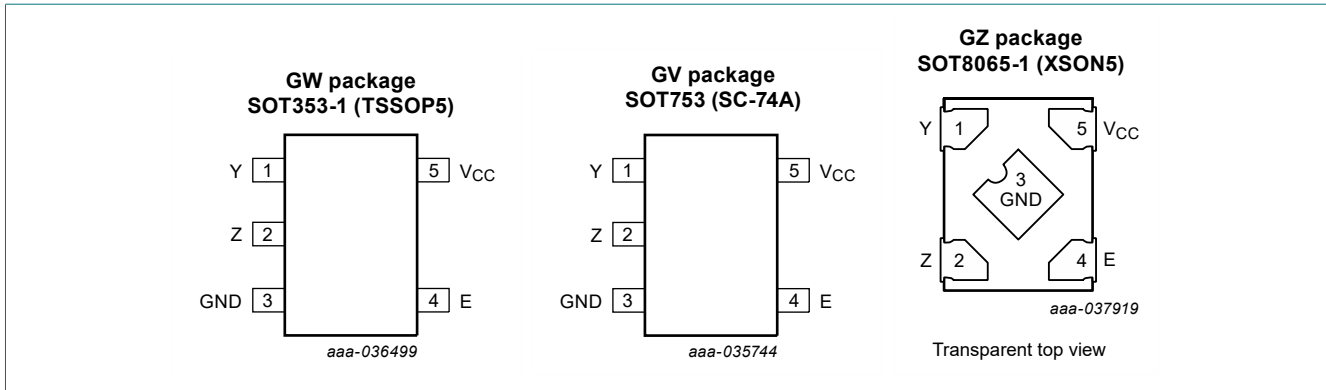
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram



6. Pinning information

6.1. Pinning



6.2. Pin description

Table 3. Pin description

| Symbol | Pin | Description |
|-----------------|-----|-----------------------------|
| Y | 1 | independent input or output |
| Z | 2 | independent output or input |
| GND | 3 | ground (0 V) |
| E | 4 | enable input (active HIGH) |
| V _{CC} | 5 | supply voltage |

7. Functional description

Table 4. Function table

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

| Input E | Switch |
|---------|-----------|
| L | OFF-state |
| H | ON-state |

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_{CC} | supply voltage | | -0.5 | +6.5 | V |
| V_I | input voltage | [1] | -0.5 | +6.5 | V |
| I_{IK} | input clamping current | $V_I < -0.5 \text{ V}$ or $V_I > V_{CC} + 0.5 \text{ V}$ | -50 | - | mA |
| I_{SK} | switch clamping current | $V_I < -0.5 \text{ V}$ or $V_I > V_{CC} + 0.5 \text{ V}$ | - | ± 50 | mA |
| V_{SW} | switch voltage | enable and disable mode [2] | -0.5 | $V_{CC} + 0.5$ | V |
| I_{SW} | switch current | $V_{SW} > -0.5 \text{ V}$ or $V_{SW} < V_{CC} + 0.5 \text{ V}$ | - | ± 50 | mA |
| I_{CC} | supply current | | - | 100 | mA |
| I_{GND} | ground current | | -100 | - | mA |
| T_{stg} | storage temperature | | -65 | +150 | °C |
| P_{tot} | total power dissipation | $T_{amb} = -40 \text{ °C}$ to $+125 \text{ °C}$ [3] | - | 250 | mW |

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

[2] The minimum and maximum switch voltage ratings may be exceeded if the switch clamping current rating is observed.

[3] For SOT353-1 (TSSOP5) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.
 For SOT753 (SC-74A) package: P_{tot} derates linearly with 3.8 mW/K above 85 °C.
 For SOT8065-1 (XSON5) package: P_{tot} derates linearly with 3.2 mW/K above 72 °C.

9. Recommended operating conditions

Table 6. Recommended operating conditions

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------------|-------------------------------------|--|------|-----|----------|------|
| V_{CC} | supply voltage | | 1.65 | - | 5.5 | V |
| V_I | input voltage | | 0 | - | 5.5 | V |
| V_{SW} | switch voltage | [1] | 0 | - | V_{CC} | V |
| T_{amb} | ambient temperature | | -40 | - | +125 | °C |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC} = 1.65 \text{ V}$ to 2.7 V [2] | - | - | 20 | ns/V |
| | | $V_{CC} = 2.7 \text{ V}$ to 5.5 V [2] | - | - | 10 | ns/V |

[1] To avoid sinking GND current from terminal Z when switch current flows in terminal Y, the voltage drop across the bidirectional switch must not exceed 0.4 V. If the switch current flows into terminal Z, no GND current will flow from terminal Y. In this case, there is no limit for the voltage drop across the switch.

[2] Applies to control signal levels.

10. Static characteristics

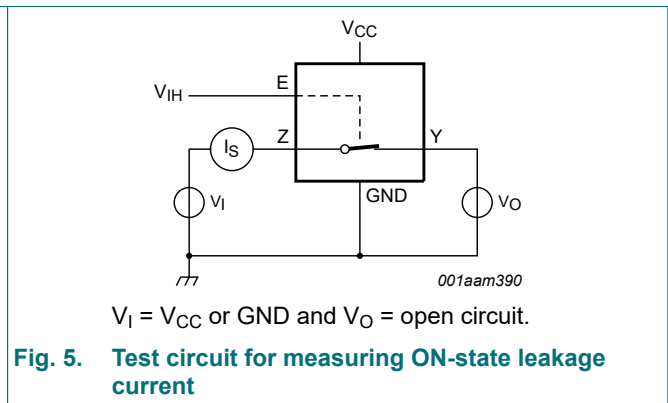
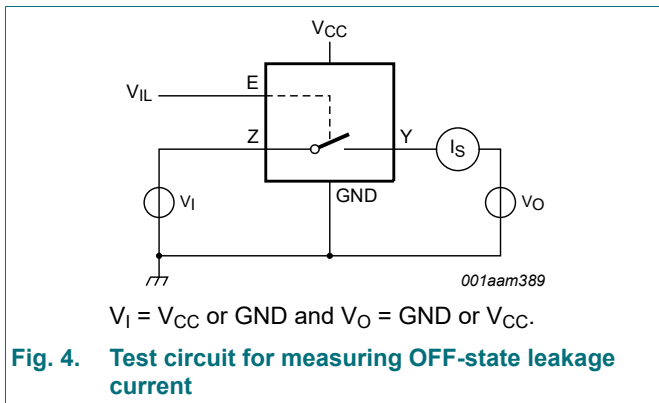
Table 7. Static characteristics

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

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit | |
|---------------------|---------------------------|---|---------------------|---------|---------------------|---------------------|---------------------|------|----|
| | | | Min | Typ [1] | Max | Min | Max | | |
| V _{IH} | HIGH-level input voltage | V _{CC} = 1.65 V to 1.95 V | 0.65V _{CC} | - | - | 0.65V _{CC} | - | V | |
| | | V _{CC} = 2.3 V to 2.7 V | 1.7 | - | - | 1.7 | - | V | |
| | | V _{CC} = 2.7 V to 3.6 V | 2.0 | - | - | 2.0 | - | V | |
| | | V _{CC} = 4.5 V to 5.5 V | 0.7V _{CC} | - | - | 0.7V _{CC} | - | V | |
| V _{IL} | LOW-level input voltage | V _{CC} = 1.65 V to 1.95 V | - | - | 0.35V _{CC} | - | 0.35V _{CC} | V | |
| | | V _{CC} = 2.3 V to 2.7 V | - | - | 0.7 | - | 0.7 | V | |
| | | V _{CC} = 2.7 V to 3.6 V | - | - | 0.8 | - | 0.8 | V | |
| | | V _{CC} = 4.5 V to 5.5 V | - | - | 0.3V _{CC} | - | 0.3V _{CC} | V | |
| I _I | input leakage current | pin E; V _I = 5.5 V or GND; V _{CC} = 0 V to 5.5 V | [2] | - | ±0.1 | ±1 | - | ±1 | µA |
| I _{S(OFF)} | OFF-state leakage current | V _{CC} = 5.5 V; see Fig. 4 | [2] | - | ±0.1 | ±0.2 | - | ±0.5 | µA |
| I _{S(ON)} | ON-state leakage current | V _{CC} = 5.5 V; see Fig. 5 | [2] | - | ±0.1 | ±1 | - | ±2 | µA |
| I _{CC} | supply current | V _I = 5.5 V or GND; V _{SW} = GND or V _{CC} ; V _{CC} = 1.65 V to 5.5 V | [2] | - | 0.1 | 4 | - | 4 | µA |
| ΔI _{CC} | additional supply current | pin E; V _I = V _{CC} - 0.6 V; V _{SW} = GND or V _{CC} ; V _{CC} = 5.5 V | [2] | - | 5 | 500 | - | 500 | µA |
| C _I | input capacitance | | | - | 2.0 | - | - | - | pF |
| C _{S(OFF)} | OFF-state capacitance | | | - | 6.5 | - | - | - | pF |
| C _{S(ON)} | ON-state capacitance | | | - | 11 | - | - | - | pF |

- [1] All typical values are measured at T_{amb} = 25 °C.
- [2] These typical values are measured at V_{CC} = 3.3 V.

10.1. Test circuits



10.2. ON resistance

Table 8. ON resistance

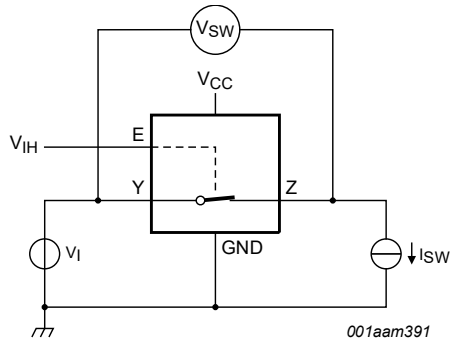
At recommended operating conditions; voltages are referenced to GND (ground 0 V);
for test circuit see Fig. 6; for graphs see Fig. 7 to Fig. 12.

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit |
|-----------------------|--------------------------|--|------------------|---------|-----|-------------------|-----|------|
| | | | Min | Typ [1] | Max | Min | Max | |
| R _{ON(peak)} | ON resistance (peak) | V _I = GND to V _{CC} | | | | | | |
| | | I _{SW} = 4 mA; V _{CC} = 1.65 V to 1.95 V | - | 34.0 | 130 | - | 195 | Ω |
| | | I _{SW} = 8 mA; V _{CC} = 2.3 V to 2.7 V | - | 12.0 | 30 | - | 45 | Ω |
| | | I _{SW} = 12 mA; V _{CC} = 2.7 V | - | 10.4 | 25 | - | 38 | Ω |
| | | I _{SW} = 24 mA; V _{CC} = 3.0 V to 3.6 V | - | 7.8 | 20 | - | 30 | Ω |
| | | I _{SW} = 32 mA; V _{CC} = 4.5 V to 5.5 V | - | 6.2 | 15 | - | 23 | Ω |
| R _{ON(rail)} | ON resistance (rail) | V _I = GND | | | | | | |
| | | I _{SW} = 4 mA; V _{CC} = 1.65 V to 1.95 V | - | 8.2 | 18 | - | 27 | Ω |
| | | I _{SW} = 8 mA; V _{CC} = 2.3 V to 2.7 V | - | 7.1 | 16 | - | 24 | Ω |
| | | I _{SW} = 12 mA; V _{CC} = 2.7 V | - | 6.9 | 14 | - | 21 | Ω |
| | | I _{SW} = 24 mA; V _{CC} = 3.0 V to 3.6 V | - | 6.5 | 12 | - | 18 | Ω |
| | | I _{SW} = 32 mA; V _{CC} = 4.5 V to 5.5 V | - | 5.8 | 10 | - | 15 | Ω |
| | | V _I = V _{CC} | | | | | | |
| | | I _{SW} = 4 mA; V _{CC} = 1.65 V to 1.95 V | - | 10.4 | 30 | - | 45 | Ω |
| | | I _{SW} = 8 mA; V _{CC} = 2.3 V to 2.7 V | - | 7.6 | 20 | - | 30 | Ω |
| | | I _{SW} = 12 mA; V _{CC} = 2.7 V | - | 7.0 | 18 | - | 27 | Ω |
| | | I _{SW} = 24 mA; V _{CC} = 3.0 V to 3.6 V | - | 6.1 | 15 | - | 23 | Ω |
| | | I _{SW} = 32 mA; V _{CC} = 4.5 V to 5.5 V | - | 4.9 | 10 | - | 15 | Ω |
| R _{ON(flat)} | ON resistance (flatness) | V _I = GND to V _{CC} [2] | | | | | | |
| | | I _{SW} = 4 mA; V _{CC} = 1.65 V to 1.95 V | - | 26.0 | - | - | - | Ω |
| | | I _{SW} = 8 mA; V _{CC} = 2.3 V to 2.7 V | - | 5.0 | - | - | - | Ω |
| | | I _{SW} = 12 mA; V _{CC} = 2.7 V | - | 3.5 | - | - | - | Ω |
| | | I _{SW} = 24 mA; V _{CC} = 3.0 V to 3.6 V | - | 2.0 | - | - | - | Ω |
| | | I _{SW} = 32 mA; V _{CC} = 4.5 V to 5.5 V | - | 1.5 | - | - | - | Ω |

[1] Typical values are measured at T_{amb} = 25 °C and nominal V_{CC}.

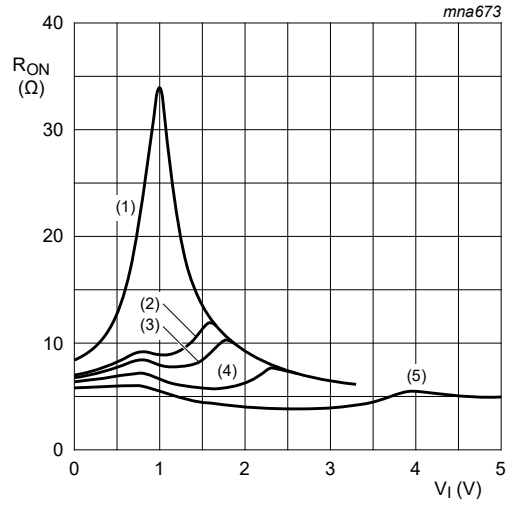
[2] Flatness is defined as the difference between the maximum and minimum value of ON resistance measured at identical V_{CC} and temperature.

10.3. ON resistance test circuit and graphs



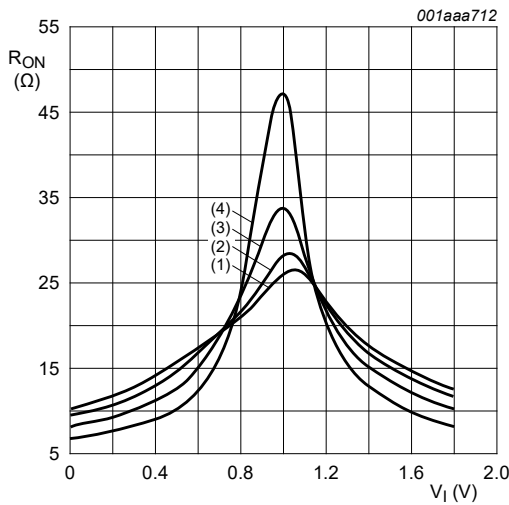
$R_{ON} = V_{SW}/I_{SW}$.

Fig. 6. Test circuit for measuring ON resistance



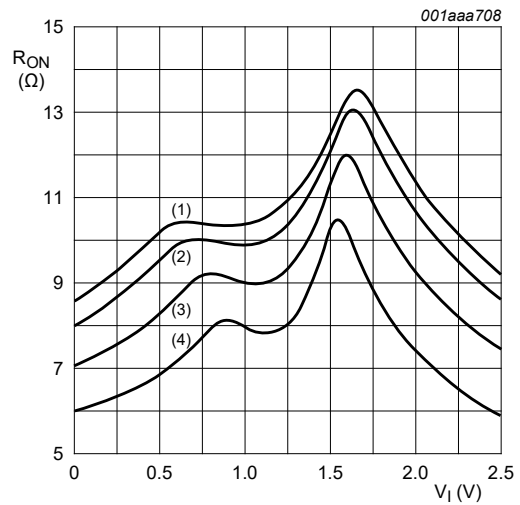
- (1) $V_{CC} = 1.8 \text{ V}$.
- (2) $V_{CC} = 2.5 \text{ V}$.
- (3) $V_{CC} = 2.7 \text{ V}$.
- (4) $V_{CC} = 3.3 \text{ V}$.
- (5) $V_{CC} = 5.0 \text{ V}$.

Fig. 7. Typical ON resistance as a function of input voltage; $T_{amb} = 25 \text{ }^\circ\text{C}$



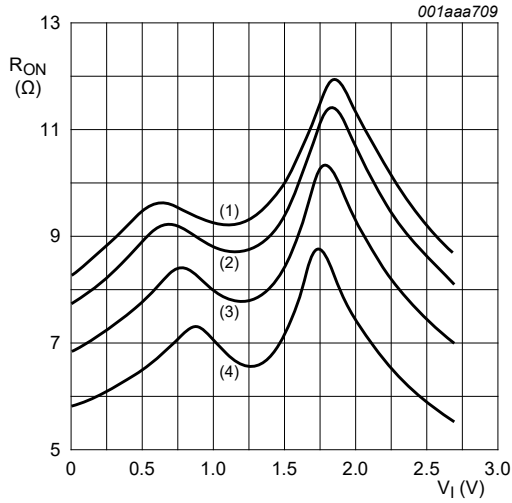
- (1) $T_{amb} = 125 \text{ }^\circ\text{C}$.
- (2) $T_{amb} = 85 \text{ }^\circ\text{C}$.
- (3) $T_{amb} = 25 \text{ }^\circ\text{C}$.
- (4) $T_{amb} = -40 \text{ }^\circ\text{C}$.

Fig. 8. ON resistance as a function of input voltage; $V_{CC} = 1.8 \text{ V}$



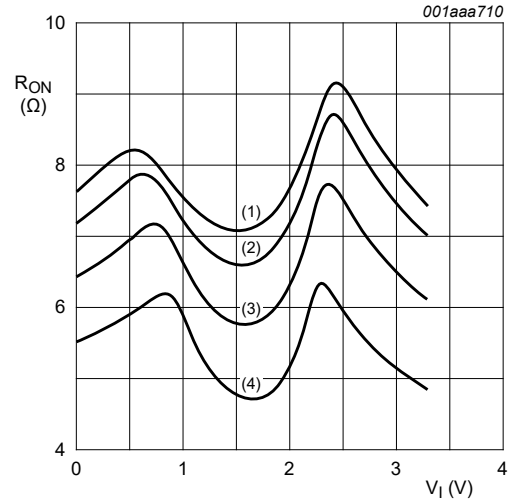
- (1) $T_{amb} = 125 \text{ }^\circ\text{C}$.
- (2) $T_{amb} = 85 \text{ }^\circ\text{C}$.
- (3) $T_{amb} = 25 \text{ }^\circ\text{C}$.
- (4) $T_{amb} = -40 \text{ }^\circ\text{C}$.

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



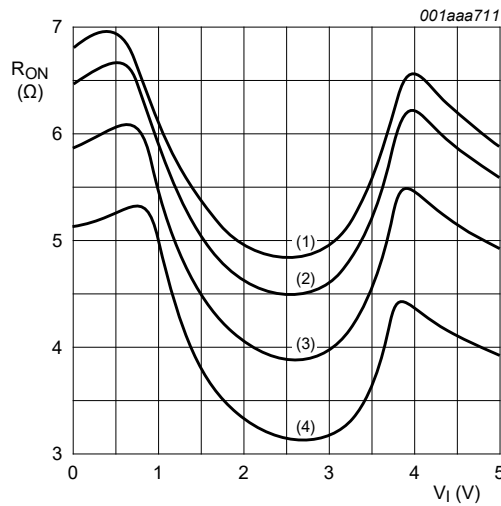
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}$.
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}$.
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}$.
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}$.

Fig. 10. ON resistance as a function of input voltage; $V_{CC} = 2.7\text{ V}$



- (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; $V_{CC} = 3.3\text{ V}$



- (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; $V_{CC} = 5.0\text{ V}$

11. Dynamic characteristics

Table 9. Dynamic characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 15.

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit |
|------------------|-------------------------------|--|------------------|---------|-----|-------------------|------|------|
| | | | Min | Typ [1] | Max | Min | Max | |
| t _{pd} | propagation delay | Y to Z or Z to Y; see Fig. 13 [2] [3] | | | | | | |
| | | V _{CC} = 1.65 V to 1.95 V | - | 0.8 | 2.0 | - | 3.0 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | - | 0.4 | 1.2 | - | 2.0 | ns |
| | | V _{CC} = 2.7 V | - | 0.4 | 1.0 | - | 1.5 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | - | 0.3 | 0.8 | - | 1.5 | ns |
| | | V _{CC} = 4.5 V to 5.5 V | - | 0.2 | 0.6 | - | 1.0 | ns |
| t _{en} | enable time | E to Y or Z; see Fig. 14 [4] | | | | | | |
| | | V _{CC} = 1.65 V to 1.95 V | 1.0 | 5.3 | 12 | 1.0 | 15.5 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 1.0 | 3.0 | 6.5 | 1.0 | 8.5 | ns |
| | | V _{CC} = 2.7 V | 1.0 | 2.6 | 6.0 | 1.0 | 8.0 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 1.0 | 2.5 | 5.0 | 1.0 | 6.5 | ns |
| | | V _{CC} = 4.5 V to 5.5 V | 1.0 | 1.9 | 4.2 | 1.0 | 5.5 | ns |
| t _{dis} | disable time | E to Y or Z; see Fig. 14 [5] | | | | | | |
| | | V _{CC} = 1.65 V to 1.95 V | 1.0 | 4.2 | 10 | 1.0 | 13 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 1.0 | 2.4 | 6.9 | 1.0 | 9.0 | ns |
| | | V _{CC} = 2.7 V | 1.0 | 3.6 | 7.5 | 1.0 | 9.5 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 1.0 | 3.4 | 6.5 | 1.0 | 8.5 | ns |
| | | V _{CC} = 4.5 V to 5.5 V | 1.0 | 2.5 | 5.0 | 1.0 | 6.5 | ns |
| C _{PD} | power dissipation capacitance | C _L = 50 pF; f _i = 10 MHz; V _I = GND to V _{CC} [6] | | | | | | |
| | | V _{CC} = 2.5 V | - | 9.8 | - | - | - | pF |
| | | V _{CC} = 3.3 V | - | 12.0 | - | - | - | pF |
| | | V _{CC} = 5.0 V | - | 17.3 | - | - | - | pF |

[1] Typical values are measured at T_{amb} = 25 °C and nominal V_{CC}.

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

[3] Propagation delay is the calculated RC time constant of the typical ON resistance of the switch and the specified capacitance when driven by an ideal voltage source (zero output impedance).

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

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

[6] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

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

f_i = input frequency in MHz;

f_o = output frequency in MHz;

C_L = output load capacitance in pF;

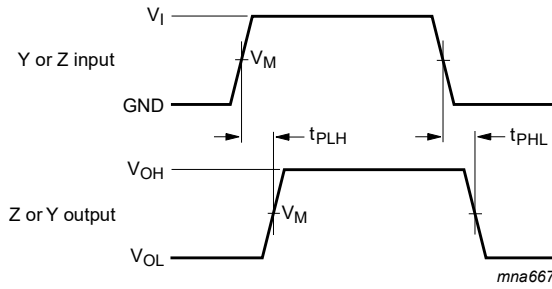
C_{S(ON)} = maximum ON-state switch capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

Σ{(C_L + C_{S(ON)}) × V_{CC}² × f_o} = sum of the outputs.

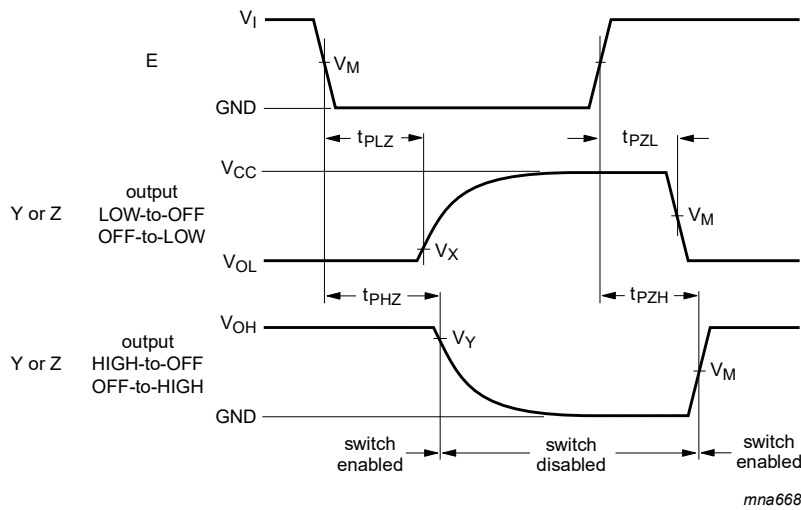
11.1. Waveforms and test circuit



Measurement points are given in [Table 10](#).

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 13. Input (Y or Z) to output (Z or Y) propagation delays



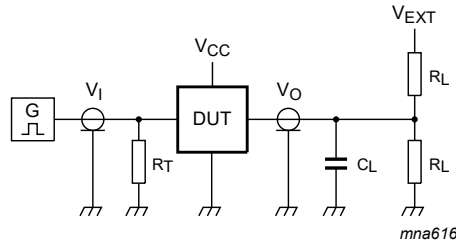
Measurement points are given in [Table 10](#).

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 14. Enable and disable times

Table 10. Measurement points

| Supply voltage | Input | Output | | |
|------------------|-------------|-------------|-------------------|-------------------|
| V_{CC} | V_M | V_M | V_X | V_Y |
| 1.65 V to 1.95 V | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.15 V$ | $V_{OH} - 0.15 V$ |
| 2.3 V to 2.7 V | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.15 V$ | $V_{OH} - 0.15 V$ |
| 2.7 V | 1.5 V | 1.5 V | $V_{OL} + 0.3 V$ | $V_{OH} - 0.3 V$ |
| 3.0 V to 3.6 V | 1.5 V | 1.5 V | $V_{OL} + 0.3 V$ | $V_{OH} - 0.3 V$ |
| 4.5 V to 5.5 V | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 0.3 V$ | $V_{OH} - 0.3 V$ |



Test data is given in [Table 11](#).

Definitions for test circuit:

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

C_L = Load capacitance including jig and probe capacitance;

R_L = Load resistance;

V_{EXT} = External voltage for measuring switching times.

Fig. 15. Test circuit for measuring switching times

Table 11. Test data

| Supply voltage | Input | | Load | | V_{EXT} | | |
|------------------|----------|---------------|-------|--------------|--------------------|--------------------|--------------------|
| V_{CC} | V_I | t_r, t_f | C_L | R_L | t_{PLH}, t_{PHL} | t_{PZH}, t_{PHZ} | t_{PZL}, t_{PLZ} |
| 1.65 V to 1.95 V | V_{CC} | ≤ 2.0 ns | 30 pF | 1 k Ω | open | GND | $2V_{CC}$ |
| 2.3 V to 2.7 V | V_{CC} | ≤ 2.0 ns | 30 pF | 500 Ω | open | GND | $2V_{CC}$ |
| 2.7 V | 2.7 V | ≤ 2.5 ns | 50 pF | 500 Ω | open | GND | 6 V |
| 3.0 V to 3.6 V | 2.7 V | ≤ 2.5 ns | 50 pF | 500 Ω | open | GND | 6 V |
| 4.5 V to 5.5 V | V_{CC} | ≤ 2.5 ns | 50 pF | 500 Ω | open | GND | $2V_{CC}$ |

11.2. Additional dynamic characteristics

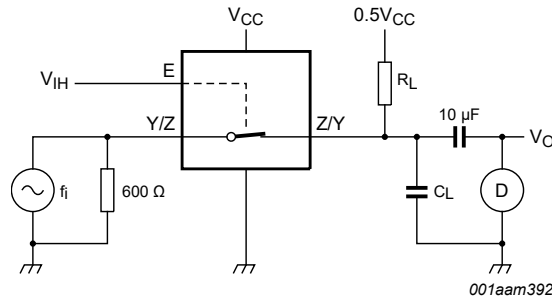
Table 12. Additional dynamic characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); $T_{amb} = 25$ °C.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit | |
|--------|---------------------------|--|-----|-------|-----|------|--|
| THD | total harmonic distortion | $R_L = 10$ k Ω ; $C_L = 50$ pF; $f_i = 1$ kHz; see Fig. 16 | | | | | |
| | | $V_{CC} = 1.65$ V | - | 0.032 | - | % | |
| | | $V_{CC} = 2.3$ V | - | 0.008 | - | % | |
| | | $V_{CC} = 3.0$ V | - | 0.006 | - | % | |
| | | $V_{CC} = 4.5$ V | - | 0.001 | - | % | |
| | | $R_L = 10$ k Ω ; $C_L = 50$ pF; $f_i = 10$ kHz; see Fig. 16 | | | | | |
| | | $V_{CC} = 1.65$ V | - | 0.068 | - | % | |
| | | $V_{CC} = 2.3$ V | - | 0.009 | - | % | |
| | | $V_{CC} = 3.0$ V | - | 0.008 | - | % | |
| | | $V_{CC} = 4.5$ V | - | 0.006 | - | % | |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------------------------|--------------------------|---|-----|-------|-----|------|
| $f_{(-3dB)}$ | -3 dB frequency response | $R_L = 600 \Omega$; $C_L = 50 \text{ pF}$; see Fig. 17 | | | | |
| | | $V_{CC} = 1.65 \text{ V}$ | - | 135 | - | MHz |
| | | $V_{CC} = 2.3 \text{ V}$ | - | 145 | - | MHz |
| | | $V_{CC} = 3.0 \text{ V}$ | - | 150 | - | MHz |
| | | $V_{CC} = 4.5 \text{ V}$ | - | 155 | - | MHz |
| | | $R_L = 50 \Omega$; $C_L = 5 \text{ pF}$; see Fig. 17 | | | | |
| | | $V_{CC} = 1.65 \text{ V}$ | - | > 500 | - | MHz |
| | | $V_{CC} = 2.3 \text{ V}$ | - | > 500 | - | MHz |
| | | $V_{CC} = 3.0 \text{ V}$ | - | > 500 | - | MHz |
| | | $V_{CC} = 4.5 \text{ V}$ | - | > 500 | - | MHz |
| | | $R_L = 50 \Omega$; $C_L = 10 \text{ pF}$; see Fig. 17 | | | | |
| | | $V_{CC} = 1.65 \text{ V}$ | - | 200 | - | MHz |
| | | $V_{CC} = 2.3 \text{ V}$ | - | 350 | - | MHz |
| | | $V_{CC} = 3.0 \text{ V}$ | - | 410 | - | MHz |
| $V_{CC} = 4.5 \text{ V}$ | - | 440 | - | MHz | | |
| α_{iso} | isolation (OFF-state) | $R_L = 600 \Omega$; $C_L = 50 \text{ pF}$; $f_i = 1 \text{ MHz}$; see Fig. 18 | | | | |
| | | $V_{CC} = 1.65 \text{ V}$ | - | -46 | - | dB |
| | | $V_{CC} = 2.3 \text{ V}$ | - | -46 | - | dB |
| | | $V_{CC} = 3.0 \text{ V}$ | - | -46 | - | dB |
| | | $V_{CC} = 4.5 \text{ V}$ | - | -46 | - | dB |
| | | $R_L = 50 \Omega$; $C_L = 5 \text{ pF}$; $f_i = 1 \text{ MHz}$; see Fig. 18 | | | | |
| | | $V_{CC} = 1.65 \text{ V}$ | - | -37 | - | dB |
| | | $V_{CC} = 2.3 \text{ V}$ | - | -37 | - | dB |
| | | $V_{CC} = 3.0 \text{ V}$ | - | -37 | - | dB |
| | | $V_{CC} = 4.5 \text{ V}$ | - | -37 | - | dB |
| V_{ct} | crosstalk voltage | between digital input and switch; $R_L = 600 \Omega$; $C_L = 50 \text{ pF}$; $f_i = 1 \text{ MHz}$; $t_r = t_f = 2 \text{ ns}$; see Fig. 19 | | | | |
| | | $V_{CC} = 1.65 \text{ V}$ | - | 69 | - | mV |
| | | $V_{CC} = 2.3 \text{ V}$ | - | 87 | - | mV |
| | | $V_{CC} = 3.0 \text{ V}$ | - | 156 | - | mV |
| | | $V_{CC} = 4.5 \text{ V}$ | - | 302 | - | mV |
| Q_{inj} | charge injection | $C_L = 0.1 \text{ nF}$; $V_{gen} = 0 \text{ V}$; $R_{gen} = 0 \Omega$; $f_i = 1 \text{ MHz}$; $R_L = 1 \text{ M}\Omega$; see Fig. 20 | | | | |
| | | $V_{CC} = 1.8 \text{ V}$ | - | 3.3 | - | pC |
| | | $V_{CC} = 2.5 \text{ V}$ | - | 4.1 | - | pC |
| | | $V_{CC} = 3.3 \text{ V}$ | - | 5.0 | - | pC |
| | | $V_{CC} = 4.5 \text{ V}$ | - | 6.4 | - | pC |
| | | $V_{CC} = 5.5 \text{ V}$ | - | 7.5 | - | pC |

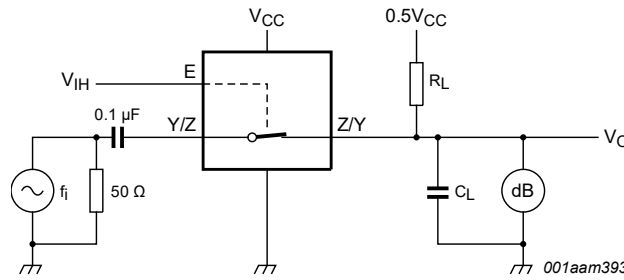
11.3. Test circuits



Test conditions:

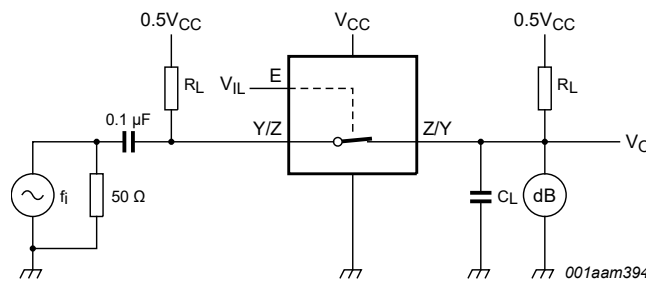
- $V_{CC} = 1.65\text{ V}$: $V_i = 1.4\text{ V (p-p)}$.
- $V_{CC} = 2.3\text{ V}$: $V_i = 2\text{ V (p-p)}$.
- $V_{CC} = 3\text{ V}$: $V_i = 2.5\text{ V (p-p)}$.
- $V_{CC} = 4.5\text{ V}$: $V_i = 4\text{ V (p-p)}$.

Fig. 16. Test circuit for measuring total harmonic distortion



Adjust f_i voltage to obtain 0 dBm level at output. Increase f_i frequency until dB meter reads -3 dB.

Fig. 17. Test circuit for measuring the frequency response when switch is in ON-state



Adjust f_i voltage to obtain 0 dBm level at input.

Fig. 18. Test circuit for measuring isolation (OFF-state)

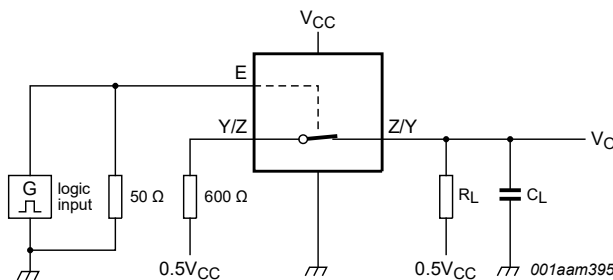
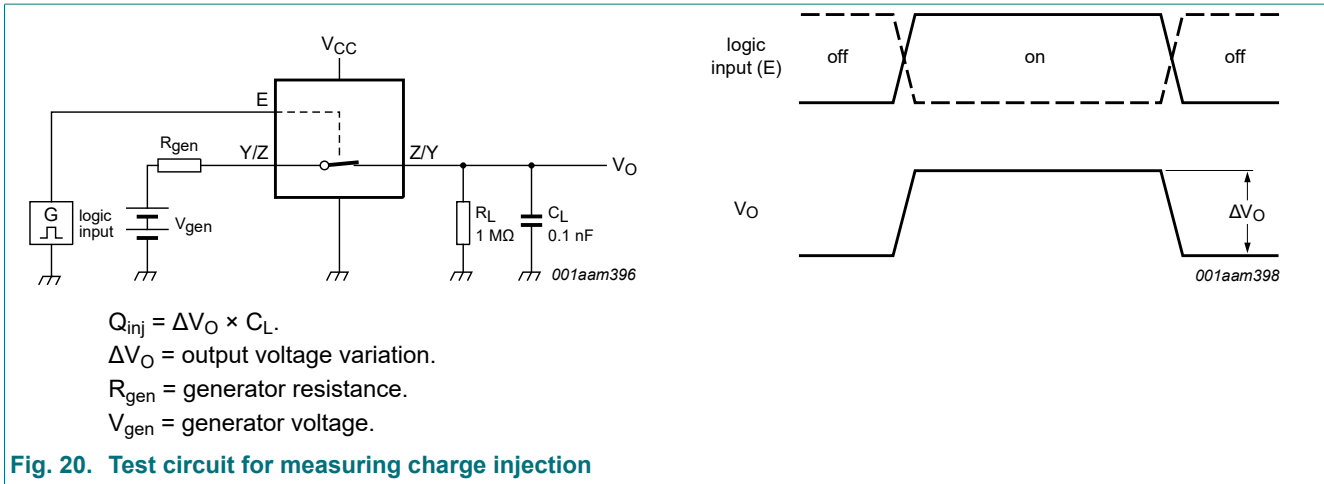


Fig. 19. Test circuit for measuring crosstalk between digital input and switch



12. Package outline

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm

SOT353-1

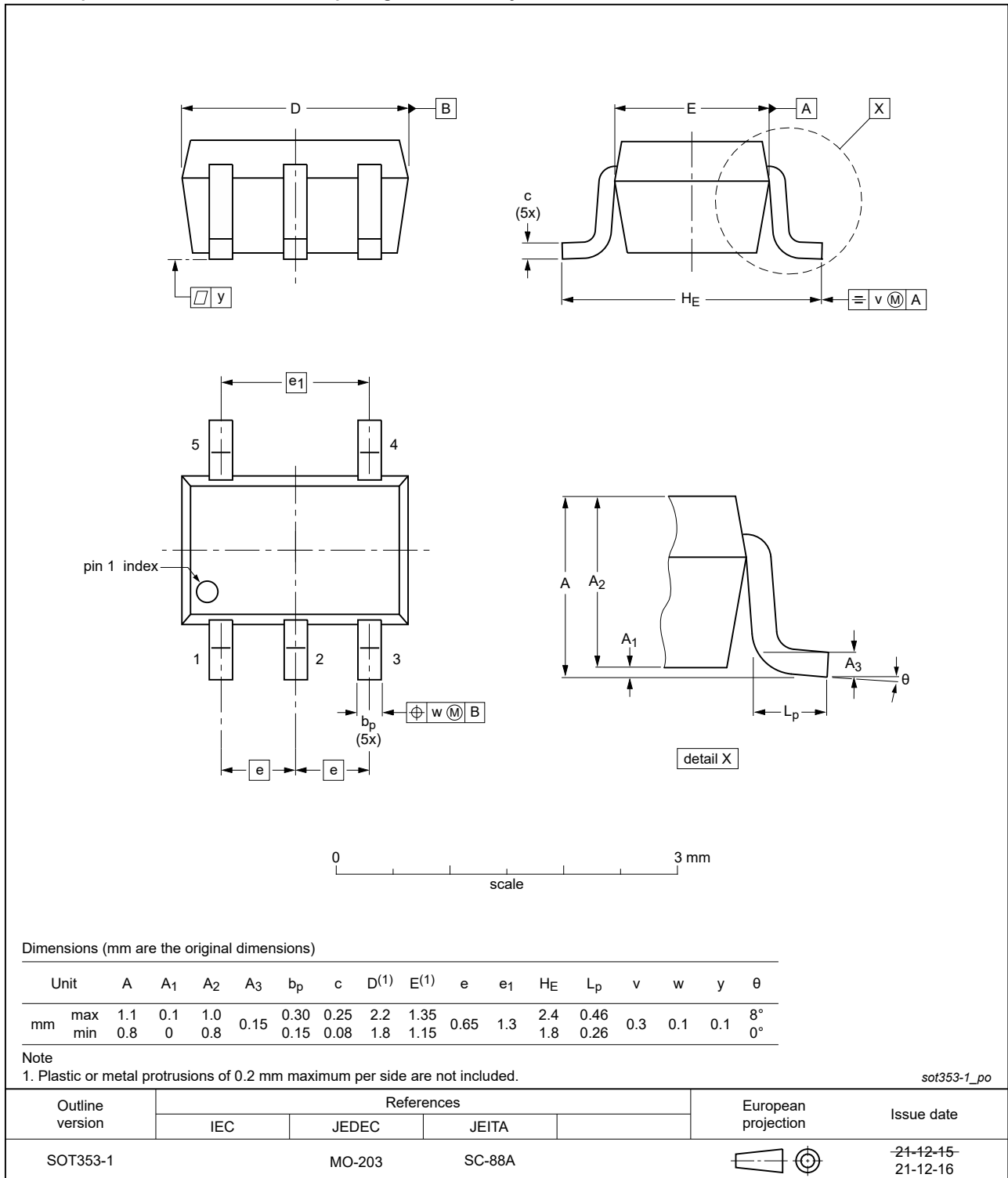


Fig. 21. Package outline SOT353-1 (TSSOP5)

Plastic surface-mounted package; 5 leads

SOT753

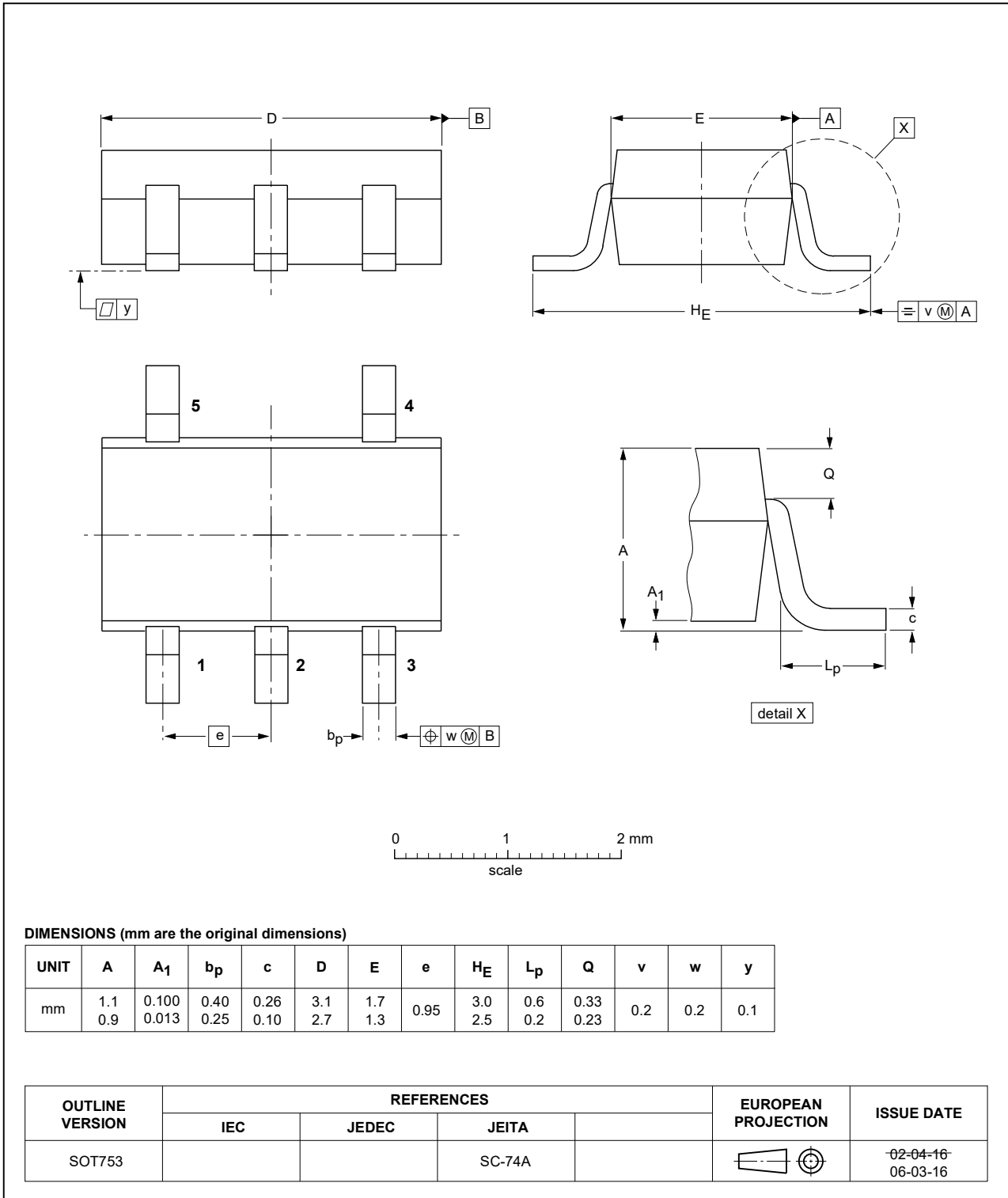


Fig. 22. Package outline SOT753 (SC-74A)

XSON5: Plastic thermal enhanced extremely thin small outline package with side-wettable flanks (SWF); no leads; 5 terminals; body 1.1 × 0.85 × 0.5 mm

SOT8065-1

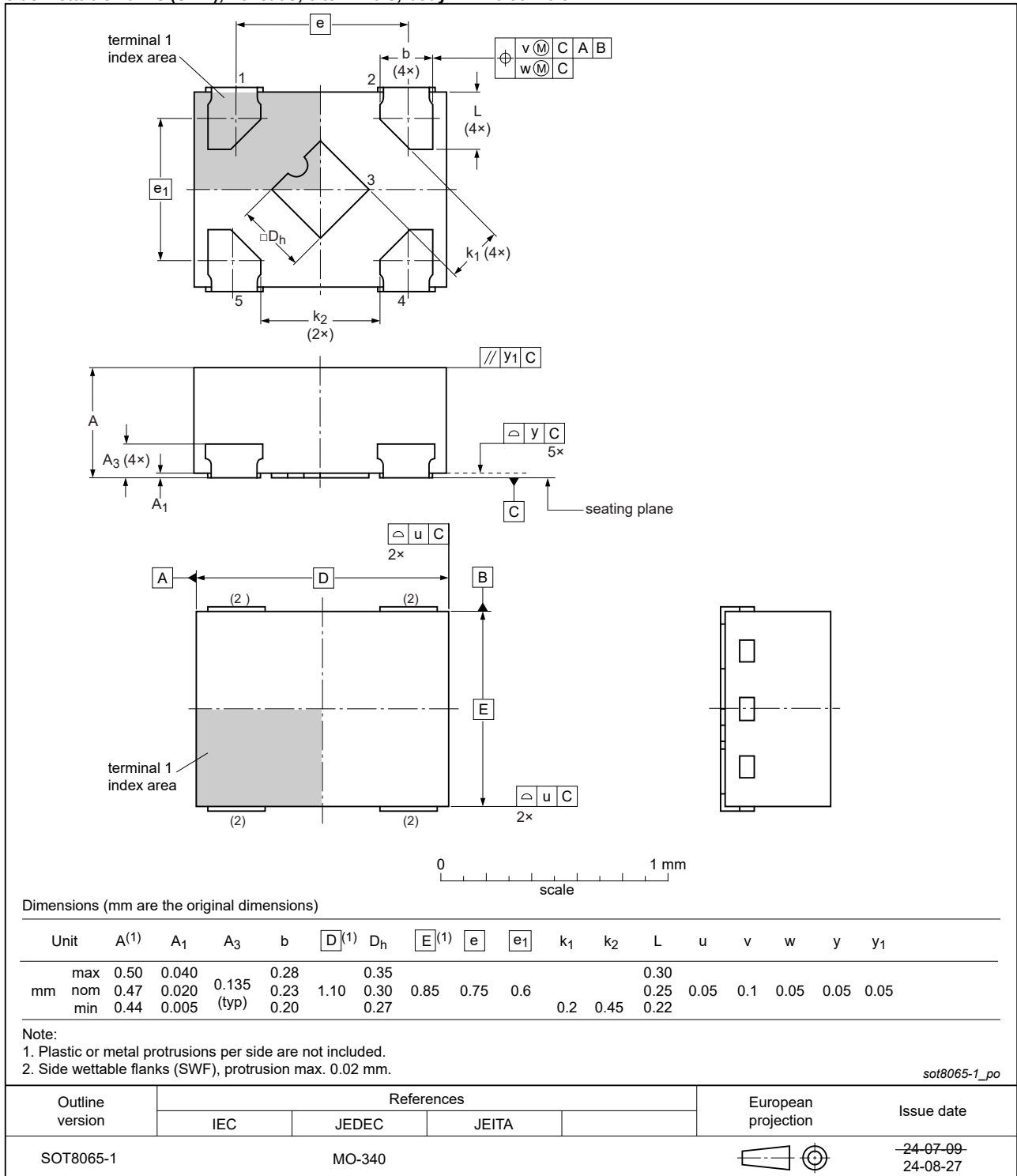


Fig. 23. Package outline SOT8065-1 (XSON5)

13. Abbreviations

Table 13. Abbreviations

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

14. Revision history

Table 14. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------------|---|--------------------|---------------|--------------------|
| 74LVC1G66_Q100 v.6.1 | 20240903 | Product data sheet | - | 74LVC1G66_Q100 v.6 |
| Modifications: | <ul style="list-style-type: none"> Fig. 23: Added JEDEC reference MO-340 to SOT8065-1 package outline drawing. | | | |
| 74LVC1G66_Q100 v.6 | 20240712 | Product data sheet | - | 74LVC1G66_Q100 v.5 |
| Modifications: | <ul style="list-style-type: none"> Type number 74LVC1G66GZ-Q100 (SOT8065-1/XSON5) added. | | | |
| 74LVC1G66_Q100 v.5 | 20230824 | Product data sheet | - | 74LVC1G66_Q100 v.4 |
| Modifications: | <ul style="list-style-type: none"> Section 2: ESD specification updated according to the latest JEDEC standard. | | | |
| 74LVC1G66_Q100 v.4 | 20220112 | Product data sheet | - | 74LVC1G66_Q100 v.3 |
| Modifications: | <ul style="list-style-type: none"> Fig. 21: Package outline drawing SOT353-1 (TSSOP5) has changed. | | | |
| 74LVC1G66_Q100 v.3 | 20210608 | Product data sheet | - | 74LVC1G66_Q100 v.2 |
| Modifications: | <ul style="list-style-type: none"> The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. Legal texts have been adapted to the new company name where appropriate. Section 1 updated. Section 8: Derating values for P_{tot} total power dissipation updated. | | | |
| 74LVC1G66_Q100 v.2 | 20161209 | Product data sheet | - | 74LVC1G66_Q100 v.1 |
| Modifications: | <ul style="list-style-type: none"> Table 7: The maximum limits for leakage current and supply current have changed. | | | |
| 74LVC1G66_Q100 v.1 | 20120801 | Product data sheet | - | - |

15. Legal information

Data sheet status

| Document status [1][2] | Product status [3] | Definition |
|--------------------------------|--------------------|---|
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| 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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Contents

| | |
|--|-----------|
| 1. General description | 1 |
| 2. Features and benefits | 1 |
| 3. Ordering information | 1 |
| 4. Marking | 2 |
| 5. Functional diagram | 2 |
| 6. Pinning information | 2 |
| 6.1. Pinning..... | 2 |
| 6.2. Pin description..... | 2 |
| 7. Functional description | 3 |
| 8. Limiting values | 3 |
| 9. Recommended operating conditions | 3 |
| 10. Static characteristics | 4 |
| 10.1. Test circuits..... | 4 |
| 10.2. ON resistance..... | 5 |
| 10.3. ON resistance test circuit and graphs..... | 6 |
| 11. Dynamic characteristics | 8 |
| 11.1. Waveforms and test circuit..... | 9 |
| 11.2. Additional dynamic characteristics..... | 10 |
| 11.3. Test circuits..... | 12 |
| 12. Package outline | 14 |
| 13. Abbreviations | 17 |
| 14. Revision history | 17 |
| 15. Legal information | 18 |

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