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Kind regards,

Team Nexperia

# DATA SHEET



## **PBSS4350T**

50 V; 3 A NPN low  $V_{CEsat}$   
(BISS) transistor

Product data sheet  
Supersedes data of 2002 Aug 08

2004 Jan 09



# 50 V; 3 A NPN low $V_{CEsat}$ (BISS) transistor

**PBSS4350T**

**FEATURES**

- Low collector-emitter saturation voltage  $V_{CEsat}$  and corresponding low  $R_{CEsat}$
- High collector current capability
- High collector current gain
- Improved efficiency due to reduced heat generation.

**APPLICATIONS**

- Power management applications
- Low and medium power DC/DC convertors
- Supply line switching
- Battery chargers
- Linear voltage regulation with low voltage drop-out (LDO).

**DESCRIPTION**

NPN low  $V_{CEsat}$  transistor in a SOT23 plastic package. PNP complement: PBSS5350T.

**MARKING**

| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| PBSS4350T   | ZC*                         |

**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         | 50   | V          |
| $I_C$       | collector current (DC)            | 2    | A          |
| $I_{CRP}$   | repetitive peak collector current | 3    | A          |
| $R_{CEsat}$ | equivalent on-resistance          | 130  | m $\Omega$ |

**PINNING**

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

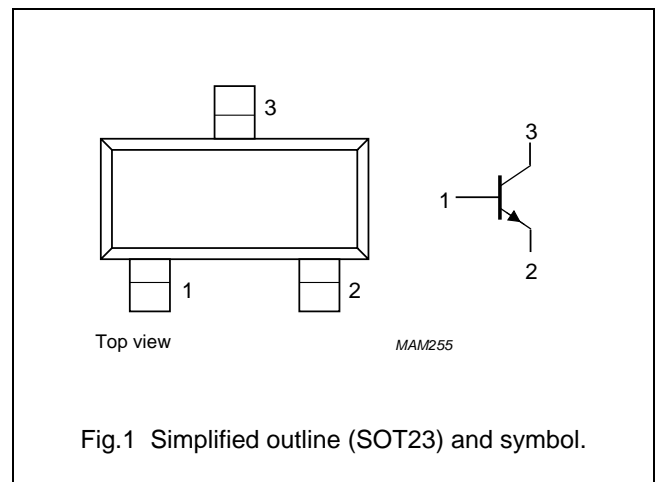


Fig.1 Simplified outline (SOT23) and symbol.

**ORDERING INFORMATION**

| TYPE NUMBER | PACKAGE |  |         |
|-------------|---------|--|---------|
|             | NAME    | DESCRIPTION                              | VERSION |
| PBSS4350T   | –       | plastic surface mounted package; 3 leads | SOT23   |

50 V; 3 A NPN low  $V_{CEsat}$  (BISS) transistor

## PBSS4350T

**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                                | –    | 50   | V    |
| $V_{CEO}$ | collector-emitter voltage         | open base                                   | –    | 50   | V    |
| $V_{EBO}$ | emitter-base voltage              | open collector                              | –    | 5    | V    |
| $I_C$     | collector current (DC)            |   | –    | 2    | A    |
| $I_{CRP}$ | repetitive peak collector current | note 1                                      | –    | 3    | A    |
| $I_{CM}$  | peak collector current            | single peak                                 | –    | 5    | A    |
| $I_B$     | base current (DC)                 |   | –    | 0.5  | A    |
| $P_{tot}$ | total power dissipation           | $T_{amb} \leq 25\text{ °C}$ ; note 2        | –    | 300  | mW   |
|           |                                   | $T_{amb} \leq 25\text{ °C}$ ; note 3        | –    | 480  | mW   |
|           |                                   | $T_{amb} \leq 25\text{ °C}$ ; note 4        | –    | 540  | mW   |
|           |                                   | $T_{amb} \leq 25\text{ °C}$ ; notes 1 and 2 | –    | 1.2  | W    |
| $T_{stg}$ | storage temperature               |   | –65  | +150 | °C   |
| $T_j$     | junction temperature              |   | –    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature     |   | –65  | +150 | °C   |

**Notes**

- Operated under pulsed conditions: pulse width  $t_p \leq 100\text{ ms}$ ; duty cycle  $\delta \leq 0.25$ .
- Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
- Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector  $1\text{ cm}^2$ .
- Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector  $6\text{ cm}^2$ .

**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  |
|               |   | in free air; note 3        | 230   | K/W  |
|               |   | in free air; notes 1 and 4 | 104   | K/W  |

**Notes**

- Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
- Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector  $1\text{ cm}^2$ .
- Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector  $6\text{ cm}^2$ .
- Operated under pulsed conditions: pulse width  $t_p \leq 100\text{ ms}$ ; duty cycle  $\delta \leq 0.25$ .

50 V; 3 A NPN low  $V_{CEsat}$  (BISS) transistor

## PBSS4350T

**CHARACTERISTICS**

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

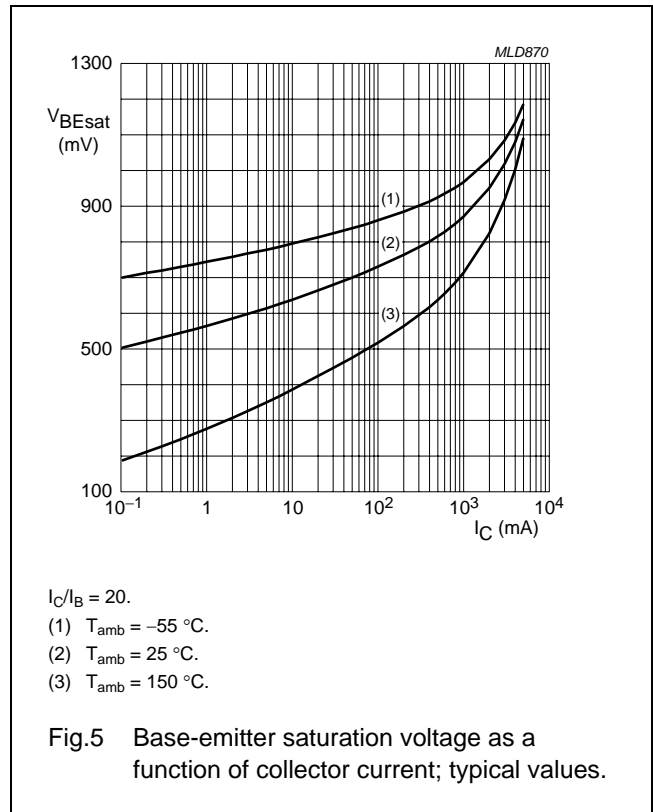
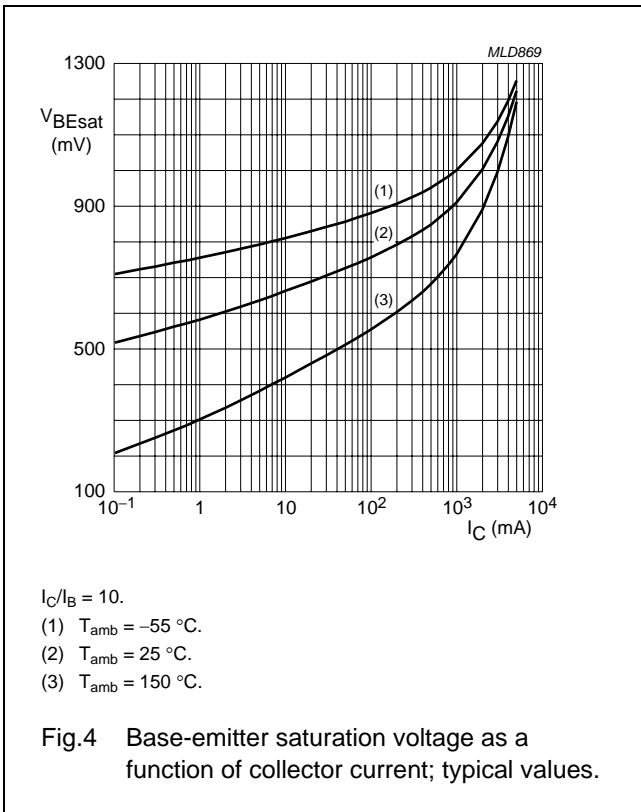
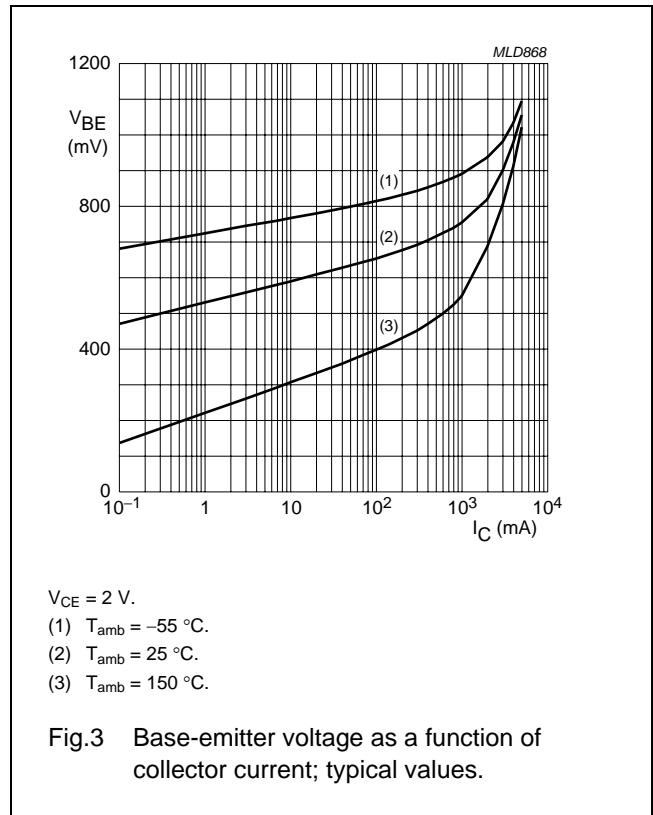
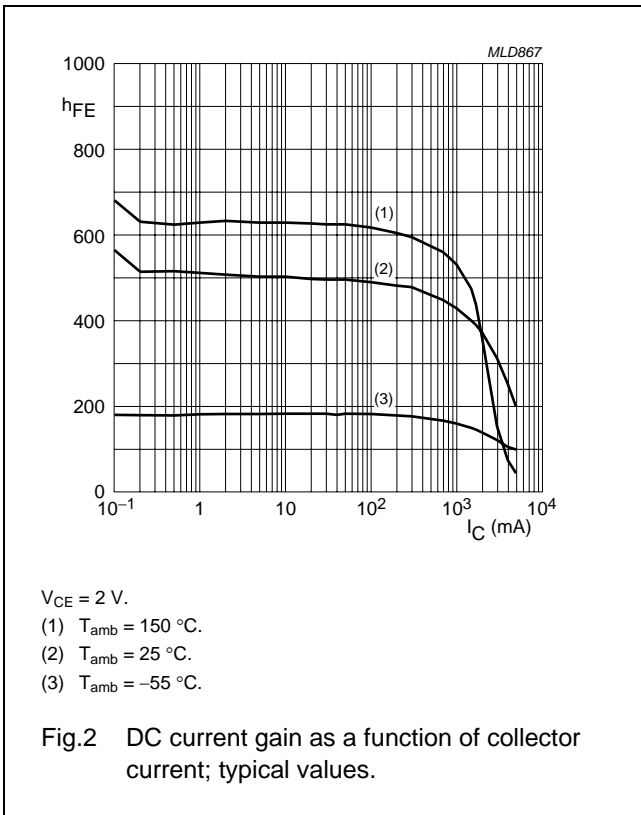
| SYMBOL      | PARAMETER                            | CONDITIONS  | MIN. | TYP. | MAX. | UNIT             |
|-------------|--------------------------------------|---|------|------|------|------------------|
| $I_{CBO}$   | collector-base cut-off current       | $I_E = 0; V_{CB} = 50\text{ V}$                                     | –    | –    | 100  | nA               |
|             |                                      | $I_E = 0; V_{CB} = 50\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$  | –    | –    | 50   | $\mu\text{A}$    |
| $I_{EBO}$   | emitter-base cut-off current         | $I_C = 0; V_{EB} = 5\text{ V}$                                      | –    | –    | 100  | nA               |
| $h_{FE}$    | DC current gain                      | $I_C = 100\text{ mA}; V_{CE} = 2\text{ V}$                          | 300  | –    | –    |                  |
|             |                                      | $I_C = 500\text{ mA}; V_{CE} = 2\text{ V}$                          | 300  | –    | –    |                  |
|             |                                      | $I_C = 1\text{ A}; V_{CE} = 2\text{ V};$ note 1                     | 300  | –    | –    |                  |
|             |                                      | $I_C = 2\text{ A}; V_{CE} = 2\text{ V};$ note 1                     | 200  | –    | –    |                  |
|             |                                      | $I_C = 3\text{ A}; V_{CE} = 2\text{ V};$ note 1                     | 100  | –    | –    |                  |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 500\text{ mA}; I_B = 50\text{ mA}$                           | –    | –    | 80   | mV               |
|             |                                      | $I_C = 1\text{ A}; I_B = 50\text{ mA}$                              | –    | –    | 160  | mV               |
|             |                                      | $I_C = 2\text{ A}; I_B = 100\text{ mA};$ note 1                     | –    | –    | 280  | mV               |
|             |                                      | $I_C = 2\text{ A}; I_B = 200\text{ mA};$ note 1                     | –    | –    | 260  | mV               |
|             |                                      | $I_C = 3\text{ A}; I_B = 300\text{ mA};$ note 1                     | –    | –    | 370  | mV               |
| $R_{CEsat}$ | equivalent on-resistance             | $I_C = 2\text{ A}; I_B = 200\text{ mA};$ note 1                     | –    | 100  | 130  | $\text{m}\Omega$ |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = 2\text{ A}; I_B = 100\text{ mA};$ note 1                     | –    | –    | 1.1  | V                |
|             |                                      | $I_C = 3\text{ A}; I_B = 300\text{ mA};$ note 1                     | –    | –    | 1.2  | V                |
| $V_{BEon}$  | base-emitter turn-on voltage         | $I_C = 1\text{ A}; V_{CE} = 2\text{ V};$ note 1                     | 1.2  | –    | –    | V                |
| $f_T$       | transition frequency                 | $I_C = 100\text{ mA}; V_{CE} = 5\text{ V};$<br>$f = 100\text{ MHz}$ | 100  | –    | –    | MHz              |
| $C_c$       | collector capacitance                | $I_E = I_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$             | –    | –    | 25   | pF               |

**Note**

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

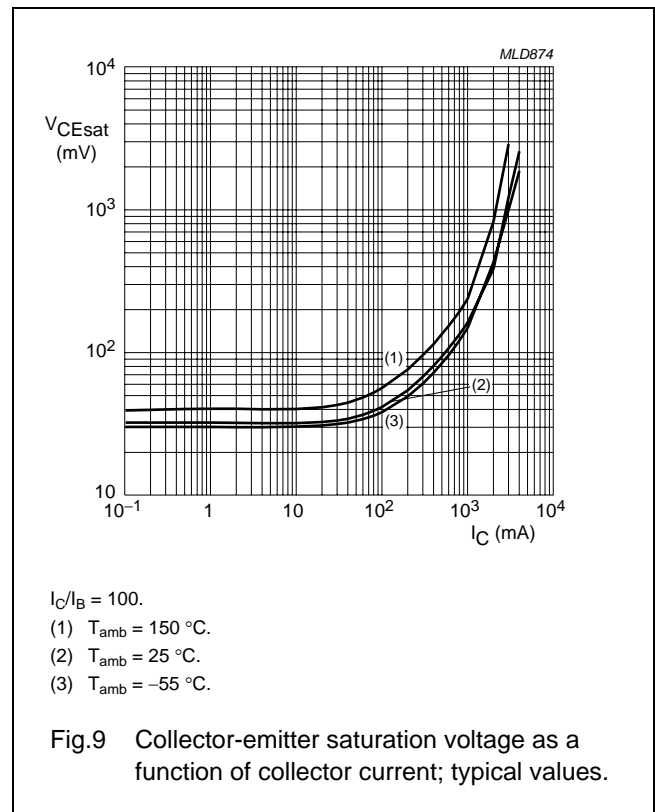
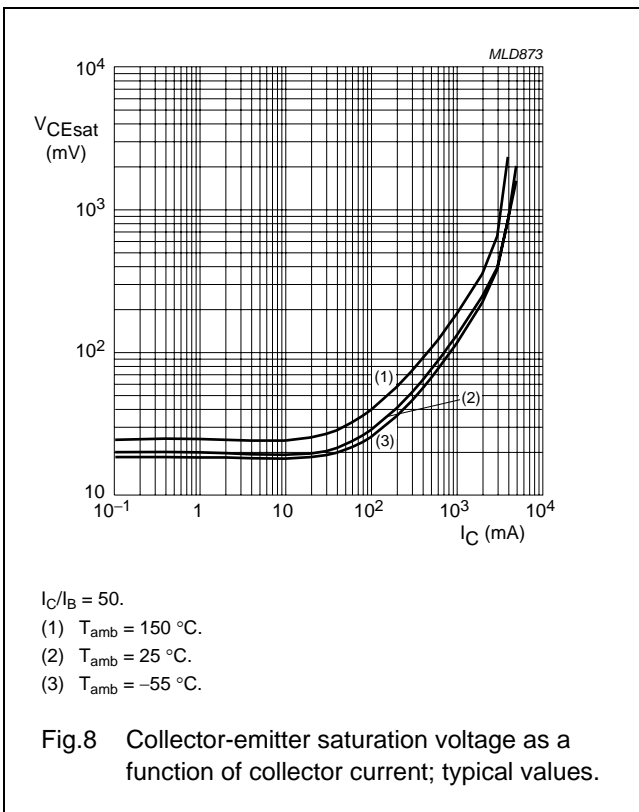
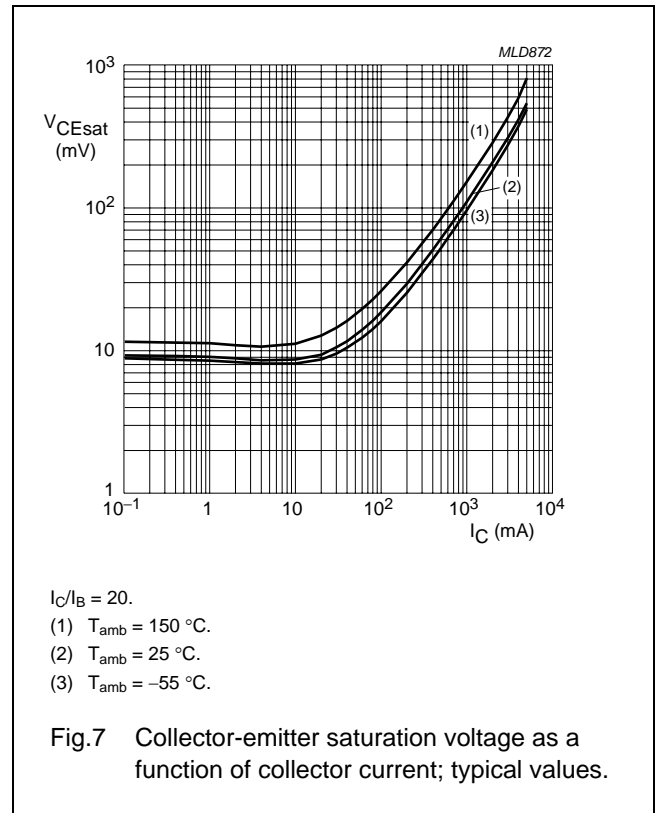
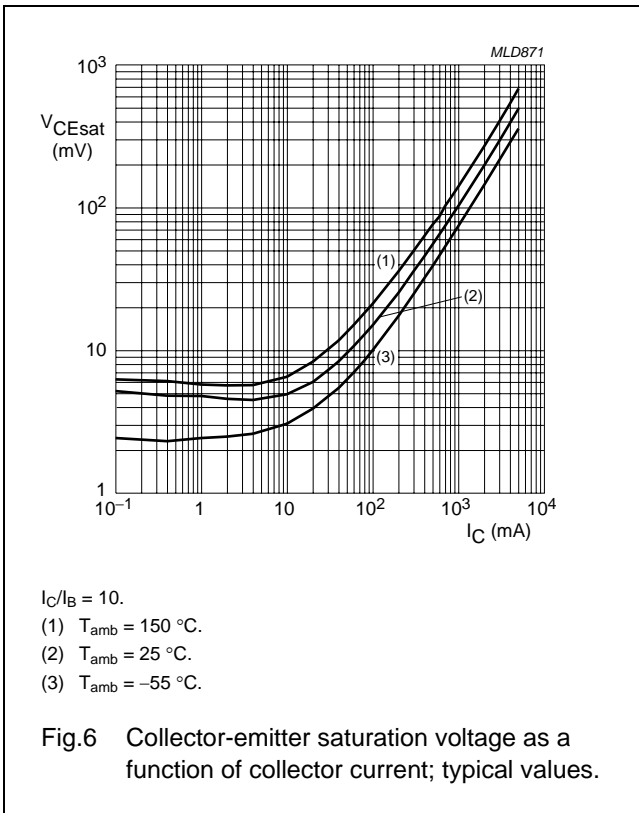
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PBSS4350T



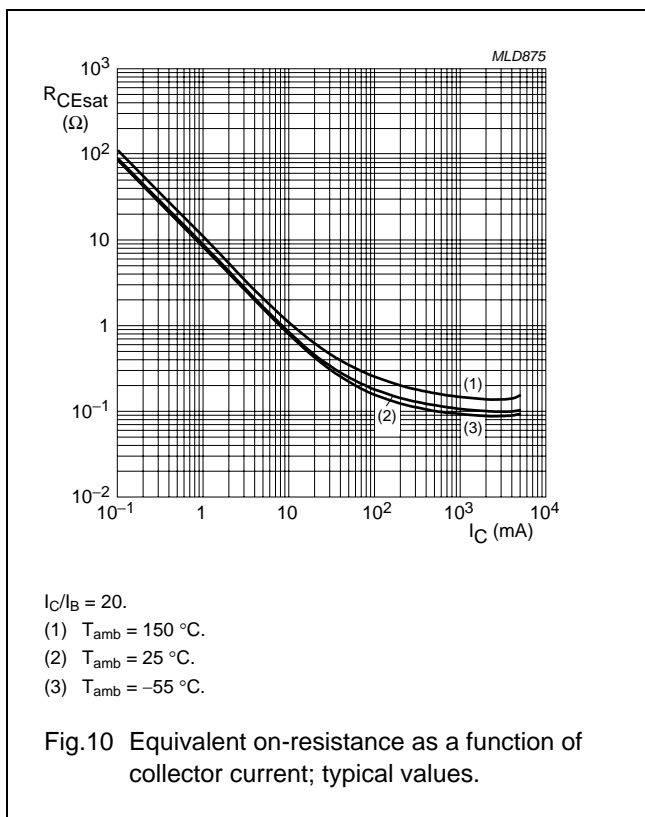
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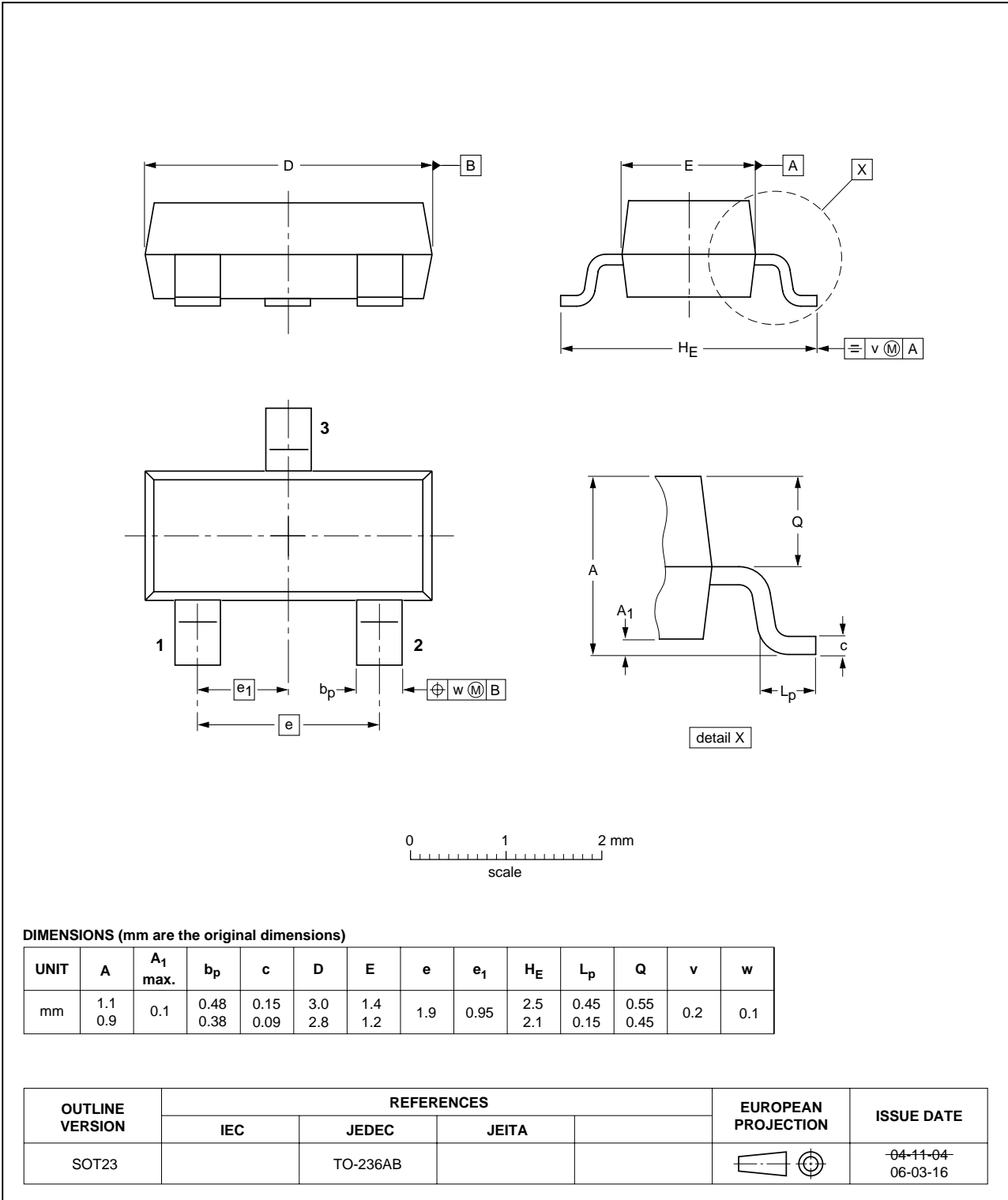
50 V; 3 A NPN low  $V_{CEsat}$  (BISS) transistor

PBSS4350T

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



50 V; 3 A NPN low  $V_{CEsat}$  (BISS) transistor

PBSS4350T

**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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# ***NXP Semiconductors***

## **Customer notification**

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

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