

DATA SHEET

PDTC115E series

NPN resistor-equipped transistors;

$R1 = 100\text{ k}\Omega$, $R2 = 100\text{ k}\Omega$

Product specification
Supersedes data of 2002 May 8

2003 May 14

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

PDTC115E series

FEATURES

- Built-in bias resistors
- Simplified circuit design
- Reduction of component count
- Reduced pick and place costs.

APPLICATIONS

- General purpose switching and amplification
- Inverter and interface circuits
- Circuit driver.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	TYP.	MAX.	UNIT
V _{CEO}	collector-emitter voltage	–	50	V
I _O	output current (DC)	–	100	mA
R1	bias resistor	100	–	k Ω
R2	bias resistor	100	–	k Ω

DESCRIPTION

NPN resistor equipped transistor (see “Simplified outline, symbol and pinning” for package details).

PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE
	PHILIPS	EIAJ	
PDTC115EE	SOT416	SC-75	46
PDTC115EK	SOT346	SC-59	56
PDTC115EM	SOT883	SC-101	DV
PDTC115ES	SOT54 (TO-92)	SC-43	TC115E
PDTC115ET	SOT23	–	*44 ⁽¹⁾
PDTC115EU	SOT323	SC-70	*15 ⁽¹⁾

Note

- * = p: Made in Hong Kong.
* = t: Made in Malaysia.
* = W: Made in China.

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SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
PDTC115ES	MAM364	1 2 3	base collector emitter
PDTC115EE PDTC115EK PDTC115ET PDTC115EU	Top view MDB269	1 2 3	base emitter collector
PDTC115EM	bottom view MHC506	1 2 3	base emitter collector

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PDTC115E series

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	–	10	V
V _I	input voltage				
	positive		–	+40	V
	negative		–	–10	V
I _O	output current (DC)		–	100	mA
I _{CM}	peak collector current		–	100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C			
	SOT54	note 1	–	500	mW
	SOT23	note 1	–	250	mW
	SOT346	note 1	–	250	mW
	SOT323	note 1	–	200	mW
	SOT416	note 1	–	150	mW
	SOT883	notes 2 and 3	–	250	mW
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Refer to standard mounting conditions.
2. Reflow soldering is the only recommended soldering method.
3. Refer to SOT883 standard mounting conditions; FR4 with 60 μ m copper strip line.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th j-a}	thermal resistance from junction to ambient	in free air		
	SOT54	note 1	250	K/W
	SOT23	note 1	500	K/W
	SOT346	note 1	500	K/W
	SOT323	note 1	625	K/W
	SOT416	note 1	822	K/W
	SOT883	notes 2 and 3	500	K/W

Notes

1. Refer to standard mounting conditions.
2. Reflow soldering is the only recommended soldering method.
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CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{\text{CB}} = 50\text{ V}$; $I_{\text{E}} = 0$	–	–	100	nA
I_{CEO}	collector-emitter cut-off current	$V_{\text{CE}} = 50\text{ V}$; $I_{\text{B}} = 0$	–	–	1	μA
		$V_{\text{CE}} = 30\text{ V}$; $I_{\text{B}} = 0$; $T_{\text{j}} = 150\text{ }^{\circ}\text{C}$	–	–	50	μA
I_{EBO}	emitter-base cut-off current	$V_{\text{EB}} = 5\text{ V}$; $I_{\text{C}} = 0$	–	–	50	μA
h_{FE}	DC current gain	$V_{\text{CE}} = 5\text{ V}$; $I_{\text{C}} = 5\text{ mA}$	80	–	–	
V_{CEsat}	collector-emitter saturation voltage	$I_{\text{C}} = 5\text{ mA}$; $I_{\text{B}} = 0.25\text{ mA}$	–	–	150	mV
$V_{\text{i(off)}}$	input-off voltage	$I_{\text{C}} = 100\text{ }\mu\text{A}$; $V_{\text{CE}} = 5\text{ V}$	–	1.5	0.5	V
$V_{\text{i(on)}}$	input-on voltage	$I_{\text{C}} = 1\text{ mA}$; $V_{\text{CE}} = 0.3\text{ V}$	3	1.1	–	V
$R1$	input resistor		70	100	130	$\text{k}\Omega$
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	
C_{c}	collector capacitance	$I_{\text{E}} = i_{\text{e}} = 0$; $V_{\text{CB}} = 10\text{ V}$; $f = 1\text{ MHz}$	–	–	2.5	pF

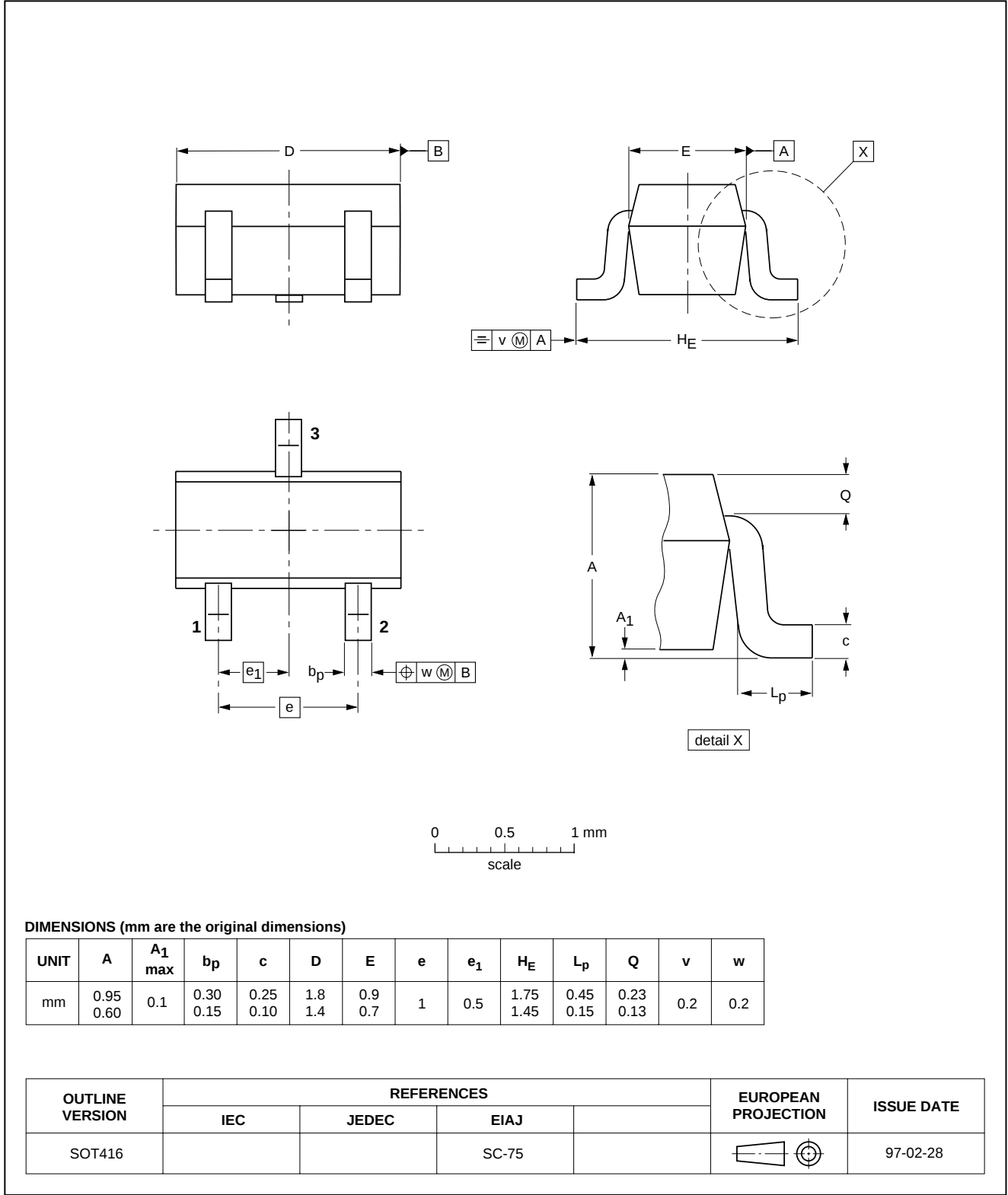
NPN resistor-equipped transistors;
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PDTC115E series

PACKAGE OUTLINES

Plastic surface mounted package; 3 leads

SOT416

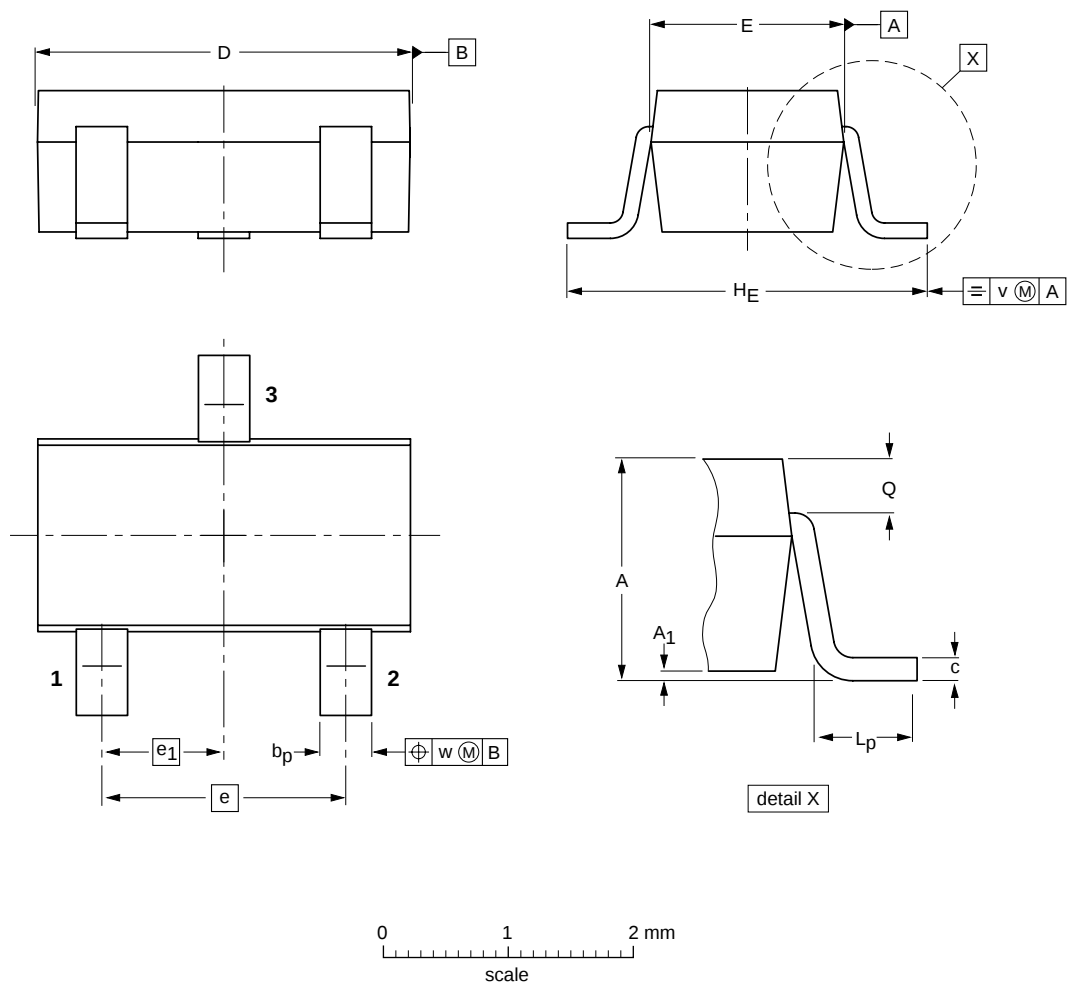


NPN resistor-equipped transistors;
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Plastic surface mounted package; 3 leads

SOT346



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.3 1.0	0.1 0.013	0.50 0.35	0.26 0.10	3.1 2.7	1.7 1.3	1.9	0.95	3.0 2.5	0.6 0.2	0.33 0.23	0.2	0.2

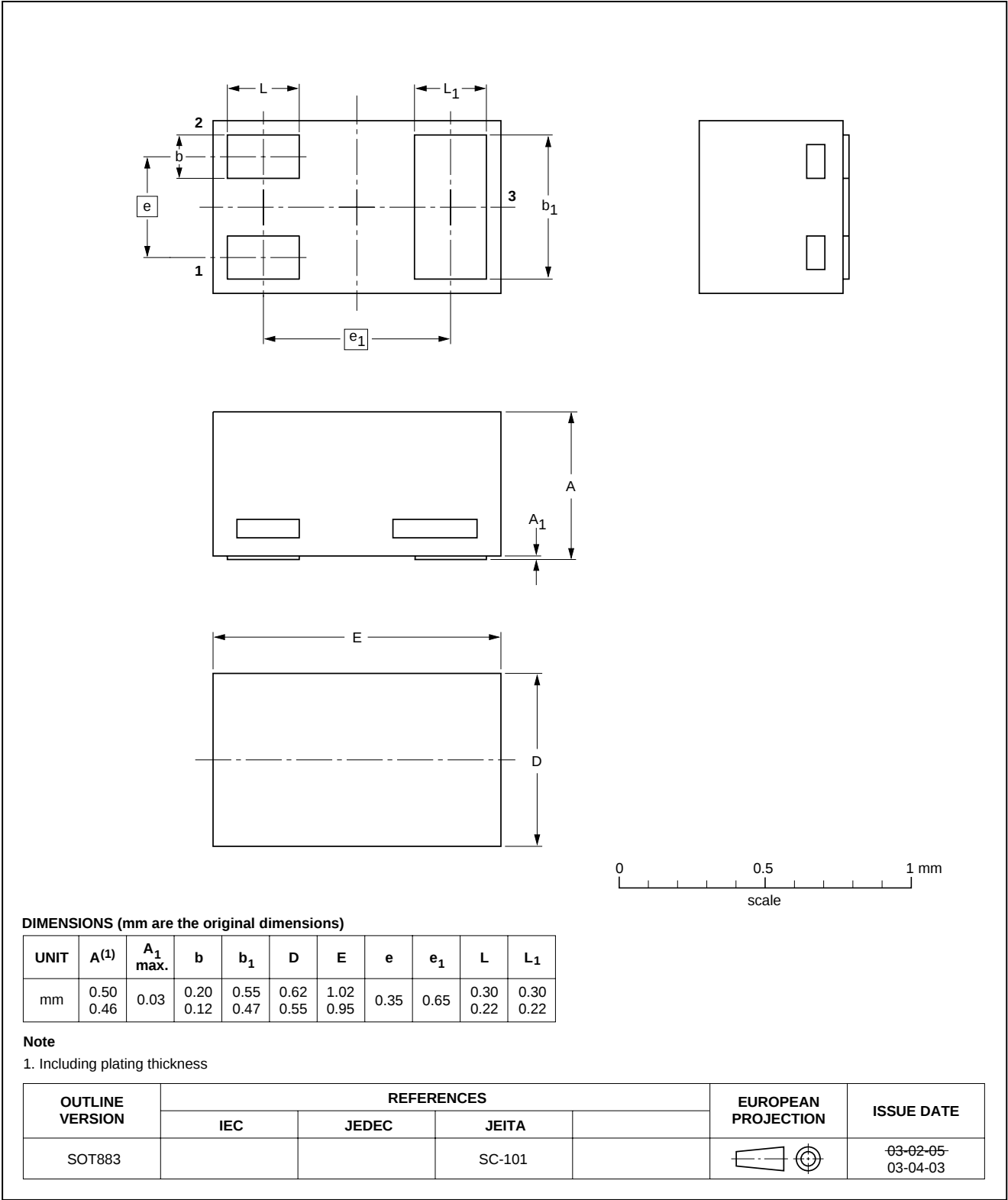
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT346		TO-236	SC-59			98-07-17

NPN resistor-equipped transistors;
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Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883

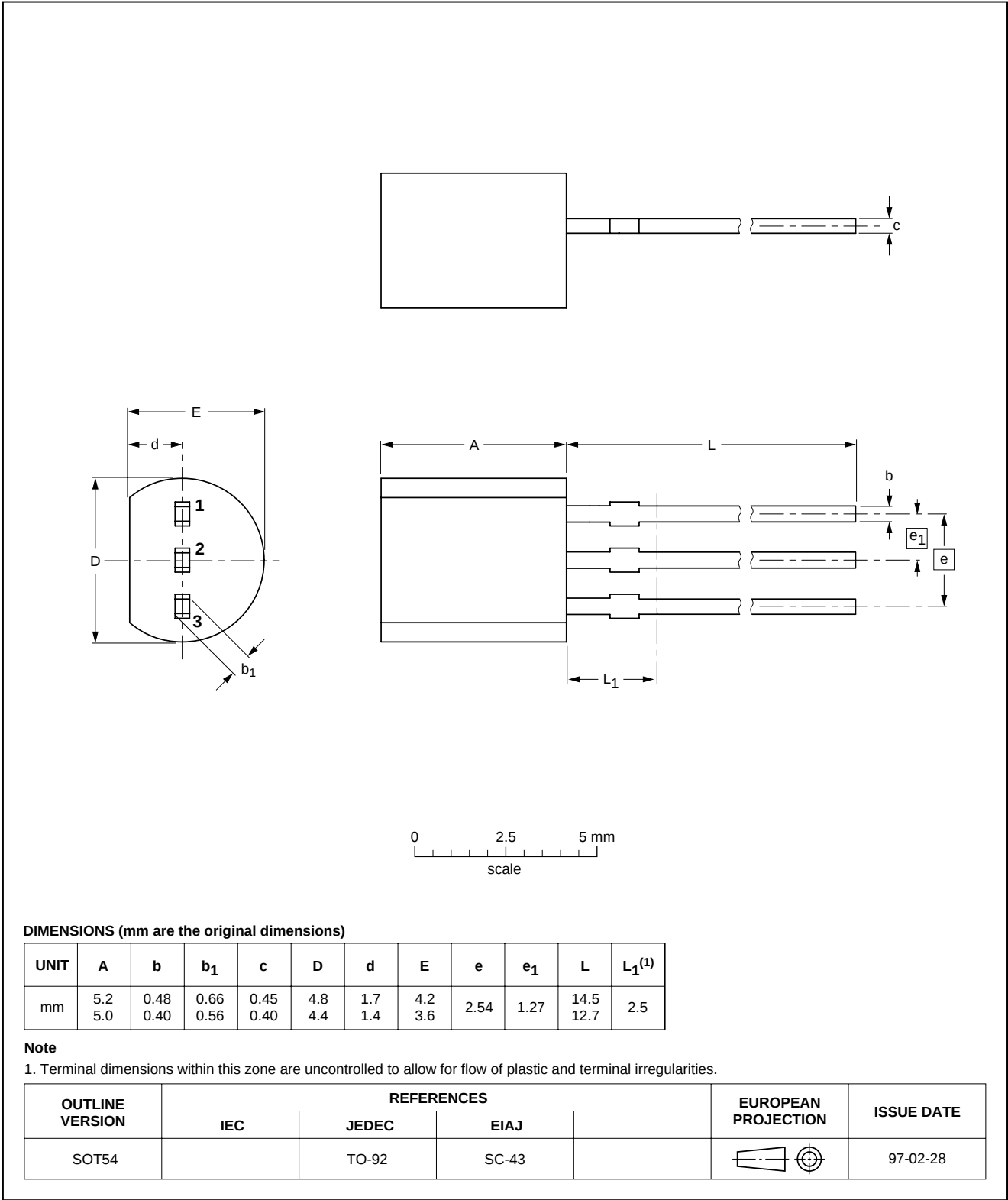


NPN resistor-equipped transistors;
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PDTC115E series

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

SOT54

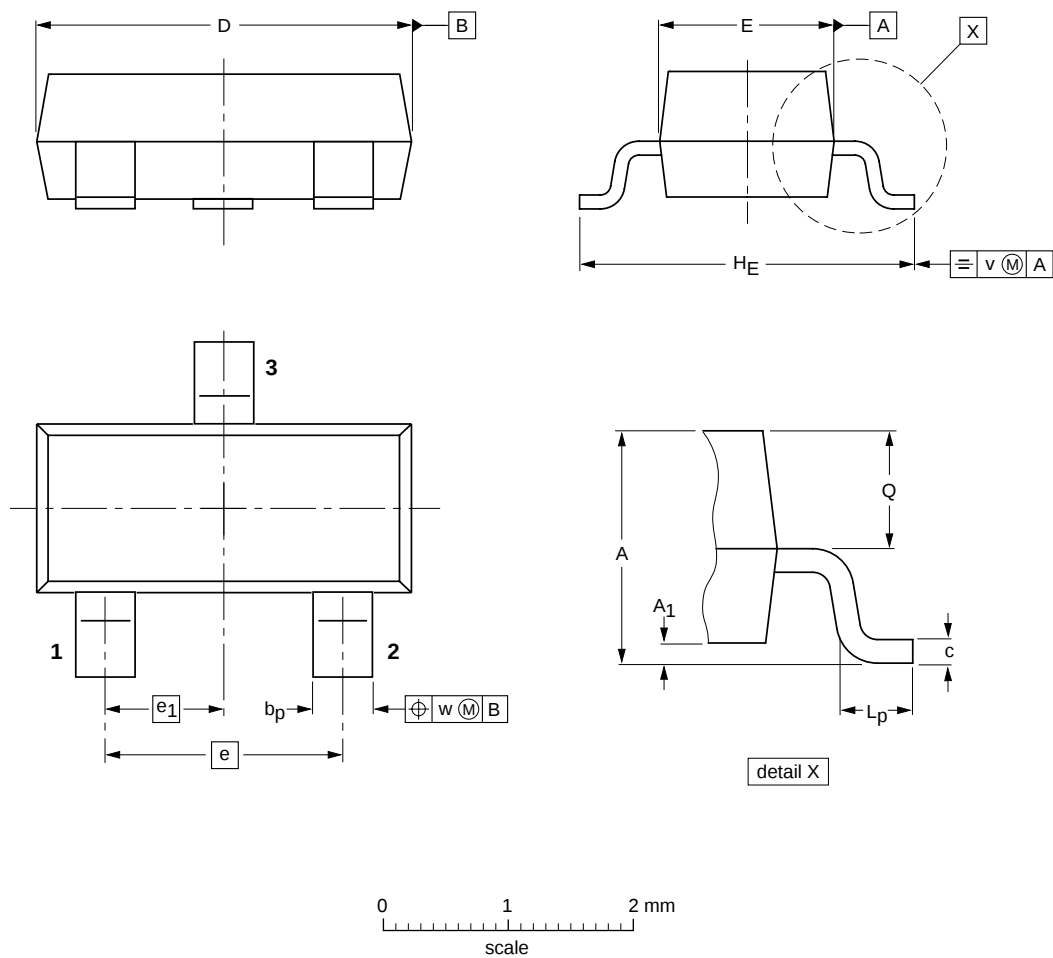


NPN resistor-equipped transistors;
R1 = 100 kΩ, R2 = 100 kΩ

PDTC115E series

Plastic surface mounted package; 3 leads

SOT23



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 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

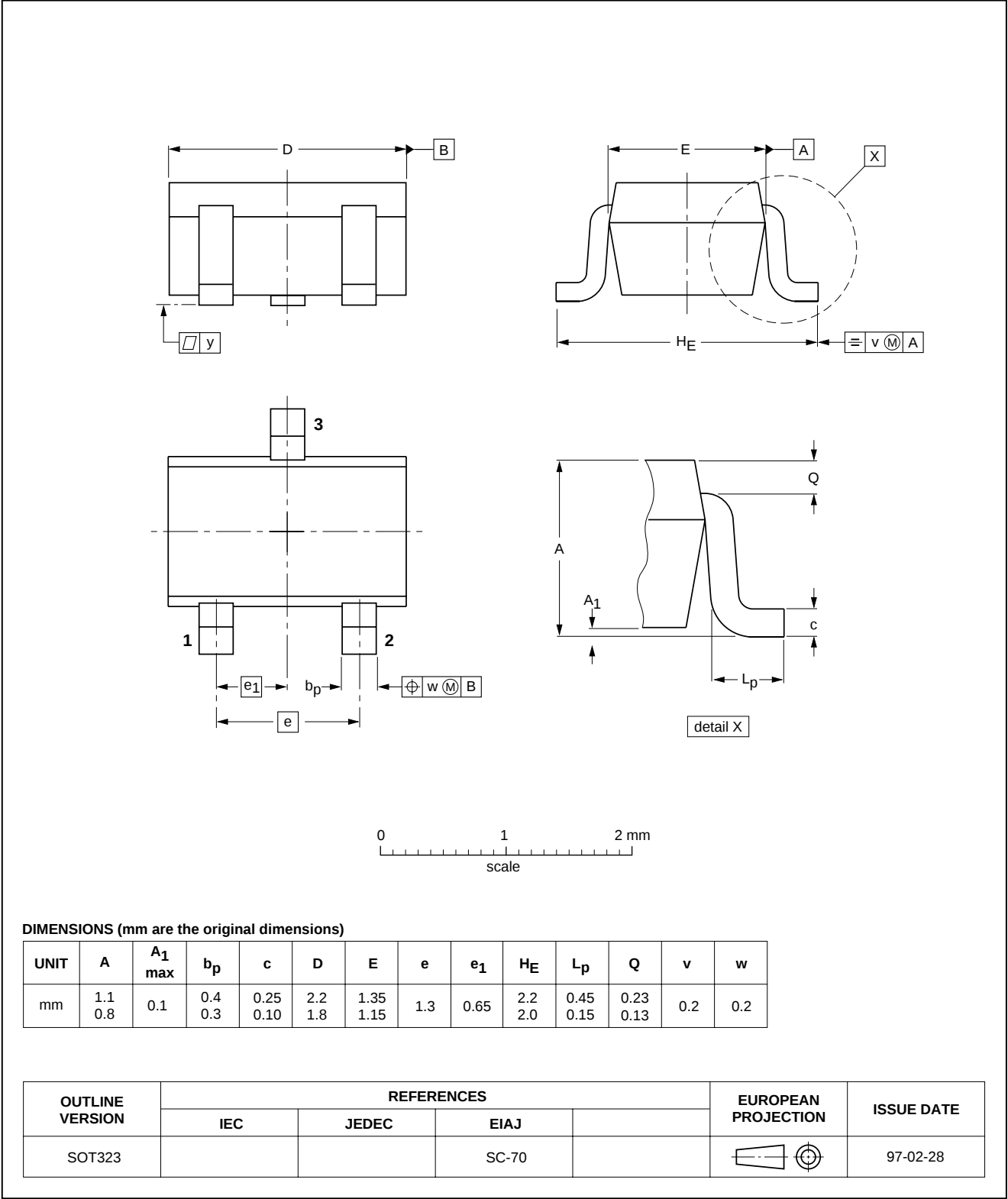
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23		TO-236AB				97-02-28 99-09-13

NPN resistor-equipped transistors;
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Plastic surface mounted package; 3 leads

SOT323



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DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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Notes

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3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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NOTES

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NOTES

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Contact information

For additional information please visit <http://www.semiconductors.philips.com>. Fax: **+31 40 27 24825**

For sales offices addresses send e-mail to: sales.addresses@www.semiconductors.philips.com.

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Printed in The Netherlands

613514/02/pp16

Date of release: 2003 May 14

Document order number: 9397 750 11013

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