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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# 74HC107; 74HCT107

Dual JK flip-flop with reset; negative-edge trigger

Rev. 4 — 26 January 2015

Product data sheet

## 1. General description

The 74HC107; 74HCT107 is a dual negative edge triggered JK flip-flop featuring individual J and K inputs, clock ( $\overline{CP}$ ) and reset ( $\overline{R}$ ) inputs and complementary Q and  $\overline{Q}$  outputs. The reset is an asynchronous active LOW input and operates independently of the clock input. The J and K inputs control the state changes of the flip-flops as described in the mode select function table. The J and K inputs must be stable one set-up time prior to the HIGH-to-LOW clock transition for predictable operation. Inputs include clamp diodes that enable the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

## 2. Features and benefits

- Complies with JEDEC standard no. 7A
- Input levels:
  - ◆ The 74HC107: CMOS levels
  - ◆ The 74HCT107: TTL levels
- ESD protection:
  - ◆ HBM JESD22-A114F exceeds 2000 V
  - ◆ MM JESD22-A115-A exceeds 200 V
- Multiple package options
- Specified from  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$  and from  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$

## 3. Ordering information

Table 1. Ordering information

Type number	Package			Version
	Temperature range	Name	Description	
74HC107N	$-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$	DIP14	plastic dual in-line package; 14 leads (300 mil)	SOT27-1
74HCT107N				
74HC107D	$-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$	SO14	plastic small outline package; 14 leads; body width 3.9 mm	SOT108-1
74HCT107D				
74HC107DB	$-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$	SSOP14	plastic shrink small outline package; 14 leads; body width 5.3 mm	SOT337-1
74HC107PW	$-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$	TSSOP14	plastic thin shrink small outline package; 14 leads; body width 4.4 mm	SOT402-1



## 4. Functional diagram

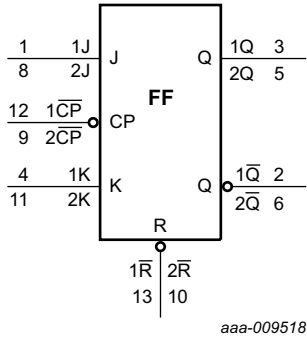


Fig 1. Logic symbol

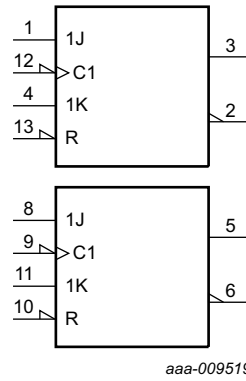


Fig 2. IEC logic symbol

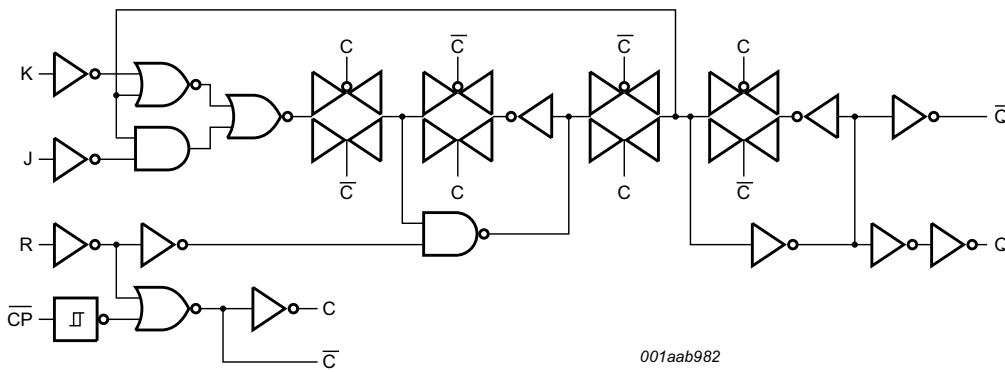


Fig 3. Logic diagram (one flip-flop)

## 5. Pinning information

### 5.1 Pinning

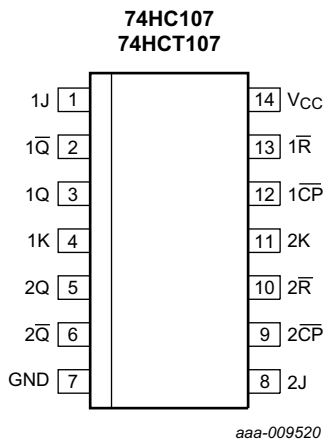


Fig 4. Pin configuration DIP14, SO14 and (T)SSOP14

### 5.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
1J, 2J	1, 8	synchronous J input
1Q̄, 2Q̄	2, 6	complement output
1Q, 2Q	3, 5	true output
1K, 2K	4, 11	synchronous K input
1C̄P, 2C̄P	12, 9	clock input (HIGH-to-LOW edge-triggered)
1R̄, 2R̄	13, 10	asynchronous reset input (active LOW)
GND	7	ground (0 V)
V <sub>CC</sub>	14	supply voltage

## 6. Functional description

Table 3. Function table<sup>[1]</sup>

Input				Output		Operating mode
$\overline{R}$	$\overline{CP}$	J	K	Q	$\overline{Q}$	
L	X	X	X	L	H	asynchronous reset
H	↓	h	h	$\overline{q}$	q	toggle
H	↓	l	h	L	H	load 0 (reset)
H	↓	h	l	H	L	load 1 (set)
H	↓	l	l	q	$\overline{q}$	hold (no change)

- [1] H = HIGH voltage level;  
 h = HIGH voltage level one set-up time prior to the HIGH-to-LOW clock transition;  
 L = LOW voltage level;  
 l = LOW voltage level one set-up time prior to the HIGH-to-LOW clock transition;  
 q = state of referenced output one set-up time prior to the HIGH-to-LOW clock transition;  
 X = don't care;  
 ↓ = HIGH-to-LOW clock transition.

## 7. Limiting values

Table 4. 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 $V_{CC} + 0.5\text{ V}$	-	±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	$T_{amb} = -40\text{ °C}$ to $+125\text{ °C}$				
		DIP14 package	[2]	-	750	mW
		SO14 package	[3]	-	500	mW
		(T)SSOP14 package	[4]	-	500	mW

- [1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.  
 [2]  $P_{tot}$  derates linearly with 12 mW/K above 70 °C.  
 [3]  $P_{tot}$  derates linearly with 8 mW/K above 70 °C.  
 [4]  $P_{tot}$  derates linearly with 5.5 mW/K above 60 °C.



## 8. Recommended operating conditions

**Table 5. Recommended operating conditions**

Voltages are referenced to GND (ground = 0 V)

Symbol	Parameter	Conditions	74HC107			74HCT107			Unit
			Min	Typ	Max	Min	Typ	Max	
V <sub>CC</sub>	supply voltage		2.0	5.0	6.0	4.5	5.0	5.5	V
V <sub>I</sub>	input voltage		0	-	V <sub>CC</sub>	0	-	V <sub>CC</sub>	V
V <sub>O</sub>	output voltage		0	-	V <sub>CC</sub>	0	-	V <sub>CC</sub>	V
T <sub>amb</sub>	ambient temperature		-40	+25	+125	-40	+25	+125	°C
Δt/ΔV	input transition rise and fall rate	V <sub>CC</sub> = 2.0 V	-	-	625	-	-	-	ns/V
		V <sub>CC</sub> = 4.5 V	-	1.67	139	-	1.67	139	ns/V
		V <sub>CC</sub> = 6.0 V	-	-	83	-	-	-	ns/V

## 9. Static characteristics

**Table 6. Static characteristics**

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

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
<b>74HC107</b>										
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 2.0 V	1.5	1.2	-	1.5	-	1.5	-	V
		V <sub>CC</sub> = 4.5 V	3.15	2.4	-	3.15	-	3.15	-	V
		V <sub>CC</sub> = 6.0 V	4.2	3.2	-	4.2	-	4.2	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 2.0 V	-	0.8	0.5	-	0.5	-	0.5	V
		V <sub>CC</sub> = 4.5 V	-	2.1	1.35	-	1.35	-	1.35	V
		V <sub>CC</sub> = 6.0 V	-	2.8	1.8	-	1.8	-	1.8	V
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> = 2.0 V	1.9	2.0	-	1.9	-	1.9	-	V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 4.5 V	4.4	4.5	-	4.4	-	4.4	-	V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 6.0 V	5.9	6.0	-	5.9	-	5.9	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 4.5 V	3.98	4.32	-	3.84	-	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> = 2.0 V	-	0	0.1	-	0.1	-	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V	-	0	0.1	-	0.1	-	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V	-	0	0.1	-	0.1	-	0.1	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 4.5 V	-	0.15	0.26	-	0.33	-	0.4	V
I <sub>l</sub>	input leakage current	V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V	-	-	±0.1	-	±1.0	-	±1.0	μA
		V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 6.0 V	-	-	4.0	-	40	-	80	μA

**Table 6. Static characteristics ...continued**

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

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
C <sub>I</sub>	input capacitance		-	3.5	-					pF
<b>74HCT107</b>										
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 4.5 V to 5.5 V	2.0	1.6	-	2.0	-	2.0	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 4.5 V to 5.5 V	-	1.2	0.8	-	0.8	-	0.8	V
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 4.5 V								
		I <sub>O</sub> = -20 μA	4.4	4.5	-	4.4	-	4.4	-	V
		I <sub>O</sub> = -4 mA	3.98	4.32	-	3.84	-	3.7	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>CC</sub> = 4.5 V								
		I <sub>O</sub> = 20 μA	-	0	0.1	-	0.1	-	0.1	V
		I <sub>O</sub> = 4.0 mA	-	0.16	0.26	-	0.33	-	0.4	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 5.5 V	-	-	±0.1	-	±1.0	-	±1.0	μA
I <sub>CC</sub>	supply current	V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 5.5 V	-	-	4.0	-	40	-	80	μA
ΔI <sub>CC</sub>	additional supply current	per input pin; V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; I <sub>O</sub> = 0 A; other inputs at V <sub>CC</sub> or GND; V <sub>CC</sub> = 4.5 V to 5.5 V								
		pin nCP, nJ	-	100	360	-	450	-	490	μA
		pin nR	-	65	234	-	293	-	319	μA
		pin nK	-	60	216	-	270	-	294	μA
C <sub>I</sub>	input capacitance		-	3.5	-	-	-	-	-	pF

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

GND (ground = 0 V);  $C_L = 50$  pF unless otherwise specified; for test circuit, see [Figure 7](#)

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
<b>74HC107</b>										
$t_{pd}$	propagation delay	$\overline{nCP}$ to nQ; see <a href="#">Figure 5</a> <sup>[1]</sup>								
		$V_{CC} = 2.0$ V	-	52	160	-	200	-	240	ns
		$V_{CC} = 4.5$ V	-	19	32	-	40	-	48	ns
		$V_{CC} = 5.0$ V; $C_L = 15$ pF	-	16	-	-	-	-	-	ns
		$V_{CC} = 6.0$ V	-	15	27	-	34	-	41	ns
		$\overline{nCP}$ to $\overline{nQ}$ ; see <a href="#">Figure 5</a>								
		$V_{CC} = 2.0$ V	-	52	160	-	200	-	240	ns
		$V_{CC} = 4.5$ V	-	19	32	-	40	-	48	ns
		$V_{CC} = 5.0$ V; $C_L = 15$ pF	-	16	-	-	-	-	-	ns
		$V_{CC} = 6.0$ V	-	15	27	-	34	-	41	ns
		$\overline{nR}$ to nQ, $\overline{nQ}$ ; see <a href="#">Figure 6</a>								
		$V_{CC} = 2.0$ V	-	52	155	-	195	-	235	ns
		$V_{CC} = 4.5$ V	-	19	31	-	39	-	47	ns
		$V_{CC} = 5.0$ V; $C_L = 15$ pF	-	16	-	-	-	-	-	ns
$V_{CC} = 6.0$ V	-	15	26	-	33	-	40	ns		
$t_t$	transition time	nQ, $\overline{nQ}$ ; see <a href="#">Figure 5</a> <sup>[2]</sup>								
		$V_{CC} = 2.0$ V	-	19	75	-	95	-	110	ns
		$V_{CC} = 4.5$ V	-	7	15	-	19	-	22	ns
		$V_{CC} = 6.0$ V	-	6	13	-	16	-	19	ns
$t_w$	pulse width	$\overline{nCP}$ input, HIGH or LOW; see <a href="#">Figure 5</a>								
		$V_{CC} = 2.0$ V	80	22	-	100	-	120	-	ns
		$V_{CC} = 4.5$ V	16	8	-	20	-	24	-	ns
		$V_{CC} = 6.0$ V	14	6	-	17	-	20	-	ns
		$\overline{nR}$ input, HIGH or LOW; see <a href="#">Figure 6</a>								
		$V_{CC} = 2.0$ V	80	22	-	100	-	120	-	ns
		$V_{CC} = 4.5$ V	16	8	-	20	-	24	-	ns
		$V_{CC} = 6.0$ V	14	6	-	17	-	20	-	ns
$t_{rec}$	recovery time	$\overline{nR}$ to $\overline{nCP}$ ; see <a href="#">Figure 6</a>								
		$V_{CC} = 2.0$ V	60	19	-	75	-	90	-	ns
		$V_{CC} = 4.5$ V	12	7	-	15	-	18	-	ns
		$V_{CC} = 6.0$ V	20	6	-	13	-	15	-	ns
$t_{su}$	set-up time	nJ, nK to $\overline{nCP}$ ; see <a href="#">Figure 5</a>								
		$V_{CC} = 2.0$ V	100	22	-	125	-	150	-	ns
		$V_{CC} = 4.5$ V	20	8	-	25	-	30	-	ns
		$V_{CC} = 6.0$ V	17	6	-	21	-	26	-	ns



**Table 7. Dynamic characteristics ...continued**  
 GND (ground = 0 V);  $C_L = 50$  pF unless otherwise specified; for test circuit, see [Figure 7](#)

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
$t_h$	hold time	nJ, nK to $\overline{nCP}$ ; see <a href="#">Figure 5</a>								
		$V_{CC} = 2.0$ V	3	-6	-	3	-	3	-	ns
		$V_{CC} = 4.5$ V	3	-2	-	3	-	3	-	ns
		$V_{CC} = 6.0$ V	3	-2	-	3	-	3	-	ns
$f_{max}$	maximum frequency	$\overline{nCP}$ input; see <a href="#">Figure 5</a>								
		$V_{CC} = 2.0$ V	6	23	-	4.8	-	4.0	-	MHz
		$V_{CC} = 4.5$ V	30	70	-	24	-	20	-	MHz
		$V_{CC} = 5.0$ V; $C_L = 15$ pF	-	78	-	-	-	-	-	MHz
	$V_{CC} = 6.0$ V	35	85	-	28	-	24	-	MHz	
$C_{PD}$	power dissipation capacitance	per flip-flop; $V_I = GND$ to $V_{CC}$ <a href="#">[3]</a>	-	30	-	-	-	-	-	pF
<b>74HCT107</b>										
$t_{pd}$	propagation delay	$\overline{nCP}$ to nQ; see <a href="#">Figure 5</a> <a href="#">[1]</a>								
		$V_{CC} = 4.5$ V	-	19	36	-	45	-	54	ns
		$V_{CC} = 5.0$ V; $C_L = 15$ pF	-	16	-	-	-	-	-	ns
		$\overline{nCP}$ to $\overline{nQ}$ ; see <a href="#">Figure 5</a>								
		$V_{CC} = 4.5$ V	-	21	36	-	45	-	54	ns
		$V_{CC} = 5.0$ V; $C_L = 15$ pF	-	18	-	-	-	-	-	ns
		$\overline{nR}$ to nQ, $\overline{nQ}$ ; see <a href="#">Figure 6</a>								
	$V_{CC} = 4.5$ V	-	20	38	-	48	-	57	ns	
	$V_{CC} = 5.0$ V; $C_L = 15$ pF	-	17	-	-	-	-	-	ns	
$t_t$	transition time	nQ, $\overline{nQ}$ ; see <a href="#">Figure 5</a> <a href="#">[2]</a>								
		$V_{CC} = 4.5$ V	-	7	15	-	19	-	22	ns
$t_{w}$	pulse width	$\overline{nCP}$ input, HIGH or LOW; see <a href="#">Figure 5</a>								
		$V_{CC} = 4.5$ V	16	9	-	20	-	24	-	ns
		$\overline{nR}$ input, HIGH or LOW; see <a href="#">Figure 6</a>								
	$V_{CC} = 4.5$ V	20	11	-	25	-	30	-	ns	
$t_{rec}$	recovery time	$\overline{nR}$ to $\overline{nCP}$ ; see <a href="#">Figure 6</a>								
		$V_{CC} = 4.5$ V	14	8	-	18	-	21	-	ns
$t_{su}$	set-up time	nJ, nK to $\overline{nCP}$ ; see <a href="#">Figure 5</a>								
		$V_{CC} = 4.5$ V	20	7	-	25	-	30	-	ns
$t_h$	hold time	nJ, nK to $\overline{nCP}$ ; see <a href="#">Figure 5</a>								
		$V_{CC} = 4.5$ V	5	-2	-	5	-	5	-	ns

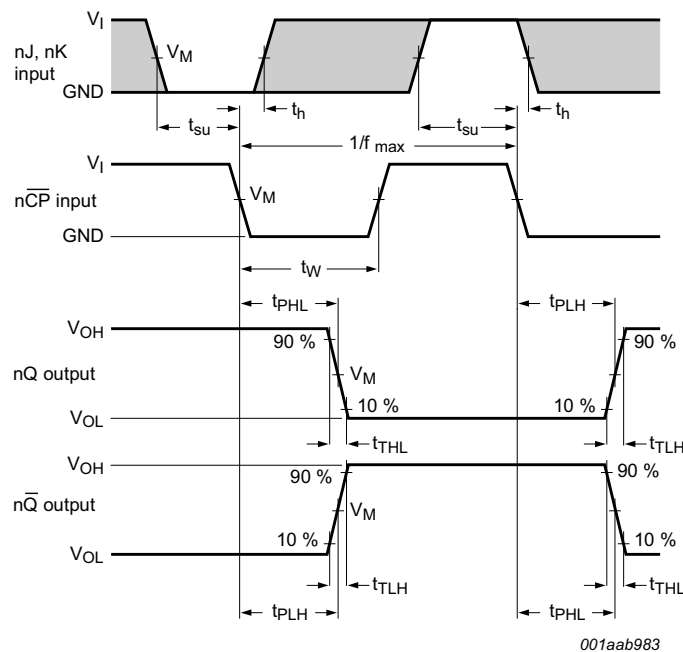
**Table 7. Dynamic characteristics ...continued**

GND (ground = 0 V);  $C_L = 50 \text{ pF}$  unless otherwise specified; for test circuit, see [Figure 7](#)

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
$f_{\text{max}}$	maximum frequency	nCP input; see <a href="#">Figure 5</a>								
		$V_{\text{CC}} = 4.5 \text{ V}$	30	66	-	24	-	20	-	MHz
		$V_{\text{CC}} = 5.0 \text{ V}; C_L = 15 \text{ pF}$	-	73	-	-	-	-	-	MHz
$C_{\text{PD}}$	power dissipation capacitance	per flip-flop; $V_I = \text{GND to } V_{\text{CC}} - 1.5 \text{ V}$ <a href="#">[3]</a>	-	30	-	-	-	-	-	pF

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

## 11. Waveforms

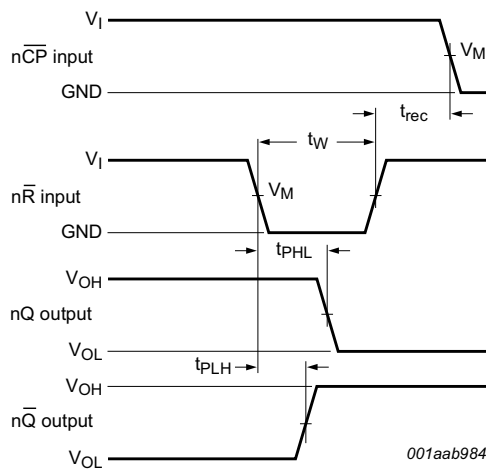


The shaded areas indicate when the input is permitted to change for predictable output performance.

Measurement points are given in [Table 8](#).

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

**Fig 5. Clock propagation delays, pulse width, set-up and hold times, output transition times and the maximum frequency**



Measurement points are given in [Table 8](#).  
 $V_{OL}$  and  $V_{OH}$  are typical voltage output levels that occur with the output load.

**Fig 6. Reset propagation delays, pulse width and recovery time**

**Table 8. Measurement points**

Type	Input		Output
	$V_I$	$V_M$	$V_M$
74HC107	$V_{CC}$	$0.5V_{CC}$	$0.5V_{CC}$
74HCT107	3 V	1.3 V	1.3 V

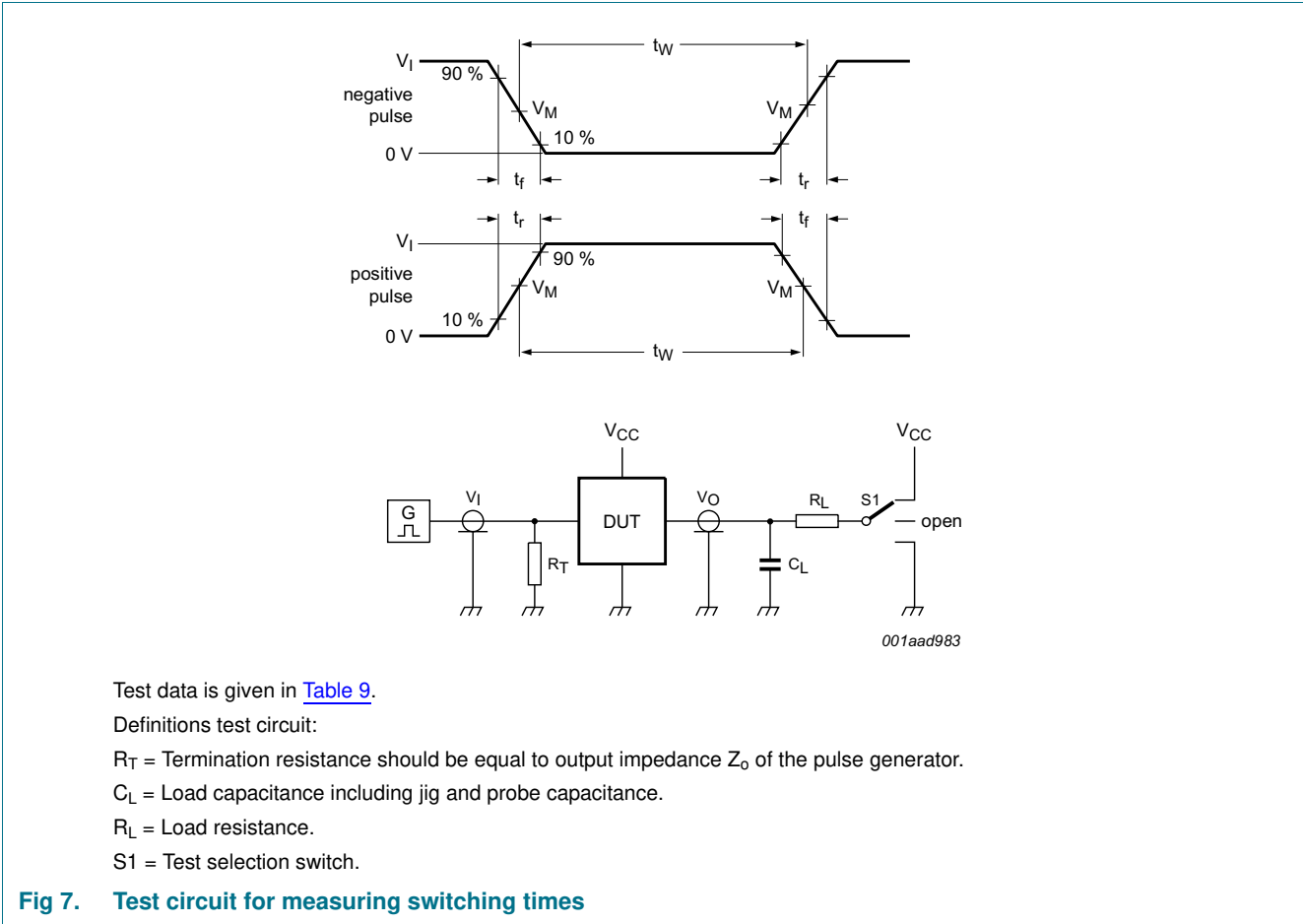


Table 9. Test data

Type	Input		Load		S1 position		
	$V_I$	$t_r, t_f$	$C_L$	$R_L$	$t_{PHL}, t_{PLH}$	$t_{PZH}, t_{PHZ}$	$t_{PZL}, t_{PLZ}$
74HC107	$V_{CC}$	6 ns	15 pF, 50 pF	1 k $\Omega$	open	GND	$V_{CC}$
74HCT107	3 V	6 ns	15 pF, 50 pF	1 k $\Omega$	open	GND	$V_{CC}$

12. Package outline

DIP14: plastic dual in-line package; 14 leads (300 mil)

SOT27-1

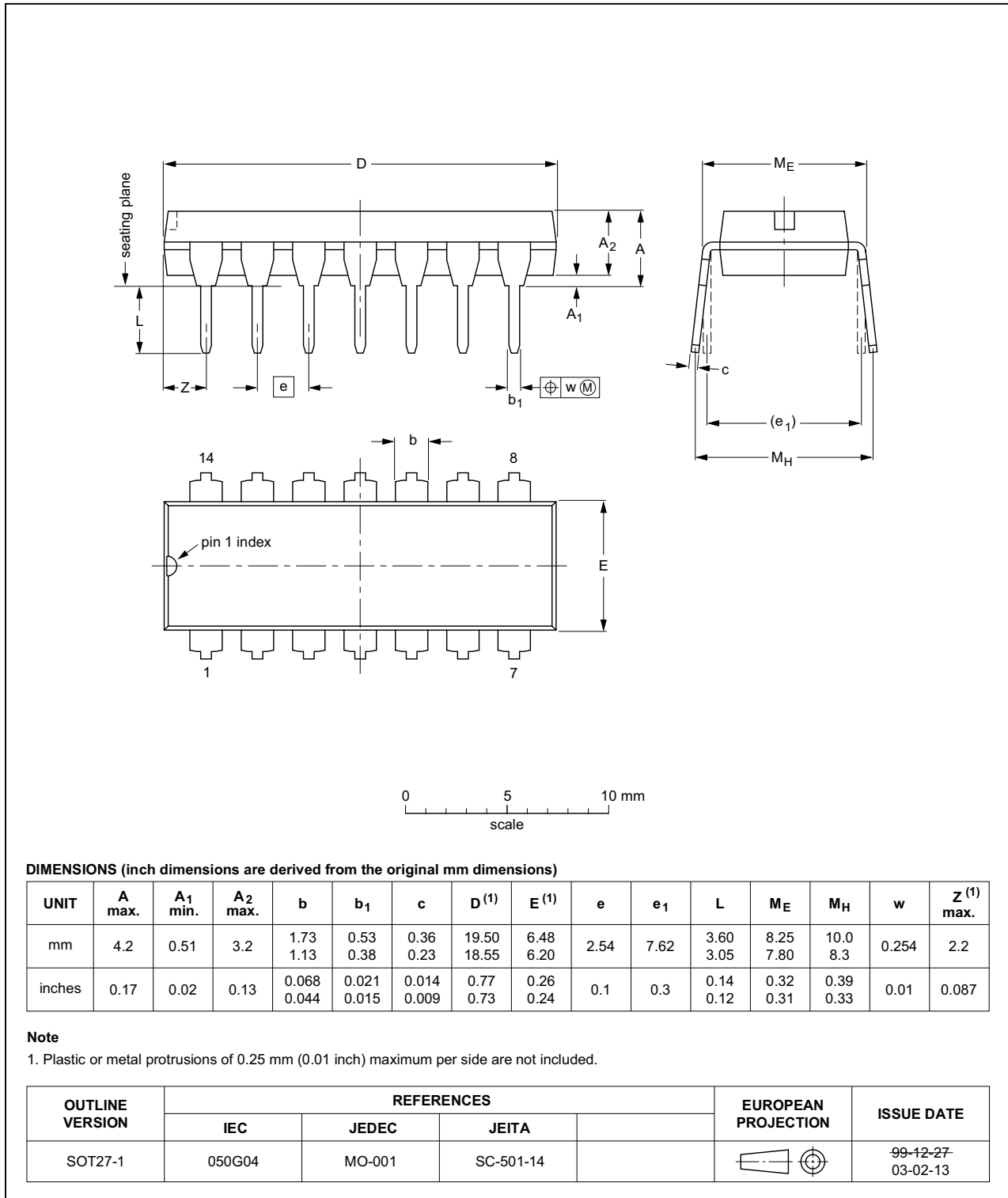


Fig 8. Package outline SOT27-1 (DIP14)

SO14: plastic small outline package; 14 leads; body width 3.9 mm

SOT108-1

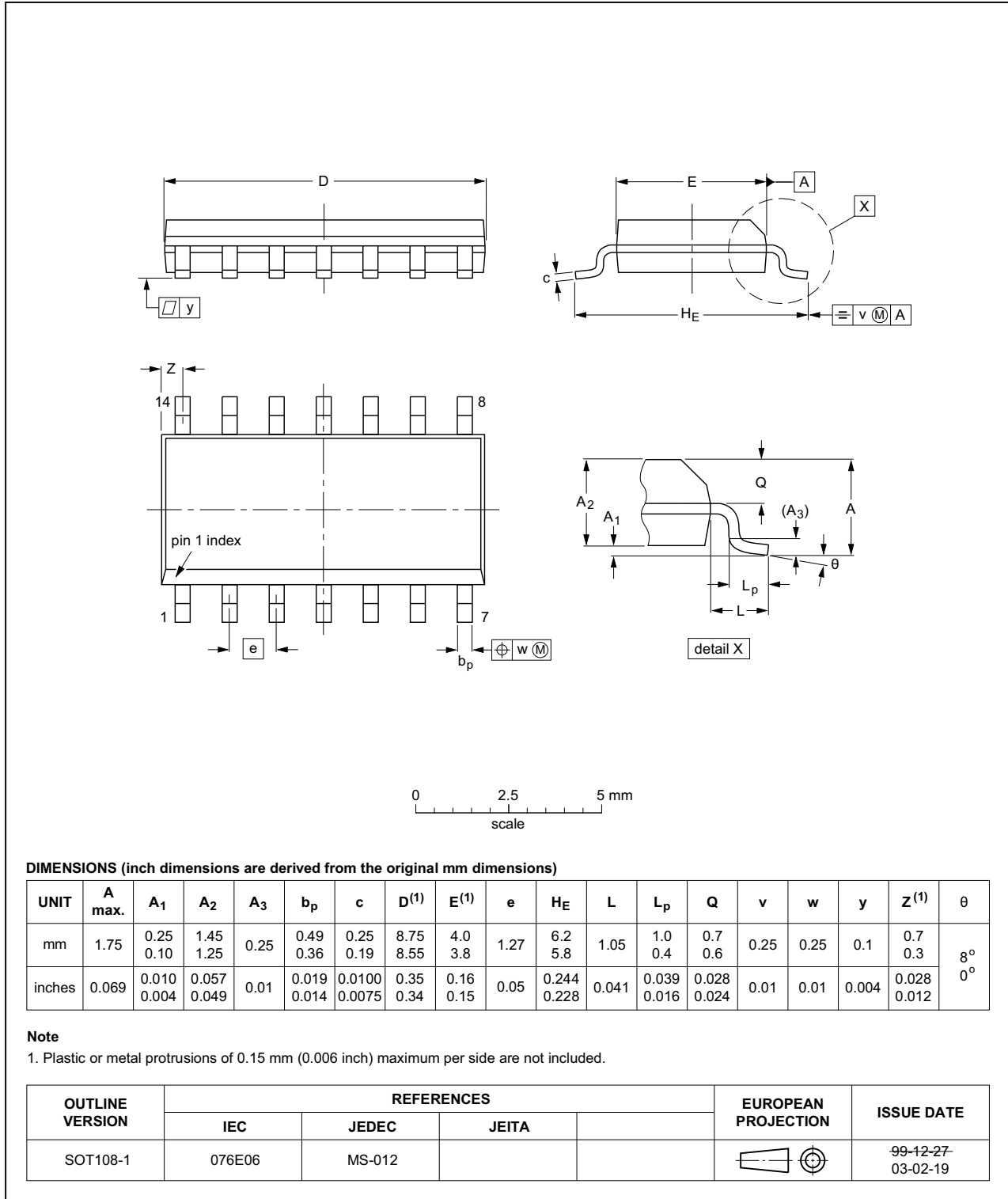


Fig 9. Package outline SOT108-1 (SO14)



SSOP14: plastic shrink small outline package; 14 leads; body width 5.3 mm

SOT337-1

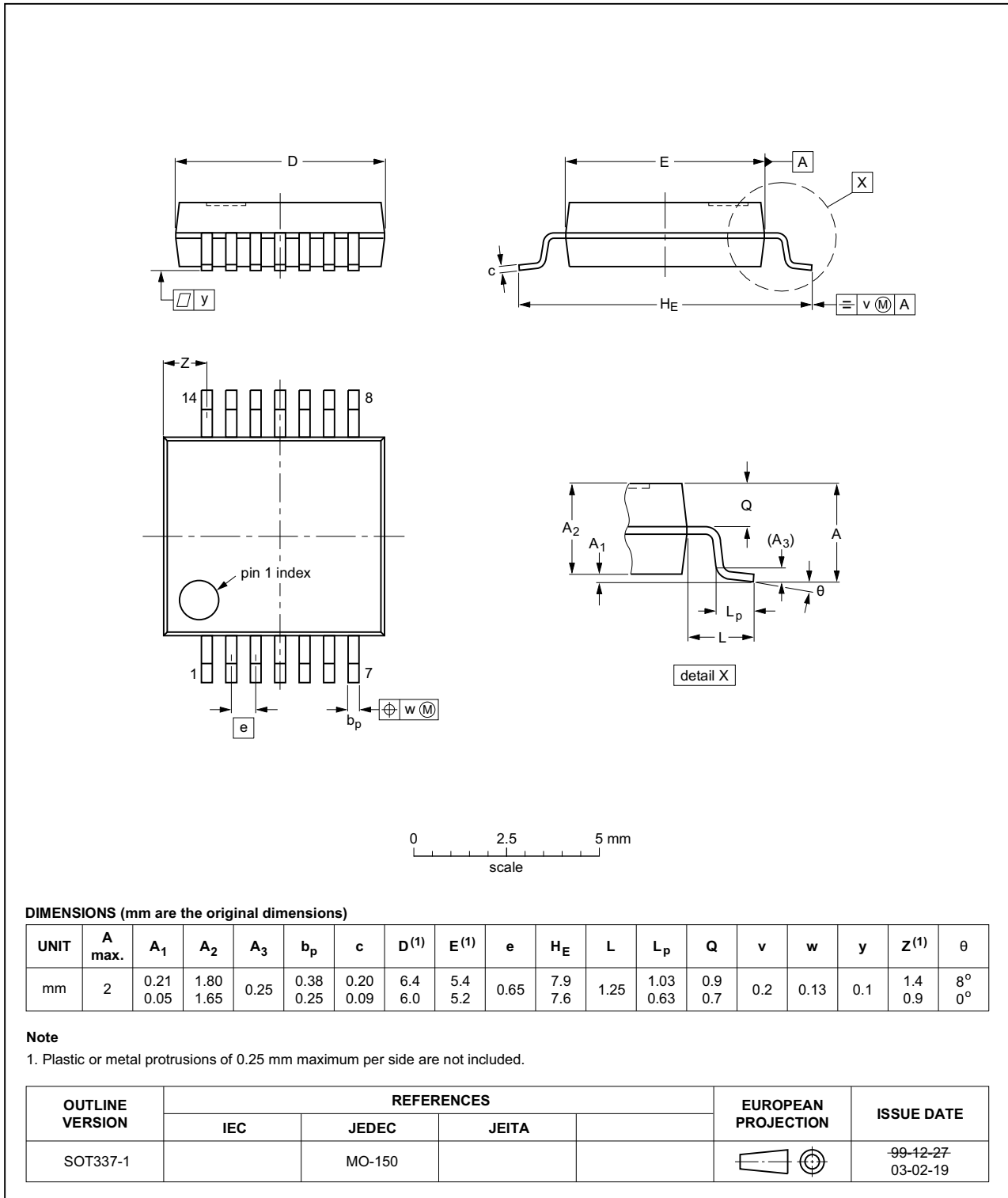


Fig 10. Package outline SOT337-1 (SSOP14)

TSSOP14: plastic thin shrink small outline package; 14 leads; body width 4.4 mm

SOT402-1

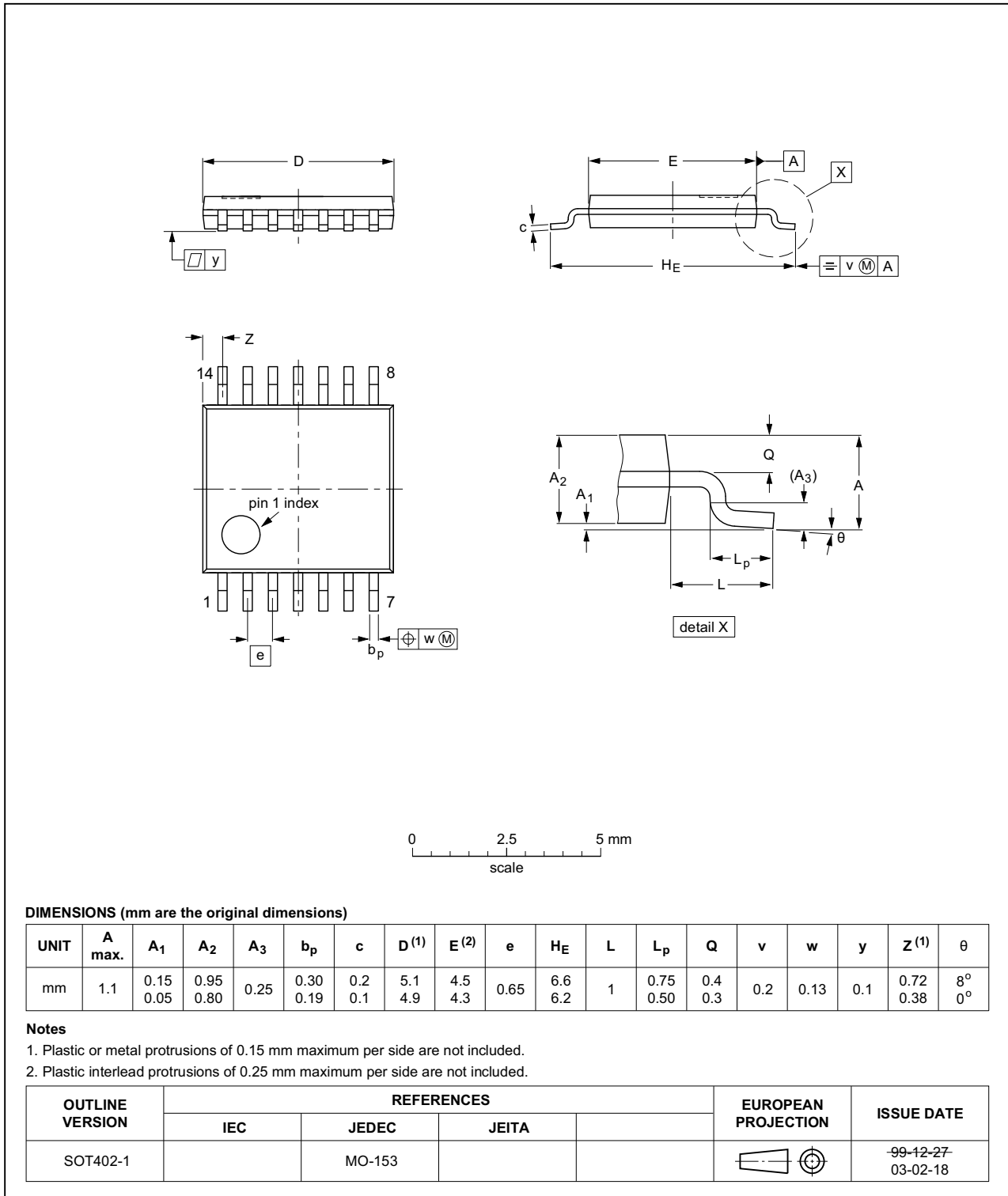


Fig 11. Package outline SOT402-1 (TSSOP14)

## 13. Abbreviations

Table 10. Abbreviations

Acronym	Description
CMOS	Complementary Metal Oxide Semiconductor
LSTTL	Low-power Schottky Transistor-Transistor Logic
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model
CDM	Charge-Device Model
TTL	Transistor-Transistor Logic

## 14. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74HC_HCT107 v.4	20150126	Product data sheet	-	74HC_HCT107 v.3
Modifications:	<ul style="list-style-type: none"> <li><a href="#">Table 7</a>: Power dissipation capacitance condition for 74HCT107 is corrected.</li> </ul>			
74HC_HCT107 v.3	20131118	Product data sheet	-	74HC_HCT107_CNV v.2
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> </ul>			
74HC_HCT107_CNV v.2	19901201	Product specification	-	-

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### 15.1 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.

[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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