

# 74HC2G14; 74HCT2G14

## Dual inverting Schmitt trigger

Rev. 01 — 11 October 2006

Product data sheet

### 1. General description

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The 74HC2G14; 74HCT2G14 is a high-speed Si-gate CMOS device.

The 74HC2G14; 74HCT2G14 provides two inverting buffers with Schmitt trigger action which accept standard input signals. They are capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

The inputs switch at different points for positive and negative-going signals. The difference between the positive voltage  $V_{T+}$  and the negative voltage  $V_{T-}$  is defined as the input hysteresis voltage  $V_H$ .

### 2. Features

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- Wide supply voltage range from 2.0 V to 6.0 V
- Complies with JEDEC standard no. 7A
- High noise immunity
- ESD protection:
  - ◆ HBM JESD22-A114-D exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V
- Low power dissipation
- Balanced propagation delays
- Unlimited input rise and fall times
- Multiple package options
- Specified from  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$  and  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$

### 3. Applications

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- 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	
74HC2G14GW	-40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363
74HC2G14GV	-40 °C to +125 °C	SC-74	plastic surface-mounted package (TSOP6); 6 leads	SOT457
74HCT2G14GW	-40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363
74HCT2G14GV	-40 °C to +125 °C	SC-74	plastic surface-mounted package (TSOP6); 6 leads	SOT457

## 5. Marking

Table 2. Marking

Type number	Marking code
74HC2G14GW	HK
74HC2G14GV	H14
74HCT2G14GW	TK
74HCT2G14GV	T14

## 6. Functional diagram

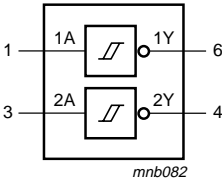


Fig 1. Logic symbol

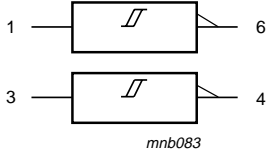


Fig 2. IEC logic symbol

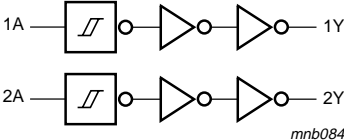
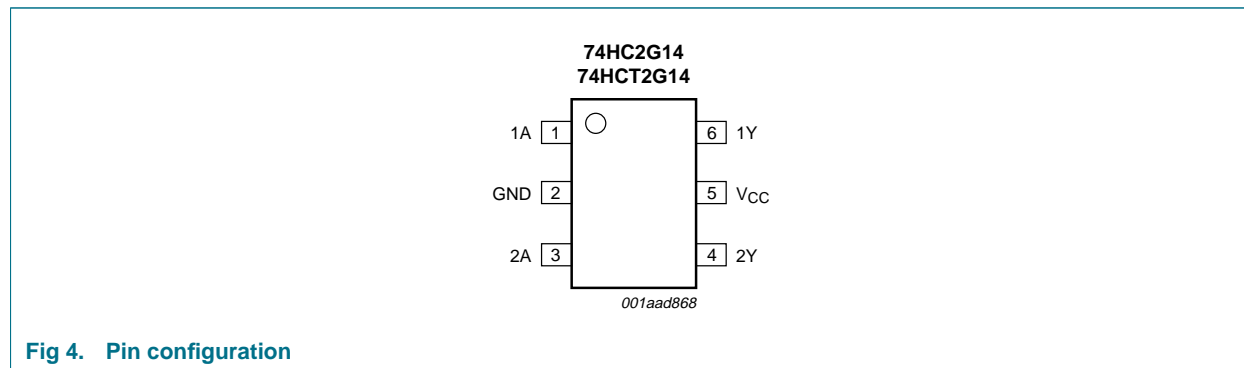


Fig 3. Logic diagram

## 7. Pinning information

### 7.1 Pinning



## 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 <sub>CC</sub>	5	supply voltage
1Y	6	data output

## 8. Functional description

Table 4. Function table<sup>[1]</sup>

Input	Output
nA	nY
L	H
H	L

- [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 <sub>CC</sub>	supply voltage		-0.5	+7.0	V
I <sub>IK</sub>	input clamping current	V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V	[1]	±20	mA
I <sub>OK</sub>	output clamping current	V <sub>O</sub> < -0.5 V or V <sub>O</sub> > V <sub>CC</sub> + 0.5 V	[1]	±20	mA
I <sub>O</sub>	output current	V <sub>O</sub> = -0.5 V to V <sub>CC</sub> + 0.5 V	[1]	±25	mA
I <sub>CC</sub>	supply current		[1]	+50	mA
I <sub>GND</sub>	ground current		[1]	-50	mA
T <sub>stg</sub>	storage temperature		-65	+150	°C
P <sub>tot</sub>	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<sub>tot</sub> derates linearly with 4.0 mW/K.

## 10. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Type 74HC2G14</b>						
$V_{CC}$	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
<b>Type 74HCT2G14</b>						
$V_{CC}$	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 74HC2G14

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b><math>T_{amb} = 25\text{ °C}</math></b>						
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = -20\text{ }\mu\text{A}$ ; $V_{CC} = 2.0\text{ V}$	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
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = 20\text{ }\mu\text{A}$ ; $V_{CC} = 2.0\text{ V}$	-	0	0.1	V
		$I_O = 20\text{ }\mu\text{A}$ ; $V_{CC} = 4.5\text{ V}$	-	0	0.1	V
		$I_O = 20\text{ }\mu\text{A}$ ; $V_{CC} = 6.0\text{ V}$	-	0	0.1	V
		$I_O = 4.0\text{ mA}$ ; $V_{CC} = 4.5\text{ V}$	-	0.15	0.26	V
$I_I$	input leakage current	$V_I = \text{GND}$ or $V_{CC}$ ; $V_{CC} = 6.0\text{ V}$	-	-	$\pm 0.1$	$\mu\text{A}$
		$V_I = \text{GND}$ or $V_{CC}$ ; $I_O = 0\text{ }\mu\text{A}$ ; $V_{CC} = 6.0\text{ V}$	-	-	1.0	$\mu\text{A}$
$I_{CC}$	supply current	$V_I = \text{GND}$ or $V_{CC}$ ; $I_O = 0\text{ }\mu\text{A}$ ; $V_{CC} = 6.0\text{ V}$	-	-	1.0	$\mu\text{A}$
$C_I$	input capacitance		-	2.0	-	pF

**Table 7. Static characteristics for 74HC2G14 ...continued**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b><math>T_{amb} = -40\text{ }^{\circ}\text{C to }+85\text{ }^{\circ}\text{C}</math></b>						
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = -20\text{ }\mu\text{A}; V_{CC} = 2.0\text{ V}$	1.9	-	-	V
		$I_O = -20\text{ }\mu\text{A}; V_{CC} = 4.5\text{ V}$	4.4	-	-	V
		$I_O = -20\text{ }\mu\text{A}; V_{CC} = 6.0\text{ V}$	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	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = 20\text{ }\mu\text{A}; V_{CC} = 2.0\text{ V}$	-	-	0.1	V
		$I_O = 20\text{ }\mu\text{A}; V_{CC} = 4.5\text{ V}$	-	-	0.1	V
		$I_O = 20\text{ }\mu\text{A}; V_{CC} = 6.0\text{ V}$	-	-	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 $V_{CC}; V_{CC} = 6.0\text{ V}$	-	-	$\pm 1.0$	$\mu\text{A}$
$I_{CC}$	supply current	$V_I = \text{GND}$ or $V_{CC}; I_O = 0\text{ }\mu\text{A};$ $V_{CC} = 6.0\text{ V}$	-	-	10.0	$\mu\text{A}$
<b><math>T_{amb} = -40\text{ }^{\circ}\text{C to }+125\text{ }^{\circ}\text{C}</math></b>						
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = -20\text{ }\mu\text{A}; V_{CC} = 2.0\text{ V}$	1.9	-	-	V
		$I_O = -20\text{ }\mu\text{A}; V_{CC} = 4.5\text{ V}$	4.4	-	-	V
		$I_O = -20\text{ }\mu\text{A}; V_{CC} = 6.0\text{ V}$	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
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = 20\text{ }\mu\text{A}; V_{CC} = 2.0\text{ V}$	-	-	0.1	V
		$I_O = 20\text{ }\mu\text{A}; V_{CC} = 4.5\text{ V}$	-	-	0.1	V
		$I_O = 20\text{ }\mu\text{A}; V_{CC} = 6.0\text{ V}$	-	-	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 $V_{CC}; V_{CC} = 6.0\text{ V}$	-	-	$\pm 1.0$	$\mu\text{A}$
$I_{CC}$	supply current	$V_I = \text{GND}$ or $V_{CC}; I_O = 0\text{ }\mu\text{A};$ $V_{CC} = 6.0\text{ V}$	-	-	20.0	$\mu\text{A}$

**Table 8. Static characteristics for 74HCT2G14**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>T<sub>amb</sub> = 25 °C</b>						
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 4.5 V	4.4	4.5	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 4.5 V	4.18	4.32	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 4.5 V	-	0	0.1	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 4.5 V	-	0.15	0.26	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND or V <sub>CC</sub> ; V <sub>CC</sub> = 5.5 V	-	-	±0.1	µA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 µA; V <sub>CC</sub> = 5.5 V	-	-	1.0	µA
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; V <sub>CC</sub> = 4.5 V to 5.5 V; I <sub>O</sub> = 0 µA	-	-	300	µA
C <sub>I</sub>	input capacitance		-	2.0	-	pF
<b>T<sub>amb</sub> = -40 °C to +85 °C</b>						
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 4.5 V	4.4	-	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 4.5 V	4.13	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 4.5 V	-	-	0.1	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 4.5 V	-	-	0.33	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND or V <sub>CC</sub> ; V <sub>CC</sub> = 5.5 V	-	-	±1.0	µA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 µA; V <sub>CC</sub> = 5.5 V	-	-	10.0	µA
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; V <sub>CC</sub> = 4.5 V to 5.5 V; I <sub>O</sub> = 0 µA	-	-	375	µA
<b>T<sub>amb</sub> = -40 °C to +125 °C</b>						
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 4.5 V	4.4	-	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 4.5 V	3.7	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 4.5 V	-	-	0.1	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 4.5 V	-	-	0.4	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND or V <sub>CC</sub> ; V <sub>CC</sub> = 5.5 V	-	-	±1.0	µA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 µA; V <sub>CC</sub> = 5.5 V	-	-	20.0	µA
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; V <sub>CC</sub> = 4.5 V to 5.5 V; I <sub>O</sub> = 0 µA	-	-	410	µA

## 12. Dynamic characteristics

**Table 9. Dynamic 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)	
<b>74HC2G14</b>									
$t_{pd}$	propagation delay	nA to nY; see <a href="#">Figure 5</a> <a href="#">[1]</a>							
		$V_{CC} = 2.0\text{ V}; C_L = 50\text{ pF}$	-	53	125	-	155	190	ns
		$V_{CC} = 4.5\text{ V}; C_L = 50\text{ pF}$	-	16	25	-	31	38	ns
		$V_{CC} = 6.0\text{ V}; C_L = 50\text{ pF}$	-	13	21	-	26	32	ns
$t_t$	transition time	nY; see <a href="#">Figure 5</a> <a href="#">[2]</a>							
		$V_{CC} = 2.0\text{ V}; C_L = 50\text{ pF}$	-	20	75	-	95	110	ns
		$V_{CC} = 4.5\text{ V}; C_L = 50\text{ pF}$	-	7	15	-	19	22	ns
		$V_{CC} = 6.0\text{ V}; C_L = 50\text{ pF}$	-	5	13	-	16	19	ns
$C_{PD}$	power dissipation capacitance	$V_I = \text{GND to } V_{CC}$ <a href="#">[3]</a>	-	10	-	-	-	-	pF
<b>74HCT2G14</b>									
$t_{pd}$	propagation delay	nA to nY; see <a href="#">Figure 5</a> <a href="#">[1]</a>							
		$V_{CC} = 4.5\text{ V}; C_L = 50\text{ pF}$	-	21	32	-	40	48	ns
$t_t$	transition time	nY; see <a href="#">Figure 5</a> <a href="#">[2]</a>							
		$V_{CC} = 4.5\text{ V}; C_L = 50\text{ pF}$	-	6	15	-	19	22	ns
$C_{PD}$	power dissipation capacitance	$V_I = \text{GND to } V_{CC} - 1.5\text{ V}$ <a href="#">[3]</a>	-	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  $\mu\text{W}$ ).

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

$f_i$  = input frequency in MHz;

$f_o$  = output frequency in MHz;

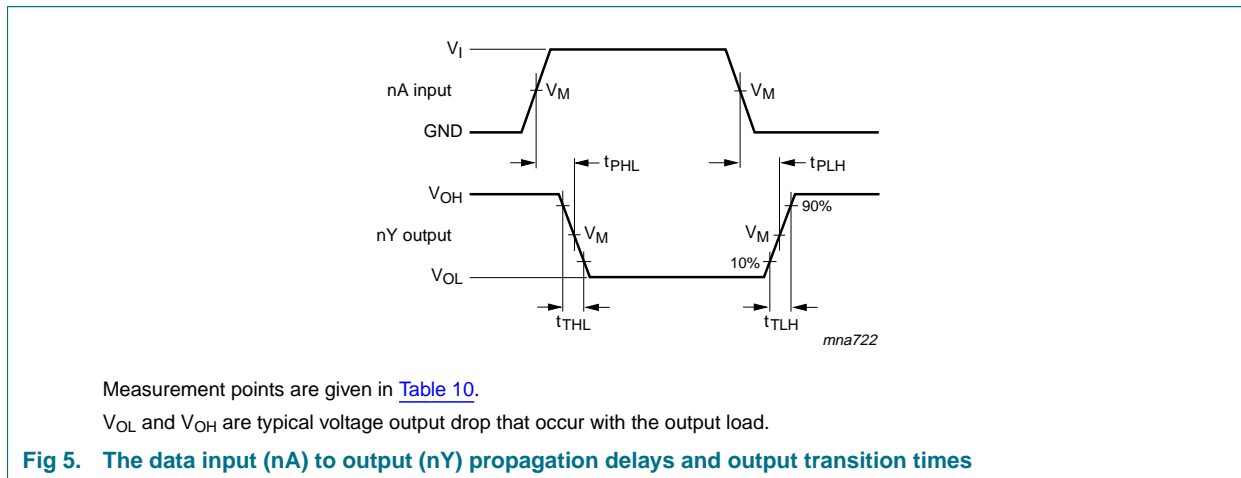
$C_L$  = output load capacitance in pF;

$V_{CC}$  = supply voltage in V;

$N$  = number of inputs switching;

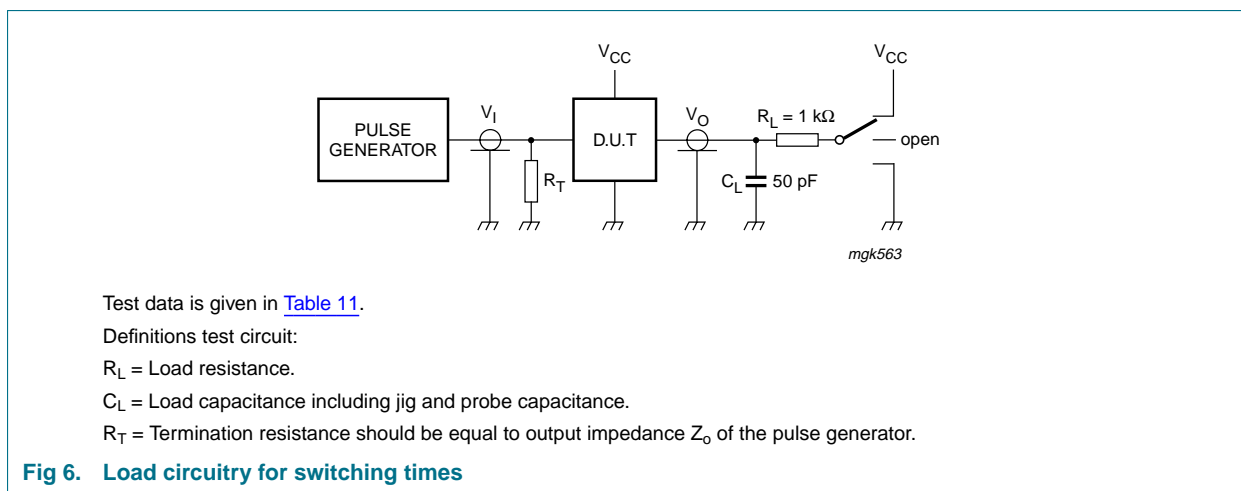
$\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of the outputs.

## 13. Waveforms



**Table 10. Measurement points**

Type	Input			Output
	$V_M$	$V_I$	$t_r = t_f$	$V_M$
74HC2G14	$0.5V_{CC}$	GND to $V_{CC}$	6.0 ns	$0.5V_{CC}$
74HCT2G14	1.3 V	GND to 3.0 V	6.0 ns	1.3 V



**Table 11. Test data**

Type	Input		Test
	$V_I$	$t_r, t_f$	$t_{PHL}, t_{PLH}$
74HC2G14	GND to $V_{CC}$	6 ns	open
74HCT2G14	GND to 3.0 V	6 ns	open



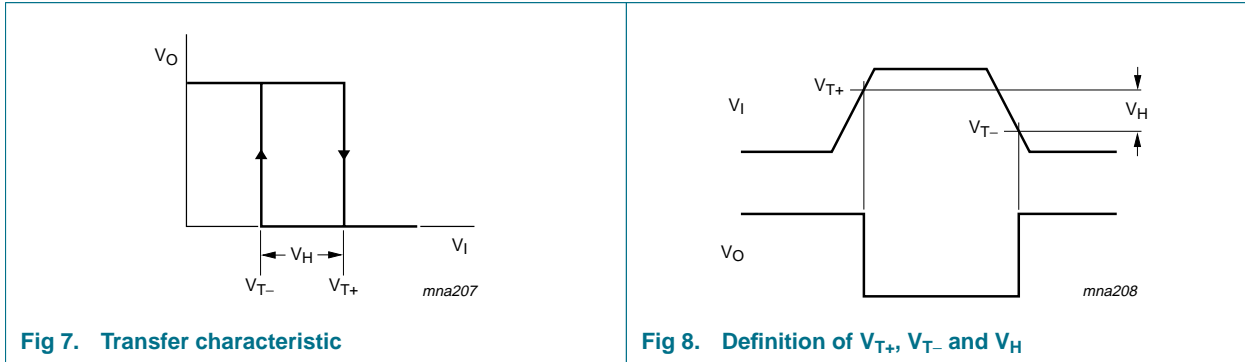
## 14. Transfer characteristics

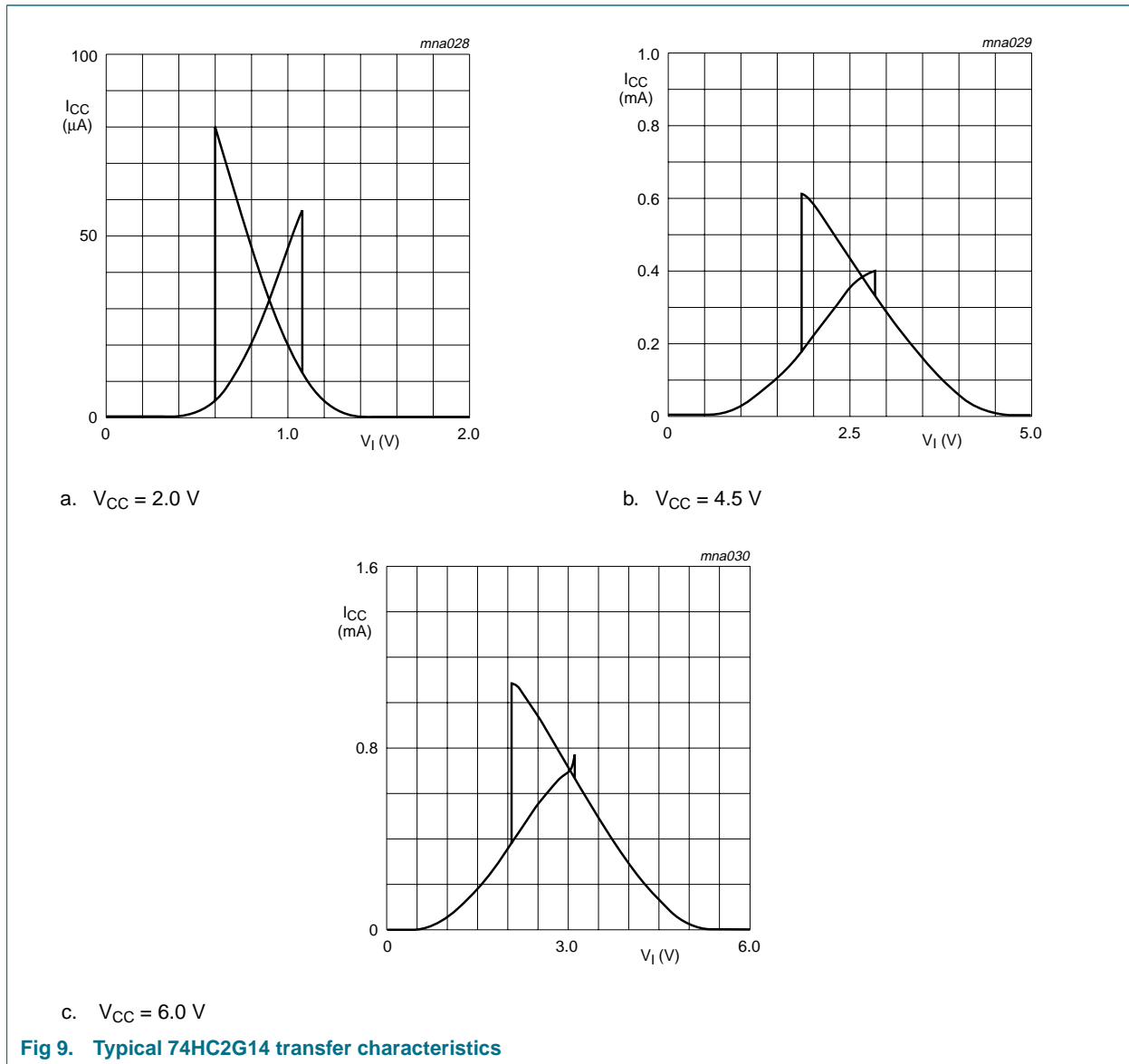
Table 12. Transfer characteristics

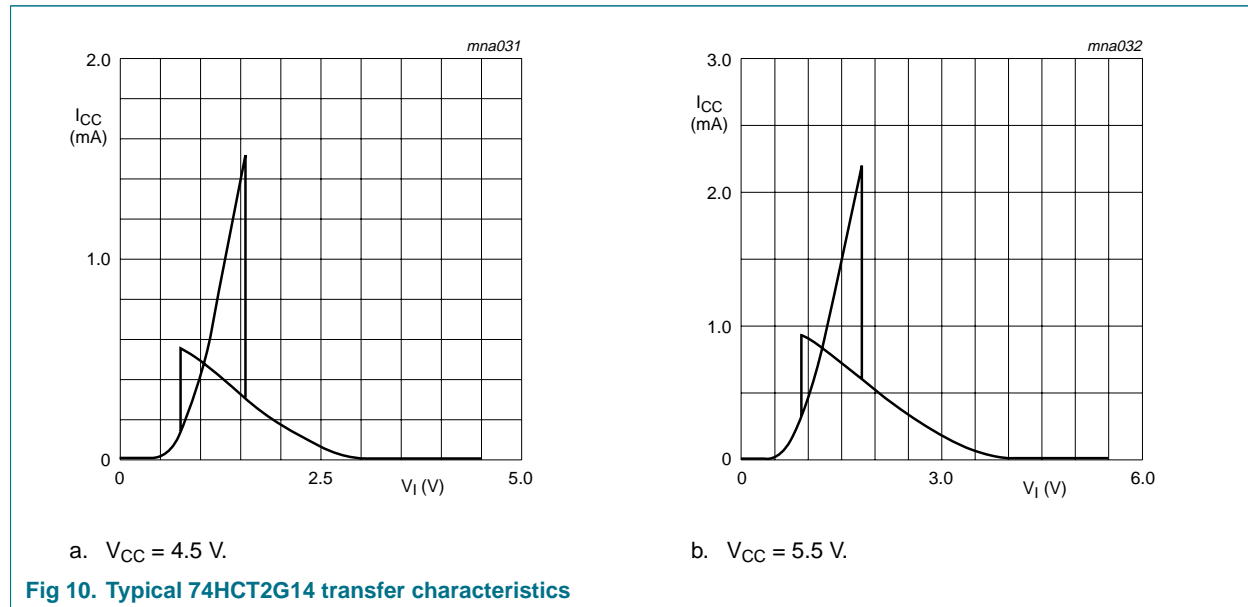
Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 6](#).

Symbol	Parameter	Conditions	25 °C			-40 °C to +125 °C			Unit
			Min	Typ	Max	Min	Max (85 °C)	Max (125 °C)	
<b>74HC2G14</b>									
$V_{T+}$	positive-going threshold voltage	see <a href="#">Figure 7</a> , <a href="#">Figure 8</a>							
		$V_{CC} = 2.0\text{ V}$	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
		$V_{CC} = 6.0\text{ V}$	3.00	3.46	4.20	3.00	4.20	4.20	V
$V_{T-}$	negative-going threshold voltage	see <a href="#">Figure 7</a> , <a href="#">Figure 8</a>							
		$V_{CC} = 2.0\text{ V}$	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
		$V_{CC} = 6.0\text{ V}$	1.50	2.06	2.60	1.50	2.60	2.60	V
$V_H$	hysteresis voltage	$(V_{T+} - V_{T-})$ ; see <a href="#">Figure 7</a> , <a href="#">Figure 8</a> and <a href="#">Figure 9</a>							
		$V_{CC} = 2.0\text{ V}$	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
<b>74HCT2G14</b>									
$V_{T+}$	positive-going threshold voltage	see <a href="#">Figure 7</a> and <a href="#">Figure 8</a>							
		$V_{CC} = 4.5\text{ V}$	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 <a href="#">Figure 7</a> and <a href="#">Figure 8</a>							
		$V_{CC} = 4.5\text{ V}$	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 <a href="#">Figure 7</a> , <a href="#">Figure 8</a> and <a href="#">Figure 10</a>							
		$V_{CC} = 4.5\text{ V}$	0.40	0.71	-	0.40	-	-	V
		$V_{CC} = 5.5\text{ V}$	0.40	0.67	-	0.40	-	-	V

## 15. Waveforms transfer characteristics







## 16. Application information

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

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

$P_{\text{add}}$  = additional power dissipation ( $\mu\text{W}$ );

$f_i$  = input frequency (MHz);

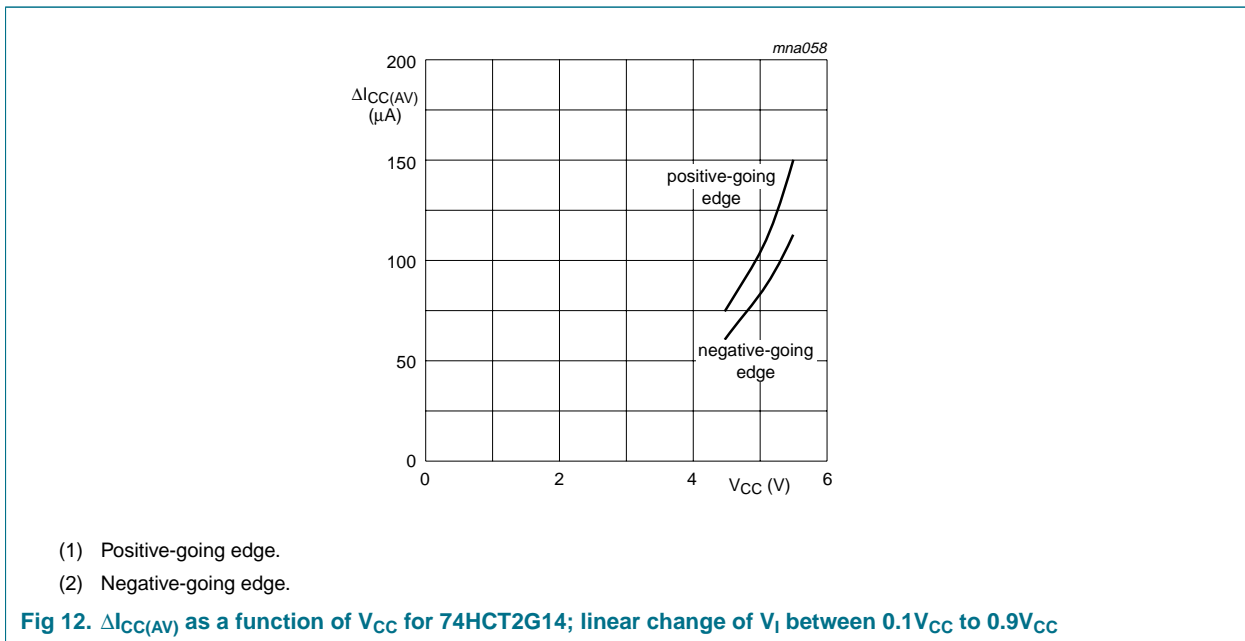
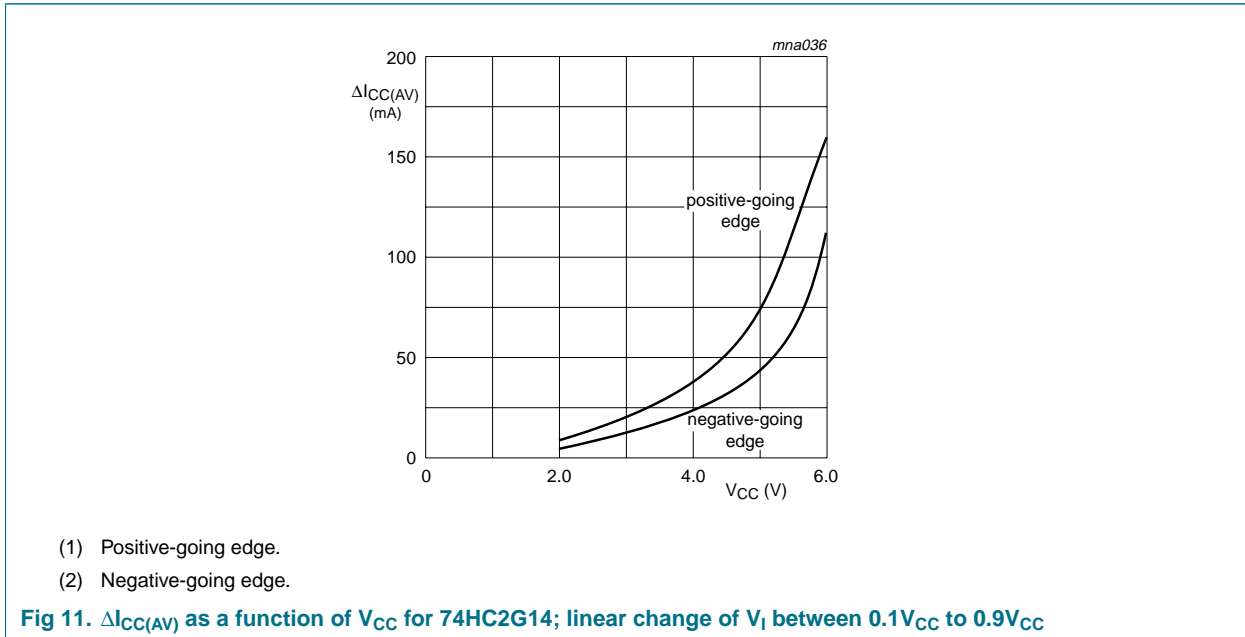
$t_r$  = input rise time (ns); 10 % to 90 %;

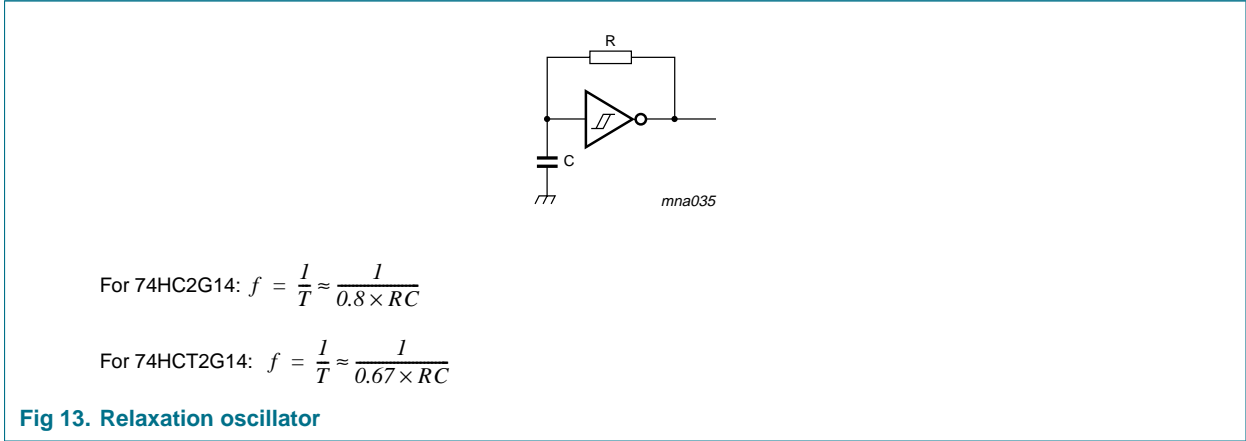
$t_f$  = input fall time (ns); 90 % to 10 %;

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

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

An example of a relaxation circuit using the 74HC2G14/74HCT2G14 is shown in [Figure 13](#).





## 17. Package outline

Plastic surface-mounted package; 6 leads

SOT363

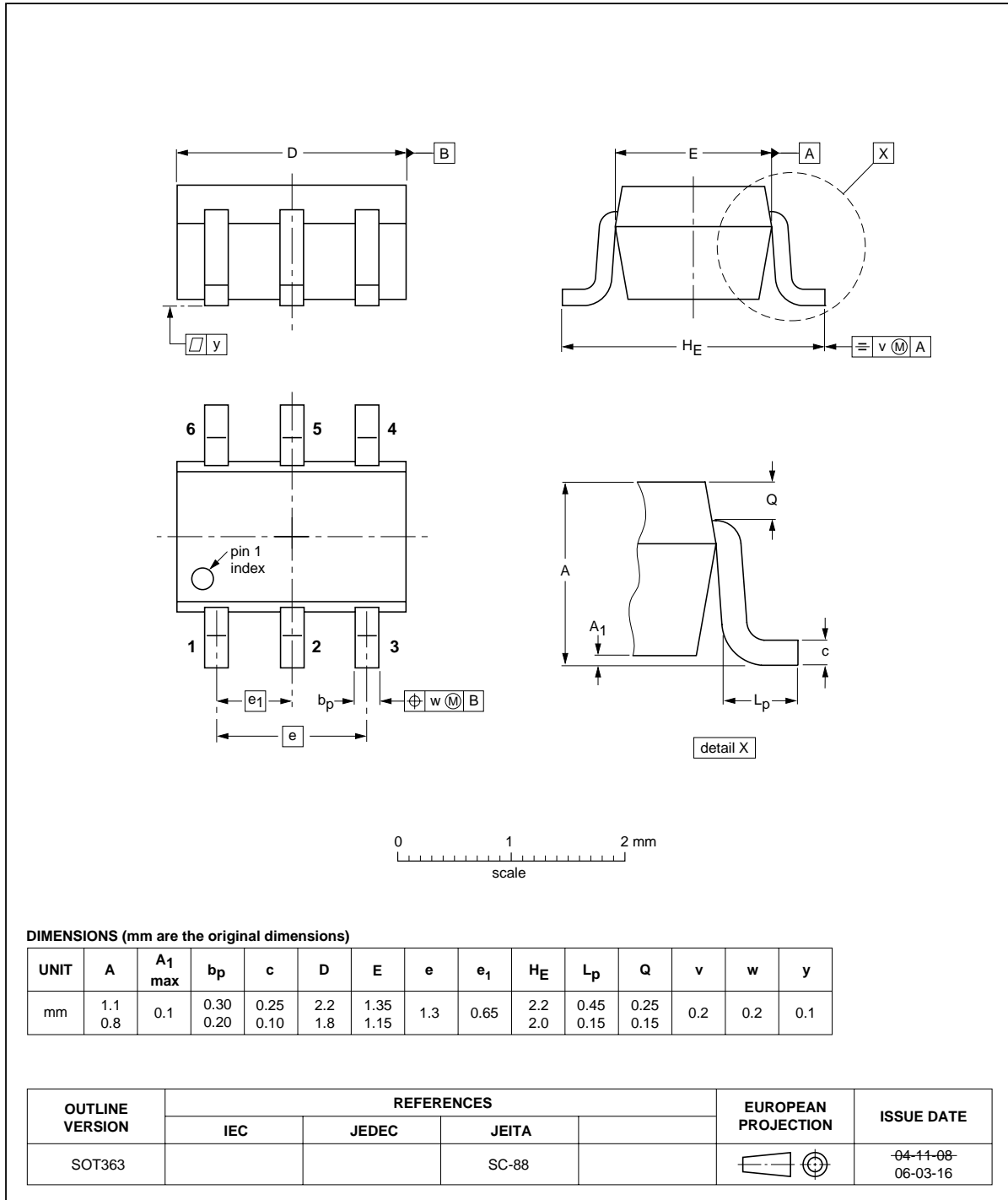


Fig 14. Package outline SOT363 (SC-88)

Plastic surface-mounted package (TSOP6); 6 leads

SOT457

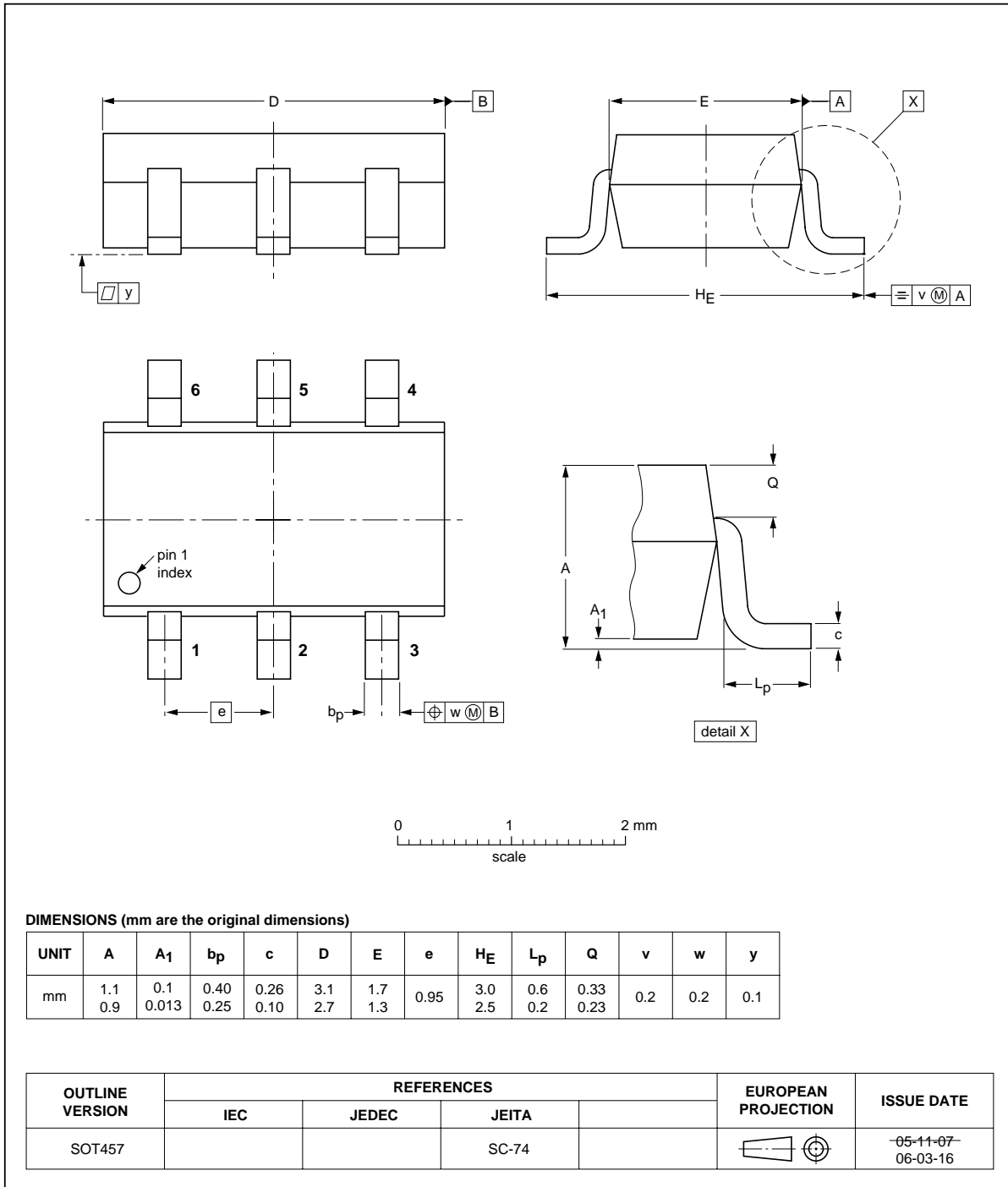


Fig 15. Package outline SOT457 (SC-74)



## 18. Abbreviations

Table 13. Abbreviations

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

## 19. Revision history

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74HC_HCT2G14_1	20061011	Product data sheet	-	-

## 20. Legal information

### 20.1 Data sheet status

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

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

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