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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



# 74HC4024

## 7-stage binary ripple counter

Rev. 7 — 31 October 2013

Product data sheet

### 1. General description

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The 74HC4024 is a 7-stage binary ripple counter with a clock input ( $\overline{CP}$ ), an overriding asynchronous master reset input (MR) and seven fully buffered parallel outputs (Q0 to Q6). The counter advances on the HIGH-to-LOW transition of  $\overline{CP}$ . A HIGH on MR clears all counter stages and forces all outputs LOW, independent of the state of  $\overline{CP}$ . Each counter stage is a static toggle flip-flop. Schmitt-trigger action in the clock input makes the circuit highly tolerant to slower clock rise and fall times. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

### 2. Features and benefits

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- Low-power dissipation
- Complies with JEDEC standard no. 7A
- 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  $+80\text{ }^{\circ}\text{C}$  and from  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$ .

### 3. Applications

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- Frequency dividing circuits
- Time delay circuits.





## 6. Pinning information

### 6.1 Pinning

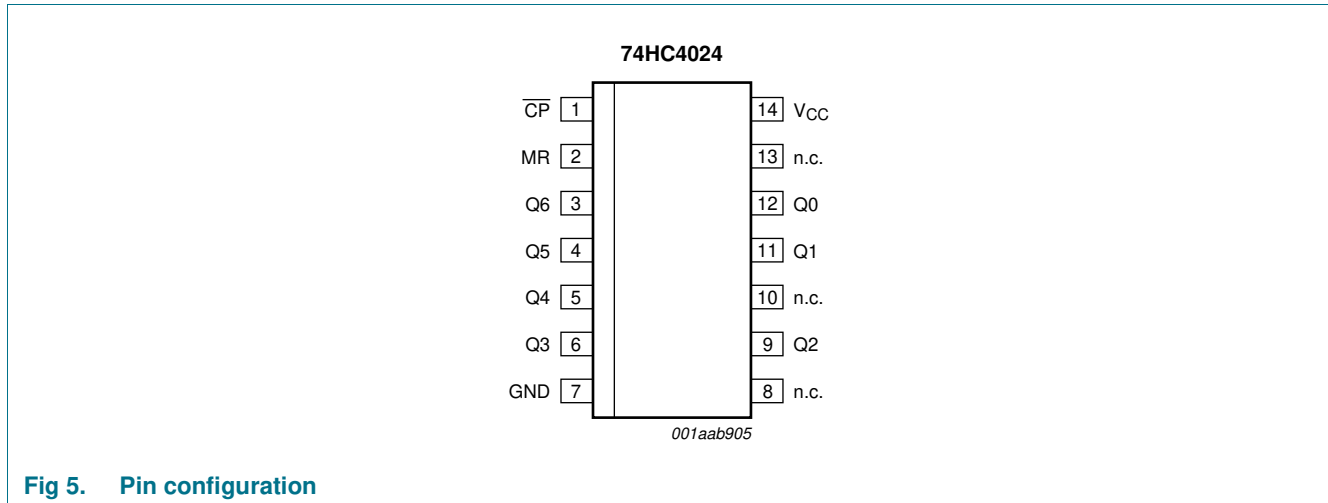


Fig 5. Pin configuration

### 6.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
CP	1	clock input (HIGH-to-LOW, edge-triggered)
MR	2	master reset input (active HIGH)
Q6, Q5, Q4, Q3, Q2, Q1, Q0	3, 4, 5, 6, 9, 11, 12	parallel output
GND	7	ground (0 V)
n.c.	8, 10, 13	not connected
V <sub>CC</sub>	14	positive supply voltage

## 7. Functional description

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

Input		Output
MR	$\overline{\text{CP}}$	Q <sub>n</sub>
H	X	L
L	↑	no change
	↓	count

[1] H = HIGH voltage level;  
 L = LOW voltage level;  
 X = don't care;  
 ↑ = LOW-to-HIGH clock transition;  
 ↓ = HIGH-to-LOW clock transition.

## 8. 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	V
$I_{IK}$	input clamping current	$V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$	-	$\pm 20$	mA
$I_{OK}$	output clamping current	$V_O < -0.5\text{ V}$ or $V_O > V_{CC} + 0.5\text{ V}$	-	$\pm 20$	mA
$I_O$	output current	$V_O = -0.5\text{ V}$ to $V_{CC} + 0.5\text{ V}$	-	$\pm 25$	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	DIP14 package	[1] -	750	mW
		SO14 package	[2] -	500	mW
		SSOP14 and TSSOP14 package	[3] -	500	mW

[1] For DIP16 package:  $P_{tot}$  derates linearly with 12 mW/K above 70 °C.

[2] For SO16 package:  $P_{tot}$  derates linearly with 8 mW/K above 70 °C.

[3] For (T)SSOP16 packages:  $P_{tot}$  derates linearly with 5.5 mW/K above 60 °C.

## 9. Recommended operating conditions

**Table 5. Recommended operating conditions**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CC}$	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
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 2.0\text{ V}$	-	-	625	ns/V
		$V_{CC} = 4.5\text{ V}$	-	1.67	139	ns/V
		$V_{CC} = 6.0\text{ V}$	-	-	83	ns/V
$T_{amb}$	ambient temperature		-40	-	+125	°C

## 10. Static characteristics

**Table 6. Static characteristics**

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>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 2.0 V	1.5	1.2	-	V
		V <sub>CC</sub> = 4.5 V	3.15	2.4	-	V
		V <sub>CC</sub> = 6.0 V	4.2	3.2	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 2.0 V	-	0.8	0.5	V
		V <sub>CC</sub> = 4.5 V	-	2.1	1.35	V
		V <sub>CC</sub> = 6.0 V	-	2.8	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	-	V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 4.5 V	4.4	4.5	-	V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 6.0 V	5.9	6.0	-	V
		I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 4.5 V	3.98	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> = 2.0 V	-	0	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V	-	0	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V	-	0	0.1	V
		I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 4.5 V	-	0.15	0.26	V
		I <sub>O</sub> = 5.2 mA; V <sub>CC</sub> = 6.0 V	-	0.16	0.26	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V	-	-	±0.1	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> = 6.0 V	-	-	8.0	μA
C <sub>I</sub>	input capacitance		-	3.5	-	pF
<b>T<sub>amb</sub> = -40 °C to +85 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 2.0 V	1.5	-	-	V
		V <sub>CC</sub> = 4.5 V	3.15	-	-	V
		V <sub>CC</sub> = 6.0 V	4.2	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 2.0 V	-	-	0.5	V
		V <sub>CC</sub> = 4.5 V	-	-	1.35	V
		V <sub>CC</sub> = 6.0 V	-	-	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	-	-	V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 4.5 V	4.4	-	-	V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 6.0 V	5.9	-	-	V
		I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 4.5 V	3.84	-	-	V
		I <sub>O</sub> = -5.2 mA; V <sub>CC</sub> = 6.0 V	5.34	-	-	V

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

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
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	-	-	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V	-	-	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V	-	-	0.1	V
		I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 4.5 V	-	-	0.33	V
		I <sub>O</sub> = 5.2 mA; V <sub>CC</sub> = 6.0 V	-	-	0.33	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V	-	-	±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> = 6.0 V	-	-	80	μA
<b>T<sub>amb</sub> = -40 °C to +125 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 2.0 V	1.5	-	-	V
		V <sub>CC</sub> = 4.5 V	3.15	-	-	V
		V <sub>CC</sub> = 6.0 V	4.2	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 2.0 V	-	-	0.5	V
		V <sub>CC</sub> = 4.5 V	-	-	1.35	V
		V <sub>CC</sub> = 6.0 V	-	-	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	-	-	V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 4.5 V	4.4	-	-	V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 6.0 V	5.9	-	-	V
		I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 4.5 V	3.7	-	-	V
		I <sub>O</sub> = -5.2 mA; V <sub>CC</sub> = 6.0 V	5.2	-	-	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	-	-	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V	-	-	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V	-	-	0.1	V
		I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 4.5 V	-	-	0.4	V
		I <sub>O</sub> = 5.2 mA; V <sub>CC</sub> = 6.0 V	-	-	0.4	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = V <sub>CC</sub> or GND; V <sub>CC</sub> = 6.0 V	-	-	±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> = 6.0 V	-	-	160	μA

## 11. Dynamic characteristics

**Table 7. Dynamic characteristics**

$GND = 0\text{ V}$ ;  $t_r = t_f = 6\text{ ns}$ ;  $C_L = 50\text{ pF}$ ; see [Figure 7](#).

Symbol	Parameter	Conditions	Min	Typ	Max	Unit		
<b><math>T_{amb} = 25\text{ °C}</math></b>								
$t_{pd}$	propagation delay	$\overline{CP}$ to Q0; see <a href="#">Figure 6</a>	[1]					
		$V_{CC} = 2.0\text{ V}$	-	47	175	ns		
		$V_{CC} = 4.5\text{ V}$	-	17	35	ns		
		$V_{CC} = 6.0\text{ V}$	-	14	30	ns		
		$V_{CC} = 5.0\text{ V}$ ; $C_L = 15\text{ pF}$	-	14	-	ns		
		Qn to Qn+1; see <a href="#">Figure 6</a>	[1]					
		$V_{CC} = 2.0\text{ V}$	-	25	80	ns		
		$V_{CC} = 4.5\text{ V}$	-	9	16	ns		
$t_{PHL}$	HIGH to LOW propagation delay	MR to Q0; see <a href="#">Figure 6</a>						
		$V_{CC} = 2.0\text{ V}$	-	63	200	ns		
		$V_{CC} = 4.5\text{ V}$	-	23	40	ns		
$t_t$	transition time	see <a href="#">Figure 6</a>	[2]					
		$V_{CC} = 2.0\text{ V}$	-	19	75	ns		
		$V_{CC} = 4.5\text{ V}$	-	7	15	ns		
$t_w$	pulse width	$\overline{CP}$ HIGH or LOW; see <a href="#">Figure 6</a>						
		$V_{CC} = 2.0\text{ V}$	80	17	-	ns		
		$V_{CC} = 4.5\text{ V}$	16	6	-	ns		
		$V_{CC} = 6.0\text{ V}$	14	5	-	ns		
		MR HIGH; see <a href="#">Figure 6</a>						
		$V_{CC} = 2.0\text{ V}$	80	22	-	ns		
		$V_{CC} = 4.5\text{ V}$	16	8	-	ns		
		$V_{CC} = 6.0\text{ V}$	14	6	-	ns		
		$t_{rec}$	recovery time	MR to $\overline{CP}$ ; see <a href="#">Figure 6</a>				
				$V_{CC} = 2.0\text{ V}$	50	6	-	ns
$V_{CC} = 4.5\text{ V}$	10			2	-	ns		
$f_{max}$	maximum frequency	CP; see <a href="#">Figure 6</a>						
		$V_{CC} = 2.0\text{ V}$	6.0	27	-	MHz		
		$V_{CC} = 4.5\text{ V}$	30	82	-	MHz		
		$V_{CC} = 6.0\text{ V}$	35	98	-	MHz		
$C_{PD}$	power dissipation capacitance	$V_1 = GND$ to $V_{CC}$	[3]	25	-	pF		



**Table 7. Dynamic characteristics ...continued**  
*GND = 0 V;  $t_r = t_f = 6$  ns;  $C_L = 50$  pF; see [Figure 7](#).*

Symbol	Parameter	Conditions	Min	Typ	Max	Unit		
<b><math>T_{amb} = -40</math> °C to <math>+85</math> °C</b>								
$t_{pd}$	propagation delay	$\overline{CP}$ to Q0; see <a href="#">Figure 6</a>	[1]					
		$V_{CC} = 2.0$ V	-	-	220	ns		
		$V_{CC} = 4.5$ V	-	-	44	ns		
		$V_{CC} = 6.0$ V	-	-	37	ns		
		Qn to Qn+1; see <a href="#">Figure 6</a>	[1]					
		$V_{CC} = 2.0$ V	-	-	100	ns		
		$V_{CC} = 4.5$ V	-	-	20	ns		
		$V_{CC} = 6.0$ V	-	-	17	ns		
		$t_{PHL}$	HIGH to LOW propagation delay	MR to Q0; see <a href="#">Figure 6</a>				
$V_{CC} = 2.0$ V	-			-	250	ns		
$V_{CC} = 4.5$ V	-			-	50	ns		
$V_{CC} = 6.0$ V	-			-	43	ns		
$t_t$	transition time	see <a href="#">Figure 6</a>	[2]					
		$V_{CC} = 2.0$ V	-	-	95	ns		
		$V_{CC} = 4.5$ V	-	-	19	ns		
		$V_{CC} = 6.0$ V	-	-	16	ns		
$t_w$	pulse width	$\overline{CP}$ HIGH or LOW; see <a href="#">Figure 6</a>						
		$V_{CC} = 2.0$ V	100	-	-	ns		
		$V_{CC} = 4.5$ V	20	-	-	ns		
		$V_{CC} = 6.0$ V	17	-	-	ns		
		MR HIGH; see <a href="#">Figure 6</a>						
		$V_{CC} = 2.0$ V	100	-	-	ns		
		$V_{CC} = 4.5$ V	20	-	-	ns		
		$V_{CC} = 6.0$ V	17	-	-	ns		
		$t_{rec}$	recovery time	MR to $\overline{CP}$ ; see <a href="#">Figure 6</a>				
				$V_{CC} = 2.0$ V	65	-	-	ns
$V_{CC} = 4.5$ V	13			-	-	ns		
$V_{CC} = 6.0$ V	11			-	-	ns		
$f_{max}$	maximum frequency	CP; see <a href="#">Figure 6</a>						
		$V_{CC} = 2.0$ V	4.8	-	-	MHz		
		$V_{CC} = 4.5$ V	24	-	-	MHz		
		$V_{CC} = 6.0$ V	28	-	-	MHz		

**Table 7. Dynamic characteristics ...continued**  
 $GND = 0\text{ V}$ ;  $t_r = t_f = 6\text{ ns}$ ;  $C_L = 50\text{ pF}$ ; see [Figure 7](#).

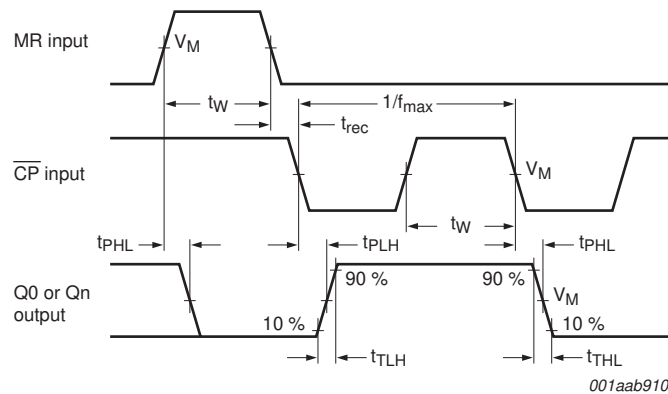
Symbol	Parameter	Conditions	Min	Typ	Max	Unit		
<b><math>T_{\text{amb}} = -40\text{ °C to }+125\text{ °C}</math></b>								
$t_{\text{pd}}$	propagation delay	$\overline{\text{CP}}$ to Q0; see <a href="#">Figure 6</a>	[1]					
		$V_{\text{CC}} = 2.0\text{ V}$	-	-	265	ns		
		$V_{\text{CC}} = 4.5\text{ V}$	-	-	53	ns		
		$V_{\text{CC}} = 6.0\text{ V}$	-	-	45	ns		
		Qn to Qn+1; see <a href="#">Figure 6</a>	[1]					
		$V_{\text{CC}} = 2.0\text{ V}$	-	-	120	ns		
		$V_{\text{CC}} = 4.5\text{ V}$	-	-	24	ns		
		$V_{\text{CC}} = 6.0\text{ V}$	-	-	20	ns		
		$t_{\text{PHL}}$	HIGH to LOW propagation delay	MR to Q0; see <a href="#">Figure 6</a>				
$V_{\text{CC}} = 2.0\text{ V}$	-			-	300	ns		
$V_{\text{CC}} = 4.5\text{ V}$	-			-	60	ns		
$V_{\text{CC}} = 6.0\text{ V}$	-			-	51	ns		
$t_t$	transition time	see <a href="#">Figure 6</a>	[2]					
		$V_{\text{CC}} = 2.0\text{ V}$	-	-	110	ns		
		$V_{\text{CC}} = 4.5\text{ V}$	-	-	22	ns		
		$V_{\text{CC}} = 6.0\text{ V}$	-	-	19	ns		
$t_w$	pulse width	$\overline{\text{CP}}$ HIGH or LOW; see <a href="#">Figure 6</a>						
		$V_{\text{CC}} = 2.0\text{ V}$	120	-	-	ns		
		$V_{\text{CC}} = 4.5\text{ V}$	24	-	-	ns		
		$V_{\text{CC}} = 6.0\text{ V}$	20	-	-	ns		
		MR HIGH; see <a href="#">Figure 6</a>						
		$V_{\text{CC}} = 2.0\text{ V}$	120	-	-	ns		
		$V_{\text{CC}} = 4.5\text{ V}$	24	-	-	ns		
		$V_{\text{CC}} = 6.0\text{ V}$	20	-	-	ns		
		$t_{\text{rec}}$	recovery time	MR to $\overline{\text{CP}}$ ; see <a href="#">Figure 6</a>				
				$V_{\text{CC}} = 2.0\text{ V}$	75	-	-	ns
$V_{\text{CC}} = 4.5\text{ V}$	15			-	-	ns		
$V_{\text{CC}} = 6.0\text{ V}$	13			-	-	ns		

**Table 7. Dynamic characteristics ...continued**  
*GND = 0 V;  $t_r = t_f = 6 \text{ ns}$ ;  $C_L = 50 \text{ pF}$ ; see [Figure 7](#).*

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$f_{\text{max}}$	maximum frequency	CP; see <a href="#">Figure 6</a>				
		$V_{\text{CC}} = 2.0 \text{ V}$	4.0	-	-	MHz
		$V_{\text{CC}} = 4.5 \text{ V}$	20	-	-	MHz
		$V_{\text{CC}} = 6.0 \text{ V}$	24	-	-	MHz

- [1]  $t_{\text{pd}}$  is the same as  $t_{\text{PLH}}$  and  $t_{\text{PHL}}$ .
- [2]  $t_t$  is the same as  $t_{\text{THL}}$  and  $t_{\text{TLH}}$ .
- [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.

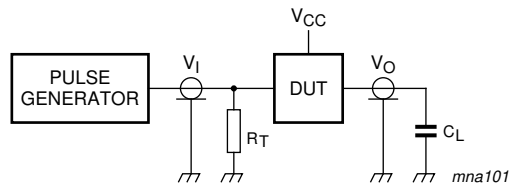
## 12. Waveforms



Also showing the master reset (MR) pulse width, the master reset to output (Qn) propagation delays and the master reset to clock ( $\overline{\text{CP}}$ ) recovery time.

$$V_M = 0.5 \times V_I.$$

**Fig 6. Waveforms showing the clock ( $\overline{\text{CP}}$ ) to output (Qn) propagation delays, the clock pulse width, the output transition times and the maximum clock frequency**



Test data is given in [Table 8](#).

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.

**Fig 7. Test circuit for measuring switching times**

**Table 8. Test data**

Supply	Input		Load
$V_{CC}$	$V_I$	$t_r, t_f$	$C_L$
2.0 V	$V_{CC}$	6 ns	50 pF
4.5 V	$V_{CC}$	6 ns	50 pF
6.0 V	$V_{CC}$	6 ns	50 pF
5.0 V	$V_{CC}$	6 ns	15 pF

13. Package outline

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

SOT27-1

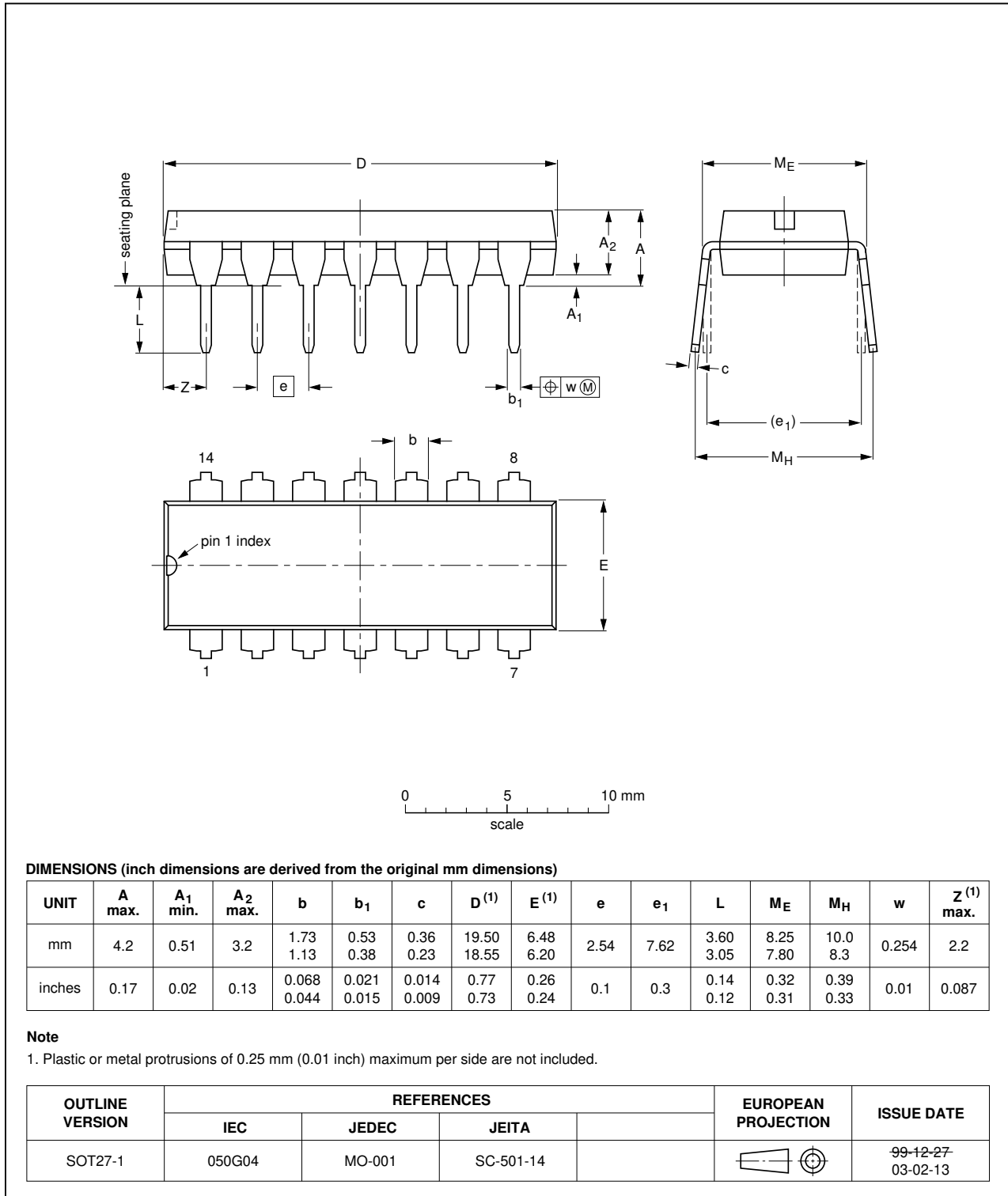


Fig 8. Package outline SOT27-1 (DIP14)

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

SOT108-1

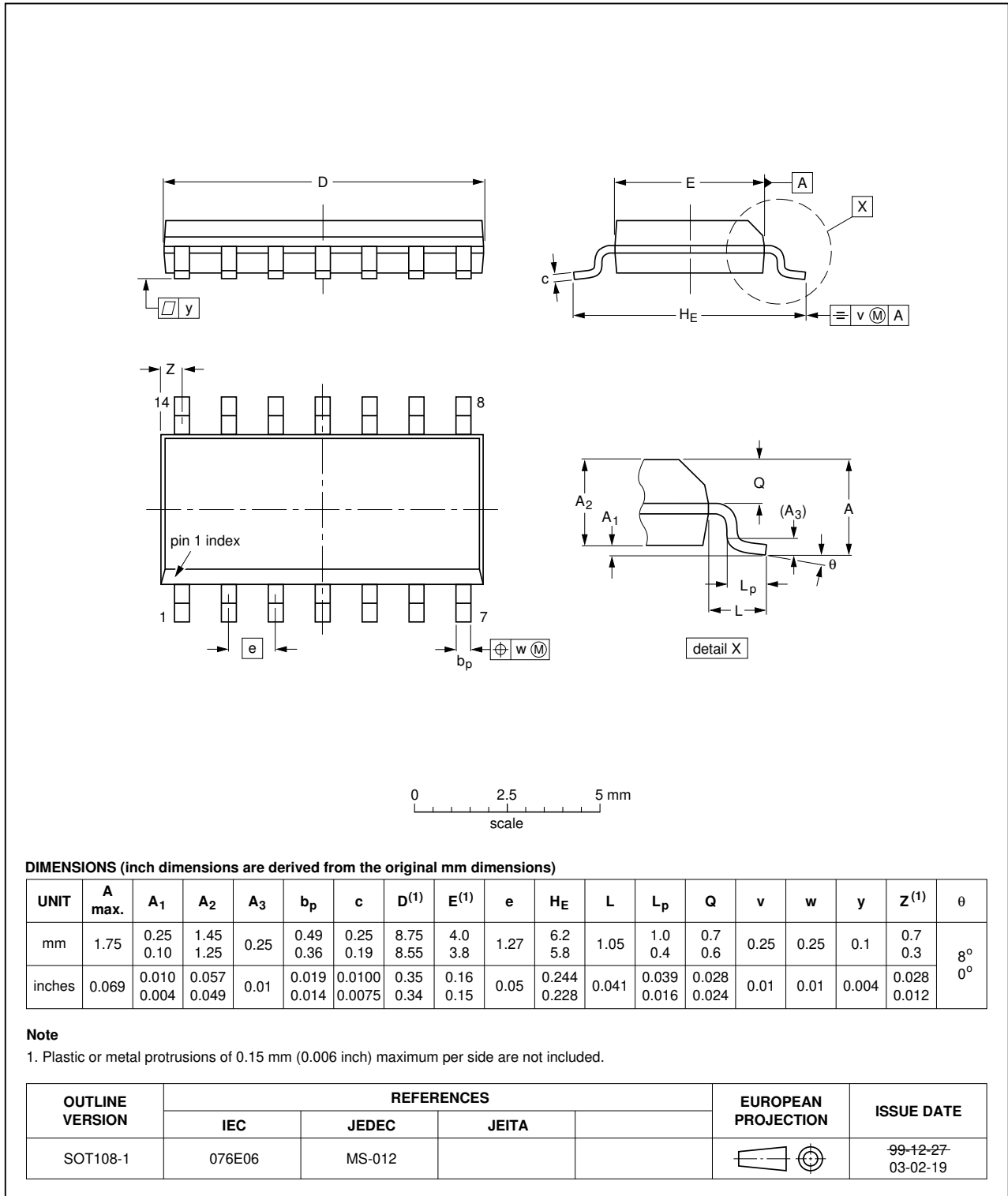


Fig 9. Package outline SOT108-1 (SO14)

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

SOT337-1

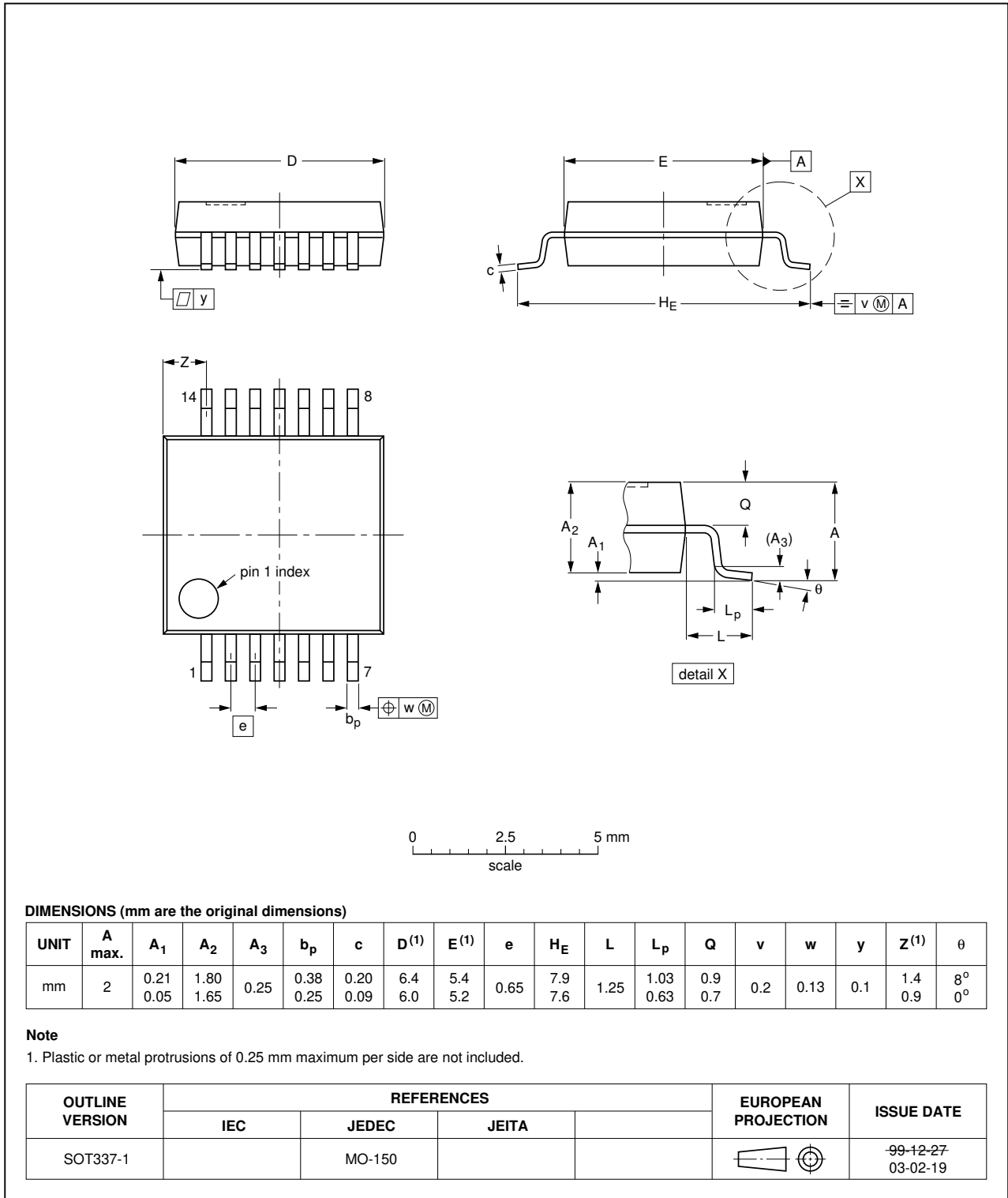


Fig 10. Package outline SOT337-1 (SSOP14)

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

SOT402-1

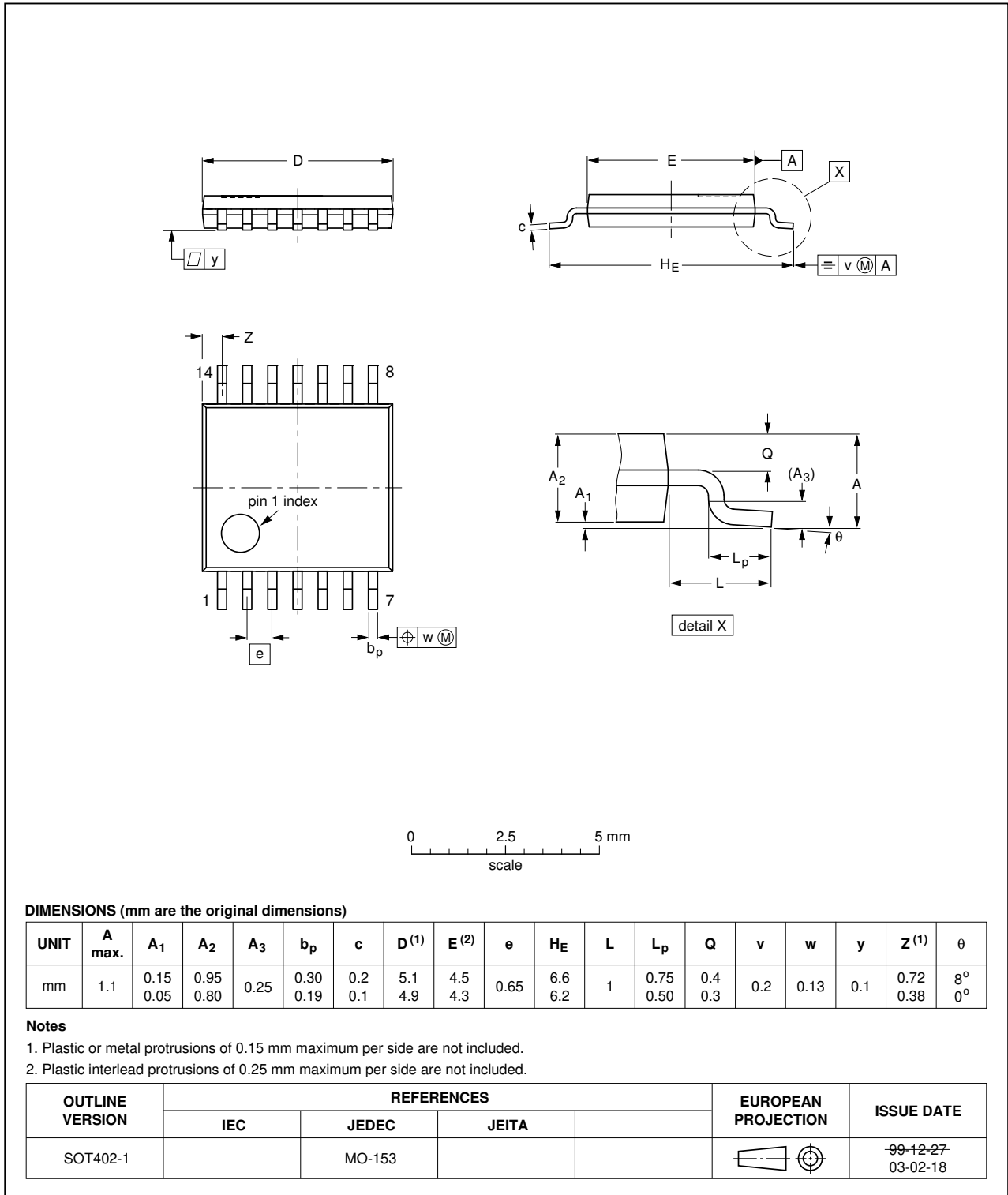


Fig 11. Package outline SOT402-1 (TSSOP14)



## 14. Abbreviations

**Table 9. Abbreviations**

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

## 15. Revision history

**Table 10. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
74HC4024 v.7	20131031	Product data sheet	-	74HC4024 v.6
Modifications:	• General description updated.			
74HC4024 v.6	20120823	Product data sheet	-	74HC4024 v.5
74HC4024 v.4	20100929	Product data sheet	-	74HC4024 v.3
74HC4024 v.3	20041112	Product data sheet	-	74HC_HCT4024_CNV v.2
74HC_HCT4024_CNV v.2	19970901	Product specification	-	74HC_HCT4024 v.1
74HC_HCT4024 v.1	19901201	Product specification	-	-

## 16. Legal information

### 16.1 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".

[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.nxp.com>.

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