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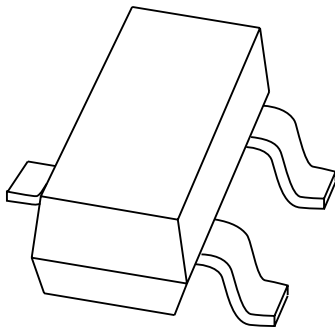Should be replaced with:
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Kind regards,

Team Nexperia

# DATA SHEET



# PBSS4130T

# 30 V, 1 A

# NPN low $V_{CEsat}$ (BISS) transistor

Product specification                                   2003 Nov 27

PHILIPS

# 30 V, 1 A
# NPN low $V_{CEsat}$ (BISS) transistor

# PBSS4130T

## FEATURES

- Low collector-emitter saturation voltage $V_{CEsat}$
- High collector current capability $I_C$ and $I_{CM}$
- High efficiency leading to less heat generation
- Reduced printed-circuit board requirements
- Cost effective alternative to MOSFETs in specific applications.

## APPLICATIONS

- Power management
  - DC/DC conversion
  - Supply line switching
  - Battery charger
  - LCD backlighting.
- Peripheral driver
  - Driver in low supply voltage applications (e.g. lamps and LEDs)
  - Inductive load drivers (e.g. relays, buzzers and motors).

## DESCRIPTION

NPN BISS transistor in a SOT23 plastic package providing ultra low $V_{CEsat}$ and $R_{CEsat}$ parameters.
PNP complement: PBSS5130T.

## MARKING

| TYPE NUMBER | MARKING CODE[1] |
|---|---|
| PBSS4130T | *3C |

## Note

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

## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|---|---|---|---|
| $V_{CEO}$ | collector-emitter voltage | 30 | V |
| $I_C$ | collector current (DC) | 1 | A |
| $I_{CM}$ | peak collector current | 3 | A |
| $R_{CEsat}$ | equivalent on-resistance | 220 | mΩ |

## PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | base |
| 2 | emitter |
| 3 | collector |



Top view                MAM255

Fig.1  Simplified outline (SOT23) and symbol.

## ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|---|---|---|---|
| | NAME | DESCRIPTION | VERSION |
| PBSS4130T | – | plastic surface mounted package; 3 leads | SOT23 |
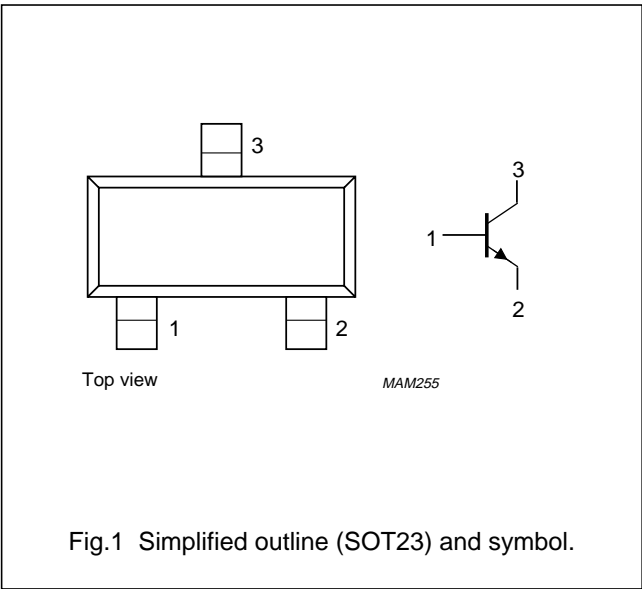
## 30 V, 1 A
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PBSS4130T

### 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 | – | 30 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | – | 5 | V |
| $I_C$ | collector current (DC) | | – | 1 | A |
| $I_{CM}$ | peak collector current | | – | 3 | A |
| $I_{BM}$ | peak base current | | – | 300 | mA |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C; note 1 | – | 300 | mW |
| | | $T_{amb} \leq 25$ °C; note 2 | – | 480 | mW |
| $T_{stg}$ | 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 FR4 printed-circuit board, single-sided copper, tinplated, standard footprint.

2. Device mounted on a FR4 printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm$^2$.

### THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | in free air; note 1 | 417 | K/W |
| | | in free air; note 2 | 260 | K/W |

#### Notes

1. Device mounted on a FR4 printed-circuit board, single-sided copper, tinplated, standard footprint.

2. Device mounted on a FR4 printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm$^2$.

## CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | collector-base cut-off current | $V_{CB}$ = 30 V; $I_E$ = 0 | – | – | 100 | nA |
| | | $V_{CB}$ = 30 V; $I_E$ = 0; $T_j$ = 150 °C | – | – | 50 | µA |
| $I_{EBO}$ | emitter-base cut-off current | $V_{EB}$ = 4 V; $I_C$ = 0 | – | – | 100 | nA |
| $h_{FE}$ | DC current gain | $V_{CE}$ = 2 V; $I_C$ = 100 mA | 350 | 470 | – | |
| | | $V_{CE}$ = 2 V; $I_C$ = 500 mA | 300 | 450 | – | |
| | | $V_{CE}$ = 2 V; $I_C$ = 1 A | 300 | 420 | – | |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C$ = 100 mA; $I_B$ = 1 mA | – | – | 90 | mV |
| | | $I_C$ = 500 mA; $I_B$ = 50 mA | – | – | 120 | mV |
| | | $I_C$ = 750 mA; $I_B$ = 15 mA | – | – | 220 | mV |
| | | $I_C$ = 1 A; $I_B$ = 50 mA; note 1 | – | – | 270 | mV |
| $R_{CEsat}$ | equivalent on-resistance | $I_C$ = 500 mA; $I_B$ = 50 mA; note 1 | – | – | 240 | mΩ |
| $V_{BEsat}$ | base-emitter saturation voltage | $I_C$ = 1 A; $I_B$ = 100 mA; note 1 | – | – | 1.1 | V |
| $V_{BEon}$ | base-emitter turn-on voltage | $V_{CE}$ = 2 V; $I_C$ = 100 mA | – | – | 0.75 | V |
| $f_T$ | transition frequency | $I_C$ = 100 mA; $V_{CE}$ = 10 V; f = 100 MHz | 100 | – | – | MHz |
| $C_c$ | collector capacitance | $V_{CB}$ = 10 V; $I_E$ = $I_e$ = 0; f = 1 MHz | – | – | 20 | pF |

**Note**

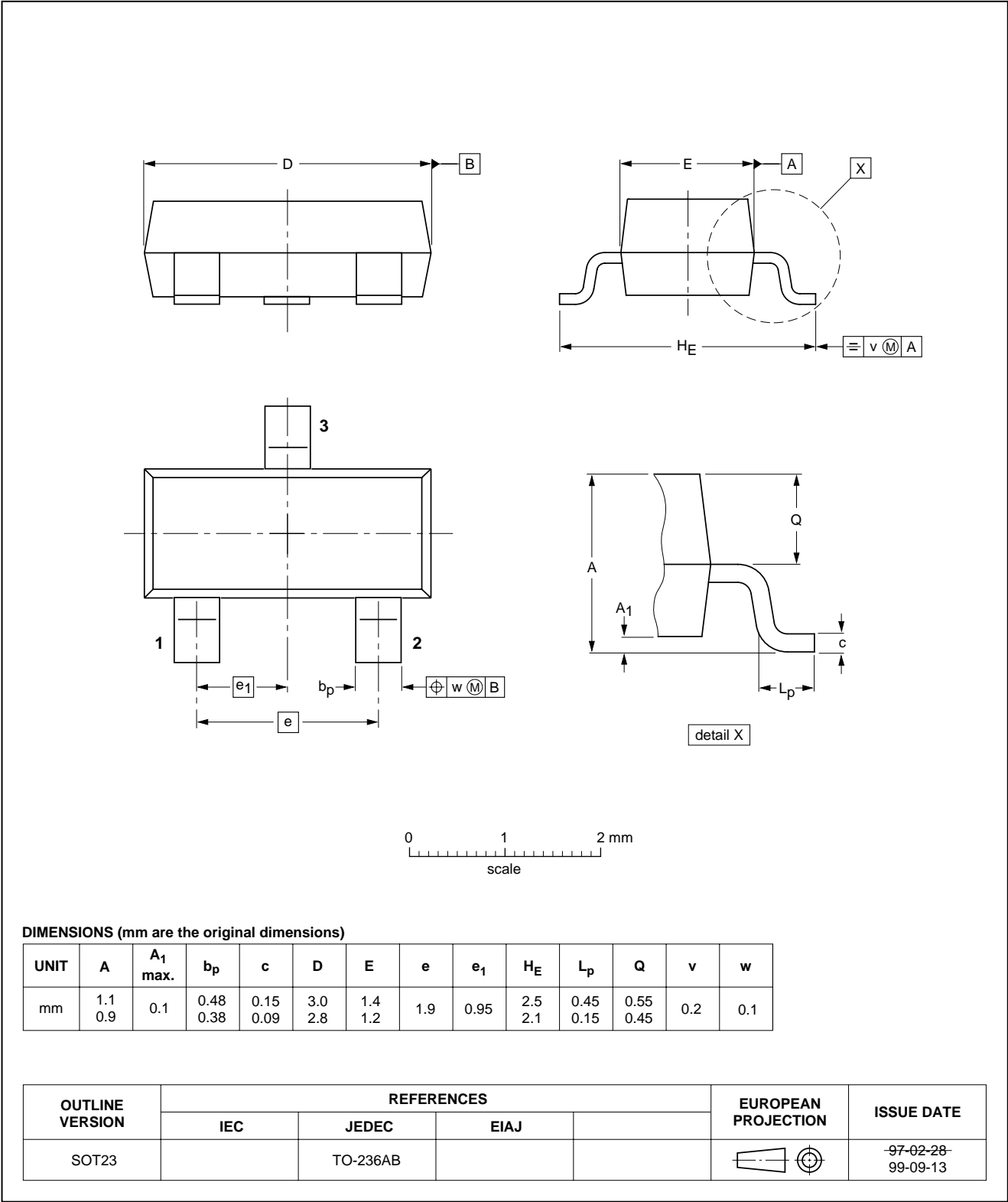1.  Pulse test: $t_p \leq$ 300 µs; $\delta \leq$ 0.02.

## 30 V, 1 A
## NPN low $V_{CEsat}$ (BISS) transistor

**PBSS4130T**

**PACKAGE OUTLINE**

**Plastic surface mounted package; 3 leads**

**SOT23**



0   1   2 mm

scale

**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 | EIAJ | | | |
| SOT23 | | TO-236AB | | | | ~~97-02-28~~ 99-09-13 |

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30 V, 1 A
NPN low $V_{CEsat}$ (BISS) transistor                                                PBSS4130T

## DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS[1] | PRODUCT STATUS[2][3] | 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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**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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