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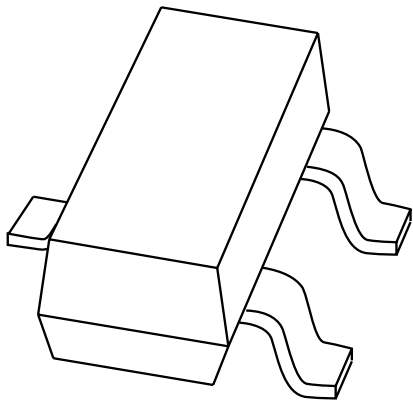
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Kind regards,

Team Nexperia

# DATA SHEET



**PBSS5220T**

20 V, 2 A

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

Product data sheet

2003 Dec 18

**20 V, 2 A**  
**PNP low  $V_{CEsat}$  (BISS) transistor**

**PBSS5220T**

**FEATURES**

- 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
- Cost effective alternative to MOSFETs in specific applications.

**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 BISS transistor in a SOT23 plastic package offering ultra low  $V_{CEsat}$  and  $R_{CEsat}$  parameters.

**MARKING**

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PBSS5230T	3F*

**Note**

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

**ORDERING INFORMATION**

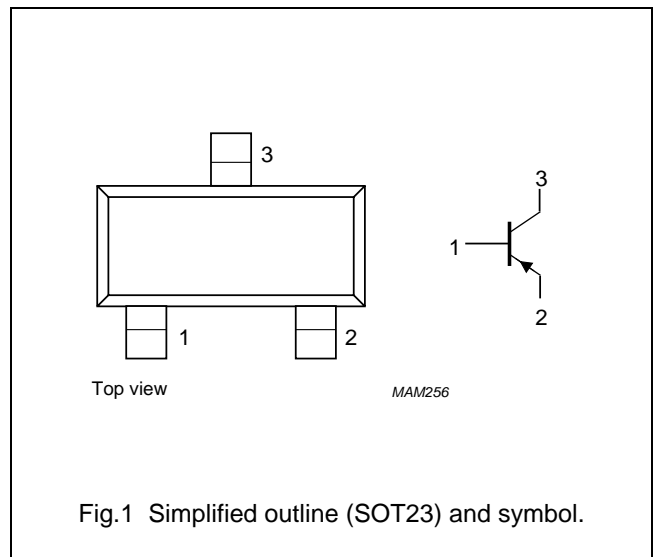
TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PBSS5220T	–	plastic surface mounted package; 3 leads	SOT23

**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	MAX.	UNIT
$V_{CEO}$	collector-emitter voltage	–20	V
$I_C$	collector current (DC)	–2	A
$I_{CM}$	peak collector current	–3	A
$R_{CEsat}$	equivalent on-resistance	113	m $\Omega$

**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	–	–20	V
$V_{CEO}$	collector-emitter voltage	open base	–	–20	V
$V_{EBO}$	emitter-base voltage	open collector	–	–5	V
$I_C$	collector current (DC)		–	–2	A
$I_{CM}$	peak collector current	single peak	–	–3	A
$I_B$	base current (DC)		–	–300	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; note 1	–	300	mW
		$T_{amb} \leq 25\text{ °C}$ ; note 2	–	480	mW
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C
$T_{stg}$	storage temperature		–65	+150	°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	417	K/W
		in free air; note 2	260	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** $T_{amb} = 25\text{ °C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -20\text{ V}; I_E = 0$	–	–	–100	nA
		$V_{CB} = -20\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–	–50	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	–	–	–100	nA
$h_{FE}$	DC current gain	$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}$	225	–	–	
		$V_{CE} = -2\text{ V}; I_C = -500\text{ mA}$	225	–	–	
		$V_{CE} = -2\text{ V}; I_C = -1\text{ A}; \text{note 1}$	200	–	–	
		$V_{CE} = -2\text{ V}; I_C = -2\text{ A}; \text{note 1}$	150	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -500\text{ mA}; I_B = -50\text{ mA}$	–	–	–80	mV
		$I_C = -1\text{ A}; I_B = -50\text{ mA}$	–	–	–150	mV
		$I_C = -2\text{ A}; I_B = -100\text{ mA}; \text{note 1}$	–	–	–250	mV
		$I_C = -2\text{ A}; I_B = -200\text{ mA}; \text{note 1}$	–	–	–225	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = -2\text{ A}; I_B = -200\text{ mA}; \text{note 1}$	–	–	113	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -2\text{ A}; I_B = -100\text{ mA}; \text{note 1}$	–	–	–1.1	V
$V_{BEon}$	base-emitter turn on voltage	$V_{CE} = -2\text{ V}; I_C = -1\text{ A}; \text{note 1}$	–1.2	–	–	V
$f_T$	transition frequency	$V_{CE} = -5\text{ V}; I_C = -100\text{ mA}; f = 100\text{ MHz}$	100	–	–	MHz
$C_c$	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	–	50	pF

**Note**

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

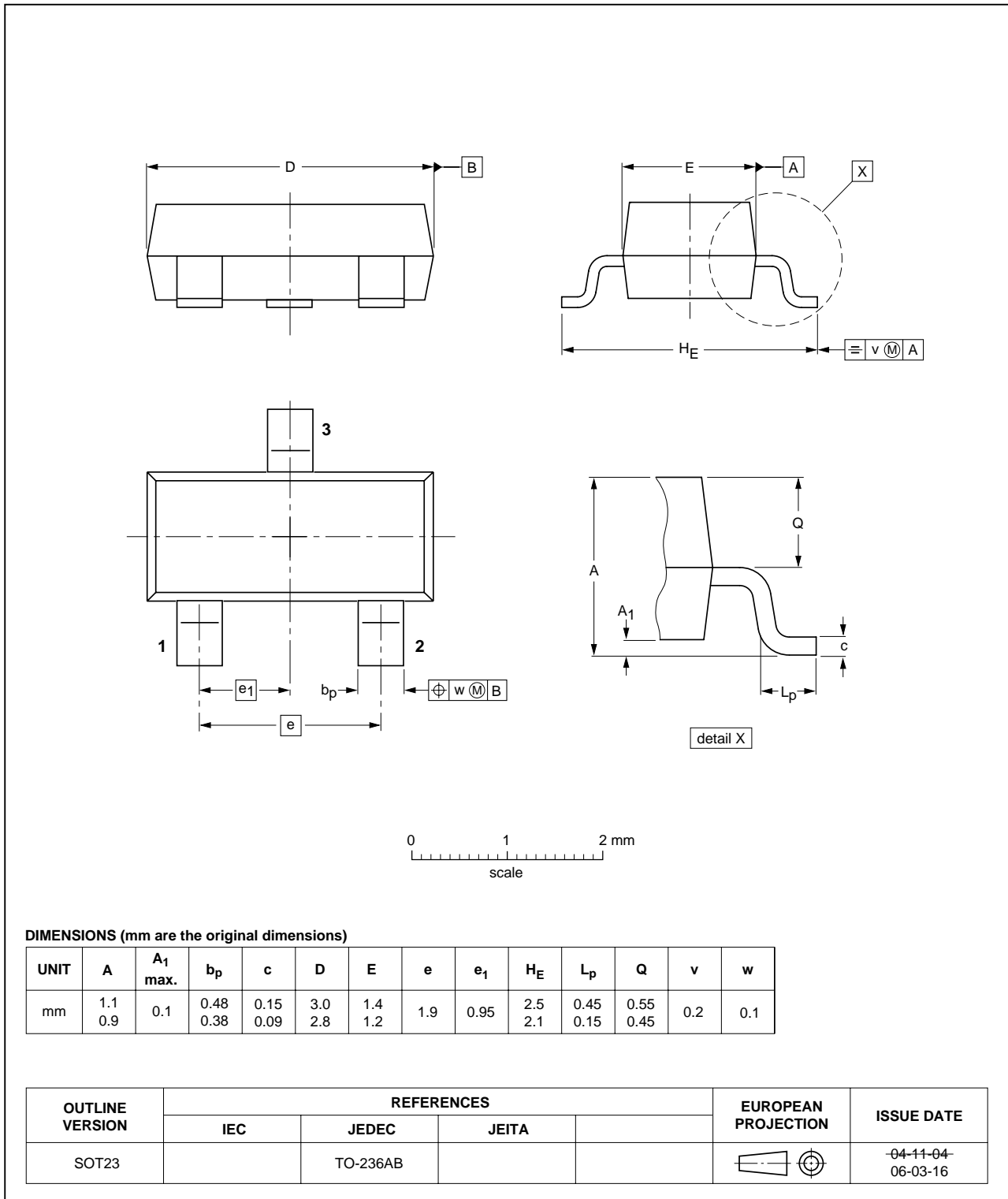
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PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



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PBSS5220T

**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.

**Notes**

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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>

For sales offices addresses send e-mail to: [salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)

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