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Electronic Components Sourcing Information

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## Product Reference Information

**Part Number:** PBSS5250XZ  
**Manufacturer:** Nexperia USA Inc.  
**Package:** TO-243AA  
**Availability:** Please confirm with sales

### Product Page:

<https://antrexco.com/product/details/nexperia-usa-inc/pbss5250xz.html>

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### Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

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# PBSS5250X

50 V, 2 A PNP low V<sub>CEsat</sub> transistor

2 February 2026

Product data sheet

## 1. General description

PNP low V<sub>CEsat</sub> transistor in a SOT89 (SC-62) flat lead Surface-Mounted Device (SMD) plastic package.

NPN complement: PBSS4250X

## 2. Features and benefits

- Low collector-emitter saturation voltage V<sub>CEsat</sub>
- High collector current capability: I<sub>C</sub> and I<sub>CM</sub>
- Higher efficiency leading to less heat generation
- Reduced printed-circuit board requirements

## 3. 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)

## 4. Quick reference data

Table 1. Quick reference data

| Symbol           | Parameter                 | Conditions                                                                | Min | Typ | Max | Unit |
|------------------|---------------------------|---------------------------------------------------------------------------|-----|-----|-----|------|
| V <sub>CEO</sub> | collector-emitter voltage | open base                                                                 | -   | -   | -50 | V    |
| I <sub>C</sub>   | collector current         |                                                                           | -   | -   | -2  | A    |
| h <sub>FE</sub>  | DC current gain           | V <sub>CE</sub> = -2 V; I <sub>C</sub> = -0.1 A; T <sub>amb</sub> = 25 °C | 200 | -   | -   |      |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------|--------------------|----------------|
| 1   | E      | emitter     | <br>SOT89          | <br>sym132     |
| 2   | C      | collector   |                    |                |
| 3   | B      | base        |                    |                |

6. Ordering information

Table 3. Ordering information

| Type number | Package |                                                                                        |                       |
|-------------|---------|----------------------------------------------------------------------------------------|-----------------------|
|             | Name    | Description                                                                            | Version               |
| PBSS5250X   | SOT89   | plastic, surface-mounted package; 3 leads; 1.5 mm pitch; 4.5 mm x 2.5 mm x 1.5 mm body | <a href="#">SOT89</a> |

7. Marking

Table 4. Marking codes

| Type number | Marking code <a href="#">[1]</a> |
|-------------|----------------------------------|
| PBSS5250X   | % 1 L                            |

[1] % = placeholder for manufacturing site code

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol           | Parameter                 | Conditions                     |                     | Min | Max  | Unit |
|------------------|---------------------------|--------------------------------|---------------------|-----|------|------|
| V <sub>CBO</sub> | collector-base voltage    | open emitter                   |                     | -   | -50  | V    |
| V <sub>CEO</sub> | collector-emitter voltage | open base                      |                     | -   | -50  | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector                 |                     | -   | -5   | V    |
| I <sub>C</sub>   | collector current         |                                |                     | -   | -2   | A    |
| I <sub>CM</sub>  | peak collector current    | limited by T <sub>j(max)</sub> |                     | -   | -5   | A    |
| I <sub>B</sub>   | base current              |                                |                     | -   | -0.5 | A    |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C       | <a href="#">[1]</a> | -   | 550  | mW   |
|                  |                           |                                | <a href="#">[2]</a> | -   | 1    | W    |
| T <sub>j</sub>   | junction temperature      |                                |                     | -   | 150  | °C   |
| T <sub>amb</sub> | ambient temperature       |                                |                     | -65 | 150  | °C   |
| T <sub>stg</sub> | storage temperature       |                                |                     | -65 | 150  | °C   |

[1] Device mounted on an FR4 PCB, single-sided, 35 µm copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided, 35 µm copper, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol         | Parameter                                        | Conditions  |     | Min | Typ | Max | Unit |
|----------------|--------------------------------------------------|-------------|-----|-----|-----|-----|------|
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1] | -   | -   | 225 | K/W  |
|                |                                                  |             | [2] | -   | -   | 125 | K/W  |
|                |                                                  |             | [3] | -   | -   | 90  | K/W  |
|                |                                                  |             | [4] | -   | -   | 80  | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             |     | -   | -   | 16  | K/W  |

- [1] Device mounted on an FR4 PCB, single-sided, 35  $\mu$ m copper, tin-plated and standard footprint.  
[2] Device mounted on an FR4 PCB, single-sided, 35  $\mu$ m copper, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.  
[3] Device mounted on an FR4 PCB, single-sided, 35  $\mu$ m copper, tin-plated, mounting pad for collector 6 cm<sup>2</sup>.  
[4] Device mounted on a ceramic PCB, 7 cm<sup>2</sup>, single-sided, 35  $\mu$ m copper, tin-plated; standard footprint.

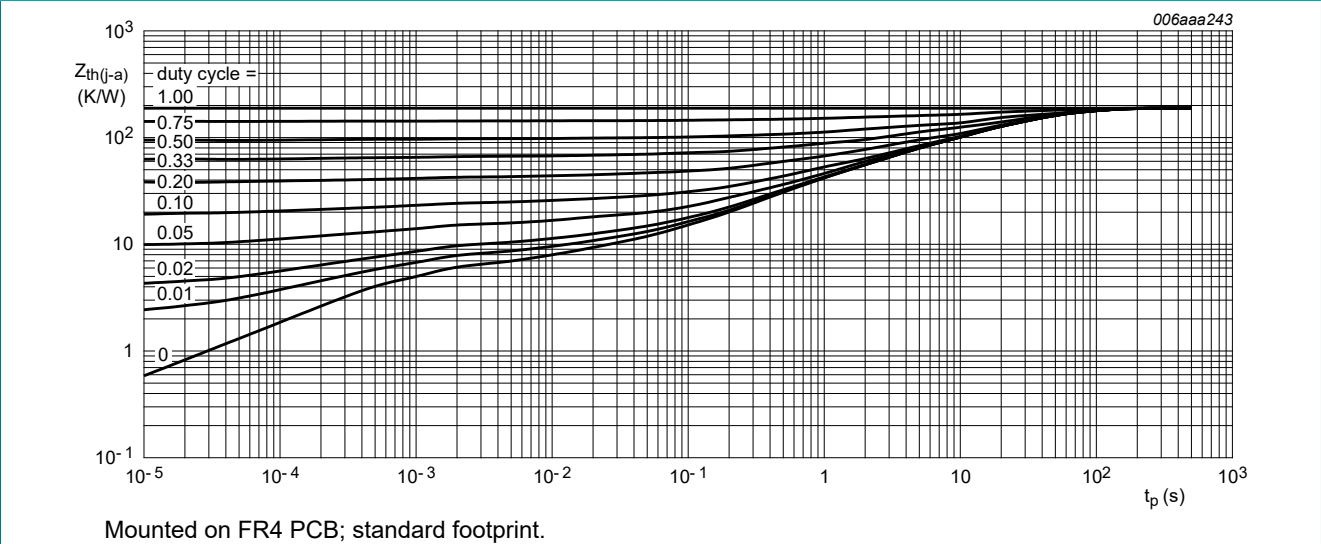


Fig. 1. Transient thermal impedance as a function of pulse duration; typical values

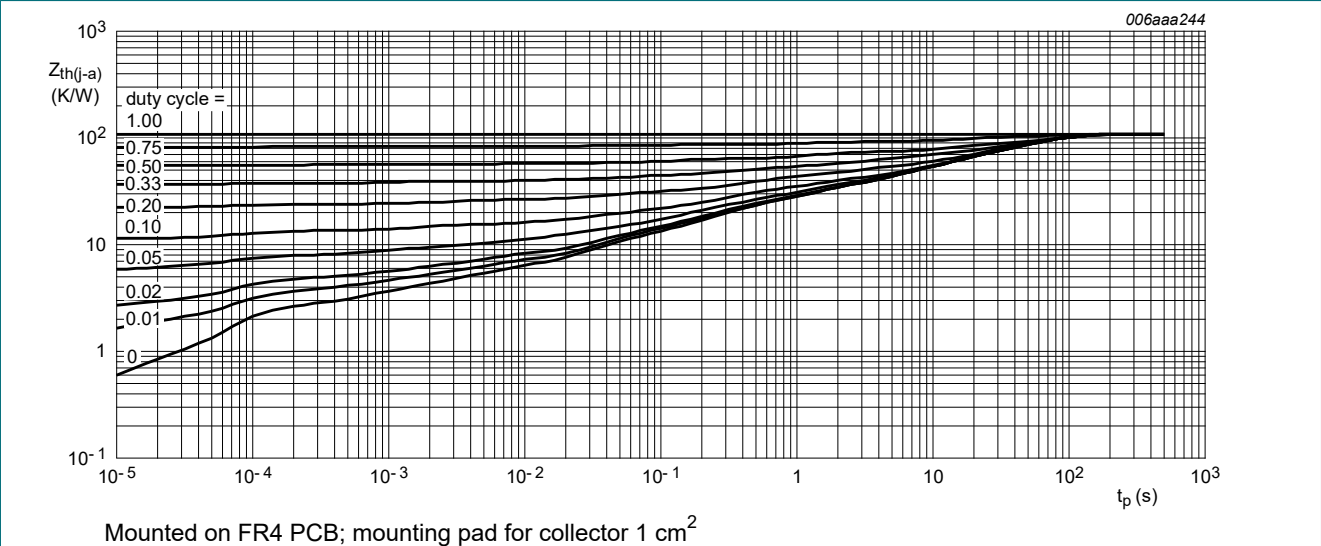
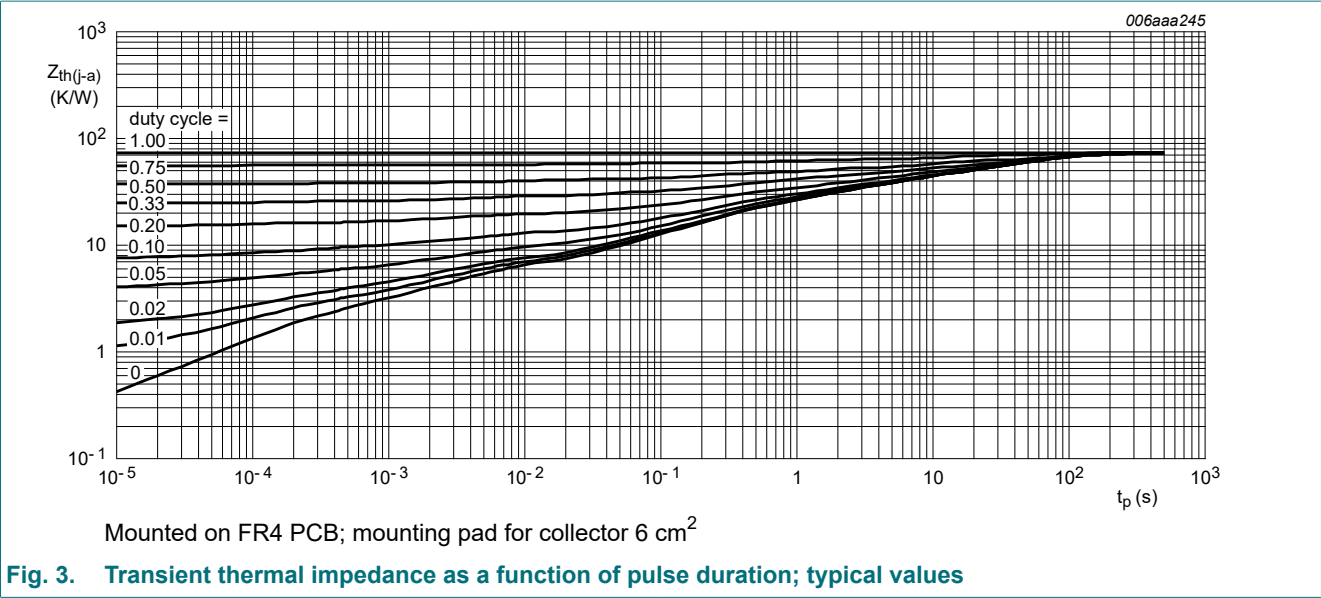


Fig. 2. Transient thermal impedance as a function of pulse duration; typical values



10. Characteristics

Table 7. Characteristics

| Symbol        | Parameter                               | Conditions                                                                                                                                           | Min | Typ | Max  | Unit          |
|---------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| $V_{(BR)CBO}$ | collector-base breakdown voltage        | $I_C = -100\text{ }\mu\text{A}$ ; $I_E = 0\text{ A}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                          | -50 | -   | -    | V             |
| $V_{(BR)CEO}$ | collector-emitter breakdown voltage     | $I_C = -2\text{ mA}$ ; $I_B = 0\text{ A}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                     | -50 | -   | -    | V             |
| $V_{(BR)EBO}$ | emitter-base breakdown voltage          | $I_E = -100\text{ }\mu\text{A}$ ; $I_C = 0\text{ A}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                          | -5  | -   | -    | V             |
| $I_{CBO}$     | collector-base cut-off current          | $V_{CB} = -50\text{ V}$ ; $I_E = 0\text{ A}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                  | -   | -   | -100 | nA            |
|               |                                         | $V_{CB} = -50\text{ V}$ ; $I_E = 0\text{ A}$ ; $T_j = 150\text{ }^\circ\text{C}$                                                                     | -   | -   | -50  | $\mu\text{A}$ |
| $I_{CES}$     | collector-emitter cut-off current       | $V_{CE} = -50\text{ V}$ ; $V_{BE} = 0\text{ V}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                               | -   | -   | -100 | nA            |
| $I_{EBO}$     | emitter-base cut-off current            | $V_{EB} = -5\text{ V}$ ; $I_C = 0\text{ A}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                   | -   | -   | -100 | nA            |
| $h_{FE}$      | DC current gain                         | $V_{CE} = -2\text{ V}$ ; $I_C = -0.1\text{ A}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                | 200 | -   | -    |               |
|               |                                         | $V_{CE} = -2\text{ V}$ ; $I_C = -0.5\text{ A}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                | 200 | -   | -    |               |
|               |                                         | $V_{CE} = -2\text{ V}$ ; $I_C = -1\text{ A}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ }^\circ\text{C}$ | 200 | -   | -    |               |
|               |                                         | $V_{CE} = -2\text{ V}$ ; $I_C = -2\text{ A}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ }^\circ\text{C}$ | 100 | -   | -    |               |
| $V_{CEsat}$   | collector-emitter saturation voltage    | $I_C = -0.5\text{ A}$ ; $I_B = -50\text{ mA}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                 | -   | -   | -90  | mV            |
|               |                                         | $I_C = -1\text{ A}$ ; $I_B = -50\text{ mA}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                   | -   | -   | -250 | mV            |
|               |                                         | $I_C = -2\text{ A}$ ; $I_B = -100\text{ mA}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                  | -   | -   | -380 | mV            |
|               |                                         | $I_C = -2\text{ A}$ ; $I_B = -200\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ }^\circ\text{C}$ | -   | -   | -320 | mV            |
| $R_{CEsat}$   | collector-emitter saturation resistance |                                                                                                                                                      | -   | -   | 160  | m $\Omega$    |
| $V_{BEsat}$   | base-emitter saturation voltage         | $I_C = -2\text{ A}$ ; $I_B = -100\text{ mA}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                  | -   | -   | -1.1 | V             |
| $V_{BEon}$    | base-emitter turn-on voltage            | $V_{CE} = -2\text{ V}$ ; $I_C = -1\text{ A}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$                                                                  | -   | -   | -1.1 | V             |



13. Soldering

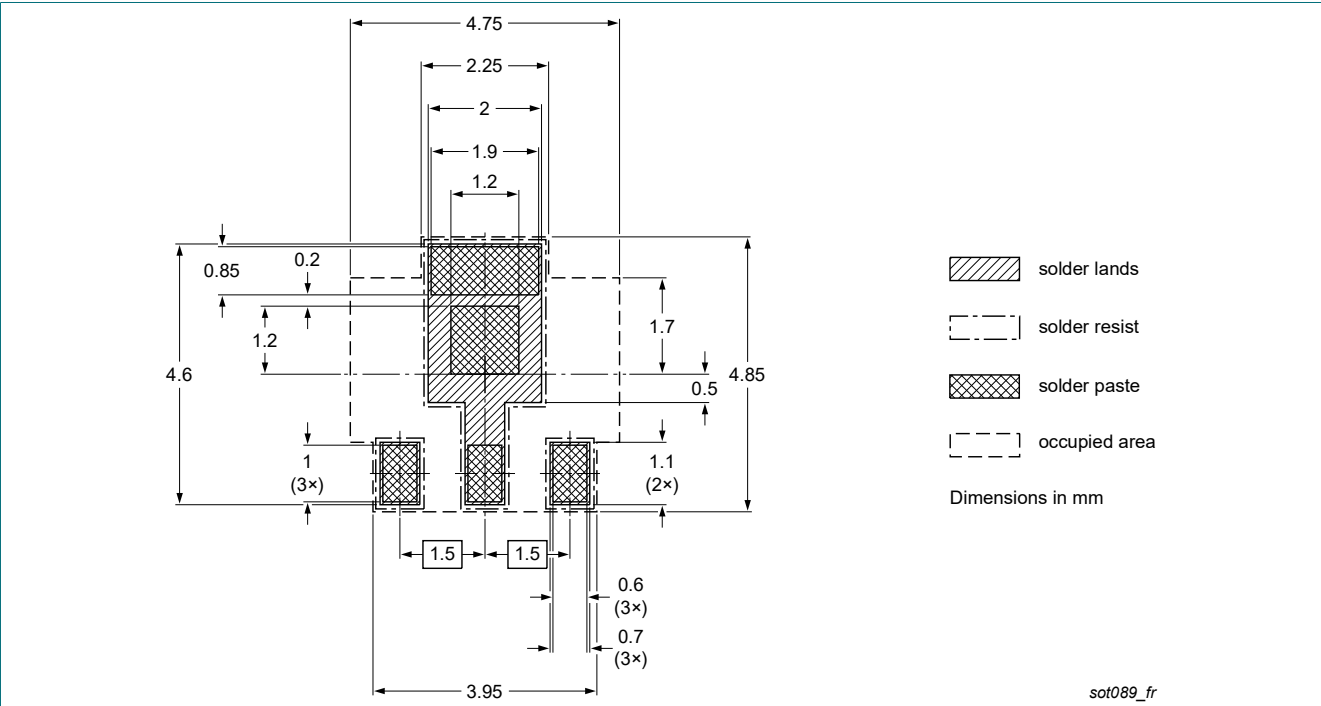


Fig. 5. Reflow soldering footprint for SOT89

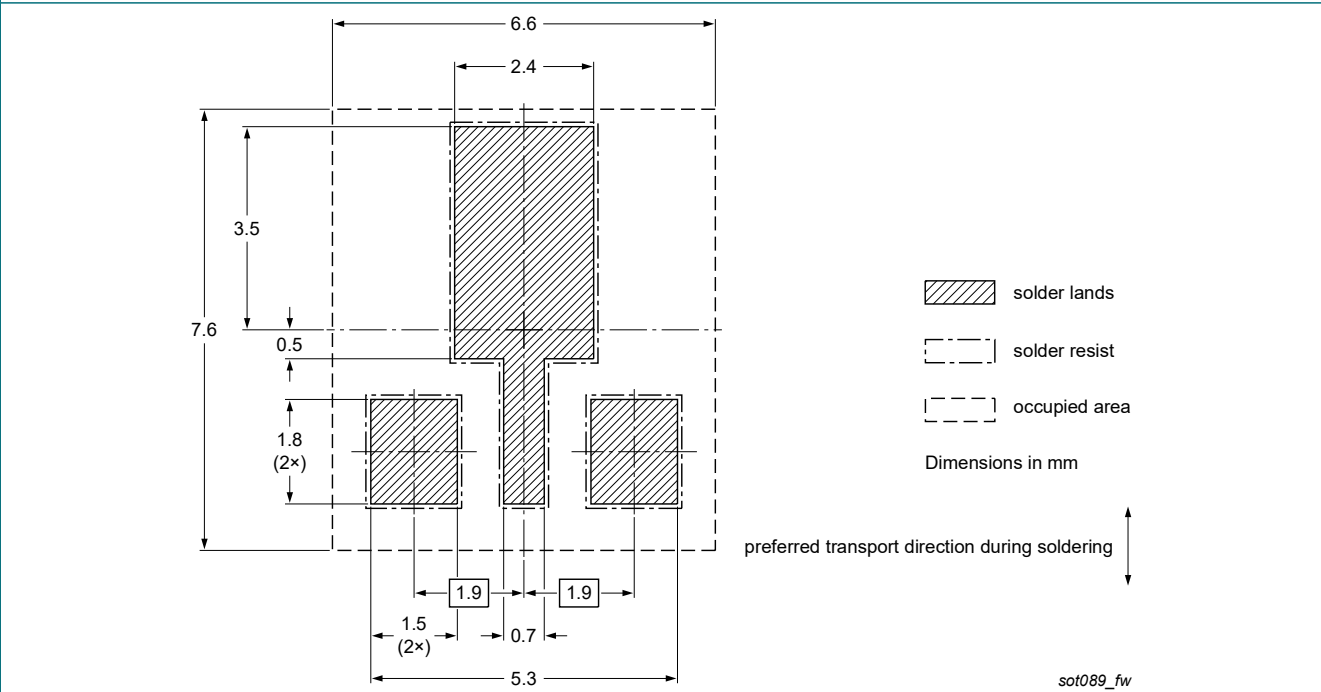


Fig. 6. Wave soldering footprint for SOT89

14. Revision history

Table 8. Revision history

| Data sheet ID  | Release date                                                             | Data sheet status     | Change notice | Supersedes    |
|----------------|--------------------------------------------------------------------------|-----------------------|---------------|---------------|
| PBSS5250X v.4  | 20260202                                                                 | Product data sheet    | -             | PBSS5250X v.3 |
| Modifications: | • Characteristics: Typo corrected at $V_{BEon}$ : value moved to maximum |                       |               |               |
| PBSS5250X v.3  | 20230424                                                                 | Product data sheet    | -             | PBSS5250X v.2 |
| PBSS5250X v.2  | 20041104                                                                 | Product data sheet    | -             | PBSS5250X v.1 |
| PBSS5250X v.1  | 20030617                                                                 | Product specification | -             | -             |

## 15. Legal information

### Data sheet status

| Document status [1][2]         | Product status [3] | Definition                                                                            |
|--------------------------------|--------------------|---------------------------------------------------------------------------------------|
| Objective [short] data sheet   | Development        | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification      | This document contains data from the preliminary specification.                       |
| Product [short] data sheet     | Production         | This document contains the product specification.                                     |

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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