

# DATA SHEET

## **PDTA143E series**

**PNP resistor-equipped transistors;**

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

Product specification  
Supersedes data of 2003 Apr 11

2003 Sep 08

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

## PDTA143E 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             | 4.7  | –    | 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   |                    |                |
| PDTA143EE   | SOT416        | SC-75  | 01                 | PDTC143EE      |
| PDTA143EEF  | SOT490        | SC-89  | 50                 | PDTC143EEF     |
| PDTA143EK   | SOT346        | SC-59  | 01                 | PDTC143EK      |
| PDTA143EM   | SOT883        | SC-101 | DL                 | PDTC143EM      |
| PDTA143ES   | SOT54 (TO-92) | SC-43  | TA143E             | PDTC143ES      |
| PDTA143ET   | SOT23         | –      | *01 <sup>(1)</sup> | PDTC143ET      |
| PDTA143EU   | SOT323        | SC-70  | *01 <sup>(1)</sup> | PDTC143EU      |

### Note

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

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

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SIMPLIFIED OUTLINE, SYMBOL AND PINNING

| TYPE NUMBER  | SIMPLIFIED OUTLINE AND SYMBOL | PINNING     |                              |
|--|-------------------------------|-------------|------------------------------|
|  |                               | PIN         | DESCRIPTION                  |
| PDTA143ES  |                               | 1<br>2<br>3 | base<br>collector<br>emitter |
| PDTA143EE<br>PDTA143EEF<br>PDTA143EK<br>PDTA143ET<br>PDTA143EU |                               | 1<br>2<br>3 | base<br>emitter<br>collector |
| PDTA143EM  |                               | 1<br>2<br>3 | base<br>emitter<br>collector |

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## PDTA143E 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<br>positive<br>negative |                          | –    | +10  | V    |
|                  |                                       |                          | –    | –30  | 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 |      |      |      |
|                  | 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.

**THERMAL CHARACTERISTICS**

| SYMBOL              | PARAMETER                                   | CONDITIONS    | VALUE | UNIT |
|---------------------|---|---------------|-------|------|
| R <sub>th j-a</sub> | thermal resistance from junction to ambient | in free air   |       |      |
|                     | 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.

PNP resistor-equipped transistors;  
 $R1 = 4.7 \text{ k}\Omega$ ,  $R2 = 4.7 \text{ k}\Omega$

PDTA143E 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         | $V_{\text{EB}} = -5 \text{ V}$ ; $I_{\text{C}} = 0$  | –    | –    | –0.9 | mA               |
| $h_{\text{FE}}$     | DC current gain                      | $V_{\text{CE}} = -5 \text{ V}$ ; $I_{\text{C}} = -10 \text{ mA}$                                   | 30   | –    | –    |                  |
| $V_{\text{CEsat}}$  | 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                    | $I_{\text{C}} = -100 \text{ }\mu\text{A}$ ; $V_{\text{CE}} = -5 \text{ V}$                         | –    | –1.1 | –0.5 | V                |
| $V_{\text{i(on)}}$  | input-on voltage                     | $I_{\text{C}} = -20 \text{ mA}$ ; $V_{\text{CE}} = -0.3 \text{ V}$                                 | –2.5 | –1.9 | –    | V                |
| R1                  | input resistor                       |  | 3.3  | 4.7  | 6.1  | $\text{k}\Omega$ |
| $\frac{R2}{R1}$     | resistor ratio                       |  | 0.8  | 1    | 1.2  |                  |
| $C_{\text{c}}$      | collector capacitance                | $I_{\text{E}} = i_{\text{e}} = 0$ ; $V_{\text{CB}} = -10 \text{ V}$ ; $f = 1 \text{ MHz}$          | –    | –    | 3    | pF               |

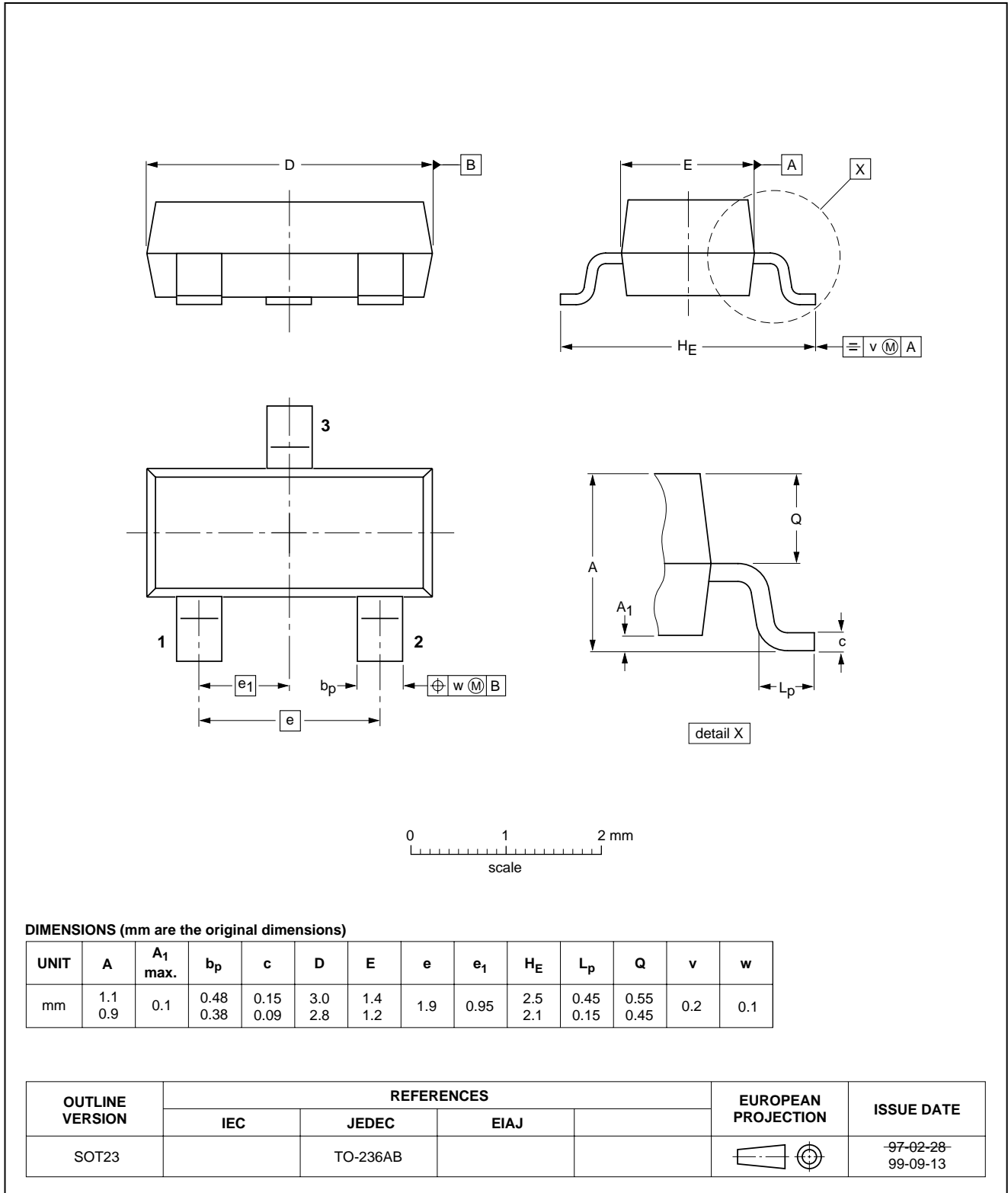
PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 4.7 kΩ

PDTA143E series

PACKAGE OUTLINES

Plastic surface mounted package; 3 leads

SOT23

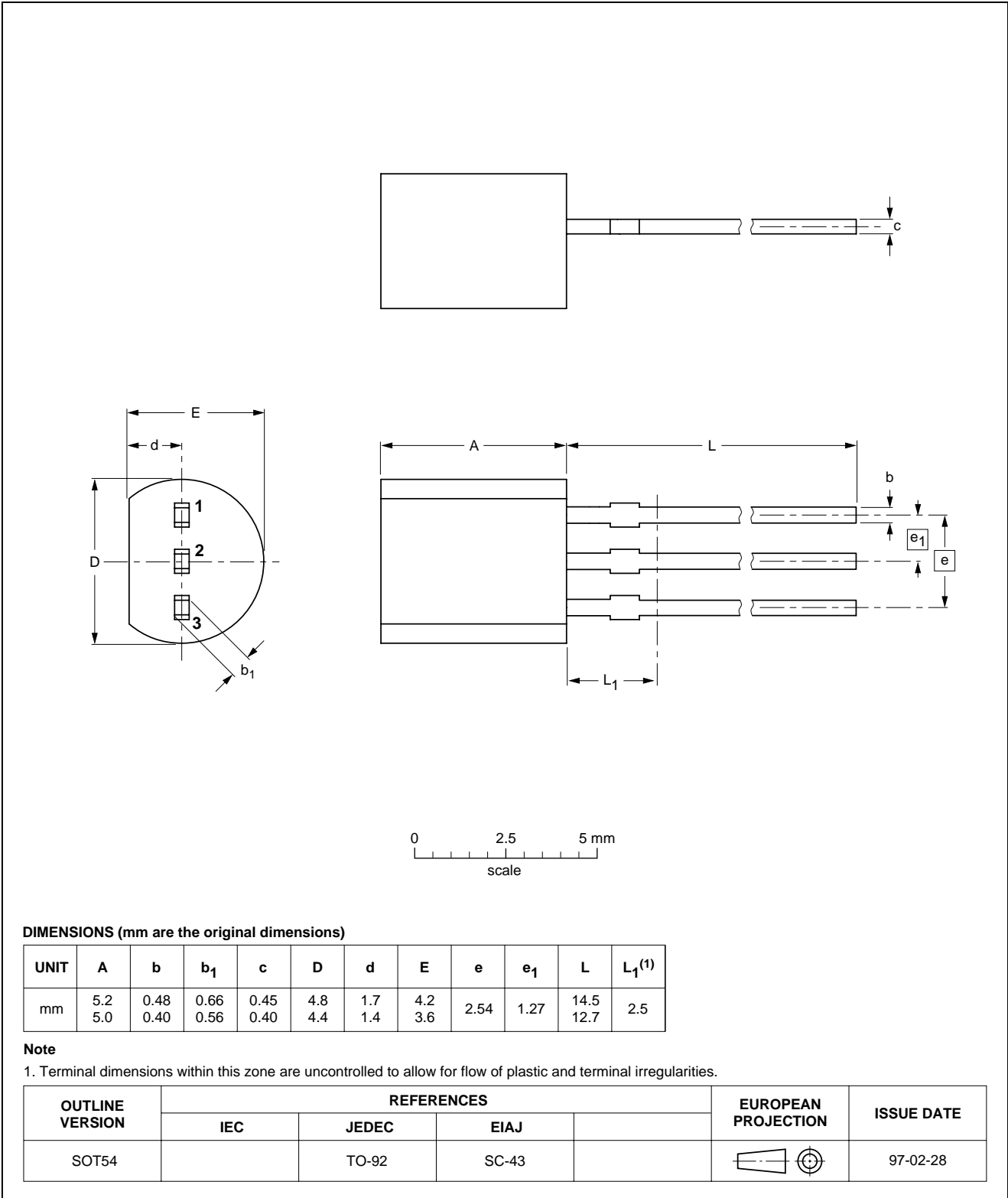


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 4.7 kΩ

PDTA143E series

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

SOT54

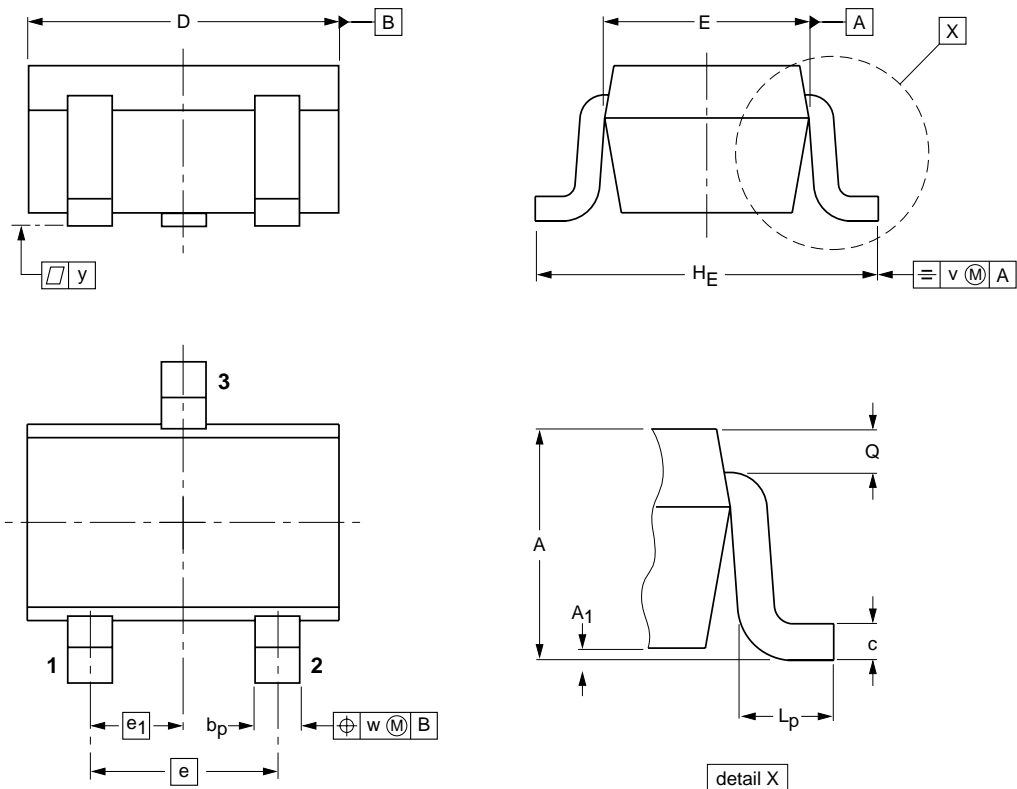


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 4.7 kΩ

PDTA143E series

Plastic surface mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub><br>max | b <sub>p</sub> | c            | D          | E            | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | Q            | v   | w   |
|------|------------|-----------------------|----------------|--------------|------------|--------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm   | 1.1<br>0.8 | 0.1                   | 0.4<br>0.3     | 0.25<br>0.10 | 2.2<br>1.8 | 1.35<br>1.15 | 1.3 | 0.65           | 2.2<br>2.0     | 0.45<br>0.15   | 0.23<br>0.13 | 0.2 | 0.2 |

| OUTLINE VERSION | REFERENCES |       |       |  | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|-------|--|---------------------|------------|
|                 | IEC        | JEDEC | EIAJ  |  |                     |            |
| SOT323          |            |       | SC-70 |  |                     | 97-02-28   |

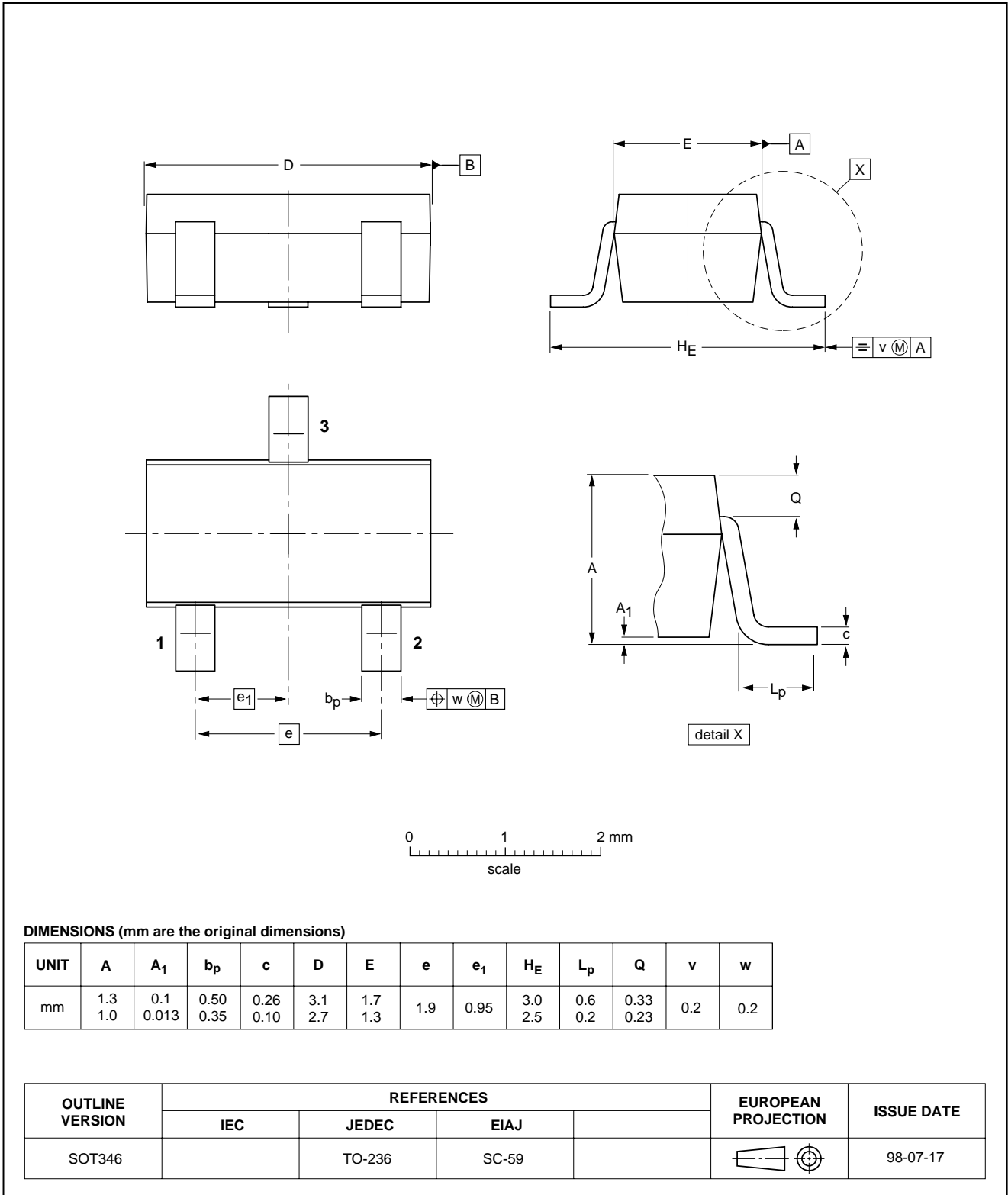


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 4.7 kΩ

PDTA143E series

Plastic surface mounted package; 3 leads

SOT346

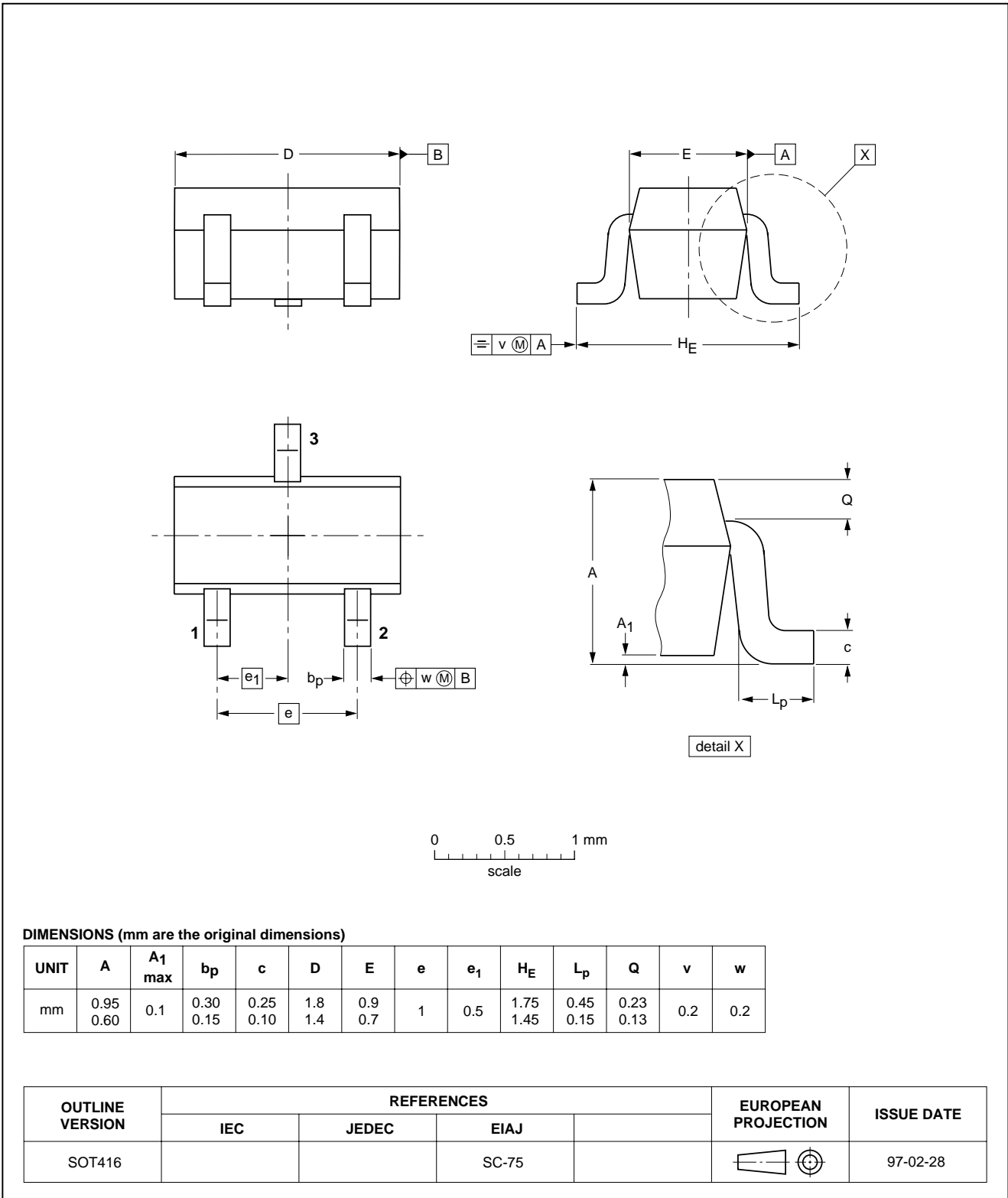


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 4.7 kΩ

PDTA143E series

Plastic surface mounted package; 3 leads

SOT416

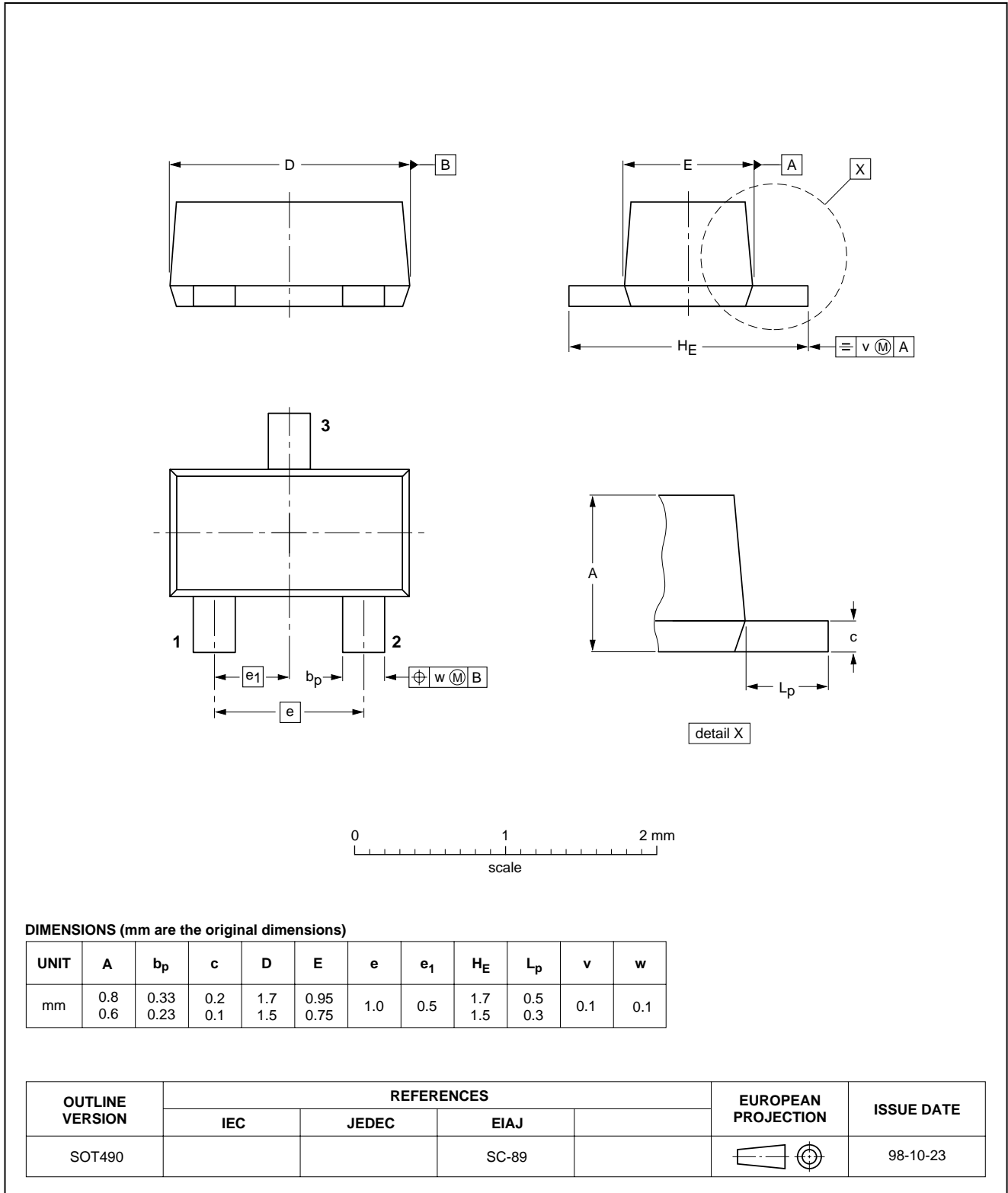


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 4.7 kΩ

PDTA143E series

Plastic surface mounted package; 3 leads

SOT490

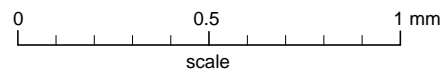
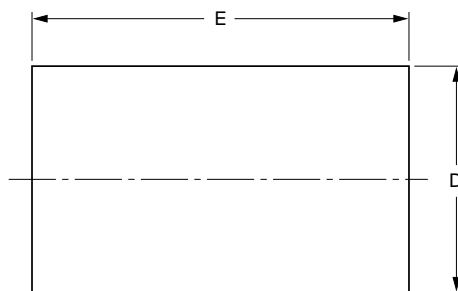
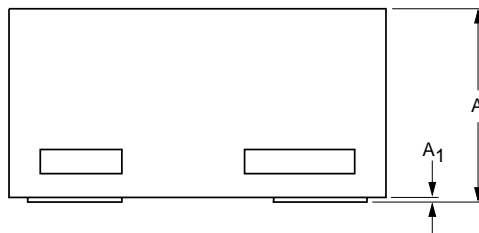
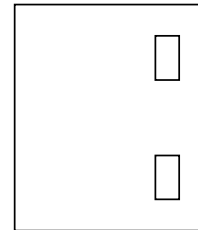
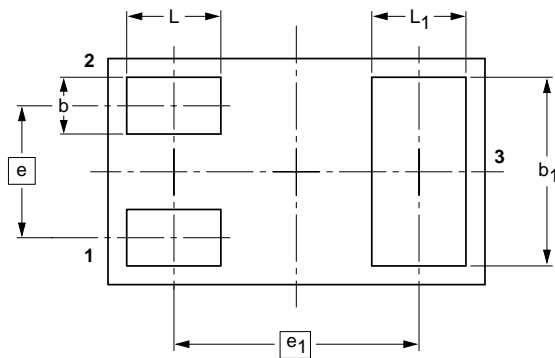


PNP resistor-equipped transistors;  
R1 = 4.7 kΩ, R2 = 4.7 kΩ

PDTA143E 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><br>max. | b            | b <sub>1</sub> | D            | E            | e    | e <sub>1</sub> | L            | L <sub>1</sub> |
|------|------------------|------------------------|--------------|----------------|--------------|--------------|------|----------------|--------------|----------------|
| mm   | 0.50<br>0.46     | 0.03                   | 0.20<br>0.12 | 0.55<br>0.47   | 0.62<br>0.55 | 1.02<br>0.95 | 0.35 | 0.65           | 0.30<br>0.22 | 0.30<br>0.22   |

Note

1. Including plating thickness

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

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

PDTA143E 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.  |
| II    | Preliminary data                 | Qualification                    | This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.             |
| III   | Product data                     | Production                       | This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). |

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