

74HC2G17-Q100; 74HCT2G17-Q100

Dual non-inverting Schmitt trigger

Rev. 1 — 22 May 2013

Product data sheet

1. General description

The 74HC2G17-Q100; 74HCT2G17-Q100 are dual buffers with Schmitt-trigger inputs. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of V_{CC} . Schmitt trigger inputs transform slowly changing input signals into sharply defined jitter-free output signals.

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 $+85\text{ °C}$ and from -40 °C to $+125\text{ °C}$
- Input levels:
 - ◆ For 74HC2G17-Q100: CMOS level
 - ◆ For 74HCT2G17-Q100: TTL level
- Complies with JEDEC standard no. 7A
- High noise immunity
- ESD protection:
 - ◆ MIL-STD-883, method 3015 exceeds 2000 V
 - ◆ HBM JESD22-A114F exceeds 2000 V
 - ◆ MM JESD22-A115-A exceeds 200 V ($C = 200\text{ pF}$, $R = 0\ \Omega$)
- Low power dissipation
- Balanced propagation delays
- Unlimited input rise and fall times
- Multiple package options

3. Applications

- Wave and pulse shaper for highly noisy environments
- Astable multivibrators
- Monostable multivibrators

4. Ordering information

Table 1. Ordering information

| Type number | Package | | | Version |
|------------------|-------------------|-------|--|---------|
| | Temperature range | Name | Description | |
| 74HC2G17GW-Q100 | -40 °C to +125 °C | SC-88 | plastic surface-mounted package; 6 leads | SOT363 |
| 74HC2G17GV-Q100 | -40 °C to +125 °C | SC-74 | plastic surface-mounted package (TSOP6); 6 leads | SOT457 |
| 74HCT2G17GW-Q100 | -40 °C to +125 °C | SC-88 | plastic surface-mounted package; 6 leads | SOT363 |
| 74HCT2G17GV-Q100 | -40 °C to +125 °C | SC-74 | plastic surface-mounted package (TSOP6); 6 leads | SOT457 |

5. Marking

Table 2. Marking

| Type number | Marking code ^[1] |
|------------------|-----------------------------|
| 74HC2G17GW-Q100 | HV |
| 74HC2G17GV-Q100 | HV |
| 74HCT2G17GW-Q100 | TV |
| 74HCT2G17GV-Q100 | TV |

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

6. Functional diagram

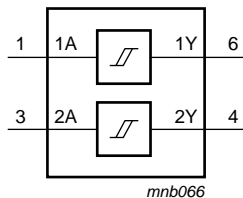


Fig 1. Logic symbol

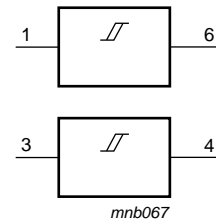


Fig 2. IEC logic symbol

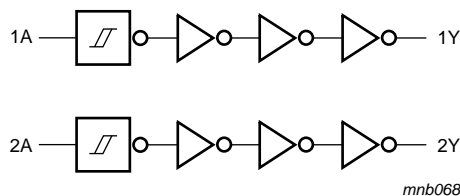


Fig 3. Logic diagram

7. Pinning information

7.1 Pinning

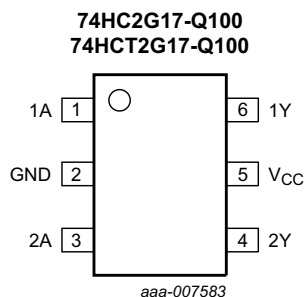


Fig 4. Pin configuration

7.2 Pin description

Table 3. Pin description

| Symbol | Pin | Description |
|-----------------|-----|----------------|
| 1A | 1 | data input |
| GND | 2 | ground (0 V) |
| 2A | 3 | data input |
| 2Y | 4 | data output |
| V _{CC} | 5 | supply voltage |
| 1Y | 6 | data output |

8. Functional description

Table 4. Function table^[1]

| Input | Output |
|-------|--------|
| nA | nY |
| L | L |
| H | H |

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

9. 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 | +7.0 | V |
| I_{IK} | input clamping current | $V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$ | [1] - | ±20 | mA |
| I_{OK} | output clamping current | $V_O < -0.5\text{ V}$ or $V_O > V_{CC} + 0.5\text{ V}$ | [1] - | ±20 | mA |
| I_O | output current | $V_O = -0.5\text{ V}$ to $V_{CC} + 0.5\text{ V}$ | [1] - | ±25 | mA |
| I_{CC} | supply current | | [1] - | 50 | mA |
| I_{GND} | ground current | | [1] - | -50 | mA |
| T_{stg} | storage temperature | | -65 | +150 | °C |
| P_{tot} | total power dissipation | | [2] - | 250 | mW |

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

[2] For SC-88 and SC-74 packages: above 87.5 °C the value of P_{tot} derates linearly with 4.0 mW/K.

10. Recommended operating conditions

Table 6. Recommended operating conditions

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------------|---------------------|------------|-----|-----|----------|------|
| 74HC2G17-Q100 | | | | | | |
| V_{CC} | supply voltage | | 2.0 | 5.0 | 6.0 | V |
| V_I | input voltage | | 0 | - | V_{CC} | V |
| V_O | output voltage | | 0 | - | V_{CC} | V |
| T_{amb} | ambient temperature | | -40 | +25 | +125 | °C |
| 74HCT2G17-Q100 | | | | | | |
| V_{CC} | supply voltage | | 4.5 | 5.0 | 5.5 | V |
| V_I | input voltage | | 0 | - | V_{CC} | V |
| V_O | output voltage | | 0 | - | V_{CC} | V |
| T_{amb} | ambient temperature | | -40 | +25 | +125 | °C |

11. Static characteristics

Table 7. Static characteristics for 74HC2G17

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|---------------------------|--|------|------|-----|------|
| $T_{amb} = 25\text{ °C}$ | | | | | | |
| V_{OH} | HIGH-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = -20\text{ }\mu\text{A}$; $V_{CC} = 2.0\text{ V}$ | 1.9 | 2.0 | - | V |
| | | $I_O = -20\text{ }\mu\text{A}$; $V_{CC} = 4.5\text{ V}$ | 4.4 | 4.5 | - | V |
| | | $I_O = -20\text{ }\mu\text{A}$; $V_{CC} = 6.0\text{ V}$ | 5.9 | 6.0 | - | V |
| | | $I_O = -4.0\text{ mA}$; $V_{CC} = 4.5\text{ V}$ | 4.18 | 4.32 | - | V |
| | | $I_O = -5.2\text{ mA}$; $V_{CC} = 6.0\text{ V}$ | 5.68 | 5.81 | - | V |

Table 7. Static characteristics for 74HC2G17 ...continued

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---------------------------|---|------|------|-----------|---------------|
| V_{OL} | LOW-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 2.0 \text{ V}$ | - | 0 | 0.1 | V |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 4.5 \text{ V}$ | - | 0 | 0.1 | V |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 6.0 \text{ V}$ | - | 0 | 0.1 | V |
| | | $I_O = 4.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$ | - | 0.15 | 0.26 | V |
| | | $I_O = 5.2 \text{ mA}; V_{CC} = 6.0 \text{ V}$ | - | 0.16 | 0.26 | V |
| I_I | input leakage current | $V_I = \text{GND}$ or $V_{CC}; V_{CC} = 6.0 \text{ V}$ | - | - | ± 0.1 | μA |
| I_{CC} | supply current | $V_I = \text{GND}$ or $V_{CC}; I_O = 0 \text{ A}; V_{CC} = 6.0 \text{ V}$ | - | - | 1.0 | μA |
| C_I | input capacitance | | - | 2.0 | - | pF |
| $T_{\text{amb}} = -40 \text{ }^\circ\text{C}$ to $+85 \text{ }^\circ\text{C}$ | | | | | | |
| V_{OH} | HIGH-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = -20 \mu\text{A}; V_{CC} = 2.0 \text{ V}$ | 1.9 | - | - | V |
| | | $I_O = -20 \mu\text{A}; V_{CC} = 4.5 \text{ V}$ | 4.4 | - | - | V |
| | | $I_O = -20 \mu\text{A}; V_{CC} = 6.0 \text{ V}$ | 5.9 | - | - | V |
| | | $I_O = -4.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$ | 4.13 | - | - | V |
| | | $I_O = -5.2 \text{ mA}; V_{CC} = 6.0 \text{ V}$ | 5.63 | - | - | V |
| V_{OL} | LOW-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 2.0 \text{ V}$ | - | - | 0.1 | V |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 4.5 \text{ V}$ | - | - | 0.1 | V |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 6.0 \text{ V}$ | - | - | 0.1 | V |
| | | $I_O = 4.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$ | - | - | 0.33 | V |
| | | $I_O = 5.2 \text{ mA}; V_{CC} = 6.0 \text{ V}$ | - | - | 0.33 | V |
| I_I | input leakage current | $V_I = \text{GND}$ or $V_{CC}; V_{CC} = 6.0 \text{ V}$ | - | - | ± 1.0 | μA |
| I_{CC} | supply current | $V_I = \text{GND}$ or $V_{CC}; I_O = 0 \text{ A}; V_{CC} = 6.0 \text{ V}$ | - | - | 10.0 | μA |
| $T_{\text{amb}} = -40 \text{ }^\circ\text{C}$ to $+125 \text{ }^\circ\text{C}$ | | | | | | |
| V_{OH} | HIGH-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = -20 \mu\text{A}; V_{CC} = 2.0 \text{ V}$ | 1.9 | - | - | V |
| | | $I_O = -20 \mu\text{A}; V_{CC} = 4.5 \text{ V}$ | 4.4 | - | - | V |
| | | $I_O = -20 \mu\text{A}; V_{CC} = 6.0 \text{ V}$ | 5.9 | - | - | V |
| | | $I_O = -4.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$ | 3.7 | - | - | V |
| | | $I_O = -5.2 \text{ mA}; V_{CC} = 6.0 \text{ V}$ | 5.2 | - | - | V |

Table 7. Static characteristics for 74HC2G17 ...continued

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------|--------------------------|---|-----|-----|-----------|---------------|
| V_{OL} | LOW-level output voltage | $V_I = V_{T+}$ or V_{T-} | | | | |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 2.0 \text{ V}$ | - | - | 0.1 | V |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 4.5 \text{ V}$ | - | - | 0.1 | V |
| | | $I_O = 20 \mu\text{A}; V_{CC} = 6.0 \text{ V}$ | - | - | 0.1 | V |
| | | $I_O = 4.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$ | - | - | 0.4 | V |
| | | $I_O = 5.2 \text{ mA}; V_{CC} = 6.0 \text{ V}$ | - | - | 0.4 | V |
| I_I | input leakage current | $V_I = \text{GND}$ or $V_{CC}; V_{CC} = 6.0 \text{ V}$ | - | - | ± 1.0 | μA |
| I_{CC} | supply current | $V_I = \text{GND}$ or $V_{CC}; I_O = 0 \text{ A}; V_{CC} = 6.0 \text{ V}$ | - | - | 20.0 | μA |

Table 8. Static characteristics for 74HCT2G17

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|---------------------------|--|------|------|-----------|---------------|
| $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | | | | | | |
| V_{OH} | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}; V_{CC} = 4.5 \text{ V}$ | | | | |
| | | $I_O = -20 \mu\text{A}$ | 4.4 | 4.5 | - | V |
| | | $I_O = -4.0 \text{ mA}$ | 4.18 | 4.32 | - | V |
| V_{OL} | LOW-level output voltage | $V_I = V_{T+}$ or $V_{T-}; V_{CC} = 4.5 \text{ V}$ | | | | |
| | | $I_O = -20 \mu\text{A}$ | - | 0 | 0.1 | V |
| | | $I_O = -4.0 \text{ mA}$ | - | 0.15 | 0.26 | V |
| I_I | input leakage current | $V_I = \text{GND}$ or $V_{CC}; V_{CC} = 5.5 \text{ V}$ | - | - | ± 0.1 | μA |
| I_{CC} | supply current | $V_I = \text{GND}$ or $V_{CC}; I_O = 0 \text{ A}; V_{CC} = 5.5 \text{ V}$ | - | - | 1.0 | μA |
| ΔI_{CC} | additional supply current | $V_I = V_{CC} - 2.1 \text{ V}; V_{CC} = 4.5 \text{ V}$ to $5.5 \text{ V}; I_O = 0 \text{ A}$ | - | - | 300 | μA |
| C_I | input capacitance | | - | 2.0 | - | pF |
| $T_{\text{amb}} = -40 \text{ }^\circ\text{C}$ to $+85 \text{ }^\circ\text{C}$ | | | | | | |
| V_{OH} | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}; V_{CC} = 4.5 \text{ V}$ | | | | |
| | | $I_O = -20 \mu\text{A}$ | 4.4 | - | - | V |
| | | $I_O = -4.0 \text{ mA}$ | 4.13 | - | - | V |
| V_{OL} | LOW-level output voltage | $V_I = V_{T+}$ or $V_{T-}; V_{CC} = 4.5 \text{ V}$ | | | | |
| | | $I_O = -20 \mu\text{A}$ | - | - | 0.1 | V |
| | | $I_O = -4.0 \text{ mA}$ | - | - | 0.33 | V |
| I_I | input leakage current | $V_I = \text{GND}$ or $V_{CC}; V_{CC} = 5.5 \text{ V}$ | - | - | ± 1.0 | μA |
| I_{CC} | supply current | $V_I = \text{GND}$ or $V_{CC}; I_O = 0 \text{ A}; V_{CC} = 5.5 \text{ V}$ | - | - | 10.0 | μA |
| ΔI_{CC} | additional supply current | $V_I = V_{CC} - 2.1 \text{ V}; V_{CC} = 4.5 \text{ V}$ to $5.5 \text{ V}; I_O = 0 \text{ A}$ | - | - | 375 | μA |

Table 8. Static characteristics for 74HCT2G17 ...continued

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|---------------------------|---|-----|-----|------|------|
| T_{amb} = -40 °C to +125 °C | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{T+} or V _{T-} ; V _{CC} = 4.5 V | | | | |
| | | I _O = -20 μA | 4.4 | - | - | V |
| | | I _O = -4.0 mA | 3.7 | - | - | V |
| V _{OL} | LOW-level output voltage | V _I = V _{T+} or V _{T-} ; V _{CC} = 4.5 V | | | | |
| | | I _O = -20 μA | - | - | 0.1 | V |
| | | I _O = -4.0 mA | - | - | 0.4 | V |
| I _I | input leakage current | V _I = GND or V _{CC} ; V _{CC} = 5.5 V | - | - | ±1.0 | μA |
| I _{CC} | supply current | V _I = GND or V _{CC} ; I _O = 0 A; V _{CC} = 5.5 V | - | - | 20.0 | μA |
| ΔI _{CC} | additional supply current | V _I = V _{CC} - 2.1 V; V _{CC} = 4.5 V to 5.5 V; I _O = 0 A | - | - | 410 | μA |

12. Dynamic characteristics

Table 9. Dynamic characteristicsVoltages are referenced to GND (ground = 0 V); for test circuit see [Figure 6](#).

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +125 °C | | | Unit |
|----------------------|-------------------------------|---|-------|-----|-----|-------------------|-------------|--------------|------|
| | | | Min | Typ | Max | Min | Max (85 °C) | Max (125 °C) | |
| 74HC2G17-Q100 | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Figure 5 [1] | | | | | | | |
| | | V _{CC} = 2.0 V; C _L = 50 pF | - | 36 | 115 | - | 140 | 175 | ns |
| | | V _{CC} = 4.5 V; C _L = 50 pF | - | 12 | 22 | - | 27 | 34 | ns |
| | | V _{CC} = 6.0 V; C _L = 50 pF | - | 10 | 18 | - | 22 | 28 | ns |
| t _t | transition time | nY; see Figure 5 [2] | | | | | | | |
| | | V _{CC} = 2.0 V; C _L = 50 pF | - | 20 | 75 | - | 95 | 110 | ns |
| | | V _{CC} = 4.5 V; C _L = 50 pF | - | 7 | 15 | - | 19 | 22 | ns |
| | | V _{CC} = 6.0 V; C _L = 50 pF | - | 5 | 13 | - | 16 | 19 | ns |
| C _{PD} | power dissipation capacitance | V _I = GND to V _{CC} [3] | - | 10 | - | - | - | - | pF |

Table 9. Dynamic characteristics ...continued

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 6](#).

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +125 °C | | | Unit |
|-----------------------|-------------------------------|--|-------|-----|-----|-------------------|-------------|--------------|------|
| | | | Min | Typ | Max | Min | Max (85 °C) | Max (125 °C) | |
| 74HCT2G17-Q100 | | | | | | | | | |
| t_{pd} | propagation delay | nA to nY; see Figure 5 [1] | | | | | | | |
| | | $V_{CC} = 4.5\text{ V}; C_L = 50\text{ pF}$ | - | 21 | 29 | - | 36 | 45 | ns |
| t_t | transition time | nY; see Figure 5 [2] | | | | | | | |
| | | $V_{CC} = 4.5\text{ V}; C_L = 50\text{ pF}$ | - | 6 | 15 | - | 19 | 22 | ns |
| C_{PD} | power dissipation capacitance | $V_I = \text{GND to } V_{CC} - 1.5\text{ V}$ [3] | - | 10 | - | - | - | - | pF |

- [1] t_{pd} is the same as t_{PLH} and t_{PHL}
- [2] t_t is the same as t_{TLH} and t_{THL}
- [3] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ where:
 f_i = input frequency in MHz;
 f_o = output frequency in MHz;
 C_L = output load capacitance in pF;
 V_{CC} = supply voltage in V;
 N = number of inputs switching;
 $\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of the outputs.

13. Waveforms

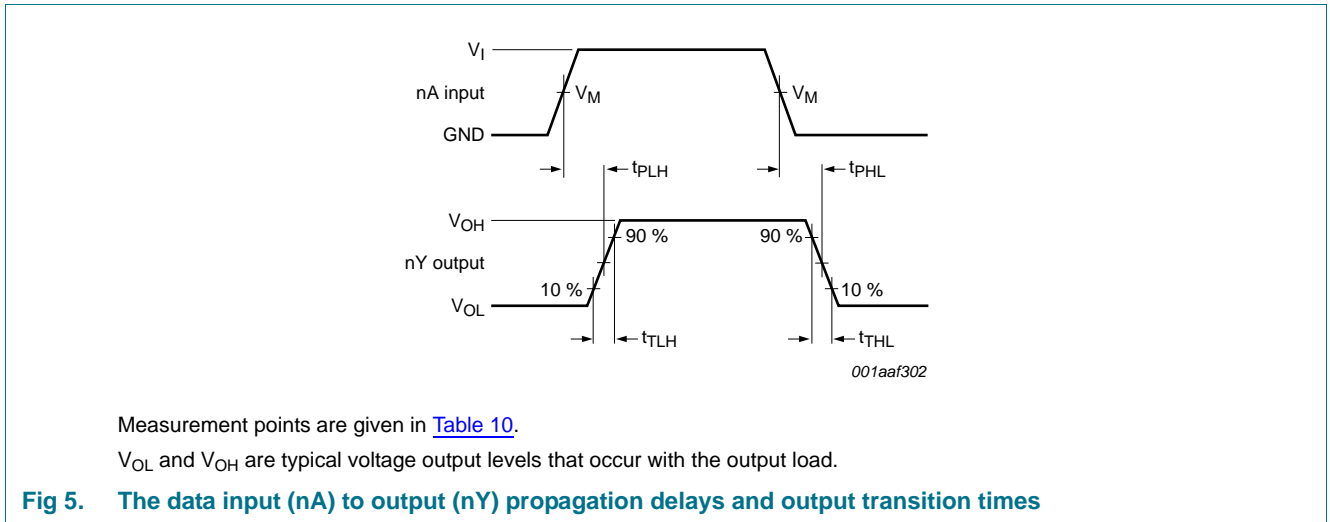


Table 10. Measurement points

| Type | Input | | | Output |
|----------------|-------------|-----------------|-------------|-------------|
| | V_M | V_I | $t_r = t_f$ | V_M |
| 74HC2G17-Q100 | $0.5V_{CC}$ | GND to V_{CC} | 6.0 ns | $0.5V_{CC}$ |
| 74HCT2G17-Q100 | 1.3 V | GND to 3.0 V | 6.0 ns | 1.3 V |

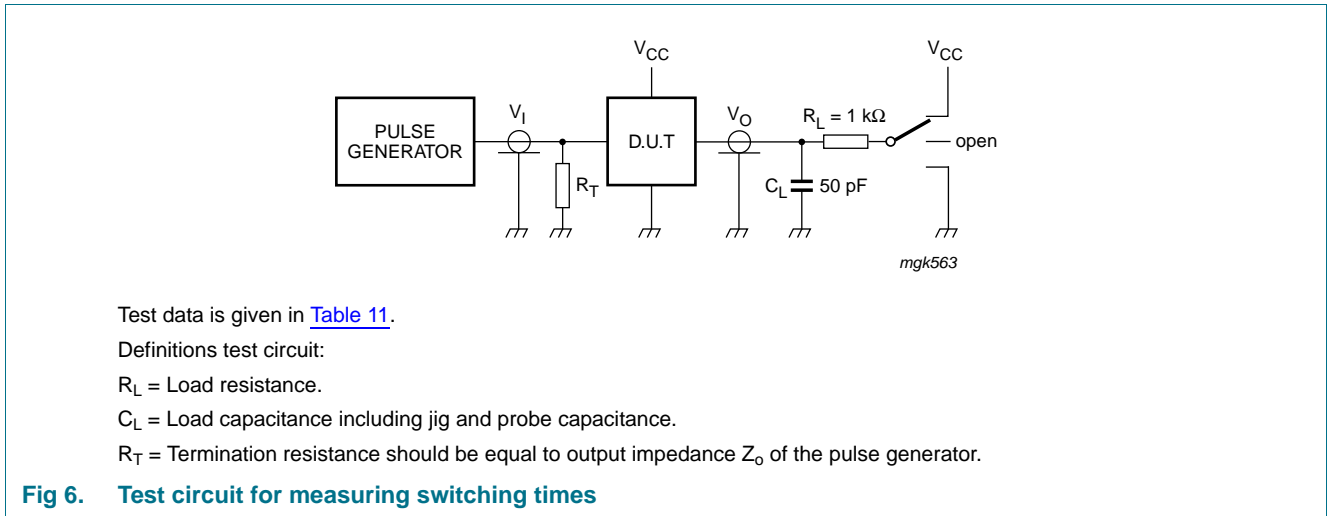


Table 11. Test data

| Type | Input | | Test |
|----------------|-----------------|------------|--------------------|
| | V_i | t_r, t_f | t_{PHL}, t_{PLH} |
| 74HC2G17-Q100 | GND to V_{CC} | 6 ns | open |
| 74HCT2G17-Q100 | GND to 3.0 V | 6 ns | open |

14. Transfer characteristics

Table 12. Transfer characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 6](#).

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +125 °C | | | Unit |
|--------|-----------|------------|-------|-----|-----|-------------------|-------------|--------------|------|
| | | | Min | Typ | Max | Min | Max (85 °C) | Max (125 °C) | |

74HC2G17-Q100

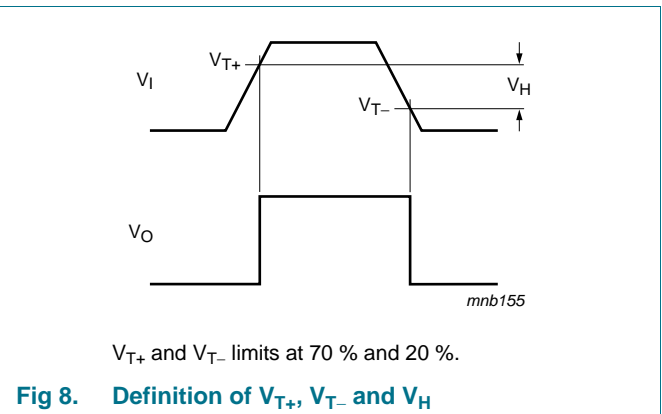
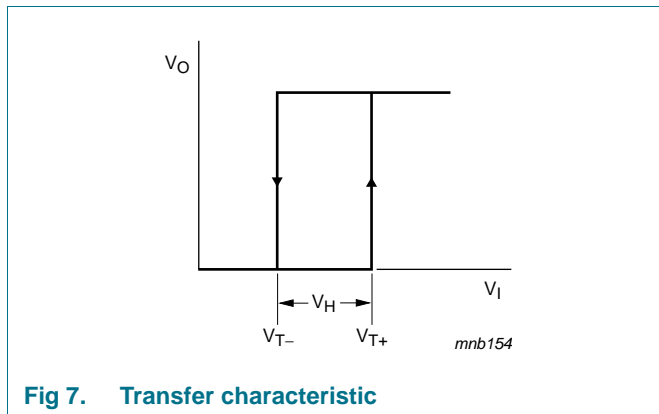
| | | | | | | | | | |
|----------|----------------------------------|--|------|------|------|------|------|------|---|
| V_{T+} | positive-going threshold voltage | see Figure 7 , Figure 8 | | | | | | | |
| | | $V_{CC} = 2.0\text{ V}$ | 1.00 | 1.18 | 1.50 | 1.00 | 1.50 | 1.50 | V |
| | | $V_{CC} = 4.5\text{ V}$ | 2.30 | 2.60 | 3.15 | 2.30 | 3.15 | 3.15 | V |
| V_{T-} | negative-going threshold voltage | see Figure 7 , Figure 8 | | | | | | | |
| | | $V_{CC} = 2.0\text{ V}$ | 0.30 | 0.60 | 0.90 | 0.30 | 0.90 | 0.90 | V |
| | | $V_{CC} = 4.5\text{ V}$ | 1.13 | 1.47 | 2.00 | 1.13 | 2.00 | 2.00 | V |
| V_H | hysteresis voltage | $V_{T+} - V_{T-}$; see Figure 7 , Figure 8 and Figure 9 | | | | | | | |
| | | $V_{CC} = 2.0\text{ V}$ | 0.30 | 0.60 | 1.00 | 0.30 | 1.00 | 1.00 | V |
| | | $V_{CC} = 4.5\text{ V}$ | 0.60 | 1.13 | 1.40 | 0.60 | 1.40 | 1.40 | V |
| | | $V_{CC} = 6.0\text{ V}$ | 0.80 | 1.40 | 1.70 | 0.80 | 1.70 | 1.70 | V |

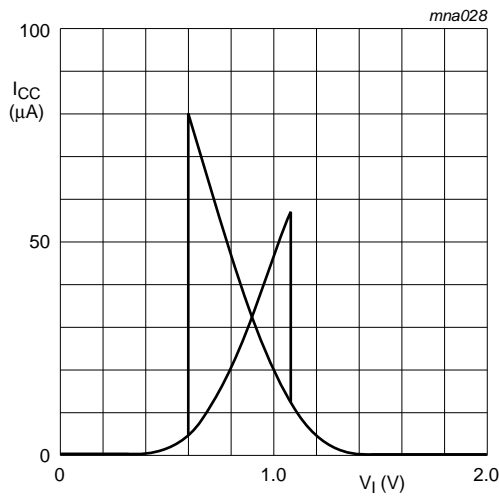
Table 12. Transfer characteristics ...continued

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 6](#).

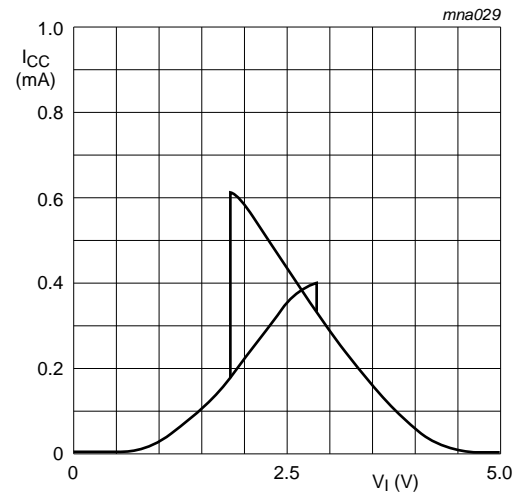
| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +125 °C | | | Unit |
|-----------------------|----------------------------------|---|-------|------|------|-------------------|-------------|--------------|------|
| | | | Min | Typ | Max | Min | Max (85 °C) | Max (125 °C) | |
| 74HCT2G17-Q100 | | | | | | | | | |
| V_{T+} | positive-going threshold voltage | see Figure 7 and Figure 8 | | | | | | | |
| | | $V_{CC} = 4.5 \text{ V}$ | 1.20 | 1.58 | 1.90 | 1.20 | 1.90 | 1.90 | V |
| | | $V_{CC} = 5.5 \text{ V}$ | 1.40 | 1.78 | 2.10 | 1.40 | 2.10 | 2.10 | V |
| V_{T-} | negative-going threshold voltage | see Figure 7 and Figure 8 | | | | | | | |
| | | $V_{CC} = 4.5 \text{ V}$ | 0.50 | 0.87 | 1.20 | 0.50 | 1.20 | 1.20 | V |
| | | $V_{CC} = 5.5 \text{ V}$ | 0.60 | 1.11 | 1.40 | 0.60 | 1.40 | 1.40 | V |
| V_H | hysteresis voltage | $V_{T+} - V_{T-}$; see Figure 7 , Figure 8 and Figure 10 | | | | | | | |
| | | $V_{CC} = 4.5 \text{ V}$ | 0.40 | 0.71 | - | 0.40 | - | - | V |
| | | $V_{CC} = 5.5 \text{ V}$ | 0.40 | 0.67 | - | 0.40 | - | - | V |

15. Waveforms transfer characteristics

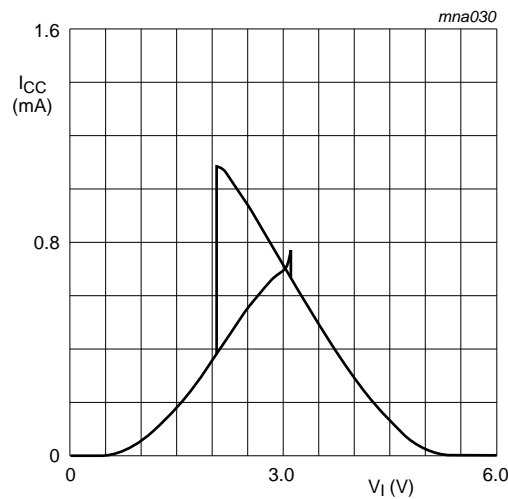




a. $V_{CC} = 2.0\text{ V}$

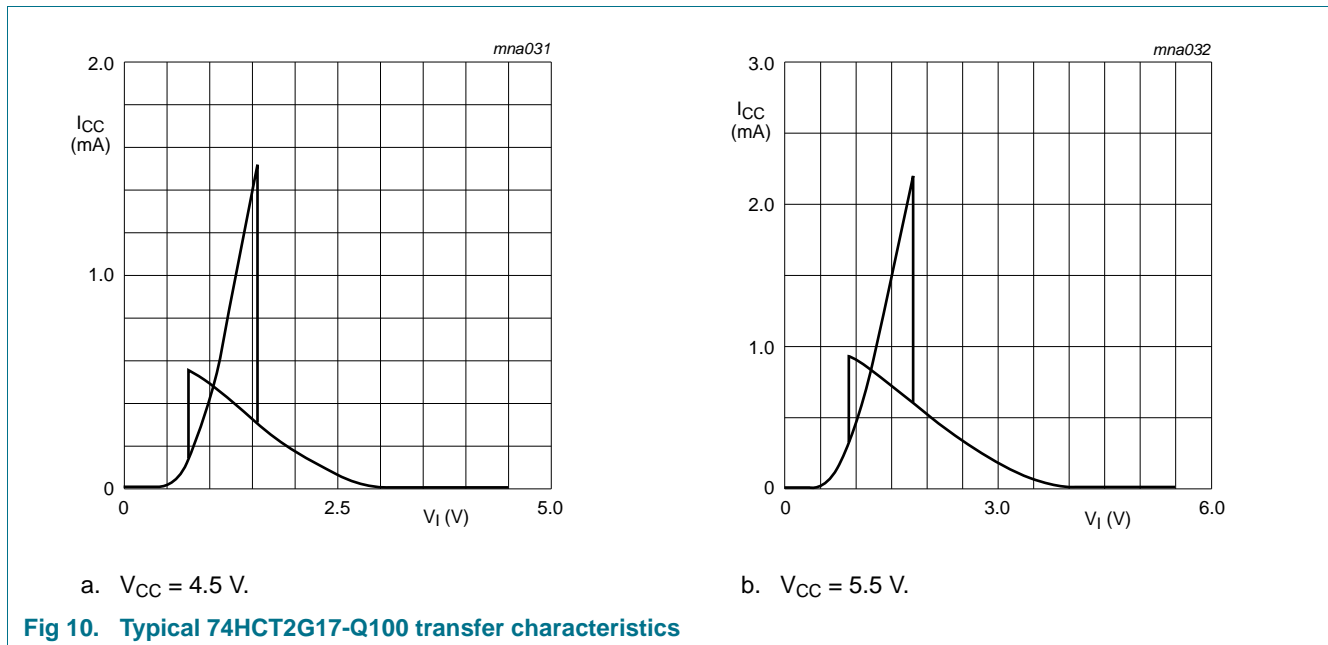


b. $V_{CC} = 4.5\text{ V}$



c. $V_{CC} = 6.0\text{ V}$

Fig 9. Typical 74HC2G17 transfer characteristics



16. Application information

The slow input rise and fall times cause additional power dissipation which can be calculated using the following formula:

$$P_{\text{add}} = f_i \times (t_r \times \Delta I_{CC(\text{AV})} + t_f \times \Delta I_{CC(\text{AV})}) \times V_{CC} \text{ where:}$$

P_{add} = additional power dissipation (μW);

f_i = input frequency (MHz);

t_r = input rise time (ns); 10 % to 90 %;

t_f = input fall time (ns); 90 % to 10 %;

$\Delta I_{CC(\text{AV})}$ = average additional supply current (μA).

$\Delta I_{CC(\text{AV})}$ differs with positive or negative input transitions, as shown in [Figure 11](#) and [Figure 12](#).

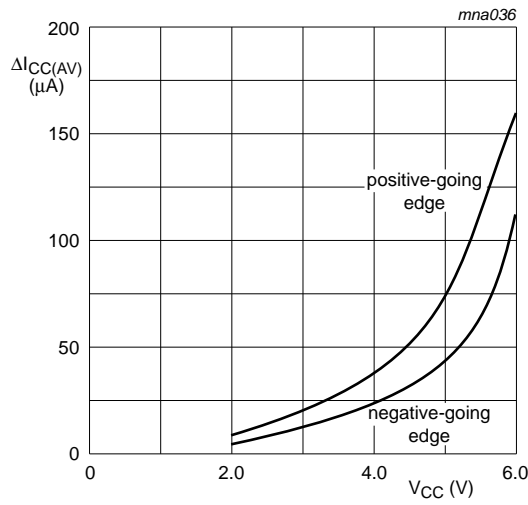


Fig 11. $\Delta I_{CC(AV)}$ as a function of V_{CC} for 74HC2G17-Q100; linear change of V_I between $0.1V_{CC}$ to $0.9V_{CC}$

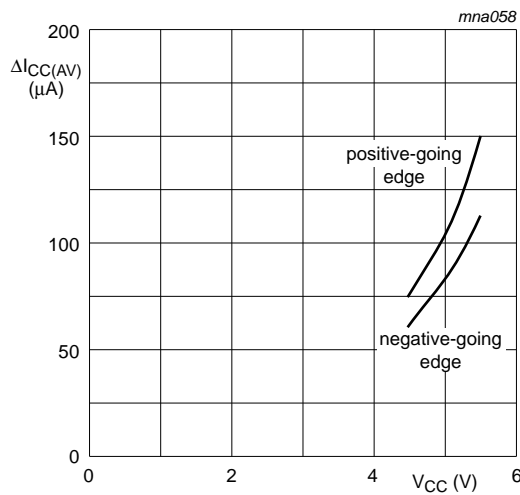


Fig 12. $\Delta I_{CC(AV)}$ as a function of V_{CC} for 74HCT2G17-Q100; linear change of V_I between $0.1V_{CC}$ to $0.9V_{CC}$

17. Package outline

Plastic surface-mounted package; 6 leads

SOT363

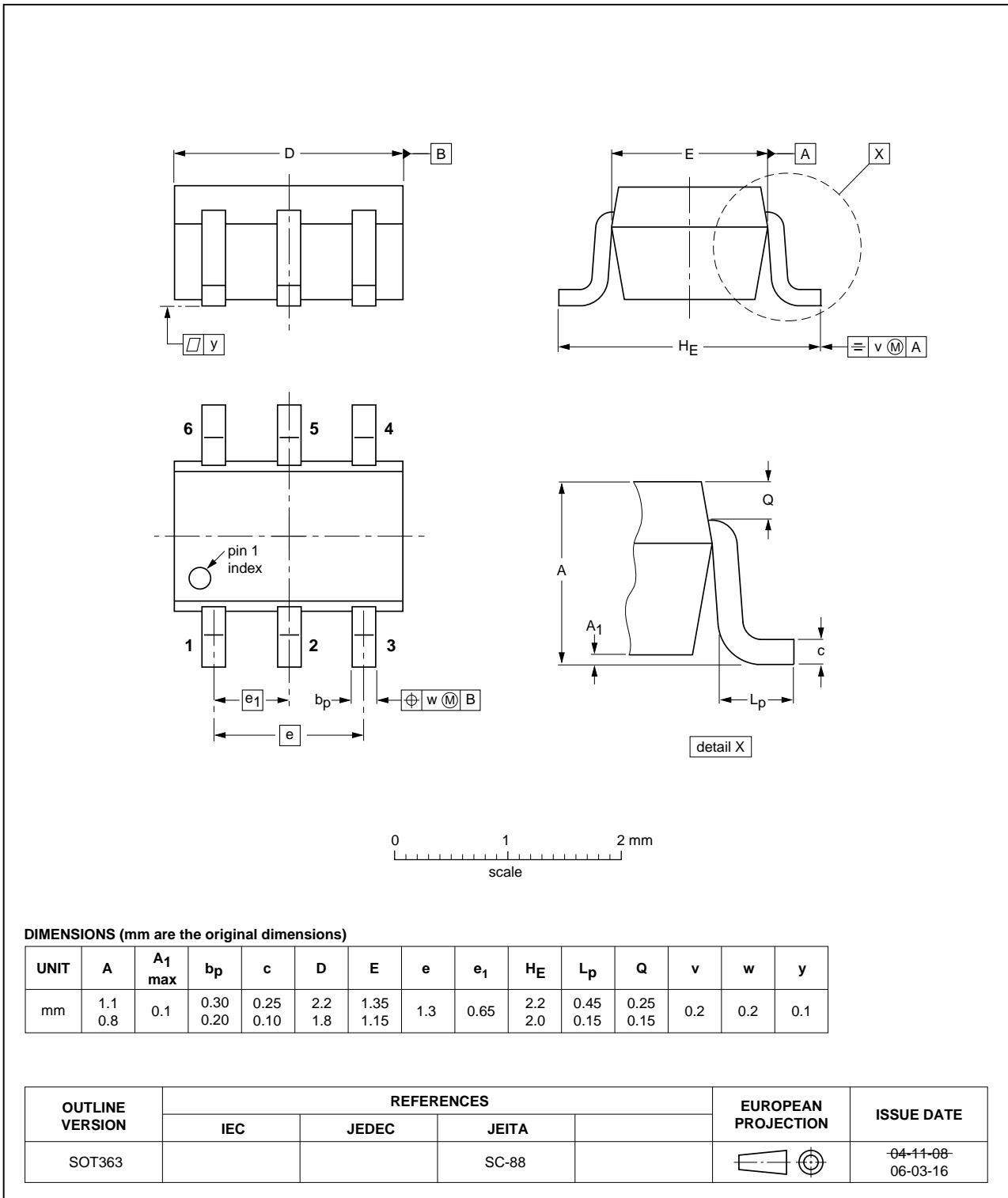


Fig 13. Package outline SOT363 (SC-88)

Plastic surface-mounted package (TSOP6); 6 leads

SOT457

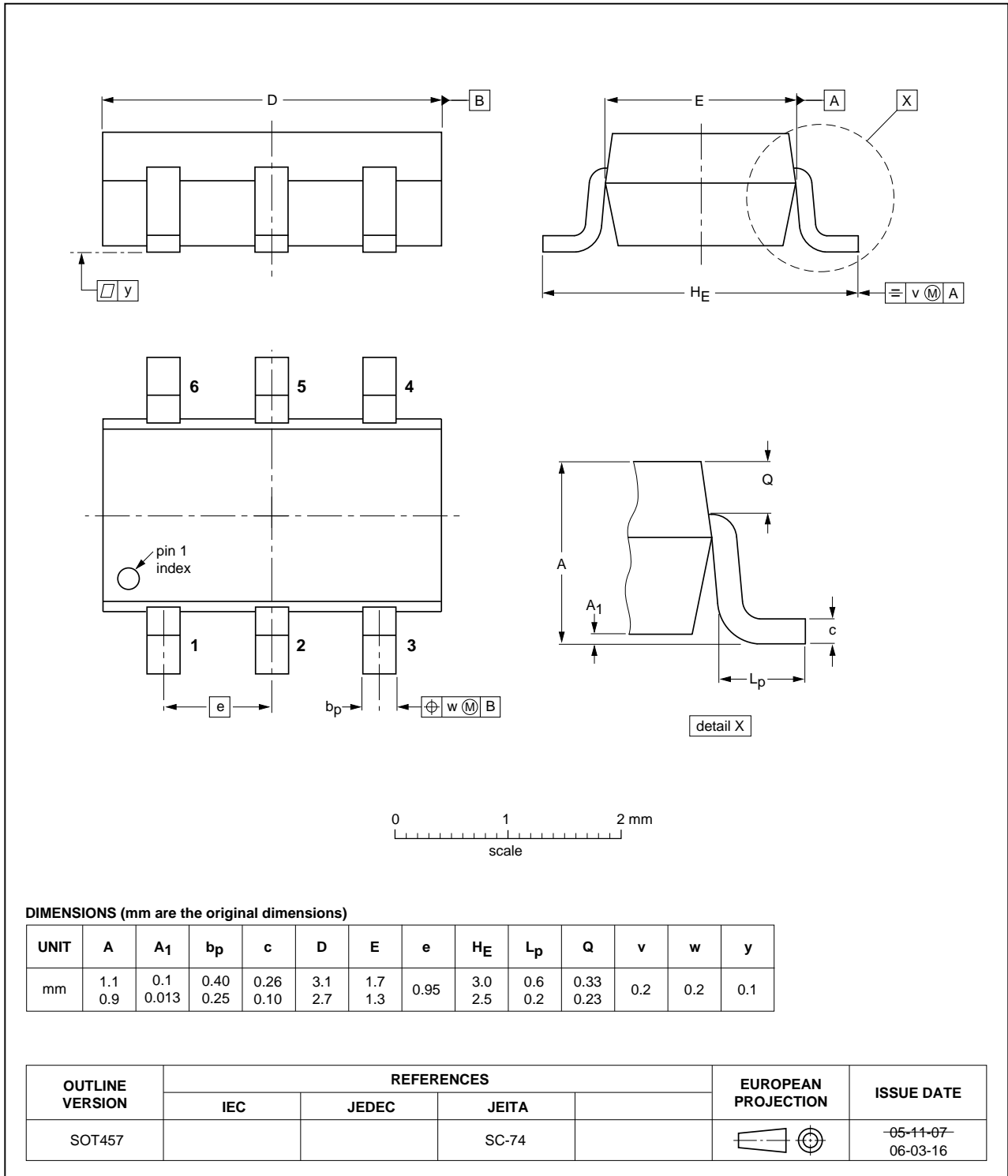


Fig 14. Package outline SOT457 (SC-74)

18. Abbreviations

Table 13. Abbreviations

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

19. Revision history

Table 14. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-----------------------|--------------|--------------------|---------------|------------|
| 74HC_HCT2G17_Q100 v.1 | 20130522 | Product data sheet | - | - |

20. Legal information

20.1 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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