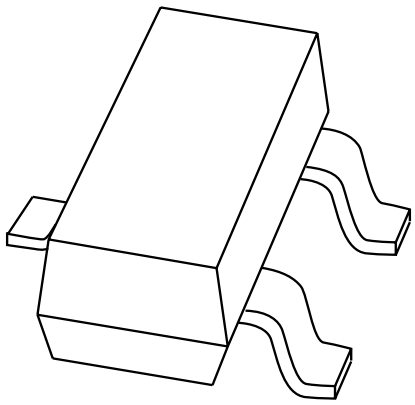
DATA SHEET



PBSS5220T

20 V, 2 A

PNP low V_{CEsat} (BISS) transistor

Product specification

2003 Dec 18

Philips
Semiconductors

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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(1)
PBSS5230T	3F*

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	–20	V
I_C	collector current (DC)	–2	A
I_{CM}	peak collector current	–3	A
R_{CEsat}	equivalent on-resistance	113	mΩ

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

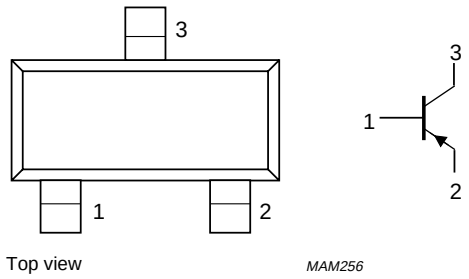


Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

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

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	$T_{amb} \leq 25$ °C; note 1	–	300	mW
		$T_{amb} \leq 25$ °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^2.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	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^2.

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified

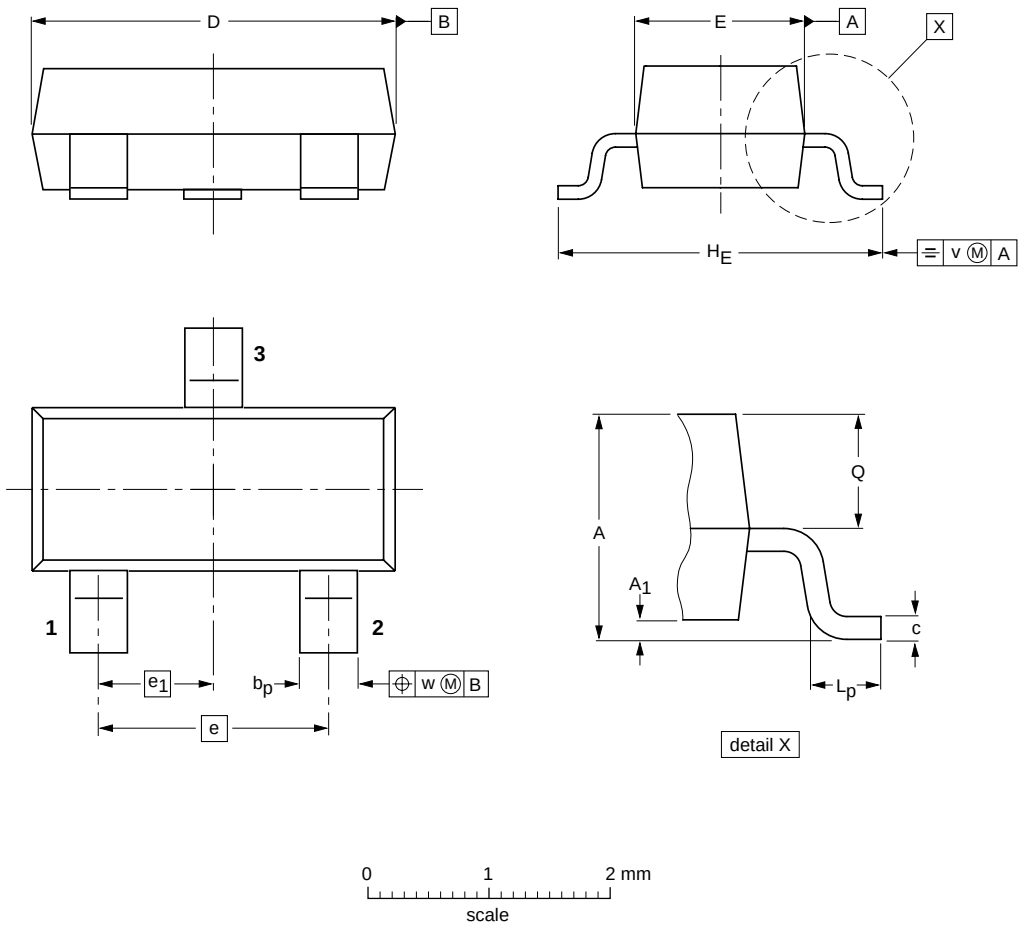
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = –20 V; I_E = 0	–	–	–100	nA
		V_{CB} = –20 V; I_E = 0; T_j = 150 °C	–	–	–50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = –5 V; I_C = 0	–	–	–100	nA
h_{FE}	DC current gain	V_{CE} = –2 V; I_C = –100 mA	225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

Note

1. Pulse test: $t_p \leq 300$ µs, $\delta \leq 0.02$.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23		TO-236AB				~~97-02-28~~ 99-09-13

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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III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

Notes

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

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

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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