

# DATA SHEET

## **PDTA115E series**

PNP resistor-equipped transistors;

R1 = 100 k $\Omega$ , R2 = 100 k $\Omega$

Product data sheet  
Supersedes data of 2004 May 05

2004 Jul 30

# PNP resistor-equipped transistors; R1 = 100 k $\Omega$ , R2 = 100 k $\Omega$

## PDTA115E 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 <sub>CEO</sub>	collector-emitter voltage	–	–50	V
I <sub>O</sub>	output current (DC)	–	–20	mA
R1	bias resistor	100	–	k $\Omega$
R2	bias resistor	100	–	k $\Omega$

### DESCRIPTION

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

### PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE	NPN COMPLEMENT
	PHILIPS	EIAJ		
PDTA115EE	SOT416	SC-75	5E	PDTC115EE
PDTA115EEF	SOT490	SC-89	6B	PDTC115EEF
PDTA115EK	SOT346	SC-59	62	PDTC115EK
PDTA115EM	SOT883	SC-101	F6	PDTC115EM
PDTA115ES	SOT54 (TO-92)	SC-43	TA115E	PDTC115ES
PDTA115ET	SOT23	–	*AB <sup>(1)</sup>	PDTC115ET
PDTA115EU	SOT323	SC-70	*7C <sup>(1)</sup>	PDTC115EU

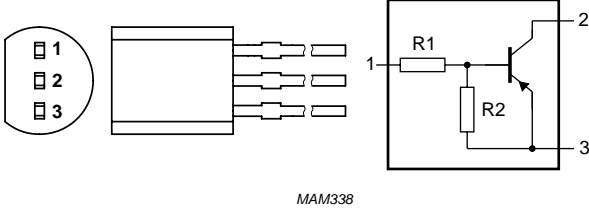
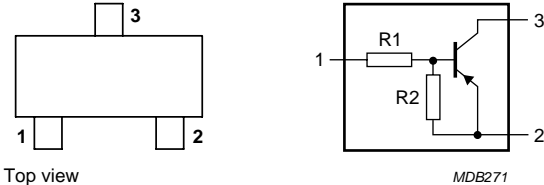
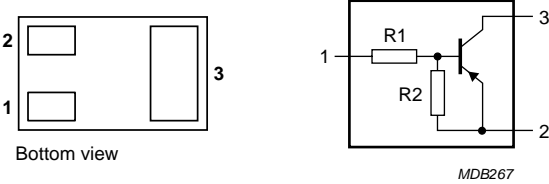
### Note

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

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

PDTA115E series

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
PDTA115ES		1 2 3	base collector emitter
PDTA115EE PDTA115EEF PDTA115EK PDTA115ET PDTA115EU		1 2 3	base emitter collector
PDTA115EM		1 2 3	base emitter collector

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PDTA115E series

## ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PDTA115EE	–	plastic surface mounted package; 3 leads	SOT416
PDTA115EEF	–	plastic surface mounted package; 3 leads	SOT490
PDTA115EK	–	plastic surface mounted package; 3 leads	SOT346
PDTA115EM	–	leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.5 mm	SOT883
PDTA115ES	–	plastic single-ended leaded (through hole) package; 3 leads	SOT54
PDTA115ET	–	plastic surface mounted package; 3 leads	SOT23
PDTA115EU	–	plastic surface mounted package; 3 leads	SOT323

## LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter	–	–50	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	–50	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	–10	V
V <sub>I</sub>	input voltage				
	positive		–	+10	V
	negative		–	–40	V
I <sub>O</sub>	output current (DC)		–	–20	mA
I <sub>CM</sub>	peak collector current		–	–100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C			
	SOT23	note 1	–	250	mW
	SOT54	note 1	–	500	mW
	SOT323	note 1	–	200	mW
	SOT346	note 1	–	250	mW
	SOT416	note 1	–	150	mW
	SOT490	notes 1 and 2	–	250	mW
	SOT883	notes 2 and 3	–	250	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	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  $\mu$ m copper strip line.

PNP resistor-equipped transistors;  
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## PDTA115E series

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	T <sub>amb</sub> ≤ 25 °C		
	SOT23	note 1	500	K/W
	SOT54	note 1	250	K/W
	SOT323	note 1	625	K/W
	SOT346	note 1	500	K/W
	SOT416	note 1	833	K/W
	SOT490	notes 1 and 2	500	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.
3. Refer to SOT883 standard mounting conditions; FR4 with 60  $\mu$ m copper strip line.

## CHARACTERISTICS

T<sub>amb</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>CBO</sub>	collector-base cut-off current	V <sub>CB</sub> = -50 V; I <sub>E</sub> = 0 A	–	–	-100	nA
I <sub>CEO</sub>	collector-emitter cut-off current	V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0 A	–	–	-1	$\mu$ A
		V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0 A; T <sub>j</sub> = 150 °C	–	–	-50	$\mu$ A
I <sub>EBO</sub>	emitter-base cut-off current	V <sub>EB</sub> = -5 V; I <sub>C</sub> = 0 A	–	–	-50	$\mu$ A
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = -5 V; I <sub>C</sub> = -5 mA	80	–	–	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = -5 mA; I <sub>B</sub> = -0.25 mA	–	–	-150	mV
V <sub>i(off)</sub>	input-off voltage	I <sub>C</sub> = -100 $\mu$ A; V <sub>CE</sub> = -5 V	–	-1.2	-0.5	V
V <sub>i(on)</sub>	input-on voltage	I <sub>C</sub> = -1 mA; V <sub>CE</sub> = -0.3 V	-3	-1.6	–	V
R1	input resistor		70	100	130	k $\Omega$
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	
C <sub>c</sub>	collector capacitance	I <sub>E</sub> = i <sub>e</sub> = 0 A; V <sub>CB</sub> = -10 V; f = 1 MHz	–	–	3	pF

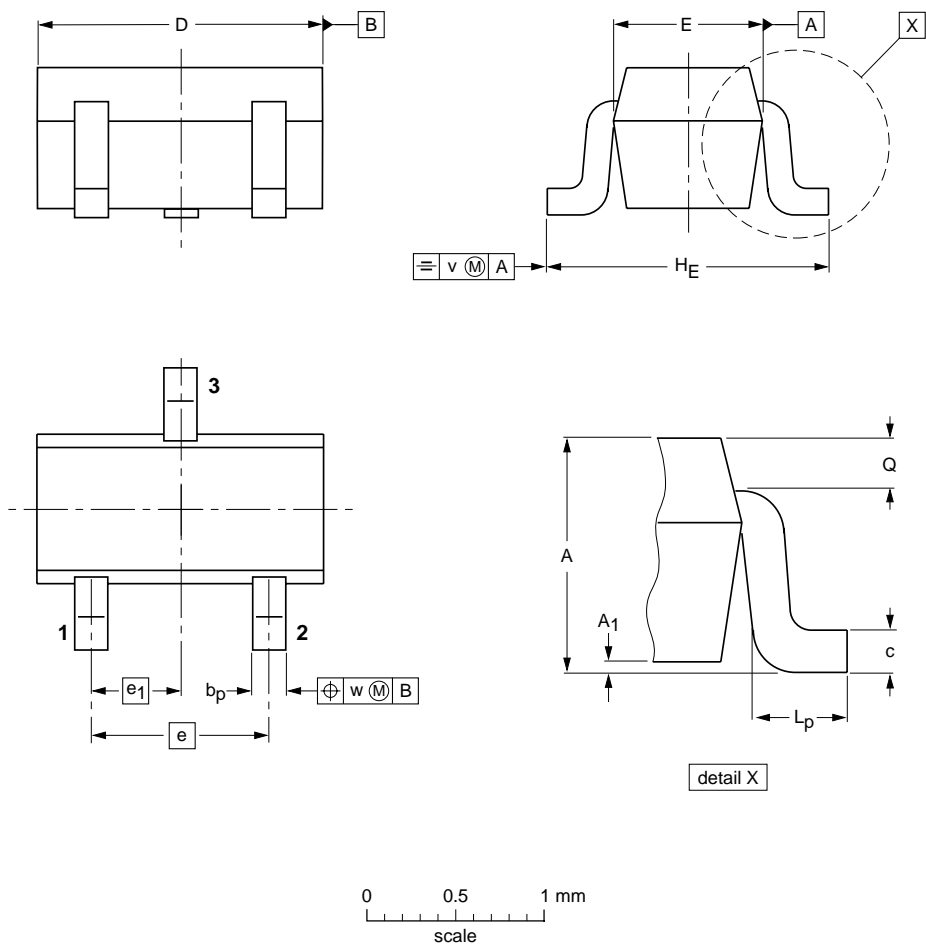
PNP resistor-equipped transistors;  
R1 = 100 kΩ, R2 = 100 kΩ

PDTA115E series

PACKAGE OUTLINES


Plastic surface-mounted package; 3 leads

SOT416



DIMENSIONS (mm are the original dimensions)

UNIT	A	A1 max	bp	c	D	E	e	e1	HE	Lp	Q	v	w
mm	0.95 0.60	0.1	0.30 0.15	0.25 0.10	1.8 1.4	0.9 0.7	1	0.5	1.75 1.45	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT416			SC-75			<del>04-11-04</del> 06-03-16

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

PDTA115E series

Plastic surface-mounted package; 3 leads

SOT490

Technical drawing of the SOT490 package showing top, side, and lead views with dimensions A, B, D, E, H<sub>E</sub>, L<sub>p</sub>, v, w, e, e<sub>1</sub>, b<sub>p</sub>, c, and a detail X.

0 1 2 mm  
scale

**DIMENSIONS (mm are the original dimensions)**

UNIT	A	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	v	w
mm	0.8 0.6	0.33 0.23	0.2 0.1	1.7 1.5	0.95 0.75	1.0	0.5	1.7 1.5	0.5 0.3	0.1	0.1

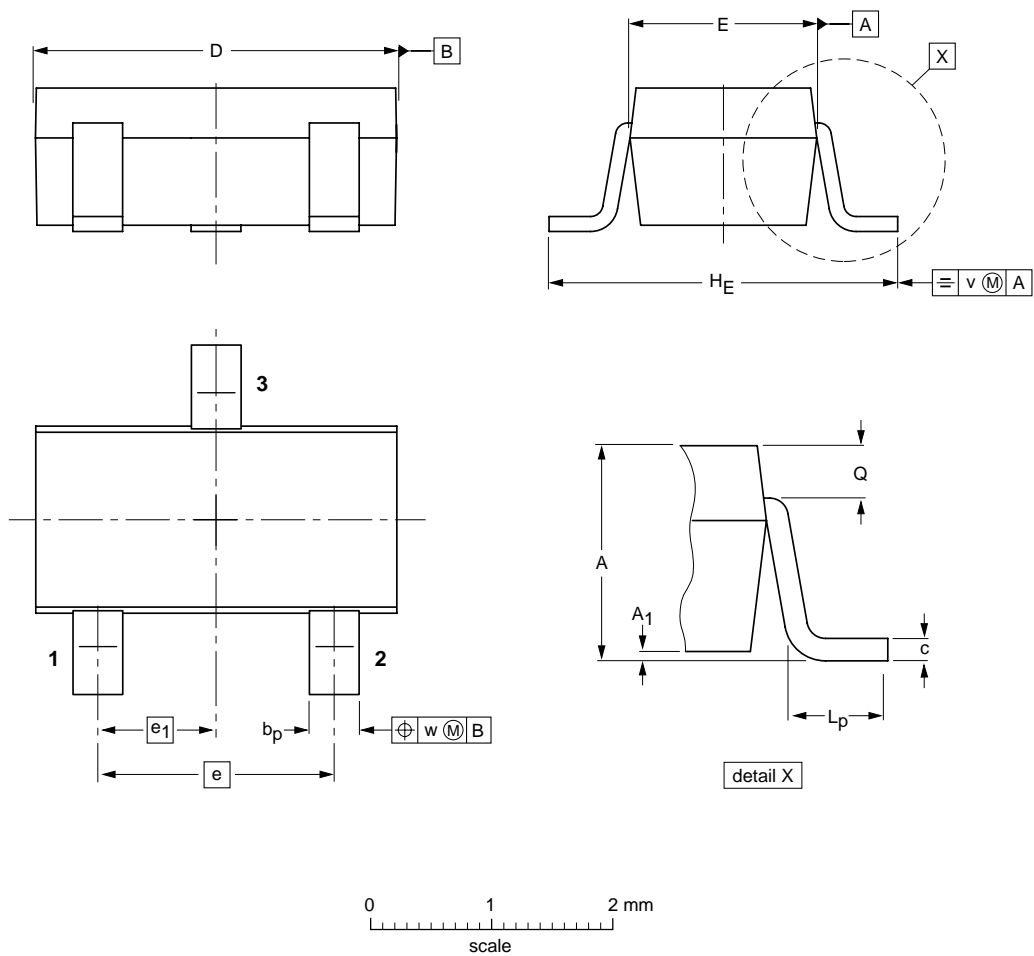
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT490			SC-89			05-07-28 06-03-16

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

PDTA115E series


Plastic surface-mounted package; 3 leads

SOT346



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub>	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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	JEITA			
SOT346		TO-236	SC-59A			04-11-11 06-03-16

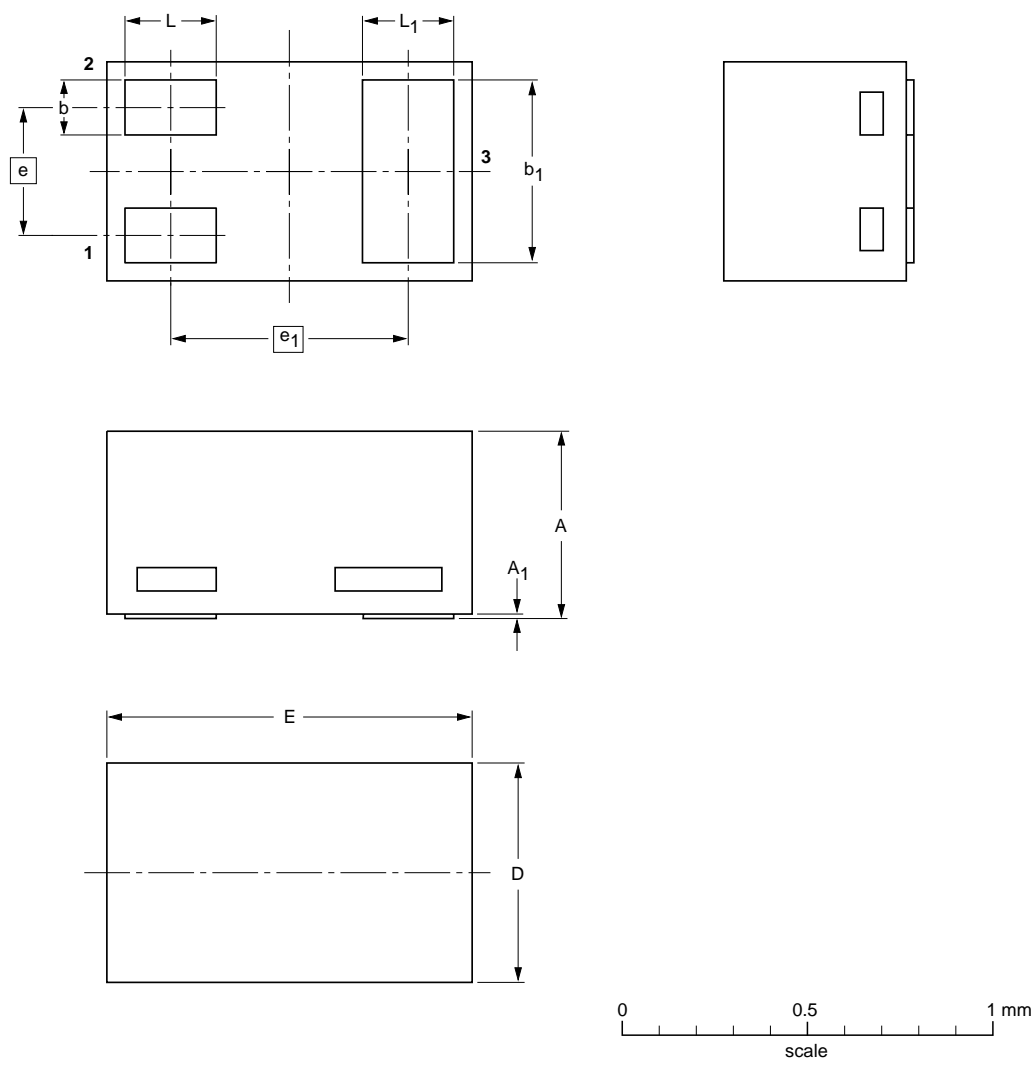


PNP resistor-equipped transistors;  
R1 = 100 kΩ, R2 = 100 kΩ

PDTA115E series

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

SOT883



DIMENSIONS (mm are the original dimensions)

UNIT	A <sup>(1)</sup>	A <sub>1</sub> max.	b	b <sub>1</sub>	D	E	e	e <sub>1</sub>	L	L <sub>1</sub>
mm	0.50 0.46	0.03	0.20 0.12	0.55 0.47	0.62 0.55	1.02 0.95	0.35	0.65	0.30 0.22	0.30 0.22

Note  
1. Including plating thickness

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT883			SC-101			03-02-05 03-04-03

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

PDTA115E series

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

SOT54

Technical drawing of the SOT54 package showing top, side, and end views with dimension labels A, b, b<sub>1</sub>, c, D, d, E, e, e<sub>1</sub>, L, L<sub>1</sub>.

0 2.5 5 mm  
scale

**DIMENSIONS (mm are the original dimensions)**

UNIT	A	b	b <sub>1</sub>	c	D	d	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup> max.
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

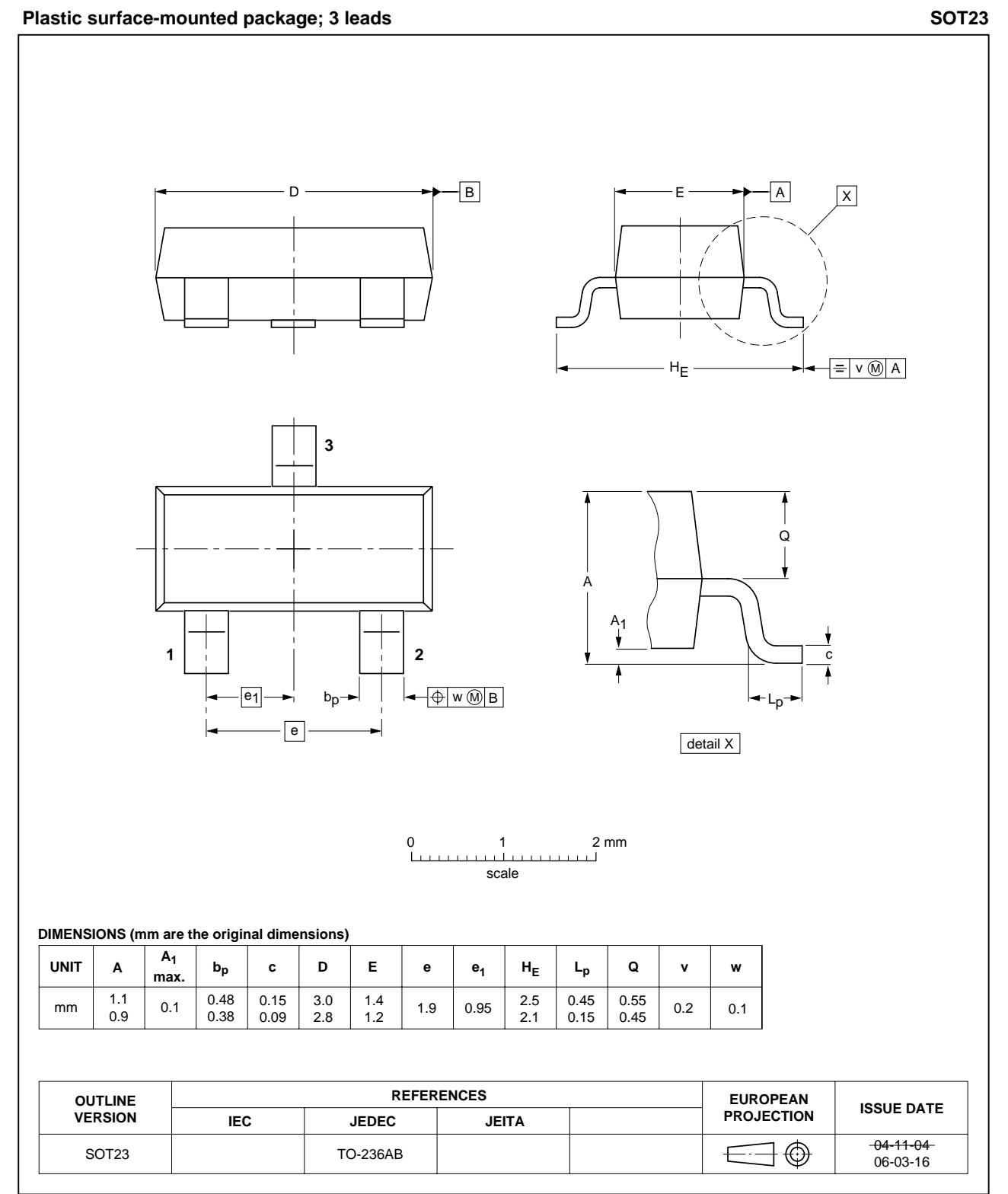
**Note**

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT54		TO-92	SC-43A			04-06-28 04-11-16

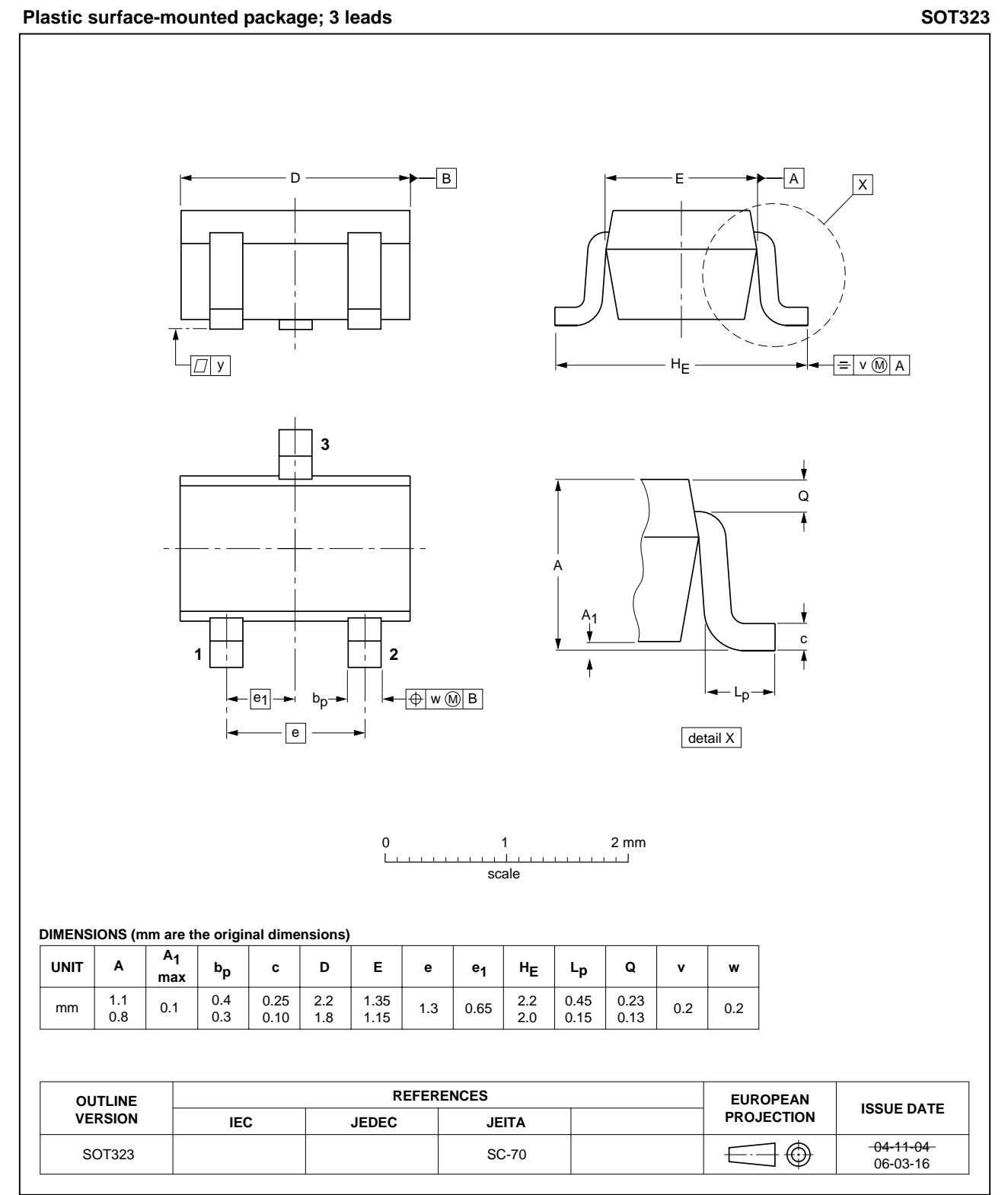
PNP resistor-equipped transistors;  
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PDTA115E series



PNP resistor-equipped transistors;  
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PDTA115E series



PNP resistor-equipped transistors;  
R1 = 100 k $\Omega$ , R2 = 100 k $\Omega$

PDTA115E series

## DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

## Notes

1. Please consult the most recently issued document before initiating or completing a design.
2. 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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# ***NXP Semiconductors***

## **Customer notification**

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, except for package outline drawings which were updated to the latest version.

## **Contact information**

For additional information please visit: <http://www.nxp.com>

For sales offices addresses send e-mail to: [salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)

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