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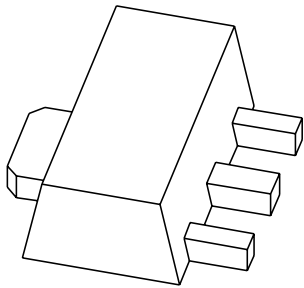
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Kind regards,

Team Nexperia

DATA SHEET



PBSS5250X

50 V, 2 A

PNP low V_{CEsat} (BISS) transistor

Product data sheet
Supersedes data of 2003 Jun 17

2004 Nov 04

50 V, 2 A
PNP low V_{CEsat} (BISS) transistor

PBSS5250X

FEATURES

- SOT89 (SC-62) package
- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability: I_C and I_{CM}
- Higher efficiency leading to less heat generation
- Reduced printed-circuit board requirements.

APPLICATIONS

- Power management
 - DC/DC converters
 - Supply line switching
 - Battery charger
 - LCD backlighting.
- Peripheral drivers
 - Driver in low supply voltage applications (e.g. lamps and LEDs).
 - Inductive load driver (e.g. relays, buzzers and motors).

DESCRIPTION

PNP low V_{CEsat} transistor in a SOT89 plastic package.
 NPN complement: PBSS4250X.

MARKING

| TYPE NUMBER | MARKING CODE ⁽¹⁾ |
|-------------|-----------------------------|
| PBSS5250X | *1L |

Note

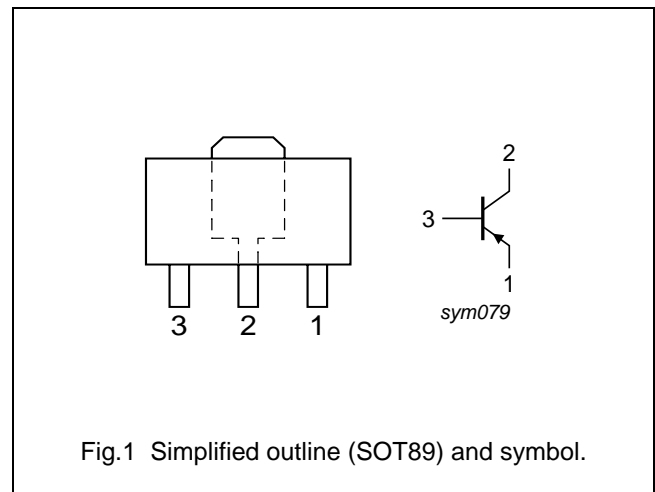
1. * = p: Made in Hong Kong
 * = t: Made in Malaysia
 * = W: Made in China.

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|-------------|---------------------------|------|------------|
| V_{CEO} | collector-emitter voltage | -50 | V |
| I_C | collector current (DC) | -2 | A |
| I_{CM} | peak collector current | -5 | A |
| R_{CEsat} | equivalent on-resistance | 160 | m Ω |

PINNING

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



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ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| PBSS5250X | SC-62 | plastic surface mounted package; collector pad for good heat transfer; 3 leads | SOT89 |

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_{CM} | peak collector current | $T_{j(max)}$ | – | –5 | A |
| I_B | base current (DC) | | – | –0.5 | A |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ note 1 note 2 | – – | 550 1 | mW W |
| T_{stg} | storage temperature | | –65 | +150 | °C |
| T_j | junction temperature | | – | 150 | °C |
| T_{amb} | ambient temperature | | –65 | +150 | °C |

Notes

1. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; standard footprint.
2. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 1 cm².

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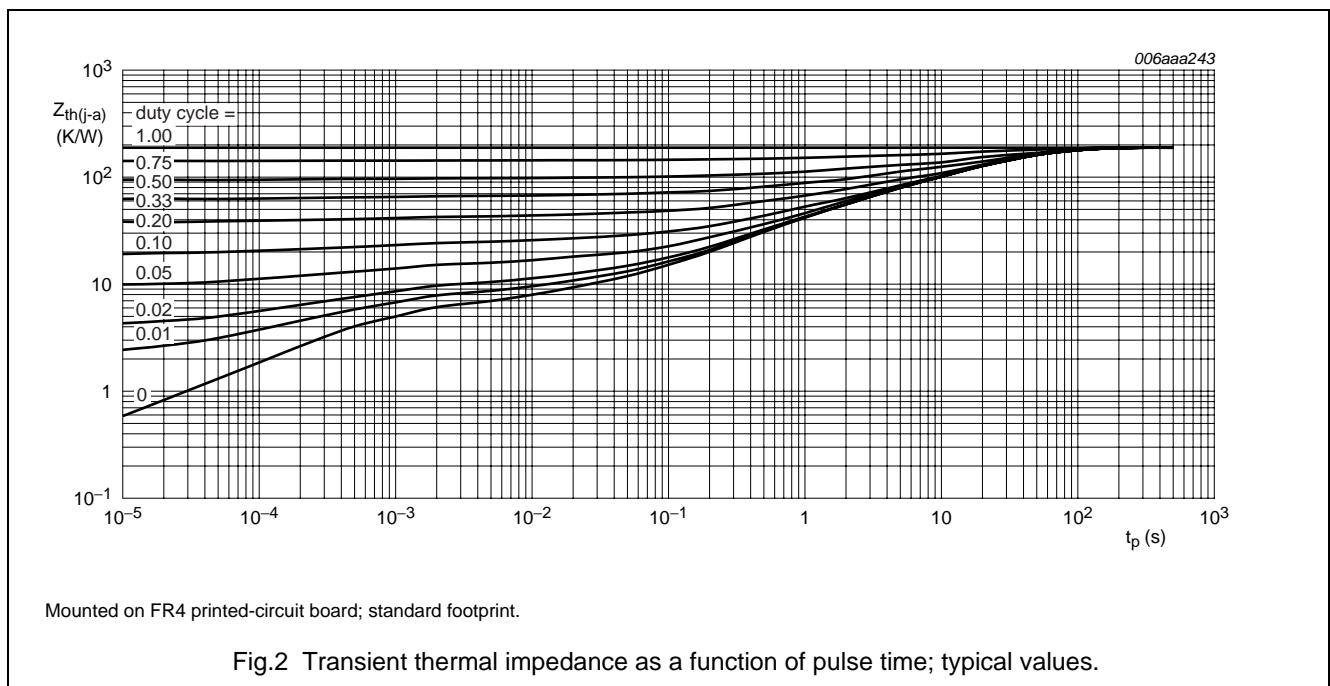
PBSS5250X

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|-------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | | |
| | | note 1 | 225 | K/W |
| | | note 2 | 125 | K/W |
| | | note 3 | 90 | K/W |
| | note 4 | 80 | K/W | |
| $R_{th(j-s)}$ | thermal resistance from junction to soldering point | | 16 | K/W |

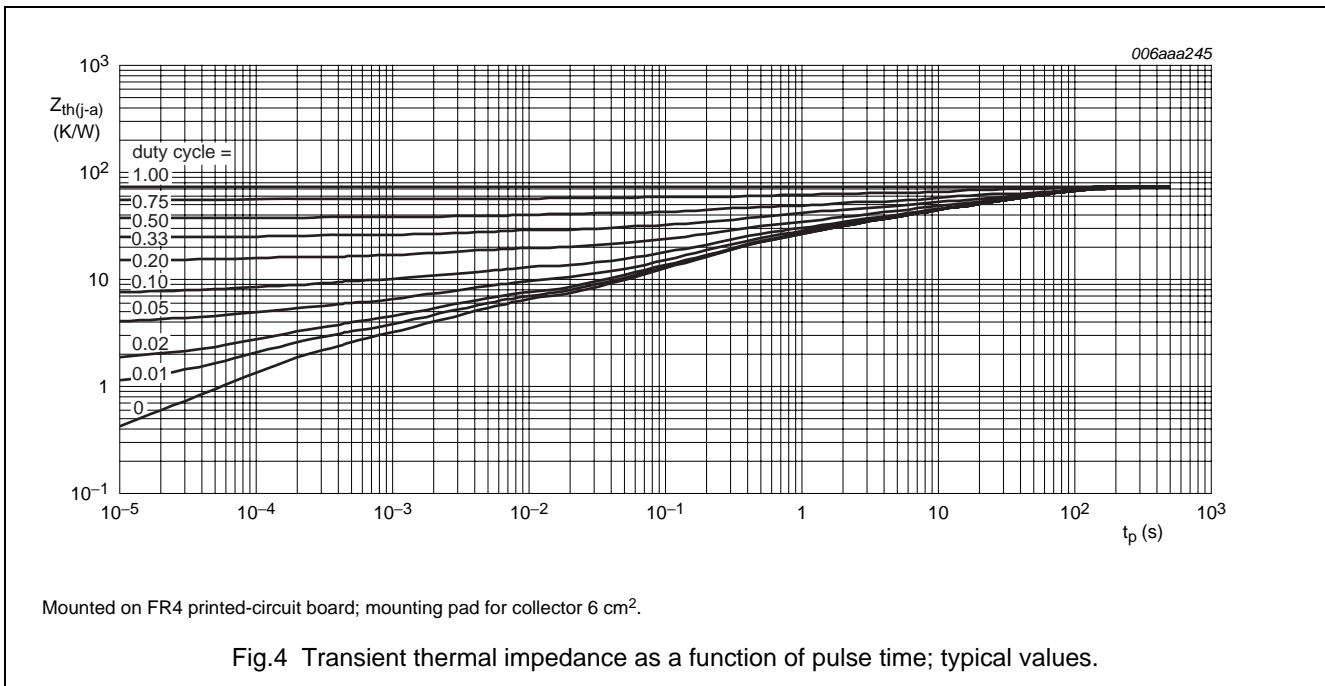
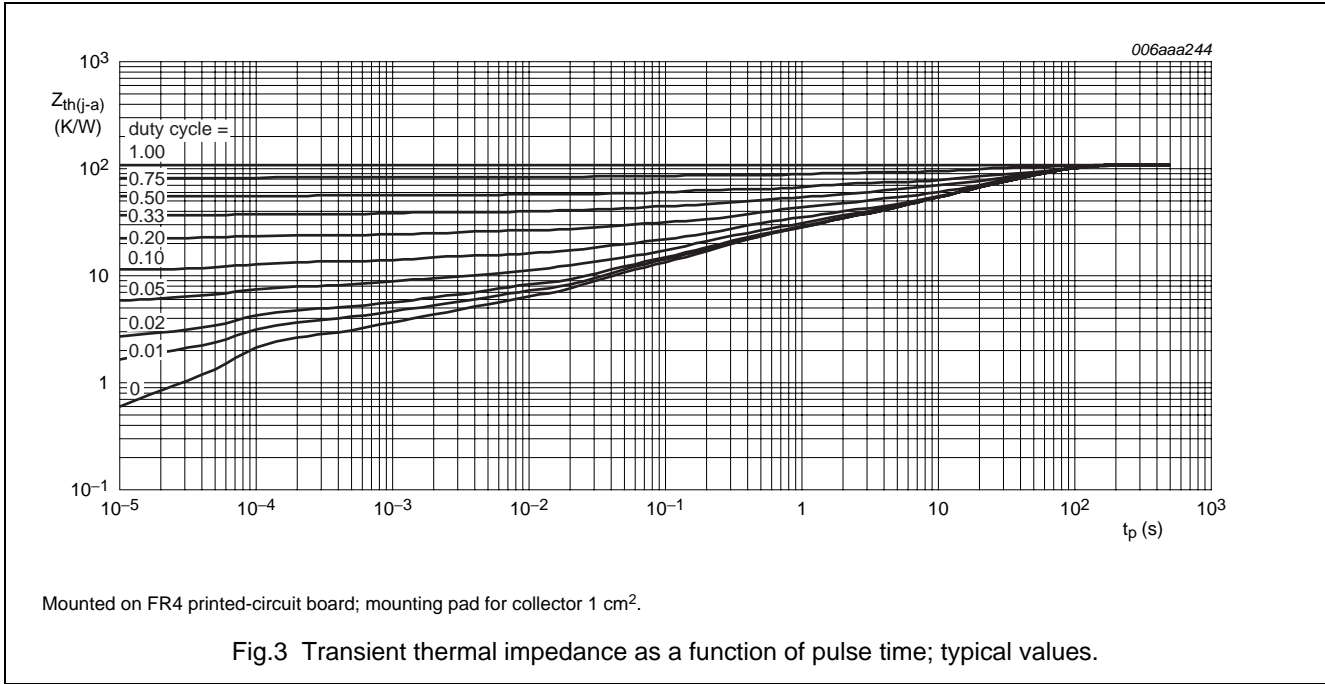
Notes

1. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; standard footprint.
2. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 1 cm².
3. Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 6 cm².
4. Device mounted on a ceramic printed-circuit board 7 cm², single-sided copper, tin-plated.



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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|--------------------------------------|---|------|------|------------------|
| I_{CBO} | collector-base cut-off current | $V_{CB} = -50\text{ V}; I_E = 0\text{ A}$ | – | –100 | nA |
| | | $V_{CB} = -50\text{ V}; I_E = 0\text{ A}; T_J = 150\text{ °C}$ | – | –50 | μA |
| I_{CES} | collector-emitter cut-off current | $V_{CE} = -50\text{ V}; V_{BE} = 0\text{ V}$ | – | –100 | nA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = -5\text{ V}; I_C = 0\text{ A}$ | – | –100 | nA |
| h_{FE} | DC current gain | $V_{CE} = -2\text{ V}$ $I_C = -0.1\text{ A}$ | 200 | – | |
| | | $I_C = -0.5\text{ A}$ | 200 | – | |
| | | $I_C = -1\text{ A}; \text{note 1}$ | 200 | – | |
| | | $I_C = -2\text{ A}; \text{note 1}$ | 100 | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = -0.5\text{ A}; I_B = -50\text{ mA}$ | – | –90 | mV |
| | | $I_C = -1\text{ A}; I_B = -50\text{ mA}$ | – | –250 | mV |
| | | $I_C = -2\text{ A}; I_B = -100\text{ mA}$ | – | –380 | mV |
| | | $I_C = -2\text{ A}; I_B = -200\text{ mA}; \text{note 1}$ | – | –320 | mV |
| R_{CEsat} | equivalent on-resistance | $I_C = -2\text{ A}; I_B = -200\text{ mA}; \text{note 1}$ | – | 160 | $\text{m}\Omega$ |
| V_{BEsat} | base-emitter saturation voltage | $I_C = -2\text{ A}; I_B = -100\text{ mA}$ | – | –1.1 | V |
| V_{BEon} | base-emitter turn-on voltage | $V_{CE} = -2\text{ V}; I_C = -1\text{ A}$ | –1.1 | – | V |
| f_T | transition frequency | $I_C = -100\text{ mA}; V_{CE} = -5\text{ V};$ $f = 100\text{ MHz}$ | 100 | – | MHz |
| C_c | collector capacitance | $V_{CB} = -10\text{ V}; I_E = I_e = 0\text{ A}; f = 1\text{ MHz}$ | – | 35 | pF |

Note1. Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

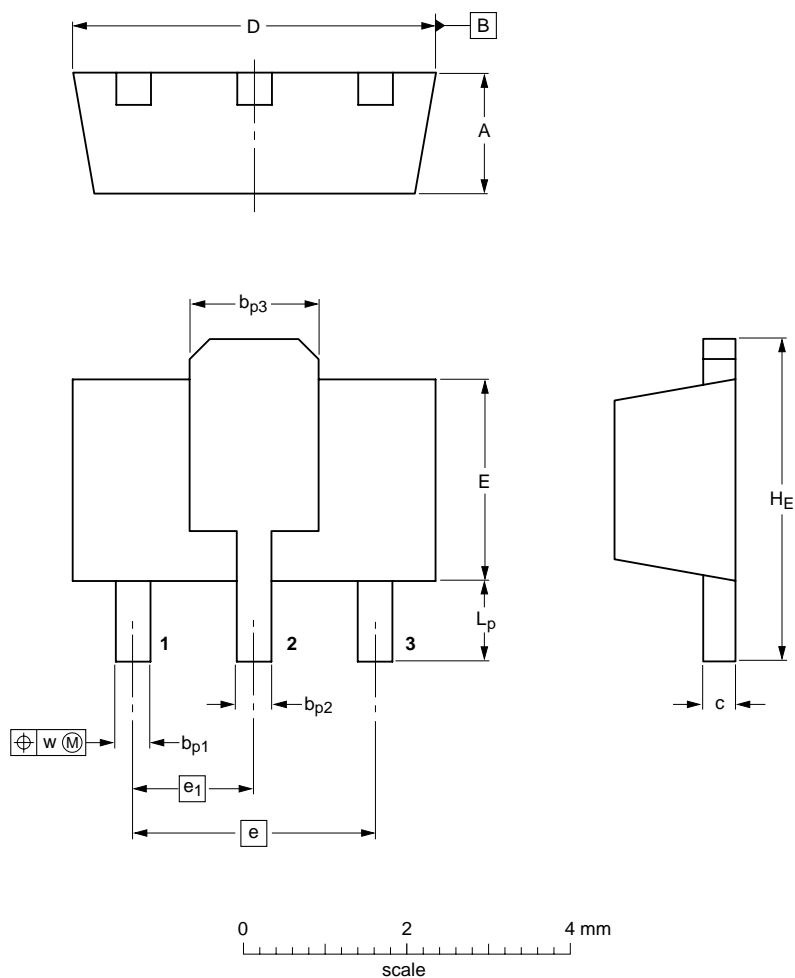
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PACKAGE OUTLINE

Plastic surface-mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

| UNIT | A | bp1 | bp2 | bp3 | c | D | E | e | e1 | HE | Lp | w |
|------|------------|--------------|--------------|------------|--------------|------------|------------|-----|-----|--------------|------------|------|
| mm | 1.6 1.4 | 0.48 0.35 | 0.53 0.40 | 1.8 1.4 | 0.44 0.23 | 4.6 4.4 | 2.6 2.4 | 3.0 | 1.5 | 4.25 3.75 | 1.2 0.8 | 0.13 |

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|--------|-------|---------------------|----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT89 | | TO-243 | SC-62 | | 04-08-03 06-03-16 |

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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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2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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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.

Contact information

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

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