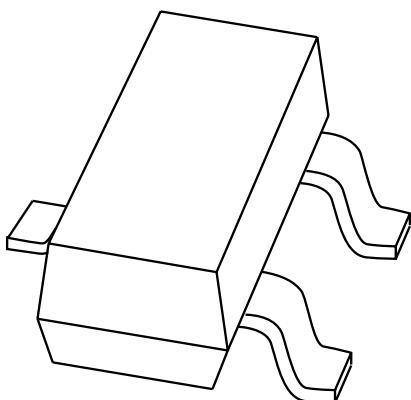


DATA SHEET



PBSS5230T
30 V, 2 A
PNP low V_{CEsat} (BISS) transistor

Product specification

2003 Dec 18

30 V, 2 A

PNP low V_{CEsat} (BISS) transistor

PBSS5230T

FEATURES

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

APPLICATIONS

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

DESCRIPTION

PNP BISS transistor in a SOT23 plastic package offering ultra low V_{CEsat} and R_{CEsat} parameters.

MARKING

| TYPE NUMBER | MARKING CODE ⁽¹⁾ |
|-------------|-----------------------------|
| PBSS5230T | 3K* |

Note

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

ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PBSS5230T | – | plastic surface mounted package; 3 leads | SOT23 |

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|-------------|---------------------------|------|-----------|
| V_{CEO} | collector-emitter voltage | -30 | V |
| I_C | collector current (DC) | -2 | A |
| I_{CM} | peak collector current | -3 | A |
| R_{CEsat} | equivalent on-resistance | 220 | $m\Omega$ |

PINNING

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

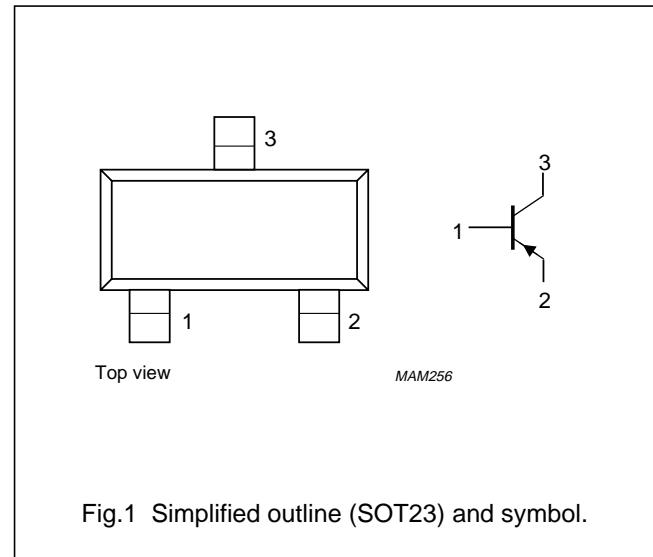


Fig.1 Simplified outline (SOT23) and symbol.

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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 | – | –30 | V |
| V_{CEO} | collector-emitter voltage | open base | – | –30 | V |
| V_{EBO} | emitter-base voltage | open collector | – | –5 | V |
| I_C | collector current (DC) | | – | –2 | A |
| I_{CM} | peak collector current | single peak | – | –3 | A |
| I_B | base current (DC) | | – | –300 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25^\circ\text{C}$; note 1 $T_{amb} \leq 25^\circ\text{C}$; note 2 | – | 300 480 | mW mW |
| T_j | junction temperature | | – | 150 | °C |
| T_{amb} | operating ambient temperature | | –65 | +150 | °C |
| T_{stg} | storage 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 cm².

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|--------------|---|--|------------|------------|
| $R_{th j-a}$ | thermal resistance from junction to ambient | in free air; note 1 in free air; note 2 | 417 260 | K/W 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 cm².

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CHARACTERISTICS $T_j = 25^\circ\text{C}$ unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------|--------------------------------------|---|------|------|-------|------------------|
| I_{CBO} | collector cut-off current | $V_{CB} = -30\text{ V}; I_E = 0$ | — | — | -100 | nA |
| | | $V_{CB} = -30\text{ V}; I_E = 0; T_j = 150^\circ\text{C}$ | — | — | -50 | μA |
| I_{EBO} | emitter cut-off current | $V_{EB} = -4\text{ V}; I_C = 0$ | — | — | -100 | nA |
| h_{FE} | DC current gain | $V_{CE} = -2\text{ V}; I_C = -100\text{ mA}$ | 300 | 450 | — | |
| | | $V_{CE} = -2\text{ V}; I_C = -1\text{ A}; \text{note 1}$ | 200 | 290 | — | |
| | | $V_{CE} = -2\text{ V}; I_C = -2\text{ A}; \text{note 1}$ | 100 | 180 | — | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = -500\text{ A}; I_B = -50\text{ mA}$ | — | -70 | -110 | mV |
| | | $I_C = -1\text{ A}; I_B = -50\text{ mA}$ | — | -140 | -225 | mV |
| | | $I_C = -2\text{ A}; I_B = -200\text{ mA}$ | — | -240 | -350 | mV |
| R_{CEsat} | equivalent on-resistance | $I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$ | — | 160 | 220 | $\text{m}\Omega$ |
| V_{BEsat} | base-emitter saturation voltage | $I_C = -2\text{ A}; I_B = -50\text{ mA}; \text{note 1}$ | — | — | -1.1 | V |
| V_{BEon} | base-emitter turn-on voltage | $V_{CE} = -2\text{ V}; I_C = -100\text{ mA}$ | — | — | -0.75 | V |
| f_T | transition frequency | $V_{CE} = -10\text{ V}; I_C = -100\text{ mA}; f = 100\text{ MHz}$ | 100 | 200 | — | MHz |
| C_c | collector capacitance | $V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$ | — | 23 | 28 | pF |

Note

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

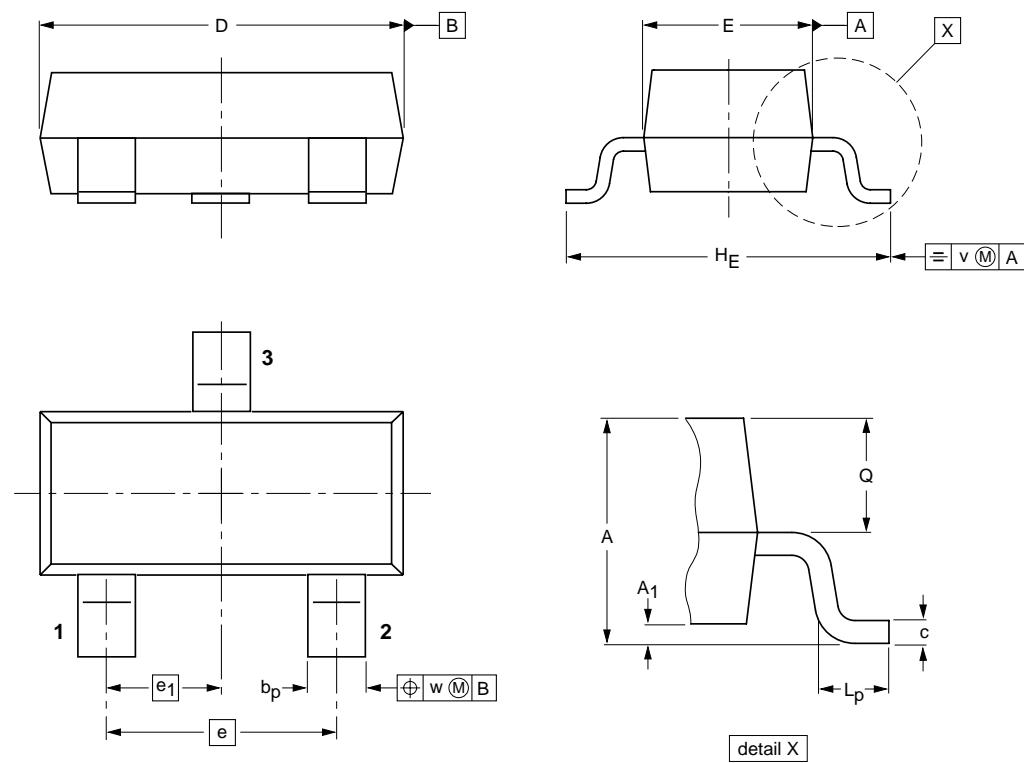
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PACKAGE OUTLINE

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

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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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