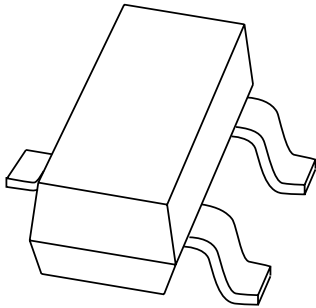


DATA SHEET



PBSS4230T

30 V, 2 A

NPN low V_{CEsat} (BISS) transistor

Product data sheet

2003 Sep 29

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

PBSS4230T

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: PBSS5230T.

MARKING

| TYPE NUMBER | MARKING CODE ⁽¹⁾ |
|-------------|-----------------------------|
| PBSS4230T | *3D |

Note

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

ORDERING INFORMATION

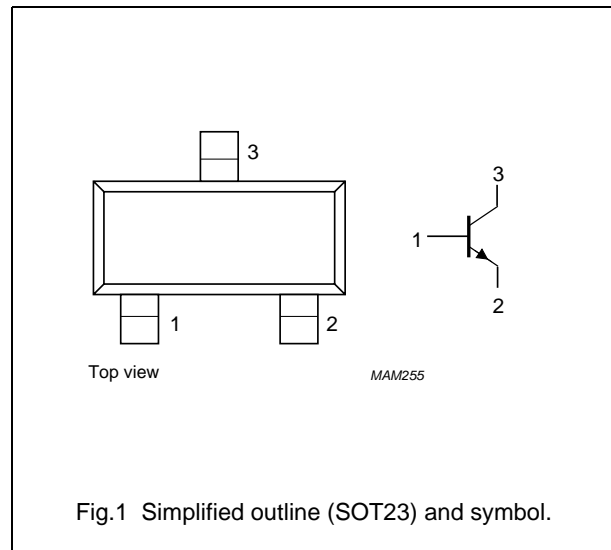
| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PBSS4230T | – | plastic surface mounted package; 3 leads | SOT23 |

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 | 200 | m Ω |

PINNING

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



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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 | – | 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) | | – | 2 | A |
| I_{CM} | peak collector current | | – | 3 | A |
| I_{BM} | peak base current | | – | 300 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$; note 1 | – | 300 | mW |
| | | $T_{amb} \leq 25\text{ °C}$; 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 cm².

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 cm².

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------|--------------------------------------|---|------|------|------|------------------|
| I_{CBO} | collector-base cut-off current | $V_{CB} = 30\text{ V}; I_E = 0$ | – | – | 100 | nA |
| | | $V_{CB} = 30\text{ V}; I_E = 0; T_j = 150\text{ °C}$ | – | – | 50 | μA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = 4\text{ V}; I_C = 0$ | – | – | 100 | nA |
| h_{FE} | DC current gain | $V_{CE} = 2\text{ V}; I_C = 100\text{ mA}$ | 350 | 470 | – | |
| | | $V_{CE} = 2\text{ V}; I_C = 500\text{ mA}$ | 300 | 450 | – | |
| | | $V_{CE} = 2\text{ V}; I_C = 1\text{ A}$ | 300 | 420 | – | |
| | | $V_{CE} = 2\text{ V}; I_C = 2\text{ A}$ | 150 | 250 | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 100\text{ mA}; I_B = 1\text{ mA}$ | – | 45 | 70 | mV |
| | | $I_C = 500\text{ mA}; I_B = 50\text{ mA}$ | – | 70 | 100 | mV |
| | | $I_C = 750\text{ mA}; I_B = 15\text{ mA}$ | – | 120 | 180 | mV |
| | | $I_C = 1\text{ A}; I_B = 50\text{ mA}; \text{note 1}$ | – | 130 | 180 | mV |
| | | $I_C = 2\text{ A}; I_B = 200\text{ mA}; \text{note 1}$ | – | 240 | 320 | mV |
| R_{CEsat} | equivalent on-resistance | $I_C = 500\text{ mA}; I_B = 50\text{ mA}; \text{note 1}$ | – | 140 | 200 | $\text{m}\Omega$ |
| V_{BEsat} | base-emitter saturation voltage | $I_C = 2\text{ A}; I_B = 200\text{ mA}; \text{note 1}$ | – | – | 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 | $I_C = 100\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$ | 100 | 230 | – | MHz |
| C_c | collector capacitance | $V_{CB} = 10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$ | – | 15 | 20 | pF |

Note

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

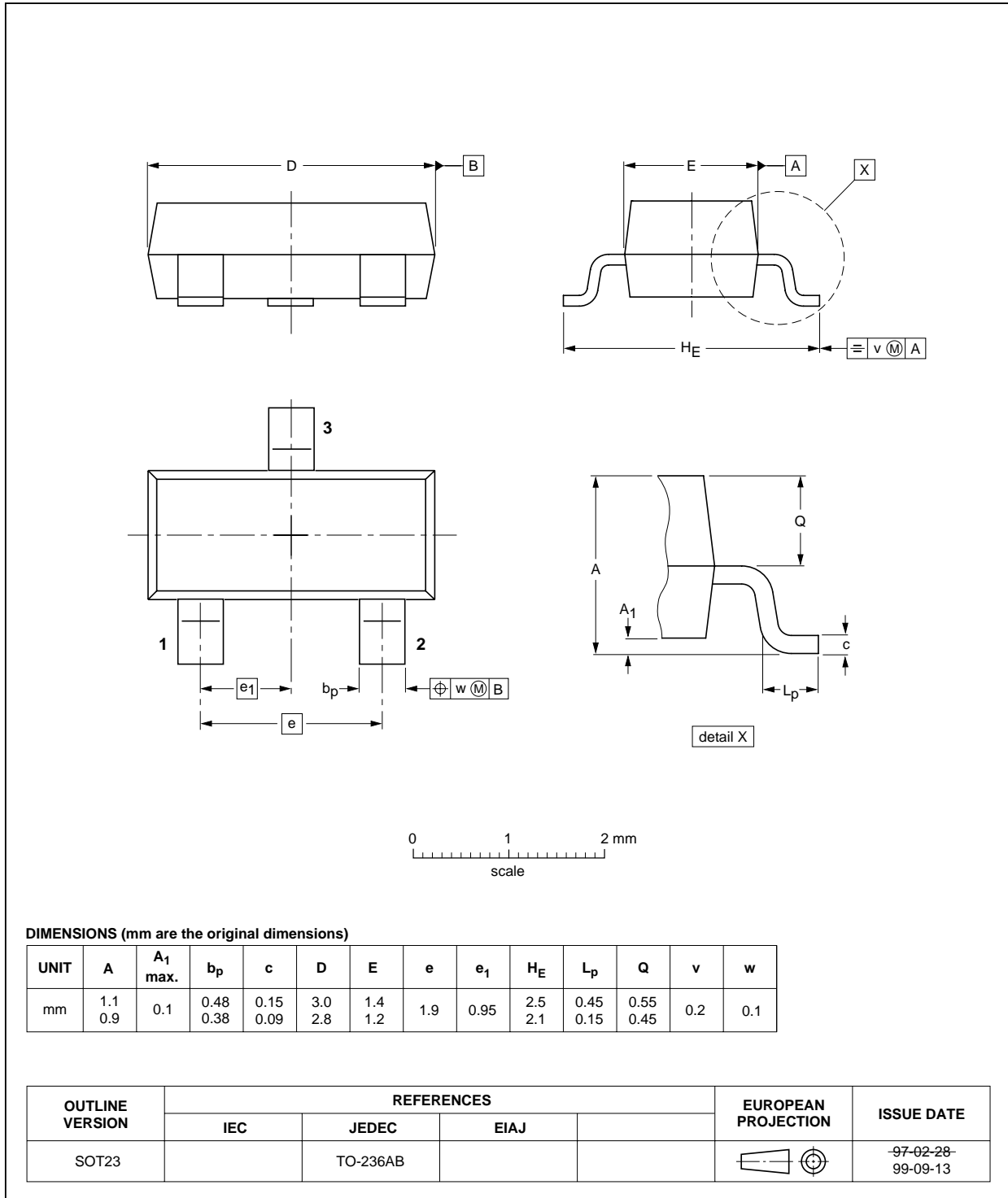
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



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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

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