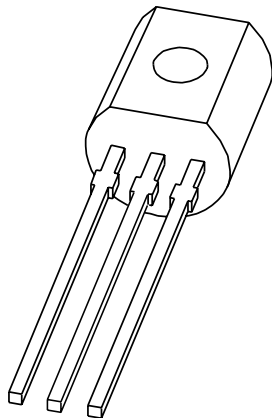


# DATA SHEET



**PBSS8110AS**

100 V, 1 A

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

Product data sheet  
Supersedes data of 2003 Dec 03

2004 Aug 10

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

## PBSS8110AS

### FEATURES

- SOT54 package
- Low collector-emitter saturation voltage  $V_{CEsat}$
- High collector current capability:  $I_C$  and  $I_{CM}$
- Higher efficiency leading to less heat generation.

### APPLICATIONS

- Automotive 42 V power
- Telecom infrastructure
- General industrial applications
- Power management
  - DC/DC converters
  - Supply line switching
  - Battery charger
  - LCD backlighting.
- Peripheral drivers
  - Generic driver (e.g. lamps and LEDs)
  - Inductive load driver (e.g. relays, buzzers and motors).

### DESCRIPTION

NPN low  $V_{CEsat}$  BISS transistor in a SOT54 plastic package.

### QUICK REFERENCE DATA

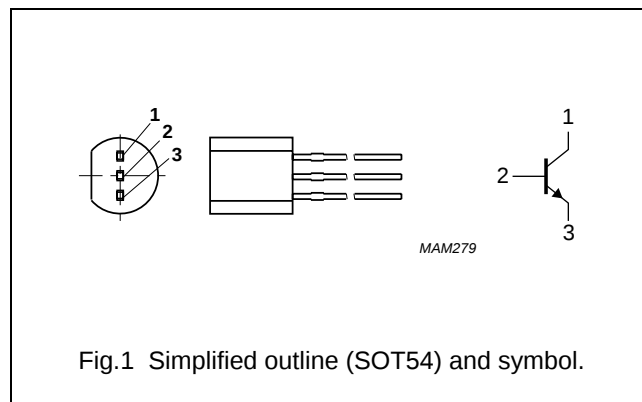
| SYMBOL      | PARAMETER                 | MAX. | UNIT       |
|-------------|---------------------------|------|------------|
| $V_{CEO}$   | collector-emitter voltage | 100  | V          |
| $I_C$       | collector current (DC)    | 1    | A          |
| $I_{CM}$    | peak collector current    | 3    | A          |
| $R_{CEsat}$ | equivalent on-resistance  | 200  | m $\Omega$ |

### MARKING

| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PBSS8110AS  | S8110AS      |

### PINNING

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



### ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |                                                             |         |
|-------------|---------|-------------------------------------------------------------|---------|
|             | NAME    | DESCRIPTION                                                 | VERSION |
| PBSS8110AS  | –       | plastic single-ended leaded (through hole) package; 3 leads | SOT54   |

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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                         | –    | 120  | V    |
| $V_{CEO}$ | collector-emitter voltage     | open base                            | –    | 100  | V    |
| $V_{EBO}$ | emitter-base voltage          | open collector                       | –    | 5    | V    |
| $I_C$     | collector current (DC)        |                                      | –    | 1    | A    |
| $I_{CM}$  | peak collector current        | $T_{j\max}$                          | –    | 3    | A    |
| $I_B$     | base current (DC)             |                                      | –    | 300  | mA   |
| $P_{tot}$ | total power dissipation       | $T_{amb} \leq 25\text{ °C}$ ; note 1 | –    | 830  | mW   |
| $T_j$     | junction temperature          |                                      | –    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature |                                      | –65  | +150 | °C   |
| $T_{stg}$ | storage temperature           |                                      | –65  | +150 | °C   |

**Note**

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

**THERMAL CHARACTERISTICS**

| SYMBOL        | PARAMETER                                   | CONDITIONS          | VALUE | UNIT |
|---------------|---------------------------------------------|---------------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air; note 1 | 150   | K/W  |

**Note**

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

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**CHARACTERISTICS**

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

| SYMBOL      | PARAMETER                            | CONDITIONS                                                     | MIN. | TYP. | MAX. | UNIT             |
|-------------|--------------------------------------|----------------------------------------------------------------|------|------|------|------------------|
| $I_{CBO}$   | collector cut-off current            | $V_{CB} = 80\text{ V}; I_E = 0$                                | –    | –    | 100  | nA               |
|             |                                      | $V_{CB} = 80\text{ V}; I_E = 0; T_j = 150\text{ °C}$           | –    | –    | 50   | $\mu\text{A}$    |
| $I_{CES}$   | collector cut-off current            | $V_{CE} = 80\text{ V}; V_{BE} = 0$                             | –    | –    | 100  | nA               |
| $I_{EBO}$   | emitter cut-off current              | $V_{EB} = 4\text{ V}; I_C = 0$                                 | –    | –    | 100  | nA               |
| $h_{FE}$    | DC current gain                      | $V_{CE} = 10\text{ V}; I_C = 1\text{ mA}$                      | 150  | –    | –    |                  |
|             |                                      | $V_{CE} = 10\text{ V}; I_C = 250\text{ mA}$                    | 150  | –    | 500  |                  |
|             |                                      | $V_{CE} = 10\text{ V}; I_C = 0.5\text{ A}; \text{note 1}$      | 100  | –    | –    |                  |
|             |                                      | $V_{CE} = 10\text{ V}; I_C = 1\text{ A}; \text{note 1}$        | 80   | –    | –    |                  |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 100\text{ mA}; I_B = 10\text{ mA}$                      | –    | –    | 40   | mV               |
|             |                                      | $I_C = 500\text{ mA}; I_B = 50\text{ mA}$                      | –    | –    | 120  | mV               |
|             |                                      | $I_C = 1\text{ A}; I_B = 100\text{ mA}$                        | –    | –    | 200  | mV               |
| $R_{CEsat}$ | equivalent on-resistance             | $I_C = 1\text{ A}; I_B = 100\text{ mA}; \text{note 1}$         | –    | 165  | 200  | $\text{m}\Omega$ |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = 1\text{ A}; I_B = 100\text{ mA}; \text{note 1}$         | –    | –    | 1.05 | V                |
| $V_{BEon}$  | base-emitter turn-on voltage         | $V_{CE} = 10\text{ V}; I_C = 1\text{ A}$                       | –    | –    | 0.9  | V                |
| $f_T$       | transition frequency                 | $V_{CE} = 10\text{ V}; I_C = 50\text{ mA}; f = 100\text{ MHz}$ | 100  | –    | –    | MHz              |
| $C_c$       | collector capacitance                | $V_{CB} = 10\text{ V}; I_E = I_C = 0; f = 1\text{ MHz}$        | –    | –    | 7.5  | pF               |

**Note**

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

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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leadsSOT54

0 2.5 5 mm  
scale

**DIMENSIONS (mm are the original dimensions)**

| UNIT | A          | b            | b <sub>1</sub> | c            | D          | d          | E          | e    | e <sub>1</sub> | L            | L <sub>1</sub> <sup>(1)</sup><br>max. |
|------|------------|--------------|----------------|--------------|------------|------------|------------|------|----------------|--------------|---------------------------------------|
| mm   | 5.2<br>5.0 | 0.48<br>0.40 | 0.66<br>0.55   | 0.45<br>0.38 | 4.8<br>4.4 | 1.7<br>1.4 | 4.2<br>3.6 | 2.54 | 1.27           | 14.5<br>12.7 | 2.5                                   |

**Note**

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

| OUTLINE<br>VERSION | REFERENCES |       |        |  | EUROPEAN<br>PROJECTION | ISSUE DATE           |
|--------------------|------------|-------|--------|--|------------------------|----------------------|
|                    | IEC        | JEDEC | JEITA  |  |                        |                      |
| SOT54              |            | TO-92 | SC-43A |  |                        | 04-06-28<br>04-11-16 |

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

PBSS8110AS

## 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.                                     |

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## **Customer notification**

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## **Contact information**

For additional information please visit: <http://www.nxp.com>

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