

DATA SHEET

PDTA123E series

PNP resistor-equipped transistors;

R1 = 2.2 k Ω , R2 = 2.2 k Ω

Product data sheet
Supersedes data of 2004 Apr 07

2004 Aug 02

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PDTA123E 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 | 2.2 | – | k Ω |
| R2 | bias resistor | 2.2 | – | k Ω |

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 | | |
| PDTA123EE | SOT416 | SC-75 | 5C | PDTC123EE |
| PDTA123EEF | SOT490 | SC-89 | 6C | PDTC123EEF |
| PDTA123EK | SOT346 | SC-59 | 42 | PDTC123EK |
| PDTA123EM | SOT883 | SC-101 | F7 | PDTC123EM |
| PDTA123ES | SOT54 (TO-92) | SC-43 | TA123E | PDTC123ES |
| PDTA123ET | SOT23 | – | *21 ⁽¹⁾ | PDTC123ET |
| PDTA123EU | SOT323 | SC-70 | *42 ⁽¹⁾ | PDTC123EU |

Note

1. * = 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 |
| PDTA123ES | <p>MAM338</p> | 1 2 3 | base collector emitter |
| PDTA123EE PDTA123EEF PDTA123EK PDTA123ET PDTA123EU | <p>Top view</p> <p>MDB271</p> | 1 2 3 | base emitter collector |
| PDTA123EM | <p>Bottom view</p> <p>MDB267</p> | 1 2 3 | base emitter collector |

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ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PDTA123EE | – | plastic surface mounted package; 3 leads | SOT416 |
| PDTA123EEF | – | plastic surface mounted package; 3 leads | SOT490 |
| PDTA123EK | – | plastic surface mounted package; 3 leads | SOT346 |
| PDTA123EM | – | leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm | SOT883 |
| PDTA123ES | – | plastic single-ended leaded (through hole) package; 3 leads | SOT54 |
| PDTA123ET | – | plastic surface mounted package; 3 leads | SOT23 |
| PDTA123EU | – | 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 _{CB0} | 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 | | – | +10 | V |
| | negative | | – | –12 | 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 |
| | SOT490 | notes 1 and 2 | – | 250 | 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.

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R1 = 2.2 k Ω , R2 = 2.2 k Ω

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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|----------------------|---|--------------------------|-------|------|
| R _{th(j-a)} | thermal resistance from junction to ambient | T _{amb} ≤ 25 °C | | |
| | 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 | 830 | 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 μ m copper strip line.

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---------------------|--------------------------------------|--|------|------|------|------------|
| I _{CBO} | collector-base cut-off current | V _{CB} = -50 V; I _E = 0 A | - | - | -100 | nA |
| I _{CEO} | collector-emitter cut-off current | V _{CE} = -30 V; I _B = 0 A | - | - | -1 | μ A |
| | | V _{CE} = -30 V; I _B = 0 A; T _j = 150 °C | - | - | -50 | μ A |
| I _{EBO} | emitter-base cut-off current | V _{EB} = -5 V; I _C = 0 A | - | - | -2 | mA |
| h _{FE} | DC current gain | V _{CE} = -5 V; I _C = -20 mA | 30 | - | - | |
| V _{CEsat} | collector-emitter saturation voltage | I _C = -10 mA; I _B = -0.5 mA | - | - | -150 | mV |
| V _{i(off)} | input-off voltage | I _C = -1 mA; V _{CE} = -5 V | - | -1.2 | -0.5 | V |
| V _{i(on)} | input-on voltage | I _C = -20 mA; V _{CE} = -0.3 V | -2 | -1.6 | - | V |
| R1 | input resistor | | 1.54 | 2.2 | 2.86 | k Ω |
| $\frac{R2}{R1}$ | resistor ratio | | 0.8 | 1 | 1.2 | |
| C _c | collector capacitance | I _E = i _e = 0 A; V _{CB} = -10 V; f = 1 MHz | - | - | 3 | pF |

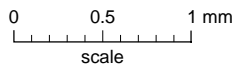
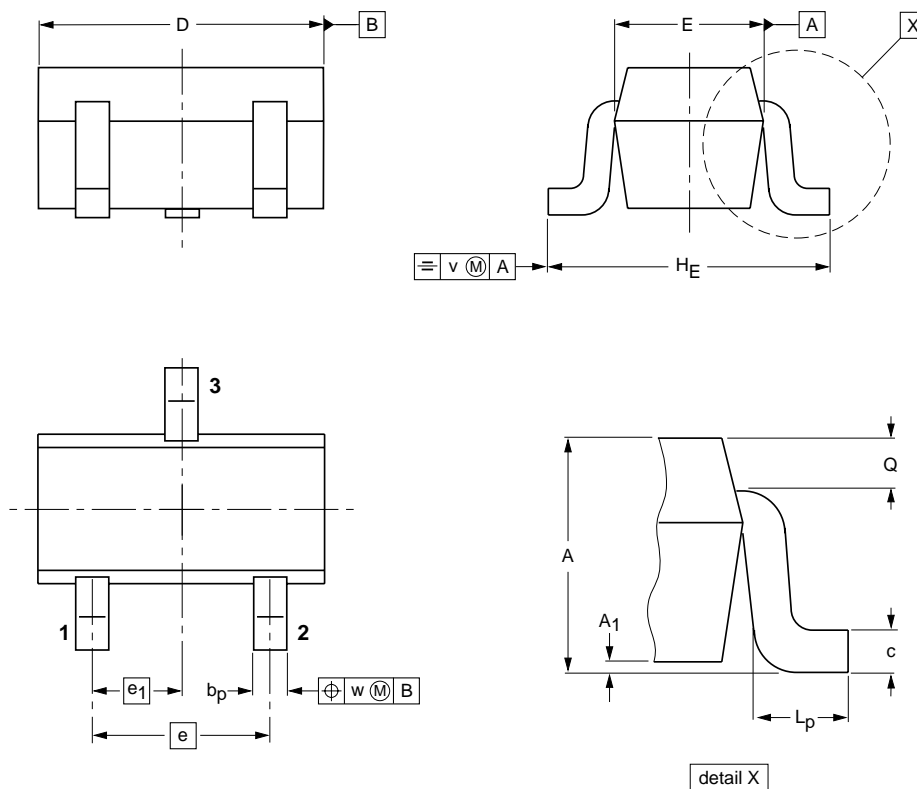
PNP resistor-equipped transistors;
R1 = 2.2 kΩ, R2 = 2.2 kΩ

PDTA123E series

PACKAGE OUTLINES

Plastic surface-mounted package; 3 leads

SOT416



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 | 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 |

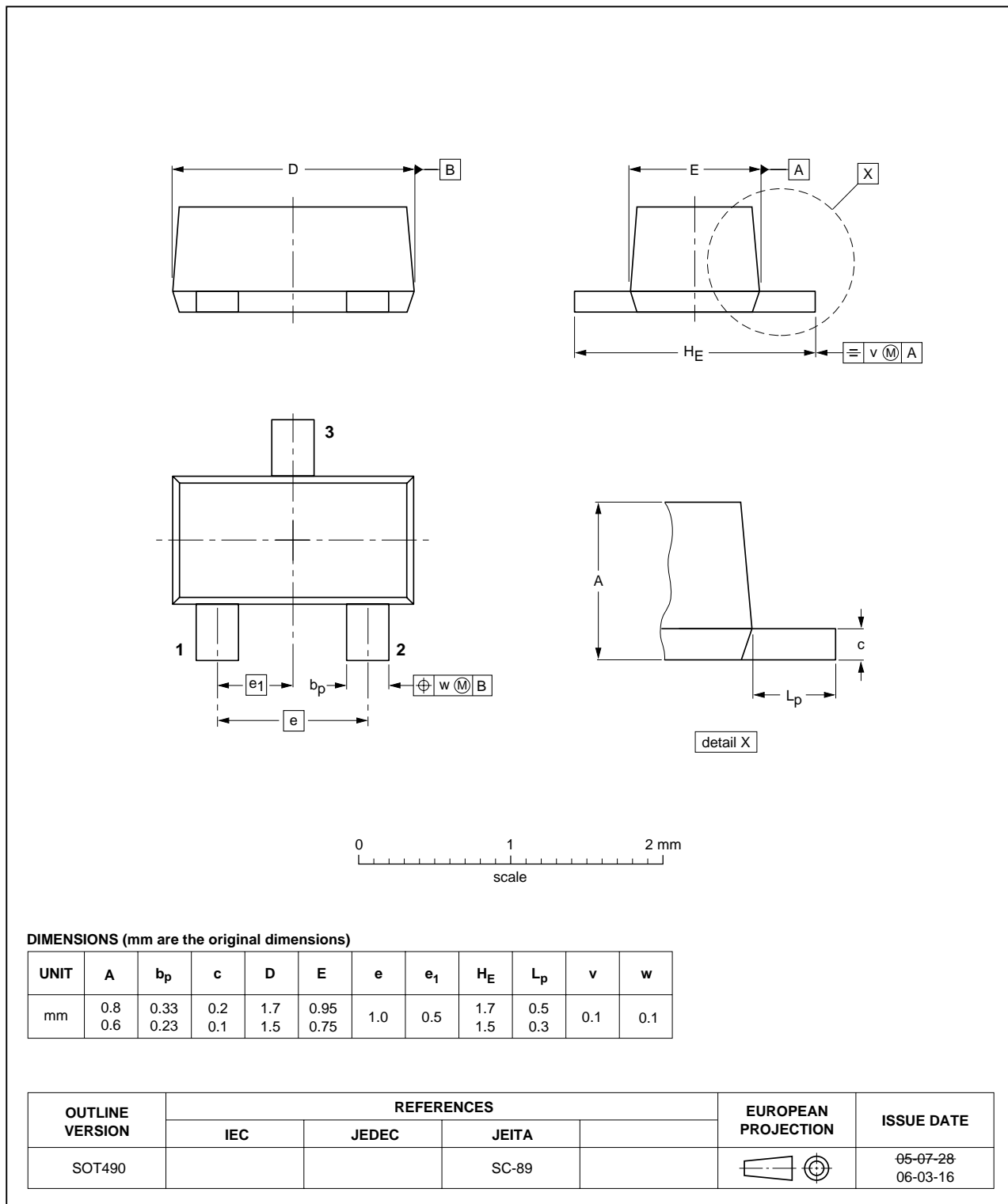
| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|------------------------|----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT416 | | | SC-75 | | 04-11-04 06-03-16 |

PNP resistor-equipped transistors;
R1 = 2.2 kΩ, R2 = 2.2 kΩ

PDTA123E series

Plastic surface-mounted package; 3 leads

SOT490

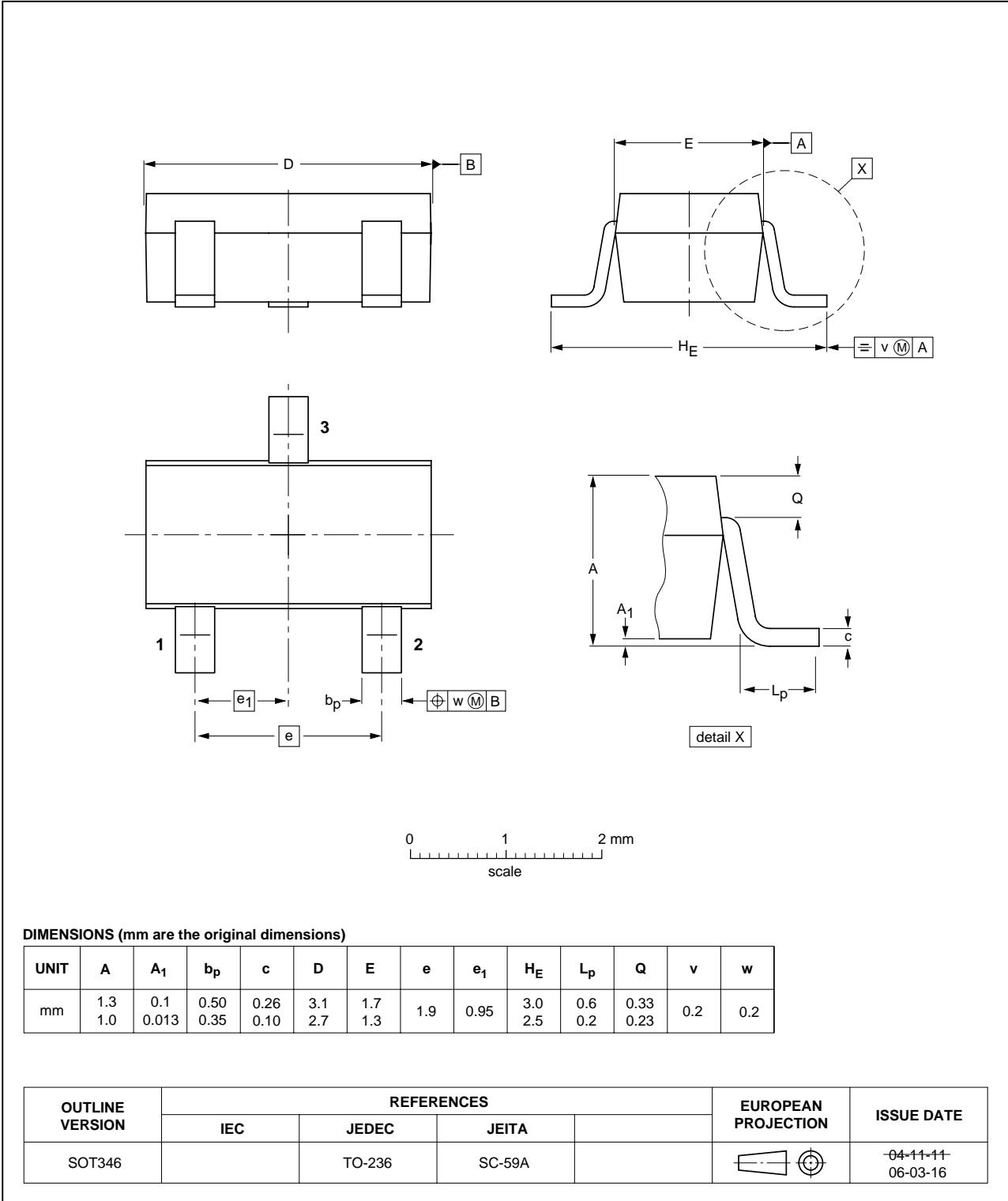


PNP resistor-equipped transistors;
R1 = 2.2 kΩ, R2 = 2.2 kΩ

PDTA123E series

Plastic surface-mounted package; 3 leads

SOT346

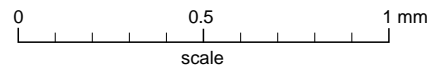
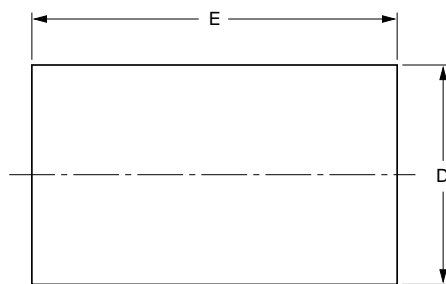
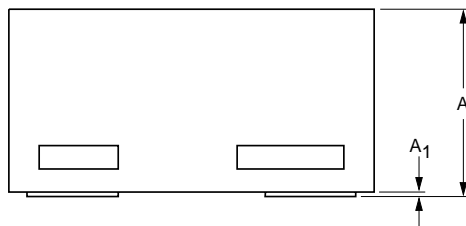
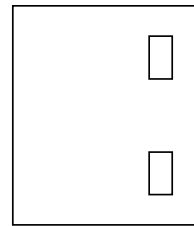
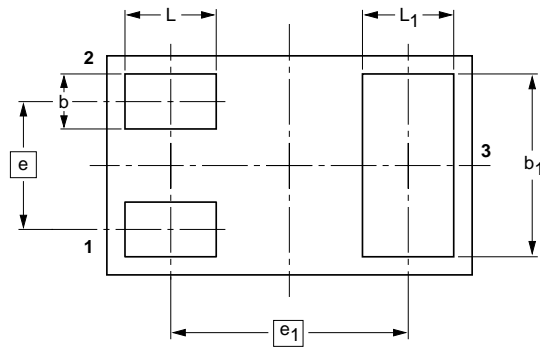


PNP resistor-equipped transistors;
R1 = 2.2 kΩ, R2 = 2.2 kΩ

PDTA123E 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 ⁽¹⁾ | A ₁ max. | b | b ₁ | D | E | e | e ₁ | L | L ₁ |
|------|------------------|---------------------|--------------|----------------|--------------|--------------|------|----------------|--------------|----------------|
| 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

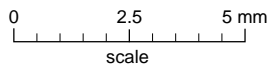
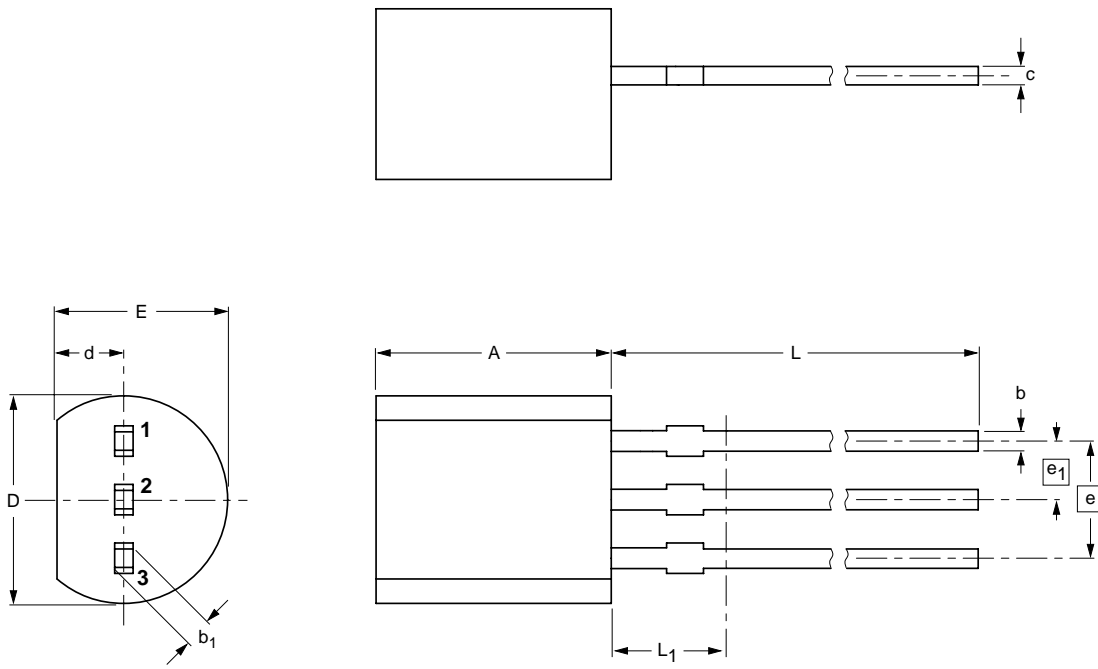
| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|--------|---------------------|----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT883 | | | SC-101 | | 03-02-05 03-04-03 |

PNP resistor-equipped transistors;
R1 = 2.2 kΩ, R2 = 2.2 kΩ

PDTA123E series

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

SOT54



DIMENSIONS (mm are the original dimensions)

| UNIT | A | b | b ₁ | c | D | d | E | e | e ₁ | L | L ₁ ⁽¹⁾ 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.

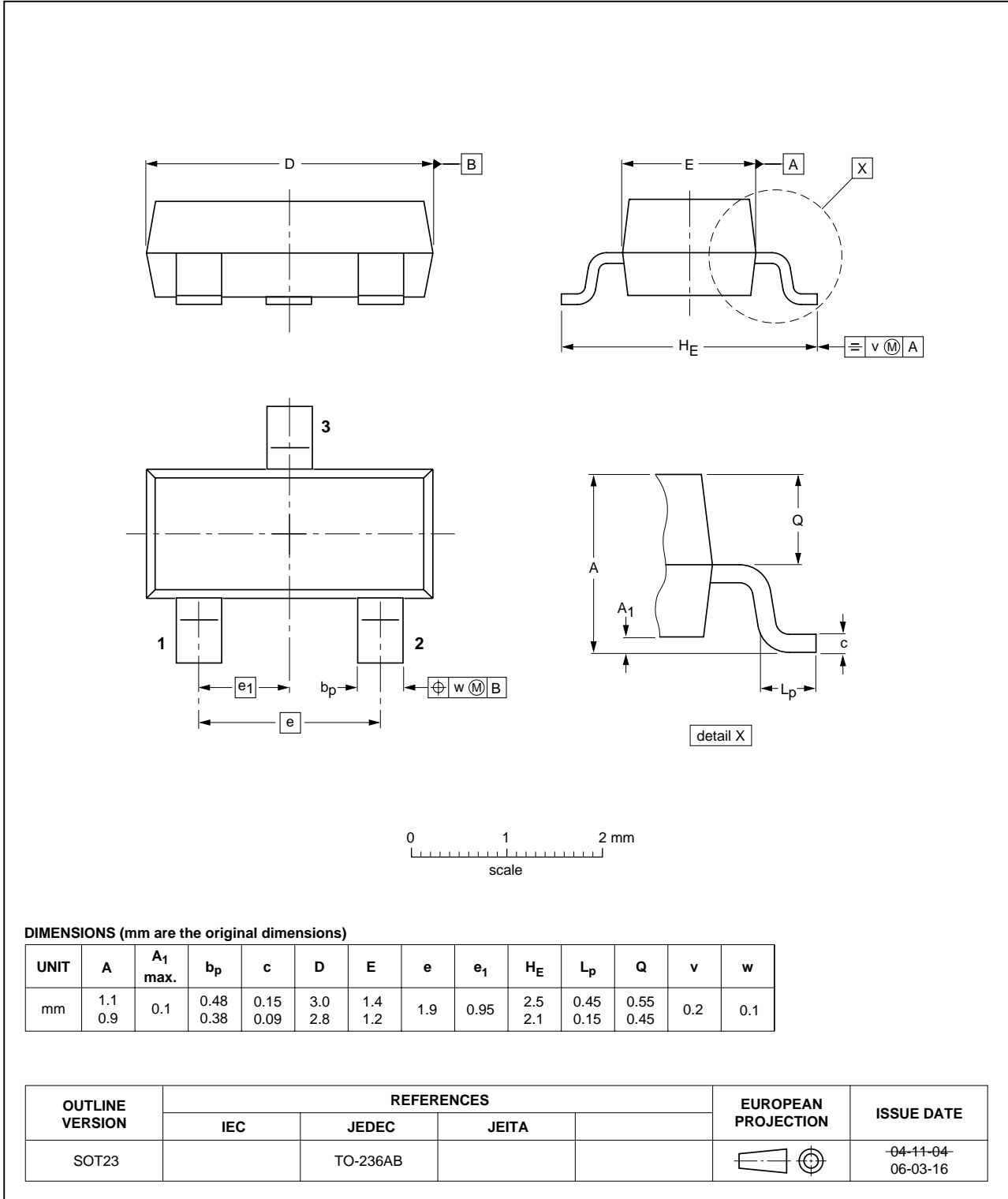
| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|--------|------------------------|----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT54 | | TO-92 | SC-43A | | 04-06-28 04-11-16 |

PNP resistor-equipped transistors;
R1 = 2.2 kΩ, R2 = 2.2 kΩ

PDTA123E series

Plastic surface-mounted package; 3 leads

SOT23

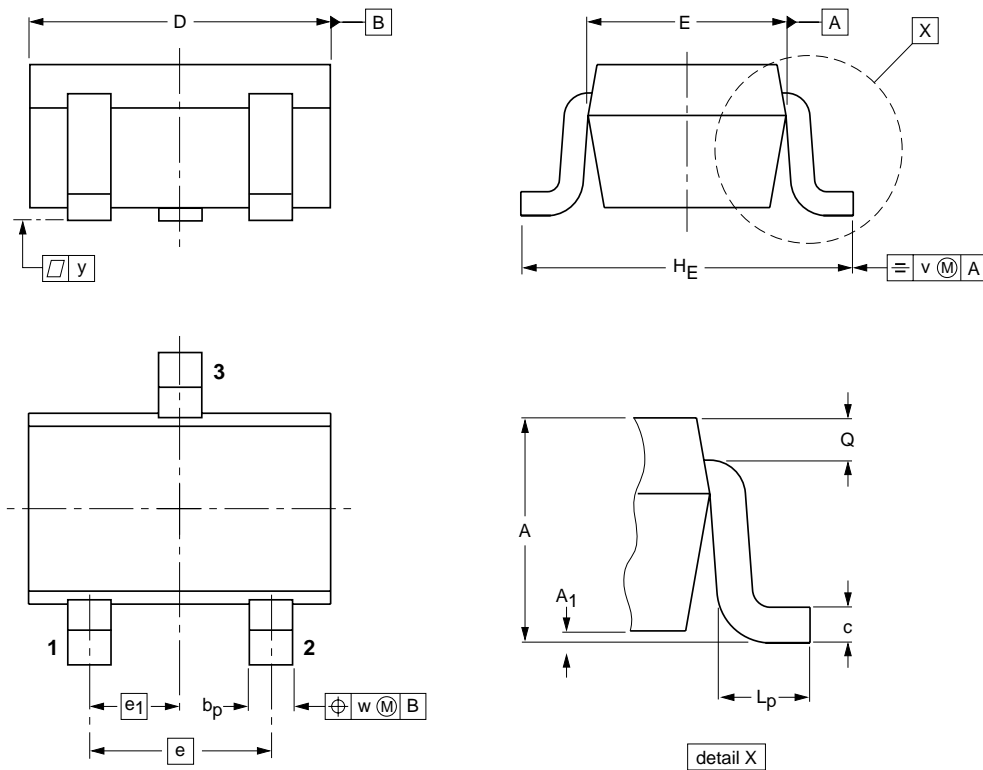


PNP resistor-equipped transistors;
R1 = 2.2 kΩ, R2 = 2.2 kΩ

PDTA123E series

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 |

PNP resistor-equipped transistors;
R1 = 2.2 kΩ, R2 = 2.2 kΩ

PDTA123E series

DATA SHEET STATUS

| DOCUMENT STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | 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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Contact information

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