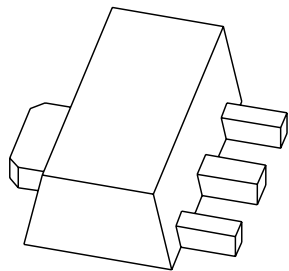


# DATA SHEET



**PBSS5250X**

50 V, 2 A

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

Objective specification

2003 Jun 17

# 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

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

### MARKING

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PBSS5250X	*1L

### Note

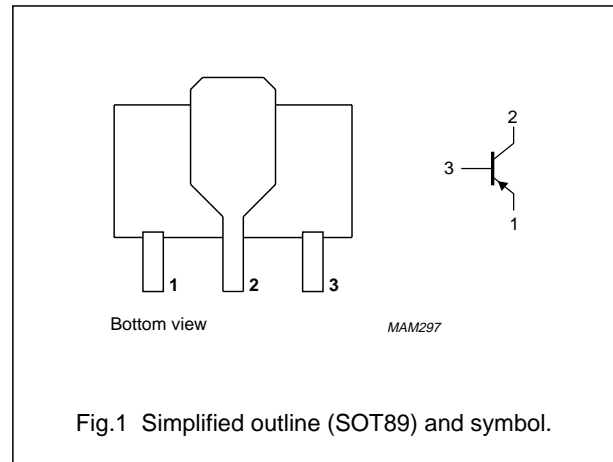
- \* = p : made in Hong Kong  
\* = t : made in Malaysia  
\* = W : made in China.

### 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 $\Omega$

### PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base



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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	–	–50	V
$V_{CEO}$	collector-emitter voltage	open base	–	–50	V
$V_{EBO}$	emitter-base voltage	open collector	–	–5	V
$I_C$	continuous collector current (DC)		–	–2	A
$I_{CM}$	peak collector current	$T_{j\ max}$	–	–5	A
$I_B$	continuous base current (DC)		–	–0.5	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\ ^\circ\text{C}$ note 1 note 2	– –	550 1	mW W
$T_j$	junction temperature		–	150	$^\circ\text{C}$
$T_{amb}$	operating ambient temperature		–65	+150	$^\circ\text{C}$
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$

**Notes**

1. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; standard footprint.
2. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; mounting pad for collector 1 cm<sup>2</sup>.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air note 1 note 2	225 125	K/W 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; tinplated; standard footprint.
2. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; mounting pad for collector 1 cm<sup>2</sup>.

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$V_{CB} = -50\text{ V}; I_E = 0$	–	–100	nA
		$V_{CB} = -50\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–50	$\mu\text{A}$
$I_{CES}$	collector cut-off current	$V_{CE} = -50\text{ V}; V_{BE} = 0$	–	–100	nA
$I_{EBO}$	emitter cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	–	–100	nA
$h_{FE}$	DC current gain	$V_{CE} = -2\text{ V}$			
		$I_C = -0.1\text{ A}$	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	$V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	35	pF

**Note**

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

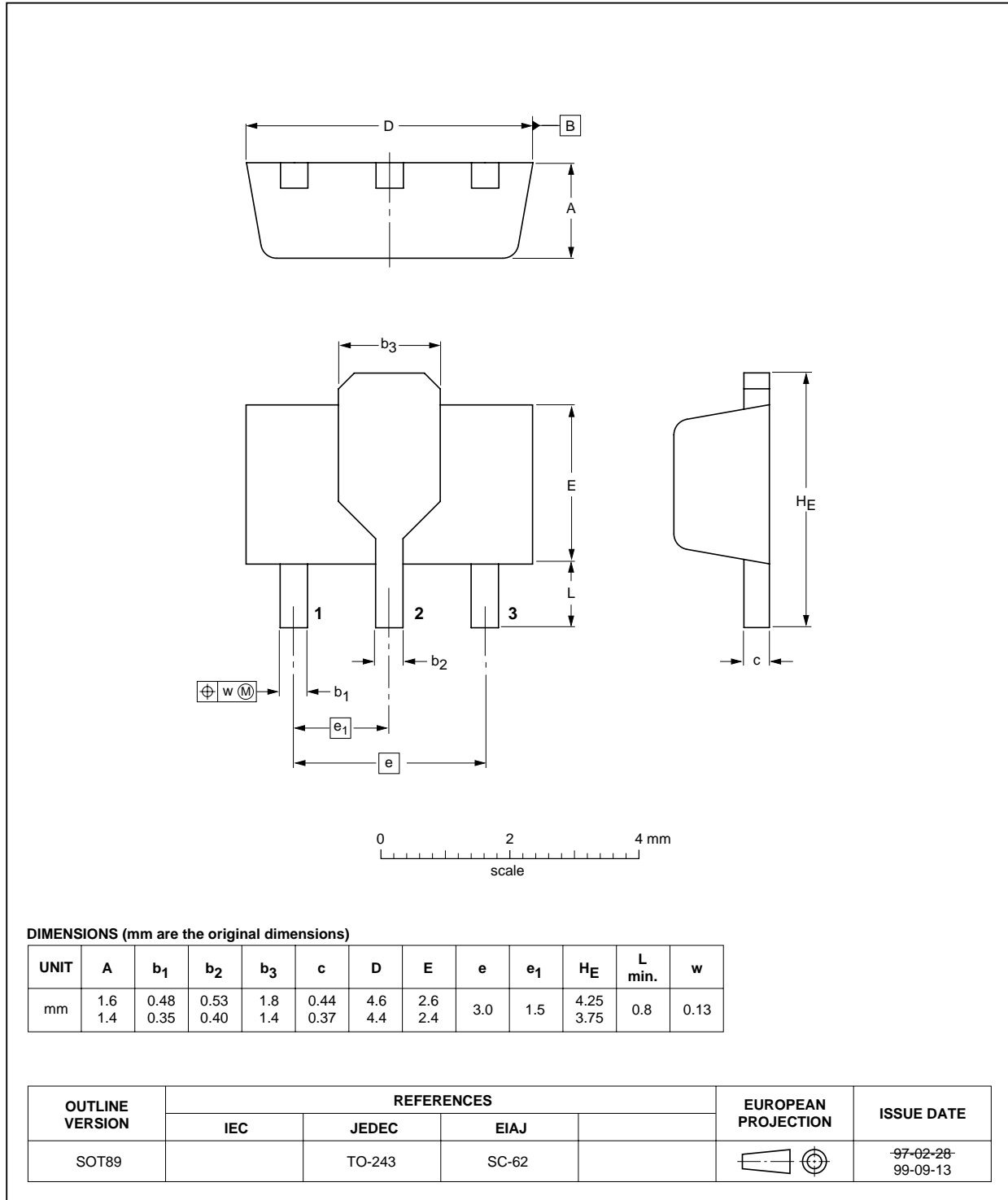
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PACKAGE OUTLINE

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

SOT89



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## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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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PBSS5250X

**NOTES**

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