

# DATA SHEET

## **PDTA143X series**

**PNP resistor-equipped transistors;**

**R1 = 4.7 k $\Omega$ , R2 = 10 k $\Omega$**

Product specification  
Supersedes data of 2002 Mar 14

2003 Apr 10

## PNP resistor-equipped transistors; R1 = 4.7 k $\Omega$ , R2 = 10 k $\Omega$

## PDTA143X 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)	–	–100	mA
R1	bias resistor	4.7	–	k $\Omega$
R2	bias resistor	10	–	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		
PDTA143XE	SOT416	SC-75	35	PDTC143XE
PDTA143XEF	SOT490	SC-89	41	PDTC143XEF
PDTA143XK	SOT346	SC-59	25	PDTC143XK
PDTA143XM	SOT883	SC-101	DN	PDTC143XM
PDTA143XS	SOT54 (TO-92)	SC-43	TA143X	PDTC143XS
PDTA143XT	SOT23	–	*31 <sup>(1)</sup>	PDTC143XT
PDTA143XU	SOT323	SC-70	*46 <sup>(1)</sup>	PDTC143XU

### Note

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

PNP resistor-equipped transistors;  
 R1 = 4.7 kΩ, R2 = 10 kΩ

PDTA143X series

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
PDTA143XS		1 2 3	base collector emitter
PDTA143XE PDTA143XEF PDTA143XK PDTA143XT PDTA143XU		1 2 3	base emitter collector
PDTA143XM		1 2 3	base emitter collector

PNP resistor-equipped transistors;  
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## PDTA143X series

**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 negative		–	+7	V
			–	–20	V
I <sub>O</sub>	output current (DC)		–	–100	mA
I <sub>CM</sub>	peak collector current		–	–100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 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
	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.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	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	833	K/W
	SOT490	notes 1 and 2	500	K/W
SOT883	notes 2 and 3	500	K/W	

**Notes**

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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;  
 $R1 = 4.7 \text{ k}\Omega$ ,  $R2 = 10 \text{ k}\Omega$

PDTA143X series

### CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{\text{CBO}}$	collector-base cut-off current	$V_{\text{CB}} = -50 \text{ V}$ ; $I_{\text{E}} = 0$	–	–	–100	nA
$I_{\text{CEO}}$	collector-emitter cut-off current	$V_{\text{CE}} = -30 \text{ V}$ ; $I_{\text{B}} = 0$	–	–	–1	$\mu\text{A}$
		$V_{\text{CE}} = -30 \text{ V}$ ; $I_{\text{B}} = 0$ ; $T_{\text{j}} = 150 \text{ }^\circ\text{C}$	–	–	–50	$\mu\text{A}$
$I_{\text{EBO}}$	emitter-base cut-off current	$V_{\text{EB}} = -5 \text{ V}$ ; $I_{\text{C}} = 0$	–	–	–600	$\mu\text{A}$
$h_{\text{FE}}$	DC current gain	$V_{\text{CE}} = -5 \text{ V}$ ; $I_{\text{C}} = -10 \text{ mA}$	50	–	–	
$V_{\text{CEsat}}$	collector-emitter saturation voltage	$I_{\text{C}} = -10 \text{ mA}$ ; $I_{\text{B}} = -0.5 \text{ mA}$	–	–	–150	mV
$V_{\text{i(off)}}$	input-off voltage	$I_{\text{C}} = -100 \mu\text{A}$ ; $V_{\text{CE}} = -5 \text{ V}$	–	–0.9	–0.3	V
$V_{\text{i(on)}}$	input-on voltage	$I_{\text{C}} = -20 \text{ mA}$ ; $V_{\text{CE}} = -0.3 \text{ V}$	–2.5	–1.5	–	V
R1	input resistor		3.3	4.7	6.1	$\text{k}\Omega$
$\frac{R2}{R1}$	resistor ratio		1.7	2.1	2.6	
$C_{\text{c}}$	collector capacitance	$I_{\text{E}} = i_{\text{e}} = 0$ ; $V_{\text{CB}} = -10 \text{ V}$ ; $f = 1 \text{ MHz}$	–	–	3	pF

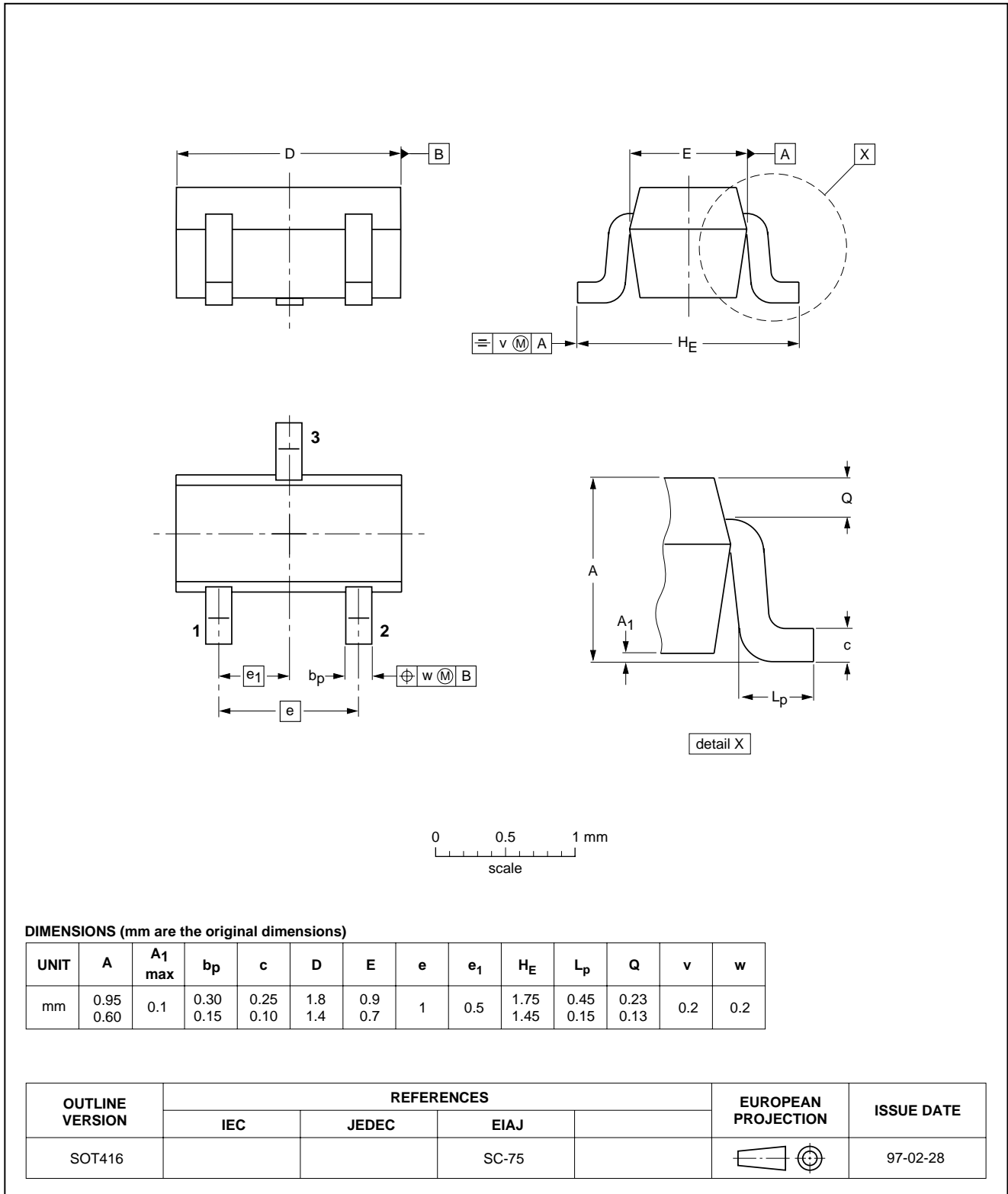
PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 10 kΩ

PDTA143X series

PACKAGE OUTLINES

Plastic surface mounted package; 3 leads

SOT416

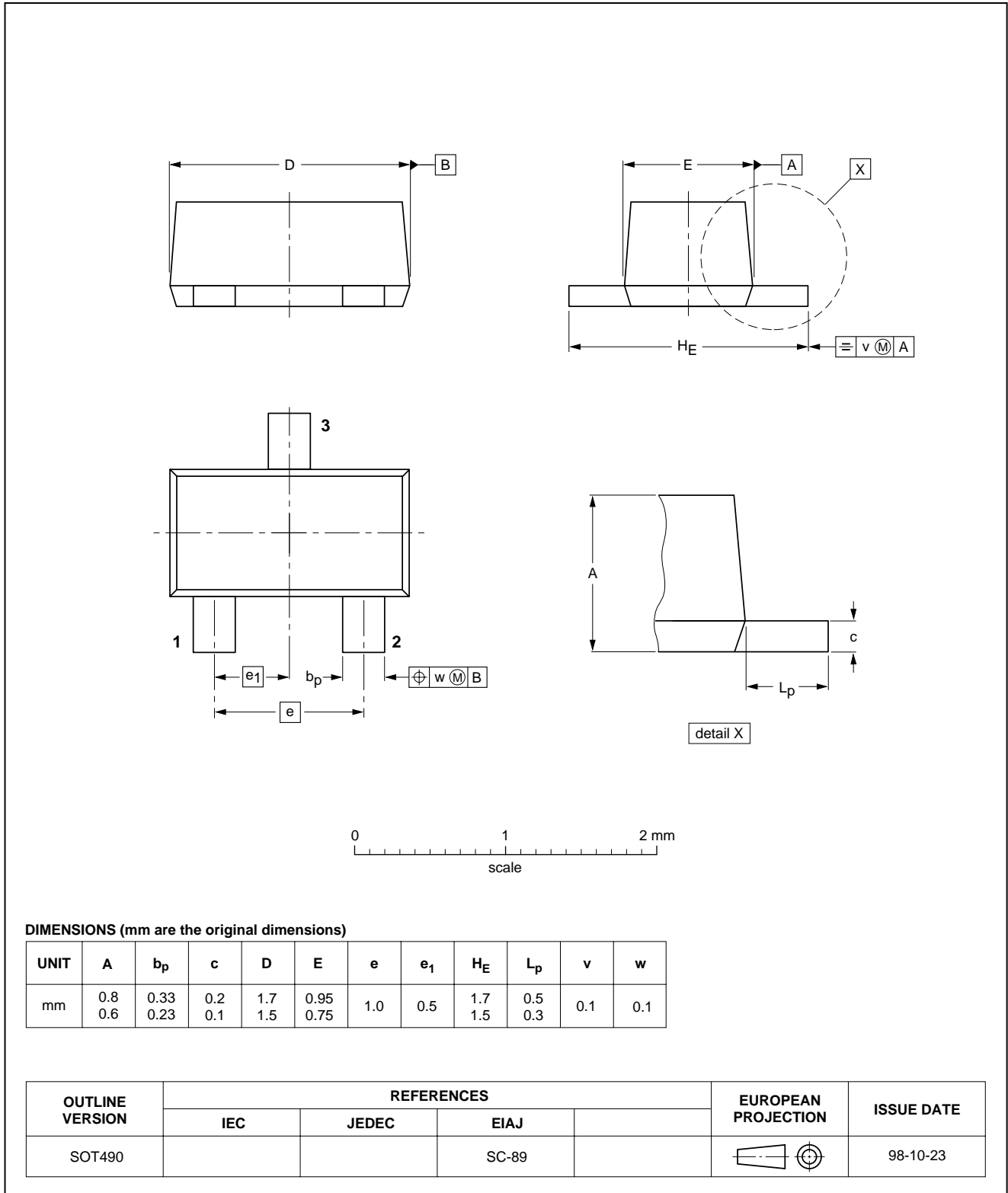


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 10 kΩ

PDTA143X series

Plastic surface mounted package; 3 leads

SOT490

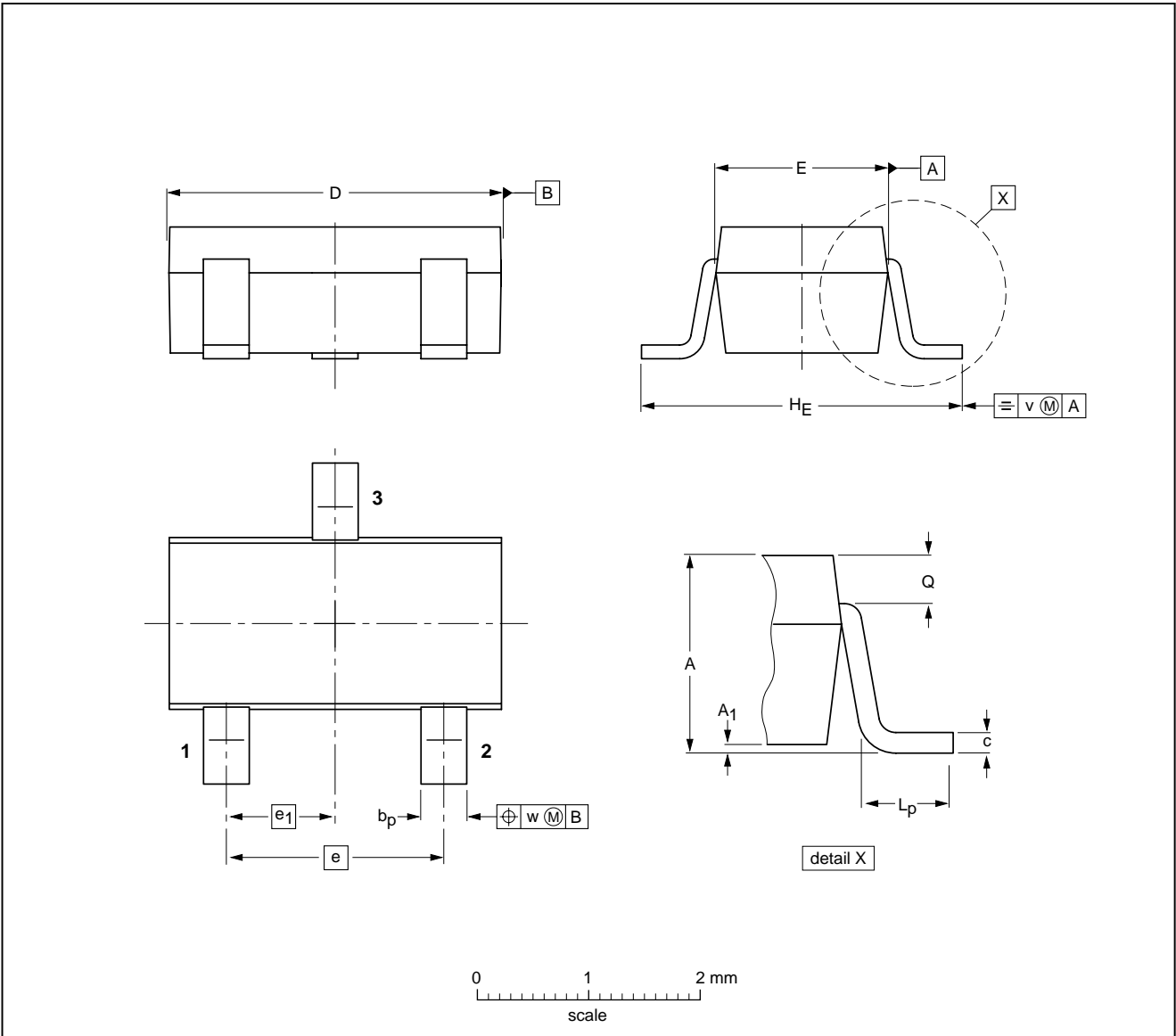


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 10 kΩ

PDTA143X 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	EIAJ			
SOT346		TO-236	SC-59			98-07-17

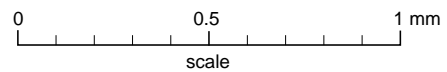
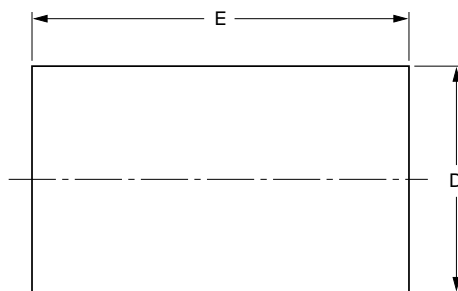
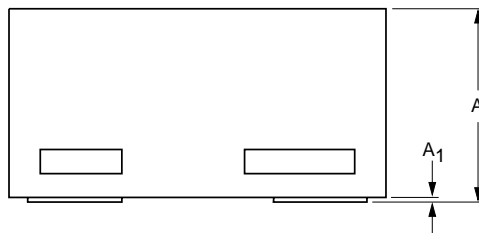
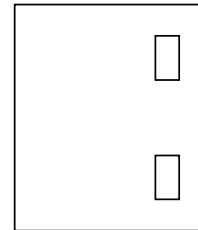
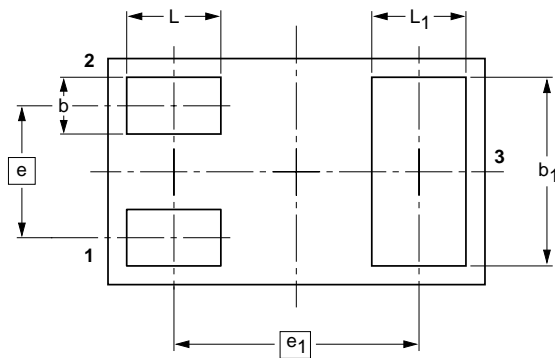


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 10 kΩ

PDTA143X 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

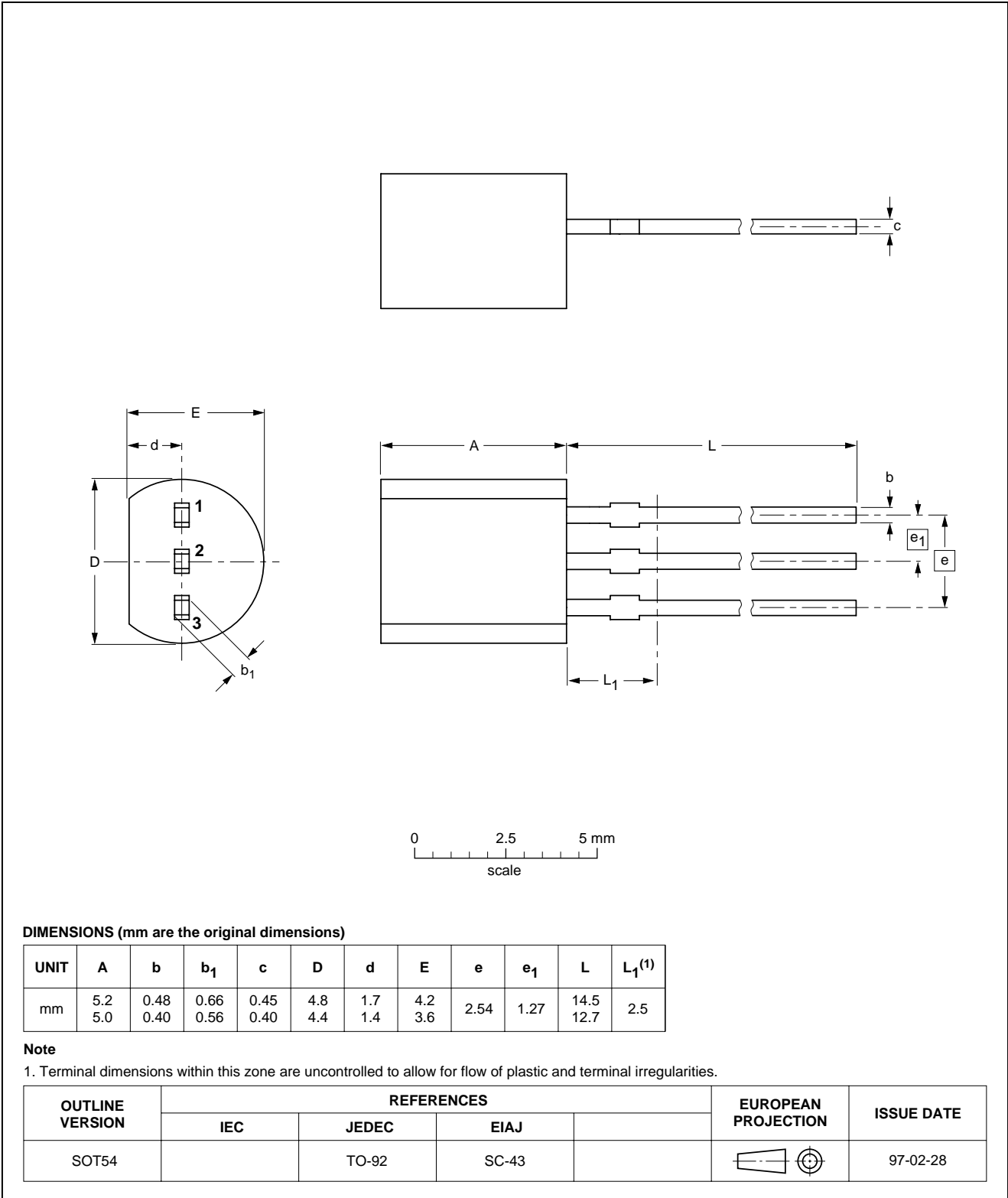
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT883			SC-101			03-02-05- 03-04-03

PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 10 kΩ

PDTA143X series

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

SOT54

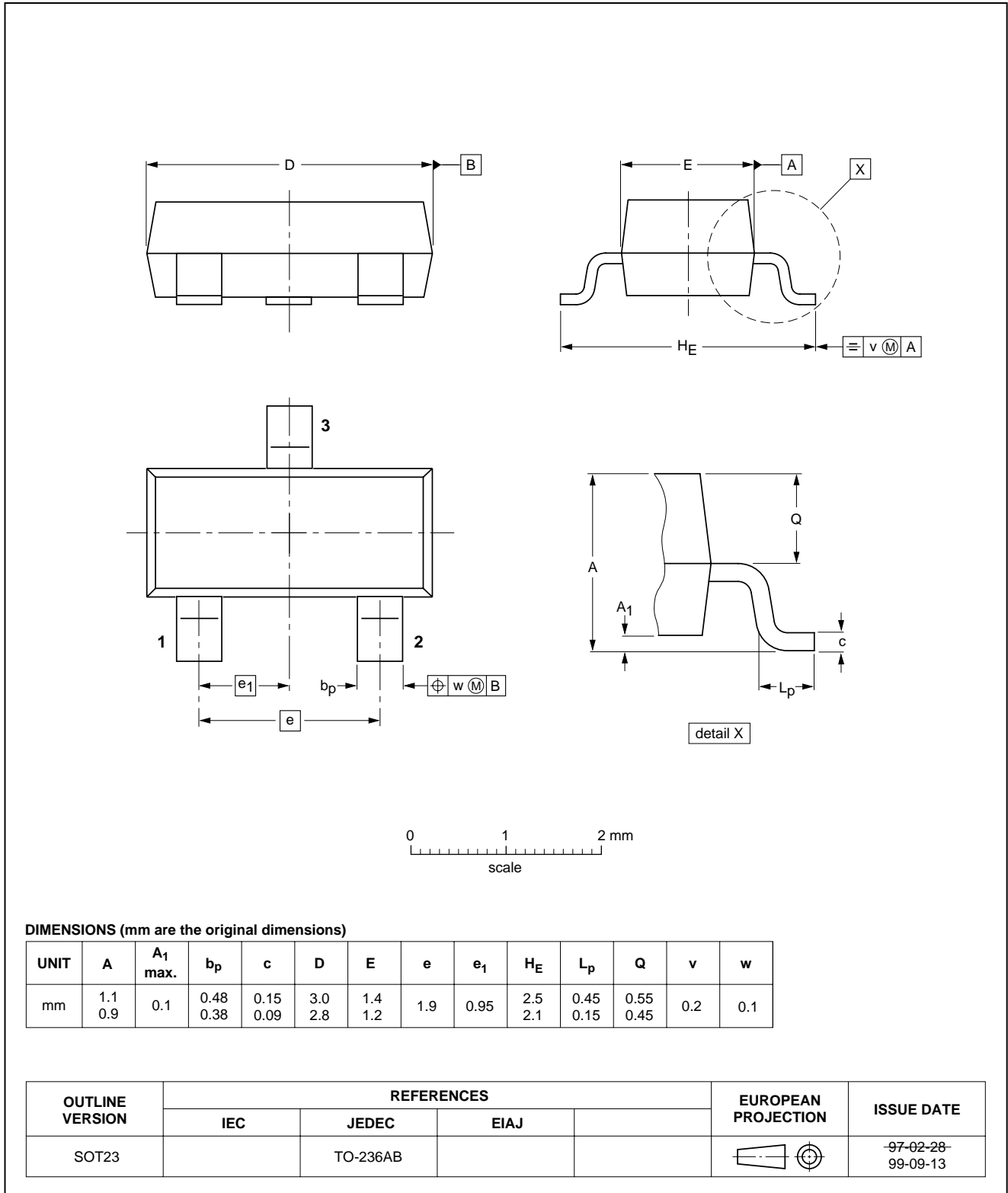


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 10 kΩ

PDTA143X series

Plastic surface mounted package; 3 leads

SOT23

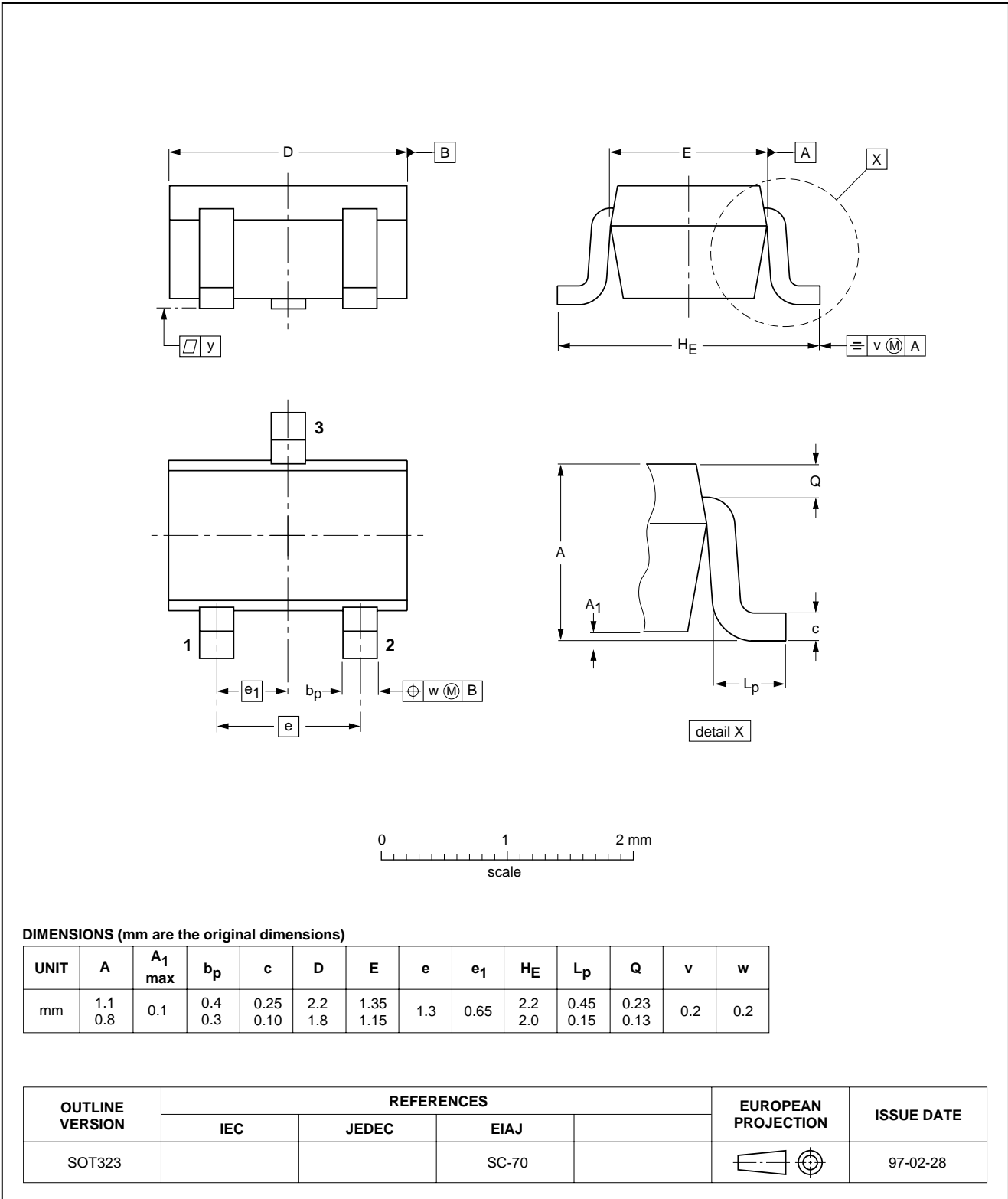


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 10 kΩ

PDTA143X series

Plastic surface mounted package; 3 leads

SOT323



PNP resistor-equipped transistors;  
R1 = 4.7 k $\Omega$ , R2 = 10 k $\Omega$

PDTA143X series

#### DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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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3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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R1 = 4.7 k $\Omega$ , R2 = 10 k $\Omega$

PDTA143X series

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**NOTES**

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R1 = 4.7 k $\Omega$ , R2 = 10 k $\Omega$

PDTA143X series

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**NOTES**

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Information as of 2003-04-22

# PDTA143X series; PNP resistor-equipped transistors; R1 = 4.7 kOhm, R2 = 10 kOhm

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## General description

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

## ❑ 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.

[AN10116\\_2: Breakthrough In Small Signal - Low  \$V\_{CEsat}\$  \(BISS\) Transistors and their Applications](#) (date 05-Aug-02)

## ❑ Datasheet

<u>Type number</u>	<u>Title</u>	<u>Publication release date</u>	<u>Datasheet status</u>	<u>Page count</u>	<u>File size (kB)</u>	<u>Datasheet</u>
PDTA143X series	PNP resistor-equipped transistors; R1 = 4.7 kOhm, R2 = 10 kOhm	4/10/2003	Product specification	16	84	 <a href="#">Download</a>

## ▣ Parametrics

Type number	Package	hFE min	hFE max	POLARITY	$I_O$ max(mA)	VCEO max(V)	Ptot max(mW)	RES RATIO	Complement	Input Resistor(kOhm)
PDTA143XE	<a href="#">SOT416</a> (EMT3, SMPAK)	50	>50	PNP	100	50	150	2.1	PDTC143XE	4.7
PDTA143XEF	<a href="#">SOT490</a> (SC-89)	50	>50	PNP	-100	-50	250	2.1	PDTC143XEF	4.7
PDTA143XK	<a href="#">SOT346</a> (SMT3, MPAK)	50	>50	PNP	100	50	250	2.1	PDTC143XK	4.7
PDTA143XT	<a href="#">SOT23</a> (SST3)	50	>50	PNP	100	50	250	2.1	PDTC143XT	4.7

## ▣ Products, packages, availability and ordering

<u>Type number</u>	<u>North American type number</u>	<u>Ordering code (12NC)</u>	<u>Marking/Packing</u>  <a href="#">Discretes packing info</a>	<u>Package</u>	<u>Device status</u>	<u>Buy online</u>
PDTA143XE	PDTA143XE T/R	9340 552 81115	Standard Marking * Reel Pack, SMD	<a href="#">SOT416</a> (EMT3; SMPAK)	Full production	<input type="text" value="order this"/> -
	PDTA143XE /T3	9340 552 81135	Standard Marking * Reel Pack, SMD, Large	<a href="#">SOT416</a> (EMT3; SMPAK)	Full production	<input type="text" value="order this"/> -
PDTA143XEF	PDTA143XEF T/R	9340 570 05115	Standard Marking * Reel Pack, SMD	<a href="#">SOT490</a> (SC-89)	Full production	<input type="text" value="order this"/> -
PDTA143XK	PDTA143XK T/R	9340 569 75115	Standard Marking * Reel Pack, SMD	<a href="#">SOT346</a> (SMT3; MPAK)	Full production	<input type="text" value="order this"/> -
PDTA143XM		9340 571 67315	Standard Marking * Reel Pack, SMD, Pitch 2mm	<a href="#">SOT883</a>	Development	-

PDTA143XS		9340 575 63126	Standard Marking * Ammopack, Radial	<a href="#">SOT54</a> (SPT; E-1)	Full production	-
PDTA143XT	PDTA143XT T/R	9340 550 53215	Standard Marking * Reel Pack, SMD, Low Profile	<a href="#">SOT23</a> (SST3)	Full production	<a href="#">order this</a> -
PDTA143XU		9340 575 36115	Standard Marking * Reel Pack, SMD	<a href="#">SOT323</a> (UMT3; CMPAK)	Full production	-

## Similar products

[PDTA143X series](#) links to the similar products page containing an overview of products that are similar in function or related to the type number(s) as listed on this page. The similar products page includes products from the same catalog tree(s), relevant selection guides and products from the same functional category.

## Support & tools

[Spice model of PDTA143XE](#)

[Spice model of PDTA143XT](#)

[Resistor-equipped transistors; small-signal transistors that reduce handling costs](#)

[New SOT66x package generation](#)(date 31-Aug-01)

[Letter Symbols - Transistors General](#)(date 01-May-99)

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