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Kind regards,

Team Nexperia

PDTA115T series

PNP resistor-equipped transistors; R1 = 100 k Ω , R2 = open

Rev. 05 — 2 September 2009

Product data sheet

1. Product profile

1.1 General description

PNP resistor-equipped transistors.

Table 1. Product overview

Type number	Package		NPN complement
	NXP	JEITA	
PDTA115TE	SOT416	SC-75	PDTC115TE
PDTA115TK	SOT346	SC-59	PDTC115TK
PDTA115TM	SOT883	SC-101	PDTC115TM
PDTA115TS ^[1]	SOT54 (TO-92)	SC-43A	PDTC115TS
PDTA115TT	SOT23	-	PDTC115TT
PDTA115TU	SOT323	SC-70	PDTC115TU

[1] Also available in SOT54A and SOT54 variant packages (see [Section 2](#))

1.2 Features

- Built-in bias resistors
- Reduces component count
- Simplifies circuit design
- Reduces pick and place costs

1.3 Applications

- General purpose switching and amplification
- Circuit drivers
- Inverter and interface circuits

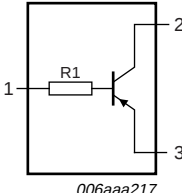
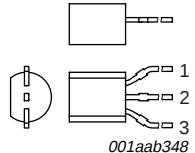
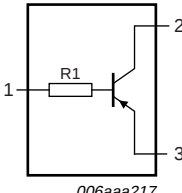
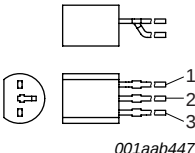
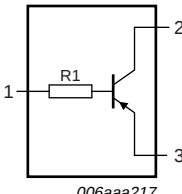
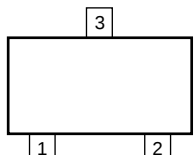
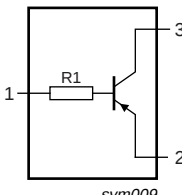
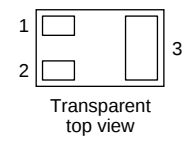
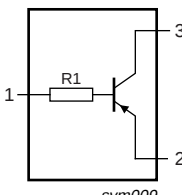
1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{CEO}	collector-emitter voltage	open base	-	-	-50	V
I _O	output current (DC)		-	-	-100	mA
R1	bias resistor 1 (input)		70	100	130	k Ω

2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
SOT54			
1	input (base)		
2	output (collector)		
3	GND (emitter)		
SOT54A			
1	input (base)		
2	output (collector)		
3	GND (emitter)		
SOT54 variant			
1	input (base)		
2	output (collector)		
3	GND (emitter)		
SOT23, SOT323, SOT346, SOT416			
1	input (base)		
2	GND (emitter)		
3	output (collector)		
SOT883			
1	input (base)		
2	GND (emitter)		
3	output (collector)		

3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PDTA115TE	SC-75	plastic surface mounted package; 3 leads	SOT416
PDTA115TK	SC-59	plastic surface mounted package; 3 leads	SOT346
PDTA115TM	SC-101	leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.5 mm	SOT883
PDTA115TS ^[1]	SC-43A	plastic single-ended leaded (through hole) package; 3 leads	SOT54
PDTA115TT	-	plastic surface mounted package; 3 leads	SOT23
PDTA115TU	SC-70	plastic surface mounted package; 3 leads	SOT323

[1] Also available in SOT54A and SOT54 variant packages (see [Section 2](#) and [Section 9](#)).

4. Marking

Table 5. Marking codes

Type number	Marking code ^[1]
PDTA115TE	12
PDTA115TK	11
PDTA115TM	E8
PDTA115TS	TA115T
PDTA115TT	*AC
PDTA115TU	*11

[1] * = -: made in Hong Kong
 * = p: made in Hong Kong
 * = t: made in Malaysia
 * = W: made in China

5. Limiting values

Table 6. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V _{CBO}	collector-base voltage	open emitter	-	-50	V
V _{CEO}	collector-emitter voltage	open base	-	-50	V
V _{EBO}	emitter-base voltage	open collector	-	-5	V
I _O	output current (DC)		-	-100	mA
I _{CM}	peak collector current		-	-100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C			
	SOT416		[1] -	150	mW
	SOT346		[1] -	250	mW
	SOT883		[2][3] -	250	mW
	SOT54		[1] -	500	mW
	SOT23		[1] -	250	mW
	SOT323		[1] -	200	mW
T _{stg}	storage temperature		-65	+150	°C
T _j	junction temperature		-	150	°C
T _{amb}	ambient temperature		-65	+150	°C

[1] Refer to standard mounting conditions.

[2] Reflow soldering is the only recommended soldering method.

[3] Refer to SOT883 standard mounting conditions; FR4 printed-circuit board with 60 μ m copper strip line.

6. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
R _{th(j-a)}	thermal resistance from junction to ambient	in free air				
	SOT416		[1] -	-	833	K/W
	SOT346		[1] -	-	500	K/W
	SOT883		[2][3] -	-	500	K/W
	SOT54		[1] -	-	250	K/W
	SOT23		[1] -	-	500	K/W
	SOT323		[1] -	-	625	K/W

[1] Refer to standard mounting conditions.

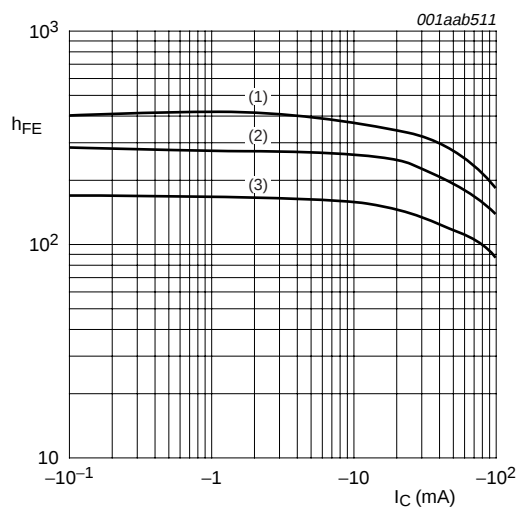
[2] Reflow soldering is the only recommended soldering method.

[3] Refer to SOT883 standard mounting conditions; FR4 printed-circuit board with 60 μ m copper strip line.

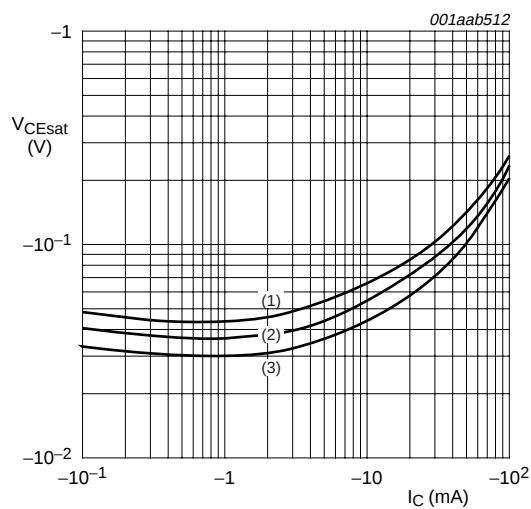
7. Characteristics

Table 8. Characteristics
 $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	$V_{CB} = -50\text{ V}$; $I_E = 0\text{ A}$	-	-	-100	nA
I_{CEO}	collector-emitter cut-off current	$V_{CE} = -30\text{ V}$; $I_B = 0\text{ A}$	-	-	-1	μA
		$V_{CE} = -30\text{ V}$; $I_B = 0\text{ A}$; $T_j = 150\text{ }^{\circ}\text{C}$	-	-	-50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}$; $I_C = 0\text{ A}$	-	-	-100	nA
h_{FE}	DC current gain	$V_{CE} = -5\text{ V}$; $I_C = -1\text{ mA}$	100	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -5\text{ mA}$; $I_B = -0.25\text{ mA}$	-	-	-150	mV
R1	bias resistor 1 (input)		70	100	130	k Ω
C_c	collector capacitance	$V_{CB} = -10\text{ V}$; $I_E = i_e = 0\text{ A}$; $f = 1\text{ MHz}$	-	-	3	pF



- $V_{CE} = -5\text{ V}$.
- (1) $T_{amb} = 100\text{ }^{\circ}\text{C}$.
 - (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$.
 - (3) $T_{amb} = -40\text{ }^{\circ}\text{C}$.

Fig 1. DC current gain as a function of collector current; typical values


- $I_C/I_B = 20$.
- (1) $T_{amb} = 100\text{ }^{\circ}\text{C}$.
 - (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$.
 - (3) $T_{amb} = -40\text{ }^{\circ}\text{C}$.

Fig 2. Collector-emitter saturation voltage as a function of collector current; typical values

8. Package outline

Plastic surface-mounted package; 3 leads

SOT416

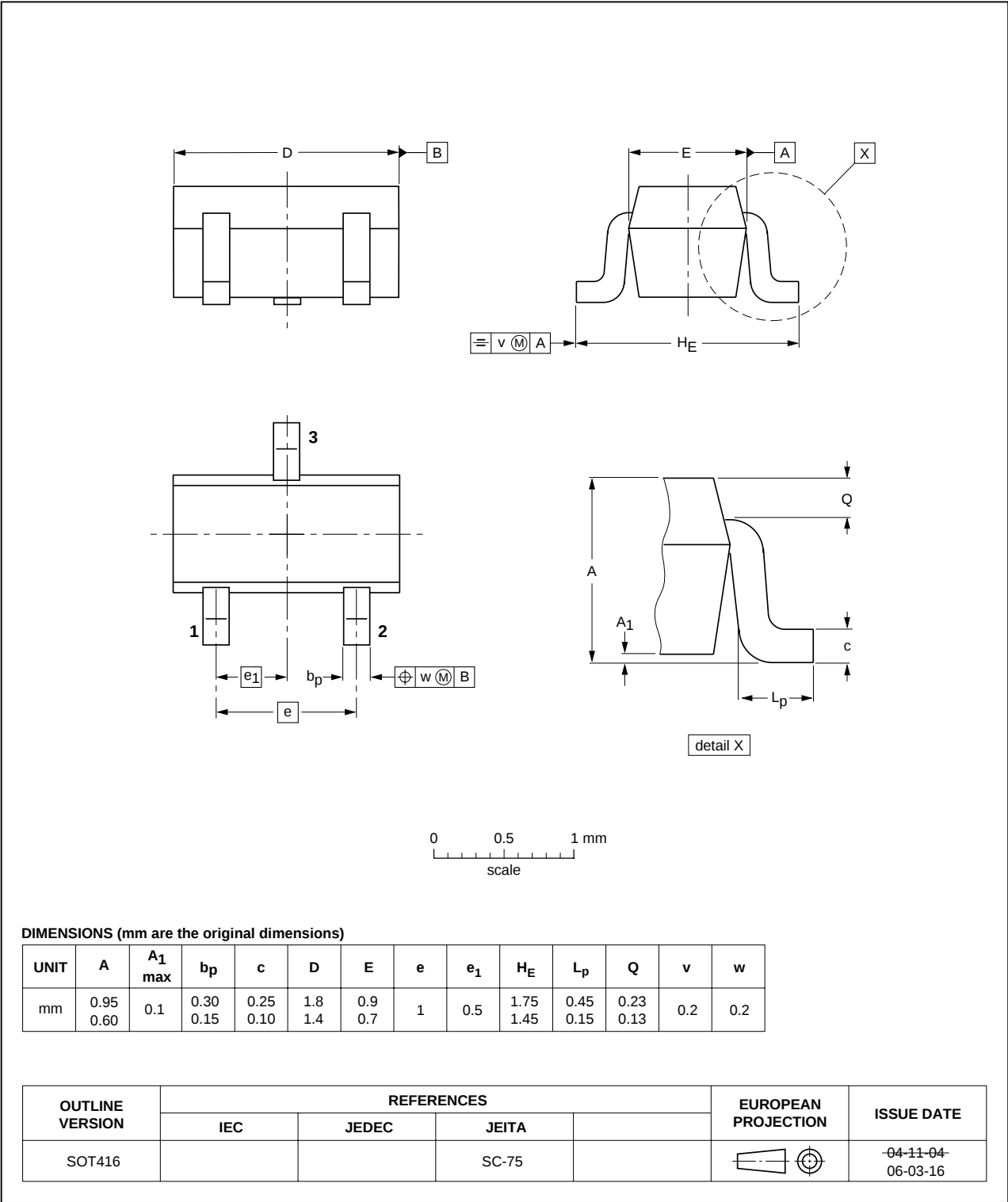


Fig 3. Package outline SOT416 (SC-75)

Plastic surface-mounted package; 3 leads

SOT346

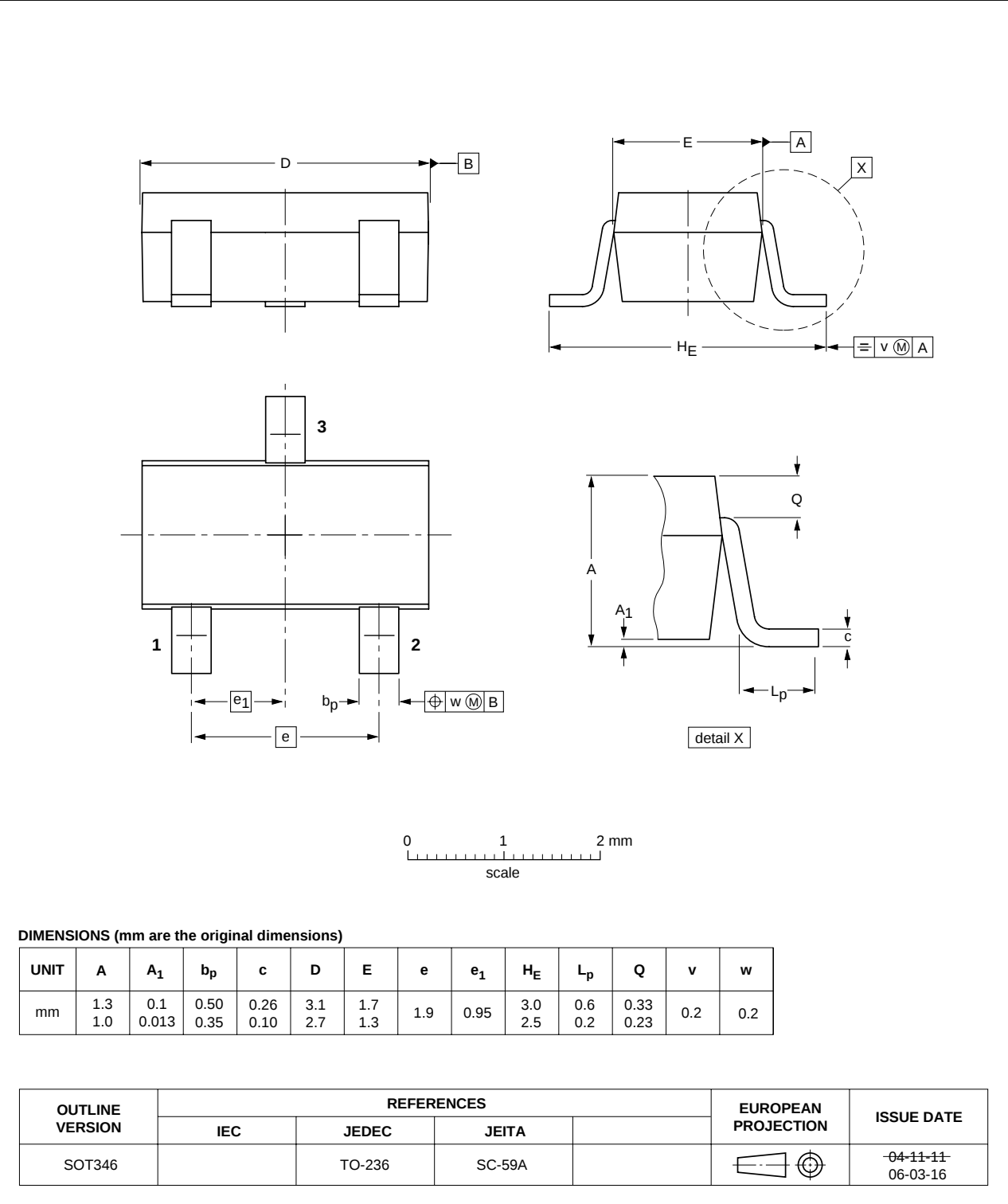


Fig 4. Package outline SOT346 (SC-59/TO-236)

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883

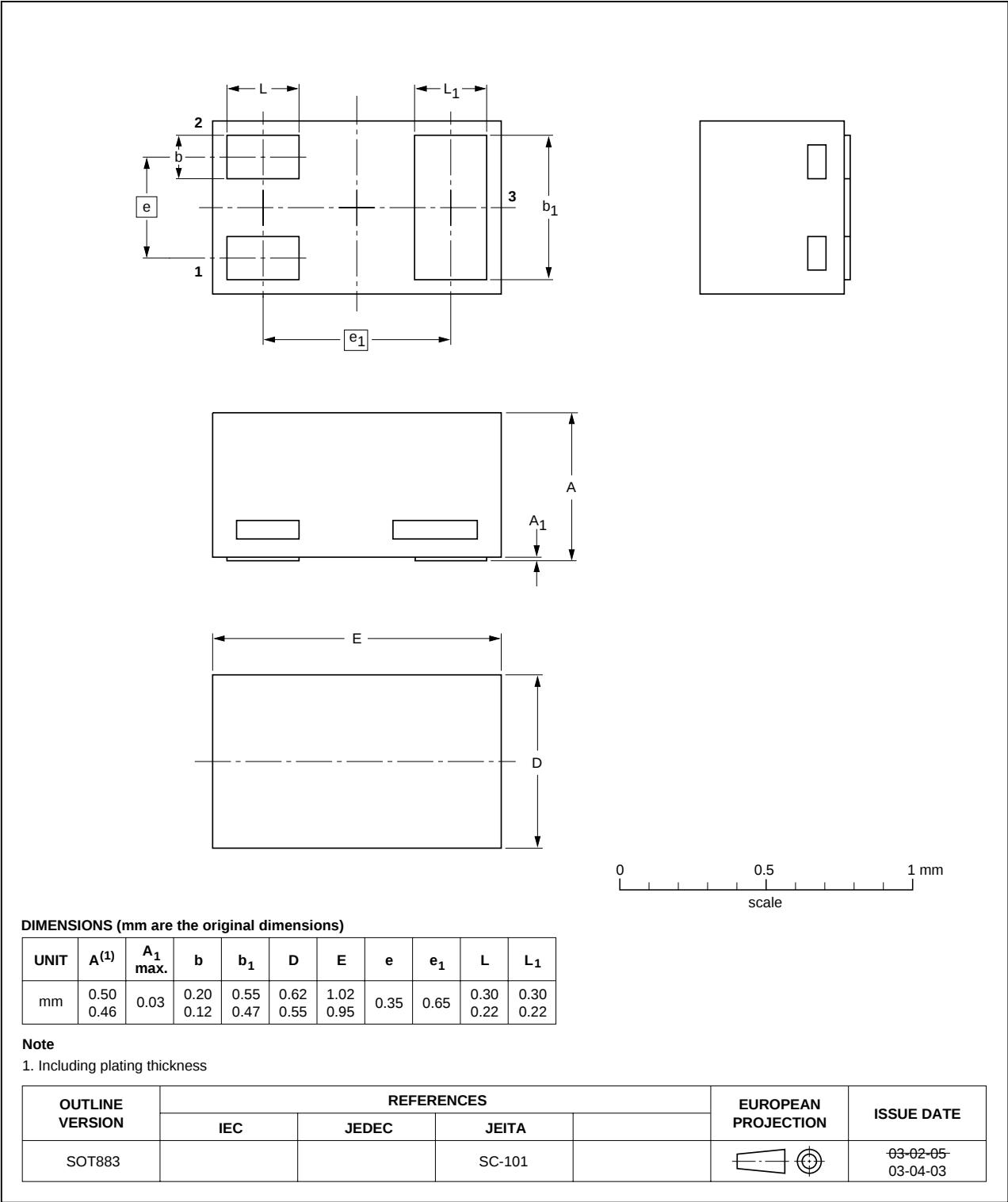


Fig 5. Package outline SOT883 (SC-101)

Plastic single-ended leaded (through hole) package; 3 leads

SOT54

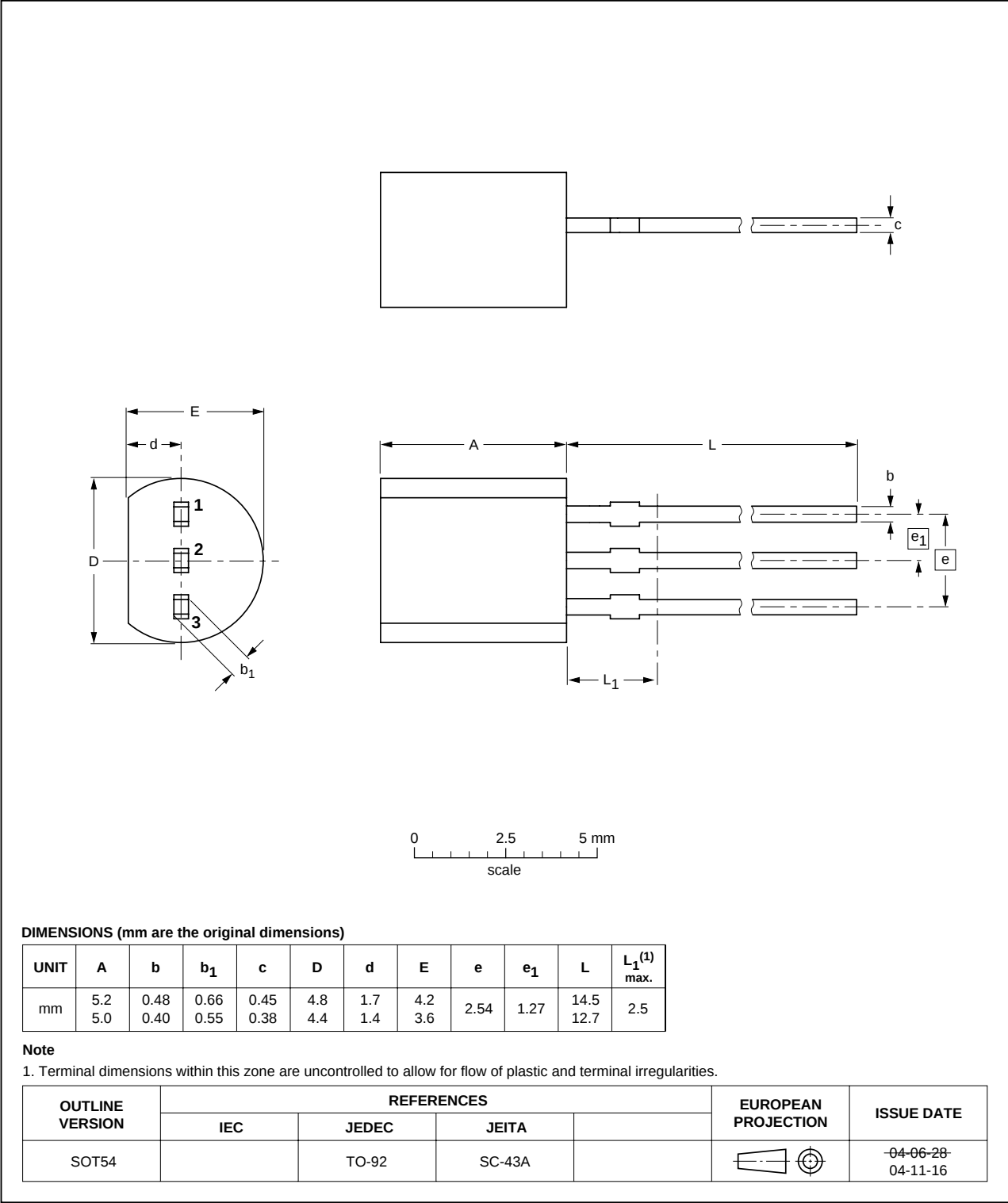


Fig 6. Package outline SOT54 (SC-43A/TO-92)

Plastic single-ended leaded (through hole) package; 3 leads (wide pitch)

SOT54A

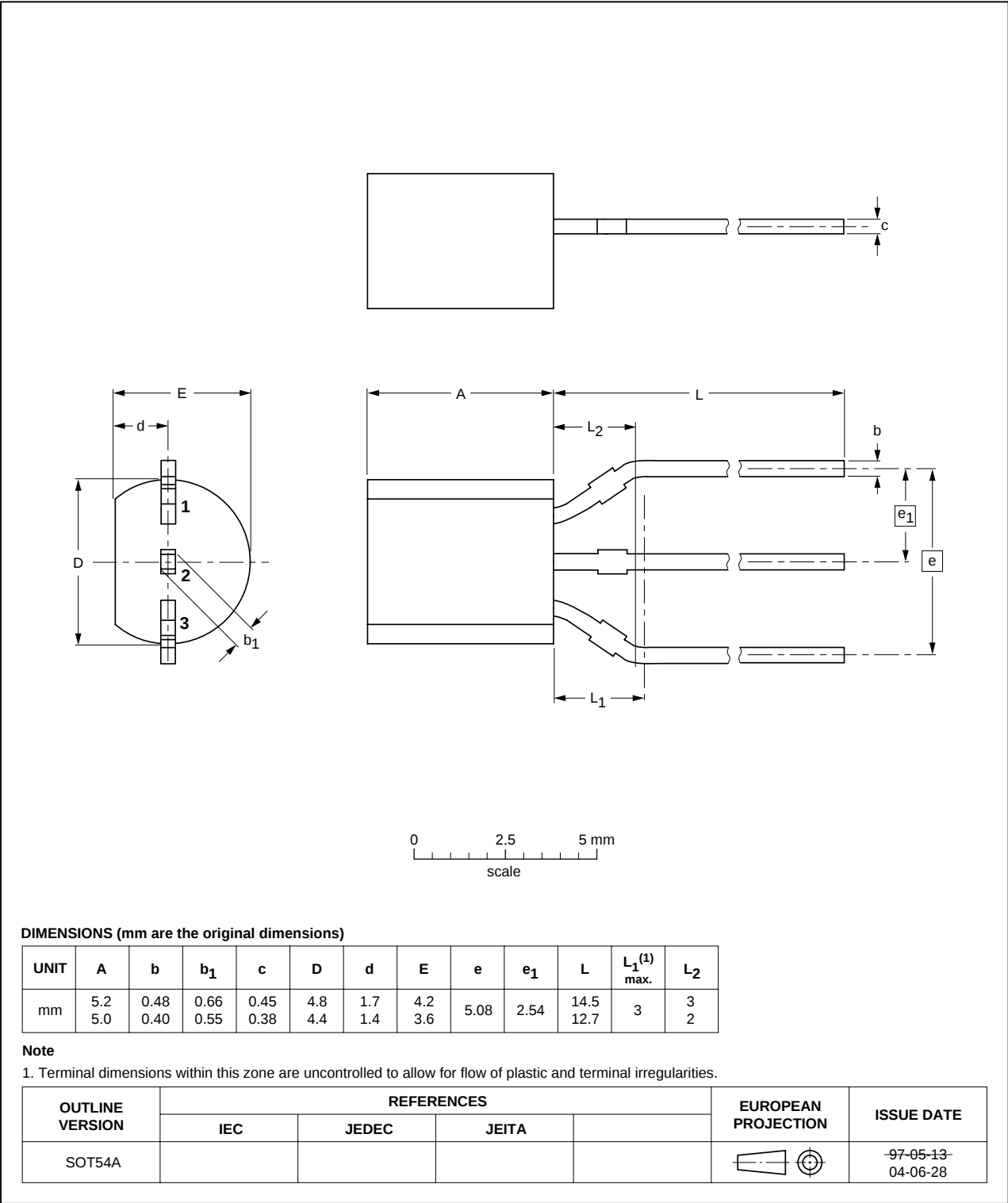


Fig 7. Package outline SOT54A

Plastic single-ended leaded (through hole) package; 3 leads (on-circle)

SOT54 variant

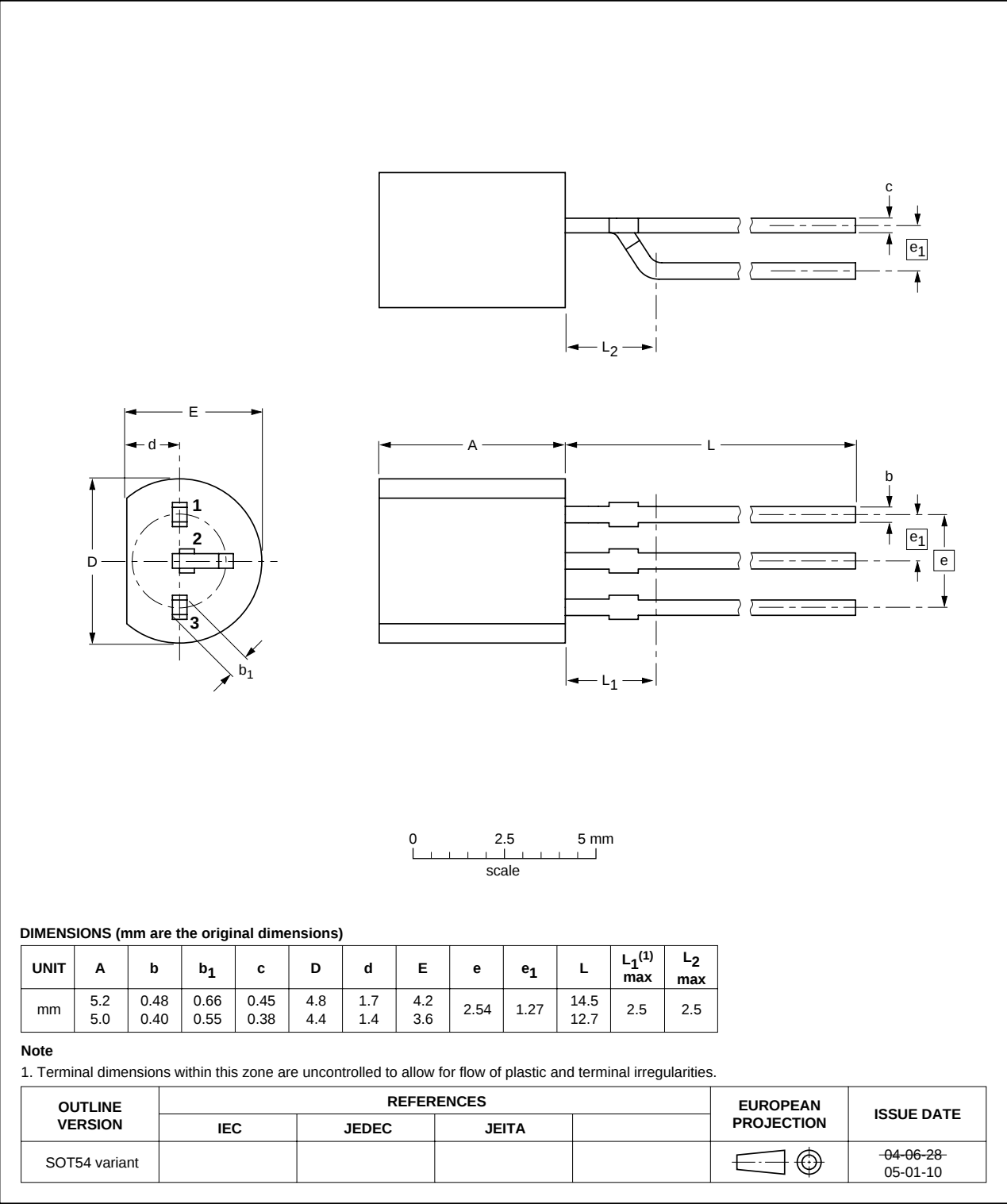


Fig 8. Package outline SOT54 variant

Plastic surface-mounted package; 3 leads

SOT23

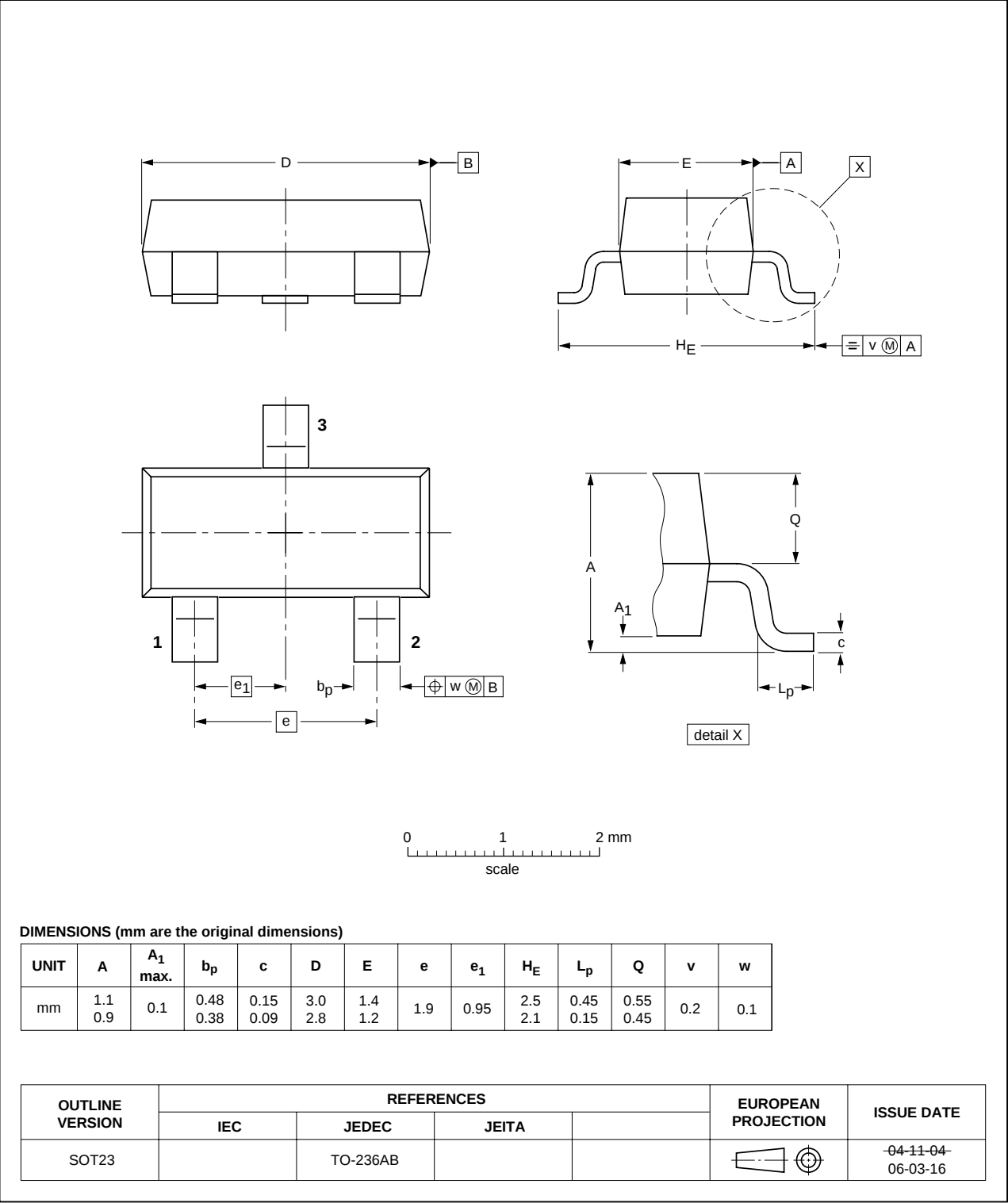
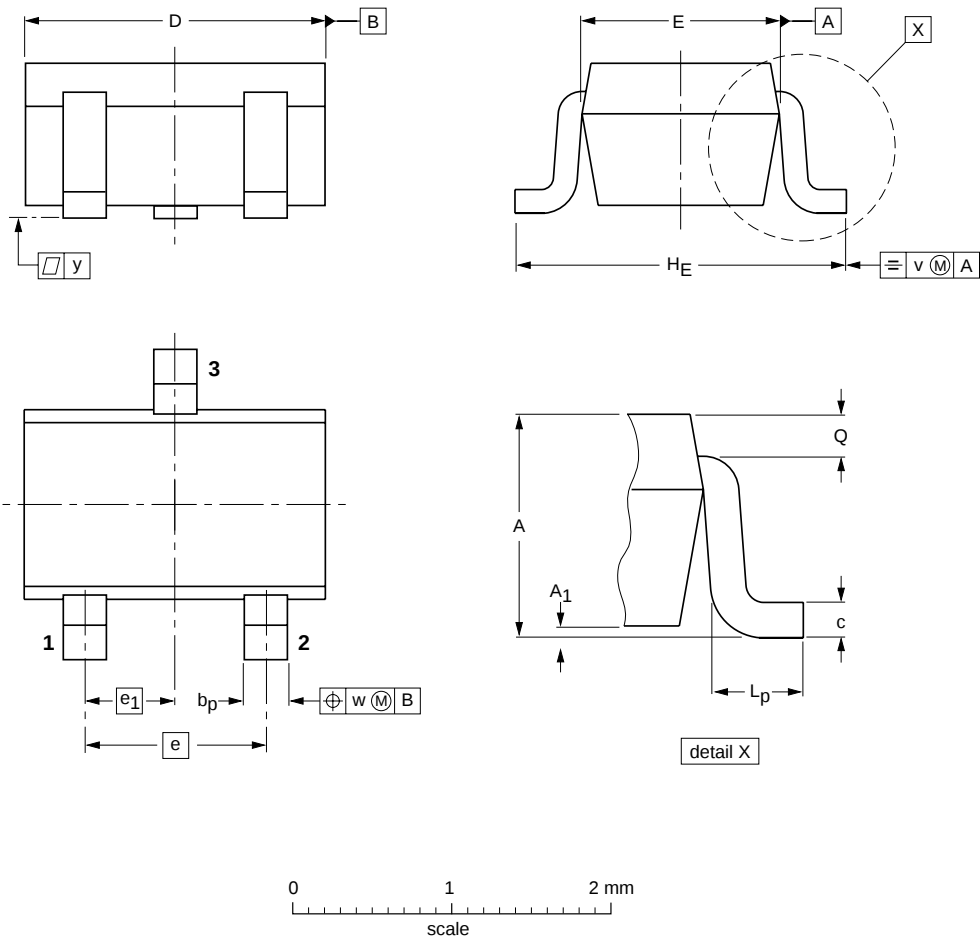


Fig 9. Package outline SOT23 (TO-236AB)

Plastic surface-mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT323			SC-70			04-11-04 06-03-16

Fig 10. Package outline SOT323 (SC-70)

9. Packing information

Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code. [\[1\]](#)

Type number	Package	Description	Packing quantity		
			3000	5000	10000
PDTA115TE	SOT416	4 mm pitch, 8 mm tape and reel	-115	-	-135
PDTA115TK	SOT346	4 mm pitch, 8 mm tape and reel	-115	-	-135
PDTA115TM	SOT883	2 mm pitch, 8 mm tape and reel	-	-	-315
PDTA115TS	SOT54	bulk, straight leads	-	-412	-
	SOT54A	tape and reel, wide pitch	-	-	-116
	SOT54A	tape ammopack, wide patch	-	-	-126
	SOT54 variant	bulk, delta pinning	-	-112	-
PDTA115TT	SOT23	4 mm pitch, 8 mm tape and reel	-215	-	-235
PDTA115TU	SOT323	4 mm pitch, 8 mm tape and reel	-115	-	-135

[1] For further information and the availability of packing methods, see [Section 12](#).

10. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PDTA115T_SER_5	20090902	Product data sheet	-	PDTA115T_SER_4
Modifications:	• This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content. • Figure 3 "Package outline SOT416 (SC-75)": updated • Figure 4 "Package outline SOT346 (SC-59/TO-236)": updated • Figure 9 "Package outline SOT23 (TO-236AB)": updated • Figure 10 "Package outline SOT323 (SC-70)": updated			
PDTA115T_SER_4	20050405	Product data sheet	-	PDTA115TT_3
PDTA115TT_3	20040907	Objective data sheet	-	PDTA115TT_2
PDTA115TT_2	20040518	Objective data sheet	-	PDTA115TT_1
PDTA115TT_1	20040323	Objective data sheet	-	-

11. Legal information

11.1 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".

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