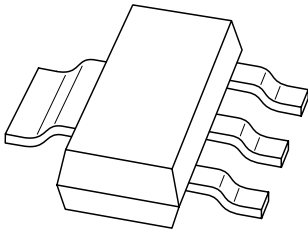


# DATA SHEET



## **PBSS4540Z** NPN medium power transistor

Preliminary specification

1999 Aug 04

# NPN medium power transistor

# PBSS4540Z

### FEATURES

- High current (max. 10 A)
- Low voltage (max. 40 V)
- Low  $V_{CEsat}$ .

### APPLICATIONS

- Heavy duty battery powered equipment (Automotive, Telecom and Audio/Video) such as motor and lamp drivers
- $V_{CEsat}$  critical applications such as the latest low supply voltage IC applications
- All battery driven equipment to save battery power.

### DESCRIPTION

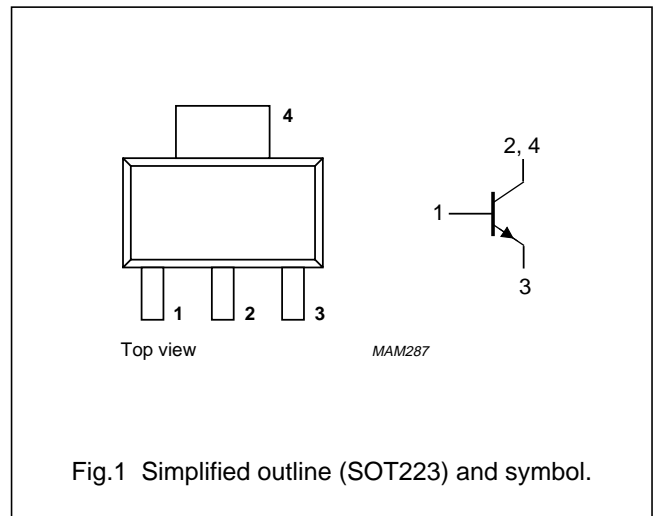
NPN low  $V_{CEsat}$  transistor in a SOT223 plastic package. PNP complement: PBSS5540Z.

### MARKING CODE

| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PBSS4540Z   | PB4540       |

### PINNING

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



### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| 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                       | –    | 6    | V    |
| $I_C$     | collector current (DC)        |                                      | –    | 5    | A    |
| $I_{CM}$  | peak collector current        |                                      | –    | 10   | A    |
| $I_{BM}$  | peak base current             |                                      | –    | 2    | A    |
| $P_{tot}$ | total power dissipation       | $T_{amb} \leq 25\text{ °C}$ ; note 1 | –    | 1.35 | W    |
| $T_{stg}$ | storage temperature           |                                      | –65  | +150 | °C   |
| $T_j$     | junction temperature          |                                      | –    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature |                                      | –65  | +150 | °C   |

### Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>. For other mounting conditions, see “Thermal considerations for SOT223 in the General Part of associated Handbook”.

## NPN medium power transistor

PBSS4540Z

## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                   | CONDITIONS | VALUE | UNIT |
|---------------|---|------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1     | 92    | K/W  |

## Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>. For other mounting conditions, see "Thermal considerations for SOT223 in the General Part of associated Handbook".

## CHARACTERISTICS

$T_j = 25\text{ °C}$  unless otherwise specified.

| SYMBOL      | PARAMETER                    | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|-------------|------------------------------|--|------|------|------|------|
| $I_{CBO}$   | collector cut-off current    | $I_E = 0; V_{CB} = 30\text{ V}$                                | –    | –    | 100  | nA   |
|             |                              | $I_E = 0; V_{CB} = 30\text{ V}; T_j = 150\text{ °C}$           | –    | –    | 50   | μA   |
| $I_{EBO}$   | emitter cut-off current      | $I_C = 0; V_{EB} = 5\text{ V}$                                 | –    | –    | 100  | nA   |
| $h_{FE}$    | DC current gain              | $V_{CE} = 2\text{ V}$<br>$I_C = 500\text{ mA}$                 | 300  | 500  | –    |      |
|             |                              | $I_C = 1\text{ A}; \text{note 1}$                              | 300  | 500  | –    |      |
|             |                              | $I_C = 2\text{ A}; \text{note 1}$                              | 250  | 450  | –    |      |
|             |                              | $I_C = 5\text{ A}; \text{note 1}$                              | 50   | 150  | –    |      |
| $V_{CEsat}$ | saturation voltage           | $I_C = 500\text{ mA}; I_B = 5\text{ mA}$                       | –    | 65   | 120  | mV   |
|             |                              | $I_C = 1\text{ A}; I_B = 10\text{ mA}$                         | –    | 100  | 150  | mV   |
|             |                              | $I_C = 2\text{ A}; I_B = 200\text{ mA}; \text{note 1}$         | –    | 130  | 170  | mV   |
|             |                              | $I_C = 5\text{ A}; I_B = 500\text{ mA}; \text{note 1}$         | –    | 300  | 400  | mV   |
| $V_{BEsat}$ | saturation voltage           | $I_C = 5\text{ A}; I_B = 500\text{ mA}; \text{note 1}$         | –    | 1.1  | 1.3  | V    |
| $V_{BEon}$  | base-emitter turn-on voltage | $I_C = 2\text{ A}; V_{CE} = 2\text{ V}$                        | 1.1  | 0.8  | –    | V    |
| $C_C$       | collector capacitance        | $I_E = i_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$        | –    | 60   | 70   | pF   |
| $f_T$       | transition frequency         | $I_C = 500\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$ | 80   | 120  | –    | MHz  |

## Note

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

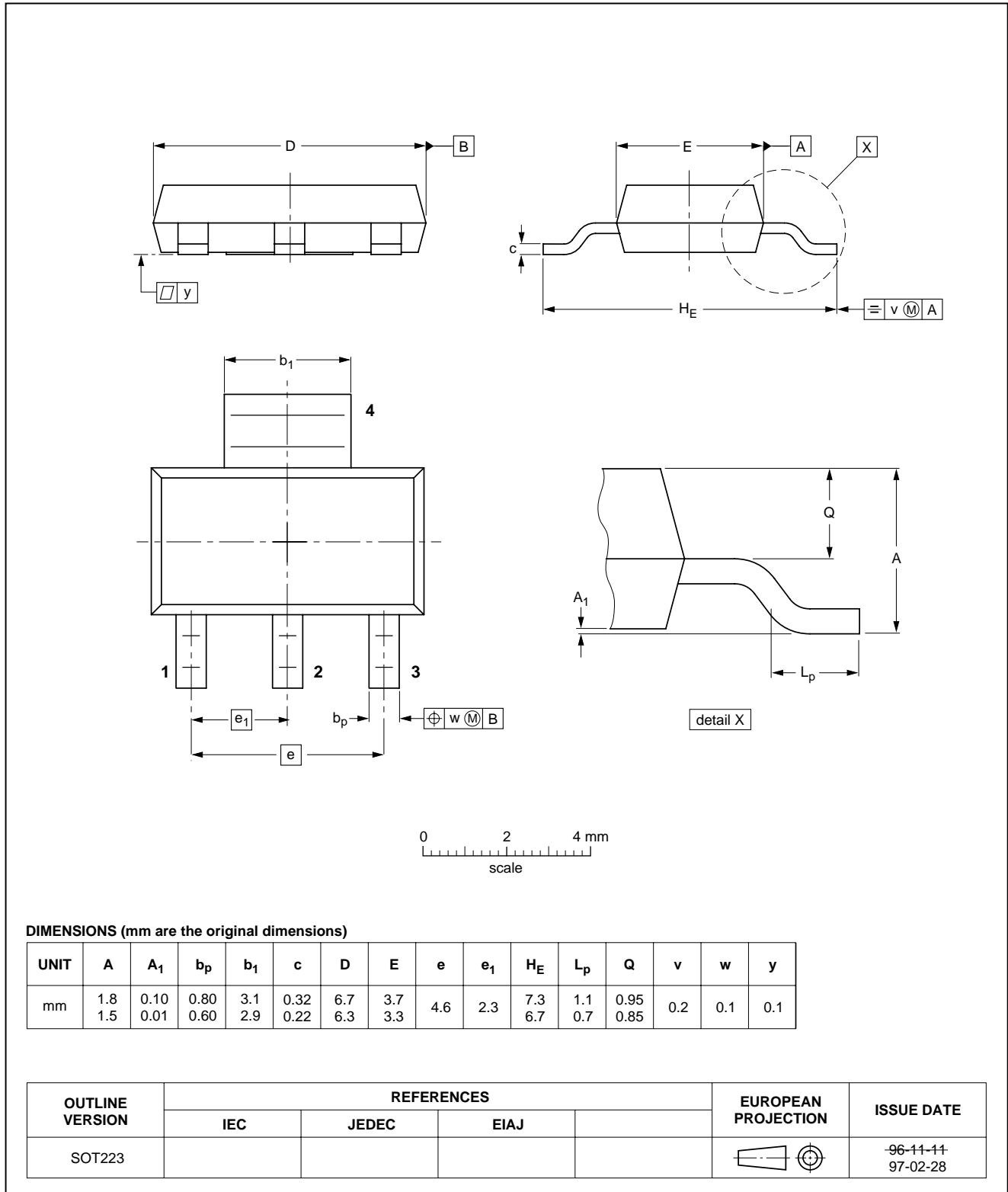
NPN medium power transistor

PBSS4540Z

PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



## NPN medium power transistor

PBSS4540Z

**DEFINITIONS**

|   |   |
|---|---|
| <b>Data sheet status</b>  |   |
| Objective specification   | This data sheet contains target or goal specifications for product development.       |
| Preliminary specification   | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification   | This data sheet contains final product specifications.                                |
| <b>Limiting values</b>  |   |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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. |   |
| <b>Application information</b>  |   |
| Where application information is given, it is advisory and does not form part of the specification.   |   |

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NPN medium power transistor

PBSS4540Z

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**NOTES**

NPN medium power transistor

PBSS4540Z

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**NOTES**

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