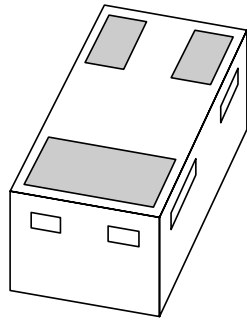


DATA SHEET



PBSS3540M

40 V, 0.5 A

PNP low V_{CEsat} (BISS) transistor

Product specification

2003 Aug 12

40 V, 0.5 A PNP low V_{CEsat} (BISS) transistor

PBSS3540M

FEATURES

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High efficiency leading to reduced heat generation
- Reduced printed-circuit board requirements.

APPLICATIONS

- Power management:
 - DC-DC converter
 - 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

Low V_{CEsat} PNP transistor in a SOT883 leadless ultra small plastic package.
NPN complement: PBSS2540M.

MARKING

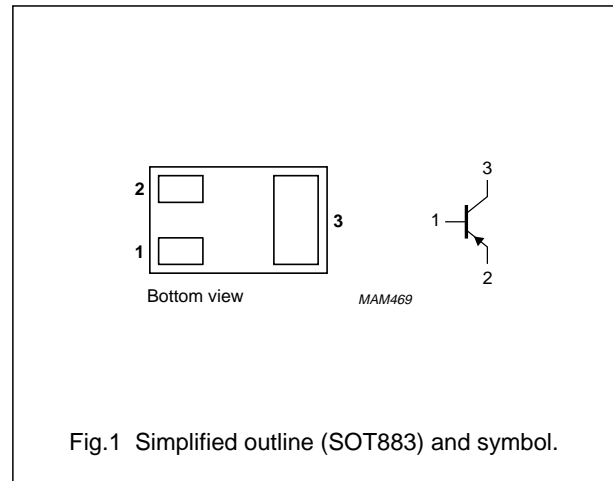
| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PBSS3540M | DA |

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|-------------|---------------------------|------|------------|
| V_{CEO} | collector-emitter voltage | -40 | V |
| I_C | collector current (DC) | -500 | mA |
| I_{CM} | peak collector current | -1 | A |
| R_{CEsat} | equivalent on-resistance | <700 | 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 | – | –40 | V |
| V_{EBO} | emitter-base voltage | open collector | – | –6 | V |
| I_C | collector current (DC) | notes 1 and 2 | – | –500 | mA |
| I_{CM} | peak collector current | | – | –1 | A |
| I_{BM} | peak base current | | – | –100 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$; notes 1 and 2 | – | 250 | mW |
| | | $T_{amb} \leq 25\text{ °C}$; note 1 and 3 | – | 430 | mW |
| T_{stg} | storage temperature | | –65 | +150 | °C |
| T_j | junction temperature | | – | 150 | °C |
| T_{amb} | operating ambient temperature | | –65 | +150 | °C |

Notes

1. Refer to SOT883 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint, with 60 μm copper strip line.
3. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm^2 .

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|-------------------------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | in free air; notes 1 and 2 | 500 | K/W |
| | | in free air; notes 1, 3 and 4 | 290 | K/W |

Notes

1. Refer to SOT883 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint, with 60 μm copper strip line.
3. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm^2 .
4. Operated under pulsed conditions: duty cycle $\delta \leq 20\%$, pulse width $t_p \leq 30\text{ ms}$.

Soldering

Reflow soldering is the only recommended soldering method.

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

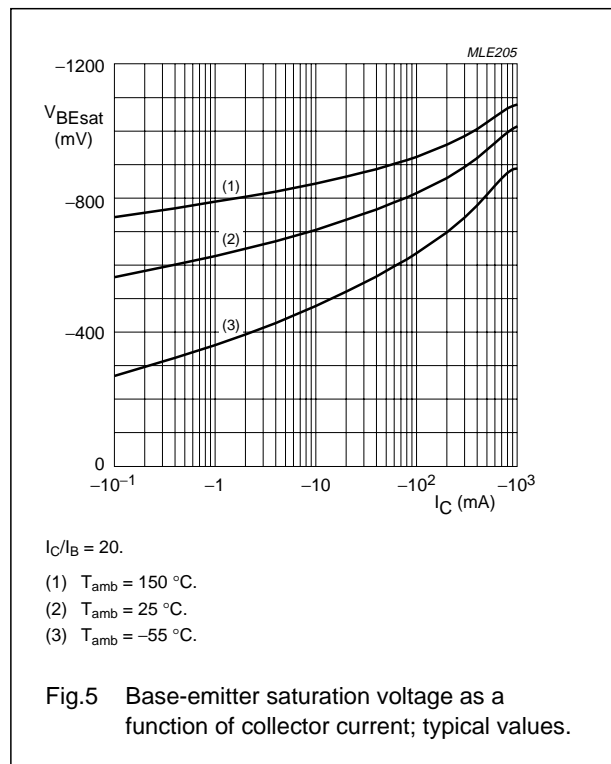
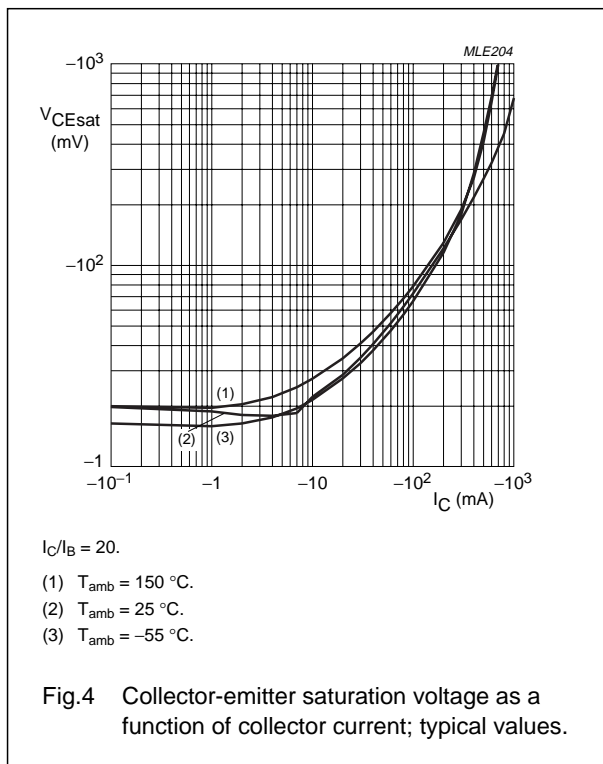
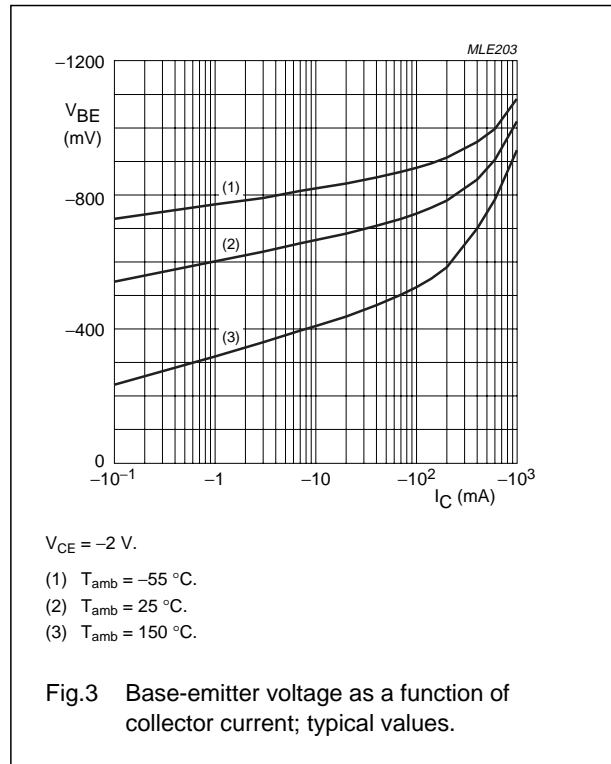
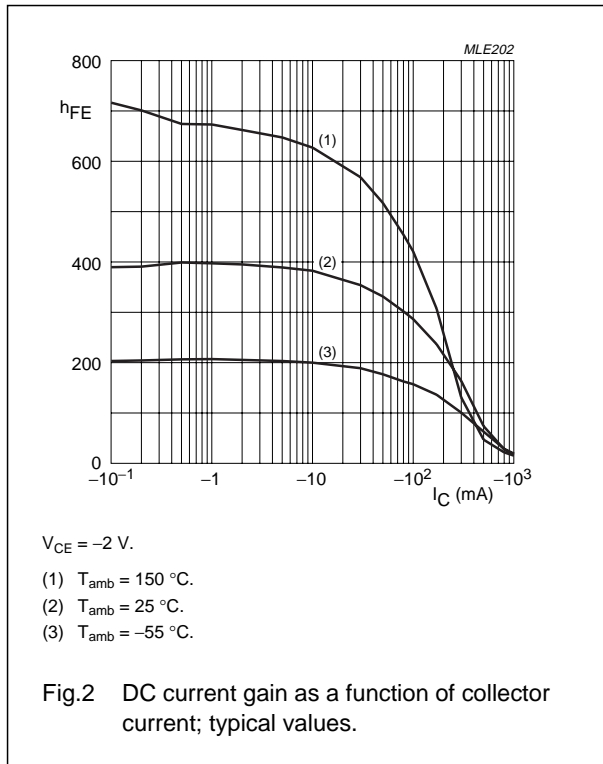
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------|--------------------------------------|---|------|------|------|------------------|
| I_{CBO} | collector-base cut-off current | $V_{CB} = -30\text{ V}; I_E = 0$ | – | – | –100 | nA |
| | | $V_{CB} = -30\text{ V}; I_E = 0; T_j = 150\text{ °C}$ | – | – | –50 | μA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = -5\text{ V}; I_C = 0$ | – | – | –100 | nA |
| h_{FE} | DC current gain | $V_{CE} = -2\text{ V}; I_C = -10\text{ mA}$ | 200 | – | – | |
| | | $V_{CE} = -2\text{ V}; I_C = -100\text{ mA};$ note 1 | 150 | – | – | |
| | | $V_{CE} = -2\text{ V}; I_C = -500\text{ mA};$ note 1 | 40 | – | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$ | – | – | –50 | mV |
| | | $I_C = -100\text{ mA}; I_B = -5\text{ mA}$ | – | – | –130 | mV |
| | | $I_C = -200\text{ mA}; I_B = -10\text{ mA}$ | – | – | –200 | mV |
| | | $I_C = -500\text{ mA}; I_B = -50\text{ mA};$ note 1 | – | – | –350 | mV |
| R_{CEsat} | equivalent on-resistance | $I_C = -500\text{ mA}; I_B = -50\text{ mA};$ note 1 | – | 440 | <700 | $\text{m}\Omega$ |
| V_{BEsat} | base-emitter saturation voltage | $I_C = -500\text{ mA}; I_B = -50\text{ mA};$ note 1 | – | – | –1.2 | V |
| V_{BEon} | base-emitter turn-on voltage | $V_{CE} = -2\text{ V}; I_C = -100\text{ mA};$ note 1 | – | – | –1.1 | V |
| f_T | transition frequency | $I_C = -100\text{ mA}; V_{CE} = -5\text{ V};$ $f = 100\text{ MHz}$ | 100 | 300 | – | MHz |
| C_c | collector capacitance | $V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$ | – | – | 10 | μF |

Note

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

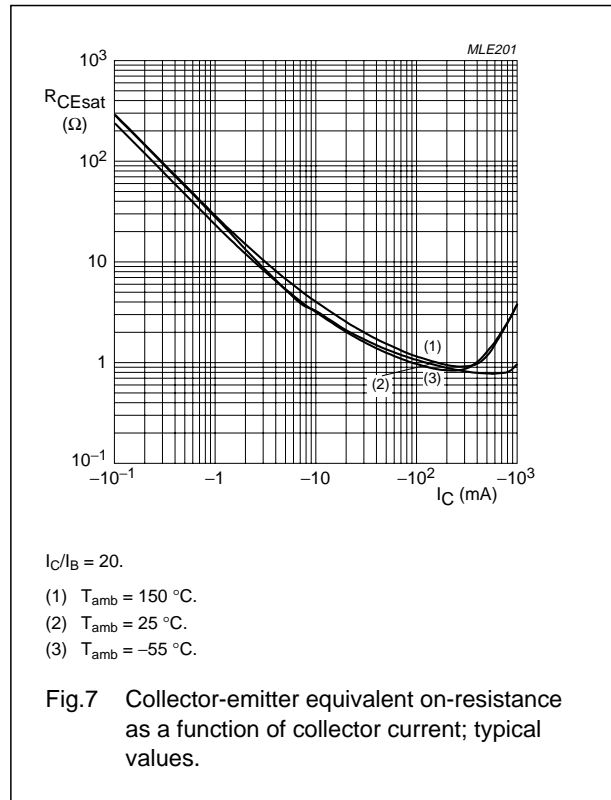
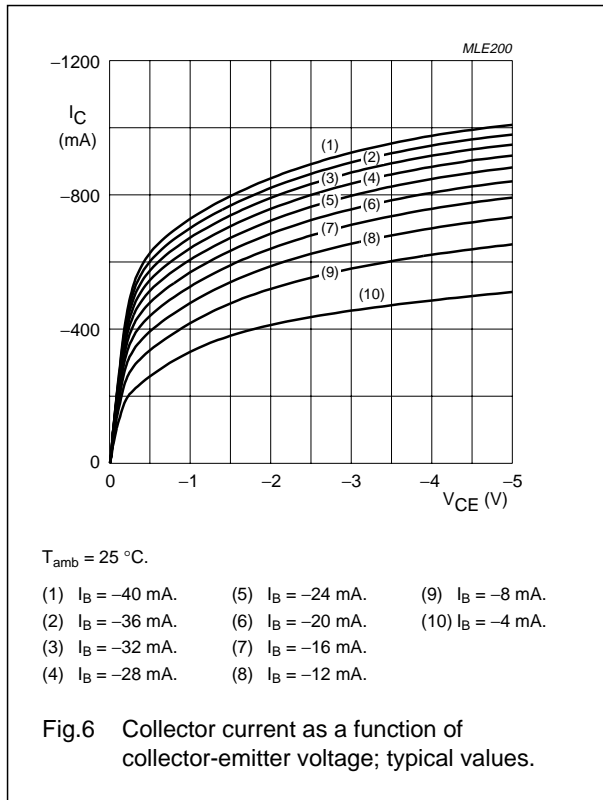
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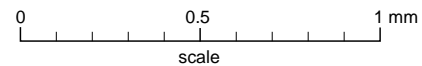
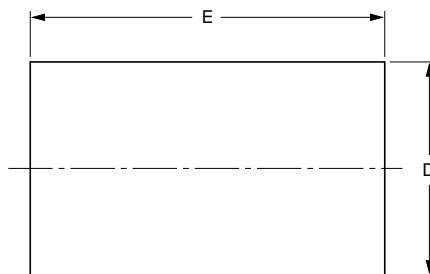
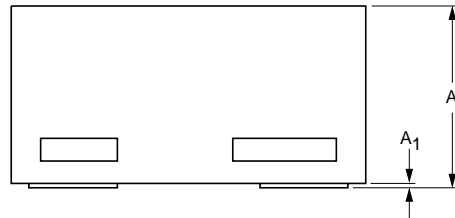
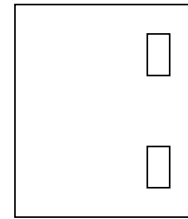
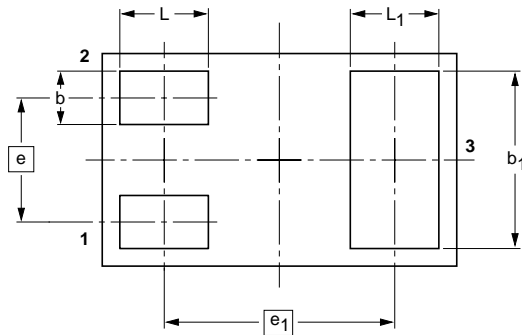
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PACKAGE OUTLINE

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883

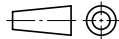


DIMENSIONS (mm are the original dimensions)

| UNIT | A ⁽¹⁾ | A ₁ max. | b | b ₁ | D | E | e | e ₁ | L | L ₁ |
|------|------------------|------------------------|--------------|----------------|--------------|--------------|------|----------------|--------------|----------------|
| mm | 0.50 0.46 | 0.03 | 0.20 0.12 | 0.55 0.47 | 0.62 0.55 | 1.02 0.95 | 0.35 | 0.65 | 0.30 0.22 | 0.30 0.22 |

Note

1. Including plating thickness

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|--------|--|---|----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOT883 | | | SC-101 | |  | 03-02-05 03-04-03 |

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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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3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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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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