# THE DATASHEET OF

# 74HC2G17GV-Q100H

# 74HC2G17-Q100; 74HCT2G17-Q100

## Dual non-inverting Schmitt trigger

Rev. 3 — 4 December 2023 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 °C and from -40 °C to +125 °C
- Wide supply voltage range from 2.0 V to 6.0 V
- CMOS low power dissipation
- High noise immunity
- Unlimited input rise and fall times
- Balanced propagation delays
- Input levels:
  - For 74HC2G17-Q100: CMOS level
  - For 74HCT2G17-Q100: TTL level
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- Complies with JEDEC standards:
  - JESD8C (2.7 V to 3.6 V)
  - JESD7A (2.0 V to 6.0 V)
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V

## 3. Applications

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

## 4. Ordering information

**Table 1. Ordering information**

| Type number | Package | | | |
|---|---|---|---|---|
| | Temperature range | Name | Description | Version |
| 74HC2G17GW-Q100 | -40 °C to +125 °C | TSSOP6 | plastic thin shrink small outline package; 6 leads; body width 1.25 mm | SOT363-2 |
| 74HCT2G17GW-Q100 | | | | |
| 74HC2G17GV-Q100 | -40 °C to +125 °C | SC-74; TSOP6 | plastic surface-mounted package; 6 leads | SOT457 |
| 74HCT2G17GV-Q100 | | | | |

# 5. Marking

**Table 2. Marking**

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

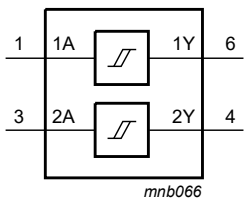


**Fig. 1. Logic symbol**

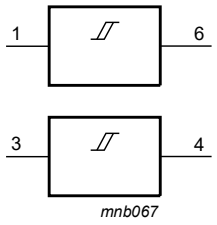


**Fig. 2. IEC logic symbol**

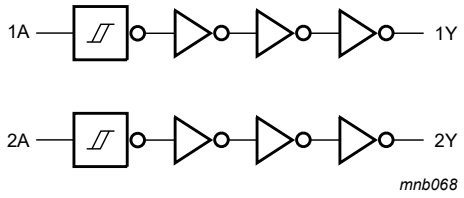


**Fig. 3. Logic diagram**

# 7. Pinning information

## 7.1. Pinning

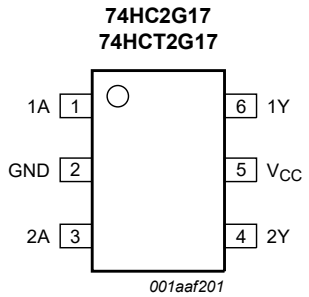


**Fig. 4. Pin configuration SOT363-2 (TSSOP6) and SOT457 (SC-74; TSOP6)**

## 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 |


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# 8. Functional description

**Table 4. Function table**

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

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

# 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 | $V_I < -0.5$ V or $V_I > V_{CC} + 0.5$ V | [1] | - | ±20 | mA |
| $I_{OK}$ | output clamping current | $V_O < -0.5$ V or $V_O > V_{CC} + 0.5$ V | [1] | - | ±20 | mA |
| $I_O$ | output current | $V_O = -0.5$ V to $V_{CC} + 0.5$ 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 SOT363-2 (TSSOP6) package: $P_{tot}$ derates linearly with 3.7 mW/K above 83 °C.
For SOT457 (SC-74; TSOP6) package: $P_{tot}$ derates linearly with 4.1 mW/K above 89 °C.

# 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 |


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# 11. Static characteristics

**Table 7. Static characteristics for 74HC2G17-Q100**

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **$T_{amb}$ = 25 °C** | | | | | | |
| $V_{OH}$ | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}$ | | | | |
| | | $I_O$ = -20 µA; $V_{CC}$ = 2.0 V | 1.9 | 2.0 | - | V |
| | | $I_O$ = -20 µA; $V_{CC}$ = 4.5 V | 4.4 | 4.5 | - | V |
| | | $I_O$ = -20 µA; $V_{CC}$ = 6.0 V | 5.9 | 6.0 | - | V |
| | | $I_O$ = -4.0 mA; $V_{CC}$ = 4.5 V | 4.18 | 4.32 | - | V |
| | | $I_O$ = -5.2 mA; $V_{CC}$ = 6.0 V | 5.68 | 5.81 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I = V_{T+}$ or $V_{T-}$ | | | | |
| | | $I_O$ = 20 µA; $V_{CC}$ = 2.0 V | - | 0 | 0.1 | V |
| | | $I_O$ = 20 µA; $V_{CC}$ = 4.5 V | - | 0 | 0.1 | V |
| | | $I_O$ = 20 µA; $V_{CC}$ = 6.0 V | - | 0 | 0.1 | V |
| | | $I_O$ = 4.0 mA; $V_{CC}$ = 4.5 V | - | 0.15 | 0.26 | V |
| | | $I_O$ = 5.2 mA; $V_{CC}$ = 6.0 V | - | 0.16 | 0.26 | V |
| $I_I$ | input leakage current | $V_I$ = GND or $V_{CC}$; $V_{CC}$ = 6.0 V | - | - | ±0.1 | µA |
| $I_{CC}$ | supply current | $V_I$ = GND or $V_{CC}$; $I_O$ = 0 A; $V_{CC}$ = 6.0 V | - | - | 1.0 | µA |
| $C_I$ | input capacitance | | - | 2.0 | - | pF |
| **$T_{amb}$ = -40 °C to +85 °C** | | | | | | |
| $V_{OH}$ | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}$ | | | | |
| | | $I_O$ = -20 µA; $V_{CC}$ = 2.0 V | 1.9 | - | - | V |
| | | $I_O$ = -20 µA; $V_{CC}$ = 4.5 V | 4.4 | - | - | V |
| | | $I_O$ = -20 µA; $V_{CC}$ = 6.0 V | 5.9 | - | - | V |
| | | $I_O$ = -4.0 mA; $V_{CC}$ = 4.5 V | 4.13 | - | - | V |
| | | $I_O$ = -5.2 mA; $V_{CC}$ = 6.0 V | 5.63 | - | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I = V_{T+}$ or $V_{T-}$ | | | | |
| | | $I_O$ = 20 µA; $V_{CC}$ = 2.0 V | - | - | 0.1 | V |
| | | $I_O$ = 20 µA; $V_{CC}$ = 4.5 V | - | - | 0.1 | V |
| | | $I_O$ = 20 µA; $V_{CC}$ = 6.0 V | - | - | 0.1 | V |
| | | $I_O$ = 4.0 mA; $V_{CC}$ = 4.5 V | - | - | 0.33 | V |
| | | $I_O$ = 5.2 mA; $V_{CC}$ = 6.0 V | - | - | 0.33 | V |
| $I_I$ | input leakage current | $V_I$ = GND or $V_{CC}$; $V_{CC}$ = 6.0 V | - | - | ±1.0 | µA |
| $I_{CC}$ | supply current | $V_I$ = GND or $V_{CC}$; $I_O$ = 0 A; $V_{CC}$ = 6.0 V | - | - | 10.0 | µA |


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| 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 $V_{T-}$ | | | | |
| | | $I_O$ = -20 µA; $V_{CC}$ = 2.0 V | 1.9 | - | - | V |
| | | $I_O$ = -20 µA; $V_{CC}$ = 4.5 V | 4.4 | - | - | V |
| | | $I_O$ = -20 µA; $V_{CC}$ = 6.0 V | 5.9 | - | - | V |
| | | $I_O$ = -4.0 mA; $V_{CC}$ = 4.5 V | 3.7 | - | - | V |
| | | $I_O$ = -5.2 mA; $V_{CC}$ = 6.0 V | 5.2 | - | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I = V_{T+}$ or $V_{T-}$ | | | | |
| | | $I_O$ = 20 µA; $V_{CC}$ = 2.0 V | - | - | 0.1 | V |
| | | $I_O$ = 20 µA; $V_{CC}$ = 4.5 V | - | - | 0.1 | V |
| | | $I_O$ = 20 µA; $V_{CC}$ = 6.0 V | - | - | 0.1 | V |
| | | $I_O$ = 4.0 mA; $V_{CC}$ = 4.5 V | - | - | 0.4 | V |
| | | $I_O$ = 5.2 mA; $V_{CC}$ = 6.0 V | - | - | 0.4 | V |
| $I_I$ | input leakage current | $V_I$ = GND or $V_{CC}$; $V_{CC}$ = 6.0 V | - | - | ±1.0 | µA |
| $I_{CC}$ | supply current | $V_I$ = GND or $V_{CC}$; $I_O$ = 0 A; $V_{CC}$ = 6.0 V | - | - | 20.0 | µA |

**Table 8. Static characteristics for 74HCT2G17-Q100**

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

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


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| 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 |
| $\Delta I_{CC}$ | additional supply current | $V_I$ = $V_{CC}$ - 2.1 V; $V_{CC}$ = 4.5 V to 5.5 V; $I_O$ = 0 A | - | - | 410 | µA |

## 12. Dynamic characteristics

**Table 9. Dynamic characteristics**

*Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 6.*

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| **74HC2G17-Q100** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | nA to nY; see Fig. 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 Fig. 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 |
| **74HCT2G17-Q100** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | nA to nY; see Fig. 5 [1] | | | | | | | | |
| | | $V_{CC}$ = 4.5 V; $C_L$ = 50 pF | - | 21 | 29 | - | 36 | - | 45 | ns |
| $t_t$ | transition time | nY; see Fig. 5 [2] | | | | | | | | |
| | | $V_{CC}$ = 4.5 V; $C_L$ = 50 pF | - | 6 | 15 | - | 19 | - | 22 | ns |
| $C_{PD}$ | power dissipation capacitance | $V_I$ = GND to $V_{CC}$ - 1.5 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.


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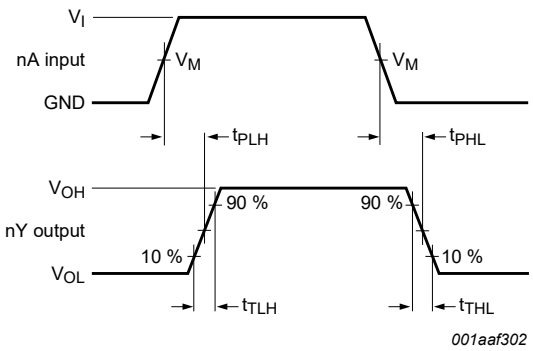
## 12.1. Waveforms and test circuit



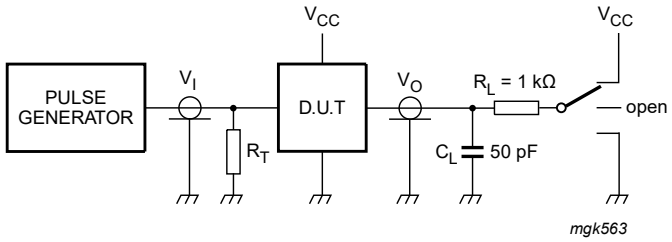

Measurement points are given in Table 10.

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

**Fig. 5. The data input (nA) to output (nY) propagation delays and output transition times**

**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 |




Test data is given in Table 11.

Definitions test circuit:

$R_L$ = Load resistance.

$C_L$ = Load capacitance including jig and probe capacitance.

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

**Fig. 6. Test circuit for measuring switching times**

**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 |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# 13. Transfer characteristics

**Table 12. Transfer characteristics**

*Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 6.*

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| **74HC2G17-Q100** | | | | | | | | | | |
| $V_{T+}$ | positive-going threshold voltage | see Fig. 7, Fig. 8 | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | 1.00 | 1.18 | 1.50 | 1.00 | 1.50 | 1.00 | 1.50 | V |
| | | $V_{CC}$ = 4.5 V | 2.30 | 2.60 | 3.15 | 2.30 | 3.15 | 2.30 | 3.15 | V |
| | | $V_{CC}$ = 6.0 V | 3.00 | 3.46 | 4.20 | 3.00 | 4.20 | 3.00 | 4.20 | V |
| $V_{T-}$ | negative-going threshold voltage | see Fig. 7, Fig. 8 | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | 0.30 | 0.60 | 0.90 | 0.30 | 0.90 | 0.30 | 0.90 | V |
| | | $V_{CC}$ = 4.5 V | 1.13 | 1.47 | 2.00 | 1.13 | 2.00 | 1.13 | 2.00 | V |
| | | $V_{CC}$ = 6.0 V | 1.50 | 2.06 | 2.60 | 1.50 | 2.60 | 1.50 | 2.60 | V |
| $V_H$ | hysteresis voltage | $V_{T+}$ - $V_{T-}$; see Fig. 7, Fig. 8 and Fig. 9 | | | | | | | | |
| | | $V_{CC}$ = 2.0 V | 0.30 | 0.60 | 1.00 | 0.30 | 1.00 | 0.30 | 1.00 | V |
| | | $V_{CC}$ = 4.5 V | 0.60 | 1.13 | 1.40 | 0.60 | 1.40 | 0.60 | 1.40 | V |
| | | $V_{CC}$ = 6.0 V | 0.80 | 1.40 | 1.70 | 0.80 | 1.70 | 0.80 | 1.70 | V |
| **74HCT2G17-Q100** | | | | | | | | | | |
| $V_{T+}$ | positive-going threshold voltage | see Fig. 7 and Fig. 8 | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | 1.20 | 1.58 | 1.90 | 1.20 | 1.90 | 1.20 | 1.90 | V |
| | | $V_{CC}$ = 5.5 V | 1.40 | 1.78 | 2.10 | 1.40 | 2.10 | 1.40 | 2.10 | V |
| $V_{T-}$ | negative-going threshold voltage | see Fig. 7 and Fig. 8 | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | 0.50 | 0.87 | 1.20 | 0.50 | 1.20 | 0.50 | 1.20 | V |
| | | $V_{CC}$ = 5.5 V | 0.60 | 1.11 | 1.40 | 0.60 | 1.40 | 0.60 | 1.40 | V |
| $V_H$ | hysteresis voltage | $V_{T+}$ - $V_{T-}$; see Fig. 7, Fig. 8 and Fig. 10 | | | | | | | | |
| | | $V_{CC}$ = 4.5 V | 0.40 | 0.71 | - | 0.40 | - | 0.40 | - | V |
| | | $V_{CC}$ = 5.5 V | 0.40 | 0.67 | - | 0.40 | - | 0.40 | - | V |

## 13.1. Waveforms transfer characteristics

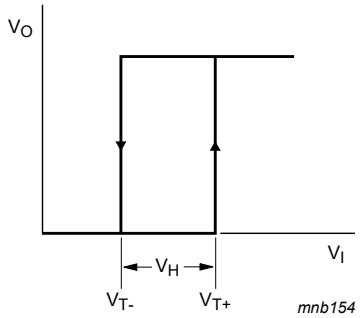
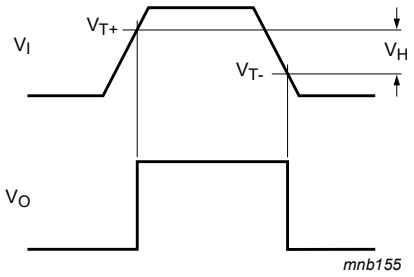



**Fig. 7. Transfer characteristic**




$V_{T+}$ and $V_{T-}$ limits at 70 % and 20 %.

**Fig. 8. Definition of $V_{T+}$, $V_{T-}$ and $V_H$**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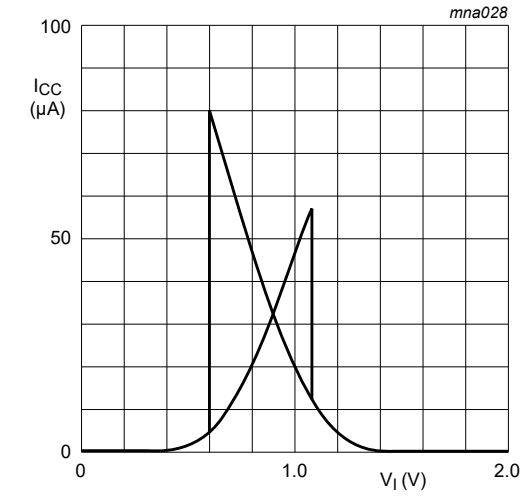
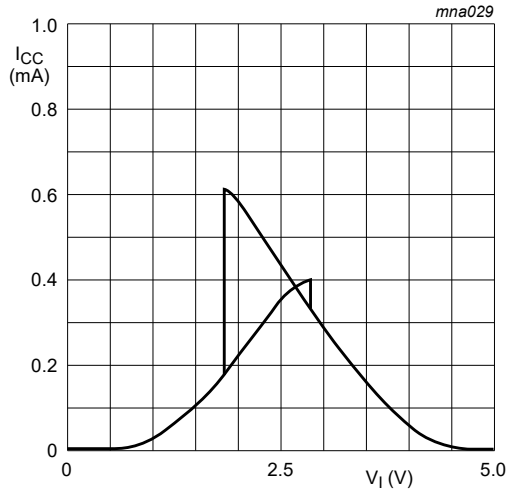
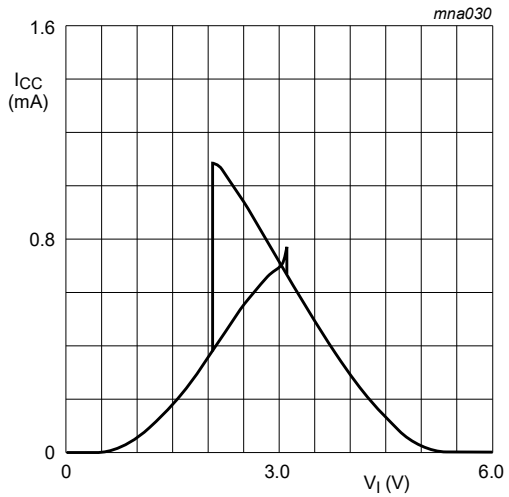



a. $V_{CC}$ = 2.0 V

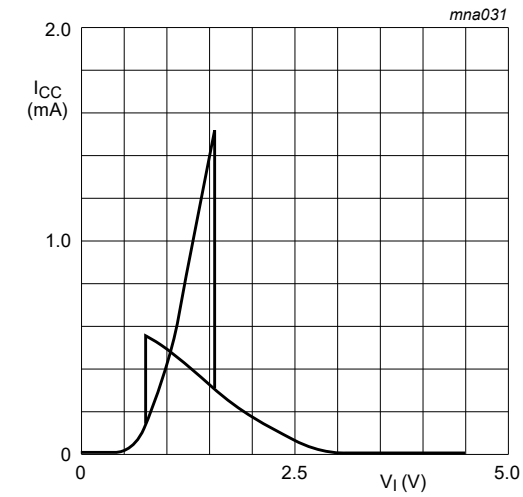



b. $V_{CC}$ = 4.5 V

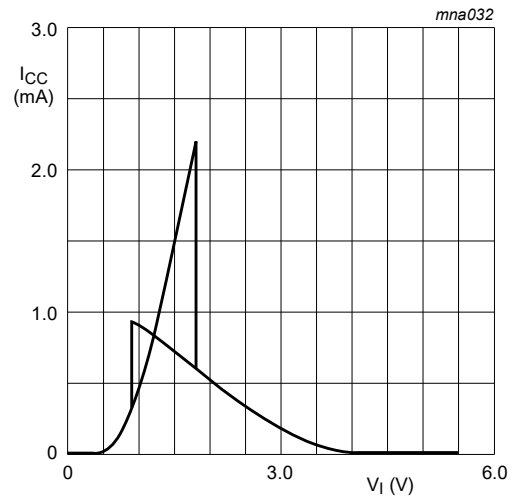



c. $V_{CC}$ = 6.0 V

**Fig. 9. Typical 74HC2G17-Q100 transfer characteristics**




a. $V_{CC}$ = 4.5 V.




b. $V_{CC}$ = 5.5 V.

**Fig. 10. Typical 74HCT2G17-Q100 transfer characteristics**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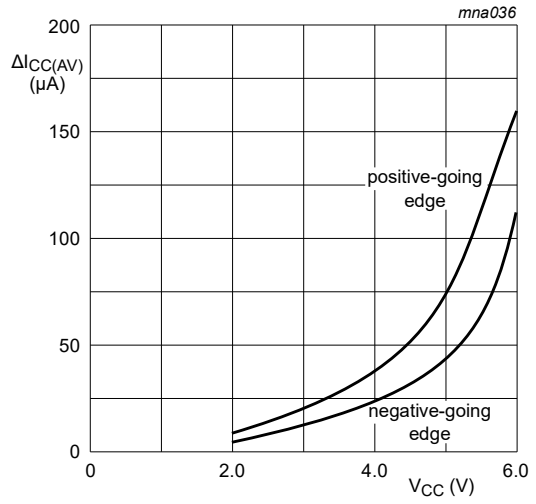
# 14. Application information

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

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

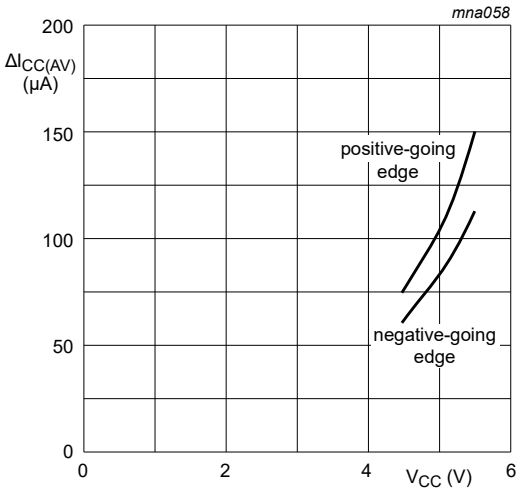
$P_{add}$ = additional power dissipation (µW);
$f_i$ = input frequency (MHz);
$t_r$ = input rise time (ns); 10 % to 90 %;
$t_f$ = input fall time (ns); 90 % to 10 %;
$\Delta I_{CC(AV)}$ = average additional supply current (µA).

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




Linear change of $V_I$ between $0.1V_{CC}$ to $0.9V_{CC}$

**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**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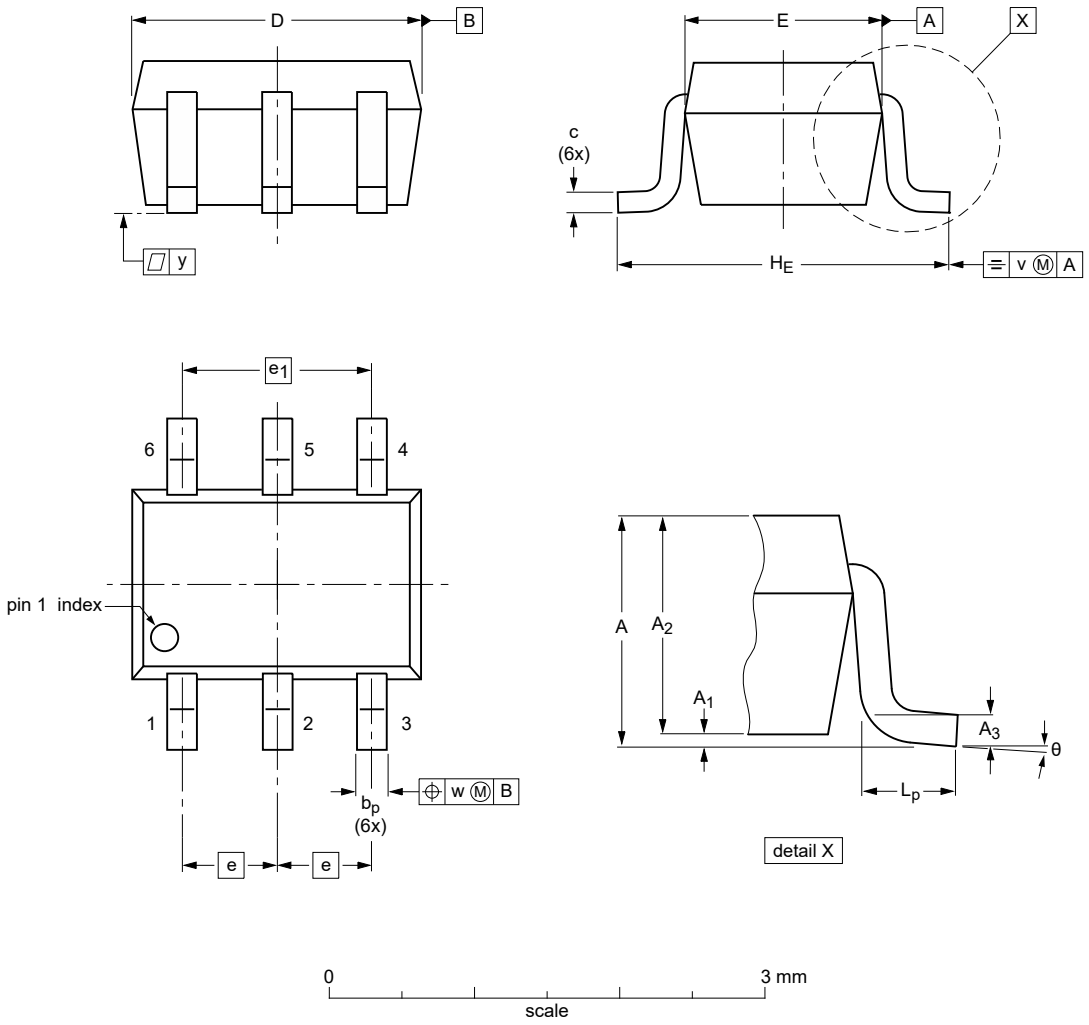
# 15. Package outline

**TSSOP6: plastic thin shrink small outline package; 6 leads; body width 1.25 mm** **SOT363-2**




Dimensions (mm are the original dimensions)

| Unit | | A | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | $D^{(1)}$ | $E^{(1)}$ | e | $e_1$ | $H_E$ | $L_p$ | v | w | y | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 1.1 | 0.1 | 1.0 | 0.15 | 0.30 | 0.25 | 2.2 | 1.35 | 0.65 | 1.3 | 2.4 | 0.46 | 0.3 | 0.1 | 0.1 | 8° |
| | min | 0.8 | 0 | 0.8 | | 0.15 | 0.08 | 1.8 | 1.15 | | | 1.8 | 0.26 | | | | 0° |

Note
1. Plastic or metal protrusions of 0.2 mm maximum per side are not included.

*sot363-2_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT363-2 | | MO-203 | SC-88A | | | ~~21-12-15~~ 21-12-16 |

**Fig. 13. Package outline SOT363-2 (TSSOP6)**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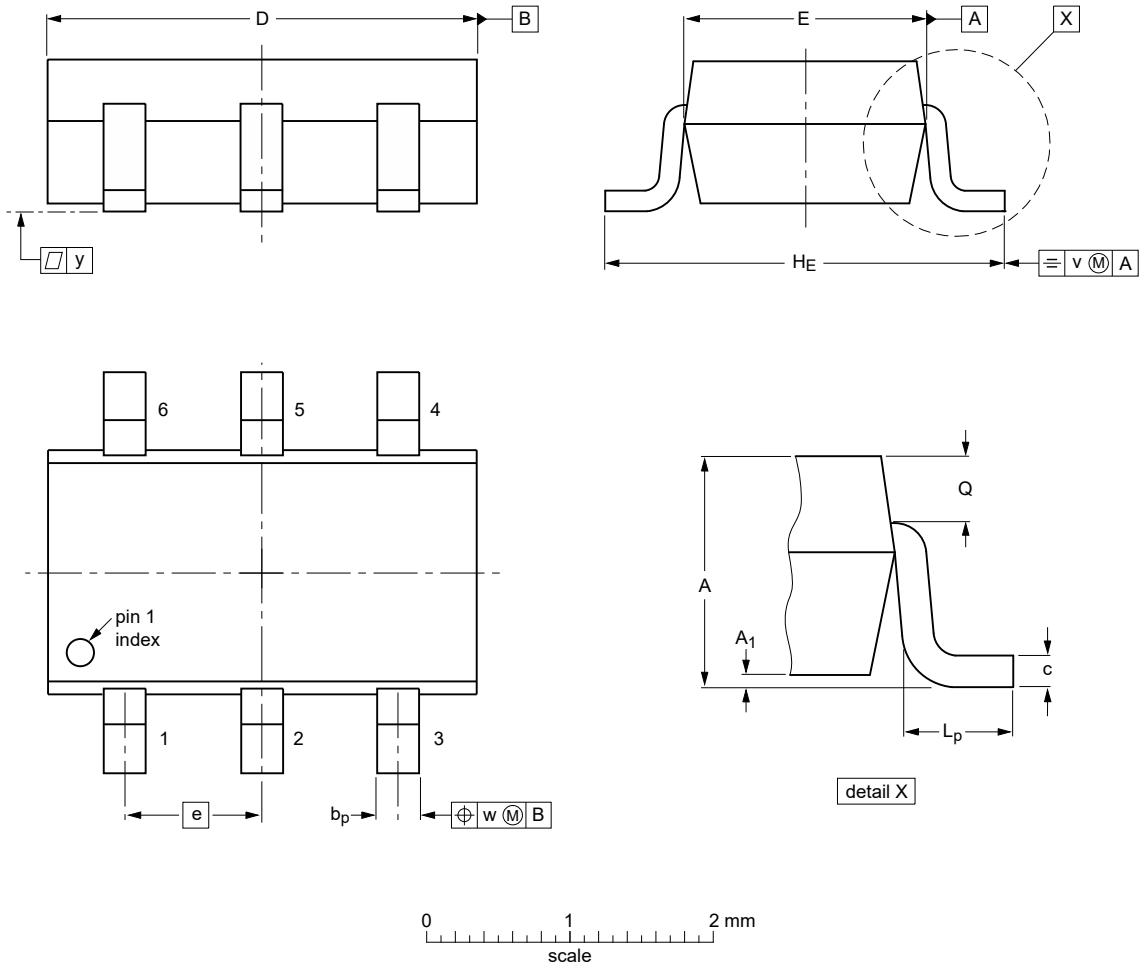
**Plastic, surface-mounted package (SC-74; TSOP6); 6 leads** **SOT457**




Dimensions (mm are the original dimensions)

| Unit | | A | $A_1$ | $b_p$ | c | D | E | e | $H_E$ | $L_p$ | Q | v | w | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 1.1 | 0.1 | 0.40 | 0.26 | 3.1 | 1.7 | | 3.0 | 0.6 | 0.33 | 0.2 | 0.2 | 0.1 |
| | nom | | | | | | | 0.95 | | | | | | |
| | min | 0.9 | 0.013 | 0.25 | 0.10 | 2.7 | 1.3 | | 2.5 | 0.2 | 0.23 | | | |

*sot457_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT457 | | | SC-74 | | | ~~06-03-16~~ 18-11-27 |

**Fig. 14. Package outline SOT457 (SC-74; TSOP6)**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# 16. Abbreviations

**Table 13. Abbreviations**

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

# 17. Revision history

**Table 14. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74HC_HCT2G17_Q100 v.3 | 20231204 | Product data sheet | - | 74HC_HCT2G17_Q100 v.2 |
| Modifications: | • Section 2: ESD specification updated according to the latest JEDEC standard. | | | |
| 74HC_HCT2G17_Q100 v.2 | 20220202 | Product data sheet | - | 74HC_HCT2G17_Q100 v.1 |
| Modifications: | • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.<br>• Legal texts have been adapted to the new company name where appropriate.<br>• Package SOT363 (SC-88) changed to SOT363-2 (TSSOP6).<br>• Section 2 updated.<br>• Section 9: Derating values for $P_{tot}$ total power dissipation updated.<br>• Fig. 14: Package outline drawing SOT457 (SC-74; TSOP6) updated. | | | |
| 74HC_HCT2G17_Q100 v.1 | 20130522 | Product data sheet | - | - |


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# 18. Legal information

## Data sheet status

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

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[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 https://www.nexperia.com.

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# Contents

**1. General description....1**
**2. Features and benefits....1**
**3. Applications....1**
**4. Ordering information....1**
**5. Marking....2**
**6. Functional diagram....2**
**7. Pinning information....2**
7.1. Pinning....2
7.2. Pin description....2
**8. Functional description....3**
**9. Limiting values....3**
**10. Recommended operating conditions....3**
**11. Static characteristics....4**
**12. Dynamic characteristics....6**
12.1. Waveforms and test circuit....7
**13. Transfer characteristics....8**
13.1. Waveforms transfer characteristics....8
**14. Application information....10**
**15. Package outline....11**
**16. Abbreviations....13**
**17. Revision history....13**
**18. Legal information....14**

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