# 74HC1G66-Q100; 74HCT1G66-Q100
## Single-pole single-throw analog switch

**Rev. 1 — 16 September 2013**                    **Product data sheet**

## 1.  General description

The 74HC1G66-Q100; 74HCT1G66-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. Inputs include clamp diodes that enable the use of current limiting resistors to interface inputs to voltages in excess of $V_{CC}$.

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 2.0 V to 10.0 V for the 74HC1G66-Q100
- Very low ON resistance:
    - 45 $\Omega$ (typ.) at $V_{CC}$ = 4.5 V
    - 30 $\Omega$ (typ.) at $V_{CC}$ = 6.0 V
    - 25 $\Omega$ (typ.) at $V_{CC}$ = 9.0 V
- High noise immunity
- Low power dissipation
- Multiple package options
- 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 pf, R = 0 $\Omega$)

## 3.  Ordering information

**Table 1.  Ordering information**

| Type number | Package | | | |
| --- | --- | --- | --- | --- |
| | Temperature range | Name | Description | Version |
| 74HC1G66GW-Q100 | $-40$ °C to $+125$ °C | TSSOP5 | plastic thin shrink small outline package; 5 leads; body width 1.25 mm | SOT353-1 |
| 74HCT1G66GW-Q100 | | | | |
| 74HC1G66GV-Q100 | $-40$ °C to $+125$ °C | SC-74A | plastic surface-mounted package; 5 leads | SOT753 |
| 74HCT1G66GV-Q100 | | | | |

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## 4. Marking

**Table 2. Marking codes**

| Type number | Marking |
|---|---|
| 74HC1G66GW-Q100 | HL |
| 74HCT1G66GW-Q100 | TL |
| 74HC1G66GV-Q100 | H66 |
| 74HCT1G66GV-Q100 | T66 |

## 5. Functional diagram
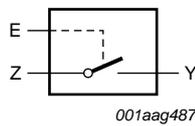


**Fig 1. Logic symbol**
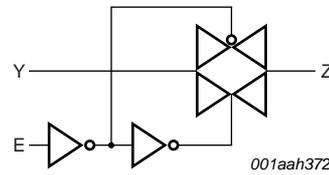


**Fig 2. Logic diagram**

## 6. Pinning information

### 6.1 Pinning
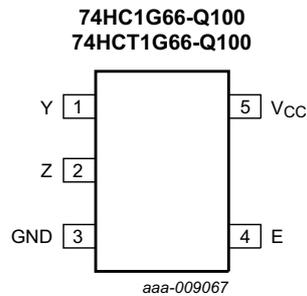


**Fig 3. Pin configuration SOT353-1 and SOT753**

### 6.2 Pin description

**Table 3. Pin description**

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

## 7. Functional description

**Table 4.    Function table[1]**

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

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

## 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 | +11.0 | V |
| $I_{IK}$ | input clamping current | $V_I < -0.5$ V or $V_I > V_{CC} + 0.5$ V | [1] | - | ±20 | mA |
| $I_{SK}$ | switch clamping current | $V_I < -0.5$ V or $V_I > V_{CC} + 0.5$ V | [1] | - | ±20 | mA |
| $I_{SW}$ | switch current | $V_{SW} > -0.5$ V or $V_{SW} < V_{CC} + 0.5$ V | | - | ±25 | mA |
| $I_{CC}$ | supply current | | | - | 50 | mA |
| $I_{GND}$ | ground current | | | −50 | - | mA |
| $T_{stg}$ | storage temperature | | | −65 | +150 | °C |
| $P_{tot}$ | total power dissipation | $T_{amb} = -40$ °C to +125 °C | [2] | - | 250 | mW |

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

[2]    For TSSOP5 and SC-74A packages: above 87.5 °C the value of $P_{tot}$ derates linearly with 4.0 mW/K.

## 9. Recommended operating conditions

**Table 6.    Recommended operating conditions**

*Voltages are referenced to GND (ground = 0 V).[1]*

| Symbol | Parameter | Conditions | 74HC1G66-Q100 | | | 74HCT1G66-Q100 | | | 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 |
| $V_{SW}$ | switch voltage | | 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 | $V_{CC} = 2.0$ V | - | - | 625 | - | - | - | ns/V |
| | | $V_{CC} = 4.5$ V | - | 1.67 | 139 | - | 1.67 | 139 | ns/V |
| | | $V_{CC} = 6.0$ V | - | - | 83 | - | - | - | ns/V |
| | | $V_{CC} = 10.0$ V | - | - | 35 | - | - | - | ns/V |

[1]    To avoid drawing $V_{CC}$ current from pin Z, when switch current flows in pin Y, the voltage drop across the bidirectional switch must not exceed 0.4 V. If the switch current flows into pin Z, no $V_{CC}$ current flows from terminal Y. In this case, the voltage drop across the switch is unlimited, but the voltage at pins Y and Z may not exceed $V_{CC}$ or GND.

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## 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 | |
| **74HC1G66-Q100** | | | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 2.0 V | 1.5 | 1.2 | - | 1.5 | - | V |
| | | $V_{CC}$ = 4.5 V | 3.15 | 2.4 | - | 3.15 | - | V |
| | | $V_{CC}$ = 6.0 V | 4.2 | 3.2 | - | 4.2 | - | V |
| | | $V_{CC}$ = 9.0 V | 6.3 | 4.7 | - | 6.3 | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 2.0 V | - | 0.8 | 0.5 | - | 0.5 | V |
| | | $V_{CC}$ = 4.5 V | - | 2.1 | 1.35 | - | 1.35 | V |
| | | $V_{CC}$ = 6.0 V | - | 2.8 | 1.8 | - | 1.8 | V |
| | | $V_{CC}$ = 9.0 V | - | 4.3 | 2.7 | - | 2.7 | V |
| $I_I$ | input leakage current | E; $V_I$ = $V_{CC}$ or GND | | | | | | |
| | | $V_{CC}$ = 6.0 V | - | 0.1 | 1.0 | - | 1.0 | µA |
| | | $V_{CC}$ = 10.0 V | - | 0.2 | 2.0 | - | 2.0 | µA |
| $I_{S(OFF)}$ | OFF-state leakage current | Y or Z; $V_{CC}$ = 10 V; see Figure 4 | - | 0.1 | 1.0 | - | 1.0 | µA |
| $I_{S(ON)}$ | ON-state leakage current | Y or Z; $V_{CC}$ = 10 V; see Figure 5 | - | 0.1 | 1.0 | - | 1.0 | µA |
| $I_{CC}$ | supply current | E, Y or Z; $V_I$ = $V_{CC}$ or GND; $V_{SW}$ = GND or $V_{CC}$ | | | | | | |
| | | $V_{CC}$ = 6.0 V | - | 1.0 | 10 | - | 20 | µA |
| | | $V_{CC}$ = 10.0 V | - | 2.0 | 20 | - | 40 | µA |
| $C_I$ | input capacitance | | - | 1.5 | - | - | - | pF |
| $C_{S(ON)}$ | ON-state capacitance | | - | 8 | - | - | - | pF |

**Table 7.** **Static characteristics** *…continued*
*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 | |
| **74HCT1G66-Q100** | | | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | 2.0 | 1.6 | - | 2.0 | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | 0.1 | 1.2 | 0.8 | - | 0.8 | V |
| $I_I$ | input leakage current | E; $V_I$ = $V_{CC}$ or GND; $V_{CC}$ = 5.5 V | - | 0.1 | 1.0 | - | 1.0 | µA |
| $I_{S(OFF)}$ | OFF-state leakage current | Y or Z; $V_{CC}$ = 5.5 V; see Figure 4 | - | 0.1 | 1.0 | - | 1.0 | µA |
| $I_{S(ON)}$ | ON-state leakage current | Y or Z; $V_{CC}$ = 5.5 V; see Figure 5 | - | 0.1 | 1.0 | - | 1.0 | µA |
| $I_{CC}$ | supply current | E, Y or Z; $V_I$ = $V_{CC}$ or GND; $V_{SW}$ = GND or $V_{CC}$; $V_{CC}$ = 4.5 V to 5.5 V | - | 1 | 10 | - | 20 | µA |
| $\Delta I_{CC}$ | additional supply current | $V_I$ = $V_{CC}$ − 2.1 V; $V_{CC}$ = 4.5 V to 5.5 V; $I_O$ = 0 A | - | - | 500 | - | 850 | µA |
| $C_I$ | input capacitance | | - | 1.5 | - | - | - | pF |
| $C_{S(ON)}$ | ON-state capacitance | | - | 8 | - | - | - | pF |

[1] Typical values are measured at $T_{amb}$ = 25 °C.

## 10.1 Test circuits



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

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



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

**Fig 5.** **Test circuit for measuring ON-state leakage current**

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## 10.2  ON resistance

**Table 8.   ON resistance**

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

| Symbol | Parameter | Conditions | –40 °C to +85 °C | | | –40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ[2] | Max | Min | Max | |
| **74HC1G66-Q100[1]** | | | | | | | | |
| $R_{ON(peak)}$ | ON resistance (peak) | $V_I$ = GND to $V_{CC}$; see Figure 6 | | | | | | |
| | | $I_{SW}$ = 0.1 mA; $V_{CC}$ = 2.0 V | - | - | - | - | - | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 4.5 V | - | 42 | 118 | - | 142 | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 6.0 V | - | 31 | 105 | - | 126 | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 9.0 V | - | 23 | 88 | - | 105 | $\Omega$ |
| $R_{ON(rail)}$ | ON resistance (rail) | $V_I$ = GND; see Figure 6 | | | | | | |
| | | $I_{SW}$ = 0.1 mA; $V_{CC}$ = 2.0 V | - | 75 | - | - | - | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 4.5 V | - | 29 | 95 | - | 115 | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 6.0 V | - | 23 | 82 | - | 100 | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 9.0 V | - | 18 | 70 | - | 80 | $\Omega$ |
| | | $V_I$ = $V_{CC}$; see Figure 6 | | | | | | |
| | | $I_{SW}$ = 0.1 mA; $V_{CC}$ = 2.0 V | - | 75 | - | - | - | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 4.5 V | - | 35 | 106 | - | 128 | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 6.0 V | - | 27 | 94 | - | 113 | $\Omega$ |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 9.0 V | - | 21 | 78 | - | 95 | $\Omega$ |
| **74HCT1G66-Q100** | | | | | | | | |
| $R_{ON(peak)}$ | ON resistance (peak) | $V_I$  = GND to $V_{CC}$; see Figure 6 | | | | | | |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 4.5 V | - | 42 | 118 | - | 142 | $\Omega$ |
| $R_{ON(rail)}$ | ON resistance (rail) | $V_I$  = GND; see Figure 6 | | | | | | |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 4.5 V | - | 29 | 95 | - | 115 | $\Omega$ |
| | | $V_I$  = $V_{CC}$; see Figure 6 | | | | | | |
| | | $I_{SW}$ = 1 mA; $V_{CC}$ = 4.5 V | - | 35 | 106 | - | 128 | $\Omega$ |

[1]   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.

[2]   Typical values are measured at $T_{amb}$ = 25 °C.

## 10.3 ON resistance test circuit and graphs



$R_{ON} = V_{SW} / I_{SW}$.
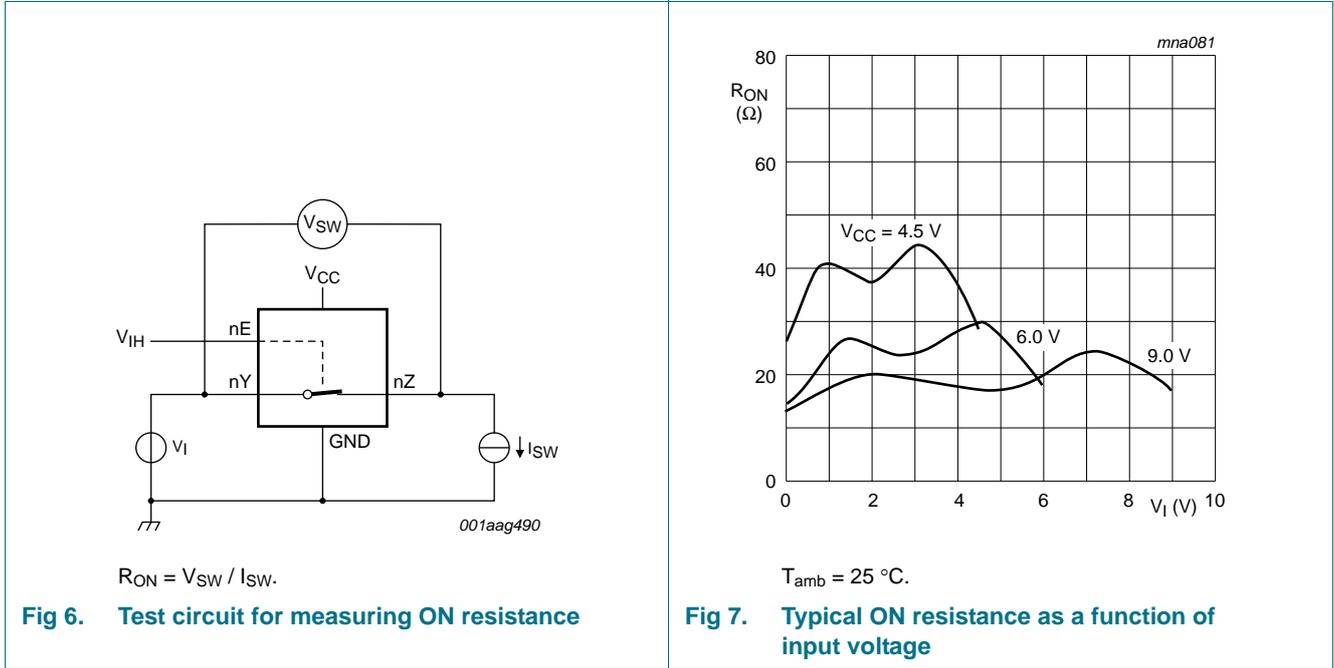
**Fig 6.** **Test circuit for measuring ON resistance**



$T_{amb} = 25\ °C$.

**Fig 7.** **Typical ON resistance as a function of input voltage**

# 11. Dynamic characteristics

**Table 9.    Dynamic characteristics**
*Voltages are referenced to GND (ground = 0 V); $C_L$ = 50 pF; $R_L$ = 1 kΩ, unless otherwise specified;*
*For test circuit, see Figure 10.*

| Symbol | Parameter | Conditions | | –40 °C to +85 °C | | | –40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **Min** | **Typ[1]** | **Max** | **Min** | **Max** | |
| **74HC1G66-Q100** | | | | | | | | | |
| $t_{pd}$ | propagation delay | Y to Z or Z to Y; $R_L = \infty\ \Omega$; see Figure 8 | [2] | | | | | | |
| | | $V_{CC}$ = 2.0 V | | - | 8 | 75 | - | 90 | ns |
| | | $V_{CC}$ = 4.5 V | | - | 3 | 15 | - | 18 | ns |
| | | $V_{CC}$ = 6.0 V | | - | 2 | 13 | - | 15 | ns |
| | | $V_{CC}$ = 9.0 V | | - | 1 | 10 | - | 12 | ns |
| $t_{en}$ | enable time | E to Y or Z; see Figure 9 | [2] | | | | | | |
| | | $V_{CC}$ = 2.0 V | | - | 50 | 125 | - | 150 | ns |
| | | $V_{CC}$ = 4.5 V | | - | 16 | 25 | - | 30 | ns |
| | | $V_{CC}$ = 5.0 V; $C_L$ = 15 pF | | - | 11 | - | - | - | ns |
| | | $V_{CC}$ = 6.0 V | | - | 13 | 21 | - | 26 | ns |
| | | $V_{CC}$ = 9.0 V | | - | 9 | 16 | - | 20 | ns |

**Table 9.    Dynamic characteristics** *…continued*

*Voltages are referenced to GND (ground = 0 V); $C_L$ = 50 pF; $R_L$ = 1 k$\Omega$, unless otherwise specified;*
*For test circuit, see Figure 10.*

| Symbol | Parameter | Conditions | | –40 °C to +85 °C | | | –40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ[1] | Max | Min | Max | |
| $t_{dis}$ | disable time | E to Y or Z; see Figure 9 | [2] | | | | | | |
| | | $V_{CC}$ = 2.0 V | | - | 27 | 190 | - | 225 | ns |
| | | $V_{CC}$ = 4.5 V | | - | 16 | 38 | - | 45 | ns |
| | | $V_{CC}$ = 5.0 V; $C_L$ = 15 pF | | - | 11 | - | - | - | ns |
| | | $V_{CC}$ = 6.0 V | | - | 14 | 33 | - | 38 | ns |
| | | $V_{CC}$ = 9.0 V | | - | 12 | 16 | - | 20 | ns |
| $C_{PD}$ | power dissipation capacitance | $V_I$ = GND to $V_{CC}$ | [3] | - | 9 | - | - | - | pF |
| **74HCT1G66-Q100** | | | | | | | | | |
| $t_{pd}$ | propagation delay | Y to Z or Z to Y; $R_L = \infty$ $\Omega$; see Figure 8 | [2] | | | | | | |
| | | $V_{CC}$ = 4.5 V | | - | 3 | 15 | - | 18 | ns |
| $t_{en}$ | enable time | E to Y or Z; see Figure 9 | [2] | | | | | | |
| | | $V_{CC}$ = 4.5 V | | - | 15 | 30 | - | 36 | ns |
| | | $V_{CC}$ = 5.0 V; $C_L$ = 15 pF | | - | 12 | - | - | - | ns |
| $t_{dis}$ | disable time | E to Y or Z; see Figure 9 | [2] | | | | | | |
| | | $V_{CC}$ = 4.5 V | | - | 13 | 44 | - | 53 | ns |
| | | $V_{CC}$ = 5.0 V; $C_L$ = 15 pF | | - | 12 | - | - | - | ns |
| $C_{PD}$ | power dissipation capacitance | $V_I$ = GND to $V_{CC}$ − 1.5 V | [3] | - | 9 | - | - | - | pF |

[1]  All typical values are measured at $T_{amb}$ = 25 °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 $P_D$ ($\mu$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 Volt;

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

## 11.1 Waveforms and test circuit
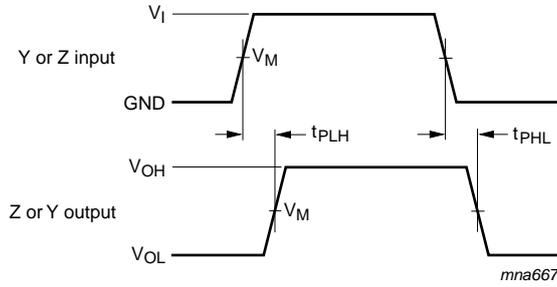


Measurement points are given in Table 10.

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

**Fig 8.    Input (Y or Z) to output (Z or Y) propagation delays**
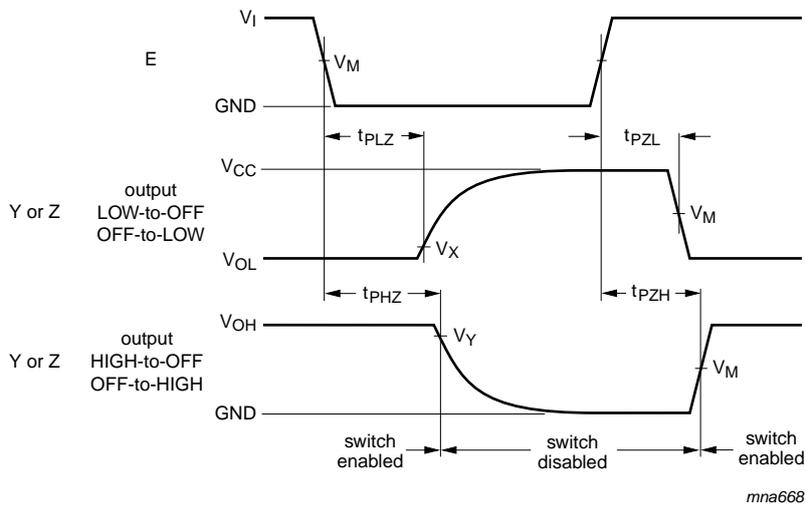


Measurement points are given in Table 10.

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

**Fig 9.    Enable and disable times**

**Table 10.    Measurement points**

| Type | Input | Output | | |
|---|---|---|---|---|
| | $V_M$ | $V_M$ | $V_X$ | $V_Y$ |
| 74HC1G66-Q100 | $0.5V_{CC}$ | $0.5V_{CC}$ | $V_{OL} + 10\%$ | $V_{OH} - 10\%$ |
| 74HCT1G66-Q100 | 1.3 V | 1.3 V | $V_{OL} + 10\%$ | $V_{OH} - 10\%$ |

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.

S1 = Test selection switch.
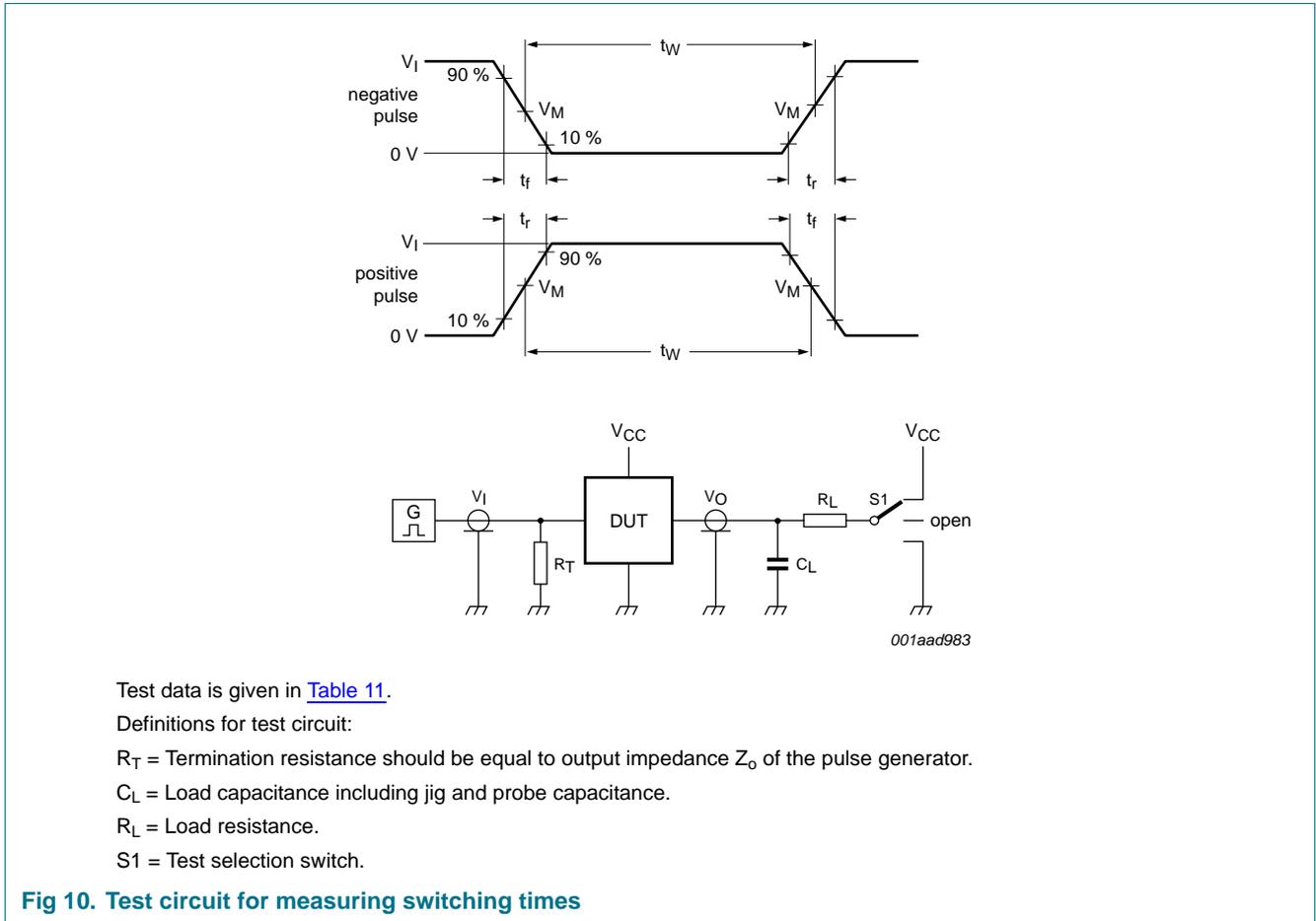
**Fig 10. Test circuit for measuring switching times**

**Table 11. Test data**

| Type | Input | | Load | | S1 position | | |
|---|---|---|---|---|---|---|---|
| | $V_I$ | $t_r$, $t_f$[1] | $C_L$ | $R_L$ | $t_{PHL}$, $t_{PLH}$ | $t_{PZH}$, $t_{PHZ}$ | $t_{PZL}$, $t_{PLZ}$ |
| 74HC1G66-Q100 | GND to $V_{CC}$ | 6 ns | 50 pF, 15 pF | 1 k$\Omega$, $\infty$ $\Omega$ | open | GND | $V_{CC}$ |
| 74HCT1G66-Q100 | GND to 3 V | 6 ns | 50 pF, 15 pF | 1 k$\Omega$, $\infty$ $\Omega$ | 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 74HC1G66-Q100 and 74HCT1G66-Q100**
*GND = 0 V; $t_r$ = $t_f$ = 6.0 ns; $C_L$ = 50 pF; unless otherwise specified. All typical values are measured at $T_{amb}$ = 25 °C.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| THD | total harmonic distortion | $f_i$ = 1 kHz; $R_L$ = 10 k$\Omega$; see Figure 11 | | | | % |
| | | $V_{CC}$ = 4.5 V; $V_I$ = 4.0 V (p-p) | - | 0.04 | - | % |
| | | $V_{CC}$ = 9.0 V; $V_I$ = 8.0 V (p-p) | - | 0.02 | - | % |
| | | $f_i$ = 10 kHz; $R_L$ = 10 k$\Omega$; see Figure 11 | | | | |
| | | $V_{CC}$ = 4.5 V; $V_I$ = 4.0 V (p-p) | - | 0.12 | - | % |
| | | $V_{CC}$ = 9.0 V; $V_I$ = 8.0 V (p-p) | - | 0.06 | - | % |

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**Table 12. Additional dynamic characteristics for 74HC1G66-Q100 and 74HCT1G66-Q100** *…continued*
*GND = 0 V; $t_r$ = $t_f$ = 6.0 ns; $C_L$ = 50 pF; unless otherwise specified. All typical values are measured at $T_{amb}$ = 25 °C.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $f_{(-3dB)}$ | −3 dB frequency response | $R_L$ = 50 Ω; $C_L$ = 10 pF; see Figure 12 and 13 | | | | |
| | | $V_{CC}$ = 4.5 V | - | 180 | - | MHz |
| | | $V_{CC}$ = 9.0 V | - | 200 | - | MHz |
| $\alpha_{iso}$ | isolation (OFF-state) | $R_L$ = 600 Ω; $f_i$ = 1 MHz; see Figure 14 and 15 | | | | |
| | | $V_{CC}$ = 4.5 V | - | −50 | - | dB |
| | | $V_{CC}$ = 9.0 V | - | −50 | - | dB |

## 11.3 Test circuits and graphs



*001aai678*
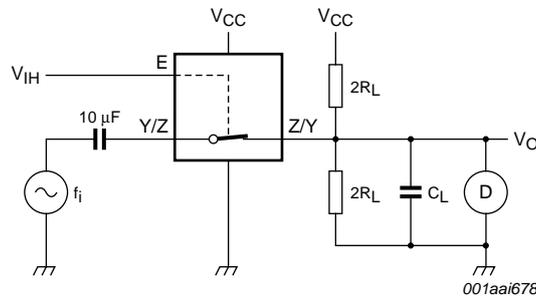
**Fig 11. Test circuit for measuring total harmonic distortion**



*001aai680*
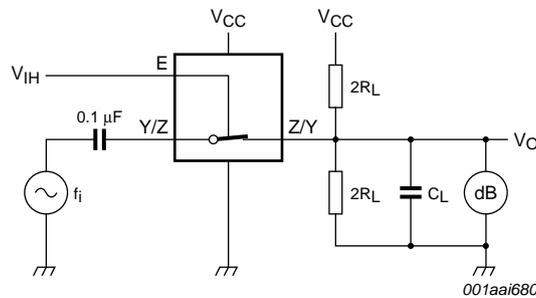
With $f_i$ = 1 MHz, adjust the switch input voltage for a 0 dBm level at the switch output (0 dBm = 1 mW into 50 Ω). Then Increase the input frequency until the dB meter reads −3 dB

**Fig 12. Test circuit for measuring the −3 dB frequency response**
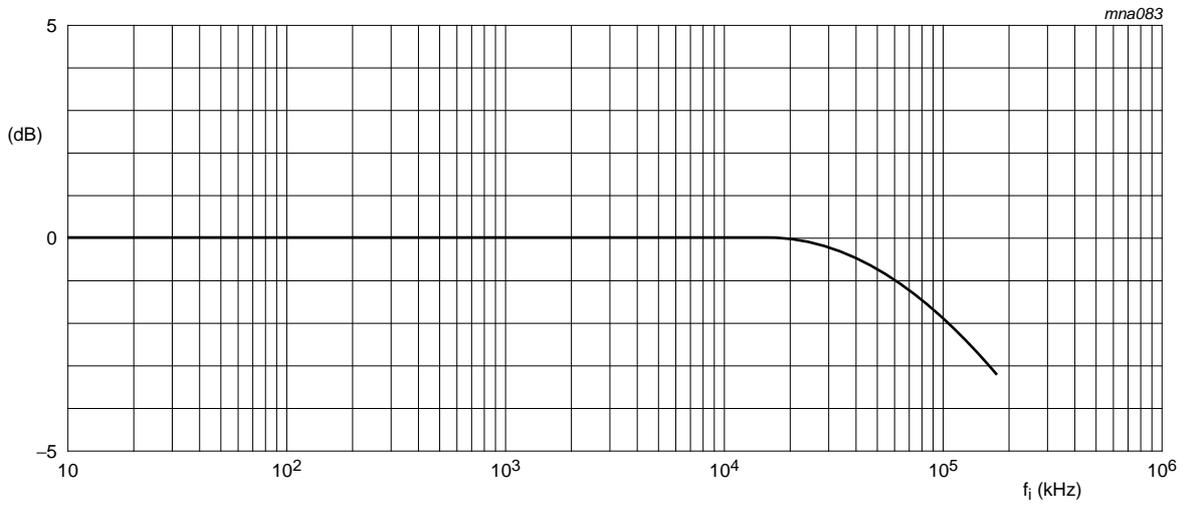
Test conditions: $V_{CC}$ = 4.5 V; GND = 0 V; $R_L$ = 50 $\Omega$; $R_{SOURCE}$ = 1 k$\Omega$.

**Fig 13. Typical −3 dB frequency response**
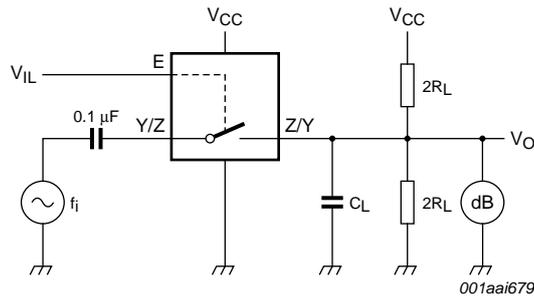
Adjust the switch input voltage for a 0 dBm level (0 dBm = 1 mW into 600 $\Omega$)

**Fig 14. Test circuit for measuring isolation (OFF-state)**
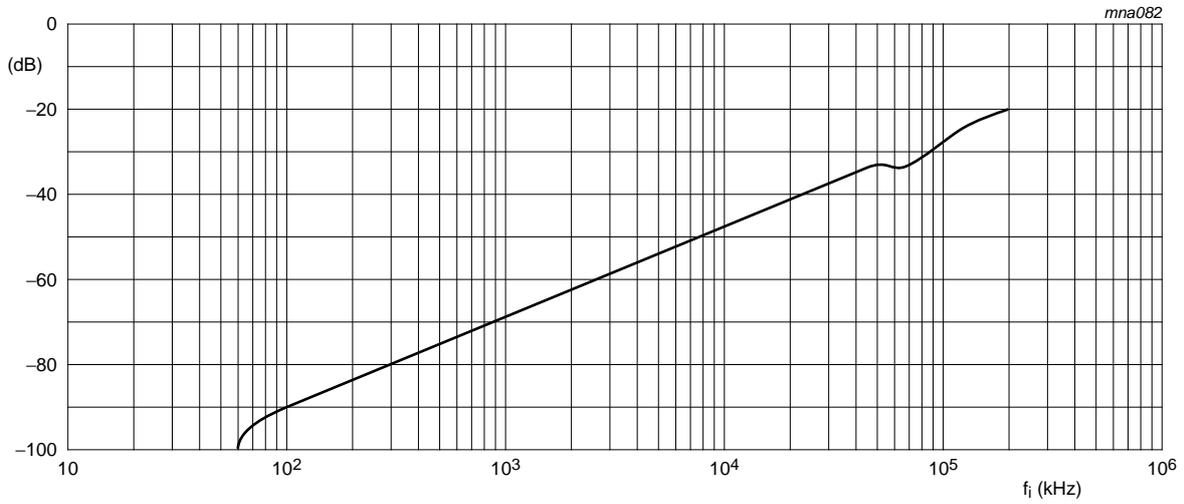
Test conditions: $V_{CC}$ = 4.5 V; GND = 0 V; $R_L$ = 50 $\Omega$; $R_{SOURCE}$ = 1 k$\Omega$.

**Fig 15.  Typical isolation (OFF-state) as a function of frequency**

74HC_HCT1G66_Q100

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**Product data sheet**

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## 12. Package outline

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm          SOT353-1



**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max. | A_1 | A_2 | A_3 | b_p | c | D[1] | E[1] | e | e_1 | H_E | L | L_p | v | w | y | Z[1] | θ |
|------|--------|-----|-----|-----|-----|---|------|------|---|-----|-----|---|-----|---|---|---|------|---|
| mm | 1.1 | 0.1 0 | 1.0 0.8 | 0.15 | 0.30 0.15 | 0.25 0.08 | 2.25 1.85 | 1.35 1.15 | 0.65 | 1.3 | 2.25 2.0 | 0.425 | 0.46 0.21 | 0.3 | 0.1 | 0.1 | 0.60 0.15 | 7° 0° |

**Note**

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|------|-------|---|---------------------|------------|
| | IEC | JEDEC | JEITA | | | |
| SOT353-1 | | MO-203 | SC-88A | | | ~~00-09-01~~ 03-02-19 |
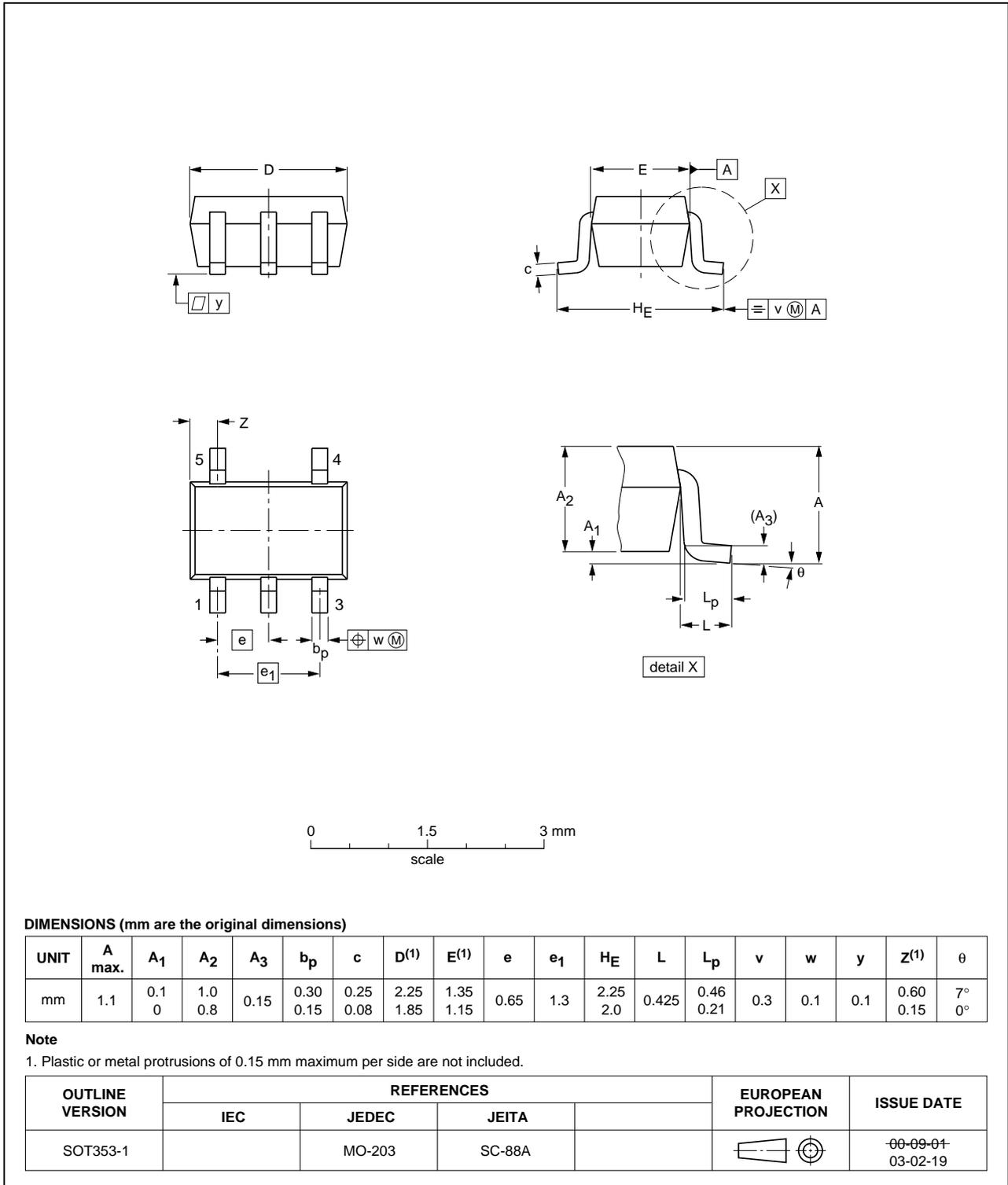
**Fig 16. Package outline SOT353-1 (TSSOP5)**

**Plastic surface-mounted package; 5 leads**

**SOT753**



**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | A₁ | bp | c | D | E | e | HE | Lp | Q | v | w | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1<br>0.9 | 0.100<br>0.013 | 0.40<br>0.25 | 0.26<br>0.10 | 3.1<br>2.7 | 1.7<br>1.3 | 0.95 | 3.0<br>2.5 | 0.6<br>0.2 | 0.33<br>0.23 | 0.2 | 0.2 | 0.1 |

| OUTLINE<br>VERSION | REFERENCES | | | | EUROPEAN<br>PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT753 | | | SC-74A | | | 02-04-16<br>06-03-16 |
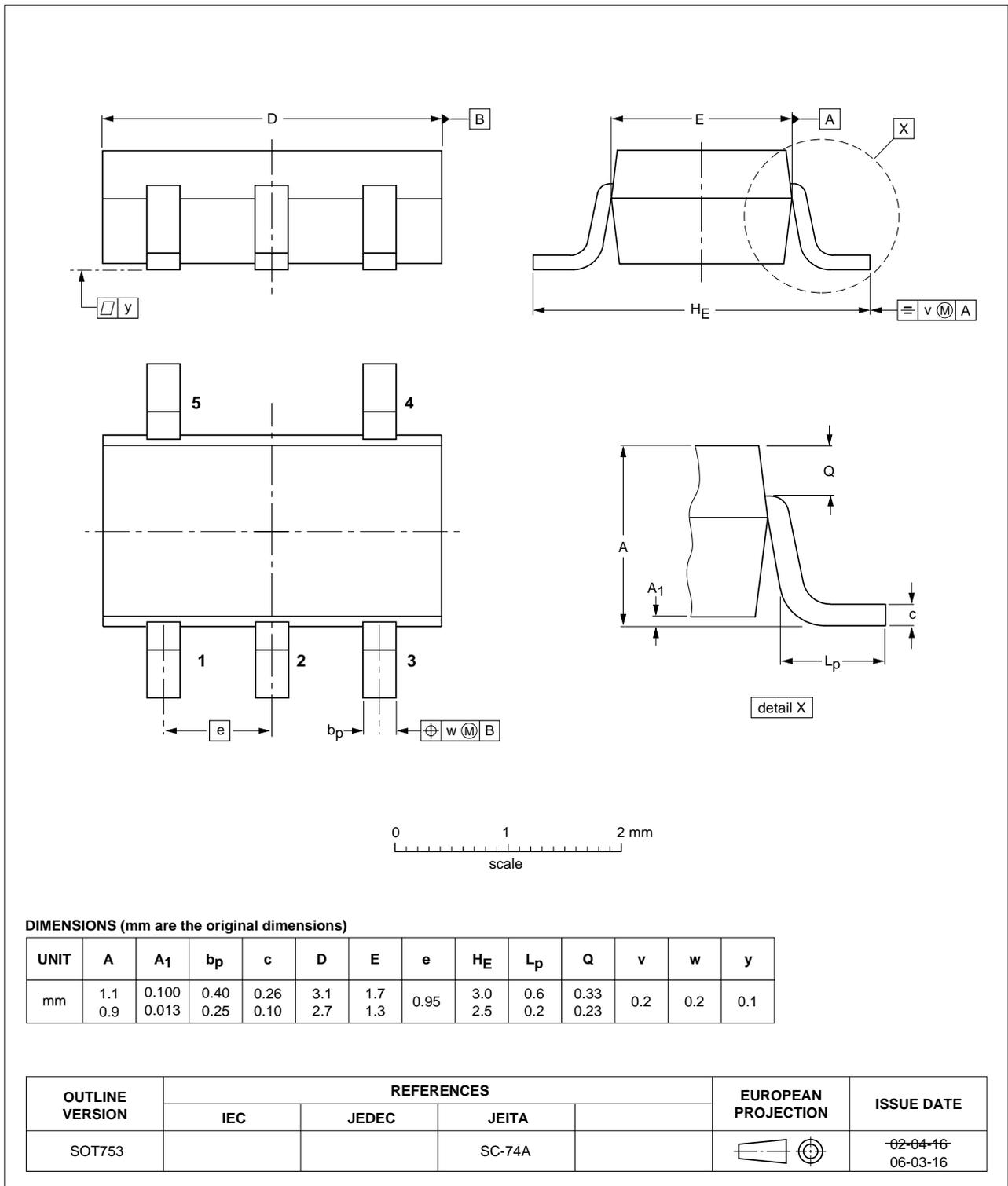
**Fig 17. Package outline SOT753 (SC-74A)**

## 13. Abbreviations

**Table 13.    Abbreviations**

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

## 14. Revision history

**Table 14.    Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74HC_HCT1G66_Q100 v.1 | 20130916 | Product data sheet | - | - |

## 15. Legal information

### 15.1 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".

[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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