

## Important notice

Dear Customer,

On 7 February 2017 the former NXP Standard Product business became a new company with the tradename **Nexperia**. Nexperia is an industry leading supplier of Discrete, Logic and PowerMOS semiconductors with its focus on the automotive, industrial, computing, consumer and wearable application markets

In data sheets and application notes which still contain NXP or Philips Semiconductors references, use the references to Nexperia, as shown below.

Instead of <http://www.nxp.com>, <http://www.philips.com/> or <http://www.semiconductors.philips.com/>, use **<http://www.nexperia.com>**

Instead of [sales.addresses@www.nxp.com](mailto:sales.addresses@www.nxp.com) or [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com), use **[salesaddresses@nexperia.com](mailto:salesaddresses@nexperia.com)** (email)

Replace the copyright notice at the bottom of each page or elsewhere in the document, depending on the version, as shown below:

- © NXP N.V. (year). All rights reserved or © Koninklijke Philips Electronics N.V. (year). All rights reserved

Should be replaced with:

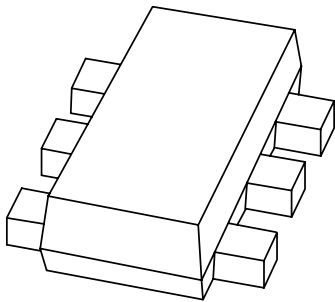
- © **Nexperia B.V. (year). All rights reserved.**

If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via **[salesaddresses@nexperia.com](mailto:salesaddresses@nexperia.com)**). Thank you for your cooperation and understanding,

Kind regards,

Team Nexperia

# DATA SHEET



**PBSS5240V**

40 V low  $V_{CEsat}$  PNP transistor

Product data sheet

2003 Jan 30

40 V low  $V_{CEsat}$  PNP transistor

PBSS5240V

FEATURES

- Low collector-emitter saturation voltage  $V_{CEsat}$
- High collector current capability  $I_C$  and  $I_{CM}$
- High collector current gain ( $h_{FE}$ ) at high  $I_C$
- High efficiency leading to reduced heat generation
- Reduced printed-circuit board area requirements.

APPLICATIONS

- Power management:
  - DC-DC converter
  - Supply line switching
  - Battery charger
  - LCD back lighting.
- Peripheral driver:
  - Driver in low supply voltage applications (e.g. lamps, LEDs)
  - Inductive load drivers (e.g. relay, buzzers and motors).

DESCRIPTION

PNP transistor providing low  $V_{CEsat}$  and high current capability in a SOT666 plastic package.  
NPN complement: PBSS4240V.

MARKING

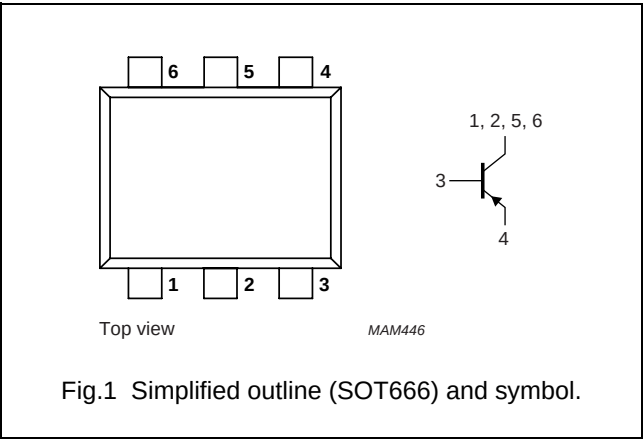
| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PBSS5240V   | 52           |

QUICK REFERENCE DATA

| SYMBOL      | PARAMETER                 | MAX. | UNIT |
|-------------|---------------------------|------|------|
| $V_{CEO}$   | collector-emitter voltage | −40  | V    |
| $I_C$       | collector current (DC)    | −1.8 | A    |
| $I_{CRP}$   | peak collector current    | −2   | A    |
| $R_{CEsat}$ | equivalent on-resistance  | <250 | mΩ   |

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | collector   |
| 2   | collector   |
| 3   | base        |
| 4   | emitter     |
| 5   | collector   |
| 6   | collector   |



40 V low  $V_{CEsat}$  PNP transistor

## PBSS5240V

**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                                | –    | –40  | V    |
| $V_{CEO}$ | collector-emitter voltage         | open base                                   | –    | –40  | V    |
| $V_{EBO}$ | emitter-base voltage              | open collector                              | –    | –5   | V    |
| $I_C$     | collector current (DC)            | note 1                                      | –    | –1.8 | A    |
| $I_{CRP}$ | peak repetitive collector current | note 2                                      | –    | –2   | A    |
| $I_{CM}$  | peak collector current            |                                             | –    | –3   | A    |
| $I_B$     | base current (DC)                 |                                             | –    | –300 | mA   |
| $I_{BM}$  | peak base current                 |                                             | –    | –1   | A    |
| $P_{tot}$ | total power dissipation           | $T_{amb} \leq 25\text{ °C}$ ; note 3        | –    | 300  | mW   |
|           |                                   | $T_{amb} \leq 25\text{ °C}$ ; note 4        | –    | 500  | mW   |
|           |                                   | $T_{amb} \leq 25\text{ °C}$ ; note 1        | –    | 900  | mW   |
|           |                                   | $T_{amb} \leq 25\text{ °C}$ ; notes 2 and 3 | –    | 1.2  | W    |
| $T_{stg}$ | storage temperature               |                                             | –65  | +150 | °C   |
| $T_j$     | junction temperature              |                                             | –    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature     |                                             | –65  | +150 | °C   |

**Notes**

1. Device mounted on a ceramic circuit board,  $Al_2O_3$ , standard footprint.
2. Operated under pulsed conditions: duty cycle  $\delta \leq 20\%$ , pulse width  $t_p \leq 30\text{ ms}$ .
3. Device mounted on a printed-circuit board, single-sided copper, tinplated, standard footprint.
4. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector  $1\text{ cm}^2$ .

**THERMAL CHARACTERISTICS**

| SYMBOL        | PARAMETER                                   | CONDITIONS    | VALUE | UNIT |
|---------------|---------------------------------------------|---------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1        | 410   | K/W  |
|               |                                             | note 2        | 215   | K/W  |
|               |                                             | note 3        | 140   | K/W  |
|               |                                             | notes 1 and 4 | 110   | K/W  |

**Notes**

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, standard footprint.
2. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector  $1\text{ cm}^2$ .
3. Device mounted on a ceramic circuit board,  $Al_2O_3$ , standard footprint.
4. Operated under pulsed conditions: duty cycle  $\delta \leq 20\%$ , pulse width  $t_p \leq 30\text{ ms}$ .

**Soldering**

The only recommended soldering method is reflow soldering.

40 V low  $V_{CEsat}$  PNP transistor

## PBSS5240V

**CHARACTERISTICS**

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

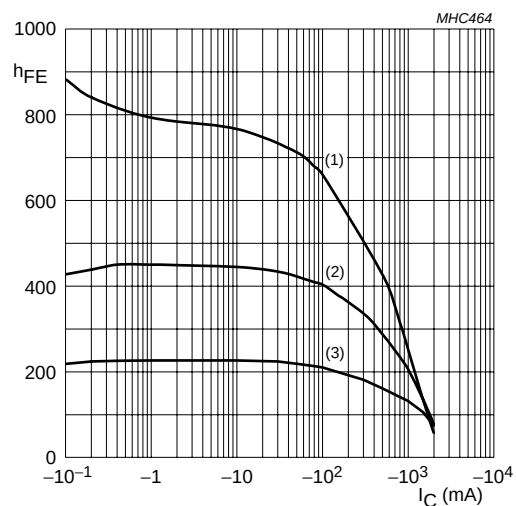
| SYMBOL      | PARAMETER                            | CONDITIONS                                                              | MIN. | TYP. | MAX. | UNIT             |
|-------------|--------------------------------------|-------------------------------------------------------------------------|------|------|------|------------------|
| $I_{CBO}$   | collector-base cut-off current       | $V_{CB} = -40\text{ V}; I_E = 0$                                        | –    | –    | –100 | nA               |
|             |                                      | $V_{CB} = -40\text{ V}; I_E = 0; T_{amb} = 150\text{ }^{\circ}\text{C}$ | –    | –    | –50  | $\mu\text{A}$    |
| $I_{CEO}$   | collector-emitter cut-off current    | $V_{CE} = -30\text{ V}; I_B = 0$                                        | –    | –    | –100 | nA               |
| $I_{EBO}$   | emitter-base cut-off current         | $V_{EB} = -5\text{ V}; I_C = 0$                                         | –    | –    | –100 | nA               |
| $h_{FE}$    | DC current gain                      | $V_{CE} = -5\text{ V}; I_C = -1\text{ mA}$                              | 300  | –    | –    |                  |
|             |                                      | $V_{CE} = -5\text{ V}; I_C = -100\text{ mA}$                            | 300  | –    | 800  |                  |
|             |                                      | $V_{CE} = -5\text{ V}; I_C = -500\text{ mA}$                            | 250  | –    | –    |                  |
|             |                                      | $V_{CE} = -5\text{ V}; I_C = -1\text{ A}$                               | 160  | –    | –    |                  |
|             |                                      | $V_{CE} = -5\text{ V}; I_C = -2\text{ A}; \text{note 1}$                | 50   | –    | –    |                  |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = -100\text{ mA}; I_B = -1\text{ mA}$                              | –    | –80  | –120 | mV               |
|             |                                      | $I_C = -500\text{ mA}; I_B = -50\text{ mA}$                             | –    | –100 | –145 | mV               |
|             |                                      | $I_C = -1\text{ A}; I_B = -100\text{ mA}; \text{note 1}$                | –    | –180 | –250 | mV               |
|             |                                      | $I_C = -2\text{ A}; I_B = -200\text{ mA}$                               | –    | –370 | –530 | mV               |
| $R_{CEsat}$ | equivalent on-resistance             | $I_C = -1\text{ A}; I_B = -100\text{ mA}; \text{note 1}$                | –    | 180  | <250 | $\text{m}\Omega$ |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = -1\text{ A}; I_B = -100\text{ mA}$                               | –    | –    | –1.1 | V                |
| $V_{BEon}$  | base-emitter turn-on voltage         | $V_{CE} = -5\text{ V}; I_C = -1\text{ A}$                               | –    | –    | –1   | V                |
| $f_T$       | transition frequency                 | $I_C = -50\text{ mA}; V_{CE} = -10\text{ V};$<br>$f = 100\text{ MHz}$   | 150  | –    | –    | MHz              |
| $C_c$       | collector capacitance                | $V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$                | –    | –    | 12   | pF               |

**Note**

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

40 V low  $V_{CEsat}$  PNP transistor

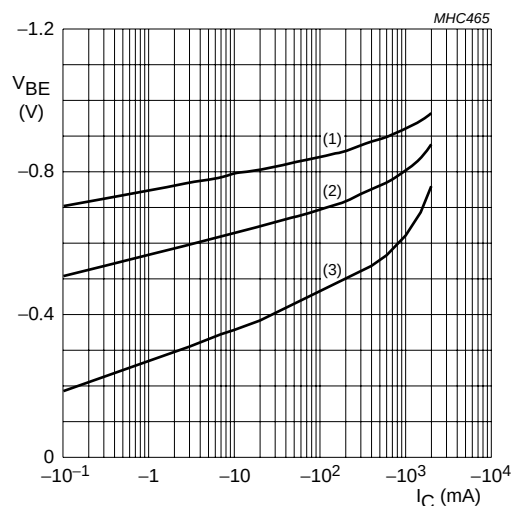
## PBSS5240V



$V_{CE} = -5$  V.

- (1)  $T_{amb} = 150$  °C.
- (2)  $T_{amb} = 25$  °C.
- (3)  $T_{amb} = -55$  °C.

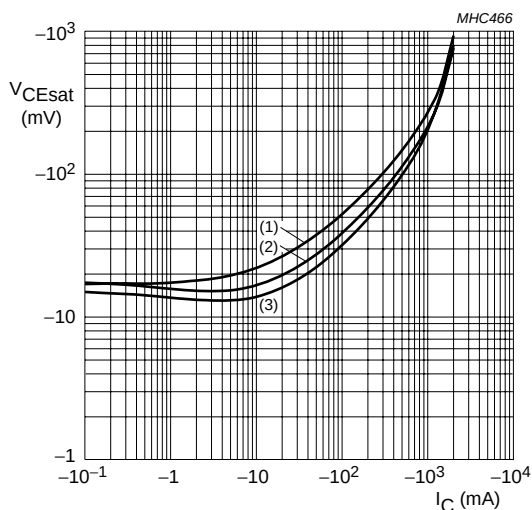
Fig.2 DC current gain as a function of collector current; typical values.



$V_{CE} = -5$  V.

- (1)  $T_{amb} = -55$  °C.
- (2)  $T_{amb} = 25$  °C.
- (3)  $T_{amb} = 150$  °C.

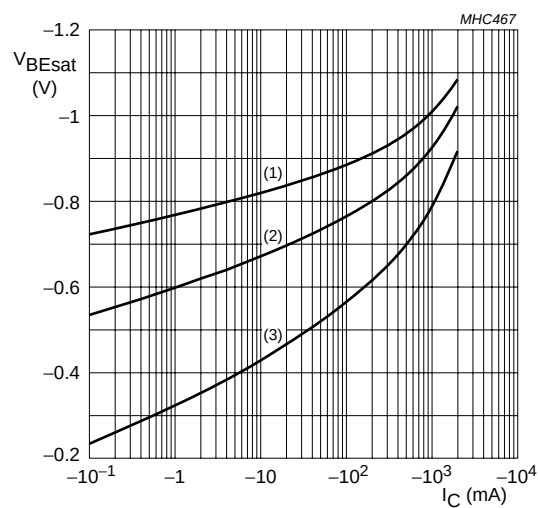
Fig.3 Base-emitter voltage as a function of collector current; typical values.



$I_C/I_B = 20$ .

- (1)  $T_{amb} = 150$  °C.
- (2)  $T_{amb} = 25$  °C.
- (3)  $T_{amb} = -55$  °C.

Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



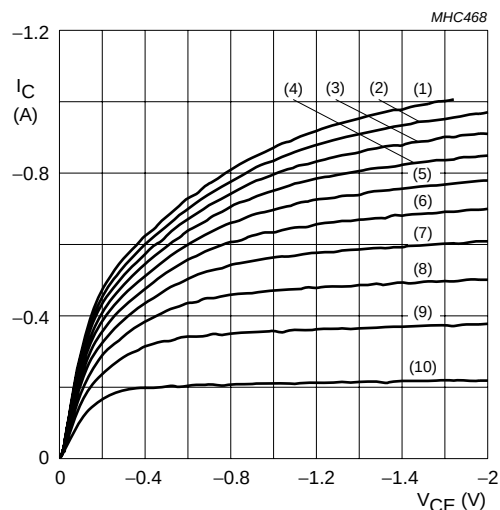
$I_C/I_B = 20$ .

- (1)  $T_{amb} = -55$  °C.
- (2)  $T_{amb} = 25$  °C.
- (3)  $T_{amb} = 150$  °C.

Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.

40 V low  $V_{CEsat}$  PNP transistor

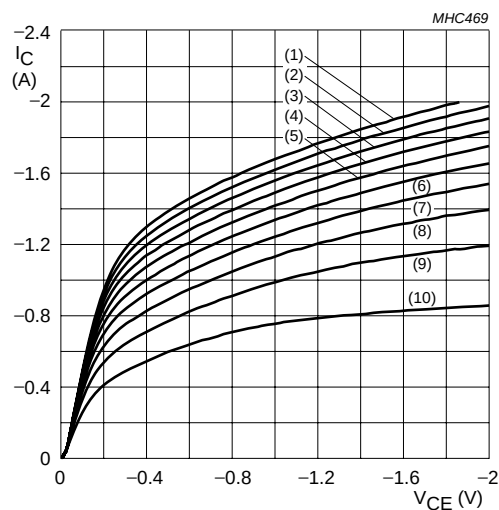
## PBSS5240V



$T_{amb} = 25\text{ °C}$ .

- |                              |                              |                               |
|------------------------------|------------------------------|-------------------------------|
| (1) $I_B = -7\text{ mA}$ .   | (5) $I_B = -4.2\text{ mA}$ . | (9) $I_B = -1.4\text{ mA}$ .  |
| (2) $I_B = -6.3\text{ mA}$ . | (6) $I_B = -3.5\text{ mA}$ . | (10) $I_B = -0.7\text{ mA}$ . |
| (3) $I_B = -5.6\text{ mA}$ . | (7) $I_B = -2.8\text{ mA}$ . |                               |
| (4) $I_B = -4.9\text{ mA}$ . | (8) $I_B = -2.1\text{ mA}$ . |                               |

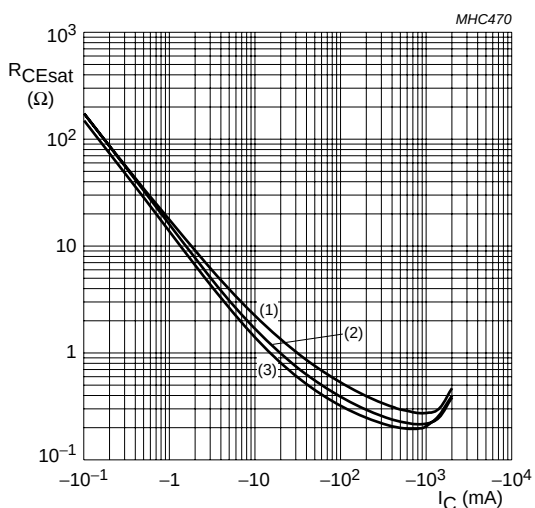
Fig.6 Collector current as a function of collector-emitter voltage; typical values.



$T_{amb} = 25\text{ °C}$ .

- |                             |                             |                             |
|-----------------------------|-----------------------------|-----------------------------|
| (1) $I_B = -50\text{ mA}$ . | (5) $I_B = -30\text{ mA}$ . | (9) $I_B = -10\text{ mA}$ . |
| (2) $I_B = -45\text{ mA}$ . | (6) $I_B = -25\text{ mA}$ . | (10) $I_B = -5\text{ mA}$ . |
| (3) $I_B = -40\text{ mA}$ . | (7) $I_B = -20\text{ mA}$ . |                             |
| (4) $I_B = -35\text{ mA}$ . | (8) $I_B = -15\text{ mA}$ . |                             |

Fig.7 Collector current as a function of collector-emitter voltage; typical values.



$I_C/I_B = 20$ .

- |                                 |                                |                                 |
|---------------------------------|--------------------------------|---------------------------------|
| (1) $T_{amb} = 150\text{ °C}$ . | (2) $T_{amb} = 25\text{ °C}$ . | (3) $T_{amb} = -55\text{ °C}$ . |
|---------------------------------|--------------------------------|---------------------------------|

Fig.8 Collector-emitter equivalent on-resistance as a function of collector current; typical values.

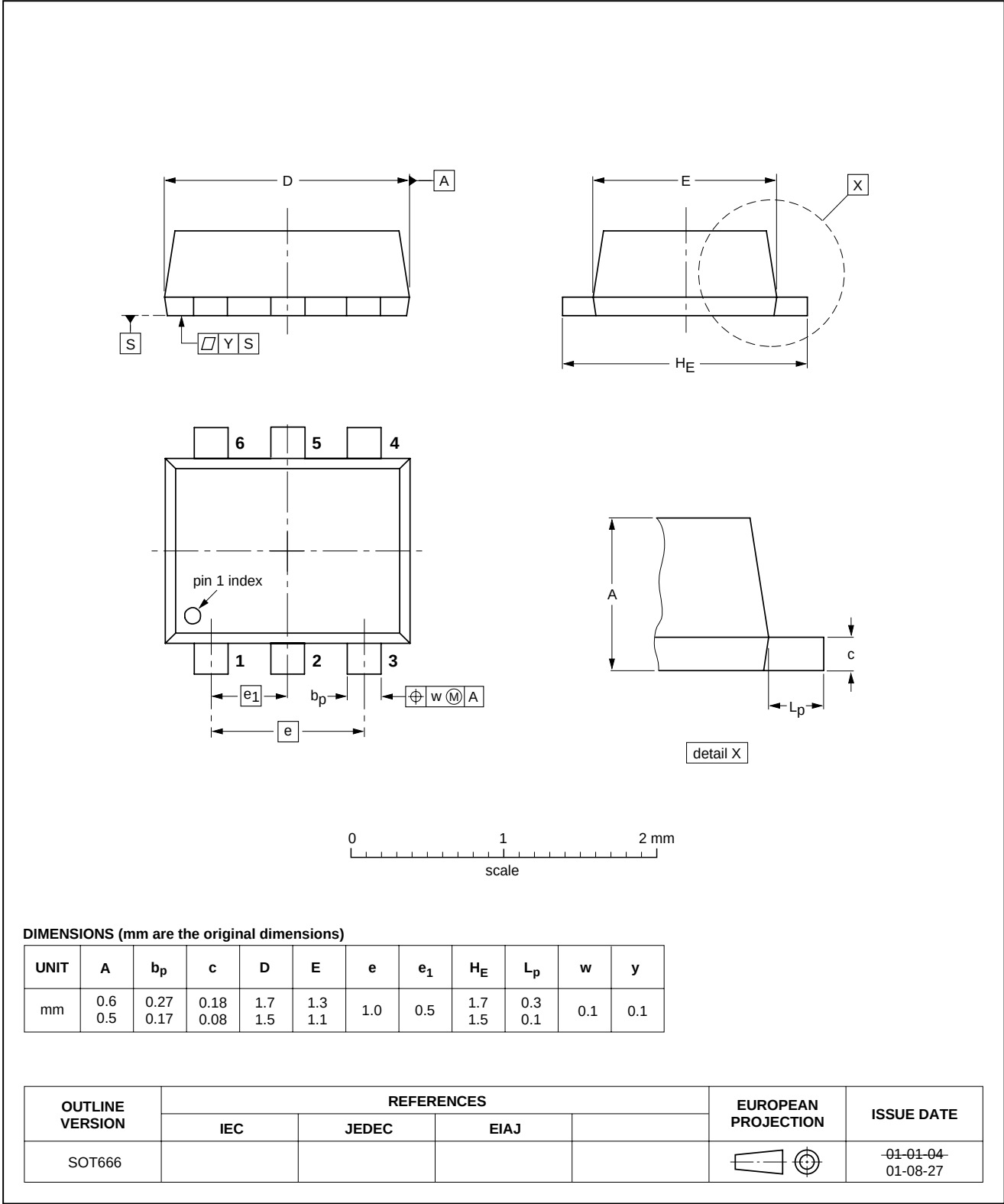
40 V low  $V_{CEsat}$  PNP transistor

PBSS5240V

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT666





40 V low  $V_{CEsat}$  PNP transistor

PBSS5240V

## 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>.

## DISCLAIMERS

**General** — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

**Right to make changes** — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

**Suitability for use** — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

**Applications** — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

**Limiting values** — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions

above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

**Terms and conditions of sale** — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nxp.com/profile/terms>, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

**No offer to sell or license** — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

**Export control** — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

**Quick reference data** — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

# ***NXP Semiconductors***

## **Customer notification**

This data sheet was changed to reflect the new company name NXP Semiconductors. No changes were made to the content, except for the legal definitions and disclaimers.

## **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)**

© NXP B.V. 2009

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.

The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Printed in The Netherlands

613514/01/pp9

Date of release: 2003 Jan 30

Document order number: 9397 750 10781

founded by

**PHILIPS**

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9