

DATA SHEET

PDTA124T series

PNP resistor-equipped transistors;

R1 = 22 k Ω , R2 = open

Product data sheet
Supersedes data of 2004 May 05

2004 Aug 04

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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 | 22 | – | k Ω |
| R2 | open | – | – | – |

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 | | |
| PDTA124TE | SOT416 | SC-75 | 3R | PDTC124TE |
| PDTA124TEF | SOT490 | SC-89 | 24 | PDTC124TEF |
| PDTA124TK | SOT346 | SC-59 | 59 | PDTC124TK |
| PDTA124TM | SOT883 | SC-101 | DJ | PDTC124TM |
| PDTA124TS | SOT54 (TO-92) | SC-43 | TA124T | PDTC124TS |
| PDTA124TT | SOT23 | – | *AE ⁽¹⁾ | PDTC124TT |
| PDTA124TU | SOT323 | SC-70 | *7B ⁽¹⁾ | PDTC124TU |

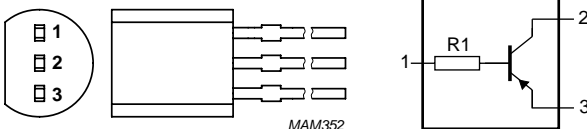
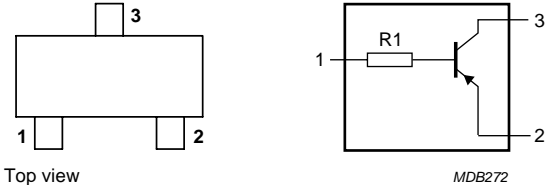
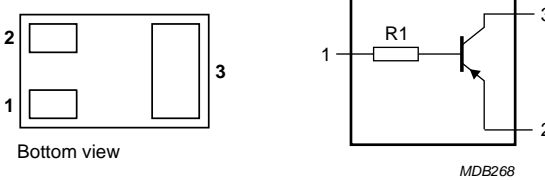
Note

- * = 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 |
| PDTA124TS |  MAM352 | 1 2 3 | base collector emitter |
| PDTA124TE PDTA124TEF PDTA124TK PDTA124TT PDTA124TU |  Top view MDB272 | 1 2 3 | base emitter collector |
| PDTA124TM |  Bottom view MDB268 | 1 2 3 | base emitter collector |

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ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|----------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PDTA124TE | – | plastic surface mounted package; 3 leads | SOT416 |
| PDTA124TEF | – | plastic surface mounted package; 3 leads | SOT490 |
| PDTA124TK | – | plastic surface mounted package; 3 leads | SOT346 |
| PDTA124TM | – | leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.5 mm | SOT883 |
| PDTA124TS | – | plastic single-ended leaded (through hole) package; 3 leads | SOT54 |
| PDTA124TT | – | plastic surface mounted package; 3 leads | SOT23 |
| PDTA124TU | – | 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 _{CBO} | collector-base voltage | open emitter | – | –50 | V |
| V _{CEO} | collector-emitter voltage | open base | – | –50 | V |
| V _{EBO} | emitter-base voltage | open collector | – | –5 | V |
| I _O | output current (DC) | | – | –100 | mA |
| I _{CM} | peak collector current | | – | –100 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 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 _{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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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|----------------------|---|---------------|-------|------|
| R _{th(j-a)} | 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 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 | – | – | -100 | nA |
| h _{FE} | DC current gain | V _{CE} = -5 V; I _C = -1 mA | 100 | – | – | |
| V _{CEsat} | collector-emitter saturation voltage | I _C = -10 mA; I _B = -0.5 mA | – | – | -150 | mV |
| R1 | input resistor | | 15.4 | 22 | 28.6 | k Ω |
| C _c | collector capacitance | I _E = I _e = 0 A; V _{CB} = -10 V; f = 1 MHz | – | – | 3 | pF |

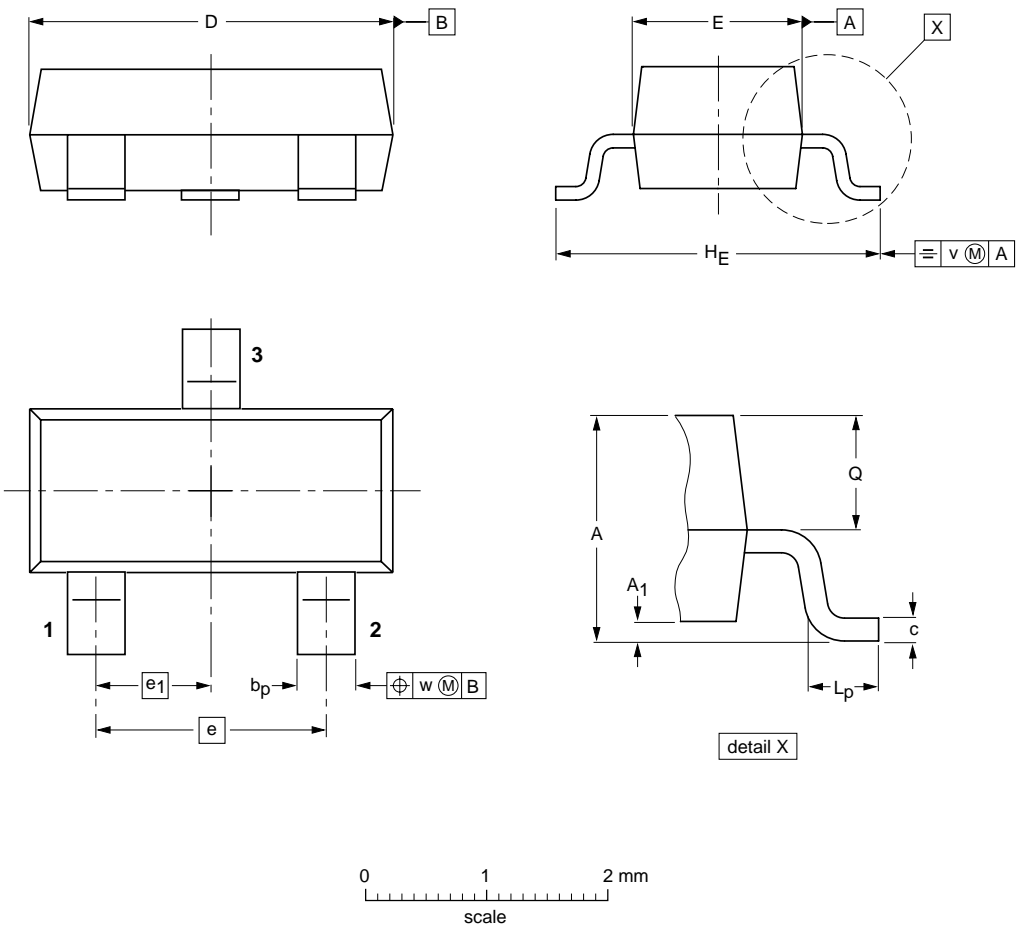
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PACKAGE OUTLINES


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 | JEITA | | | |
| SOT23 | | TO-236AB | | |  | 04-11-04 06-03-16 |

PNP resistor-equipped transistors;
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PDTA124T series

Plastic single-ended leaded (through hole) package; 3 leadsSOT54

The drawing shows three views of the SOT54 package. The top view is a circle with diameter D, with three leads extending from the center. The side view shows the package height A and lead length L. The end view shows the lead thickness c. Dimensions are labeled: A (package height), b (lead thickness), b₁ (lead thickness at base), c (lead thickness), D (package diameter), d (lead diameter), E (lead length), e (lead length), e₁ (lead length), L (lead length), L₁ (lead length), and L₁⁽¹⁾ max. (lead length).

0 2.5 5 mm
scale

DIMENSIONS (mm are the original dimensions)

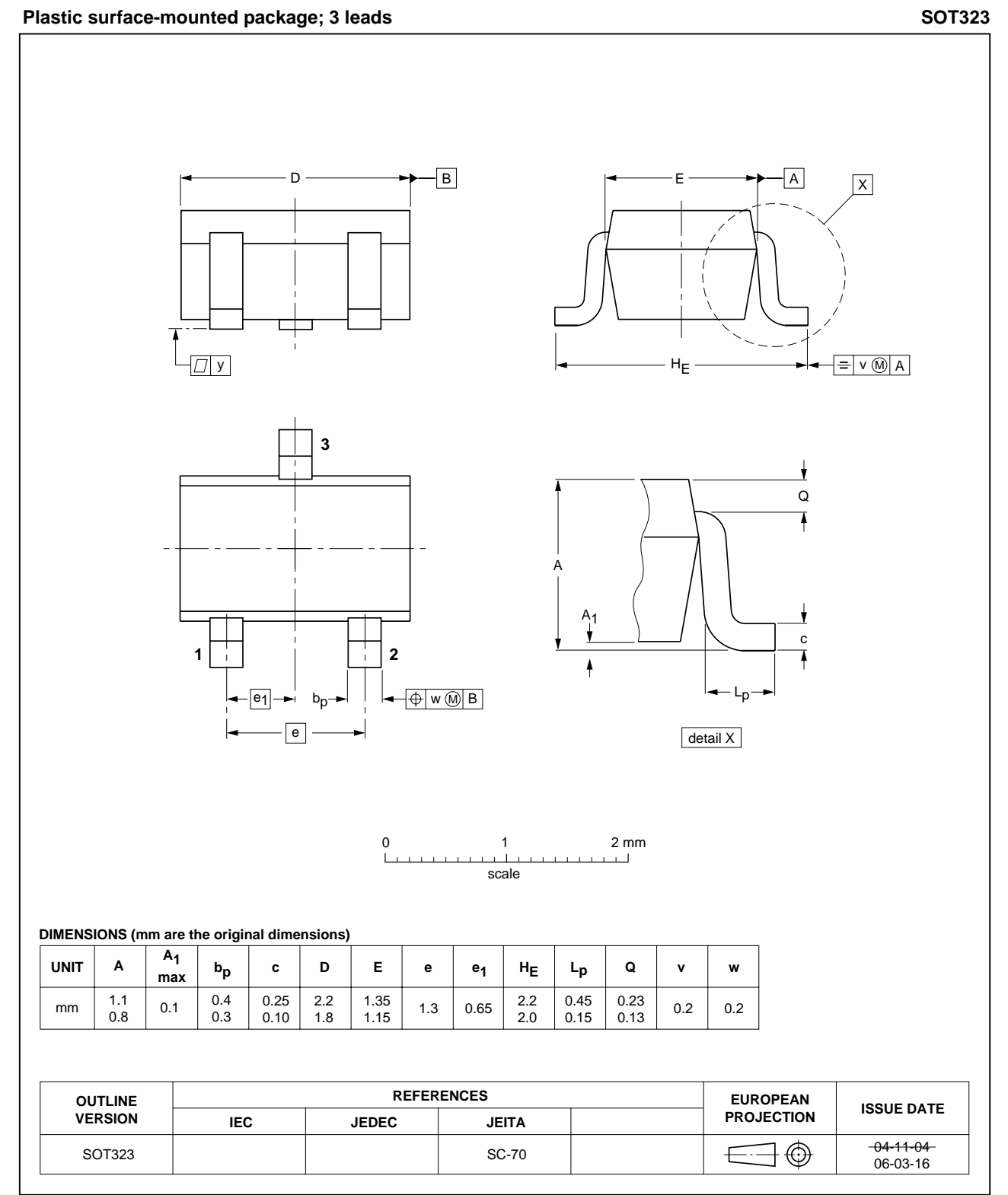
| UNIT | A | b | b ₁ | c | D | d | E | e | e ₁ | L | L ₁ ⁽¹⁾ max. |
|------|------------|--------------|----------------|--------------|------------|------------|------------|------|----------------|--------------|---------------------------------------|
| mm | 5.2 5.0 | 0.48 0.40 | 0.66 0.55 | 0.45 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 |

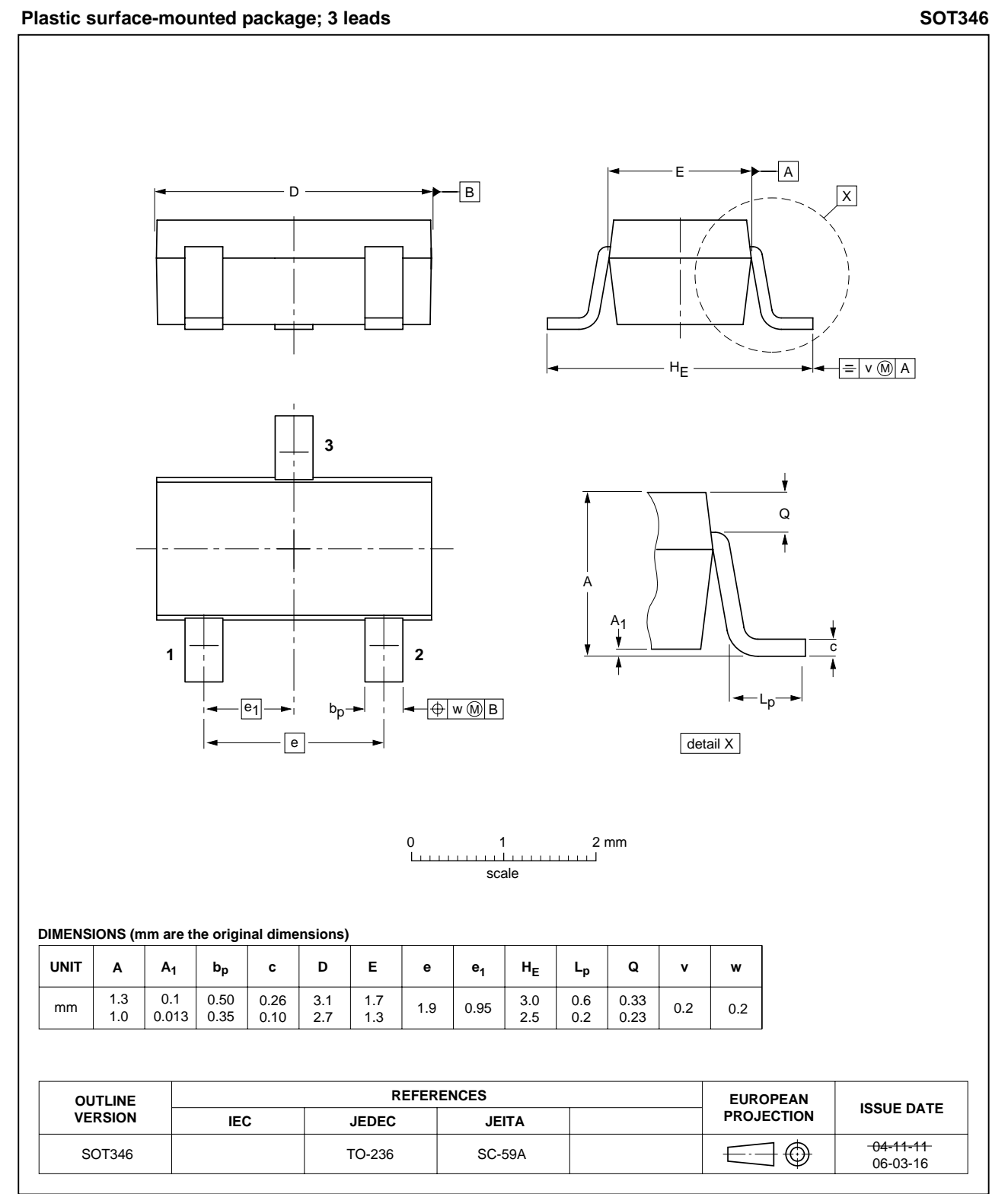
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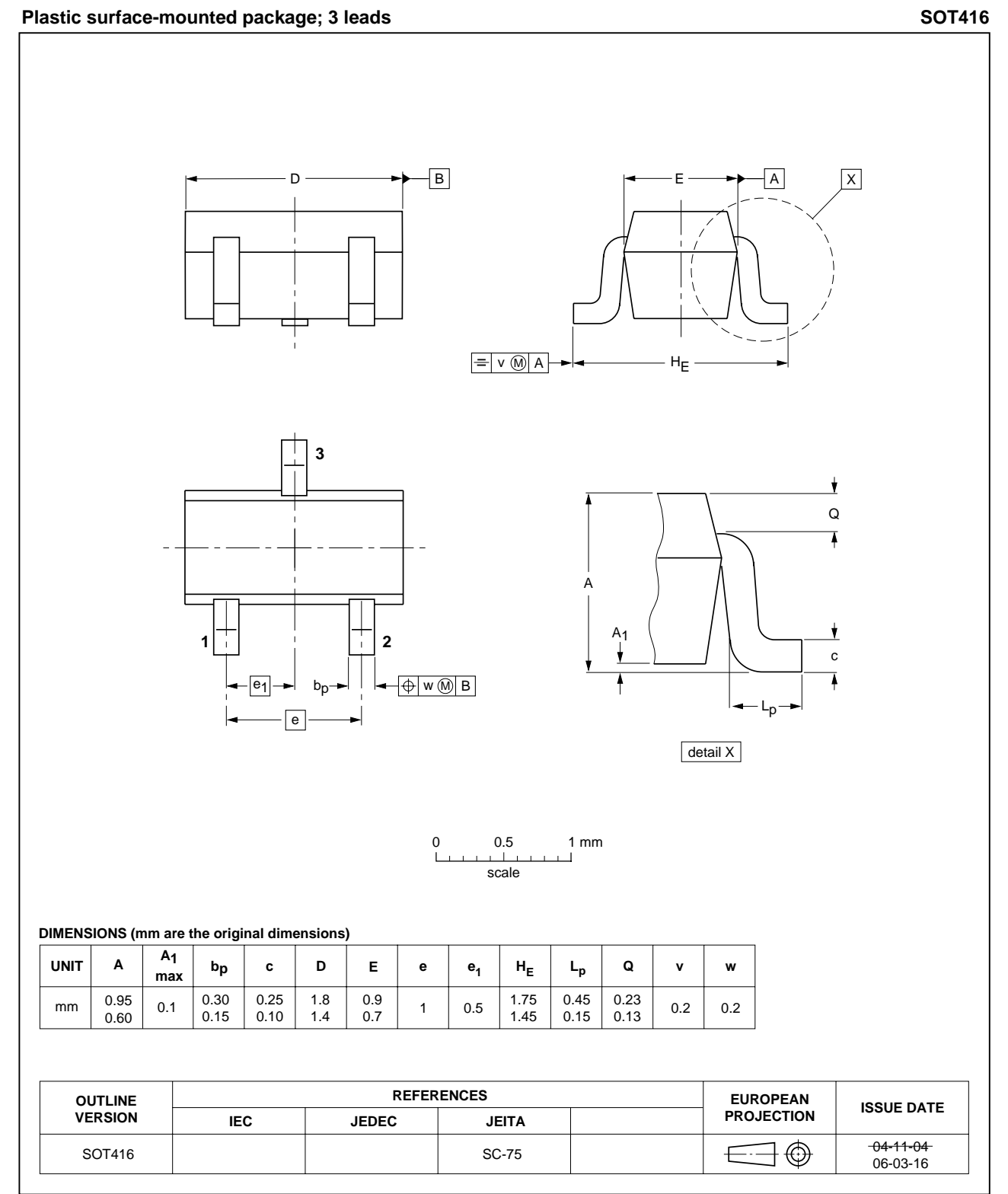
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PNP resistor-equipped transistors;
R1 = 22 kΩ, R2 = open

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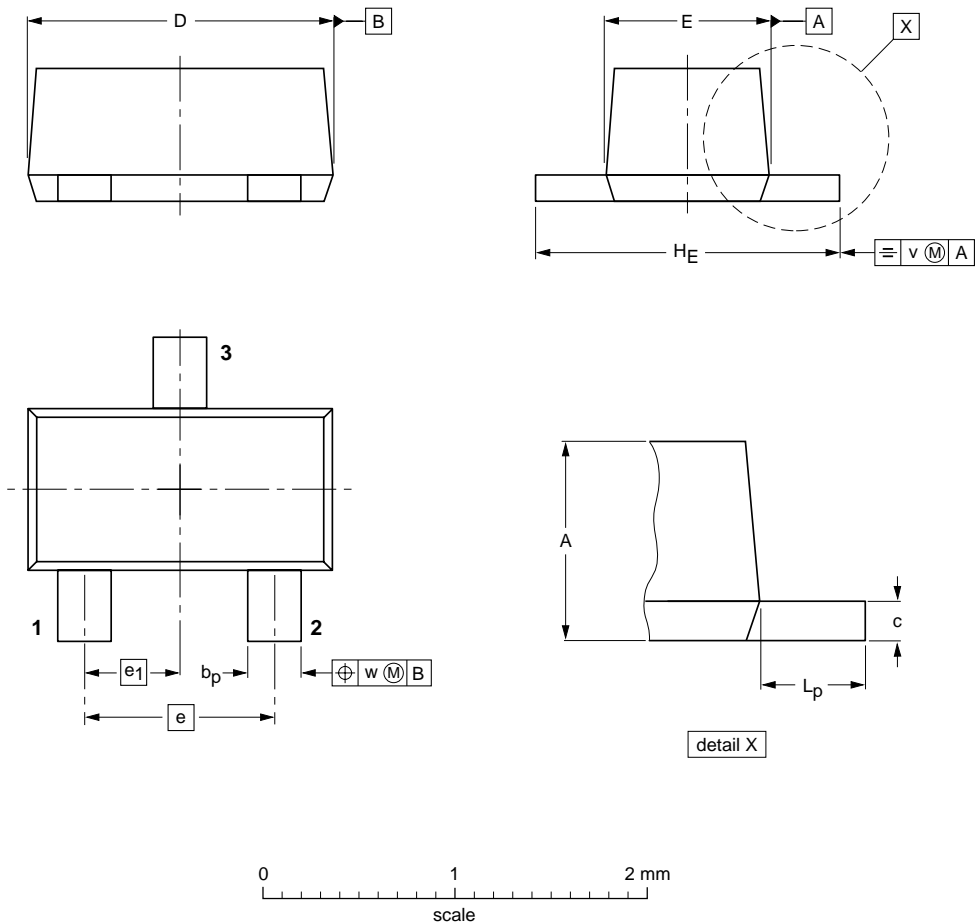


PNP resistor-equipped transistors;
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Plastic surface-mounted package; 3 leads

SOT490



DIMENSIONS (mm are the original dimensions)

| UNIT | A | b _p | c | D | E | e | e ₁ | H _E | L _p | 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 |

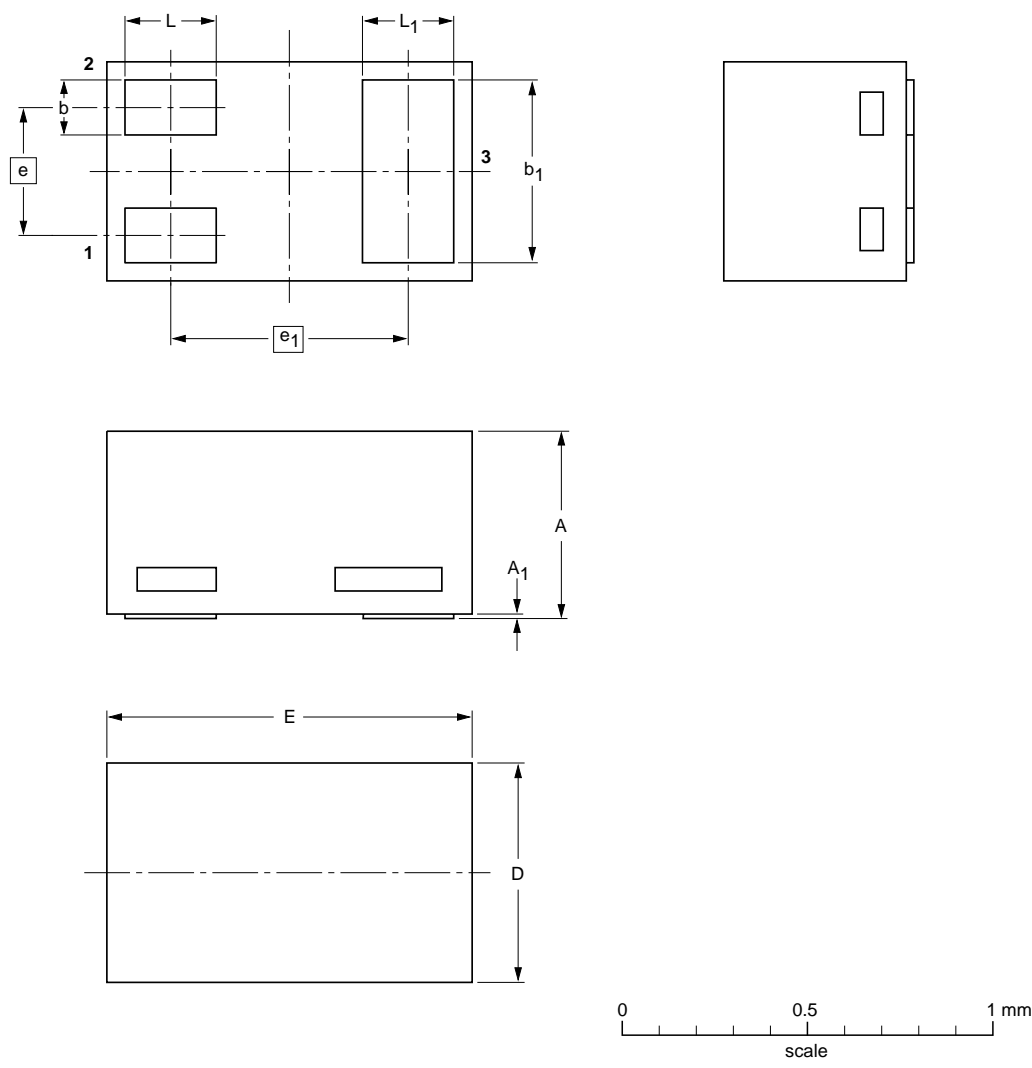
| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|--|------------------------|----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT490 | | | SC-89 | | | 05-07-28 06-03-16 |

PNP resistor-equipped transistors;
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PDTA124T 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 |

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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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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

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